START

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Vol. 1105 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

August 1, 1989

Route to:

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Office

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
August 1, 1989 Volume 1105 Number 1

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THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
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GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1101 O.G. 56 on Apr. 25, 1989.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 80 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	550.00
—Corresponding prior U.S. national application filed:	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority.	400.00
—Additional examination fee, per additional invention	130.00
—Searching Authority not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee:	436.00
Basic Supplemental fee (for each page over 30) :	9.00
Designation fee per country or region for the first 10 national or regional offices:	106.00
Designation fee for 11th and subsequent designations :	No Charge
Handling fee:	134.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	165.00	330.00
USPTO was ISA but no IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

May 3, 1989. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on July 29, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,602,384 through 4,603,438
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on July 27, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,340,976 through 4,342,120
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant..... $495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small entity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MAY 14, 1989
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,516,275	06/320,603	05/14/85
4,516,283	06/588,294	05/14/85
4,516,284	06/481,643	05/14/85
4,516,285	06/522,008	05/14/85
4,516,293	06/488,057	05/14/85
4,516,297	06/516,605	05/14/85
4,516,299	06/493,119	05/14/85
4,516,301	06/439,928	05/14/85
4,516,303	06/475,906	05/14/85
4,516,334	06/539,979	05/14/85
4,516,347	06/559,694	05/14/85
4,516,348	06/522,855	05/14/85
4,516,350	06/514,794	05/14/85
4,516,354	06/552,250	05/14/85
4,516,363	06/487,693	05/14/85
4,516,370	06/464,554	05/14/85
4,516,377	06/459,041	05/14/85
4,516,383	06/535,060	05/14/85
4,516,387	06/364,075	05/14/85
4,516,389	06/646,460	05/14/85
4,516,399	06/543,530	05/14/85
4,516,401	06/548,709	05/14/85
4,516,402	06/499,286	05/14/85
4,516,404	06/595,201	05/14/85
4,516,406	06/468,077	05/14/85
4,516,409	06/605,919	05/14/85
4,516,414	06/482,183	05/14/85
4,516,418	06/427,554	05/14/85
4,516,421	06/417,337	05/14/85
4,516,422	06/504,402	05/14/85
4,516,427	06/498,349	05/14/85
4,516,442	06/337,415	05/14/85
4,516,445	06/511,228	05/14/85
4,516,449	06/558,390	05/14/85
4,516,456	06/508,862	05/14/85
4,516,458	06/404,537	05/14/85
4,516,464	06/440,798	05/14/85
4,516,477	06/535,748	05/14/85
4,516,483	06/477,107	05/14/85
4,516,484	06/593,039	05/14/85
4,516,486	06/506,130	05/14/85
4,516,489	06/391,581	05/14/85
4,516,492	06/539,948	05/14/85
4,516,493	06/587,555	05/14/85
4,516,499	06/509,577	05/14/85
4,516,500	06/482,397	05/14/85
4,516,501	06/253,552	05/14/85
4,516,518	06/511,988	05/14/85
4,516,523	06/562,227	05/14/85
4,516,536	06/261,248	05/14/85
4,516,541	06/511,581	05/14/85
4,516,545	06/598,041	05/14/85
4,516,568	06/516,111	05/14/85
4,516,574	06/485,667	05/14/85
4,516,580	06/335,391	05/14/85
4,516,586	06/496,714	05/14/85
4,516,587	06/496,859	05/14/85
4,516,613	06/559,816	05/14/85
4,516,614	06/500,887	05/14/85
4,516,616	06/573,595	05/14/85
4,516,620	06/473,669	05/14/85
4,516,622	06/404,502	05/14/85
4,516,631	06/564,662	05/14/85
4,516,639	06/479,606	05/14/85
4,516,657	06/428,073	05/14/85
4,516,667	06/517,068	05/14/85
4,516,670	06/427,775	05/14/85
4,516,677	06/560,501	05/14/85
4,516,682	06/488,775	05/14/85
4,516,685	06/483,205	05/14/85
4,516,697	06/421,545	05/14/85
4,516,698	06/463,135	05/14/85
4,516,702	06/447,154	05/14/85
4,516,706	06/519,976	05/14/85
4,516,707	06/583,444	05/14/85
4,516,712	06/480,891	05/14/85
4,516,723	06/412,097	05/14/85
4,516,730	06/491,640	05/14/85
4,516.742	06/491,935	05/14/85
4,516,743	06/486,127	05/14/85
4,516,744	06/444,196	05/14/85
4,516,756	06/503,620	05/14/85
4,516,757	06/329,050	05/14/85
4,516,768	06/424,079	05/14/85
4,516,772	06/466,098	05/14/85
4.516,773	06/434,757	05/14/85
4,516,774	06/499,937	05/14/85

Patent Number	Serial Number	Issue Date
4,516,776	06/521,038	05/14/85
4,516,777	06/553,540	05/14/85
4,516,779	06/478,165	05/14/85
4,516,784	06/639,209	05/14/85
4,516,786	06/473,240	05/14/85
4,516,788	06/532,030	05/14/85
4,516,789	06/423,668	05/14/85
4,516,796	06/479,684	05/14/85
4,516,800	06/474,568	05/14/85
4,516,801	06/562,264	05/14/85
4,516,802	06/446,260	05/14/85
4,516,803	06/489,817	05/14/85
4,516,810	06/550,426	05/14/85
4,516,812	06/621,067	05/14/85
4,516,838	06/536,005	05/14/85
4,516,842	06/490,436	05/14/85
4,516,854	06/326,857	05/14/85
4,516,857	06/374,701	05/14/85
4,516,868	06/383,094	05/14/85
4,516,872	06/556,116	05/14/85
4,516,873	06/482,470	05/14/85
4,516,878	06/425,200	05/14/85
4,516,883	06/481,400	05/14/85
4,516,888	06/466,895	05/14/85
4,516,892	06/490,961	05/14/85
4,516,894	06/355,585	05/14/85
4,516,896	06/419,051	05/14/85
4,516,899	06/432,864	05/14/85
4,516,903	06/466,974	05/14/85
4,516,907	06/475,219	05/14/85
4,516,911	06/566,831	05/14/85
4,516,926	06/513,252	05/14/85
4,516,930	06/431,341	05/14/85
4,516,933	06/612,232	05/14/85
4,516,935	06/517,358	05/14/85
4,516,940	06/379,450	05/14/85
4,516,958	06/548,450	05/14/85
4,516,959	06/466,523	05/14/85
4,516,962	06/561,189	05/14/85
4,516,976	06/504,026	05/14/85
4,516,980	06/506,031	05/14/85
4,516,987	06/515,591	05/14/85
4,517,020	06/549,771	05/14/85
4,517,025	06/379,108	05/14/85
4,517,049	06/391,095	05/14/85
4,517,063	06/579,255	05/14/85
4,517,065	06/556,558	05/14/85
4,517,067	06/461,279	05/14/85
4,517,068	06/527,552	05/14/85
4,517,077	06/651,447	05/14/85
4,517,079	06/539,716	05/14/85
4,517,088	06/518,346	05/14/85
4,517,109	06/542,075	05/14/85
4,517,115	06/431,580	05/14/85
4,516,117	06/622,648	05/14/85
4,517,121	06/479,068	05/14/85
4,517,124	06/550,968	05/14/85
4,517,130	06/581,385	05/14/85
4,517,134	06/560,973	05/14/85
4,517,163	06/469,220	05/14/85
4,517,184	06/521,483	05/14/85
4,517,185	06/478,762	05/14/85
4,517,188	06/493,124	05/14/85
4,517,189	06/519,235	05/14/85
4,517,191	06/527,195	05/14/85
4,517,202	06/498,315	05/14/85
4,517,213	06/643,680	05/14/85
4,517,219	06/543,858	05/14/85
4,517,220	06/523,214	05/14/85
4,517,239	06/444,802	05/14/85
4,517,242	06/501,506	05/14/85
4,517,243	06/486,104	05/14/85
4,517,251	06/430,974	05/14/85
4,517,258	06/544,229	05/14/85
4,517,264	06/525,986	05/14/85
4,517,285	06/543,477	05/14/85
4,517,296	06/530,668	05/14/85
4,517,300	06/475,245	05/14/85
4,517,345	06/410,576	05/14/85
4,517,346	06/492,655	05/14/85
4,517,367	06/447,624	05/14/85
4,517,380	06/626,443	05/14/85
4,517,381	06/629,605	05/14/85
4,517,410	06/365,020	05/14/85
4,517,411	06/389,855	05/14/85
4,517,412	06/554,726	05/14/85
4,517,416	06/467,539	05/14/85
4,517,424	06/619,408	05/14/85
4,517,432	06/449,394	05/14/85
4,517,433	06/608,270	05/14/85
4,517,437	06/460,552	05/14/85
4,517,446	06/372,183	05/14/85
4,517,464	06/431,866	05/14/85
4,517,467	06/516,786	05/14/85
4,517,478	06/596,442	05/14/85
4,517,483	06/565,345	05/14/85
4,517,484	06/467,186	05/14/85
4,517,486	06/582,195	05/14/85
4,517,499	06/394,478	05/14/85
4,517,511	06/610,347	05/14/85
4,517,518	06/517,985	05/14/85
4,517,524	06/510,015	05/14/85
4,517,526	06/498,087	05/14/85
4,517,530	06/556,513	05/14/85
4,517,532	06/510,049	05/14/85
4,517,543	06/557,721	05/14/85
4,517,545	06/341,781	05/14/85
4,517,551	06/455,390	05/14/85
4,517,556	06/452,509	05/14/85
4,517,557	06/506,287	05/14/85
4,517,566	06/415,061	05/14/85
4,517,570	06/471,550	05/14/85
4,517,576	06/431,060	05/14/85
4,517,585	06/407,874	05/14/85
4,517,595	06/311,061	05/14/85
4,517,600	06/648,350	05/14/85
4,517,627	06/621,116	05/14/85
4,517,631	06/610,019	05/14/85
4,517,635	06/423,481	05/14/85
4,517,637	06/487,041	05/14/85
4,517,671	06/445,578	05/14/85
4,517,672	06/401,229	05/14/85
4,517,673	06/425,918	05/14/85
4,517,682	06/470,523	05/14/85

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41 (c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,426,860	06/281,701	1/24/84	7/09/81	6/29/89
4,455,045	06/314,735	6/19/84	10/26/81	6/29/89

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,431,187, Re. S. N. 365,951, Filed June 13, 1989, Cl. 273/80R, GOLF CLUB SHAFT, Joseph W. Rumble, et al., Owner of Record: *Brunswick Corp., Deland, Fla.*, Attorney or Agent: Arthur Greif, Ex. Gp.: 334

4,626,742, Re. S. N. 280,235, Filed Dec. 2, 1989, Cl. 313/503, PLUG-COMPATIBLE ELECTROLUMINESCENT LAMP, Richard W. Mental, Owner of Record: *Edward-Nordic Lite. Inc., Indianapolis, Ind.*, Attorney or Agent: Douglas W. Sprinkle, Ex. Gp.: 266

4,634,163, Re. S. N. 170,433, Filed Mar. 18, 1988, Cl. 293/117, APPARATUS FOR MOUNTING A TRAILER HITCH ON A VEHICLE, Donald E. Bundy, et al., Owner of Record: *Judd & Judd, Inc., Tulsa, Okla.*, Attorney or Agent: Lawerence W. Watson, Ex. Gp.: 312

4,636,077, Re. S. N. 296,721, Filed June 23, 1989, Cl. 356/356, ALIGNING EXPOSURE METHOD, Noboru Nomura, et al., Owner of Record: *Matsushita Electric Industrial Co., Osaka, Japan*, Attorney or Agent: Robert J. Frank, Ex, Gp.: 255

4,648,904, Re. S. N. 321,845, Filed Mar. 10, 1989, Cl. 106/2, AQUEOUS SYSTEM CONTAINING SILANES FOR RENDERING MASONARY SURFACES WATER REPELLANT, Ralph J. DePasquale, et al., Owner of Record: *PCR Inc., Gainsville, Fla.*, Attorney or Agent: Thomas J. Vetter, Ex. Gp.: 115

4,655,763, Re. S. N. 334,937, Filed Apr. 6, 1989, Cl. 604/404, TESTING AND DISPENSING APPARATUS FOR AN ENTERAL FEEDING SYSTEM, Alexander R. Malcolm, et al., Owner of Record: *Corpak, Inc., Wheeling, Ill.*, Attorney or Agent: Alan L. Barry, Ex. Gp.: 336

4,661,829, Re. S. N. 343,757, Filed Apr. 26, 1989, Cl. 357/30, DEVICE USING ORDERED SEMICONDUCTOR ALLOY, John C. Bean, et al., Owner of Record: *Bell Telephone Laboratories, Inc., Murry Hill, N. J.*, Attorney or Agent; Peter A. Businger, Ex. Gp.: 258

4,669,160, Re. S. N. 360,225, Filed June 1, 1989, Cl. 29/25.35, METHOD FOR PREPOLARIZING AND CENTERING A PIEZOELECTRIC CERAMIC SWITCHING DEVICE, John D. Harden, Jr., Owner of Record: *Inventor*, Attorney or Agent: Patrick G. Burns, Ex. Gp.: 326

4,678,957, Re. S. N. 360,228, Filed June 1, 1989, Cl. 310/332, PIEZOELECTRIC CERAMIC SWITCHING DEVICES AND SYSTEMS METHODS OF MAKING THE SAME, John D. Harden, Jr., et al., Owner of Record; *Inventor(s)*, Attorney or Agent: Patrick G. Burns, Ex. Gp.: 212

4,701,386, Re. S. N 367,471, Filed June 16, 1989, Cl. 429/179, BATTERY COMPRISING DUAL TERMINAL BUSHING, William H. Kump, et al., Owner of Record: *Inventor(s)*, Attorney or Agent: Charles H. Mottie, Ex. Gp.: 114

4,732,882, Re. S. N. 357,249, Filed May 26, 1989, Cl. 502/104, CATALYST COMPOSITION FOR POLYMERIZING ALPHA-OLEFINS, L. M. Allen, et al., Owner of Record: *Mobile Oil Corp., New York, N. Y.*, Attorney or Agent: Stanislaus Aksman, Ex. Gp.: 116

4,780,674, Re. S. N. 301,991, Filed Jan. 26, 1989, Cl. 324/309, PROCESS FOR IMAGING BY NUCLEAR MAGNETIC RESONANCE, Eric Brenton, et al., Owner of Record: *Thompson-CGR, Paris, France*, Attorney or Agent: Gregory J. Maier, Ex. Gp. 212

4,788,272, Re. S. N. 364,198, Filed June 9, 1989, Cl. 528/170, WHOLLY AROMATIC MESOMORPHIC POLYESTER AMIDE IMIDES AND THE PREPARATION THEREOF, Bernd Hisgen, et al., Owner of record: *BASF Aktiengeseilschaft Ludwingschafer, Fed. Republic of Germany*, Attorney or Agent; Cynthia L. Foulke, Ex. Gp.: 153

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be, constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,245,874, Reeexam. No. 90/001,794, Requested June 19, 1989, Cl. 339/149, FLEXIBLE CONNECTOR ASSEMBLY FOR TRACK LIGHTING SYSTEM, Walter F. Bishop, Owner of Record: *Cooper Industries, Inc., Houston Tex.*, Attorney or Agent: Spensley, Horn, Jubas, et al., Ex. Gp.: 320, Requester: Owner

4,445,741, Reeexam. No. 90/001,793, Requested June 20, 1989, Cl. 439/290, DOUBLE-PLUG SEISMIC CONNECTOR, Ira Annoot, Owner of Record: *Houston Geophysical Products, Inc., Houston, Tex.*, Attorney or Agent: Fulbright & Jaworski, Ex. Gp.: 320, Requester: Owner

4,481,273, Reexam. No. 90/001,792, Requested June 20, 1989, Cl. 235/61, ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER AND PREPARATION THEREOF, Kazuharu Katagiri, et al., Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Fitzpatrick, Cella, Harper, et al., Ex. Gp.: 210, Requester: Owner

4,512,098, Reexam. No. 90/001,791, Requested June 16, 1989, Cl. 40/610, SIGN FRAME AND METHOD FOR FACTORY INSTALLING FLEXIBLE SIGN FACING THEREON, Robert J. Ready, et al., Owner of Record: *LST Lighting System, Inc., Cincinnati, Ohio*, Attorney or Agent: Unknown, Ex. Gp.: 330, Requester: Frost & Jacobs, Cincinnati, Ohio

4,568,297, Reexam. No. 90/001,790, Requested June 14, 1989, Cl. 446/46, FLYING DISC, David B. Dunipace, Owner of Record: *Champion Discs, Inc., San Marino, Calif.*, Attorney or Agent: Unknown, Ex. Gp.: 330, Requester: S. J. Howle, Dallas, Tex.

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Parts 1 and 2
[Docket No. 90143-9144]
RIN 0651-AA35

Amendment of Patent and Trademark Rules concerning Judicial Review of Decisions of the Board of Patent Appeals and Interferences and the Trademark Trial and Appeal Board and other Miscellaneous Matters.

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, relating to (1) decisions of the Board of Patent Appeals and Interferences (BPAI), (2) requests for reconsideration of decisions of the BPAI and the Trademark Trial and Appeal Board (TTAB), (3) extensions of time in proceedings after a decision by the BPAI under §§ 1.196 and 1.197, (4) practices concerning judicial review of final decisions of the BPAI and TTAB, (5) extensions of time for seeking judicial review of BPAI and

TTAB decisions and (6) miscellaneous changes in the practice before the BPAI and housekeeping amendments.

Two recent decisions of the U.S. Court of Appeals for the Federal Circuit have held that even though the BPAI includes a new ground for rejection in its decision under 37 CFR § 1.196(b)(3), appellants may appeal directly to the Federal Circuit without first seeking reconsideration at the BPAI. Where judicial review is sought without requesting reconsideration, the arguments against the new ground of rejection are developed for the first time during court proceedings. The amendments require that appellants seek reconsideration of the new ground of rejection prior to appeal or commencement of a civil action.

Experience under the previous rules relating to judicial review of final board decisions indicated that the rules may have been confusing in certain respects relating to the time in which judicial review must be sought and the manner in which extensions of time for seeking judicial review may be obtained. The rules eliminate any confusion as to when judicial review must be sought and standardize the manner of obtaining extensions of time to seek judicial review.

The rules also make clarifying and housekeeping amendments with respect to practice before the BPAI.

Effective Date: August 20, 1989.

For Further Information Contact: Richard E. Schafer by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information:

Background

A notice of proposed rulemaking was published in the *Federal Register* at 54 Fed. Reg. 11009 (March 16, 1989) and at 1101 *Official Gazette* 6 (April 4, 1989). No oral hearing was held and no written comments were received.

Discussion of Specific Rules

(1) *Decisions of the BPAI and requests for reconsideration of BPAI and TTAB decisions*

Only final decisions of the BPAI and TTAB are subject to judicial review. 35 U.S.C. §§ 141, 145; U.S.C. § 1071; 28 U.S.C.§ 1295 (a)(4)(A) and (B).

Section 1.196(b) provides that if the BPAI has knowledge of any grounds, not involved in the appeal, for rejecting any appealed claim, it may include in its decision a statement to that effect. The statement then constitutes a new rejection of the claims. The previous rules permitted appellants to treat the decision as a final decision in the case and thus immediately appealable. 37 CFR § 1.196(b)(3) (1988). Therefore, when an appellant proceeded under this option, arguments against the new rejection were presented for the first time to the reviewing court.

A recent decision by the U.S. Court of Appeals for the Federal Circuit rejected the Commissioner's argument that an appellant should not be permitted to contest the BPAI's new ground for rejection because it had not requested reconsideration of that ground by the BPAI. *In re Evanega*, 829 F.2d 1110, 1113, 4 USPQ 2d 1249, 1252 (Fed. Cir. 1987). *See also In re Nielson*, 816 F.2d 1567, 1570, 2 USPQ 2d 1525, 1527 (Fed. Cir. 1987). In *Evanega*, the Commissioner urged that requiring appellants to request reconsideration, where the BPAI adopts a new ground for rejection, would provide the BPAI with an opportunity to consider appellant's arguments and correct any errors while the case was still in the PTO. This conserves judicial resources, and in any event, obtains the benefit of the BPAI's view should judicial review ultimately be sought. The court held, however, that in view of PTO regulations (37 CFR § 1.196(b)(3)) which "expressly provide that the board's decision, even if based on a new ground, is a final determination and thus may be appealed without seeking reconsideration," appellant could not be required to request reconsideration by the BPAI. *Id.*

The new rule changes eliminate 37 CFR § 1.196(b)(3). By removing § 1.196(b)(3), appellants no longer have the option of treating a new ground of rejection as final and immediately appealable. Appellants' options are limited to requesting remand to the examiner or requesting reconsideration by the BPAI as set forth in §§ 1.196(b)(1) and 1.196(b)(2). The preamble of § 1.196(b) has been amended to specifically recite that a new ground of rejection shall not be considered a final decision for judicial review.

Appellants still may elect further prosecution before the examiner under 37 CFR § 1.196(b)(1) or request reconsideration under § 1.196(b)(2). The option of § 1.196(b)(2) requires that any request for reconsideration address the new ground of rejection and specifically state the reasons why the new ground was in error. Section 1.196(b)(2) also provides that the BPAI will reconsider the new rejection and, if necessary, render a new decision. The decision on reconsideration will be deemed to incorporate the earlier decision except for any portions of the earlier decision specifically withdrawn.

Reconsideration or remand need not be requested if appellant does not contest the new ground. Appellants may seek judicial review as to claims not subject to the new ground.

Section 1.196(a) expressly provides for remands to the examiner for further consideration. The BPAI has inherent authority, as part of its role in reviewing standards of patentability applied in the PTO, to remand applications to the examiner for further consideration. *Cf.* Manual of Patent Examining Procedure (MPEP) §§ 1211 and 1212. The change merely makes express that which is inherent.

The amendments also delete the portion of former § 1.196(d) which provides (1) that any decision which includes a remand shall not be a final decision for the purposes of judicial review and (2) that upon conclusion of the proceedings on remand the BPAI may enter an order making its decision final. Those provisions have been included as new § 1.196(e). Under this paragraph, decisions pursuant to § 1.196(b) would not be final as to the claims subject to a new rejection.

The last sentence of former § 1.196(b)(1) has been deleted and placed in new § 1.196(e).

(2) *Requests for reconsideration of BPAI and TTAB decisions*

Section 1.197(b) provides that any request for reconsideration must specifically state the points believed to have been misapprehended or overlooked in the BPAI's decision. Experience has shown that many requests for reconsideration are nothing more than reargument of appellant's position on appeal. The provision, as adopted, limits requests to the points of law or fact which appellant feels were overlooked or misapprehended by the BPAI.

The amendments also clarify the exception found in the first sentence of § 1.197(b) by including specific references to the "original decision" and the "decision on reconsideration." Some confusion had been noted with respect to the meaning of the current language.

In order to simplify calculation of times for requesting reconsideration of the decisions of the boards, §§ 1.658(b), 2.129(c), and 2.144 specify a period of one month rather than the periods expressed in days. Section 1.197(a) already specified a one-month period.

(3) *Extensions of time after a decision by the BPAI to take action under §§1.196 and 1.197*

Appellants in patent cases may no longer use fee extensions under § 1.136(a) to extend the time for making an election under § 1.196(b) or seeking reconsideration under § 1.197.

Under previous rules appellants could request reconsideration of a BPAI decision up to five months after a decision or file a response to a new ground of rejection up to six months after the decision. This inordinately delayed final disposition of appeals. Section 1.136(a) provides that fee extensions are not available to file responses to a BPAI decision pursuant to §§ 1.196, 1.197 or 1.304. One month is deemed to be ample time to submit a request for reconsideration. Note that Fed. R. Civ. P. 59 provides 10 days and Fed. R. App. P. 40 provides 14 days for similar requests. Extensions under § 1.136(b) will be available to extend the time to file a response under §§ 1.196 and 1.197. Section 1.304(a) exclusively governs extensions of time to file a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action. See further discussion below.

Section 1.136(a) specifically refers to § 1.136(b) for extensions of time to file responses under §§ 1.196 and 1.197 and refers to § 1.304 for extensions of time to initiate judicial review. Sections 1.196(f) and 1.197(b) correlatively reference § 1.136(b) for extensions of time.

Fee extensions are not available to extend the time for electing further prosecution before the examiner under § 1.196(b)(1). Where an appellant elects further prosecution before the examiner, fee extensions under § 1.136(a) remain available to respond to the primary examiner's Office actions.

(4) *Time for seeking judicial review of decisions of the BPAI and TTAB*

Under previous rules, judicial review of final decisions of the BPAI or TTAB had to be sought within sixty days of the decision or thirty days after a decision on reconsideration. However, where a decision on reconsideration was, in effect, a new decision, it was not always clear whether the time for appeal was thirty or sixty days. Sections 1.304(a) and 2.146(d)(1) provide a two-month period to appeal from either the date of the decision or the decision on a timely filed request for reconsideration.

Some problems have been noted with respect to the time for seeking judicial review in days. Miscalculations of the statutory sixty-day time period have resulted in filing untimely requests for judicial review. In order to simplify calculation of the time for seeking judicial review, §§ 1.304(a) and 2.145(d)(1) specify two months. The two-month period meets the sixty-day requirement of 35 U.S.C. §§ 142, 145 and 146 and 15 U.S.C. §§ 1071(a)(2) and (b)(1) except for time periods which include February 28. In order to comply with the sixty-day requirement, §§ 1.304(b) and 2.145(d)(2) provide that an additional day shall be added to any two-month period for initiating judicial review which includes February 28. Appeals will always be timely if the judicial review is initiated within two months of the final decision.

Previously, the rules did not specify a time period for filing a cross-appeal or cross-action in *inter partes* cases. The absence of such a time period made it difficult for parties and their attorneys to make appropriate plans for judicial review. For example, in an interference where there has been a split judgment, one of the parties may be satisfied with the judgment but may desire to appeal the adverse judgment only if an appeal is noted by the other party. Where the appeal is filed on the last possible day, a cross-appeal is precluded. Sections 1.304(a) and 2.145(d)(1) specify that the time for filing a cross-appeal or commencing a cross-action expires (1) fourteen days after service of the notice of appeal or the summons and complaint or (2) two months after the decision to be reviewed, whichever is later.

Similarly, no provision for filing a cross-action was provided where an appellee elects to have further proceedings conducted in the district court pursuant to 35 U.S.C. § 146 or 15 U.S.C. § 1071(a)(1). Section 1.304(c) and 2.145(d)(3) provide that the time for filing a cross-action expires 14 days after service of the summons and complaint. The district court will determine whether any cross-action was timely filed since neither the complaint nor cross-action is filed in the PTO.

(5) *Extensions of time to seek judicial review*

In the past, standards for granting requests for extensions of time to take an appeal or commence a civil action varied depending upon which board was involved and upon the particular type proceeding before the board. For example, extensions relating to patent applications could be obtained by paying the appropriate fee under § 1.136(a). However, in reexamination proceedings or when judicial review was sought from a decision of the TTAB, the requester must demonstrate sufficient cause under § 1.550(c) or § 2.145(d)(1). The rules standardize the manner in which an extension of time to initiate judicial review may be obtained. The PTO has adopted a standard which is similar to the standard used in the Federal courts for granting extensions. Under the rules the Commissioner may extend the time (1) for good cause if requested before the expiration of the time provided for initiating judicial review or (2) upon a showing of excusable neglect in failing to initiate judicial review if requested after the expiration of the time period. This standard will be applicable in both trademark and patent proceedings (§§ 1.304(a) and 2.145(e)) once the "last" decision, i.e., either the decision (in circumstances where no timely reconsideration is sought) or the decision on reconsideration, of either board has been entered. In patent cases, extensions of time under § 1.136(b) and § 1.550(c) and fee extensions under 37 CFR § 1.136(a) are no longer available to extend the time for the purpose of judicial review once a decision or a decision on reconsideration has been entered. Section 1.304(a) states that the provisions of §§ 1.136 and 1.550(c) are not available to extend the time to initiate judicial review. Sections 1.136(a), 1.136(b), 1.191(d), 1.550(c), 1.645(a) and(b) refer to § 1.304 for extensions of time for seeking judicial review after a decision has been entered. Section 1.645(a) has been amended by (1) adding the introductory phrase "Except to extend the time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action," to the first sentence and (2) deleting the references to filing a notice of appeal or commencing a civil action in the second sentence.

In view of the amendments to §§ 1.197 and 1.304, relating to extensions of time to seek reconsideration or initiate judicial review, § 1.191(d) does not refer to §§ 1.196 and 1.197.

(6) *Miscellaneous amendments*

In the past, appellants could use fee extensions to delay the time for requesting an oral hearing at the BPAI. This delays final disposition of the appeal and causes administrative problems and duplication of effort due to the transfer of the appeal to the hearing docket. Section 1.191(d) no longer refers to § 1.194. Fee extensions are no longer available to extend the time for requesting an oral hearing. Extensions under § 1.136(b) are available to extend the time to request an oral hearing.

Section 1.191(b) has been rewritten as one sentence without any change in substance.

Some confusion has resulted as to who has jurisdiction over a patent application after a notice of appeal to the BPAI has been filed. Problems arose, for example, as to the appropriate PTO official to decide certain petitions and other matters after an appeal has been filed. MPEP § 1210 indicates that jurisdiction over the application normally passes at one of five possible times listed therein. Section 1.191 includes a new section (e) which provides that jurisdiction transfers to the BPAI when the application or reexamination file including all briefs and examiner's answers is transmitted to the BPAI. Thus, jurisdiction transfers to the BPAI when all written submissions by the applicant and the examiner have been entered and the application papers have been forwarded to the BPAI.

New paragraph 1.191(e) also includes a provision that the Commissioner, prior to the time the BPAI renders its decision, may *sua sponte* order that an application be remanded to the examiner for further consideration. This provision merely makes explicit the inherent authority of the Commissioner to direct and supervise the examination of patent applications.

Under previous rules there was some confusion as to when "termination of proceedings" occurs. Section 1.197(c) provides that proceedings are "terminated" when the Federal Circuit's mandate is received by the PTO or after the time for appeal from the judgment of the district court in a civil action under 35 U.S.C. § 145 has expired. The language "In such cases," in the second sentence of former § 1.197(c) has been eliminated since it was superfluous and may have been confusing.

The rules delete the phrase "that he or she elects" and substitutes "electing" therefor in §§ 1.304(c) and 2.145(c)(3), as amended. The amendment merely changes wording without any change in substance.

Section 1.196(b) changes the verb "make" to "makes" to conform the verb to the singular subject of the sentence.

Sections 1.301, 1.303, 2.145(a)(2) and 2.145(c)(3) no longer refer to transmittal of the certified list and certified copies of the notice of election to the U.S. Court of Appeals for the Federal Circuit under 35 U.S.C. § 141 or 15 U.S.C. § 1071(a)(1). These procedures are required by applicable statutes or Court Rules and are unnecessary in the PTO's regulations.

Sections 1.304(a), 1.304(c), 2.145(c)(3) and 2.145(d)(1) include a statement that the certificate of mailing provisions of § 1.8 are *not* applicable. No substantive change is involved since the inapplicability of § 1.8 is already stated in §§ 1.8(a)(2)(viii) and (ix).

Sections 1.304(b) and 2.145(d)(2) recite "Federal holiday in the District of Columbia" rather than "legal holiday." These changes merely conform the language of these sections with the language of 35 U.S.C. § 21(b) and 37 CFR § 1.7.

Section 2.145(c)(2) and (3) include changes in wording without any change in substance.

Other Considerations

These rules will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 350 et seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities [Regulatory Flexibility Act, Pub. L. 96-354]. The rule change requiring appellants to request reconsideration under the specific circumstances set forth is not expected to result in an increase of fees charged by attorneys and agents to entities, including small entities, since the rule change is intended to eliminate erroneous grounds for rejection prior to appeal and in some instances is expected to eliminate the need for appeal.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect to the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The PTO has also determined that this notice has no Federalism implications affecting the relationship between the national government and the states as outlined in Executive Order 12612.

The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR, Part 1:

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and record keeping requirements, Small businesses.

List of Subjects in 37 CFR, Part 2:

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons given in the preamble and pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. § 6, Parts 1 and 2 of Title 37 of the Code of Federal Regulations are amended as set forth below.

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.136 is revised to read as follows:

§ 1.136 Filing of timely responses with petition and fee for extension of time and extensions of time for cause.

(a) If an applicant is required to respond within a non-statutory or shortened statutory time period, applicant may respond up to four months after the time period set if a petition for an extension of time and the fee set in § 1.17 are filed prior to or with the response, unless (1) applicant is notified otherwise in an Office action, (2) the application is involved in an interference declared pursuant to § 1.611 or (3) the response is to a decision by the Board of Patent Appeals and Interferences pursuant to §§ 1.196, 1.197 or 1.304. The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See § 1.136(b) for extensions of time relating to proceedings pursuant to §§ 1.196 or 1.197, § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action, § 1.645 for extension of time in interference proceedings and § 1.550(c) for extension of time in reexamination proceedings.

(b) When a response with petition and fee for extension of time cannot be filed pursuant to paragraph (a) of this section, the time for response will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. In no case can any extension carry the date on which response to an Office action is due beyond the maximum time period set by statute or be granted when the provisions of paragraph (a) of this section are available. See § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action, § 1.645 for extension of time in interference proceedings and § 1.550(c) for extension of time in reexamination proceedings.

3. Section 1.191 is amended by revising paragraphs (b) and (d) and adding paragraph (e) to read as follows:

§ 1.191 Appeal to Board of Patent Appeals and Interferences

* * * * *

(b) The appeal in an application or reexamination proceeding must identify the rejected claim or claims appealed, and must be signed by the applicant, patent owner or duly authorized attorney or agent.

* * * * *

(d) The time periods set forth in §§ 1.191 through 1.193 are subject to the provisions of § 1.136 for patent applications or § 1.550(c) for reexamination proceedings. See §1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action.

(e) Jurisdiction over the application or patent under reexamination passes to the Board of Patent Appeals and Interferences upon transmittal of the file, including all briefs and examiner's answers, to the Board. Prior to the entry of a decision on the appeal, the Commissioner may *sua sponte* order the application remanded to the examiner.

4. Section 1.196 is amended by revising paragraphs (a), (b) and (d) and adding new paragraphs (e) and (f) to read as follows:

§1.196 Decision by the Board of Patent Appeals and Interferences

(a) The Board of Patent Appeals and Interferences, in its decision, may affirm or reverse the decision of the examiner in whole or in part on the grounds and on the claims specified by the examiner or remand the application to the examiner for further consideration. The affirmance of the rejection of a claim on any of the grounds specified constitutes a general affirmance of the decision of the examiner on that claim, except as to any ground specifically reversed.

(b) Should the Board of Patent Appeals and Interferences have knowledge of any grounds not involved in the appeal for rejecting any appealed claim, it may include in the decision a statement to that effect with its reasons for so holding, which statement shall constitute a new rejection of the claims. A new rejection shall not be considered final for the purpose of judicial review. When the Board of Patent Appeals and Interferences makes a new rejection of an appealed claim, the appellant may exercise either of the following two options with respect to the new ground:

(1) The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the examiner in which event the application will be remanded to the examiner. The statement shall be binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground for rejection stated in the decision. Should the examiner again reject the application the applicant may again appeal to the Board of Patent Appeals and Interferences.

(2) The appellant may have the case reconsidered under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. The request for reconsideration shall address the new ground for rejection and state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. Where request for such reconsideration is made the Board of Patent Appeals and Interferences shall reconsider the new ground for rejection and, if necessary, render a new decision which shall include all grounds upon which a patent is refused. The decision on reconsideration is deemed to incorporate the earlier decision, except for those portions specifically withdrawn on reconsideration, and is final for the purpose of judicial review.

* * * * *

(d) Although the Board of Patent Appeals and Interferences normally will confine its decision to a review of rejections made by the examiner, should it have knowledge of any grounds for rejecting any allowed claim it may include in its decision a recommended rejection of the claim and remand the case to the examiner. In such event, the Board shall set a period, not less than one month, within which the appellant may submit to the examiner an appropriate amendment, a showing of facts or reasons, or both, in order to avoid the grounds set forth in the recommendation of the Board of Patent Appeals and Interferences. The examiner shall be bound by the recommendation and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection. Should the examiner make the recommended rejection final the applicant may again appeal to the Board of Patent Appeals and Interferences.

(e) Whenever a decision of the Board of Patent Appeals and Interferences includes or allows a remand, that decision shall not be considered a final decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

(f) See § 1.136(b) for extensions of time to take action under this section.

5. Section 1.197 is amended by revising paragraphs (b) and (c) to read as follows:

§ 1.197 Action following decision

* * * * *

(b) A single request for reconsideration or modification of the decision may be made if filed within one month from the date of the original decision, unless the original decision is so modified by the decision on reconsideration as to become, in effect, a new decision, and the Board of Patent Appeals and Interferences so states. The request for reconsideration shall state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. See 37 CFR § 1.136(b) for extensions of time for seeking reconsideration.

(c) Termination of proceedings. Proceedings are considered terminated by the dismissal of an appeal or the failure to timely file an appeal to the court or a civil action (§ 1.304) except: (1) where claims stand allowed in an application or (2) where the nature of the decision requires further action by the examiner. The date of termination of proceedings is the date on which the appeal is dismissed or the date on which the time for appeal to the court or review by civil action (§ 1.304) expires. If an appeal to the court or a civil action has been filed, proceedings are considered terminated when the appeal or civil action is terminated. An appeal to the U.S. Court of Appeals for the Federal Circuit is terminated when the mandate is received by the Office. A civil action is terminated when the time to appeal the judgment expires.

6. Section 1.301 is revised to read as follows:

§ 1.301 Appeal to U.S. Court of Appeals for the *Federal Circuit.*

Any applicant or any owner of a patent involved in a reexamination proceeding dissatisfied with the decision of the Board of Patent Appeals and Interferences, and any party to an interference dissatisfied with the decision of the Board of Patent Appeals and Interferences, may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal: (a) In the Patent and Trademark Office file a written notice of appeal directed to the Commissioner (see §§ 1.302 and 1.304); and (b) in the Court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court.

7. Section 1.303 is amended by revising paragraph (c) to read as follows:

§ 1.303 Civil Action under 35 U.S.C. 145, 146, 306.

* * * * *

(c) If any adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an interference proceeding files notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (§ 1.302), that he or she elects to have all further proceedings conducted as provided in 35 U.S.C. 146. The notice of election must be served as provided in § 1.646.

8. Section 1.304 is revised to read as follows:

§1.304 Time for appeal or civil action.

(a) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (§ 1.302) or for commencing a civil action (§ 1.303) is two months from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time provided under § 1.197(b) or § 1.658, the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In interferences, the time for filing a cross-appeal or cross-action expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months after the date of decision of the Board of Patent Appeals and Interferences, whichever is later. The time periods set forth in this section are not subject to the provisions of § 1.136, 1.550(c) or 1.645(a) or (b). The Commissioner may extend the time for filing an appeal or commencing a civil action (1) for good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action, or (2) upon written request after the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect. The

certificate of mailing practice of § 1.8 is not available for filing a notice of appeal or cross-appeal. See § 1.8(a)(2)(ix).

(b) The times specified in this section in days are calendar days. The times specified herein in months are calendar months except that one day shall be added to any two-month period which includes February 28. If the last day of the time specified for appeal of commencing a civil action falls on a Saturday, Sunday or Federal holiday in the District of Columbia, the time is extended to the next day which is neither a Saturday, Sunday nor a Federal holiday.

(c) If a defeated party to an interference has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under 35 U.S.C. 141 electing to have all further proceedings conducted under 35 U.S.C. 146 (§ 1.303(c)), the time for filing a civil action thereafter is specified in 35 U.S.C. 141. The time for filing a cross-action expires 14 days after service of the summons and complaint. The certificate of mailing practice of § 1.8 is not available for filing a notice of appeal of cross-appeal. See § 1.8(a)(2)(viii).

9. Section 1.550 is amended by revising paragraph (c) to read as follows:

§ 1.550 Conduct of reexamination proceedings

* * * * *

(c) The time for taking any action by a patent owner in a reexamination proceeding will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the patent owner is due, but in no case will the mere filing of the request effect any extension. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action.

* * * * *

10. Section 1.645 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1.645 Extension of time, late papers, stay of proceedings

(a) Except to extend the time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action, a party may file a motion (§ 1.635) seeking an extension of time to take action in an interference. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action. The motion shall be filed within sufficient time to actually reach the examiner-in-chief before expiration of the time for taking action. A moving party should not assume that the motion will be granted even if there is no objection by any other party. The motion will be denied unless the moving party shows good cause why an extension should be granted. The press of other business arising after an examiner-in-chief sets a time for taking action will not normally constitute good cause. A motion seeking additional time to take testimony because a party has not been able to procure the testimony of a witness shall set forth the name of the witness, any steps taken to procure the testimony of the witness, the dates on which the steps were taken, and the facts expected to be proven through the witness.

(b) Any paper belatedly filed, will not be considered except upon motion (§ 1.635) which shows sufficient cause why the paper was not timely filed. See § 1.304(a) for exclusive procedures relating to belated filing of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or belated commencement of a civil action.

* * * * *

11. Section 1.658 is amended by revising paragraph (b) to read as follows:

§ 1.658 Final Decision

* * * * *

(b) Any request for reconsideration of a decision under paragraph (a) of this section shall be filed within one month after the date of the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. Any reply to a request for reconsideration shall be filed within 14 days of the date of service of the request for reconsideration. Where reasonably possible, service of the request for reconsideration shall be such that delivery is accomplished by hand or "Express Mail." The Board shall enter a decision on the request for reconsideration. If the Board shall be of the opinion that the decision on the request for reconsideration significantly modifies its original decision under paragraph (a) of this section, the Board may designate the decision on the request for reconsideration as a new decision.

* * * * *

PART 2 - RULES OF PRACTICE IN TRADEMARK CASES

12. The authority citation for 37 CFR Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

13. Section 2.129 is amended by revising paragraph (c) to read as follows:

§ 2.129 Oral argument; reconsideration

* * * * *

(c) Any request for rehearing or reconsideration or modification of a decision issued after final hearing must be filed within one month from the date of the decision. A brief in response must be filed within fifteen days from the date of service of the request. The times specified may be extended by order of the Trademark Trial and Appeal Board on motion for good cause.

14. Section 2.144 is revised to read as follows:

§ 2.144 Reconsideration of decision on ex parte appeal

Any request for rehearing or reconsideration, or modification of the decision, must be filed within one month from the date of the decision. Such time may be extended by the Trademark Trial and Appeal Board upon a showing of sufficient cause.

15. Section 2.145 is amended by revising paragraphs (a), (c)(2), (c)(3), (d)(1), (d)(2) and (d)(3) and adding new paragraph (e) to read as follows:

§ 2.145 Appeal to court and civil action.

(a) Appeal to U.S. Court of Appeals for the Federal Circuit. An applicant for registration, or any party to an interference, opposition, or cancellation proceeding or any party to an application to register as a concurrent user, hereinafter referred to as inter partes proceedings, who is dissatisfied with the decision of the Trademark Trial and Appeal Board and any registrant who has filed an affidavit or declaration under section 8 of the Act or who has filed an application for renewal and is dissatisfied with the decision of the Commissioner (§§ 2.165, 2.184), may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal:

(1) In the Patent and Trademark Office give written notice of appeal to the Commissioner (see paragraphs (b) and (d) of this section);

(2) In the court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court.

* * * * *

(c) * * *

(2) Any applicant or registrant in an ex parte case who takes an appeal to the U.S. Court of Appeals for the Federal Circuit waives any right to proceed under section 21(b) of the Act.

(3) Any adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an inter partes proceeding may file a notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (paragraph (b) of this section), electing to have all further proceedings conducted as provided in section 21(b) of the Act. The notice of election must be served as provided in § 2.119. The certificate of mailing practice of § 1.8 is not available for filing a notice of election. See § 1.8(a)(2)(viii).

(d) Time for appeal or civil action. (1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration or modification of the decision is filed within the time specified in §§ 2.127(b), 2.129(c) or 2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In inter partes cases, the time for filing a cross-action or a notice of a cross-appeal expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, whichever is later. The certificate of mailing practice of § 1.8 is not available for filing a notice of appeal or cross-appeal. See § 1.8(a)(2)(ix).

(2) The times specified in this section in days are calendar days. The times specified herein in months are calendar months except that one day shall be added to any two-month period which includes February 28. If the last day of time specified for an appeal, or commencing a civil action falls on a Saturday, Sunday or Federal holiday in the District of Columbia, the time is extended to the next day which is neither a Saturday, Sunday nor a Federal holiday.

(3) If a party to an inter partes proceeding has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under section 21(a)(1) of the Act electing to have all further proceedings conducted under section 21(b) of the Act, the time for filing a civil action thereafter is specified in section 21(a)(1) of the Act. The time for filing a cross-action expires 14 days after service of the summons and complaint.

(e) Extensions of time to commence judicial review. The Commissioner may extend the time for filing an appeal or commencing a civil action (1) for good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action, or (2) upon written request after the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect.

June 21, 1989

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Hollywood Magic, Inc., Studio City, Calif., Reg. No. 1,426,182, for the mark "HOLLYWOOD MAGIC COSMETICS BY MICHAEL WESTMORE" and design, Canc. No. 17,527.

John I. Paulding, Inc., New Bedford, Mass., Reg. No. 992,402, for the mark "TRADESMAN", Canc. No. 17,774.

Little Miss America Beauty Pageant Systems, Inc., Dover, Fla., Reg. No. 1,445,636, for the mark "GRAND NATIONAL LITTLE MISS AMERICA BEAUTY PAGEANT" and design, Canc. No. 17,820.

Erma S. Brown
Administrator of the Trademark Trial and Appeal Board
For Jeffery M. Samuels
Assistant Commissioner for Trademarks

Drawings in Patent Applications Filed After January 1, 1989

The general rule applicable to release of any paper in a patent application file is that no paper (including a drawing) will be returned for any purpose whatever. 37 CFR 1.59. New rules published in the *Official Gazette* (1097 OG 36 (December 13, 1988)) effective January 1, 1989, no longer require the submission of formal drawings in a patent application. Since corrections are the responsibility of the applicant, the original drawing(s) should be retained by the applicant for future correction, if necessary.

As a result of adoption of these new rules relating to drawings, the Patent and Trademark Office will no longer release to applicants, bonded drafting companies or others, drawings from patent applications filed after January 1, 1989, and after January 1, 1991, no drawings may be borrowed from the office.

Access to applications is still provided with the proper power to inspect. If copies of any papers or drawings within the application are required, arrangements may be made through the File Information Unit and copies may be made in the Public Search Room. If there is some extraordinary situation that requires release of an original drawing in possession of the office, relief may be requested by filing a petition under 37 CFR 1.183.

July 7, 1989

Theresa A. Brelsford
Assistant Commissioner for Administration

Patent Terms Extended Under 35 USC 156

A certificate extending the term of the following patent was issued on July 3, 1989.

Patent No. 4,158,068, granted June 12, 1979 to Gert-Wolfhard Von Rymon Lipinski, et al., Owner of Record: Hoechst Aktiengesellschaft, Title: SWEETENER MIXTURE, Classification: 426-548, Product Trade Name: Acesulfame Potassium, Term Extended: 2 years.

A certificate extending the term for the following patent was published in the Official Gazette of July 11, 1989, in error (Patent No. 4,543,956 was identified) and is hereby corrected.

Patent No. 4,543,954, granted October 1, 1985 to William A. Cook, et al., Owner of Record: Purdue Research Foundation, Title: EXERCISE RESPONSIVE CARDIAC PACEMAKER, Classification: 128-419 PG, Product Trade Name: Sensor Model Kelvin 500, Term Extended: 410 days.

PATENT NOTICES

Certificates of Correction for the Week of August 1, 1989

RE. 32,484	4,768,523	4,790,390	4,801,319
D. 299,780	4,769,774	4,790,913	4,801,397
D. 300,651	4,769,848	4,791,064	4,801,779
4,387,297	4,772,331	4,791,590	4,802,321
4,613,490	4,773,368	4,791,647	4,802,413
4,624,844	4,774,236	4,792,043	4,802,634
4,628,476	4,774,648	4,792,146	4,803,384
4,666,376	4,775,420	4,792,205	4,803,577
4,670,775	4,775,680	4,792,369	4,804,125
4,677,182	4,775,919	4,792,490	4,804,820
4,688,499	4,776,742	4,792,621	4,805,141
4,689,573	4,776,857	4,792,682	4,805,177
4,691,979	4,777,244	4,792,870	4,805,557
4,710,578	4,777,506	4,793,414	4,806,157
4,727,596	4,777,508	4,793,729	4,806,185
4,732,967	4,777,975	4,794,200	4,806,246
4,734,766	4,778,804	4,794,556	4,806,799
4,736,436	4,779,085	4,794,737	4,806,820
4,736,820	4,779,235	4,795,127	4,807,669
4,742,528	4,780,557	4,795,168	4,807,905
4,746,660	4,782,445	4,795,442	4,807,947
4,748,103	4,783,107	4,796,168	4,808,009
4,748,542	4,783,795	4,796,728	4,808,177
4,750,038	4,784,871	4,797,817	4,808,352
4,752,693	4,785,804	4,798,245	4,808,897
4,754,088	4,786,394	4,798,267	4,809,512
4,754,280	4,786,469	4,798,363	4,810,036
4,756,969	4,786,752	4,798,843	4,810,418
4,757,974	4,786,855	4,799,237	4,811,856
4,759,162	4,786,974	4,799,555	4,811,901
4,761,183	4,787,446	4,799,965	4,812,260
4,762,572	4,787,457	4,800,100	4,813,049
4,764,756	4,788,180	4,800,139	4,813,588
4,766,064	4,788,468	4,800,280	4,813,694
4,766,069	4,788,558	4,800,459	4,813,762
4,766,370	4,789,354	4,800,705	4,814,725
4,767,858	4,789,795	4,801,020	4,825,264

Disclaimer and Dedication

4,545,221.—*Winfield C. Daniel; Richard K. Sitterding*, both of Altavista, Va. ADJUSTMENT AND CLEANING OF THE VENTURI GAP IN A DYEING MACHINE. Patent dated Oct. 8, 1985. Disclaimer and Dedication filed May 1, 1989, by the assignee, Burlington Industries, Inc.

Hereby disclaims and dedicates to the Public the term of this patent subsequent to Oct. 8, 1989.

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Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
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Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.
Box Assignments	All assignment documents except those filed in new patent applications.

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The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to libary, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effctive access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

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Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
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Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
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New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(201) 932-2895
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
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	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
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	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF July 1, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	6-4-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. SHAW, Acting Director	5-12-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-27-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-17-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	6-23-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—D. G. KELLY, Director	1-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	4-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-24-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-1-88

Expiration of patents: The patents within the range of numbers indicated below expire during July 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,673,609 to 3,680,148 inclusive
Plant Patents ..... 3,224 to 3,244 inclusive

REEXAMINATIONS

AUGUST 1, 1989

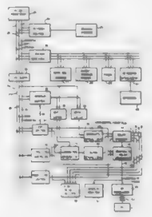
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 32,201 (1108th)

APPARATUS AND METHOD FOR READING AND WRITING TEXT CHARACTERS IN A GRAPHICS DISPLAY

David J. Bradley, Boca Raton, Fla., assignor to International Business Machines Corp., Armonk, N.Y.

Reexamination Request No. 90/001,645, Nov. 23, 1988.
Reexamination Certificate for Reissue Patent Re. 32,201, issued Jul. 8, 1986, Ser. No. 638,340, Aug. 6, 1984.
Original No. 4,408,200, dated Oct. 4, 1983, Ser. No. 292,084, Aug. 12, 1981.
Int. Cl.[4] G09G *1/28*
U.S. Cl. 340—747



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **4, 9, 10, 14–16** and **18–20** is confirmed.

Claims **1** and **2** were previously cancelled.

Claims **3, 5, 11–13** and **17** are determined to be patentable as amended.

Claims **6–8**, dependent on an amended claim are determined to be patentable.

3. A method for writing a text character on a raster scan all points addressable video display, comprising the steps of:

retrieving from storage the graphic dot image of the *text* character to be written, *each dot being represented by a single bit;*

expanding said graphic *dot* image to a selected pixel and color format *by duplicating each bit and logically combining the bits representing each dot with encoded color information*;

storing the expanded dot image *by placing the bits representing each dot* in *contiguous address memory locations in* a display refresh buffer.

B1 4,263,347 (1109th)

APPARATUS AND METHOD FOR MASKING SURFACES

Maynard A. Banta, Los Alamitos, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Reexamination Request No. 90/001,393, Dec. 7, 1987.
Reexamination Certificate for Patent No. 4,263,347, issued Apr. 21, 1981, Ser. No. 22,857, Mar. 22, 1979.
Int. Cl.[4] B05D *1/32*
U.S. Cl. 427—282

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **17, 18,** and **20–22** is confirmed.

Claims **1–5, 7–14** and **24** are cancelled.

Claims **6, 15, 19** and **23** are determined to be patentable as amended.

Claim **16**, dependent on an amended claim, is determined to be patentable.

15. Apparatus for use in covering a surface including a vertical surface, said apparatus comprising:

(a) an elongated covering sheet laterally folded along the length thereof to form a folded sheet having first and



second sides defined by at least one fold thereof, and having longitudinally extending edges,

(b) means fixed to said folded sheet for securing a first portion thereof along said vertical surface whereby subsequent to said securing, a second portion of said folded sheet may be unfolded to increase the extension thereof from said first portion,

said folded sheet and said securing means being longitudinally rolled together to form a cylindrical roll, *and*

(c) means for rotatably supporting said roll in a generally vertical position adjacent the upright body of a person for movement therewith along said vertical surface,

whereby during said movement the hands and arms of said person are free to unroll said folded sheet and attach said first portion thereof along said vertical surface.

B1 4,384,514 (1110th)

NIP CONTROL METHOD AND APPARATUS

René Larivé, Grand'Mère, and Osman J. Walker, Lansdowne, both of Canada, assignors to Consolidated-Bathurst Inc., West Montreal, Canada

Reexamination Request No. 90/001,442, Feb. 19, 1988.
Reexamination Certificate for Patent No. 4,384,514, issued May 24, 1983, Ser. No. 240,150, Mar. 3, 1981.
Int. Cl.[4] B30B *3/04, 15/34*
U.S. Cl. 100—38

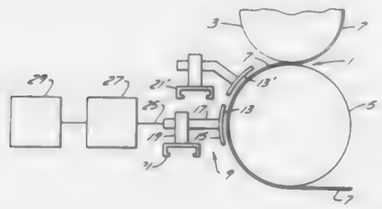
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2, 5–8, 10, 11, 15** and **16** are cancelled.

Claims **1, 3, 4, 9,** and **12–14** are determined to be patentable as amended.

New claims 17–19 are added and determined to be patentable.

1. *In a* [A] method for controlling *the entire transverse profile of at least one* [a] desired physical property of [a product involving] a web *of paper* material *which is* subjected to a roll pressing operation, *and* wherein said property is controlled by said operation, *and wherein said web of material is subsequently wound into a reel,* the *improved* method comprising the steps of: passing said web material through a nip formed by two co-operating pressing elements, where at least one of said elements is a rotating roll *having a plurality of transverse segments* and where at least a portion of said roll is made of a material which will allow the local diameter of any transverse segment of said roll to change in dimension and thereby



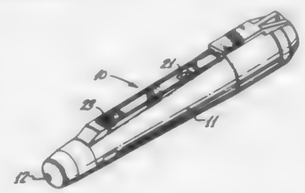
change the nip pressure associated with said segment when energy in the form of a magnetic field is directed at said segment; *providing means for directing said energy to a sufficient number of said segments such that the sum of the lengths of the segments equals said portion of said roll* producing and directing said energy to [at least one] *a sufficient number* of said transverse segments of said roll so that the nip pressure between said roll segment and the other said co-operating element will change in response to changes in said energy thereby effecting changes in said roll pressing operation; taking a [measurement] *sufficient number of measurements* of said physical property; generating [an] electrical [signal] *signals* proportional to said property measurement; taking said *signals* [signal] and using [it] *them* to control said changes in said energy so that said physical *transverse profile of said* property will be controlled by said changes in said roll pressing operation.

B1 4,471,218 (1111th)
SELF-CONTAINED, PORTABLE DATA ENTRY TERMINAL
David W. Culp, Huntington Beach, Calif., assignor to MSI Data Corporation, Costa Mesa, Calif.
Reexamination Request No. 90/001,322, Sep. 3, 1987.
Reexamination Certificate for Patent No. 4,471,218, issued Sep. 11, 1984, Ser. No. 379,929, May 19, 1982.
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—472

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

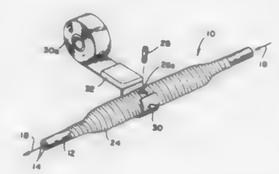
Claims 1–5 are cancelled.

[1. A self-contained, portable data entry terminal comprising:
a bar code optical sensor;
signal conditioning means responsive to said optical sensor;
processor means responsive to said signal conditioning means for processing bar code input data sensed by said sensor;
memory means for storing said bar code input data;
a power source; and



a self-contained, cordless, wand-type enclosure for housing said sensor, said signal conditioning means, said processor means, said memory means and said power source.]

B1 4,545,830 (1112th)
METHOD OF SEALING PRESSURIZED ELECTRICAL CABLE WHILE UNDER PRESSURE
Zoltan B. Dienes, Annandale, and Thomas L. Mineur, High Bridge, both of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.
Reexamination Request No. 90/001,497, Apr. 18, 1988.
Reexamination Certificate for Patent No. 4,545,830, issued Oct. 8, 1985, Ser. No. 419,256, Sep. 17, 1982.
Int. Cl.[4] H01B *13/06*
U.S. Cl. 156—48



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 4, 6 and 14–18 are cancelled.

Claims 2, 3, 5, 7, 12 and 13 are determined to be patentable as amended.

Claims 8–11, dependent on an amended claim, are determined to be patentable.

New claims 19–27 are added and determined to be patentable.

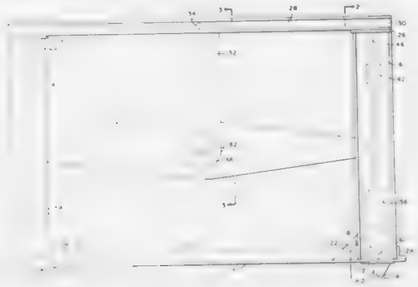
[1. A method of sealing an exposed area of a gas pressurized electrical cable while under pressure, comprising the steps of:
(a) sealably covering, while maintaining a positive gas pressure in said cable, a portion of said exposed area defining thereby a pressure venting area less than that of said exposed area whereby gas may escape therethrough; and then
(b) sealably closing said pressure venting area.]

STATUTORY INVENTION REGISTRATIONS

PUBLISHED AUGUST 1, 1989

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

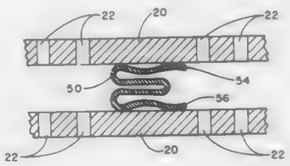
H637
TORQUE CALIBRATOR
Roy L. Cameron, Athens, and James S. Burgess, Harvest, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Sep. 2, 1988, Ser. No. 239,814
Int. Cl.[4] G01C *17/38*
U.S. Cl. 73—1 C **4 Claims**



1. A torque calibrator comprising a frame of general rectangular shape and having spaced apart upright members at opposite ends, a pair of parallel torque beams mounted in spaced relation in said frame, each torque beam having first and second ends with said first end of each beam being secured to respective hydraulic cylinders and to the frame for exerting forces at said first end of each of the torque beams, said first end of each torque beam being on an opposite side to that of the other first end, load cells connected to the respective beams at said second ends of the beams and to the frame for measuring the forces applied by the hydraulic cylinders to the torque beams, said torque beams being mounted parallel to each other by said hydraulic cylinders and said load cells, and said hydraulic cylinders and said load cells being aligned with each load cell being over a respective one of said hydraulic cylinders, and said torque beams having means thereon for having a torque cell mounted therebetween for applying torque to the torque cell when said hydraulic cylinders apply forces to the torque beams.

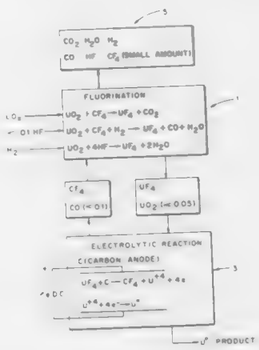
H658
HIGH EFFECTIVENESS ALL METAL HEAT EXCHANGER
Robert W. Breckenridge, and Thomas P. Hosmer, both of Concord, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jun. 22, 1988, Ser. No. 209,770
Int. Cl.[4] F28F *1/42*
U.S. Cl. 165—154 **1 Claim**

1. A counterflow type heat exchanger adapted for improved cryogenic operation comprising:
a cylindrical metallic shell;
a plurality of flat circular plates each having perforations therethrough;
a plurality of metallic spacer rings;
each of said plurality of circular plates having their flat surfaces arranged in parallel along the length of said shell and having their circular edges abutting the inner wall of said cylindrical shell;
adjacent ones of said plurality of circular plates being separated by one of said plurality of spacer rings disposed concentrically therebetween to form isolated axial and annular flow paths for fluids through said shell;



each of said plurality of metallic spacer rings having a convoluted and E-shaped cross section for providing increased thermal isolation between adjacent ones of said plurality of cylindrical plates.

H659
PROCESS FOR ELECTROLYTICALLY PREPARING URANIUM METAL
Paul A. Haas, Knoxville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Apr. 6, 1989, Ser. No. 334,031
Int. Cl.[4] C25C *3/34, 1/22;* **C25D** *3/54, 5/46*
U.S. Cl. 204—1.5 **2 Claims**



1. A process for converting UO_2 to uranium metal comprising:
a first reaction wherein a fluoride compound and UO_2 are reacted in a first reaction chamber to form UF_4;
a second reaction wherein said UF_4 and unreacted UO_2 are electrolytically converted in a second reaction chamber, said second reaction chamber being an electrolytic cell, to U° by using a carbon anode resulting in the formation of CF_4 as by-product;
and subsequent to said second reaction, recycling said CF_4 into said first reaction for reuse of said fluoride.

H660
METHOD AND COMPOSITION FOR IMMOBILIZATION OF WASTE IN CEMENT-BASED MATERIALS

Othar K. Tallent, Oak Ridge; Karen E. Dodson, Knoxville, and Earl W. McDaniel, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

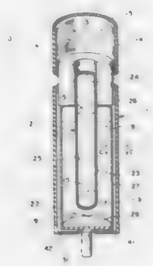
Filed Oct. 1, 1987, Ser. No. 103,149
Int. Cl.[4] G21F *9/16*; C04B *7/02, 7/32*
U.S. Cl. 252—628 9 Claims

1. A composition for use as a waste disposal grout comprising:
an aqueous waste material;
from about 6.0 to about 10.0 pounds of dry-solid blend per gallon of said waste material, said dry-solid blend comprising
30–45 weight percent cement,
5–30 weight percent clay, and
30–62 weight percent fly ash; and
an ionic aluminum compound selected from the group aluminum nitrate, aluminum hydroxide and aluminum phosphate in an amount to significantly reduce the drainable water in the cured grout.

H661
CATHODE CONTAINER FOR SODIUM-SULFUR CELLS

Ross E. Dueber, Kettering, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 24, 1987, Ser. No. 29,561
Int. Cl.[4] H01M *4/36*
U.S. Cl. 429—104 10 Claims



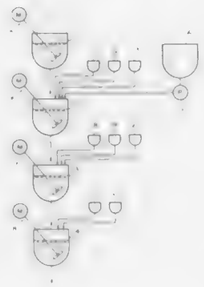
1. A container structure for the cathode of a sodium-sulfur electric cell comprising:
(a) a metallic first container having an inner surface defining a substantially closed chamber for containing sulfur comprising the cathode of said cell;
(b) a thin continuous layer of glass on said inner surface of said metallic first container; and
(c) a substantially closed metallic foil second container disposed within said metallic first container for containing said sulfur comprising said cathode of said cell and for collecting current from said cathode.

6. In a hermetically sealed sodium-sulfur electric cell including a solid ceramic electrolyte separating a first chamber containing a sodium anode from a second chamber containing a sulfur cathode, an improvement comprising a corrosion resistant container structure for said cathode including:
(a) a metallic first layer having an inner surface defining and substantially enclosing the second chamber;
(b) a thin continuous layer of glass on said inner surface of said metallic first layer; and
(c) a substantially closed metallic foil second layer disposed within said metallic first layer and enclosing the cathode for collecting current from said cathode.

H662
PROCESS FOR PRODUCING SILVER HALIDE EMULSION IN EQUIPMENT MADE OF STAINLESS STEEL CONTAINING MOLYBDENUM

Toshio Saito; Akihiko Kabasawa; Masami Ishikura; Sadayuki Miyazawa; Nobuo Suzuki, all of Tokyo, Japan, and , assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Apr. 16, 1987, Ser. No. 39,100
Claims priority, application Japan, Jun. 5, 1986, 61-130991
Int. Cl.[4] G03C *1/02*
U.S. Cl. 430—564 2 Claims

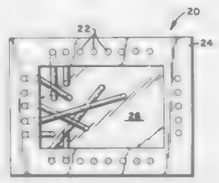


1. In a process for producing a silver halide emulsion through mixing a halide solution and a silver nitrate solution in the presence of a hydrophilic colloid, the improvement wherein any part of the equipment that is employed in the process starting with the initiation of silver halide formation and ending with the coating of the emulsion on a support and with which the reaction solution will come in contact is made of a stainless steel having a molybdenum content of 2.2–5.0 wt %.

H663
HIGH DENSITY PROBE HEAD FOR CHIP TESTING

Dan Massopust, Rte. 3, Box 544, Menomonie, Wis. 54751

Filed Jan. 13, 1988, Ser. No. 143,511
Int. Cl.[4] G01R *1/06*
U.S. Cl. 324—158 F 4 Claims

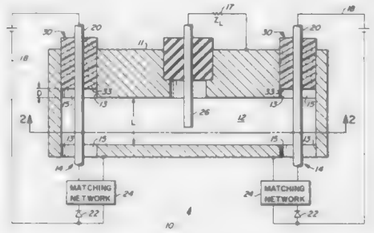


1. A probe head for testing integrated circuit chips comprising:
a multilayered frame having an outer rigid perimeter and an inner open area;
a plurality of probe points formed at one end of continuous probe leads, said probe leads disposed between a plurality of the layers of said multilayered frame, and
said probe points disposed within said inner open area of said frame for contacting the integrated circuit chips.

H664
POWER COMBINER FOR MICROWAVE SOURCES

Darry M. Kinman, and Donald R. Bowling, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 21, 1989, Ser. No. 316,346
Int. Cl.[4] H03B *7/14*
U.S. Cl. 331—56 14 Claims

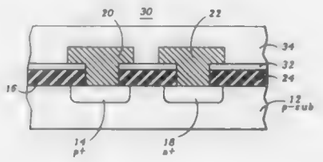


1. In a microwave power combiner having a cavity resonant in a frequency band about a predetermined frequency and having a microwave source circuit which extends oppositely from the cavity and has a microwave source disposed at one side of the cavity and a load constructed of lossy material which is disposed at the other side of the cavity to suppress oscillations of said source outside of said band and which bears a surface disposed toward the cavity and spaced a predetermined distance therefrom, the improvement comprising said predetermined distance being less than one-fourth of the wavelength in said circuit along said distance at said frequency.

H665
RESISTIVE FIELD SHIELDS FOR HIGH VOLTAGE DEVICES

William R. Knolle, Lower Macungie Township, Lehigh County, and John W. Osenbach, Spring Township, Berks County, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 19, 1987, Ser. No. 110,153
Int. Cl.[4] H01L *29/34, 29/92*
U.S. Cl. 357—52 5 Claims

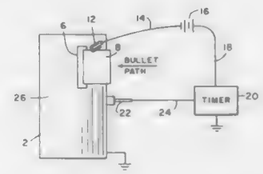


1. A semiconductor structure comprising
a semiconductor substrate of a first conductivity type, said substrate being defined as having top and bottom major surfaces;
a first semiconductor region of the first conductivity type more heavily doped than said substrate and formed in a portion of said semiconductor substrate so as to coincide with the top major surface;
a second semiconductor region of the second conductivity type more heavily doped than said substrate and formed in a portion of said semiconductor substrate so as to coincide with said top major surface and spaced-apart from said first semiconductor region;
first and second electrode means contacting said first and second semiconductor regions, respectively;
a dielectric insulating layer disposed over said substrate for electrically isolating said first and second semiconductor regions; and
a resistive field shield layer comprising semi-insulating silicon nitride (sin-SiN) for limiting the potential buildup caused by electrical charge on said dielectric insulating layer.

H666
CIRCUIT FOR MEASURING ABSOLUTE TIME LAPSE BETWEEN IMPACT AND DETONATION

Robert W. Milton, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 13, 1989, Ser. No. 309,759
Int. Cl.[4] G04F *8/00*
U.S. Cl. 368—110 6 Claims



1. A circuit for measuring absolute time lapse between impact and detonation in a bullet test, comprising: a grounded motor case, said motor case having an electrically conductive surface, missile propellant contained within said motor case; a first insulator having a first end, a second end, and a crease adjacent to said first end, said first insulator attached at said ends to said motor surface so as to raise said creases above said surface; a second insulator having a first end, a second end, and a crease adjacent to said first end, said second insulator attached at said ends to said motor surface so as to raise said crease above said surface, said second insulator being spaced apart from said first insulator to provide a region of exposed motor case surface therebetween; an electrically conductive metal foil having two opposing ends, said foil attached at said opposing ends to said creases of said insulators so as to leave an air gap between said region of said motor surface and said foil, said foil further being disposed to receive an impact on its surface and collapse on said motor surface on such impact; a power source; a timer; said foil, power source and timer being coupled in series and connection therebetween being such as to maintain a complete electrical separation between said foil and said motor case surface until impact, said motor case and said timer being coupled to a common ground; a piezo-electric pin attached to said motor case for creating a voltage pulse upon detonation of said motor case, and said pin being electrically coupled to said timer for coupling the pulse thereto, said timer being responsive to said pulse to stop timing.

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,002

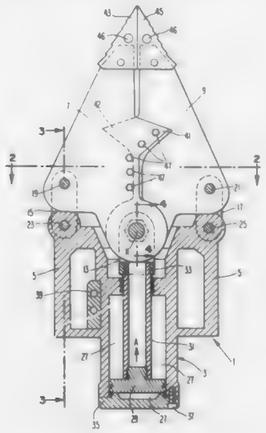
HIGH-POWER RESCUE TOOL

Francis M. Brick, Dresher, Pa., assignor to F. M. Brick Industries, Inc., Hatboro, Pa.

Original No. 4,531,289, dated Jul. 30, 1985, Ser. No. 461,853, Jan. 28, 1983. Continuation of Ser. No. 853,422, Apr. 18, 1986, abandoned. Application for reissue Oct. 16, 1987, Ser. No. 110,549

Int. Cl.[4] **B25F** *1/100;* **B26B** *15/00*

U.S. Cl. 30—134 **4 Claims**



12. A high-power, portable rescue tool, comprising:

a frame,

a pair of substantially flat arms, the arms being pivotably mounted in a common yoke, the yoke being attached to a piston means disposed within the frame, the frame defining a region within which the piston means can move upward and downward, wherein upward movement of the piston means causes the arms to separate, and wherein downward movement of the piston means causes the arms to come together,

the arms being connected to the frame by a pair of links, the links being spaced equidistant from the yoke, the links being pivotably mounted to the frame and to the arms,

hydraulic means for moving the piston means upward and downward within the frame, and

blade means attached to the arms, the blade means being distinct from the arms, the arms being constructed of a lightweight material.

Re. 33,003

JOINT SYSTEM

Larry M. Dugan, Boulder, Colo., assignor to Adolph Coors Company, Golden, Colo.

Original No. 4,719,845, dated Jan. 19, 1988, Ser. No. 804,628, Dec. 5, 1985. Application for reissue May 23, 1988, Ser. No. 197,761

Int. Cl.[4] **F16J** *1/10;* **F01B** *11/02;* **F16B** *7/10*

U.S. Cl. 92—84 **14 Claims**

9. Apparatus for increasing the working life of a pump having a cylinder and a piston comprising:

a pump;

said pump having a cylinder;

a piston mounted for reciprocation in said cylinder;

a piston rod having one end thereof fixedly connected to said piston;

said piston rod having a longitudinal axis and an other end;

a cavity having a generally cylindrical inner surface and a generally planar bottom surface formed in said other end of said piston rod;

a solid, deformable, non-compressible material having a generally cylindrical outer surface and generally planar end surfaces, which are continuous in all directions, located in said cavity;

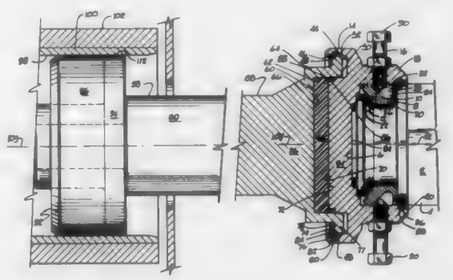
said solid, deformable, non-compressible material having a diameter slightly less than but substantially equal to the diameter of said inner surface of said cavity;

reciprocating driving means for applying forces to said piston rod so as to reciprocate said piston rod and therefore said piston in said cylinder;

said driving means having a longitudinal axis;

coupling means for connecting said driving means to said other end of said piston rod so that reciprocal movement of said driving means causes reciprocal movement of said piston rod;

said coupling means having a plug having a generally cylindrical outer surface having a diameter slightly less than but



substantially equal to said diameter of said inner surface of said cavity and having a generally planar end surface located in said cavity and adapted to contact one of said generally planar end surfaces of said solid, deformable, non-compressible material to deform said solid, deformable, non-compressible material until it reaches its non-compressible state so that said driving force from said driving means is distributed evenly across said generally planar bottom surface of said cavity of said piston rod, including those instances wherein said longitudinal axes of said piston rod and said driving means are not in alignment so as to move said piston rod in one direction;

an annular recess formed in said outer surface of said plug and said end surface of said plug;

retaining means in said annular recess for preventing extrusion of said solid, deformable non-compressible material out of said cavity when a relatively high force is applied thereto by said driving means; and

movement permitting means for permitting limited relative movement between said plug and said solid, deformable, non-compressible material so as to allow for the formation of a separation therebetween.

Re. 33,004

APPARATUS AND METHOD FOR SELECTIVELY ACTIVATING PLURAL ELECTRICAL LOADS AT PREDETERMINED RELATIVE TIMES

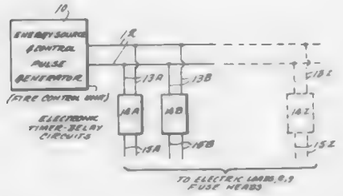
Ian Kirby; Michael Mitchell, both of Cheshire, and Andrew Stratton, Hampshire, all of England, assignors to Imperial Chemical Industries PLC, London, England

Original No. 4,409,897, dated Oct. 18, 1983, Ser. No. 307,634, Oct. 1, 1981. Division of Ser. No. 5,551, Jan. 22, 1979, Pat. No. 4,324,182. Application for reissue Oct. 25, 1988, Ser. No. 261,888

Claims priority, application United Kingdom, Feb. 2, 1978, 4057/78

Int. Cl.[4] F42C *15/40*

U.S. Cl. 102—200 19 Claims



6. A method of energizing an electrical load at a predetermined delay after a starting signal, said method comprising:

feeding control signals at accurately timed intervals to a preset signal selecting system wherein two control signals characteristic of the desired delay are selected,

generating first and second timing signals in response to each of said two selected control signals,

feeding said first and second timing signals to timing means wherein the time interval between the said first and second timing signals is measured,

generating a starting signal and,

after a delay period from said starting signal, *which begins at a reference time defined by said control signals and* [that] is determined by the time interval between said first and second timing signals as measured by the timing means, feeding energy to the load.

Re. 33,005

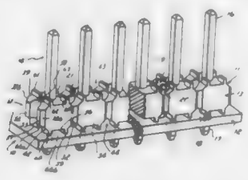
ELECTRICAL CONNECTOR

J. Robert Bryce, Fairport, N.Y., assignor to Crane Electronics, Inc., Cincinnati, Ohio

Original No. 4,655,517, dated Apr. 7, 1987, Ser. No. 701,950, Feb. 15, 1985. Application for reissue May 18, 1988, Ser. No. 195,253

Int. Cl.[4] H01R *9/09*

U.S. Cl. 439—78 25 Claims



1. An electrical connector comprising:

an insulator block [having a bottom] adapted to [rest upon] *be placed over* a printed circuit board-type substrate [placed therebelow, the insulator block having a top spaced above the bottom];

at least one row of electrically conductive pins spaced apart from one another and fixedly secured in the insulator block, each said pin having a first end [below the bottom and] extending from the insulator block [in a first direction generally perpendicularly the bottom] for electrical and mechanical connection to [a] *the* printed circuit board-type substrate;

the insulator block further including (a) a series of holes, a different one of which is located between each pair of adjacent pins in the row of pins, each said hole extending [generally in the first direction] *through the insulator block* and adapted to receive therethrough a peg for securing the insulator block to [a] *the* printed circuit board-type substrate, and (b) a series of notches along the insulator block [top], each said notch of the series of notches extending across and through a respective said hole of the series of holes, the holes and notches cooperating to produce planes of weakness spaced apart from one another along the insulator block and through the holes to facilitate breaking the insulator block at desired locations.

Re. 33,006

FEED-WATER HEATER COMPRISING LOW C-CR-MO STEEL COMPONENTS USED UNDER WET STEAM

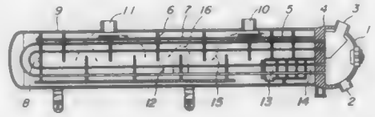
Fumio Hataya, Hitachi; Masakiyo Izumiya, Mito; Yoshikuni Ohshima, Hitachi; Koichi Akutsu, Ibaragi; Syuzo Ueda; Masaaki Ishikawa, both of Chiba; Yuji Kusuhara, Kurashiki, and Iwao Shiraishi, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo and Kawasaki Steel Corporation, Kobe, both of, Japan

Original No. 4,529,454, dated Jul. 16, 1985, Ser. No. 351,752, Feb. 24, 1982. Application for reissue Jul. 8, 1987, Ser. No. 71,709

Claims priority, application Japan, Feb. 27, 1981, 56-26972; Feb. 27, 1981, 56-26976

Int. Cl.[4] F28F *19/06*

U.S. Cl. 165—134.1 14 Claims



1. In a feed-water heater comprising a water chamber provided with an inlet and an outlet for the feed-water flowing through the heater, heat exchanging tubes in which the feed-water exchanged and flowed to the outlet of the heater, support plates supporting the heat exchanging tubes at a proper distance and a shell into which heating fluids for heating the feed-water flowing in the heat exchanging tubes are introduced, the improvement comprising at least one of the heat exchanging tubes, the support plates and the shell is composed of a low C-Cr-Mo steel subjected to normalizing and tempering treatment and consisting of, in % by weight, 0.02–0.14% of C, not more than 0.90% of Si, 0.30–0.80% of Mn, 0.70–1.60% of Cr, 0.40–0.70% of Mo and the remainder being substantially Fe, and having a ferrite-pearlite microstructure.

Re. 33,007

METHOD OF VAPORIZING MULTICOMPONENT LIQUIDS

Mark E. Bier, West Lafayette, Ind., assignor to American Sterilizer Company, Erie, Pa.

Original No. 4,642,165, dated Feb. 10, 1987, Ser. No. 684,461, Dec. 21, 1984. Application for reissue Feb. 9, 1988, Ser. No. 153,878

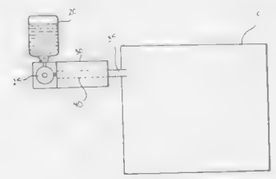
Int. Cl.[4] B01D *3/06, 3/42*

U.S. Cl. 203—12 5 Claims

1. A method of vaporizing a multicomponent liquid comprising:

metering successive predetermined increments of said multicomponent liquid at a predetermined rate onto a heated surface of a vaporization chamber;

substantially instantaneously vaporizing each said liquid increment on said heated surface before the succeeding said liquid increment is metered onto said heated surface



so that each liquid increment vaporization produces a multicomponent vapor increment having substantially the same weight percent composition as said multicomponent liquid increment; and

passing each said vapor increment into a [vacuum] chamber.

Re. 33,008

ACRYLIC EMULSION COPOLYMERS FOR THICKENING AQUEOUS SYSTEMS AND COPOLYMERIZABLE SURFACTANT MONOMERS FOR USE THEREIN

Charles G. Ruffner, Chattanooga, and John M. Wilkerson, III, Hixson, both of Tenn., assignors to Alco Chemical Corporation, Chattanooga, Tenn.

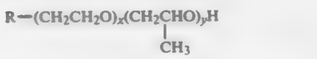
Original No. 4,600,761, dated Jul. 15, 1986, Ser. No. 782,571, Oct. 1, 1985. Continuation-in-part of Ser. No. 719,768, Apr. 4, 1985. Application for reissue Jun. 13, 1988, Ser. No. 206,024

Int. Cl.[4] C08F *216/14*

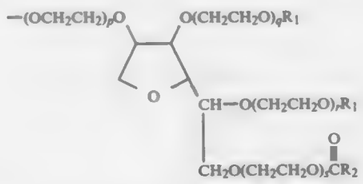
U.S. Cl. 526—270 26 Claims

1. A copolymer obtained by aqueous emulsion copolymerization of a monomer system comprising

(A) about 1 to about 25 percent of at least one nonionic urethane monomer which is the urethane reaction product of a monoethylenically unsaturated monoisocyanate with a nonionic surfactant of the formula:



in which x is an integer of from [1] *0* to 150 and y is an integer of from 0 to 40 when R a sorbitan fatty ester of the formula



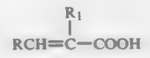
where each of p, q, r and s is an integer and the sum of said integers is from 0 to 100, R_1 is H or —COR_2 and R_2 is alkyl, alkylphenyl, or dialkylphenyl 5 to 30 carbon atoms;

or x and y are each integers of from 0 to 40 when R is —$NH(CH_2)_3O—R_3$, or



where R_2 is H or R_3, and R_3 is alkyl, alkylphenyl, or dialkylphenyl of from 5 to 30 carbon atoms;

(B) about 5 to about 70 percent of a copolymerizable α,β-ethylenically unsaturated carboxylic acid monomer of the formula

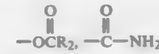


where R is H and R_1 is H, an alkyl group containing from 1 to 4 carbon atoms, or —CH_2COOX; R is —COOX and R_1 is H, and X is H or an alkyl group containing from 1 to 4 carbon atoms,

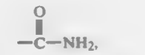
(C) about 10 to to about 90 percent of at least one nonionic, copolymerizable α,β-ethylenically unsaturated monomer of the formula



where Y is H and Z is CN, Cl, —COOR, C_6H_4R,



or —$CH=CH_2$; Y and Z are Cl, and Y is CH_3 and Z is CN,



—$CH=CH_2$, —C_6H_4R, or —$COOR_1$, and R is H, Cl, Br or alkoxy containing from 1 to 4 carbon atoms; R_1 is alkyl containing from 1 to 12 carbon atoms, or hydroxyalkyl containing from 2 to 8 carbon atoms, and R_2 is alkyl containing from 1 to 8 carbon atoms; and

(D) up to 1 percent of a copolymerizable polyethylenically unsaturated cross-linking monomer, said percentages being by weight, based on the total weight of said monomers.

Re. 33,009

METHOD FOR PREPARING CRYSTALLINE ZIRCONIUM PHOSPHATES

E. G. Derouane, Namur, Belgium; R. M. Dessau, Edison, N.J.; I. J. Heilweil, Princeton, N.J., and G. T. Kerr, Lawrenceville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Original No. 4,695,642, dated Sep. 22, 1987, Ser. No. 902,121, Sep. 2, 1986. Continuation of Ser. No. 676,968, Nov. 30, 1984, abandoned. Application for reissue Jul. 5, 1988, Ser. No. 215,469

Int. Cl.[4] C07F *7/00*

U.S. Cl. 556—14 42 Claims

22. A crystalline zirconium phosphate compound having the composition:

where A is an organic cation; M' is a cation of valence m; [Ox4; Oy6; Oz3; Ow20;] $0<x<4$; $0<y<6$; $0<z<3$; $0<w<20$; and having the significant X-ray diffraction lines of Table 1 of the specification.

PLANT PATENTS

GRANTED AUGUST 1, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,955

APPLE TREE — GALAXY CULTIVAR

Kenneth W. Kiddle, Hawkes Bay, New Zealand, assignor to Stark Brothers Nurseries and Orchards Company, Louisiana, Mo.

Filed May 24, 1988, Ser. No. 198,088
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of apple tree, substantially as illustrated and described, which can be distinguished from the Tenroy variety by (1) the ability to form fruit which bears over its entire surface a cherry red coloration with an often indistinct darker red overstriping, and (2) the ability to produce fruit coloration on an earlier date.

6,956

CRABAPPLE TREE NAMED SATIN CLOUD

John L. Fiala, Medina, Ohio, assignor to Chas. Klehm & Son, South Barrington, Ill.

Filed Jun. 30, 1988, Ser. No. 213,915
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—34 **1 Claim**

1. A new and unique flowering crabapple tree named Satin Cloud, as illustrated and described.

6,957

CRABAPPLE TREE NAMED SERENADE

John L. Fiala, Medina, Ohio, assignor to Chas. Klehm & Son, South Barrington, Ill.

Filed Jun. 30, 1988, Ser. No. 213,916
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—34 **1 Claim**

1. A new and unique flowering crabapple tree named Serenade, as illustrated and described.

6,958

CRABAPPLE TREE NAMED SPRING SONG

John L. Fiala, Medina, Ohio, assignor to Chas. Klehm & Son, South Barrington, Ill.

Filed Jun. 30, 1988, Ser. No. 213,917
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—34 **1 Claim**

1. A new and unique flowering crabapple tree named Spring Song, as illustrated and described.

6,959

BOUGAINVILLEA HYBRID CV. MONKA

Gilbert N. Resendez, La Verne, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Sep. 6, 1988, Ser. No. 240,803
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct selection of Bougainvillea as substantially shown and described herein, that is characterized particularly as a novelty by the unique combination of floriferous habit, dwarf mounding shape, and vibrant purple flower bracts.

6,960

PERIWINKLE PLANT NAMED RALPH SHUGERT

David S. MacKenzie, Spring Lake, Mich., assignor to Hortech, Spring Lake, Mich.

Filed Jul. 11, 1988, Ser. No. 217,421
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct lesser periwinkle plant named Ralph Shugert, as described and illustrated.

6,961

VARIEGATED EVERGREEN AZALEA PLANT

Hubert G. Lowe, Rte. 1, Box 21, Elon, N.C. 27244

Filed Jun. 3, 1987, Ser. No. 56,986
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—55 **1 Claim**

1. A new and distinct variegated, evergreen azalea plant substantially as herein shown and described; characterized by a unique purple-red bloom and lustrous green foliage with white margins.

6,962

ILEX GLABRA NAMED 'CHAMZIN'

James W. Zampini, P.O. Box 122, Perry, Ohio 44081

Continuation of Ser. No. 127,629, Dec. 1, 1987, abandoned, which is a continuation of Ser. No. 30,288, Mar. 23, 1987, abandoned, which is a continuation of Ser. No. 787,691, Oct. 15, 1985, abandoned, which is a continuation of Ser. No. 697,271, Feb. 1, 1985, abandoned, which is a continuation of Ser. No. 551,719, Nov. 15, 1983, abandoned. This application Sep. 9, 1988, Ser. No. 243,149
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—65 **1 Claim**

1. A new and distinct cultivar of *Ilex glabra* plant, substantially as herein shown and described, characterized particularly by a more spreading than upright growth and which is more compact at the center and base to provide a well branched and more rounded habit, the plant has a more vigorous growth and matures at about one-half the species size under such growing conditions, and having leaves which are of a dark-glossy-green color above and of a light dull-green color below, and with the top surface of the leaves having a substantially greater lustrous green color that glistens in natural sunlight.

6,963

VERBENA PLANT CALLED VERBENA "A"

Janet N. Egger, Ventura, Calif., assignor to Mitsuwa Nursery, Inc., Moonpark, Calif.

Filed Jun. 6, 1988, Ser. No. 203,016
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Verbena as described and illustrated, particularly characterized by its floriferous showy lavender pink flowers, deep green foliage, vigorous growth, and trailing habit.

6,964

SPATHIPHYLLUM CULTIVAR 'GORGUSIS NO. 1'

James J. Georgusis, Hollywood, Fla., assignor to Oglesby Plant Laboratories, Inc., Altha, Fla.

Filed Sep. 2, 1988, Ser. No. 239,819
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct Spathiphyllum cultivar, substantially as herein shown and described, characterized particularly as to

novelty by the taller, wider habit than either parent, fewer suckers than several known varieties, longer, broader leaves of darker color and more shiny than either parent, white flowers and particularly attractive aspect for ornamental use.

6,965

ASPARAGUS PLANT — 'JERSEY GENERAL'

J. Howard Ellison, Milltown, and John J. Kinelski, Princeton, both of N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Feb. 24, 1988, Ser. No. 159,680
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—89 1 Claim

1. A new and distinct variety of Asparagus plant as hereinbefore shown and described, characterized particularly as to novelty by the unique combination of particular adaptation to light sandy soil, substantially overall greater yield than other prior varieties, excellent production of jumbo spears, high marketable total yield, spear tips which remain tight even in hot weather, and good production in Fusarium infested heavy sandy loam.

6,966

ASPARAGUS PLANT—'TARA'

J. Howard Ellison, Milltown, and John J. Kinelski, Princeton, both of N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Feb. 24, 1988, Ser. No. 159,681
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—89 1 Claim

1. A new and distinct variety of Asparagus plant substantially as herein shown and described, characterized particularly as to novelty by its ability to transmit rust (*Puccinia asparagi*) and Fusarium tolerance, when asexually propagated as well as produce an all male hybrid when combined sexually with a male hybrid.

6,967

ASPARAGUS PLANT—'LOUISE'

J. Howard Ellison, Milltown, and John J. Kinelski, Princeton, both of N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Feb. 24, 1988, Ser. No. 159,682
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—89 1 Claim

1. A new and distinct Asparagus plant as herein shown and described, characterized particularly as to novelty by its tolerance to rust (*Puccinia asparagi*) and Fusarium infestation, and its vigor, together with high yield and tight spear tip formation for improved commercial table use.

6,968

ASPARAGUS PLANT—'KATHRYN'

J. Howard Ellison, Milltown, and John J. Kinelski, Princeton, both of N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Feb. 24, 1988, Ser. No. 159,683
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—89 1 Claim

1. A new and distinct variety of Asparagus plant as hereinfore shown and described, characterized particularly as to novelty by its female characteristics together with its vigor, resistance to rust (*Puccinia asparagi*) when planted in isolation with a male plant producing F 1 seed.

6,969

ASPARAGUS PLANT—'JERSEY TITAN'

J. Howard Ellison, Milltown, and John J. Kinelski, Princeton, both of N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Feb. 24, 1988, Ser. No. 159,684
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—89 1 Claim

1. A new and distinct variety of Asparagus plant as herein shown and described, characterized particularly as to novelty by the unique combination as an all male hybrid of production of high yield of marketable spears with tight spear tips in hot weather which remain closed longer than most cultivars, tolerance to rust (*Puccinia asparagi*), root rot (*Fusarium oxysporum*), and crown rot (*F. moniliforme*) of good vigor, and very high branching.

6,970

ASPARAGUS PLANT—JERSEY GEM

J. Howard Ellison, Milltown, and John J. Kinelski, Princeton, both of N.J., assignors to Rutger Univ., New Brunswick, N.J.

Filed Feb. 24, 1988, Ser. No. 159,685
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—89 1 Claim

1. A new and distinct Asparagus hybrid as hereinbefore shown and described, characterized particularly as to novelty by the unique combination of exceptionally high yield of good quality spears under widely diverse conditions of soil and climate, as compared with a large number of other hybrid Asparagus, its all male characteristics, and resistance to rust (*Puccinia asparagi*).

PATENTS

GRANTED AUG. 1, 1989

ERRATA

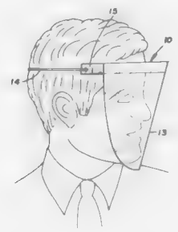
For CLASS	See PATENT NO.
277-001	4,852,893
250-327	4,852,975
104-243	4,853,038
558-483	4,853,157
562-046	4,853,158
562-017	4,853,159
202-202	4,853,527
364-431	4,853,720
355-071	4,853,756
370-081	4,853,939

PATENTS

GRANTED AUGUST 1, 1989

GENERAL AND MECHANICAL

4,852,185
PROTECTIVE FACE SHIELD
David V. Olson, 929 Medical Arts Bldg., Minneapolis, Minn. 55402
Filed Oct. 13, 1987, Ser. No. 106,866
Int. Cl.[4] A61F *9/06*
U.S. Cl. 2—9 10 Claims



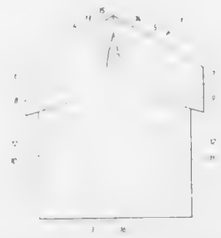
1. A protective face shield comprising:
(A) a generally flat crescent-shaped semi-rigid body member composed of synthetic resinous plastic foam having a forehead-engaging rearward edge,
(B) resilient head-engaging means attached to said body member for securing the body member to a wearer's head,
(C) vertical vent means through said body member, and
(D) a semi-rigid face-covering transparent sheet fixedly secured to the forward edge of said body member and depending therefrom.

4,852,186
COMBINED VISOR AND PROTECTIVE SHIELD
Timothy J. Landis, 2006 McLaren Dr., Roseville, Calif. 95661-4945
Continuation-in-part of Ser. No. 194,150, May 16, 1988. This application Aug. 8, 1988, Ser. No. 229,349
Int. Cl.[4] A61F *9/00*; A42B *1/06*
U.S. Cl. 2—9 12 Claims



1. A protective device comprising a unitary blank of thin, transparent material comprising a shield portion, a spacer portion and means to attach said blank portion to the head of a wearer,
said shield portion having a top edge, sides and a bottom and first attachment means located near said top edge,
said spacer portion having a curved inner edge to conform to the shape of the forehead of the wearer and a curved outer edge, a hinge section comprising a portion of said outer edge and a portion of said top edge shield, and second attachment means located near said outer edge,
said first and second attachment means being cooperable to be engaged to cause the top edge of said shield to conform substantially to the shape of said outer edge.

4,852,187
PIECE OF MATERIAL FOR AN ARTICLE OF CLOTHING AND USE OF THE PIECE OF MATERIAL FOR PRODUCTION OF AN ARTICLE OF CLOTHING
Eva Johansson, Fridhemsvägen 11, S-183 65 Täby, Sweden
PCT No. PCT/SE87/00342, § 371 Date Jun. 29, 1988, § 102(e) Date Jun. 29, 1988, PCT Pub. No. WO88/00444, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 23, 1987, Ser. No. 216,621
Claims priority, application Sweden, Jul. 24, 1986, 8603197
Int. Cl.[4] A41B *1/08, 9/06*; A41D *1/02*
U.S. Cl. 2—69 7 Claims

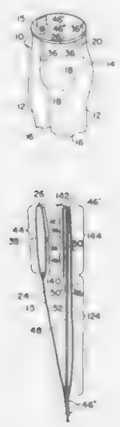


1. Piece of material for an article of clothing (2) or part of such and produced from a thin, web-like material, which article of clothing or part is intended to cover at least the upper body of a wearer and thus to be provided with a front and a back which are finished with a lower edge, and, opposite this, a shoulder section with a neck opening (13) and, moreover, arms which are finished with wrists, wherein the piece of material comprises a first edge (3), which is intended to form the said lower edge, a second edge (4, 5) opposite this, two side edges (6, 10 and 7, 11) opposite each other which connect the two first-mentioned edges, and two cuts (8, 9) which extend inwards from the side edges and which are finished at a distance from each other which corresponds approximately to the size across the chest between the armpits for the body size for which the garment is intended, wherein the piece of material is essentially symmetrical about a centre axis (16) along which a neck opening (13) is to be located close to the second edge (4, 5), characterized in that the said cuts (8, 9) form an angle, to the centre axis (16), which, measured in the direction of the first edge (3), is less than 90°, and in that the second edge is divided into two parts (4, 5) each projecting from a side edge (6, 10 and 7, 11), which parts each have an angle, to the centre axis (16), which, measured in the direction of the first edge (3), is less than the corresponding angle for the cuts (8, 9).

4,852,188
PANTY-TYPE GARMENTS WITH SECURITY POCKET
Renee H. Marsh, Wallburg; Regina H. Henderson, Trinity, and Earle W. Rearwin, Archdale, all of N.C., assignors to It's A Peach, Inc., High Point, N.C.
Filed Mar. 14, 1988, Ser. No. 167,848
Int. Cl.[4] A41D *27/20*; D04B *9/46*; A41B *9/04*
U.S. Cl. 2—250 8 Claims

1. In a woman's pantyhose, panty and any like undergarment having a panty portion with a waistband, the improvement comprising a pocket formed in said panty portion at said waistband for defining an enclosure for security storage of valuables, said pocket being open at the extent of said enclosure

along said waistband of said panty portion and closed along the remaining extent of said enclosure, said pocket having a flap extending inwardly within said enclosure along said open extent of said pocket for retaining stored valuables within said enclosure, one of said waistband and said flap including means



for generally adhering to the other for generally closing said pocket, said adhering means including an uncovered elastomer yarn partially exposed at a surface of said one of said waistband and said flap facing the other thereof for adhering contact therewith.

4,852,189

HEADBAND STRUCTURE

Charles M. Duggan, 3120 Earhart Rd., Ann Arbor, Mich. 48105

Filed Aug. 22, 1988, Ser. No. 234,554
Int. Cl.[4] A61F *9/00*; G02C *3/02*
U.S. Cl. 2—452 **1 Claim**



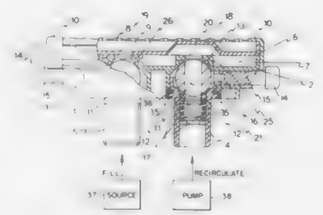
1. In combination with a continuous elastic headband having moisture absorptive properties and textured to present a larger plurality of upstanding fibrous loops, the improvement which compresses a rimless relative thin one-piece preformed flexible thermoplastic eyeglass member of generally wraparound configuration having a central body portion and integral rearwardly directed tapered wing portions to substantially entirely shield the eyes from sun rays and the intrusion of foreign objects, and means adhesively secured to the body and wing portions of said eyeglass member along the upper inner marginal portions thereof and presenting fibrous hooks outstanding therefrom for cooperative releasable engagement with the upstanding loops of the textured continuous elastic headband along the outer exposed surface thereof, said eyeglass member thereby being readily invertible by rotation through an angle of about 180 degrees from an active line of sight position on said headband depending downwardly thereon to an active out of line sight position on said headband extending upwardly thereon in releasable engagement therewith.

4,852,190

DOUBLE CASCADE SPOUT

Remo Jacuzzi, and Eugene C. Smith, both of Little Rock, Ak., assignors to Jason International, Inc., Little Rock, Ak.

Filed Mar. 18, 1988, Ser. No. 170,230
Int. Cl.[4] E03C *1/04*
U.S. Cl. 4—192 **28 Claims**



1. A wide mouth double cascade delivery unit connectable to at least two liquid delivery pipes for emitting a curtain of liquid therefrom comprising:

superimposed elongated upper and lower liquid receiving and dispensing chambers, each of said chambers being in atmospheric communication via a long narrow slot in a side of said chamber, the length of each of said slots being substantially equal to the length of the cross-section of each of said chambers transverse to the flow of liquid from said chambers;

a first liquid delivery insert;

a second liquid delivery insert and each of said chambers having a bottom, wherein the bottom of said lower chamber has first and second laterally spaced apart apertures therein, and

wherein the bottom of said upper chamber has a third aperture therein,

said second and third apertures being co-axial, whereby said first insert is inserted through said first aperture, and conveys liquid into said lower chamber therethrough, and

whereby said second insert is inserted through said second and third apertures, and conveys liquid into said upper chamber therethrough, and

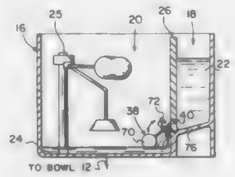
independent valve means in said first and second inserts for controlling liquid flow through said first and said second delivery inserts.

4,852,191

TOILET

Felicino Giglio, 1624 Kimball St., Brooklyn, N.Y. 11234

Filed May 17, 1988, Ser. No. 194,880
Int. Cl.[4] E03D *9/03*
U.S. Cl. 4—228 **8 Claims**



1. An improved toilet having a bowl and flushing means wherein the improvement comprises:

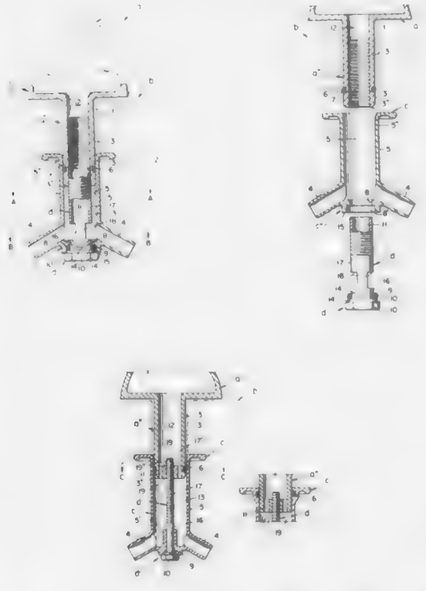
a toilet water tank having a removable partition transversly mounted in said tank and dividing said tank into a first compartment filled with a deodorant and a second compartment to be filled with a flushing fluid, said partition having an aperture adjacent the lower end thereof, first valve means in said second compartment for flushing fluid from said second compartment through said toilet bowl, and for replenishing fluid in said second comparment, and second valve means mounted on said partition and disposed within said second compartment at a lower end therof, for closing said aperture, said valve means including actuating means responsive to fluid level in said second compartment wherein said aperture is opened when said fluid level drops to a predetermined level in said second compartment for allowing a predetermined amount of said deodorant to pass from said first compartment into said second compartment and a closed when a predetermined level of flushing fluid is replenished in said second compartment for preventing said deodorant from passing from said first compartment into said second compartment whereby said deodorant mixes with said fluid in said second compartment when the level of said flushing fluid is near the lower end thereof to provide deodorizing for the toilet.

4,852,192

FAUCET ASSEMBLY PLUMBING FIXTURE

Rodolfo J. Viegener, Uriarte Street No. 1534, Buenos Aires, Argentina

Filed Feb. 6, 1987, Ser. No. 11,527
Claims priority, application Argentina, Feb. 7, 1985, 303082
Int. Cl.[4] E03C *1/00, 1/04*
U.S. Cl. 4—191 **6 Claims**



1. An improved faucet assembly plumbing fixture to facilitate installation of a faucet assembly in lavatory or kitchen sinks and the like, the sink including a conventional flange and at least one conventional orifice therethrough for mounting of the faucet assembly, the plumbing fixture comprising: an upper spigot outlet; a lower, tubular plunger depending from the spigot outlet, the plunger being inserted through the sink flange orifice and protruding therebelow; an adjustable tubular holder element means telescopically slidably fitted over said tubular plunger for tightly clamping the plunger and holder together against the upper and lower surfaces of the sink flange adjacent the orifice, said holder having at least one lateral feed passage means thereinto, said holder further including means defining a lower, open base therein; circular seal means inserted between the plunger and holder at a predetermined location whereby the plunger and holder may be slidably adjusted to accommodate varying thicknesses of sink flanges yet maintain a fluid tight sealed relationship therebetween; said holder including an upper peripheral collar seated against the sink flange lower surface adjacent the orifice; headed, screw threaded means extended through said holder open lower base in sealed relationship therewith, said headed screw threaded means including first screw threads formed about at least the upper end thereof, said lower tubular plunger including second screw threads means formed therein mating with said first screw threads whereby, in assembly of the plumbing fixture, said headed screw thread means is threadably engaged with the plunger second screw thread means thus to draw said outlet and plunger, holder and head screw thread means together; and means defining a fluid conduit from said lateral feed passage means upwardly to said upper spigot outlet.

4,852,193

THERAPEUTIC TABLE

Allen W. Alsip, Aurora; James N. Robinson, Addison, and Clayton E. Bossert, Aurora, all of Ill., assignors to Thomas J. Ring, Harvey, Ill.

Filed Apr. 17, 1985, Ser. No. 724,409
Int. Cl.[4] A61G *7/10*
U.S. Cl. 5—61 **11 Claims**



1. In a therapeutic table having a frame and a patient support composed of a plurality of panels mounted to the frame, an improved panel mounting mechanism for at least one of said panels, comprising:

a nonmovable connector member mounted to one of the frame and one side of the panel;

means connected to the other of, the frame and the one side of the panel for receipt of the nonmovable connector member for support of the panel at said one side;

another connector member;

means for mounting said other connector member to said panel adjacent another side thereof for movement relative to the panel;

means connected to the frame for receipt of said movably mounted connector member to support said panel at said other side; and

means connected with said movable connector member and manually engagable to move the movable connector member into and out of supportive receipt within said movable connector member supporting means.

4,852,194

SAFETY BARRIER FOR SMALL CHILDREN

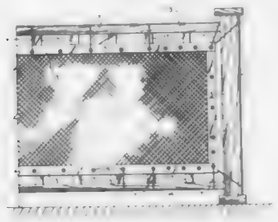
Jeffrey M. Langan, 3413 Sunset, Boise, Id. 80376

Filed Feb. 5, 1988, Ser. No. 152,544
Int. Cl.[4] A47C *21/08*
U.S. Cl. 5—427 **4 Claims**

1. A wall construction comprising, in combination:

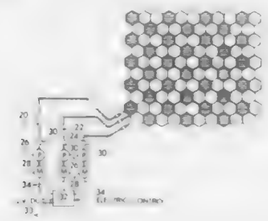
(a) a fence or railing construction including right and left end vertical support members, top and bottom horizontal support members, and a plurality of horizontally spaced, parallel rail members extending vertically between upper and lower ends anchored to said top and bottom horizontal support members, respectively;

(b) a substantially rectangular, flexible panel of netting material having relatively small apertures, said panel having a predetermined width and height at least substantially as great as the distances between said vertical and horizontal support members, respectively;
(c) a border of flexible reinforcing material secured to said panel to form marginal edge portions extending continuously along all four sides thereof;
(d) a plurality of openings, each surrounded by a reinforcing grommet, extending through said marginal edge portions, one of said openings being positioned adjacent each of the four corners of said marginal edge portions and a plurality of said openings being spaced at predetermined intervals along all four of said marginal edge portions in a straight line between said openings at said four corners; and



(e) a plurality of laces extending through at least selected ones of said openings, said laces each being anchored to one of said members adjacent the opening through which they extend to support said panel in covering relation to said fence or rail construction, the number and spacing of said openings along all of said marginal edge portions being such that said panel and border may be folded upon themselves in both the width and the height directions and said laces passed through said openings in folded portions of said border and anchored to said support structure, whereby the effective width and height of said panel and border may be selectively reduced to conform to fence or railing constructions wherein the width and/or height are less than said predetermined width and/or height, respectively, said panel thus providing a safety barrier preventing small children from passing partially or entirely through the spaces between said rail members.

4,852,195
FLUID PRESSURIZED CUSHION
David A. Schulman, 7701 Newton Ave. North, Brooklyn Park, Minn. 55444
Filed Oct. 16, 1987, Ser. No. 109,298
Int. Cl.[4] A61G *7/04*; A47C *27/10*
U.S. Cl. 5—453 **15 Claims**



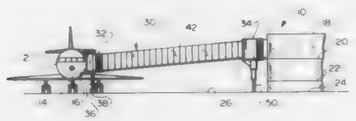
1. A hollow, fluid pressurized, body support cushion formed from a plurality of interfitting matrices,
each such matrix comprising a set of hollow cells formed from a resilient elastomeric material,
the cells of one matrix being fitted between the cells of each other such matrix to define a body support surface composed of all sets of cells,
separate interconnecting fluid ducts between the cells in each matrix,
fluid pressurizing means to inflate and deflate the separate matrices at different times to shift body support from one set of cells to another for promoting blood circulation and enhancing comfort for the user, and
said plurality including matrices, each having cells arranged in an array with spaces between cells of each matrix of the same size as the cells of other matrices to accommodate the cells of an adjacent matrix so that when the said matrices are interfitted together a complete cushion is formed having an upper supporting surface defined by adjacent top portions of all the matrices and the ducts of each matrix are positioned at a different elevation to allow the matrices to be nested together.

4,852,196
COMBINATION DRILL AND SCREWDRIVER
Ronald L. Martin, Bristol, Wis., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Jul. 18, 1988, Ser. No. 220,201
Int. Cl.[4] B25B *15/00*
U.S. Cl. 7—165 **4 Claims**



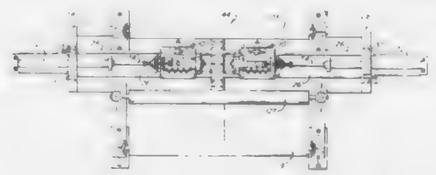
1. A combination device for use with a drive means for forming holes in wallboard material and the like and for driving screws, said device comprising:
an elongated core having a forward end, and a rearward end;
means for forming a first hole, said means having a plurality of equally spaced wings formed on said forward end, said wings separated by valleys, each said wing having a first portion extending radially outwardly and away from said forward end and each said wing having a second portion extending rearwardly from said first portion, the junction of each said first wing portion and each said valley forming an abrading edge for removing wallboard material when said device is rotated and is pressed with a first axial force directly into engagement with wallboard and rotated to form a first hole having a first diameter;
stop means for resisting further penetration by said core into said wallboard when said first axial force is applied to said device, said stop means comprising an annular surface extending radially outwardly from said core, said annular surface spaced a first distance from said forward end;
a shank section between said first hole forming means and said annular surface, a portion of said shank section having a reduced cross section for relieving abraded wallboard material when forming said first hole;
a counterbore surrounding said core and axially displaced rearwardly from said annular surface, said counterbore for forming a second hole having a second diameter; said stop means being pushable through said wallboard when said device is subjected to a second axial force, whereby said counterbore engages said wallboard to form said second hole; and
means formed on said rearward end for connection to said drive means.

4,852,197
APPARATUS FOR TRAFFICKING PEOPLE THROUGH AIRPORTS OR LIKE TRANSIT TERMINALS
Joseph R. Thomas, Jr., 4606 Baycrest Dr., Tampa, Fla. 33615
Filed Mar. 11, 1988, Ser. No. 166,684
Int. Cl.[4] E01D *1/00*
U.S. Cl. 14—71.5 **4 Claims**



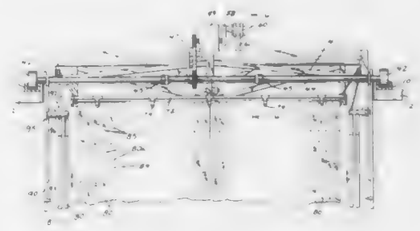
1. A system for facilitating the movement of passengers at an airport facility comprising in combination:
a terminal building having a plurality of passenger transfer zones disposed one above the other, each transfer zone located at the edge of the building;
an aircraft positionable at a distance from the building and having a door with a threshold across which passengers may move; and
a single elongated walkway having a first end and a second end and positionable with its first end adjacent to the aircraft and with its second end positionable adjacent to a preselected one of the transfer zones, each end having a supporting structure therebeneath for retaining the supported end at one of the plurality of elevational positions whereby the first end may be placed at a height corresponding to the threshold of the aircraft independent of the height of such threshold and whereby the second end may be placed at a height corresponding to one of the transfer zones to thereby allow for the movement of passengers between the aircraft and the terminal building independent of the height of the threshold of the aircraft or the height of the preselected transfer zone.

4,852,198
EDGE BRUSH FOR ELECTROPLATED STRIP
Edwin J. Gebhardt, Center Township, Porter County; George H. Keaton, Porter Township, Porter County; Michael M. Sinar, Porter Township, Porter County, all of Ind., and James N. Wendt, Novi, Mich., assignors to USX Corporation, Pittsburgh, Pa.
Division of Ser. No. 90,482, Aug. 28, 1987, Pat. No. 4,787,112.
This application Oct. 21, 1988, Ser. No. 260,761
Int. Cl.[4] A46B *13/02*
U.S. Cl. 15—77 **9 Claims**



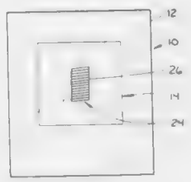
1. Apparatus for removing excess plated metal from a portion of a broad surface of electroplated metal strip adjacent to the strip edge, said apparatus comprising:
a brush;
a carriage for supporting said brush, said carriage being slidably movable in a transverse direction with respect to the strip,
means mounted on said carriage for rotatably driving said brush,
means for slidably moving said carriage inwardly and outwardly in said transverse direction to maintain said brush in contact with a uniform portion of the width of said broad strip surface near the edge thereof,
resilient means for maintaining said brush in position so as to exert substantially constant pressure against the strip,
said brush comprising a disc having filaments extending radially outwardly therefrom.

4,852,199
AUTOMATIC VEHICLE WASHING APPARATUS
Edward Holbus, 500 Cross Creek Rd., Racine, Wis. 53402
Filed Apr. 11, 1988, Ser. No. 180,329
Int. Cl.[4] B60S *3/04*
U.S. Cl. 15—97 B **12 Claims**



1. A washing apparatus for a vehicle, comprising:
a plurality of hanging flexible and wettable washing strips arrayed transverse to the length of the vehicle and on both sides of the vehicle;
means for moving the plurality of strips and the vehicle relative to each other from one end of the vehicle to the other end of the vehicle; and
means for delivering water to the surface of the vehicle in advance of the strips,
said washing strips being each formed of a plurality of sponge elements arranged end to end along the length of the strip, the sponge elements comprising an outer water permeable tube and an inner water absorbable filling.

4,852,200
DEVICE FOR CLEANING ELECTRIC KNIVES
James L. Phillips; Dale W. Richardson, both of Mattawan, Mich., and Lawrence M. Silverman, Danville, Calif., assignors to Richardson & Associates, Ltd., Kalamazoo, Mich.
Filed Feb. 17, 1988, Ser. No. 157,289
Int. Cl.[4] A47L *25/00*
U.S. Cl. 15—104 R **20 Claims**



1. An electric-knife cleaning device useful in connection with surgery which device comprises a cleaning head mounted on a laminated base, the bottom lamina of which is a removable pull-off sheet adhered to said base by a tacky adhesive which remains on said base when said pull-off sheet is removed and is then operative to adhere said base to a surface, and the top lamina of which comprises means for mounting said cleaning head on said base, whereby the bottom lamina can be removed and the device adhered to a surface adjacent the situs of the

surgery in a position convenient for cleaning the knife during the surgery,

in which the cleaning head comprises a tightly-wound coil spring in which the convolutions of the coil are juxtaposed whereby, when the blade of the knife is drawn through juxtaposed convolutions, it will be wiped clean, and

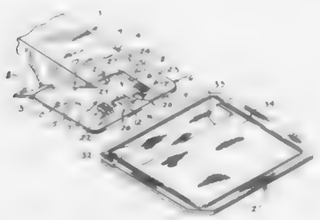
in which the last convolution at each end of said spring has a leg portion which extends tangentially from the last convolution, both of which leg portions have their ends bent to form two feet, one on each leg, said feet being anchored between said top lamina and an under-lying lamina.

4,852,201

TOILET BOWL CLEANER

John A. Wundrock, West Bend, and Mary L. Conrardy, Wauwatosa, both of Wis., assignors to Badger Pharmacal, Inc., Jackson, Wis.

Filed May 23, 1988, Ser. No. 197,684
Int. Cl.[4] A46B *17/02*
U.S. Cl. 15—145 **6 Claims**



1. A holder for a disposable toilet bowl cleaning pad, comprising:

an elongate rigid handle member having a grip portion at one end and a head portion at its opposite end, said head portion includes a leading edge;

a tongue member having opposite ends with one of said ends pivotally mounted on said head portion and the other of said ends movable between a first attached position for attaching a disposable toilet bowl cleaning pad having a premeasured amount of a cleaning composition therein to said handle member and a second detached position for releasing said pad from said handle member, said tongue member includes a trailing edge spaced forwardly of said head portion leading edge; and

lock means for releasably locking said tongue member to said head portion of said handle member, said lock means comprises a snap-lock mechanism located along said leading and trailing edges which includes a resilient lock means on one of said edges releasably engageable with an abutment surface on the other of said edges.

4,852,202

TOOTHBRUSH WITH ANGLED BRISTLES

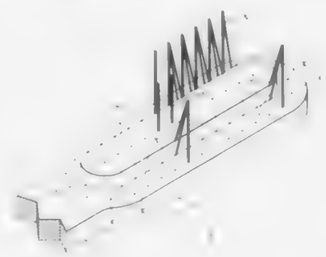
Kenenth W. Ledwitz, 824G Main St., Belleville, N.J. 07109

Filed Jul. 21, 1988, Ser. No. 222,203
Int. Cl.[4] A45B *9/04*
U.S. Cl. 15—167.1 **6 Claims**

4. A toothbrush of the type having a working surface from which extends a plurality of bristles in a direction substantially perpendicular from the working surface, the bristles terminating within a predetermined region distal from the working surface, the toothbrush comprising:

a working platform installed on the working surface for providing a further working surface; and

further bristles extending from said further working platform at an angle other than perpendicular with respect to the working surface and directed so as to terminate sub-



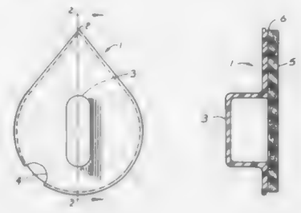
stantially in the region of the termination of the bristles extending from the working surface.

4,852,203

PAINT EDGER FOR THE APPLICATION OF PAINT

Charles E. LaBelle, Rt. 2 Box 592, Oostburg, Wis. 53070

Filed Mar. 9, 1988, Ser. No. 165,921
Int. Cl.[4] A47L *13/00, 13/06*
U.S. Cl. 15—210 R **3 Claims**



1. In combination, an assembly for accurately assembling a paint pad to a paint edger, comprising:

a paint edger having a flat, rigid body and a handle connected to and projecting from said body;

a paint pad having a flat, foam body for applying paint and an adhesive layer on one side of said foam body; and

a loading fixture including a flat member having an opening formed therethrough and a shoulder formed along the periphery of said opening defining a first cutout portion dimensioned to receive said edger body and a second cutout portion dimensioned to receive said pad body so that a flat surface of said edger body engages the adhesive layer of said pad to attach said pad to said edger body.

4,852,204

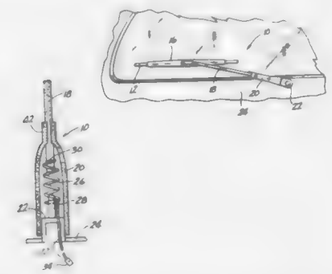
WINDSHIELD WIPER STRUCTURE

Harold Wilson, 62-B Stoneridge Rd., Bridgeport, Conn. 06706

Filed Oct. 26, 1987, Ser. No. 112,531
Int. Cl.[4] B60S *1/34*
U.S. Cl. 15—250.07 **5 Claims**

1. In windshield wiper structure, a wiper blade for engaging a windshield of a vehicle, a metallic wiper blade carrier for carrying the blade, a metallic wiper arm connected to said carrier, a metallic post for reciprocating rotary motion, said wiper arm connected to said post via a metallic end piece, a metallic spring engaging said post and said wiper arm for selectively resiliently urging said blade against or away from the windshield, and an electrical lead connected to said spring

for connection to the electrical system of the vehicle, said structure utilizing said spring as a heating element for tending



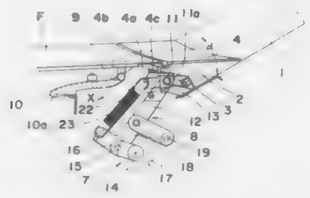
to melt snow and ice from said blade and other elements of said system.

4,852,205

CONTROLLING CIRCUIT FOR WINDOW WIPER ACCOMMODATING APPARATUS

Takahiko Tanaka, Shizuoka; Naogi Hisanaga, Kosai; Takeshi Yamamoto; Susumu Okazaki, both of Hiroshima, and Shinshi Kajimoto, Kure, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 4, 1988, Ser. No. 164,403
Claims priority, application Japan, Mar. 5, 1987, 62-52256; Mar. 5, 1987, 62-52257
Int. Cl.[4] B60S *1/08*
U.S. Cl. 15—250.17 **9 Claims**



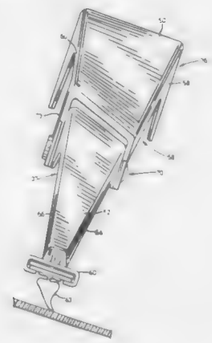
1. A controlling circuit for a concealed window wiper accommodating apparatus wherein a cowl is provided movably to open or close an opening portion formed between the lower edge of a front window glass and the rear end portion of a bonnet, and a wiper including a wiping portion to be lifted for wiping the front window glass through the opening portion is accommodated within the bonnet, comprising a cowl motor for operating the cowl cover to move from the closed position to the opened position, a wiper motor for operating the wiper so as to lift the wiper portion onto the front window glass, a first means for driving the cowl motor to be turned on by a drive controlling operation, and a second means for generating a position signal to actuate the wiper motor upon detecting that the cowl cover moving to open has reached a position where the wiping portion is capable of lifting without causing an interference with the cowl cover, a switch which is opened and closed in accordance with the position of an output shaft of a gear portion being provided, the gear portion being disposed along a transmission route extending between the cowl driving motor and the cowl cover, as a detector for inputting into the controlling circuit the position signal during the opening and closing operation of the cowl cover so that before the cowl cover reaches the opened position, the wiper is set to be operated.

4,852,206

AERODYNAMIC WINDSHIELD WIPER

Brian A. Fisher, Burlington, Canada, assignor to Tridon Limited, Oakville, Canada

Filed Jul. 28, 1987, Ser. No. 78,730
Claims priority, application Canada, Feb. 10, 1987, 529424
Int. Cl.[4] B60S *1/04*
U.S. Cl. 15—250.42 **8 Claims**



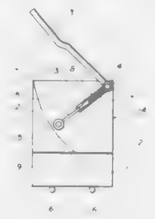
1. A windshield wiper superstructure comprising a first yoke having a centrally located attachment means for connection to a wiper arm and ends, the first yoke having a spine on the top surface of the yoke defining a varying angle of attack to air flowing over the first yoke, the angle of attack being a maximum at the ends of the first yoke and a minimum at the center of the first yoke.

4,852,207

MOP SQUEEZER

Izumi Yamane, 3715-30, Yana Kisarazu-shi, Chiba-ken, Japan

Filed Feb. 18, 1988, Ser. No. 157,633
Int. Cl.[4] A47L *13/60*
U.S. Cl. 15—262 **1 Claim**



1. A mop squeezer comprising a freely rotatable movable roller held at the ends of a pair of swingable arms fixed to a horizontal shaft pivotally supported in the upper part of an upwardly opening box and rotatable by means of a hand lever fixed to the shaft, and a squeezer plate having a curved surface provided with a plurality of drain perforations, said surface being formed by the movement of a generating line in parallel with the shaft, said squeezer plate being fixed inside the box to face the movable roller with the distance between the surface of the squeezer plate and the shaft being smallest at the half length or below along the curved surface of the squeezer plate,

wherein the distances between the upper end of the squeezer plate and the shaft and between the lower end of the squeezer plate and the shaft are in the range of from 105% to 140% and in the range of from 100% to 110%, respectively, based on the smallest distance between the squeezer plate and the shaft, and

wherein a thrusting means is coupled to each of the pair of swingable arms for compression between said pair of swingable arms and a mop positioned on the squeezer plate to press said mop against the squeezer plate.

4,852,208

VACUUM CLEANER

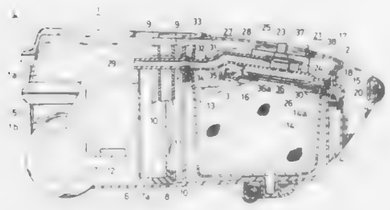
Takuya Morishita, Himeji; Atushi Okuda, and Shinji Asanaka, both of Kasai, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Oct. 6, 1988, Ser. No. 254,434

Claims priority, application Japan, Oct. 8, 1987, 62-253986; Oct. 13, 1987, 62-257816; Oct. 16, 1987, 62-262237

Int. Cl.[4] A47L *9/00*

U.S. Cl. 15—339 **18 Claims**



1. A vacuum cleaner comprising a cleaner body having a dust chamber formed with a suction opening and a fan chamber communicating with the dust chamber and accommodating an electric fan therein, the fan chamber having an air discharge opening, and drive control means for controlling the operation of the fan,

the cleaner body being provided with an air channel in its interior for holding a portion of the fan chamber at the air discharge side of the fan in communication with the dust chamber and closure means for closing the suction opening of the dust chamber,

the drive control means comprising cleaning operation means for driving the fan to thereby draw dust collecting air into the suction opening, pass the air through the dust chamber and the fan chamber and discharge the air from the discharge opening for a cleaning operation, and organism killing operation means for driving the fan after the cleaning operation to cause air to flow through the dust chamber, the fan chamber and the air channel into the dust chamber in circulation by the action of the closure means and kill noxious small organisms in the dust trapped in the dust chamber by heating.

4,852,209

APPARATUS FOR CLEANING CALENDER ROLLS AND THE LIKE

Peter Svenka, Grefarth, and Richard Rauf, Krefeld-Oppum, both of Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

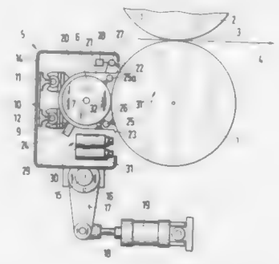
Filed May 16, 1988, Ser. No. 195,108

Claims priority, application Fed. Rep. of Germany, May 20, 1987, 3716902

Int. Cl.[4] B21B *28/02*

U.S. Cl. 15—308 **23 Claims**

1. Apparatus for intermittently removing impurities from a roll having a predetermined length and arranged to rotate in a predetermined direction, and being utilized in calenders and like machines, comprising a rotary cleaning implement having an axial length which is a small fraction of said predetermined length; guide means movable supporting the cleaning implement and extending in parallelism with the roll so that the cleaning implement can be moved into cleaning engagement with axially spaced-apart portions of the periphery of the roll; a frame for said cleaning implement movable along said guide means; and means for blowing a gaseous fluid against the roll,



said blowing means being located past said frame as seen in the direction of rotation of the roll.

4,852,210

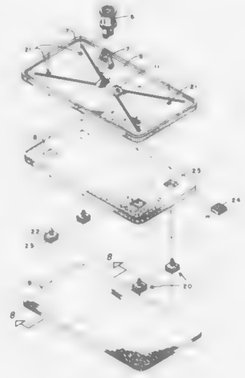
WET MOP WITH INTERCHANGEABLE SCRUBBING PAD AND CLOTH WIPE

Stephen W. Krajicek, One Lakeside Plaza, Ste. 800, Lake Charles, La. 70601

Continuation of Ser. No. 152,480, Feb. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 85,800, Aug. 17, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,778

Int. Cl.[4] A47L *13/16*

U.S. Cl. 15—228 **4 Claims**



1. A wet mop with a removable scrubbing pad to accommodate a cloth wipe, comprising:

(a) a flat, rigid plate;

(b) an elongated handle;

(c) means to pivotally connect an end of said handle to a top side of said plate;

(d) a planar deformable cushion of a size similar to that of said plate having a top side attached to a bottom side of said plate, said cushion further having a bottom side and a plurality of recesses extending through a thickness of said cushion;

(e) pad grippers positioned in said recesses, each of said pad grippers having a foundation secured to said plate and a plurality of downwardly extending bristles within said recesses such that said bristles do not extend beyond a bottom surface of said cushion; and

(f) a substantially planar, porous scrubbing pad detachably secured to said bottom side of said cushion, wherein areas of said scrubbing pad overlaying said recesses are sunken into said recesses and said bristles penetrate into and engage said scrubbing pad.

4,852,211

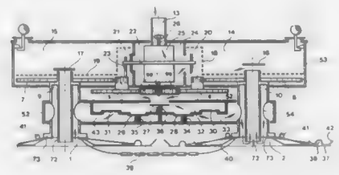
AUTOMATIC POOL CLEANER

Benedikt Strausak, Bergdorf, Switzerland

Continuation-in-part of Ser. No. 908,574, Sep. 18, 1986, abandoned. This application Jul. 5, 1988, Ser. No. 215,297

Int. Cl.[4] E04H *3/20*

U.S. Cl. 15—1.7 **14 Claims**



1. A self-propelling machine for cleaning swimming pools by suction, of the type having a housing, two suction disks, a water turbine, means for connecting said turbine to the suction line of a circulating pump, and changeover means for causing suction to act upon said two suction disks alternately, wherein the improvement comprises:

means for mounting said suction disks rotatingly in said housing; and

drive means for causing said suction disks to rotate.

4,852,212

SET OF HARDWARE FOR MOUNTING A HINGED AND SLIDABLE DOOR ON A BOX UNIT OF FURNITURE

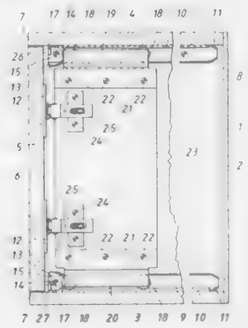
Reinhard Amann, Lustenau, Austria, assignor to Alfit Gesellschaft m.b.H., Götzis, Austria

Filed Oct. 2, 1987, Ser. No. 104,803

Claims priority, application Austria, Oct. 16, 1986, 2750/86

Int. Cl.[4] A47H *15/00;* **A47B** *88/00*

U.S. Cl. 16—102 **7 Claims**



1. A set of hardware for mounting a hinged and slidable door on a box unit of furniture having an open side to be closed by said door and a wall which extends perpendicularly to said open side and has two spaced apart parallel horizontal edge portions, which set comprises

hinge means adapted to define a hinge axis and to mount said door at one edge thereof for rotation about said axis from a closed position over said open side to an open position in which said door extends out of said box and is parallel to said wall, said door having two further edges extending from said one edge perpendicularly thereto, and

slide track means adapted to be mounted on said wall so as to extend parallel thereto and to guide said hinge means and said door mounted on said hinge means into said box unit when said door is in said open position,

wherein the improvement comprises

two track rails constituting said slide track means and having respective bearing surfaces, the track rails being adapted to be secured to said two spaced apart parallel horizontal edge portions so that said bearing surfaces extend along said edge portions,

two carriages adapted to be associated with respective ones of said track rails and each of which comprises at least two rollers adapted to roll on the bearing surface of the associated track rail, each carriage being provided with a bracket bent out toward the side facing away from the rollers,

a mounting plate adapted to be secured to said brackets, to interconnect said carriages and to extend on that side of said carriages which is opposite to said wall, and further adapted to carry adjustable furniture hinges which constitute said hinge means and permit said door to be rotated to an open position in which said door is aligned with said mounting plate,

carriage stop means adapted to limit the movement of said carriages along said track rails, and

adjustable door stop means adapted to be mounted for cooperation with said additional edges of said door in said closed position.

4,852,213

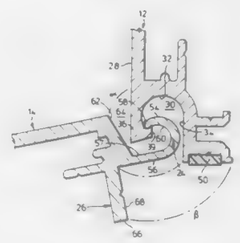
RELEASABLE EXTRUDED HINGE

Peter Shewchuk, 1055 Shawnmarr Road, Unit 144, Mississauga, Ontario, Canada L5H 3V2

Filed Oct. 13, 1987, Ser. No. 106,595

Int. Cl.[4] E05D *1/06, 9/00*

U.S. Cl. 16—266 **10 Claims**



1. A pinless releasable hinge assembly, comprising:

a first member and a second member, one of said first and second members being a stationary member and the other of said first and second members being a hingedly swingable member,

said first member having a cavity therein with an inner curved mating surface,

a retaining flange at a first end of said inner mating surface,

an entrance slot to said cavity defined between said retaining flange and a second end of said inner mating surface,

said second member having a hooked portion with an outer curved mating surface, said hooked portion having an outer end,

said outer mating surface mating with said inner mating surface in a closed configuration in which said outer end abuts said retaining flange,

one of said retaining flange and said outer end being hingedly swingable along a generally arcuate path relative to the other from said closed configuration to define a plurality of open configurations along said arcuate path,

a limiting release configuration on said arcuate path at which said hooked portion is releasably removable through said

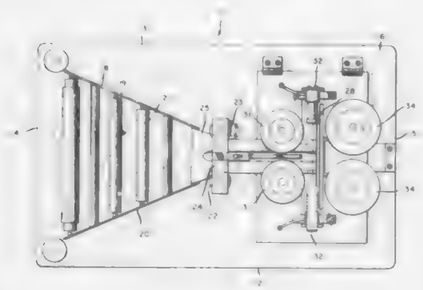
slot, said hooked portion being captive in said cavity between said closed configuration and said limiting release configuration,

resilient seal means on one of said first and second members, remote from said inner and outer mating surfaces, and abutment means on the other of said first and second members, said seal means resiliently sealingly engaging said abutment means in said closed configuration.

4,852,214
LINK SEPARATOR GUIDE

Leslie B. Melanson, Belmar, and Gerald C. Berendt, Seaside Park, both of N.J., assignors to Bermel Industries, Inc., Seaside Park, N.J.

Filed Oct. 25, 1988, Ser. No. 262,484
Int. Cl.[4] A22C *11/00*; B26D *5/34*
U.S. Cl. 17—1 F **1 Claim**



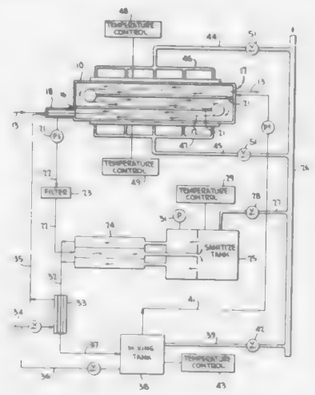
1. An improved link separator which is comprised of a means for drive feeding to a severing station a chain of articles joined together by joining segments, a photocell and opposed light source proximate to the severing station, a radial knife positioned at the severing station and rotatable in a plane generally perpendicular to and extending through said joining segments, a drive means for the knife, a control means for the drive means activated in response to a signal from the photocell, the control means generating a rotation of said knife for each joining segment, a means for drive discharging severed articles from the severing station, a means for governing the vertical position of the articles proximate to the severing station including a lower support and an upper vertically opposed finger and support said chain of articles must pass, the improvement therein comprising:

an elongated link separator guide extending from said drive feed to said severing station, said guide having formed on the top thereof, and a longitudinal arcuate channel conforming substantially to a portion of the circumference of the chain of articles, said longitudinal arcuate channel passing between said drive feed and cooperating with said drive feed to partially encapsulate a portion of the circumference of the chain of articles and to position said joining segment of said chain of articles in alignment with said severing station, said link separator guide comprising a first end and a second end, said first end being inclined to permit the successive positioning of chain link articles in said arcuate channel, said second end terminating proximate to said severing station, said second end having an upstanding transparent post for additional alignment of said chain of articles, said transparent post permitting the passage of said light beam from said light source to said photocell, said drive feeding means being positioned between said first end and said second end of said improved link separator guide, said drive feeding means being positioned in juxtaposed semi-circular indents intersecting said arcuate channel.

4,852,215
POULTRY SCALDING SYSTEM AND PROCESS

Edward H. Covell, III, 919 Riverside Dr., Salisbury, Md. 21801

Filed Feb. 27, 1989, Ser. No. 315,841
Int. Cl.[4] A22C *21/04*
U.S. Cl. 17—11.2 **15 Claims**



5. A poultry scalding system comprising, an open immersion tank adapted to contain scalding liquid at a predetermined scald temperature, conveyor means positioned above said tank for moving poultry in one direction through said tank from an entrance station to an exit station at said tank while the poultry is immersed in the liquid as the poultry hangs by the legs from said conveyor means, a pipe circuit external to said tank for recirculating substantially all the scalding liquid in a direction opposite said one direction during operation of said conveyor means, said circuit being connected to said tank for removing the liquid at the entrance station, means for supplying unheated add-on liquid to the removed liquid to form recirculated liquid, means for heating the recirculated liquid to the scald temperature, and said circuit being connected to said tank for returning the recirculated liquid to said tank at said exit station.

4,852,216
ANIMAL SLAUGHTERING CHEMICAL TREATMENT AND METHOD

R. Paul Clayton, Greeley, and Rod A. Bowling, Fort Collins, both of Colo., assignors to Monfort of Colorado, Inc., Greeley, Colo.

Filed Jan. 16, 1987, Ser. No. 3,855
Int. Cl.[4] A22B *5/00*
U.S. Cl. 17—50 **18 Claims**

1. In a method for packing meat the steps comprising:

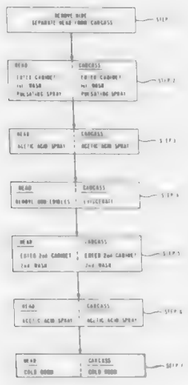
removing the hide from the animal leaving a carcass;

a first water rinsing of the carcass within one hour of removal of the hide, with water maintained from 80 to 150 degrees fahrenheit;

a first spraying of the carcass, immediately after the first washing, with acetic acid spray;

evisceration of the carcass;

a second rinsing of the carcass, immediately, with water maintained from 80 to 150 degrees fahrenheit;

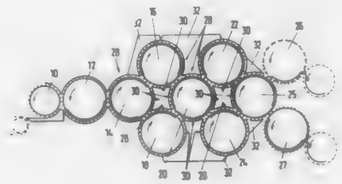


a second spraying of the carcass with acetic acid spray, immediately after the second rinsing.

4,852,217
CARDER FOR MANUFACTURING NON-WOVENS FROM FIBROUS MATERIAL

Siegfried Bernhardt, Sandesch 5, D2820 Bremen 71; Alfred Knake, Samlandstr. 43, 2820 Bremen 71, and Hans Schmiedgen, Korbweide 15, D2820 Bremen 70, all of Fed. Rep. of Germany

Filed Dec. 15, 1987, Ser. No. 133,423
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, 3643304
Int. Cl.[4] D01G *15/00, 15/46*
U.S. Cl. 19—98 **4 Claims**



1. A carder for manufacturing non-woven materials from fibrous material comprising:

at least one draw-in roller,

a licker-in roller following said draw-in roller and rotating in the same direction,

at least two worker rollers of the same diameter following said licker-in roller, said two worker rollers rotating in the same direction and at a greater speed than said licker-in roller,

at least one doffing cylinder cooperating with the last of said worker rollers,

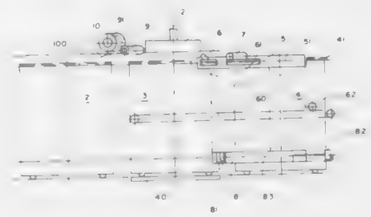
a further worker roller following said two worker rollers, the worker rollers being separated by transfer regions between adjacent roller, the relative speeds of the worker rollers being adjustable to control the proportion of fibrous material that can be returned to previous worker rollers and succeeding worker rollers, and

air-guiding box members projecting into said transfer regions between said worker rollers for effecting air turbulence in the transfer regions.

4,852,218
PROCESS AND APPARATUS FOR AUTOMATICALLY CHANGING DRUMS WHICH ARE TO RECEIVE WICKS DELIVERED BY TEXTILE MACHINES

Pierre J. Lenaertz, Hoelbeck Bilzen, Belgium, assignor to Societe Anonyme Des Ateliers Houget Duesberg Bosson, Verviers, Belgium

Filed Apr. 11, 1988, Ser. No. 179,869
Claims priority, application European Pat. Off., Apr. 13, 1987, 87870050.9
Int. Cl.[4] D04H *11/00*
U.S. Cl. 19—159 A **23 Claims**



1. An apparatus for automatically replacing, with an empty drum, a drum being filled with spirals of wick exiting from a textile machine of the type having a feeding head that delivers the wick in a continuous manner, said apparatus comprised of:

a frame;

a translationally movable table, said table being pivotably mounted to the frame about a substantially horizontal axis for pivotal movement between a substantially vertical position and a substantially horizontal position;

means for translationally moving the table along the substantially horizontal axis in a first direction and in a second opposite direction between a first position, wherein the table is positioned between the drum being filled and the empty drum, and a second position, wherein the table is positioned between the drum being filled and a filled drum, such that the table translationally moves under the feeding head during the translational movement between the first and second positions;

means for selectively pivoting the table between the substantially horizontal position and the substantially vertical position, such that the table is positioned in the horizontal position during translational movement of the table in the first direction, whereby the wick is received thereon along a substantially longitudinal axis, and further such that the table is positioned in the vertical position during translational movement of the table in the second opposite direction;

means for gripping a wick positioned thereon and pulling the gripped wick in the second opposite direction along a substantially horizontal plane, such that the wick is deposited in the drum being filled;

means for gripping a wick received thereon and for severing the gripped wick when the wick is pulled;

means for translationally moving the drums in the first direction between a first empty position, a second filling position and a third filled position;

the means for gripping and severing and the means for gripping and pulling each being at least partially carried by the table, said respective means being spaced apart from one another;

wherein during translational movement of the table in the first direction from the first position to the second position, the wick is delivered by the feeding head, said wick being received on the table along a substantially longitudinal axis, that portion of the means for gripping and severing carried by the table and that portion of the means for gripping and pulling carried by the table; and

such that in the second position, the means for gripping and

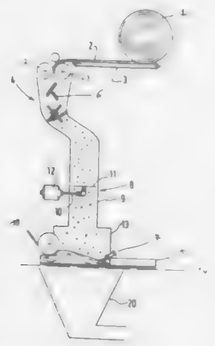
pulling grips and pulls the wick in the second opposite direction substantially along the horizontal plane and substantially along the longitudinal axis guiding the wick into the drum being filled, and the means for gripping and severing grips the wick and severs the pulled wick.

4,852,219

FORMATION OF MINERAL FIBRE FLAKES AND USE OF THESE FLAKES TO RECONSTITUTE INSULATING MATS

Yves Demars, Clermont; Francois Szalata, Rantigny, and Christian DeCoopman, St-Just-En-Chaussee, all of France, assignors to Isover Saint-Gobain, Courbevoie, France

Filed Jun. 1, 1987, Ser. No. 55,888
Int. Cl.[4] D01G *25/00*
U.S. Cl. 19—305 **11 Claims**



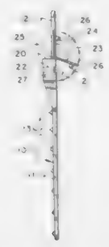
1. A method of forming an insulating layer from a mat of compressed fibrous fleece, comprising the steps of:
forming flakes of fibrous material from a mat of compressed fibrous fleece by an opening type operation;
immediately discharging the formed flakes from the opening operation; and
constituting an insulating layer using said discharged flakes.

4,852,220

FLOWER MOUNTING PIN DEVICE

Joseph G. Berardi, 274 N. Goodman St., Rochester, N.Y. 14607

Filed Sep. 2, 1988, Ser. No. 239,643
Int. Cl.[4] A45F *5/08*
U.S. Cl. 24—6 **4 Claims**



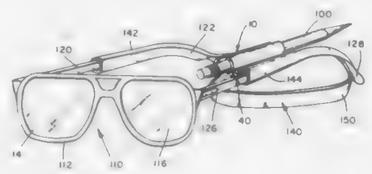
1. A flower mounting pin device including a body and a safety pin removably mounted thereon;
said body including an upright member and a transverse crossbar; said crossbar including a transverse pin channel with a central keyslot therein, and a hinged cover adapted to close over said channel to secure said safety pin within said pin channel;
said safety pin including a stationary arm disposed in said transverse pin channel of said crossbar, said stationary arm having a central offset portion extending into said central keyslot to secure said safety pin against rotation and translation within said pin channel.

4,852,221

APPARATUS FOR RETAINING A WRITING INSTRUMENT ON A PAIR OF SPECTACLES OR SUNGLASSES

Mark Antonucci, 2520 A 5th St., Santa Monica, Calif. 90405

Filed Oct. 17, 1988, Ser. No. 258,593
Int. Cl.[4] A44B *21/00*
U.S. Cl. 24—10 R **20 Claims**



1. An apparatus for retaining a writing instrument on a temple of a pair of spectacles, comprising:
a. a writing instrument retaining means;
b. said writing instrument retaining means further comprising:
(i) an elongated hollow member having a side wall which is open at its front end and its rear end to thereby define an interior chamber which runs for the entire length of the retaining means and is open at both ends,
(ii) the side wall having a longitudinal slot which runs the entire length of the elongated hollow member and which opens into the interior chamber and intersects the front opening and the rear opening of the elongated hollow member;
c. an attachment means connected to said elongated hollow member by which said writing instrument retaining means is retained on a temple of a pair of spectacles; and
d. said attachment means comprising a flat elongated bar which is attached to a portion of the side wall of said elongated hollow member by a cross-bar such that the flat elongated bar extends for at least a portion of the distance adjacent the side wall;
e. whereby a temple of said pair of spectacles is fitted with a tight flexible sleeve and the flat elongated bar is inserted between the temple and the tight flexible sleeve.

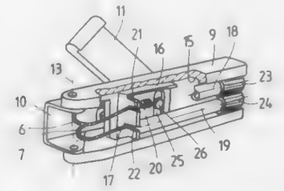
4,852,222

TENSIONING DEVICE FOR A SKI BOOT TIGHTENING CABLE

Guy Courvoisier, Celigny, and Simon Arieh, Geneva, both of Switzerland, assignors to Lange International S.A., Switzerland

Filed May 4, 1988, Ser. No. 190,151
Claims priority, application Switzerland, Jul. 21, 1987, 2767/87
Int. Cl.[4] A43B *5/04*
U.S. Cl. 24—68 SK **5 Claims**

1. A tensioning device for a ski boot tightening cable, comprising a base intended to be fixed to the boot and carrying a tensioning lever articulated on the base and having an anchorage for at least one cable, wherein the anchorage forms part of a member adapted to move between two positions, namely a tightening position and a relaxation position, and mounted for longitudinal sliding on the tensioning lever, said device being



provided with an auxiliary lever associated with said movable member for the purpose of moving the latter.

4,852,223

CLOTHING CORD SECURING CLAMP

John C. McCreary, 355 S. Madison, Apt. 207, Pasadena, Calif. 91101

Filed Mar. 15, 1989, Ser. No. 323,683
Int. Cl.[4] F16G *11/00*
U.S. Cl. 24—115 G **5 Claims**

1. A clothing cord securing claim comprising in combination:
an elastomeric plastic hemisphere having an exterior peak and an internal post of a selected diameter depending from the apex of said hemisphere interior to a position coterminous with an upper edge of an internal groove in the thin wall of said hemisphere, said groove being selectively spaced parallel from said hemisphere diameter, and said selected diameter post having an adaptively sized piercing aperture there through parallel to said hemisphere diameter and disposed a selected distance just above said upper edge of said groove, and,
a thin rigid circular plate securely disposed in said groove, said plate having a centrally disposed second aperture selectively larger in diameter than said post, allowing said post to freely move through said circular plate second aperture.

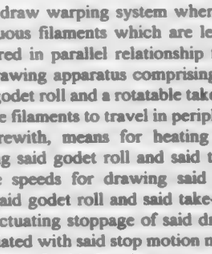
4,852,224

ORNAMENTAL Z-SHAPED ROTARY FASTENING DEVICE

John J. Gentile; Anthony R. Gentile, both of New York, and Christopher T. Gentile, Nyack, all of N.Y., assignors to Abrams/Gentile Entertainment Inc., New York, N.Y.

Filed Feb. 12, 1988, Ser. No. 155,315
Int. Cl.[4] A44B *21/00;* **A44C** *13/00*
U.S. Cl. 24—590 **5 Claims**

1. A fastening device for coupling a first and second object such that said objects can be attached and disengaged with out the need for the user to have to remember the direction in which the objects should be rotated comprising:
a holding member having a shank, one end of said shank being fixed to said first object and the other end of said shank having a Z-shaped flange extending therefrom; and
an attaching member having a Z-shaped opening complementary to said Z-shaped flange such that said Z-shaped opening fits over said Z-shaped flange and when rotated both clockwise and counterclockwise releasably secures



said attaching member to said holding member thereby securing said second object to said first object, said attaching member being releasable by rotating both clockwise and counterclockwise.

4,852,225

DRAW WARPING APPARATUS

John F. Hagewood, Monroe; Kurt W. Niederer, Charlotte, and Daniel W. McCoy, Sr., Monroe, all of N.C., assignors to McCoy-Ellison, Inc., Monroe, N.C.

Filed Jun. 27, 1988, Ser. No. 212,214
Int. Cl.[4] D02H *13/08;* **D02J** *1/22*
U.S. Cl. 28—187 **11 Claims**

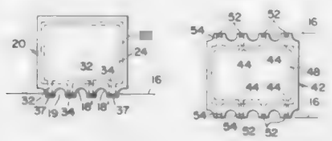
1. In a textile draw warping system wherein a plurality of synthetic continuous filaments which are less than fully oriented are delivered in parallel relationship for winding on a warp beam, a drawing apparatus comprising a rotatable feed roll, a rotatable godet roll and a rotatable take-up roll arranged for training of the filaments to travel in peripheral engagement sequentially therewith, means for heating said godet roll, means for driving said godet roll and said take-up roll at respective relative speeds for drawing said filaments during travel between said godet roll and said take-up roll, stop motion means for actuating stoppage of said drawing apparatus, and means associated with said stop motion means to be operative upon stoppage of said drawing apparatus for removing said filaments from engagement with said godet roll to prevent continued application of heat to said filaments and further operative upon restart of said drawing apparatus for reengaging the filaments with said godet roll at the same location as the previous contact between the filaments and said godet roll, said filament removing and reengaging means including means for maintaining a predetermined tension in the removed filaments along their respective extents between the location of their last contact with said godet roll and said take-up roll and to maintain substantially constant length of the filaments between said feed roll and said take-up roll, thereby to prevent degradation of the filaments during stopping and starting of said drawing apparatus.

4,852,226
COMPOSITE YARN TEXTURING SYSTEM
Andre M. Goineau, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Filed Feb. 29, 1988, Ser. No. 161,584
Int. Cl.[4] D02G *1/16*; D02J *1/12, 3/02*
U.S. Cl. 28—220 3 Claims



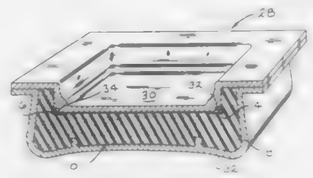
1. A system to provide a spun-like yarn from a plurality of synthetic filament yarns comprising: a first means to draw and texturize a plurality of filament yarns which causes at least one yarn to form loops, a second means operably associated with said first means to break the loops formed by said first means and a third means to take up the yarn with the broken loops therein, said second means including a housing with a door thereon, means applying a suction pressure inside said housing, a plurality of rolls in said housing and an opening means to periodically open the door of said housing to break the vacuum therein.

4,852,227
METHOD FOR MAKING A MULTILAYER CERAMIC CAPACITOR WITH BURIED ELECTRODES AND TERMINATIONS AT A CASTELLATED EDGE
Darnall P. Burks, Nashua, N.H., assignor to Sprague Electric Company, North Adams, Mass.
Filed Nov. 25, 1988, Ser. No. 276,089
Int. Cl.[4] H01G *7/00*
U.S. Cl. 29—25.42 7 Claims



1. In a method for making a multilayer ceramic capacitor including forming a green ceramic parent substrate with a stack of mutually parallel spaced-apart sheet electrodes buried therein, each of one group of said electrodes having a plurality of tab portions extending in one direction through one plane orthogonal to said electrodes, the improvement comprising:
forming one row of holes in said green parent substrate, the center of each hole lying in said one plane between adjacent tab portions;
separating a green elemental substrate from said green parent substrate by dicing in said plane through said row of holes, said elemental substrate including said electrodes and proximal parts of said tab portions, the remainder of said parent substrate including the distal parts of said tab portions; and
heating and sintering said elemental substrate.

4,852,228
METHOD OF MANUFACTURING A VEHICLE SEAT WITH MOLD-IN-FACE SUSPENSION SYSTEM
Randy A. Zeilinger, Ypsilanti Township, Washtenaw County, Mich., assignor to Hoover Universal, Inc., Ann Arbor, Mich.
Filed Oct. 26, 1987, Ser. No. 113,651
Int. Cl.[4] B68G *7/00*
U.S. Cl. 29—91.1 5 Claims



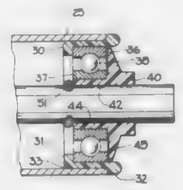
1. A method of manufacturing a vehicle seat cushion suspension assembly for mounting on a frame having laterally separated side rails, said method comprising the steps of:
(a) providing a rectangular woven elastic fabric sheet having retaining means attached to a pair of opposing edges of said fabric sheet;
(b) positioning said sheet within a mold cavity;
(c) injecting expandable foam into said mold to form a foam body molded and bonded to said sheet; and
(d) removing said body from said mold with said fabric molded and bonded to said body.

4,852,229
SELF-LOADING CONTROLLED DEFLECTION ROLL
Jere W. Crouse, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.
Filed Oct. 11, 1988, Ser. No. 256,016
Int. Cl.[4] B21B *31/32*
U.S. Cl. 29—116.2 10 Claims



1. A self-loading controlled deflection roll for engaging a mating roll along a nip line of contact therebetween and disengaging therefrom, comprising, in combination:
a support beam having longitudinal and major and minor axes, the major and minor axes extending through the longitudinal axis and transverse thereto;
support means rotatably supporting the support beam about its longitudinal axis;
a roll shell disposed about the support beam;
roll shell support element means extending longitudinally along the beam surface, said support element means comprising at least three sets of support element means with two sets disposed in substantially opposed array extending along corresponding areas of the surface in a plane through the major axis and along the longitudinal axis, and another set extending along the surface in a plane through the minor axis and along the longitudinal axis whereby the roll shell is supported by at least three sets of support element means; and
drive means operatively connected to the support beam for selectively rotating the support beam to bring the support element means along the major and minor axes out of, and into, alignment with the nip line of contact and longitudinal axis to effect radial movement of the roll shell relative to the longitudinal axis into nipping engagement and out of nipping engagement according to alignment of the support element means along the major and minor axes with the nip, respectively.

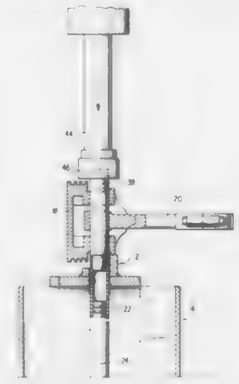
4,852,230
METHOD OF FABRICATING ROLLERS FOR USE IN ROLLER CONVEYOR SYSTEMS
Thomas C. Yu, Cincinnati, Ohio, assignor to The Buschman Company, Cincinnati, Ohio
Filed Apr. 4, 1988, Ser. No. 177,253
Int. Cl.[4] B23P *11/00, 19/02*
U.S. Cl. 29—148.4 D 4 Claims



1. The method of fabricating a free-running roller for use in a roller conveyor system which comprises the steps of:
(a) saw cutting both ends of a cylindrical tube to a predetermined length having a rough edge on each end thereof,
(b) press fitting into each end of said tube an annular cup composed of plastic material of a consistency which will readily adapt itself to said rough edge on said tube, and
(c) press fitting an anti-friction bearing into each said cup.

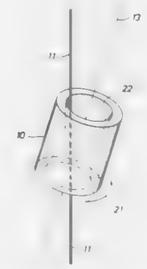
4,852,231
PISTON WRIST PIN INSTALLATION AND REMOVAL DEVICE AND METHOD OF USING
James E. Turner, 407 Sunset, Nashville, Ark. 71852
Filed May 5, 1987, Ser. No. 47,299
Int. Cl.[4] B23Q *1/00*
U.S. Cl. 29—156.5 A 11 Claims

1. A method for inserting a wrist pin into an eye of a connecting rod of a piston assembly comprising:
inserting an upper end section of a press pin into a ram for driving the press pin;
inserting a lower end section of reduced diameter of the press pin into a bore in an upper end of a wrist pin;
inserting an upper end section of reduced diameter of a guide pin into a bore in a lower end of the wrist pin;
thereby forming a rigid rectilinear structure of the press pin, wrist pin and guide pin;
driving the rigid rectilinear structure through the eye of a connecting rod of a piston assembly until the wrist pin is positioned through said eye of said connecting rod; and



removing the press pin from the upper end of the wrist pin and the guide pin from the lower end of the wrist pin.

4,852,232
NOZZLE FABRICATION TECHNIQUE
Dennis L. Wells, League City, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Apr. 1, 1988, Ser. No. 176,587
Int. Cl.[4] B21D *53/00*
U.S. Cl. 29—157 C 19 Claims



1. A method for forming a thruster nozzle from a body of an electro-conductive material comprising the steps of:
forming a passage extending through the body;
positioning a longitudinally-movable EDM electrode wire in said body passage;
coupling a voltage source to the body and the EDM electrode wire;
while the EDM electrode wire is moving along its axis of travel, moving the EDM electrode wire to a selected position within the body and then moving the body to a predetermined inclined position where a selected axis of the body is tilted in relation to the axis of the EDM electrode wire for producing a transverse cut into the body that is inclined in relation to the selected body axis; and
retaining the body in its inclined position and revolving the body about the selected body axis for progressively cutting a generally-hyperbolic nozzle throat within the body.

4,852,233
METHOD OF MANUFACTURING EXTRUDED FLAT MULTIHOLE ALUMINUM TUBE FOR HEAT-EXCHANGER

Hiroshi Kawase, Tokyo, Japan, assignor to Furukawa Aluminum Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,251
Claims priority, application Japan, Jul. 27, 1987, 62-187308; Apr. 8, 1988, 63-85119
Int. Cl.[4] B21D *53/02*
U.S. Cl. 29—157.3 R 4 Claims



1. A method of manufacturing extruded flat multihole aluminum tubes for heat exchangers, including the steps of:
hot extruding a plurality of flat multiple hole Al-Cu or Al-Cu-Mn tubes side by side in the longitudinal direction; and
substantially simultaneously flame spraying Zn onto both even surfaces of the tubes in the vicinity of the extrusion exit of the tubes to cover both even surfaces of the extruded tubes with Zn.

4,852,234
PULLER ASSEMBLY

Daryl Wheeler, Lesmurdie, Australia, assignor to Haben Corporation Ltd., Bayswater, Australia

PCT No. PCT/AU87/00032, § 371 Date Oct. 7, 1987, § 102(e) Date Oct. 7, 1987, PCT Pub. No. WO87/04965, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 5, 1987, Ser. No. 153,275
Claims priority, application Australia, Feb. 13, 1986, PH4585
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—261 9 Claims

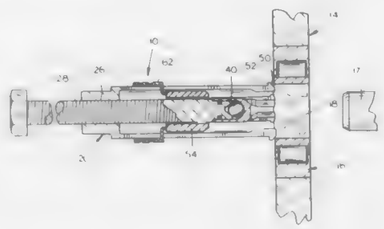


1. A puller assembly comprising at least two angled brackets, each angled bracket having a first end and second end remote from the first end and an elbow located intermediate the first end and second end, the second ends of the angled brackets being pivotally mounted to a base, a screw means threadedly engaged with the second ends of the angled brackets, a drive bolt threadedly engaged in the base centrally of the angled brackets, the drive bolt having an end arranged to be fixed in motion with a stationary shaft from which an object is to be pulled, and at least two legs pivotally attached one to each angled bracket, each leg having a lip remote from the respective angled bracket, each lip being disposed to attached about said object, the drive bolt being threadedly moveable in the base to vary the distance between said end and said lips independent of the action of the screw means, the screw means being disposed substantially at right angles with respect to the drive bolt so that rotation of the screw means in one direction causes movement of said first ends of the angled brackets toward each other and movement of the lips in a direction toward said end of the drive bolt to pull said object off said shaft, and rotation of the screw means in an opposite direction causes movement of said first ends of the angled brackets away from each other and movement of the lips in a direction away from said end of the drive bolt to disengage said lips from said object.

4,852,235
BEARING PULLER

Dwaine A. Trease, P.O. Box 122, Clearwater, Nebr. 68726, and Leroy E. Trease, P.O. Box 115, Pleasant Dale, Nebr. 68423

Filed Aug. 19, 1988, Ser. No. 234,630
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29--263 7 Claims



1. A pulling device for pulling bearings or the like from a supporting member comprising,
an elongated body member having inner and outer ends,
said body member having an internally threaded bore at its outer end,
said body member having a plurality of spaced-apart longitudinally extending gripping arms at its inner end,
each of said gripping arms having a gripping shoulder means provided at the free end thereof which extends outwardly therefrom,
each of said gripping arms having an inwardly projecting boss provided at the free end thereof;
said gripping arms being comprised of a metal material which permits the free ends of said gripping arms to be selectively deflected towards one another, and away from one another,
an elongated bolt member threadably mounted in said internally threaded bore and having an outer end positioned outwardly of the outer end of said body member and an inner end normally positioned between said gripping arms,
a selectively longitudinally movable sleeve means positioned between said gripping arms and said bolt means and being longitudinally movable between a first position wherein it is positioned longitudinally of the free ends of said gripping arms and a second position wherein said sleeve gripping arms and a second position wherein said sleeve means engages said bosses and deflects the free ends of the gripping arms outwardly and prevents the inward deflection of said gripping arms thereby maintaining the gripping shoulders in engagement with the member being pulled,
and an actuator means positioned outwardly of said gripping arms which is operatively interconnected to said sleeve means for selectively moving said sleeve means between its said first and second positions.

4,852,236
METHOD OF REPAIRING A WORN WOBBLER HOUSING FOR A CONSTANT-SPEED DRIVE

Leo D. Emery, Banner Elk, N.C., and Meryl Taulbee, Deerfield Beach, Fla., assignors to Emery Corporation, Deerfield Beach, Fla.

Filed Jul. 11, 1988, Ser. No. 217,466
Int. Cl.[4] B23P *6/00*
U.S. Cl. 29—402.11 16 Claims



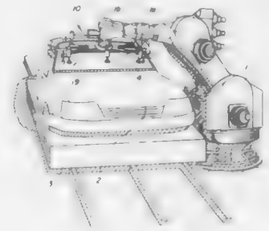
1. A method of repairing a wobbler housing for a constant-speed drive, said housing being rotatable upon a first axis to a limited extent, with said housing including a bottom normally flat control face which has become worn and irregular in shape and further including an axial bore and tapered shaft clearance opening located upon a second axis which has become worn and out of round, comprising the steps of:
(a) grinding the worn bottom control face in a plane parallel to said first axis to a uniform depth;
(b) turning the ground bottom control face to a preset dimension;
(c) drilling a cylindrical bore in the wobbler housing upon said second axis at right angle to the first axis to a predetermined diameter;
(d) grinding said cylindrical bore to a preset irregular shape;
(e) taking a preformed wear plate having a body, a flat control wear face with a opposed flat wearface undersurface, a cylindrical shank, a bore and a clearance taper;
(f) forming the exterior surface of the shank to a corresponding irregular shape;
(g) inserting the wear plate body into the machined wobbler housing with the irregular surfaces in registry and with the flat wear face undersurface of said body snugly bearing against the machined bottom face of said housing; and
(h) securing the wear plate body within the wobbler housing.

4,852,237
METHOD AND APPARATUS FOR MOUNTING WINDSHIELDS ON VEHICLES

Hans-Richard Tradt, Friedberg, and Hans Schillmeier, Kaufbeuern, both of Fed. Rep. of Germany, assignors to Kuka, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 928,466, Nov. 7, 1986, abandoned. This application Dec. 23, 1987, Ser. No. 137,467
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1985, 3539797; May 14, 1987, 3716232
Int. Cl.[4] B23Q *17/00;* B23P *21/00;* B66C *23/00;* B25J *11/00*
U.S. Cl. 29—407 15 Claims

1. A process for the automatic positioning of a windshield for mounting a windshield in a windshield opening of a vehicle using an automatic windshield gripper carrying at least one sensor comprising the steps of: passing the windshield gripper carrying the said at least one sensor over the windshield opening across edges of the opening; and, detecting said edges,



using said at least one sensor, as said at least one sensor passes across said edges of said windshield opening.

4,852,238
DRUM CLOSURE AND METHOD OF MAKING

Robert E. Schurr, Harvey, La., assignor to Robert G. Evans, Gretna, La.

Filed Jun. 13, 1988, Ser. No. 208,578
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—453 22 Claims

1. A method of forming a threaded dispensing opening for a cylindrical light-gauge metal stock drum container having a generally flat circular closed bottom, a generally flat circular light-gauge closed top, and a cylindrical sidewall comprising:
(a) forming an aperture in the drum stock top;
(b) drawing the drum metal adjacent the aperture upwardly to define an upwardly extending annular shoulder;
(c) compressing the shoulder downwardly to thicken the shoulder; and
(d) forming a female thread on the inside of the annular shoulder.

4,852,239
METHOD OF AFFIXING A RING TO PLASTIC PIPE

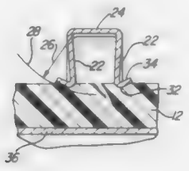
Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Filed Oct. 26, 1987, Ser. No. 112,827
Int. Cl.[4] B21D *39/00;* B23P *11/00*
U.S. Cl. 29—520 3 Claims

1. A method of providing means for enabling application of axial forces on a relatively deformable plastic conduit comprising the steps of:
(a) providing one or more metal rings comprised of an outer peripheral band portion having on the ends thereof oppositely axially inwardly extending deformable leg portions defining outwardly turned free edges with an inside diameter to enable said conduit to easily pass through;
(b) then inserting said conduit through said leg portions of said one or more rings; and

(c) then deforming said leg portions axially toward one another such that said leg portions are positioned substantially directly under said outer peripheral band portion

to reduce the inside diameter of said leg portions of said ring by said deforming such that said reduced inside diameter has a diameter less than the outside diameter of said conduit



thereby applying a larger magnitude force to said conduit by said leg portions with said outwardly turned free edges preventing damage to said conduit to lock

said leg portions to said conduit in a compressional relationship with the said outer band portion while

maintaining said large forces in said compressional relationship on said conduit.

4,852,240

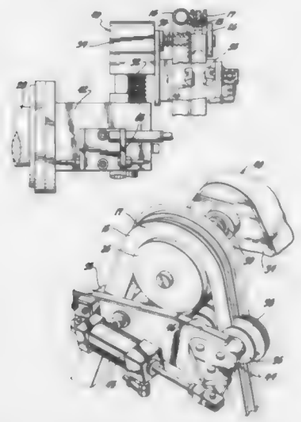
METHOD OF LOADING AN ARM OF A ROBOT WITH A LOOP OF WEATHER STRIPPING

Stephen St. Angelo, Rochester Hills, Mich.; George C. Carver, Albany; David W. Patterson, Duluth, both of Ga., and Owen K. Fremont, Rochester, Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 91,198, Oct. 15, 1987, Pat. No. 4,780,943, which is a division of Ser. No. 888,238, Jul. 18, 1986, Pat. No. 4,715,110. This application Jun. 24, 1988, Ser. No. 212,251

Int. Cl.[4] B23Q *7/00*

U.S. Cl. 29—559 **2 Claims**



1. A method of loading an arm of a robot with a loop of weather stripping from a loading station wherein the robot has an EOAT with a pressure roller and a guide roller having a first position of engagement with the closed loop of weather stripping and a second position out of engagement with said loop of weather stripping and a selectively operable gripper to grab the loop of weather stripping, said method including;

contacting said loop of weather stripping with said pressure roller; and closing said gripper to grab said loop of weather stripping and translating said guide roller from said second to said first position whereby said loop of weather stripping is loaded to said robot arm.

4,852,241

MACHINE FOR AUTOMATICALLY FITTING CONNECTORS TO THE ENDS OF ELECTRIC CONDUCTORS

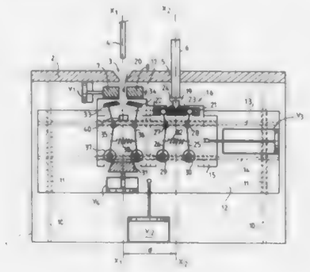
Ali Belaidouni, Dijon; André Benani, Seurre, and Jean-Marie Millet, Bellefond, all of France, assignors to La Telemecanique Electrique, France

Filed Apr. 14, 1988, Ser. No. 181,764

Claims priority, application France, Apr. 14, 1987, 87 05464

Int. Cl.[4] H01R *43/05, 43/055*

U.S. Cl. 29—564.4 **9 Claims**



1. A machine for automatically fitting connecting end-pieces to the stripped ends of electric conductors having an insulating sheath portion, said machine including end-piece supply means, holding means for guiding and holding in position the end of a conductor, shearing and stripping means cooperating with a first actuator for removing said sheath portion from said end, means for fitting an end-piece to the stripped end; and means for crimping the end-piece on said end, wherein said machine further comprises:

i—a fixed structure, the end-piece supply means being arranged on said fixed structure for supplying the end-piece along a first axis, the holding means being arranged on said fixed structure for guiding and holding the conductor along a second axis, said axes being parallel to each other;

ii—a mobile structure and a second actuator carried by the fixed structure and moving the mobile structure in translation parallel to said axes;

iii—a carriage movable with respect to said supply means, the mobile structure and a third actuator carried by the mobile structure and moving said carriage in translation along a rectilinear path perpendicular to said axes,

stripping means and reception means for receiving an end-piece fed from the supply means, said reception means and stripping means being supported by said carriage and respectively positioned on the respective axes, said crimping means being supported by said carriage and positioned on the first axis, and control means for controlling the operation of said actuators, said holding means, said shearing and stripping means, said supply means, said reception means and said crimping means, for providing an operating sequence comprising the following steps:

a first step in which the carriage occupies, with respect to the fixed structure, a first position in which said holding means and said supply means respectively cooperate with the shearing and stripping means and the reception means, the first step including positioning the end of the conductor inside the holding means with respect to the shearing and stripping means, supplying an end-piece into the reception means, and coupling the first actuator to the shearing and stripping means for shearing the insulating sheath portion of the conductor;

a second step including first translation of the mobile structure by the second actuator, said first translation bringing the carriage into a second position spaced from the first position and causing extraction of the insulating sheath portion by the shearing and stripping means;

a third step including a second translation of the carriage by the third actuator, said second translation bringing the carriage into a third position in which the reception means are positioned on the second axis;

a fourth step including a third translation of the mobile structure by the second actuator, said third translation bringing the carriage into a fourth position and during said third translation, the end-piece carried by the reception means is engaged on the stripped end of the conductor;

a fifth step including the crimping of the end-piece on said stripped end through cooperation of the crimping means with the first actuator, then the de-actuating of the shearing and stripping means through uncoupling the first actuator thereof, and

a sixth step during which the carriage is successively reset to its third position by movement of the mobile structure under the effect of the second actuator, to its second position by movement of the carriage under the effect of the third actuator, and finally to its first position by movement of the mobile structure under the effect of the second actuator.

4,852,242

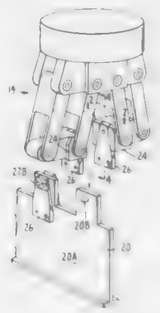
TOOL COUPLING APPARATUS AND METHOD

Richard P. Tella, Sunnyvale, Calif., and Stuart D. Lerner, Evanston, Ill., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 24, 1988, Ser. No. 172,611

Int. Cl.[4] B23Q *3/155;* **B25J** *15/04*

U.S. Cl. 29—568 **11 Claims**



1. A system for exchangeably coupling tools to robotic hands comprising:

tapered receiver means which are fixedly connected to robotic hands;

complementary tapered means which are fixedly connected to tools and which are configured for generally self-centering mating with the tapered receiver means;

latching means for latching the tapered receiver means to the complementary tapered means, the latching means each comprising a spring connected to the tapered receiver means and having an end which extends to engage the complementary tapered means; and

aperture means formed in each of the complementary tapered means to permit an actuator to engage the spring via the aperture means.

4,852,243

TOOL CHANGER FOR DRILL PRESS

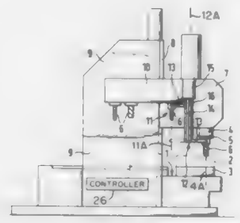
Gerhard Peter, Bielefeld; Heinz Kempkensteffen, Rietberg, and Rudolf Heid, Lutterbach, all of Fed. Rep. of Germany, assignors to IMA-NORTE Maschinenfabriken Klessmann GmbH & Co., Fed. Rep. of Germany

Filed May 16, 1988, Ser. No. 194,144

Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717016

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 **9 Claims**



1. In combination with an apparatus that machines a workpiece with any of a plurality of tools of different lengths and that comprises:

a generally stationary frame adapted to support the workpiece at a working station;

a vertically displaceable drive unit on the frame;

a spindle fixed to the drive unit and centered on and rotatable by the drive unit about an upright spindle axis passing through the working station; and

a chuck fixed on the spindle and adapted to hold a one of the tools for machining the workpiece held on the frame;

a tool changing apparatus comprising:

a holder for a plurality of the tools fixed to and vertically displaceable jointly with the drive unit and displaceable to move the tools through a transfer station spaced above the chuck by a predetermined distance equal generally to the difference in vertical length between the shortest of the tools and the longest of the tools;

a pair of vertically independently displaceable like grippers fixed together for joint pivoting about a gripper axis between the transfer station and the chuck, the grippers being diametrally opposite relative to the gripper axis and each being positionable in the transfer station and under the chuck;

actuator means for vertically displacing the grippers independently of each other between a lower position level with the tool in the chuck and an upper position level with the tool in the transfer station and for pivoting the grippers jointly through substantially 180° between a position in the transfer station and a position aligned with the chuck.

4,852,244

OPTICAL FIBER STRIPPING AND BREAKING APPARATUS

Helmut H. Lukas, Carleton Place, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 6, 1987, Ser. No. 117,816

Int. Cl.[4] B26F *3/00*

U.S. Cl. 29—566.3 **23 Claims**

1. An apparatus for preparing an optical fiber for connection to another optical fiber, said apparatus comprising:

a base having a cavity for receiving cleaved optical fiber ends portions;

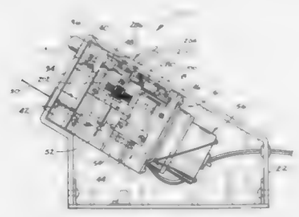
a housing having a base engaging portion;

first fiber clamp means secured to said housing for clamping

an optical fiber at a location thereon spaced from an end of said fiber;

a carriage secured to said housing for movement toward and away from said first clamp means longitudinally of a length of optical fiber secured to said first clamp means;

stripping means secured to said carriage for removing insulation from at least a portion of said optical fiber intermediate said (position) location and said end of said optical fiber and to provide a bared optical fiber portion and an insulation severed end;



scoring means secured to and movable with said carriage for forming a score in said bared end portion at a predetermined distance from said insulation severed end;

second fiber clamp means secured to and movable with said carriage for clamping said optical fiber on a side of said score remote from said first position; and

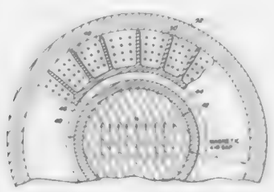
cam means for longitudinally tensioning said optical fiber so as to cause said fiber to break along a radial plane containing said score and form a cleaved optical fiber portion.

4,852,245

TOOTHLESS STATOR ELECTRICAL MACHINE CONSTRUCTION METHOD

Joseph Denk, Manhattan Beach, Calif., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 800,184, Nov. 20, 1985, Pat. No. 4,709,180.
This application Oct. 9, 1987, Ser. No. 107,150
Int. Cl.[4] H02K *15/00*
U.S. Cl. 29—596 6 Claims



1. A method of making a stator for an electrical machine comprising:

providing a winding support structure made of a non-magnetizable, non-conductive material, said winding support structure having a cylindrical portion with a plurality of thin longitudinal support fins which extend radially outwardly from said cylindrical portion, said support fins providing therebetween a plurality of slot areas;

forming a plurality of fine stranded conductors into a plurality of stator windings;

laying said plurality of stator windings into said plurality of slot areas within said winding support structure;

mounting a substantially cylindrical flux collector ring made of ferromagnetic material around the outer periphery of said winding support structure, said collector ring thereby extending around the outermost edges of said support fins; and

installing said winding support structure, said stator windings and said cylindrical flux collector ring into a housing, said housing extending from the one end of said winding support structure around the outer diameter of said flux collector ring to the other end of said winding support structure, said one end and said other end of said winding support structure sealably contacting said housing, said housing having a cooling inlet and a cooling outlet adapted for coolant flow through said stator windings.

4,852,246

METHOD OF INSULATING A FIELD WINDING COIL

D. Eugene Rochester, Rte. 1, Box 447, Walhalla, S.C. 29691

Filed Nov. 7, 1988, Ser. No. 267,560
Int. Cl.[4] H02K *15/10*
U.S. Cl. 29—596 4 Claims



1. A method of insulating a field winding coil of a direct current starter motor, said motor having a motor shaft, an armature, an armature winding, a motor housing, field poles, and a commutator, from the motor housing an d from an associated field pole about which said winding coil is disposed, the method comprising the steps of; removing the rotor shaft and its associated armature winding and commutator, removing the field pole associated with said field coil, moving the winding inwardly relative to said housing and to a position of spaced relation to an inner surface of the housing, placing an insert sheet having a border portion and a pair of door-like panels into a position such that said border portion is interposed between said housing and said winding coil and said door-like panels are moved into said coil winding and to positions immediately adjacent the portions of said coil winding which are normally in contact with said field pole, and reassembling said field pole into a position of snug engagement with said door-like panels and with said border portion securely gripped between said winding and the inner surface of said housing.

4,852,247

SUCTION PICK-UP APPARATUS FOR ELECTRICAL OR ELECTRONIC COMPONENTS

Victor T. Hawkswell, Witham, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jun. 15, 1988, Ser. No. 207,362
Claims priority, application United Kingdom, Jun. 17, 1987, 8714175
Int. Cl.[4] H05K *13/04*
U.S. Cl. 29—740 3 Claims

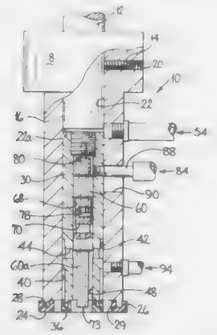
1. A suction pick-up head for surface mount electronic components comprising body means having a first annular projection depending from the bottom thereof and a concentric bore extending upwardly from the bottom thereof,

first annular seal means secured to the bottom of said first annular projection,

first piston means displaceable within said bore and including a second annular projection depending from the bottom thereof,

second annular seal means secured to the bottom of said second annular projection,

means for displacing said piston means from a first position whereat said first and second annular seal means are coplanar so that said first and second annular seal means will conjointly seal the top surface of an engaged electronic component to a second position whereat said second annular seal means will be located below said first annular seal means so that only said second annular seal means will seal an engaged electronic component,



means for subjecting the volume defined between said first and second annular seal means, when said piston is at said first position, and an engaged electronic component to a vacuum, while the volume defined by the engaged electronic component and said second annular seal means remains at ambient pressure, and

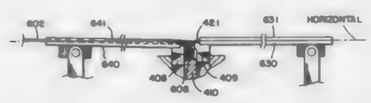
means for subjecting the volume defined by said second annular seal means, when said piston is at said second position, and an engaged electronic component to a vacuum.

4,852,248

CONNECTOR INSTALLATION STATION FOR COMPACT SEMI-AUTOMATIC CABLE ASSEMBLY SYSTEM

James D. Anderson, Norwalk, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Division of Ser. No. 834,095, Feb. 26, 1986, Pat. No. 4,761,879.
This application Mar. 15, 1988, Ser. No. 147,360
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—749 3 Claims



1. In apparatus for installing connectors, each connector having connector portions including a body portion and a cover portion, to flat cables having multiple electrical conductors separated by, and encased in, electrically insulating material, said apparatus comprising a frame, magazines on said frame adapted to support a plurality of body portions and cover portions respectively, and a transport station to sequentially move connector portions from said magazines to an installation station, an improved installation station comprising:

platen means for supporting a cable in a generally horizontal plane, said platen means including two movable platens laterally offset from each other with a space therebetween to allow the passage of a connector portion therepast, each of said platens having a first end at said space and a second end pivotally connected to the frame of the apparatus, said platens having a home position in said horizontal plane; and

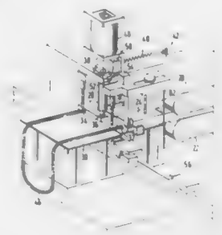
means for allowing independent movement of said platens from said home position to an angled connector installation position comprising vertically movable platen first end guides and means for biasing said guides to position said platens at said home position, each guide having a cable abutment surface and means for supporting a platen first end whereby said platens are maintained in said horizontal home position by said first end guides, said biasing means and said pivotally connected second ends and are individually movable from said home position by vertically depressing said guides against said biasing means thereby allowing said platens to pivot at said second ends and said first ends to be moved from said horizontal plane to said connector installation position.

4,852,249

METHOD AND APPARATUS FOR CUTTING CABLES TO LENGTH FROM A CABLE SUPPLY AND PROCESSING THE CABLE ENDS

Willi Muskulus, Frankfurt-Bergen-Enkheim; Helmut Kolodziej, Mainatl, and Helmut Nitsch, Sulzbach i. Ts., all of Fed. Rep. of Germany, assignors to Statomat-Globe Maschinenfabrik GmbH, Niederdorfelden, Fed. Rep. of Germany

Filed Dec. 17, 1987, Ser. No. 133,960
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, 3643201
Int. Cl.[4] H02G *1/12;* H01R *43/00*
U.S. Cl. 29—825 11 Claims



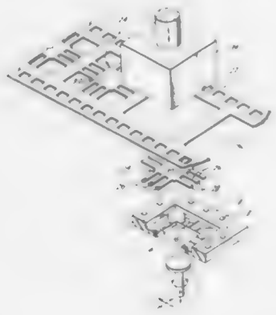
1. A process for the trimming of cables from a cable supply into predetermined cable lengths and for the processing of the cable ends, wherein the cable front end is moved into a predetermined intermediate position and is thereafter bent over by the formation of a loop into a predetermined starting position so that said cable front end is facing in a direction opposite to the feed direction, enlarging the cable loop to a predetermined length by continued cable feeding and severing the cable rear end from the cable supply and holding said cable rear end in a predetermined starting position essentially parallel with the cable front end and in identical alignment therewith, characterized by continuously advancing the cable front end until it strikes a bending means, thereby triggering movement of the bending means into its starting position, the cable being further continuously fed until the cable loop has reached the predetermined length.

4,852,250

HERMETICALLY SEALED PACKAGE HAVING AN ELECTRONIC COMPONENT AND METHOD OF MAKING

Daniel M. Andrews, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Jan. 19, 1988, Ser. No. 145,356
Int. Cl.[4] H01L *21/88*
U.S. Cl. 29—827 **6 Claims**



1. A method of making a hermetically sealed package having an electronic component therein comprising,
forming a body of insulating material with an opening therethrough with a plurality of electrical conductors in the body extending from adjacent the opening through the body to points on the exterior of the body outside of said opening,
placing a plurality of electrical leads having inner and outer ends in the opening in which the inner ends of the leads are connected together for aligning the leads with each other,
aligning the outer ends of the plurality of leads in contact with the electrical conductors adjacent the opening,
bonding each of the outer ends of each of the leads with one of the electrical conductors,
disconnecting the inner ends of the leads from each other,
bonding an electronic component to the top of a bottom cover,
placing the electronic component in the opening,
aligning and bonding the electronic component to the inner ends of the electrical leads, and
sealing the bottom cover to the bottom of the body, and sealing a top cover to the top of the body enclosing the opening.

4,852,251

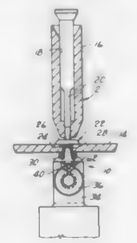
GRIPPING EYELET DIE TOOL ASSEMBLY

Donald A. Boucher, Acushnet, Mass., assignor to PCI Group Inc., New Bedford, Mass.

Filed Jun. 7, 1988, Ser. No. 202,987
Int. Cl.[4] H01R *9/20;* **B23P** *19/00;* **B21D** *31/02*
U.S. Cl. 29—845 **17 Claims**

1. The method of "grip attaching" an eyelet into a printed circuit board, comprising the steps of:
inserting the barrel of an eyelet into an opening in a printed circuit board;
inserting the tip of a cutting and forming blade into the barrel of the eyelet;
segmenting at least two portions of the barrel of the eyelet into curled strips which wrap around to press against the printed circuit board; and
receiving non-curled portions of the barrel of an eyelet into a conically shaped hole in a holder supporting said blade.

5. A gripping tool assembly for the attachment of a grip eyelet onto a receiving element, said gripping tool assembly comprising:
a spindle and die cap assembly for arranging a grip eyelet in a receiving element;
a die blade assembly arranged in axial alignment with said spindle and die cap assembly including a blade holder having a slot disposed thereacross;



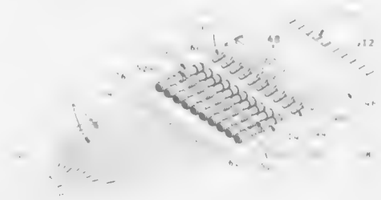
a blade arranged in said slot in said holder;
means on said blade for curling segments of an eyelet pressed thereagainst; and
means on said holder to form portions of an eyelet pressed thereagainst, into gripping flanges biased toward one another.

4,852,252

METHOD OF TERMINATING WIRES TO TERMINALS

Kenneth N. Ayer, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 29, 1988, Ser. No. 277,094
Int. Cl.[4] H01R *43/02*
U.S. Cl. 29—860 **5 Claims**



1. A method of terminating wires to terminals and simultaneously sealing the terminations, comprising the steps of:
identifying an apparatus being capable of generating a constant amplitude high frequency alternating current of known frequency;
selecting at least one terminal disposed in housing means, each said at least one terminal including a portion extending rearwardly from said housing means to a wire-receiving section at a wire-receiving end, at least each said wire-receiving section comprising first layer of a first metal having low electrical resistance and minimal magnetic permeability and deposited on an outwardly facing surface thereof a second layer of a second metal having high electrical resistance and high magnetic permeability, said second layer having a thickness approximately equal to one skin depth of said second metal, given said known frequency;
selecting solder material having a nominal melting temperature slightly less than the Curie temperature of said second metal and selecting heat recoverable tubing having a nominal shrinking temperature slightly less than the Curie temperature of said second metal;

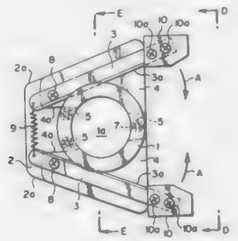
positioning a stripped wire end of a conductor wire associated with each said at least one terminal along an inwardly facing surface of said wire-receiving section of each said at least one terminal;
placing a preform of said solder material at least adjacent each said stripped wire end along a respective said wire-receiving section and placing a length of said heat recoverable tubing of sufficient diameter around each said solder preform and said respective wire-receiving section and extending forwardly along at least a portion of said associated terminal to a forward tubing end and rearwardly along said stripped wire end to an insulated portion of said wire to a rearward tubing end, defining a pretermination assembly;
placing said pretermination assembly within said apparatus; and
generating said constant amplitude high frequency alternating current in said apparatus for a selected length of time, whereby a corresponding current is generated in each said wire-receiving section and sufficient thermal energy is generated by each said wire-receiving section to achieve and maintain the Curie temperature of said second layers, the thermal energy being transmitted radially outwardly to said solder preforms adjacent said stripped wire ends and said wire-receiving sections melting said solder preforms and forming assured terminations of said stripped wire ends to said wire-receiving sections, and the thermal energy being further transmitted radially outwardly and axially from said terminations to said lengths of heat recoverable tubing radially shrinking said tubing lengths to conform to the outwardly facing surfaces of said wires and said terminal portions therewithin and tightly engaging the insulated wires extending rearwardly therefrom and the terminal portions extending forwardly therefrom, sealing the terminations.

4,852,253

CUTTING DEVICE FOR WRAPPED COIN STACK

Shinya Uchida, Chigasaki, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 210,983
Claims priority, application Japan, Jul. 2, 1987, 62-165910; Feb. 19, 1988, 63-36631
Int. Cl.[4] B67B *7/00*
U.S. Cl. 30—2 **8 Claims**



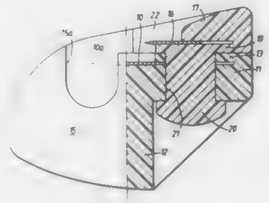
1. A cutting device for a wrapped coin stack comprising:
cylindrical support means including a bore for receiving one end of a wrapped coin stack bar which is formed by a certain number of coins and wrapped by wrapping means,
base plate means for abutting against said one end of the wrapped coin stack bar on its surface, said base plate means being connected to said cylindrical support means by a plurality of bolt members through tubular spacers so that the base plate means is placed at a position spaced from the cylindrical support means, and
cutting means supported by the cylindrical support means at a position offset from the surface of said base plate means for being advanced inward of the cylindrical support means and cutting the wrapping means.

4,852,254

RAZOR BLADE ASSEMBLY AND ITS METHOD OF MANUFACTURE

David S. Duncan, London, England, assignor to Wilkinson Sword Limited, United Kingdom

Continuation of Ser. No. 777,158, Sep. 18, 1985, Pat. No. 4,690,018. This application Jun. 5, 1987, Ser. No. 58,804
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.[4] B26B *21/06, 21/14*
U.S. Cl. 30—50 **10 Claims**



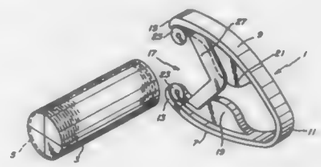
1. A double edge razor assembly comprising:
a first integrally molded portion including a first blade molded between a blade platform with a guard bar and a first half spacer formed integrally with the blade platform; and
a second integrally molded portion including a second blade integrally molded between a top cap and a second half spacer formed integrally with the top cap;
the molded portions having complementary fastening means for securing the first integrally molded portion to the second integrally molded portion.

4,852,255

DEVICE FOR OPENING A WRAPPED ROLL OF COINS

Stanley Hochfeld, Howard Beach, N.Y., assignor to Leonard Holtz, Oceanside, N.Y.

Continuation of Ser. No. 933,756, Nov. 21, 1986, abandoned. This application Jul. 8, 1988, Ser. No. 219,839
Int. Cl.[4] B26B *27/00*
U.S. Cl. 30—102 **28 Claims**



1. A device for opening a wrapped roll of coins, comprising:
means for receiving therein a roll of coins held within a wrapper, said receiving means including a one piece molded structure having first and second elements, each element having opposite end portions, said first and second element being integrally molded and joined together only at one end portion thereof to form said one-piece structure and being spaced apart and unconnected from each other along the length thereof to form a substantially unobstructed opening passing therebetween and which extends from said joined end portions to the opposite end portions thereof, said first and second elements being

relatively movable about said integrally molded and joined end portions, said joined end portions defining a hinge-like resilient connection between said elements and biasing said elements apart to form said substantially unobstructed opening therebetween which extends from said hinge-like resilient connection to said opposite end portions of said first and second elements;

said first and second elements each having inner surface portions facing inwardly of said opening, and outside surface portions facing away from said opening;

the inner surface portion of one of said first and second elements comprising a roll receiving support surface in the vicinity of said opening for engaging and supporting a wrapped roll of coins inserted in said opening between said first and second elements, and defining an abutment surface against which said roll of coins abuts during use;

cutter means on the inner surface portion of at least the other of said first and second elements and being positioned in the vicinity of said opening, said cutter means facing said roll receiving support surface and having at least one edge extending toward said support surface and which is selectively engageable against a roll of wrapped coins received in said opening and supported on said support surface, said at least one edge extending in a direction substantially transverse to the longitudinal axis of a wrapped roll of coins received in said opening;

said support surface being arranged to apply a force to a wrapped roll of coins supported thereon at least in a direction toward said at least one edge of said cutter means;

manually operable means on said outside surface portions of said first and second elements and which are manually grippable for manually squeezing together said first and second elements by a hand of a user for forcedly moving said first and second elements toward each other against said biasing force, with said wrapped roll of coins in said opening therebetween to apply a force passing through said cutter means to thereby force said at least one edge of said cutter means against said wrapper of said wrapped roll of coins to at least weaken said wrapper, in a direction substantially transverse to the longitudinal axis of said wrapped roll of coins, where said at least one edge is forced thereagainst, said wrapped roll of coins abutting against at least a portion of said abutment surface during forcing of said at least one edge against said wrapper; and

force applying means on at least one of said first and second elements and located adjacent said abutment surface on the side of said support means closest to said joined end portions of said first and second elements for applying a force to said wrapped roll of coins when said first and second elements are squeezed together, said applied force having a component in a direction passing between said first and second elements.

4,852,256

DEVICE FOR CUTTING MUSHROOMS INTO SLICES

Hans Schoettler, Herscheid, Fed. Rep. of Germany, assignor to Westmark Schulte & Co. KG, Herscheid, Fed. Rep. of Germany

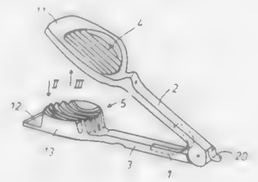
Filed Dec. 9, 1987, Ser. No. 130,639

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642697

Int. Cl.[4] **A21C** *5/08*

U.S. Cl. 30—114 **8 Claims**

1. A cutting device for cutting mushrooms into slices, the device comprising two pincer arms, means disposed at rear ends of the pincer arms for articulating the arms to each other enabling the cutting device to be held in one hand of a user, a return spring means interposed between the pincer arms and being adapted to enable a compression of the pincer arms against a returning force of the return spring means, a cutting grid means disposed at a forward end of one of said pincer arms, receiving depression means disposed on the other pincer arm for receiving the mushrooms and disposed in alignment with said cutting grid means, the receiving depression means having a substantially round trough shape for enabling accommodation of a mushroom resting in the receiving depression on a cap side thereof, and including a bottom portion having only a slightly curved area and extending over more than two-third of a diameter of the receiving depression means and steep edges, said cutting grid means including an odd number of sharp stainless steel cutting blade means, wherein handle means are provided at forward ends of the respective pincer arms,



with the handle means projecting beyond the butting grid means and receiving depression means thereby enabling the pincer arms to be additionally grippable and compressible by the other hand of the user, and wherein limiting stop means are provided whereby the stainless steel cutting blade means upon striking a cutting grid frame, are sunk into the cutter receiving grooves of the receiving depression means while backs of the stainless steel cutting blade means are still between the cut slices.

4,852,257

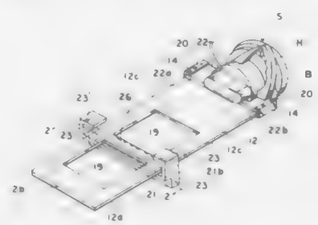
SKILL SAW RIP GUIDE

Kenneth D. Moore, P.O. Box 1494, Columbus, Ga. 31902

Filed Nov. 20, 1987, Ser. No. 123,559

Int. Cl.[4] **B23D** *47/02*

U.S. Cl. 30—373 **5 Claims**



1. A work guide for attachment to a portable, power operated skill saw having a blade and a substantially flat base provided with spaced apart front and rear edges comprising, in combination:

a substantially planar, elongated arm having opposite ends and a pair of side edges;

means for releasably attaching one said end of said arm to said saw base with the longitudinal axis of said arm extending perpendicular to the plane of said saw blade and on one side thereof, a transversely extending guide fence on said arm;

mounting means on said guide fence for attaching said guide fence to said arm for sliding movement along the longitudinal axis of said arm;

said guide fence extending from said arm and including a guide surface for engagement with one edge of a work piece to be cut by said saw;

means for releasably clamping said guide fence in a selected position along the longitudinal axis of said arm; and

said arm provided with indicia means for indicating a selected position of said guide fence corresponding to the dimension of the cut to be made in a work piece.

4,852,258

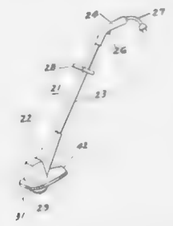
APPARATUS FOR CUTTING VEGETATION

Gary H. Foster, Houston, Tex., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Continuation of Ser. No. 245,459, Mar. 19, 1981, abandoned, which is a continuation of Ser. No. 891,666, Mar. 30, 1978, abandoned. This application Jul. 16, 1984, Ser. No. 631,000

Int. Cl.[4] **A01D** *55/18*

U.S. Cl. 30—276 **27 Claims**



1. Apparatus for cutting vegetation comprising:

a head rotatable about an axis of rotation, said head having at least one aperture and a cavity for storing a relatively long length of flexible cutting line;

drive means capable when operative of effecting rotation of said head;

a quantity of flexible cutting line disposed in said cavity and having a free end extending outwardly from said head through said aperture into a cutting plane; and

feed effective means operable in response to a shortening of said free end during rotation of said head to enable additional cutting line to be released through said aperture to restore the length of said free end.

4,852,259

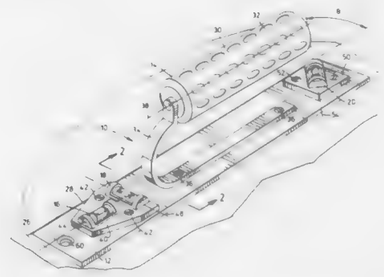
STRAIGHT EDGE CUTTER GUIDE

Pasquale M. Manserra, 656 Pharmacy Avenue, Scarborough, Ontario, Canada M1L 3H5

Filed Mar. 7, 1988, Ser. No. 165,255

Int. Cl.[4] **B26D** *7/20*

U.S. Cl. 30—289 **2 Claims**



1. A straight edge cutter guide for use when cutting a web such as wallpaper after it has been hung on a support surface which is normal to or inclined with respect to the horizontal plane comprising;

(a) a substantially rigid blade having a top face, a bottom face, and a straight edge extending longitudinally along one edge thereof, said straight edge being sharpened to provide a cutting edge, said bottom face being flat so as to distribute loads which are applied to it in use across a wide area, said bottom face having a sufficient area to provide a stable base for the cutter guide,

(b) a handle attached directly to and located directly above said base, said handle having a hand grip portion located above said top face which is accessible for use when retaining the base in any required position with its bottom face bearing against a web in use, and

(c) level indicator means mounted on said top face of said blade so as to be visible when said bottom face is operably located, said level indicator means being arranged in a predetermined relationship with respect to said straight edge to provide a visible indication of the orientation of the straight edge with respect to the horizontal plane when the bottom face is held against the surface of a web in use.

4,852,260

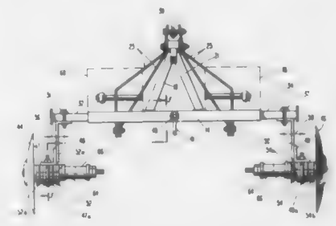
SIDEWALK EDGING DEVICE

Joseph W. Federico, and Daniel J. Whittenberger, both of Clearwater, Fla., assignors to Luis A. Herrero, Clearwater, Fla.

Filed Apr. 22, 1988, Ser. No. 185,003

Int. Cl.[4] **B26B** *21/00*

U.S. Cl. 30—292 **15 Claims**



1. An apparatus, towed by a vehicle, that trims vegetation growing over the edges of longitudinally extending walkways, comprising:

a first rotatably mounted cutting blade member that trims vegetation along a first edge of a walkway;

a second rotatably mounted cutting blade member, laterally spaced from said first cutting blade member, that trims vegetation along a second edge of a walkway;

a frame member disposed in a generally horizontal plane;

a first pivotally mounted, generally transversely and horizontally disposed arm member having an inner end, a medial portion and an outer end;

a first generally vertically disposed interconnecting member depending from an outer end of said first arm member;

said first cutting blade member being rotatably mounted to a lower end of said first interconnecting member;

a second pivotally mounted, generally transversely and horizontally disposed arm member having an inner end, a medial portion, and an outer end;

a second generally vertically disposed interconnecting member depending from an outer end of said second arm member;

said second cutting blade member being rotatably mounted to a lower end of said second interconnecting member;

pivoting means forming a part of said frame member for pivoting said first and second arm members in a generally horizontal plane so that their respective outer ends, and hence said respective first and second cutting blade members, follow an arcuate path of travel;

said first and second cutting blade members being disposed in parallel, straightforward alignment when said respective arm members are in unpivoted positions transverse to the longitudinal extent of said walkway, and said first and second cutting blade members being disposed in a con-

verging or diverging disposition relative to each other dependent upon the direction said outer ends of said arm members are swung by said pivoting means;

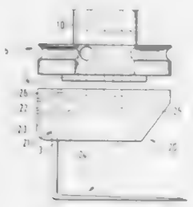
whereby the angle between the cutting blade members and the respective walkway edges is adjustable.

4,852,261

KNIFE INSERT

Winfried D. Wittek, Walluf, Fed. Rep. of Germany, assignor to Chicago Pneumatic Tool Company, Fed. Rep. of Germany

Filed Mar. 8, 1988, Ser. No. 165,522
Int. Cl.[4] B26B *9/00, 3/08, 7/00, 3/00*
U.S. Cl. 30—347 **10 Claims**



1. In a knife insert for tools with an oscillating head, such as the type used for cutting open rubber or adhesive beading strips around windscreens, and having a cutting face bounded by one or a plurality of cutting edges, the improvement being that a section of the knife is in the form of an L-shape at right-angles to its cutting face, the cutting face forming a first leg of the L and the second leg of the L, which extends substantially at a right-angle from the cutting face, being attached to a connecting element for connecting the knife to an actuating tool so that rotational oscillating motion is imparted to the cutting face and wherein the connecting element contains a bore or groove in its surface, the groove or bore extending substantially at a right-angle to the direction of connection of the knife insert on to the actuating tool.

4,852,262

GAUGE FOR IN SITU MEASUREMENT OF BOREHOLE DIAMETER

Clarence O. Babcock, Lakewood, and George J. Schneider, Golden, both of Colo., assignors to United States of America, as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 21, 1988, Ser. No. 146,504
Int. Cl.[4] G01N *3/24*
U.S. Cl. 33—178 F **5 Claims**



1. A gauge for measuring the diameter of a borehole comprising:

a generally cylindrical gauge body insertable lengthwise into a borehole, said gauge body having a transverse opening capable of slidably retaining a pair of air displacement sensors and a central air passageway capable of channeling a flow of air into said transverse opening so as to displace said pair of sensors outwardly towards the walls of the borehole;

a pair of air displacement sensors positionable in said transverse opening so that when a flow of air is channeled into said transverse opening from said central air passageway, said pair of sensors are displaced outwardly towards the walls of the borehole, one sensor towards one wall of the borehole, and the other sensor towards the opposite wall of the borehole, the distance between the outer ends of said sensors thus defining a diameter of the borehole when said sensors are pushed outwardly to the point where they are retained by the walls of the borehole;

each of said air displacement sensors having a slotted internal keyway at its inner end so that when said pair of sensors are positioned in said transverse opening, said slotted keyways form a central orifice between said sensors which provides a passage for air through said gauge body, the area of said central orifice thus being proportional to the distance between said sensors, and the diameter of the borehole, defined by the outer ends of said sensors when said sensors are retained outwardly by the walls of the borehole, being determinable by measuring the flow of air through said central orifice when a flow of air is channeled into said transverse opening so as to displace said sensors outwardly to the point at which they are retained by the walls of the borehole;

means for providing a stream of air into said gauge body; and

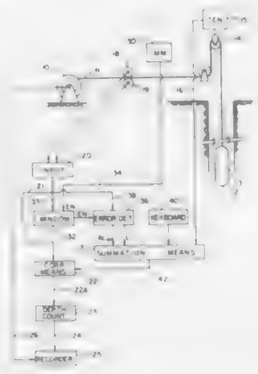
means for measuring the flow of air through said gauge body.

4,852,263

METHOD FOR DETERMINING CABLE LENGTH IN A WELL BORE

Wayne L. Kerr, Houston, Tex., assignor to Kerr Measurement Systems, Inc., Houston, Tex.

Continuation of Ser. No. 810,728, Dec. 19, 1985, Pat. No. 4,718,168. This application Jan. 11, 1988, Ser. No. 141,724
Int. Cl.[4] G01B *7/04, 5/18, 7/26*
U.S. Cl. 33—133 **9 Claims**



1. A method for determining cable length in a well bore and for determining the change in cable length due to permanent or inelastic stretch of the cable in a well bore for an armored electrical cable coupled between a well tool in a well bore and a spooling winch at a surface above the well bore where the armored cable is repeatedly utilized in well bores under tension and the number of cable uses under tension is defined as the number of tension cycles, the method including the steps of:

(a) for each tension cycle of a well cable for moving a well tool on an armored electrical cable in a well bore traversing earth formations,

(1) measuring the length of cable between the spooling winch at the earth's surface and the well tool in a well bore while moving the well tool through a well bore for deriving first measurements of the length of cable in the well bore between the spooling winch and the well tool,

(2) measuring the tension on the cable while the well tool is in the well bore for obtaining a tension measurement,

(3) determining the plastic stretch value for the cable as a function of said tension measurements,

(b) determining the accumulated number of tension cycles of the cable in well bores,

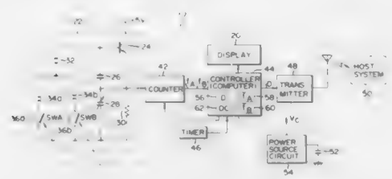
(c) modifying the first measurements of the length of a cable while the cable is in the well bore for changes in length of cable due to permanent stretch of the cable where such modification is by a factor of the relationship of permanent or inelastic stretch value to the number of tension cycles.

4,852,264

DISTANCE MEASURING DEVICE WITH TRANSMITTER

Giichiro Shimizu; Toshiharu Okuyama, and Yoshio Wakatsuki, all of Tokyo, Japan, assignors to Man Design Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,361
Claims priority, application Japan, Jul. 31, 1987, 62-191625
Int. Cl.[4] G01B *7/02*
U.S. Cl. 33—832 **5 Claims**



1. A distance measuring device with a transmitter comprising:

probe means in contact with an object under measurement and movable according to the displacement of the object;

core member means coupled with said probe means;

oscillating means having a plurality of coils in which said core member means is slidably inserted which oscillates at a frequency determined by the distance moved by said core member means within said coils;

means for computing the distance moved by said probe means from a reference position at first time intervals by using a shift of the oscillating frequency of said oscillating means;

means for deciding if the distances moved computed by said computing means are within a predetermined range;

means for continuously outputting the distances moved as computed at said first time intervals by said computing means immediately after said deciding means decides that the computed distances moved are within the predetermined range;

means for stopping the continuous output of the computed distances moved by said continuous output means when said deciding means decides that the computed distances moved are not within the predetermined range; and

means for wirelessly transmitting the distance moved output from said continuous output means.

4,852,265

LEVEL/PLUMB INDICATOR WITH TILT COMPENSATION

Joseph F. Rando, Los Altos Hills, and Henry L. Schwartz, Los Gatos, both of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Apr. 8, 1988, Ser. No. 179,510
Int. Cl.[4] G02B *7/14;* **G01B** *11/26*
U.S. Cl. 33—227 **16 Claims**

1. A device for projecting a plumb line, a level line or an alignment line, comprising,

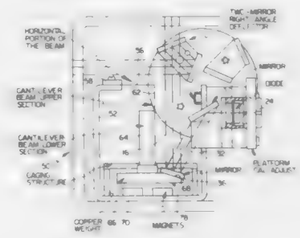
a housing capable of being placed on a generally horizontal surface,

laser diode means for emitting a visible laser beam, mounted within the housing,

battery means contained within the housing, for powering the laser diode means,

optical means for receiving the light from the laser diode and delivering a collimated light beam out of the housing, generally vertically upwardly,

compensator means associated with the laser diode means and the optical means, for correcting for small tilt angles of the housing placed on said generally horizontal surface



and for assuring that the beam from the optical means is oriented substantially vertically in spite of such small tilt angles,

a reference marker means associated with the housing, visible to a user when the housing rests on said surface and located near the bottom of the housing, for aligning the vertical light beam with a desired position on said surface, and

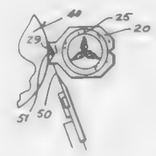
reflector means within the housing for redirecting said substantially vertical light beam, to a substantially horizontal orientation when desired, including manual selector means on the outside of the housing for permitting the user to redirect the beam horizontally when desired.

4,852,266

ANGLE MEASURING ADAPTER

Robert W. Whitman, and John R. Pellinen, both of Green Bay, Wis., assignors to Esco, Incorporated, Green Bay, Wis.

Filed Dec. 10, 1987, Ser. No. 131,051
Int. Cl.[4] G01C *9/06*
U.S. Cl. 33—366 **7 Claims**



1. An angle gauge and level for directly measuring the angle of a doctor blade comprising a sensor, a read-out means, and a means connecting said sensor to said read-out means, said sensor being able to send an electronic signal to said read-out means, a housing, said sensor being rotatably fastened to said housing so that said sensor may be pre-set to a position respecting said housing, said position being able to be maintained even when said housing is rotated in space, said housing having two sharp parallel linear feet having connected sides forming an including angle, said read-out means being capable of displaying angle measures in which said housing having an alignment needle which bisects the angle between said feet, said align-

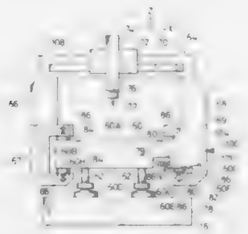
ment needle being movable axially but in no other direction, said alignment needle being urged outwardly by a spring.

4,852,267

COORDINATE MEASURING MACHINE HAVING A GUIDE SECTION FOR A COLUMN OF A MEASURING MEMBER SUPPORT BODY

Kazusaku Tezuka, Kawachi, Japan, assignor to Mitutoyo Corporation, Tokyo, Japan

Filed Apr. 12, 1988, Ser. No. 180,765
Claims priority, application Japan, Jul. 31, 1987, 62-192335
Int. Cl.[4] G01B *5/03, 7/03*
U.S. Cl. 33—503 **8 Claims**



1. A coordinate measuring machine comprising a table having an upper surface for placing a work thereon; a measuring member support body crossing over the table and capable of moving relative to the table; and a measuring member supported on the measuring member support body for measuring size and shape of the work from the displacement of the measuring member which is moved in multidimensional directions and contacted with the work placed on the table, comprising;

a Y-axis guide section which is formed at one lateral end of the table and which has a first lower flat guide surface in parallel to the upper surface of the table, and two parallel vertical guide surfaces formed on the opposite sides of the first lower flat guide surface so as to extend along the direction of movement of the measuring member support body;

a second lower flat guide surface which is formed at the other lateral end of the table in parallel to the upper surface of the table;

means for regulating the vertical position of the measuring member support body relative to the table, provided on a leg portion of a column of the measuring member support body on the side of the Y-axis guide section so as to be associated with the upper surface of the table and the first lower flat guide surface of the Y-axis guide section;

means for regulating the horizontal position of the measuring member support body relative to the lateral direction of the table, provided on the leg portion of the column of the measuring member support body on the side of the Y-axis guide section so as to be associated with the two parallel vertical guide surfaces of the Y-axis guide section; and

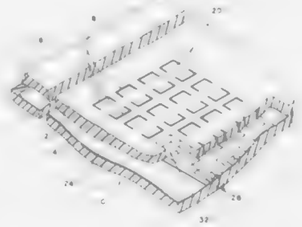
means for regulating the vertical position of the measuring member support body relative to the table, provided on a leg portion of a column of the measuring member support body on a side opposite to the Y-axis guide section so as to be associated with the upper surface of the table and the second lower flat guide surface.

4,852,268

LOTTERY TICKET TEMPLATE

Ronald G. Sutherland, and Brenda A. Sutherland, both of General Delivery, Clandeboye, Manitoba, Canada R0C 0P0

Filed May 31, 1988, Ser. No. 200,440
Int. Cl.[4] B42D *15/00;* **G07C** *15/00*
U.S. Cl. 33—562 **2 Claims**



1. A template for use with a user-marked lottery ticket, comprising a rectangular bottom sheet of transparent plastic material having substantially the same size and shape as the lottery ticket and a rectangular top sheet of the same transparent plastic material as the bottom sheet, having the same size as the bottom sheet and joined to the bottom sheet along a single fold line, the top sheet having a plurality of perforations therethrough outlining removeable rectangular areas of the template, the removeable areas being arranged in columns and rows and corresponding in number, position and form to user-markable spaces on the lottery ticket, the positional relationship between the removeable areas and the fold line being the same as the positional relationship between the user-markable spaces on the lottery ticket and a longitudinal edge of the ticket, whereby the template may be opened by unfolding the top and bottom sheets from one another about the fold line, inserting the lottery ticket between the top and bottom sheets with the longitudinal edge of the ticket engaged with the fold line and end edges of the ticket in registry with end edges of the template, and the template may be closed, leaving the ticket captured therein with the user-markable spaces in registry with the removeable areas of the top sheet, and both sides of the ticket visible through the transparent template.

4,852,269

COMBINED SEWAGE AND LIME SLUDE TREATMENT PROCESS

John D. Glorioso, Clearwater, Fla., assignor to Enviro-Gro Technologies, Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 924,630, Oct. 29, 1986, Pat. No. 4,761,893. This application Sep. 12, 1988, Ser. No. 243,485
Int. Cl.[4] F26B *3/24*
U.S. Cl. 34—11 **10 Claims**

1. A combined process for pelletizing sewage sludge and recalcining lime sludge comprising:

providing a calciner, feeding said lime sludge into said calciner, producing lime therein and a heated off gas;

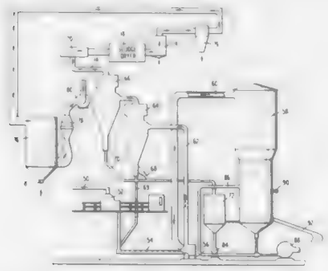
mixing said sewage sludge with recycled, previously dried sludge particles and pellets;

drying said mixture in a thermal drier utilizing as a heat source the heated off gas from said calciner, at least in part to form pellets and particles thereof;

conveying the dried pellets and particles and drier off gas to a low velocity gas/solids separator and separating and collecting the pellets and a substantial portion of the particles;

clarifying the collected pellets and particles and separating and collecting the pellets of a predetermined size, the undersized pellets and particles and the oversized pellets;

mechanically crushing the oversized pellets and collecting the crushed pellets and undersized pellets and particles;



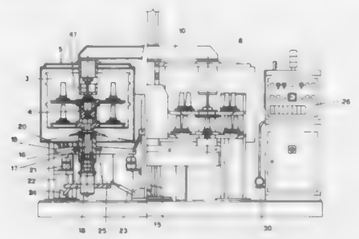
and recycling the collected undersized pellets and particles and crushed pellets by mixing said recycled materials with said incoming sludge to the drier.

4,852,270

HYDROEXTRACTOR FOR YARNS ON A REEL

Piergiorgio Dettin, Schio, Italy, assignor to F.lli Dettin S.p.a., Schio Vicenza, Italy

Filed Nov. 12, 1987, Ser. No. 119,844
Claims priority, application Italy, Dec. 4, 1986, 85.642
Int. Cl.[4] F26B *15/08*
U.S. Cl. 34—58 **4 Claims**



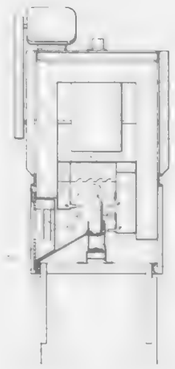
1. An hydroextractor for yarns wound on reels for removal of the liquid by exposure to centrifugation after the yarns have been immersed in a dyeing bath, which comprises a carousel conveyor (10) having four arms, a piston (15) for lifting and lowering said conveyor, a control piston (12) for rotating said conveyor 180°, two fixed basins (1, 2), baskets (3) within the basins, said baskets being perforated, reels having yarns wound thereon mounted in the interior of the baskets, a first pair of loaders (4) supporting said reels in the interior of said baskets, said loaders being supported by said baskets and being mounted on two of said arms of said carousel conveyor, said loaders rotating at high speed together with said baskets, a first pair of covers (5, 6) adapted to cover said baskets, whereby when said carousel conveyor is lifted and rotates by 180° and when said covers (5, 6) are opened, it extracts from said baskets said loaders (4) with the reels on which the yarns have already been exposed to centrifugation, and the liquid goes through the perforations of the baskets, is introduced into the basins (1, 2) and is then eliminated through discharge conduits (45, 46), a second pair of covers (7, 8), a second pair of loaders located outside of said basins, said second pair of loaders located below said second pair of covers (7, 8) and mounted on the two other arms of said conveyor and on a loading and unloading plane (9), and when said conveyor is lowered it loads on said plane (9) said reels on which the yarns have been already exposed to centrifugation, it loads two loaders with reels thereon having yarn to be exposed to centrifugation on said loading and unloading plane (9), whereby while two reels on a pair of loaders are in position for hydroextraction, the other pair of loaders is being loaded.

4,852,271

PREHEAT OVEN FOR GLASS CONTAINERS

Russell W. Heckman, Perrysburg; Robert C. Miller, Whitehouse, and George A. Nickey, Maumee, all of Ohio, assignors to Owens-Illinois Glass Container Inc., Toledo, Ohio

Filed Mar. 4, 1988, Ser. No. 164,296
Int. Cl.[4] F26B *25/00*
U.S. Cl. 34—105 **7 Claims**



1. A preheat oven for heating glass containers at selected vertical zones prior to the application of a roll-on, heat-shrinkable label thereto, said oven comprising, a linear, horizontal moving conveyor extending the length of the oven for supporting a succession of containers with their axes vertical, a pair of opposed, stationary side rails extending along the length of said conveyor, said side rails being spaced apart a distance greater than a single container diameter but not greater than 1½ container diameters, a source of heated air at a temperature of 300° F.–800° F., said source being above the conveyor, duct means extending from said source to along at least one side of the containers on said conveyor, nozzle means carried at the lower edge of said duct for directing heated air against the shoulders of said containers for heating the containers to 100° F. to 140° F., said containers engaging each other and the side rails during their linear movement through said oven to thereby rotate the containers about their vertical axes to heat the containers about their circumference.

4,852,272

SLIPPER SOCK CONSTRUCTION AND METHOD FOR MAKING SAME

Sandy Chilewich, and Kathy Moskal, both of New York, N.Y., assignors to Moskal & Chilewich, Inc., New York, N.Y.

Filed Jul. 12, 1988, Ser. No. 218,117
Int. Cl.[4] A43B *13/28*
U.S. Cl. 36—12 **5 Claims**

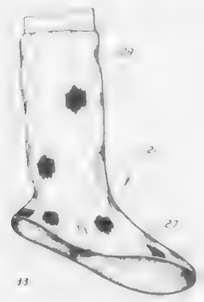
1. A method for constructing a slipper sock from a sole member having a perimeter and a sock member including an upper portion and a sole portion defining a juncture therebetween, wherein said sole portion of said sock member corresponds substantially in shape and dimension to said sole member, the method comprising:

superimposing said sole member over said sole portion of said sock member;

turning said sock member inside out so that said superimposed sole member is hidden from view; and

sewing at least one continuous stitch through said sole por-

tion, said sole member and said upper portion so that said at least one continuous stitch runs adjacent said sole member perimeter and said sock member juncture, whereby said sole member is maintained affixed to said sole portion of said sock member.

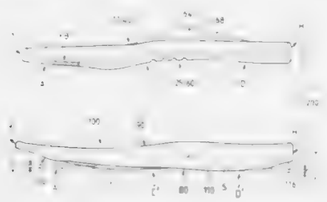


4,852,273

SOLE ARRANGEMENT FOR FOOTWARE

Norbert Hamy, Toronto, Canada, assignor to Bata Limited, Toronto, Canada

Filed May 9, 1988, Ser. No. 192,205
Claims priority, application Switzerland, May 21, 1987, 965/87; Aug. 28, 1987, 321/87
Int. Cl.[4] A43B *13/18*
U.S. Cl. 36—28 15 Claims



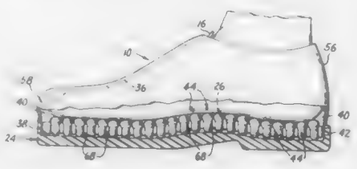
1. A sole arrangement for footwear comprising:
a longitudinally elongated insole for providing a natural support for the human foot, said insole having an upper surface adapted to be engaged by a foot and a lower bearing surface having a support system with a plurality of webs and channels; and
a longitudinally elongated outsole having an upper bearing surface engaging the lower bearing surface of the insole, said outsole having a lower tread surface which will face the ground when the outsole is in use, the outsole tread surface having front and rear edges, first and second opposite sides, the first side being designated as inside, the second side being designated as outside, and a toe region adjacent the front edge;
the outside having a first part with a web-like profile disposed intermediate the front and rear edges and a flat support part arranged on the toe region and spaced from the first part, the first part being spaced from the rear edge and extending longitudinally along the outside to at least to the center of the outsole;
the inside having a second part with a web-like profile disposed intermediate the front and rear edges, the second part being spaced from the front edge and extending longitudinally along the inside to at least the center of the outsole.

4,852,274

THERAPEUTIC SHOE

James T. Wilson, 132 Barrington Dr., Brandon, Fla. 33511

Filed Nov. 16, 1987, Ser. No. 121,687
Int. Cl.[4] A43B *13/20, 13/18*
U.S. Cl. 36—29 16 Claims



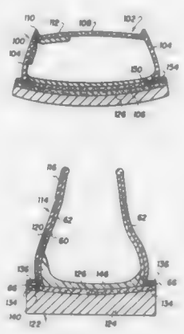
1. A shoe including an upper component and a sole component for receiving the foot of a wearer therebetween, the shoe also including a plurality of force absorbing units positioned between the upper and sole components, each unit having a first portion to receive the wearer's foot thereon and a remote second portion whereby, in response to forces exerted on the units by the wearer's foot, the first portions of the units will contract and the second portions of the units will expand to thereby absorb and distribute such exerted forces and further including support means of substantial rigidity in operative proximity to the second portions of the units to preclude the compression of the second portions when the first portions contract.

4,852,275

SHOE HAVING A RIGID BACK PART

William L. Bianchini, Elmwood, and Gary P. Duclos, Newburyport, both of Mass., assignors to Highland Import Corporation, Marlboro, Mass.

Continuation-in-part of Ser. No. 911,370, Sep. 25, 1986, Pat. No. 4,704,808. This application Nov. 9, 1987, Ser. No. 118,842
The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.
Int. Cl.[4] A43B *1/10, 3/14, 9/00, 23/08*
U.S. Cl. 36—102 25 Claims



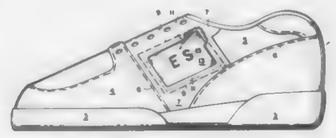
1. A shoe comprising
a sole component having a forepart and a back part, said back part being relatively stiff and having a wide outwardly extending lasting margin extending about its periphery;
and an upper having a forepart and rear part,
a molded counter with a stiff outwardly extending flange incorporated into and covered on the outside by the upper rear part, said upper rear part having a lasting margin which extends outwardly over the flange of the counter;
stitching joining the lasting margin of the back part of the sole component to the flange of the counter and the lasting margin of the rear part overlying the flange,
said forepart of the upper having a base which is secured in face to face relationship to the forepart of the sole component.

4,852,276

SHOE HAVING A REPLACEABLE LOGO

Sebastian E. Savoca, 121 Skymeadow La., Leola, Pa. 17540, and Samuel E. Savoca, 3044 Linda La., Sinking Spring, Pa. 19608

Filed Jan. 21, 1988, Ser. No. 146,415
Int. Cl.[4] A43B *23/24*
U.S. Cl. 36—136 9 Claims



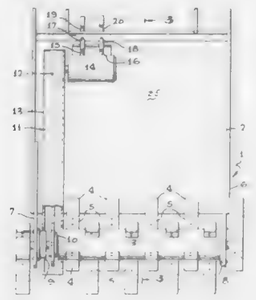
1. A shoe comprising a side or quarter panel over a part of which an outer material is secured, said outer material having a cut-out section forming a frame or opening and wherein said outer material is secured to said quarter panel by stitching positioned such that a flexible lip is formed by the outer material along the perimeter of said frame or opening; and an insert material located within said frame or opening and reversibly secured to said quarter panel with an acrylic pressure sensitive adhesive and positioned such that the flexible lip formed by the outer material overlaps said insert material.

4,852,277

BACKHOE SCRAPER APPARATUS

Arthur A. Ward, P.O. Box 64, Saugus, Calif.

Filed Jan. 19, 1988, Ser. No. 145,107
Int. Cl.[4] E02F *3/76*
U.S. Cl. 37—117.5 5 Claims



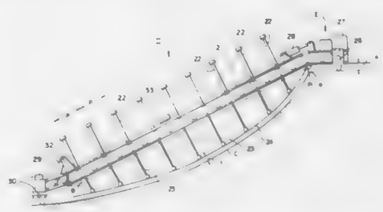
1. In a backhoe tractor for dislodging of and collection of soil during a trench excavation procedure, including a hydraulic power system and a hydraulically actuated boom assembly mounted on said backhoe tractor, the improvement which comprises the combination:
a bucket pivotally connected to said boom assembly having a terminating edge between opposite sides leading into a storage cavity for gathering and receiving hardpan soil;
an elongated cylindrical roller rotatably carried on said bucket opposite sides parallel to and facing said terminating edge of said bucket in fixed spaced relationship and having a plurality of outwardly and radially projecting elements arranged in staggered rows and columns from said roller immediately ahead of said terminating edge;
each of said elements is characterized as being replaceable and deployed about the circumference of said roller;
motor means carried on said bucket for driving said roller and including means of connection to said hydraulic power system of the backhoe tractor; and
said rotatable roller disposed with respect to said bucket storage cavity for reception and collection of dislodged soil directly conducted via said plurality of blades.

4,852,278

METHOD AND APPARATUS FOR GRADING AND MEASURING A SURFACE HAVING A CURVED PROFILE

Seiichiro Takizawa, Tokyo; Mitsuo Fukukawa, Saitama; Masayuki Yazawa, Chiba; Kazumitsu Asai, and Yoshiharu Okamoto, both of Saitama, all of Japan, assignors to Kajima Corporation and Kajima Road Company, both of Tokyo, Japan

Filed Jun. 23, 1987, Ser. No. 65,528
Claims priority, application Japan, Jun. 27, 1986, 61-149653; Jun. 27, 1986, 61-149654; Jul. 8, 1986, 61-158738
Int. Cl.[4] E02F *5/00*
U.S. Cl. 37—197 12 Claims



1. An earthworking method for forming a surface which has a curved and inclined profile, comprising the steps of,
positioning a rule in a plane of a desired curved and inclined profile and shaping the rule by moving points thereon so that the rule has a first shape corresponding to a first desired profile which is inclined and curved,
shaping a first section of the surface with an earthworking means using said rule in said first shape as a reference,
reshaping the rule into a second shape corresponding to a second desired profile which is inclined and curved, said second shape being different from said first shape, and
shaping a second section of the slope with said earthworking means, using the rule in said second shape as a reference,
both of said shaping steps being performed by moving the earthworking means in a direction which extends lengthwise along the rule.

4,852,279

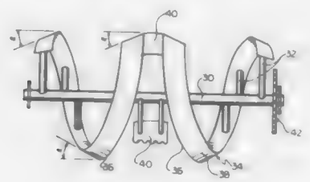
DIGGING IMPLEMENT OR BLADE THEREFOR

George Gerbrandt, Winnipeg, Canada, assignor to Met-Line Inc., Otterburne, Canada

Filed Aug. 17, 1988, Ser. No. 233,020
Claims priority, application United Kingdom, Aug. 18, 1987, #719487
Int. Cl.[4] E01H *5/09*
U.S. Cl. 37—252 19 Claims

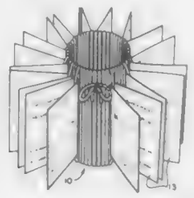
1. A blade for a digging implement of the type having a shaft, a coiled band wound around the shaft with a space between the shaft and the band and spokes joining the band to the shaft, the blade being arranged for advancement sideways

into a body of particulate material, said band having a leading edge wound along a blade axis, and a tapered body with a



linear cross section in planes containing the axis and which slopes towards the axis.

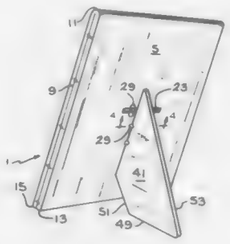
4,852,280
GREETING CARD HOLDING AND DISPLAYING APPARATUS
Robert T. Beattie, 301 Trousdale Pl., Beverly Hills, Calif. 90210
Continuation of Ser. No. 85,952, Aug. 17, 1987, abandoned. This application Jan. 12, 1989, Ser. No. 296,918
Int. Cl.[4] G09F *1/10*
U.S. Cl. 40—124 2 Claims



1. A greeting card holding and displaying apparatus comprising;
(a) a central hollow cylindrical core member having an inside surface and an outside surface, said core member being of a height at least equal to the height of the greeting cards to be held and displayed thereon, the base of said core member having at least three points in a planar surface to permit stable resting support of the core member upon a planar surface; and,
(b) cord means of a continuous strand being wrapped in successive loops lengthwise of said hollow cylindrical core and flush against the inside and outside surfaces of said hollow cylindrical core member to cover the core surfaces, said cord means being operative to permit the easy insertion of cards under individual strands thereof and, being taut to prevent sagging to the cord means due to the weight of the cards and individual strands of said cord means being adjacent to each other to cover the inside surface and the outside surface of said core members.

4,852,281
FRAME
Fred C. Blome, Maumee, and Jack L. Bernard, Toledo, both of Ohio, assignors to Bernard Engraving Co., Toledo, Ohio
Filed Feb. 22, 1988, Ser. No. 158,840
Int. Cl.[4] A47G *1/06;* G09F *1/12*
U.S. Cl. 40—152.1 10 Claims

1. A frame for receiving objects to be displayed having a display side for an object and a back plate positioned opposite said display side, said frame comprising:
at least one opening positioned in said back plate of said frame;
at least one pair of opposed securing devices positioned adjacent said opening, said securing devices extending at least partially over said opening, said opposed securing devices forming a passageway;
a support member having a projection on one side, said projection being disposed for insertion into said opening in said back plate, said passageway formed by said opposed securing devices being slightly narrower than said thick-



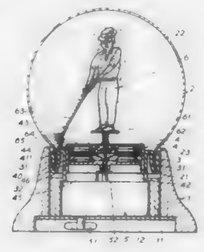
ness of said projection, said securing devices engaging said support member to maintain said projection of said support member in said opening, said support member extending from said back plate whereby said support member supports said frame in a manner where an object positioned on said display side can be viewed.

4,852,282
MAGNETIC CALENDAR FRAME
William A. Selman, Decatur, Ga., assignor to S & D Products, Inc., Greenville, S.C.
Filed Jun. 23, 1987, Ser. No. 65,583
Int. Cl.[4] A47G *1/06;* G09F *1/10*
U.S. Cl. 40—159 4 Claims



1. A removably supported calendar frame for use with a perpetual calendar, comprising:
a generally planar, transparent member, said planar member being relatively thick and rigid, and having respective planar surfaces on opposite sa[illegible] thereof;
magnetic support means, comprising a plurality of strip magnets rigidly attached respectively along at least a portion of plural edges of one of said planar surfaces of said planar member, for magnetically and removably supporting said planar member on a magnetically-attractable support surface in spaced relation thereto, said strip magnets having a predetermined thickness so as to define a fixed-form planar compartment between such support surface and said one planar surface adapted for receipt and support therein of a sheet with perpetual calendar indicia thereon facing said one planar surface, wherein said compartment has a thickness greater than that of such sheet and fully supports such sheet therein with one edge of such sheet resting against at least one of said strip magnets, and further wherein the other of said planar surfaces is adapted for marking thereon with removable ink, which marking may be selectively aligned with perpetual calendar indicia of such sheet supported in a selected orientation on the opposite side of said planar member of transparent material, whereby temporary markings may be entered on said other planar surface in alignment with indicia removably and selectively supported therebeneath.

4,852,283
ROTATABLY-TWISTING DISPLAY DEVICE
Haieh-Yih Teng, P.O. Box 20-5, Hsinchu, Taiwan
Filed Jul. 8, 1988, Ser. No. 216,515
Int. Cl.[4] G09F *19/00*
U.S. Cl. 40—426 4 Claims



1. A rotatably-twisting display device comprising:
a base having an inner cylindrical hole formed therein;
a crystal ball generally formed as a spherical shape for filling water therein having a neck portion mounted on an upper portion in said cylindrical hole of said base and sealed therein by an outer skirt of a packing;
an inner cylinder having an upper socket having an upper disk mounted with ferrous plates in the upper disk rotatably mounted in said upper socket, and a lower socket partitioned under said upper socket having a lower disk rotatably mounted in said lower socket and fixed with a plurality of magnets on the lower disk to magnetically attract said ferrous plates in said upper disk, said lower disk being fixed on a shaft of a spring system of a musical device mounted on a lower portion inside said inner cylinder, said inner cylinder being inserted into an opening of said neck portion and sealed therein by an inner skirt of a packing and mounted to said base by a bottom plate; and
at least a model creature mounted on a foot stand resiliently held on said upper disk by a central spring, having a side actuator member having its upper end secured to a central creature and having its lower end rotatably striking a side follower means resiliently mounted by a side spring on a flange laterally extending from an upper edge of said inner cylinder outside the upper disk, whereby upon a rotation of said lower disk to drive the upper disk as magnetically attracted to said lower disk to rotate the creature, the side actuator member may hit the side follower means to cause a twisting or vibration action of the creature and the side follower means to vividly mimic a sportsman's action or the like.

4,852,284
GLASS MOUNTABLE SIGN
Tom Faggiano, 161 Hollywood Ave., Santa Cruz, Calif. 95060
Continuation-in-part of Ser. No. 75,108, Jul. 20, 1987, abandoned. This application Nov. 1, 1988, Ser. No. 265,589
Int. Cl.[4] G09F *11/00*
U.S. Cl. 40—488 16 Claims



1. A glass mountable sign comprising of:
a panel having a first and second planar surface parallel to each other and each extending in a vertical direction and a horizontal direction, said first surface having a message carrying area;
at least one pair of magnetic plates each having a first and a second surface with said first surface of the plate attached to said first surface of the panel about the periphery of said message carrying area, said pair of magnetic plates being separated to form a groove extending in said horizontal direction; and
a ferromagnetic plate having a first flat surface for attachment to a planar glass and a second surface, a tab member extending perpendicularly from said second surface of the ferromagnetic plate and extending in said horizontal direction, said tab member being sized to mate within said groove with said second surface of the magnetic plates in abuttment with said second surface of the ferromagnetic plate and with said message carrying area of said flat first surface of the panel being parallel with said glass, and the ferromagnetic plate being positionable on said glass to align said tab with one of said grooves of the magnetic plates, whereby the ferromagnetic plates are in functional engagement with the magnetic plates and are movable in said horizontal direction relative to one another in response to expansion and contraction of said glass relative to the panel.

4,852,285
LUMINOUS GAS-DISCHARGE SIGN PANEL
Masaaki Kimoto, Ikoma, Japan, assignor to Kimoto Sign Co. Ltd., Osaka, Japan
Filed Dec. 31, 1984, Ser. No. 687,632
Claims priority, application Japan, Dec. 30, 1983, 58-248828
Int. Cl.[4] G09F *13/20*
U.S. Cl. 40—542 6 Claims

1. A luminous gas-discharge sign panel comprising:
a panel made up of a transparent front plate and a back plate, both being facedly bonded together on their respective inner sides; and
a pair of electrodes,
said transparent front plate having main grooves sinking on its inner side and extruding on its outer side;
said main grooves being noncontinuous forming a pattern to be made luminous by gas discharging;
said back plate having a continuous subordinate groove sinking on the inner side of said back plate, forming a continuous gas discharge path in company with said transparent front plate including the parts where said main grooves are formed;
said gas discharge path having a constant cross-sectional area throughout the whole length of the same and being

filled with a discharge gas at a predetermined pressure; and



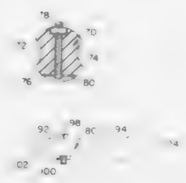
each of said pair of electrodes being provided at each end of said gas discharge path.

4,852,286

DETACHABLE GUN TRIGGER SAFETY DEVICE

Robert Troncoso, and Fernando Troncoso, Jr., both of 14090-6100 Rd., Montrose, Colo. 81401

Division of Ser. No. 177,391, Apr. 4, 1988, Pat. No. 4,825,576.
This application Nov. 7, 1988, Ser. No. 268,273
Int. Cl.[4] F41C *17/02*
U.S. Cl. 42—70.07 5 Claims



1. An improved detachable gun trigger safety device, said device comprising, in combination:
(a) a gun trigger;
(b) a trigger guard disposed around and spaced from the front and rear of said trigger; and,
(c) an elastomeric ball which expands in one direction while it compresses in another direction, said ball being wedged between the rear of said trigger and the rear portion of said trigger guard to block rearward movement of said trigger.

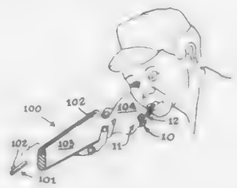
4. An improved gun trigger safety device, said device comprising, in combination:
(a) a gun trigger;
(b) a trigger guard disposed around and spaced from said trigger; and,
(c) a safety component wedged between the rear of said trigger and the adjacent rear portion of said guard, said safety component comprising, in combination, an elongated box with an open end out through which a plate telescopes longitudinally, said box and plate bearing a plurality of transverse holes extending therethrough and spaced along the length thereof, and a bolt disposed in holes aligned in said box and plate to releasably tightly hold said component against the rear of said trigger and the adjacent rear portion of said guard.

4,852,287

SHOOTERS HEAD IMMOBILIZING APPARATUS

Maurice Martin, 13 Ashbrook Rd., Exeter, N.H. 03833

Filed Sep. 29, 1988, Ser. No. 250,665
Int. Cl.[4] F41C *27/00*
U.S. Cl. 42—90 5 Claims



1. A shooters head immobilizing apparatus for use on a firearm having a cheekplate wherein the apparatus comprises:
an anchor unit comprising an anchor member formed from one portion of a conventional hook and loop releasable fastening arrangement; wherein, the anchor member is further provided with securing means for fastening the anchor member to the cheekplate of a firearm; and,
a mouthpiece unit comprising: a mouthpiece base member including the other portion of the conventional hook and loop releasable fastening arrangement; a generally flexible tether member having one end attached to the mouthpiece base member; and, a resilient tab member attached to the other end of said tether member.

4,852,288

ARTICULATED WILD GAME DECOY

H. Dwaine Payne, 2602 Cypress Circle, Bryan, Tex. 77803, and Terry C. Brunner, Sr., P.O. Box 159, Oakwood, Tex. 77855

Filed Oct. 7, 1988, Ser. No. 254,850
Int. Cl.[4] A01M *31/06*
U.S. Cl. 43—2 28 Claims



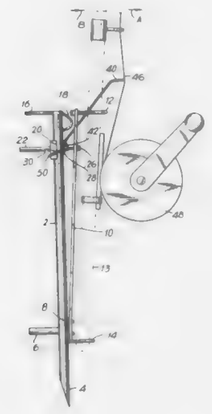
1. An articulated wild game decoy activated by wind comprising;
a main body member formed of sheet material having the profile of the body of a deer or other wild game animal without the legs,
means on said main body member for mounting on trees, shrubs and other objects above the ground surface,
a head and neck member separate from said main body member formed of sheet material having the profile of the head and neck of said deer or other animal and pivotally connected to said main body member for pivotal movement relative thereto,
an ear member separate from said main body member and said head and neck member formed of sheet material having the shape of the ears of said deer or other animal viewed from the front and slidably received on said head and neck member and frictionally retained thereon in a transverse relation thereto with the ears extending laterally outward from each side thereof to catch the wind, and
resilient means operatively connected between said main body member and said head and neck member and cooperative with said pivotal connection to oscillate said head and neck member about the pivotal connection relative to said main body when subjected to a breeze.

4,852,289

LATCH FOR A HOOK SETTING MECHANISM FOR FISHING RODS

David G. B. Lenden, Orchard East Road, R.D.2,, Ngatea, New Zealand

Filed Nov. 12, 1987, Ser. No. 119,562
Claims priority, application New Zealand, Nov. 14, 1986, 217211
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—15 1 Claim



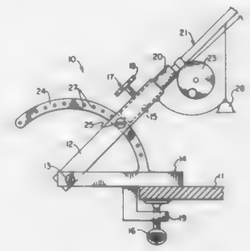
1. A latch for a hook setting mechanism for a fishing rod, comprising:
a keeper block having a first bore;
a second bore intersecting said first bore and extending transversely thereof;
a third bore intersecting said first bore, said third bore being spaced from said second bore in a direction axially of said first bore;
a keeper rod slidably mounted within said second bore, said keeper rod having at least one indentation for the reception of a latching ball;
a latching ball freely movable within said first bore and partially receivable within said indentation of said keeper rod;
a cylindrical cam member mounted for rotation within said third bore and having a camming surface for moving said latching ball into engagement with said indentation of said keeper rod upon rotation of said cylindrical cam member angularly from a first position to a second position, and for retaining said latching ball in latching engagement with said indentation of said keeper rod while in said second position; and,
a trigger arm rigidly connected to said cylindrical cam member and extending radially of the axis thereof;
whereby, movement of said keeper rod to a latching position will permit movement of said latching ball into engagement with said indentation of said keeper rod, and in turn, will permit rotation of said cylindrical cam member by said trigger arm to a set position in which said latching ball is held in latching engagement with said indentation of said keeper rod, and thus holds said keeper rod against axial movement, and, subsequent reverse movement of said cylindrical cam member by said trigger arm will release said latching ball and in turn release said keeper rod.

4,852,290

FISHING ROD HOLDER

Terry A. Wallace, 107 Kathyrn La., Greenville, N.C. 27834; Lyvone Wallace, Greenville, and Harry C. Hopkins, Williamston, both of N.C., assignors to Terry A. Wallace, Greenville, N.C.

Filed Jul. 29, 1987, Ser. No. 79,219
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—17 8 Claims



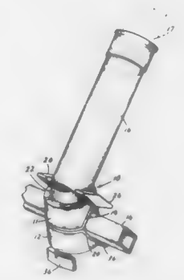
1. A fishing rod holder comprising:
a first bracket arm having an open hollow cylinder at one end and a pivot point at the other end;
a second bracket arm connected at one end to the pivot point of said first bracket arm;
clamping means for reducing at least a portion of the diameter of the cylinder to clamp a fishing rod in the cylinder, said clamping means bring adapted to enable quick release of the fishing rod from the fishing rod holder;
means for mounting the second bracket arm to a stationary object; and
means for adjustably locking the angular relation between the first and second bracket arms which comprises an adjusting bracket extending from said second bracket arm along the path of adjustment of a portion of said first bracket which is remote from the pivot point, said adjusting bracket and said first bracket arm defining locking means for locking the angular relationship between said first and second brake arms.

4,852,291

FISHING ROD HOLDER MOUNT KIT

Alfred Meago, Kenosha, Wis., assignor to Meago Industries, Inc., Kenosha, Wis.

Filed Nov. 2, 1988, Ser. No. 266,008
Int. Cl.[4] A01K *97/10*
U.S. Cl. 43—21.2 11 Claims



1. A kit for adapting a fishing rod holder to a round or a polysided support comprising:
a first base plate having an end portion for connection to the

rod holder and adapted to be mounted on the one side of a round or a polysided support;
a second base plate adapted to be mounted on an opposing side of a round or a polysided support;
a first pair of insert members presenting a round opening when placed in a face-to-face manner for surrounding a round support;
a second pair of insert members presenting a polysided opening when placed in a face-to-face manner for surrounding a polysided support;
said first and second base plates defining oppositely facing cavities said inserted member each having an inwardly extending portion and laterally extending flange portions, said inwardly extending portion being accommodated in said cavities with said flange portions of oppositely positioned insert members contacting each other when, said first pair of insert members or said second pair of insert members are in said face-to-face manner; and
fastening means operatively associated with said first and second base plate members and said first and second pair of insert members to hold said round openings of said first pair of insert members against said round support in one instance and said polysided openings of said second pair of insert members against said polysided support in another instance.

4,852,292

CABLE TERMINAL

Eugene D. Pease, Muskegon, Mich., assignor to Armstrong International, Inc., Three Rivers, Mich.

Filed Jul. 29, 1988, Ser. No. 225,731
Int. Cl.[4] A01K *91/00*
U.S. Cl. 43—27.4 **7 Claims**



1. A cable terminal requiring no knots or radical deformation in the cable comprising:
a plastic clam-shell type connector having a pair of shell plates and an integral hinge controlling closure of a first of said pair of shell plates upon a registering second receiving of said shell plates, said shell plates having passages defined therein with integral cable securing and confinement means engaged on said shells with said cable upon closure, and an integral deforming bail portion closed under stress by said cable as secured within said clam-shell connector.

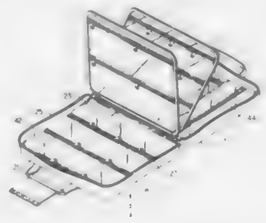
4,852,293

FISHING ACCESSORY CONTAINER

Lance R. Levine, and Clarence A. Pratt, Jr., both of El Paso, Tex., assignors to MFI International, Inc., El Paso, Tex.

Filed May 26, 1988, Ser. No. 199,058
Int. Cl.[4] A01K *97/06*
U.S. Cl. 43—54.1 **2 Claims**

1. A fishing accessory container, comprising:
a flexible outer bag made up of left and right halves adapted to meet along a peripheral edge, the peripheral edge of each half of the outer bag being defined by a top and bottom extent which is separated by opposing side extents;
an external zipper for joining the left and right halves along the peripheral edge to thereby define a closed interior for the flexible outer bag, the external zipper extending along at least the side and top extents of each half of the outer bag, the bottom extent of the halves also being joined together;
a plurality of removable inserts located within the closed interior of the bag and being accessible by unzipping the external zipper, each insert having top and bottom edges separated by opposing side edges, the bottom edge of selected inserts being provided with a zipper part which extends substantially along the entire length of the bottom edge for removably engaging a mating zipper part pro-



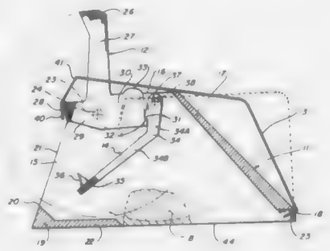
vided along the bottom extent of the flexible outer bag, each insert having an exterior and an interior for holding fishing accessories and each insert being arranged in the bag interior with its insert zipper running parallel to the next adjacent insert zipper on the bottom extent of the flexible outer bag, whereby the inserts lie side-by-side in the bag interior when the external zipper is zipped, whereby the inserts can be turned in page-like fashion when the outer bag is open; and
wherein the interior of each insert is divided into a plurality of pockets, each pocket being accessibly by means of a pocket opening.

4,852,294

STRIKE TRAP FOR CATCHING MICE AND RATS

Ola K. Langli, N-6650 Surnadal, Norway

PCT No. PCT/NO85/00024, § 371 Date Jan. 6, 1986, § 102(e) Date Jan. 6, 1986, PCT Pub. No. WO85/05007, PCT Pub. Date Nov. 21, 1985
Continuation of Ser. No. 824,004, Jan. 6, 1986, abandoned. This PCT application May 6, 1985, Ser. No. 113,388
Claims priority, application Norway, May 7, 1984, 841815
Int. Cl.[4] A01M *23/30*
U.S. Cl. 43—81 **4 Claims**



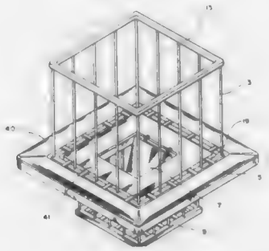
1. A strike trap adapted for resting on a support surface for the capture and extermination of rodents, the strike trap having a frame means and a spring loaded striker means which can be released from a raised, loaded position by an activating element means connected to a swivelling release lever means, characterized in that the striker means is mounted on pivots adjacent to an open end of the frame means of said strike trap, the frame means includes a generally large opening in a surface adjacent to the support surface whereby a rodent bait sitting on said support surface is surrounded by said frame means, said release lever means includes a transverse element which protrudes into the area between the rodent bait in the large opening and said open end in the frame means adjacent to said striker means, and
the striker means includes a band-shaped spring means which extends from an abuttment provided at one end of said frame means to a transverse leg mounted on said striker means whereby said striker means is spring biased to pivot downwardly when released from the loaded position so as to swing across the opening in said frame means so as to exterminate any rodent that enters into said opening to obtain said bait.

4,852,295

OPEN WATER LIVE TRAP FOR PINNIPEDS AND OTHER MARINE ANIMALS

Michael Sandlofer, 610 City Island Ave., City Island, N.Y. 10464

Filed Jan. 13, 1989, Ser. No. 297,454
Int. Cl.[4] A01K *69/00*
U.S. Cl. 43—100 **11 Claims**



1. A live trap for capturing pinnipeds and other marine animals in open water comprising:
a pen for holding captured animals, the pen including an interior chamber sized suitably to receive the captured animal;
a platform for supporting the captured animal, the platform being slidably coupled to the pen for vertical movement relative thereto, the platform including flotation means for supporting the platform high enough in the water to allow an animal sitting thereon to breathe air;
trigger means for causing the pen to rise vertically relative to the platform to capture any animal resting on the platform, wherein the trigger means is arranged such that it is activated only after an animal has climbed onto the platform.

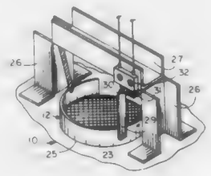
4,852,296

DEVICE FOR ATTRACTING AND ELECTROCUTING FLYING INSECTS

Ernest B. Swanson, S. 3701 Loretta, and It S. Chane, 10716 E. 29th Ave., both of Spokane, Wash. 99206

Filed Dec. 8, 1988, Ser. No. 281,460
Int. Cl.[4] A01M *1/22*
U.S. Cl. 43—112 **4 Claims**

1. In a device to destroy insects by electrocution having a protective cover with a cylindrical body defining a plurality of orifices, a solid top closing its upper portion, and bottom structure closing its lower portion with concentric spaced cylindrical grids spacedly carried therein, each electrically isolated from the other, and an optical attractant carried within the inner electrical grid, the invention comprising a bottom structure including:
a depending inner portion defining a hole slidably carrying a vertically movable attractant cup spring biased to an



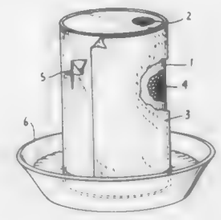
upper position but movable a spaced distance below said medial body portion for servicing, and
an annular portion about the depending inner portion defining a plurality of spaced orifices.

4,852,297

METHOD AND ARTICLE OF MANUFACTURE FOR PRODUCING MUSHROOMS FROM SELF CONTAINED VESSELS

Douglas L. Moren, 6264 N. Hunter Rd., Livingston, Calif. 95334

Filed Jun. 23, 1987, Ser. No. 65,402
Int. Cl.[4] A01G *1/04*
U.S. Cl. 47—1.1 **18 Claims**



1. An apparatus
for growing mushrooms , including: a nutritive substrate, colonized by mushroom mycelium ; an enclosed container having a top surface, and housing said substrate and said mushroom mycelium ; a fabric surrounding said container, said fabric being capable of absorbing and translocating
water ; and a reservoir of water partially submerging the fabric for keeping said fabric wet, so that the fabric will translocate water from the reservoir to a target region of the fabric in order to provide
moisture
to the target region, and wherein a hole extends through the container and the fabric at the target region, so that water translocated from the reservoir to the target region will contribute to a microclimate conducive to cultivation of a mushroom at the hole.

4,852,298

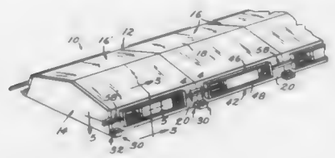
PORTABLE COLD FRAME

Peter Markos, 5440 N. Braeswood #1002, Houston, Tex. 77096-3201

Filed Feb. 22, 1988, Ser. No. 158,638
Int. Cl.[4] A01G *9/16, 9/24*
U.S. Cl. 47—17 **12 Claims**

1. A cold frame comprising a central longitudinally extended housing including at least one section with an outside surface, a roof and opposed side walls, said housing terminating in opposed open ends, an end wall removably closing each of said ends, each open end being defined by a laterally directed edge

flange forming an edge channel opening outward relative to the housing, each end wall including an inwardly directed edge flange received within the outwardly opening edge channel of the adjacent housing end, said housing having multiple sections longitudinally joined with the endmost sections defining the opposed open ends of said housing, each of said sections having opposed section ends with a laterally directed edge channel along each section end, the edge channels of adjacent sections internesting to form a joinder therebetween, and at



least two mating positioning blocks mounted on the outside surface of each section side wall adjacent the opposed section ends, said positioning blocks including longitudinal alignment bores therethrough which longitudinally align upon a longitudinal joining of said sections for mating said at least two position blocks, and said positioning blocks having alignment pins receivable through the aligned bores of said positioning blocks on adjacent sections to maintain a longitudinal alignment between the attached sections.

4,852,299

SELF RELEASING TREE SUPPORT STRAP

Copley H. Smoak, 8308 Mariner Crt., and Terrill L. Chalfant, 8304 Mariner Crt., both of Gaithersburg, Md. 20879

Continuation-in-part of Ser. No. 894,215, Aug. 7, 1986. This application Nov. 10, 1987, Ser. No. 119,401

Int. Cl.[4] A01G *17/06*

U.S. Cl. 47—42 **8 Claims**



1. A self-releasing tree support strap for encircling and providing support to a tree over a single growing season sufficient for the tree to develop its own support system, which comprises a flexible elongated member with memory comprising a strap composed of a climatologically degradable material having sufficient strength over said growing season to provide support to said tree without impeding the growth and well-being of the tree, but self degrading thereafter under climatic influences sufficiently to deteriorate and fall away from said tree at the end of said growing season and without requiring further intervention.

4,852,300

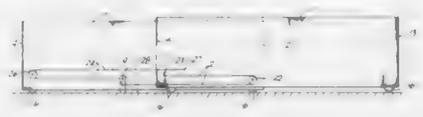
STACKING GATES OR DOORS

Alfred W. Keast, 1008 Juanita Ave., La Verne, Calif. 91750

Filed Sep. 16, 1988, Ser. No. 245,782

Int. Cl.[4] E05F *17/00*

U.S. Cl. 49—102 **15 Claims**



1. A pair of stacking gates or doors comprising:
- a trailing gate including wheels for rolling along a first track between a retracted position and an extended position;
- a leading gate including wheels for rolling along a second track parallel to the first track between a retracted position approximately side-by-side with the trailing gate and an extended position further from the retracted position than the trailing gate;
- a fixed anchor between the tracks;
- a rear idler on the rear of the trailing gate;
- a flexible retraction member having one end connected to the fixed anchor, wrapped around the rear idler, and connected at the other end to the leading gate;
- a front idler on the front of the trailing gate;
- a flexible extension member having one end connected to the fixed anchor, wrapped around the front idler, and connected at the other end to the rear of the leading gate; and
- means at the top of the gates for maintaining the tops of the gates spaced apart a uniform distance from each other.

4,852,301

NON-METALLIC DOOR EDGE GUARD HAVING CLEARANCE TO ADJACENT BODY STRUCTURE

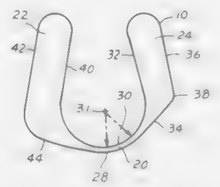
Robert Adell, 200 Adell Blvd., Sunnyvale, Tex. 75182

Continuation-in-part of Ser. No. 56,592, Jun. 1, 1987, Pat. No. 4,753,040. This application Dec. 28, 1987, Ser. No. 138,291

The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.

Int. Cl.[4] E05F *7/00*

U.S. Cl. 49—462 **12 Claims**



1. In an automobile body in combination with the trailing edge of a swinging closure which is separated from a mating edge of adjacent body structure by a gap, the improvement in a decorative and protective edge guard fitted onto the trailing edge of the swinging closure, comprising a non-metallic body that is extruded to a transverse cross section that comprises a curved base fitting over the end of said trailing edge and inner and outer legs extending from said base over the sides of said trailing edge, said non-metallic body having at least one of said legs of thickness greater than that of said base and at least a certain region of said base being provided with thickness less than the thickness of said at least one leg so as to allow the edge guard to fit in said gap without interfering with said adjacent body structure, said at least a certain region of said base being provided with thickness less than the thickness of said at least

one leg by the selective removal of material from said non-metallic body subsequent to the extrusion thereof.

4,852,302

SEAL FOR THE LOWER EDGE OF DOORS AND THE LIKE

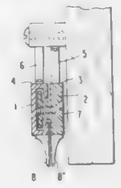
Antonio Bernaola Gil, Floridablanca, 124, 1°1ª 08011 Barcelona, Spain

Filed Mar. 17, 1988, Ser. No. 169,497

Claims priority, application Spain, Mar. 20, 1987, 8701399

Int. Cl.[4] E06B *7/16*

U.S. Cl. 49—482 **3 Claims**



1. A seal rail for the lower edge of doors or panels comprising, at least two juxtaposed longitudinally extending rails, an interengaging longitudinal sliding connection means between said two rails permitting longitudinal extension of said rails to a length conforming to the width of a door or panel, means for fastening said two rails to a door or panel such that once fastened to a door or panel the vertical height of said rails can be adjusted so as to act as a seal for a gap under a door or panel, and releasable lock means connected to one of said rails and extending into contact with the other of said two rails, said releasable lock means having a release position in which said releasable lock means is not in contact with the other of said two rails permitting longitudinal extension of said two rails one to the other to a desired extended length once the two rails are fastened to a door or panel by said fastening means, and said releasable lock means having a locked position in which said releasable lock means is in contact with the other of said two rails fastening them one to the other in a desired extended length.

4,852,303

REFRIGERATOR DOOR FRAME WITH INSULATED MULLION

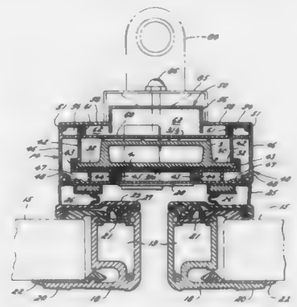
Matthew Rolek, Chicago, Ill., assignor to Ardco, Inc., Chicago, Ill.

Filed Dec. 10, 1987, Ser. No. 131,182

Int. Cl.[4] E06B *1/32*

U.S. Cl. 49—504 **22 Claims**

1. A refrigerator door assembly mountable within the opening in the wall of a refrigerated cabinet at its front comprising
- a door mounting frame having an outer peripheral portion mountable within said cabinet opening,
- a plurality of insulated doors mounted for pivotal movement on said frame, said doors each having sealing gasket means adjacent an outer peripheral side thereof,
- said frame including at least one mullion spanning between top and bottom sides of said frame with the outer periphery thereof being remote from said cabinet wall for establishing a stop for a pair of doors when said doors are in a closed condition,
- said mullion including a metallic structural frame member having an elongated cross sectional configuration with a long side thereof facing the front of said cabinet, a sealing plate mounted forwardly of said structural frame member for engagement by the gasket means of said pairs of doors when in a closed condition,
- insulating and retaining means for supporting said sealing plate in parallel spaced-apart, thermally isolated relation to a front side of said structural frame member with an air insulating space between said sealing plate and said structural frame member, and
- said insulating and retaining means includes means defining first plastic non-metallic walls which encompass the outer



periphery of said structural frame member and means defining second plastic non-metallic walls which together with said first walls define an air insulating space about a rear and opposite lateral sides of said structural frame member.

4,852,304

APPARATUS AND METHOD FOR SLICING A WAFER

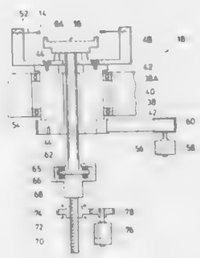
Katsuo Honda, and Susumu Sawafuji, both of Mitaka, Japan, assignors to Tokyo Seimtsu Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 150,376

Claims priority, application Japan, Oct. 29, 1987, 62-274536; Oct. 29, 1987, 62-274537

Int. Cl.[4] B24B *7/00*

U.S. Cl. 51—5 C **8 Claims**



1. A wafer slicing apparatus for slicing a cylindrical hard and fragile material into thin pieces, comprising:
- a main body of said wafer slicing apparatus;
- a rotary drive source disposed in said main body;
- a cylindrical rotor supported rotatably by said main body and connected through a transmission mechanism to said rotary drive source;
- a cylindrical chuck body disposed in an end portion of said rotor;
- an annular inner periphery slicing blade having an edge formed in an inner peripheral edge portion and an outer peripheral edge portion fixedly secured to an inner peripheral surface of said chuck body, said slicing blade being rotatable integrally with said rotor when driven by said drive source through said transmission mechanism;
- a grind stone shaft supported rotatably by said main body and disposed within and coaxially with said rotor;

a grind stone mounted to one end of said grind stone shaft and located within said annular slicing blade;

engagement means for integrally rotatably connecting said rotor to said grind stone shaft while permitting axial movement of said grind stone shaft relative to said rotor, said engagement means including a recessed portion formed in one of an inner peripheral surface of said rotor and an outer peripheral surface of the grind stone shaft, and a projected portion formed in the other of the inner peripheral surface of said rotor and the outer peripheral surface of said grind stone shaft for engaging the recessed portion; and

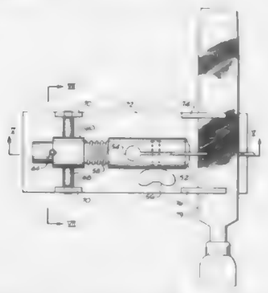
a feed device for axially moving said grind stone shaft in an axial direction thereof relative to said rotor.

4,852,305

FISHHOOK SHARPENER

John C. Juranitch, Rte. 1, Box 2006, Ely, Minn. 55731

Continuation of Ser. No. 946,930, Dec. 17, 1986, abandoned.
This application Jul. 20, 1988, Ser. No. 222,362
Int. Cl.[4] B24B *7/00*
U.S. Cl. 51—59 R 12 Claims



1. An apparatus for sharpening a fishhook which has a shank portion, a curved portion, a barbed portion, and an elongate end portion, comprising:

(a) rotary means for supporting said fishhook for revolution about the longitudinal axis of said end portion; so that a line tangent to said curved portion may lie in at least three different planes which intersect the longitudinal axis of said end portion;

(b) grinding means movable transversely of said end portion for grinding flat surfaces on said end portion; and

(c) stationary means for guiding said grinding means in a fixed plane which intersects the longitudinal axis of said end portion, whereby said grinding means will grind flat surfaces on said end portion of said fishhook at least three circumferentially spaced positions with the plane of each of said flat surfaces intersecting the plane of at least two other flat surfaces and said longitudinal axis of said end portion.

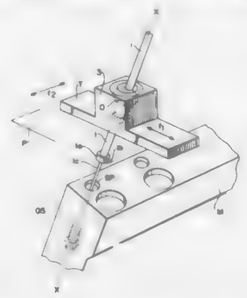
4,852,306

TOOLHOLDER DEVICE FOR A MACHINE TOOL

Pierre Harmand, 47, route de Vovray, 74000 Annecy, France

Filed Oct. 5, 1987, Ser. No. 104,068
Claims priority, application France, Oct. 7, 1986, 86 14079
Int. Cl.[4] B24B *19/00*
U.S. Cl. 51—241 VS 7 Claims

1. A toolholder device for a machine tool, integral with a table (T) and movable in a plane (P) in at least one direction, said device comprising a toolholder spindle; guiding means for the guidance and angular orientation of the spindle relative to the plane (P), said guiding means including a sleeve with a bearing surface of convex sphericity and a housing with a seat of matching concave sphericity; means for supporting the sleeve relative to the housing without friction; magnetic means for generating a magnetic field, said magnetic means being associated with the seat of the housing; and control means for controlling the magnetic means to move the bearing surface of the sleeve relative to the seat to adjust the angular position of



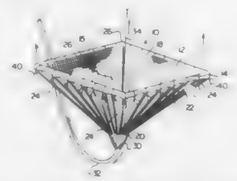
the spindle and lock the angular position of the bearing surface relative to the seat to maintain a working position of the said spindle.

4,852,307

SYSTEM FOR RETRIEVING SANDBLASTED CUTTINGS

James L. Goudeau, 450 Vitrano La., Independence, La. 70443

Filed Jun. 20, 1988, Ser. No. 208,690
Int. Cl.[4] B24C *1/00, 5/00*
U.S. Cl. 51—319 6 Claims



1. A method for trapping cuttings during sandblasting of a structure, comprising the following steps:

(a) providing an inflatable collection bin;

(b) suspending the inflatable collection bin in the deflated state from the structure to be sandblasted;

(c) introducing air or the like into the inflatable bin, imparting expansion of the inflatable bin from the deflated state to a cone shape state, the mouth of the cone positioned adjacent the structure being sandblasted for receiving cuttings sandblasted therefrom;

(e) attaching a retrieval line to the lower portion of the cone, so that any cuttings falling into the cone would likewise be retrieved in the retrieval line; and

(f) transporting the cuttings through the retrieval line by vacuum into a receiving tank located away from the collecting bin.

4,852,308

GUTTER ASSEMBLY WITH CLEANING SYSTEM

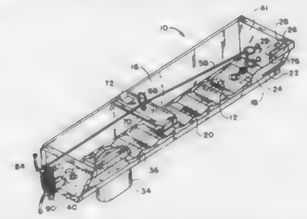
Francis X. Papenbrock, 104 Shawnee Rd., Ardmore, Pa. 19003, and Glenn C. Holcombe, 1155 S. Lehigh Clr., Swarthmore, Pa. 19081

Filed Oct. 6, 1988, Ser. No. 254,302
Int. Cl.[4] E04D *13/00*
U.S. Cl. 52—12 17 Claims

1. A gutter assembly comprising a longitudinally extending elongated

channel member having an inner sidewall, an outer sidewall, and a bottom wall connecting and spacing said inner sidewall and said outer sidewall, a first end cap located at one end of said channel member and a second end cap located at the other end of said channel member, a flexible strip disposed along the length of said bottom wall, and means to remove and re-insert said strip through the one

end of said channel member with a portion of said strip remaining in sliding contact with said bottom wall as said



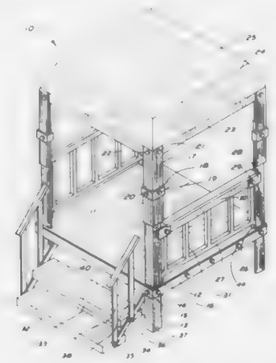
strip is being removed from the confines of said channel member.

4,852,309

MODULAR PORCH FOR A MOBILE HOME

Homer M. Stamp, Sr., Box 93, Scott City, Mo. 63780

Filed Jun. 8, 1988, Ser. No. 203,905
Int. Cl.[4] E04H *14/00*
U.S. Cl. 52—79.6 1 Claim



1. A modular porch for a mobile home, comprising:

a floor;

a plurality of vertically adjustable support legs connected to said floor;

a plurality of roof support legs adjustably connected to said vertically adjustable support legs;

a roof mounted by said roof support legs;

a vertically adjustable stairway connected to said vertically adjustable support legs;

said adjustable stairway having a pair of space support bars mounted for pivotal adjustment on said vertically adjustable support legs;

a pair of stair treads mounted in parallel spaced relation between said support bars;

a pair of vertical hand rail supports pivotally secured to each of said support bars adjacent opposed end portions of said stair treads;

a pair of hand rails secured at opposite sides of said stairs treads;

means for independently adjusting the height of said floor and the height of said roof with respect to each of said vertically adjustable support legs;

each of said vertically adjustable support legs formed from a right angle channel strip extending through a right angle slot in said floor;

a plurality of right angle floor support rails extending around a periphery of said floor;

said roof support legs each formed from a right angle channel strip and each receiving an upper end portion of one of said vertically adjustable support legs in telescoping relation;

a plurality of clamps for securing said vertically adjustable support legs to said roof support legs;

each of said clamps having first and second leg portions connected in perpendicular relation;

a first retaining leg portion connected in space parallel relation to said first leg portion by a first transverse leg portion at a free end of said first leg portion;

a second retaining leg portion connected in spaced parallel relation to said second leg portion by a second transverse leg portion at a free end of said second leg portion,

a threaded aperature extending through a midpoint of each of said first and second leg portions receiving a threaded clamping bolt for frictional engagement with said vertically adjustable and roof support legs;

a rectangular notch formed adjacent each end of said floor support rails;

a pair of elongated slots formed through a lower end portion of each of said vertically adjustable support legs; and

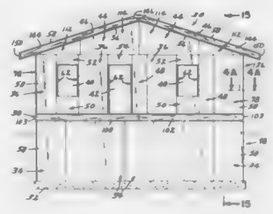
means for securing said floor support rails to said slotted vertically adjustable support leg lower end portions.

4,852,310

INSULATED BUILDING CONSTRUCTION

Harold B. Healey; Kenneth L. Norberg, and John P. Devine, all of Watertown, S. Dak., assignors to Enercept, Inc., Watertown, S. Dak.

Continuation of Ser. No. 24,884, Mar. 11, 1987, Pat. No. 4,720,948, which is a continuation of Ser. No. 832,358, Feb. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 454,543, Dec. 20, 1982, Pat. No. 4,578,909. This application Jan. 11, 1988, Ser. No. 144,639
The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.
Int. Cl.[4] E04B *7/02*
U.S. Cl. 52—90 2 Claims



1. Building apparatus comprising:

first and second walls;

first means for joining said first and second walls;

one of said first and second walls including first and second panels having interior and exterior skins and an insulating core fastened between said interior and exterior skins; and

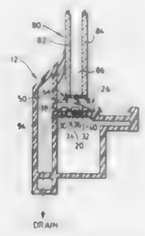
means for bearing a load, said bearing means including post with interior and exterior support members and an insulating layer therebetween, said first post being fastened between said first and second panels with said insulating layer aligned with said insulating cores of said panels to provide continuous thermal insulation from said panels across said first post, said first and second panels having first passageways in the insulating cores extending between opposite first and second vertical edges of said cores, said first post in the insulating layer having a second passageway aligned with the first passageways of said panels whereby said passageways are available for routing electrical wiring.

4,852,311
ROOF STRUCTURES
Sandra Lea, Cross Cottage, Holt-on-Dee, Nr. Wrexham, Clwyd, LL13 9JA, Wales
Filed Mar. 23, 1988, Ser. No. 172,073
Claims priority, application United Kingdom, Mar. 26, 1987, 8707232; Jan. 18, 1988, 8801028
Int. Cl.[4] E04B 7/02
U.S. Cl. 52—92 3 Claims



1. A stressed skin panel comprising:
(a) first and second elongate planar plywood sheets for defining lower and upper skins, respectively, of the panel in use;
(b) longitudinally extending, internal wooden joists nailed and glued between said first and second elongate planar plywood sheets so as to mount said plywood sheets in parallel, spaced-apart relationship, with a uniform distance therebetween;
(c) a body of heat insulation material mounted to portions of the first plywood sheet intermediate the joists;
(d) the thickness of said body of heat insulation material being such that a continuous ventilation passage is defined between said body of heat insulation material and the second one of said plywood sheets;
(e) at its one end, the panel being mitred for joining to a similarly mitred end of another of said panels to form a ridge of a roof; and
(f) at the other end of the panel, the corresponding ends of both of the first and second plywood sheets being cut back in relation to adjacent ends of said joists so that the joists project freely beyond both of said first and second sheets, the extent of the cut back of the second sheet for defining the upper skin being less than that of the first sheet for defining the lower skin.

4,852,312
WINDOW FRAME ASSEMBLY
John Harbom, Bolton, Canada, assignor to Plastmo Ltd., Brampton, Canada
Filed Dec. 23, 1988, Ser. No. 289,097
Int. Cl.[4] E04B 2/82
U.S. Cl. 52—126.3 5 Claims



1. A window frame assembly including:
a frame member having a longitudinally extending channel with a bottom surface and front and rear walls, each wall having a longitudinally extending recess adjacent the bottom surface,
a plurality of support members for a window unit, said support members being longitudinally spaced along the channel, each support member resting on the bottom surface of the channel and having front and rear longitudinally extending projections in snapping engagement in the recesses in the front and rear walls of the channel.

4,852,313
BUILDING ARRANGEMENT AND METHOD FOR VIEW [illegible]
Robert E. Jones, P.O. Box 1128, La Jolla, Calif. 92038
Filed Jul. 26, 1985, Ser. No. 759,357
Int. Cl.[4] E02D 1/92
U.S. Cl. 52—169.3 15 Claims

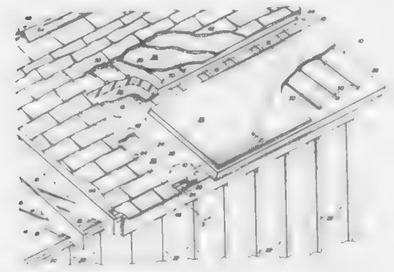


1. A housing arrangement for maximizing the number of houses with a line of sight to a view site, said housing arrangement comprising:
a plurality of adjoining lots located adjacent the view site and along a string line arranged in an undulating path adjacent the view site and passing through the middle of each of said lots; and
a plurality of spaced apart houses on a predetermined number of said lots, respectively, each house lying within a standard building envelope configured and dimensioned to fit within any of said predetermined number of lots, all of said building envelopes being spaced from one of the side boundaries of the lots within which they are located to define visual spaces between adjacent houses, respectively, whereby some portion of each of said houses is on a line-of-sight to the view site and whereby all of said houses may use a single floor plan or a reverse or mirror image of said single floor plan.

4,852,314
PREFABRICATED INSULATING AND VENTILATING PANEL
Thomas W. Moore, Jr., 2025 Sylvester Rd., Lakeland, Fla. [illegible]
Continuation of Ser. No. 940,269, Dec. 11, 1986, abandoned.
This application Nov. 9, 1988, Ser. No. 270,375
Int. Cl.[4] E04H 12/28
U.S. Cl. 52—199 16 Claims

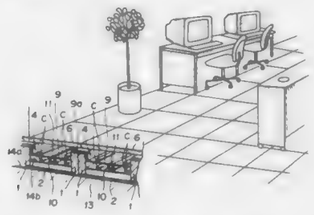
6. A prefabricated insulating and ventilating panel for use between the roofing and framing components of a roof in

building construction, comprising a rigid, integral structure having:
a generally planar substrate of rigid insulating material and including an outer surface having edges;
a generally planar deck of rigid nailable material superposed over said substrate and including an inner surface having edges; and
a plurality of elongated spacers secured between said outer surface of said substrate and said inner surface of said deck, and serving to define the spacing therebetween, said



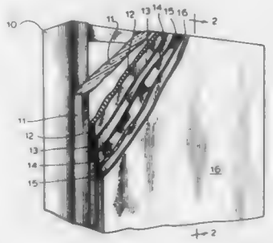
spacers being positioned inwardly of the edges of the surfaces to present unobstructed marginal edge air channel between said substrate and said deck at least adjacent the ends of said spacers, and said spacers being separated from each other to present a plurality of adjacent interconnecting channels for the flow of ventilating air through the panel between said substrate and said deck, and among said channels.
7. A panel as in claim 6, further comprising a moisture impermeable facing on said insulating material.

4,852,315
READJUSTABLE FLOOR SYSTEM
Tateki Fukayama, 1909, Kodachi, Kawaguchiko-machi, Minami-Tsuru-gun Yamanashi-ken, Japan
Filed Dec. 15, 1988, Ser. No. 288,551
Int. Cl.[4] E04B 5/55
U.S. Cl. 52—220 4 Claims



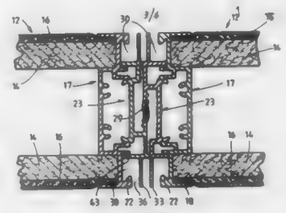
1. A readjustable floor system comprising:
unit members of an approximately U-shaped cross section each composed of a pair of floor member-supporting joists disposed parallelly on a floor surface in an opposed relation to each other across a fixed interval and a bottom plate laid to interconnect the lower parts of said pair of floor member-supporting joists, said unit members defining therein a space for distribution of cables and pipes;
a plurality of antistatic sheets each having opposite ends fastened to said pair of floor member-supporting joists for vertically partitioning said space; and
unit floor boards detachably mounted one each on top of said unit members.

4,852,316
EXTERIOR WALL PANEL
William Webb, Bellmore, N.Y., assignor to Composite Panel Manufacturing, Bohemia, N.Y.
Filed Nov. 13, 1987, Ser. No. 120,342
Int. Cl.[4] E04H 1/00
U.S. Cl. 52—235 5 Claims



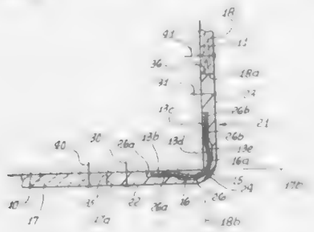
1. A building curtain wall panel system for use in building construction comprising:
a plurality of adjacent, superimposed layered panels attached to a steel stud frame, said layered panels including sequentially a phenolic foam insulation layer, a medium density calcium silicate composite panel, a sizing layer, Fiberglas mesh, a composite coating, and a sealer.

4,852,317
DEMOUNTABLE PANEL SYSTEM
Antonino Schiavello, Lower Templestowe, and Richard A. Ramadell, Templestowe, both of Australia, assignors to Schiavello Bros. (Vic.) Pty. Ltd., Victoria, Australia
Filed Nov. 6, 1987, Ser. No. 117,529
Claims priority, application Australia, Nov. 7, 1986, PG08852
Int. Cl.[4] E04H 1/00
U.S. Cl. 52—239 16 Claims



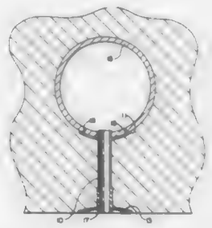
1. A demountable panel for assembly with other similar panels to form a partition structure or workstation, said panel comprising a clip rail section, a panel member having at least opposed side edges defined by a surround section of a shape to be secured to the panel member, the surround section including leg means extending along the length thereof to releasably engage cooperating parts of the clip rail section, said clip rail section having a tongue extending generally in a direction perpendicular to the plane of the panel member, the tongue having a shape to engage with a similar tongue of the partition structure or workstation by an engaging movement perpendicular to the panel member.

4,852,318
BULL NOSE CORNER PIECE
Arthur Anderson, 45-700 Rancho Palmeras, Indian Wells, Calif. 92210
Filed Mar. 24, 1988, Ser. No. 173,115
Int. Cl.[4] E04F *19/02*; E04B *1/00*
U.S. Cl. 52—288 7 Claims



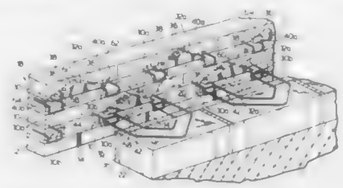
1. In combination with an approximately 90° corner defined by two upright walls, a thin protective strip attached to the two walls and elongatd vertically, the strip having a rounded nose extending outwardly from planes defined by the walls and around said corner, and two like base boards that respectively extend adjacent the lowermost side of the walls and toward said corner, the combination comprising:
(a) a generally L-shaped corner piece having two arms that extend flatly adjacent the respective walls between said base boards and said corner, said arms having substantially the same height and thickness as said base boards to simulate continuations thereof and said arms being attachable to said walls,
(b) the corner piece having a rounded nose that is spaced outwardly of the corner and that merges with said two arms,
(c) the corner-piece defining a recess that is spaced inwardly of said corner-piece nose and rounded in parallel relation thereto, the recess having straight portions extending endwise into said arms, and the recess opening toward said strip to receive and conceal said rounded nose of the strip, the strip having curvature relative to said corner piece nose such that said arms extend respectively into said straight portions of the recess, the strip arms having thicknesses, and the straight portions of the recesses having depths exceeding said thicknesses of the arms of the strip,
(d) the recess having an inner wall that is concave and the strip rounded nose contacting the wall corner and also contacting the inner wall of the recess, proximate said nose.

4,852,319
COMBINATION VOID DRAIN VENT CHAIN
John D. Cowan, 2436 Brixton Rd., Columbus, Ohio 43221
Filed Sep. 19, 1988, Ser. No. 246,236
Int. Cl.[4] E04B *1/70*
U.S. Cl. 52—302 7 Claims



1. A combination void drain vent chair comprising:
an elongated tube having an upper and a lower end,
a flat member attached to said upper end of said tube, said flat member being spaced from said upper end of said tube and projecting laterally therefrom,
and being sufficiently flexible to conform to the shape of and to be attached to a hollow tubular void form,
a base member attached to said tube adjacent to said lower end of said tube.

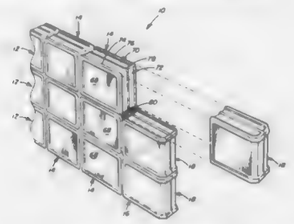
4,852,320
MORTAR COLLECTING DEVICE FOR USE IN MASONRY WALL CONSTRUCTION
Brian R. Ballantyne, 18 Markdale Ave., Toronto, Ontario, Canada M6L 1S9
Filed Apr. 19, 1988, Ser. No. 185,053
Int. Cl.[4] E04B *1/70*
U.S. Cl. 52—303 16 Claims



1. A kit for affixing a mortar collecting device to a masonry wall, comprising:
a mortar collecting device, said device comprising:
(i) a substantially planar end surface adapted for placement against a wall surface of said masonry wall;
(ii) upper surface means having an inclined portion which is horizontally inclined when said mortar collecting device is affixed to said masonry wall, said inclined portion being inclined at angles sufficient to shed moisture in the form of water droplets and prevent any substantial amount of said moisture form accumulating on said upper surface means, said inclined portion being sufficiently horizontal to allow retention of mortar falling thereon; and
(iii) first passageway means extending through said device substantially perpendicular to the plane of said end surface; and
connection means for affixing said mortar collecting device to said wall comprising:
(i) a head portion of a size sufficient to prevent passage through said first passageway means; and
(ii) a stem portion affixed at one end to said head portion, said stem portion at an end opposite said head portion adapted to be inserted through said first passageway means in said mortar collecting device and into uncured mortar in said masonry wall thereby cementing said connecting means intermediate masonry on said masonry wall and affixing said mortar connecting device to said masonry wall.
3. The mortar collecting device as claimed in claim 1, wherein said device is substantially comprised of a polypropylene plastic.

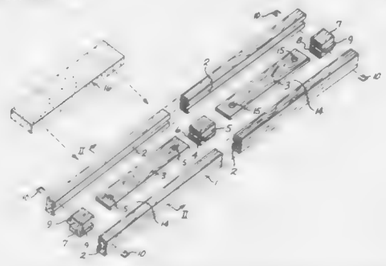
4,852,321
TRANSLUCENT END BLOCK
Harry A. Fleming, Jr., Smethport; Edward F. Fosnaught, and Robert L. Wehman, both of Port Allegany, all of Pa., assignors to Pittsburgh Corning Corporation, Pittsburgh, Pa.
Filed Dec. 7, 1987, Ser. No. 129,154
Int. Cl.[4] F04C *1/42*
U.S. Cl. 52—306 5 Claims

1. A translucent glass end block comprising,
a pair of substantially parallel planar upper and lower mortar receiving surfaces spaced from each other, each of said surfaces having an outwardly extending mortar retaining bead portion,
a pair of side walls which are perpendicular and joined to said upper and lower mortar receiving surfaces, said side walls having decorative exposed surfaces,



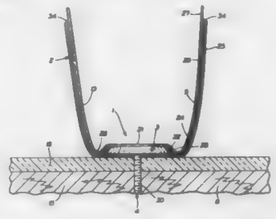
each of said side walls having first wall portions positioned in parallel, spaced relation with each other and nonparallel second wall portions, each of said nonparallel second wall portions extending from and integral with one of said first wall portions, said nonparallel second wall portions converging toward each other,
a rear mortar receiving end wall positioned between and joined to said pair of side wall first wall portions and to said upper and lower surfaces, said rear end wall having an outwardly extending mortar retaining bead portion,
said block formed from two identical halves, each half including one of said side walls and a half of said upper and lower mortar receiving surfaces and a half of said rear mortar receiving end wall, and
means joining said identical two halves including a seam which forms the juncture of the said two identical halves, said seam running centrally along the upper and lower mortar receiving surfaces as well as centrally along the rear mortar receiving end wall, with a seam running centrally along a front end wall with said front end wall extending between the said nonparallel second wall portions.

4,852,322
WOODEN I-BEAM WITH INTEGRATED INSULATING FOAM
Dicky W. McDermid, Nanoose Bay, Canada, assignor to West-Isle Industries Inc., Canada
Filed Sep. 2, 1988, Ser. No. 240,037
Claims priority, application Canada, Sep. 4, 1987, 546236
Int. Cl.[4] E04C *3/29*
U.S. Cl. 52—404 4 Claims



1. A composite structural beam or stud for use in construction comprising:
(a) two parallel wooden rails each having a groove midway on the inside face of the rail and extending longitudinally for the length of the rail such that the groove on each rail is opposite the groove on the other rail;
(b) two rectangular pieces of wooden web, one piece located in the upper end of the beam and the other in the lower end, each slotting into the grooves on the inside facing sides of the parallel rails;
(c) two wooden blocks, arranged with one at each end of the beam, each having transverse tongues, located one on each side, opposite to the grooves in the wooden rails, and each having a transverse groove located midway on the inward facing end of each block opposite the grooves in the chords and the pieces of wooden web;
(d) one wooden block positioned in the middle of the beam and having transverse tongues, located midway one on each side, opposite to the grooves in the wooden rails, and having transverse grooves located midway on the ends facing longitudinally along the beam and opposite to the pieces of wooden web; and
(e) blocks of insulating foam secured in and filling the cavities formed upon the assembly of the side rails, webs and blocks.

4,852,323
NONPENETRATING ROOF MEMBRANE FASTENING SYSTEM
Henry A. Kartfilt, Noblesville, Ind., assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed May 31, 1988, Ser. No. 200,280
Int. Cl.[4] E04B *7/00, 5/00*
U.S. Cl. 52—410 12 Claims



1. In a roofing structure of the type having a deck for supporting the roofing structure, said structure including:
(a) a plurality of flexible bonding pads arranged in a spaced relationship on the deck, said pads having upper and lower surfaces and formed of reinforced EPDM;
(b) a fastener plate mounted on the upper surface of each of the bonding pads having a raised substantially annular portion, and having a smaller area than that of the bonding pads to provide peripheral exposed areas on each of the bonding pads surrounding said fastener plates, said fastener plates having greater rigidity than the flexible bonding pads;
(c) fastener means extending through each of the bonding pads and fastener pates for securing said pads and plates to the deck;
(d) a flexible waterproof membrane formed of nonreinforced EPDM supported by the deck and covering the secured bonding pads and fastener plates;
(e) an adhesive bonding an underside surface of the membrane to the exposed peripheral areas of the bonding pads to secure said membrane to the pads with said membrane being relatively slack along the raised annular portion of the fastener plates; and
(f) said bonding pads having sufficient flexibility so that the bonded peripheral areas thereof flex with the upward movement of the bonded membrane upon said membrane experiencing uplift wind forces, and having an elongation factor at most one tenth that of the nonreinforced membrane so that the adhesive is subject to a shear separation force and is relatively free of peel forces.

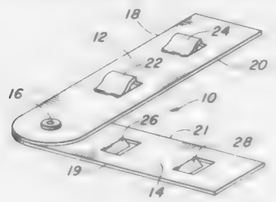
4,852,324
VARIABLE ANGLE REFRACTORY ANCHOR FOR CONNECTING SURFACES
Gary L. Page, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.
Filed Dec. 1, 1988, Ser. No. 278,697
Int. Cl.[4] E04B *1/80, 1/24*
U.S. Cl. 52—506 9 Claims

1. A variable angle refractory anchor comprising:
(a) a first flag elongated member having straight sides and an

arcuate end:

(b) a second flat elongated member having straight sides and an arcuate end;

(c) connecting means pivotally joining the arcuate ends of said first and second members, said connecting means being located a distance inward from said arcuate ends equal to the radius of curvature of said arcuate ends; and



(d) each of said elongated members including at least one tab formed therein; and each of said tabs extending away from on another.

4,852,325

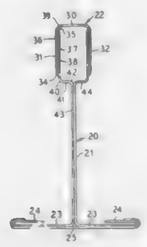
REINFORCED BEAD

James J. Dunn, St. Charles; Martin D. Jahn, Chicago, and Ronald W. Vukmanic, Naperville, all of Ill., assignors to Chicago Metallic Corporation, Chicago, Ill.

Continuation of Ser. No. 112,549, Oct. 26, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 296,853

Int. Cl.[4] E04B *5/52*

U.S. Cl. 52—729 **27 Claims**



1. A grid tee for a suspended ceiling having a central web, a reinforced bead on one edge of the web and a pair of oppositely extending panel support flanges on an edge of the web opposite said bead, said tee comprising an elongated strip of metal bent substantially along a center line to form the bead with a double layer central web extending from the bead and being bent to form the flanges, said bead having at least one side with the strip being bent to have at least two reversed bends interconnecting three layers of the strips to form a thickness of at least three layers for the one side, and said bead having an upper side having a continuous outer layer to form a continuous outer surface for the upper side.

4,852,326

DUMMY AEROPLANE

Christer Lindberg, Gamleby, Sweden, assignor to Diab-Barracuda AB, Laholm, Sweden

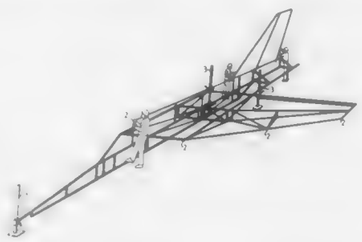
Filed Apr. 26, 1988, Ser. No. 186,461

Claims priority, application Sweden, Apr. 29, 1987, 8701779

Int. Cl.[4] E04H *3/00*

U.S. Cl. 52—745 **6 Claims**

1. A method for assembling a dummy aeroplane in which a latticework aeroplane carcass is constructed of components from an assembly kit and covered with a weatherproof drape, said carcass consisting of at least one part comprising a plurality of latticework modules connectable to each other, the modules of each of said parts being assembled at the same level, the dummy aeroplane further including an undercarriage having wheels, said parts being assembled one above the other anf fixed to each other when more than one level of said parts is required to form said carcass, the assembled parts being placed above the undercarriage and fixed thereto, said method comprising the steps of (1) assembling a portion comprising at least one said part of the carcass at a first level, (2) subsequently raising the thus assembled portion to a second level with the aid of lifting devices permanently attached to this portion and holding the assembled portion at this second level, (3) assembling another portion comprising at least one said part of the carcass at said first level if said carcass requires more than one level of said parts, (4) subsequently raising the thus assembled portions to said second level with the aid of said lifting devices attached to said first portion if said carcass requires more than one level of said parts, (5) repeating steps (3) and (4) until said carcass is assembled, (6) fitting the undercarriage to a lowermost part of the carcass and then (7) withdrawing the lifting devices so that the dummy rests on its wheels, whereby all assembly work is carried out at a suitable working height for the assembly personnel concerned.



4,852,327

MACHINE FOR ASSEMBLING A CONTAINER

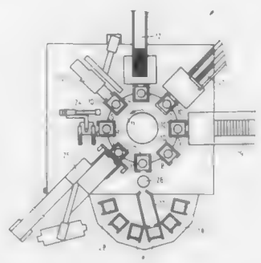
Frank Kurkowski, Messenkamp, and Manfred Lucht, Rodenberg, both of Fed. Rep. of Germany, assignors to Philips and DuPont Optical Company, New York, N.Y.

Filed Dec. 16, 1987, Ser. No. 133,678

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1986, 3643693

Int. Cl.[4] B65B *25/24, 5/04*

U.S. Cl. 53—201 **4 Claims**



1. The combination of an adaptor and a machine having a plurality of stations and useful for assembling containers for optically readable disc-shaped information carriers, each container comprising a bottom section, a cover section which is pivotably attachable to said bottom section, a tray latched within its associated bottom section for detachably retaining thereon a disc-shaped information carrier when placed on said tray, said machine having holders for retaining bottom sections during assembly of containers, said holders being moveable from station to station by said machine during the assembly of containers, said adaptor comprising an auxiliary bottom section having substantially the same dimensions as a container bottom section, said auxiliary bottom section being carried by one of said holders, said machine including a tray placing means for placing a predetermined tray in said auxiliary bottom section, a disc-shaped information carrier placing means for placing a predetermined carrier on said predetermined tray and removing means for removing said predetermined tray and said predetermined carrier as a unit from said auxiliary bottom section.

4,852,328

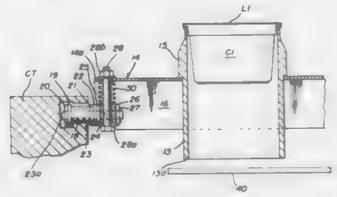
CONTAINER SEALING APPARATUS

Will L. Culpepper, Covington, and James J. Feliks, Doraville, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Oct. 25, 1988, Ser. No. 262,425

Int. Cl.[4] B65B *7/28;* **B67B** *3/06*

U.S. Cl. 53—300 **2 Claims**



1. Apparatus for applying a container lid to a filled container, said apparatus comprising an intermittently movable container support means, intermittently movable lid support means arranged for synchronous movement with movement of said intermittently movable container support means for positioning a container lid atop an open and filled container positioned on said intermittently movable container support means during dwell periods of said container support means and of said lid support means, a reciprocable sealing head disposed above said container and said lid and arranged to engage and seal said lid to the top edge of said container, and vertically yieldable intermittently movable conveyor means comprising a conveyor chain including a working reach disposed below said intermittently movable container support means at least during a dwell period thereof on which compression spring means is mounted and engageable with said intermittently movable container support means and said compression spring means comprising a support bar fixedly mounted on said conveyor chain, and a pair of guide posts slidably disposed in apertures formed in said support bar and in said intermittently movable container support means, and a pair of compression springs disposed about said guide posts respectively and between said support bar and said movable container support means for supporting and moving said intermittently movable container support means.

4,852,329

METHOD AND APPARATUS FOR HOLDING A PLURALITY OF OBJECTS IN A TAPE-WRAPPED BUNDLE

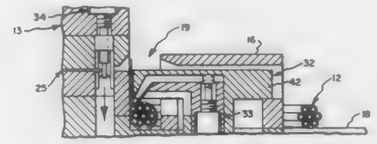
Louis Terragnoli, Williamsville, N.Y., assignor to A. J. Panneri Enterprises, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 944,430, Dec. 18, 1986, abandoned. This application Dec. 31, 1987, Ser. No. 139,948

Int. Cl.[4] B65B *13/04, 27/06*

U.S. Cl. 53—399 **31 Claims**

1. A method of wrapping a plurality of objects with tape having an adhesive on one surface thereof, comprising the steps of: positioning a length of said tape across a recess, with the adhesive thereon facing away from said recess; inserting a plurality of objects-to-be-wrapped into said recess such that said tape length will be gathered into said recess with an intermediate part of said tape engaging at least some of said objects and with the leading and trailing parts of said tape length arranged to substantially face one another within said recess; pressing first portions of said facing portions of said leading and trailing tape parts together to cause them to adhere to each other in face-to-face relationship within said recess; and wiping second portions of said facing portions of said leading and trailing tape parts in a direction toward said objects, to progressively increase the length of such pressed-together adhered portions toward said objects; thereby to hold said objects together in a tape-wrapped bundle.



4,852,330

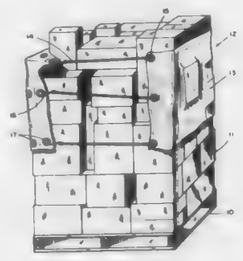
METHOD FOR STABILIZING STACKED LOAD

Martin C. Carangelo, 52 Orchard La., Wolcott, Conn. 06716

Continuation-in-part of Ser. No. 861,363, May 9, 1986. This application Jul. 24, 1987, Ser. No. 77,044

Int. Cl.[4] B65D *13/02*

U.S. Cl. 53—399 **1 Claim**



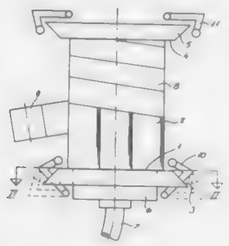
1. A method for securing a stacked load comprising stacking a plurality of layers of items, providing a reusable wrapping means consisting essentially of a flexible, rectangular wrapping member, said wrapping member having fastening members attached to a short side of said member and securing means attached opposite said side thereof; 5 to 50 percent of the total length of the wrapping means being elastomeric, said wrapping means being collapsible upon itself and being devoid of any fastening means capable of reaching over the top of a stacked load, placing said wrapping means around one or more of the uppermost layers of the stacked load leaving said wrapping means separate from any base and leaving at least the lowest layer uncovered, and, connecting said fastening members to said securing means under tension.

4,852,331

METHOD AND APPARATUS FOR PACKAGING A NUMBER OF PACKAGES OF GENERALLY ELASTIC INSULATION MATERIAL

Bo B. Bogh, Roskilde, Denmark, assignor to Rockwool International A/S, Denmark

Filed Dec. 14, 1987, Ser. No. 132,474
Claims priority, application Denmark, Dec. 22, 1986, 6216/86
Int. Cl.[4] B65B *1/26, 13/04, 27/12, 63/02*
U.S. Cl. 53—399 8 Claims



1. A method for wrapping generally cylindrical packages comprising the steps of:

providing nine packages, each of said packages including a cylindrical body of insulating material, each of said bodies having sides, each of said sides being wrapped with a substantially airtight foil, each of said bodies having two ends, each of said ends being open;

arranging said packages in a group, said group including three rows, each of said rows including three of said packages; arranging each of said bodies on one of its ends; placing said packages in close relationship to each other; placing two of said packages adjacent to each other so that said two packages contact each other along a line; and arranging said nine packages so that diamond-shaped cavities are formed between said nine packages, said cavities being separated from ambient air;

closing said nine packages from above; and closing said nine packages by a perforated plate, said plate being connected to a vacuum source;

holding said nine packages together in a rectangular pattern;

evacuating said nine packages and said cavities, said evacuating including applying a vacuum from said source to said nine packages and said cavities so that said two packages remain in contact with each other after said evacuating and so that said cavities remain separated from ambient air;

substantially reducing the volume of said nine packages and deforming said nine packages to substantially fill up said cavities;

discontinuing said holding;

tightly wrapping said nine packages with foil after said discontinuing of said holding; and

subsequently, discontinuing said vacuum applying.

4,852,332

PROCESS FOR TREATING FILAMENTARY OR THREAD TEXTILE MATERIAL

Hubert Becker; Josef Becker, and Matthias Becker, all of Niederforstbacher Str. 80-84, 5100 Aachen, Fed. Rep. of Germany

Filed May 3, 1988, Ser. No. 189,634
Claims priority, application Fed. Rep. of Germany, May 23, 1987, 3717495
Int. Cl.[4] B65B *35/50, 53/02, 63/02, 63/04*
U.S. Cl. 53—436 6 Claims

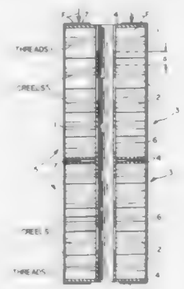
1. A method of treating filamentary textile material which is wound on lap creels capable of being assembled to form stacks, comprising the following steps:

(a) enveloping a stack with a repeatedly shrinkable film material,

(b) first shrinking of said film material onto said stack to form a film envelope on each stack,

(c) assembling prior to treatment, several stacks to form a column in which each stack is individually enclosed by its film envelope,

(d) applying longitudinally, axially effective pressure to said



column to form a compressed column, whereby tension of said film envelopes is slackened again and the film forms wrinkles,

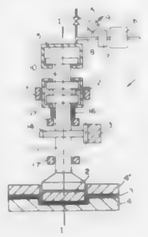
(e) and exposing the compressed column to a heated textile treatment medium acting upon the textile material, said heated treatment medium simultaneously causing a second shrinking of said film envelopes until the film material again tautly surrounds each stack in the axially compressed column.

4,852,333

METHOD FOR MAKING A GROUND COFFEE DISCOID PAD

Ernesto Illy, Trieste, Italy, assignor to Illycaffe' S.p.A., Trieste, Italy

Filed Nov. 23, 1987, Ser. No. 123,913
Claims priority, application Italy, Nov. 25, 1986, 22456A/86
The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.
Int. Cl.[4] B65B *29/02, 1/24, 47/02*
U.S. Cl. 53—436 2 Claims



1. Method for making a ground coffee discoid pad for brewing an express coffee, comprising the steps of:

placing a lower web of water-and-air permeable material in a molding plate concavity to form a pocket in said web,

positioning a measured heap of ground coffee in said pocket,

squashing said heap to transform it into a coffee pad,

applying a pressure to transform said coffee pad into a coherent, well compacted element,

covering said element with an upper web of water-and-air permeable material, and

attaching said lower and upper webs to one another along the perimeter of said coffee element,

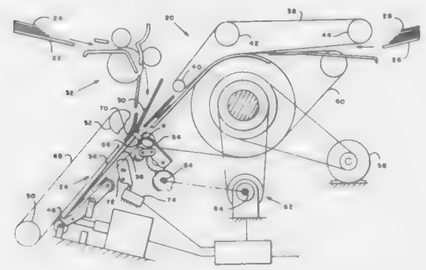
wherein in said step of transforming said coffee pad into a coherent, well compacted element, the applied pressure is driven up to a maximum pressure in the range of from 22 to 65 atmospheres such that oily substances on and in the coffee granules uniformly fill up all the interstices between said granules in the entire coherent coffee element, thereby providing a space closed by a continuous oily surface substantially coincident with the peripheral surface of the coherent coffee element, with the oily particles on said continuous surface acting to oxidize on contact with the air passed through the permeable material covering said element, but working as a barrier against the oxidation proceeding towards the interior of the coherent element.

4,852,334

ENVELOPE OPENING APPARATUS

David R. Auerbach, West Redding, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 12, 1988, Ser. No. 242,566
Int. Cl.[4] B65B *43/28, 43/34*
U.S. Cl. 53—569 5 Claims



1. Apparatus for separating the front and back walls of an envelope in a transport path, comprising:

a support frame;

means mounted on said supporting frame along said transport path for holding an envelope having a back wall, a front wall, and a flap extending from said back wall, said flap not being contiguous with said back wall; and

an orbital claw assembly mounted in said supporting frame, said assembly including a claw movable in a D-shaped orbit wherein the vertical portion of the D-shaped orbit is substantially perpendicular to said transport path and wherein the orbit positions the tip of the claw at an appropriate time between the front and back walls of said envelope and thereafter further movement of said claw in said orbit causes saw claw to separate the front wall from the back wall of the envelope; and

means mounted on said frame for generating said D-shaped orbit of said orbital claw assembly.

4,852,335

APPARATUS FOR PRODUCING (CIGARETTE) PACKS FROM AT LEAST ONE FOLDABLE BLANK

Heinz Focke, Verden, and Wolfgang Oertel, Kirchlinteln, both of Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

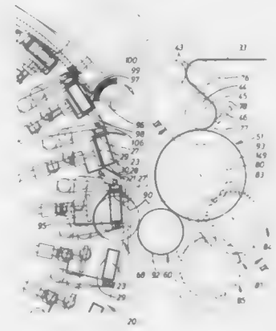
Continuation of Ser. No. 945,938, Dec. 23, 1986, abandoned.
This application Dec. 22, 1988, Ser. No. 290,826
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1985, 3545884
Int. Cl.[4] B65B *19/24*
U.S. Cl. 53—575 29 Claims

1. Apparatus for producing soft-cup packs for cigarettes from at least one foldable blank, comprising in a blank transfer station (35, 36):

a continuously rotating folding turret (20, 24) having fixed around its periphery a plurality of hollow receptacles in the form of hollow mandrels (23) each of which is elongated in a direction parallel to the turret's axis of rotation, and each of which has a first end, fixed to said turret (20, 24), and an opposite free end projecting axially away from said turret (20, 24); and

a blank feed unit (31, 32) for feeding individual rectangular blanks (21, 22) to successive ones of said hollow mandrels (23) of said continuously rotating turret (20, 24);

said blank feed unit (31, 32) comprising a stationary blank holder in the form of a holding disc (68) for holding a blank for transfer to the free end of a passing mandrel (23) of said continuously rotating turret (20, 24);



said holding disc (68) being disposed out of the path of movement of said mandrels (23), and axially adjacent to the free ends of said mandrels (23);

said holding disc (68) having means for gripping only a lateral edge strip of a blank so that the majority of the blank extends axially in a direction toward said rotating turret (20, 24) and into said path of movement so that the blank (21, 22) is engaged by, and transferred to, a passing mandrel (23);

said holding disc (68) having a peripheral surface on which said blank is held by said gripping means, and which has a circumference greater than the blank's length in the circumferential direction of the disc, so that the blank is held, on only a portion of said peripheral surface of the holding disc, in the form of a stable curved partial cylinder having in said majority portion thereof a gap located to receive an on-coming mandrel (23).

4,852,336

HALTER WITH POP-RELEASE FASTENER MEANS

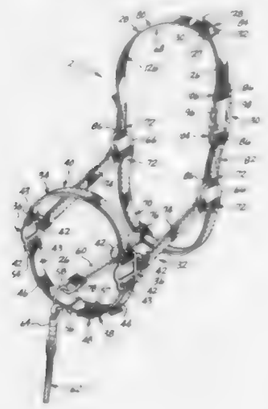
Floyd M. Gammill, 3489 Locker Rd. SE., Port Orchard, Wash. 98366

Filed Dec. 7, 1987, Ser. No. 129,787
Int. Cl.[4] B68B *1/02*
U.S. Cl. 54—24 21 Claims

1. In a halter for an animal whose body has a relatively angular head thereon, and ears adjacent the apex of the same, the head comprising a snout which projects relatively forwardly of the ears, a poll which is disposed relatively behind the ears, and a jaw which interconnects the snout and poll at the bight of the animal's head, the halter comprising flexible strap material which is formed into a pair of first and second loops that are adapted to be encircled about the animal's snout and poll, respectively, the second loop being alternately openable and closeable and operatively interconnected with the first loop, crosswise of the jaw, so that when the second loop is opened, the halter can be removed from the animal's head in

the direction relatively forwardly of its snout, and the second loop being in two parts and closeable by fastener means which are positioned between the parts and manually releaseable to reopen the loop when the user desires to remove the halter from the animal's head, the improvement wherein:

the fastener means include a pair of male/female fastener elements which are reciprocal in relation to one another, circumferentially of the second loop, to and from a first point therein, and cooperatively engageable an disengageable with and from one another, to close and open the second loop, respectively, when the elements are reciprocated in relation to one another over that portion of the



second loop extending between the aforesaid first point therein, and a second point therein, spaced apart from the first point, circumferentially of the second loop, and

there are manually releaseable latch means in the second loop which are operable to interlock the fastener elements against reciprocation in relation to one another when the elements engage with one another at the second point in the second loop, and

drive means including yieldable biasing means which are responsive to release of the latch means at the second point in the second loop to reciprocate the fastener elements in relation to one another from the second point to the first point in the second loop, to open the second loop.

4,852,337

METHOD AND APPARATUS FOR REMOVING AQUATIC PLANTS

Thomas K. M. Peterson, 23 Stoney Point Rd., Courtland, Minn. 56021

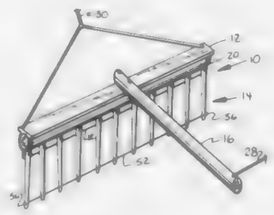
Filed Aug. 31, 1987, Ser. No. 90,855
Int. Cl.[4] A01D *7/10*
U.S. Cl. 56—8 **5 Claims**

1. A method of removing aquatic plants from an underwater bottom, comprising the steps of:

(a) lowering a rake to the underwater bottom, with a plurality of teeth on the rake each having an individually suspended flexible and resilient tine pointed downward toward and into the bottom;

(b) pulling the rake over the bottom and into and through aquatic plants growing from the bottom with the tines engaging the bottom and removing the plants therefrom;

(c) distributing bending stress in any one said tooth to other of said teeth upon engagement of the rake with an underwater object sufficiently resistant to bend any one of said teeth, said stress distributing being done with a relatively flexible and resilient filament extending transversely between and loosely through each tip of all said tines, said filament having its ends positively fastened to the rake on the outside of each end said tooth; and



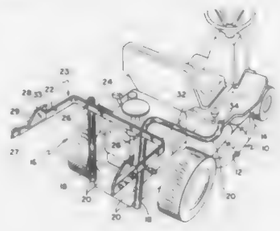
(d) resiliently pulling both of said end teeth toward each other during said stress distribution with the filament and thereby providing a tensile tauntness in the filament to resist the object.

4,852,338

DEBRIS COLLECTOR FRAME AND ASSEMBLY

John W. Hopkins, and Peter P. Knoell, both of Charlotte, N.C., assignors to Textron Inc., Providence, R.I.

Filed Jan. 11, 1988, Ser. No. 142,804
Int. Cl.[4] A01D *34/70*
U.S. Cl. 56—202 **14 Claims**



1. A frame for adapting a mower for utilizing a conventional debris receptacle, said mower having a chute interconnecting a debris discharge opening in the housing of the mower to a cover for the debris receptacle, said debris receptacle having oppositely disposed handle means for lifting and transporting the debris receptacle, the frame comprising :

an elongated support member,the lower end of which has means for securing the support member to a mower so that the support member is vertically oriented;

a U-shaped cross member having a pair of spaced apart arms joined to a crossbar joined to the upper end of the support member so that the arms extend transversely relative to the support member to at least partially encircle a debris receptacle; and

a bracket mounted on the end of each arm, said bracket including raised projecting means extending above the arms for engaging the handle means of the debris receptacle for suspending and transporting the debris receptacle.

4,852,339

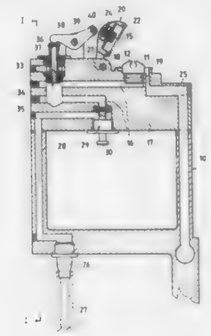
SPLICING DEVICE OPERATING WITH COMPRESSED AIR ADMIXED WITH A LIQUID, FOR SPLICING THREADS FOR TEXTILE YARNS

Mauro Premi, Salò , Italy, assignor to Mesdan S.p.A., Salo, Italy

Filed Dec. 2, 1988, Ser. No. 279,018
Claims priority, application Italy, Dec. 14, 1987, 22991 A/87
Int. Cl.[4] D01H *15/00*
U.S. Cl. 57—22 **8 Claims**

1. Splicing device for splicing threads or textile yarns with the aid of a gas or compressed air to which a liquid is added,

comprising a body on which a splicing head containing the mixing chamber is mounted, at least a feed duct, by means of which the liquid-admixed compressed air is fed, leading to said chamber, a controllable valve for the delivery of compressed air, and means for adding the liquid to compressed air before said compressed air is delivered into said chamber, characterized in that the splicing head with its mixing chamber are positioned inside an isolated tank, that controllable closure means are provided for tightly sealing said tank immediately before and during the splicing operation, and that from said tank a discharge duct starts, through which the liquid-admixed compressed air charged to said chamber during the splicing operation is discharged to the outside.

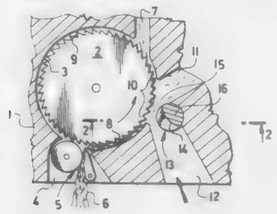


4,852,340

FIBER SEPARATING DEVICE

Zdenek Kotrba, Tvardkova; Frantisek Jaros; Frantisek Burysek, both of Dukla; Miloslav Kubovy, Hlavni; Jiri Hejduk, Nadrazni, and Pavel Bures, Dukla, all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, usti nad Orlici, Czechoslovakia

Filed Feb. 16, 1988, Ser. No. 156,782
Claims priority, application Czechoslovakia, Feb. 13, 1987, 957-87
Int. Cl.[4] D01H *7/888, 7/892*
U.S. Cl. 57—301 **10 Claims**



1. A fiber separating device comprising

a housing, said housing having a cavity and a recess;

a fiber opening cylinder accommodated in said cavity;

a fiber feeding device arranged in said recess and communicating with said cavity;

a cleaning aperture provided in a wall of said cavity and communicating with an impurity withdrawing duct, and

an air supply duct having an inlet and an outlet, said outlet leading to said impurity withdrawing duct;

said air supply duct being provided with air flow regulating means, said air flow regulating means having a regulating wall which is arranged proximate to the outlet of the air supply duct for regulating the direction of air flow into the cleaning aperture toward the fiber opening cylinder and for regulating the amount of air passing through said air supply duct.

4,852,341

BELT TYPE FALSE TWISTER

Hisaaki Kato, Shiga, and Hideshi Mori, Joyo, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Apr. 13, 1988, Ser. No. 180,992
Claims priority, application Japan, Apr. 16, 1987, 62-93829
Int. Cl.[4] D01H *5/28;* **D02G** *1/04*
U.S. Cl. 57—328 **20 Claims**



1. A belt type false twister for false-twisting fibers by nipping the fibers at a nipping area between two crossed endless belts travelling in directions different from each other, characterized in that a pair of pulleys with said endless belts entrained thereabout are mounted fixedly and that in a position offset from said nipping area of one endless belt there is provided a pressing roller device which urges said one endless belt toward the other endless belt to provide an inclining nipping pressure across the nipping area during a false-twisting operation.

9. A belt-type false-twister device for false-twisting fibers, comprising:

a first belt defining a first belt path;

a second belt defining a second belt path arranged to cross the first belt path and to provide a nipping area for nipping fibers, said nipping area being defined by a portion of each belt path which is crossed by the other belt path, said nipping area having a first edge and a second edge opposite to the first edge;

nipping pressure providing means for providing a nipping pressure variance across said nipping area during a false twisting operation with a relatively low nipping pressure occurring at said first edge of the nipping area and a greater nipping pressure occurring at said second edge of the nipping area.

4,852,342

CABLE HANDLING CHAIN

Anthony J. Hart, Arnold, United Kingdom, assignor to Mansign Engineering Limited, United Kingdom

Filed Oct. 6, 1987, Ser. No. 104,958
Claims priority, application United Kingdom, Jul. 1, 1987, 8715478
Int. Cl.[4] F16G *13/16*
U.S. Cl. 59—78.1 **13 Claims**

1. A cable/hose handling chain comprising:

a plurality of hingedly connected chain links;

each chain link including a transmission link assembly hingedly connected to adjacent transmission link assemblies to form said chain;

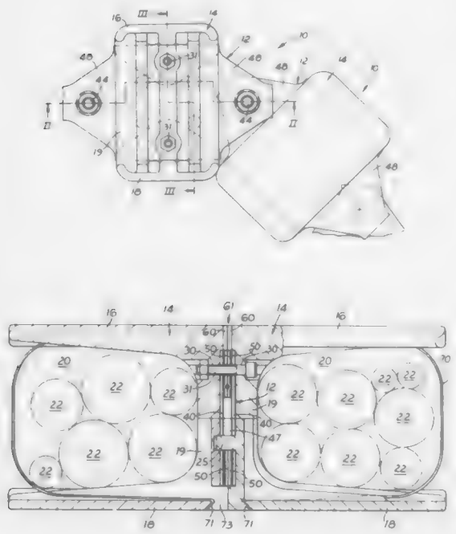
each chain link including cable/hose attachment means for attaching cables/hose thereto;

the transmission link assembly for each alternate chain link comprising a pair of side by side plate members and, for each chain link located between the alternative chain links, comprising at least one plate member;

the plate members for said alternate chain links being arranged so as to be spaced apart to define a gap to accommodate the plate member(s) of the chain links located between said alternate chain links;

the transmission link assembly for each chain link located

between said alternate chain links including a pair of plate members in face to face contact;
the plate members for all the chain links being identical and formed from a metal strip; and



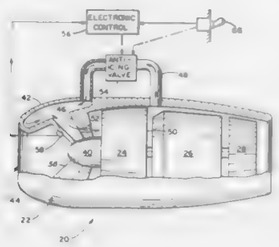
for said alternate chain links, the plate members being spaced apart by at least one spacing member.

4,852,343

METHOD OF OPERATING ANTI-ICING VALVE

Richard M. Norris, Stratford; Kimball J. Rumford, Fairfield, and Douglass S. Youd, Shelton; all of Conn., assignors to Avco Corporation, Providence, R.I.

Division of Ser. No. 69,419, Jul. 2, 1987, Pat. No. 4,831,819.
This application Nov. 2, 1988, Ser. No. 265,911
Int. Cl.[4] F02C *7/047*
U.S. Cl. 60—79.02 **3 Claims**



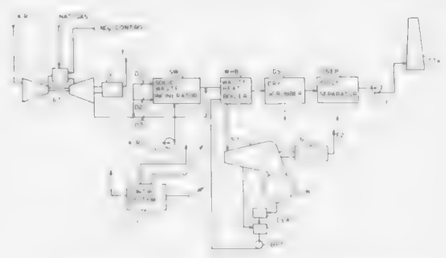
1. In a gas turbine engine having inlet surfaces subject to the formation of ice thereon and including a source of heated air, air duct means adjacent to said surfaces for receiving the heated air to prevent the formation of ice thereon, and passage means enabling the flow of heated air from said source to said air duct means, a method of operation comprising the steps of:
providing valve means operable to pulsate between open and closed positions for controlling the flow of heated air through said passage means on a pulse width basis; and
pulsing the valve means over a range of pulse widths according to a predetermined pattern which assures a flow rate of heated air into said air duct means sufficient to prevent the formation of ice on said inlet surfaces.

4,852,344

WASTE DISPOSAL METHOD AND APPARATUS

Donald F. Warner, Speculator, N.Y., assignor to Energy Economics & Development, Inc., Speculator, N.Y.

Filed Jun. 6, 1988, Ser. No. 202,560
Int. Cl.[4] F02C *6/00;* **F02G** *3/00*
U.S. Cl. 60—39.182 **12 Claims**



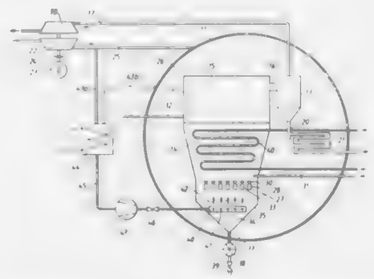
1. A waste-burning plant, comprising, in combination:
a gas turbine generation means which includes a gas turbine and a first electric generator mechanically connected to be driven by said gas turbine;
a waste-burning incinerator; a boiler, said incinerator being connected to receive at least a portion of the exhaust from said gas turbine as combustion air, to receive a waste, to burn said waste and to supply heat to said boiler to generate steam;
a steam turbine and a second electric generator, said steam turbine being connected to receive steam from said boiler and connected to drive said second electric generator.

4,852,345

METHOD OF COOLING BED MATERIAL FROM A FLUIDIZED BED AND A POWER PLANT WITH COOLING MEANS FOR BED MATERIAL

Ingemar Greis, Västerås, Sweden, assignor to ABB Stal AB, Sweden

Filed Feb. 18, 1988, Ser. No. 157,012
Claims priority, application Sweden, Mar. 3, 1987, 8700877
Int. Cl.[4] F02C *3/26*
U.S. Cl. 60—39.464 **5 Claims**



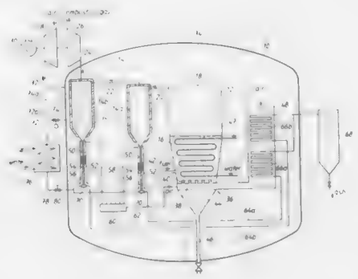
1. A power plant for combustion of a fuel in a fluidized bed at an elevated pressure substantially higher than atmospheric pressure, comprising
a bed vessel;
a bottom in a lower part of said bed vessel including nozzles for supplying air for the fluidization of a bed material and combustion of a fuel;
an ash chamber located below said bottom and means for feeding out bed material from said ash chamber;
a turbine driven by combustion gases generated in said bed vessel;
a compressor for compressing the combustion air supplied to said bed vessel;
a cooling air distributor provided in said ash chamber for introducing air compressed by said compressor into ashes in said ash chamber for cooling said ashes; and
an air cooler located upstream of said air cooling distributor for cooling said compressed air from said compressor before supplying said air to said ash chamber.

4,852,346

POWER PLANT WITH CYCLONE CLEANERS HAVING COOLED CYCLONE LEGS

Evert Granqvist, and Alf Wike, both of Västerås, Sweden, assignors to ABB Stal AB, Västerås, Sweden

Filed Apr. 8, 1988, Ser. No. 179,360
Claims priority, application Sweden, Apr. 9, 1987, 8701486
Int. Cl.[4] F02C *3/26*
U.S. Cl. 60—39.464 **16 Claims**



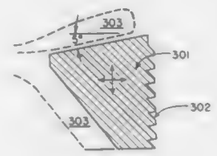
1. A power plant in which fuel is burnt in a fluidized bed of particulate material at a pressure exceeding atmospheric pressure comprising a pressure vessel, a bed vessel inside the pressure vessel, means to feed fuel to be burnt to the bed vessel, an air distributor with nozzles locted within the bed vessel, means to feed pressurized air to the air distributor to create a fluidized bed in which the fuel is burnt, at least one cyclone within the pressure vessel, means for leading combustion gases from the bed vessel to the at least one cyclone, a pressure reducing ash discharge system for the removal of separated ash from the at least one cyclone, a turbine which is driven by combustion gases cleaned in the at least one cyclone outside said bed vessel but inside said pressure vessel, and a compressor for the compression of combustion air supplied to the pressure vessel in which said cyclone at its lower end is connected to an elongated downwardly extending tubular leg communicating with said ash discharge system, a cooling jacket surrounding said cyclone leg to form a channel for a cooling medium around the leg and within the jacket, an inlet at one end of said channel communicating with the space in said pressure vessel containing pressurized combustion air and an outlet for said cooling medium at the other end of said channel.

4,852,347

ADVANCED COMPOSITE POLAR BOSS

Hugh M. Reynolds, San Jose, Calif., and Curt M. Kawabata, North Ogden, Utah, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 16, 1987, Ser. No. 109,810
Int. Cl.[4] F02K *9/32, 9/97*
U.S. Cl. 60—253 **1 Claim**



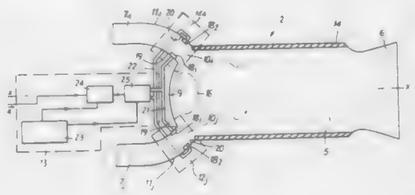
1. A composite polar boss for attaching a nozzle assembly to a solid fueled rocket motor case, said solid fueled rocket motor case having an exhaust opening which has an indentation which circumscribes its inner circumference, said composite polar boss comprising:
an annular billet which forms a ring with an outer circumference which is shaped to fit within the indentation of the solid fueled rocket motor case, said annular billet thereby being fixed to said solid fueled rocket motor case, said annular billet having a threaded inner circumference which screws onto a complementary set of threads on said nozzle assembly to attach it to said fueled rocket motor case, said annular billet being constructed of materials which enable it to withstand service temperatures of up to about 1,200 degrees F., wherein said annular billet is composed of carbon-carbon fabricated material which is machined into said ring with said set of threads machined onto its inner circumference, and wherein said carbon-carbon fabricated material includes 2D and 3D fabrics which have been impregnated with a resin and carbonized into said annular billet.

4,852,348

FUEL INJECTION SYSTEM FOR RAMJET ENGINE

Pierre Allard, Antony; Robert Lefebvre, Chatillon; Daniel Vallee, Montrouge, and Pierre Berton, Boulogne, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Continuation of Ser. No. 937,827, Dec. 4, 1986, abandoned. This application Jun. 20, 1988, Ser. No. 210,198
Claims priority, application France, Dec. 13, 1985, 85 18513
Int. Cl.[4] F02K *7/10*
U.S. Cl. 60—270.1 **5 Claims**



1. A ramjet engine comprising a combustion chamber which does not contain any flameholders and which opens outwardly via a nozzle and into which open out, obliquely with respect to the axis of said combustion chamber and on the periphery of the closed end thereof opposite said nozzle, a plurality of air capture ducts of which at least certain are equipped with an

individual fuel injection device, close to the opening of the corresponding air duct in said combustion chamber, said plurality of air capture ducts each being inclined to the centerline or said combustion chamber at an angle sufficiently great to insure that combustion within said chamber is swirling, in such a way that said chamber has a first recirculation zone, opposite said nozzle and defined between said closed end of the combustion chamber and said openings of said air capture ducts, and a plurality of second recirculation zones, each located near the wall of said combustion chamber, downstream of each of said openings, wherein

each individual fuel injection device comprises:

at least one first injector arranged in the inner part of the corresponding air duct, for supplying said first recirculation zone with fuel;

at least one second injector arranged in the outer part of the corresponding air duct, for supplying the corresponding second recirculation zone with fuel;

said engine further comprising:

first supply means for supplying said first injectors in common with fuel;

second supply means for supplying said second injectors in common with fuel; and

distribution means for controlling and dividing the overall flow of fuel to said combustion chamber between said first and second supply means.

4,852,349

ARRANGEMENT FOR THE REMOVAL OF SOOT PARTICLES FROM THE EXHAUST GAS STREAM OF A DIESEL INTERNAL COMBUSTION ENGINE

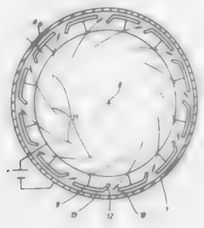
Joerb Abthoff, Pluederhausen; Hans-Dieter Schuster, Schorndorf; Hans-Joachim Langer, Remseck; Erwin Strohmer, Bergies; Rolf Gabler, Waiblingen, and Roland Schulte, Korb, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 176,153

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1987, 3711311

Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—303 **11 Claims**



1. An arrangement for removing soot particles from the exhaust gas stream of a diesel internal combustion engine, comprising soot particle collecting section means arranged in an exhaust gas line, conductor means in said soot particle collecting section means which are disposed at different potential, the soot particles being caught between said conductor means and producing thereat a closed electric circuit by means of which the soot particles are brought to the reaction temperature required for their automatic burning-off, a centrifugal separator means connected to the exhaust gas line, the soot particle collecting section means being constructed as soot particle collecting chamber means, said soot particle collecting chamber means being connected with the centrifugal separator means on the downstream side thereof and being constructed symmetrical with respect to the longitudinal axis of the centrifugal separator means, a number of electrode means arranged at a relatively small distance to the casing interior surface of the soot particle collecting chamber means, and the electrode means and the soot particle collecting chamber means being at different potential.

4,852,350

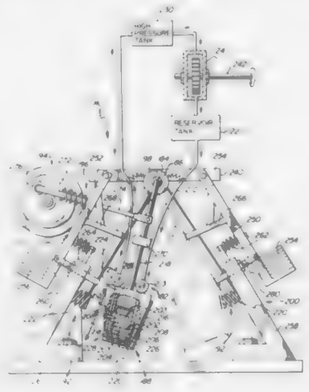
ENERGY GENERATOR

Peter Krisko, 695 Orchard St., Trumbull, Conn. 06601

Filed Jan. 25, 1988, Ser. No. 147,508

Int. Cl.[4] F16D *31/00*

U.S. Cl. 60—325 **22 Claims**



1. A power booster, comprising at least one pendulum means suspended at one end to oscillate about the point of suspension;

power generating means;

mass means connected to one end of the said pendulum means;

spring means disposed in operative cooperation with said mass means to impart energy into said pendulum means and assist the pendulum means in oscillating about the point of suspension; and

energy transfer linkage means between said pendulum means and said power generating means for transferring energy between said pendulum means and said power generating means.

4,852,351

DUAL-CIRCUIT MASTER CYLINDER WITH SOLENOID OPENED RESERVOIR VALVE

Anthony G. Price, Cwmbran, Great Britain, assignor to Lucas Industries public limited company, Birmingham, England

Filed Jan. 12, 1988, Ser. No. 143,043

Claims priority, application United Kingdom, Jan. 13, 1987, 8700551

Int. Cl.[4] B60T *11/20, 11/34*

U.S. Cl. 60—545 **20 Claims**

1. A tandem master cylinder comprising:

a housing;

two pressure chambers in said housing;

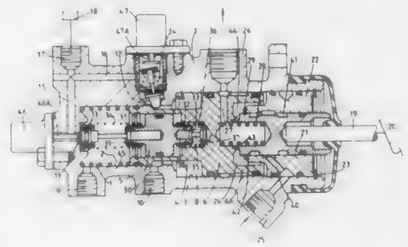
an outlet for each pressure chamber for connection in use to separate braking circuits;

pressure piston means movable in said two pressure chambers;

a force input device for moving said pressure piston means in said chambers for supplying fluid in said two pressure chambers under pressure through said outlets;

a balance piston operatively associated with said pressure piston means and having opposed surfaces engaged respectively by fluid pressures in said two pressure chambers, said balance piston being movable in response to a pressure difference between said two pressure chambers for reducing said pressure difference;

control valve means operatively associated respectively with said two pressure chambers for normally operating in response to said movement of said pressure piston means by said force input device to isolate said two pressure chambers from a low pressure region; and



disabling means operatively associated with said control valve means for disabling said control valve means individually to prevent pressurization of one of said pressure chambers when actuation of only one brake is required.

4,852,352

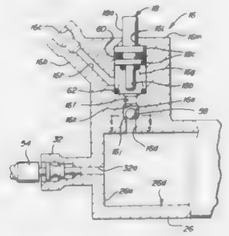
MANUAL OVERRIDE FOR RELIEF OF PULSATOR CIRCUIT WITH RESERVOIR BALL VALVE

Keith V. Leigh-Monstevens, Troy, Mich., assignor to Automotive Products plc, Warwickshire, England

Filed Mar. 5, 1987, Ser. No. 21,979

Int. Cl.[4] B60T *11/26;* **F16K** *15/18*

U.S. Cl. 60—585 **7 Claims**



1. A hydraulic actuator assembly comprising:

(A) a hydraulic system including

(1) a master cylinder including an input member and an output port,

(2) a slave cylinder including an output member and an input port, and

(3) conduit means providing hydraulic communication between said master cylinder output port and said slave cylinder input port whereby stroking movement of said master cylinder input member into said master cylinder delivers pressure fluid from said master cylinder through said master cylinder output port, through said conduit means and through said slave cylinder input port to said slave cylinder to extend said slave cylinder output member;

(B) valve means positioned in said conduit and including a reservoir port adapted to be connected to a hydraulic fluid reservoir, a system port communicating with said conduit, and a valving member, said valve means being operative in response to pressurization of said system to move said valving member to a closed position in which it blocks communication between said system port and said reservoir port and operative in response to depressurization of said system to move said valving member to an open position in which it establishes communication between said system port and said reservoir port to allow flow of replenishing reservoir fluid into said system or flow or fluid into said reservoir from said system; and

(C) manual override means operative when actuated to move said valving member to its open position, and thereby establish communication between said system and said reservoir port, irrespective of the state of pressurization of said system so as to allow retraction of said slave cylinder output member into said cylinder without a corresponding extending movement of said master cylinder input member out of said master cylinder.

4,852,353

METHOD AND AN ARRANGEMENT FOR CONTROLLING THE WORKING CYCLE OF A TURBOCHARGED INTERNAL COMBUSTION ENGINE

Ernst Holmér, Gothenburg, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Jan. 11, 1988, Ser. No. 142,661

Claims priority, application Sweden, Jan. 14, 1987, 8700116

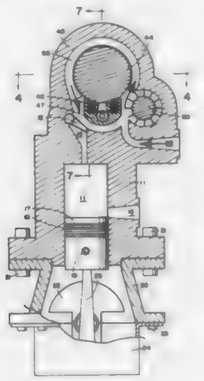
Int. Cl.[4] F02B *37/00*

U.S. Cl. 60—605.1 **11 Claims**



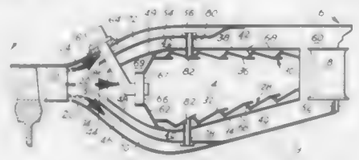
1. A method for controlling the working cycle of an internal combustion engine (**1**) which is supercharged by means of at least one exhaust-driven turbo-compressor (**4, 5**) and each cylinder of which having firstly at least one inlet valve (**2**) to which an induction system is connected, said induction system including the compressor (**6, 8**) of the or each turbo-compressor (**4, 5**) and an induction or inlet line (**12**) for delivering air to the inlet valve (**2**) from the compressor (**6, 8**) of the turbo-compressor or of at least one of the turbo-compressors (**4, 5**), and secondly an outlet valve (**3**) from which the exhaust gases are passed from the cylinder through an outlet line (**13**) to the turbine (**7, 9**) of the turbo-compressor or of at least one of the turbo-compressors (**4, 5**), characterized by placing each cylinder in communication with the induction system during each engine working cycle by opening and closing the inlet valve (**2**) during the induction stroke and also through the medium of a separate pressure control valve (**19**) which is connected to the induction system by means of a pressure control line (**20**) and which is opened when the piston, during the compression stroke, is located in a first predetermined position (C, F) in the cylinder, in or at a distance from the bottom-dead-center position (C) of the piston, and is closed when the piston, during the compression stroke, is located at a second predetermined position (D) in the cylinder at a greater distance from the bottom-dead-center position (C) of the piston, opening the inlet valve (**2**) when the piston is located in the vicinity of its top-dead-center position (C) of the piston, opening the inlet valve (**2**) when the piston is located in the vicinity of its top-dead-center position (A) after the exhaust stroke of the working cycle; and closing the inlet valve (**2**) during the induction stroke, when the piston is located in a third predetermined position (B) at a distance from the bottom-dead-center position (C) of the piston.

4,852,354
EXTERNAL COMBUSTION CLOSED REGENERATIVE CYCLE PISTON ENGINE
George R. Morgan, 1831 S. Berthed Pl., Tucson, Ariz. 85710
Filed Jun. 23, 1988, Ser. No. 210,356
Int. Cl.[4] F02C 1/04; F02G 1/00
U.S. Cl. 60—682 3 Claims



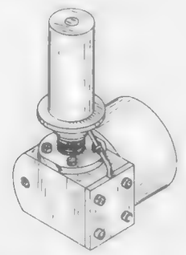
1. A closed regenerative cycle engine in which a plurality of fluids are alternately expanded and compressed in closed thermodynamic systems comprising:
a power cylinder located in said power unit with a piston reciprocating in said cylinder;
a rotatable output crankshaft operatively coupled to said piston mounted perpendicular to said cylindrical axis;
a compressor means located on axis of said rotatable output crankshaft mounted adjacent to said power unit;
a transmission means operatively coupling said rotatable output crankshaft to said compressor means mounted between said components;
an accumulator unit located in the proximity of said compressor means in-flow up stream communicating to said control means and in-flow down stream communicating to said cooler;
a working fluid control means mounted in the working fluid piping located adjacent to said compressor means in-flow upstream communicating to said compressor means and in-flow down stream communicating to said accumulator unit;
a heat exchanger unit located adjacent to said power unit and compressor means in-flow up stream communicating to said heater unit and in-flow down stream communicating to said compressor means, also in-flow up stream communicating to said cooler and in-flow down stream communicating to said power cylinder;
a cooler located adjacent to said compressor means in-flow up stream communicating to said accumulator unit and in-flow down stream communicating to said heat exchanger unit;
a heater unit located on said power unit providing a heat source for said working fluid in-flow up stream communicating to said power unit and in-flow down stream communicating to said heat exchanger unit;
a rotatable heater drum mounted in said heater housing enclosed and sealed by said heater flange plates;
a heater drum seal holder mounted inside of said heater housing contacts and seals said rotatable heater drum minimizing working fluid leakage;
a heater burner mounted external of said heater unit protruding into said heater drum seal holder applying heat to said rotatable heater drum;
an opening in said heater flange plate to exhaust burned combustibles;
a heater blower mounted in said heater housing located parallel to the cylindrical axis of said rotatable heater drum in-flow down stream communicates and moves working fluid from said heat exchanger unit and in-flow up stream communicates and circulates said working fluid over said rotatable heater drum and heater housing fins;
a power cylinder intake valve located in said heater housing in-flow up stream communicating to said power cylinder by said power cylinder intake valve passage and in-flow down stream communicating to said heater unit;
a power cylinder working fluid exhaust means located on said power cylinder in-flow up stream communicating to said heat exchanger unit and in-flow down stream communicating to said power cylinder;
a working fluid make-up means mounted in the proximity of said accumulator unit in-flow up stream communicating to said accumulator unit providing a source of working fluid to said accumulator unit;
a first working space defined by said power cylinder and said piston in which a heated working fluid expands to perform work in moving said piston;
a second working space defined by said compressor means whereby a cooled working fluid is compressed;
whereby a working fluid is heated by said heater unit, flows into said working space where it expands to perform work, flows through said heat exchanger unit and cooler depositing heat, flows into said accumulator unit where it is pooled, flows through said working fluid control means regulating flow of said working fluid into said compressor means where it is compressed, and thereafter flows through said heat exchanger unit picking up heat, and thence to said heater unit to cyclically perform a closed regenerative cycle.

4,852,355
DISPENSING ARRANGEMENT FOR PRESSURIZED AIR
Milton J. Kenworthy, and Robert C. King, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio
Continuation of Ser. No. 528,870, Sep. 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 219,286, Dec. 22, 1980, abandoned. This application Oct. 24, 1988, Ser. No. 261,596
Int. Cl.[4] F02C 7/12
U.S. Cl. 60—751 2 Claims



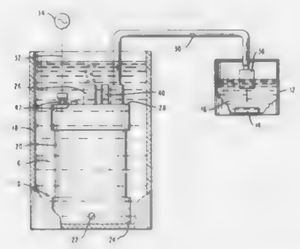
1. In a gas turbine engine combustor having a compressor which provides an airstream to a duct which diffuses the airstream, the improvement comprising:
(a) means for tapping first and second airstreams from the diffusing airstream and for carrying the airstreams in respective primary and secondary conduits, the average energy level of the air in the primary conduit being higher than the average energy level of the air in the secondary conduit;
(b) means for directing air from the secondary conduit into the combustor for diluting combustion gases;
(c) means for directing air from the primary conduit into a hollow stator located near the outlet of the combustor for cooling the hollow stator.

4,852,356
CRYOGENIC COOLER
Rueven Z. Unger, Kfar-Vradim, and Mark Kushnir, Rehovot, both of Israel, assignors to ICE Cryogenic Engineering Ltd., Tel Aviv, Israel
Filed Mar. 16, 1987, Ser. No. 26,037
Claims priority, application Israel, May 27, 1986, 78933
Int. Cl.[4] F25B 9/00
U.S. Cl. 62—6 15 Claims



1. An integral Stirling cryogenic cooler comprising:
a compressor;
an expander-displacer defining an expansion volume;
a cold tip adjacent said expansion volume;
a regenerator heat exchanger and a displacer;
a crank shaft arranged to receive input rotary power and to drive the compressor and the displacer; and
bellows means for low vibration mounting of the cold tip with respect to the compressor.

4,852,357
CRYOGENIC LIQUID PUMP
Warren W. Porter, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio
Filed Oct. 14, 1988, Ser. No. 258,261
Int. Cl.[4] F17C 9/04
U.S. Cl. 62—50.4 17 Claims



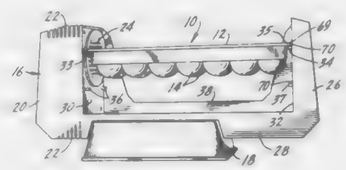
1. A pump for delivering a cooling fluid from a reservoir of said fluid to a destination comprising:
a vessel for holding fluid to be delivered, said vessel being submersible within said reservoir and having a fluid inlet near its bottom for receiving fluid from said reservoir and a gas discharge outlet near its top;
an inlet valve for preventing said fluid from flowing out of said vessel through said fluid inlet;
a gas discharge valve responsive to the level of fluid within said vessel for opening and closing said gas discharge outlet;
a conduit for conducting fluid from inside said vessel to said destination;
a pressure regulator for limiting the pressure within said conduit; and
heating means for evaporating the fluid within said vessel to create a pressure head within said vessel when said gas discharge outlet is closed thereby causing said fluid to flow through said conduit.

4,852,358
CRYOGENIC COMBINATION TUNNEL FREEZER
Arun Acharya, East Amherst, and Jeffert J. Nowobilski, Orchard Park, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.
Filed Jul. 16, 1988, Ser. No. 219,666
Int. Cl.[4] F25D 13/06
U.S. Cl. 62—63 12 Claims



1. A method of controlling the depth of crust freezing of an organic comprised article processed in a cryogenic freezer, said method comprising:
(a) contacting at least a portion of the surface of an organic comprised article to be frozen with a liquid cryogen to form a frozen crust on the surface of said article, wherein the thickness of said crust formed is sufficient to permit transfer of a substantial amount of heat from within the interior of said article while maintaining at least a portion of said frozen crust adequate to act as a water conduction or transmission barrier, and wherein the thickness of said crust formed is limited to prevent thermal fracture of or physical damage to said article and such that portions of said article having cross-sections which are relatively small compared with the largest cross-sectional dimension of said article do not become brittle and subject to fracture and damage during the freezing of said article;
(b) removing said article from contact with said liquid cryogen for a residence time period sufficient to permit heat transfer from the interior of said article, while at the same time maintaining at least a portion of said frozen crust on the surface of said article adequate to function as a water conduction or transmission barrier; and
(c) repeating step (a) at least once subsequent to step (b) during the freezing of said article.

4,852,359
PROCESS AND APPARATUS FOR MAKING CLEAR ICE CUBES
Ermanno J. Manzotti, 2556 Bark Wood Rd. #304, Schaumburg, Ill. 60173
Filed Jul. 27, 1988, Ser. No. 224,888
Int. Cl.[4] F25C 1/18
U.S. Cl. 62—68 30 Claims



28. An ice-maker comprising:
an ice-forming tray for holding water to be frozen into ice cubes;
means for supporting at least one ice-forming tray to permit movement of said tray in at least two different axis including:

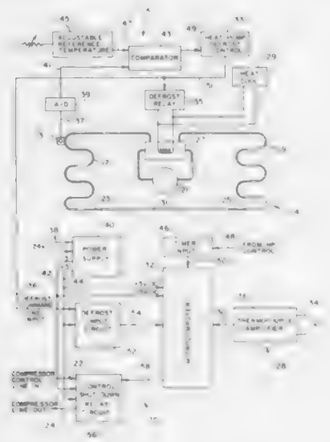
a carrier body;
a first support disposed at one end of the carrier body;
a second support disposed at the other end of the carrier body;
a pair of coaxial support arms, a first end of each pivotally joined and second ends extending in opposite directions to form an elongated flexible member, said flexible member rotatably mounted at the first ends to said first support;
a pair of elongated rods having first and second ends, said first ends of each of said rods being respectively mounted to a respective second end of said coaxial support arms and extending longitudinally therefrom;
holding means rotatably mounted about its center on the second support, said holding means having two opposing ends respectively attached to respective second ends of said elongated rods;
said ice-forming tray being disposed on the pair of elongated rods between the first and second ends of the pair of elongated rods;
wherein the ice-maker further comprises:
a harvest motor means mounted within the carrier body for rotating said elongated rods and ice-forming tray through a predetermined arc for release and removal of the frozen ice-cubes;
tension means connected to one of the coaxial support arms to subject the ice-forming tray to a predetermined degree of torsion when rotation of the ice-forming tray commences to cause release of the ice-cubes from the ice-forming tray as the ice-forming tray is rotated.

4,852,360

HEAT PUMP CONTROL SYSTEM

John H. Harshbarger, Jr., and John H. Harshbarger, III, both of Xenia, Ohio, assignors to Visual Information Institute, Inc., Xenia, Ohio

Filed Dec. 8, 1987, Ser. No. 130,076
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.[4] F25D *21/02*
U.S. Cl. 62—126 **8 Claims**



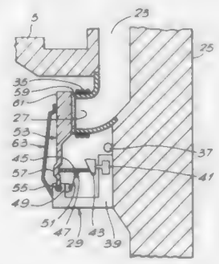
1. A heating system comprising:
supplemental heating means for supplying heat to an interior space,
heat pump means for supplying heat to the interior space, said heat pump means for comprising an indoor heat exchanger in thermal contact with the interior space,
control means including at least one thermostat having a sensor in the interior space for activating one or both of said supplemental heating means and said heat pump means into operation,
a thermal sensor in thermal contact with said indoor heat exchanger,
defrost control means connected to said thermal sensor and said heat pump means and responsive to indoor heat exchanger temperature for causing said heat pump means to go into its defrost mode when the indoor heat exchanger temperature falls below a preset threshold temperature, and
heat pump control override means connected to said defrost control means for detecting when said heat pump means is in its defrost mode and disabling said heat pump means from operating in its heating mode when the heat pump means is detected as operating in its defrost mode for a predetermined portion of a given cyclically recurring time interval.

4,852,361

REFRIGERATOR WITH A MALFUNCTION DETECTION SYSTEM

Hiroshi Oike, Osaka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 7, 1988, Ser. No. 164,962
Claims priority, application Japan, Mar. 11, 1987, 62-57573
Int. Cl.[4] F25B *49/00*; F25D *17/04*
U.S. Cl. 62—131 **14 Claims**



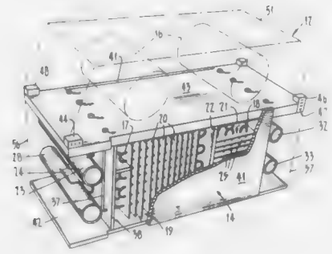
1. A refrigerator including a damper controlling inflow of cold air into a compartment thereof, comprising:
means for detecting temperature within the compartment;
means for driving the damper in accordance with the temperature detected by the temperature detecting means;
means for detecting a position of the damper;
heater means for defrosting the damper;
abnormality detection means for monitoring an operation time of the damper and energizing the heater means when the operation time of the damper reaches a predetermined value without being reset by the damper position detecting means indicating the damper has assumed a desired position; and
malfunction detection means for monitoring an operation time of the heater means and deenergizing the heater means when the operation time of the heater means reaches a predetermined value without being reset by the abnormality detection means.

4,852,362

MODULAR REFRIGERATION SYSTEM

Ronald D. Coury, Ringwood, Australia, assignor to Multistack, Inc., St. louis, Mo.

PCT No. PCT/AU85/00155, § 371 Date Mar. 13, 1986, § 102(e) Date Mar. 13, 1986, PCT Pub. No. WO86/00977, PCT Pub. Date Feb. 13, 1986
PCT Filed Jul. 16, 1985, Ser. No. 849,499
Claims priority, application Australia, Jul. 24, 1984, PG6190; Sep. 28, 1984, PG7409
Int. Cl.[4] F25B *5/00*
U.S. Cl. 62—175 **8 Claims**



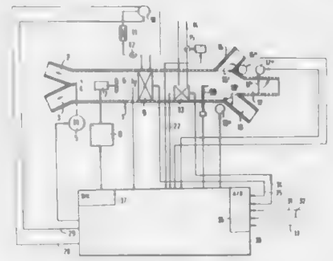
1. An expandable refrigeration system for transferring heat from one fluid to another where a total load requirement is supplied by a plurality of modular units, comprising:
an assembly of a plurality of readily interconnectable and transportable, substantially identical complete modular refrigeration units each of which includes:
a housing means to carry at least one refrigeration circuit including an electrically powered compressor means, evaporator means and condenser means, each said housing further containing
a first fluid flow passage means for flow of a first fluid in heat exchange relation with said evaporator means, and
a separate second fluid flow passage means for flow of a second fluid in heat exchange relation with said condenser means,
a first fluid supply means in fluid communication with the first fluid flow passage means to supply said first heat exchange fluid thereto,
a first fluid return means in fluid communication with said first fluid flow passage means to remove said heat exchange fluid therefrom,
second fluid supply means in fluid communication with said second fluid flow passage means to supply said second heat exchange fluid thereto,
said first fluid supply means and said first fluid return means comprising header pipes extending laterally of said housing means, and
releasable connecting means interconnecting adjacent ends of said header pipes of adjacent modular units to form a unitary fluid supply manifold and a unitary fluid return manifold for the assembly to interconnect the first flow passage of respective units in parallel, and to readily enable replacement or addition or removal of a unit from the system.

4,852,363

AIR CONDITIONER HUMIDITY CONTROL SYSTEM

Hans Kampf, Korb, and Karl Lochmahr, Vaihingen/Enz, both of Fed. Rep. of Germany, assignors to Sueddeutsche Kuehlerfabrik, Julius Fr., Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Nov. 18, 1988, Ser. No. 272,937
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1987, 3739372
Int. Cl.[4] B01F *3/02*
U.S. Cl. 62—176.6 **16 Claims**



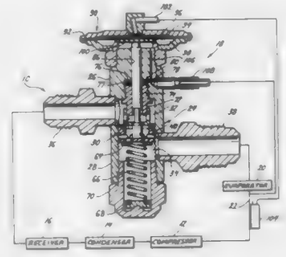
1. An air conditioner for controlling the humidity within a motor vehicle having a window pane comprising:
an air duct;
means within the air duct for varying the humidity of air passing through the air duct;
means for measuring and generating signals representing measured values for outside temperature, temperature inside the vehicle and humidity inside the vehicle; and
means, including a microcomputer, for selectively operating said humidity varying means in response to signals received representing said values for outside temperature, inside temperature and inside humidity and for determining a threshold humidity as a ratio of the saturated vapor pressure inside the window pane and the saturated vapor pressure of the inside air, the microcomputer actuating the humidity varying means if the difference between threshold humidity and inside humidity differs from a first stipulated value.

4,852,364

EXPANSION AND CHECK VALVE COMBINATION

G. Thomas Seener, and Dennis L. Hoehne, both of St. Louis, Mo., assignors to Sporlan Valve Company, St. Louis, Mo.

Filed Oct. 23, 1987, Ser. No. 113,135
Int. Cl.[4] F25B *41/04*
U.S. Cl. 62—225 **11 Claims**



1. A combination expansion valve and check valve for controlling the flow of refrigerant in a refrigeration system comprising:

(a) a valve body including an upper portion providing a first chamber and lower portion providing a second chamber said first chamber defining an inlet chamber and said second chamber defining an outlet chamber receiving refrigerant at a lower pressure than the refrigerant pressure in said inlet chamber when refrigerant flow is in a normal direction from said first chamber to said second chamber,

(b) compound valve means disposed between said first and second chambers including:

(1.) a seating means defining a check valve port,

(2.) a movable check valve element receivable by said seating means, said check valve element including a control valve port, and

(3.) a control valve element; movable into and out of said control valve port,

(4.) said check valve being urged into engagement with said check valve seating means and said control valve regulating flow between said first and second chambers, when refrigerant flow is normal, and

(5.) said check valve element being urged out of engagement with said check valve seating means when refrigerant flow is reversed so that refrigerant flows relatively freely from said second chamber to said first chamber,

(c) means for controlling movement of the control valve element when the refrigerant flow is normal.

4,852,365

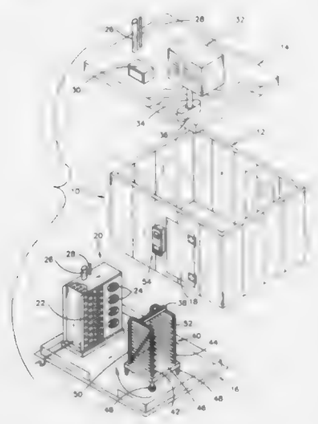
REFRIGERATION SYSTEM

Granville P. Elrod, Murfreesboro; John W. Westbrooks, Christiana, and Tracy L. McDonald, Winchester, all of Tenn., assignors to Standex International Corporation, Salem, N.H.

Filed Jul. 19, 1988, Ser. No. 224,500

Int. Cl.[4] F25D *15/00*

U.S. Cl. 62—237 **7 Claims**



1. A refrigeration system for storing movable food rack means comprising:

an insulated enclosure including an enclosure cover;

rotating means on said enclosure cover for rotating movable food rack means; and

at least one movable food rack means in said enclosure, said movable food rack means including rack coupling means for mating with said rotating means, said rack coupling means comprising a U-shaped bracket having restraint means pivotably mounted thereon.

4,852,366

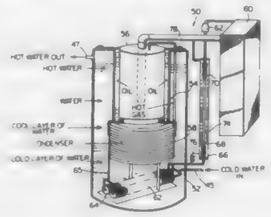
HEAT PUMP AND SYSTEM

Kenneth J. Harris, Chardon, Ohio, assignor to Conserve, Inc., Erie, Pa.

Filed Dec. 15, 1986, Ser. No. 941,762

Int. Cl.[4] F25B *27/00*

U.S. Cl. 62—238.6 **34 Claims**



1. A heat pump installation comprising a motor-compressor unit, an outer tank containing a liquid, an inner tank having oil or the like contained therein, said inner tank being mounted within and sealed from said outer tank so as to prevent the intermixing of said liquid and said oil, and said motor-compressor unit being sealed from and mounted within said inner tank such that at least a portion of said motor-compressor unit is immersed in said oil.

4,852,367

MAGNET SYSTEM

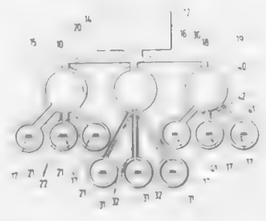
Cord-Henrich Dustmann, Weinheim, Fed. Rep. of Germany, assignor to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 285,704

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3743033

Int. Cl.[4] F25B *19/00*

U.S. Cl. 62—51.1 **7 Claims**



1. Magnet system, comprising a refrigerating system supplying refrigerated coolant, first coolant lines connected to said refrigerating system, control cryostats connected to said first coolant lines, second coolant lines connected to said control cryostats, a multiplicity of magnet cryostats each being connected to a respective one of said second coolant lines, a multiplicity of electromagnets each being associated with a respective one of said magnet cryostats and each having a magnet coil formed of superconducting wire, a current supply lead supplying power for exciting said magnet coils, individual current connections each being disposed in a respective one of said control cryostats and being connected to said current supply lead, and superconducting cables each being disposed in a respective one of said second coolant lines and each being connected between one of said current connections and a respective one of said magnet coils.

4,852,368

EVAPORATOR FOR COOLANT FLUIDS

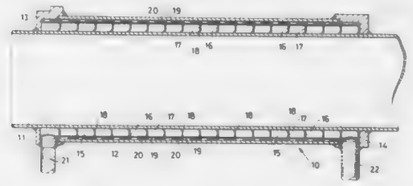
Francesco Bravo, Montecchio Maggiore, Italy, assignor to Bravo S.p.A., Vincenza, Italy

Filed Sep. 9, 1988, Ser. No. 242,181

Claims priority, application Italy, Sep. 25, 1987, 22037 A/87

Int. Cl.[4] F25B *39/02*

U.S. Cl. 62—515 **2 Claims**



1. An evaporator for coolant fluids of the type comprising two tubular elements of different diameter coaxially inserted one into the other so as to form therebetween a circumferential space for coolant circulation, a plurality of annular baffles between said elements operatively dividing said space into a plurality of adjacent annular chambers intercommunicating by means of at least a bore through each of said baffles, the bore of one baffle being in a position diametrically opposite the bore of an adjacent baffle, there being at opposite ends of the evaporator a coolant inlet and a coolant outlet duct, respectively, and wherein each of said annular baffles has a clawed circumferential edge which is pressure-fitted onto said tubular element, and a collar having a conical portion adapted to couple to the collar of the adjacent baffle, said other tubular element being pressure-fitted onto the conical portions of said baffles.

4,852,369

DEVICE FOR MOUNTING AND CONTROLLING THE SWITCH RETAINING AND PRESSING MEANS IN AUTOMATIC FLAT KNITTING MACHINES

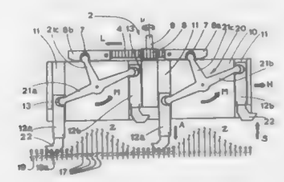
Benito Stoppazzini, Sala Bolognese, Italy, assignor to E.M.M., S.R.L., Padulle Di Sala Bolognese (Bologna), Italy

Filed Jul. 6, 1988, Ser. No. 215,650

Claims priority, application Italy, Oct. 2, 1987, 4961/87[U]

Int. Cl.[4] D04B *7/04*

U.S. Cl. 66—64 **2 Claims**



1. A device for mounting an controlling stitch-retaining means and stitch-pressing means, with said means being designed to press on corresponding potions of knitted fabric being formed on an automatic flat knitting machine, with said portions being dynamically located in proximity to at least one work zones of needles of said machine, with said machine comprising at least one needle bed above which a carriage moves with an outwards and return motion, to send said needles into operation, and with said needles being housed in said needle bed; said device comprising: a box-shaped element that is fixed such that it is able to be moved with said carriage; a plate that is an integral part of said element and lies in a vertical place above said needle bed, at least one side of said element featuring at least two vertical grooves in each work zone, that lie on either side of said work zone in relation to the direction of movement of said work zone in relation to the direction of movement of said carriage, and within which an equal number of pins are located respectively, each pin being numbered consecutively to provide even numbered pins and odd numbered pins, said even and odd pins being slidable vertically along their axes in opposite directions, raised and lowered, respectively; a rocker for each pair of pins, that is hinged to said plate and features two arms whose free ends act on said pins respectively, and also featuring a third arm that is subjected to the action of drive means designed to swing said rockers in opposite directions lying in a plane parallel to said plate, causing, respectively, said even pins to be moved in said raised direction, whilst said odd pins are simultaneously moved in said lowered direction, and vice versa; said stitch retaining-pressing means being mounted to a lower ends of said pins respectively, in such a way that they are able to be moved.

4,852,370

WARP-KNITTING MACHINE, PARTICULARLY STITCH KNITTING MACHINE

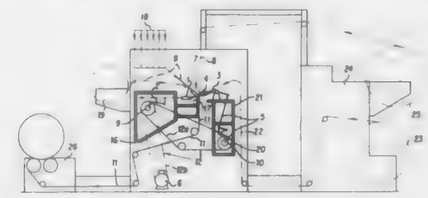
Guenter Tasler, Klaffenbach; Klaus Wiesdenhoeft; Michael Schultheiss, both of Karl Marx Stadt; Martin Schoenfuss, Hohenstein-Ernstthal; Theo Ludwig, Karl Marx Stadt; Klaus Huster, Karl Marx Stadt, and Dietmar Grenzendoerfer, Karl Marx Stadt, all of German Democratic Rep., assignors to VEB Kombinat Textima, Karl Marx Stadt, German Democratic Rep.

Filed Sep. 1, 1988, Ser. No. 239,723

Claims priority, application German Democratic Rep., Oct. 9, 1987, 307778

Int. Cl.[4] D04B *23/00*

U.S. Cl. 66—203 **10 Claims**



1. In a warp knitting machine equipped with a row of knitting needles which are movable forward and backward by directly assigned drive means and which have hooks lokcable by slides, and in addition comprising at least one guide bar with a row of guide needles which are each likewise connected, for the performance of oscillatory and displacing motions, with directly appurtenant drive means; the drive means of the row of knitting needles and the drive means of the row of guide needles being coupled with the main drive of the machine, the machine being provided over, between and under the rows of needles with a free space for passage of a basic material and the finished goods which extends along the entire length of the rows of needles, so as to be able to feed the basic material undisturbed in the direction over the rows of needles and guide it through between the row of knitting needles and the row of guide needles, as well as to be able to remove the goods, the improvement wherein the drive means for the operation of the row of knitting needles and the drive means for the performance of the oscillatory motions of the row of guide needles are connected to separate drive shafts, the drive shafts having a drive connection with the main drive and each being arranged between the main drive and the appurtenant drive means, the drive shaft for the drive means for the performance of the oscillatory motions of the row of guide needles being located under and/or behind the working plane of the row of knitting needles and before the finished goods, the drive shaft for the drive means for the performance of the oscillatory

motions of the row of guide needles having a plurality of drive means distributed across the working width of the machine.

4,852,371

LOCKABLE PORTABLE CONTAINER, ESPECIALLY SUITCASE, BOARD CASE, FILE CASE, FILE CASE OR THE LIKE

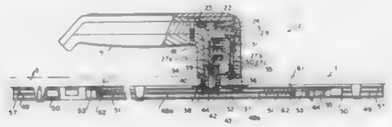
Michael Pfeiffer, Ismaning, Fed. Rep. of Germany, assignor to Michael Pfeiffer Design und Marketing GmbH, Ismaning, Fed. Rep. of Germany

Filed Mar. 1, 1988, Ser. No. 162,648

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1987, 3706723

Int. Cl.[4] E05B *65/52*

U.S. Cl. 70—70 **20 Claims**



1. A lockable portable container of the suitcase, brief case, file case variety having:
- locking and latching means mounted in the container, for holding a cover of the container fixedly abutting and secured to a body of the container;
- a single carrying grip means for lifting and toting of the container;
- said single grip means being pivotally mounted with respect to the container and connected to the locking and latching means;
- pivotal movement of said grip means from a first position causing both unlocking and then separation of the locking and latching means with respect to the body of the container by first unlocking the locking and latch means and then by spacing an edge of the cover from the body of the container by the locking and latch means;
- means for locking pivotal movement of the single grip means, including actuating means therefor; and
- wherein said actuating means is carried by said single grip means.

4,852,372

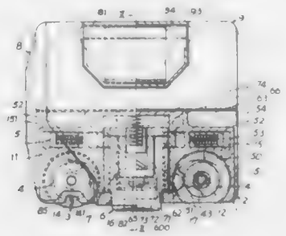
RANDOMLY ENGAGEABLE COMBINATION LOCKING DEVICE

Chong-Kuan Ling, P.O. Box 53-58, Taipei, Taiwan

Filed Dec. 12, 1988, Ser. No. 282,691

Int. Cl.[4] E05B *37/02*

U.S. Cl. 70—312 **14 Claims**



1. A combination locking device comprising:
- a locking base means secured on a first fixing member of a case portion, and a hasping cover means secured on a second fixing member of a case cover combinable with said case portion for forming a case, a container or a luggage; the locking base means including:
- a first bottom plate secured to said first fixing member;
- a base housing combinable with the first bottom plate having a hasp slot formed in said housing;
- a plurality of combination dials pivotally mounted in said housings;
- a plurality of sleeves resiliently engageable with the dials, each said sleeve having a divergent notch diverging radially formed in said sleeve;
- a plurality of sleeve couplers each having a taper extension engageable with each said divergent notch of said sleeve and having a locking block formed thereon;
- a slide member resiliently formed in a central portion of said housing having at least a recess portion engageable with said locking block of said sleeve coupler for locking the slide member; and
- a latching tongue member slidably retained in said slide member and having a latching tongue formed on its front portion operatively depressible by said slide member; and
- the hasping cover means including: a second bottom plate secured to the second fixing member and an upper cover pivotally secured to said second bottom plate, having a hasp member formed with a tongue slot therein engageable with and fastened by the latching tongue of the locking base means when poking through the hasp slot in said housing, whereby upon a rotation of the dials and sleeves to an opening combination to engage the sleeve notches with the coupler extensions to disengage the locking blocks from the recess portions of the slide member, the slide member is depressed to retract the latching tongue to unlock the upper cover from the locking base means, and upon a rotation towards a locking state to disengage the coupler extensions from the sleeve notches to allow the locking blocks to engage the recess portions of the slide member, the slide member can not be depressed, thereby locking the upper cover on the base means.

4,852,373

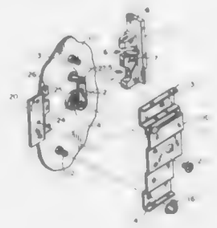
LOCK PROTECTOR ASSEMBLY

Gerald B. McGough, Huntsville, Ala., assignor to Palco Telecom Inc., Nashville, Tenn.

Filed Feb. 3, 1989, Ser. No. 305,709

Int. Cl.[4] E05B *63/00*

U.S. Cl. 70—417 **9 Claims**



1. A lock protector assembly for use with a lock mounted in a telephone paystation housing, said lock of the type including a cylinder, a cam and a bolt all mounted within the interior of said paystation housing, said lock protector assembly comprising:
- a protector positioned along a first side of said lock, adapted to receive said bolt and said cam, when said lock is operated to a locked position;
- a back up plate positioned along a second side of said lock;
- a clamping plate secured to said paystation interior and further fastened to said back up plate, and positioned over said protector;
- whereby said protector, said back up plate and said clamping plate in combination with said paystation housing provide a protective enclosure for said lock.

4,852,374

ELECTRICAL SHOCK-PREVENTABLE KEY UNIT

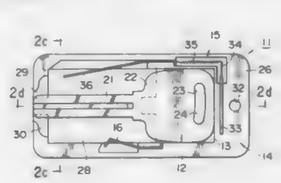
Motohiro Gotanda, 1802-10, Nakabyo, Abiko-shi, Chiba-ken, Japan

Filed Feb. 25, 1988, Ser. No. 160,199

Claims priority, application Japan, Feb. 28, 1987, 62-28111[U]

Int. Cl.[4] A47G *29/10*

U.S. Cl. 70—456 R **5 Claims**



1. An electric shock-preventable key unit comprising:
- a case formed of an electrically insulating material and having a longitudinally extending chamber therein;
- a longitudinally extending slot formed in said case;
- an aperture formed at one end of said case;
- a slide plate slidably disposed within said chamber and having a projection engaged with and protruded from said slot, so that said slide plate can be longitudinally slid between first and second positions by moving said projection along said slot, said slide plate being formed of an electrically insulating material;
- a key body formed of an electrically conductive material and having a grip portion secured to said slide plate and a key portion extending from said grip portion, so that said key portion is extended out of said chamber through said aperture when said slide plate is located in said first position and retracted therefrom when said slide plate is located in said second position;
- an electrically conductive member having a portion exposed on the surface of said case;
- an electrically conductive contacting member provided in said chamber at a position so that said contacting member is electrically contacted with said key grip portion when said slide plate is located in said first position;
- a resistor having both terminals electrically connected to said conductive member and said contacting member, respectively; and
- retaining means coacting with said slide plate to maintain said slide plate in said first position with said key portion extended from said chamber, said retaining means comprising a plate spring disposed on said case and having a portion for engagement with said slide plate, said engagement portion being shaped to provide a lower mechanical resistance to sliding movement of said slide plate to said first position from said second position and to provide a greater mechanical resistance to sliding movement of said slide plate to said second position from said first position.

4,852,375

RACK ASSEMBLY FOR FORMING SPLINES IN THIN-WALL MEMBER

James T. Killop, Warren, and Carl E. Anderson, Mt. Clemens, both of Mich., assignors to Anderson-Cook, Inc., Fraser, Mich.

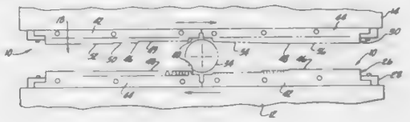
Division of Ser. No. 862,458, May 12, 1986, Pat. No. 4,729,233.

This application Sep. 24, 1987, Ser. No. 100,543

The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.

Int. Cl.[4] B21H *5/00, 17/04*

U.S. Cl. 72—88 **1 Claim**



1. A die assembly (26) for forming a splined power transmission member from a thin-walled blank (35) comprising: a supporting frame (28); first (42) and second (44) die bodies independently mounted on said frame (28) in end-to-end coaxial relationship with each other; said first die body (42) including a rough spline forming surface (46) and said second die body (44) including a finish spline-forming surface (48); a loading notch (40) formed along said rough (46) and finish (48) forming surfaces for receiving a mandrel (34) with the blank (35) mounted thereon in a neutral position of said die assembly (26); a pair of inclined wedge blocks (94, 96) each slideably supported for longitudinal movement along a complementary abutment surface (62) on said frame (28) and having one of said die bodies (42, 44) supported thereon to perpendicularly raise and lower each die body (42, 44), including an actuator (88) for longitudinally moving each of said wedge blocks (94, 96) and a locking screw (103) to maintain the position thereof for providing for independent replacement and recalibrating of said independently mounted die bodies (42, 44) having rough and finish forming surfaces (46, 48).

4,852,376

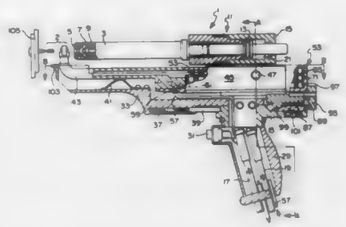
LOCKBOLT INSTALLATION TOOL WITH CARTRIDGE FEED

Boris P. Suhov, Mission Viejo, Calif., assignor to Huck Manufacturing Company, Irvine, Calif.

Filed Oct. 5, 1987, Ser. No. 104,705

Int. Cl.[4] B21D *9/05*

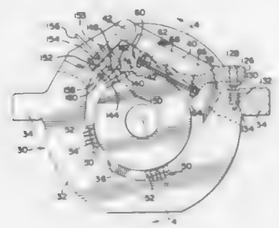
U.S. Cl. 72—391 **10 Claims**



1. An installation tool for setting a pin and collar type fastener on a workpiece, said tool comprising:
- a body member;
- fastener storage means for storing a plurality of fastener members within said tool;
- fastener installation means provided on said body member; and

fastener delivery means mounted on said body member for transferring said fastener members from said storage means to said installation means, said delivery means comprising workpiece engagement means for engaging said workpiece and pivoting said delivery means about said body member so as to avoid contact between said delivery means and said installation means during setting of said fastener.

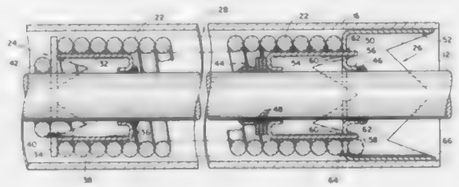
4,852,377
TOOL PACK
Raymond Mikas, Chicago; Robert M. Szczerba, Algonquin, and Sam C. Puliani, Norridge, all of Ill., assignors to American National Can Company, Chicago, Ill.
Continuation-in-part of Ser. No. 136,730, Dec. 22, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 286,301
Int. Cl.[4] B21D *22/28, 37/14, 37/18*
U.S. Cl. 72—349 18 Claims



1. A tool pack for a drawing and ironing machine comprising a cradle having an opening with closure means for said opening, said cradle defining an open space therein open at opposite ends for receiving a plurality of ironing dies with a plurality of lubricating rings interposed between respective adjacent pairs of ironing dies, a plurality of circumferentially-spaced locator means exposed in said space for engagement with said ironing dies, a manifold fixed in said cradle and having a mounting surface exposed to said open space, said manifold having a single inlet port and a plurality of outlet ports equal in number to said lubricating rings and extending through said mounting surface, each of said lubricating rings having a fitting having an exposed surface with an inlet port extending through said exposed surface so that said lubricating ring can be rotated on said locator means to produce extended surface contact between said exposed surface and said mounting surface and align said inlet port of said lubricator ring with an outlet port of said manifold, at least one of said locator means being deflectable to apply pressure to said ironing dies and lubricating rings and maintain accurate alignment of said ironing dies and lubricating rings with respect to a punch movable therethrough while producing sealing engagement between said mounting surface and said exposed surfaces.

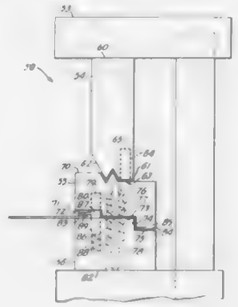
4,852,378
COUNTERBALANCE SPRING RETAINING MEANS FOR A ROLLER DOOR
Vincent Greco, 15-20 129th St., College Point, N.Y. 11356
Filed Aug. 19, 1988, Ser. No. 234,088
Int. Cl.[4] B21D *51/16*
U.S. Cl. 72—379 2 Claims

1. For use in winding and thereafter retaining in said wound condition a counterbalance spring for an overhead door mechanism, a spring retainer member of lightweight steel construction material formed in accordance with a method comprising the steps of die stamping a square blank of said steel construction material, notching out triangular shapes at each of the midpoints between the four corners of said square blank to form between adjacent notches four radially oriented arms extending at 90 degrees to each other, die stamping a shaft-receiving hole centrally of said blank for the subequent projection therethrough of a shaft, forming in an initial shaping step a cylindrical shape in said blank in the area thereof about said shaft-receiving hole, and forming in a subequent shaping step a completed cylindrical shape by bending said four arms into adjacent position to each other incident to closing the previ-



ously removed triangular shaped notches, whereby said resulting spring retainer member is adapted to be disposed on a shaft of said overhead door mechanism and attached to an end of said counterbalance spring and to a drum support of said overhead door mechanism and functions as a replacement for a prior art cast iron spring retainer member.

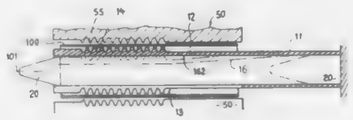
4,852,379
METAL FORMING METHODS AND PRODUCTS FORMED THEREBY
Nat Levenberg, 2 Windsor Pl., Lynbrook, N.Y. 11563
Filed Jul. 15, 1988, Ser. No. 219,232
Int. Cl.[4] B21D *5/01*
U.S. Cl. 72—384 2 Claims



1. An improved sheet metal die construction for forming an integral track and slotted guide adjacent thereto, comprising: first, second and third die elements; said first die element being of elongated configuration and having a first end defining a first wedged-shaped bending surface, and gauge means controlling the depth of penetration of said first bending surface; said second die element having a second end surface corresponding to said first end surface, said first and second end surfaces in engaged condition with a piece of sheet metal stock forming a pair of open undulating portions; said second die element having a third planar end surface opposite said second end surface; said third die element having a fourth planar end surface adapted to be positioned opposite said third end surface and having an axially oriented recess therein and a spacer member positioned within said recess, said member having a laterally extending planar spacer gauge thereon; whereby upon the making of a first bending operation upon stock, said stock is inserted between said first and second die elements to partly form an "S" fold of open configuration, and upon the making of a second bending operation, said partially formed stock is inserted between said second and third die elements with said

planar space gauge disposed within one of the previously formed partial folds in said stock prior to the flattening of said stock to form a planar hem and a parallel slotted guide.

4,852,380
METHOD AND DEVICE FOR SHAPING BY HAMMERING A CORRUGATED TUBE AND THE APPLICATION THEREOF TO TUBES FOR THE AUTOMOBILE INDUSTRY
Bernard Haldric, Vendome, and Pascal Feucht, Amboise, both of France, assignors to NACAM, Vendome, France
Filed Jun. 29, 1988, Ser. No. 213,228
Claims priority, application France, Jul. 2, 1987, 87 09408
Int. Cl.[4] B21D *41/02, 15/04, 15/06*
U.S. Cl. 72—402 11 Claims



1. A device for shaping by hammering a tube having a longitudinal axis for imparting thereto a corrugated shape, said device comprising:

circumferentially spaced-apart hammers movable relative to the axis of the tube in radial planes away from and toward the tube for striking the tube and forming the corrugated shape therein, each said hammer defining a corrugated impression for contributing to the imparting of the corrugated shape to the tube;

a mandrel to be placed coaxially inside a tube to be shaped and having a hollow body and circumferentially spaced-apart arms connected to and longitudinally extending from said body;

each said arm carrying an end part remote from said body and defining a corrugated impression of a given axial extent and cooperative with said impressions of said hammers;

said arms being angularly movable in radial planes relative to the body between an outer position, whereat said end parts are adjacent to the tube for supporting the tube during the striking of the tube by said hammers, and an inner position, whereat said end parts are spaced radially away from the tube;

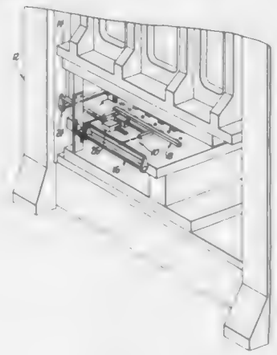
said end parts having rectilinear inner surfaces parallel to said axis in said outer position of said arms and inclined toward said axis in a direction away from said body in said inner position of said arms;

means for elastically biasing said arms to said inner position;

a locking member located coaxially within said mandrel and defining a generally cylindrical surface, said locking member being axially movable between a first position, whereat said cylindrical surface thereof is in engagement with said rectilinear surfaces of said end parts to an axial extent substantially equal to said given extent of said impressions on said end parts and substantially in radial alignment with said impressions of said end parts and locks and firmly supports said end parts in said outer position of said arms in opposition to the action of said biasing means, and a second position, whereat said locking member is withdrawn from said rectilinear inner surfaces to allow said arms to move to said inner position; and

said hammers, the tube and said mandrel being relatively rotatable about said axis to allow said hammers to act on the entire periphery of the tube.

4,852,381
TRANSFER MECHANISM FOR PUNCH PRESSES
Hugh M. Sofy, 201 Warrington Dr., Bloomfield Hills, Mich. 48013
Filed May 31, 1988, Ser. No. 199,431
Int. Cl.[4] B21J *13/08*
U.S. Cl. 72—405 13 Claims



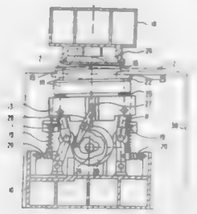
1. A transfer assembly (10) for moving workpieces (W) through a series of in-line equidistant progressive forming stations in a press (12) of the type including a reciprocating forming member (14), said assembly (10) comprising: engagement means (16) for engaging the workpieces (W) in the respective stations and moving the workpieces (W) longitudinally an indexing output distance to subsequent stations and then disengaging the workpieces (W) for workpiece forming; drive means (24) responsive to the movement of the forming member (14) of the press (12) to be moved thereby a predetermined input distance for displacing said engagement means (16) longitudinally of the stations; said drive means (24) including an input element (28), a rock shaft (36) having a longitudinal axis, a rocker arm (34) disposed on said rock shaft (36) for oscillation about said longitudinal axis of said rock shaft (36) in response to movement of the forming member (14) and having a free end distal said longitudinal axis of said rock shaft (36) connected to said input element (28), said free end connected to said input element (28) being at a fixed length from said longitudinal axis of said rock shaft (36); said assembly (10) characterized by including motion multiplier means (26) drivingly connected to said input element (28) and disposed between said input element (28) and said engagement means (16) for displacing said engagement means (16) said output distance which is a different distance from said predetermined input distance.

4,852,382
DIE STAMPING AND PUNCHING TOOL
Hanspeter Gietz, Gossau, and Manfred Roesli, Herisau, both of Switzerland, assignors to Maschinenfabrik Gietz AG, Gossau, Switzerland
Filed Mar. 8, 1988, Ser. No. 165,306
Claims priority, application Switzerland, Apr. 8, 1987, 01357/87
Int. Cl.[4] B21J *9/18*
U.S. Cl. 72—406 10 Claims

1. A die stamping and punching tool machine comprising an upper press part; a tool plate carried by said upper press part; a lower press part including a rollable stamping table and a counter-pressure plate with a rolling profile; first and second toggle lever means for supporting said lower press part, each of said toggle lever means having a portion independently movable toward and away from a machine centerline to raise and lower an end of said lower press part relative to said upper

press part; first and second cam disks rotatably mounted adjacent said independently movable portions of said first and second toggle lever means, respectively, for acting against said movable portions to control the movement of said lower press part,

said cam disks having cam shapes selected to move the respective ends of said lower press part and thereby cause a desired rolling movement pattern of said stamping table including a portion shaped to cause substan-



tially linear movement of said table with time during a stamping phase of said movement;

drive means for driving said cam disks in synchronism with each other so that predetermined portions of said cam shapes act against said movable portions of said toggle lever means concurrently;

a stamping table guide slidably engaging said stamping table for guiding the motion thereof; and

a third cam disk operatively associated with said table guide for controlling the motion of said guide.

4,852,383

PRESS APPARATUS FOR REDUCING WIDTHS OF HOT SLABS

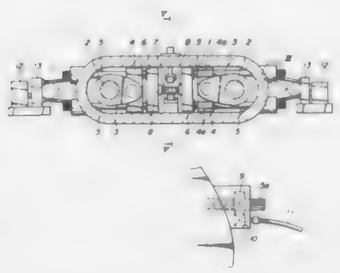
Hideyuki Nikaido; Naoi Takayuki, both of Kurashiki; Atsushi Komori, and Mitsuo Nihei, both of Hitachi, all of Japan, assignors to Kawasaki Steel Corporation, Kobe and Hitachi, Ltd., Tokyo, both of, Japan

Division of Ser. No. 921,549, Oct. 21, 1986, Pat. No. 4,760,728. This application May 6, 1988, Ser. No. 190,997

Claims priority, application Japan, Nov. 22, 1985, 60-261307

Int. Cl.[4] B21J *13/00, 13/08*

U.S. Cl. 72—407 **5 Claims**



1. A press apparatus for reducing widths of hot slabs comprising a pair of anvils movable toward and away from each other in width directions of the hot slabs, each of said anvils having a parallel portion in parallel to a feeding direction of the hot slabs and an inclined portion on an entry side in the feeding direction; width reduction heads to which said pair of anvils are attached, respectively; eccentric presses for reciprocatively driving said width reduction heads through sliders, respectively; and width adjusting means incorporated in said eccentric presses, respectively, for changing distances between said width reduction heads and said sliders, each said width adjusting means comprises a plurality of screw-threaded rods having threaded portions threadedly engaged in internally threaded apertures formed in the slider, said width reduction head being fixed to one ends of said screw-threaded rods and driving means for driving the other ends of said screw-threaded rods, said driving means comprises splined gears slidably fitted on said other ends of the screw-threaded rods formed with grooves, pinions in mesh with said gears, respectively, and spindles connected to said pinions, respectively, and driving source for driving said spindles.

4,852,384

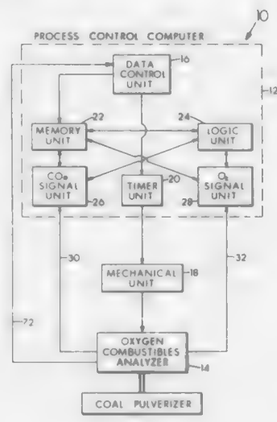
AUTOMATIC CALIBRATION AND CONTROL SYSTEM FOR A COMBINED OXYGEN AND COMBUSTIBLES ANALYZER

Gordon D. Woolbert, North Canton; Scotty Y. Jewett, Lyndhurst, and John W. Robertson, Jr., Chesterland, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 21, 1986, Ser. No. 854,256

Int. Cl.[4] G01N *31/00*

U.S. Cl. 73—1 G **11 Claims**



1. An automatic, periodically calibrating system for continuous output of calibrated signals from a combined oxygen and combustibles analyzer comprising:

a combined oxygen and combustibles analyzer for sensing a level of oxygen and a level of combustibles in a volatile atmosphere and for producing a first sample signal indicative of the oxygen level and a second sample signal indicative of the combustibles level;

means for introducing zero and span calibration test gases into the analyzer;

means for periodically calibrating the analyzer including:

(a) a data control unit for automatically controlling the calibration of the analyzer, for presetting optimum zero and span values for oxygen and combustibles, and for presetting alarm limits for oxygen and combustibles;

(b) a timer unit connected to the data control unit for setting discrete time intervals to activate the means for introducing the zero and span calibration test gases into the analyzer;

(c) a mechanical unit, connected to the timer unit and to the analyzer, for introducing zero and span calibration test gases into said analyzer;

(d) means for calculating zero and span values for oxygen and combustibles while the calibration test gases are introduced into the analyzer;

(e) means for comparing said calculated zero and span values for oxygen and combustibles to the preset alarm limits for oxygen and combustibles;

(f) means for activating an operator alarm if the zero and span values exceed the preset alarm limits for oxygen and combustibles;

(g) means for calculating oxygen and combustibles drift adjustments based upon the zero and span values for oxygen and combustibles obtained form the calibration test gases, and upon the preset zero and span values for oxygen and combustibles;

(h) a memory unit, connected to the data control unit, and to the means set forth in (d), (e), (f) and (g) above, for storing the preset optimum zero and span values, and the alarm limits; and

means for applying the oxygen and combustibles drift adjustments concurrently to the first and second sample signals, according to a predetermined mathematical relationship, to obtain calibrated output signals indicative of the oxygen and combustibles levels in the volatile atmosphere.

4,852,385

MAINTENANCE DEVICE FOR AT LEAST PARTIALLY AUTOMATIC CLEANING AND CALIBRATION OF A PROBE CONTAINING A MEASURED VALUE TRANSMITTER

Heinz J. Brinkmann, Frankfurt am Main, Fed. Rep. of Germany, assignor to Dr. W. Ingold AG, Urdorf, Switzerland

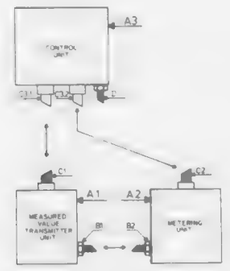
PCT No. PCT/CH86/00070, § 371 Date Jan. 27, 1987, § 102(e) Date Jan. 27, 1987, PCT Pub. No. WO86/07151, PCT Pub. Date Dec. 4, 1986

PCT Filed May 28, 1986, Ser. No. 15,859

Claims priority, application Switzerland, May 30, 1985, 2279/85

Int. Cl.[4] G01N *27/30, 27/38;* **G01D** *18/00*

U.S. Cl. 73—1 R **11 Claims**



1. A maintenance device for at least partial automatic cleaning and calibration of a probe which is part of a measuring device for continuously monitoring biological or chemical processes by measuring analytical parameters in a fluid medium to be investigated, comprising:

a measured value transmitter unit including the probe;

said probe containing a measured value transmitter;

a sensor of said probe being operatively connected to said measured value transmitter;

an external tube of said probe;

a guidc device of said probe being associated with said external tube and holding and guiding said sensor of said probe in said external tube;

pneumatically operated displacement means of said probe being responsive to pneumatic signals and acting upon said guide device such as to displace said sensor of said probe between an operative position, in which said sensor of said probe is immersed into the fluid medium to be investigated, and a maintenance position, in which said sensor of said probe is placed outside said fluid medium to be investigated;

a shut-off device for closing said probe to said fluid medium to be investigated;

a metering unit for feeding at least one rinsing fluid and at least one buffer as calibration fluid;

a control unit for having control elements for emission of pneumatic signals for controlling the operation of the measured value transmitter unit and the operation of the metering unit;

said control unit further containing indicators for indicating the operational states and malfunctions in the operation of the measured value transmitter unit and the metering unit; and

the measured value transmitter unit and the metering unit being coupled to the control unit by means of compressed air conduits for tramsmitting the pneumatic signals.

4,852,386

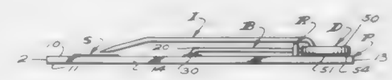
DISPOSABLE TORQUE SCREWDRIVER TESTER

Bosko Grabovac, Arcadia, and Jadranka Kurtovic, Walnut, both of Calif., assignors to Consolidated Devices Inc., City of Industry, Calif.

Filed Nov. 14, 1988, Ser. No. 270,795

Int. Cl.[4] G01L *25/00*

U.S. Cl. 73—1 C **12 Claims**



1. A hand-held torque tester for hand-held torque-limiting tools comprising an elongate horizontal plate with a central longitudinal axis, top and bottom surfaces, front and rear ends and opposite sides, an elongate horizontal longitudinally-extending deflection beam with front and rear ends in spaced relationship above the top surface and parallel with the longitudinal axis of the plate, a vertical mounting pin depending from the front end of the beam and into the plate for free relative rotation therein and against vertical and horizontal displacement relative thereto, a driver part fixed to and projecting rearwardly from the rear end of the beam and having a central vertical drive opening to receive and establish rotary driving engagement with a part of a tool to be tested, reaction means carried by the plate and defining laterally-spaced oppositely-disposed reaction surfaces at opposite sides of the beam adjacent the rear end thereof, an elongate horizontal pointer with front and rear ends normally in spaced parallel relationship with the beam and having its rear end fixed to the driver and a front end portion projecting forwardly and toward the top surface of the plate forward of the beam, and a force-indicating scale on and extending laterally of the plate below the front end of the pointer.

4,852,387

METHOD FOR TESTING RELIEF VALVE

George H. Bingham, P.O. Box 10706, Bakersfield, Calif. 93309

Division of Ser. No. 157,593, Feb. 19, 1988. This application Oct. 14, 1988, Ser. No. 257,537

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—4 R **3 Claims**

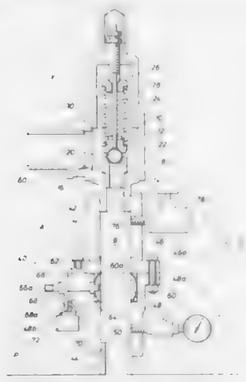
1. A method of in service testing a pressure relief safety valve for verifying the pressure at which the safety valve will open including the steps of:

connecting a safety valve test housing between a contained source of operating fluid under pressure and the pressure relief safety valve for communicating the operating fluid to the inlet of the pressure relief safety valve;

unlocking a valve actuator mounted with the safety valve test housing for enabling manual manipulation of the valve actuator from exteriorly of the safety valve test housing;

manipulating the valve actuator from exteriorly of the safety

valve test housing to block communication of the operating fluid from the inlet of the pressure relief safety valve;
communicating a source of test fluid to the inlet of the pressure relief safety valve through the safety valve test housing;
increasing the pressure of the test fluid for opening the pressure relief safety valve;
determining the pressure of the test fluid when the pressure relief safety valve opens;



venting the test fluid from the safety valve test housing;
manipulating the valve actuator from exteriorly of the safety valve test housing to place the operating fluid in communication with the inlet of the pressure relief safety valve; and
locking the valve actuator to prevent undesired movement that could block communication of the operating fluid from the inlet of the pressure relief safety valve.

4,852,388

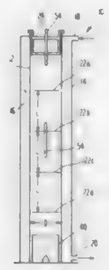
METHOD FOR MEASURING DENSITY OF NEWTONIAN AND NON-NEWTONIAN FLUIDS

Noh-Aeok Park, Norristown, Pa., and Thomas F. Irvine, Jr., Stony Brook, N.Y., assignors to J & L Instruments Corporation, Norristown, Pa.

Continuation-in-part of Ser. No. 178,461, Apr. 7, 1988, abandoned, which is a continuation-in-part of Ser. No. 168,167, Mar. 15, 1988, abandoned. This application Jul. 1, 1988, Ser. No. 214,299

Int. Cl.[4] G01N *9/00, 11/12*

U.S. Cl. 73—32 R **13 Claims**



1. A method of determining the density of a Newtonian fluid comprising the steps of:
allowing a needle of a first predetermined density to fall through the fluid in a vertical cylinder and measuring the time of fall along a predetermined distance along the cylinder;
allowing a needle of a second predetermined density different from the first predetermined density to fall through said fluid in the cylinder and measuring the time of fall along a predetermined distance along the cylinder; and
calculating the density of the fluid, ρ_f, using the following equation:

$$\rho_f = \frac{(\rho_{s1} - \rho_{s2})(V_{t1}/V_{t2})}{1 - (V_{t1}/V_{t2})} = \rho_{s1}\frac{1 - \frac{\rho_{s2}}{\rho_{s1}}(V_{t1}/V_{t2})}{1 - V_{t1}/V_{t2}}$$

where
ρ_{s1} and ρ_{s2}=first and second densities of the needles respectively
V_{t1} and V_{t2}=velocities of the two needles respectively.

4,852,389

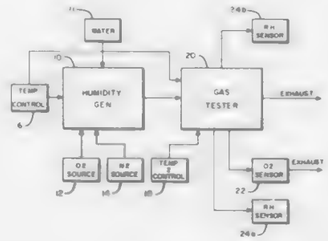
SYSTEM FOR CONTROLLED HUMIDITY TESTS

Daniel W. Mayer, Arden Hills; Craig K. Loebig, Elk River, and Wayne K. Savick, Eden Prairie, all of Minn., assignors to Modern Controls, Inc., Minneapolis, Minn.

Filed Mar. 28, 1988, Ser. No. 174,195

Int. Cl.[4] G01N *15/08;* **G01M** *3/00*

U.S. Cl. 73—38 **13 Claims**



1. A system for controllably measuring permeability of a test gas through a membrane under conditions of controllable relative humidity of the test gas, wherein the test gas is obtained from a source of dry test gas, comprising:
(a) a gas bubbler means for bubbling said dry gas through a liquid-filled container to form a humidified test gas reservoir;
(b) a gas conduit coupled between said source of dry gas and said gas bubbler, said gas conduit including means for diverting a portion of said dry gas from entering said gas bubbler means;
(c) means for controllably connecting and mixing dry test gas from said means for diverting and from said humidified test gas reservoir, and for conveying said mixed dry and humidified test gas;
(d) a test cell having a first chamber connected to said means for conveying said mixed dry and humidified test gas, and having a second chamber, said first and second chambers being separated by a membrane;
(e) a gas sensor coupled to said second chamber, said gas sensor being adapted to measure trace amounts of said test gas; and
(f) temperature control means connected to said gas bubbler means, said gas conduit, said means for conveying said mixed dry and humidified test gas and said test cell, said temperature control means having further means for controlling the temperature of said test gas and for insuring that the temperature of said test gas in said test cell is lower than the temperature of said test gas in all other elements connected by said temperature control means.

4,852,390

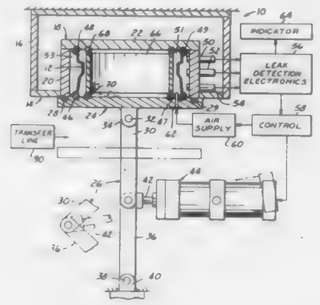
WHEEL RIM LEAK DETECTION

Alfred C. Fisch, Clarkston, Mich., assignor to Oakland Engineering, Inc., Mich.

Filed Jul. 21, 1988, Ser. No. 222,018

Int. Cl.[4] G01M *3/24*

U.S. Cl. 73—40.5 A **10 Claims**



1. Apparatus for testing leak integrity of a plurality of workpieces comprising: an air-tight housing, automatic transfer means for sequentially feeding, positioning and removing said plurality of workpieces to and from sealing engagement with portions of said housing so as to form first and second chambers within said housing internally and externally of said workpiece, means for supplying air under pressure from a source of compressed air to one of said chambers, and means for detecting leakage of air through the workpiece into the other of said chambers and thereby indicating absence of leak integrity at the workpiece; characterized in that said means for supplying air under pressure comprises:
means forming a precharge chamber separate from said housing and said source, means for precharging said precharge chamber to predetermined pressure from said source of compressed air while said automatic transfer means is positioning a workpiece in said housing, and means for
connecting said precharge chamber to said one of said first and second chambers independently of said source when the workpiece is positioned in sealing engagement with said portions of said housing to dump air rapidly from said precharge chamber to said one of said first and second chambers independently of air flow of said source, whereby workpiece test cycle time is reduced.

4,852,391

PIPELINE VEHICLE

Ola Ruch, Flataasen; Trond V. Johansen, Trondheim; Ludvig Naess, Tiller, all of Norway; Horst Poerner, Roettenbahn; Georg Gebhard, Erlangen, both of Fed. Rep. of Germany; Robert Weber, and Max Heller, both of Uttenreuth, Fed. Rep. of Germany, assignors to Den Norske Stats Oljeselskap A.S., Stavanger, Norway

PCT No. PCT/NO87/00027, § 371 Date Feb. 16, 1988, § 102(e) Date Feb. 16, 1988, PCT Pub. No. WO87/06323, PCT Pub. Date Oct. 22, 1987

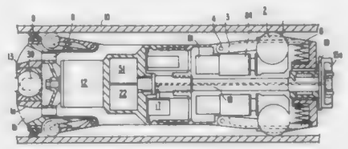
PCT Filed Apr. 9, 1987, Ser. No. 130,226

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1986, 3612498; Norway, Nov. 19, 1986, 864605

Int. Cl.[4] F16L *55/00*

U.S. Cl. 73—40.5 R **14 Claims**

1. A self-driven vehicle for pipelines comprising:
a vehicle body having means for allowing a medium flowing in the pipeline to flow through and around the vehicle body;
a drive module on the vehicle body resiliently bearing against an internal surface of the pipeline;
a hydraulic means for powering the drive module;
a power supply means for operating the hydraulic means;



a control module controlling at least movement of the vehicle in the pipeline; and
a drive mechanism arranged to anchor and secure and also to release a device to be used in the pipeline, the drive mechanism being connected via an axle to an end of the coupling mechanism on the vehicle for the connection to and the actuation of the device.

4,852,392

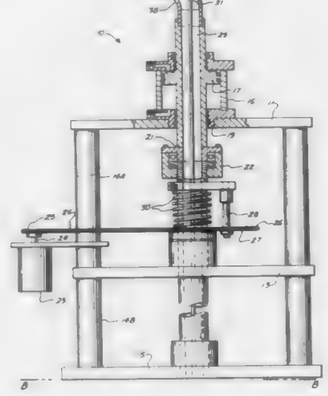
HIGH PRESSURE DRUM TESTING APPARATUS AND METHOD

Robert G. Evans, 41 Colony Rd., Gretna, La. 70056

Filed Aug. 12, 1988, Ser. No. 231,867

Int. Cl.[4] G01M *3/04*

U.S. Cl. 73—41.2 **50 Claims**



1. A thin wall drum testing apparatus for simultaneously testing the integrity of multiple areas of a drum having a cylindrical side wall and one or more generally flat drum ends comprising:
(a) a frame for supporting a drum to be tested;
(b) a turntable base movably supported upon the frame and having a rotatable surface for supporting and turning the drum;
(c) means for covering multiple areas of the drum with liquid during testing and while the turntable base rotates the drum and including spray means for spraying a portion of the drum with liquid and immersing means for simultaneously immersing a portion of the drum during testing;
(d) holding means including spaced apart portions engaging respectively the top portion and bottom end portions for supporting the drum end portions during testing; and

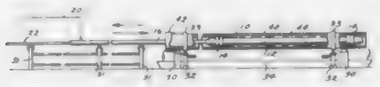
(e) an air pressure source means for pressurizing the drum interior during testing.

4,852,393

PIPE SEGMENT PRESSURE TESTER AND PROCESS OF USE

Charles D. Pate, Friendswood; Bob R. Young, Pasadena, and Hector Plata, Rosenberg, all of Tex., assignors to Loomis International, Pasadena, Tex.

Filed Apr. 25, 1988, Ser. No. 185,662
Int. Cl.[4] G01M *3/28*
U.S. Cl. 73—49.5 8 Claims



1. Apparatus for pressure testing of pipe segments, comprising:

a tubular body portion having first and second ends and having high pressure seal means proximate to each end of said tubular body portion for sealing said body portion to an inner surface of a surrounding pipe segment, said first and second ends each having pressure actuation means for expanding each said respective seal means from a retracted to an extended position wherein said seal means extends radially outwardly from said tubular body portion to support said tubular body portion on said inner surface of a surrounding pipe segment and to seal an annular cavity enclosed by said inner surface of said surrounding pipe segment, said tubular portion located between said first and second ends and said respective seal means, said tubular body portion and said first and second ends being out of contact with said inner surface of the surrounding pipe segment when said seal means are expanded from said retracted position,

said first end having draw bar means connected thereto for inserting and extracting said tubular body portion from a pipe segment, and

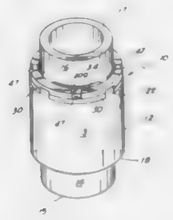
said draw bar means and said tubular body portion having fluid feed lines located therein for pressurizing and actuating said seals and for directing fluid outside of said body portion into said annular cavity between said body portion and an inner surface of a surrounding pipe segment.

4,852,394

ANTI-EXTRUSION SEALING MEANS

Kip B. Goans, Harvey, La., assignor to Richard Lazes, Harvey, La.

Filed Nov. 10, 1988, Ser. No. 269,621
Int. Cl.[4] E21B *33/00*
U.S. Cl. 73—49.8 4 Claims



1. In an apparatus for pressurizing under fluid pressure a segment of conduit, anti-extrusion means comprising:

(a) a cylindrical body member having a central longitudinal bore therethrough and further having a reduced diameter portion at one of its ends, thereby defining an annular shoulders

(b) means mounted on said annular shoulder for preventing extrusion of said anti-extrusion means, said means comprising:

i. a plurality of arcuately shaped first ring segments having upwardly and downwardly depending annular projections, said downwardly depending projections adapted to be mounted on said annular shoulder and said upwardly depending projections adapted to abut a portion of the circumference of said reduced diameter portion of said body member; and,

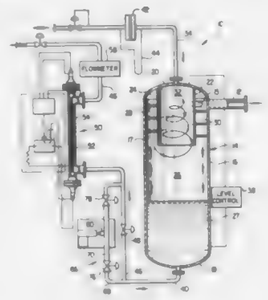
ii. a plurality of arcuately shaped second ring segments adapted to be mated on said first ring segments and having means provided on the undersides thereof for matingly engaging said protrusions.

4,852,395

THREE PHASE FLUID FLOW MEASURING SYSTEM

Miroslav M. Kolpak, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 8, 1988, Ser. No. 281,421
Int. Cl.[4] G01N *33/28*
U.S. Cl. 73—61.1 R 20 Claims



1. A system for measuring multi-phase fluid flow including a water-oil-gas mixture comprising:

conduit means for conducting a multi-phase fluid flow stream;

separator means connected to said conduit means for separating the liquid phase of said fluid flowstream from the gas phase, said liquid phase having a residual gas content said separator means including a gas outlet conduit and a liquid outlet conduit;

gas flow rate measuring means interposed in said gas outlet conduit;

means for measuring the residual gas content of a liquid flowstream leaving said separator means through said liquid outlet conduit; and

means for measuring the fraction of one liquid in another in said liquid flowstream leaving said separator means through said liquid outlet conduit.

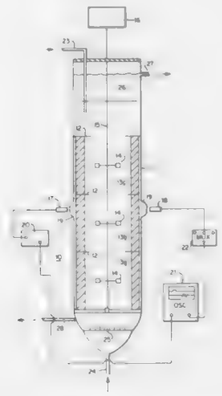
4,852,396

SELF-CALIBRATING ULTRASONIC MEASUREMENT OF DISPERSED PHASE VOLUMETRIC HOLDUP IN LIQUID/LIQUID DISPERSIONS

Lawrence L. Tavlarides, Fayetteville, N.Y., and Julio C. Bonnet, Los Chaguaramos, Venezuela, assignors to Syracuse University, Syracuse, N.Y.

Filed Apr. 5, 1988, Ser. No. 177,695
Int. Cl.[4] G01N *29/02*
U.S. Cl. 73—61.1 R 5 Claims

1. A column reactor of the type in which first and second liquid phases are mixed to form a two-liquid dispersed phase system with one of the liquid phases being held up as a liquid/-liquid dispersion in the other liquid phase, including a reactor vessel having a vessel wall within which the two-liquid system is contained, means for introducing the first and second liquids into said vessel, and mixing means for agitating the liquids; vessel ultrasonic transducer means disposed in acoustic communication with the two-liquid dispersed phase system in said vessel for transmitting ultrasonic pulses into said two-liquid dispersed phase system and for receiving said pulses after they have travelled through said two-liquid dispersed phase system over a predetermined path; and means for electrically exciting said vessel transducer means; the improvement comprising a velocimeter that includes a body that is formed of first and second chamber portions, input means that draws said two-liquid system from said vessel and separates the system into said first and second liquids with the first liquid in said first chamber portion and the second liquid in the second chamber portion, means to drain the liquids from the first and second chamber portions, and first and second velocimeter ultrasonic transducer means disposed in acoustic communication with the first and second liquids in the respective chamber portions of said velocimeter body for transmitting ultrasonic pulses into said first liquid and said second liquid and for receiving the pulses after they have travelled through said first liquid and said second liquid over predetermined paths in the first and second velocimeter chamber portions, respectively; means for electrically exciting said first and second velocimeter transducer means to generate said ultrasonic pulses; means for sensing the pulse reception at the respective transducer means; and means for computing the sound velocities C_1, C_2, and C^* in the first liquid, the second liquid, and said first two liquid system, respectively, from travel times of said ultrasonic pulses and the lengths of the respective predetermined paths, such that a dispersed phase fractional holdup ϕ of the two-liquid dispersed phase system can be calculated according to the relationship:



$$\phi = \frac{C_2 (C_1 - C^*)}{C^* (C_1 - C_2)}$$

4,852,397

FIELD INDENTATION MICROPROBE FOR STRUCTURAL INTEGRITY EVALUATION

Fahmy M. Haggag, 115 Clemson Dr., Oak Ridge, Tenn. 37830

Continuation-in-part of Ser. No. 144,088, Jan. 15, 1988, abandoned. This application Mar. 15, 1989, Ser. No. 323,967
Int. Cl.[4] G01N *3/42*
U.S. Cl. 73—82 13 Claims

13. An indentation microprobe for automatically and non-destructively determining mechanical properties of a structure in the field, which comprises:

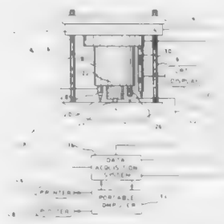
a head member adapted for movement in X and Y directions in a plane substantially parallel to a surface of said structure;

attaching means for releasably attaching said head member rigidly to said surface of said structure;

load applying means operatively associated with said head member and said attaching means;

a load measuring means mounted to said head member having an axis substantially perpendicular to said surface of said structure, said load measuring means adapted to provide an output signal of load applied to said structure by said load applying means;

an indenter holder carried by said load measuring means and adapted for axial movement along said axis of said load measuring means, said indenter holder having an exposed end;



an indenter carried by said exposed end of said holder, said indenter having a selected size and configuration;

a displacement transducer means mounted on said load measuring means, said displacement transducer means adapted to provide an output signal in proportion to movement of said indenter into said surface of said structure;

a data acquisition system for receiving said output signal from said load cell and said output signal from said displacement transducer means; and computer means, including pre=selected computer programs, connected to said load applying means through said data acquisition system to automatically and cyclically apply and release selected increasing loads to said indenter holder, and, thus, to said indenter, at a given position on said surface, and to analyze data received by said data acquisition system during said cyclic application and release of said loads to compute and produce an information signal corresponding to said mechanical properties of said structure at said given position.

4,852,398

TIRE TESTING MACHINE HAVING ADJUSTABLE BEAD WIDTH

Barry D. Cargould, Akron, and James C. Beebe, Kent, both of Ohio, assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

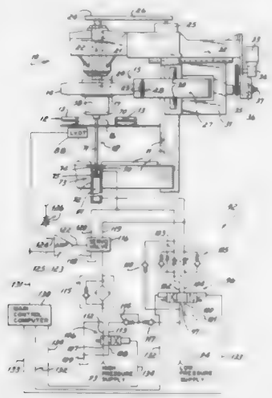
Filed Mar. 9, 1988, Ser. No. 165,814
Int. Cl.[4] G01M *17/02*
U.S. Cl. 73—146 16 Claims

1. In a tire testing machine having an axially-fixed rotatable upper rim, a rotatable lower rim located below said upper rim and means for positioning a tire between said rims, apparatus for positioning the lower rim with respect to the upper rim to the required bead width, comprising:

means for raising said lower rim until the space between said upper and lower rims is less than the required bead width,

means for inflating a tire between said rims while said lower

rim is in the raised position to set the beads on the rims, and



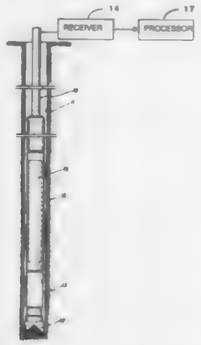
means for lowering said lower rim to the required bead width while said tire is inflated.

4,852,399

METHOD FOR DETERMINING DRILLING CONDITIONS WHILE DRILLING

Ian G. Falconer, The Meadows, Tex., assignor to Anadrill, Inc., Sugar Land, Tex.

Filed Jul. 13, 1988, Ser. No. 218,730
Int. Cl.[4] E21B *49/00*
U.S. Cl. 73—151.5 **14 Claims**



1. A method for monitoring the drilling process while drilling a borehole through subsurface formations with a drill bit, comprising the steps of:

a. generating a signal indicative of the torque applied to the drill bit in the drilling process; and

b. distinguishing between argillaceous, porous and tight formations and generating an indication thereof in response to said signal indicative of torque.

4,852,400

METHOD AND APPARATUS FOR DETERMINING PHYSICAL INTEGRITY OF GEOLOGICAL STRATA

James A. Wingrave, Chadds Ford, Pa., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

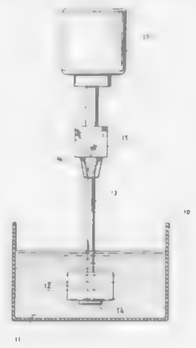
Continuation-in-part of Ser. No. 161,549, Feb. 29, 1988, abandoned. This application Jan. 23, 1989, Ser. No. 300,240
Int. Cl.[4] E21B *49/00*
U.S. Cl. 73—153 **12 Claims**

11. An apparatus for simulating the environment experienced by geological strata during drilling which comprises:

(a) a cup for holding a drilling liquid;

(b) a liquid bath surrounding said cup for indirectly heating or cooling said drilling liquid;

(c) means for immersing a specimen in said drilling liquid which comprises a nail having the specimen attached to



the shank adjacent the head inverted in said cup to hold the specimen below the surface of the drilling liquid; and

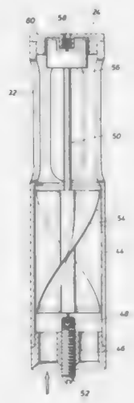
(d) means for spunning said specimen at a predetermined speed while it is immersed.

4,852,401

WELL FLUID FLOW VELOCITY MEASURING APPARATUS INCLUDING A SPINNER CARTRIDGE ASSEMBLY

Andrew A. Hrametz, Rosenberg, and William B. King, Houston, both of Tex., assignors to Halliburton Logging Services Inc., Houston, Tex.

Filed Jun. 20, 1988, Ser. No. 208,436
Int. Cl.[4] E21B *47/10*
U.S. Cl. 73—155 **14 Claims**



1. For use in a well pipe flowing fluid at a velocity to be measured, a measuring apparatus forming an indication of fluid flow velocity which comprises:

(a) an elongate body adapted to be placed in a well pipe subject to flowing fluid to be measured;

(b) fluid flow inlet means at one end of said body for admitting flowing fluid into an axial passage along said body;

(c) fluid flow outlet means spaced along said body in communication with said inlet means to enable fluid flow along said passage;

(d) a registration shoulder along said body;

(e) rotatable spinner means having a range calibrated between specified fluid flow velocities, said spinner means intercepting fluid flow along said passage and converting velocity into spinner means created signals;

(f) a removable insert supporting said spinner means and being registered against said shoulder for alignment in said passage, said removable insert enclosing a magnetic clutch output for connecting said rotatable spinner means for transfer of motion thereby; and

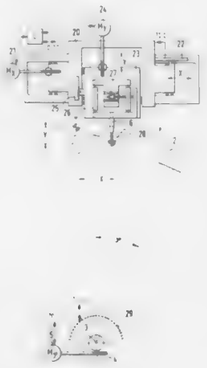
(g) means supported by said body and responsive to said spinner means created signals for forming a fluid flow velocity signal.

4,852,402

METHOD AND APPARATUS FOR CHECKING OR TESTING THE PROFILE OF GEAR FLANKS, PARTICULARLY OF INVOLUTE GEARS

Hans-Ulrich Bertz, Rastatt, Fed. Rep. of Germany, assignor to Willy Höfler, Karlsruhe, Fed. Rep. of Germany

Filed May 11, 1988, Ser. No. 192,787
Claims priority, application Fed. Rep. of Germany, May 26, 1987, 3717666
Int. Cl.[4] G01M *13/02*
U.S. Cl. 73—162 **7 Claims**



1. A method for checking or testing the profile of flanks of a gear tooth of the gear and especially of a tooth having involute shape,

utilizing a gear flank checking or testing apparatus, especially to check gear teeth having involute shape,

said apparatus having

means (4, 5) for rotating the gear (2);

a measuring and sensing head (6, 30, 50);

means for moving said measuring and sensing head in a plane transverse to the axis (3) of the gear (2) being tested, while maintaining the measuring and sensing head in engagement with a selected flank of a gear tooth; and

means (C) for controlling said moving means and said gear rotating means for rolling off the measuring and sensing head against a selected flank of said gear tooth,

comprising the step of

controlling said moving means by said controlling means (C), to move the measuring and sensing head (6, 30, 50) in predetermined paths (35, 36; 65, 66) when the measuring head is in respective engagement with a right gear tooth flank and a left gear tooth flank of a tooth,

which predetermined paths are inclined with respect to each other and intersect with each other at an intersection point (43, 53) outside of a base circle (32, 52) of the gear; and

further place a tangential moving path portion of said controlled movement required, respectively, for engagement with a right flank and left flank of a gear tooth in a region close to said intersection point (43, 53).

6. A gear flank checking or testing apparatus, especially to check gear teeth having involute shape, having

means (4, 5) for rotating the gear (2);

a measuring and sensing head (6, 30, 50);

means for moving said measuring and sensing head in a plane transverse to the axis of the gear (2) being tested, while maintaining the measuring and sensing head in engagement with a selected flank of a gear tooth; and

means (C) for controlling said moving means and said gear rotating means for rolling off the measuring and sensing head against a selected flank of said gear tooth,

wherein said moving means comprises

a first moving means (7, 20) moving said measuring and sensing head in a direction tangential to at least approximately a base circle of the gear;

and second moving means (10, 23) moving the measuring and sensing head in a direction radial with respect to the axis (3) of the gear,

said controlling means (C) controlling movement of the measuring and sensing head in two paths (35, 36; 65, 66) which, when in respective engagement with a right gear tooth flank and a left gear tooth flank of a tooth, are inclined with respect to each other, intersect each other at an intersection point (43, 53) outside of at least approximately the base circle (32, 52) of the gear, and to place said measuring and sensing head at a tangential path portion when in engagement with the right flank and left flank of the gear teeth, respectively, which is located in the region of the intersecting point,

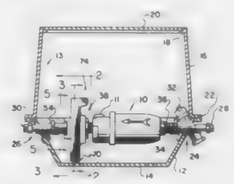
said controlling means (C) additionally controlling the rotating means for rotation of the gear for roll-off of the respective right and left flanks of the gear teeth against said measuring and sensing head.

4,852,403

WATER METER LOCK

James W. Bednarz, 1025 West Crosby, Slaton, Tex. 79364

Filed Apr. 21, 1987, Ser. No. 40,922
Int. Cl.[4] G01F *15/18*
U.S. Cl. 73—201 **10 Claims**



1. The method of locking a meter in a fluid system, said fluid system including:

a. a stationary meter housing having two ends,

b. a bottom, and

c. a top, encasing

d. a fluid meter,

e. an opening in the top of the meter housing,

f. an inlet pipe structurally connected to one end of the housing,

g. an outlet pipe structurally connected to the other end of the housing,

h. said fluid meter connected between the outlet pipe and inlet pipe,

i. a hexagon nut and a hand nut adjacent to one another on the connection of the meter to the one of the pipes structurally connected to the housing,

ii. said meter housing enclosing the meter and the hexagon nut and the hand nut;

wherein the improved process comprises:

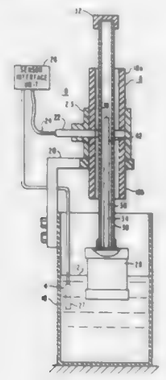
j. locking a cover over the hexagon nut and hand nut,
k. engaging the cover with the hexagon nut, thereby
l. preventing relative rotation between the hexagon nut and the cover,
m. engaging the cover with the and nut, thereby
n. preventing relative rotation between the hand nut and the cover, and
o. engaging the cover with the housing, thereby
p. preventing relative rotation between the cover and the housing.

4,852,404

LIQUID LEVEL DETECTOR

John A. Catanese, Seward, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 15, 1987, Ser. No. 73,607
Int. Cl.[4] G01F *23/68, 23/70*
U.S. Cl. 73—319 **8 Claims**



4. Apparatus, for measuring the level of a liquid, comprising:
(a) a non-metallic, generally vertically-disposed guide shaft;
(b) a metal-detecting proximity sensor disposed proximate said guide shaft at a height along said guide shaft and having an output signal proportional to the radial distance from itself to metal present within said guide shaft at said height;
(c) a float buoyantly disposed on said liquid;
(d) a tube with two ends, one of said ends attached to said float and the other of said ends insertably disposed within said guide shaft; and
(e) a piece of metal, disposed within said tube, having an outer surface whose radial distance to said proximity sensor, at said height of said proximity sensor, changes with changes in said liquid level.

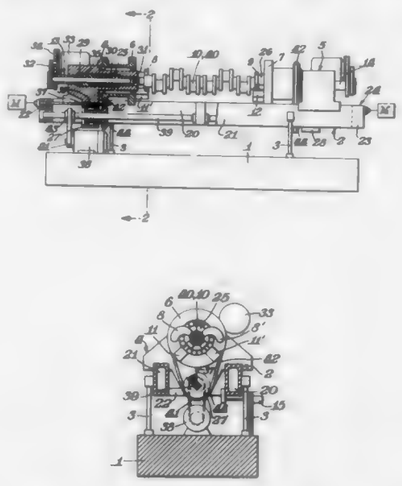
4,852,405

MACHINE FOR MASS-CENTERING ROTORS

Harald Schoufeld, Darmstadt, Fed. Rep. of Germany, assignor to Carl Schenck AG, Fed. Rep. of Germany

Filed Jan. 6, 1988, Ser. No. 141,995
Claims priority, application European Pat. Off., Feb. 13, 1987, #87102010.3
Int. Cl.[4] G01M *1/24, 1/26*
U.S. Cl. 73—461 **7 Claims**

1. A machine for mass-centering rotors comprising a machine bed, a pair of spaced apart headstocks, one at each longitudinal end of the machine bed, adapter disc means connected to each headstock constructed and arranged to support the ends of a rotor being investigated and also to cause the rotor to rotate, at least one guide rail interconnecting and supporting the headstocks, vibration sensing structure connected between the machine bed and the guide rail and separated from the head-stocks for determining the unbalance of the rotor as it rotates, adjuster mechanisms for changing the axis of rotation of the rotor as it rotates, means on each headstock for marking the end faces of the rotor at the axis of rotation thereof which results in less than a predetermined rotor unbalance, at least one of the units comprising the headstock and the means for marking being longitudinally shiftable along the guide rail toward the other to thereby accommodate rotors of varying length, common motor means connected to rotate the adapter disc means of each headstock, each adapter disc means being



rotatably mounted to its associated headstock, belting interconnecting each adapter disc means to the common rotor means, a journalled shaft arranged generally parallel to the longitudinal axis of the rotor under test and connected for rotation by the motor means, a pair of belt pulleys, one near each longitudinal end of the machine bed, slidably mounted on the journalled shaft but connected to rotate with the shaft, and wherein the belting extends between each adapter disc means and its associated belt pulley to rotate the adapter disc means when the motor means is operational.

4,852,406

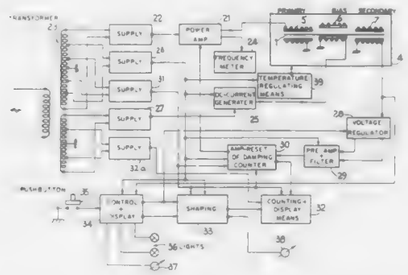
METHOD AND APPARATUS FOR DETERMINING THE COEFFICIENT OF INTERNAL FRICTION OF STEEL OR THE LIKE

Oliver Chrithian, Creil, and Charles Brun, Montataire, both of France, assignors to Usinor Aciers, Puteaux, France

Filed Jul. 10, 1987, Ser. No. 72,253
Claims priority, application France, Jul. 11, 1986, 86 10214
Int. Cl.[4] G01H *11/04, 3/38;* **G01L** *1/14;* **G01N** *27/80*
U.S. Cl. 73—579 **23 Claims**

7. A device for determining the coefficient of internal friction of an elongate specimen of ferromagnetic material, in particular for determining the content of interstitial elements of said material, said device comprising excitation means for electromagnetically imparting longitudinal oscillations to the specimen, means for cutting off the excitation means, means for electromagnetically detecting and counting damped oscillations whose amplitude is equal to at least the initial amplitude

of the oscillations multiplied by a coefficient α, wherein detecting and counting of said damped oscillations occur after said



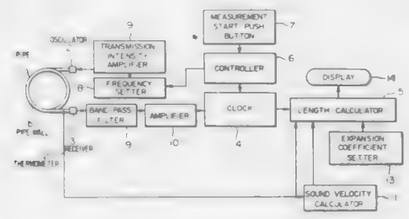
cutting of said excitation and wherein the damped oscillations can be used to compute said coefficient of internal friction.

4,852,407

METHOD AND APPARATUS FOR DETERMINING LENGTH OF PIPE UTILIZING SOUND WAVES

Isamu Komine; Masataka Kobayashi, and Shiro Ariga, all of Tokyo, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1988, Ser. No. 200,764
Claims priority, application Japan, Jun. 24, 1987, 62-155531; May 20, 1988, 63-124291
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—597 **6 Claims**



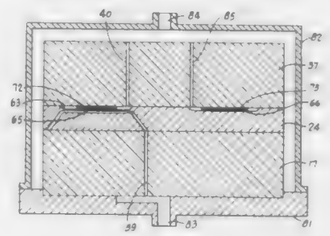
1. In a method for determining a length of a pipe utilizing sound waves, comprising the steps of:
transmitting sound waves having a prescribed frequency and a prescribed transmission intensity toward the interior of a pipe at one end of the length of said pipe;
receiving said transmitted sound waves at the other end of said pipe;
measuring a propagation time required for said sound waves to pass through the air in said pipe from said one end to said other end thereof;
measuring a temperature of the air in said pipe; and
determining a length of said pipe on the basis of a propagation velocity of said sound waves determined on the basis of said measured temperature of the air in said pipe and said measured propagation time of said sound waves;
the improvement comprising:
digitally and intermittently reducing said frequency of said sound waves transmitted toward the interior of said pipe while keeping constant said transmission intensity of said sound waves; and
selecting said frequency of said sound waves transmitted toward the interior of said pipe so that a receiving intensity of said sound waves at said other end of said pipe falls within the range of a prescribed receiving intensity.

4,852,408

STOP FOR INTEGRATED CIRCUIT DIAPHRAGM

Gary G. Sanders, Lakewood, Ohio, assignor to Scott Fetzer Company, Westlake, Ohio

Filed Sep. 3, 1987, Ser. No. 92,608
Int. Cl.[4] G01L *7/08, 9/06, 9/12*
U.S. Cl. 73—718 **22 Claims**



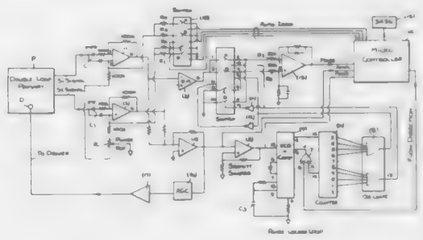
1. A semiconductor transducer comprising, in combination:
a semiconductor base having first and second planar parallel faces;
a cavity formed in said base from said first face to form a deformable diaphragm unitary with said base;
a substrate having a planar surface bonded to said first face of said base;
a physical stop and locator means integral with and carried by said substrate and positioned in said cavity; and
said physical stop and locator means having a stop face substantially parallel to and positioned closely adjacent to said diaphragm to be contactable by said diaphragm upon excessive excursion to prevent rupture thereof, and having lateral sides cooperable with the side walls of said cavity for location within the cavity.

4,852,409

SIGNAL RECOVERY SYSTEM FOR MASS FLOWMETER

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Jun. 9, 1988, Ser. No. 204,565
Int. Cl.[4] G01F *1/84*
U.S. Cl. 73—861.38 **10 Claims**



1. A mass flowmeter of the Coriolis-type having a primary wherein fluid being metered is conducted through a flow tube in the form of a double loop anchored at its inlet and outlet ends and also at its center to define a tuning fork in which the loops on either side of the center function as tines that are free to twist as well as to vibrate, the inlet and outlet ends extending in opposing directions the loops being excited by a driver to vibrate in phase opposition at the resonance frequency of the tuning fork, said resonance frequency being subject to change because of changes in the density of the fluid being metered and other variables encountered under actual operating conditions, the vibrating loops being caused to torsionally oscillate

in accordance with the mass flow of the fluid because the fluid passing through the vibrating loops are subjected to Coriolis forces, a pair of sensors mounted on the respective loops yielding sensor signals having a magnitude and phase that depends on the amplitude of the torsional oscillations, which amplitude is subject to change because of said variables, and a secondary coupled to said primary in the form of a signal recovery system comprising:

A differential amplifier having inverting and non-inverting inputs to which are applied the respective sensor signals to produce an output voltage that is a function of mass flow;

B a microcontroller whose output is coupled to an indicator providing a reading of mass flow, the output voltage from the differential amplifier being applied to an input of the microcontroller, said microcontroller being calibrated to produce an indication proportional to mass flow at the resonance frequency under normal operating conditions of the meter;

C means to derive from said sensor signals a frequency signal and an amplitude signal that reflect deviations in the resonance frequency and in the amplitude of the torsional oscillations resulting from said variables encountered under actual operating conditions; and

D means to apply said frequency signal and said amplitude signal to said microcontroller, the microcontroller in response thereto acting to correct its mass flow indication accordingly to provide an accurate reading of mass flow.

4,852,410

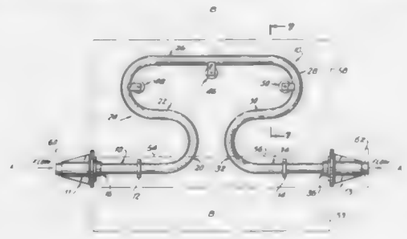
OMEGA-SHAPED, CORIOLIS-TYPE MASS FLOW RATE METER

Michael E. Corwon, and Randy L. Oliver, both of Greenwood, S.C., assignors to Schlumberger Industries, Inc., Atlanta, Ga.

Filed Oct. 3, 1986, Ser. No. 915,085

Int. Cl.[4] G01F *1/84*

U.S. Cl. 73—861.38 **36 Claims**



3. A twin conduit Coriolis-type mass flow meter in which each conduit has at least two flow reversing bends which have opposite angular directions and each of at least two of the flow reversing bends in each conduit changes the direction of flow through the conduit from a first direction to a second direction which is substantially opposite to said first direction, said meter comprising:

a first continuous conduit which has inlet and outlet portions which are substantially coaxial with an oscillation axis and a middle portion which is offset from the oscillation axis and is transverse to a response axis;

a second conduit which is substantially the same as the first conduit and is substantially parallel to and aligned therewith and has respective oscillation and response axes;

wherein each conduit has at least two flow reversing bends which have opposite angular directions and the bends of a conduit are free of torque beams and each of at least two of the flow reversing bends in each conduit changes the direction of flow through the conduit from a first direction to a second direction which is substantially opposite to said first direction;

a drive which oscillates the conduits relative to each other about their respective oscillation axes to cause a relative Coriolis-type response of the conduits about the response axes when fluid flows through the conduits; and

a circuit responsive to said relative Coriolis-type response to provide an indication of mass flow rate through the conduits.

4,852,411

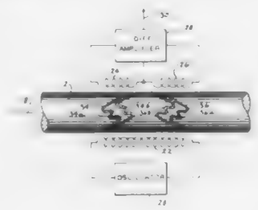
TORQUE SENSOR

Bruce C. Beihoff, Wauwatosa, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 21, 1988, Ser. No. 288,081

Int. Cl.[4] G01L *3/10*

U.S. Cl. 73—862.36 **9 Claims**



1. A torque sensor comprising:

a cylindrical shaft subject to torque;

an electrically conductive loop on said shaft exhibiting changing electrical impedance with changing stress and strain as said shaft is torqued;

means for inducing electric current in said loop;

means for sensing electric current in said loop.

4,852,412

SAMPLING THE CONTENTS OF PRESSURISED VESSELS

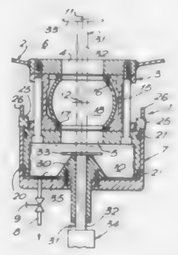
Derek A. Hill, Basingstoke, England, assignor to Baker Perkins PLC, Great Britain

Filed Sep. 30, 1987, Ser. No. 102,873

Claims priority, application United Kingdom, Oct. 3, 1986, [illegible]

Int. Cl.[4] G01N *1/00, 35/00*

U.S. Cl. 73—863.85 **8 Claims**



1. Apparatus for sampling the contents of a pressure vessel, comprising:

a valve having an inlet connectable with the interior of the pressure vessel, and an outlet;

a valve member disposed between the valve inlet and the valve outlet and defining a flow passageway therethrough;

a sample-receiving receptacle sealably connectable to the valve outlet, the receptacle having an interior which is connectable with said passageway by means of said valve member, and which is substantially larger in cross-section than said passageway;

a probe carried by the receptacle and movable relative to the receptacle, the probe having an enlarged rake head, said head formed such that a sample of the vessel's contents can be raked through the valve passageway and into the receptacle; and,

means for atmospherically equalizing the pressure in the interior of receptacle.

4,852,413

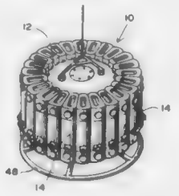
WATER SAMPLER ROSETTE

Shale Niskin, deceased, late of Miami Beach, and by Deborah E. Niskin, executor, 3415 Chase Ave., Miami Beach, both of Fla. 33140

Filed Aug. 17, 1988, Ser. No. 233,014

Int. Cl.[4] G01N *1/12*

U.S. Cl. 73—864.67 **17 Claims**



1. In a water sampler device including a holder, a plurality of water-collecting containers mounted to said holder, each of said water-collecting containers having a pair of opposed open portions, a pair of rotatable valves with one of said pair of rotatable valves being disposed in each of said open portions, means for interconnecting said rotatable valves so that rotation of one of said rotatable valves rotates the other said rotatable valve, triggering means for rotating said rotatable valves from an initially closed condition to an opened condition and then back to said closed condition to collect a sample of water, the improvement in said triggering means comprising:

rod means including a rotation-stopping portion having a first longitudinal axis and further having a first catch means and a second catch means formed therein with said second catch means being disposed a greater distance from one end of said rod means and a greater distance from said first longitudinal axis than said first catch means, said rod means further having a spiral rod portion with a second longitudinal axis;

a rotatable member having a rotational axis and being disposed in surrounding relationship to at least a part of said spiral rod portion with said second longitudinal axis of said spiral rod portion being substantially coincident with said rotational axis of said rotatable member, said rotatable member having traversing means for engaging said spiral rod portion to cause displacement of said spiral rod portion along said rotational axis when said rotatable member is rotated;

torsion means connected between said holder and said rotatable member for applying a torque to said rotatable member;

stop means mounted to said holder for engaging said first catch means in a first stop position to prevent longitudinal movement of said rod means along said first longitudinal axis and for engaging said second catch means in a second stop position to prevent longitudinal movement of said rod means;

lateral movement means mounted to said holder for causing said rotation-stopping portion to move laterally with respect to said first longitudinal axis to disengage said stop means from said first catch means in said first stop position and to engage said stop means with said second catch means in said second stop position and thereafter to disengage said stop means from said second catch means so as to allow said rod means to move to a third stop position; and

coupling means for coupling said rotable member to one of said rotatable valves so that rotation of said rotatable member permitted by longitudinal movement of said rod means between said first stop position and said second stop position allows for said rotatable member to rotate said rotatable valves from said closed condition to said open condition and rotation of said rotatable member permitted by longitudinal movement of said rod means between said second stop position to said third stop position allows for said rotatable member to rotate said rotatable valves from said opened condition to said closed condition.

12. In a water sampler device including a holder, a plurality of water-collecting containers mounted to said holder and disposed in side by side relationship in a circle around said holder, each of said water-collecting containers having a pair of opposed open portions, each of said open portions having a rotatable valve mounted therein, the improvement comprising:

each of said water-collecting containers having a substantially trapezoidal configuration defining a pair of opposed inwardly-angled sides and a pair of opposed end sides consisting of an inner end side and an outer end side, said inner end side being shorter than said outer end side;

each of said water-collecting containers having four corners defined by said trapezoidal configuration, each of said corners being rounded; and

each of said water-collecting containers being disposed in wedged side-by-side relationship around said holder with said inwardly-angled sides of each said water-collecting containers being in abutting relationship with said inwardly-angled sides of other said water-collecting containers.

4,852,414

DEVICE FOR INSERTING AND REMOVING THE SAMPLE IN AN ANALYSIS OVEN

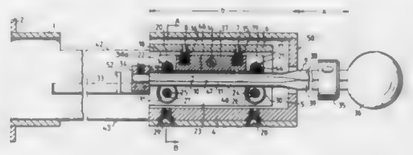
Klaus Gretzinger, Moembris, and Erich Wombacher, Bessenbach, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau

Filed Feb. 17, 1988, Ser. No. 157,329

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1988, 3800184

Int. Cl.[4] G01N *1/28*

U.S. Cl. 73—864.85 **12 Claims**



1. Apparatus for the insertion and removal of a sample in an analysis oven, comprising:

a horizontal carrier tube affixed to the apparatus;

a transport rod mounted horizontally and for longitudinal displacement in the carrier tube along a longitudinal axis thereof;

a sample carrier disposed at one end of the transport rod;

means for driving the transport rod in operative connection with the transport rod, the transport rod comprising a shaped rod having rounded portions and having at least one flat portion extending along the transport rod; and

a slide which is mounted in the carrier tube and which is spring loaded and movable transversely of the transport rod and which has portions which lie on at least one of the group consisting of the flat and the rounded portions and which slide portions hold and guide the transport rod in a

longitudinal movement on the one hand, and on the other hand permit a rotary movement about its longitudinal axis.

4,852,415

INSPECTION MACHINE FOR PLASTIC BOTTLES

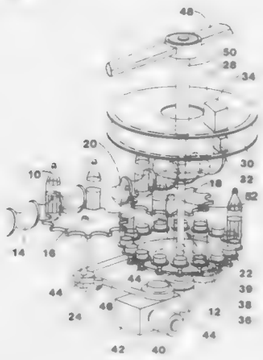
Hans-Ulrich Bogatzki, Zürich, and Felix Kramer, Friedlisberg, both of Switzerland, assignors to Elpatronic AG, Zug, Switzerland

Filed Apr. 18, 1988, Ser. No. 182,790

Claims priority, application Switzerland, May 12, 1987, 01841/87

Int. Cl.[4] G01B *11/00, 11/02;* **G01M** *3/32;* **G01D** *21/02*

U.S. Cl. 73—865.8 **8 Claims**



1. An inspection machine for plastic bottles, having a turntable which is rotatable about a vertical axis and which has a plurality of stations to receive the bottles to be inspected, having sensor devices each consisting of a sensor and a mark to be sensed thereby and for producing corresponding output signals, and having evaluation electronics for processing the output signals, characterized in that

(a) each station (26) comprises a plate (22) on which the bottle (10) is rotatable about a central longitudinal axis thereof, and

(b) all the sensors (21, 21', 92, 94) and the evaluation electronics (34) are secured to the turn-table (12) and rotate jointly therewith.

4,852,416

ULTRASONIC TESTING SYSTEM WITH VARIABLE ANGLE TRANSDUCER MOUNT

Bruce T. Boone, Acworth; Steven Nafziger, Chamblee; Thomas A. Rak, and John A. McMennamy, both of Marietta, all of Ga., assignors to Movats Incorporated, Kennesaw, Ga.

Division of Ser. No. 60,747, Jun. 10, 1987, Pat. No. 4,782,702. This application Jul. 22, 1988, Ser. No. 226,196

Int. Cl.[4] H04R *1/02*

U.S. Cl. 73—866.5 **12 Claims**

1. Ultrasonic searching apparatus for use in locating a valve within a fluid conduit network, said apparatus comprising:

a transducer mount for placement against the conduit, said transducer mount comprising a housing structure and a transducer supporting means for supporting a transducer search unit for movement within said housing structure;

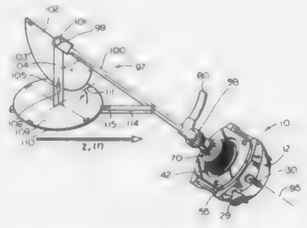
a transducer search unit held by said transducer supporting means, which search unit transmits an ultrasonic signal beam;

beam representing member oriented parallel to the centerline of said signal beam;

plumb means suspended from said beam representing member for defining a vertical axis;

first protractor means for indicating the angle between said beam representing member and said vertical axis;

flow representing member for orientation in a vertical plane which plane is parallel to the direction of fluid flow through the valve; and



second protractor means for indicating the angle between said beam representing member and said flow representing member.

4,852,417

STARTER FOR ENGINE

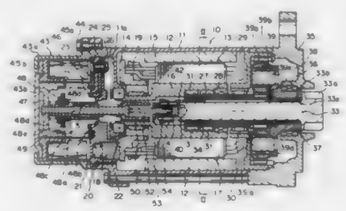
Toshinori Tanaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1988, Ser. No. 168,267

Claims priority, application Japan, Mar. 18, 1987, 62-40548[U]

Int. Cl.[4] F02N *15/06*

U.S. Cl. 74—7 E **25 Claims**



1. A starter for an engine comprising:

a motor means comprising an armature which includes a hollow armature rotary shaft and an armature core mounted on the outer periphery of said armature rotary shaft;

an overrunning clutch means comprising a clutch over member and a clutch inner member, for transmitting the rotative force of said motor means to said clutch inner member, said overrunning clutch means being coaxially disposed within said hollow armature rotary shaft;

said clutch outer member comprising said hollow armature rotary shaft;

said clutch inner member comprising a tubular member coaxially received and rotatably supported within said armature rotary shaft;

an output rotary shaft means coaxially disposed within said clutch inner member and supported slidably in the axial direction;

an epicylic reduction gear train means for transmitting the rotative force of said clutch inner member to said output rotary shaft means without preventing the axial sliding motion of said output rotary shaft;

means for sliding said output rotary shaft in the axial direction.

4,852,418

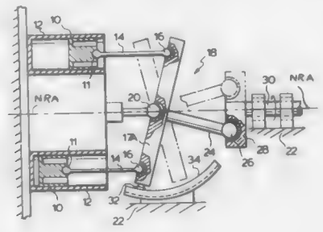
NUTATING DRIVE

Richard J. Armstrong, 17 Alcorn Avenue, 2nd Floor, Toronto, Ontario, Canada M4V 1E5

Filed Mar. 30, 1987, Ser. No. 31,358

Int. Cl.[4] F16H *23/08*

U.S. Cl. 74—60 **7 Claims**



1. Means for effecting conversion between rotary and reciprocating motion, comprising:

a shaft rotatably mounted on a base to define a rotary axis and restricted against axial movement,

a member mounted to be reciprocal on a reciprocation axis approximately parallel to and radially displaced from said rotary axis,

a nutation frame mounted on the base at a fulcrum connection on said rotary axis for limited angular movement relative to its connection about those axes which are perpendicular to said rotary axis, but restricted against cumulative angular movement about said rotary axis, said connection allowing restricted reversing angular movement about said rotary axis,

a rotation connection between said nutation frame and said rotary shaft at a location axially displaced from said nutation frame mounting and radially displaced from said rotary axis,

said rotation connection allowing conversion between rotary movements of said shaft and nutating movement of said frame,

a reciprocation connection between said nutation frame and said reciprocating member at a location radially displaced from said rotary axis and approximately in the plane of said fulcrum,

said reciprocation connection allowing conversion between nutating movement of said frame and reciprocating movement of said member,

said frame rigidly connecting said rotation connection, said reciprocation connection and said fulcrum connection.

4,852,419

CONTROL DEVICE, IN PARTICULAR FOR A MOTOR-VEHICLE FRICTION CLUTCH

Friedrich Kittel; Dieter Lutz, both of Schweinfurt; Franz Nagler, Gädheim; Horst Oppitz, Dittelbrunn, and Gerhard Gasper, Schweinfurt, all of Fed. Rep. of Germany, assignors to Sachs Systemtechnik GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Feb. 26, 1988, Ser. No. 160,646

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1987, 3706849

Int. Cl.[4] F16H *55/22, 21/54;* **F16D** *25/00*

U.S. Cl. 74—99.14 **19 Claims**

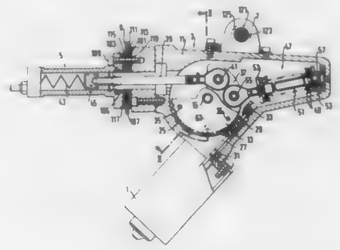
1. A control device, in particular for a motor-vehicle, comprising:

an electric motor having a drive shaft,

a substantially translationally movable output member, a crank gear unit converting the rotational motion of the drive shaft into the substantially translational motion of the output member,

wherein the crank gear unit comprises a gear case forming a combined mechanism with the electric motor, a worm gearwheel pivoted in the gear case, and a worm sitting on the drive shaft of the electric motor and meshing with the worm gearwheel,

wherein the output member is mounted eccentrically to the axis of rotation of the worm gearwheel swivellably on the latter,



and wherein the axis of rotation of the worm and the resultant force exerted by the worm gearwheel on the output member lie substantially in a common plane normal to the axis of rotation of the worm gearwheel.

4,852,420

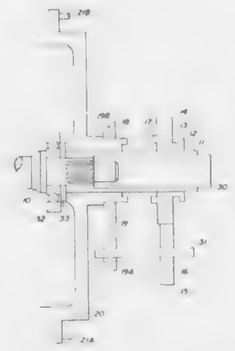
BACKWARD DRIVING DEVICE FOR TRICYCLE

Huan-Sung Cheng, No. 222, 1-Ming Road, Ping-Tzeng Hsiang Taoyuan, Taiwan

Filed Sep. 9, 1987, Ser. No. 94,957

Int. Cl.[4] F16H *3/14*

U.S. Cl. 74—376 **1 Claim**



1. A backward driving device for reversing the rotational direction of a wheel comprising

a drive shaft, receiving power from an engine;

a power transmission shaft, coupled to said drive shaft;

a power transfer gear, coaxially coupled to and slidable on said transmission shaft;

said wheel being coaxially mounted and freely rotatable with respect to said transmission shaft and located between said drive shaft and said transfer gear;

said transfer gear having a shift collar for sliding said transfer gear on said transmission shaft;

said transfer gear and said wheel each having a dog clutch, respectively confronting each other such that said dog clutches are engageable and disengageable with each other by said sliding of said transfer gear on said transmission shaft whereby rotational power from said transmission shaft is directly transferred to said wheel when said dog clutches engage each other so that said wheel rotates

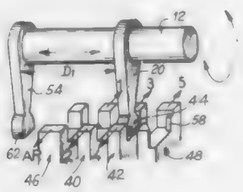
with said transmission shaft in the same rotational direction as said transmission shaft;
an idling shaft arranged parallel to said transmission shaft, said idling shaft having an idling gear and an idling sprocket coaxially mounted on respective ends of said idling shaft;
said wheel being further provided with a coaxial sprocket coupled to said idling sprocket in a manner such that said wheel and said idling shaft always rotate together in the same rotational direction;
said transfer gear being further provided with circumferential teeth for engaging said idling gear when said transfer gear is slid away from said wheel such that said dog clutches are disengaged from each other, said teeth thereby transferring rotational power from said transmission shaft to said idling shaft so that said idling shaft rotates in a direction opposite the direction of rotation of said transmission shaft; the outer periphery of the wheel being provided with a plurality of lugs for mounting a tire rim and tire.

4,852,421

CONTROL DEVICE FOR AN AUTOMOBILE VEHICLE GEARBOX

Güy Kerboul, Maurecourt, France, assignor to Automobiles Peugeot, Paris and Automobiles Citroen, Neilly/Seine, both of, France

Filed May 25, 1988, Ser. No. 198,243
Claims priority, application France, May 25, 1987, 87 07334
Int. Cl.[4] F16H *57/06*
U.S. Cl. 74—476 **8 Claims**



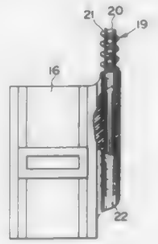
1. A device for controlling an automobile vehicle gearbox which has a case and movable elements for engaging different gear ratios, said device comprising for shifting said movable elements yokes which are substantially parallel to one another and slidable in substantially parallel directions, said yokes including two lateral end yokes, a control shaft which is slidable in a direction substantially perpendicular to said directions of sliding of the yokes, a main finger member mounted on the control shaft to be rotatable and movable in translation with the control shaft, the main finger member being slidable for selecting any one of the yokes and engaging said selected one of the yokes and pivotable for sliding the selected yoke in at least one direction for engaging the respective gear ratio, an auxiliary control finger member pivotable about the axis of the control shaft, driving means interconnecting the two control finger members, the auxiliary control finger member being pivotable about the axis of the control shaft for sliding a first one of said two lateral end yokes in a first direction and causing the engagement of the reverse gear ratio, it only being possible to shift a second one of said two lateral end yokes by means of the main control finger member in the opposite direction for selecting a forward gear ratio of the highest rank, a first transverse abutment cooperative with said first lateral end yoke for preventing the sliding of the first lateral end yoke in said opposite direction, a second transverse abutent cooperative with said second lateral end yoke for preventing the sliding of said second lateral end yoke in said first direction, a ramp being provided on said second lateral end yoke, with which ramp cooperates the main control finger member when the main control finger member is shifted in said first direction for causing its lateral disengagement from said second lateral end yoke and permitting a driving in rotation of the auxiliary control finger member about the axis of said control shaft by said driving means interconnecting the two control finger members.

4,852,422

DRIVING CABLE CONNECTION

Keiji Mori, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 280,368, Jul. 6, 1981, abandoned, which is a continuation of Ser. No. 24,977, Mar. 29, 1979, abandoned.
This application Jul. 20, 1984, Ser. No. 633,006
Claims priority, application Japan, Mar. 30, 1978, 53-3700
Int. Cl.[4] F16C *1/26*
U.S. Cl. 74—502.6 **4 Claims**



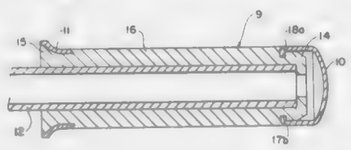
1. A shoe construction for slidably mounting a vehicle roof on a guide rail and for connecting the vehicle roof to a movable driving cable, comprising: a shoe member slidably fitted in a first groove in the guide rail, said member having a lateral extension slidably fitted in a second groove in the guide rail, with a portion of the extension being of circular cross section and being integrally molded about a portion of the driving cable, said portion of the driving cable being of sufficient length to rigidly connect the driving cable to the shoe member.

4,852,423

CAP ATTACHING STRUCTURE OF HANDLE GRIP

Tetsuo Mikami, Fujimi; Yasushi Ohmika, and Hidetoshi Miyazaki, both of Shiki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1987, Ser. No. 124,981
Claims priority, application Japan, Nov. 25, 1986, 61-280305
Int. Cl.[4] B62K *21/26*
U.S. Cl. 74—551.9 **8 Claims**



1. A handle grip for resiliently attaching to a handle tube having a predetermined outer diameter, said handle grip comprising:
a grip body having a predetermined thickness formed of a resilient material and having a first end, a second end and an outer surface extending between said first and second ends;
an inner bore having a diameter slightly smaller than the predetermined outer diameter of the handle tube, said inner bore extending axially within said grip body between the first and second ends thereof;

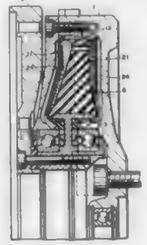
an attaching portion formed in said outer surface of said grip body adjacent to said second end of said grip body, said attaching portion including two engaging grooves formed therein, said engaging grooves extending radially inwardly partially through the thickness of said grip body from said outer surface toward the axis of said inner bore at positions locatd about said inner bore and circumferentially spaced from each other about said axis; and
a cap member including two radially inwardly extending engaging projections, said cap member positioned on said attaching portion with said engaging projections being received within said engaging grooves;
whereby mounting said cap member on said attaching portion and mounting said grip body on said handle tube creates a resilient expansion force at said outer surface due to the smaller diameter of said inner bore of said grip body relative to the predetermined outer diameter of said handle tube for securely retaining said cap to said grip body.

4,852,424

FLYWHEEL ASSEMBLY

Volker Grassmuck; Benno Jörg, both of Weinheim, and Eberhard Sommer, Laudenbach, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

Filed Jun. 29, 1987, Ser. No. 68,180
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1986, 3621997
The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.
Int. Cl.[4] F16F *15/10*
U.S. Cl. 74—574 **26 Claims**



1. In a flywheel assembly comprising a first flywheel ring adapted to be joined to a drive shaft and a second flywheel ring adapted to be joined to a driven shaft, said first and second flywheel rings being mounted for relative rotation coaxially one inside the other, a spring and a damping system for the suppression of rotary vibrations being coupled in parallel between said first and second flywheel rings, the improvement wherein said damping system includes means for damping rotary vibrations between said flywheel rings upon relative rotation of said flywheel rings within a first angular amount, said damping means providing substantially reduced damping of said rotary vibrations when said first angular amount is exceeded.

4,852,425

VARIABLE LENGTH ROD ASSEMBLY HAVING LOCKING ADJUSTMENT MECHANISM

Raymond Stocker, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1987, Ser. No. 138,478
Int. Cl.[4] G05G *1/00;* **F16B** *7/10*
U.S. Cl. 74—586 **11 Claims**

1. A connecting device having an adjustable length, comprising:
an adjuster adapted to support a component of a first mechanical attachment thereon;
first engageable means extending along a portion of the length of the adjuster;
a housing adapted to support a component of a second mechanical attachment thereon;



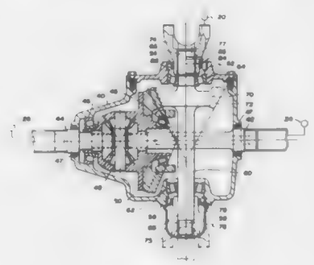
alignment means for fixing the angular position of the housing relative to the adjuster and permitting the axial position of the housing to vary relative to the adjuster; and
locking means having second engageable means for fixing the axial position of the adjuster relative to the housing by mutual engagement of the first and second engageable means.

4,852,426

AXLE DRIVE

Delbert D. DeRees, Romeo, Mich., assignor to American Motors Corporation, Southfield, Mich.

Continuation of Ser. No. 839,798, Mar. 14, 1986, abandoned.
This application Oct. 6, 1987, Ser. No. 105,972
Int. Cl.[4] F16H *57/02*
U.S. Cl. 74—607 **10 Claims**



1. An axle drive comprising:
a housing having a first end and a second end opposite to said first end;
at least one axle shaft and means for rotatably supporting said at least one axle shaft in said housing, each of said at least one axle shaft being aligned on a single longitudinal axis; and
an input shaft having a longitudinal axis, a first end portion adjacent said first end of said housing and a second end portion adjacent said second end of said housing;
means for rotatably supporting said input shaft in said hous-

ing for rotation about said longitudinal axis of said input shaft; and

gear means for coupling said input shaft to said at least one axle shaft;

wherein said means for rotatably supporting said input shaft comprises a first bearing means for rotatably supporting said shaft adjacent said first end portion of said input shaft, and second bearing means for rotatably supporting said shaft adjacent said second end of said shaft; and

wherein each of said first and second ends of said housing includes aperture means for exposing the respective end portions of said input shaft exteriorly of said first and second ends of said housing; and

wherein said first end portion of said input shaft forms a first input means for driving said at least one axle shaft; and

wherein said second end portion of said input shaft forms a second coaxial input means for driving said at least one axle shaft; and

wherein said at least one axle shaft comprises two axially aligned axle shafts, and further comprising differential means for rotatably driving said two axle shafts in response to rotation of said input shaft; and

cover means for interchangeably and for completely covering said aperture means at said first and second ends of said housing.

4,852,427

TRANSMISSION

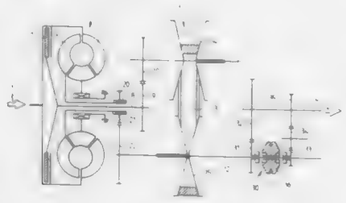
Siebren C. van der Veen, Veldhoven, Netherlands, assignor to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Filed Nov. 30, 1982, Ser. No. 445,748

Claims priority, application Netherlands, Dec. 3, 1981, 8105451

Int. Cl.⁴ F16H *37/00*

U.S. Cl. 74—689 **5 Claims**



1. A transmission, in particular for a vehicle, comprising a hydrodynamic torque converter, a prime mover shaft mounted coaxially with the torque converter, an infinitely variable V-belt transmission unit with a primary and a secondary shaft, an output shaft driven by the secondary shaft through a first gear set, the layout being such that in a first mode the secondary shaft of the V-belt transmission is driven by the prime mover shaft through the torque converter while the V-belt transmission is idle, and such that in a second mode the primary shaft is driven by the prime mover shaft through a mechanical clutch, the prime mover shaft and the torque converter being parallel, but not coaxial, relative to the primary and to the secondary shaft and both the primary and the secondary shaft being driven through gear-wheel transmissions.

4,852,428

INDEXING DEVICE

Katutoshi Haga; Hisatoshi Yoshida, and Yushi Mitani, all of Toyota, Japan, assignors to Fujii Seiko Limited, Japan

PCT No. PCT/JP87/00809, § 371 Date Jun. 13, 1988, § 102(e) Date Jun. 13, 1988

PCT Filed Oct. 22, 1987, Ser. No. 210,518

Claims priority, application Japan, Oct. 22, 1986, 61-251276; Oct. 22, 1986, 61-161717

Int. Cl.⁴ B23Q *16/02*

U.S. Cl. 74—826 **6 Claims**



1. An indexing device including a rotary member supported by a support member such that said rotary member is rotatable about its axis and is axially movable between a first position thereof and a second position thereof, an axial drive mechanism for moving said rotary member in its axial direction, a rotational drive mechanism having a one-way clutch, for rotating said rotary member only in one direction in increments of a predetermined angle, said rotary member being rotated by said rotational drive mechanism, by said predetermined incremental angle, after said rotary member is moved to said first position by said axial drive mechanism, said indexing device comprising:

a stopper mechanism wherein an intermediate member is provided between said support member and said rotary member so that said intermediate member is rotatable about the axis of said rotary member relative to said rotary member and relative to said support member, and is biased by a spring member in a direction opposite to a rotating direction of said rotary member, one of said intermediate member and said rotary member being provided with a plurality of first engaging portions which are equally spaced apart from each other on a circle having a center on the axis of said rotary member, at angular intervals corresponding to said predetermined angle by which said rotary member is rotated, the other of said intermediate member and said rotary member being provided with at least one second engaging portion which engages one of said first engaging portions when said rotary member is placed in said first position, and which is disengaged from said first engaging portions when said rotary member is placed in said second position, said support member and said intermediate member being provided with respective stopper portions, which abut on each other to prevent rotations of said intermediate member and said rotary member when a sum of a rotating angle of said rotary member before engagement of said first engaging portion and said second engaging portion, and a rotating angle of concurrent rotations of said rotary member and said intermediate member as a unit after said engagement, amounts to said predetermined angle by which said rotary member is rotated.

4,852,429

METHOD AND APPARATUS FOR CONTROLLING THE STEPLESSLY VARIABLE TRANSMISSION RATIO OF A CONTINUOUSLY VARIABLE TRANSMISSION, ESPECIALLY OF A CONE DISK BELT TRANSMISSION, IN A MOTOR VEHICLE

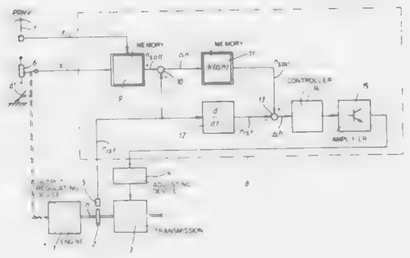
Adolf Künzer, Remshalden, and Thomas Klaiber, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Oct. 21, 1987, Ser. No. 110,866

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1986, 3636463

Int. Cl.⁴ B60K *41/14*

U.S. Cl. 74—866 **22 Claims**



1. A method for controlling a continuously a continuously variable transmission ratio of a continuously variable transmission wherein values representing desired engine rotational speed produced in dependence on a position of a drive pedal of a driving engine control an engine output regulating device and are continuously compared with values representing measured, actual engine rotational speed and in dependence on the magnitude of the difference between the values of desired and actual engine rotational speed, a rapid change of transmission ratio is effected for a large difference and a slower change of transmission ratio is effected as the difference between measured and desired engine rotational speed diminishes such that the change in transmission ratio is terminated when the actual and desired engine rotation speeds are substantially equal, said method comprising the steps of:

(a) determining a desired rate of change of engine rotational speed from a memory having a predetermined stored values which provide a desired rate of change of engine rotational speed as a function of the magnitude of the difference between desired and actual engine rotational speed;

(b) comparing actual rate of change of engine rotational speed with desired rate of change of engine rotational speed; and

(c) providing a control signal as a function of the difference between the desired rate of change and actual rate of change of engine rotational speed to a controller for receiving the control signal and for controlling an adjusting device for adjusting the rate of change of the transmission ratio in response thereto.

4,852,430

BAND SAW STRAIGHTENING APPARATUS

Walter Oppliger, Unterhaltesstrasse 3, CH-3625 Heiligenschwendi, and Jakob Mürl, Bozeneggstrasse 11, CH-5107 Schinznach-Dorf, both of Switzerland

Filed Mar. 4, 1988, Ser. No. 164,099

Int. Cl.⁴ B23D *63/18*

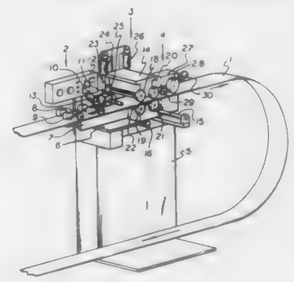
U.S. Cl. 76—27 **11 Claims**

1. A band saw straightening machine for the removal of unevenness in band saw blades comprising:

drive means for moving the blade;

a detector station including sensor means for the detection of unevenness in a blade moving therethrough;

a straightening station including straightening means for removing unevenness in a blade moving therethrough;



a measuring station including rate measuring means for determining the rate of movement of the blade between said detector station and said straightening station; and

control means for causing said straightening means to function a controlled interval after the blade moves through said detector station to act on the blade to straighten it.

4,852,431

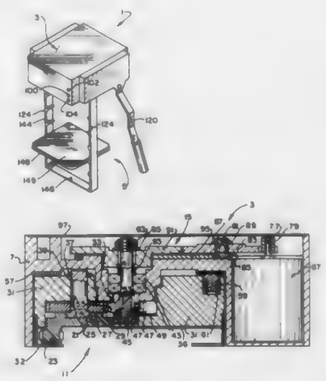
AUTOMATICALLY ADJUSTABLE THREADED CAP LOOSENING APPARATUS AND METHOD

William L. Frangel, 2012 Jeaner La., St. Louis, Mo. 63138

Filed May 9, 1988, Ser. No. 191,996

Int. Cl.⁴ B67B *7/18*

U.S. Cl. 81—3.2 **17 Claims**



1. Apparatus for loosening threaded caps assembled to upper ends of containers, including:

a housing;

rotatable cap gripping and loosening means mounted in said housing;

circumferentially spaced and eccentrically mounted cap gripper elements operatively included in said rotatable cap gripping and loosening means;

gear train means mounted in said housing for rotating said cap gripper elements into circumferential gripping engagement relative to a threaded cap assembly to an associated container;

friction clutch means operatively associated with said gear train means for enabling said cap gripper elements to be rotated into circumferential gripping engagement relative

to such threaded cap assembled to an associated container, said friction clutch means being overcome by torquing force necessary to loosen such threaded cap from its associated container;

said gear train means also being operative after said friction clutch means is overcome for driving said rotatable cap as a unit for imparting circumferential loosening forces to such threaded cap for loosening same from its associated container; and

said rotatable cap gripping and loosening means includes said cap gripper elements, a planetary gear for each cap gripper element which is operatively engageable with said gear train means, and a rotatable outer ring carrying said cap gripper elements which is driven by each of said planetary gears when said friction clutch means is overcome.

4,852,432

BOTTLE CAP OPENER

Manuel de Jesûs Rodríquez Salcedo, c/o Banco de Reservas de la Rep. Dominicana, John F. Kennedy #16, Puerto Plata, Dominican Republic

Filed Oct. 13, 1987, Ser. No. 107,462
Int. Cl.[4] B67B *7/16*
U.S. Cl. 81—3.08 1 Claim



1. A bottle cap opener for a quick release of a bottle cap from the rim of a carbonated drink bottle head, said opener comprising:

a fixed base, including a laterally directed, U-shaped neck embracing hollow portion for laterally receiving a portion of the neck of said bottle below said rim,

a lever pivotaly mounted to and overlying said base, said lever including a front arm having an end abutting said U-shaped hollow portion of said base, and engagable with a lower edge of said bottle cap to the side of said opener proximate to said pivoted handle, a spring mounted to said base and engaging said lever to bias said front arm downwardly and toward from said U-shaped hollow portion, and a magnetic appendix hinged to said U-shaped hollowed portion, to the side thereof diametrically opposite to said pivoted handle and extending in line with said handle for movement between a first position overlying and in contact with the top of said bottle cap, and an upwardly oblique raised portion to permit manual removal of the cap from said magnetic appendix after the cap is removed from the bottle head rim, with a minimum distortion of the bottle cap and permitting recapping of the bottle.

4,852,433

INTERLOCKING BLADE PAIR FOR STRIPPING INSULATED ELECTRICAL CONDUCTORS

John D. Butler, New Berlin, Wis., assignor to Mechtrix Corporation, Menomonee Falls, Wis.

Filed May 18, 1987, Ser. No. 51,722
Int. Cl.[4] H02G *1/12*
U.S. Cl. 81—9.51 22 Claims



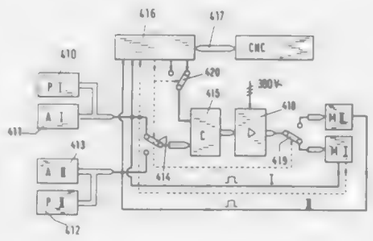
1. A blade having a generally T-shaped transverse cross section defined by a leg portion having opposed leg side surfaces and a leg face, and further defined by a base/cross portion having an outer face, said blade having opposed longitudinal ends, the outer and leg faces extending continuously in respective flat planes between the opposed longitudinal ends, one of the longitudinal ends having an opening extending between the outer face and the leg face, inclusive, said opening being defined by a V-shaped cutting edge lying in the plane of the leg face and having first and second edges that converge toward a longitudinal center line of the blade to terminate in a curved cutting edge at said center line, and further defined by a beveled surface extending from said V-shaped cutting edge to said outer face.

4,852,434

MACHINE TOOL WITH A SLIDING SCREW DRIVE

Hubert Bald, Bad Bereleburg, Fed. Rep. of Germany, assignor to Paul Forkardt GmbH & Co. KG, Erkrath-Unterfeldhaus, Fed. Rep. of Germany

Continuation of Ser. No. 947,502, Dec. 29, 1986, abandoned. This application Apr. 19, 1988, Ser. No. 185,259
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1985, 3546251; Dec. 28, 1985, 3546252; Sep. 6, 1986, 3630441
Int. Cl.[4] B23B *3/00, 7/00, 15/00*
U.S. Cl. 82—118 23 Claims



1. An electrically actuated clamping device for a machine tool having a work spindle and a first motor for driving said spindle, said clamping device comprising:

a sliding screw drive associated with and disposed coaxially relative to said spindle,

a second motor comprising a three phase motor drivingly coupled to said screw drive, and

a control means for continuously regulating energy supply to said second motor, said control means including frequency converter means for feeding said second motor with a three phase current comprised of a magnetizing current component and a torque-producing current component, and said control means further including a computer means for continuously adjusting both said magnetizing and torque-producing components in response to operational conditions of said second motor, and

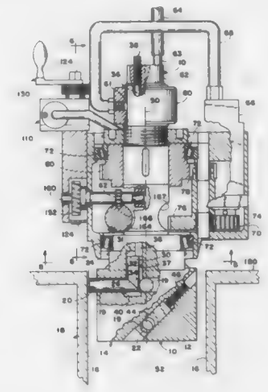
a sensor means for detecting an actual clamping force magnitude to produce an output signal in response thereto and to feed said output signal to said control means which, in response thereto during actuation of said clamping device to produce said clamping force, adjusts said current components after engagement of the clamping device with a workpiece, so as to reduce the speed of said second motor until a predetermined clamping force is achieved.

4,852,435

PORTABLE FLANGE FACER

Christopher Hunt, Newberg, Oreg., assignor to Climax Portable Machine Tools, Inc., Newberg, Oreg.

Filed Aug. 10, 1987, Ser. No. 83,631
Int. Cl.[4] B23B *3/24*
U.S. Cl. 82—113 28 Claims



1. A portable lathe for machining a workpiece, said lathe comprising:

a central spindle and clamping means therefor;

a main body rotatable about said central spindle;

means for rotating said main body about said central spindle;

a cutting element carried by said main body and adapted to machine said workpiece;

a feed cam integral to said central spindle;

a radial feed shaft wherein rotation of said radial feed shaft causes said cutting element to move radially inwardly and outwardly with respect to said central spindle;

an axial feed shaft wherein rotation of said axial feed shaft causes said cutting element to move toward and away from said workpiece;

a feed pump having a feed pump piston connected to a cam follower held against said feed cam such that upon rotation of said main body about said central spindle said feed pump piston causes a flow of a hydraulic fluid in a conduit; and

a feed slave unit coupled to said conduit and having a slave piston responsive to the flow of the hydraulic fluid in the hose and a clutch having a means held against said slave piston such that movement of said lever arm in response to said slave piston is translated into a unidirectional rotation via an output coupler;

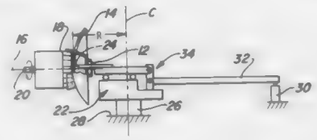
wherein said output coupler is connectable to said radial feed shaft for automatic radial feeding of said cutting element or to said axial feed shaft for automatic axial feeding of said cutting element.

4,852,436

CAM-CONTROLLED TURNING MACHINE

Roland J. Benjamin, Park Ridge, Ill., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 16, 1987, Ser. No. 121,390
Int. Cl.[4] B23B *3/28*
U.S. Cl. 82—19 10 Claims



1. Apparatus for machining an aspheric surface in a workpiece, said apparatus comprising:

a cam surface;

workpiece holder means for rotating a surface of a workpiece about a given axis;

tool assembly means having a cutting tip mounted on one end thereof for removing material from the workpiece, the tool assembly means being pivotable about a pivot axis extending generally perpendicular to and spaced from the axis of rotation of the workpiece, the tool assembly further including a member extending from an opposite end thereof and engaging said cam surface; and means for pivoting the tool assembly about said pivot axis to carry the cutting tip along an arcuate path while substantially simultaneously moving the member along the cam surface; and

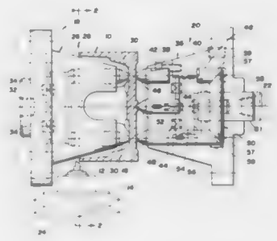
adjustment means for translating movement of the member as it traverses across the cam surface into linear movement of the cutting tip relative to said pivot axis as it moves in its arcuate path to thereby change the instantaneous radius defined by the distance between the cutting tip and pivot axis so that the apparatus can form an aspheric surface in the workpiece.

4,852,437

METHOD AND APPARATUS FOR LOCATING AND CLAMPING A WORKPIECE, SUCH AS A PISTON, PRIOR TO ROTATING SAME IN A MACHINING OPERATION

Robert W. DeBruyne, Warren, Mich., assignor to The Cross Company, Fraser, Mich.

Filed Jan. 29, 1988, Ser. No. 213,192
Int. Cl.[4] B23B *5/24, 23/04, 33/00*
U.S. Cl. 82—165 15 Claims



6. In combination with an apparatus for locating and clamping a workpiece, such as a piston (10, 110), prior to rotating same about a rotary axis (22, 122) in a machining operation, the

apparatus having a first set of axially extending members (46, 48; 146, 148) for applying a first axial force on a first surface of the workpiece in a first direction at non-colinear contact points angularly spaced apart about the rotary axis, and a second set of axially extending members (30, 130) for applying a second axial force on a second surface of the workpiece in a second direction opposite the first direction at non-colinear contact points, the first and second sets of members coacting to at least partially clamp the workpiece therebetween, the improvement wherein:

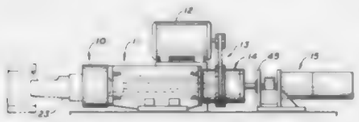
the first set of axially extending members includes two locating members (46, 146) and two equalizing locating members (48, 148) and the second set of axially extending members includes four equalizing driving members (30, 130) directly opposite from the locating members (46, 48; 146, 148) of the first set of axially extending members, wherein the apparatus further includes equalizing means (50, 150) for equalizing the axial force applied by the pair of equalizing members (48, 148) of said first set of members so that the two locating members (46, 146) and the two equalizing locating members (48, 148) effectively provide three non-colinear contact points wherein a locating plane on the first surface of the workpiece is created by the three non-colinear contact points.

4,852,438

GENERATING HEAD CUTTING TOOL

Lee Reiterman, Royal Oak, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Sep. 11, 1987, Ser. No. 95,071
Int. Cl.[4] B23B *3/00*
U.S. Cl. 82—131 13 Claims



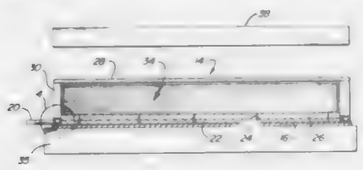
1. Rotary tool comprising rotary tool head, radial feed-out tool slide in said head, rotary motor driven spindle with drive connection to said head, rotary shaft within said spindle, means responsive to differential speeds of said respective spindle and shaft for producing radial feed-out of said tool slide, said responsive means including a mechanical link between said shaft and tool slide responsive to relative rotation of said shaft within said head, and harmonic drive means for producing said differential shaft and spindle speeds.

4,852,439

VACUUM DIE CUTTING METHOD AND APPARATUS

Martin M. Levene, 53 Rusholme Rd., Kitchener, Ontario N2M 2T5, and William W. Lessard, 141 Cornell Ave., Kitchener, Ontario, both of Canada N2G 3E5

Filed Oct. 13, 1987, Ser. No. 107,747
Int. Cl.[4] B26D *7/02*
U.S. Cl. 83—19 22 Claims



1. A method of cutting compressible materials comprising:

(A) providing a generally planar support structure;

(B) providing an upwardly facing cutting edge on said support structure and an upwardly facing closed loop sealing surface on said support structure in surrounding relation to said cutting edge;

(C) positioning a layer of compressible material over said cutting edge;

(D) forming an enclosure over said layer of material and over said cutting edge including a rigid top wall overlying said layer of material, collapsible side walls extending between said top wall and said support structure in circumferentially surrounding relation to said cutting edge and to said layer of material, and a rigid closed loop frame member secured to the lower edge of said side walls and sealingly coacting with said closed loop sealing surface to define a sealed, vertically collapsible chamber totally enclosing said edge and said layer of material;

(E) evacuating air from said chamber to vertically collapse said side walls to an extent to vertically compress said layer of material and substantially reduce its vertical thickness and to press said compressed reduced thickness layer of material downwardly against said edge; and

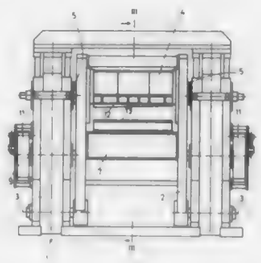
(F) moving said cutting edge through said compressed reduced thickness layer of material to cut a fixed pattern in the material corresponding to the shaped of the cutting edge.

4,852,440

FLYING SHEAR OR STAMPING APPARATUS FOR STRIP MATERIAL

Eberhard Bald, Waldstrasse 14, D-5927 Erndtebruck 2, Fed. Rep. of Germany

Filed Nov. 5, 1987, Ser. No. 117,147
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1986, 3637625
Int. Cl.[4] B23D *25/06;* B26D *1/58*
U.S. Cl. 83—317 3 Claims



1. Apparatus for cutting a moving strip (6) of material, comprising

(a) a frame (1);

(b) an oscillating yoke (2) connected with said frame for pivotal movement about a horizontal axis (3) which is arranged below the strip and which extends perpendicular to the direction of movement of the strip;

(c) a bottom cutting assembly (7) connected with said yoke;

(d) a top cutting assembly (4) guided by said yoke and being vertically displaced relative to said bottom cutting assembly to cut the moving strip transported between said top and bottom cutting assemblies;

(e) a first rotatable eccentric device (5) connected with said yoke and with said top cutting assembly for simultaneously oscillating said yoke and for displacing said top cutting assembly; and

(f) controlled drive means (10) connected with said first eccentric device for rotating said eccentric device at a given speed in accordance with the speed of movement of the strip, whereby the oscillation of said yoke and the displacement of said top cutting assembly are coordinated

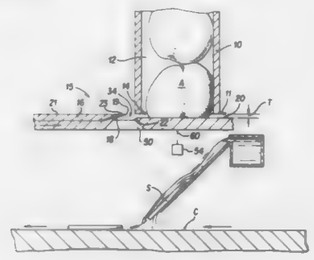
to control the length of successive pieces of strip material cut from the strip by said top and bottom cutting assemblies.

4,852,441

APPARATUS FOR SLICING FOOD PIECES

Gary H. Anders, Euless, and James A. Moran, Jr., Irving, both of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Jul. 22, 1987, Ser. No. 76,406
Int. Cl.[4] B26D *7/06, 3/28*
U.S. Cl. 83—155 24 Claims



1. An apparatus for slicing a food piece and monolayering food piece slices on a conveyor, comprising:

(a) at least one stationary feeding channel for serially feeding food pieces, the feeding channel having a feed outlet through which a food piece passes prior to slicing thereof;

(b) a moving conveyor belt disposed below said feed outlet

(c) at least one moving slicing assembly that includes a first substantially planar support surface on which the food piece exiting the feed outlet rests prior to a slice being cut, the first substantially planar support surface disposed at a distance below the feed outlet about equal to the desired slice thickness; a fixed slicing blade having a cutting edge maintained at a set distance from said first supporting surface and adjacent to said feed outlet to sever a slice from the food piece; the slicing blade being disposed at an angle with respect to said feed outlet, the distance between the first support surface and the edge of the slicing blade defining a slice exit through which individual slices exit the slicing assembly; a blade holder having a second substantially planar support surface contingent to and extending over a portion of said slicing blade and extending in an opposing direction from said first support surface, on which second planar surface said food piece rests while a slice is being cut, the cutting edge of the slicing blade being in the plane of said second planar surface, a slice-throwing surface extending from the slicing blade in the vicinity of the slice exit with a portion of the slicing blade disposed between the slice-throwing surface and the second planar surface, the slice-throwing surface being at an acute angle relative to second planar surface for throwing slices away from the slice exit during movement of the slicing assembly and monolayering said slices on said moving conveyor belt; and

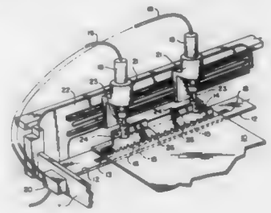
(d) means for moving the slicing blade in a cutting direction past the feed outlet to serially slice a food piece into individual slices and to throw the slices away from the slice exit with the slice-throwing surface so as to monolayer said slices on said moving conveyor belt.

4,852,442

SELF-SHARPENING PERFORATOR FOR PLASTIC FILM

Earl T. Pottorff, 2346 Taylor Rd., Savannah, N.Y. 13146

Filed Mar. 30, 1988, Ser. No. 175,189
The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.
Int. Cl.[4] B26D *7/12;* B26F *1/18, 1/14*
U.S. Cl. 83—697 7 Claims



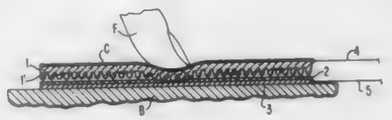
1. In apparatus for perforating a web of plastic film material in which a reciprocal punching head is moved in a direction generally perpendicular to the plane of the film material and passes through the material and through an apertured backing die upon which the plastic film is supported thereby punching a series of slits across the web of film material; the improvement wherein said head is an interchangeable plastic cutting head carried on said apparatus and formed of a plate of a flexible semirigid plastic resin with a plurality of aligned and tapered cutting teeth forming a cutting edge, with spaces distributed at predetermined locations among said teeth, said teeth being beveled to form the cutting edge at a back surface so that said cutting edge is self-sharpening when employed to cut perforations in the plastic film material, said plastic resin being of sufficient resilience that if the head contacts the backing die during a perforating operation, the cutting teeth will resiliently deflect rather than break off, so that the cutting operation can continue.

4,852,443

CAPACITIVE PRESSURE-SENSING METHOD AND APPARATUS

Donald A. Duncan, Cambridge, and Jeffrey B. Tripp, Rockport, both of Mass., assignors to Key Concepts, Inc., Woburn, Mass.

Filed Mar. 24, 1986, Ser. No. 843,054
Int. Cl.[4] G10H *3/14*
U.S. Cl. 84—1.04 42 Claims



1. Apparatus comprising a capacitive pressure sensitive sensor having, in combination, first electrode means comprising a thin resilient conductive plastic sheet formed with a plurality of permanent, spaced, resiliently deformable, conductive projections protruding from one surface thereof and with adjacent regions pressure-deformable by application of pressure at an opposite surface thereof, and a second electrode means facing and coextensive with the projections and separated from the projections by a thin dielectric layer disposed between the projections and the second electrode means, with the first electrode means, the second electrode means, and the dielectric layer being disposed such that the projections may be resiliently deformed and compressed against the dielectric

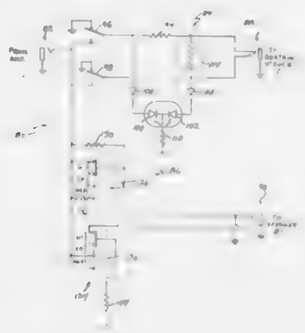
layer by the application of pressure at the opposite surface of said sheet, and with the projections being shaped such that the area thereof against the dielectric layer, and therefore the capacitance of said sensor, changes in a continuous manner with changes in compression of the projections against the dielectric layer due to changes in pressure at the opposite surface of said sheet.

4,852,444

ELECTRO-MECHANICAL TRANSDUCER WHICH COUPLES POSITIVE ACOUSTIC FEEDBACK INTO AN ELECTRIC AMPLIFIED GUITAR BODY FOR THE PURPOSE OF SUSTAINING PLAYED NOTES

Alan A. Hoover, R.R. 2, Box 124, New Palestine, Ind. 46163, and Gary T. Osborne, 6052 North Guilford Ave., Indianapolis, Ind. 46220

Filed Dec. 4, 1986, Ser. No. 937,871
Int. Cl.[4] G10H *3/18, 3/26*
U.S. Cl. 84—1.05 14 Claims



12. A system for feeding back musical note vibrations to a musical instrument to sustain the playing time of the musical note on the instrument, the instrument being sensitive to the phase of the vibrations fed back to it, the system comprising means for conditioning an electrical signal corresponding to the played note to provide a conditioned electrical signal at a level at which the conditioned electrical signal can be fed back to the musical instrument to sustain the playing time of the musical note, means for coupling the musical instrument to the conditioning means, and means for coupling the conditioning means to the musical instrument, the conditioning means including a digital shift registor having an input terminal and an output terminal, an A/D converter, a D/A converter, means for coupling the A/D converter to the input terminal of the digital shift register and means for coupling the output terminal of the digital shift register to the D/A converter, at least one of the input terminal to the digital shift register and the output terminal from the digital shift register being selectively variable for providing a selectively variable time delay for controllably and selectively varying the phase between the played note and the conditioned electrical signal.

4,852,445

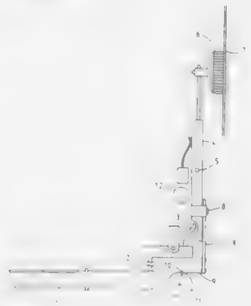
PEDAL MECHANISM FOR KEYBOARD INSTRUMENTS

Denis de La Rochefordiere, 55 rue de Flandre, Paris, France

PCT No. PCT/FR87/00198, § 371 Date Jan. 29, 1988, § 102(e) Date Jan. 29, 1988, PCT Pub. No. WO87/07746, PCT Pub. Date Dec. 17, 1987
PCT Filed Jun. 3, 1987, Ser. No. 162,325
Claims priority, application France, Jun. 6, 1986, 8608177
Int. Cl.[4] G10C *3/00*
U.S. Cl. 84—218 5 Claims

1. In the stringed instrument device such as a piano having a set of strings, a corresponding set of hammers for vibrating the strings, an equal number of mufflers for damping vibration of individual strings and pivotal muffler support means individual to each muffler, the improvement comprising:

a first bar means cooperating with each said muffler support means and making a driving connection therewith for pivoting all aid support means through a first angle to move all mufflers in unison from an unsolicited position to a solicited position,



key means individual to each muffler support means operable to contact and rotate the muffler support means individual to the key means,

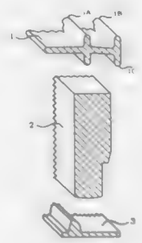
said key means being further operable to break said driving connection between said first bar means and the muffler support means individual to said key means whereby the support means individual to said key means is free to return to said unsolicited position while the balance of said muffler support means and their mufflers remain in the solicited position.

4,852,446

TWO-IN-ONE BANJO TONE RING

Davis E. Kennedy, Drawer F, Athens, W. Va. 24712

Filed Jan. 19, 1989, Ser. No. 298,690
Int. Cl.[4] G10D *1/10*
U.S. Cl. 84—272 5 Claims



1. A tone ring for a banjo comprising: an annular body;

means on said body for supporting said tone ring on a banjo shell;

first means located on one axial side of said body for defining the vibrating portion of a banjo head to have a diameter approximately equal to the inner diameter of the banjo shell for which the tone ring is intended; and

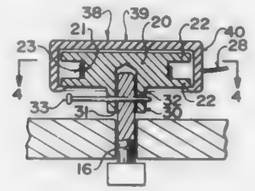
second means located on the other axial side of said body for defining the vibrating portion of a banjo head to have a diameter approximately equal to the outer diameter of said banjo shell, whereby when said tone ring is assembled on said banjo shell with said one side outermost, a raised head type banjo is formed, and when said tone ring is assembled on said banjo shell with said other side outermost, a flat head type banjo is formed.

4,852,447

STRING ARRANGEMENT FOR A MUSICAL INSTRUMENT

Carroll R. St. Denis, 146 Dowling Avenue, Winnipeg, Manitoba, Canada R2C 0Z8

Filed May 16, 1988, Ser. No. 194,140
Int. Cl.[4] G10D *3/00*
U.S. Cl. 84—297 R 2 Claims



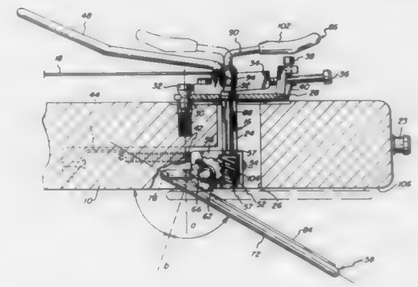
1. A string arrangement for attachment to a musical instrument of the type in which the string, when attached at spaced first and second positions on the instrument and tensioned by adjustment of one of said positions, is vibrated to produce a musical note, said first position on the instrument including a circular cylindrical post having a transverse hole therethrough for receiving a string, the string arrangement comprising an elongate string; and integrally molded, unitary reel member, defining a cylindrical surface around an axis of the reel member and a pair of flanges circumferentially surrounding the cylindrical surface and extending radially therefrom at respective ends thereof, one end of the string being attached to the reel member with the string wrapped around the reel member on the cylindrical surface and between the flanges leaving a free end of the string, said reel member further defining a sleeve member coaxial with said reel member axis and extending axially beyond one flange, said sleeve member having an outer peripheral surface of a diameter less than that of the flanges and an inner recess of a circular cylindrical shape extending axially therealong from an opening on a base surface of the sleeve member lying in a radial plane and remote from said one flange, said recess being shaped to pass over said post at said first position on said instrument, said sleeve member including a transverse hole extending from the outer peripheral surface into said inner recess; a pin member mounted in the hole and having a length such that it extends from the recess to a radial position beyond the diameter of the flanges and a diameter such that it can be pressed in a radial direction through said hole and through said transverse hole in said post; a cover member comprising an integrally molded unitary body having a circular end wall and a cylindrical flange extending axially from the periphery of the end wall, the cylindrical flange fully surrounding the cylindrical surface and extending from the end wall which lies closely adjacent an end face of the other of the flanges to an outermost edge of the cylindrical flange which extends just beyond said one of the flanges, said cylindrical flange and said one flange cooperating to locate said cover member against axial movement away from said reel member, the cylindrical flange including an opening therein through which the free end projects, said opening confining the string for removal from the reel member solely by longitudinal movement of the string caused by pulling of the free end, and means on the free end of the string for attachment of the free end to said second position on the instrument.

4,852,448

BILATERAL TREMOLO APPARATUS

James R. Hennessey, 7 Sunrise Hill Dr., West Hartford, Conn. 06107

Filed Apr. 29, 1988, Ser. No. 187,957
Int. Cl.[4] G10D *3/04*
U.S. Cl. 84—313 26 Claims



1. A bridge block assembly for a musical instrument, comprising:

a bridge block having opposite end portions and having means thereon adapted to pivotally mount said block on a musical instrument body to enable angular shifting of said opposite end portions relative to the instrument body, one of said end portions having means thereon for attaching at least one string;

a first lever having means mounting it on said bridge block, proximate said one end portion, for effecting pivotal movement of said bridge block and for movement of said first lever, relative to said bridge block, between first and second positions;

a second lever having means mounting it on said bridge block, proximate said opposite end portion thereof, for effecting pivotal movement of said bridge block, and for movement of said second lever, relative to said bridge block, between first and second positions; and

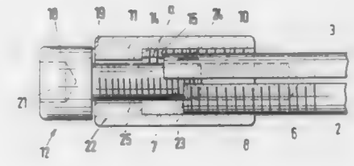
coupling means operatively interconnecting said first and second levers for effecting movement of said second lever between said positions thereof by movement of said first lever between said positions thereof.

4,852,449

NECK ROD MEMBER FOR STRINGED INSTRUMENTS

Walter Zeitler, Rösrau, Fed. Rep. of Germany, assignor to Hans-Peter Wilfer

Filed Dec. 28, 1987, Ser. No. 138,335
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1986, 3644694
Int. Cl.[4] G10D *1/08*
U.S. Cl. 84—293 11 Claims



1. In a neck rod member for stringed instruments having a neck with a free end, the neck defining a blind-end bore open at the free and of the neck, the neck rod member including first

and second oblong rod portions which extend parallel relative to each other and essentially contact one another, the first and second rod portions each having first and second ends, the first ends of the first and second rod portions being fixedly connected to each other, the second ends of the first and second rod portions at the free end of the neck including first means for effectively shortening the length of the first rod portion relative to the effective length of the second rod portion, the neck rod member being inserted into the blind-end bore such that the means for shortening the effective length of the first rod portion is accessible from the opening of the blind-end bore at the free end of the neck, the improvement comprising second means for shortening the effective length of the second rod portion relative to the effective length of the first rod portion, the second means also being accessible from the opening of the blind-end bore at the free end of the neck, wherein the first rod portion is shorter than the second rod portion, the first rod portion having an external thread at the second end thereof, a cap nut being mounted on the external thread, the second end of the second rod defining an end face, the cap nut forming a stop means for the end face of the second rod portion, the second end of the second rod portion having an internal thread, a set screw having an external thread being mounted in the internal thread, the set screw defining a stop means for contacting the cap nut.

4,852,450

FINGERBOARD FOR A STRINGED INSTRUMENT

Ralph Novak, 638 Dowling Blvd., San Leandro, Calif. 94577

Filed Jun. 30, 1988, Ser. No. 214,006
Int. Cl.[4] G10D *3/04*
U.S. Cl. 84—314 R **3 Claims**



1. A fingerboard for a stringed instrument having a sound box comprising:
   a. a neck portion including a surface, said neck portion linked to the sound box;
   b. a plurality of strings passing over a saddle and a nut along said neck portion;
   c. means for tensioning said plurality of strings along said neck between said bridge and said nut; and
   d. a series of frets, each of said frets extending along a straight line, such that at least two of said straight lines are not parallel to one another, such that each of said strings possesses a different scale length, at least three of said straight lines associated with said plurality of strings substantially converging to a point, said saddle and nut extending along straight lines that substantially converge to said point of convergence of said three lines associated with three of said series of strings.

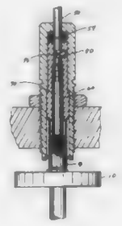
4,852,451

POWDER LEVEL SENSING DEVICE

Ronald O. Rogers, 11932 La Cima, La Mirada, Calif. 90638

Filed Nov. 2, 1988, Ser. No. 266,105
Int. Cl.[4] F42B *33/02*
U.S. Cl. 86—33 **20 Claims**

1. An apparatus for detecting the presence of an insufficient or excessive amount of powder deposited in a cartridge shell and for preventing that improperly loaded cartridge shell from completing the loading process so that any defective condition can be corrected before a safety hazard results from that defectively loaded cartridge shell, comprising:
   a housing adaptable to be mounted on a press frame having upper and lower sections where said upper section has an interior cross-sectional area less than the interior cross-sectional area at said lower section and having a downwardly facing sloping ramp on its interior surface at the change of the two cross-sectional areas;
   a sleeve slidably inserted within said housing having a hole extending radially which is at least partially below the ramp when said sleeve is in its initial position;
   a plunger slidably inserted within said sleeve having a groove thereabout;
   a probe mounted on the lower end of said plunger; and
   a ball within said radial hole having a diameter so that it protrudes beyond the exterior surface of said sleeve when



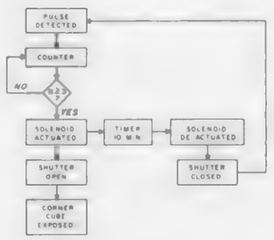
against said plunger and when said sleeve is in its initial position, and when said probe and sleeve are in proper relative positions with respect to each other upon the presence of a properly powder-filled cartridge shell, the ramp will force said ball toward the groove of said plunger so that said sleeve can move upward with said probe and plunger as the cartridge shell contacts and forces upwardly said sleeve, and when said probe and sleeve are not in proper relative positions, said ball cannot move toward the groove and thus is positioned against said ramp so that the sleeve remains in its initial position, thus preventing the entrance of the cartridge shell into said housing.

4,852,452

DEFENSE TO LASER LIGHT IRRADIATION

James D. Barry, Los Angeles, and Chandler J. Kennedy, Huntington Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 6, 1982, Ser. No. 338,198
Int. Cl.[4] F41F *5/00;* **G01D** *5/34;* **G02B** *26/02*
U.S. Cl. 89—1.11 **3 Claims**



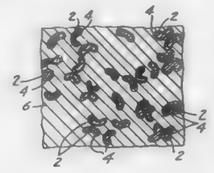
1. A defense system for a unit to protect itself against an attacker which uses a laser beam and an attack sensor detecting reflection of the laser beam to determine the direction and range to said unit; said defense system comprising:
   a plurality of corner cube reflectors each having a shutter and an associated laser illumination detector, with circuit means coupled to the laser illumination detector and to the shutter operative in response to a given condition indicating detection of said beam to open said shutter so that the laser beam is reflected back with power several orders of magnitude greater than would be expected for reflection from said unit, whereby the reflection has sufficient strength to saturate said attack sensor.

4,852,453

CHAFF COMPRISING METAL COATED FIBERS

Louis G. Morin, Tarrytown, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 584,483, Feb. 28, 1984, Pat. No. 4,609,449, which is a continuation of Ser. No. 541,611, Oct. 13, 1983, abandoned, which is a division of Ser. No. 358,637, Mar. 16, 1982, abandoned. This application Jul. 13, 1984, Ser. No. 630,709
Int. Cl.[4] F41F *5/00*
U.S. Cl. 89—1.11 **10 Claims**



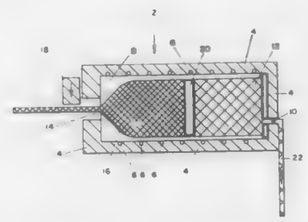
1. A method of reflecting radar comprising dispersing in effective proximity to a radar source an effective amount of a chaff comprising continuous composite fibers, each comprising a semi-metallic core and at least one thin and uniform, firmly adherent, electrically conductive layer of at least one metal on said core, said composite fibers having been chopped into one or more lengths.

4,852,454

METHOD AND APPARATUS FOR DELIVERING ELECTRIC CURRENTS TO REMOTE TARGETS

J. Samuel Batchelder, 412 Benedict Ave., 1A, Tarrytown, N.Y. 10591

Filed Nov. 10, 1987, Ser. No. 119,182
Int. Cl.[4] F41F *1/00*
U.S. Cl. 89—1.11 **20 Claims**



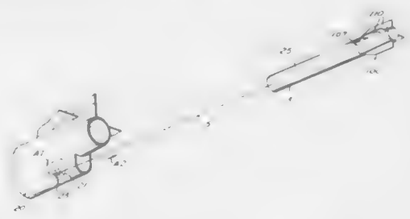
1. A non-lethal weapon for delivering an electric current to a living target, said weapon comprising:
   a housing defining at least first and second separated storage areas electrically isolated from each other for storing an electrically conductive material,
   means for ejecting said electrically conductive material from said weapon in two separated liquid streams, one of said liquid streams being ejected from said first storage area and the other of said liquid streams being ejected from said second storage area,
   means for applying a voltage across said conductive material stored within said first and second storage areas for creating a potential difference across said two separated ejected streams of conductive material;
   said conductive material existing in solid form at ambient temperatures such that said two separated liquid streams are caused to solidify after ejection from said weapon and exposure to ambient temperature.

4,852,455

DECOY SYSTEM

Roger D. Brum, Irvine, Calif., assignor to Southwest Aerospace Corporation, Santa Ana, Calif.

Continuation-in-part of Ser. No. 3,248, Jan. 12, 1987, Pat. No. 4,718,320. This application Jan. 4, 1988, Ser. No. 140,478
Int. Cl.[4] B64D *1/00;* **F41J** *9/08*
U.S. Cl. 89—1.14 **24 Claims**



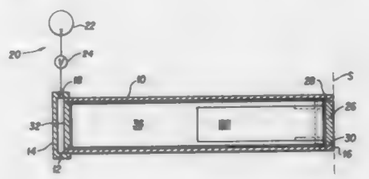
22. A decoy deployment system comprising:
   a housing sized to be stored upon an aircraft;
   a decoy positioned within said housing and adapted to be ejected through one end of said housing;
   a rotatable spool positioned within said housing;
   a towline connected to said decoy and dispensably stored upon said spool; and
   plural roller bearings formed having a contoured exterior surface disposed within said housing adjacent said one end of said housing for contacting said decoy during ejection of said decoy from said housing to accommodate frictional forces exerted upon said decoy arising from aerodynamic side load encountered during ejection of said decoy in directions generally perpendicular to the airstream of the aircraft.

4,852,456

DECOY SYSTEM

Francis L. Thornburg, Sapulpa, Okla., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Oct. 26, 1988, Ser. No. 262,660
Int. Cl.[4] F41F *5/02;* **F41B** *13/42*
U.S. Cl. 89—1.51 **15 Claims**



1. A radar decoy deploying apparatus for an aircraft comprising
   a launch tube having a first, normally closed end and a second end terminating at the skin of said aircraft;
   a decoy dispenser adapted to fit within the launch tube, the dispenser comprising a hollow body containing a length of towline and a length of radar-reflective material connected to a first end of said towline;
   a plug disposed within said tube between said dispenser and

said first end, the other end of said towline being connected to said plug, said plug being moveable from said first end toward said second end;

means for retaining said dispenser within said launch tube; and

means for driving said plug and said dispenser away from said first tube end with sufficient force to expel said retaining means and eject the dispenser from the second end of the launch tube.

4,852,457

SMALL-ARM AND AMMUNITION IN SHOT FORM FOR THE SAME

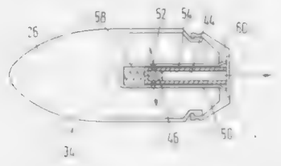
Kurt Schlegel, Zurich, Switzerland, and C. Friedemann Betz, Edertal/Giflitz, Fed. Rep. of Germany, assignors to Obisco Trading & Consulting S.A., Switzerland

Continuation-in-part of Ser. No. 835,226, Mar. 3, 1986, abandoned. This application Jan. 4, 1988, Ser. No. 140,682

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1985, 3507758; European Pat. Off., Feb. 14, 1986, 86 101927.1

Int. Cl.[4] F42C *17/00;* **F41G** *3/06*

U.S. Cl. 89—6.5 **6 Claims**



1. A small-arm device for firing ammunition in shot form, the ammunition having a propelling charge with a propelling charge igniter, and an explosive charge with an explosive charge igniter, said explosive charge igniter having a fixed time lag, said device comprising:

target optics means having a range finder for automatically determining range values between said device and a target;

a trigger unit for operating the propelling charge igniter with a variable time lag;

an electronic control unit coupled to said trigger unit for controlling said variable time lag as a function of said range values supplied by said range finder, said variable time lag being no longer than said fixed time lag, so that the explosive charge has a detonation point close to the target; and

an electrical supply unit providing power for the electronic components.

4,852,458

LIQUID PROPELLANT WEAPON SYSTEM

Melvin J. Bulman, Colchester, Vt., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 16, 1987, Ser. No. 150,351

Int. Cl.[4] F41F *1/04;* **F42B** *5/16*

U.S. Cl. 89—7 **7 Claims**

1. A gun system, for accelerating a projectile disposed in a gun barrel bore, comprising:

a housing;

a gun barrel fixed to said housing and having a bore with an aft portion;

a source of liquid propellant under pressure;

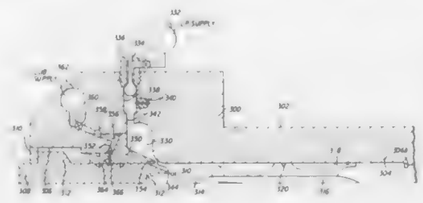
a combustion engine;

means coupled to said source, said combustion engine and said aft portion of said gun barrel bore for providing a flow of liquid propellant from said source into said combustion engine and into said bore aft portion;

means for inserting a projectile into said gun barrel bore forward of said bore aft portion;

means for closing said gun barrel bore aft of said bore aft portion;

said system having a mode of operation wherein liquid propellant is provided by said source into said combustion



engine and into said bore aft portion, and thereafter said combustion engine generates combustion gas which it provides into said bore aft of said aft portion to provide initial acceleration forwardly along said gun barrel bore to the combined mass of the projectile and the liquid propellant disposed in said bore aft portion.

4,852,459

LIQUID PROPELLANT WEAPON SYSTEM

Melvin J. Bulman, Colchester, Vt., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 16, 1987, Ser. No. 150,350

Int. Cl.[4] F41F *1/04;* **F42B** *5/16*

U.S. Cl. 89—7 **3 Claims**



1. A gun system for a projectile comprising:

a housing;

a gun barrel fixed to said housing and having an inner gun bore having a gun axis, a chamber and an aft opening;

an annular regenerative piston journaled for reciprocation along an axis which is coaxial to said gun axis and having a head with a forward face having a relatively small transverse area and an aft face having a relatively large transverse area;

a gun bolt journaled for reciprocation, along an axis which is coaxial to said gun axis, to and between an aft disposition whereat said gun bore aft opening is open, a forwardmost position whereat any projectile carried by said bolt is disposed within said gun bore chamber, and an intermediate position whereat said gun bolt closes said aft opening and is locked with respect to said chamber;

a liquid propellant storage volume defined in part by said piston head forward face;

a combustion chamber defined in part by said piston head aft face;

an injection port intercoupling said storage volume and said combustion chamber;

said piston having an aftmost disposition whereat said injection port is closed and the volume of said combustion chamber is minimized and a forwardmost disposition whereat said storage volume is minimized and said injection port is open;

means for providing liquid propellant to said storage volume, and to said gun bore chamber aft of any projectile therein;

means for providing ignition to said combustion chamber;

said system having a mode of operation wherein the functioning of said means for providing ignition eventuates in the forward movement of said piston and thereby the opening of said injection port and the progressive reduction in volume of said storage volume and the flow of liquid propellant from said storage volume both through said injection port into said combustion chamber and into said chamber; and combustion in said combustion chamber eventuates in the minimization of said storage volume and the flow of combustion gas through said injection port into said chamber to ignite and generate a Taylor cavity in the aft face of the liquid propellant in said chamber aft of the projectile.

4,852,460

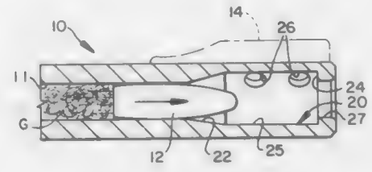
MUZZLE BRAKE SYSTEM

Windell L. Davidson, 729 West Davis, Rawlins, Wyo. 82301

Filed May 4, 1988, Ser. No. 189,962

Int. Cl.[4] F41F *17/12*

U.S. Cl. 89—14.05 **14 Claims**



1. A gun barrel having a longitudinal bore therethrough and having a forward muzzle end, wherein said muzzle end includes an interior chamber which is coaxial with said bore, wherein said chamber has forward and rearward ends, wherein said rearward end of said chamber includes a sloped wall portion which is sloped outwardly toward said forward end at an angle in the range of about 8° to 15° with respect to said bore, wherein said forward end of said chamber includes a wall which is planar and which is perpendicular to said bore, wherein said perpendicular wall has a height of at least about 0.03 inch, wherein said chamber includes a central section connecting said sloped wall at said rearward end and said perpendicular wall at said forward end; wherein said central section includes a wall which is parallel to the central axis of said chamber; wherein said muzzle end of said barrel further includes a plurality of openings therein which communicate with said chamber, wherein said openings are symmetrically disposed in the upper half of said muzzle end to release gases from said bore upon firing, whereby recoil and muzzle jump are prevented.

4,852,461

ARMORED VEHICLE WITH TOP-MOUNTED BARRELED WEAPON

Klaus von Laar, Lauf/Pegn.; Hans Sackenreuter, Ruckersdorf, and Werner Heberlein, Nuremberg, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

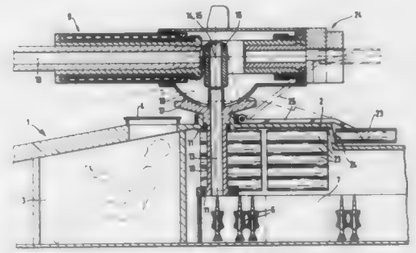
Filed Jul. 7, 1986, Ser. No. 887,180

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524924

Int. Cl.[4] F41F *9/06*

U.S. Cl. 89—46 **4 Claims**

1. An armored vehicle including a top-mounted barreled weapon, a fork-shaped cradle support supporting said barreled weapon on trunnions for elevation about a being trunnion axis; an arrangement for the storage of ammunition and for the infeed of the ammunition to said weapon from a storage magazine; said arrangement including a vertically extending loading tube which is rotatable about its longitudinal axis; a pivotable projectile chamber operatively associated with the barrel of said weapon and which is pivotable from a position in alignment with the bore axis of said weapon barrel into a vertical position extending coaxially with the loading tube independently of the elevation of the barreled weapon, the longitudinal



axis of said loading tube being concurrently the azimuthal axis of the weapon barrel and intersecting with the trunnion axis and the pivoting axis of said pivotable projectile chamber at a single point of intersection, said fork-shaped cradle support being arranged on the end of said loading tube facing said weapon for the receipt of said trunnions, and bearing means for rotatably supporting said loading tube about the longitudinal axis of said tube at the end extending towards said weapon and at the end extending towards the magazine.

4,852,462

OPERATING NOISE-FREE FLUID FLOW DISTRIBUTOR CIRCUIT FOR VARIABLE ASSIST POWER STEERING SYSTEM

Koh Uchida, Sagamihara; Takashi Kurihara, Atsugi, and Makoto Miyoshi, Kawasaki, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 1, 1988, Ser. No. 151,121

Claims priority, application Japan, Jan. 30, 1987, 62-19783

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—375 A **3 Claims**



1. A power assist steering system including a hydraulic fluid source, a fluid reservoir, and a hydraulic pressure operated power cylinder, comprising:

a control valve which defines a fluid flow distributor circuit which includes two parallel first and second fluid flow paths connected between the hydraulic fluid source and the fluid reservoir and includes an inflow control variable flow orifice and an outflow control variable flow orifice

arranged in each of the parallel fluid flow paths to produce a pressure difference in the power cylinder in response to a first predetermined variable, the inflow and outflow control variable flow orifices varying their orifice flow areas depending on the first predetermined variable, wherein at least one of said inflow and outflow variable flow orifices is connected in series with at least one auxiliary variable flow orifice which effects a throttling before said at least one of said inflow and outflow variable flow orifices is substantially closed, and an externally controlled variable flow orifice is arranged in parallel to said at least one of said inflow and outflow control variable flow orifices.

4,852,463

AXIAL PISTON MACHINES WHOSE PISTONS ARE FORMED AS STEPPED PISTONS

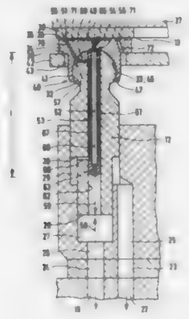
Ludwig Wagenseil, Vöhringen, Fed. Rep. of Germany, assignor to Hydromatik GmbH, Fed. Rep. of Germany

Filed Jul. 1, 1988, Ser. No. 214,506

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1987, 3723988

Int. Cl.[4] F01B *13/04*

U.S. Cl. 91—488 **12 Claims**



1. An axial piston machine whose pistons are formed as stepped pistons and which bound a first cylinder space and at least a second cylinder space, each cylinder space forming a working chamber and communicating with inlet and outlet ports, wherein the pistons are driven on the driving side via an axially displaceable driving surface on which they slide in a sliding bearing with a pressure pocket which is connected to the first cylinder space by a passage, characterised in that the second cylinder space is connected to a second pressure pocket on one of the two sliding surfaces of the sliding bearing by a second passage separated from the first passage.

4,852,464

TWO-STAGE TELESCOPING HYDRAULIC CYLINDER

Günter Bartmann, Holzwickede, and Gerd Bräckelmann, Unna-Uelzen, both of Fed. Rep. of Germany, assignors to Montan-Hydraulik GmbH, Holzwickede, Fed. Rep. of Germany

PCT No. PCT/DE87/00297, § 371 Date Jan. 28, 1988, § 102(e) Date Jan. 28, 1988, PCT Pub. No. WO88/00296, PCT Pub. Date Jan. 14, 1988

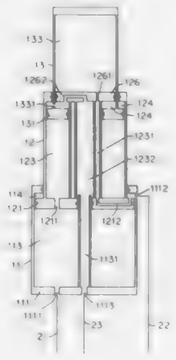
PCT Filed Jul. 2, 1987, Ser. No. 155,722

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1986, 36224243

Int. Cl.[4] F01B *7/20*

U.S. Cl. 92—53 **5 Claims**

1. A two-stage telescoping hydraulic cylinder with two telescoping pistons, one of said pistons sliding back and forth inside the other piston, said telescoping pistons having cylindrical gaps therebetween; said cylinder having a pressure space; a first pressure-medium line communicating with said pressure space; said cylinder having a first stage and a second stage; a second pressure-medium line communicating with a cylindrical gap in said first stage above the bottom of said first stage; said first stage having a pressure space therein; said second stage having a pressure space therein; means for constant communication between said pressure space of said cylinder and said pressure space in said first state; means for constant communication between said pressure space of said first stage and said space in said second stage; an end plate on said first stage and defining said space in said second stage; said first





stage and said second piston forming said cylindrical gap of said second stage, said cylindrical gap having communicating sections; telescoping passage means extending through the bottom of said first stage and the bottom of said second stage to the end plate of the first stage, said cylindrical gap of said second stage communicating with a third pressure-medium line through the bottom of said cylinder and said telescoping passage means; said cylindrical gap of said first stage and said space in said second stage having equal volumes; said pressure space of said second stage and the cylindrical gap of said second stage having substantially equal surface areas.

4,852,465

CARRIER BRACKET FOR POWER CYLINDER

Gary W. Rosengren, Brooklyn Park, Minn., assignor to Tol-O-Matic, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 810,403, Dec. 18, 1985, Pat. No. 4,724,744. This application Feb. 3, 1988, Ser. No. 151,839

The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.

Int. Cl.[4] F01B *29/00*

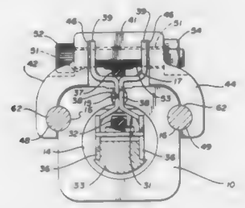
U.S. Cl. 92—88 **10 Claims**

1. A carrier bracket usable with a power cylinder of the type having an elongated cylinder member and a reciprocally mov-

able piston therein for transfering reciprocal movement of said piston to a desired work piece comprising:

a central bracket portion;

a pair of guide arms extending outwardly from said central bracket portion so that the outermost ends of said arms each include an inner surface facing the inner surface of the other of said arms;



each of said guide arms being provided with an elongated guide surface, said guide surfaces of said arms extending generally parallel to one another;

means facilitating the limited flexing movement of at least one of said arms relative to said central bracket portion so as to facilitate the limited selective movement of said arms toward and away from one another; and

means for causing the limited selective movement of said arms toward and away from one another.

4,852,466

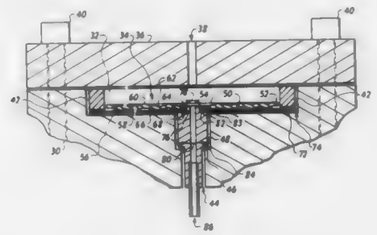
FLOATING DIAPHRAGM APPARATUS

Mark D. Freeman, Wrentham; John L. Koukol, Jr., North Attleboro; Stanislaw Koziol, Wrentham, and George E. Sgourakes, Millis, all of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed May 15, 1987, Ser. No. 50,167

Int. Cl.[4] F01B *19/00;* **F16J** *3/00;* **G01L** *7/00, 7/08*

U.S. Cl. 92—104 **21 Claims**



1. A floating diaphragm apparatus comprising:

(a) a diaphragm having an attachment edge, an inner surface, and an outer surface inside the perimeter of the attachment edge,

(b) a diaphragm support at least coextensive with the diaphragm having an inner support surface opposite the diaphragm inner surface and coupled at a peripheral region thereof to the diaphragm along the attachment edge, thereby forming a diaphragm cavity between the diaphragm inner surface and inner support surface, said diaphragm support being structurally supported at a central region thereof and said peripheral region being free of structural support whereby said peripheral region and the attachment edge of said diaphragm are substantially isolated from structural force transmission, and

(c) a substantially incompressible tube including a fluid passage sealingly linked to the diaphragm cavity to conduct fluid to and from the diaphragm cavity.

4,852,467

SPOOL VALVE FOR CONCRETE PUMPS

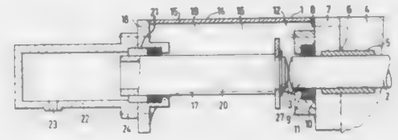
Friedrich Schwing, Gelsenkirchen, Fed. Rep. of Germany, assignor to Friedrich Wilh. Schwing GmbH, Herne, Fed. Rep. of Germany

Continuation of Ser. No. 894,635, Aug. 8, 1986, abandoned. This application Mar. 7, 1988, Ser. No. 166,778

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1985, 3528746

Int. Cl.[4] F01B *29/00;* **F16J** *1/10*

U.S. Cl. 92—128 **6 Claims**



1. In a pump for pumping concrete which has a spool valve for controlling the flow of concrete and wherein the concrete has a number of fine particles therein, the spool valve having a valve casing (4), at least one slide rod (2) mounted for reciprocal axial movement in the valve casing (4) to control the flow of concrete therethrough with each outer end (3) of the slide rod (2) extending out of the valve casing (4), guide bushing means (5) within the valve casing (4) for supporting the slide rod (2) adjacent each outer end (3) thereof, drive means for alternatively pushing on each outer end (3) of the slide rod (2) which includes, for each outer end (3) of the slide rod (2), a driving cylinder (22) and an associated working piston (20) reciprocally mounted therein with the piston (20) aligned for selective axial engagement of a distal end (27) thereof with its respective outer end (3) of the slide rod (2), the improvement which comprises:

annular slide rod seal means (9) retained on an outer surface of the valve casing (4) and surrounding the slide rod (2) proximate each outer end (3) thereof for limiting the escape of fine particles of concrete out of the valve casing (4) along the slide rod (2) as the slide rod (2) is pushed out of the valve casing (4) and for cleaning any fine particles of concrete which have escaped off of the slide rod (2) as the slide rod (2) is pushed back into the valve casing (4) thereby preventing a buildup of concrete along the slide rod (2) at the guide bushing means (5) within the valve casing 4;

each outer end (3) of the slide rod (2) and its respective distal end (27) of the piston (20) axially and loosely abutting in operative connection with the piston (20) being retractable within its driving cylinder (22) to create an axial separation between the outer end (3) of the slide rod (2) and the distal end (27) of the piston (20) of size to permit insertion and removal of the annular slide rod seal means (9) over the outer end (3) of the slide rod (2); and

the outer end (3) of the slide rod (2) and the distal end (27) of the piston (20) being freely accessible from outside the spool valve on at least one side thereof and at all positions of abutting operative connection of the slide rod (2) and piston (20).

4,852,468

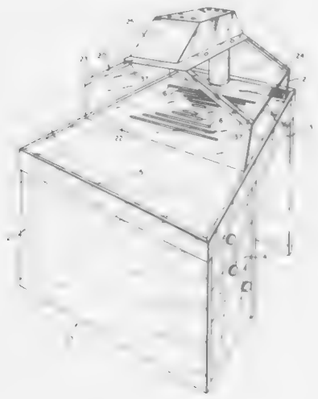
WORK STATION WITH FUME COLLECTING MEANS

Mickey Harris, HCR 61 Box 3, Sumerduck, Va. 22742

Continuation of Ser. No. 902,770, Sep. 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 766,016, Aug. 15, 1985, abandoned. This application Mar. 29, 1988, Ser. No. 174,875

Int. Cl.[4] B08B *15/02*

U.S. Cl. 98—115.3 5 Claims



1. A ventilated work station for sculpting fingernails, comprising:

a flat, horizontal work platform supported at its opposite ends on pedestals;

one of said pedestals containing at least one drawer for storing tools and supplies;

ventilation slots formed in one end portion of said platform over a work area thereof for conveying heavier than air fumes downwardly through the platform;

a collector beneath said slots for collecting the fumes conveyed downwardly therethrough;

a transparent ventilation hood supported on top of said platform for confining to the area beneath the hood those fumes emitted during a nail sculpting process performed in the work area, said hood extending over and covering only that portion of the platform defining the work area and having the slots therein, whereby a portion of said platform remains free for placement of tools and supplies used in a nail sculpting process, said hood having opposite end walls with bottom edges thereof engaged on top of said platform, and downwardly sloping top walls extending at bottom edges thereof to closely spaced positions above the platform, defining with said platform low profile access slots on opposite sides of the platform through which a nail technician and a customer, respectively, can insert their hands for sculpting fingernails on the hands of the customer, the transparent sloping top walls enabling the technician and customer to view the work area and defining a collector for collecting lighter than air fumes emitted during the nail sculpting process;

duct means connected to the collectors for conveying fumes away from the work area; and

exhaust fan means connected with the duct means for producing a low pressure in the work area beneath the hood for drawing away the fumes collected during a nail sculpting process.

4,852,469

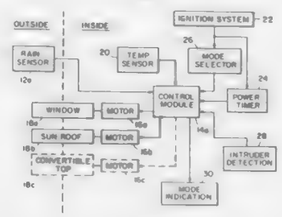
AUTOMATIC VENTING SYSTEM

Cliff L. Chuang, 114 Crawford St., Lowell, Mass. 01854

Filed Feb. 18, 1988, Ser. No. 157,850

Int. Cl.[4] B60H *1/24*

U.S. Cl. 98—2.01 19 Claims



1. An automatic venting system for a vehicle, comprising:

means for sensing precipitation;

means for determining the temperature of the interior of the vehicle;

a plurality of venting elements in communication with the interior of the vehicle;

drive means for operating each of said venting elements; and

control means, responsive to said means for sensing and said means for determining, for commanding in a first mode each said drive means to open its corresponding venting element when the interior temperature rises above a preselected threshold to accomplish venting of the vehicle, and for commanding each said drive means to close its corresponding venting element when precipitation is detected and for commanding in a second, security mode each said drive means to immediately close its corresponding venting element regardless of whether precipitation is sensed.

4,852,470

AIR DISPERSER FOR AIR CONDITIONER/HEATER DUCTS

Joseph A. Corriveau, 17339 Wiltshire Blvd., Southfield, Mich. 48076

Filed Jul. 19, 1988, Ser. No. 221,370

Int. Cl.[4] F24F *7/06*

U.S. Cl. 98—39.1 7 Claims



1. An air disperser for attachment to the air outlet delivering cool and warm air to a room comprising

housing means having an elongated internal flow passage, said housing means being arranged to be positioned with said internal flow passage being oriented along a vertical axis,

said housing means forming a lower opening for receiving air flow from an air outlet disposed in a lower portion of the room and delivering cool or warm air to the room,

attachment means for affixing the housing means against a wall or floor of the room with said lower opening in alignment with the air outlet,

said housing means further having a upper vent opening mounted in an upper portion of the room above said lower opening for dispersing cool air into the room, and

fan means positioned above at least a portion of said air outlet in said flow passage for boosting the velocity of cool air in an upward direction for directing the cool air to said upper vent opening for dispersion into a upper portion of the room.

4,852,471

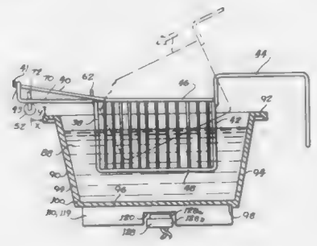
SEMIAUTOMATIC FRYING MACHINE AND AIR FILTER APPARATUS THEREFOR

James P. Lansing, St. Cloud, Minn., assignor to JVJ Enterprises, Inc., St. Cloud, Minn.

Filed Nov. 10, 1987, Ser. No. 119,785

Int. Cl.[4] A47J *37/12*

U.S. Cl. 99—330 5 Claims



1. Semiautomatic frying apparatus comprising:

a food-carrying basket having a forward mounting lip and a rearward handle;

an elongated basket-supporting shaft having lip-engaging means for selectively engaging and disengaging said basket lip as said basket is moved in generally forward and rearward directions, respectively;

means for mounting said shaft for rotation in opposite directions;

rotation means for rotating said shaft in opposing directions between first and second positions in response to first and second rotational control signals;

vessel means for holding a liquid cooking medium, said vessel means spaced from said shaft so that a basket having the lip thereof engaged with said lip engaging means is at least partly immersed in said liquid cooking medium when said shaft is in said first position an is removed from said liquid cooking medium when said shaft is in said second position;

enclosure means beneath said vessel means;

heating means for heating the liquid cooking medium in said vessel, including a generally plate-like member having an upper vessel-engaging surface dispose below said shaft and an internal electrical heat source, said plate-like member cooperating with said inclosure means to form a downwardly extending cavity therewith, said plate-like member defining a downwardly facing recess opening into said cavity and said heating means including at least one temperature sensor in said recess for sensing the temperature of said heating means and disposed adjacent said cavity so as to sense the temperature of the air thereat;

control means including means for initiating an input signal, and means responsive to said input signal for initiating a sequence of first and second control signals for rotating said shaft so as to bring said basket into and out of engagement with said liquid cooking medium; connecting means for transmitting said first and second control signals from said control means to said rotating means;

air ventilation means at least partly surrounding said vessel for inducing a flow of air for withdrawing cooking vapors rising from liquid cooking medium disposed in said vessel and for inducing a flow of air through said cavity and across said temperature sensor; and

door means adjacent the front of said plate-like member, movable between an open position for allowing air flow through said cavity and across said at least one temperature sensor and a closed position for blocking air flow through said cavity and across said at least one temperature sensor.

4,852,472

APPARATUS FOR PREPARING COFFEE

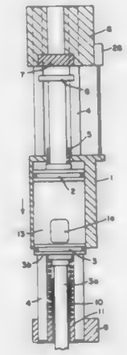
Jean-Paul In-Albon, Rue des Pontets, CH-1917 Ardon, and Heinz-Anton Eicher, Säntisstrasse 19, CH-8640 Rapperswil, both of Switzerland

Filed Jul. 14, 1988, Ser. No. 218,992

Claims priority, application Switzerland, Jul. 17, 1987, 2720/87

Int. Cl.[4] A47J *31/34*

U.S. Cl. 99—289 R 10 Claims

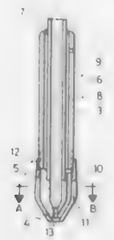


1. An apparatus for the preparing of coffee in an automatic coffee-percolator, including a scalding cylinder intended for receipt of ground coffee, including further a first and a second piston and piston rods belonging thereto, which pistons are allocated to said cylinder and are movable relative to each other along the axis of said cylinder and operative to define a scalding chamber and to compress ground coffee filled thereinto, which first piston closes off one of the ends of the cylinder and which second piston is movable between a working piston inside said cylinder and a working position outside of latter such to clear the other end of said cylinder allowing said first piston to push the used ground coffee out, including further means for feeding water or steam and for discharging the coffee prepared, said apparatus comprising a driving device operative to move said scalding cylinder back and forth between predetermined positions in a controlled manner along at least one longitudinal guide along its axis, which cylinder moves in the one of the directions of movement over the substantially resting second piston and positively carries thereby the first piston along until the filled in ground coffee is compressed under a predetermined force between the two pistons, and moves off said second piston when moving in the opposite directions of movement and clears the corresponding end of said cylinder and shifts relative to said first piston locked in a predetermined position such that it urges the used portion of ground coffee out of the free end of the cylinder.

4,852,473
WATER VAPOR RELIEF DEVICE FOR DOMESTIC COFFEE MAKERS

Domingo F. Azpitarte Bolivar, Durango Vizcaya, Spain, assignor to Oficina De Investigacion Agrupada, S.A, Eibar, Spain

Filed May 9, 1988, Ser. No. 192,232
Claims priority, application Spain, Dec. 3, 1987, 8703782
Int. Cl.[4] A47J *31/46*
U.S. Cl. 99—293 3 Claims

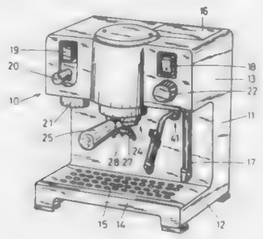


1. A water vapour relief device for domestic coffee makers, comprising a first tube connected to a vapour generator of the coffee maker, said tube having a free end terminating in a small outlet hole through which said vapour emerges to the outside, a second tube coaxial with and surrounding said first tube to define therebetween a chamber provided with a hole for admission thereinto of surrounding air, and an auxiliary conduit located close to the outlet hole of the first tube and inclined such that the water vapour, due to an outlet pressure thereof, generates, through the Venturi effect, a suction on said auxiliary conduit, such that the device as a whole supplies a mixture of water vapour and air which creates, in a liquid wherein the device is submerged, such as milk, the bubbling which generates a foam.

4,852,474
ESPRESSO MACHINE WITH CAPPUCCINO MAKING ATTACHMENT

Gotthard C. Mahlich, Kronberg, and Michael Borgmann, Solingen, both of Fed. Rep. of Germany, assignors to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 100,339, Sep. 23, 1987, Pat. No. 4,800,805. This application Sep. 9, 1988, Ser. No. 242,715
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632375; Dec. 24, 1986, 3644519; Sep. 12, 1987, 3742203
Int. Cl.[4] A47J *31/40*
U.S. Cl. 99—293 23 Claims

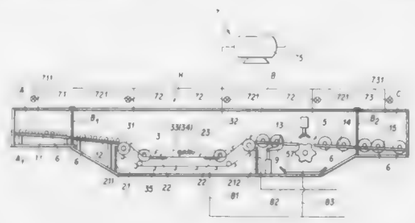


1. An expresso machine comprising a source of steam; steam supplying first conduit means having at least one steam discharging orifice; air supplying second conduit means having at least one air-admitting inlet and at least one air-discharging outlet adjacent said orifice so that steam which issues from said orifice draws air from said second conduit means by way of said outlet; and means for regulating the flow of air into said second conduit means by way of said inlet, said regulating means comprising a valving element movable with reference to said second conduit means between a plurality of positions in each of which said inlet communicates with the surrounding atmosphere to a different extent.

4,852,475
CONTINUOUS PROCESSING MACHINE ASSEMBLY FOR FRYING RAW MATERIALS

Chen-shi Yang, No.2, Lane 1558,Ming Chueng E. Road, Taipei, Taiwan

Filed Apr. 25, 1988, Ser. No. 185,890
Int. Cl.[4] A47J *37/12*
U.S. Cl. 99—404 12 Claims



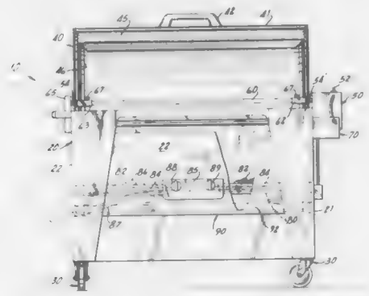
1. A continuous processing machine assembly for frying raw materials comprising:
an outer housing having a pair of airtight gates locationally positioned at an entrance section and an egress section respectively; a plurality of sectionally disposed rails longitudinally extending from said entrance section to said egress section of said outer housing and said rails being downwardly inclined;
a frying mechanism disposed in an interval between two sections of said rails including an oil pool containing heated oil and conveyer facility means having spaced end rollers and endless conveyer belts installed parallel to each other on said end rollers for displacing said raw materials;
a plurality of pairs of hook members longitudinally spacedly and transversely correspondingly secured on said conveyer belts;
an oil escapement mechanism disposed in an interval between two sections of said rails downstream of said frying mechanism including seizing means and drive gear means for separating said oil from said raw material;
an air suction apparatus with pipes connected to said outer housing; and
a plurality of cylindrical containers filled with well-prepared raw material, each of said containers including a cylindrical outer case formed of wire net and having a port hole, a corresponding cover, and two shafts axially projecting from the side walls of the outer case, each of said shafts having a gear rigidly sleeved thereon.

4,852,476
BARBECUE APPARATUS

Raymond Sanchez, 8235 SW. 46 St., Miami, Fla. 33155

Filed May 16, 1988, Ser. No. 194,564
Int. Cl.[4] A23L *3/00*
U.S. Cl. 99—443 R 7 Claims

1. A barbecue grill for cooking food items, comprising:
A. a housing member defining a compartment;
B. a heat source assembly mounted within said compartment;
C. means for supporting said food items within said compartment;
D. means for lifting and lowering said heat source assembly including a bar member that is positioned above said heat source assembly and further includes at least two wire means wound around said bar substantially at its ends and said wire means having two ends, one of said ends of each of said wire means being attached to said heat source assembly at one point and the other end being attached to another point in said heat source assembly and including at least one pulley means for each one of said wire means so arranged and constructed that said heat source assembly is lifted and lowered uniformly by rotating said bar;
E. means for covering said compartment at said top end; and

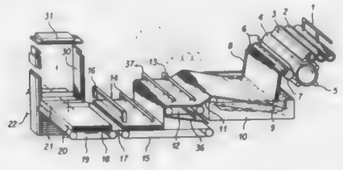


F. first electric motor means for driving said bar and said first electric motor means being of the reversible type and including single pole double throw switch means for activating it in either direction, and further comprising normally closed switch means in series with the connections from each of the two positions of said double throw switch means and said normally closed switch means positioned in said housing member so that they are interrupted by movements of said heat source assembly thereby limiting its travel.

4,852,477
APPARATUS FOR THE MANUFACTURE OF TEXTURED MEAT AND FISH PRODUCTS

Reinhard Schubring; Juergen Witt; Irene Harwardt; Sigrd Neumann, all of Rostock; Christoph Schneider, Kleinmachnow; Gerhard Mieth, Potsdam; Wolfgang Raue, Rostock, and Juergen Brueckner, Bergholz-Rehbruecke, all of German Democratic Rep., assignors to Institut fuer Hochseefischerei und Fischverarbeitung-Betrieb des VEB Fischkombinat Rostock, Rostock, German Democratic Rep.

Division of Ser. No. 90,068, Aug. 27, 1987. This application Aug. 11, 1988, Ser. No. 232,065
Claims priority, application German Democratic Rep., Dec. 3, 1986, 296986; Mar. 6, 1987, 300512
Int. Cl.[4] A23P *1/00*
U.S. Cl. 99—450.2 9 Claims

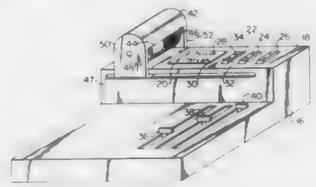


1. An apparatus for texturizing muscle flesh, comprising a rolling system including a plurality of cylinders for rolling a mass of comminuted muscle flesh into a sheet of dough, means for rotating the plurality of cylinders at differential speeds, rotating drum means for thermally threating the sheet of dough, immersion bath means for containing a stabilizing solution, endless conveyor means for conveying the sheet of dough from the rotating drum through the immersion bath means, first spraying means for removing stabilizing solution from the sheet of dough, second spraying means for applying a fluid to the sheet of dough, and folding means for folding the sheet of dough into a plurality of laminated layers.

4,852,478
APPARATUS FOR IMPRINTING A DOCUMENT WITH SECURE, MACHINE READABLE INFORMATION

James L. Young, Alexandria, Va., and James M. Patterson, Jr., Norwell, Mass., assignors to Data Card Corporation, Minneapolis, Minn.

Filed Mar. 24, 1987, Ser. No. 30,627
Int. Cl.[4] B41F *19/02, 1/24*
U.S. Cl. 101—18 12 Claims



1. An imprinter for imprinting a document with two rows of alphanumeric characters having the same character configurations and the same informational content wherein one of the rows is substantially tamperproof and the other is machine readable, comprising:
a base including a print bed;
a printing member including at least two rows of raised alphanumeric characters extending above said printing member;
a first print roller member;
a second print roller member;
a document adapted to be positioned over said printing member;
means for effecting relative movement of said first and second print roller members with respect to said printing member to thereby imprint on said document two rows of imprinted alphanumeric characters having corresponding characters and relative character positions in the respective rows;
at least one of said first and second print roller members and said printing member including paper-embossing formations producing protrusions in said document where one of said two rows of imprinted characters are imprinted thereon so that said one row of imprinted characters are rendered substantially tamperproof, said one row of imprinted characters being of poor print quality because of the deformation of said document; and
means for making the print quality of the other of said two rows of imprinted characters imprinted on said document substantially better than that of said one row of imprinted characters.

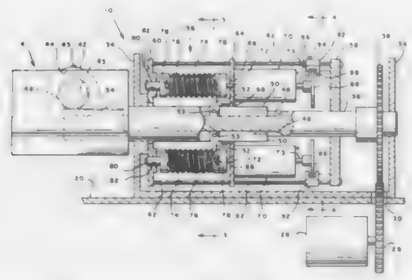
4,852,479
POSTAGE METER HAVING A WORM GEAR DRIVE

David W. Hubbard, Stamford, Conn., assignor to Pitney Bowes Inc., Stamfod, Conn.

Filed Dec. 7, 1987, Ser. No. 129,638
Int. Cl.[4] B41J *1/22*
U.S. Cl. 101—91 14 Claims

1. A postage meter for printing selected value amounts on a mail piece, comprising:
a support,
a plurality of value print devices individually rotatably mounted by said support,

each of said devices having a plurality of value printing elements on the perimeter thereof,
a plurality of worm gears rotatably supported by said support means,
a plurality of means for connecting said worm gears with said value print devices to rotate said value print devices individually upon rotation of each of said worm gears,
each of said connecting means having a follower received within the helix of one of said worm gears,
means for rotatably driving said worm gears,



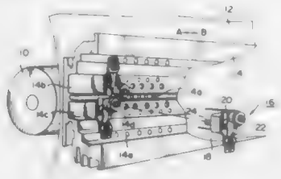
each of said worm gears having a helix with a varied pitch causing a follower received within said helix to move 0 to 20% its distance of travel during the first and last 90 degrees of rotation of said worm gear and travel 30 to 50% of its distance of travel during the middle two 90 degrees of rotation of said worm gear, and
means for supporting a mail piece with said value print devices whereby a portion of said value printing elements will be in engagement with the mail piece.

4,852,480

DOT LINE PRINTER WITH INDIVIDUALLY REPLACEABLE PRINTING HEAD

Masao Kunita; Michio Koizumi, and Seiichi Ohsawa, all of Saitama, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 159,501, Feb. 16, 1988, abandoned, which is a continuation of Ser. No. 935,145, Nov. 25, 1986, abandoned, which is a continuation of Ser. No. 770,393, Aug. 28, 1985, abandoned. This application Jan. 6, 1989, Ser. No. 294,993
Claims priority, application Japan, Sep. 7, 1984, 59-187714
Int. Cl.[4] B41J *3/12*
U.S. Cl. 101—93.05 **2 Claims**



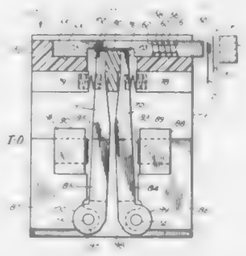
1. A printing head for a shuttle type dot line printer including a single reciprocating frame and a plurality of electromagnetic actuating units individually mounted on the frame, said single reciprocating frame being made of a material of high heat conductivity such as aluminum, being provided with rectangular-bottomed recesses formed parallel to a platen for closely accommodating said plurality of electromagnetic actuating units and being provided with heat radiation fins formed parallel to said platen for radiating heat generated by said units, and each of said electromagnetic actuating units comprising:
a base plate formed of electromagnetically permeable material;
a shell mounted on one side of the base plate, said shell being of a square cross section capable of fitting into said rectangular recess in the frame and occupying said recess with identical other shells arranged closely side by side, and said shell having an open end;
a core secured to the shell with an end of said core lying in the same plane as said open end of said shell;
a coil wound around the core;
a heat conductive filler provided in said shell between said coil and inner surface of said shell, said heat conductive filler consisting of high heat conductive epoxy resin filler which is provided between said coil and said square cross sectional shell for radiating heat generated in said coil to said shell with high efficiency;
a single printing spring, one end of which is fixed on the other side of said base plate;
an armature fixed on the spring and at a position facing the core, said armature being attracted to said core when said coil is energized;
a wire carried on a free end of the printing spring;
a single screw extending from a backside of said shell and a single screw extending only through said one end of said printing spring, whereby each of said electromagnetic actuating units is individually, removably mounted to said frame by only both said single screws; and
a damper means for preventing a rebound of said printing spring affixed to said base plate adjacent to said free end of said printing spring.

4,852,481

PRINT HAMMER MECHANISM

Ronald J. Kobryn, Longwood, and Justin Gaskins, Deltona, both of Fla., assignors to L. James Hubbard and Virginia M. Hubbard, both of, P.R.

Filed Jul. 14, 1988, Ser. No. 219,494
Int. Cl.[4] B41J *9/12, 9/38*
U.S. Cl. 101—93.48 **20 Claims**



1. A print hammer mechanism comprising a print hammer moveable toward and away from a printing position, first and second armatures moveably disposed for engagement with said hammer, and means for mounting said first and second armatures in non-interfering relationship with said hammer until engagement therewith to drive said armatures toward and away from said printing position, said spacing being sufficient to enable said armatures to accelerate prior to contacting said hammer in impact delivering relationship and means for actuating said armatures into motion.

4,852,482

AUTOMATIC PRINTWHEEL SETTING SYSTEM

Anthony Storace, Norwalk, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 21, 1987, Ser. No. 136,087
Int. Cl.[4] B41J *1/24*
U.S. Cl. 101—110 **12 Claims**



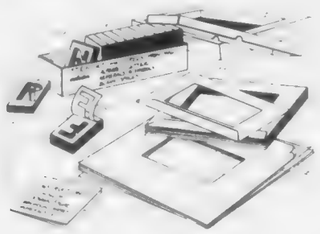
1. A printwheel setting apparatus for setting a plurality of printwheels, the apparatus comprising:
a plurality of printwheel actuators respectively associated with a plurality of printwheels to be set, said printwheel actuators each comprising a verge and a starwheel, said starwheel being advanceable upon being contacted by said verge;
means connected to said starwheel for advancing an associated printwheel when said starwheel is advanced by said verge;
a single solenoid positionable for selectively operating each of said verges; and
means for selectively positioning said solenoid operatively adjacent to respective verge for operating the verge of said selected printwheel actuators.

4,852,483

KIT FOR INDIVIDUALIZED SILK SCREEN PRINTING

Janice W. Bussard, 201 N. Fruitport Rd., Spring Lake, Mich. 49456

Filed May 18, 1988, Ser. No. 195,598
Int. Cl.[4] B41F *15/02*
U.S. Cl. 101—128 **11 Claims**



1. A kit for individualized silk screen printing comprising, in combination, a plurality of stencils, a plurality of carriers each supporting several of said stencils assembled in a row during a printing process, a plurality of masks each shielding around a printing area during said process and a mesh-fitted screen printing frame for performing said process; each said stencil comprising a paper sheet having a central cutout, and a pressure sensitive adhesive on one side of said stencil for mounting upon one of said carriers; each said carrier comprising a paper sheet having at least one pocket along one edge thereof receiving one end of said stencils; and said pocket being formed by a folded-over tab along a fold line of said paper.

4,852,484

METHOD AND APPARATUS FOR PRINTING ON A TRAVELING WEB

Koichi Karakawa, Chiba; Tatsuhiko Yoshimatsu, Shisui; Hideyuki Tsuchimoto, Urawa, and Katsumi Hiwatashi, Urayasu, all of Japan, assignors to Kyokuto International Corporation, Japan

Filed Aug. 5, 1988, Ser. No. 229,152
Claims priority, application Japan, Aug. 6, 1987, 62-195369
Int. Cl.[4] B41M *1/10*
U.S. Cl. 101—170 **17 Claims**



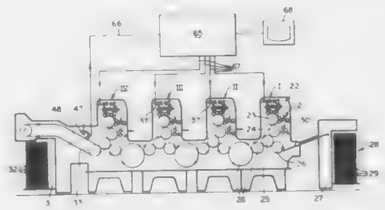
1. A method for printing on a traveling web, comprising the steps of:
controlling the tension of said web for preventing it from becoming loose;
passing the web over a rotating printing means;
driving the web at a traveling speed which is at a predetermined ratio to the peripheral speed of the printing means; and
pressing said web into contact with said printing means by an impression means having a radius of curvature in a range between 2 mm and 70 mm.

4,852,485

METHOD OF OPERATING AN AUTOTYPICAL COLOR OFFSET PRINTING MACHINE

Felix Brunner, CH-6677 Corippo (TI), Switzerland

Filed Mar. 20, 1986, Ser. No. 841,947
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1985, 3510172; Dec. 9, 1985, 3543444; Feb. 11, 1986, 3604222; European Pat. Off., Feb. 14, 1986, 86101892.7
Int. Cl.[4] B41F *31/04, 7/06*
U.S. Cl. 101—211 **18 Claims**



1. A method of operating a multicolor printing press having a plurality of printing units for printing a multicolor picture composed of color picture elements too small for the human eye to dissolve, each unit having an ink foundation for feeding one of a plurality of different printing inks onto a substrate, and also having a plurality of adjustable ink regulating means for controlling feeding of said inks onto a plurality of adjacent zones of said substrate; said method comprising the steps of: successively printing a plurality of pictures with said inks onto said substrate; successively printing measuring patches with said inks onto said substrate such that said inks within said patches have characteristics of a group of characteristics containing at least one of the following: solid density and screen dot sizes; repeatedly determining said characteristics of said

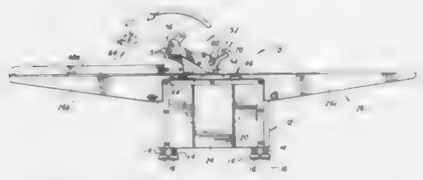
inks within said patches; repeatedly determining selected relationships between the characteristics of different inks within said patches; associating first tolerance ranges with said relationships; determining whether said relationships are inside or outside said first tolerance ranges; and controlling said regulating means such that said relationships fall within said first tolerance ranges, to thereby achieve uniform printing of said pictures.

4,852,486

PORTABLE FLEXOGRAPHIC PROOFER DEVICE

James E. Ely, and Steven D. Saylor, both of Charlotte, N.C., assignors to BASF Corporation, Clifton, N.J.

Filed Nov. 25, 1988, Ser. No. 275,874
Int. Cl.[4] B41F *7/02*
U.S. Cl. 101—218 20 Claims



1. A portable, manually fed flexographic proofer device, said device comprising:
- a cylindrical drive roll,
- a drive motor for said roll for providing rotation thereof at a constant speed;
- an anilox cylinder;
- a transfer roller for transferring ink from said anilox cylinder to a substrate disposed between the transfer roller and the drive roll;
- an applicator unit carrying said anilox cylinder and transfer roller; and
- means for mounting said applicator unit on the proofer device so that said unit is movable between an inoperative position thereof and an operative position thereof in which the transfer roller exerts pressure on said drive roll; said applicator unit including means removably receiving a weight device thereon of a calibrated weight such that the pressure exerted by the transfer roller on the drive roll is substantially constant.

4,852,487

METHOD AND DEVICE FOR PRINTING IMAGES ON HALVES OF BOTH SIDES OF SHEETS

Jan B. Stienstra, Venlo, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Division of Ser. No. 919,230, Oct. 15, 1986, Pat. No. 4,815,378. This application Oct. 13, 1988, Ser. No. 257,406
Claims priority, application Netherlands, Nov. 4, 1985, [redacted]
Int. Cl.[4] B41F *13/24*
U.S. Cl. 101—232 7 Claims



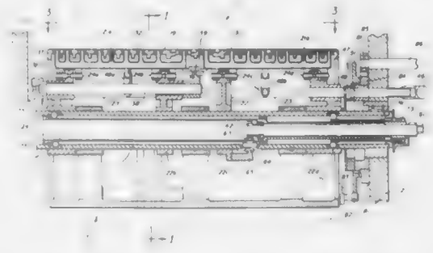
1. A device for copying and printing images on halves of both sides of a receiving sheet, said device comprising:
- (a) a scanning station;
- (b) a document feeder for individually feeding a plurality of original documents in sheet form from a stack to said scanning station; said feeder including first and second conveyor means for feeding an original from a different side of said stack and through said scanning station to perform a cycle in which said first conveyor feeds two originals from one side of said stack and said second conveyor feeds two originals from said other side;
- (c) a printng station for printing said scanned originals;
- (d) a sheet conveyor path through the printing station;
- (e) a sheet turn-over path following the conveyor path for re-feeding a sheet to the printing station;
- (f) a sheet discharge path following said conveyor path;
- (g) sheet conveyor means for conveying sheets in said paths;
- (h) a sheet deflector having a first position to guide a sheet from said sheet conveyor path into said turn-over path and a second position to guide said sheet from said sheet conveyor path into said discharge path;
- (i) first control means for holding said sheet deflector in said first position during three consecutive passes of a sheet through the sheet conveyor path and in a second position during a fourth pass of the sheet through said sheet conveyor path; and
- (j) second control means for printing an image on one half of the sheet in said first and fourth passes of said sheet and for printing an image on the other half of the sheet in the second and third passes of said sheet.

4,852,488

SHEET TRANSFER DRUM FOR A PRINTING PRESS

Paul Abendroth; Josef Mathes, both of Offenbach am Main, and Roland Höll, Weiterstadt, all of Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen, Fed. Rep. of Germany

Filed Aug. 11, 1982, Ser. No. 400,707
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1981, 3128947
Int. Cl.[4] B41F *71/04*
U.S. Cl. 101—246 12 Claims



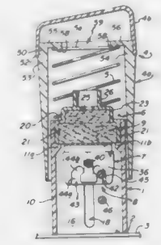
1. A sheet transfer drum for a printing press comprising, in combination a cylinder journalled on the press frame for relative rotation about a central axis, a sheet gripper secured to the cylinder for securing the leading edge of a generally rectangular sheet to the surface of the cylinder with the leading edge of the sheet generally parallel to the cylinder axis, a pair of suckers each having a suction surface near the cylinder surface for applying suction force to the trailing edge of the sheet and adhering the trailing edge of the sheet to the suckers, said suckers each being offset from the center of the cylinder towards the end of the cylinder opposite the other sucker, a sucker support within said cylinder for supporting the suckers at a generally predetermined angular position about the cylinder axes with respect to the sheet gripper, a pair of guides disposed on said sucker support having respective axes which are diagonally oriented with respect to the cylinder axis and skewed oppositely relative to each other for connecting the suckers to said sucker support and for guiding relative movement of the suckers in diagonal directions with respect to the cylinder axis with the diagonal directions of relative movement of the suckers being skewed oppositely so that circumferential motion of the suckers in a common circumferential direction with respect to the cylinder causes motion of the suckers in opposite axial directions, a glide member associated with each sucker for cooperation with said guides, and periodic cam-operated means for intermittently moving said suckers in a common circumferential direction at predetermined phases of the rotating cylinder with respect to the press frame so that the sheet is stretched by the intermittent motion of the suckers in both the circumferential and axial direction of the cylinder.

4,852,489

SELF-INKING STAMPING DEVICE

Alexander C. Wall, Nokomis, Fla., and Leonard H. Sculler, Brunswick, N.J., assignors to M&R Marking Systems, Inc., Cranford, N.J.

Filed Nov. 18, 1987, Ser. No. 122,127
Int. Cl.[4] B41K *1/40;* B41F *31/24*
U.S. Cl. 101—334 7 Claims



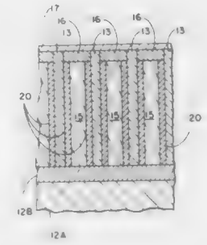
1. In a stamping device comprising an upright hollow frame member having an open lower end to bear against a supporting surface, an operating member comprising a hollow encasement interfitting with and displaceable vertically relative to said frame member and a top closure fitting removably onto the upper end of said encasement, spring means normally holding said encasement in an upward position from which by one's hand it can be pressed downward relative to said frame member to a stamping position, an ink pad holder supported by said frame member at a distance above said lower end, ink receiving means on the upper side of said holder for receiving and delivering ink for inking a pad in said holder, a displaceable type-carrying platen inside said frame member, and coacting means connected respectively with said platen, said frame member and said encasement for disposing said platen in an inking position at said holder when said encasement is in said upwrd position and disposing said platen in position to impress a surface at said lower end when said encasement is depressed to stamping position, said encasement comprising an upright wall outside and extending above said frame member and having spring seating means fixed to opposite upper end portions of opposite panels of said wall, said spring means being compressed between said ink pad holder and said seating means,
- the improvement wherein said spring seating means comprises separate ridge members protruding inward each toward another from said opposite upper end portions and each terminating at a free inner end spaced away from the inner end of the other, said opposite panels being divergent in downward direction from said bridge members to the lower end of said wall, said ink receiving means being accessible in the space between said bridge members upon removal of said top closure and depression of said encasement to stamping position, and said spring means comprises a coiled spring having an upper coil thereof being against the undersides of and spanning the space between said bridge members.

4,852,490

MAGNETIC CYLINDER HAVING RIGID SUPPORT FOR MAGNET COVER

David A. McEachern, St. Paul, Minn., assignor to T. D. Wright, Inc., St. Paul, Minn.

Filed Jun. 27, 1988, Ser. No. 211,829
Int. Cl.[4] B41F *27/02, 27/06*
U.S. Cl. 101—378 9 Claims



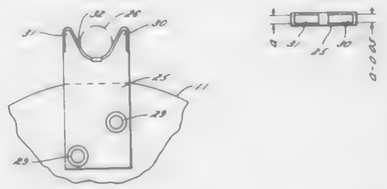
8. For a magnetic cylinder comprising a central core, radially extending annular pole pieces which are spaced apart along the cylinder axis, radially extending annular magnets made of a relatively pliable material located in the spaces between the pole pieces and a protective layer covering the outer circumferential surface of each of the magnets, said magnetic cylinder circumferentially magnetically grasping a printing plate or the like, said plate exerting a radially inward force on the cylinder when printing, the improvement comprising:
- rigid support means having a magnetic permeability at least as great as the pole pieces extending radially outward from the central core of the magnetic cylinder in juxtaposition with each annular magnet for supporting the covering layer against the radial force of the printing plate.

4,852,491

DEVICE FOR THE IN-REGISTER TRANSFER OF SHEETS BETWEEN THE PRINTING UNITS OF A MULTICOLOR PRESS

Roland Holl, Weiterstadt, and Dietrich Dettinger, Heusenstamm, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen, Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 114,215
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636578
Int. Cl.[4] B41F *21/00*
U.S. Cl. 101—408 2 Claims



1. An arrangement for the transfer and conveyance of sheets between first and second printing units of a multicolor press comprising, in combination, a receiving drum in the first printing unit, a feed drum in the second printing unit having an associated impression cylinder, an endless chain trained about the drums, a stationary guide rail following the path of the chain, a plurality of gripper carriages movable with the chain, each carriage having a cam roller and means for defining slots

on opposite sides thereof, said feed drum having a radially mounted drive fork for engaging said cam roller prior to sheet transfer, said drive fork being formed with an outwardly opening notch which defines a leading flank and a trailing flank, said leading and trailing flanges being successively engageable with said carriage slots on opposite sides of said cam roller as said drive fork engages cam roller, said leading flank having a thickness that is less than the thickness of the trailing flank so that upon engagement of said drive fork flanks with said carriage slots said leading flank moves the carriage into initial axial prealignment and the trailing flank thereupon causes the carriage to be moved into predetermined register for effecting sheet transfer.

4,852,492

DEVICE FOR AFTERTREATING A COATED OR PRINTED MATERIAL WEB

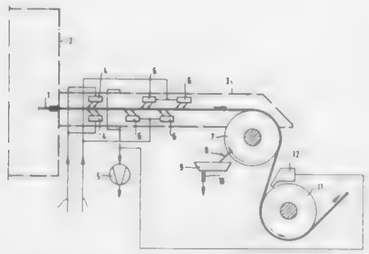
Wolfgang Pfizenmaier, Neckargemünd, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 44,793, Apr. 30, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 273,132

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1986, 3614742

Int. Cl.[4] **B41F** *23/04*

U.S. Cl. 101—424.1 **6 Claims**



1. Device for aftertreating a material web which is coated or printed on at least one side thereof, the device having a drier for heating the material web to vaporize solvents contained therein, a vapor channel connected to the drier and traversible by the material web, and an arrangement of cooling rollers located downstream of the vapor channel, each of the cooling rollers being enveloped by the material web over a region of the circumference of the cooling rollers, respectively, a first one of the cooling rollers located in the travel direction of the material web having a jacket surface thereof facing towards the coated or printed side of the web, the device comprising a doctor blade device having a traversing doctor blade engaging a region of the circumference of the first cooling roller located opposite the region thereof envelopede by the material web and disposed between an oncoming strand and a departing strand of the material web.

4,852,493

FERRITE CORE COUPLED SLAPPER DETONATOR APPARATUS AND METHOD

Ralph E. Boberg; Ronald S. Lee, and Richard C. Weingart, all of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 12, 1988, Ser. No. 155,439

Int. Cl.[4] **F42B** *3/12;* **F42C** *19/12*

U.S. Cl. 102—202.5 **8 Claims**

1. A slapper detonator-related apparatus, for coupling a temporally short electric power pulse, that has a duration of from about 0.1 to 0.4 microseconds and a peak amplitude in the range extending from zero to about 10 kiloamps, from a thick flat-conductor power cable, that comprises an input conductor and an output conductor, into a thin flat-conductor slapper detonator circuit, that comprises a thin conductive metal foil that is, in use, adapted to be explosively vaporized by the electric power pulse, the apparatus comprising:

a first planar and generally circular loop, formed from an end portion of the input conductor and an adjoining end portion of the output conductor, with the two portions circularly and planarly flared apart and conductively joined at their termini;



a second planar and generally circular loop, formed from at least a part of the thin flat-conductor slapper detonator circuit, with the diameter of the first circular loop and the diameter of the second circular loop being approximately equal; and

a ferrite housing, that provides a ferrite path for magnetically coupling the first loop and the second loop.

4,852,494

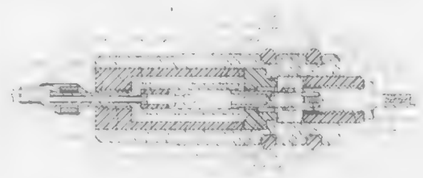
EXPLOSIVELY ACTUATED SWITCH

Robert A. Williams, 2721 White Settlement Rd., Fort Worth, Tex. 76107

Continuation of Ser. No. 121,416, Nov. 16, 1987, abandoned. This application Dec. 6, 1988, Ser. No. 281,886

Int. Cl.[4] **F42C** *15/40;* **H01H** *39/00*

U.S. Cl. 102—263 **22 Claims**



1. A switch, comprising:

body means having first and second ends with an opening extending into said body means at least from said second end,

a first contact located in said opening of said body means,

an electrical lead connected to said first contact and extending out of said body means,

a second contact located in said opening of said body means and being normally electrically insulated from said first contact,

an electrical lead connected to said second contact and extending out of said body means,

said first and second contacts being coaxial with respect to each other,

a third contact,

plunger means located in said opening of said body means at said second end for movement from a first position toward said first end of said body means,

said third contact being releasably coupled to a first end of said plunger means facing said second contact,

means located at least partially between said third contact and said plunger means for applying pressure to said third contact in response to movement of said plunger means from said first position toward said first end of said body means for causing said third contact to be released from said plunger means for movement into engagement with said first and second contacts for forming an electrical connection between said two leads.

4,852,495

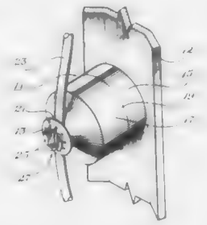
SHAPED CHARGE DETONATING CORD RETAINER ARRANGEMENT

Michael P. Hancock, Cleburne, and Scott L. Hayes, Mansfield, both of Tex., assignors to Goex, Inc., Cleburne, Tex.

Filed Feb. 17, 1988, Ser. No. 157,379

Int. Cl.[4] **F42B** *1/02*

U.S. Cl. 102—306 **21 Claims**



1. A detonating cord retainer arrangement for a shaped charge, comprising:

a shaped charge case, said shaped charge case having an end for receiving a portion of a length of detonating cord, said shaped charge case end having interface means for interfacing said detonating cord portion to an explosive charge in said shaped charge case, said shaped charge case end having a projection projecting from said end, said projection being bifurcated to form a slot for receiving said detonating cord portion, said slot allowing said detonating cord portion to be placed contiguous to said interface means;

an annular retainer means having an opening for receiving said projection for retaining said detonating cord portion in said slot and contiguous to said interface means.

4,852,496

CHARGING AND DETONATION DEVICE FOR SUBMUNITION

Carl J. Campagnuolo, Potomac, and Jonathan E. Fine, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 25, 1988, Ser. No. 276,251

Int. Cl.[4] **F42B** *3/00*

U.S. Cl. 102—322 **7 Claims**

1. An environmental charging and detonation system for providing detonation energy to a submunition having an explosive charge without the use of external charging equipment comprising:

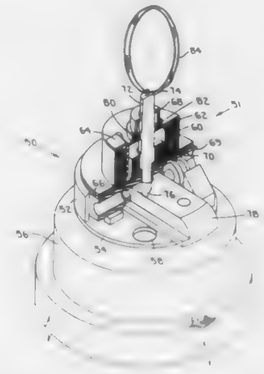
a housing mounted onto said submunition;

a charging circuit enclosed within said housing having energy storage means;

an alternator electrically connected to said charging circuit, said alternator comprising a stator enclosed within said housing, a rotor shaft located along the longitudinal portion of said housing having a first end projecting external to said housing and a second substantially pointed end, and a multipole permanent magnet affixed to said rotor shaft;

means for engaging said rotor shaft to said housing in a first position so that said alternator is inoperative;

a ram air actuated energizing means, attached to the first end of said rotor shaft, for disengaging said rotor shaft from the first position to a second position where said rotor shaft is free to rotate and for rotating said rotor shaft upon the introduction of ram air, the rotation of said rotor shaft causing said alternator to generate electrical energy which is stored in the energy storage means in said charging circuit;



an electrical firing circuit electrically connected to the energy storage means in said charging circuit, said electrical firing circuit comprising impact detecting means, securely mounted to said housing, for triggering the discharge of said energy storage means in said charging circuit;

mechanical detonating means, operated by impact of the substantially pointed end of said rotor shaft upon said mechanical detonating means, for detonating said explosive charge upon submunition impact; and

electrical detonating means, operated by said electrical firing circuit, for detonating said explosive charge upon submunition impact.

4,852,497

TOY FOR DEMOSTRATING MAGNETIC FORCE AND THE EFFECTS OF AIR PRESSURE

Yu-Ming Tsai, No. 34-3, Alley 31, Lane 59, Sec. 5, Nanking E. Rd.,, Taipei, Taiwan

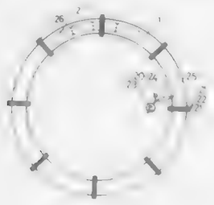
Filed Sep. 16, 1983, Ser. No. 533,427

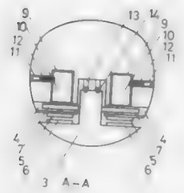
Int. Cl.[4] **B61B** *13/10*

U.S. Cl. 104—138.1 **6 Claims**

1. A toy comprising an air-tight hollow pipe forming a closed loop, rail means comprising a central upstanding portion and two annular portions, said annular portions being an opposite sides of said central portion, a toy vehicle for moving along said rail means and having a recess for receiving said central portion and wheel means consisting of wheels rotatably mounted to said vehicle engaging said central portion for causing said vehicle to move along said rail means, first permanent magnet means located on said two annular portions and second permanent magnet means located on said vehicle, said first and second permanent means being arranged to provide a repulsive force to support the weight of said vehicle, and

selectively controlable exhausting means for providing a selected and variable air pressure in the entire said closed loop,





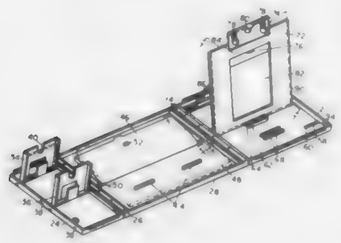
whereby a toy for teaching the effects of air and magnetic fields is provided.

4,852,498

LAP TOP COMPUTER WORK STATION

Thomas W. Judd, Peterborough, N.H., assignor to Curtis Manufacturing Company, Inc., Jaffrey, N.H.

Filed Mar. 20, 1989, Ser. No. 325,567
Int. Cl.[4] A47B *23/00*
U.S. Cl. 108—43 **11 Claims**



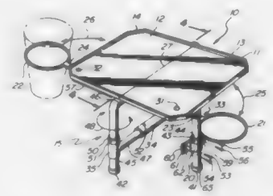
1. A lap top computer work station which comprises:
(a) a center base having sides to define a shallow depth and a top outer and bottom inner surface;
(b) a first top cover having a top outer and inner surface;
(c) a second top cover having a top outer and inner surface;
(d) first hinge means to secure the first top cover to one side of the center base and to permit hinged movement of the first top cover between an open, use and a closed, non-use position;
(e) second hinge means to secure the second top cover to the other opposite side of the center base and to permit hinged movement between an open, use and a closed, non-use position;
(f) the total width of the first and second top cover sufficient in a closed carrying position of the work station to extend the width of the center base to form an enclosed, slim, portable, closed position work station;
(g) latching means to latch the first and second top outer cover together in a closed position so that the work station may be carried in the closed position by the user;
(h) diskette holding means position on the inner surface of the first top cover and adapted to move between an upright, use position when the first top cover is in the open position, and a flat, non-use, storage position generally adjacent to the inner surface of the first top cover when the covers is in the closed position;
(i) sheet material display means positioned on the inner surface of the second top cover and adapted to move between a generally upright position wherein a sheet material may be placed for display when the second top cover is in an open position, and a flat, non-use, storage position generally adjacent to the inner surface of the second top cover when the second cover is in the closed position and sheet holding means to retain the sheet material in the display position; and
(j) a computer rest means on the center base and adapted to move between an upright, tilted position to hold a lap top computer in a use position when the first and second top covers are in an open position, and a flat, non-use position generally adjacent the bottom inner surface of the center base when the first and second top covers are in a closed position.

4,852,499

ADJUSTABLE FOLDING TABLE FOR VEHICLES

Ilmars Ozols, 11 Killarney Gardens, Pointe Claire, Quebec, Canada H9S 4X7

Filed Apr. 11, 1988, Ser. No. 180,224
Int. Cl.[4] A47B *23/00*
U.S. Cl. 108—44 **14 Claims**



1. For use within a vehicle interior having an interior surface, an adjustable folding table comprising:
first and second planar table halves;
a first support member having a first arm and a second arm joined in a substantially orthogonal relationship;
hinge means pivotally securing said first and second table halves to said first arm of said first support member, said first and second table halves pivotable between a horizontal opposed open position and a parallel vertical closed position;
lock means locking said first and second table halves in said open position;
a second support member having a third arm, joined to said second arm in a rotational attachment in which said second arm is rotatable with respect to said third arm and defining an extendable member having an adjustable length, and a fourth arm joined orthogonally to said third arm; and
bracket means receiving said fourth arm in a pivotal attachment and having attachment means for securing said bracket means to an interior surface within the vehicle interior.

4,852,500

INTEGRATED COMPUTER IMPLEMENT WORK AREA

Jon B. Ryburg, and Neil Goldberg, both of Ann Arbor, Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Mar. 18, 1987, Ser. No. 27,611
Int. Cl.[4] A47B *11/00*
U.S. Cl. 108—105 **35 Claims**



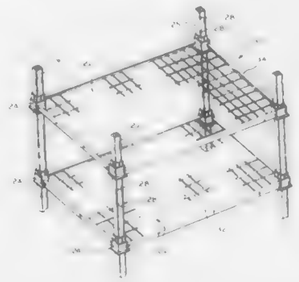
1. An integrated computer implement work area system comprising:
a vertical wall panel mounted on a floor surface;
a rail mounted to said wall panel and extending horizontally a spaced distance from a floor surface at a working height therefrom; and
a computer central processing unit mounted within said wall panel;
an arm having one end and a video display terminal support at another end thereof;
means for mounting the arm one end to the rail for sliding movement therealong;
a video display terminal mounted to said video display terminal support;
cable guide means at least partially within said wall panel for guiding electrical cabling from said computer central processing unit to said video display terminal support when said arm is positioned at any selected location along the rail; and
electrical communication cabling through said cable guide means between said computer central processing unit and said video display terminal.

4,852,501

ADJUSTABLE RACK OF SHELVES

Ralph Olson, Lombard, and Irwin Kulbersh, Skokie, both of Ill., assignors to Amco Corporation, Chicago, Ill.

Continuation of Ser. No. 863,954, May 16, 1986, which is a continuation of Ser. No. 835,432, Mar. 3, 1986, abandoned, which is a continuation of Ser. No. 611,493, May 17, 1984, abandoned. This application Mar. 22, 1988, Ser. No. 171,850
Int. Cl.[4] A47B *3/00*
U.S. Cl. 108—111 **21 Claims**



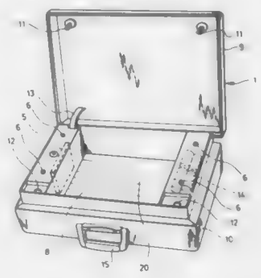
1. A rack of adjustable shelves for sale in kit form to be assembled on site, said rack comprising at least two spaced parallel vertically oriented posts, each of said posts having a generally rectangular cross section and a plurality of recesses located at periodic intervals along the length of an edge, said recesses being formed along at least one corner of said rectangular cross section, keeper means in the form of a plastic sleeve with at least two external tapered side walls forming external contours which are at least part of a truncated pyramidal shape, said keeper means having at least part of two side walls forming an internal passageway for gripping said post and for fixing the rotational position of said keeper means on said post, whereby said two side walls embrace said post to hold said keeper in place at a fixed rotational position on said post and to enable it to slide longitudinally to a selected position along the length of said post, detent means formed in said keeper and on an inside corner edge of the internal passageway within said keeper, said detent means fitting into said recesses when said keeper is in said fixed rotational position on said post in order to fix the longitudinal position of said keeper on said post, and socket means formed on each shelf at points where said shelf is supported by said posts, each of said socket means having an internal opening with a generally truncated pyramidal shape with internal surface walls which are complementary to the contours of the external walls of said keeper means, whereby said rack may be assembled by placing said keeper on said post with said socket means over and resting on said keeper means without requiring a rotational indexing of the keeper at the time when a socket is placed over the keeper.

4,852,502

SAFETY BOX FOR SAFEGUARDING DOCUMENTS AND THE LIKE

Sven Klingberg, Erik Dahlbergsgatan 19, 52100 Falköping, and Sixten Persson, PL 2215, 52050 Stenstorp, both of Sweden

PCT No. PCT/EP87/00386, § 371 Date May 13, 1988, § 102(e) Date May 13, 1988, PCT Pub. No. WO88/01003, PCT Pub. Date Feb. 11, 1988
PCT Filed Jul. 16, 1987, Ser. No. 196,630
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1986, 3627105
Int. Cl.[4] E05G *3/00*; G08B *13/22*
U.S. Cl. 109—25 **4 Claims**



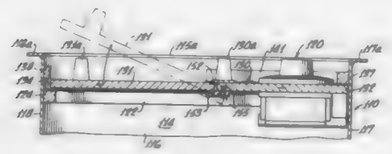
1. A safety box comprising a wall having provided therein at least one conductor, which is either interrupted or short-circuited with an additional conductor if damage is caused to said wall, and further comprising a shield means, which is located within said wall and which surrounds the wall portion through which said conductor extends, and still further comprising a circuit responding to the interruption or the short-circuiting of said conductor and used for producing an actuation signal for actuating a means for effecting changes in documents contained in the safety box, characterized in that the shield means is galvanically separate from the circuit.

4,852,503

SLIDING DOOR SAFE WITH ANTI-INTRUSION LOCK DEVICE

Robert J. Lichter, 15571 Placid Cir., Huntington Beach, Calif. 92647

Filed Feb. 26, 1988, Ser. No. 160,817
Int. Cl.[4] E05G *1/04*; E05D *15/56*
U.S. Cl. 109—59 R 24 Claims



1. In a door closure arrangement for a safe having a first pair of opposing walls and a second pair of opposing walls for defining a chamber having an opening for receiving valuables therein, the combination comprising:

separable door means configured to close said opening;

rail means formed in one pair of opposing walls, said rail means being positioned and configured for abutting relation with the periphery of said door means in the closed position;

first and second groove means formed in the other pair of opposing walls, said groove means being configured and dimensioned for receiving opposing edges of said door means therein with said first groove means having a depth greater than said second groove means, said door means having a dimension in the direction between said groove means slightly less than the dimension between the bottoms of said groove means for permitting sliding movement of said door means in a given direction between said other pair of opposing walls on said rail means between said groove means;

lock means on said door means;

stop means on the inner surface of said door means in proximate relation to the edge of said door means adjacent said first groove means; and

other means operative on actuation of said lock means to the locked position for interposing blocking means in generally abutting engagement between said stop means on said door means and a portion of the interior of said chamber adjacent said first groove means with said door means slid to a positioned bottomed within said second groove means for substantially preventing sliding movement of said door means in said given direction.

4,852,504

WASTE FUEL INCINERATION SYSTEM

James A. Barresi, Castle Hill; Kenneth C. Arndt, Presque Isle; Michael N. Young, Washburn; Daniel O. Bridgeham, Mapleton, and Howard H. Hede, Stockholm, all of Me., assignors to First Aroostook Corporation, Caribou, Me.

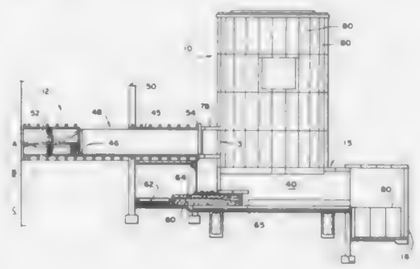
Filed Jun. 20, 1988, Ser. No. 209,703
Int. Cl.[4] F23G *7/06*
U.S. Cl. 110—346 34 Claims

34. An incinerator hearth for the primary combustion chamber of a waste fuel incinerator which utilizes under fire combustion air in the combustion chamber and an ash ram constructed and arranged with a path of travel across the base of the hearth for removing ashes comprising:

a double "V" shaped gravel bed hearth having an upper level "V" shaped gravel bed of first and second inwardly inclined gravel sides;

first and second laterally spaced apart ledges or shelves, said shelves being spaced apart on either side of the hearth and positioned over the path of travel of the ash ram, said upper level first and second inwardly inclined gravel sides terminating respectively at the first and second spaced apart shelves;

a plurality of under fire air inlet passageways positioned below the respective shelves for blowing under fire air from both sides of the hearth without interference from gravel;



and a lower level "V" shaped gravel bed of third and fourth inwardly inclined gravel sides below the respective shelves and under fire air inlet passageways, said lower level inwardly inclined third and fourth gravel sides sloping into the path of travel of the ash ram for removal of a layer of gravel with each advance of the ash ram.

4,852,505

TUFTING MACHINE HAVING AN INDIVIDUAL NEEDLE CONTROL SYSTEM

George D. Dedmon, 106 Lovella, Rte. 7, Ringold, Ga. 30736

Filed Mar. 24, 1988, Ser. No. 172,463
Int. Cl.[4] D05C *15/32*
U.S. Cl. 112—80.42 10 Claims



1. A tufting machine for inserting yarns into stitching in a base fabric:

at least one needle bar means;

a reciprocating carrier for the needle bar means;

means for supporting said base fabric in a plane substantially transverse to the reciprocating of said carrier;

needle means carried by said needle bar means for penetrating said fabric whereby reciprocation of said carrier imparts a reciprocating movement to said needle means which are moved along preselected axis substantially transverse to said plane of said base fabric; and

control means for adjusting the position of the stroke of said needle means for selectively penetrating said fabric while said carrier reciprocates, said control means comprising selectively operable actuator means having a cylinder means and a piston member slidably received within said cylinder means, said piston member having an arm portion being releasably connected to said needle means, and air supply means for selectively injecting air into said cylinder means to position said needle means at a desired location for adjusting the stroke of said needle means.

4,852,506

MULTI-NEEDLE WALKING-FOOT CHAIN STITCH SEWING MACHINE

Felix Salganik, 4408 10th Ave., Apt. 3A, Brooklyn, N.Y. 11219

Filed May 23, 1988, Ser. No. 197,665
Int. Cl.[4] D05B *3/02, 25/00, 27/02, 1/10*
U.S. Cl. 112—220 4 Claims



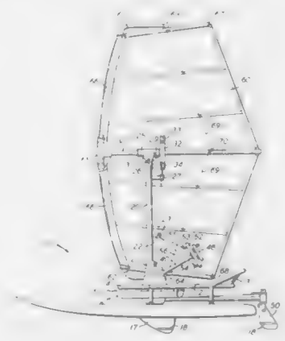
1. A multi-needle walking-foot chain stitch sewing machine with sewing heads including alternating presser feet, synchronized reciprocatable needles and needle-reciprocation mechanisms thereof, and feed-dogs and feed dog reciprocation-mechanisms thereof, the improvement comprising in combination: (1) support structure, (2) spaced-apart sewing heads mounted on said support structure, the spaced-apart sewing heads including at-least separate laterally spaced-apart first and second needle-reciprocating means for reciprocating needles, the spaced-apart sewing heads including at-least third and fourth spaced-apart first and second feed-dogs-reciprocation means for reciprocating feed dogs, (3) an upper primary drive-shaft, (4) secondary lower first and second drive means for driving said first and second needle-reciprocation means, and secondary lower third and fourth drive means for driving said first and second feed-dogs-reciprocation means, each of said first, second, third and fourth drive means including a drive shaft having a maximum length of about sixteen inches, (5) separate first and second wheel synchronizer means mounted on said support structure, one of the first and second wheel synchronizer means being driven by one of said first and second drive means through said drive shaft thereof, and a remaining other of said first and second wheel synchronizer means being driven by a remaining other one of said first and second drive means through said drive shaft thereof, one of said first and second wheel synchronizer means driving one of said first and second needle-reciprocation means, and a remaining other one of said first and second wheel synchronizer means driving a remaining other one of said first and second needle-reciprocation means, (6) separate third and fourth wheel synchronizer means mounted on said support structure, one of said third and fourth synchronizer means being driven by one of third and fourth drive means through said drive shaft thereof and a remaining other one of said third and fourth wheel synchronizer means being driven by a remaining other one of said third and fourth drive means through said drive shaft thereof, one of said third and fourth synchronizer means driving one of said third and fourth feed-dog-reciprocation means, and a remaining other one of said third and fourth synchronizer means driving a remaining other one of said third and fourth feed-dog-reciprocation means, and (7) synchronizer activation and deactivation means for alternately initiating and deactivating concurrently at-least two of said first, second, third and fourth synchronizer means for synchronization of at-least one of said first needle-reciprocation means with said third feed-dog-reciprocation means and said second needle-reciprocation means with said fourth feed-dog-reciprocation means.

4,852,507

SAIL-WING AND CONTROLS FOR A SAIL CRAFT

Randall C. Ryon, 36 Alina St., Fairport, N.Y. 14450, and Robert A. Austin, Penfield, N.Y., assignors to Randall C. Ryon, Fairport, N.Y.

Filed Jan. 7, 1988, Ser. No. 141,486
Int. Cl.[4] B63H *9/04*
U.S. Cl. 114—39.1 18 Claims



15. A sail craft including

a platform on the hull of said craft, said platform including a seat having a back stop curved in the plane of sail platform, and a diametrically opposed curved foot rail, said back stop and said foot rail providing pilot support and leverage for lateral movement on said platform: and

a control column pivotally movable relative to said hull on vertical and horizontal pivot axes; and

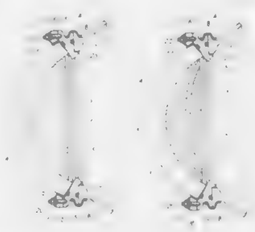
a rotatable steering wheel fixed to said control column and operatively connected to a rudder.

4,852,508

UNDERWATER WINDOW FOR VESSELS

Shigeyuki Takada, 1-22-5, Kakinokizaka, Meguro-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 51,528, May 19, 1987, abandoned. This application Aug. 9, 1988, Ser. No. 229,758
Claims priority, application Japan, Jun. 4, 1986, 61-129430
Int. Cl.[4] B63B *3/13, 19/00*
U.S. Cl. 114—177 3 Claims



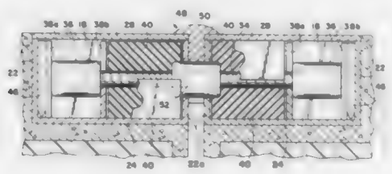
1. An underwater window for vessels which is provided to cover an opening made on the hull and comprises a first transparent plate curved to form a convex surface bulging toward

the outside of the hull outwardly from the hull and a second transparent plate provided to cover a concave space which is formed on the cabin side by said curved plate, said space formed between the two transparent plates being filled with liquid, wherein the second plate is a substantially flat plate, wherein the liquid contains distilled water, at least 1.5 ppm Cl_2 and algaecide such as $CuSO_4$, and its pH is adjusted to within the range of 7.0–7.6.

4,852,509
FLOATING DOCK HAVING SHOCK-ABSORBING COUPLING

Sig T. Fransen, Estacada, and Wayne K. Dye, Jr., Oregon City, both of Oreg., assignors to Oregon Marine Floats, Inc., Oregon City, Oreg.

Filed Aug. 15, 1988, Ser. No. 232,296
Int. Cl.[4] B63B *35/38*
U.S. Cl. 114—263 **2 Claims**



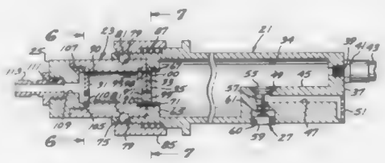
1. A multi-element floating structure comprising:
(a) two or more floating dock sections which are positioned in end-to-end adjacency relative to one another;
(b) at least one elongate, flexible, noncompressible tieing element which extends between each adjacent pair of dock sections, said tieing element having a stop located proximate each of its ends;
(c) first elastically compressible means associated with each of said dock sections in each adjacent pair of dock sections and with said stops for exerting a compressibly yieldable restraint against the separation of the dock sections in each adjacent pair of dock sections relative to one another, and for preventing the dock sections in each adjacent pair of dock sections from being separated from one another by more than a first predetermined distance;
(d) second elastically compressible means located between each adjacent pair of dock sections for exerting a compressibly yieldable restraint against the movement of dock sections in each adjacent pair of dock sections toward one another and preventing the dock sections in each adjacent pair of dock sections from becoming closer than a second predetermined distance to one another;
(e) wherein said dock sections have cavities defined in the top surfaces thereof, with each cavity in every dock section being located proximate to and aligned with a mating cavity in an adjacent dock section, and said first elastically compressible means comprises an elastomeric pad which fits in said cavities and has an opening defined medially therethrough which receives said tieing element, said pad being separated into two pieces, one which fits into said cavity below said tieing element and one which fits into said cavity above said tieing element.

4,852,510
SCUBA WHISTLE

Alan W. Joseph, Jr., 302 Washington Ave., Mount Vernon, Ind. 47620, and Timothy E. Joseph, Los Angeles, Calif., assignors to Alan W. Joseph, Jr., Mount Vernon, Ind.

Filed Apr. 20, 1987, Ser. No. 40,161
Int. Cl.[4] G10K *5/00*
U.S. Cl. 116—140 **4 Claims**

1. An underwater whistle for coupling with a regulator hose leading from a scuba diver's regulator mounted on a scuba diver's compressed air cylinder to supply air at a predetermined pressure, said whistle comprising:
elongated housing means including elongated inlet and resonant tubes disposed in end to end relationship, said inlet tube having an upstream and downstream end, said resonant tube having an inlet end, said inlet tube being formed with internal threads at one end to define said upstream end and abutting on its downstream end with the inlet end of said resonant tube, and being formed internally with a gland;
an inlet cap in said upstream end and including coupling means for coupling with such regulator hose;
a control valve for controlling air flow from an outlet end of said resonant tube;
a stationary air actuated sound generator mounted in said housing means interposed between said inlet cap and

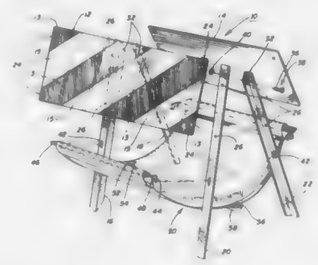


control valve positioned for direct flow of air therethrough, said sound generator being responsive when said whistle is disposed underwater, to air flow from said inlet cap at said predetermined pressure, to generate an audible sound vibration within said resonant tube, said sound generator includes a sound disc disposed on said gland and formed with an orifice responsive to air flowing therethrough to generate said audible sound vibration; and
joining means for joining said inlet and resonant tubes together, whereby said coupling means may be coupled with said hose and a diver wearing said compressed air cylinder, while underwater, may open said control valve to communicate air from such diver's compressed air cylinder through said hose to said sound generator to generate said audible sound vibration to be propogated through such water.

4,852,511
PORTABLE TRAFFIC BARRIER

Art Look, 76 West Rd., Lombard, Ill. 60148, and Joseph Valenti, 23823 W. Rosemont La., Lake Villa, Ill. 60046

Filed Feb. 29, 1988, Ser. No. 162,068
Int. Cl.[4] E01F *13/00*
U.S. Cl. 116—63 P **7 Claims**



1. A portable road barrier comprising:
at least one high visibility panel;
legs for supporting said at least one panel;
a flexible substantially closed container;
means for supporting said container from said legs, such that said container is located beneath said at least one panel and between said legs when said barrier is positioned for use;
fill means provided on said container for readily introducing a fluid into said container, whereby the weight of said fluid will result in a low center of gravity for said barrier, so as to stabilize said barrier during use;
discharge means provided on said flexible container for discharging said fluid from said container, whereby the weight of said barrier may be reduced for moving and storage.

4,852,512
LOCATION MARKING STAKE

Richard J. Klatt, S86 W23640 Edgewood Ave., Big Bend, Wis. 53103

Filed Apr. 19, 1988, Ser. No. 183,589
Int. Cl.[4] G09F *17/00*
U.S. Cl. 116—209 **11 Claims**



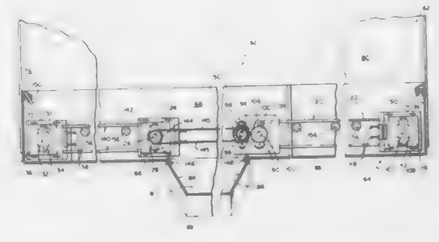
1. A marking device comprising:
an elongated hollow body having one open end and an opposite end including means to facilitate inserting the body into the ground; and;
a tightly wrapped roll, essentially solid in cross-section, formed of thin strip material disposed in and attached to the hollow body, an inner portion of the roll forming a tab means for permitting axial withdrawal of said roll from said body to form a rigid self-supporting spiral cone.

4,852,513
POWDER RECOVERY SYSTEM

Stanley K. Hayes, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Filed Mar. 25, 1988, Ser. No. 173,256
Int. Cl.[4] B05B *15/12*
U.S. Cl. 118—326 **2 Claims**

1. An apparatus for recovering a grannular material which is dispensed onto articles to be coated by the grannular material in an enclosure but not all of which grannular material adheres to the articles, the enclosure having an upstream end into which articles to be coated enter the enclosure and a downstream end from which grannular material-coated articles exit the enclosure, the apparatus including a first continuous belt of a material which is essentially impermeable to the grannular material, a first pair of rolls about which the first belt is trained, the first rolls extending generally horizontally and generally parallel to each other, the first belt trained about the first rolls having a vertically upper, generally horizontal run and a vertically lower, generally horizontal run, means for rotatably mounting the first rolls so that the vertically upper, generally horizontal run of the first belt is exposed to the interior of the enclosure, at least some of the non-adherent material being deposited onto the upper run of the first belt, means defining adjacent and vertically below one of the first rolls a hopper for recovering the non-adherent material deposited on the upper run of the first belt, a prime mover, means for coupling the prime mover to at least one of the first rolls, operation of the prime mover causing the vertically upper, generally horizontal run of the first belt to convey non-adherent grannular material to the hopper, the means for rotatably mounting the first rolls comprising means for rotatably mounting one of the first rolls adjacent the upstream end of the enclosure and means for rotatably mounting the other of the first rolls intermediate the upstream and downstream ends of the enclosure and adjacent the hopper, a first blade, means for mounting the first blade to project into closely spaced orientation to the first belt adjacent the hopper to remove from the first belt any grannular material which tends to adhere to the first belt and to deposit such grannular material into the hopper, a second continuous belt of a material which is essentially impermeable to the grannular material, a second pair of rolls about which the second belt is trained, the rolls of the second pair extending generally horizontally and generally parallel to each other, the second belt trained about the rolls of the second pair and having a vertically upper, generally horizontal run and a vertically lower, generally horizontal run, means for rotatably mounting the rolls of the second pair so that the vertically upper, generally horizontal run of the second belt is exposed to the interior of the enclosure, some of the non-adherent material being deposited onto the upper run of the second belt, the means for rotatably mounting the rolls of the second pair comprising means for rotatably mounting one of the second rolls adjacent the downstream end of the enclosure and means for rotatably mounting the other of the second rolls intermediate the upstream and downstream ends of the enclosure and adjacent the hopper, means for coupling at least one of the rolls of the second pair of rolls to the prime mover, operation of the prime mover causing the vertically upper run of the second belt to convey non-adherent grannular material to the hopper, a second blade, and means for mounting the second blade to project into closely spaced orientation to the second belt adjacent the hopper to remove from the second belt any grannular material which tends to adhere to the second belt and to deposit such grannular material into the hopper.



4,852,514
COATING DEVICE

Albert Wohrle, deceased, late of Heidenheim, Fed. Rep. of Germany (by Ingrid Wohrle, executor), assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 843,141, Mar. 24, 1986. This application Aug. 13, 1987, Ser. No. 85,000
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513790
Int. Cl.[4] B05C *5/02*
U.S. Cl. 118—410 **1 Claim**

1. A coating device for a web passing over a rotatable roll

and extending essentially across the width of a coating mixture application space defined at the trailing end by a blade element provided with a coating edge for smoothing the coating mixture remaining on the web and at the leading end by a restrictor plate extending parallel to the coating edge of the blade element and at each side by a respective coating deckle adjustable within a range in a direction parallel to the coating edge of the blade element, the restrictor plate including a pair of recesses, each coating deckle comprising:

a sealing element,

a holder means for holding the sealing element toward the rotatable roll,

a collecting and directing means including a collecting space disposed outwardly of said sealing element and communi-



cating with a respective one of said pair of recesses of the restrictor plate for receiving excess coating mixture issued out of the application space by way of the sealing element and for directing the excess coating mixture through the respective recess of the restrictor plate, and

a sealing tongue fixed to the coating deckle and extending inwardly of said sealing element parallel to the restrictor plate for a distance at least corresponding to the range of adjustment of the coating deckle, said sealing tongue bearing flat on the restrictor plate and covering the respective recess of the restrictor plate inwardly of said sealing element,

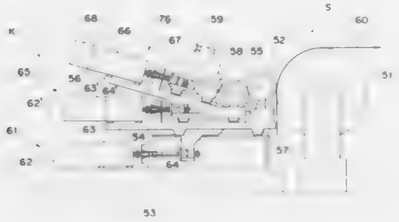
said restrictor plate including a groove in which said sealing tongue is movably held.

4,852,515

DEVICE FOR AUTOMATICALLY CONTROLLING COATING AMOUNT FOR USE IN COATING MACHINE

Yoshiyasu Terasaka, Ibaraki, and Masao Tanabe, Osaka, both of Japan, assignors to Chugai Ro Co, Ltd., Japan

Continuation of Ser. No. 610,691, May 16, 1984, abandoned. This application Jun. 18, 1986, Ser. No. 875,624
Claims priority, application Japan, May 25, 1983, 58-93247
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—663 **13 Claims**



1. A device for automatically controlling the coating amount of paint deposited on a continuous strip moving between a pair of circular rolls in a coating machine including at least three tandemly located circular rolls that are in continuous adjustable contact with the next adjacent roll in the tandem sequence, said rolls including a circular backup roll and a circular applicator roll of an elastic material with a strip to be coated moveable therebetween, a circular pickup roll in contact with said elastic applicator roll for picking up paint stored in a pickup pan, and a circular metering roll in contact with the circular pickup roll, a fixed base, a first table slidably mounted on said base, and a second table slidably mounted on said first table such that said circular applicator roll and said circular pickup roll are, respectively, slidably secured to said first and said second table for a continuous and automatically adjustable pressure contact between all of said circular rolls, said device comprising:

a present pressure control program for automatically and continuously controlling the pressure adjustment between adjacent individual ones of said above-claimed circular rolls to lie within an equilibrium condition within a predetermined range of pressure;

means for emitting a first preset signal indicative of a desired preset contact pressure range between said circular backup roll and said circular elastic applicator roll while said strip to be coated is moved therebetween;

a first pressure adjusting mechanism coupled between said fixed base and said first table for continuously and automatically adjusting the contact pressure applied from said applicator roll through said backup roll such that said applicator roll is slidably brought into pressing elastic contact with said backup roll at a pressure lying within said predetermined equilibrium pressure range;

means for emitting a second preset signal indicative of a range of desired preset contact pressure between said applicator roll and said pickup roll;

a second pressure adjusting mechanism carried by said first table and coupled between said first and second tables for continuously and automatically adjusting the pressure between said applicator roll and said pickup roll such that said pickup roll is slidably brought in pressing contact with said applicator roll at a pressure lying within said second pressure range therebetween;

said first pressure adjusting mechanism further comprising;

a first sensor in combination with a first precision ball bearing screw member for detecting a first signal representing a contact pressure reaction force of said elastic applicator roll material produced between said applicator roll and said backup roll;

a first comparator circuit means for generating and storing said first detected signal, and means associated with said first comparator circuit for emitting a first difference signal indicative of the difference, if any, between said first preset value range and said first sensor's detected signal value;

a first stepping motor arranged to be intermittently driven through step angle rotation thereof by said first difference signal when said first sensed signal is outside said predetermined range and in accordance with said preset pressure control program;

said first precision ball bearing screw member being further adapted for moving said first table relative to said base upon the intermittent rotation of said first stepping motor such that said applicator roll is slideably moved by steps toward or away from said backup roll at a speed controlled by said preset pressure control program until said desired and controlled preset pressure is achieved within said predetermined range and the reaction force sensed by said first sensor is at a null condition that stops further rotation of said first stepping motor;

said second pressure adjusting mechanism further comprising;

a second sensor in combination with a second precision ball bearing screw member detecting a second signal representing a contact pressure reaction force of said elastic applicator roll material produced between said pickup roll and said elastic applicator roll;

a second comparison circuit means for generating and storing said second sensor's detected signal, and means associated with said second comparator circuit for emitting a second difference signal indicative of the difference, if

any, between said second preset value range and said second sensor's detected value;

a second stepping motor arranged to be intermittently driven through step angle rotation thereof in accordance with said second difference signal when said second signal is outside said second predetermined range and in accordance with said preset pressure control program; and

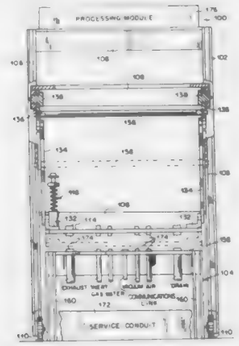
said second precision ball bearing screw member being further adapted for moving said second table relative to said first table upon the intermittent rotation of said second stepping motor such that said pickup roll is slidably moved by steps toward or away from said applicator roll at a speed controlled by said preset pressure control program until said second desired and controlled preset pressure is achieved and said reaction force sensed by said second sensor is at a null condition that stops further rotation of said second stepping motor.

4,852,516

MODULAR PROCESSING APPARATUS FOR PROCESSING SEMICONDUCTOR WAFERS

Richard H. Rubin, Fairfield; Benjamin J. Petrone, Netcong, both of N.J.; Richard C. Heim, Mountain View, Calif., and Scott M. Pawenski, Wappingers Falls, N.Y., assignors to Machine Technology, Inc., Parsippany, N.J.

Division of Ser. No. 865,251, May 19, 1986, Pat. No. 4,722,298. This application Sep. 1, 1987, Ser. No. 91,651
Int. Cl.[4] C23C *14/00*
U.S. Cl. 118—715 **23 Claims**



1. A modular processing apparatus comprising a chassis, a module attached to said chassis for performing at least one operation on a workpiece to be processed, a subassembly separate from said chassis, service supply means attached to said subassembly for supplying a preselected service to said module for the operation thereof, and connection means for releasably connecting said service supply means to said module, whereby said module functions as an independent, self-contained processing unit.

4,852,517

INSECT TRAPPING MAT

Dwight L. Smith, Box 4364, Fullerton, Calif. 92634, and Marvin Elkins, 1600 Colfax, Lemon Grove, Calif. 92020

Continuation-in-part of Ser. No. 764,323, Aug. 12, 1985, Pat. No. 4,649,861. This application Mar. 16, 1987, Ser. No. 26,534
The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.
Int. Cl.[4] A01K *1/015*
U.S. Cl. 119—1 **13 Claims**

1. A mat, having a generally planar shape and lying in a plane, for domestic animals comprising:

a. a top layer of insect pervious material;

b. a bottom layer;

c. layer means intermediate said top layer and said bottom layer for resisting the deformation of the mat by forces normal to said plane and also mechanically obstructing the



entry of the animal's hair, down or hide while allowing the movement of insects therethrough; and

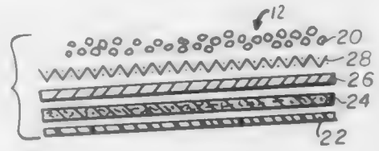
d. tack-adhesive means intermediate said top and bottom layers to cause the insects to self-adhere to it.

4,852,518

ODORLESS ANIMAL LITTER UNIT

Patrick Yananton, 1518 Little Hill Rd., Point Pleasant, N.J. 08742

Continuation-in-part of Ser. No. 10,309, Feb. 3, 1987, which is a continuation of Ser. No. 573,958, Jan. 26, 1984, Pat. No. 4,640,225, which is a continuation-in-part of Ser. No. 315,307, Oct. 27, 1981, Pat. No. 4,469,046, which is a continuation-in-part of Ser. No. 909,256, May 24, 1978, abandoned. This application Mar. 2, 1987, Ser. No. 20,719
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 **26 Claims**



1. The method of preventing the formation of the odor associated with cat urine by preventing bacterial action on the urine, comprising the steps of

a providing cat urine transfer directly to a sorbtive-desiccant member,

b sorbing said urine in a high surface area, high urine sorbency sorbtive-desiccant member having a high wicking capacity,

c aerating said sorbtive-desiccant member to inhibit the growth and bacterial action of anaerobic bacteria,

d rapidly dispersing urine across said sorbtive-desiccant member by the wicking action of said member thereby maximizing the surface area of the urine and causing the urine to evaporate from said high surface area sorbtive-desiccant member at a rate which causes bacteria in said sorbtive-desiccant member to die or become dormant thereby preventing significant odor formation.

4,852,519

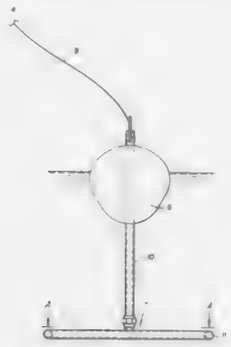
PROCESS AND DEVICE FOR MEDICAL TREATMENT OF FISH

Jakob Karlsen, Ekkilsoy, Norway, assignor to Aqua Fisk A/S, Ekkilsoy, Norway

Filed Aug. 11, 1987, Ser. No. 84,381
Claims priority, application Norway, Aug. 14, 1986, 863290
Int. Cl.[4] A01K *61/00*
U.S. Cl. 119—3 **15 Claims**

9. A process for administering anti-parasite and/or anti-bacterial medications to water in which fish are raised wherein a solution medication is supplied continuously under pressure to

the water in which the fish are raised from at least one nozzle placed below the surface so as to bathe the fish in a relatively

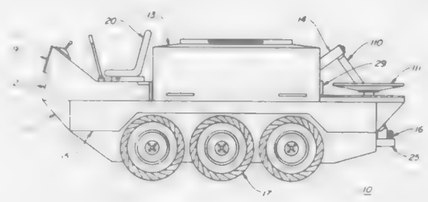


dilute concentration of medicine for a prolonged period of time under controlled conditions.

4,852,520
PORTABLE PET CARRIER
Charles R. Goetz, Carnegie, Pa., assignor to Alco Industries, Inc., Valley Forge, Pa.
Filed Nov. 16, 1987, Ser. No. 120,872
Int. Cl.[4] A01K *1/02*
U.S. Cl. 119—19 9 Claims

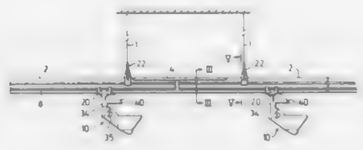
1. A portable pet carrier having a lower section and a separable upper section; said lower section having a bottom wall, spaced side walls, a rear wall and a front wall having an opening formed therein, said upper section having a top wall, spaced side walls, a rear wall and a front wall having an opening formed therein; said walls of said upper section and said walls of said lower section having free edges; means on said free edges of said walls for attaching said upper section to said lower section; a gate pivotally mounted in the openings formed in the front walls of said upper section and said lower section; latch means on said gate for retaining said gate in the closed position and means on said upper section and on said lower section adapted to receive said latch means on said gate when said gate is in the closed position; a locking pin adapted to extend through said latch means on said gate and through said means on said upper section and said means on said lower section to receive said latch means on said gate to retain said gate in the closed position; said locking pin having a closure leg, a lateral leg connected at one end to an end of said closure leg and a right-angle retaining portion connected to the other end of said lateral leg to prevent the accidental removal of said latch pin from said latch member; roller means on the exterior of said bottom wall of said lower section and handle means on the exterior of said top wall for moving said pet carrier.

4,852,521
AMPHIBIOUS AQUACULTURE FEED DISTRIBUTION MACHINE
J. J. Harrington, Twin Falls, Id., assignor to Mariculture Equipment Development, Inc., Twin Falls, Id.
Filed Apr. 6, 1987, Ser. No. 34,925
Int. Cl.[4] A01K *61/02*
U.S. Cl. 119—51.04 27 Claims



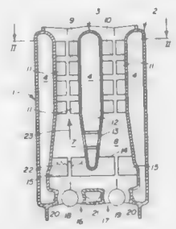
1. An amphibious aquaculture feed and chemical distribution machine which comprises:
an amphibious vehicle for traveling upon both land and in both deep and shallow water;
means for storing feedstuffs within said amphibious vehicle;
feed distribution means for transferring said feed stuffs from the storage means, through the air to the surface of the water, an auger which transfers feed from the storage means to a plurality of drop chutes; a plurality of drop chutes which drops feed onto centrifugal distribution fans; a plurality of centrifugal distribution fan means which centrifugally disperses feedstuff or chemicals over an area of water.

4,852,522
SUSPENSION-TYPE WATER SUPPLY SYSTEM FOR POULTRY
Ehud Uri, Menashe, Israel, assignor to Plasson Maagan Michael Industries Ltd., Enashe, Israel
Filed Nov. 23, 1987, Ser. No. 123,737
Claims priority, application Israel, Apr. 17, 1987, 82252
Int. Cl.[4] A01K *7/00*
U.S. Cl. 119—72 6 Claims



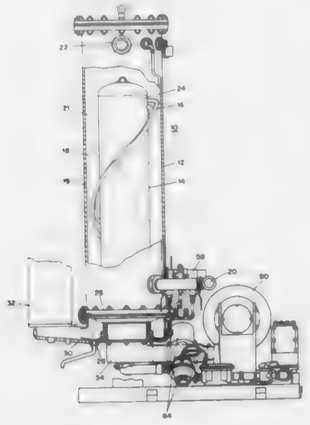
1. A suspension-type water supply system for poultry including a plurality of rigid, elongated suspension members each formed at one side with a longitudinally-extending socket section receiving a water supply pipe for supplying water to poultry drinking devices suspended therefrom, and at its opposite side with a continuous, longitudinally-extending flange section for increasing the resistance of the water supply system to a plurality of bridging members each bridging ends of the flange sections of two adjacent suspension members and securing them together by fasteners passing through the bridging members and the flange sections of the suspension members; said flange section of each of the suspension members having an outer edge and a pair of longitudinally-extending ribs on its opposite faces spaced inwardly from its outer edge; and a plurality of hangers slidably receiving said ribs for supporting the water supply system in suspension at any desired points thereof.

4,852,523
ATMOSPHERIC GAS BOILER
Manfred Zeimes, Hilden, Fed. Rep. of Germany, assignor to Thyssen Industrie AG, Fed. Rep. of Germany
Filed Jan. 29, 1988, Ser. No. 149,437
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1987, 3702600; Feb. 19, 1987, 3705230
Int. Cl.[4] F22B *5/00*
U.S. Cl. 122—14 8 Claims



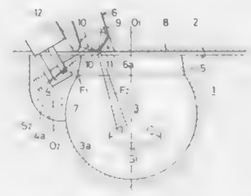
1. An atmospheric gas boiler, comprising two vertically arranged end pieces and at least one middle piece disposed between said end pieces and defining vertically extending gas passes between said middle piece and each of said end pieces and a lower part having an interconnection between said gas passes and defining a furnace area, said end and middle pieces having passages through which hot water flows and defines secondary heating surfaces, said middle piece having a tongue extending into said furnace area through which hot water flow, said tongue having cooling rims on its exterior which extend into adjacent gas passes.

4,852,524
GAS FIRED WATER HEATER
Kenneth W. Cohen, Fort Lee, N.J., assignor to Aerco International, Inc., Northvale, N.J.
Filed Jun. 16, 1988, Ser. No. 208,138
Int. Cl.[4] F22B *37/42;* F22D *5/00*
U.S. Cl. 122—448 R 34 Claims



1. A heating device comprising:
combustion means for igniting a combustible mixture of air and gas to provide a first fluid for heating a second fluid;
heat exchanger means for providing heat transfer between said first and second fluids, said exchanger means including a combustion chamber for receiving the first fluid, a water chamber having an inlet and outlet between which said second fluid passes, said water chamber enclosing the combustion chamber, and a plurality of exchange tubes formed through, extending from and surrounding said combustion chamber such that the first fluid travels through the combustion chamber and tubes in physical isolation from and in heat exchange relation with said second fluid which passes on the outside of said combustion chamber and tubes within the water chamber;
temperature control means for controlling the temperature of the fluids, including thermal measuring means having a sensor for sensing the temperature of a mixture of incoming and outgoing portions of said second fluid, and controlling means responsive to the sensed temperature for controlling the rate of heat transfer between the fluids by modulating the flow of air and gas to said combustion means.

4,852,525
COMBUSTION CHAMBER IN INTERNAL COMBUSTION ENGINE
Shiro Ishida, Fujisawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan
Filed Nov. 19, 1986, Ser. No. 932,804
Claims priority, application Japan, Nov. 21, 1985, 60-259750
The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.
Int. Cl.[4] F02B *23/08*
U.S. Cl. 123—256 13 Claims



1. A combustion chamber for an internal combustion engine, of the type using a fuel of low ignitability such as alcohol, gasoline, or methanol, comprising:
a main combustion chamber recessed axially in a first top portion of a piston;
a subcombustion chamber recessed radially outward in a second top portion of said piston and on an upper side of said main combustion chamber, said subcombustion chamber being contiguous to said main combustion chamber with the depth of said subcombustion chamber being less than that of said main combustion chamber, said main and subcombustion chamber being arranged so that combustion gas burned in said subcombustion chamber will be carried into said main combustion chamber;
an ignition means provided within said subcombustion chamber in order to assist ignition; and
fuel injecting nozzle means for spouting fuel sprays, said nozzle means having subnozzle means for injecting fuel into said subcombustion chamber during all running conditions of the engine, and having a main nozzle hole for injecting fuel into said main combustion chamber only when the engine is operating under running conditions heavier than a light load condition.

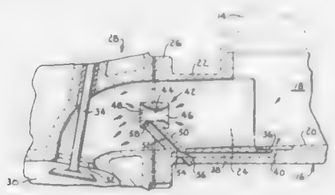
4,852,526
DELIVERY OF FUEL IN INTERNAL COMBUSTION ENGINES
Stephen E. Brown, Rte. 10, Box 4, Mountain Home, Ark. 72653
Filed Aug. 15, 1988, Ser. No. 232,144
Int. Cl.[4] F02M *61/14*
U.S. Cl. 123—52 MC 13 Claims

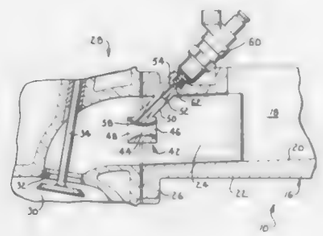
1. In an engine having a cylinder, an intake port for admit-

ting an air-fuel mixture to the cylinder, and an intake manifold coupled with the cylinder to provide a flow passage to the intake port for the air-fuel mixture, the improvement comprising:

means for presenting a reservoir in the intake manifold for collecting liquid fuel that liquifies from the air-fuel mixture;

a venturi having a restricted throat and low and high pressure sides on opposite sides of said throat;





means for mounting said venturi in the flow passage with said low pressure side located downstream from said high pressure side; and

means for providing a passage having an inlet end communicating with said reservoir to receive the liquid fuel therefrom and an outlet end opening into the low pressure side of said venturi to deliver the liquid fuel into the air-fuel mixture flowing through the venturi, thereby effecting atomization of at least some of the liquid fuel to achieve more complete combustion thereof in the cylinder.

4,852,527

LOW NOISE VALVE TRAIN

John M. Beardmore, Howell, and John A. Cafeo, Farmington, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 7,875, Jan. 28, 1987, abandoned. This application May 26, 1988, Ser. No. 199,219
Int. Cl.[4] F01L *1/04, 1/18*
U.S. Cl. 123—96 6 Claims

1. Low noise valve train for an internal combustion engine, said valve train comprising a poppet valve reciprocably movable to open and closed positions by opening and closing motions respectively including lifting from and seating upon a valve seat,

a valve spring urging the valve toward its closed position with a predetermined seating force,

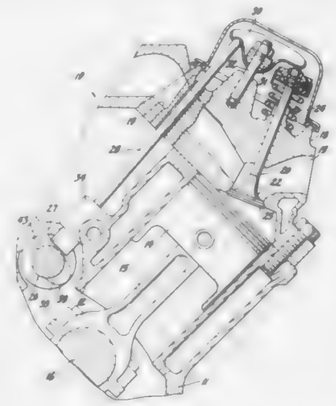
a rotatable member having a cam for causing and controlling the opening and closing motions of the valve against the force of the valve spring,

a hydraulic lash adjuster and mechanical connecting means acting between the cam and the valve to transmit the rise and fall of the cam at least partially to the valve to cause opening and closing motions thereof, said mechanical connecting means having stiffness characteristics that require a determinable cam rise to compress the mechanical connecting means from an unloaded condition to a load adequate to open the valve and a determinable cam fall to unload the mechanical connecting means after seating of the valve,

said cam having a profile operatively related to the stiffness of said mechanical connecting means and including, in the sequence of rotation,

a bluff opening ramp of variable slope operative to compress the mechanical connecting means to near the point of valve opening,

an unseating portion operative during unseating of the valve



and of shallow slope significantly lower than the maximum slope of the bluff ramp resulting in a low valve velocity during said unseating thereof,

a valve lift curve of any desired configuration, a seating portion operative during seating of the valve and of shallow negative slope resulting in a low valve velocity during said seating thereof, and

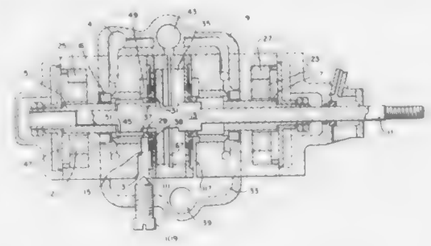
a bluff closing ramp of variable slope with a maximum significantly more negative than the slope of the closing ramp to rapidly unload the mechanical connecting means after closing of the valve.

4,852,528

PNEUMATIC ACTUATOR WITH PERMANENT MAGNET CONTROL VALVE LATCHING

William E. Richeson, and Frederick L. Erickson, both of Fort Wayne, Ind., assignors to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Jun. 20, 1988, Ser. No. 209,279
Int. Cl.[4] F01L *9/00, 9/04*
U.S. Cl. 123—90.11 15 Claims



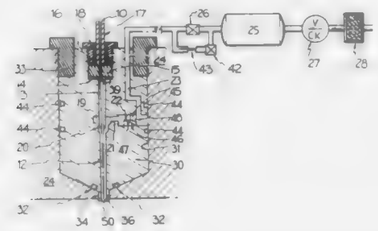
12. A pneumatically powered valve actuator comprising a valve actuator housing; a piston reciprocable within the housing along an axis, the piston having a pair of oppositely facing primary working surfaces; a pressurized air source; a pair of air control valves reciprocable along said axis relative to both the housing and the piston between open and closed positions; means for selectively opening one of said air control valves to supply pressurized air from the air source to one of said primary working surfaces causing the piston to move; pneumatic means for decelerating the piston near the extremities of its reciprocation; and differentially controllable valving means for supplying air from the pressurized source to the air control valves to compensate for variations in external forces opposing piston motion.

4,852,529

LASER ENERGY IGNITION SYSTEM

Robert W. Vowles, North Melbourne, Australia, assignor to Bennett Automotive Technology Pty. Ltd., Melbourne, Australia

PCT No. PCT/AU87/00063, § 371 Date Nov. 6, 1987, § 102(e) Date Nov. 6, 1987, PCT Pub. No. WO87/05364, PCT Pub. Date Sep. 11, 1987
PCT Filed Mar. 6, 1987, Ser. No. 156,916
Claims priority, application Australia, Mar. 7, 1986, PH04930
Int. Cl.[4] F02P *23/00*
U.S. Cl. 123—143 B 13 Claims



1. An ignition system for an internal combustion engine, said system including laser energy generating means for generating pulsed laser energy, control means for delivering a pulse of said laser energy at predetermined time intervals through a purging chamber to a combustion chamber of the internal combustion engine, said purging chamber having an opening communication with said combustion chamber through which said laser energy pulses are delivered, said purging chamber being provided with a supply of purging gas during operation of the engine, and means for concentrating said pulsed laser energy at a predetermined location within said combustion chamber, such that focussed laser energy formed by said means for concentrating the pulsed laser energy is sufficient to cause ignition of a combustible charge within said chamber.

4,852,530

AIR POLLUTION CONTROL ELECTROCATALYTIC CONVERTER

Manolis John, P.O. Box 380, New York, N.Y. 10028

Continuation-in-part of Ser. No. 128,906, Dec. 4, 1987, Pat. No. 4,762,101. This application Jan. 18, 1989, Ser. No. 298,579
Int. Cl.[4] F02P *19/02*
U.S. Cl. 123—145 A 4 Claims

1. An electrocatalytic converter comprising:

(i) a base portion having a fixing portion formed on an outer wall thereof and a terminal insulatedly provided therein and connected to an electrical source;

(ii) a heater means integrally connected to the said base portion, having heating surface and heating fins formed on a wall surface thereof and composed of a catalyst a transition metal;

(iii) a heating means comprising a resistive exothermic element connected to the terminal of said base portion, the resistive exothermic element being provided adjacent to the heating surface within the heating means;

(iv) a plurality of heating means fins outwardly extending projections radially mounted on the outer wall of the base portion and



(v) said base portion and heating fins are covered with a thin coating of platinum (Pt), palladium (Pd) and rhodium (Rd).

4,852,531

TITANIUM POPPET VALVE

Stanley Abkowitz, Lexington; Harold L. Heussi, Essex; Harold P. Ludwig, Woburn, and Stephen A. Kraus, Clinton, all of Mass., assignors to Dynamet Technology Inc., Burlington, Mass.

Filed Mar. 10, 1988, Ser. No. 166,503
Int. Cl.[4] F01L *3/00*
U.S. Cl. 123—188 AA 6 Claims

1. A poppet valve comprising:

a valve stem formed by extrusion of a rod-like powder preform of a titanium alloy including particles consisting essentially of compounds selected from the group consisting of TiC, TiB_2 and TiB; and

a valve head formed from a powder preform of a titanium alloy, said head being joined to said stem by cold compaction of said stem and head while said stem and said head are in contact followed by vacuum sintering of the joined article followed by high temperatures compaction of the vacuum sintered article.

4,852,532

ROTARY VALVE FOR INTERNAL COMBUSTION ENGINES

Arthur E. Bishop, 19 Buffalo Rd., Gladesville NSW 2111, Australia

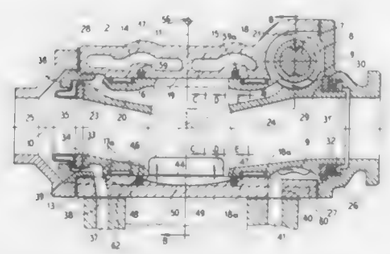
PCT No. PCT/AU87/00018, § 371 Date Sep. 22, 1987, § 102(e) Date Sep. 22, 1987, PCT Pub. No. WO87/04489, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 23, 1987, Ser. No. 130,537

Claims priority, application Australia, Jan. 23, 1986, [redacted]

Int. Cl.[4] F01L *7/10, 7/16*

U.S. Cl. 123—190 BD **4 Claims**



1. A rotary valve for an internal combustion engine comprising a hollow cylindrical rotor having at some point along its bore an inclined baffle, two rectangular ports in the periphery of the valve angularly disposed one to the other positioned along the axis adjacent the baffle, one port communicating with the bore on one side of the baffle and vice versa, a cylinder head having a bore in which said rotor rotates in a predetermined small clearance fit, a window in said cylinder head bore communicating with a combustion chamber, rolling element bearings one adjacent each side of said ports for journalling said rotor in said cylinder head, said rolling element bearings serving to maintain the said predetermined small clearance fit, longitudinal sealing elements housed directly within said bore of said cylinder head extending inwardly from said bore an amount equal to said predetermined clearance, said sealing elements having at each end a radially extending surface square to the axis of said bore and being housed within blind-ended longitudinal grooves formed integrally within said cylinder head, said grooves being of varying depth along their length, deep at the mid point thereof and shallower towards the ends of said bore, said grooves being positioned one on each side circumferentially of said window, at least two circumferential rings positioned along the axis of said rotor immediately adjacent respective radially extending end surfaces of said sealing strips, said circumferential rings having a small radially extending overlap with said sealing elements, said longitudinal sealing elements and said circumferential rings constituting an array of sealing elements providing a sealing window having four sides which floats with the motion of the periphery of said valve.

4,852,533

MOUNTING ARRANGEMENT FOR VEHICLE ENGINE AND THE LIKE

Francis Doecker, Neuhausen; Rolf Helber, Schorndorf; Gerhard Weizel, Seeshaupt, and Richard Bung, Ludwigshafen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Nov. 16, 1987, Ser. No. 121,340

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3639091

Int. Cl.[4] F02B *75/06*

U.S. Cl. 123—192 R **18 Claims**

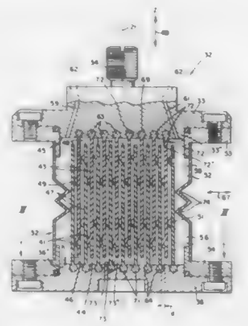
17. Vehicle engine mounting unit for supporting a vehicle engine at a vehicle body, comprising:

an engine support part attachable to an engine to be movable therewith,

a vehicle body support part attachable to a vehicle body part to be movable therewith,

elastic body means interposed between the engine support part and body support part to dampen forces during relative movement thereof,

and shear unit means interposed between the engine support part and vehicle body part in parallel relationship to the elastic body means,



wherein the shear unit means includes a plurality of plate shaped lamellae having one end thereof connected to one of the engine support part and the body support part and the other end thereof extending between respective ones of the lamellae connected to the other part, said lamellae being disposed in a chamber of viscous fluid such that the lamellae and viscous fluid act to limit relative movement of the engine support part and body support part as a function of the speed and frequency of said relative movement.

4,852,534

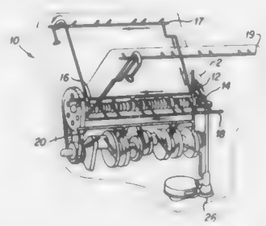
OIL RESTRICTOR SYSTEM

David C. Amaral, 9306 Sheridan St., Lanham, Md. 20706

Filed Jun. 21, 1988, Ser. No. 209,298

Int. Cl.[4] F01M *1/00*

U.S. Cl. 123—196 R **10 Claims**



1. A fluid flow restrictor system for (1) increasing oil pressure in one portion of an internal combustion engine and (2) simultaneously reducing the oil flow to a second and third portion of said engine, comprising:

a longitudinally extended restrictor member having a central bore extending in said longitudinal direction, said fluid flow restrictor system including means for independently controlling the oil flow to each of said second and third portions of said engine, said restrictor member including an annular sidewall surrounding said central bore.

4,852,535

AUTOMATIC CONTROL METHOD FOR MOVING A FINAL CONTROL ELEMENT

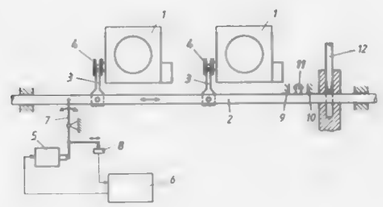
Leopold Rollenitz, Kirchstetten; Andreas Krenn, Baden; Harald Schmidt, and Otto Freudenschuss, both of Vienna, all of Austria, assignors to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Sep. 8, 1988, Ser. No. 241,960

Claims priority, application Austria, Oct. 1, 1987, 2498/87

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—357 **6 Claims**



1. In a method of automatically correcting the operation of an automatic control system comprising a final control element and an actuator for receiving a correcting signal and for imparting to said final control element consecutive movements in response to consecutive ones of said correcting signals,

wherein a position sensor is operated to generate and deliver to said computer an actual position signal corresponding to the actual position of said final control element after each of said movements,

a plurality of desired-position data corresponding to respective ones of said correcting signals are stored in a computer,

said computer is operated to compare each of said actual-position signals with that of said stored desired-position data which is associated with the last correcting signal, [redacted]

said computer is operated to correct said correcting signal in dependence on any detected deviation between said actual-position and desired-position signals so as to eliminate such deviation,

the improvement residing in that

an automatic control system is used in which said actuator is operable to move said final control element to two spaced apart reference positions, which are defined by stops, and within a predetermined control range extending between said two reference positions,

said actuator is operated to move said final control element to said two reference positions in succession,

the correcting signals associated with said two reference positions are stored as reference correcting data in said computer,

said position sensor is operated to deliver to said computer two reference position signals representing said two reference positions,

said reference position signals are stored in said computer,

said computer is operated to generate from said two reference correcting data and said two reference position signals a desired-position function, by which said desired-position data are related to said reference correcting data, and

said computer is operated after each of said movements of said final control element to detect any deviation of said actual-position signal from that of said desired-position data with in accordance with said function is associated with the last correcting signal.

4,852,536

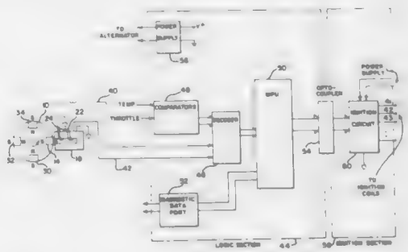
TRIGGER SYSTEM FOR IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Gerhard A. Maier, Mundelein; David L. Enlow, Wadsworth, and Paul T. Ng, Park City, all of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 11, 1987, Ser. No. 131,858

Int. Cl.[4] F02P *5/15, 7/067*

U.S. Cl. 123—414 **33 Claims**



1. An apparatus for generating ignition trigger and synchronizing signals in a spark-ignited internal-combustion engine having a plurality of cylinders and having a ring gear rotating in timed relationship with the crankshaft of the engine, the apparatus comprising:

a plurality of magnets equal in number to the number of cylinders, the magnets being disposed equally spaced on a circle coaxial with the ring gear, one of the plurality having an exposed pole of a first polarity and each of the others of the plurality having an exposed pole of a second polarity opposite to the first polarity;

a first coil disposed near the ring gear so as to be inductively coupled to the magnets upon rotation of the ring gear and generate a signal of a first polarity in response to motion of the pole of the first polarity past the first coil;

a second coil disposed near the ring gear and near the first coil so as to be inductively coupled to the magnets upon rotation of the ring gear and generate a signal of the first polarity in response to motion of each of the poles of the second polarity past the second coil; and

a decoder connected to the first and second coils and receiving as inputs the signals of the first polarity from the first and second coils and producing output signals representing the logical sum of the signals of the first polarity, whereby the signal of the first polarity in the first coil produces a synchronizing output signal and also a predetermined cylinder identifying output signal, said output signals also providing ignition trigger signals for each cylinder.

4,852,537

IGNITION TIMING CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Masami Nagano, and Takeshi Atago, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 21, 1987, Ser. No. 52,394

Claims priority, application Japan, May 23, 1986, 61-117312

Int. Cl.[4] F02P *5/15*

U.S. Cl. 123—419 **10 Claims**

1. An ignition timing control apparatus for an internal combustion engine for a vehicle comprising:

(a) rotation speed detecting means for detecting the rotation speed of the engine;

(b) speed changing direction discriminating means for discriminating the changing direction of the engine rotation speed;

(c) ignition timing correction quantity determining means for determining an ignition timing correction quantity

corresponding to a positive or negative increment of the engine rotation speed per unit time;

(d) acceleration detecting means for detecting the operation of the engine accelerating the vehicle; and

(e) ignition timing correcting means for correcting basic ignition timing on the basis of at least a quantity of ignition timing advance or a quantity of ignition timing retardation



determined by said speed changing direction discriminating means and said ignition timing correction quantity determining means after detection of the acceleration;

wherein said ignition timing correcting means corrects said basic ignition timing such that an elastic vibration of the engine generated by a step-like increment of engine torque at the time of acceleration is eliminated.

4,852,538

FUEL INJECTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

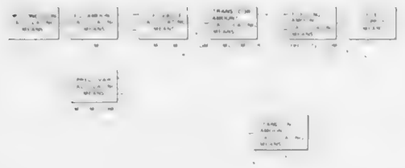
Hatsuo Nagaishi, Zushi City, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 923,983, Oct. 28, 1986, abandoned. This application Nov. 3, 1988, Ser. No. 239,830

Claims priority, application Japan, Oct. 29, 1985, 60-243605; Jan. 9, 1986, 61-2810

Int. Cl.[4] F02D *41/30*

U.S. Cl. 123—492 **15 Claims**



1. A fuel injection control system for an internal combustion engine, comprising:

means for detecting the operating condition of the engine;

means for calculating a standard injection amount in accordance with the engine operating condition;

means for calculating an equilibrium amount of adhering and floating fuel in an intake system of the engine, in a steady state of engine operation, in accordance with the engine operating condition;

means for calculating a difference value between said equilibrium amount of the adhering and floating fuel in the intake system and a predicted variable of amount of the adhering and floating fuel in the intake system at a predetermined point of time;

means for calculating a transient correction amount in accordance with said difference value and a correction coefficient which is previously set in accordance with operating condition of the engine;

means for calculating a fuel injection amount in accordance with said standard injection amount and said transient correction amount and outputting an injection signal representative of said fuel injection amount, said fuel injection amount calculating means including means for calculating said fuel injection amount in timed relation to engine speed; and

means for supplying fuel to the engine in accordance with said injection signal.

4,852,539

SUPPLEMENTAL AIR VALVE FOR INTERNAL COMBUSTION ENGINE

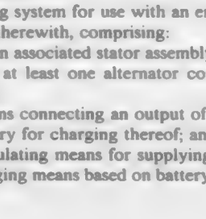
Chester W. Pankow, 4220 E. Almeria, #B-4, Phoenix, Ariz. 85008

Continuation-in-part of Ser. No. 900,088, Aug. 25, 1986, Pat. No. 4,715,351. This application Dec. 11, 1987, Ser. No. 131,666

The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.

Int. Cl.[4] F02M *123/04*

U.S. Cl. 123—587 **4 Claims**



1. A supplemental air valve for regulating the admission of supplemental combustion air to an internal combustion engine, said valve comprising:

(a) a valve body defining a bore, at least a portion of said bore defining an air chamber having an inlet and an outlet communicating with said air chamber, said outlet being adapted to be connected to an engine manifold;

(b) a valve member reciprocal within said bore having a piston member dividing at least a portion of said bore into two pressure chambers, said pressure chambers having means for connection to a source of engine vacuum;

(c) said valve member being shiftable from an open position permitting ambient air to enter through said inlet to said air chamber and having a closed position blocking admission of air to said air chamber; and

(d) resilient means normally urging said valve body to said closed position, said resilient means being selectively adjustable to provide a predetermined biasing force on said piston whereby said piston is responsive to changes in engine vacuum to control the admission of supplemental air to said engine.

4,852,540

HIGH-EFFICIENCY CHARGING AND REGULATING SYSTEM

Edward J. Safranek, Arlington Heights, Ill., assignor to F & B Mfg Co., Gurnee, Ill.

Filed May 9, 1988, Ser. No. 191,877

Int. Cl.[4] F02P *3/06;* **H02J** *7/14*

U.S. Cl. 123—599 **20 Claims**

15. A charging system for use with an engine having a battery associated therewith, comprising:

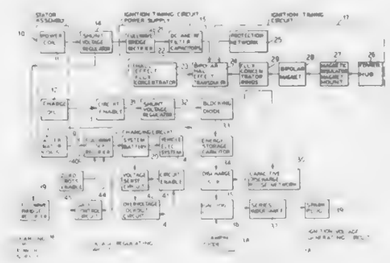
a rotor with an associated stator assembly, the stator assembly having at least one alternator coil and at least one power coil;

charging means connecting an output of the alternator coil to the battery for charging thereof; and

a voltage regulating means for supplying a control voltage to the charging means based on battery voltage and based

on an output voltage of the power coil, said power coil being separated from the alternator coil.

18. A system according to claim 15 wherein the stator assembly also has a charge coil connecting to an ignition voltage



generating means for generating a voltage for a spark plug of the engine, and an ignition timing means is provided which is also connected to the power coil at an input and at an output controls the ignition voltage generating means.

4,852,541

DISTRIBUTOR FOR INTERNAL COMBUSTION ENGINE

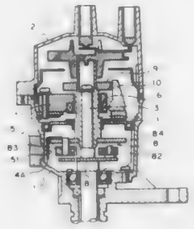
Seiki Kodama; Shigenobu Murase; Haruyuki Matsuo; Hideki Maruhashi; Shigemi Murata, and Hidetoshi Miyaji, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 224,041

Claims priority, application Japan, Jul. 24, 1987, 62-185934; Jul. 24, 1987, 62-185935; Jul. 24, 1987, 62-114008[U]; Jul. 24, 1987, 62-114009[U]

Int. Cl.[4] F02P *7/00, 5/14*

U.S. Cl. 123—617 **10 Claims**



1. A distributor for an internal combustion engine having a rotary shaft rotated synchronously with said internal combustion engine, a centrifugal spark advance member rotated through a centrifugal spark advance mechanism so that said member revolves relative to said rotary shaft, an ignition timing reluctor provided on said centrifugal spark advance member, and ignition timing signal generating means for generating an ignition timing signal by detecting approach and passage of said ignition timing reluctor,

wherein the improvement comprises a cylinder discriminating reluctor installed on said centrifugal spark advance member so as to rotate together with it, and a cylinder discriminating sensor for generating a cylinder discriminating signal by detecting approach and passage of said cylinder discriminating reluctor.

4,852,542

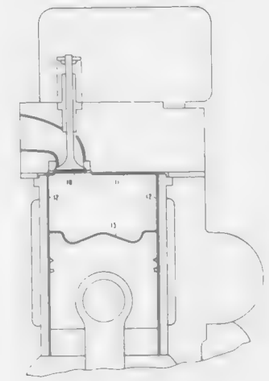
THIN THERMAL BARRIER COATING FOR ENGINES

Roy Kamo; Melvin E. Woods, both of Columbus, Ind., and W. Bryzik, Grosse Pointe Woods, Mich., assignors to Adiabatics, Inc., Columbus, Ind.

Filed Oct. 23, 1987, Ser. No. 111,933

Int. Cl.[4] F02B *77/11, 75/08*

U.S. Cl. 123—668 **8 Claims**



1. An internal combustion engine combustion chamber component having on a surface thereof a layer of thermally insulative material of a thickness of approximately 0.002 inch to 0.009 inch.

4,852,543

SLING APPARATUS

Kenneth J. Mosser, P.O. Box 242, Clarissa, Minn. 56440

Division of Ser. No. 20,862, Mar. 2, 1987, Pat. No. 4,805,583. This application Sep. 12, 1988, Ser. No. 242,824

Int. Cl.[4] F41B *3/00*

U.S. Cl. 124—20 R **12 Claims**



1. An apparatus for throwing an object into the environment comprising: elongated linear shaft means including a first shaft having a first end and a second end and a second shaft having a first end and a second end, means releasably connecting the second end of the first shaft to the first end of the second shaft whereby the first end of the first shaft and the second end of the second shaft are at opposite ends of the shaft means, sling means mounted on the first end of the first shaft for propelling

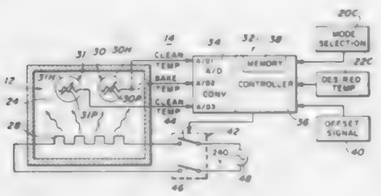
the object into the environment, said sling means comprising a generally V-shaped member having a vertex secured to the first end of the first shaft and diverging arms projected laterally in opposite directions from said first shaft, elastic bands attached to said arms, and means for accommodating an object attached to said elastic bands, stake means at the second end of the second shaft adapted to extend into the ground, and means secured to the stake means usable to drive the stake means into the ground, said means secured to said stake means including a cross beam secured to said stake means whereby when the stake means is positioned in the ground, the shaft means is anchored and stabilized relative to the ground.

4,852,544

SELF-CLEANING OVEN TEMPERATURE CONTROL WITH MULTIPLE REDUNDANT OVEN TEMPERATURE SENSING ELEMENTS

Robert R. Williams, and Ronald W. Holling, both of Lincoln Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 31, 1987, Ser. No. 139,918
Int. Cl.[4] F24C *3/00*
U.S. Cl. 126—39 BA **23 Claims**



1. A self-cleaning oven comprising
an oven cavity adapted to receive items to be cooked by said oven,
heating means within said oven cavity for raising the temperature of said oven cavity and
control means for controlling the operation of said oven in a BAKE mode of operation and in a separate CLEAN mode of operation,
said control means including first and second temperature sensing means for sensing the temperature of said oven cavity and also including automated means for controlling the operation of said heating means, said automated means being responsive to output signals from both said first and second temperature sensing means for controlling the operation of said heating means during said BAKE mode of operation and also being responsive to output signals from both said first and second temperature sensing means for controlling the operation of said heating means during said CLEAN mode of operation.

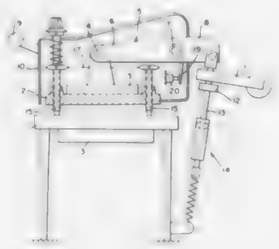
21. A method of controlling the operation of a self-cleaning oven having heating means for raising the internal temperature of the oven and control means for controlling the operation of the oven in a BAKE mode of operation and in a CLEAN mode of operation, comprising the steps of
sensing with a first oven temperature sensor the internal temperature of said oven during said BAKE mode of operation and during said CLEAN mode of operation,
sensing with a second oven temperature sensor the internal temperature of said oven during said BAKE mode of operation and during said CLEAN mode of operation,
automatically controlling the operation of said heating means in response to output signals from both said first and second temperature sensors during said BAKE mode of operation and
automatically controlling the operation of said heating means in response to output signals from both said first and second temperature sensors during said CLEAN mode of operation.

4,852,545

APPARATUS FOR COOKING FOOD

Victor Sherman, 13-10 34 Ave., Long Island City, N.Y. 11106; Ilya Zborovsky, 6 Schoolhouse Way, Dix Hills, N.Y. 11746; William Sanchez, 35-69 169 St., Flushing, N.Y. 11358, and Wladimir Kowalenko, 24 Witney Clr., Glen Cove, N.Y. 11542

Filed Mar. 25, 1988, Ser. No. 173,592
Int. Cl.[4] F24G *3/00*; **A47J** *27/62*
U.S. Cl. 126—39 H **9 Claims**



1. An apparatus for cooking food, comprising
at least two plates arranged to confine an initial food material therebetween and to cook the same;
means for heating said plates;
means for moving at least one of said plates relative to the other of said plates between a distal position in which said one plate is spaced from said other plate so that the initial food material can be introduced between the plates, and a proximal position in which said one plate is located close to said other plate so that the initial food material is somewhat compressed and cooked by heat and pressure applied thereto by said plates, said moving means including power drive means arranged to apply pressure to said one plate and therefore to the initial food material, said power drive means being formed as magnetic power drive means and located laterally outside of said plates, said one plate being pivotable relative to said other plate between said two positions; and
two-arm lever having one arm which is connected with said one plate, another arm having a portion which is located laterally outside of said plates and connected with said magnetic power drive means, and a pivot which defines a pivot point of said two-arm lever.

4,852,546

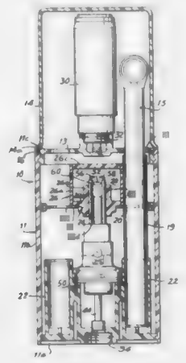
HAIR ROLLER HEATING DEVICE

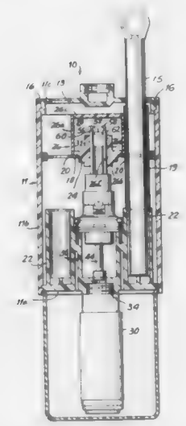
Thaddeus Zaborowski, Cambridge, Mass., assignor to The Schawbel Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 825,275, Feb. 3, 1986, Pat. No. 4,699,123, and a continuation-in-part of Ser. No. 56,447, Jun. 1, 1987, Pat. No. 4,776,321, which is a continuation-in-part of Ser. No. 781,262, Sep. 27, 1985, Pat. No. 4,733,651. This application Aug. 1, 1988, Ser. No. 226,730
Int. Cl.[4] A45D *4/00*
U.S. Cl. 126—403 **17 Claims**

1. A portable heating appliance comprising: a housing defined by a top wall, side wall and bottom wall, said top wall including a plurality of apertures through which a plurality of elongated objects can be inserted into said housing;
a heating chamber in said housing for heating said objects inserted through said apertures;
at least one burner tube with a free end extending into said heating chamber;
fuel delivery means for supplying fuel to said heating chamber through said at least one burner tube;
ignition means for igniting said fuel supplied to said heating chamber by said at least one burner tube so as to heat said chamber;
first securing means in one wall of said housing for removably connecting a fuel supply cartridge thereto in an inoperative state when said heating appliance is not being used; and
second securing means in another wall of said housing for removably connecting the fuel supply cartridge thereto in an operative state to supply fuel to said fuel delivery means when said heating appliance is in use.

15. A portable heating appliance for a plurality of hair rollers comprising:
(a) a housing having a plurality of heat transfer members





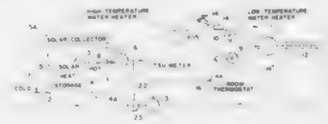
comprising a plurality of tubes through which said plurality of hair rollers are insertable for heating by said appliance;
(b) a heating chamber in said housing for heating said heat transfer members;
(c) at least one burner tube with a free end extending into said heating chamber;
(d) fuel delivery means for providing fuel to said heating chamber through said at least one burner tube;
(e) ignition means for igniting said fuel supplied to said heating chamber by said at least one burner tube so as to heat said chamber;
(f) securing means in said housing for selectively and removably connecting the outlet port of a fuel supply cartridge to said fuel delivery means; and
(g) connecting means alternatively usable with said securing means for selectively securing said outlet port of said fuel supply cartridge to said housing in a manner such that fuel is not supplied to said fuel delivery means and, yet, said outlet port of said fuel supply cartridge is not exposed.

4,852,547

HEAT STORAGE

Harry E. Thomason, 609 Cedar Ave., Fort Washington, Md. 20744

Continuation of Ser. No. 428,075, Sep. 29, 1982, abandoned, which is a continuation-in-part of Ser. No. 237,960, Feb. 25, 1981, abandoned, which is a division of Ser. No. 66,497, Aug. 14, 1979, Pat. No. 4,265,219, which is a division of Ser. No. 398,323, Sep. 18, 1973, Pat. No. 4,102,327. This application Nov. 28, 1988, Ser. No. 279,253
Int. Cl.[4] F24J *2/42*
U.S. Cl. 126—427 **10 Claims**



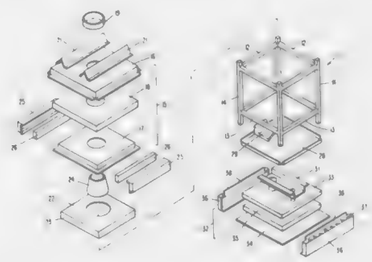
1. Heating and back-up heating apparatus comprising heat-producing means and heat-storage means, back-up heat means comprising both LOW and HIGH-temperature heaters, LOW-temperature and HIGH-temperature heat-use means, means to direct flow of heated fluid from said heat-storage means to said LOW-temperature heat-use means or from said heat-storage means to said HIGH-temperature heat-use means, said LOW-temperature heater being located between said heat-storage means and said LOW-temperature heat-use means.

4,852,548

UNIVERSAL FIREPLACE ASSEMBLY

Ronald J. Shimek, 8944 W. 154 St., Prior Lake, Minn. 55372, and Daniel C. Shimek, 5260 W. 132nd St., Apple Valley, Minn. 55124

Filed May 31, 1988, Ser. No. 200,536
Int. Cl.[4] F24B *1/181, 1/19*
U.S. Cl. 126—518 **18 Claims**



1. A universal fireplace of the type having four sidewalls, a top wall and a bottom wall wherein at least one of said sidewalls is provided with economical heat resistant glass comprising:
a substantially hollow rectangular prism L-shaped frame for supporting all six walls of said universal fireplace,
said hollow rectangular prism frame comprising a plurality of structural steel formed shapes welded together to form a rigid support frame,

bottom wall means connected to said rectangular prism frame forming a bottom closure for said frame,

top wall means connected to said rectangular prism frame forming a top closure for said frame,

a plurality of bottom support shields connected to said bottom wall means and to the bottom of said rectangular prism frame for uniformly distributing the weight of said fireplace onto said rectangular prism frame,

a plurality of top support shields connected to said top wall means and to the top of said rectangular prism frame for uniformly distributing the weight of said fireplace onto said rectangular prism frame,

smoke shield means supported by said rectangular prisms frame for diverting smoke to an exhaust stack,

exhaust outlet means extending through said smoke shield means and said top wall means for receiving an exhaust stack, and

four sidewall panels each being supported by said rectangular prism frame and said bottom support shields and nesting between pairs of said bottom and said top support shields.

4,852,549

LIGHT RAY RADIATION DEVICE FOR ADMINISTERING ORAL MEDICAL TREATMENT TO DISEASED GUMS

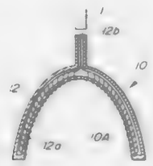
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Apr. 17, 1987, Ser. No. 39,503

Claims priority, application Japan, Oct. 15, 1986, 61-244875

Int. Cl.[4] A61B *19/00*; **A61H** *7/00*

U.S. Cl. 128—395 **8 Claims**



1. A light ray radiation device for administering oral medical treatment to a person's gums comprising an optical conductor cable for conducting light rays corresponding to the visible light ray component of solar rays, a mouthpiece which receives said conducted light rays and adapted to be accommodated within a person's mouth, said mouthpiece comprising a generally curved, U-shaped structure means which conforms generally to the configuration of a person's gums, said structure means being made of a transparent material, said structure means having facing surfaces which face a person's gums when said mouthpiece is placed in a person's mouth, a plurality of optical fibers attached to said structure means, each of said optical fibers being connected to said optical conductor cable and receiving said light rays conducted by said optical cable, said plurality of optical fibers each having end portions distributed throughout said facing structure of said structure means, said end portions having end faces coincident with said facing surfaces of said structure means, said end portions projecting said light rays at an approximately right angle relative to said facing surfaces so as to project light rays conducted by said optical fibers onto a person's gums.

4,852,550

INSTRUMENT FOR INSERTION INTO AN ENDOSCOPE SHAFT

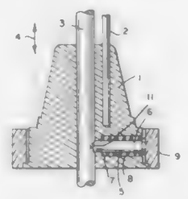
Roland Koller, Öhningen, and Horst Dittrich, Immendingen, both of Fed. Rep. of Germany, assignors to Karl Storz GmbH & Co., Tuttlingen, Fed. Rep. of Germany

Filed Apr. 28, 1988, Ser. No. 187,426

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1987, 3714170

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—4 **15 Claims**



1. Insertion assembly for controlling insertion of an instrument assembly into an endoscope shaft, said instrument assembly being of the type bendable by actuator means, comprising:

instrument locking means having a first position for preventing movement of said instrument assembly relative to said shaft and having a second position allowing movement of said instrument assembly relative to said shaft, said instrument locking means being movable between said first and second positions;

actuator locking means having a first position for allowing bending of said instrument assembly by said actuator means and having a second position for preventing said actuator means from bending said instrument assembly, said actuator locking means being movable between said first and second positions; and

wherein movement of said instrument locking means into said first position moves said actuator locking means into said first position and wherein movement of said instrument locking means into said second position moves said actuator locking means into said second position.

4,852,551

CONTAMINATION-FREE ENDOSCOPE VALVES FOR USE WITH A DISPOSABLE ENDOSCOPE SHEATH

Eric A. Opie, Brier, and Fred E. Silverstein, Seattle, both of Wash., assignors to Opielab, Inc., Seattle, Wash.

Filed Apr. 22, 1988, Ser. No. 185,115

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—4 **28 Claims**



1. An endoscope for use with a disposable sheath having a casing, a plurality of channels associated with said casing and a plurality of resilient tubes extending from respective channels, said endoscope comprising:

a flexible insertion tube having distal and proximal ends;

a tip portion formed at the distal end of said insertion tube, said insertion tube and tip portion being surrounded by the casing of said sheath when said sheath is installed on said endoscope;

a control handle secured to said insertion tube at the proximal end thereof; and

manually actuated valve means having a plurality of valve-actuating members mounted in said control handle, said valve means selectively pinching off said tubes responsive to actuation of a respective valve-actuating member to control the flow of fluid through said tubes without allowing any contact between the interiors of said tubes and said valve means or control handle.

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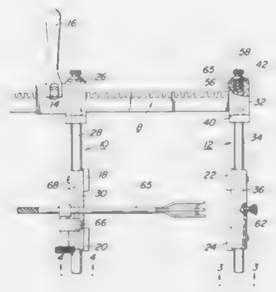
STERNAL RETRACTOR

Aurelio Chaux, Los Angeles, Calif., assignor to Pilling Co., Fort Washington, Pa.

Filed Sep. 3, 1987, Ser. No. 92,640

Int. Cl.[4] A61B *17/02*

U.S. Cl. 128—20 **4 Claims**



1. A sternal retractor for use in internal mammary artery dissection comprising:

a rack bar;

a pair of spreader arms connected to the rack bar, said spreader arms being sufficiently straight to conform to a sternal incision and extending substantially perpendicular to the rack bar and substantially parallel to each other, one of the spreader arms being movable along the rack bar whereby the spacing between the arms can be adjusted;

means connected to the rack bar and to the spreader arm movable thereon for applying a force causing the spreader arms to separate from each other while being maintained in substantially parallel relationship to each other;

means for engaging and spreading split sternal halves comprising sternum-engaging retractor blade means attached to each of said spreader arms;

at least one of said spreader arms comprising a first part connected to the rack bar and a second part extending beyond the first part in a direction away from the rack bar, said second part carrying the sternum engaging retractor blade means on said one of said spreader arms, means joining and locking said first and second parts against relative rotation about an axis of relative rotation substantially parallel to the arm, said joining and locking means being disengagable to allow adjustment of the rotational relationship of the first and second parts about said axis, and being capable of positively locking said first and second parts together only in a predetermined limited number of discrete rotational relationships; and

pivot means for connecting sternum-engaging retractor blade means to said one of said spreader arms, the pivot means permitting rotation of each of the sternum-engaging blade means on said one of said spreader arms about first and second axes, said first and second axes being substantially perpendicular to each other and being both substantially perpendicular to the axis of relative rotation of the first and second parts of said one of said spreader arms but preventing rotation of said sternum-engaging retractor blade means about said axis of relative rotation.

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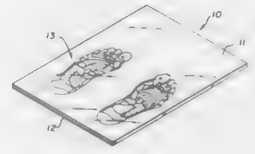
SELF-ADMINISTERING REFLEX MASSAGE THERAPY APPARATUS

William J. Voykin, 542 Baker Street, Nelson, British Columbia V1L 4H9, Canada

Filed Mar. 22, 1988, Ser. No. 171,580

Int. Cl.[4] A61H *1/00, 7/00, 15/00*; **A61F** *5/00*

U.S. Cl. 128—25 B **5 Claims**



1. A foot zone reflex self-administering therapy apparatus, comprising:

a display housing to display foot reflexology zone charts, said housing having a display area for viewing a single chart at at time and a storage area for storing said charts;

said display area comprising a transparent plastic sheet positioned above a chart holding cavity;

said storage area comprising a compartment with a hinged cover; and

stimulating members comprising a body having pressure projections and attachment means to allow said stimulating members to be releasably positioned on said transparent sheet in patterns according to the various zones displayed on said single chart visible in said chart holding cavity through said transparent plastic sheet whereby a user's foot can be placed on said positioned stimulating means in other to apply a kneading, massaging action to the user's foot.

4,852,554

RECONSTRUCTIVE ORTHOPEDIC DEVICES FOR CADAVERS

Michael N. Alten, 248 Sunset Rd., Avon Lake, Ohio 44012

Filed Oct. 11, 1988, Ser. No. 255,615

Int. Cl.[4] A61F *5/00*

U.S. Cl. 128—68 **2 Claims**

1. A reconstructive prosthesis device adapted to be used with cadavers as replacement bones comprising:

a first elongated member having first and second terminating ends, said first terminating end terminating in a first plug member having a fastening member integral thereto,

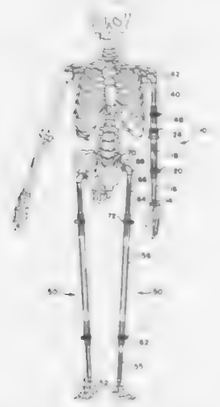
a second elongated member, having first and second terminating ends, wherein said first terminating end is adapted to telescopically receive the second terminating end of said first elongated member,

means for holding said first and second elongated members in fixed relationship with respect to each other,

said second terminating end of said second elongated member being pivotally connected to an elbow member having a defined pivot point,

a third elongated member having first and second terminating ends, wherein said first terminating end is rotatably connected to said elbow member, and

a fourth elongated member having first and second terminating ends, said first terminating end telescopically connected to said second terminating end of said third member, said second terminating end of said fourth elongated member affixed to a second plug member having fastening means thereon.

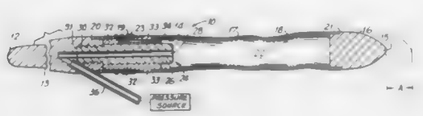


4,852,555

INFLATABLE PENILE PROSTHESIS

Robert E. Trick, Racine, Wis., assignor to Medical Engineering Corporation, Racine, Wis.

Filed Dec. 2, 1987, Ser. No. 128,016
Int. Cl.[4] A61F *2/26*
U.S. Cl. 128—79 **5 Claims**



1. A penile prosthesis comprising

an elongated cylindrical body having a proximal tip at one end, a distal tip at the other end, and an intermediate portion therebetween,

said intermediate portion having a fluid pressurizable internal chamber, an anchoring stem at one end of the internal chamber, a flexible cylindrical sheath surrounding said chamber, said sheath including a flexible substantially non-distensible portion, said portion being adjustable lengthwise from a wrinkled retracted state to a relatively taut and extended state in response to a change of fluid pressure in said chamber, said sheath portion being fixedly secured to said anchoring stem, said intermediate portion further including a moveable mount within said internal chamber secured to said sheath portion, said moveable mount being reversibly moveable proximally and distally, said sheath portion being in a retracted state when said moveable mount is proximal and in an extended state when said moveable mount is distal, fixed support means within said intermediate portion for supporting said moveable mount, said moveable mount being slideable along said fixed support means, said sheath portion being secured to said moveable mount, and

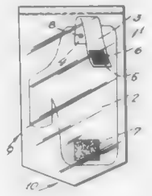
varying means for varying the fluid pressure within said chamber.

4,852,556

ORTHOPEDIC RIGID SPLINT-PLATE ORTHOSIS

Jorge A. Groiso, 885 C. Pellegrini St., Buenos Aires, Argentina 1358

Filed Nov. 24, 1986, Ser. No. 934,120
Claims priority, application Argentina, Sep. 26, 1986, 305.395
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—87 R **3 Claims**



1. A method for immobilizing an injured body member comprising:

(a) opening the bag in a combination comprising a splint-plate inside a water impervious aseptically closed bag, mechanically resistant to the weight of the splint-plate and thermally resistant to temperatures at or below the boiling point of water, the splint-plate comprising a rigid thermoplastic plate pre-cut to conform to a specific body member and provided with fastening means attached thereon;

(b) pouring a liquid into the opened bag, the liquid being at a temperature at or below the boiling point of water and above the softening point of the thermoplastic splint-plate;

(c) allowing the splint-plate to remain in the liquid until the splint-plate softens;

(d) removing the softened splint-plate from the bag;

(e) applying the softened splint-plate to a body member and molding it to fit the body member; and

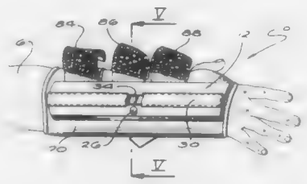
(f) securing the splint-plate in place around the body member with the fastening means.

4,852,557

SOFT-GOODS TYPE, FORMABLE ORTHOPAEDIC CAST

Tracy E. Grim, Tulsa, Okla., assignor to Royce Medical Company, Culver City, Calif.

Filed May 24, 1988, Ser. No. 198,152
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—90 **29 Claims**



1. A soft goods type orthopedic cast assembly comprising:

a foldable or wrappable sleeve immobilizing means for circumscribingly immobilizing a body limb or joint;

a water and air impervious elongated pouch encapsulating water permeable material impregnated with water-activated, hardenable material which structurally conforms to said limb when activated, said pouch being mounted as part of said immobilizing means;

means for the external introduction of water into said elongated pouch to fully activate said water-activated hardenable material; and

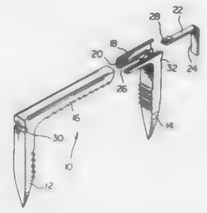
said immobilizing means including means for adjustably securing and releasing said immobilizing means to permit selective loosening and adjustment thereof while said assembly is resting on a support.

4,852,558

COMPRESSIBLE BONE STAPLE

Howard K. G. Outerbridge, #502 - 713 Columbia Street, New Westminster, British Columbia, Canada V3M 1B2

Filed Jul. 29, 1987, Ser. No. 79,266
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 YF **11 Claims**



1. A bone staple for compressibly sustaining joinder of first and second bone segments comprising:

a first downwardly extending elongated staple leg having an upper end and a lower end for securely penetrating said first bone segment;

a second downwardly extending elongated staple leg having an upper end and a lower end for securely penetrating said second bone segment; and

ratchet means for adjustably and compressibly coupling said first and second staple legs together and for lockably positioning said staple legs a selected distance apart from one another, said ratchet means comprising a first elongated member having a relatively smooth upper surface and a lower surface, and extending at an angle from the upper end of said first staple leg in a direction toward said second staple leg and fixed to said first staple leg, said first elongated member having a plurality of spaced downwardly extending ratchet teeth on the lower surface of said first elongated member, said ratchet means further comprising a second elongated member having an elongated guide member extending at an angle from the upper end of said second staple leg and fixed thereto, said first elongated member being receivable within said guide member, said guide member having an upper wall, a bottom wall and enclosing side walls forming a guide slot through which said first elongated member extends, said ratchet means further including an elongated ratchet member having an upper surface and a lower surface receivable within said guide slot and fixedly secured within said guide slot, said ratchet member having a plurality of upwardly extending spaced ratchet teeth thereon for ratchably engaging said ratchet teeth on said first elongated member whereby the walls of said guide member encompass the engagement of the ratchet teeth of said ratchet member and said first elongated member to provide a shield to prevent fouling of the area of ratchet engagement.

4,852,559

DEVICE FOR PINNING BONE FRACTURES

Ira Chernoff, 515 E. 72 St., Apt. 19A, New York, N.Y. 10021

Filed Apr. 21, 1988, Ser. No. 184,312
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 YZ **7 Claims**



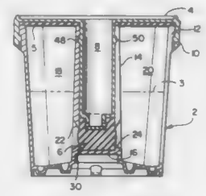
1. A device for pinning bone fractures, comprising: an integral metal pin having an elongated shaft and a head at one end of the pin, said head comprising an arcuate hook having a free end, an inner radial surface and an outer radial surface, and means extending from said shaft to said inner radial surface and forming a closed loop with the inner radial surface of the hook, said closed loop not extending past the free end of the arcuate hook.

4,852,560

TOXICOLOGY SPECIMEN COLLECTION SYSTEM

William J. Hermann, Jr., Sealy, and John R. Zanek, Missouri City, both of Tex., assignors to 501 North American Biotechnology, Inc., Sealy, Tex.

Filed Apr. 26, 1988, Ser. No. 186,267
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—762 **6 Claims**



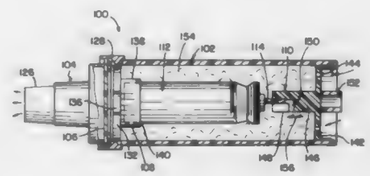
1. An improved urine specimen collection vessel comprising a substantially cylindrical base cup, a cap adapted to be superposed thereon, and a means to sealing engage and to lock the cap upon the base cup and resist subsequent removal of the cap from the base cup once sealingly engaged and locked, wherein the base cup further comprises a plurality of upwardly open chambers disposed circumferentially around a central receiving passageway having a tubular wall, a set of equal distribution ports within said tubular wall to communicate said central receiving passageway with each of said surrounding chambers, and means to permit access into a chamber through an exterior wall portion of the base cup, wherein further the means to sealingly engage and lock the cap comprises a first means to sealingly engage against an upper portion of said base cup and a second means to sealingly engage against said equal distribution ports, when the cap is locked upon the base cup.

4,852,561

INHALATION DEVICE

Charles R. Sperry, 113 Clinton St., Springfield, Vt. 05156

Filed Jul. 27, 1988, Ser. No. 224,883
Int. Cl.[4] A61M *15/00*
U.S. Cl. 128—200.23 **26 Claims**



1. An inhalation device for use with a cartridge having an outlet valve mechanism from which a medicant contained within said cartridge may be discharged in the form of an aerosol, said device comprising a hollow housing having a

longitudinal axis, and two ends located along said longitudinal axis receiving means within said housing for receiving said cartridge at least partially therein, activating means moveable within one of said ends of said housing and attached to said outlet valve mechanism for discharging a quantity of a medicant containing aerosol from said cartridge into that portion of said housing unoccupied by said cartridge, said activating means having a projecting member extending outwardly of said one end of said housing whereby depression of said member with a sufficient force causing discharging said medicant containing aerosol into said housing, and dispensing means at the other of said ends of said housing for dispensing said medicant containing aerosol from said housing to a user of said device.

4,852,562

HELMET

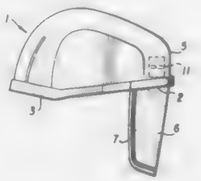
Robin M. Howie, Edinburgh, Scotland, assignor to Coal Industry (Patents) Limited, United Kingdom

Filed Feb. 22, 1988, Ser. No. 158,650

Claims priority, application United Kingdom, Mar. 6, 1987, [illegible]

Int. Cl.[4] A62B 7/00

U.S. Cl. 128—201.25 **6 Claims**



1. A powered respirator helmet comprising a helmet shell, a visor attached to the helmet shell, said shell having a front part and a rear part and a head harness mounted therein so as to define an open region between the inside of the helmet shell and the head harness, at least one air intake means in said open region between the rear part of the shell and the head harness, a filter medium, a removable perforate filter holder for holding said filter medium within the rear part of the shell, at least one passage means in said open region for enabling air to pass through the filter medium and thereafter within the shell;

at least two fans mounted within the front part of the shell and down stream from said filter medium and in communication with said passage means;

at least one means defining an opening for air to pass from the fans to a space between the visor and a wearer's face, whereby in operation air is drawn by the fans through the filter medium and through the region between the shell and the head harness to provide a stream of filtered air, the filtered air passes through the passage means to the fans and is exhausted through said opening.

4,852,563

MULTIFUNCTION CONNECTOR FOR A BREATHING CIRCUIT

James R. Gross, St. Charles, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jun. 22, 1987, Ser. No. 65,203

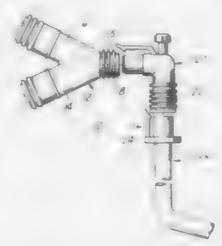
Int. Cl.[4] A62B 9/04

U.S. Cl. 128—202.27 **4 Claims**

1. A component which is part of and articulatable with respect to a breathing circuit for directing the flow of air to and from a patient, while permitting the safe sampling of air from therewithin, the breathing circuit including a first component having a female end including at least two annular rings as part of the outer surface thereof and a second component having a male end and locking clip means adjacent thereto the component comprising:

a hollow housing having a first male end and a second female end, said male end having a tapered outer surface means for frictional engagement and communication with the female end of the first component in the breathing circuit, said female end having a tapered inner receiving surface means for frictional engagement and communication with the male end of the second component in the breathing circuit;

an air sampling port disposed on said component housing



and in fluid communication with said hollow housing therewithin;

locking clip means arranged on said housing adjacent the male end of said component for engaging any one of the rings on the first component to allow articulation therebetween

means for receiving the locking clip means of the second component to allow articulation therebetween, disposed about the female end of said component, said locking clip receiving means comprising a plurality of annular rings as part of the outer surface of said female end of said component.

4,852,564

FLEXIBLE CONNECTORS FOR MEDICO-SURGICAL TUBES

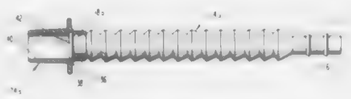
David S. Sheridan, Argyle, and Isaac S. Jackson, Greenwich, both of N.Y., assignors to Sheridan Catheter Corp., Argyle, N.Y.

Continuation of Ser. No. 625,837, Jun. 28, 1989, abandoned. This application Sep. 14, 1988, Ser. No. 243,219

The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.

Int. Cl.[4] A62B 9/09

U.S. Cl. 128—202.27 **1 Claim**



1. An improved proximal end connector unit for use in connection of a medico-surgical tube to external fluid flow equipment which comprises:

a straight, rigid, cylindrical distal open end portion having a first I.D.,

a straight, rigid, cylindrical proximal open end portion having a second I.D. different from said I.D. of said distal end portion, and

a central tubular portion joining said distal end portion to said proximal end portion, said central tubular portion being bendable in an arc of at least 180° C. without any substantial diminution of its effective lumen which is at least equal to the lumen of said tube,

said proximal end portion, distal end portion and central tubular portion all being integral and formed of thin, plastic material,

said proximal end portion having an annular ring thereon,

said central tubular portion comprising an integral plurality of segments each consisting of a first circumferential portion having an inner and an outer end and

a second circumferential portion having an inner and an outer end, said second portion being of different length than said first portion,

said circumferential portions being tapered in diameter from the outer ends to the inner ends and being joined together at said outer ends such that adjacent portions form an obtuse angle therebetween at their outer ends in an extended position and an acute angle in a compressed position where the first circumferential portion is displaced into the second circumferential portion, and

said inner ends of said first circumferential portion of each segment being joined at its inner end to the inner end of a second circumferential portion of an adjacent segment, and

a coupler member connected to said cylindrical proximal end portion of said connector unit comprising

a female proximal end portion,

a female distal end portion that surrounds said cylindrical proximal end portion and

a shoulder in the inner surface of said female distal end portion into which is snapped said annular ring of said cylindrical proximal end portion,

said shoulder and said annular ring being sized so that said coupler member may swivel freely on said connector unit without gas leakage through the junction between said shoulder and said annular ring.

4,852,565

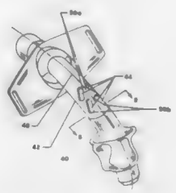
FENESTRATED TRACHEOSTOMY TUBE

Robert F. Eisele, Laguna Niguel, Calif., assignor to Shiley Inc., Irvine, Calif.

Filed Mar. 22, 1988, Ser. No. 171,708

Int. Cl.[4] A61M 16/00

U.S. Cl. 128—207.14 **5 Claims**



1. An improved fenestrated tracheostomy tube for insertion onto a patient's trachea to assist breathing, said tube being adapted to be used with an inner cannula, comprising:

a tubular outer cannula having a distal end for insertion within the trachea and a proximal end remaining outside;

said outer cannula having a generally circular cross section and a generally circular radius of curvature and having an upper wall portion thereof with a longitudinal center and a plurality of generally slotted fenestrations; and

an inner cannula having a distal end and a proximal end and adapted to fit closely and be removably inserted within said outer cannula;

means for enabling ready insertion of said inner cannula into said outer cannula without interference from said fenestrations, said means including said fenestrations through said upper wall portion of said outer cannula being arranged on both sides of the longitudinal center so that each said fenestration is closely spaced from and forms an acute angle away from the longitudinal center in the direction of the distal end of said outer cannula.

4,852,566

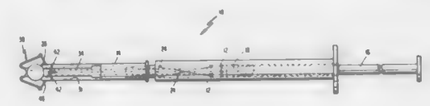
DEVICE FOR IMPLANTATION OF INTRAOCULAR LENSES

Wayne B. Callahan, 5119 Woodland Hills Dr., Brentwood, Tenn. 37207, and James E. Burnes, 610 W. Due West Ave., Madison, Tenn. 37115

Continuation of Ser. No. 928,500, Nov. 7, 1986, abandoned. This application Jul. 1, 1988, Ser. No. 214,808

Int. Cl.[4] A61F 1/16, 9/00

U.S. Cl. 128—303 R **8 Claims**



1. A device for implanting intraocular lenses in the eye, comprising syringe means, including a plunger and a piston attached to a forward end of the plunger; intraocular lens holding means secured to a forward end of the syringe means; a harness having a first end attached to said piston and a second end adapted for connection to a haptic of the intraocular lens to transmit tension to the haptic as a function of the location of the piston in the syringe means; and severing means connected for movement with the piston for severing the harness; whereby depression of the plunger causing movement of the piston can be used to control tension applied to the haptic through the harness to decrease retraction of the haptic and release of the plunger can be used to increase retraction of the haptic allowing for control and adjustment of the haptic, and depression of the plunger causing movement of the piston and thereby the severing means through a predetermined distance results in severing of the harness and release of the haptic from the forward end of the syringe means.

4,852,567

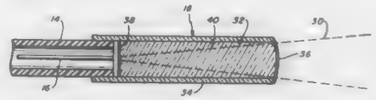
LASER TIPPED CATHETER

Edward L. Sinofsky, Reading, Mass., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Jan. 21, 1988, Ser. No. 146,341

Int. Cl.[4] A61B 17/36

U.S. Cl. 128—303.1 **45 Claims**



1. A laser catheter for internal application of laser radiation in a first wavelength range, comprising:

an elongated, flexible element suitable for insertion in a body passage or cavity, said flexible element having a distal end and a proximal end;

optical waveguide means for carrying laser radiation in a second wavelength range through said flexible element; and

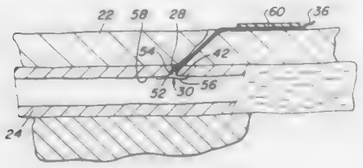
laser means attached to said flexible element at the distal end thereof and suitable for insertion in a body passage or cavity, said laser means being responsive to laser radiation in said second wavelength range carried by said optical waveguide means, for generating laser radiation in said first wavelength adjacent to an internal application site.

4,852,568

METHOD AND APPARATUS FOR SEALING AN OPENING IN TISSUE OF A LIVING BEING

Kenneth Kensey, Hinsdale, Ill., assignor to Kensey Nash Corporation, Exton, Pa.

Continuation of Ser. No. 15,267, Feb. 17, 1987, Pat. No. 4,744,364. This application Dec. 28, 1987, Ser. No. 138,245
The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.
Int. Cl.[4] A61B *17/04*
U.S. Cl. 128—325 19 Claims



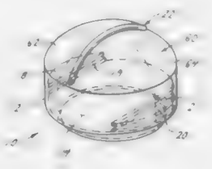
1. A method for sealing a small incision or puncture in tissue separating one portion of the body of a living being from another portion thereof to prevent the flow of a bodily fluid from said one portion to said other portion through said incision or puncture by the introduction of plug means therein, said plug means being formed of a material which the body will absorb, said method comprising introducing said plug means into said incision or puncture, said plug means having a first portion extending into said incision or puncture and a second portion configured to conform to the surface of the tissue contiguous with said incision or puncture, and causing said plug means to engage said tissue so that said first portion intimately engages the tissue in said incision or puncture and the second portion intimately engages the surface of said tissue contiguous with said incision or puncture to seal said incision or puncture and thereby prevent communication between said body portions through said incision or puncture, and thereafter leaving said plug means in place, whereupon said incision or puncture is permanently sealed.

4,852,569

PACIFIER SHIELD

Jerroll M. Sanders, 15 Riverwood Estates Blvd., Florissant, Mo. 63031

Filed Feb. 1, 1988, Ser. No. 151,180
Int. Cl.[4] A61J *17/00*
U.S. Cl. 128—360 21 Claims



1. A shield for a baby pacifier having a nipple and a guard flange, the shield comprising,

a molded, relatively thin-wall nipple cover of flexible, resilient material having a top wall and an open bottom through which the nipple of a pacifier may be inserted upwardly into the cover, and

means for releasably engaging portions of the pacifier guard flange to secure said shield in fixed position relative to the pacifier,

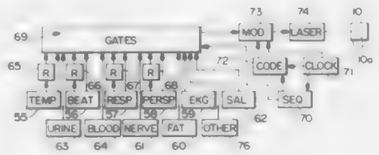
said top wall of the cover comprising at least two separate sections movable relative to one another between a closed position in which the sections are disposed immediately adjacent one another to form, in conjunction with the remainder of the cover and the guard flange, an enclosure for the nipple substantially free of openings to protect the nipple when not in use, and an open position in which the sections are turned back to separate the sections from one another to expose the nipple for use.

4,852,570

COMPARATIVE MEDICAL-PHYSICAL ANALYSIS

Alfred B. Levine, P.O. Box 15968, Chevy Chase, Md. 20815

Filed Feb. 9, 1989, Ser. No. 308,071
Int. Cl.[4] A61B *5/00*; G01D *9/00*
U.S. Cl. 128—630 18 Claims



1. A method for comparative trend medical analysis of persons comprising the steps of:

a. repetitively performing a multiphasic medical examination of said person at frequent short term intervals less than one year,

b. each of said multiphasic medical examinations comprising the step of examining and monitoring a like series of different physiological conditions during each short term interval,

c. each of said repetitive multiphasic examinations comprising the additional step of recording each one of said different monitored physiological conditions onto a miniature medical record adapted to be retained by that person,

d. recording on said miniature medical record along with each of said different multiphasic medical examinations the date that such examination was performed,

e. recording on said miniature medical record along with each one of the monitored physiological conditions a unique identification of that type of physiological condition,

f. whereby after passage of a long term interval comprising a plurality of short term intervals, said miniature medical record contains a plurality of chronologically related recordings for each different type of monitored physiological condition, with each one of the different recordings being uniquely identified on the record by the type of condition being monitored and by the date of the measurement,

g. at long term intervals after the passage of plural ones of such multiphasic examinations, selectively retrieving from said miniature medical record a chronologically related series of recordings for one of the different physiological conditions being monitored,

h. comparing the individual recordings of said related series of like conditions being monitored with each other to chronologically detect any unusual trends or changes in that monitored condition occuring over that long term interval,

i. at long term intervals after the passage of plural multiphasic physiological medical examinations, selectively retrieving from said miniature medical record, a second series of chronologically related recordings for a different monitored physiological condition,

j. comparing the individual recordings of the retrieved second series of recordings with each other to chronologically detect any unusual trends or changes in the different monitored condition occuring over that long term period,

k. and cumulatively repeating the same multiphasic medical examination of that person over additional short term intervals, and cumulatively recording all of the like monitored conditions for each such examination on said miniature medical record, together with the date of each said examination and a unique identification of each type of monitored physiological condition,

l. whereby said miniature medical record retained by the person retains a progressively lengthened series of chronologically made recordings for each different monitored physiological condition, with the passage of time, and accordingly provides a progressively greater base for comparative trend medical analysis of that person.

4,852,571

DISPOSABLE BIOPOTENTIAL ELECTRODE

Peter D. Gadsby; Martin R. Moore, both of Cedarburg; Denis E. Olson, Brookfield, and Barry M. Scott, West Bend, all of Wis., assignors to Marquette Electronics, Milwaukee, Wis.

Filed Sep. 3, 1987, Ser. No. 92,440
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—640 15 Claims

1. A disposable, biopotential electrode structure providing improved electrical properties and comprising:

a flat, sheet-like flexible base having first and second orthogonal dimensions lying in the plane of, said base, said first orthogonal dimension terminating at a pair of ends, said base having defined thereon an electrode portion for receiving biopotential signals and a connector portion for supplying the signals externally of said electrode structure, said electrode portion and connector portion lying in a generally side by side contiguous relationship on said base along said first orthogonal dimension with said portions at opposite ends of said first orthogonal dimension, said electrode portion having substantially the same dimension as said base along said second orthogonal dimension;

electrically conductive carbon material associated with said base in quantitities sufficient to render said electrode portion electrically conducting, said carbon material being associated at least coterminously with said electrode portion;

a layer of silver/silver chloride having dimensions at least coterminous with those of said electrode portion, said layer being electrically coupled to said carbon material, said carbon material associated with said base serving to lessen the amount of silver/silver chloride in said layer while enabling the improved electrical properties to be provided in said electrode structure;

at least one of said electrically conductive carbon material and silver/silver chloride layer extending into said connector portion; and

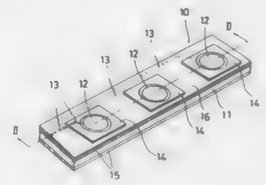
and an ionically conductive adhesive lying over said silver/-silver chloride layer, said adhesive being coextensive with said electrode portion.

4,852,572

MULTI-ELECTRODE TYPE ELECTROCARDIOGRAPHIC ELECTRODE STRUCTURE

Yoshinao Nakahashi, Kashiwa; Soichi Osada, Matudo; Chuji Shimizu, Funabashi, and Shinshichi Ichida, Tokyo, all of Japan, assignors to Fukuda Denshi Co., Ltd. and Daido Sangyo Co., Ltd., both of Tokyo, Japan

Filed Mar. 14, 1988, Ser. No. 168,089
Claims priority, application Japan, Mar. 30, 1987, 62-47093[U]
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—640 4 Claims



1. A multi-electrode type electrocardiographic electrode comprising:

a base member made of non-woven cloth;

a plurality of electrodes and leads provided on said base member;

said electrodes and leads being integrally formed by printing on or impregnating said base member within a liquid conductor, said leads being connected to individual electrodes;

an electrolyte material provided on said electrodes and serving to reduce the resistance of the skin of a living body; and

an insulating adhesive material layer provided on said base member to alternate with said electrodes whereby said electrocardiographic electrode structure is held in close contact with the skin of the living body.

4,852,573

IMPLANTABLE NEURAL ELECTRODE

Philip R. Kennedy, 3240 Indian Valley Trail, Atlanta, Ga. 30341

Filed Dec. 4, 1987, Ser. No. 128,721
Int. Cl.[4] A61B *5/04*; A61N *1/05*
U.S. Cl. 128—642 21 Claims



1. A neural electrode capable of being implanted in operative relation with neural structure in a body, comprising:

a flexible electrical conductor, insulated except for a predetermined area, for conducting an electrical signal between a predetermined location within said body and predetermined point outside said body;

a biologically inert electrically insulative structure defining an interior cavity and having at least one opening into the cavity, said insulative structure surrounding at least said predetermined area of said conductor and electrically substantially isolating said conductor from points other than said predetermined within said body; and

a nerve segment separate from the neural structure, said nerve segment being disposed in electroconductive relation with the predetermined area and being at least partially within the insulative structure so as to facilitate the

growth, within said insulative structure, of neurites associated with the neural structure,

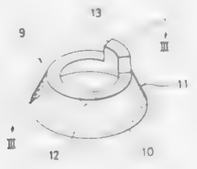
whereby the electrical conductor is capable of receiving electrical signals from the body or transmitting electrical signals to the body.

4,852,574

ELECTROCARDIOGRAM ELECTRODE PAD

Hirokatsu Inoue, Chiba, and Chuji Shimizu, Funabashi, both of Japan, assignors to Fukuda Denshi Co., Ltd., Japan

Continuation of Ser. No. 132,704, Dec. 11, 1987, abandoned, which is a continuation of Ser. No. 920,527, Oct. 17, 1986, abandoned. This application Jan. 9, 1989, Ser. No. 296,402
Claims priority, application Japan, Jan. 6, 1985, 60-85418
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—643 6 Claims



1. An electrocardiogram electrode pad formed of a material having elasticity and flexibility for covering an electrocardiogram electrode to be held in close contact with the skin surface of a man to derive a weak current therefrom, said electrocardiogram electrode pad is electrically conductive and is cup shaped with a hollow interior and a bottom wall to be held in contact with the skin surface of the man, said bottom wall has a circumferentially extending outer edge and a substantially central circular hole therethrough communicating with the hollow interior, and a circumferentially extending side wall extending outwardly from the outer edge of said bottom wall and arranged to be fitted around the electrocardiogram electrode, said side wall having a circumferentially extending stem portion extending from said outer edge outwardly from said bottom wall, a circumferentially extending intermediate portion extending from said stem portion and a circumferentially extending free end portion extending from said intermediate portion away from said outer edge, said side wall having a greater thickness at said free end portion as compared to said stem portion, a pinch portion attached to and projecting outwardly from a limited circumferentially extending part of said free end portion of said side wall in the direction away from said bottom wall and arranged to be pinched when fitting and removing said electrocardiogram electrode pad with respect to an open-ended cup shaped electrode section of an electrocardiogram electrode.

4,852,575

ULTRASOUND FLOW MEASUREMENT APPARATUS

Mehrdad Nikoonahad, Peekskill, N.Y., assignor to North American Philips Corporation, New York, N.Y.

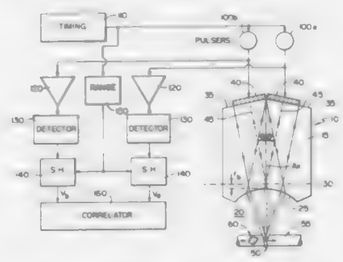
Filed Feb. 26, 1988, Ser. No. 160,871
Int. Cl.[4] A61B 8/06; G01P 5/00
U.S. Cl. 128—660.01 5 Claims

1. Ultrasound flow measuring apparatus comprising:

an ultrasound lens comprising a solid body having a front concave spherical surface which defines a back focal plane which lies within the body when the lens is in contact with a propagating medium and a lens axis which lies normal to said back focal plane, and at least two flat rear surfaces which are inclined at equal angles with respect to the lens axis, each of said rear surfaces being adapted for attachment of an ultrasound transducer so that principal rays of each of the transducers propagate through the body normal to the relevant rear surface and all of said principal rays intersect on the lens axis at the back focal plane;

ultrasound transducers disposed on at least two of said rear surfaces;

transmitter means connected to simultaneously excite each of the transducers with periodic pulses of baseband ultrasound energy whereby energy from said transducers is



directed toward separate, nearby foci in a sample volume and echoes of said energy are reflected to said transducers;

receiver means which amplify and amplitude detect signals representing the echoes reflected to the transducers from the sample volume; and

means which cross correlate said detected signals from the transducers to characterize transverse flow in the sample volume.

4,852,576

TIME GAIN COMPENSATION FOR ULTRASONIC MEDICAL IMAGING SYSTEMS

Dan Inbar, and Moshe Delevy, both of Haifa, Israel, assignors to Elscint Ltd., Haifa, Israel

Continuation of Ser. No. 719,204, Apr. 2, 1985, abandoned. This application Oct. 8, 1987, Ser. No. 106,020
Int. Cl.[4] A61B 8/00
U.S. Cl. 128—660.6 12 Claims



1. An ultrasonic imaging method including time gain compensation (TGC) to correct received ultrasonic echoes for attenuation due to distance traversed by ultrasonic signals and echoes, said method for use with ultrasonic imaging system having transmitting and receiving means for transmitting the ultrasonic signals and receiving means for transmitting the ultrasonic signals and receiving the ultrasonic echoes, said receiving means having gain varying means, said method comprising determining attenuation characteristics of a body being examined, said determining step comprising the steps of:

(a) transmitting beams of ultrasonic signals into said body, the direction of transmittal being a depth direction;

(b) receiving echoes back from the interior of the body;

(c) locating the source of the echoes;

(d) amplifying the received echoes;

(e) measuring the intensity of the amplified received echoes;

(f) converting the measured intensity into pixel values according to the echo source location whereby the location of the pixel value in the image corresponds to the echoe source location in the body being examined;

(g) selecting pixels along ultrasonic beams extending in the depth direction;

(h) dividing said scanned depth into a plurality of segments;

(i) using rows of the selected pixels to obtain average pixel values per segment in the depth direction;

(j) said average pixel values providing intensity versus depth values for use in determining an intensity versus depth function extending along the scanned depth of the body;

(k) fitting an intensity versus depth function curve over each of said plurality segments;

(l) the slopes of said curves being the determined attenuation characteristics of the body; and

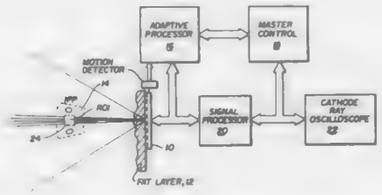
the step of using the determined attenuation to vary the gain of the receiving means.

4,852,577

HIGH SPEED ADAPTIVE ULTRASONIC PHASED ARRAY IMAGING SYSTEM

Stephen W. Smith, Rockville, Md., and Gregg E. Trahey, Hillsborough, N.C., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Apr. 7, 1988, Ser. No. 178,736
Int. Cl.[4] A61B 8/00
U.S. Cl. 128—660.07 20 Claims



1. A method of ultrasonic imaging comprising the steps of:

placing a transducer, having at least one transducer element, over a region of interest;

entering an adaptive mode of operation which comprises performing the following steps for each element of the transducer:

(a) measuring average brightness in the region of interest for normal operation;

(b) incrementing phased array scan data for said element and for the region of interest;

(c) obtaining a value representing the average image brightness of the region of interest responsive to the phased array scan data;

(d) repeating steps (a) through (d) until a maximum average image brightness has been reached;

updating the phased array scan data for the region of interest using the phased array scan data which produced the maximum average image brightness; and

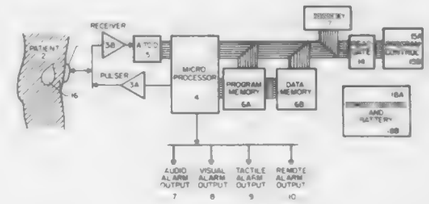
entering the normal mode of operation using the updated phased array scan data.

4,852,578

RAPIDLY QUANTIFYING THE RELATIVE DISTENTION OF A HUMAN BLADDER

John A. Companion, Hampton; Joseph S. Heyman, Williamsburg, both of Va.; Beth A. Mineo; Albert R. Cavalier, both of Arlington, Tex., and Travis N. Blalock, Knoxville, Tenn., assignors to The United State of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 929,869, Nov. 13, 1986, abandoned. This application Nov. 10, 1987, Ser. No. 118,993
Int. Cl.[4] A61B 10/00
U.S. Cl. 128—661.03 4 Claims



1. A device for rapidly quantifying the relative distention of the bladder of a human subject, which device comprises:

ultrasonic transducer means for positioning on the external abdomen of the subject in proximity to the bladder, for the purpose of launching acoustic waves into the subject followed by receiving reflected acoustic waves from the subject:

pulser/receiver means communicating with a source of power and the ultrasonic transducer means for exciting the ultrasonic transducer means to launch the acoustic waves and for amplifying and processing the reflected waves received by the ultrasonic transducer means, and for providing analog signals representative of at least one reflected ultrasonic waveform over a respective time interval;

converter means communicating with the pulser/receiver means for digitizing the analog signal from the pulser/receiver means to provide a corresponding digital signal representative of said at least one waveform:

memory means communicating with the converter means for storage of the digital signal therefrom;

input means for providing a digital input signal representative of a characteristic of said subject related to the relative distention of the bladder: and

logic means communicating with the pulser/receiver means for commanding excitation of the ultrasonic transducer means the logic means communicating additionally with the converter means for commanding the digitization of the analog signals from the pulser/receiver means; the logic means communicating additionally with the memory means for receiving said digital input and said stored signals for processing said stored signals to provide a function signal related to the value of the digitized signals and their time of occurrence within said respective time intervals, and for comparing said function signal with said digital input signal; thereby quantifying the relative distention of the bladder of the human subject as a function of the propagated ultrasonic energy.

4,852,579

PHOTOCHARACTERIZATION AND TREATMENT OF NORMAL ABNORMAL AND ECTOPIC ENDOMETRIUM

Dennis W. Gilstad; Ronald L. Branstetter, and Ralph H. Hill, Jr., all of San Antonio, Tex., assignors to Karl Storz Endoscopy GmbH and Company, Fed. Rep. of Germany

Filed Apr. 20, 1987, Ser. No. 40,597
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—665 10 Claims



1. A method of photocharacterization of tissue, comprising the steps of:
injecting said patient with a hormone-specific chemical marker, said chemical marker being preferential to genital tissue;
illuminating a portion of said tissue with an optical excitation means producing light having a predetermined wavelength; and
detecting fluorescent radiation produced by said portion of tissue; and
correlating said fluorescent radiation with the existence of abnormal cells in said portion of tissue.

4,852,580

CATHETER FOR MEASURING BIOIMPEDANCE

Roger Wood, Paramount, Calif., assignor to Axiom Medical, Inc., Paramount, Calif.

Continuation of Ser. No. 908,185, Sep. 17, 1986, abandoned. This application Nov. 6, 1987, Ser. No. 119,294
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—693 11 Claims



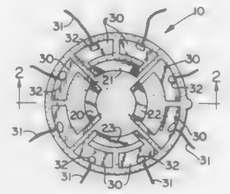
1. An elongated, flexible catheter adapted to be inserted into a patient's esophagus for measuring the bioimpedance of a thoracic section thereof in order to determine the patient's cardiac output, the catheter having on the outer surface of a distal portion thereof a pair of axially spaced apart, cylindrically shaped sensing electrodes formed of conductive fabric, and a pair of axially spaced apart, cylindrically shaped transmitting electrodes, one of the transmitting electrodes disposed proximally to the pair of sensing electrodes and one of the transmitting electrodes disposed distally to the pair of sensing electrodes with axial spacing between each transmitting electrode and the adjacent sensing electrode being at least as great as the outer diameter of the catheter, the pair of transmitting electrodes being adapted to contact tissue on the inner wall of the patient's esophagus in order to apply high frequency electrical current to the thoracic section and the pair of sensing electrodes being adapted to contact tissue on the inner wall of the patient's esophagus in order to detect electrical signals therefrom which result from the application of high frequecy electrical current to the body section by the transmitting electrodes, the electrical signals sensed by the sensing electrodes being related to the bioimpedance of the thoracic section.

4,852,581

PRESSURE TRANSDUCER WITH CONDUCTIVE POLYMER BRIDGE

Thomas P. Frank, Dublin, Ohio, assignor to Medex, Inc., Hilliard, Ohio

Filed Dec. 14, 1987, Ser. No. 132,014
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—672 6 Claims



1. A pressure transducer comprising:
a molded high temperature, thermoplastic substrate having a thin flexible section,
at least one conductive polymer resistor printed on said flexible section,
said resistor changing its resistance when said substrate is flexed.

4,852,582

METHOD AND KIT FOR MEASURING THE EFFECTIVENESS OF BRONCHODILATORS

Donald M. Pell, P. O. Box 31647, St. Petersburg, Fla. 33732

Filed Sep. 11, 1987, Ser. No. 95,232
Int. Cl.[4] A61B 5/08
U.S. Cl. 128—716 10 Claims

DRUG OF CHOICE	PRE FEV_1	POST FEV_1	PRE VITAL CAP	POST [illegible]	REST 2 SOLUT	FINAL FEV_1
ALUPENT 0.3 ml						
BRONKOSOL 0.5 ml						
TERBUTALINE 1 mg						
VENTALIN 0.5 ml						
ALUPENT 0.3ml + ATROPINE SULFATE 0.8g						
BRETHINOL 0.5ml + ATROPINE SULFATE 0.8g						
TERBUTALINE 1mg + ATROPINE SULFATE 0.8g						
VENTALIN 0.5ml + ATROPINE SULFATE 0.8g						

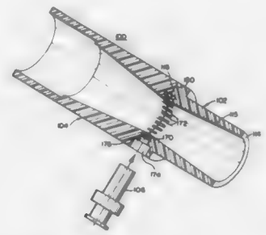
1. A kit for measuring the effectiveness of various bronchodilators on an individual patient comprising a plurality of bronchodilator test solutions and a nebulizer means for providing a measured dose of each test solution for introduction into a patient's lungs, means for measuring a patient's forced expiratory flow data and a test panel means for recording the flow data before and after inspiration of each of the plurality of bronchodilator test solutions and for visual comparison of the quantitative results for determining the effectiveness of the bronchodilators.

4,852,583

AIRWAY ADAPTER

Arthur H. Walker, Canyon Country, Calif., assignor to SpaceLabs, Inc., Bothell, Wash.

Filed Jan. 16, 1987, Ser. No. 4,359
Int. Cl.[4] A61B 5/08
U.S. Cl. 128—716 6 Claims



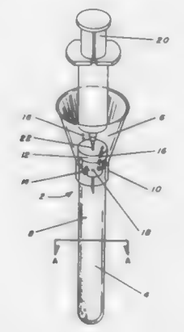
1. An airway adapter for obtaining a sample gas flow from a patient's exhalations, comprising:
a tubular body having a cylindrical wall containing an annular channel, said cylindrical wall and annular channel surrounding a hollow interior for passing a gas flow therethrough, the thickness of at least a portion of the wall of said adapter gradually increasing along the direction of gas flow from one end of said tubular body to said annular channel to form a first conical interior surface, the thickness of at least a portion of the wall of said adapter gradually decreasing along the direction of gas flow from said annular channel to the other end of said tubular body to form a protruding region of said wall in said hollow interior in the region of said annular channel;
a port in said wall providing fluid communication between said annular channel and ambient atmosphere; and
a plurality of radial channels extending between the interior of said tubular body and said annular channel to provide fluid communication therebetween, said radial channels forming a plurality of parallel slits through said protruding region, said slits being substantially parallel to the longitudinal axis of said adapter.

4,852,584

FLUID COLLECTION TUBE WITH A SAFETY FUNNEL AT ITS OPEN END

Charles R. Selby, 1710 F Rd., Delta, Colo. 81416

Filed Oct. 11, 1988, Ser. No. 256,398
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—760 5 Claims



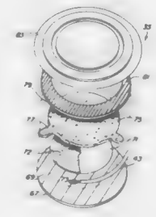
1. A medical safety device for body fluid samples which comprises:
a funnel shaped needle guard which is open at its upper end and lower end, said upper end being of a larger diameter than the lower end, said lower end forming a neck portion, the interior surface of the guard having one or more vertical grooves and one or more circular grooves which interconnect and provide for the passage of body fluid, and
a resin coated glass sample tube having an upper open and a closed lower end receiving and holding a body fluid sample, the upper end of said tube being positioned within the neck of said needle guard, and said resin coated tube being characterized in that said coating is continuous and covers the exterior surface of the glass tube to make it substantially shatterproof.

4,852,585

TIN-STANNOUS CHLORIDE ELECTRODE ELEMENT

Roger L. Heath, Evanston, Ill., assignor to DaRox Corporation, Niles, Ill.

Continuation of Ser. No. 946,161, Dec. 22, 1986, abandoned, which is a continuation of Ser. No. 841,007, Mar. 14, 1986, abandoned, which is a continuation of Ser. No. 709,986, Mar. 17, 1985, abandoned, which is a continuation of Ser. No. 476,332, Mar. 17, 1983, abandoned, which is a division of Ser. No. 176,270, Aug. 8, 1980, Pat. No. 4,419,998. This application Feb. 9, 1988, Ser. No. 150,520
Int. Cl.[4] A61N 1/04
U.S. Cl. 128—798 9 Claims



1. A disposable physiological electrode element for use in monitoring or stimulating the heart comprising:
a non-conductive base;
an electrically conductive plate secured to said base and having at least a surface thereof formed primarily of tin;
electrically conducting means electrically connected to said conductive plate for conveying electrical energy to and from said conductive plate;
a quantity of stannous chloride affixed to at least a portion of said tin between said tin and the skin of a patient;
an electrically conductive medium covering said stannous chloride and said tin to provide for electrical current flow between said conductive plate and the skin of the patient, said electrically conductive medium being secured in the electrode element; and
adhesive means secured in the electrode element and adapted to adhesively attach the electrode element to a patient.

4,852,586

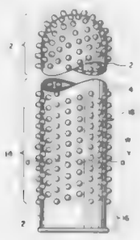
SENSORY TRANSMITTING MEMBRANE DEVICE

Bernard M. Haines, 31 Chaparral Cir., Glenwood Springs, Colo. 81601

Filed Feb. 26, 1988, Ser. No. 161,087
Int. Cl.[4] A61F 13/00
U.S. Cl. 128—842 12 Claims

1. A device for the transmission of tactile and anomalous sensations between surfaces, at least one of which is living tissue, comprising a substantially homogenous, elastomeric

material base having a plurality of projection pairs spaced apart and integrally formed with said base material, each pro-



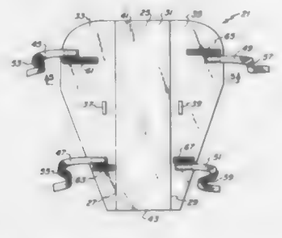
jection pair comprising two continuous coaxial projections extending from the opposite sides of said material base.

4,852,587

PROTECTIVE SHIELD AND RESTRAINING DEVICE

Mark Share, 2401 NE. 187th St., Miami Beach, Fla. 33180

Filed Jan. 19, 1988, Ser. No. 145,398
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—869 8 Claims



1. A device for subduing and then restraining a violent person comprising a shield having opposed major surfaces, a longitudinal direction terminating in a top edge and a bottom edge and a lateral direction terminating in side edges, said shield including two narrow, substantially-parallel, bendable regions of reduced thickness extending in said longitudinal direction, a wide stiff central panel between said bendable regions, and a wide stiff side panel attached at one side thereof to each of said bendable regions and terminating on its other side in one of said side edges, whereby said shield is bendable in said lateral direction to fit around said person, at least two handles for manually supporting and manipulating said shield attached to one of said major surfaces, one of said handles being attached to each of said side panels, at least one strap attached at one end thereof to said one major surface and fastening means for releasably attaching the extended portion of said strap to said one major surface.

4,852,588

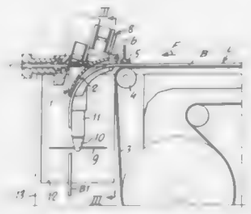
ROD DEFLECTING AND BREAKING DEVICE IN A CIGARETTE MAKING MACHINE

Maurizio Piana, Casalecchio di Reno, and Renato Manservisi, Bologna, both of Italy, assignors to SASIB S.p.A., Bologna, Italy

Filed Mar. 14, 1988, Ser. No. 167,985
Claims priority, application Italy, Apr. 17, 1987, 12467 A/87
Int. Cl.[4] A24C *5/18*
U.S. Cl. 131—84.1 5 Claims

1. A continuous cigarette rod deflecting and breaking device for a cigarette making machine, which device is located upstream of a unit for cutting a tobacco-containing rod travelling horizontally along a rod-forming line into individual cigarette lengths, the device comprising:

a deflecting member movable between an upper active position wherein said deflecting member downwardly deflects the tobacco-containing rod from its normal path along the rod-forming line along a deflected path, and a lower rest position wherein said deflecting member is located below the normal path along the rod-forming line leaving the tobacco-containing rod free to travel toward the cutting unit, said deflecting unit including an integral severing element located such that said severing element crosses the normal path along the rod-forming line so as to cut the road as said deflecting member is moved from one position to the other position, and



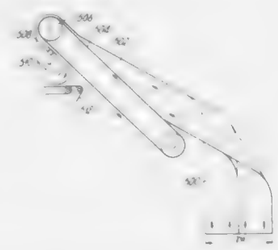
a rod breaking apparatus adapted for breaking up the rod which has been deflected by said deflecting member along the deflected path, said rod breaking apparatus including a rotary element driven by a motor and at least one rotary cutting member extending radially with respect to an axis of rotation of said rotary element and which is caused to cross the deflected path, said rotary element being mounted in a stationary position and capable of being set in rotation simultaneously with the movement of said deflecting member from its lower rest position to its upper active position, and capable of being stopped simultaneously with the movement of said deflecting member from its upper active position to its lower rest position.

4,852,589

CIGARETTE MAKING MACHINE

Francis A. M. Labbe, Neuilly-sur-Seine, France, assignor to Molins PLC, London, England

Continuation of Ser. No. 885,142, Jul. 14, 1986, Pat. No. 4,742,834. This application Mar. 15, 1988, Ser. No. 168,467
Claims priority, application United Kingdom, Jul. 12, 1985, [illegible]
Int. Cl.[4] A24D *5/14*
U.S. Cl. 131—84.3 3 Claims



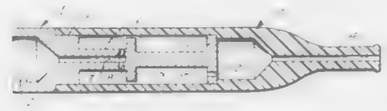
1. A cigarette making machine including means for conveying a layer of tobacco to be showered pneumatically to form a cigarette filler stream, shower means for showering two portions of the tobacco stream along separate paths towards a downstream end of the shower means at which two separate laterally-spaced sub-filler streams of tobacco collect, and means for combining the two sub-filler streams to form a cigarette filler stream of which the respective sub-filler streams form contiguous horizontally spaced components, said combining means including means for causing movement of the sub-filler streams from laterally spaced positions to positions in which the sub-filler streams contact one another.

4,852,590

INSERTABLE CIGARETTE SMOKE BAFFLE FOR HOLDERS

Robert Ferka, 2018 S. 40th St., San Diego, Calif. 92113

Filed Jul. 7, 1988, Ser. No. 215,993
Int. Cl.[4] A24F *1/16, 1/04, 1/02*
U.S. Cl. 131—210 1 Claim



1. A insertable cigarette smoke baffle which is dimensioned to be inserted into a cigarette holder and to hold a cigarette comprising:

an insert, with a receptacle for said cigarette at the far end of said insert, said receptacle being dimensioned to retain a lip end of said cigarette in a friction fit,

adjacent to said receptacle, a holder shoulder which is reduced in its outside diameter from the outside diameter of said receptacle so that said shoulder engages said cigarette holder in a tight friction fit when inserted into said cigarette holder,

a hollow extension tube along the axis of the insert having a small axial hole at its geometric center and extending from said receptacle and shoulder through the length of said hollow extension tube,

a small diametrical hole through said hollow extension tube, which intersects said axial hole,

a baffle in the shape of a disc perpendicular and concentric to said extension tube, said baffle having a diameter slightly less than the inside diameter of said cigarette holder so as to create an annular gap,

a solid extension cylinder perpendicular to said baffle and continuing along the axis of said hollow extension tube, and

a seal in the shape of a disc perpendicular and concentric to said solid extension cylinder and said seal having an outside diameter dimensioed to friction fit with the inside of said cigarette holder, said seal having a vent hole penetrating through,

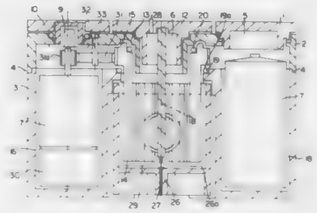
so that when a lighted cigarette is placed in said receptacle, and said insert is seated in said cigarette holder, smoke from said cigarette passes through said axial hole, in said hollow extension, exiting said axial hole by said diametrical hole, smoke then passing through annular gap around said baffle and moving parallel to said solid extension towards said seal then passing through said vent hole and exiting into a mouthpiece of said cigarette holder whereby such described passage of said smoke, said smoke experiences several cooling expansions resulting in a partial cleaning of said cigarette smoke.

4,852,591

APPARATUS FOR THE CARE OF CONTACT LENSES

Klaus-Dieter Wisotzki, Erkrath; Udo Schaab, Korschenbroich; Hans-Joachim Reitz, Roesrath, and Jüergen Orczech, Ebersberg, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 6, 1987, Ser. No. 69,664
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1986, 3622391
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—57 R 15 Claims



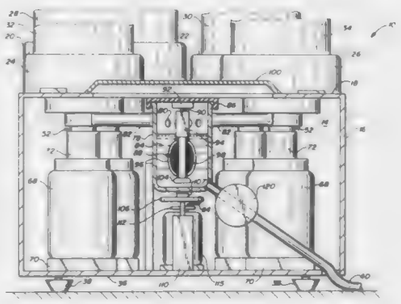
1. An apparatus for the care of contact lenses comprising a housing, a treatment compartment in said housing for containing a liquid, a stirrer supported by said housing above said compartment for movement about a vertical axis extending substantially centrally of said compartment, said stirrer having stirring means extending into said compartment from an annular gear extending around the upper end of said stirrer above said treatment compartment, and drive means cooperating with said gear for imparting rotation to said stirrer to agitate liquid in said compartment with said stirring means, and a lens holder formed separately from said stirrer, said lens holder being removably supported in said housing and extending into said compartment.

4,852,592

APPARATUS FOR THE CLEANING OF CONTACT LENSES

Joel D. DiGangi, San Diego, Calif., and Kenneth L. Ross, Redmond, Wash., assignors to Digangi and Ross, San Diego, Calif.

Continuation-in-part of Ser. No. 84,945, Aug. 13, 1987, abandoned. This application Aug. 23, 1988, Ser. No. 235,994
Int. Cl.[4] B08B *3/04, 11/02*
U.S. Cl. 134—57 R 20 Claims



1. A contact lens washer comprising,

a housing having a plurality of container receptacles, each having a support surface contoured to releasably receive a container of contact lens care solution and having means for selectively securing said container in a fixed position,

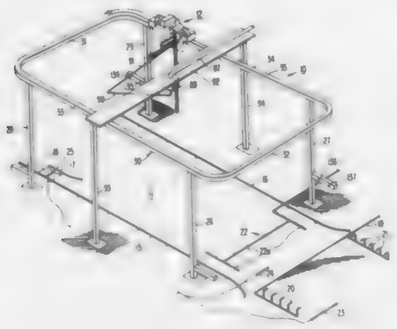
a plurality of conduits, each of said container receptacles being associated with one of said conduits to channel fluid flow from said containers,
a cleaning chamber mounted in said housing, said cleaning chamber being in fluid communication with said conduits,
a flow regulation means for initiating fluid flow from each of said containers,
means for draining fluid from said cleaning chamber,
a perforated lens-encasing member disposed within said cleaning chamber, said lens-encasing member having two compartments, each compartment adapted to hold a contact lens,
motor means for providing relative motion between said lens-encasing member and said cleaning chamber, and
a timing cycle means for self-operation of said contact lens washer, said timing cycle means controlling said flow regulation means for sequential fluid supply from said containers to said cleaning chamber, said timing cycle means further controlling said motor means and said means for draining fluid from the cleaning chamber.

4,852,593

APPARATUS AND METHOD FOR WASHING VEHICLES

William T. Daugherty, Bristol, Texas., assignor to Magic Spray Inc., Bristol, Va.

Division of Ser. No. 744,637, Jun. 14, 1985, abandoned. This application Mar. 26, 1987, Ser. No. 30,355
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—94 47 Claims



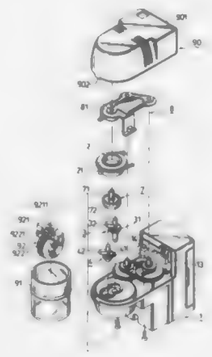
47. A vehicle washing apparatus comprising:
means for supporting a vehicle to be washed,
first means for applying a first solution at a low line pressure for penetrating and dislodging foreign substances on the surface of the vehicle,
second means for applying a second solution at a low line pressure for providing a cleansing action by entraining and carrying away the foreign substances dislodged by said first solution,
third means for applying fluid at a high line pressure for rinsing said first and second solutions from said vehicle, and
means for atomizing said first and second solutions and spraying said fluid onto the surface of said vehicle.

4,852,594

CONTACT LENS WASHING APPARATUS

Ching-Shih Chen, No. 18, Shuang Hsi Street, Sheh Lin District, Taipei, Taiwan

Filed Dec. 15, 1987, Ser. No. 132,936
Claims priority, application United Kingdom, Sep. 4, 1987, [redacted]
The portion of the term of this patent subsequent to Oct. 11, 2005, has been disclaimed.
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—140 2 Claims



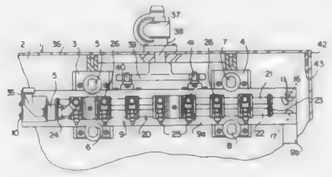
1. A contact lens washing apparatus comprising:
a power supply;
a motor having a shaft which is driven by said power supply to rotate at a first speed;
a speed reduction transmission including an input end connected to said motor shaft, and an output end provided with an annular member which rotates at a second speed lower than said first speed, said annular member having an inner surface from which a push rod projects radially inwardly;
a body for mounting said power supply, motor, and speed reduction transmission thereon;
a container secured detachably to said body and adapted for receiving a washing liquid therein;
a first rotating shaft disposed inside said annular member and having a first swing arm projecting radially outwardly therefrom;
a lens mounting member including at least one basket secured to said first rotating shaft for retaining a contact lens therein, said basket extending into said washing liquid in said container and having openings so that said contact lens can be completely immersed in said washing liquid;
a second rotating shaft disposed inside said annular member in parallel with said first rotating shaft and having a second swing arm projecting radially outwardly from said second rotating shaft;
a gearing interconnecting said first and second rotating shafts so that said first and second rotating shafts always rotate in opposite directions; and
said push rod always impelling alternately said first and second swing arms so that said basket can reciprocate clockwise and counterclockwise.

4,852,595

MACHINE FOR ETCHING OBJECTS

Dietfried Baier, Herrenberg; Ivan Grasa, Gäufelden, and Rainer Haas, Herrenberg, all of Fed. Rep. of Germany, assignors to Hans Hollmuller Maschinenbau GmbH & Co, Herrenberg, Fed. Rep. of Germany

Filed May 12, 1988, Ser. No. 193,058
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1988, 3807261
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—144 4 Claims



1. A machine for etching objects, in particular for the production of plates for electronic circuits which includes
(a) a housing (1),
(b) at least one nozzle assembly (20) mounted within said housing, said assembly including a plurality of nozzles which are adapted to spray a liquid etching medium in a specific spray pattern,
(c) means to guide the objects through the spray pattern formed by the liquid etching medium,
(d) an oscillation device operatively connected to said nozzle assembly which sets the nozzle assembly in an oscillating movement, said oscillation device including a drive motor (37), having a rotary movement and a cam disc (39) operatively connected both to each other and to the nozzle assembly whereby rotary movement of the drive motor (37) is by means of the cam disc (39) converted into an oscillating movement of the nozzle assembly (20), said oscillating movement having an effective outer contour that is heart-shaped, and
(e) two engagement members (40, 41) operatively connected to the nozzle assembly (20) and engageable with diametrically opposed points of the outer contour of said cam disc (39).

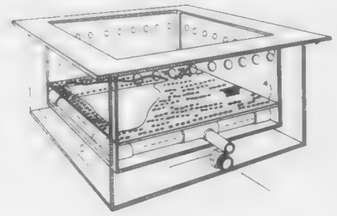
4,852,596

MICRO SLIDE IRRIGATING UNIT

David M. Fry, and Sharon A. Fry, both of Faber, Va., assignors to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Continuation of Ser. No. 48,467, May 8, 1987, abandoned, which is a continuation of Ser. No. 917,494, Oct. 10, 1986, abandoned, which is a continuation of Ser. No. 720,274, Apr. 5, 1986, abandoned. This application Jul. 7, 1988, Ser. No. 217,124
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—182 17 Claims

1. A portable cleaning apparatus for rinsing water soluble stains from microscope slides comprising,
rinsing chamber means for holding objects to be rinsed and for receiving rinsing fluid,
fluid inlet means, disposed at a lower portion of the rinsing chamber means, for introducing rinsing fluid into the rinsing chamber,
water circulating means, disposed around a perimeter and at a bottom portion of the rinse chamber means and further having apertures along a side portion towards a center of the apparatus along the entire water circulating means for circulating incoming rinsing fluid from a source of rinsing fluid,
fluid outlet means, disposed at a lower portion of a draining chamber means, for releasing contaminant-bearing rinsing fluid to a drain,
fluid passage means, disposed at an upper portion of the



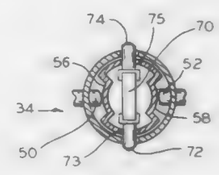
rinsing chamber means, for passing rinsing fluid from the rinsing chamber means to the draining chamber, and
floor means for supporting microscope slides therein disposed in a bottom portion of the rinsing chamber means.

4,852,597

CRUTCH DESIGN

Irving L. Mark, and Varun Soni, both of Highland Park, Ill., assignors to Medline Industries, Inc., Mundelein, Ill.

Filed Mar. 24, 1987, Ser. No. 29,716
Int. Cl.[4] A61H *3/02*
U.S. Cl. 135—69 12 Claims



1. A crutch comprising a pair of vertical weight bearing support members with uniform cross section extending from an under arm support to a terminal telescoping section, said members and terminal section being joined to form a crutch, said telescoping section comprising an outer telescoping tube having at least one row of periodically recurring holes formed therein, an inner telescoping tube having at least one spring biased detent confronting said row of holes for popping through and locking into a selected one of the holes in said row, thereby fixing the length of said telescoping section, and means associated with said telescoping tubes for limiting the rotational excursion of said inner and outer telescoping tubes relative to each other, said limited rotational excursion positioning said detents relative to said holes so that said detent slides past said holes, but the detent remains close enough to the holes for said spring bias to push said detent into a selected one of said hole for automatically locking the telescoped position upon release of said rotation, whereby said limited rotationally excursion provides means for enabling said inner telescoping tube to slide past all of said holes in said row for length adjustment purposes while the spring bias tends to limit the telescoping motion responsive to weight applied to unrotated tubes of said crotch, the limited telescoping motion being approximately a distance between an adjacent two of said holes.

4,852,598

BED TENT

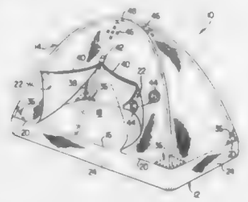
Harrell Griesenbeck, 2502 St. Andrews Dr., Ennis, Tex. 75119

Continuation-in-part of Ser. No. 867,778, May 27, 1987, abandoned, which is a continuation of Ser. No. 604,847, Apr. 27, 1987, Pat. No. 4,590,956. This application Sep. 18, 1987, Ser. No. 98,537

The portion of the term of this patent subsequent to May 27, 2003, has been disclaimed.

Int. Cl.[4] E04H *15/36, 15/40;* A47C *29/00;* A47G *9/02*

U.S. Cl. 135—102 6 Claims



1. A bed tent for providing an enclosure over a conventional mattress having a top surface, a bottom surface and side surfaces defining a peripheral edge comprising:

(a) canopy means adapted to define an enclosure above a conventional mattress having a top surface, a bottom surface and side surfaces defining a peripheral edge, said canopy means having an open base adapted to be coextensive with the peripheral edge of said mattress and said canopy means including a recloseable entry for providing ingress and egress for a user;

(b) elongated flexible frame members adapted to support said canopy means over said mattress when positioned between said top surface of said mattress and said canopy means by engaging the top surface of said mattress and being held in a fixed position by said canopy means and said mattress; and

(c) securing means extending from the base of said canopy means adapted to attach said canopy means to said mattress, said securing means adapted to engage a limited portion of the bottom surface of said mattress.

4,852,599

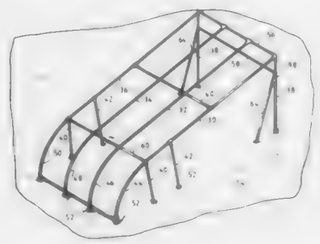
PORTABLE SHELTER FRAME STRUCTURE

Thomas Mc Namara, Port Jefferson, N.Y., assignor to Random Wheels, Inc., Port Jefferson, N.Y.

Filed Apr. 22, 1988, Ser. No. 184,812

Int. Cl.[4] E04B *1/32*

U.S. Cl. 135—102 11 Claims



1. A portable shelter frame structure comprising a roof including a plurality of parallelly disposed longitudinally extending rafter bars, each having at one end connected thereto a bow member, said rafter bars being connected at their other ends to a common ridge bar supported above ground level by a pair of spaced upright bars connected thereto at the lateral ends of said ridge bar, a door bar connecting the upright bars to each other, said upright bars and the ends of said bow members being set in base plates adapted to rest on the ground, and a removable sheet covering shaped to fit over said frame structure, secured to said rafter bars and depending therefrom.

4,852,600

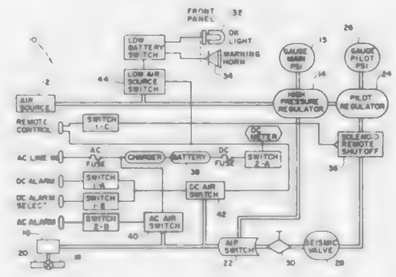
AIR ACTUATED VALVE SYSTEM WITH SEISMIC CONTROLLER

Martin R. Asbra, 2475 Butternut Dr., Hillsborough, Calif. 94010; Andrew F. Asbra, San Mateo, Calif.; Nicholas J. Bovis, Burlingame, Calif., and Charles W. Greer, San Carlos, Calif., assignors to Andrene Associates and Martin R. Asbra, both of Burlingam, Calif., part interest to each

Filed Oct. 7, 1988, Ser. No. 254,872

Int. Cl.[4] F16K *17/36*

U.S. Cl. 137—38 8 Claims



1. An air actuated valve system for shutting off fluid flow in a fluid conduit, comprising:

a fluid shut off valve for placement in the fluid conduit;

an air driven actuator, connected to the fluid shut off valve, for moving the fluid shut off valve between open and closed positions;

a primary air circuit, in fluid communication with the air driven actuator, for supplying air to the air driven actuator at a pressure sufficient to maintain the fluid shut off valve in the open position;

an air switch disposed in the primary air circuit upstream of the air driven actuator and being movable between open and closed positions; and

seismic control means, connected to the air switch, for shutting off air to the air driven actuator in response to a predetermined level of seismic activity, said seismic control means comprising:

a seismic air circuit, in fluid communication with the primary air circuit and the air switch, for supplying air to the air switch at a pressure sufficient to maintain the air switch in the open position, and

a seismic valve disposed in the seismic air circuit for shutting off air supplied to the air switch in response to a predetermined level of seismic activity, thereby causing the air switch to close and thus the shut off valve to close.

4,852,601

THERMALLY-ACTIVATED DRIP VALVE

John M. Chamberlin, 2800 Dunsinane Rd., Pensacola, Fla. 32503

Filed Jan. 3, 1989, Ser. No. 292,860

Int. Cl.[4] F16K *31/64;* E03B *7/12*

U.S. Cl. 137—62 6 Claims

1. A self-actuating drip valve for attachment to a standard external water faucet to prevent freezing of water pipes exposed to outside temperatures comprising

a hollow tube having an internally threaded collar at one end thereof, said collar adapted to be removably attachable to an external water faucet, said tube having a first coefficient of expansion;

at least one port connecting said faucet to the interior of said tube whereby the interior of said tube is filled with water when said faucet is open;

an orifice through the other end of said tube;

an adjustable stem secured within said threaded collar at said one end of said tube and extending substantially the length of said tube, said port extending from the interior of said threaded collar and through said stem to a point interior of said hollow tube, said stem having a second coefficient of expansion different from said tube; and



compressible means at the distal end of said stem for releasably sealing said orifice in said tube, whereby a predetermined drop in the ambient outside temperature causes relative movement between said tube and said stem so as to move said compressible means away from said orifice at a predetermined ambient temperature set by adjusting said stem and permit water to flow from said port into said hollow tube and out through said orifice, wherein said valve self-regulates the water flow through said tube and orifices so as to balance the heat loss to the outside ambient temperature by said faucet and said valve with available latent heat from the water flow.

4,852,602

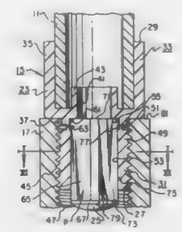
RISER CHECK VALVE

Robert M. McKinnon, P.O. Box 648, Bedford, Tex. 76021

Filed May 3, 1988, Ser. No. 189,776

Int. Cl.[4] F16K *15/02*

U.S. Cl. 137—68.1 23 Claims



1. An apparatus for use in an irrigation system, comprising:

a conduit member comprising wall structure forming an opening extending through said conduit member between first and second opposite ends thereof,

said first end being adapted to be connected to a water supply conduit and said second end being adapted to be connected to a water discharge conduit,

seat means located in said opening intermediate said first and second opposite ends,

a valve means having a closure means at one end and wall means extending from said closure means to a seating end,

said wall means of said valve means having a length from said seating end to said closure means which is greater than the distance from said seat means to said first end of said conduit member and having a size sufficient to be located in said opening of said conduit member and positioned with said seating end of said wall means engaging said seat means and with said closure means extending beyond said first end of said conduit member such that said closure means is spaced from said first end of said conduit member defining a first position of said valve means,

in said first position of said valve means, passageway means of a given size leads into said opening of said conduit member by way of said first end for the flow of water into said opening of said conduit member for flow through said opening and out of said second end of said conduit member,

said wall structure of said conduit member comprising a weakened portion which connects said seat means to said conduit member first end whereby sufficient force applied to said conduit member between said second end and said weakened portion will cause said wall structure to be severed at said weakened portion forming a severed end and severing said seat means from said conduit member first end and allowing water pressure to move said valve means in a direction whereby said closure means may move toward said first end of said conduit member to a given position defining a second position of said valve means,

in said second position of said valve means, a passageway exist for the flow of water into said opening by way of said first end of said conduit member which is substantially smaller than said given size of said passageway means allowing a reduced amount of water to flow into said opening by way of said first end of said conduit member.

4,852,603

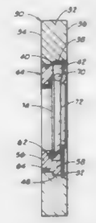
SWING CHECK VALVE WITH SECURED CARTRIDGE

John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170

Filed Dec. 20, 1988, Ser. No. 286,706

Int. Cl.[4] F16K *15/03*

U.S. Cl. 137—316 19 Claims



1. A swing check valve comprising:

a body having planar upstream and downstream ends and a bore therethrough interconnecting the upstream and downstream ends, said bore having a larger diameter portion and a smaller diameter portion providing an annular shoulder in the bore facing downstream, and said bore having an annular groove therein downstream from said shoulder

a valve seat in the bore having an annular shoulder thereon mating with the annular shoulder in the body;

a disc sized to mate with the seat member;

a ring shaped cage in the bore downstream from the seat supporting the disc for pivotal movement toward and away from the seat having a recess in the outer periphery thereof between the opposite ends thereof mating with said groove; and

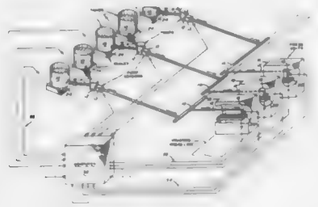
a plate-like member extending into said groove and said recess to prevent the seat and cage from moving downstream in the valve body.

4,852,604

INK MONITOR SYSTEM

R. Langdon Wales, Lincoln, and H. W. Crowley, Newton, both of Mass., assignors to Automation, Inc., Needham, Mass.

Division of Ser. No. 792,745, Oct. 30, 1985, Pat. No. 4,796,782.
This application Oct. 5, 1987, Ser. No. 104,241
Int. Cl.[4] F16K *31/02, 31/12*
U.S. Cl. 137—392 4 Claims



1. Ink fountain system comprising;
at least one ink source tank,
a plurality of ink storage fountains,
at least one pump means disposed external of the ink storage fountains and connected to said at least one source tank,
a plurality of coupling lines for the ink connecting from said at least one ink source tank to said at least one pump means to the respective ink storage fountains,
the ink in said coupling lines being commonly pressurized by said pump means,
a plurality of valve means one in each of said coupling lines,
control means for selectively operating each said valve means to couple ink under pressure into its associated ink storage fountain,
a level sensor associated with each said ink storage fountain,
and means responsive to said level sensor for controlling said control means and in turn said valve means to maintain the level of ink in the ink storage fountain within a desired level range,
said control means including means for operating only one valve means at a time to control delivery of ink to only one fountain out of said plurality of fountains at a given pump stroke time period,
wherein for said given pump stroke time period, the amount of ink remaining in said source tank is directly indicative of the amount of ink that has been used by said fountains, and
said means for operating only one valve means at a time including time control means to enable each valve means to be activated sequentially upon a desired time basis.

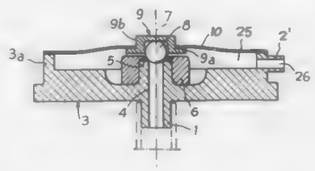
4,852,605

VALVE OPERATING WITHOUT FRICTION

Dany Gouhier, Saint Pierre De Bailleul, France, assignor to Societe Anonyme: Societe Europeenne De Propulsion, Suresnes, France

PCT No. PCT/FR87/00119, § 371 Date Dec. 14, 1987, § 102(e) Date Dec. 14, 1987, PCT Pub. No. WO87/06320, PCT Pub. Date Oct. 22, 1987
PCT Filed Apr. 13, 1987, Ser. No. 141,609
Claims priority, application France, Apr. 14, 1986, 86 05288
Int. Cl.[4] F16K *15/14, 17/18, 31/06*
U.S. Cl. 137—493 6 Claims

1. A valve comprising:
a base;
a conjugated annular seat including a support to secure said conjugated annular seat to said base and a truncated seat;
a substantially flat flexible circular membrane having a central circular opening, said circular membrane being mechanically isotropic about the center thereof, elastically deformable in a direction perpendicular to the plane of said circular membrane, and substantially rigid in any radial direction of the plane of said circular membrane;
a support secured by welding in said central circular opening to constrain said support in said circular membrane;
an obturating ball member fixed in said support for movement in a direction perpendicular to the plane of said truncated seat to permit said obturating ball member to move into and away from said truncated seat to interrupt and allow fluid flow through said truncated seat, respectively; and wherein



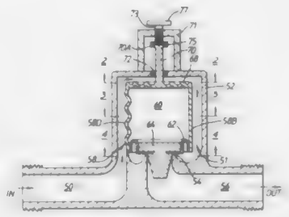
said circular membrane is secured to said base in a prestressed condition by welding the contour of said circular member to said base to contain said circular membrane in said base, said circular membrane being secured in a plane parallel to the plane of said truncated seat with said obturating ball member centered in confronting relation with said truncated seat, and wherein the prestressed condition of said circular membrane exerts a restoring force on said obturating ball member to cause said obturating ball member to seat in said truncated seat.

4,852,606

FLUID FLOW CONTROL APPARATUS

Stephen R. Heneker, 60 Broadwood Avenue, Ruislip, Middlesex HA4 7XR, United Kingdom

Filed Sep. 21, 1987, Ser. No. 99,397
Claims priority, application United Kingdom, Sep. 23, 1986, 8622561
Int. Cl.[4] G05D *7/01*
U.S. Cl. 137—495 6 Claims



1. Fluid flow control apparatus comprising
a valve seat defining an outlet port,
a valve member,
a membrane having a first side and a second side and supporting the valve member for movement towards and away from the valve seat to control the flow of fluid through the port, both the valve member and the membrane lying on the same side of the valve seat,
means for supplying fluid under pressure to the first side of the membrane and to the valve member over a part of the face of the valve member not shielded by the valve seat,
first control means responsive to a command, to vary the pressure on the second side of the membrane so as to allow the fluid pressure on the first side of the membrane to displace the valve member away from the valve seat by a predetermined extent to achieve a predetermined flow from the port, and

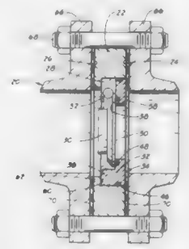
second control means responsive to variations of pressure in the fluid supplied to the port to adjust the pressure on said second side of the membrane in a sense and by an amount to tend to maintain the rate of flow from the outlet substantially constant over a predetermined range of pressure variations in the fluid supplied.

4,852,607

SUPPORT FOR CHECK VALVE DISC

John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170

Filed Jun. 29, 1988, Ser. No. 213,266
Int. Cl.[4] F16K *15/03*
U.S. Cl. 137—515.7 18 Claims



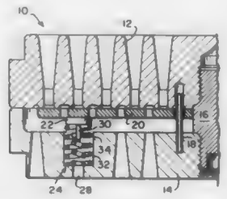
1. A swing check valve comprising:
a body having a circular bore therethrough;
a ring-shaped seat fitting in the bore of the body having an annular seating area on one end face thereof;
a disc in said circular bore having a seating face sized to mate with the seating area of the seat and having a hinge pin thereon extending along an axis parallel with the seating face thereof, the opposite end portions of the hinge pin projecting from the disc;
a hinge pin support in the body forming a single of aligned flat surfaces positioned in a plane parallel with the centerline of the seating area of the seat and radially outwardly of said seating area;
the opposite end portions of the hinge pin resting on said flat surfaces, with the opposite ends of the hinge pin engaging the wall of the bore through the body; and
retainer means in the body for holding the opposite end portions of the hinge pin on said flat surfaces.

4,852,608

FLUID CONTROL VALVE

Robert A. Bennitt, Painted Post, N.Y., assignor to Dresser-Rand Company, Corning, N.Y.

Filed Oct. 4, 1988, Ser. No. 253,000
Int. Cl.[4] F16K *15/12*
U.S. Cl. 137—516.13 7 Claims



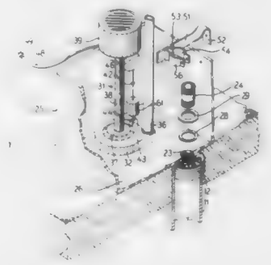
1. A fluid control valve, comprising:
first means defining a ported, valve seat having a valving-element-receiving surface;
second means defining a ported, stop plate, having a valving-element-receiving surface, spaced apart from said seat to define a space between said surfaces;
a ported, valving element, disposed in said space, movable onto, and between, said surfaces; and
biasing means, interposed between said element and one of said first and second means for (a) urging said element toward one of said first and second means, and (b) for decelerating said element in its movement toward the other of said first and second means; wherein
said biasing means comprise pairs of separate and distinct, albeit co-acting, compression springs; and
said compression springs of said pairs thereof are concentrically nested together and counter-wound; and further including
buffer means, interposed between said element and said biasing means, for isolating said element from contact with said biasing means; wherein
said buffer means comprises single, imperforate buttons for each of, and surmounting, said pairs; and
each button has a single stem projecting perpendicularly and centrally therefrom, each of said stems being circumscribed by said springs of its respective pair and comprising means for centralizing its respective button.

4,852,609

SUMP PUMP ADAPTOR

Anton Schoenauer, 502 E. Ironwood, Mt. Prospect, Ill. 60056

Filed Nov. 3, 1988, Ser. No. 266,875
Int. Cl.[4] E03B *5/00;* F04B *49/04*
U.S. Cl. 137—565 1 Claim



1. A sump pump and tank for a pipe drain comprising, a tank with sidewalls and a bottom, means connecting said drain pipe to the tank so that liquid can flow from said drain pipe into said tank, and a sump pump mounted in said tank, a base and an inlet which rest on the bottom of said tank and provided with an outlet conduit so that fluid can be pumped from said tank, wherein said means connecting said drain pipe to said tank includes a stand pipe coupler, a nipple threadedly received in said stand pipe coupler and at least one threaded collar and a flexible gasket receivable on said nipple to seal the bottom of said tank to said drain pipe, wherein said sump pump has a vertical hollow member and a bracket which extends between opposite sides of said tank and across the top of said tank attached to said sides and to said vertical hollow member to lock said sump pump to said tank, said nipple has a length which extends upwardly into said tank, and wherein said sump pump has a float valve to turn it on when the liquid in said tank reaches a predetermined level.

4,852,610

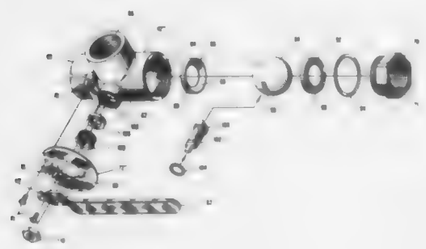
VALVE AND ARRANGEMENT FOR FIRE SUPPRESSION WATER SPRINKLER SYSTEM

George J. McHugh, Broomall, Pa., assignor to AGF Manufacturing, Inc., West Chester, Pa.

Continuation-in-part of Ser. No. 881,270, Jul. 2, 1986, Pat. No. 4,741,361, which is a continuation-in-part of Ser. No. 874,653, Jun. 16, 1986, abandoned. This application Dec. 28, 1987, Ser. No. 138,436

Int. Cl.[4] G01M *19/00*; F16K *5/10*

U.S. Cl. 137—559 34 Claims



1. An arrangement for testing and draining a fire suppression water sprinkler system, comprising:

conduit means for supplying water to a plurality of sprinklers;

means for sensing a flow of water in said conduit means;

valve means provided downstream of said means for sensing and in communication with said conduit means, said valve means comprising

a housing defining an interior chamber having an inlet and first and second outlets,

a valve member having a turning axis and first, second and third ports arranged about a circumference of the valve member which is perpendicular to the turning axis, said first and second ports including central axis which are generally perpendicular to one another and said third port having a central axis which is generally perpendicular to the axis of the second port, said first port having a size which is smaller than either of the second and third ports, said valve member being selectively positionable within the interior chamber in either one of a first and a second orientation with respect to the turning axis, the first position being substantially inverted with respect to the second position whereby the valve means may be selectively oriented in a right-handed or a left-handed manner,

seat means for selectively sealingly receiving a surface of the valve member adjacent one of the outlets;

plug means for closing off one of the first and second outlets; and

moving means for selectively moving said valve member while in either of the two positions within said interior chamber whereby communication between said inlet and the other of the first and second outlets may be sequentially closed, opened to a first preselected flow rate and then opened to a second preselected flow rate, the second preselected flow rate being greater than the first preselected flow rate, said plug means closing said one of the first and second outlets during all of the sequential movements of said valve member.

4,852,611

WELLHEAD CONNECTION OF HYDRAULIC CONTROL LINES

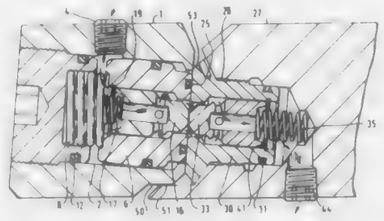
Edwin R. Knerr, Houston, Tex.; Robert Hart, Middlesex, England, and William S. Cowan, Houston, Tex., assignors to National Oil Well (U.K.) Limited, Great Britain

Filed Sep. 16, 1987, Ser. No. 97,490

Claims priority, application United Kingdom, Sep. 16, 1986, [illegible]

Int. Cl.[4] F16L *37/28*

U.S. Cl. 137—595 6 Claims



1. A connector assembly for connecting hydraulic lines in a control stab module assembly, the connector assembly comprising:

an inner annular ring;

a plurality of radially outwardly facing ports in said inner annular ring for the passage of hydraulic fluid therethrough;

an outer annular ring;

a plurality of radially inwardly facing ports in said outer annular ring for the passage of hydraulic fluid therethrough, said inwardly facing ports being arranged to be aligned with said outwardly facing ports when said outer ring is positioned about said inner ring;

a plurality of first valve members arranged in said ports;

biassing means for resiliently biassing said first valve members to a closed position for closing said ports;

urging means for urging said first valve members into an open position against said biassing means when said rings are positioned one about the other;

sealing means for sealing a said inwardly facing port with a said outwardly facing port aligned therewith;

means for enhancing the sealing effect of said sealing means when pressurized hydraulic fluid passes through said aligned ports;

said sealing means comprising a sealing face for forming a fluid-tight seal between said rings;

a plurality of second valve members, each surrounding one of said first valve members;

further biassing means for resiliently biassing said second valve members radially with respect to said respective ring member, said second valve members being provided with said sealing means,

each of said first valve members being slidable within one of said second valve members;

a first shoulder on each of said first valve members; and

a second shoulder on each of said second valve members, each of said first shoulders abutting against one of said second shoulders when in said closed position to form a seal thereagainst.

4,852,612

FLUID FLOW CONTROL DEVICE

Edward P. Bucko, Sr., P.O. Box 721, Silver Star, Mont. 59751

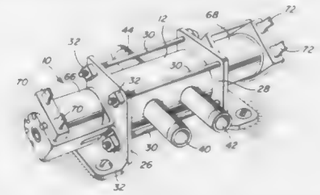
Filed Sep. 23, 1983, Ser. No. 535,053

Int. Cl.[4] F16K *11/044*

U.S. Cl. 137—625.5 3 Claims

1. A three-way valve structure comprising a housing defining a cylindrical valve chamber, a pair of axially spaced ports

communicating with the chamber, a third central port communicating with the chamber between said pair of ports, an axially extending valve rod carrying a thin flexible valve disc mounted in the chamber for movement therein between respective first and second positions, the valve disc in the first position being located on one side of the third port providing communication between the third port and one of said pair of ports while blocking communication between the third port and the other of said pair of ports, the valve disc in the second position being located on the other side of the third port providing communication between the third port and said other of the pair of ports while blocking communication between the third port and said



one of the pair of ports, the valve chamber including a pair of tight-fitting cylindrical liner sleeves covering the respective axially spaced ports, the liner sleeves having openings communicating with the respective axially spaced ports, the liner sleeves further having spaced inner ends located respectively on opposite sides of the third port, the disc being movable between the respective inner ends of the sleeves and engaging face to face against the respective inner ends of the sleeves in the respective first and second positions of the disc, the ends of the periphery of the sleeves providing sealing and support for the disc against fluid pressure forces resulting from fluid flow between the respective ports and tending to distort the periphery of the disc.

4,852,613

FLUIDIC PUMP CONTROL SYSTEMS

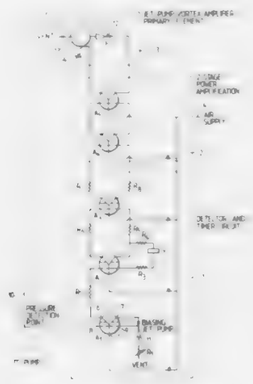
John R. Tippetts, and Geoffrey H. Priestman, both of Sheffield, United Kingdom, assignors to United Kingdon Atomic Energy Authority, London, England

Filed Jul. 11, 1988, Ser. No. 217,673

Claims priority, application United Kingdom, Jul. 15, 1987, [illegible]

Int. Cl.[4] F15C *1/13*

U.S. Cl. 137—805 9 Claims



1. A fluidic control system for a fluidic pump having a displacement vessel, the system comprising in combination a detection stage, a power amplification stage connected to receive signals from the detection stage, and a primary element stage connected to receive further signals from the power amplification stage, the detection stage comprising bistable fluidic amplifiers for detecting pressure changes in a gas pressure line to the displacement vessel of the fluidic pump and providing said signals in response to said changes, the power amplification stage comprising means to amplify the signals from the detection stage and direct the further signals to the primary element stage and the primary element having an output connected to the gas pressure line, the primary element stage comprising means responsive to the further signals from the power amplification stage and operative to achieve high drive pressure in the gas pressure line.

4,852,614

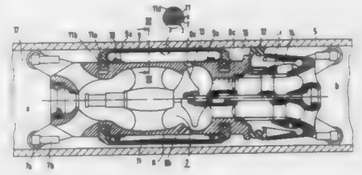
SHUT-OFF DEVICE WHICH CAN BE INSERTED INTO A PIPELINE

Trond V. Johansen, Trondheim; Ola Ruch, Flatsåen; Ludvig Naess, Tiller, all of Norway; Robert Weber, Uttenreuth, Fed. Rep. of Germany; Bernd Veenhoff, Langensendelbach, Fed. Rep. of Germany; Horst Pörner, Röttenbach, Fed. Rep. of Germany; Erwin Laurer, Möhrendorf, Fed. Rep. of Germany; Erich Strickroth, Buckenhof, Fed. Rep. of Germany, and Hans-Peter Schabert, Erlangen, Fed. Rep. of Germany, assignors to Den Norske stats oljeselskap a.s., Norway

Filed Mar. 27, 1987, Ser. No. 31,404

Int. Cl.[4] F16L *55/12*

U.S. Cl. 138—93 22 Claims



1. A movable pipeline shut-off device which can be inserted into a pipeline and be positioned in the pipeline during normal operation of the pipeline while pipeline medium flows through the pipeline, said shut-off device comprising:

(a) a hollow cylinder;

(b) braking means for locking the shut-off device at a given point in the pipeline, said braking means attached to said hollow cylinder and disposed between the hollow cylinder and the pipeline wall;

(c) a valve disposed in the hollow cylinder (8), said valve being of a size for normal passage of all of the pipeline medium, said valve having an open position and a closed position;

(d) a remotely controlled, radially displaceable sealing means for sealing the space between the pipeline wall and the hollow cylinder, said sealing means attached to said hollow cylinder and disposed between the hollow cylinder and the pipeline wall;

(e) means for remotely controlled closing and opening of the valve;

(f) means for the automatic closing of the valve when the velocity of flow of the pipeline medium exceeds an operational velocity; and

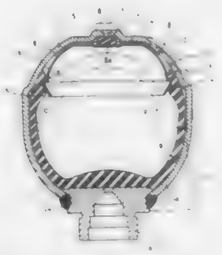
(g) means for pressing said sealing means against the wall of the pipeline upon a given pressure difference between side (b) on which the pipeline medium enters into the shut-off device and side (a) on which the pipeline medium exits from the shut-off device.

4,852,615

HYDROPNEUMATIC ACCUMULATOR

André Stil, Vimont Par Argences, France, assignor to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly Sur Seine, both of, France

Division of Ser. No. 80,028, Jul. 30, 1987, Pat. No. 4,800,642.
This application Sep. 30, 1988, Ser. No. 252,507
Claims priority, application France, Aug. 4, 1986, 86 11482
Int. Cl.[4] F16L *55/04*
U.S. Cl. 138—30 1 Claim



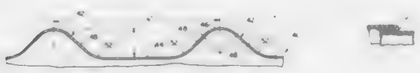
1. A hydropneumatic accumulator, comprising:
a cold-formed accumulator housing having a closed end formed with an orifice and with internal bosses spaced around said orifice, and an open end;
a liquid fitting connected to said housing at said open end and defining a closed space with said housing;
a membrane in said space subdividing said space into a first chamber communicating with said orifice and adapted to be filled with a gas, and a second chamber communicating with said liquid fitting and adapted to receive a liquid introduced through said fitting, said membrane having a lip lying along a wall of said housing;
a cup in said housing welded to said bosses and clamping said lip of said membrane against said wall, said cup having an opening communicating between said orifice and said first chamber; and
means for closing said orifice.

4,852,616

CORRUGATED PIPE

Richard A. Holcomb, East Point, Ga., assignor to Mid-State Drainage Products, Inc., Stockbridge, Ga.

Continuation of Ser. No. 818,429, Jan. 10, 1986. This application Mar. 23, 1987, Ser. No. 29,390
Int. Cl.[4] F16L *9/02*
U.S. Cl. 138—173 12 Claims



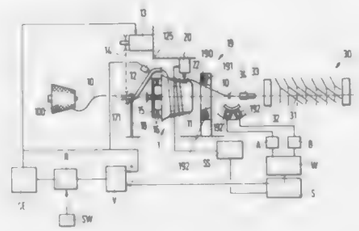
1. In a pipe adapted to be used in the ground as a culvert, the improvement comprising:
(a) said pipe formed of a strip of material of uniform thickness which enables the pipe to withstand compressive loads experienced by culverts in the ground,
(b) means for helically joining together adjacent edges of said strip to form said pipe,
(c) the pipe being of single thickness of material between said helical joint means,
(d) the pipe having helically extending longitudinally spaced corrugations of equal diameters, and a flat portion between adjacent corrugations,
(e) said flat portions being cylindrical and of equal diameter,
(f) the material of said flat portions and said corrugations having substantially the same thickness,
(g) said corrugations each comprising as viewed from the exterior of the pipe, a convex portion having an arcuate crest in longitudinal cross-section at a greater radius from the pipe axis than said flat portion, said convex portion subtending an angle of less than 180°,
(h) means for providing a smooth transition of said material being each said flat portion and the adjacent corrugations comprising, as viewed from the exterior of the pipe, a concave portion at the edge of said flat portion and tangent thereto, said concave portions each joined to a said convex portion,
(i) said corrugations, said concave portions adjacent thereto, and said flat portions being located sequentially along the axis of the pipe, and
(j) said corrugations being the only protuberances of said pipe between said helical joint means.

4,852,617

WEFT YARN STORE

Antonius Hamer, Eindhoven, and Gerardus Spang, Deurne, both of Netherlands, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 4, 1988, Ser. No. 176,944
Claims priority, application Switzerland, Apr. 8, 1987, 01347/87
Int. Cl.[4] D03D *47/34*
U.S. Cl. 139—452 8 Claims



1. A weft yarn store comprising
a stationary drum for receiving a plurality of yarn windings;
a yarn eye spaced from said drum for guiding a yarn axially from said drum; and
a monitor device disposed between said drum and said eye in a zone where a yarn balloon forms between said drum and said eye, said monitor device including a ring having an internal surface for circumferential sliding of the yarn balloon thereon, at least one transmitter in said ring for directing a light beam across the path of the yarn balloon during sliding of the yarn balloon on said internal surface and at least one receiver in said ring for receiving said light beam.

4,852,618

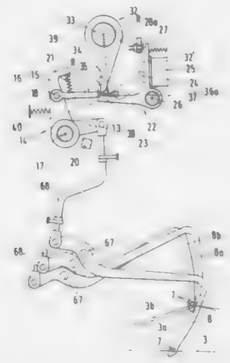
WEFT YARN SELECTOR FOR A LOOM

Hans Zollinger, and Fredi Oderbolz, both of Tann-Ruti, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 30, 1988, Ser. No. 175,048
Claims priority, application Switzerland, Apr. 3, 1987, 1285/87
Int. Cl.[4] D03D *47/38*
U.S. Cl. 139—453 20 Claims

1. A weft yarn selector for a loom comprising
a plurality of yarn regulators, each regulator being selectively movable between a standby position and a transfer position;
a plurality of driving members, each said member being

connected with a respective regulator for moving said regulator between said positions and having a step therein;
a common driver oscillated at the cadence of a picking frequency for engaging against said step of a selected driving member to move a respective regulator between said positions;
a plurality of guide members, each said guide member being engageable with a respective driving member to position said respective driving member in engagement with said driver;
a plurality of electromagnets, each electromagnet being operable between an active state and a passive state and being positioned adjacent a respective guide member to



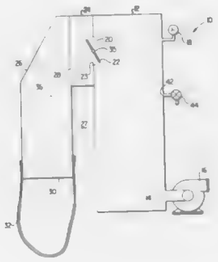
move said respective guide member into engagement with a respective driving member in said active state; and
each said guide member being engageable with a respective driving member in said active state of a respective electromagnet to position said respective driving member for engagement with said driver for movement therewith into a position corresponding to said yarn transfer position and to selectively lick said respective driving member in said position corresponding to said yarn transfer position and being disengaged from said respective driving member in said passive state to allow said respective driving member to move with said driver into a position corresponding to said yarn standby position.

4,852,619

SEAT COVER INVERTER

Reuben Krein, Fort Smith, Ark., assignor to BJK Industries, Inc., Fort Smith, Ark.

Filed Sep. 3, 1987, Ser. No. 92,476
Int. Cl.[4] B65B *31/04*
U.S. Cl. 141—7 12 Claims



1. An apparatus for turning a seat cover inside out, the seat cover having an internal volume and at least one open end, comprising:
a pressure vessel of a first predetermined volume;
means for creating a vacuum inside pressure vessel;
a blood having a first end attached to said pressure vessel and an open end distal to said first end;
said hood having an interior space with a defined volume;
inhibit means for inhibiting air flow through said opening, said means for inhibiting having an open position and a closed position;
an opening disposed between the interior space of said hood and the anterior of said pressure vessel;
select means for selecting said open position or said closed position of said inhibit means;
the seat cover having peripheral edges on the open end thereof; and
means for attaching the seat cover at the peripheral edges of the unsealed end thereof to said open end of said hood to seal the open end of said hood and define a second predetermined volume ar a higher pressure than said pressure vessel, whereby selecting the open position of said inhibit means by said select means in air being sucked through said opening from the interior space of said hood and the seat cover pressure into the pressure vessel to raise the pressure within said pressure vessel, thus drawing the seat cover into the interior space of the hood and turning the seat cover inside out.

9. A method of turning a seat cover inside out, the seat cover having an interior space and at least one open end, comprising:
providing a pressure vessel having opening on the surface thereof;
providing a hood having an interior space, an open end and an attachment end;
attaching the peripheral edges of the open end of the seat cover to an open end of the hood;
the attachment end of the hood attached to the pressure vessel over the opening on the surface thereof;
removing the seal from the opening;
creating a vacuum in said pressure vessel to create a lower pressure in the interior of the pressure vessel relative to the interior of the hood; and
the step of removing the seal allowing air to pass between the hood and the pressure vessel such that the seat cover is sucked into the open end of the hood as air from inside the hood and the seat cover is transferred to the vacuum in the pressure vessel.

4,852,620

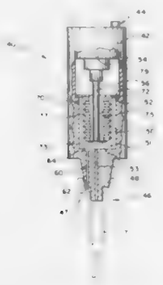
PIPETTE WITH INVERTED BELLOWS

Raymond F. Jakubowicz, Rush, and Johannes J. Porte, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 20, 1988, Ser. No. 183,970
Int. Cl.[4] B01L *3/02*
U.S. Cl. 141—25 4 Claims

1. In a pipette comprising first means for aspirating liquid into the pipette including a fluid passageway through said means, and second means for creating an operative vacuum or a pressure in a said passageway different from atmospheric pressure, said second means including a piston chamber having an end fluidly connected to said fluid passageway, a piston and a bellows mounted for movement within said chamber, said bellows having a preformed sidewall with an inside, generally concave surface and an outside, generally convex surface, and actuating means for advancing or retracting said piston;
the improvement wherein said bellows is mounted in said chamber and on said piston so that said outside convex

surface and said piston chamber define the air volume operative on said fluid passageway.



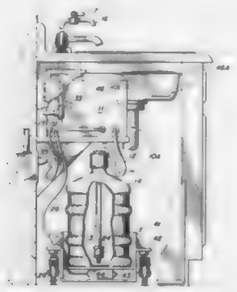
whereby said bellows is readily assembled within said chamber and said actuating means requires minimal force to fully extend the piston to said chamber end.

4,852,621

BOTTLED WATER PRESSURIZATION SYSTEM

Don E. Bear, 1301 Camino Miraflores, Tucson, Ariz. 85745

Filed Aug. 10, 1987, Ser. No. 83,110
Int. Cl.[4] B65B *1/30, 3/26*
U.S. Cl. 141—83 **14 Claims**



1. An apparatus for supplying pressurized water from an unpressurized bottle, comprising in combination:

(a) a cover having a hole therein and covering an opening at the upper portion of the bottle;

(b) a sealed tank containing a certain quantity of pressurized air and having an inlet/outlet opening located at the bottom of the tank and a delivery tube connected in open communication with the inlet/outlet opening for delivering pressurized water in the tank to an external utilization device, such as a faucet, or an ice maker and/or a cold drinking water delivery unit of a refrigerator;

(c) a pump, having an inlet and an outlet, for pumping water from the bottle into the tank;

(d) a tube connecting the outlet of the pump to the inlet/outlet opening;

(e) first tubular means extending through the hole in the cover to a level near the bottom of the bottle;

(f) second tubular means for connecting an upper end of the first tubular means to the inlet opening of the pump;

(g) first valve means located in the bottle connected to the bottom of the first tubular means for preventing spillage of residual water from the first tubular means when it is removed from the bottle;

(h) second valve means connected in series relationship with the inlet/outlet opening of the tank for preventing flow of water from the tank back into the outlet of the pump;

(i) a pump motor for driving the pump;

(j) pressure sensing means for sensing the pressure in the tank;

(k) control means connected to the pressure sensing means for turning on the pump motor when the pressure in the tank falls below a first level and turning the pump motor off when the pressure in the tank exceeds a second level that is greater than the first level; and

(l) means for producing a control signal when the level of water in the bottle falls below a selected level near the bottom of the bottle, the control means responding to the control signal by turning off the pump motor, thereby preventing the pump from running dry,

whereby the pump and pump motor operate to maintain a supply of pressurized water from the bottle in the tank and a continuous supply of pressurized water is provided to the utilization device.

4,852,622

DEBARKING MEANS FOR ROTATION RING TYPE BARKING MACHINES

Bror Eriksson, Iggesund, Sweden, assignor to Iggesund Tools AB, Iggesund, Sweden

Filed Nov. 22, 1988, Ser. No. 274,835
Claims priority, application Sweden, Dec. 1, 1987, 8704786
Int. Cl.[4] B27L *1/00;* **B27G** *13/00*
U.S. Cl. 144—208 E **12 Claims**



1. Debarking means for a rotation ring-type barking machine having a plurality of curved arms, wherein said debarking means comprises a leading edge forming a cutting edge; a trailing edge adapted to engage with a seat on a curved arm; a pair of side edges extending between opposite ends of said cutting edge and said trailing edge, said side edges being of different lengths thereby forming long and short side edges, said trailing edge extending at an acute angle to said leading edge; and means for detachable mounting said debarking means to a curved arm.

4,852,623

EXTENSION TABLE FOR A TABLE SAW

John M. Rodrigues, 12358 Deerbrook La., Los Angeles, Calif. 90049

Filed May 3, 1988, Ser. No. 189,548
Int. Cl.[4] B25H *1/02*
U.S. Cl. 144—287 **3 Claims**

1. An extension table for use with a table saw which includes a table with discharge end and a power saw, said extension table comprising:

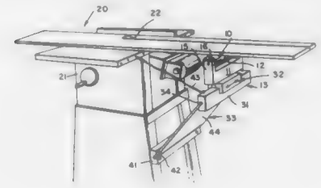
a. a rectangular member which has a bottom surface with a rectangular slot therein and which has a pair of arms;

b. a cylinder;

c. rotatingly coupling means for rotatingly coupling said cylinder to said pair of arms of said rectangular member; and

d. supporting means for supporting said retangular member

whereby said extension table is attached to the discharge end of the table saw in order to facilitate support of a



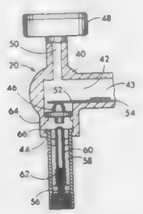
comparatively long board throughout its entire length of travel.

4,852,624

TIRE INFLATION DEVICE FOR EMERGENCIES

Frank R. Belrose, 2349 Dodd Rd., St. Paul, Minn. 55120

Filed Sep. 17, 1987, Ser. No. 97,673
Int. Cl.[4] B60C *23/00*
U.S. Cl. 152—415 **4 Claims**



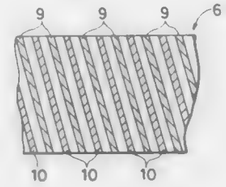
1. An emergency transfer apparatus for filling flat tires comprising, a flexible air transfer hose having an air inlet chuck at one end of the hose, said air inlet chuck having a manually releasable retaining clip thereon for automatically locking and temporarily retaining the inlet chuck on a stem of an inflated tire, manually operable means connected to the retaining clip for releasing the clip when the inlet chuck is to be removed from the tire stem, an inflation chuck at the opposite end of the hose, a movable check valve element in the inflation chuck allowing the hose to hold air pressure supplied by the inflated tire when the inlet chuck is connected thereto, a rotatable extension tube rotatably connected to said inflation chuck and projecting from the inflation chuck, said extension tube having a passage therethrough, and operating pin slidably mounted within the extension tube, said pin being adapted to extend from the check valve element in the inflation chuck to a tire stem for operating a tire valve within the tire stem when manual pressure is applied radially outwardly to the inflation chuck, said extension is provided with internal screw threads for threading the extension onto a tire stem whereby the extension can be screw-threaded onto the tire stem while the inflation chuck remains stationary, whereby said manual pressure will force the pin toward the tire valve to open the tire valve and at the same time will open said movable check valve element in the inflation chuck to permit air to be transferred through the device into the flat tire.

4,852,625

TIRE FOR TWO-WHEELED VEHICLE IN WHICH INDIVIDUAL CORD BELTS CONTAIN BOTH ADHESIVE AND REINFORCING CORDS

Satoshi Mashimo; Tatsuya Kitajima; Masayuki Tanaka, and Shinji Kuramoto, all of Hyogo, Japan, assignors to Mitsubishi Belting Ltd., Japan

Continuation of Ser. No. 721,518, Apr. 9, 1985, abandoned. This application May 25, 1988, Ser. No. 201,352
Claims priority, application Japan, Apr. 10, 1984, 59-52987[U]; Apr. 17, 1984, 59-57073[U]; Apr. 18, 1984, 57468[U]; Jun. 19, 1984, 59-92331[U]; Sep. 11, 1984, 59-138074[U]
Int. Cl.[4] B60C *9/13*
U.S. Cl. 152—511 **2 Claims**



1. A tire (1) for a two-wheeled vehicle, comprising: a carcass layer (2) formed in a desired shape by arranging cord belts (6) with a rubber paste coated thereon in such a manner that cords of respective ones of said cord belts cross each other, a tube (5) fitted to an inside of said carcass layer, and a rubber tread portion (3) bonded to an outer periphery of said carcass layer, wherein each of said cord belts includes first cords made of aromatic polyamide fibers and second cords comprising at least one of cotton, silk, polyester, and aliphatic polyamide fibers, said first cords (9) being superior in durability and impact resistance relative to said second cords, said second cords (10) being superior in adhesion with rubber relative to said first cords, said first and second cords being individually alternately arranged and being in a bias form.

4,852,626

BEAD REINFORCEMENT FOR PNEUMATIC RADIAL TIRE FOR HEAVY-DUTY ROAD VEHICLE

Tetsuhito Tsukagoshi, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 100,060
Claims priority, application Japan, Sep. 30, 1986, 61-230118
Int. Cl.[4] B60C *15/06*
U.S. Cl. 152—541 **7 Claims**



1. A pneumatic radial tire for a heavy-duty road vehicle, said tire comprising; a pair of bead cores, a rubber stock positioned above each bead core and a carcass composed of radially arranged metallic cords and an inner carcass portion extending between one of the bead core and another bead core and said carcass having turn-up portions each extending radially inwardly from the tire inner side to the tire outer side around

each bead core so as to wrap up each bead core and the rubber stock;

a first reinforcing layer composed of metallic cords intersecting the carcass cords at an angle and arranged between each rubber stock and the inner carcass portion, a radially inward end thereof being located near an inner end of the bead core and not wrapping around said bead core and a radially outward end thereof being located within a range of 0.3 to 0.7H where H denotes a radial distance between a bead base line and a maximum tire width position; and

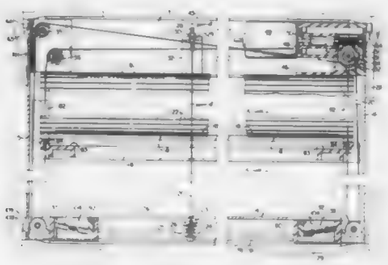
a second reinforcing layer composed of metallic cords intersecting the metallic cords of said first reinforcing layer and the carcass at two different angles and arranged in cooperation with said first reinforcing layer so as to sandwich the inner carcass portion therebetween such that said first and second reinforcing layers are overlapped with each other extending within a range corresponding to at least 25% of a peripheral length L of said first reinforcing layer beginning from a radially outward end of said second reinforcing layer located at least 0.05H inward from a radially outward end of said first reinforcing layer and an inward end of said second reinforcing layer not wrapping around said bead core; where L is measured along said first reinforcing layer and H is the radial height from a rim to the tire maximum width position.

4,852,627

CLOSED LOOP CONTROL SYSTEM FOR SHADE ASSEMBLY

James E. Peterson, Denver, and Robert W. Collett, Arvada, both of Colo., assignors to Daylighting, Inc., Denver, Colo.

Filed Apr. 13, 1987, Ser. No. 37,716
Int. Cl.[4] E06B *3/94*
U.S. Cl. 160—84.1 28 Claims



1. In an adjustable shade assembly of the accordion or cell type wherein a generally rectangular frame is installed in outer surrounding relation to an opening in a building structure, there being a stationary rail disposed along one end of said frame, a movable rail in parallel to said stationary rail and movable toward and away from an opposite end of said frame with a shade member having opposite ends, each of which is attached to a respective one of said rails for expansion and contraction in response to advancement of said movable rail toward and away from said opposite end of said frame, the improvement comprising:

guide members at four corners of said frame, said shade member also having opposite sides extending between said rails including a rotatable drive pulley at one corner of said frame adjacent to one end of said stationary rail, and means resiliently mounting the guide members at said opposite end of said frame;

a cord trained over said guide members including said drive pulley, said cord including generally U-shaped loop sections extending along said opposite sides of said shade member, each said loop section extending under a respective one of said guide members at said opposite end of said frame and secured to opposite ends of said movable rail such that rotation of said drive pulley imparts movement to said cord in a direction advancing the opposite ends of said rail in the same direction, said resilient mounting means maintaining a substantially constant tension on said cord when said movable rail is advanced by said cord toward and away from the opposite end of said frame; and

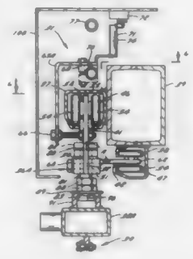
drive means engaging and reversibly rotating said drive pulley at said one corner of said frame thereby advancing said shade member and said movable rail across the opening.

4,852,628

SUSPENSION SYSTEM FOR FOLDING DOOR

Arno Klein, Hirz-Maulsbach, Fed. Rep. of Germany, assignor to Labex GmbH, Bundesrepublic, Fed. Rep. of Germany

Filed Apr. 27, 1987, Ser. No. 43,087
Int. Cl.[4] E05D *15/26*
U.S. Cl. 160—199 18 Claims



1. A suspension system for a folding door, comprising:

a first elongated generally horizontal guide track having a generally horizontal guide surface;

a support carriage disposed for movement along said first guide track;

a hinge pivotally supported on said carriage and a rack for supporting a suspended door panel connected by said hinge to said carriage, said rack being configured to pivot about said hinge in a substantially horizontal plane;

a second elongated guide track, having first and second opposing guide surfaces, disposed parallel to said first guide track in a position horizontally and vertically offset therefrom;

wherein said support carriage includes a first traveling support device for traveling engagement with said generally horizontal guide surface, and a second traveling support device disposed in interlocking relationship with said second guide rack proximate said first and second guide surfaces, for effecting simultaneous movement of said carriage along both of said guide tracks.

4,852,629

COLD-BOX PROCESS FOR FORMING FOUNDRY SHAPES WHICH UTILIZES CERTAIN CARBOXYLIC ACIDS AS BENCH LIFE EXTENDERS

Robert B. Fechter, and John J. Gardikes, both of Worthington, Ohio, assignors to Ashland Oil, Inc., Russell, Ky.

Division of Ser. No. 899,696, Aug. 25, 1986, Pat. No. 4,760,101.
This application May 16, 1988, Ser. No. 195,562
Int. Cl.[4] B22C *9/00*
U.S. Cl. 164—16 10 Claims

1. A cold-box process for the fabrication of foundry shape which comprises:

(a) mixing a foundry aggregate with a bonding amount of up to about 10% by weight, based upon the weight of the aggregate, of a binder composition comprising in admixture

(1) a resole phenolic resin component;

(2) a polyisocyanate hardener component; and

(3) an effective bench life extending amount of a carboxylic acid having at least one carboxyl group which is bonded to another carboxyl group, or is bonded to a carbon atom which is bonded to a hydroxyl group or a tertiary amino group;

(b) introducing the foundary mix obtained from step (a) into a pattern;

(c) hardening the foundry mix in the pattern with a gaseous tertiary amine to become self-supporting; and

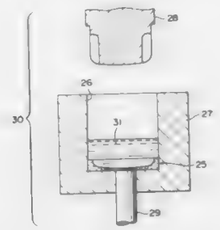
(d) thereafter removing the shaped foundry mix of step (c) from the pattern.

4,852,630

SHORT FIBER PREFORM, METHOD OF MAKING IT, AND COMPOSITE MATERIAL MANUFACTURED FROM IT

Kaneo Hamajima; Atsuo Tanaka; Masahiro Kubo, and Tadashi Dohnomoto, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 723,757, Apr. 16, 1985, abandoned.
This application Feb. 17, 1987, Ser. No. 16,499
Claims priority, application Japan, Jan. 17, 1985, 60-6576
Int. Cl.[4] B22D *19/00, 25/00;* B29C *43/02*
U.S. Cl. 164—761 13 Claims



1. A method for making a composite material wherein a matrix material selected from the group consisting of magnesium alloy and aluminum alloy is reinforced by fibers embedded therein, and wherein said method comprises:

a) preparing a mass of a mixture of fibers selected from the group consisting of alumina, carbon, potassium titanate, alumina-silica and silicon carbide fibers and an inorganic binder of silica or alumina, said binder being in such a partially dried condition that said mass is uniformly deformable under compression;

b) compressing a portion of said mass with said binder being in said partially dried condition so as to increase the density of said fibers in said portion from that in the remainder of said mass, and wherein for said compression, a first portion of the moist mass is substantially compressed, a second portion of the moist mass is compressed to a relatively low extent, and a third portion, joining between said first portion and said second portion, is compressed by an amount which changes substantially continuously from the portion adjoining to said first portion to the portion adjoining to said second portion;

c) drying said mass to harden said binder;

d) infiltrating under pressure a molten alloy selected for said matrix into interstices of said mass to fill said interstices while substantially maintaining a fiber work structure of said mass under the binding force of said binder; and

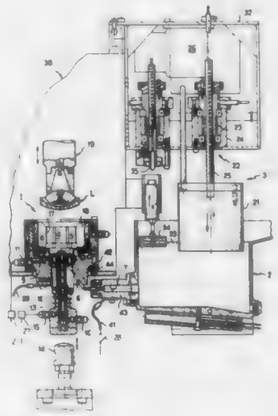
e) solidifying said molten alloy with said fiber work structure of said mass being embedded in the matrix of said alloy.

4,852,631

METHOD AND APPARATUS FOR FIXING A METAL BLOCK ON A FACE OF AN OPHTHALMIC LENS, BY CASTING MOLTEN METAL THEREON

Patrick Herbin, Morlaincourt, and Jean-Claude Lacroix, Ligny-en-Barrois, both of France, assignors to Essilor International (Compagnie Generale d'Optique), Creteil, France

Filed Mar. 25, 1988, Ser. No. 173,292
Claims priority, application France, Mar. 30, 1987, 87 04376
Int. Cl.[4] B22D *19/04, 35/00*
U.S. Cl. 164—98 1 Claim



1. A metehod of fixing a metal block on a face of an ophthalmic lens, said method comprising the steps of:

(a) providing a mold which, together with the lens itself, defines a mold cavity, said mold having a mold inlet orifice;

(b) providing a tank containing molten low melting point metal, said tank being connected to said mold inlet orifice via a pipe;

(c) admitting molten metal into said mold cavity via said mold inlet orifice and said pipe;

(d) cooling said mold in order to solidify the molten metal admitted into said mold cavity;

(e) cooling at least a portion of said pipe when said mold is cooled in order to form a plug of solidified metal in said portion of said pipe;

(f) separating the block of solidified metal in said mold cavity from the plug of metal solidified in said pipe by forcibly ejecting the block of solidified metal together with the lens attached thereto from said mold cavity while leaving the plug of metal solidified in said pipe; and

(g) refilling said mold cavity by heating at least said portion of said pipe in order to melt the plug of metal solidified in said pipe.

4,852,632

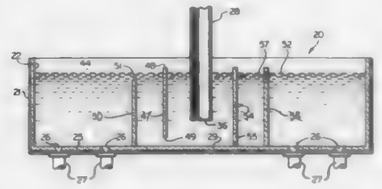
APPARATUS FOR PREVENTING UNDISSOLVED ALLOYING INGREDIENT FROM ENTERING CONTINUOUS CASTING MOLD

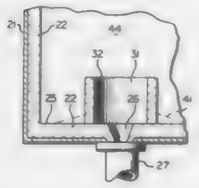
Charles R. Jackson, Dyer, Ind.; Daniel Rellis, Jr., Lansing, Ill.; Howard M. Pielet, Munster, Ind.; Debanshu Bhattacharya, Richton Park, Ill.; Larry A. Frank, Crown Point, Ind.; Purnendu Dasgupta, Highland, Ind., and John R. Knoepke, Munster, Ind., assignors to Inland Steel Co., Chicago, Ill.

Continuation of Ser. No. 134,051, Dec. 17, 1987, abandoned, which is a division of Ser. No. 88,526, Aug. 21, 1987, Pat. No. 4,754,800, which is a continuation of Ser. No. 808,570, Dec. 13, 1985, abandoned. This application Oct. 17, 1988, Ser. No. 259,503

Int. Cl.[4] B22D *11/10*

U.S. Cl. 164—437 19 Claims





1. A tundish for use in producing a continuously cast steel shape from molten steel containing an undissolved, molten alloying ingredient having a density greater than said molten steel, said tundish comprising:

a tundish bottom;

tundish walls, including opposed tundish sidewalls, extending upwardly from the periphery of said bottom;

an outlet opening at said bottom, said outlet opening having a top and comprising means for forming a descending stream of molten metal;

means for receiving molten metal within said tundish at an entry location spaced linearly along the tundish bottom from said outlet opening;

and structure for preventing large globules of undissolved, molten alloying ingredient from being carried into said descending stream, said structure comprising at least of the following expedients (a)–(d);

(a) a raised outlet opening top located above at least that part of the tundish bottom surrounding and adjacent said outlet opening;

and a tundish bottom portion sloping upwardly to the top of said outlet opening on opposite upstream sides of said opening;

there being no seam, having a vertical component, in the locations on the tundish bottom portion surrounding and adjacent said outlet opening at which undissolved, molten alloying ingredient accumulates;

(b) a refractory dam surrounding said outlet opening, located between said entry location and said outlet opening and extending upwardly from the tundish bottom;

and a tunish bottom portion sloping upwardly to said surrounding dam, around the outer side of the dam, said upwardly sloping bottom portion comprising means for preventing said undissolved, molten alloying ingredient from accumulating around the outer side of said dam throughout a continuous casting operation;

(c) a sump at the bottom of said tundish, said sump being located between said entry location and said outlet opening and lying across the path of molten metal flowing from said entry location to said outlet opening;

said tundish bottom having a part which is located upstream of said sump and a part which is located downstream of said sump;

said sump having a floor which is lower than the top of said outlet opening and lower than the tundish bottom parts located upstream and downstream of the sump;

said entry location being at the tunish bottom part which is upstream of the sump;

said outlet opening being located on the tundish bottom part which is downstream of the sump;

said entry location and the bottom part which contains said entry location being physically separated, by the sump, from the bottom part which contains said outlet opening, whereby said molten metal flowing from said entry location to said outlet opening flows along a path crossing said sump;

said sump comprising means for collecting undissolved, molten alloying ingredient as a result of the difference in density between said molten alloying ingredient and said molten steel; and

(d) an elongated refractory dam interposed between said entry location and said outlet opening, said elongated dam extending, from on tundish sidewall to the other sidewall, upwardly from the tundish bottom above the level of the outlet opening, said dam being devoid of flow passageways to a height greater than the thickness of the layer of undissolved alloying ingredient normally allowed to accumulate on the tundish bottom;

said dam resting atop said tundish bottom;

a tundish bottom portion on the upstream side of said dam and a tundish bottom portion on the downstream side of the dam;

said tundish bottom portion on the upstream side of said dam sloping upwardly to said dam to a height above the tundish bottom portion on the downstream side of the dam;

said upwardly sloping bottom portion comprising means for preventing said undissolved, molten alloying ingredient from accumulating at the upstream side of said dam;

each of said expedients (a)–(d) comprising means operable throughout a continuous casting operation, for restraining undissolved, molten alloying ingredient from entering said outlet opening and for causing said undissolved, molten alloying ingredient to accumulated on tundish bottom at a location spaced from the outlet opening while allowing dissolved, molten alloying ingredient of the dam composition to enter the outlet opening;

each of said expedients (a), (b) and (d) comprising means for preventing molten metal in said tundish from following a continuous descending or horizontal path across the tundish bottom downstream from said entry location to the top of said outlet opening;

expedient (a) comprising means for accumulating said undissolved, molten alloying ingredient on the tundish bottom at locations spaced from the outlet opening, on opposite upstream sides of said opening;

expedient (b) comprising means for accumulating said undissolved, molten alloying ingredient on the tundish bottom at locations spaced from the outer side of the surrounding dam, all around the dam;

and expedient (d) comprising means for accumulating undissolved, molten alloying ingredient on the tundish bottom at a location spaced from the outlet opening and from the elongated dam on the upstream side of the dam.

4,852,633

IMMERSION NOZZLE FOR CONTINUOUS CASTING OF STEEL

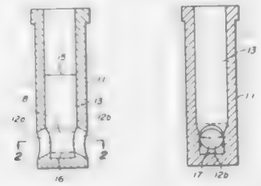
Toshio Teshima; Tooru Kitagawa; Mikio Suzuki; Toshio Masuoka; Takashi Mori, and Kazutaka Okimoto, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed May 26, 1988, Ser. No. 199,113

Claims priority, application Japan, Jun. 1, 1987, 62-134940

Int. Cl.[4] B22D *11/10*

U.S. Cl. 164—437 4 Claims



1. An immersion nozzle for continuous casting of steel, comprising:

an immersion nozzle body for introducing molten steel supplied from a tundish into a continuous casting mold;

said immersion nozzle body having two exit ports located symmetrically about a vertical center axis of said immersion nozzle body at a lower portion thereof, said immersion nozzle body being immersed in the molten steel of the mold and the two exit ports introducing the molten steel into the mold;

said immersion nozzle body having a bore which includes a first and a second sectional area of the two exit ports, the first sectional area being smaller than the second sectional area, the first sectional area being at a lower end level of said two exit ports and the second sectional area being at an upper end level of said two exit ports, and the molten steel passing through said bore and out through said two exit ports; and

said bore having, at the level of said two exit ports, an inner diameter which is substantially equal to a horizontal inner length of said two exit ports.

4,852,634

GAS VENTING ARRANGEMENT IN INJECTION MOLDING APPARATUS AND METHOD FOR VENTING GAS IN THE INJECTION MOLDING APPARATUS

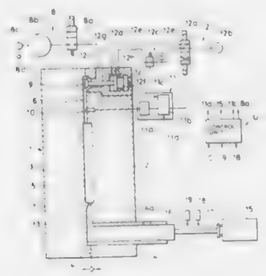
Kazuaki Kawai; Hitoshi Ishida, and Noriyoshi Yamauchi, all of Fuchu, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Dec. 3, 1987, Ser. No. 128,185

Claims priority, application Japan, Oct. 12, 1987, 62-156616; Oct. 12, 1987, 62-156615[U]; Oct. 20, 1987, 62-265797[U]

Int. Cl.[4] B22D *17/00*

U.S. Cl. 164—457 8 Claims



1. A gas venting arrangement in a high speed injection molding apparatus which includes a casting sleeve and mold halves defining a mold cavity therebetween, an injected molten metal which is electrically conductive being fed through said casting sleeve and molded within said mold cavity, said gas venting arrangement comprising;

a gas vent passage formed in said mold halves, said gas vent passage in fluid communication with said mold cavity and positioned downstream thereto;

a gas vent control valve disposed at a downstream end portion of said gas vent passage;

a detection member disposed in said gas vent passage, the detection member comprising a means for detecting said injected molten metal in said gas vent passage and generating a detection signal indicative thereof;

a valve driving mechanism operably connected to said gas vent control valve for selectively driving said gas vent control valve to a first position in which said gas vent control valve is closed and a second position in which said gas vent control valve is open, said valve driving mechanism comprising an electromagnetic change-over valve;

a pneumatic piston/cylinder drive means connected to said gas vent control valve and operable in response to said change-over operation of said electromagnetic valve for moving said gas vent control valve;

a vacuum sucking device connected to said gas vent passage and positioned downstream of said gas vent control valve for positively discharging gas from said mold cavity during injection of said molten metal;

a control means having an electronic circuit means connected between said detection member and said electromagnetic change-over valve, said electromagnetic change-over valve providing change-over operation for selectively actuating said gas vent control valve to said first position in response to said detection signal,

said electronic circuit means comprising a flip-flop circuit which provides instantaneous operation of said electromagnetic change-over valve upon detection of a leading edge of a detection signal instantaneously generated by the detection of injected molten metal by said detection member.

6. A method for venting gas in an injection molding apparatus which includes a casting sleeve and mold halves defining a mold cavity therebetween, an injected material being fed through said casting sleeve and molded within said mold cavity, said gas venting method comprising the steps of:

detecting said injected material by a detection member provided in a gas vent passage downstream of said mold cavity;

sending to a flip-flop circuit of an electric control means a first detection signal indicative of detection of said injected material by said detection member;

outputting an instruction signal from said flip-flop circuit of said electric control means to a valve driving mechanism in response to said first detection signal;

operating said valve driving mechanism in response to said instruction signal to close a gas vent control valve provided in said gas vent passage.

4,852,635

METHOD OF ELECTROMAGNETIC STIRRING IN CONTINUOUS METAL CASTING PROCESS

Toshiyasu Onishi; Kenzo Ayata, both of Kobe; Hiroshi Takagi; Yasuo Suzuki, both of Hyogo; Yasuhiko Ohta, Kobe; Takao Shiozawa; Koichi Fujiwara, both of Hyogo, and Masakazu Itashiki, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation of Ser. No. 438,653, Nov. 2, 1982, abandoned. This application Nov. 8, 1984, Ser. No. 669,722

Claims priority, application Japan, Nov. 6, 1981, 56-178803

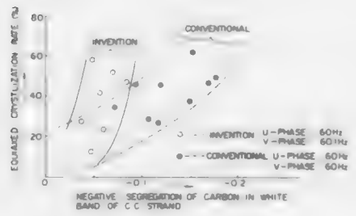
Int. Cl.[4] B22D *11/10*

U.S. Cl. 164—468 4 Claims

1. A method of electromagnetically stirring molten metal in an unsolidified portion of a continuously cast strand by a mag-

netic field formed by applying alternating current to at least one group of exciting coils comprising at least two exciting coils, wherein said method comprises:

supplying to one of said exciting coils in each group a first alternating current of a frequency in the range of 1–60 Hz



and to the other one of said exciting coils in each group a second alternating current with a frequency different in the range of 0.03–0.25 Hz from said first alternating current to form a varying composite magnetic field thereby to induce stirred movement of varying direction and intensity in said molten metal.

4,852,636

PROCESS FOR PREPARING FOUNDRY SHAPES AND CASTINGS UTILIZING CERTAIN POLYURETHANE BINDERS

Colleen M. Henry, Dublin, Ohio, assignor to Ashland Oil, Inc., Russell, Ky.

Division of Ser. No. 144,845, Jan. 15, 1988, Pat. No. 4,814,363. This application Feb. 8, 1989, Ser. No. 307,797

Int. Cl.[4] B22C *9/00*

U.S. Cl. 164—527 **8 Claims**

1. A process for preparing a foundry shape comprising:

a. mixing a foundry aggregate with a bonding amount of up to about 10% by weight, based upon the weight of the aggregate, of a binder composition comprising:

(1) a phenolic resin; and

(2) a solvent composition comprising:

a. propylene glycol mono methyl ether acetate and;

b. an aromatic hydrocarbon solvent wherein the weight ration of (a) to (b) is from 45:55 to 55:45, and the weight ratio of (i) to (ii) is from 1:2 to 2:1; and

(3) a polyisocyanate composition;

b. introducing the foundry mix obtained from step (a) into a pattern;

c. hardening the foundry mix in the pattern to become self-supporting; and

d. thereafter removing the shaped foundry mix of step (c) from the pattern and allowing it to further cure, thereby obtaining a hard, solid, cured foundry shape.

4,852,637

THERMOSTATIC CONTROLLED SYSTEM

Gordon R. Grubert, Westfield, Mass., and Douglas L. Christians, Vernon, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 2, 1988, Ser. No. 201,231

Int. Cl.[4] B60H *1/00*

U.S. Cl. 165—40 **24 Claims**

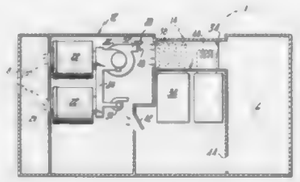
1. An environmental control system for supplying conditioned, filtered and pressurized air to an enclosed environment at a given temperature, the system comprising:

a constant speed blower for pressurizing and supplying the air, said blower having an air outlet,

a cooling means for lowering the temperature of the air passing from said air outlet to said environment,

a heating means for raising the temperature of the air passing from said air outlet to said environment, and

a thermostatic control valve mounted upon said air outlet, said valve opening a minimum degree to limit the amount of air supplied from said blower to said environment when the temperature of ambient air falls below a maximum parameter, said valve opening a maximum degree when the temperature of the ambient air exceeds a maximum parameter, and said valve opening in a roughly linear degree between said lower parameter and said upper



parameter, such that the system is able to heat said air passing from said air outlet to said environment to said given temperature when said temperature of said ambient air is below said minimum parameter and the system is able to cool the air passing from said air outlet to said environment to said given temperature when said temperature of said ambient air is above said maximum parameter.

4,852,638

AIR CONDITIONING AND HEATING UNIT FOR AUTOMOTIVE VEHICLES

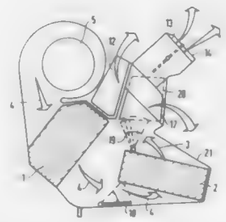
Reinhard Hildebrand, and Friedrich Riedel, both of Redwitz, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 12, 1986, Ser. No. 896,126

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1985, 3529940

Int. Cl.[4] B60H *1/02*

U.S. Cl. 165—42 **1 Claim**



1. An air conditioning and heating unit for an automotive vehicle, comprising:

a housing of synthetic resin material;

a blower disposed in said housing;

an evaporator disposed in said housing and communicating with said blower;

a heat exchanger disposed in said housing and communicating with said blower;

a mixing chamber having a common inlet opening for receiving hot air and cold air and a plurality of inlet openings for individual air discharge nipples for defroster level, outside level, center level and foot room level of a passenger compartment in the vehicle;

a first air mixing flap at an inlet to the heat exchanger;

a second air mixing flap, associated with said common inlet opening and coupled to said first air mixing flap, controlling the inflow of cold air and hot air into said mixing chamber;

wherein said heat exchanger is disposed substantially transverse to said evaporator;

wherein said mixing chamber is disposed above a region between said evaporator and said heat exchanger;

wherein a discharge opening to a center level nozzle is arranged between two discharge openings to two defroster nozzles; and

wherein said second air mixing flap is subdivided into three flap sections, of which a center section is arranged radially displaced with respect to two outside sections.

4,852,639

AIR CONDITIONING SYSTEM FOR VEHICLE

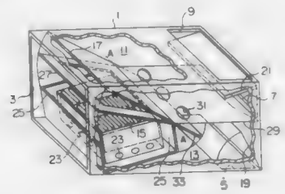
Hyosei Horiguchi; Akira Tezuka, both of Katsuta, and Shunichi Seki, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 181,067

Claims priority, application Japan, Apr. 13, 1987, 62-88829

Int. Cl.[4] B60H *3/06*

U.S. Cl. 165—42 **20 Claims**



1. An air conditioning system for a vehicle, comprising:

a duct case provided with an inlet and discharge opening means, said duct case having defined therewithin a cold-air passageway and a hot-air passageway which extend from said inlet toward said discharge opening means;

heater means arranged within said hot-air passageway for heating air flowing through said hot-air passageway from said inlet toward said discharge opening means of said duct case;

air-mixing damper means arranged for angular movement within said duct case at a location upstream of said heater means, for adjusting flow rate of air passing through said cold-air passageway and flow rate of air passing through said hot-air passageway;

mode switching damper means arranged in association with said discharge opening means provided in said duct case, for switching blowing modes; and

air mixing means including a plurality of cold-air blowing openings which open to said hot-air passageway at a location downstream of and adjacent to said heater means, and cold-air bypass passage means for leading cold air around said heater means to said cold-air blowing openings, wherein the cold air led by said cold-air bypass passage means is blown from said cold-air blowing openings into flow of hot air having passed through said heater means in such a fashion that flow of the cold air from said cold-air blowing openings is intersected with the hot-air flow, thereby forcibly mixing the cold air and the hot air with each other.

4,852,640

RECUPERATIVE HEAT EXCHANGER

Bruce A. McKenna, Toledo, Ohio, assignor to Exothermics-Eclipse Inc., Toledo, Ohio

Filed Mar. 28, 1986, Ser. No. 845,608

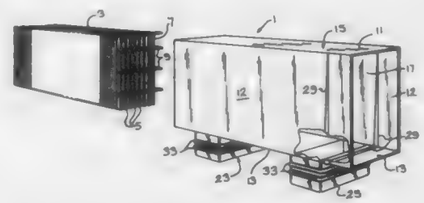
Int. Cl.[4] F24H *3/10*; F28F *3/00*

U.S. Cl. 165—47 **27 Claims**

1. A recuperative heat exchanger comprising:

a heat exchanger core composed of a plurality of spaced apart plate members, said plate members being positioned in adjacent substantially parallel relationship a first plurality of passageways and a second plurality of passageways extending between said spaced apart plate members, said first plurality of passageways being separate from said second plurality of passageways, said first plurality of passageways in said core being disposed for receiving high temperature exhaust gases, said second plurality of passageways in said core being disposed for receiving supply air;

a case member having a top, two substantially parallel sides and a bottom positioned around said heat exchanger core, said case having an exhaust gas inlet opening and an exhaust gas discharge opening, said exhaust gas inlet opening and said exhaust gas discharge opening being in communication with said first plurality of passageways, said high temperature exhaust gases moving through said first plurality of passageways in said plates from said exhaust gas inlet opening to said exhaust gas discharge opening, said case member having a supply air inlet opening and a supply air discharge opening, said supply air inlet opening and supply air discharge opening being in communication with said second plurality of passageways, said supply air inlet and discharge openings being disposed to direct



supply air through said second plurality of passageways in said core, said plates of said core being secured to said case at least at said exhaust gas inlet and discharge openings;

a jacket having a top, two substantially parallel sides and a bottom positioned in spaced apart relationship around said case member, said jacket having an intake opening and an exhaust opening, said intake opening in said jacket being in alignment with said exhaust gas inlet opening in said case member and said exhaust opening in said jacket being in alignment with said exhaust gas discharge opening in said case member, said supply air inlet and discharge openings passing through said jacket, said case member being rigidly secured to said jacket only at said end of said case where said exhaust gas discharge opening is located, said core and said case member being capable of expansion and contraction relative to said jacket during operation of said recuperative heat exchanger, whereby said core and said case member can expand and contract at a rate different than said jacket and said core and said case member can move relative to said jacket during such expansion and contraction to allow said heat exchanger to be used in high temperature applications.

4,852,641

PLASMA BAG SUPPORT RACK

Bradley T. Noble, 110 S. Helberta Ave., Redondo Beach, Calif. 90277

Filed Feb. 29, 1988, Ser. No. 161,720

Int. Cl.[4] F28F *7/00*

U.S. Cl. 165—80.1 **12 Claims**

1. A plasma bag support rack particularly configured for suspending within a conventional water bath frozen plasma bags of the type having at least two support holes at the top of the plasma bag, said support rack comprising in combination :

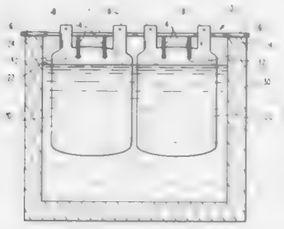
a. a support rack having a cross member that extends the width of and rests on the top edge of a water bath ; and

b. spaced apart and vertically oriented pairs of hooks that

project downward from the cross member as a suspending means for frozen plasma bags ; and

c. rubber coated cross member ends to prevent slippage of the rack.

7. A method for suspending frozen plasma bags in a water bath having an upper edge, said method comprising the steps of:



a. suspending the frozen plasma bags from the support rack ; and

b. locating the rack suspending the plasma bags on the top edge of a water bath ; and

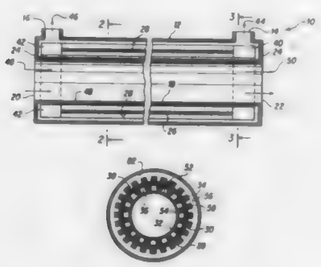
c. supporting the entry ports of the plasma bags during thawing to prevent their contact with the contaminated water.

4,852,642

HEAT EXCHANGE DEVICE

Yong N. Lee, 1010 W. Lonnquist Blvd., Mt. Prospect, Ill. 60056

Filed Nov. 6, 1987, Ser. No. 118,209
Int. Cl.[4] F28F *13/12*
U.S. Cl. 165—109.1 18 Claims



1. An improved heat exchange device comprising outer stationary cylindrical means having inlet and outlet means,

inner stationary cylindrical means having an inlet end portion and an outlet end portion;

said outer and said inner stationary cylindrical means defining a longitudinal annulus therebetween;

rotatable, cylindrical means floatably disposed within said annulus between said outer and said inner stationary cylindrical means and being free to rotate therein;

said rotatably cylindrical means having formed thereon a plurality of projections that define a plurality of grooves;

viscous fluid means adaptable for movement through said longitudinal annulus over and about said rotatable, cylindrical means;

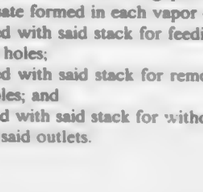
said rotatable cylindrical means when moving angularly within said annulus between said outer and said inner stationary cylindrical means being effective to cause vortical motion circulation to said fluid means within said annulus between an inner circumferential surface of said outer stationary cylindrical means and an outer circumferential surface of said inner stationary cylindrical means so as to greatly increase the heat transfer coefficient therebetween.

4,852,643

VACUUM CONDENSOR WITH CONDENSATE CATCH

Mihail V. Mihailov, Sofia, Bulgaria, assignor to Kombinat "Korabostroene", Varna, Bulgaria

Division of Ser. No. 935,858, Nov. 26, 1986, Pat. No. 4,726,418.
This application Feb. 12, 1988, Ser. No. 155,304
Int. Cl.[4] F28B *9/10*
U.S. Cl. 165—113 2 Claims



1. A vacuum condenser, comprising:

a generally horizontal housing formed with a pair of horizontally spaced bottoms at opposite ends of the housing and with a vapor inlet between said ends;

a condenser-plate stack mounted on one of said bottoms and comprising:

a multiplicity of identical generally rectangular vertical plates defining between them alternating water and vapor compartments, each of said plates having a lower hole, an upper hole, and a condensate outlet located proximal to a bottom edge of the plate, all of said upper holes being horizontally aligned, all of said lower holes being horizontally aligned, and all of said outlets being horizontally aligned,

first gaskets mounted on the plates defining said vapor compartments along vertical edges and a bottom edge thereof, and around the said holes thereof to bound said vapor compartments along vertical sides and bottoms thereof and isolate said holes from said vapor compartments;

second gaskets mounted all around edges of said plates bounding said water compartments;

third gaskets mounted on said plates defining said water compartments and surrounding said outlets in said water compartments , and

means mounted to said plates defining said vapor compartments and forming a barrier gate overlying said outlets in said vapor compartments and extending downwardly to terminate above a respective bottom of a respective vapor compartment to form a gap therewith traversed by condensate formed in each vapor compartment;

means connected with said stack for feeding cooling water to said lower holes;

means connected with said stack for removing water from said upper holes; and

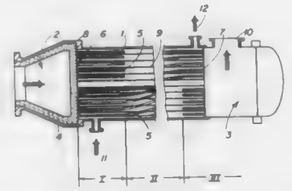
means connected with said stack for withdrawing said condensate from said outlets.

4,852,644

TUBULAR HEAT EXCHANGER

Alfred Schlemenat, Dornchen, and Helmut David, Oberhausen, both of Fed. Rep. of Germany, assignors to Man Gutehoffnungshuette GmbH, Fed. Rep. of Germany

Filed Nov. 30, 1987, Ser. No. 126,748
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 3640970
Int. Cl.[4] F28F *9/02*
U.S. Cl. 165—158 2 Claims



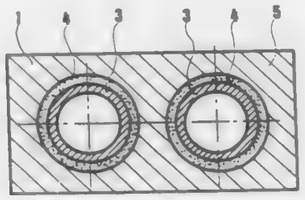
1. A heat exchanger for operation at high gas temperatures and high jacket pressures and especially a cracked gas cooler, comprising a jacket defining an inlet chamber, a tube chamber and an outlet chamber in succession, a tube sheet arranged at an end of said inlet chamber and said outlet chamber respectively, a plurality of tie rods extending between and bracing said tube sheets, and hollow tubular heat exchanger tubes having ends seated in the respective tube sheets, said tubes including straight tubular portions adjacent each tube sheet and an intermediate tubular portion of helical form, said tubes and said tie rods being arranged at a plurality of concentric rows which are graduated so as to provide an increased number of tubes in each successive row proceeding outwardly, said tube sheets being made thin corresponding to requirements for jacket cooling and having a ductility of a protective magnetite layer, said tie rods being arranged in rows alternately with said tubes, said intermediate portion of said tubes being bent away from the longitudinal axis of each tube in a helical form, said straight portion of said tubes adjacent said inlet chamber being greater than the straight portion of said tubes adjacent said outlet tube sheet.

4,852,645

THERMAL TRANSFER LAYER

Michel Coulon, Le Plessis Bouchard; Robert Faron, Courbevoie, and Daniel Besson, Lyon, all of France, assignors to Le Carbone Lorraine; Uranium Pechiney and Navatome, all of Courbevoie, France

PCT No. PCT/FR87/00220, § 371 Date Feb. 12, 1988, § 102(e) Date Feb. 12, 1988, PCT Pub. No. WO87/07695, PCT Pub. Date Dec. 17, 1987
PCT Filed Jun. 15, 1987, Ser. No. 163,115
Claims priority, application France, Jun. 16, 1986, 86 08981; Jan. 23, 1987, 87 01213
Int. Cl.[4] F28F *21/00*
U.S. Cl. 165—180 13 Claims



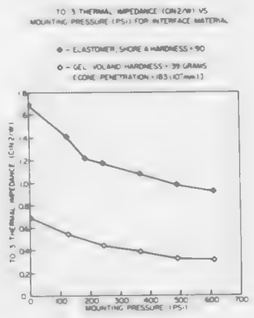
1. In a structure subjected to an intense continuous, intermittent or pulsating heat flux, a cooling means comprising fluids circulation tubes placed in passages in said structure, each of said tubes being surrounded by a layer of a heat conducting flexible carbonaceous material compressed between said tube and said structure, the heat transfer coefficient between said tube and said structure being at least $10^4 Wm^{-2}K^{-1}$.

4,852,646

THERMALLY CONDUCTIVE GEL MATERIALS

Catherine A. Dittmer, Half Moon Bay, and Robert S. Dubrow, Redwood City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 16, 1987, Ser. No. 63,552
Int. Cl.[4] H01L *23/40*
U.S. Cl. 165—185 26 Claims



1. An assembly comprising:

a first substrate and a second substrate;

said first substrate being maintained by resistive heating at a higher temperature than said second substrate;

said first substrate comprising an electrical component; and,

placed between and in heat transferring contact with said first and second substrates an article comprising a flexible carrier supporting a thermally conductive cured composition comprising:

(a) a gel material having a cone penetration value of about 50 to 350 (10^{-1} mm) and an ultimate elongation of at least about 50%; and

(b) dispersed in said gel material a particulate filler having a thermal conductivity of at least about 10 watts/m-°K.; wherein the filler is present in an amount between 5% and about 70% by weight of the composition;

whereby heat is conducted from said first substrate to said second substrate.

4,852,647

WIRE LINE HOLD DOWN DEVICE

Henry H. Mohaupt, 1151 Estrella Dr., Santa Barbara, Calif. 93110

Continuation-in-part of Ser. No. 777,360, Sep. 18, 1985, Pat. No. 4,823,876. This application Sep. 19, 1988, Ser. No. 245,527
Int. Cl.[4] E21B *43/263, 23/04*
U.S. Cl. 166—63 6 Claims

1. Apparatus for fracturing a subterranean formation penetrated by a casing string, comprising

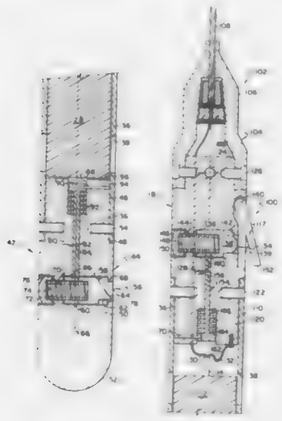
a carrier having means for connecting to a wire line, a propellant supported by the carrier for generating a large quantity of high pressure gaseous combustion products and an ignitor for initiating combustion of the propellant in response to an electric signal delivered down the wire line; and

means for retarding upward movement of the carrier after the onset of combustion of the propellant including

an element on the carrier movable from a first retracted position out of engagement with the casing string to a

second extended position for engagement with the casing string;

means maintaining the element in the first position and then releasing the element for movement toward the second position in response to a pressure buildup adjacent the carrier comprising a frame providing a cylindrical passage therein exposed to the pressure buildup adjacent the carrier, a piston in the passage movable



from a first position corresponding to the first position of the element and a second position releasing the element, a shear pin holding the piston in a first position and means interconnecting the piston and the element for holding the element in the first position until movement of the piston to the second position thereof; and

means moving the element toward the second position after the element is released for movement.

4,852,648

WELL INSTALLATION IN WHICH ELECTRICAL CURRENT IS SUPPLIED FOR A SOURCE AT THE WELLHEAD TO AN ELECTRICALLY RESPONSIVE DEVICE LOCATED A SUBSTANTIAL DISTANCE BELOW THE WELLHEAD

Neil H. Akkerman, and Daniel O. Dewey, both of Houston, Tex., assignors to AVA International Corporation, Houston, Tex.

Filed Dec. 4, 1987, Ser. No. 128,724
Int. Cl.[4] E21B *23/00, 34/06, 43/12, 41/00*
U.S. Cl. 166—66.4 **27 Claims**

1. A well installation, comprising

a wellhead including a casing head and a tubing head above the casing head,

casing extending downwardly from the casing head into the well bore,

tubing suspended from the tubing head and extending downwardly within the casing,

valve means including a closure member moveable within the tubing for opening and closing the tubing a substantial distance beneath the wellhead,

means urging the closure member toward closed position,

a latch which is movable to and maintained in a position holding the closure member in open position, in response to the supply of electrical current thereto, and which is permitted to move to a position releasing the closure member for movement to closed position in response to the loss of said supply,

a source of alternating or time varying current outside the wellhead, and

an electric connector including

a first annular coil mounted about a non-magnetic portion of the wellhead,

a second annular coil mounted on the tubing concentrically within and generally opposite the first coil,

a first conductor extending from the source of current outside the wellhead to the first coil to supply alternat-



ing or time varying current thereto in order to inductively couple the first and second coils, and

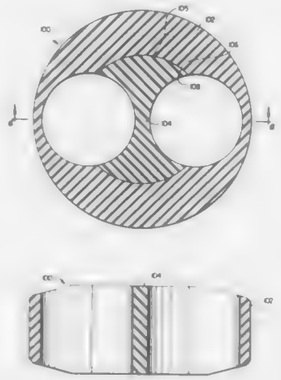
means for controlling movement of the latch including a second conductor extending from the second coil downwardly between the casing and tubing for supplying electrical current to the latch.

4,852,649

PACKER SEAL MEANS AND METHOD

Carter R. Young, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Sep. 20, 1988, Ser. No. 247,084
Int. Cl.[4] E21B *33/122*
U.S. Cl. 166—189 **30 Claims**



1. A seal element for use on a multiple packer for sealing between a plurality of mandrels, or similar rod-like members, and the inner wall of a well pipe, said seal element comprising:

body means of polymeric material having longitudinal holes therethrough for receiving said mandrels and capable of being distorted into sealing engagement with the inner wall of said well pipe by being expanded laterally in response to being compressed longitudinally, said seal element having a longitudinal axis parallel to said longitudinal holes, said seal element

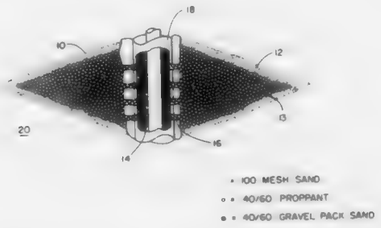
having means for facilitating such lateral distortion while minimizing the stresses created internally of said seal element by such lateral distortion.

4,852,650

HYDRAULIC FRACTURING WITH A REFRACTORY PROPPANT COMBINED WITH SALINITY CONTROL

Alfred R. Jennings, Jr., and Lawrence R. Stowe, both of Plano, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,173
Int. Cl.[4] E21B *47/00, 43/267*
U.S. Cl. 166—250 **21 Claims**



1. A method for controlling fines or sand in an unconsolidated or loosely consolidated formation, or reservoir which method additionally improves heat transfer comprising:

(a) placing at least one wellbore in said formation;

(b) hydraulically fracturing said formation via said wellbore via

a fracturing fluid which creates at least one fracture;

(c) placing a fused refractory proppant consisting essentially of silicon carbide or silicon nitride into said fracture which proppant gravel packs said fracture while providing for increased heat transfer into said formation;

(d) determining the critical salinity rate and the critical fluid flow velocity of the formation or reservoir surrounding the wellbore;

(e) injecting a saline solution into the formation or reservoir at a velocity exceeding the critical fluid flow velocity and at a saline concentration sufficient to cause the fines or clay particles to be transferred and fixed deep within the formation or reservoir without plugging the formation, fracture or wellbore; and

(f) producing via a thermal oil recovery method a hydrocarbonaceous fluid from the formation or reservoir at a velocity such that the critical flow velocity is not exceeded deep within the formation, fracture or wellbore.

4,852,651

POLYDIALKYLSILALKYLENE POLYMER USEFUL IN ENHANCED OIL RECOVERY USING CARBON DIOXIDE FLOODING

Bruce W. Davis, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 23, 1988, Ser. No. 275,248
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—268 **10 Claims**

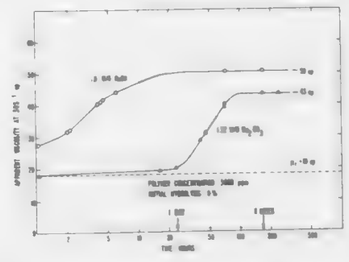
1. In a method for recovering oil from an underground oil-bearing earth formation penetrated by an injection well and a producing well, in which method carbon dioxide is injected into said formation to displace oil towards said producing well from which the oil is produced to the surface, the improvement comprising injecting into said formation carbon dioxide, the viscosity of which is increased at least three-fold by the presence of a sufficient amount of a polydialkylsilalkylene polymer.

4,852,652

CHEMICAL FLOODING WITH IMPROVED INJECTIVITY

Donald L. Kuehne, Orange, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 24, 1988, Ser. No. 197,929
Int. Cl.[4] F21B *43/22*
U.S. Cl. 166—270 **11 Claims**



1. A caustic waterflooding process for enhanced oil recovery from a production well comprising injecting an aqueous solution under pressure into an injection well to sweep oil to the production well, said aqueous solution comprising:

a. a caustic; and

b. a polymer that has an intrinsic viscosity that is at least twice as high in its hydrolyzed form than in its unhydrolyzed form, wherein said polymer is selected from the group consisting of a polyacrylamide homopolymer and a polymethylacrylamide homopolymer, wherein said polymer is injected with less than 15% of polymer being hydrolyzed;

wherein said polymer is hydrolyzed in situ by said caustic.

4,852,653

METHOD TO OBTAIN RAPID BUILD-UP OF PRESSURE IN A STEAM FOAM PROCESS

John K. Borchardt, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 6, 1988, Ser. No. 215,951
Int. Cl.[4] E21B *43/22, 43/24*
U.S. Cl. 166—272 **13 Claims**

8. In a steam foam process for recovering oil by injecting a fluid containing steam and a surfactant through a well and into a subterranean reservoir in which the formation of foam by the surfactant is inhibited by properties of the reservoir, the improvement which comprises:

initially injecting into the reservoir steam and a first surfactant, wherein the surfactant is selected from the group consisting of secondary alkane sulfonates;

forming a foam near the well that provides a rapid increase in injection pressure and mobility control at the well; and

subsequently injecting steam and a second surfactant.

10. A process for recovering oil from a subterranean reservoir penetrated by at least one well through use of a steam foam process comprising:

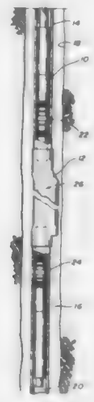
(a) injecting into the reservoir a first steam foam mixture containing steam and a rapidly foaming first surfactant selected from the group consisting of internal olefin sulfonates and vinylidene olefin sulfonates;

(b) forming a foam within the reservoir sufficient to substantially increase injection pressure at the well, wherein the foam is formed within a few hours of when the first steam foam mixture is injected into the reservoir;

(c) injecting into the reservoir a second steam foam mixture containing steam and a second steam foam surfactant after the injection pressure is increased, wherein the second surfactant is selected from the group consisting of alpha

olefin sulfonates, alkyltoluene sulfonates, alkyxylene sulfonates, and alpha olefin sulfonate dimers; and
(d) recovering oil from the reservoir.

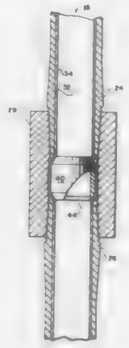
4,852,654
WIRELINE HYDRAULIC ISOLATION PACKER SYSTEM
Robert K. Buckner, Rowlett; Norman W. Read, Dallas, and Donald E. Ritchie, Houston, all of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.
Continuation of Ser. No. 10,059, Feb. 2, 1987, abandoned. This application May 13, 1988, Ser. No. 195,418
Int. Cl.[4] E21B *33/124*
U.S. Cl. 166—277 6 Claims



1. An apparatus for installing a tubing patch in a tubing string to seal against a leak of fluids between the interior of the tubing string and the tubing annulus, comprising:
an assembly insertable as a unit into the tubing string said unitary assembly defining a passage therethrough having an upper packer to form a seal against the interior of the tubing string above the leak and a lower packer to form a seal against the interior of the tubing string below the leak, a tailpipe connecting the upper and lower packers, and upper and lower packers being set sequentially, each packer being set without use of a drilling or workover rig to facilitate use in offshore environments.

6. A method for installing a tubing patch in a tubing string to seal against leakage of fluid between the interior of the tubing string and the tubing annulus, comprising the steps of:
positioning an integral assembly having an upper packer set by a wireline tool and a lower packer set by hydraulic pressure within the interior of the tubing string within the tubing string proximate the leak;
setting the upper packer with the wireline tool to form a seal against the interior of the tubing string above the leak; and
subsequently setting the lower packer with hydraulic pressure within the interior of the tubing string independently of the setting of the upper packer to form a seal against the interior of the tubing string below the leak to thus isolate the leak.

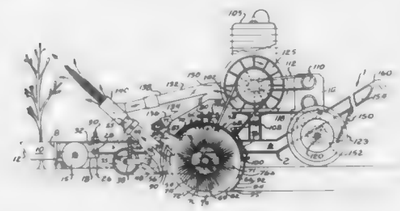
4,852,655
TUBING COUPLING AND METHOD
Weldon E. Guy, 4242 Stillwood, Odessa, Tex. 79762
Continuation-in-part of Ser. No. 54,944, Jun. 27, 1987, Pat. No. 4,773,479. This application Sep. 26, 1988, Ser. No. 249,375
The portion of the term of this patent subsequent to Sep. 27, 2005, has been disclaimed.
Int. Cl.[4] E21B *17/02*; F16L *9/14, 15/00*
U.S. Cl. 166—380 12 Claims



1. The process of placing a string of tubing in an oil field well;
a. said string of tubing when placed extending from the surface of the earth to an oil bearing formation far below the surface,
b. said string made from
i. a plurality of tubing sections,
ii. each section having external threads on each end, and
iii. cuffs with internal threads coupling said tubing sections together,
c. each of said tubing sections having
i. an axis,
ii. a wall thickness, and
iii. a corrosion resistant coating on its inside bore;
WHEREIN THE IMPROVED METHOD COMPRISES:
d. placing a section of tubing into the well with a cuff attached to the upper end at the surface of the earth,
e. dropping a corrosion resistant nipple into the cuff,
f. said nipple being free and moveable in the cuff,
g. attaching an additional section of tubing onto the cuff, and
h. screwing the additional section tightly to the cuff, thereby
j. forming a fluid tight seal between the corrosion resistant nipple and the section of tubing below the cuff and the section of tubing above the cuff, and
k. centering the nipple with the two sections of tubing by forming an internal taper of at least 12° to the axis on the bore of the tubings and an external taper of at least 12° to the axis on the exterior ends of the nipple.

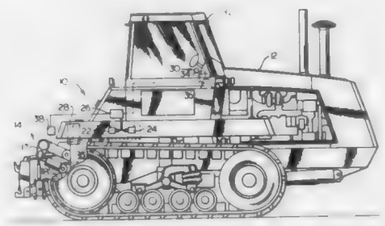
4. In an oil field well having:
a. a string of tubing extending from the surface of the earth to an oil bearing formation far below the surface,
b. said string made from
i. a plurality of tubing sections,
ii. each section having external threads on each end, and
iii. cuffs with internal threads coupling said tubing sections together,
c. each of said a tubing sections having
i. a tubing bore,
ii. a tubing axis,
iii. a wall thickness, and
iv. a corrosion resistant coating on its bore;
THE IMPROVED STRUCTURE COMPRISING:
d. the bore of each section of tubing having an internal tapered end,
e. said tapered end having a corrosion resistant coating,
f. a corrosion resistant nipple within each cuff,
g. the nipple having external tapered ends mating with the tapered ends of the tubing bores, thus forming fluid tight seals between the nipple and tubing section, and
h. the taper on each nipple and tubing bore being at least about 12° to the axis.

4,852,656
FIRE EXTINGUISHING APPARATUS
Robert J. Banahan, 3249 N. Alcott Ave., Chicago, Ill. 60634
Filed Nov. 2, 1987, Ser. No. 115,417
Int. Cl.[4] A62C *1/08, 27/24*
U.S. Cl. 169—91 19 Claims



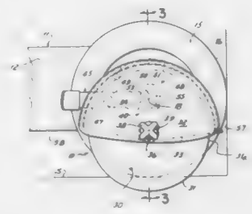
2. Fire fighting apparatus having means for removing overburden including weeds and soil and the like from an an area adjacent to burning terrain to expose nonflammable soil therebeneath,
means for comminuting said soil into discrete particles and said apparatus having means including a guide chute for directing particles onto the burning areas,
and said comminuting means comprising a disk plow at the leading end of the apparatus for cutting the overburden, and
a share plow behind the disk plow for folding the overburden laterally for exposing the nonflammable soil.

4,852,657
APPARATUS FOR SELECTIVELY POSITIONING MOVABLE WORK ELEMENT WITH PRESELECTED MAXIMUM VELOCITY CONTROL
Gerald D. Hardy, East Peoria; John P. Hoffman, and Larry E. Kendrick, both of Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Jul. 2, 1986, Ser. No. 881,412
Int. Cl.[4] A01B *63/111*
U.S. Cl. 172—2 14 Claims



1. An apparatus for selectively positioning a movable work element of a work vehicle at a plurality of preselected locations, comprising:
a control element positionable at a plurality of preselected locations;
a spool valve having a neutral position and a number of operable positions;
first sensing means for delivering a first signal correlative to the location of said control element;
second sensing means for delivering a second signal correlative to the location of said work element;
comparator means for receiving said first and second signals and delivering a third signal correlative to the difference between said first and second signals;
means for receiving said third signal and delivering a desired velocity signal correlative to the magnitude of said third signal in response to said third signal being less than a preselected maximum valve and having a magnitude set to the preselected maximum value in response to said third signal being greater than the preselected maximum valve;
means for receiving and differentiating said second signal, and delivering an actual velocity signal correlative to the velocity of said movable work element;
means for receiving said actual and desired velocity signals and delivering a control signal correlative to the absolute difference between said actual and desired velocity signals and representative of a desired displacement of said spool valve from said neutral position; and
means for receiving said control signal and for delivering a pilot pressure to position said spool valve in response to the magnitude of said pilot pressure for controller the direction and velocity of movement of said work element so as to be in a direction to reduce the absolute magnitude of said third signal and said control signal.

4,852,658
MOUNTED EDGER
Lloyd E. Wessel, 2810 Meadow Dr., and Edward O. Wessel, 3116 Cawein Way, both of Louisville, Ky. 40220
Filed Jun. 22, 1987, Ser. No. 64,519
Int. Cl.[4] A01D *34/84*
U.S. Cl. 172—14 7 Claims



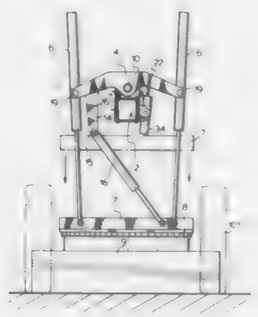
1. Turf edging apparatus including in combination
a wheeled lawn care apparatus having a frame and a non-rotational front axle and a front wheel mounted thereon, said front wheel having a circumferential tread for rolling engagement with a surface over which the lawn care apparatus can be rolled,
an edging disk having a turf cutting edge,
arm means mounting said edging disk on said axle for selective movement about said axle, said disk having a disk axis,
said disk axis being radially spaced from said axle and radially adjustable in a circular direction about said axle independently of said frame,
said disk being rotatable about said disk axis,
said disk being movable between a stowed position above said surface and a deployed edging position wherein said turf cutting edge is disposed beyond the circumferential tread of said front wheel from said axle for edging,
wherein said lawn care apparatus comprises a lawnmower and further including means for adjusting the cutting height of said mower with respect to said front axle, and independently of the position of said disk, while maintaining constant the position of said disk with respect to the position of said axle, such that adjustment of the cutting height of said mower does not affect the edging position of said disk.

4,852,659

MOTOR GRADER WITH HIGH-LIFT AND LOCK ARRANGEMENT

Murray A. Ross; Gordon L. Adams, and Michael A. Sully, all of Goderich, Canada, assignors to Champion Road Machinery Limited, Goderich, Canada

Filed Feb. 18, 1987, Ser. No. 16,085
Int. Cl.[4] E02F *3/76*
U.S. Cl. 172—789 20 Claims



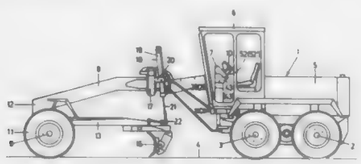
7. In a motor grader, the motor grader having a support frame with a drawbar universally secured thereto adjacent the forward end of said support frame and a scraper blade rotatably supported at the opposite end of said drawbar, a high-lift adjustably supporting said blade, said high-lift comprising a beam pivotally secured atop said frame and rotating about an axis above said frame and extending in the longitudinal direction thereof, said beam extending beyond either side of said frame and supporting opposed lift cylinders below said axis to either side of said frame and lock means for locking said beam at at least one of three positions at various angles relative to the grader frame, said lock means being located to one side of said frame and pivotally connected to said beam and pivotally connected to said frame on said one side thereof, said lock means in combination with said beam and said frame forming a fixed 3 bar linkage which maintains a given position of said beam relative to said frame.

4,852,660

GRADER BLADE HAVING A PRESSURIZED FLOAT POSITION

Gustav Leidinger, Friedberg; Günther Pröll, and Walter Kolb, both of Augsburg, all of Fed. Rep. of Germany, assignors to O & K Orenstein & Koppel Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Oct. 28, 1988, Ser. No. 265,300
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1987, 3739525
Int. Cl.[4] E02F *3/85*; E01H *6/00*
U.S. Cl. 172—795 11 Claims



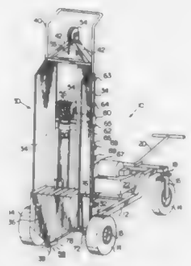
1. A grader for grading ground comprising:
a grader blade arranged generally transverse to a center longitudinal plane of a vehicle;
at least one lifting drive connected between said grader blade and said vehicle on each side of the center longitudinal plane and at a distance therefrom, each said lifting drive comprising a piston cylinder drive having a cylinder in which a piston rod is disposed, a piston attached to one end of the piston rod and slidably disposed in the cylinder, a piston ring chamber at the end of the cylinder traversed by the piston rod and a piston chamber at the other end of the cylinder separated from the piston ring chamber by the piston and free from being traversed by the piston rod, each of the drives being selectively chargeable with a working fluid under pressure, ports of the piston ring chamber and the piston chamber of each said drive being adapted to be opened substantially simultaneously in order to bring the grader blade into a float position in which said grader blade follows the contour of the ground with a downward force corresponding to its dead weight, and wherein the piston chamber and the piston ring chamber of each drive are each selectively chargeable with working fluid under a controllable pressure while the grader blade is in the float position, so that each selected drive exerts a force on the grader blade which increases or decreases the downward pressure of the greater blade on the ground while still allowing the grader blade to follow the contour of the ground.

4,852,661

PORTABLE CONCRETE HAMMER

David A. Ellington, 4271 Capital Ave., Grand Island, Nebr. 68803

Filed May 26, 1987, Ser. No. 53,927
Int. Cl.[4] B25D *9/00*
U.S. Cl. 173—84 14 Claims



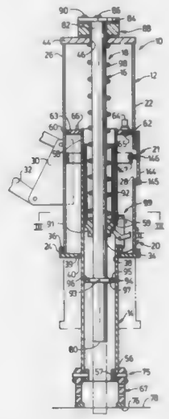
1. A self propelled portable concrete hammer, comprising:
a frame supported by ground wheels;
a mast attached to said frame:
a weight adapted to slideably engage said mast;
means for selectively lifting said weight to a predetermined elevation and allowing said weight to drop by gravity to impact a concrete surface; and
a drive attached to and interconnecting said selective lifting means and one of said ground wheels, said drive being operable to advance said concrete hammer over the concrete surface while said weight is being raised ; wherein, the drive will automatically engage one of said ground wheels as the weight is being raised and will automatically disengage from said one of said ground wheels as the weight falls; and, wherein the incremental distance traveled by the concrete hammer is operatively associated with the raising of the weight relative to the mast.

4,852,662

IMPACTING MECHANISM

Raymond A. Bianchi, Pekin, Ill.; David Kistner, Huber Heights, Ohio; Joseph Oswald, Hopedale, and Elmer B. Phelps, Creve Coeru, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Mar. 28, 1988, Ser. No. 173,899
Int. Cl.[4] B23B *45/16*
U.S. Cl. 173—119 25 Claims



1. An impacting mechanism adapted to be mounted on a movable manipulator for movement relative to a surface to be impacted, comprising:
a guide structure adapted for being connected to the manipulator;
a tubular actuator movably supported by the guide structure and having an end surface adapted to contact the surface to be impacted;
an elongate impact plunger movably supported relative to the guide structure and the tubular actuator and being disposed in generally centered relation within the tubular actuator;
resilient means disposed between the guide structure and the elongate impact plunger for biasing the impact plunger toward the end surface of the tubular actuator;
means for releasably coupling the tubular actuator and the impact plunger together to maintain the position of the impact plunger in respect to the tubular actuator so that the resilient means is compressed in response to the guide structure being moved toward the contact end surface of the tubular actuator when the end surface of the tubular actuator is in contact with the surface to be impacted; and
means for releasing the releasable coupling means when the guide structure reaches a predetermined distance from the end surface of the tubular actuator so that the resilient means drives the impact plunger toward the surface to be impacted.

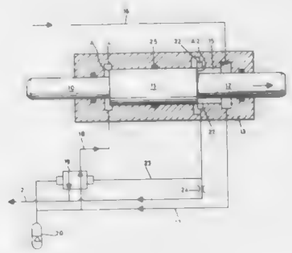
4,852,663

HYDRAULIC PERCUSSIVE MACHINES

Clive W. Hunt, Malanshof, South Africa, assignor to The Steel Engineering Company Limited, Transvaal, South Africa

Continuation of Ser. No. 840,867, Mar. 18, 1986, abandoned. This application Dec. 1, 1987, Ser. No. 127,240
Claims priority, application South Africa, Mar. 26, 1985, 85/2166
Int. Cl.[4] B23B *45/16*
U.S. Cl. 173—134 4 Claims

1. A hydraulic percussive machine comprising:
a cylinder,
a piston which can reciprocate in the cylinder,
a return chamber at one end of the cylinder,
a drive chamber at one end of the cylinder,
faces on the piston exposed to the drive chamber and return chamber respectively with the face exposed to the drive chamber being the larger,
means for connecting the return chamber to a source of hydraulic fluid under pressure,
a shuttle valve for connecting and disconnecting the drive chamber to the source of high pressure and for connecting the drive chamber to a tank when the drive chamber is disconnected from the source, the shuttle valve having a plunger with first and second differential plunger areas,



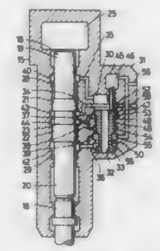
the first and smaller of which is constantly connected to a source,
a port in the return chamber which is uncovered when the piston moves on its return stroke and is covered when the piston moves on its working stroke,
a connection between the port and the second differential plunger area, and
means for allowing fluid to slowly pass from the second differential plunger area to the tank when the port is covered by the piston, said means comprising a restrictive orifice between the tank and the second differential plunger area.

4,852,664

HYDRAULIC IMPACT TOOL

Hiromu Terada, Ikoma, Japan, and Hiroshi Okada, Suita, both of Japan, assignors to Nippon Pneumatic Manufacturing Co., Ltd., Osaka, Japan

Filed Apr. 25, 1988, Ser. No. 185,674
Int. Cl.[4] B25D *9/00*
U.S. Cl. 173—134 2 Claims



1. A hydraulic impact tool for striking a tool such as a chisel, comprising:
a cylinder having the tool slidably mounted therein at lower end thereof;
a piston reciprocably mounted in said cylinder for striking the tool during its downward movement, wherein said piston having an upper small-diameter portion and a lower small-diameter portion and upper and lower large-diame-

ter portions between said upper and lower small-diameter portions, and a middle small-diameter portion between said upper and lower large-diameter portions, wherein said cylinder having an upper chamber filled with a gas to apply gas pressure to the top of said piston, and a middle chamber and a lower chamber defined directly above said upper large-diameter portion and directly below said lower large-diameter portion, respectively;

a valve chest connected to said middle chamber and said lower chamber and an oil supply port and an oil discharge port;

a valve body slidably mounted in said valve chest; and

an oil circuit having an oil passage communicating said middle small-diameter portion with said valve chest for controlling the communication between said middle chamber and said lower chamber on one hand and said oil supply port and said oil discharge port on the other hand to alternately raise and lower said piston under the pressure of said gas and oil,

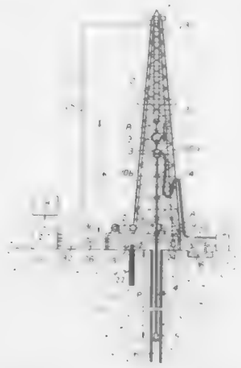
and wherein said oil circuit is so arranged that prior to said piston striking the tool, the pressure oil will be fed into said lower chamber to increase the oil pressure in said lower chamber, and wherein said middle small-diameter portion communicates with said valve chest through said oil passage to raise and lower said valve body in said valve chest.

4,852,665

METHOD FOR MONITORING THE OPERATIONS OF THE ROTARY DRILLING OF A WELL

Bertrand Peltier, Paris, and Richard Deshais, Courbevoie, both of France, assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Nov. 19, 1987, Ser. No. 123,075
Claims priority, application France, Dec. 10, 1986, 86 17304
Int. Cl.[4] E21B *47/04*
U.S. Cl. 175—40 **8 Claims**



1. A method for determining the depth at which a parameter measured during a drilling operation is acquired, said depth being the depth in a borehole of the end of a string suspended from a vertically moveable block, said string consisting of a plurality of incremental members which may be added to or removed from said string, said method comprising the steps of:

a. deriving an indication of the weight of said string born by said block as a function of time;

b. deriving an indication of the vertical position of said block as a function of time;

c. deriving an indication of said parameter as a function of time;

d. in response to said weight indication, identifying those portions of said position indication which correspond to those times during which the weight of said string is not born by said block;

e. identifying those portions of said position indication which do not vary monotonically relative to the remaining portions of said position indication;

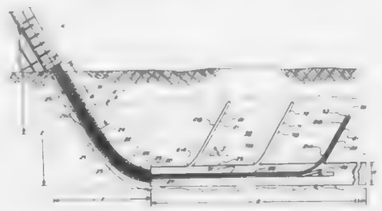
f. in response to the identifications of steps d. and e. and to said indication of said parameter , determining the depth at which said parameter was acquired and generating a log of said parameter as a function of depth.

4,852,665

APPARATUS FOR AND A METHOD OF DRILLING OFFSET WELLS FOR PRODUCING HYDROCARBONS

Charles G. Brunet, and Alton Watson, both of 3613 A Amb. Caffery Pkwy., Suite 9, Lafayette, La. 70503

Filed Apr. 7, 1988, Ser. No. 178,500
Int. Cl.[4] E21B *7/08, 7/06*
U.S. Cl. 175—61 **30 Claims**



1. A directional guidance device for drilling offset wells from a substantially horizontal section of a wellbore, the device comprising:

a housing means;

a deflector means disposed in the housing means;

moving means for allowing the deflector means to move, by gravitational force, between a first position in which it prevents advancement of a drill bit and a second position in which it allows advancement of a drill bit and causes the drill bit to deflect from the longitudinal axis of a substantially horizontal section of a wellbore in which the device is situated; and

means for attaching the device to a drill string.

12. A method of drilling a well, the method comprising the steps of:

(a) drilling a wellbore including a substantially straight, substantially horizontal section; and

(b) drilling a plurality of offset wells from the substantially straight, substantially horizontal section of the wellbore, the offset wells including a substantially straight portion at an angle of between 10° and 45° from the substantially straight, substantially horizontal section of the wellbore; and wherein the offset wells include a substantially curved portion drilled at an angular rate of build of between 3.3° and 15° per 100 feet.

4,852,667

PRESSURE RELIEF PROCESS FOR WELL-DRILLING

Andre M. Dorleans, Le Perray-En-Yvelines, France, assignor to TOTAL Compagnie Francaise des Petroles, Paris, France

Filed Jun. 26, 1987, Ser. No. 66,599
Claims priority, application France, Jul. 2, 1986, 86 09589
Int. Cl.[4] E21B *7/00, 10/60*
U.S. Cl. 175—65 **2 Claims**

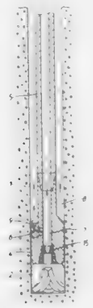
1. A well drilling process using a drill string (3) carrying a dril bit (2) at a lower end thereof and comprising, above the drill bit, an enlargement (4) having a maximum external diameter smaller than the diameter of a bore hole being drilled and provided with a system of n injection ducts (6) connecting an interior (7) of said drill string to an annular space (8) between

the well and said drill string and opening upwardly into said annular space, comprising the steps of:

(a) pumping drilling fluid downwardly through the interior of said drill string,

(b) diverting a portion of said drilling fluid into said annular space via said injection ducts, the remainder of said drilling fluid flowing downwardly to said drill bit from where it passes upwardly around an exterior of said enlargement and into said annular space, and

(c) selecting the flow Q of said diverted portion of drilling fluid, expressed in m^3/s, to provide a difference H, expressed in meters of head of water, in the pressure of the



drilling fluid below said enlargement relative to the pressure of said drilling fluid at a level of said enlargement in the absence of said injection ducts, greater than a threshold value of H=10 m, and substantially in accordance with the equation:

$$Q=\sqrt{10H\times S\times s\times n},$$

wherein s and S are respective cross-sections, expressed in m^2, of an annular space above the enlargement between an imaginary cylinder extending an outer periphery of the enlargement upwardly and the drill string, and of the injection ducts, and 10 is an approximate value of gravitational acceleration in m/s^2.

4,852,668

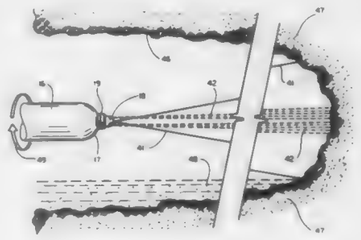
HYDRAULIC DRILLING APPARATUS AND METHOD

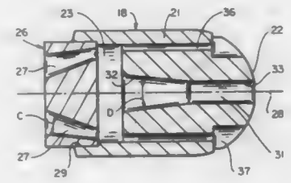
Ben W. O. Dickinson, III, 2125 Broderick St., San Francisco, Calif. 94115; Robert W. Dickinson, 40 Maplewood Dr., San Rafael, Calif. 94901; Sherman C. May, San Francisco, and Charles S. Mackey, Bakersfield, both of Calif., assignors to Ben Wade Oakes Dickinson, III and Robert Wayne Dickinson, both of San Francisco, Calif.

Division of Ser. No. 853,548, Apr. 18, 1986, abandoned. This application Jan. 4, 1988, Ser. No. 140,488
Int. Cl.[4] E21B *7/18*
U.S. Cl. 175—67 **7 Claims**

1. In hydraulic drilling apparatus: a tubular drill string proximal and distal ends and an axial passageway to which a pressurized drilling fluid is supplied, a tubular drill head carrier having proximal and distal ends removably disposed in the axial passageway toward the distal end of the drill string and being adapted to be withdrawn from the drill string through the passageway, said carrier having an axial passageway in fluid communication with the passageway in the drill string, a hydraulic drill head connected to the distal end of the carrier for receiving the pressurized drilling fluid through the passageway in the drill string and the carrier and discharging the pressurized fluid as a high velocity cutting jet capable of cutting a borehole in the earth larger than the removable carrier and the drill string, said drill head being adapted to be withdrawn from the drill string with the carrier, and means forming a fluid seal between the distal end portion of the drill string and the distal end portion of the carrier.

3. In a method of drilling a borehole in the earth with a hydraulic drill head and a tubular drill string, the steps of: mounting the drill head at the distal end of a tubular drill head carrier of a size which will pass through the axial passageway of the drill string, positioning the carrier within the passage-





way toward the distal end of the drill string with the drill head extending beyond the distal end of the string, delivering a pressurized drilling fluid to the drill head through the drill string and the carrier, discharging the fluid from the drill head in the form of a high velocity cutting jet which is directed against the earth to cut a borehole larger than the drill head carrier and the drill string, and withdrawing the drill head and the carrier from the drill string.

4,852,669

DIRECTIONAL DOWNHOLE DRILL APPARATUS

Thomas A. Walker, R.D. #1, Box 160, Berlin, Pa. 15330

Filed May 9, 1988, Ser. No. 191,374
Int. Cl.[4] F21B *17/00*
U.S. Cl. 175—73 **6 Claims**

1. An air-driven directional downhole drilling apparatus, adapted to allow a non-vertical drilling angle, comprising:

(a) a non-rotational drill string having a lower end;

(b) an external air source;

(c) directional means engaging the lower end of the drill string for changing the drilling angle;

(d) motor means engaging the directional means, the motor means having:

(i) a rotatable shaft;

(ii) an air intake; and

(iii) an air exhaust;

wherein the motor means translates compressed air from the external air source into rotational motion of the shaft;

(e) means coupling the external air source to the motor means air intake;

(f) an externally rotated downhole drill hammer;

(g) means engaging the shaft to the downhole drill hammer;

(h) means engaging the motor means air exhaust to the

downhole drill hammer, to produce a percussive force on a rock face;



wherein the compressed air rotates the shaft and operates the hammer to produce both rotational and percussive force to a bit located on said hammer.

4,852,670

DRILLING TOOL WITH AN EXCHANGEABLE FEED HELIX

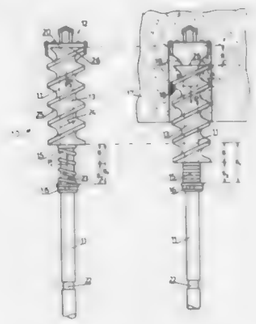
Wolfgang Peetz, Blitzenreute, and Bernhard Moser, Altshausen, both of Fed. Rep. of Germany, assignors to Hawera Probst GmbH & Co., Ravensburg, Fed. Rep. of Germany

Filed Oct. 2, 1987, Ser. No. 103,754

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1986, 3635538

Int. Cl.[4] E21B *10/62*

U.S. Cl. 166—323 **11 Claims**



1. A drilling tool, for making perforations in concrete and masonry comprising:

a drill shank having a drill head located at one end of said drill shank;

an exchangeable feed helix means coaxially disposed around said drill shank with one end of said feed helix means disposed adjacent a portion of said drill head thereby defining a position where rotation of said feed helix means relative to said drill shank is prevented;

a supporting device fixed to said drill shank at a location closer to the other end of said feed helix means; and

a supporting spring means positioned between said feed helix means and said supporting device for axially bracing said feed helix in said position up to a predetermined external force which acts on said feed helix means and for allowing axial displacement of said feed helix means relative to said drill shank when said predetermined force is reached, said supporting spring means and said feed helix means each having a pitch such that the pitch of said supporting spring means is oriented opposite to the pitch of said feed helix means.

4,852,671

DIAMOND CUTTING ELEMENT

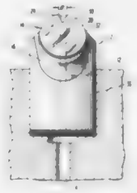
Stephen G. Southland, Houston, Tex., assignor to Diamant Boart-Stratabit (USA) Inc., Houston, Tex.

Filed Mar. 17, 1987, Ser. No. 26,962

Int. Cl.[4] E21B *10/46, 10/60*

U.S. Cl. 175—329 **18 Claims**





1. A cutting element for use on a rotary drill bit, said cutting element comprising a cylindrical stud and a cutting disk bonded to said stud, said stud defining a longitudinal axis and including a forwardly facing front face, said cutting disk including a substrate and a diamond substance bonded to one surface of said substrate to define a forwardly facing cutting face, said diamond cutting face having a width no greater than a width of said stud, another surface of said substrate being bonded to said front face of said stud, said diamond cutting face including an outer peripheral edge and arranged such that a portion of said outer peripheral edge is disposed forwardly of the remaining portion of said peripheral edge to define a formation-contacting zone, a rearwardly extending recess disposed in said formation-contacting zone of said edge to form therein a pair of cutting points separated by said recess, said recess being of smaller width than both said cutting face and said stud, said recess being bisected by a plane containing said longitudinal axis and disposed equidistantly from said cutting points.

4,852,672

DRILL APPARATUS HAVING A PRIMARY DRILL AND A PILOT DRILL

Robert N. Behrens, 4802 W. Laurel La., Glendale, Ariz. 85304

Filed Aug. 15, 1988, Ser. No. 231,953

Int. Cl.[4] E21B *10/26, 10/36, 17/18*

U.S. Cl. 175—389 **6 Claims**

1. Drill bit apparatus, comprising, in combination:

primary drill bit means for drilling holes, including

first base means for securing the primary drill bit means a drill chuck, said first base means having an axially extending portion having flat surfaces thereon adapted to be received by said drill chuck,

a first stem portion connected to the first base means,

drill tip means connected to the stem portion and including

a plurality of drill tips, and

slots disposed between the drill tips of the plurality of drill tips, and

first bore means extending through the first base means, the stem portion, and the drill tip means through which compressed air flows; and

pilot drill means, including

second base means having a rear impact face for receiving an impact for drilling and a front impact face for impacting the first base means of the primary drill bit means,



a second stem portion connected to the second base means and extending through the bore means of the primary drill bit means,

a tip connected to the second stem portion remote from the second base means and extending outwardly from the drill tip means of the primary drill bit means, and

second bore means extending through the second base means and the second stem portion through which compressed air flows to blow dust and debris from the hole being drilled.

4,852,673

WEIGHING APPARATUS WITH RADIO INTERFERENCE PROTECTION

Yoshiharu Asai; Shinji Tsukamoto, and Shuji Murata, all of Shiga, Japan, assignors to Ishida Scales Mfg. Co., Ltd., Kyoto, Japan

Filed Jul. 29, 1988, Ser. No. 225,837

Claims priority, application Japan, Aug. 1, 1987, 62-193417

Int. Cl.[4] G01G *13/00, 3/14*

U.S. Cl. 177—25.18 **6 Claims**

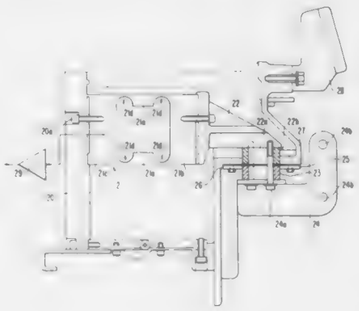
1. A weighing apparatus for measuring the weight of an article, comprising:

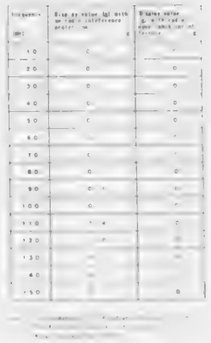
a load cell having strain generating means for detecting a weight signal indicative of the weight of the article;

an amplifier, coupled to said load cell, for amplifying the weight signal from said load cell;

an article holding member formed of a metallic material and coupled to said load cell; and

a radio wave inhibiting member made of a magnetic material having a high magnetic permeability and disposed continuously around a region where said load cell and said article holding member are coupled to each other.





4,852,674

METHOD FOR DISPLAYING LOAD DISTRIBUTION BY MONITORING A WORK VEHICLE SUSPENSION

Adam J. Gudat, Edelstein, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 79,559, Jul. 30, 1987, abandoned. This application Sep. 14, 1988, Ser. No. 246,027

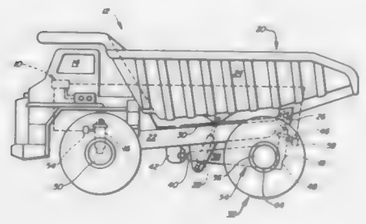
Int. Cl.[4] G01G *19/10, 23/32*

U.S. Cl. 177—141 **24 Claims**

1. An apparatus for displaying the distribution of a payload loaded onto a work vehicle by a separate loading vehicle, said

work vehicle having a plurality of hydraulic struts in supporting relation to the payload comprising:

means for sensing the internal pressure of preselected struts and delivering a plurality of first signals each having a value responsive to the internal pressure of one of said respective struts;



means for modifying each of said first signals, and delivering modified signals in response to said modification, each modified signal being indicative of the payload supported by one of said respective struts;

visual display means on the loading vehicle for receiving said modified signals, and displaying respective visual signals in response to the magnitude of said modified signals.

4,852,676

ELECTRONIC WEIGHING MACHINE

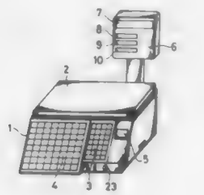
Takashi Futakata, Shizuoka, Japan, assignor to Tokyo Electric Company, Ltd., Tokyo, Japan

Filed Jul. 20, 1988, Ser. No. 221,552

Claims priority, application Japan, Jul. 21, 1987, 62-181996

Int. Cl.⁴ G01G *23/00, 23/22, 23/32*

U.S. Cl. 177—245 **5 Claims**



1. An electronic weighing machine, comprising:

a weighing section for measuring a weight of an item;

a plurality of memories each for storing a single message;

message combination means for combining messages stored in said memories;

a display buffer for storing a combined message;

display means having a weight display section, a price display section, and an item name display section for displaying a message; and

key input means for inputting various operation instructions.

4,852,675

APPARATUS FOR INTERMEDIATE TRANSMISSION OF SENSED OIL PRESSURE IN A SCALE

Hsug-Fang Wang, 129, Tsan-Chu Lane, Tsan-Chu Li, Chiayi City, Taiwan

Filed Dec. 8, 1988, Ser. No. 281,066

Int. Cl.⁴ G01G *5/04;* **G01L** *1/02;* **F01B** *19/00;* **F16J** *3/00*

U.S. Cl. 177—208 **8 Claims**

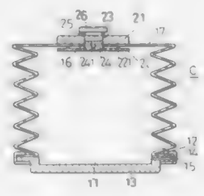
1. An apparatus used in a scale having an oil pressure gauge for displaying measured weight and for intermediate transmission of sensed pressure, comprising:

a bellows-shaped envelope for containing hydraulic oil therein, made of flexible materials, having an open end and an sealed end respectively;

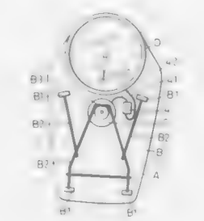
a substantially plate-shaped base member having an annular flange formed on the peripheral portions thereof for connection to said open end of said envelope, and an oil passage formed therein enabling said hydraulic oil to flow out of said envelope;

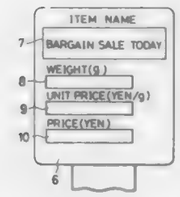
means for connecting said open end portion of said envelope to said base member;

an air leakage means formed on said sealed end of said envelope having an air leakage passage for leading out the air originally existing in the envelope during the process of filling said envelope with hydraulic oil; and



a knob for blocking said air leakage passage after said envelope has been filled with hydraulic oil.





4,852,677

GUIDING METHOD FOR AUTONOMOUS TRAVELING VEHICLE

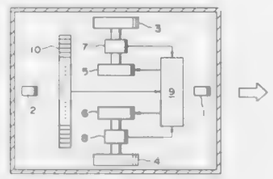
Mamoru Okazaki, Daitoh, Japan, assignor to Tsubakimoto Chain Co., Japan

Continuation of Ser. No. 40,567, Apr. 17, 1987, abandoned. This application Dec. 15, 1988, Ser. No. 285,397

Claims priority, application Japan, Jul. 14, 1986, 61-166061

Int. Cl.⁴ B62D *1/24*

U.S. Cl. 180—169 **3 Claims**



1. A guiding method for an autonomous traveling vehicle which travels along a predetermined, internally set route by individual control of rotation of the wheels mounted on both the right and left sides of the traveling direction thereof so that the traveling direction of said autonomous traveling vehicle is controlled wherein

a pair of magnets being previously arranged along an actual route corresponding to the predetermined route for fixed point correction, and comprising the following steps:

individually detecting the number of the rotations of said wheels;

estimating the position and azimuth of said autonomous traveling vehicle based on the detected number of rotations of said wheels and on factors determined by the specification of said autonomous traveling vehicle; and

guiding said autonomous traveling vehicle toward said route based on the estimated position and azimuth and said internally set route; and

when any one of said magnets is detected, the position and azimuth of said autonomous traveling vehicle are detected based on the relationship of the relative position between said detected magnet and said autonomous traveling vehicle, the deviation of the detected position and azimuth from said estimated position and azimuth are detected, said factors related to said deviation are changed, and further guiding of said autonomous traveling vehicle is executed based on the varied factors.

4,852,678

VEHICLE BODY FRAME FOR MOTORCYCLE

Ken Yamaguchi, Hidakamachi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1987, Ser. No. 128,052

Claims priority, application Japan, Dec. 5, 1986, 61-289894; Dec. 17, 1986, 61-300721

Int. Cl.⁴ B62K *11/04*

U.S. Cl. 180—219 **16 Claims**

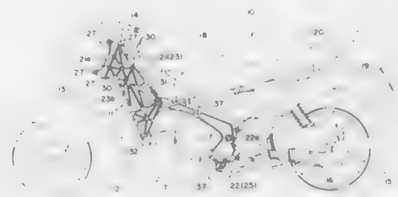
1. A vehicle body frame for a motorcycle for mounting a front fork and a rear fork comprising:

an engine;

a pair of right front and left front frame members, said right and left front frame members being secured to each other and extending forwardly and upwardly relative to said engine and having a predetermined vertical width to form a support for a front fork of a motorcycle at each upper front end thereof and being spaced relative to each other to form an interior portion for retaining said engine therebetween;

bosses being formed on an internal lateral wall of each of said pair of front frame members and projecting from said internal lateral wall to be contacted and connected to each other in face-to-face relation for forming a predetermined lateral interval therebetween;

a rear frame including a right rear frame member and a left rear frame member, said right and left rear frame members being secured to each other to form a support for a rear fork of a motorcycle and to form an interior portion for retaining said engine therebetween;



a fuel tank being positioned in an open space formed rearwardly of said front frame members and above said engine; and

a seat rail mounted at a front end on each of said rear frame members and extending rearwardly of the rear frame members toward and above said rear fork;

respective lower rear ends of said front frame members being secured on opposite sides of said engine at two spaced upper and lower portions and at said predetermined lateral interval and said rear frame members being secured to said engine for forming the motorcycle body frame with said engine being one of the elements of the body frame.

4,852,679

WHEELCHAIR STEERING

Jeremy J. Fry, The Brewery, Freshford, Bath BA3 6BU, Great Britain

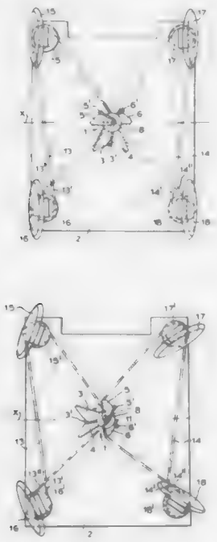
Filed Sep. 30, 1987, Ser. No. 102,918

Int. Cl.⁴ B62D *7/08;* **A61G** *5/04*

U.S. Cl. 180—234 **3 Claims**

1. A powered wheelchair having a transverse axis, front and back left and front and back right wheels, all of said wheels being driven and power-steered, and a rotatable steering assembly for steering said wheels comprising a pair of steering drive cams, a pair of steering return cams, and first and second flexible transmission members connecting one of said steering drive cams and one of said steering return cams to said left and right wheels respectively, so that the center of turning of said wheels lies on said transverse axis of said wheelchair said drive and return cams being differently shaped for differentially

rotating said left and right wheels and moving center of turning to a position within the confines of the wheels responsive to



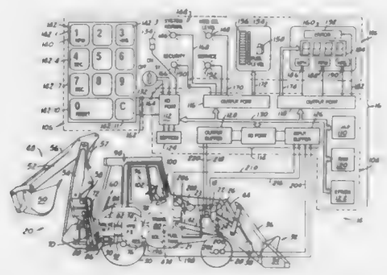
rotation of the steering assembly through a predetermined angle.

4,852,680

VEHICLE ANTI-THEFT SYSTEM WITH REMOTE SECURITY MODULE

Thomas R. Brown, Plainfield, Ill.; Richard H. Logan, West Burlington, Iowa; Robert W. Hahn, Lemont; Charles D. Rodeghiero, Naperville, both of Ill., and Kevin L. Brekkestran, Fargo, N. Dak., assignors to J. I. Case Company, Racine, Wis.

Filed Apr. 7, 1988, Ser. No. 178,742
Int. Cl.[4] B60R *25/00*
U.S. Cl. 180—287 4 Claims



1. In an off-road vehicle anti-theft system which controls when at least one electrically-operated actuator on the vehicle may be operated, comprising:

a master control module including operator input means for entering a sequence of first signals from an operator of the vehicle, means for determining whether the entered sequence of first signals matches a first template in the master control module, and means of automatically generating a second signal for transmission to a remote location when the entered sequence of first signals matches the first template; and

security module means, at a location remote from the master control module and directly adjacent to the one electrically-operated actuator for protecting the actuator against unauthorized operation, the security module means including signal input means for receiving the second signal from the master control module, means for determining whether the received second signal includes the first predetermined identifying characteristic;

the operator input means includes a keypad having a plurality of keys;

the sequence of first signals is a sequence of at least three keystrokes on the keypad;

the means for determining whether the entered sequence of first signals received form the operator includes memory means for storing a sequence of at least three characters corresponding to three predetermined keystrokes; and

the means for automatically generating includes means for encoding at least eight bits of information in the second signal;

wherein the electrically-operated actuator is a device selected from the group of electrical devices employed on the vehicle consisting of solenoids and electric motors, and the portion of the vehicle is part of a vehicle subsystem selected from the group of vehicle subsystems consisting of the fuel delivery subsystem, the transmission control subsystem, and the control subsystem for a vehicle-stabilizing system including at least one deployable stabilizer, and wherein:

the means for providing an electrical signal to the actuator includes a solid-state power switching device; and,

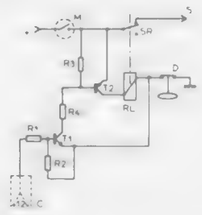
wherein the master control module also includes means for readily changing the first template without disassembly of the master control module and without replacement of components within the master control module, such that, after the first template is changed, a different sequence of first signals must be entered by the operator in order to match the first template.

4,852,681

DEVICE FOR PREVENTING THE THEFT OF MOTOR VEHICLES

Jean Bombled, Montesson, France, assignor to Neiman, Courbevoie, France

Filed Jul. 6, 1988, Ser. No. 215,601
Claims priority, application France, Jul. 9, 1987, 87 09722
Int. Cl.[4] B60R *25/00, 25/04*
U.S. Cl. 180—287 3 Claims



1. In an anti-theft device for motor vehicles operating by cutting off the electrical supply to the engine ignition circuit by means of a relay which is movable from a first closed position to a second open position when energized by a control circuit including a central electronic unit which is connected in series with the "on" contact of the vehicle's anti-theft steering switch when in a monitoring mode, the improvement of

(a) at least one transistor connected between the relay and the central unit through which transistor the central unit can energize the relay when in a monitoring mode and the "on" contact of the anti-theft steering switch is closed,

(b) a switch device for grounding the relay when the engine is not running, and

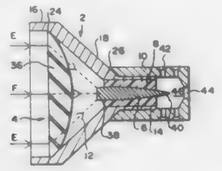
(c) said switch device being open from ground while the engine is running.

4,852,682

UNDERWATER VOICE COMMUNICATOR

Charles M. Benjamin, 5050 Ocean Beach Blvd., #105, Cocoa Beach, Fla. 32931

Filed Sep. 23, 1987, Ser. No. 100,175
Int. Cl.[4] G10K *11/00*
U.S. Cl. 181—21 16 Claims



1. An apparatus for transmitting acoustical energy between differing mediums, comprising:

(a) means for transmitting acoustical energy from a first medium to a second medium, said first medium having an impedance differing from said second medium;

(b) said transmitting means having an impedance substantially equal to an impedance of said second medium;

(c) said transmitting means including first and second portions, said first portion being exposed to said first medium and said second portion being exposed to said second medium;

(d) means for channeling sound waves from a source to said transmitting means;

(e) said channeling means including a housing provided with a passageway having first and second ends; said first end being operably associated with the source of the acoustical energy and said second end being operably associated with said transmitting means;

(f) means for concentrating acoustical energy at said first portion of said transmitting means positioned in said passageway; and

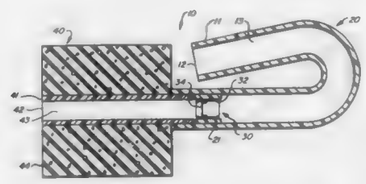
(g) said concentrating means being spaced relative to said second medium.

4,852,683

EARPLUG WITH IMPROVED AUDIBILITY

Mead C. Killion, Elk Grove Village, Ill., assignor to Etymotic Research, Inc., Elk Grove Village, Ill.

Filed Jan. 27, 1988, Ser. No. 148,939
Int. Cl.[4] G10K *11/00*; H04R *25/02*
U.S. Cl. 181—130 19 Claims



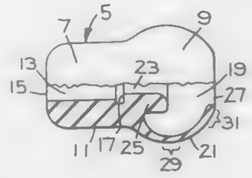
1. A protective earplug with improved audibility, comprising: first passage means arranged for positioning with at least an inner end portion thereof in an earcanal to define a first sound passage extending from an inner end within the ear canal to an opposite outer end, a relative large acoustic resistance means arranged for cooperation with an intrinsic acoustic mass reactance of said first passage and an intrinsic acoustic compliance of the ear canal to provide a substantially non-resonant acoustic impedance, and second passage means defining a second sound passage having an inner end coupled to said outer end of said first passage and having an opposite sound-receiving outer end, said second passage being operative to increase response characteristics at frequencies in an audible spectrum above approximately 800 Hz.

4,852,684

COMPRESSIBLE EAR TIP

Thomas J. Packard, Somerset, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 133,522, Dec. 16, 1987, abandoned. This application Sep. 30, 1988, Ser. No. 252,511
Int. Cl.[4] A61B *7/02*
U.S. Cl. 181—131 12 Claims



1. An ear tip adapted to deliver sound to a canal of a human ear, which ear tip comprises:

(a) a first section adapted to couple with a sound-transmitting device, and

(b) a second section connected to and in open communication with the first section, the second section comprising (1) walls defining a bulbous second section having a region of greatest outside diameter and a convex inner surface, which inner surface defines a hollow inner chamber having an inside diameter and a preselected length, and (2) a outlet port adapted for open communication with the ear canal;

wherein

the second section presents a surface for contact with the ear;

the walls have a hardness in a range between (1) a lower limit above that hardness which will allow loss of open communication between the ear and the sound-transmitting device when the ear tip is in place in the ear, and (2) an upper limit of about 90 Shore A;

the second section is deformable under an axial force in a range between about 8 ounces and 12 ounces from a relaxed state to a compressed state, in which compressed state the ear-contacting surface is of substantially greater area than in the relaxed state;

the sound section is adapted to conform in the compressed state to the external acoustic meatus of the ear;

a maximum outside diameter of the second section is at least about 0.40 inches; and

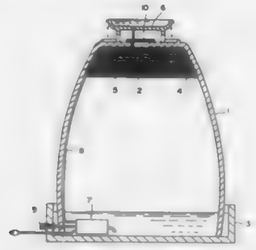
the ear tip exhibits a compression diameter increase of at least about 10% under an axial force of 12 ounces.

4,852,685

DRIPPING SOUND GENERATING APPARATUS

Kengo Maekawa, Tokoname; Moitsu Suzuki; Yukiya Nakano, both of Aichi, and Hisahiko Tani, Aichi, all of Japan, assignors to Kabushiki Kaisha Asaplan, Tokyo, Japan

Filed May 31, 1988, Ser. No. 200,621
Int. Cl.[4] G10K *11/00*
U.S. Cl. 181—175 12 Claims



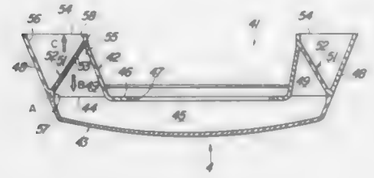
1. A dripping sound generating apparatus, which comprises:
(a) a dripping sound echoing or resonating member having a cavity therein and a top portion which has a hole therein, said hole communicating an outside of said member with said cavity so that a liquid is allowed to drip inside said member to generate dripping sounds therein which are to be heard outside said member;
(b) means for positively retaining the liquid having dripped inside said member; and
(c) means for recycling the liquid having dripped so that the liquid is allowed to drip repeatedly.

4,852,686

SILENCER FOR OUTBOARD ENGINE

Masafumi Sougawa, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 9, 1987, Ser. No. 71,618
Claims priority, application Japan, Jul. 10, 1986, 61-162429
Int. Cl.[4] F02M *35/12*
U.S. Cl. 181—229 4 Claims



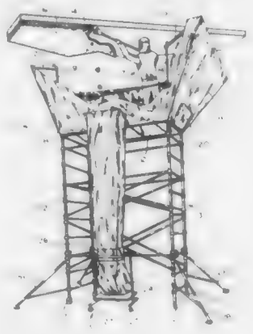
1. An air inlet device for a machine that inducts atmospheric air through an inlet opening, said device being comprised of an outer housing defining a plenum chamber, an outlet from said outer housing lying in a plane at one side of said plenum chamber and communicating said plenum chamber with the machine inlet opening, a pair of inlet passageways to said plenum chamber extending at opposing angles divergently from the plane of said outlet and each having effective cross-sectional areas that do not decrease from an inlet end of the respective inlet passageways to a point where the respective inlet passageways communicate with the plenum chamber.

4,852,687

METHOD AND APPARATUS FOR HAZARDOUS MATERIAL CONTAINMENT AND DISPOSAL

Kurt Hittler, Alpharetta, Ga., assignor to Grayling Industries, Inc., Alpharetta, Ga.

Filed Feb. 24, 1989, Ser. No. 314,882
Int. Cl.[4] E04G *1/26, 21/30*
U.S. Cl. 182—129 16 Claims



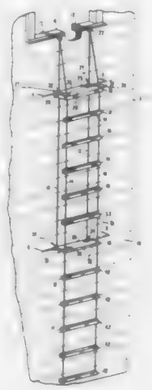
1. Apparatus for use in removing hazardous materials such as asbestos from overhead structures, said apparatus comprising:
platform means for supporting a worker;
scaffold means for supporting said platform means upon and elevated above a floor beneath overhead structures from which hazardous material is to be removed; and
enclosure means mounted atop said scaffold means about said platform means, said enclosure means and platform means at least partialy defining an open top work chamber in which hazardous materials may be removed and collected from overhead structures.

4,852,688

COLLAPSIBLE LADDER ASSEMBLY

Robert W. Strohmeyer, Sr., 214 Bethel Rd., Mooresville, Ind. 46158

Filed Jun. 27, 1988, Ser. No. 211,820
Int. Cl.[4] E04C *1/56*
U.S. Cl. 182—199 28 Claims



1. A collapsible ladder assembly for deployment from an emergency exit of a building, comprising: 'anchoring means for anchoring the ladder assembly to the building;

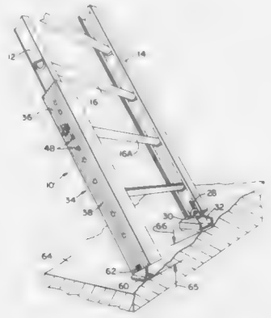
a first pair of flexible rail members connected at one end to said anchoring means;
a second pair of flexible rail members connected at one end to said anchoring means;
a top step having a back edge and an opposite front edge, said first pair of rail members being connected to said top step at spaced-apart points adjacent the back edge, said second pair of rail members being connected to said top step at spaced-apart points adjacent the front edge, and said top step being supported by all of said rail members to extend substantially perpendicularly in relation thereto in a deployed condition;
at least one lower step having a back edge and an opposite front edge, said first pair of rail members being connected to said lower step at spaced-apart points adjacent the back edge, said second pair of rail members being connected to said lower step at spaced-apart points adjacent the front edge, and said lower step being supported by all of said rail members to extend substantially perpendicularly in relation thereto in the deployed condition;
a plurality of upper rungs supported by said second pair of rail members to extend generally perpendicularly therebetween in vertically spaced-apart relation between said first step and said lower step in the deployed condition; and
wherein said top step is generally rectangular and defines a cavity for nested receipt of said lower step and said plurality of upper rungs in a stored condition.

4,852,689

LADDER LEVELING ACCESSORY

George T. Erion, 1251 Upland Ave., Fort Wright, Ky. 41011

Continuation-in-part of Ser. No. 896,077, Aug. 13, 1986, abandoned. This application Nov. 13, 1987, Ser. No. 120,407
Int. Cl.[4] E06C *7/44*
U.S. Cl. 182—204 2 Claims



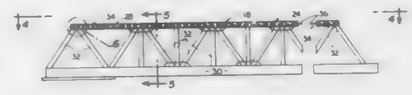
1. The combination of a ladder which includes a pair of rails, at least one hollow rung spanning the rails, and a respective foot member pivotally attached to a lower portion of each of the rails with a generally channel shaped leveling accessory slideably mounted on one of the rails, the foot member pivotally attached to the rail upon which the accessory may be slideably mounted being swingable between a ladder supporting position transversely of the said rail and a storage position extending lengthwise of the said rail, the channel shaped accessory being slideable on the rail and receiving the foot member thereof when the foot member pivotally attached to the rail is in storage position, there being a plurality of spaced openings in a web of the channel shaped accessory alignable with the rung, an elongated pin received in a selected one of the openings and extending through the hollow rung, means at end portions of the pin member outboard of the channel shaped accessory and outboard of the other rail for preventing withdrawal of the pin member through the rung and the selected opening in the accessory, whereby the pin member holds the channel shaped accessory in position and an accessory foot pivotally mounted on the accessory below the said one of the rails, the foot member of the one rail and of the accessory mounted on the other rail being arranged to support the ladder in upright position.

4,852,690

AERIAL LADDER TOWER WITH PRETENSIONED TRUSS MEMBERS

James A. Salmi, Lititz, Pa., assignor to Simon Ladder Towers, Inc., Ephrata, Pa.

Filed Dec. 5, 1988, Ser. No. 280,417
Int. Cl.[4] E06C *7/10*
U.S. Cl. 182—219 13 Claims



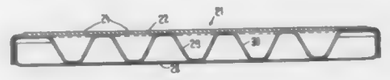
1. In a ladder tower section having a pair of longitudinally extending, laterally spaced apart truss members and a plurality of longitudinally spaced ladder rungs interconnecting said truss members, each of said truss members including an upper hand rail, a lower rung rail being spaced below said upper hand rail, and reinforcing means extending between and interconnecting said upper hand rail and lower rung rail, said ladder rungs extending between and interconnecting said rung rails of said respective truss members, the improvement which comprises:
means attached to each of said truss members so as to preload said hand rail thereof in compression and said rung rail thereof in tension such that an increase in the live load capacity of said section is achieved.

4,852,691

SCAFFOLDING BOARD FORMED FROM PLASTICS MATERIALS, A METHOD OF PRODUCING SAME, AND AN APPARATUS FOR IMPLEMENTING THE METHOD

Mueller Bruno, Grenchen, Switzerland, assignor to Polytex Plastic SA, Grenchen, Switzerland

Filed Nov. 17, 1987, Ser. No. 122,136
Claims priority, application European Pat. Off., Nov. 24, 1986, 86810534.7
Int. Cl.[4] E04G *5/08*
U.S. Cl. 182—222 7 Claims



1. A scaffolding board formed from plastics material comprising an upper panel having side flanges forming a box-shaped member and a lower reinforcing box-shaped member which is provided with longitudinal ribs, wherein the upper and lower box-shaped members are fastened together.

4,852,692

ROOFING SAFETY DEVICE

Brian J. Flaherty, Tustin, Calif., assignor to Davey Roofing, Inc., Irvine, Calif.

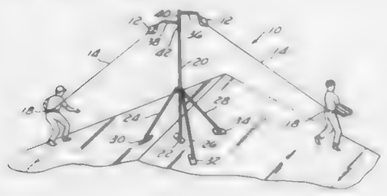
Filed Jun. 30, 1988, Ser. No. 213,772
Int. Cl.[4] A62B *35/00*
U.S. Cl. 182—231 7 Claims

1. A roofing safety device, comprising:
an axially elongate support member having a first end and a second end;
an axially elongate brace having an inner end and an outer

end, said inner end of said brace secured to said support, intermediate said first and second ends;

first and second rectangular base members, secured to said second end of said support and said outer end of said brace, respectively, said base members securable to a roof;

a pair of stabilizing struts, each having an inner end and an outer end, said struts secured to said support member, adjacent said brace, intermediate said first and second ends of said support;



a pair of rectangular feet secured to said outer ends of said struts, respectively, said feet being rotatable about a pair of non-parallel axes and securable to a roof or adjacent surface; and

at least one self-braking safety mechanism, mounted to said first end of said support, said safety mechanism adapted to attach to a roof worker so as to prevent said worker from falling off said roof.

4,852,693

LUBRICATION MONITORING APPARATUS FOR MACHINE

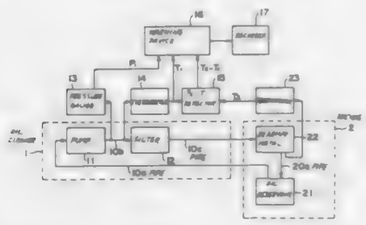
Yoshiaki Nakajima, Yono; Tadashi Suzaki, Machida, and Yoneji Wada, Urawa, all of Japan, assignors to Takano Corporation, Saitama, Japan

Filed Aug. 5, 1988, Ser. No. 229,135

Claims priority, application Japan, Aug. 18, 1987, 62-203426

Int. Cl.[4] F01M *1/18, 11/10, 9/10, 11/06*

U.S. Cl. 184—6.4 **9 Claims**



1. A lubrication monitoring apparatus for a machine comprising a pump for pumping lubricating oil with a constant flow rate from a lubricating oil reservoir of the machine, a filter for removing contaminants from lubricating oil outputted from said pump, an oil supply device for supplying lubricated mechanical section with lubricating oil cleaned by said filter, and an oil discharge device for discharging lubricating oil passed through said lubricated mechanical section to said lubricating oil reservoir, and further comprising an oil pressure gauge for detecting pressure of lubricating oil inputted from said pump to said filter, a first oil thermometer for detecting temperature of lubricating oil at an adequate position between said lubricating oil reservoir and an inlet of said lubricated mechanical section, a second oil thermometer for detecting temperature of lubricating oil in the vicinity of an outlet of said lubricated mechanical section, a differential oil temperature detecting device to obtain difference in temperature from values detected by said first and second oil thermometers, and a warning device for giving warning when any of detected values of said oil pressure gauge, said first oil thermometer, and said differential oil temperature detecting device is out of a predetermined value.

4,852,694

ELEVATOR STARTING COMPENSATION METHOD AND APPARATUS

Noboru Arabori; Hideaki Takahashi, both of Katsuta; Yoshio Sakai, Ibaraki, and Kenji Yoneda, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 19, 1988, Ser. No. 183,088

Int. Cl.[4] B66B *1/44*

U.S. Cl. 187—115 **5 Claims**



1. An elevator starting compensation method for compensating an unbalanced torque due to a difference in weight between an elevator cage and a counter weight comprising the steps of:

(a) processing parameters of an arithmetic operating equation which calculates starting compensation quantities from data related to a load obtained in a voluntary and an actual condition, said data related to said load being developed when said elevator cage is set in a predetermined light-load condition and when said elevator cage is set in a predetermined heavy-load condition;

(b) storing said arithmetic operating equation and said parameters into an electrically erasable programmable non-volatile memory;

(c) processing said starting compensation quantities based on said data related to said load obtained in said actual condition, said stored arithmetic operating equation, and said stored parameters at a starting time of operation of said elevator cage; and

(d) compensating a starting torque at said starting time in accordance with said starting compensation quantities.

4,852,695

ELEVATOR CONTROL SYSTEM

Morris Ostrowiecki, 5-21-11 Jingumae, Shibuya-ku, Tokyo, Japan

Filed Oct. 9, 1985, Ser. No. 785,804

Int. Cl.[4] B66B *1/18*

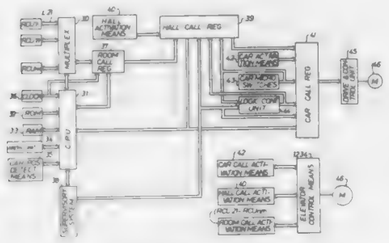
U.S. Cl. 187—121 **27 Claims**

1. An elevator control system which comprises:

an elevator car (46) for transporting people up and down in a building;

car call registering means (42) located inside the car for registering car calls from within the car; of the building for registering hall calls from the halls of the building;

room call registering means (RCU21–RCUnm) located in respective rooms of the building for registering respective room calls from the respective rooms of the building, the registered room calls indicating to the elevator control system that the person registering the room call would like to utilize the elevator car from the floor number that the room call originated from at a desired time from the time that a room call registering means is activated; and



elevator control means (1234) for controlling said car in response to the registered calls entered through said activation means.

4,852,696

INFORMATION DEVICE OF ELEVATOR

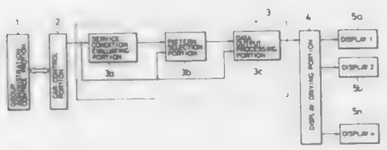
Toshio Fukuda; Kenji Yoneda; Takaaki Ueshima, and Osamu Sasaki, all of Katsuta, Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 159,221

Claims priority, application Japan, Feb. 28, 1987, 62-45652

Int. Cl.[4] B66B *3/00*

U.S. Cl. 187—139 **7 Claims**



1. An information device of an elevator which serves a plurality of floors comprising:

service information devices which are disposed at each boarding place; evaluation value arithmetic means for obtaining an evaluation value from the state of said elevator;

means for judging at least said evaluation value, and determining a type of display pattern of said service information device; and

processing means for generating picture data of said service information device in accordance with information showing said state of said elevator and said determined type of display pattern.

4,852,697

WHEELCHAIR HANDBRAKES WITH ACTUATOR TUBE AND REPLACEABLE BRAKE STOPPER

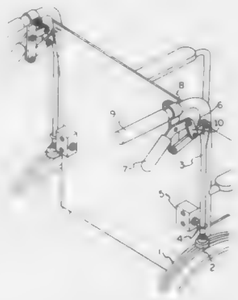
Helmut Kulik, 169 Green Pond Rd., Rockaway, N.J. 07866

Filed Jan. 4, 1989, Ser. No. 293,359

Int. Cl.[4] B60T *1/04*

U.S. Cl. 188—2 F **3 Claims**

1. A manually-operated wheelchair brake and brake locking device which enables a person pushing the wheelchair to perform auxiliary braking and brake locking functions, comprising a fixed, generally vertically oriented brake mounting bracket (8) fixedly attached at one end to a wheelchair handle(9), a brake lever arm(7) with a first end including a brake handle, and intermediate portion and a second end, the brake lever arm(7) being pivotally connected at said intermediate portion thereof to an intermediate part of said mounting bracket(8), an opposite end of said mounting bracket(8) being pivotally connected at one end of a self-locking lever mechanism(6), a brake lever actuator arm(10) pivotally connected at one of its ends to the second end of the brake lever arm(7) opposite the brake handle and the brake arm(10) pivotally connected at the other of its ends to the self-locking mechanism(6) at an intermediate location of said mechanism(6), the other end of the self-locking mechanism(6) being pivotally connected to a vertically disposed and vertically acting brake actuator tube(3), said tube(3) vertically descending from one of its ends from the other end of said self-locking mechanism(6), said actuator



tube(3) transcending down through an actuator tube guide(4) which guide is in the form of a threaded eyebolt(4) connected to the wheelchair, the other end of said actuator tube(3) including a replaceable stopper(2) which brakes or engages and locks the upper arcuate or circumferential surface of the rear wheel(1) of the wheelchair when said brake lever arm(7) is placed in a locking position and disengages when said brake lever arm(7) is in a non-locking position wherein the brake device is generally perpendicular to the plane of rotation of the wheel.

4,852,698

SIDE-PULL TYPE CALIPER BRAKE

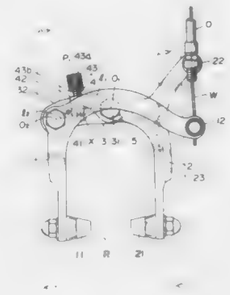
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Nov. 25, 1988, Ser. No. 276,387

Claims priority, application Japan, Nov. 27, 1987, 62-181241[U]; Nov. 27, 1987, 62-181242[U]; Nov. 27, 1987, 62-181243[U]

Int. Cl.[4] B62L *1/16*

U.S. Cl. 188—24.19 **5 Claims**



1. A side-pull type caliper brake provided with a pair of brake arms having brake shoes and operating portions respectively, a fixing member having a pivot shaft and a support arm disposed at one radial side of said pivot shaft and extending

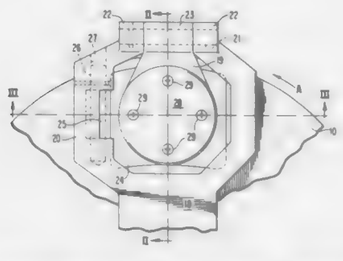
reversely to the position where said operating portion at each of said brake arms is disposed, and a return spring, so that one of said brake arms is pivoted to said pivot shaft, the other of said brake arms is supported to said support arm, between said brake arms is provided an association mechanism having an adjusting screw bolt having a rotary operating portion, the pivot position of said brake arm pivoted to said support arm is displaced toward said brake shoe with respect to a horizontal line passing the axis of said pivot shaft, a straight line connecting said pivot position and the axis of said pivot shaft inclines with respect to said horizontal line, said adjusting screw bolt is disposed perpendicularly to said inclining straight line, and said rotary operating portion of said adjusting screw bolt is positioned apart from said pivot shaft with respect to the utmost end of said adjusting screw bolt.

4,852,699

DISK BRAKE ASSEMBLY

Dean C. Karnopp, and Yoshiyuki Yasui, both of Davis, Calif., assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Mar. 31, 1987, Ser. No. 32,255
Int. Cl.[4] F16D *55/224, 65/21, 63/00*
U.S. Cl. 188—72.2 **8 Claims**



1. A disk brake assembly comprising first and second brake pads having planar faces adapted to frictionally engage opposite planar faces of a rotatable brake disk, means for supporting said first brake pad laterally of a first face of said brake disk for pivotable movement about a first fixed axis disposed in a plane space from and parallel to one said first planar face of said brake disk, said fixed axis disposed substantially normal to a plane containing a line tangent to the periphery of said brake disk at a point located substantially near the top of said brake disk, said first brake pad pivotable about said fixed axis into and out of engagement with the brake disk such that only said first brake pad initially engages the brake disk only at the upstream edge of said first brake pad, a reversible electric motor, and drive means responsive to the actuation of said motor for moving said first brake pad about said fixed axis into and out of engagement with the brake disk.

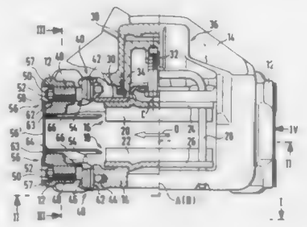
4,852,700

SPOT-TYPE DISK BRAKE

Helmut Heibel, Moschheim, Fed. Rep. of Germany, assignor to Lucas Industries public limited company, Birmingham, England

PCT No. PCT/EP87/00755, § 371 Date May 31, 1988, § 102(e) Date May 31, 1988, PCT Pub. No. WO88/04375, PCT Pub. Date Jun. 16, 1988
PCT Filed Dec. 4, 1987, Ser. No. 222,912
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1986, 8632646; Dec. 9, 1986, 8632995
Int. Cl.[4] F16D *65/14*
U.S. Cl. 188—73.43 **6 Claims**

1. Spot-type disk brake comprising
a brake support (12) which engages over a brake disk (10),
a floating caliper (14) which on a first side of the brake disk (10) comprises an actuator (36) with a piston (34),
a first brake pad (16) which is arranged on the first side of the brake disk (10) and actuable by the piston (34),
a second brake pad (18) which is arranged on the second side of the brake disk (10) and is actuable by displacement of the floating caliper (14), and
slide guides (40) for supporting the piston (34) on the brake support (12) on the first side of the brake disk (10) and for supporting the floating caliper (14) on the brake support (12) on the second side of the brake disk (10), the slide guides (40) being formed in each case by
a guide body (42) comprising a groove (46) at least approximately parallel to the axis (A) of the brake disk (10),
a threaded pin (48) which extends transversely of the axial



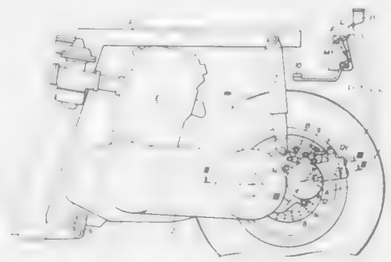
centre plane (B) of the brake and engages into the groove (46) and
a sealing sleeve (54) which protects the parts of the guide body (42) and threaded pin (48) co-operating with each other from soiling and is protected by a heat shield (66) arranged between it and the brake disk (10), characterized in that
there is associated with at least one of the threaded pins (48) an anti-rotation lock securing the pin against turning and which comprises a mounting member (56) secured to the brake support (12), and
the heat shield (66) provided for protecting the sealing sleeve (54) of said threaded pin (48) is carried by the mounting member (56).

4,852,701

REAR WHEEL BRAKING SYSTEM FOR MOTORCYCLE

Goroei Wakatsuki, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1988, Ser. No. 247,750
Claims priority, application Japan, Sep. 25, 1987, 62-241896
Int. Cl.[4] B60J *8/34*
U.S. Cl. 188—181 A **3 Claims**



1. A rear wheel braking system for a motorcycle in which an axle connected to a hub of a rear wheel of the motorcycle is rotatably supported at a rear end of a transmission case rearwardly extending from one side of an engine supported on a body frame, and a transmission connected to a crankshaft of

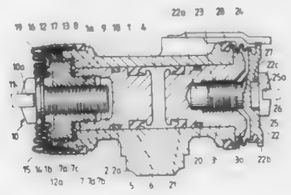
said engine and a gear type deceleration unit connecting an output shaft of said transmission to said axle are accommodated in said transmission case, said rear wheel braking system comprising a master cylinder operated by a driver, a brake operated by an output hydraulic pressure of said master cylinder so as to apply a braking force to said rear wheel, and an antilock controlling device equipped therein with an inertia type wheel deceleration sensor which is operatively connected to said rear wheel so as to control a braking hydraulic pressure in response to an output of said wheel deceleration sensor, a casing for accommodating said antilock controlling device being mounted on said transmission case and a pinion coupled to a driving shaft of said sensor being meshed with a final gear of said deceleration unit.

4,852,702

AUTOMATIC ADJUSTER FOR OPERATION GAP OF BRAKE

Kiyokazu Kaneko, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed May 12, 1988, Ser. No. 193,039
Claims priority, application Japan, May 14, 1987, 62-115888
Int. Cl.[4] F16D *65/56*
U.S. Cl. 188—196 D **11 Claims**



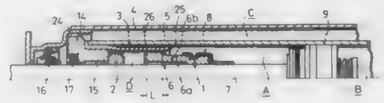
1. An automatic adjuster for the operation gap of a brake, comprising:
a piston slidably fitted in a cylinder, said piston being provided with a recess at the outer end thereof;
an adjusting nut supported by the outer end of said piston, said adjusting nut being rotatable relative to said piston, said adjusting nut being provided with a small-sideout-diameter portion, a large-sideout-diameter portion and a annular step, said small-sideout-diameter portion being rotatably mounted in said recess of said piston, said annular step contacting the end of said piston and the cylinder;
an nonrotatable adjusting screw means supporting a brake friction member at the outer end of said screw means, said screw means being engaged with the internal thread of said nut at the external thread to form a non-reversible screw-thread connection, said adjusting screw and said adjusting nut cannot rotate relative to each other by any force acting to said nonreversible screw-thread connection in the axial direction thereof;
a drive screw means connected to said cylinder through a friction clutch and engaged with the external thread of said nut at the internal thread to form a reversible screw-thread connection which has a backlash corresponding to said operation gap, said drive screw means and said adjusting nut can rotate relative to each other by a force acting to said reversible screw-thread connection in the axial direction thereof, said drive screw being threadable mounted on said large-sideout-diameter portion of said adjusting nut; and
an elastic pressure means for elastically pushing said drive screw means in the axial direction thereof to urge the engagement of said clutch.

4,852,703

SHOCK ABSORBER

Yukio Nishimoto, Gifu, Japan, assignor to Kayaba Kogyo K.K, Japan

Filed Jul. 6, 1988, Ser. No. 215,577
Claims priority, application Japan, Jul. 31, 1987, 62-117749
Int. Cl.[4] F16F *9/34*
U.S. Cl. 188—284 **8 Claims**



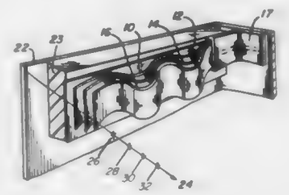
1. A shock absorber comprising:
(a) a combined cylinder composed of concentric inner and outer cylinders defining therebetween a reservoir, said inner cylinder communicating with said reservoir via first damping means;
(b) a piston rod having at one end a piston movably received in said inner cylinder, said piston having second damping means;
(c) a sub-cylinder mounted in said inner cylinder at one end thereof;
(d) a rebound cushion mounted in said sub-cylinder at one end thereof; and
(e) an oil-lock piston fixedly mounted on a periphery of said piston rod and having an annular gap in confronting relation to an interior of said sub-cylinder, said annular gap being adapted to form an annular choke orifice when rebounding, said oil-lock piston having a small-diameter hole for allowing a bypass flow to said annular gap.

4,852,704

ENERGY ABSORPTION AND BARRIER DEVICE FOR AUTOMOTIVE VEHICLES AND METHOD FOR MAKING THE SAME

Roger L. Brockenbrough, Scott Township, Allegheny County, Pa., and Donald L. Douty, Oakland County, Mich., assignors to USX Corporation, Pittsburgh, Pa.

Filed Jan. 6, 1988, Ser. No. 141,176
Int. Cl.[4] F16F *7/12*
U.S. Cl. 188—376 **6 Claims**



1. An energy absorption and barrier device for automotive vehicles, said device comprising:
(a) a plurality of elongated sheet metal strips mounted in stacked relation and each having a corrugated sinusoidal shape in said elongated direction thereof, and
(b) means for securing only the opposed narrow ends of said sheet metal strips together at fixed spaced locations to a support surface of said vehicle, each of said elongated sheet metal strips having a plurality of spaced nodes occurring at substantially the same locations in the longitudinal direction as those on the other of said strips, said nodes being plastically deformed portions of the strips which retain a corrugated shape after forming, the longitudinal edges of the nodes of said strip which extend in a trans-

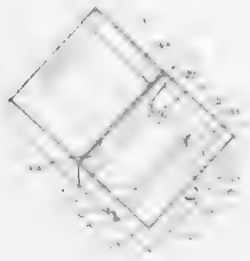
verse direction to the longitudinal axes of the corrugations being not secured together, corresponding nodes on said sheet metal strips having maximum depths in the transverse direction increasing in degree from said one of the strips adjacent to a direction from which impact to be received to the other of said strips remote therefrom such that the total length of said strips in the node portions thereof also increases in the same order as the depth of said nodes, said device not having a flat retaining strip on the side thereof remote from that on which impact is to be received whereby said strips will have fracture absorption energies increasing in said order at increased deflection distances with respect to said direction from which impact is to be received.

4,852,705

CASE WITH EXTENDABLE WHEELS AND HANDLE

Samuel C. Cowan, Jr., Route 2, Box 94, Granbury, Tex. 76048

Filed Jul. 22, 1988, Ser. No. 223,165
Int. Cl.[4] A45G *5/14*
U.S. Cl. 190—18 A 5 Claims



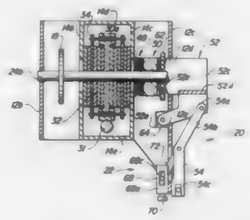
1. A transportable case of for carrying items:
a main wall having side walls extending therefrom forming a container,
two of said side walls being located on opposite sides of said main wall,
two spaced apart opening means formed through said main wall near one of said two side walls,
means located near said one side wall for rotatably supporting an elongated rod means,
said rod means having two opposite ends extending into said two opening means respectively,
two arm means coupled to said two opposite ends of said rod means respectively and extending transversely from the axis of the rod means,
two wheels rotatably coupled to said two arm means respectively,
said rod means being rotatable to first and second positions to locate said two wheel means in said two opening means respectively for storage purposes and out of said two opening means respectively for use for rotatably supporting said case on the ground, floor, or the like,
linkage arm means coupled to said rod means between said two opposite ends and extending transversely from the axis of said rod means,
a linkage having a first end pivotally coupled to said linkage arm means and a second end extending toward the other of said two side walls,
guide means located within the walls of said case,
a tubular handle slideably coupled to said guide means for movement between inner and outer positions,
said second end of said linkage extending into said tubular handle through a first end thereof,
an opening formed through said other of said two side walls for receiving the other end of said tubular handle,
in said inner position of said handle, a substantial portion of said handle being located within the walls of said case,
in the outer position of said handle, the other end of said handle extends through said handle opening such that a substantial portion of said handle extends outwardly of the walls of said case,
means located at said first end of said tubular handle for engaging said second end of said linkage for moving said linkage toward said other of said two walls when said handle is moved to said outer position for causing said rod means to be rotated toward said second position for moving said two wheels out of said two opening means respectively,
handle locking means for releasably locking said handle in said inner position and in said outer position, and
means for urging said rod means to said first position when said handle is in said inner position for maintaining said wheels into said two opening means for storage purposes.

4,852,706

GATE OPERATOR

Edward Pietrzak, 3612 Cummings, Berkley, Mich. 48072, and James M. Ihm, 22317 St. Gertrude, St. Clair Shores, Mich. [illegible]

Filed Sep. 2, 1987, Ser. No. 92,240
Int. Cl.[4] F16D *7/02*
U.S. Cl. 192—8 R 24 Claims



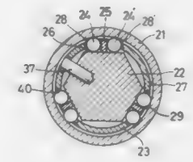
1. An operator mechanism for a gate comprising:
A. an electric motor;
B. a drive shaft driven by said motor;
C. a drive member on said drive shaft for driving the gate;
D. a clutch interposed between said motor and said drive shaft;
E. a clutch operator member operative in response to macro movement thereof to engage and disengage said clutch and operative in response to micro movement thereof with the clutch engaged to adjust the load at which said clutch slips;
F. disconnect means operative to impart macro movement to said operator member to engage and disengage said clutch; and
G. adjustment means including a selectively movable adjustment member remote from said clutch and from said clutch operator member and operative independently of the operation of said disconnect means and in response to selective movement of said adjustment member to impart micro movement to said operator member proportionate to the movement of said adjustment member to selectively adjust the load at which the engaged clutch slips.

4,852,707

REVERSIBLE SELF-LOCKING CLUTCH

Kenichiro Ito; Hiromi Nojiri, and Kenro Adachi, all of Iwata, Japan, assignors to NTN Toyo Bearing Co., Ltd., Osaka, Japan

Filed Sep. 7, 1988, Ser. No. 241,283
Claims priority, application Japan, Sep. 8, 1987, 62-224493
Int. Cl.[4] F16D *15/00, 67/00*
U.S. Cl. 192—44 4 Claims



1. A clutch, comprising:
an outer member;
an inner member mounted in said outer member;
one of said outer member and said inner member being formed with a cam surface and the other being formed with a cylindrical surface;
a cage interposed between said outer member and said inner member and formed with a plurality of pockets angularly spaced from one another;
a plurality of pairs of rolling elements mounted in each of said pockets;
a plurality of wedge-like spaces defined by the inner peripheral surface of said outer member and the outer peripheral surface of said inner member, and wherein walls of said pockets being formed in said cage;
a spring mounted in each of said pockets between said pair of rolling elements so as to bias said rolling elements away from each other into said wedge-like spaces; and
means for causing said cage to engage said one member formed with a cam surface with a first clearance in the direction of rotation,
wherein said one member formed with a cam surface being adapted to be brought into engagement with said other member formed with a cylindrical surface through only one rolling element of each of said pairs of rolling elements when said cage moves with respect to said one member formed with a cam surface, wherein a second clearance is formed between said rolling element and said wall of said pocket in the direction of rotation, wherein said first clearance is larger than said second clearance, wherein at least one of said inner member and said outer member which is formed with a cylindrical surface is drivingly connected to a first driving means, wherein said cage is drivingly connected to a second driving means, and wherein said one member formed with a cam surface is connected to a driven unit.

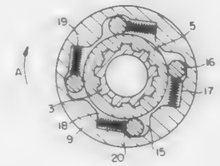
4,852,708

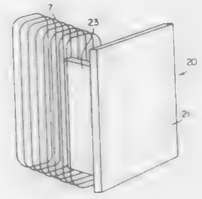
SPRING SHIELD FOR STARTER DRIVES FOR INTERNAL COMBUSTION ENGINES

Charles Parkhurst, 1282 Pitt River Road, Port Coquitlam, British Columbia, Canada V3C 1N7

Filed Mar. 24, 1988, Ser. No. 173,180
Int. Cl.[4] F16D *23/00*
U.S. Cl. 192—45 4 Claims

1. In a starter drive for internal combustion engines said starter drive having an overrunning clutch comprising a driving member concentric with and around a driven, member said driven member having a cylindrical outer surface, a plurality of cylindrical rollers housed within recesses formed in said driving member, each roller being biassed by a rectangular coil spring, the improvement comprising a shield of durable material positioned between the end of said spring and a surface of said roller wherein said shield comprises:
(a) a rectangular face having dimensions greater than or equal to the rectangular cross-sectional shape of said spring, and comprising a durable material no harder than said roller; and





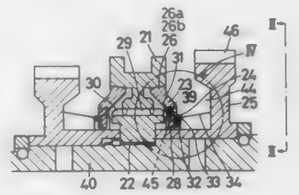
(b) a projection connected to said face and received in a central opening of one end of said spring and having a length less than the length of said spring when said spring is in its state of maximum operating compression.

4,852,709

SYNCHRONIZING APPARATUS FOR A POWER TRANSMISSION

Yuichi Fukuhara, Toyoake, and Tetsuo Ikeda, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Mar. 28, 1988, Ser. No. 174,437
Claims priority, application Japan, Mar. 31, 1987, 62-078981
Int. Cl.[4] F16D *23/06*
U.S. Cl. 192—53 F 3 Claims



1. A synchronizing apparatus for a power transmission, comprising:
a shaft for rotation in response to a power source;
a clutch hub fixed to the shaft for rotation therewith, the hub including an outer spline thereon;
sleeve means including an inner spline for engaging the outer spline of the clutch hub, and having an inner frictional face radially outward from the inner spline;
gear means rotatably mounted on the shaft including an outer spline surface having first and second grooves therein, and a circular groove between the first and second grooves; the spline surface also having a pair of adjoining sloped portions thereon, each having a different degree of slope;
synchronizing ring means including an outer frictional sur-

face for frictional contact with the inner frictional face, and an inner projection for engaging the outer spline surface of the gear means;

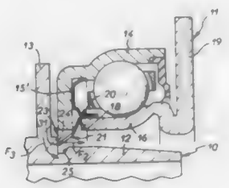
spring means mounted in the circular groove for movement along the two sloped portions of the outer spline surface for biasing the ring means toward the sleeve means.

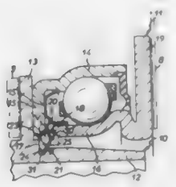
4,852,710

CLUTCH RELEASE BEARING WITH BISTABLE SPRING WASHER

Christian Gay, Paris, and Philippe Lassiaz, Boulogne, both of France, assignors to Valeo, Paris, France

Filed Dec. 4, 1987, Ser. No. 128,823
Claims priority, application France, Dec. 5, 1986, 8617046
Int. Cl.[4] F16D *23/14*
U.S. Cl. 192—98 17 Claims





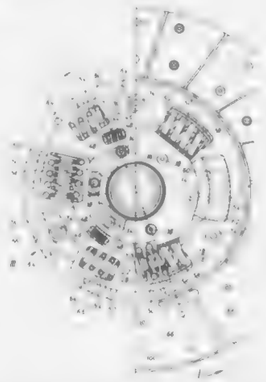
1. A clutch release bearing comprising a maneuvering member adapted to be operated on by a control member, said clutch release bearing having an axis, a drive member in direct or indirect axial bearing engagement with said maneuvering member and having a portion cooperable, when operated on by said maneuvering member, with a clutch release device, and a Belleville type axially acting spring washer for urging said drive member against said maneuvering member and retaining in the axial direction said drive member relative to said maneuvering member, said spring washer being selectively movable between respective operative and inoperative stable configurations, one of the configurations being concave and the other being a convex configuration, one peripheral edge of said spring washer bearing axially on said drive member in the operative configuration and another peripheral edge of said spring washer having at least one lug for bearing on said maneuvering member, said at least one lug defining a dihedral angle with the rest of said spring washer, said maneuvering member including a circumferential groove cooperable with said at least one lug, said groove having one flank defining an abutment for said at least one lug in the inoperative configuration of said spring washer and another flank for supporting said at least one lug in the operative configuration of said spring washer, the dihedral angle being substantially the same for both of said spring washer configurations.

4,852,711

CLUTCH DISC

Seiichi Kitano, Shijonawate, and Toshiki Yamaguchi, Takatuki, both of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

PCT No. PCT/JP87/00474, § 371 Date Feb. 19, 1988, § 102(e) Date Feb. 19, 1988, PCT Pub. No. WO88/00659, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 6, 1987, Ser. No. 168,130
Claims priority, application Japan, Jul. 10, 1986, 61-106258[U]
Int. Cl.[4] F16D *13/46, 13/64*
U.S. Cl. 192—107 C 4 Claims



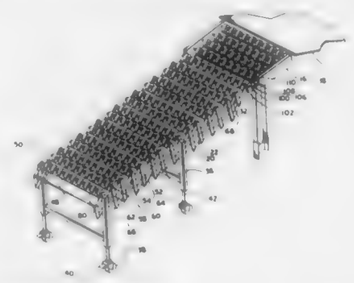
1. A clutch disc having a disc-like hub flange extending in a radially outer peripheral direction of a spline hub, side plates at the opposite sides of said hub flange, a circumferentially divided cushioning plate fastened to a radial outside of one of said side plates, friction facings secured to the opposite sides of said cushioning plate, and a stop pin circumferentially connecting said side plates at the cushioning plate fastening portions of said one of said side plates, a stepped coined section at the stop pin fitting part of said one of said side plates, an outer peripheral part of said one of said side plates to which said cushioning plate is fastened being formed into a conical shape, said cushioning plate being inclined relative to said one of said side plates.

4,852,712

CONVEYOR

John W. Best, Jonesboro, Ark., assignor to Northstar Industries, Inc., Columbus, Ga.

Filed Sep. 21, 1987, Ser. No. 99,152
Int. Cl.[4] B65G *13/00*
U.S. Cl. 193—35 TE 25 Claims



1. A conveyor comprising:

(a) a plurality of lazy tong structures each comprising a plurality of bars connected to each other;

(b) a plurality of roller support braces, each spanning two lazy tong structures and connected to two corresponding bars in the lazy tong structures and, for each brace:

(i) a plurality of roller supports connected to the brace;

(ii) an axle extending through the roller supports on the brace and connecting two bars in each lazy tong structure; and

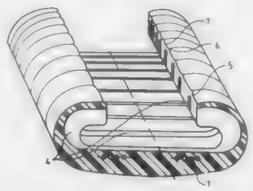
(iii) a skate-wheel conveyor roller rotatably mounted on each roller support and supported by the roller support and the axle.

4,852,713

ESCALATOR HAND-RAIL MADE OF ELASTIC MATERIAL

Ilona Tatai; Gusztáv Gündisch; László Palotás, and Gyula Subotics, all of Budapest, Hungary, assignors to Taurus Gumilpari Vallalat, Hungary

Filed May 28, 1987, Ser. No. 55,076
Int. Cl.[4] B66B *23/00*
U.S. Cl. 198—337 7 Claims



1. Reinforced "C" profiled moving hand-rail made of elastic material particularly for use with escalators, moving pavement and the like, said hand-rail comprising side portions having inner and outer surfaces, said hand-rail is injection mou!ded from polyurethane, foamed polyurethane or a synthetic material possessing similar physical characteristics so that at least one of the inner and outer surface of side parts of the hand-rail is lamellated, the other one of said inner and outer surface opposite the lamellated surface is wave-shaped and the hand-rail in a neutral or stress free zone generally at a central part of the hand-rail is provided with reinforcing steel wire insert extending in the longitudinal direction, wherein said inner surface is formed by a plurality of indentations having an open outer and a closed inner end, and being made in said surface transversely with respect to the longitudinal direction of said hand-rail and formed in a series sequence along said longitudinal direction with a predetermined distance between adjacent indentations, wherein opposite said inner ends of said indentations said lamellated surface forming wave crests and between adjoining indentations said lamellated surface forming wave troughs.

4,852,714

ACCUMULATOR TABLE

Nicholas J. Faber, Jr., Raleigh, N.C., assignor to Bristol-Myers Company, New York, N.Y.

Filed Sep. 19, 1988, Ser. No. 246,701
Int. Cl.[4] B65G *1/00*
U.S. Cl. 198—347 6 Claims

1. An accumulator table for use with items to be processed, said accumulator table comprising:

a horizontal table surface;

means for rotating said table surface in a predetermined direction about an axis perpendicular to said table surface;

a substantially circular peripheral retaining member spaced above and generally parallel to said table surface, the axis of said circular retaining member being coincident with said axis of rotation of said table surface;

a first elongated guide means spaced above and parallel to said table surface, said first guide means pivotable about a first axis parallel to said axis of rotation of said table surface and spaced a first predetermined distance therefrom;

a second elongated guide means spaced above and parallel to said table surface, said second guide means pivotable about a second axis parallel to said axis of rotation of said

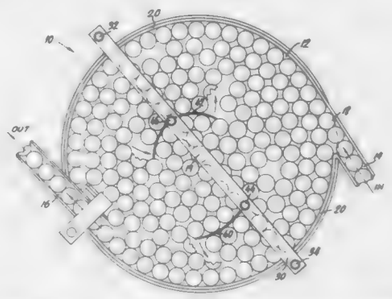


table surface and spaced a second predetermined distance therefrom; and

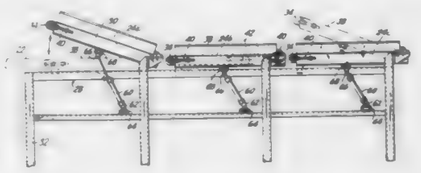
means for biasing said first and second guide means relative to their respective axes in a direction opposite said predetermined direction of rotation.

4,852,715

CONVEYOR SYSTEM FOR DOCUMENT-TYPE PACKAGE DISTRIBUTION

Joseph J. Kmetz, Huntington, Conn., assignor to London & Egazarian Associates, Inc., Rye Brook, N.Y.

Filed Nov. 18, 1987, Ser. No. 122,258
Int. Cl.[4] B65G *37/00*
U.S. Cl. 198—370 10 Claims



1. A conveyor system for distributing generally flat articles uniformly at an article pick-up location in a sorting conveyor installation, comprising:

slide means forming a slide surface, for receiving generally flat articles landing on said slide surface and directing the landed articles to an article pick-up area;

feed conveyor means for delivering articles to an associated feed end in the vicinity of said slide means;

first pivot conveyor means having an upstream end and a downstream end, wherein said first pivot conveyor means is mounted for swinging movement about an axis located in the vicinity of its downstream end; and

first pivot drive means for swinging said first pivot conveyor means between a first position at which its upstream end confronts the feed end associated with said feed conveyor means to receive articles and said first pivot conveyor means conveys the received articles to its downstream end, and a second position at which its upstream end is raised a certain height above said feed end;

wherein the feed end associated with said feed conveyor means is positioned over a first landing portion of said slide surface, and the downstream end of said first pivot conveyor means is positioned over a second landing portion of said slide surface, so that when said first pivot conveyor means is at said first position, articles delivered to the feed end associated with said feed conveyor means are received and conveyed by said first pivot conveyor means to land on a portion of said slide surface other than said first landing portion, and when said first pivot con-

veyor means is at said second position, articles delivered to said feed end drop freely to land on the first landing portion of said slide surface; and

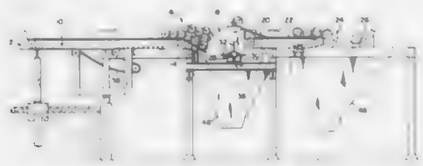
wherein said feed conveyor means includes clutch/brake means for momentarily halting movement of said feed conveyor means just before said first pivot conveyor means drops from its second position to its first position, in response to a halt command signal, so that articles delivered to said feed end are not caught between said feed end and the upstream end of said first pivot conveyor means.

4,852,716

APPARATUS FOR SEPARATING LOGS

James B. Roche, 6828 S.R. 92, Lake Stevens, Wash. 98258

Continuation of Ser. No. 303,951, Sep. 21, 1981, abandoned. This application Sep. 5, 1985, Ser. No. 773,354
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—443 12 Claims



1. An apparatus for separating logs from a bundle and for feeding the logs singly to a debarker, comprising:

(a) an input conveying means to receive a bundle of logs;

(b) a revolving drum having a solid cylindrical periphery and a plurality of fixed, rigid flights having a pitched surface projecting outwardly from the periphery of the drum at an acute angle, wherein the longitudinal axis of the drum is disposed substantially perpendicular to the direction of movement of the input conveying means and wherein each flight is capable of conveying logs from the input conveying means as the drum revolves;

(c) a downwardly pitched collection ramp between the input conveying means and the drum to serve as a catch for incoming bundles of logs wherein the downward pitch is sufficient to position the end of the ramp substantially in a horizontal plane containing the axis of the drum;

(d) means for receiving each log as each log leaves the drum;

(e) means for conveying each log away from the drum and means for receiving each log to ensure a single layer of logs, each log being properly disposed for entry to a debarker conveyor; and

(f) stop and loader means to load each log of the single layer, in turn, to a debarker conveyor.

4,852,717

COMPUTER CONTROLLED LIGHT CONTACT FEEDER

Jeffrey L. Ross, Pulaski, and James W. Krueger, Green Bay, both of Wis., assignors to FMC Corporation, Chicago, Ill.

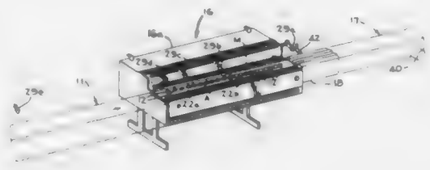
Filed Nov. 12, 1986, Ser. No. 929,457
Int. Cl.[4] B65G *47/31*
U.S. Cl. 198—462 12 Claims

1. A light contact feeder for receiving randomly spaced articles from a supply conveyor, lightly abutting the articles and delivering a single article or a plurality of articles to an article processing machine, having an article processing machine flighted conveyor, at a spacing to match said flighted conveyor on said article processing machine, said feeder comprising:

a master digital position encoding means coupled to said article processing machine for providing information relating to position and velocity of said flighted conveyor on said article processing machine;

an article metering conveyor for delivering said articles to said processing machine;

a metering motor means coupled to said master encoding means and to said metering conveyor for operating said metering conveyor at a predetermined position and velocity relative to said flighted conveyor of said article processing machine;



an accumulator conveyor for delivering said articles to said article metering conveyor; and

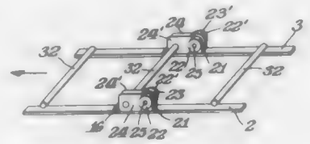
means responsive to the relative spacing of articles on said accumulator conveyor for automatically varying the speed of said accumulator conveyor so as to maintain said articles in substantially end-to-end abutting relationship on said metering conveyor while substantially minimizing excessive contact pressure between said articles.

4,852,718

CONVEYOR SYSTEM

Uwe Kunstmann, Robdorb, Fed. Rep. of Germany, assignor to Carl Schenck AG, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 114,208
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1987, 87101561
Int. Cl.[4] B65G *37/00*
U.S. Cl. 198—465.3 8 Claims



1. Conveyor apparatus comprising a pair of parallel conveyor belts trained around a plurality of guides for movement along a path of travel, spaced apart elastic rubber axle mounts secured to the conveyor belts, a roller mount rotatably secured to each of the elastic rubber axle mounts and generally extending rearwardly from the mounts, each roller mount having spaced apart generally parallel side walls, support rollers rotatably secured to the roller mount on the outside of the sidewalls thereof, and a retaining roller also rotatably secured to the roller mount but between the side walls thereof, the retaining roller supportingly engaging articles for transport along a path of travel and rotating freely underneath stalled accumulated articles.

2. Conveyor apparatus as in claim 1 wherein the roller mounts on each conveyor belt are transversely opposite the roller mounts on the other belt, and connecting rods transversely extending between opposite roller mounts.

4,852,719

MODULAR SCREW CONVEYOR

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation of Ser. No. 888,282, Jul. 24, 1986, abandoned, which is a continuation of Ser. No. 537,345, Sep. 29, 1983, abandoned. This application Jan. 27, 1988, Ser. No. 149,912
Int. Cl.[4] B65G *33/32*
U.S. Cl. 198—666 15 Claims



1. A screw conveyor composed of a plurality of like modules mated end-to-end, each of said plurality of modules being integrally molded and each of said plurality of modules comprising:

a central tube having first and second ends and an opening extending therethrough between said first and second ends, said opening having a non-circular cross section;

a helical web disposed around the outer surface of said central tube and integrally formed thereto, said helical web having a predetermined length and first and second ends extending axially outwardly of said first and second ends of said central tube, respectively, by a predetermined length;

said first and second ends of said central tube having means for sealingly engaging adjacent ones of said plurality of like modules as mated end-to-end to form said screw conveyor to provide helical screw conveying surfaces disposed around an effectively continuous central tube;

said first and second ends of said helical web having means for confronting corresponding means on adjacent ones of said plurality of like modules as mated end-to-end to form said screw conveyor to provide helical screw conveying surfaces disposed around an effectively continuous central tube;

a tensile member extending through said openings of said effectively continuous central tube of said plurality of like modules mated end-to-end to form said screw conveyor, said tensile member having a non-circular cross section corresponding to said non-circular cross section of said opening of said central tube; and

means for securing ends of said tensile member with respect to end ones of said plurality of like modules to maintain said plurality of like modules mated end-to-end in compressive mated engagement.

4,852,720

POSITIVE DRIVE HELICAL CONVEYOR SYSTEM

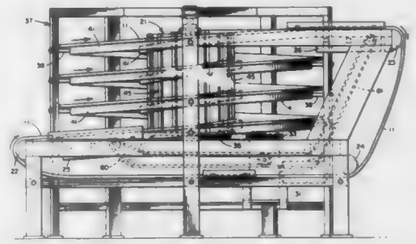
Gerald C. Roinestad, Winchester, Va., assignor to Ashworth Bros., Inc., Falls River, Mass.

Continuation-in-part of Ser. No. 780,790, Sep. 27, 1985, Pat. No. 4,741,430. This application May 3, 1988, Ser. No. 189,927
Int. Cl.[4] B65G *21/18*
U.S. Cl. 198—778 26 Claims

3. A conveyor system comprising an endless flat belt having a plurality of links connected together by a plurality of transverse rods and adapted for alternate collapse and expansion relative to said rods along at least one edge of said belt to permit passage of the belt around lateral curves, with said rods extending radially in said curves, said rods having heads protruding from said links along said belt edge,

means to support said belt for passage through an endless path including a helical portion extending through a plurality of vertically spaced loops with the belt curved laterally in each of said loops, an approach portion leading into the first loop at one end of said helical portion and an exit portion leading away from the last loop at the other end of said helical portion,

primary drive means having drive surfaces engaging spaced ones of said rod heads in positive driving relationship at a plurality of circumferentially spaced places along a radially inner edge of said belt in each of said loops to positively drive said radially inner edge at the same speed as said driving surfaces, said rods transferring the driving force to the radially outer portions of said belt, said primary drive means including means at predetermined vertically spaced locations along said driving surfaces to effect



controlled release of said positive driving engagement with the driven rod heads at said locations to permit said released positive driving engagement to be re-established with an adjoining rod head,

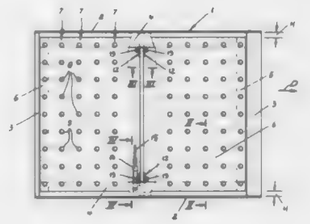
secondary drive means synchronized with said primary drive means to maintain a substantially fixed length of belt extending between said one end and said other end of said helical portion to enable said belt to be positively driven smoothly through said loops by said primary drive means under substantially minimal tension and substantially minimal driving pressure exerted by said primary drive means.

4,852,721

BALL-TYPE CONVEYOR

Volker Stille, Baunatal, Fed. Rep. of Germany, assignor to Lödige Fördertechnik GmbH, Friedrich-Böhlen-Str., Fed. Rep. of Germany

Filed Sep. 28, 1987, Ser. No. 101,683
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1986, 3637003
Int. Cl.[4] B65G *13/02*
U.S. Cl. 198—782 11 Claims



1. A conveyor comprising:

a stationary support frame;

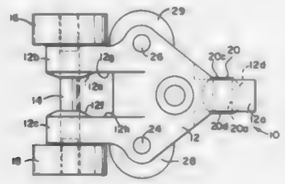
a plate on the support frame formed with a plurality of generally parallel rows of holes extending transversely of a longitudinal transport direction;

a respective shaft underneath and substantially parallel to each row of holes, the shafts being journaled in the support frame for rotation about respective transverse axes;

respective balls in the holes each projecting upward through the respective hole beyond the plate and downward

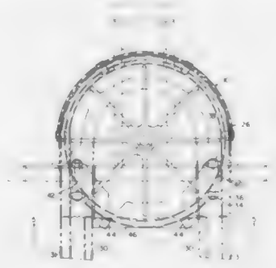
through the respective hole into engagement with the shaft of the respective row;
means for rotating the shafts about the respective axes and thereby rotating the balls to displace an object resting on the balls in the longitudinal transport direction;
means including a guide for displacement of the plate and the balls transversely but not longitudinally of the direction through a predetermined transverse distance relative to the shafts and frame; and
control means for transversely displacing the plate and balls through the distance relative to the shafts and frame.

4,852,722
SINGLE GRIPPER CONVEYOR SYSTEM
J. D. Houseman, Lake Saint Louis, Mo., assignor to Quipp Incorporated, Miami, Fla.
Continuation of Ser. No. 831,186, Feb. 20, 1986, Pat. No. 4,746,007. This application Dec. 21, 1987, Ser. No. 136,745
The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.
Int. Cl.[4] B65G *29/00*
U.S. Cl. 198—803.7 6 Claims



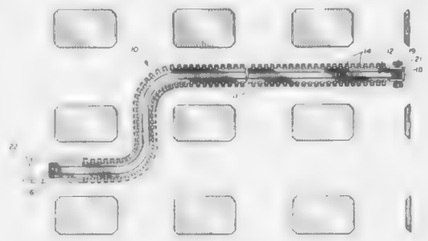
1. Interconnecting members for a gripper conveyor system each being adapted to support a gripper assembly and being comprised of:
a solid unitary, one-piece body formed of a plastic material and having a main body portion;
an integral pair of arms extending in a first direction from said body portion, each arm having an opening;
said openings being substantially coaxially aligned for receiving a linking pin;
the opposite end of said main body portion having an integral projection for positioning in the gap space between the pair of arms of an adjacent interconnectintg member;
said integral projection being a single arm having a substantially spherical-shaped cavity communicating with coaxially aligned openings on opposite sides of said single arm;
a substantially spherical-shaped metallic member being embedded in and slidably encased within said spherical-shaped cavity, forming a ball and socket assembly whereby said ball directly slidably engages the surface of said spherical-shaped cavity enabling said ball to be freely slidable within said cavity to eliminate the need for a conventional independent socket, said ball and said socket each providing a through-opening for receiving said linking pin;
said spherical-shaped ball rotatably supporting an adjacent interconnecting member mounted on said linking pin and enabling the linking pin to swivel in mutually perpendicular directions;
the ends of said linking pin extending beyond the outer ends of said pair of arms;
a roller being rotatably mounted upon each end of said linking pin; and
means for securing said rollers against axial movement on said linking pin.

4,852,723
GUARD FOR CONVEYOR TURNS
Daniel S. Ellens, Brighton, Mich., assignor to Jervis B. Webb Company, Farmington Hills, Mich.
Filed Apr. 26, 1988, Ser. No. 186,356
Int. Cl.[4] B65G *21/00*
U.S. Cl. 198—860.5 6 Claims



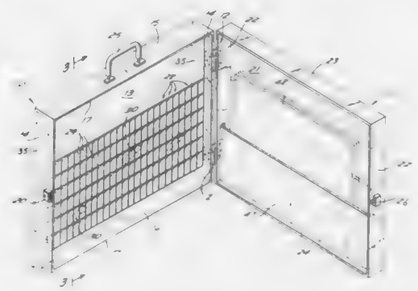
1. A guard for a turn in a conveyor having a track, trolleys supported by the track, and an endless chain connected to the trolleys in vertically spaced relation therewith, said turn including a curved section in the track at which the chain is guided by engagement with the periphery of a rotatable circular member through an arc of a desired length, said guard comprising:
a circular cover portion having a circumferential edge whose diameter is greater than the diameter of said rotatable member, and a skirt formed integrally with said cover portion, said skirt extending from said circumferential edge in generally perpendicular relation to said cover portion;
and mounting means for positioning said guard in superimposed enclosing relation with said rotatable member, portions of said skirt being severable from said guard at spaced locations defined by the ends of said arc, said severable portions providing passages for said chain through said skirt into and out of said engagement with said rotatable member whereby said guard is adapted for use with turns of different arcuate length.

4,852,724
CRAWLER-MOUNTED CONVEYING TRAIN
Theodore B. Bodimer, Franklin, Pa., assignor to Joy Manufacturing Company, Pittsburgh, Pa.
Filed Feb. 24, 1986, Ser. No. 832,188
Int. Cl.[4] B65G *21/00*
U.S. Cl. 198—861.2 25 Claims



1. A material conveyor structure capable of traversing a surface along an elongated path, said structure comprising:
framework members arranged in tandem on said surface along said elongated path;
connector means on said framework members cooperable with connector means on an adjacent framework member for coupling of said framework members to form an elongated train;
a first plurality of said framework members including means for supporting orbitally moveable crawler chain means in engagement with said surface, said chain means capable of propelling said conveyor structure along said surface, said orbitally moveable crawler chain means extending continuously throughout said first plurality of framework members along the longitudinal extent of said train; and
a second plurality of said framework members including means for supporting orbitally moveable conveying means above said orbitally moveable crawler chain means, the conveying run of said orbitally moveable conveying means operable to convey material substantially throughout the longitudinal extent of said train.

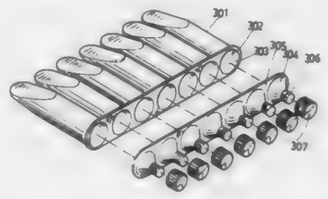
4,852,725
CARRYING AND STORAGE CASE FOR ARTIST'S SUPPLIES
Dale Folsom, 42-49 Colden St., Flushing, N.Y. 11355
Filed Aug. 17, 1988, Ser. No. 232,941
Int. Cl.[4] B05C *17/00;* B44D *3/00;* B65D *1/24*
U.S. Cl. 206—1.7 15 Claims



1. A carrying and storage case for artist's supplies comprising:
a tray-like base having a back wall, two side walls, a top wall, a bottom wall, and an open front,
a plurality of rows of receptacles within the base, each row containing a plurality of receptacles,
the axes of all the receptacles being at an acute angle to the plane of the back wall of the base, said angle opening toward the top wall of the base, and
a cover movable with respect to the base for optionally closing the open front thereof.

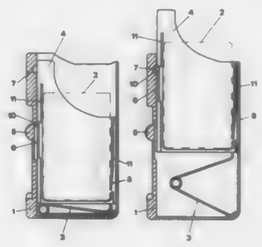
4,852,726
MULTIPLE WATER COLOR COMBINATION SET
Genius Lee, No. 25, Lane 380, Sec. 2, Chung-Shan Road, Chung-Ho City, Taipei Hsien, Taiwan
Filed Dec. 15, 1988, Ser. No. 285,609
Int. Cl.[4] B05C *17/00;* B44D *3/00*
U.S. Cl. 206—1.9 3 Claims

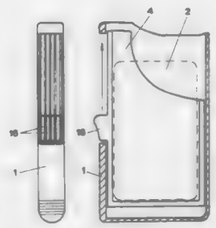
1. A multiple water color combination set of which the structure includes:
a flexible plastic tube having cavity made therein for filling of color pigment, having inner thread made at the top of said cavity, and having retainer nose made at appropriate position;
a socket cap comprised of shoulder portion, base seat, and head portion, said head portion comprising an outer thread and having a diaphragm made on the top, said base seat being connected to said shoulder portion at the bottom and being arranged to provide outer thread;
by means of said component parts to let a fixed number of flexible plastic tubes be conjugated together and be filled with color pigment and to let the conjugate and pigment-filled tubes



be block up by said socket cap and to let the conjugated tubes and socket cap be processed by high frequency heat sealing procedure to form an integral unit.

4,852,727
DEVICE FOR HOLDING CREDIT CARDS AND BANK CHECK CARDS
Ferdinand Oberle, Rorschacherberg, Switzerland, assignor to Ferob, A.G., Hohriet, Switzerland
Filed Oct. 15, 1987, Ser. No. 108,455
Claims priority, application Switzerland, Apr. 13, 1987, 1426/87
Int. Cl.[4] B65D *83/12*
U.S. Cl. 206—39.4 13 Claims



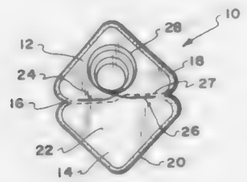


1. A device for holding credit cards and/or check cards, said device comprising a case having a plurality of drawers, each drawer being adapted to accommodate a respective one of said cards, and means for at least partially ejecting each card from the case, in which each drawer has a card clip which is arranged to hold a respective card in the drawer.
4. A device for holding credit cards and/or check cards, said device comprising a case having a plurality of compartments, in which a separate compartment is provided in the case for each card, a spring being provided in each compartment and each said spring being tensioned and restrained when the card is pushed into the compartment, and detent means being pro-

vided to retain each card in its respective compartment against the force of the associated spring whereby, when the detent is released, the spring is effective to eject the card from the compartment.

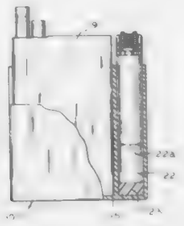
11. A device for holding credit cards and/or check cards, said device comprising a case having means for accommodating a plurality of cards and means for at least partially ejecting each card from the case, in which provided on the outside of the case is an electronic display area in which the contents of the case can be programmed.

4,852,728
ORAL HYGIENE DEVICE
John R. Court, 2631 Fordyce Rd., Ojai, Calif. 93023
Filed Jul. 14, 1988, Ser. No. 219,289
Int. Cl.[4] A61B *19/02*
U.S. Cl. 206—63.5 **6 Claims**



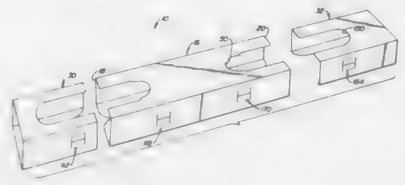
3. An oral hygiene device comprising:
first and second flexible planar members;
releasable attaching means adhering opposing surfaces of said first and second members in superimposed relationship along a peripheral seal line to define a substantially sealed interior compartment between said members;
a single use length of dental floss having first and second ends;
said dental floss being accommodated in said compartment with said first end secured to said first member and said second end secured to said second member whereby release of said members from one another yields said length of dental floss with each end thereof having a planar member secured thereto.

4,852,729
CIGARETTE-LIGHTER HOLDER
John R. Conte, 843 W. 15th St., Newport Beach, Calif. 92663
Filed Mar. 1, 1988, Ser. No. 162,559
Int. Cl.[4] B65D *85/10, 85/20*
U.S. Cl. 206—86 **4 Claims**



1. A holder for cigarettes and a lighter, said holder comprising a one piece five sides plastic box with the top of the box open, an internal partition wall integrally formed within said box, said partition wall being integrally joined with three of said five sides and parallel to the other two of said five sides thereby forming said box into first and second compartments, said box having a height which is sufficiently less than the height of a regular pack of cigarettes so that a person may grip the top of the pack for pulling it from or inserting it into said box and so that packs of different lengths may be inserted into said box, said first compartment in said box and on one side of said partition wall having an internal length and width which receives the bottom of a pack of cigarettes with a friction fit adequate to prevent accidental separation of the pack and box while enabling an easy insertion or removal of said pack from said box, said second compartment in said box and on an opposite side of said partition wall having an internal length and width which receives the bottom of a lighter which is no wider than the width of said pack of cigarettes, a length and width of said second compartment receiving said lighter with a snug fit to prevent accidental separation of said lighter from said box while enabling an intentional insertion or removal of said lighter from said box, and means for deposit in the bottom of said second compartment for limiting the depth of said second compartment, said limiting means adjusting the depth of said second compartment so that the top of a lighter is no lower than the top of said pack of cigarettes when in said box.

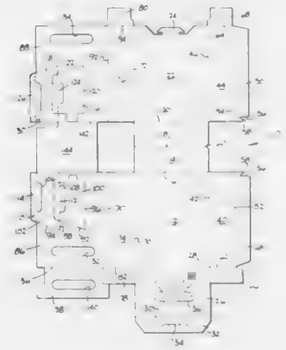
4,852,730
LOCKING CONTAINER CARRIER
Everett Thykeson, San Ramon, Calif., assignor to The Clorox Company, Oakland, Calif.
Filed Jul. 28, 1988, Ser. No. 225,400
Int. Cl.[4] B65D *75/00*
U.S. Cl. 206—145 **9 Claims**



1. A carrier for containers having an elongated neck finish above a shoulder, said neck finish having a first width, and an enlarged closure means at the end of said neck finish, said carrier comprising:
(a) an elongated body having top and bottom portions;
(b) a first aperture on the said top portion of said body for closely receiving a portion of said neck, said top portion of said body adapted to bear against said enlarged closure means;
(c) a first aperture on the bottom portion of said body juxtaposed with said aperture on said top portion of said body for closely receiving said shoulder; and
(d) a first retainer means closely receiving the remaining portion of said neck adapted to bear against said enlarged closure means in contacting relation with said body, adapted to hold said container therein, said retainer means being separable from said body so as to permit removal of the container from said body.

4,852,731
SLING-BOTTOM ARTICLE CARRIER
Leonard M. Cooper, West Monroe, La., assignor to Manville Corporation, Denver, Colo.
Filed Oct. 13, 1988, Ser. No. 256,900
Int. Cl.[4] B65D *5/46, 5/48*
U.S. Cl. 206—167 **3 Claims**

1. A sling-bottom article carrier, comprising:
a front panel and a back panel connected to side panels to form a four-sided carrier;
each side panel being comprised of two connected panel sections, one of the side panel sections being foldably connected to the front panel and the other side panel section being foldably connected to the back panel;
a bottom panel foldably connected to both the front and back panels;
a top panel foldably connected to at least one of the front or back panels;
the front, bottom, back and top panels being formed from a single sheet of material;
a center partition inside the carrier extending from one side panel to the other side panel, the center partition being foldably connected to the side panels and being substantially parallel to the front and back panels;
transverse partitions foldably connected to the center partition and extending between the center partition and the front and back panels, the transverse partitions dividing the space between the center partition and the front and back panels into article-receiving cells;
the top panel being foldably connected to one of the front or back panels and spanning the distance between the front and back panels, the carrier further including means for mechanically interlocking the top panel with the front or back panel to which the top panel is not foldably connected; and
the center partition containing a handle opening and the top panel containing a handle access opening generally aligned with the center partition, whereby a user may reach through the handle access opening in the top panel and grasp the handle opening in the center partition to lift the carrier.



4,852,732
PACKAGE FOR DRY-RESIST MATERIAL
Hans Wilski, Bad Soden, and Hermann Schmidt, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Jul. 3, 1986, Ser. No. 881,794
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524846
Int. Cl.[4] B65D *81/20, 81/24*
U.S. Cl. 206—204 **21 Claims**

1. A packaged photoresist material comprising:
photoresist material which is wound up into a roll, and
means providing a substantially water vapor impermeable enclosure comprising a sealed package enclosing said roll, said package comprising a material having a permeability to water vapor of less than 0.01 gram of water vapor per square meter per day, under conditions of a humidity gradient of 97% and an ambient temperature of 23° C.



4,852,733
FLAG MOUNTING CLIPS
Dayton G. Blume, 855 Starboard Dr., Vero Beach, Fla. 32963
Filed Aug. 15, 1988, Ser. No. 232,623
Int. Cl.[4] A44B *13/02*
U.S. Cl. 206—223 **6 Claims**



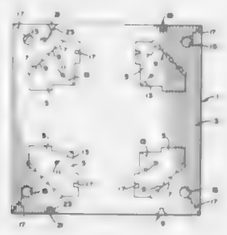
1. A clip for mounting a flag on a flag support formed of wire bent to define a circular coil from which first leg and a second leg tangentially extend,
said first leg being substantially straight and terminating in a hooked end,
said second leg consisting of first, second and third straight, integral sections of approximately equal length with said first section extending from said coil at an acute angle with respect to said first leg and with the distance between said first section and said first leg being greater than the diameter of said coil,
said second section extends from said first section at a first angle with respect to said first section,
said third section extends from said second section toward said first leg and at a second angle with respect to said second section terminating in a hooked end,
said first and second angles being such that said hooked end of said third section may, by flexing of said coil, be hooked over said first leg at a point between its end and said coil with said third section positioned approximately normal to said first leg.

4,852,734
CIGARETTE PACKAGE
John S. Allen; John P. Butler, and Floyd L. Phillips, Jr., all of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Sep. 21, 1988, Ser. No. 247,221
Int. Cl.[4] B65D *85/10*
U.S. Cl. 206—273 10 Claims



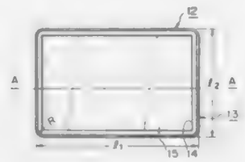
1. An assembled hinged lid cigarette package comprising:
(a) a body portion including a front wall, a bottom wall, a rear wall, inner side walls and outer side walls;
(b) a lid portion including a rear wall integrally hinged to the rear wall of the body portion, a front wall, a top wall, inner side walls, and outer side walls; and
(c) lid reinforcing panel integrally connected to the front wall of the lid portion and forming an inner wall of the lid portion, the lid reinforcing panel having tabs integrally connected to each side thereof and held in place between the respective outer and inner side walls of the lid portion.

4,852,735
BREAKAWAY CRATE BASE
Orlen J. Ortlieb, Galesburg, Ill., and Donald R. Bartlett, West Plains, Mo., assignors to Maytag Corporation, Newton, Iowa
Filed Sep. 7, 1988, Ser. No. 241,260
Int. Cl.[4] B65D *81/02*
U.S. Cl. 206—320 9 Claims



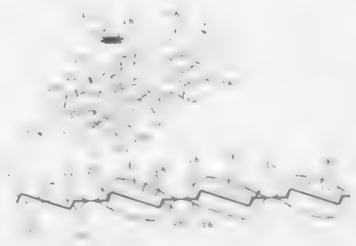
1. A breakaway crate base for attachment to an appliance provided with a plurality of leveling screws at the bottom of the appliance, the base comprising:
(a) a panel formed from tearable material;
(b) a plurality of flaps formed in the panel, each flap being die cut from and hinged to the panel for folding outwardly of the panel along a hinge axis for disposition in a superimposed overlying engagement position therewith;
(c) each flap including a hole positioned to receive a leveling screw therethrough for attaching the panel to the bottom of an appliance; and
(d) tearing means formed in the panel to permit the panel to be torn and removed from the appliance without requiring removal of the leveling screws.

4,852,736
METAL CASE FOR HOUSING AN IC AND A MANUFACTURING METHOD THEREFOR
Masayasu Kojima, and Chihiro Hayashi, both of Takarazuka, Japan, assignors to Sumitomo Metal Industries, Osaka, Japan
Filed Oct. 14, 1988, Ser. No. 257,866
Claims priority, application Japan, Oct. 16, 1987, 62-261237; Oct. 26, 1987, 62-269867; Jul. 13, 1988, 63-174598; Sep. 14, 1988, 63-230509
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—328 17 Claims



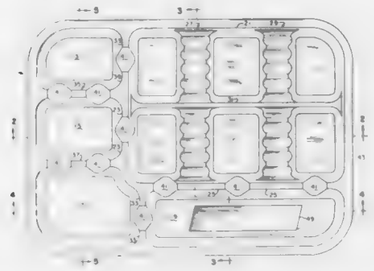
1. A metal case for housing electronic parts including an IC of the type having a depression and rim which surrounds the depression and has the shape of a picture frame, characterized by comprising a shallow vessel having a wall on its periphery which is formed from metal sheet having the same thickness as the bottom of said depression and a rectangular metal ring which has a contour such that it can fit into the wall of said shallow vessel, said rectangular metal ring being fit into said shallow vessel and connected thereto so as to form a single body.

4,852,737
PACKAGING SYSTEM FOR ELECTRICAL CONNECTORS
Willian B. Noll, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Nov. 22, 1988, Ser. No. 274,580
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—330 12 Claims



1. A packaging system for electrical connectors, or the like, comprising
(a) an elongated, essentially planar sheet or strip-like member, said member including one or more longitudinal rows of cavities on each side thereof, each such cavity being suitable for containing an electrical connector, or the like, where a portion of said sheet or strip-like member is skewed at an angle relative to the longitudinal direction of said member to form a pair of said opposing cavities, each said cavity being further defined by a pair of side walls joined together by an end wall, and
(b) a restraining strip for maintaining said connectors, or the like, in said cavities, said strip comprising a flexible, elongated strip overlying said connectors, or the like, where each said strip is operable for securing along a longitudinal row of cavities and is joined to an opposing such strip operable for securing the opposing row of cavities.

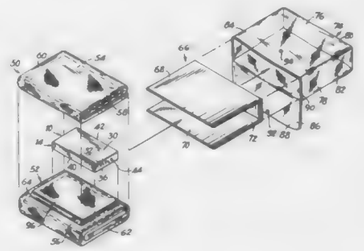
4,852,738
DISPOSABLE DENTAL TRAY
Richard Craig, Joliet, and Brian L. Wilt, Frankfort, both of Ill., assignors to HealthPak, Incorporated, Joliet, Ill.
Filed Sep. 12, 1988, Ser. No. 243,417
Int. Cl.[4] A61C *3/00*; B65D *1/36*
U.S. Cl. 206—369 10 Claims



1. A disposable dental tray comprising a disposable, unitary tray body defining four utility compartments, said tray body being generally rectangular and being sized to accept a plurality of dental instruments and accessories, three of said utility compartments being disposed along a first side of the tray body with a first of said compartments being disposed in a corner of the tray body, the fourth utility compartment being disposed adjacent the first compartment along a second side of the tray body, at least one of the three compartments disposed along the first side having a width as measured from the first side different from the width of at least one of the other of said three compartments, all four of said compartments having relatively flat bases and being defined by integrally formed ridges extending upwardly from the compartment bases, each compartment being surrounded by a defining ridge, the width of the first compartment as measured from the second side being different from the width of the fourth utility compartment as measured from the second side.

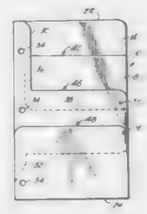
4,852,739
TRANSPORT/DISPLAY PACKAGE FOR MAGNETIC TAPE CASSETTES
Jack D. Franco, Deal, N.J., assignor to Franco Manufacturing Co., Inc., Metuchen, N.J.
Filed Aug. 3, 1988, Ser. No. 227,778
Int. Cl.[4] B65D *85/672*
U.S. Cl. 206—387 12 Claims

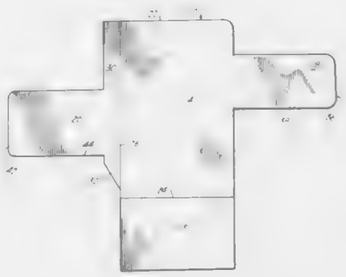
1. A transport/display package, comprising:
(a) a tape cassette for holding a magnetic tape for use in a magnetic recording/playback apparatus, said tape cassette having opposite major walls between which the tape is held;
(b) means for cushioning the tape cassette from exterior shocks, including a pair of folded bedding sheets of soft fabric material, each situated at a respective major wall of the tape cassette, said folded sheets sandwiching the tape cassette therebetween, each folded sheet being folded over upon itself multiple times to form a plurality of generally rectangular sheet portions stacked one above another, said sheet portions of each folded sheet being sufficient in number to cushion effectively the tape cassette from exterior shocks directed toward the respective major wall at which the respective folded sheet is situated;
(c) an envelope in which the folded sheets and the tape cassette sandwiched therebetween are insertable;
(d) means for selectively opening and closing the envelope; and



(e) means for holding the folded sheets in position relative to the major walls of the tape cassette during simultaneous insertion of the folded sheets with the tape cassette sandwiched therebetween into the envelope when the envelope is opened.

4,852,740
HOLDER FOR FLAT OBJECTS SUCH AS COMPUTER DISKS
James R. Sellar, Pittsford; James E. Reisdorf, Rochester; Mark F. Lappies, Marion, and Mark S. Valle, Spencerport, all of N.Y., assignors to Information Packaging Corp., Macedon, N.Y.
Filed Mar. 11, 1988, Ser. No. 167,065
Int. Cl.[4] B65D *85/30*
U.S. Cl. 206—444 16 Claims





1. A holder for flat objects, such as computer disks in tiered relationship, which comprises a single sheet of material having a rectangular center panel with side, top and bottom edges, a first flap extending from one of the side edges and a second flap

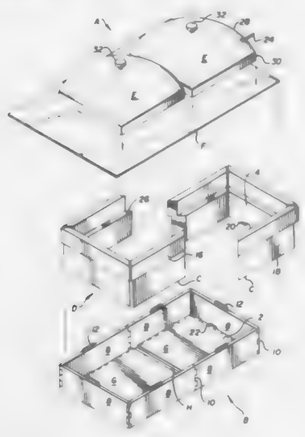
extending from the bottom edge, said first flap being disposed above said bottom edge of said center panel, said first flap being secured to the center panel to define a first pocket open at the top thereof with said center panel, said first pocket being spaced from said bottom edge, and said second flap being secured in partially overlapping relationship with said first flap to said center panel to define a second pocket below said first pocket and in partially overlapping, tiered relationship with said first pocket.

4,852,741

PORTABLE TABLE TOP SALAD BAR

Doris G. Van Benschoten, 6 Parker Ave., Poughkeepsie, N.Y. 12601

Filed May 27, 1988, Ser. No. 199,447
Int. Cl.[4] B65D *1/34*; G55D *6/04*
U.S. Cl. 206—558 **18 Claims**



1. A portable knock-down salad bar, comprising:
(a) a collapsible frame defining a perimeter support in the erected position;
(b) a plurality of inserts for positioning within said frame and forming a ring therein;
(c) said ring being open at top and having an internal periphery;
(d) said ring including a ledge extending about the internal periphery thereof;
(e) removable lid means cooperating with said ledge for closing the top opening of said ring; and
(f) a liner positioned in the opening under said lid means.

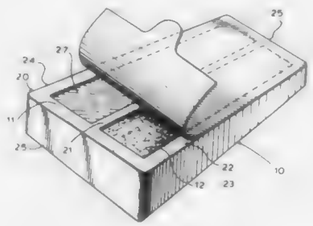
4,852,742

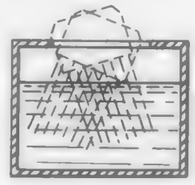
KIT ASSEMBLY FOR ORAL HYGIENE CARE

Kathleen Scuorzo, 2804 Billy Ct., Medford, N.Y. 11763

Continuation-in-part of Ser. No. 112,950, Oct. 26, 1987, abandoned. This application Dec. 8, 1988, Ser. No. 281,533
Int. Cl.[4] B65D *69/00*
U.S. Cl. 206—568 **3 Claims**

1. A dental oral hygiene kit assembly comprising:
a housing to accommodate a toothbrush head, said housing being a generally hollow hexahedron parallelepiped having two longitudinally extending sides intersecting the planes of a front planar edge and a rear planar edge, said sides and planar edges having a common bottom plane, said housing defining a reservoir chamber therein;
a premeasured unit of baking soda within said housing;
a container containing a premeasured unit of an oxygenating agent;
said sides and planar edges being constructed to accommodate the mixing of said baking soda and said oxygenating agent by the movement of said toothbrush head said housing, and,
an inwardly extending top surface located upon and ing inward from the perimeter of the opening housing, said top surface having an opening to sai voir chamber, said top surface being capable of pe the movement of the bristles of said toothbrus within said housing while restricting excessive





movement of said toothbrush head within said chamber of said housing.

2. The invention according to claim 1, wherein the ating agent is contained in a generally hollow he parallelepiped shaped container adjacent to said hou taining said baking soda, said housing and said conta ing a common longitudinally extending side wall inwardly extending circumference lip being shaped i ally figure 8 shape.

4,852,743

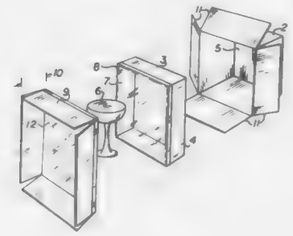
MEMBRANE PACKING

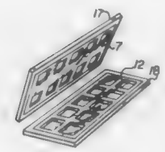
Louis H. Ridgeway, 5835 Leadrope Way, Bonita, Cal

Filed Feb. 29, 1988, Ser. No. 162,215
Int. Cl.[4] B65D *81/02*
U.S. Cl. 206—583

1. A device for packaging a solid object which c
a first element comprising a first frame defining a fi opening and a first sheet of pliable material stret said first central opening and attached to said f
a second element comprising a second frame gene mensurate with said first frame, having a seco opening and a second sheet of pliable material over said second central opening an attached t of said second frame; and
means for holding said first and second elements i rical alignment and for placing said sheets again sides of said object sandwiched therebetween sufficient pressure to hold the object and limit ment in relation to said device when said devic to impacts from various directions; wherein saic holding comprise a shipping container encl elements;
each of said frames being shaped and dimensionec erally contact the inner walls of said containe

wherein each of said frames has a plurality of peripheral foldable flaps;





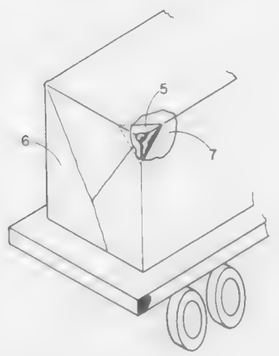
said flaps being shaped and dimensioned to space said frame apart from one of said walls.

4,852,744

TARPAULIN CORNER PROTECTOR

Charles A. Van Breemen, 825 Evergreen St., Burbank, Calif. 91505

Continuation of Ser. No. 90,143, Aug. 27, 1987, abandoned. This application Aug. 15, 1988, Ser. No. 233,879
Int. Cl.[4] B65D *81/00, 61/00*
U.S. Cl. 206—586 **12 Claims**



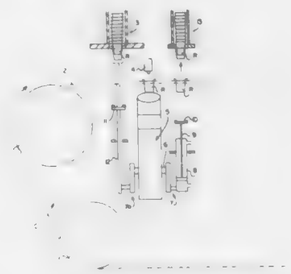
1. The combination comprising:
a first structure having at least one corner;
a second structure comprising three substantially planar sides, each side being substantially perpendicular to the other sides of said second structure, such that all three sides converge toward a vertex, a blunting means being formed at said vertex, said second structure being removably placed over said first structure so that said blunting means is located over said corner; and
covering means draped over said first and second structures so that said blunting means causes stress in said covering means to be evenly distributed, thereby preventing tears in said covering means, said second structure being held in place by said covering means, such that if said covering means is removed, said second structure can be lifted off said first structure.

4,852,745

APPARATUS FOR AUTOMATICALLY ELIMINATING A GROUP OF ARTICLES TO BE TREATED OF WHICH AT LEAST ONE IS MISSING OR DEFECTIVE

Didier Lemaire, Cherisy, and Jean-Marc Dronet, Putanges Pont Ecrepin, both of France, assignors to E. P. Remy & Cie., France

Filed Apr. 18, 1988, Ser. No. 182,914
Claims priority, application France, Apr. 24, 1987, 87 05846
Int. Cl.[4] B07C *5/342*
U.S. Cl. 209—588 **1 Claim**



1. An apparatus for automatically eliminating a group of articles, such as for example a group of containers or goblets of which at least one is missing or defective, comprising
at least one detecting means, such as for example a cell, located above the articles or containers transported by a conveyor on its carrying run,
one magazine for storing the containers which are eliminated, located near the detecting means, and
pushers arranged vertically under said magazine and under the articles or containers to push the articles which are transported by the conveyor into the magazine,
said pushers constituted by rods of cylinders which are actuatable by said detecting means,
wherein the body of said cylinders is connected to the output shaft of a reducer through a connecting rod-crank system, and
further comprising a supply station for holding piles of articles at which a group of articles can be released, and
wherein the output shaft of the reducer is also connected, through another connecting rod-crank system, to pushing rods which pass through the carrying run of the conveyor to deposit the articles or containers released from the piles at the supply station on the conveyor.

4,852,746

ORIENTATION AND STORAGE APPARATUS FOR REMOTE CONTROL UNIT

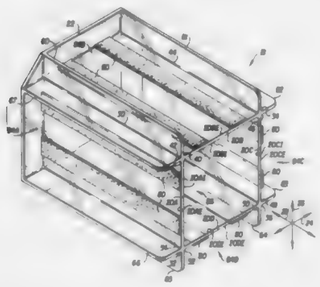
Eugene M. Wells, 915 Tascosa Dr., Huntsville, Ala. 35802, and Keith Thompson, 1104 Kerr Dr., Huntsville, Ala. 35803

Filed Apr. 5, 1988, Ser. No. 177,307
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—13 **18 Claims**

1. An apparatus for storing a unit such as an electronic control unit, said apparatus comprising:
at least three wall members connected together whereby surfaces thereof at least partially define an interior cell along two rectangular axes, said surfaces of said wall members defining said interior cell being interior surfaces

of said wall members, said interior surfaces of each wall member having an oppositely disposed exterior surface parallel thereto;

a base member connected to said wall members for bounding said interior cell along a third rectangular axis at a first end of said wall members, said interior cell being unbounded



along said third rectangular axis at a second end of said wall members whereby said interior cell is capable of receiving articles for storage therein; and,

fastening means provided on an exterior surface of at least one of said wall members for mating with complementary fastening means on a unit to be stored on said apparatus.

4,852,747

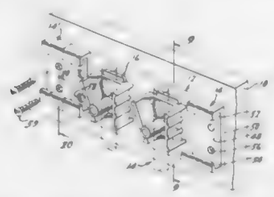
MULTIPLE TOOL HOLDER ASSEMBLY

Franklin L. Breveglieri, Spring Lake, Mich., assignor to Geerpres, Inc., Muskegon, Mich.

Continuation-in-part of Ser. No. 83,429, Aug. 10, 1987. This application Mar. 9, 1988, Ser. No. 165,982

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—70.6 **6 Claims**



1. An article of manufacture for releasably holding handled objects, characterized by an elongated support bracket adapted to be horizontally mounted on a substantially vertical wall, said support bracket is extruded from a polymeric material into a squared-C cross-section to define a pair of horizontally extending channels each sized to receive a respective flange extending from opposite edges of a base member, an object holding device comprising a base member having an inclined slot, fixed and movable gripping means extending from said base member for producing a gripping force on the handle of said object when placed between said fixed and movable means, and spacer means for spacing the base member from the support bracket, said movable gripping means being supported and rotatable in said slot to produce a gravity operated movement toward and away from said fixed gripping means in a direction inclined to the fixed gripping means, said movable gripping means comprising a cylndrical shaft journalled in said slot and having an end portion in the space defined by the spacer means, flanges on said base member to retain and permit the holding device to be selectively positioned at any desired horizontal position defined by the mounted bracket, stop means for preventing the object holding device from being inadvertently removed from said support bracket, said stop means including fastener means extending through the spacer means and the support bracket for immovably fastening the object holding device to the wall, a second fixed gripping means cooperating with said movable gripping means for enhancing the gripping force on the handle, the first and second gripping means including first and second wall members each extending generally perpendicularly from the base member and the support bracket, the second wall member defining a plane inclined at the same angle as the slot to provide support for the movable gripping means, said first and second wall members each including one or more exterior ribs, said exterior ribs providing reinforcement to said first and second wall members.

4,852,748

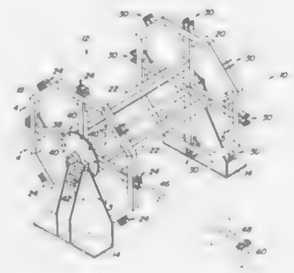
FERRIS WHEEL SHAPED FIXTURE HOLDING APPARATUS

William C. Burgess; Gary L. Jochum; David Goetzinger, and David A. Beckius, all of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Feb. 22, 1988, Ser. No. 158,414

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—70.6 **2 Claims**



1. A fixture holding apparatus for holding a plurality of fixtures, the apparatus comprising:

a mounting base;

a support frame rotatively mounted on the mounting base for rotation about a rotation axis, the support frame defining an outer periphery;

an elongated fixture mounting assembly having a first end and a second end between which is mounted at least one fixture, the first and second ends of the fixture mounting assembly comprising first and second trunnions respectively, the first trunnion of the fixture mounting assembly is secured to a pivotable sleeve pivotally mounted to the outer periphery of the support frame, the pivotable sleeve defining a pivot axis that is substantially perpendicular to the rotation axis of the support frame, so that the fixture mounting assembly can be pivoted away from a stored position on the outer periphery of the support frame to a work position extending outwardly from the outer periphery of the support frame;

a latch for holding the fixture mounting assembly in the stored position by releasably securing the second trunnion to the outer periphery of the support frame; and

indexing means for holding the support frame stationary relative to the mounting base.

4,852,749

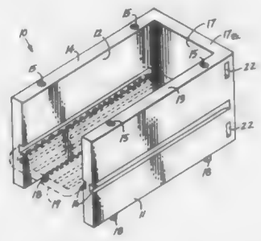
EXPANDABLE CHAFFING DISH STRUCTURE

Elio M. Fernandez, 114 Airport Rd., and Jean DeVane, Rte. 1, Box 54, both of Sylvester, Ga. 31791

Filed Mar. 2, 1988, Ser. No. 163,305

Int. Cl.[4] A47J *47/00*

U.S. Cl. 211—133 **6 Claims**



1. An expandable chaffing dish structure for accommodating a range of chaffing dishes comprising,

a "U" shaped member formed with a vertical right side wall, left side wall, and adjoining rear wall defining an upper support surface for support of a chaffing dish, and

a first and second planar tray, and

a first horizontal tray slot formed along an interior surface of said left side wall with a second horizontal tray slot formed along an interior surface of said right side wall, and a third tray slot formed along an exterior surface of said right side wall wherein said first and second slots are arranged for accommodating the first planar slide-in tray element with said first and second slots where said tray element provides a support surface for support of a heat source, and

an expansion "L" shaped member securable to said "U" shaped member including a side wall and end wall for providing additional support surface for said chaffing dishes, and

wherein said "U" shaped member and said "L" shaped member are formed with blind bores in their support surface and feet members at lower portions of the side walls wherein said blind bores receive said feet portions enabling stacking of said "U" shaped and "L" shaped members, as desired, and

wherein associating slots are formed along rearwardmost portions of exterior surfaces of said side walls of said "U" shaped members for receiving registering hooks formed at rearwardmost positions of walls of said "L" shaped members, and

wherein said "L" shaped members are formed with a fourth tray slot along an interior surface of the side wall, and a fifth tray slot formed along an exterior surface of the side wall for acceptance of said second slide-in tray associatable with said slots of said "L" shaped member and said third slot of said "U" shaped member, and said slots are in horizontal alignment when said "L" shaped member is secured to said "U" shaped member.

4,852,750

ELEMENT FOR DRESSING SHELVES AND DISPLAY COMPOSED OF SUCH ELEMENTS

Marek Zlotek, 100, rue Beranger, 92320 Chatillon, France

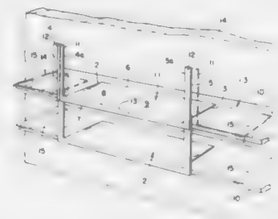
Filed Dec. 22, 1987, Ser. No. 136,294

Claims priority, application France, Dec. 24, 1986, 86 18157

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—183 **5 Claims**

1. A dressing element for a shelf adapted to form a display which consists solely of a substantially rectangular metal plate, said plate having two slots substantially parallel to the transverse sides thereof, said slots having a blind end and opening out in the rear side of said plate, a fold line joining the blind end of said slots substantially parallel to the longitudinal side of said plate, said plate comprising, after being bent along said line, a U-surround which has a central panel, said surround extending



perpendicularly to the said central panel of said element and adapted to rest on said shelf, said surround having lateral arms and a web, said lateral arms forming dummy uprights, said web forming a flange which covers the edge of said shelf.

4,852,751

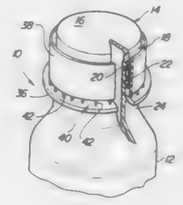
TAMPER INDICATING CONTAINER-CLOSURE PACKAGE

J. Wayne Halfacre, Iuka, Ill., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed May 25, 1988, Ser. No. 198,434

Int. Cl.[4] B65D *1/02*

U.S. Cl. 215—32 **14 Claims**



1. A tamper indicating container-closure package comprising, in combination:

a container having a neck with means for attaching a closure thereto;

a satellite ring attached to said container neck with a frangible connection below said closure attaching means; and

a closure cap having a top and an annular skirt depending from said top with attaching means complementary to said container attaching means;

said satellite ring extending over a substantial height of said annular skirt and preventing gripping of said annular skirt for removal of said cap from said container neck without fracture of said frangible connection and removal of said ring thereby indicating tampering or initial opening of said cap on said container neck.

4,852,752

NECK STRUCTURE OF SYNTHETIC RESIN BOTTLE-SHAPED CONTAINER

Akiho Ota, Tokyo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 93,120, Sep. 2, 1987, abandoned, which is a continuation of Ser. No. 839,506, Mar. 14, 1986, abandoned. This application Jan. 14, 1988, Ser. No. 208,862

Int. Cl.[4] B65D *1/02*

U.S. Cl. 215—31 **6 Claims**

1. A neck structure of a bottle-shaped container which in-

cludes a cylindrical neck portion adapted for association with a rolled on cap member constructed of thin aluminum plate and having a top-closed cylindrical shape, said cylindrical neck portion comprising:

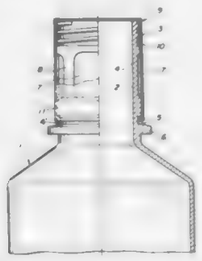
an upper end having threads circumferentially formed on an outer peripheral portion of said upper end;

a lower end having a flange circumferentially formed on an outer peripheral portion of said lower end;

a long, thick upper cylindrical portion extending below said upper end and having a diameter;

a lower cylindrical portion having a smaller diameter than said diameter of said upper cylindrical portion between said upper cylindrical portion and said lower end;

a plurality of circumferentially spaced recesses formed in said upper cylindrical portion;



a plurality of circumferentially spaced longitudinal strips formed between said circumferentially spaced recesses, an outer surface of said circumferentially spaced longitudinal strips being disposed on an imaginary single peripheral surface of said upper cylindrical portion which extends radially outward of the surface of said recesses; and

a circumferential engaging step formed between a lower circumferential surface of said upper cylindrical portion and said lower cylindrical portion, said engaging step being adapted for engagement with a rolled engaging portion of said rolled on cap member by inwardly bending the lower end of said rolled engaging portion of said rolled on cap member to form an inward flange.

4,852,753

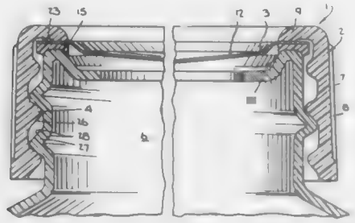
CLOSURE CAP AND THIN WALLED CONTAINER

Charles S. Ochs, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 48,560, May 11, 1987, abandoned, which is a division of Ser. No. 839,557, Mar. 14, 1986. This application Aug. 11, 1988, Ser. No. 231,371

Int. Cl.[4] B65D *41/04*

U.S. Cl. 215—271 1 Claim



1. An improved package comprising a thin walled container sealed with a composite closure including a vacuum indicator button, said thin walled container being adapted to expand under reduced atmospheric pressure to maintain the same relative pressure difference on the vacuum indicating button thereby keeping it depressed to indicate a good seal while the package is at a place of reduced atmospheric pressure.

4,852,754

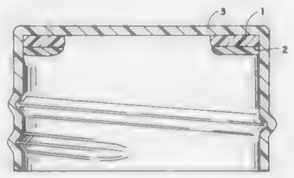
HOT MELT GASKETS AND METHOD OF FORMING SAME

Robert S. Holdsworth, Arlington; Shawn E. Brown, N. Cambridge, and Joel A. Gribbons, Framingham, all of Mass., assignors to W. R. Grace & Co., Lexington, Mass.

Filed Feb. 26, 1988, Ser. No. 160,628

Int. Cl.[4] B65D *53/00*

U.S. Cl. 215—347 8 Claims



1. A hot melt gasket for a plastic closure comprising a first adhesion layer and a second sealing layer, the first adhesion layer being bonded to an inner surface of the closure and being comprised of a base polymer selected from the group consisting of ethylene vinyl acetate copolymers and thermoplastic block copolymers, a tackifier resin and a viscosity reducing agent; the second sealing layer being bonded to an upper surface of the first adhesion layer and the second sealing layer being comprised of a base polymer selected from the group consisting of ethylene vinyl acetate copolymers and thermoplastic block copolymers, and a viscosity reducing agent, and the second sealing layer being essentially free of any tackifier resin.

4,852,755

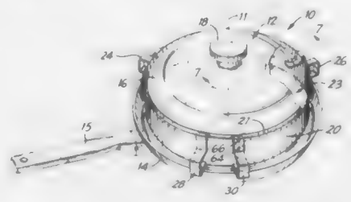
COOKING VESSEL WITH EXPANSIBLE COVER

Robert C. Michel, 52 Sigrid Dr., Carnegie, Pa. 15106, and Douglas D. Michel, 301 Beech St., Hackensack, N.J. 07601

Filed Sep. 13, 1988, Ser. No. 243,765

Int. Cl.[4] B65D *6/00*

U.S. Cl. 220—4 D 6 Claims



1. A cooking vessel including a pan and a cover, said cover having a lid and a shield assembly with a peripheral space therebetween, said shield assembly comprising an expansible shield member which is supported by the pan, and a plurality of clip members which support the lid and which are supported by the expansible shield member, said expansible shield member having overlapping peripherally spaced end portions for adjusting the diameter of the shield member.

4,852,756

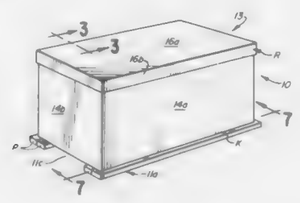
SHIPPING CONTAINER

John T. Holladay, Pinson, Tenn., assignor to Packaging Corporation of America, Evanston, Ill.

Filed Feb. 5, 1988, Ser. No. 152,433

Int. Cl.[4] B65D *19/20*

U.S. Cl. 220—4 F 6 Claims



1. A shipping container void of upright supports and inner packing, for accommodating a heavy, bulky article, said container comprising a skid section for subtending and supportingly engaging the accommodated article; a tubular section for embracing the accommodated article and being secured to and extending upright from said skid section; and a cover section for overlying the accommodated article and having a depending marginal flange encompassing and being secured to an upper end portion of said tubular section; said tubular section being formed of a pair of interconnected complemental blanks of corrugated fiberboard material, each blank including an outer lamina of corrugated fiberboard material, and an inner lamina of corrugated fiberboard material secured to a concealed surface of said outer lamina, said outer and inner laminas, each having opposed upright side edge portions, the side edge portions of said outer lamina of each blank extending a like amount beyond the corresponding side edge portions of said inner lamina and forming a joint flap and a side panel portion, each spanning substantially the distance between the skid and cover sections, the joint flap of each blank outer lamina being affixed to and concealed by the side panel portion of the outer lamina of the other blank whereby the joint flap abuts a side edge of the second lamina of said other blank; said cover section including a center portion delimited by said depending marginal flange, said center portion having an outer lamina and an inner lamina, the latter having a peripheral configuration substantially corresponding to an area defined by the exterior surface of the upper end portion of said tubular section; the laminas of said tubular section blanks having flutes extending in an upright direction.

4,852,757

ADAPTER FOR EXPANDING THE VOLUME OF A CONTAINER

Milton Gold, 620 Longview Ave., South Orange, N.J. 07079

Filed Apr. 21, 1988, Ser. No. 184,367

Int. Cl.[4] B65D *25/00*

U.S. Cl. 220—4 A 6 Claims

1. The combination of a container having a standard size storage space for material defined by a bottom, sidewall means connected at one end to the bottom, and an annular bead on an upper end of said sidewall means for remote from the bottom, with an adapter means operatively and detachably connectable to said upper end of the sidewall means to increase the volumetric capacity of the storage space in the container a predetermined amount, said adapter means including,

a. at least one shaped and sized annular member having outer wall means and inner wall means defining an auxiliary storage space of predetermined volumetric capacity,

b. said annular member having a first edge forming a first opening at one end in communication with the auxiliary storage spaced, and a second edge remote from said first edge,

c. an inverted J-shaped skirt made of a material having a memory, connected at one end medially along the inner wall means of said annular member longitudinally inward of said first edge to define therewith a connecting space, and having a second end which extends to a point longitudinally inwardly of said second edge of said annular member,

d. said connecting space between the inner wall means and the inverted J-ahaped skirt having a width which is less than the width of said upper end of the sidewall means of the container,



e. seal means in said connecting space proximate to said first end of said inverted J-shaped skirt operative to form a fluid-tight joint when said adapter means is assembled on the container, and

f. an annular groove formed on said inner wall of said annular member below said seal means for mating engagement with said annular bead on said container to hold the adapter in assembled position to the upper end of the sidewall means of the container and to permit release of the annular member from assembled position on the container as may be required during use thereof.

4,852,758

PLASTIC FUEL TANK

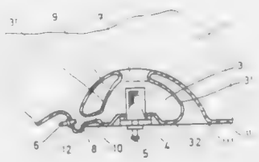
Kalman Kormendi; Dieter Lampart, both of Ettlingen; Fritz Mannherz, Karlsbad-Spielberg, and Dieter Scheurenbrand, Wolfschlugen, all of Fed. Rep. of Germany, assignors to Schmalbach-Lubeca AG, Braunschweig, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 213,533

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3721691

Int. Cl.[4] B65D *1/40*

U.S. Cl. 220—20.5 11 Claims



1. A plastic fuel tank for supplying fuel to combustion engines, comprising,

a main tank having an outer wall defining an outer contour of said fuel tank,

a collecting tank in fluid communication with said main tank through a flow-through opening, said collecting tank being articulated in an underside of said main tank and being enclosed within said outer contour of said fuel tank, said collecting tank including a vaulted lateral wall extend-

ing from said flow-through opening to a bottom part of said collecting tank,

a connecting channel formed in the underside of said main tank and circumscribing said vaulted lateral wall, said connecting channel being connected to said collecting tank via an admission bore, and

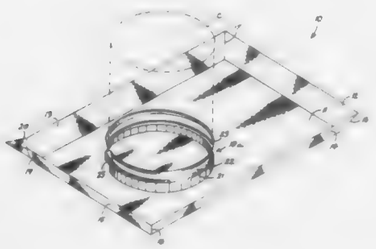
a nozzle from a fuel return line opening into said connecting channel and being oriented towards said admission bore so as to act as a jet pump for propelling fuel from said connecting channel into said collecting tank.

4,852,759

PAINT TRIM TRAY APPARATUS

Walter J. Williams, and David L. Foot, both c/o P.S. Paint Shop Ltd., P.O. Box 13575, St. John's, Newfoundland A1B 4B8, Canada

Filed Mar. 2, 1988, Ser. No. 162,882
Int. Cl.[4] B65D *83/00*
U.S. Cl. 220—85 H 1 Claim



1. A paint trim tray apparatus for the selective securement of a paint can containing fluid paint within, said apparatus comprising,

a rectangular planar floor including a plurality of walls integrally secured to said floor upwardly directed from said floor to an equal predetermined height, and each of said walls joined to form a continuous perimeter,

a pouring spout means for directing paint overflowing from said paint can formed at an intersection of two of said walls,

securement means for resiliently engaging said paint can integrally formed and upward directed from said floor,

wherein each of said walls being obliquely secured at an angle greater than 90 degrees to said floor, and

wherein each of said walls are integrally secured to one another at respective corners to form a linear seam wherein three corners have linear seams of equal length and a fourth corner comprises a linear seam of approximately one-half th length of the other seams with said pouring spout means formed aligned with said fourth seam and extending outwardly of said fourth seam,

said securement means being a discontinuous split ring integrally secured to and extending upwardly of said planar floor and formed with a slit opening aligned with said pouring spout, and

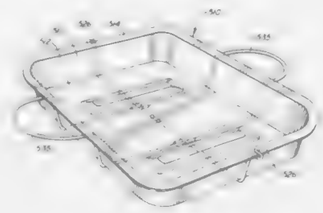
wherein said discontinuous split ring includes a medially positioned bulged inwardly directed clamping ring to engage and clamp said paint can to said ring, and an upper wall positioned above said ring outwardly directed from said clamping ring portion.

4,852,760

OVEN PAN HOLDER AND COMBINATION OF OVEN PAN HOLDER WITH OVEN PAN

Norton Sarnoff, Northbrook, and Carl R. Fletcher, Arlington Heights, both of Ill., assignors to Ensar Corporation, Wheeling, Ill.

Continuation-in-part of Ser. No. 603,781, Apr. 25, 1984, Pat. No. 4,817,812. This application Jul. 25, 1988, Ser. No. 223,799
Int. Cl.[4] B65D *90/04, 90/12*
U.S. Cl. 220—85 H 9 Claims



1. A cooking utensil comprising, in combination:

a metal foil oven pan of the type having a bottom, a side wall extending upwardly from the periphery of the bottom, and a rim extending outwardly from the upper periphery of the side wall; and

a wire frame holding said pan, said frame including

first and second wire frame sections arranged transversely to each other and being rigidly connected to each other where said sections cross;

said first frame section having

(1) a central support region for supporting the bottom of said oven pan,

(2) an upwardly extending arm at each end of the central support region adjacent, and capable of horizontally restraining, said oven pan side wall,

(3) a peripheral lower engaging member extending horizontally outwardly from each arm to support engage the lower surface of said pan rim, and

(4) an upper retaining member extending from each said lower engaging member and being reversely bent over the top surface of said pan rim to grip said rim between said lower engaging member and said upper retaining member; and

said second frame section having

(1) a central support region for supporting the bottom of said oven pan,

(2) at least one upwardly extending arm at each end of the second frame section central support region adjacent, and capable of horizontally restraining, said oven pan side wall, and

(3) a handle means at the end of each said second frame section arm extending sufficiently outwardly of said pan rim for being gripped.

4,852,761

IN TANK VAPOR STORAGE CANISTER

Kenneth W. Turner, Webster; Charles H. Covert, Manchester, and Karen M. Meyer, Webster, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 25, 1988, Ser. No. 223,495
Int. Cl.[4] F02M *33/02*
U.S. Cl. 220—85 VR 3 Claims

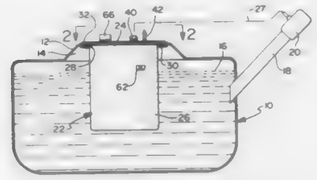
1. An evaporative emissions control system for an automotive vehicle, comprising,

a fuel tank having a vapor space defined between the top of said tank and the normal fuel fill level of said tank,

a fuel adsorbent containing canister located within said tank so that at least the upper portion of an outer wall of said canister is located above said normal fuel fill level and within said tank vapor space,

a trap chamber internal to said canister having a catch basin into which a purge tube opens and a vapor distribution port located above said catch basin and opening to said adsorbent,

at least one vapor inlet tube opening through the upper portion of said canister outer wall and sloping upwardly through said canister into said trap chamber,



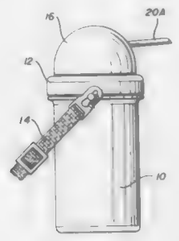
whereby, fuel vapors in said tank vapor space may rise through said inlet tube and into said trap chamber where condensing vapor will be collected in said catch basin to be purged later and non-condensing vapor will be distributed to said adsorbent, while liquid fuel entering said upwardly sloping inlet tube will run back out so as to protect said adsorbent.

4,852,762

CHILD'S CANTEEN

Huang Chou-Sheng, Taipei, Taiwan, assignor to Pecoware Products, Inc., City of Industry, Calif.

Filed Sep. 19, 1988, Ser. No. 246,633
Int. Cl.[4] B65D *47/12*
U.S. Cl. 220—90.2 3 Claims



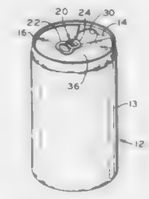
1. A canteen, or the like, including a liquid drink container having an open top and further having a cap removably mounted on the open top; a bushing eccentrically mounted on said cap displaced from the center thereof; elongated tubular means extending through said cap at a position displaced from the center of said cap, said elongated tubular means comprising a first elongated tubular member received in said bushing and extending down from said cap into the interior of said container when said cap is in place on said container, and said elongated tubular means comprising a second tubular member extending into said bushing on the upper side of said cap and coupled to said first tubular member through said bushing to form a drinking straw with said first tubular member; and a cover rotatably mounted on said cap, said cover having an opening therein and means projecting from the internal surface thereof to engage said second tubular member to cause said second tubular member to turn and project through said opening when said cover is turned to a particular angular position with respect to said cap.

4,852,763

BEVERAGE CONTAINER COVER

Donald J. Dimberio, 11416 Westwind Dr., Fort Wayne, Ind. 46845

Filed Jun. 2, 1988, Ser. No. 202,834
Int. Cl.[4] B65D *51/18*
U.S. Cl. 220—253 17 Claims



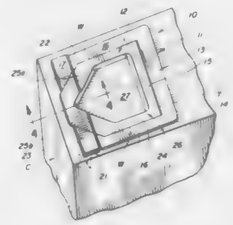
1. In combination with a beverage container having a top, a tab opener means connected two said top for creating an opening through said top when said tab opener means is actuated, and a circumferential upper lip disposed peripherally around the top and extending above the container top, a cover for said container comprising: a planar disc having an edge, an open notch formed in said disc extending completely to said edge, said disc being removably disposed within a recessed area on said container top within the upper lip, a portion of said disc adjacent said notch being disposed underneath said tab opener means between said tab opener means and said container top, said disc being rotatable so that aid disc selectively covers said container opening and alternatively uncovers said container opening when said notch is aligned with said opening.

4,852,764

POUR SPOUT CLOSURE

James L. Stone, Grand Rapids, Mich., assignor to Packaging Corporation of America, Evanston, Ill.

Filed Aug. 22, 1988, Ser. No. 235,387
Int. Cl.[4] B65D *5/74*
U.S. Cl. 220—315 12 Claims



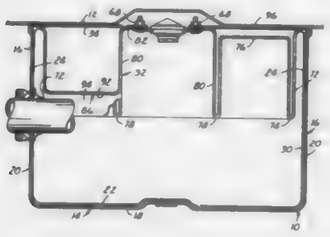
1. A pour spout closure of unitary construction for mounting proximate an opening formed in a surface of a container, comprising a base section adapted to be affixed to a portion of the container surface circumjacent the opening; and a cover section hingedly connected to a first portion of said base section and selectively movable relative thereto between open and reclose positions, said cover section having peripheral segments disposed adjacent corresponding second portions of said base section, said cover section being provided with a protuberance sized for entering the container opening when the cover section is in a reclose position; said base section having a foldable flap disposed in a folded relation with a second portion of said base section, said folded flap having an edge thereof engaging said cover section protuberance exterior when the latter is disposed within the container opening and retain said cover section in a reclose position.

4,852,765

FUEL TANK WITH BLADDER

Walter A. Lyzohub, Redford, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Sep. 12, 1988, Ser. No. 243,368
Int. Cl.[4] B65D 88/16, 90/28
U.S. Cl. 220—461 4 Claims



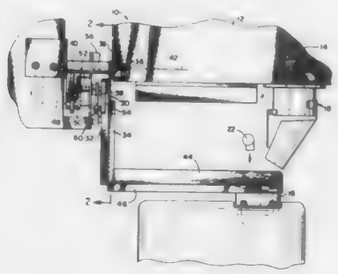
1. A fuel tank for a vehicle, comprising: an outer enclosure of sheet metal material including a bottom wall, a top wall and a side wall thereby defining an interior space; a liner of resilient sheet material having a lower wall, an upper wall and a side wall which extends therebetween, the lower and side walls being located in overlying relation to the bottom and side walls of the outer enclosure; the upper wall of the liner having a molded non-planar configuration including a first wall portion depending from the upper edge of liner's side wall, a second wall portion located radially inward in the tank from the first wall portion, and an intermediate wall portion extending between the first and second wall portions, the first and second wall portions extending in substantial parallelism with the tank's side wall; the second wall portion having an upper edge portion affixed to the top wall of the outer enclosure, whereby the liner's top wall separates the interior of the enclosure into a fuel space and an air space; edge means connecting the first and intermediate wall portions configured to urge the first wall portion to fold and roll back upon itself when the intermediate portion is moved upward away from the tank's bottom wall as the fuel level increases.

4,852,766

APPARATUS FOR AUTOMATICALLY DISPENSING A LIQUID INTO A CONTAINER INCLUDING A MEMBER FOR BLOCKING ACCESS TO THE INTERIOR OF THE APPARATUS

Martin E. Wigg, Warrington; Bryan M. Peckjian, Philadelphia, and Judson D. Smith, Jr., North Wales, all of Pa., assignors to Gross-Given Manufacturing Company, St. Paul, Minn.

Filed Mar. 9, 1988, Ser. No. 165,861
Int. Cl.[4] A47F 1/00
U.S. Cl. 221—96 11 Claims



1. In an apparatus for automatically dispensing a liquid into a container comprising: a housing containing a supply of containers, a source of the liquid to be dispensed, and a container well having an opening for receiving and supporting a container during dispensing of the liquid; means for delivering containers one at a time from the container supply to the container well; and means for dispensing liquid from the liquid source into a container supported in the container supply to the container well; and means for dispensing liquid from the liquid source into a container supported in the container well, the improvement comprising:

a support member supported by the housing for pivotal movement;

a blocking member secured to the support member distal from the point at which the support member is pivotally connected to the housing for movement with the support member between an operative position and an inoperative position, the blocking member being at least slightly larger than the container well opening so that the blocking member engages and closes the container well and completely blocks access to the interior of the housing via the container well when in the operative position, the blocking member being moved away from the container well to permit containers to be delivered to the container well and liquid to be dispensed into container supported in the container well when in the inoperative position; and

means for pivoting the support member to move the blocking member to the inoperative position when liquid is to be dispensed and to the operative position upon completion of the dispensing of the liquid.

4,852,767

VENDING MACHINE DISPENSER

Dallas Humphrey, Plymouth, Minn., assignor to Edina Technical Products, Inc., Eden Prairie, Minn.

Filed Mar. 3, 1988, Ser. No. 163,550
Int. Cl.[4] G07F 11/08; B65G 57/00
U.S. Cl. 221—241 18 Claims



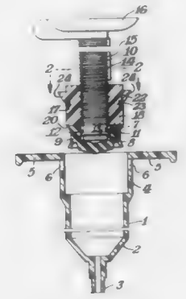
1. In a machine for vending generally cylindrical articles, a dispenser comprising, in combination: means for storing a plurality of the articles, with the storing means having an outlet of a size and shape allowing one of the plurality of articles to pass therethrough; a cradle positioned adjacent the outlet of the storing means, with the cradle being generally cylindrical in shape and having an axis; a cavity formed in the cradle for receiving the article to be ended, with the cavity having an opening; and means for rotatably mounting the cradle below the outlet of the storing means about the axis for positioning the cradle between a first position with the opening of the cavity aligned with the outlet of the storing means for receiving the article to be vended from the storing means and a second position with the cradle blocking the passage of the articles through the outlet of the storing means and with the opening of the cavity allowing the article to fall from the cavity through the opening, wherein the cradle comprises, in combination: first and second semicylindrical halves, with the cavity located in the second semicylindrical half allowing first semicylindrical halves of identical construction to be utilized with second semicylindrical halves having cavities of different sizes to dispense articles of corresponding sizes allowing the cradle to be interchanged in the dispenser for dispensing varying sized articles.

4,852,768

DOSING SYRINGE

Klaus Bartsch, Budenheim, Fed. Rep. of Germany, assignor to Blendax-Werke R. Schneider GmbH & Co., Fed. Rep. of Germany

Filed Mar. 22, 1988, Ser. No. 171,662
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1987, 3709783
Int. Cl.[4] B67D 5/42
U.S. Cl. 222—46 1 Claim



1. A dosing syringe comprising a cylindrical syringe body having a tapering end with a dispensing orifice therein, a stepped cylindrical enlargement, two opposing handles connected to and extending from the cylindrical enlargement, two opposing recesses in the cylindrical enlargement one underneath each handle, a piston inserted into the cylindrical syringe body from the enlarged end thereof, two retainer sides each having an internal thread, and a dosing plunger having an external thread, the dosing plunger being rotatably arranged in the two-part retainer sides with the threads engaging one another and the two retainer sides positioned in the enlargement of the syringe body, each retainer side having a positioning projection fitted into the recesses in the enlargement, a spring retainer connection releasably connecting the piston to the dosing plunger, each of the retainer sides having an outside groove, and an O-ring in the groove holding the two retainer sides together, and wherein the retainer sides are slightly spaced apart forming a pair of gaps 180° from each other, and a longitudinal rib on the plunger constructed and arranged to fit into one of the gaps and to be movable to the other gap upon 180° rotation of the dosing plunger.

4,852,769

REFRIGERANT CHARGING TOOL

James D. Robertson, Hollywood, and Paul E. Balthaser, Hialeah, both of Fla., assignors to Kwik Kool, Inc., Tallahassee, Fla.

Continuation of Ser. No. 499,028, Jun. 2, 1983, abandoned, which is a continuation of Ser. No. 225,628, Jan. 16, 1981, abandoned. This application Jul. 8, 1985, Ser. No. 752,017
Int. Cl.[4] B67B 7/24
U.S. Cl. 222—83.5 9 Claims

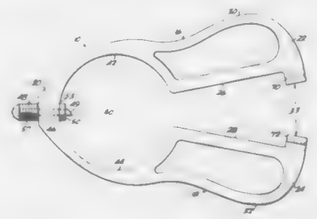
1. A hand-held can piercing tool comprising:

a nose portion;

first and second handle means extending from said nose portion,

can piercing means located in said nose portion,

and first push means located on said first handle means and second push means located on said second handle means



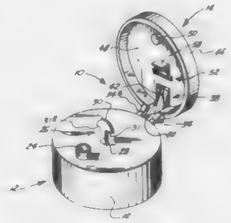
wherein said first and second push means are equal distanced from said nose portion and forces a can positioned between said first second handle means into engagement with said piercing means upon the user grasping and squeezing said first and second handle means with one hand.

4,852,770

CHILD-RESISTANT DISPENSING CLOSURE

Larry C. Sledge, Midlothian, Va., and Gordon J. Filipczak, Edina, Minn., assignors to Specialty Packaging Licensing Co., Wilmington, Del.

Filed Dec. 31, 1987, Ser. No. 140,157
Int. Cl.[4] B67B 5/00
U.S. Cl. 222—153 29 Claims



1. A child-resistant dispensing closure for a container, said closure comprising:

(a) a base having,

(i) an annular base side wall,

(ii) a base top wall at one end of said annular base side wall,

(iii) a dispensing orifice in said base top wall through which the contents of said container can be dispensed; and

(iv) a resilient post extending upwardly from said base top wall and adapted to flex in a flexing direction, said post having an enlarged upper end enlarged in a direction lateral of said flexing direction; and

a cap hingedly connected to said base, said cap being movable between an open position and a closed position and said cap having a cap top wall being formed with a locking aperture located within the periphery of said cap top wall, said aperture having a wider first portion and a narrower second portion, arranged side-by-side in said flexing direction, the enlarged upper end of said post being aligned with said wider first portion when the post is in a deflected position and being aligned with said narrower second portion when said post is in its predeflection posi-

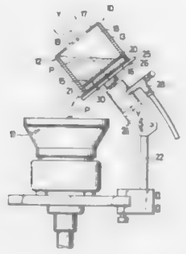
tion, said wider first portion being dimensioned to pass said enlarged upper end, said narrower second portion being dimensioned to receive a portion of the post underneath said enlarged upper end but not being ample enough to pass said enlarged upper end, thereby blocking the opening of the cap when said cap is in said closed position until the post is moved to the deflected position.

4,852,771

PARTS SUPPLY HOPPER

Akiyoshi Kando, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 14, 1988, Ser. No. 181,395
Claims priority, application Japan, Apr. 17, 1987, 62-58899[U]
Int. Cl.[4] B67D *5/64*
U.S. Cl. 222—169 8 Claims



1. A parts supply hopper comprising:
(a) a generally cup-shaped container rotatably disposed in an inclined plane with an open end facing upwardly and movable at least through an angle of 180 degrees about its own longitudinal central axis;
(b) a partition wall disposed in said container and lying in parallel spaced relation to a bottom wall of said cup-shaped container so as to define, jointly with said container, a pair of upper and lower chambers disposed one on each side of said partition wall, said partition wall having a transfer aperture communicating between said upper and lower chambers; and
(c) a peripheral wall of said cup-shaped container having a discharge outlet opening communicating with said lower chamber and located in diametrically opposed relation to said transfer aperture.

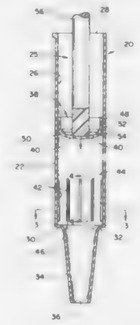
4,852,772

DISPENSER FOR VISCOUS FLUIDS

James F. Ennis, III, Preston, Conn., assignor to Genesis Industries, Incorporated, Spring Valley, Wis.

Filed Dec. 7, 1987, Ser. No. 129,447
Int. Cl.[4] B67D *5/42*
U.S. Cl. 222—386 5 Claims

1. A dispenser for a viscous fluid comprising:
a barrel having a cylindrical inside wall defining a chamber for receiving, containing and discharging a viscous fluid;
a nozzle at one end of said barrel, said nozzle having an open end spaced axially from said barrel for passing said fluid into said chamber and for discharging said fluid therefrom;
a cylindrical piston head in said barrel axially movable in said chamber, said head having an external diameter substantially equal to the internal diameter of said inside wall of said barrel to grip the same frictionally and thereby to seal said fluid in said chamber, said piston head having a closed wall facing said nozzle for pushing said fluid to discharge the same from said chamber; and
means in said chamber near said nozzle defining a plurality of shallow, fine, circumferentially spaced passages between said piston head and said inside wall of said chamber, said passages comprising a multiplicity of short shallow narrow grooves in said inside wall of said barrel, said grooves being fine enough to pass air entrapped between said fluid and said closed end of said head while preventing said fluid from passing therethrough, said passages extending axially of said chamber near said nozzle a distance not exceeding twice the axial length of said piston head at said inside wall of said barrel, said distance being not less than 102% of said axial length of said piston head,



to pass said entrapped air rearwardly beyond said piston head, said head having sufficient hardness to prevent said head from extending laterally into said passages to avoid obstructing the same and thereby permitting said entrapped air to pass therethrough, said hardness of said head being sufficient to prevent said fluid from leaking rearwardly of said piston at all positions of said head in said barrel, even when said head is advanced axially under pressure in said chamber to discharge said fluid from said nozzle.

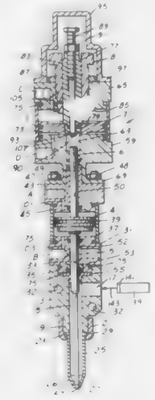
4,852,773

ADJUSTABLE FLOW APPLICATOR FOR A POSITIVE DISPLACEMENT CONSTANT FLOW-RATE DISPENSER

Ronald E. Standlick, Rochester, and David A. Standlick, Utica, both of Mich., assignors to Jesco Products Company, Inc., Sterling Heights, Mich.

Filed Dec. 28, 1987, Ser. No. 138,713
Int. Cl.[4] B67D *3/00*
U.S. Cl. 222—504 22 Claims

1. An adjustable flow applicator for pressurized fluidic materials comprising:
a body having an axial flow passage and an inlet passage communicating therewith and adapted for connection to a source of pressurized fluidic material;
an axial nozzle connected to said body communicating with said flow passage and terminating in a converging orifice for feeding said material;
an axially reciprocal piston rod exension spaced within said flow passage and nozzle terminating in a tapered valve member having an advanced position normally seated within said orifice shutting off flow of fluidic material therethrough, and first and second retracted positions variably opening said orifice for a reduced flow rate of said material when in said first position and at an increased flow rate when in said second position;
first pneumatic control means axially mounted upon said body receiving said piston rod extension and including a first piston connected to said piston rod extension for effecting alternate reciprocal movements of said valve member for alternately opening and closing said orifice;
a piston rod connected to said piston; and
a second pneumatic control means axially mounted upon said first pneumatic control means receiving said piston rod and including a reciprocal second piston;
said second piston having an advanced position limiting axial retracting movements of said piston rod and valve member to a limited retracted reduced flow position and an alternate retracted position axially outward of said piston rod so that said valve member may move to said increased flow rate position, said second piston having a greater surface area than said first piston.



4,852,774

DISPENSER WITH CLOSURE CAP

John C. Crawford, Lake Mahopac, N.Y., assignor to Colgate-Palmolive Company, Piscataway, N.J.

Filed Aug. 26, 1988, Ser. No. 237,186
Int. Cl.[4] B67D *3/00*
U.S. Cl. 222—545 8 Claims



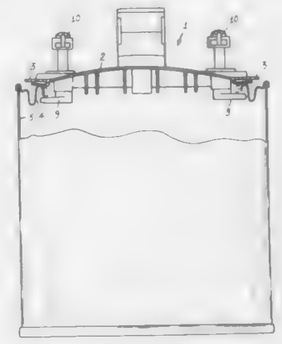
1. A dispenser for a flowable material, comprising:
a container having a chamber for retaining the material, and a nozzle being offset from a central axis of the container and defining an outlet orifice for dispensing the material from the container; and
a cap for covering the nozzle including means for securing the cap to the container at a plurality of rotational positions relative to the container, and means on the cap for closing the nozzle at each of said rotational positions, wherein the closing means comprises a plurality of inner plugs on the cap which separately register with the nozzle at each of said rotational positions.

4,852,775

POURING COVER FOR PAINTS, ENAMELS AND THE LIKE

Daniele Zordan, Via Solone, 7, Monza (Milano), Italy

Filed Nov. 13, 1987, Ser. No. 120,346
Int. Cl.[4] B65D *25/42*
U.S. Cl. 222—569 1 Claim



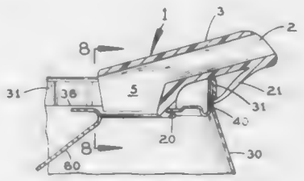
1. A pouring cover structure, specifically designed for pouring paints, enamels and the like, comprising a cover body provided with a pouring spout with a metering gate member and operating cam members for coupling said cover body to the inner edge of a paint cam or the like, a resilient lip gasket member arranged under the perimetrical edge of said cover member and adapted to engage the top portion of said can, said resilient lip gasket member being coupled to said cover body through a resilient loop portion integral with said resilient lip gasket member to provide resiliency in the axial direction of said can, said resilient lip gasket member further comprising integral axial resilient projections to be deflected against the inner edge of said can as an axial closure force is exerted on said resilient loop portion, said resilient lip gasket member depending from said perimetrical edge by said resilient loop portion, said resilient lip gasket member having upper and lower surfaces and said axial resilient projections depending from the lower surface of said resilient lip gasket member.

4,852,776

DRINKING SPOUT FOR A BEVERAGE CAN

Marilyn Patton, Pompano Beach, Fla., assignor to Mastodon, Inc., Pompano Beach, Fla.

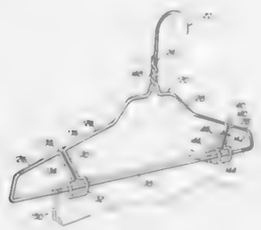
Continuation of Ser. No. 44,752, May 1, 1987, abandoned. This application Jul. 21, 1988, Ser. No. 222,178
Int. Cl.[4] A47G *19/22*; B65D *25/48, 39/00*
U.S. Cl. 222—570 4 Claims



1. A spout for attachment to a can having a top bounded by a raised peripheral rim and an opening in the top located off-center toward one side of the can and spaced from said rim on said one side of the can, said top of the can being thin vertically and substantially flat circumferentially around said opening, said spout comprising:

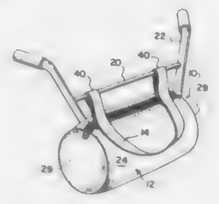
a tubular plastic body having an inner end for attachment to the can at said opening therein and an outer end providing a drinking opening laterally outward beyond and above said rim at said one side of the can;
said tubular body having a bottom side with an opening at its inner end bounded by an arcuate edge that extends only part-way around said opening in the top of the can;
said body having a passageway extending from said opening at its inner end to said drinking at its outer end;
said body on its bottom side having a vertically narrow groove which is located laterally outward from said arcuate edge of said opening at its inner end and extends substantially completely around said arcuate edge, said groove being open toward said one side of the can to snugly receive the top of the can part-way around the edge of said opening in the top of the can;
and a flexible and resilient lip spaced from said body and extending from said bottom side of the body downwardly and rearwardly at an angle toward said groove and terminating in an inner edge spaced below said bottom side of the body and spaced outward from said groove;
said groove and said lip being positioned so that when said groove receives the top of the can part-way around the edge of said opening therein said lip engages beneath said peripheral rim on the can to manually releasably attach said body to the top of the can.

4,852,777
LOCKING GARMENT HANGER
Larry M. Balkin, 2690 Valleydale Dr., Conyers, Ga. 30207
Filed Mar. 21, 1988, Ser. No. 170,763
Int. Cl.[4] A47G *25/24, 25/52*
U.S. Cl. 223—91 **5 Claims**



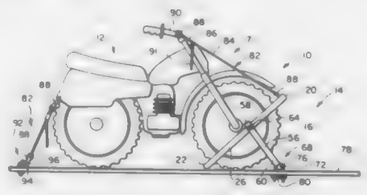
5. A locking garment hanger comprising a length of wire formed into a generally triangular form having a hook means extending from the upper end of said triangular form for suspending said hanger from a suitable support, arm means extending angularly downward from both right and left sides of said hook means for supporting the arm portions of a garment, and a lower garment supporting rod member extending transversely relative to said arm means and disposed in a first vertical plane for connecting said arm means, with portions of at least one of said arm means being extended inwardly relative to said triangular form and formed into at least one garment retaining clip means, said clip means being disposed in a plane parallel to said first plane when in a resting position and spaced from said rod member, said clip means also being laterally displaceable to the side of said rod member opposite the side on which said clip means is disposed when in said resting position and tensioning said arm means for engaging and securing with said clip means a garment disposed on said rod member.

4,852,778
COMBINATION BICYCLE BAG AND HANDBAG
Wayne Beiser, Cincinnati, Ohio, and Amy A. Bloom, Shillington, Pa., assignors to Huffy Corporation, Miamisburg, Ohio
Continuation of Ser. No. 914,683, Oct. 2, 1986, abandoned. This application Feb. 25, 1988, Ser. No. 161,290
Int. Cl.[4] B62J *9/00*
U.S. Cl. 224—30 A **5 Claims**



1. A combination bicycle bag and shoulder-type handbag for quickly releasable mounting on a predetermined normally substantially horizontal bar on a bicycle, comprising:
(a) a bag body,
(b) a strap of one-piêce construction having opposite ends fastened to spaced portions of said bag body and extending perpendicular to the length thereof,
(c) said strap being of appropriate length to suspend said bag from a shoulder of a person,
(d) a set of first and second complementary fastening members mounted near each of said opposite ends of said strap,
(e) said first member of each of said sets being positioned on said strap in closely spaced relation with the adjacent said end of said strap,
(f) said second member of each of said sets being positioned on said strap in spaced relation with the adjacent said first member, and
(g) each said set of fastening members being of such combined length and spacing that the portion of said strap on which they are mounted is of a length to surround said bicycle bar and to bring said set of fastening members into complementary engagement, whereby said bag may be releasably mounted on such bicycle bar by looping each portion of said strap having said complementary fastening members thereon about said bar and fastening said fastening members together.

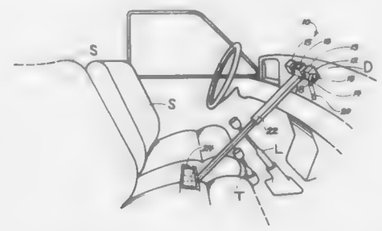
4,852,779
COLLAPSIBLE BIKE RACK FOR AUTOMOTIVE VEHICLE
Kevin Berg, P.O. Box 470, Cal-Nev-Ari, Nev. 89039
Filed Feb. 16, 1988, Ser. No. 156,451
Int. Cl.[4] B60R *9/10*; B60P *3/06*
U.S. Cl. 224—42.32 **8 Claims**



1. A collapsible bike rack for use in an automotive vehicle comprising a rectangular frame formed with a first pair of parallel sides serving as horizontal members and a second pair of parallel sides serving as ends oriented perpendicular to said horizontal members and further including a plurality of interior dividers extending parallel to said ends and spaced arart to define openings to receive a wheel of a bike, a pair of arms of

equal length each rotatably hinged along a common axis to a separate one of said ends, means for rotatably coupling said arms to the bed of the vehicle comprised of a horizontally disposed axle extending between said arms and located on said bed of said vehicle wherein said arms are rigidly joined to the ends of said axle remote from said common axis whereby said axle turns in rotation with said arms, a sleeve disposed about the center of said axle, and means for rigidly securing said sleeve to said bed of said vehicle, whereby said axle turns within said sleeve and whereby said arms rotate in tandem parallel to each other to alternatively bring said frame into an erected position and a collapled position residing flat against said vehicle bed, and straps of adjustable length having releasable coupling means for releasably securing said frame to a bike positioned with a wheel in one of said openings.

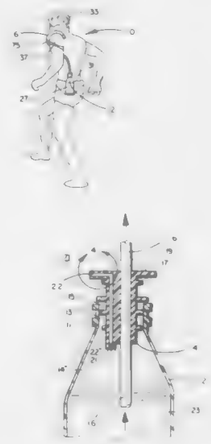
4,852,780
GUN RACK
Wayne F. Woodbury, P.O. Box 1154, Delta Junction, Ak. 99737
Filed Aug. 10, 1988, Ser. No. 230,361
Int. Cl.[4] B60R *11/00*
U.S. Cl. 224—42.45 R **12 Claims**



1. A portable gun rack for holding rifles and shotguns and an interior of a vehicle having front bucket seats, a dashboard and a floor, comprising:
an elongated barrel support block;
at least one notch for receiving a gun barrel in said block;
strap fastening means on said block for securing a gun barrel in said notch;
releasable securing means on said block for securing said block to the vehicle dashboard;
an elongated strut having an upper end perpendicularly attached to said block; and
an elongated gun butt support box extending parallel to said block and perpendicularly attached to a lower end of said strut, said box dimensioned to be received between the vehicle front bucket seats and rest on the vehicle floor.

4,852,781
RUNNER'S PORTABLE FLUID SUPPLY CONTAINER
Carl W. Shurnick, and Sabrina M. Bradley, both of 10062 San Pablo, Fountain Valley, Calif. 92708
Filed Nov. 17, 1987, Ser. No. 121,917
Int. Cl.[4] A45F *3/18*
U.S. Cl. 224—148 **3 Claims**

1. A runner's portable fluid supply container, comprising:
a water bottle having a neck having an interior surface capable of removeable coupling to a cap;
a hollow cap having an exterior surface capable of removeably coupling to the interior surface of the neck of the bottle, a first generally cylindrical interior surface capable of coupling around the exterior surface of a sipping hose disposed through the cap and a second interior surface defining an air passage only tunnel coupling the exterior atmosphere to the interior of the bottle in a substantially liquid leak proof coupling which permits substantially free flow of gases between the exterior atmosphere and the interior of the bottle adjacent the cap;
coupling means coupling the bottle to a selected part of the wearer's body;
a curved hollow only slightly flexible sipping tube open at both ends, having a lower interior end adjacent the interior bottom surface of the bottle, and an upper exterior end near the mouth of the wearer of the bottle, the hose curving near the shoulder of the wearer;
the air passage only tunnel interior surface is generally upside down L-shaped, the top surface of the L exiting into



the exterior atmosphere and the bottom surface of the L exiting from the bottom surface of the cap near the top of the bottle with the opening at the bottom of the tunnel substantially parallel to the opening at the top of the tunnel, the top surface of the L defines a liquid deflecting notch in location substantially parallel to the lower surface edge closest to the tunnel exit into the exterior atmosphere and at approximately a 45 degree angle to both cap top and bottom surfaces of the L; and
further including coupling means coupling the tube to the upper arm of the runner.

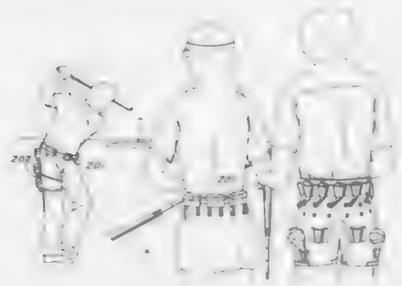
4,852,782
EQUIPMENT FOR PLAYING GOLF
Ko-Lee Wu, 34d Floor, No. 5, Alley 9, Lane 56, Hou-Kang Street, Shih-Lin District, Taipei 11154, and Ming-Chi Huang, 2nd Floor, No. 4-1, Alley 4, Lane 74, Hsin-I Rd, Sec. 4, Taipei 10656, both of Taiwan
Filed Jan. 21, 1987, Ser. No. 5,673
Int. Cl.[4] A63B *53/02*
U.S. Cl. 224—226 **11 Claims**

1. A set of equipment for playing golf, comprising:
(a) a set of golf club heads corresponding to a conventional golf club set;
(b) a shaft, configured at a first end thereof for ready assembly or disassembly therewith of a selected head and for locking the head into position between such assembly and disassembly and at a second end thereof for ready relative longitudinal adjustment of an end grip portion to provide different selected effective shaft lengths;
(c) graspable transportation means dimensioned and shaped to accommodate the said full set of golf club heads; and
(d) at least one wearable carrying means to accommodate a selection of such heads during a round of golf, secured to

or part of a waist belt in such a location as not to interfere with a player's movements and presenting the heads for ready choice of a selected head for interchange on the shaft when necessary,

wherein the assembly configuration between the shaft and any head comprises:

(a) on the head, a straight hollow neck of generally cylindrical internal form and possessing towards an inner end of a cylindrical hollow an internal collar with a pair of opposed diametral interruptions, and



(b) on the shaft, a cylindrical end portion dimensioned to fit within the cylindrical hollow, having an endmost region which is of a smaller diameter and possesses a pair of opposed diametral protrusions, capable of passage through the interrupted portions of the internal collar within the neck and capable of engagement beneath the collar when the shaft is twisted through 90° relative to the head.

4,852,783

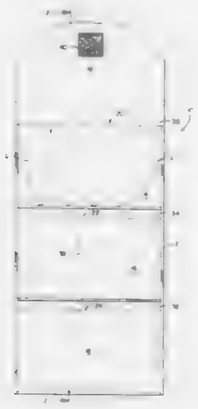
MULTI-COMPARTMENT RECEPTACLE FOR INDIVIDUALLY PACKAGING AND DISPENSING PAIRS OF GLOVES FOR USE BY HEALTH CARE OR EMERGENCY RESCUE PERSONNEL

Norman E. Bryden, 2407 Arden Dr., Champaign, Ill. 61821, and Philip B. Johnson, 809 W. Sunset Dr., Mahomet, Ill. 61853

Filed May 17, 1988, Ser. No. 195,042

Int. Cl.⁴ A45F *5/00;* **B65D** *65/12, 85/18*

U.S. Cl. 224—253 **16 Claims**



1. A multi-compartment receptacle for packaging and storing a plurality of pairs of protective gloves to be carried by a single person whereby each pair of gloves may be distributed to one of several persons on a rescue team, hospital crew, or like group of persons, said receptacle comprising:

a. a web of foldable flexible material which in an extended condition thereof includes a closure flap and a series of hinge areas;

b. a series of compartments;

c. first and second securing means; and

d. carrying means;

wherein said web of foldable flexible material includes a front side and a back side, said series of compartments are disposed on said front side of said web of material, said carrying means is disposed on the back side of said web of material behind said first compartment and is adapted to be releasably secured to the body of said person, each of said compartments having an opening along an upper edge thereof, each of said hinge areas extending transversely from side to side of said web of material above the opening of one of said compartments whereby each of said compartments starting with the last compartment may be folded along a preceding one of said hinge areas over a preceding one of said compartments, said closure flap being disposed above the first one of said hinge areas and extending to a free end of said web of material whereby said closure flap may be folded along said first hinge area over said compartments after each of said compartments has been folded against the respective preceding compartment, said first securing means being disposed on the front side of said web of material on said closure flap, said second securing means being disposed on the back of said web of material behind said second compartment in a position accessible for contact and cooperation with said first securing means when said closure flap is folded thereagainst.

4,852,784

HANDCUFF HOLDER

Willie L. Burton, Jr., 4321 7th St. N.W., Washington, D.C. 20011

Filed Jan. 25, 1989, Ser. No. 301,137

Int. Cl.⁴ A45F *5/00*

U.S. Cl. 224—255 **1 Claim**



1. In combination a handgun holster and a handcuff holder, said holster having an outer surface, said handcuff holder including retaining means for releasably retaining a pair of handcuffs and attachment means for removably attaching said handcuff holder to said outer surface of said holster.

4,852,785

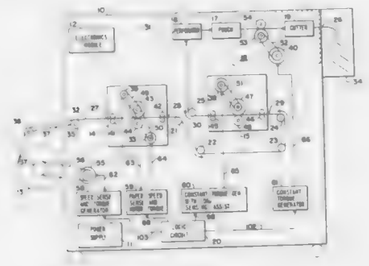
PRINTER PAPER CONTROL APPARATUS AND METHOD

Richard A. Bettendorf, and Scott S. Morris, both of Oklahoma City, Okla., assignors to Honeywell Bull Inc., Minneapolis, Minn.

Filed Nov. 24, 1987, Ser. No. 124,695

Int. Cl.⁴ B65H *23/18, 59/18*

U.S. Cl. 226—42 **11 Claims**



1. The combination comprising:

a roll of material mounted on a spindle, said roll of material being a source of a web;

a first intermediate work station means and a remote work station means, said work station means for performing operations on the web as it moves from the roll of material sequentially through the intermediate and remote work stations, movement of the web through the work stations being opposed by frictional forces;

first means for applying an active torque of controllable magnitude to the roll of material opposing movement of the web through the work stations;

second means for applying a second force to the web in the remote work station, said second force acting to move the web from its source through the work stations, the magnitude of the second force being less than the frictional forces opposing movement of the web;

third means for applying a third force to the web in the first intermediated work stations, said third force acting to move the web from its source through the work stations, the magnitude of the third force being greater than the forces acting on the web opposing such movement; and

control means for varying the magnitude of the active torque applied to the roll of material and the magnitudes of the second and third forces to maintain the tension of the web from its source to the remote work station substantially constant and to move the web through the work stations at a substantially constant and predetermined speed.

4,852,786

TAPE MODULE FOR A MODULAR MAILING MACHINE

Hugh S. Dannatt, Bethel, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 17, 1987, Ser. No. 134,626

Int. Cl.⁴ B65M *17/36*

U.S. Cl. 226—137 **6 Claims**

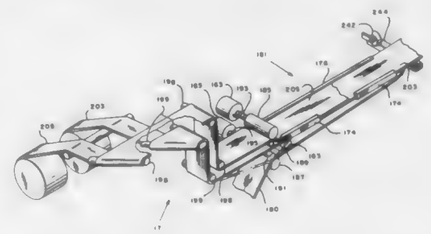
1. A tape module for selectively feeding one of a plurality of tapes for imprinting on said selected tape by an imprinting mean at an imprinting station, comprising:

a tape track having a generally longitudinal extending stripe member and side member fixably mounted longitudinally to said stripe member in transverse spaced apart relations;

support means for supporting said tape track;

tape position means for selectively positioning said support means in a first position located in said imprinting station and in a second position removed from said first position;

tape feed means for selectively feeding a portion of one of said plurality of tapes to and through said tape track such



that said fed tape resides within said tape track when said tape track is in said first position for imprinting thereon.

4,852,787

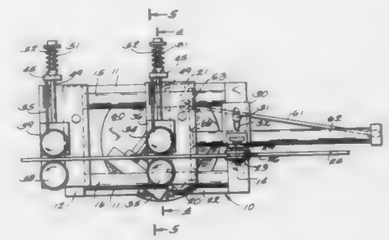
STOCK FEEDING MECHANISM FOR PRESS

Dale F. Radtke, Jefferson, and Ronald F. Rutke, Milwaukee, both of Wis., assignors to R & R Engineering, Inc., Jefferson, Wis.

Filed Nov. 27, 1987, Ser. No. 125,669

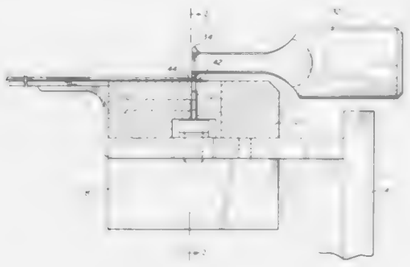
Int. Cl.⁴ B65H *20/04*

U.S. Cl. 226—142 **3 Claims**



1. A feeding mechanism for feeding stock into a machine comprising; a frame; gripping means carried by said frame for rectilinear movement and adapted to grip the stock that is being fed to the machine, drive means connected to move said gripping means to move the gripped stock in a feeding movement; a slide block slidably supported by said drive means for movement along a predetermined path of travel; means connecting said slide block to said gripping means for coupling said drive means thereto; means for moving said slide block relative to said drive means for adjusting the length of the feeding movement of the stock for each cycle of the feeding mechanism; a reference surface fixedly mounted on said drive means; a measuring surface movable with said slide block relative to said reference surface and calibrated so that the distance between said reference surface and said measuring surface is equal to the feeding movement of said stock during each cycle of the feeding mechanism; a locking plate slidably supported by said drive means; a locking edge on said locking plate in engagement with one edge of said slide block; a tapered edge formed on said locking plate opposite its locking edge; a complementary tapered edge presented by said drive means for engagement with said tapered edge of said locking plate; and means for moving said locking plate for sliding its tapered edge along the complementary tapered edge on said drive means for causing said locking edge to shift into tight engagement with said slide block for securely locking the latter in its adjusted position.

4,852,788
METHOD AND APPARATUS OF ULTRASONIC GANG WELDING
Michael J. Patrikios, Stratford, Conn., assignor to American Technology, Inc., Milford, Conn.
Filed Jun. 16, 1988, Ser. No. 206,702
Int. Cl.[4] B23K *20/10*
U.S. Cl. 228—110 8 Claims

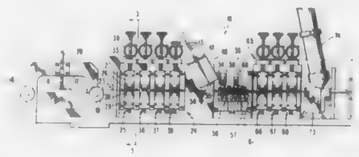


6. The method of simultaneously ultrasonically welding individual wire ends to individual contacts on a wire connector, comprising the steps of:
providing an anvil having a plurality of first projections;
providing a comb having a plurality of teeth spaced from each other to enable them to be slidably received between the projections of the anvil;
positioning the teeth of the comb so that they project from the top surface of the anvil;
positioning the individual contacts of the wire connector on the anvil and between the teeth of the comb;
placing the individual wire ends between the teeth of the comb so as to contact the individual connector;
providing an ultrasonic horn having an ultrasonic welding tip, said welding tip having a plurality of projections extending therefrom and being separated from each other a distance to enable sliding engagement between the teeth of said comb;
moving said ultrasonic welding tip whereby the end of the projections presses the individual wires against the contacts which are resting on the anvil; and
ultrasonically welding the wires to the contacts.

4,852,789
PROCESS FOR MODIFYING THE SURFACE OF METAL OR METAL ALLOY SUBSTRATES AND SURFACE MODIFIED PRODUCTS PRODUCED THEREBY
Robert B. Pond, Sr., 299 Ridge Rd., Westminster, Md. 21157
Division of Ser. No. 243,608, Sep. 13, 1988. This application Dec. 15, 1988, Ser. No. 284,707
Int. Cl.[4] B23K *23/00*
U.S. Cl. 228—198 14 Claims

1. A process for producing a reactive metal or reactive metal alloy substrate having a tightly bonded abrasion resistant surface layer, said process comprising:
disposing a powdered mixture comprising silicon oxide and iron oxide on at least one outer surface of said reactive metal or reactive metal alloy substrate; and
heating said substrate and powdered mixture to a temperature from below a melting point or solidus temperature of the substrate to about the melting point or solidus temperature of the substrate, thereby producing a tightly bonded abrasion resistant surface layer on said substrate.

4,852,790
APPARATUS AND METHOD FOR CONTINUOUS MANUFACTURE OF ARMORED OPTICAL FIBER CABLE
Herbert E. Karlinski, San Diego, Calif., assignor to K-Tube Corporation, San Diego, Calif.
Division of Ser. No. 75,839, Jul. 16, 1987, Pat. No. 4,759,487, and a continuation-in-part of Ser. No. 23,927, Mar. 9, 1987, abandoned, which is a continuation of Ser. No. 802,853, Nov. 27, 1985, abandoned. This application Mar. 4, 1988, Ser. No. 164,381
Int. Cl.[4] B23K *31/06, 26/02;* B23P *19/04;* B21D *39/00*
U.S. Cl. 228—148 8 Claims

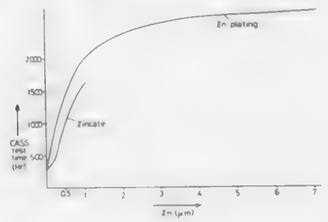


8. A process for continuous manufacture of optical fiber cable in which optical fiber is encased by an hermetically sealed homogeneous metal tube formed from flat metal strip, comprising the steps of:
passing the metal strip through a first metal forming means that transforms the metal strip into a partially formed tube with a longitudinal gap at the top thereof;
guiding optical fiber through the gap of said partially formed tube to lie within the partially formed tube;
passing the partially formed tube with optical fiber therein through a second metal forming means that transforms the partially formed tube into a substantially completely formed tube having a seam with abutted edges at the top thereof; and
directing a beam of laser light onto the abutted edges of the tube seam as said seam in conveyed through the beam at a location where said optical fiber lies within the tube adjacent the seam without heat shielding intermediate the optical fiber and the abutting edges of said seam, wherein the beam of laser light is focused such that the focal point is located above the surface of the seam, for conduction welding the seam together without filler metal, thereby creating a homogeneous tube having an hermetically sealed seam with optical fiber within the tube.

4,852,791
METHOD FOR MAKING CORROSION RESISTANCE HEAT EXCHANGERS
Tatsuo Otsuka; Ichiro Iwai, both of Oyamashi, and Noboru Yamaguchi, Ashikagashi, all of Japan, assignors to Showa Aluminum Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 91,992, Sep. 2, 1987, abandoned. This application Jun. 2, 1988, Ser. No. 201,188
Claims priority, application Japan, Sep. 4, 1986, 61-209154
Int. Cl.[4] B23K *1/12, 1/19;* F28D *19/06, 21/00*
U.S. Cl. 228—183 3 Claims

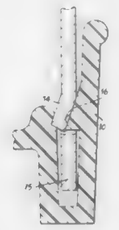
1. A method for producing corrosion resistant heat exchangers having a plurality of aluminum tubular elements and fin members, the method comprising: immersing the tubular elements in a first bath for a period of time between 15 and 90 seconds, without passing an electric current, to form foundation layers on the surfaces of the elements; immersing the tubular elements in a second bath and passing an electric current so that the surfaces of the elements are covered with zinc layers, the thickness of said layers being in the range of 1.0 to 3.0 μm; said first and second baths containing 5 to 15 g/l of ZnO, 50 to 150 g/l of NaOH and 3 to 10 ml/l of a lustering agent, and being kept at a temperature of 20° to 35° C.; combining the zinc plated tubular elements with fin members covered

with a brazing sheet so that a core is provisionally formed; and placing the provisional core in a furnace to braze the fin mem-



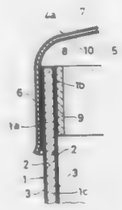
bers to the tubular elements, and also to enable the electroplated zinc layers to diffuse over the surfaces of the tubular elements.

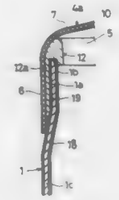
4,852,792
SELF LOCKING COVER/BOTTOM FOR FIBRE DRUMS
James A. Hale, Red Bank, N.J., assignor to Greif Bros. Corporation, Delaware, Ohio
Filed Mar. 2, 1988, Ser. No. 163,064
Int. Cl.[4] B65D *3/12*
U.S. Cl. 229—5.5 6 Claims



1. The combination of a fibre drum and a self locking cover/bottom wherein the fibre drum includes a tubular drum side wall and opposed ends, the side wall having surfaces defining a plurality of spaced notches adjacent at least one of the ends, said notches being so constructed and arranged to have a free end facing the adjacent end and being movable radially inwardly into the interior of the side wall, and the cover/bottom comprising a planar surface and a peripherally extending depending projection in association with the exterior surfaces of the adjacent end of the side wall of the fibre drum and having a plurality of spaced tapered portions in registry with the notches, each tapered portion extending inwardly and towards the planar surface to engage, when in registry therewith, surfaces of the side wall defining the free end of a notch in the side wall, with the tapered portion projecting into the surfaces defining the associated notch to reinforce the fibre side walls of the notch and render it relatively impossible for the side wall to move away from the tapered portion of the projection of the cover/bottom.

4,852,793
SEALED CONTAINER AND PROCESS OF MANUFACTURE THEREOF
Yoshihiro Homma, Urawa; Akira Nakata, Ageo; Shiroh Matsumoto, Iwatsuki; Kunitoshi Yoshimura, Ohmiya, and Masahiko Minato, Iwatsuki, all of Japan, assignors to Hokkai Can Co., Ltd., Tokyo, Japan
Division of Ser. No. 795,901, Nov. 7, 1985, Pat. No. 4,757,936. This application May 4, 1988, Ser. No. 190,064
Claims priority, application Japan, Nov. 7, 1984, 59-167999; Dec. 19, 1984, 59-266284; Dec. 19, 1984, 59-266286
Int. Cl.[4] B65D *3/12, 3/30*
U.S. Cl. 229—5.5 13 Claims





1. A sealed container, comprising:
a waterproof container barrel body made of paper and having opposing opposite ends; and
a pair of closure members, one for each end, each cooperatively engageable with an end of the barrel body to form a hermetically sealed container, each closure member including,
a panel to generally cover each open end,
a peripheral wall portion extending downward from the periphery of said panel and generally perpendicular thereto,
a covering means for covering an end surface of said container barrel body, and
a reinforcing member adhered to a peripheral surface of each of the opposing open ends of the container barrel body, the peripheral wall portion of the closure member being mounted on the container barrel body and adhered thereto at a position corresponding to the adhered position of said reinforcing member, said reinforcing member withstanding pressure and force applied thereto when the closure member is positioned on said container barrel body;
said covering means and said reinforcing member are an integral covering and reinforcing member and the covering and reinforcing member is an L-shaped element for covering the end surface and only one surface of the opening portion of the container barrel body.

4,852,794

DIRECT MAIL SOLICITATION DEVICE AND METHOD FOR ASSEMBLY THEREOF

Stanley N. Bennett, Bridgeton, N.J.; James T. Perry, West Chester, and Ronald D. Greene, Villanova, both of Pa., assignors to Devon Direct Marketing & Advertising, Inc., Malvern, Pa.

Filed Aug. 26, 1988, Ser. No. 236,806
Int. Cl.[4] B65D *27/04*
U.S. Cl. 229—73 6 Claims



1. A direct mail solicitation device comprising:
(A) an outer wrapper folded along one side edge, open at one end, closed, at the other end and having an adhesive coated flap extending along another side edge thereof for sealing the wrapper along said another side edge;
(B) an elongated inner sheet, having first and second portions, folded about a transverse fold line and disposed in said outer wrapper with the fold line adjacent the closed end of the outer wrapper with the end of at least one of said portions opposite the fold line disposed adjacent the open end of the outer wrapper; and
(C) a reply envelope in said outer wrapper between said first and second portions of said inner sheet adjacent said fold line and dimensioned relative to said outer wrapper to be frictionally compressed between the side edges of said outer wrapper when said flap is sealed to said wrapper thereby locking the reply envelope and the folded sheet within said outer wrapper.

4,852,795

MAILING COVER WITH REPLY ENVELOPE AND RESPONSE DEVICE MADE FROM INTEGRAL WEB

Kurt E. Volk, Jr., Westport, Conn., assignor to Kurt H. Volk, Inc., Milford, Conn.

Continuation of Ser. No. 502,345, Jun. 10, 1983, abandoned, Continuation-in-part of Ser. No. 366,190, Apr. 7, 1982, abandoned. This application May 22, 1985, Ser. No. 736,978
Int. Cl.[4] B65D *65/22*
U.S. Cl. 229—92 6 Claims



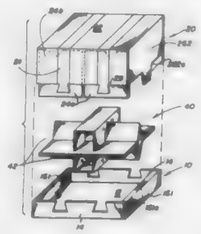
1. As an article of manufacture, a composite mailing cover, adapted to be secured to a magazine or catalog, comprising front and rear cover sheets joined along a longitudinal fold line, said longitudinal fold line being aligned with the binding of the magazine or catalog, and at least one preformed reply envelope with open flap, said envelope flap being parallel to and adjacent a transverse edge of said cover sheets, the envelope lying inside of and detachably connected to at least one of the cover sheets, a portion of the reply envelope positioned proximate the longitudinal fold line and in contact with the binding of the magazine or catalog to thereby maintain said envelope inside the cover sheets during transmittal, and wherein said composite wrapper is prepared from an integral web.

4,852,796

DISPLAY CONTAINER

Abe Katzman, Scarsdale, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 98,069, Sep. 18, 1987, Pat. No. 4,775,097. This application Jun. 17, 1988, Ser. No. 208,238
Int. Cl.[4] B65D *5/30, 5/48*
U.S. Cl. 229—125.28 7 Claims



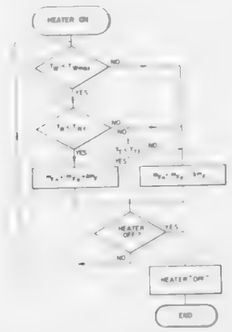
1. A display container comprising:
a base having a bottom wall, two side walls, two end walls and an open top, said side and end walls having upper edges;
a lid having a top wall, two side walls, two end walls and an open bottom;
said lid end walls having lower portions engagable over at least part of respective base end walls, and at least partly covering said base end wall upper edges, said lid side walls having inner portions which are telescopically engagable into said base behind respective base side walls;
each lid end wall having an upper portion with an outer surface, which is co-planar with an outer surface of its respective lower portion, each lid side wall having an outer portion over a respective base side wall, said outer portion of each lid side wall having an outer surface which is co-planar with an outer surface of its respective base side wall, whereby tape can be smoothly wrapped in a continuous loop over outer surfaces of said top, bottom and base side walls, as well as over said outer surfaces of said outer portion of said lid side walls; and
one of said lid and base including a wedge-shaped, locking tab and the other of said lid and base includes a locking recess having a shape corresponding to that of said locking tab for receiving said locking tab to lock said lid to said base.

4,852,797

PROCESS FOR OPERATING A FUEL-OPERATED HEATER AND CONTROL ARRANGEMENT FOR PERFORMING THE PROCESS

Dieter Goerlich, Emmering, Fed. Rep. of Germany, assignor to Webasto AG Fahrzeugtechnik, Gauting, Fed. Rep. of Germany

Filed Nov. 4, 1987, Ser. No. 116,342
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1986, 3639172
Int. Cl.[4] G05D *23/00*
U.S. Cl. 237—2 A 21 Claims



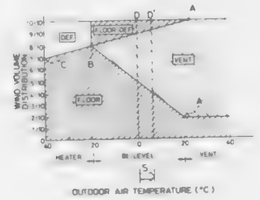
1. Process for operating a fuel-burning heater, especially a vehicle auxiliary heater, without limiting the maximum heating power output to a predetermined fixed rated power output, in which fuel and combustion air are fed to a burner of the heater, and combusted for heating a heat exchange medium via a heat exchanger, wherein an instantaneous operating condition of the heater is determined and wherein the maximum heating power output producible by the heater is adjusted during operation of the burner in accordance with said instantaneous operating condition of the heater in a manner progressively increasing and decreasing output of the burner, as appropriate, to achieve the maximum heating power output of the heater safely obtainable under existing operating conditions as a function of the maximum sustainable temperature of critical components of the heater relative to the instantaneous operating condition determined without being limited to a predetermined fixed rated power output.

4,852,798

AIR CONDITIONING APPARATUS FOR A MOTOR VEHICLE

Toshikazu Ito, Toukai, and Takashi Degawa, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 19, 1987, Ser. No. 122,751
Claims priority, application Japan, Dec. 15, 1986, 61-296542
Int. Cl.[4] G05D *23/00*
U.S. Cl. 237—2 A 8 Claims



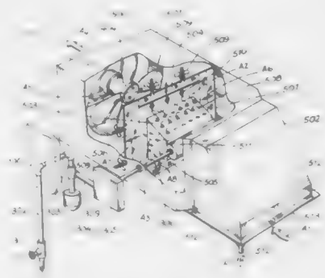
1. An air conditioning apparatus for a motor vehicle which sets a controlled target upper portion air discharge temperature and a controlled target lower portion air discharge temperature, respectively depending on an outdoor air temperature, and obtains the upper controlled temperature air flow and the lower controlled temperature air flow corresponding to the controlled desired upper portion air discharge temperature and the controlled desired lower portion air discharge temperature, respectively, wherein a control device is equipped for controlling air flow volume distributions of an upper blow air port and a lower blow air port in such a manner that controls of a defrost blow temperature flowing through a defrost blow port, a vent blow temperature flowing through a vent blow port, and a floor blow temperature flowing through a floor blow port are carried out at same time based on a desired air discharge temperature control pattern corresponding to said outdoor temperature and a setting temperature by a temperature setting device, said control device controlling continuously and independently the degrees of the openings of the defrost blow port, the vent blow port and the floor blow port in an order of the vent blow port, and the defrost blow port or the floor blow port in accordance with a decrease of said outdoor temperature based on the target blow air temperature.

4,852,799

WEATHERIZED, BAFFLED, GAS FILTERED, SEMI-AUTOMATIC HEATING SYSTEM FOR A POULTRY HOUSE OR THE LIKE

Ace A. Grant, and Vivian M. Grant, both of Circulo Del Sur, Green Valley, Ark. 85614

Filed Oct. 7, 1988, Ser. No. 254,616
Int. Cl.[4] A01K *31/20*
U.S. Cl. 237—3 15 Claims



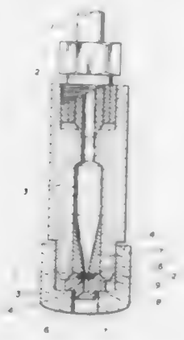
1. A heating and cooling system for installation within a building, such as a poultry building, said poultry building having an electrical source and a pressurized gas fuel source available for utilization by said system, said system comprising:
(a) a main forced-air heating and cooling means having an inlet port for receiving outside air, an outlet port adjacent a fan means for directing heated outside air and unheated outside air into a mainstream airflow pattern within said poultry building, a gas burner assembly for generating heat, said gas burner assembly being adapted with extendable baffle plate means for controlling the air profile feeding a flame used to generate said heat;
(b) a control means for controlling operation of said fan means and the flow of gas flowing from said gas fuel source to said gas burner assembly, said control means comprising,
(i) a timer means,
(ii) a gas pilot means,
(iii) a plurality of gas burner valve means; and
(c) a gas line filtering means for collecting impurities such as moisture condensation droplets contained in said gas fuel.

4,852,800

METHOD AND APPARATUS FOR STABLIZING FLOW TO SHARP EDGES ORIFICES

G. Duncan Murdock, Kent, Wash., assignor to Flow Systems, Inc., Kent, Wash.

Filed Jun. 17, 1985, Ser. No. 744,980
Int. Cl.[4] B05B *1/00;* E21B *7/18*
U.S. Cl. 239—1 7 Claims



1. An improved fluid jet cutting nozzle of the type utilizing a jeweled orifice downstream of a collimating chamber, the improvement comprising:

a convergent cone upstream of the jeweled orifice adjacent thereto for collimating the fluid flow to said orifice, the minimum diameter of the cone being larger than the diameter of the orifice; and,

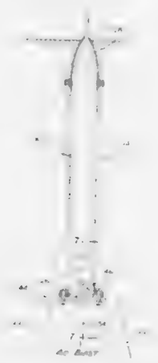
means for mounting said convergent cone in said collimating chamber.

4,852,801

AIRPOWERED WATER DISPLAYS

Mark W. Fuller, Studio City, and Alan S. Robinson, El Monte, both of Calif., assignors to Wet Enterprises, Inc., Universal City, Calif.

Filed Mar. 11, 1988, Ser. No. 166,998
Int. Cl.[4] B05B *1/08, 17/08*
U.S. Cl. 239—12 18 Claims



1. A water display comprising:

a body of water;

a pressure resistant enclosure disposed at least in part within said body of water, said pressure resistant enclosure having at least one nozzle coupled to the upper end thereof for directing water delivered thereto under pressure upward in at least one stream, said nozzle being disposed near the surface of said body of water;

a compressed air storage tank;

first valve means coupled between said compressed air storage tank and a lower portion of said pressure resistant enclosure for controllably coupling compressed air from said compressed air storage tank to said lower portion of said pressure resistant enclosure;

air-compressor means coupled to said compressed air storage tank for increasing the air pressure therein, and;

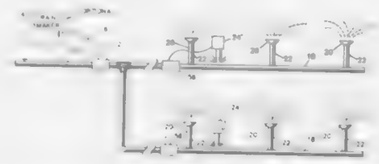
control means for controlling said first valve means to couple compressed air from said compressed air storage tank to said lower portion of said pressure resistant enclosure to eject at least a substantial part of the water therein upward through said nozzle in a transient, high energy water stream.

4,852,802

SMART IRRIGATION SPRINKLERS

Jerry R. Iggulden, 21600 Cleardale St., Newhall, Calif. 91321; Donald A. Streck, 832 Country Dr., Ojai, Calif. 93023, and Joseph W. Pender, 21550 Cleardale St., Newhall, Calif. 91321, assignors to Jerry Iggulden; Joseph Pender, both of Santa Clarita and Donald A. Streck, Ojai, all of, Calif.

Filed Aug. 8, 1988, Ser. No. 229,555
Int. Cl.[4] B05B *12/08;* A01G *25/16*
U.S. Cl. 239—64 16 Claims



1. In an irrigation system wherein a sprinkler head is selectably connected to a supply of water under pressure through a primary valve, the improvement comprising:

(a) moisture sensing probe means placed in the soil adjacent the sprinkler head for developing an electrical signal representing the moisture content of the soil surrounding said probe means;

(b) irrigation bypass logic means disposed at said probe means and operably connected to the valve and said probe means for comparing the moisture content of the soil surrounding said probe means to pre-established limits and for preventing the valve from supplying water to the sprinkler head when there is sufficient moisture in the soil; and,

(c) supplemental valve means in a pipe disposed between the primary valve and the sprinkler head supplying water to the sprinkler head and connected to said irrigation bypass logic means for operation thereby for controlling the flow of water to the sprinkler head whereby the flow of water to the sprinkler head is stopped when no water is needed in the area.

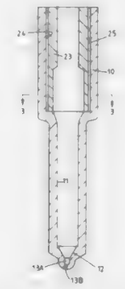
4,852,803

FUEL INJECTION NOZZLES

David J. Gaskell, Sudbury, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed Nov. 24, 1987, Ser. No. 124,825
Claims priority, application United Kingdom, Nov. 29, 1986, [illegible]
Int. Cl.[4] B29C *45/20;* B05B *1/28*
U.S. Cl. 239—86 3 Claims

1. A fuel injection nozzle for supplying fuel to an internal combustion engine comprising an elongated body, a bore formed in the body, a seating defined at one end of the bore, a valve member for co-operation with the seating to control fuel flow from the bore to an outlet in the body, a sleeve secured in the end portion of the bore remote from the seating, the internal surface of said sleeve supporting the valve member for movement towards and away from the seating and passage means defined between the external peripheral surface of the sleeve and the wall of the bore, said passage means acting to convey fuel from a fuel inlet to a point in the bore intervediate the sleeve and the seating, said passager means being defined by a plurality of grooves of predetermined width formed in the external wall of the sleeve, the end portion of the sleeve directed towards the seating and the valve member defining an annular space and radial slits having a width less than said predetermined width extending through the sleeve from the base walls of the grooves to said space, and radial slits being of a width small enough to trap particles of dirt contained in the fuel flowing therethrough.



4,852,804

MACHINE FOR TREATING OBJECTS WITH A TREATING LIQUID

Dietfried Baier, Herrenberg; Ivan Grasa, Gäufelden, and Rainer Haas, Herrenberg, all of Fed. Rep. of Germany, assignors to Hans Hollmuller Maschinenbau GmbH & Co, Herrenberg, Fed. Rep. of Germany

Filed May 12, 1988, Ser. No. 193,054
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1988, 3807262
Int. Cl.[4] B05B *1/28, 15/06*
U.S. Cl. 239—121 14 Claims



1. In a machine for treating objects with a treatment liquid such as an etching medium which includes

a housing (1) having a side opening (43) which can be closed,

at least one nozzle assembly (20) which includes a plurality of nozzles and from which the treatment liquid is sprayed onto the objects to be treated, the improvement comprising that

(a) said nozzle assembly (20) is mounted within said housing so that it can be withdrawn in the manner of a drawer from a first working position within the housing (1) outwardly through said side opening (43) of the housing (1) to a second position in which it extends laterally outwardly from the interior of the housing (1) so that the nozzles (25) are easily accessible for inspection or maintenance, and

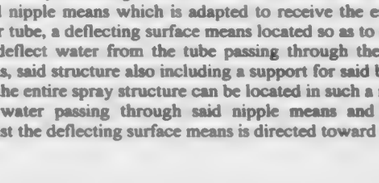
(b) cooperating plug-in coupling members (28, 35) are provided in said housing (1) and on said nozzle assembly (20) by which the nozzle assembly (20) is in a first position connected to a source of treatment liquid and in a second position is automatically disconnected from the source of treatment liquid when the nozzle assembly (20) is withdrawn outwardly through said side opening (43).

4,852,805

HYBRID THRUST REVERSER CASCADE BASKET AND METHOD

Michael L. Vermilye, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 30, 1983, Ser. No. 567,072
Int. Cl.[4] B29C *45/14*
U.S. Cl. 239—265.11 10 Claims



1. In a jet engine, a thrust reverser cascade basket comprising:

an elongated metal frame having transversely spaced, elongated metal strongbacks, the frame having metal transverse opposite ends joining opposite ends of respective strongbacks;

the transverse opposite ends each having a transverse outwardly extending attachment flange, the flanges extending outwardly in the elongated direction;

reinforced hard plastic pressure injection molded on the strongbacks, and transversely extending reinforced hard plastic vanes, spaced in the elongated direction, pressure injection molded to extend between the strongbacks; said vanes and strongbacks extending substantially coextensively from an outer end of said basket to an inner end;

the plastic vanes being integral with the plastic on the strongbacks, and the strongbacks having openings having the plastic molded therein for strengthening engagement, the openings being spaced between the vanes; and

substantially all plastic knit lines being formed along strongback surfaces, spaced adjacent mid-span locations between the vanes.

4,[illegible]

SPRAY STRUCTURES FOR USE IN WATERING PLANTS

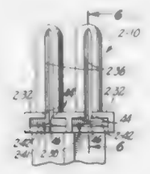
David Zeman, c/o Disco, P.O. Box 42040, Las Vegas, Nev. 89116

Filed Dec. 15, 1987, Ser. No. 132,959
Int. Cl.[4] B05B *1/04, 15/06*
U.S. Cl. 239—276 18 Claims

1. A one-piece unitary spray structure constructed so as to have a body including a stake at one end thereof and an elongated nipple means which is adapted to receive the end of a water tube, a deflecting surface means located so as to receive and deflect water from the tube passing through the nipple means, said structure also including a support for said body so that the entire spray structure can be located in such a manner that water passing through said nipple means and hitting against the deflecting surface means is directed toward an area

to be watered using the spray structure in which the improvement comprises:

shoulder means located on said body at the extremity of said nipple means closest adjacent to the remainder of said body for limiting the amount that said end of said tube can be moved on said nipple means is limited to the length of said nipple means, and said deflecting surface means is located so that when said end of said tube is on said nipple means and is against said shoulder means said end of said tube and said deflecting means define a slot extending transverse to said nipple means which constricts the spray pattern of water hitting against said deflecting surface means,



said body includes a generally horizontal cavity located therein, said slot extending across the interior of said cavity, said deflecting surface means serving as the bottom of said cavity saad cavity having vertically extending side walls located at an angle with respect to one another,

said deflecting surface means is a surface extending at an acute angle of from about 2 to about 12 degrees to the horizontal which slopes downwardly away from said nipple means,

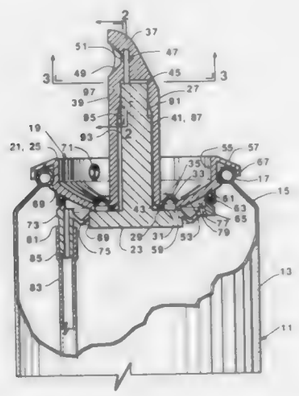
said body includes wall means spaced from and extending above and in substantially the same direction as said deflecting surface means, said wall means being located so as to extend outwardly away from slot.

4,852,807

NEOTERIC SIMPLIFIED AEROSOL VALVE

William R. Stoody, 8659 Summerdale Rd., San Diego, Calif. 92126

Filed Mar. 28, 1988, Ser. No. 173,924
Int. Cl.[4] B05B *1/30*
U.S. Cl. 239—337 **12 Claims**



1. A dispensing valve, for controlled discharge of fluent material confined under pressure in a container having a fill opening having an annular rim, that is normally in a closed state against discharge of said material and being manually operable to an open state for discharge of said material, which comprises:

a flexibly compliant one piece entity valve body having, a base structure member that includes a bottom having a convex underside surface and an annular ledge for attaching said valve to said container opening for closure thereof, an upstanding hollow nozzle member being a moveable means for manipulative operation of said valve to said open state and having a discharge passageway means defined therein and a lowermost end face projecting beneath said base structure member, and a springy diaphragm member continuously joining said base structure member and said nozzle member so as to sealingly and flexibly link said base structure member with said nozzle member;

a one piece entity obstruent, that includes a stem extending into and cooperating with said nozzle, having an annular base flange normally seated and biased in sealing engagement against a discernible seating surface defined on the underside surface of said base structure member;

a ring being sealingly and latchingly embraced in a bezel formed on the bottom surface of said base structure member, and having a depending cylindrical nipple having a through axial hole;

a springy second diaphragm member sealingly and flexibly linking said base flange with said ring, and being continuous with said ring and said flange;

said ring providing a chamber beneath said valve body, and said axial hole being an entry passage into said chamber from the interior region of the container;

said base flange engagement against said seating surface sealingly blocking entrance into said discharge passageway means, whereas, said valve is in said closed state;

said nozzle being resilingly responsive to said moveable manipulation, and said obstruent being moveable in unity with said nozzle for unblocking and blocking said discharge passageway means, whereas, said base flange is displaced from said seating surface by manipulative movement of said nozzle and unblocks entrance into said passageway means, and said base flange is reseated by resilingly responsive movement of said nozzle to said manipulation.

4,852,808

FUEL INJECTION VALVE USED IN FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINE

Yoshihisa Yamamoto, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 3, 1987, Ser. No. 128,399
Claims priority, application Japan, Dec. 5, 1986, 61-290946
Int. Cl.[4] F02M *45/00*
U.S. Cl. 239—533.3 **13 Claims**

1. A fuel injection valve for injecting fuel into a combustion chamber of an internal combustion engine comprising:

a valve housing having a nozzle portion which has an injection opening for injecting fuel into said combustion chamber and defining a fuel inlet for receiving pressurized fuel;

means for defining a first fuel passage for communicating said nozzle portion with said fuel inlet;

a first needle valve element slidably disposed in said nozzle portion for opening and closing said injection opening;

a first spring disposed in said valve housing for applying pressure to said first needle valve element;

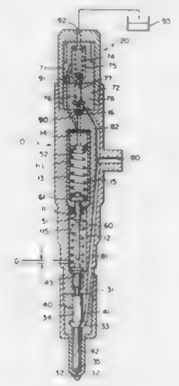
a pin device disposed in said valve housing providing an axial gap between said pin device and an end portion of said first needle valve element;

a second spring disposed in said valve housing for urging said pin device towards said first needle valve element;

back pressure chamber means formed in said valve housing for applying pressure to said first needle valve element;

means for defining a second fuel passage for communicating said back pressure chamber means with said fuel inlet;

an ON-OFF valve means for opening and closing said second fuel passage, said ON-OFF valve means being disposed separately from said back pressure chamber means and being arranged to operate independently of pressure of fuel in said back pressure chamber means;



means for defining a drain passage for communicating said back pressure chamber means to a lower pressure than that of said back pressure chamber means and for relieving at least some of the pressure from said back pressure chamber after an injection of fuel; and

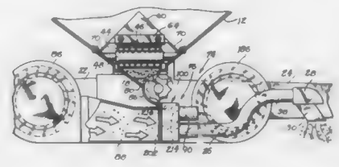
orifice means disposed in said drain passage.

4,852,809

PNEUMATIC SPREADER

Harold A. Davis, Willmar, and Gerald B. Saude, Spicer, both of Minn., assignors to Willmar Manufacturing, a division of Waycrosse, Inc., Willmar, Minn.

Filed Oct. 6, 1987, Ser. No. 106,492
Int. Cl.[4] A01C *15/04*
U.S. Cl. 239—654 **5 Claims**



1. A spreader apparatus to distribute materials at multiple locations in a preselected pattern comprising:

a hopper for holding a bulk supply of said materials having an opening for discharging said materials therethrough;

a forced gas supply for creating a gas flow;

an elongate, generally continuous metering roller disposed below said opening having a series of alternating axially extending raised ridges continuous along the length of said roller for blocking said materials and elongate axially extending recesses of uniform cross-section between the raised ridges for receiving said materials and for dispensing a metered quantity of said materials in a generally downward direction;

an elongate trough means below said metering roller to receive said metered quantity of said materials discharged therefrom;

a spaced array of discharge conduits, arranged in at least two staggered rows and disposed below said trough means for dividing and directing said gas flow into a plurality of smaller gas flows;

partition means dividing said trough means to form a plurality of individual compartments associated with respective ones of said discharge conduits so as to divide said metered quantity into a plurality of smaller metered quantities; and

a plurality of internal nozzles at respective lower ends of said individual compartments, each protruding into a smaller gas flow through a respective discharge conduit, said internal nozzles angled in a generally downstream direction and communicating with said discharge conduits to form a passageway directing said smaller metered quantities of said materials into said smaller gas flows for mixture therewith and for transport through said discharge conduits.

4,852,810

APPARATUS FOR ELECTROSTATIC COATING OF OBJECTS

Hans Behr, Stuttgart; Kurt Vetter, Remseck; Rolf Schneider, Burgstetten, and Fred Luderer, Leutenbach, all of Fed. Rep. of Germany, assignors to Behr-Industrieanlagen GmbH & Co., Ingersheim, Fed. Rep. of Germany

Continuation of Ser. No. 12,082, Feb. 6, 1987, abandoned. This application Jun. 14, 1988, Ser. No. 207,022
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1986, 3609240
Int. Cl.[4] B05B *5/04*
U.S. Cl. 239—703 **22 Claims**



1. An apparatus for electrostatic coating of objects with an electrically conductive coating material comprising: a rotary atomizer (1) including a spraying head (2); an external housing (7) connected to said spraying head (2); a line supplying coating material from a storage system to a spraying edge (6) on said spraying head, said line and the coating material being at ground potential to said spraying head; charging electrodes (10) distributed radially around said spraying head (2) on a circle concentric with the axis thereof and spaced at uniform angular distances, said electrodes (10) being connected to a high voltage source for the purpose of producing an electrical field for charging the coating material, the radial distance between the front ends of said electrodes (10) facing the object to be coated and said spraying head (2) being twice the diameter of said spraying head (2); an electrode mounting means (20) made of an insulating material in which said charging electrodes (10), except for their front ends, are enclosed, said mounting means (20) having at least one support (24) running radially from said external housing (7) of said spraying head (2) and containing a high voltage conductor (12) connected electrically to said charging electrodes (10), and characterized by said mounting means being an annular ring (20) surrounding said external housing (7) of said spraying head (2) at a distance therefrom and made of an insulating material, said charging electrodes (10) being inserted into said annular ring (20), an

electrical conductor (12) disposed within said annular ring (20) connecting said charging electrodes (10) annularly to each other and is connected to the high voltage cable conductor (14), said mounting means having an end face (21) including depressions (22) disposed on the front of said end face (21) at the point where said electrodes (10) are exposed, said conductor (12) being electrically insulated from the end face (21), facing the object to be coated of the annular ring (20), whereby the distance between said charging electrodes (10) are such that, while the unit is in operation, there is no substantial deposit of coating material upon the end face (21) of said annular ring (20).

4,852,811

COMMINUTION OF MATERIAL

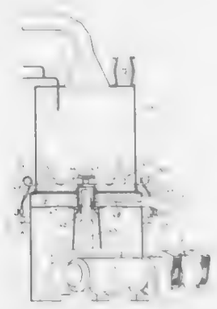
Roger W. Adams; Hugh R. Falcon-Steward, and David A. Pearce, all of St. Austell, United Kingdom, assignors to E.C.C. International Limited, United Kingdom

Continuation of Ser. No. 890,162, Jul. 25, 1986, abandoned. This application Mar. 4, 1988, Ser. No. 166,772

Claims priority, application United Kingdom, Aug. 1, 1985, [redacted]

Int. Cl.[4] B02C *13/18, 19/18, 23/24*

U.S. Cl. 241—1 **21 Claims**



1. A process for comminuting a material, the process comprising:

(a) feeding the material, in a substantially dry state, into a grinding chamber,

(b) agitating the material by means of a rotor disposed in the grinding chamber, thereby comminuting the material with some particles of comminuted material forming agglomerations,

(c) introducing a gas into the grinding chamber at a first pressure, thereby providing an upward flow of gas passing through the grinding chamber substantially uniformly across the cross-section of the grinding chamber, and entraining fine particles of the material in said flow of gas,

(d) extracting the upward flowing gas and entrained particles from the grinding chamber through an outlet in the upper region of the grinding chamber, and

(e) introducing pulses of gas into the grinding chamber at a second pressure higher than the first pressure, directing said pulses of gas at the agitated material, said pulses have a duration of from 0.1 second to 2 seconds and a frequency of one pulse per 1–120 seconds, and contacting the material with said pulses of gas, thereby breaking up said agglomerations.

4,852,812

APPARATUS AND METHOD FOR PREPARING FRAGMENTS FROM TIRE CASINGS

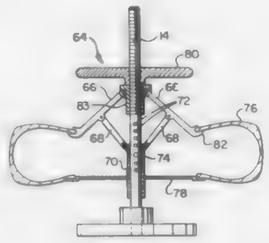
Reuben Penner, Box 975, Cranbook, British Columbia, Canada V1C 4J6

Filed Jan. 27, 1988, Ser. No. 148,908

Claims priority, application Canada, May 8, 1987, 536693

Int. Cl.[4] B02C *19/12*

U.S. Cl. 241—24 **10 Claims**



1. Apparatus for shredding tire casings comprising,

(a) means for supporting a tire casing,

(b) means for rotating the tire casing,

(c) cutter means comprising shredder means having a plurality of teeth to form a plurality of multi-cutting edges for converting said tire casing into fine fragment portions,

(d) said cutter means being mounted for slideable movement on a first elongate arm member and for movement to different positions around the tire casing in a plane containing the axis of the tire casing to reduce the whole tire casing to a fine fragment form,

(e) said first arm member being pivotally mounted on a second elongate arm member,

(f) said second arm member being itself pivotally mounted on a stationary supporting member,

(g) whereby said cutter means is capable of movement towards and away from said tire casing.

4,852,813

METHOD FOR TREATING GARBAGE DISPOSAL UNITS

Douglas C. Brackett, 196 Pine St., Portland, Me. 04102

Filed Jun. 17, 1988, Ser. No. 208,235

Int. Cl.[4] B02C *19/00, 23/00*

U.S. Cl. 241—30 **18 Claims**



1. A method for automatically treating a garbage disposal unit, which includes an interior chamber defined by a surrounding wall and a rotatable grinder assembly located within the chamber, using a device, which includes a body which is deformable upon impact with the wall of the garbage disposal unit and which is erodable in response to the rotation of the grinder assembly of the garbage disposal unit, the body being made from a material having an elastic memory selected such that the device automatically returns to its original shape after contacting the wall of the garbage disposal unit and having a porosity selected such that the device absorbs fluids, said method comprising the steps of:

(a) inserting the device into the interior chamber of the garbage disposal unit;

(b) activating the garbage disposal unit; and

(c) rotating the grinder assembly such that the grinder assembly contacts the device and propels the device against the wall of the chamber with a force sufficient to cause the device to ricochet off of the wall, thereby randomly striking and treating a plurality of areas on the wall of the chamber, the rotation of the grinder assembly continuing without substantial interruption until the grinder assembly has eroded the device to such an extent that the device can no longer be propelled by the grinder assembly and is small enough to exit the garbage disposal unit.

4,852,814

APPARATUS FOR GRINDING AND STRAINING FOOD PRODUCTS, SUCH AS FRUITS OR VEGETABLES

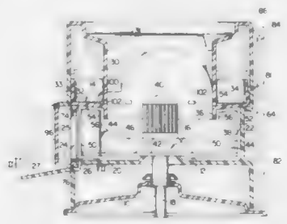
Jacques H. J. Amiot; Jacky R. P. Fourny, both c/o Societe Moulinex, 25, route de Mamers, 61000 Alencon; Gilles J. M. Letournel, and Vital A. Parise, both c/o Societe Moulinex, 2, rue de l'Industrie, Cormelles-Le-Royal 14123-IFS, all of France

Filed Jun. 30, 1988, Ser. No. 213,673

Claims priority, application France, Jul. 1, 1987, 87 09325

Int. Cl.[4] A47J *43/46*

U.S. Cl. 241—37.5 **7 Claims**



1. Apparatus for grinding and straining food products such as fruits or vegetables so as to reduce them to a puree and comprising a working receptacle which comprises a bottom wall and a side wall which are figures of rotation having a vertical axis and comprising a sieve through which interior of the receptacle communicates with the exterior, the lower region of said sieve being located adjacent said bottom wall, and which encloses a mashing tool secured for rotation to a rotatable shaft disposed on said vertical axis and driven by a motor unit, said mashing tool comprising at least one blade having a frontal attack surface which is disposed transversely to the direction of rotation and is located between the internal surface of the side wall and the rotatable shaft, so as to form with the internal surface of the side wall, at least in the region of the end of said frontal surface and substantially over all the height of the sieve, a corner at an acute angle which opens in the direction of rotation, and whose end free edge extends parallel and in proximity to the internal surface of said side wall thereby leaving a small gap between said edge and said internal surface, said receptacle further comprising a counter-wall which is removably mounted on the side wall and transversely to the vertical axis, and which is disposed above the blade, adjacent the upper edge of said blade so as to leave a small gap between itself and said upper edge, said counted-wall being formed by a ring having a central opening and carrying on its inner edge a downwardly extending skirt which extends over only a portion of the height of the receptacle, so as to form a pressure crown between said skirt and the internal surface of the side wall, while the blade comprises an internal edge of which one portion extends at least the length of said skirt.

4,852,815

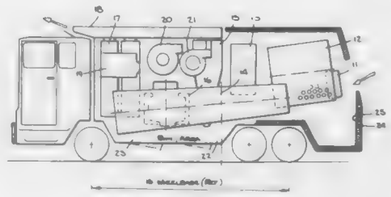
TRANSIT REFUSE RESOURCE RECOVERY AND INCINERATION SYSTEM

Hugo V. Giannotti, 879 S. Country Rd., E. Patchogue, N.Y. 11772

Filed Feb. 29, 1988, Ser. No. 166,450

Int. Cl.[4] B02C *21/02*

U.S. Cl. 241—65 **8 Claims**



1. A mobile unit for processing refuse as it is collected comprising an outer casing, means for bag ripping followed by means for sorting high density matter from low density matter followed by means for shredding followed by means for preheating and classifying the matter into a light fraction and a heavy fraction followed by means for separating the light fraction from the gas stream followed by means for incinerating the light fraction followed by means for cleaning the combustion gases, means for collecting the resource recovery items and ash.

4,852,816

COMPOSTING EQUIPMENT

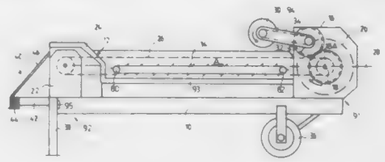
Werner Doppstadt, Vossnacker Strasse 67, 5620 Velbert-Langenberg, Fed. Rep. of Germany

Filed Dec. 21, 1987, Ser. No. 135,587

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644210

Int. Cl.[4] B02C *13/286, 13/30*

U.S. Cl. 241—101.7 **9 Claims**



1. A composting equipment for crushing organic waste, comprising:

an elongated trough-shaped container having a bottom, opposite side walls and a first and a second end, a conveyer device which extends along said elongated trough-shaped container between said first and second ends of said elongated trough-shaped container;

said conveyer device serving for conveying material placed thereupon in a conveying direction longitudinally of said elongated trough-shaped container toward said first end of said elongated trough-shaped container,

an impact mechanism arranged at said first end of the elongated trough-shaped container and having an inlet side and an outlet side,

said impact mechanism receiving, on its inlet side, said material conveyed by said conveyer device toward said first

end of said elongated trough-shaped container for crushing said material,

said impact mechanism expelling, on it output side, the received material in a crushed condition,

said impact mechanism comprising a horizontal shaft driven to rotate about an axis of rotation and carrying flails arranged to hit the material to be crushed during such rotation, the direction of rotation of the impact mechanism being such that the flails, on the side of the conveyer device, are moved upwards,

said conveyer device being arranged in or above a horizontal plane extending through said axis of rotation of said horizontal shaft,

a driving engine attached to said elongated trough-shaped container at said second end of said elongated trough-shaped container and opposite to said impact mechanism as viewed in said conveying direction of said conveyer device,

power transmission means for coupling said driving engine with said impact mechanism and driving said horizontal shaft to rotate about said axis of rotation, and

said power transmission means extending along said elongated trough-shaped container.

4,852,817

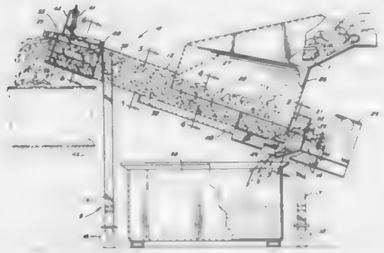
MACHINE FOR BREAKING UP FOOD CONTAINERS AND FOR RECOVERING FOOD PRODUCT THEREFROM

Walter E. Tipton, 9246 Telegraph Rd., Winnebago, Ill. 61088

Filed May 20, 1988, Ser. No. 196,745

Int. Cl.[4] B02C *19/22*

U.S. Cl. 241—260.1 **13 Claims**



1. A machine for extracting flowable food such as dairy products from crushable containers, said machine comprising an auger having an upstream end and a downstream end and supported to rotate about an inclined axis which slants upwardly upon progressing from said upstream end toward said downstream end, power-operated means for rotating said auger in a direction to advance material upwardly from the upstream end portion of said auger toward the downstream end portion thereof, a tubular barrel closely surrounding at least part of said auger, means adjacent the upstream end of said barrel for enabling crushable containers filled with flowable food to be introduced into said barrel for advancement by said auger, means adjacent the downstream end of said barrel for restricting the advance of said containers thereby to cause said auger to coact with said barrel to crush and break up said containers and release said food, the upstream end of said barrel being open to allow food to drain from the upstream end of the barrel, baffle means adjacent the upstream end of said barrel for reversing the flow of food draining from the barrel and for directing such flow downwardly beneath the barrel, and a tank below said barrel between the ends thereof for collecting the food flowing from said baffle means.

4,852,818

MATERIAL COMMINUTOR

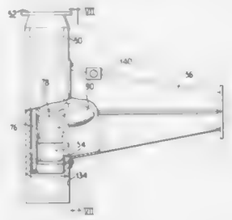
Thomas E. Rolle; David J. Nebel; John L. Shulan, and William P. Liljestrom, all of Dubuque, Iowa, assignors to T.D.J. Co., Inc., Dubuque, Iowa

Continuation of Ser. No. 841,795, Mar. 20, 1986, Pat. No. 4,718,609. This application Dec. 7, 1987, Ser. No. 112,408

The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.

Int. Cl.[4] B02C *19/18*

U.S. Cl. 241—301 **7 Claims**



1. A device for the comminution of solid material comprising:

(a) a turbine comprising a plurality of blades mounted on a shaft for rotation about an axis, said shaft mounted in cantilevered manner in a set of bearings;

(b) a motor;

(c) a drive connection between said motor and said turbine for rotatably driving said turbine;

(d) a housing enclosing said turbine having an axial inlet and a tangential outlet for the passage of an air stream caused by said rotating turbine;

(e) means for varying the comminution effect of said device upon said material comprising varied sized replaceable expansion chambers connected at one end to the axial inlet of said housing and connected at another end to varied sized removably secured velocity chambers; and

(f) feed tube means for feeding material to be comminuted into said air stream upstream of said velocity chamber;

whereby, material carried in said air stream is subjected to a rapid decrease in pressure in said expansion chamber as said material is drawn through said expansion chamber, said decrease in pressure being adjustable by interchanging various sized expansion chambers to vary the size of resultant comminuted material, and said material is comminuted and is exhausted with said air stream through said housing outlet.

4,852,819

YARN WINDER

Katsumi Hasegawa; Michio Ohno, both of Kusatsu, and Akira Kadotsuji, Otsu, all of Japan, assignors to Toray Industries

Continuation of Ser. No. 15,218, Feb. 17, 1987, abandoned. This application Dec. 29, 1988, Ser. No. 290,844

Claims priority, application Japan, Feb. 20, 1986, 61-35821; Feb. 20, 1986, 61-35824

Int. Cl.[4] B65H *54/02*

U.S. Cl. 242—18 R **10 Claims**

1. A yarn winder comprising:

(a) a base mounted on a machine frame for supporting a yarn take-up means, and

(b) the yarn take-up means including,

(b-1) a spindle driving mechanism mounted to the base,

(b-2) a long spindle comprising,

(b-2-1) a bobbin holding portion more than 800 mm in length including a first cylindrical hollow body, a cylindrical and substantially solid body which follows the first cylindrical hollow body and a second cylindrial hollow body which follows the cylindrical solid body, and

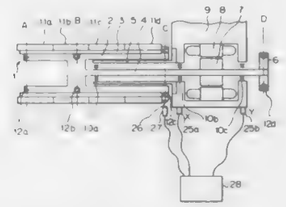
(b-2-2) a shaft extending from a center of the inner end of the cylindrical solid body along the axis thereof through the interior of the second cylindrical hollow body and projecting therefrom, the shaft being connected to the spindle driving mechanism,

(b-3) bearing means for rotatably supporting the spindle on the base,

(b-4) a bobbin holding mechanism secured around the periphery of the bobbin holding portion, for detachably mounting thereon at least a bobbin for taking up a yarn,

(b-5) a tubular supporting member stationarily mounted on the base in a cantilever manner for supporting the spindle, a free end of the tubular supporting member being projected into the interior of the second cylindrical hollow body and the spindle being rotatably held by the tubular supporting member through a second bearing means positioned between the inner periphery of the tubular supporting member and the outer periphery of the shaft, and

(b-6) means on the bobbin holding portion for selectively attaching weights, each of said weights being attached in at least one of the three separate planes, wherein the bobbin holding portion has at least three groups of holes in at least three positions defined at opposition ends of the bobbin holding portion and an intermediate point therebetween, respectively, for mounting securely but detachably a test weight for measuring the first, second, and third critical speeds of the spindle and to which there is affixed a correction weight determined by measuring of the critical speeds with the test weight.



4,852,820

WINDING METHOD AND APPARATUS

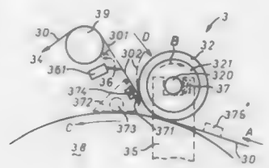
Gottlieb Looser, In der Finne 910, FL-9496 Balzers, Liechtenstein

Filed Nov. 30, 1987, Ser. No. 126,856

Claims priority, application Switzerland, Dec. 4, 1986, 4840/86; Jun. 19, 1987, 2323/87

Int. Cl.[4] B65H *11/20*

U.S. Cl. 242—56 R **24 Claims**



13. An apparatus for winding a continuously moving web of a flexible material having at least one electrically insulating surface, comprising:

a web source for feeding the continuously moving web along a predetermined travel path in a predetermined travel direction to a first winding core located at a winding location for forming a coil from said continuously moving web on said first winding core;

a winding drum drivingly engaging said first winding core for forming said coil from said continuously moving web;

web lifting means for lifting said continuously moving web from said winding drum and directing said continuously moving web from said winding drum to said first winding core located at said winding location;

electrostatic discharge means and cutting means substantially stationarily located, at least in their active positions, at predetermined locations adjacent said predetermined travel path of said continuously moving web and upstream of said web lifting means as viewed in said predetermined travel direction of said continuously moving web;

said electrostatic discharge means being arranged upstream of said cutting means as viewed in said predetermined travel direction of said continuously moving web;

said cutting means, during operation, moving through a cutting stroke for cutting through said continuously moving web moving along said predetermined travel path in order to form a trailing edge of a predetermined length of said continuously moving web and a leading edge of a further predetermined length of said continuously moving web;

support means for rotatably supporting a second winding core in a predetermined mutually spaced relationship to said electrostatic discharge means and said cutting means and upstream of said electrostatic discharge means as viewed in said predetermined travel direction of said continuously moving web;

said continuously moving web passing between said winding drum and said second winding core such that said second winding core is drivingly engaged by said winding drum through said continuously moving web;

said electrostatic discharge means, during said cutting stroke of said cutting means being energized for producing an electrostatic potential difference between said leading edge of said further predetermined length of said continuously moving web and said second winding core in order to electrostatically adhere said leading edge of said further predetermined length of said continuously moving web to said second winding core; and

displacing means for displacing said support means for rotatably supporting said second winding core when containing at least one layer of said further predetermined length of said continuously moving web, to said winding location, after removal from said winding location of a completed roll formed by said predetermined length of said continuously moving web on said first winding core.

4,852,821

SPOOL FOR WEB-SHAPED FILM

Clark E. Harris, Fairport; Randy Armbruster; Michael Decker, both of Rochester, and Bradley A. Phillips, Honeoyo Falls, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

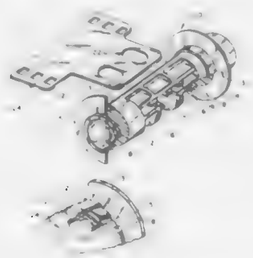
Filed Aug. 29, 1988, Ser. No. 237,027

Int. Cl.[4] B65H *75/18;* **G03B** *17/26*

U.S. Cl. 242—71.8 **9 Claims**

1. A spool for winding of a web-shaped film strip of the kind having a narrow end portion, said spool comprising a spool core having a slot for receiving such film end portion, and a pair of end flanges, said spool core having shoulder portions, respectively, adjacent said flanges to support the edge portions of the full-width film, said shoulder portions having an initial

height above said core surface and rising an additional height from a region proximate the location where the full width of an



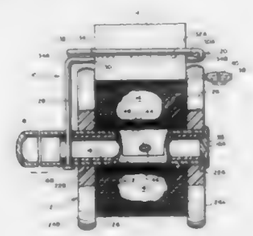
inserted and wound film strip is first juxtaposed said flanges to a height approximately equal to the thickness of said film.

4,852,822

PORTABLE MARKER LINE REELING APPARATUS

William O. Brady, 6600 E. Telephone Rd., #1205, Ventura, Calif. 93003

Filed Mar. 4, 1988, Ser. No. 164,444
Int. Cl.[4] B65H *75/40*
U.S. Cl. 242—96 **16 Claims**



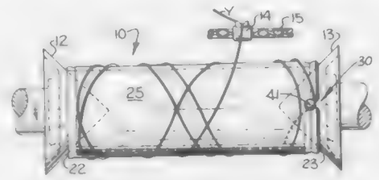
1. A portable marker line reeling apparatus, comprising:
(a) a marking tape winding and unwinding reel composed of an elongated hollow sleeve for winding a band of marking tape thereabout and a pair of tape side guides connected to and spaced apart axially along the sleeve;
(b) an elongated shaft sized to slideably fit through said sleeve of said reel and rotatably mount said reel;
(c) a handle connected to and extending from one end of said shaft;
(d) a marking tape cleaning guide mounted to said handle and defining an elongated slot having a pair of spaced ends and being disposed outwardly of said reel, and slot extending from one of its ends disposed adjacent one side guide to the other of its ends disposed adjacent the other side guide and aligned with the sleeve in a position to receive the band of marking tape through said slot, said slot also being closed at one of its ends and open at the opposite of its ends for insertion or removal of the band of tape into or from the slot through said opposite open end thereof from a side of the tape at any location along the tape between opposite ends of the tape; and
(e) said cleaning guide has a pair of spaced apart rod-like elements connected together at one of their ends to define said closed one end of said slot and spaced apart at the opposite of their ends to define said open opposite end of said slot, said rod-like elements having said generally parallel surfaces thereon which define said elongated slot therebetween being located beyond said reel and extending generally parallel to said reel sleeve for alignment of said slot with said storage chamber and for movement through the slot of the tape as the same is being unwound from or wound into said storage chamber of said real, portions of said rod-like elements adjacent said one closed end of said slot defining an enlarged hole having a diameter greater than the distance between said surfaces which define said slot for preventing hangup of the tape at said closed end of said slot as the tape moves therethrough.

4,852,823

YARN TUBE WITH IDENTIFICATION MEANS AND WINDING METHOD UTILIZING SUCH TUBE

Samuel F. Adams, and Hans-Peter Bolz, both of Greenville, S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Nov. 10, 1988, Ser. No. 269,562
Int. Cl.[4] B65H *75/28, 75/10*
U.S. Cl. 242—125.1 **10 Claims**



1. A yarn carrier adapted to be mounted on a winding machine and have a yarn wound thereon to form a yarn package, said yarn carrier comprising
a tube having opposite ends and a peripheral wall for receiving the yarn to be wound thereon;
yarn catching and identifying means for retaining a free end of the yarn to be wound upon said peripheral wall and for identifying a particular characteristic of the yarn, said yarn catching and identifying means comprising
(a) an opening extending radially through said peripheral wall and communicating with one of said ends; and
(b) an insert removably received in said opening, with said opening and insert being configured to define at least one yarn engaging notch which is formed between the peripheries of said opening and said insert and which opens toward said one end of said tube, so that a free end of the yarn can be quickly and easily caught and retained in said notch, and wherein said insert includes visual indicium means for readily identifying a particular characteristic of the yarn to be wound upon said tube.

4,852,824

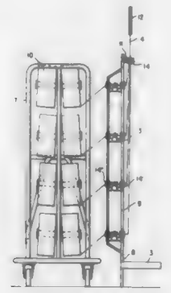
CREEL

Jurgen Beltz, Neumunster; Karl-Heinz Erren, Aukrug-Homfeld, and Ekkehard Mantz, Grob-Kummerfeld, all of Fed. Rep. of Germany, assignors to Norddeutsche Faserwerke GMBH, Neumunster, Fed. Rep. of Germany

Filed Sep. 3, 1987, Ser. No. 95,436
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1986, 3629927
Int. Cl.[4] B65H *49/14*
U.S. Cl. 242—131.1 **12 Claims**

1. A warping creel comprising
(a) a plurality of creel carriages;
(b) a plurality of bobbins arranged side-by-side and one-above-the-other in each one of said plurality of creel carriages;
(c) a plurality of creel posts;
(d) a plurality of swing-out creel gates mounted on each one of said plurality of creel posts, each one of said plurality of swingout creel gates providing access to associated ones of said plurality of bobbins;

(e) a plurality of thread guides mounted on each one of said plurality of swing-out creel gates, each one of said plurality of thread guides being associated with a corresponding one of said plurality of bobbins; and



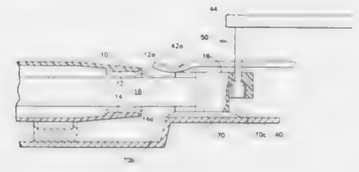
(f) means for guiding threads from each one of said plurality of thread guides, first vertically upwards and then horizontally above the associated one of said plurality of creel carriages.

4,852,825

EXTRACTION AND INSERTION MECHANISM FOR A LEADER BLOCK OF A TAPE CARTRIDGE

Jeffrey S. McGee, San Diego, and Thomas C. Kadien, Vista, both of Calif., assignors to Cipher Data Products, Inc., San Diego, Calif.

Filed Sep. 14, 1988, Ser. No. 244,694
Int. Cl.[4] G11B *15/66*
U.S. Cl. 242—195 **6 Claims**



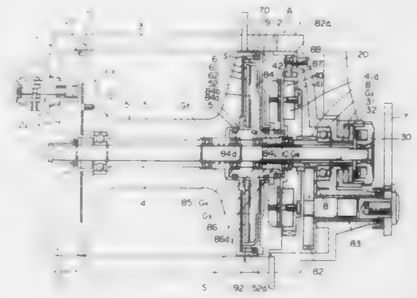
1. A transport for a leader block tape cartridge, comprising:
a generally rectangular frame including a deck plate;
means for receiving and supporting the cartridge within the frame;
a supply reel motor mounted to the frame;
first drive means connected to the supply reel motor and engageable with a supply reel inside the cartridge for rotating the same;
a take-up motor mounted to the frame;
a take-up hub;
second drive means connected to the take-up motor for rotating the take-up hub;
a magnetic tape transducer assembly mounted to the frame between the take-up hub and the cartridge when the cartridge is inserted in the frame; and
tape threading means for extracting a leader block from the cartridge, pulling the leader block adjacent the deck plate past the transducer assembly, and inserting the leader block into the take-up hub during a threading operation, and for extracting the leader block from the take-up hub, pulling the leader block past the transducer assembly and inserting the leader block into the cartridge during a rewinding operation, including first guide means connected to the frame adjacent the cartridge supporting means for engaging and guiding the leader block to ensure proper insertion thereof back into the cartridge during the rewinding operation and second guide means connected to the frame adjacent the take-up hub for engaging and guiding the leader block to ensure proper insertion thereof into the take-up hub during the threading operation, the first and second guide means each including a friction pad mounted on the deck plate and a spring member mounted to the frame and spaced from the friction pad so that the leader block is pulled between the friction pad and the spring member with the leader block engaging the friction pad on a first side thereof and engaging and deflecting and the spring member on a second side thereof.

4,852,826

FISHING REEL HAVING IMPROVED COVER AND SEAL STRUCTURE DRAG MECHANISM

Jun Sato, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Nov. 30, 1987, Ser. No. 126,353
Claims priority, application Japan, Dec. 28, 1986, 61-315240; Dec. 28, 1986, 61-315241
Int. Cl.[4] A01K *89/015, 89/02*
U.S. Cl. 242—270 **9 Claims**



1. A fishing reel comprising:
a reel body,
a spool shaft supported rotatably relative to said reel body,
a spool having a pair of flanges and supported rotatably relative to said spool shaft,
a drive train assembly including a drive mechanism supported on said reel body, for driving said spool, and a drag mechanism, supported on said spool shaft and having a braking member and a drag disc, for transmitting a driving force from said drive mechanism to said spool,
a cover mechanism including (i) a cover defining an inner space for housing and covering said braking member and said drag disc and (ii) a sealing means for sealing said inner space, and
a clutch means interposed in said drive train assembly between said drive mechanism and said spool for allowing said spool to freely rotate when said clutch means is disengaged,
wherein said drag mechanism includes a transmission member having a cylinder supported rotatably relative to said spool shaft and a disc disposed opposite to one of said flanges of said spool, said braking member and said drag disc are disposed between said transmission member and said one of said flanges of said spool, said cover is mounted on said one of said flanges of said spool so as to cover an outside extremity of said transmission member, said sealing means is interposed between said cover and said transmission member, and said clutch means is disposed at an input side of said drive train assembly with respect said drag mechanism, so that when said clutch means is disengaged, said spool together with said drag mechanism including said transmission member are in a freely rotatable condition.

4,852,827

APPARATUS FOR CONTROLLING A PROJECTILE

Walter Kranz, Taufkirchen, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 14, 1988, Ser. No. 167,823
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1987, 3708312
Int. Cl.[4] F42B *15/033*
U.S. Cl. 244—3.22 3 Claims



1. In an apparatus for controlling a projectile having a housing and including a nozzle arrangement rotatably disposed in said projectile housing, which arrangement is coupled to a propellant source and comprises a rotary nozzle body having a thrust nozzle, and a positioning drive for controlled adjustment of the angular position of the rotary nozzle body, such that a propellant jet from said thrust nozzle can be ejected approximately perpendicular to the longitudinal axis of said projectile for steering of said projectile, an improvement wherein the axis of rotation of said rotary nozzle body is arranged to be non-parallel to the longitudinal axis of said projectile, and guide means being provided to guide the propellant jet from said thrust nozzle, said positioning drive being operable to rotate said rotary nozzle body into predetermined angular positions and said guide means being arranged to guide said propellant jet in a first angular position of said rotary nozzle body substantially crosswise to the longitudinal axis of said projectile for steering said projectile and in a second angular position substantially parallel to the longitudinal axis of said projectile to provide additional propulsion of said projectile, and wherein the guide means comprises first and second guide means, each of the guide means being disposed in said projectile housing, said first guide means being in fluid communication with said thrust nozzle in said first angular position and said second guide means being in fluid communication with said thrust nozzle in said second angular position.

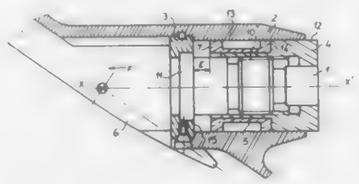
4,852,828

DEVICE TO BRAKE THE UNFOLDING OF A FIN AND GUIDED MISSILE FITTED WITH A DEVICE OF THIS TYPE

Etienne Lamarque, Le Mesnil Saint Denis, France, assignor to Thomson-Brandt Armements, Boulogne Billancourt, France

Filed Dec. 21, 1987, Ser. No. 135,269
Claims priority, application France, Dec. 23, 1986, 86 18084
Int. Cl.[4] F27B *13/32, 15/053*
U.S. Cl. 244—3.29 9 Claims

1. A guided missile, which comprises;
a body;
at least one pair of unfolding fins mounted on said body; and
a device for braking unfolding of said fins wherein said device comprises a device to brake the unfolding of said at least one pair of unfolding fins with respect to a body, said device being hinged on a bearing neck which is fixed with respect to said body, wherein said bearing neck is rotatable about an axis of said body so as to unfold said fins by rotation of said bearing neck about said axis, said device comprising:
a stop element positioned on said body; and
means for converting rotational kinetic energy into translational energy, wherein said converting means comprises:
a screw thread formed on an outer surface of said bearing neck;



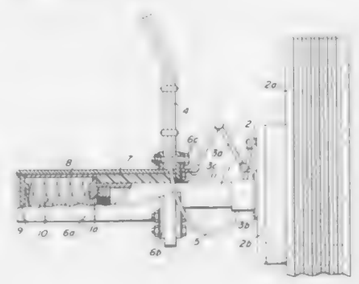
a compression ring screwed onto said screw thread; and
a deformation part positioned around said bearing neck between said stop element positioned on said body and said compression ring
such that said fins unfold at a substantially constant velocity and said converting means absorbs part of the rotational kinetic energy of said fins upon unfolding.

4,852,829

UNDERCARRIAGE APPARATUS FOR VERTICAL-LIFT AIRCRAFT

Marvin Garfinkle, P.O. Box 15855, Philadelphia, Pa. 19103

Filed Sep. 14, 1987, Ser. No. 95,636
Int. Cl.[4] B64C *25/36*
U.S. Cl. 244—100 R 4 Claims



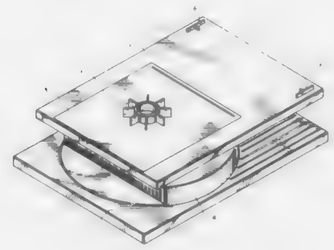
1. An undercarriage apparatus for vertical-lift aircraft comprising a spring-loaded device slidably securing the axle rod of the conventional main wheel assembly to the flat-spring of a conventional main flat-spring undercarriage gear, said main wheel assembly comprising a tire and brake assembly;
said spring-loaded device, contained within a cylindrical shell rigidly secured to said flat-spring, providing lateral movement of said flat-spring relative to said wheel assembly in response to axial forces imposed on said wheel assembly by said flat spring during landing of said aircraft from a hover so as to permit proper deflection of said flat-spring to cushion the landing impact of said aircraft.

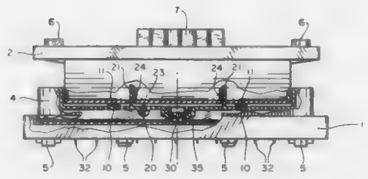
4,852,830

COMPUTER MONITER STAND

Robert A. Howard, Palo Alto, and Robert Elliman, Cupertino, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Jul. 21, 1988, Ser. No. 222,218
Int. Cl.[4] H04M *1/04*
U.S. Cl. 248—183 10 Claims





1. A monitor stand apparatus for placing and positioning a computer monitor comprising:
a platform having a convexly curved bottom and having a rack means;
a swivel piece means having a concavely curved top that is matched to accept and fit said convexly curved bottom, said top having pawl means for engaging said rack means, said pawl means being an integral part of said top, said pawl means cooperatively engaging said rack means to latch said platform in a fixed angular position of inclination and said pawl means and said rack means disengaging when a horizontal force is applied to said platform to allow changes in the angular position of inclination of said platform, said swivel piece having a hole located near the center of said swivel piece, said hole acting as a hole for rotating said swivel piece;
a base, coupled to said swivel piece means by a pivot means for allowing change in the angle of rotation of said platform relative to said base.

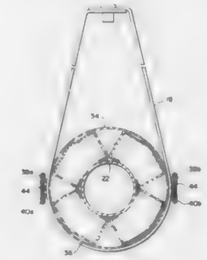
4,852,831

PIPE SUPPORT SYSTEM

Wayne R. Sandstrom, Box 2414, Fairbanks, Ak. 99707

Filed Sep. 23, 1987, Ser. No. 100,203
Int. Cl.[4] F16L *3/00*
U.S. Cl. 248—58 22 Claims

1. A pipe supporting device interposed between a pipe and a support means comprising:
(a) a plurality of generally "U" shaped members, each member comprising:
(i) a base portion adapted to bear against the support [illegible]
(ii) a pair of leg portions extending from the base portion, each leg portion having a distal end; and
(iii) a flange portion extending from the distal end of each leg portion and adapted to bear against an outer surface of the pipe; and,
(b) a guide flange member associated with at least one "U" shaped member and extending generally laterally therefrom, the guide flange member defining an opening adapted to accommodate the passage of at least a portion of the support means therethrough.

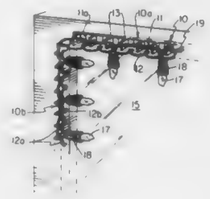


4,852,832

DECORATIVE LIGHT STRIP HOLDER

John H. Delaney, 146-25 20th Rd., Whitestone, N.Y. 11357

Continuation of Ser. No. 91,766, Aug. 31, 1987, abandoned. This application Aug. 31, 1988, Ser. No. 239,053
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—65 2 Claims



1. A decorative light holder strip adapted to hold a string of decorative lights, light sockets and interconnecting electric wire means comprising an elongated member having two generally perpendicular flat legs connected along a common edge, one of said legs defining a plurality of spaced slots extending from the edge thereof toward the other leg, each slot being adapted to receive therein electric wire means connected to a light socket, a plurality of generally rectangular webs attached perpendicularly to each of said legs and located at regular intervals intermediate the socket wire receiving slots, each of said webs defining wire receiving slots and apertures coaxially arranged along the length of said members to permit the reception of wire means interconnecting a series of light sockets, and said second leg defining transverse slits to permit a curvilinear adjustment of said leg adjacent to a socket and bulb receiving slot.

4,852,833

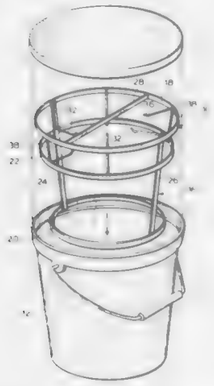
PAINT BRUSH HOLDER

Larry E. Lockwood, 341 Wilson Drive, Unit 4, Milton, Ontario, Canada L9T 3Y9

Filed Jul. 20, 1988, Ser. No. 221,655
Int. Cl.[4] A46B *17/02*
U.S. Cl. 248—110 12 Claims

1. A paint brush support for removal insertion into a container, which comprises:

frame means of a generally cylindrical shape and shaped to conform to the shape of the interior of the container and dimensioned to be located within said enclosure, said frame means comprising circular horizontal frame members defining the upper and lower extremities respectively of said frame means and vertical frame members extending between and joined to said upper and lower extremity frame members, said frame means further comprising a further circular horizontal frame member connected to said vertical frame member spaced downwardly from and generally parallel to said upper extremity frame member,



paint brush holder means in the form of a plurality of elongate prongs extending inwardly from each of said upper extremity horizontal frame member and said further horizontal frame member and dimensioned to be received through openings in paint brush handles to support paint brushes thereby in a substantially vertical orientation, and transverse bar means extending diametrically between and joined to opposite sides of said upper extremity horizontal member to act both as a handle for removal from and insertion in said enclosure of said paint brush support and, when in said enclosure, as a scraping bar for removal of excess paint from a brush.

4,852,834
UNIVERSAL MOUNTING POST ASSEMBLY
Reo Hosman, Little Rock, Ark., assignor to Osppco, Inc., Little Rock, Ark.
Filed Aug. 15, 1988, Ser. No. 232,463
Int. Cl.[4] A45F *3/44*
U.S. Cl. 248—156 **20 Claims**



9. A universal mounting post assembly for mounting one or more terminal boxes such as telephone subscriber network interfaces (SNI's), telephone protectors, CATV connectors, and similar electrical terminal boxes, said mounting post assembly comprising:

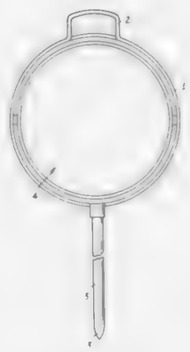
a rigid, elongated, stake having a plate receptive end and a spaced apart, integral ground engaging end, a depressed, generally V-shaped central reinforcing channel substantially longitudinally coextensive with the length of said stake which receives the service wire, flange-like edges bordering said channel, a fastening means at least one stud receptive orifice defined in said stake adjacent said channel for receiving said fastening means, and a plurality of regularly spaced apart pairs of notches formed in said edges;

a rigid, receiving plate adapted to be firmly attached to said plate receptive end of said stake at a user selected location, said plate comprising:

tab means for engaging a user suitable one of said pairs of notches defined in said stake thereby positioning said plate at a user desired height, said tab means comprising a prong flange for wedging said tab means against said notches as said plate is fitted to said stake; and,

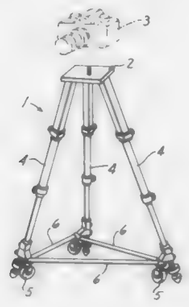
a plurality of regularly spaced apart keyed slots defined in said plate, at least one of said slots adapted to be engaged by said fastening means when said tab means seats within the selected pair of notches, substantially concurrently with the engagement of said tab means within said notches.

4,852,835
PORTABLE TABLE HAVING A SINGLE SUPPORTING LEG TO BE ANCHORED TO THE GROUND AND A TILTABLE TOP PANEL
Paolo Ciulli, Via Pontaccio, 19, 20121 Milano, Italy
Filed Jun. 13, 1988, Ser. No. 206,473
Claims priority, application Italy, Jun. 15, 1987, 20904 A/87
Int. Cl.[4] A45F *3/44*
U.S. Cl. 248—156 **3 Claims**



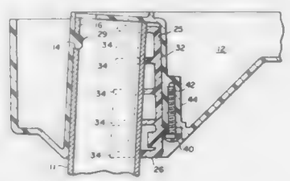
1. A portable table comprising a first ring member mounted, at a perimetrical portion thereof, on a pointed rigid rod radially extending with respect to said first member and lying in the same plane as said first ring member, said first ring member supporting, on a diametrical axis perpendicular to said rod, a circular closed loop element which can be brought to and restrained in a horizontal position to operate as a supporting surface, said first ring member having a circular shape and being provided with a perimetrical projecting lug operating as a handle.

4,852,836
TRIPOD
Michio Kawazoe, 30-11 Higashi 5 chome, Narita Suginamiku Tokyo, Japan
Filed Oct. 22, 1987, Ser. No. 112,347
Int. Cl.[4] F16M *11/38*
U.S. Cl. 248—168 **4 Claims**



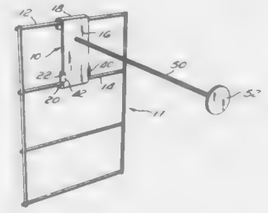
1. A tripod having leg stabilizers comprising;
an enlargement at the end of each leg of said tripod;
each of said enlargements having a threaded hole for receiving the threaded portions of a caster wheel;
a plurality of elastic means connecting the bottom of the legs of said tripod;
said plurality of elastic means being secured on the end of each leg by each of said caster wheels.

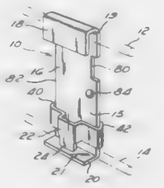
4,852,837
REMOVABLE LEG ASSEMBLY
Barry Merten, Orchard Park, and Gordon W. Kamman, Elma, both of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.
Filed Aug. 2, 1985, Ser. No. 762,133
Int. Cl.[4] F16M *11/16*
U.S. Cl. 248—188 **16 Claims**



1. A leg assembly for an object comprising:
a leg receiving chamber in said object;
a projection attached to said chamber;
a leg having a first end disposed within said chamber;
a recess formed in said leg adjacent the first end of said leg and engaging said projection;
a wedge disposed at least partially within said chamber for securing said leg therein with said recess engaging said projection; and
means for fixing said wedge within said chamber.

4,852,838
LOCKABLE BRACKET FOR ATTACHMENT TO WIRE GRID
Frank P. Field, 854 Napoli Dr., Pacific Palisades, Calif. 90272
Filed Jun. 22, 1988, Ser. No. 210,117
Int. Cl.[4] A47C *96/06*
U.S. Cl. 248—222.1 **10 Claims**



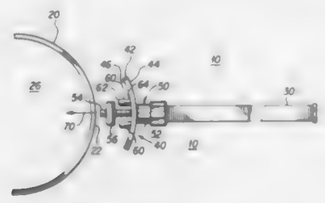


1. A mounting bracket for lockably attaching miscellaneous items to first and second wire members of a wire grid, said mounting bracket comprising:
a generally flat bracket body having lateral sides, a front surface, a rear surface, a J-shaped curl formed on a first longitudinal end thereof and a flange extending perpendicularly from a second longitudinal end thereof, said flange having an upper surface which is substantially continuous with and forms an approximate 90-degree angle with the rear surface of said mounting bracket body;
said J-shaped curl on the first longitudinal end of said bracket being sized and configured to be positionable over the first wire member in a hook-like fashion;
said flange located on the second end of the bracket being sized and configured to be positionable beneath said second wire member while the J-shaped curl of the first longitudinal end remains positioned over the first wire member; and
a locking member connected to said bracket and reciprocably moveable between "locked" and "unlocked" positions, said locking member having a keeper projection extending downward therefrom such that when in said "locked" position the keeper projection will capture the second wire member within the approximate 90-degree angle formed between the upper surface of said flange and the rear surface of the mounting bracket, and when in its "unlocked" configuration the second wire member will be released therefrom such that said bracket may be freely moved away from said second wire member.

4,852,839
TUBULAR SUPPORT DISPLAY SYSTEM
Russell K. Winter, Crownsville; Thomas D. Harvey, Rockville; Richard S. Kain, Woodbine, and Nedim Savas, Bethesda, all of Md., assignors to Russell William, Ltd., Odenton, Md.
Filed Mar. 29, 1988, Ser. No. 174,890
Int. Cl.[4] A47G *29/02*
U.S. Cl. 248—225.1 **5 Claims**

1. A display system having at least one display element releasably coupled to a support member, comprising means for

clampingly engaging said display element to said support member through an aperture in said support member; said aperture having a slot contour, said means for clampingly engaging including (1) a plate member having a through opening formed therein and extending between opposing first and second surfaces, (2) at least one cylindrically shaped pin member fixedly coupled to said second surface of said plate member adjacent said plate member through opening on a first end thereof, said pin member being oriented for insertion into said aperture in said support member and having predetermined dimensions relative to said aperture to substantially prevent rotation of said display element relative to said support member, and (3) fastening means slidingly coupled to said plate member for releasably coupling said plate member to said support member, said fastening means including:



a threaded member extending through said plate member through opening for insert into said support member aperture;

a head member fixedly coupled to a first end of said threaded member, and,

a clamp member threadedly coupled to a second end of said threaded member and having a shape adapted for (1) passage through said slot contour of said support member aperture when said clamp member is oriented substantially parallel to an opening length of said aperture, and (2) preventing said passage of said clamp member through said aperture when said orientation is substantially non-parallel, said pin member being formed with a dome shaped contour on a second end thereof, whereby said clamp member is substantially prevented from inadvertently being lockingly held in contiguous contact with said dome shaped second end of said pin member.

4,852,841

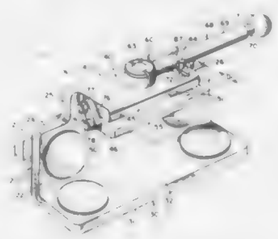
DEVICE FOR CLAMPING THE EDGE OF A TABLE

John P. Sebring, 20 School St., Townsend, Mass. 01469

Filed Oct. 12, 1988, Ser. No. 256,843

Int. Cl.[4] A47B *96/00*

U.S. Cl. 248—231.5 **11 Claims**



1. A device for clamping the edge of a table top comprising:

a clamping block having a substantially vertical inside face for abutting the side surface of the table top;

a first jaw means connected to the clamping block having a substantially horizontal first inner face for abutting one of the top and bottom surfaces of the table top;

a second articulatable jaw means having an outer plate connected to the clamping block and an inner plate movably attached to the outer plate, the inner plate having a substantially horizontal second inner face spaced from the first inner face for abutting the other of the top and bottom surfaces of the table top;

a vertical bore in the outer plate aligned along a vertical axis;

a vertical edge surface on the inner plate offset from the vertical axis;

an actuating means for moving the inner plate along a substantially circular arc between a clamping position in which the inner plate engages the table top and an open position in which the inner plate is spaced from the table top, the actuating means comprising at least one dual pivot link having an outer pivot point at which the link and outer plate are pivotally connected and an inner pivot point at which the link and inner plate are pivotally connected, a vertical shaft means rotatable in the bore of the outer plate on the vertical axis, a vertical pin extending from the shaft means and disposed adjacent the offset edge surface on the inner plate, and a lever arm extending from the shaft for rotating the shaft on the vertical axis and respect thereto about the pivot axis of the main body from an opened position such that the clamp may receive the structural tubular to a closed position such that the main body in combination with the jaw encircle the structural tubular;

one of either the main body or the jaw having an internal surface for engagement with the structural tubular;

the jaw mounted to the main body such that the jaw is further movable with respect to the main body in a direction along the pivot axis from an unlocked position wherein the jaw is spaced from the main body to a locked position wherein the jaw is substantially aligned along the pivot axis with the main body;

the jaw including a locking surface for engagement with the stop surface on the main body when the jaw is in its locked position, thereby preventing the jaw from pivotably moving to its opened position; and

a securing member carried by and selectively movable with respect to he other of the main body or the jaw for engaging the structural tubular and bringing the internal surface into tight engagement with the structural member when the jaw is in its locked position.

4,852,842

CLAMP FOR MOUNTING A DEVICE TO A TUBULAR

Dale H. Marks, 5402 Renwick, Houston, Tex. 77081

Filed Sep. 6, 1988, Ser. No. 242,346

Int. Cl.[4] A47B *96/06*

U.S. Cl. 248—230 **24 Claims**



1. A clamp for mounting a device to an elongate member, the clamp comprising:

a main body securable to the device and having a pivot axis and a stop surface thereon;

a jaw mounted to the main body and pivotally movable with

causing the offset pin to move horizontally and engage the offset edge for pushing horizontally on the inner plate, wherein the pivot link transforms the horizontal force applied by the pin to a combined horizontal and vertical motion of the inner plate along a circular arc having a center defined by the outer pivot point.

4,852,842

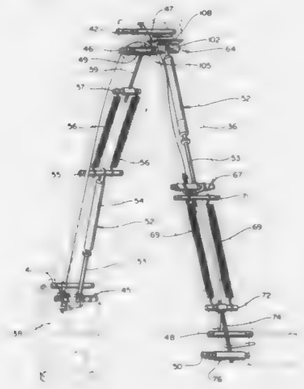
APPLIANCE SUPPORT APPARATUS

Edward O'Neill, San Leandro, Calif., assignor to Lucasey Manufacturing Company, Inc., Oakland, Calif.

Filed Sep. 24, 1987, Ser. No. 100,527

Int. Cl.[4] E04G *3/00*

U.S. Cl. 248—280.1 **13 Claims**



1. An apparatus for supporting and positioning an appliance relative to a support surface, comprising:

at least one arm having a proximal end and a distal end, said one arm being mounted to a support surface at the proximal end and adapted at its distal end for attachment of said appliance; and

biasing means associated with said one arm for holding said arm in a variety of orientations while supporting said appliance, said biasing means having a spring means and a hydraulic shock absorber cooperating with said spring means, for preventing or damping undesired movement of said apparatus in response to a change in the forces applied to said one arm or appliance.

4,852,843

BEVERAGE HOLDER FOR ATTACHMENT TO VEHICLE HEATING AND COOLING VENTS

Daniel E. Chandler, P.O. Box 1893, Cave Creek, Ariz. 85331

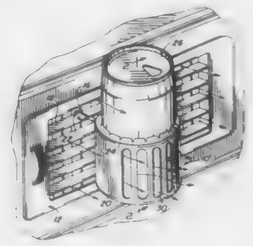
Filed Sep. 7, 1988, Ser. No. 241,336

Int. Cl.[4] A47G *29/00*

U.S. Cl. 248—311.2 **12 Claims**

1. A beverage holder for holding a substantially cylindrical beverage container in an upright position in an automotive vehicle having a air conditioning and heating unit, said beverage holder comprising:

(a) a sheet material forming a substantially U-shaped jacket, said jacket comprises a curved front portion including a plurality of openings, an open back portion for receiving air from the air conditioning and heating unit of said vehicle, and a top opening for receiving said substantially cylindrical beverage container in circumferentially spaced relationship therewith, said jacket having a diameter greater than the diameter of said beverage container to define a substantially annular space between said container and said jacket for retaining air from said air conditioning and heating unit and allowing said air to circulate around said container and maintain said beverage at a desired temperature; and



(b) fastening means on the ends of said curved front portion of said jacket which comprises a pair of horizontally extending hooks for demountably securing said holder to the grille of the air conditioning and heating unit.

4,852,844

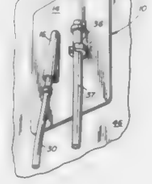
DEVICE FOR AIDING IN PREPARATION OF INTRAVENOUS THERAPY

James W. Villaveces, 88 Eugenia Dr., Ventura, Calif. 93003

Filed Apr. 25, 1988, Ser. No. 185,963

Int. Cl.[4] A61M *5/32*

U.S. Cl. 248—314 **13 Claims**



1. A device for aiding a nurse in the preparation of intravenous therapy, and the like, comprising:

a backing plate having a substantially planar front surface and rear surface;

means for holding and gripping a needle-cap mounted on said front surface defining a frustro-conically shaped hollow interior into which a needle-cap may be inserted;

said rear surface of said backing plate having securing means thereon for attaching said backing plate to an IV pole, whereby a needle with its cap may be inserted into said means for holding and gripping to grip the needle-cap, after which the needle proper may be removed from its cap for use in intravenous therapy; and

a C-clamp means for holding a tube-end mounted to said front surface of said backing plate.

4,852,845

HANGER CLAMP WITH INCLINED FRAME

Lawrence I. Lener, Springfield, N.J., assignor to Lenox Incorporated, Lawrenceville, N.J.

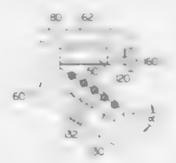
Filed Mar. 3, 1988, Ser. No. 163,641

Int. Cl.[4] A47F *5/00*

U.S. Cl. 248—316.1 **10 Claims**

1. An improved clamp for retaining hangers of the type having a rigid frame member having a top leg, a rear leg and a bottom leg defining a general C-shape with a space between the top leg and the bottom leg, and, an eccentric clamp bar in

the frame, rotatable on an axis and having an elongated contact member with a lower surface co-extensive with an upper surface of the bottom leg when the clamp bar is rotated closed, the clamp bar being journalled to the frame member at least at one leg of the frame member, the clamp bar being rotatable on said axis between an open position in which the contact member is spaced from the upper surface of the bottom leg, whereby hangers can be placed on and supported by the upper surface of the bottom leg, and a closed position in which the contact



member is disposed against the upper surface of the bottom leg, whereby the hangers are clamped in place, the improvement comprising:

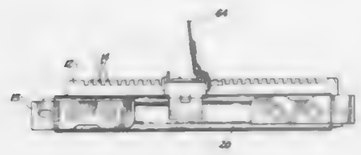
said upper surface of the bottom leg being inclined downwardly toward a front of the clamp and the contact member defining a lower surface at a radially increasing space from the axis progressing toward the front, whereby the clamp defines an increasingly wider opening toward the front and the opening is unobstructed when the clamp is open.

4,852,846

METHOD AND APPARATUS OF A CONVENTIONAL FORE AND AFT VEHICLE SEAT ADJUSTER CONVERTIBLE INTO AN EASY ENTRY SEAT ADJUSTER SLIDE

Mark D. Weier, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 4, 1987, Ser. No. 93,356
Int. Cl.[4] B60N *1/04*
U.S. Cl. 248—430 2 Claims



1. A manual easy entry vehicle seat adjuster with memory for selectively adjusting a vehicle seat to a plurality of positions with respect to said vehicle and for returning said seat to a prior selected position upon utilization of said easy entry feature, said adjuster in combination comprising:

a lower channel for connection with said vehicle, said lower channel having engagement means along a portion of the length of said lower channel;

an upper channel connected with said seat and slidably mounted on said lower channel;

a first latch connected with said upper channel for selectively contacting with said lower channel engagement means for affixing said upper channel on said lower channel;

a manually activated handle to operate said first latch and said handle having a tab;

an easy entry activator to move said first latch independently of said handle; and

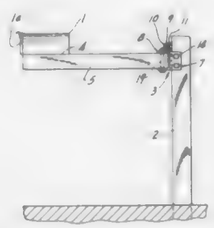
a quick connect plate mounted on said lower channel for covering and preventing contact of said first latch with a portion of said engagement means, and said plate having a second latch whereby said second latch being biased to connect said plate with said lower channel and said second latch being moved contemporaneously with said first latch by said handle and said plate having a slot for reception of said tabe for contact with said tab when said handle moves said first latch so that said plate moves with said upper channel when the position of said seat is being selectively adjusted with respect to said vehicle and said second latch retaining said plate in a fixed position with respect to said lower channel when said easy entry activator moves said first latch thereby preventing said first latch from contacting said lower channel engagement means except at said prior selected position.

4,852,847

RELEASABLE MAILBOX MOUNTING APPARATUS

John R. Pagel, 14004 Pioneer Dr., Marathon, Wis. 54448

Filed Aug. 11, 1987, Ser. No. 84,611
Int. Cl.[4] B65D *91/00*
U.S. Cl. 248—548 6 Claims



3. A mailbox mounting apparatus for roadside mounting of a mailbox adjacent the side of the path of over-the-road vehicles, comprising

an integral U-shaped mailbox bracket including a pair of horizontal support plates projecting outwardly of a base member,

a mailbox support adapted to project between said support plates and projecting outwardly therefrom and having an outer end for support of a mailbox in spaced relation to said bracket,

a post mounting bracket for attachment to the upper end of a vertical support post and including a mounting member for attachment to the post,

said brackets including overlapping locking members having aligned openings, and

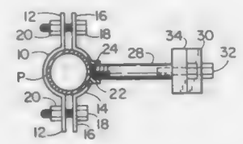
a break-away pin means passing through said openings to releasably secure said brackets in said mail receiving position, said break-away pin releasing from said openings in response to a vehicle engaging and moving past said mailbox.

4,852,848

PIPE VIBRATION REDUCER

Richard J. Kucera, 11041 Firethorne Dr., Cupertino, Calif. 95014

Continuation-in-part of Ser. No. 44,676, May 1, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 312,390
Int. Cl.[4] F16M *13/60*
U.S. Cl. 248—559 7 Claims



1. A vibration reducer for pipes and the like, comprising:

(a) a cantilever support member,

(b) attaching means engageable with the support member for securing the latter rigidly to a pipe or the like,

(c) an elongated resilient cantilever bar member secured at its inner end rigidly to the support member and arranged to extend therefrom in a direction to project laterally from a vertical plane through a pipe or the like, the cantilever bar member being longitudinally rigid and laterally resilient, and

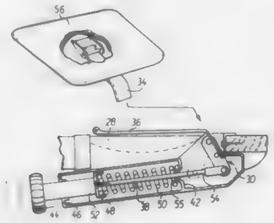
(d) a vibration dynamic mass member of a solid, dense and rigid material which is secured rigidly to the outer end of the cantilever bar member against independent movement relative to said bar member.

4,852,849

LIFTING SEATS

Eifion R. Jones, 18 Bryn Helyg, Penmaenmawr, Gwynedd, United Kingdom

Filed Feb. 17, 1988, Ser. No. 157,380
Int. Cl.[4] A47C *3/03*
U.S. Cl. 248—575 12 Claims



1. A lifting seat device for mounting to a structure having a support and a seat member movable from said support, said lifting seat device comprising:

(a) a lifting arm for coupling to the seat member; and

(b) a lowering and raising mechanism for controlling the angular position of the lifting arm to assist in lowering and raising the seat member, the lowering and raising mechanism comprising:

(1) a housing having opposed first and second ends and comprising a stop at the first end, said stop comprising an aperture extending therethrough;

(2) mounting means carried by the housing for enabling the housing to be mounted rigidly to the structure;

(3) a rod extending through the aperture in the stop and into the housing;

(4) at least one helical coil spring disposed within the housing and surrounding a portion of the rod disposed in the housing, said spring comprising an end disposed adjacent the stop of the housing;

(5) an adjusting member adjustably coupled to the rod and mounted generally adjacent the second end of said housing such that said spring is compressed intermediate said adjusting member and the stop of said housing with the compression of said spring being determined by the adjustable position of said adjusting member relative to said rod; and

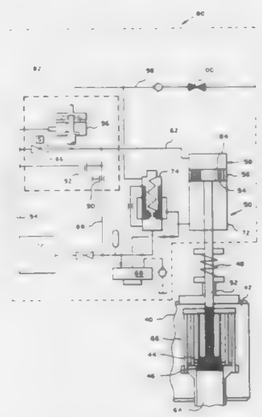
(6) linkage means for coupling the helical coil spring to the lifting arm such that the stress in the helical coil spring is increased when the lifting arm is angularly displaced as a result of a user sitting on said seat member, said linkage means comprising a linkage member which is pivotable relative to said housing, said linkage member comprising engaging means for receiving one end of said lifting arm, said linkage member being pivotally connected to the end of said rod opposite said adjusting member, whereby angular displacement of the lifting arm caused by a user sitting on the seat member causes an angular displacement of said linkage member relative to said housing and a corresponding axial displacement of the rod relative to the stop to increase the compression of the spring.

4,852,850

VALVE SYSTEM WITH ADJUSTABLE SEATING FORCE

Peter L. Wilhelm, and Gilbert F. Hyde, both of Winter Springs, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 14, 1987, Ser. No. 49,364
Int. Cl.[4] F16K *31/122*
U.S. Cl. 251—28 5 Claims



1. A steam bypass valve system for a steam turbine power generating system for increasing valve seating force without affecting valve opening response comprising:

(a) a normally closed single acting hydraulic valve including:

(i) a body member having an inlet port connected to a steam supply line and an outlet port connected to a steam return line;

(ii) a valve seat positioned within said body member adjacent said inlet port;

(iii) at least one movable plug positionable against said valve seat for closing said valve;

(iv) a valve stem connected at a first end to said plug and extending outwardly therefrom;

(v) at least one spring operatively coupled to said plug for

providing a first closing force to close said valve by positioning said plug against said valve seat; and

(b) a hydraulic actuating cylinder means operatively coupled to said valve stem for receiving a first hydraulic force independent of the steam passing through the valve for seating said plug against said valve seat after said valve is closed.

4,852,851

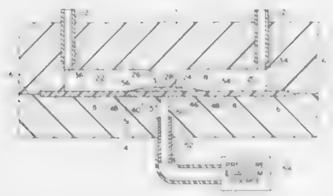
VALVE WITH FLEXIBLE SHEET MEMBER

Milo E. Webster, Braintree, Mass., assignor to Integrated Fluidics, Inc., Plainville, Conn.

Filed Dec. 11, 1987, Ser. No. 131,751

Int. Cl.[4] F16K *7/12*

U.S. Cl. 251—61.1 **17 Claims**



1. A valve comprising:

a first body portion having a first substantially flat surface,

a second body portion having a second substantially flat surface facing the first surface,

a flexible sheet positioned between the first and second surfaces,

a fluid receiving chamber comprising a void in the first body portion created and defined by a concave surface formed in the first substantially flat surface and a first side of the flexible sheet,

at least two fluid passageways formed in the first body portion communicating at spaced locations with the void which forms the fluid receiving chamber,

at least one of the fluid passageways being a channel formed in the first substantially flat surface laterally of the void and progressing to and terminating in the void,

the channel being defined jointly by a portion of the first body portion which is located laterally of the concave surface and by the first surface of the flexible sheet which is engagable with the first substantially flat surface and the concave surface in the first body portion,

means for flexing the sheet against and away from the concave surface formed in the first body portion,

in order that when the flexible sheet is flexed against concave surface in the first body portion, the passageways are sealed from each other, and

when the flexible sheet is flexed away from the concave surface in the first body portion the fluid passageways are placed in communication with each other by way of the fluid receiving chamber comprising the void.

4,852,852

HYDRAULIC VALVE ACTUATING DEVICE

Karl Krieger, deceased, late of Wuppertal, Fed. Rep. of Germany (by Hildegard Krieger, legal representative); Werner Reinelt, Bochum, and Wolfgang Kobow, Wuppertal, both of Fed. Rep. of Germany, assignors to Hermann Henscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany

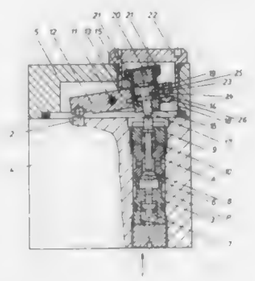
Filed May 20, 1988, Ser. No. 196,685

Claims priority, application Fed. Rep. of Germany, May 23, 1987, 3717403

Int. Cl.[4] F16K *31/44*

U.S. Cl. 251—78 **4 Claims**

1. A device for actuating an hydraulic control valve comprising a closure member, a spring loading the closure member, a push rod arranged to adjust the closure member into an actuating position, and a return spring serving to hold the push rod in the starting position, wherein the actuating device comprises a two-armed lever mounted like the beam of a balance for transmitting movement of a pulse generator to the push rod, a bush being disposed within said lever and adjustable in the actuation direction of the lever arm on the side of the valve, a pressure member being disposed within said bush and



supported by the bush so as to be axially guided with respect thereto, a part-spherical head on the pressure member arranged to abut the push rod of the valve, a spring supported by the bush and bearing on the pressure member so as to urge the pressure member towards the valve push rod, and an adjustable set screw disposed within said bush and arranged to act on the spring whereby adjustment of the set screw is adapted to pre-stress the spring to an extent corresponding to a pre-set force for actuating the valve push rod.

4,852,853

PRESSURE BALANCE TYPE SOLENOID CONTROLLED VALVE

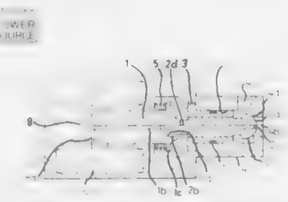
Kamimura Toshio, and Ito Koji, both of Gifu, Japan, assignors to Teijin Seiki Co., Ltd., Osaka, Japan

Filed May 12, 1988, Ser. No. 193,407

Claims priority, application Japan, May 14, 1987, 62-72306[U]

Int. Cl.[4] F16K *31/06*

U.S. Cl. 251—129.07 **2 Claims**



1. A pressure balance type solenoid controlled valve comprising an armature and a poppet valve pivotally connected to each other at a joint portion, wherein said poppet valve is provided with a seat portion formed at a front end thereof for switching a fluid passage, said poppet valve has an outer diameter substantially equal to a diameter of said seat portion at an intermediate portion between said seat portion and said joint portion, said intermediate portion is slidably inserted into a sleeve loosely fitted to a body of the solenoid controlled valve, and said poppet valve has a passage formed therein for equalizing pressures applied to sides of said sleeve.

4,852,854

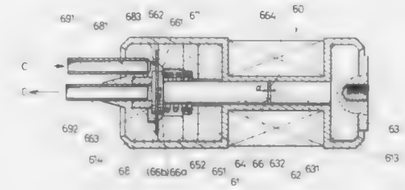
ELECTROMAGNETIC PERMEABLE-SHELL-FREE DIAPHRAGM VALVE

Yu-Yin Peng, and Shih-Lien Fu, both of Hsinchu Hsien, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu Hsien, Taiwan

Continuation-in-part of Ser. No. 82,086, Aug. 5, 1987, Pat. No. 4,769,650. This application Mar. 31, 1988, Ser. No. 175,754

Int. Cl.[4] F16K *31/06*

U.S. Cl. 251—129.17 **4 Claims**



1. An electromagnetic permeable-shell-free diaphragm valve comprising:

a shell made of non-permeable material;

a coil wound around the outside of said shell, the outer surface of said coil being directly exposed to the atmosphere for improved heat dissipation;

a stator made of permeable material, fixed within said shell in the vicinity of said coil;

a valve stem made of permeable material, for being slideable within said shell, having a first end portion opposite said stator and a second end portion;

an elastic diaphragm secured to said second end portion of said valve stem;

means for urging said first end portion of said stem apart from said stator;

a valve seat disposed within said shell for securing said elastic diaphragm to form a room therebetween;

an inlet pipe communicating with said room; and

an outlet pipe communicating with said room, having one end rim penetrating into said room, which end rim is opposite the said elastic diaphragm,

said urging means urges said elastic diaphragm against said end rim to block said outlet pipe, and when an electric current passes through said coil, the magnetic flux induced by said coil drives said first end portion of said valve stem to move against the urging force of said urging means toward said stator and subsequently drives said elastic diaphragm to leave said end rim and open said outlet pipe, and said urging means urges said elastic diaphragm against said end rim to block said outlet pipe again when electric current ceases to pass through said coil.

4,852,855

MANEUVERING DEVICE FOR HEAVY FLAT PLATES

Gerald L. Moisan, 12555 North 75th St., Longmont, Colo. 80501

Continuation-in-part of Ser. No. 93,857, Sep. 8, 1987, abandoned. This application Feb. 16, 1988, Ser. No. 156,380

Int. Cl.[4] B66F *11/00*

U.S. Cl. 254—131 **8 Claims**

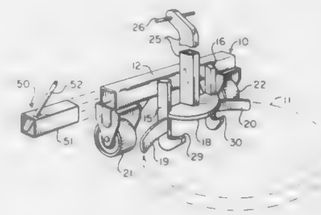
1. Apparatus for facilitating the entire support and handling of heavy objects having generally flat, parallel and spaced opposite surfaces such as manhole covers, storm drain grates and the like comprising:

a gripper assembly including first and second plate means and an elongated frame means with said first and second plate means rigidly attached to said frame means and extending outwardly therefrom in spaced and substantially parallel relation with respect to one another so as to accept a heavy object inserted therebetween with the center of gravity of the object being disposed outward from said first and second plate means;

said first plate means including means for engaging one of the object surfaces in at least one pressure point adjacent an edge of an object when the object is inserted between said first and second plate means;

said second plate means including means for engaging the other of the object surfaces adjacent the edge of the object and in at least two pressure points when the object is inserted between said first and second plate means wherein said two pressure points are established in laterally spaced relation on opposite sides of said first plate means pressure point;

means for pivoting said gripper assembly in a direction



generally perpendicular to at least one of the surfaces of the object when it is positioned between said first and second plate means, said pivoting of said gripper assembly thereby causing the object to be wedged between said pressure points by virtue of the relative positions of the object center of gravity and said pressure points; and

roller means attached to said gripper assembly for permitting movement of said apparatus into a position for receiving the object between said pressure points and for subsequently transporting said apparatus after said gripper assembly is pivoted in an upward direction relative to the plane of at least one of the object surfaces.

4,852,856

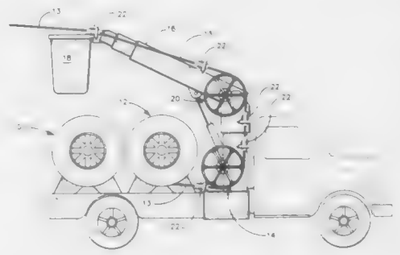
SYSTEM FOR LAYING COMMUNICATIONS CABLE ESPECIALLY ADAPTED FOR AERIALLY STRINGING FIBER OPTIC CABLE AND ADAPTED FOR INTERCHANGEABLE USE WITH CONVENTIONAL CABLE

Daniel J. Correll, 104 Seymour Rd., Woodbridge, Conn. 06525

Filed Jan. 5, 1988, Ser. No. 141,045

Int. Cl.[4] B65H *59/00*

U.S. Cl. 254—134.3 R **38 Claims**



1. A system for aerially stringing communications cable comprising:

a vehicle;

an aerial boom mounted on said vehicle;

a reel of non-fiber optic communications cable adapted to be mounted on said vehicle and adapted to be unreeled, passed along said boom, and aerially strung;

a reel of fiber optic communications cable adapted to be

mounted on said vehicle and adapted to be unreeled, passed along said boom, and aerially strung;

a guide roller assembly mounted on said boom for guiding cable from a reel mounted on said vehicle and along said boom to the distal end of said boom, said guide roller assembly including at least one substantially circular, rotatable roller adapted to roll with said non-fiber optic cable as said non-fiber optic cable is unreeled, passed along said boom, and aerially strung while in substantially point contact with said non-fiber optic cable;

a chute possessing a substantially curved interior surface adapted to direct said fiber optic cable as said fiber optic cable is unreeled, passed along said boom, and aerially strung while in substantially line contact with said fiber optic cable;

means for interchangeably, selectively, releasably securing said chute to said guide roller assembly.

4,852,857

PROTECTIVE DEVICE FOR SUBMERSIBLE LANCE IN STEEL MAKING OR THE LIKE

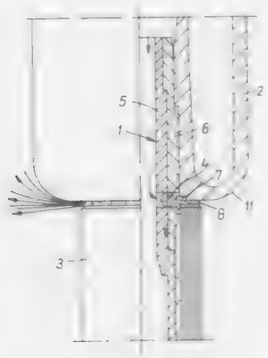
Wilhelm Schwarz, Hilchenbach, and Winfried Heinz, Schortens, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft Mit Beschrankter, Essen, Fed. Rep. of Germany

Filed Oct. 21, 1988, Ser. No. 261,584

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1987, 3736495

Int. Cl.[4] C21D *11/00*

U.S. Cl. 266—99 **8 Claims**



1. A device for the prevention of deposits in the region of the juncture between a lance and a probe of a control device to be inserted into molten material in a vessel, wherein said lance is provided with an interior channel for conducting a gas stream to said juncture, and at said juncture concentrically between said lance and said probe there is provided a gas-conducting disk which circumferentially projects said gas stream onto the lower surface of said lance at said juncture.

4,852,858

CHARGING MATERIAL PREHEATER FOR PREHEATING CHARGING MATERIAL FOR A METALLURGICAL SMELTING UNIT

Ralph Weber, Rio de Janeiro, Brazil, assignor to Kortec AG, Zug, Switzerland

Filed Apr. 20, 1988, Ser. No. 183,939

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1987, 3713369

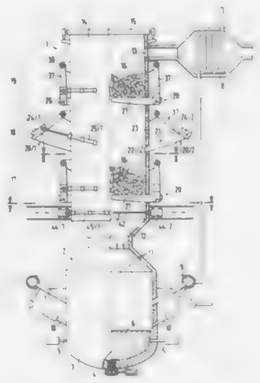
Int. Cl.[4] C22B *1/00*

U.S. Cl. 266—175 **17 Claims**

1. A charging material preheater for preheating charging material for a metallurgical smelting unit, comprising:

a container for accommodating the charging material to be preheated, said container having a container wall and at least one grid comprising individual spaced-apart grid bars which extend to the exterior of the container through passage openings in the container wall, said grid bars being arranged in mutually parallel relationship;

outer ends of said grid bars being mounted in a support beam which is movable by actuating means between a closed



position in which the grid bars project into the interior of the container and a release position in which the grid bars are retracted out of the interior of the container;

the grid bars being mounted in the support beam so as to be rotatable about a horizontal axis; and

support means for said grid bars at the points of entry into the container.

4,852,859

GASTIGHT BOTTOM CONSTRUCTION FOR A SHAFT FURNACE

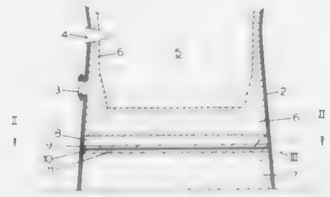
Jacobus van Laar, Driehuis; Frank T. Niemeijer, Nieuwe Niedorp, and Ronald J. Stokman, Hillegom, all of Netherlands, assignors to Hoogovens Groep B.V., IJmuiden, Netherlands

Filed Mar. 1, 1988, Ser. No. 162,502

Claims priority, application Netherlands, Mar. 5, 1987, 8700524

Int. Cl.[4] C21B *7/06*

U.S. Cl. 266—197 **6 Claims**



1. Gastight bottom construction for a shaft furnace, having a peripheral shell, which bottom construction comprises

(a) a plurality of horizontal layers of refractory material arranged one above another, and

(b) a horizontal gastight metal membrane sealed to the shell and located on one of said layers of refractory material, said refractory material layer on which said metal membrane being located is formed of refractory blocks and having a level upper surface, and

(c) said metal membrane being formed of unbonded, mutually abutting metal plates which are stacked in at least three layers, each of said three layers having, as seen in plan view, a pattern of joints between its said plates which is offset with respect to the pattern of the joints of both of the other two said layers.

4,852,860

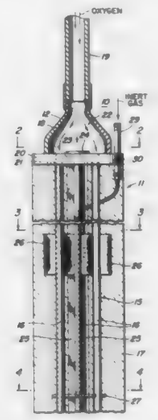
CONSUMABLE INJECTION LANCE

Neal R. Griffing, Bethlehem, and Evan L. Hand, Sr., Hummelstown, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 88,449, Aug. 24, 1987, Pat. No. 4,792,125. This application Dec. 19, 1988, Ser. No. 288,665

Int. Cl.[4] C21C *5/32*

U.S. Cl. 266—268 **11 Claims**



1. A consumable lance for injecting gases below the surface of a molten metal bath said consumable lance comprising:

(a) an upper lance portion including a gas disbursing manifold attached to a gas source.

(b) a lower lance portion including a nozzle end for injecting said gases into the molten metal bath.

(c) a longitudinal structural support assembly extending from said gas disbursing manifold to said nozzle end said longitudinal structural support assembly including:

(i) elongated support members extending downwardly along the central axis of the consumable lance from the gas disbursing manifold to said nozzle end and secured within an opening provided within the manifold cover plate of said gas disbursing manifold, and,

(ii) anchor members and spacer members alternatively spaced along the length of said elongated support members where said anchor members are attached to said elongated support members and the spacer members enclose said elongated structural support members and are provided with concentrically spaced sets of openings;

(d) longitudinal gas conveying conduits extending from a manifold chamber within said gas disbursing manifold to said nozzle end and said gas conveying conduit tubes confined within the concentrically spaced sets of openings of said spacer members of the structural support assembly (c) to maintain a tube to tube spaced relationship, and,

(e) a protective refractory covering surrounding and encasing said longitudinal structural support assembly and each said longitudinal gas conveying conduit said protective covering extending from the underside of said gas disbursing manifold to said nozzle end.

4,852,861

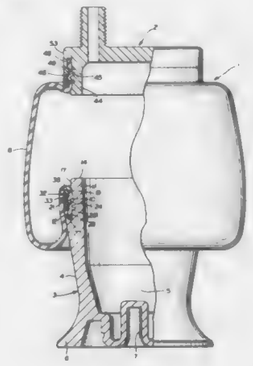
END CAP ASSEMBLY FOR AIR SPRING

Robert S. Harris, Indianapolis, Ind., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Dec. 29, 1988, Ser. No. 291,889

Int. Cl.[4] F16F *9/04*

U.S. Cl. 267—64.27 **17 Claims**



1. An improved air spring including:

(a) a pair of end members adapted to be mounted at generally axially spaced locations;

(b) a flexible sleeve formed of an elastomeric material containing reinforcing cords and having open ends sealingly engaged with the end members forming a pressurized fluid chamber therebetween:

(c) an annular axially extending sealing surface formed on at least one of said end members said sealing surface being formed with a pair of axially spaced annular clamping surfaces and an intermediate annular projection extending radially outwardly beyond said clamping surfaces;

(d) a continuous clamp ring located concentrically with respect to the annular sealing surface for sealingly clamping one end of the flexible sleeve therebetween, said clamp ring having an axially extending inner clamping surface formed with a concave recess cooperating with the intermediate projection to positionally locate said ring with respect to said one end member, and with said projection and spaced clamping surfaces of the clamp ring providing a series of axially spaced pinch areas for clamping the flexible sleeve therebetween and for changing the direction of travel of the reinforcing cords in the clamped sleeve end; and

(e) groove means being formed in the said one end member for trapping and concealing a substantially uncompressed end of the flexible sleeve therein, which end extends beyond the clamp ring.

4,852,862

FLUID-FILLED PISTON-CYLINDER UNIT

Hans-Peter Bauer, and Hans J. Bauer, both of Altdorf, Fed. Rep. of Germany, assignors to Fritz Bauer and Sohne OHG, Altdorf, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 219,749

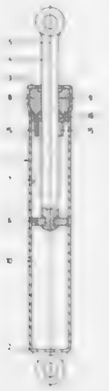
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 8710208[U]

Int. Cl.[4] F15B *15/14;* **F16F** *9/36;* **F16J** *15/56*

U.S. Cl. 267—120 **15 Claims**

1. A fluid-filled piston-cylinder unit, particularly a gas spring or fluid damper, with a tubular fluidfilled housing (1) having two ends (2, 3) and being closed at one end (2) and with a piston rod (4) emerging from the other end (3) of said housing, one end of the piston rod (4) which is inside the housing (1) being provided with a guide piston (6) for lateral supporting of

the piston rod (4) against the inside wall (7) of the housing (1), the said piston rod (4) being guided at the other end (3) of the housing (1) in a guide bush (8) comprising an inner seal (18) for sealing tightness against the piston rod (4) and an outer seal (17) for sealing tightness against the inner wall (7) each of the said seals consisting of a resilient sealing material and said piston rod (4) being movable in said bush (8) in a direction of a central longitudinal axis (5), wherein the guide bush (8) is provided with at least one spacer (15) extending parallel to said axis (5) and beyond the said seals (17, 18) in a direction to the



guide piston (6), the said spacer (15) having a cross-section which is considerably smaller than the cross-section of the guide bush (8);

wherein a plurality of spacers (15) are provided which are disposed at substantially equal angular intervals;

said seals (17, 18) are in a transition zone from the guide bush (8) to said spacers (15), fixed in a directly surfacecontacting manner; and

said seals (17, 18) are constructed as a one-piece sealing member (16).

4,852,863

PNEUMATIC SUSPENSION FOR MOTOR VEHICLES

Juergen Breitenbacher, Winterbach; Walter Kuehle, Neckarwestheim; Roland Moennings, Stuttgart; Udo Neumann, Leonberg, and Wolfgang Schramm, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

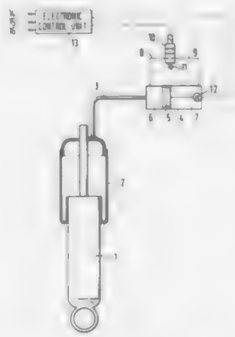
Filed Jun. 16, 1988, Ser. No. 207,477

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1987, 3728120

Int. Cl.[4] B60G *17/04;* **F16F** *9/50*

U.S. Cl. 267—218 **6 Claims**

1. A pneumatic suspension for motor vehicles which includes a shock absorber having a spring bellows disposed between a vehicle axle and a vehicle body, a work cylinder, an adjustable piston in said work cylinder that separates said work cylinder into first and second work chambers, a fluid flow line connected from said shock absorber to one work chamber of said work cylinder, the volume of said one work chamber serving as an additional spring volume for said spring bellows and being variable in volume by means of said adjusting piston, a further fluid flow line that connects said first work chamber with said second work chamber, a control valve assembly disposed in said further fluid flow line to control fluid flow between said first and second work chambers, said one work chamber connected to said spring bellows is variable in volume without pressure when said valve assembly is open, and said second work chamber communicates with said first work



chamber only during adjustment of a spring rate in said shock absorber.

4,852,864

HYDRAULIC-DAMPING TWO-CHAMBER ENGINE MOUNT

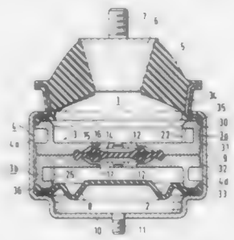
Horst Bitschkus, Hilgert; Manfred Hofmann, Hünfelden; Karl-Heinz Klöckner, Niederwerth; Uwe Nelles, Bonn, and Günther Siewert, Deesen, all of Fed. Rep. of Germany, assignors to Metzeler GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 19, 1988, Ser. No. 246,506

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1987, 3731495

Int. Cl.[4] F16M *5/00;* **B62D** *21/00*

U.S. Cl. 267—219 **7 Claims**



1. Hydraulic-damping two-chamber engine mount, comprising a working chamber, a compensating chamber, an intermediate plate separating said chambers from each other and having an overflow conduit extending helically therein through which said chambers communicate hydraulically with one another, said intermediate plate having two outer surfaces and an outer periphery merging into a cylindrical ring extending beyond both of said outer surfaces, said ring having an outer surface with two axially superposed conduits formed therein having ends and extending over at least a portion of the outer periphery of said intermediate plate, said intermediate plate having a longitudinal axis and having a conduit portion formed therein extending obliquely relative to the longitudinal axis through which one end of each of said superposed conduits communicate with each other, and an outer conduit wall in the form of a cylindrical mount housing with an inner wall surface covering said superposed conduits, said cylindrical ring having corresponding radially inwardly oriented openings formed therein through which the other ends of said superposed conduits commuicate with said working chamber and with said compensating chamber.

4,852,865

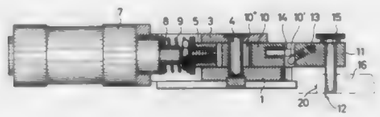
HOLDING DEVICE ON A PUNCH PRESS

Günter Edrich, Münchweiler/Rodalb, and Klaus Deppert, Pirmasens, both of Fed. Rep. of Germany, assignors to Schön & CIE. GmbH, Pirmasens, Fed. Rep. of Germany

Filed Oct. 7, 1987, Ser. No. 106,376

Int. Cl.[4] B23Q *1/00*

U.S. Cl. 269—48 **16 Claims**



1. Holding device for a stack (16) of paper, cardborad or similar sheet-form punching material on a punching table of a punch press having a punching knife (19), the punching material having centering holes, said holding device comprising:

a centering pin (15) for engagement into the centering holes of the punching material;

said centering pin (15) being rigid and having a substantially smooth surface; and

means for movably suspending said centering pin (15) relative to the punching table to permit said centering pin (15) to be both tiltingly and also thrustingly movable in or parallel to a plane of the punching table so that said centering pin (15) can elastically yield perpendicular and parallel to an adjacent edge (20) of the stack (16) when the punching material is thrust by a wedge action of the punching knife (19).

4,852,866

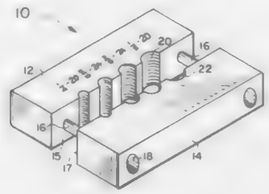
VISE ADAPTER FOR THREADED OBJECTS

Louis D. Kristoff, 415-C Banana Cay Dr., South Daytona, Fla. 32019

Filed Jan. 25, 1988, Ser. No. 148,033

Int. Cl.[4] B25B *1/00*

U.S. Cl. 269—87.2 **10 Claims**



1. In a vise adapter for holding a threaded object, the improvement comprising:

a first essentially rectangular block having a first clamping face, said first face having at least one essentially semi-cylindrical channel thereacross, said channel having an arc slightly less than 180°;

a second essentially rectangular block having a second clamping face opposing said first clamping face, said second face having at least one essentially semi-cylindrical channel thereacross for mating with said channel of said first face; and

slide means for slidably coupling said first and second blocks to permit said first and second opposing faces to be moved and clamped in contact with each other, said channels thereby forming an essentially cylindrical opening, said channels each including threads forming a continuous thread through said opening for accepting threads of said object, said threaded channels including chase grooves thereacross, wherein said threaded object is gripped in said essentially cylindrical opening.

4,852,867

COPYING APPARATUS HAVING AN AUTOMATIC DOCUMENT FEEDER WITH DOCUMENT CIRCULATING FUNCTION AND A PAPER CONTAINER WITH PAPER BINDING FUNCTION

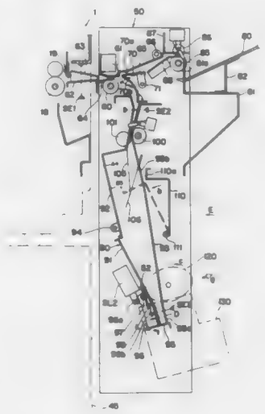
Akiyoshi Johdai; Keichi Kinoshita, and Toshio Matsui, all of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 8, 1987, Ser. No. 105,561

Claims priority, application Japan, Oct. 9, 1986, 61-240725; Oct. 9, 1986, 61-240726

Int. Cl.[4] B42B *1/02*

U.S. Cl. 270—53 **5 Claims**



1. A copying apparatus, comprising:

image forming means for forming a duplicate sheet of a document placed in an exposure position;

a circulating automatic document feeding unit which has a document container for storing one set of documents stacked in order, wherein the documents are transported sheet by sheet from the document container to the exposure position and again stored in the container after the exposure;

means for storing duplicated sheets, said storing means including means for stapling one set of the duplicated sheets stored in the storing means;

means for entering a number of copies to be prepared per one set of documents;

first control means for operating continuously both the image forming means and the circulating automatic document feeding unit until the image forming operation for a specific number of sets of copies has been completed, the specific number being the number entered by the number entering means;

means for selecting either a stapling mode or a nonstapling mode;

second control means for controlling the storing means in the stapling mode and in the non-stapling mode, wherein when in the stapling mode the storing means stores the duplicated sheets and the stapling means operates every time after a completion of the storing operation for stapling each set of duplicating sheets, and when in the nonstapling mode the storing means stores the duplicated sheets without operating the stapling means; and

third control means, responsive to the selection of the nonstapling mode during the storing operation in the stapling mode, for controlling said storing means in the non-sta-

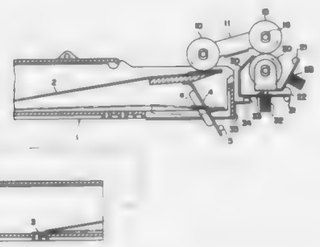
pling mode after the completion of the storing and stapling operation to the set of copies currently being stored.

4,852,868

AUTOMATIC PAPER FEEDING APPARATUS

Kazuyuki Fukui, and Chujiro Yokoyama, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 7, 1988, Ser. No. 164,836
Claims priority, application Japan, Mar. 9, 1987, 62-53759
Int. Cl.[4] B65H *3/52*
U.S. Cl. 271—122 6 Claims



1. An automatic paper feeding apparatus comprising:
means for storing a stack of sheets thereon;
a paper-feeder roller for feeding sheets by its own rotation, touching the top of the sheet stack stored on said sheet storing means;
a transport roller positioned at the downstream relative to said paper-feeder roller in the paper feeding direction and rotatable in the paper feeding direction;
a separation roller touching and pressing said transport roller and rotatable in the reverse direction to the paper feeding direction;
means for rotatably supporting said separation roller, the supporting means being pivotably provided to move in the directions where said separation roller touches with and separates from said transport roller, and being urged by an elastic member so as to cause said separation roller to be pressed toward said transport roller; and
a guide plate for guiding a sheet into the nipping portion between said transport roller and said separation roller, the guide plate being movably provided to enter and to leave a paper feeding path and having a contact portion which touches said supporting means for regulating the guide plate at a specified position;
wherein said guide plate moves to leave the paper feeding path independently of said separation roller when many sheets are fed by said paper-feeder roller.

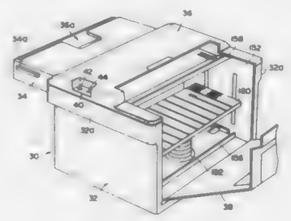
4,852,869

FEED APPARATUS CAPABLE OF FEEDING IMAGE FORMING MEDIA BY RELATIVELY SMALL DRIVE POWER

Junji Watanabe; Ken Iseda, both of Yokohama; Takehito Fukunaga, and Akihito Tokutsu, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 26, 1988, Ser. No. 224,554
Claims priority, application Japan, Jul. 31, 1987, 62-191617; Jul. 31, 1987, 62-191618
Int. Cl.[4] B65H *1/12*
U.S. Cl. 271—126 10 Claims

1. A feed apparatus for feeding image forming media to an image-forming apparatus, comprising:
means for holding said image forming media, said holding means being movable between a feed position from which the image forming media are fed into the image-forming apparatus and a non-feed position;
means for constantly urging said holding means toward the feed position, said urging means having a predetermined urging force;
means for producing a driving force to move said holding means, said holding means being moved to the feed position by utilization of both the driving force and the urging force; and



means for permitting the driving force of said producing means to be transmitted to said holding means only in the case where said holding means should be moved to the feed position, and for, in the other cases, preventing a force acting toward the feed position from being transmitted to said holding means, except for the urging force of said urging means.

4,852,870

SUBSTITUTE GROUND SURFACE MATERIAL

Paul Hawkins, Leicester, and John D. Dachtler, Isle of Wight, both of England, assignors to En-tout-cas plc, Syston, England

Continuation-in-part of Ser. No. 939,540, Dec. 8, 1986, Pat. No. 4,792,133. This application Sep. 14, 1988, Ser. No. 244,697
Claims priority, application United Kingdom, Jan. 14, 1986, 8529869
Int. Cl.[4] A63J *3/00*; A63K *1/00*; C09K *3/18*
U.S. Cl. 272—3 6 Claims

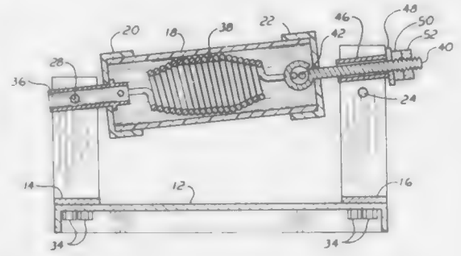
1. Substitute ground surface material comprising sand or other particulate or granular mineral material treated with a binder comprising a styrene-butadiene-styrene copolymer dispersed or dissolved in an oil having a viscosity such that it is substantially non-fluid at ambient temperatures so as to produce an inert, discrete material permanently capable of being raked when laid in a layer upon a substrate.

4,852,871

HAND EXERCISE DEVICE

John Perko, 11176 100th St. North, Largo, Fla. 34643

Filed Dec. 2, 1988, Ser. No. 279,433
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—67 10 Claims



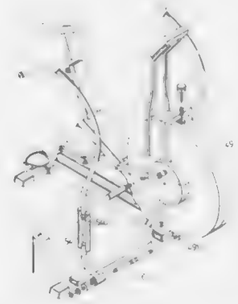
1. A portable hand exercise device comprising:
a first and second mounting bracket attached to a base,
a mounting sleeve fixedly attached to the first mounting bracket,
a tubular sleeve held by the second mounting bracket,
a rod movably mounted within the sleeve, the rod having a first end in the form of a hook and a threaded second end, the threaded resistance second end held in place by a threaded adjusting element outside the sleeve,
a spring connecting the mounting sleeve to the hook on the rod,
a cylindrical gripping member housing and enclosing the spring the gripping member being fixedly connected at one end to the hook and spring, while being rotatably attached to the mounting sleeve at the other end, so that a twisting motion on the cylindrical gripping member will cause the spring to increase pressure.

4,852,872

EXERCISE BICYCLE FOR EXERCISING ARMS AND LEGS

Peter K. Lo, P.O. Box 13-124, Taipei, Taiwan

Continuation-in-part of Ser. No. 192,166, May 10, 1988, Pat. No. 4,824,102. This application Jan. 19, 1989, Ser. No. 298,692
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—73 4 Claims



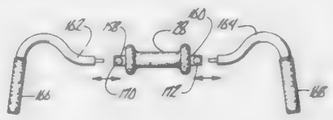
1. An exercise bicycle comprising:
a frame assembly including a base frame, a driven wheel frame fixed on a front portion of said base frame, and a seat frame fixed on a rear portion of said base frame;
a foot operated drive assembly including a driving shaft journalled on said seat frame, a rear driving sprocket sleeved rigidly on an intermediate portion of said driving shaft, two crank arms respectively secured to two ends of said driving shaft, and two pedals secured to said respective crank arms;
a hand operated drive assembly including a wheel axle journalled on said wheel frame, a front driving sprocket sleeved rigidly on said wheel axle, two swing arms secured to two opposite end portions of said wheel axle, and two hand operated swing levers mounted pivotally at their lower ends on said base frame, each of said levers including an upper lever portion, two parallel rods respectively secured to two sides of a lower end of said upper lever portion, and a lower lever portion secured to inner sides of lower ends of said rods so as to define a slide slot between said rods, each of said rods having an arcuated inner side portion, each of said swing arms having a crank pin member and including a sheave sleeved rotatably on said crank pin member, each of said sheaves having an annular groove of a generally V-shaped cross-section and inserted into said slide slot of corresponding said lever in such a manner that said annular groove engages with said arcuated inner side portions of said rods, so that said crank pin member can slide along said slide slot of said lever;
a driven shaft assembly including a driven shaft journalled on said base frame between said driving shaft and said wheel axle, a foot driven sprocket sleeved rotatably on said driven shaft, clutch means for locking said foot driven sprocket on said driven shaft when said foot driven sprocket rotates in a predetermined direction, a foot driven chain trained on said rear driving sprocket and said foot driven sprocket, a hand driven sprocket sleeved rotatably on said driven shaft, clutch means for locking said hand driven sprocket on said driven shaft when said hand driven sprocket rotates in a predetermined direction, a hand driven chain trained on said front driving sprocket and said hand driven sprocket, and a rear pulley sleeved rigidly on said driven shaft; and
a wheel assembly including a wheel hub sleeved rotatably on said wheel axle, a wheel sleeved rigidly on said wheel hub, a front pulley sleeved rigidly on said wheel hub, and an endless belt trained on said front pulley and said rear pulley;
whereby, when said pedals are rotated in said predetermined direction, said driving shaft, rear driving sprocket, foot driven chain, foot driven sprocket, driven shaft, rear pulley, endless belt, front pulley, hub, and wheel are in turn rotated in said predetermined direction;
when said levers are swung, said wheel axle, front driving sprocket, hand driven chain, hand driven sprocket, driven shaft, rear pulley, endless belt, front pulley, hub, and wheel are in turn rotated in said predetermined direction; and
when a first torque is applied to said driven shaft through said foot driven sprocket by rotating said pedals in said predetermined direction, and when a second torque is applied to said driven shaft through said hand driven sprocket by swinging said levers, the sum of said first and second torques is output through said rear pulley.

4,852,873

EXERCISE DEVICE

Jerry L. O'Donnell, and Cecil W. Bopp, both of Waterloo, Iowa, assignors to For You, Inc., Waterloo, Iowa

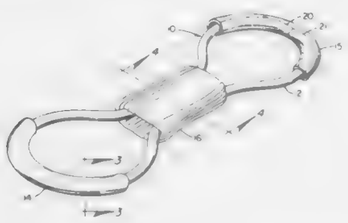
Continuation-in-part of Ser. No. 847,760, Apr. 3, 1986, Pat. No. 4,718,666. This application Jan. 7, 1988, Ser. No. 141,619
The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.
Int. Cl.[4] A63B *21/02*
U.S. Cl. 272—137 7 Claims



1. An exercise device for development of the body of an exerciser, comprising:
an elastomeric middle member;
first and second oppositely extending arm members, each arm member having a first end encapsulated in opposite ends of the middle member to provide a secure nonreleasable junction between the middle member and the arm members, all surfaces of each first end being encapsulated and covered by the middle member to prevent slippage of the arm members during twisting and all other movement between the arm members and the middle member;
the arm members having second ends which extend outwardly from the middle member, each second end including coupling means adapted for connection to an attachment taken from the set consisting of handle means for gripping by a user and attachment means for connection to an object to allow relative movement and twisting between opposite arm members for exercise purposes; and
said middle member being deformable and twistable by a user from an original position allowing said arm members to be moved towards one another and to be twisted with respect to said middle member, while providing resistance to such movement and resiliently returning to said original

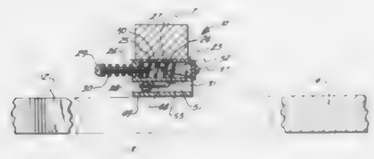
position after deformation and twisting of said middle member.

4,852,874
PORTABLE ISOKINETIC EXERCISING DEVICE
Charles G. Sleichter, III, San Juan Capistrano; Don Danks, Newport Beach, both of Calif., and Dale Strong, Carberry, Canada, assignors to Advantage Entertainment, Inc., Costa Mesa, Calif.
Continuation-in-part of Ser. No. 100,362, Sep. 23, 1987, abandoned. This application Aug. 5, 1988, Ser. No. 229,220
Int. Cl.[4] A63B *21/02*
U.S. Cl. 272—137 **13 Claims**



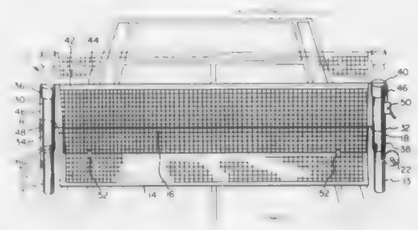
1. An exercise device comprising:
an elastic member in the form of an endless loop;
generally tubular handles disposed on said loop in diametrically opposed relation to one another and in surrounding relation to said loop; and
retainer means in the form of an elongated protective pliable elastic sleeve surrounding intermediate portions of said endless loop to retain said intermediate portions in closely spaced relation to one another between said handles whereby said retainer means yieldingly resists separation of said intermediate portions of said loop but will not stretch lengthwise in response to grasping of said handles and stretching of said loop between said handles.

4,852,875
RACQUET SWING TRAINING APPARATUS
Jim McLennan, 430 San Luis Ave., Los Altos, Calif. 94022; Richard Davis, 4037 El Camino Way, Palo Alto, Calif. 94306, and Donald Kerr, P.O. Box 386, Waveland, Miss. 39576
Filed Dec. 15, 1987, Ser. No. 133,374
Int. Cl.[4] A63B *61/00, 69/38*
U.S. Cl. 273—29 A **12 Claims**



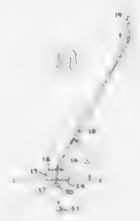
1. A swing training apparatus for use with a hand held sports implement having a head and a handle with a longitudinal axis extending between the handle and the head, comprising:
a. a support;
b. means for attaching the support to the implement at a position adjacent to the head;
c. the support having a bore generally parallel to the longitudinal axis of the implement when the support is attached thereto in an operating position;
d. a magnetic slug shiftably mounted in the bore;
e. means for biasing the slug in one direction to cause it to return to an initial rest position after the slug moves in response to force applied thereto during a swinging of the implement;
f. magnetic sensor means normally spaced from the magnetic slug for producing an electrical output signal proportional to the proximity of the magnetic slug to the sensor means; and
g. transducer means for generating a measured signal as the implement is swung and when the magnetic slug is moved to a position that approaches the linear magnetic sensor means, the signal changing in value depending upon the proximity of the slug to the sensor means.

4,852,876
TENNIS NET HEIGHT EXTENDER
David M. Scioscia, 2506A Chapel Hill Rd., Durham, N.C. 27707
Filed Sep. 1, 1988, Ser. No. 239,531
Int. Cl.[4] A63B *69/38*
U.S. Cl. 273—29 A **20 Claims**



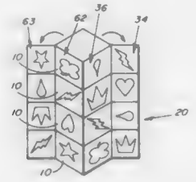
1. A tennis net height extender adapted to be used with a regulation tennis net and tennis net posts situated within a tennis court comprising:
a pair of auxiliary tennis net posts, each configured and dimensioned to fit over the regulation tennis net posts;
means for releasably fastening said auxiliary tennis net posts adjustably to the tennis net posts so that they extend above the tennis net posts a desired level; and
an auxiliary tennis net attached to and between said auxiliary tennis net posts and overlapping the regulation tennis net in a fully extended position.

4,852,877
GOLF PUTTER
John H. Scalf, River St., Betsy Lane, Ky. 41605
Filed Jun. 28, 1988, Ser. No. 211,654
Int. Cl.[4] A63B *53/00*
U.S. Cl. 273—77 R **4 Claims**



1. A golf putter construction consisting of:
a putter head member including a straight vertical front impact fact; a generally flat top surface provided with a recess having a raised aiming reference element therein that is oriented perpendicular to the vertical front impact face; a generally flat bottom; two side surfaces and a rear face having a generally straight vertical portion; and,
an elongated shaft member provided with a handle element on one end and fixedly connected on the other end to the rear surface of the putter head member; wherein, the shaft member is disposed at an angle "α" relative to a horizontal plane passing through said putter head member; at an angle "Δ" relative to the vertical impact surface of the putter head member; and, at an angle "β" relative to a vertical plane disposed perpendicular to the vertical impact surface of the putter head member; wherein, the handle element of said shaft member is disposed at an angle relative to said elongated shaft, and is disposed perpendicular to the vertical impact face of said putter head member.

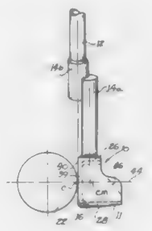
4,852,878
TOY BLOCKS FOR MULTIPLE PUZZLES AND GAMES OF VARYING SKILL LEVELS
Jeffrey C. Merrill, P.O. Box 33, #363, Long Beach, Calif. 90801
Filed Dec. 9, 1987, Ser. No. 130,409
Int. Cl.[4] A63F *9/08*
U.S. Cl. 273—156 **12 Claims**



10. An apparatus for games and puzzles, comprising:
a plurality of playing elements having a plurality of sides including opposing sides;
an indicia sequence associated with the sides of each of the playing elements, each indicia sequence having a unique plurality of non-Arabic numerical value and direction designating indicia when considering both directional and numerical characters of the indicia in each sequence, the directional character being such that, if two opposing side pairs of indicia in two sequences are numerically the same, and each indicia in the two pairs having a first numerical value are aligned in one directional character, the other indicia in the two pairs having a second numerical value have a different directional character in relation to one another.

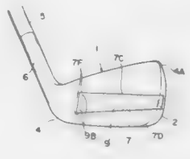
4,852,879
GOLF PUTTER HEAD
Truman F. Collins, 3550 Cherry St. Rd., Springfield, Mo. 65804
Filed Jun. 17, 1987, Ser. No. 63,577
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—164 **7 Claims**

1. A golf putter head comprising:
a body having an elongated generally planar ball-contacting surface (**40**) with a generally hollow center disposed between two massive ends (**16, 18**);
said head having a center of mass (CM) generally aligned behind a center C of said ball-contacting surface along a line (**44**) extending generally in the direction of swing of the golf putter; and
means (**14**) for engaging a handle comprising an elongated hosel (**14***a*) extending from the top of said head and having a longitudinal axis extending generally through the center of mass (CM) of said head and a generally parallel socket (**14***b*) for receiving a handle having a longitudinal axis, said socket **14**(*b*) being laterally offset from said hosel (**14***a*) and having an elongated axis lying in the plane of said ball-engaging surface (**40**) so as to extend through the



center (C) thereof, said socket (**14***b*) adapted for coaxial alignment with the longitudinal axis of said handle (**12**).

4,852,880
HEAD STRUCTURE FOR GOLD CLUBS
Kenji Kobayashi, Niigata, Japan, assignor to Endo Manufacturing Co., Ltd, Japan
Filed Feb. 17, 1988, Ser. No. 156,726
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—169 **1 Claim**



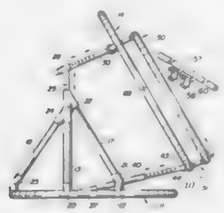
1. A head structure for a golf club, comprising:
a head body having a face for providing a ball hitting surface;
a balancing weight made denser than said head body;
means for press-fitting said balancing weight so firmly on said head body that it may not come out, said means including a fitting mortise flaring towards its bottom and extending longitudinally of one of said head body and said balancing weight, and a corresponding fitting tenon flaring to have a width diminishing toward its root and extending longitudinally of the other so that it may be firmly fitted in said mortise, and wherein said fitting mortise and tenon are narrowed from the heel to the toe of said head body partly to retain said tenon in said mortise while preventing said balancing weight from coming out against the centrifugal force which is established when said golf club is swung and partly to displace the position of the overall centroid of said head structure toward said heel.

4,852,881
GOLF TRAINING APPARATUS
Miro D. Bellagamba, 13140 Lake Mary Jane Rd., Orlando, Fla. 32832, and Richard L. Ohly, 3000 S. Semoran Blvd., Apt. 7, Orlando, Fla. 32822
Filed Sep. 26, 1988, Ser. No. 248,592
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—183 B **17 Claims**

1. A golf training apparatus comprising:
a frame having a base for sitting on the ground;
a first golf club swing guide attached to said frame, said first golf club swing guide for guiding a person's swing;
guide adjustment means for adjusting the position of said golf club swing guide, said guide adjustment means hav-

ing a height and angle adjustment for said golf club swing guide;

a second golf club swing guide removably attachable to said first golf club swing guide for guiding a person's swing,



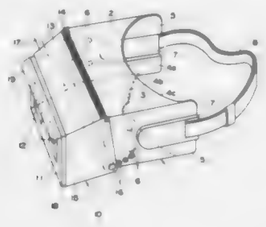
said second golf club swing guide being adjusted by said guide adjustment means adjusting said first golf club swing guide with said second golf club swing guide attached thereto; whereby said guides allow different size golfers and different size clubs to be used thereon.

4,852,882

DEVICE FOR GOLF PRACTICING

Kazuhiko Otsuka, and Koji Nobiraki, both of Nara, Japan, assignors to Nitta Industries Corporation, Osaka, Japan

Filed Jun. 20, 1988, Ser. No. 209,326
Claims priority, application Japan, Jul. 10, 1987, 62-172498; Oct. 5, 1987, 62-251145; Nov. 16, 1987, 62-289063; Jan. 6, 1988, 63-998; Jan. 6, 1988, 63-999
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—183 B 23 Claims



1. A device for golf practicing for use by a golfer by mounting it on his head when the golfer trains himself in hitting a golf ball with a golf club, comprising:

a body which is open at its front and rear sides and adapted to be held in position by bringing its rear open portion in abutment with the face of a wearer at a location around the eyes, a field of vision constricting element having at least two field-of-vision constricted view apertures and provided at the front open side of said body, holding means secured to said body for holding said device in position on the head, position adjuster means for adjusting the position of said field-of-vision constricted view apertures, and aperture diameter adjuster means for diametrical adjustment of said field-of-view constricted view apertures,

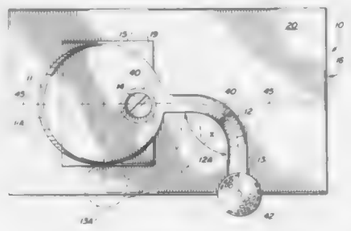
whereby the golfer can hit the golf ball while looking at the ball through said field-of-view constricted view apertures via the interior of said body.

4,852,883

APPARATUS FOR PRACTISING GOLF STROKE

John Heselton, 680 NW. 24th St., Faribault, Minn. 55021; Perry Nelson, 13033 N. 8th Ave., Phoenix, Ariz. 85029, and Tod Aldrich, 201 Main St., Westcliffe, Colo. 81252

Continuation-in-part of Ser. No. 908,231, Sep. 17, 1986, abandoned. This application Mar. 1, 1988, Ser. No. 162,613
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—197 R 4 Claims



1. Golf practising apparatus including

(a) a base having a generally horizontal upper surface;

(b) a resilient elongate arm having a first and a second end, said second end being attached to a fixed pivot point connected to and positioned above said base such that said arm moves in a fixed flat reference plane when said arm rotates about said pivot point, said plane being sloped with respect to said horizontal upper surface;

(c) golf ball means attached to said first end of said elongate arm and moving above said base in said reference plane with said arm when said arm rotates about said pivot point;

(d) a counterweight attached to said second end of said elongate arm and

(i) moving in said reference plane above said base when said counterweight rotates about said pivot point with said arm,

(ii) resting in said reference plane above said base when stationary,

(iii) having a mass generally equal to the combined mass of said elongate arm and golf means, and,

(iv) having a peripheral edge;

the moment of inertia of said elongate arm and golf ball means with respect to the moment of inertia of said counterweight being in the range of 4:1 to 2:1;

the force of gravity acting on said golf ball means and elongate arm being generally equivalent to the force of gravity acting on said counterweight;

the torque produced by said force of gravity on said counterweight being less than the sum of the torque produced by the force of gravity on said golf ball means and said elongate arm;

the center of gravity of said golf ball means and elongate arm being at a distance from said pivot point which is greater than the distance from said pivot point to the center of gravity of said counterweight; and,

(e) said elongate arm having at least two operative positions,

(i) a first operative position in which said arm, counterweight and golf ball means are stationary, and

(ii) a second operative position immediately after said golf ball means is struck by the head of a golf club, said first end of said elongate arm being at an angle to said second end of said arm which is ninety degrees or less, said golf ball means contacting said peripheral edge in said second operative position when said golf ball means is contacted by the head of a wood golf club moving at a selected speed of travel.

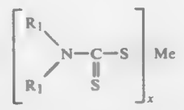
4,852,884

USE OF METAL CARBAMATE ACCELERATOR IN PEROXIDE-CURED GOLF BALL CENTER FORMULATION

Michael J. Sullivan, Chicopee, Mass., assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.

Filed Dec. 24, 1987, Ser. No. 137,647
Int. Cl.[4] A63B *37/06*
U.S. Cl. 273—230 24 Claims

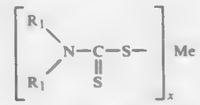
1. An improved core composition for a golf ball exhibiting a high coefficient of restitution, said composition comprising an elastomer selected from polybutadiene and mixtures of polybutadiene with other elastomers, at least one metallic salt of an alpha,beta-ethylenically unsaturated monocarboxylic acid, a free radical initiator and a metallic dithiocarbamate having the formula:



wherein R, is lower alkyl having from 1 to 5 carbon atoms, Me is a cation having a valence of from 2 to 4 and and x is an integer having a value equal to the valence of said cation, said dithiocarbamate present in said composition in an amount of from about 0.1 to about 0.5 parts by weight, based on 100 parts of said elastomer.

13. A golf ball comprising a molded, spherical core and a cover therefor,

said core comprising an elastomer selected from polybutadiene and mixtures of polybutadiene with other elastomers, said elastomer crosslinked with at least one metallic salt of an alpha,beta-ethylenically unsaturated monocarboxylic acid and from about 0.1 to about 0.5 parts by weight, based on 100 parts of said elastomer, of a metallic dithiocarbamate of the formula:



wherein R, is lower alkyl having from 1 to 5 carbon atoms, Me is a cation having a valence of from 2 to 4 and x is an integer having a value equal to the valence of said cation.

4,852,885

GAME DEVICE

Shahin Baratpour, and Salina Ventresca, both of 110 Wheeler Ave., Mass. 02176

Filed Oct. 14, 1987, Ser. No. 108,013
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—237 1 Claim

1. A method of playing a fast paced word game, comprising the steps of:

providing:

a generally rectangular hollow housing;

a circular wheel mounted for rotation within said housing, said wheel having a face exposed through an opening in said housing;

said wheel having letters of the alphabet and the numbers one through six imprinted thereon;

electrical motor means mounted within said housing operatively connected for rotating said wheel;

a battery mounted within said housing and operatively connected for powering said motor;

a plurality of independent switches mounted on an exposed face of said housing, said switches being connected in parallel between said battery and said motor for independently energizing said motor;

a convex transparent cover mounted on said housing and covering said wheel;

a score sheet for each of a plurality of players, said score sheet formed from plastic designated with categories including name, fruit, city, item, animal, color, car, country, flower, and famous people categories, a point score associated with each of said categories designated on said score sheet, and said score sheet also designated with a plurality of adjacent columns;

selecting one of said wheel numbers by each of a plurality of players;

spinning said wheel by one of said players and randomly indicating a number or letter by activating one of said independent switches;



recording bonus points on a player's score sheet if a player's selected number is indicated;

completing one of said score sheet columns by writing a word beginning with a selected letter in each of said categories;

repeatedly spinning said wheel upon completion of one of said score sheet columns by one of said plurality of players;

repeatedly completing said score sheet columns with words in each category beginning with randomly selected letters; and

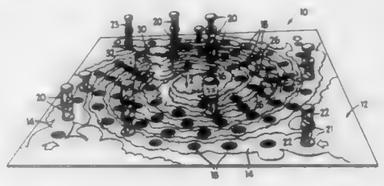
totalling said score sheet point totals upon completion of all of said score sheet columns by one of said players, to determine the game winner.

4,852,886

BOARD GAME WITH STACKABLE TOKENS AND RANDOM MOVING DISRUPTER

John V. Zaruba, Chicago; Donald A. Rosenwinkel, Oak Park, and Jeffrey D. Breslow, Highland Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 11, 1988, Ser. No. 141,993
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—249 18 Claims



15. A game for a plurality of players comprising in combination:

a board providing a relatively flat playing surface and containing a path;

a set of playing tokens for each player; and

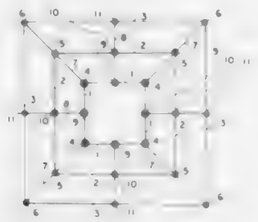
means self-propelled by a motor carried by the means with the motor also effecting a periodic change in direction of the means so that the means is self-propelled about the playing surface in a random manner capable of knocking over a playing token upon contact with the playing token.

4,852,887

METHOD OF PLAYING A THREE IN A ROW GAME

Jian X. Li, 139 Princeton Ave., #1, Amherst, N.Y. 14226

Filed Jun. 14, 1988, Ser. No. 206,361
Int. Cl.[4] A63F *3/02*
U.S. Cl. 273—264 1 Claim



1. A method of playing a game comprising:
selecting two players to exercise alternate turns in playing;
providing a game board having a design with lines having intersections, some intersections being vertices of squares;
providing markers of two different identifying means for showing possession by each player;
placing a marker on one of said intersections by each player when his turn comes;
proceeding said alternate turns until one player attains for his markers a three in a row situation on one straight line of said design;
said one player removing one of his opponent's marker from the game board;
continuing play until all of the intersections are covered;
removing from the board all of the markers that are surrounded by the opponent's markers at adjacent intersections that are connected by straight lines containing the intersection on which the surrounded marker is situated;
proceeding by moving a marker from one intersection to an adjacent intersection on the same straight line for each turn of each player in an effort to make the three in a row situation;
removing one of the opponent's markers when a player attains this situation;
whereby a game ending occurrence happens when any one of the three occurrences transpires; namely, when and if there are no surrounded markers and all of the intersections are covered with markers so that a loser cannot fulfill his turn, when and if one winning player's markers surround all his opponent's markers so that a losing player's markers cannot be removed; when and if all a losing player's markers are removed from the board.

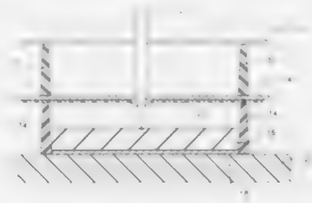
[illegible]

ELECTRICALLY SCORING DART BOARD

Donald K. Ross, 1195 E. 347th St., Eastlake, Ohio 44094, and Donald L. Luttermoser, 8789 Gract Ct., Mentor, Ohio 44060

Filed Apr. 28, 1988, Ser. No. 187,215
Int. Cl.[4] F41J *5/04*
U.S. Cl. 273—373 8 Claims

1. A target board adapted for use with projectiles having substantially cylindrically-shaped conductive points, said board comprising, in spaced apart relationship, a first conductive layer that is easily penetrable by said conductive point and a resilient second conductive layer that is substantially impenetrable by said conductive point, which target board may be adapted to an electrical circuit for detecting momentary circuit closures between said two conductive layers through said conductive-pointed projectile, and which target board may thereby sense the arrival of a conductive-pointed projectile by the momentary closing of the electrical circuit comprising, in series connection, said first conductive layer, said penetrating



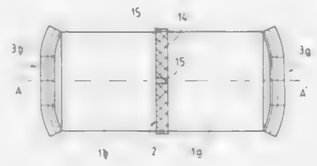
conductive projectile point, and said second conductive layer, which momentary closure is terminated when the point of said projectile rebounds and breaks contact with said resilient second conductive layer, which rebound is caused primarily by the resilient nature of said second conductive layer.

4,852,889

INSTALLATION FOR BALL GAME WITH RETURN PANEL

Bernard Tomczak, 5, rue du Muguet, 62490 Vitry en Artois, France

Filed Aug. 30, 1988, Ser. No. 227,828
Claims priority, application France, Aug. 12, 1987, 87 11621; Apr. 25, 1988, 88 05833
Int. Cl.[4] A63B *67/00*
U.S. Cl. 273—411 7 Claims



1. A ball game installation comprising
a rectangular playing field,
a central obstacle having a determined height and dividing the field into two zones of equal surface area,
two return panels placed along the two opposite sides of the field parallel to the central obstacle, the return panel length being approximately equal to that of said side,
each return panel being made of a hard material having its surface facing the field inclined toward said field,
and each return panel being flat in its central part and curved in its two lateral parts so that a ball coming from one zone of the field and going over the central obstacle and striking the panel placed in the other zone is returned onto that other zone of the field.

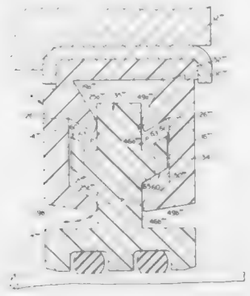
4,852,890

ROTARY SHAFT BEARING ISOLATOR SEAL

Richard Borowski, Palmyra, N.Y., assignor to Garlock Inc., Palmyra, N.Y.

Continuation-in-part of Ser. No. 151,945, Feb. 3, 1988, Pat. No. 4,817,966. This application May 3, 1988, Ser. No. 189,822
Int. Cl.[4] F16J *15/34, 15/447;* F16C *33/72, 33/80*
U.S. Cl. 277—25 9 Claims

1. A rotary shaft bearing isolator seal comprising:
a stator housing having an inner radially extending face;
a first, radially outermost annular flange and a second, radially innermost annular flange both being of substantially frusto-conical shape, and said annular flanges being concentrically disposed in spaced relationship to each other and extending radially and axially inwardly from a larger diameter end fixed to said radially extending face to a smaller diameter free end;
a rotor disposed within said stator housing and having a peripheral radial flange, said peripheral radial flange being provided with a sealing surface for engaging with said annular flanges and being provided with a frusto-conical wall extending axially and radially outwardly from said sealing surface in a manner dividing said sealing surface into radially inner and outer surface portions;
wherein drain ports are provided in a wall of the stator



housing defining said inner radially extending face at locations disposed in proximity to a radially inner side of said radially outermost frusto-conical annular flange; and
wherein said rotor is provided with radially extending pumping grooves in an end surface of said frusto-conical wall, said end surface being disposed substantially parallel and in close proximity to a portion of said radially extending face of the stator located between said first and second annular flanges as a means for propelling lubricant, entering past said second annular flange to between said rotor and said portion of the radially extending face of the stator housing, toward the radially inner side of the first, radially outermost one of said annular flanges for discharge through said drain ports under dynamic sealing conditions.

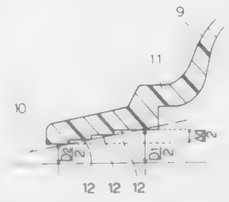
4,852,891

PLASTIC BOOTS AND METHOD OF MANUFACTURING THE SAME

Hidemi Sugiura, Takahama; Mikio Ukai, Nagoya, and Kenji Miyamoto, Inazawa, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Continuation-in-part of Ser. No. 816,633, Jan. 6, 1986, abandoned. This application Aug. 31, 1987, Ser. No. 91,353
Claims priority, application Japan, Jan. 10, 1985, 60-2415; Jan. 17, 1985, 60-6320
Int. Cl.[4] F16J *15/52;* B29C *49/04, 49/06;* F16D *3/84*
U.S. Cl. 277—212 FB 2 Claims

1. A method for providing a dust-proof boot for a protruding equipment shaft which has a cylindrical outer surface portion having a radially outwardly-opening, circumferentially-extending groove provided therein with a bottom wall and opposite flanks which axially-spacedly confront one another, this groove being located intermediate the axial extent of said shaft, said method comprising the steps of:
(a) molding a parison of thermoplastic material between opposed mold surfaces so as to provide thereon in substantially final form an attachment structure for circumferentially engaging said boot with said surface portion of said shaft and including:
(i) an axially-elongated annular ring having an axially outer end, a radially inner surface, and an axially inner end;
(ii) an axially-elongated sleeve having an axially inner end circumferentially joined with an end of a blow-moldable portion of said parison, a radially inner surface, and an axially outer end; and
(iii) a radially extending annular base wall having a radially inner end circumferentially joined with said axially inner end of said annular ring, an axially inwardly-facing inner surface, and a radially outer end circumferentially joined with said axially outer end of said sleeve;
said annular ring between said ends thereof being dimensioned to fit between said opposite flanks of said groove with at least portions of said radially inner surface thereof in circumferential engagement with said bottom wall of said groove;
said radially inner surface of said sleeve being dimensioned to fit loosely about said surface portion of said shaft adjacent a respective flank of said groove; and
said axially inwardly-facing inner surface of said base wall being sharply discontinuous in direction of extent relative to said radially inner surface of said annular ring at a juncture therewith and extending at an angle which lies within twenty degrees of perpendicular to the longitudinal axis of said boot;
(b) while confining a respective portion of said parison between said opposed mold surfaces to maintain said annular ring, said axially-elongated sleeve and said radially-extending annular base wall in said substantially final form:



(i) blow molding said blow-moldable portion of said parison to provide an annularly-corrugated tubular bellows having said attachment structure provided at one end thereof; and
(c) providing at an opposite end of said annularlycorrugated tubular bellows another circumferentially extending attachment structure;
as part of said molding step (a),
providing said radially inner surface of said annular ring with a plurality of axially-space circumferentially extending ribs,
providing said radially inner surface of said annular ring so as to be annularly stepped so as to provide said ribs where respective generally radially-directed annular portions thereof meet generally axially-directed annular portions thereof at respective radially inner corners, and
providing said annular ring to have a shape such that when not stressed by being received in said groove, said annular ring has the respective radially inner corners of said radially inner surface thereof circumferentially arranged on a notional conical surface which enlarges in diameter towards said axially inner end of said annular ring.
2. A plastic dust-proof boot comprising:
(a) a bellows;
(b) a stationary ring provided at least on one end of the bellows, said stationary ring having an engaging portion arranged to be fitted to an engaging groove formed externally circumferentially on an attaching shaft;
said stationary ring having an inner circumferential surface

provided with a plurality of circumferentially extending ribs arranged so as to lie axially spaced from one another in a series along a circumferential surface of an imaginary truncated cone, said inner circumferential surface being annularly stepped so as to provide said ribs where respective generally radially directed annular portions thereof meet generally axially directed annular portions thereof at respective radially inner corners to define a series of radial steps, each step having a radially facing top and a radially facing bottom spaced radially outwardly from the respective top,

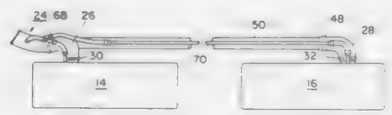
and the internal diameter of the bottom of each step being not greater than that of the top of the respective adjoining said step in the direction of tapering of said imaginary truncated cone so as to allow said boot to release easily from a mold used for molding said boot.

4,852,892

CONVENIENT DUAL FUEL TANK SYSTEM

Richard M. Reid, 25474 State St., Loma Linda, Calif. 92354

Filed Aug. 7, 1984, Ser. No. 638,377
Int. Cl.[4] B60R *27/00*
U.S. Cl. 280—834 **17 Claims**



1. A convenient dual fuel tank system for gasoline or diesel powered vehicles comprising:

first and second fuel tanks, said two fuel tanks being mounted on opposite sides of a vehicle;

a single fuel filler port fitting having an input mouth and including a Y-junction located close to the mouth of the filler port fitting having two branch fuel conduits, and including means for receiving the spout of a fuel filling hose to selectively direct fuel into either of said two branch fuel conduits;

means for connecting one of said branch conduits to fill said first fuel tank; and

means for connecting the other of said branch conduits to fill said second fuel tank;

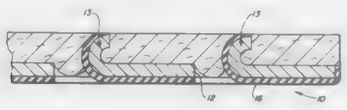
whereby either or both of said fuel tanks may be filled with a single vehicle fuel stop through a single fuel input port fitting.

4,852,893

ELASTOMERIC COATED PERFORATED METAL CORE COMPOSITE GASKET AND METHOD OF MAKING SAME

Alan C. Wesley, Wildwood, Ill., assignor to Fel-Pro Incorporated, Skokie, Ill.

Filed Dec. 6, 1988, Ser. No. 280,327
Int. Cl.[4] F16J *15/12*
U.S. Cl. 277—1 **9 Claims**



1. A thin gasket defining at least one service opening comprising:

a tanged perforated metallic layer having clinching tangs projecting from one side of said metallic layer, said metallic layer being formed from an imperforate metallic sheet pre-coated with an elastomeric layer on at least one of its major surfaces, whereby the subsequently formed projecting tangs are pre-coated, and

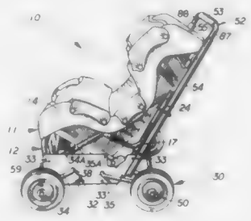
a facing layer clinched against one of said major surfaces by said tangs to said metallic layer.

4,852,894

APPARATUS FOR CONVERTING A CAR SEAT TO A STROLLER

Gloria Dyer, 8429 Menke Way, Citrus Heights, Calif. 95610

Filed Feb. 1, 1988, Ser. No. 150,909
Int. Cl.[4] B62B *1/04*
U.S. Cl. 280—30 **17 Claims**



1. A combination car seat and stroller comprising:

a car seat portion having a back and a seat and framework connected to said car seat portion for supporting the same;

a wheeled understructure removably connected to said framework, said understructure having front and rear wheel assemblies; and

means associated with both said front and rear wheeled assemblies for selectively moving the same between (A) a first operative position where said wheels extend downwardly and are adapted to engage a supporting surface so that said combination can be used as a stroller; and

(B) a second inoperative position where said wheels are disposed in a stored position upwardly with respect to the lowermost portion of said combination so that said combination can be used as a car seat, said car seat portion being connected to said superstructure, in both the first and second positions;

wherein said understructure includes a pair of plates on each side of said framework extending along the bottom thereof from front to rear, each of said plates having one front wheel assembly and one rear wheel assembly mounted thereon, each of said wheel assemblies including a wheel journaled on a resiliently mounted shaft, each of said shafts extending through an opening in said plate; and locking means on each of said shafts cooperating with means on said plates for locking said shaft so that said wheel assemblies are in said first operative position.

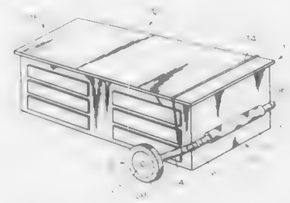
4,852,895

DOLLY

Don Moffitt, 3389 Rivendell Ct., Roswell, Ga. 30075

Filed Apr. 14, 1988, Ser. No. 181,674
Int. Cl.[4] B62B *1/12*
U.S. Cl. 280—47.131 **2 Claims**

2. A dolly for movably supporting an end of a load, and with the dolly comprising two arms and two legs linked at their ends by corner keys to define an open space in which a bottom end portion of a load may be cradled, a pair of wheels rotatably mounted to opposed corner keys at opposite ends of one of said arms, spring means for biasing said dolly to a predetermined width, and wherein at least one of said corner keys includes a hook located within its corresponding arm and wherein said



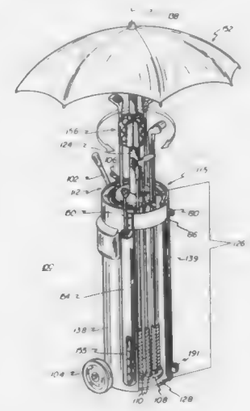
spring means includes a tension spring mounted to said corner key hook.

4,852,896

GOLF EQUIPMENT CARRIER WITH ROTATING CLUB REDUCING FRAME

S. Dwight Mills, 2023 Eastview Dr., Sun City Center, Fla. 33570

Filed Aug. 19, 1986, Ser. No. 897,894
Int. Cl.[4] A63B *55/00, 55/02*
U.S. Cl. 280—47.18 **8 Claims**



1. A golf equipment carrier comprising:

a circular bottom member having a plurality of upwardly directed socket means distributed thereabout for receiving the handle ends of inverted club shafts;

a circular top member having a corresponding plurality of outwardly opening club engaging means for receiving and retaining shank portions of the club shafts;

a tubular member centrally interconnecting said top and bottom members and spacing said top and bottom members from one another and aligning said engaging means and said socket means thereby forming a vertically elongated club receiving frame, said tubular member extending above said top member and having an open upper end for receiving a ball retriever, additional club, umbrella or other elongated piece of golf equipment;

ball holder means spaced above the top member and attached to and surrounding the tubular member, so that a ball may be accessed therefrom at a plurality of circumferential positions on the tubular member;

ball holder means spaced above the top member and attached to and surrounding the tubular member, so that a ball may be accessed therefrom at a plurality of circumferential positions on the tubular member;

base means for supporting said club receiving frame for rotation thereon about a generally vertical axis; and

outer frame means including a plurality of vertical ribs extending upwardly from said base means at least to said top member,

a platform member attached to said vertical ribs and cooperating with a portion of said top member to restrain lateral movement of said club receiving frame within said outer frame means,

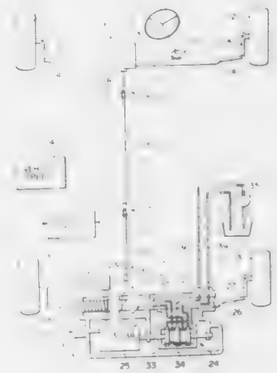
said outer frame means including cover means for protecting clubs supported on said club receiving frame, said outer frame means having an opening therein extending from the top thereof downwardly a substantial distance toward said bottom member whereby clubs can be inserted into and withdrawn from said club receiving frame laterally through said outer frame means.

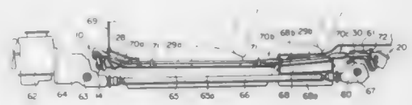
4,852,897

LAYOUT OF STEERING MECHANISM FOR FOUR-WHEEL STEERING VEHICLE

Teruhiko Takatani, Kure; Muneharu Yamada, and Tomomi Miyamoto, both of Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 26, 1988, Ser. No. 186,483
Claims priority, application Japan, Apr. 28, 1987, 62-105414
Int. Cl.[4] B62D *5/10, 7/14*
U.S. Cl. 280—91 **20 Claims**





1. A four-wheel steering mechanism comprising a front steering mechanism disposed outside of a passenger compartment for steering front wheels in accordance with an operation of a steering wheel, a rear steering mechanism disposed outside of the passenger compartment for steering rear wheels in accordance with the steering amount of the front wheels, and connecting means connected with both the front and rear steering mechanisms and extending longitudinally for transmitting the movement of the front steering mechanism to the rear steering mechanism, a part of the connecting means being provided in the passenger compartment, a first opening and a second opening formed in walls constituting the passenger compartment, and the connecting means extending into the passenger compartment through the first opening and extending out of the passenger compartment through the second opening.

4,852,898

COLLAPSIBLE HYDRAULIC POLYCYCLE

Teresa Donoghue, Paterson, and Jose I. Vilches, Passaic, both of N.J., assignors to Teresa Donoghue

Filed Jun. 15, 1988, Ser. No. 206,714
Int. Cl.[4] B62M *1/10*
U.S. Cl. 280—216 **10 Claims**



1. In a pedal operated polycycle having at least three wheels and having pedal means, a polycycle comprising:
(a) a front-to-rear mainframe;
(b) at least one rear axle and associated wheels, journalled within a rear wheel assembly depending from said mainframe;
(c) handle bars depending laterally outwardly from a steering column;
(d) a front wheel assembly integrally depending from a front end of said mainframe and secured to said steering column;
(e) a front wheel journalled upon a front axle of said front wheel assembly;
(f) a seat secured on said main frame between said front and rear axles; and
(g) means for the selective, telescoping, partial collapse of said front-to-rear mainframe;
(h) a hydraulic cylinder in fluid and pressure integral communication with piston means depending from said pedal means;
(i) a hydraulic line in substantial co-alignment with said main frame, and input of said line in hydraulic communication with said cylinder; and
(j) rear wheel drive means securing rotational relationship with both an output of said hydraulic line and a tangent surface of said rear wheels, where upon, upon reciprocation of said piston means, as by a pedalling action applied to said pedal means, a hydraulic amplification of pressure resulting from said pedalling action will be transmitted through said line to said drive means, thereby applying a rotational force to said tangent surface of said rear wheel causing a resultant rotation thereof and a consequential transactional movement of said polycycle.

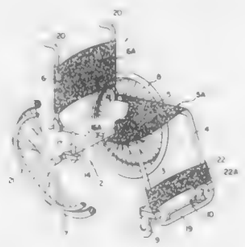
4,852,899

LIGHTWEIGHT WHEELCHAIR ADJUSTABLE FOR A SPECIFIC BALANCE

Rainer Kueschall, Oetlingerstrasse 82, 8057 Basel, Switzerland

Filed Jul. 17, 1987, Ser. No. 74,909
Claims priority, application Switzerland, Jul. 31, 1986, 03071/86
Int. Cl.[4] B62M *1/14*
U.S. Cl. 280—250.1 **11 Claims**

1. A lightweight wheelchair (1) adjustable for a specific balance, comprising a seat (5) arranged on two frame bars (3,4) of a support frame (2), a backrest (6) connected with the support frame (2) two adjustable camber rear wheels (7,8) being vertically adjustable and rotatably connected to the support frame (2) and two front wheels (9,10) being vertically adjustable in relation to the rear wheels (7,8) characterized in that the frame bars (3,4) at the seat level (5) have at least two parts (3a,3b) telescopically adjustable relative to one another and adjustably connecting the back rest with the support frame to selectively shift the position of the back rest relative to the seat, said two rear wheels (7,8) being interconnected with a common rear axle (14) having angled wheel-axle-receiving bores



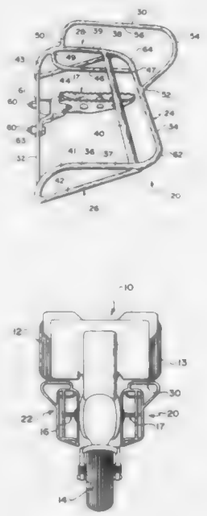
(15) and said rear axle (14) being rotatably adjustably mounted with said support frame.

4,852,900

FOOT GUARDS FOR ALL TERRAIN VEHICLES

Vladimir W. Nahachewski, Box 36, R.R. #5, Site 11, Pleasant Valley Road, Vernon, British Columbia, Canada V1T 6L8

Filed May 12, 1988, Ser. No. 194,038
Int. Cl.[4] B62J *25/00*
U.S. Cl. 280—291 **1 Claim**



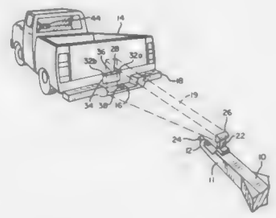
1. A combination of:
(a) an all terrain vehicle having a pair of spaced apart rear wheels with an axle therebetween, and at least one front wheel, the vehicle including a foot rest connected a distance in front of each of the rear wheels; and
(b) a pair of devices for protecting the foot of a rider of the vehicle, each said device comprising a frame having a rectangular perimeter, the frame being substantially horizontal in use, the frame having a front end and a rear end front and rear elongated members, and inner and outer elongated members, the front and rear elongated members having portions coplanar with and adjacent the outer member and having curved portions adjacent the inner member and connected thereto, the inner member being below the outer member in use, the frame including means for connecting the frame to the vehicle so that the frame abuts one of the foot rests, and a deflector member connected to the frame adjacent the rear end of the frame so that the deflector member extends upwardly from the frame in use and extends generally parallel to the axle so that the rider's foot is protected from the rear wheel behind said one foot rest.

4,852,901

TRAILER HITCH POSITIONING APPARATUS

Donald R. Beasley, 2140 S. Pacific Hwy., Kelso, Wash. 98626, and Paul J. Hanson, 2914 Westside Hwy., Castle Rock, Wash. 98611

Filed Feb. 20, 1987, Ser. No. 17,262
Int. Cl.[4] B62Q *1/00*
U.S. Cl. 280—477 **4 Claims**



1. An apparatus for directing a towing vehicle having a towing coupling element toward a towing vehicle having a towed coupling element for hitching the coupling elements of said vehicles together, comprising:
emitting means mounted on the towed vehicle for transmitting a first focused optical beam toward the towing vehicle, the first beam having a predetermined width and for transmitting a second focused optical beam in a generally downward direction;
first receiver means mounted on the towing vehicle and comprising a plurality of optical sensors in predetermined relation to the towing coupling element for discretely detecting the presence of the first beam relative to the towing coupling element; and
second receiver means mounted to the towing vehicle for detecting the second focused beam when the towed coupling element of the towed vehicle is in hitching relation to the towing coupling element; and
indicator means coupled to the first receiver means for indicating the alignment of the towing coupling element with the towed coupling element as the towing vehicle is moved toward the towed vehicle and coupled to the second receiver means for indicating when said coupling elements are in hitching relation.

4,852,902

TOWING HITCH COVER

David A. Young, Plymouth, and Kenneth E. Bol, II, Canton, both of Mich., assignors to The Fisher Group, Inc., Canton, Mich.

Filed May 19, 1988, Ser. No. 196,044
Int. Cl.[4] B60R *27/00*
U.S. Cl. 280—507 **23 Claims**

1. In combination with the drawbar receiver tube of a towing hitch, said drawbar receiver tube having a tubular wall terminating in an open end via which a drawbar is inserted into the receiver tube, said tubular wall containing a hole in inwardly set relation to the open end thereof via which the drawbar is inserted, a molded plastic cover for covering the open end of the receiver tube when the drawbar is removed therefrom, said cover comprising an end wall covering the open end of the receiver tube and an integral locator and releasable catch projecting from the inside of said end wall to locate the cover on the end of the receiver tube and to releasably latch the cover to the receiver tube by the catch engaging said receiver tube hole when the cover is fully installed on the receiver tube, said integral locator and releasable catch comprising for the integral locator a relatively rigid tubular wall that has an opening in spaced relation from said end wall and that closely fits the open end of the receiver tube tubular wall, and said integral locator and releasable catch having said catch defined in a portion of said relatively rigid tubular wall by a



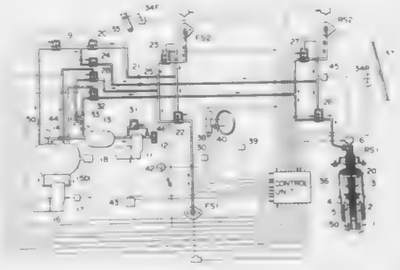
pair of slots that project from said opening in the direction toward said cover's end wall and that lie on either side of the catch whereby when the cover is being installed on and removed from the receiver tube tubular wall, the catch relatively resiliently deflects for passing into and out of the receiver tube tubular wall, and when the cover is fully installed on the receiver tube tubular wall, the catch resiliently relaxes for engaging said hole to latch the cover to the receiver tube tubular wall.

4,852,903

VEHICLE SUSPENSION APPARATUS

Tadao Tanaka; Mitsuhiko Harara, both of Okazaki; Yasutaka Taniguchi, Nagoya; Shozo Takizawa, and Minoru Tatemoto, both of Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1988, Ser. No. 251,660
Claims priority, application Japan, Oct. 15, 1987, 62-260154
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—689 **5 Claims**



1. A vehicle suspension apparatus comprising:
a plurality of suspension units;
a plurality of fluid spring chambers provided for said suspension units, respectively;
fluid supply valve means;
fluid-supplying means for supplying a fluid to said fluid spring chambers through said fluid supply valve means;
fluid exhaust valve means;
fluid-exhausting means for exhausting the fluid from said fluid spring chambers through said fluid exhaust valve means;
a G sensor for detecting lateral acceleration G acting on the body of a vehicle;
rough-road judging means for determining whether the vehicle is running on a rough road;

drive-pattern setting means for setting drive patterns for said fluid supply means and said fluid exhaust means, in accordance with the lateral acceleration G detected by said G sensor and exceeding a predetermined value;

non-sensitive area widening means for widening a non-sensitive area of said drive pattern setting means when said rough-road judging means determines that the vehicle is running on a rough road; and

roll control means for driving said fluid supply valve means for driving said fluid supply valve means and said fluid exhaust valve means in accordance with the drive pattern set by said drive pattern setting means, by supplying the fluid to the fluid spring chamber of any contracted suspension unit and exhausting the fluid from the fluid spring chamber of any expanded suspension unit.

4,852,904

VEHICLE SUSPENSION SYSTEM

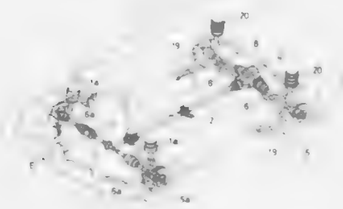
Tadanobu Yamamoto, Higashi-Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 25, 1988, Ser. No. 173,161

Claims priority, application Japan, Mar. 26, 1987, 62-72575

Int. Cl.[4] B60G *3/00, 19/04*

U.S. Cl. 280—701 **17 Claims**



1. A rear suspension system for a motor vehicle comprising:

a rear differential gear mechanism for transmitting a driving force to rear wheels through rear axles,

a suspension support member for supporting the rear differential gear mechanism,

pair of front lateral links extending substantially horizontally and transversely,

a pair of rear lateral links extending substantially horizontally and transversely at respective rear positions relative to the front lateral links, the inner end of each of the lateral links being swingably connected to the suspension support member and the outer end of each of the lateral links being connected to a wheel carrier for carrying the wheel, and

a plurality of elastic means disposed between a vehicle body and the suspension support member in a spaced relationship with one another in a longitudinal direction of the vehicle body, at least one of the elastic means having a non-linear load-deformation property in an up and down direction when a reacting force against the driving force transmitted from the wheels acts on the suspension support member through the rear differential gear mechanism.

4,852,905

VEHICLE SUSPENSION APPARATUS

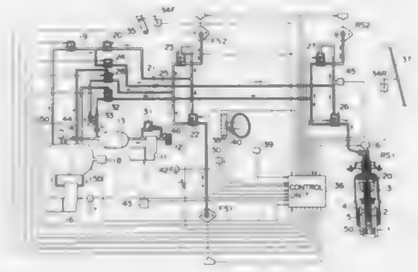
Tadao Tanaka; Mitsuhiko Harara, both of Okazaki; Yasutaka Taniguchi, Nagoya; Shozo Takizawa, and Minoru Tatemoto, both of Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1988, Ser. No. 238,751

Claims priority, application Japan, Sep. 4, 1987, 62-221243

Int. Cl.[4] B60G *11/26, 11/08*

U.S. Cl. 280—707 **6 Claims**



1. A vehicle suspension apparatus having a fluid spring chamber provided for each wheel and inserted between the wheel and a vehicle body, fluid supply means for supplying a fluid to said fluid spring chambers through supply valve means, fluid exhaust means for exhausting the fluid from said fluid spring chambers through exhaust valve means, roll amount detecting means for detecting a roll amount of said vehicle body, and roll control means for setting a control target corresponding to the roll amount detected by said roll amount detecting means and executing roll control in which said supply valve means corresponding to said fluid spring chambers at a contracting side with respect to a direction of roll generated in said vehicle body and said exhaust valve means corresponding to said fluid spring chambers at an expanding side are opened in accordance with the control target, comprising:

pressure detecting means for detecting an internal pressure in said fluid spring chamber at one of front and rear sides; and

internal pressure relationship memory means for storing a mutual relationship between the internal pressures in said fluid spring chambers at the front and rear sides,

wherein said control means calculates control targets at the front and rear sides with reference to said mutual relationship said internal pressure relationship memory on the basis of the internal pressure detected by said pressure detecting means and executes roll control in accordance with the control targets, thereby supplying/exhausting the fluid in/from said fluid spring chambers at the front and rear sides.

4,852,906

ELECTRONICALLY CONTROLLED FLUID SUSPENSION SYSTEM

Shuuichi Buma; Nobutaka Ohwa, both of Toyota; Osamu Takeda, Susono, and Toshio Aburaya, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 10, 1988, Ser. No. 192,360

Claims priority, application Japan, May 11, 1987, 62-70284[U]; Jan. 22, 1988, 63-7505[U]

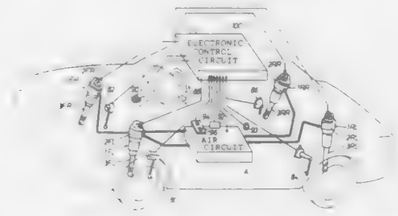
Int. Cl.[4] B60G *11/26*

U.S. Cl. 280—707 **9 Claims**

1. A fluid suspension system for controlling a vehicle's attitude comprising:

a fluid suspension having a fluid spring and a shock absorber; and

vehicle attitude control means for controlling the fluid suspension to control vehicle attitude variance caused by acceleration applied to the vehicle; wherein the vehicle attitude control means comprise:



fluid supply/release means connected to the fluid spring for supplying and releasing fluid to and from the fluid spring; and

damping force alteration means for increasing a damping force of the shock absorber after the fluid supply/release means supply and release the fluid to and from the fluid spring for a predetermined time period.

4,852,907

PAD FOR AIR BAG DEVICE

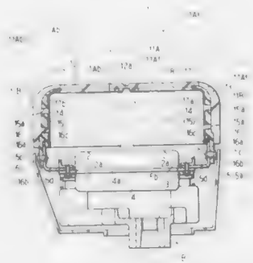
Kouji Shiraki, Gifu; Minoru Niwa, Ichinomiya; Kuniyasu Itou, Hashima; Tadashi Yamamoto, Aichi, and Mitsuru Harata, Nagoya, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Apr. 5, 1988, Ser. No. 177,976

Claims priority, application Japan, Apr. 6, 1987, 62-84293; Apr. 6, 1987, 62-84292; Apr. 6, 1987, 62-84290; Apr. 6, 1987, 62-84291; May 26, 1987, 62-79505[U]; May 26, 1987, 62-79504[U]

Int. Cl.[4] B60R *21/16*

U.S. Cl. 280—731 **18 Claims**



1. A pad for use in an air bag device enclosing an air bag which inflates in case of an accident, the air bag device being mounted to mount members disposed around the air bag, said pad comprising:

an upper wall;

side walls extending downward from the fringes of the upper wall;

inserts disposed inside the upper wall and the side walls;

a coat layer formed on the inserts by injection molding from a soft synthetic resin so as to cover the upper wall and the side walls;

a thin-walled portion which is formed in the coat layer on the upper wall and which, when the air bag inflates, breaks;

a rectangular tubular base portion made from a synthetic resin and forming the inserts disposed inside the side walls;

a plurality of flexible nets forming the insert disposed inside the upper wall, the nets being located on opposite sides of the thin-walled portion in the coat layer, the nets being connected to the top of the base portion;

an attachment portion formed on the base portion and mounted to the mount members; and

setting portions formed on the base portion and acting to set the inserts in a mold used to mold the coat layer.

4,852,908

WEBBING DRIVING DEVICE FOR USE IN SEAT BELT APPARATUS

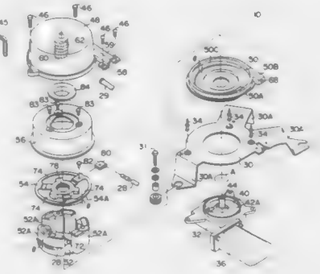
Yuji Nishimura, Niwa, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Sep. 9, 1988, Ser. No. 242,209

Claims priority, application Japan, Sep. 18, 1987, 62-142685[U]; Sep. 18, 1987, 62-142684[U]; Sep. 18, 1987, 62-142686[U]; Sep. 18, 1987, 62-142687[U]

Int. Cl.[4] B60R *21/10*

U.S. Cl. 280—804 **20 Claims**



1. A webbing driving device for use in a seat belt apparatus for fastening a webbing on an occupant, and for releasing said webbing by moving a wire connected to said webbing, comprising:

a rotatable drum;

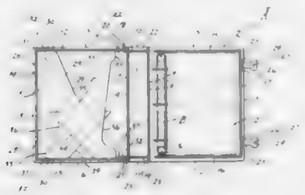
a screw plate connected to said wire, and being movable in an axial direction of said rotatable drum when rotated together with said rotatable drum;

a wire driving means for winding said wire around said drum in helical fashion by rotating said rotatable drum and said screw plate in a first direction while moving said screw plate in one direction of said axial direction and for drawing said wire from said rotatable drum by rotating said drum and said screw plate in a second direction opposite to said first direction while moving said screw plate in the other direction of said axial direction;

a first sloping surface formed on said screw plate substantially parallel to the direction in which said wire is wound around said rotatable drum so as to define one end of the wire winding area in said axial direction of said rotatable drum; and

a second sloping surface formed substantially parallel to the direction in which said wire is wound around said rotatable drum so as to define the other end of said wire winding area in said axial direction of said rotatable drum.

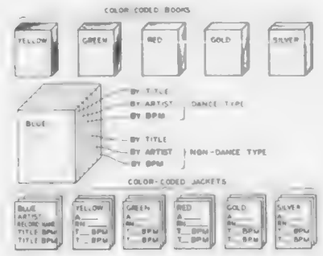
4,852,909
STORAGE RECEPTACLE ADAPTED FOR FACILE CONTENT REFERENCE
Louis J. Stoyanoff, Pacific Palisades, Calif., assignor to Academic Products, Inc., Pacoima, Calif.
Filed Jul. 27, 1987, Ser. No. 77,897
Int. Cl.[4] A47B *23/04, 97/04, 97/06;* E05D *3/00*
U.S. Cl. 281—33 **12 Claims**



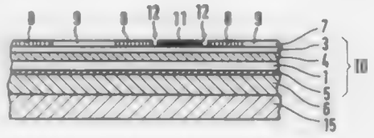
1. A portable receptacle comprising first and second flat cover members, each of said cover members having parallel inner and outer side edges and parallel upper and lower end edges, a flat spine-forming member disposed between the confronting inner side edges of said first and second cover members, hinge means interengaging said spine and each of said cover members whereby the latter are swingable between spaced apart planar parallel or receptacle-closed relation and planar contiguous parallel relation in which latter position the spine is co-planar with said first cover member, an outer side wall-forming member and a pair of parallel end wall-forming members provided on said second cover member proximate the adjacent edges of said cover member and being in planar perpendicular relationship to said cover member for abutting on their cover member-remote portions said first cover member when the cover members are in spaced-apart, closed, or planar parallel relation, first and second support members carrier on said second cover member, said first support member being remote from said spine and said second support member being proximate said spine, said support members each having opposed ends, there being integral pivot pins provided at each of said ends for projection therebeyond, said pins being configured for reception in openings provided on the proximate end wall-forming member for swingably mounting said first and second support members with respect to the related end wall-forming members for movement of said support members between operative, generally diverging, extended position when said cover members are in planar contiguous parallel relation for engaging a support surface and inoperative, overlapping planar parallel relation to, and disposition against, said second cover member when said cover members are in spaced-apart planar parallel relation.

4,852,910
APPARATUS AND METHOD FOR SELECTING AND PLAYING MUSIC
Jon Taffer, 2806 Centre Clr., Downers Grove, Ill. 60515
Filed Jan. 5, 1987, Ser. No. 402
Int. Cl.[4] B42D *15/00, 1/00, 1/08;* G11B *3/82*
U.S. Cl. 283—67 **11 Claims**

1. A method of selecting and playing music to create and maintain a predetermined musical ambiance for a public establishment, without the need for highly trained personnel on site, comprising the steps of; providing a set of color-coded books containing listings of musical pieces on records available to the establishment, the color of each of said books corresponding to the audience reaction or energy of the music listed therein, providing a schedule grid correlating plural time periods with the energy color of music to be played during such time periods for such predetermined musical ambiance; referring to the book of the corresponding energy for each of said time periods and selecting therefrom particular music pieces to be played during said time periods to maintain said predetermined musical ambiance; and playing said selected musical pieces within said time periods.

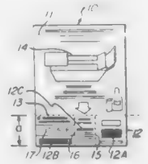


4,852,911
IDENTIFICATION CARD HAVING A MAGNETIC TRACK COVERED BY COLOR AND METHODS FOR PRODUCING IT
Joachim Hoppe, Munich, Fed. Rep. of Germany, assignor to GAO Gesellschaft fur Automation und Organisation mbH, Fed. Rep. of Germany
Filed Nov. 12, 1987, Ser. No. 119,782
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1986, 3638575
Int. Cl.[4] B42D *15/00;* G09F *3/00*
U.S. Cl. 283—82 **11 Claims**



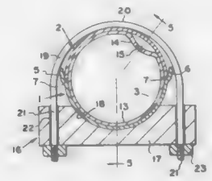
1. A method for making an identification card having at least one opaque card layer, at least one magnetic track applied to one side of the card with a carrier band and covered by one or more layers and a printed pattern applied to the card surface, characterized by the steps of:
- applying a white masking layer with high covering power and a magnetic layer to a carrier band,
- transferring the magnetic layer and the masking layer with the aid of this carrier band to a white or transparent plastic card cover layer in such a way that the magnetic layer comes to lie between the masking layer and the card cover layer;
- printing the card cover layer at least in the areas of the white masked magnetic layer;
- joining the printed card cover layer with at least one further card layer, this further card layer being colored white or transparent if the card cover layer provided with the magnetic layer is colored white, or being colored white if the card cover layer is transparent;
- laminating the card cover layer with at least one other layer to form a desired layer structure of an identification card; and
- punching the individual card(S) out of the layer structure.

4,852,912
ADVERTISING DEVICE
Peter Engel, 100 Seabeach Ave., Stamford, Conn. 06902-8126
Division of Ser. No. 893,353, Aug. 5, 1986, Pat. No. 4,751,894. This application Feb. 16, 1988, Ser. No. 155,887
Int. Cl.[4] B42D *15/00*
U.S. Cl. 283—95 **1 Claim**



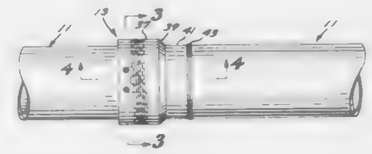
1. An advertising device comprising
- a sheet of material in the form of an advertising ad having indicia means thereon for advertising a particular product,
- said sheet of material having a first portion and a second portion,
- means for rendering said first and second portions readily separable from each other,
- said first portion having visible indicia thereon to define a coupon redeemable for certain particular predetermined goods,
- and said second portion having an invisible indicia thereon to define a second coupon redeemable for an unknown quantity
- and a developing ink for coating said second portion to develop the invisible indicia thereon for ascertaining the unknown quantity to be redeemed.

4,852,913
APPARATUS FOR REPAIRING PIPES
Albert J. Brooks, 4165 Emerick, Saginaw, Mich. 48603
Continuation-in-part of Ser. No. 1,342, Jan. 8, 1987, abandoned. This application Nov. 2, 1987, Ser. No. 115,850
Int. Cl.[4] F16L *55/10*
U.S. Cl. 285—15 **20 Claims**



1. Apparatus for encircling application to a pipe comprising a pair of separate, elongate, trough-like units each of which has an imperforate wall of such size and configuration as partially to encircle said pipe, one of said units having its wall offset at spaced zones to form spaced shoulders from which extend flanges having free edges, the other of said units having opposite side edges spaced from one another a distance enabling them to be accommodated between said flanges of said one of said units and seated upon said shoulders, said units together forming a tubular assembly of such size as closely to encircle said pipe; and clamp means for maintaining said units in assembled relation about said pipe, said shoulders and the side edges of said other of said units being so configured that the seating of said side edges of said other of said units on said shoulders prevents movement of said side edges past said shoulders, thereby limiting the minimum transverse dimension of said tubular assembly.

4,852,914
PLASTIC PIPELINE HAVING RAPIDLY FUSIBLE JOINTS AND METHOD OF MAKING SAME
Lucian H. Lyall, Woodland Hills, Calif., assignor to Milfuse Systems, Inc., Santa Fe Springs, Calif.
Filed Jun. 19, 1987, Ser. No. 64,114
Int. Cl.[4] F16L *47/02*
U.S. Cl. 285—21 **17 Claims**



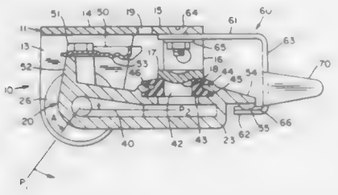
1. A rapidly fusible plastic pipe system comprising:
- a plurality of thermoplastic pipes of a predetermined outside diameter, having a predetermined fusion temperature, and further having first and second ends;
- a plurality of thermoplastic connection fittings having selected fusion temperature at least as high as said predetermined temperature and including respective necks prefused to said first ends of the respective pipes to form prefabricated pipe lengths and further including bell connectors formed with sockets for telescopical receipt of the respective second ends of the respective joining pipes, said bell connectors being formed medially in the respective sockets with heating coil-receiving glands;
- helical heating coils formed from a length of coiled resistance wire coated with an electrically insulative coat, said insulative coat in turn coated with a thermoplastic fusion coat having a fusion temperature substantially the same as said predetermined temperature, said heating coils being nested in the respective glands and including terminal ends; and
- a pair of electrical connectors embedded in the walls of the respective bell connectors and connected with the respective terminal ends,
- whereby said prefabricated pipe lengths may be deployed at an installation site, said second ends rapidly telescoped into said sockets, and an electrical voltage applied across said connectors to heat said heating coils to said selected fusion temperature to rapidly melt said fusion coating to form a puddle of molten fusion material within the envelope formed between the respective gland and periphery of the adjoining pipe ends and continuing application of said voltage to continue to propagate heat rapidly through said molten material to the wall of said pipes and the wall of said bell connectors to fuse said second end in the respective sockets;
- said bell connectors each including a wall section formed with an exterior radial recess defining a well terminating in a bottom wall spaced a predetermined distance from said heating coil, said predetermined distance being such that, when said pipe lengths have been telescoped together and said heating coils have been energized sufficiently long to generate sufficient heat to melt said fusion coating and the interior surfaces of the joining socket, said bottom wall will melt to give an indication that fusion has been completed.

4,852,915

SHUT-OFF AND LOCKING ASSEMBLY FOR SWIVEL GLADHAND

Sergio Campanini, Iola, Kans., assignor to Hose America, Inc., Iola, Kans.

Filed Mar. 31, 1988, Ser. No. 176,266
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—38 **8 Claims**



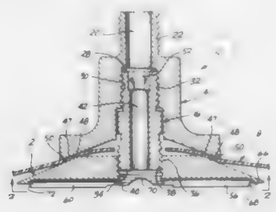
1. A combination swivel gladhand and locking assembly comprising a gladhand including a mounting bracket and a body having a base portion pivotally mounted to said mounting bracket so as to be movable from a first to a second position, said body having a coupler member extending outwardly from said base portion, a stop member carried by said mounting bracket, a seal member carried by said stop member, a first opening in said base portion and a second opening in said coupler member, an air passageway extending through said base portion and said coupler member and communicating said first and second openings with one another, said coupler member being spaced from said stop member when said base portion is in said first position and said second opening in said coupler member being closed by said seal member when said base portion is in said second position, a looking bracket having a first portion pivotably mounted to said mounting bracket and a second portion extending outwardly therefrom, said locking member being pivotable between a first and second position, said second portion of said locking bracket being selectively engageable with said coupler member when said coupler member is closed by said seal member and said locking member is pivoted to said second position to thereby retain said coupler member against said seal member.

4,852,916

HIGH TEMPERATURE VACUUM PROBE

Keith D. Johnson, 20716 Church Lake Dr., Sumner, Wash. [redacted]

Filed Jan. 19, 1988, Ser. No. 145,456
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—187 **6 Claims**



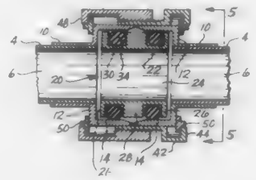
1. A vacuum probe device for use in connecting a vacuum line through a sheet of material, comprising:
- a sheet of material;
- a body, positioned on one side of said sheet, having a downwardly facing recess with a tapered pinching surface;
- a base, positioned on the other side of said sheet, having an upwardly facing tapered pinching surface that is sized to be at least partially received in said body's downwardly facing recess, with said sheet of material positioned between said tapered pinching surfaces said body and said base each having a threaded opening; and
- a rotatable screw member interconnecting said base and body, said screw member having an end portion in threaded engagement with said opening in said body, said engagement being defined by a first thread pitch, and another end portion in threaded engagement with said opening in said base, said latter engagement being defined by a second thread pitch which is greater than said first thread pitch, wherein rotation of said screw member causes said screw member to act as a differential screw drive for urging said body's pinching surface toward said base's pinching surface, to pinch at least a portion of said sheet therebetween.

4,852,917

TUBING CONNECTOR WITH FLOATING SPOOL

Wilton S. Viall, Jr., Des Moines, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 26, 1988, Ser. No. 199,125
Int. Cl.[4] F16L *19/02*
U.S. Cl. 285—353 **4 Claims**



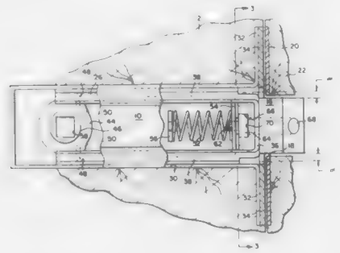
1. A tubing connector comprising:
- first and second sections of tubing each comprising a cylindrical sidewall defining a central fluid conveying passageway, and an end portion including an annular outwardly directed radial flange and an annular axial extension projecting axially outwardly from a peripheral portion of said radial flange; said sections being substantially coaxially aligned with their flanges directed toward each other;
- an annular spool comprising an inner cylindrical sidewall portion defining a central axial opening, first and second end wall projecting radially outwardly from opposite ends of said sidewall portion, and a center land portion projecting radially outwardly from said sidewall portion between said end walls; said land portion and said end walls defining therebetween first and second outwardly opening radial recesses; and said spool being dimensioned to be received between said radial flanges of said sections and within said axial extensions, with said opening aligned with said passageways, and with clearance between said spool and said radial flanges and between said spool and said axial extensions;
- first and second annular seals positioned in said first and second recesses, respectively, and sealingly engaging said sidewall portion of the spool and said axial extensions of said first and second sections of tubing, respectively; and
- means for engaging said radial flanges to detachably secure said sections together;
- said spool and said seals being dimensioned to provide an axial clearance between the spool and the radial flanges to cause the spool to float on and be positioned by the seals when said sections are secured together, to allow said sections to deflect relative to each other while maintaining sealing engagement between the seals and the spool and said axial extensions.

4,852,918

ADJUSTABLE LATCH BOLT MECHANISM

Charles H. Allen, Clifton Springs, N.Y., assignor to Doris L. Davie, Geneva, N.Y., a part interest

Filed Jan. 22, 1988, Ser. No. 147,813
Int. Cl.[4] E05C *1/16*
U.S. Cl. 292—169 **7 Claims**



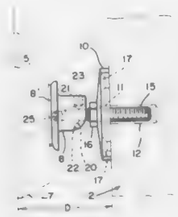
1. An adjustable latch bolt mechanism mountable on a door for aligning a latch bolt with a strike plate opening in a strike plate on a facing door jamb, comprising:
- a latch body reciprocally movable in one direction toward the strike plate opening;
- a latch bolt supported by and mounted at an end of the latch body for movement in the one direction for engaging the strike plate; and
- means coupling the latch bolt to the latch body for moving the latch bolt relative to the latch body in a transverse direction to a selected adjusted position in which the latch bolt is in alignment with the strike plate opening.

4,852,919

DOOR MAGNET IMPROVEMENT

George S. Nimee, Cherry, and Andrew Current, Oglesby, both of Ill., assignors to Schlage Lock Company, San Francisco, Calif.

Continuation of Ser. No. 69,992, Jul. 6, 1987, abandoned. This application Feb. 2, 1989, Ser. No. 304,909
Int. Cl.[4] E05C *19/16*
U.S. Cl. 292—251.5 **12 Claims**



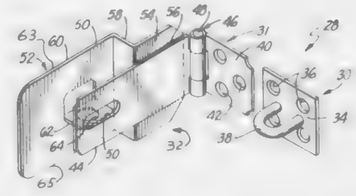
1. A magnetic door holding assembly for securing a door in an open position against an adjacent wall with varying offset dimension comprising:
- an armature having a planar face which coacts with a magnetic means in parallel relationship as a means for securing a door;
- a variable set and lockable adjustment means attached to said armature for mounting said armature to a door surface and for selectively adjusting and retaining the set distance between said door surface and said armature face; and
- a means in contact with and coacting with said armature for adjusting and maintaining the parallelism of said armature face relative to a face of said magnetic means on contact to accommodate a varying offset dimension.

4,852,920

SELF PROTECTING HASP

William DeForrest, Sr., 1825 Via Burton, Anaheim, Calif. 92806

Filed Jul. 30, 1987, Ser. No. 79,346
Int. Cl.[4] E05C *19/08*
U.S. Cl. 292—205 **14 Claims**



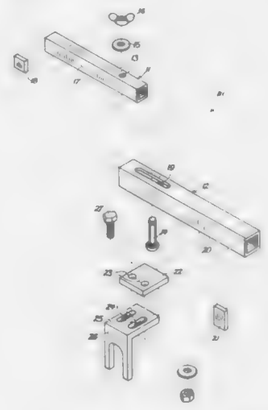
1. A self protecting hasp for use with a padlock which comprises:
- an eye, said eye including means for attaching said eye to a structure;
- a latch for engaging with said eye, said latch including a hinge portion, said hinge portion including means for attaching said latch to a structure;
- said latch further including a flap, said flap including a slot for engaging said eye, said flap movably connecting to said hinge portion;
- a cover member having side edges, said cover member fixedly connected to said flap, a portion of said cover member sized and shaped to overlay and cover at least that portion of said flap wherein said slot is located;
- a latch eye fixedly connected to said cover member at a location spaced inwardly from said side edges of said cover member and extending essentially perpendicularly from said cover member towards said slot in said flap whereby said latch eye aligns with said eye when said eye is positioned in said slot and is capable of being locked to said eye with a padlock when said padlock is positioned between said flap and said cover member.

4,852,921

DOOR SECURITY DEVICE

Eugene Gilbert, and Cynthia J. Gilbert, both of HC 74 Box 238, Mountain View, Ark. 72560

Filed May 3, 1988, Ser. No. 189,791
Int. Cl.[4] E05C *19/18*
U.S. Cl. 292—259 R **6 Claims**



1. A door securement device for use in combination with a

door pivotally mounted to a structure between a first and second vertical door frame defining a door opening therebetween wherein said door is mounted for pivotal motion to said second door frame to position exteriorly of the structure, and said device is mountable interiorly of said structure, said device comprising,

a first elongate bar means of a first constant cross-sectional external configuration;

a second elongate bar means of a second constant cross-sectional external configuration with an internal cross-sectional configuration equal to said first external cross-sectional configuration for slidingly and telescopingly receiving said first elongate bar means within said second elongate bar means,

a terminal end of a first bar forward face of said first bar means including a first engagement pad means for frictional engagement with said first door frame,

said second bar means including a second bar forward face parallel to said first bar forward face including a terminal end surface including a second engagement pad means for frictional engagement with said second door frame;

adjustment lock means for releasably locking said first bar means within said second bar means at a predetermined distance greater than said door opening, and

door handle bracket means adjustably mounted to said second bar means for engagement with an interior surface of a door knob wherein said interior surface is oriented between said door knob and said door about a door knob axle rotatably securing said door knob through said door orthogonally thereto.

4,852,922

TUBULAR DOOR LOCK WITH A BELL

Nan C. Shih, 116 Changtsao Rd., Changhua, Taiwan (500)

Division of Ser. No. 923,739, Oct. 28, 1986, Pat. No. 4,800,833.
This application Jul. 15, 1987, Ser. No. 73,684
Int. Cl.[4] E05C *1/16*
U.S. Cl. 292—336.3 **2 Claims**



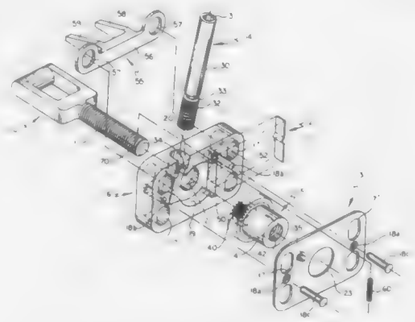
1. A tubular door lock comprising an inside knob having a locking structure and a pipe shaft formed with a pair of elongate slots defining respective arcuate portions of the pipe shaft, an outside knob with a hollow square shaft in which is located a flat plate having one end adapted to engage the locking structure of the inside knob for rotating the flat plate, at least two holes in the square shaft in each of which is located a ball for radial up and down movement therein, an assembling plate having two arcuate slots for receiving the respective arcuate portions of the pipe shaft and with a square hole centrally of the arcuate slots for receiving the square shaft so that both knobs are connected for rotation through the assembling plate, a latch connected with a linking plate, the linking plate having a shaft hole with a pair of circumferential recesses, the shaft hole receiving the square shaft therein with said balls in line with the recesses, the flat plate extending through the square shaft for rotation by the locking structure between an unlocked position in which opposite edges of the flat plate engage the balls and urge the balls outwardly into said recesses to drivingly connect the square shaft and the linking plate, and a locked position in which the flat plate is rotated to release the balls from said recesses thereby disconnecting the square shaft from the flat plate.

4,852,923

VERTICAL ACCESS ADJUSTABLE LATCHING MECHANISM EXTERNALLY ACCESSIBLE ADJUSTABLE KEEPER MECHANISM

Raymond E. Harmon, Orange, and William R. E. McCown, Montclair, both of Calif., assignors to Rexnord Holdings Inc., Brookfield, Wis.

Filed Feb. 27, 1987, Ser. No. 19,913
Int. Cl.[4] E05B *15/02*
U.S. Cl. 292—341.18 **12 Claims**



1. An adjustable keeper mechanism constructed and arranged for securing a first structure relative to a second structure, said mechanism comprising:

a connecting element having a longitudinal axis for joining a first structure to a second structure;

an assembly for adjusting the position of said connecting element along its longitudinal axis relative to the structures:

said assembly including a driver and a rotatable drive unit;

said driver having a tool operable, free, first end at the exterior surface of one of said structures and a second end opposite thereto, said driver second end having a first meshing surface thereon;

said drive unit having a second meshing surface arranged for interacting engagement with said first meshing surface for translating rotational movement to said drive unit upon rotation of said driver;

said drive unit receiving said connecting element for translating rotational movement of said drive unit into linear movement of said connecting element along its longitudinal axis; and

said driver having a length predetermined by the depth at which said assembly is mounted from the exterior surface of said structures, permitting the mounting of said adjustable keeper mechanism and its said assembly over a range of depths within said first and second structures.

4,852,924

PET'S EXCREMENT COLLECTOR

Veronica L. Ines, 1745 Bryers Rd., Hatboro, Pa. 19040

Filed Sep. 16, 1988, Ser. No. 245,454
Int. Cl.[4] A01K *29/00*; E01H *1/12*
U.S. Cl. 294—1.5 **1 Claim**

1. A pet's excrement collector characterized by comprising:

a circular frame having a circular groove, a notched support, an L connector and two lugs,

a telescopic handle movably connected to the circular frame at the lower end by means of the L connector and having two ribbed sections that slide one in another, and a cap with a string for hanging purpose, and



a plastic bag having a built-in elastic cord at the top opening for removably attaching to the groove of the circular frame,

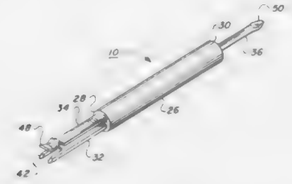
and being constructed in such way that it is convenient for use to collect pet's excrement outdoors.

4,852,925

LAMP REPLACEMENT TOOL

David W. Lodin, Peoria, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 22, 1988, Ser. No. 209,711
Int. Cl.[4] B25B *9/02*; B25J *1/02*
U.S. Cl. 294—2 **17 Claims**



1. A lamp replacement tool for use in replacing a lamp mounted in a lamp housing wherein the lamp includes a bulb portion, a base portion having one end adjacent the bulb portion, a base contact protruding from another end of the base portion and a flange positioned on the base portion intermediate of the base portion ends, said tool comprising:

a. a handle member,

b. a lower blade extending from said handle member,

c. flange engaging means formed on said lower blade for engaging with the base portion and the flange,

d. an upper blade extending from said handle member in the same direction as said lower blade, and

e. base contact engaging means formed on said upper blade in predetermined relationship to said flange engaging means.

4,852,926

VACUUM CUP CONSTRUCTION

Edmund R. Littell, 81 High St., Winnetka, Ill. 60093

Filed Jan. 11, 1988, Ser. No. 142,135
Int. Cl.[4] B25J *15/06*; B66C *1/02*
U.S. Cl. 294—64.1 **27 Claims**

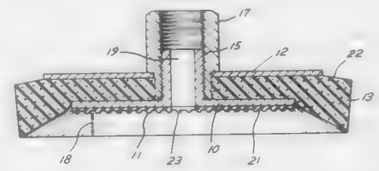
1. An improved vacuum cup construction comprising in combination:

a. a first generally planar outer plate;

b. a second, generally planar inner plate having an effective area which is less than that of the outer plate;

c. a generally planar, compressible, elastomeric, non-preformed sealing member between the outer and inner plates, the sealing member having an effective area greater than the inner plate area;

d. means for connecting the outer plate to the inner plate for compression of the sealing member there-between and



thereby forming a sealing edge about the periphery of the inner plate; and

e. at least one vacuum passage extending from the inner side of the construction whereby a vacuum source may be connected thereto to effect attachment of the construction to an object.

4,852,927

DEVICE FOR GRIPPING NECKS OF PACKED SACKS

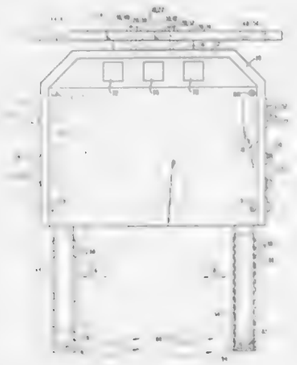
Leonid P. Minenko, ulitsa Narimanova, 72/I, kv.6.; Mikhail I. Osher, ulitsa Lenina, 93/4, kv.28.; Evgeny V. Belikov, pereulok Pronsky, I06a, kv.35., all of Rostov-na-Donu, and Lev M. Klyatis, ulitsa Bestuzhevykh, I0, kv.I55., Moscow, all of U.S.S.R.

PCT No. PCT/SU86/00065, § 371 Date Feb. 19, 1988, § 102(e) Date Feb. 19, 1988, PCT Pub. No. WO87/07883, PCT Pub. Date Dec. 30, 1987
PCT Filed Jun. 20, 1986, Ser. No. 183,186
Int. Cl.[4] B66C *1/42*
U.S. Cl. 294—86.4 **8 Claims**



1. A device for gripping necks of packed sacks comprising a housing with a horizontal support and a frame one side of which is pivotably connected to the housing, and the other of which has a horizontal rod member forcing the neck of the packed sacks to the horizontal support of the housing, and a pivot for connecting the frame to the housing being arranged below the horizontal support of the housing, side bars of which having ears with horizontal axes thereof being offset relative to the horizontal support of the housing and arranged in a vertical plane tangent to the horizontal rod member of the frame when the horizontal rod member is brought in contact with the horizontal support of the housing.

4,852,928
ROBOTIC END EFFECTORS
Mathew L. Monforte, Hamilton, N.J., assignor to Multivisions Corporation, Bound Brook, N.J.
Continuation-in-part of Ser. No. 837,749, Mar. 10, 1986, abandoned, which is a continuation of Ser. No. 580,715, Feb. 16, 1984, Pat. No. 4,591,198. This application Apr. 7, 1988, Ser. No. 178,524
The portion of the term of this patent subsequent to May 27, 2003, has been disclaimed.
Int. Cl.[4] B25J *15/08*
U.S. Cl. 294—88 11 Claims



1. An end effector suitable for use on a robotic arm coupled to a central computer capable of providing an electronic command signal and a power source associated therewith, comprising, in combination:
(a) means for removably affixing said end effector to the distal end of said robotic arm;
(b) gripper means including;
(i) a pair of finger members having a hollow body portion slideably retained within said end effector, said pair of finger members being adapted to be coupled, via a driving means to said power source and cooperate with and removably retain a plurality of end effector tools and components, each of said finger members being provided with at least one through aperture that functions as an indexing means, and
(ii) first means disposed entirely within each of said hollow body portions of said finger members for locking and releasing said tools and components having cooperating protrusions extending into said through aperture upon receiving said electronic command signal; and
(c) second means for coupling said electronic command signal to said pair of finger members and for controlling the application of power from said power source.

4,852,929
FREE STANDING TWEEZER
Grace C. Shafir, 36 Jane Dr., Englewood Cliffs, N.J. 07632
Filed Jul. 25, 1988, Ser. No. 224,056
Int. Cl.[4] B65G *7/12*
U.S. Cl. 294—99.2 8 Claims

1. A free standing tweezer including:
confronting first and second elongated arms each having a first end and a second end opposite said first end;
said arms being joined at said first ends;
said second ends including gripping surfaces between which articles are grasped;
biasing means urging said gripping surfaces apart;
a block unit at said first ends interposed between said arms and a horizontal surface on which said tweezer is supported;
said block unit being constructed to engage and cooperate with a horizontal surface to maintain said arms extending upward therefrom;
said block unit including an arcuate surface and weight means operatively disposed so that with said arcuate sur-



face resting on a horizontal supporting surface, gravity acts on said weight means to automatically position the tweezer with said arms projecting generally vertically upward.

4,852,930
UTILITY DECORATOR
Lois M. Agee, 2922 Gulf of Mexico Dr., Longboat Key, Fla.
Filed Jun. 24, 1986, Ser. No. 878,053
Int. Cl.[4] A47F *7/00*; A47G *29/00*; B25H *3/04*
U.S. Cl. 294—143 8 Claims



1. A decorating device of use in a residence room of choice which utilizes at least one hammer and at least one set of pliers as an integral part thereof, said decorating device to function as a decorator and also as a caddy and storage holder,
said decorating device comprising a rigid foundation and decoration means therefor, said decoration means being selected from the group consisting of coverings, coatings, moldings, carvings, attachments, impregnations, burnings and antiqueing, said foundation comprising a plurality of support means for said hammer and said pliers, said support means comprising a decorative aspect relative to said foundation whereby said support means functions decoratively as part of said decorating device, said foundation comprising means for transporting said decorating device and whereby said decorating device functions as a working caddy, said means for transporting said decorating device comprising handle means positioned upon said foundation whereby said decorating device may be removed from a vertical surface, transported and replaced single handedly, said handle means comprising a decorative aspect relative to said foundation whereby said handle means functions decoratively as part of said decorating device.

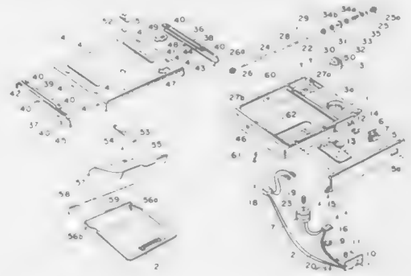
4,852,931
SKI AND POLE CARRIER
Allan W. Ferdi, 2207 Zollinger Rd., Columbus, Ohio 43221
Filed Oct. 31, 1988, Ser. No. 264,812
Int. Cl.[4] A63C *11/02*
U.S. Cl. 294;147 19 Claims



1. A ski and pole carrier for a pair of skis having toe clips and a pair of ski poles which comprises:
an elongated vertical body member;
a releasable, horizontally extending upper ski loop means for releasably clamping the pair of skis together immediately above said toe clips;
said upper ski loop means being attached to one end of said body member;
a releasable horizontally extending lower ski loop means for releasably engaging the skis immediately below said toe clips to support the weight thereof to thereby enable a user to transport said skis in a vertical orientation with said carrier;
said lower ski loop means being attached to the other end of said body member;
a pole loop means attached to said body member for receiving and clamping said pair of poles together;
said pole loop means extending from said body member on the side opposite that from which said upper and lower ski loop means extends;
a handle means attached to said body member;
wherein one and of said handle means is attached to one end of said body member and the other end of said handle means is attached to the other end of said body member such that said handle means extends parallel to said body member to enable one to simultaneously grasp said handle means and a pair of poles such that said poles extend in a direction parallel to said skis.

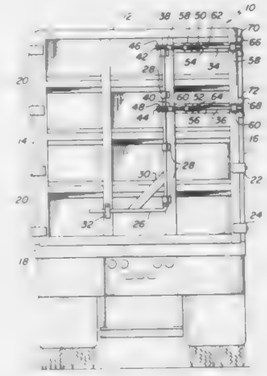
4,852,932
CONTAINER DEVICE USED IN A VEHICLE
Seiji Komeya, and Mitsuhiro Hara, both of Toyoto, Japan, assignors to Kajima Press Industry Co., Ltd., Toyota, Japan
Filed Nov. 12, 1987, Ser. No. 119,858
Claims priority, application Japan, Nov. 14, 1986, 61-174025[U]; Nov. 14, 1986, 61-174026[U]; Nov. 14, 1986, 61-174027[U]; Nov. 17, 1986, 61-175381[U]
Int. Cl.[4] B60N *3/12*
U.S. Cl. 296—37.9 10 Claims

1. A container device used in a vehicle comprising:
a retainer;
box means extendably held by said retainer;
power source means capable of driving said box means at least in one of the directions of extending said box means from said retainer and retracting said box means into said retainer, said power source means bring provided on a back portion of said box means itself and a back portion of said retainer as viewed along the direction of extending and retracting of said box means; said power source means is connected to said box means, a rack is operatively provided on said retainer and driving force transmission means between said power source means and said rack for transmitting the driving force of



said power source means from said power source means to said box means.

4,852,933
SOLID WASTE CARRIER TAILGATE-SIDEWALL CLOSURE REINFORCING LATCH MEANS
Saul R. Spector, Palm City, Fla., assignor to Steco, Inc., St. Clair, Pa.
Filed Dec. 14, 1987, Ser. No. 132,767
Int. Cl.[4] B60J *5/10*
U.S. Cl. 296—50 12 Claims



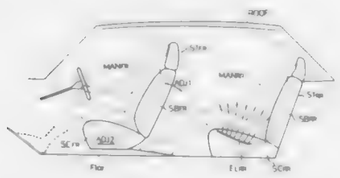
9. A reinforcing latching means for strengthening a tailgate-sidewall joint closure between the outwardly swinging distal end of a tailgate assembly vertically hinged to one sidewall of a trailer and the opposing sidewall of the trailer and for preventing outward bulging of said mechanical tailgate-sidewall joint closure caused by rearward compaction of refuse or other solid material contained therein comprising a single handle means disposed along the bottom portion of the tailgate assembly which mechanically rotates a vertically oriented control shaft about an axis defined by the circumference of said control shaft and is operatively connected by said control shaft to at least one horizontally disposed latching rod means having a right angle bend at the distal end of said latching rod means extending around the closure between the tailgate assembly and the opposing sidewall a distance along the opposing sidewall for engaging a latching plate means, said at least one latching rod means being capable of movement along the tailgate assembly for controlling the engaging and disengaging of said at least one latching rod means with said latching plate

means disposed along the exterior lateral surface of the upper portion of the opposing sidewall of the trailer.

4,852,934
ATTITUDE CONTROL APPARATUS FOR ONBOARD SEAT

Tomio Yasuda, Kasukabe, and Kohji Aoki, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Dec. 3, 1987, Ser. No. 128,447
Claims priority, application Japan, Dec. 4, 1986, 61-289622
Int. Cl.[4] B60N *1/02*; A47C *15/00*; B60Q *1/00*
U.S. Cl. 296—65.1 7 Claims

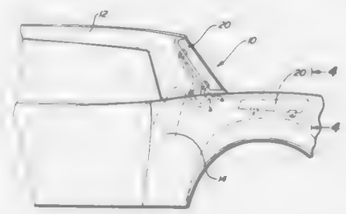


1. An attitude control apparatus for an onboard seat comprising:
a first onboard seat;
an attitude changing mechanism effective to change a position of the frist onboard seat in the fore-and-aft direction including drive means for changing the attitude of the first onboard seat;
input means for providing a command to change the attitude of the first onboard seat including:
forward drive command input means for providing a command to drive the first onboard seat forwardly; and
rear drive command input means for providing a command to drive the first onboard seat rearwardly; and
attitude detecting means for detecting the attitude of the first onboard seat which detects the position of the first onboard seat in the fore-and-aft direction;
a second onboard seat which is disposed behind the first onboard seat;
occupant detecting means for detecting the presence or absence of an occupant on the second onboard seat;
attitude control means responsive to a command from the input means for controlling the drive means of the attitude changing mechanism in accordance with the presence or absence of an occupant detected by the occupant detecting means and the attitude detected by the attitude detecting means, thereby controlling the attitude of the first onboard seat, including memory means which stores a rear limit for the first onboard seat, the attitude control means being responsive to a forward drive command for energizing the drive means of the fore-and-aft drive mechanism for driving the first onboard seat forwardly, the attitude control means being responsive to a rear drive command for energizing the drive means of the fore-and-aft drive mechanism to drive the first onboard seat rearwardly in the absence of an occupant detected by the occupant detecting means, the attitude control means being responsive to a rear drive command in the presence of an occupant detected by the occupant detecting means for energizing the drive means of the fore-and-aft drive mechanism to drive the first onboard seat rearwardly unless the fore-and-aft position of the first onboard seat detected by the attitude detecting means exceeds the rear limit.

4,852,935
RETRACTABLE BACKLIGHT

Donald Varner, Allen Park, Mich., assignor to ASC Incorporated, Southgate, Mich.

Filed Feb. 16, 1988, Ser. No. 155,824
Int. Cl.[4] B60J *1/18*
U.S. Cl. 296—146 5 Claims



1. A backlight assembly which is attachable to a roof section of a convertible vehicle, the vehicle having a right rear wheel well and a left rear wheel well separated by a distance, the vehicle having side walls, the assembly comprising:
(a) a backlight panel which attaches to the roof when the roof section and the panel are in a raised position, the backlight panel having a width that is almost the distance between the wheel wells;
(b) a pair of linkage mechanisms which are pivotally connected to the backlight panel, one linkage mechanism being disposed on each side of the backlight panel, each linkage mechanism having a driver-track, each driver-track being pivotally connected to the lower end of each linkage mechanism;
(c) means for pivoting power for the controlled movement of the backlight panel between the raised position and a retracted position; and
(d) a pair of guideframes, one guideframe being disposed on each side of the backlight panel, each guideframe being fixedly mounted to side walls of the vehicle, the upper end of each linkage mechanism being pivotally connected to each side of the backlight panel, the lower end of each linkage mechanism operatively connected to one of the guideframes, each driver-track being slidably engaged with each guideframe, the power means being operatively connected to the driver-tracks for slidably movement of the driver-track along the guideframes;
wherein the linkage-mechanism positions the backlight panel in a substantially horizontal alignment detached from the roof section and under a decklid and above the wheel wells when the panel is in the retracted position.

4,852,936
VEHICLE BODY AND BODY TO FRAME MOUNTING STRUCTURE

Carl B. Greene, and Carl B. Greene, III, both of Chickasha, Okla., assignors to The New Bus Company, Inc., Plaistow, N.H.

Filed Apr. 26, 1988, Ser. No. 186,226
Int. Cl.[4] B62D *31/02*
U.S. Cl. 296—178 20 Claims

1. A vehicle body and frame combination including a vehicle frame having opposite side longitudinal frame members, a body including a flooring assembly incorporating a plurality of depending transversely extending and longitudinally spaced stiffening ribs, a pair of upwardly opening opposite side channel members disposed beneath said flooring assembly and including upstanding opposite side flanges interconnected by a web extending therebetween, said channel members overlying said frame members and extending longitudinally therealong, mounting means anchoring said channel members to said frame members at points spaced longitudinally therealong, said

flanges including longitudinally spaced upwardly opening narrow transverse slots formed therein downwardly into which said stiffening ribs project and in which said ribs are secured.

6. A vehicle body construction including an elongated flooring assembly, a plurality of inverted U-shaped bows spaced along, extending transversely of said flooring assembly and including opposite side legs having lower end portions embracingly receiving opposite side longitudinal margins of said flooring assembly therebetween with lower terminal ends of said legs projecting downwardly below said flooring assembly, a longitudinally extending and edge upstanding heavy gauge sheet material sill panel overlying the outer sides of each set of corresponding legs of said bows, said sill panels each including an integral lower horizontally inwardly projecting and re-



versely bent double thickness shelf extending longitudinally therealong downwardly through which the lower end portions of the corresponding legs extend and an integral inwardly directed horizontal flange spaced above said shelf downwardly through which the lower end portions of said legs also extend, said flanges each terminating inwardly in an upwardly directed upper marginal portion of the corresponding sill panel extending upwardly along the inner sides of the corresponding legs of said bows, said sill panels each, between the horizontal flange and said shelf, defining a longitudinally extending and horizontally inwardly opening channel in which the corresponding longitudinal margin of said flooring assembly is embracingly received, said longitudinal margins of said flooring assembly being secured within said horizontally inwardly opening channels, and outer side wall panel portions secured over the outer surfaces of said bows and said sill panels.

4,852,937
COMMON GROOVED AND SLOTTED STRUCTURAL MEMBERS FOR A TRUCK BODY

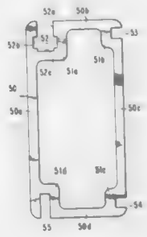
Michael J. Lemieux, Ocala, Fla., assignor to American Eagle Fire Apparatus Co., Inc., Gainesville, Fla.

Filed Jan. 29, 1987, Ser. No. 8,345
Int. Cl.[4] B60R *29/00*
U.S. Cl. 296—183 21 Claims

5. A groove and T-slot frame member for providing angled surfaces in a truck body construction, comprising:
a one piece elongated member having a uniform cross-section and a first pair of mutually parallel walls along its longitudinal length, a T-slot having a T-shaped cross-section with a T-slot opening extending longitudinally along a first one of said parallel walls, said T-slot being adapted to receive a headed fastener therein, and first panel receiving means suitable for insertion of a body panel comprising a first groove having a first opening extending longitudinally along a second one of said walls;
said elongated member further including a third wall integral between said first pair of mutually parallel walls to form an open cross-section;
wherein said first pair of mutually parallel walls are neither parallel nor perpendicular to said third wall; and
wherein said member includes second panel receiving means suitable for insertion of a body panel situated at said second one of said parallel walls and having a second opening extending longitudinally along said second one of said walls.

21. A groove and T-slot frame member for simultaneously supporting several panels or fixtures in a truck body construction comprising:
a one piece elongated member having a uniform cross-section and a first pair of mutually parallel walls along its





longitudinal length, a T-slot having a T-shaped cross-section with a T-slot opening extending longitudinally along a first one of said parallel walls, said T-slot being adapted to receive a headed fastener therein, and first panel receiving means suitable for insertion of a body panel comprising a first groove in a second one of said walls having a first opening extending longitudinally along said second one of said walls, and a second pair of mutually parallel walls perpendicular to said first pair of parallel walls to form a generally hollow closed cross-section and four longitudinal corners;
wherein said T-slot includes an inset channel and a slot perpendicularly intersecting said channel to form a pair of sharp parallel edges and wherein said inset channel includes a longitudinal recess opposing said slot.

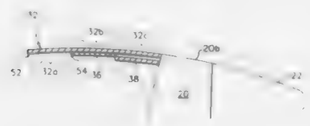
4,852,938
TRANSPARENT ROOF CONVERTIBLE AUTOMOBILE WITH RETRACTABLE SUNSHADE

Gerald P. Hirshberg; Joseph E. Mrozowski, both of Del Mar, and Stephen D. Ball, San Diego, all of Calif., assignors to Nissan Design International, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 11,302, Feb. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 855,821, Apr. 24, 1986, abandoned. This application Jun. 9, 1988, Ser. No. 204,696
Int. Cl.[4] B60J *7/047*
U.S. Cl. 296—214 4 Claims

1. In combination with an automobile body having a front

windshield, a rear window and a pair of side doors cooperatively defining a passenger compartment with a roof opening;
a roll bar extending transversely across the body and separating the roof opening from the rear window;
a T-bar extending in a longitudinal direction between an upper edge of the front windshield and the roll bar substantially intermediate a transverse width of the roll bar;
a roof panel having an area corresponding to that of the roof opening, at least a portion of the roof panel being transparent and the roof panel being moveable over the roll bar



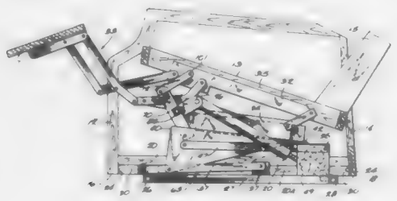
from a normal position in which the roof opening is covered by the roof panel to a retracted position in which a transparent portion of the roof panel overlies the rear window and the roof opening is uncovered; and
retractable sunshade means for covering selected amounts of the transparent portion of the roof panel when the roof panel is in its normal position, including a plurality of sunshade panels having inner edges slideable in a track member connected to the T-bar, the sunshade panels being moveable to stowed overlapping positions above the roll bar.

4,852,939

DEVICE FOR CONVERTING A RECLINER CHAIR TO A RECLINER-LIFT CHAIR

Bernard J. Krauska, Wauwatosa, Wis., assignor to Orthokinetics, Inc., Waukesha, Wis.

Continuation of Ser. No. 113,374, Oct. 23, 1987, abandoned, which is a continuation of Ser. No. 932,171, Nov. 18, 1986, abandoned. This application Sep. 9, 1988, Ser. No. 243,151
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—71 **15 Claims**



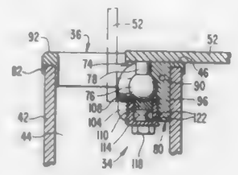
1. A lift base useful for converting a manual recliner chair into a combined recliner-lift chair comprising:
a. a generally planar frame for resting on the ground;
b. a generally u-shaped frame having legs with respective free ends, each leg free end being pivotally attached to the planar frame;
c. a pair of spaced parallel linkage control plates having respective first end pivotally joined to a respective leg of the u-shaped frame and respective second ends;
d. a pair of elongated links having respective first ends pivotally attached to a respective linkage control plate and respective second ends attached to the planar frame;
e. driven link means for pivotally connecting to the linkage control plates; and
f. power actuator means having a first end pivotally connected to the planar frame and a second end pivotally connected to the driven link means for operating the lift base between a first configuration wherein the u-shaped frame and the linkage control plates rest on the planar frame and a second configuration wherein the u-shaped frame and the linkage control plates are lifted off the planar frame.

4,852,940

STOWABLE TABLE SYSTEM

Andrzej S. Kanigowski, La Crescenta, Calif., assignor to Weber Aircraft Corporation, Burbank, Calif.

Filed Aug. 20, 1987, Ser. No. 87,667
Int. Cl.[4] A47C *7/70*
U.S. Cl. 297—145 **11 Claims**



1. A stowable table system adapted for use in a vehicle seat, or the like, for pivotal movement of a table body about three substantially mutually perpendicular axes between a stowed position and a position of use, comprising:
a table structure including said table body;
a hinge element attached to said table structure including a spherical body spaced from said table structure and a stem interconnecting said spherical body and said table structure;
a hinge mount securing said hinge element for movement with respect to said seat including a body containing an elongated internal bore, a fixed surface at one end of said bore for bearing engagement with one side of said spherical body, a resiliently biased movable surface in facing relation to said fixed surface for bearing engagement with the other side of said spherical body, an elongated guide slot substantially coextensive with said bore extending through said body to the exterior thereof and being sized to receive said stem for translatory and rotational motion, and limit means at opposite ends of said guide slot against which said stem is rotatable, one of said limit means being disposed at one end of said guide slot to angularly displace said table structure in a vertical plane to and from said stowed position and the other of said limit means being disposed at the other end of said guide slot to angularly displace said table structure in a horizontal plane to and from said position of use.

4,852,941

ADJUSTABLE DEBRIS TRAY ASSEMBLY FOR PODIATRY CHAIRS

Larry Jones, Sidney, Ohio, assignor to Midmark Corporation, Versailles, Ohio

Filed Jul. 22, 1988, Ser. No. 222,852
Int. Cl.[4] A61G *15/00*
U.S. Cl. 297—188 **3 Claims**

1. In a podiatry chair of the type having a foot section member adapted to receive and hold the legs and feet of a patient and a debris tray slidably connected to said foot member and adapted to receive debris clippings from a foot or feet of said patient, the improvement comprising adjustable connection means connecting said debris tray to said foot section member for providing infinite angular positioning of said debris tray relative to said foot section member, wherein said adjustable connection means comprises a bracket means slidably connected to said foot section member, said bracket means comprising a pair of outwardly extending arm members, each said arm being provided with a groove therein, said debris tray having a pair of opposed sidewall members having threaded

apertures therein, a pair of knurled torque knobs, each said knob being threaded through one of said grooves and received



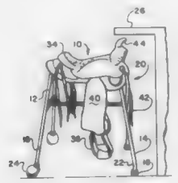
in one of said threaded apertures of said debris tray sidewall members.

4,852,942

CHILD'S DINNER SEAT AND METHOD OF FEEDING

Robert L. York, Lubbock, Tex., assignor to Yet, Inc., Lubbock, Tex.

Filed Sep. 7, 1988, Ser. No. 241,320
Int. Cl.[4] A63G *9/10*
U.S. Cl. 297—195 **4 Claims**



1. A child's seat for eating at a dining table comprising:
a replica of a childhood fantasy with
a front, said replica mounted on
a rigid stand having four legs, with two legs in front and two legs in rear, swivel rollers on the two rear legs so that the front of the seat may be lifted and moved,
said seat is at the table with the front of the replica under the table, and
anchor means on the front two legs for anchoring the seat with a child thereon.

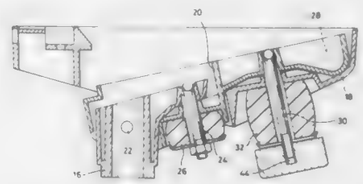
4,852,943

PEDESTAL CHAIRS

Lewis P. Roper, Cambridge, England, assignor to PHR Furniture Limited, Cambridge, England

Filed Mar. 10, 1988, Ser. No. 167,002
Claims priority, application United Kingdom, Mar. 14, 1987, 8706129
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—302 **7 Claims**

1. A pedestal chair having a pedestal supporting a chair chassis to which a chair seat and a chair back are attached, wherein the chair chassis is mounted on the pedestal for limited pivotal movement, in dependence on the weight distribution of the chair user, about either or both of two generally horizontal axes spaced apart in the front back direction of the chair, wherein the chair chassis comprises three parts which restrict its pivotal movement to tilting from a datum position in one sence about one axis and in the opposite sense about the second axis, and wherein said three parts are constituted by a pedestal mounting block, a main frame to which the seat and back of the chair are attachable and an intermediate member, the chassis also including interconnecting means through which the main frame and the intermediate member are normally caused to assume a datum position relative to the mounting block and



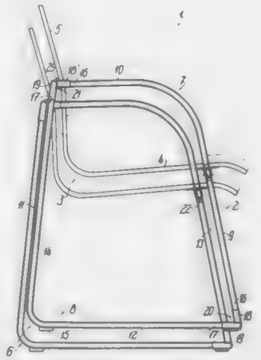
rearward tilting about the more forward axis is permitted by movement of the main frame relative to the mounting block and intermediate member, and forward tilting about the more rearward axis is permitted by movement of the seat and intermediate member relative to the mounting block.

4,852,944

SEATING FURNITURE, MORE PARTICULARLY CHAIR

Theo Hartmann, Tauberbischofsheim-Distelhausen, Fed. Rep. of Germany, assignor to VS Vereinigte Spezialmöbelfabriken Verwaltungs GmbH, Fed. Rep. of Germany

Filed May 12, 1987, Ser. No. 48,764
Claims priority, application Fed. Rep. of Germany, May 23, 1986, 3617297
Int. Cl.[4] A47C *5/10*
U.S. Cl. 297—445 **41 Claims**



1. An article of seating furniture, comprising:
at least one circumferentially closed profile supporting frame (6) disposed laterally of a sitting member (4) and having at least one lower standing surface (15) located in a standing plane for the article, said supporting frame being assembled from two separate angled members (7, 8) made of elongated profile sections, each of said angled members (7, 8) being bent at least once substantially only in a single plane substantially parallel to a plane of the supporting frame, thereby forming an angle, front and rear supporting legs (13, 14) and a supporting connection for the sitting member (4) being provided on said supporting frame (6), each of said angled members (7, 8) forming one of the supporting legs (13, 14) and defining frame arms (9, 10 and 11, 12) having arm ends (16, 17) with an outer contour;
connecting members (18, 19) affixed to said arm ends (16, 17), the arm ends (16, 17) of the angled members (7, 8)

engaging one another positively via said connecting members (18, 19); and,

wherein said arm ends (16, 17) of the angled members (7,8) adjoin one another at an angle, said connecting members (18, 19) being formed by separable nodal members (20, 21), each of the nodal members having plug-in attachment members (23) providing means for receiving associated ones of said arm ends (16, 17) to be connected and connecting heads (24) projecting beyond the connected arm end (16, 17), each said connecting head (24) having an outer contour substantially equal to an outer contour of the connected arm end (16, 17).

4,852,945

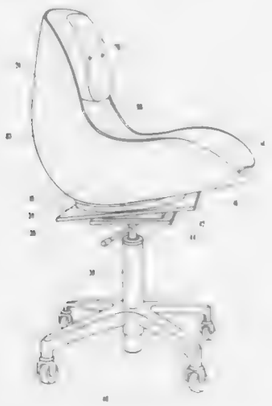
COMPREHENSIVE CONTOUR CHAIR APPARATUS

John W. Rowles, and Carl M. Arko, both of 4426 Appian Way, El Sobrante, Calif. 94803

Continuation-in-part of Ser. No. 855,312, Apr. 24, 1986, abandoned. This application Aug. 18, 1987, Ser. No. 86,592

Int. Cl.[4] A47C *7/02*

U.S. Cl. 297—458 **11 Claims**



1. A chair for prolonged body support formed from contoured specifications comprising a one positive molded substantially vertical back having a positive contact area in the lumbo thoracic area; and having substantially horizontal seat support shell having an upper area of the chair back and having relief areas in the sacroliac and recto genital areas and concave areas in the spinal area another areas as needed in one or more positive contact areas and one or more concave areas; said shell is mounted on a mounting ring base, said base then securely affixed to said mounting, then movably affixed to a mounting wedge interposed between the shell and a chair stand; said mounting ring base and mounting wedge adjustably mounted to said chair stand base support.

4,852,946

SURFACE WORKING ACCESSORY AND METHOD

Alfred Hackmack, Am Deich 30, D-2095 Obermarschacht, Fed. Rep. of Germany

Continuation of Ser. No. 483,494, Apr. 11, 1983, Pat. No. 4,761,038. This application Nov. 30, 1987, Ser. No. 126,360

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1982, 3213898

The portion of the term of this patent subsequent to Aug. 2, 2005, has been disclaimed.

Int. Cl.[4] **E01C** *23/09*

U.S. Cl. 299—10 **21 Claims**

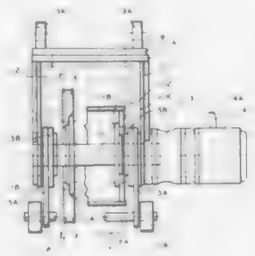
1. A multi-function accessory for the boom or structure of ground or road working equipment, comprising:

a frame;

rotative means for providing rotatable support and mounting in said frame;

a motor mounted on said frame; and

at least one of a plurality of functionally different rotary tools for engaging said ground or road, detachably mounted on said rotative means and driven by said motor, said rotative means being adapted to interchangeably support and rotate any one of said plurality of different rotary tools.



8. A method for using either one of a pair of functionally different rotary tools on a boom or structure of ground or road working equipment having a power source, comprising the steps of:

rotatably attaching a first one of said rotary tools to said boom or structure;

rotating said tool with power from said power source;

adjusting said boom or structure to press at least by gravity said tool against a surface; and

replacing said first one of said functionally different rotary tools with a second one of said functionally different rotary tools.

4,852,947

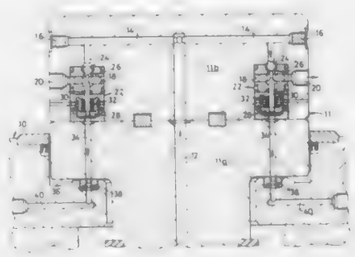
OPERATING HEAD WITH PHASED FLUID DELIVERY

Philip Jones, Bromsgrove, England, assignor to Pitcraft Summit Limited, Hoyland Nether, Nr. Barnsley, United Kingdom

Filed Nov. 20, 1987, Ser. No. 123,140

Int. Cl.[4] **E21C** *35/22*

U.S. Cl. 299—81 **22 Claims**



1. An operating head assembly comprising a non-rotatable body, a power driven, rotary head journaled in said body and thereby having an axis of rotation, and a fluid distribution system, a fluid input duct means incorporated in said fluid distribution system and connecting said body with said for head for continuous feed of fluid thereto as said head, in use, rotates relatively to said body, a plurality of delivery jet nozzles located at respective positions on said head, manifold means including at least one duct in said head for passing said fluid to said jet nozzles, a plurality of valve units carried in said head, a shut-off valve incorporated in each of said valve units,

each said shut-off valve being biassed, in use, to a closed position, an hydraulic power operated actuating means, to open or close said duct(s) leading to said jet(s) in a respective angular sector of said actuating means being constituted by a plunger type actuator operable to displace said shut-off valve from said closed position, a plurality of hydraulic power ducts located equiangularly around said head on a common pitch circule, an annular radial face provided on said head, said hydraulic power ducts at one end thereof emerging at said annular radial face, an annular radial face of said body located in close proximity to said annular radial face of said head, a plurality of seal formations located in said annular radial face of said body about the same pitch circle, an annular radial face provided on said head, said hydraulic power ducts at one end thereof emerging at said annular radial face of said body located in close proximity to said annular radial face of said head, a plurality of seal formations located in said annular radial face of said body about the same pitch as said hydraulic power ducts so as to be co-operable therewith for the transmission of hydraulic power between said body and said head, and automatic timing means including drive input means of said body of said assembly operable for selective transmission of hydraulic power to said plunger type actuators of said valve units individually by way of said hydraulic power ducts co-acting with said seal formations as said head rotates, said timing means being controllable so that said fluid is supplied to said jet nozzles as they pass sequentially through a pre-selectable angular sector determined by the direction in which said head assembly is being displaced.

4,852,948

TRACTION DEVICE

Ernest Vagias, 265 Prospect St., Baden, Pa. 15005

Filed Mar. 12, 1984, Ser. No. 588,499

Int. Cl.[4] **B60B** *15/00*

U.S. Cl. 301—44 T **1 Claim**



1. A traction device for vehicle wheel assembly which includes a tire with a treadwall portion supported by a rim having a plurality of spokes extending radially from a hub portion, said traction device including a traction arm having a traction finger protruding angularly from a base, said traction finger having a length sufficient to extend across at least part of the treadwall portions of said tire, clamp means including arms extending from opposite sides of said base, said arms having reversely-curved end portions terminating each of opposite radial sides of one of said spokes, and a shaft including a threaded portion receiving a nut member which is affixed to at least one of said arms for drawing the curved end portion of the arms into clamping engagement with opposite sides of one of said spokes, wherein said nut member is attached to said arms such that said shaft engages the nut member to present a protruding end portion to engage with at least one of said spokes.

4,852,949

TRACTION CONTROL SYSTEM

Michael H. Quinn, and Paul H. Quinn, both of 175 Beech Ridge Rd., Scarborough, Me. 04074

Filed Dec. 7, 1987, Ser. No. 102,130

Int. Cl.[4] **B60T** *8/58, 17/00;* **B60B** *39/10*

U.S. Cl. 303—100 **3 Claims**



1. A traction control system for an automotive vehicle comprising a container filled with marble chips and mounted vertically to said vehicle in front of a wheel of said vehicle, said container comprising a frusto-conical shaped top portion for receiving and storing said marble chips, and a dispensing portion extending vertically downward from said top portion and having an upper portion of substantially constant cross section and a lower portion having a cross section that is greater than that of said upper portion to allow free flow of marble chips therethrough; said container further comprising a door pivotably attached via a hinge means to a horizontal opening located on the outside of said container; said door being opened by a solenoid means, which when energized, is operable to vertically move a push rod attached to said door to open said door in opposition to the force of said spring, said system further comprising an operator controlled switch means which actuates said solenoid when a control operation is desired in order to open said door, thereby allowing said chips to flow underneath said wheel and improve the traction between the wheel and the road; and wherein said marble chips are at least ¼ inch in diameter and the dispensing portion of said container is dimensioned such that the flow rate of said chips out of said container during a control operation is one kilogram per three seconds.

4,852,950

VEHICLE BRAKING SYSTEM CAPABLE OF PREVENTING ROCK-BACK MOTION OF DRIVER/PASSENGER UPON VEHICLE STOPPING

Zensaku Murakami, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 12, 1988, Ser. No. 242,915

Claims priority, application Japan, Sep. 16, 1987, 62-231586; Dec. 17, 1987, 62-319691; Dec. 18, 1987, 62-322243; Apr. 21, 1988, 63-53959[U]

Int. Cl.[4] **B60K** *41/20;* **B60T** *8/24*

U.S. Cl. 303—100 **17 Claims**



1. A braking system for a motor vehicle, comprising:

a hydraulically operated brake device having a brake operating member, and wheel cylinders provided on wheels of the vehicle for braking the wheels with braking pressures

corresponding to an operation of the brake operating member;

vehicle speed detecting means for detecting a running speed of the vehicle;

stop control means for effecting an anti-rock-back operation to lower said braking pressures of said wheel cylinders when the detected running speed of the vehicle falls below a predetermined reference value, and thereby reducing an amount of rock-back of a driver and a passenger of the vehicle upon stopping of the vehicle;

slope determining means for effecting determination as to whether a road on which the vehicle is running is a level road, an uphill or a downhill; and

pressure-decrease pattern determining means for determining a pressure-decrease pattern in which said braking pressures of said wheel cylinders are lowered by said stop control means, according to a result of said determination by said slope determining means.

4,852,951

ANTI-SKID BRAKE CONTROL SYSTEM WITH FEATURE FOR ASSURING DERIVATION OF VEHICLE SPEED REPRESENTING VALUE PRECISELY REFLECTING ACTUAL VEHICLE SPEED

Toshiro Matsuda, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 23, 1986, Ser. No. 945,559

Claims priority, application Japan, Dec. 23, 1985, 60-287677; Dec. 23, 1985, 60-287678

Int. Cl.[4] B60T *8/02*

U.S. Cl. 303—109 **11 Claims**



1. An anti-skid brake control system for an automotive vehicle comprising:

a hydraulic brake circuit including a plurality of wheel cylinders for establishing braking pressure for decelerating vehicular wheels;

first and second anti-skid brake control valves, each associated with at least one of first and second wheel cylinders associated with first and second wheels for adjusting braking pressure therein, each of said anti-skid brake control valves being operable to increase braking pressure in the associated wheel cylinder in a first mode position, and to decrease the braking pressure in the associated wheel cylinder in a second mode position;

first sensor for monitoring rotation speed of said first wheel for producing a first wheel speed indicative signal;

second sensor for monitoring rotation speed of said second wheel for producing a second wheel speed indicative signal;

first means for deriving a first control signal for controlling said first anti-skid brake control valve based on said first wheel speed indicative signal between said first and second mode positions;

second means for deriving a second control signal for controlling said second anti-skid brake control valve based on said second wheel speed indicative signal between said first and second mode positions; and

third means for detecting synchronous increasing of braking pressure in said first and second wheel cylinders to cause synchronous locking of said first and second wheels, and producing a third control signal for providing a given delay time to one of said first and second means so as to operate an associated one of said first and second anti-skid brake control valves into said first mode position so as to increase braking pressure in said first and second wheel cylinders at different timings and thus preventing synchronous locking of said first and second wheels.

4,852,952

HYDRAULIC BRAKE CIRCUIT FOR MOTOR VEHICLE, HAVING A DUAL CIRCUIT IN THE FORM OF A CROSS AND A WHEEL ANTI-LOCK DEVICE

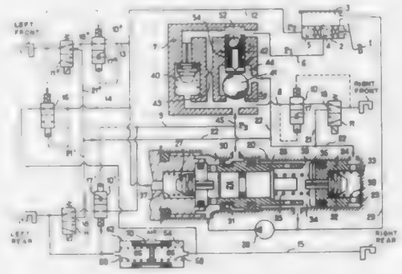
Gilbert Kervagoret, Argenteuil, France, assignor to Bendix France, Drancy, France

Filed Aug. 18, 1988, Ser. No. 233,409

Claims priority, application France, Sep. 30, 1987, 87 13501

Int. Cl.[4] B60T *8/26, 17/18*

U.S. Cl. 303—110 **16 Claims**



1. A hydraulic brake circuit for motor vehicle, having a dual primary and secondary circuit in the form of a cross for supplying wheel brake motors and a tandem master cylinder with reservoir, the circuit being provided with a wheel anti-lock device of the type in which pressures of a brake fluid in front wheel brake motors are controlled separately, while a back wheel having the lowest resistance to skidding controls the setting of the same pressure of fluid in back wheel brake motors, the pressures being governed by an admission-release electrovalve associated respectively with each front wheel and with a rear axle, each electrovalve comprising a release valve, the circuit being resupplied in an anti-lock phase by a single pump connected directly on a suction side to the reservoir of the tandem master cylinder, characterized in that the circuit comprises a safety device which is hydraulically connected to the release valves of the electrovalves and to a delivery side of the pump and which is provided with first valve means controlled by the delivery pressure of the pump to isolate the release valves of the electrovalves from the reservoir of the master cylinder for normal braking and in the case of a pump failure and to return the brake fluid which has come from the valves to the reservoir during the anti-lock phase, when the pressure of the fluid which is delivered by the pump reaches a predetermined level signifying proper functioning of the pump.

4,852,953

ANTI-SKID BRAKING SYSTEMS FOR VEHICLES

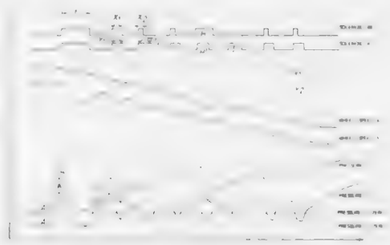
Malcolm Brearley, Solihull; Mark I. Phillips, Acocks Green; Robert D. Prescott, South Yardley, and Colin F. Ross, Kidderminster, all of England, assignors to Lucas Industries public limited company, Birmingham, England

Filed May 9, 1988, Ser. No. 191,991

Claims priority, application United Kingdom, May 13, 1987, 8711303

Int. Cl.[4] B60T *8/64, 8/82, 8/70*

U.S. Cl. 303—111 **14 Claims**



1. In an anti-skid braking system for a vehicle comprising a supply of fluid for actuating a plurality of wheel brakes, a skid control unit interposed between the fluid supply and the brakes, sensors to detect the skidding of a plurality of wheels and actuating means responsive to skid signals form the sensors and adapted to actuate the skid control unit to relieve the fluid pressure at the brake of the wheel at impending lock by means of a plurality of successive first brake release periods, means effective such that, when an impending skid condition is detected at one wheel, the skid control unit also induces second brake release periods in at least one of the brakes of the wheels not at impending lock, said second periods being of shorter duration than said first periods, at least when said first periods are above a preset minimum length for said second periods, and, once initiated, the control of the lengths of said second periods being wholly independent of the controlled response of the said one wheel, unless the length of said first brake release periods is shorter than said minimum preset length for the said second periods.

4,852,954

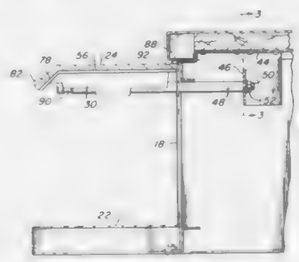
STEP-FRONT CABINET WITH IMPROVED OVERHANGING COVER AND TRAY RETAINER

Allen C. Brown; Ray R. Brown, both of Jasper, and J. Marshall Suttles, Elberton, all of Ga., assignors to Royston Corporation, Royston, Ga.

Filed May 26, 1988, Ser. No. 198,849

Int. Cl.[4] A40B *96/18*

U.S. Cl. 312—140.4 **9 Claims**



1. A protective cover structure comprising a pair of rods extending in spaced parallel relationship to each other, a substantially rigid sheet, a pair of supports, each being removably engageable with one of said rods, and means on said supports for engaging said sheet, for preventing said sheet from becoming disengaged from the supports while the supports are engaged, and in a predetermined relationship, with said rods and for permitting the sheet to become disengaged from the supports when the supports are disengaged from said rods, in which each of said rods has a forward end and in which each of said supports has means providing a passage for receiving one of said rods whereby the support can be brought into said predetermined relationship with its rod by causing the forward end of the rod to enter the passage of the support and thereafter sliding the support rearwardly on the rod.

4,852,955

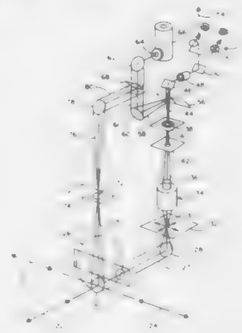
MICROSCOPE FOR USE IN MODULAR FTIR SPECTROMETER SYSTEM

Walter M. Doyle, Laguna Beach, and Norman S. Hughes, San Clemente, both of Calif., assignors to Laser Precision Corporation, Irvine, Calif.

Filed Sep. 16, 1986, Ser. No. 907,993

Int. Cl.[4] G02B *5/10, 13/14, 21/18*

U.S. Cl. 350—1.2 **14 Claims**



1. In an FTIR spectrometry apparatus having a source of infrared radiation, a source of visible radiation, and an interferometer which outputs an infrared beam; a microscope accessory unit operable in infrared transmittance and reflectance modes, comprising:

a housing having one or more ports for entering radiation;

a sample-supporting platform;

a Cassegrain objective having a focus at the platform-supported sample;

means for visually observing such sample;

a detector for receiving infrared radiation from the sample through the objective;

first optical means providing a first infrared radiation path along which the entering infrared radiation beam both travels through the Cassegrain and illuminates the sample in the transmittance mode, directional changes of the infrared radiation beam as it travels along said first path being caused solely by fully-reflecting mirrors;

second optical means providing a second infrared radiation path along which the entering infrared radiation beam both travels through the Cassegrain and illuminates the sample in the reflectance mode, directional changes of the infrared radiation beam as it travels along said second path being caused solely by fully-reflecting mirrors and by the sample;

the first and second infrared radiation paths first entering the Cassegrain from opposite directions, and the second radiation path traveling completely through the Cassegrain in both directions as it moves toward and away from the sample; and

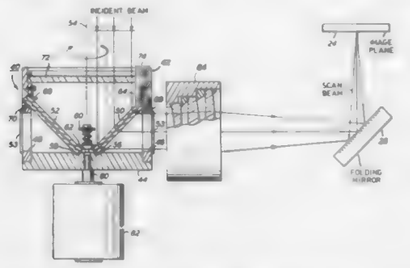
optical switching means for determining whether the entering infrared radiation travels along the first radiation path or along the second radiation path.

4,852,956

HOLOGAN SCANNER SYSTEM

Charles J. Kramer, Pittsford, N.Y., assignor to Holotek Ltd., Rochester, N.Y.

Continuation-in-part of Ser. No. 941,880, Dec. 15, 1986, abandoned. This application Nov. 23, 1987, Ser. No. 147,041
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—3.71 37 Claims



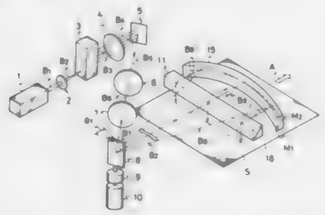
1. An elevator control system which comprises:
an elevator car (46) for transporting people up and down in a building;
car call registering means (42) located inside the car for registering car calls from within the car; of the building for registering hall calls from the halls of the building;
room call registering means (RCU21-RCUnm) located in respective rooms of the building for registering respective room calls from the respective rooms of the building, the registered room calls indicating to the elevator control system that the person registering the room call would like to utilize the elevator car from the floor number that the room call originated from at a desired time from the time that a room call registering means is activated; and
elevator control means (1234) for controlling said car in response to the registered calls entered through said activation means.

4,852,957

OPTICAL SYSTEM FOR FLYING SPOT SCANNING APPARATUS

Zenji Wakimoto; Shinichi Nagata, and Mikizo Katsuyama, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Apr. 22, 1988, Ser. No. 185,093
Claims priority, application Japan, Apr. 24, 1987, 62-102836
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.6 17 Claims



1. An optical system for a flying spot scanning apparatus, comprising:
a light source emitting a light beam;
optical modulator means for modulating the light beam;
a focusing lens forming a beam waist on an optical axis thereof;
deflection means disposed optically between the focusing lens and a recording medium for reciprocatingly deflecting the light beam to scan the recording medium;
a concave mirror disposed optically between the deflection means and the recording medium, the concave mirror extending along a direction where a recording spot of the light beam runs thereon; and
the recording medium disposed optically behind the concave mirror, the recording medium being laid on an image plane of the optical system and fed in a predetermined direction while the recording spot scans the recording medium,
wherein the deflection means being disposed at a position where a distance given by subtracting a distance between the focusing lens and the deflection means from a distance between the focusing lens and a beam waist formed by the focusing lens, is approximately equal to the focal length of the concave mirror, and
the concave mirror comprising a second-surface mirror disposed at a position such that the following formula is satisfied:

$$0.75 < b/V < 0.95$$

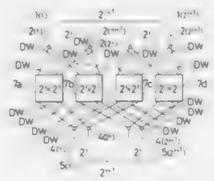
where V is a distance given by subtracting a distance between the focusing lens and the deflection means from a distance between the focusing lens and a beam waist formed by the focusing lens, and b is a distance between the deflection means and the concave mirror.

4,852,958

OPTICAL MATRIX SWITCH HAVING OPTIMIZED CROSSTALK CHARACTERISTICS AND UNIFORM OPTICAL OUTPUT INTENSITY

Hideaki Okuyama; Shigehiro Kusumoto; Keisuke Watanabe, and Kiyoshi Nagai, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1988, Ser. No. 166,305
Claims priority, application Japan, Mar. 10, 1987, 62-53072; Mar. 24, 1987, 62-67836
Int. Cl.[4] G02B *6/10*; G02F *1/29*
U.S. Cl. 350—96.13 6 Claims



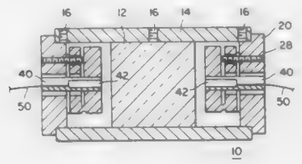
1. An optical matrix switch with 2^{i+1} input ports (where i is a natural number) and 2^{i+1} output ports, that performs a matrix selection on optical input signals received at the input ports and outputs them as optical output signals at the output ports comprising:
an i-state input branching tree consisting of 1×2 branching means connected in a tree configuration, for dividing the optical input signals into $2^{(2i+1)}$ branched signals;
a double tree including 2^{2i} 2×2 optical switches connected in series to the input branching tree so that each 2×2 optical switch receives two branched signals from different input ports and generates switch output signals at a selected one of its two outputs;
an i-stage output merging tree consisting of 2×1 merging means connected in a tree configuration for receiving the switch output signals from the 2×2 optical switches and generating optical output signals at the 2^{i+1} output ports; and
means providing dummy points of intersection to equalize the number of points of intersection on any light propagation path from an input port to an output port.

4,852,959

ADJUSTABLE FIBER OPTIC BULK POLARIZER

Walter V. Werner, Caldwell, and Robert L. Lamour, Towaco, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Mar. 17, 1988, Ser. No. 169,636
Int. Cl.[4] G02B *6/32*
U.S. Cl. 350—96.18 8 Claims



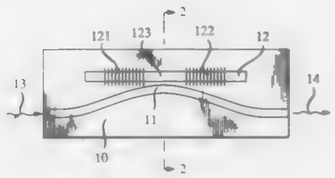
1. A fiber optic polarizer comprising:
a tubular member;
a bulk polarizer disposed within said tubular member;
a first fiber optic to graded index lens interface device disposed in one end of said tubular number;
a second fiber optic to graded index lens interface device disposed in the other end of said tubular member;
first adjusting means for two-axes adjusting of the first graded index lens with respect to the bulk polarizer; and
second adjusting means for two axes adjusting of the second graded index lens with respect to the bulk polarizer.

4,852,960

NARROW-LINEWIDTH RESONANT OPTICAL DEVICE, TRANSMITTER, SYSTEM, AND METHOD

Rodney C. Alferness, Holmdel; Charles H. Henry, Skillman; Rudolf F. Kazarinov, Martinsville; Nils A. Olsson, New Providence, and Kenneth J. Orlowsky, Middlesex, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 153,550, Feb. 8, 1988, abandoned, which is a continuation of Ser. No. 24,609, Mar. 11, 1987, abandoned. This application Sep. 23, 1988, Ser. No. 249,212
Int. Cl.[4] G02B *6/34*
U.S. Cl. 350—96.19 23 Claims



1. An optical device comprising first and second optical waveguides,
said first waveguide being designed for optical input and optical output,
said second waveguide being in side-by-side optical coupling relationship with said first waveguide,
said second waveguide comprising first and second sections in which effective refractive index varies in a spatially periodic fashion,
whereby said second waveguide is adapted as a resonator for radiation at a desired wavelength traveling in said first waveguide.

4,852,961

NONLINEAR OPTICAL WAVEGUIDE DEVICE INCLUDING GRATING FOR CHANGING OF THE WAVELENGTH OF LIGHT

Osamu Yamamoto, Nara, and Toshihiko Yoshida, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Sep. 30, 1988, Ser. No. 251,564
Claims priority, application Japan, Sep. 30, 1987, 62-247623
Int. Cl.[4] G02B *6/34*; H01S *3/10*; H03F *7/00*
U.S. Cl. 350—96.19 7 Claims



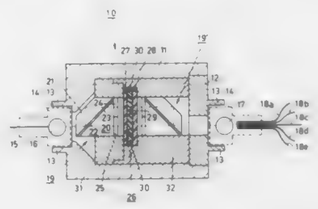
1. A device for the changing of the wavelength of light comprising a non-linear optical crystal, first and second optical waveguides that are formed in said nonlinear optical crystal, and an introducing means that is positioned adjacent to said second optical waveguide, said light being incident upon said first optical waveguide and propagated within said first optical waveguide, resulting in harmonic light that satisfies the phase-matching conditions, and said harmonic light being introduced, by said introducing means, into said second optical waveguide from which said harmonic light is output.

4,852,962

OPTICAL FIBER SWITCH USING NEMATIC CRYSTAL TO SWITCH UNPOLARIZED OPTICAL SIGNALS

Antonius J. A. Nicia, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1982, Ser. No. 411,928
Claims priority, application Netherlands, Sep. 7, 1981, [illegible]
Int. Cl.[4] G02B *6/36*; G02F *1/13*
U.S. Cl. 350—96.20 15 Claims



1. An optical switch for transmitting unpolarized light from an input optical fiber to one of a plurality of output optical fibers, said switch comprising means for optically coupling the input and output fibers to said switch, means, disposed in the path of the unpolarized light emitted by the input fiber and coupled to said switch by said coupling means, for dividing the unpolarized light into two spatially separated, linearly polarized beams whose directions of polarization are orthogonal, a nematic crystal disposed between said dividing means and said output fibers and in the path of said beams, means for rotating the direction of polarization of linearly polarized light through an angle of 90°, said polarization rotating means being disposed between said dividing means and said nematic crystal and being arranged so as to rotate the direction of polarization of only one of said beams so that the linearly polarized light of said beams incident on said nematic crystal have the same

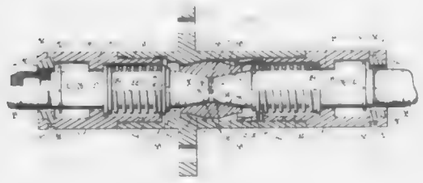
direction of polarization, and electrode means for producing an adjustable electric field under the influence of which said nematic crystal changes the path of the light between the input and output fibers so as to direct the light from the input fiber to a selected one of the output fibers.

4,852,963

OPTICAL FIBER BICONIC CONNECTOR

Norman R. Lampert, Norcross, Ga., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 30, 1987, Ser. No. 68,586
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 16 Claims



16. An optical fiber connection, which includes:

a coupling which includes a housing having opposed cavities each having an internally threaded entrance portion and which includes a longitudinal axis;

first and second plug assemblies each being mounted to said coupling and each including:

a plug having a truncated conically shaped end portion and a passageway extending therethrough;

a cap associated with said plug and in which said plug is mounted with a threaded portion thereof engaged with a threaded portion of said housing, said cap capable of being turned rotatably with respect to said plug, said cap including an optical fiber cable entrance end, and an end retainer mounted in said cap adjacent of the optical fiber cable entrance portion thereof; and

spring means disposed about said plug and being effective to urge said plug in a direction away from said cable entrance end; and

an optical fiber cable including an optical fiber end portion which is disposed in the passageway of each of said plugs with an end of each fiber terminating in an end face of the plug in which it is mounted;

sleeve means disposed in said housing and having opposed cavities in each of which is disposed one of said truncated conically shaped portions of said plugs, with walls which define the cavities including surfaces conformable to and mating with outer surfaces of said plugs, said sleeve means together with the plugs therein being capable of movement through a first distance in a direction along the longitudinal axis of the coupling and relative thereto prior to the occurence of relative movement between a plug and the sleeve means; and

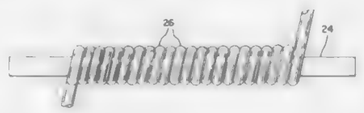
retaining means disposed about each said plug for holding said plug within its associated cap and effective upon said plug assembly being secured to said housing and said truncated conically shaped portions becoming disposed in said sleeve for becoming disposed adjacent to said end retainer and spaced a second distance, which is less than the first distance, therefrom such that upon the application of axial forces to one of the cables, the plug which terminates the cable to which forces are applied is restricted to axial movement equal to the second distance which is insufficient to cause relative movement between the truncated conically shaped end portions of the plugs thereby preventing optical disconnection between the optical fibers.

4,852,964

FIBER OPTIC COIL CORD

John W. Holland, Countryside, and Ronald J. Weiss, Addison, both of Ill., assignors to Storm Products Co., Hinsdale, Ill.

Filed Mar. 4, 1987, Ser. No. 21,467
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 21 Claims



13. A method of making a coiled optical cable comprising the steps of;

a. placing an optical fiber in a hollow cylindrical buffer tube of a thermoplastic material sized to make a loose fit with the optical fiber and to permit relative motion of the optical fiber therein;

b. winding a plurality of reinforcing fibers in an open helix about the buffer tube;

c. disposing an outer jacket of a thermoplastic material to cover the plurality of reinforcing fibers and thereby form a cable;

d. winding the cable in a tight helix on a mandrel;

e. heating the mandrel and wound cable to a temperature that softens the thermal plastic material;

f. cooling the cable and mandrel to room temperature;

g. removing the mandrel from the coiled cable; and

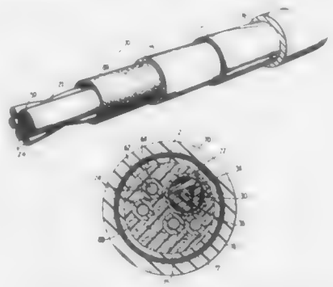
h. reverse winding the coiled cable.

4,852,965

COMPOSITE SERVICE AND DISTRIBUTION COMMUNICATIONS MEDIA

Francis J. Mullin, Chamblee, and William C. Reed, Lilburn, both of Ga., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 27, 1987, Ser. No. 19,719
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 28 Claims



20. A composite optical fiber, metallic conductor cable, which comprises:

a core which comprises:

at least one reinforced optical fiber unit, which comprises:

at least one optical fiber;

a plurality of discrete impregnated fibrous strength members which cooperate to enclose said at least one optical fiber and being decoupled therefrom to provide tensile strength and to provide columnar strength which resists compression;

a jacket which is made of plastic material and which encloses said strength members; and

a waterblocking material which is disposed within said jacket to fill interstices between said jacket and said strength members and between the strength members and said optical fiber, wherein said waterblocking material is a composition of matter which comprises about 91.4 to 95% by weight of an oil selected from the group consisting of:

(a) paraffinic oil having a mimimum specific gravity of about 0.86 and a pour point less than −4° C. and being of ASTM type 103, 104A or 104B;

(b) naphthenic oil having a minimum specific gravity of about 0.86 and a pour point less than −4° C. and being of ASTM type 103, 104A or 104B;

(c) polybutene oil having a minimum specific gravity of about 0.83 and a pour point less than 18° C.; and

(d) any mixture thereof, and wherein said composition of matter also includes about 6 to 8.5% by weight colloidal particles selected from the group consisting of hydrophobic fumed silica, hydrophilic fumed silica, precipitated silica and clay, the colloidal particles having a BET surface area in the range from about 50 to about 400 m^2;

at least one metallic conductor; and

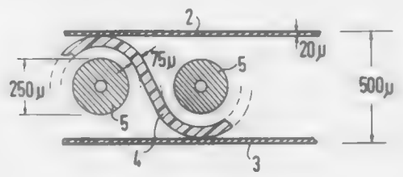
a sheath system which encloses said at least one optical fiber unit and said at least one metallic conductor and which includes an outer plastic jacket encloses the strength members.

4,852,966

OPTICAL CABLE ELEMENT AND OPTICAL CABLE

Klaus Kimmich, Stuttgart, and Ferdinand Groegl, Oberstenfeld, both of Fed. Rep. of Germany, assignors to Alcatel NV, Amsterdam, Netherlands

Filed Mar. 17, 1988, Ser. No. 169,380
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709170
Int. Cl.[4] G42B 6/44
U.S. Cl. 350—96.23 42 Claims



1. Ribbonlike optical cabling element comprising two tapelike sheets between which a number of optical waveguides are arranged parallel to each other, characterized in that a corrugated structural sheet (4) is provided between the tapelike sheets to define a plurality of adjacent hollow spaces (2, 3), and that the optical waveguides (5) are arranged in at least some of the hollow spaces between the corrugated sheet (4) and the tapelike sheets (2, 3) whereby the corrugated structural sheet provides protective spaces for the optical waveguides.

4,852,967

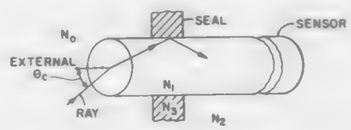
EVANESCENT WAVE SENSORS

Thomas A. Cook, Corning; Walter F. Love, Horseheads, both of N.Y., and Rudolf E. Slovacek, Norfolk, Mass., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.

Filed Mar. 25, 1986, Ser. No. 843,637
Int. Cl.[4] G02B 6/02
U.S. Cl. 350—96.29 8 Claims

1. An evanescent wave sensor comprising:

(a) a light conducting member having an index of refraction (N_1) which is surrounded by a medium having an index of refraction (N_2), where N_1 is greater than N_2; and



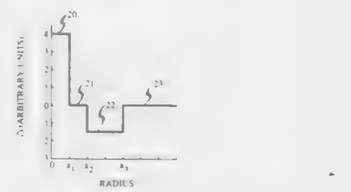
(b) a holding means having an index of refraction (N_3), such that N_3 is less than N_2, which is designed and configured to contact the light conducting member at the wave-propagating surface.

4,852,968

OPTICAL FIBER COMPRISING A REFRACTIVE INDEX TRENCH

William A. Reed, Summit, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 894,871, Aug. 8, 1986, abandoned. This application Apr. 2, 1987, Ser. No. 33,327
Int. Cl.[4] G02B 6/22
U.S. Cl. 350—96.33 25 Claims



1. An optical fiber, adapted for single mode operation at an operating wavelength λ_{op}, that comprises

(a) a core having a refractive index $n_1(a)$, and a radius a_1, where a is the radial fiber coordinate;

(b) a cladding that contactingly surrounds the core and extends outward from a_1, at least the part of the cladding between a_1 and a radius a_d consists of relatively low optical loss first cladding material having a refractive index that nowhere exceeds the maximum value of $n_1(a)$; associated with the fiber are fiber characteristics comprising:

(i) a curve of chromatic dispersion vs wavelength, the curve having a slope and a zero at least at one zero dispersion wavelength λ_o;

(ii) a dependence of λ_o on a_1;

(iii) a spectral range in which the absolute value of the curve of chromatic dispersion vs. wavelength is less than a predetermined value;

(iv) a curve of integrated mode power vs. radius;

(v) a bending loss at a given bend radius; and

(vi) a maximum core doping level and, associated therewith, a Rayleigh scattering loss;

(c) the cladding comprises a first cladding region that extends from a_1 to radius a_2 and has a refractive index $n_2(a)$, an index trench that extends from a_2 to a radius a_3 and has a refractive index $n_3(a)$, and a second cladding region that extends outward from a_3 and has a refractive index $n_4(a)$, with $a_1 < a_2 < a_3 \leqq a_d$, and with the maximum value of $n_3(a)$ being less than the minimum value of $n_2(a)$ and also less than $n_4(a=a_3)$, the refractive index of the second cladding at a_3.

4,852,969

SILYL 2-AMIDOACETATE AND SILYL 3-AMIDOPROPIONATE COMPOSITIONS AND OPTICAL FIBER MADE THEREFROM

Stefan A. Babirad, Minneapolis; Fredrick Bacon, St. Paul; Steven M. Heilmann, Afton; Larry R. Krepski, White Bear Lake; Andrew S. Kuczma, Clinton, and Jerald K. Rasmussen, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 17, 1988, Ser. No. 169,377
Int. Cl.[4] G02B *6/02, 1/04*
U.S. Cl. 350—96.34 26 Claims

20. An optical fiber comprising a silyl 2-amidoacetate or a silyl 3-amidopropionate composition of matter.

4,852,970

VISUAL SIGNAL DEVICE FOR A BICYCLE

John V. Kitrell, 4639 Holdrege St., Lincoln, Nebr. 68503

Filed Jan. 21, 1988, Ser. No. 146,302
The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.
Int. Cl.[4] G02B *5/12;* B60Q *1/26;* A47F *5/00;* B80R *1/02*
U.S. Cl. 350—99 3 Claims



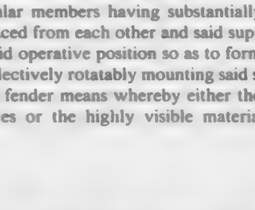
1. A visual signal device for a bicycle, comprising,
a support means,
means for securing the support means to the bicycle,
an upstanding support member selectively rotatably mounted, between first and second positions, on said support means and extending upwardly therefrom,
said support member having spaced-apart opposite front and back sides and opposing right and left sides,
one of said front and back sides of said support member having a light reflective surface provided thereon,
the other of said front and back sides of said support member having a material provided thereon which is highly visible during daylight hours, and
at least a first and second flat, substantially rectangular member having upper and lower ends and opposite sides, each of said members being selectively pivotally secured at the lower end thereof to said supporting support member,
said rectangular members having a light reflective surface on one side thereof,
said rectangular members having material on the other side thereof which is highly visible during daylight hours,
said first rectangular member being selectively pivotally movable from a super-imposed stored position in said support member to an operative position, pivoted to the left, outwardly from said support member,
said second rectangular member being selectively pivotally movable from a super-imposed stored position in said support member to an operative position, pivoted to the right, outwardly from said support member,
said rectangular members having substantially their entire lengths spaced from each other and said support member, when in said operative position so as to form a fan-shape,
and means selectively rotatably mounting said support member to said support means whereby either the light reflective surfaces or the highly visible material may be presented in the desired viewing direction.

4,852,971

FENDER MOUNTED VISUAL SIGNAL DEVICE FOR A BICYCLE

John V. Kitrell, 4639 Holdrege St., Lincoln, Nebr. 68503

Filed Jan. 21, 1988, Ser. No. 146,488
Int. Cl.[4] G02B *5/12;* B60Q *1/26;* A47F *5/00;* B60R *1/02*
U.S. Cl. 350—99 3 Claims



1. A visual signal device for a bicycle, comprising,
a arcuate fender means having rearward and forward ends,
means for securing the forward end of the fender means to the rear of the bicycle,
an upstanding support member selectively rotatably mounted, between first and second positions, on said fender means and extending upwardly therefrom,
said support member having spaced-apart opposite front and back sides and opposing right and left sides,
one of said front and back sides of said support member having a light reflective surface provided thereon,
the other of said front and back sides of said support member having a material provided thereon which is highly visible during daylight hours, and
at least a first and second flat, substantially rectangular member having upper and lower ends and opposite sides, each of said members being selectively pivotally secured at the lower end thereof to said upstanding support member,
said rectangular members having a light reflective surface on one side thereof,
said rectangular members having material on the other side thereof which is highly visible during daylight hours,
said first rectangular member being selectively pivotally movable from a super-imposed stored position in said support member to an operative position, pivoted to the left, outwardly from said support member,
said second rectangular member being selectively pivotally movable from a super-imposed stored position in said support member to an operative position, pivoted to the right, outwardly from said support member,
said rectangular members having substantially their entire lengths spaced from each other and said support member, when in said operative position so as to form a fan-shape,
and means selectively rotatably mounting said support member to said fender means whereby either the light reflective surfaces or the highly visible material faces rearwardly.

4,852,972

METHOD OF CONTROLLING VARIATION OF DENSITY OF IMAGES IN 3-D PICTURES

Allen K. Wah Lo, 5022 Hidden Branches Dr., Dunwoody, Ga. 30338

Filed Jun. 8, 1987, Ser. No. 59,742
Int. Cl.[4] G02B *26/04;* G03B *27/22*
U.S. Cl. 350—131 6 Claims





1. An improved method of printing a three-dimensional image on a lenticular print material using a printer wherein;
said printer is comprised of means for holding a negative, an enlarging means, light projecting means, and means for changing the angle at which light is projected from the printer;
said lenticular print material is comprised of a lenticular screen having a plurality of lenticules;
said negative having a plurality of two-dimensional views of an object;
said printing being accomplished by projecting light through said projecting means and through said negative to expose said lenticular print material in such a way that a plurality of image bands are formed across the width of each lenticule;
the improvement in said method is accomplished by utilizing a greater intensity of light on the lenticular screen when exposing the image bands near the edges of the lenticule than those near the center of the lenticule in order to obtain image bands of substantially equal density across the width of the lenticule.

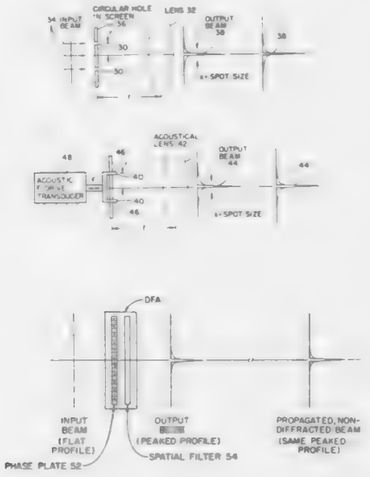
4,852,973

DIFFRACTION FREE ARRANGEMENT

James E. Durnin, and Joseph H. Eberly, both of Rochester, N.Y., assignors to Research Corporation, New York, N.Y.

Filed Oct. 3, 1986, Ser. No. 915,187
Int. Cl.[4] G02B *5/18;* G10K *11/32;* H05H *3/02;* G21G *4/00*
U.S. Cl. 350—162.11 15 Claims

1. A method for generating a well defined traveling wave beam not subject to beam spreading in the sense that the intensity pattern of the traveling wave beam in a transverse plane is substantially unaltered by propagation over a range which is substantially larger than the Rayleigh range of a Gaussian beam with equal central spot width, comprising, generating a traveling wave beam the amplitude of which has its transverse dependence substantially identical to $J_m(\alpha\rho)$, the mth Bessel function of the first kind, wherein α is a geometrical constant and ρ designates the transverse radial coordinate of the wave, and further wherein the Bessel function argument is independent of the distance z of propagation, which results in a well defined traveling wave beam not subject to beam spreading.

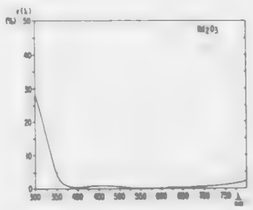


4,852,974

ANTI-REFLECTION FILM FOR AN OPTICAL ELEMENT CONSISTING OF AN ORGANIC MATERIAL

Manfred Melzig, Wessling, and Erhard Effer, Pöcking, both of Fed. Rep. of Germany, assignors to Optische Werke G. Rodenstock, Munich, Fed. Rep. of Germany

PCT No. PCT/DE86/00299, § 371 Date Mar. 19, 1987, § 102(e) Date Mar. 19, 1987, PCT Pub. No. WO87/00641, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 21, 1986, Ser. No. 41,101
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1985, 3525892
Int. Cl.[4] G02B *5/26, 5/23, 1/10*
U.S. Cl. 350—165 6 Claims



1. An anti-reflection film of several alternative inorganic layers on an optical element consisting of an organic material with photochromic properties
characterized by the fact that the mean reflection of the film over the range between 330 nm and 380 nm is less than 4%; the mean reflection over the range between 290 nm and 330 nm is greater than 15%; and the film has at least five layers which consist alternately of silicon dioxide and a metal oxide material with a high refractive index of $n \geqq 2.0$, and of which the first layer applied directly to the optical element consists of silicon dioxide and has a thick-

ness of about λ/2, the thicknesses of the second, third and fourth layers behave as

$$1:2Y:2OZ/3$$

where

$$Y=X+1.5(n_e-1.8);\ Z=X\pm0.2;$$

$$X=1.05+(n_e-2)1/(4-n_e)$$

and the sum of the thicknesses of the second to fourth layer is also about λ/2 with the fifth layer being a λ/4 layer (λ=350 nm).

4,852,975

IRRADIATION IMAGE ERASE UNIT FOR USE WITH STIMULABLE PHOSPHOR SHEET

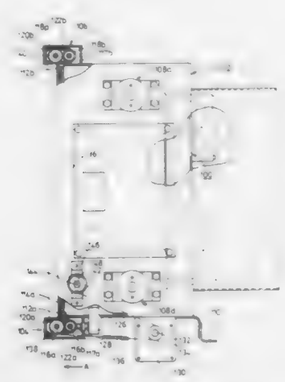
Sadami Yamada, Kanagawa, Japan, assignor to Fuji Photo Film Co., Inc., Kanagawa, Japan

Continuation of Ser. No. 740,458, Jun. 3, 1985. This application Feb. 25, 1988, Ser. No. 137,706

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.⁴ G01N *23/04*

U.S. Cl. 250—327.2 **13 Claims**



1. A radiation image recording and read-out system including a radiation image erase unit (**100**) for erasing a residual radiation image from a stimulable phosphor sheet (**150**) by exposing the sheet to erasure light and an image read-out unit (**62**) for irradiating the stimulable phosphor sheet with stimulating rays to cause the sheet to emit light representative of the radiation image stored therein, for detecting the light emitted from the stimulable phosphror sheet, and for converting said emitted light photoelectirically into an electric signal, wherein the radiation image erase unit further comprises: a casing (**102**) having an inlet slot (**112***a*) for passage therethrough of said stimulable phosphor sheet fed from said image read-out unit into said casing; erasure light source means (**108**) disposed in said casing for emitting the erasure light; and at least one feeder means (**104**) mounted on said casing at said inlet slot for delivering said stimulable phosphor sheet into said casing and including shielding means for blocking an escaping portion of the erasure light which passes through said inlet slot from passing to said image read-out unit wherein said shielding means includes a pair of rollers and a cover for enclosing said rollers.

4,852,976

LIQUID CRYSTAL DISPLAY DEVICE

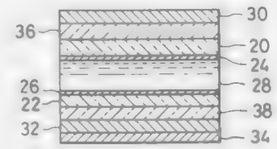
Yasushi Suzuki, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

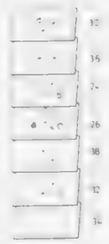
Continuation of Ser. No. 829,384, Feb. 13, 1986, abandoned. This application Jan. 17, 1989, Ser. No. 298,207

Claims priority, application Japan, Feb. 15, 1985, 60-027588; Feb. 19, 1985, 60-030998; Feb. 19, 1985, 60-030999; Mar. 26, 1985, 60-061169

Int. Cl.⁴ G02F *1/13*; G02B *5/30*

U.S. Cl. 350—339 R **14 Claims**





1. A monochromic display device for modulating in intensity an incident light passing therethrough, which comprises:

(A) a liquid crystal panel including,

(a) first and second transparent substrates spaced apart substantially in parallel from each other to form a gap therebetween,

(b) a liquid crystal body filling the gap between said substrates, and

(c) orientation means urging the molecules of said liquid crystal body to orient in a first direction in the vicinity of the inner face of said first substrate and in a second direction in the vicinity of the inner face of the second substrate, the first direction being substantially perpendicular to said second direction;

(B) a pair of first and second polarizer films one overlying said first substrate and the other underlying of said second substrate; and

(C) a pair of phase-shift films each having two vibrational directions consisting of a direction of axis (X') which travel with the larger one of two different refractive indices and direction (Z') which travels with the smaller one of the two different refractive indices, said phase-shift films being so disposed between one of said first and second substrates and one of said polarizer films facing said one of the first and second substrates that said phase-shift films function to invert an incident linearly polarized light into an elliptically polarized light and then to invert the elliptically polarized light into a linearly polarized light.

4,852,977

19 -HYDROXY CARBOXYLIC ACID DERIVATIVES SUITABLE FOR USE IN LIQUID CRYSTAL MATERIALS AND DEVICES

Lawrence K. M. Chan, Hull; David Coates, Bishop's Stortford; Peter A. Gemmell, Runcorn; George W. Gray, Cottingham; David Lacey; Kenneth J. Toyne, both of Hull, and Daniel J. S. Young, Conisborough, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, Whitehall, England

PCT No. PCT/GB85/00512, § 371 Date Aug. 19, 1986, § 102(e) Date Aug. 19, 1986, PCT Pub. No. WO86/02938, PCT Pub. Date May 22, 1986

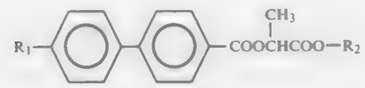
PCT Filed Nov. 8, 1985, Ser. No. 887,172

Claims priority, application United Kingdom, Nov. 13, 1984, [redacted]

Int. Cl.⁴ G02F *1/13*; C09K *19/12, 19/52, 19/30*

U.S. Cl. 350—350 S **7 Claims**

1. A lactic acid derivative, useful as a host or dopant in a ferroelectric smectic liquid crystal mixture, having the formula:



wherein R_1 is C_1–C_{20} alkyl or C_1–C_{20} alkoxy and R_2 is C_1–C_{20} alkyl, the total number of carbon atoms in R_1 plus R_2 being at most 25.

4,852,978

LIQUID CRYSTAL CELL UTILIZING A FERROELECTRIC LIQUID CRYSTAL HAVING A NATURAL PITCH LENGTH IS NO LONGER THAN THE LONGEST WAVELENGTH OF VISIBLE LIGHT

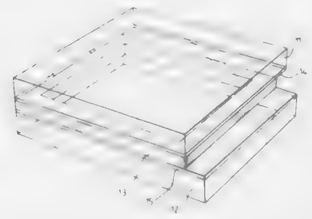
Anthony B. Davey, and Matthew F. Bone, both of Bishop's Stortford, Great Britain, assignors to STC PLC, London, England

Filed Jun. 23, 1987, Ser. No. 65,918

Claims priority, application United Kingdom, Jul. 2, 1986, [redacted]

Int. Cl.⁴ G02F *1/13*; C09K *19/30*

U.S. Cl. 350—350 R **8 Claims**



1. A liquid crystal cell switchable between an optically clear state that is stable, or is quasi-stable having a relaxation period in excess of one second, and an optically scattering stable state, wherein the active medium of said cell is provided by a layer of ferroelectric liquid crystal material whose natural pitch length is in the range defined by the wavelength range of visible light, which layer is confined by surfaces that promote planar alignment of the liquid crystal molecules at the major surfaces of the liquid crystal layer.

4,852,979

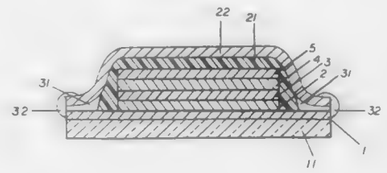
ENCAPSULATED ELECTROCHROMIC MIRROR AND METHOD OF MAKING SAME

Anoop Agrawal, Holland, Mich., assignor to Donnelly Corporation, Holland, Mich.

Filed Jul. 30, 1987, Ser. No. 79,764

Int. Cl.⁴ G02F *1/01, 1/17*

U.S. Cl. 350—357 **8 Claims**



1. An electrochromic mirror which can be alternatively darkened or lightened to decrease or increase reflectivity comprising a glass substrate; an electrochromic cell; and a coating suitable to protect said electrochromic mirror from environmental and mechanical damage comprising a shatterproofing coating in contact with and adhered to said glass substrate and substantially covering the exposed surfaces of said electrochromic cell and a hermetically sealing coating covering the entire exposed surface of said shatterproofing coating and being in contact with and adhered to said substrate.

4,852,980

OPTICAL SYSTEM

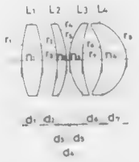
Nagata Shinichi, Kyoto, Japan, assignor to Dainippon Screen Manufacturing Co., Ltd., Kyoto, Japan

Filed Jan. 16, 1987, Ser. No. 3,957

Claims priority, application Japan, Jan. 31, 1986, 61-21049

Int. Cl.⁴ G02B *13/18, 27/00*

U.S. Cl. 350—432 **4 Claims**



1. An optical system for use in illuminating an object, comprising:

a light source;

lens means having an entrance pupil for receiving light from the light source and an exit pupil for passing the light received to the object; and

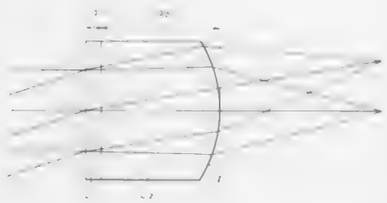
an optical axis which extends through the lens means to the light source and the object, respectively, wherein the light received in the entrance pupil has an entrance height which is substantially proportioned to the tangent of the exit angle in the exit pupil.

4,852,981

IMAGING LENS SYSTEM COMPRISING A DISTRIBUTED INDEX LENS AND A PLANO-CONVEX LENS

Shigeyuki Suda, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1986, Ser. No. 867,497
Claims priority, application Japan, May 31, 1985, 60-119433
Int. Cl.⁴ G02B *3/00*
U.S. Cl. 350—413 **10 Claims**



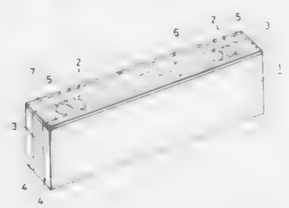
1. An imaging lens system comprising a distributed index lens which has planar opposite end surfaces and in which the index gradient near the optic axis is substantially zero and the refractive index becomes progressively higher from the optic axis toward the marginal portion, and a plano-convex lens, having a planar surface on the side thereof which is adjacent to said distributed index lens, formed of a homogeneous medium.

4,852,982

GRADED INDEX LENS ARRAY

Takashi Yamamoto, Saeki; Yoshihiko Mishina, and Masaaki Oda, both of Ohtake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 162,121
Claims priority, application Japan, Nov. 16, 1987, 62-287268
Int. Cl.⁴ G02B *1/10*
U.S. Cl. 350—413 **9 Claims**



1. A graded index lens array comprising a plurality of graded index lenses made of a synthetic resin and arranged in parallel, characterized in that at least one end surface of said lens array is coated with a cured film formed from a cross-linkable resin consisting essentially of a multifunctional compound having two or more (meth)acryloyloxy groups per molecule, and a fluorinated alkyl (meth)acrylate.

4,852,983

DISTANCE SIMULATOR

Michael E. Fein, Mountain View, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.

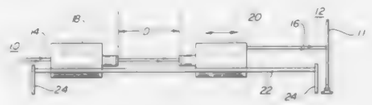
Filed Sep. 21, 1987, Ser. No. 99,103
Int. Cl.⁴ G02B *26/00*
U.S. Cl. 350—453 **24 Claims**

1. An optical system for simulating the optical effect of traveling over a large distance on light traveling from a first reference surface to a second reference surface, said first and second reference surfaces being relatively closely spaced, comprising:

a first afocal magnifying lens system for receiving light from said first reference surface and providing a magnification ratio of M_1,

a second afocal magnifying lens system for receiving light from said first afocal magnifying lens system and transmitting it to said second reference surface with a magnification ratio of M_2, M_2 equaling k/M_1, and

means for supporting said first and second afocal magnifying lens system such that they are spaced from one another by a distance D, the length of the distance which is simulated being equal to D/M_1^2 and the size of the output image being scaled by a factor k from the actual image being simulated.

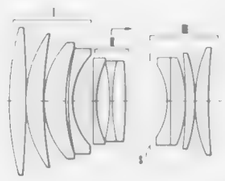


4,852,984

TELEPHOTO LENS OF LARGE APERTURE RATIO

Sadatoshi Takahashi; Hideki Ogawa, both of Tokyo, and Hiroshi Endo, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1988, Ser. No. 159,957
Claims priority, application Japan, Feb. 25, 1987, 62-042410; Oct. 15, 1987, 62-260854; Dec. 11, 1987, 62-313900; Dec. 11, 1987, 62-313901
Int. Cl.⁴ G02B *13/02, 9/64*
U.S. Cl. 350—454 **21 Claims**



1. A photographic lens comprising, from front to rear,

a first lens unit of positive overall refractive power having a lens of negative refractive power whose rear surface is concave toward the rear;

a second lens unit of negative refractive power axially movable for focusing; and

a third lens unit of positive overall refractive power having a negative lens whose front-most lens surface is concave toward the front and having at least two positive lenses in that order from front.

4,852,985

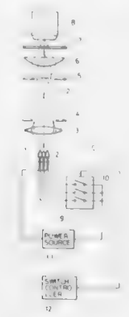
ILLUMINATING DEVICE FOR MICROSCOPES

Tadafumi Fujihara; Yoshihiro Shimada; Chikara Nagano, all of Tokyo, and Katsuo Tsukamoto, Sendai, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1987, Ser. No. 108,935
Claims priority, application Japan, Oct. 16, 1986, 61-246187
Int. Cl.⁴ G02B *21/06*
U.S. Cl. 350—523 **10 Claims**

1. An illuminating device for microscopes comprising a surface light source including a plural number of semiconductor light sources arranged in two dimensions, a control circuit connected to said surface light source for lighting some or all

of said plural number of semiconductor light sources in conjunction with selection of an illumination mode, and an optical system arranged in alignment with said surface light source for condensing and transmitting light emitted from said surface



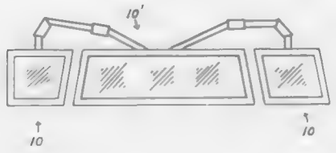
light source, one of said plural number of semiconductor light sources being arranged on the optical axis of said optical system and the rest of said semiconductor light sources being arranged along a circle coaxial with the optical axis.

4,852,986

AUTOMOBILE REAR-VIEW MIRROR

Zhou Yu, 1139 Maple, Evanston, Ill. 60202

Filed May 17, 1988, Ser. No. 194,871
Int. Cl.⁴ G02B *7/18, 5/08, 5/10;* B60R *1/08*
U.S. Cl. 350—603 **8 Claims**



1. An automobile rear-view mirror which is mounted to a side of a conventional, automobile center, rear-view mirror, comprising a clip means, a flexible supporting means, and a mirror set,

said clip means being clipped on a bar connecting said conventional, automobile, center, rear-view mirror to the interior of said automobile,

said flexible supporting means connecting said clip means to said mirror set to allow said mirror set to be moved and rotated arbitrarily,

said mirror set having two mirror plates facing opposite directions, at least one of said two mirror plates having a flat major part with a convex, curved tail.

4,852,987

DEVICE FOR MEASURING EYE LENS OPACITY

Wolfgang Lohmann, Petersweiher 20, D-6300 Giessen, Fed. Rep. of Germany

PCT No. PCT/DE86/00478, § 371 Date Sep. 29, 1987, § 102(e) Date Sep. 29, 1987, PCT Pub. No. WO87/03188, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 24, 1986, Ser. No. 105,294
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1985, 3542167
Int. Cl.⁴ A61B *3/10, 5/00*
U.S. Cl. 351—221 **9 Claims**

1. An apparatus for making an in vivo measurement of eye lens cloudiness such as caused by cataracta nuclearis, the eye lens having an inherent natural fluorescence corresponding to the cloudiness, the apparatus comprising:

a device for positioning the head of the patient so as to place the eye in a predetermined fixed position desirable for making the in vivo measurement;

a projecting device for projecting a slit image onto the eye lens, the projecting device including:

a light source for generating a monochromatic excitation beam of light defining an excitation beam axis and having a wavelength λ_A lying in the range of 350 nm to 500 nm;

imaging means arranged in said beam for forming the slit image; sand

optic means for focusing the slit image on the eye so as to excite the natural fluorescence in the eye lens to produce a fluorescence light defining a fluorescence light axis;

a measuring device for measuring said fluorescence light, the measuring device including:



a recording spectrophotometer for recording a fluorescence spectrum in the wavelength range of 380 nm to 650 nm which is longer than said excitation wavelength λ_A;

optic directing means for receiving said fluorescence light from the eye lens and directing the same to said recording spectrophotometer; and,

signal processing means for analyzing the fluorescence spectrum recorded by said recording spectrophotometer to determine the wavelength λ_{max} corresponding to the maximum intensity I of said recorded fluorescence spectrum; said signal processing means including:

a memory having a scale of values for eye lens cloudiness and storing an empirically determined table of values of the measured parameters (λ_A and λ_{max}) corresponding to said scale of values; and, comparator means for comparing the actual measured parameters λ_A, λ_{max} to said table of values thereby determining the degree of the eye lens cloudiness.

4,852,988

VISOR AND CAMERA PROVIDING A PARALLAX-FREE FIELD-OF-VIEW IMAGE FOR A HEAD-MOUNTED EYE MOVEMENT MEASUREMENT SYSTEM

Jose Velez, Newton, and Joshua D. Borah, Mansfield, both of Mass., assignors to Applied Science Laboratories, Waltham, Mass.

Filed Sep. 12, 1988, Ser. No. 243,330
Int. Cl.⁴ A61B *3/14*
U.S. Cl. 351—210 **57 Claims**

1. A system for viewing an external scene visually observed through at least one eye of an observer thereof comprising:

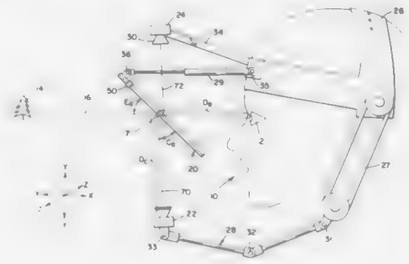
(a) helmet means for mounting on the head of an observer;

(b) a field-of-view camera mounted on said helmet and having a field-of-view camera axis generally perpendicular to the optic axis of the observer's eye in the sense that said

field-of-view camera's optic axis intersects said eye's optic axis;

(c) an especially configured visor mounted on said helmet directly in front of said eye, said visor at least partially transparent to light from said scene transmitted to said eye of the observer along said optic axis and reflecting said light from said scene as a mirror image to said field-of-view camera; and

(d) adjustment means associated with said visor, said field-of-view camera and said helmet means for spacing the visor at equal distances between said eye and said field-of-view camera measured from said intersection of said optic axis, and adjusting the angle between said visor and said field-of-view camera axis, to be equal to the angle between said visor and said eye's optic axis said angles being measured from the same side of said visor so that parallax is



minimized to permit the point-of-view camera to accurately record said external scene as visualized by said eye.

CHEMICAL

4,852,989

BLEACHING COMPOUNDS AND COMPOSITIONS COMPRISING FATTY PEROXYACIDS SALTS THEREOF AND PRECURSORS THEREFOR HAVING AMIDE MOIETIES IN THE FATTY CHAIN

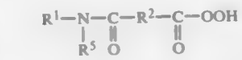
Michael E. Burns, West Chester, Ohio, and Frederick E. Hardy, Newcastle upon Tyne, England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 8, 1987, Ser. No. 47,804

Int. Cl.[4] C07C *179/10, 179/20;* **C11D** *3/39;* **D06L** *3/02*

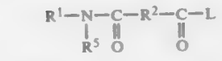
U.S. Cl. 8—107 **19 Claims**

1. A bleaching compound which provides in an aqueous solution a compound of the formula:



wherein each R^1 is an alkyl, aryl or alkaryl group containing from about 1 to about 14 carbon atoms, R^2 is trans —CH═CH—, and R^5 is H or an alkyl, aryl or alkaryl group containing from about 1 to about 10 carbon atoms, the total number of carbon atoms being from about 10 to about 20.

8. A bleach activator of the general formula:



wherein R^1 is an alkyl, aryl or alkaryl grop containing from about 1 to about 14 carbon atoms, R^2 is trans—CH═CH—, and R^5 is H or an alkyl, aryl or alkaryl group containing from about 1 to about 10 carbon atoms, and L is a leaving group.

4,852,990

PROCESS FOR BLEACHING DENIM FABRICS AND GARMENTS

James R. Patterson, Dunwoody, Ga., assignor to The Virkler Company, Charlotte, N.C.

Filed Aug. 24, 1987, Ser. No. 88,683

Int. Cl.[4] D06L *3/06*

U.S. Cl. 8—108.1 **26 Claims**

1. A method of textile bleaching denim fabric, comprising the steps of immersing the fabric in an aqueous bleach bath containing a chlorine bleaching agent and from about 0.01 to about 10 grams per liter of a polyacrylic acid, and maintaining the fabric in the bleach bath for a time sufficient to bleach the fabric.

4,852,991

DYEING OF POLYAMIDE FIBERS WITH ANIONIC DYES USING A CATIONIC ASSISTANT FOLLOWED BY AN ANIONIC ASSISTANT

Josef Frauenknecht, Therwil, and Dieter Schwer, Riehen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

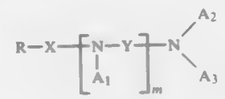
Filed Mar. 3, 1988, Ser. No. 163,443

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706887

Int. Cl.[4] D06P *3/06, 1/60, 5/02*

U.S. Cl. 8—586 **40 Claims**

1. A process for dyeing a textile substrate comprising synthetic or natural polyamide fibres with anionic dyestuffs, comprising the steps of (i) bringing the polyamide fibres into contact with an aqueous dyeing liquor which contains, in addition to one or more anionic dyestuffs, a cationic dyeing assistant which is capable of forming an addition product with the anionic dyestuff and which has a retarding action on the anionic dyestuff, and dyeing the polyamides fibres in said dyeing liquor at a temperature of from 60° to 105° C., and (ii) adding an anionic dyeing assistant to the dyeing liquor 15 to 60 minutes after reaching the dyeing temperature and continuing the dyeing to complete the dye exhaustion, said cationic dyeing assistant being selected from the group consisting of compounds of formula I



I

in which

R is $C_{12\text{-}30}$ alkyl or alkenyl

X is a direct bond or —CO—

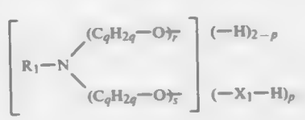
Y is C_2 or C_3 alkylene

each of A_1, A_2 and A_3 is independently selected from the class consisting of polyethylene oxide chains and poly(ethylene oxide/C_3 or C_4 alkylene oxide) chains, the total sum of the ethylene oxide units in all three chains being from 3 to 200 and the total sum of the C_3 or C_4 alkylene oxide units in all three chains being up to 100, and

m is 0 or an integer from 1 to 6,

which compounds may also contain up to a total of 5 styrene-oxy groups distributed through the chain A_1 and/or A_2 and/or A_3

and their quanternization products; and compounds of formula II



II

in which

R_1 is $C_{12\text{-}24}$ alkyl or alkenyl

X_1 is the anion of a polybasic acid,

r and s represent whole numbers the sum of which is 10 to 100,

q is 2, 3 or 4, and

p is 1 or 2,

and their protonation and quaternizaiton products.

4,852,992

COMBUSTION AIDS

Atsushi Nasu, 99 Katako, Youkaichiba-shi, Chiba-ken, Japan

Filed Oct. 23, 1987, Ser. No. 111,657

Claims priority, application Japan, Oct. 23, 1986, 61-253478; Dec. 27, 1986, 61-313996

Int. Cl.[4] C10L *1/00, 1/32*

U.S. Cl. 44—50 **9 Claims**

1. A combustion aid, in the form of an aqueous alkaline solution, comprising (a) water and (b), dissolved in said water, the product obtained by treating a hydrocarbon oil with an alkali, wherein the amount of said product (b) is 0.5–10% of the total of (a) and (b).

4,852,993

ORI-INHIBITED AND DEPOSIT-RESISTANT MOTOR FUEL COMPOSITION

Rodney L. Sung, Fishkill; Thomas Hayden, Wappingers Falls; Michael A. Caggiano, Chelsea, and Milton D. Behrens, Fishkill, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

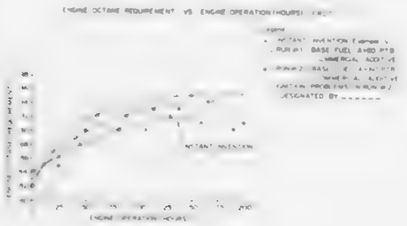
Filed Aug. 12, 1987, Ser. No. 84,354

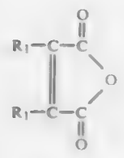
Int. Cl.[4] C10L *1/14*

U.S. Cl. 44—62 **11 Claims**

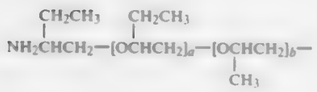
1. A motor fuel composition comprising a mixture of hydrocarbons boiling in the range from about 90° F.–450° F. and additionally comprising:

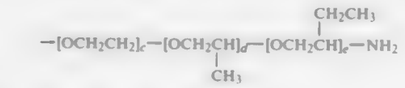
(I) from 0.0005–5.0 weight percent of the reaction product obtained by reacting a temperature of 30° C.–200° C.:
(a) about 1 mole of a dibasic acid anhydride of the formula





where R_1 is H or a C_1-C_5 alkyl radical,
(b) 1–2 moles of a polyoxyalkylene diamine of the formula





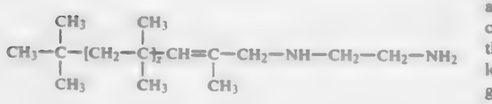
where c has a value from about 5–150, b+d has a value from about 5–150, and a+e has a value from about 2–12, and
(c) 1–2 moles of a hydrocarbyl polyamine which may be either
(i) a hydrocarbyl polyamine of the formula

$$R_2(NH-R_3)_x-NH_2$$

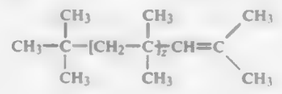
where R_2 is an alkyl radical having from about 1–24 carbon atoms, R_3 is an alkylene radical having from about 1–6 carbon atoms, and x has a value from about 1–10, or
(ii) a n-alkyl-alkylene diamine of the formula

$$R_4-NH-(CH_2)_n-NH_2$$

where R_4 is an aliphatic hydrocarbon radical having from about 1–24 carbon atoms and n has a value from about 1–6; and
(II) from 0.001–1.0 weight percent of a mixture comprising a hydrocarbon solvent and:
(a) 50–75 parts by weight of polyisobutylene ethylene diamine of the formula



and
(b) 5–25 parts by weight of polyisobutylene of the formula

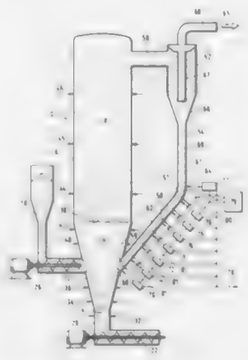


where z has a value of 30–40.

4,852,994
PROCESS FOR THE PRODUCTION OF GAS CONTAINING HYDROGEN AND CARBON MONOXIDE FROM SOLID FUEL

Johannes Lambertz, Kerpen; Wolfgang H. Adlhoch, Swistal; Alfred G. Mittelstädt, Hürtz-Berrearath, and Wolfgang Hermann, Erftstadt-Gymnich, all of Fed. Rep. of Germany, assignors to Rheinische Braunkohlenwerke AG, Cologne, Fed. Rep. of Germany

Filed May 22, 1987, Ser. No. 53,447
Claims priority, application Fed. Rep. of Germany, May 27, 1986, 3617802
Int. Cl.[4] C10J *3/54*
U.S. Cl. 48—197 R **16 Claims**

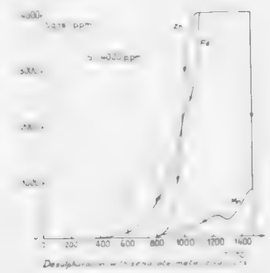


1. A process for the production of gas containing hydrogen and carbon monoxide from solid fuel at elevated pressure comprising the steps of forming a fluidized bed of the solid fuel above which is a post-gasification space, removing the product gas from the post-gasification space, passing the product gas through a separator in which at least a part of entrained solid particles in the product gas is separated off, removing the product gas from the separator, returning the separated solid particles to said fluidized bed by way of a recycling conduit having a plurality of nozzles, each said nozzle being spaced apart from the next nozzle along the longitudinal axis of said conduit, and successively injecting gas in a pulse-like manner through said plurality of nozzles into the recycling conduit to loosen up the solid particles therein such that an initial pulse of gas begins at a downstream position proximal said fluidized bed and successively runs along said plurality of spaced apart nozzles to an upstream position distal said fluidized bed.

4,852,995
PROCESS FOR DESULFURIZING FUEL GAS CONTAINING SULFUR

Jean Cordier, Saint Saulve, and André Rist, Gif-sur-Yvette, both of France, assignors to Union Siderurgique du Nord et de L'Est de La France, Puteaux, France

Continuation of Ser. No. 703,659, Feb. 21, 1985, abandoned. This application May 15, 1987, Ser. No. 51,152
Claims priority, application France, Feb. 23, 1984, 84 02769
Int. Cl.[4] C10J *3/46;* C10K *3/00*
U.S. Cl. 48—197 R **13 Claims**



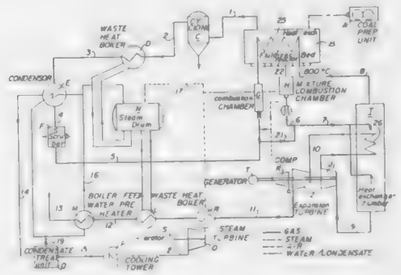
1. A process for desulfurizing in a fuel gas desulfurizing plant a fuel gas containing sulfur resulting from a gasification of a sulfur-containing fuel by means of a bath of liquid iron in said plant, comprising:
allowing the gas resulting from said gasification of said sulfur-containing fuel by means of said bath of liquid iron to cool during a sufficient stay in a sufficient volume within said plant down to the following recited temperatures so as to
treat the gas first by the action of vapours of a first substance selected from at least one of the group consisting of manganese and manganese oxides, in the form of aerosols, which action occurs while the gas is at a temperature ranging from 1600° C. to 600° C.,
said vapours being produced by directing a jet of oxygen onto the bath of liquid iron which liquid iron is at a temperature of 1300° C. to 1600° C. so as to cause the volatilization of said substance by the encounter of the jet with the bath and a thorough vaporisation of said substance, and
then treat the resulting gas by means of the action of vapours of a second substance selected from the group consisting of zinc and zinc oxides, which action of said vapours of said second substance occurs while the gas is at a temperature of between 1000° C. and 350° C.

4,852,996
PROCESS FOR GASIFYING COAL

Klaus Knop, Geldern; Günter Wolters, Düsseldorf, and Helmut Kubiak, Herne, all of Fed. Rep. of Germany, assignors to Man Gutehoffnungshuette GmbH, Fed. Rep. of Germany

Filed May 21, 1986, Ser. No. 865,989
Claims priority, application Fed. Rep. of Germany, May 21, 1985, 3518260; Jan. 9, 1986, 3600432
Int. Cl.[4] C10J *3/54;* F02G *3/00*
U.S. Cl. 48—197 R **15 Claims**

1. Process for producing electricity from carbonaceous fuel comprising the steps of: supplying finely atomized carbon-containing fuel to a fluidized bed reactor; gasifying the fuel in the reactor by means of an essentially allothermal gasification reaction to produce synthesis gas; withdrawing the synthesis gas from said reactor; and purifying the synthesis gas so as to remove dust and sulfur from the synthesis gas; combusting a first portion of the purified synthesis gas and producing a first portion of flue gas; heating the reactor by indirect heat exchange by conveying the first portion of flue gas through a heat exchanger is said reactor for production of synthesis gas allothermally; burning a second portion of the purified synthesis gas to produce a second portion of flue gas; mixing the first



portion of flue gas with the second portion of flue gas to form a combined flue gas stream; directing said combined flue gas stream into an expansion turbine for rotation upon expansion of said combined flue gas stream; and, driving an electric generator with the expansion turbine.

4,852,997
SLAG WATER BATH PROCESS

Clifford C. Segerstrom; Charles V. Sternling, both of Houston, Tex.; Hans-Wolfgang Lüke, Hamburg, Fed. Rep. of Germany, and Hsi L. Wu, The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 5, 1987, Ser. No. 104,467
Int. Cl.[4] C10J *3/72*
U.S. Cl. 48—210 **2 Claims**



1. A method for separating slag from water, said slag being discharged downwardly from a slag tag of a coal gasification reactor into a slag water bath having a discharge opening from which slag is downwardly removed, comprising the steps of:
directing the flow of said slag to a chamber which is at least partially submerged below the surface of said slag water bath, said chamber having converging walls which form a discharge port spaced above and aligned with the discharge opening of said slag water bath, said discharge port having a diameter no greater than the diameter of the discharge opening of said slag water bath;
wetting and entraining said slag within said chamber with at

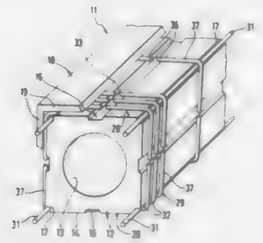
least one fluid causing said slag to sink towards said discharge port of said chamber;
converging the flow of slag by means of said converging chamber to said discharge opening of said slag water bath;
withdrawing water from a point within said slag water bath but outside said chamber and above the discharge opening of the slag water bath; and
recycling said withdrawn water to an inlet opening of said water bath.

4,852,998

METHOD FOR MANUFACTURING METAL WIRES PARTIALLY COVERED WITH ABRASIVE PARTICLES FOR CUTTING TOOLS

Oswald Kopp, Nürtingen, Fed. Rep. of Germany, assignor to Kadia Diamond Hone Corporation, Rockford, Ill.

Filed Feb. 8, 1988, Ser. No. 153,595
Int. Cl.[4] B24D *3/02*
U.S. Cl. 51—309 **14 Claims**



1. A method for the manufacture of metal wire partially covered with abrasive particles for cutting tools, comprising the steps of:
mounting at least one metal wire to be covered on a holder;
covering those areas of said at least one metal wire which are to be kept free of abrasive particles with one or more covering elements; and
dipping the holder with said at least one metal wire and the covering element into an electrolytic bath, into which abrasive particles have been introduced, wherein the uncovered areas of said at least one metal wire are coated with a layer of metallic carrier substance and partial embedding of a plurality of abrasive particles by means of galvanic metal precipitation.

4,852,999

CUTTING TOOL

Pankaj K. Mehrotra, Greensburg; Elizabeth R. Billman, Pittsburgh, and Bernard North, Greensburg, all of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed May 28, 1987, Ser. No. 56,091
Int. Cl.[4] B24D *3/02*
U.S. Cl. 51—309 **17 Claims**



1. A sintered ceramic composition comprising a polycrystalline alumina matrix having titanium carbide whiskers distributed therein, said composition comprising
(a) 50 to 90 volume percent high purity alumina,
(b) 10 to 50 volume percent single crystal titanium carbide whiskers, and
(c) up to 3 volume percent being the residue of sintering aids.

4,853,000

PROCESS AND COMPOSITION FOR A METAL POLISH

John L. Potter, Box 321, Strong City, Kans. 66869

Filed Nov. 25, 1987, Ser. No. 125,115
Int. Cl.[4] B24D *3/02*
U.S. Cl. 51—309 **20 Claims**

1. A cleaning and polishing composition for metals, comprising
(a) from about 0.25 to about 0.35 wt. % of a flour component, comprising unrefined wheat flour, the wt. % being based on the finished cleaner and polish composition,
(b) from about 77 to about 82 wt. % of a mineral spirits component, comprising a hydrotreated middle petroleum distillate of C_{14}–C_{18} isoparaffinic hydrocarbons, the wt. % being based on the finished cleaner and polish composition, and
(c) from about 18 to about 23 wt. % of an abrasive component comprising a metal oxide, the wt. % being based on the finished cleaner and polish composition.

4,853,001

POROUS INORGANIC SILICEOUS-CONTAINING GAS ENRICHING MATERIAL AND PROCESS OF MANUFACTURE AND USE

Joseph J. Hammel, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 872,342, Jun. 6, 1986, abandoned. This application Dec. 1, 1987, Ser. No. 127,352
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—16 **39 Claims**

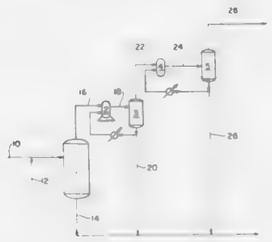
1. A process of enriching at least one gas from a mixture of gases utilizing a porous, silica-rich membrane material comprising:
using at least one hollow, porous, silica-rich, inorganic hydrophilic fiber that is non-crystalline as a porous separation membrane, where the fiber has pore sizes within the range of 1 to around 50 Angstroms in diameter and has a predominant percentage of pore volume comprised of average pore diameters of around 25 Angstroms or less and has a fiber diameter in the range of around 1 to 250 microns and has a wall thickness in the range of around 1 to 50 microns, wherein the silica-rich fiber results from extracting at least 15 weight percent extractable components selected from the group consisting of: (a) components extractable with acids, where the acids are other than hydrofluoric acid, (b) water extractable components, or (c) a mixture thereof, from non-phase-separated, hollow glass fibers formed by attenuation from melt at speeds in the range of at least 500 ft/min to around 30,000 ft/min, where the non-phase-separated glass fibers have a composition selected from the group consisting of: (a) leachable, single-phase, fiberizable, glass compositions; and (b) leachable, phase-separable but non-phase-separated fiberizable silica-containing glass compositions, both having at least 15 to about 60 weight percent components selected from the group consisting of components soluble in acids, where the acids are other than hydrofluoric acid, water soluble components, and mixtures thereof whereby membrane performance in terms of selectivities and permeabilities in gas enrichment can be enhanced over that performance predicted from Knudsen diffusion calculations.

4,853,002

PROCESS FOR REMOVING HYDROGEN SULFIDE FROM WASTE WATER

Joseph L. Niedzwiecki, Fanwood, and Ralph G. Wolfe, East Brunswick, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 849,129, Apr. 7, 1986, abandoned. This application Apr. 15, 1988, Ser. No. 181,828
Int. Cl.[4] C02F *1/20*
U.S. Cl. 55—19 **5 Claims**



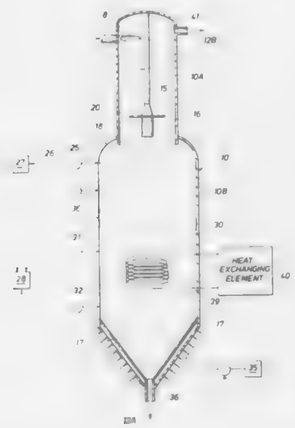
1. A process for removing hydrogen sulfide from a water stream, derived by separating water from crude oil at the production well, said water stream comprising hydrogen sulfide or a hydrogen sulfide precursor and a concentration of at least about 1000 mg/L of a Group IIA metal component of the Periodic Table of Elements, which process comprises the steps of: (a) maintaining said water stream at a temperature ranging from about 150° F. to about 200° F. and at a pH ranging from about 5 to about 6; (b) subjecting the water stream resulting from step (a), in the absence of a stripping gas, to a pressure ranging from about 3 to about 10 psia, whereby at least a portion of said hydrogen sulfide is removed by volatilization from said water stream and whereby salt deposition is minimized.

4,853,003

REMOVAL OF PARTICULATES FROM SYNTHESIS GAS

Thomas S. Dewitz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 18, 1987, Ser. No. 98,178
Int. Cl.[4] B01D *45/12*
U.S. Cl. 55—20 **20 Claims**



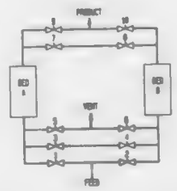
11. A method for separating fine particulates mixed with gas and stripping interstitial and adsorbed gases therefrom under elevated temperature and pressure conditions, said method comprising:
introducing said mixture tangentially into a first containing means, said first containing means having upper and lower portions;
separating said mixture into two streams, a first stream being mostly particulates forming a bed in said containing means prior to discharge therefrom, and a second stream being mostly gas;
stripping interstitial and adsorbed gases from said particles;
controlling a temperature of said first stream in said first containing means by adjusting the height of said particulate bed; and
discharging said first and second streams separately from said first containing means, said second stream being discharged through a small diameter outlet.

4,853,004

METHOD FOR DENSELY PACKING MOLECULAR SIEVE ADSORBENT BEDS IN A PSA SYSTEM

Robert H. Kaplan, New City, N.Y.; Alberto LaCava, South Plainfield, N.J.; Arthur I. Shirley, New Providence, N.J., and Steven M. Ringo, Springtown, N.J., assignors to The BOC Group, Inc., Murray Hill, N.J.

Filed Jan. 20, 1988, Ser. No. 146,017
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—25 **6 Claims**



1. In a system for enrichment of one or more components of a gas mixture by pressure swing adsorption comprising at least one adsorbent bed and means to pass the gas mixture through the bed under pressure, said bed containing coarse particles of carbon molecular sieve, the improvement wherein said bed also contains, as an inert material, glass beads wherein the coarse particles have an average diameter of 1 to 7 mm and the glass beads are between about 40 and 80 mesh, the ratio of the smallest dimension of the coarse particles to the largest dimension of the glass beads is between about 5:1 and 15:1 and the glass beads comprise from about 10 to 50 percent by volume of the bed.

4. A process for enriching a gas stream in a primary product gas comprising introducing said gas stream into a pressure swing adsorption system including at least one adsorbent bed containing coarse particles of carbon molecular sieve and from about 10 to 50 percent by volume of an inert material consisting of glass beads between about 40 and 80 mesh wherein the coarse particles of carbon molecular sieve have an average diameter of 1 to 7 mm and the ratio of the smallest dimension of the coarse particles to the largest dimension of the glass beads is between about 5:1 to 15:1.

4,853,005

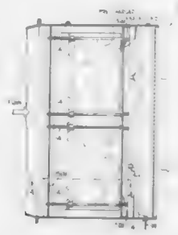
ELECTRICALLY STIMULATED FILTER METHOD AND APPARATUS

Rajan A. Jaisinghani, Midlothian; Thomas A. Hamade, Richmond, both of Va., and Clyde W. Hawley, Fairport, N.Y., assignors to American Filtrona Corporation, Richmond, Va.

Continuation of Ser. No. 785,757, Oct. 9, 1985, abandoned. This application May 11, 1987, Ser. No. 48,452

Int. Cl.[4] B03C *3/00*

U.S. Cl. 55—132 24 Claims



1. An electrically stimulated filter assembly for separating suspended particles from a flowing fluid stream comprising:

a filter housing having an upstream end for admitting said fluid stream into said filter housing, a downstream end for discharging said fluid stream from said filter housing, and a filter flow path through said filter housing from said upstream end to said downstream end;

an electrically non-conductive filter means disposed in said filter flow path such that substantially said entire fluid stream passes through said filter means;

a first and a second electrode which are perforated plates disposed in said filter housing at the upstream and downstream sides, respectively, of said filter means;

a first insulative spacer means for establishing a first air gap preventing physical contact between said first electrode means and said filter means; and

a second insulative means for establishing a second air gap preventing physical contact between said second electrode means and said filter means;

said filter housing including a frame of electrically conductive material, wherein said first electrode means is disposed proximate said upstream end in electrically conductive relation to said frame, and wherein said second electrode means is disposed proximate said downstream end, said assembly further comprising mounting means for securing said second electrode means to said frame in electrically insulated relation to said frame;

said frame includes a lip at said downstream end to define a downstream outlet having predetermined length and width dimensions, said lip having upstream and downstream facing surfaces;

wherein said second electrode means which is a perforated plate has length and width dimensions which are smaller than said predetermined length and width dimensions, respectively;

said mounting means comprising first and second elongated support members of insulative material having a length slightly greater than said predetermined width but smaller than the width of said frame, said support members having a thickness dimension defined between upstream-facing and downstream-facing sides of said support members, said upstream-facing side being secured to said second perforated plate, said downstream-facing side being secured to said upstream-facing surface of said lip to extend width-wise across said downstream outlet;

whereby said second perforated plate is supported within said frame spaced from said downstream outlet by the thickness of said support members; and

whereby filtering efficiency is not significantly affected by increase in humidity in said fluid stream due to the presence of said air gap.

4,853,006

LIQUID DEAERATING APPARATUS

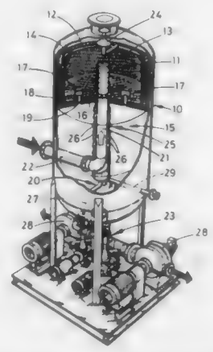
Keith Mangnall, Bolton, United Kingdom, assignor to Hick, Hargreaves & Company Limited, United Kingdom

Filed Jun. 13, 1988, Ser. No. 206,104

Claims priority, application United Kingdom, Oct. 21, 1987, [illegible]

Int. Cl.[4] B01D *19/00*

U.S. Cl. 55—185 6 Claims



1. A liquid deaerating apparatus comprising a deaerating tank housing a spray-type deaerator having spray nozzle means for spraying the liquid to be deaerated horizontally against a surrounding liquid spray impingement absorbing and contacting means below which is disposed packed bed means though which the liquid passes to a collection area within the deaerating tank, and vacuum applying and maintaining system is connected to the deareating tank and comprises a vacuum applying plant associated with an air, gas and water vapour extraction pipe surrounding the liquid inlet pipe and open to the packed bed.

4,853,007

SOOT RESERVOIR FOR AN EXHAUST GAS SCRUBBING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

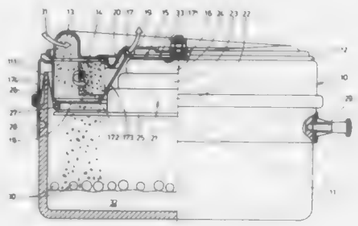
Rolf Leonhard, Schwieberdingen, and Peter Schütz, Herdecke, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 26, 1988, Ser. No. 236,708

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731233

Int. Cl.[4] F01N *3/02*

U.S. Cl. 55—337 17 Claims



1. A soot reservior for an exhaust gas scrubbing system of an internal combustion engine, in particular a Diesel engine, comprising a housing having an inlet for introducing a soot-laden carrier flow diverted from a exhaust gas flow and an outlet for escape of the scrubbed carrier flow, a soot filter disposed in said housing between the inlet and the outlet, a collecting chamber disposed below the soot filter to receive the soot separated by the filter, and a plurality of compacting ball means (30) disposed loosely in the collecting chamber for densifying the collected soot (11).

4,853,008

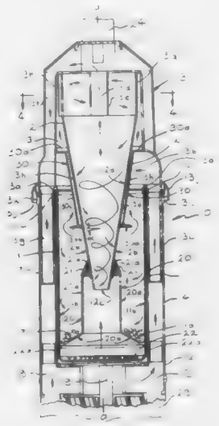
COMBINED DISC AND SHROUD FOR DUAL CYCLONIC CLEANING APPARATUS

James Dyson, Bathford, England, assignor to Notetry Limited, Bristol, England

Filed Jul. 27, 1988, Ser. No. 224,694

Int. Cl.[4] B01D *45/12*

U.S. Cl. 55—345 28 Claims



1. In a cleaning apparatus including an outer container comprising a bottom and a sidewall extending to and meeting the bottom, the sidewall having an interior surface, a dirty air inlet which is oriented for supplying dirt laden air into the container tangentially to the interior surface of the outer container which has a circular cross-section and an air outlet from the container; a circular cross-sectioned cyclone having a longitudinal axis mounted inside the container, the cyclone comprising a cyclone air inlet at an upper end having a first diameter of the cyclone in air communication with the air outlet of the container, an interior dirt rotational surface of frusto-conical shape for receiving an air flow from the air inlet and for maintaining its velocity to a cone opening smaller in diameter than the diameter of the upper end of the cyclone, the air inlet being oriented for supplying air tangentially to the surface, an outer surface of frusto-conical shape, and a cyclone air outlet communicating with the interior of the cyclone adjacent the upper end of the cyclone; a dirt receiving and collecting chamber extending from the cone opening; and means for generating an air flow which passes sequentially through the dirty air inlet, the container, the cyclone air inlet, the cyclone, the receiving chamber and the cyclone air outlet, the air flow rotating around the frusto-conical interior surface of the cyclone and depositing the dirt in the receiving chamber the improvement which comprises:

(a) a shroud means mounted on and around the outer surface of the cyclone and having opposed ends along the longitudinal axis and providing for outlet air from the container into the air inlet to the cyclone wherein the shroud means is mounted at one end below the air inlet to the cyclone and extends along the outer surface with the other end at a position intermediate to the cone opening and the air inlet to the cyclone, wherein the shroud means contacts the outer surface of the cyclone for closure at the other of the ends and wherein the shroud means has perforations adjacent to the position intermediate to the cone opening for the flow of air from the outer container to the cyclone inlet; and

(b) disc means provided on the shroud means at a lower longitudinal extent of the shroud means and the air inlet of the cyclone and around the axis of the cyclone with a space between the interior surface of the container and the disc means for passage of air, wherein the disc means aids in dirt removal in the first container by preventing some of the dirt from flowing into the air inlet to the cyclone.

4,853,009

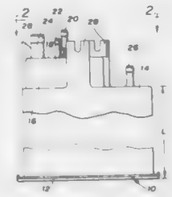
MULTI ORIENTATION FUEL VAPOR STORAGE CANISTER ASSEMBLY

Kenneth W. Turner, Webster; Richard H. Simons, Jr., and Gordon R. Paddock, both of Rochester, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 31, 1988, Ser. No. 238,789

Int. Cl.[4] B01D *39/00*

U.S. Cl. 55—387 3 Claims



1. A fuel vapor storage canister assembly kit capable of multi orientation installation in a vehicle, comprising,

an elongated canister body having a generally rectangular cross section of differing thickness and width,

a bed of fuel vapor adsorbent material for said canister to define an adsorbent surface proximate one end of said canister body,

a generally box shaped trap housing located at said one end of said canister body and having an end wall spaced from and generally parallel to said adsorbent surface, said housing end wall further including a centrally located purge opening and a vapor fill opening located near a corner of said end wall so that, for multiple possible installation orientations of said canister body, including upright, reclining with vertically oriented thickness, and reclining with vertically oriented width, said fill opening may be located at a high point relative to said trap housing and said purge opening will remain at a central location, and,

a series of modular fuel trap subassemblies of sizes to fit within said trap housing, one for each desired installation orientation of said canister body, each trap subassembly having a catch basin oriented beneath said trap housing fill opening so as to collect any liquid fuel entering said trap housing and a purge tube including an outlet sized to plug into said trap housing purge opening,

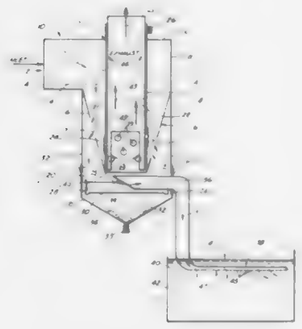
whereby, for any desired installation orientation, the appropriate fuel trap subassembly may be chosen from the kit and fitted within said trap housing before the addition of said adsorbent material, allowing multiple installation orientations with a single canister body.

4,853,010

MULTI STAGE GAS SCRUBBER

Billy F. Spence, deceased, late of Houston, Tex.; by Eva L. Spence, legal representative, 8202 Research Blvd., No. 207, Austin, Tex. 78758, and Jesus F. Balandrano, deceased, late of Monterrey, Mexico (Julia Balandrano, legal representative)

Filed Sep. 12, 1984, Ser. No. 650,240
Int. Cl.[4] B03C *3/36;* B01D *47/02;* B04C *5/13*
U.S. Cl. 55—122 6 Claims



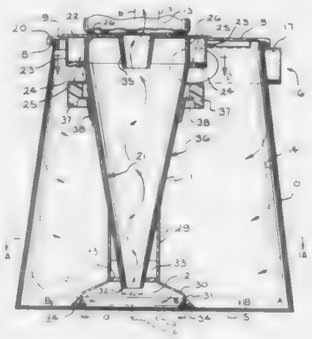
1. A gaseous stream pollution control apparatus comprising:
a. a cylindrical housing having a curved outer vertical wall for confining therewithin a gaseous stream to be treated;
b. a flow inlet communicating with the housing for introducing the gaseous stream into the upper end portion of said housing, the inlet having an axis of flow tangentially placed so that the gaseous stream entering the housing tracks a circular flow path;
c. a primary flow outlet for discharging a primary gaseous component from the lower end portion of the housing;
d. a vortex tube having a vertical central bore and being centrally positioned in the housing and extending below the flow inlet so that the circular flow path surrounds the vortex tube;
e. a secondary outlet positioned at the top of the vortex tube for discharging a secondary gaseous component from the housing via the bore of the vortex tube;
f. at last one passage opening in the bottom portion of the vortex tube for allowing gas flow between the circular flow path and the bottom of the vortex tube bore;
g. repelling means associated with the passage means for repelling particulate matter which attempts to flow from the circular path to the vortex tube; an inverted frustrum shaped baffle having an opening therethrough, and connected at its upper edge in the top of said housing below the inlet and at its lower end to the vortex tube below the passages in the vortex tube thereby dividing the housing into an upper end portion above the baffle and a lower end portion below the baffle said opening allowing particulate matter under the influence of gravity that is sliding downwardly on the wall of the baffle to enter the lower end portion of the housing; and
i. trap means for collecting particulate matter which falls from said baffle to the lower end portion of said housing.

4,853,011

VACUUM CLEANING APPARATUS

James Dyson, Bathford, England, assignor to Notetry Limited, Bristol, England

Division of Ser. No. 628,346, Jul. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 452,917, Dec. 27, 1982, abandoned, which is a continuation of Ser. No. 274,252, Jun. 16, 1981, abandoned. This application Mar. 10, 1988, Ser. No. 166,402
Claims priority, application United Kingdom, Jun. 19, 1980, 8020041; Aug. 8, 1980, 8025960; Sep. 25, 1980, 8030964; Sep. 26, 1980, 8031121
Int. Cl.[4] B01D *45/12*
U.S. Cl. 55—345 9 Claims



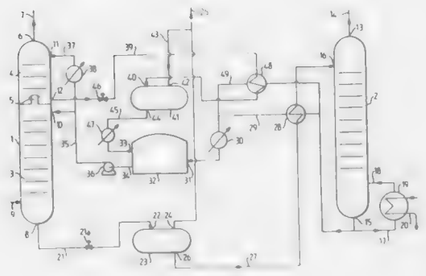
1. A cleaning apparatus comprising:
(a) an outer container comprising a bottom and a sidewall extending to and meeting the bottom wherein the sidewall is tapered outwardly towards the bottom, the sidewall having an interior surface, a dirty air inlet at an upper portion of the outer container spaced from the bottom and is oriented for supplying dirt laden air into the container tangentially to the interior surface of the outer container which has a circular cross-section and an air outlet from the container at the upper portion of the container;
(b) a circular cross-sectioned cyclone with a longitudinal axis mounted inside the container, the cyclone comprising a cyclone air inlet at an upper end having a first diameter of the cyclone in air communication with the air outlet of the container, an interior dirt rotational surface of frusto-conical shape for receiving an air flow from the air inlet and for maintaining its velocity to a cone opening smaller in diameter than the diameter of the upper end of the cyclone, the cyclone air inlet being oriented for supplying air tangentially to the surface, an outer surface of frusto-conical shape, and a cyclone air outlet communicating with the interior of the cyclone adjacent the upper end of the cyclone;
(c) a dirt receiving and collecting chamber extending from the bottom of the container to a portion of the outer surface of the cyclone such that a portion of the cyclone projects into the receiving chamber wherein the receiving chamber has a circular cross-sectioned inner tapered surface around the axis of the cyclone having frusto-conical shape increasing in diameter away from the cone opening and cyclone with a minimum diameter furthest from the opening of 3 times the diameter of the cone opening; and
(d) means in communication with the dirty air inlet and the cyclone air outlet for generating an air flow which passes sequentially through the dirty air inlet, the container, the cyclone air inlet, the cyclone, the receiving chamber and the cyclone air outlet, the air flow rotating around the frusto-conical interior surface of the cyclone and the inner tapered surface of the receiving chamber and depositing the dirt in the receiving chamber.

4,853,012

PROCESS AND DEVICE FOR DEACIDIFICATION OF A GAS CONTAINING H_2S AND/OR CO_2 AND MERCAPTANS

Jacques Batteux, and Ahmad Sharonizadeh, both of Morlaas, France, assignors to Societe Nationale ELF Aquitaine, Courbevoie, France

PCT No. PCT/FR87/00248, § 371 Date Feb. 25, 1988, § 102(e) Date Feb. 25, 1988, PCT Pub. No. WO88/00085, PCT Pub. Date Jan. 14, 1988
PCT Filed Jun. 26, 1987, Ser. No. 171,003
Claims priority, application France, Jun. 30, 1986, 86 09450
Int. Cl.[4] B01D *53/14*
U.S. Cl. 55—44 17 Claims



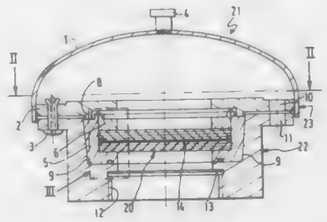
1. In a process for the deacidification of a gas containing H_2S and/or CO_2 and mercaptans wherein the gas to be treated is contacted countercurrently with a regeneratable absorbent liquid in a primary absorption zone to produce a gas having a reduced content of H_2S and CO_2 and a primary stream of absorbent liquid charged with H_2S and CO_2, and said primary stream of absorbent liquid is subjected to regeneration in a regeneration zone to release the H_2S and CO_2 acid compounds that have been absorbed, to produce a primary regenerated absorbent liquid that is recycled to the primary absorption zone, the improvement which comprises: separating a fraction of the recycled, primary regenerated absorbent liquid; cooling the separated fraction of recycled primary absorbent liquid to a temperature below the temperature of the primary absorption zone; introducing the cooled separated fraction into a secondary absorption zone at the upper part thereof; injecting the gas from the primary absorption zone into the lower part of the secondary absorption zone; countercurrently contacting the gas from the primary absorption zone with the separated fraction to remove mercaptans and produce a purified gas; collecting the purified gas from the secondary absorption zone; removing a secondary stream of absorbent liquid charged with mercaptans from the secondary absorption zone; reducing the pressure on the secondary absorbent liquid in an expansion zone to deabsorb the mercaptans and form a secondary regenerated absorbent liquid substantially free of mercaptans; mixing said secondary regenerated absorbent liquid with the primary regenerated absorbent liquid prior to separating the fraction of the primary regenerated absorbent liquid introduced into the secondary absorption zone.

4,853,013

FILTERING STRUCTURE FOR A VENT DEVICE AND DEVICE INCLUDING SAID STRUCTURE

Michel Rio, Arzon; Claude Iltis, Saint-Leu-la-Foret; Hervé Louis, Chalon-sur-Saone; Georges Buffet, Saint Marcel; Marcel Joly, Chatenoy-le-Royal; Jean-Francois Goudard, Chalon-sur-Saone; Joël Bacherot, Givry, and Claude Ducret, Buxy, all of France, assignors to L'Air Liquide, Societe Anonyme Pour L'etude et Exploitation des Procedes Georges Claude, Paris, France

Filed Feb. 17, 1988, Ser. No. 158,140
Claims priority, application France, Feb. 17, 1987, 87 01990
Int. Cl.[4] B01D *29/00;* B65D *51/16*
U.S. Cl. 55—159 17 Claims



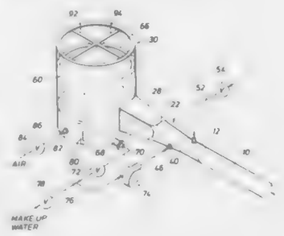
1. Filtering structure for a vent device of a liquid container, comprising at least two rigid outer elements which are gas- and liquid-permeable and have confronting parallel bearing surfaces, and a gas-permeable, liquid-impermeable intermediate element maintained in a static position between said bearing surfaces of said rigid elements, said intermediate element comprising: at least one gas-permeable, liquid-impermeable first filter, said first filter having a first face in contact with one of said bearing surfaces and a second face opposed to said first face an having a peripheral region; a liquid-impermeable peripheral seal made of a material which flows under pressure and disposed on said peripheral region and defining an interior surface; and a gas-permeable, liquid-impermeable second filter disposed on said second face of said first filter, said second filter having a peripheral surface an having a first thickness, in coincidence with said interior surface of said peripheral seal, said seal having a second thickness which, at rest, is greater than said first thickness.

4,853,014

METHOD AND APPARATUS FOR CLEANING CONDUITS

Christopher J. Bloch, Kingwood, Tex., assignor to Naylor Industrial Services, Inc., Pasadena, Tex.

Filed Jul. 27, 1987, Ser. No. 78,127
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—185 17 Claims



1. An exhaust apparatus for venting high velocity steam, such apparatus connected to at least one outlet of a conduit

system for carrying steam from a boiler to at least one remote location, such steam passing through the conduit system at near sonic velocities and causing cavitation at the internal wall surfaces of said conduit system comprising:

(a) first expander means having an inlet and an outlet;

(b) piping connected for fluid flow with at least one of said outlets of said conduit system and said inlet of said first expander means to direct passage of said stem from said boiler through said conduit system to said first expander means, said piping having a cross-sectional dimension at least equal to the cross-section dimension of said outlet of said conduit system;

(c) said inlet of said first expander means having a cross-sectional dimension at least equal to the cross sectional dimension of said outlet of said conduit system;

(d) said outlet of said first expander means having a cross-sectional dimension greater than the cross-sectional dimension of said inlet of said first expander means; and

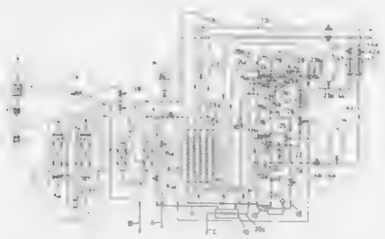
(e) first fluid injection means for injecting a dispersion of fluid into said first expander means to cool and decelerate said steam and to prevent creation of a sonic compression wave downstream of said outlet of said conduit system.

4,853,015

HIGH PURITY NITROGEN AND OXYGEN GAS PRODUCTION EQUIPMENT

Akira Yoshino, Osaka, Japan, assignor to Daidousanso Co., Ltd., Osaka, Japan

Continuation of Ser. No. 926,417, Oct. 14, 1986, abandoned. This application Oct. 14, 1988, Ser. No. 258,063
Claims priority, application Japan, Feb. 2, 1985, 60-29042
Int. Cl.[4] F25J 1/02
U.S. Cl. 62—40 2 Claims



1. An apparatus for manufacturing highly pure nitrogen and oxygen gas consisting essentially of an air-compressing means for compressing outside air, a removing means for removing carbon dioxide gas and water in the air compressed by said air compressing means, a heat-exchanging means for cooling the compressed air from the above removing means to supercold temperature, a liquid nitrogen-storing means for storing liquid nitrogen supplied from outside of the apparatus, a nitrogen-distilling tower in which apart of the compressed air chilled at supercold temperature by the above heat-exchanging means is liquefied to store it inside while only nitrogen is maintained in its gaseous state, liquid nitrogen introducing means for introducing liquid nitrogen from the above storing means for nitrogen gas into the above nitrogen distilling tower as the refrigerant for liquefying the compressed air, an outlet for nitrogen gas provided in the nitrogen-distilling tower in which gaseous nitrogen from the liquid nitrogen refrigerant and gaseous nitrogen produced in the above nitrogen distilling tower are taken out as a nitrogen gas from the above nitrogen distilling tower, an oxygen distilling tower in which nitrogen and oxygen are separated from liquid air utilizing the difference between their boiling points, a liquid air supplying means for supplying liquid air remaining in the nitrogen distilling tower to the oxygen distilling tower, a storing means for storing liquid oxygen supplied from outside of the apparatus, liquid oxygen introducing means for introducing liquid oxygen from the liquid oxygen-storing means into the oxygen distilling tower as the refrigerant, and liquid oxygen gas outlet means for removing both oxygen gas separated from the liquid air utilizing the difference between boiling points of oxygen and nitrogen and oxygen gas from the liquid oxygen refrigerant from the oxygen distilling tower.

4,853,016

PROCESS FOR CONSOLIDATION OF SILICON MONOXIDE FINES

Chad I. Stevens, Stratham, N.H., and Edward D. Parent, Hamilton, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 8, 1988, Ser. No. 229,679
Int. Cl.[4] C03B 5/00
U.S. Cl. 65—18.1 5 Claims

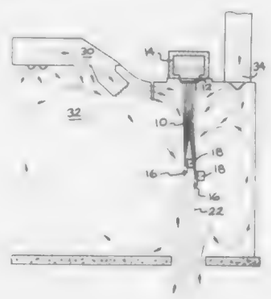
1. The process of consolidating silicon monoxide fines for use in vapor deposition comprising the steps of screening silicon monoxide granular material to separate out grains finer than 10 mesh, and vacuum hot pressing the minus 10 mesh silicon monoxide material at a high enough temperature and pressure to form a glass billet.

4,853,017

METHOD AND APPARATUS FOR THE ENVIRONMENTAL CONTROL OF FIBER FORMING ENVIRONMENT

Douglas J. Eberle, West Bloomfield, Mich., and Scott R. Northrup, Pickerington, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 129,265, Dec. 7, 1987, abandoned. This application Dec. 30, 1988, Ser. No. 292,592
Int. Cl.[4] C03B 40/04, 37/012
U.S. Cl. 65—2 10 Claims



1. An apparatus for the production of glass fiber comprising in combination:

a bushing member for receiving molten glass from a glass melt furnace, said bushing member having a plurality of discharge orifices for providing a plurality of streams of molten glass for attenuation into filaments;

a forming means for conditioning and attenuating such filaments;

a winding means for processing such attenuated filaments;

a housing member engaged with said bushing member, said housing member including side wall members positioned on opposed sides of said discharge orifices and a back wall positioned between said side wall members, wherein said side wall members extend from said bushing to a point just below said forming means and said back wall extends from said bushing generally angularly toward said forming means ending at a location closely proximate said forming means without engaging such attenuating filaments, whereby said side walls and said back wall seal off the fiber attenuation area between said bushing and said forming means to prevent the introduction of air and particulate from anywhere outside said housing into said fiber attenuation area; and

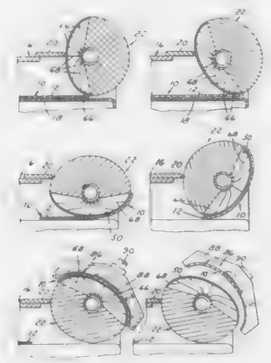
air ducts within said housing member for supplying clean air across such attenuating filaments in said fiber attenuation area.

4,853,018

METHOD AND APPARATUS FOR FORMING A GLASS SHEET

George A. Koss, Dearborn Heights, and Gary W. Sitzman, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 124,189, Nov. 23, 1987, abandoned, Ser. No. 124,190, Nov. 23, 1987, abandoned, Ser. No. 124,240, Nov. 23, 1987, abandoned, and Ser. No. 124,317, Nov. 23, 1987, abandoned. This application Sep. 27, 1988, Ser. No. 249,811
Int. Cl.[4] C03B 11/07, 23/035
U.S. Cl. 65—94 25 Claims



1. A method of forming a glass sheet from a first condition into a second condition, said glass sheet having a selected thickness with first and second surfaces and having a selected peripheral configuration defining a peripheral edge, which forming method comprises the steps of:

heating said glass sheet to a temperature at which said glass sheet is formable from said first condition to said second condition;

conveying said heated glass sheet by conveying means at a selected velocity along a path of travel to a forming station comprising a rotatable glass former including means defining an outer peripheral forming surface having at least a portion thereof with a defined shape substantially corresponding to said second condition of said glass sheet, said outer peripheral forming surface being in communication with a source of reduced pressure, wherein a leading edge of said glass sheet is brought into registered contact with a leading portion of said peripheral forming surface while said peripheral forming surface is being rotated by rotating means about an axis substantially transverse to said path of travel at a peripheral velocity substantially equivalent to said selected velocity; and

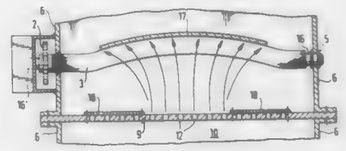
progressively moving said first surface into close proximity with said defined shape portion of said outer peripheral forming surface, said glass sheet there being transformed into said second condition at least in part by external fluid pressure acting against said second surface while reduced pressure acts against said first surface and while said peripheral forming surface continues rotating.

4,853,019

METHOD FOR THE TRANSPORTATION OF GLASS SHEETS BROUGHT TO THE DEFORMATION TEMPERATURE, ITS APPLICATION TO BENDING AND DEVICE FOR ITS IMPLEMENTATION

Kurt Blank, Aachen; Friedrich Halberschmidt, Herzogenrath; Heinz-Josef Reinmold; Josef Audi, both of Aachen; Jakob Kaesmacher, Stolberg; Ralf Reinicke, and Udo Niedenhoff, both of Cologne, all of Fed. Rep. of Germany, assignors to Saint Gobain Vitrage, Neuilly sur Seine, France

Filed Sep. 30, 1983, Ser. No. 537,674
Claims priority, application France, Oct. 11, 1982, 82 16969
Int. Cl.[4] C03B 23/035
U.S. Cl. 65—106 14 Claims



1. A method for the transportation of a glass mass disposed in substantially horizontal plane on a conveyor system along a path in a heating oven of a bending station to improve the bending of said glass mass, said method comprising providing a driving rotational input to a plurality of rollers of said conveyor system along said path, said rollers of said conveyor system comprising a family of rollers each formed to one of a concave or convex configuration along their length across said heating oven and of an outline substantially complementary to the configuration to which the glass mass is to be bent, and substantially simultaneously impinging a gaseous flow throughout the width of the lower surface of said glass mass, said gaseous flow impinging on said lower surface at a flow speed and pressure which varies continuously over said width to balance a part of the weight of said glass mass and support predetermined areas of said glass mass across said width with different values of dynamic pressure whereupon areas of said glass mass contact said rollers over a period of contact longer than the period of contact of other areas across said width which are permitted to move toward said rollers under forces of gravity.

9. Apparatus for transporting a glass mass through a heating oven along a path from an upstream to a downstream location of a bending station while said glass mass is permitted to bend in a direction transverse to said direction of movement along said path, comprising a conveyor system formed by a plurality of rollers extending across said path for supporting said glass mass in transit, said rollers of said conveyor system comprising a family of rollers each formed to one of a concave or convex configuration along their length across said heating oven and of an outline substantially complementary to the configuration to which the glass mass is allowed to bend, a chamber below said path adapted for connection in a recirculating flow system for a gas under pressure, and means between said chamber and conveyor system for adjusting a pressurized gaseous flow along specific areas in a spread of dynamic pressure to balance a part of the weight of said glass mass and support predetermined areas of said glass mass across its width with different values of dynamic pressure whereupon areas of said glass mass contact said rollers over a period of contact longer than the period of contact of other areas across said width which are permitted to move in bending movement toward said rollers under forces of gravity.

4,853,020

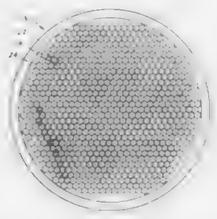
METHOD OF MAKING A CHANNEL TYPE ELECTRON MULTIPLIER

Ronald A. Sink, Roanoke, Va., assignor to ITT Electro Optical Products, A Division of ITT Corporation, Roanoke, Va.

Continuation of Ser. No. 781,842, Sep. 30, 1985, abandoned. This application Jan. 25, 1988, Ser. No. 147,068

Int. Cl.[4] C03C *25/06*

U.S. Cl. 65—4.1 11 Claims



1. A method of forming a fused structure for making a microchannel plate comprising the steps of:

forming a plurality of optical fibers each having a core fabricated of an etchable material and a cladding fabricated of a non-etchable material surrounding the core;

positioning the plurality of optical fibers together to form an assembly;

placing the assembly into a tube;

fabricating a plurality of support rods solely of a non-etchable material and replacing the optical fibers along the longitudinal outer periphery of the assembly by the support rods in order to prevent distortion of the optical fibers during subsequent fabrication steps;

fusing together the assembly, support rods and tube to form a fused structure; and

removing the etchable material from the fused structure.

4,853,021

PROCESS AND APPARATUS FOR PRODUCING COATED SINGLE TWIST GLASS YARNS

Barbara Soszka, Chambery; Robert Federowsky, Aix-les-Bains, and Jacques Mahler, Chambery, all of France, assignors to Vetrotex Saint-Gobain, Chambery, France

Filed Dec. 2, 1987, Ser. No. 127,732

Claims priority, application France, Dec. 4, 1986, 86-16971

Int. Cl.[4] C03B *37/10;* C03C *25/02*

U.S. Cl. 65—2 29 Claims

1. A process for producing a single twist coated glass yarn which comprises;

drawing a plurality of fibers from a source of glass wherein said source is heated above a melting point of said glass

at least partially coating only an outer surface of said glass fibers, directly after said fibers exit said source, with a sizing coating capable of a polymerization and/or cross-linking reaction upon said surface;

gathering said coated fibers into a yarn;

imparting a continuous rotative twisting movement to said coated yarn; and



treating said coated yarn to polymerize and/or crosslink said sizing coating upon said surface.

4,853,022

APPARATUS FOR THE PRODUCTION OF HOLLOW GLASS BODIES

Hans-Dieter Renkl, Beuhlenhausen, and Rudi Waibel, Niederstotzingen, both of Fed. Rep. of Germany, assignors to Findag Corporation N.V., Netherlands

Filed Apr. 18, 1984, Ser. No. 601,631

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314584; Apr. 25, 1983, 3314960

Int. Cl.[4] C03B *40/02*

U.S. Cl. 65—170 23 Claims



1. A device for producing hollow glass bodies which comprise an axis, a trunk portion and a neck, the device comprising a molding cavity having an axis and an inner molding surface with a first portion corresponding to the trunk of the hollow glass body and a second portion corresponding to the neck of the hollow glass body, the first portion of the inner mold face being formed by two mold halves (72*a,* 72*b*) which in a basic position have abutting mold separating surfaces (72*c,* 72*d*) disposed in a mold separating plane which contains the axis of the molding cavity, the second portion of the inner face furthermore being formed by two mouth ring halves (74*a,* 74) which in a basic position abut with a mouth ring separating surface (74*c,* 74*d*) in a mouth ring separating plane which contains the axis of the molding cavity, each mouth ring half having a mouth ring connecting face (74*aa,* 74*ba*) bearing on mold connecting faces of the mold halves (72*a,* 72*b*) in a plane of connection which is substantially perpendicular to the axis

of the mold cavity, the two mold halves (72*a,* 72*b*) defining at their ends which are remote from the mold ring halves (74*a,* 74*b*) a filling aperture for a glass blob (82), the filling aperture being adapted to be closed by an occluding member (84), a blower (78) provided so as to be insertable between the mouth ring halves (74*a,* 74*b*), the mold halves (72*a,* 72*b*) being movable out of their position substantially at a right angle to the plane of mold separation, away from each other into an opening position in order to form between them a gap so that the relevant hollow glass body (82″) is removed through said gap from the mold cavity, the mold ring halves (74*a,* 74*b*) being movable together with the relevant hollow glass body (82″) out of their basic position, through the gap, to a transfer location in which they are movable away from each other substantially at a right angle to the plane of separation of the mouth rings and into a detachment position so that the hollow glass body (82″) can be passed over to receiving means (90), the mouth ring halves (74*a,* 74*b*) being returnable from the detachment position and the transfer location through the gap in the mold halves (72*a,* 72*b*) which are in the open position and back into their basic position, the mold halves (72*a,* 72*b*), after return of the mouth ring halves (74*a,* 74*b*) being likewise adapted to be returned to their basic position, spray means (10) furthermore being provided in order to spray the inner mold face with a lubricant and separating agent, a single nozzle part (13) being associated with the mold cavity, on the outside thereof, close to the axis of the mold and on the side of the mold halves (72*a,* 72*b*) which is towards the filling aperture, said nozzle part (12) serving both for spraying at least one part (72*e,* 72*f*) of the inner mold face and also for spraying at least one part of the mouth ring connecting faces (74*aa,* 74*ba*), the nozzle part (12) being connected to a control device (54) which provides one of two different control functions, namely a first control function which triggers a first sequence of spray pulses (24′) by the nozzle part (12) when the mold halves (72*a,* 72*b*) and the mouth ring halves (74*a,* 74*b*) are in their basic position, when the mold cavity is closed, so that essentially only the inner mold face is sprayed, and a second series of spray pulses (24) when the mouth ring halves (74*a,* 74*b*) assume their basic position but the mold halves (72*a,* 72*b*) are still in their open positions so that it is substantially only the mouth ring connecting faces (74*aa,* 74*ba*) which are subject to the spraying pulses (24), and a second control function which in each case triggers a single series of spray pulses (24) when the mouth ring halves (74*a,* 774*b*) are in their basic position and the mold halves (72*a,* 72*b*) are still not completely closed, so that at each spray pulse, both the inner mold face and also at least a part of the mouth ring connecting faces (74*aa,* 74*ba*) are sprayed.

4,853,023

GLASSWARE FORMING MACHINE

James A. Bolin, Tulsa, Okla., assignor to Liberty Glass Company, Sapulpa, Okla.

Filed Jun. 6, 1988, Ser. No. 202,977

Int. Cl.[4] C03B *9/353*

U.S. Cl. 65—323 11 Claims

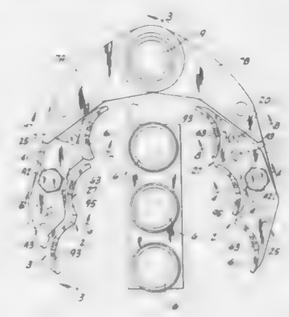
1. In a glassware forming machine comprising a pair of carriers each pivoted on a first generally vertical axis for swinging movement toward and away from each other between an open position and a closed position, and a set of at least three mold members carried by each carrier, each mold member on each carrier being related to a mold member on the other carrier so that, with the carriers in their said closed position, each mold member on one carrier mates with a mold member on the other carrier to define a mold cavity for molding an item of glass, the improvement comprising at least one holding assembly on each carrier for holding a respective set of mold members, said holding assembly comprising:

a first holder for holding one or more members of a respective set of mold members;

means mounting said first holder on a respective carrier for pivotal movement of said first holder and said one or more mold members held thereby relative to the carrier on a second vertical axis;

a second holder for holding the remaining mold members of a respective set of mold members; and

means mounting said second holder on said first holder for pivotal movement of said second holder and said remaining mold members held thereby on a third vertical axis relative to said first holder and said one or more mold members held thereby,



the arrangement being such that, as the carriers swing to their said closed position and respective mold members move into mating relationship, the first and second holders of said holding assemblies, and the mold members held thereby, are adapted to pivot about their respective second and third axes to final positions wherein substantially the same closing pressure is applied to each pair of mating mold members.

4,853,024

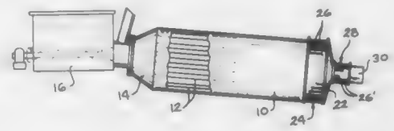
SCRAP RECOVERY APPARATUS

Stephen Seng, Bladensburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 17, 1988, Ser. No. 194,762

Int. Cl.[4] C03B *1/00*

U.S. Cl. 65—335 9 Claims



1. An apparatus for processing wet textile scrap glass into glass batch material comprising, in combination: a cylindrical member of specified circumference having an inlet frustum and an opposed outlet frustum; means for supplying preheated transfer media to said inlet frustum; means for supplying scrap glass to said inlet frustum to mix with such heated transfer media in said inlet frustum; means for rotating said cylindrical member thereby causing such mixture of scrap glass and heated transfer media to move toward said outlet frustum as such scrap glass is ground and heated by such heated transfer media; a first rod grating for separating such heated and ground scrap glass from such transfer media, said fist rod grating including a plurality of rod members axially aligned and spaced about such circumference of said cylindrical member immediately proximate said outlet frustum, such spacing of said rod members forming openings which are less than the diameter of such transfer media and providing an opening in said cylinder from the interior to the exterior of said cylinder; a second rod grating also proximate said outlet frustum and extending axially from the minor circumference of said outlet

frustum in a direction away from said cylindrical member, said second rod grating including a second set of rod members oriented axially and spaced to form openings smaller than the diameter of such transfer media; and means for transporting such transfer media from said outlet frustum to said supply means for reheating.

4,853,025

BENZYLSULFONYLUREAS AND ARYLSULFAMOYLUREAS

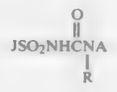
Robert J. Pasteris, and Mark E. Thompson, both of Wilmington, Del., assignors to E. I. Du Pont de Nemour and Company, Wilmington, Del.

Division of Ser. No. 886,151, Jul. 16, 1986, Pat. No. 4,746,355, which is a division of Ser. No. 686,796, Dec. 26, 1984, Pat. No. 4,609,395, which is a division of Ser. No. 585,170, Mar. 1, 1984, abandoned. This application Feb. 16, 1988, Ser. No. 156,007

Int. Cl.[4] A01N *43/54;* **C07D** *417/12*

U.S. Cl. 71—91 **15 Claims**

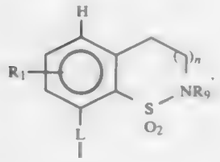
1. A compound of the formula



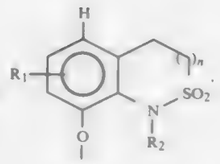
I

wherein

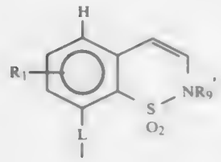
J is selected from



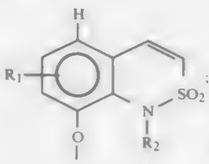
J_1



J_5



, and



;

J_7 J_{10}

n is 0 or 1;

L is CH_2 or O;

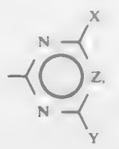
R is H or CH_3;

R_1 is H, F, Cl, Br, CH_3 or OCH_3;

R_2 is H or C_1–C_3 alkyl;

R_9 is H, OH, C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_1–C_6 alkoxyalkyl, C_3–C_6 alkenyl, C_3–C_6 alkynyl, C_1–C_6 alkoxy, phenyl, C_3–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl, C_1–C_6 alkylcarbonyl, C_1–C_6 alkoxycarbonyl, benzyl, C_3–C_4 haloalkenyl, C_3–C_6 haloalkynyl, C_3–C_6 alkylcarbonylalkyl, C_3–C_6 alkoxycarbonylalkyl or C_1–C_4 cyanoalkyl;

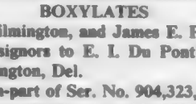
A is



A-1

X is CH_3, OCH_3, Cl, Br, OCH_2CF_3 or OCF_2H;

Y is C_1–C_3 alkyl, CH_2F, cyclopropyl, C≡CH, OCH_3, OC_2H_5, OCH_2OCH_3, NH_2, $NHCH_3$, $N(CH_3)_2$, OCH_2CH_2F, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$, $CR(OCH_3)_2$,



$CR(OCH_2CH_3)_2$ or OCF_2H;

Z is CH; and

provided that

when X is Cl or Br, then Y is OCH_3, OC_2H_5, $NHCH_3$, $N(CH_3)_2$ or OCF_2H.

11. A method for the control of undesirable vegetation comprising applying to the locus of such vegetation an herbicidally effective amount of a compound of claim 1.

4,853,026

HERBICIDAL EMULSIONS

Gerhard Frisch, Wehrheim, and Konrad Albrecht, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 30, 1987, Ser. No. 44,444

Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614788

Int. Cl.[4] A01N *25/22*

U.S. Cl. 71—86 **4 Claims**

1. A herbicidal composition comprising an aqueous phase containing a water-soluble salt of a herbicide selected from the group consisting of glufosinate and glyphosate;

an organic phase containing a herbicide being soluble in organic solvents, said herbicide selected from the group consisting of metolachlor, linuron, monolinuron and alachlor; and

a surfactant mixture comprising 0.1 to 4.5% by weight of a phenylsulfonate salt, 1.0 to 10.0% by weight of an ethoxylated alkylphenol phosphate or polyarylphenol phosphate, 0.1 to 2.0% by weight of an ethoxylated acidic phosphoric acid ester and 1.0 to 8.0% by weight of an alkylphenol polyglycol ether,

wherein the total amount of (a) the herbicides is 1 to 60% by weight, (b) the surfactant mixture is 3 to 30% by weight and (c) the solvent is 0 to 75% by weight, all the above weight ratios based on the total weight of the composition.

4,853,027

PHYTOTOXIC 2-ALKYL-5-(HETEROCYCLIC)-PYRROLE-3,4-DICARBOXYLATES

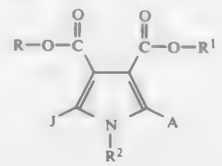
Kanu M. Patel, Wilmington, and James E. Powell, Greenville, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 904,323, Sep. 8, 1986, abandoned. This application Jan. 14, 1987, Ser. No. 3,233

Int. Cl.[4] C07D *401/04;* **A01N** *43/40*

U.S. Cl. 71—94 **13 Claims**

1. A compound of the formula



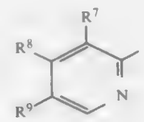
(I)

wherein

R and R^1 each independently is alkyl, mono- or polyhaloalkyl, alkenyl or alkynyl of up to four carbon atoms, and

A is C_1 to C_3 alkyl;

J is



J-5

wherein

R^2 is

(a) hydrogen;

(b) hydroxymethyl;

(c) —B(alkyl)$_2$ of two to six carbon atoms;

(d) —C(O)R^{17} wherein R^{17} is C_1–C_4 alkyl, C_5 to C_6 cycloalkyl, phenyl or pyridinyl substituted by one or more halogen atoms and/or by one of alkoxy, alkylthio, alkyl, alkoxycarbonyl, carbonyl, alkylsulfinyl or alkylsulfonyl; such that the total number of carbon atoms is one to eight;

(e) —CH_2—O—C(O)—R^{18} wherein R^{18} is C_1–C_4 alkyl, C_5 to C_6 cycloalkyl, phenyl or pyridinyl substituted by one or more halogen atoms and/or one of alkoxy, alkylthio, alkyl, alkoxycarbonyl, carboxyl, alkylsylfinyl or alkylsulfonyl; such that the total number of carbon atoms is one to eight;

(f) —S—C(O)O—R^{19}, wherein R^{19} is C_4 alkyl or phenyl;

R^7, R^8 and R^9 each independently is hydrogen, halogen, trifluoroethoxy, difluoromethoxy, cyano, nitro, hydroxy, amino, alkyl, alkoxy, amono- or dialkoxyalkyl, alkylthio, mono- or dialkylamino, wherein each alkyl amino moiety is of one to four carbon atoms.

4,853,028

CERTAIN 2-(2-SUBSTITUTED BENZOYL)-1,3-CYCLOHEXANEDIONES

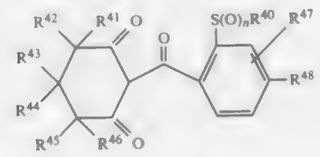
Charles G. Carter, San Francisco; David L. Lee, Martinez, and William J. Michaely, Richmond, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 880,370, Jun. 30, 1986, Pat. No. 4,780,127. This application Dec. 4, 1987, Ser. No. 128,126

Int. Cl.[4] A01N *35/06;* **C07C** *49/813, 49/84, 79/36*

U.S. Cl. 71—103 **34 Claims**

1. Compounds of the formula



wherein

n is the integer 0, 1 or 2;

R^{40} is C_1–C_4 alkyl;

R^{41} is hydrogen or C_1–C_4 alkyl;

R^{42} is hydrogen, C_1–C_4 alkyl or



wherein R^a is C_1–C_4 alkyl; or

R^{41} and R^{42} together are alkylene having 3 to 6 carbon atoms;

R^{43} is hydrogen or C_1–C_4 alkyl;

R^{44} is hydrogen or C_1–C_4 alkyl;

R^{45} is hydrogen or C_1–C_4 alkyl;

R^{46} is hydrogen or C_1–C_4 alkyl; and

R^{47} and R^{48} independently are (1) hydrogen; (2) halogen; (3) C_1–C_4 alkyl; (4) C_1–C_4 alkoxy; (5) trifluoromethoxy; (6) cyano; (7) nitro; (8) C_1–C_4 haloalkyl; (9) R^bSO_n13 wherein n is the integer 0, 1 or 2; and R^b is (a) C_1–C_4 alkyl; (b) C_1–C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) —NR^cR^d wherein R^c and R^d independently are hydrogen or C_1–C_4 alkyl; (11) R^eC-(O)—wherein R^e is C_1–C_4 alkyl or C_1–C_4 alkoxy; or (12) $SO_2NR^cR^d$ wherein R^c and R^d are as defined, with the proviso that R^{47} is not attached to the 6-position and their salts.

4,853,029

COMPOSITIONS OF METHYL-3-(3'METHYLPHENYL-CARBAMOYLOXY PHENYLCARBAMATE, STABLE IN AN AQUEOUS EMULSION

Sergio Maccone, Milan, Italy, assignor to Agrimont S.p.A., Milan, Italy

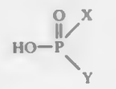
Filed Dec. 14, 1987, Ser. No. 132,278

Claims priority, application Italy, Dec. 19, 1986, 22768 A/86

Int. Cl.[4] A01N *37/44*

U.S. Cl. 71—111 **1 Claim**

1. A herbicidal composition, stable in an aqueous emulsion, consisting essentially of: 15–20% by weight of methyl-3-(3'-methylphenyl-carbamoyloxy)phenyl carbamate, isophorone in amount sufficient to reach 100%, 3 to 5% by weight of calcium dodecylbenzenesulphonate, and 7–10% by weight of phosphoric esters of polyoxyethylated alkylarylphenols having the formula:

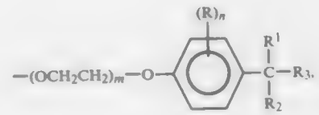


(I)

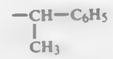
wherein:

Y is —OH or X;

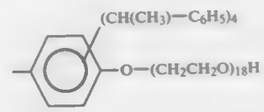
X is



m=18, R=



n=4, R^1 and R^2=—CH_3, R^3=



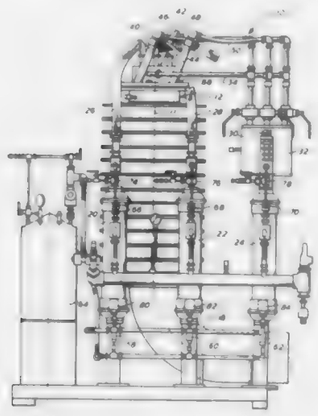
and further, wherein the phosphoric esters of polyoxyethylated alkylarylphenols are a 1:1 mixture of the compound of formula (I) wherein Y=OH in combination with the compound of formula (I) wherein Y=X.

4,853,030

METHOD AND APPARATUS FOR THE MANUFACTURE OF METALLIC FILAMENTS

Moshe Gershenson, Bronx, N.Y., and Thomas Schell, Wyckoff, N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Apr. 15, 1988, Ser. No. 181,968
Int. Cl.[4] C22B *5/20*
U.S. Cl. 75—0.5 A 5 Claims



1. A multi-stage apparatus for the continuous manufacture of differing quantities of metallic filaments comprising:
- a vertical reactor having a vertical axis of symmetry and having a top end wall and a cylindrical peripheral wall enclosing a reactor chamber;
- a stack of magnet rings surrounding the cylindrical peripheral wall and supported by the reactor;
- a feed vessel having first and second vapor feed lines for feeding metal carbonyl vapor;
- first and second heat exchangers respectively connecting the first and second vapor feed lines;
- first and second vapor supply lines respectively connecting to the first and second heat exchangers;
- first and second mixing nozzles respectively connecting to the first and second vapor supply lines and connecting to the top end wall of the reactor;
- a receiver tank having first and second gas lines respectively connecting to the first and second mixing valves for supplying an inert gas thereto; and
- an outlet duct suspended from the cylindrical peripheral wall for removing the metallic filaments from the reactor chamber.

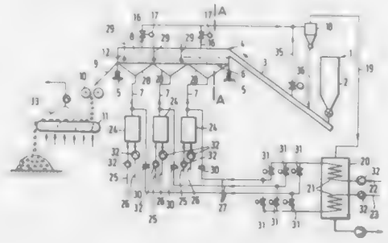
4,853,031

PROCESS FOR PREPARING BINDERFREE HOT BRIQUETTES FOR SMELTING PURPOSES

Erich Höffken, Dinslaken; Rudolf Auth, Dorsten; Werner Kaas, Dinslaken, and Lothar Seidelmann, Duisburg, all of Fed. Rep. of Germany, assignors to Thyssen Stahl AG, Duisburg, Fed. Rep. of Germany

Filed Jul. 18, 1986, Ser. No. 888,551
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1985, 3529094
Int. Cl.[4] C22B *7/02*
U.S. Cl. 75—0.5 R 23 Claims

1. A process for preparing binderfree hot briquettes for smelting purposes comprising
- fluidizing in a fluidized bed reactor a fluidized bed of metallic iron-containing pyrophoric finely divided solids,
- prior to conducting an oxidation of at least a portion of the metallic iron in the solids, supplying sensible heat from outside the fluidized bed reactor to the fluidized bed, until the start of the oxidation,
- subjecting the fluidized bed to vibrations to aid in a conveying of the solids through the reactor,
- introducing a heated oxidizing gas below said bed to form a heated oxidizing gas flow,



- controlling the oxidizing gas flow by conducting an oxidation of at least a portion of the metallic iron in the solids, the temperature of the solids being increased up to a range of 450° C. to 650° C., to provide heated solids,
- conveying said heated solids through the reactor,
- introducing heated solids into a briquetting operation and hot briquetting said heated solids to form binder free hot briquettes.

4,853,032

PROCESS FOR PRODUCING LOW CARBON STEEL FOR COLD DRAWING

Bhaskar Yalamanchili; Frank Wisniewski, and Thad Boudreaux, all of Beaumont, Tex., assignors to Cargill, Incorporated, Minneapolis, Minn.

Filed Aug. 17, 1987, Ser. No. 86,407
Int. Cl.[4] C21C *7/00*; C22B *4/00*
U.S. Cl. 75—10.49 6 Claims

1. A process for the manufacture of low carbon steels in electric arc furnaces which comprises the steps of preparing a heat including scrap to provide a chemistry in the range:

C	.03-.22	Ni	.20 MAX
Mn	.25-.60	Cr	.20 MAX
P	.025 MAX	Mo	030 MAX
S	.030 MAX	Sn	030 MAX
Si	.08 to .15	N	.01 MAX
Cu	.29 MAX		

adding boron to the heat in an amount to establish a B:N ratio of between about 0.8 and 1.5, and casting the heat.

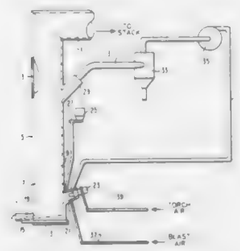
4,853,033

METHOD OF DESULFURIZING MOLTEN METAL IN A PLASMA FIRED CUPOLA

Shyam V. Dighe, North Huntingdon, and Raymond F. Taylor, Irwin, both of Pa., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Jun. 29, 1988, Ser. No. 212,851
Int. Cl.[4] C22B *4/00*
U.S. Cl. 75—10.22 9 Claims

1. A method of desulfurizing a material in a plasma fired cupola having a plasma torch feed nozzle with a plasma torch and particulate feed system cooperatively associated therewith, the method comprising the steps of:
- charging the cupola with the material, coke and a fluxing agent;
- igniting the coke and adding air to melt the material to form a pool of molten material and slag;
- feeding a desulfurizing agent from a group comprising CaO, MgO, $CaCO_3$, $MgCO_3$, and $CaCO_3$ $MgCO_3$ into the plasma torch feed nozzle;
- feeding air into the plasma torch feed nozzle; and
- operating the plasma torch at a power level sufficient to melt the desulfurizing agent in the plasma torch feed nozzle, so that the melted desulfurizing agent and air reaches a temperature of 2500° to 3500° F. prior to entering the cupola adjacent the molten pool whereby the melted desulfurizing agent mixes directly with the molten pool and reacts with the sulfur in the molten material to desulfurize the molten material in the pool, and the reacted and unreacted melted desulfurizing agent become part of the slag, making the slag less viscous and thus the slag flows better.

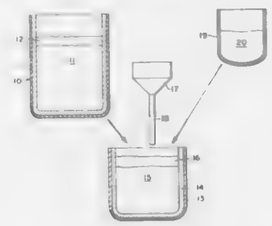


4,853,034

METHOD OF LADLE DESULFURIZING MOLTEN STEEL

Joseph R. Quigley, 7425 Ben Hur St., Pittsburgh, Pa. 15208

Continuation-in-part of Ser. No. 37,942, Apr. 13, 1987, Pat. No. 4,795,491. This application Sep. 29, 1988, Ser. No. 250,530
Int. Cl.[4] C27C *7/02*
U.S. Cl. 75—58 7 Claims



1. A method for desulfurizing molten steel which comprises contacting said molten steel with a molten synthetic slag containing at least 5% by weight of magnesium oxide which has been obtained from a ferrovanadium process by aluminum reduction of vanadium oxides.

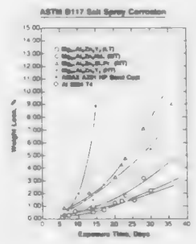
4,853,035

RAPIDLY SOLIDIFIED HIGH STRENGTH, CORROSION RESISTANT MAGNESIUM BASE METAL ALLOYS

Santosh K. Das, and Chin-Fong Chang, both of Morris, N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 781,620, Sep. 30, 1985, Pat. No. 4,765,954. This application Apr. 16, 1987, Ser. No. 40,397
The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.
Int. Cl.[4] C22C *23/02*
U.S. Cl. 75—249 3 Claims

1. A metal article consolidated from a rapidly solidified magnesium based alloy consisting of the formula $Mg_{bal}A_aZn_bX_c$, wherein X is at least one element selected from the group consisting of manganese, cerium, neodymium, praseodymium, yttrium and silver, "a" ranges from about 0 to 15 atom percent, "b" ranges from about 0 to 4 atom percent, "c" ranges from about 0.2 to 3 atom percent, the balance being magnesium and incidental impurities, with the proviso that the sum of aluminum and zinc present ranges from about 2 to 15 atom percent, said alloy, after consolidation, having a microstructure containing precipitates of intermetallic phase having an average size of less than 0.1 μm.



4,853,036

INK FOR INK-JET RECORDING AND INK-JET RECORDING PROCESS USING THE SAME

Shoji Koike, Yokohama, and Yasuko Tomida, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1987, Ser. No. 124,060
Claims priority, application Japan, Nov. 25, 1986, 61-280273; Nov. 25, 1986, 61-280274
Int. Cl.[4] C09D *11/02*
U.S. Cl. 106—20 26 Claims

1. A liquid ink-jet recording ink, comprising a water-soluble dye, from 60–95 wt. % of a volatile solvent having a vapor pressure of 1mmHg or more at 25° C. and from 5–35 wt. % of a water-miscible material which is solid at room temperature and has a molecular weight of at least 300, said material being selected from the group consisting of polyethylene glycol, polyoxyethylene alkyl ether, polyoxyethylene alkylphenyl ether and polyoxyethylene/polyoxypropylene block polymer, where said recording ink satisfies formula (I) shown below, assuming viscosity as A_1 cP at 25° C. measured when the content of the solid material in said composition is 10% by weight, and assuming viscosity as B_1 cP at 25° C. measured when the content of the solid material in said composition is 30% by weight:

4,853,037

LOW GLYCOL INKS FOR PLAIN PAPER PRINTING

Loren E. Johnson, Corvallis, Oreg.; Kenneth A. Norton, Richland, Wash.; Norman E. Pawlowski, and Margaret L. Wooding, both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 30, 1987, Ser. No. 115,496
Int. Cl.[4] C09D *11/02*
U.S. Cl. 106—22 13 Claims

1. An ink composition for use in ink-jet printers for printing on plain paper comprising:
- (a) about 5 to 10 wt % diethylene glycol;
- (b) about 1 to 4% of a soluble dye; and
- (c) the balance water.

4,853,038

PROCESS FOR THE PREPARATION OF LOW VISCOSITY AQUEOUS DISPERSION OF GLYCEROL ESTERS OF LONG-CHAIN FATTY ACIDS, AND THEIR USE

Horst Leithaeuser; Dirk Reese, and Walter Trautmann, all of Marl, Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 12, 1987, Ser. No. 60,787

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1986, 3620037

Int. Cl.[4] C08L *95/00*

U.S. Cl. 106—243 14 Claims

1. A process for the preparation of low-viscosity aqueous dispersions of glycerol stearates of long-chain fatty acids, comprising using a starting concentration based on the total amount of said glycerol stearates in said dispersions of 0.5–6% by weight of an alkali metal soap of a long-chain fatty acid in a starting solution of an effective amount of an essentially soap-free glycerol stearate containing less than 55% of monoglyceride and less than 2% of free glycerol, based on the total amount of said glycerol stearates in said dispersions.

4,853,039

PROCESS FOR MAKING A PHTHALOCYANINE PIGMENT DISPERSION

Thomas E. Donegan; John H. Bantjes, both of Holland, and Timothy G. Leary, Grand Haven, all of Mich., assignors to BASF Corporation, Parsippany, N.J.

Filed Nov. 23, 1987, Ser. No. 123,670

Int. Cl.[4] C09B *67/50*

U.S. Cl. 106—412 17 Claims

1. A process for producing an aqueous pigment dispersion comprising:

(a) adding a first phase-directing organic solvent to a pigment crude whereby a mixture is formed, the amount of phase-directing solvent added being between 2 percent and 10 percent by weight of crude, the pigment crude comprising a green shade copper phthalocyanine blue crude;

(b) activating the crude within the mixture whereby an activated crude mixture is formed;

(c) adding the activated crude mixture to an emulsion, the emulsion comprising water, an effective surfactant, and a second phase-directing organic solvent, wherein the amount of the emulsion, the proportions of ingredients within the emulsion and the surfactant are together effective to substantially wet-out the activated crude;

(d) fine-milling the activated crude which has been wetted-out within the emulsion, the fine milling taking place within a stirring mill, the fine milling producing a pigment slurry, the fine milling being continued for a period between 15 minutes and 3 hours, so that substantially 100 percent β-phase, isometric copper phthalocyanine pigment particles are formed; and

(e) isolating an aqueous presscake from the pigment slurry.

4,853,040

PROCESSES FOR DECONTAMINATING POLLUTED SUBSTRATES

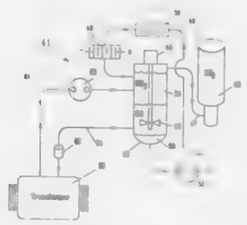
Duane J. Mazur, Amherst; Norman L. Weinberg, E. Amherst, both of N.Y., and Albert E. Abel, Columbus, Ohio, assignors to A. L. Sandpiper Corporation, Columbus, Ohio

Filed Mar. 30, 1987, Ser. No. 31,701

Int. Cl.[4] C10M *175/02;* C10G *31/00;* B08B *7/00*

U.S. Cl. 134—2 6 Claims

1. A process for decontaminating a substrate polluted with a toxic substance, which comprises the steps of generating solvated electrons electrochemically in an electrolytic cell comprising an anode side and a cathode side by electrolyzing an alkali metal salt in a solvent selected from the group consisting of liquid ammonia, a primary amine, an amide and mixtures thereof; withdrawing the resulting solution comprising the solvated electrons from the cathode side of the electrolytic cell, and chemically reducing the toxic substance by applying



said solution in-situ to said polluted substrate in an amount sufficient to substantially decontaminate the substrate.

4,853,041

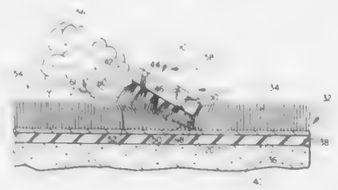
METHOD OF CLEANING A CARPET

Bobbie Clardy, 1037 Winding Clr. W, Grapevine, Tex. 76051

Continuation of Ser. No. 105,006, Oct. 6, 1987. This application Dec. 12, 1988, Ser. No. 283,216

Int. Cl.[4] B08B *1/00*

U.S. Cl. 134—6 3 Claims



1. A method of cleaning carpet fibers with a brush having a front, rear and bottom surface adapted for use by an operator in said cleaning, said method comprising the steps of:

providing a handle on said brush adapted for being grasped by the operator;

securing bristles to the bottom of said handle to depend therefrom, with said bristles forming a defined array beneath said handle, and said array having a lower sweeping surface defined therebeneath, and having a width defined from front to rear of said brush;

defining a tapered sweeping face on said brush comprising a generally flat plane of bristles the frontal region of which is relatively longer and more flexible than the bristles at the rear of said brush for engaging said carpet with said longer frontal bristles and deflecting said carpet fibers in the direction of brushing motion;

imparting a rolling-sweeping motion and an angulated engagement with said carpet by said brush including imparting both a frontal movement to said brush and an upward movement of said bristles relative to said carpet fibers being cleaned, the longer bristles engaging the top portion of the carpet fibers prior to the engagement by the rear bristles;

disposing said shorter, stiffer bristles in said rear of said brush into said carpet fibers during said rolling-sweeping motion for imparting a flicking action with said shorter bristles in said rear of said brush;

applying an indentation pressure on said handle in the area of said shorter bristles during said frontal movement of said brush for separating adjacent sections of said carpet fibers and exposing the interstitial regions therebetween and permitting said shorter bristles at the rear of said brush to dig deeply therein; and

imparting said rolling-sweeping motion across said carpet with said brush in a direction opposite to said taper.

4,853,042

PROCESS FOR REMOVING ASBESTOS OR OTHER FRIABLE COATING FROM A SURFACE

John W. Widerman, Jr., Baltimore, Md., assignor to General Maintenance Company, Inc., Cockeysville, Md.

Filed Jun. 29, 1987, Ser. No. 67,242

Int. Cl.[4] B08B *1/00*

U.S. Cl. 134—6 17 Claims

1. A process for removing deposits from a surface, comprising the step of:

scrubbing the surface with a resilient pad of rubberized fibers, the pad including a tangled plurality of elongated fibers and resinous material adhering to the fibers, the resinous material additionally forming a plurality of resilient bridges which couple adjacent fibers.

4,853,043

SOLAR BATTERY FOR TIME PIECE

Yoshiyuki Umemoto, Kanagawa, Japan, assignor to Fuji Electric Company, Ltd., Kanagawa, Japan

Continuation of Ser. No. 170,649, Mar. 16, 1988, abandoned, which is a coutinuation of Ser. No. 917,547, Oct. 10, 1986, abandoned. This application Dec. 8, 1988, Ser. No. 282,933

Claims priority, application Japan, Oct. 14, 1985, 60-228337

Int. Cl.[4] H01L *27/14*

U.S. Cl. 136—244 5 Claims

1. A solar battery for a time piece, comprising:

an insulated substrate;

a plurality of generating regions arranged in a circular pattern around a first point on the insulated substrate, each region including a non-crystalline semiconductor film, and upper and lower electrodes on opposite sides of the film;

each of said electrodes including first through seventh sides, wherein

said first and second sides extend radially from a second point;

said third and said seventh sides extend from said second and first sides, respectively;

said fourth and sixth sides extend from said third to said fifth sides and from said seventh to said fifth sides, respectively; and

said fifth side is an arc having a length extending from said fourth of said sixth sides; and

connecting means for reducing the power loss of the battery, including radially extending overlapping areas at surfaces between adjacent regions, and circumferentially extending overlapping perimeter areas at surfaces on the perimeter of adjacent regions, for connecting the upper and lower electrodes of adjacent regions

wherein said circumferential areas extend substantially entirely along the arc length of said fifth sides of corresponding upper and lower electrodes of adjacent regions.

4,853,044

ALLOY SUITABLE FOR MAKING SINGLE CRYSTAL CASTINGS

David A. Ford; Anthony D. Hill, and Ian R. Pashby, all of Bristol, England, assignors to Rolls-Royce plc, London, England

Continuation of Ser. No. 943,865, Dec. 22, 1986, abandoned, which is a continuation of Ser. No. 679,065, Dec. 6, 1984, abandoned. This application Jan. 13, 1988, Ser. No. 144,697

Claims priority, application United Kingdom, Dec. 24, 1983, 8334476

Int. Cl.[4] C22F *1/10*

U.S. Cl. 148—3 8 Claims

1. A single crystal casting cast from an alloy consisting essentially of, by weight percent:

Chromium	8–15%
Aluminum	5–7%
Titanium	2–5%
Niobium	0.1–2%
Molybdenum	0–7%
Tantalum	1–8%
Tungsten	0–7%
Cobalt	5–15%
Vanadium	0.5–2%
Carbon	0–0.5%

Balance Nickel plus impurities,

provided that the combined weight of Tungsten, Molybdenum and Tantalum is from 2.5 to 8.0 percent by weight of the total alloy weight and that the combination of Aluminum, Titanium, Niobium, Tantalum and Vanadium are balanced such as to give an alloy volume fraction of between 60 and 75% of gamma prime ($Ni_3(M)$) where M is Aluminum, Titanium, Niobium, Tantalum, Vanadium, and also minimum gamma/gamma prime iattice mismatch.

4. A method of manufacturing a single crystal having the composition claimed in claim 1, the method comprising the steps of forming a melt having said composition and allowing the melt to solidify while controlling the rate of solidification and conditions of solidification to form a single crystal alloy.

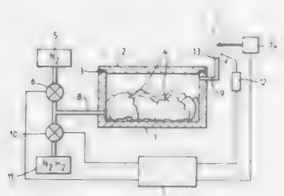
5. A method according to claim 4 wherein the solidified alloy is heat treated by heating the alloy at a temperature between 1250° C. and the alloy solidus for between one and five hours followed by heating the alloy at 1100° C. for one hour and 850° C. for 16 hours.

4,853,045

METHOD FOR THE MANUFACTURE OF RARE EARTH TRANSITION METAL ALLOY MAGNETS

Ewood Rozendaal, Southport, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 24, 1988, Ser. No. 159,820
Claims priority, application United Kingdom, Feb. 27, 1987, 8704713
Int. Cl.[4] H01F *1/02*
U.S. Cl. 148—103 17 Claims



1. A method of manufacturing a magnet from a magnetic material the main phase of which comprises an intermetallic compound of at least one rare earth metal and at least one transition metal and boron, comprising the steps of:

(a) forming a bulk alloy material of the constituent rare earth and transition metals with the addition of boron,

(b) comminuting the bulk alloy material to form a powder by the process of hydrogen decrepitation in an explosion suppressant atmosphere comprising a gaseous mixture of hydrogen and a chemically substantially non-reactive gas,

(c) further comminuting the resultant hydride powder to an average particle size in the range of 0.3 to 80 μm.

(d) forming a magnet body by pressing the further comminuted resultant hydride powder in a pressing tool while said hydride body is situated in a magnetic aligning field,

(e) dehydrogenating and sintering, in vacuo the magnet body at a temperature in the range of about 800 to 1200 degrees C. followed by slow cooling, and

(f) after, if necessary, machining to shape, magnetising the magnet body.

4,853,046

ION CARBURIZING

Stephen H. Verhoff, Toledo, Ohio, and Garrol Tackett, Temperance, Mich., assignors to Surface Combustion, Inc., Maumee, Ohio

Filed Sep. 4, 1987, Ser. No. 93,297
Int. Cl.[4] C21D *1/38*
U.S. Cl. 148—16.5 13 Claims

1. A process controlling the case carburizing of a ferrous workpiece under a vaccum in a chamber by the ion discharge of a carbon bearing gas comprising:

(a) heating said workpiece by heating means independent of the operation of the flow discharge to a carburizing temperature whereat carburizing can occur and maintaining said temperature within said chamber principally by said heating means through the completion of step (e);

(b) applying a DC current pulsed at constant periodically repeating intervals at a predetermined voltage between said workpiece as a cathode and said chamber as an anode in the presence of non-carbon bearing, ionizable gas at a predetermined vacuum to clean said workpiece;

(c) reducing said DC pulsed current to a lower value while said non-carbon bearing gas is evacuated from said chamber and a gas consisting essentially of a carbon bearing gas is continuously introduced into said chamber through step (e);

(d) after said non-carbon bearing gas has been substantially evacuated from said chamber in step c, increasing said voltage and said pulsed current to a predetermined watt-age value correlated to the surface area of said workpiece to define a watt density power; and



(e) simultaneously controlling said watt density power at said carburizing temperature and the continuous mass flow of said carbon bearing gas to establish a uniform carbon gradient profile within the case of said workpiece.

4,853,047

WORK-PERFORMING MEMBER FOR FARM MACHINES

Jury L. Perevozkin; Jury A. Gajun; Petr K. Grigorov; Vasily M. Zhurakovsky, and Boris V. Samelik, all of Rostov-na-Donu, U.S.S.R., assignors to Nauchno-Proizvodstvennoe Obiedinenie Po Tekhnologii Mashinostroenia Dlya Zhivotnovodstva I Kormoproizvodstva "RostNIITM", Rostov-na-Donu, U.S.S.R.

PCT No. PCT/SU86/00081, § 371 Date Apr. 8, 1988, § 102(e) Date Apr. 8, 1988, PCT Pub. No. WO88/01655, PCT Pub. Date Mar. 10, 1988
PCT Filed Aug. 25, 1986, Ser. No. 198,998
Int. Cl.[4] C22C *38/36*
U.S. Cl. 148—905 2 Claims

1. A work-performing member for a farm machine, having its cutting edge made of a high-carbon steel, characterized in that this steel contains graphite in a structurally free state, the amount of said graphite thus contained being from 0.5 to 1.32 percent of the total mass of the material.

4,853,048

PERMANENT MAGNETIC ALLOY COMPRISING GOLD, PLATINUM AND COBALT

Shotaro Shimizu, and Yosuke Sakakibara, both of Tokyo, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 947,709, Dec. 30, 1986, abandoned. This application Jan. 29, 1988, Ser. No. 154,493
Claims priority, application Japan, Feb. 7, 1986, 61-25593
Int. Cl.[4] C22C *5/02*
U.S. Cl. 148—300 3 Claims

1. A permanent magnetic alloy consisting essentially of 50 to 75% by weight gold, 16 to 40% by weight platinum and greater than 5 but less than or equal to 15% by weight cobalt, wherein the alloy is composed of a gold rich phase and an



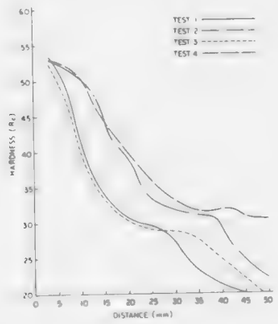
ordered platinum cobalt phase, and that the alloy has a coercive force over 1,300 oersted.

4,853,049

NITRIDING GRADE ALLOY STEEL ARTICLE

Calvin D. Loyd, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 52,143, May 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 675,001, Feb. 13, 1984, abandoned. This application Jun. 3, 1988, Ser. No. 203,601
Int. Cl.[4] C22C *38/24*
U.S. Cl. 148—318 2 Claims



1. A nitride steel article formed of a through hardening, nitriding grade steel having a composition consisting essentially of, by weight percent:

Carbon	0.24–0.34
Manganese	0.90–1.30
Chromium	0.90–1.20
Aluminum	0.07–0.20
Vanadium	0.05–0.10
Iron and Trace Elements which include Molybdenum, Copper and Nickel	Balance

and said article having a substantially uniform martensitic microstructure, a surface hardness of at least Rockwell 15N 89, and a core hardness of at least Rockwell C 25.

4,853,050

OIL-IN-WATER EXPLOSIVE COMPOSITION CONTAINING ASPHALT

Andrew Bates, and Vladimir Sujansky, both of Victoria, Australia, assignors to Ici Australian Operators Pty Ltd., Victoria, Australia

Filed Sep. 23, 1988, Ser. No. 248,717
Claims priority, application Australia, Sep. 23, 1987, PI4556
Int. Cl.[4] C06B *15/00*
U.S. Cl. 149—2 27 Claims

1. A method of preparing a particulate ammonium nitrate explosive composition comprising contacting ammonium nitrate particles with an oil-in-water emulsion wherein the discontinuous phase comprises asphalt.

4,853,051

PROPELLANT BINDER PREPARED FROM A PCP/HTPB BLOCK POLYMER

S. John Bennett, Brigham City, Utah; Michael W. Barnes, Warrenton, Va., and Kenneth J. Kolonko, Brigham City, Utah, assignors to Morton Thiokol, Inc., Chicago, Ill.

Division of Ser. No. 927,895, Nov. 6, 1986, abandoned. This application May 5, 1988, Ser. No. 191,807
Int. Cl.[4] C06B *45/10*
U.S. Cl. 149—19.4 6 Claims

1. A propellant comprising between about 70 and about 85 weight percent solid particulates, including particulates of fuel material and oxidizer particulates and between about 15 and about 30 weight percent of a binder system comprising an elastomeric binder and nitrate ester plasticizer stably retained thereby, said elastomeric binder comprising a block copolymer having a central poly(butadiene) block and flanking poly(caprolactone) blocks, said poly(butadiene) block comprising between about 30 and about 70 weight percent of said block copolymer, balance of said block copolymer being said poly(caprolactone) blocks, and an isocyanate curative joining and cross-linking said block copolymer.

4,853,052

METHOD FOR PRODUCING A PYROTECHNICAL CHARGE

Staffan Calsson; Tore Boberg, and Conny Sjögvist, all of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Sep. 26, 1988, Ser. No. 248,707
Claims priority, application Sweden, Sep. 29, 1987, 8703742
Int. Cl.[4] D03D *23/00*
U.S. Cl. 149—109.6 6 Claims

1. A method of producing pyrotechnical delay and ignition charges with burning rates of between 3 and 150 mm/sec., characterized in that the solid components included therein, comprising

up to 20 % by weight of boron (B)

6–60 % by weight of zirconium (Zr), titanium (Ti) and/or zirconium-nickel alloys (Zr/Ni)

up to 70 % by weight of lead dioxide (PbO_2)

up to 70 % by weight of tin dioxide (SnO_2)

up to 3.0 % by weight of zinc stearate or alternatively aluminum stearate, and

up to 45 % by weight of titanium dioxide (TiO_2)

up to 60 % by weight of bismuth trioxide (Bi_2O_3)

are mixed in water in which an aqueous dispersible acrylate binder has been dispersed in an amount corresponding to

0.3–5.0 % by weight

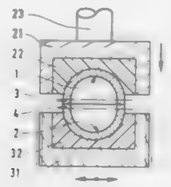
whereafter the thus obtained mixture is granulated, dewatered and dried.

4,853,053

METHOD OF WELDING TWO HALVES OF A HOLLOW CERAMIC COMPONENT

Louis Minjolle, Tarbes; Michel Drouet, Juillan; Jean-Louis Fatta-Barou, Bazet; Michel Callegari, and Jacques Noël, both of Tarbes, all of France, assignors to Societe Anonyme Dite: Ceraver, Paris, France

Continuation of Ser. No. 912,209, Sep. 25, 1986, abandoned, which is a continuation of Ser. No. 673,449, Nov. 21, 1984, abandoned. This application Nov. 30, 1987, Ser. No. 129,352
Claims priority, application France, Nov. 21, 1983, 83 18483
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—73.5 **3 Claims**



1. A method for welding two halves of a hollow ceramic component together, each half having a jointing plane, said method comprising the steps of:

loading first and second hollow ceramic half-components, respectively, into two dies with the die for the second component being integral with a vibrating table, each of said first and second ceramic half-components containing an organic binder and having monolithic characteristics,

bringing together the jointing planes of the two half-components into contact with one another by bringing together the two dies,

applying working pressure on the first half-component perpendicular to the jointing planes and simultaneously applying vibration to said vibrating table parallel to the jointing planes in order to produce a weld of the two half-components by interpenetration and thus forming a one-piece component having monolithic characteristics,

adjusting the length of the pressure-vibration phase in order to obtain a given depth of interpenetration,

separating the two dies,

extracting the one-piece component, and

sintering the one-piece component so as to preserve the monolithic characteristics of the component.

4,853,054

PROCESS FOR PREPARING POLYURETHANE CARPET BACKINGS BASED ON HIGH EQUIVALENT WEIGHT POLYOLS

Robert B. Turner, Lake Jackson, Tex.; Randall C. Jenkines, Resaca, Ga.; John F. Serratelli, Lake Jackson, Tex., and Garland R. Barnes, Rocky Face, Ga., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 29, 1987, Ser. No. 102,220
Int. Cl.[4] B32B *31/14, 5/18*
U.S. Cl. 156—78 **10 Claims**

1. In a process for preparing a polyurethane-backed textile wherein an uncured polyurethane-forming composition is applied to a surface of the textile, gauged and cured to form an adherent backing thereto, the improvement comprising employing a frothed polyurethane-forming composition comprising

(A) a polyol based on a C_3–C_8 alkylene oxide, which polyol has an equivalent weight of about 1000 to about 5000, and an internal poly(ethylene oxide) block or a terminal ethylene oxide cap constituting about 15 to about 30 percent of the weight of the polyol, or mixture of such polyols, wherein said polyol or mixture thereof has an average functionality of about 1.8 to about 2.2,

(B) a minor amount of a low equivalent weight compound having about 2 active hydrogen containing groups per molecule, and

(C) a polyisocyanate having an average functionality of about 1.9 to about 2.4, in an amount to provide the composition with about 0.9 to about 1.3 isocyanate groups per active hydrogen containing group, and

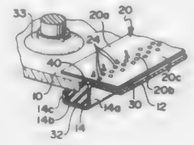
(D) an effective amount of a blowing agent.

4,853,055

FLUSH GLASS INSTALLATION PROCESS

Edward F. Taylor, Laguna Miguel, Calif., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 11, 1988, Ser. No. 217,992
Int. Cl.[4] B60J *1/00*
U.S. Cl. 156—108 **4 Claims**



1. In a method for adhesively installing a fixed window to vehicle body structure which defines a window opening and a trough around the periphery of the opening for receiving adjacent edge portions of the window comprising the steps of:

a. providing a tape having an inner portion with an adhesive on one side, an outer portion with an adhesive on one side and a midportion having a multiplicity of perforations therethrough and a parting agent on one side located between the inner and outer portions,

b. adhesively securing the inner portion of said tape to the outer edge portions of the window and with the perforated inner portion and outer portion overhanging said outer edge portions of the window and adhesively securing a second adhesive tape to the body structure around said trough,

c. placing uncured adhesive material which is adherent to glass and metal in said trough,

d. positioning said window in said trough and against said adhesive material, and

pressing the outer portion of said tape against said second tape and with said perforated midportion allowing entrapped air and any excess adhesive material to pass therethrough upon the window being fully positioned in said trough, and

e. removing said first tape and then said second tape after said adhesive material cures whereby said window glass is adhesively secured to said trough and is flush with adjacent portions of said vehicle body structure.

4,853,056

METHOD OF MAKING TENNIS BALL WITH A SINGLE CORE AND COVER BONDING CURE

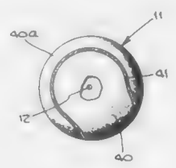
Allan C. Hoffman, 2891 Rumsey Dr., Riverside, Calif. 92506

Filed Jan. 20, 1988, Ser. No. 145,897
The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.
Int. Cl.[4] A63B *41/00*
U.S. Cl. 156—147 **4 Claims**

1. A method of making internally pressurized tennis balls and the like which includes an assembly of core parts and fabric cover pieces bonded together by suitable curable cements comprising the steps of:

providing a subassembly of core parts, at least one of which has a one-way air valve therein for subsequent introduction of a core pressurizing medium such as air, in the form of an internally unpressurized ball shaped core having a mass of air therein at substantially atmospheric pressure and holding said subassembly of core parts together by the tackiness of a suitable, dried but uncured, first curable cement provided between said parts;

applying fabric pieces about said core subassembly to provide a fabric cover thereabout and holding said fabric pieces to said core subassembly by the tackiness of a suitable, dried but uncured, second curable cement provided between said pieces and said core parts, thus providing an uncured and unpressurized ball assembly;



bonding said core parts to each other and said fabric pieces to said core parts by a single cement curing step, wherein said bonding step includes the substeps of:

placing said uncured and unpressurized ball assembly within a surrounding mold which snugly surrounds the same;

applying heat through said mold to said assembly with the air pressure within said assembly being only that due to the affect of said heat on said mass of air therein to heat and cure the cements previously provided; and

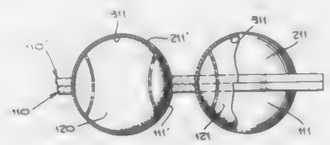
thereafter introducing an internal pressurizing medium such as air into said ball assembly through said one-way air valve.

4,853,057

METHOD OF MAKING TENNIS BALLS OR THE LIKE

Allan C. Hoffmann, 2891 Rumsey Dr., Riverside, Calif. 92506

Continuation-in-part of Ser. No. 145,897, Jan. 20, 1988. This application Jan. 27, 1988, Ser. No. 212,197
Int. Cl.[4] A63B *45/00, 43/00*
U.S. Cl. 156—147 **16 Claims**



1. A method of making internally pressurized tennis balls and the like which include an assembly of core parts and fabric cover pieces bonded together by suitable curable cements comprising the steps of:

providing a subassembly of core parts, at least one of which has a one-way air valve therein for subsequent introduction of a core pressurizing medium such as air, in the form of an internally unpressurized ball shaped core and holding said subassembly of core parts together by the tackiness of a suitable, dried but uncured, first curable cement provided between said parts;

applying fabric pieces about said core subassembly to provide a fabric cover thereabout and holding said fabric pieces to said core subassembly by the tackiness of a suitable, dried but uncured, second curable cement provided between said pieces and said core parts, thus providing an uncured and unpressurized ball assembly;

containing said ball assembly within a heat conductive shell at atmospheric pressure, wherein said step of containing said ball assembly within a heat conductive shell at atmospheric pressure comprises the substeps of:

forming a plurality of hemispherical shell halves of lightweight metal material on the order of 10 to 15 thousandth of an inch thick,

mounting said plurality of shell halves on two or more separate mounting plates having a thickness on the order of ¼ inch to provide an egg crate like pair of facing plates having facing shell halves to contain a ball assembly between facing pairs thereof;

heating said shell and ball assembly until said cements are cured; removing a ball assembly from its associated shell halves immediately following the completion of said heating step; and

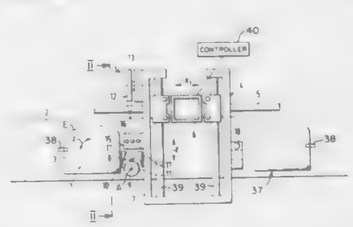
thereafter introducing a pressurizing medium such as air into said bonded ball assembly through the one-way air valve provided therein.

4,853,058

APPARATUS AND METHOD FOR ADHERING TAPE TO NONSTRAIGHT WORKPIECE EDGE

Wilhelm Riesmeier, Lübbecke, and Martin Rose, Espelkamp, both of Fed. Rep. of Germany, assignors to IMA-Norte Maschinenfabriken Klessmann GmbH & Co., Gutersloh, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 141,842
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1987, 3702154
Int. Cl.[4] B32B *31/22*; B65H *31/00*
U.S. Cl. 156—153 **11 Claims**



1. An apparatus for custom shaping and adhering an adhesived tape to a nonstraight edge of a generally planar workpiece, the apparatus comprising:

a stationary workpiece taping station;

a stationary workpiece edging station adjacent the taping station;

means for retaining a workpiece stationary in each of the stations in a generally horizontal position with its edges upright;

a carriage displaceable adjacent the stations parallel to the planes of the workpieces and relative to the workpieces in horizontal and generally perpendicular longitudinal and transverse directions;

an edging tool carried on the carriage and engageable with the workpiece in the edging station;

a roller engageable with the workpiece in the taping station and rotatable on the carriage about an upright axis generally perpendicular to the workpiece planes;

means for displacing the carriage in the directions relative to the stationary workpiece to roll the roller around the workpiece edge in the taping station and to move the edging tool around the workpiece edge in the edging station to custom shape this edge;

a supply of the adhesived tape on the carriage;

means including a guide for feeding the tape from the supply to the roller; and

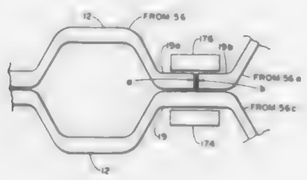
control means for pressing the tape by the roller against the workpiece edge in the taping station as the roller rolls around the workpiece edge, whereby the tape is adhered to the workpiece edge.

4,853,059

APPARATUS AND PROCESS FOR MANUFACTURING CUVETTER BELTS

Jun-ichi Meguro, Huntington Beach, and Curtis J. Nicolaisen, Fallbrook, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Filed Dec. 24, 1986, Ser. No. 946,747
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—157 **10 Claims**



1. A method of making cuvette belts from lengths of strip plastic material formed with a series of regularly spaced transverse elongated pockets separated by web portions so as to define two integral, side-by-side, mirror image belt halves, including the steps of:

feeding lengths of said formed strip material to provide two continuous formed strips in face-to-face relation including splicing together discrete lengths of said strip material to provide at least one of said continuous formed stirps by bringing together in face-to-face register the lengths forming the respective strips and splicing the web portions at the adjacent ends of the discrete lengths forming the at least one strip during the face-to-face registration;

joining the two continuous strips so provided together in register to form a composite strip defining two integral, side-by-side, mirror image cuvette belts;

wherein the ends of the lengths of strip material are formed with half-web portions at each end and the lengths forming said at least one continuous formed strip are spliced together by joining the end half-web portions while urging said half-web portions against the facing web portion of the opposing strip length, whereby the half-web portions are joined together and to the facing web portion; and

dividing the composite strip longitudinally to separate the cuvette belts.

4,853,060

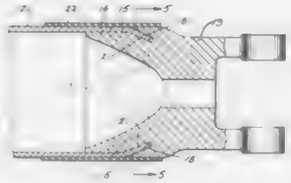
METHOD OF FORMING A COMPOSITE TUBULAR STRUCTURE

Herbert W. Nickel, Germantown, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Division of Ser. No. 75,234, Jul. 17, 1987, Pat. No. 4,792,320, which is a continuation of Ser. No. 777,191, Sep. 18, 1985, abandoned. This application Feb. 22, 1988, Ser. No. 158,839
Int. Cl.[4] B65H *81/00*
U.S. Cl. 156—172 **10 Claims**

1. A method of forming a composite torque-transmitting tubular structure, comprising the steps of forming a metal yoke with a generally cylindrical sleeve, forming a rigid fiber reinforced resin tubular member, forming a plurality of longitudinal circumferentially spaced ribs on the outer surface of said sleeve, said ribs projecting radially outward from said sleeve, forming a plurality of slots in an end of said tubular member with said slots extending completely through the wall of said tubular member and said slots opening at said end of the tubular member with a tongue disposed between each pair of adjacent slots, moving the sleeve and the tubular member longitudinally of each other to bring the ribs into registry with the





slots and to bring the tongues into contiguous overlapping relation with said sleeve, and applying a clamping force to overlapping portions of the sleeve and the tubular member.

4,853,061

POLYURETHANE ADHESIVE THERMOFORMING LAMINATION PROCESS EMPLOYING WATER-BASED

Pak T. Leung, Granger, Ind., assignor to Uniroyal Plastics Company, Inc., Mishawaka, Ind.

Division of Ser. No. 46,598, May 5, 1987, Pat. No. 4,762,880. This application Nov. 2, 1987, Ser. No. 115,802
Int. Cl.[4] B32B *3/04*
U.S. Cl. 156—216 **18 Claims**

1. A method of joining an expandable and a non-expandable component which comprises:

(a) applying to the non-expandable component, an adhesive forming composition comprising (i) an aqueous aromatic polyurethane emulsion or dispersion comprising a polyurethane compound of repeating urethane subunits, each having at least one aromatic substituent associated therewith; (ii) an effective amount of a cross-linking agent which is water-dispersible and stable in the presence of water yet being able to induce cross-linking of the polyurethane at room temperature at a rate sufficient to permit the composition to form an adhesive haaving suitable ultimate bond strength and green strength; and (iii) a sufficient solids content to enable the resultant polyurethane to join and hold said components together;

(b) drying the applied adhesive forming composition to remove the water; and

(c) joining the expandable component to the surface coated with the dried adhesive by a thermoforming lamination process.

4,853,062

METHOD FOR THE PRODUCTION OF WOOD PANELS

Matthew Gartland, Raharney, Mullingar, County Westmeath, Ireland

Filed Feb. 1, 1988, Ser. No. 151,189
Claims priority, application Ireland, Feb. 2, 1987, 265/87
Int. Cl.[4] B32B *31/10, 31/20*
U.S. Cl. 156—219 **9 Claims**

1. A method for producing a simulated framed solid wood panel member comprising the steps of:

(i) providing a one piece panel element comprising a low grade wood, chip board or medium density fiber board;

(ii) routing, compression molding or embossing the panel element so as to remove the relatively hard outer layer of the panel element thereby exposing the relatively soft substrate thereof;

(iii) selectively recessing the exposed surface of the panel element to produce a decorative shape therein;

(iv) covering the exposed surface with a plurality of veneer elements, each veneer element having a visible grain pattern and at least some of the veneer elements being oriented with their grain patterns at an angle to the grain patterns of immediately adjacent veneer elements;

(v) applying an adhesive between the veneer elements and the exposed surface; and

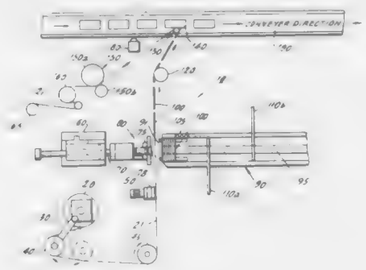
(vi) pressing the veneer elements into intimate contact with the panel element using a compression molding or embossing apparatus to form the panel member, whereby visible lines between adjacent bonded veneer elements simulate the appearance of joints between solid wood components.

4,853,063

SYSTEM FOR APPLYING OUTSERTS TO CONTAINERS

David E. Basgil, Edgewater Park; Mark K. Shuster, Indian Mills, and Thomas R. Pituch, Medford, all of N.J., assignors to Alford Industries, Inc.

Filed Jun. 17, 1988, Ser. No. 207,785
Int. Cl.[4] B65C *9/10, 9/14*
U.S. Cl. 156—238 **15 Claims**



10. A method of applying outserts to articles, comprising the steps of:

supplying a web having adhesive on one side to a position in proximity to an outlet of a hopper containing said outserts;

bumping said web into contact with an outsert located within said outlet of said hopper;

removing said outsert from said hopper by applying a vacuum to said outsert, said outsert being adhered to said web by said adhesive;

transporting said outsert adhered to said web to a position in proximity with said articles; and

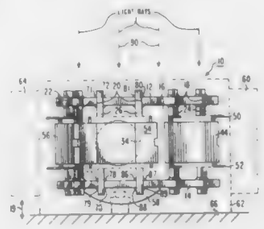
transferring said outserts adhered to said web from said web to said articles.

4,853,064

METHOD OF FORMING A STRUCTURAL BOND EMPLOYING INDIRECT EXPOSURE OF A LIGHT RESPONSIVE ADHESIVE

Aaron W. Levine, Mercer County, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 2, 1987, Ser. No. 69,068
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—275.5 **11 Claims**



1. A method of adheringly attaching a glass structure having at least one side wall to a member having at least one wall, said structure characterized in that, in response to light incident on an end thereof, the structure transmits light in a length direction and exhibits scattering of light transverse that length direction through said at least one side wall, said scattered light having an intensity lower than the intensity of said incident light, said method comprising:

applying adhesive to a wall of at least one of said glass structure and member, said adhesive being of the type which cures upon exposure to said transverse scattered light incident thereon;

positioning a wall of said member in contact with said glass structure at a side wall thereof parallel to said length dimension and in contact with said adhesive; and

illuminating one end of the glass structure in a direction parallel to said length direction for a time sufficient for said low intensity transverse scattered light passing through said at least one side wall to which the adhesive is applied to cure said adhesive.

4,853,065

METHOD OF MANUFACTURING CLEAN-ROOM COMPATIBLE HONEYCOMB TABLES

Dennis C. Terry, Costa Mesa; Waldemiro M. Filho, Laguna Hills, and John J. Turechek, Glendale, all of Calif., assignors to Newport Corporation, Fountain Valley, Calif.

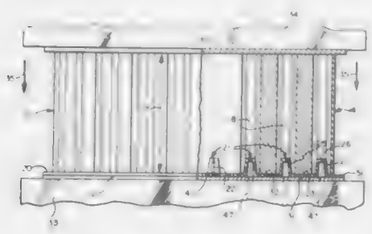
Continuation-in-part of Ser. No. 890,632, Jul. 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 663,343, Oct. 22, 1984, Pat. No. 4,621,006. This application Jan. 26, 1988, Ser. No. 148,592
Int. Cl.[4] B32B *31/04, 3/12*
U.S. Cl. 156—292 **36 Claims**

1. In a method of manufacturing a honeycomb table including a table leaf having an outside surface and apertures for receiving fasteners for attaching objects at said outside surface and including a honeycomb core supporting said table leaf and extending inside said table leaf between said table leaf and a facing sheet spaced from said table leaf and having internal cells, the improvement comprising in combination the steps of:

providing a sealing sheet with projections corresponding in number and location at least to said apertures for projection from said table leaf for a distance being smaller than a spacing between said facing sheet and said table leaf; and

providing said sealing sheet between said table leaf and said honeycomb core for sealing said internal cells relative to said apertures, with said projections projecting away from said table leaf and said apertures in said table leaf commu-

nicating with insides of said projections to render said honeycomb table clean-room compatible by enabling



cleaning of said projections inside said table leaf through said apertures from outside of said table leaf.

4,853,066

METHOD FOR GROWING COMPOUND SEMICONDUCTOR CRYSTAL

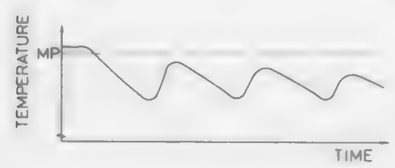
Seikoh Yoshida; Toshio Kikuta, both of Yokohama, and Yuzo Kashiwayanagi, Yokosuka, all of Japan, assignors to Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1987, Ser. No. 113,546

Claims priority, application Japan, Oct. 31, 1986, 61-258309; Jul. 30, 1987, 62-188964

Int. Cl.⁴ C30B *11/14, 11/00*

U.S. Cl. 156—616.4 **7 Claims**



1. A method for growing a crystal of a compound semiconductor, comprising steps of:

preparing a melt of the compound semiconductor in a boat having two ends, one end being a crystal growth starting end and the other end being a crystal growth terminating end, by heating said component semiconductor in said boat to at least the melting point of said compound semiconductor;

then forming a crystalline nucleus by first lowering the temperature of said melt only at said crystal growth starting end of said boat to a temperature lower than said melting point, while maintaining the temperature of the rest of said melt above said melting point, at the start of crystal growth; and thereafter alternatingly changing the temperature of said melt only at said crystal growth starting end of said boat, in descending and ascending modes, in order to minimize formation of additional crystaline nuclei within a temperature range which is lower than said melting point of said compound semiconductor, while maintaining the temperature of the rest of said melt above said melting point, the upper temperature of said temperature range being below said melting point; and

then growing the crystal by gradually freezing said melt at a temperature gradient including the freezing point of said melt from said crystal growth starting end of said boat to said crystal growth terminating end thereof, after the formation of said crystalline nucleus.

4,853,067

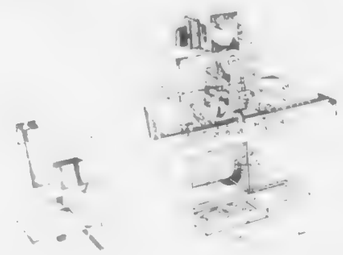
TACK STRIP PADDING APPLICATOR

Dulin L. Annas, Sr., Hickory, and Richard M. Teague, Taylorsville, both of N.C., assignors to TSA, Inc., Hickory, N.C.

Filed Jun. 30, 1988, Ser. No. 213,627

Int. Cl.⁴ B32B *31/18*

U.S. Cl. 156—351 **24 Claims**



1. An apparatus for applying an adhesive strip to a substrate comprising:

(a) a conveyor for conveying said substrate along an elongated path;

(b) a arm biased to a first position, disposed above the conveyor so that said arm comes in contact with said substrate as said substrate is conveyed along said elongated path, movable from said first position to a second position when brought into contact with said substrate and movable from said second to said first position when said arm is not in contact with said substrate;

(c) a feeding device disposed over the conveyor for feeding an adhesive strip to said substrate along a first path;

(d) a cut-off device having a moveable part for cutting said adhesive strip, said moveable part movable from a first position above the substrate to a second position below said substrate in response to said arm being moved from its second to its first position; and,

(e) a drive device in communication with said arm responsive to said arm being moved from its first to its second position to cause the drive device to drive said feeding device.

4,853,068

HAND LABELING DEVICE

Werner Becker, Hirschhorn/N., Fed. Rep. of Germany, assignor to Esselte Meto International Produktions GmbH, Hirschhorn/N., Fed. Rep. of Germany

Filed Feb. 29, 1988, Ser. No. 162,254

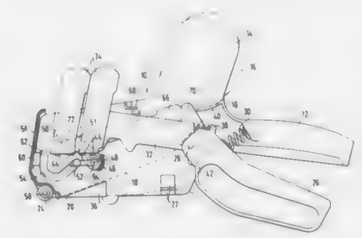
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1987, 3706433

Int. Cl.⁴ B41F *1/46;* **B65C** *11/02*

U.S. Cl. 156—384 **6 Claims**

1. A hand labeling device for imprinting, dispensing and applying self-adhering labels to articles in the course of an operating cycle controlled by an operating lever pivotal out of a rest position into a pulled position, the hand labeling device comprising a printing mechanism arranged in a device housing and having print types for producing an imprint on a self-adhering label disposed in a printing position, transport means for bringing the self-adhering labels consecutively into the printing position and into the position for application to the articles, and an inking device for inking the print types of the printing mechanism before each printing operation, the inking device comprising an inking roll which is held by a stirrup member mounted in the device housing pivotally about an axis and on pivoting of the stirrup member rolls on the print types

of the printing mechanism, wherein the stirrup member (51) is in drive connection with a rod 66 whose displacement is controlled by the operating lever (26) and wherein the rod (66)



comprises an end formed as a rack and the stirrup member (51) comprises a pinion (72) concentrically mounted on said axis (50) the pinion engaging the end of the rod (66) formed as rack.

4,853,069

ELASTOMERIC STRUCTURES HAVING CONTROLLED SURFACE RELEASE CHARACTERISTICS

Cleo M. Williams; Myron D. Sanders, both of Noblesville, and William C. Cook, Arcadia, all of Ind., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 17, 1984, Ser. No. 661,644

Int. Cl.⁴ B29D *30/26, 30/32;* **B32B** *1/10*

U.S. Cl. 156—401 **3 Claims**

1. A bladder, for use in a tire assembly machine having about 10–90% of its outer surface bearing an exposed releasing surface coating of release-effective thickness formed by the method comprising the steps of:

(I) Applying to the outer surface of the bladder a releasing composition comprising:

(a) a chlorosulphonated polyethylene having a Mooney viscosity of about 30–160;

(b) a carbon black or silica reinforcing filler;

(c) a green tackifying agent; and optionally

(d) a suitable chemical curing system; and optionally

(e) a first inert, volatile solvent/diluent viscosity-reducing vehicle for components (a)-(d), and optionally

(f) a second, inert volatile solvent/diluent viscosity-reducing vehicle;

(II) Removing a sufficient amount of vehicles present to leave a coherent, adhering film on the surface; and

(III) Curing the film to form the exposed releasing coating consisting essentially of said chlorosulphonted polyethylene (a), said carbon black or silica filler (b), said green tackifying agent (c) and optionally said chemical curing system (d).

4,853,070

APPARATUS FOR MAKING MULTIPLE HOOK FASTENER MEDIA

George H. Erb, Cuttingsville, and Susan E. Beard, Rutland, both of Vt., assignors to Erblok Associates, Charlottesville, Va.

Continuation of Ser. No. 186,671, Apr. 20, 1988, abandoned, which is a continuation of Ser. No. 945,208, Dec. 19, 1986, abandoned, which is a continuation of Ser. No. 827,663, Feb. 7, 1986, abandoned, which is a continuation of Ser. No. 642,999, Aug. 21, 1984, abandoned. This application Nov. 15, 1988, Ser. No. 273,743

Int. Cl.⁴ B32B *5/02;* **A44B** *18/00*

U.S. Cl. 156—436 **22 Claims**

1. Apparatus for making a multiple-hook fastener medium capable of hook-like gripping engagement, comprising:

a first plurality of shaping teeth movable along a first endless path,

a second plurality of shaping teeth movable along a second endless path meshing with said teeth of the first plurality along a predetermined portion of their respective paths,

means for revolving said first and second plurality of shaping teeth along their respective endless paths for meshing them together along said portion of their respective paths,

means for feeding at least one strand of bendable material between the meshing shaping teeth as they move along said portion of their respective paths for bending the strand back and forth zig-zag fashion on opposite sides of a centerline forming sharp U-bends facing in opposite directions from said centerline,

bending means for bending the strand near at least some of said sharp U-bends for forming hooks with a sharp U-bend being located at the tip of each hook, and

bonding means for bonding the strand to a backing with the hooks upstanding from the backing.

13. Apparatus for making a multiple-hook fastener medium



capable of hook-like gripping engagement with an opposed area containing multiple accessible apertures into which the multiple hooks can become engaged by bringing said fastener medium into contact with said opposed area comprising:

first bending means for bending at least one strand of a bendable, settable material for forming a plurality of sharp U-bends positioned at spaced locations along the strand,

first setting means for setting the bent material of said strand a first time for causing the strand to retain said sharp U-bends,

second bending means for bending the strand near at least some of said sharp U-bends to form hooks with said sharp U-bends forming the tips of the hooks,

second setting mean for setting material of said strand a second time for causing the strand to retain said hooks and

bonding means for bonding the strand having said hooks to a backing with the hooks upstanding from the backing for forming the multiple-hook fastener medium.

4,853,071

APPARATUS FOR THE CONDITIONING IN ENVELOPES OF INDIVIDUAL DUAL-USE FILTER SACHETS IN AMCHINES FOR THE CONTINUOUS PRODUCTION OF SUCH FILTER SACHETS

Andrea Romagnoli, San Lazzaro Di Savena, Italy, assignor to Cestind - Centro Studi Industriali-S.R.L., Osteria Grande-Castel, Italy

Filed Feb. 10, 1988, Ser. No. 154,783

Claims priority, application Italy, Mar. 9, 1987, 3381 A/87

Int. Cl.⁴ B65B *63/04*

U.S. Cl. 156—443 **2 Claims**

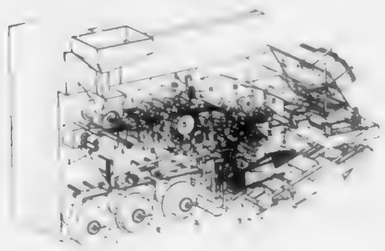
1. An apparatus for making infusion packets which comprises:

means for feeding a strip of thermally weldable filter paper along a transport path;

means along said path for feeding successive measured quantities of an infusion product onto said strip;

means along said path for folding said strip into a flattened tube around said infusion product and for forming transverse and longitudinal seals across and along said strip to

define individual bags each containing a measured quantity of said infusion products;
means along said path for applying labels, tabs and strings to said strip and for severing segments of said strip from one another along alternate transverse welds to form respective segments each comprising two of said bags joined by an intervening weld;
means downstream of said path for forming in each segment a fanfold along the intervening transverse weld thereof;
means for feeding pieces of envelop paper into registry with each of said segments;
stationary folding means for folding the bags of each segment along said fanfold and simultaneously folding the respective piece of envelope paper to flank said bags and form an assembly of each folded segment and the respective folded piece of paper;
a pincer wheel formed with pincers engageable with said assembly for displacing same along a trajectory;
means along said trajectory for joining the edges of said bags of each segment remote from the respective fanfold; and
means along said trajectory for folding a flap of each piece of paper over the sealed remote edges of the respective pair of bags and sealing edges of said piece of paper to close an envelope formed by said piece of paper around the respective pair of bags.

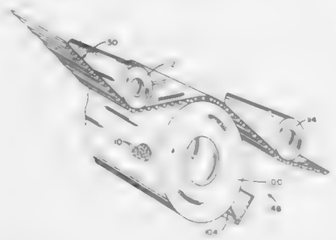


4,853,072

CORRUGATING MACHINES

Frederick H. Thompson, Marion, Ill., assignor to Thompson Corrugated Systems, Inc., Marion, Ill.

Continuation of Ser. No. 724,097, Apr. 17, 1985, abandoned.
This application Jan. 14, 1987, Ser. No. 6,326
Int. Cl.[4] B05C *11/00*
U.S. Cl. 156—470 15 Claims



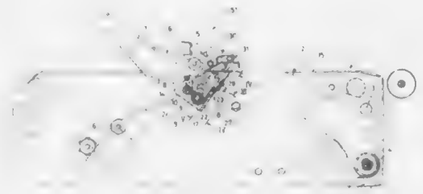
1. An apparatus for making a double-face corrugated web from a single-face web formed by a corrugated member having spaced corrugation ridges on both opposite surfaces, the corrugation ridges on one surface being attached to a first liner member, and a second liner member to be attached to the corrugation ridges on the surface of the corrugated member opposite from the first liner member, the apparatus comprising an adhesive applicator roller having a cylindrical outer surface defined by a smooth surface with a plurality of spaced depressions formed therein and distributed in a uniform arrangement and density over the outer surface thereof, container means to directly apply an adhesive substance in liquid form to a portion of the surface of the applicator roller to fill the depressions therein and including means to maintain a predetermined amount of adhesive that can be contained in the container means and scraping means associated with the container means in position to positively engage with the smooth cylindrical portion of the applicator roller to bear against the surface thereof substantially uniformly along the length thereof and positioned against the direction of rotation thereof to uniformly scrape excess adhesive therefrom leaving a quantity of the adhesive in the depressions therein, means spaced apart from the applicator roller a distance greater than the thickness of a single-faced web to maintain the corrugation ridges on one side of the single-face web engaged with the surface of the applicator roller over a predetermined arcuate portion of the surface thereof, means for rotating the applicator roller whereby adhesive from the spaced roller depressions has time to be transferred to the corrugation ridges by such engagement, and other means for bringing the second liner member into contact with the corrugation ridges under pressure to produce adhesive connections therebetween.

4,853,073

ADHESIVE TAPE CUTTING DEVICE FOR TAPING UNIT

Augusto Marchetti, Via Caccialepori, 35-20148 Milan, Italy

Filed Mar. 8, 1988, Ser. No. 165,710
Claims priority, application Italy, Oct. 23, 1987, 22393 A/87
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—510 8 Claims



1. An adhesive tape cutting device for taping unit comprising:
a cutting blade constrained to a moving support which guides said blade to intercept the tape at a predetermined point on a path of travel of the tape;
constraint means provided between said blade and the associated support being of a yielding type in such a manner that said blade, following engagement of said blade with the tape, moves in an advancing direction along said path of travel, in relation to said support.

4,853,074

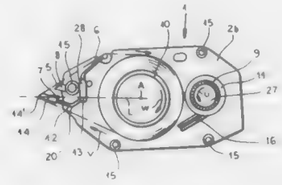
DEVICE FOR TRANSFERRING A FILM FROM A CARRIER TAPE

Christoph Manusch, Hanover; Hans-Jürgen Harp, Hemmingen, both of Fed. Rep. of Germany, and Roy van Swieten, S'Herpoegenbosch, Netherlands, assignors to PELIKAN Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Apr. 15, 1988, Ser. No. 181,779
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1987, 3736367
Int. Cl.[4] B32B *35/00*
U.S. Cl. 156—577 20 Claims

1. A device for the transfer of a film from a carrier tape to a substrate, which comprises:

a housing;
a feed reel for said tape and a windup reel for said tape mounted rotatably in said housing;
mounting means on said housing;
a stiff applicator bar on said mounting means and protruding from said housing and over which said tape passes in going from said feed reel to said windup reel, said stiff applicator bar being configured to press said tape against said substrate with the side of said tape carrying the film against said substrate to effect transfer of said film;
mounting means including an elongated support member connecting said stiff applicator bar to said housing and being elastically deflectable as pressure is exerted on said device, and means for affixing one end of said elongated support member immovably with respect to said housing, an opposite end of said support member bearing said stiff applicator bar, said stiff applicator bar having on a side facing said carrier tape a rounded pressure-applying edge;
a protrusion formed on said stiff applicator bar, located at a distance from said pressure-applying edge; and
a detent fixed on said housing located with respect to said protrusion on said stiff applicator bar such that said detent serves to limit the movement of said stiff applicator bar.

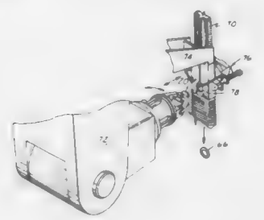


4,853,075

APPARATUS FOR AUTOMATED ASSEMBLY OF A HARNESS RETAINER STUD

Michael D. Leslie, Warren, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Nov. 5, 1987, Ser. No. 116,939
Int. Cl.[4] B44C *1/00*; B32B *31/00*; B23P *19/00*
U.S. Cl. 156—584 2 Claims



1. In an automated equipment environment, an apparatus for automated assembly of a retainer stud to a panel with a robotic arm, the stud having a circular flat plate having a shaft face and a seal face, the faces parallel to one another, a shaft disposed upon the shaft face of the plate having slip engaging means for communicating with a retainer clip, a resilient annular seal having a plate surface and an adhesive surface, the surfaces parallel to one another, the plate surface attached to the seal face of the plate, the annular seal having a central cavity, a contact adhesive coating on the adhesive surface of the seal for mounting the stud on the panel, an uncured adhesive in the central cavity of the seal which when cured will bond the seal to the panel, the contact adhesive protected by a removable backing wafer attached to the stud by the contact adhesive, the wafer being larger than the plate and the seal of the stud, the apparatus for automated assembly of a retainer stud comprising:
a housing;
a stud guide mounted to the housing forming a longitudinal passage between the housing and the stud guide, the stud guide having a longitudinal slot and an opening, the slot and opening communicating with the passage, the slot and passage designed to allow movement of the stud and wafer assemblies through the passage to the opening, the plate and the seal of the stud and wafer assembly in the passage and the shaft of the stud extending outward through the slot, the opening being larger than the plate and the seal but smaller than the wafer;
a tube attached to the top of the housing and stud guide to feed stud and wafer assemblies into the passage;
a plurality of mount guides extending rearward from the housing;
a carriage slidably mounted on the mount guides;
a spring mounted on each of the mount guides to bias the carriage to a predetermined location;
an air cylinder mounted between the housing and the carriage for moving the carriage in opposition to the springs;
a locating guide;
a pair of end stops mounted on the locating guide to define the motion limits of the carriage;
a lower retaining nest mounted to the carriage and extending through the passage to retain a stud and wafer assembly in the passage behind the opening in the stud guide with other stud and wafer assemblies stacked above the stud and wafer assembly behind the opening in the stud guide when the carriage is against one end stop, the lower retaining nest moves out of the passage, allowing the empty wafer to pass through the passage when the carriage is moved against the other end stop after the stud has been removed from the wafer through the opening by the robotic arm;
an upper retaining nest mounted to the carriage and extending through the passage to retain the stud and wafer assemblies in the passage above the opening in the stud guide when the lower retaining nest has been moved out of the passage to allow the empty wafer to pass through the passage, the upper retaining nest moves out of the passage when lower retaining nest moves into the passage, allowing a stud and wafer assembly to drop down in the passage behind the opening in the stud guide.

4,853,076

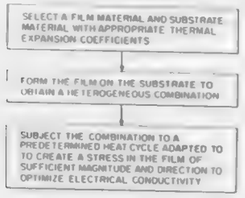
SEMICONDUCTOR THIN FILMS

Bor-Yeu Tsaur, Arlington; John C. C. Fan, Chestnut Hill, and Michael W. Geis, Acton, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 566,579, Dec. 29, 1983, abandoned, which is a continuation of Ser. No. 301,199, Sep. 11, 1981, abandoned. This application Jul. 9, 1987, Ser. No. 70,599
The portion of the term of this patent subsequent to Feb. 1, 2000, has been disclaimed.
Int. Cl.[4] C30B *1/02, 29/60*
U.S. Cl. 156—603 16 Claims

1. The method of forming a semiconductor device comprising the steps of:
(a) forming a heterogeneous structure comprising: a first layer of Si or Ge semiconductor material over a SiO_2 or sapphire substrate in which the thermal coefficient of expansion of the semiconductor material is different than the thermal coefficient of expansion of the material of the substrate, and an intermediate layer positioned between the first layer and the substrate having minimal thermal stress isolation effect between the substrate and the first layer such that the intermediate layer substantially reduces interaction between the substrate and the first layer;
(b) subjecting the structure to a temperature cycle by heating the heterogeneous structure with heater means to melt

at least a substantial volume of the layer material while maintaining the substrate temperature below the melting point of the layer and the substrate and recrystallizing the melted layer while the substrate and layer temperature are within a range which induces a substantial thermal stress in a portion of the layer; wherein such stress is of the type which enhances charge carrier mobility properties of the layer, when the layer is recrystallized and doped with a



suitble dopant, as compared to the carrier mobility of a layer having the same thermal coefficient of expansion as the substrate;

(c) selecting a dopant such that if the induced thermal stress is tensile, the layer is doped with an n-type dopant and if the induced thermal stress is compressive, the layer is doped with a p-type dopant;

(d) allowing the structure to cool to ambient temperature while retaining most of such stress.

4,853,077

PROCESS FOR THE PREPARATION OF MONO-CRYSTALLINE 3-5 SEMI-INSULATING MATERIALS BY DOPING AND USE OF THE SEMI-INSULATING MATERIALS THUS OBTAINED

Bertrand Lambert; Yves Toudic, both of Lannion, and René Coquille, Trelevern, all of France, assignors to Etat Francais, Issy Les Moulineaux, France

Filed Apr. 8, 1987, Ser. No. 35,979
Claims priority, application France, Apr. 8, 1986, 86 05000
Int. Cl.⁴ C30B *15/04*
U.S. Cl. 156—605 **10 Claims**

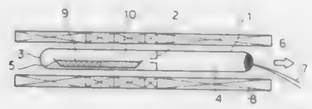
1. Process for the preparation of mono-crystalline 3–5 semi-insulating material by doping, comprising doping the starting charge of type p with at least one deep donor due to a transition element, wherein the starting charge or the mono-crystal previously doped with a deep donor is doped with at least one acceptor, and wherein the acceptors are selected from among Cd and/or Hg.

4,853,078

PROCESS FOR GROWING A MULTI-COMPONENT CRYSTAL

Kenji Miyazaki, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 41,450, Apr. 23, 1987, abandoned. This application Nov. 9, 1988, Ser. No. 268,650
Claims priority, application Japan, Apr. 23, 1986, 61-94336
Int. Cl.⁴ C30B *29/46*
U.S. Cl. 156—616.4 **11 Claims**



1. A process for growing a multi-component type crystal from the melt of a starting material consisting of more than three elements in a sealed reaction container divided internally into two zones consisting of a reaction zone and a vapor pressure control zone which are in communication through at least one opening, characterized by the steps of

placing said starting material for the multi-component crystal in said reaction zone while a vapor pressure control material consisting of more than two elements which are constituent elements of said multi-component crystal and are volatile as compared with the rest of constituent elements of said multi-component crystal is placed in said vapor pressure control zone,

raising the temperature in the reaction zone to fuse said starting material while said vapor pressure control material in said vapor pressure control zone is heated to such a temperature that is sufficiently high to cause the formation and maintenance of a vapor pressure of said pressure control material in said vapor pressure control zone,

creating such a temperature gradient in said reaction zone that a first portion of said reaction zone is maintained lower than a melting point of the multi-component crystal and a second portion of said reaction zone is maintained higher than the melting point in such a manner that the fused front of the starting material is created between the first portion and the second portion, and then

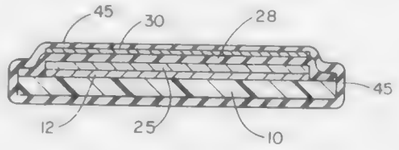
effecting a relative motion between said sealed reaction container and a heating means surrounding the sealed container so that the fused front is retracted gradually until the total of the fused material is solidified.

4,853,079

METHOD FOR MAKING ELECTROLUMINESCENT PANELS

Nicholas T. Simopoulos; George N. Simopoulos, and Gregory N. Simopoulos, all of Dayton, Ohio, assignors to Lumel, Inc., Dayton, Ohio

Division of Ser. No. 840,630, Mar. 17, 1986, Pat. No. 4,767,966, which is a continuation-in-part of Ser. No. 801,511, Nov. 25, 1985, Pat. No. 4,647,337, which is a continuation of Ser. No. 677,645, Dec. 4, 1984, abandoned. This application May 10, 1988, Ser. No. 192,260
Int. Cl.⁴ B44C *1/22;* **C03C** *15/00;* **B05D** *3/06;* **C23F** *1/02*
U.S. Cl. 156—633 **9 Claims**



1. The method of making a decorative electroluminescent lamp in which the lighted field of the lamp is formed into at least one discrete lighted portion at least partially surrounded by non-lighted portions of the lamp forming a decorative pattern of light thereon, comprising the steps of:

applying a transparent electrode to one side of a base sheet of polyester film;

printing said sheet on the electrode side thereof with an acid resist in a pattern corresponding to a desired configuration of the transparent electrode, said desired configuration corresponding to said decorative pattern plus electric connecting segments as necessary to join together portions of said electrode corresponding to said lighted panel portions;

etching said printed panel to remove said transparent electrode therefrom except where protected by said resist;

removing said resist to expose the remaining said transparent electrode;

applying a polymer resin containing an electroluminescent phosphor on said remaining transparent electrode corresponding to said discrete lighted portion to form a phosphor layer;

applying a dielectric polymer layer to said phosphor layer;

applying a second electrode polymer layer to said phosphor layer; and

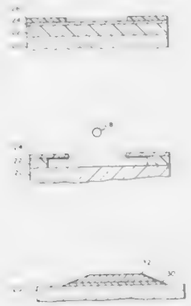
applying a sealing coating to said second electrode layer.

4,853,080

LIFT-OFF PROCESS FOR PATTERNING SHIELDS IN THIN MAGNETIC RECORDING HEADS

Thomas C. Anthony, Sunnyvale, Calif., assignor to Hewlett-Packard, Palo Alto, Calif.

Filed Dec. 14, 1988, Ser. No. 284,166
Int. Cl.⁴ B44C *1/22;* **B29C** *37/00;* **C03C** *15/00;* **B05D** *5/12*
U.S. Cl. 156—637 **24 Claims**



1. A lift-off process for patterning shields employed in thin film magnetic recording heads, said lift-off process comprising the steps of:

providing a substrate;

depositing a first layer of resist material on a surface of the substrate;

depositing a transfer layer on the exposed surface of the first layer of resist material;

depositing a second layer of resist material on the exposed surface of the transfer layer;

patterning and developing the second layer of resist material;

etching the patterned structure to form a mask structure wherein the transfer layer overhangs the first layer of resist material;

depositing an amorphous magnetic alloy material on the exposed surface of the substrate; and

removing the first layer of resist material, the transfer layer and excess amorphous alloy material.

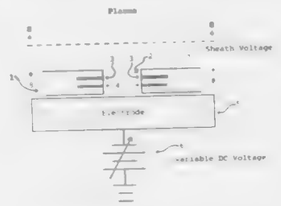
4,853,081

PROCESS FOR REMOVING CONTAMINANT

Walter E. Mlynko, Burlington, Vt., assignor to IBM Corporation, Armonk, N.Y.

Filed Oct. 30, 1987, Ser. No. 114,941
Int. Cl.⁴ B44C *1/22;* **H01L** *21/306*
U.S. Cl. 156—643 **11 Claims**

1. A process for removing contaminant from holes located in a substrate and having an entrance, outer edges and interior walls which comprises etching said holes having contaminant present on the interior walls of the holes in a gaseous plasma to selectively remove contaminant from the interior of the holes in preselected locations within said holes whereby a sheath voltage is generated between said substrate and said plasma by controlling the value of the sheath voltage to direct ions of the plasma in a curved path to contact the interior of said holes in the vicinity of said preselected locations in order to selectively



remote contaminant therefrom without overetching the outer edges of the holes.

4,853,082

PROCESS FOR THE ACTIVATION AND DELIGNIFICATION OF CELLULOSE PULP

Hans O. Samuelson, Gothenburg, Sweden, assignor to Mooch Domsjo Aktiebolag, Ornskoldsvik, Sweden

Continuation-in-part of Ser. No. 938,935, Dec. 8, 1986. This application Jun. 9, 1987, Ser. No. 60,131
Int. Cl.⁴ D21C *3/16*
U.S. Cl. 162—38 **9 Claims**



1. A process for the activation and delignification of cellulose pulp, which comprises:

(1) subjecting chemical cellulose pulp to activation by reaction with nitrogen dioxide in the presence of water at a temperature within the range from about 20° to about 120° C., while

(a) withdrawing from the pulp gas containing at least 1.2 mmol NO and other nitrogen oxides per liter of gas determined at 25° C. and calculated as nitrogen, reacting NO in said withdrawn gas with oxygen gas in an amount within the range from about 10 to about 200 mole percent, calculated on the amount of NO present, and recycling the reacted gas to the activation; and

(b) separating from the pulp gas containing less than 0.4 mmol NO and other nitrogen oxides per liter of gas determined at 25° C. and calculated as nitrogen from the cellulose pulp and removing said gas from the process; and

(2) delignifying the activated cellulose pulp.

4,853,083

METHOD OF FORMING BEATER-SATURATED SHEET USING CARBONATE ION

Jack F. Blevins, Leola, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation of Ser. No. 74,769, Jul. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 588,194, Mar. 12, 1984, abandoned, which is a continuation-in-part of Ser. No. 518,952, Aug. 1, 1983, abandoned. This application Oct. 3, 1988, Ser. No. 239,403

Int. Cl.[4] D21H *3/36, 5/12*

U.S. Cl. 162—145 16 Claims

1. The method of forming a beater-saturated, non-woven sheet comprising forming in water a slurry of paper-making fibers, in indifferent order (1) adding alum to the slurry, and (2) adding sodium hydroxide and sodium bicarbonate, to precipitate aluminum hydroxide on and around the fibers, the pH of the slurry after addition of both alum and bicarbonate being in the range of 7 to 9, adding a binder latex to the carbonate-treated slurry, agitating the latex-containing slurry to precipitate the binder onto the fibers and to precipitate any multivalent cations as carbonates, and forming a sheet from the resulting slurry.

4,853,084

METHOD FOR CONTROLLING ALKALINE PULPING PROCESS

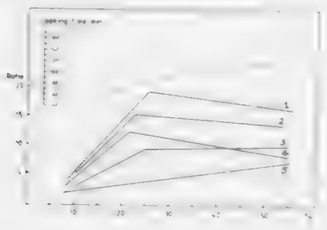
Raimo Alen, Ratamestarinkatu 13 A 17, SF-00520 Helsinki, and Eero Sjöstrand, Pitkänkalliontanhau 3 D 14, SF-02170 Espoo, both of Finland

Continuation of Ser. No. 818,101, Jan. 9, 1986, abandoned. This application Mar. 9, 1987, Ser. No. 23,994

Claims priority, application Finland, Jan. 17, 1985, 850208

Int. Cl.[4] D21C *3/02, 7/12*

U.S. Cl. 162—49 3 Claims



1. A method of controlling an alkaline pulping process, comprising the steps of pulping cellulose material with an alkaline cooking liquor in a pulping process, said process being selected from the group consisting of a sulfate process and a soda anthraquinone process, determining at a plurality of time intervals the concentration ratios of at least two different hydroxymonocarboxylic acids formed during the pulping wherein the ratios change at various times during the pulping, and terminating the pulping when a predetermined concentration ratio of said two hydroxymonocarboxylic acids is reached.

4,853,085

NEUTRAL SIZED PAPER FOR USE IN THE PRODUCTION OF GYPSUM WALLBOARD

Norman E. Johnstone, and John R. Kehoe, both of Schaumburg, Ill., assignors to United States Gypsum Company, Chicago, Ill.

Continuation-in-part of Ser. No. 263,371, May 13, 1981, Pat. No. 4,372,814. This application Nov. 15, 1982, Ser. No. 441,711

The portion of the term of this patent subsequent to Feb. 8, 2000, has been disclaimed.

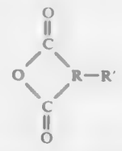
Int. Cl.[4] D21H *1/02*

U.S. Cl. 162—128 28 Claims

1. Gypsum wallboard comprising a core of set calcium sulfate dihydrate and a paper cover sheet bonded to each surface thereof, each of said paper cover sheets having been fabricated by first incorporating the ingredients including calcium carbonate into an aqueous slurry and then forming and drying said paper cover sheet, said ingredients comprising:

(A) a major proportion of cellulose fibers consisting essentially of waste paper stock providing an acidic furnish,

(B) a cyclic dicarboxylic acid anhydride applied as an internal sizing agent having the structural formula:



wherein R is selected from the group consisting of dimethylene and trimethylene radicals, and wherein R′ is a hydrophobic group containing more than 5 carbon atoms selected from the group consisting of alkyl, alkenyl, aralkyl and aralkenyl groups,

(C) a cationic agent, and

(D) a buffering agent comprising calcium carbonate adapted to maintain the aqueous paper slurry during forming at a pH of at least 7.

4,853,086

HYDROPHILIC CELLULOSE PRODUCT AND METHOD OF ITS MANUFACTURE

Peter A. Graef, Tacoma, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Dec. 15, 1986, Ser. No. 941,461

Int. Cl.[4] D21H *3/02*

U.S. Cl. 162—157.6 7 Claims

1. A method of making a resilient hydrophilic cellulose fluff product which comprises:

sheeting a fibrous cellulosic material from an aqueous slurry into a fibrous web;

treating the web with an aqueous solution of a glycol and dialdehyde wherein the glycol is of the type HO—[$(CH_2)_m$O]$_n$—H where m is 2 or 3 and n is in the range 1–500, and the dialdehyde is of the type OCH—$(CHX)_n$—CHO where n is in the range of 0–4 and X is hydrogen or hydroxyl, said glycol being applied in an amount in the range of 5–50 kg/t of fiber and the dialdehyde being applied in the range of 5–50 kg/t;

drying the treated web to a moisture content in the range of about 1–20% to react the cellulosic material with the dialdehyde, and

mechanically defiberizing the dried treated sheet and air felting the fiber into an absorbent fluff product.

4,853,087

PROCESS AND APPARATUS FOR PRODUCING A FILTER WITH MULTIPLE FOLDS

Georg Schlör, Lübeck, and Gerd Pantaleon-Stemberg, Mölln, both of Fed. Rep. of Germany, assignors to Draegerwerk Aktiengesellschaft, Fed. Rep. of Germany

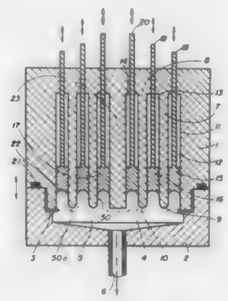
Division of Ser. No. 53,378, May 22, 1987, Pat. No. 4,784,813. This application Jun. 23, 1988, Ser. No. 209,844

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1986, 3622356

Int. Cl.[4] D21J *3/00*

U.S. Cl. 162—383 3 Claims

1. A device for producing a filter, comprising a mold housing having two interengageable parts connectable together along a split mold plane, a porous filter form having a plurality of filter fold portions arranged along its lateral disposed in said housing on said split mold plane, said mold housing defining a suction chamber on one side of said filter fold portions, said mold housing having support structures on the opposite side of said filter fold portions from said suction chamber which have end portions extending down to the base of said filter fold portions, a plurality of movable pump elements, and wherein each of said pump elements is arranged over each of said fold portion and positned between said support structures so as to be movable toward and away from said porous filter form between at least some of said support structures.



4,853,088

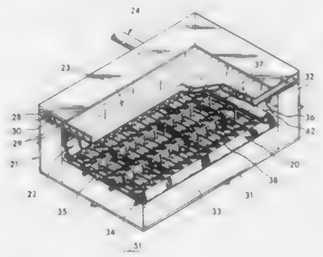
SOLAR ENHANCED SEPARATION OF VOLATILE COMPONENTS FROM A LIQUID

David D. Conway, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Apr. 12, 1988, Ser. No. 180,735

Int. Cl.[4] B01D *3/28*

U.S. Cl. 203—10 20 Claims



1. An apparatus for separating a volatile component from a volatile-containing liquid to produce a substantially volatile-free liquid comprising:

an inclined enclosure; a volatile-containing liquid inlet and a volatile-containing stripping gas outlet at an upper end of said enclosure;

a substantially volatile-free liquid outlet and a stripping gas inlet at a lower end of said enclosure; a transparent face panel for admitting solar radiation into said enclosure;

a flow plate positioned along an inclined plane within said enclosure to form a void space between said flow plate and said face panel, said flow plate having a top surface in liquid communication with said volatile-containing liquid inlet and said top surface facing said face panel to directly receive the solar radiation admitted into said enclosure;

convex protrusions spaced at intervals on said top surface of said flow plate, said protrusions having a perpendicular orientation relative to the inclination of said flow plate to agitate liquids flowing down said top surface of said flow plate;

a stripper gas conveying means at said stripper gas inlet for conveying a stripper gas upwards through said void space; and a volatile recovery means in fluid communication with said volatile -containing stripping gas outlet.

11. A process for separating a volatile component from a volatile-containing liquid to produce a substantially volatile-free liquid comprising:

(a) feeding a volatile-containing liquid to the upper end of an inclined enclosure;

(b) distributing said volatile-containing liquid substantially downward across a top surface of an inclined flow plate positioned within said enclosure;

(c) heating said flow plate by directing solar radiation onto said top surface through a transparent panel on the face of said enclosure;

(d) transferring heat from said flow plate to said volatile-containing liquid flowing downward across said top surface of said flow plate;

(e) agitating said volatile-containing liquid flowing downward across said top surface of said flow plate by means of spaced protrusions on said top surface aligned substantially perpendicular to the direction of liquid flow;

(f) feeding a stripping gas to the lower end of said inclined enclosure;

(g) conveying said stripping gas substantially upward countercurrent to the flow of said volatile-containing liquid through a head space within said enclosure above said flowing volatile-containing liquid;

(h) entraining said volatile component from said volatile-containing liquid in said stripping gas as said gas flows through said head space;

(i) exhausting said stripping gas and volatile component from the upper end of said enclosure; and

(j) withdrawing said substantially volatile free liquid from the lower end of said enclosure.

4,853,089

PROCESS FOR PURIFYING EXO-2-HYDROXY-1,4 CINEOLE

James O. Bledsoe, Jr., and Bernard Brust, both of Jacksonville, Fla., assignors to Union Camp Corporation, Wayne, N.J.

Continuation-in-part of Ser. No. 874,536, Jun. 16, 1986, abandoned. This application Oct. 29, 1987, Ser. No. 114,883

Int. Cl.[4] B01D *3/34*

U.S. Cl. 203—38 17 Claims

1. A method of purifying exo-2-hydroxy-1,4-cineole contaminated by admixture with a ketone, which comprises;

reacting the admixed ketone with an amine to obtain an enamine; and

separating the exo-2-hydroxy-1,4-cineole from the enamine by distillation.

9. A method of separating exo-2-hydroxy-1,4-cineole from a mixture with solvent hydrocarbons and ketone impurities, comprising;

reacting the ketone impurities in the mixture with an amine to obtain an enamine and water by-product;

distilling the reaction mixture to remove the water by-product and the solvent hydrocarbons; and

further distilling the reaction mixture to obtain said exo-2-hydroxy-1,4-cineole free from said enamine.

4,853,090

LITHIUM ION-SELECTIVE COMPOSITIONS, ELECTRODES AND A METHOD OF USE

Daniel S. Daniel, Rochester; Mary H. Delton, Honeoye Falls, and Harold C. Warren, III, Rush, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 28, 1988, Ser. No. 187,175

Int. Cl.[4] G01N *27/30*

U.S. Cl. 204—1 T 26 Claims

10. A lithium ion-selective electrode having a dried lithium ion-selective membrane composition comprising an uncomplexed lipophilic group-substituted 1,10-phenanthroline, a

compound capable of solvating said phenanthroline, and a supporting matrix.

19. A method for the potentiometric determination of lithium ions in an aqueous liquid comprising the steps of:

A. contacting a sample of a fluid suspected of containing lithium ions with the membrane of a lithium ion-selective electrode said membrane comprising an uncomplexed lipophilic group-substituted 1,10-phenanthroline, a compound capable of solvating said phenanthroline, and a supporting matrix,

B. connecting said electrode to a second reference electrode, and

C. detecting and comparing the electrical potentials generated by lithium ions in contact with said electrodes.

4,853,091

METHOD AND APPARATUS FOR THE ELECTROCHEMICAL DETERMINATION OF OXYGEN CONCENTRATION

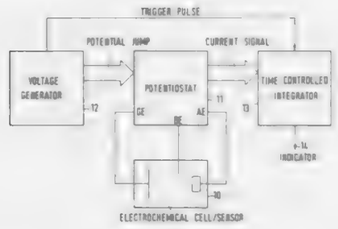
Konrad Mund, Uttenreuth; Walter Preidel, Erlangen; J. Raghavendra Rao, and Gerhard Richter, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 763,464, Aug. 7, 1985. This application Apr. 26, 1988, Ser. No. 186,755

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1984, 3429583

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—1 T **15 Claims**



1. A method for the electrochemical determination of oxygen concentration by means of an oxygen sensor with a measuring electrode comprising a smooth vitreous carbon or pyrographite electrode and further having a counter electrode, comprising cyclically impressing two potentials on the measuring electrode, one potential comprising a measuring potential in the range $-1.4\ V \leqq \rho Ag/AgCl \leqq -0.4\ V$ and another potential comprising a recovery potential in the range $0.2\ V \leqq \rho Ag/AgCl \leqq +0.2\ V$; maintaining a small dwelling time at the measuring potential with respect to the duration of the cycle; and evaluating a current flowing during the measuring period as the measuring signal; the cycle time of said cycle being between 0.5 and 10 seconds, said dwelling time at the measuring potential being between 5 and 100 msec, said counter electrode comprising a material which is inert and biocompatible and having a high double layer capacity relative to said measuring electrode, a diffusion membrane not being placed betwen said measuring electrode and the material whose oxygen concentration is being measured, said dwelling time at the measuring potential being substantially smaller than said cycle time whereby oxygen loss from the material whose oxygen concentration is being measured is compensated during the time during which the recovery potential is applied.

4,853,092

PRODUCTION OF MULTICOLOR DISPLAY

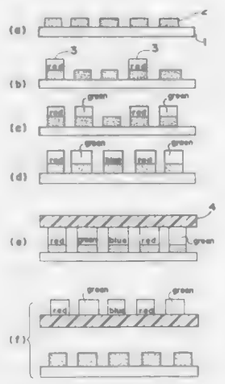
Akira Matsumura, Hirakata; Yasuo Nozaki, Kobe, and Katsukiyo Ishikawa, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Apr. 25, 1988, Ser. No. 186,074

Claims priority, application Japan, Apr. 24, 1987, 62-102339

Int. Cl.[4] C25D *13/02*

U.S. Cl. 204—18.1 **4 Claims**



1. A process for producing a multicolor display composed of a transparent substrate and multicolor layers thereon, consisting essentially of the following steps:

(a) immersing a transfer panel which has thereon electroconductive layers, insulated from each other, in an electrodeposition bath in which a voltage is applied to one or more of said electroconductive layers to be colored with a same color to form the color layer thereon,

(b) repeating said step (a) with the other colors to form a multicolor layer, and

(c) transferring said multicolor layer onto a transparent substrate.

4,853,093

ALUMINUM OR AN ALUMINUM ALLOY SUPPORT MATERIAL FOR USE IN OFFSET PRINTING PLATES

Michael Brenk, and Renate Ernst, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 114,771

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1986, 3637764

Int. Cl.[4] C25D *5/44*

U.S. Cl. 204—37.6 **19 Claims**

1. A support material for offset printing plates comprising aluminum or an aluminum alloy which has been anodized in alkaline solutions, characterized by having a reflectometer value, at an angle of incidence of 60° (measured according to DIN 67 530; 1982), of greater than about 5, an abrasion of the oxide layer of less than about 0.5 g/m^2 and a resistance to alkali of greater than about 140 s.

4,853,094

PROCESS FOR THE ELECTROLYTIC PRODUCTION OF METALS FROM A FUSED SALT MELT WITH A LIQUID CATHODE

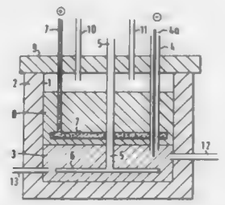
Anthonie Honders; Alfred J. Horstik, and Gerbrand J. M. Van Eyden, all of Arnhem, Netherlands, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed Mar. 15, 1988, Ser. No. 167,753

Claims priority, application United Kingdom, Apr. 1, 1987, 8707781

Int. Cl.[4] C25C *3/26, 3/30, 3/32, 3/34*

U.S. Cl. 204—64 R **19 Claims**



1. A process for the production of metal Me or an alloy containing metal Me from a metal halide MeXn by electrolysis in a cell comprising an anode, a liquid metal cathode comprising one or more metals M and a liquid electrolyte comprising a salt melt of one or more alkali metal or alkaline earth metal halides, which comprises: introducing metal halide MeXn directly into the liquid metal cathode; and withdrawing Me or an alloy containing Me from the metal cathode material, wherein Me represents a metal selected from the groups *2b*, *3b* (comprising the lanthanide series and the actinide series), *7b* and *8* of the periodic table and Cr, Cu, Au, Pb, Sn and Bi, x represents halogen and n represents the valency of the metal Me.

4,853,095

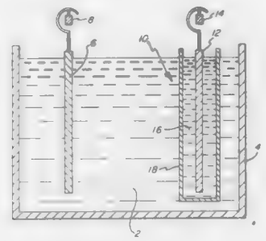
CONVERSION OF MANGANESE DIOXIDE TO PERMANGANATE

Joseph J. D'Ambrisi, Trumbull, Conn., assignor to MacDermid, Incorporated, Waterbury, Conn.

Filed Mar. 9, 1988, Ser. No. 165,752

Int. Cl.[4] C25B *1/28*

U.S. Cl. 204—82 **18 Claims**



1. In a process for generating alkali metal permanganate by electrolytic oxidation of manganese dioxide in the presence of an electrolyte comprising an aqueous solution of alkali metal hydroxide the improvement which comprises employing a non-sacrificial anode mounted in said electrolyte and a cathode which comprises an alkali resistant electrode immersed in a concentrated aqueous solution of an alkali metal hydroxide in a container porous to ions, said container being mounted in said electrolyte and serving as a diaphragm separating said anode and said cathode.

10. A process for regenerating an aqueous etchant bath comprised of an alkali metal hydroxide and permanganate which has approached or reached inefficiency as to its useful operating life by virtue of diminished permanganate concentration in said bath and precipitation in said bath of manganese dioxode, comprising subjecting said bath to electrolytic oxidation using a non-sacrificial anode mounted in said bath and a cathode comprising an alkali-resistant electrode immersed in a concentrated aqueous solution of an alkali metal hydroxide in a container porous to ions, said container being mounted in said bath and serving as a diaphragm separating said anode and said cathode.

4,853,096

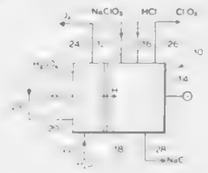
PRODUCTION OF CHLORINE DIOXIDE IN AN ELECTROLYTIC CELL

Marek Lipsztajn, Rexdale; James D. McGilvery, Etobicoke, and Zbigniew Twardowski, Mississauga, all of Canada, assignors to Tenneco Canada Inc., Islington, Canada

Filed Feb. 18, 1988, Ser. No. 156,965

Int. Cl.[4] C25B *1/26*

U.S. Cl. 204—101 **20 Claims**



1. An electrolytic process for the production of chlorine dioxide, which comprises:

providing an electrolytic cell having a cathode compartment with a three-dimensional high surface-area cathode therein and an anode compartment separated from the cathode compartment by a cation-exchange membrane,

feeding chlorate ions to the cathode compartment and providing hydrogen ions and chloride ions in said cathode compartment,

reducing said chlorate ions with said hydrogen ions and chloride ions in said cathode compartment to form chlorine dioxide while an electric current is applied to the cathode compartment to reduce chlorine co-produced with said chlorine dioxide to chloride ions,

venting chlorine dioxide so produced, and electrolytically forming hydrogen ions in said anode compartment and transferring said hydrogen ions across said cation exchange membrane from said anode compartment to said cathode compartment.

4,853,097

PERFLUOROPOLYETHERS FREE FROM PEROXIDIC OXYGEN AND CONTAINING PERFLUOROEPOXY GROUPS POSITIONED ALONG THE PERFLUOROPOLYETHER CHAIN, AND THEIR DERIVATIVES

Giuseppe Marchionni; Ugo De Patto, both of Milan; Ezio Strepparola, Treviglio, and Gian T. Viola, Cervia, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

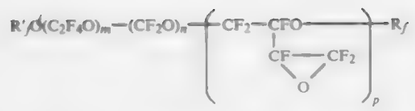
Filed May 4, 1987, Ser. No. 45,541

Claims priority, application Italy, May 7, 1986, 20346 A/86

Int. Cl.[4] B01J *19/12*

U.S. Cl. 204—157.6 **5 Claims**

1. Process for preparing perfluoropolyethers represented by the following formulae;



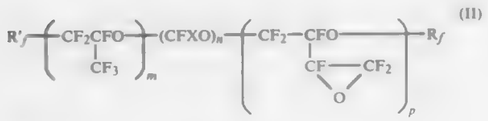
(I)

wherein

R_f and R'_f are $-CF_2COF$ or $-CF_3$ end groups at least one being $-CF_2COF$, or groups R_f, R'_f which are $-CF_2COOR$ or $-CF_2Br$;

m, n, and p are integers different from zero, the m/n ratio being within the range of from 0.5 to 2, the oxyfluoroalkylene units being randomly distributed along the chain;

the m+n/p ratio ranging from 3 to the 40; or



(II)

wherein:

X=F or CF_3;

m, n and p are integers different from zero;

R_f and R'_f indicate the above end groups;

the m/n ratio being within the range of from 5 to 40; and

the m/p ratio being within the range of from 2 to 50;

comprising subjecting to photochemical oxidation with molecular oxygen, and in the presence of U.V. light, at temperatures within the range from −80° C. to +50° C., a liquid-phase mixture of at least one perfluorinated olefin and at least one conjugated perfluorodiene, and in subsequently decomposing the peroxy groups present in the photoxidation product:

(a) by treatment with U.V. light at a wavelength within the range of from 248 to 334 nm, and at temperatures of from 0° to +160° C.; or

(b) by reacting with HI in an alkanol ROH wherein R is alkyl C_1–C_6.

4,853,098

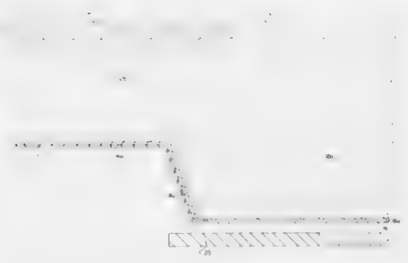
METHOD OF MAKING IMAGE INTENSIFIER TUBE

Monte J. Drinkwine, Lake Zurich, Ill., assignor to ITT Electro Optical Products, A Division of ITT Corporation, Roanoke, Va.

Division of Ser. No. 899,768, Aug. 22, 1986, Pat. No. 4,724,357, which is a continuation of Ser. No. 655,399, Sep. 27, 1984, abandoned. This application Dec. 17, 1987, Ser. No. 134,289

Int. Cl.[4] C23C *14/34*

U.S. Cl. 204—192.28 **3 Claims**



1. A method of making an image intensifier tube comprising the steps of:

forming a face plate of optical material having a light transmitting surface and a light receiving surface

positioning photoemissive means adjacent the face plate for emitting electrons in response to light transmitted through the face plate;

depositing a first coating of a metal oxide onto a portion of the light transmitting surface and adjacent the photoemissive means by reactively sputtering a metal, the metal oxide being non-reflecting and light absorbing at least in the near infrared region;

forming a transition layer on the first coating by gradually withdrawing a portion of reactant and increasing the amount of metal in the layer; and

withdrawing the remaining reactant to deposit a second coating of an electrically conductive metallic material onto the transition layer and joining the photoemissive means.

4,853,099

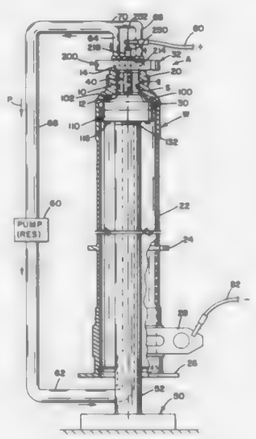
SELECTIVE ELECTROPLATING APPARATUS

Gary W. Smith, North Olmsted, Ohio, assignor to SIFCO Industries, Inc., Cleveland, Ohio

Filed Mar. 28, 1988, Ser. No. 174,431

Int. Cl.[4] C25D *17/00, 17/12, 21/10*

U.S. Cl. 204—224 R **37 Claims**



1. An electroplating apparatus for rapidly depositing a metal onto a selected surface of a workpiece, said apparatus comprising: an anode having an active surface with a selected shape to combine with said selected surface of said workpiece to define an elongated gap of at least 0.050 inches; means for supporting said anode in a fixed position to define said elongated gap; solution circulating means for forcing an electroplating solution with metal cations through said gap in a generally closed path at an ultra high velocity to exchange electroplating solution in said gap at a rate of at least 200 times per minute; and, means for applying current flow between said selected workpiece surface and the active surface of said anode through said gap at a current density in excess of 2.0 amperes/in^2.

4,853,100

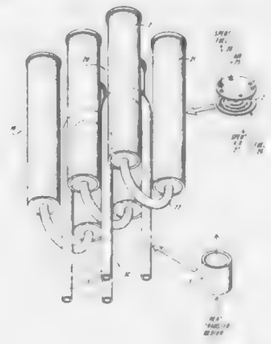
HIGH PERFORMANCE ELECTROCHEMICAL ENERGY CONVERSION SYSTEMS

Michael S. Hsu, Roundhill Rd., Lincoln, Mass. 01773

Continuation-in-part of Ser. No. 861,433, May 9, 1986, Pat. No. 4,721,556, which is a continuation-in-part of Ser. No. 735,441, May 17, 1985, Pat. No. 4,629,537. This application Jan. 11, 1988, Ser. No. 142,067

Int. Cl.[4] C25B *9/00;* **H01M** *8/04*

U.S. Cl. 204—256 **21 Claims**



1. An electrochemical system, the system comprising:

an electrochemical converter assembly having a plurality of columnar converter elements, each columnar element comprising a set of electrolyte plates having a fuel electrode material coated on one side and an oxidizer electrode material coated on the other side, and a set of interconnector plates to provide electrical contact with the electrode coatings of the electrolyte plates, as well as passages for the distribution of gases, wherein the columnar element is assembled by stacking alternating layers of electrolyte and interconnector plates and then joining said plates together at their peripheral edges to define a gastight assembly; and

an inter-columnar heat transport assembly, having a plurality of integrated heat transport elements disposed between the elements of the converter assembly without contacting the converter elements to provide efficient temperature regulation by radiant heat transfer.

4,853,101

POROUS SEPARATOR COMPRISING INORGANIC/POLYMER COMPOSITE FIBER AND METHOD OF MAKING SAME

Louis W. Hruska, Geneva, and Carl W. Brown, Jr., Painesville, both of Ohio, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Continuation of Ser. No. 768,880, Aug. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 651,247, Sep. 17, 1984, abandoned. This application May 29, 1987, Ser. No. 55,661

Int. Cl.[4] C25B *13/00*

U.S. Cl. 204—296 **32 Claims**

32. A deposited diaphragm, deposited from a slurry on a foraminous substrate, said diaphragm having non-isotropic organic and inorganic composite fibers of 5 to 70 weight organic halocarbon polymer fiber in adherent combination with from about 30 to 95 weight percent of very finely-divided inorganic particulates impacted into said fiber during fiber formation, said deposited diaphragm having a weight per unit of surface area of between about 3 and about 12 kilograms per square meter.

4,853,102

SPUTTERING PROCESS AND AN APPARATUS FOR CARRYING OUT THE SAME

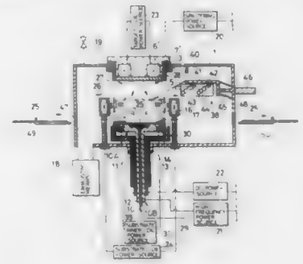
Hideki Tateishi, Yokohama; Hiroshi Saito, Fujisawa; Shinji Sasaki, Yokohama, and Mitsuaki Horiuchi, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,562

Claims priority, application Japan, Jan. 7, 1987, 62-363; Mar. 11, 1987, 62-54005; Apr. 1, 1987, 62-77419

Int. Cl.[4] C23C *14/00*

U.S. Cl. 204—298 **24 Claims**



1. A sputtering apparatus that includes a vacuum chamber for holding an inert gas comprises:

first means for holding a target comprising film forming material wherein said target is disposed on a first side of said first means and wherein said first means comprises a cathode electrode;

an anode electrode;

second means, connected to said cathode electrode and said anode electrode, for generating an electric field;

third means for producing a first magnetic field, wherein said third means comprises a target magnetic device disposed on a second side of said first means, opposite to said first side;

fourth means for supporting a substrate wherein said fourth means comprises a supporting electrode;

fifth means for producing a cusp magnetic field along the perimeter of said substrate in conjunction with said first magnetic field, wherein said fifth means comprises an outer magnetic device disposed around said fourth means; and

sixth means for producing a central magentic field distributed substantially uniformly over a first surface of the substrate in conjunction with said first magnetic field, wherein said sixth means comprises an inner magnet disposed beneath said substrate.

4,853,103

LUBE CATALYTIC DEWAXING-HYDROTREATING PROCESS

Mohsen N. Harandi, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 11, 1988, Ser. No. 179,727

Int. Cl.[4] C10G *45/64, 45/00*

U.S. Cl. 208—58 **7 Claims**

1. A method of producing a catalytically dewaxed, hydrotreated lubricating oil of improved quality, which comprises:

(i) catalytically dewaxing a hydrocarbon lubricating oil fraction by contacting the fraction during a dewaxing/hydrotreating cycle with a zeolitic dewaxing catalyst in the presence of hydrogen under dewaxing conditions, to produce a dewaxed effluent,

(ii) hydrotreating the dewaxed effluent by contacting the effluent during the dewaxing/hydrotreating cycle with a hydrotreating catalyst comprising a metal hydrogen component on a porous non-acidic support in the presence of

hydrogen under hydrotreating conditions, to produce a hydrotreated, dewaxed effluent,

(iii) reactivating the dewaxing catalyst at the end of the dewaxing/hydrotreating cycle by contacting the dewaxing catalyst with hydrogen at an elevated temperature to restore dewaxing activity to the catalyst,

(iv) oxidatively regenerating the hydrotreating catalyst at the end of the dewaxing/hydrotreating cycle by contacting the hydrotreating catalyst with an oxygen-containing gas at an elevated temperature to restore hydrotreating activity to the catalyst,

(v) repeating steps (i) and (ii) with the reactivated dewaxing and regenerated hydrotreating catalysts in a new dewaxing/hydrotreating cycle in which aromatic components formed by the hydrogenative reactivation of the dewaxing catalyst in step (iii) and sorbed on the dewaxing catalyst pass with the dewaxed effluent form the dewaxing catalyst to the hydrotreating catalyst on which they are sorbed during the initial stages of the dewaxing/hydrotreating cycle.

4,853,104

PROCESS FOR CATALYTIC CONVERSION OF LUBE OIL BAS STOCKS

Thomas F. Degnan, Jr., Yardley, Pa., and Philip Varghese, Voorhees, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 20, 1988, Ser. No. 183,866
Int. Cl.[4] C10G *67/02, 69/04*
U.S. Cl. 208—61 **10 Claims**

1. A process for producing lube oil and gasoline from a lube oil base stock and a standard catalytic cracking feedstock comprising:

(a) hydrocracking said lube oil base stock at moderate severity conditions including a reactor inlet pressure of 400 to 2000 psig, a reactor temperature of 650° to 850° F. and a space velocity of 0.1 to 10 hr^{-1} to produce a hydrocrackate comprising at least about 10 percent by weight aromatic hydrocarbons;

(b) solvent extracting at least a portion of said hydrocrackate to provide a paraffin rich raffinate and an aromatics rich extract, said extract comprising aromatic hydrocarbons in an amount at least about 10 percent of the extract on a solvent free weight basis;

(c) dewaxing said raffinate to produce a lube oil having a viscosity index of at least about 90; and

(d) catalytically concurrently cracking said extract and said standard catalytic cracking feedstock under fluidized conditions, the ratio of said standard catalytic cracking feedstock to said extract being greater than about 1:4.

4,853,105

MULTIPLE RISER FLUIDIZED CATALYTIC CRACKING PROCESS UTILIZING HYDROGEN AND CARBON-HYDROGEN CONTRIBUTING FRAGMENTS

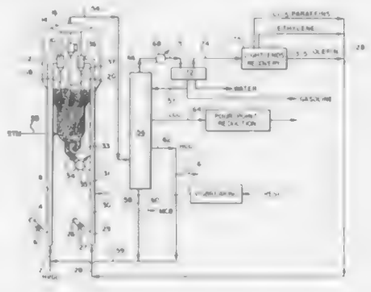
Joseph A. Herbst, Turnersville; Hartley Owen, Belle Mead, both of N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 903,182, Sep. 3, 1986, abandoned. This application Feb. 1, 1988, Ser. No. 148,204
Int. Cl.[4] C10G *51/04*
U.S. Cl. 208—74 **20 Claims**

1. A catalytic cracking process which comprises:

(a) cracking a gas oil in a first riser in the presence of a mixed catayist composition comprising, as a first catalyst component, at least one member of the group of amorphous cracking catalyst and large pore crystalline cracking catalyst and as a second catalyst component, a shape selective zeolite, at a mixed catalyst to feed ratio from about 2:1 to about 20:1 and a temperature from about 900° to 1150° F. to produce cracked products comprising C_1 to C_5 hydrocarbons, gasoline boiling range materials and spent catalyst, and stripping at least a portion of spent catalyst to produce stripped catalyst which is regenerated in a catalyst regeneration zone to produce hot, regenerated catalyst;

(b) generating in a lower region of a second riser reactor at least one of mobile hyrogen species and carbon-hydrogen fragments by contacting a stream of light hydrocarbons with hot regenerated catalyst at a catalyst to feed ratio of about 50:1 to 200:1 and at a temperature of about 1100° to 1500° F. to form a catalyst-hydrocarbon suspension comprising carbon-hydrogen fragments, which suspension is discharged into an upper region of said second riser;



(c) adding a visbroken resid feed to said upper region to contact the catalyst-hyrocarbon suspension discharged from the lower region of the second riser and reacting said visbroken resid in the presence of said mixed catalyst composition under conditions effecting cracking and additive carbon-hydrogen reactions with said resid and forming a resid-catalyst mixture;

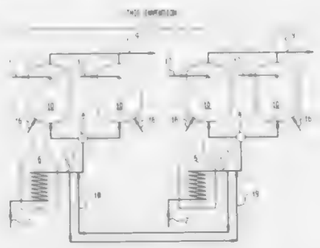
(d) quenching said resid-catalyst mixture in said second riser by adding thereto a portion of said spent catalyst, discharged from said first riser to produce a quenched resid-catalyst mixture having a temperature of about 950° to 1150° F. and discharging from said second riser a mixture of catalytically cracked products and spent catalyst.

4,853,106

DELAYED COKING PROCESS

J. Jay Grove, Cherry Hill, and Grant G. Karsner, Voorhees Township, Camden County, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 19, 1987, Ser. No. 87,564
Int. Cl.[4] C10G *9/14*
U.S. Cl. 208—131 **6 Claims**



1. A process for the delayed coking of a heavy hydrocarbon oil feedstock in an apparatus comprising a first and second coker furnace and a first and second active coking drum, each of said coking drums having a processing capacity for C ft^3 of heavy hydrocarbon oil feedstock preheated to coking temperature by said furnaces, each of said furnaces being capable of providing a continuous flow of said preheated feedstock at a fixed flow rate of V ft^3/hr such that at a total drum-fill time of t hours each provides a flow (V×t)=C, which process comprises:

(a) providing conduit and valve means whereby the combined output of said first and second furnace is unequally proportioned between said first and second active coking drums;

(b) initiating the fill of said first active coking drum at flow rate V_1 which is greater than V but less then 2V and maintaining said flow for 0.5 t hours while passing the remainder of said combined output to said second active coking drum whereby completing its fill; and,

(c) completing the fill of said first active coking drum at a flow rate of $V_2=2V-V_1$ while initiating the fill of said second active coking drum at flow rate V_1.

4,853,107

METHOD AND APPARATUS FOR REMOVING SMALL CATALYST PARTICLES IN FCC SYSTEMS

James H. Haddad, Princeton Junction, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed Nov. 2, 1984, Ser. No. 667,661
Int. Cl.[4] C10G *11/18*
U.S. Cl. 208—152 **2 Claims**

1. A method for reducing catalyst particulate contamination in fluid catalyst cracking process, where catalyst, having passed through a reactor vessel and accumulated deactivating hydrocarbons is passed to a regenerator vessel, said method comprising the steps of:

passing a gaseous effluent in said regenerator vessel from at least a first separator through at least a primary cyclone separator to at least a secondary cyclone separator positioned within the regenerator vessel;

passing a gaseous effluent from the secondary cyclone separator to an exhaust outside the regenerator vessel;

passing at least a portion of the catalyst separated by the secondary cyclone to a temporary catalyst retaining area located in said regenerator vessel and from there to a catalyst storage area; and

withdrawing from said regenerator vessel a portion of catalyst contained in said temporary catalyst retaining area.

4,853,108

PROCESS FOR HYDROTREATING HYDROCARBON FEEDS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 67,039, Jun. 29, 1987, Pat. No. 4,738,945, which is a continuation-in-part of Ser. No. 924,222, Oct. 28, 1986, abandoned. This application Nov. 19, 1987, Ser. No. 122,864
Int. Cl.[4] C10G *45/08*
U.S. Cl. 208—216 R **35 Claims**

1. A process for hydrotreating hydrocarbon feeds by contacting said feeds with a hydrotreating catalyst which has a surface area above about 300 m^2/g and at least about 80% of the pore diameters less than about 70 Å, wherein said catalyst is prepared by a process which comprises:

(a) precipitating an aqueous solution of one or more aluminum salt(s) by adjusting the pH of said solution to a range between about 5.5 and about 10.0 at a temperature in the range between about 20° C. and about 90° C.,

(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 8.0 to about 12.0,

(c) washing the precipitate,

(d) mixing the precipitate with dry, water-soluble salts of nickel and a heavy metal selected from the group consisting of molybdenum, tungsten and mixtures thereof, and a phosphorus-containing compound in an amount of from about 0.2 to about 1.5 moles of phosphorus per mole of heavy metal, at a pH in the range between about 4.0 and about 8.0 and a temperature in the range between about 25° C. and about 100° C. to yield a final catalyst having from about 1% w to about 5% w nickel and from about 8% w to about 32% w heavy metal,

(e) extruding the product of step (d), and

(f) drying and calcining the product of step (e) at a temperature ranging from about 300° C. to about 900° C.

4,853,109

DEMETALATION OF HYDROCARBONACEOUS FEEDSTOCKS USING DIBASIC CARBOXYLIC ACIDS AND SALTS THEREOF

John G. Reynolds, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 7, 1988, Ser. No. 164,597
Int. Cl.[4] C10G *17/00*
U.S. Cl. 208—252 **13 Claims**

1. A method for demetalizing Group IIA and/or Group VIII metals from hydrocarbonaceous feedstock comprising:

mixing said hydrocarbonaceous feedstock with an aqueous solution of a metals sequestering agent, said agent comprising dibasic carboxylic acid or salts thereof; and

separating the substantially demetalated hydrocarbonaceous feedstock from the aqueous solution; wherein the feedstock to be demetalated is selected from the group consisting of crude petroleum, atmospheric or vacuum residua, solvent deasphalted oil derived from these crudes or residua, shale oil, liquefied coal, and tar sand effluent.

4,853,110

METHOD FOR SEPARATING ARSENIC AND/OR SELENIUM FROM SHALE OIL

Gopal H. Singhal, Houston, and Daniel F. Ryan, Friendswood, both of Tex., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 31, 1986, Ser. No. 925,676
Int. Cl.[4] C10G *29/04*
U.S. Cl. 208—253 **7 Claims**

1. A method for separating arsenic and/or selenium from a shale oil consisting essentially of the steps of:

(a) combining said shale oil with a metal complex, selected from the group consisting of the mono- and dihydrocarbyl-substituted metal complexes of dithiocarbamic acids, dithiophosphoric acids and xanthic acid, said metal being selected from the metals of Groups VI-A and VIII-A of the Periodic Table of the Elements, and mixtures thereof, which metal complex is soluble in said shale oil and which will decompose to the corresponding metal sulfide;

(b) converting said metal complex to the corresponding metal sulfide by heating;

(c) contacting said shale oil and said converted metal complex at a temperature within the range from about 300° F. to about 800° F. in an inert or reducing atmosphere for a period of time within the range from about 10 to about 180 minutes, such that said converted metal complex reacts with arsenic and/or selenium in the shale oil;

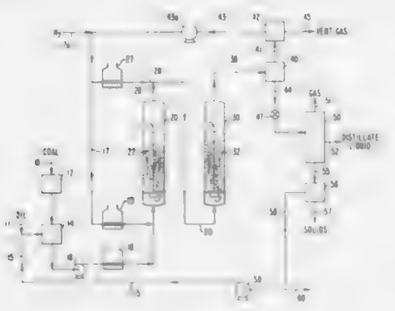
(d) separating the reacted arsenic and/or selenium from said shale oil; and

(e) recovering a shale oil having a reduced concentration of arsenic and/or selenium.

4,853,111
TWO-STAGE CO-PROCESSING OF COAL/OIL FEEDSTOCKS

James B. MacArthur, Denville; Joseph B. McLean, S. Somerville, both of N.J., and Alfred G. Comolli, Yardley, Pa., assignors to HRI, Inc., Lawrenceville, N.J.

Continuation of Ser. No. 725,457, Apr. 22, 1985, abandoned. This application Jul. 25, 1986, Ser. No. 889,587
The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.
Int. Cl.[4] C10G *1/06, 1/08*
U.S. Cl. 208—421 14 Claims



1. A two-stage continuous process for catalytic hydroconversion of a fluid blend of a solid carbonaceous material and heavy hydrocarbon liquid, comprising:

(a) mixing a solid carbonaceous particulate material with sufficient heavy hydrocarbon liquid having at least about 90 V% normally boiling above 650° F. to provide a flowable slurry mixture, the total hydrocarbon liquid/coal feed weight ratio being between about 1.0/1 and 3/1 with the solid carbonaceous material being between about 25 and 50 W% of the total feed material;

(b) feeding the flowable slurry mixture with hydrogen into a first stage back-mixed catalytic reaction zone containing an ebullated catalyst bed of particulate hydrogenation catalyst, said reaction zone having an internal liquid recycle; said catalyst containing an active metal component wherein the metal in said component is selected from the metals group consisting of cobalt, iron, molybdenum, nickel, tin, tungsten, and mixtures thereof on a support material, said catalyst bed being maintained at 650°–800° F. temperature, 1000–4000 psig hydrogen partial pressure and feed rate of 10–100 lb carbonaceous material plus heavy hydrocarbon liquid feed per hour per ft^3 reaction zone volume for hydrogenation reaction to partially hydrogenate and hydroconvert the feed materials to hydrocarbon material containing less than 6 W% C_1–C_3 hydrocarbon gases, 15–25 W% 650° F.— light liquid fraction and 60–70 W% 650° F.+ hydrocarbon material fraction;

(c) passing the total effluent material from said first stage reaction zone with additional hydrogen directly to a close-coupled second stage back-mixed catalytic reaction zone containing an ebullated catalyst bed so as to avoid forming retrograde materials in the effluent, said catalyst containing an active metal component wherein the metal in said component is selected from the metals group consisting of cobalt, iron, molybdenum, nickel, tin, tungsten and mixtures thereof on a support material, said second stage reaction zone being maintained at a higher temperature than the first stage reaction zone, and at 750°–900° F. temperature and 1000–4000 psig hydrogen partial pressure to convert the remaining unconverted carbonaceous material to hydrocarbon gases, hydrocarbon liquid fraction normally boiling between 400°–650° F. and including a high boiling residuum fraction;

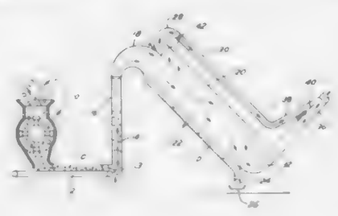
(d) passing the resulting effluent material from said second stage reaction zone to successive phase separation and distillation steps to separate the gas material fraction; and

(e) removing unconverted coal and ash solids material and a heavy hydrocarbon bottoms liquid material, and thereby producing low-boiling hydrocarbon liquid products normally boiling between 150° F. and 975° F.

4,853,112
LOW VELOCITY AIR CLASSIFIER

Victor Brown, 2208 Shadowdale, Houston, Tex. 77043

Filed Jul. 25, 1988, Ser. No. 223,440
Int. Cl.[4] B07B *4/00*
U.S. Cl. 209—142 11 Claims



1. An improved apparatus for continuously separating lightweight combustible constituents from heavy constituents of mixed solid municipal waste comprising

(a) an elongated chamber having an inlet opening at one end thereof and an outlet opening at the opposite end thereof,

(b) a trough connecting to the bottom of said chamber, said trough having a discharge opening for said heavy constituents,

(c) means for removing the heavy constituents from said discharge opening,

(d) an air inlet duct connecting to said inlet opening of said chamber, said inlet duct being of smaller cross section than the cross section of said chamber,

(e) a suction fan connecting to said outlet opening to provide an air stream through said apparatus, including said inlet duct,

(f) means for feeding said waste into said air stream to entrain waste particles in said stream,

(g) a by-pass duct separate from and substantially parallel to said chamber connecting to the upstream end of said chamber adjacent said inlet opening, and adjacent the outlet opening at the downstream end of the chamber, and

(h) a damper disposed at the downstream end of said by-pass duct to adjust the volume of air flowing through said by-pass duct.

4,853,113
FROTH FLOTATION OF BASTNAESITE

Srdjan Bulatovic, Peterborough, Canada, assignor to Falconbridge Limited, Toronto and Highwood Resources Ltd., Vancouver, both of, Canada

Continuation-in-part of Ser. No. 933,845, Nov. 24, 1986, Pat. No. 4,772,382. This application Jul. 15, 1988, Ser. No. 219,633
Claims priority, application Canada, Sep. 5, 1986, 517639
Int. Cl.[4] B03D *1/02*
U.S. Cl. 209—166 9 Claims

1. A method for the froth flotation separation of rare earth metal compounds contained in oxidic minerals comprising,

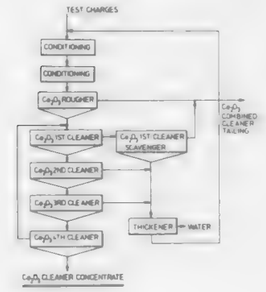
(i) adding a premixed collector emulsion mixture selective to rare earth metal compounds, to an aqueous slurry of oxidic minerals, said collector emulsion mixture comprising:

(a) 23 to 33 wt. % of a secondary amine modified sulphonated fatty acid, having 12 carbon atoms in the hydrocarbon chain which is linked to the carboxyl group of said fatty acid;

(b) 40 to 50 wt. % high rosin containing, tall oil fatty acid;

(c) 15 to 20 wt. % anionic petroleum sulphonate; and,

(d) 5 to 15 wt. % high molecular weight primary amine of general formula $R''NH_2$, wherein R'' is a hydrocarbon radical containing alkyl and aryl groups,



(ii) subjecting the aqueous slurry containing said collector emulsion mixture to froth flotation, wherein the rare earth metal compounds are selectively concentrated in the froth.

4,853,114
METHOD FOR THE DEPRESSING OF HYDROUS, LAYERED SILICATES

Norman J. Lewis, Lisvane Cardiff, Wales, and Hans P. Panzer, Stamford, Conn., assignors to American Cyanamid Copany, Stamford, Conn.

Filed Mar. 3, 1989, Ser. No. 318,789
Claims priority, application South Africa, Apr. 5, 1988, 88/2304
Int. Cl.[4] B03D *1/02*
U.S. Cl. 209—167 7 Claims

1. A method for the beneficiation of value minerals from an ore containing said value minerals and hydrous, layered silicates with selective rejection of said hydrous, layered silicates which comprises:

(a) providing an aqueous pulp slurry of finely-divided, liberated ore particles;

(b) conditioning said pulp slurry with an effective amount of hemicellulose to selectively depress said hydrous, layered silicates, a mineral collector and a frothing agent, respectively;

(c) subjecting the conditioned pulp slurry to froth flotation to produce a froth containing beneficiated value minerals and a resultant pulp slurry containing said depressed hydrous, layered silicates; and

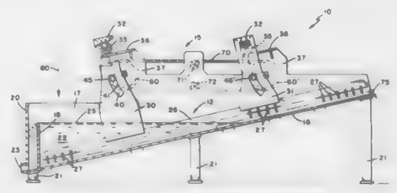
(d) recovering the beneficiated value minerals from the froth.

4,853,115
RAKE CLASSIFIER

George W. Kennel, White Plains, N.Y., and Matthew J. Rollberg, Stamford, Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Jul. 20, 1988, Ser. No. 221,956
Int. Cl.[4] B03B *5/64, 5/54*
U.S. Cl. 209—173 9 Claims

1. A rake classifier comprising a tank having side and end walls, a rake structure, an electric motor having a motor shaft and motor-driven means for imparting raking movement to said rake structure, said rake structure positioned in said tank and having two pairs of upstanding hanger elements spaced along the length of said rake structure, said motor driven means comprising a driven slot in each hanger element with the slots of each pair aligned, a plurality of supporting guide surfaces with one of said guide surfaces adjacent each hanger element, means at the upper end of each hanger element for contacting said supporting guide surfaces, a drive shaft for each pair of hanger elements passing through said aligned driven slots, a crank element located on each end of said drive shafts, a plurality of bearing shafts fixed in said side walls, one

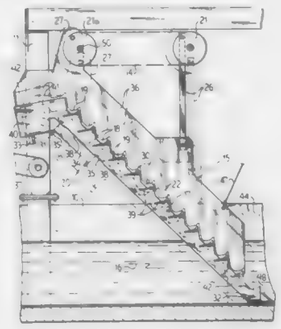


of said crank elements joining one of said drive shafts to said motor shaft with the crank element at the other end thereof joining said drive shaft to a bearing shaft, the other of said drive shafts connected at both ends thereof to crank elements which are connected to bearing shafts mounted in said side walls, and means for driving said drive shafts in synchronism.

4,853,116
DEVICE FOR COLLECTING AND DISCHARGING SOLID MATTER

Carl O. Wallander, Gothenburg, Sweden, assignor to Hydropress Wallander & Co., Sweden

Continuation of Ser. No. 769,516, Aug. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 507,025, Jun. 23, 1983, abandoned. This application Jun. 12, 1987, Ser. No. 80,321
Claims priority, application Sweden, Jul. 5, 1982, 82-04127; May 24, 1985, 8502582
Int. Cl.[4] B01D *33/00*
U.S. Cl. 210—104 16 Claims



1. A device including a grid structure located in a conduit for collecting and discharging solid matter from a waste collecting stream having a liquid-solid mixture therein, comprising:

an inclined grid structure formed by a series of stationary bars defining a stationary grid and a series of displaceable bars defining a displaceable grid, the displaceable bars alternating with the stationary bars, the series of stationary and displaceable bars being configured to form steps, and further with displaceable bars being placed at outermost positions of the series,

the stationary and displaceable bars having means to retard the downward movement of solid matter on the inclined grid structure,

displaceable vertical side plates affixed to the outermost displaceable bars which move in tandem with the displaceable bars and are displaceable therewith so as to

substantially prevent any solid matter from falling along the sides of the grid structure,

the stationary bars and the displaceable bars being inclined at an angle such that, in use, any solid matter collected on the bars will be substantially prevented from falling back down the inclined grid structure,

means including a beam structure connected to the displaceable vertical side plates and running transversely below the displaceable bars and positioned on the inclined grid structure so as to be above the waste collecting stream for interconnecting at least two of the displaceable bars,

means interconnecting the displaceable bars into one unit in the displaceable grid;

saw teeth formed on selected combinations of the displaceable bars and the stationary bars to prevent the displaceable bars from becoming blocked at the beam structure, and

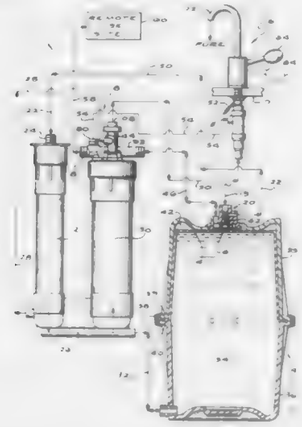
driving means having a power source and a connecting means connected to the displaceable vertical side plates such that, when the power source is engaged, the driving means will impart a movement to the displaceable vertical side plates in said at least one unit so that at any point the edges of the displaceable bars will perform a generally closed circuitous path of movement including at least one vertical component of movement within each path to cause solid matter collected at the grid structure to move upwardly along the displaceable bars.

4,853,117

PURIFIED WATER SUPPLY SYSTEM

Bruce D. Burrows, 24844 Anza Dr., Valencia, Calif. 91355

Filed Oct. 15, 1987, Ser. No. 108,770
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—110 **27 Claims**



1. A purified water supply system, comprising:

a reverse osmosis unit having a tap water inlet, a purified water outlet, and a reject water outlet;

means for coupling a tap water supply means to said inlet of said reverse osmosis unit, said reverse osmosis unit including means for producing from said tap water supply means a supply of relatively purified water at said purified water outlet, and a supply of reject water at said reject water outlet;

a storage vessel having an internal movable barrier separating the interior of said vessel into a purified water chamber and a reject water chamber;

flow path means for coupling said purified water supply from said purified water outlet to said purified water chamber;

at least one faucet valve;

flow path means defining a discharge path for said purified water supply, said discharge path being coupled between said purified water chamber and said at least one faucet valve, said at least one faucet valve being movable between a closed position closing said discharge path to prevent dispensing of said purified water supply and an open position for opening said discharge path for dispensing of the purified water supply;

means defining a drain;

flow path means defining a reject water flow path communicating between said reject water outlet and said reject water chamber, and for defining a reject water drain path communicating between said reject water chamber and said drain; and

control means responsive to the operational position of said at least one faucet valve for coupling said reject water supply via said reject water drain path to said drain when said at least one faucet valve is in said closed position and for coupling said reject water supply to said reject water chamber via said reject water flow path when said at least one faucet valve is in said open position, said control means including means for regulating the pressure level within said vessel to a pressure level substantially below tap water line pressure;

said control means including a reject water flow control valve positioned along said reject water flow path and movable between a seated position permitting a limited flow of reject water along said reject water flow path and an unseated position permitting a substantial flow of reject water along said reject water flow path, and a reject water drain valve mounted along said reject water drain path and movable between an open position permitting flow of reject water along said reject water drain path and a closed position preventing flow of reject water along said reject water drain path;

said control means further including means responsive to the position of said at least one faucet valve for moving said flow control valve to said seated position and said drain valve to said open position when said faucet valve is in the closed position, and for moving said flow control valve to said unseated position and said drain valve to said closed position when said at least one faucet valve is in said open position, said means responsive to the position of said at least one faucet valve comprising a single actuator member for engaging and moving both of said flow control and drain valves.

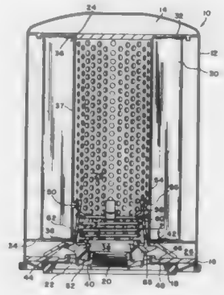
4,853,118

LIQUID FILTER

Peter Brownell, Providence; Joseph A. Borgia, Cranston, and Robert Gabrielson, Smithfield, all of R.I., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Jul. 15, 1988, Ser. No. 219,411
Int. Cl.[4] B01D *27/10*
U.S. Cl. 210—130 **16 Claims**

1. Liquid filter comprising an outer shell defining a cavity therewithin, said cavity defining an axis, said shell having an end member, said end member defining an outlet opening coaxial with said shell for communicating liquid filtrate from said cavity, said outlet opening including means for attaching said shell to a fluid utilization device, circumferentially spaced inlet openings circumscribing said outlet opening and radially offset from the later with respect to said axis, a filtering media cartridge within said cavity dividing the latter into an outlet chamber communicating with the outlet opening and an inlet chamber communicating with the inlet openings, an annular fixture circumscribing said outlet opening and including projecting means projecting into said outlet chamber, passage means extending through said fixture for communicating the inlet with the outlet chamber, said fixture including a circumferentially extending sealing surface, and an annular valve member mounted on said sealing surface of the fixture, said valve member including a circumferentially extending central portion supported by said sealing surface of the fixture and providing a fluid tight seal with the media cartridge to prevent bypass of the liquid filtrate from said inlet chamber to the outlet chamber, means for holding the media cartridge in sealing engagement with the circumferentially extending central portion, said valve member including a first deflectable portion projecting from said circumferentially extending central portion into said inlet chamber for controlling communication of the liquid filtrate through said inlet openings and a second deflectable portion projecting from said circumferen-



tially extending portion for controlling communication of the liquid filtrate through said passage means, said projecting means including a member projecting axially from said fixture into said outlet chamber, resilient means bearing against said projecting member and against said second deflectable portion to prevent deflection of the latter to permit fluid flow through the passage means until the pressure differential across the second deflectable portion exceeds a predetermined level, said axially projecting member including circumferentially spaced slots defining spaces therebetween, said second deflectable portion including circumferentially spaced flaps extending through said slots.

4,853,119

MICROWAVE EMULSION TREATER WITH INTERNAL COALESCER

Nicholas O. Wolf; Roger L. Hudgins, and David S. Seidner, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Mar. 24, 1988, Ser. No. 172,688
Int. Cl.[4] B01D *17/04*
U.S. Cl. 210—181 **4 Claims**



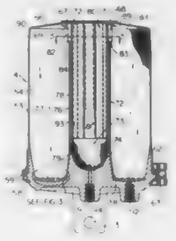
1. In a microwave-based emulsion treating system comprising a microwave energy source and a microwave energy applicator having an inlet for an oil and water emulsion to be treated with microwave energy and an outlet for discharge of treated oil and water, the improvement comprising a coalescer medium having a dielectric constant at 2450 MHz of from about 0.1 to about 15 and a loss factor of less than 2 positioned inside said applicator for contacting said emulsion simultaneously with treatment of said emulsion by microwave energy wherein said emulsion contacts said coalescer medium while said emulsion contains the most heat energy from said microwave source to enhance separation of said water from said emulsion.

4,853,120

AXIAL REVERSE FLOW FILTER ASSEMBLY FOR FLUIDS

John M. Frantz, 12337 Delaware Rd., Hickman, Calif. 95323-9602

Filed May 13, 1989, Ser. No. 194,035
Int. Cl.[4] B01D *46/00*
U.S. Cl. 210—184 **18 Claims**



1. An axial reverse flow filter housing assembly adapted to removably receive therein a spirally wound filter element for filtering fluids, comprising:

(a) a base (2) having inlet (9) and outlet (12) passageways therein for said fluids, said outlet passageway including an annular channel (38) on one side of said base (2) having an annular bottom wall (37), said inlet passageway channeling fluids initially axially and then transversely to pass over one end (88) of said spirally wound filter element (8) remote from said annular channel (38) whereby said inlet passageway connects with said annular channel (38) only through said filter element (8) when said filter element (8) is removably mounted in said housing assembly, and said outlet passageway (12) connects directly with said annular channel (38) through said annular bottom wall (37);

(b) screen means (3) mounted on said base member (2) and disposed in said annular channel (38) adjacent said bottom wall (37);

(c) cover means (4) detachably mounted sealingly on said base member (2) enclosing said annular channel (38) and adapted to sealingly enclose said removable filter element (8) when disposed wherewithin; and

(d) a hollow elongated boss (71) mounted on said cover means and adapted to extend into said filter element and engage the inner periphery thereof when a filter element is mounted in said housing assembly.

4,853,121

CHAMBER FILTER PRESS

Hans J. Heinrich, Ennepetal, and Max Oelbermann, Remscheid, both of Fed. Rep. of Germany, assignors to Rittershaus & Blecher GmbH

Filed Jul. 31, 1986, Ser. No. 891,171
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1985, 3527556
Int. Cl.[4] B01D *25/12, 25/32*
U.S. Cl. 210—225 **15 Claims**

1. A chamber filter press comprising a pack of frameless chamber plates covered on respective sides thereof with filter cloths stretched thereover, two adjacent chamber plates contact each other with an outer continuous clamping ring and define between them a filter chamber, said filter chamber including a central filter cake compartment lying between the filter cloths and two outer filtrate compartments lying respectively between the chamber plate and the filter cloth, repressing means for the filter cakes arranged in a zone of at least one of the two filtrate compartments of each filter chamber, a central aperture means disposed in each chamber plate for enabling a feeding of slurry with a filter cloth sleeve penetrating the central aperture means and connected to the filter

cloths on the respective sides of the chamber plate, said repressing means including distensible annular cushions, means for mounting a distensible annular cushion within at least one filtrate compartment of each filter chamber at an adjoining chamber and for keeping open, at least along a lower edge of the distensible cushion, a liquid passage between the half of the filtrate compartment on a filter cloth side and the half on the

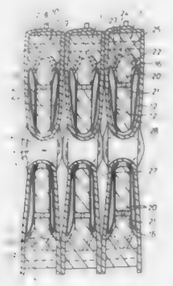


plate side, wherein the chamber plates in a central area thereof are provided with support cog means which rest against each other when a filter plate pack is closed, and wherein each distensible annular cushion includes two elastic diaphragms, each diaphragm having a central aperture and the two diaphragms being tightly connected with each other along an outer edge thereof and along an inner edge thereof along marginal strips in flat contact with each other.

4,853,122

P-XYLYLENEDIAMIDE/DIIMIDE COMPOSITE RO MEMBRANE

Scott B. McCray, Bend, Oreg., assignor to Bend Research, Inc., Bend, Oreg.

Filed Sep. 15, 1987, Ser. No. 98,201
Int. Cl.[4] B01D *13/01*
U.S. Cl. 210—321.89 **6 Claims**

1. A composite membrane comprising:

(a) a microporous polymeric support; and

(b) an aromatic aliphatic diamide/diimide membrane formed on said support by interfacial polymerization of trimesoyl chloride and an aromatic aliphatic amine/imine of the formula

$$R_2HNR_1—Ph—R_1NHR_2$$

where Ph is a para-substituted phenylene group, R_1 is an alkylene group containing from 1 to 2 carbon atoms, and R_2 is hydrogen or an alkyl group containing from 1 to 2 carbon atoms.

4,853,123

COMPLETELY SEALED FUEL FILTER AND METHOD OF MAKING SAME

Mark B. Hayes, Mt. Clemens, and Daniel Scanlon, Detroit, both of Mich., assignors to Cusolar Industries, Inc., Mt. Clemens, Mich.

Filed Jul. 15, 1988, Ser. No. 219,185
Int. Cl.[4] B01D *29/14*
U.S. Cl. 210—316 **22 Claims**

1. A completely sealed fuel filter comprising an open mesh support open at its ends;

a closed tubular perforate body covering said support, of a material having openings throughout its surface sufficiently small in the micron range so as to pass fuel therethrough, but not aqueous solutions present in fuel and contaminants;

said body having an outlet, said outlet generally extending on a first axis;

a connector surrounding the outlet and secured to said body adapted for coupling the filter to the inlet of a fuel pump, with said outlet adapted to communicate with the pump inlet; and



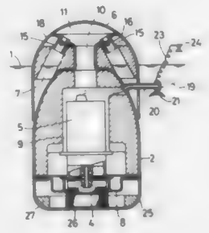
a filter outlet patch made of a material having openings in the same micron range as said body, spanning and covering said outlet and peripherally secured to said body to thereby completely seal the filter, said filter outlet patch being transverse to said first axis.

4,853,124

DEVICE FOR PRODUCING BUBBLING STREAM OF WATER IN BATHTUB

Seisaku Terada, Yamatotakada, Japan, assignor to Terada Pump Mfg. Co., Ltd., Nara, Japan

Filed Nov. 9, 1987, Ser. No. 117,837
Claims priority, application Japan, Apr. 8, 1987, 62-54897[U]
Int. Cl.[4] E04H *3/18*
U.S. Cl. 210—242.2 **1 Claim**



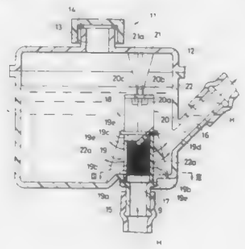
1. A device for forming a bubbling stream of water for use in a bathtub, comprising a float body, a pump mounted in said float body, a motor for driving said pump, and a strainer for filtering the water sucked by said pump, said float body being provided with a plurality of injection nozzles each having an air intake port for mixing air into the water sucked up by said pump and with a plurality of downwardly angled discharge ports for discharging bubbling streams of water into the bathtub, said float body containing a buoyant material means in an amount sufficient for causing the buoyancy of the body to be sufficient so that during operation, the injection nozzles are above the level of the water surface and the discharge ports are below the level of the water surface, and whereby the downwardly angled discharged ports discharge water downward and outward providing an upward force on said body to facilitate floating and to reduce the need for buoyant material.

4,853,125

FLUID CHAMBER HAVING A TUBULAR FILTER AND A SECURING RECESS FOR MOUNTING THE SAME

Hisao Hanabusa, Aichi, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jun. 11, 1987, Ser. No. 60,616
Claims priority, application Japan, Jun. 30, 1986, 61-100732[U]
Int. Cl.[4] B01D *29/00, 35/02*
U.S. Cl. 210—172 **15 Claims**



1. A fluid filtering chamber comprising: a main body portion having a fluid inlet port and a fluid outlet port, said main body portion defining a fluid chamber;

means defining a securing recess about the periphery of said fluid inlet port on the interior surface of said main body portion;

a tubular filter element sized so as to be snuggly received at least partially within said securing recess means, said filter element including a lower cylindrical portion having an open bottom, an upper cylindrical portion having a closed top and a substantially conical downwardly projecting portion provided on the under-surface of the closed top, a plurality of supporting rod elements extending between and coupling said upper cylindrical portion and said lower cylindrical portion, and means for filtering fluid secured to the inner peripheries of said upper cylindrical portion, said lower cylindrical portion and said supporting rod elements; and

a radial, discoid projecting flange mounted to an upper portion of the periphery of said lower cylindrical portion and a radial, discoid projecting flange mounted to the upper cylindrical portion, and at least one position regulating rib extending between the inner surface of said fluid chamber and each said flange, each said flange having at least one notch for receiving said at least one position regulating rib.

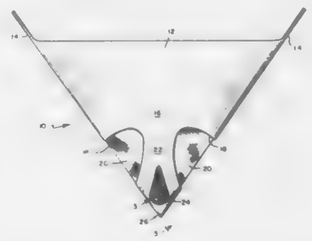
4,853,126

PAINT STRAINER

James P. Whelan, North Marshfield, Mass., assignor to Ad-Tec Products, Inc., Plymouth, Mass.

Filed Jun. 6, 1988, Ser. No. 202,522
Int. Cl.[4] B01D *23/28*
U.S. Cl. 210—469 **1 Claim**

1. A conical strainer embodying a conical side wall defining a rim and terminating in a tip; peripherally-spaced, symmetrically-disposed openings in the side wall of the cone located between the rim of the cone and the tip, adjacent to, but above, the tip; an intermediate opening located in the side wall between the symmetrically-disposed. peripherally-spaced openings above the tip, but below the upper ends of the peripherally-spaced openings; and a drainage opening disposed between the intermediate opening and the tip, said drainage opening extending less than half the distance around the tip and terminating at a defined apex of the tip such that the extremity of the tip is imperforate.



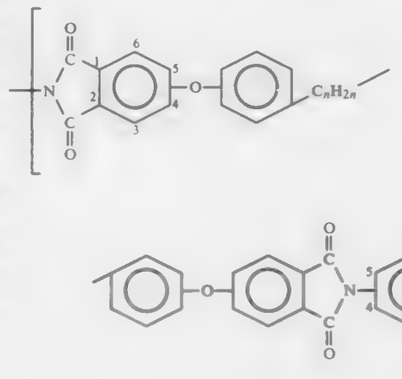
4,853,127

MICROPOROUS MEMBRANE

Minh S. Le, Gateshead, and John S. Wilkes, South Shields, both of England, assignors to Domnick Hunter Ilbiry Limited, Birtley, Great Britain

Filed Dec. 2, 1987, Ser. No. 127,796
Claims priority, application United Kingdom, Dec. 3, 1986, 8628938
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—500.39 **23 Claims**

1. A microporous membrane for use in filtration, the membrane being self-supporting formed of a polyetherimide derived from an aromatic bis (ether anhydride) and an organic diamine, and having the formula



wherein n is an integer from 1 to 8, the positions of the oxygen atoms linking the phenylene and phthalimide rings are selected from the 3,3'; 4,4' or 3,4' positions and mixtures thereof, and m is any integer; and containing a void volume of at least 60%.

4,853,128

NON-DISTORTING SEPARATOR FOR AUTOCLAVABLE MEMBRANE STACKS

Wolfgang J. Wrasidlo, LaJolla; Frieder K. Hofmann, Oceanside, and Dirk M. DeWinter, Vista, all of Calif., assignors to Brunswick Corporation, Skokie, Ill.

Filed Apr. 19, 1988, Ser. No. 183,056
Int. Cl.[4] B01D *13/04*
U.S. Cl. 210—636 **8 Claims**

1. In the method including forming an autoclavable assembly of interleaved membranes and sheet separators comprising

forming a stack of membranes interleaved with polymer web separators, the improvement comprising subjecting at least said separators to pre-shrinking prior to the formation of said stack by heating without tension at a temperature of from about 120 to about 130 degrees C. with wet steam at a pressure of from about 1.0 to 2.0 atmospheres for a time of from about 10 to about 60 minutes to produce an irreversible shrinkage of said separators.

4,853,129

MODIFIED REGENERATED CELLULOSE MEMBRANE FOR NON-AQUEOUS SEPARATIONS

Wankei Wan, Sarnia, Canada, assignor to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 561,286, Dec. 14, 1983, abandoned. This application May 18, 1987, Ser. No. 50,771

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—651 **13 Claims**

10. A method for separating nonaqueous, water wet mixtures by permeation through a selective separation membrane wherein the selective separation membrane is regenerated cellulose which has been chemically modified by the step consisting essentially of contacting said memrane with a bifunctional reagent which reacts with the hydroxy groups in the anhydroglucose units of the regenerated cellulose but which bifunctional reagent, after reaction, has no residual unreacted hydroxy groups of its own.

4,853,130

METHOD FOR PURIFYING LIQUIDS

Philip J. D'Angelo, Glen Mills; Richard Hetherington, Glenside, and Joseph J. Rogan, Levittown, all of Pa., assignors to Epicor Incorporated, Linden, N.J.

Continuation-in-part of Ser. No. 811,525, Dec. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 640,528, Aug. 14, 1984, abandoned. This application Jun. 17, 1987, Ser. No. 63,177

Int. Cl.[4] C02F *1/42;* **B01D** *37/02*

U.S. Cl. 210—663 **19 Claims**

1. A method for purifying a waste liquid containing radioactive material which comprises:

Passing the radioactive waste liquid through a filter containing a pre-coat medium, said pre-coat medium consisting essentially of a flocculated and substantially uniform mixture of (A) a finely-divided zeolitic material and (B) a finely-divided ion-exchange resin material selected from the group consisting of: (a) an admixture of a strongly acidic cation exchange resin and a strongly basic anion exchange resin, (b) an admixture of a strongly acidic cation exchange resin and a weakly basic anion exchange resin, (c) an admixture of a weakly acidic cation exchange resin and a strongly basic anion exchange resin, and (d) a strongly basic anion exchange resin;

Separating said radioactive material at least in part on said pre-coat medium; and

Recovering a filtrate fluid stream containing a reduced concentration of radioactive material.

4,853,131

METHOD FOR WATER TREATMENT

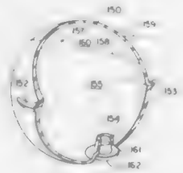
Kenji Etani, P.O. Box 102, West Townsend, Mass. 01474

Division of Ser. No. 93,186, Sep. 4, 1987, Pat. No. 4,775,485, which is a division of Ser. No. 488,597, Apr. 22, 1983, Pat. No. 4,692,314, which is a continuation-in-part of Ser. No. 40,302, May 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 934,425, Aug. 17, 1978, abandoned, which is a continuation of Ser. No. 717,514, Aug. 25, 1976, abandoned, which is a continuation-in-part of Ser. No. 591,536, Jun. 30, 1975, abandoned. This application Mar. 17, 1988, Ser. No. 169,430

The portion of the term of this patent subsequent to May 28, 2002, has been disclaimed.

Int. Cl.[4] C02F *5/08*

U.S. Cl. 210—696 **15 Claims**



1. A process for adding chemicals to water comprising the steps of:

(1st.) providing a feeder in the form of a stiff waterproof shell perforated by a number less than 26 of holes each greater than five thousandths of an inch (0.005") in diameter and less than three square millimeters in cross section, containing a dose of a chemical having said number of and size of said holes to provide a desired rate of feeding of said dose,

(2nd) placing said feeder so as to be free to move about and roll within an intermediate-velocity chamber, and

(3rd) impinging the water over said feeder in said chamber at a rate to provide a flow at an appropriate intermediate-flow velocity in said chamber, thereby to extract said dose at a substantially uniform rate into said water,

(a) said feeder being small enough and close enough to spherical in shape and to neutral buoyancy depending on the said flow velocity that it is free to move about and roll in said water when impinged upon by said flow, and

(b) said chemical is of the group consisting of nutrients, fungicides, herbicides, insecticides, microbiocides, germicides, corrosion inhibitors, scale inhibitors, dispersants, and defoamers,

(c) wherein an effective amount of said chemical is added to treat said water.

4,853,132

PAINT SPRAY BOOTH TREATMENT

Gene A. Merrell, Huntingdon Valley, and Deborah L. Purnell, Philadelphia, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Feb. 29, 1988, Ser. No. 161,866

Int. Cl.[4] C02F *1/56*

U.S. Cl. 210—712 **8 Claims**

1. A process for detackifying and coagulating paint, lacquer, or enamel in spray booths in which water is used to wash air in said booth and to remove oversprayed paints, enamels, or lacquers from said water prior to said water being recirculated for further washing the air in said spray booth, said process consisting essentially of the steps of adding to said water a sufficient amount for the purpose of a water-soluble or water-dispersible cationic polymer selected from the group consisting of:

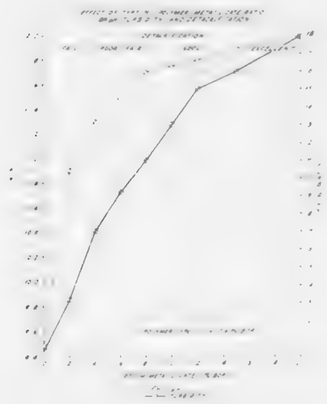
condensation polymers of dimethylamine and epichlorohydrin and ethylene diamene,

condensation polymers of melamine and formaldehyde,

condensation polymers of diethylenetriamine and adipic acid and epichlorohydrin,

condensation polymer of dimethylaminopropylamine and epichlorohydrin, and

condensation polymer of dimethylamine and epichlorohydrin, in selective combination with a sufficient amount for



the purpose of a water-soluble salt selected from the group consisting of metasilicate, orthosilicate, disilicate, mixed silicates, metaaluminate, molybdates, phosphomolybdates and phosphates, the anion of said salt reacting with said polymer to cause said polymer to form a precipitate in said water which in turn detackifies and coagulates said paint, lacquer or enamel to provide a paint sludge that is high in solids and low in volume.

4,853,133

COAL DEWATERING

Steven A. Flynn, Thames Ditton, and Paul R. Rutter, Richmond, both of England, assignors to The British Petroleum Company p.l.c., London, England

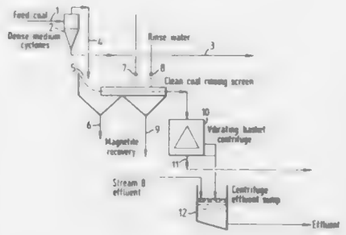
PCT No. PCT/GB87/00303, § 371 Date Dec. 10, 1987, § 102(e) Date Dec. 10, 1987, PCT Pub. No. WO87/06855, PCT Pub. Date Nov. 19, 1987

PCT Filed May 7, 1987, Ser. No. 132,951

Claims priority, application United Kingdom, May 10, 1986, 8611462; Dec. 12, 1986, 8629768

Int. Cl.[4] B01D *21/26*

U.S. Cl. 210—729 **8 Claims**



1. The process for reducing the water content of wet small coal in the size range 38 mm to 0.5 mm which comprises the successive steps of:

(1) adding to the small coal a quantity of water soluble anionic surfactant in the range 25 to 200 ppm based on weight of water in the wet small coal, wherein said anionic surfactant is selected from the group consisting of a dialkyl sulphosuccinate in which each alkyl group contains from 5 to 12 carbon atoms, an alkyl aryl sulphonate in which the aryl group is a benzene group or a napthalene group and the alkyl group contains from 3 to 12 carbon atoms, an alkyl sulfate in which the alkyl group contains from 8 to 15 carbon atoms, and an alkyl ether sulfate in which the alkyl group contains from 8 to 15 carbon atoms,

(2) subjecting the coal to a centrifugation step to produce coal with reduced water content and an aqueous effluent, and

(3) subsequently adding a foam-suppressing amount of a cationic organic compound to the aqueous effluent from the centrifugation step, said cationic organic compound being a quaternary ammonium salt having at least an alkyl chain having from 10 to 25 carbon atoms linked directly to the nitrogen atom or to an aryl group linked directly to the nitrogen atom.

4,853,134

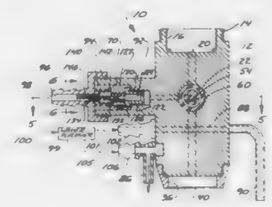
HEAT SENSITIVE SHUT-OFF DIVERTER VALVE

Richard L. Cure, Stratton, and David A. Meyer, Aurora, both of Colo., assignors to Water Purification Systems, Inc., Stratton, Colo.

Filed Nov. 30, 1987, Ser. No. 126,751

Int. Cl.[4] C02F *1/00;* **G05D** *23/00*

U.S. Cl. 210—742 **20 Claims**



16. The method of protecting a purifier from damage wherein the purifier has a component carrying fluid flow which is damaged by excessive fluid temperature by stopping fluid flow thereto when the fluid has excessive temperature, and resuming fluid flow thereto rapidly when the excessive temperature is reduced, comprising the steps of:

passing a fluid to the purifier through a valve port prior to reaching the component, which valve port is closable by a heat sensing device in the fluid flow so that when the temperature of the fluid is excessive, the valve port is closed and flow to the purifier stopped;

bringing the temperature of the fluid below the excessive temperature; and

passing the lowered temperature fluid past the sensing device to conduct heat away therefrom to rapidly open the port.

4,853,135

CATALYST RESINS FOR THE CATALYTIC REDUCTION OF OXYGEN IN AQUEOUS MEDIA, THE PREPARATION OF THE CATALYST RESINS, AND NEW CATALYST RESINS

Siegfried Oeckl, Bergisch Gladbach; Friedrich Martinola, Cologne, and Paul Thomas, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 5, 1987, Ser. No. 47,222

Claims priority, application Fed. Rep. of Germany, May 23, 1986, 3617273

Int. Cl.[4] C02F *1/70*

U.S. Cl. 210—757 9 Claims

1. In the process for the removal of oxygen from aqueous media by catalytic reduction of the oxygen with the use of an anion exchanger which is charged with palladium or platinum and is based on crosslinked polystyrene as a catalyst, the improvement which comprises using as the catalyst a macroporous weakly basic anion exchanger charged with palladium or platinum and based on crosslinked polystyrene, which resin has been prepared by pretreating a macroporous, weakly-basic anion exchanger with a dilute aqueous mineral acid, steeping the pretreated anion exchanger in an aqueous solution of a complex salt of palladium or platinum which contains the metal in the form of an anionic complex, and subjecting the anion exchanger to reductive treatment.

4,853,136

PROCESS FOR OXIDIZING SUBSTANCES DISSOLVED OR IN SUSPENSION IN AN AQUEOUS SOLUTION

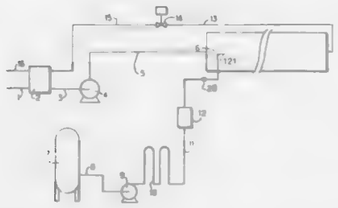
Jacques Roussel, Hauterives, and Xavier Cochet, Trets, both of France, assignors to L'Air Liquide, Paris, France

Continuation of Ser. No. 824,063, Jan. 30, 1986, abandoned. This application Jan. 22, 1988, Ser. No. 147,056

Claims priority, application France, Feb. 4, 1985, 85 01488

Int. Cl.[4] C02F *1/72*

U.S. Cl. 210—761 6 Claims



1. Process for oxidizing substances which are dissolved or in suspension in an aqueous solution, said process comprising injecting into an inlet of a hollow, polyphase tubular reactor, said reactor having a single oxygen inlet connected to a jet located internally of said reactor, said solution at such temperature that the oxidation reaction occurs at a temperature higher than 50° C. and at an absolute pressure higher than 2 bars, injecting gaseous oxygen into said oxygen inlet as a single injection at a pressure slightly higher than said liquid pressure, and collecting the solution in which said substances are oxidized at an outlet of said tubular reactor, said injection of the solution and the gaseous oxygen being effected in the same direction at a pressure which is not more than about 210 bars and a temperature which is not more than about 370° C., the velocity in an empty pipe of between 1 m/s and 10 m/s and the injection of the oxygen being carried out at a surface velocity in an empty pipe of between 0.0m/s and 5 m/s, the specific energy due to pressure drops consumed in the reactor per unit volume of the reactor being between 0.4 KW/m^3 and 40 KW/m^3, the rate of oxidation of the substances being at least 90% while the rate of utilization of the oxygen in the course of the oxidation reaction is at least 90%.

4,853,137

METHOD AND DEVICE FOR SEPARATING SERUM/PLASMA FROM BLOOD

Nils-Olof Ersson, Bokvägen 5, S-961 37 Boden, Sweden

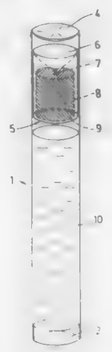
PCT No. PCT/SE86/00381, § 371 Date Apr. 27, 1987, § 102(e) Date Apr. 27, 1987, PCT Pub. No. WO87/01457, PCT Pub. Date Mar. 12, 1987

PCT Filed Aug. 27, 1986, Ser. No. 50,298

Claims priority, application Sweden, Aug. 27, 1986, 8503991

Int. Cl.[4] B01D *21/26*

U.S. Cl. 210—782 2 Claims



1. A method for separating serum or plasma from a given volume of blood, comprising:

providing a test tube having a peripheral sidewall with an inner peripheral surface and two opposite ends;

disposing in said test tube a separating body including a shell having a first recess which opens axially towards one of said ends, a second recess which opens axially towards the other of said ends, an axially extending internal passage connecting said first and second recesses, and an outer periphery which is spacedly surrounded by said inner peripheral surface of said sidewall, so as to leave an annular gap therebetween; said separating body further including a filling of viscous or fine granular material received in said first recess; said separating body having a specific gravity substantially corresponding to that of leukocytes and thrombocytes contained in the blood that is to be separated; said filling having a higher specific gravity than said shell; said separating body being disposed near said one end of said test tube;

introducing into said test tube a given volume of blood;

with said test tube closed, centrifuging the blood-containing test tube in an orientation such as to separate said blood into a heavy phase containing red corpuscles and located between said one end and said separating body and a light phase containing serum or plasma and located between said opposite end and said separating body, plus leukocytes and thrombocytes located in said light phase adjacent said second recess;

further centrifuging the test tube and its contents, in said orientation, and thereby causing said filling to flow axially out of said first recess and, reversing axial direction, into said annular gap thereby sealing said annular gap, creating a negative pressure in said second recess and causing at least some of said leukocytes and thrombocytes to be sucked into said second recess, whereby light phase relatively free of luekocytes and thrombocytes remains outside said separating body in said test tube, between said separating body and said opposite end.

4,853,138

C-BRANCHED ZWITTERIONIC SURFACTANTS AND ENHANCED OIL RECOVERY METHOD USING SAME

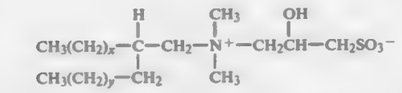
Roman Loza, Solon, and Roseann M. Cyngier, Cleveland, both of Ohio, assignors to The Standard Oil Company

Filed Aug. 5, 1987, Ser. No. 81,824

Int. Cl.[4] E21B *43/22*

U.S. Cl. 252—8.554 15 Claims

1. A method of recovering oil from a subterranean formation comprising injecting an aqueous composition into said formation and displacing said oil toward one or more production wells, said aqueous composition comprising a surface-active amount of at least one compound of the formula



wherein x is in the range of about 3 to about 5 and y is in the range of about 10 to about 12, x is less than or equal to y+1, and the sum of x+y is in the range of about 7 to about 19, with the provisos that: (1) when the sum of x+y is in the range of about 7 to about 13, x/y is in the range of about 0.3 to about 1.2; and (2) when the sum of x+y is in the range of about 14 to about 19, x/y is in the range of about 0.1 to about 0.7.

4. The method of claim 1 wherein said aqueous composition comprises a surfactant slug, said surfactant slug being injected into said formation through one or more injection wells, said method further comprising the steps of:

injecting into said formation through said injection wells a buffer slug to follow said surfactant slug, said buffer slug comprising an aqueous solution containing an effective amount of at least one thickener to provide said buffer slug with a viscosity exceeding the viscosity of said surfactant slug, then

injecting into said formation through said injection wells an aqueous flooding medium to displace the oil toward said production wells.

4,853,139

LUBRICATING OIL COMPOSITION HAVING IMPROVED TEMPERATURE CHARACTERISTICS

Toshihiko Ichihashi, Ichihara, Japan, assignor to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1988, Ser. No. 183,777

Claims priority, application Japan, May 14, 1987, 62-115966

Int. Cl.[4] C10M *145/14, 157/10*

U.S. Cl. 252—32.7 E 15 Claims

1. A lubricating oil composition having improved temperature characteristics, containing:

(A) a base oil having a kinematic viscosity at 100° C. of 1.5 to 50 cSt, a pour point of −25° C. or lower and a viscosity index of at least 60;

(B) an ethylene-α-olefin copolymer having a number average molecular weight of 1,000 to 8,000; and

(C) at least one additive selected from an extreme pressure agent, an anti-wear agent, an oiliness agent and a detergent dispersant.

4,853,140

LUBRICATING FLUIDS FOR SLICING SILICON INGOTS

Charles C. Payne, Aurora, and Earnest M. Kerr, Naperville, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation of Ser. No. 87,844, Aug. 21, 1987, abandoned. This application Feb. 16, 1989, Ser. No. 312,012

Int. Cl.[4] C10M *173/00*

U.S. Cl. 252—34 11 Claims

1. An aqueous lubricant composition for use in cutting silicon wafers comprising water a complexing agent for complexing hardness, a biocide, and fungicides, a soap prepared from a C6–C18 fatty acid and an amine selected from the group consisting of monoethanolamine, diethanolamine, triethanolamine and aminoethylethanolamine;

and a phosphorous compound having extreme pressure lubricant properties and;

an ethylene oxide-propylene oxide polymer having a viscosity range at 9,000–12,000 SUS determined at 100° F.; said composition having a water to composition weight ratio of at least 100:1.

7. A method of slicing a silicon wafer comprising the steps of adding a lubricant composition to a silicon wafer; said composition comprising a soap prepared from a C_6–C_{18} fatty acid and an amine selected from the group consisting of monoethanolamine, diethanolamine, triethanolamine and aminoethylethanolamine;

a phosphorous compound having extreme pressure lubrication properties;

a complexing agent for complexing hardness; and an ethylene oxide propylene oxide polymer havin a viscosity range at 9000–12,000 SUS, where SUS is determined at 100° F., said composition having first been diluted with water to at least 100:1 water to composition weight ratio; and slicing said wafer.

4,853,141

POLYFLUORINATED AMINO ALCOHOLS AND THEIR ESTERS, PREPARATION OF THESE COMPOUNDS AND THEIR USE AS LUBRICANT ADDITIVES

Pierre Durual, Vernaison; Marc Hermant, Cormeilles-en-Parisis, and Charles Laviron, Lyons, all of France, assignors to Societe ATOCHEM, Puteaux, France

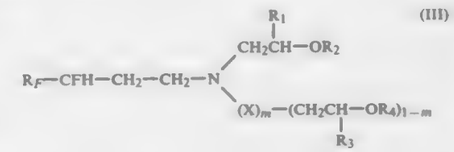
Filed Jun. 10, 1988, Ser. No. 205,207

Claims priority, application France, Jun. 19, 1987, 87 08662

Int. Cl.[4] C10M *133/04*

U.S. Cl. 252—51 12 Claims

1. A Polyfluorinated compound, comprising the general formula:



in which

R_F denotes a linear or branched perfluoroalkyl radical containing from 1 to 19 carbon atoms,

R_1 and which may be identical or different, each denote a hydrogen atom, an alkyl radical containing from 1 to 20 carbon atoms, a cycloalkyl radical containing 5 to 6 carbon atoms or an optionally substituted aryl radical,

R_2 and R_4 which may be identical or different, each denote a hydrogen atom or the acyl residue of an aliphatic, cycloaliphatic or aromatic carboxylic acid,

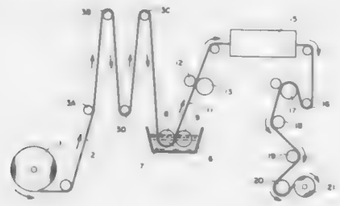
m equals zero or one,

X denotes a hydrogen atom or a 2-hydroxy-1-phenyl-ethyl group.

4,853,142
HIGH MELTING TEMPERATURE LAUNDRY DETERGENT SHEET

Maung H. Win; William D. Lloyd, both of Neenah, Wis.; William A. Abbe, Neenah, Wis., and Diego H. Daponte, Woodstock, Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 4, 1988, Ser. No. 177,567
The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.
Int. Cl.[4] C11D *9/42*
U.S. Cl. 252—90 17 Claims



1. A laundry cleaning product for washing a load of laundry comprising a meltblown web containing at least 1 gram of active liquid laundry detergent solids per gram of meltblown web, said meltblown web comprising a thermoplastic polymer having a melting point of 170° C. or greater.

4,853,143
BLEACH ACTIVATOR COMPOSITIONS CONTAINING AN ANTIOXIDANT

Frederick E. Hardy; Frank Caelik, both of Newcastle upon Tyne, England; Alastair J. Pretty, Overijse, Belgium; Kenneth Young, Englefield Green, and Gerald Scott, Lichfield, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 16, 1988, Ser. No. 168,723
Claims priority, application United Kingdom, Mar. 17, 1987, 8706273; Dec. 9, 1987, 8728727
Int. Cl.[4] C09K *15/08;* C11D *3/20, 3/39, 3/395*
U.S. Cl. 252—102 6 Claims

1. A bleach activator composition in the form of particles, comprising:

(a) from about 50% to about 99.9% by weight of a peroxyacid bleach precursor having the general formula I

$$Ac—L \qquad I$$

wherein Ac is the acyl moiety of an organic carboxylic acid comprising an optionally substituted, linear or branched C_6–C_{20} alkyl or alkenyl moiety or a C_6–C_{20} alkyl-substituted aryl moiety and L is a leaving group, the conjugate acid of which has a pKa in the range from about 4 to about 13, and

(b) from about 0.1% to about 50% by weight of 4-methyl-2,6-di-t-butylphenol, and

(c) from about 0.5% to 50% by weight of polyvinylpyrrolidone, wherein said 4-methyl-2,6-di-t-butylphenol is incorporated within said polyvinylpyrrolidone.

5. A detergent composition, comprising:

(a) from about 1% to about 75% of organic surfactant selected from anionic, nonionic, cationic, ampholytic and zwitterionic surfactants and mixtures thereof,

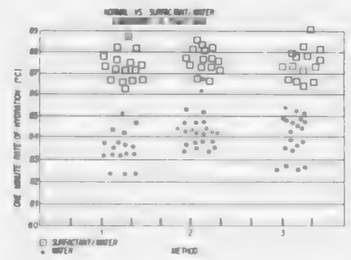
(b) from about 0.5% to about 40% of peroxygen bleaching agent, and

(c) from about 0.1% to about 20% of a bleach activator composition according to claim 1.

4,853,144
MOISTURIZED COMPOSITIONS OF HYDRATE-FORMING PHOSPHATES AND METHODS FOR PREPARATION THEREOF

Louis A. Highfill, 101 Youngridge Dr., Union, Mo. 63084

Continuation-in-part of Ser. No. 193,024, May 12, 1988, Pat. No. 4,803,058, which is a division of Ser. No. 30,091, Mar. 31, 1987, Pat. No. 4,770,865, which is a continuation-in-part of Ser. No. 901,920, Aug. 19, 1986, abandoned. This application Dec. 19, 1988, Ser. No. 286,017
Int. Cl.[4] B01F *1/00;* C09K *3/00;* C11D *7/16, 17/06*
U.S. Cl. 252—135 24 Claims



1. A composition of matter in particulate, crystalline form, free-flowing during storage and prolonged exposure to ordinary temperature and humidity conditions, having an increased rate of solution comprising a hydrate-forming phosphate selected from the group consisting of sodium pyrophosphate and trisodium phosphate and added water from about 0.1% by weight up to full hydration in the form of water of hydration, said water containing in solution sufficient surfactant to provide the composition with from about 0.2 ppm to about 125 ppm surfactant.

17. A method for the preparation of a particulate, crystalline, composition comprising contacting a crystalline phosphate selected from the group consisting of sodium pyrophosphate and trisodium phosphate containing less than about 0.1% water with an aqueous solution of surfactant to produce a particulate, crystalline composition comprising between about 0.1% by weight an up to full hydration in the form of water of hydration and between about 0.2 ppm and about 125 ppm of the surfactant.

4,853,145
ALKYL AND ALKENYL DIETHANOLAMINE COMPOUNDS AS SOLUBILIZERS FOR LOW-FOAM SURFACTANTS

Karl-Heinz Schmid, Mettmann; Adolf Asbeck, Duesseldorf, and Detlev Stanislowski, Mettmann, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 21, 1987, Ser. No. 136,048
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643934
Int. Cl.[4] B01D *19/02;* C11D *1/835, 3/30, 17/08*
U.S. Cl. 252—136 15 Claims

1. In an aqueous low-foam cleaning composition containing at least one surfactant comprising either at least one surfactant of the formula:

$$R_3—O—(CH_2CH_2O)_n—R_4 \qquad (III)$$

in which R_3 is a linear or branched C_8–C_{18} alkyl or alkenyl radical, R_4 is a C_4–C_8 alkyl radical, and n is a number of from 7 to 12, or a mixture of (i) polyethylene glycol ethers corresponding to general formula IV

$$R_5—O—(CH_2—CH_2O)_p—R_6 \qquad (IV)$$

in which
R_5 is a linear or branched C_8–C_{18} alkyl or alkenyl radical,
R_6 is a C_4–C_8 alkyl radical, and
p is a number of from 3 to 7, and (ii), alkyl polyalkylene glycol mixed ethers corresponding to general formula V

$$R_7—O—(CH_2CH_2O)_x—(CH_2—\underset{\displaystyle CH_3}{\underset{|}{CH}}O)_y—H \qquad (V)$$

in which
R_7 is a linear or branched C_8–C_{18} alkyl radical,
x is a number of from 1 to 3, and
y is a number of from 3 to 6, the improvement comprising the presence therein of a solubilizing-effective quantity of at least one diethanolamine derivative of the formula

$$R_1—N\begin{matrix}(CH_2—CH_2—O)_rH\\(CH_2—CH_2—O)_sH,\end{matrix} \qquad (I)$$

$$R_2—CHOH—CH_2—N\begin{matrix}(CH_2—CH_2—O)_tH\\(CH_2—CH_2—O)_uH,\end{matrix} \qquad (IIa)$$

$$R_2—\underset{\displaystyle CH_2OH}{\underset{|}{CH}}—N\begin{matrix}(CH_2—CH_2—O)_vH\\(CH_2—CH_2—O)_wH\end{matrix} \qquad (IIb)$$

in which
R_1 and R_2 are linear or branched alkyl or alkenyl radicals containing 8 to 14 carbon atoms for R_1 and 9 to 17 carbon atoms for
R_2, and
r, s, t, u, v and w are intergers of from 1 to 3.

11. A method of enhancing the solubility of the surfactant component of an aqueous low-foam composition for use at low temperatures or in the acidic range or both containing at least one surfactant of the formula:

$$R_3—O—(CH_2CH_2O)_n—R_4 \qquad (III)$$

in which R_3 is a linear or branched C_8–C_{18} alkyl or alkenyl radical, R_4 is a C_4–C_8 alkyl radical, and n is a number of from 7 to 12, or a surfactant mixture of

(i) from about 20 to about 80% by weight polyethylene glycol ethers corresponding to general formula IV

$$R_5—O—(CH_2CH_2O)_p—R_6 \qquad (IV)$$

in which
R_5 is a linear or branched C_8–C_{18} alkyl or alkenyl radical,
R_6 is a C_4–C_8 alkyl radical, and
p is a number of from 3 to 7;

(ii) from about 10 to about 40% by weight alkyl polyalkylene glycol mixed ethers corresponding to general formula (V)

$$R_7—O—(CH_2CH_2O)_x—(CH_2—\underset{\displaystyle CH_3}{\underset{|}{CH}}O)_y—H \qquad (V)$$

in which
R_7 is a linear or branched C_8–C_{18} alkyl radical,
x is a number of from 1 to 3 and
y is a number of from 3 to 6; and

(iii) from 0 to about 40% by weight alkyl (poly)propylene glycol ethers corresponding to general formula VI

$$R_8—O—(CH_2\underset{\displaystyle CH_3}{\underset{|}{CH}}O)_zH \qquad (VI)$$

in which
R_8 is a linear or branched C_{16}–C_{22} alkyl or alkenyl radical
and
z is a number of from 1 to 3; the percentages by weight being based on the weight of the mixture,

comprising adding thereto a solubilizing-effective quantity of at least one diethanolamine derivative of the formula

$$R_1—N\begin{matrix}(CH_2—CH_2—O)_rH\\(CH_2—CH_2—O)_sH,\end{matrix} \qquad (I)$$

$$R_2—CHOH—CH_2—N\begin{matrix}(CH_2—CH_2—O)_tH\\(CH_2—CH_2—O)_uH.\end{matrix} \qquad (IIa)$$

$$R_2—\underset{\displaystyle CH_2OH}{\underset{|}{CH}}—N\begin{matrix}(CH_2—CH_2—O)_vH\\(CH_2—CH_2—O)_wH\end{matrix} \qquad (IIb)$$

in which
R_1 and R_2 are linear or branched alkyl or alkenyl radicals containing 8 to 14 carbon atoms for R_1 and 9 to 17 carbon atoms for R_2, and
r, s, t, u and v and w are integers of from 1 to 3.

4,853,146
THICKENING COMPOSITIONS AND THICKENED AQUEOUS ACID SOLUTIONS

Hans Rörig, Merzenich, and Norbert Porta, Nörvenich, both of Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands

Filed Sep. 29, 1987, Ser. No. 102,332
Claims priority, application European Pat. Off., Jan. 24, 1987, 87200096
Int. Cl.[4] C11D *7/08, 7/32*
U.S. Cl. 252—142 22 Claims

1. A thickened aqueous composition, comprising

(a) 0.1–50% by weight of a weak acid, having a pK value >2.0 and

(b) from 0.1 to 20% by weight of an amine, selected from the group consisting of primary amines, secondary amines, tertiary amines, diamines, and amines in the form of a heterocyclic ring, wherein said primary, secondary, and tertiary amines and diamines carry at least one nitrogen linked hydrocarbon group, which represents a saturated or unsaturated linear or branched alkyl group having at least 10 carbon atoms, or an aryl, aralkyl or alkaryl group containing up to 24 carbon atoms, and wherein the other nitrogen linked groups may be different or the same and represent hydrogen, unsubstituted or substituted alkyl groups, aryl groups, aralkyl groups or polyalkoxy groups, containing at most 5 alkoxy groups and wherein when the amine selected is in the form of a heterocyclic ring, it contains at least two nitrogen atoms, one of which being substituted by amino aklyl or hydroxy alkyl, which may be reacted with fatty acids, with the ring further carrying a linear or branched alkyl or alkenyl group having at least 10 carbon atoms;

(c) from 0.01% to 5% by weight of an organic, anionic sulphonate selected from the group consisting of cumene

sulphonate, xylene sulphonate, and toluene sulphonate, in their acid or salt form, and mixtures thereof;

(d) water, wherein one or more additional cleaning, disinfecting and/or odorizing agents may be dissolved in minor amounts, the percentages by weight being calculated on the weight of the total aqueous composition.

4,853,147

LIQUID DISHWASHING DETERGENT COMPOSITION FOR IMPROVED HAND WASHING OF DISHES IN COLD WATER

Sunhee Choi, Annandale, N.J., assignor to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 798,530, Nov. 15, 1985, Pat. No. 4,725,377. This application Nov. 16, 1987, Ser. No. 121,182

The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.

Int. Cl.[4] C11D *1/04*

U.S. Cl. 252—174.19 **11 Claims**

1. A liquid dishwashing detergent composition for hand washing of dishes in cold water which comprises a synthetic organic nonionic detergent, a cationic surface active agent, a water soluble C_{21} dicarboxylic salt and an aqueous medium, with proportions of the first three of such components being such that the combination of nonionic detergent and cationic surface active agent is a detersive proportion for fatty deposits on dishes and that of the C_{21} dicarboxylic salt is sufficient to improve the detersive action in cold water of the combination of nonionic detergent and cationic surface active agent with respect to fatty deposits on dishes being washed, with the proportion of C_{21} dicarboxylic salt being less than the sum of the proportion of nonionic detergent and cationic surface active agent.

4,853,148

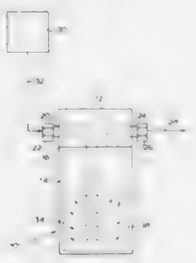
PROCESS AND COMPOSITION FOR DRYING OF GASEOUS HYDROGEN HALIDES

Glenn M. Tom, New Milford, and Duncan W. Brown, Wilton, both of Conn., assignors to Advanced Technology Materials, Inc., New Milford, Conn.

Filed Mar. 24, 1987, Ser. No. 29,631

Int. Cl.[4] C09K *3/00*

U.S. Cl. 252—194 **9 Claims**



1. A scavenger, having utility for drying a gaseous hydrogen halide of the formula HX, wherein X is selected from the group consisting of bromine, chlorine, fluorine, and iodine, to remove water impurity therefrom and produce an essentially completely water-free gaseous hydrogen halide effluent characterized by residual water concentration of below 0.1 part per million by volume (ppm), said scavenger comprising:

(a) a support; and

(b) associated with said support an active scavenging moiety selected from one or more members of the group consisting of:

(i) metal halide compounds dispersed in the support, of the formula MX_y;

(ii) metal halide pendant functional groups, of the formula $-MX_{y-1}$, covalently bonded to the support,

wherein:

M is a y-valent metal selected from the group consisting of lithium (I), beryllium (II), magnesium (II), calcium (II), strontium (II), barium (II), cadmium (II), nickel (I), iron (II), iron (III), zinc (II), and aluminum (III);

y is an integer whose value is from 1 to 3; and

the active scavenging moiety metal halide compounds and/or metal halide pendant functional groups have been formed by reaction of corresponding partially or fully akylated compounds and/or pendant functional groups, with the gaseous hydrogen halide, to form the ative scavenging moiety metal halide compounds and/or metal halide pendant functional groups;

the vapor pressure of the support is less than 1 ppm;

M is selected such that the heat of formation of its hydrated halide, $MX_y \cdot (H_2O)_n$, is greater than or equal to 10.1 kilocalories per mole of such hydrated halide compound for each hydrated water molecule, wherein n is the number of water molecules bound to the metal halide in the metal halide hydrate;

with the proviso that the support is formed of a material which is both chemically and physically different from said active scavenging moiety.

9. An apparatus for drying a gaseous hydrogen halide of the formula HX, wherein X is selected from the group consisting of bromine, chlorine, fluorine, and iodine, to remove water impurity therefrom, comprising:

(a) a vessel containing a bed of a scavenger according to claim 1;

(b) means for introducing the water impurity-containing gaseous hydrogen halide to said vessel for passage through said bed therein; and

(c) means for discharging water impurity-depleted gaseous hydrogen halide from said vessel.

4,853,149

HETEROCYCLIC LIQUID CRYSTAL COMPOUNDS

Joachim Krause, Dieburg; Andreas Wächtler, Griesheim, both of Fed. Rep. of Germany; Bernhard Scheuble, Yokohama, Japan, and Georg Weber, Erzhausen, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Oct. 26, 1987, Ser. No. 112,165

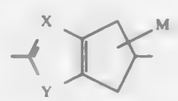
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1986, 3636370

Int. Cl.[4] C09K *3/34*; C07D *333/78, 307/935, 209/94, 277/60, 235/02, 263/52*

U.S. Cl. 252—299.61 **12 Claims**

1. A liquid crystal phase comprising at least two liquid crystal components, wherein at least one liquid crystal component is a heterocyclic compound having the structure

wing group-ring-(bridge member-ring)$_{(1-3)}$-wing group, wherein at least one ring is of the formula



wherein

M is H, CN, NCS, halogen or alkyl of 1–5 C atoms,

X is CR^4 or N,

Y is CHR^4, O, S or NR^5,

R^4 is H, alkyl of 1–15 C atoms, halogen or cyano and

R^5 is H, alkyl of 1–15 C atoms, with the proviso that when Y=CHR^4,

X is N.

4,853,150

2-(4,3-DISUBSTITUTED PHENYL)-5-ALKYL-1,3,2-DIOXABORINANE DERIVATIVES AND LIQUID CRYSTAL MATERIAL

Vladimir S. Bezborodov; Oleg A. Grinkevich, both of Minsk; Mikhail F. Grebenkin, Moscow; Valery I. Lapanik, Minsk; Anatoly A. Minko, Minsk; Vitaly V. Rzhussky, Minsk; Anatoly A. Muravsky, Minsk; Vladimir F. Petrov, Moscow, and Alexandr V. Ivaschenko, Minsk, all of U.S.S.R., assignors to Nauchno-Issledovatelsky Institut Prikladnykh Fizicheskikh Problem Imeni A. N. Sevchenko, Minsk, U.S.S.R.

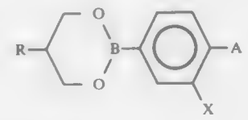
Filed Dec. 16, 1987, Ser. No. 133,635

Claims priority, application U.S.S.R., Dec. 17, 1986, 4162761[I]; Dec. 17, 1986, 4162762[I]; Mar. 17, 1987, 4206873[I]; Mar. 17, 1987, 4206874[I]; Mar. 17, 1987, 4206875[I]

Int. Cl.[4] C09K *19/34*; G02F *1/13*; C07F *5/04*

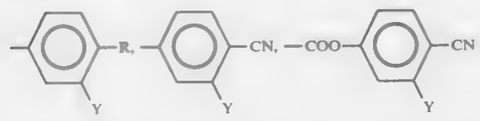
U.S. Cl. 252—299.61 **13 Claims**

1. 2-(4,3-Disubstituted phenyl)-5-alkyl-1,3,2-dioxaborinane derivatives of the general formula



(I)

wherein A is —OR′, —CN,



X and Y being simultaneously or independently H, F, or Cl, at least one of X and Y being other than H, R and R′ standing for an alkyl radical of a normal structure, comprising from 1 to 7 carbon atoms, as components for a liquid crystal material.

4,853,151

DISPIROTETRADECANES

Fritz Vögtle, Alfter, and Wolfgang Calaminus, Königswinter, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankfter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP86/00722, § 371 Date Aug. 11, 1987, § 102(e) Date Aug. 11, 1987, PCT Pub. No. WO87/03581, PCT Pub. Date Jun. 18, 1987

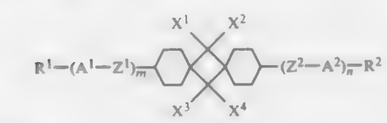
PCT Filed Dec. 8, 1986, Ser. No. 112,356

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3543997

Int. Cl.[4] C09K *19/32*; C07C *43/18, 121/46, 13/72, 23/18, 49/385, 49/587, 43/21*

U.S. Cl. 252—299.61 **12 Claims**

1. A dispirotetradecane of the formula I



I

wherein

R^1 and R^2 are each independently alkyl containing 1 to 12 carbon atoms wherein one or more non-adjacent CH_2 groups may also be replaced by —O—, —CO—, —CO—O—, —O—CO—, —O—COO— and/or —CH=CH— (trans), and one of the radicals R^1 and R^2 can also be H, F, Cl, Br, I, CN, NO_2, or NCS,

A^1 and A^2 are each independently trans-1,4-cyclohexylene wherein one or two nonadjacent CH_2 groups may be replaced by —O— and/or —S—, or 1,4-phenylene wherein one or more CH groups may also be replaced by N, with it also being possible optionally for A^1 and A^2 to be substituted laterally or axially by F, Cl, CN, or CH_3,

Z^1 and Z^2 are each independently —CO—O—, —O—CO—, $—CH_2CH_2—$, $—CH_2O—$, $—OCH_2—$ or a single bond,

m and n are each 0, 1 or 2,

(m+n) 0, 1 or 2,

X^1, X^2, X^3 and X^4 are each independently H, F, Cl or CN, and one or both of the groups CX^1X^2 and CX^3X^4 may also be C=O,

with the proviso that (m+n) is 1 or 2 if both groups CX^1X^2 and CX^3X^4 are C=O.

4,853,152

CYCLOHEXANE DERIVATIVE

Yasuyuki Goto, Ichihara, Japan, assignor to Chisso Corporation, Japan

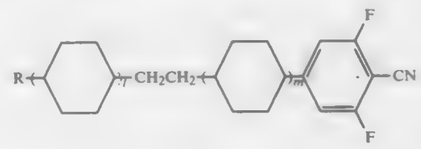
Filed Nov. 7, 1988, Ser. No. 268,184

Claims priority, application Japan, Nov. 16, 1987, 62-289132

Int. Cl.[4] G02F *1/13*; C09K *19/30*; C07C *25/18, 121/60*

U.S. Cl. 252—299.63 **4 Claims**

1. A cyclohexane derivative expressed by the formula



wherein R represents an alkyl group of 1 to 10 carbon atoms, l represents an integer 1 or 2, m represents an integer of 0 or 1 and $l+m=2$.

4,853,153

STABILIZATION OF MIXTURES OF CHLORINATION OF PHENOL/CHLOROPHENOLS

Jean-Roger Desmurs, Saint-Symphorien d'Ozon, and Serge Ratton, Villefontaine, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Sep. 25, 1987, Ser. No. 101,013

Claims priority, application France, Sep. 25, 1986, 86 13555

Int. Cl.[4] B66D *3/08*

U.S. Cl. 252—400.22 **26 Claims**

1. A process for the stabilization of a mixture of chlorination of a phenol and/or a chlorophenol comprising stirring such mixture, which contains at least one unsaturated gem-dichlorinated cyclic ketone, in the presence of an effective stabilizing amount of at least one reducing compound that is a chlorine acceptor.

4,853,154

LOW SMOKE POLYPROPYLENE INSULATION COMPOSITIONS

Ronald D. Icenogle, Spokane, Wash., and Lie K. Djiauw, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 802,806, Nov. 27, 1985, abandoned. This application Jul. 27, 1987, Ser. No. 77,826

Int. Cl.[4] H01B *7/00*; C09K *21/00*; C09D *5/16, 5/18*

U.S. Cl. 252—602 **11 Claims**

1. An electrically conductive wire extrusion coated with a flame retardant insulation composition comprising:

(a) 15–20 percent by weight of a hydrogenated styrene-butadiene-styrene block copolymer;

(b) 4–8 percent by weight of a plasticizer;

(c) 4–8 percent by weight of polypropylene;
(d) 63–75 percent by weight of a hydrated magnesium hydroxide which has been surface treated with a coupling agent, wherein the magnesium hydroxide has a mean particle size of about 0.6 to about 1.2 microns and a crystallite aspect ratio greater than 4.

4,853,155

ELECTRICALLY CONDUCTIVE SYNTHETIC RESIN COMPOSITION

Morio Kurasawa, Tokyo, Japan, assignor to Kurasawa Optical Industry Co., Ltd., Japan

Filed Jul. 24, 1987, Ser. No. 77,424
Claims priority, application Japan, Jul. 26, 1986, 61-176365
Int. Cl.[4] H01B 1/06
U.S. Cl. 252—512 **4 Claims**

1. An electrically conductive synthetic resin composition comprising a high polymeric synthetic resin having mixed therein by melting at least one electrically conductive-component consisting essentially of niobium and niobic substances in which the said synthetic resin contains the niobium or niobic substances in an amount of 0.5 to 25 percent by weight of the total composition.

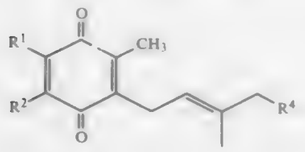
4,853,156

PROCESS FOR THE MANUFACTURE OF QUINONE DERIVATIVES

August Rüttimann, Arlesheim, Switzerland, and George H. Büchi, Jackson, N.H., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

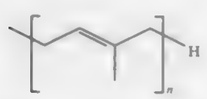
Division of Ser. No. 634,000, Jul. 24, 1984, Pat. No. 4,603,223.
This application Mar. 24, 1986, Ser. No. 843,475
Claims priority, application Switzerland, Jul. 2[illegible], 1983, 4143/83; May 16, 1984, 2398/84
Int. Cl.[4] C07C 50/00, 50/06
U.S. Cl. 260—396 R **6 Claims**

1. A process for producing a compound of the formula



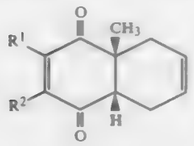
V

wherein R^1 and R^2 each are methoxy or when taken together are —CH=CH—CH=CH—, and R^4 is 3,7,11-trimethyl-dodecyl or a group of the formula:



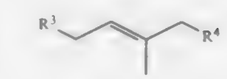
III

wherein n is an integer from 0 to 12, said process comprising:
(a) reacting a compound of the formula



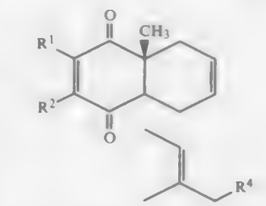
I

wherein R^1 and R^2 are as above,
with a compound of the formula



II

wherein R^3 is halogen, mesyloxy, tosyloxy, or acetate, and R^4 is as above, in an inert organic solvent and in the presence of a strong base at a reaction temperature of about −20° C. to about +30° C.,
(b) converting a so obtained compound of formula



IV

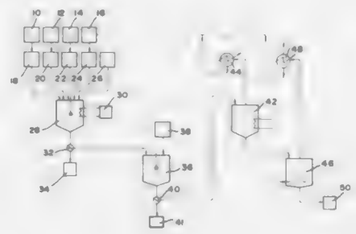
wherein R^1, R^2 and R^4 are as above,
into a compound of formula V using a retro-Diels-Alder reaction at a reaction temperature of about 23° C. to about 200° C.

4,853,157

PROCESS FOR THE MANUFACTURE OF NITRIC ACID ESTERS

Anthony J. Stiff, Johannesburg, South Africa, assignor to AECI Limited, Johannesburg, South Africa

Filed Jun. 14, 1984, Ser. No. 620,624
Claims priority, application South Africa, Jun. 24, 1983, [illegible]
Int. Cl.[4] C07C 77/02
U.S. Cl. 558—483 **4 Claims**



1. Process for the preparation of nitric acid esters of organic hydroxyl compounds selected from the group consisting of alkylene glycol monoalkyl ethers, polyalkylene glycol monoalkyl ethers and polyalkylene glycols in which at least 92% of the organic hydroxyl compound is converted to a nitric acid ester selected from the group consisting of alkylene glycol monoalkyl ether mononitrates, polyalkylene glycol monoalkyl ether mononitrates and polyalkylene glycol nitrates, which process comprises the steps of:
(1) reacting the organic hydroxyl compound with nitric acid in an amount of from 180% to 220% of the stoichiometric requirement for complete nitration in the presence of sulphuric acid in such an amount that the mole ratio of water to sulphuric acid (FWSR) at the end of the reaction is from 0.2:1 to 2.5:1 and in the presence of an organic solvent which is inert to the reaction conditions in an amount of 200 to 2000 ml per mole of hydroxyl group, followed by
(2) separating off first of all a spent acid comprising substantially sulphuric acid and water from the reaction mixture, leaving substantially all the unreacted nitric acid in solution in the organic solvent,
(3) washing the remaining reaction mixture after removal of the sulphuric acid to remove nitric therefrom as a separate solution from the already separated sulphuric acid and to leave the solvent containing the desired nitric acid esters,
(4) substantially neutralizing the residual acidity of the organic solvent solution, and
(5) removing the solvent to leave the nitric acid ester.

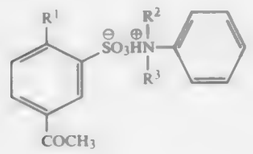
4,853,158

PROCESS FOR PREPARING N,N-DIALKYLANILINE SALT OF 5-ACETYL-2-ALKYLBENZENE SULFONIC ACID

Kunioki Kato; Masao Kawamura, both of Akashi; Hiroshi Goda, Himeji; Kiyoshi Sawada, Kako, and Kazuhiro Hamatani, Kakogawa, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Hyogo, Japan

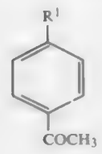
Continuation of Ser. No. 20,242, Mar. 2, 1987, abandoned, which is a continuation of Ser. No. 733,832, May 14, 1985, abandoned.
This application Mar. 25, 1988, Ser. No. 178,833
Claims priority, application Japan, May 15, 1984, 59-98327; May 15, 1984, 59-98328; Sep. 18, 1984, 59-196470; Apr. 3, 1985, 60-71624
Int. Cl.[4] C07C 143/38, 143/78
U.S. Cl. 562—46 **8 Claims**

1. A process for preparing N,N-dialkylaniline salt of 5-acetyl-2-alkylbenzene sulfonic acid, represented by the formula:



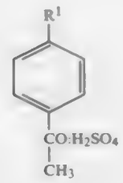
(5)

wherein R^1 is an alkyl group having 1 to 5 carbon atoms and R^2 and R^3 are the same or different and are each an alkyl group having 1 to 5 carbon atoms characterized by:
(a) forming a complex of 4-alkylacetophenone represented by the general formula (9)



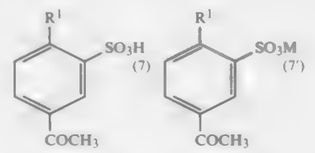
(9)

wherein R^1 is the same as defined above with 3 to 15 moles of concentrated sulfuric acid per mole of said 4-alkylacetophenone wherein said complex is represented by the formula (8):

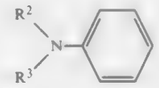


(8)

wherein R^1 is the same as defined above;
(b) then reacting said complex with sulfuric anhydride per se, or SO_3 of 65–100% by weight in fuming sulfuric acid wherein the amount of SO_3 in said sulfuric anhydride or said fuming sulfuric acid is 2 to 15 moles per mole of said 4-alkylacetophenone to thereby obtain 5-acetyl-2-alkylbenzenesulfonic acid or salt thereof, represented by the general formula (7) or (7'):

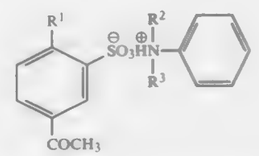


wherein R^1 is the same as defined above and M is an alkali metal;
(c) separating the resulting 5-acetyl-2-alkylbenzenesulfonic acid (7) or salt thereof (7') by reacting with an N,N-dialkylaniline represented by the general formula (6):



(6)

wherein R^2 and R^3 are the same or different and are each an alkyl group having 1 to 5 carbon atoms or its mineral acid salt to form the corresponding N,N-dialkylaniline salt of 5-acetyl-2-alkylbenzene-sulfonic acid, represented by the general formula (5):



(5)

wherein R^1, R^2, and R^3 are the same as defined above.

4,853,159

PROCESS FOR PRODUCING N-PHOSPHONOMETHYLGLYCINE

Dennis P. Riley, Chesterfield, and Willie J. Rivers, Jr., University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 26, 1987, Ser. No. 112,594
Int. Cl.[4] C07F 9/38
U.S. Cl. 562—17 **5 Claims**

1. A process for the production of N-phosphonoglycine which comprises contacting N-phosphonomethyliminodiacetic acid with a molecular oxygen-containing gas in the presence of aqueous solvent, and a catalyst selected from the group consisting of salts and salt complexes of cobalt.

4,853,160

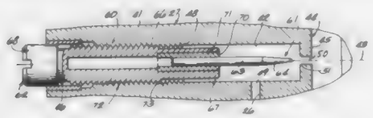
APPARATUS FOR ADJUSTING A VARIABLE LENGTH VALVE MEMBER FOR A NEEDLE VALVE

LeRoy T. Wood, Racine, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 26, 1988, Ser. No. 262,730
Int. Cl.[4] F02M 3/08
U.S. Cl. 261—41.5 **13 Claims**

1. A carburetor comprising a fuel/air induction passage, a secondary orifice communicating with said induction passage, and fuel supply means operable to supply fuel from a source of fuel to said secondary orifice, said fuel supply means including a valve apparatus, said valve apparatus including a wall defining a chamber having an axis and having therein an inlet and an

outlet, one of said inlet and said outlet communicating with said chamber, and the other of said inlet and said outlet having a valve seat and being communicable with said chamber, a valve member having first and second opposite ends and having a variable length in the direction of said axis which decreases only when at least a predetermined force is applied to the valve member in the direction of said axis, and means for limiting movement of said second end towards said valve seat.

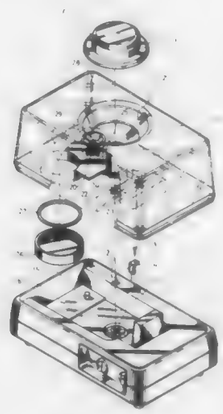


4,853,161

AUTO TURNING-OFF HUMIDIFIER

Koa-Cherng Huang, Tainan, Taiwan, assignor to Han Chi Hang Co., Ltd., Taiwan

Continuation of Ser. No. 113,205, Oct. 27, 1987, abandoned. This application Jul. 11, 1988, Ser. No. 219,879
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—81 **1 Claim**



1. An auto turning-off humidifier comprising,

a base having a hollowed space for storing water, a vibrating plate set at the bottom surface of the base, and a water sensor set at a side wall of the base with its sensing needle protruding inside the hollowed space for storing water for functioning to cut off electricity in case of not touching water,

a water tank being placed on said base and having a vapor room at its central part separated from the water tank to prevent the water in the tank from going into the vapor room,

a vapor room being placed at the central part of the water tank, separated from the water tank, and just located just above the vibrating plate in the base,

a sieve set at the bottom of the vapor room, having a round hole at its center to let the vapor produced by the vibrating plate pass through into the vapor room, and able to let down the water drops coming down from the vapor room,

a lid covering a hole on the top of the vapor room and having several little windows for the vapor in the vapor room to flow out and,

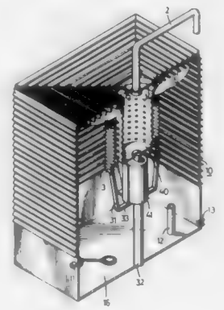
a handle set at the bottom of the water tank for carrying it and having a round hole for the water vapor produced by the vibrating plate to pass through.

4,853,162

CENTRIFUGAL COOLING DEVICE

Wen H. Liu, No. 139, Chunghwa Road,, Miaulih, Taiwan

Filed May 23, 1988, Ser. No. 197,656
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—89 **4 Claims**



1. An improved centrifugal cooling device, comprising a housing, said housing including a water tank at the lower portion thereof, a valve for supply of water, an overflow pipe and an outlet:

a plurality of louvers and long slits on a perimeter and an upper portion of said housing, a screen structure set near an upper inner side thereof for collecting of water vapor, a ring portion formed in an upper center portion thereof and fixed beams and a double-function rotating cylinder secured by a fixed post to an inside central portion thereof, means to supply water to the interior of said cylinder, said fixed beams and rotating cylinder having a respective deflection screen member and a motor-driven perforated drum at upper ends thereof, said perforated drum being locatable in said ring portion by an edge portion formed by the upper end thereof for maintaining stability during rotation and provided near the upper portion thereof with a spiral blade fan located beneath said screen structure.

4,853,163

METHOD OF CONTROLLING DISCHARGE OF STORED ELECTRIC CHARGE IN PLASTIC OBJECTS AND FORMING LICHTENBERG FIGURES IN PLASTIC OBJECTS

Jose M. Mendonca, Jr., Salem, N.H., assignor to United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 22, 1988, Ser. No. 158,447
Int. Cl.[4] B29C *71/00*
U.S. Cl. 264—22 **6 Claims**

2. A method of providing an object with multiple Lichtenberg figures therein, said method comprising the steps of:

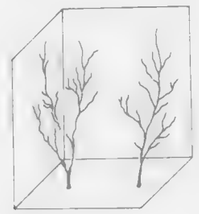
a. forming an object of a preselected shape of a dielectric material;

b. removing surface faults on said object to a microscopic size whereby the surface has a glass-like appearance;

c. determining a maximum input charge before damage occurs;

d. inputting said charge into said object; and

e. initiating the discharge of said object by pricking a surface of said object at a desired location;



f. heating said object for a predetermined time; and

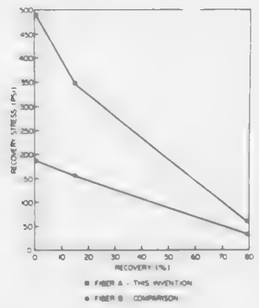
g. repeating steps "a" to "f" for each new figure.

4,853,164

METHOD OF PRODUCING HIGH STRENGTH FIBERS

Joseph K. Kiang, Los Altos; Patrick K. C. Tsou, Half Moon Bay, and Christine E. Vogdes, Mountain View, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 47,557, Apr. 27, 1987, Pat. No. 4,778,633, which is a continuation of Ser. No. 718,143, Apr. 1, 1985, abandoned. This application Jul. 15, 1988, Ser. No. 219,675
Int. Cl.[4] D02J *1/22*
U.S. Cl. 264—22 **15 Claims**



1. A method of making a high strength, high creep recovery polymeric fiber, comprising the steps of:

(a) providing a fiber of a polymeric material selected from the group consisting of polyvinylidene fluoride, ethylene-tetrafluoroethylene copolymer, polyamide, and polybutylene terephthalate;

(b) crosslinking the polymeric material;

(c) thereafter heating the fiber to a temperature T_1, which (i) in the event the polymeric material is amorphous, is above the glass transition temperature T_g of the polymeric material and (ii) in the event the polymeric material is crystalline, is above the second order transition temperature $T_{\alpha c}$ and below the crystalline melting temperature T_m of the polymeric material;

(d) drawing the heated fiber to a draw ratio of at least about two at a rate of at least about 200% per minute; and

(e) cooling the drawn fiber;

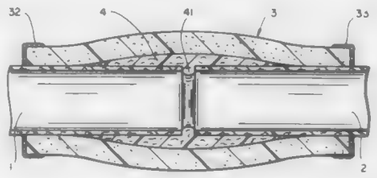
whereby a fiber is obtained which has a tensile strength of at least about 70,000 psi and which, when subjected to a stress of 15,000 psi at 25° C. for at least 1 hour, thereby causing the fiber to deform, is capable of substantially complete recovery to its undeformed configuration when the stress is removed.

4,853,165

METHOD OF USING HEAT-RECOVERABLE ARTICLES COMPRISING CONDUCTIVE POLYMER COMPOSITIONS

Nachum Rosenzweig, Palo Alto, and Pravin L. Soni, Union City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 720,117, Apr. 2, 1985, Pat. No. 4,775,501, which is a continuation-in-part of Ser. No. 596,761, Apr. 4, 1984, abandoned. This application Jun. 26, 1987, Ser. No. 67,679
Int. Cl.[4] B29C *61/02*
U.S. Cl. 264—27 **27 Claims**



1. A method of modifying a substrate, which method comprises

(1) placing adjacent to the substrate a heat-recoverable article comprising a heat-recoverable element, the heat-recoverable element being at least 0.1 inch thick, having a recovery temperature TR, and being composed of a conductive polymer composition which (a) comprises (i) a matrix consisting essentially of organic polymer particles which have been sintered together so that the particles have coalesced without losing their identity, and (ii) a particulate conductive filler which is dispersed in said matrix but is present substantially only at or near the boundaries of the coalesced particles; and (b) increases in resistivity by a factor of less than 5 over the temperature range 23° C. to (TR+50)° C.;

(2) placing between the substrate and the article an insert which is in the form of a self-supporting sheet and which comprises a thermosetting resin;

(3) generating heat within the heat-recoverable element by passing electrical current therethrough, thus causing the article to recover into contact with the insert; and

(4) continuing to generate heat within said element by passing electrical current therethrough after the heat-recoverable article has recovered into contact with the insert, thus pressing the insert against the substrate and heating the insert so that the thermosetting resin is cured while the insert conforms to and is pressed against the substrate, thus bonding the insert to the substrate.

14. A method of modifying a substrate, which method comprises

(1) placing adjacent to the substrate a heat-recoverable article comprising a melt-shaped heat-recoverable element, the heat-recoverable element being at least 0.1 inch thick, having a recovery temperature TR, and being composed of a conductive polymer composition which (a) comprises (i) an organic polymer having a molecular weight of at least 50,000 and (ii), dispersed in the polymer, a particulate conductive filler; and (b) increases in resistivity by a factor of less than 5 over the temperature range 23° C. to (TR+50)°C.;

(2) placing between the substrate and the article an insert which is in the form of a self-supporting sheet and which comprises a thermosetting resin;

(3) generating heat within the heat-recoverable element by passing electrical current therethrough, thus causing the element to recover into contact with the insert; and

(4) continuing to generate heat within said element by passing electrical current therethrough after the heat-recover-

able article has recovered into contact with the insert, thus pressing the insert against the substrate and heating the insert so that the thermosetting resin is cured while the insert conforms to and is pressed against the substrate, thus bonding the insert to the substrate.

4,853,166

METHOD AND AN APPARATUS FOR PRODUCING COMPOUND BLOCK MEMBERS, ESPECIALLY BUILDING BLOCKS HAVING A HEAT INSULATING INTERMEDIATE LAYER

Bent S. Andersen, and Jens Therkildsen, both of Videbaek, Denmark, assignors to A/S Fibo, Riskov, Denmark

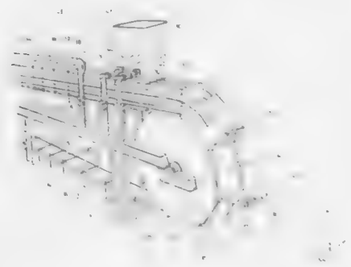
PCT No. PCT/DK87/00083, § 371 Date Mar. 1, 1988, § 102(e) Date Mar. 1, 1988, PCT Pub. No. WO88/00267, PCT Pub. Date Jan. 14, 1988

PCT Filed Jul. 2, 1987, Ser. No. 159,593

Claims priority, application Denmark, Jul. 2, 1986, 3141/86

Int. Cl.[4] B29C *31/00*

U.S. Cl. 264—46.5 **10 Claims**



1. A method for successive production of block members by assembling at least two separated block elements by means of an intermediate filling of a binding material comprising the steps of

(a) providing a segmented conveyor having a row of carrier plates, each having an outwardly projecting end mould plate fixedly connected at one end thereof such that an associated end mould plate at the opposite end of the carrier plate is constituted by the corresponding end mould plate on the next carrier plate;

(b) forwarding the carrier plates together with the outwardly projecting end mould plates through a bent or arched reception section of the conveyor path such that the end mould plates are mutually diverging;

(c) placir g the separated block elements on the successively passing carrier plates while said plates are situated in said bent or arched section of the conveyor path during continuous m vement of the conveyor, wherein the outwardly projec g end mould plates engage opposite ends of the block e ements, said end mould plates being mutually divergin; in said arched section such that it is easy to place the block elements on the carrier plates; and

(d) forwarding the row of carrier plates containing the separated bloc elements past a filling station at which the binding material is placed between the block elements to form the block member.

4,853,167

METHOD FOR MAKING LEAD PENCILS AND COLORED PENCILS

Martin Bard, Amberg; Rosemarie Rieger, and Isfried Petzenhauser, both of Rodental, all of Fed. Rep. of Germany, assignors to Buchtal GmbH, Schwarzenfeld, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 164,125

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706977

Int. Cl.[4] B29C *47/02, 47/04, 67/00*; C09D *13/00*

U.S. Cl. 264—112 **11 Claims**

1. A method for making leads, pencils or crayons, wherein mixtures of graphite and MgO made at low temperatures from Mg salts are made hardenable by $MgCl_2$ solutions and formed into leads, pencils or crayons.

4,853,168

PROCESS FOR SPINNING STARCH FIBERS

James Eden, East Millstone, and Ralph M. Trksak, Manville, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Dec. 23, 1987, Ser. No. 137,485

Int. Cl.[4] D01F *9/00*

U.S. Cl. 264—180 **8 Claims**

1. In a method for the production of starch fibers wherein a stabilized colloidal dispersion of starch is extruded into a moving coagulating salt bath containing a salt selected from the group consisting of ammonium sulfate, ammonium sulfamate, mono-basic ammonium phosphate, di-basic ammonium phosphate, sodium sulfate and mixtures thereof, the improvement which comprises adding 1 to 130% by weight of a salt selected from the group consisting of ammonium sulfate, ammonium sulfamate, ammonium monobasic or dibasic phosphate, sodium sulfate and mixtures thereof, to an aqueous starch slurry; and cooking the starch slurry to form the colloidal dispersion of starch.

4,853,169

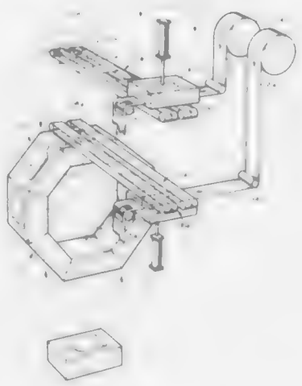
METHOD FOR APPLYING LABELS TO BLOW MOLDED ARTICLES

Ronald S. Kaminski, Bowling Green, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Jun. 22, 1987, Ser. No. 63,643

Int. Cl.[4] B29C *43/22*

U.S. Cl. 264—509 **3 Claims**



1. In a method of making hollow plastic articles wherein a label is positioned in each of a plurality of sets of spaced partible molds in a predetermined array, preforms are positioned in each set of partible molds and the molds are closed and the preforms are blown outwardly to the confines of the molds to apply the label to the resultant hollow plastic article, the method of delivering the labels to the molds which comprises:

providing labels in a web of a roll of labels,

moving the web of the roll of labels past a die cutting station,

successively die cutting a label from the web of the roll of labels at said die cutting station by moving a punch through the web at a right angle to the web,

continuing the movement of said punch at a right angle to deliver said label simultaneously directly onto an endless vacuum conveyor,

indexing a remaining portion of the web which has the label die cut therefrom past the die cutting station after a label has been die cut and delivered to said conveyor,

indexing the endless vacuum conveyor after each die cut to provide an array of labels on the conveyor which corresponds in spacing to the spacing of the array of molds,

engaging the array of labels on the conveyor and removing them from the conveyor, and;

depositing the array of labels in one section of the array of molds.

4,853,170

PROCESS FOR PRODUCING PRESS MOLDED ARTICLES PROVIDED WITH CHANNELS FROM POWDERY MOLDING COMPOUNDS

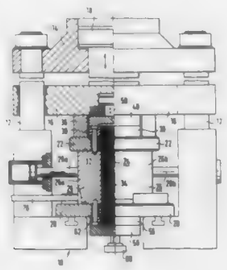
Eugen Bühler, Burtenbach; Klaus Strobel, and Karl Schwarzmeier, both of Selb, all of Fed. Rep. of Germany, assignors to Hutschenreuther AG, Selb and Eugen Buhler, Burtenbach, both of, Fed. Rep. of Germany

Continuation of Ser. No. 936,149, Dec. 1, 1986, abandoned. This application Dec. 3, 1987, Ser. No. 128,086

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1985, 3542332

Int. Cl.[4] B28B *3/00*; B30B *5/02*

U.S. Cl. 264—517 **4 Claims**



1. A process for producing press-molded articles having a plurality of cavities therein, from particulate material, said process comprising the steps of:

introducing into a mold cavity having an inner wall surface a plurality of rods sheathed with resiliently expandable tubes, said resiliently expandable tubes being fitted over said rods and not attached thereto over a major part of the surface area of said expandable tubes whereby to define interior spaces within said expandable tubes,

introducing a pressable particulate material into said mold cavity while said mold cavity is completely closed except for air exhaust opening means and filling opening means, both said exhaust opening means and said filling opening means having a very small cross sectional area as compared with the inner wall surface of said mold cavity, whereby to surround said sheathed rods and substantially to fill said mold cavity with said particulate material,

introducing a fluid under pressure into said interior space within said tubes where by to cause said tubes to expand and thereby compress said particulate material within said mold cavity,

withdrawing said pressure fluid from said interior spaces within said tube to allow said tubes to return substantially to their original unexpanded dimensions spaced from cavities now formed in the compressed particulate material,

withdrawing said sheathed rods from said mold cavity, and

opening said mold cavity to allow removal therefrom of a pressed article formed from said particulate material, said introducing of said particulate material being effected by applying a vacuum to said closed mold cavity through said air exhaust opening means whereby to draw said particulate material through said filling opening means and applying a balancing vacuum to said interior spaces of said expandable tubes during said interior spaces of particulate material, whereby to hold said expandable tubes in contact with said rods and prevent expansion thereof from taking place under the action of said vacuum applied to said mold cavity.

4,853,171

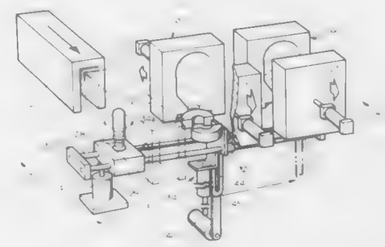
METHOD OF MAKING PARTIALLY CRYSTALLINE BIAZIALLY ORIENTED HEAT SET CONTAINERS

Prakash R. Ajmera, Toledo, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Continuation of Ser. No. 923,503, Oct. 27, 1986, abandoned. This application Mar. 24, 1988, Ser. No. 177,859

Int. Cl.[4] B29C *49/18, 49/32, 49/64*

U.S. Cl. 264—530 **17 Claims**



1. A method for making a partially crystalline, biaxially oriented heatset hollow plastic container from a hollow parison of polyethylene terephthalate having an open end and a closed end comprising: engaging the open end of a plastic parison which is at a temperature within its molecular orientation temperature range by a clamping and blow pin assembly, enclosing a hot mold at a temperature ranging between about 177° C. and 230° C. about the parison, said mold being at heatsetting temperature, expanding said plastic parison within said hot mold by internal pressurization to induce biaxial orientation of the plastic parison and to force the plastic parison into intimate contact and conformance with the hot mold and to maintain contact between the mold and the biaxially oriented container for a time sufficient to induce partial crystallization in the biaxially oriented container, thereafter maintaining a lower internal pressurization of the container to prevent significant shrinkage of the blown container when the hot mold is opened, opening the hot mold while maintaining said lower internal pressurization and while maintaining engagement of the clamping and blow pin assembly with the blown hollow container, and transferring the biaxially oriented container adjacent a cold mold, the cold mold being at a temperature of about 1° C. to 100° C. and having substantially the same volume as said hot mold, or smaller, by relatively moving the clamping and pin assembly while maintaining the reduced internal pressurization, the ratio of the volume of the hot mold to the volume of the cold mold ranging between about 1.0 and 1.1, maintaining the blown hollow container in stable con-

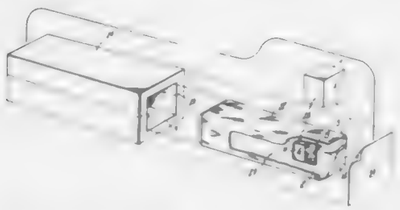
trolled condition with the interior of the container under said lower internal pressurization, and minimizing any tendency of the container to deform or shrink, and enclosing the container in the cold mold by closing the cold mold about the clamping and blow pin assembly and increasing the internal pressurization to force the container into intimate contact with the cold mold to cool the container, exhausting the pressurization to atmospheric pressure, opening the cold mold, removing the container, the container having an on-set of shrinkage temperature of at least about 56° C. and a post-mold shrinkage of no more than about 0.54%, and moving the clamping and blowing pin assembly relative to the hot mold and cold mold to bring the clamping and blow pin assembly into position adjacent the hot mold.

4,853,172

METHOD OF FABRICATING TUBULAR COMPOSITE STRUCTURE

Gary J. Jacaruso, Milford, and Peter B. Leoni, Bethany, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 1, 1987, Ser. No. 126,664
Int. Cl.[4] B29C *43/10, 43/56*
U.S. Cl. 264—571 **1 Claim**



1. A method particularly adapted for fabricating a fiber reinforced resin composite article having a tubular structure comprising:
(a) disposing a prepreg structure within a tool having at least one hole;
(b) said prepreg structure disposed adjacent a mandrel, said mandrel comprising an inner bag containing a solid filler core that comprises about 75% to about 95% of the volume of the inner bag;
(c) enclosing said hole with a vacuum bag thereby forming a void space between said vacuum bag and said prepreg;
(d) evacuating said void space;
(e) causing said vacuum bag to apply a predetermined pressure to said inner bag thus causing said inner bag to apply a substantially uniform predetermined pressure to the surface of said prepreg; and
(f) exposing said prepreg to heat.

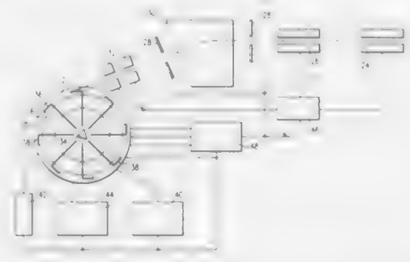
4,853,173

METHOD OF PRODUCING FUSION REACTIONS AND APPARATUS FOR A FUSION REACTOR

Rolf Stenbacka, Vagsättravägen 25, S-141 40 Huddinge, Sweden

PCT No. PCT/SE86/00542, § 371 Date Jul. 24, 1987, § 102(e) Date Jul. 24, 1987, PCT Pub. No. WO87/034.6, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 27, 1986, Ser. No. 78,907
Claims priority, application Sweden, Nov. 27, 1985, 8505600-0
Int. Cl.[4] G21B *1/02*
U.S. Cl. 376—123 **11 Claims**

1. An apparatus for a fusion reaction, comprising;
two annular, coaxially disposed magnets arranged to produce magnetic fields in a vacuum tank, the inner magnet producing a homogeneous field, transversely to the plane in which deuterium ions are intended to circulate prior to a reaction, the outer magnet producing an inhomogeneous field which decreases outwardly in a radial direction and is also directed substantially transversely to said plane;
controlling means for controlling the magnetic fields of the two magnets separately;
means for ions to circulate with a constant path radius in said inhomogeneous magnetic field while accumulated;
means being provided to determine the ion density in said path; and
electrodes (**16, 18**) being provided to produce a radial electric field in the area having said inhomogeneous magnetic field and transversely to this inhomogeneous field, and in that a deuterium ion source (**24**), followed by coaxially disposed electrostatic lens electrodes (V_1-V_3), are disposed to inject ions in a path in said area with inhomogeneous magnetic field, a reaction center (**34**) being disposed in the tank in a magnetic field free area in the center of the inner magnet, towards which point ions in said path are intended to be deflected by reducing the radius of the path to zero by changing the electric field.

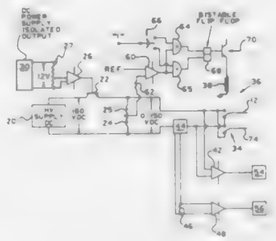


4,853,174

LOW LEVEL DETECTOR MONITOR

Fred H. Bednar, Pittsburgh, and Kenneth G. Lunz, Blannox, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 875,912, Jun. 19, 1986, abandoned. This application Oct. 6, 1987, Ser. No. 105,186
Int. Cl.[4] G21C *17/00*; G01T *3/00*
U.S. Cl. 376—254 **7 Claims**



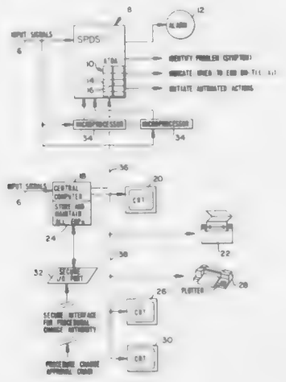
1. A system for monitoring the flux in a nuclear reactor, said system comprising:
at least one neutron detector composed of two electrodes between which a current representative of neutron density flows when a d.c. bias voltage is applied between said electrodes, said detector being constructed to have a neutron sensitivity which is higher for one d.c. bias voltage polarity than for the opposite d.c. bias voltage polarity;
a d.c. voltage source;
connecting means for applying a c. voltage from said source between said electrodes, as a d.c. bias voltage, said connecting means being switchable for applying the d.c. voltage between said electrodes with either polarity;
voltage control means connected to said source for varying the amplitude of the d.c. bias voltage; and
safety interlock means coupled to said connecting means and connected to monitor the amplitude of the d.c. bias voltage for permitting said connecting means to be switched only when the d.c. bias voltage amplitude is below a selected value.

4,853,175

POWER PLANT INTERACTIVE DISPLAY

Theodore L. Book, Sr., Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 10, 1988, Ser. No. 166,959
Int. Cl.[4] G21C *7/36*
U.S. Cl. 376—216 **20 Claims**



1. An interactive display apparatus for a plant operating at a plurality of process parameters from which a current plant status can be calculated, and from which symptoms of a transient condition in the plant status requiring at least one mitigating action an implied time interval can be diagnosed, extreme action being necessary beyond the time interval if the mitigating action is unsuccessful in mitigating the transient condition, the apparatus comprising:
computer means for receiving signals indicative of the process parameters and for diagnosing a plurality of symptoms of transient conditions in the plant status, said computer means operating to measure the time interval for each mitigating action;
a plurality of symptom indicators connected to said computer means, each symptom indicator being activatable by said computer means upon the diagnosis by said computer means of one of the symptoms; and
a plurality of extreme action indicators connected to said computer means, each extreme action indicator being activatable by said computer means upon expiration of the time interval for taking a mitigating action.

4,853,176

HAFNIUM STAINLESS STEEL ABSORBER ROD FOR CONTROL ROD

James E. Charnley, Gilroy; James E. Cearley, San Jose; Robert C. Dixon, Morgan Hill; Kenneth R. Izzo, San Jose, all of Calif., and Louis L. Aiello, Castle Hayne, N.C., assignors to General Electric Company, San Jose, Calif.

Filed Jul. 5, 1988, Ser. No. 215,188
Int. Cl.[4] G21C *7/10*
U.S. Cl. 376—333 **8 Claims**

1. In a control rod having a stainless steel body for enclosing a neutron absorbing poison, said control rod having movement along an axial direction for insertion into and out of a nuclear reactor for controlling a nuclear reaction, the improvement comprising:
a piece of hafnium;
a piece of stainless steel joined to said hafnium by a thin diffusion interface created by friction welding;
said hafnium and said stainless steel oriented serially in said axial direction with said thin diffusion interface disposed normal to the axial direction of said control rod movement;



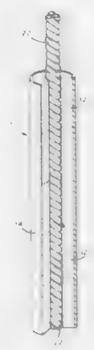
means for confining said hafnium to movement along said axial direction with said control rod; and
means for attaching said piece of stainless steel to the remaining portion of said control rod to load the weld therebetween under compression or tension during said control rod movement whereby said thin diffusion interface is loaded in tension or compression only upon dynamic movement of said control rod.

4,853,177

VOID PLUG FOR ANNULAR FUEL PELLETS

William G. Pettus, Monroe, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 814,001, Dec. 17, 1985, abandoned, which is a continuation of Ser. No. 492,081, May 6, 1983, abandoned. This application May 21, 1987, Ser. No. 53,560
Int. Cl.[4] G21C *3/16*
U.S. Cl. 376—418 **5 Claims**



1. An improved pressurized water reactor nuclear fuel rod comprising, in combination, a gas-tight outer tubular cladding made of zircaloy, a plurality of annular fuel pellets axially stacked within the cladding, each of the fuel pellets consisting essentially of uncoated and unencased uranium dioxide,

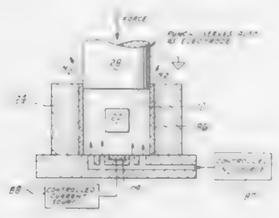
wherein each of the fuel pellets has a cylindrical outer surface in contact with the cladding and a cylindrical inner surface defining a portion of a continuous central cavity extending axially along the center of the fuel rod, a porous void plug inserted within and substantially filling the central cavity, the porous void plug having a transverse thickness perpendicular to the axis of the cladding substantially equal to the inner diameter of the fuel pellets and pressing upon the inner surface of the fuel pellets so as to exert sufficient pressure against the fuel pellets to prevent the breaking away and the relocation of fuel fragments from the fuel pellets, the porous void plug being a compacted porous refractory fiber material operative as a getter for fission product gases and providing means for distributing burnable poisons within the cladding.

4,853,178

ELECTRICAL HEATING OF GRAPHITE GRAIN EMPLOYED IN CONSOLIDATION OF OBJECTS

Brian L. Oslin, Carmichael, Calif., assignor to Ceracon, Inc., Sacramento, Calif.

Filed Nov. 17, 1988, Ser. No. 272,327
Int. Cl.[4] G22F *3/00*
U.S. Cl. 419—23 **39 Claims**



1. In the method of consolidating a metallic body in any of initially powdered, sintered, fibrous, sponge, or other form capable of compaction, that includes the steps:

(a) providing a bed of flowable particles within a contained zone, said particulate including flowable and resiliently compressible carbonaceous particles;

(b) positioning said body in said bed, to be surrounded by said particles;

(c) effecting pressurization of said bed to cause pressure transmission via said particles to said body, thereby to compact the body into desired shape, increasing its density;

(d) the particles being heated to elevated temperature prior to compacting of the body into desired shape; and

(e) the heating of the particles being effected by passing electric current through same, and heat generated in the particles also to be transferred to said body.

4,853,179

METHOD OF MANUFACTURING HEAT RESISTANT, HIGH-STRENGTH STRUCTURAL MEMBERS OF SINTERED ALUMINUM ALLOY

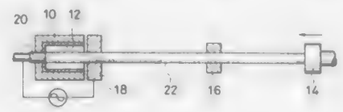
Haruo Shiina, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1986, Ser. No. 921,999
Claims priority, application Japan, Oct. 22, 1985, 60-234503
Int. Cl.[4] B22F *3/24*
U.S. Cl. 419—28 **8 Claims**

1. A manufacturing method for a structural member having heat resistance and high strength and made of an Al alloy powder of a composition making it difficult to perform hot plastic working, comprising the steps of:

a. producing from said Al alloy powder by an extrusion process a hot extruded rod of substantially uniform shape; and

b. forming said hot extruded rod under pressure into the desired shape while heating at least part of said extruded



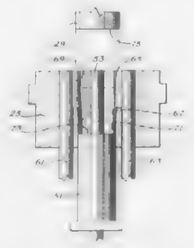
rod via electric resistance heating by passing an electric current therethrough.

4,853,180

METHOD OF MANUFACTURING BUSHINGS WITH POWDERED METALS

Billy G. Howard, Arlington, Tex., assignor to Martin Sprocket & Gear, Inc., Fort Worth, Tex.

Division of Ser. No. 122,839, Nov. 19, 1987, Pat. No. 4,818,201.
This application Sep. 15, 1988, Ser. No. 244,320
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—66 **4 Claims**



1. A method for forming powdered metal machine components such as bushings for shafts, comprising:

depositing powdered metal within a die cavity;

compressing the powdered metal in the die between an upper and a lower punch;

forming during the compressing of the powder an inner wall in the bushing with a core extending from the lower punch into the die cavity

forming during the compressing of the powder at least one groove in an upper region of the bushing with a core extension having a lateral protrusion extending into the cavity;

ejecting from the die said component after powder compression with the lower punch;

raising the core extension to free the lateral protrusion from said component.

4,853,181

HOT WORK TOOL STEEL

David E. Wert, 304 Raymond St., Hyde Park, Reading, Pa. 19605, and Raymond M. Hemphill, 813 Evergreen Dr., Wyomissing, Pa. 19610

Filed Jun. 18, 1986, Ser. No. 875,648
Int. Cl.[4] C22C *38/22, 38/24*
U.S. Cl. 420—111 **10 Claims**

1. A deep air hardenable alloy steel having a high hardness capability, improved room temperature toughness when air cooled in large section sizes, good temper resistance up to 1100° F., and exceptional wear resistance, said alloy steel, in weight percent, consisting essentially of

	w/o
Carbon	0.35–0.50

-continued

	w/o
Manganese	1.0 Max.
Silicon	2.0 Max.
Chromium	5.8–7.0
Molybdenum	1.8–2.2
Vanadium	0.6–1.1

and the balance essentially Iron.

4,853,182

METHOD OF MAKING METAL MATRIX COMPOSITES REINFORCED WITH CERAMIC PARTICULATES

James A. Cornie, North Chelmsford; Theodoulos Kattamis, Watertown; Brent V. Chambers, Cambridge; Bruce E. Bond, Bedford, and Raul H. Varela, Canton, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 2, 1987, Ser. No. 104,173
Int. Cl.[4] C22C *1/10*
U.S. Cl. 420—129 **8 Claims**

1. A process for preparing a metal matrix composite reinforced with ceramic particulates, the process comprising:

adding a refractory metal to a carbon-containing molten base metal to form a solution;

allowing the reaction of said refractory metal and carbon, and the precipitation of a resulting refractory metal carbide from said solution; and

controlling the temperature during cooling of the solution such that a solid composite is formed having a base metal matrix reinforced with particulates of the precipitated carbide ranging from about 2 microns to about 75 microns in average size.

4,853,183

AIR MELTABLE CASTABLE CORROSION RESISTANT ALLOY AND ITS PROCESS THEREOF

Thomas E. Johnson, Helenville, and John K. McBroom, Jr., Hartland, both of Wis., assignors to Chas s. Lewis & Co., Inc., St. Louis, Mo.

Filed Aug. 28, 1987, Ser. No. 90,657
Int. Cl.[4] C22C *30/00*
U.S. Cl. 420—454 **17 Claims**

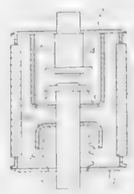
1. An air meltable, nickel-based alloy having high corrosion resistance to severe phosphoric acid environments, said alloy having a copper content of less then about 0.15 percent by weight and a silicon content of between about 0.5 and 1.0 percent by weight, between about 12–20% iron, between about 20–25% chromium, between about 33–53% nickel, between about 6–9% molybdenum, between about 4–8% cobalt, and between about 2–4% manganese, said alloy having a highly fluid and castable melt to form complex shapes, and having a high resistance to concentrated phosphoric acid, the combination of low copper content and the presence of silicon produces a highly castable alloy that retains a high corrosion resistance in severe phosphoric acid environments.

4,853,184

CONTACT MATERIAL FOR VACUUM INTERRUPTER

Naya Eizo; Nagata Yoshikazu; Horiuchi Toshiaki; Okumura Mitsuhiro; Demiza Michinosuke; Harima Mitsuhiro; Asakawa Shigeki, and Asakawa Masuo, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP84/00440, § 371 Date Dec. 16, 1985, § 102(e) Date Dec. 16, 1985, PCT Pub. No. WO85/03802, PCT Pub. Date Aug. 29, 1985
PCT Filed Sep. 11, 1984, Ser. No. 797,324
Claims priority, application Japan, Feb. 16, 1984, 59-28194
Int. Cl.[4] C22C *9/00*
U.S. Cl. 420—489 **6 Claims**



1. A contact material for a vacuum interrupter containing copper as a basic component, and, as another component, from approximately 20 to 35% by weight of chromium, and further containing an amount of silicon about 5% by weight or below.

4,853,185

NITROGEN STRENGTHENED FE-NI-CR ALLOY

Michael F. Rothman; Dwaine L. Klarstrom, both of Kokomo, and George Y. Lai, Carmel, all of Ind., assignors to Haynes International, IMC., Kokomo, Ind.

Filed Feb. 10, 1988, Ser. No. 154,606
Int. Cl.[4] C22C *38/50, 30/00*
U.S. Cl. 420—584 **16 Claims**

1. A metal alloy comprised of, in weight percent, about 30% to 45% nickel, about 12% to 32% chromium, at least one of 0.1% to 2.0% columbium, 0.2% to 4.0% tantalum and 0.05% to 1.0% vanadium, up to about 0.20% carbon, about 0.05% to 0.50% nitrogen, an effective addition of titanium up to 0.20% to provide beneficial strengthening effects at elevated temperatures, and the balance being iron plus impurities and wherein $(C+N)_F$ is greater than 0.14% and less than 0.29% $(C+N)_F$ being defined as

$$(C + N)_F = C + N - \frac{Cb}{9} - \frac{V}{4.5} - \frac{Ta}{18}$$

4,853,186

WATER-COMPATIBLE REDUCIBLE COMPOUNDS AND THEIR USE IN ANALYTICAL COMPOSITIONS AND METHODS

Albert J. Mura, Rochester; Robert T. Belly, Webster, and Vanessa R. Lum, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 30, 1986, Ser. No. 868,855
The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.
Int. Cl.[4] G01N *21/78;* C07C *50/12*
U.S. Cl. 422—55 **16 Claims**

1. A water-compatible reducible compound of the structure CAR—$(R^1)_n$ wherein CAR— is a substituted or unsubstituted aromatic or quinone nucleus, R is

$$\begin{array}{l} R^6 \\ | \\ +R^5+_m N-Q-FRAG \end{array}$$

wherein R—5 is substituted or unsubstituted alkylene of 1 to 2 carbon atoms, R—6 is substituted or unsubstituted alkyl, substituted or unsubstituted cycloalkyl or substituted or unsubstituted aryl, Q is carbonyl or thiocarbonyl, m is 0 or 1, FRAG is a chromogen or fluorogen and n is 1 or 2,

provided said compound is constructed such that it is capable of being reduced at a pH of 9 or less to release said FRAG, and said compound comprises at least one water-compatibilizing moiety which has a hydrophobic parameter less than about −2.0, and

further provided that when R^1 is replaced with H, CA-R—$(H)_n$ is constructed such that it has an $E_{\frac{1}{2}}$ of at least about +100 mV when measured in water.

4,853,187

APPARATUS TO REDUCE NO_x EMISSIONS FROM A FLUID CATALYTIC CRACKING UNIT

Joseph A. Herbst, Turnersville; Hartley Owen, Belle Mead, both of N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 903,344, Sep. 3, 1986, abandoned. This application May 2, 1988, Ser. No. 188,817

Int. Cl.⁴ F27B *15/08, 15/00*

U.S. Cl. 422—144 **9 Claims**



9. An apparatus for reducing NO_x in flue gas from a regenerator for regenerating a spent fluid catalytic cracking catalyst stream comprising a mixture of ZSM-5 catalyst and zeolite Y catalyst particles from a fluid catalytic cracking reactor to produce regenerated catalyst, comprising:

a first regenerator riser having an inlet in a lower portion thereof for regenerating a first mixture of said spent catalyst stream, a portion of regenerated catalyst and a first oxygen-containing stream by passing said first mixture therethrough and an outlet in

an upper portion of said first riser for discharging a mixture of catalyst and first flue gas from said first riser;

a second regenerator riser comprising a lower portion adapted to contain a dense bed of catalyst and an upper portion above said lower portion, said lower portion having a larger inside diameter than said upper portion;

means for separating and discharging said first mixture from said first riser and downwardly directing catalyst from said first mixture from said first riser to a first catalyst bed located in said lower portion having a larger inside diameter;

means for withdrawing from said apparatus said first flue gas stream from said discharged first mixture;

means for adding a second oxygen-containing stream to said first bed;

means for passing a second mixture of catalyst and gases comprising said NO_x from said first bed into said upper portion of said second riser wherein at least a portion of said NO_x is converted to N_2 in said second riser upper portion;

an enlarged catalyst collecting chamber above said first catalyst bed comprising an upper portion and a lower portion;

means for discharging said second mixture from said second riser and downwardly directing said second mixture from said second riser to a second catalyst bed located in said lower portion of said collecting chamber;

means for separating a second flue gas stream from said second mixture prior to passing said second mixture into said second bed;

means for adding a third oxygen-containing gas stream to said second bed;

means for recycling regenerated catalyst from said second bed to said first riser;

means for withdrawing regenerated catalyst from said second bed; and

means for separating a third flue gas stream from an atmosphere of said collecting chamber above said second bed.

4,853,188

CELL FOR PLACING SOLID MATTERS ON A SLIDE GLASS UNDER CENTRIFUGAL FORCE

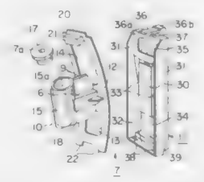
Matsumi Toya, Koushoku, Japan, assignor to Kabushiki Kaisha Tiyoda Seisakusho, Koushoku and Sakura Seiki Kabushiki Kaisha, Tokyo, both of, Japan

Continuation of Ser. No. 930,340, Nov. 12, 1986, abandoned. This application Jan. 6, 1989, Ser. No. 294,913

Claims priority, application Japan, Nov. 14, 1985, 60-174240; Jan. 27, 1986, 61-8899

Int. Cl.⁴ B01D *33/22;* **G01N** *1/18*

U.S. Cl. 422—104 **20 Claims**



1. A method of placing solid matter in a liquid on a slide glass with centrifugal force, the method comprising:

providing a cell portion having a container for accommodating solid matter in a liquid, an arcuate, elastic base plate connected to the container on one, concave, front side, the arc of the base plate extending between a bottom and an opposite, upper end of the base plate, and connecting-passage means connecting the container to means defining an opening in an opposite, convex, back side of the base plate for passage of the solid matter in the liquid from the container to the opening; and

providing a box-like holder having holder bottom-end means on a bottom end of the holder;

engaging the holder bottom-end means with base-plate bottom-end means on the bottom end of the base plate with the back side of the base plate facing the holder;

elastically deforming uppermore portions of the arc of the base plate toward the holder to make the base plate less arcuate;

swinging a hook on an opposite, upper end of the holder for engaging hooking means on the upper end of the base plate when the holder and base-plate bottom-end means are engaged and the base plate is deformed toward the holder;

holding one side of a packing plate against the back side of the base plate with the elastic deformation of the base plate when the hook portion is engaged with the hooking means with means defining a hole in the packing plate registered with the opening in the back side of the base plate and holding one side of a slide glass against an opposite side of the packing plate; and

rotating the cell portion and holder in a centrifuge to receive on the slide glass the solid matter in the liquid from the container passing through the connecting-passage means, opening and hole centrifugally.

4,853,189

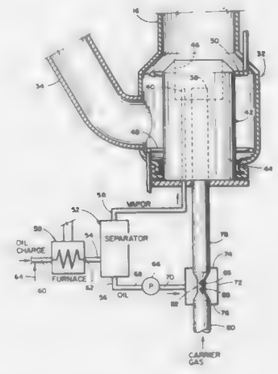
APPARATUS FOR CONVERSION OF OILS TO HYDROCARBON PRODUCTS

Floyd H. Holland, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 23, 1987, Ser. No. 6,084

Int. Cl.⁴ B01J *8/18*

U.S. Cl. 422—140 **19 Claims**



1. Apparatus for enhancing catalytic conversion of an oil feedstock stream in combination with a reactor, comprising:

means for separating an oil feedstock stream into a vapor stream and a liquid stream;

means in fluid communication with said separating means for atomizing said liquid stream prior to contact by said vapor stream in said reactor; and

means in fluid communication with said atomizing means for introducing the separated streams into said reactor for catalytic conversion.

4,853,190

PROCESS & APPARATUS FOR THE PRODUCTION OF HYDROGEN CYANIDE

Reinhard Manner, Maintal; Hans Schaefer, Hanau; Carl Voight, Rodenbach, and Wolf D. Pfeifer, Bruhl, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany

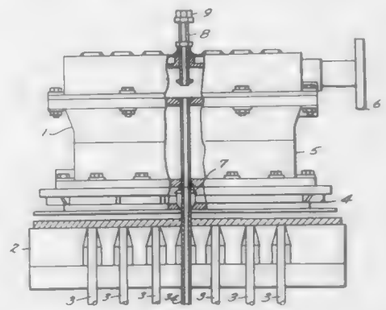
Continuation of Ser. No. 807,178, Dec. 10, 1985, abandoned, which is a division of Ser. No. 589,217, Mar. 13, 1984, Pat. No. 4,594,234. This application May 16, 1988, Ser. No. 196,799

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309394

Int. Cl.⁴ B01J *10/00*

U.S. Cl. 422—197 **2 Claims**

1. A tube furnace suitable for carrying out the BMA process at a temperature above 1000° C. comprising at least one furnace chamber having hanging ceramic reaction tubes therein, a common gas supply means in communication with said tubes, a common gas withdrawal means in communication with said tubes, at least one burner for heating said at least one furnace chamber, a cooling head through which gas is withdrawn from said ceramic tubes to said common gas withdrawal means, said cooling head having a lower part, said lower part having a cooling chamber, means for introducing cooling liquid into said cooling chamber, means for withdrawing liquid from said cooling chamber, a plurality of individual heat exchange tubes extending through said cooling chamber, the exterior of each of said heat exchange tubes being independently in contact with said cooling liquid, said heat exchange tubes corresponding in number to the number of ceramic tubes, a plurality of stuffing boxes, each containing a tubular flexible insulator positioned and arranged within a respective said individual



heat exchange tube, one of said ceramic tubes being suspended within each of said flexible insulators, whereby each ceramic tube is in heat exchange communication with said cooling liquid, the height of said lower part corresponding to that of the individual heat exchange tubes, the stuffing boxes contacting the heat exchangers in such manner that the product gases flowing through the ceramic tubes experience a temperature drop in the lower part of said cooling head to a temperature below 300° C., whereby it is possible to maintain, in the warmer and colder zones formed by heating the furnace chamber, the necessary temperature profile for the customary throughout of reaction gases either (1) by tighter or less tight arrangement of the ceramic tubes, and/or (2) by employing ceramic tubes having different inner and/or outer diameters.

4,853,191

PROCESS FOR THE REMOVAL OF SULFUR-CONTAINING GASES

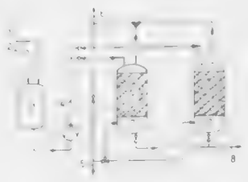
Wilhelm Bruening, Rio de Janeiro, Brazil; Rudolf Uchdorf, Krefeld, and Alfred Mitschker, Odenthal-Holz, both of Fed. Rep. of Germany, assignors to Bayer Do Brasil S.A., Rio de Janeiro, Brazil

Filed Feb. 25, 1988, Ser. No. 159,147

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1987, 3706619

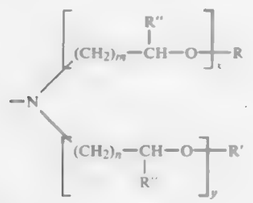
Int. Cl.⁴ C01B *11/16, 31/20, 17/00;* **B01J** *8/00*

U.S. Cl. 423—226 **14 Claims**



1. A process for the selective removal of sulfur-containing

gases from industrial gases or waste gases comprising contacting the industrial gases or waste gases with a polymerization resin crosslinked with polyvinyl compounds, the resin containing tertiary amino groups corresponding to the following formula:



in which
m and n individually are 1 or 2,
x and y individually are from 0 to 10,
R and R′ individually are hydrogen or alkyl and
R′ is hydrogen or methyl.

4,853,192

WATER REMOVAL IN A REDOX PROCESS

Howard L. Fong, Sugar Land, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 91,486, Aug. 31, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 282,898
Int. Cl.[4] C01B *17/16, 31/20, 17/02*
U.S. Cl. 423—226 **20 Claims**



1. A process for the selective removal of hydrogen sulfide from a gas stream which comprises (a) treating the gas stream with an aqueous polyvalent metal ion or polyvalent metal chelate redox solution containing a catalytically effective amount of polyvalent metal ion or chelate, and optionally containing a ligand degradation inhibitor; (b) recovering a sweetened gas stream; (c) removing sulfur from the solution; (d) regenerating the solution with an excess of an oxygen containing gas under oxidizing conditions in a regeneration zone until substantially all of the polyvalent metal is in its higher valence state; (e) in a separate zone from the regeneration, contacting the regenerated redox solution containing water in excess of that required to maintain a catalytically effective concentration of polyvalent metal ion or chelate in solution, with an inert gas in a manner to provide for the substantial saturation of the inert gas with excess water from te regenerated redox solution without substantial undesirable contamination of or oxidation of the metal or ligand in the regenerated redox solution; and (f) recycling the regenerated redox solution having a polyvalent metal ion or chelate concentration substantially the same as the feed soluton to step (a).

4,853,193

PROCESS FOR REMOVING NO_x AND SO_x FROM A GASEOUS MIXTURE

Robert P. Cahn, Millburn, and Boyd E. Hurst, Long Valley, both of N.J., assignors to Exxon Research and Engineering Company, Florham, N.J.

Continuation-in-part of Ser. No. 817,583, Jan. 10, 1986, abandoned. This application Nov. 21, 1986, Ser. No. 933,112
Int. Cl.[4] C01B *21/00, 17/00, 17/02;* **C01C** *1/24*
U.S. Cl. 423—235 **13 Claims**

1. A combination denitrogenation and desulfurization process which comprises the steps of:
(a) contacting a gaseous mixture comprising nitrogen oxides and sulfur oxides in the presence of oxygen and in the absence of a catalyst, with ammonia in a molar amount equal to the sum of about 1.0 to about 3.0 times the moles of said nitrogen oxides plus about 0.01 to about 2.0 times the moles of said sulfur oxides to reduce said nitrogen oxides to nitrogen, at a temperature ranging from about 1300° to about 2200° F.;
(b) passing the gaseous effluent resulting from step (a) comprising said nitrogen, said sulfur oxides and unreacted ammonia to a gas desulfurization zone maintained at desulfurization conditions, including a temperature ranging from about 100° to about 400° F., to react said sulfur oxides with ammonia at a molar ratio of at least 1 mole of ammonia per mole of said sulfur oxides to produce a gaseous effluent and an ammonium salt of an acid of sulfur; and
(c) recovering said ammonium salt.

4,853,194

METHOD FOR TREATING EXHAUST GAS

Masao Hino; Kenichi Yoneda, both of Hiroshima; Masato Miyake, Tokyo; Hidehiko Otani, Kobe; Noriya Shingu, Osaka; Tsukasa Isahaya, Himeji; Shigeshi Hamada, Himeji, and Tsuyoshi Arahori, Himeji, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1987, Ser. No. 17,829
Claims priority, application Japan, Feb. 24, 1986, 61-37326
Int. Cl.[4] B01J *8/00;* **C01B** *17/00, 21/00*
U.S. Cl. 423—239 **2 Claims**

1. A method for treating an exhaust gas which comprises leading a coal-fixed exhaust gas to a dry+denitrating device and removing oxides of nitrogen from said exhaust gas in said device; leading said exhaust gas from said denitrating device to a dry electric dust collector and a wet waste smoke desulfurizing device disposed at downstream positions, and removing dust from said exhaust gas in these devices, characterized in that said method further comprises adding a sodium compound to all or a portion of a waste liquid from said wet desulfurizing device thereby forming a sodium compound containing solution of 1% to 4% sodium; spraying said sodium compound containing solution into said exhaust gas flowing between said dry denitrating device and said dry electric dust collector in such a way that the concentration of sodium in said exhaust gas is in the range of 0.5% to 3% by weight in terms of sodium oxides in the dust which will follow through said dry electric dust collector; and then collecting the resulting dry solids together with said dust by said dry electric dust collector.

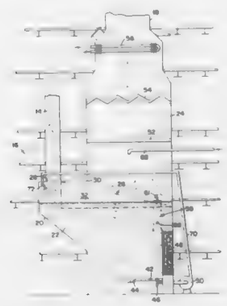
4,853,195

FLUE GAS SCRUBBER SYSTEM

John M. Lehto, Cokato, Minn., assignor to Northern States Power Company, Minneapolis, Minn.

Division of Ser. No. 872,118, Jun. 9, 1986, Pat. No. 4,762,686. This application Jun. 12, 1987, Ser. No. 61,217
Int. Cl.[4] B01D *47/02, 50/00, 53/34*
U.S. Cl. 423—242 **12 Claims**

1. A method of simultaneously removing fly ash and sulfur dioxide pollutants from flue gas, comprising the steps of:
partially filling a tank with aqueous absorbent having sufficient water and alkaline material in order to maintain a pH between about 3 and 6;
positioning across the upper end of the tank an upright partition which extends entirely between opposite sides of the tank, in order to define two subchambers above the aqueous absorbent in the upper end of the tank, said partition including a plurality of horizontal fingers each bounded in part by interconnected spaced-apart side walls with end walls connected between adjacent fingers in order to define a continuous zig-zag lower edge submerged in said aqueous absorbent,
directing dirty flue gas into one subchamber, down one side and around the continuous zig-zag lower edge of the partition, and into contact with the aqueous absorbent;



injecting oxygen-containing gas into the aqueous absorbent beneath the continuous zig-zag lower edge of the partition, whereby the fly ash and sulfur dioxide react with the aqueous absorbent to form calcium sulfate which precipitates out of solution;
agitating the aqueous absorbent to keep the calcium sulfate suspended in solution as a slurry;
directing the clean flue gas up the other side of the partition, out of the aqueous absorbent to keep the calcium sulfate suspended in solution as a slurry and into the other subchamber; and
exhausting the clean flue gas from the other subchamber to atmosphere.

4,853,196

WATER-SOLUBLE BORON CONTAINING IMPURITY REDUCED HEXAGONALLY CRYSTALLINE BORON NITRIDE AND PROCESS FOR PRODUCTION THEREOF

Takahisa Koshida; Ryoji Uchimura, both of Chiba, and Takeshi Ogasawara, Tokyo, all of Japan, assignors to Kawasaki Steel Corp., Japan

Filed Apr. 30, 1987, Ser. No. 44,445
Int. Cl.[4] C01B *21/064*
U.S. Cl. 423—290 **17 Claims**

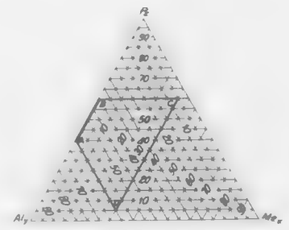
1. A method for purifying a hexagonally crystalline boron nitride, comprising the steps of:
preparing particles of boron nitride powder
dispersing said boron nitride powder in a dispersion medium and stirring for a given period of time for removing a water-soluble boron containing impurity and
drying the boron nitride in an atmosphere in which the vapor pressure of water is maintained lower than or equal to 10 mmHG and/or at a process temperature which is maintained lower than or equal to 100° C.

4,853,197

CRYSTALLINE METAL ALUMINOPHOSPHATES

Stephen T. Wilson, Shrub Oak, N.Y., and William C. Mercer, Brookfield, Conn., assignors to UOP, Des Plaines, Ill.

Filed Jun. 4, 1987, Ser. No. 58,032
Int. Cl.[4] C01B *25/26*
U.S. Cl. 423—306 **20 Claims**



1. Crystalline metal aluminophosphates having a three-dimensional microporous framework structure of MO_2, AlO_2 and PO_2 tetrahedral units and having an empirical chemical composition on an as synthesized, anhydrous basis expressed by the formula

$$mR:(M_xAl_yP_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system: "m" represents the moles of "R" present per mole of $(M_xAl_yP_z)O_2$ and has a value of from zero to 0.3, "M" represents at least one metal of the group magnesium, manganese, zinc, iron and cobalt, "x", "y" and "z" represent the mole fraction of the metal "M", aluminum and phosphorus respectively present as tetrahedral oxides, said mole fractions being such that they are within the tetragonal compositional area defined by points A, B, C and D of the ternary diagram which is FIG. 1 of the drawings and having an X-ray diffraction pattern of one of Table 43S or Table 50S

TABLE 43S

	d, (Å)	Relative Intensity
12.4	7.14–7.17	VS
17.3–17.4	5.10–5.12	W
21.5–21.6	4.12–4.13	M
27.6–27.7	3.22–3.23	W–M
28.1–28.2	3.16–3.18	W
33.1–33.2	2.701–2.706	VW

TABLE 50S

2θ	d,(Å)	Relative Intensity
7.8	11.4	W–VW
8.0–8.1	10.9–11.1	VS
9.8–9.9	8.93–9.03	W
23.5–23.6	3.77–3.79	W–M
24.1–24.3	3.66–3.69	W
26.2	3.40	VW

4,853,198

PROCESS FOR PRODUCING UNSINTERED CRISTOBALITE SILICA

Koichi Orii; Iwao Ohshima, both of Yokohama, and Naotake Watanabe, Yokosuka, all of Japan, assignors to Nitto Chemical Industry Co., Ltd and Mitsubishi Rayon Co., Ltd., both of Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,548
Claims priority, application Japan, Mar. 23, 1987, 62-65746
Int. Cl.[4] C01B *3/12*
U.S. Cl. 423—335 9 Claims

1. A process for producing unsintered cristobalite silica by heating an amorphous silica in the presence of an alkali component, which comprises heating an amorphous silica having a specific surface area (measured according to BET method) of 50 m^2/ g or more at a temperature in the range of 1000° to 1300° C. in the presence of an alkali metal component in a concentration of 5 to 600 ppm to said silica to change it partially or completely into cristobalite and then heating at a temperature exceeding 1300° C to eliminate alkali.

4,853,199

METHOD FOR PRODUCING CRYSTALLINE COMPLEX PEROVSKITE COMPOUNDS

Osamu Inoue, and Syunichiro Kawashima, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jan. 7, 1988, Ser. No. 141,774
Claims priority, application Japan, Jan. 8, 1987, 62-2375; Mar. 5, 1987, 62-50558; Sep. 29, 1987, 62-245121
Int. Cl.[4] C01G *33/00, 35/00*
U.S. Cl. 423—594 19 Claims

1. A method of producing a fine powder, crystalline complex perovskite compound of the formula

$$A(B_jC_k)O_3,$$

wherein

A represents at least one divalent metal selected from the group consisting of Ca, Sr and Ba,

B represents at least one metal selected from the group consisting of Mg, Zn, Co and Ni, and

C represents at least one pentavalent metal selected from the group consisting of Ta and Nb, the method comprising

providing a proportion of at least one member selected from the group consisting of oxides, hydroxides, hydrous oxides, water-soluble inorganic salts and organic compounds of the metals A, at least one member selected from the group consisting of oxides, hydroxides, hydrous oxides, water-soluble inorganic salts and organic compounds of the metals B, and at least one member selected from the group consisting of oxides, hydroxides, hydrous oxides, water-soluble inorganic salts and organic compounds of the metals C, provided that the watersoluble inorganic salts and organic compounds of the respective metals are, respectively, capable of yielding oxides, hydroxide and hydrous oxides of the metals by hydrolysis, said member which are not water soluble having a size of one micrometer or less, the proportion of said members being such as to effect formation of said perovskite compound; and

reacting the selected members in an alkaline aqueous solution at a temperature of 140° C. or lower, said temperature being sufficient to cause the members to convert into the fine powder, crystalline complex perovskite compound.

4,853,200

CONTINUOUS PROCESS FOR PREPARING SODIUM ORTHOPHOSPHATE SLURRIES FROM NATURAL SODA ASH ORTHOPHOSPHORIC ACID

N. Earl Stahlheber, Columbia, Ill., and John E. Lyon, Florissant, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 10,606, Feb. 4, 1987, abandoned, which is a division of Ser. No. 653,182, Sep. 24, 1984, Pat. No. 4,661,331. This application Mar. 21, 1988, Ser. No. 171,199
Int. Cl.[4] C01B *25/30*
U.S. Cl. 423—309 8 Claims

1. A batch-wise or semi-continuous slurry process for the preparation of pentasodium tripolyphosphate precursor which comprises:

(a) providing a reaction medium at a temperature above about 80° C. having a molar Na:P ratio in the range of about 1.42 to about 1.58 and uncombined water content of about 7% to about 20% by weight;

(b) adding to the reaction medium with agitation granular natural soda ash and a mixture consisting essentially of 75–92% by weight H_3PO_4 and 8–25% by weight H_2O substantially simultaneously in such proportions, rate and acid concentration to maintain said molar Na:P ratio and said uncombined water content and to provide a sojourn time of at least 12 minutes at a temperature about 80° C., thereby forming a slurry product;

(c) passing the slurry of (b) to a separate mixer; and

(d) reacting the slurry at a temperature of at least 95° C. in the separate mixer with sufficient amount of aqueous sodium hydroxide to provide a resultant slurry having a molar Na:P ratio of about 1.64 to about 1.70.

4,853,201

RECOVERY OF P_2O_5 VALUES FROM PHOSPHORIC ACID HEMIHYDRATE CRYSTALS

Fernando Oré, Whittier, Calif., and Thomas E. Richards, Jasper, Fla., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jul. 11, 1988, Ser. No. 217,186
Int. Cl.[4] C01B *25/16*
U.S. Cl. 423—320 20 Claims

1. In a process for recovering P_2O_5 values from a first aqueous slurry of calcium sulfate hemihydrate crystals where

(1) said first slurry is filtered in a hemihydrate filter to form a product filtrate containing said P_2O_5 values and a calcium sulfate hemihydrate filter cake;

(2) said hemihydrate filter cake is transported to a hemihydrate filter cake dissolver where said hemihydrate filter cake is dissolved;

(3) said dissolved hemihydrate filter cake is transported to a separate dihydrate crystallizer where a second aqueous slurry, of calcium sulfate dihydrate crystals, is formed; and

(4) said second slurry is transported to a dihydrate filter, separate from said hemihydrate filter, where said second slurry is filtered to form a dihydrate filter cake and a first filtrate, the improvement which comprises

(a) maintaining the free sulfate ion concentration in said dihydrate crystallizer between about 0.1 and about 10%; and

(b) maintaining the phosphoric acid concentration in said dihydrate crystallizer between about 0.1 and about 10% on a P_2O_5 basis.

4,853,202

LARGE-PORED CRYSTALLINE TITANIUM MOLECULAR SIEVE ZEOLITES

Steven M. Kuznicki, Easton, Pa., assignor to Engelhard Corporation, Edison, N.J.

Filed Sep. 8, 1987, Ser. No. 94,237
Int. Cl.[4] C01B *33/24*
U.S. Cl. 423—326 5 Claims

1. A crystalline titaniumsilicate molecular sieve zeolite having a pore size of approximately 8 Angstrom units and a composition in terms of mole ratios of oxides as follows:

$$1.0\pm0.25\ M_{2/n}O:\ TiO_2:\ y\ SiO_2:\ z\ H_2O$$

wherein M is at least one cation having a valence of n, y is from 2.5 to 25, and z is from 0 to 100, said zeolite being characterized by an X-ray powder diffraction pattern having the lines and relative intensities set forth in Table I of the specification.

4,853,203

FERRIERITES; THEIR PROCESS OF MANUFACTURE

Jean-Louis Guth; Anne-Catherine Faust, both of Mulhouse; Francis Raatz, Rueil-Malmaison, and Jean-Marc Lamblin, Mulhouse-Dornach, all of France, assignors to Institut Francais Du Petrole, Rueil-Malmaison, France

Filed Nov. 23, 1987, Ser. No. 124,122
Claims priority, application France, Nov. 21, 1987, 86 16362
Int. Cl.[4] C01B *33/28, 35/00, 7/00, 15/00*
U.S. Cl. 423—328 22 Claims

1. A crystalline synthetic ferrierite characterized by:

a) the following approximate formula:

$$M_{x/n}(T^{III}O_2)_x(Si^{IV}O_2)_{36-x}$$

where T^{III} represents at least one element selected from the group of boron (B^{III}), aluminum (Al^{III}), gallium (Ga^{III}) and iron (Fe^{III})

x ranges from 0.05 to 6.6

M is a compensation cation

n is the valence of M.

b) an X-ray diffraction diagram shown in Table 1B of the specification,

c) a fluorine content after synthesis ranging from 0.2 to 1.6% by weight, and

d) a Si^{IV}/T^{III} molar ratio of at least about 4.75.

4,853,204

METHOD FOR PRODUCTION OF OXIDATION-RESISTANT SILICON NITRIDE MATERIAL

Nobuyuki Azuma, Kasugai; Minoru Maeda, Konan, and Kazuo Nakamura, Owari-Asahi, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Dec. 16, 1987, Ser. No. 133,627
Claims priority, application Japan, Dec. 23, 1986, 61-307547
Int. Cl.[4] B05D *3/02;* C01B *21/063, 33/06*
U.S. Cl. 423—344 3 Claims



1. A method for the production of an oxidation-resistant silicon nitride material having a surface region thereof formed with a phase of closely packed crystals, which method consists essentially of coating the surface of a silicon nitride substrate with a layer of an alkali metal compound in a ratio of 2 to 30 mg per cm^2 of said substrate by supplying at least one alkali metal compound selected from the group consisting of halogenides, carbonates, nitrates, and sulfates of alkali metals in the form of either powder or aqueous solution to the surface of said substrate, firing the resultant covering substrate at a temperature in the range of 800° to 1,300° C. in the presence of oxygen thereby forming on the surface of said silicon nitride substrate a coating layer consisting substantially of an alkali metal-containing vitreous substance, and crystallizing the surface of said silicon nitride substrate, and then removing said coating layer to expose the crystallized surface of said silicon nitride substrate.

4,853,205

SUPERCRITICAL FLUID METAL HALIDE SEPARATION PROCESS

William K. Tolley, Salt Lake City, and Alton B. Whitehead, Sandy, both of Utah, assignors to The United states of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 12, 1987, Ser. No. 25,252
Int. Cl.[4] C01B *9/00, 9/02;* C01F *7/62;* C01G *23/02*
U.S. Cl. 423—472 6 Claims

1. A process for separating, purifying and recovering metal halide from a mixture, using supercritical fluids comprising:

placing a mixture containing metal halides in an autoclave;

passing a supercritical fluid selected from the group consisting of carbon dioxide, ethane, propane, fluorocarbons, pentane, chlorofluorocarbons, and mixtures thereof at temperatures from about 15° to about 400° C. and at pressures from about 700 to about 25,000 psig through the mixture;

removing said supercritical fluid and a more soluble metal halide dissolved in said supercritical fluid;

altering process variables selected from the class of temperature and pressure to effect precipitation of the more soluble metal halide dissolved in said supercritical fluid; and

recovering the less soluble metal halide residue remaining in the autoclave.

4,853,206

TREATMENT OF WASTE MATERIAL

Richard W. Watson, 1 Woodlands Grove, Ilkley, West Yorkshire LS29 9BX, United Kingdom, assignor to The BOC Group plc, Windlesham, United Kingdom

Filed May 1, 1987, Ser. No. 45,973
Claims priority, application United Kingdom, May 2, 1986, 8610856
Int. Cl.[4] C01B *17/52, 17/50*
U.S. Cl. 423—542 5 Claims

1. A method of recovering a gas mixture including sulphur dioxide from waste material comprising a sulfate, comprising burning fuel with an axial burner directed substantially downward to form a flame zone in a chamber, introducing sulphate waste material into the flame zone, employing pure oxygen or oxygen-enriched air to support combustion of the fuel and to generate a flame of sufficient temperature to crack solid sulfate waste material and thereby liberate sulphur dioxide therefrom, separating solids containing residual sulfate from the gaseous combustion products by collecting such solids from the chamber where they fall substantially vertically under gravity from the flame zone, and thermally cracking said residual sulfate in a region spaced from said chamber to liberate additional sulphur dioxide.

4,853,207

PROCESS FOR THE MANUFACTURE OF VITREOUS METAL OXIDES

Henri Wautier, Braine-le-Comte; Franz Legrand, Quaregnon, and Luc Lerot, Brussels, all of Belgium, assignors to Solvay & Cie (Société , Brussels, Belgium

Filed Feb. 19, 1987, Ser. No. 16,373
Claims priority, application France, Feb. 24, 1986, 86 02618
Int. Cl.[4] C01B *13/14*
U.S. Cl. 423—592 12 Claims

1. Process for the manufacture of vitreous metal oxides, comprising:

dissolving a metal alcoholate in an alcohol having a pKa which is less than 15.74 to provide an alcoholic solution;

preparing an aqueous medium having a pH which is greater than 1.5 by dissolving water in an organic solvent therefor; and

mixing together the alcoholic solution and the aqueous medium under conditions effective to hydrolyze the metal alcoholate to form a metal oxide and to cause gelling of the metal oxide.

4,853,208

METHOD OF BINDING WASTES IN ALKALINE SILICATE MATRIX

Robert S. Reimers, Metairie; Thomas G. Akers, New Orleans, and C. Paul Lo, Destrehan, all of La., assignors to Chemfix Technologies, Icc., Metairie, La.

Filed Mar. 21, 1988, Ser. No. 170,543
Int. Cl.[4] C04B *28/26, 35/16;* C09D *1/02*
U.S. Cl. 423—659 46 Claims

1. A method of reducing the leachability of hazardous wastes containing mercury, selenium, arsenate, antimony, or thallium, comprising the steps of:

forming a silicate matrix by mixing the waste with alkali metal silicate and a setting agent selected from the group consisting of cement, lime, gypsum, and calcium chloride which sets the matrix;

prior to setting, mixing the waste with an additive other than the silicate and setting agent, the additive being selected from the group consisting of amines, imines, mercaptans, ethylene diammine tetraacetic acid, and polyvinyl sulfonic acid, which forms a complex with mercury, selenium, arsenate, antimony, or thallium, the complex having a lower leachability in the environment of the silicate matrix than that of a matrix without the additive when both are contacted with a leaching solution under the same conditions.

4,853,209

BONE MARROW SUPPRESSING AGENTS

Donald A. Kaplan, and William F. Goeckeler, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 50,667, May 18, 1987, abandoned. This application Oct. 27, 1987, Ser. No. 114,275
Int. Cl.[4] A61K *43/00;* C07F *17/00*
U.S. Cl. 424—1.1 20 Claims

1. A method of suppressing bone marrow which causes partial or total eradication of the bone marrow for the treatment of diseases selected from the group consisting of leukemias, lymphomas, myelomas, Hodgkins disease and genetic disorders which comprises administering to a mammal in need of such treatment a bone marrow suppressing amount of at least one bond marrow suppressing composition comprising at least one radionuclide selected from the group consisting of Samarium-153, Gadolinium-159, and Holmium-166 with at least one ligand selected from the group consisting of ethylenediaminetetramethylenephosphonic acid, diethylenetriaminepentamethylenephosphonic acid, hydroxyethylethylenediaminetrimethylenephosphonic acid, nitrilotrimethylenephosphonic acid and tris(2-aminoethyl)aminehexamethylenephosphonic acid, or a physiologically-acceptable salt thereof.

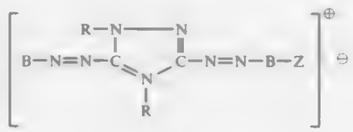
4,853,210

METHOD OF STAINING CELLS WITH A DIAZO DYE AND COMPOSITIONS THEREOF

Lawrence Kass, Hinckley, Ohio, assignor to Cytocolor, Inc., Hinckley, Ohio

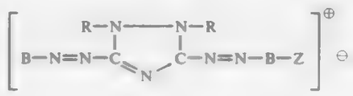
Continuation-in-part of Ser. No. 604,741, Apr. 27, 1984, abandoned. This application Jan. 26, 1988, Ser. No. 148,668
Int. Cl.[4] G01N *1/00*
U.S. Cl. 424—3 16 Claims

1. A method of differentiating, identifying, and enumerating normal and abnormal cells among a plurality of cells of hematopoietic origin which comprises staining a biopsy specimen of said cells with an effective amount of a basic water-soluble cationic heterocyclic diazo dye to obtain a plurality of stained cells having individual color characteristics which permit the differentiation, identification, and enumeration of each cell, wherein said dye is represented by formula I or II:



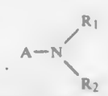
I

or



II

wherein R is a lower alkyl or benzyl radical, $Z\theta$ is an anion, and B is a radical having the formula:



wherein A is a phenylene or naphthylene radical and R_1 and R_2 are selected from the group consisting of hydrogen and lower alkyl radicals.

4,853,211

STABLE, EFFERVESCENT VAGINAL SUPPOSITORIES

Toshio Kurobe; Masayoshi Kasai, and Masanori Kayano, all of Saitama, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 827,216, Feb. 5, 1986, abandoned, which is a continuation of Ser. No. 628,977, Jul. 12, 1984, abandoned, which is a continuation of Ser. No. 471,453, Mar. 2, 1983, abandoned. This application Oct. 28, 1987, Ser. No. 117,398
Claims priority, application Japan, Mar. 5, 1982, 57-34034
Int. Cl.[4] A61K *31/74*
U.S. Cl. 424—44 3 Claims

1. An effervescent vaginal suppository composition which consists essentially of:

(A) from about 0.1 to about 20 percent, based upon the weight of the suppository composition, of anhydrous sodium sulfate as stabilizer,

(B) an amount sufficient to achieve effervescence upon contact with vaginal body fluid of an effervescing agent which is a combination of:

(1) at least one acidic substance selected from the group consisting of phosphoric acid, citric acid, tartaric acid, fumaric acid, malic acid and water soluble acid alkali metal salts thereof, and

(2) at least one basic substance selected from the group consisting of sodium bicarbonate and potassium bicarbonate,

the ratio of (1):(2) being sufficient to achieve effervescence of the composition upon contact with vaginal body fluid,

(C) a base for vaginal suppository, and

(D) an effective amount of a member selected from the group consisting of a spermatocide, an antibacterial agent, and antiinflammatory agent and an antifungal agent.

4,853,212

REDUCED BASE CONTENT CHEWING GUM COMPOSITIONS HAVING ANESTHETIC PROPERTIES

Steven M. Faust, Stanhope, and Subraman R. Cherukuri, Towaco, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 13, 1987, Ser. No. 72,303
The portion of the term of this patent subsequent to Nov. 8, 1988, has been disclaimed.
Int. Cl.[4] A61K *9/68;* A23G *3/30*
U.S. Cl. 424—48 9 Claims

1. A palatable low base-content chewing gum composition capable of providing an anesthetic effect to the throat and mouth through the release of an anesthetic producing active, said composition consisting essentially of in weight percent of the total composition:

(a) gum base in the amount of about 16% to about 20% wherein the gum base is selected from the group consisting of synthetic gums, natural gums, synthetic elastomers, natural elastomers and mixtures thereof;

(b) flavor in amount of about 0.5% to about 3%;

(c) sweetener in the amount of about 50% to about 80%; and

(d) an anesthetic-producing active present in an amount of from about 0.05% to about 0.5% which is sufficient to provide an anesthetic effect to the mouth and throat areas upon chewing of the composition.

4,853,213

USE OF PERIWINKLE IN ORAL HYGIENE

Neville Thame, Montclair, N.J., assignor to Peri-Oral Dental Products, Inc., Teaneck, N.J.

Continuation of Ser. No. 840,019, Mar. 17, 1986, abandoned. This application Mar. 16, 1988, Ser. No. 168,989
Int. Cl.[4] A61K *7/26, 7/16, 7/18*
U.S. Cl. 424—58 13 Claims

1. An oral hygiene method for reducing plaque and for the treatment of periodontal diseases of bacterial etiology, the method comprising reducing bacterial activity in the oral cavity by applying to the oral cavity a composition containing from about 0.3% to about 50% by weight of a dried methanol extract from the perennial herb periwinkle.

4,853,214

ANTIPERSPIRANT CREAMS CONTAINING VOLATILE SILICONES

Thomas V. Orr, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 8, 1987, Ser. No. 93,928
Int. Cl.[4] A61K *7/035*
U.S. Cl. 424—69 24 Claims

1. An antiperspirant cream composition, comprising:

(a) from about 5% to about 60% of a volatile silicone oil;

(b) from about 0.1% to about 60% of a non-volatile emollient having a viscosity of at least about 10 cs at 25° C.;

(c) from about 2% to about 10% of a particulate thickening material;

(d) from about 15% to about 45% of a particulate antiperspirant active material; and

(e) from about 0.25% to about 5% of a particulate hydrophilic polymer selected from the group consisting of cellulose ether polymers, polyamides, polypeptides, and mixtures thereof;

wherein said composition has a penetration force value of from about 150 g to about 800 g at 25° C. and 50% relative humidity.

4,853,215

TREATMENT OF HAIR

Barbara E. Brockway, Berkshire, England, assignor to University of Reading of Whiteknights House, Reading, England

Filed Nov. 4, 1987, Ser. No. 116,297
Claims priority, application United Kingdom, Nov. 4, 1986, 8626356
Int. Cl.[4] A61K *7/09;* A45D *7/02*
U.S. Cl. 424—71 9 Claims

1. A process for treating hair in which the hair is urged to undergo macroscopic reconfiguration while being contacted with a composition which is safe for topical application to a living human subject, wherein said composition comprises an aqueous medium containing protein disulphide isomerase E.C.5.3.4.1, under conditions such that the enzyme can catalyse rearrangement of disulphide linkages in the hair.

4,853,216

PROCESS AND COMPOSITION FOR THE TOPICAL APPLICATION OF ALPHA$_1$ ADRENERGIC AGONIST FOR PILOMOTOR EFFECTS

Randy J. Koslo, East Windsor, and Alison B. Lukacsko, Robbinsville, both of N.J., assignors to Bristol-Myers Company, New York, N.Y.

Filed Apr. 2, 1987, Ser. No. 33,987
Int. Cl.[4] D61K *7/15*
U.S. Cl. 424—73 25 Claims

16. A shaving composition having incorporated therein at least one alpha$_1$ adrenergic receptor agonist which exhibits essentially only alpha$_1$ adrenergic receptor agonist activity, said alpha$_1$ adrenergic receptor agonist being present in sufficient concentration to elicit a pilomotor response when applied to topically to hair-bearing skin.

4,853,217

METHODS AND COMPOSITIONS FOR CONTROLLING THE PEAR LEAF BLISTER MOTH, *LEUCOPTERA SCITELLA*

Wittko Francke, Reinbek, Fed. Rep. of Germany, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed May 4, 1987, Ser. No. 45,453
Claims priority, application Fed. Rep. of Germany, May 10, 1986, 3615854
Int. Cl.[4] A61K *31/74*
U.S. Cl. 424—84 7 Claims

1. A composition for controlling the pear leaf blister moth, Leucoptera scitella, which comprises: an effective amount of 5,9-dimethylheptadecane as an active agent for attracting the moths and a carrier or diluent for the active agent.

4,853,218

ZINC-PROTAMINE-ALPHA INTERFERON COMPLEX

Zachary Yim, Paramus; Michael A. Zapon, Basking Ridge, and Imtiaz A. Chaudry, Denville, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Feb. 24, 1987, Ser. No. 18,243
Int. Cl.[4] A61K *45/02*
U.S. Cl. 424—85.7 10 Claims

1. A sustained release pharmaceutical composition comprising a parenterally acceptable insoluble zinc-protamine-alpha interferon complex, wherein the alpha interferon is present at 2×10^6 to 200×10^6 International Units/ml complex.

10. A method of treating basal cell carcinoma comprising administering an amount of a composition of claim 1 effective to treat basal cell carcinoma to a mammal in need of such treatment.

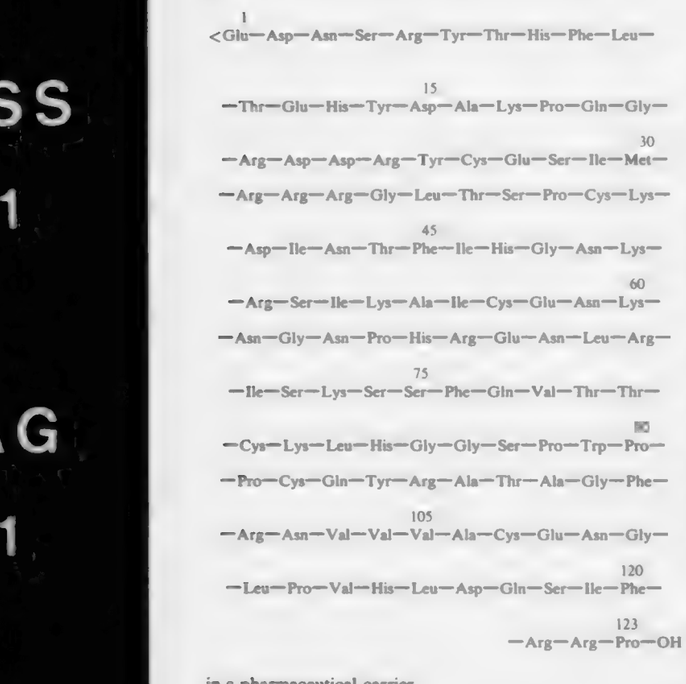
4,853,219

ANTIBODIES TO ANGIOGENIN: IMMUNOTHERAPEUTIC AGENTS

Edward M. Alderman, Dedham; James W. Fett, Waltham, and Bert L. Vallee, Brookline, all of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed Aug. 6, 1987, Ser. No. 83,231
Int. Cl.[4] A61K *39/395;* C07K *15/16*
U.S. Cl. 424—85.8 1 Claim

1. A pharmaceutical composition comprising a therapeutically effective amount of an antibody immunologically reactive to angiogenin having the amino acid sequence of



in a pharmaceutical carrier.

4,853,220

PROTEIN ISOLATED FROM BLOOD, PROCESS FOR PREPARING SAID PROTEIN, ANTIBODIES AGAINST SAID NEW PROTEIN, AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAID PROTEIN OR SAID ANTIBODIES

Inge D. Clemmensen, Farum, Denmark, and Cornelis Kluft, Sassenheim, Netherlands, assignors to Nederlandse Centrale Organisatie Voor Toegerastnatuurwete Nschappelijk Onderzoek, The Hague, Netherlands

Filed Jun. 10, 1986, Ser. No. 872,613
Claims priority, application Netherlands, Jun. 11, 1985, 8501681
Int. Cl.[4] A61K *37/02;* C07K *13/00, 15/06, 15/12*
U.S. Cl. 424—101 6 Claims

1. A substantially purified protein called Tetranectin showing at least the following properties:

a. it has an apparent molecular mass of about 68,000 as determined by gel chromatography on Ultrogel ACA 34, and of about 80,800 calculated from the amino acid composition,

b. in the presence of sodium dodecyl sulphate the protein dissociates into a protein sub-unit having an apparent molecular mass of about 17,000 by SDS-PAGE, or of about 20,200 calculated from the amino acid composition,

c. the N-terminal sequence of the protein is N-glu-pro-pro-thr-gln,

d. the protein binds specifically to kringle 4 of plasminogen,

e. the protein does not contain α-carboxyglutamic acid residues,

f. the protein does not contain sugar residues and is not a glycoprotein,

g. the protein binds bivalent cations,

h. the protein binds to heparin and, in the presence of calcium ions, to fibrin.

4,853,221

METHOD FOR TREATING NON-SMALL CELL LUNG CANCER, HEAD AND NECK CANCERS AND BREAST CANCER

Edward F. Elslager, and Wilbur R. Leopold, III, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 15,597, Feb. 17, 1987, abandoned, which is a continuation of Ser. No. 820,779, Jan. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 691,614, Jan. 15, 1985, abandoned, which is a continuation of Ser. No. 471,681, Dec. 20, 1982, abandoned, which is a division of Ser. No. 206,596, Nov. 13, 1980, Pat. No. 4,391,809, which is a continuation of Ser. No. 84,944, Oct. 15, 1979, abandoned. This application Oct. 23, 1987, Ser. No. 112,919
Int. Cl.[4] A61K *31/66, 31/44, 33/24, 31/70, 31/505, 31/52*
U.S. Cl. 424—649 16 Claims

1. A method of treating non-small cell lung cancer, head and neck cancers, or breast cancer in a mammal in need thereof comprising administering to said mammal an antineoplastically effective amount of 5-methyl-6-[[(3,4,5-trimethoxyphenyl-)amino]-methyl]-2,4-quinazolinediamine or a pharmaceutically acceptable salt thereof alone or in combination with an antineoplastically effective amount of a compound selected from the group consisting of

(a) (8S,10S)-10-[(3-amino-2,3,6-trideoxy-α-L-lyxo-hexopyranosyl)oxy]-8-glycoloyl-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-5,12-naphthacenedione or a pharmaceutically acceptable salt thereof;

(b) 5-fluoro-2,4(1H,3H)-pyrimidinedione or a pharmaceutically acceptable salt thereof;

(c) 2-amino-1,7-dihydro-6H-purine-6-thione or a pharmaceutically acceptable salt thereof;

(d) 22-oxo-vincaleukoblastine or a pharmaceutically acceptable salt thereof;

(e) 2-bis[(2-chloroethyl)amino]tetrahydro-2H-1,3,2- oxazaphosphorine, 2-oxide, or a pharmaceutically acceptable salt thereof;

(f) N-[4-[[(2,4-diamino-6-pteridinyl)methyl]methylamino]benzoyl]-L-glutamic acid, or a pharmaceutically acceptable salt thereof; or

(g) cis-diamminedichloroplatinum (II).

4,853,222

OINTMENT FOR CONCEALING SKIN BLEMISHES AND SCARS

Nadia Avalle, Lausanne, Switzerland, assignor to Intercos Italiana S.p.A., Italy

Filed Jul. 22, 1987, Ser. No. 76,351
Claims priority, application Italy, Aug. 1, 1986, 21385 A/86
Int. Cl.[4] A61K *7/035, 9/06*
U.S. Cl. 424—195.1 10 Claims

1. An ointment for providing a film on the skin for concealing skin blemishes and scars comprising a greasy-waxy vehicle, a powder and additives, which contains from 0.1 to 4% of a synthetic wax or a hydrogenated castor oil and from 1 to 8% of octyl dodecanol.

4,853,223

CONTROL OF ECTOPARASITES

Jean-Francois Graf, Binningen, Switzerland; Hans W. Hässlin, Grenzach-Wyhlen, Fed. Rep. of Germany; Hessel J. Schuurman, Pfeffingen; Theodor Steiner, Riehen, both of Switzerland, and Bruno Wieland, Oakville, Canada, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 108,346, Oct. 14, 1987, abandoned. This application Sep. 22, 1988, Ser. No. 247,972
Claims priority, application Switzerland, Oct. 23, 1986, 4221/86
Int. Cl.[4] A01N *25/00*
U.S. Cl. 424—405 13 Claims

1. A method of controlling ectoparasites in domestic animals, in which method the domestic animals are passes through a dip charged with a dip liquid that contains an ectoparasiticide, and in which method used treatment liquid is utilized for the treatment of further domestic animals, characterized in that a dip in which there is an aqueous dispersion of a microencapsulated ectoparasiticide is utilized.

4,853,224

BIODEGRADABLE OCULAR IMPLANTS

Vernon G. Wong, Sunnyvale, Calif., assignor to Visionex, Sunnyvale, Calif.

Filed Dec. 22, 1987, Ser. No. 136,402
Int. Cl.[4] A61F *2/00*
U.S. Cl. 424—427 12 Claims

1. A method for treating an eye condition which comprises: implanting at least one of the anterior or posterior chamber of an eye at least one microencapsulated drug as particles of not greater than about 300 micrometers, said particles comprising said drug and a pharmacologically acceptable biodegradable polymer which is degraded in the eye.

4,853,225

PROCESS FOR IMPLANTING A MEDICAMENT DEPOT

Helmut Wahlig, Darmstadt; Elvira Dingeldein, Dreieich; Johannes Rothe, Rossdorf, and Wolfgang Stille, Frankfurt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Dec. 5, 1986, Ser. No. 938,200
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1985, 3542972
Int. Cl.[4] A61F *2/00*
U.S. Cl. 424—423 13 Claims

1. A method of combating an infection in a patient in whom the infection already exits, comprising implanting in the patient an implantable medicament depot consisting essentially of a physiologically acceptable excipient which achieves delayed release of an active agent and an infection-treating effective amount of at least one chemotherapeutic gyrase inhibitor as the active agent for delayed release.

4,853,226

SUSTAINED-RELEASE PARTICULATE PREPARATION AND PROCESS FOR PREPARING THE SAME

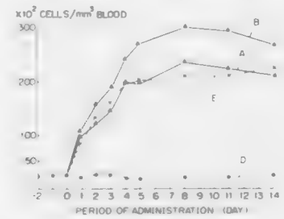
Minoru Machida, Tokyo, and Masayuki Arakawa, Shizuoka, both of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1987, Ser. No. 105,887
Claims priority, application Japan, Oct. 7, 1986, 61-237027
Int. Cl.[4] A61F *2/00;* A61K *9/50*
U.S. Cl. 424—426 5 Claims

1. A sustained release particulate preparation consisting essentially of particles having a diameter not greater than 150 micrometers, prepared by a method which comprises the steps of:

(a) combining an organic solution of a polymeric compound which is capable of being degraded in the living body and is compatible with living tissue, and an organic or organic-/aqueous solution of a pharmacologically active agent, which pharmacologically active agent solution is capable of forming a solution, suspension or emulsion with said polymer solution and of forming a suspension in an aqueous solution;

(b) combining the solution, suspension or emulsion of (a) with an aqueous solution of a natural high molecular weight compound selected from the group consisting of



chitins and derivatives thereof, chitosans and derivatives thereof, hyaluronic acid and a salt thereof, soluble dextrans having a molecular weight of from about 10,000 to about 150,000 pectins, dextrins, having a molecular weight of from about 2,500 to about 150,000, and chondroitin sulfate and a salt thereof; and

(c) recovering said particles therefrom.

4,853,227

TRANSDERMAL ADMINISTRATION OF A SYSTEMIC ACTIVE AGENT TO A PREMATURE NEONATAL INFANT

Tamie Kurihara-Bergstrom, New City; William R. Good, Suffern, both of N.Y., and Charles D. Ebert, Salt Lake City, Utah, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 23, 1987, Ser. No. 112,917
Int. Cl.[4] A61K *9/24*
U.S. Cl. 424—443 9 Claims

1. A method of treating a premature neonatal infant of a gestational age between about 24 and about 36 weeks with a pharmaceutically acceptable, systemically active, substantially skin compatible, water-soluble neonatal therapeutic agent having molecular weight below about 5000, and which agent is substantially non-transmissable through normal mature full term infant intact human skin, comprising:

(a) applying to the intact neonatal skin of said infant of gestational age between about 24 and about 36 weeks a transdermal device comprising (i) a backing member, (ii) a substantially shape retaining hydrogel reservoir having a water content of between about 5 percent and about 95 percent preferably between 10 percent and 80 percent by weight of said reservoir and containing an effective amount of said agent which is substantially non-transmissable through normal mature intact human skin, (iii) a skin contacting surface of predetermined area, and (iv) means for maintaining said reservoir in material transmitting relationship to said skin;

(b) maintaining said skin contacting surface of said device in material transmitting relationship to said intact neonatal skin of the infant for a extend period of time; and

(c) delivering said agent through the intact neonatal skin in a controlled continuous manner such that the blood plasma level of said agent is substantially within the therapeutic index of said agent is substantially within the therapeutic index of said agent for a majority of said extended period of time.

4,853,228

METHOD OF MANUFACTURING UNILAMELLAR LIPID VESICLES

Donald F. H. Wallach, Brookline, Mass., and Jean Philippot, St Clement la Riviere, France, assignors to Micro-Pak, Inc., Wilmington, Del.

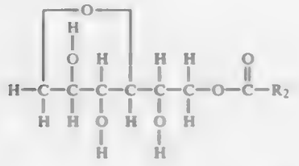
Filed Jul. 28, 1987, Ser. No. 78,834
Int. Cl.[4] A61K *9/52, 9/66*
U.S. Cl. 424—450 23 Claims

1. A large unilamellar vesicle comprising a surfactant selected from a group consisting of polyoxyethylene alkyl ethers having the structure

$$R_1—O—(CH_2—CH_2—O—)_m—H$$

wherein R_1 is $CH_3—(CH_2)_n$, n ranges from 11 to 15, and m ranges from 2 to 4

and sorbitan alkyl esters having the structure



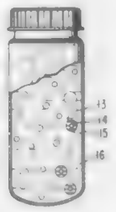
wherein R_2 is $CH_3—(CH_2)_x$ and x ranges from 11 to 15 and a sterol, whereby said surfactant comprises substantially all the lipid in the structure of said large unilamellar lipid vesicle.

4,853,229

METHOD FOR ADMINSTERING TINY PILLS

Felix Theeuwes, Los Altos, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Filed Oct. 26, 1987, Ser. No. 112,189
Int. Cl.[4] A61K *9/52, 9/66*
U.S. Cl. 424—455 10 Claims



1. A method for delivering a beneficial drug to the gastrointestinal environment of an animal, which method comprises:

(A) admitting into the gastrointestinal environment of an animal a pharmaceutically acceptable liquid carrier comprising:

(1) a plurality of tiny pills comprising:

(a) a beneficial drug; and

(b) wall means for controlling the release of the beneficial drug from the tiny pills, which wall means surrounds the beneficial drug; and,

(2) means in the pharmaceutically acceptable liquid for delaying the release of the beneficial drug from the tiny pills;

(B) contacting the pharmaceutically acceptable liquid by the gastrointestinal environment thereby substantially decreasing the ability of the means in the pharmaceutically acceptable liquid for delaying the release of drug from the tiny pills; and

(C) delivering the drug by the tiny pills releasing the drug at a controlled rate to the gastrointestinal environment over a prolonged period of time.

4,853,230

PHARMACEUTICAL FORMULATIONS OF ACID LABILE SUBSTANCES FOR ORAL USE

Kurt I. Lovgren, Mölnlycke; Ake G. Pilbrant, Kungsbacka, both of Sweden; Mitsuru Yasumura; Satoshi Morigaki, both of Hyogo; Minoru Oda, Ohita, and Naohiro Ohishi, Fukuoka, all of Japan, assignors to Aktiebolaget Hassle, Molndal, Sweden

Filed Apr. 20, 1987, Ser. No. 40,490
Claims priority, application United Kingdom, Apr. 30, 1986, [illegible]
The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.
Int. Cl.[4] A61K *9/46*
U.S. Cl. 424—466 15 Claims

1. A pharmaceutical preparation comprising:

(a) an alkaline reacting core comprising an acid-labile pharmaceutically active substance and an alkaline reacting compound different from said active substance, an alkaline salt of an acid labile pharmaceutically active substance, or an alkaline salt of an acid labile pharmaceutically active substance and an alkaline reacting compound different from said active substance;

(b) an inert subcoating which rapidly dissolves or disintegrates in water disposed on said core region, said subcoating comprising one or more layers comprising materials selected from the group consisting of tablet excipients, film-forming compounds and alkaline compounds; and

(c) an enteric coating layer surrounding said subcoating layer, wherein the subcoating layer isolates the alkaline reacting core from the enteric coating layer such that the stability of the preparation is enhanced.

4,853,231

METHOD FOR PREPARATION OF TASTABLE MATTERS CONSISTING PRIMARILY OF LOW MOLECULAR WEIGHT PEPTIDES

Kazuharu Osajima, 1037-8, Minomicho, Fukuyama 720, and Katsuhiro Osajima, 222-4, Oaza-Yashiro, Yahatahama 796, both of Japan

Filed Apr. 29, 1987, Ser. No. 43,922
Claims priority, application Japan, Apr. 29, 1986, 61-098903
Int. Cl.[4] C12P *21/06;* A23J *1/02, 1/04;* A23L *1/31*
U.S. Cl. 426—7 21 Claims

1. A method for preparation of tastable matters consisting primarily of low molecular weight peptides, which comprises:

a first step of finely pulverizing a raw meat selected from the group consisting of fish, shellfish, bird and beast by mechanical means;

a second step of decomposing the pulverized meat with autolyzing enzymes of said pulverized meat under the following conditions defined by a procedure comprising:

(a) placing the meat in a decomposing chamber,

(b) adding water in an amount of from 50 to 200% of the meat,

(c) stirring the resulting meat solution at a rotational speed of from 50 to 100 rpm.

(d) adjusting the pH value of the resulting meat solution within a range of approximately 3 to 6.5, and

(e) controlling the temperature of the meat solution within a range of approximately 20° to 60° C.; and, thereafter, a third step of adding to the decomposed product of said second step additional protein-decomposing enzymes at a subsequent time defined by one of:

(a) in case the meat is classified as fish or shellfish within, 30 to 120 minutes after completion of said procedure in said second step, or

(b) in case the meat is classified as bird or beast within 40 to 180 minutes after completion of said procedure in said second step;

so that protein-decomposing reactions by the added enzymes and the autolyzing enzymes proceeds simultaneously under said conditions,

a fourth step of deactivating both said enzymes followed by purifying and concentrating the resulting solution;

a fifth step of adding decomposed product as obtained in the previous second step and amino acids to the concentrated solution as obtained in the fourth step each in a proper amount so that the reaction of said concentrated solution is again initiated in order to bond low molecular weight peptides to the amino acids; and

a sixth step of deactivating said enzymes in the product of said fifth step.

4,853,232

NON-BITTER ENZYME MODIFIED CHEESE FLAVORING MATERIAL AND SPRAY DRIED PRODUCT

Anandaraman Subramaniam, Syracuse; Robert M. Ozogar, Mattydale, and Carlton K. Bergsbaken, Syracuse, all of N.Y., assignors to Borden, Inc., Columbus, Ohio

Filed Apr. 28, 1987, Ser. No. 43,317
Int. Cl.[4] A23C *9/12, 19/086*
U.S. Cl. 426—35 5 Claims

1. A non-bitter flavoring material that can be eaten as is or added to a foodstuff to impart a cheese flavor to the foodstuff, comprising

a proteolyzed mixture of a cheese having at least 60% by weight solids and a purified microbial coagulase having proteolytic activity,

said mixture having been thinned by proteolysis at a pH of less than 4.9 and at a temperature in the range of 80 degrees to 120 degrees Farenheit, and

said coagulase being inactivated after said proteolysis.

4,853,233

RUMINANT FEEDSTUFFS, THEIR PRODUCTION AND APPARATUS FOR USE THEREIN

William McAskie, Killeshandra, Ireland, assignor to Balfour Manufacturing Company, Dublin, Ireland

Division of Ser. No. 848,144, Apr. 4, 1986, which is a continuation-in-part of Ser. No. 721,865, Apr. 10, 1985. This application Jul. 18, 1988, Ser. No. 222,889
Claims priority, application United Kingdom, Apr. 10, 1984, 8409213; Aug. 1, 1984, 8419582; Australia, Oct. 14, 1985, [illegible]
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—74 12 Claims

1. A continuous process for the production of a ruminant feedstuff comprising the steps of

(1) continuously mixing (a) one or more edible, saturated or unsaturated fatty acids containing 14, 16 and/or 18 carbon atoms each and not more than minor amounts of fatty acids containing 12 and/or 20 carbon atoms each, the said fatty acid or fatty acids having an iodine value of less than about 60 and a melting point of at least 30° C., and being mixed with triglycerides of said fatty acids and unsaponifiable material in the proportions of 60% to 90% by weight of said acids, 40% to 10% by weight of said triglycerides and less than 3% by weight of unsaponifiables; (b) one or more edible basic oxides which form edible, water-insoluble salts with said fatty acids, the weight of the said oxides being from 20% to 80% in excess of the weight equivalent of the total fatty acids; and (c) water in a proportion of 10% to 30% by weight of said fatty acids and triglycerides; said mixing being substantially completed before substantial chemical reaction takes place;

(2) continuously spreading out said mixture obtained in step (1) at about 60° C. in a continuously moving layer and allowing said mixture to react exothermically to form water-insoluble salts of said fatty acids; and

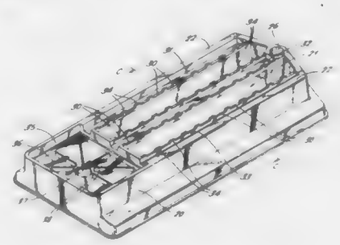
(3) continuously maintaining the reacting mixture of step (2) in a spread-out configuration in said continuously moving layer until said reacted mixture has cooled to below 70° C. and sufficient water has evaporated to give a friable product.

4,853,234

BEVERAGE PACKAGES

Andrew C. Bentley, Oxon; Christine A. King, Banbury; Alistair J. MacMahon, Brackley; Robert W. Tansley, Stratford-upon-Avon, and Alec T. Newman, Banbury, all of United Kingdom, assignors to General Foods Limited, Banbury, England

Filed Dec. 21, 1987, Ser. No. 136,176
Claims priority, application United Kingdom, Dec. 23, 1986, [illegible]
Int. Cl.[4] B65B *29/02*
U.S. Cl. 426—77 9 Claims



1. A sealed beverage package containing one or more beverage ingredients and being formed from substantially air-and water-impermeable materials comprising:

(a) a body portion;

(b) a compartment within said body portion for holding beverage ingredients;

(c) an inlet channel for water flowing through said compartment;

(d) slots in said compartment; said slots of a specific size to maintain the beverage ingredients in said compartment;

(e) an outlet channel formed along at least part of the periphery of said compartment wherein liquid or beverage flows through said slots of said compartment into said outlet channel during the preparation of a beverage from the package; and

(f) a collection chamber communicates with said outlet channel for collecting the liquid.

4,853,235

COLOR-CHANGING CEREALS AND CONFECTIONS

Hideo Tomomatsu, Crystal Lake, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Sep. 16, 1987, Ser. No. 97,040
Int. Cl.[4] A23L *1/18;* A23P *1/08*
U.S. Cl. 426—93 3 Claims

1. A ready-to-eat cereal capable of changing color instantly upon immersion in an aqueous medium such as milk, said ready-to-eat cereal comprising:

a. A solid colored cereal or confection base, in which the true color of the base will not undergo dispersion is said aqueous medium,

b. An edible opaque powder adhering to said base in a quantity sufficient to obscure the color of the base, and

c. A water soluble non-film forming edible adhesive liquid bonding said powder to said base, and in which the water soluble liquid is glycerine.

4,853,236
DUAL TEXTURED FOOD PIECE OF ENHANCED STABILITY

James E. Langler, White Bear Lake, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Mar. 18, 1988, Ser. No. 169,711
Int. Cl.[4] A23L *1/064, 1/035, 1/04*
U.S. Cl. 426—102 24 Claims

1. A composite food article having a dual texture of enhanced shelf stability, comprising:
a first solid portion comprising an intermediate moisture fruit composition in the form of an homogenous plastic mass having a water activity ranging from about 0.5 to 0.8 having a first, hard texture;
a second thixotropic fluid portion in physical contact with the first portion having a water activity ranging from about 0.5 to 0.8 having a second, soft texture, wherein the water activities differential between the first to second portion ranges from up to about 0.2, said second portion comprising an oil in water emulsion comprising
(a) about 50% to 92% by weight of the emulsion of a continuous water phase, said water phase comprising
(1) sufficient quantities of said water phase of water soluble solids to have a water activity ranging from about 0.4 to 0.8,
(b) a first oil-in-water forming emulsifier, and
(c) a discontinuous oil phase comprising about 8% to 50% by weight of the emulsion of an edible oil.

4,853,237
FITNESS DRINK POWDER

Helena M. Prinkkilä, and Esko J. Pajunen, both of Helsinki, Finland, assignors to Oy Sinebrychoff AB, Helsinki, Finland

Continuation of Ser. No. 947,369, Dec. 29, 1986, abandoned.
This application May 18, 1988, Ser. No. 196,782
Claims priority, application Finland, Oct. 16, 1986, 864178
Int. Cl.[4] A23L *2/00*
U.S. Cl. 426—590 6 Claims

1. A drink powder which when dissolved in water forms a drink for replenishing body fluids and salts lost by physical exertion and stress, which powder consists essentially of

maltodextrine	60–85% by weight
sodium chloride	0.5–5% by weight
sodium bicarbonate	10–20% by weight
magnesium chloride	0.2–3% by weight
malic acid	3–16% by weight

which powder, when dissolved in water, provides an aqueous solution having a pH value of 5.2 to 5.8, and when said solution is ingested does not cause dissolution of tooth enamel or erosion of the teeth, does not inhibit gastric emptying, and permits a high and prolonged increase in blood glucose and a low increase in blood insulin level.

4,853,238
METHOD OF TREATING LIQUID EGG AND EGG WHITE WITH MICROWAVE ENERGY TO INCREASE REFRIGERATED SHELF LIFE

Frank Huang, Worthington, Ohio, assignor to Worthington Foods, Inc., Worthington, Ohio

Filed Jul. 21, 1988, Ser. No. 222,658
Int. Cl.[4] A23B *5/00*
U.S. Cl. 426—241 8 Claims

1. A method of treating a liquid egg material selected from the group consisting of liquid egg white and liquid whole egg after having been removed from the egg shell, which comprises subjecting said liquid egg material to continuous microwave energy while said liquid egg material is flowing though a conduit for a time sufficient to inactivate or destroy a sufficient amount of micro-organisms contained in said liquid egg material without significantly reducing the egg protein functionality of said liquid egg material so as to permit extended shelf life of said liquid egg material, whereby said liquid egg material is capable of being heated to a temperature above approximately 162° F.

4,853,239
METHOD FOR PRODUCING A FISH SLURRY INTO EDIBLE PRODUCTS

Teisuke Suzuki, Whittier, and Hiroshi Matsuhara, Monterey Park, both of Calif., assignors to JAC Creative Foods, Inc., Los Angeles, Calif.

Continuation of Ser. No. 151,219, Feb. 1, 1988, abandoned. This application Sep. 6, 1988, Ser. No. 240,634
Int. Cl.[4] A22C *25/00, 25/22*
U.S. Cl. 426—249 12 Claims

1. A method of processing fish paste or slurry to produce a fish product, comprising the steps of
(a) forming the paste or slurry into a thin coherent sheet,
(b) traveling the sheet in a direction "x",
(c) progressively folding the traveling sheet to produce a spiral convolution sheet roll traveling endwise in direction "y" which extends at an angle α relative to direction "x", where α is between 30° and 60°,
(d) traveling a belt in said direction "y" and folding the traveling belt to result in a channel form U-shaped belt and to simultaneously exert side loading on opposite sides of the traveling roll to press together said spiral convolutions, and also employing a roller to penetrate into the belf now in channel form and also engage the top of the roll in the channel to press together said spiral convolutions, the roller being urged against the traveling roll to in turn urge the roll against the channel form U-shape belt, thereby causing the traveling belt to positively displace the roll endwise in direction "y" to create force resulting in progressive folding of the belt.

4,853,240
METHOD FOR DYEING EGGS USING A WATER SOLUBLE DYEING COMPOSITION IN A SHAPED CONTAINER

James E. McShane, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.

Filed Sep. 16, 1987, Ser. No. 97,038
Int. Cl.[4] A23L *1/27, 1/32*
U.S. Cl. 426—250 12 Claims

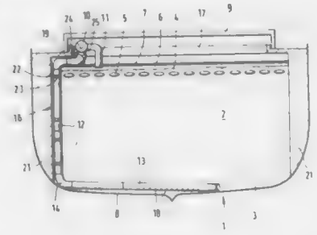
1. A method of coating an inside surface of a shaped inflexible container with a water-soluble dyeing composition comprising: (a) adding to said container an admixture comprising about 60–80 parts by weight of water, about 10–20 parts by weight of water-soluble dye carrier, about 4–15 parts by weight of water-soluble dye and about 0.5–7 parts by weight of water-soluble dye plasticizer; and (b) drying the so formed admixture to form a coating of water-soluble dyeing composition on an inside surface of said container so that the resulting dried admixture may be activated to dye an egg.

10. In a method of dyeing eggs wherein an egg is contacted with an aqueous dyeing medium for a time sufficient to dye the egg and the dyed egg is removed therefrom and allowed to dry, the improvement which comprises preparing the aqueous dyeing medium by admixing in a shaped inflexible container having a dried water-soluble dyeing composition coated on an inside surface, water and an acidifying agent in amounts sufficient to activate the water-soluble dyeing composition and to form an aqueous dyeing medium, wherein said water-soluble dye dyeing composition comprises a water-soluble dye carrier, water-soluble dye and a water-soluble dye plasticizer in the ratio of about 10–20 parts by weight of said carrier to about 4–15 parts by weight of water-soluble dye to about 0.5–7 parts by weight of said plasticizer.

4,853,241
PROCESS FOR TREATING AGRICULTURAL PRODUCTS WITH PESTICIDES ON SHIPS

Manfred Dörnemann, Frankfurt am Main, Fed. Rep. of Germany, assignor to Degesch GmbH, Fed. Rep. of Germany Division of Ser. No. 819,691, Jan. 10, 1986, Pat. No. 4,729,298.

This application Dec. 15, 1987, Ser. No. 133,338
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1985, 3503650
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—320 9 Claims



1. A process for disinfecting bulk foods or animal feeds in a cargo hold of a ship by an agent that releases gaseous phosphine pesticide, said process comprising the steps of:
(a) detachably mounting in the cargo hold a fumigation system including line sections extending from the vicinity of a loading hatch to the bottom of the cargo hold and provided with gas openings at least in the area of the bottom of the cargo hold;
(b) filling the cargo hold with the bulk material;
(c) connecting an end of the fumigation system which projects out of the bulk material to a fan;
(d) placing the agent on or below the surface of the bulk material whereby the air above the bulk material becomes enriched with the gaseous pesticide;
(e) operating the fan so the air above the bulk material which is enriched with the gaseous pesticide is circulated through the bulk material; and
(f) sealing the cargo hold so it is air tight.

4,853,242
PROCESS FOR PRODUCING A FISH FOOD

Klaus-Jürgen V. Poeppinghausen, Melle, Fed. Rep. of Germany, assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 17, 1988, Ser. No. 156,785
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1987, 3707032
Int. Cl.[4] A23P *1/00;* A23K *1/18*
U.S. Cl. 426—516 2 Claims

1. A process for the production of a fish food, said process comprising the steps of:
(a) mixing
(1) 15% to 35% by weight gluten,
(2) 15% to 35% by weight kaolin,
(3) 5% to 25% by weight alfalfa meal,
(4) 5% to 20% by weight casein,
(5) 5% to 20% by weight krill,
(6) 1% to 10% by weight soya oil,
(7) 2% to 8% by weight cement,
(8) 1% to 10% by weight milk protein,
(9) 1% to 10% by weight natural rubber,
(10) vitamins and trace elements,
(11) coloring and aroma materials,
(12) preservatives;
(b) extruding the mixture formed in Step (a) by means of a twin-screw conveyor at a speed of 200–250 rpm at a temperature of from 50° C. to 90° C. with the addition of 20 to 40 liters of water per hour and a throughput of 100–150 kg/hr;
to yield feed sticks with a length of from 10–25 mm and a diameter of 5–15 mm.

4,853,243
FREEZER STABLE WHIPPED ICE CREAM AND MILK SHAKE FOOD PRODUCTS

Marvin L. Kahn, Williamsville, and Robert J. Lynch, Buffalo, both of N.Y., assignors to Rich Products Corp., Buffalo, N.Y.

Continuation of Ser. No. 777,176, Sep. 18, 1985, abandoned, which is a continuation of Ser. No. 529,766, Sep. 6, 1983, Pat. No. 4,552,773, which is a continuation of Ser. No. 439,129, Nov. 12, 1982, Pat. No. 4,421,778. This application Dec. 1, 1987, Ser. No. 127,516
The portion of the term of this patent subsequent to Dec. 30, 2000, has been disclaimed.
Int. Cl.[4] A23G *9/02, 9/04*
U.S. Cl. 426—564 12 Claims

1. A whipped food product comprised of an oil-in-water emulsion of nonfat milk solids, and about 40% to about 70% water, and sugar in a ratio to water of about 1:1.75 to about 3.0, said sugar being comprised of at least about 30% fructose and/or dextrose; and fat, wherein at least about 50% of said fat is a solid beta phase-tending crystalline fat, and minor effective amounts of flavoring, emulsifier, and stabilizers comprised of microcrystalline cellulose and sodium carboxymethylcellulose, wherein the product is substantially noncrystalline and spoonable at about 0° F., and the volume of the product remains substantially constant during storage about 0° F. for at least about six months.

4,853,244
METHOD OF PREPARING A GELLED OMELETTE MIX AND THE PRODUCT PRODUCED THEREBY

Kenneth Clare, Vista, Calif.; James H. McMullen, Hersham, United Kingdom; Medeana Findlay, Lewes, United Kingdom, and Susan E. Gaisford, Bletchingley, United Kingdom, assignors to Kelco International Limited, London, United Kingdom

Filed Jun. 11, 1987, Ser. No. 61,852
Claims priority, application United Kingdom, Jun. 17, 1986, 8614664
Int. Cl.[4] A23L *1/32*
U.S. Cl. 426—573 14 Claims

1. A method of preparing gelled omelette mix from a liquid egg product, comprising adjusting the pH of a liquid egg product to be in the range 6.3 to 7.1, mixing it with 0.1 to 1.0% alginate, throughly mixing the ingredients with further addition of an aqueous slurry of 0.01 to 0.5% of a calcium salt in order to form a homogenous material and facilitate any required cross-linking of the alginate molecular chains to form a gel, forming this material into any desired shape and freezing or chilling it to produce a stable intermediate material that can readily be quickly heated to give an omelette in a form ready for consumption.

4,853,245
RECONSTRUCTED FRUIT PIECES AND, PROCESS FOR PREPARATION

Thierry Bouillette, Orange; Denis Olivier, Les Taillades, and Bernard Guigou, Apt, all of France, assignors to Etude Recherche Et Developpement - E.R.D. Sarl, Orange, France

Filed Dec. 11, 1987, Ser. No. 131,686
Claims priority, application France, Dec. 11, 1986, 86 17463
Int. Cl.[4] A23L *1/064*
U.S. Cl. 426—575 9 Claims

1. In a food product in form of pieces or lumps of fruit containing a fruit concentrate and a gelling substance, the improvement wherein the weight composition thereof is:
approximately 1–30% fruit alcohol or denaturated natural alcohol,
approximately 15–50% fruit concentrate,

approximately 5–30% sugar, and approximately 0.5–3% alginate.

4,853,246

SWEETENED HIGH PROTEIN MILK PRODUCT AND PROCESS FOR PRODUCING SAME

Robert F. Stevens, Smyrna, Ga., assignor to Tetra Pak Inc., Shelton, Conn.

Continuation of Ser. No. 127,226, Dec. 1, 1987. This application Oct. 12, 1988, Ser. No. 256,411

Int. Cl.[4] A23C *3/02, 9/12;* A23G *1/00*

U.S. Cl. 426—580 13 Claims

1. A sweetened high protein, low fat, reduced lactose milk product comprising between about 10% and 35% total milk solids, less than about 2% milk fat, and less than about 1% lactose, by weight, said product having been produced by increasing the total milk solids in the initial low fat milk, followed by ultraheat treating of the milk solids mixture and addition of lactase to the ultraheat treated milk solids mixture.

4,853,247

TASTE AND ODOR MASKED EDIBLE OIL COMPOSITIONS

Shirley Ann Barcelon; Alfred Oppenheimer, both of Randolph, and Mamoun M. Hussein, Mountain Lakes, all of N.J., assignors to Warner-Lambert Co., Morris Plains, N.J.

Filed Jun. 16, 1987, Ser. No. 62,930

Int. Cl.[4] A23D *5/00*

U.S. Cl. 426—613 16 Claims

1. A sensory masked edible oil composition which comprises:

An unpleasant edible oil, and an oil soluble sensory masking agent capable of producing a masking sensation for the unpleasant edible oil, wherein the sensory masking agent is present in an amount sufficient to sensory mask the unpleasant edible oil and the taste masking agent must be extractable into the aqueous medium of the oral cavity and the odor masking agent must have a boiling point between about 150° C. and about 250° C. resulting in a pleasant edible oil.

4,853,248

FOOD PRODUCT OF LEGUMINOUS SEEDS AND PROCESS FOR MAKING IT

Pierre Würsch, La Tour-de-Peilz, Switzerland; Francois Musso, Pontarlier, and Eric Goulois, Beauvais, both of France, assignors to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 795,980, Nov. 7, 1985, abandoned. This application Nov. 13, 1987, Ser. No. 122,550

Claims priority, application Switzerland, Nov. 28, 1984, 5668/84

Int. Cl.[4] A23L *1/36*

U.S. Cl. 426—634 24 Claims

3. A process for producing a dehydrated puree having a digestion index of less than 30 from starch-containing seeds of leguminous plants comprising:

rehydrating dry starch-containing seeds of leguminous plants by soaking the seeds while avoiding gelatinization of the starch;

cooking the rehydrated seeds in saturated steam at atmospheric pressure for gelatinizing the starch;

passing the cooked seeds through openings in a plate at a speed of from 2 cm/s to 20 cm/s for reducing the cooked seeds to a puree, the openings having dimensions of which the smallest dimension is between a smallest means dimension of the rehydrated seeds and a largest mean dimension of the rehydrated seeds;

distributing the puree as a film on a heated drum surface, drying the puree on the drum surface and then removing dried puree from the drum surface; and

reducing the dried puree to flakes.

4,853,249

METHOD OF PREPARING SUSTAINED-RELEASE PHARMACEUTICAL/PREPARATION

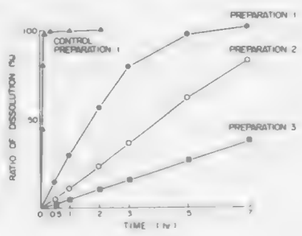
Yasuji Takashima, Ageo; Ikuo Koyama, Hasuda; Tooru Maki, Ageo, and Katsu Nakamori, Tokyo, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

Filed Nov. 10, 1986, Ser. No. 928,370

Claims priority, application Japan, Nov. 15, 1985, 60-257302

Int. Cl.[4] A61K *9/22*

U.S. Cl. 427—3 16 Claims



1. A method of preparing a sustained-release pharmaceutical preparation, said method comprising:

providing solid particles containing a drug;

tumbling said drug-containing solid particles;

applying to the surfaces of the tumbling drug-containing particles a solution of 1–30 parts by weight of a binder in water or an alcohol to wet the surfaces of the tumbling drug-containing particles;

simultaneously with application of said binder, separately applying 100 parts by weight of a fine powder of a hydrophobic solid material, which does not easily dissolve within the stomach and intestines, to the wetted surfaces of said drug-containing particles to thereby coat said solid particles with said binder and said hydrophobic solid material; and

heating the coated particles to a temperature ranging from the melting point of said hydrophobic solid material to 30° C. above said melting point.

4,853,250

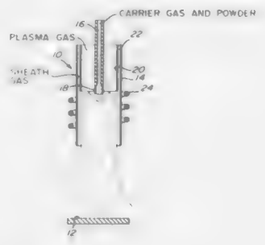
PROCESS OF DEPOSITING PARTICULATE MATERIAL ON A SUBSTRATE

Maher Boulos, and Jerzy Jurewicz, both of Sherbrooke, Canada, assignors to Universite de Sherbrooke, Sherbrooke, Canada

Filed May 11, 1988, Ser. No. 192,702

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—34 5 Claims



1. A process for heating and depositing a particulate material on a substrate, said process comprising the steps of:

flowing ionizable plasma gas at a certain velocity in a plasma container along a longitudinal axis thereof;

inductively coupling energy to said plasma gas to create in said plasma container a body of plasma directed toward said substrate;

accelerating particulate material to be deposited on said substrate to a velocity higher than the velocity of said plasma gas flowing in said plasma container; and

feeding said particulate material in said plasma container along a longitudinal axis thereof, wherein said particulate material is heated while passing in said body of plasma at a velocity higher than the velocity of said plasma gas and is deposited on said substrate.

4,853,251

PROCESS FOR FORMING DEPOSITED FILM INCLUDING CARBON AS A CONSTITUENT ELEMENT

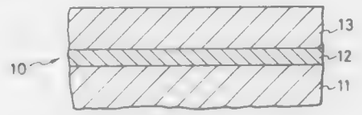
Shunichi Ishihara, Ebina; Shigeru Ohno, Yokohama; Masahiro Kanai; Shunri Oda, both of Tokyo, and Isamu Shimizu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 20, 1986, Ser. No. 831,411

Claims priority, application Japan, Feb. 22, 1985, 60-034772; Feb. 25, 1985, 60-035602; Feb. 26, 1985, 60-036762; Feb. 27, 1985, 60-038573; Feb. 28, 1985, 60-037413; Mar. 1, 1985, 60-039900

Int. Cl.[4] B05D *3/06;* C23C *16/30*

U.S. Cl. 427—38 3 Claims



1. A process for forming a deposited film including carbon as a constitutent element of said film, comprising:

separately introducing into a film forming space housing a substrate therein a gaseous or gasified active species (A) formed in an activation chamber (a) by decomposition of a chain or cyclic hydrocarbon of which hydrogen atoms are partially or wholly substituted with halogen atoms and a gaseous or gasified active species (B) formed in an activation chamber (b) which is different from said activation chamber (a) from a chemical substances for film formation which is reactive with said active species (A) and is selected from the group consisting of hydrogen gas, halogen gas and a mixture thereof;

providing both active species (A) and (B) with discharge energy in said film forming space sufficient to promote a chemical reaction therebetween; and

allowing both active species (A) and (B) to react with each other thereby forming the deposited film on the substrate.

4,853,252

METHOD AND COATING MATERIAL FOR APPLYING ELECTRICALLY CONDUCTIVE PRINTED PATTERNS TO INSULATING SUBSTRATES

Juergen Fränkel, Baldham, Fed. Rep. of Germany; Antoon Mattelin, Oostkamp; Pol Pecceu, Brugge, both of Belgium; Ferdinand Quella, Neubiberg; Hans-Fr. Schmidt, Eurasburg, both of Fed. Rep. of Germany; Luc Boone, Oostkamp, Belgium; Sybille Von Tomkewitsch, Poecking, Fed. Rep. of Germany, and Marc De Vogelaere, Zedelgem, Belgium, assignors to Siemens Aktiengesellschaft, Berlin and Munich and Michael Huber GmbH, Heimstetten, both of, Fed. Rep. of Germany

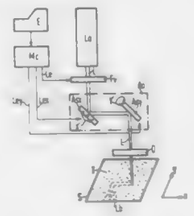
Filed Dec. 3, 1987, Ser. No. 128,186

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1986, 3643130

Int. Cl.[4] B05D *3/06, 5/12;* C25D *5/02*

U.S. Cl. 427—53.1 49 Claims

1. A method for applying electrically conductive printed patterns to insulating substrates wherein a metal-containing coating agent is transferred onto a substrate under the influence of energy radiation in a printed pattern to be produced and is chemically metallized, the coating agent includes a non-metallic grainy carrier substance having metal of the oxidation degree 0 applied thereto.



30. The method of claim 1 wherein the coating agent is anchored to the substrate by use of an energy beam deflectable in accord with a printed pattern to be generated.

31. The method of claim 30 wherein a laser beam is employed as an energy beam.

4,853,253

METHOD OF ACTIVATING SURFACE OF SHAPED BODY FORMED OF SYNTHETIC ORGANIC POLYMER

Koichiroh Katoh, Abiko, Japan, assignor to Director General of Agency of Industrial Science and Technology, Japan

Filed Mar. 4, 1988, Ser. No. 163,894

Claims priority, application Japan, Mar. 30, 1987, 62-76764

Int. Cl.[4] B05D *3/06, 3/10*

U.S. Cl. 427—54.1 12 Claims

1. A method of treating a surface of a shaped body formed of a synthetic organic polymer comprising the steps of:

heating the surface to a first temperature of 30° C. or more; and then

contacting said surface with a UV ray-absorbing organic liquid at a second temperature and for a period of time sufficient to swell said surface, said second temperature being 10°–80° C. lower than said first temperature; and

irradiating UV rays having wave lengths in the range of 1800–2100 Å on said swollen surface thereby increasing the surface energy of said surface of the shaped body.

4,853,254

PROCESS FOR BINDING PIGMENT PARTICLES TO PHOSPHOR PARTICLES

Robert W. Wolfe, Towanda, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jan. 11, 1988, Ser. No. 141,739

Int. Cl.[4] B05D *5/06*

U.S. Cl. 427—64 1 Claim

1. A process for binding pigment particles to phosphor particles, said process consisting essentially of

(a) forming an aqueous slurry consisting essentially of said phosphor particles, said pigment particles, and a binding agent selected from the group consisting of latex polymers and latex copolymers, said binding agent having a glass transition temperature of greater than about 20° C. and a minimum film formation temperature, and agitating said slurry;

(b) separating the solids from the resulting liquor; and

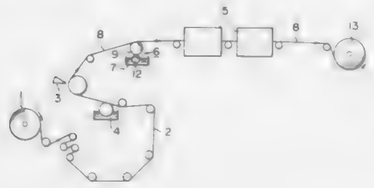
(c) drying said solids at a temperature above the Minimum Film Formation Temperature of said latex to produce the phosphor particles wherein said pigment particles are bonded to said phosphor particles.

4,853,255

PROCESS FOR CONTROLLING CURL IN COATED PAPERS

Takami Onishi, and Satoshi Dotsui, both of Amagasaki, Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 935,005, Nov. 26, 1986, abandoned. This application Mar. 11, 1988, Ser. No. 166,994
Claims priority, application Japan, Nov. 30, 1985, 60-270407
Int. Cl.[4] B41M *3/12*; B05D *1/00*
U.S. Cl. 427—148 16 Claims



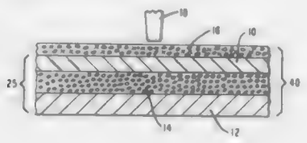
1. A process for controlling curl in coated paper without the formation of translucent specks or cockle which comprises applying a coating composition to one surface of a web of base paper and wetting the other surface of said web of paper with water by means of an applicator roll of a kiss roll coater from the group consisting of a one-roll kiss coater, a two-roll kiss coater and a three-roll kiss coater wherein the relative difference of the surface speed of said applicator roll from the running speed of said paper web is at least 1000 m/min.

4,853,256

TWO PLY THERMAL PAPER AND METHOD OF MAKING

Thomas J. Obringer, Vandalia; Louis F. Siegel, and Maurice W. Lewis, both of Dayton, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Division of Ser. No. 896,495, Aug. 14, 1986, abandoned. This application Mar. 11, 1988, Ser. No. 170,567
Int. Cl.[4] B41M *5/18*
U.S. Cl. 427—152 6 Claims



1. A method of forming a two ply thermal paper comprising the steps of:
providing a base sheet of bond paper;
coating the base sheet with a thermoreactive layer essentially consisting of a thermochromic color forming dye of about 8 to 12%, a temperature modifying, saturated fatty alcohol of about 10 to 15%, a bisphenol of about 20 to 35%, a fluorescent brightener of about 1 to 2%, a filler of about 25 to 35%, and a binder of polyvinyl alcohol applied on one surface of the base sheet,
laminating a top sheet of tissue-type paper to the base sheet within a fraction of a second of time while the thermoreactive layer is in a wet condition for adhering the two sheets,
drying the laminated sheets,
coating the top sheet with a thermoreactive layer essentially consisting of a thermochromic color forming dye of about 5 to 7%, a synthetic wax of about 10 to 15%, a bisphenol of about 18 to 25%, an amide wax of about 4 to 6%, a white pigment of about 1 to 4%, an anti-stick agent of about 1 to 3%, a filler of about 28 to 40%, and a binder of polyvinyl alcohol applied on one surface of the top sheet, and
drying the coating on the top sheet.

4,853,257

CHEMICAL VAPOR DEPOSITION OF TIN OXIDE ON FLOAT GLASS IN THE TIN BATH

Vern A. Henery, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 30, 1987, Ser. No. 103,090
Int. Cl.[4] B05D *5/06*; C23C *16/40*
U.S. Cl. 427—166 14 Claims



1. A method for depositing a low emissivity metal oxide coating comprising the steps of:
a. supporting a glass substrate on a molten metal bath;
b. maintaining a nonoxidizing atmosphere over the molten metal bath and glass substrate;
c. contacting said glass substrate on the surface which is not supported on said molten metal bath with a vapor mixture comprising a metal-containing coating reactant in vapor form and oxygen; and
d. thermally reacting said coating reactant vapor in the presence of said oxygen to deposit a metal oxide film on said glass surface while maintaining temperature uniformity of said glass substrate by contact with said molten metal bath in said nonoxidizing atmosphere.

4,853,258

METHOD FOR THE IMPERVIOUS METALLIC COATING OF AN OPTIC FIBER AND DEVICE

Jean Gombert, Verrieres le Buisson; Christian Quinty, Gif sur Yvette; Maryse Gazard, Puteaux, and Serge Blaison, Villebon, all of France, assignors to Thomson-CSF, Paris, France

Filed Aug. 30, 1987, Ser. No. 68,189
Claims priority, application France, Jun. 30, 1986, 86 09442
Int. Cl.[4] B05D *5/06*; B05C *3/02*; C23C *14/00*
U.S. Cl. 427—169 21 Claims



1. A method for the impervious metallic coating of an optical fiber, said method comprising the steps of:
(a) passing the optic fiber downwardly through a fiber guide;
(b) providing molten metal above the fiber guide and around the optic fiber; and
(c) creating a pressure differential such that the pressure above the molten metal is less than the pressure around the optic fiber beneath the fiber guide.

7. A device for the impervious metallic coating of an optic fiber, said device comprising:
(a) a pot which, in use, contains a molten metal;
(b) a hole for the passage of an optic fiber in the upper part of said pot;
(c) a fiber guide in the bottom part of said pot in alignment with said hole; and
(d) first means for creating a pressure differential in said pot such that, in use, the pressure in said pot above the molten metal is less than the pressure around the optic fiber beneath said fiber guide,
wherein:
(e) said pot is located in a chamber and
(f) said first means creates a pressure differential between the inside of said pot and the inside of said chamber outside said pot.

4,853,259

PROCESS FOR MANUFACTURING PARTICULATE BUILT NONIONIC SYNTHETIC ORGANIC DETERGENT COMPOSITION COMPRISING POLYACETAL CARBOXYLATE AND CARBONATE AND BICARBONATE BUILDERS

Rind A. Taha, Spotswood, N.J., assignor to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 616,461, Jun. 1, 1984, Pat. No. 4,720,399. This application Jan. 11, 1988, Ser. No. 142,384
Int. Cl.[4] B05D *7/00*; C11D *17/00*
U.S. Cl. 427—221 6 Claims

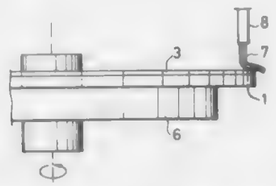
1. A process for manufacturing a particulate built nonionic synthetic organic detergent composition comprising a detersive proportion of nonionic synthetic organic detergent, and a building proportion, in combination, of polyacetal carboxylate, alkali metal carbonate and alkali metal bicarbonate builders for the nonionic detergent, which process comprises spray drying an aqueous crutcher mix of alkali metal carbonate and alkali metal bicarbonate, mixing the spray dried beads resulting with the nonionic detergent in liquid form at elevated temperature, whereby the detergent is absorbed into the spray dried carbonate-bicarbonate beads, and mixing such beads containing the nonionic detergent with the polyacetal carboxylate builder, whereby said builder is held to such beads and a free flowing particulate detergent composition results.

4,853,260

OPTICAL DISK AND PROCESS FOR PRODUCING THE SAME

Yukio Kimura; Toshikazu Yoshino, and Ryutaro Hayashi, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 22, 1988, Ser. No. 171,723
Claims priority, application Japan, Mar. 23, 1987, 62-68711; Mar. 23, 1987, 62-68712
Int. Cl.[4] B05D *3/12*
U.S. Cl. 427—240 7 Claims



1. A process for producing an optical disk laminate from first and second optical disks each having a transfer layer formed on a substrate, with at least one of said first and second optical disks further having a recording layer formed on its transfer layer, said method comprising the steps of:
removing the recording layer in a bonding area; and
bonding said two disks to one another via a spacer with the recording layer facing inside and with an adhesive agent being applied to the bonding area where the two disks face the spacer.
6. The process of claim 1, wherein the removing step is implemented using a solvent having a rapid drying characteristic.

4,853,261

PROCESS FOR THE PREPARATION OF COATINGS WITH HYDANTOIN STRUCTURES BY THE REACTION OF COMPOUNDS CONTAINING CARBODIIMIDE GROUPS WITH UNSATURATED CARBOXYLIC ACIDS

Willi Dünwald; Hans Schlegel, both of Leverkusen; Reinhard Halpaap, and Josef Pedain, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 13, 1988, Ser. No. 181,058
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1987, 3713670
Int. Cl.[4] C08G *18/08*
U.S. Cl. 427—388.1 2 Claims

1. Process for the production of coatings containing hydantoin rings which comprises reacting at temperatures of from 50° to 700° C. α,β-unsaturated dicarboxylic acids or derivatives thereof selected from the groups consisting of monoalkyl esters having from 1 to 4 carbon atoms in the alkyl moiety and N,N-disubstituted mono-amides substituted by alkyl having 1 to 4 carbon atoms, with blocked polyisocyanates containing carbodiimide and/or uretone imine groups characterized in that the reaction is carried out on the substrate to be coated.

4,853,262

COVER FILM FOR MICROSCOPY

Ikutaro Horie; Masashi Ishiyama, and Teiichi Tomizuka, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 11, 1986, Ser. No. 895,665
Claims priority, application Japan, Aug. 13, 1985, 60-178327
Int. Cl.[4] G01N *1/28*; G02B *21/34*; C09J *7/02*
U.S. Cl. 428—13 10 Claims

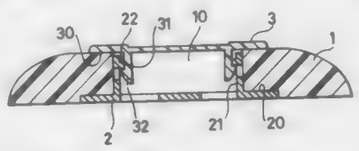
1. A cover film for use in microscopy, which comprises a transparent plastic substrate having provided thereon a layer of a polymer adhesive which is a blend of a first polymer adhesive and second polymer adhesive which are different and which are both selected from the group consisting of an acrylic adhesive and an acrylic copolymer of alkyl methacrylate and alkyl acrylate, said first polymer adhesive having a glass transition temperature of at least 80° C. and said second polymer adhesive having a glass transition temperature of 50° C. to less than 80° C. with the weight ratio of the first adhesive to the second adhesive being 7:3 to 5:5 and said polymer adhesive being soluble in any one of xylene, toluene, ethyl acetate, methyl acetate, acetone, methyl ethyl ketone or mixtures thereof.

4,853,263

MOLDING WITH FITTING AND RETAINER MEANS

Takuji Nagata, and Yasuhisa Kuzuya, both of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

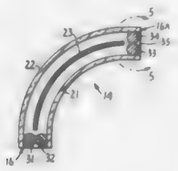
Filed Apr. 18, 1988, Ser. No. 182,464
Int. Cl.[4] B60R *13/04*
U.S. Cl. 428—31 5 Claims



1. A molding, comprising:
a main molding body made of soft resin and formed in an elongated plate-like shape, said main body molding having

a fitting hole passing therethrough in the direction of the thickness thereof;
a retainer means inserted into said fitting hole from a reverse side of the main molding body; and
a fitting part means made of hard resin and inserted into said fitting hole from an obverse side of said main molding body, said fitting part means being mechanically connected to said retainer means to thereby allow said fitting part means to be secured to said main molding body;
said fitting means having a first seating surface which abuts against the obverse side of said main molding body, said retainer means having a second seating surface which abuts against the reverse side of said main molding body, a width of a space defined between said first seating surface and said second seating surface being slightly smaller than a thickness of said main molding body.

4,853,264
CURVED TRIPLE-PANE GLAZING
Steve M. Vincent, Union City; Gerald R. Behling, Sunnyvale; Thomas G. Hood, San Francisco, and William E. Gomm, Stockton, all of Calif., assignors to Southwall Technologies, Palo Alto, Calif.
Filed Jan. 14, 1988, Ser. No. 143,728
Int. Cl.[4] E06B *3/24, 7/12;* **E04C** *2/54*
U.S. Cl. 428—34 **15 Claims**

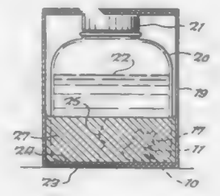


1. A curved insulated glazing structure comprising
a first rigid glazing panel having a perimeter defined by two opposite parallel curved edges and two opposite parallel straight edges,
an intermediate flexible plastic glazing panel at least about 5 mils in thickness, similar in size, shape and perimeter to, and spaced from and parallel to, the first rigid glazing panel, and
a second rigid glazing panel similar in size, shape and perimeter to, and spaced from and parallel to, the first rigid glazing panel and the intermediate flexible glazing panel, with
the first and second rigid panels being joined to one another in their spaced parallel relationship on substantially their entire perimeter with the flexible panel being joined into the structure only on its parallel curved edges and being substantially free from attachment into the structure on its parallel straight edges.

4,853,265
EVA BASED MULTI-LAYER, HEAT-SHRINKABLE, PACKAGING FILM AND BAGS MADE THEREFROM
Thomas C. Warren, Greer, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.
Filed Sep. 2, 1987, Ser. No. 92,022
Int. Cl.[4] B32B *27/08*
U.S. Cl. 428—34.9 **23 Claims**

1. A thermoplastic, multi-layer, heat-shrinkable packaging film, having improved orientation characteristics comprising at least two layers of a copolymer of ethylene and vinyl acetate wherein the melt index of the ethylene-vinyl acetate of one layer is different from the melt index of the ethylene-vinyl acetate of the other layer about 0.3 dg/minute or more.

4,853,266
LIQUID ABSORBING AND IMMOBILIZING PACKET CONTAINING A MATERIAL FOR TREATING THE ABSORBED LIQUID
John S. Cullen, Buffalo, N.Y., assignor to Multiform Desiccants, Inc., Buffalo, N.Y.
Filed Mar. 14, 1988, Ser. No. 168,052
The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.
Int. Cl.[4] B27N *5/02;* **B65D** *81/26*
U.S. Cl. 421—35.7 **18 Claims**



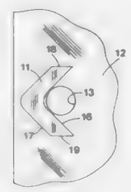
6. In an outer container having an inner container with liquid from which said liquid can leak, an absorbent packet located between said inner and outer containers for absorbing and immobilizing said liquid within said outer container in the event of leakage of said liquid from said inner container comprising an envelope which is degradable in said liquid, a first material in said envelope for absorbing and immobilizing said liquid, and a second material confined in said envelope for additionally treating said liquid which is absorbed and immobilized to nullify a specific undesirable quality thereof.

4,853,267
EASY OPEN CLOSURE SYSTEM
Shih-Lai Lu, and Andrew H. Wong, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 9, 1984, Ser. No. 578,651
Int. Cl.[4] B65D *17/34;* **C08G** *18/30*
U.S. Cl. 428—35.7 **12 Claims**

1. In a container sealed by means of a tape closure, the improvement which comprises the use of a polyurethane adhesive to seal said closure, said polyurethane adhesive comprising the non-crystallizable reaction product of an aryl isocyanate, an aliphatic glycol, and a mixture of hydroxy terminated polyesters, said mixture of polyesters comprising a low molecular weight polyester, the molecular weight thereof being from about 750 to about 1,250 and a high molecular weight polyester, the molecular weight thereof being from about 1,700 to about 2,400, the ratio of said low molecular weight polyester to said high molecular weight polyester being from about 4:1 to about 0.25:1.

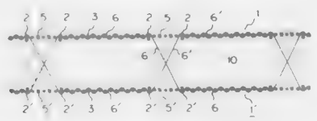
4,853,268
BINDING HOLE REINFORCEMENT, METHOD AND APPARATUS
Robert S. Hansen, P. O. Box 2238, Rohnert Park, Calif. 94928
Division of Ser. No. 922,406, Oct. 23, 1986, Pat. No. 4,822,446. This application Aug. 15, 1988, Ser. No. 232,470
Int. Cl.[4] B32B *3/16*
U.S. Cl. 428—42 **9 Claims**

1. A reinforcement for strengthening a sheet of paper near a binding hole, comprising a generally chevron shaped strip having parallel opposing edges of similar length and contour,



and means on one side of the strip for adhesively affixing the strip to the sheet of paper.

4,853,269
FABRIC FORM CONSISTING OF MULTILAYER FABRIC AND COMPOSITE STRUCTURE MADE BY USING FABRIC FORM
Kunihiko Fukumori, Takatsuki, and Hiroshi Kikuta, Yokohama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 823,721, Jan. 29, 1986, abandoned. This application Mar. 30, 1988, Ser. No. 178,757
Claims priority, application Japan, Jan. 30, 1985, 60-14566
Int. Cl.[4] B65D *65/28*
U.S. Cl. 428—43 **14 Claims**



1. A multilayer fabric comprising a plurality of layers of distinct fabrics each consisting of ground warps, ground wefts, connecting warps connecting the layers of the distinct fabrics, and temporary wefts which can be broken by external action after weaving without substantially damaging the connecting warps; the interlaced connected warps and the temporary wefts being capable of being disengaged by subjecting the multilayer fabric to external action, and fixing portions formed by increasing partially or entirely a cover factor of the ground warp as the ground weft in order to fix the connecting warp to the ground weave being provided on either or both layers of the distinct fabric, whereby the layers of the distinct fabric are separated from each other at a predetermined distance.

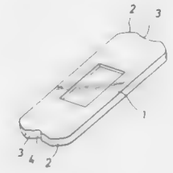
4,853,270
KNEE BLOCKER FOR AUTOMOTIVE APPLICATION
Joseph S. Wycech, Grosse Pointe Woods, Mich., assignor to Essex Specialty Products, Inc., Clifton, N.J.
Filed Jun. 27, 1988, Ser. No. 211,751
Int. Cl.[4] B32B *1/00, 3/00*
U.S. Cl. 428—68 **7 Claims**

1. A passive restraint system for a vehicle comprising an energy absorbing core enveloped by a frame, said core being filled with a plurality of pellets, each said pellet consisting essentially of substantially uncured thermoset polymeric resin



and microspheres which have been intermixed and extruded, each said pellet also having a coating of a B-staged resin.

4,853,271
CERAMIC SUBSTRATE FOR SEMICONDUCTOR PACKAGE
Katsumi Nakamura, Youkaichi, and Tadahisa Yamamoto, Shiga, both of Japan, assignors to Kyocera Corporation, Kyoto, Japan
Filed Jan. 19, 1988, Ser. No. 145,466
Claims priority, application Japan, Mar. 31, 1987, 62-49467[U]
Int. Cl.[4] B32B *3/02*
U.S. Cl. 428—81 **4 Claims**



1. A nearly rectangular ceramic substrate for use in packaging semiconductors, the end portion of at least one short side of said substrate comprising two outwardly projecting arcuate convex portions with a radius of curvature of Rs, an arcuate inwardly depressed concave portion with a radius of curvature of R_B formed between said convex portions to define a nearly central part of said short side, corner portions with a radius of curvature of Rc each connecting the outside end portion of each arcuate convex portion to each long side of the substrate, and curvature connecting portions with a radius of curvature of Rt each connecting the inside end portion of each arcuate convex portion to each end portion of the arcuate concave portion, a pair of most projecting portions being located in the curvature connecting portions and spaced from each other by a distance corresponding to about one-half of the width of the ceramic substrate, the radii of curvature of the individual portions having the following sizes
Rs=20–110 mm,
R_B=60–350 mm,
Rc=0.1 mm or more, and
Rt=7–20 mm.

4,853,272

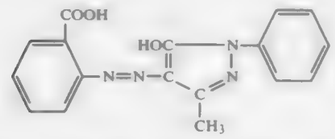
FLAME RETARDANT FIBERS FOR TEXTILE USE

Ling Yeh, and Hugh G. Harrelson, Jr., both of Anderson, S.C., assignors to BASF Corporation, Williamsburg, Va.

Filed Dec. 9, 1987, Ser. No. 130,763
Int. Cl.[4] C08K *5/34*
U.S. Cl. 428—96 13 Claims

1. A method of preparing one or more flame retardant fibers comprising:

(a) incorporating into a thermoplastically processable synthetic polymer a flame retardant amount of a flame retardant material consisting essentially of a chromium 1:2 complex azo dye having the following formula:



(b) melt processing said synthetic polymer and said fire retardant material of step (a) into said one or more fibers.

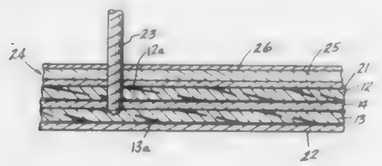
11. A carpet having a pile comprising the fibers prepared in accordance with claim 1.

4,853,273

DRILL BOARD AND METHOD OF MAKING THE SAME

Earl C. Harris, Jr., Guilford, Conn., assignor to Elmatco Products, Incorporated, Hamden, Conn.

Filed Dec. 21, 1987, Ser. No. 136,746
Int. Cl.[4] B32B *3/12, 31/00*
U.S. Cl. 428—116 8 Claims



1. A backup board having high surface hardness for use when drilling through a circuit board having an electrically conductive layer thereon, said backup board comprising a lamination of outer planar sheets, and an inner core of a double wall corrugated material, said double wall corrugated material having outer planar sheets, a central planar sheet and corrugated paper between each of said outer sheets and said central sheet, said outer sheets being impregnated with a thermosetting adhesive, said sheets and said core being subjected to heat and pressure to form a laminate where said thermosetting adhesive bonds said outer sheets to the outer sheets of said double wall corrugated material, said corrugations fold over to provide a backup board giving surface support by said outer sheets with a less rigid core therebetween.

4,853,274

THERMAL TRANSFER MATERIAL

Hideo Makishima, and Kenji Hyodo, both of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Mar. 10, 1988, Ser. No. 166,516
Claims priority, application Japan, Mar. 12, 1987, 62-57831
Int. Cl.[4] B41M *5/26*
U.S. Cl. 428—143 2 Claims

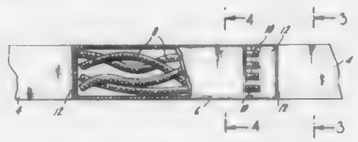
1. A thermal transfer material comprising a polymeric base film, a hot-melt ink layer formed on one side of the base film, said hot-melt ink layer comprising a coloring agent, a solid wax and a resin, and a heat resistant layer formed on the other side of the base film, said heat resistant layer comprising a resin and particles having an average particle size of 0.2 to 0.4 μm, and said heat resistant layer having an average surface roughness of 0.15 to 0.35 μm, and projections of 0.35 to 1.00 μm high, there being 50 or more of said projections per mm^2 on the surface thereof, the amount of particles in the heat resistant layer being from 0.05 to 5 parts by weight per 100 parts by weight of the solid content of the heat resistant layer; said base film containing inorganic particles in an amount ranging from 1 to 6 parts by weight per 100 parts by weight of the polymer of the base film and having an average particle size of 0.04 to 2.0 μm.

4,853,275

CUSHIONED STRAP

Charles R. Tracy, Greensboro, N.C., and Robert S. Elliott, Parsippany, N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

Filed Oct. 27, 1986, Ser. No. 924,194
Int. Cl.[4] B32B *1/00*
U.S. Cl. 428—178 26 Claims



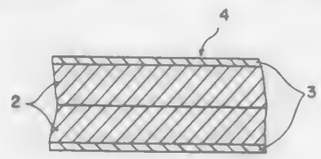
1. An article of manufacture for producing cushioned straps, comprising a continuously woven fabric having flat and tubular portions, and a plurality of lengths of yarn positioned in each of the tubular portions and extending through each of the tubular portions between the end portions thereof.

4,853,276

MARBLE-TRANSLUCENT THIN RESILIENT DECORATIVE SHEET

Toyokazu Kurushima, Chita, Japan, assignor to Inax Corporation, Japan

Filed Jul. 16, 1987, Ser. No. 74,283
Claims priority, application Japan, Jul. 22, 1986, 61-172510
Int. Cl.[4] B32B *3/00, 5/16, 7/14*
U.S. Cl. 428—187 14 Claims



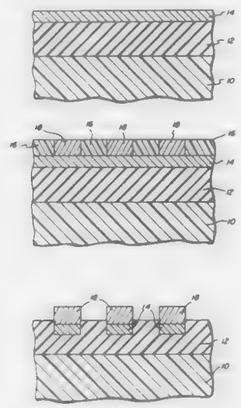
1. A marble-translucent resilient decorative sheet, said resilient decorate sheet having a thickness in the range of about 0.1 mm to 5 mm and comprising a layer of permeable pulp paper, a substantially transparent cured resin impregnated throughout the pulp paper, and a fine, substantially white inorganic filler powder uniformly deposited onto at least one surface of the pulp paper and being firmly fixed thereto, whereby the decorative sheet is provided with a deep marble-translucent tone by the synergistic effect of both the filler powder and the pulp paper impregnated with the cured resin.

4,853,277

METHOD FOR PRODUCING CIRCUIT BOARDS WITH DEPOSITED METAL PATTERNS AND CIRCUIT BOARDS PRODUCED THEREBY

Peter R. Chant, Burlington, Canada, assignor to Firan Corporation, Burlington, Canada

Continuation-in-part of Ser. No. 90,043, Aug. 31, 1987, Pat. No. 4,797,508, which is a continuation-in-part of Ser. No. 909,256, Sep. 19, 1986, Pat. No. 4,707,394. This application Oct. 5, 1988, Ser. No. 253,986
Int. Cl.[4] H05K *1/00;* B32B *3/00;* C23F *1/02;* B29C *37/00*
U.S. Cl. 428—209 30 Claims



26. In a circuit board, the combination comprising:

(a) a resinous substrate;

(b) an intermediate coating on one surface of said substrate of about 0.0005–0.015 inch and containing a rubber component and an epoxy polymer which have interacted to provide a matrix of the interacted rubber/epoxy polymer, said rubber component comprising at least 35 percent by weight of said coating; and

(c) a metal conductive pattern on said coating providing a circuit, said conductive pattern having a base metal layer with microformations at the interface with said coating and extending thereinto, said conductive pattern being embedded in said coating to a depth at least substantially equal to the thickness of said base metal layer, said coating being firmly bonded to said base metal layer and said conductive pattern thereby being bonded through said coating and base metal layer to said substrate, said circuit board being produced by a process comprising the steps of:

(i) coating a temporary substrate with a fluid mixture of a formulation containing a rubber component and an epoxy polymer component which are interactive at temperatures of at least 180° F., said rubber component comprising 50–200 percent by weight of the epoxy polymer component, said coating having a thickness of 0.0005–0.015 inch;

(ii) drying said coating on said initial substrate to produce a transfer coating member, said dried coating exhibiting limited adhesion to said initial substrate;

(iii) disposing said dried coating of said transfer coating member against a resinous substrate and applying heat to transfer said coating from said initial substrate to said resinous substrate;

(iv) partially curing the coating to produce partial cross-linking of said epoxy polymer component, and interaction of said rubber and epoxy polymer components to form a matrix of the interacted rubber and epoxy components;

(v) etching the exposed surface of the coating to produce a microporous surface;

(vi) depositing metal on said microporous surface of the coating to form a conductive layer with microformations extending into the recesses of said microporous surface;

(vii) electrodepositing metal on said conductive layer to form a conductive pattern therewith; and

(ix) applying heat and pressure to at least said conductive layer and coating to fully cure said coating, thereby firmly bonding said coating to said metal layer and thereby said conductive pattern through said coating to said resinous substrate, said heat and pressure embedding said conductive pattern in said coating to a depth of at least 10 percent of the thickness of the conductive pattern.

4,853,278

COATED COOKWARE

Kenneth Batzar, Cherry Hill, N.J., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 902,024, Aug. 25, 1986, Pat. No. 4,818,350. This application Jun. 1, 1988, Ser. No. 202,277
Int. Cl.[4] B32B *7/02, 15/08, 27/08*
U.S. Cl. 428—213 6 Claims

1. A rice cooker insert comprising an aluminum alloy blank having a coating wherein

the coating is a multi-layer release coating which facilitates removal of food residues from the finished rice cooker insert, comprising a primer coat, an intermediate coat and a topcoat,

said primer coat comprising polytetrafluoroethylene and polyamide-imide in a weight ratio of from 4:1 to 10:1 along with from 1.5 to 10% by weight colloidal silica, based on the solids content of the primer,

said intermediate coat comprising polytetrafluorethylene, pigment and coalescing agent which can be decomposed by heat at temperatures used to cure the coating system, and

said topcoat comprising polytetrafluoroethylene, coalescing agent which can be decomposed by heat at temperatures used to cure the coating system, catalyst to enhance decomposition, and mica flake or pigment-coated mica-flake,

said insert being made by a process of deep drawing at a draw ratio between 1.4:1 and 2.5:1 to produce an insert with the coating on the inside of the insert.

5. The rice cooker of claim 1, wherein in the total dry film thickness of the coating is about 12.5 to 87.5 m,

the primer coat dry film thickness is about 2.5 to 15 m, and

the ratio of the dry film thickness of the intermediate coat to that of the topcoat is about from 1:3 to 3:1.

4,853,279

CURABLE COMPOSITION FOR A FIBER-REINFORCED RESIN

Jouji Shibata, Hoajo; Kazuo Ohtani, Fukaya; Norio Shinohara, Isesaki, and Toshiaki Hanyuda, Yokohama, all of Japan, assignors to Showa Highpolymer Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1987, Ser. No. 30,748
Claims priority, application Japan, Mar. 27, 1986, 61-67225
Int. Cl.[4] B32B *7/00, 27/34;* C08K *5/20, 7/04*
U.S. Cl. 428—267 4 Claims

1. A curable composition for a fiber-reinforced resin having a viscosity of a range of 3–41.5 poise at 25° C., consisting essentially of:

60–90 weight % of an epoxy-containing acrylate or methacrylate resin which contains an epoxy group and an unsaturated ester group in its molecules, and which is formed by the reaction of an epoxy resin containing at least two epoxy groups per molecule and having an epoxy equivalent of 100–1000 with an unsaturated—monobasic acid in an amount such that there are 0.2–0.7 equivalents of carboxyl groups per 1 equivalent of epoxy groups in the presence of a catalyst selected from the group consisting of chromium napthenate, zirconium naphthenate, lithium naphthenate and lithium chloride;

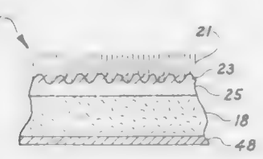
40–10 weight % of a radical polymerizable monomer; an organic peroxide; a curing agent for the epoxy resin; and one or more reinforcing material selected from continuous fibers and fiber cloth.

4,853,280

RELEASABLE POLYURETHANE BACKED TEXTILES

William C. Poteet, Dalton, Ga., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 17, 1986, Ser. No. 931,500
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—286 7 Claims



1. A floor covering which may be easily removed from its underlying surface and which resists buckling or folding when rolled, comprising:

(a) a facing layer having a weight of about 8–40 ounces/-square yard;

(b) a bottommost release backing layer having a weight from about 0.9 to 24 ounces per square yard which comprises a nonwoven fabric or relatively short fibers or continuous filament fibers, and

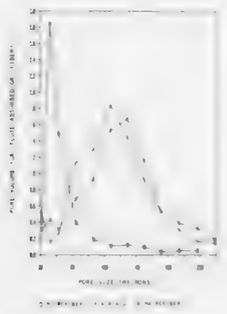
(c) a polymer layer which is bonded to the release backing layer on one side and directly or indirectly to the facing layer on the other side.

4,853,281

UNIFORMLY MOIST WIPES

Maung H. Win, Neenah, Wis.; Stephen S. Hata, Cedar Rapids, Iowa; William A. Abba, Neenah, and James Olszewski, Menasha, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 896,895, Aug. 15, 1986, Pat. No. 4,775,582, and a continuation-in-part of Ser. No. 108,875, Oct. 15, 1987. This application Jul. 13, 1988, Ser. No. 219,493
The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—286 4 Claims



1. A stack of moist wipes within a container, said stack comprising a plurality of meltblown sheets containing from about 100 to about 700 dry weight percent liquid, wherein each of the sheets within the stack of wipes contains substantially the same concentration of liquid and can maintain a substantially equal concentration of liquid for at least 30 days.

4,853,282

MULTI-LAYER POLYAMIDE MOULDED ARTICLE

Erik R. Peerlkamp, Born, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Dec. 10, 1987, Ser. No. 131,085
Claims priority, application Netherlands, Dec. 10, 1986, [redacted]
Int. Cl.[4] B32B *5/16, 27/08, 27/34*
U.S. Cl. 428—323 14 Claims

1. Multi-layer polyamide moulded article comprising a filler-reinforced polyamide layer covered on at least one side with a non-reinforced polyamide layer, wherein

a. the polyamide is substantially consisting of tetramethyleneadipamide units, b. the filler is predominantly non-fibrous.

2. Multi-layer polyamide moulded article according to claim 1, wherein the filler is chosen from the group of powdery, spherical or plate-shaped particles.

4,853,283

LIGHT REFLECTIVE LAMINATE

Barry Skolnick, East Windsor, N.J., assignor to Scharr Industries Inc., Bloomfield, Conn.

Filed Feb. 11, 1988, Ser. No. 154,972
Int. Cl.[4] B32B *15/08, 15/12*
U.S. Cl. 428—335 6 Claims

1. A light reflective material comprising:

a substrate layer;

an adhesive layer on said substrate layer;

a first lacquer protective coating on said adhesive layer;

a light reflective metal layer on said first lacquer protective coating; and

a second lacquer protective coating on said light reflective metal layer.

6. The material of claim 1 wherein:

said lacquer protective coatings have a thickness of about 0.01 to about 2 mil.

4,853,284

MECHANICAL PART

Takashi Ishii, Tokyo; Hajime Kohama, Yokohama, and Hisao Yabe, Fujisawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 26, 1987, Ser. No. 19,336
Claims priority, application Japan, Feb. 28, 1986, 61-41524
Int. Cl.[4] B32B *15/04, 15/06, 15/08, 27/06*
U.S. Cl. 428—335 9 Claims

1. A mechanical part which is in contact with a non-fibrous member selected from the group consisting of paper, rubber, plastics, resin, ceramics, and metal, comprising a non-porous substrate of an austenite stainless steel or a ferrite stainless steel and a surface layer formed on a surface of said substrate and containing chromium oxide (Cr_2O_3) as a major constituent, the chromium oxide being converted from a chromium compound upon heating thereof, and an intermediate layer including a reaction product between the chromium oxide and said surface layer and said substrate being formed at an interface between said surface layer and said substrate.

2. A mechanical part according to claim 1, wherein said surface layer has a thickness of 1 to 560 μm.

4,853,285

CORROSION RESISTANT, COATED METAL LAMINATE, ITS PREPARATION AND COATING MATERIALS

Tamotsu Sobata; Masaaki Takimoto, both of Osaka, and Yuichi Yoshida, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Division of Ser. No. 869,857, May 28, 1986, Pat. No. 4,719,038, which is a continuation-in-part of Ser. No. 687,004, Dec. 27, 1984, abandoned. This application Sep. 30, 1987, Ser. No. 103,013
Claims priority, application Japan, Dec. 27, 1983, 58-248312; Dec. 29, 1983, 58-245747; Dec. 29, 1983, 58-245748; Jan. 21, 1984, 59-008678; Mar. 2, 1984, 59-040874; Mar. 29, 1984, 59-062555; Mar. 29, 1984, 59-062556
Int. Cl.[4] B32B *15/04, 15/08;* H01B *1/06*
U.S. Cl. 428—336 18 Claims

1. An anti-corrosive, coated laminate comprising a metal substrate, an anti-corrosive layer coated on the metal substrate and formed by using a composition containing, as essential components, at least one hexa-valent chromium containing chromium compound having a solubility of 20 to 10^{-5} and a binder material selected from the group consisting of an aqueous silica and an aqueous resin, and an electrically conductive paint layer formed on said anti-corrosive layer, wherein said paint layer is formed by using a coating composition comprising, as solid,

(A) 10 to 35% by weight of at least one binder resin whose aromatic ring content in its molecule is less than 50% by weight and which is selected from the group consisting of epoxy resin, alkyd resin, acryl resin, melamine resin, urethane resin, phenol resin, vinyl resin, polyvinyl butyral resin, polyvinyl acetate resin, chlorinated rubber, oil-free polyester resin, phthalic acid resin, styrene resin and polyolefin resin,

(B) 4 to 50% by weight of polyethylene wax capable of being decomposed exothermically at 300° to 500° C., and

(C) 15 to 86% by weight of electrically conductive pigment having a mean diameter of less than 20 microns, which is selected from the group consisting of stainless steel, gold, silver, cadmium, aluminum, zinc, tin, copper and graphite powders; iron, nickel, titanium, tungsten, niobium and manganese carbides; and ferromanganese, ferromolybdenum, ferrosilicon, ferrochromium, ferrotitanium and ferrosphosphorous ferroalloys.

2. The laminate according to claim 1 wherein the paint layer has a thickness of 1 to 20μ.

4,853,286

WAFER PROCESSING FILM

Osamu Narimatsu, Nagoya; Michiyasu Ito, Kuwana; Kazuyoshi Komatsu, and Yasuhiro Shibata, both of Nagoya, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

PCT No. PCT/JP85/00284, § 371 Date Jan. 16, 1986, § 102(e) Date Jan. 16, 1986, PCT Pub. No. WO85/05734, PCT Pub. Date Dec. 19, 1985
PCT Filed May 23, 1985, Ser. No. 823,492
Claims priority, application Japan, May 29, 1984, 59-107539; Aug. 7, 1984, 59-164328
Int. Cl.[4] C09V *7/02*
U.S. Cl. 428—343 5 Claims

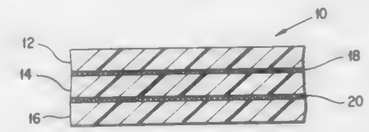
1. A wafer processing film comprising a base film having a Shore D harness of 40 or less, an adhesive layer disposed on one surface of said base film, said adhesive layer including an additive which is selected from the group consisting of nonionic surface active agents and ethylene glycol derivaties, and a supporting film having a Shore D hardness greater than 40 being laminated to the surface of said base film, said supporting film having no adhesive layer disposed thereon.

4,853,287

HIGHLY FORMABLE LAMINATES

Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Oct. 19, 1987, Ser. No. 109,900
Int. Cl.[4] C09J *7/02*
U.S. Cl. 428—349 11 Claims



1. A thermoplastic laminate comprising:

a) a first film, disposed as one surface of the laminate, comprising an abuse-resistant polymeric material;

b) a second film comprising an oxygen barrier polymeric material;

c) a third film, disposed as another surface of the laminate, comprising a heat sealable polymeric material; and

d) at least one of said first, second, and third films being a hot blown film having a layer of high molecular weight material with a melt index of less than one gram/10 minutes at 190° C.

4,853,288

STABILIZED RED PHOSPHORUS AND PROCESS FOR MAKING IT

Horst Staendeke, Lohmar; Ursus Thümmler, Erftstadt, and Wilhelm Adam, Neu-Isenburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 10, 1988, Ser. No. 166,107
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 3710170
Int. Cl.[4] C01B *25/01, 25/023*
U.S. Cl. 428—402.24 8 Claims

1. Stabilized pulverulent red phosphorus, the individual particles of which have a size of at most 2 mm and are encapsulated in a thin layer of an oxidation stabilizer, the oxidation stabilizer comprising a polycondensation product of melamine and formaldehyde and at least one water-insoluble or sparingly water-soluble metal hydorxide selected from the group consisting of the hydroxides of aluminum, silicon, chromium, manganese, zinc, germanium, zirconium, niobium, cadmium, tin, lead, bismuth and cerium.

4,853,289

MAGNETIC LACQUER DISPERSIONS, PROCESS FOR THEIR PRODUCTION AND THEIR USE

Peter Schick, Krefeld; Friedrich Jonas, Aachen, and Lutz Leitner, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 8, 1987, Ser. No. 93,763
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1986, 3631537
Int. Cl.[4] G11B *5/64*
U.S. Cl. 428—408 11 Claims

1. A magnetic lacquer dispersion for magnetic recording supports, consisting of magnetic pigment, abrasive, carbon black or another additive for regulating conductivity, binder, solvent, lubricant, and wetting agent, characterized in that the respective quantities of wetting agent and lubricant is between

at least 100 and 140 of the individually determined saturation adsorptions of the wetting agent and lubricant, based on 100 grams of magnetic pigment.

4,853,290

POLYPROPYLENE LAMINATE HAVING AN EMA-EAA TIE LAYER

Apostol Yanidis, Berkeley, Calif., assignor to James River II, Inc., Oakland, Calif.

Filed Jun. 3, 1988, Ser. No. 202,077
Int. Cl.[4] B32B *27/08*
U.S. Cl. 428—516 5 Claims

1. In a laminate comprising a layer of polypropylene and a layer of a polymer composition coextruded onto the polypropylene layer, the polymer composition comprising (a) a tie layer adjacent the polypropylene layer and (b) a functional polymer layer on the other side of the tie layer, the improvement wherein the tie layer comprises a blend of (a) from about 50 to 90 percent by weight of a copolymer of ethylene and methyl acrylate or ethyl acrylate and (b) from about 10 to about 50 percent of a copolymer of ethylene and acrylic acid or methacrylic acid.

4,853,291

GOLD-PALLADIUM-NICKEL-COPPER-MANGANESE FILLER METAL FOR JOINING SUPERALLOY

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 174,278, Mar. 28, 1988. This application Oct. 26, 1988, Ser. No. 262,384
Int. Cl.[4] C22C *1/09*
U.S. Cl. 428—593 1 Claim

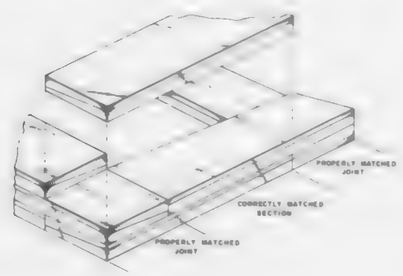
1. A panel comprising a honeycomb structure of thin superalloy metal sandwiched between and brazed to two sheets of superalloy metal, the braze consisting of an alloy of, in weight percent, 5–30 Au, 15–35 Pd, 10–30 Ni, 20–48 Cu, 5–25 Mn, the brazing alloy having a solidus temperature above 1000° C. and a liquidus temperature above 1018° C.

4,853,292

STACKED LAMINATION MAGNETIC CORES

Christopher A. Bruckner, Madison, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 25, 1988, Ser. No. 185,754
Int. Cl.[4] H01F *27/24*
U.S. Cl. 428—600 10 Claims



1. A magnetic core comprising a plurality of elongated laminations, each of said lamins ons consisting essentially of a plurality of substantially amorp ous ferromagnetic strips, said laminations being arranged in a plurality of groups each of which comprises at least two laminations, with a major surface of each lamination of each group being substantially co-extensive with a major surface of an adjacent lamination of said group, at least two laminations of each group having non-uniform cross-sections (each taken in a plain normal to the direction of elongation of the lamination), wherein said laminations of each group are arranged such that surfaces of said laminations defining top and bottom surfaces of the corresponding group are, on cross-section taken in a plain normal to the direction to elongation of said laminations, substantially parallel, said groups being arranged in partially overlapping relationship to define a closed loop.

4,853,293

COMPACTED METALLIC WIRE ELEMENT

Lars Andersson; Berndt Stenlund, both of Sandviken, and Rolf Wiberg, Gävle, all of Sweden, assignors to Sandvik AB, Sandviken and Plo AB, Ockelbo, both of, Sweden

Filed Nov. 30, 1987, Ser. No. 126,918
Claims priority, application Sweden, Dec. 1, 1986, 8605137
Int. Cl.[4] B23P *17/06*; B65D *53/02*
U.S. Cl. 428—605 6 Claims



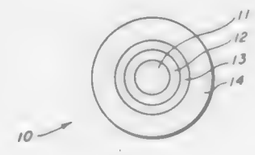
1. Metallic element including a number of closely compacted wires (11), said element having a center axis, characterized in that each wire (11) of the metallic element (12,14) has a mainly rectangular cross-section and is wound at least ten revolutions around said axis and in that each wire (11) has a coiled basic shape, said element (12;14) being comprised of a limited number of wires which are mutually interlocked by means of plastic deformation of the coils of the wires (11) and by means of mutual metallic binding of parts of the wires (11).

4,853,294

CARBON FIBER REINFORCED METAL MATRIX COMPOSITES

Richard K. Everett, Alexandria, and William F. Henshaw, Lorton, both of Va., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 28, 1988, Ser. No. 212,553
Int. Cl.[4] B32B *15/14*; C22C *1/09*
U.S. Cl. 428—614 15 Claims



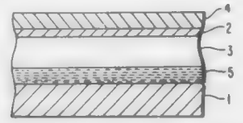
1. A composite comprising:
a matrix material selected from the group consisting of pure metal, and metal alloys, and
an inner barrier layer of a ductile, low density, oxygen absorbing rare earth metal covering the surface of said fiber, and
an outer barrier layer of stable non-matrix-reactive material contiguous with and covering said inner barrier layer.

4,853,295

SURFACE TREATED STEEL MATERIAL PARTICULARLY ELECTROPLATED STEEL SHEET

Yoshio Shindo; Koichi Wada, and Fumio Yamazaki, all of Kimitsu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 13, 1987, Ser. No. 50,529
Claims priority, application Japan, May 14, 1986, 61-110119; May 14, 1986, 61-110120; May 14, 1986, 61-110121
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—621 12 Claims



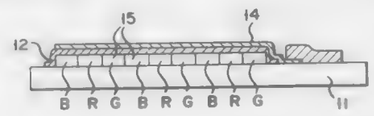
8. A steel material comprising a lower plated layer of a metal plated directly on the steel selected from the group consisting of Fe, Ni and Co, an upper plated layer comprising an Fe-series alloy containing at least 70% by weight Fe, a middle plated layer comprising a Zn series alloy or Zn-composite material between said lower and upper plated layers and a chemical conversion layer interposed between said middle and upper plated layers.

4,853,296

ELECTRODE PLATE FOR COLOR DISPLAY DEVICE

Kenzo Fukuyoshi, Niiza, Japan, assignor to Toppan Printing Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1987, Ser. No. 110,869
Claims priority, application Japan, Oct. 22, 1986, 61-251478; Jan. 21, 1987, 62-12084; Feb. 10, 1987, 62-29376; Apr. 3, 1987, 62-82554; Apr. 30, 1987, 62-107163; Jul. 22, 1987, 62-183015; Sep. 22, 1987, 62-238493
Int. Cl.[4] G02F *1/13*
U.S. Cl. 428—623 23 Claims



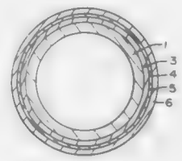
1. An electrode plate for a color display device, comprising a transparent substrate, a color filter formed on said substrate, a transparent electrode formed on said color filter, and a metal conductor formed on said transparent electrode and at least partly containing nickel.

4,853,297

MULTILAYER COATED CORROSION RESISTANT METAL PIPE

Teruhisa Takahashi, Mishima, and Masashi Kajiyama, Tagata, both of Japan, assignors to Usui Kokusai Sangyo Kaisha Ltd., Sunto, Japan

Filed Jun. 2, 1988, Ser. No. 202,098
Int. Cl.[4] F16L *9/14*
U.S. Cl. 428—623 8 Claims



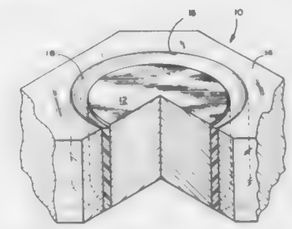
1. A corrosion resistant pipe comprising a metal pipe having an outer surface coated with a zinc film, a chromate film, an intermediate layer consisting essentially of an epoxy resin, and a polyvinyl fluoride film formed one upon another in the order listed.

4,853,298

THERMALLY STABLE SUPER INVAR AND ITS NAMED ARTICLE

Leslie L. Harner, Fleetwood, and Earl L. Frantz, Reading, both of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 849,569, Apr. 8, 1986, abandoned. This application Dec. 10, 1987, Ser. No. 132,702
Int. Cl.[4] C03C *27/02*
U.S. Cl. 428—630 23 Claims



11. A precision article comprising:
a low expansion glass member; and
a dimensionally stabilized metal member adjoining said glass member in close relation, said dimensionally stabilized metal member formed from an austenitic alloy having both a martensitic transformation start temperature below 90 C. (130 F.) an average coefficient of thermal expansion no greater than 0.7×10^{-6}/°C. from 55 C. to +90 C. (67 F. to +194 F.), said alloy, in weight percent consisting esentially of about.

	W/O
Carbon	0.02 Max.
Manganese	0.4–0.8
Silicon	Up to 0.25
Nickel	32.0–33.2
Cobalt	2.5–5.5

and the balance essentially iron.

4,853,299

SILICON CARBIDE SINTERED BODY AND METHOD OF MANUFACTURING THE SAME

Toshiaki Mizutani, Yokohama; Takeyuki Yoneznwa, Tokyo; Hiroshi Inoue, Kawaguchi; Akihiko Tsuge, Yokohama, and Yoshiyuki Ohnuma, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 3, 1986, Ser. No. 903,141
Claims priority, application Japan, Sep. 6, 1985, 60-195750; Sep. 6, 1985, 60-195751; Sep. 6, 1985, 60-195754; Jul. 9, 1986, 61-159773
Int. Cl.[4] C04B *35/56*
U.S. Cl. 428—698 18 Claims

1. A silicon carbide sintered body containing from not less than 0.03% by weight to not more than 0.14% by weight of boron, a total of not more than 0.3% by weight of metallic element impurities including the boron, each metallic impurity, other than boron, being present in an amount of at most 0.05% by weight, not more than 1.0% by weight of free carbon, a total of not more than 0.15% by weight of non-metal impurities other than the free carbon, and the balance essentially consisting of silicon carbide, and having a density of not less 3.10 g/cm^3.

5. A method of manufacturing a silicon carbide sintered body under a non-pressurized condition, comprising the steps of:

(a) molding a mixture containing a silicon carbide powder, a

boron-containing sintering assistant, and a carbon-containing oxygen scavenger wherein the content of each metal impurity, other than boron, in the silicon carbide powder is not more than 0.05% by weight, and wherein said mixture consists essentially of boron-containing sintering assistant in an amount sufficient to provide 0.05 to 1% by weight of boron with respect to the weight of the silicon carbide powder, the carbon-containing scavenger in an amount sufficient to provide carbon content 1.0 to 3.0 times that of the oxygen content in the silicon carbide powder;

(b) heating the resultant molded body to a sintering temperature;

(c) maintaining the molded body at a temperature lower than the sintering temperature during the heating process in step (b) until an oxide film covering the silicon carbide powder is substantially removed by the oxygen scavenger; and

(d) sintering the molded body at the sintering temperature under a non-pressurized condition.

4,853,300

AMORPHOUS HYDRATED METAL OXIDE PRIMER FOR ORGANIC ADHESIVELY BONDED JOINTS

Roscoe A. Pike, Granby, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 911,580, Sep. 24, 1986, abandoned. This application Nov. 16, 1987, Ser. No. 122,495

Int. Cl.[4] B32B *9/00*; C09J *5/04*

U.S. Cl. 428—702 10 Claims

1. A method of bonding a plurality of articles together, at least one of which is ceramic, by placing a polymeric adhesive in contact with and between the articles and applying pressure, and optionally heat, to said articles wherein the improvement comprises:

(a) applying to a surface of the at least one ceramic article prior to placing adhesive on the surface a layer comprising $M_x(OR)_y$ or mixtures thereof, wherein

(i) x is 1;

(ii) y is 3 or 4;

(iii) M is silicon or magnesium; and

(iv) R is an organic radical;

(b) exposing the ceramic article having the $M_x(OR)_y$ layer thereon to moisture and a temperature of about 25° C. to about 300° C. prior to contact with the adhesive; resulting in a joint resistant to crack propagation.

4,853,301

FUEL CELL PLATES WITH SKEWED PROCESS CHANNELS FOR UNIFORM DISTRIBUTION OF STACK COMPRESSION LOAD

Samuel J. Granata, Jr., Greensburg, and Boyd M. Woodle, North Huntingdon Township, Westmoreland County, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

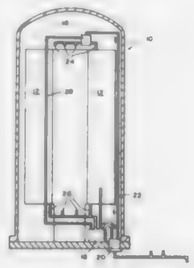
Filed Dec. 4, 1985, Ser. No. 804,415

Int. Cl.[4] H01M *8/02*

U.S. Cl. 429—39 5 Claims

1. In an electrochemical fuel cell including an anode electrode, a cathode electrode, an electrolyte matrix sandwiched between said electrodes and a pair of plates above and below said electrodes, said plates having corresponding pairs of opposite edges, said plate above said electrodes having a lower surface with a first group of process gas flow channels formed thereon and said plate below said electrodes having an upper surface with a second group of process gas flow channels formed thereon, said channels of each group extending generally parallel to one another, the improvement which comprises:

said process gas flow channels on said lower surface of said plate above said anode electrode and said process gas flow channels on said upper surface of said plate below said cathode electrode being open at their opposite ends at the same ones of said corresponding edges of said plates and being skewed substantially the same amount in opposite directions such that contact areas of said surfaces of said plates through said electrodes are formed in crisscross arrangements; and



at least one gas-holding groove defined in areas of said surfaces of said plates where said channels are absent for holding process gas and increasing electrochemical activity of said fuel cell.

4,853,302

BATTERY COMPARTMENT

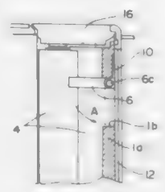
Akira Yamanaka, and Keiji Yamazaki, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 195,359, May 16, 1988, abandoned, which is a continuation of Ser. No. 920,288, Oct. 17, 1986, abandoned. This application Dec. 21, 1988, Ser. No. 287,651

Claims priority, application Japan, Oct. 21, 1985, 60-161575[U]

Int. Cl.[4] H01M *2/10*

U.S. Cl. 429—99 11 Claims



1. A battery compartment capable of selectively accommodating first battery means and second battery means having different shapes from each other, comprising:

a housing formed to fit said first battery means, and

a support member pivotably placed about a support section attached to a side interior wall of said housing between a supporting position wherein said support member is projected along a plane substantially perpendicular to said side interior wall to laterally support said second battery means as accommodated in said housing and a recessed position along said side interior wall to be recessed from an accommodating space for said first battery means, wherein an edge of said support member is rotated to a position away from said side wall of said housing when said support member is placed at the supporting position, said support member being urged toward the supporting position,

wherein said first battery means is an integrated battery unit and said second battery means includes a plurality of cylindrical batteries which are arranged such that total occupying area in a cross section thereof is smaller than a cross section of said first battery means.

4,853,303

ELECTROCHEMICAL STORAGE CELL

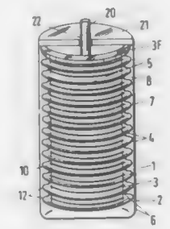
Gunther Steinleitner, Schriesheim; Stefan Mennicke, Leimen-Gauangelloch; Philbert Feindler, St. Leon-Rot; Herbert Klein, Frankenthal, and Sigisfredo Maldonado-Zagal, Edingen-Neckarhausen, all of Fed. Rep. of Germany, assignors to BBC Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed May 12, 1988, Ser. No. 192,955

Claims priority, application Fed. Rep. of Germany, May 19, 1987, 3716735

Int. Cl.[4] H01M *10/39*

U.S. Cl. 429—104 11 Claims



1. Electrochemical storage cell based on sodium and sulphur, comprising a metallic housing, a solid electrolyte disposed in said housing and defining an anode space and a cathode space mutually separated by said solid electrolyte and outwardly bounded by said housing, and a felt disposed in said cathode space to form an electrode, said felt being impregnated with sulphur and folded at least twice, and said felt having graphite or carbon fibers disposed substantially perpendicular to the longitudinal axis of the storage cell and substantially perpendicular to the surface of said solid electrolyte.

4,853,304

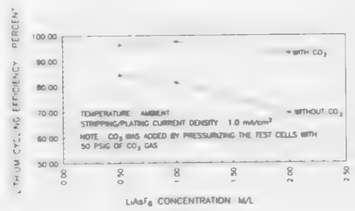
ELECTROLYTE FOR SECONDARY NON-AQUEOUS CELLS

Walter B. Ebner, Warminster, Pa., and Hsiu-Ping W. Lin, Cherry Hill, N.J., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Jan. 21, 1988, Ser. No. 146,533

Int. Cl.[4] H01M *6/14*

U.S. Cl. 429—192 23 Claims



1. An improved electrolyte solution for lithium non-aqueous secondary cells comprising a solution of methyl formate containing an amount of lithium salt and an amount of CO_2 in said electrolyte solution.

4,853,305

CATHODIC ELECTRODE

Menahem Anderman, Boyds, and Steven L. Johnson, Catonsville, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation of Ser. No. 843,347, Mar. 24, 1986, abandoned. This application Aug. 14, 1987, Ser. No. 85,330

The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.

Int. Cl.[4] H01M *4/60, 4/62*

U.S. Cl. 429—212 29 Claims

1. A cathodic electrode suitable for use in a non-aqueous battery system comprising at least one microporous sheet product formed from a substantially homogeneous composition consisting essentially of from about 70–98 weight percent of electrochemically active and electrically conductive particulate material composed of at least one metal chalcogenide having a metal selected from titanium, zirconium, hafnium, niobium, copper, iron, tantalum, molybdenum, vanadium, manganese and mixtures of said metals, said particulate material includes up to about 30 weight percent thereof of a conductive carbon black having an average particle size of from about 1 to 100 millimicrons; from about 2–30 weight percent of high density polyethylene having a weight average molecular weight of from about 150,000 to 5,000,000; and from 0 to about 5 weight percent of an organic plasticizer for said polyethylene; and a current collector composed of a conductive material, said collector being intimate contact with each of said at least one microporous sheet product.

4,853,306

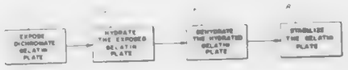
METHOD AND APPARATUS FOR DEHYDRATING DICHROMATIC GELATIN HOLOGRAMS

John E. Wreede, Monrovia, and James E. Scott, Culver City, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 21, 1987, Ser. No. 99,281

Int. Cl.[4] G03H *1/18, 1/04*

U.S. Cl. 430—1 19 Claims



7. In a method of manufacturing optical elements from holographically recorded interference patterns in a dichromated gelatin comprising, the steps of:

developing the hologram pattern by hydration;

dehydrating the hydrated hologram gelatin by contacting the hydrated gelatin with a mixture of alcohol and a liquid fluorinated hydrocarbon solution, and

stabilizing the dehydrated hologram pattern in the gelatin by baking.

4,853,307

IMAGING MEMBER CONTAINING A COPOLYMER OF STYRENE AND ETHYL ACRYLATE

Man C. Tam; Steven Bloembergen; Gregory J. Kovacs; Carol A. Jennings; Rafik O. Loutfy; Sandra J. Gardner, and Michael G. Taylor, all of Ontario, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 4, 1988, Ser. No. 140,441

Int. Cl.[4] G03G *5/05, 13/22*

U.S. Cl. 430—41 22 Claims

1. A migration imaging member comprising a substrate and an electrically insulating softenable layer adjacent said substrate, said softenable layer comprising a fracturable layer of electrically photosensitive migration marking material located substantially at or near the surface of said softenable layer spaced from said substrate, and a copolymer of styrene and ethyl acrylate in at least one layer adjacent said substrate, said

copolymer comprising between about 40 and about 80 mole percent styrene, between about 20 and about 60 mole percent ethyl acrylate, and between about 0 and about 3 mole percent copolymerizable organic acid having carbon-to-carbon unsaturation or copolymerizable derivative thereof, said copolymer having a M_n between about 4,000 and about 35,000, a M_w between about 10,000 and about 80,000, an acid number up to about 25, T_g between about 30° C. and about 75° C., and a melt viscosity between about 1×10^2 poise and about 1×10^6 poise at 115° C.

17. An imaging method comprising providing a substrate and an electrically insulating softenable layer on said substrate, said softenable layer comprising charge transport molecules, said charge transport molecules being capable of increasing charge injection from said electrically photosensitive migration marking material to said softenable layer, being capable of transporting charge to said substrate and being dissolved or molecularly dispersed in said softenable layer a fracturable layer of electrically photosensitive migration marking material located substantially at or near the surface of said softenable layer spaced from said substrate, and a copolymer of styrene and ethyl acrylate at or near the surface of said softenable layer adjacent said substrate, said copolymer comprising between about 40 and about 80 mole percent styrene, between about 20 and about 60 mole percent ethyl acrylate, and between about 0 and about 3 mole percent copolymerizable organic acid having carbon-to-carbon unsaturation or copolymerizable derivative thereof, said copolymer having a M_n between about 10,000 and about 35,000, a M_w between about 25,000 and about 80,000, an acid number up to about 25, a T_g between about 30° C. and about 75° C., a melt viscosity between about 1×10^2 poise and about 1×10^6 poise at 115° C.; exposing said member to activating radiation in an imagewise pattern whereby said electrically photosensitive migration marking material struck by said activating radiation photogenerates charge carriers; decreasing the resistance to migration of migration marking material in said softenable layer sufficiently to allow the light-struck migration marking material to retain a small net charge which allows at most slight agglomeration, slight coalescence, slight migration in depth of marking material towards said substrate or combination thereof; and further decreasing the resistance to migration of marking material in said softenable layer sufficiently to allow migration marking material which escapes radiation to substantially agglomerate and coalesce.

4,853,308

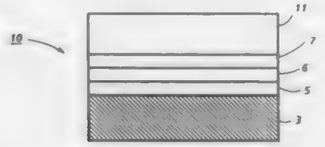
PHOTORESPONSIVE IMAGING MEMBERS WITH FLUORENE HOLE TRANSPORTING LAYERS

Beng S. Ong, Mississauga; John R. C. Fuller, Oakville, and Dasarao K. Murti, Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

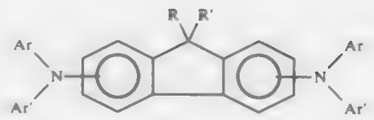
Filed Nov. 9, 1987, Ser. No. 118,677

Int. Cl.⁴ G03G *15/02*

U.S. Cl. 430—59 **32 Claims**



1. A layered photoresponsive imaging member comprised of a photogenerating layer and in contact therewith a hole transporting layer consisting essentially of fluorene derivatives of the following formula dispersed in an inactive resinous binder:



where R and R' are independently selected from the group consisting of hydrogen, alkyl, and substituted alkyl groups; and Ar and Ar' are independently selected from the group consisting of aryl and substituted aryl substituents.

4,853,309

PHOTORECEPTOR FOR ELECTROPHOTOGRAPHY WITH A-SI LAYERS HAVING A GRADIENT CONCENTRATION OF DOPED ATOMS AND SANDWICHING THE PHOTOCONDUCTIVE LAYER THEREBETWEEN

Takashi Hayakawa, Tenri; Hideo Nojima; Yoshimi Kojima, both of Nara; Shiro Narikawa, Kashihara; Toshiro Matsuyama, Tenri; Eiji Imada, and Shaw Ehara, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 838,753, Mar. 12, 1986, abandoned. This application Jun. 3, 1988, Ser. No. 204,954

Claims priority, application Japan, Mar. 12, 1985, 60-49518

Int. Cl.⁴ G03G *5/085, 5/10*

U.S. Cl. 430—65 **26 Claims**

1. A photoreceptor for electrophotography comprising an electrically conductive substrate, a bottom layer, a photoconductive layer composed mainly of amorphous silicon, and a surface layer, in that order, both the bottom and surface layers having a greater optical bandgap than said photoconductive layer, wherein a first middle layer is disposed between said bottom layer and said photoconductive layer, and a second middle layer is disposed between said photoconductive layer and said surface layer, both the first and second middle layers being composed mainly of amorphous silicon and having a varied distribution of concentrations of doped atoms from the bottom to the top of the layer.

4,853,310

TRIIODIDE SALTS OF CYANINE DYES SUITABLE FOR SENSITIZATION OF PHOTOCONDUCTIVE SYSTEMS

David E. Brown, St. Paul, and Louis M. Leichter, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Mich.

Filed May 20, 1988, Ser. No. 196,739

Claims priority, application United Kingdom, May 22, 1987, 8712151

Int. Cl.⁴ G03G *5/04, 5/06*

U.S. Cl. 430—83 **11 Claims**



1. A photoconductor composition comprising an organic photoconductor compound in admixture with a sensitising dye characterised in that the sensitising dye is a cyanine dye having a polymethine chain of at least 7 carbon atoms and at least 10 molar percent of the dye is in the form of a tri-iodide salt.

4,853,311

FUSIBLE ELECTROSTATICALLY ATTRACTABLE TONER

Serge M. Tavernier, Lint; August M. Mariën, Oevel, and Herman J. Uytterhoeven, Bonheiden, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Feb. 18, 1988, Ser. No. 156,957

Claims priority, application European Pat. Off., Feb. 24, 1987, 87200288.6

Int. Cl.⁴ G03G *9/08, 9/06*

U.S. Cl. 430—106 **12 Claims**

1. A toner composition comprising electrostatically attractable fusible powder particles having an average particle size in the range of 1 to 100 μm and a melt viscosity at 190° C. in the range of 20 to 200 Pa.s measured as defined herein, said powder particles containing a colouring substance and a polymeric binder, said polymeric binder consisting essentially of a copolymer of:

(1) styrene or styrene homologue,

(2) an alkyl acrylate or alkyl methacrylate monomer wherein alkyl is a straight chain of at least 8 carbon atoms, and

(3) a crosslinking monomer containing at least two ethylenically unsaturated groups,

wherein said monomer (2) constitutes at least 5% and at most 50% by weight of the copolymer, the amount of said monomer (3) is sufficient to impart to said copolymer a gel content of 20 to 65% by weight, the gel content being determined by the test defined herein, and said copolymer constitutes more than 50% of the total weight of said powder particles.

4,853,312

MATERIAL WITH PH NOT HIGHER THAN 7 CONTAINING SILVER HALIDE, REDUCING AGENT AND POLYMERIZABLE COMPOUND

Makoto Yamada, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 6, 1987, Ser. No. 46,360

Claims priority, application Japan, May 6, 1986, 61-104226

Int. Cl.⁴ G03C *5/54*; G03F *7/06, 7/26*

U.S. Cl. 430—138 **14 Claims**

1. A light-sensitive material comprising a light-sensitive layer which contains silver halide grains, a reducing agent and an ethylenic unsaturated polymerizable compound provided on a support, said silver halide grains and polymerizable compound being contained in microcapsules which are dispersed in the light-sensitive layer, wherein the light-sensitive layer has a pH value of not higher than 7.

4,853,313

PRINTING PLATE

Yoichi Mori, Otsu; Shigeo Abiko, Moriyama; Mikio Tsuda, Ohmihachiman, and Chikara Ichijo, Kyoto, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 10, 1987, Ser. No. 37,222

Claims priority, application Japan, Apr. 11, 1986, 61-82244; May 28, 1986, 61-121277

Int. Cl.⁴ G03C *1/74, 1/54*; G03F *7/08*

U.S. Cl. 430—156 **10 Claims**

1. A printing plate in which the surface of the photosensitive layer or the primer layer serve as an ink receivable image area enabling printing without the use of dampening water, comprising a substrate and superimposed on said substrate in the following order

(a) a primer layer, wherein said primer layer contains 0.01 to 25% by weight, based on the total weight of the primer layer, of a compound containing a photosensitive o-quinoediazide group,

(b) a photosensitive layer containing an o-quinonediazide compound, and wherein after processing the surface of the photosensitive layer or the primer layer serves as an ink receivable image area, and

(c) a silicone rubber layer.

4,853,314

POSITIVE-WORKING RADIATION-SENSITIVE COATING SOLUTION AND POSITIVE PHOTORESIST MATERIAL WITH MONOALKYL ETHER OF 1,2-PROPANEDIOL AS SOLVENT

Hans Ruckert, and Ralf Ohlenmacher, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation of Ser. No. 946,621, Dec. 29, 1986, Pat. No. 4,764,450, which is a continuation of Ser. No. 742,063, Jun. 6, 1985, abandoned. This application Jun. 10, 1988, Ser. No. 204,719

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421160; Mar. 3, 1985, 3510220

The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.

Int. Cl.⁴ G03C *1/60, 1/74*

U.S. Cl. 430—191 **13 Claims**

1. A positive-working radiation-sensitive coating solution suitable as a photoresist, consisting essentially of, in admixture, (i) at least one polymeric binder which is soluble or swellable in alkaline media and soluble in mono-C_1 to C_4-alkyl ethers of 1,2-propanediol, said binder being present in an amount between about 30 and 90 percent by weight, relative to the total solids of said coating solution; (ii) a sufficient amount of at least one radiation-sensitive compound to impart radiation sensitivity to said coating solution; and (iii) an organic solvent present in an amount sufficient to solubilize said binder, which organic solvent consists essentially of a mono-C_1 to C_4-alkyl ether of 1,2propanediol in an amount of between about 80% and 100% by weight of said organic solvent.

4,853,315

O-QUINONE DIAZIDE SULFONIC ACID MONOESTERS USEFUL AS SENSITIZERS FOR POSITIVE RESISTS

Dennis R. McKean; Robert D. Miller, both of San Jose; Joseph G. Walsh, Oakland, and Carlton G. Willson, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1988, Ser. No. 144,825

Int. Cl.⁴ G03C *1/54, 1/60*; C07C *113/00*

U.S. Cl. 430—192 **6 Claims**

1. A radiation sensitive monoester of an acid selected from the group consisting of 1-oxo-2-diazonaphthalene-4-sulfonic acid and 1-oxo-2-diazonaphthalene-5-sulfonic acid and of an alcohol selected from the group consisting of 3-hydroxymethyl tricyclo decane and 4-hydroxymethyl tricyclo decane.

2. A positive resist composition comprising a resin in an amount sufficient to form a film and in an amount sufficient to sensitize it to radiation, a monoester as claimed in claim 1.

4,853,316

SUBBED SUPPORTS FOR IMAGING MATERIALS

James F. Sanders, St. Joseph, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 18, 1987, Ser. No. 121,938

Int. Cl.⁴ G03C *1/76, 1/68*

U.S. Cl. 430—272 **30 Claims**

1. A carrier element having a photopolymerizable composition on at least one surface thereof, said carrier element comprising a polymeric film or paper substrate having coated on said at least one surface thereof a continuous coating of a substantially aliphatic polymeric reaction product having at least twenty mole percent of polymeric bridging groups formed by the polymerization reaction which forms said polymeric reaction product present in said reaction product as

polyurea or biuret groups, said coating having a contact angle with water of greater than 60 degrees.

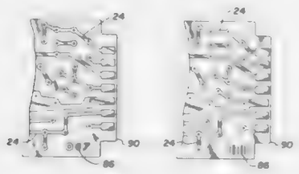
25. The carrier element of claim 1 wherein said polymerization reaction uses an amine containing a silane group as a reagent.

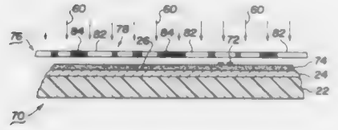
4,853,317

METHOD AND APPARATUS FOR SERIALIZING PRINTED CIRCUIT BOARDS AND FLEX CIRCUITS

Donald J. Hayes, Plano, Tex., assignor to Microfab Technologies, Inc., Plano, Tex.

Filed Apr. 4, 1988, Ser. No. 177,131
Int. Cl.[4] G03C 5/16
U.S. Cl. 430—318 12 Claims





1. A method of serializing a printed circuit board or flex circuit, said method comprising the steps of:

providing a printed circuit board or flex circuit having at least an insulating substrate which is covered on at least one side by a conductive foil layer which is covered by a layer of negative-acting photoresist material which is sensitive to a predetermined type of radiation;

reverse printing serializing information onto a predetermined area of said layer of negative-acting photoresist material with a fluid which blocks the passage therethrough of said predetermined type of radiation;

placing a photomask in operative position with respect to said layer of negative-acting photoresist material, said mask having at least a predetermined pattern of paths thereon which allows the passage therethrough of said predetermined type of radiation and other predetermined areas which block the passage therethrough of said predetermined type of radiation;

irradiating said photomask with said predetermined type of radiation such that said layer of negative-acting photoresist material will be exposed by the predetermined type of radiation passing through the predetermined pattern of paths on said photomask and said reverse printed serializing information but will not be exposed where the other predetermined areas are located on the photomask;

developing the layer of negative-acting photoresist material; and

etching the conductive foil layer where it is not covered by the negative-acting photoresist material to provide the predetermined pattern of paths and serializing information from the conductive foil on the insulating substrate.

4,853,318

PROCESS FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL USING A DEVELOPER COMPRISING SUBSTANTIALLY NO BENZYL ALCOHOL

Yoshihiro Fujita; Hiroshi Fujimoto; Takatoshi Ishikawa, and Shinzo Kishimoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 17, 1987, Ser. No. 15,647
Claims priority, application Japan, Feb. 17, 1986, 61-32465; Jul. 29, 1986, 61-178443
Int. Cl.[4] G03C 7/30, 5/24
U.S. Cl. 430—380 15 Claims

1. A process for processing a silver halide color photographic material, which comprises processing a silver halide color photographic material having at least one silver halide emulsion layer on a reflective support with a color developer containing not more than 0.5 ml/l of benzyl alcohol and containing a compound represented by formula wherein Z represents an atomic group forming an aromatic nucleus, wherein said processing comprises blixing and thereafter washing or stabilizing or washing and stabilizing with aldehyde compoundfree washing water or stabilizing liquid wherein the washing water or stabilizing liquid is replenished, and the amount of replenisher for the washing water or stabilizing liquid in the washing and/or stabilizing step is from 0.1 to 50 times the amount of liquid carried into the washing and/or stabilizing step from a bath prior to the washing and/or stabilizing step per unit area of the color photographic material.

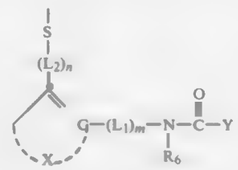
4,853,319

PHOTOGRAPHIC SILVER HALIDE ELEMENT AND PROCESS

Sundaram Krishnamurthy, Penfield; Brian H. Johnston; Kenneth N. Kilminster, both of Rochester; David C. Vogel, Holcomb, all of N.Y., and Paul R. Buckland, St. Albans, United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 944,095, Dec. 22, 1986, abandoned. This application Dec. 14, 1987, Ser. No. 132,531
Int. Cl.[4] G03C 7/38
U.S. Cl. 430—387 13 Claims

1. A photographic element comprising a support and at least one silver halide emulsion layer having associated therewith a pyrazolone photographic coupler having in the coupling position a coupling-off group represented by the formula:



wherein:

L_1 and L_2 individually are unsubstituted or substituted methylene or ethylene;

m and n individually are 0 or 1;

Y is R_1 or ZR_2;

R_1 is an unsubstituted or substituted aryl or heterocyclic group, or a secondary or tertiary carbon group represented by



wherein

R_3 and R_4 individually are selected from the group consisting of halogen, R_2 and Z_1R_b, or join together, with or without R_5, to form one or two unsubstituted or substituted alicyclic or heterocyclic rings;

Z is O, S, or NR_a;

Z_1 is O, S, or NR_c;

R_2 is an unsubstituted or substituted alkyl, aryl or heterocyclic group;

R_5 is hydrogen, halogen, an unsubstituted or substituted alkyl, aryl, or heterocyclic group or Z_1R_b, or joins together with at least one of R_3 and R_4 to form one or two unsubstituted or substituted alicyclic or heterocyclic rings;

R_6, R_a and R_c are individually alkyl, aryl or heterocyclic groups;

R_b is an unsubstituted or substituted alkyl, aryl or heterocyclic group when Z_1 is O then R_b is othe than substituted phenyl; and

X represents atoms selected from the group consisting of carbon, oxygen, nitrogen, and sulfur atoms necessary to complete a 5-, 6-, or 7-member unsubstituted or substituted unsaturated ring.

4,853,320

METHOD OF LOCALLY PROVIDING METAL ON A SURFACE OF A SUBSTRATE

Johannes W. M. Jacobs, and Johannes M. G. Rikken, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 2, 1987, Ser. No. 116,413
Claims priority, application Netherlands, Sep. 16, 1987, 8702219
Int. Cl.[4] G03F 7/00
U.S. Cl. 430—413 7 Claims

1. A method of locally providing a metal image of dimensions less than 10 μm on the surface of a substrate, in which method the substrate is provided at its surface with an electrocatalytic image, which image is brought into contact with an electroless metal-plating solution containing a metal salt and a reducing agent capable of reducing the metal ions of said metal salt to metal thereby causing metal to be deposited from said solution onto said electrocatalytic image to thereby intensify said image characterized in that reduction of oxygen in said soltution by said reducing agent is counteracted at least relative to the reduction of the metal ions of the metal salt by said reducing agent.

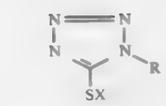
4,853,321

METHOD OF FORMING A COLOR IMAGE AND SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL USING DEVELOPER WITH SUBSTANTIALLY NO BENZYL ALCOHOL AND LOW BROMIDE CONCENTRATION

Yasuhito Momoki; Masahiro Asami; Nobuo Sakai, and Shigeaki Otani, all of Kanagawa, Japan, assignors to Fuji Photo Film, Co., Ltd., Kanagawa, Japan

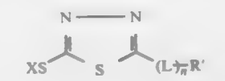
Filed May 19, 1987, Ser. No. 51,437
Claims priority, application Japan, May 19, 1986, 61-114276
Int. Cl.[4] G03C 7/30, 5/24, 1/34
U.S. Cl. 430—380 25 Claims

1. A method of forming a color image which comprises processing a silver halide color photographic material comprising a reflective support having thereon at least one light-sensitive layer containing at least one coupler which forms a dye upon a coupling reaction with an oxidation product of an aromatic primary amine color developing agent and a silver halide emulsion which contains at least 80% by mol of silver chloride with a color developing solution which contains not more than 0.002 mol of a bromine ion per liter for a development time of not more than 2 minutes and 30 seconds in the presence of at least one compound represented by the following formula (I), (II), or (III):



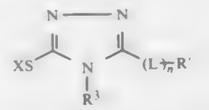
(I)

wherein R represents an alkyl group, an alkenyl group, or an aryl group; and X represents a hydrogen atom, an alkali metal atom, an ammonium group, or a precursor;



(II)

wherein L represents a divalent connecting group; R' represents a hydrogen atom, an alkyl group, an alkenyl group, or an aryl group; X has the same meaning as defined in formula (I); and n represents 0 or 1; and



(III)

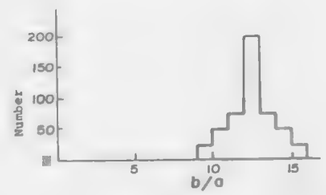
wherein R^1, X, L, and n each has the same meaning as defined in formula (II); R^3 has the same meaning as defined for R'; and R^1 and R^3 may be the same or different, wherein the color developing solution has a benzyl alcohol concentration of not more than 0.5 ml per liter of the color developing solution and wherein the content of silver iodide in the silver halide emulsion which contains at least 80% by mol of silver chloride is not more than 1% by mol.

4,853,322

LIGHT-SENSITIVE SILVER HALIDE EMULSION AND COLOR PHOTOGRAPHIC MATERIALS USING THE SAME

Katsumi Makino; Yuichi Ohashi; Hiroshi Takehara; Yoichi Suga, and Takekimi Shiozawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 28, 1987, Ser. No. 138,267
Claims priority, application Japan, Dec. 26, 1986, 61-311130
Int. Cl.[4] G03C 1/02, 1/46
U.S. Cl. 430—567 28 Claims



1. A light-sensitive silver halide emulsion comprising light-sensitive silver halide grains in a binder, wherein tabular grains having a diameter of at least 0.15 μm account for at least 70% of the total projected area of said silver halide grains, said tabular grains have a mean aspect ratio of not more than 8.0, and at least 50% (by number) of all of said tabular grains are tabular grains in which the ratio (b/a) of the thickness (b) of said tabular grain to the longest spacing (a) between two or more parallel twinning planes of said tabular grain is at least 5.

4,853,323

SILVER HALIDE EMULSION

Hideo Ikeda; Shuzo Suga, and Nobuaki Miyasaka, all of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 15, 1986, Ser. No. 919,136
Claims priority, application Japan, Oct. 16, 1985, 60-230828
Int. Cl.[4] G03C *1/10*
U.S. Cl. 430—569 **18 Claims**

8. A process for producing a silver halide emulsion wherein the silver halide grain is formed in the presence of a thiocyanate so that an absorbance of at least 0.015 due to thiocyanate ion is observed at 2052 cm^{-1} on infrared spectroscopic analysis of the silver halide contained in the silver halide emulsion, and a tricarboxylic acid or its salt is added from the beginning of the formation of the silver halide grain to immediately before the application of the emulsion.

4,853,324

LIVER ASSIST DEVICE EMPLOYING TRANSFORMED CELL LINES

Joseph M. Viles, 2407 Knapp St., Ames, Iowa 50010, and Paul V. Hart, Rte. 1, Lawson, Mo. 64062

Division of Ser. No. 803,564, Dec. 2, 1985, Pat. No. 4,675,002.
This application Nov. 17, 1986, Ser. No. 931,249
Int. Cl.[4] A01N *1/02*; C12N *7/00, 5/00*
U.S. Cl. 435—2 **9 Claims**

1. A method of preparing a semipermeable membrane presenting a pair of opposed faces for use as a liver assist device, said method comprising the steps of:

providing a mass of priamry hepatocytes;

reversibly transforming said hepatocytes to cause the hepatocytes to proliferate in vitro, and to decrease the contact inhibition thereof;

culturing said reversibly transformed hepatocytes on one face of said membrane until at least a confluent monolayer of reversibly transformed hepatocytes is formed thereon, said culturing step comprising the steps of seeding said one face with an effective quantity of said reversibly transformed hepatocytes to form said confluent monolayer, and continuously circulating culture medium which supports the growth of said reversibly transformed hepatocytes into contact with the reversibly transformed hepatocytes for a period of from about 1 to 48 days; and

causing said cultured, reversibly transformed hepatocytes to revert to the somatic phenotype thereof.

4,853,325

SALIVA TEST FOR FELINE LEUKEMIA VIRUS

Morton A. Vodian, Escondido; Eric S. Bean, San Diego, and Eric D. LeMoine, Poway, all of Calif., assignors to Synbiotics Corporation, San Diego, Calif.

Filed Mar. 26, 1986, Ser. No. 844,098
Int. Cl.[4] G01N *33/569, 33/577*
U.S. Cl. 435—5 **19 Claims**



7. A method for detecting a feline leukemia virus (FeLV) infection in a cat, comprising:

inserting a probe into a cat's oral cavity, the probe comprising an immunochemically sensitive member having a test submember coated with immobilized anti-p27 antibody and having a wettable surface, then

contacting said immunochemically sensitive member with saliva in the cat's oral cavity, thereby wetting a sample of the cat's saliva onto said member, then

removing said probe from the cat's oral cavity, then

transferring said probe to an incubation vessel, said vessel containing an incubation solution comprising a soluble enzyme conjugate of anti-p27 antibody, the volume of the incubation solution being sufficient for submerging said immunochemically sensitive member, then

incubating said immunochemically sensitive member with said incubation solution under conditions suitable for binding p27 antigens and FeLV particles in the saliva sample to both the immobilized anti-p27 antibody and the soluble enzyme conjugate, whereby p27 antigens or FeLV particles become sandwiched between said immobilized anti-p27 antibody and said soluble anti-p27 antibody of the enzyme conjugate, the enzyme conjugate thereby becoming bound onto the test submember in proportion to the presence of p27 antigens and FeLV particles in the saliva sample, then

removing said probe from said incubation vessel, then

rinsing unbound soluble enzyme conjugate of anti-p27 antibody from said probe, then

developing the bound enzyme conjugate of anti-p27 antibody remaining on said probe by contacting and incubating the washed probe with a developing solution containing a chromogenic substrate for said enzyme, and then

observing the development of a color specific for the presence of the bound enzyme conjugate.

4,853,326

CARBOHYDRATE PERTURBATIONS OF VIRUSES OR VIRAL ANTIGENS AND UTILIZATION FOR DIAGNOSTIC PROPHYLACTIC AND/OR THERAPEUTIC APPLICATIONS

Gerard A. Quash, France Ville, France; John D. Rodwell, Yardley; Thomas J. McKearn, New Hope, both of Pa., and Jean P. Ripoll, Chassieu, France, assignors to Cytogen Corporation, Princeton, N.J.

Filed Nov. 18, 1986, Ser. No. 928,631
Claims priority, application France, Nov. 25, 1985, 85 17377
Int. Cl.[4] G01N *33/531, 33/569, 33/571, 33/576*
U.S. Cl. 435—5 **18 Claims**

1. A method for detecting virus neutralizing antibodies in an aqueous sample, comprising:

(a) contacting (i) a ligand which comprises a virus, viral antigen or fragment thereof, said virus, viral antigen or fragment thereof having perturbed oligosaccharide moiety, in which said perturbed oligosaccharide moiety was obtained by oxidation, by means of an agent selected from the group consisting of periodic acid, salts thereof, paraperiodic acid, salts thereof, metaperiodic acid, salts thereof, and oxidase enzymes, of an unperturbed oligosaccharide moiety, with (ii) an aqueous sample suspected of containing virus neutralizing antibodies in an assay system selected from the group consisting of an enzyme-linked immunosorbent assay, a radioimmunoassay, an agglutination assay, and an immunofluorescence assay; and

(b) detecting any reaction with the ligand; in which any reaction with the ligand indicates the presence of neutralizing antibodies in the sample.

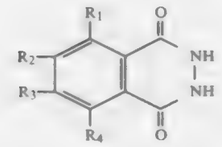
4,853,327

ENHANCED PHTHALAZINEDIONE CHEMILUMINESCENCE

Nanibhushan Dattagupta, New Haven, Conn., assignor to Molecular Diagnostics, Inc., West Haven, Conn.

Filed Jul. 10, 1985, Ser. No. 753,739
Int. Cl.[4] G01N *33/532*; C12Q *1/68*
U.S. Cl. 435—6 **20 Claims**

1. In a process for the generation of light chemiluminescently by contacting a chemiluminescence precursor, an oxidant, and an enzyme, the improvement which comprises said chemiluminescense precursor being a 2,3-dihydro-1,4-phthalazinedione of the formula



wherein R_1 is an amino and R_2, R_3 and R_4 are all H, and wherein R_1 is amino and each of R_2, R_3 and R_4 is unsubstituted or substituted C_1–C_6 alkyl, unsubstituted or substituted alkenyl, unsubstituted or substituted hydroxyl, C_1–C_6 alkoxy, carboxyl, or amino, or R_2 is amino and each of R_1, R_3 and R_4 is H, unsubstituted or substituted C_1–C_6-alkyl, unsubstituted or substituted C_2–C_{10} alkenyl, unsubstituted or substituted hydroxyl, C_1–C_6 alkoxy, carboxyl, or amino, or R_1 and R_2 together with the ring carbons they are attached to form a fused benz ring substituted with an amino or substituted amino group, and each of R_3 and R_4 is H, unsubstituted or substituted C_1–C_6-alkyl, unsubstituted or substituted alkenyl, unsubstituted or substituted hydroxyl, C_1–C_6-alkoxy, carboxyl or amino, substituents for said substituted alkyl and alkenyl being selected from the group consisting of chlorine, flourine, bromine, iodine, hydroxy, carboxy, nitro, cyano and thiol, said substituted amino being substituted by a substituent selected from the group consisting of C_1 to C_{10} alkyl and C_2 to C_{10} alkenyl, said substituted hydroxy being substituted by a substituent selected from the group consisting of C_1 to C_{10} alkyl and C_2 to C_{10} alkenyl, said enzyme being a peroxidase enzyme and effecting such cntact in the presence of a nitrogen compound selected from the group consisting of (a) ammonia and its salts, (b) a heterocyclic aromatic, wherein said heterocyclic aromatic is selected from the group consisting of imidazoles and alkyl derivatives thereof, pyridine and alkyl derivatives thereof and thiazine, said thiazine selected from the group consisting of thionine and methylene blue, and (c) a water-soluble organic amine, said water-soluble organic amine selected from the group consisting of alkyl amines, polyamines selected from the group consisting of spermine, spermidine and putrescine, benzylamine, said alkyl amine being of the formula



wherein X_1, X_2 and X_3 are the same or different and are unsubstituted alkyl having 1 to 8 carbon atoms or alkyl having 1 to 8 carbon atoms and substituted by a substituent selected from the group consisting of hydroxy, nitro, fluorine, chlorine, bromine, iodine and carboxy.

4,853,328

REAGENT FOR ASSAYING HYDROGEN PEROXIDE AND METHOD OF QUANTITATIVE ASSAY FOR HYDROGEN PEROXIDE

Masaki Okazaki, and Yoshio Inagaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

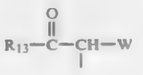
Continuation of Ser. No. 357,938, Mar. 15, 1982, abandoned.
This application May 9, 1986, Ser. No. 862,195
Claims priority, application Japan, Mar. 13, 1981, 56-36050
Int. Cl.[4] C12Q *1/28, 1/26*; G01N *33/535*
U.S. Cl. 435—28 **5 Claims**

1. A method of assaying hydrogen peroxide which comprises reacting a sample liquid containing hydrogen peroxide with a reagent kit for assaying hydrogen peroxide and incubating the resulting mixture of the sample liquid and the reagent kit and determining the intensity of fluorescence emitted in proportion to hydrogen peroxide as a result of the incubation, wherein the reagent kit comprises:

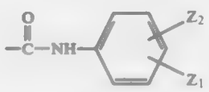
(1) a compound having a coupler moiety formed at a coupling size by removing one hydrogen atom from an active methylene group of the formula —CH_2— having directly or indirectly bonded thereto an electron withdrawing or electron attracting group, and a fluorescing moiety, which compound is represented by the formula:

Q—Fl

wherein Q represents the coupler moiety formed at the coupling site by removing one hydrogen atom from the active methylene group of the formula —CH_2—, which coupler moiety is a yellow coupler moiety which causes an oxidative coupling reaction with an oxidized product of a hydrogen donor, which yellow coupler moiety is represented by the formula:



wherein R_{13} represents an alkyl group having 1 to 10 carbon atoms, an aryl group having 6 to 10 carbon atoms or an amino group; and wherein W is



—$COOC_2H_5$, —$COOC_6H_{13}$, —C≡N or $COOC_4H_9$; wherein Z_1 and Z_2 are from the pairs:

H, —Cl;

—OCH_3, —$COOC_2H_5$;

—Cl, —$NHCCH_3$;

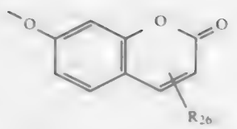
O

H, H;

—COOH, —COOH;

—OCH_3, —$COOC_6H_{13}$; or

H, —COOH; and wherein Q is bonded to Fl by an active methine group therein; and Fl represents the fluorescing moiety which emits fluoroescence by being separated from Q, which moiety is represented by the formula:



wherein R_{26} is a hydrogen atom, an alkyl group having 1 to 10 carbon atoms or an aryl group having 6 to 10 carbon atoms, wherein Fl is splittable from Q—Fl;

(2) a hydrogen donor and

(3) a peroxidase, and measuring the intensity of the fluorescence emitted from the fluorescing moiety formed by the reaction of hydrogen peroxide, the hydrogen donor and the compound of the formula Q—Fl in the presence of peroxidase.

4,853,329

STABILIZATION OF MICROBIAL RENNET

Herbert J. Havera, Edwardsburg, Mich.; John D. Humphreys, Elkhart, and Joan M. Jazdzewski, South Bend, both of Ind., assignors to Miles Inc., Elkhart, Ind.

Filed Jun. 27, 1988, Ser. No. 214,027

Int. Cl.[4] G09B *17/00*

U.S. Cl. 435—183 **10 Claims**

1. An aqueous solution of microbial rennet which has been derived from an organism of the species *Rhizomucor pusillus* and oxidized to increase its thermal lability having a pH within the range of from 6.0 to 8.5 which rennet solution exhibits greater storage stability than do such solutions whose pH is below 6.0.

4,853,330

HUMAN TISSUE PLASMINOGEN ACTIVATOR

David V. Goeddel, Hillsborough; William J. Kohr, San Mateo; Diane Pennica, Foster City, and Gordon A. Vehar, San Carlos, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 483,052, Apr. 7, 1983, Pat. No. 4,766,075, which is a continuation-in-part of Ser. No. 398,003, Jul. 14, 1982, abandoned, and a continuation-in-part of Ser. No. 374,860, May 5, 1982, abandoned. This application Apr. 21, 1988, Ser. No. 184,477

The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.

Int. Cl.[4] C12N *9/64, 9/48, 5/00, 1/20, 15/00*

U.S. Cl. 435—226 **15 Claims**

1. A process which comprises expressing a DNA sequence encoding human tissue plasminogen activator in a recombinant host cell, said recombinant host cell being a microorganism or cell culture transformed with an expression vector containing said DNA sequence.

4,853,331

CLONING AND EXPRESSION OF *BACILLUS THURINGIENSIS* TOXIN GENE TOXIC TO BEETLES OF THE ORDER COLEOPTERA

Corinna Herrnstadt, San Diego, and Edward Wilcox, Escondido, both of Calif., assignors to Mycogen Corporation, San Diego, Calif.

Division of Ser. No. 219,420, Jul. 15, 1988, which is a continuation-in-part of Ser. No. 767,227, Aug. 16, 1985. This application Nov. 30, 1988, Ser. No. 278,292

The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.

Int. Cl.[4] C12N *1/20, 5/00, 15/00;* **C07K** *13/00*

U.S. Cl. 435—252.1 **1 Claim**

1. A host transformed by a recombinant DNA transfer vector comprising DNA coding for a protein toxin having the following amino acid sequence:

```
                5                  10                  15
Met Asn Pro Asn Asn Arg Ser Glu His Asp Thr Ile Lys Thr Thr

               20                  25                  30
Glu Asn Asn Glu Val Pro Thr Asn His Val Gln Tyr Pro Leu Ala

               35                  40                  45
Glu Thr Pro Asn Pro Thr Leu Glu Asp Leu Asn Tyr Lys Glu Phe

               50                  55                  60
Leu Arg Met Thr Ala Asp Asn Asn Thr Glu Ala Leu Asp Ser Ser

               65                  70                  75
Thr Thr Lys Asp Val Ile Gln Lys Gly Ile Ser Val Val Gly Asp

               80                  85                  90
Leu Leu Gly Val Val Gly Phe Pro Phe Gly Gly Ala Leu Val Ser

               95                 100                 105
Phe Tyr Thr Asn Phe Leu Asn Thr Ile Trp Pro Ser Glu Asp Pro

              110                 115                 120
Trp Lys Ala Phe Met Glu Gln Val Glu Ala Leu Met Asp Gln Lys

              125                 130                 135
Ile Ala Asp Tyr Ala Lys Asn Lys Ala Leu Ala Glu Leu Gln Gly

              140                 145                 150
Leu Gln Asn Asn Val Glu Asp Tyr Val Ser Ala Leu Ser Ser Trp

              155                 160                 165
Gln Lys Asn Pro Val Ser Ser Arg Asn Pro His Ser Gln Gly Arg

              170                 175                 180
Ile Arg Glu Leu Phe Ser Gln Ala Glu Ser His Phe Arg Asn Ser

              185                 190                 195
Met Pro Ser Phe Ala Ile Ser Gly Tyr Glu Val Leu Phe Leu Thr

              200                 205                 210
Thr Tyr Ala Gln Ala Ala Asn Thr His Leu Phe Leu Leu Lys Asp

              215                 220                 225
Ala Gln Ile Tyr Gly Glu Glu Trp Gly Tyr Glu Lys Glu Asp Ile

              230                 235                 240
Ala Glu Phe Tyr Lys Arg Gln Leu Lys Leu Thr Gln Glu Tyr Thr

              245                 250                 255
Asp His Cys Val Lys Trp Tyr Asn Val Gly Leu Asp Lys Leu Arg

              260                 265                 270
Gly Ser Ser Tyr Glu Ser Trp Val Asn Phe Asn Arg Tyr Arg Arg

              275                 280                 285
Glu Met Thr Leu Thr Val Leu Asp Leu Ile Ala Leu Phe Pro Leu

              290                 295                 300
Tyr Asp Val Arg Leu Tyr Pro Lys Glu Val Lys Thr Glu Leu Thr

              305                 310                 315
Arg Asp Val Leu Thr Asp Pro Ile Val Gly Val Asn Asn Leu Arg

              320                 325                 330
Gly Tyr Gly Thr Thr Phe Ser Asn Ile Glu Asn Tyr Ile Arg Lys

              335                 340                 345
Pro His Leu Phe Asp Tyr Leu His Arg Ile Gln Phe His Thr Arg

              350                 355                 360
Phe Gln Pro Gly Tyr Tyr Gly Asn Asp Ser Phe Asn Tyr Trp Ser

              365                 370                 375
Gly Asn Tyr Val Ser Thr Arg Pro Ser Ile Gly Ser Asn Asp Ile

              380                 385                 390
Ile Thr Ser Pro Phe Tyr Gly Asn Lys Ser Ser Glu Pro Val Gln
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-continued

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              395                 400                 405
Asn Leu Glu Phe Asn Gly Glu Lys Val Tyr Arg Ala Val Ala Asn

              410                 415                 420
Thr Asn Leu Ala Val Trp Pro Ser Ala Val Tyr Ser Gly Val-Thr

              425                 430                 435
Lys Val Glu Phe Ser Gln Tyr Asn Asp Gln Thr Asp Glu Ala Ser

              440                 445                 450
Thr Gln Thr Tyr Asp Ser Lys Arg Asn Val Gly Ala Val Ser Trp

              455                 460                 465
Asp Ser Ile Asp Gln Leu Pro Pro Glu Thr Thr Asp Glu Pro Leu

              470                 475                 480
Glu Lys Gly Tyr Ser His Gln Leu Asn Tyr Val Met Cys Phe Leu

              485                 490                 495
Met Gln Gly Ser Arg Gly Thr Ile Pro Val Leu Thr Trp Thr His

              500                 505                 510
Lys Ser Val Asp Phe Phe Asn Met Ile Asp Ser Lys Lys Ile Thr

              515                 520                 525
Gln Leu Pro Leu Val Lys Ala Tyr Lys Leu Gln Ser Gly Ala Ser

              530                 535                 540
Val Val Ala Gly Pro Arg Phe Thr Gly Gly Asp Ile Ile Gln Cys

              545                 550                 555
Thr Glu Asn Gly Ser Ala Ala Thr Ile Tyr Val Thr Pro Asp Val

              560                 565                 570
Ser Tyr Ser Gln Lys Tyr Arg Ala Arg Ile His Tyr Ala Ser Thr

              575                 580                 585
Ser Gln Ile Thr Phe Thr Leu Ser Leu Asp Gly Ala Pro Phe Asn

              590                 595                 600
Gln Tyr Tyr Phe Asp Lys Thr Ile Asn Lys Gly Asp Thr Leu Thr

              605                 610                 615
Tyr Asn Ser Phe Asn Leu Ala Ser Phe Ser Thr Pro Phe Glu Leu

              620                 625                 630
Ser Gly Asn Asn Leu Gln Ile Gly Val Thr Gly Leu Ser Ala Gly

              635                 640
Asp Lys Val Tyr Ile Asp Lys Ile Glu Phe Ile Pro Val Asn
```

and variations thereof, wherein, the biological activity is retained.

4,853,332

STRUCTURAL GENES, PLASMIDS AND TRANSFORMED CELLS FOR PRODUCING CYSTEINE DEPLETED MUTEINS OF BIOLOGICALLY ACTIVE PROTEINS

David F. Mark, Danville; Leo S. Lin, Fremont, and Shi-Da Yu Lu, Oakland, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Division of Ser. No. 564,224, Dec. 20, 1983, Pat. No. 4,518,584, which is a continuation-in-part of Ser. No. 486,162, Apr. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 435,154, Oct. 19, 1982, abandoned. This application Dec. 21, 1984, Ser. No. 684,483

Claims priority, application Ireland, Oct. 10, 1983, 2380/83

Int. Cl.[4] C12N *1/20, 15/00;* **C07H** *21/04*

U.S. Cl. 435—252.33 **17 Claims**

1. A structural gene having a DNA sequence that encodes a synthetic interleukin-2 mutein wherein the cysteine residue at position 125, numbered in accordance with native human interleukin-2, is replaced by a neutral amino acid.

4,853,333

PRODUCTION OF ROTAVIRUS IN YEAST

Chu-lai Hsiao, Wilmington, Del.; Bruce B. Mason, St. Davids, and Alan R. Davis, Wayne, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Jul. 26, 1985, Ser. No. 759,546

Int. Cl.[4] C12N *15/00, 5/00;* **C12P** *21/00*

U.S. Cl. 435—256 **2 Claims**

1. The *Saccharomyces cerevisiae* expression vector pWY4-3 which comprises a DNA sequence coding for the human WA rotavirus surface antigen VP7 and which vector when transformed into a suitable *Saccharomyces cerevisiae* strain confers upon said strain the ability to produce glycosylated human WA rotavirus surface antigen VP7.

4,853,334

METHOD FOR THE DEGRADATION OF VOLATILE CHLORINATED ALIPHATIC HYDROCARBONS USING *PSEUDOMONAS FLUORESCENS*

Peter A. Vandenbergh, Sarasota, and Blair S. Kunka, Bradenton, both of Fla., assignors to Microlife Technics, Inc., Sarasota, Fla.

Filed Apr. 27, 1988, Ser. No. 186,962

Int. Cl.[4] C07B *63/00;* **C07C** *19/00*

U.S. Cl. 435—262 **20 Claims**

1. A process for degrading a halogenated aliphatic hydrocarbon containing 1 to 3 carbon atoms which comprises:

(a) inoculating a halogenated aliphatic hydrocarbon containing composition with a number of *Pseudomonas fluorescens* NRRL-B-18296 sufficient to produce degradation; and

(b) incubating the Pseudomonas fluorescens in the composition in the presence of oxygen or an oxygen source at a temperature which allows the *Pseudomonas fluorescens* NRRL-B-18296 to degrade a substantial portion of the halogenated aliphatic hydrocarbon to carbon dioxide, water and hydrochloric acid.

4,853,335

COLLOIDAL GOLD PARTICLE CONCENTRATION IMMUNOASSAY

Duane A. Olsen, 7619 44 West No. 2, Tacoma, Wash. 98466, and David Bernstein, 5814 Melville Rd., Sykesville, Md. 21784

Filed Sep. 28, 1987, Ser. No. 101,415

Int. Cl.[4] G01N *33/543, 33/544*

U.S. Cl. 436—527 **27 Claims**

1. A method for detecting in a biological specimen the presence of a ligand or an antiligand selected from the group consisting of antigens, haptens, antibodies and nucleic acids, said method comprising the steps of:

(a) adding to said biological specimen (1) a colloidal gold labeled ligand or a colloidal gold labeled antiligand and (2) solid phase capture particles coated with ligand or with antiligand;

(b) applying the resultant of step (a) to a small zone on a porous film, said film having a minimal effective pore size smaller than (2) but greater than the size of (1), whereby the capture particles (2) are deposited on the exposed surface of the porous film; and

(c) observing the small zone of the porous film for any color development due to (1) having become bound to (2).

4,853,336

SINGLE CHANNEL CONTINUOUS FLOW SYSTEM

Stephen Saros, Wantagh; John L. Smith, New City; Michael M. Cassaday, Peekskill, all of N.Y.; Rand E. Herron, Wilton, Conn., and Milton H. Pelavin, Chappaqua, N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 798,509, Nov. 15, 1985, abandoned, which is a continuation of Ser. No. 441,881, Nov. 15, 1982, abandoned. This application Feb. 2, 1987, Ser. No. 10,236

Int. Cl.[4] G01N *35/08*

U.S. Cl. 436—53 11 Claims

1. A method of reacting discrete liquid segments passing tnrough sequential first, second and third sections of a single conduit, which method comprises the steps of:

(a) introducing and passing a first segment of a liquid sample and a second segment of a liquid reagent separated by a first gas segment into and along said first conduit section;

(b) forming the first gas segment to occlude said first conduit section to maintain the first and second liquid segments separate while in said first conduit section;

(c) rendering the first gas segment ineffective to occlude said second conduit section to combine in said second conduit section the first and second liquid segments, which had been previously maintained separate in said first conduit section, to provide a combined liquid segment;

(d) completely mixing the combined liquid segment in said third conduit section;

(e) receiving the completely mixed combined liquid segment and the gas segment from said third conduit section; and

(f) analyzing the completely combined liquid segment.

4,853,337

BLENDING OF HYDROCARBON LIQUIDS

Ghazi B. Dickakian, Kingwood, Tex., assignor to Exxon Chemicals Patents Inc., Linden, N.J.

Continuation-in-part of Ser. No. 48,167, May 11, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 253,940

Int. Cl.[4] G01N *30/90;* Z10G *9/12*

U.S. Cl. 436—55 17 Claims

1. A method of blending two hydrocarbon liquids to form a hydrocarbon liquid blend of reduced fouling tendency, said method comprising:

(a) selecting a first hydrocarbon liquid which contains asphaltenes incompatible with the oil fraction thereof;

(b) selecting a second hydrocarbon liquid which contains substantially no asphaltenes or the asphaltenes thereof are more compatible in the oil fraction thereof than the asphaltenes in the first hydrocarbon liquid oil fraction;

(c) blending the two hydrocarbon liquids to form a stream;

(d) determining the level incompatible asphaltenes in the blend stream; and

(e) adjusting the relativde proportions of each hydrocarbon liquid added in step (c) in response to step (d) to maintain the level of incompatible asphaltenes in the blend substantially below the level of incompatible asphaltenes in the first hydrocarbon liquid.

4,853,338

CYANIDE-FREE HEMOGLOBIN REAGENT

Jeffrey Benezra, Bronx, N.Y., and Michael J. Malin, Park Ridge, N.J., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 52,646, May 20, 1987, abandoned. This application Dec. 13, 1988, Ser. No. 284,804

Int. Cl.[4] G01P *33/48*

U.S. Cl. 436—66 5 Claims

1. A method for determining hemoglobin in a blood sample which comprises the step of:

(a) combining the blood sample with a reagent composition including an ionic surfactant at a concentration of from about 2 to 4 percent weight to volume, which reagent composition has a pH of from about 11.3 to about 13.7 and is free of ionic cyanide to form a reaction mixture;

(b) measuring the absorbence of said reaction mixture as an indication of hemoglobin in said blood sample.

4,853,339

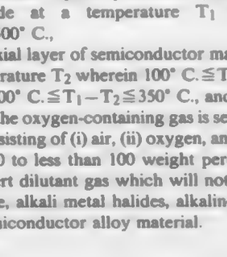
METHOD OF SENSITIZING PB-SALT EPITAXIAL FILMS FOR SCHOTTKY DIODES

Tak-Kin Chu, Bethesda, and Francisco Santiago, Elkridge, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 27, 1988, Ser. No. 224,962

Int. Cl.[4] H01L *31/18, 21/44*

U.S. Cl. 437—2 11 Claims



1. In a process for preparing an infrared sensitive photodiode comprising the steps of

(1) forming by vacuum deposition an epitaxial layer of a semiconductor alloy material selected from the group consisting of PbS, PbSe, PbTe, PbS_xSe_{1-x}, PbS_xTe_{1-x}, $PbSe_xTe_{1-x}$, $Pb_ySn_{1-y}S$, $Pb_ySn_{1-y}Se$, $Pb_ySn_{1-y}Te$, $Pb_ySn_{1-y}S_xSe_{1-x}$, $Pb_ySn_{1-y}S_xTe_{1-x}$, $Pb_ySn_{1-y}Se_xTe_{1-x}$, $Pb_zCd_{1-z}S$, $Pb_zCd_{1-z}Se$, $Pb_zCd_{1-z}Te$, $Pb_zCd_{1-z}S_xSe_{1-x}$, $Pb_zCd_{1-z}S_xTe_{1-x}$, and $Pb_zCd_{1-z}Se_xTe_{1-x}$, wherein $0<x<1$, $0<y<1$, and $0<z<1$, to cover at least a portion of the surface of a substrate composed of an infrared transparent single crystal material selected from the group consisting of

(a) alkali metal halides and

(b) alkaline earth halides;

(2) vacuum depositing Pb metal onto a portion of the epitaxial layer of semiconductor alloy material to form a non-Ohmic Pb metal contact; and

(3) forming an Ohmic contact on another portion of the epitaxial layer of semiconductor alloy material;

the improvement comprising:

after step (1) but prior to step (2), forming a layer of a lead halide selected from the group consisting of $PbCl_2$, $PbBr_2$, PbF_2, and mixtures thereof on the epitaxial layer of semiconductor alloy material by exposing the epitaxial layer to vapor of the lead halide in the presence of a flow of oxygen-containing gas wherein

(a) the lead halide vapor is produced by heating the solid lead halide at a temperature T_1 wherein $200° C. \leqq T_1 \leqq 500° C.$,

(b) the epitaxial layer of semiconductor material is heated at a temperature T_2 wherein $100° C. \leqq T_2 \leqq 300° C.$ and wherein $100° C. \leqq T_1 - T_2 \leqq 350° C.$, and

(c) wherein the oxygen-containing gas is selected from the group consisting of (i) air, (ii) oxygen, and (iii) a mixture of from 20 to less than 100 weight percent of oxygen and an inert dilutant gas which will not react with the lead halide, alkali metal halides, alkaline earth halides, or the semiconductor alloy material.

4,853,340

SEMICONDUCTOR DEVICE ISOLATED BY A PAIR OF FIELD OXIDE REGIONS

Michio Komatsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

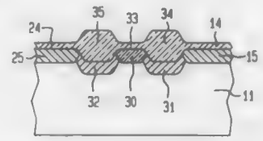
Division of Ser. No. 842,797, Mar. 24, 1986, Pat. No. 4,748,489.

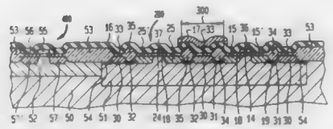
This application Mar. 31, 1988, Ser. No. 176,145

Claims priority, application Japan, Mar. 22, 1985, 60-57801

Int. Cl.[4] H01L *21/316, 21/76*

U.S. Cl. 437—20 4 Claims





1. A method of manufacturing an integrated circuit semiconductor device, said device comprising a semiconductor substrate, a first area of one conductivity type positioned in said substrate and having a first impurity concentration, first and second circuit elements provided in said first area of said substrate, and an isolation structure provided in said first area of said substrate between said first and second circuit elements, said isolation structure including a pair of thick insulating layers formed in said first area of said substrate and being located with a gap therebetween, a thin insulating layer formed on a surface of said first area at said gap and bridging said pair of thick insulating layers, a first impurity portion of said one conductive type having a second impurity concentration higher than said first impurity concentration and formed in said first area under said thin insulating layer, and a pair of second impurity portions of said one conductivity type having a third impurity concentration higher than said first impurity concentration and lower than said second impurity concentration, said pair of second impurity portions being formed in said first area under said pair of thick insulating layers,

said method comprising the steps of forming said pair of second impurity portions and said pair of thick insulating layers of said isolation structure, thereafter forming said thin insulating layer of said isolation structure, and forming said first impurity portion of said isolation structure by ion-implanting impurities through said thin insulating layer.

4,853,341

PROCESS FOR FORMING ELECTRODES FOR SEMICONDUCTOR DEVICES USING FOCUSED ION BEAMS

Tadashi Nishioka; Yoji Mashiko; Hiroaki Morimoto, and Hiroshi Koyama, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 9, 1987, Ser. No. 118,031

Claims priority, application Japan, Mar. 25, 1987, 62-72211; Jul. 15, 1987, 62-174909

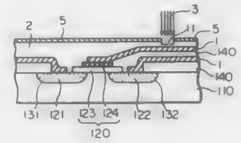
Int. Cl.[4] H01L *21/265, 21/20, 21/44*

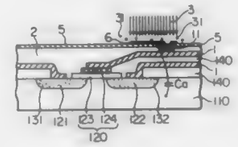
U.S. Cl. 437—24 18 Claims

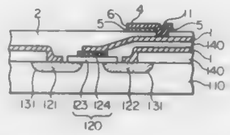
14. A process for forming electrodes for semiconductor devices having a semiconductor substrate and an electrically conductive portion covered and protected by an electrically insulating coating, said process comprising the steps of:

forming a first electrically conductive film on the electrically insulating coating;

forming an electrode to be connected to an external circuit on said first electrically conductive film at a position overlying the electrically conductive portion on a portion of said first electrically conductive film by exposing portions of the electrically insulating coating and the first electrically conductive film to a converged ion beam in the presence of a gaseous or vaporized metal compound







such as tungsten carbonyl and molybdenum carbonyl that is decomposed where irradiated by the converged ion beam to produce a metal film;

electrically connecting said electrode to a portion of the first electrically conducting film; and

removing the portions of the first electrically conductive film that are not covered by said electrode.

4,853,342

METHOD OF MANUFACTURING SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING TRANSISTOR

Shin-ichi Taka, Yokosuka, and Jiro Ohshima, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

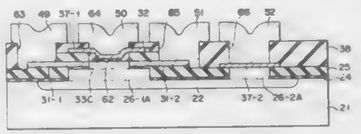
Continuation of Ser. No. 231,035, Aug. 11, 1988, abandoned.

This application Jan. 24, 1989, Ser. No. 300,224

Claims priority, application Japan, Aug. 14, 1987, 62-202664

Int. Cl.[4] H01L *21/265*

U.S. Cl. 437—31 20 Claims



1. A method of manufacturing a semiconductor integrated circuit device comprising steps of:

selectively forming a high-concentration impurity region of a second conductivity type in a major surface region of a semiconductor substrate of a first conductivity type;

forming a first thermal oxide film on a major surface of said semiconductor substrate;

forming a first insulating layer on said first thermal oxide film;

forming first and second openings in prospective base/emitter and collector regions, respectively, of said first insulating layer and said first thermal oxide film on said high-concentration impurity region;

burying/forming a first semiconductor layer consisting of an amorphous or polycrystalline semiconductor in said first and second openings;

doping an impurity of the second conductivity type in said first semiconductor layer;

forming first and second buried semiconductor regions serving as a collector region by recrystallizing said first semiconductor layer in the same crystal orientation as that of said semiconductor substrate;

forming a second thermal oxide film by thermally oxidizing surfaces of said first and second semiconductor buried regions;

forming a second semiconductor layer consisting of an amorphous or polycrystalline semiconductor on said second thermal oxide film;

doping an impurity of the first conductivity type in said second semiconductor layer;

forming a second insulating layer on said second semiconductor layer;

removing said second insulating layer, said second semiconductor layer, and said second thermal oxide film except for portions corresponding to a base extraction region on said semiconductor substrate;

forming a third semiconductor layer consisting of an amorphous or polycrystalline semiconductor on the major surface of said semiconductor substrate;

doping an impurity of the first conductivity type in said third semiconductor layer;

removing said third semiconductor layer except for a portion corresponding to the prospective base/emitter region;

forming a third buried semiconductor region serving as an internal base region by recrystallizing said third semiconductor layer in the same crystal orientation as that of said semiconductor substrate and of said first and second buried semiconductor regions;

forming a third insulating layer on the entire surface of the resultant semiconductor structure;

forming a side wall consisting of said third insulating layer on a side surface of said second insulating film by etching back said third insulating layer;

forming a fourth semiconductor layer consisting of an amorphous or polycrystalline semiconductor on the entire surface of the resultant semiconductor structure;

doping an impurity of the second conductivity type in said fourth semiconductor layer;

removing said fourth semiconductor layer except for a portion corresponding to the emitter and collector regions;

forming a fourth insulating layer on the entire surface of the resultant semiconductor structure;

forming an emitter region by doping an impurity of the second conductivity type in a surface region of said third buried semiconductor region using said fourth semiconductor layer as a diffusion source by annealing; and

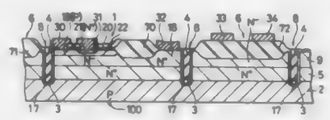
forming openings in portions of said fourth insulating layer above the emitter, base extraction, and collector extraction regions, and extracting emitter, base, and collector electrodes.

4,853,343

METHOD FOR FABRICATING A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING THICK OXIDE FILMS AND GROOVE ETCH AND REFILL

Akihisa Uchida; Daisuke Okada; Toshihiko Takakura, all of Koganei; Katsumi Ogiue, Tokyo; Yoichi Tamaki, Kokubunji, and Masao Kawamura, Fuchu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 946,778, Dec. 29, 1986, Pat. No. 4,746,963, which is a continuation of Ser. No. 529,132, Sep. 2, 1983, abandoned. This application Mar. 18, 1988, Ser. No. 169,748
Claims priority, application Japan, Sep. 6, 1982, 57-153910
Int. Cl.⁴ H01L *21/76, 21/95*
U.S. Cl. 437—33 **20 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

(a) preparing a semiconductor body having a major surface;

(b) selectively forming an oxidation impermeable mask on the major surface of said semiconductor body, said mask covering a first surface portion of each of a plurality of first semiconductor regions in which semiconductor elements are to be respectively formed and a second surface portion of a second semiconductor region which lies among said plurality of first semiconductor regions and in which an isolation region is to be formed, excepting at least a third surface portion of a third semiconductor region which is surrounded with said second semiconductor region to form said isolation region therein;

(c) forming a thick oxide film on the third surface portion by thermal oxidation of the major surface of said semiconductor substrate by employing said oxidation impermeable mask to selectively provide said thick oxide film in said third surface portion;

(d) removing said oxidation impermeable mask on said second surface portion;

(e) forming a groove in said second surface portion of said major surface of said semiconductor body by employing as an etching mask said thick oxide film formed in said third surface portion and said oxidation impermeable mask covering said first surface portion, said groove extending with a substantially constant width and with a depth electrically isolating said major surface of said semiconductor body into said plurality of said first semiconductor regions;

(f) filling said groove with a material so as to form an isolation structure;

(g) forming the semiconductor elements in said first semiconductor regions, the major surface of said each first semiconductor region having a thin oxide film which is formed by thermal oxidation and which is thinner than said thick oxide film of said third surface portion; and

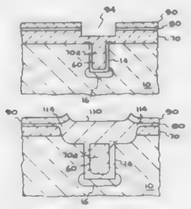
(h) forming wiring layers on said thick oxide film of said third surface portion, said wiring layers being used for interconnecting said semiconductor elements.

4,853,344

METHOD OF FORMING ISOLATION REGION IN INTEGRATED CIRCUIT STRUCTURE BY FORMING ISOLATION SLOT, OXIDIZING WALLS OF ISOLATION SLOT, GROWING EPITAXIAL LAYER OVER ISOLATION SLOT, AND THEN LOCALLY OXIDIZING EPITAXIAL LAYER OVER ISOLATION SLOT UNTIL OXIDE GROWN

Johan A. Darmawan, San Antonio, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 12, 1988, Ser. No. 231,452
Int. Cl.⁴ H01L *21/76*
U.S. Cl. 437—38 **21 Claims**



1. A process for forming an isolation region in a substrate of an integrated circuit structure which comprises:

(a) forming a first mask over a portion of said substrate where an isolation region is to be formed;

(b) forming an isolation slot in said substrate through an opening in said mask;

(c) oxidizing the walls of said slot;

(d) removing said first mask;

(e) growing an epitaxial layer over said isolation slot in said substrate;

(f) forming a second mask over said epitaxial layer with an opening therein over said isolation slot beneath said epitaxial layer of greater dimension than said slot; and

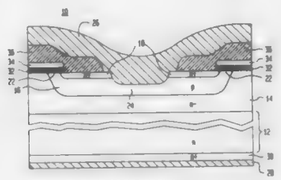
(g) oxidizing the exposed portion of said epitaxial layer through said opening in said second mask to form an oxide cap over said isolation slot which extends downwardly through said epitaxial layer to said oxide in said isolation slot.

4,853,345

PROCESS FOR MANUFACTURE OF A VERTICAL DMOS TRANSISTOR

James M. Himelick, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Aug. 22, 1988, Ser. No. 234,761
Int. Cl.⁴ H01L *21/22, 21/78*
U.S. Cl. 437—41 **7 Claims**



1. A process for making a semiconductive device comprising the steps of:

preparing a silicon wafer of one conductivity type having opposed front and back surfaces;

forming over the front surface and insulated therefrom a patterned polysilicon layer suitable for use as a silicon gate electrode;

using the polysilicon layer as a mask for forming over the front surface a surface well having a conductivity type opposite said one type;

doping simultaneously with dopant ions of the type characteristic of the one-type a surface portion of said surface well, the polysilicon layer and the back surface of the water, which had been previously stripped of any polysilicon or oxide;

driving in said dopants to form a source region of the one conductivity type at the surface of the well region, leaving unconverted a channel portion and a body diode portion of the well region, and to increase the conductivity of the polysilicon layer and of the back surface; and

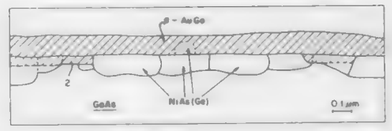
providing a source electrode contacting both the source region and the body diode portion and providing a drain electrode contacting the back surface.

4,853,346

OHMIC CONTACTS FOR SEMICONDUCTOR DEVICES AND METHOD FOR FORMING OHMIC CONTACTS

John M. Baker; Alessandro C. Callegari, both of Yorktown Heights; Dianne L. Lacey, Mahopac, all of N.Y., and Yih-Cheng Shih, Middletown, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1987, Ser. No. 140,072
Int. Cl.⁴ H01L *21/44, 21/465*
U.S. Cl. 437—184 **27 Claims**



1. A method of forming an ohmic contact on a semiconductor material containing GaAs comprising the steps of:

(a) depositing a non-uniform layer of Au onto one surface of the semiconductor material by sputter cleaning the semiconductor by using an Au-coated rf-electrode;

(b) depositing a multi-layer ohmic contact of AuGeNi onto the non-uniform Au layer; and

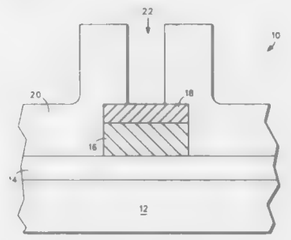
(c) alloying the ohmic contact to the semiconductor material.

4,853,347

SELECTIVE METAL DEPOSITION PROCESS

Yefim Bukhman, Phoenix, and Gary F. Witting, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1988, Ser. No. 251,739
Int. Cl.⁴ H01L *21/00, 21/02, 21/285, 21/88*
U.S. Cl. 437—192 **9 Claims**



1. A method for the selective deposition of tungsten in semiconductor device manufacturing comprising the steps of:

providing a wafer surface including semiconductor struc-

tures disposed thereon, said wafer surface having both conducting and non-conducting materials;

placing said wafer surface into an RIE reactor and subjecting it to a hydrogen plasma; and

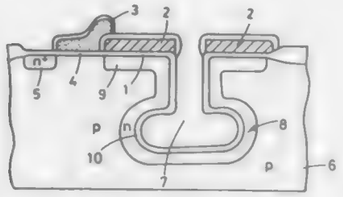
placing said wafer surface into a CVD reactor and selectively depositing tungsten on said conducting materials of said wafer surface, said tungsten being derived from tungsten hexafluoride that is reduced by hydrogen on said wafer surface, the wafer temperature being in the range of 450 to 500 degrees centigrade, the reactor pressure being in the range of 100 to 150 millitorr, the hydrogen gas flow being in the range of 20 to 60 SCCM and the tungsten hexafluoride gas flow being in the range of 2 to 6 SCCM.

4,853,348

PROCESS FOR MANUFACTURE OF A SEMICONDUCTOR MEMORY DEVICE

Natsuro Tsubouchi, and Masafumi Kimata, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 67,398, Jun. 24, 1987, Pat. No. 4,763,179. This application Dec. 22, 1987, Ser. No. 137,298
Claims priority, application Japan, Dec. 5, 1984, 59-258671
Int. Cl.[4] H01L *27/10*
U.S. Cl. 437—203 **6 Claims**



1. A method of manufacturing a semiconductor memory device having a capacitor, comprising the steps of:

(a) forming a substrate of a first conductive type;

(b) forming a capacitor hole in said substrate such that said capacitor hole includes a generally vertical passage extending within the substrate and which passage terminates in a cavity formed with a curved surface portion extending in the substrate;

(c) forming a semiconductor region of a second conductive type on said substrate and which semiconductor region extends coextensive with said passage and areas defining said cavity and such that a resulting generally vertical passage defined by the semiconductive region is dimensionally smaller in cross section than a corresponding cross section of the cavity formed within the substrate;

whereby a capacitor region is formed within said capacitor hole between said substrate of the first conductive type and said semiconductor region of the second conductive type.

4,853,349

GLASS-CERAMICS SUITABLE FOR DIELECTRIC SUBSTRATES

Francis W. Martin, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 26, 1988, Ser. No. 199,184
Int. Cl.[4] C03C *10/06*
U.S. Cl. 501—8 **6 Claims**

5. A substrate for integrated circuit packaging comprising a glass-ceramic material exhibiting a dielectric constant less than that of Al_2O_3, a linear coefficient of thermal expansion (25°–800° C.) between about 50–90$\times 10^{-7}$/°C., and containing gehlenite, anorthite, and akermanite as the predominant crystal phases, said material having a composition essentially free from Li_2O, Na_2O, and K_2O and consisting essentially, expressed in terms of weight percent on the oxide basis, of about 1–7.25% MgO, 22–40% CaO, 18–36% Al_2O_3, and 29–42% SiO_2.

6. A substrate for integrated circuit packaging comprising a glass-ceramic material exhibiting a dielectric constant less than that of Al_2O_3, a linear coefficient of thermal expansion (25°–800° C.) between about 50–90$\times 10^{-7}$/°C., and containing gehlenite, anorthite, and hardystoneite as the predominant crystal phases, said material having a composition essentially free from Li_2O, Na_2O, and K_2O and consisting essentially, expressed in terms of weight percent on the oxide basis, of about 2–13% AnO, 22–37.5% CaO, 18–34% Al_2O_3, and 28–42% SiO_2.

4,853,350

EXTRUDED WHISKER-REINFORCED CERAMIC MATRIX COMPOSITES

Shih-Lu Chen, Painted Post; Kishor P. Gadkaree, Big Flats, and Joseph F. Mach, Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 42,114, Apr. 23, 1987, Pat. No. 4,776,866. This application Mar. 11, 1988, Ser. No. 167,178
Int. Cl.[4] C03C *10/08*
U.S. Cl. 501—9 **2 Claims**



1. A whisker-reinforced ceramic matrix composite article comprising an SiC whisker reinforcement phase constituting 5–25% by weight of the article and a crystalline ceramic matrix phase constituting 75–95% by weight of the article, wherein the ceramic matrix phase is a barium-magnesium aluminosilicate glass-ceramic having (i) a composition consisting essentially, in weight percent, of about 41–45% SiO_2, 35–38% Al_2O_3, 12–14% MgO, 5–7% BaO, 0.01–5% of nucleating agents selected from the group consisting of ZrO_2 and Cr_2O_3, and 0–2% As_2O_3, (ii) a principal crystal phase of barium-stuffed cordierite, (iii) a porosity not exceeding 10% by volume, and (iv) a liquidus temperature not exceeding about 1600° C.

4,853,351

SILICA SHAPED BODIES AND PROCESS FOR PREPARING SAME

Akira Takahashi, Kagamihara; Kazuo Shibahara; Katsuhiro Morimoto, both of Gifu; Hiromasa Samma, Ogaki, and Kazuhiko Kubo, Gifu, all of Japan, assignors to Kabushiki Kaisha Osaka Packing Seizosho, Osaka, Japan

PCT No. PCT/JP85/00499, § 371 Date Apr. 28, 1987, § 102(e) Date Apr. 28, 1987, PCT Pub. No. WO87/01370, PCT Pub. Date Mar. 12, 1987
PCT Filed Sep. 6, 1985, Ser. No. 53,294
The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.
Int. Cl.[4] C04B *35/15*
U.S. Cl. 501—87 **4 Claims**

1. A silica shaped body comprising a multiplicity of interconnected secondary particles of amorphous silica, voids interspersed between the secondary particles, and at least one inorganic inactive substance selected from among carbonaceous substances, nitride and metallic substances, physically united with and enclosed in the secondary particles, the secondary particles being compressed in at least one direction by the shaping pressure, and being each in the form of a substantially globular shell formed of three-dimensionally interlocked primary particles of amorphous silica, the secondary particles having an outside diameter of about 5 to about 150 μm, and the shaped body containing the inactive substance in an amount of about 2 to about 70% by weight based on the total solids of shaped body.

4,853,352

METHOD OF MAKING SELF-SUPPORTING CERAMIC MATERIALS AND MATERIALS MADE THEREBY

Marc S. Newkirk, Newark, Del., and Harry R. Zwicker, Elkton, Md., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 822,999, Jan. 27, 1986, abandoned, which is a continuation-in-part of Ser. No. 776,965, Sep. 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 747,788, Jun. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 632,636, Jul. 20, 1984, abandoned. This application Jun. 23, 1988, Ser. No. 220,935
Int. Cl.[4] C04B *35/10, 35/56, 35/58*
U.S. Cl. 501—88 **41 Claims**



1. A method for producing a self-supporting ceramic body, said body being produced from an oxidation reaction between a molten parent metal and a vapor-phase oxidant and said body being adapted or fabricated for use as an article of commerce, the method comprising:

(a) applying a layer of dopant material to at least a portion of a surface of a parent metal to provide thereon a dopant-carrying surface;

(b) heating said parent metal to a temperature above its melting point but below the melting point of its oxidation reaction product to form a body of molten parent metal, and at said temperature (i) reacting the molten parent metal by initially contacting said dopant-carrying surface thereof with said vapor-phase oxidant to form an oxidation reaction product and (ii) maintaining at least a portion of said oxidation reaction product in contact with and extending between said body of molten metal and said oxidant, to draw molten metal therethrough towards the oxidant such that fresh oxidation reaction product continues to form at an interface between the oxidant and previously formed oxidation reaction product; and

(c) continuing said reaction for a time sufficient to grow said oxidation reaction product through and beyond the applied layer of dopant material, thereby resulting in said ceramic body which consists essentially of (i) the oxidation reaction product of said parent metal with said vapor-phase oxidant and (ii) at least one non-oxidized constituent of the parent metal.

4,853,353

METHOD FOR PREVENTING LOW-TEMPERATURE DEGRADATION OF TETRAGONAL ZIRCONIA CONTAINING MATERIALS

Philip J. Whalen, Sparta; Franz Reidinger, Convent Station, and Robert Antrim, Morris Plains, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jan. 25, 1988, Ser. No. 148,726
Int. Cl.[4] C04B *35/48*
U.S. Cl. 501—103 **10 Claims**

1. A process for preparing a ceramic body having a surface region that consists essentially of tetragonal zirconia and is partially stabilized with yttria and mixtures thereof with ceria comprising the steps of:

(a) sintering the body to at least 95% theoretical density at a temperature below about 1550° C.;

(b) abrading a portion of said surface region to impart strain and deformation thereto; and

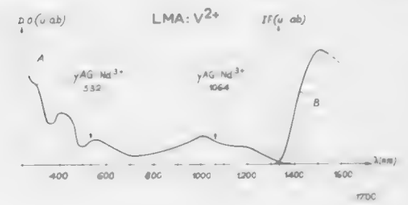
(c) heat treating said surface region to recrystallize thereon tetragonal strain free grains of yttrium oxide zirconium oxide, the content of yttrium on said surface region being the same as the average content of yttrium in said ceramic body, such that said surface region is covered with a thin layer consisting solely of tetragonal grains.

4,853,354

MIXED LANTHANUM-MAGNESIUM ALUMINATES AND LASERS USING MONOCRYSTALS OF THESE ALUMINATES

Claude Calvat, Saint Egreve; Laurent Colle, Paris; Maurice Couchaud, Seyssinet-Pariset; Anne-Marie LeJus, Montrouge; Richard Moncorge, Trevoux; Daniel Vivien, Garches, and Christophe Wyon, Saint Egreve, all of France, assignors to Commissariat A L'Energie Atomique Center National De La Recherche Scientifique, both of Paris, France

Filed Dec. 4, 1987, Ser. No. 128,772
Claims priority, application France, Dec. 5, 1986, 8617082
The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.
Int. Cl.[4] C04B *35/02*
U.S. Cl. 501—119 **11 Claims**



1. A mixed lanthanum-magnesium aluminate, of the formula (I):

$$La_{1-x}Mg_{1-y-z-t}V_{t+u}Al_{11+x+2y/3-u}O_{19-z} \quad (I)$$

in which x represents a number such that $0<x<0.3$; y, z, t and u represent numbers such that $0<y+z+t\leqq 1$ and $0<t+u\leqq 1$ with $0<y<1$, $0<z<1$, $0<t\leqq 1$ and $0\leqq u<1$; said aluminate being single-phase and having the structure of magnetoplumbite.

4,853,355

SILICA BONDING OF MOLECULAR SIEVES

Albert S. Behan, Bronxville, N.Y.; Robert L. Chiang, Oakland, N.J., and Mark T. Staniulis, Peekskill, N.Y., assignors to UOP, Des Plains, Ill.

Filed Jan. 7, 1988, Ser. No. 141,712
Int. Cl.[4] B01J *29/04, 29/06*
U.S. Cl. 502—64 **11 Claims**

1. A method of enhancing the binding of negatively surface charged molecular sieves to a silica binder comprising treating the surface of said molecular sieve without substantial impregnation with a cationic species to reverse the charge, on the surface, thereof, prior to contacting said, molecular sieve with the said silica binder.

2. A method according to claim 1 wherein the molecular sieve to be treated is selected from the group comprising K-L zeolite, ZSM-5, LZ-210, Mordenite, LZ-105, Zeolite-Y and silicalite.

3. A method according to claim 2 wherein the cationic species is Al, La or Zr.

10. A catalyst comprising a molecular sieve which has been treated according to the method of claim 1.

4,853,356

PROCESS FOR TRIMERIZATION

John R. Briggs, South Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 873,708, Jun. 12, 1986, abandoned, which is a division of Ser. No. 839,638, Mar. 14, 1986, Pat. No. 4,668,838. This application Aug. 22, 1988, Ser. No. 234,610

Int. Cl.[4] B01J *31/14;* **C08F** *4/62*

U.S. Cl. 502—117 **11 Claims**

1. A catalyst comprising the reaction product of (i) a chromium compound, which will provide active catalytic species under trimerization conditions; (ii) a hydrocarbyl aluminum hydrolyzed with about 0.8 to about 1.1 moles of water per mole of aluminum compound; and (iii) a donor ligand selected from the group consisting of hydrocarbyl isonitriles, amines, and ethers wherein the catalyst has an aluminum to chromium mole ratio in the range of up to about 200 to one and a ligand to chromium mole ratio in the range of up to about 100 to one.

4,853,357

OLEFIN OXIDATION CATALYST SYSTEM

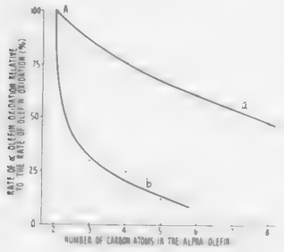
Janis Vasilevskis, Los Gatos; Jacques C. De Deken, Palo Alto; Robert J. Saxton, Mountain View; Paul R. Wentrcek, Redwood City; Jere D. Fellmann, Livermore, and Lyubov S. Kipnis, Sunnyvale, all of Calif., assignors to Catalytica Associates, Mountain View, Calif.

Continuation of Ser. No. 779,501, Sep. 24, 1985, Pat. No. 4,720,474. This application Sep. 30, 1987, Ser. No. 103,442

The portion of the term of this patent subsequent to Jan. 9, 2005, has been disclaimed.

Int. Cl.[4] B01J *31/02*

U.S. Cl. 502—165 **18 Claims**



10. An unsupported, aqueous catalyst system useful for olefin oxidation to a carbonyl product which comprises:

(a) at least one heteropolyoxoanion component which is a member selected from the group consisting of the compounds which have the general formula:

$$[X_xMo_aM'_bM''_cO_z]^m$$

wherein X is a member selected from the group consisting of B, Si, Ge, P, As, Se, Te, I, Co, Mn and Cu; wherein M' and M'' are members independently selected from the group consisting of W, V, Nb, Ta and Re: a, x, z and m are integers greater than zero; b and c are integers; and $a+b+c \geq 2$;

(b) at least one palladium component; and

(c) at least one redox active metal component, wherein said catalyst system is substantially free of nitrogen compounds selected from the group consisting of nitric acid, nitrogen oxides and esters of nitrous acid.

4,853,358

METHOD OF MAKING INORGANICALLY CROSSLINKED LAYERED COMPOUNDS

Charles M. Schramm, Cupertino, Calif.; Robert H. Lane, Plano, Tex., and Martin B. Dines, deceased, late of Laguna Beach, Calif. (by Elaine Dines, legal representative), assignors to Occidental Research Corporation, Los Angeles, Calif.

Filed Aug. 22, 1986, Ser. No. 899,346

Int. Cl.[4] B01J *27/88, 27/19, 31/02*

U.S. Cl. 502—167 **11 Claims**

1. A process for preparing a catalyst composition comprising a moiety having catalytic activity intercalated between the layers of a layered crystalline material, said catalyst being characterized as resistant to egress of said moiety from between said layers, which process comprises the steps of:

(a) intercalating a moiety having catalytic activity into the layers of a compound selected from the group consisting of compounds represented by the general formula:

$$M(O_3ZO_xR)_n$$

wherein M is a tetravalent metal selected from the group consisting of Zr, W, U, Ti, Th, Te, Sn, Si, Ru, Pu, Pr, Pb, Os, Nb, Mo, Mn, Ir, Hf, Ge, Ce and mixtures thereof; Z is a pentavalent atom selected from the group consisting of members of Group V of the Periodic Table of the Elements having an atomic weight of at least 30; x varies from 0 to 1; R is a radical selected from the group consisting of hydrogen and organo radicals wherein at least a portion of said R radicals comprise a crosslinkable functional group selected from the group consisting of hydroxyl, amino, carboxylic acid, epoxide and sulfonyl groups; and n varies from >1 to 2; said compound being characterized as a layered crystalline material comprising contiguous layers, each of said layers being spaced from and substantially unconnected to its neighboring layer to thereby allow access of said moiety into the interior of said crystalline material, and

(b) crosslinking said layers to thereby connect said contiguous layers to neighboring layers and hinder egress of said moiety from the interior of said crystalline material, by reacting said compound with a hydroxy metal complex of aluminum, zirconium, titanium, chromium, zinc, uranium, thorium, antimony or mixtures thereof.

4,853,359

NOVEL TRANSITION METAL DICHALCOGENIDE CATALYSTS

S. Roy Morrison, Burnaby; Robert F. Frindt, Vancouver; Per Joensen, Coquitlam; Michael A. Gee, Vancouver, and Bijan K. Miremadi, Coquitlam, all of Canada, assignors to Simon Fraser University, Burnaby, Canada

Continuation-in-part of Ser. No. 855,065, Apr. 23, 1986, abandoned. This application Feb. 18, 1987, Ser. No. 15,920

Int. Cl.[4] B01J *27/051, 27/049, 27/047;* **C10G** *45/08*

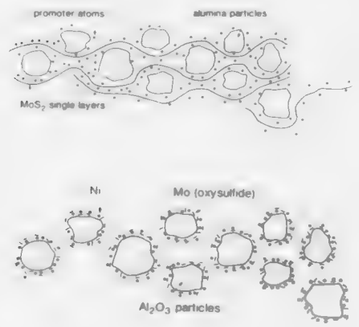
U.S. Cl. 502—220 **42 Claims**

1. A process for preparing a substance of the form:

$$MS_2{:}Z$$

wherein MS_2 is a layer of a transition metal dichalcogenide selected from the group consisting of MoS_2, TaS_2 and WS_2; Z is a support substance selected from the oxides or hydrous oxides of Al, Sn or Ti, which comprises:

(a) immersing multi-layered MS_2 containing an alkali metal, with an alkali metal to M atomic ration of about 1, in liquid water to thereby cause the layers of MS_2 to exfoliate;



(b) adhering the exfoliated layers of MS_2 with the support substance Z in the water to generate a solid; and

(c) separating generated solid from the water.

4,853,360

METHOD FOR MANUFACTURING THE METALLIC CARRIER BASE MATERIAL FOR MAINTAINING A CATALYST FOR EXHAUST GAS PURIFICATION

Yuzo Hitachi, Shizuoka, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Japan

Filed May 4, 1988, Ser. No. 190,091

Claims priority, application Japan, May 7, 1987, 62-109846

Int. Cl.[4] B01J *32/00*

U.S. Cl. 502—439 **23 Claims**

1. A method for manufacturing a metallic carrier base material having a multi-layer structure for use in maintaining a catalyst for exhaust gas purification, comprising assembling alternate layers of a planar band material made of a thin nickel-plated steel strip and a corrugated band material made of a thin nickel-plated steel strip to form a multi-layer body having a plurality of screen-like vent holes in an axial direction, said multi-layer body serving as a contact portion, and immersion treating the multi-layer body in a molten aluminum bath.

4,853,361

HEAT- AND LIGHT-SENSITIVE RECORDING MATERIAL

Toshimi Satake; Toshiaki Minami; Tomoaki Nagai, and Fumio Fujimura, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

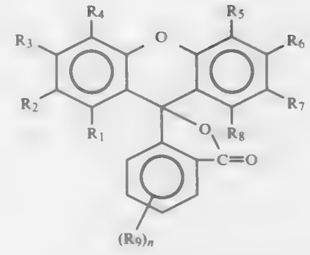
Filed Apr. 14, 1988, Ser. No. 181,711

Claims priority, application Japan, Apr. 17, 1987, 62-94595

Int. Cl.[4] B41M *5/18;* **G03C** *5/00*

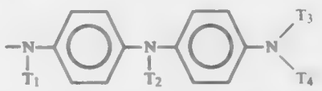
U.S. Cl. 503—201 **8 Claims**

5. A heat- and light-sensitive recording method, wherein a thermal pattern is applied to a heat- and light-sensitive material for the formation of a latent image, and then a light is irradiated thereon for the formation of a visible image, said heat- and light-sensitive material comprising a substrate having thereon a color-forming layer which contains electron-donating compound and does not contain electron-accepting compound, said color-forming layer comprising as said electron-donating a fluoran-type leuco dye represented by the following general formula (I).



wherein

at least one of R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8 and R_9 represents



the remainders of R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8 and R_9, which may be the same or different, represent a hydrogen atom, an alkyl group, an alkoxy group, a cycloalkyl group, a halogen atom, a nitro group, a hydroxy group, an amino group, a substituted amino group, an aralkyl group, a substituted aralkyl group, an aryl group or a substituted aryl group;

T_1, T_2 and T_3, which may be the same or different, represent a hydrogen atom, a C_3–C_9 alkyl group, a C_3–C_9 alkenyl group, or a C_3–C_9 alkinyl group;

T_4 represents a hydrogen atom, a C_1–C_8 alkyl group, a C_3–C_9 alkenyl group, a C_3–C_9 alkinyl group or a phenyl group; in addition,

T_3 and T_4 taken together with the nitrogen to which they are attached, may represent, a morpholino group, a pyrrolidino group, a piperidino group or a hexamethylenimino group; and n represent an integer from 0 to 4.

4,853,362

HEAT-SENSITIVE RECORDING SHEET

Toshimi Satake; Tadakazu Fukuchi; Toshiaki Minami; Tomoaki Nagai; Toshio Kaneko, and Fumio Fujimura, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

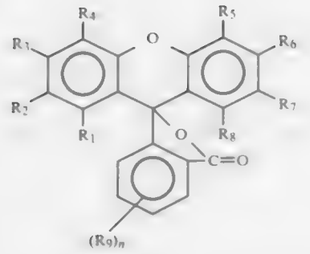
Filed Aug. 19, 1988, Ser. No. 234,463

Claims priority, application Japan, Sep. 14, 1987, 62-230774; Dec. 28, 1987, 62-333939

Int. Cl.[4] B41M *5/18*

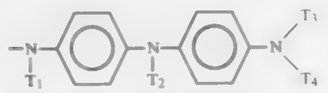
U.S. Cl. 503—209 **9 Claims**

1. A heat-sensitive recording material comprising a support having thereon a color-developing layer which contains as main ingredient a colorless or pale colored basic chromogenic dye and an organic colordeveloping agent, wherein the color-developing layer comprises as the colorless or pale colored basic chromogenic dye at least one substance selected from the group consisting of a fluorane-type leuco dye represented by the following general formula (I) and a divinyl compound represented by the following general formula (II), and as a stabilizer at least one halogen-substituted zinc benzoate derivative represented by the following general formula (III):



(I)

wherein
at least one of R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8 and R_9 represents



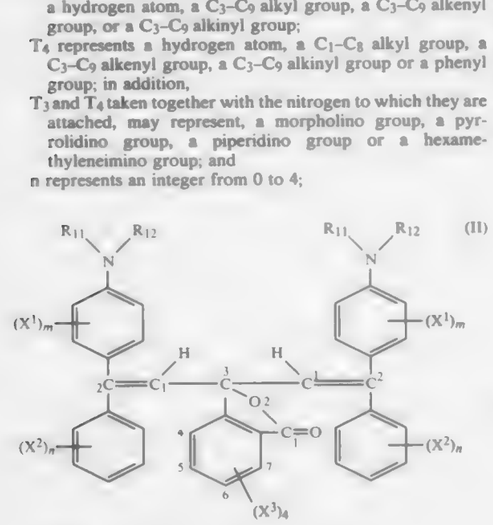
the remainders of R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8 and R_9, which may be the same or different, represent a hydrogen atom, an alkyl group, an alkoxy group, a cycloalkyl group, a halogen atom, a nitro group, a hydroxy group, an amino group, a substituted amino group, an aralkyl group, a substituted aralkyl group, an aryl group or a substituted aryl group;

T_1, T_2 and T_3, which may be the same or different, represent a hydrogen atom, a C_3–C_9 alkyl group, a C_3–C_9 alkenyl group, or a C_3–C_9 alkinyl group;

T_4 represents a hydrogen atom, a C_1–C_8 alkyl group, a C_3–C_9 alkenyl group, a C_3–C_9 alkinyl group or a phenyl group; in addition,

T_3 and T_4 taken together with the nitrogen to which they are attached, may represent, a morpholino group, a pyrrolidino group, a piperidino group or a hexamethyleneimino group; and

n represents an integer from 0 to 4;



(II)

wherein

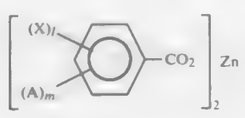
R_{11} represents an alkyl group of not more than 6 carbon atoms;

R_{12} represents an alkyl group of not more than 8 carbon atoms, a C_5–C_7 cycloalkyl group, a benzyl group which may be substituted with a chlorine atom, a bromine atom and/or an alkyl group of not more than 4 carbon atoms, or a phenyl group which may be substituted with a chlorine atom, a bromine atom and/or an alkyl group of not more than 4 carbon atoms;

X^1 and X^2, which may be the same or different, represent an alkyl group of not more than 8 carbon atoms, an alkoxy group of not more than 8 carbon atoms, a fluorine atom, a chlorine atom or a bromine atom;

m and n each represents 0, 1, 2 or 3; each X^1 of $(X^1)n$, each X^2 of $(X^2)n$ or each X^3 of $(X^3)n$ can be the same or different;

and X3 represents a chlorine atom or a bromine atom, in which at least one of X^3 in $(X^3)_4$ represents a bromine atom;



(III)

wherein

X represents a halogen atom;

A represents a halogen atom, a nitro group, a C_1–C_{12} alkyl group, a C_1–C_{12} alkoxy group, a C_3–C_{10} cycloalkyl group, a cyano group or a hydroxy group; l represents 1 or 2; and m represents an integer from 0 to 5.

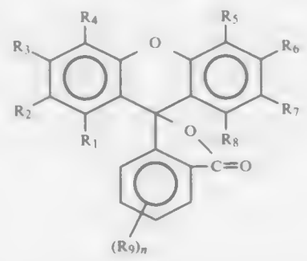
4,853,363

HEAT-SENSITIVE RECORDING MATERIAL

Toshimi Satake; Toshiaki Minami; Tomoaki Nagai, and Fumio Fujimura, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1988, Ser. No. 178,143
Claims priority, application Japan, Apr. 9, 1987, 62-87503
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—210 **9 Claims**

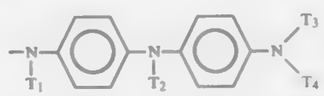
1. A heat-sensitive recording material comprising a substrate having theron a color-developing layer which contains an electron acceptor and an electron donor which react with each other under chelate formation, said color-developing recording layer comprising a near infrared-absorbing fluorantype leuco dye of the following general formula (I):



(I)

where

at least one of R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8 and R_9 represents



the remainders of R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8 and R_9, which may be the same or different, represent a hydrogen atom, an alkyl group, an alkoxy group, a cycloalkyl group, a halogen atom, a nitro group, a hydroxy group, an amino group, a substituted amino group, an aralkyl group, a substituted aralkyl group, an aryl group or a substituted aryl group;

T_1, T_2 and T_3, which may be the same or different, represent a hydrogen atom, a C_3–C_9 alkyl group, a C_3–C_9 alkenyl group or a C_3–C_9 alkinyl group;

T_4 represents a hydrogen atom, a C_1–C_8 alkyl group, a

C_3–C_9 alkenyl group, a C_3–C_9 alkinyl group or a phenyl group; in addition, T_3 and T_4 taken together with the nitrogen to which they are attached, may represent a morpholino group, a pyrrolidino group, a piperidino group or a hexamethylenimino group; and

n represents an integer from 0 to 4.

4,853,364

DEVELOPER COMPOSITION COMPRISING PHENOL RESINS AND VINYLIC OR ACRYLIC RESINS

Rong-Chang Liang, Centerville; Emerson K. Colyer, Kettering, both of Ohio, and Kelli J. Borello, Beaver Falls, Pa., assignors to The Mead Corporation, Dayton, Ohio

Filed Feb. 5, 1988, Ser. No. 152,685
Int. Cl.[4] C08G *8/12;* **D41M** *5/00, 5/18, 5/22*
U.S. Cl. 503—216 **34 Claims**

1. A developer composition comprising first and second developer materials, said first developer material being a finely divided thermoplastic phenolic resin and said second developer material being a finely divided thermoplastic vinylic or acrylic resin containing pendant developer moieties, said first and second developer materials being sufficiently compatible that upon heating they coalesce to form a film.

4,853,365

THERMAL DYE TRANSFER-DYE RECEPTOR CONSTRUCTION

Susan K. Jongewaard, and Julia A. Sills, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 23, 1988, Ser. No. 213,523
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 **21 Claims**

1. A thermal dye transfer receptor element for thermal dye transfer in intimate contact with a dye transfer donor sheet, said receptor element comprising a substrate having coated thereon a dye-receiving layer, characterized in that said dye receiving layer comprises a chlorinated polyvinyl chloride resin wherein the chlorinated polyvinyl chloride has a chlorine content of between 62–74%, a glass transition of between 100°–1610° C., and an inherent viscosity of 0.46-1.15, said donor sheet comprising a substrate with a dye donor layer coated thereon, and said dye-receiving layer being in intimate contact with said dye donor layer.

21. A process of transferring dye onto a thermal dye transfer receptor element for thermal dye transfer comprising a substrate having coated thereon a dye-receiving layer, characterized in that said dye receiving layer comprises a chlorinated polyvinyl chloride resin wherein the chlorinated polyvinyl chloride has a chlorine content of between 62–74%, a glass transition of between 100°–160° C., and an inherent viscosity of 0.46-1.15, said process comprising

(1) contacting said element with a donor sheet having a dye donor layer comprising dye in a polyvinyl chloride resin, chlorinated polyvinyl chloride, or mixture thereof,

(2) heating the backside of said donor sheet, and

(3) transferring dye to said receptor element.

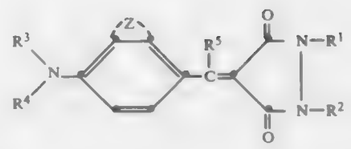
4,853,366

PYRAZOLIDINEDIONE ARYLIDENE DYE-DONOR ELEMENT FOR THERMAL DYE TRANSFER

Steven Evans, Rochester; Helmut Weber, Webster, and Donald R. Diehl, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 168,837, Mar. 16, 1988. This application Jan. 30, 1989, Ser. No. 303,865
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 **20 Claims**

1. A dye-donor element for thermal dye transfer comprising a support having thereon a dye dispersed in a polymeric binder, said dye having the formula:



wherein

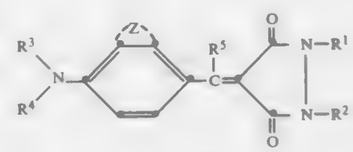
R^1 and R^2 each independently represents a substituted or unsubstituted alkyl group having from 1 to about 10 carbon atoms, a cycloalkyl group having from about 5 to about 7 carbon atoms or an aryl group having from about 6 to about 10 carbon atoms;

R^3 and R^4 each represents R^1; or either or both of R^3 and R^4 can be joined to the carbon atom of the aromatic ring at a position ortho to the position of attachment of the anilino nitrogen to form a 5- or 6-membered ring; or R^3 and R^4 can be joined together to form, along with the nitrogen to which they are attached, a 5- or 6-membered heterocyclic ring;

R^5 represents hydrogen; halogen, cyano; carbamoyl; alkoxycarbonyl; acyl; a substituted or unsubstituted alkyl or alkoxy group group having from 1 to about 10 carbon atoms; a cycloalkyl group having from about 5 to about 7 carbon atoms; an aryl group having from about 6 to about 10 carbon atoms; or a dialkylamino group; and

Z represents hydrogen or the atoms necessary to complete a 5- or 6-membered ring.

11. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising a dye dispersed in a polymeric binder and transferring a dye image to a dye-receiving element to form said dye transfer image, the improvement wherein said dye has the formula:



wherein

R^1 and R^2 each independently represents a substituted or unsubstituted alkyl group having from 1 to about 10 carbon atoms, a cycloalkyl group having from about 5 to about 7 carbon atoms or an aryl group having from about 6 to about 10 carbon atoms;

R^3 and R^4 each represents R^1; or either or both of R^3 and R^4 can be joined to the carbon atom of the aromatic ring at a position ortho to the position of attachment of the anilino nitrogen to form a 5- or 6-membered ring; or R^3 and R^4 can be joined together to form, along with the nitrogen to which they are attached, a 5- or 6-membered heterocyclic ring;

R^5 represents hydrogen; halogen; cyano; carbamoyl; alkoxycarbonyl; acyl; a substituted or unsubstituted alkyl or alkoxy group group having from 1 to about 10 carbon atoms; a cycloalkyl group having from about 5 to about 7 carbon atoms; an aryl group having from about 6 to about 10 carbon atoms; or a dialkylamino group; and

Z represents hydrogen or the atoms necessary to complete a 5- or 6-membered ring.

4,853,367
PARTICULATE POLYPROPYLENE WAXES FOR DYE-DONOR ELEMENT USED IN THERMAL DYE TRANSFER

Richard P. Henzel, Webster; Noel R. Vanier, Rochester, and George B. Bodem, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 173,346, Mar. 25, 1988, abandoned. This application Feb. 10, 1989, Ser. No. 309,743
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 18 Claims

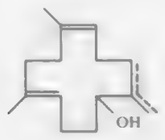
1. In a dye-donor element for thermal dye transfer comprising a support having thereon a dye layer comprising sublimable a dye dispersed in a polymeric binder, the improvement wherein said dye layer also contains at least one particulate polypropylene wax having an average particle size less than about 30μm and having a melting point above about 125° C.

4,853,368
METHYLCYCLODODECATRI-2,5,9-EN-1-OLS, A PROCESS FOR THEIR PREPARATION, AND THEIR USE

Jürgen Neinhaus; Rudolf Hopp, both of Holzminden; Wilhelm Göttsch, and Egon Oelkers, both of Bevern, all of Fed. Rep. of Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Fed. Rep. of Germany

Filed Mar. 22, 1988, Ser. No. 171,632
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1987, 3711157
Int. Cl.[4] A61K *7/46; C07C 35/205*
U.S. Cl. 512—25 3 Claims

1. A methylcyclododecatri-2,5,9-en-1-ol of the formula



in which
one of the dashed lines is a double bond and the other is a single bond.

4,853,369
SCHIFF BASE REACTION PRODUCT OF ETHYL VANILLIN AND METHYL ANTHRANILATE AND ORGANOLEPTIC USES THEREOF

Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Point Pleasant, both of N.J.; Nicholas Calderone, Laurel Hollow, N.Y., and Ronald S. Fenn, New Providence, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 134,978, Dec. 18, 1987. This application Jun. 3, 1988, Ser. No. 201,846
Int. Cl.[4] A61K *7/46*
U.S. Cl. 512—25 2 Claims

1. A process for augmenting or enhancing the aroma of a perfume composition, cologne, or perfumed article comprising the step of intimately admixing with said perfume composition, cologne or perfumed article, an aroma augmenting or enhancing quantity of a schiff base reaction product of ethyl vanillin and methyl anthranilate.

4,853,370
SUBSTITUTE FOR HUMAN BLOOD AND A METHOD OF MAKING THE SAME

Bernard Ecanow, Wilmette, and Charles S. Ecanow, Skokie, both of Ill., assignors to Synthetic Blood Corporation, Deerfield, Ill.

Continuation of Ser. No. 811,675, Dec. 20, 1985, Pat. No. 4,738,952, which is a continuation-in-part of Ser. No. 604,476, Apr. 27, 1984, abandoned. This application Apr. 15, 1988, Ser. No. 182,099
The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.
Int. Cl.[4] A61K *37/00*
U.S. Cl. 514—6 18 Claims

1. A synthetic whole blood substitute, comprising a non-toxic two phase liquid system, both said phases being aqueous, one of said phases being a relatively non-polar coacervate phase, the other of said phases being a relatively polar liquid aqueous phase, said relatively non-polar coacervate phase being insoluble in and in equilibrium with said relatively polar liquid aqueous phase, and incorporated into at least one of said two phases a microencapsulated hemoglobin component selected from the group consisting of polymerized hemoglobin, pyridoxylated-polymeriz and mixtures thereof.

4,853,371
THERAPEUTIC SOMATOSTATIN ANALOGS

David H. Coy, New Orleans; William A. Murphy, Covington, both of La., and Mark L. Heiman, Indianapolis, Ind., assignors to The Administrators of the Tulane Educational Fund, New Orleans, La.

Continuation-in-part of Ser. No. 70,400, Jul. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 10,349, Feb. 3, 1987, which is a continuation-in-part of Ser. No. 875,266, Jun. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 775,488, Sep. 12, 1985, abandoned. This application Jun. 22, 1988, Ser. No. 209,883
Int. Cl.[4] H61K *37/24; C07K 7/26*
U.S. Cl. 514—12 11 Claims

1. An octapeptide of the formula D-β-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH_2, or a pharmaceutically acceptable salt thereof.

4,853,372
NON-AQUEOUS IVERMECTIN FORMULATION WITH IMPROVED ANTIPARASITIC ACTIVITY

James B. Williams, Freehold, and Russell U. Nesbitt, Somerville, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 767,463, Aug. 20, 1985, abandoned, which is a continuation of Ser. No. 564,140, Dec. 22, 1983, abandoned. This application Nov. 28, 1986, Ser. No. 935,914
Int. Cl.[4] A61K *31/71*
U.S. Cl. 514—30 1 Claim

1. An endo or ectoparasiticidal parenteral formulation consisting of from 0.1 to 20% by weight of ivermectin dissolved in a combination of propylene glycol and glycerol formal in a ratio of about 60:40 v/v.

4,853,373
THERAPEUTIC TREATMENT FOR ARTHRITIC CONDITION

William S. Livingston, 1080 Triunfo Canyon Rd., West Lake Village, Calif. 91361

Filed Sep. 15, 1986, Ser. No. 907,623
Int. Cl.[4] A61K *31/52; C07H 19/16*
U.S. Cl. 514—46 2 Claims

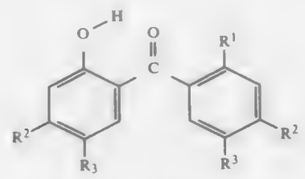
1. A method for the treatment of mammalian rheumatoid arthritis and osteoarthritis comprising intradermal administration of hypoxanthine of at least 95% purity in a dosage range of 2×10^{-8} to 1×10^{-5} grams to a mammal in need of said treatment.

4,853,374
VISCOELASTIC VITREOUS SUBSTITUTE WITH UV BLOCKER

Mark D. Allen, Lakewood, Colo., assignor to M.D.R. Group, Inc., Denver, Colo.

Filed Jun. 9, 1987, Ser. No. 60,013
Int. Cl.[4] A61K *31/72*
U.S. Cl. 514—57 5 Claims

1. The viscoelastic vitreous substitute for blocking ultraviolet light during ophthalmic surgery which comprises: approximately 2% of a hydroxy-substituted cellulose derivative in a physiologic balanced salt solution convalently bonded to approximately 0.2% of a UV-absorbant molecule having the formula:



where R^1 is selected from the group consisting of H and OH; R^2 is selected from the group consisting of H, OH and OR where R is any alkyl group; and, R^3 is selected from the group consisting of H, SO_3, OSO_2X and where X is selected from the group consisting of the alkali metals, the alkaline earth metals, hydroxyl, alkoxy and hydroxy groups.

4,853,375
METHOD OF LOWERING INTRAOCULAR (EYE) PRESSURE

Theodore Krupin, Philadelphia, and Richard A. Stone, Havertown, both of Pa., assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Sep. 16, 1987, Ser. No. 97,554
Int. Cl.[4] A61K *31/65*
U.S. Cl. 514—152 5 Claims

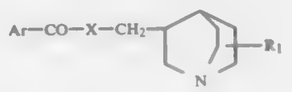
1. A method of lowering intraocular pressure in the eye of a human or an animal, said method comprising administering to said eye, a therapeutically effective amount of tetracycline or a derivative of the tetracycline series having the property to achieve a significant lowering of intraocular pressure in the eye.

4,853,376
BENZAMIDES AND BENZOATES HAVING ANTI-EMETIC ACTIVITY

Francis D. King, Harlow, England, assignor to Beecham Group, p.l.c., Brentford, England

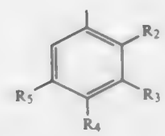
Filed Oct. 17, 1986, Ser. No. 920,022
Claims priority, application United Kingdom, Oct. 19, 1985, 8525844
Int. Cl.[4] A61K *31/62, 31/435;* C07D *453/02*
U.S. Cl. 514—161 12 Claims

1. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein:
X is HN; or O when Ar is of formula (a) and R_2 is hydrogen or when Ar is a group of formula (b);
R_1 is hydrogen, C_{1-6} alkyl, phenyl or phenyl-C_{1-6} alkyl, which phenyl moieties may be substituted by C_{1-6} alkyl, C_{1-6} alkoxy or halogen;
Ar is a group of formula (a):



(a)

wherein either
R_2 is C_{1-6} alkoxy and one of R_3, R_4 and R_5 is hydrogen and the other two are selected from hydrogen, halogen, CF_3, C_{1-6} alkoxy, C_{1-6} alkyl, C_{1-6}-alkylthio, C_{2-6} alkanoyl, C_{1-10} carboxylic acylamino, C_{1-6}-alkyl S(O)n wherein n is 0, 1 or 2, nitro or amino, aminocarbonyl or aminosulphonyl optionally substituted by one or two groups selected from C_{1-6} alkyl, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl C_{1-4} alkyl or phenyl C_{1-4} alkyl groups any of which phenyl moieties may be substituted by one or two groups selected from halogen, CF_3, C_{1-6} alkyl or C_{1-6} alkoxy; or R_3 is hydrogen and R_2, R_4 and R_5 are independently selected from hydrogen, C_{1-6} alkyl, hydroxy, C_{1-6} alkoxy, C_{1-6} alkylthio or halo; or any two on adjacent carbon atoms together are C_{1-2} alkylenedioxy and the third is hydrogen, C_{1-6} alkyl, C_{1-6} alkoxy or halo;
or Ar is a group of formula (b);



(b)

wherein
Z is CH_2, O, S or NR_7 wherein R_7 is hydrogen, C_{1-6} alkyl, C_{3-7} alkenyl-methyl, phenyl or phenyl C_{1-4} alkyl either of which phenyl moieties may be substituted by one or two of halogen, CF_3, C_{1-6} alkoxy or C_{1-6} alkyl; and Y is CH or N; or Z is CH or N and Y is NR_a or CHR_a where R_a is as defined for R_7 above;
R_b is present when the COX linkage is attached at the phenyl ring, and is selected from hydrogen, halogen, CF_3, hydroxy, C_{1-6} alkoxy or C_{1-6} alkyl;
R_6 is hydrogen, halogen, CF_3, C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkylthio, C_{107} acyl, C_{107} acylamino, C_{1-6} alkylsulphonylamino, N-(C_{1-6} alkylsulphonyl)-N-C_{1-4} alkylamino, C_{1-6} alkylsulphinyl, hydroxy, nitro or amino, aminocarbonyl, aminosulphonyl, aminosulphonylamino or N-(aminosulphonyl)-C_{1-4} alkylamino optionally N-substituted by one or two groups selected from C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl C_{1-4} alkyl, phenyl or phenyl C_{1-4} alkyl groups or optionally N-disubstituted by C_{4-5} polymethylene.

10. A method of treatment of disorders relating to impaired gastro-intestinal motility, emesis, migraine, cluster headaches or trigeminal neuralgia which comprises the administration of an effective amount of a compound of formula (I) as defined in claim 1, or a pharmaceutically acceptable salt thereof.

4,853,377

METHOD AND COMPOSITION FOR INCREASING PRODUCTION OF SEROTONIN

Robert L. Pollack, 8442 Chippewa Rd., Philadelphia, Pa. 19128

Continuation of Ser. No. 25,002, Mar. 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 787,502, Oct. 15, 1985, Pat. No. 4,650,789. This application Feb. 29, 1988, Ser. No. 165,444

The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.

Int. Cl.[4] A61K *31/35, 31/40, 31/62, 31/70*

U.S. Cl. 514—161 13 Claims

1. A method for treating physiological disorders responsive to treatment with L-tryptophan, wherein said method comprises:

administering to a patient a dosage of a composition comprising L-tryptophan in an amount sufficient to increase transport of L-tryptophan into the patient's brain and a salicylate selected from the group consisting of sodium salicylate, choline salicylate and magnesium salicylate in an amount sufficient to release L-tryptophan from the patient's serium albumin, said dosage of the composition being sufficient to increase production of serotonin within the patient's brain to a level which provides relief of said physiological disorders.

4,853,378

FLUORINE DERIVATIVES OF VITAMIN D_3 AND PROCESS FOR PRODUCING THE SAME

Noritaka Hamma, Sakai; Yoshikazu Saito, Nishinomiya; Toshio Nishizawa, Saita, and Takashi Katsumata, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

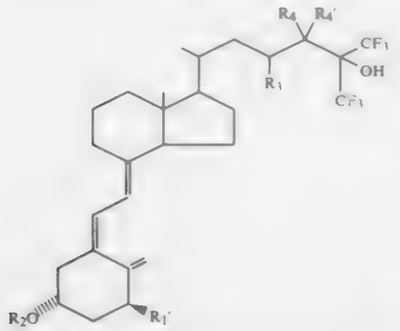
Filed Oct. 14, 1987, Ser. No. 108,497

Claims priority, application Japan, Oct. 20, 1986, 61-249095

Int. Cl.[4] A61K *31/59;* C07J *9/00*

U.S. Cl. 514—167 23 Claims

1. A compound represented by the general formula:



wherein R_1' denotes a hydrogen atom, a hydroxyl group or a protected hydroxyl group, R_2 denotes a hydrogen atom or a protecting group for hydroxyl group, R_3 denotes a fluorine atom, a hydroxyl group or a protected hydroxyl group and R_4 and R_4' each denotes a hydrogen atom, or one of them denotes a hydrogen atom and the other denotes a fluorine atom, hydroxyl group or a protected hydroxyl group or R_4 and R_4' are combined to denote an oxo group, with a proviso that at least one of R_3, R_4 and R_4' denotes a fluorine atom.

4,853,379

STABLE HYDROCORTISONE-BASED COMPOSITION FOR USE IN LOCAL CORTICOTHERAPY

Braham Shroot, Antibes; Carole Le Foyer de Costil, and Liliane Ayache, both of Paris, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation-in-part of Ser. No. 559,245, Dec. 8, 1983, abandoned. This application Oct. 15, 1986, Ser. No. 918,978

Claims priority, application Luxembourg, Dec. 9, 1982, 84515

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—179 4 Claims

1. A hydrocortisone skin-penetrating composition for the treatment of eczema, psoriatic or eczematous erythrodermy, pruriginous lesions, chronic erythematous lupus, patch psoriasis and para-psoriasis, hyperthropic cicatrix and radiotherapic or solar erythema, said composition consisting essentially of 0.01 to 12 weight percent hydrocortisone based on the total weight of said composition, said hydrocortisone being solubilized in a hydrocortisone solubilizing mixture consisting essentially of (i) 15 to 60 weight percent based on the total weight of said mixture of an aliphatic alcohol selected from the group consisting of methanol, ethanol and isopropanol, (ii) 15 to 60 weight percent based on the total weight of said mixture of propylene glycol, (iii) 3 to 30 weight percent based on the total weight of said mixture of dimethyl coco benzyl ammonium chloride and (iv) 10 to 50 weight percent based on the total weight of said mixture of water.

4,853,380

COORDINATION COMPLEXES OF PLATINUM USEFUL AS ANTIPROLIFERATIVE AGENTS

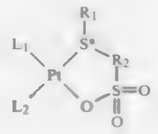
Paul Schwartz, Rockville, Md., assignor to International Pharmaceutical Products, Walnut, Calif.

Filed May 26, 1987, Ser. No. 54,883

Int. Cl.[4] A61K *31/555, 31/28*

U.S. Cl. 514—184 32 Claims

1. A compound having the formula:



wherein

L_1 and L_2 are individually ammonia or monodentate amine ligands or L_1 and L_2 together comprise a bidentate amine ligand;

S° is sulfur; and

R_1 and R_2 together with S° comprise a heterocyclic moiety selected from the group consisting of thiophene, thiazole, benzothiazole and benzothiophene, substituted or unsubstituted.

4,853,381

ETHANOLAMINE COMPOUNDS

Harry Finch, Hitchin; Lawrence H. C. Lunts, Broxbourne; Alan Naylor, Royston; Ian F. Skidmore, Welwyn, and Ian B. Campbell, Ware, all of United Kingdom, assignors to Glaxo Group Limited, London, United Kingdom

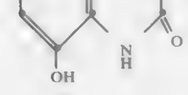
Continuation-in-part of Ser. No. 724,179, Apr. 17, 1985, abandoned. This application Oct. 15, 1986, Ser. No. 919,122

Claims priority, application United Kingdom, Apr. 17, 1984, 8409908; Jun. 11, 1984, 8414858; Jun. 20, 1984, 8415761; Jun. 20, 1984, 8415762; Oct. 16, 1985, 8525488; Oct. 16, 1985, 8525489; Oct. 16, 1985, 8525490; Oct. 16, 1985, 8525491; Oct. 16, 1985, 8525492

Int. Cl.[4] C07C *143/74;* A61K *31/18*

U.S. Cl. 514—211 10 Claims

1. A compound of formula (I)



(I)

wherein

Ar represents a phenyl group optionally substituted by one or more substituents selected from halogen atoms, or the groups C_{1-6}alkyl, C_{1-6}alkoxy, nitro, $-(CH_2)_qR$ [where R is hydroxy, $-NR^3R^4$ (where R^3 and R^4 each represent a hydrogen atom or a C_{1-4} alkyl group, or $-NR^3R^4$ forms a saturated heterocyclic amino group which has 5–7 ring members and optionally contains in the ring one or more atoms selected from —O— or —S— or a group —NH— or $-N(CH_3)-$), $-NR^5COR^6$ (where R^5 represents a hydrogen atom or a C_{1-4} alkyl group, and R^6 represents a hydrogen atom or a C_{1-4} alkyl, C_{1-4} alkoxy, phenyl or $-NR^3R^4$ group), $-NR^5SO_2R^7$ (where R^7 represents a C_{1-4} alkyl, phenyl or $-NR^3R^4$ group), $-COR^8$ (where R^8 represents hydroxy, C_{1-4} alkoxy or $-NR^3R^4$), $-SR^9$ (where R^9 is a hydrogen atom, or a C_{1-4} alkyl or phenyl group), $-SOR^9$, SO_2R^9, or —CN, and q represents an integer from 0 to 3], $-(CH_2)_rR^{10}$ (where R^{10} is a C_{1-4} alkoxy group and r represents an integer from 1 to 3) or $-O(CH_2)_tR^{11}$ (where R^{11} represents a hydroxy or C_{1-4} alkoxy group and t is an integer 2 or 3), or Ar is a phenyl ring substituted by an alkylenedioxy group of formula $-O(CH_2)_pO-$ where p represents an integer 1 or 2;

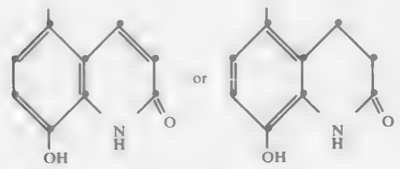
Q represents a group of formula



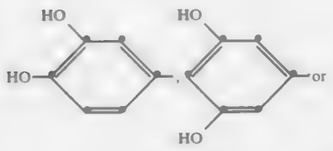
where

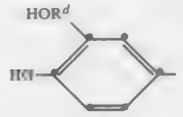
R^a represents a hydrogen atom or a C_{1-3} alkyl group,

R^b represents



and Rc represents





where R^d represents a straight or branched C_{2-3} alkylene chain;

R^1 and R^2 each represent a hydrogen atom or a C_{1-3} alkyl group with the proviso that the sum total of carbon atoms in R^1 and R^2 is not more than 4;

X represents a C_{1-7} alkylene, C_{2-7} alkenylene or C_{2-7} alkynylene chain; and

Y represents a bond or a C_{1-6} alkylene, C_{2-6} alkenylene or C_{2-6} alkynylene chain with the proviso that the sum total of carbon atoms in X and Y is 2–10, and physiologically acceptable salts and solvates thereof.

10. A pharmaceutical composition comprising at least one compound of general formula (I) as defined in claim 1 or a physiologically acceptable salt or solvate thereof, together with a physiologically acceptable carrier or excipient.

4,853,382

AMINOPHENOL DERIVATIVES

Ian F. Skidmore, Welwyn; Harry Finch, Hitchin; Alan Naylor, Royston; Lawrence H. C. Lunts, Broxbourne, and Ian B. Campbell, Ware, all of England, assignors to Glaxo Group Limited, London, England

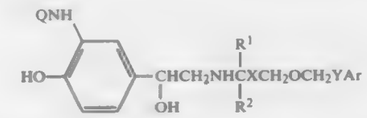
Division of Ser. No. 817,676, Jan. 10, 1986, Pat. No. 4,730,008, which is a continuation-in-part of Ser. No. 788,120, Oct. 16, 1985, abandoned. This application Nov. 24, 1987, Ser. No. 124,601

Claims priority, application United Kingdom, Oct. 17, 1984, [illegible]

Int. Cl.[4] A61K *31/16, 31/17, 31/18, 31/19*

U.S. Cl. 514—212 14 Claims

1. A method of therapy or propylaxis of conditions susceptible to amelioration by a compound possessing selective stimulant action at $beta_2$-adrenoreceptors in a patient which comprises administration of a $beta_2$-adrenoreceptor stimulating amount of a compound of formula (I)



(I)

wherein

Ar represents a phenyl group optionally substituted by one or more substituents selected from halogen atoms, or the groups C_{1-6}alkyl, C_{1-6}alkoxy, nitro, $-(CH_2)_qR$, $-(CH_2)_rR^{10}$ or $-O(CH_2)_tR_{11}$, or Ar is a phenyl group substituted by an alkylenedioxy group of formula $-O(CH_2)_pO-$;

R is hydroxy, $-NR^3R^4$, $-NR^5COR^6$, $-NR^5SO_2R^7$, $-COR^8$, $-SR^9$, $-SOR^9$, $-SO_2R^9$ or —CN;

R^1 and R^2 each represent a hydrogen atom or a C_{1-3}alkyl group with the proviso that the sum total of carbon atoms in R^1 and R^2 is not more than 4;

R^3 and R^4 each represents a hydrogen atom or a C_{1-4}alkyl group or $-NR^3R^4$ forms a saturated heterocyclic amino group which has 5–7 ring members and optionally contains in the ring one or more atoms selected from —O— or —S— or a group —NH— or $-N(CH_3)-$;

R^5 represents a hydrogen atom or a C_{1-4}alkyl group;

R^6 represents a hydrogen atom or a C_{1-4}alkyl, C_{1-4}alkoxy, phenyl or $-NR^3R^4$ group;

R^7 represents a C_{1-4}alkyl, phenyl or $-NR^3R^4$ group;

R^8 represents hydroxy, C_{1-4}alkoxy or $-NR^3R^4$;

R^9 is a hydrogen atom or a C_{1-4}alkyl or phenyl group;

R^{10} is a C_{1-4}alkoxy group;

R^{11} represents a hydroxy or C_{1-4}alkoxy group;

p represents 1 or 2;

q represents an integer from 0 to 3;

r represents an integer from 1 to 3;

t is 2 or 3;

X represents a C_{1-7}alkylene, C_{2-7}alkenylene or C_{2-7}alkynylene chain;

Y represents a bond, or a C_{1-6}alkylene, C_{2-6}alkenylene or

C_{2-6}alkynylene chain with the proviso that the sum total of carbon atoms in X and Y is 2 to 10;

Q represents a group $R^{12}CO$—, $R^{12}NHCO$—, $R^{12}R^{13}NSO_2$— or $R^{14}SO_2$, where R^{12} and R^{13} each represent a hydrogen atom or a C_{1-3}alkyl group, and R^{14} represents a C_{1-4}alkyl group; with the proviso that when X represents C_{1-7}alkylene, and Y represents a bond or C_{1-6}alkylene, then the group Ar does not represent an unsubstituted phenyl group or a phenyl group substituted by one or more substituents selected soley from halogen atom or C_{1-6}alkyl or C_{1-6}alkoxy groups or an alkylenedioxy group —$O(CH_2)_pO$; or a physiologically acceptable salt or solvate thereof.

4,853,383

β-BLOCKING SUBSTITUTED IMIDAZOLES

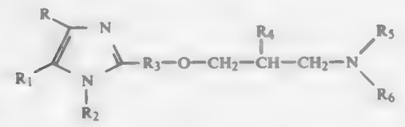
John J. Baldwin, Gwynedd Valley, and Gerald S. Ponticello, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 607,909, May 7, 1984, Pat. No. 4,642,311, Continuation-in-part of Ser. No. 503,923, Jun. 13, 1983, Pat. No. 4,567,276, Division of Ser. No. 255,202, Apr. 20, 1981, Pat. No. 4,440,774, Continuation-in-part of Ser. No. 184,501, Sep. 5, 1980, abandoned, Continuation of Ser. No. 801,120, May 27, 1977, abandoned, Continuation of Ser. No. 641,420, Dec. 17, 1975, Pat. No. 4,137,983, Continuation-in-part of Ser. No. 554,372, Mar. 3, 1975, abandoned. This application Sep. 8, 1986, Ser. No. 905,088

Int. Cl.[4] A61K *31/535;* **C07D** *413/06*

U.S. Cl. 514—235.8 **9 Claims**

1. A compound of the formula:



wherein:

R and R_1 are independently selected from:

(a) hydrogen;

(b) C_5–C_{10} linear or branched alkyl;

(c) substituted C_1–C_{10} linear or branched alkyl having 1–3 substituents selected from the group consisting of fluoro, bromo, chloro, hydroxy, C_1–C_4 alkoxy, morpholino, di(C_1–C_4 alkyl)amino;

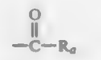
(d) unsubstituted or substituted aryl of C_6 or C_{10} and the substituents are 1-2 halo or C_1–C_6 alkoxy group;

(e) pentafluorophenyl;

(f) halo (fluoro, chloro, bromo);

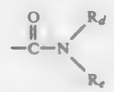
(g) carboxy and carbalkoxy;

(h)



wherein R_a is hydrogen or C_1–C_6 alkyl, and;

(i)



wherein R_d and R_e are hydrogen C_1–C_8 linear or branched alkyl, C_6 or C_{10} unsubstituted or substituted aryl having 1–2 substituents selected from C_1–C_4 linear or branched alkyl, halo, alkoxy or hydroxy;

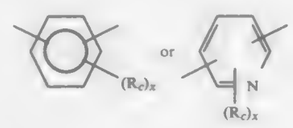
(j) C_1–C_6 alkanoylamino provided that at least one of R and R_1 is selected from (b) to (j);

R_2 is

(a) hydrogen;

(b) C_1–C_{10} linear or branced alkyl;

R_3 is



wherein R_c is

(a) hydrogen

(b) halo;

(c) C_1–C_4 alkyl;

(d) C_1–C_4 alkoxy;

(e) hydroxy;

x is 0–4;

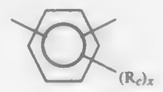
R_4 is hydroxy;

R_5 and R_6 are independently:

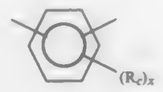
(a) hydrogen;

(b) C_1–C_6 alkyl;

(c) C_1–C_6 substituted alkyl wherein the substituent is selected from alkoxy, methoxyphenyl or dimethoxyphenyl; provided that at least one of R_5 and R_6 is a substituent selected from (b) and (c), and provided that when R_3 is



and R_6 is (b), R is selected from (d)—(j) inclusive, and when R_3 is



and R_6 is (c), R is selected from (c)—(j) inclusive; or a pharmaceutically acceptable acid addition salt or a quaternary ammonium salt thereof.

8. A method for treating hypertension, arrhythmia, or angina, or effecting β-adrenergic blockade, or providing cardioprotection comprising administering to a patient in need of such treatment a pharmaceutically effective amount of a compound of claim 1 in a dose range from 0.01 to 50 mg/kg.

4,853,384

1-CARBONYL DERIVATIVES OF 4-ARYL-4-ARYLOXYPIPERIDINES

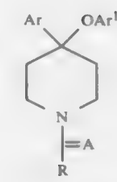
Grover C. Helsley, Pluckemin; Larry Davis, Sergeantsville, and Gordon E. Olsen, Somerset, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Mar. 14, 1988, Ser. No. 167,929

Int. Cl.[4] A61K *31/445;* **C07D** *211/44*

U.S. Cl. 514—255 **35 Claims**

1. A compound of the formula:



wherein Ar is phenyl optionally substituted by one or more loweralkyl, loweralkoxy, halogen, or trifluoromethyl groups; Ar^1 is phenyl optionally substituted by one or more halogen, nitro, amino or trifluoromethyl groups; A is oxygen or sulfur; and R is hydrogen, loweralkyl, phenylloweralkyl wherein the phenyl group is substituted by one or more substituents selected from the group consisting of halogen, loweralkyl, loweralkoxy, and trifluoromethyl, heteroaryllowerakyl wherein the heteroaryl moiety is selected from the group consisting of pyridyl, pyrazinyl, quinolinyl, benzimidazolyl, thienyl, thiazolyl, imidazolyl, and benzisoxazolyl substituted by one or more substituents selected from the group consisting of halogen, loweralkyl, and loweralkoxy, amino, loweralkylamino, diloweralkylamino, or phenylamino wherein the phenyl group is substituted by one or more substituents selected from the group consisting of halogen, loweralkyl, loweralkoxy, and trifluoromethyl.

4,853,385

7-N,8-N-ETHYLENEMITOMYCIN 8-IMINES

Yutaka Saito, Machida; Masaji Kasai, Fujisawa; Kunikatsu Shirahata, Komae; Motomichi Kono, Machida; Makoto Morimoto, Shizuoka, and Tadashi Ashizawa, Numazu, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

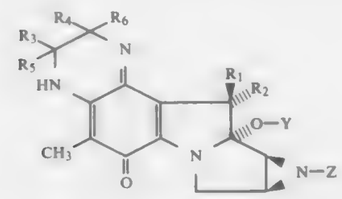
Filed Mar. 29, 1988, Ser. No. 174,897

Claims priority, application Japan, Mar. 31, 1987, 62-78185

Int. Cl.[4] C07D *241/00;* **A61K** *31/495*

U.S. Cl. 514—250 **5 Claims**

1. 7-N,8-N-ethylenemitomycin 8-imines represented by formula (I):



(I)

wherein one of R_1 and R_2 represents carbamoyloxymethyl and the other represents hydrogen, or both are combined together to form methylene; R_3, R_4, R_5 and R_6 independently represent hydrogen or C_{1-4} alkyl, or R_3 and R_4 are combined together to represent —$(CH_2)_n$—, wherein n is 3 or 4; and Y and Z represent hydrogen or methyl, provided that when R_1 represents carbamoyloxymethyl and Y represents methyl, R_2, R_3, R_4, R_5, R_6 and Z are not hydrogen simultaneously.

4,853,386

N[6]-DISUBSTITUTED PURINE DERIVATIVES, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM, USEFUL FOR TREATING ALLERGIC DISEASES, BRONCHOSPASTIC AND BRONCHOCONSTRICTORY CONDITIONS

Walter-Gunar Friebe, Mannheim, and Otto-Henning Wilhelms, Weinheim-Rittenweier, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

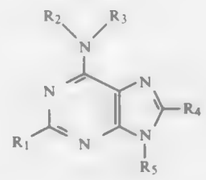
Filed Aug. 15, 1986, Ser. No. 897,109

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1985, 3529497

Int. Cl.[4] A61K *31/52;* **C07D** *473/34, 473/16, 473/40*

U.S. Cl. 514—266 **26 Claims**

1. A compound of the formula:



(I)

wherein

R_1 and R_4 are individually a hydrogen atom, a halogen atom or NR_6R_7, R_6 and R_7 are individually hydrogen, C_1–C_6 alkyl radical and R_2 and R_3 are individually alkyl radicals of from 1 to 6 carbon atoms, alkenyl radicals of from 2 to 6carbon atoms, cycloalkyl radicals of from 3 to 7 carbon atoms, phenylalkyl radicals containing alkyl groups of from 1 to 4 carbon atoms and the phenyl moiety of which is unsubstituted or substituted by halogen, hydroxyl, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio or trifluoromethyl, furylmethyl, furylethyl, thiophenemethyl, thiopheneethyl, pyridylmethyl, pyridylethyl, the pyridyl moieties of which are unsubstituted or substituted by C_1–C_4 alkyl radicals, indanyl or tetrahydronapthyl radicals and R_5 is hydrogen, a tetrahydrofuranyl radical, a tetrahydropyranyl radical, or an alkyl radical of from 1 to 10 carbon atoms which is unsubstituted or substituted by hydroxyl, C_1–C_6 alkanoyloxy, C_1–C_6 alkoxycarbonyl, C_2–C_6 carboxyalkanoyloxy, C_2–C_6 hydroxyalkoxy, C_3–C_6 dihydroxyalkoxy, carboxyl, cyano or 1H-tetrazol-5-yl radical, or pharmaceutically acceptable salts thereof

provided that

(i) R_2 and R_3 are not simultaneously alkyl radicals, or

(ii) when R_5 is hydrogen, then R_2 and R_3 are not simultaneously alkenyl, unsubstituted benzyl or furylmethyl, or

(iii) when R_3 is methyl and R_5 is hydrogen, then R_2 is not alkenyl, unsubstituted benzyl or furylmethyl.

20. The composition useful in treating allergic diseases, bronchospastic and bronchoconstrictory conditions, comprising a therapeutically effective amount of the compound of claim 1, in a pharmaceutically acceptable carrier.

22. A method of treating allergic diseases, bronchospastic and bronchoconstrictory conditions, comprising administering to a subject a therapeutically effective amount of the compound of claim 1 in a pharmaceutically acceptable carrier.

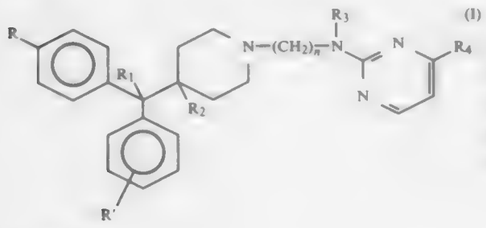
4,853,387

PIPERIDINE DERIVATIVES, AND THEIR APPLICATION IN THERAPY

Philippe Manoury, Verrières le Buisson; Jean Binet, Breuillet, and Elisabeth Dewitte, Saint Gratien, all of France, assignors to Synthelabo, Paris, France

Filed Jul. 22, 1988, Ser. No. 223,076
Claims priority, application France, Jul. 23, 1987, 87 10408
Int. Cl.[4] A61K *31/495;* C07D *239/02*
U.S. Cl. 514—272 7 Claims

1. A compound which is a piperidine derivative of formula (I)



(I)

in which:
n is 1, 2, 3 or 4,
R is hydrogen or a halogen,
R', which is identical to R, is hydrogen or a halogen,
either R_1 is H or OH and R_2 is H, or R_1 and R_2 together denote a bond,
R_3 is hydrogen or (C_{1-4})alkyl, and
R_4 is H or OH,
including tautomeric forms thereof, or a pharmaceutically acceptable acid addition salt thereof.

7. A method of treatment of migraine, anxiety, depression, obesity, inflammation, asthma, an allergy, vascular or gastrointestinal spasms, hypertension or platelet aggregation or of a condition requiring an antiemetic or antihistaminic compound, which comprises administering to a subject suffering or liable to suffer therefrom an effective amount of a compound of formula (I) as defined in claim 1.

4,853,388

METHOD FOR TREATING PSORIASIS WITH CYTOTOXIC AGENTS

Dale L. Pearlman, 21063 Christensen Dr., Cupertino, Calif. 95014

Filed May 15, 1987, Ser. No. 50,983
Int. Cl.[4] A61K *31/505*
U.S. Cl. 514—274 10 Claims

1. A method for treating psoriasis consisting essentially of applying a therapeutically sufficient quantity of a composition consisting essentially of 5-fluorouracil dissolved in a penetration enhancing agent to a psoriatic lesion until remission occurs, the composition being applied in one or more pulses at about one week intervals, each pulse comprising applying to the lesion one or more times over a period of up to 48 hours, an amount of the composition sufficient to wet the lesion.

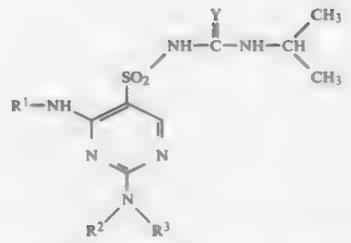
4,853,389

DIURETIC AND ANTIHYPERTENSIVE SUBSTITUTED-5-PYRIMIDINESULFONYLUREAS

Terence M. Dolak, Canadaigua, N.Y.; Sung J. Lee, Clarks Summit, Pa., and James L. Bullington, Hamilton Square, N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 26, 1988, Ser. No. 186,499
Claims priority, application Canada, Jul. 24, 1987, 542916
Int. Cl.[4] C07D *239/46;* A61K *31/505*
U.S. Cl. 514—275 14 Claims

1. A compound of the formula (I)



(I)

wherein R^1 is lower alkyl or lower alkylene containing 3 to 6 straight chain or branched carbon atoms; cycloalkyl, bicycloalkyl, tricycloalkyl, or alicycloalkyl containing 4 to 10 carbon atoms; phenyl or phenyl substituted with lower alkyl, lower alkoxy, or halogen; R^2 and R^3 are each independently hydrogen or methyl; Y is oxygen or sulfur; or a pharmaceutically acceptable salt thereof.

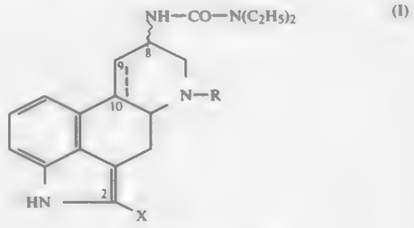
4,853,390

(2-HALOERGOLINYL)-N'-N'-DIETHYLUREA COMPOUNDS USEFUL AS MEDICINAL AGENTS E.G., AS NEUROLEPTICS

Jean-Claude Hilscher; Wolfgang Kehr; Gerhard Sauer; Herbert Schneider, and Helmut Wachtel, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 731,245, May 7, 1985, abandoned, which is a continuation-in-part of Ser. No. 559,068, Dec. 7, 1983, abandoned, which is a continuation of Ser. No. 339,566, Jan. 15, 1982, abandoned. This application Mar. 2, 1987, Ser. No. 21,582
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1981, 3101535
Int. Cl.[4] A61K *31/48;* C07D *457/12*
U.S. Cl. 514—288 23 Claims

1. A (2-Haloergolinyl)-N',N'-diethylurea of the formula



(I)

or a pharmaceutically acceptable salt thereof,
wherein
R is hydrogen or alkyl of up to 6 carbon atoms,
X is halogen,



is a CC single or CC double bond, and the 8-positioned urea residue is in the α— or β— configuration,
with the proviso that when, R is CH_3, and 9 10 is a single bond, then X is not chloro.

22. A method of achieving a neuroleptic effect in a patient comprising administering to a patient in need of such treatment an amount of a compound of claim 5 effective as a neuroleptic.

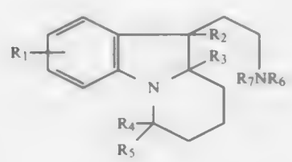
4,853,391

PYRIDO[1,2-A]INDOLES AND THEIR USE AS CARDIOVASCULAR

Guy Nadler, 16 Rue de la Fonderie, 35100 Rennes; Jean-Bernard Le Polles, 16 Rue de Primauguet, 35000 Rennes, and Marie-Noelle Legave, 8 Rue de Robien, 35850 Geveze, all of France

Filed Jun. 28, 1985, Ser. No. 750,038
Claims priority, application United Kingdom, Jun. 30, 1984, 8416724
Int. Cl.[4] A61K *31/395;* C07D *471/02*
U.S. Cl. 514—294 22 Claims

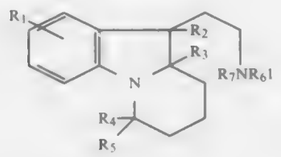
1. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein
R_1 is hydrogen, C_{1-6} alkyl, C_{1-6} alkoxy or halogen;
R_2 and R_3 are both hydrogen or together represent a bond;
R_4 is hydrogen and R_5 is hydrogen or R_4 and R_5 together represent an oxo group;
R_6 is hydrogen; C_{1-6} alkyl; C_{3-7} cycloalkyl; C_{3-7} cycloalkyl-C_{1-4} alkyl; phenyl or phenyl C_{1-7} alkyl in which the phenyl moiety is optionally substituted by one or two of halogen, ortho-nitro, meta- or para-methoxy, methyl or NR_8R_9 wherein R_8 and R_9 are independently hydrogen or C_{1-6} alkyl or R_8 and R_9 together form polymethylene of 2 to 6 carbon atoms, or the phenyl moiety is 3,4-disubstituted by methylenedioxy or ethylendioxy; heteroaryl-C_{1-4} alkyl, wherein said heteroaryl moiety is pyridyl, thienyl, furyl or optionally N-methyl substituted pyrryl; or aliphatic heterocyclyl or aliphatic heterocyclyl-C_{1-4} alkyl, wherein said aliphatic heterocyclyl moiety is optionally N-methyl substituted piperidyl or optionally N-methyl substituted pyrrolidinyl; and
R_7 is hydrogen or C_{1-4} alkyl;
with the proviso that when R_1 is hydrogen, R_2 and R_3 are a bond, R_4 and R_5 are an oxo group and R_7 is hydrogen, R_6 is other than hydrogen or benzyl.

22. A composition for the treatment of cerebrovascular disorders or disorders associated with cerebral senility in mammals including humans, comprising a therapeutically effective amount of a compound of formula (II) or a pharmaceutically acceptable salt thereof:



(II)

wherein R_1, R_2, R_3, R_4, R_5, and R_7 are as defined in claim 1 and R_6 is hydrogen, C_{1-4} alkyl, C_{5-7} cycloalkyl, or phenyl C_{1-7} alkyl optionally monosubstituted by fluoro, chloro, bromo, NR_8R_9 and where R_8 and R_9 are as defined in claim 21, methoxy or nitro, and a pharmaceutically acceptable carrier.

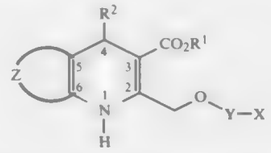
4,853,392

FUSED 1,4-DIHYDROPYRIDINES AS ANTIALLERGY AND ANTIINFLAMMATORY AGENTS

Kelvin Cooper, Deal; Peter E. Cross; Michael J. Fray, both of Canterbury, and Kenneth Richardson, Birchington, all of England, assignors to Pfizer Inc., New York, N.Y.

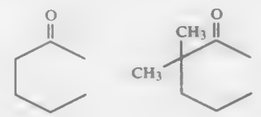
Filed Jul. 11, 1988, Ser. No. 217,584
Claims priority, application United Kingdom, Jul. 17, 1987, 8716971
Int. Cl.[4] A61K *31/47, 31/415;* C07D *221/04, 235/04*
U.S. Cl. 514—311 5 Claims

1. A compound of the formula



I

or a pharmaceutically acceptable salt thereof, wherein R^1 is alkyl having one to three carbon atoms; R^2 is 2-chlorophenyl; Y is alkylene having two to five carbon atoms with at least two carbon atoms in the chain linking X to the oxygen atom; X is 2-alkylimidazol-1-yl said alkyl having one to four carbon atoms, 2,4,5-trimethylimidazol-1-yl or 2-methylbenzimidazol-1-yl; and Z is



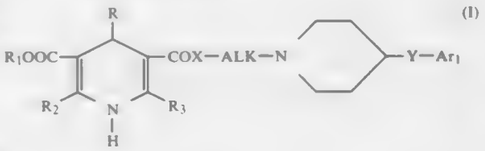
4,853,393

3,5-DIACYL-4-ARYL-1,4 DIHYDROPYRIDINE DERIVATIVES, THEIR USES AND COMPOSITIONS

Markus Zimmermann, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 774,773, Sep. 11, 1985, abandoned. This application Dec. 30, 1987, Ser. No. 139,407
Claims priority, application Switzerland, Sep. 14, 1984, 4308/84
Int. Cl.[4] C07D *401/12;* A61K *31/44*
U.S. Cl. 514—318 21 Claims

1. A compound of formula I



(I)

wherein
R is phenyl which is mono or disubstituted by lower alkyl, lower alkoxy, halogen-lower alkoxy, halogen-lower alkenyloxy or halogen, wherein said halogen group has an atomic number 35 or less, or mono substituted by CF_3, NO_2, or CN, said phenyl substituents occupying the 2- or 3-position of said phenyl ring;
R_1, R_2, and R_3 each represents lower alkyl
X is oxygen or —NH—;
Alk is $—(CH_2)_n—$ wherein n is 2–6;
Y is carbonyl; and
Ar_1 is phenyl which is substituted by halogen of atomic

number 35 or less; or a pharmaceutically acceptable salt thereof.

4,853,394

N-(ω-B-HYDROXYETHYLPIPERID-4-YL ESTERS AND AMIDES

Francis D. King; Roger T. Martin, and Eric A. Watts, all of Harlow, England, assignors to Beecham Group p.l.c., Brentford, England

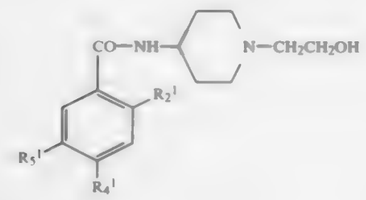
Filed Nov. 3, 1986, Ser. No. 926,427

Claims priority, application United Kingdom, Nov. 2, 1985, [illegible]

Int. Cl.⁴ C07D *211/58;* A61K *31/445*

U.S. Cl. 514—329 **10 Claims**

1. A compound according formula (II):



(II)

wherein

R_2^1 is C_{1-6} alkoxy;

R_4^1 is amino or C_{1-7} alkanoylamino;

R_5^1 is halo or C_{1-6} alkylthio.

10. A method of treatment of disorders relating to impaired gastro-intestinal motility and emesis which comprises the administration of an effective amount of a compound of formula (I) as defined in claim 1, or a pharmaceutically acceptable salt thereof.

4,853,395

CERTAIN 3-CARBOXYLATE OR 3-CARBAMYL-5-ACYL-2-(1H)-PYRIDINONES HAVING CARDIOTONIC PROPERTIES

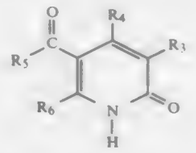
Winton D. Jones; Richard A. Schnettler, and Richard C. Dage, all of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 867,825, May 27, 1986, Pat. No. 4,731,371, which is a division of Ser. No. 594,767, Mar. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 490,081, Apr. 29, 1983, Pat. No. 4,568,751. This application Nov. 17, 1987, Ser. No. 121,543

Int. Cl.⁴ C07D *403/12, 405, 12, 409/12;* A61K *31/44*

U.S. Cl. 514—332 **2 Claims**

1. A compound according to the formula



and the pharmaceutically acceptable salts thereof, wherein

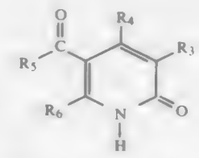
R_3 is $CONH_2$, and COOR with R being hydrogen or lower alkyl,

R_4 is hydrogen or lower alkyl,

R_5 is phenyl, X-substituted phenyl, pyridyl, thienyl, furyl, pyrrolyl and OR wherein R is hydroxy or lower alkoxy, and X is lower alkyl, lower alkoxy, lower alkyl thio, halogen, nitro, lower alkanoyl, alkoxy carbonyl, carboxy, cyano, NH_2, $CONH_2$, amidino, imidazol-2-yl, and CF_3, and

R_6 is hydrogen, methyl, ethyl.

2. A method of treating cardiac failure in a patient in need thereof which comprises administering to said patient a cardiotonically effective amount of a compound of the formula



or a pharmaceutically acceptable salt thereof wherein

R_3 is NH_2, $CONH_2$ and COOR with R being hydrogen or lower alkyl,

R_4 is hydrogen or lower alkyl,

R_5 is pyridyl, and

R_6 is hydrogen, methyl, or ethyl.

4,853,396

PESTICIDAL COMPOSITIONS

Saleem Farooq, Arisdorf, Switzerland, assignor to Ciba-Geigy Corporation, Hawthorne, N.Y.

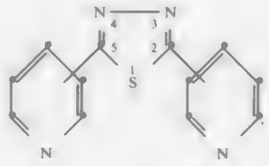
Filed Apr. 4, 1988, Ser. No. 177,228

Claims priority, application Switzerland, Apr. 9, 1987, 1360/87; Feb. 15, 1988, 543/88

Int. Cl.⁴ A61K *31/425*

U.S. Cl. 514—333 **8 Claims**

1. A method of controlling pests selected from insects and representatives of the order Acarina, which comprises treating said pests, their different development stages and/or the locus thereof, with a pesticidally effective amount of a compound of formula I



(I)

or a salt thereof, or with a composition containing such a compound or salt thereof, together with adjuvants and carriers.

4,853,397

SUBSTITUTED FURAZANS AND INSECTICIDAL AND ACARICIDAL USE

Wilhelm Sirrenberg, Sprockhövel; Albrecht Marhold, Leverkusen, and Robert Steffens, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

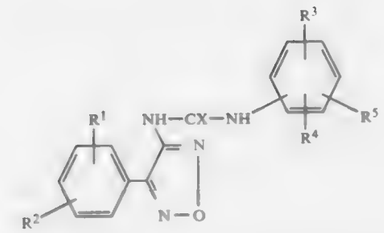
Filed Jun. 25, 1987, Ser. No. 66,920

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1986, 3622862

Int. Cl.⁴ A01N *43/82;* C07D *273/02*

U.S. Cl. 514—364 **9 Claims**

1. A substituted furazan of the formula



in which

R^1 and R^2 are identical or different and represent hydrogen, halogen, C_1–C_6-alkyl, C_1–C_6-alkoxy, C_1–C_6-alkylthio, halogeno-C_1–C_6-alkyl, halogeno-C_1–C_6-alkoxy, halogeno-C_1–C_6-alkylthio or aryloxy, having 6 to 10 carbon atoms in the aryl part, which is optionally substituted by halogen, nitro, cyano, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, halogeno-C_1–C_4-alkyl, halogeno-C_1–C_4-alkoxy and/or halogeno-C_1–C_4-alkylthio, or

R^1 and R^2 together represent C_1–C_3-alkylene radical which is interrupted by 1 or 2 oxygen atoms or bonded to the phenyl ring via 1 or 2 oxygen atoms and which is optionally substituted by halogen and/or C_1–C_2-alkyl,

R^3 and R^4 are identical or different and represent hydrogen, halogen, C_1–C_6-alkyl, C_1–C_6-alkoxy, halogeno-C_1–C_6-alkyl or halogeno-C_1–C_4-alkoxy,

R^5 represents cycloalkyl, having 3 to 8 carbon atoms, which is substituted by halogen and/or C_1–C_2-alkyl, and

X represents oxygen or sulphur.

8. A method of combating insects or acarids which comprises applying to such insects or acarids or to an insect or acarid habitat an insecticidally or acaricidally effective amount of a compound according to claim 1.

4,853,398

LEUKOTRIENE ANTAGONISTS AND USE THEREAS

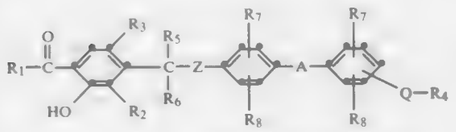
F. P. Carr, Indianapolis; Robert D. Dillard, Zionsville, and Doris E. McCullough, Carmel, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 13, 1987, Ser. No. 38,254

Int. Cl.⁴ C07D *257/04;* A61K *31/41, 31/19;* C07C *59/48*

U.S. Cl. 514—381 **20 Claims**

1. A compound of the Formula



I

and pharmaceutically acceptable salts thereof, wherein:

R_1 is hydrogen, C_1–C_6 alkyl, C_3–C_8 cycloalkyl, phenyl-substituted-(C_1–C_3 alkyl), phenyl, or phenyl substituted with a halo, C_1–C_4 alkyl, or C_1–C_4 alkoxy functionality;

R_2 is C_1–C_{10} alkyl, C_2–C_6 alkenyl, benzyl, or 2-phenylethyl;

R_3 is hydrogen, bromo, or chloro;

Z is $-O-$, $-NR-$, or $-\overset{(O)_p}{\overset{\|}{S}}-$;

A is $-O-$, $-\overset{(O)_p}{\overset{\|}{S}}-$, $-NR-$, $-\overset{O}{\overset{\|}{C}}-$, $-CHOR-$ or

straight or branched chain C_1–C_4 alkylidene;

Q is a bond or straight or branched chain C_1–C_4 alkylidene;

R_4 is COR_9, or 5-tetrazolyl; and p is 0, 1, or 2; where

each R is independently hydrogen, C_1–C_3 alkyl or C_1–C_4 alkanoyl;

each R_5 and R_6 is independently hydrogen, C_1–C_3 alkyl, phenyl, or benzyl;

each R_7 and R_8 is independently hydrogen, C_1–C_4 alkoxy, halo, hydroxy, amino, nitro, or C_1–C_4 alkyl; and

R_9 is hydroxy.

9. A method of treating a mammal suffering from or susceptible to any condition characterized by an excessive release of leukotrienes, which comprises administering to said mammal a leukotriene antagonizing amount of a compound of claim 1.

4,853,399

MICROBICIDAL TRIAZOLYL PHENYLETHANONE KETALS

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

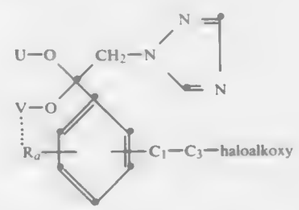
Filed Nov. 17, 1986, Ser. No. 931,289

Claims priority, application Switzerland, Nov. 22, 1985, [illegible]

Int. Cl.⁴ A01N *43/653;* C07D *249/08, 405/06*

U.S. Cl. 514—383 **11 Claims**

1. A compound of formula I

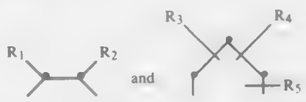


(I)

wherein one of the two phenyl substituents is in 2-position and the other is in 4-position, and wherein

R_a is halogen, methyl or C_1–C_3haloalkoxy,

U and V both taken together are an alkylene bridge selected from



wherein

R_1 and R_2 are each independently of the other hydrogen, C_1–C_6alkyl,

C_1–C_6alkyl which is substituted by one or more halogen atoms, or are phenyl or phenyl which is substituted by one or more halogen atoms and/or C_1–C_2alkyl groups;

R_3, R_4 and R_5 are each independently hydrogen or C_1–C_4alkyl, with the proviso that the total number of carbon atoms in R_3, R_4 and R_5 may not exceed 6; or an acid addition salt or metal complex salt thereof.

4,853,400

FUNGICIDES

John H. Parsons, Saffron; Russell G. Hunt, Harston; Susan E. Leach, Gt. Shelford; Anthony D. Buss, Trumpington; David E. Green, Linton; Michael Mellor, Haverhill, and Albert Percival, Hauxton, all of England, assignors to Schering Agrochemicals Limited, England

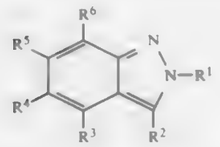
Division of Ser. No. 054,191, May 26, 1987, Pat. No. 4,772,613. This application May 16, 1988, Ser. No. 194,330

Claims priority, application United Kingdom, May 27, 1986, 8612976

Int. Cl.[4] A61K *31/415;* **C07D** *403/04*

U.S. Cl. 514—383 **2 Claims**

1. A compound of any one of formulae I–VI



II

where

R^1 is phenyl, C_{1-6}-alkyl-phenyl, halo-C_{1-6}-alkyl-phenyl, C_{1-6}-alkoxy-phenyl, halo-C_{1-6}-alkoxy-phenyl or nitrophenyl;

R^2 is 1-imidazolyl or 1,2,4-triazol-1-yl; and R^3, R^4, R^5 and R^6, which may be the same or different, are each hydrogen, halo, C_{1-6} alkyl or C_{1-6} alkoxy.

4,853,401

SPIRO-HYDANTOINS AS ALDOSE REDUCTASE INHIBITORS

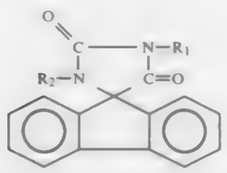
Philippe R. Bovy, St. Louis, Mo.; Claude Gillet, Blanmont, Belgium; Albert Lenaers, Triel-sur-Seine, France; Paul Niebes, Grez-Doiceau, Belgium; Joseph Roba, Dion Valmont, Belgium, and Georges Lambelin, Brussels, Belgium, assignors to G. D. Searle & Co., Chicago, Ill.

Filed Apr. 1, 1987, Ser. No. 33,427

Int. Cl.[4] A61K *31/415;* **C07D** *233/72*

U.S. Cl. 514—389 **18 Claims**

17. A method of inhibiting aldose reductase activity which comprises administering to a mammal in need thereof a therapeutically effective amount of a compound of the formula (I):



(I)

in which:

R_1 and R_2, which may or may not be identical, represent:

(a) Hydrogen or

(b) A $CHR_3—OR_4$ group in which R_3 represents:

(1) Hydrogen

(2) A straight-chain or branched C_1, C_2, C_3 or C_4 alkyl group or

(3) A phenyl group,

R_4 represents:

(1) Hydrogen

(2) A straight-chain or branched C_1, C_2, C_3, C_4, C_5, C_6, C_7, C_8, C_9 or C_{10} alkyl group,

(3) A C_3, C_4, C_5, C_6, C_7 or C_8 cycloalkyl group

(4) A straight-chain or branched C_1, C_2, C_3 or C_4 alkyl group substituted by:

(a) A phenyl or phenoxy group, or

(b) A phenyl or phenoxy group substituted by one or more C_1, C_2, C_3, or C_4 alkyl or C_1, C_2, C_3 or C_4 alkoxy radicals or by one or two atoms of fluorine, chlorine or bromine,

(5) A phenyl group, substituted if required by one or two C_1, C_2, C_3, C_4 alkyl or C_1, C_2, C_3, C_4 alkoxy radicals or by one or two atoms of fluorine, chlorine or bromine

(6) A



group in which R_5 represents:

(a) A straight-chain or branched C_1, C_2, C_3, C_4, C_5, C_6, C_7, C_8, C_9 or C_{10} alkyl group

(b) A C_5, C_6 or C_7 cycloalkyl group

(c) A straight-chain or branched C_1, C_2, C_3, C_4 or C_5 alkyl group substituted by a radical chosen from among the following group:

A C_5, C_6, C_7 cycloalkyl radical,

A phenyl or phenoxy radical,

A phenyl or phenoxy radical substituted by one, two or three straight-chain or branched C_1, C_2, C_3, C_4 alkyl or C_1, C_2, C_3, C_4 alkoxy groups or by one or two atoms of fluorine, chlorine or bromine,

(d) A phenyl group

(e) An —NH—R_6 group in which R_6 represents hydrogen or a straight-chain or branched C_1, C_2, C_3, C_4 alkyl group or a phenyl group

(f) An —O—R_7 group in which R_7 represents a straight-chain or branched C_1, C_2, C_3, C_4 alkyl group or a phenyl or benzyl group, with the restriction that R_1 and R_2 are not simultaneously hydrogen, or a stereoisomer or a mixture of stereoisomers or a salt of said compound formed with a pharmaceutically useful metal or organic base.

4,853,402

FEED ADDITIVE FOR IMPROVING GROWTH IN AGRICULTURAL ANIMALS

Werner Bomann; Franz Esser; Ulrich Hamel, and Helmut Stäble, all of Ingelheim am Rhein, Fed. Rep. of Germany, assignors to Boehringer Ingelheim Vetmedica GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

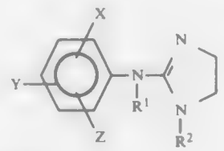
Continuation of Ser. No. 760,239, Jul. 30, 1985, abandoned. This application Feb. 26, 1987, Ser. No. 19,447

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1984, 3428342

Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—401 **3 Claims**

1. A method for promoting growth in an animal which comprises administering to said animal a growth promoting amount of an imidazoline of the formula



I

wherein

R^1 is hydrogen or alkyl;

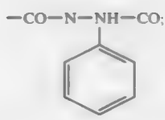
R^2 is hydrogen, benzoyl or acetonyl;

Y is hydrogen, a halogen atom, alkyl, haloalkyl, alkoxy, haloalkoxy, amino, nitro, hydroxy, alkylthio, halothio, or cyclopropyl; and,

X and Z are the same or different and each is hydrogen, a halogen atom, alkyl, haloalkyl, alkoxy, haloalkoxy, amino, nitro, hydroxy, alkylthio, or halothio; or,

X or Z together form —$(CH_2)_4$—,

or a physiologically acceptable acid addition salt thereof.



—CO—N—NH—CO;

n is an integer of 1 to 5 when X is a halogen atom or 1 when X is a group other than the halogen atom; and m is 0 or an integer of 1 to 3, or a salt thereof with a base, when X is hydroxyl group, R^1 is hydrogen atom or R^2 is hydrogen atom.

33. A method of effecting an antiallergic response in a mammal which comprises administering to said mammal an antiallergic effective amount of a 3-phenylthiomethylstyrene derivative according to claim 1.

4,853,403

3-PHENYLTHIOMETHYLSTYRENE DERIVATIVE, PROCESS FOR PREPARING THE SAME, AND ANTIALLERGIC AGENT AND TYROSINEKINASE INHIBITING AGENT CONTAINING THE SAME

Tadayoshi Shiraishi, Takasago; Naohiro Imai, Kakogawa; Takeshi Domoto, Kakogawa; Keiji Kameyama, Kakogawa; Ikuo Katsumi; Takayoshi Hidaka, both of Kobe; Kazunori Hosoe, Takasago, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

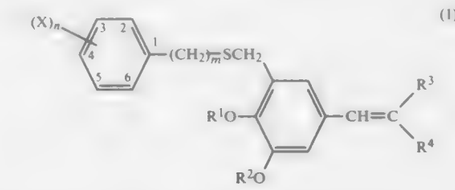
Filed Jul. 28, 1986, Ser. No. 890,034

Claims priority, application Japan, Jul. 29, 1985, 60-167998; Jul. 18, 1986, 61-169303

Int. Cl.[4] A61K *31/085, 31/095, 31/04, 31/135, 31/19, 31/215, 31/275, 31, 365, 31/40, 31/41;* **C07D** *231/08, 207/12, 307/32;* **C07C** *149/40, 147/107, 143/67, 147/13, 147/11*

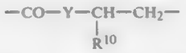
U.S. Cl. 514—404 **34 Claims**

1. A 3-phenylthiomethylstyrene derivative having the formula (1):

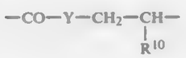


(1)

wherein X is hydrogen atom, an alkyl group having 1 to 5 carbon atoms, an alkoxyl group represented by the formula: R^5O in which R^5 is an alkyl group having 1 to 3 carbon atoms, a nitro group, an amino group, a hydroxyl group, a halogen atom or an alkoxycarbonyl group represented by the formula: $COOR^6$ in which R^6 is an alkyl group having 1 to 3 carbon atoms; R^1 is hydrogen atom, an alkyl group having 1 to 3 carbon atoms or an acyl group represented by the formula: R^7CO in which R^7 is phenyl group or an alkyl group having 1 to 3 carbon atoms; R^2 is hydrogen atom or an alkyl group having 1 to 5 carbon atoms; R^3 is a group represented by the formula: $COOR^8$ in which R^8 is hydrogen atom or an alkyl group having 1 to 4 carbon atoms or a carbamoyl group; R^4 is cyano group or an alkylsulfonyl group represented by the formula: R^9SO_2 in which R^9 is an alkyl group having 1 to 4 carbon atoms; R^3 and R^4 when taken together represent a group represented by the formula:



in which R^{10} is hydrogen atom or an alkyl group having 1 to 4 carbon atoms and Y is oxygen atom or NH, a group represented by the formula:



in which R^{10} and Y are as defined above or a group represented by the formula:

—CO—N—NH—CO;

n is an integer of 1 to 5 when X is a halogen atom or 1 when X is a group other than the halogen atom; and m is 0 or an integer of 1 to 3, or a salt thereof with a base, when X is hydroxyl group, R^1 is hydrogen atom or R^2 is hydrogen atom.

33. A method of effecting an antiallergic response in a mammal which comprises administering to said mammal an antiallergic effective amount of a 3-phenylthiomethylstyrene derivative according to claim 1.

4,853,404

PHENOXYACETIC ACID DERIVATIVES COMPOSITION AND USE

Norio Takamura, Asaka; Kuniyuki Oda, Urawa; Shinichi Kodato, Kawaguchi; Isso Yamaguchi, Tokyo, and Koji Yano, Hoya, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

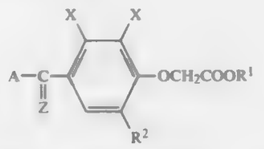
Filed Oct. 5, 1987, Ser. No. 105,173

Claims priority, application Japan, Oct. 13, 1986, 61-242802

Int. Cl.[4] A61K *31/415;* **C07D** *231/12*

U.S. Cl. 514—406 **13 Claims**

1. A phenoxyacetic acid derivative of the formula:



(I)

wherein A is 5-pyrazolyl group or a 5-pyrazolyl group having at least one substituent selected from a halogen atom, an alkyl (C_{1-10}) group, a cycloalkyl (C_{3-8}) group, a phenyl group, a phenyl-lower alkyl group, a lower alkoxy-lower alkyl group, a lower alkoxy-lower alkoxy-lower alkyl group, a di(lower alkyl)amino-lower alkyl group, a lower alkanoyl group, benzoyl group and a di-or triphenyl-lower alkyl group, R^1 is hydrogen atom or a lower alkyl group, R^2 is hydrogen atom or a lower alkenyl group, X is a halogen atom and Z is oxygen atom or methylene group, or a pharmaceutically acceptable salt thereof.

10. A pharmaceutical composition exhibiting diuretic and uricosuric effects which comprises a diuretically and uricosurically effective amount of the compound claimed in claim 1 and a pharmaceutically acceptable carrier therefor.

4,853,405

CONDENSED PYRAZOLE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS AND USE

Gianfederico Doria, Milan; Anna M. Isetta, Rho; Mario Ferrari, and Domenico Trizio, both of Milan, all of Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

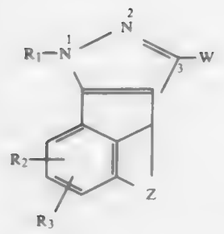
Filed Jan. 15, 1988, Ser. No. 144,330

Claims priority, application United Kingdom, Jan. 21, 1987, 8701238; Sep. 18, 1987, 8721972; Oct. 27, 1987, 8725085

Int. Cl.[4] A61K *31/415, 31/44;* **C07D** *231/54, 491/06*

U.S. Cl. 514—406 **7 Claims**

1. A compound having the following general formula (I)



(I)

wherein

Z represents a C_2–C_6 alkylene chain or a —CH=CH—CH= group or an —E—CHR_4—$(CH_2)_p$— group, in which p is zero, 1 or 2;

E represents an oxygen atom or a $>S(O)_q$ group, wherein q is zero, 1 or 2; and R_4 is hydrogen or C_1–C_3 alkyl;

R_1 represents C_1–C_6 alkyl, benzyl, pyridyl or phenyl, the phenyl being unsubstituted or substituted by one or two substituents chosen independently from halogen, trifluoromethyl, C_1–C_6 alkyl, C_1–C_6 alkoxy, nitro, amino, formylamino and C_2–C_8 alkanoylamino;

each of R_2 and R_3 is independently:

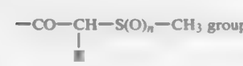
(a) hydrogen, halogen or C_1–C_6 alkyl;

(b) hydroxy, C_1–C_6 alkoxy or C_3–C_4 alkenyloxy; or

(c) nitro, amino, formylamino or C_2–C_8 alkanoylamino; and

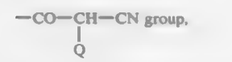
W represents:

(a′) a

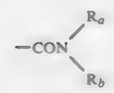


wherein n is 1 or 2 and R represents hydrogen or C_1–C_6 alkyl; or

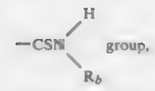
(b′) a



wherein Q represents hydrogen, carboxy, $CONH_2$, C_2–C_7 alkoxycarbonyl or a



or a



group,

wherein R_a represents hydrogen or C_1–C_{20} alkyl and R_b represents C_1–C_{20} alkyl or a —$(CH_2)_m$—R_5 group, wherein m is zero, 1 or 2 and R_5 is:

(a″) C_5–C_8 cycloalkyl;

(b″) pyridyl unsubstituted or substituted by one or two substituents chosen independently from halogen, C_1–C_6 alkyl and C_1–C_6 alkoxy; or

(c″) phenyl unsubstituted or substituted by one or two substituents independently chosen from halogen, CF_3, C_1–C_6 alkyl, C_1–C_6 alkoxy, amino, nitro, formylamino, C_2–C_8 alkanoylamino, di(C_1–C_6 alkyl)amino, hydroxy, formyloxy and C_2–C_8 alkanoyloxy, and

the pharmaceutically acceptable salts thereof.

6. A pharmaceutical composition suitable for treating bacterial and viral infections in mammals, comprising, as an immunomodulating agent, a compound of formula (I) according to claim 1, or a pharmaceutically acceptable salt thereof, in association with a suitable carrier and/or diluent, said compound or salt being in an amount effective to cause immunomodulating activity thereby treating a bacterial or a viral infection in a mammal.

4,853,406

POLYHYDROBENZI[C,D]INDOLESULPHONAMIDES

Ulrich Rosentreter, Wuppertal; Horst Böshagen, Haan; Folker Lieb, Leverkusen; Hermann Oediger, Cologne; Ulrich Niewöhner, Wermelskirchen; Friedel Seuter; Elisabeth Perzborn, both of Wuppertal, and Volker-Bernd Fiedler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 31, 1988, Ser. No. 200,342

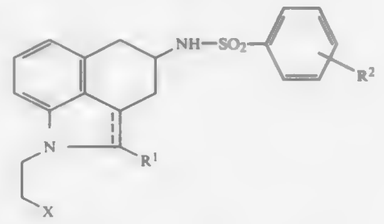
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718892

Int. Cl.⁴ A61K *31/40;* **C07D** *209/92*

U.S. Cl. 514—411 **14 Claims**

1. A polyhydrobenz[c,d]indolesulphonamide of the formula

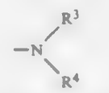
(I)



in which

R^1 is hydrogen, C_{6-12} aryl or C_{1-12} alkyl,

R^2 is hydrogen, halogen, C_{1-12} alkyl, C_{1-12} alkoxy, trifluoromethyl, trifluoromethoxy, hydroxyl, C_{7-14} aralkoxy or a group of the formula



R^3 and R^4 each independently is hydrogen, C_{1-12} alkyl, C_{6-12} aryl, C_{7-14} aralkyl, benzoyl or C_{1-6} alkylcarbonyl and

X is cyano or carboxyl, or a physiologically acceptable salt thereof.

4,853,407

AMINOETHYLCYSTEINE DERIVATIVES

Norio Shibamoto, Chigasaki; Takeo Yoshioka, Ayase; Yasuo Fukagawa, Kamakura, and Tomoyuki Ishikura, Chigasaki, all of Japan, assignors to Sanraku Incorporated, Tokyo, Japan

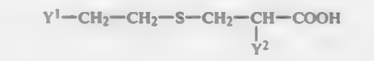
Filed May 20, 1988, Ser. No. 197,446

Claims priority, application Japan, May 22, 1987, 62-124055

Int. Cl.⁴ A61K *31/40;* **C07D** *209/48*

U.S. Cl. 514—414 **5 Claims**

1. Compounds represented by formula



(I)

wherein Y^1 and Y^2 are identical or different, and respectively denote benzoylamino groups or phthalimide groups.

4. A pharmaceutical composition comprising a dipeptidase-inhibiting amount of a compound of the formula (I) given in claim 1 and a pharmaceutically acceptable carrier or diluent.

4,853,408

4-PHENYLPROPYL-INDOLES HAVING ANTIARYTHMIC ACTIVITY

Francois Clemence; Jacques Guillaume, both of Paris, and Gilles Hamon, Montrouge, all of France, assignors to Roussel Uclaf, Paris, France

Filed Apr. 17, 1986, Ser. No. 853,030

Claims priority, application France, Apr. 23, 1985, 85 06135; Jan. 21, 1986, 86 00761

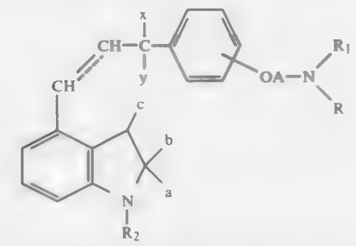
The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.

Int. Cl.⁴ A61K *31/40;* **C07D** *209/04*

U.S. Cl. 514—415 **18 Claims**

1. A compound selected from the group consisting of 4-phenyl propyl-indoles of the formula

I



wherein R and R_1 are individually selected from the group consisting of hydrogen, linear alkyl of 1 to 5 carbon atoms, branched alkyl of 3 to 5 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, cycloalkylalkyl of 4 to 7 carbon atoms and aralkyl of 7 to 12 carbon atoms optionally substituted with 1 to 3 members of the group consisting of halogen, methyl, ethyl, methoxy, ethoxy, CF_3—, CH_3S—, —NH_2 and —NO_2 or R_1 and R taken together with the nitrogen atom form an heterocycle selected from the group consisting of pyrrolidino, piperidino, morpholino and piperazinyl optionally substituted with a member of the group consisting of alkyl of 1 to 5 carbon atoms, phenyl, naphthyl and aralkyl of 7 to 12 carbon atoms, a together with b forms =O or a together with c forms a carbon-carbon bond, b is hydrogen or with a forms =O, c is hydrogen or with a forms a carbon-carbon bond, the dotted line is an optional carbon-carbon bond, A is —$(CH_2)_n$—, n is an integer from 2 to 5, R_2 is selected from the group consisting of hydrogen, linear alkyl of 1 to 5 carbon atoms and branched alkyl of 3 to 5 carbon atoms, x is hydrogen or —OH or together with y forms =O and y is hydrogen or together with x forms =O and their non-toxic, pharmaceutically acceptable acid addition salts.

13. A method of inducing antiarythmic activity in warm-blooded animals comprising administering to warm-blooded animals an antiarythmically effective amount of at least one compound of claim 1.

4,853,409

3-SUBSTITUTED-2-OXINDOLE-1-CARBOXAMIDES FOR SUPPRESSING T-CELL FUNCTION

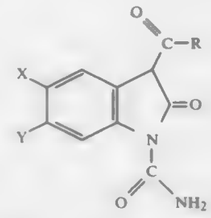
Henry J. Showell, New London County, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Apr. 13, 1988, Ser. No. 181,142

Int. Cl.⁴ A61K *31/40*

U.S. Cl. 514—418 **40 Claims**

1. A method of suppressing T-cell function in a mammal which comprises administering to a mammal in need thereof a T-cell function suppressing amount of a compound of the formula



or a pharmaceutically-acceptable base salt thereof, wherein X is H, Cl or F; Y is H or Cl; and R is benzyl or thienyl.

4,853,410

HYDROXYACETIC ACID DERIVATIVES FOR THE TREATMENT OF DIABETIC COMPLICATIONS

Christopher A. Lipinski, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

PCT No. PCT/US86/00091, § 371 Date Oct. 9, 1987, § 102(e) Date Oct. 9, 1987, PCT Pub. No. WO87/04344, PCT Pub. Date Jul. 30, 1987

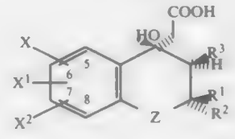
PCT Filed Jan. 17, 1986, Ser. No. 130,360

Int. Cl.⁴ A61K *31/38, 31/35;* **C07D** *311/96, 311/04, 335/06*

U.S. Cl. 514—432 **38 Claims**

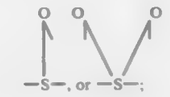
1. A racemic compound having the relative stereochemical formula or a chiral compound having the absolute stereochemical formula

(I)



wherein

Z is —O—, —S—,



R^1 and R^2 are taken separately;

R^1 is (C_1–C_4)alkyl, trifluoromethyl or $(CH_2)_nAr$ where n is 0, 1 or 2 and Ar is phenyl or phenyl mono- or disubstituted by methoxy, fluoro, chloro or bromo, where disubstituents are the same or different; and

R^2 is hydrogen, methyl or ethyl; or R^1 and R^2 are taken together and are $(CH_2)_4$ or $(CH_2)_5$;

R^3 is hydrogen or methyl; with the provisos that when either Z is other than —O—, or R^1 is other than methyl, ethyl or trifluoromethyl, both R^2 and R^3 are hydrogen;

X is hydrogen, a first substituent at the 6-position which is fluoro, chloro, bromo, methyl, nitro, cyano, methanesulfonyl or benzoyl, with the proviso that when Z is other than —O—, X is other than hydrogen and is a first substituent at the 6-position which is fluoro, chloro, cyano or nitro; and

X^1 and X^2 are taken separately;

X^1 is hydrogen, a first substituent at the 7-position which is fluoro, chloro, bromo, carboxy, or methyl, or a second substituent at either the 5- or 7-position which is fluoro, chloro, bromo, (C_1–C_3)alkyl, (C_1–C_3)alkoxy or benzyloxy; and

X^2 is hydrogen, or a first or second substituent at the 8-position which is fluoro, chloro, bromo or (C_1–C_3)alkyl; or

X^1 and X^2 are taken together and are 7,8-benzo; or a pharmaceutically-acceptable cationic salt thereof.

30. A pharmaceutical composition of the control of chronic diabetic complications in mammals which comprises a compound of claim 1 in a pharmaceutically-acceptable carrier.

4,853,411

BIOCIDE

Douglas Clarkson, Aughton, and Richard P. Clifford, South Wirral, both of England, assignors to W.R. Grace & Co.-Conn., New York, N.Y.

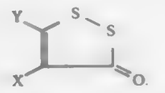
Filed Dec. 11, 1987, Ser. No. 131,681

Claims priority, application European Pat. Off., Feb. 3, 1987, [redacted]

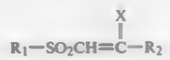
Int. Cl.⁴ A01N *43/26, 37/34*

U.S. Cl. 514—441 **16 Claims**

1. A biocidal composition suitable for addition to an aqueous system which comprises a synergistically effective combination of a thiolan of the formula:



wherein each of X and Y represents chlorine, and a sulphone of the formula:



in which R_1 represents a phenyl radical, R_2 represents a cyano radical and X represents chlorine; the thiolan and the sulphone being present in a weight ratio of the thiolan to the sulphone of from about 1:15 to 1:1.

4,853,412

N-[[6-METHOXY-5-(TRIFLUOROMETHYL)-1-NAPHTHALENYL]-[SUBSTITUTED IMINO]METHYL]-N-METHYLGLYCINES

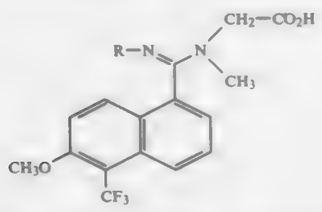
Jay E. Wrobel, Lawrenceville, and Kazimir Sestanj, Monmouth Junction, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 23, 1987, Ser. No. 137,381

Int. Cl.⁴ C07C *143/80;* **A61K** *31/195*

U.S. Cl. 514—510 **7 Claims**

1. A compound of formula (I)



(I)

wherein R is —CN, $—SO_2CF_3$, or $—SO_2p—BrC_6H_4$, or the pharmaceutically acceptable salt thereof.

4,853,413

REPELLING ANIMALS WITH COMPOSITIONS COMPRISING CITRONELLYL NITRILE, CITRONELLOL AND, OPTIONALLY METHYL TERPENYL ETHER, LEMON OIL, CARYOPHYLLENE, ISOPULEGOL, ISOPULEGYL ACETATE AND QUININE OR ONE OR MORE OF ITS SALTS

Ira Katz, West Long Branch, and Donald A. Withycombe, Lincroft, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 3, 1987, Ser. No. 33,788

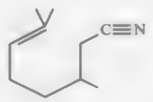
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.

Int. Cl.⁴ A01N *31/275, 31/075, 31/045*

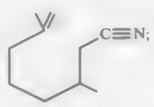
U.S. Cl. 514—526 **6 Claims**

1. A method for repelling dogs which consists of applying to an area or article of manufacture a dog repellent amount of a composition of matter contained in a solid or liquid carrier, said composition of matter consisting essentially of:

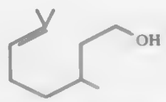
(a) from about 40 parts by weight up to about 90 parts by weight of citronellyl nitrile which is a mixture containing from about 60 up to about 100% by weight of the compound having the structure:



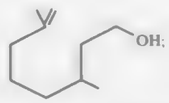
and from about 0 up to about 40% by weight of the compound having the structure:



(b) from about 4 parts by weight up to about 20 parts by weight of citronellol which is a mixture of compounds containing from about 60% up to about 100% by weight of the compound having the structure:



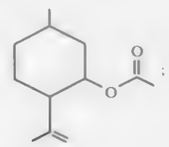
and from about 0 up to about 40% by weight of the compound having the structure:



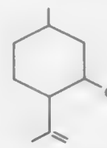
(c) from about 0 up to about 2 parts by weight of beta-caryophyllene having the structure:



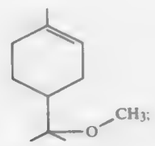
(d) from about 0 up to about 0.5 parts by weight of isopulegyl acetate having the structure:



(e) from about 0 up to about 1.5 parts by weight of the isopulegol having the structure:

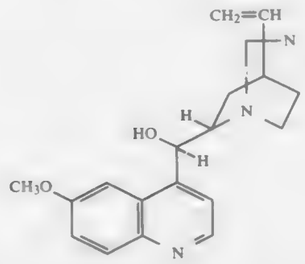


(f) from about 0 parts by weight up to about 50 parts by weight of alpha-terpenyl methyl ether having the structure:



(g) from about 0 parts by weight up to about 50 parts by weight of lemon essential oil;

(h) from about 0 parts by weight up to about 25 parts by weight of quinine having the structure:



or one or more of its salts.

4,853,414

HALOGENATED ESTERS

Michael J. Robson, and John Williams, both of Bracknell, United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

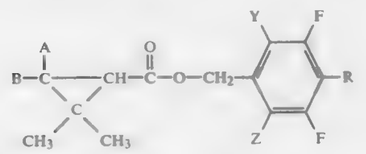
Filed Oct. 30, 1987, Ser. No. 114,732

Claims priority, application United Kingdom, Nov. 6, 1986, [redacted]

Int. Cl.⁴ C07C *69/74;* **A01N** *53/00*

U.S. Cl. 514—531 **14 Claims**

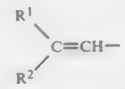
1. A compound of formula



wherein Y represents alkoxy of up to six carbon atoms; Z represents halo or alkoxy of up to six carbon atoms; R represents a group of formula:

$$—(CH_2)_p—(O)_m—R^3$$

wherein each of m and p may have a value selected from zero and one, R^3 represents alkyl containing up to six carbon atoms, phenyl or benzyl, and additionally R^3 may represent alkenyl containing up to six carbon atoms, haloalkenyl containing up to six carbon atoms, alkynyl containing up to six carbon atoms or haloalkynyl containing up to six carbon atoms when m has the value zero; and either (a) A and B are both selected from alkyl containing up to four carbon atoms, or (b) A represents hydrogen and B represents a group of formula:



wherein R^1 and R^2 are each selected from methyl, fluoro, chloro, bromo and trifluoromethyl.

4,853,415

2-(SUBSTITUTED SULFAMYL) DERIVATIVES OF 4-NITROBENZAMIDE AS RADIATION SENSITIZERS

Edward L. Engelhardt, Gwynedd Valley, and Walfred S. Saari, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

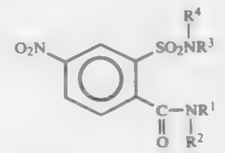
Continuation of Ser. No. 178,783, Mar. 30, 1988, abandoned, which is a continuation of Ser. No. 937,277, Dec. 3, 1986, abandoned. This application Dec. 5, 1988, Ser. No. 279,340

The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.

Int. Cl.⁴ A61K *31/18;* **C07C** *143/78*

U.S. Cl. 514—603 **6 Claims**

1. A 2-(substituted sulfamyl) derivative of 4-nitrobenzamide, of the formula:



wherein:

R^1 is hydrogen or loweralkyl of 1–4 carbons;

R^2 and R^4 are the same or different and are each hydrogen, loweralkyl of 1–4 carbons, or hydroxyloweralkyl;
R^3 is loweralkyl of 1–4 carbons substituted with

$$-N(Q^1)-Q^2,$$

wherein Q^1 is the same or different from Q^2 and both Q^1 and Q^2 are hydrogen, loweralkyl of 1–4 carbons, or hydroxyloweralkyl, or Q^1 and Q^2 taken together with the nitrogen atom in

$$-N(Q^1)-Q^2$$

form an heterocyclic ring selected from aziridinyl, azetidinyl, pyrrolidinyl or piperidinyl; or any physiologically acceptable salt thereof.

4,853,416

SOLUTIONS OF PENTAMIDINE

Aloysius Anaeboaam, Brookline; Emmett Clemente, Manchester; Theresa Devlin, Brighton, and Diane Ringden, Somerville, all of Mass., assignors to Fisons Corporation, Leicestershire, England

Filed Apr. 25, 1988, Ser. No. 185,463
Int. Cl.[4] A61K *31/155*
U.S. Cl. 514—636 **18 Claims**

1. A pharmaceutical composition comprising an aqueous solution of pentamidine or a pharmaceutically acceptable salt thereof, the solution having a concentration of active ingredient of 0.1 to 10% w/v and a pH greater than 1.5 and less than 4.5.

4,853,417

PROCESS FOR MANUFACTURING RIGID POLYURETHANE FOAM

Eckehard Weigand, Kobe; Yoshinori Kihara, Yamada-Nishi, and Masaru Honda, Kobe, all of Japan, assignors to Sumitomo Bayer Urethane Co., Ltd, Amagasaki, Japan

Filed Jun. 8, 1988, Ser. No. 204,053
Claims priority, application Japan, Jun. 19, 1987, 62-154236
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—131 **5 Claims**

1. A process for manufacturing rigid polyurethane foam comprising reacting an isocyanate-reactive component containing at least two isocyanate-reactive hydrogen atoms and having a molecular weight of from 32 to 10,000 or a mixture thereof, with a polyisocyanate composition comprising
(a) 30 to 70 parts by weight of polymethylene polyphenyl polyisocyanate having an isocyanate content of from 29 to 32%,
(b) 30 to 70 parts by weight of a compound having 30 to 42% by weight isocyanate content obtained by reacting 2,4- and/or 2,6-tolylene diisocyanate with a polyhydric alcohol having a molecular weight of from 60 to 800, thereafter initiating a reaction in the presence of a trimerization catalyst, and if necessary, diluting the resultant product with 2,4-and/or 2,6-tolylene diisocyanate,
(c) 0 to 30 parts by weight of other isocyanate compounds, in the presence of water and/or organic blowing agents, catalysts and surfactants.

4,853,418

POLYURETHANE EMULSION, SHEET-LIKE POROUS MATERIAL MAKING USE OF THE EMULSION AND PRODUCTION PROCESS OF THE MATERIAL

Kazuyuki Hanada, Washinomiya; Iwao Misaizu, Ageo; Masashi Kashimura, Tokyo; Tomoko Goto, Kawaguchi, and Katsumi Kuriyama, Koshigaya, all of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd. and Ukima Colour & Chemicals Mfg. Co., Ltd., both of Tokyo, Japan

Filed Aug. 8, 1988, Ser. No. 229,491
Claims priority, application Japan, Aug. 10, 1987, 62-198320
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—154 **6 Claims**

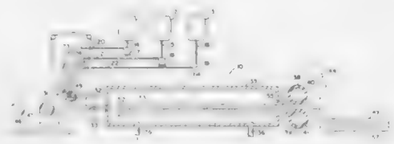
1. A polyurethane emulsion comprising:
an organic solvent solution of a polyurethane resin containing silicone segments and/or fluorocarbon segments as backbones and/or side chains; and
water emulsified in the organic solvent solution.

4,853,419

DISTILLED PRODUCTS OF POLYETHYLENE TEREPHTHALATE POLYMERS AND POLYCARBOXYLIC ACID-CONTAINING POLYOLS AND POLYMERIC FOAMS OBTAINED THEREFROM

Richard K. Hallmark, Largo, and Ernest K. Moss, Clearwater, both of Fla., assignors to Sloss Industries Corporation, Birmingham, Ala.

Division of Ser. No. 756,107, Jul. 18, 1985, Pat. No. 4,758,607. This application Apr. 7, 1988, Ser. No. 178,942
The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.
Int. Cl.[4] C08G *18/00, 18/14*
U.S. Cl. 521--172 **30 Claims**



1. A polyisocyanurate form comprising the reaction product of an organic polyisocyanate, a blowing agent, a trimerization catalyst. and a minor amount of a polyol, wherein from about 5 to 100 weight percent of the polyol comprises a polyester polyol mixture comprising the reaction product obtained by
(a) digesting polyethylene terephthalate with a digesting medium comprising a polycarboxylic acid component-containing polyol derived from a digesting polycarboxylic acid component and a digesting polyol component to form a digested polyol mixture and liberate ethylene glycol from said polyethylene terephthalate, and
(b) distilling from said digested polyol mixture the amount of liberated ethylene glycol sufficient for improved storage stability of the mixture.

4,853,420

FOAMABLE THERMOPLASTIC POLYMERS AND A METHOD FOR FOAMING

Tu-Anh Pham, Lake Jackson, and Gerald M. Lancaster, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 4, 1987, Ser. No. 47,071
Int. Cl.[4] C08J *9/00*
U.S. Cl. 521—50.5 **4 Claims**

1. A method for forming a shaped object from a thermoplastic polymer foam which method comprises
(a) foaming or expanding by high frequency electromagnetic radiation or by conventional means individual thermoplastic beads or pellets which have been imbibed with a mechanical or physical foaming or blowing agent: and
(b) placing the expanded beads or pellets in a suitable mold having the desired shape and subjecting the thus filled mold to high frequency electromagnetic radiation thereby causing the beads or pellets to fuse together thereby forming a foamed object of the desired shape.

4,853,421

POLYAMIDE RESIN DISPERSIONS AND METHOD FOR THE MANUFACTURE THEREOF

Michael E. Hayes, Fernandina Beach, Fla., assignor to Union Camp Corporation, Wayne, N.J.

Division of Ser. No. 151,733, Feb. 3, 1988. This application Mar. 8, 1989, Ser. No. 320,683
Int. Cl.[4] C08K *7/16*
U.S. Cl. 523—223 **1 Claim**

1. The stable aqueous dispersion comprised of dispersed particles of a nonsolvated, un-neutralized, low acid, low amine number polymerized fatty acid polyamine resin having a volume average particle size distribution of less than 20 microns, water and a surfactant which is the salt of the amine of the formula:

$$R-NH-(CH_2)_{N1}NH-(CH_2)_{n2})_{n3}NH_2$$

wherein R represents an alkyl having 16–20 carbon atoms and n_1 and n_2 are the same or different and each represents a whole number from 1–3 and n_3 is 0 or 1; said dispersion containing 20 to 60 percent by weight of said polyamide resin with the particles thereof being uniformly dispersed in the water to form the dispersion having a stability against separation into separate phases at ambient temperatures in excess of 24 hours.

4,853,422

THERMOSETTING ARCYLIC LATEXES

Kenneth G. Hahn, Jr., Hinckley, Ohio, assignor to The Glidden Company, Cleveland, Ohio

Division of Ser. No. 157,256, Feb. 18, 1988, Pat. No. 4,812,491, which is a continuation-in-part of Ser. No. 100,537, Sep. 24, 1987, Pat. No. 4,789,694. This application Oct. 31, 1988, Ser. No. 265,009
The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.
Int. Cl.[4] C08J *3/08;* C08L *61/00*
U.S. Cl. 523—310 **5 Claims**

1. A self-curing paint coating composition substantially free of cations and comprising a self-curing emulsion polymer, said emulsion polymer comprising copolymerized monomers on a weight basis, between 0.6% and 30% functional monomers selected from carboxyl monomers and hydroxyl monomers, between 0.1% and 10% alkylol acrylamide monomers, and between 60% and 99.4% after ethylenically unsaturated monomers, but substantially free of amine monomers and amine functional groups, where said self-curing emulsion polymer is ion-exchanged to remove cations therefrom, said self-curing emulsion polymer having a pH below 2.5.

4,853,423

CURABLE POLYPHENYLENE ETHER-POLYEPOXIDE COMPOSITIONS USEFUL IN PRINTED CIRCUIT BOARD PRODUCTION

Erik W. Walles, Rensselaer; John H. Lupinski, Scotia; Mark Markovitz, Schenectady; Robert E. Colborn, Schenectady; James R. Presley, Schenectady, all of N.Y.; Michael J. Davis, Coshocton, Ohio; Michael G. Minnick, Coshocton, Ohio; Steven J. Kubisen, Jr., Coshocton, Ohio; John E. Haligren; Donald A. Bolon, both of Scotia, N.Y.; Victoria J. Eddy, and Patricia C. Irwin, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 14, 1988, Ser. No. 219,106
Int. Cl.[4] C08L *61/10, 63/02, 63/04, 71/04*
U.S. Cl. 523—428 **17 Claims**

1. A curable composition containing chemically combined bromine in an amount effective to impart flame retardancy and comprising:
(I) about 25–50% of a resinous composition containing 15–20% chemically combined bromine and comprising the reaction product obtained by heating at a temperature in the range of about 125°–225° C., in the presence of a catalytic amount of at least one basic reagent, a mixture comprising:
(A) at least one halogen-free bisphenol polyglycidyl ether having an average of at most one aliphatic hydroxy group per molecule;
(B) about 15–25% of at least one halogen-free epoxidized novolak; and
(C) 25–35% of at least one bisphenol containing bromine as aryl substituents;
the percentages of components B and C being based on total reagents A, B and C;
(II) about 35–55% of at least one polyphenylene ether;
(III) about 4–15% of at least one halogen-free noyolak, substantially all oxygen therein being in the form of phenolic hydroxy groups;
(IV) an amount of at least one of imidazoles and arylene polyamines to provide a total of at least 2 milliequivalents of basic nitrogen per 100 parts of said curable composition;
(V) about 0.1–1.0% of zinc in the form of a zinc salt which is soluble or stably dispersible in said curable composition; and
(VI) about 1–4% of antimony pentoxide stably dispersed in said curable composition;
said composition being dissolved in an effective amount of an inert organic solvent;
said percentages being by weight and based on the total of components I–VI and any other resinous materials and brominated materials present.

4,853,424

FLAME-RETARDANT POLYMER COMPOSITIONS

Horst Staendeke, Lohmar, Fed. Rep. of Germany, and Daniel Scharf, East Greenwich, R.I., assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 12, 1988, Ser. No. 231,709
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1987, 3728629
Int. Cl.[4] C08K *00/00*
U.S. Cl. 523—506 **11 Claims**

1. A flame-retardant polymer composition, wherein the polymer is an unsaturated polyester resin, containing a flame-retardant system consisting essentially of 5 to 50 parts by weight of ammonium polyphosphate and 50 to 175 parts by weight of aluminum hydroxide per 100 parts by weight of polymer the said ammonium polyphosphate containing 0.5 to 25 weight % of a water-insoluble synthetic resin encapsulating the individual ammonium polyphosphate particles.

4,853,425

MELT-PROCESSABLE FLUORINE-CONTAINING RESIN COMPOSITION

Tatsushiro Yoshimura; Nobuyuki Tomihashi, both of Takatsuki, and Shuhei Shimasaki, Yono, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed Nov. 17, 1987, Ser. No. 122,084
Claims priority, application Japan, Nov. 18, 1986, 61-274904
Int. Cl.[4] C08K *5/47, 5/57, 5/18*
U.S. Cl. 524—83 4 Claims

1. A melt-processable fluorine-containing resin composition comprising:

(A) a fluorovinyl ether-tetrafluoroethylene copolymer and

(B) a thermal stabilizer is at least one member selected from the group consisting of an amine antioxidant, an organosulfurous compound and an organotin antioxidant in an amount of not less than 0.05 to less than 400 ppm of said copolymer (A).

4,853,426

IN-REACTOR STABILIZATION OF POLYOLEFINS VIA COATED STABILIZERS

Ananda M. Chatterjee, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 25, 1988, Ser. No. 147,953
Int. Cl.[4] C08K *9/10*
U.S. Cl. 524—100 11 Claims

1. A process for providing in-reactor stabilization of a polyolefin during a polymerization reaction comprising the steps of:

forming a particulate adapted for use in polyolefin polymerization reactions, by the steps consisting of

heating until liquid a polyolefin wax;

fluidizing with a hot gas, additive particles selected from the group consisting of an antioxidant, a processing stabilizer, an acid acceptor, and mixtures thereof;

spraying the liquid polyolefin wax on the heated fluidized additive particles; and

maintaining the fluidized additive particles at a temperature which is sufficient to prevent the formation of fibers and adequate to form discrete substantially coated additive particles;

adding said discrete substantially coated additive containing particles to a polymerization reactor and using a magnesium supported titanium halide/aluminum alkyl catalyst system wherein said system comprises

(i) a procatalyst compound obtained by halogenating a magnesium compound of the formula MgR′R″ wherein R′ is an alkoxide or aryloxide group or halogen, and R″ is an alkoxide, alkyl carbonate, aryloxide, or halogen with a halide of tetravalent titanium and electron donor, contacting the halogenated product with a tetravalent titanium halide, washing it to remove unreacted titanium and an electron donor, contacting the halogenated product with a tetravalent titanium halide, washing it in an inert solvent to remove unreacted titanium compounds and recovering the solid product;

(ii) a cocatalyst component comprising an organoaluminum compound selected from the group comprising diethyl aluminum chloride, ethyl aluminum dichloride, ethyl aluminum sesquichloride and tri-ethyl aluminum; and

(iii) a selectivity control agent selected from the group comprising; diphenyl dimethoxy silane, paraethoxy benzoate, ethyl paratoluate, paramethoxy ethyl benzoate, phenyl triethoxysilane and 2,2,6,6-tetramethyl piperidine.

4,853,427

COMPOSITION AND METHOD TO PROCESS POLYMERS INCLUDING ULTRAHIGH MOLECULAR WEIGHT POLYETHYLENE

Joris F. Herten, and Bernard D. Louies, both of Brussels, Belgium, assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 621,295, Jun. 15, 1984, abandoned. This application Sep. 19, 1986, Ser. No. 909,157
Int. Cl.[4] C08K *5/09*
U.S. Cl. 524—394 16 Claims

1. A composition comprising: (a) an ultrahigh molecular weight vinylic polymer having a weight average molecular weight of at least 1,000,000, (b) from about 0.1 to about 25 percent by weight based on the weight of the vinylic polymer of a second polymeric material containing more than one acid group, and having a weight average molecular weight of less than 10,000, and (c) from about 0.01 to about 2.5 percent by weight, based on the weight of the vinylic polymer, of a carboxylic acid salt.

4,853,428

ELASTOMER COMPOSITIONS WITH SUPERIOR LOW TEMPERATURE FLEXIBILITY

Area N. Theodore, Farmington Hills, and Paul C. Killgoar, Jr., Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 2, 1987, Ser. No. 115,800
The portion of the term of this patent subsequent to Feb. 24, 2004, has been disclaimed.
Int. Cl.[4] C08K *5/01*
U.S. Cl. 524—49 20 Claims

1. An elastomer composition comprising a substantially homogeneous mixture of:

(a) 100 parts by weight of elastomer having a fully saturated backbone;

(b) curing agent for said elastomer in amount sufficient to crosslink said elastomer;

(c) reinforcing particulate filler; and

(d) at least 20 parts by weight polyalphaolefin oil having a kinematic viscosity of between about 2 and about 200 centistokes wherein at least 85% by weight of said polyalphaolefin oil boils above about 180° C.

4,853,429

SEED COLORANT

Takanori Sannan, Tokyo; Mitsutaka Seki, Kawaguchi; Shinya Tsuchida, Urawa, and Shojiro Horiguchi, Omiya, all of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co. Ltd., Tokyo, Japan

Filed Feb. 5, 1988, Ser. No. 152,498
Claims priority, application Japan, Feb. 14, 1987, 62-30700
Int. Cl.[4] C08L *89/00, 77/00, 63/00, 23/06*
U.S. Cl. 524—29 3 Claims

1. A seed colorant comprising:

an aqueous medium;

a dye and/or pigment;

spherical resin particles; and

a binder resin compound of the salt of chitosan and an organic acid.

4,853,430

METHOD OF INCREASING VISCOSITY WITH FATTY ACID-MODIFIED POLYESTERS AND HIGHLY VISCOUS COMPOSITIONS OBTAINED THEREBY

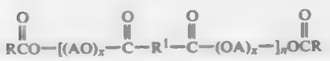
Herbert Stühler, Burgkirchen/Alz; Alwin Reng, Kelkheim; Werner Skrypzak, Liederbach, and Jochen M. Quack, Eppstein/Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 527, Jan. 5, 1987, abandoned. This application Dec. 30, 1987, Ser. No. 140,914
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1986, 3600263
Int. Cl.[4] C08J *67/02;* C11D *17/00;* A61K *31/74*
U.S. Cl. 524—604 9 Claims

1. A surfactant composition comprising:

a nonionic, anionic or amphoteric surfactant or a mixture of said surfactants and, as a viscosity-increasing agent therefor,

a fatty acid-modified polyester which is the reaction product of the components comprising a dimerized fatty acid and a polyalkylene oxide, said fatty acid-modified polyester having the formula



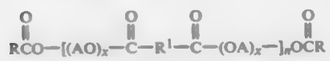
in which R is C_8–C_{22}-alkyl or C_8–C_{22}-alkenyl; R^1 is the alkyl skeleton of a dimerized fatty acid having 22 to 42 carbon atoms; A is $—C_2H_4—$ or $—C_3H_6—$, n is a number from 1 to 5; and x is a number from 20 to 150.

9. A cleaning, cosmetic, or pharmaceutical composition comprising:

a water-containing phase,

a nonionic, anionic or amphoteric surfactant or a mixture of said surfactants dissolved, suspended or emulsified in said water-containing phase, and, as a viscosity-increasing agent therefor,

a fatty acid-modified polyester which is the reaction product of the components comprising a dimerized fatty acid and a polyalkylene oxide, said fatty acid-modified polyester having the formula



in which R is C_8–C_{22}-alkyl or C_8–C_{22}-alkenyl; R^1 is the alkyl skeleton of a dimerized fatty acid having 22 to 42 carbon atoms; A is $—C_2H_4—$ or $—C_3H_6—$, n is a number from 1 to 5; and x is a number from 20 to 150,

said fatty acid-modified polyester being dissolved in the water-containing phase.

4,853,431

METHOD FOR STABILIZING AQUEOUS SOLUTIONS OF CATIONIC THERMOSETTING POLYAMIDE-EPICHLOROHYDRIN RESINS

John F. Miller, Tacoma, Wash., assignor to Georgia-Pacific Resins, Inc., Atlanta, Ga.

Filed Dec. 7, 1987, Ser. No. 129,670
Int. Cl.[4] C08L *77/06;* D21H *3/58*
U.S. Cl. 524—608 16 Claims

1. A process of stabilizing, against gellation and viscosity loss due to hydrolysis, an aqueous solution containing at least about 15% by weight of a water-soluble cationic polyamide-epichlorohydrin thermosetting wet strength resin which comprises, adding to said aqueous solution an aqueous mixture of a weak acid and a strong acid in an amount sufficient to provide a total acidity of between about 0.6 and 1.2 millimols of titratable protons per gram of resin solids, the mol ratio of total protons available from the weak acid to total protons available from the strong acid being within the range of about 0.5 to 10.0.

4,853,432

PRESSURE SENSITIVE ADHESIVES CONTAINING LIGHT COLOR, LOW SOFTENING POINT HYDROCARBON RESINS

Mary E. Ahner, Baton Rouge, La., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Continuation-in-part of Ser. No. 830,410, Feb. 18, 1986, Pat. No. 4,683,268. This application Jun. 30, 1987, Ser. No. 68,590
Int. Cl.[4] C08L *217/00, 93/04*
U.S. Cl. 524—274 10 Claims

1. An adhesive composition comprising from about 20% to about 80% by weight of a copolymer and, correspondingly, from about 80% to about 20% by weight of a tackifying hydrocarbon resin having a softening point of from 0° C. to about 40° C., a number average molecular weight of from about 100 to about 600, and a Gardner color less than about 7 prepared by the Friedel Crafts polymerization of a hydrocarbon feed comprising:

(a) from about 5% to about 75% by weight of C_8 to C_{10} vinyl aromatic hydrocarbon stream;

(b) up to about 35% by weight of a piperlene concentrate; and

(c) from about 25% to about 70% by weight of a C_4 to C_8 monoolefin chain transfer agent of the formula RR′C═R″R‴ where R and R′ are C_1 to C_5 alkyl, and R″ and R‴ are independently H or C_1 to C_4 alkyl group, wherein said copolymer and said tackifying hydrocarbon resin are compatible.

4,853,433

EPOXY RESIN MATERIALS HAVING AN IMPROVED SHELF LIFE

Rainer Blum, Ludwigshafen; Gerd Rehmer, Bobenheim-Roxheim; Rolf Osterloh, Erftstadt, and Hans Sander, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 1, 1988, Ser. No. 176,660
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 3712017
Int. Cl.[4] C08L *51/06, 63/02*
U.S. Cl. 525—65 7 Claims

1. An epoxy resin material containing

(A) an epoxy resin having a mean molecular weight of from 300 to 6,000 and on average from 1.5 to 3.0 epoxy groups in the molecule and

(B) a polyacrylate resin obtainable by polymerization, in an organic solvent or solvent mixture, of

(b_1) from 30 to 95% by weight of esters of acrylic acid or methacrylic acid or ethylacrylic acid, or a mixture of these, with C_1–C_{20}-alcohols in the presence of

(b_2) from 5 to 70% by weight of carboxyl-containing copolymers having a mean molecular weight of from 500 to 20,000, obtainable by bulk or solution polymerization at a temperature of from 180° to 400° C. and a pressure of from 1 to 200 bar of monoolefinically unsaturated monomers containing a monoolefinically unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, ethylacrylic acid, maleic acid, C_1–C_4 monoalkyl esters of maleic acid, fumaric acid, and C_1–C_4 monoalkyl ester of fumaric acid.

4,853,434

MODIFIED THERMOSETTING RESIN, A METHOD FOR ITS PRODUCTION AND ITS USE

Hermann Block, Echem, Fed. Rep. of Germany, assignor to Hanse Chemie GmbH, Fed. Rep. of Germany

Filed Oct. 2, 1987, Ser. No. 103,760

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1986, 3634084

Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—160 **21 Claims**

1. Modified theromosetting resin, comprising:

(a) 50-98% by weight of a thermosetting resin or a mixture of thermosetting resins being crosslinkable by polyaddition or polycondensaion polymerization and processible into thermosetting plastics, said thermosetting resin or mixture of thermosetting resins being liquid at temperatures in the range of from 18 to 120° C. and having an average molecular weight of from 200 to 500,000; and

(b) 2-50% by weight of one or more three-dimensional crosslinked polyorganosiloxane rubbers, which are present in the reaction thermosetting resin or mixture of t.hermosetting resins in finely divided form as polyorganosiloxsane rubber particles having a diameter of from 0.01 to 50 micrometers, the rubber particles selected from the group consisting of those having the following generally formula of silioxane units:

$$-(R_2\,SiO)- \qquad (1)$$

in which both monovalent R radicals, which are identical or different, are linear or branched alkyl groups with 1 to 18 C atoms, cycloaliphatic groups with 4 to 8 C atoms, linear or branched alkenyl groups with 2 to 4 C atoms, phenyl or alkylphenyl groups with 1 to 12 C atoms in the aliphatic radical, and the hydrocarbon radicals can be substituted by hydrogen, halogen, hydroxyl-, carboxyl, carboxylic acid anhydride-, amino-, epoxy-, alkoxy-, alkenyl oxy-, polyether- or polyolefine groups, said groups being connected directly or through an oxygen or nitrogen atom with a silicon atom of the polysilixane chain.

4,853,435

PROCESS FOR PREPARING THERMOSETTING RESIN

Motoyuki Yamato, Kanagawa; Susumu Ueno, Tokyo; Kin-ichi Okumura, and Masao Fuchi, both of Okayama, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1988, Ser. No. 171,721

Claims priority, application Japan, Mar. 23, 1987, 62-65672

Int. Cl.[4] C08F *277/00*; C08L *45/00*

U.S. Cl. 525—193 **10 Claims**

1. A process for the preparation of a thermosetting resin which comprises bulk-polymerizing a a monomer charge comprising cyclic olefin monomer containing a norbornene ring and mixtures thereof in a mold in the presence of a metathesis catalyst system, characterized in that the polymerization reaction is carried out in the presence of a dicyclopentadiene heat-polymerized resin said resin containing up to 50% comonomer and having softening point of 60° to 200° C. in an amount of 15 to 150 parts by weight per 100 parts by weight of said monomer charge.

4,853,436

GRAFT POLYMERIZATION OF SUBSTITUTED STYRENE POLYMERS HAVING PENDANT VINYLIDENE GROUPS

Masatoshi Obata, Sakai; Koichi Tsutsui, Tanabecho; Ikedai Shoji, Hirakata, and Teruo Fujimoto, Nagaoka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

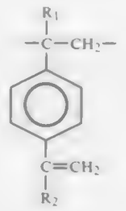
Filed Feb. 19, 1988, Ser. No. 157,560

Claims priority, application Japan, Feb. 20, 1987, 62-38238

Int. Cl.[4] C08F *279/06, 279/04, 279/02, 279/00*

U.S. Cl. 525—244 **8 Claims**

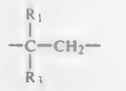
1. A graft copolymer having a backbone polymer segment and a plurality of polymer side chains grafted to said backbone polymer segment, wherein said backbone polymer is a polymer having a plurality of pendant vinylidene groups consisting essentially of (a) 0.1 to 100 mole % of a recurring unit of the formula:



(I)

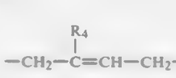
wherein R_1 is H or C_1–C_4 alkyl; and R_2 is C_2–C_{10} alkyl or alkoxy, unsubstituted or substituted phenyl, or tri-(C_1–C_4 alkyl)silyl; and

(b) 0 to 99.9 mole % of (i) a recurring unit of the formula



(II)

wherein R_1 is as defined, R_3 is C_1–C_4 alkyl or alkoxy, or unsubstituted or substituted phenyl; (ii) a recurring unit of the formula:



(III)

wherein R_4 is H, C_1–C_4 alkyl or halogen; (iii) a position isomer of the unit of the formula (III); or (iv) a mixture of said units (II), (III) or its position isomer,

said polymer having a number average molecular weight of 1000, to 1,000,000, and wherein each of said polymer side chains consists essentially of a polymer of an ethylenically unsaturated monomer capable of anion polymerization having a number average molecular weight from 500 to 1,000,000 per chain, said polymer side chains being grafted to said backbone polymer and said plurality of pendant vinylidene groups, and said polymer side chains being terminated with a functional group capable of crosslinking.

4,853,437

WATER- AND CAUSTIC-INSOLUBLE, INSWELLABLE, FIBROUS, PARTICULATE CROSSLINKED POLYMER

Carl A. Lukach, Katy, Tex., and Arjun C. Sau, Newark, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Mar. 4, 1988, Ser. No. 164,165

Int. Cl.[4] C08L *63/10*

U.S. Cl. 525—54.21 **19 Claims**

1. A composition of matter comprising a water- and caustic-insoluble, inswellable (does not swell with water so as to form gels), fibrous, particulate polymer comprising:

(a) units of (i) a water-soluble anionic polymer selected from the group consisting of alkali metal salts of carboxymethyl cellulose, carboxymethyl hydroxyethyl cellulose, carboxymethyl guar, carboxymethyl hydroxyethyl guar and carboxymethyl hydroxypropyl guar, xanthan gum, and copolymers of sodium acrylate having from about 10% to about 90% acrylate content, or (ii) a nonionic, water-soluble polymer selected from the group consisting of polyacrylamides, polyacrylonitrile, polyvinylpyrrolidone, copolymers of acrylamide, methyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, methylhydroxyethyl cellulose, ethylhydroxyethyl cellulose, methylhydroxypropyl cellulose, methylhydroxybutyl cellulose, hydroxypropyl hydroxyethyl cellulose, hydrophobically modified methyl cellulose, hydrophobically modified hydroxyethyl cellulose, hydrophobically modified hydroxypropyl cellulose, guar, hydroxyethyl guar and hydroxypropyl guar, or (iii) a water-soluble cationic water soluble polymer selected from the group consisting of cationic methyl cellulose, cationic hydroxyethyl cellulose, cationic hydroxypropyl cellulose, cationic methylhydroxyethyl cellulose, cationic ethylhydroxyethyl cellulose, cationic methylhydroxypropyl cellulose, cationic methylhydroxybutyl cellulose, cationic ethylhydroxyethyl cellulose, cationic hydroxypropyl hydroxyethyl cellulose, hydrophobically modified cationic methyl cellulose, hydrophobically modified cationic hydroxyethyl cellulose, hydrophobically modified cationic hyroxypropyl cellulose, cationic guar, cationic hydroxyethyl guar and cationic hydroxypropyl guar; cross-linked with

(b) units of a water-soluble cationic poly(diallylamine)-epichlorohydrin resin.

4,853,438

WATER-SOLUBLE POLYMERS BEARING QUATERNARY AMMONIUM OR PYRIDINIUM GROUPS AND ALKOXYSILYL GROUPS, A METHOD FOR THEIR PREPARATION, AND THE USE THEREOF

Günther Bernhardt, Rheinstr. 33, 5205 St. Augustin 2, and Horst Hanisch, Fröbelweg 19, 5202 Hennef, both of Fed. Rep. of Germany

Continuation of Ser. No. 847,944, Apr. 3, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 143,216

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 3512560

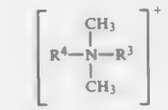
Int. Cl.[4] C08F *30/08*

U.S. Cl. 525—326.5 **17 Claims**

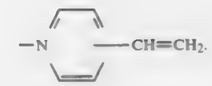
1. A copolymer formed by polymerizing at least three dfffer-ent ethylenically unsaturated constituents, each of said constituents having two chain carbon atoms wherein a first of said ethylenically unsaturated constituents is linked with a Carboxylic acid moiety through an oxygen atom of said acid moiety, said acid moiety having an α-position carbon atom which is substituted with a halogen, said first constituent being present in an amount of 2 to 30 wt.-%; 2 to 30 wt.-% of a second of said constituents having an alkoxysilyl moiety linked to one of the chain carbon atoms of said second constituent directly or through a group

$$-\overset{\overset{O}{\|}}{C}-O-(CH_2)_3-;$$

and 40 to 96 wt.-% of a carboxylic acid ester with an unsaturated grouping from the group consisting of a fatty acid vinyl ester, an acrylic acid alkyl ester and a methacrylic acid alkyl ester, to form a halogenated base copolymer; and reacting the halogenated base copolymer with a tertiary amine to form the copolymer wherein the α-position carbon atom is substituted with a grouping



wherein R^3 represents the halogen-free moiety of the base copolymer, and R^4 represents an acryloxyethyl or methacryloxyethyl moiety, or a vinyl pyridinium grouping of the formula



4,853,439

WATER-SOLUBLE COMPLEXES OF WATER-INSOLUBLE ORGANIC COMPOUNDS

Eugene S. Barabas, Watchung, N.J., assignor to GAF Corporation, Wayne, N.J.

Filed Oct. 9, 1987, Ser. No. 106,845

Int. Cl.[4] C08F *8/34*

U.S. Cl. 525—326.9 **16 Claims**

1. A complex of a substantially insoluble organic compound selected from the group consisting of sulfathiazole, furosemide, quinine, trifluralin and dapsone and a polymer selected from the group consisting of solid homopolymers of N-vinyl-2-pyrrolidone and copolymers thereof that are water-soluble, the water solubility of the complex being at least about 25-fold that of the organic compound itself.

4,853,440

POLYMERIC STABILIZER COMPOUNDS AND PROCESS FOR THEIR PREPARATION

Arnaldo Roggero, San Donato Milanese, and Guglielmo Bertolini, Pavia, both of Italy, assignors to Enitricerche, S.p.A., Milan and Enichem Sintesi, S.p.A., Palermo, both of, Italy

Filed Jun. 2, 1987, Ser. No. 57,092

Claims priority, application Italy, Jun. 5, 1986, 20683 A/86

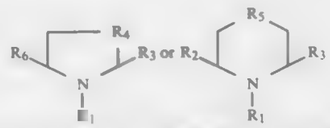
Int. Cl.[4] C08F *8/04*

U.S. Cl. 525—338 **8 Claims**

1. Process for the preparation of polymeric stabilizer compounds formed by an organic polymeric matrix characterized in that it comprises the following steps in succession:

(a) polymerizing a diene, under the influence of an alkali metal-alkyl or alkali metal-aryl catalyst, to yield a polydience bearing on its chain end a terminal metal atom;

(b) reacting said metal-terminated polydiene with a sterically hindered aminic compound, said compound comprising units of the formula



wherein R_1 is hydrogen, R_2 is dimethyl or aryl, R_3 and R_6 are dimethyl, R_4 is carbon or nitrogen and R_5 is oxygen, carbon, or nitrogen; or related derivatives substituted on the hindered nitrogen atom with an alkyl group of from 1 to 18 carbon atoms bearing in its molecule an electrophilic group reactive towards said metal of the metal-terminated polydiene;

(c) catalylically hydrogenating said polydiene bearing said sterically hindered aminic function at its chain end, for the purpose of eliminating, at least to a substantially complete extent, the unsaturation of the polydiene chain.

4,853,441

PROCESS FOR HYDROGENATING NITRILE GROUP-CONTAINING UNSATURATED POLYMERS

Hartmuth Buding, Dormagen, and Rudolf Casper, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 848,497, Apr. 7, 1986, abandoned. This application Nov. 19, 1987, Ser. No. 122,921

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1985, 3514403

Int. Cl.[4] C08F *8/04*

U.S. Cl. 525—339 7 Claims

1. A process for the selective heterogeneous catalytic hydrogenation of carbon-carbon double bonds without hdyrogenating nitrile groups in copolymers having

from 50 to 85% by weight of copolymerized units of conjugated diene,

from 15 to 50% by weight of copolymerized units of monomers selected from the group consisting of acrylonitrile and methacrylonitrile, and

from 0 to 10% by weight of copolymerized units of other ethylenically unsaturated monomers,

with a degree of hydrogenation of said double bonds of above 80%, wherein the hydrogenation catalyst is palladium precipitated on an alkaline earth metal carbonate support in a quantity of from 5 to 20,000 ppm of palladium, calculated on the basis of the copolymer to be hydrogenated, with a palladium/support ratio of (0.01 to 20):100.

4,853,442

AMINE-TERMINATED POLYSULFONE SULFIDE, USEFUL AS EPOXY CURING AGENT

Tuyen T. Nguyen, New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 3, 1987, Ser. No. 33,563

Int. Cl.[4] C08G *75/04*

U.S. Cl. 525—471 12 Claims

1. A sulfur-containing aromatic polyether oligomer which is characterized by the formula:

$$Q—L_x—(—S—Ar—Z)—L_y^1—Q^1 \quad (I)$$

where Q and Q^1 are each independently —O—Ph—$(NHR)_a$, —S—Ph—$(NHR)_a$, hydrogen or halogen, where Ph is phenylene, O is divalent oxygen, R is hydrogen or lower alkyl and a is one or two; Ar is the residuum of a halobenzenoid compound bearing two replaceable halogens; Z is the residuum of a dihydroxy aromatic compound; S is divalent sulfur and L is:

$$—(Ar)_p—(S—Ar)_m—(Z—Ar)_n— \quad (II)$$

where Ar, Z and S are as above; p is zero or one; m plus n is zero or an integer of one or greater; x is zero or one, provided if x or p is zero then Q is hydrogen; L_1 is:

$$—(Ar—S)_{m1}—(Ar—Z)_{n1}—(Ar—)_p \quad (III)$$

where Ar, Z, p and S are as above; m1 plus n1 is zero or an integer of one or greater; y is zero or one provided that if y or m1 plus n1 plus p is zero than Q^1 is hydrogen; m plus n plus m1 plus n1 is an integer between one and twenty-five and m plus m1 divided by n plus n1 is less than about nine but greater than zero; provided, however, that an average of at least about 50 mole percent of all the Q and Q^1 comprise —O—Ph—$(NHR)_a$ or —S—Ph—$(NHR)_a$.

4,853,443

POLYCYANOARYL ETHER WITH THERMOPLASTIC RESIN

Shigeru Matsuo; Tomoyoshi Murakami; Thoru Bando, all of Chiba, and Kikuo Nagatoshi, Kisarazu, all of Japan, assignors to Idemitsu Kosan Company, Limited, Tokyo, Japan

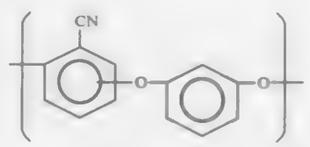
Division of Ser. No. 27,629, Mar. 18, 1987, abandoned. This application Nov. 9, 1987, Ser. No. 118,527

Claims priority, application Japan, Mar. 25, 1986, 61-64746; Apr. 10, 1986, 61-81066; Jun. 23, 1986, 61-144917; Jun. 23, 1986, 61-144918; Jun. 24, 1986, 61-146038; Jul. 1, 1986, 61-152626

Int. Cl.[4] C08L *73/00*

U.S. Cl. 525—534 5 Claims

1. A resinous composition comprising 10 to 90% by weight of a polycyanoaryl ether containing a recurring unit represented by the formula:



(I)

and having a reduced viscosity (ηsp/c) of 0.3 d/g or more at 6020 C. in a solution of a concentration of 0.2 g/dl in p-chlorophenol as a solvent, as a main component, and 10 to 90% by weight of a thermoplastic resin.

4,853,444

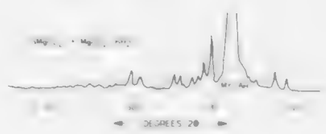
MAGNESIUM HALIDE HYDRATES AND POLYMERIZATION CATALYSTS PREPARED THEREFROM

Kenneth E. Inkrott, and Gil R. Hawley, Bartlesville, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 546,712, Oct. 28, 1983, Pat. No. 4,520,121. This application Feb. 11, 1985, Ser. No. 700,587

Int. Cl.[4] C08F *4/66, 10/00*

U.S. Cl. 526—119 7 Claims



1. A process for the polymerization of an alpha olefin comprising contacting said alpha olefin under polymerization conditions with a catalyst prepared by reacting a hydrous magnesium dihalide composition with reactants comprising a benzoic acid ester and an alkoxytitanium compound to form a first catalyst component, then reacting said first catalyst component with an organoaluminum halide to form a solid product, then reacting said solid product with a halogenating agent comprising a titanium halide, wherein the molar ratio of water to magnesium dihalide in said hydrous magnesium dihalide composition is in the range of about 0.5/1 to 2/1 and the hydrous magnesium dihalide composition is prepared by comminuting a mixture of an anhydrous magnesium dihalide and a hydrous magnesium dihalide at least until the amount of the most highly hydrated magnesium dihalide species in the comminuted product has become substantially stabilized.

4,853,445

DIBUTYLIN COMPOUNDS IN STYRENE MONOMER POLYMERIZATION

Bernard H. Meyer, Newtown Square; Joseph C. Kinslow, West Chester; Paul E. Arch, Wayne, and D. Harper Meek, Newtown Square, all of Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

Filed May 21, 1987, Ser. No. 52,508

Int. Cl.[4] C08F *2/18, 12/08*

U.S. Cl. 526—190 9 Claims

1. In a process for producing polymer beads by suspending from 50 to 100 weight percent of a vinyl aromatic monomer and from 0 to 50 weight percent of at least one monomer selected from the group consisting of butadiene, alkyl methacrylates, alkyl acrylates, acrylonitrile, maleic anhydride, and polymers capable of further polymerization, selected from the group of styrene-butadiene rubbers, styreneisoprene rubbers, and polybutadiene rubbers, said monomers containing a monomer soluble, free radical producing catalyst in an aqueous medium with the aid of from 0.1 to 2.0 percent by weight based on total monomer of a suitable suspending agent and subjecting the suspension to an elevated temperature to cause said monomers to polymerize, the improvement for producing a narrow distribution of bead diameter sizes which comprises adding to said suspension between 10 and 1000 parts per million based on total monomer of an organotin compound as a modifier for the suspending agent.

4,853,446

PHENOTHIAZINE COMPOSITION FOR USE IN REACTOR SCALE PREVENTION

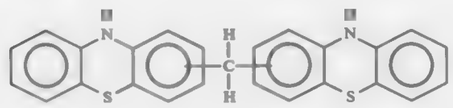
Raymond C. DeWald, Douglassville, and Paul O. Hong, Wayne, both of Pa., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 79,315, Jul. 30, 1987. This application Jun. 30, 1988, Ser. No. 213,743

Int. Cl.[4] C07D *279/70*

U.S. Cl. 526—205 18 Claims

1. In a process for polymerizing vinyl chloride monomer and optional ethylenically unsaturated comonomers in a proportion of up to about 80 mole percent comonomers, based on the total monomer content, the improvement comprising conducting the polymerization in the presence of a compound having the formula



4,853,447

POLYMERIZATION OF CATIONIC N,N-DIMETHYLALKYLAMINE TYPE MONOMERS

Dennis G. Peiffer, East Brunswick, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 21, 1987, Ser. No. 136,108

Int. Cl.[4] C08F *4/28, 2/16*

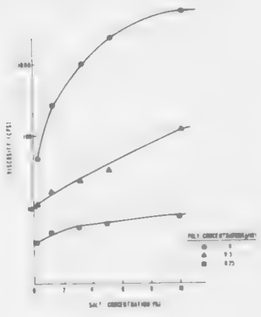
U.S. Cl. 526—229 7 Claims

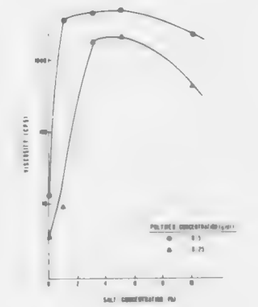
1. A homogeneous free radical copolymerization process for the formation of a hydrophocially associating copolymer of acrylamide and an catonic monomer derive from ally halide and N,N-dimethyl alkyamines which consisting of the steps of:

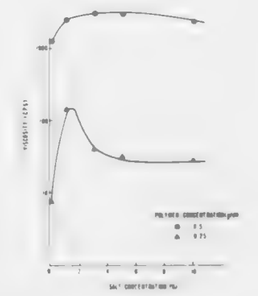
(a) forming a mixture of acrylamide monomer and the cationic monomer derive from allyl halide and N,N-dimethyl alkylamines and under a nitrogen atmosphere;

(b) adding deoxygenated water to said mixture to form a homogeneous reaction solution wherein said cationic monomer forms micelles in said homogeneous reaction solution, said micelles being aggregates of about 50 to about 200 molecules of said cationic monomer;

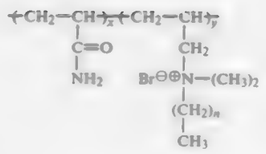
(c) adding a free radical initiator to said homogeneous reaction solution to initiate polymerization of said acrylamide monomer and said cationic monomer derived from allyl halide and N,N-dimethylalkylamines; and







(d) copolymerizing with no phase separation said acrylamide monomer and said cationic monomer derive from said allyl halide and said N,N-dimethyl alkylamines at a sufficient temperature and for a sufficient period of time to form said copolymer of acrylamide without the formation of substantial amounts of particulates or phase separation occurring, said copolymer having an intrinsic viscosity of about 1 to about 10 dl/g, said copolymer having the formula:



wherein n is 6 to 22 straight chained or branched alkyl or cycloalkyl group and X is about 90 to about 99.9 mole %, and Y is about 0.1 to about 10.0 mole %.

4,853,448

PERFLUOROALKYL GROUP-CONTAINING COPOLYMERS

Werner H. Müller, E. Greenwich, R.I., and Arnold Schneller, Mainz, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 742,394, Jun. 7, 1985, Pat. No. 4,724,195. This application Jul. 30, 1987, Ser. No. 79,404

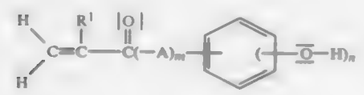
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 3421526

Int. Cl.[4] C08F *14/18; C04F 214/18*

U.S. Cl. 526—254 **5 Claims**

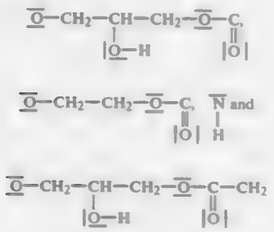
1. A perfluoroalkyl group-containing copolymer comprising the reaction product of at least two different monomers, each said monomer having a polymerizable ethylenically unsaturated end group, one of said monomers having a perfluoroalkyl group, wherein:

(a) at least one monomer containing acryloyl or methacryloyl groups and phenolic OH groups and corresponding to the formula (I)



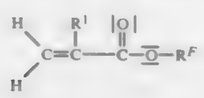
(I)

wherein R^1 is H or CH_3; n is 1, 2, or 3; m is 0 or 1 and A is selected from the group consisting of:



is copolymerized with

(b) at least one monomer containing acryloyloxy, methacryloyloxy or vinyl groups and a perfluoroalkyl group and corresponding to the formulae (II) or (III)



(II)

-continued



(III)

wherein R^1 has the above meaning, R^2 is H or alkyl from C_1 to C_5; B is $\overline{O}$ or



R^F is $F(C_wF_{2w})(-CH_2)_z$ or $F(C_{w-1}F_{2w-2})-CF=CH$, $F(C_wF_{2w})(-CH_2)_z$ is selected from the group consisting of (1) there being no linking bridging groups and (2) there being linking ether bridging groups; w is 5 to 15 and z is 0 to 5.

4,853,449

BISMALEIMIDE FORMULATIONS CONTAINING OLEFINIC ETHER MODIFIERS

Linda A. Domeier, Flemington, N.J., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 885,723, Jul. 15, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 142,670

The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.

Int. Cl.[4] C08F *226/06*

U.S. Cl. 526—259 **6 Claims**

1. A resin formulation comprising a bismaleimide and as a reactive diluent a diallyl ether selected from the group consisting of the diallyl ethers of dihydric phenols, the diallyl ethers of bisphenols, the diallyl ethers of naphthols, and mixtures thereof.

4,853,450

TERPOLYMER LATICES

Ulrich Jansen, Dormagen, and Karl-Heinz Ott, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 13, 1989, Ser. No. 309,146

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1988, 3806075

Int. Cl.[4] C08F *20/60, 120/60*

U.S. Cl. 526—303.1 **8 Claims**

1. A shear-stable terpolymer latex prepared by emulsion polymerization of

(a) 50 to 85 parts by weight of α-methylstyrene,

(b) 10 to 50 parts by weight of acrylonitrile and/or methacrylonitrile, and

(c) 1 to 50 parts by weight of methacrylamide.

4,853,451

TERPOLYMER EMULSIONS

Nigel L. Clark, Banstead, England, assignor to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Continuation of Ser. No. 80,363, Jul. 29, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 284,780

Claims priority, application United Kingdom, Jul. 30, 1986, [illegible]

Int. Cl.[4] C08F *118/02*

U.S. Cl. 526—331 **7 Claims**

1. A process for the the preparation of a terpolymer having a monomer composition of

Vinyl acetate	10 to 90 parts by weight
Vinyl chloride	5 to 50 parts by weight

-continued

Ethylene	5 to 40 parts by weight

wherein from about 10% to 100% of the monomer charge of vinyl acetate and vinyl chloride is introduced into the reaction vessel with at least about 50% of the ethylene charge in the absence of initiator and any remainder of the monomer charge being added over a period together with the initiator system at a rate which ensures there is a reservoir of free monomer in the reaction medium.

4,853,452

NOVEL SOLUBLE POLYIMIDESILOXANES AND METHODS FOR THEIR PREPARATION USING A FLOURINE CONTAINING ANHYDRIDE

Chung J. Lee, Amherst, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Feb. 9, 1988, Ser. No. 153,898

Int. Cl.[4] B05D *3/02;* **C08F** *2/46;* **C08G** *77/04*

U.S. Cl. 528—26 **71 Claims**

1. In a substantially fully imidized polyimidesiloxane comprising the reaction product of an organic dianhydride, a difunctional siloxane monomer, and an organic diamine, the improvement wherein the polyimidesiloxane is soluble in diglyme and the organic dianhydride comprises a bis(dicarboxyphenyl)hexafluoropropane dianhydride (6FDA) as the sole essential organic dianhydride, and the organic dianhydride is free of polyether linkage.

37. A process for producing a polyimidesiloxane that is soluble in diglyme, which comprises reacting an organic diamine, a difunctional siloxane monomer, and an organic dianhydride that consists essentially of a bis(dicarboxylphenyl)hexafluoropropane dianhydride as the sole essential organic dianhydride and wherein the organic dianhydride is free of polyether linkage.

4,853,453

MODIFIED SILICONE RUBBER AND ITS USE AS A MATERIAL FOR OPTICAL LENSES AND OPTICAL LENSES MADE FROM THIS MATERIAL

Horst Schäfer, Aschaffenburg; Gerhard Koesmehl, Berlin, and Walter Neumann, Königsbronn, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 863,136, May 14, 1986, abandoned. This application Dec. 18, 1987, Ser. No. 135,512

Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517612

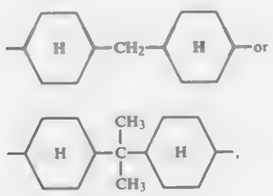
Int. Cl.[4] C08B *77/06*

U.S. Cl. 528—28 **12 Claims**

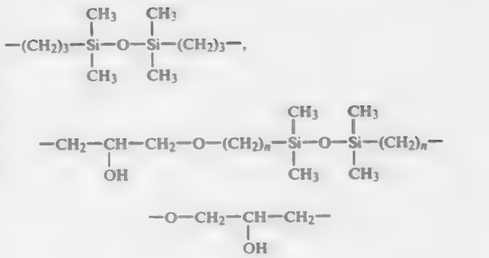
1. Silicone rubber having hydrophilic properties and having main chains of the partial formula

—OCONH—R^1—NHCO—$OCH_2C(CH_3)_2CHOH$-
$CONH(CH_2)_3$—O—CONH—R^1—NH-
CO—O—R^2—

in which: R^1 is $-(CH_2)_w-$,



w being an integer from 2 to 16, and R^2 is



where n is 3, 4 or 5, and with said main chains being crosslinked through methyl groups.

4,853,454

PREPARATION OF STORAGE-STABLE, MOISTURE-CURED, SINGLE-COMPONENT POLYURETHANE SYSTEMS AND THEIR USES

Franz Merger, Frankenthal; Gisbert Schleier, Heidelberg, both of Fed. Rep. of Germany, and Dietrich Schlotterbeck, Inkster, Mich., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 23, 1987, Ser. No. 76,865

The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.

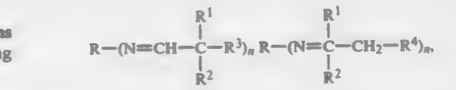
Int. Cl.[4] C08G *18/10*

U.S. Cl. 528—59 **15 Claims**

1. A storage-stable, moisture cured, single-component polyurethane system, comprising:

(a) a polyurethane prepolymer having an NCO content of from about 1 to 10 weight percent, prepared by the reaction of higher molecular weight polyols and an aromatic polyisocyanate;

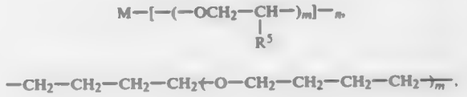
(b) at least one polyaldimine having the structural formula



and mixtures thereof, in which

R is selected from the group consisting of a linear or branched, multivalent hydrocarbon radical having from 2 to 16 carbon atoms,

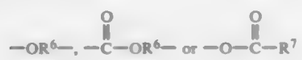
linear or branched, multivalent, hydrocarbon radical containing in bonded form oxy groups as bridge members, having from about 4 to 16 carbon atoms, a cycloalkylene radical having from about 6 to 20 carbon atoms, a multivalent polyoxyalkylene radical having the following structural formulas:



and mixtures thereof, in which M is the hydroxyl group-free radical of an initiator molecule, R^5 is a hydrogen atom, methyl group, ethyl group and mixtures thereof, and m is a whole number of from 1 to 25,

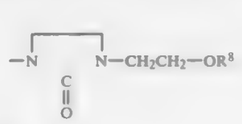
wherein R^1 and R^2 are the same or different, linear or branched alkyl groups having from 1 to 6 carbon atoms or are a cycloalkyl group,

R^3 is

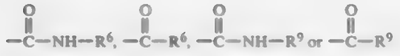


radical, wherein R^6 is a linear or branched alkyl group having from 1 to 10 carbon atoms or a cycloalkyl group, and R^7 is the same as R^6 or is a linear or branched oxyalkyl radical having from 1 to 10 carbon atoms,

R^4, R^3 and R^7 are a hydrogen atom or the radical



wherein R^5 is



and R^9 is an aromatic radical having from about 6 to 15 carbon atoms, and

n is a whole number of from 2 to 8

4,853,455

SELECTED PHOSPHORIC ACID ESTERS AS HARDENERS FOR EPOXY RESINS

Wolfgang Schneider, Kaiseraugst, and Kurt Amsler, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 6, 1988, Ser. No. 191,088

Claims priority, application Switzerland, May 14, 1987, 1859/87

Int. Cl.[4] C08G *59/40*

U.S. Cl. 528—108 **11 Claims**

1. A curable mixture containing:

(i) a polyglycidyl ether of an aliphatic, cycloaliphatic or aromatic alcohol or a polyglycidyl ester of a carboxylic acid and

(ii) a curing agent obtainable by reaction of;

(A) a mixture of 2–4 mol of a monohydric, aliphatic alcohol and 1 mol of phosphorus pentoxide in an inert organic solvent, or of 2 mol of a dialkyl phosphate or of 2 mol of phosphoric acid, if appropriate in combination with 1–2 mol of a monohydric, aliphatic alcohol, with

(B) 0.5–1.5 mol of a diglycidyl ether of a cycloaliphatic or aromatic diol,

with the proviso that the said diglycidyl ether used for the preparation of the curing agent has an average molecular weight (number-average) of not more than 2,500 and the said curing agent is essentially free from 1,2-epoxide groups.

4,853,456

AMIDOAMINE CO-CURATIVES IN EPOXY THERMOSET ADHESIVES

Kathy B. Sellstrom, Pflugerville, and Terry L. Renken, Austin, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Feb. 19, 1988, Ser. No. 157,757

Int. Cl.[4] C08G *59/54*

U.S. Cl. 528—111 **7 Claims**

1. An epoxy resin thermoset adhesive composition comprising the cured reaction product of:

(A) a vicinal polyepoxide having an average of at least 1.8 reactive, 1,2-epoxy groups per molecule,

(B) a curing amount of an admixture comprising

(1) an amidoamine comprising the reaction product of one molar quanity of isophthalic acid or terephthalic acid with two molar quantities of polyoxypropylene amine of the formula:

$$H_2NCH(CH_3)CH_2—[OCH_2CH(CH_3)]_xNH_2$$

wherein: x ranges from 2 to 40.

(2) a co-curative comprising an aliphatic polyetheramine, aromatic amine or mixture thereof.

4,853,457

PREPARATION OF SPIROBIINDANE POLYARYLATES, AND SPIROBIINDANE POLYARYLATE-POLYETHYLENE TEREPHTHALATE COPOLYMERS, VIA MELT POLYMERIZATION

Richard P. Joyce, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

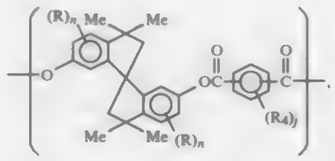
Filed Oct. 26, 1987, Ser. No. 112,587

Int. Cl.[4] C08G *63/26*

U.S. Cl. 528—190 **5 Claims**

1. A method for preparing a spirobiindane polyarylate-polyester copolymer which comprises reacting at a temperature of above 260° C.,

(A) at least one polyarylate having the formula:



wherein R is a monovalent hydrocarbon radical selected from the group consisting of alkyl radicals, cycloalkyl radicals, aryl radicals, aralkyl radicals, alkaryl raldicals, and halogen radicals; R^4 are a monovalent hydrocarbn radical selected from the group consisting of alkyl radicals, cycloalkyl radicals, aryl radicals, aralkyl radicals, alkaryl raldicals, and halogen radicals; n is a positive integers having a value from 0 to 3 inclusive; and j is a positive integer having a value of from 0–4 inclusive, and

(B) at least one polyester having repeating units of the general formula:

wherein M is a polymethylene of 2–4 carbons.

4,853,458

CARBOXY-FUNCTIONALIZED POLYCARBONATE FROM CARBOXYPHENOL

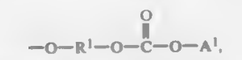
Ronald J. Gambale, Clifton Park; Susan J. Hathaway, Albany; Kathryn L. Longley, Saratoga Springs, and Timothy J. Ullman, Niskayuna, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 19, 1987, Ser. No. 109,873

Int. Cl.[4] C08G *63/62*

U.S. Cl. 528—198 **17 Claims**

1. A carboxy-functionalized polycarbonate containing end groups of the formula



(I)

wherein each R^1 is independently a divalent aliphatic, alicyclic or aromatic radical and A^1 is a carboxylic acid-substituted phenyl group or an ester, anhydride or imide derivative thereof.

4,853,459

PREPARATION OF LINEAR POLYCARBONATES FROM CYCLIC OLIGOMER COMPOSITIONS USING METAL CHELATE CATALYST

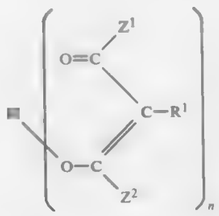
Kevin R. Stewart, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 25, 1988, Ser. No. 185,596

Int. Cl.[4] C08G *63/62*

U.S. Cl. 528—371 **18 Claims**

1. A method for preparing a resinous composition which comprises contacting, at a temperature in the range of about 200°–350° C., at least one cyclic polycarbonate oligomer with a catalytic amount of at least one metal chelate of the formula



wherein:

M is a metal of the lanthanide series or of Groups 3–13 of the Periodic Table, in the new notation as defined in *CRC Handbook of Chemistry and Physics*, 68th Edition (1987–88), inside front cover;

each Z1 and Z2 is independently a primary or secondary alkyl or alkoxy radical containing about 1–5 carbon atoms;

each R1 is hydrogen or a primary or secondary alkyl radical containing about 1–5 carbon atoms; and

n is 2 or 3.

4,853,460

LONG OPEN ASSEMBLY TIME VINYL-BONDING POLYAMIDE FROM DIMER ACID

Nancy W. Harman, Savannah, Ga., assignor to Union Camp Corporation, Wayne, N.J.

Filed Mar. 24, 1988, Ser. No. 173,331

Int. Cl.[4] C08G *69/34*

U.S. Cl. 528—339.3 **23 Claims**

1. A polyamide hot melt adhesive composition having a long open assembly time of at least 45 seconds, which comprises the polyamide condensation product of substantially equimolar quantities of:

(a) an acid component consisting essentially of one or more polymeric fatty acids and one or more dicarboxylic acids, and

(b) an amine component consiting essentially of (i) one or more cyclic aliphatic diamines, (ii) one or more non-cyclic aliphatic diamines in which the amine groups are bonded to odd-numbered carbon atoms on the aliphatic chain, and (iii) one or more alkylene diamines, with or without (iv) one or more polyglycol diamines.

4,853,461

METHOD OF ISOLATING COPOLYMERS OF VINYLPYRIDINE AND STYRENE

Yeong-Ho Chang, and Waylon L. Jenkins, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 13, 1988, Ser. No. 207,075

Int. Cl.[4] C08F *6/18*

U.S. Cl. 528—486 **7 Claims**

1. The method of isolating of copolymer comprising repeat units from vinylpyridine and styrene from an aqueous emulsion of said copolymer which comprises mixing said aqueous emulsion with an acidic material such that the mixture has a pH of about 4–8 to aggregate the copolymer, and heating the resulting slurry containing the aggregated copolymer to a temperature of about 55°–100° C. for about 10–120 minutes to increase the size of the aggregated particles.

4,853,462

PREPARATION OF DISCRETE PARTICLES OF POLYALKYLENE CARBONATE

Donald E. Hostetler, West Chester; Michael J. Cannarsa, Lafayette Hill; Haven S. Kesling, Jr., Drexel Hill, all of Pa., and Hsiang-Ning Sun, Houston, Tex., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

Filed Mar. 21, 1988, Ser. No. 171,334

Int. Cl.[4] C08J *3/14*

U.S. Cl. 528—494 **13 Claims**

1. A method for producing discrete particles of a polyalkylene carbonate comprising:

(a) combining the polyalkylene carbonate and a polar solvent to form a mixture;

(b) heating the mixture to form a solution;

(c) cooling and agitating the solution at a controlled rate of cooling until a temperature is reached at which the polyalkylene carbonate precipitates in the form of discrete particles having a desired particle size of between 30 and 3000 microns; and

(d) separating the precipitated discrete particles from the polar solvent.

4,853,463

AMINO ACID DERIVATIVES

Kinji Iizuka; Tetsuhide Kamijo; Tetsuhiro Kubota, all of Nagano; Kenji Akahane, Tokyo; Hideaki Umeyama, Chiba, and Yoshiaki Kiso, Osaka, all of Japan, assignors to Kissei Pharmaceutical Co., Ltd., Japan

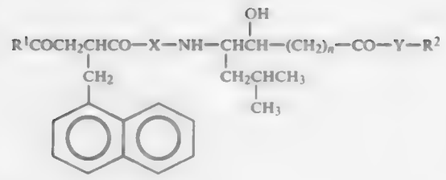
Continuation of Ser. No. 903,803, Sep. 4, 1986, abandoned. This application Dec. 13, 1988, Ser. No. 283,694

Claims priority, application Japan, Sep. 4, 1985, 60-195563

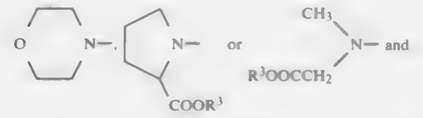
Int. Cl.[4] C07C *103/50*; **C07D** *233/64, 413/12*

U.S. Cl. 530—323 **15 Claims**

1. An amino acid derivative represented by the formula:



wherein R^1 represents



in which R^3 represents a lower alkyl group, X represents an amino residual group selected from glycine, alanine, β-alanine, valine, leucine, phenylalanine, tryptophane and serine, n is zero or 1, Y represents —O—, or —NH—, and R^2 represents a straight- or branched- chain alkyl group having 1 to 7 carbon atoms, and a pharmaceutically acceptable salt thereof.

4,853,464

HYBRIDOMA CELL LINE XMMBR-B14 AND MONOCLONAL ANTIBODY WHICH IS SPECIFIC FOR A NON-CROSS REACTIVE EPITOPE OF CEA

Adeline J. Hackett, and Shahnaz H. Dairkee, both of Orinda, Calif., assignors to Peralta Cancer Research Institute, Oakland, Calif.

Continuation of Ser. No. 21,922, Mar. 5, 1987, abandoned. This application Feb. 16, 1988, Ser. No. 158,086

Int. Cl.[4] A61K *39/395;* **C07K** *15/14;* **C12N** *15/00*

U.S. Cl. 530—387 **3 Claims**

1. Hybridoma cell line XMMBR-B14 having A.T.C.C. Accession No. HB 9308.

4,853,465

ORGANOPHILIC POLYPHENOLIC ACID ADDUCTS

Jack C. Cowan, Lafayette, La.; Victor M. Granquist, Beaufort, S.C., and Roy F. House, Houston, Tex., assignors to Venture Chemicals, Inc., Lafayette, La.

PCT No. PCT/US85/01664, § 371 Date Dec. 14, 1987, § 102(e) Date Dec. 14, 1987, PCT Pub. No. WO88/00584, PCT Pub. Date Jan. 28, 1988

Continuation-in-part of Ser. No. 887,360, Jul. 21, 1986, Pat. No. 4,737,269. This PCT application Jul. 13, 1987, Ser. No. 142,861

Int. Cl.[4] C07F *9/02*

U.S. Cl. 530—506 **8 Claims**

1. An organophilic polyphenolic material comprising an adduct of a polyphenolic acid-containing material, or a water soluble or colloidally dispersible salt thereof, and one or more phosphatides having the empirical formula

$$R_1—CO—O—CH_2—CH(R_2)—CH_2—Q$$

[(I)]

where: R_1 is an aliphatic group containing from 8 to 29 carbon atoms; R_2 is selected from the group consisting of H, OH, R_1COO, and $OP(O)(O^-zM^{a+})OZ$; Q is selected from the group consisting of R_1COO and $OP(O)(O^-zM^{a+})OZ$; Z is selected from the group consisting of xM^a, $C_6H_6(OH)_5$ and CH_2-CH(Y)-N(R_3)(R_4)(R_5)$_y$(A^{b-})$_n$; Y is selected from the group consisting of H and [$COO(xM^a)$]; $COO(wM^a)$; R_3, R_4, and R_5 are independently selectedly from the group consisting of H, aliphatic groups containing from 1 to 30 carbon atoms, and R_6CO; R_6 is an aliphatic group containing from 1 to 29 carbon atoms; M is a cation selected from the group consisting of H, an alkali metal, an alkaline earth metal, ammonium, and mixtures thereof; A is an anion of valence of b; y=0 or 1; w, x, and z=0 or 1/a where a is the valence of M; v=0 or [a/b] 1/b; and where Q is R_1COO only when R_5 is $OP(O)(O^-zM^{a+})OZ$; wherein said polyphenolic acid is selected from the group consisting of humic acids, lignosulfonic acids, lignins, tannins, oxidized humic acids, oxidized lignosulfonic acids, oxidized lignins, oxidized tannins, sulfonated humic acids, sulfonated lignins, sulfonated tannins, sulfomethylated humic acids, sulfomethylated lignins, sulfomethylated tannins, and mixtures thereof.

4,853,466

WATER-SOLUBLE DISAZO REACTIVE DYES AND METALS COMPLEXES (CONTAINING PHOSPHONIC ACID GROUPS) FOR DYEING CELLULOSIC FIBERS

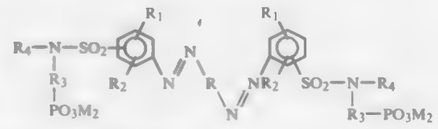
James F. Feeman, Wyomissing, Pa., assignor to Crompton & Knowles Corporation, Stamford, Conn.

Filed Nov. 20, 1987, Ser. No. 123,391

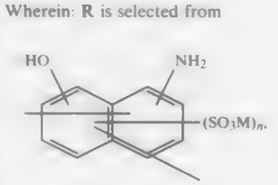
Int. Cl.[4] C09B *62/82, 62/825, 62/83, 62/835*

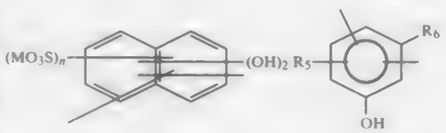
U.S. Cl. 534—617 **7 Claims**

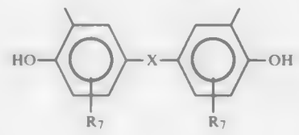
1. A disazo dye and its copper, cobalt or chromium complex having the structure before metallization:



Wherein: R is selected from

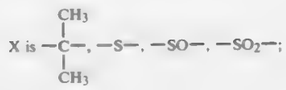






Wherein

the azo bonds are ortho to the —OH or NH_2 groups;
R_1 is H, lower alkyl, lower alkoxy, or $—CO_2M$;
R_2 is H, lower alkyl, lower alkoxy, Cl;
R_3 is lower alkylene;
R_4 is H, -lower alkyl;
R_5 is H, lower alkyl, $—CO_2M$;
R_6 is OH or $—NH_2$;
R_7 is H, $—CH_2SO_3M$:
M is H, Na, Li, K, Mg, Ca, NH_4;



and n is 0, 1, 2.

4,853,467

NITROGEN CONTAINING DERIVATIVES OF EPIPODOPHYLLOTOXIN GLUCOSIDES

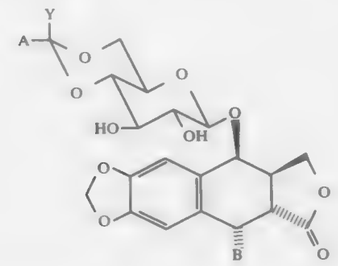
Dolatrai M. Vyas, Madison; Mark G. Saulnier, Middletown, and John F. Kadow, New Haven, all of Conn., assignors to Bristol-Myers Company, New York, N.Y.

Filed May 19, 1987, Ser. No. 51,434

Int. Cl.[4] C07H *15/26*

U.S. Cl. 536—17.9 **59 Claims**

1. A compound having the formula

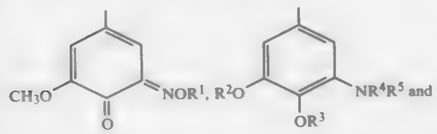


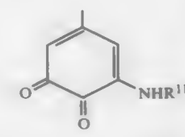
Y is H and A is selected from the group consisting of (C_{1-10})alkyl; (C_{2-20})alkenyl; (C_{5-6})cycloalkyl; 2-furyl; 2-thienyl; aryl, aralkyl, and aralkenyl, each of the aromatic rings may be unsubstituted or substituted with one or more groups selected from halo, (C_{1-8})alkyl, (C_{1-8})alkoxy, hydroxy, nitro, and amino; or

A and Y are each (C_{1-8})alkyl; or

A, Y, and the carbon to which they are attached join to form a (C_{5-6}) cycloalkyl group; and

B is selected from the group consisting of

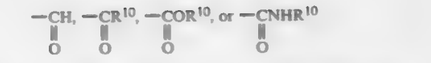




wherein R^1 is (C_{1-10})alkyl, (C_{4-7})cycloalkyl, (C_{2-10})alkenyl, (C_{2-10})alkynyl, each of the above groups may be unsubstituted or substituted with one or more Z; aryl, heteroaryl, aralkyl, or heteroaralkyl, the ring portion of the above groups may be unsubstituted or substituted with one or more groups selected from (C_{1-8})alkyl and Z; wherein said Z is selected from halo, (C_{1-5})alkoxy, amino, nitro, cyano, hydroxy, and mercapto;

R^2 is H or methyl;

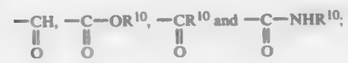
R^{11} is H,



wherein R^{10} is aryl(C_{1-5})alkyl, or (C_{1-10})alkyl unsubstituted or substituted with one or more Z;

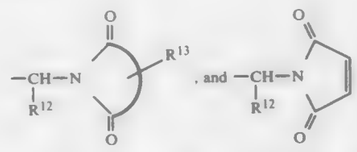
R^3 is H or a phenol protecting group;

R^4 and R^5 are each independently selected from (C_{1-10})alkyl, (C_{4-7})cycloalkyl, (C_{2-10})alkenyl, (C_{2-10}) alkynyl, each of the above groups may be unsubstituted or substituted with one or more Z; aryl, heteroaryl, aralkyl, heteroaralkyl, the ring portion of the above groups may be unsubstituted or substituted with one or more groups selected from (C_{1-8})alkyl and Z; H,



wherein Z and R^{10} are as defined above; or

R^4 is H and R^5 is selected from the group consisting of sulfonyl,



wherein R^{12} is H or (C_{1-8})alkyl; R^{13} is selected from the group consisting of H, a group within the definition for R^1, and $—SR^1$ wherein R^1 is as defined above; or

R^3, R^4 and R^5 together is $—CR^{14}=$ wherein R^{14} is H or (C_{1-5})alkyl; or

NR^4R^5 taken together is selected from the group consisting of nitro, azido, $N=CHR^6$, $N=CHNR^7R^8$, and $N=NNHR^9$ wherein R^6 is a group within the definition for R^1; R^7 and R^8 are each independently H or (C_{1-8})alkyl; R^9 is (C_{1-8})alkyl; or

NR^4R^5 taken together is $N_2^{\oplus}X^{\ominus}$ wherein $X^{\ominus}$ is an anionic group with the proviso that R^3 is not H; or

R^3 and NR^4R^5 together represent diazonium hydroxide inner salt.

4,853,468

PROCESS FOR THE PREPARATION OF CEPHEM DERIVATIVES

Sigeru Torii; Kenji Uneyama; Hideo Tanaka; Junzo Nokami; Michio Sasaoka; Norio Saito, and Takashi Shirai, all of Okayama, Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

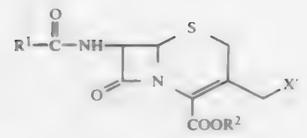
Division of Ser. No. 71,664, Jul. 9, 1987, Pat. No. 4,784,734, which is a division of Ser. No. 865,651, May 16, 1986, Pat. No. 4,689,411, which is a continuation of Ser. No. 524,689, Aug. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 364,405, Apr. 1, 1982, abandoned. This application Mar. 11, 1988, Ser. No. 166,918

Claims priority, application Japan, Apr. 10, 1981, 61-54864; Apr. 10, 1981, 61-54865; May 8, 1981, 61-69688; Aug. 29, 1981, 61-174330

Int. Cl.[4] C07D *501/02*

U.S. Cl. 540—215 **2 Claims**

1. A process for preparing derivatives of 3-halomethyl-3-cephem represented by the formula:



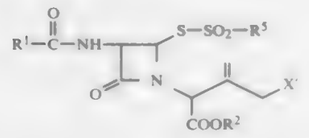
(IV)

wherein

R^1 is lower alkyl mono-substituted with aryl or with aryloxy, the aryl being optionally substituted with hydroxy, methoxy, chloro or nitro and the aryloxy being optionally substituted with hydroxy, methoxy or nitro;

R^2 is lower alkyl mono- or di-substituted with aryl or with aryloxy, the aryl being optionally substituted with methoxy, chloro or nitro, and the aryloxy being optionally substituted with nitro, or R^2 is lower alkyl optionally mono- or tri-substituted with halogen;

X' is a halogen, the process comprising permitting ammonia or ammonia water to react with an azetidinone derivative represented by the formula:



(Ib)

wherein R^1, R^2 and X' are as defined above and R^5 is aryl optionally substituted with hydroxy, chloro, nitro, methyl or methoxy in the presence of an organic solvent selected from the group consisting of dimethylformamide, diethylformamide and dimethylacetamide.

4,853,469

QUINOLINECARBOXYLIC ACID DERIVATIVE STARTING COMPOUNDS

Masahiro Taguchi, Hirakata; Hirosato Kondo, Suita; Yoshimasa Inoue, Osaka; Yoshihiro Kawahata, Minoo, and Goro Tsukamoto, Toyonaka, all of Japan, assignors to Kanebo, Ltd., Japan

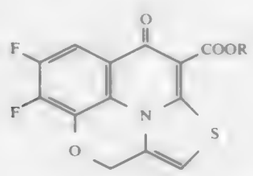
Division of Ser. No. 178,603, Apr. 7, 1988, Pat. No. 4,808,584. This application Jul. 28, 1988, Ser. No. 225,369

Claims priority, application Japan, Apr. 7, 1987, 62-85319; Oct. 19, 1987, 62-264681

Int. Cl.[4] A61K *31/535, 31/47*

U.S. Cl. 544—99 **2 Claims**

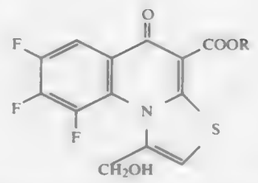
1. A compound of the formula (II):



(II)

wherein R is hydrogen atom or a lower alkyl.

2. A compound of the formula (III):



(III)

wherein R is hydrogen atom or a lower alkyl.

4,853,470

3-(PIPERIDINYL)- AND 3-(PYRROLIDINYL)-1H-INDAZOLES

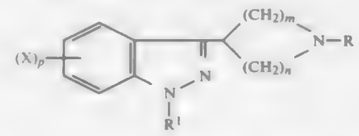
Joseph T. Strupczewski, Flemington, N.J., assignor to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 228,201, Aug. 4, 1988, Pat. No. 4,806,649, which is a division of Ser. No. 181,960, Apr. 15, 1988, Pat. No. 4,775,761, which is a division of Ser. No. 102,684, Sep. 30, 1987, Pat. No. 4,758,668, which is a division of Ser. No. 37,194, Mar. 19, 1987, Pat. No. 4,710,573, which is a division of Ser. No. 811,090, Dec. 19, 1985, Pat. No. 4,670,447, and a continuation-in-part of Ser. No. 694,198, Jan. 23, 1985, abandoned, and a continuation-in-part of Ser. No. 679,662, Dec. 7, 1984, abandoned, and a continuation-in-part of Ser. No. 525,088, Aug. 22, 1983, abandoned. This application Dec. 23, 1988, Ser. No. 289,874

Int. Cl.[4] C07D *401/14*

U.S. Cl. 546—199 **2 Claims**

1. A compound having the formula

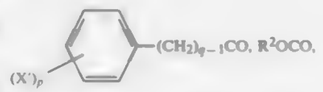


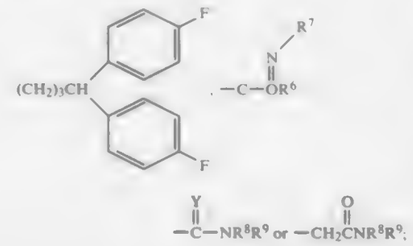
I

wherein R is hydrogen, loweralkyl, loweralkenyl, lowercycloalkylloweralkyl,



cyano, cyanomethyl, formyl, loweralkanoyl, diloweralkylphosphinomethyl,





4,853,471

2-(2-HYDROXYPHENYL)-BENZTRIAZOLES, THEIR USE AS UV-ABSORBERS AND THEIR PREPARATION

Jean Rody, Richen, and Mario Slougo, Muttenz, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

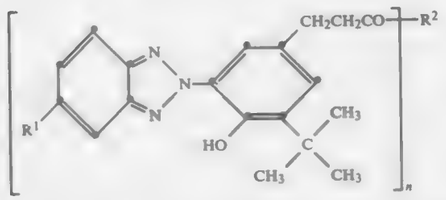
Continuation of Ser. No. 608,529, May 9, 1984, abandoned, Continuation of Ser. No. 339,254, Jan. 13, 1982, abandoned, Continuation of Ser. No. 869,819, May 30, 1986, abandoned. This application Nov. 12, 1987, Ser. No. 122,554

Claims priority, application Switzerland, Jan. 23, 1981, 4371/81

Int. Cl.[4] C07D *249/20*

U.S. Cl. 548—261 **5 Claims**

1. A compound of the formula I

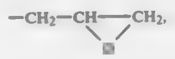


(I)

in which R^1 is H, Cl or straight-chain or branched C_1–C_4 alkyl and n is one of the numbers 1 or 2, in which,

(a) when n=1, R^2 is Cl or —OR^3, and

(b) when n=2, R^2 is —O—R^9—O—, R^3 is H, straight-chain or branched C_1–C_{18} alkyl which is unsubstituted or substituted by 1 to 3 OH groups or straight-chain or branched C_3–C_{18} alkyl which is interrupted by —O— or —S— and which can be unsubstituted or substituted by OH, C_5–C_{12} cycloalkyl which is unsubstituted or substituted by OH, straight-chain or branched C_2–C_{18} alkenyl which is unsubstituted or substituted by OH, C_7–C_{15} aralkyl, or

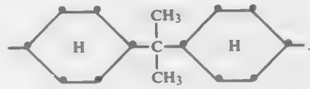


R^9 is C_2–C_8 alkylene, C_4–C_8 alkenylene, cyclohexylene,

straight-chain or branched C_4–C_{10} alkylene which is interrupted by —O—, and R^{11} is straight-chain or branched C_2–C_8 alkylene, straight-chain or branched C_4–C_{10} alkylene which is interrupted by —O—, cycloalkylene, arylene,

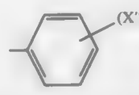


or





cycloalkylloweralkyl, where the cycloalkyl group contains 3 to 10 carbon atoms, a lower alkyl substituted with an amino, loweralkylamino, diloweralkylamino; and R^7, R^8 and R^9 are independently hydrogen, loweralkyl or



the optical antipode thereof; or the pharmaceutically acceptable salt thereof.

4,853,472

VITAMIN E INTERMEDIATES

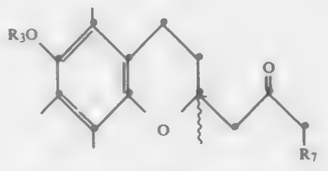
David L. Coffen, Glen Ridge, N.J.; Rudolf Schmid, Muttenz-stein/BL, Switzerland, and Mark J. Sebastian, Plainfield, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 30,798, Mar. 27, 1987, Pat. No. 4,789,750. This application Sep. 9, 1988, Ser. No. 242,248

Int. Cl.[4] C07D *311/72*

U.S. Cl. 549—407 **3 Claims**

1. A compound of the formula



wherein R_3 taken together with its attached oxygen atom forms an ether hydroxy protecting group; R_7 is —$COOR_4$ or R_6—SO_2; R_4 is lower alkyl and R_6 is lower alkyl or aryl.

4,853,473

PREPARATION OF 2(5H)-FURANONES

Rolf Fischer, Heidelberg; Juergen Frank, Schwetzingen; Franz Merger, Frankenthal; Michael Roeper, Wachenheim, and Uwe Vagt, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 1, 1988, Ser. No. 201,050

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1987, 3718527

Int. Cl.[4] C07D *307/88*

U.S. Cl. 549—326 **14 Claims**

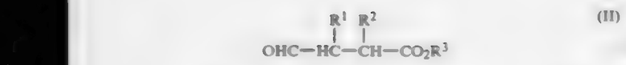
1. A process for the preparation of a 2(5H)-furanone of the formula



(I)

where R^1 and R^2 are each hydrogen, C_1–C_6-alkyl, C_5- or C_6-cycloalkyl, C_7–C_{12}-aralkyl or aryl, which comprises:

heating a 3-formyl-carboxylate or 3-formylcarboxylic acid of the formula



(II)

where R^3 is hydrogen, C_1–C_{12}-alkyl, C_5- or C_6-cycloalkyl, C_7–C_{12}-aralkyl or aryl, to 100°–450° C. in the presence of an acidic catalyst and in an otherwise inert liquid or gas phase reaction medium.

4,853,474

CROSS-LINKED ORGANOPOLYSILOXANES AND EMULSIONS BASED THEREON

Bradley C. Bahr; Peter Y. Lo, both of Midland; A. Wade Lomas, Rhodes, and David J. Romenesko, Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 8, 1987, Ser. No. 70,896

Int. Cl.[4] C07F *7/08*

U.S. Cl. 556—445 **10 Claims**

1. An organopolysiloxane-polyoxyalkylene useful as an emulsifier comprising:

at least two organopolysiloxane-polyoxyalkylene molecules cross linked by a cross linking radical having nonhydrolyzable bonds to the organopolysiloxane-polyoxyalkylene molecules and being free of internal hydrolyzable bonds which under conditions inducing hydrolysis could result in separation of the two organopolysiloxane-polyoxyalkylene molecules.

4,853,475

PROCESS FOR SYNTHESIZING ALKYLENE BISDITHIOCARBAMATES OR THE AMMONIA ADDUCTS THEREOF AS WELL AS MIXTURES THAT CAN BE SYNTHESIZED THEREBY

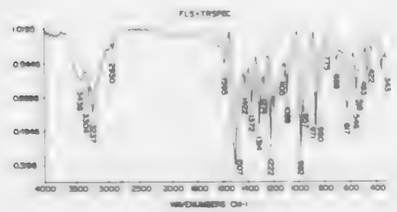
Manfred Bergfeld, Erlenbach-Mechenhard, and Ludwig Eisenhuth, Obernburg, both of Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands

Filed Sep. 25, 1986, Ser. No. 911,364

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1985, 3534246

Int. Cl.[4] C07F *11/00*

U.S. Cl. 556—50 **7 Claims**



1. A process for synthesizing adducts of alkylene bisdithiocarbamates and ammonia in a molar ratio of $1/\leq 2$, comprising reacting a metal compound selected from the group consisting of manganese (II) oxide and the hydrate and hydroxide thereof with an aqueous mixture of an alkylenediamine, carbon disulfide and ammonia in water using 2 moles or less of ammonia per mole of alkylenediamine.

4,853,476

PHOSPHORUS CONTAINING COMPOUNDS AS INHIBITORS OF ENKEPHALINASES

Konstantinos S. Petrakis, Montclair; Joel G. Berger, Verona, and Elijah H. Gold, West Orange, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 685,511, Dec. 24, 1984, abandoned. This application Sep. 24, 1987, Ser. No. 102,753

Int. Cl.[4] C07F *9/09*

U.S. Cl. 558—170 **9 Claims**

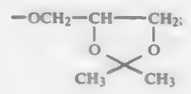
1. A compound having the structural formula I:

$$W—P(O)OR^1—V—CHR^3—C(O)—NH—Z—C(O)R^2$$

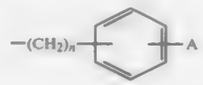
or a pharmaceutical acceptable salt thereof, wherein:

R^1 is hydrogen, methyl, ethyl, phenyl, benzyl, phenylethyl or $—CR^{11}HOC(O)R^{12}$ wherein R^{11} and R^{12} are each independently alkyl having from 1 to 6 carbon atoms or cycloalkyl having from 5 to 7 carbon atoms;

R^2 is hydroxy, methoxy, ethoxy, propoxy, phenylmethoxy, phenoxyethyloxy, pivaloyloxymethyloxy, $—OCH_2CHOHCH_2OH$ or

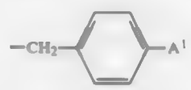


W is hydroxy, alkoxy having 1 to 6 carbon atoms, phenylmethoxy, alkyl having from 1 to 6 carbon atoms or



{wherein n' is an integer of from 0–6, and A is hydrogen, fluorine or chlorine};

VC^*HR^3 contains an asymmetric carbon (C^*) the chirality of which is the S absolute configuration wherein V is oxygen or sulfur and wherein R^3 is



wherein A^1 is hydrogen, fluorine, chlorine or trifluoromethyl; and

Z is p-phenylene.

4,853,477

SEPARATION OF DIASTEREOMERS OF CYCLOPROPANECARBOXYLIC ACID ESTERS

Rainer Fuchs, and Wilhelm Stendel, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

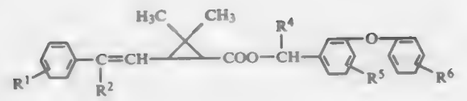
Filed Aug. 20, 1987, Ser. No. 87,574

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629387

Int. Cl.[4] C07C *69/612*

U.S. Cl. 558—398 **13 Claims**

1. A process for the separation of mutually diastereomeric forms of a cyclopropanecarboxylic acid ester of the formula



in which

R^1 is selected from the group consisting of hydrogen and halogen,

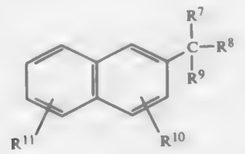
R^2 is selected from the group consisting of hydrogen and halogen.

R^4 is selected from the group consisting of hydrogen, CN, —C≡CH and CH_3,

R^5 is selected from the group consisting of hydrogen and halogen, and

R^6 is selected from the group consisting of hydrogen and halogen,

comprising reacting such ester in a first stage with a second compound in a molar ratio of ester to second compound selected from the group consisting of 2:1 and 1:1, the second compound having the formula



in which

R^7, R^8 and R^9 each is selected from the group consisting of hydrogen and methyl, or, together with the C atom to which they are bound and with an adjacent C atom of the R^{10}-carrying ring form a fused 6-membered ring,

R^{10} is selected from the group consisting of hydrogen, methyl, ethyl, halogen, amino, methylamino, and

R^{11} is selected from the group consisting of hydrogen, methyl and ethyl to form complexes, and,

in a second stage allowing the less soluble complexes of one part of the diastereomers to crystallize out in the presence of a solvent selected from the group consisting of a lower aliphatic alcohol, an aliphatic hydrocarbon and a cyclic hydrocarbon, and separating off the crystallized complex from the still dissolved material.

4,853,478

FUNCTIONALIZED MONOMERS FROM 1-(1-ISOCYANATO-1-METHLETHYL)-3 OR 4-(1-METHYLETHENYL) BENZENE

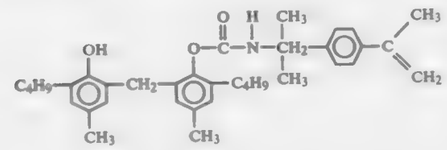
Howard A. Colvin; Kirkwood S. Cottman, both of Akron, and Dane K. Parker, Massillon, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 806,688, Dec. 16, 1985, Pat. No. 4,714,772, which is a division of Ser. No. 737,742, May 28, 1985, Pat. No. 4,604,439. This application Feb. 18, 1987, Ser. No. 16,148

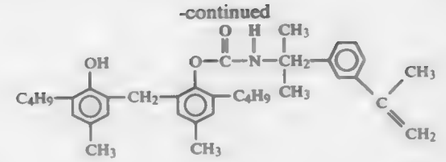
Int. Cl.[4] C07D *125/06*

U.S. Cl. 560—32 **3 Claims**

1. A compound selected from the group consisting of:



-continued



4,853,479

PROCESS FOR THE MANUFACTURE OF AROMATIC DICARBOXYLIC ACIDS AND DERIVATIVES THEREOF

Jihad Dakka, Bakka El Garbia; Amikam Zoran, and Yoel Sasson, both of Jerusalem, all of Israel, assignors to Gadot Petrochemical Industries, Ltd., Haifa and Yissum R & D Company of the Hebrew University of Jerusalem, Jerusalem, both of, Israel

Filed Nov. 3, 1988, Ser. No. 266,820

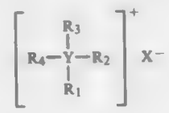
Claims priority, application Israel, Nov. 27, 1987, 84620

Int. Cl.[4] C07C *67/39, 51/265*

U.S. Cl. 566—77 **13 Claims**

1. A process for the manufacture of aromatic dicarboxylic acid and derivatives thereof from a corresponding aromatic hydrocarbon by a liquid phase oxidation of said hydrocarbon using an oxygen-containing gas, being carried out in the presence of a phase-transfer catalyst and traces of a polar solvent able to solubilize the catalyst, the process being characterized in that the oxidation reaction occurs in the presence of a catalytic system comprising:

(a) a quaternary onium salt having the general formula:



wherein:

Y may be nitrogen or phosphorus,

R_1 is alkyl and R_2, R_3 and R_4 may be the same, different or interlinked, selected from alkyl, hydroxyalkyl, aryl or aralkyl group having a total number of carbon atoms in the range of between 17 and 58, and X^- is selected from F^-, Cl^-, Br^-, OH^-, CH_3COO^- and HSO_4, provided that when Br^- is absent from the system a bromide is added, and (b) a transition heavy metal salt, the molar ratio between (a) and (b) being in the range of between 0.25:1 to 1.5:1.

4,853,480

OXYIODINATION INCORPORATING AN IODINE GENERATOR FOR THE CONVERSION OF METHYL IODIDE TO IODINE

Gerald C. Tustin, Kingsport, Tenn.; Kyle C. Smith, Nickelsville, Va., and Mark Rule, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1987, Ser. No. 82,300

Int. Cl.[4] C07C *69/76*

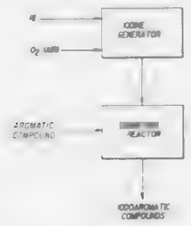
U.S. Cl. 170—100 **10 Claims**

1. A process for the iodination of an aromatic compound, comprising the steps of:

(i) combusting a $C_{1\text{-}10}$ alkyl or $C_{6\text{-}20}$ aromatic iodide in the presence of a source of oxygen and an ignition source, to produce molecular iodine, and

(ii) oxyiodinating a hydrocarbon, nitrogen-containing, oxy-

gen-containing or sulfur-containing aromatic compound at a temperature of about 100° to 500° C. in the presence



of molecular oxygen, a non-acid catalyst and said iodine, to produce said iodinated aromatic compound.

4,853,481

PREPARATION OF ALKYL-SUBSTITUTED AROMATIC KETONES

Jochem Henkelmann, Mutterstadt; Manfred Eggersdorfer, Frankenthal; Walter Grosch, Edingen-Neckarhausen; Alfred Schuhmacher, Ludwigshafen, and Hardo Siegel, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 30, 1987, Ser. No. 126,868

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1986, 3641793

Int. Cl.[4] C07C *51/083*

U.S. Cl. 562—460 15 Claims

1. A process for preparing tertiary amylbenzoylbenzoic acid which comprises:

reacting amylbenzene with phthalic anhydride in the presence of a Friedel-Crafts catalyst and also in the presence of tertiary amine which is added to the reaction in an amount sufficient to suppress or prevent the detachment or isomerization of the amyl substituent.

4,853,482

PROCESS FOR THE PREPARATION OF ACIDS

David J. Drury, Twickenham, and John E. Hamlin, Hull, both of England, assignors to BP Chemicals Limited, London, England

Filed Oct. 25, 1983, Ser. No. 545,150

Claims priority, application United Kingdom, Nov. 4, 1982, 8231576

Int. Cl.[4] C07C *51/12, 53/08, 53/126*

U.S. Cl. 562—607 3 Claims

1. A process for the preparation of a carboxylic acid of formula RCO_2H where R is a C_1 to C_{10} aliphatic hydrocarbyl group which process comprises heating under substantially anhydrous conditions an ester of formic acid of formula HCO_2R where R is as defined above in the presence of carbon monoxide and an effective amount of a catalyst system comprising a Group VIII metal, a halide and a compound containing a quaternary Group V atom, wherein the quaternary Group V atom is formed by adding a compound containing a trivalent nitrogen atom quaternizable under the reaction conditions and a quaternizing agent and wherein said compound containing a trivalent quaternizable nitrogen atom is N-methyl imidazole.

4,853,483

PREPARATION OF ALKYL THIOSEMICARBAZIDES

Danielle A. Bright, Spring Valley, N.Y., assignor to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 927,478, Nov. 6, 1986, Pat. No. 4,713,467. This application Sep. 17, 1987, Ser. No. 97,900

Int. Cl.[4] C07C *159/00, 155/08*

U.S. Cl. 564—18 7 Claims

1. A process for preparing alkyl thiosemicarbazides which comprises reacting an alkyl dithiocarbamate and hydrazine at a pH of from about 7 to about 9 in the presence of a catalytically effective amount of a metal rearrangement catalyst.

4,853,484

N-[[6-METHOXY-5-(TRIFLUOROMETHYL)-1-NAPHTHALENYL]-THIOXOMETHYL]-N-METHYLGLYCINE S-OXIDE AND THE AMIDE THEREOF

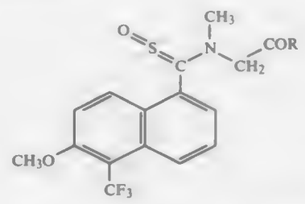
Eckhardt S. Ferdinandi, Princeton; Michael S. Malamas, Plainsboro; Kazimir Sestanj, Monmouth Junction, and Surendra N. Sehgal, Princeton, all of N.J., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 934,760, Nov. 25, 1986, Pat. No. 4,734,435, which is a continuation-in-part of Ser. No. 849,242, Apr. 7, 1986, abandoned. This application Oct. 28, 1987, Ser. No. 113,691

Int. Cl.[4] C07C *153/05*

U.S. Cl. 564—74 1 Claim

1. The process for preparing the substantially pure compound of formula (I)



(I)

wherein R is $—NH_2$ which comprises oxidizing [[[6-methoxy-5-(trifluoromethyl)-1-naphthalenyl]thioxomethyl]methylamino]-acetamide with m-chloroperbenzoic acid in anhydrous CH_2Cl_2 at −78° C.; pouring the reaction mixture into hexane and collecting the precipitated product by filtration and recrystallizing from acetone/water at about 0° C.

4,853,485

METHOD FOR PRODUCING MONOMETHYLFORMAMIDE AND DIMETHYLFORMAMIDE

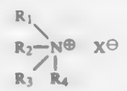
Harold E. Bellis, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 603,908, Apr. 24, 1984, abandoned. This application Oct. 21, 1987, Ser. No. 112,017

Int. Cl.[4] C07C *103/127*

U.S. Cl. 564—215 3 Claims

1. In the preparation of monomethylformamide and dimethylformamide by the catalytic reaction of formamide and methanol, the improvement comprising using as the catalyst a quaternary ammonium compound represented by the structure



where

R_1, R_2, R_3 and R_4 can be an alkyl radical of 1–12 carbon atoms;

a hydroxy ethyl radical;

a pyridyl radical; or

a benzyl radical; and

X can be Cl, Br, I, F or -OH, said reaction being run without the utilization of carbon monoxide.

4,853,486

METHOD FOR PRODUCTION OF DITHIODIALDEHYDE

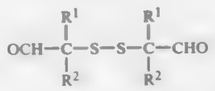
Masao Kitano, Yokohama; Tsunemasa Ueno; Kouichi Kojima, both of Kawasaki, and Yutaka Morimoto, Yokohama, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Jun. 7, 1988, Ser. No. 204,039

Int. Cl.[4] C07C *148/00*

U.S. Cl. 568—22 12 Claims

1. In a method for the production of a dithiodialdehyde represented by the formula II:



(II)

wherein R^1 and R^2 are independently alkyl group of 1 to 8 carbon atoms, by condensation of an active hydrogen-containing aldehyde represented by the formula I:



(I)

wherein R^1 and R^2 have the same meanings as defined above, with sulfur monochloride, the improvement which comprises simultaneously supplying said active hydrogen-containing aldehyde and sulfur monochloride to an inactive solvent.

4,853,487

PROCESS FOR THE PREPARATION OF HYDROXYBIPHENYLS

Alain Nonn, Saint Foy Les Lyon, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

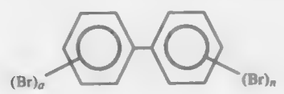
Filed Jan. 20, 1988, Ser. No. 146,108

Claims priority, application France, Jan. 21, 1987, 87 00824

Int. Cl.[4] C07C *39/14*

U.S. Cl. 568—730 14 Claims

1. A process for the preparation of a hydroxybiphenyl, comprising the step of bringing a bromobiphenyl of formula (I):



(I)

in which m and n are identical or different integers equal to 0, 1, 2 or 3, and the sum n+m of which is greater than or equal to 1 and less than or equal to 4, into contact with a base of the formula $M(OH)_p$ in which M is a metal chosen from amongst alkali metals or alkaline earth metals, and p is an integer equal to 1 or 2 depending on the valency of M, in an aqueous liquid phase, at a temperature below 300° C., and in the presence of both a copper-based catalyst and a separate cocatalyst selected from the group consisting of halides, phosphates, nitrates, alcoholates, inorganic or organic silicates or sources of inorganic or organic silicates, alcohols, carboxylic acids, sulfonic acids, organic sulfur-containing compounds, carbon monoxide or a source of carbon monoxide, quinolines, ammoniums, tertiary amines, phosphines, phosphoniums, cyanides and palladium.

4,853,488

PROCESS FOR THE PREPARATION OF (2,2)-PARACYCLOPHANE AND DERIVATIVES THEREOF

Raffaele Ungarelli, Trecate, and Loris Sogli, Novara, both of Italy, assignors to Montedison S.p.A., Milan, Italy

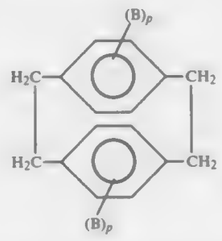
Filed Apr. 8, 1988, Ser. No. 179,250

Claims priority, application Italy, Apr. 10, 1987, 20059 A/87

Int. Cl.[4] C07C *21/24, 25/18*

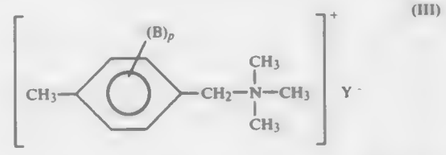
U.S. Cl. 570—184 7 Claims

1. A process for preparing (2,2)-paracyclophane and derivatives thereof of the formula:



(II)

wherein B is a halogen atom, an alkyl radical, an aralkyl radical, or a halo-aralkyl radical, having up to 20 carbon atoms, and p is zero or an integer from 1 to 4, by the Hofmann elimination of a p-methylbenzyltrimethyl-ammonium derivative of the formula:



(III)

wherein B and p are the same as defined hereinabove, and Y is a hydroxy radical or a halogen atom, in an alkaline aqueous solution, characterized in that said elimination is carried out at a temperature of 50° to 150° C. and in the presence of at least a catalytic amount of a compound having the formula:

$$(R)_m—A—(X)_n \qquad (I)$$

wherein A is an aromatic group, X is an electron donor group, R is a hydrogen atom or an alkyl radical having from 1 to 4 carbon atoms, n is an integer from 1 to 6, and m is zero or an integer from 1 up to a value such that the sum m+n is equal to the number of substitutable positions in the aromatic group A, and wherein the electron-donor group X is selected from the group consisting of $—OR_1$, $—N(R_1)_2$ and $—SR_1$, and wherein R_1 is hydrogen, an alkyl radical having from 1 to 6 carbon atoms, an aryl radical, an alkyl-aryl radical, or an arylalkyl radical containing from 6 to 18 carbon atoms.

4,853,489

SELECTIVE CHLORINATION OF PARA-TERTIARY-BUTYTOLUENE

Hans U. Gonzenbach, 61 bis rue de Lyon, Geneva, Switzerland

Filed May 28, 1983, Ser. No. 497,611

Claims priority, application Switzerland, Jun. 3, 1982, 3397/82; Apr. 19, 1983, 2083/83

Int. Cl.[4] C07C *17/12*

U.S. Cl. 570—197 7 Claims

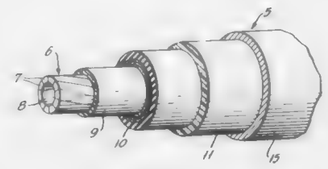
1. A process for the manufacture of p-tert-butylbenzyl chloride from p-tert-butyltoluene which comprises reacting said p-tert-butyltoluene with chlorine radicals generated from molecular chlorine at temperatures between −20° C. and 35° C.

4,853,490

LAMINATED PAPER-PLASTIC INSULATING TAPE AND CABLE INCLUDING SUCH TAPE

Claudio Bosisio, Brembate Sotto, Italy, assignor to Societa' Cavi Pirelli S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 927,840, Nov. 5, 1986, abandoned. This application Dec. 3, 1987, Ser. No. 129,329
Claims priority, application Italy, Nov. 8, 1985, 22768 A/85
Int. Cl.[4] H01B 7/02; B32B 23/08
U.S. Cl. 174—25 R 16 Claims



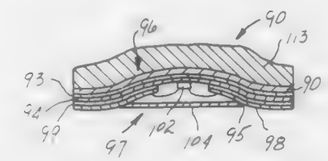
9. A high voltage electrical cable comprising at least one conductor having insulation therearound, said insulation comprising a winding of a composite tape having a thickness in the range from 50 to 200 microns, said tape comprising a layer of cellulose paper bonded to at least one surface of a film of bi-oriented polymeric plastic material by a layer of copolymer plastic material having a softening temperature lower than the softening temperature of said bi-oriented polymeric plastic material wherein the improvement comprises including in said paper a weight content of mineral salt selected from the group consisting of borates and silicates in the range from about 0.1 to about 3% based on the weight of the paper, said copolymer layer being a microlayer and having a thickness in the range from about 1 micron to about 10 microns and all plastic material of the composite tape including the copolymer plastic material having a total thickness in the range from about 10 to about 30% of the total thickness of the tape whereby the cellulose paper which is relatively brittle because of the mineral salt content is supported by the plastic material and an improvement in both the mechanical and electrical properties of the composite tape is obtained while maintaining a maximum of cellulose content in the composite tape.

4,853,491

CHIP CARRIER

Sheldon H. Butt, Godfrey, Ill., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 657,433, Oct. 3, 1984, abandoned. This application Sep. 27, 1985, Ser. No. 781,080
Int. Cl.[4] H05K 1/02
U.S. Cl. 174—52.4 9 Claims



1. A leadless chip carrier adapted for mounting a chip, comprising:

a copper base alloy substrate adapted to support the chip, said substrate having an indentation adapted to received said chip;

a copper base alloy circuit foil adapted to be electrically connected to said chip;

said circuit foil and said substrate having a desired coefficient of thermal expansion;

a bonding component having a coefficient of thermal expansion of at least about 160×10^{-7} in/in/°C. for bonding said circuit foil to said substrate, said coefficient of thermal expansion of said bonding component being closely matched to said desired coefficient of thermal expansion; and

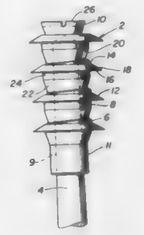
means bonded to said circuit foil for enclosing said indentation and forming an enclosure adapted to seal said chip within said chip carrier.

4,853,492

ELECTRIC TRANSMISSION CONDUCTOR SUPPORT INSULATORS

Carl L. Hussey, 214 Linda La., West Palm Beach, Fla. 33405

Filed Sep. 28, 1988, Ser. No. 250,073
Int. Cl.[4] H01B 17/14; H02G 7/20
U.S. Cl. 174—174 7 Claims



1. An electric transmission conductor support insulator made of plastic material for mounting on the top of a support pole that comprises:

an elongated cylindrical body having a top end and a bottom end,

a longitudinal bore within said body extending through said bottom end and tapering inwardly toward said top end,

at least one circular ledge extending laterally from said body,

said ledge having an upper surface, a lower surface and a side surface, said upper and lower surfaces being positioned normal to the longitudinal axis of said body, said lower surface being larger in diameter than said upper surface with said side surface sloping inwardly toward said body from said lower surface to said upper surface, and

a circular notch in the side of said body juxtaposed above said ledge.

4,853,493

ELECTROGRAPHIC APPARATUS

Philip A. Schlosser, Columbus, and Robert G. Kable, Dublin, both of Ohio, assignors to Scriptel Holding, Inc., Columbus, Ohio

Filed May 6, 1988, Ser. No. 190,762
Int. Cl.[4] G08C 21/00
U.S. Cl. 178—18 42 Claims

1. Apparatus of a type wherein a surface is selectively accessed with respect to positional data, comprising:

an insulative substrate;

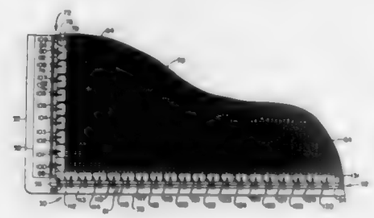
a resistive layer supported upon said substrate having an operational region extending within an operational periphery of predetermined geometric pattern and configured to exhibit predetermined values of conductivity and resistivity; said operational periphery being spaced inwardly from an outer boundary;

mutually spaced terminals supported upon said substrate positioned adjacent said outer boundary and the corners of said geometric pattern;

means defining a conduction band exhibiting enhanced conductivity with respect to said operational region conduc-

tivity supported upon said substrate intermediate said outer boundary and said operational periphery;

a plurality of spaced, discrete resistance elements, each in electrical communcation intermediate said conduction band and said resistive layer and each having a resistance value selected to effect exhibition of a substantially uniform electrical impedance of said layer to each said terminal;



an excitation signal source;

a ground reference;

swich means actuable for applying said ground reference to first select ones of said terminals while, simultaneously applying said excitation signal source to second ones of said terminals oppositely disposed from said first ones; and

control means for actuating said switch means to effect derivation of positional data modes.

4,853,494

INFORMATION PROCESSING APPARATUS FOR INPUTTING COORDINATE DATA SELECTIVELY FROM EITHER THE OBVERSE OR THE REVERSE SURFACE OF AN INPUT TABLET

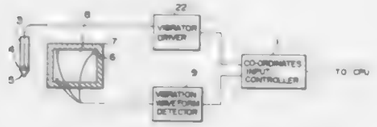
Noriyuki Suzuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1988, Ser. No. 168,995

Claims priority, application Japan, Mar. 20, 1987, 62-63681

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—18 **8 Claims**



1. An information processing apparatus comprising:

a vibration pen for generating a vibration;

a transmission propagation member with which said vibration pen is brought into contact so as to propagate the vibration generated by said vibration pen;

sensors for detecting the vibration propagating in said vibration propagation member;

operating means for calculating a contact position of said vibration pen from detection times of the vibration detected by said sensors;

detecting means for detecting an obverse or reverse surface of said vibration propagation member; and

memory means for storing coordinate values calculated by said calculating means in different memory areas according to a detection result of said detecting means.

4,853,495

ELECTRONIC BLACKBOARD AND ELECTRONIC BLACKBOARD SYSTEM

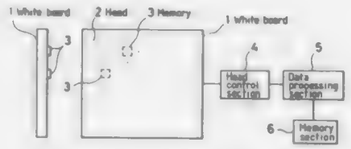
Tomonori Ouchi; Otsuro Wakamatsu; Hiroshi Kawanishi, and Masao Yasui, all of Kyobashi, Japan, assignors to Shimizu Construction Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1988, Ser. No. 209,824

Claims priority, application Japan, Jun. 24, 1987, 62-157384

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—18 **5 Claims**



1. An electronic blackboard designed to enable storage data to be read from and written into memories on the surface of a board, comprising a multiplicity of heads for reading and writing storage data in relation to the memories, said heads being disposed lengthwise and breadthwise on the board surface.

4,853,496

ACOUSTIC COORDINATE INPUT DEVICE USING A ROUGHENED SURFACE TO ATTENUATE THE SURFACE WAVE COMPONENT

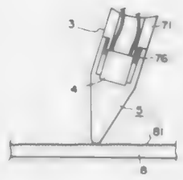
Shinnosuke Tanishi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1988, Ser. No. 171,747

Claims priority, application Japan, Mar. 27, 1987, 62-071400; Apr. 1, 1987, 62-077547

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—18 **8 Claims**



1. A coordinates input device comprising:

vibration generation means for generating vibration;

a vibration pen adapted to vibrate at an end thereof in response to the vibration generated by said vibration generation means and transmitted to the pen; and

a vibration transmission plate having a roughened abutment surface presented to the vibration pen for reducing a surface wave component in order to eliminate the surface wave component of the transmitted vibration.

4,853,497

SHIELDING TECHIQUE FOR DIGITIZERS

Waldo L. Landmeier, Scottsdale, Ariz., assignor to Calcomp Inc., Anaheim, Calif.

Filed Jun. 20, 1988, Ser. No. 208,467

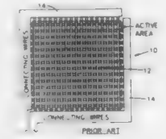
Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—18 **5 Claims**

1. A shield for use in eliminating edge effects from an electromagnetic digitizer having a rigid rectangular circuit board

therein containing an active area of a grid of wires surrounded by a peripheral area of conencting wires containing sensitive interconnecting circuitry comprising:

a pan-shaped shield of a non-ferrous metal, said shield being sized and shaped to fit over an underside of the grid of wires and surrounding area of connecting wires, said



shield comprising a center section disposed over the active area of the grid wires and spaced from the active area a distance sufficient to provide no interference with the operation thereof and an outer peripheral shielding lip that is disposed in close-spaced, non-contacting relationship to the areas of sensitive interconnecting circuitry contained within the connecting wires.

4,853,498

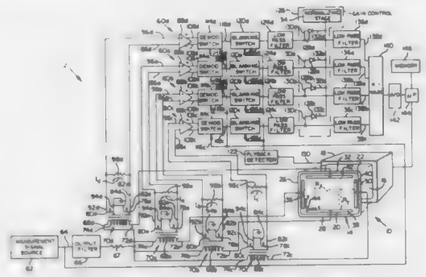
POSITION MEASUREMENT APPARATUS FOR CAPACITIVE TOUCH PANEL SYSTEM

Robert D. Meadows, Beaverton, and Roger J. McCoy, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 13, 1988, Ser. No. 205,896

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—19 **25 Claims**



1. In a display system including a display surface positioned adjacent an optically transparent, electrically conductive layer having a first resistivity and first and second opposed side margins of preselected lengths, a position address encoder for generating an address signal indicative of a location on the conductive layer in contact with a stylus that is electrically connected to a reference potential, comprising:

time-varying position measurement signal of substantially constant frequency and preselected magnitude;

first and second bar electrodes positioned along the lengths of the respective first and second opposed side margins and receiving the position measurement signal generated by the signal generating means, the resistivity of the conductive layer establishing an effective total resistance between the first and second bar electrodes; and

current measuring means for measuring currents corresponding to the position measurement signal and drawn through the first and second bar electrodes whenever a stylus contacts the conductive layer, whereby the stylus contacting the conductive layer divides the total resistance into first and second resistances that cause currents to be drawn through the respective first and second bar electrodes in proportion to the separation between the bar electrodes and the location.

4,853,499

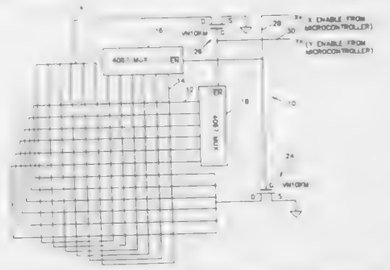
GROUND SWITCHING TECHNIQUE FOR SILKSCREENED DIGITIZER GRIDS

James S. Watson, Phoenix, Ariz., assignor to Calcomp Inc., Anaheim, Calif.

Filed Dec. 12, 1988, Ser. No. 283,509

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—19 **5 Claims**



1. In an electromagnetic digitizer having a plurality of first grid conductors connected from a first multiplexer controlled by a first enable input to ground and a plurality of second grid conductors connected from a second multiplexer controlled by a second enable input to ground and crossing over the first grid conductors at multiple points, the improvement for eliminating errors caused by capacitively coupled signals between the grid conductors at the cross over points comprising:

(a) first switching means connected in series with the connection of the first grid conductors to ground and including a control input for breaking the connection to ground of the second grid conductors when the first multiplexer is enabled by the first enable input; and,

(b) second switching means connected in series with the connection of the second grid conductors to ground and including a control input for breaking the connection to ground of the first grid conductors when the second multiplexer is enabled by the second enable input.

4,853,500

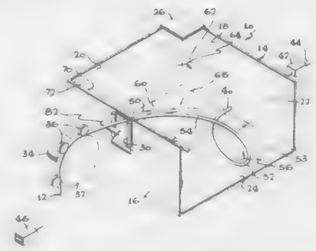
JAMFREE CABLE STORAGE

Joseph Tydlacka, El Segundo, Calif., assignor to Wyle Laboratories, El Segundo, Calif.

Filed Dec. 11, 1987, Ser. No. 131,740

Int. Cl.[4] H02G *11/00*

U.S. Cl. 191—12 R **8 Claims**



1. An apparatus for retrieving an elongated flexible member, which includes a storage bin having a front and opposite sides and having an opening in said front, and which includes means for moving said elongated member in a generally rearward direction through said opening into said bin, the improvement comprising:

a support;

means for holding said support at a location to support said flexible member as it moves through said opening into said bin, said holding means supporting the weight of said support and of the portion of said flexible member thereon while allowing said support to move in substantially free horizontal movement towards said opposite sides of said bin by a distance greater than one inch.

4,853,501

POWER CONTROL DEVICE FOR MICROWAVE OVEN

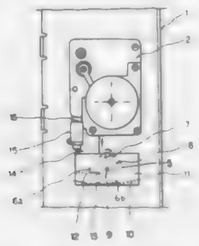
Yuha K. Sung, Kyungkido, and Yoo E. Bong, Seoul, both of Rep. of Korea, assignors to Sam Sung Electronic Co. Ltd., Suwonsi, Rep. of Korea

Filed Nov. 13, 1987, Ser. No. 119,929

Claims priority, application Rep. of Korea, Nov. 14, 1986, [illegible]7760

Int. Cl.[4] H61H *43/10*

U.S. Cl. 200—38 FA **6 Claims**



1. A power control device for a microwave oven equipped with a panel for a timer switch, the timer switch having an intermittent pressing arm extending from it, the power control device comprising:

(a) a microswitch, attached to the panel, said microswitch havng a microswitch lever extending from it so that the intermittent pressing arm of the timer switch intermittently physically presses on said microswitch lever during a "low mode" of operation of the microwave oven, said microswitch lever turning on said microswitch when said microswitch lever is pressed and turning off said microswitch when said microswitch lever is not pressed, thereby controlling power to the microwave oven;

(b) a continuous pressing element, fixed movably on the panel, for selectively

(1) pressing against said microswitch lever during a "high mode" of operation of the microwave oven, or

(2) releasing said microswitch lever during said low mode so that the intermittent pressing arm controls position of said microswitch lever;

(c) a cam assembly, comprising

(1) a cam with a first protruding portion for pressing against a driving surface of said continuous pressing element;

(2) a control shaft penetrating said cam, for turning said cam so as to switch selectively between a "high position" corresponding to said high mode and a "low position" corresponding to said low mode; and

(3) a limiting pin extending from said cam to fit into an arc-shaped aperture in the panel for travelling within said arc-shaped aperture as said cam rotates, said limiting pin physically contacting respective ends of said arc-shaped aperture when said cam is in said high and low positions; and

(d) a band spring for pressing against said cam for stable holding and switching operation throughout the turning of said control shaft.

4,853,502

COMBINATION BRAKE AND/OR CLUTCH PEDAL OPERATED SWITCH MECHANISM

Michael R. Canipe, Shelby, N.C., assignor to Fasco Controls Corporation, Shelby, N.C.

Filed Jul. 11, 1988, Ser. No. 217,229

Int. Cl.[4] H01H *3/16*

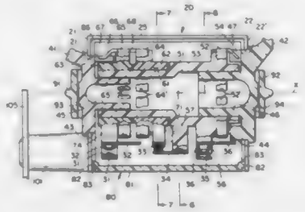
U.S. Cl. 200—61.89 **16 Claims**

1. A switch mechanism, comprising

a housing having in one end thereof a receptacle for receiving a plug of a wiring harness,

a plurality of switch blades secured intermediate their ends in said housing and defining therein a plurality of switches, said blades extending each at one end into said receptacle releasably to be connected to the plug of said wiring harness, and projecting each at its opposite end into a chamber in the opposite end of said housing,

a plurality of cams mounted in said chamber adjacent said opposite ends of said blades to rotate about an axis extending transversely of said blades, and operative selectively to open and close said switches,



a pair of levers mounted on opposite sides, respectively, of said housing for rotational movement in opposite directions coaxially of said axis,

clutch means frictionally coupling said levers to said cams to impart rotational movement thereto, and

means interposed between said cams and said housing and operative to limit the rotation of said cams in each direction about said axis.

4,853,503

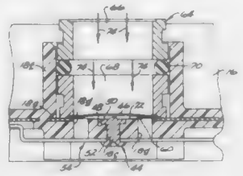
PRESSURE SWITCH APPARATUS HAVING IMPROVED LONGEVITY AND WIDENED TOLERANCE FOR LOCATION OF STATIONARY CONTACT

Carlton E. Sanford, E. Providence, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 169,799, Mar. 18, 1988. This application Sep. 26, 1988, Ser. No. 249,214

Int. Cl.[4] H01H *35/34*

U.S. Cl. 200—83 P **8 Claims**



1. An electric switch having an electrically insulative base, the base having a bottom wall and a side wall extending from the bottom wall defining a switch chamber, an electrical contact member disposed on the base member having at least a portion in the switch chamber, a dish shaped metallic diaphragm having an at rest convex surface configuration on a face thereof and having a circular outer peripheral edge engaging the electrical contact member and with the convex surface facing away from the base member, the center of the diaphragm having a pressure versus deflection relationship such that for increasing pressure from 0 psig up to and beyond a range of deflections between d_1 and d_2 the diaphragm has a relatively stiff effective spring rate with the center deflecting between d_1 and d_2 at essentially the same pressure, the diaphragm also having a relatively narrow differential between the pressure at which the center of the diaphragm deflects between d_1 and d_2 on increasing pressure and the pressure at which it deflects between d_2 and d_1 on decreasing pressure, means to place a fluid pressure source in communication with the said face of the diaphragm and an electrically conductive center contact member mounted in alignment with the center of the diaphragm between d_1 and d_2 from a plane on which the outer peripheral edge of the diaphragm lies.

4,853,504

TRIPLE ACTION PRESSURE SWITCH APPARATUS

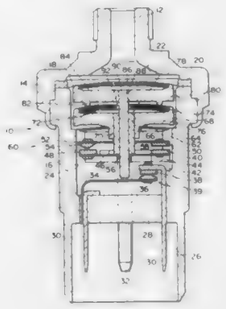
Hazime Tanaka, Yokohama; Hirayoshi Suzuki, Hadano, and Keiji Sasaki, Tokyo, all of Japan, assignors to Fuji Koki Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,720

Claims priority, application Japan, Jul. 23, 1987, 62-182386

Int. Cl.[4] H01H *35/34*

U.S. Cl. 200—83 P **20 Claims**



1. A triple action pressure switch apparatus including first switch means which is set in one of ON and OFF states when a pressure of a pressurized fluid is set within a predetermined range, and is set in the other of the ON and OFF states when the pressure of the pressurized fluid is decreased below a lower limit of the predetermined range and is increased over an upper limit of the predetermined range, and second switch means which is set in one of the ON and OFF states when the pressure of the pressurized fluid is set to be larger than a predetermined value within the predetermined range, and is set in the other of the ON and OFF states when the pressure of the pressurized fluid is decreased below the predetermined value, comprising:

a housing having an inner space and a path for introducing the pressurized fluid into said inner space;

a diaphragm which is provided in said inner space so that said inner space of said housing is partitioned into a pressure actuating chamber communicating with said pressurized fluid introduction path and a switch mechanism storage chamber blocked from said pressurized fluid introduction path in a sealed state;

a first piston member which is arranged adjacent to said diaphragm in said switch mechanism storage chamber, and is moved together with a central portion of said diaphragm in a moving direction of said central portion when said central portion is moved upon movement of said diaphragm;

a second piston member which is arranged adjacent to said first piston member at a side farther from said diaphragm in said switch mechanism storage chamber, and is moved together with said first piston member in a moving direction of said first piston member when said first piston member is moved upon deformation of said diaphragm;

first snap disc means which is arranged adjacent to a side surface of said second piston member farther from said first piston member in said switch mechanism storage chamber, a peripheral portion of which is supported by a peripheral surface of said switch mechanism storage chamber so as not to be moved away from said diaphragm in the moving direction of said second piston member, and which is transformable with a snap action between a first configuration wherein its central portion projects toward said diaphragm to cause said second piston member to move close to said diaphragm and a second configuration wherein its central portion projects in a direction away from said diaphragm to cause said second piston member to be moved inwardly in the moving direction in said switch mechanism storage chamber,

said first snap disc means being in the first configuration until the pressure of the pressurized fluid transmitted through said diaphragm and said first and second piston members is increased from the lower limit of the predetermined range by a further predetermined value while the pressure of the pressurized fluid is increased,

said first snap disc means being transformed from the first configuration to the second configuration when the pressure of the pressurized fluid is increased from the lower limit of the predetermined range by a further predetermined value, and

when the pressure of the pressurized fluid is decreased after said first snap disc means was once transformed to the second configuration, said first snap disc means being transformed from the second configuration to the first configuration when the decreasing pressure of the pressurized fluid has reached the lower limit of the predetermined range;

second snap disc means which is interposed between said second and first piston members, and is transformable with a snap action between a first configuration wherein its central portion projects toward said first piston member and a second configuration wherein its central portion projects in a direction away from said first piston member,

said second snap disc means being in the first configuration until the pressure of the pressurized fluid transmitted through said diaphragm and said first piston member reaches the upper limit of the predetermined range while the pressure of the pressurized fluid is increased,

said second snap disk being transformed from the first configuration to the second configuration when the pressure of the pressurized fluid has reached the upper limit of the predetermined range, and

when the pressure of the pressurized fluid is decreased after said second snap disc means is once transformed to the second configuration, said second snap disc means being transformed from the second configuration to the first configuration when the pressure of the pressurized fluid is decreased from the upper limit of the predetermined range by a further predetermined value;

third snap disc means which is interposed between said first piston member and said diaphragm and is transformable with a snap action between a first configuration wherein its central portion projects toward said diaphragm and a second configuration wherein its central portion projects in a direction away from said diaphragm,

said third snap disc means being in the first configuration until the pressure of the pressurized fluid transmitted through said diaphragm reaches a predetermined value in the predetermined range while the pressure of the pressurized fluid is increased,

said third snap disc means being transformed from the first configuration to the second configuration when the increasing pressure of the pressurized fluid has reached the predetermined value, and

when the pressure of the pressurized fluid is decreased after said third snap disc means is once transformed to the second configuration, said third snap disc means being transformed from the second configuration to the first configuration when the pressure of the pressurized fluid is decreased from the predetermined value by a predetermined value;

a first actuating rod which is inserted in said second piston member and said first snap disc means to be movable in the moving direction of said second piston member and is moved in the moving direction upon transformation of said second snap disc means between the first and second configurations; and

a second actuating rod which is inserted in said first piston member, said second snap disc means, said second piston member, and said first snap disc means to be movable in the moving direction of said first piston member, and is

moved in the moving direction upon transformation of said third snap disc means between the first and second configurations;

wherein said first switch means has a pair of resilient switch segments which are arranged further inwardly from said first snap disc means in the moving direction of said first and second piston members in said switch mechanism storage chamber, are formed of an electrically conductive material, and are separated from each other in the moving direction,

said pair of resilient switch segments of said first switch means are separated from each other or are in contact with each other to be in one of the OFF and ON states until the pressure of the pressurized fluid is further increased from the lower limit of the predetermined range by the predetermined value while the pressure is increased,

when the pressure of the pressurized fluid is increased from the lower limit of the predetermined range by the predetermined value and said first snap disc means is transformed from the first configuration to the second configuration, one of said pair of resilient switch segments is pressed by one of the transformed first snap disc means and said second piston member which is moved inwardly in said switch mechanism storage chamber upon transformation of said first snap disc means, so as to be resiliently transformed, and one resilient switch segment which is resiliently transformed is in contact with or separated from the other resilient switch segment to set the other one of the ON and OFF states,

when the pressure of the pressurized fluid is further increased over the upper limit of the predetermined range and said second snap disc means is transformed from the first configuration to the second configuration, said other resilient switch segment is pressed by said first actuating rod which is moved inwardly in said switch mechanism storage chamber upon transformation of said second snap disc means, so as to be resiliently transformed, and said other resilient switch segment which is resiliently transformed is again separated from or in contact with said one resilient switch segment which has been already resiliently transformed to set said one of the OFF and ON states,

when the pressure of the compressed fluid is further decreased from the upper limit of the predetermined range by the predetermined value while the pressure of the pressurized fluid is decreased after said second snap disc means is transformed to the second configuration, said second snap disc means is transformed from the second configuration to the first configuration, so that said first actuating rod is allowed to be moved toward said diaphragm in said switch mechanism storage chamber, pressing of said other resilient switch segment by said first actuating rod is released, and said other resilient switch segment is in contact with or separated from said one resilient switch segment again to recover said other one of the ON and OFF states, and

when the pressure of the pressurized fluid reaches the lower limit of the predetermined range while the pressure of the pressurized fluid is decreased after at least said first snap disc means is transformed to the second configuration, said first snap disc means is transformed from the second configuration to the first configuration, so that said second piston member is allowed to be moved toward said diaphragm in said switch mechanism storage chamber, pressing of said one resilient switch segment by one of said first snap disc means and said second piston member is released, and as a result, said one resilient switch segment is again separated or in contact with said other resilient switch segment to set said one of the OFF and ON states;

wherein said second switch means has at least one resilient switch segment which is arranged further inwardly from said first snap disc means in the moving direction of said first and second piston members in said switch mechanism storage chamber, and is formed of an electrically conductive material,

said at least one resilient switch segment of said second switch means is set in one of the ON and OFF states when said third snap disc means is in the first configuration until the pressure of the pressurized fluid reaches the predetermined value in the predetermined range while the pressure is increased,

when the increasing pressure of the pressurized fluid has reached the predetermined value and said third snap disc means is transformed from the first configuration to the second configuration, said at least one resilient switch segment is pressed by said second actuating rod which is moved inwardly in said switch mechanism storage chamber upon transformation of said third snap disc means, so as to be resiliently deformed, and said at least one switch segment which is resiliently transformed is set in said other one of the OFF and ON states,

when the pressure of the pressurized fluid is further decreased from the predetermined value by a further predetermined value while the pressure is decreased after said third snap disc means is once transformed to the second configuration, and said third snap disc means is transformed from the second configuration to the first configuration, said second actuating rod is allowed to be moved toward said diaphragm in said switch mechanism storage chamber upon transformation of said third snap disc means and pressing of said at least one resilient switch segment by said second actuating rod is released, so that said at least one resilient switch segment is recovered to said one of the ON and OFF states; and

wherein said first and second switch means are electrically connected to the other end of each of two terminal means whose one end projects outside said housing.

4,853,505

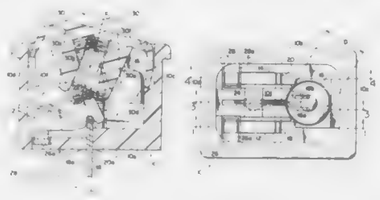
MINIATURE ILLUMINATED ROCKER SWITCH

Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.

Filed Mar. 9, 1988, Ser. No. 165,744

Int. Cl.[4] H01H *9/16*

U.S. Cl. 200—315 **6 Claims**



*1. A miniature double pole electrical switch with lighted actuator, said switch comprising an upwardly open molded plastic case having a bottom wall and integrally connected front, rear, and end walls, said switch case having an integrally formed divider wall between said front and rear walls to provide front and rear cavities inside said case, at least two fixed center contact terminals provided in aligned center slots in said bottom wall, said center terminals having upper end portions located in said front and rear switch case cavities, movable contacts provided in said front and rear cavities, each movable contact having a pivoted end supported on one of said fixed contact terminal upper ends, each movable contact having a free end, each movable contact defining a land spaced above said pivoted end and above said fixed contact terminal upper end, an actuator movably mounted in said case, spring means provided in part in said actuator and having parts acting on said movable contact lands to pivot said movable contacts in response to actuator movement, at least two fixed end terminals adjacent one end wall of said molded case, said two fixed end terminals having upper ends engageable by said movable contact free ends in a closed condition for said switch actuator, a lamp provided adjacent an end of said molded case opposite said one end, said lamp provided in part in said front and said rear cavities and having first and second conductive leads, said divider wall having an opening to receive said lamp, each of said center fixed contacts having an integrally formed tang, one tang being bent in a direction to electrically connect its associated terminal to said first conductive lamp lead, said divider wall and case bottom wall defining a downwardly open resistor receptacle, said divider wall defining a slot for receiving said second conductive lamp lead, said slot having a portion in communication with said resistor receptacle, a resistor held in said receptacle by said tang on the other of said center fixed contact terminals.

4,853,506

PRESSURE ACTUATED SNAP SWITCH

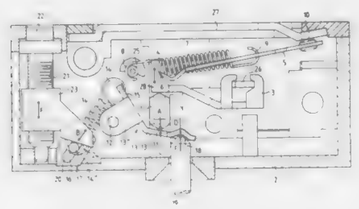
Klaus Poschet, Baldham, Fed. Rep. of Germany, and Willy Bänteli, Schaffhausen, Switzerland, assignors to Bircher, AG., Beringen, Switzerland

Filed Jun. 30, 1987, Ser. No. 68,080

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1986, 3623200

Int. Cl.[4] H01H *5/06*

U.S. Cl. 200—463 **6 Claims**



1. A snap switch comprising:

a casing;

first and second contact bars which are spaced apart in fixed positions;

a first electrically conductive element pivotable about the second bar between first and second positions;

a second electrically conductive element mechanically and electrically coupled to said first element, said second element, when the first element is in the first position, being moved to a corresponding first position at which a current carrying path is established between the first and second contact bars, said second element, when the first element is in the second position being moved to a corresponding second position at which said path is broken, said casing accommodating said first and second contact bars and said first and second elements;

a pressure responsive ram having one end extending into the casing and spaced from said first element and an opposite end disposed outside the casing, said one end of the ram having first and second positions of penetration into the casing which differ in depth, the depth of penetration being greater in the second position of penetration than in the first position, said first element being in a first position when the one ram end is in the first penetration position and being in its second position when the one ram end is in the second penetration position;

a bolt also accommodated in said casing and having one end engaging the first element and an opposite end adjacent but offset from the ram, said bolt placing the first element in the first position when the one ram end is in the first penetration position and placing the first element in the second position when the one ram end is in the second position; and

biasing-pressure exerting means disposed in said casing and exerting pressure onto said bolt, the path being opened when pressure is applied to the opposite end of the ram and causes the one end of the ram to be moved into the second position of penetration;

the biasing-pressure exerting means including a bent lever having two arms of unequal length, one of said arms being engageable with said one end of the ram at one side thereof and with said opposite end of said bolt at an opposite side thereof and another of said arms having a fulcrum mounted in said casing so that said lever is pivotable about a point spaced from said first and second elements, a tension spring having one end connected to said one of said arms, a bearing bolt supporting another end of said tension spring, said casing having a guide groove receiving said bearing bolt and guiding the bolt, and adjusting means for displacing said bearing bolt in said guide groove and thereby adjusting an action point of said tension spring acting on said lever, said guide groove extending substantially along an axis of said tension spring, said adjusting means including a set screw inclined with respect to the axis of said tension spring.

4,853,507

APPARATUS FOR MICROWAVE SEPARATION OF EMULSIONS

Nikola Samardzija, Wilmington, Del., assignor to E. I. Dupont de Nemours & Company, Wilmington, Del.

Filed Apr. 28, 1988, Ser. No. 187,667

Int. Cl.[4] H05B *6/78*

U.S. Cl. 219—10.55 A **17 Claims**



1. Apparatus for emulsion separation, comprising:

a microwave energy source of pre-selected frequency;

a wave guide section of selected length dimensioned in accordance with the wavelength of said microwave frequency, and having first and second ends with said microwave energy input at the first end;

an impedance matching member for increasing the microwave energy power transfer, said member being secured across said wave guide section in liquid-tight affixture to divide the wave guide section into a lesser volume space adjacent the first end and a greater volume space adjacent the second end;

means for flowing emulsion liquid into said greater volume space adjacent said impedance matching member to receive microwave heating; and

second means for flowing microwave treated emulsion liquid out of the second end for liquid separation.

4,853,508

LIGHTING DEVICE FOR AN OVEN TO BE EXPOSED TO MICROWAVE ENERGY, IN PARTICULAR A HOUSEHOLD OVEN

Günter Hammerl, Bad Reichenhall, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeräte GmbH, München, Fed. Rep. of Germany

Filed Dec. 15, 1988, Ser. No. 285,009

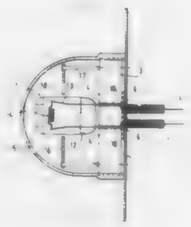
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1987, 3742518

Int. Cl.[4] H05B *6/76;* **F24C** *7/02*

U.S. Cl. 219—10.55 R **5 Claims**

1. Lighting device for an oven, in particular a household

oven, comprising a baking chamber with a wall to be exposed to microwave energy, a lamp socket protruding freely into the baking chamber without a microwave shielding covering, electrical connecting lines supplying the lamp socket with current from outside the baking chamber, an incandescent bulb with a lamp base and an incandescent filament with an incan-



descent coil being mounted on the lamp socket, and an electrically conductive disk being substantially parallel to and electrically conductively connected to the baking chamber wall, said disk having a duct opening formed therein for the lamp base, and said disk surrounding the incandescent filament in the vicinity of the incandescent coil.

4,853,509

RICE COOKER FOR MICROWAVE RANGES

Tatsuo Murakami, Chiba, Japan, assignor to Hario Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1988, Ser. No. 195,835
Claims priority, application Japan, Nov. 18, 1987, 62-176207[U]
Int. Cl.⁴ H05B *6/80*
U.S. Cl. 219—10.55 E 2 Claims



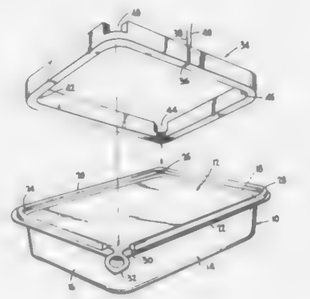
1. A rice cooker for microwave ranges comprising:
a microwave permeable bowl,
a perforated, microwave permeable rice container detachable encased in said bowl and internally provided with at least two spaces suited for accommodating rice, and
a lid closing the top open end of said bowl in detachable engagement with said rice container in which said rice container is made up of a pair of counterparts which are separable combined with each other in order to internally define said at least two spaces, and
at least one of said counterparts is provided with at least one slit for passage of water therethrough in which said pair of counterparts are lower and upper trays,
said lower tray includes an upstanding first center tube and a plurality of receptacles circumferentially juxtaposed around said first center tube,
said first center tube is provided at its top end with a first thread and, near its bottom end, a plurality of circumferentially juxtaposed longitudinal slots,
said upper tray is provided with a second center tube and a plurality of cover sections circumferentially juxtaposed around said second center tube,
the number of said cover sections is equal to that of said receptacles so that each said cover section defines each said space in combination with each said receptacle,
said second center tube is provided near its bottom end with water inlet opening in said spaces, and
said lid is provided with a third center tube extending downwards and having an inner thread engageable with said thread on said first center tube on said lower tray.

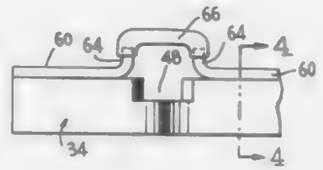
4,853,510

INDUCTION HEATING COIL

Glenn R. Mohr, Linthicum, Md., and Donald J. Roth, Westport, Conn., assignors to Continental Can Company, Inc., Norwalk, Conn.

Continuation of Ser. No. 000,076, Jan. 2, 1987, Pat. No. 4,757,173. This application Jul. 11, 1988, Ser. No. 217,700
The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.
Int. Cl.⁴ H05B *6/40*
U.S. Cl. 219—10.79 3 Claims





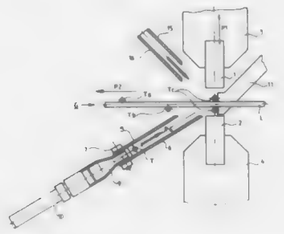
1. An induction heating coil, said coil being a single turn coil particularly configurated for inducing electrical energy into a metal foil barrier layer of a laminated container closure for effecting heat bonding of the closure to a container in a preselected seal pattern with the closure having configuration means which modified the distribution of current into said closure, said coil having an outline in accordance with said preselected seal pattern, said coil being improved by reducing the cross section of said coil in alignment with the intended position of the closure configuration means to increase inductance and thus the heating effect of said coil at the closure configuration means, said reduction in cross section being in the form of a notch disposed remote from the plane of the intended seal pattern, said coil having a cooling tube portion, and said cooling tube portion extending across said notch in a manner without changing the increased inductance of said coil at said notch.

4,853,511

APPARATUS FOR THE FEEDING OF TRANSVERSE WIRES TO THE WELDING LINE OF A GRID WELDING MACHINE

Klaus Ritter; Gerhard Ritter, and Rudolf Scherr, all of Graz, Austria, assignors to EVG Entwicklungs - U. Verwertungs-Gesellschaft M.B.H., Graz, Austria

Filed Nov. 19, 1987, Ser. No. 122,912
Claims priority, application Austria, Nov. 28, 1986, 3182/86
Int. Cl.⁴ B23K *1/00*
U.S. Cl. 219—56 10 Claims



1. Electrical resistance grid welding machine, comprising
a grid production plane for producing a grid, said grid production plane including a welding line,
a plurality of rows of mutually adjustable electrodes disposed about said welding line,
means for feeding transverse wires to said welding line, said feeding means comprising
at least one compressed air nozzle directed toward said welding line for conveying transverse wires by compressed air to said welding line, said air nozzle being stationary and being located at a distance spaced from said welding line,
a plurality of parallel guides defining a transverse wire feed path and extending from said compressed air nozzle in the direction of said welding line,
said parallel guides having discharge ends spaced from said electrodes, and
means located in the region of said electrodes for catching and holding the fed transverse wires at the welding line between said electrodes.

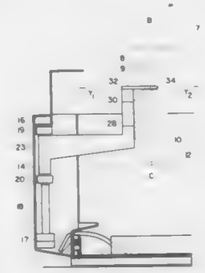
4,853,512

SPARK EROSION MACHINING APPARATUS

Rudolf Scheider, Reinach, Switzerland, assignor to Erowa AG, Reinach, Switzerland

Filed Jul. 1, 1988, Ser. No. 214,314
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, 3722032
Int. Cl.⁴ B23H *7/00, 7/22*
U.S. Cl. 219—69.15 12 Claims

1. A spark erosion machining apparatus comprising:
a spindle adapted to receive and clamp an electrode used for machining a workpiece into a desired shape;
a displaceably mounted working table located in a certain distance below said spindle;
first drive means operatively coupled to said working table to displace it with regard to said spindle within a horizontal plane in X-direction;
second drive means operatively coupled to said working table to displace it with regard to said spindle within a horizontal plane in Y-direction;
a tub mounted on said working table adapted to receive the dielectric liquid required for the erosion machining and to receive the workpiece to be machined;
at least one electrode storage means having a plurality of electrode support members and located in the interior of said tub;
said at least one electrode storage means comprising linkage means pivotally connected said electrode support members to at least one side wall of said tub;



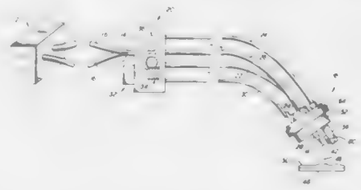
said electrode support members being pivotal from a retracted rest position near said side wall of said tub into an operating position in which they protrude from said side wall of said tub towards the interior of said tub into an operating region;
said first and second drive means being adapted to displace said tub in X- and/or Y-direction such that said spindle of the apparatus is above a selected electrode received in said electrode support members when said electrode support members are pivoted into their operating position.

4,853,513

ARC SPRAY GUN FOR COATING CONFINED AREAS

Anthony J. Fuimefreddo, Bellmore, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 28, 1988, Ser. No. 187,106
Int. Cl.⁴ B23K *9/04*
U.S. Cl. 219—76.14 10 Claims



5. In an arc spray gun adapted to spray coatings in confined areas, including a pair of electrically isolated tubular wire guides positioned in a converging relationship so as to effect a point of contact between respective spraying ends of two metal wires of selected type for formation of an arc and of molten metal generated thereby, a primary gas jet nozzle receptive of a primary flow of compressed gas and positioned between the wire guides to effect a spray stream of atomized molten metal, current means for connecting the metal wires to a source of arc current, and feeding means for feeding the metal wires respectively through the tubular wire guides, an arc spray deflector comprising:
a nozzle body with a nozzle seat thereon and a hole therein receptive of a secondary flow of compressed gas; and
a nozzle insert sealingly inserted into the hole, the nozzle insert being chosen from a first nozzle insert or a second nozzle insert;
the first nozzle insert having a first flanged end with a first

thickness positioned on the nozzle seat, and further having an orifice therein in gas communications with the hole such that the secondary flow exits the first flanged end at a first exit point on the first flanged end to direct a lateral deflecting jet toward the point of contact;

the second nozzle insert having a second flanged end with a second thickness positioned on the nozzle seat, and further having an orifice therein in gas communication with the hole such that the secondary flow exits the second flanged end at a second exit point on the second flanged end to direct a lateral deflecting jet toward the point of contact; and the first and the second inserts being adapted to be interchanged whereby selection of the distance from a respective exit point to the point of contact is effected.

4,853,514

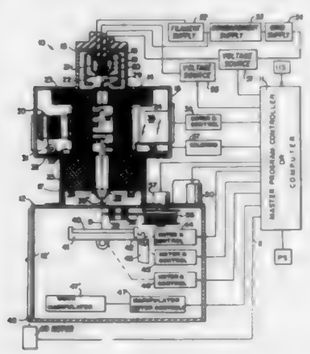
BEAM APPARATUS AND METHOD

Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540

Continuation of Ser. No. 571,188, Apr. 24, 1975, abandoned, which is a continuation of Ser. No. 849,013, Aug. 11, 1969, abandoned, which is a continuation-in-part of Ser. No. 691,676, Nov. 27, 1967, abandoned, and a continuation-in-part of Ser. No. 422,875, Nov. 25, 1964, Pat. No. 3,461,347, and a continuation-in-part of Ser. No. 710,517, Mar. 5, 1968, abandoned, and a continuation-in-part of Ser. No. 501,395, Oct. 22, 1965, Pat. No. 3,371,404, and a continuation-in-part of Ser. No. 421,897, Dec. 29, 1964, Pat. No. 3,504,063, which is a continuation-in-part of Ser. No. 734,340, May 19, 1958, Pat. No. 3,173,175. This application Oct. 21, 1986, Ser. No. 921,268

Int. Cl.[4] H01J *37/317*; H05B *7/10*

U.S. Cl. 219—121.12 **24 Claims**



1. An apparatus for selectively depositing material onto a substrate comprising in combination:

(a) first means for supporting a workpiece,

(b) second means supported adjacent said first means for generating a beam of collimated radiation,

(c) third means for feeding a first material into said beam of collimated radiation a distance away from a surface of said workpiece adapted to receive said first material,

(d) fourth means for operating said beam generating means at sufficient intensity to permit the beam generated thereby to change the state of the quantity of said first material fed into said beam by said third means,

(e) fifth means for directing said beam at said workpiece along a path to cause it to intersect a select area of a surface of said workpiece and to heat the material of said workpiece defining said select area to a temperature for bonding said first material thereto, and

(f) sixth means for controlling said third means feeding said first material into said beam and said fourth means to cause a select amount of said first material to be fed to said beam and to cause said radiation beam to carry and direct said select amount of said first material against and become integrally bonded to the material defining said select area of said workpiece.

4,853,515

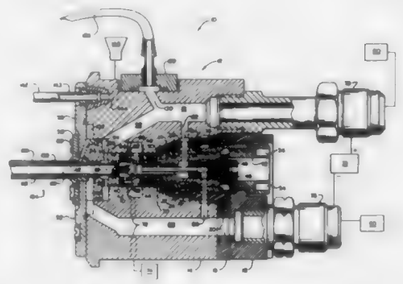
PLASMA GUN EXTENSION FOR COATING SLOTS

William S. Willen, Huntington; Robert F. Savill, Jr., Flushing, and Martin E. Hacker, Lake Ronkonkoma, all of N.Y., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sep. 30, 1988, Ser. No. 254,001

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—121.47 **4 Claims**



1. A plasma gun useful for spraying on the inside surfaces of a recessed region, comprising, in combination:

a cathode member;

a tubular anode cooperatively arranged with the cathode member and with a source of plasma forming gas and an electrical arc power supply to generate an plasma stream issuing from the tubular anode;

an elongated tubular extension including a tubular wall with an axial plasma duct therein extending forwardly from the tubular anode, the plasma duct being terminated by an end wall distal from the tubular anode, the tubular extension further having a transverse plasma duct therein formed in part by the end wall for causing the plasma stream to exit transversely from the tubular extension, with channeling for fluid coolant being in the tubular wall and extending substantially the length of the axial plasma duct;

a first external pipe connected to the tubular extension forwardly of a point proximate the transverse duct, the first pipe being in fluid flow communication with the channeling and receptive of fluid coolant from a coolant source;

disposal means for disposing of the fluid coolant from the rearward end of the tubular extension;

a powder injector disposed forwardly adjacent the transverse duct to inject spray powder into the exiting plasma stream; and

a second external pipe connected to the powder injector in powder flow communication therewith and receptive of the spray powder from a powder source.

4,853,516

ELECTRIC CABLE PRIMARILY FOR WELDING EQUIPMENT AND WELDING DEVICE INCLUDING THE SAME

Regis Julien, and Monique Antonio, both of 15 Rue de Chartre, 91400 Orsay, France, assignors to Regis Julien and Monique Antonio, both of Orsay, France

Filed May 4, 1988, Ser. No. 190,208

Claims priority, application France, May 7, 1987, 87 067498

Int. Cl.[4] B23K *9/32*; H01B *7/34*

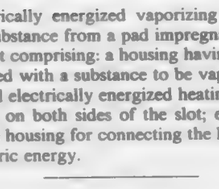
U.S. Cl. 219—137.9 **6 Claims**

1. A welding device comprising:

a welding device having at least first and second members; said first member being movable with respect to said second member during operation of the welding device; and

a cable member fixed to both first and second members, said cable having at least one electrical conductor at a central portion thereof and an insulation tube surrounding said electrical conductor, said tube being generally cylindrical with longitudinally extending channels formed at both the inner and outer peripheries thereof.

2. A cable member comprising:



at least one electrical conductor at a central position thereof; and

an insulation tube surrounding said electrical conductor, said insulation tube being generally cylindrical with longitudinally extending channels formed at both the inner and outer peripheries thereof.

4,853,517

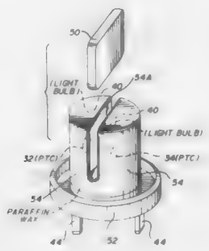
VAPORIZING UNIT

John G. Bowen, 2815 Industrial Rd., Santa Fe, N. Mex. 87501, and John M. Groome, Hemel Hempstead, England, assignors to John G. Bowen, Santa Fe, N. Mex.

Filed Mar. 28, 1988, Ser. No. 174,460

Int. Cl.[4] H05B *3/14*

U.S. Cl. 219—271 **11 Claims**



1. An electrically energized vaporizing unit for directly vaporizing a substance from a pad impregnated with the substance, said unit comprising: a housing having a slot therein; a pad impregnated with a substance to be vaporized positioned in said slot; and electrically energized heating means mounted in the housing on both sides of the slot; electrical circuitry mounted in the housing for connecting the heating means to a source of electric energy.

4,853,518

TANK-TYPE HEATING APPARATUS FOR FLUID OR DOUGHY FOOD PRODUCTS

Francesco Bravo, Montecchio Maggiore, Italy, assignor to Bravo S.p.A., Vincenza, Italy

Filed May 2, 1988, Ser. No. 188,964

Claims priority, application Italy, May 8, 1987, 21553/87[U]

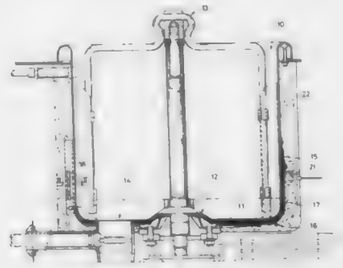
Int. Cl.[4] H05B *3/36*

U.S. Cl. 219—441 **2 Claims**

1. Tank-type heating apparatus comprising

a tank,

at least one heating element made of flexible material secured to at least a first portion of an outer surface of the tank, an outer surface of the said heating element, opposite a surface of the heating element in contact with the outer surface of the said tank, being in contact with a mantle of heat-conductive material which extends over the whole of said outer surface of the said heating element, and which also extends beyond said outer surface of said element so as to enter into contact, also with at least a further portion of the outer surface of said tank not covered by the said heating element,



a first temperature sensor for controlling the temperature of said heating element and being secured in contact with the surface of the said mantle which is opposite to the surface thereof that is in contact with the said heating element, and

a second temperature sensor secured in direct contact with a still further portion of outer surface of the tank which is not covered by said element or mantle, and which is operative for controlling the temperature of the content of the said tank.

4,853,519

HEATING APPARATUS FOR HEATING IN A PLURALITY OF HEATING MODES

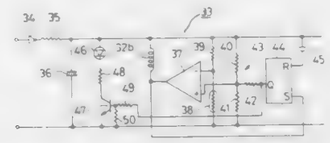
Seiji Tanaka, Yamato-Koriyama, and Hideshi Nakagawa, Osaka, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 11, 1988, Ser. No. 167,101

Claims priority, application Japan, Aug. 1, 1987, 62-118495[U]

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—497 **11 Claims**



1. A heating apparatus, comprising:

a heating member for heating a subject to be heated;

temperature detecting means for detecting a temperature of said subject and generating an output signal corresponding to the detected temperature;

reference set point generating means for changing and outputting a plurality of preset reference set signals

comparison means, operatively connected to said temperature detecting means and said reference set point generating means, for comparing said output signal of said temperature detecting means and a present preset reference set signal and generating a comparison signal representing the comparison result;

energizing control means, responsive to said comparison means, for controlling a supply of electricity to said heat-

ing member in accordance with said comparison signal from said comparison means; and

retaining means, operatively connected to said comparison means, for holding said comparison signal from said comparison means and outputting a change signal to said reference set point generating means;

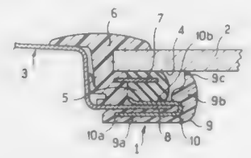
said reference set point generating means changing said present preset reference set signal once to a new preset reference set signal in response to said change signal, thereby causing said heating member to heat at a new temperature.

4,853,520

DEVICE FOR FIXING A WINDOW-PANE ON A RIGID FRAME

Paul Hochart, La Longueville; Gilbert Pagnucco, Maurepas; Marceau Bertrand, Boussois, and Alain Bertrand, Jeumont, all of France, assignors to Boussois S.A., Levallois-Perret, France

Filed May 11, 1988, Ser. No. 195,680
Claims priority, application France, May 20, 1987, 87 07049
Int. Cl.[4] B60R *13/06*; C03C *27/04*
U.S. Cl. 219—535 **9 Claims**



1. A device (1) for fixing a window-pane (2) and in particular an automobile windshield, rear window or fixed side window on a rigid frame (3), said window-pane (2) being provided with a bead (5, 12) of thermoplastic material at its periphery and on that face (4) which is intended to be applied against the rigid frame (3), said rigid frame being constituted by a wall (8) which is intended to receive said bead (5, 12) and which extends toward the interior of the frame, wherein said device comprises a sectional strip (9) of plastic material to which is secured a resistance-type heating element (10) of resilient metal having a substantially U-shaped cross-section, one wing (10*a*) of said heating element being secured to the sectional strip (9) and the other wing (10*b*) being free with respect to said strip so as to form therewith a clip which is capable of resilient engagement on said wall (8) of the rigid frame (3).

4,853,521

SYSTEM FOR VERIFYING AND RECORDING DRUG ADMINISTRATION TO A PATIENT

Ronald W. Claeys, 1462 "I" St., Springfield, Oreg. 97477, and Gary S. Decamp, 2595 Elysium, Eugene, Oreg. 97401

Filed Dec. 28, 1987, Ser. No. 138,171
Int. Cl.[4] G06F *15/20*
U.S. Cl. 235—375 **15 Claims**

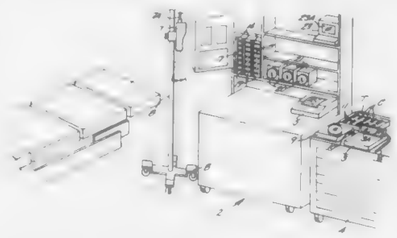
1. A system facilitating verification of medication administered to a patient and making a record of same, said system comprising,

scanner means for reading bar codes,

a scale,

bar code bearing medication containers stored in place on said scale before and after drug administration to the patient, and

a bar code reader unit with display interfaced with said scale and scanner means, said unit being of the intelligent programmable type and capable of making a record and further capable of displaying instructions and data from



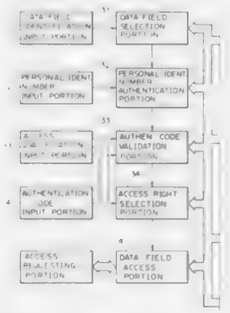
bar codes read by said scanner means and weight data from said scale.

4,853,522

SYSTEM FOR PERMITTING ACCESS TO DATA FIELD AREA IN IC CARD FOR MULTIPLE SERVICES

Nobuo Ogasawara, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 16, 1987, Ser. No. 97,625
Claims priority, application Japan, Sep. 16, 1986, 61-217722
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 **8 Claims**



1. A system for permitting access by a card acceptor to a data field area in an IC card for multiple services of multiple service suppliers using an individual card holder identification number for each of a plurality of data fields or for each groups of data fields, said system comprising:

a plurality of data fields in the IC card, each corresponding to a different service;

a sequence of data field selection means, a personal identification number authentication means, an authentication code validation means, and an access right selection means;

card acceptor input means for inputting data field identification information, a personal identification number, access qualification information, and an authentication code;

a data field access means and access request means; and

storage means for storing information for data field control;

comparisons between the information stored in said storage means and the information input through said input means being carried out, for authentication, validation, and selection; and

based on the cumulative result of a selection of a data field, an authentication of a personal identification number, an authentication of a personal identification number, a validation of an authentication code, and a selection of an access right, access to a data field area to which access is

requested is permitted within a limit of the selected access right.

4,853,524

OPTICAL IDENTIFICATION CARD SYSTEM

Masami Yamaguchi, Sagamihara; Shunichi Ishikawa, Isehara; Hideo Tamura, Hatano; Hirokazu Tanaka, Tokyo; Tomio Nakaya, Yokohama, and Kiyomitsu Ishikawa, Tokyo, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1987, Ser. No. 76,376
Claims priority, application Japan, Jul. 24, 1986, 61-174256; Jul. 24, 1986, 61-174257; Feb. 6, 1987, 62-24476; Feb. 6, 1987, 62-24775; Feb. 13, 1987, 62-29908; Apr. 3, 1987, 62-81029; May 13, 1987, 62-114422
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—468 **11 Claims**

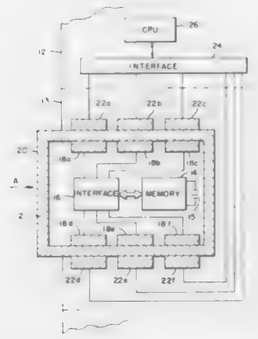
1. An optical card identification system provided with individual cards which have an individual code said cards having means for receiving a request signal from a location remote from said cards requesting a return signal together with means including a power supply for generating and irradiating infrared light modulated by the said individual codes of respective cards in response to said requesting signal while said cards are in transit through a prescribed zone spaced from said source, said system further including a detector which irradiates the said request signal as infrared light from said remote location into said prescribed area and has means for receiving said infrared light transmitted from said individual cards, and thereby detecting the individual code of the latter said cards, and an identifier which identifies the detected individual codes, together with means operative on the basis of the identification results, for actuating terminal equipment related to holders of the said individual cards.

4,853,523

VAULT CARTRIDGE HAVING CAPACITIVE COUPLING

Paul C. Talmadge, Ansonia, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 5, 1987, Ser. No. 104,125
Int. Cl.[4] G07F *7/10*
U.S. Cl. 235—492 **17 Claims**



1. A system for storing data within a data storage device comprising:

means for storing data;

means for enclosing said data storing means, said enclosing means having walls comprised of a material which is substantially electrically nonconductive and which has a dielectric constant associated therewith;

a first plurality of conductive plate means disposed within said enclosing means and substantially adjacent to an inner surface of at least one of said walls;

a plurality of electronic data receiving means, individual ones of which are coupled to individual ones of said first plurality of plate means, each of said data receiving means having an output operatively coupled to said data storing means;

a second plurality of conductive plate means being disposed substantially adjacent to an outer surface of at least one of said walls, individual ones of said second plurality of plate means further being disposed substantially in opposing relationship with individual ones of said first plurality of plate means such that corresponding ones of said first and said second plate means are operable for defining an electrical capacitor; and

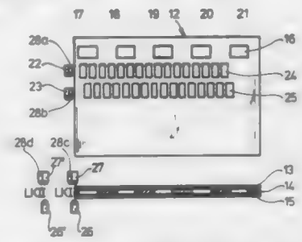
a plurality of electronic data transmission means, individual ones of which are coupled to individual ones of said second plate means for capacitively coupling data for storage within said data storing means through corresponding ones of said first and second plate means.

4,853,525

FORGERY PROOF OPTOELECTRIC CODE CARD READER

Werner Vogt, Remetschwil, Switzerland, and Anton Schuhwerk, Geislingen, Fed. Rep. of Germany, assignors to Interflex Satensysteme GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 113,653
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1986, 3636921
Int. Cl.[4] G06K *7/12*
U.S. Cl. 235—469 **13 Claims**



1. A forgery-proof optoelectric card system including a reader and code cards comprising invisible light and dark codings forming at least one reading track arranged between two cover plates which are permeable to infrared light, said light codings being permeable to infrared light and said dark codings blocking infrared light, and having at least one reading

head comprising a photodiode as a light source and a phototransistor as a light receiver, said reading head being arranged in a card-guiding channel of said reader and positioned to read at least one reading track arranged on the code card to be evaluated, supply and evaluation means connected to said reading head for evaluating the information read thereby, characterized in that superimposed over selected ones of said light codings are filters having infrared attenuation characteristics narrower than and lying within the infrared pass band of said light codings, and a secondary light receiver responsive only to light lying within the attenuation band of said filters.

4,853,526

DATA CARRIER ARRANGEMENT HAVING AN INTEGRATED CIRCUIT

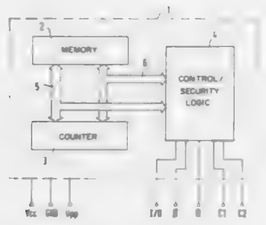
Wolfgang Effing, Gilching, Fed. Rep. of Germany, assignor to GAO Gesellschaft fur Automation und Organisation mbH, Fed. Rep. of Germany

Filed Oct. 26, 1987, Ser. No. 113,251

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1986, 3638505

Int. Cl.[4] G06K *19/06*

U.S. Cl. 235—492 **6 Claims**



1. A data carrier arrangement for obtaining services, goods, or the like and having an integrated circuit (1); the integrated circuit having at least one non-volatile data memory (2) with a predetermined number of memory cells which are readable, erasable and writable; the integrated circuit (1) having along with the data memory (2) a counter (3) comprising a plurality of stages, and a control and security logic (4); the counter (3) being operable only in one predetermined direction; the size of the data memory (2) being selected such that its memory cells are adapted to the stages of the counter (3); and the control and security logic (4) controlling, among other things, the data transfer between the memory (2) and the counter (3) in such a way that, before each use of the data carrier, the current memory value is transferred to the counter and, after the use of the data carrier, the memory content is updated with the new counter reading.

4,853,527

CONTROLLED ACCELERATION DECELERATION CIRCUIT FOR OPTICAL TRACERS

Enn Vali, Burlington, Canada, assignor to Westinghouse Canada Inc., Hamilton, Canada

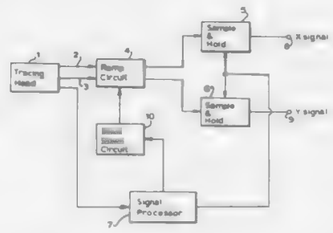
Filed Mar. 14, 1988, Ser. No. 167,913

Claims priority, application Canada, Jun. 4, 1987, 538841

Int. Cl.[4] G05B *1/00*

U.S. Cl. 250—202 **5 Claims**

1. A control circuit for a co-ordinate drive optical pattern tracing machine wherein the output of a pair of sample and hold circuits produces output signals, the amplitude of which determines the speeds of the X and Y co-ordinate drive motors through a servo amplifier loop of said tracers, said sample and hold circuits each being fed with two signals produced in the tracing head; a first signal being a sinusoid co-ordinate signal and the second signal corresponding to the line intercept signal, a slowdown circuit for producing slowdown signals in response to some predetermined stimulus, a ramp function generator being connected between said tracing head and said sample and hold circuits so as to be able to modulate said



sinusoid co-ordinate signals in accordance with some predetermined pattern upon the receipt of a slowdown signal produced in the slowdown circuit.

4,853,528

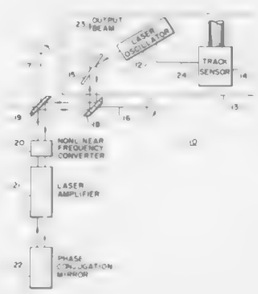
SELF-ALIGNING PHASE CONJUGATE LASER

Robert W. Byren, Hermosa Beach, and David A. Rockwell, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 810,808, Dec. 19, 1985. This application Aug. 11, 1987, Ser. No. 84,612

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—203 R **6 Claims**



1. A method of automatically pointing a high energy laser weapon in the direction of a perceived, external reconnaissance radiation beam including the steps of:

sensing an external radiation beam by searching for and collecting said external radiation beam using a moving scanning and sensing means;

comparing said sensed external radiation beam to a reference stored in said scanning and sensing means;

freezing the motion of said scanning and sensing means if said sensed external radiation is positively identified as said external reconnaissance radiation beam; and

simultaneously firing a high energy laser which is synchronously, mechanically, and electrically coupled to said moving scanning and sensing means and which resides on a gimbal with said moving scanning and sensing means, the high energy laser being fired when said motion of said scanning and sensing means is frozen in order to substantially and instantaneously deliver a high energy laser beam to the source of said external reconnaissance radiation beam, the step of firing being accomplished by the steps of:

energizing a laser oscillator, the laser oscillator being mounted on the gimbal;

passing at least a portion of the laser oscillator output radiation through a laser power amplifier which is mounted off of the gimbal;

phase conjugating the output of the laser power amplifier;

passing the phase conjugated radiation back through the laser power amplifier; and

coupling the phase conjugated and amplified laser radiation to a laser radiation outcoupling means which is mounted on the gimbal such that the high energy laser beam is delivered to the source of said external reconnaissance radiation beam.

4,853,529

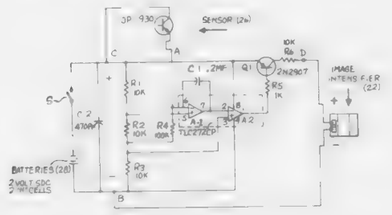
LIGHT LEVEL RESPONSIVE CONTROL FOR LIGHT INTENSIFIER IN NIGHT VISION SYSTEM

Brad E. Meyers, 17525 N.W. 67th Ct., Redmond, Wash. 98052

Filed Feb. 5, 1988, Ser. No. 152,436

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—213 VT **2 Claims**



1. A night vision telescope, comprising:

an electrically powered image intensifier;

a source of electrical energy for operating said image intensifier; and

a control circuit including an off-on switch and a deactivate circuit in series with said off-on switch between said source of electrical energy and said image intensifier, said deactivate circuit comprising a photoconductive light sensor and switch means responsive to light signals received by said photoconductive light sensor for conducting current from the source of electrical energy to the image intensifier, when the off-on switch is on and the light being sensed by the photoconductive light sensor is at a level below a predetermined level, and preventing such current flow when the light level being sensed by the photoconductive light sensor is above said predetermined level;

wherein the switch means responsive to light signals received by said photoconductive light sensor is a PNP transistor having an input, an output and a base, and said input is connected in said deactivate circuit to receive current from the source of electrical energy and the output is connected to deliver current to the image intensifier, and said deactivate circuit includes amplifier means connected between the photoconductive light sensor and the base of the transistor, and is further connected to receive operating electrical energy from the source of electrical energy, said amplifier means functioning to deliver a negative voltage to the base of the transistor in response to the photoconductive light sensor sensing a light level below said predetermined light level, for causing the transistor to conduct current from the source of electrical energy to the image intensifier whenever the off-on switch is on, said amplifier means further functioning to transmit a positive voltage to the base of the transistor in respone to the photoconductive light sensor sensing a light level which is above the predetermined light level, for turning the transistor off, so that no current will flow through it to the image intensifier and the image intensifier will be deactivated until the ambient light level falls below the predetermined light level.

4,853,530

REVERSE BIASED PHOTOSENSING SEMICONDUCTOR AND OP AMP ARRANGEMENT WHEREIN THE TWO LOAD RESISTORS OF THE OPERATIONAL AMPLIFIER UNBALANCE THE TWO TRANSISTORS

Kazuhiko Muto, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 102,264, Sep. 25, 1987, abandoned, which is a continuation of Ser. No. 848,972, Apr. 7, 1986, abandoned. This application Sep. 9, 1988, Ser. No. 243,250

Claims priority, application Japan, Apr. 11, 1985, 60-075272

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—214 A **3 Claims**



1. A photosensing semiconductor apparatus comprising an operational amplifier having a pair of differential input terminals, and a photodiode connected across said pair of differential input terminals of said operational amplifier and reverse biased by a voltage difference across said pair of differential input terminals;

said operational amplifier comprising:

a pair of transistor devices constituting a differential amplifier, and a pair of loads respectively connected to said pair of transistor devices, wherein

the resistance of said pair of loads are selected so as to unbalance said pair of transistor devices, so that the voltage difference across said pair of differential input terminals is produced by a bias current in said pair of transistor devices.

4,853,531

APPARATUS FOR CONTROLLNG THE OPENING AND/OR CLOSING OF HIGH-SPEED SHUTTER DOORS

Gabriel Rejc, Landshut, Fed. Rep. of Germany, assignor to Efaflex Transport und Lagertechnik GmbH, Bruckberg-Edlkofen, Fed. Rep. of Germany

Filed Feb. 9, 1987, Ser. No. 12,247

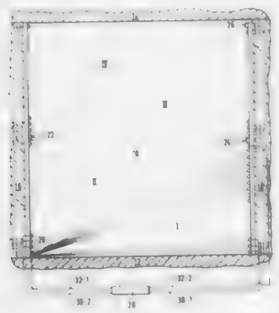
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1986, 3603940

Int. Cl.[4] G01V *9/04*

U.S. Cl. 250—221 **46 Claims**

1. A shutter door assembly comprising at least one high speed shutter door and an apparatus for controlling the opening and/or closing of the high speed shutter door, said apparatus comprising means for detecting the presence of an object in a space adjacent the door including a plurality of transmitters position on one side of said space, at least one receiver and a control circuit, said receiver being positioned on a side of said space opposite said transmitters to receive signals from said transmitters, said receiver and all transmitters being arranged to define a triangular area and being connected to said control circuit, said control circuit being operable to deliver signals to said transmitters in alteration where the signals are converted to radiant energy signals for transmission toward said receiver and, when received by said receiver, are delivered by said receiver to said control circuit, which is adapted to generate an evaluation signal, said alteration of transmitted signals being

controlled by a clock signal generated by a clock circuit in said control circuit, said control circuit including a frequency evaluating circuit to which said signals are delivered, and said evaluation circuit including a comparator circuit which compares the signals delivered by said receiver to said evaluating



circuit and the signals delivered to the transmitters relative to the frequency of said signals and which, in case of a deviation in frequency between a transmitted signal and a received signal, generates a switching signal for controlling movement of the high speed shutter door.

4,853,532

SPECULAR SURFACE INHIBIT

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 27, 1988, Ser. No. 199,636
Int. Cl.[4] G01V *9/04*
U.S. Cl. 250—221 **19 Claims**



1. In a proximity detecting system having a beam of energy transmitted to remote objects for reflection therefrom and energy detecting means positioned to receive reflected energy so as to produce an output of magnitude dependent on the amount of energy received thereby, apparatus for determining when reflected energy is received from a highly specular object, comprising:

first means connected to receive the output and to produce a resultant signal as a function thereof, the resultant signal having a value greater than a predetermined value when a specular surface is encountered; and

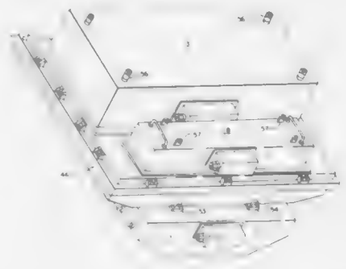
second means connected to receive the resultant signal and to produce an inhibit signal when the resultant signal exceeds the predetermined value.

4,853,533

DEFECT DETECTION SYSTEM WITH QUICK-RELEASE MODULES

James A. Little, Gazelle, Calif., and Dennis Cavin, Medford, Oreg., assignors to Simco-Ramic Corp., Medford, Oreg.

Division of Ser. No. 813,121, Dec. 24, 1985, Pat. No. 4,738,175.
This application Dec. 10, 1987, Ser. No. 131,179
Int. Cl.[4] G01N *9/04*
U.S. Cl. 250—223 R **7 Claims**



1. A defect detection system for sensing defects in discrete pieces of similar product being carried on a conveyor belt, comprising:

a mounting base supported over said conveyor belt and removably carrying the following:

a light module underslung from said base for illuminating said product;

a vision module placed on said base with camera means for sensing reflections of said illumination by said product to thereby sense said defect;

a power module placed on said base for supplying power to said vision module; and

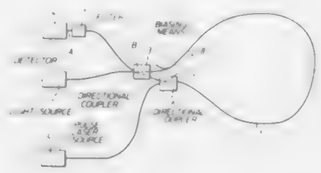
quick, release means connected individually to each of said modules for respectively connecting said modules to said base and for allowing easy removal of a said module.

4,853,534

OPTICAL FIBER SENSING SYSTEM

John P. Dakin, Hampshire, England, assignor to Plessey Overseas Limited, Illford, England

Filed Mar. 11, 1988, Ser. No. 166,932
Claims priority, application United Kingdom, Mar. 11, 1987, 8705771
Int. Cl.[4] G01B *9/02*
U.S. Cl. 250—227 **7 Claims**



1. An optical fibre sensing system for monitoring and/or measuring temperatures or pressures distributed over a predetermined path, in which the pre-determined path comprises an optical fibre defining a sensing loop, in which means are provided for applying continuous wave light to the sensing loop so that the light propagates simultaneously in opposite directions around said loop with the resultant light output from the loop being detected by detector means, in which pulse generating means is provided for generating short light pulses which propagate in one direction only around the sensing loop and by so doing produce transient variations in the propogation constant along the looped optical fibre in dependence upon the distributed temperature or pressure around the loop and in which the detector means detects the phase changes occurring in the continuous wave light received from the sensing loop due to variations in temperature or pressure around the loop.

4,853,535

LIGHT BEAM SCANNING DEVICE GENERATING A STABLE SYNCHRONIZING SIGNAL

Atsushi Suganuma, Minamiashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 14, 1988, Ser. No. 143,876
Claims priority, application Japan, Jan. 14, 1987, 62-7059; Apr. 17, 1987, 62-94817
Int. Cl.[4] H01J *5/16, 40/14*
U.S. Cl. 250—235 **5 Claims**



1. A light beam scanning device comprising:

means for generating a light beam;

a reference grid plate;

an $f\theta$ lens;

a resonant light deflector for detecting said light beam to cause the light beam to scan said reference grid plate through said $f\theta$ lens for thereby enabling said reference grid plate to produce a pulse signal;

a PLL circuit for generating a synchronizing signal from said pulse signal to read or record image information; and

said reference grid plate having slits defined at intervals, the slit intervals in that area of said reference grid plate which produces a pulse signal that is not directly contributed to the recording or reading of the image information being progressively smaller toward an end of said reference grid plate according to the scanning speed of the light beam.

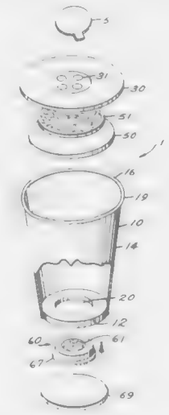
4,853,536

IONIZATION CHAMBER FOR MONITORING RADIOACTIVE GAS

John C. Dempsey, Salamanca, and Payasada Kotrappa, Olean, both of N.Y., assignors to Rad Elec Inc., Frederick, Md.

Filed Dec. 1, 1986, Ser. No. 936,240
Int. Cl.[4] G01T *1/02*
U.S. Cl. 250—253 **37 Claims**

1. A radioactive gas monitoring apparatus comprising a container, openings in the container for allowing gases to enter the container, a filter over the openings to exclude entry of radioactive progeny attached to particles, said container having an inner surface which is electrically conductive, an electret positioned within the container for holding an electrostatic charge which collects ions and other charged substances formed in the container by radioactive decay of the radioactive gases and their progeny, a removable means connected to the container for mounting the electret, and means for reducing



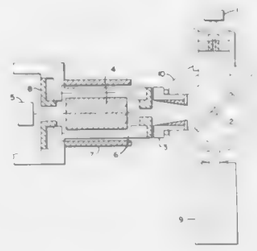
the volume of gas exposed to the electret when the chamber is not in use.

4,853,537

MEASUREMENT OF THE EFFECTIVE PHOTO-ELECTRIC ABSORPTION CROSS SECTION OF ROCK SAMPLES

George N. Salaita, Anaheim, Calif.; Carol A. Quarles, Fort Worth, Tex., and Joseph C. Altman, Mountain View, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sep. 1, 1987, Ser. No. 92,091
Int. Cl.[4] G01V *5/00*
U.S. Cl. 250—253 **8 Claims**



7. A method of determining effective photo-electric absorption cross section (PEF) of rock samples comprising the steps of:

(a) producing a photon beam;

(b) reflecting said photon beam on a target into a sample chamber;

(c) measuring an energy of said photon beam;

(d) determining a number of photons produced at said energy with said photon beam;

(e) placing a sample of known composition in said sample chamber;

(f) determining a number of photons passing through said sample;

(g) calculating a theoretical PEF for said sample of known composition;

(h) calculating a measured PEF for said sample of known

composition from measured absorption cross section based on said total electron charge, said number of photons produced, and said number of photons passing through said sample;

(i) determining a PEF correction factor from the theoretical PEF and calculated PEF;

(j) repeating step (e) and (f) for a rock sample of unknown composition;

(k) determining a number of photons passing through said rock sample of unknown composition; and

(l) determining PEF for said rock sample of unknown composition based on said PEF correction factor, said number of photons passing through said rock sample of unknown composition, said total electron charge and said number of photons produced.

4,853,538

RADIATION DETECTOR ARRANGEMENTS AND METHODS

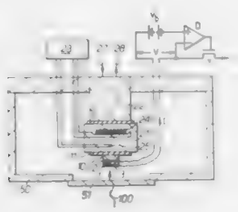
John Jackson, Lindfield, England, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jul. 26, 1988, Ser. No. 224,108

Claims priority, application United Kingdom, Jul. 31, 1987, [illegible]

Int. Cl.[4] H01L *27/18, 39/00*

U.S. Cl. 250—336.2 **11 Claims**



1. A radiation detector arrangement comprising at least one detector element in the form of a temperature-sensitive resistor whose electrical resistance changes in response to radiation incident on the detector element, the resistor having a high positive temperature coefficient of electrical resistance at a transition in its electrical conductance, circuit means for applying a voltage across the resistor during operation of the detector arrangement, and temperature-regulation means for regulating the temperature of the resistor so as to operate the resistor in said transition, characterised in that the temperature-regulation means comprises the resistor and the circuit means which passes sufficient current through the resistor by resistance heating to a position in said transition at which a further increase in its temperature in response to incident radiation reduces the resistance heating by reducing the current, thereby stabilizing the temperature of the resistor at said position, the positive temperature coefficient at said position being sufficiently high that the change in the resistance heating produced by a change in the temperature of the resistor at said position is larger than a change in power of the incident radiation required to produce that same change in temperature of the resistor in the absence of any change in resistance heating.

4,853,539

GLOW DISCHARGE MASS SPECTROMETER

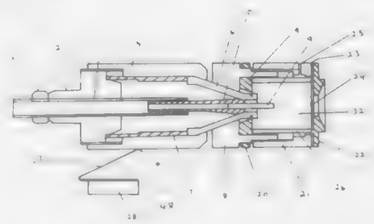
David J. Hall, Middlewich; Neil E. Sanderson, Sandiway, and Edward F. H. Hall, Winsford, all of England, assignors to VG Instruments Group Limited, Crawley, England

Filed Jun. 8, 1987, Ser. No. 59,050

Claims priority, application United Kingdom, Jun. 11, 1986, 8614177

Int. Cl.[4] H01J *47/00*

U.S. Cl. 250—288 **13 Claims**



1. In a glow discharge mass spectrometer for the elemental analysis of a sample, the spectrometer having a vacuum envelope, an improved ion source operatively associated with said envelope comprising:

(a) means defining a substantially closed chamber bounded by a wall which is separate from the spectrometer envelope, said chamber having an inlet through which a gas may be introduced at a pressure greater than that established in the spectrometer envelope and an aperture through which ions formed within said chamber may exit into the spectrometer envelope;

(b) means for introducing a solid sample into said chamber

(c) first electrode means disposed in said chamber remote from the sample;

(d) means for establishing a glow discharge in said chamber between said first electrode means and the sample, the sample at least in part comprising a second electrode means;

(e) means for extracting from said chamber via said aperture for subsequent mass analysis at least some of the ions formed in said glow discharge which are characteristic of elements in the sample; and

(f) means for maintaining at least part of said chamber wall and/or the sample at a temperature below the freezing point of water.

4,853,540

APPARATUS FOR RECORDING A RADIATION IMAGE OF AN OBJECT ON A STIMULABLE PHOSPHOR SHEET TO FACILITATE LATER RECONSTRUCTION OF AN ARBITRARY TOMOGRAPHIC IMAGE OF THE OBJECT

Nobuyoshi Nakajima, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 5, 1986, Ser. No. 870,952

Claims priority, application Japan, Jun. 5, 1985, 60-121656

The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.

Int. Cl.[4] G01T *23/04*

U.S. Cl. 250—327.2 **4 Claims**

1. A radiation image recording apparatus comprising:

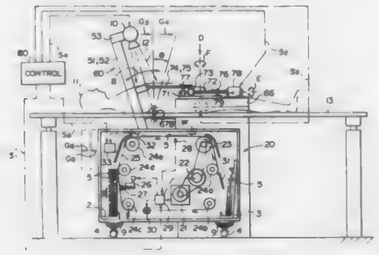
(i) a radiation source for emitting a radiation to an object,

(ii) a radiation source movement means for moving said radiation source from a first position to a second position to change an irradiation angle of said radiation with respect to said object,

(iii) a sheet changer for feeding a stimulable phosphor sheet to an image recording position exposed to said radiation passing through said object to have a radiation image of said object stored on said stimulable phosphor sheet at said image recording position, and thereafter receiving a drive signal to remove said stimulable phosphor sheet from said image recording position and feed a next stimulable phosphor sheet to said image recording position,

(iv) a sheet changer movement means for moving the entire sheet changer from a first position to a second position where the first positions of the radiation source and the sheet changer and the second positions of the radiation source and the sheet changer are so associated with each other that the stimulable phosphor sheet at said image recording position and said radiation source at both said first and second positions of the radiation source and the sheet changer approximately satisfy the linear rule and the geometric rule with respect to a point within said object or in the vicinity thereof,

(v) a controller for controlling operations of said sheet changer movement means and said radiation source movement means, intermittently activating said radiation



source at each of said first and second positions of the radiation source and the sheet changer so that said radiation is emitted at a plurality of positions where said irradiation angles are different, and sending said drive signal to said sheet changer each time after said radiation source is activated, and

(vi) a memory means for storing identification information on the stimulable phosphor sheet placed at said image recording position and information on said irradiation angle of said radiation emitted to said stimulable phosphor sheet so that said identification information and said information on said irradiation angle correspond to each other,

wherein said radiation source and said sheet changer are connected to each other, and said radiation source movement means and said sheet changer movement means are constituted by a unitary movement means for moving said radiation source and said sheet changer relative to each other from their respective first positions to their respective second positions.

4,853,541

DEVICE FOR DETECTING THE SPATIAL ORIENTATION OF EXCESSIVELY HEATED POINTS

Jens Dührkoop, Heidelberg, Fed. Rep. of Germany, assignor to Voest-Alpine AG, Linz, Austria

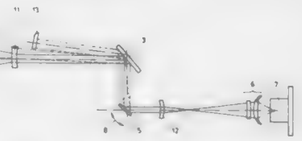
Filed Oct. 16, 1987, Ser. No. 109,798

Claims priority, application Austria, Oct. 17, 1986, 2773/86

Int. Cl.[4] G01J *5/54*

U.S. Cl. 250—347 **10 Claims**

1. A device for detecting the spatial orientation of excessively heated points of wheel bearings and/or wheel running treads of rail vehicles comprising deflecting means, said deflecting means receiving radiation from said wheel bearings and/or wheel running treads, said deflecting means being periodically changeable in its slope and being arranged in a path of rays from a measuring point to a heat radiation sensor (7), characterized in that an autocollimation mirror element (10), (13), (19) is provided, the mirror surface of which faces the path of rays coming from the heat radiation sensor (7), and, in at least one periodically recurring position of the periodically changeable deflecting means, the rays arriving from the heat radiation sensor (7) are reflected back into said heat radiation sensor (7).



4,853,542

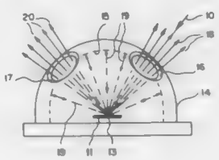
COLLECTING HEMISPHERICAL ATTACHMENT FOR SPECTROPHOTOMETRY

Milan Milosevic, Fishkill, N.Y., and Nicolas J. Harrick, Croton Dam Rd., Ossining, N.Y. 10562, assignors to Nicolas J. Harrick, Ossining, N.Y.

Filed Jun. 8, 1987, Ser. No. 59,323

Int. Cl.[4] G01J *3/44*

U.S. Cl. 250—353 **9 Claims**



1. A method for improving the spectroanalysis of a sample of a material by diffuse reflectance spectrometry in a spectrometer providing a sampling compartment in the optical path of a radiation beam to a detector, comprising the steps:

a. supporting the sample in a fixed position within the sampling compartment,

b. redirecting the radiation beam so it is incident upon a surface of the sample at an angle between 20 and 70 degrees,

c. providing a hollow body having an interior hemispherical reflecting surface and windows for entrance of a radiation beam and for allowing radiation to exit,

d. surrounding the sample with the hemispherical reflecting surface in such a manner that the redirected incident beam will pass through the entrance window and impinge upon the sample and such that the center of curvature of the hemisphere substantially coincides with the impingement area on the sample of the incident beam,

e. redirecting radiation exiting through the exit window of the hollow body toward the detector, and

f. detecting the redirected radiation exiting from the body and using the detected radiation to determine a characteristic of the sample,

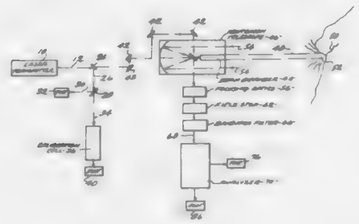
g. said entrance and exit windows being spaced from one another, and the exit window being located in a position to allow predominantly diffusely reflected radiation from the sample to exit through it.

4,853,543

METHOD AND APPARATUS FOR DETECTING A TRACER GAS USING A SINGLE LASER BEAM

Phillip Ozdemir, P.O. Box 69, Plainfield, N.J. 07060

Continuation-in-part of Ser. No. 531,729, Sep. 13, 1983, abandoned. This application Apr. 29, 1987, Ser. No. 43,962
Int. Cl.[4] G01N *21/33*
U.S. Cl. 250—372 35 Claims



1. A method of detecting a target gas having a predetermined atomic absorption line, comprising the steps of:

generating a beam of laser radiation having a spectral bandwidth including, while being broader than, said predetermined atomic absorption line of said target gas;

transmitting said beam of laser radiation toward an area to be investigated for said target gas;

splitting the beam reflected from said area into first and second portions, said first portion including the radiation in said reflected beam in the spectral region coinciding with said predetermined atomic absorption line as an on-resonance beam, and said second portion including only the radiation in said reflected beam in the spectral region outside of said spectral region coinciding with said predetermined atomic absorption line as an off-resonance beam;

measuring the intensities of said on-resonance beam and said off-resonance beam and producing an on-resonance energy signal and an off-resonance energy signal, respectively related thereto; and

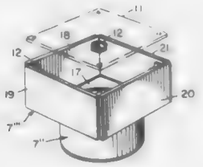
determining the absolute concentration of the target gas in said area from the measured intensities.

4,853,544

HEAT-RESISTANT CASE FOR AN IONIZATION-TYPE SMOKE DETECTOR AND METHOD OF MAKING THE SAME

Katsumasa Inamura, c/o Nohmi Bosai Kogyo Kabushiki Kaisha, 7-3, Kudan Minami 4-chome, Chivoda-ku, Tokyo 102, Japan

Continuation-in-part of Ser. No. 732,831, Apr. 19, 1985, abandoned. This application Apr. 19, 1988, Ser. No. 183,650
Claims priority, application Japan, Sep. 5, 1983, 58-136611
Int. Cl.[4] G01T *1/185*
U.S. Cl. 250—385.1 6 Claims



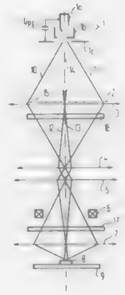
5. A heat resistant case for an ionization-type smoke detector, said case being formed of metal and comprising an outer electrode (7), and a cover plate (11); said case containing inner and outer ionization chambers (8,9), an inner electrode (4), an intermediate electrode (6), and an insulating base board (1) supporting said inner and intermediate electrodes within said outer electrode (7); wherein the improvement comprises said outer electrode having a cylindrical portion (7′), a planar stepped portion (7′) integral with said cylindrical portion and extending from one end of said cylindrical portion along a plane generally normal to the axis of said cylindrical portion, said planar stepped portion (7′) having four straight outer borders of generally rectangular outline, and a rectangular quadratic prism portion (7″) integral with said planar stepped portion (7′) and comprising four planar extensions (7‴*a* to 7‴*d*) from said borders, each extension being bent at generally right angles with respect to said planar stepped portion (7′) and extending in a direction away from said cylindrical portion (7″), said extensions (7‴*a* to 7‴*d*) having adjacent edges meeting at the corners of said quadratic prism portion, and stud means (12) joining said adjacent edges.

4,853,545

PARTICLE BEAM APPARATUS FOR LOW-ERROR IMAGING OF LINE-SHAPED SUBJECTS

Harald Rose, Darmstadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 25, 1987, Ser. No. 66,212
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 8634545[U]
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—396 R 14 Claims



1. In a particle beam apparatus comprising a particle beam source with a beam path, a condensor lens, a line-shaped subject and an imaging lens being arranged in the beam path, said imaging lens imaging the line-shaped subject onto an image surface, the improvements comprising a first multi-pole optics being positioned in the beam path after the line-shaped subject, a second multi-pole optics being arranged in the beam path immediately before said imaging lens, and said condensor lens being positioned between said first multi-pole optics and said second multi-pole optics.

4,853,546

AUTOMATIC RADIOISOTOPE FILLING APPARATUS

Shuzo Abe, Higashi-Kurume; Satoshi Matsunami; Sunao Nagamatsu, both of Tokyo; Masaaki Tanaka, and Masao Matsuno, both of Ube, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Sep. 16, 1987, Ser. No. 97,025
Claims priority, application Japan, Sep. 16, 1986, 61-217656; Nov. 12, 1986, 61-269365
Int. Cl.[4] G01T *1/16*
U.S. Cl. 250—432 PD 11 Claims

1. An automatic radioisotope filling apparatus which comprises:

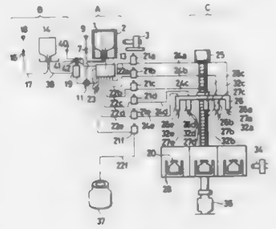
a radioisotope vial containing a radioisotope solution,

a saline vial containing a physiological saline solution,

a plurality of label vials containing a drug into which a predetermined amount of the radioisotope solution or the physiological saline solution is to be provided from the radioisotope vial and the saline vial,

a container for said plurality of label vials,

conduit means for selectively transferring the radioisotope solution and the physiological saline solution from the radioisotope vial and the saline vial to each of the pluraltiy of label vials, and



means for selectively and automatically controlling the flow of said radioisotope solution and the physiological saline solution through said conduit means,

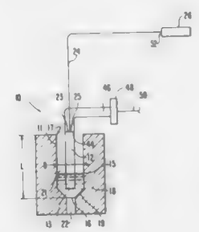
whereby a required amount of the radioisotope solution and the physiological saline solution for each of the label vials may be automatically withdrawn from the radioisotope vial and the saline vial and provided to each of the label vials.

4,853,547

SYSTEM FOR RADIATION DETECTION USING A GRADED INDEX OPTIC ELEMENT

David Bach, Westborough, Mass., assignor to Amoco Corporation, Chicago, Ill.

Filed Aug. 17, 1987, Ser. No. 85,711
Int. Cl.[4] G01J *1/58;* G01N *21/69*
U.S. Cl. 250—458.1 22 Claims



1. An apparatus for delivering excitation radiation to a sample and collecting radiation emanating from the sample, the sample being disposed in a deep well having an open top end and having a wall and a bottom end closed by a membrane to define a sample receptacle, comprising:

lens means having first surface and an opposing second surface, said lens means being dimensioned for inserting the second surface into the deep well, said lens means being a graded index type lens that is capable of converting radiation from a point source incident on the first surface to a beam of radiation emanating from the second surface with a desired focus, and operative simultaneously to direct radiation incident on said second surface to said first surface;

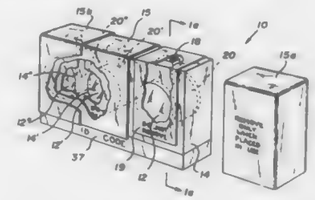
collection means disposed substantially adjacent to said first surface for receiving radiation entering said lens means through said second surface and exiting from said lens means through said first surface.

4,853,548

ULTRASENSITIVE RADIATION DOSIMETER AND DOSIMETRY SYSTEM

Brian Stevens, 2602 Regal Oaks La., Lutz, Fla. 33549

Filed Nov. 13, 1987, Ser. No. 120,037
Int. Cl.[4] G01T *1/10*
U.S. Cl. 250—484.1 10 Claims



1. A process for determining the dosage of ionizing radiation received by a location over a period of time comprising the steps of:

(a) providing a sensing element containing an effective quantity of unexposed-to-ionizing radiation endoperoxide AO_2 in close association with dispersed heavy atoms, that is atoms of high atomic number which is equal to or greater than the atomic number of the element chlorine wherein A is a fluorescent aromatic hydrocarbon and which when exposed to ionizing radiation undergoes the transformation:

$$AO_2 + \text{ionizing radiation} = A + O_2$$

(b) exposing, over the period of time, aid sensing element and its effective quantity of AO_2 and its associated high atomic number atoms to any ionizing radiation presented to the location so that such transformation may occur while keepping said element effectively shielded from non-ionizing radiation;

(c) thereafter, exposing the sensing element to a predetermined quantity of light from the ultraviolet through visible light spectra and sensing the intensity, if any, of fluorescence produced by free A present in response to that exposure,

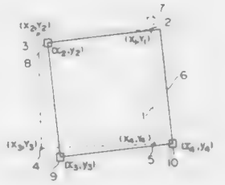
(d) correlating that fluorescence sensed with a measure of the exposure to ionizating radiation to compute the dosage of such ionizing radiation received by the location.

4,853,549

ELECTRON BEAM DRAWING METHOD

Akira Yanagisawa, Ome, and Kazunitsu Nakamura, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1988, Ser. No. 178,970
Claims priority, application Japan, Apr. 8, 1987, 62-84755
Int. Cl.[4] H01J *37/304*
U.S. Cl. 250—491.1 2 Claims



1. An electron beam drawing method whereby a surface of a semiconductor wafer is divided into a number of blocks, each

block is divided into a plurality of chips, four matching marks are formed in each of the blocks, a correction is made to an electron beam deflecting system on the basis of position information of detected matching marks, and the blocks are then drawn,

wherein the correction is performed on the basis of different correcting equations in correspondence to the number of said matching marks detected, and

wherein when the number of said matching marks detected is three, six correction coefficients are determined by a method of least squares on the basis of the coordinates of said three matching marks detected and thereafter, the correction is executed by using the following correcting equations:

$$\Delta X = AX + BY + D$$

$$\Delta = A'X + B'Y + D'$$

where, X and Y denote coordinates from the center of the block, ΔX and ΔY indicate correction amounts, and A, B, D, A', B' and D' represent correction coefficients and have the following meanings:

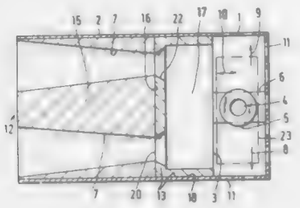
A : gain term in the X direction,
B : rotational term regarding a Y axis,
D : shift term in the X direction,
A': rotational term regarding an X axis,
B': gain term in the Y direction,
D': shift term in the Y direction.

4,853,550

DEVICE FOR IRRADIATING AN OBJECT WITH A TRANSPORTABLE SOURCE GENERATING THERMAL NEUTRONS

Wolfgang Schulz, Wunstorf, Fed. Rep. of Germany, assignor to Brown, Boveri Reaktor GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 26, 1986, Ser. No. 912,932
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1985, 3534686
Int. Cl.⁴ G21G *4/02*
U.S. Cl. 250—493.1 **5 Claims**



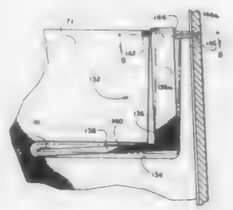
1. Device for irradiating an object, comprising a source mount, a source disposed on said source mount for generating thermal neutron rays, a moderator surrounding said source for primary moderation, a collimator having a ray inlet side with an inner surface and at least one funnel-shaped collimator duct for the neutron rays opening toward an object, a neutron-permeable wall disposed downstream of said moderator in neutron flow direction and separating said source mount from said ray inlet side of said collimator defining a space downstream of said wall between said wall and said ray inlet side with an inner peripheral surface of said space, and a plastic plating disposed on said inner peripheral surface of said space and on said inner surface of said ray inlet side for secondary moderation defining an opening of said at least one collimator duct free of said plastic plating.

4,853,551

SAFETY INTERLOCK FOR X-RAY PARTICLE SIZE ANALYZER

Jack J. Wagner, Dunwoody, and Samuel V. Tidwell, Norcross, both of Ga., assignors to Micromeritics Instrument Corporation, Norcross, Ga.

Filed Oct. 30, 1987, Ser. No. 115,499
Int. Cl.⁴ H05G *1/02*
U.S. Cl. 250—515.1 **3 Claims**



1. A safety interlock for a cabinet adjacent to an x-ray source and having a door for providing access to the interior of said cabinet, comprising:

a plate mounted for pivotal movement about an axis from a blocking position in which said plate prevents x-rays from entering said cabinet and a clear position in which said plate is out of the path of the x-rays;

an arm extending from a location on said plate to the opposite side of said axis from said x-ray source; and

cam means movable with said door and engaging said arm for moving said plate from said blocking position to said clear position responsive to closing of said door.

4,853,552

STEAM TURBINE CONTROL WITH MEGAWATT FEEDBACK

Jens Kure-Jensen, Schenectady; Bernd A. K. Westphal, Clifton Park, both of N.Y., and Thane M. Drummond, Roanoke, Va., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 30, 1988, Ser. No. 175,079
Int. Cl.⁴ F01D *17/04*
U.S. Cl. 290—40 C **4 Claims**



1. A control system for controlling a steam turbine-generator using megawatt feedback, comprising:

means for producing a load reference error;

control means responsive to said load reference error for controlling an amount of steam fed to said turbine;

means for producing a rate of change signal responsive to a rate of change of a steam pressure in said steam turbine-generator; and

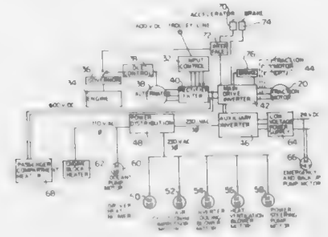
gain control means responsive to a value of said rate of change signal indicating a negative rate of change less than a predetermined value for reducing said load reference error, whereby a loading of said steam turbine-generator is rendered relatively unresponsive to steam-pressure reductions exceeding said predetermined value.

4,853,553

DUAL MODE DIESEL ELECTRIC POWER SYSTEM FOR VEHICLES

Alan P. Hosie, Box 32, Group 6, RR 1, St. Norbert, Manitoba, Canada

Filed Oct. 30, 1987, Ser. No. 115,840
Int. Cl.⁴ B60L *11/08*
U.S. Cl. 290—40 C **2 Claims**



1. A control system for controlling an electric generating apparatus including a combustion engine and an electricity generating means driven by the combustion engine, said control system comprising:

an engine governor means responsive to a control signal for controlling the operation of the engine;

a command signal generator generating a selectively variable command signal;

an engine power signal generating means for generating an engine power signal representing power available from the engine;

an electric power demand monitoring means generating a power demand signal representing the electric power being supplied by the electricity generating means to other equipment;

first comparing means for comparing the engine power signal and the command signal and producing an engine power deficiency signal representing the difference between engine power available and electric power required by the command signal;

second comparing means for combining the engine power deficiency signal with the power demand signal and generating a feedback signal;

selector means comparing the command signal and the feedback signal and passing whichever signal is the lowest to the engine governor means as the control signal.

4,853,554

STARTING DEVICE

Carl S. M. Hartwig, Täby, and Sven H. Johansson, Åmål, both of Sweden, assignors to Institut Cerac S.A., Ecublens, Switzerland

Filed Jan. 22, 1985, Ser. No. 693,107
Claims priority, application Switzerland, Jan. 26, 1984, 351/84
Int. Cl.⁴ F02N *11/04*
U.S. Cl. 290—46 **4 Claims**

1. A starting device for an automobile motor comprising a starting motor which is also operable as a generator having a rotor comprising the flywheel of the automobile motor, said flywheel mounted on the crankshaft of the automobile motor, a voltage supply having first and second terminals for said starting motor, a stator for said starting motor surrounding said rotor having a plurality of electrical conduits connected to said voltage supply characterized in that,

said starting motor is an asynchronous motor,

a metal bar extending along said stator connected to said first terminal of said voltage supply,

an inverter having a plurality of solid state switches arranged on said metal bar, and



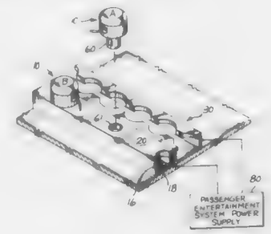
means for coupling each of said electrical conduits between a solid state switch and said second terminal of said voltage supply.

4,853,555

ELECTRICAL POWER TRANSFER SYSTEM FOR AIRCRAFT PASSENGER ENTERTAINMENT SYSTEM

Lawrence M. Wheat, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 21, 1988, Ser. No. 184,226
Int. Cl.⁴ H04B *5/00*
U.S. Cl. 307—9.1 **5 Claims**



1. An electrical power transfer system for an aircraft Passenger entertainment system comprising in combination:

an aircraft passenger seat track having a plurality of apertures distributed there along for insertion of passenger seat legs; said seat track having a rectangularly shaped cross section;

a plurality of passenger seat entertainment system power connectors;

a conductor rail assembly having a plurality of apertures distributed there along for receiving said plurality of passenger seat entertainment system power connectors, said conductor rail assembly having a rectangularly shaped cross section;

a passenger entertainment system power supply;

said conductor rail assembly having an enclosed conductive strip extending along the length thereof in electrically insulated relationship with respect to said seat track;

said passenger entertainment system power supply coupled between said conductive strip and said seat track; and,

said plurality of passenger seat entertainment system power connectors making electrical contact with said conductive strip.

4,853,556

ELECTRICAL DESIRED-VALUE TRANSMITTER, PARTICULARLY FOR AN ELECTRONIC GAS-PEDAL SYSTEM

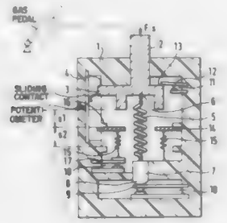
Manfred Pfalzgraf, Frankfurt am Main, and Heinz Ungermann, Linsengericht, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 3, 1987, Ser. No. 128,228

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641243

Int. Cl.[4] H01H *3/14*

U.S. Cl. 307—10.1 **7 Claims**



1. In an electrical desired-value transmitter, particularly for an electronic gas-pedal system including a gas pedal, the transmitter comprising

a return spring, and a force elastic jump spring with play arranged parallel to said jump spring;

an electrical path converter which is connected to said return spring;

a housing permitting displacement of said converter relative to said return spring and said jump spring, said converter being disconnected from said jump spring upon release of said pedal and coming into engagement with said jump spring upon displacement through a predetermined distance of said play, said converter being operatively connected to said gas pedal to provide displacement of said converter upon movement of said gas pedal, said converter generating a desired value signal in response to a position of the gas pedal; and

a safety switch contact having a contact spring, said safety switch being positioned by said housing for engagement with said return spring; and wherein

the return spring is mechanically connected to said contact spring of said safety switch contact for transmitting a force of the return spring against the contact spring.

4,853,557

AUTOMOTIVE ALTERNATOR POWER GENERATOR FOR WELDING OR USE OF POWER TOOLS

Werner A. Meier, P.O. Box 7086, East London 5200, and Stratford Voogt, 49 Pitout Street, Whitfield Boksburg, both of South Africa

Filed May 17, 1988, Ser. No. 194,925

Int. Cl.[4] H02J *7/16*

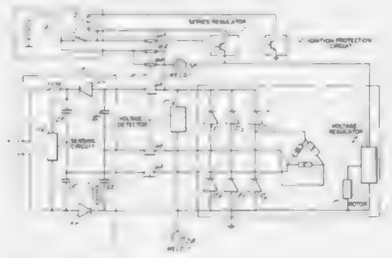
U.S. Cl. 307—10.1 **11 Claims**

1. An electrical power supply for use with a motor vehicle, said power supply being interconnected with the vehicle battery, delta connected alternatoi and voltage regulator, said power supply comprising:

voltage multiplier circuit means switchably connected to a rectified output voltage from the vehicle delta connected alternator for multiplying the rectified output voltage and having power output connector terminals for facilitating operation of a power appliance;

welding connection sockets connected to the vehicle alternator for facilitating a welding operation; and

switch means for selecting any one of a normal battery charging operation, the power appliance operation or the welding operation, said switch means connecting said voltage multiplier circuit means to said rectified output only when selecting the power appliance operation, said switch means providing said welding connection sockets



for the welding operation only when selecting the welding operation, and said switching means preventing the power appliance operation and welding operation from occurring when selecting the normal battery charging operation.

4,853,558

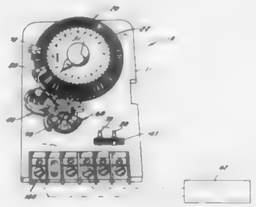
PROGRAMMABLE TIMER WITH SKIP CYCLE

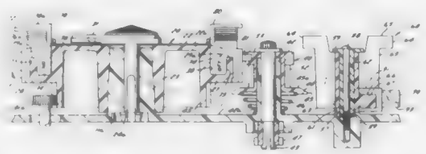
Edwin L. Skarivoda, Manitowoc, Wis., assignor to Paragon Electric Company, Inc., Two Rivers, Wis.

Filed Feb. 10, 1988, Ser. No. 154,841

Int. Cl.[4] H01H *7/08*

U.S. Cl. 307—141 **20 Claims**





1. A programmable timer device for the selective change of electrical state of a remote apparatus during a time cycle comprising:

(a) moving programmable cycle means for determining a cycle of operation of said timer device;

(b) selectively movable operative sequence means positioned at preselected positions on said cycle means for establishing an operative sequence within said cycle of operation;

(c) activator means, including a rotatable member moveable substantially along the axis of rotation between first and second axial positions, for changing the electrical state of said remote device in response to the movement of said cycle means when said rotatable member is in said first axial position; said activator means being in operative contact with said sequence means when said rotatable member is in said first axial position; and

(d) skip cycle means, being sequentially contacted by said sequence means when said skip cycle means and said sequence means are in a predetermined alignment, for moving said rotatable member to said second axial position, said activator means being out of operative contact with said sequence means when said rotatable member is in said second axial position whereby said remote apparatus remains in the same electrical state during a next operating cycle.

4,853,559

HIGH VOLTAGE AND POWER BICMOS DRIVING CIRCUIT

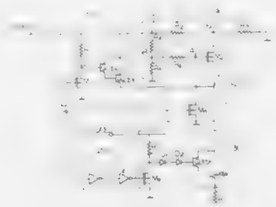
Sung-Ki Min, Inchon, and Jae S. Lee, Kyunggi, both of Rep. of Korea, assignors to Samsung Semiconductor and Telecommunications Co., Ltd., Gumi, Rep. of Korea

Filed Jan. 15, 1988, Ser. No. 144,933

Claims priority, application Rep. of Korea, Jan. 24, 1987, 87-579[U]

Int. Cl.[4] H03K *3/26, 3/01, 17/60*

U.S. Cl. 307—270 **3 Claims**



1. A high voltage and power driving circuit, comprising:

voltage-supply means for providing a supply voltage;

CMOS-level signal-input means for providing a CMOS-level input signal;

large-current driving means comprising at least one first Darlington pair of bipolar transistors for providing a large current at a voltage from the supply voltage and a first high voltage MOS transistor for controlling the first pair of bipolar transistors in response to the input signal;

delay means for receiving and delaying the input signal into a delayed input signal;

load driving means comprising at least one second Darlington pair of bipolar transistors for providing to a load from the large current a larger current and a second high voltage MOS transistor for controlling the second pair of bipolar transistors in response to the delayed input signal;

reference voltage means for providing a reference voltage from the supply voltage; and

reference voltage transport means comprising two high voltage MOS transistors responsive, respectively, to the input signal and reference voltage for controlling, together, the voltage of the large current to prevent breakdown of the first and second pairs of bipolar transistors.

4,853,560

LOGIC CIRCUIT AND SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE CAPABLE OF OPERATING BY DIFFERENT POWER SUPPLIES

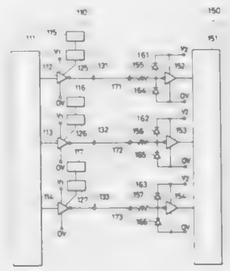
Masahiro Iwamura; Hideo Maejima, and Ikuro Masuda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

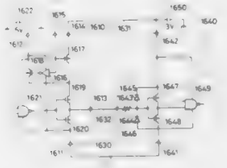
Filed Jan. 27, 1988, Ser. No. 149,187

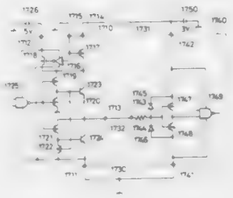
Claims priority, application Japan, Feb. 6, 1987, 62-24565

Int. Cl.[4] H03K *19/003, 17/10, 17/06, 3/013*

U.S. Cl. 307—296.1 **66 Claims**







1. A logic circuit comprising:

a selection signal generation circuit for generating a selection signal selecting one of a plurality of power supply potentials;

a power supply potential selection circuit for selecting one of said power supply potentials on the basis of said selection signal;

a first semiconductor switch circuit for forming a first current path from said selected power supply to an output terminal connected to a capacitance load in response to at least one input signal; and

a second semiconductor switch circuit for forming a second current path from said output terminal to a power supply potential, which is not said selected power supply potential, in response to at least one input signal,

said second semiconductor switch circuit being not turned ON simultaneously with said first semiconductor switch circuit under the steady state.

4,853,561

FAMILY OF NOISE-IMMUNE LOGIC GATES AND MEMORY CELLS

Roger J. Gravrok, Minneapolis, Minn., assignor to Regents of the University of Minnesota, St. Paul, Minn.

Filed Jun. 10, 1987, Ser. No. 60,318
Int. Cl.[4] H03K *17/16, 19/017;* H01L *29/80*
U.S. Cl. 307—443 49 Claims



1. A circuit for providing an output signal as a function of an input signal, the output signal switching between first and second logic states when the input signal reaches a logic-transition voltage range; the circuit comprising:

an input node at which the input signal is received;

driver means having first and second main current-carrying electrodes and a control electrode for controlling current between the first and second main current-carrying electrodes as a function of a signal received at the control electrode;

an output node, connected to the driver means, at which the output signal is supplied;

level-shifter means connected in a current path between the input node and the control electrode for permitting a voltage drop in the current path between the input node and the control electrode approximately independent of current; and

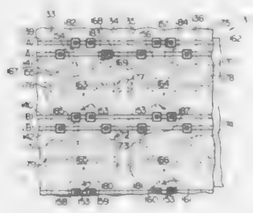
current-regulator means connected in the current path between the input node and the control electrode for regulating current in the current path between the input node and the control electrode approximately independent of voltage; wherein the level shifter means and the current-regulator means interact to provide first and second noise margins which are larger than the logic-transition voltage range.

4,853,562

PROGRAMMABLE LOGIC ARRAY USING SINGLE TRANSISTOR TO GENERATE TRUE OR COMPLEMENT SIGNAL

Shitaka Yamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 27, 1987, Ser. No. 112,925
Claims priority, application Japan, Oct. 27, 1986, 61-254984
Int. Cl.[4] H03K *19/177*
U.S. Cl. 307—465 1 Claim



1. A programmable logic array circuit fabricated on a semiconductor substrate comprising:

(a) plural pairs of true and complementary signal lines arranged in rows and extending over said semiconductor substrate, each pair of said true and complementary signal lines being adjacent to each other, said true signal lines and said complementary signal lines being electrically isolated from the semiconductor substrate by an insulating film;

(b) a plurality of product term lines arranged in columns and extending over said semiconductor substrate, said product term lines being formed in said insulating film so as to be electrically isolated from said semiconductor substrate, said true signal lines and said complementary signal lines;

(c) a first source of constant voltage supplying a first constant voltage level through load means to said product term lines;

(d) a second source of constant voltage producing a second constant voltage level different from said first constant voltage level;

(e) a plurality of active device areas each located under that area defined by one of said true signal lines, one of said complementary signal lines adjacent to aforesaid one of the true signal lines and adjacent two of said product term lines and having two field effect transistors one of which has source/drain regions provided between said second source of constant voltage and one of the adjacent two product term lines defining the active device area and the other of which has source/drain regions provided between the second source of constant voltage and the other of the adjacent two product term lines defining the active device area;

(f) a plurality of gate electrodes each forming a part of one of said field effect transistors and covered with said insulating film;

(g) a plurality of intermediate conductive layers formed in a lower portion of said insulating film and respectively connected to said gate electrode; and

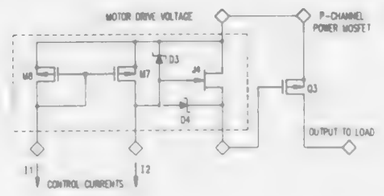
(h) a plurality of upper conductive layers formed in an upper portion of said insulating film and coupled between intermediate conductive layers selected from said intermediate conductive layers and either of said true signal line and said complementary signal line.

4,853,563

SWITCH INTERFACE CIRCUIT FOR POWER MOSFET GATE DRIVE CONTROL

Lorimer K. Hill, Cupertino; James A. Harnden, San Jose, and Barry J. Concklin, Sunnyvale, all of Calif., assignors to Siliconix Incorporated, Santa Clara, Calif.

Filed Apr. 10, 1987, Ser. No. 36,777
Int. Cl.[4] H03K *17/04, 17/687*
U.S. Cl. 307—475 27 Claims



1. A switch interface circuit for control of gate voltage on a power MOSFET having drain, source, and gate electrodes comprising:

a first depletion mode FET having drain, source, and gate electrodes;

a terminal connected to said gate electrode of said first depletion mode FET for receiving an input control current;

means for connecting said source electrode of said first depletion mode FET to said gate electrode of said power MOSFET;

means for limiting the source-to-gate voltage of said first depletion mode FET to a value greater than the pinch-off voltage of said first depletion mode FET and for conducting current while voltage limiting;

means for limiting the drain-to-gate voltage of said first depletion mode FET to a value greater than said source-to-gate voltage of said first depletion mode FET by an amount sufficient to provide a voltage to said gate electrode of said power MOSFET; and

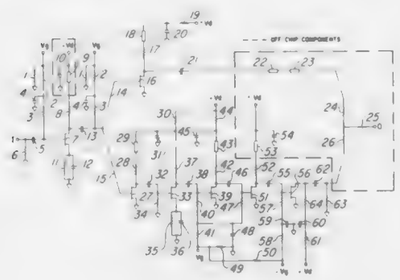
means for connecting said gate of said first depletion mode FET to said drain of said first depletion mode FET.

4,853,564

GAAS MONOLITHIC TRUE LOGARITHMIC AMPLIFIER

Mark A. Smith, Dallas, and Anthony M. Pavio, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 17, 1988, Ser. No. 194,798
Int. Cl.[4] G06G *7/24*
U.S. Cl. 307—492 26 Claims



1. A monolithic true logarithmic amplifier which comprises:

(a) a semiconductor chip including an input terminal and an output terminal;

(b) first and second parallel independent circuit paths coupled to said input terminal;

(c) said first circuit path including at least one serially connected amplifier and a delay circuit in series therewith;

(d) said second circuit path including m +2n serially connected amplifiers, where m is the number of amplifiers in said first circuit path and n is an integer greater than zero, the delay of said delay circuit being equal to the delay in said 2n amplifiers; and

(e) means coupled to said output terminal to combine the signals emanating from said first and second circuit paths.

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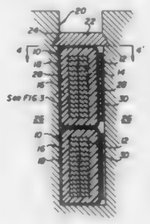
SEMI-CONDUCTING LAYER FOR INSULATED ELECTRICAL CONDUCTORS

Richard K. Elton, Altamont, and William R. Schultz, Jr., Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 23, 1984, Ser. No. 643,908
The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.
Int. Cl.[4] H02K *15/12*
U.S. Cl. 310—45 5 Claims

1. A layer covering insulated windings of an electrical machine, of the type having a slot along an axial length of said machine, comprising:

a semiconducting pyrolyzed glass fiber material having a resistivity in the range of 200 to 10,000,000 ohms per square being in intimate contact with insulation of the



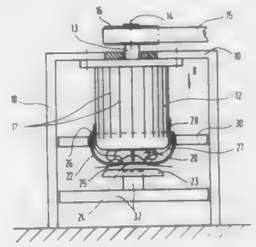
insulated windings along substantially said axial length of said machine.

4,853,566

APPARATUS FOR VENTILATING AN ELECTRIC MOTOR FOR TEXTILE SPINNING MILL MACHINES

Friedrich Dinkelmann, Rechberghausen, and Horst Wolf, Albershausen, both of Fed. Rep. of Germany, assignors to Zinser Textilemaschinen GmbH, Fed. Rep. of Germany

Filed Dec. 8, 1987, Ser. No. 130,087
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1986, 3642038
Int. Cl.[4] H02K *9/00*
U.S. Cl. 310—59 6 Claims



1. Apparatus for ventilating an electric motor, comprising a fan wheel operatively driven by said electric motor for producing a ventilating air flow, a cowling for substantially surrounding said fan wheel and said electric motor, said cowling having an air intake opening therein and said cowling being configured for defining a deflection pathway between said cowling and said electric motor for directing said ventilating air flow along the exterior of said electric motor, and support means for said cowling mounted exteriorly thereto outside said deflection pathway defined thereby without any support means for said cowling within said deflection pathway, to restrict accumulation of airborne lint and debris on said support means, said support means extending between said cowling and a machine frame.

4,853,567

DIRECT DRIVE MOTOR

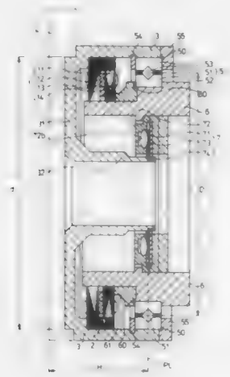
Yasuhiko Muramatsu; Susumu Ohta; Toshiyuki Takagi; Haruo Higuchi, and Mitsuhiro Nikaido, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Feb. 17, 1988, Ser. No. 156,780

Claims priority, application Japan, Mar. 2, 1987, 62-47156; Mar. 2, 1987, 62-47157; Mar. 2, 1987, 62-47158; Mar. 2, 1987, 62-47159; Mar. 2, 1987, 62-47160

Int. Cl.[4] H02K *7/00*

U.S. Cl. 310—67 R 4 Claims



1. A direct drive motor comprising

an inner stator having two pairs of magnetic substances, permanent magnets interposed therebetween and exciting coils;

a cylindrical housing to which said inner stator is fixed;

an outer rotor disposed outside said inner stator with a slight air gap formed therebetween;

a cylindrical rotor hub having its inside portion to which said outer rotor is fixed; and

a cross roller bearing, provided in an inner cylindrical portion of said rotor hub, for rotatably supporting said rotor hub,

said rotor hub being rotatably supported on said cross roller bearing within said inner cylindrical portion of said rotor hub on the basis of cantilever structure; said inner stator is fixed to said cylindrical housing, said bearing is fastened with a clamp ring between said rotor hub and said housing, wherein said clamp ring includes notches for absorbing forces acting on said clamp ring.

4,853,568

MINIATURE MOTOR

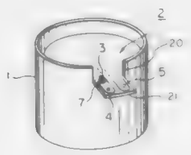
Hitoshi Fujiwara, Matsudo, Japan, assignor to Mabushi Motor Co., Ltd, Japan

Filed Jan. 29, 1988, Ser. No. 149,845

Claims priority, application Japan, Feb. 9, 1987, 62-17490[U]

Int. Cl.[4] H02K *11/00*

U.S. Cl. 310—68 C 4 Claims



1. A miniature motor assembly comprising a metallic case having a first end and a second end and having a notch portion extending from said first end a distance toward said second end; an electronic circuit for controlling a miniature motor positionable within said metallic case, said printed circuit board having a printed circuit board extension portion positionable in said notch portion and extending out of said metallic case when said printed circuit board is positioned within said metallic case; a lug portion protruding from an upper edge of said notch portion of said metallic case; and an engaging portion associated with said printed circuit board, said engaging portion for engaging said lug portion with an earth terminal, said earth terminal and said lug portion being electrically connected by means of solder when said printed circuit board is positioned in said metallic case at a predetermined distance from said first end of said metallic case so said lug portion protrudes from the bottom end of said notch portion of said metallic case and engages said engaging portion.

4,853,569

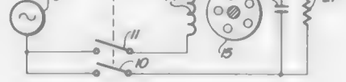
NOISE SUPPRESSION CIRCUIT FOR CAPACITOR MOTORS

Alexander J. Lewus, 9844 N. 11th Ave., Phoenix, Ariz. 85021

Filed Jun. 9, 1988, Ser. No. 204,344

Int. Cl.[4] H02K *11/00;* H02P *1/44*

U.S. Cl. 310—68 E 18 Claims



1. An alternating current motor having a stator core for operation from a source of alternating current power including in combination:

a rotor for said motor;

a first winding with first and second ends;

a second winding with first and second ends;

first capacitor means with first and second terminals, the second end of said first winding connected in series circuit with said first terminal of said first capacitor means;

energy dissipation means connected across the first and second terminals of said first capacitor means;

a source of alternating current power;

first switch means connected between said source of power and said series connected first winding and first capacitor means for supplying power thereto when said first switch means is closed;

second switch means connecting said source of power with said second winding means when said second switch means is closed, whereupon with said first and second switch means closed, said series connected first winding and first capacitor means are connected in parallel with said first and second terminals of said second winding across said source of alternating current power;

means for causing said first and second switch means to be opened together and to be closed together, whereupon said first and second switch means are interconnected in such a manner that with said first and second switch means opened, said first capacitor means is prevented from discharging into either of said first and second windings.

4,853,570

COAXIAL ENGINE STARTER WITH HOLLOW SHAFT CLUTCH

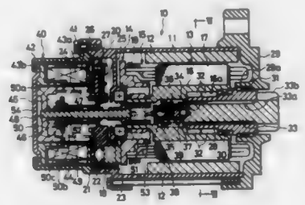
Shuzoo Isozumi, and Toshinori Tanaka, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 22, 1988, Ser. No. 146,924

Claims priority, application Japan, Jan. 23, 1987, 62-14354; Feb. 5, 1987, 62-26581

Int. Cl.[4] H02K *7/10*

U.S. Cl. 310—78 9 Claims



1. An engine starter, comprising:

electric motor means having a cylindrical yoke defining a flux path and an armature provided in said cylindrical yoke, said armature having a hollow rotary shaft therein;

rotary output shaft means for receiving a turning force, said rotary output shaft means being supported in said hollow rotary shaft and slidable in the axial direction thereof;

an overrunning clutch for applying the turning force to said rotary output shaft means form said hollow rotary shaft;

electromagnetic switch means for moving said rotary output shaft means, and for applying electricity to said electric motor means, said electromagnetic switch means being attached to one end of said electric motor means; and

a bracket secured to an end of said yoke opposite said electromagnetic switch means wherein said bracket comprises plastic which is molded integrally with said yoke.

4,853,571

INTERMEDIATE BEARING DRIVES FOR CLOTHES WASHING MACHINES

Dennis E. Smith; John J. A. Williams; Gerald D. Duncan; Graeme D. Thomas; John G. Borrows, and Frank W. Shacklock, all of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

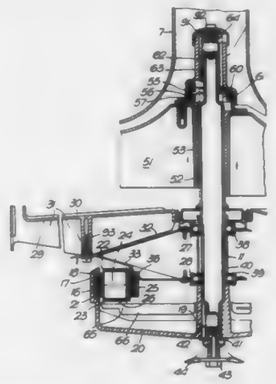
Division of Ser. No. 22,894, Mar. 6, 1987, Pat. No. 4,741,183. This application Feb. 9, 1988, Ser. No. 153,935

Claims priority, application New Zealand, Mar. 6, 1986, 215,389; Sep. 18, 1986, 217,623; Nov. 21, 1986, 218,356

Int. Cl.[4] H02K *5/16, 7/08;* F04B *17/00*

U.S. Cl. 310—90 1 Claim

1. A drive for a clothes washing machine of the type having a cabinet in which an agitator is mounted on a vertical shaft so as to rotate therewith and to be oscillated back and forth within a coaxially mounted perforated spin tub, the spin tube and the agitator being rotatable continuously in one direction for providing a spin action, and the perforated water tight container, said cabinet containing a salient pole electric motor and driving means for selectively oscillating said agitator back and forth or rotating said spin tub continuously in one direction, said electric motor having a stator carrying energizable windings on salient pole pieces stationary water tight container and supporting said stator, said shaft carrying said rotor at one end thereof and said agitator at another end thereof, said shaft being mounted on a motor rotor and said agitator.



4,853,572

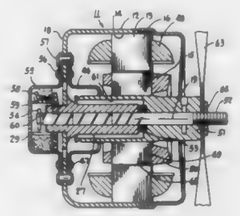
ELECTRIC MOTOR ASSEMBLY

Wayne J. Morrill, Kind & Hamsher Sts., Garrett, Ind. 46738

Continuation of Ser. No. 56,806, Jun. 2, 1987, abandoned, which is a division of Ser. No. 928,243, Nov. 7, 1986, Pat. No. 4,688,324. This application Jan. 16, 1988, Ser. No. 220,891

Int. Cl.[4] H02K *5/16*

U.S. Cl. 310—90 15 Claims



1. A frame assembly for a unit-bearing electric motor, comprising in combination:

a cup-shaped drawn steel frame having a base and an inside diameter adapted to receive a magnetically permeable stator with a bore;

said cup-shaped drawn steel frame having a longitudinal axis extending through said base;

a mounting area substantially coaxial on said base;

a surface defining a coaxial base aperture in said base mounting area;

an elongated metallic post having first and second ends and a central longitudinal journal bearing aperture therethrough;

an outer mounting surface on said post first end concentric with said journal bearing aperture and received in said coaxial base aperture;

shoulder means on said post adjacent to said first end outer mounting surface; and

means securing said post outer mounting surface in said coaxial base aperture at said shoulder means to have said post journal bearing aperture coaxial with the axis of said frame within 0.002 inch, whereby said post is adapted to journal a unit bearing shaft of a rotor the external diameter

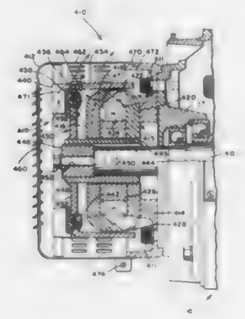
of which has an air gap concentric with the bore of the stator within 0.004 inch.

4,853,573

EDDY CURRENT BRAKE ASSEMBLY

John H. Wolcott, Bristol, and Herbert W. Weaman, Franksville, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 29, 1988, Ser. No. 226,001
Int. Cl.[4] H02K *49/04*; H02P *15/00*
U.S. Cl. 310—105 17 Claims



1. An eddy current brake for braking the rotation of a driven shaft rotated by an eddy current drive, said eddy current brake comprising:

(a) a rotatable inductor drum member connectable to the driven shaft for rotation therewith;

(b) said inductor drum member being a one-piece stamped member including a radially extending portion and an axially extending portion spaced apart from and disposed substantially parallel to the axis of rotation of the driven shaft;

(c) a non-rotatable pole means; and

(d) an adaptor plate adapted to be secured to the drive for rigidly supporting said pole means coaxial to the axis of rotation of the driven shaft;

(e) said pole means including a pair of pole members and a coil which when energized establishes a flux path which sequentially passes from said coil through one of said pole members, through said axially extending portion of said inductor drum member, through the other of said pole members and back to said coil to magnetically couple said rotatable inductor drum member and said rigidly supported pole means in order to brake rotation of said inductor drum member and said driven shaft of the drive which rotates with said inductor drum member.

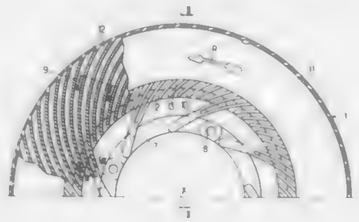
4,853,574

ARMATURE ROTORS OF ELECTROMAGNETIC RETARDERS

Michel Estaque, Taverny, France, assignor to Labavia S.G.E., Montigny Le Bretonneux, France

Filed Feb. 7, 1989, Ser. No. 307,544
Claims priority, application France, Feb. 23, 1988, 88 02125
Int. Cl.[4] H02K *49/04*
U.S. Cl. 310—105 10 Claims

1. Armature rotor for electromagnetic retarder, comprising at least one disc (2) extended axially on one of its faces by a plurality of fins (9) each fin being defined by two parallel or substantially parallel faces slanted at each of their points rearwards with respect to the corresponding radii by angles greater than 45° an curved so that their concavities are turned rearwards, the tips of the fins being connected together by an annular flange (11) and the assembly formed by the disc, the fins and the flange being made as a single moulded block from ferromagnetic material, characterized in that the fins (9) are particularly thin, numerous and so close together, the thickness of each fin being less than 5 mm and the width of the gap



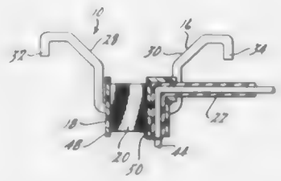
between two consecutive fins, in its narrowest zone, considered perpendicularly to the facing faces of the fins, being less than 10 mm.

4,853,575

TACHOMETER GENERATOR

William R. Lessig, III, Hunt Valley, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Aug. 31, 1984, Ser. No. 646,140
Int. Cl.[4] H02K *17/42*
U.S. Cl. 310—171 18 Claims



1. A tachometer generator for generating an electrical signal in response to a changing magnetic field comprising:

a core piece;

a nonconductive bobbin fitting around a portion of said core piece;

at least one lead wire molded within said bobbin, said lead wire having an end with an exposed electrical conductor extending from said bobbin, the embedded portion of said lead wire forming a relatively sharp bend within said bobbin, thereby firmly engaging said bobbin; and

a coil winding wrapped on said bobbin and having an end exterior to said bobbin directly attached to said exposed electrical conductor end.

4,853,576

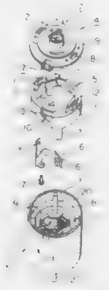
MINIATURE MOTOR

Etsuo Mayumi, and Kunio Hiromasa, both of Matsudo, Japan, assignors to Mabuchi Motor Co., Ltd., Japan

Filed Apr. 13, 1987, Ser. No. 37,737
Claims priority, application Japan, May 1, 1986, 61-66664[U]
Int. Cl.[4] H02K *13/00*
U.S. Cl. 310—239 5 Claims

1. A miniature motor comprising: a miniature motor housing with a substantially cylindrical housing wall defining a motor chamber, said miniature motor housing having an open end, said miniature motor housing having crimping portions formed in said cylindrical housing wall at spaced locations adjacent said miniature motor housing open end, each of said crimping portions including side portions disconnected from said miniature motor housing and each of said crimping portions including a base portion connected to said miniature motor housing; a permanent magnet positioned within said motor housing

motor chamber; a cover member for engagement with said miniature motor housing at said miniature motor housing open end, including a substantially annular insulating brush base member formed of synthetic resin having an outer circumferential surface of a predetermined width engaging with the miniature motor housing, said insulating brush base member including means to support a commutator brush, said insulating brush base member including recess portions formed in said outer circumferential surface, said insulating brush base member being positioned in said housing through said housing opening such that said recess portions are in alignment with



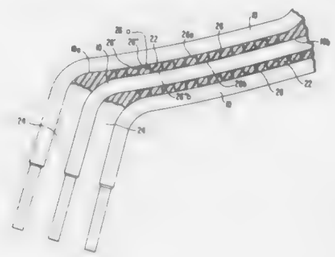
said crimping portions of said housing; and, a metallic member cover plate formed of metallic material engaging said miniature motor housing and said brush base insulating member to cover said brush base insulating member and to cover said miniature motor housing open end, said cover plate having a plurality of recesses corresponding in number and position to said brush base member recess portions in alignment with said crimping portions, said brush base insulating member and said cover plate being fixedly fitted to said housing by said crimping portions which extend into respective recesses, said recesses and crimping portions being in crimping engagement.

4,853,577

SEMI-RIGID SPACER FOR DIAMOND AREA OF DYNAMOELECTRIC MACHINE

Henry M. Holly, III, Winter Park, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 25, 1988, Ser. No. 160,472
Int. Cl.[4] H02K *3/50*
U.S. Cl. 340—260 15 Claims



1. A filler material for supporting the coil end portions at the diamond area of a stator of a dynamoelectric machine comprising:

a resin filler disposed in the vent areas defined between opposed sides of spaced coil end portions at the diamond area; and

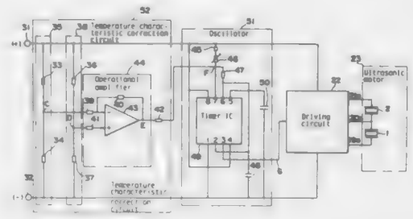
an elongated, transversely corrugated, longitudinally flexible, sheet-like spacer element disposed within said filler at each vent area and positioned to extend along the respective vent area with opposite faces thereof disposed in generally facing relationship to the sides of the coil end portions on either side of the vent area, said spacer element having a sufficient surface area in contact with the filler to retard sagging of the latter during installation and curing, and providing means for increasing the effective stiffness of the filler material and for decreasing the linear thermal coefficient of expansion thereof after curing to a level closer to that of the coil end portions.

4,853,578

DRIVING APPARATUS FOR ULTRASONIC MOTOR

Kenichiroh Takahashi, Katano; Noriyuki Harao, Ikoma, and Hiromi Tanoue, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 5, 1988, Ser. No. 141,036
Claims priority, application Japan, Jan. 8, 1987, 62-2365
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—315 3 Claims



1. A driving apparatus for an ultrasonic motor having piezoelectric elements, comprising:

an oscillator having an oscillation frequency, the oscillation frequency having a temperature characteristic;

a temperature characteristic correction circuit means, including a temperature sensing resistor, for (1) converting a change in resistance of the temperature sensing resistor to a change of voltage and (2) changing the oscillation frequency of the oscillator to correct the temperature characteristic of the oscillation frequency of said oscillator to be equal to the temperature characteristic of the resonance frequency of the piezoelectric elements; and

a driving circuit for issuing output power to drive said piezoelectric elements of said ultrasonic motor.

4,853,579

DRIVE METHOD FOR ULTRASONIC MOTOR PROVIDING ENHANCED STABILITY OF ROTATION

Osamu Kawasaki, Kyoto; Katsu Takeda, Osaka; Ritsuo Inabe, Osaka, and Tetsuji Fukada, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

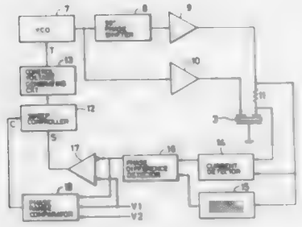
Filed Aug. 25, 1987, Ser. No. 89,334
Claims priority, application Japan, Aug. 26, 1986, 61-199630; Aug. 26, 1986, 61-199633; Aug. 26, 1986, 61-199634
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—116 9 Claims

1. A method of driving an ultrasonic motor comprising a vibration body formed of a piezoelectric body and an elastic body and a rotary body which is disposed in contact with said vibration body, the vibration body being driven to vibrate by an alternating drive voltage which is applied to said piezoelectric body for thereby rotating the rotary body by a frictional force, the method comprising successive steps of:

(a) sweeping a drive frequency of said vibration body downward from a high end of a predetermined frequency sweep range, said sweep range including at least a fre-

quency range extending between an antiresonance frequency of said vibration body and a highest resonance frequency of said vibration body with respect to a hysteresis loop exhibited by a resonance frequency characteristic of said vibration body;

(b) detecting when a predetermined operating parameter of said vibration body reaches a specific value thereof which corresponds to a value of said drive frequency that is higher than said highest resonance frequency and lower than said antiresonance frequency



(c) when said specific value is detected, halting said frequency sweeping to thereby fix the value of said drive frequency;

(d) monitoring said operating parameter to detect whether the value thereof subsequently deviates from said predetermined value by more than a predetermined permissible range of variation and;

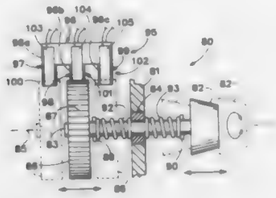
(e) if deviation of said operating parameter value outside said permissible range of variation is detected, successively repeating said steps (a) through (d).

4,851,288

PIEZOELECTRIC PULSE GENERATOR

Stanley J. Sula, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 5, 1988, Ser. No. 229,061
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—339 **14 Claims**



1. A pulse generator comprising:

a plurality of piezoelectric elements each having opposite sides and extending into a corresponding deflection zone, for producing a voltage between said opposite sides when deflected in a predetermined manner;

a pair of electrical terminals coupled to said opposite sides of each element for receiving a voltage produced by each said element;

a plurality of protrusions supported serially at spaced locations and disposed for rotation about an axis of rotation for deflecting each element when traveling through the corresponding deflection zone, said protrusions being positionable in a plurality of selected positions along said axis of rotation, said protrusions passing through a different selected one of said deflection zones when disposed in each selected position; and

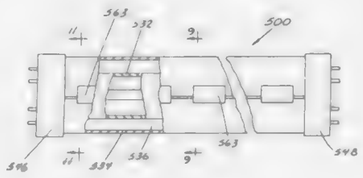
means for driving said protrusions sequentially relative to each element through the corresponding defection zone in a manner deflecting said piezoelectric film appropriately for producing a series of voltage pulses between said electrical terminals.

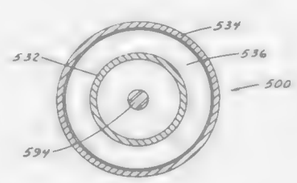
4,853,581

RADIATION-EMITTING DEVICES

Paul R. Goudy, Jr., Bayside, Wis., assignor to Photo Redux Corp., Milwaukee, Wis.

Division of Ser. No. 827,549, Feb. 10, 1986, Pat. No. 4,721,875.
This application Jan. 25, 1988, Ser. No. 147,882
Int. Cl.[4] H01J *61/30, 61/52*
U.S. Cl. 313—15 **13 Claims**





1. In a radiation-emitting device including an envelope for containing a radiation-emitting gas and an electron flow therein between electrodes, the improvement comprising:

a radiation-transmissive elongated inner tube forming an inner passageway for flow of fluid to be radiation-treated, said treated fluid being in contact with the inner tube;

an outer tube over the inner tube and separate therefrom, said inner and outer tubes forming therebetween an annular envelope volume containing said radiation-emitting gas in contact with the inner tube such that the inner tube is held under compression between said radiation-emitting gas and said treated fluid;

first and second end members secured at opposite ends of the inner and outer tubes, the end members having annular inward portions facing each other across said volume; and

first and second electrode means mounted along the inward portions of the first and second end members, respectively, whereby radiation may be directed efficiently at said treated fluid flowing through the inner tube.

4,853,581

SPARK PLUG FOR USE IN INTERNAL COMBUSTION ENGINE

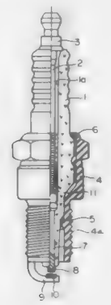
Yasuyuki Sato, Kasugai; Masaki Sugata, and Hiroyuki Murai, both of Aajo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 5, 1988, Ser. No. 177,651
Claims priority, application Japan, Apr. 6, 1987, 62-84087
Int. Cl.[4] H01T *13/39*
U.S. Cl. 313—141 **10 Claims**

1. A spark plug for use in internal combustion engines having a pair of electrodes between which electric spark discharge is effected, said spark plug comprising:

a spark discharge portion provided on at least one of said

electrodes and made of a base metal containing not less than 90 wt % of chromium (Cr),



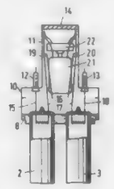
wherein the thickness of said discharge portion is not smaller than 0.3 mm.

4,853,583

LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP HAVING A LAMP CAP WITH WALLS FOR GUIDING ELECTRODE LEADS PAST STARTER MEANS DISPOSED THEREIN

Johannes A. M. Ridders, and Herman A. J. Reemers, both of Roosendaal, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 9, 1987, Ser. No. 130,756
Claims priority, application Netherlands, Dec. 9, 1986, 8603127
Int. Cl.[4] H01J *61/30, 61/36, 61/56*
U.S. Cl. 313—318 **9 Claims**



1. In a low pressure discharge lamp having a sealed discharge device defining a lamp axis with a pair of adjacent sealed ends, a discharge electrode disposed in each sealed end between which a discharge is maintained during lamp operation, a lamp base in which said sealed ends are secured for supporting said discharge device, starter means for starting the discharge device, and a shell connected to said lamp base in which said starter means is disposed, the improvement comprising:

each discharge electrode having a pair of electrode leads extending through a respective sealed end, the leads extending from said sealed ends furthest from each other defining an outer pair of electrode leads and the leads closest to each other defining an inner pair of electrode leads;

said shell being open at its end furthest from said discharge vessel and having a pair of openings at its end near said discharge vessel for receiving a respective inner electrode lead, and said shell having guide means for guiding each inner electrode lead around said starter means towards said open end;

said starter means having a pair of starter leads terminating near said open end, each of said inner electrode leads passing through a respective opening, around said starter means through said guide means, and connected to a respective starter lead near said shell open end; and

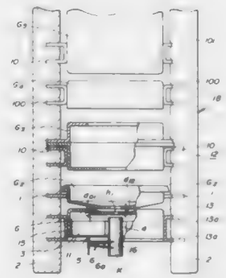
a pair of tubular current connection pins extending from said shell parallel to said lamp axis each having a bore for receiving a respective outer electrode lead, each current connection pin being aligned with a respective outer electrode lead and each outer electrode lead extending parallel to the lamp axis and being received in the bore of a respective current-connection pin.

4,853,584

CATHODE-GRID SUPPORT STRUCTURE FOR CRT ELECTRON GUN

Hirom Inoue, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 21, 1987, Ser. No. 88,155
Claims priority, application Japan, Aug. 21, 1986, 61-196013
Int. Cl.[4] H01J *29/04, 29/50, 29/82*
U.S. Cl. 313—417 **3 Claims**



1. An electron gun for a cathode ray tube comprising: a plurality of grid electrodes, each defining electron beam paths and having an extension extending substantially perpendicular to an axis of said electron gun, said grid electrodes being arranged so as to align said electron beam paths; a cathode first grid assembly for holding a cathode in alignment with an axis extending through said electron beam paths, and a first grid electrode having a plane through which an electron beam path is defined, said cathode and said first grid electrode of said assembly are oriented to have a predetermined clearance between a top of said cathode and said plane of said first grid electrode; a holder member formed separately from said cathode first grid assembly, said holder member being designed for fixedly mounting said cathode first grid assembly in assembled condition in such a position that said first grid electrode of said assembly is located at a position adjacent one of said grid electrodes with a predetermined distance defined therebetween; a glass bead receiving said extensions of said grid electrodes and said holder member for fixing the positional relationship between said grid electrodes and said holder member, wherein said first grid assembly is prepared as a pre-assembly in advance of being attached to said holder member which is held by said glass bead, and comprises a cathode for generating an electron beam, and a cathode base supporting said cathode with a mounting means, and a metal stay which is fixed to said cathode base, wherein said metal stay is rigidly fixed to said first grid electrode and wherein said holder member is of a generally hollow rectangular configuration having at least two opposite sides with extensions laterally extending from said two opposite sides.

4,853,585

DISPLAY DEVICE WITH MULTIPLICITY OF CLOSELY SPACED ELECTRON BEAMS

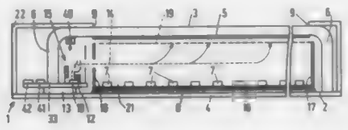
Arthur M. E. Hoeberechts, and Gerardus G. P. Van Gorkom, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 16, 1988, Ser. No. 156,491

Claims priority, application Netherlands, Feb. 27, 1987, 8700486

Int. Cl.[4] H01J 29/51, 29/62, 29/74

U.S. Cl. 313—422 11 Claims



1. A display device including an envelope having substantially flat front and rear walls, a luminescent screen on an inner surface of one of said walls and means for producing at least one electron beam directed to the screen, characterized in that said display device comprises:

a. an electron beam source comprising a multiplicity of semiconductor cathodes arranged for emitting respective electron beams in a first predetermined direction along paths lying in a first plane;

b. first deflection means for deflecting the emitted electron beams to respective paths in a second predetermined direction transverse to the first predetermined direction and lying in a second plane;

c. accelerating means for producing an acceleration field which accelerates the electron beams along their respective paths in the second predetermined direction, said field accelerating any positive ions occurring therein in a direction opposite to said second predetermined direction along respective paths which do not lead to said cathodes; and

d. second deflection means for deflecting the accelerated electron beams toward the screen.

4,853,586

VACUUM TUBE INCLUDING AN ELECTRON-OPTICAL SYSTEM

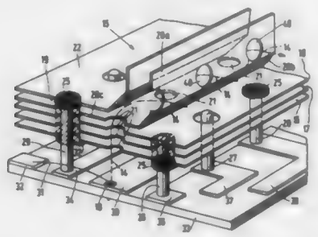
Petrus J. M. Peters, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 16, 1988, Ser. No. 156,376

Claims priority, application Netherlands, Feb. 27, 1987, 8700487

Int. Cl.[4] H01J 29/82

U.S. Cl. 313—422 8 Claims



1. In a vacuum tube provided with at least one semiconductor cathode supported on an insulating plate and having an emissive surface for emitting electrons and an electron-optical system for deflecting at least one electron beam emitted by the surface comprising a plurality of spaced apart grids of a conducting material, the improvement wherein the electron-optical system comprises a plurality of spaced apart, electrically conducting pins secured to said plate and at least one of the plurality of grids is connected in an electrically conducting manner to at least one of the pins and is connected in an electrically insulating manner to at least one other of the pins by means of a ceramic glass for the purpose of providing a mechanical connection.

4,853,587

FLAT CATHODE RAY DISPLAY TUBE WITH PERIODIC BEAM REFOCUSING MEANS

Daphne L. Lamport, Godstone, and Alfred W. Woodhead, Caterham, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1988, Ser. No. 158,524

Claims priority, application United Kingdom, Mar. 2, 1987, 8704809

Int. Cl.[4] H01J 29/62, 29/70

U.S. Cl. 313—422 13 Claims



1. A flat cathode ray display tube comprising an envelope including a substantially flat, transparent, faceplate carrying a phosphor screen, means for producing an electron beam and directing the beam parallel to the faceplate through a first region towards a reversing lens which turns the beam so that it travels in substantially the opposite direction parallel to the faceplate through a second region, first deflection means adjacent the output of the electron beam producing means for deflecting the beam substantially in a plane parallel to the faceplate and second deflection means in the second region for deflecting the electron beam towards the screen, characterised in that the tube includes an electron-optic lens system defining a beam control region located between the electron beam producing means and the reversing lens which operates to refocus the beam periodically in that region and to constrain the beam substantially in said plane despite a beam-deflecting affect of an external magnetic field in which the tube is disposed.

4,853,588

DEFLECTION YOKE APPARATUS WITH MEANS FOR REDUCING UNWANTED RADIATION

Shinji Ohtsu, Tokyo, and Haruyasu Yabushita, Kanagawa, both of Japan, assignors to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1987, Ser. No. 91,792

Claims priority, application Japan, Sep. 5, 1986, 61-209147; Oct. 17, 1986, 61-159332[U]; Mar. 27, 1987, 62-44261[U]

Int. Cl.[4] H01F 7/00; H01J 29/46

U.S. Cl. 313—440 10 Claims

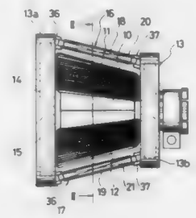
1. A deflection yoke apparatus, which is mounted on a neck of cathode-ray tube for projecting rasters on a screen by scanning at least one electron beam, said deflection yoke apparatus comprising:

a pair of horizontal deflection coils generating a magnetic field to deflect said electron beam in a horizontal direction;

a pair of vertical deflection coils generating a magnetic field to deflect said electron beam in a vertical direction;

a coil separator electrically insulating between both said vertical and horizontal deflection coils, said coil separator being provided with a front expanded part at a front end and a rear expanded part at a rear end;

an annular deflection core forming a magnetic path for a magnetic flux, generated when a deflection current is supplied to said horizontal and vertical deflection coils, a



deflection magnetic field, for deflecting said electron beam inside said annular deflection core, and an externally leaking magnetic field outside said annular deflection core;

an auxiliary coil means being arranged at least at one of two positions in said vertical direction outside said deflection core, said auxiliary core means for generating a magnetic field with a direction opposite to a direction of said externally leaking magnetic field when a horizontal deflection current is supplied to said auxiliary core means; and

an engaging means for fixing said auxiliary coil means to said coil separator.

4,853,589

ELECTRON BEAM DEVICE HAVING AN ELECTRON GUN AND A METHOD OF MAKING THE ELECTRON GUN

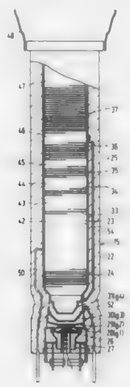
Gerardus A. H. M. Vrijssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1988, Ser. No. 168,849

Claims priority, application United Kingdom, Mar. 25, 1987, 8707169

Int. Cl.[4] H01J 9/28, 29/90

U.S. Cl. 313—477 R 33 Claims



18. An electron beam device comprising an envelope including a faceplate, a conical portion, and a neck portion said envelope containing an electron gun comprising:

a. a tubular housing consisting essentially of an electrical insulating material, said tubular housing having a longitudinal axis and including an inner surface and an outer surface;

b. a plurality of electrodes disposed along the inner surface of the tubular housing at respective axial positions; and

c. at least one conductor embedded in the tubular housing between said inner and outer surfaces and extending generally parallel to at least one of said surfaces over a substantial portion of the conductor's length, a terminal portion of said conductor extending inwardly through said inner surface and making electrical contact with one of the electrodes.

4,853,590

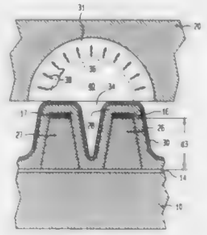
SUSPENDED-ELECTRODE PLASMA DISPLAY DEVICES

Nicholas C. Andreadakis, Readington Township, Hunterdon County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Aug. 1, 1988, Ser. No. 226,801

Int. Cl.[4] H01J 17/49

U.S. Cl. 313—485 14 Claims



1. A display device comprising:

a substrate including

a first set of spaced-apart longitudinally extending electrodes on the surface of said substrate,

spaced-apart longitudinally extending dielectric ridges overlying said electrodes and said substrate surface and disposed orthogonally with respect to said first set of electrodes to form longitudinally extending trenches between said ridges,

a second set of spaced-apart longitudinally extending electrodes each positioned on a different one of said ridges,

a dielectric layer overlying said substrate surface, said first and second set of electrodes and said ridges to only partially fill said trenches, said partially filled trenches providing distribution channels into which an ionizable gas may be introduced,

and a faceplate sealed to said substrate, said faceplate having spaced-apart phosphor regions respectively overlying intersections defined by said first and second sets of electrodes on said substrate.

4,853,591

MULTIPLE-TUBE COMPACT LOW-PRESSURE DISCHARGE FLUORESCENT LAMP

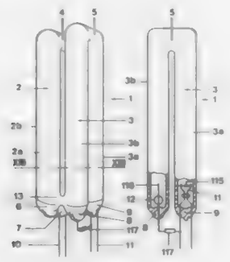
Lutz Klein; Ernst Panofski, both of Augsburg, and Roland Kastl, Unterhaching, all of Fed. Rep. of Germany, assignors to Patent Treuhand Gesellschaft fur elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 669,804, Nov. 9, 1984, abandoned. This application Dec. 29, 1987, Ser. No. 139,626

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 8333920; Dec. 8, 1987, 3741566

Int. Cl.[4] H01J *61/32, 61/54*

U.S. Cl. 313—493 26 Claims



1. Multi-tube compact low-pressure discharge fluorescent lamp having

a tubular glass discharge vessel (1) defining a continuous electrical discharge path,

said tubular glass discharge vessel having

a fluorescent coating applied to the inside of at least a major portion of the discharge vessel, a fill of mercury and at least one noble gas within the discharge vessel, and two filament-carrying electrodes (10, 11; E1, E2) sealed into end portions of the tubular discharge vessel, wherein

the discharge vessel comprises

a multi-unit sealed structure which includes

at least two discharge units (2, 3; 14, 15 16; 21, 22, 23; 27, 28, 29), each of which includes a unitary U-shaped glass tube having two longitudinal leg portions (*2a, 2b*; *3a, 3b*) extending parallel to each other, an integral cross-connecting portion (4, 5), and corner bend portions connecting the leg portions at the base of the U to the cross connecting portions,

wherein said corner bend portions define cold spots controlling the operating pressure of the fill of the discharge vessel, and

the leg portions of the U-shaped tube remote from said connections form free ends;

a pinch or press seal (6, 7, 8, 9) sealing each of said free end portions;

wherein said at least two discharge units are positioned relative to each other with the longitudinal leg portions extending parallel to each other;

one filament-carrying electrode is sealed into one of the pinch or press seals at one free end of one leg portion of one U-shaped tube of one discharge unit, and another filament-carrying electrode is sealed into another one of the pinch or press seals of a free end of one leg portion of another U-shaped tube of another discharge unit; and

wherein communicating means (12, 13) are provided forming an air-tight communicating connection between adjacent discharge units, and shaped differently from said cross connecting portions (4, 5) to form said continuous discharge path, located closely adjacent the pinch or press seals of adjacent leg portions of the U-shaped tubes of the respective units which do not have filament-carrying electrodes sealed therein, and extending laterally between said adjacent legs,

said communicating connection interconnecting the adjacent discharge units into a single unitary sealed structure forming the discharge vessel and defining the continuous discharge path entirely within said discharge units of said tubular glass discharge vessel.

4,853,592

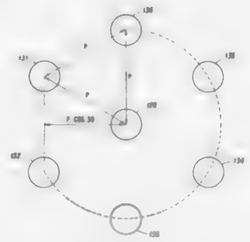
FLAT PANEL DISPLAY HAVING PIXEL SPACING AND LUMINANCE LEVELS PROVIDING HIGH RESOLUTION

Lyle R. Strathman, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 10, 1988, Ser. No. 166,144

Int. Cl.[4] H01J *1/54*; G09G *3/26*

U.S. Cl. 313—495 26 Claims



1. A flat panel matrix display having a plurality of selectably activated pixels comprising:

a selected inner pixel being fully activated at a predetermined luminance level;

a plurality of adjacent pixels surrounding said inner pixel substantially simultaneously activated at a predetermined luminance level less than said luminance level of said inner pixel.

4,853,593

LIGHT EMITTING DIODE (LED) DISPLAY

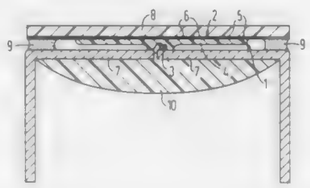
Karl-Ulrich Stein, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 8, 1987, Ser. No. 94,464

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633203

Int. Cl.[4] H01L *33/00*

U.S. Cl. 313—500 9 Claims



1. An LED display device comprising: a transparent, front panel having an exterior side and an inner side; a plurality of luminous segments each having a predetermined luminous area and located on the inner side of the transparent, front panel; each luminous segment having a corresponding LED chip; each LED chip being connected to its corresponding segment via a light guide structure; the light guide structure in the region of the corresponding LED chip being a quasi planar structure and extending away from its corresponding LED chip for distribution of light emitted by the corresponding LED chip over the predetermined luminous area; a reflector layer disposed between the inner side of the front panel and the light guide structure and occupying at least most of the luminous area of each luminous segment, the reflector layer having apertures or openings in a raster pattern forming a grid between the openings, a diffusor layer occupying each of the openings in the reflector layer and disposed between the inner side of the front panel and its respective luminous segment; and a conductor tape forming a lead frame to which each LED is glued.

4,853,594

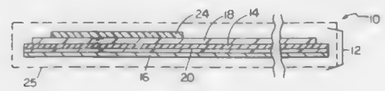
ELECTROLUMINESCENT LAMP

Alan C. Thomas, Woodstock, Conn., assignor to Rogers Corporation, Rogers, Conn.

Filed Aug. 10, 1988, Ser. No. 230,569

Int. Cl.[4] H05B *33/10, 33/26*

U.S. Cl. 313—503 10 Claims



1. In an electroluminescent lamp comprising a phosphor layer disposed between corresponding lamp electrodes that are adapted to apply an excitation potential to cause said phosphor layer to emit light, the front lamp electrode being light-transmissive to radiation from said phosphor layer,

the improvement wherein,

said front lamp electrode comprises a thin layer of light-transmissive binder containing a distribution of discrete gallium-doped zinc oxide particles.

4,853,595

PHOTOMULTIPLIER TUBE HAVING A TRANSMISSION STRIP LINE PHOTOCATHODE AND SYSTEM FOR USE THEREWITH

Robert R. Alfano, 3777 Independence Ave., Bronx, N.Y. 01463, and Ardie D. Walser, 1407 Linden Blvd. Apt. 13B, Brooklyn, N.Y. 11212

Filed Aug. 31, 1987, Ser. No. 91,123

Int. Cl.[4] H01J *43/02, 43/18, 43/28*

U.S. Cl. 313—532 18 Claims

1. A photomultiplier tube comprising a housing having therein:

a. a photocathode for receiving light and producing emission of electrons in proportion to the intensity of the light,

b. accellerating means for accellerating electrons received from the photocathode,

c. means connected to the photocathode for receiving a voltage signal, the voltage signal passing through the photocathode and negatively biasing the photocathode relative to the accellerating means so as to cause electrons emitted by the photocathode to be accellerated to the accellerating means,

d. electron multiplication means for performing electron multiplication on electrons received from the accellerating means,

e. anode means for producing an analog electrical signal output of electrons received from the electron multiplication means, and

f. means coupling the accellerating means, the electrons multiplication means and the anode means to a high voltage source for negatively biasing the accellerating means relative to the electron multiplication means and for negatively biasing the electron multiplication means relative to the anode means so as to cause electrons at the accellerating means to be moved to the electron multiplication means and then from the electron multiplication means to the anode means.

4,853,596

FLASH DISCHARGE LAMP WITH SINTERED CATHODE MEMBER

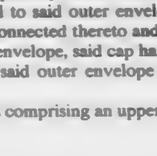
Michael Lausch, Taunustein, Fed. Rep. of Germany, assignor to Heimann GMBH, Fed. Rep. of Germany

Filed Feb. 4, 1988, Ser. No. 152,366

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1987, 8703095; Mar. 23, 1987, 8704316

Int. Cl.[4] H01J *61/06*

U.S. Cl. 313—632 1 Claim



1. A flash discharge lamp that contains anode and cathode electrodes mounted in a gas-filled, light-transmissive housing (1), whereby the cathode (2-7) is composed of a base member (2, 5) which has an extending projection (4, 6) and of a sintered member (3, 7) which is mounted on the base member and where said sintered member (3, 7) is provided with an opening into which said extending projection (4, 6) of said base member (2, 5) extends, characterized in that said sintered member (3, 7) is pressed onto said extending projection of said base member (2, 5) under high pressure and is then sintered which reduces its size thus causing a tight fit between the sintered member and the base member, and in that the volume of said sintered member (3, 7) is significantly smaller than the volume of said base member (2, 5).

4,853,597

RAPID RESTRIKE METAL HALIDE LAMP AND A METHOD OF OPERATING SUCH

Raymond A. Heindl, Euclid; Gilbert H. Reiling, Chardon, and Albert L. Suster, Chagrin Falls, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 47,082, May 5, 1987, Pat. No. 4,723,097. This application Oct. 30, 1987, Ser. No. 114,467

Int. Cl.[4] H01J *61/18, 61/36, 7/24*

U.S. Cl. 313—638 4 Claims

1. A rapid restrike metal halide lamp comprising:

(a) a light-transmissive outer envelope;

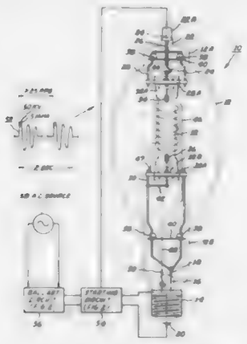
(b) a base attached to said outer envelope with a stem having an inlead appropriately connected to said base;

(c) a cap attached to said outer envelope having an inlead appropriately connected thereto and extending therefrom into said outer envelope, said cap having insulating means extending into said outer envelope and enclosing its inlead;

(d) support means comprising an upper and a lower member

for rigidly supporting and axially aligning an arc tube within said outer envelope, said lower member being electrically connected to said inlead of said stem;

(e) said arc tube containing a fill comprising an inert gas, mercury metal and a halide compound, said arc tube



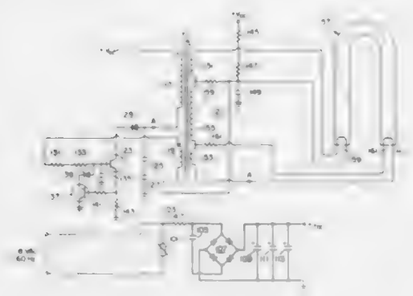
having a pair of thermionic electrodes sealed in opposite ends thereof, one of said electrodes being electrically connected to said lower support member and the other of said electrodes being electrically connected to said inlead of said cap and insulated from said upper support member.

4,853,598

FLUORESCENT LAMP CONTROLLING

Alexander Kusko, 161 Highland Ave., Needham Heights, Mass. 02194, and Noshirwan K. Medora, South Attleboro, Mass., assignors to Alexander Kusko, Weston, Mass.

Filed Oct. 13, 1987, Ser. No. 108,137
Int. Cl.[4] H05B *41/36*
U.S. Cl. 315—101 **5 Claims**



1. Apparatus for energizing a fluorescent lamp having two filament electrodes comprising,

a rectifier circuit responsive to an AC voltage for providing DC voltage,

a transformer having at least a primary winding and secondary winding means for providing transformed power to said lamp,

switching means for intermittently connecting said DC voltage to said primary winding to develop current pulses at an ultrasonic frequency,

said switching means comprising a power transistor for providing a voltage waveform at the primary winding having peaks during every cycle,

and a blocking diode for selectively isolating the primary winding form the power transistor,

means for coupling said secondary winding means to said filament electrodes to both heat said filament electrodes and establish a potential thereacross for initiating and maintaining an arc therebetween

said transformer including a feedback winding,

said power transistor including a base,

and a starting circuit having a resistor in series with a capacitor connected to said rectifier circuit and coupled through said feedback winding to said base to initially render said power transistor conductive,

wherein the switching means comprises,

a power MOSFET used as an on and off switch,

a CMOS oscillator circuit oscillating at said switching frequency for controlling the state of the power MOSFET,

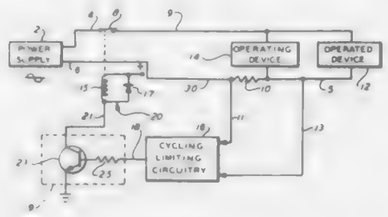
and a snubber circuit for limiting the peak voltage across the power MOSFET.

4,853,599

CYCLING LIMITING CIRCUITRY AND METHOD FOR ELECTRICAL APPARATUS

Santiago Singarayer, Southaven, Miss., assignor to FL Industries, Inc., Livingston, N.J.

Filed Feb. 11, 1988, Ser. No. 155,123
Int. Cl.[4] H05B *37/03*
U.S. Cl. 315—119 **18 Claims**



1. In electrical apparatus of the type including means operated by said apparatus, a source of electrical power, and operating means connected to the power source and operative for applying a voltage across the operated means, circuitry for limiting the cycling of the operated means, wherein said means is alternately on and off, by disconnecting the operating means from the power source to protect the operating means when a cycling limit is reached, comprising:

normally closed switching means connecting the operating means to the power source;

a resistor connected to the power source and to the operated means, whereby a voltage drop occurs across the resistor upon the operating means cycling;

means connected across the resistor and responsive to the number of times the operated means cycles and providing an output when said means cycles a predetermined number of times; and

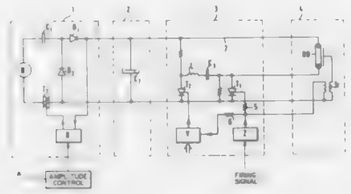
means connected to the last mentioned means and to the switching means and responsive to the output from said last mentioned means for opening the switching means to disconnect the operating means from the power source.

4,853,600

FLASH APPARATUS WITH COLOR TEMPERATURE CONTROL

Urs Zeltner, Dammstrasse 408, CH-4118 Rodersdorf, and Hans P. Hauser, Tulpenweg 9, CH-4310 Rheinfelden, both of Switzerland

Filed Apr. 13, 1987, Ser. No. 37,722
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1986, 3612164
Int. Cl.[4] H05B *41/32*; F21V *23/00*; G03B *15/05*
U.S. Cl. 315—241 P **11 Claims**



1. A method of controlling an illumination device comprising the steps of:

(a) charging an electrical energy storage device to one of a plurality of voltages;

(b) connecting said storage device to said illumination device for energizing said illumination device wherein said illumination device emits light;

(c) controlling a duration of time of energization of said illumination device;

(d) deenergizing said illumination device after a variable time duration; and

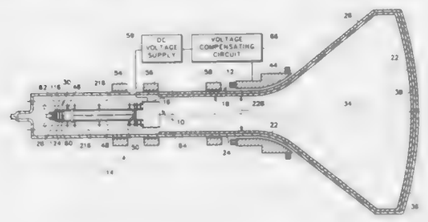
(e) cooperatively controlling the voltage and time duration in order to produce a predetermined color temperature of said light emitted from said illumination device as a function of both the voltage and the time duration.

4,853,601

MULTIPLE BEAM ELECTRON DISCHARGE TUBE HAVING BIPOTENTIAL ACCELERATION AND CONVERGENCE ELECTRODE STRUCTURE

Conrad J Odenthal, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 2, 1987, Ser. No. 115,786
Int. Cl.[4] H01J *29/70, 29/46, 29/50*
U.S. Cl. 315—368 **8 Claims**



1. In a multiple beam electron discharge tube having beam-producing means for producing plural electron beams directed along a central longitudinal axis and focusing means for focusing the electron beams toward a display surface, a bipotential acceleration and convergence electrode structure, comprising:

a first cylindrical electrode element that is axially aligned with the central longitudinal axis and has an outer diameter;

a second cylindrical electrode element that is axially aligned with the central longitudinal axis, is positioned downstream of the first cylindrical electrode element, and has an inner diameter that is greater than the outer diameter of the first cylindrical electrode element, the downstream end of the first cylindrical electrode element extending into the upstream end of the second cylindrical electrode element; and

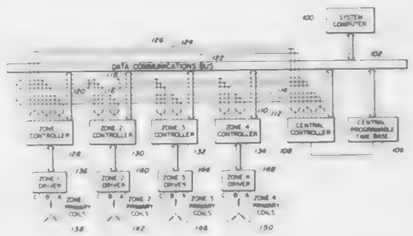
voltage source means connected to the first and second cylindrical electrode elements and applying a potential difference between them to form an image array of electron beam crossovers having an image array diameter, the focusing means focusing the image array toward the display surface and providing at the display surface a display array diameter that is proportional to the image array diameter.

4,853,602

SYSTEM FOR USING SYNCHRONOUS SECONDARIES OF A LINEAR MOTOR TO BIAXIALLY DRAW PLASTIC FILMS

William J. Hommes, Hockessin, and John J. Keegan, Jr., Wilmington, both of Del., assignors to E. I. Dupont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 57,563, Jun. 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 813,311, Dec. 24, 1985, Pat. No. 4,675,582. This application May 17, 1988, Ser. No. 194,952
Int. Cl.[4] H02K *41/00*
U.S. Cl. 318—38 **26 Claims**



1. Apparatus for continuously drawing a web of material by propelling individual carriages having tenter clips attached thereto at predetermined speeds in endless elongated paths defined by a pair of carriage guide tracks positioned opposite each other, using a linear motor, such linear motor comprising:

a primary positioned adjacent each track, each primary including a plurality of groups of coils with the groups of coils in one primary sized to match opposed groups of coils in the other primary and with each of the opposed groups of coils being electrically joined and defining a single control zone;

a synchronous secondary attached to each of the carriages;

means for simultaneously developing matching waveforms to the opposed groups of coils in each control zone, the waveforms for a control zone having specific predetermined frequency and phase characteristics for developing matching traveling electromagnetic waves in the opposed groups of coils in said control zone,

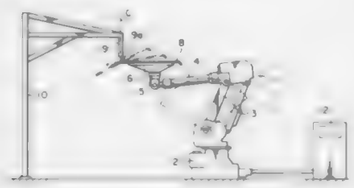
whereby the synchronous secondaries attached to the carriages adjacent a control zone synchronously engage the matching traveling electromagnetic waves developed in the opposed groups of coils in the control zone to propel the carriages in opposed pairs in symmetry through said control zone.

4,853,601

CONTROL OF AN INDUSTRIAL ROBOT

Kazuhiko Onose, Nishinomiya, and Hajime Kashiki, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Mar. 16, 1988, Ser. No. 169,018
Claims priority, application Japan, Mar. 19, 1987, 62-66863
Int. Cl.[4] G05B *19/42*
U.S. Cl. 318—568.15 5 Claims



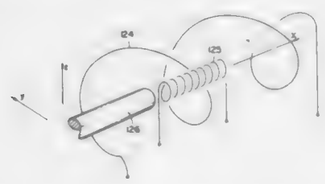
1. A method for controlling a working robot which has hand means adapted to hold a workpiece and move it with respect to a tool which is held in a stationary position so that a work is performed by the tool on the workpiece at a predetermined location, the method comprising steps of obtaining a position of a working end of said tool in first coordinates taken in said robot, operating said hand means to bring said workpiece to a first position wherein a first point on the workpiece is located with respect to said tool so that a desired work can be done by the tool on said first point and obtaining a first tool length vector in the first position in second coordinates having an origin in a point on said hand means, operating said hand means to bring said workpiece to a second position wherein a second point is located with respect to said tool so that a desired work can be done by the tool on said second point and obtaining a second tool length vector in the second position in said second coordinates, calculating a work distance on said workpiece along a path on which a work is to be performed, calculating based on said first and second tool length vectors and said work distance an intermediate tool length vector at an intermediate point on said path between said first and second points as a value in said second coordinates, converting said value of the intermediate tool length vector into a corresponding value on said first coordinates, and controlling said hand means in accordance with said corresponding value on said first coordinates.

4,853,604

POSITION AND SPEED SENSORS

Francis McMullin, Ennis; John V. Byrne, Dalkey, and Aengus Murray, Dublin, all of Ireland, assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Division of Ser. No. 789,147, Oct. 18, 1985, Pat. No. 4,737,698.
This application Jan. 26, 1988, Ser. No. 148,578
Claims priority, application Ireland, Oct. 19, 1984, 2701/84; Apr. 16, 1985, 960/85
Int. Cl.[4] G05B *1/06*
U.S. Cl. 318—653 8 Claims



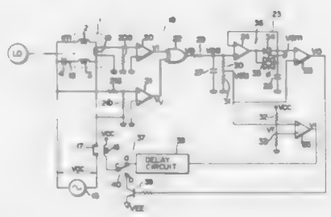
1. A sensor comprising a substantially solenoidal drive or exciting winding for establishing a forward or drive field, at least one secondary or sense winding in which a voltage may be induced in the presence of said forward or drive field, and at least one conductive screen within which eddy currents are generated in the presence of said forward field, said solenoidal drive or exciting winding and said at least one secondary or sense winding being substantially coaxial , said at least one conductive screen and said at least one secondary or sense winding being displaceable relative to one another within said forward or drive field so that said at least one secondary or sense winding may be shaded by said at least one conductive screen to a varying extent to thereby vary the voltage induced in said at least one secondary or sense winding, said at least one conductive screen having an axis of symmetry and a surface region which extends substantially circumferentially with respect to said axis of symmetry, said at least one secondary or sense winding being disposed about the periphery of a notional cylinder which is substantially coaxial with said axis of symmetry of said at least one conductive screen, and the relative displacement of said at least one conductive screen and said at least one secondary or sense winding being in the direction of said axis of said symmetry of said at least one conductive screen and said axis of said notional cylinder which is substantially coaxial therewith.

4,853,605

LOAD STATE DETECTING APPARATUS OF AN INDUCTION MOTOR FOR CONTROLLING THE SPIN DRYER OF A WASHING MACHINE

Katsuharu Matsuo, Aichi, and Yoshiyuki Azuma, Seto, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 129,865, Dec. 4, 1987, abandoned, which is a continuation of Ser. No. 810,228, Dec. 17, 1985, abandoned. This application Jun. 2, 1988, Ser. No. 201,265
Claims priority, application Japan, Dec. 18, 1984, 59-266894; Feb. 18, 1985, 60-29938; Feb. 25, 1985, 60-36022
Int. Cl.[4] H02P *5/40*
U.S. Cl. 318—729 8 Claims



1. An apparatus for controlling a spin drying means which is driven by an induction motor having two coils which are supplied with a drive voltage, said apparatus comprising:

phase difference detecting means for detecting a phase difference between the drive voltage supplied to the coils of said induction motor and a current flowing through the coils upon application of the drive voltage, and outputting a phase difference signal;

averaging means for averaging the magnitude of the phase difference signal supplied thereto from said phase difference detecting means;

dividing means for dividing an averaged phase difference signal from said averaging means and outputting a current value of the averaged phase difference signal;

holding means for holding one of an initial value and a minimum level smaller than the initial value of the averaged phase difference signal from said averaging means and outputting a first reference value corresponding to low speed spin drying;

first comparing means for comparing the current value from said dividing means and the first reference value from said holding means and obtaining a low spin drying termination detecting output of said spin drying means when the current value from said dividing means is greater than said first reference value;

reference value outputting means for outputting a second reference value having a level higher than the first reference value and corresponding to high speed spin drying;

second comparing means for comparing the current value from said dividing means and the second reference value from said reference value outputting means and obtaining a high spin drying termination detecting output of said spin drying means when the current value from said dividing means is greater than said second reference value;

switching means for selectively switching between the low and high spin drying termination detecting outputs from said first and second comparing means; and

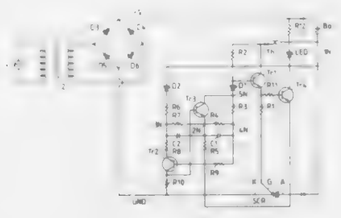
control means for cutting off the drive voltage supplied to said coils to terminate said induction motor in accordance with the output from said switching means.

4,853,606

SECONDARY BATTERY QUICK CHARGING CIRCUIT

Shinichi Nakai, Fuchu, Japan, assignor to Ryobi Limited, Japan

Filed Apr. 28, 1988, Ser. No. 187,502
Claims priority, application Japan, May 6, 1987, 62-68156[U]
Int. Cl.[4] H02J *7/10*
U.S. Cl. 320—36 2 Claims



1. A battery charging circuit comprising:

a first series circuit including a battery which increases in temperature during the charging thereof;

a thermostat which opens in response to the battery reaching a predetermined temperature corresponding to a full charge of the battery, said thermostat having a first terminal and a second terminal, a first node connecting the battery and the first terminal of said thermostat, and a thyrister having a gate, a cathode and an anode, said anode being connected to said first node;

a first transistor having a collector connected to the second terminal of said thermostat, an emitter and a base, a first resistor having a first terminal connected to the emitter of said first transistor and a second terminal connected to the gate of said thyrister, and a second resistor connected across the base and the collector of said first transistor;

a second series circuit connected in series to the base of said first transistor, and comprising a series connection of a first diode, a third resistor, a fourth resistor and a fifth resistor;

a third series circuit having a first terminal connected to the first node and a second terminal, and comprising a series connection of a second diode, a sixth resistor and a seventh resistor, said second terminal of said third series circuit being connected to a second node connecting said fourth resistor and said fifth resistor;

a first capacitor connected in parallel to said fourth resistor and a second capacitor connected in parallel to said seventh resistor;

a second transistor having a collector, an emitter and a base, an eighth resistor having a first terminal connected to a third node connecting said sixth resistor and said seventh resistor and a second terminal connected to the emitter of said second transistor, a ninth resistor having a first terminal connected to a fourth node connecting said third resistor and said fourth resistor and a second terminal connected to the base of said second transistor, a tenth resistor having a first terminal connected to the collector of said second transistor and a second terminal connected to the cathode of said thyrister; and

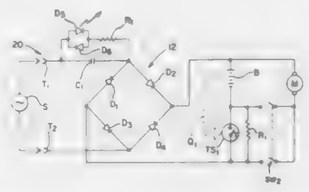
a third transistor having a collector connected to a fifth node connecting said first diode and said third resistor, an emitter connected to said second node, and a base connected to the collector of said second transistor.

4,853,607

NON-ISOLATED THERMALLY RESPONSIVE BATTERY CHARGER

Richard T. Walter; Pradeep Bhagwat, and George W. Lipa, all of Baltimore, Md., assignors to Black & Decker Inc., Newark, Del.

Continuation of Ser. No. 912,086, Sep. 29, 1986. This application Oct. 22, 1987, Ser. No. 111,337
Int. Cl.[4] H02J *7/04*
U.S. Cl. 320—36 13 Claims



1. A non-isolated temperature-responsive battery charger circuit, comprising:

a diode bridge circuit for accepting an AC input current and for providing a rectified full charging current at a level for charging a battery;

capacitive impedance means in circuit with said diode bridge circuit for connection therewith to a source of AC input current for coupling the AC input current to said diode bridge circuit and for establishing the level of full charging current for charging the battery;

a battery charging circuit path connected to said diode bridge circuit and to the battery for providing the charging current to the battery at the level for charging the battery;

temperature responsive means in thermal communication with the battery to sense the temperature thereof while being charged, and for allowing full charging current at the established level to be passed to the battery from said diode bridge circuit;

said temperature responsive means responding to the temperature of the battery during charging to interrupt or cause reduction of said full charging current to the battery when the temperature of the battery exceeds a predetermined threshold value representative of the battery having been substantially fully charged; and

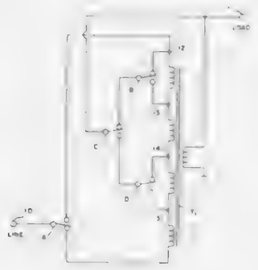
switch means, in circuit with the battery and said temperature responsive means, arranged for providing electrical power to a connected load from the battery supplemented by a smaller contribution of electrical power provided by the rectified current at the established level for charging the battery as supplied from said diode bridge circuit.

4,853,608

AC VOLTAGE REGULATOR

Chester Schrade, 139 Walnut Street, Winnipeg, Manitoba, Canada R3G 1P2

Filed Jul. 27, 1987, Ser. No. 78,[illegible] 7
Int. Cl.[4] G05F *1/20*; H02H *7/055*
U.S. Cl. 323—258 18 Claims



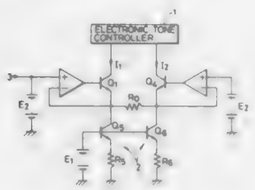
1. An AC voltage regulator comprising means for connection to an input line, means for connection to an output line, a transformer arrangement for generating an AC voltage on said output line which can differ from a voltage on said input line, said transformer arrangement having a plurality of taps which are selectable to change said voltage, means for sensing the magnitude of the voltage of the input line, switching means for selecting and for switching into contact one of said taps in dependence upon said sensed magnitude so as to tend to maintain the voltage on said output line within predetermined limits while said voltage on said input line varies, said switching means being arranged such that for a time period during switching none of said taps is contacted, and means providing said switching means and said transformer arrangement to maintain a current path and thus power to said output line during said switching.

4,853,609

DISTORTION-FREE, OPPOSITE-PHASE CURRENT SOURCE

Tatsuo Numata, and Tadashi Noguchi, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,806
Claims priority, application Japan, Jun. 9, 1982, 57-84669[U]
Int. Cl.[4] G05F *3/08*
U.S. Cl. 323—312 3 Claims



2. An opposite-phase current source, having no current mirror circuits therein, comprising;

two current sources, each of said sources being subjected to voltage feedback and comprising a transistor having an emitter, base and collector;

a resistor element connected between said emitters of the transistors of said two current sources;

constant current source means coupled to said resistor element;

whereby two opposite-phase currents are produced at said collectors of said transistor when an input signal is applied to one of said bases of said transistors; and

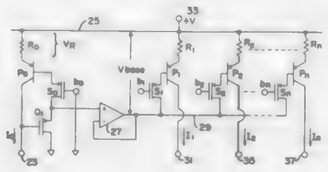
wherein said constant current source means comprises a pair of constant current sources, each serially connected to a respective one of said emitters, and coupled on opposite sides of said resistor element.

4,853,610

PRECISION TEMPERATURE-STABLE CURRENT SOURCES/SINKS

Heinrich Schade, Jr., North Caldwell, N.J., assignor to Harris Semiconductor Patents, Inc., Melbourne, Fla.

Filed Dec. 5, 1988, Ser. No. 279,885
Int. Cl.[4] G05F *3/28*
U.S. Cl. 323—316 22 Claims



1. A monolithic integrated circuit comprising:

a substrate;

a plurality of bipolar transistors, each having emitter, base, and collector electrodes formed on said substrate;

a plurality of resistors, one resistor per bipolar transistor; said resistors having similar thermal characteristics; each resistor being connected between the emitter of its corresponding bipolar transistor and a common voltage rail; and each resistor being formed on said substrate in a tight thermal connection with the base-emitter junction of its corresponding bipolar transistor; each one of said resistors having a positive temperature coefficient to produce a voltage at a given current level, which varies in a direction to fully compensate for the negative temperature coefficient of the base-to-emitter voltage of its corresponding bipolar transistor, thereby making the magnitudes of current flowing between the collector and emitter electrodes of said plurality of bipolar transistors, substantially independent of temperature; and

means formed on said substrate for connecting said plurality of bipolar transistors and resistors in a current mirror configuration of a master element and a plurality of slave elements.

4,853,611

INDUCTIVE, ELECTRICALLY-CONTROLLABLE COMPONENT

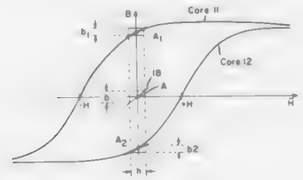
Andre Kislovski, Bern, Switzerland, assignor to Hasler AG, Bern, Switzerland

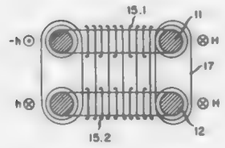
PCT No. PCT/CH86/00119, § 371 Date Jun. 29, 1987, § 102(e) Date Jun. 29, 1987, PCT Pub. No. WO87/01505, PCT Pub. Date Mar. 12, 1987
PCT Filed Aug. 15, 1986, Ser. No. 53,367
Claims priority, application Switzerland, Sep. 2, 1985, 3771/85; Nov. 13, 1985, 4868/85
Int. Cl.[4] H01F *29/14*
U.S. Cl. 323—335 20 Claims

1. An inductive, electrically controllable device (10) comprising two identical ferromagnetic cores (11, 12) which are independent from each other and co-axially disposed, and each of said cores is annularly closed, a control winding (17) which winds around the two identical ferromagnetic cores (11, 12) jointly, and an induction winding (15) which winds around the two cores (11, 12) individually in a configuration of two partial windings (15.1, 15.2) connected in series,

in such a way that magnetic fluxes, created by currents running through the windings (17, 15.1, 15.2) in the cores (11, 12), are uni-directional in one of the cores and inverse-directional in the other one of the cores,

characterized in that a functional dependence of the magnetic flux density B on the magnetic field strength H for a soft magnetic core material exhibits a curvature





that has a progressively varying incremental permeability over its full region

and thus substantially identical in its flux versus field strength curve for increasing and for decreasing field strength (H), and

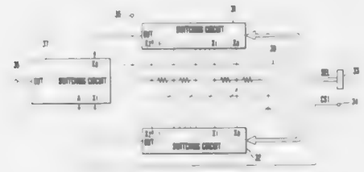
whose slope varies at least over a range defined by a ratio of 1:100 (FIG. 2, 3, 7, 8).

4,853,612

RF POWER CONTROL CIRCUIT

Shinichi Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 23, 1988, Ser. No. 275,342
Claims priority, application Japan, Nov. 27, 1987, 62-297386
Int. Cl.[4] G05B *24/02*
U.S. Cl. 323—354 3 Claims



1. An RF power control circuit for dividing a DC voltage by a plurality of resistors, selecting one of the partial voltages, and using the selected voltage as a reference voltage, thereby obtaining a multilevel RF output, comprising:

first and second switching circuits, controlled by an identical selection signal, each for selecting one of the partial voltages obtained by said resistors and outputting the selected voltage; and

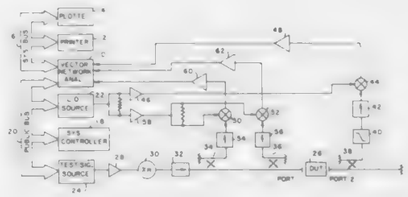
selecting means for selecting one of outputs from said first and second switching circuits in accordance with a control signal.

4,853,613

CALIBRATION METHOD FOR APPARATUS EVALUATING MICROWAVE/MILLIMETER WAVE CIRCUITS

Hermann B. Sequeira; Michael W. Trippe, both of Baltimore, and Rajendra S. Jakhete, Catonsville, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Oct. 27, 1987, Ser. No. 113,110
Int. Cl.[4] G01R *27/04*
U.S. Cl. 324—58 R 17 Claims



1. A method for calibrating measurement apparatus including a vector network analyzer for making evaluations of circuits operating at microwave and millimeter wave frequencies comprising the steps of:

(a) measuring and storing data for a plurality of measurement conditions utilizing a first standard termination, alone and in combination with a pair of termination offsets having respective lengths defining a predetermined ratio;

(b) measuring and storing data for a plurality of measurement conditions utilizing a second standard termination different from the first standard termination, alone and in combination with said pair of offsets as set forth in step (a);

(c) computing a figure of merit of the quality of the measured raw data measured in steps (a) and (b);

(d) computing the electrical length of the offsets expressed as a function of the wavelength used in steps (a) and (b);

(e) computing a plurality of error terms also known as error coefficients based on a predetermined error model;

(f) computing the reflection coefficient of the second standard; and

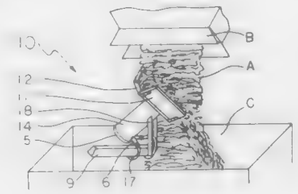
(g) determining the corrupting influences on said terminations by comparing the computed values as obtained in steps (d) and (f) with corresponding measured values obtained in steps (a) and (b).

4,853,614

METHOD AND APPARATUS FOR MEASURING MOISTURE CONTENT OF GRANULAR MATERIAL

Robert L. Carver, 1884 Glengary Rd., Akron, Ohio 44313

Filed Mar. 11, 1988, Ser. No. 166,623
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—61 R 23 Claims



1. An apparatus for the measurement of the moisture content of a material comprising:

a sensing surface having measuring means therein said measuring means comprising a first electrode means of electrically conductive material, a second electrode means of an electrically conductive material disclosed adjacent said

first electrode means, wherein said first and second electrode means define a capacitive measuring means for determining the electrical properties of a material flowing over said surface;

a pair of opposed sides extending from said sensing surface defining a space in which a substantially constant volume of said material will flow at a substantially constant density;

said sensing surface being disposed in the path of said flowing material, such that the material will fall into and fill said space to continuously sample said volume of material as said material flows over said surface; and

circuit means coupled with said measuring means for producing a signal corresponding to the moisture content of said continuously sampled volume of material.

4,853,615

DETECTION OF WATER SATURATION IN INSULATION AT CASED ROAD CROSSINGS

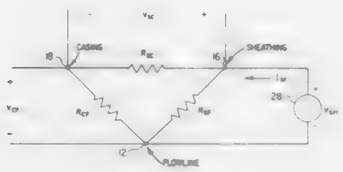
Marc C. Horn, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 21, 1988, Ser. No. 222,452

The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.

Int. Cl.[4] G01R *27/14*

U.S. Cl. 324—65 R **7 Claims**



3. A method for detecting water saturation of thermal insulation positioned between a flowline and metal sheathing at a location where said flowline is positioned in a metal casing by electrical insulating stand-offs, both said flowline and casing being in contact with the earth, comprising:

removing portions of said sheathing near each end of said casing to electrically isolate that section of the sheathing positioned within the casing,

connecting a voltage source between the sheathing section within the casing and the flowline, measuring the voltage, V_{SF1}, of the voltage source and measuring the current, I_{SF}, flowing from the voltage source,

connecting the voltage source between the casing and flowline, measuring the voltage, V_{SC2}, between the casing and the sheathing section within the casing, and measuring the voltage, V_{SF2}, between the sheathing section within the casing and the flowline,

connecting the voltage source between the casing and the sheathing section within the casing, measuring the voltage, V_{CF3}, between the casing and flowline and measuring the voltage, V_{SF3}, between the sheathing section within the casing and the flowline, and

using the measured values, calculating the electrical resistance of the thermal insulation between the flowline and the sheathing section within the casing.

4,853,616

DETECTION OF WATER SATURATION IN INSULATION AT CASED ROAD CROSSINGS

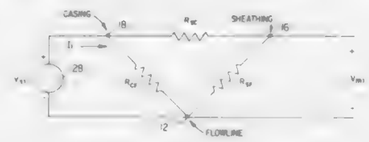
Michael F. Gard, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 21, 1988, Ser. No. 222,453

The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.

Int. Cl.[4] G01R *27/14*

U.S. Cl. 324—65 R **8 Claims**



1. A method for detecting water saturation of thermal insulation positioned between a flowline and metal sheathing at a location where said flowline is positioned in a metal casing by electrical insulating stand-offs, both said flowline and casing being in contact with the earth, comprising:

removing portions of said sheathing near each end of said casing to electrically isolate that section of the sheathing positioned within the casing,

connecting a voltage source between the casing and flowline, measuring the voltage, V_{s1}, of the voltage source, measuring the current, I_1, flowing from the voltage source and measuring the voltage, V_{m1}, between the sheathing section within the casing and the flowline,

connecting the voltage source between the sheathing section within the casing and the flowline, measuring the voltage, V_{s2}, of the voltage source, measuring the current, I_2, flowing from the voltage source, and measuring the voltage, V_{m2}, between the casing and the flowline, and

using the measured values, calculating the electrical resistance of the thermal insulation between the flowline and the sheathing section within the casing.

4,853,617

APPARATUS HAVING CAPACITIVE SENSOR AND METAL DETECTOR FOR DETECTING OBJECTS CONCEALED BEHIND SURFACES

Keith Douglas, 41 Grainger Avenue, Godmanchester, Huntingdon, Cambridgeshire, and Mark Q. Meyer, 21 Cedar Close, Grafham, Huntingdon, Cambridgeshire, both of United Kingdom

PCT No. PCT/US87/00666, § 371 Date Nov. 19, 1987, § 102(e) Date Nov. 19, 1987, PCT Pub. No. WO87/06010, PCT Pub. Date Oct. 8, 1987

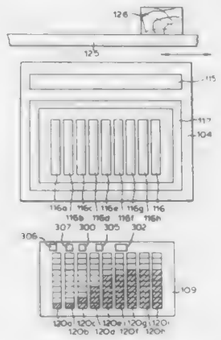
PCT Filed Mar. 24, 1987, Ser. No. 172,628

Claims priority, application United Kingdom, Mar. 27, 1987, 8607747

Int. Cl.[4] G01R *33/00, 27/26;* G01V *3/11*

U.S. Cl. 324—67 **8 Claims**

1. A device for detecting objects behind a surface comprising a support, stray field capacitor means adapted to detect dielectric constant changes, and metal detectors means; said stray field capacitor means including transmitter and receiver plate means and being responsive to differences in the dielectric constant of the surface resulting from the presence of concealed objects behind said surface, and said stray field capacitor means being positioned adjacent an exterior face of said support, said device being intended in use to be held with said capacitor means adjacent to and for traverse along the surface; and said metal detector means comprising transmitter and receiver coils located behind the plates of the stray field



capacitors means, said transmitter and receiver plate means being of electrically resistive material.

4,853,618

PARTICLE COUNTER WITH VARIABLE SIZED APERTURE

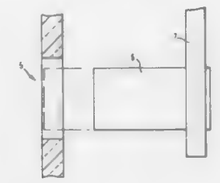
John E. F. Holley, 9 Shipfield Close, Tatsfield, Nr. Westerham, Kent, Great Britain

Filed Mar. 16, 1987, Ser. No. 26,319

Claims priority, application United Kingdom, Mar. 14, 1986, 8606299

Int. Cl.[4] G01N *27/00*

U.S. Cl. 324—71.4 **5 Claims**



1. A particle counter which incorporates an element which comprises a body having an orifice through which liquid can pass, wherein, mounted within the body, is a moveable support means having an insert attached thereto, the insert being positioned so as to be able to move in and out of the orifice and further in which there are means to develop a potential difference across the orifice and means for measuring the change in the potential difference.

4,853,619

DIGITAL PANEL METER

Brian Paulsen, Monument Beach, and Joseph Vignolo, Dedham, both of Mass., assignors to R. T. Engineering Service, Inc., Mansfield, Mass.

Filed Feb. 17, 1988, Ser. No. 156,931

Int. Cl.[4] G01R *19/00, 29/00*

U.S. Cl. 324—115 **15 Claims**

1. A digital panel meter comprising;

a housing,

input terminals means for receiving AC and DC input signals,

range circuit means including means responsive to the output of the input terminal means and means for selecting one of a plurality of different amplitude ranges,

amplifier means responsive to the output of the range circuit means and having an output,

a rectifier means responsive to the output of the amplifier means,

filter means responsive to the output of the rectifier means,

analog-to-digital converter means responsive to the filter means,

display means mounted in the housing and coupled from said analog-to-digital converter means,

a terminal strip at the rear of the housing including terminals forming the input terminal means and AC power terminals,



a comparator means responsive to the output of the filter means, means for establishing an adjustable reference input to the comparator means for establishing a trip-point,

relay means coupled from the output of said comparator means and adapted to be set when the comparator means triggers, and

a plurality of separately operable decimal point setting switches coupled to said display means for manual setting of the decimal point in the display means.

4,853,620

CIRCUIT ARRANGEMENT COMPRISING MULTIPLIER CIRCUITS TO FIND THE SUM OF ELECTRICAL POWER OUTPUTS FOR APPLICATION IN MULTI-PHASE ELECTRICITY METERS

Mathis Halder, Baar, and Andreas Joder, Unterägeri, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Jul. 28, 1988, Ser. No. 225,528

Claims priority, application Switzerland, Aug. 6, 1987, 03029/87

Int. Cl.[4] G01R *21/00, 21/08*

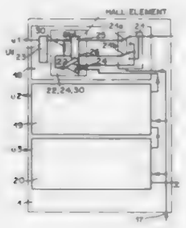
U.S. Cl. 324—142 **4 Claims**

1. A circuit arrangement for finding a sum of electrical power outputs for use in a multi-phase electricity meter, said circuit arrangement comprising:

a plurality of multiplier circuits arranged in sequence, said sequence of multiplier circuits having two poles which form the output poles of the circuit arrangement;

at least one multiplier circuit comprising a Hall element, an amplifier, and a polarity reversing switch associated with the amplifier, an output of said Hall element being connected to one input of said amplifier, a second output of said Hall element being connected to an output of said on

multiplier circuit, an output of said amplifier being connected to one input of said Hall element, and an output of



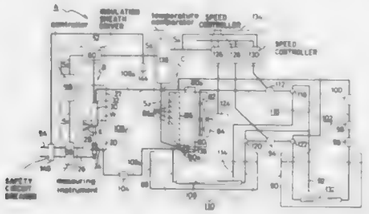
an adjacent multiplier circuit being connected to a second input of said amplifier.

4,853,621

WATER RESISTANCE LOAD SYSTEM

Kesafumi Matsumoto, Atsugi, Japan, assignor to Kouken Co., Ltd., Atsugi, Japan

Filed May 18, 1987, Ser. No. 51,092
Claims priority, application Japan, Mar. 5, 1987, 62-48875; Mar. 13, 1987, 62-56827; Mar. 23, 1987, 62-65801; Apr. 10, 1987, 62-86759
Int. Cl.[4] G01R *31/00*; H01C *10/02*; G05F *3/00*
U.S. Cl. 324—158 R 20 Claims



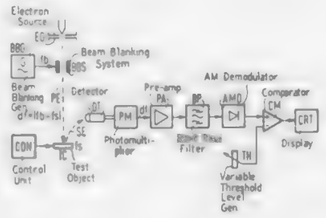
1. A water resistance load apparatus for measurement or testing of the output characteristics of electric power sources comprising a hollow cylindrical base electrode having an axis which is vertically disposed, said cylindrical base electrode having a closed bottom such that said hollow cylindrical base electrode is capable of containing water, insulation support means in said closed bottom, a cylindrical main electrode passing through said insulation support means and extending up into said hollow cylindrical base electrode, a power cable means connected to said cylindrical main electrode and said cylindrical base electrode, said cylindrical base electrode being radially spaced form said cylindrical main electrode by an annular space, an insulation sheath disposed in said annular space, control means for vertically moving said insulation sheath and operable to maintain the output power from said electric power source at a substantially constant desired value vertically moving said insulation sheath, cooling means for cooling said water, and circulation means for circulating said water between said cooling means and said hollow cylindrical base electrode.

4,853,622

METHOD AND APPARATUS FOR DETECTING AND IMAGING A VOLTAGE SIGNAL OF AT LEAST ONE SPECIFIC FREQUENCY AT A MEASURING LOCATION

Hans-Dietlef Brust, Dudweiler, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 717,115, Mar. 28, 1985, Pat. No. 4,745,362. This application Feb. 4, 1988, Ser. No. 152,158
Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420272
Int. Cl.[4] G01N *23/00*; G01R *31/26*
U.S. Cl. 324—158 R 1 Claim



1. A method for detecting and imaging a voltage signal present at least one measuring location of a specimen carrying a signal of a first frequency fs comprising the steps of:

generating a primary particle beam using a scanning particle microscope;

directing said primary particle beam at said measuring location, said primary particle beam generating a secondary particle beam including topography information emanating from said measuring location;

detecting particles in said secondary particle beam;

generating an electronic secondary particle signal including an unmodulated topography signal from the detected secondary beam particles;

selecting one of said primary particle beam, said secondary particle beam or said secondary particle signal and modifying said selected one at a second frequency fb, wherein fb=fs, so that said secondary particle signal is given a signal component having a differential frequency $df=fb-fs$;

demodulating said signal component of said secondary particle signal having said frequency df;

adding said unmodulated topography signal to the demodulated signal component of said secondary particle signal having said frequency df to obtain an added result; and

displaying the added result.

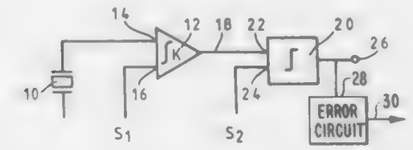
4,853,623

METHOD FOR TESTING AIRBAG SYSTEM RELEASE CIRCUIT

Georg Sterler, Grossmehring, and Heinz Bader, Karlshuld, both of Fed. Rep. of Germany, assignors to Audi AG, Fed. Rep. of Germany

Continuation of Ser. No. 17,236, Feb. 20, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 268,644
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1986, 3606547
Int. Cl.[4] G01R *31/00*; B60R *21/02*; B62D *45/00*
U.S. Cl. 324—158 R 6 Claims

1. A method for testing a circuit for releasing an airbag comprising an accelerometer, an integrator for receiving a signal from the accelerometer, said integrator being conditioned by a signal having a first threshold value such that said integrator integrates a signal received from said accelerometer only if said accelerometer signal exceeds said first threshold value, a switch for receiving a signal from said integrator and for producing a switch output signal, said switch being conditioned by a signal having a second threshold value such that said switch produces said output signal only if said integrator signal exceeds said second threshold value, said method comprising the steps of delivering a single test pulse signal to said integrator in place of said accelerometer signal, said single test pulse signal being delivered to said integrator over a given time period, and the amplitude of said single test pulse being greater than said first threshold value for at least a portion of said time period, said single test pulse exceeding said first threshold value at a predetermined first point in said time period, said single test pulse exceeding said first threshold value for at least a portion of said time period sufficient for said integrator to



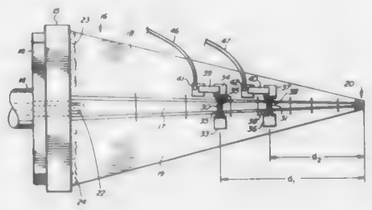
produce an integrator output signal having a magnitude greater than said second threshold value, and monitoring the output of said switch whereby proper operation of said circuit is confirmed if said switch produces a switch output signal at a predetermined second point in time directly related to said first point in said time period, and further independently checking said first threshold value by selecting a single test pulse of a predetermined first form and monitoring said integrator output signal, and independently checking said second threshold value by selecting a single test pulse of said predetermined first form and monitoring said switch output signal and said integrator output signal.

4,853,624

TUNABLE MICROWAVE WAFER PROBE

Gordon G. Rabjohn, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 9, 1988, Ser. No. 269,877
Claims priority, application Canada, Nov. 2, 1988, 582047
Int. Cl.[4] G01R *1/04*; H01P *5/22*
U.S. Cl. 324—158 P 15 Claims



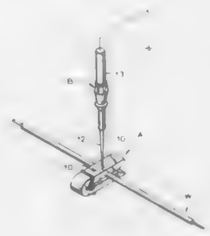
1. A tunable microwave coplanar waveguide probe for use in mapping the noise parameters on a wafer of devices to be used at microwave frequencies, the probe having a tip end adapted to contact the wafer and having support means for connecting the probe to a support structure for precise positioning of the probe relative to the wafer, the probe having an input signal line and at least one ground line extending from an electrical input connection on the probe to the tip and, the signal and ground lines at the tip end defining spaced electrical contacts, a first varactor mounted on the probe being electrically connected between a first position on the signal line and a first bias voltage line, a second varactor mounted on the probe being electrically connected between a second position on the signal line and a second bias voltage line, each of the first and second bias voltage lines being connected to the at least one ground line through a respective one of a pair of first microwave frequency shorting means mounted on the probe, the first and second bias voltage lines extending off of the probe and being adapted to be electrically connected to first and second bias voltage sources respectively, the impedance on the input signal line at the tip end of the probe being adjusted by selective variation of the first and second bias voltages.

4,853,625

ELECTRIC WIRE CLIP

Adolph Fodali, Lake Hiawatha, and George Gering, Short Hills, both of N.J., assignors to S & G Tool Aid Corp., Newark, N.J.

Filed May 23, 1988, Ser. No. 197,508
Int. Cl.[4] G01R *1/06*, *1/067*
U.S. Cl. 324—158 P 16 Claims



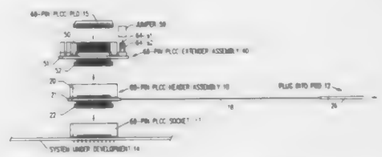
1. An electric wire clip for use with a circuit tester having a pointed probe tip, the clip comprising first and second movably connected clamping elements defining a recess, said clamping elements being movable relative to each other between an open position, wherein the elements are spread apart, and a closed position, wherein the elements are proximate each other and a wire may be clamped therebetween, means for biasing said clamping elements toward said clamping position to retain the clip on the wire and means extending from said clamping elements for gripping between the fingers, said finger gripping means being movable toward each other by fingers, against the force of the biasing means, to move said clamping elements towards said open position, said means comprising oppositely oriented external surfaces for gripping by the fingers, one of said clamping elements having an opening extending therethrough and intersecting the recess, said opening being adapted to receive the pointed probe tip.

4,853,626

EMULATOR PROBE ASSEMBLY FOR PROGRAMMABLE LOGIC DEVICES

Edwin W. Resler, San Jose, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 24,226, Mar. 10, 1987, abandoned. This application Mar. 8, 1988, Ser. No. 165,212
Int. Cl.[4] G01R *31/02*, *31/26*
U.S. Cl. 324—158 F 12 Claims



1. An emulator probe assembly for coupling a system under development to an emulator comprising:

a header socket having a plurality of header socket pins;

a header plug having a corresponding plurality of header plug pins;
a flexible cable attached at one end to a pod plug and having a plurality of cable lines leading to said pod plug;
a plurality of direct connect lines connecting from some but not all of said header socket pins to corresponding header plug pins;
a plurality of first indirect connect lines each connecting from one of said header socket pins not connected to one of said direct connect lines to one of said cable lines leading to said pod plug; and
a plurality of second indirect connect lines each connecting from one of said header plug pins not connected to one of said direct connect lines to one of said cable lines leading to said pod plug.

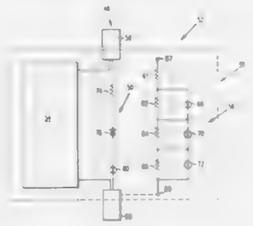
4,853,627
WAFER PROBES
Kimberly R. Gleason; Eric W. Strid, both of Portland; Robert T. Flegal, Beaverton, and Angus J. McCamant, Aloha, all of Oreg., assignors to TriQuint Semiconductor, Inc., Beaverton, Oreg.
Continuation of Ser. No. 812,480, Dec. 23, 1985, abandoned.
This application Jul. 11, 1988, Ser. No. 217,107
Int. Cl.[4] G01R *1/06, 31/02*
U.S. Cl. 324—158 P **20 Claims**



7. A wafer probe comprising:
a planar support member having an end region that is shaped to permit the end region to be brought into close proximity with a component under test, and a support region that is spaced from said end region,
an electronic circuit mounted on the support member at the end region thereof and having an input terminal, an output terminal and first and second power supply terminals,
a conductive probe element attached to the electronic circuit and electrically connected to said input terminal,
a transmission line connected to the output terminal and extending to said support region for transmitting signals from the electronic circuit to a measurement instrument, and
first and second power-supply transmission lines connected to the power supply terminals respectively and extending from those terminals to said support region of the planar support member.

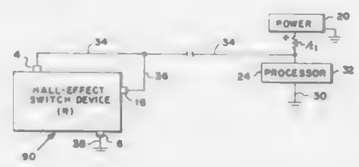
4,853,628
APPARATUS FOR MEASURING CIRCUIT PARAMETERS OF A PACKAGED SEMICONDUCTOR DEVICE
Gary R. Gouldsberry, Cupertino, and Mark E. Fitzpatrick, San Jose, both of Calif., assignors to Gazelle Microcircuits, Inc., Santa Clara, Calif.
Filed Sep. 10, 1987, Ser. No. 95,284
Int. Cl.[4] G01R *15/12*
U.S. Cl. 324—158 R **4 Claims**

1. In a semiconductor device having a circuited portion and a plurality of pins, a test structure as part of said device and connected to a part of pins of the device, the test structure in use providing electrical information concerning the circuit portion, and further comprising means comprising a disconnectable link as part of said test structure for providing that the circuit portion operates without degradation in operation of the device, as compared to a device not including said test structure, wherein the test structure in use thereof is connected



to the circuit portion, wherein the test structure further comprises a diode forward biased in the direction from the pin at higher potential during testing toward the pin at lower potential during testing, wherein the disconnectable link comprises a laser programmable fuse connected between the pair of pins.

4,853,629
HALL-EFFECT POSITION SENSING SYSTEM AND DEVICE
Paul G. Rops, Plainwell, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed May 2, 1988, Ser. No. 189,875
Int. Cl.[4] G01B *7/14*
U.S. Cl. 324—208 **17 Claims**

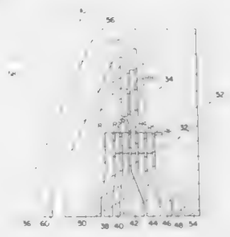


1. A system for determining position of a movable component, said system comprising:
a Hall-Effect switch device electrically connected to ground and having an input terminal for receiving electrical power from a remote substantially constant-voltage power source, said device having an output terminal operative to provide an output signal therefrom upon actuation of a switch member thereof in response to movement of the component to a predetermined position, and said device having an electrical load resistance that decreases from a higher value to a lower value upon actuation of the switch member and that increases from the lower value to the higher value upon deactuation of the switch member;
circuit means, said means comprising;
an electrical input conductor connecting the power source to the switch device input terminal for conveying the electrical power thereto and including a drop resistor having a predetermined resistance interposed between the power source and the input terminal and means for connecting the switch device output terminal directly to the input conductor in close proximity to the switch device between the input terminal thereof and the drop resistor; and
processor means electrically connected to ground and to the input conductor between the drop resistor and the connection between the switch device output terminal and the input conductor and adapted to monitor the value of voltage on the input conductor and provide information indicative of the position of the movable member therefrom,
said system operative such that;
(1) when the switch member is actuated, the lower load resistance of the switch device causes current flow through the drop resistor to increase and cause a lower voltage on the input conductor being monitored by the processor means, and
(2) when the switch member is deactuated, the higher load resistance of the switch device causes current flow through the drop resistor to decrease and cause a higher voltage on the input conductor being monitored by the processor means.

4,853,630
MAGNETIC POSITION SENSOR HAVING SPACED TOROIDAL MAGNETS IN A STATE OF EQUILIBRIUM
John S. Houston, 546 Savoy St., San Diego, Calif. 92106
Filed Aug. 28, 1987, Ser. No. 90,764
Int. Cl.[4] G01B *7/30, 7/14;* **G05G** *9/00;* **G09G** *1/00*
U.S. Cl. 324—208 **28 Claims**

1. A position sensor comprising:
a first member producing a first magnetic field extending from said first member;
a second member spaced apart from said first member and producing a second magnetic field extending from said second member to magnetically couple with said first magnetic field extending from said first member;
a spacer capable of magnetically interacting with said first and second magnetic fields, said spacer mechanically coupling said first and second members in a flexible manner allowing free rocking and swiveling movement of one member in relation to the other about an axis passing through said members and said spacer, the assemblage of said first member, second member and said spacer creating a coupled magnetic field between said first and second members which varies as a function of the relative position of said first and second members and said assemblage being in a state of equilibrium in the absence of an external force applied to change the relative position of said first and second members and said equilibrium state; and
at least one detector supported, positioned and oriented so as to sense small changes in the magnetic field between said first and second members caused by changes in the relative position of said first member with respect to said second member.

4,853,631
MAGNETORESISTIVE SENSOR HAVING INTER-LEAVED MAGNETORESISTIVE ELEMENTS FOR DETECTING ENCODED MAGNETIC INFORMATION
Ralph Carmen, Lebanon, N.J., assignor to The Superior Electric Company, Bristol, Conn.
Filed Nov. 4, 1987, Ser. No. 117,035
Int. Cl.[4] G01B *7/14;* **H03K** *17/90, 19/18;* **H01L** *43/06*
U.S. Cl. 324—208 **6 Claims**



1. A magnetoresistive displacement sensor for use with a number of different diameter magnetic recording media wheels carrying plural pieces of magnetic information recorded on at least on circumferentially running track, each of said different wheels having its associated magnetic information spaced with a predetermined constant wavelength (λ), said sensor being disposed adjacently opposite to said magnetic recording media, said sensor arrangement comprising:
at least two groups of magnetoresistive (MR) elements wherein each group includes a first plurality of elongated stripe-shaped MR elements in side-by-side relation with one another on the surface of a non-magnetic substrate, each of said MR elements extending in a longitudinal direction transverse to the direction of relative movement between the sensor and the magnetic recording media, the widths of said MR elements in the rotation direction being made substantially smaller than the wavelength (λ) and each of said MR elements having a first and a second end;
each of said groups comprising at least three MR elements, said first ends of said MR elements associated with each respective group being connected together, a first MR element in said first group being spaced a first predetermined distance from a second MR element in said first group in the direction of movement, said second MR element in said first group being spaced a second predetermined distance from a third MR element in said first group in the direction of movement, a first MR element in said second group being spaced a third predetermined distance from a second MR element in said second group in the direction of movement, said second MR element in said second group being spaced a fourth predetermined distance from a third MR element in the direction of movement, said third MR element of said first group being spaced a fifth predetermined distance from said first MR element of said second group, said second, third and fifth distances being substantially equal to one another and said first and fourth distances being substantially equal to one another and different from said second, third and fifth distances;
means forming an output connection terminal at each respective second end of said MR elements, said output terminals extending in a longitudinal direction in a side-by-side manner along one side of said non-magnetic substrate;
said connected first ends of said MR elements associated with said first group forming means for a first external power supply connection terminal and said connected first ends of said MR elements associated with said second

group forming means for a second external power supply connection terminal;

said first and second external power supply connection terminals extending to a position adjacent said output connection terminals provided at said second ends of said MR elements;

said second end of one of said three MR elements in said first group being arranged for selective external connection to said second end of one of said three MR elements in said second group so that the distance between said selectively connected MR element in said first groups and said selectively connected MR element in said second group is substantially equal to an odd multiple of λ/2, said second end of another one of said three MR elements in said first group being arranged for selective external connection to said second end of another one of said three MR elements in said second group so that the distance between said selectively connected another MR element in said first group and said selectively connected another MR element in said second group is substantially equal to an odd multiple of λ/2;

said selectively connected one MR element in said first group being spaced a distance equal to an odd multiple of λ/4 from being selectively connected another MR element in said first group and from said selectively connected another MR element in said second group, and

said selectively externally connected second end of said one MR element in said first group and said selectively connected MR element in said second group respectively forming a first output connection, and said selective externally connected second end of said another MR element in said first group and selectively connected second end of said another MR element in said second group, respectively, forming a second output connection.

4,853,632

APPARATUS FOR MAGNETICALLY DETECTING A POSITION OF A MOVABLE MAGNETIC BODY

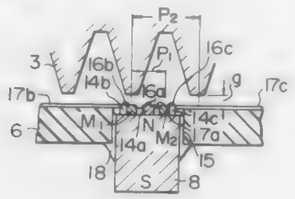
Yoosuke Nagano; Sadao Sekizawa, and Toshio Seki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 24, 1981, Ser. No. 324,669

Claims priority, application Japan, Feb. 7, 1981, 56-16313; Mar. 11, 1981, 56-33969

Int. Cl.⁴ G01B *7/14;* **H01L** *43/08, 27/02*

U.S. Cl. 324—208 **27 Claims**



1. An apparatus for magnetically detecting a position of a rotatable member having a magnetic body movable in association with a rotation operation comprising.

means for generating a magnetic field;

magneto-resistor means disposed so as to be magnetically coupled to said magnetic field generating means and arranged for being subjected to a portion of said magnetic field which exists in a space between said movable magnetic body and said magnetic field generating means, the intensity of said magnetic field of said portion being changeable in dependence upon movement of said movable magnetic body, said magneto-resistor means being responsive to a change in the intensity of said magnetic field at said portion for changing a resistance value thereof in accordance therewith;

voltage source means for applying a predetermined voltage across said magneto-resistor means to derive therefrom a first electrical output signal corresponding to said resistance value;

circuit means for converting said first electrical signal applied thereto into a second electrical signal having a predetermined waveform and generating said second electrical signal as an output; and

a substrate, said circuit means and said magneto-resistor means being integrally mounted on said substrate so as to suppress external noise;

wherein said substrate is formed of one of a ceramic material and an organic material.

4,853,633

MAGNETIC HEAD ELECTROMAGNETIC CONVERSION EFFICIENCY MEASURING METHOD AND ELEMENT THEREFOR

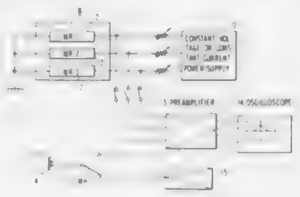
Takashi Matsumoto, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 3, 1987, Ser. No. 21,282

Claims priority, application Japan, Mar. 5, 1986, 61-46397

Int. Cl.⁴ G01R *33/06, 33/12;* **G11B** *5/39*

U.S. Cl. 324—210 **15 Claims**



8. A method for measuring characteristics of a magnetic head, comprising the steps of: disposing first and second thin film magnetoresistive elements of the same shape parallel to and on opposite sides of a reference plane with a predetermined spacing therebetween; locating said first and second thin films within a magnetic field produced by said magnetic head symmetrically with respect to a gap of said magnetic head; connecting each of said first and second thin films to a regulated power supply so as to pass a current of a predetermined value through each of said thin films; and detecting changes in said predetermined current in the presence of the magnetic field produced by said magnetic head.

4,853,634

DEVICE FOR CRACK DETECTION ON HOT CAST BILLETS AND SUPPRESSING THE EFFECTS OF MAGNETIC REGIONS

Bengt H. Törnblom, Västerås, Sweden, assignor to Törnbloms Kvalitetskontroll AB, Västerås, Sweden

Filed Aug. 14, 1987, Ser. No. 85,173

Claims priority, application Sweden, Aug. 27, 1986, 8603604

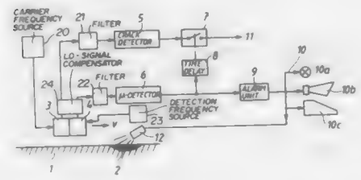
Int. Cl.⁴ G01N *27/72;* **G01R** *33/12*

U.S. Cl. 324—225 **25 Claims**

1. A device for non-destructive detection of harmful faults in a non-magnetic test object and for the detection and suppression of the influence of disturbing magnetic areas comprising at least one fault signal transducer associated with at least one fault sensor adapted to move relative to the test object, at least one magnetic signal transducer associated with at least one detector associated with the fault sensor for detecting the presence of any disturbing magnetic areas, and at least one blocking means for suppressing signals originating from the fault sensor wherein:

the magnetic detector controls the blocking means such that,

upon detection of a magnetic area, the blocking means causes the signals from the fault sensor originating from



the detection of a magnetic area to be blocked and to not be interpreted as signals originating from a fault.

4,853,635

METHOD OF RECONSTRUCTING A NUCLEAR MAGNETIZATION DISTRIBUTION FROM A PARTIAL MAGNETIC RESONANCE MEASUREMENT

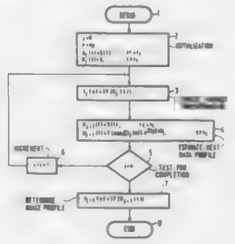
Johannes J. M. Cuppen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 62,812, Jun. 15, 1987, abandoned. This application May 27, 1988, Ser. No. 203,542

Claims priority, application Netherlands, Jun. 18, 1986, 8601571

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—309 **4 Claims**



1. A method of reconstructing an image of a nuclear magnetization distribution in a body by a complex Fourier transformation of a multi-dimensional data matrix which contains data profiles comprising sampling values of resonance signals obtained from a magnetic resonance measurement performed on the body, the data matrix in one dimension being at least half-filled with sampling values, the data profiles being converted after the complex Fourier transformation to image profiles having a real and an imaginary image component associated with phase information, the reconstruction utilizing phase information which is estimated from known sampling value data of a central part of the data matrix, wherein the complex Fourier transformation is performed first on the sampling values in the dimensions other than the one dimension and, thereafter, a Fourier transformation step is performed on each data profile which is partly filled with sampling values in a number of steps after an estimation is made of the data not known from sampling, the estimation of the data not known from sampling being added to the partly filled data profile and then being iteratively changed in each subsequent step in order to obtain, after reconstruction, an image wherein phase information at least approximates the phase estimation from the central part of the data matrix.

4,853,636

NMR IMAGING METHOD

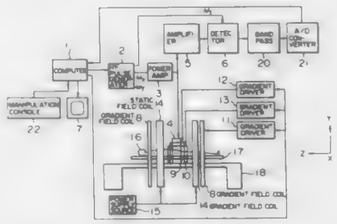
Etsuji Yamamoto, Akishima; Yukiko Ogura, Hachioji, and Hideki Kohno, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 11, 1988, Ser. No. 141,788

Claims priority, application Japan, Jan. 12, 1987, 62-3183; Feb. 4, 1987, 62-22313

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—309 **6 Claims**



1. A nuclear magnetic resonance imaging method for obtaining images of a slice of a body placed in an inspection zone to which a static magnetic field is applied, by using a system providing two-dimensional Fourier imaging which includes steps (i) to (v) of:

(i) exciting nuclear spins in said slice,

(ii) applying a phase encoding gradient magnetic field along a first direction,

(iii) obtaining data of an echo of said excited spins generated during existence of a reading gradient magnetic field along a second direction by phase sensitive detection on a signal of said echo using a reference signal, filtering of the detected signal, and discrete sampling of the filtered signal,

(iv) repeating said steps (i) to (ii) while changing a time-intensity product of said phase encoding gradient magnetic field in a stepwise manner, and

(v) reconstructing an image from data obtained through repetition of said steps, said imaging method further comprising steps of;

(a) designating the size and positions along said first and second directions of a local region to be precisely inspected within said inspection zone;

(b) calculating machine parameters of said system so that said echo reflects nuclear spins only in said local region, the change amount of the time-intensity product of said phase encoding gradient magnetic field corresponding to the width of said local region along said first direction and the frequency of said reference signal corresponding to the position of said local region along said second direction;

(c) effecting said two-dimensional Fourier iamging by said system with the calculated machine parameters; and

(d) completing a cross-sectional image of said local region by separating an image, which is obtained at said step (c), by a separating line along said second direction to obtain separated images and, by exchanging the positions of the separated images.

4,853,637

FLUID CONDUCTIVITY SENSOR FOR ACTUATING AN ELECTROEXPLODING DEVICE

Merrick A. Endres, St. Petersburg, Fla., assignor to Conax Florida Corporation, St. Petersburg, Fla.

Filed Feb. 11, 1987, Ser. No. 13,729

Int. Cl.⁴ G01N *27/02;* **F23Q** *7/02*

U.S. Cl. 324—439 **23 Claims**

1. Apparatus for operating a load in response to a predeter-

mined condition in the electrical conductivity of a fluid comprising:

(a) sensing electrode means adapted to be exposed to the fluid;

(b) sensing circuit means operatively connected to said sensing electrode means for developing a voltage having a magnitude determined by the condition of the electrical conductivity of the fluid to which said electrode means is exposed;

(c) circuit means for providing a reference voltage and having an output;



(d) comparison means having an output having a first input connected to said sensing circuit means and a second input connected to said output of said circuit means providing the reference voltage, said comparison means providing an output signal in response to a predetermined relationship between the voltage developed by said sensing circuit means and said reference voltage; and

(e) operating circuit means connected to said output of said comparison means and to the load for operating the load in response to said output signal from said comparison means.

4,853,638

WATER QUALITY CONTROL METHOD, AND METHOD AND APPARATUS FOR MEASURING ELECTRICAL CONDUCTIVITY USED IN THE WATER QUALITY CONTROL

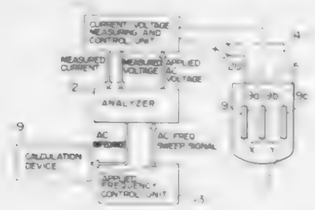
Masao Endou, Hitachi; Yamato Asakura, Katsuta; Atsushi Watanabe, Hitachi; Masaharu Sakagami, Katsuta; Shunsuke Uchida; Makoto Nagase, both of Hitachi; Tsutomu Baba, Katsuta, and Katsumi Ohsumi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 7, 1988, Ser. No. 141,424

Claims priority, application Japan, Jan. 9, 1987, 62-1651; May 13, 1987, 62-114660; Sep. 7, 1987, 62-221916

Int. Cl.[4] G01N *27/06, 27/02*

U.S. Cl. 324—441 **15 Claims**



1. A method of water quality control comprising the steps of:

(a) measuring electrical conductivities of an aqueous solution under measurement at least at a temperature To and a temperature Tn, and obtaining a relationship between the electrical conductivity and the temperature, wherein the measurement temperature To is in a first range, and the measurement temperature Tn is in a second range different from said first range, and at least one value of the electrical conductivity is measured in each of the temperature ranges;

(b) utilizing a determining means to determine a solute substance in said aqueous solution under measurement by applying the relationship obtained in said step (a) to a relationship between a temperature and an electrical conductivity of an individual substance obtained beforehand; and

(c) utilizing an estimating means to estimate a concentration of the substance determined in said step (b) by applying the electrical conductivity at a lowest temperature To among the measurement temperatures in said first temperature range in said step (a) to a relationship between an electrical conductivity and a concentration at the same temperature To with respect to an individual substance obtained beforehand.

4,853,639

NON-CONTACTING VOLTAGE METERING APPARATUS

William Vosteen, Waterport, and Mason F. Cox, Shelby, both of N.Y., assignors to Monroe Electronics, Inc., Lyndonville, N.Y.

Continuation of Ser. No. 917,144, Oct. 9, 1986, abandoned. This application Sep. 7, 1988, Ser. No. 243,120

Int. Cl.[4] G01R *29/12*

U.S. Cl. 324—457 **10 Claims**



1. A non-contacting voltage metering apparatus coupled to a test surface and to a universal reference for monitoring the electrical potential between the test surface and the universal reference, said metering apparatus comprising:

a local reference surface;

an electrode coupled to said reference surface and having an electrode surface and an output terminal, said electrode surface being capacitively coupled to said test surface;

means for modulating the capacitive coupling between said test surface and said electrode surface at a predetermined frequency;

amplifying means having an input and an output for amplifying a voltage present on said electrode output terminal;

an integrator having an input and an output, said integrator input being coupled to said amplifying means output;

a feedback circuit comprising a phase sensitive detector having an input coupled to said integrator output and an output coupled to said integrator input, and a reference terminal coupled to said modulating means for receiving said predetermined frequency, said feedback circuit providing said metering apparatus with D.C. stability to permit said apparatus to exhibit a high frequency response independent of said predetermined frequency; and

a high voltage amplifier having an input coupled to said integrator output and an output connected to said universal reference.

4,853,640

SYNCHROTRON RADIATION SOURCE

Manabu Matsumoto, Ibaraki; Takashi Ikeguchi, Hitachi; Shinjiroo Ueda, Abiko; Tadasi Sonobe, Iwaki; Toru Murashita, Atsugi; Satoshi Ido, Isehara; Kazuo Kuroishi, Hitachi; Yoshiaki Kazawa, Hitachi; Shunji Kakiuchi, Hitachi, and Toshiaki Kobari, Ibaraki, all of Japan, assignors to Hitachi, Ltd.; Nippon Telephone & Telegraph and Hitachi Service Engineering, Ltd., all of Tokyo, Japan

Filed Feb. 11, 1988, Ser. No. 155,120

Claims priority, application Japan, Feb. 12, 1987, 62-28281; Mar. 18, 1987, 62-60981; Jul. 22, 1987, 62-181015

Int. Cl.[4] H05H *13/04;* **H01J** *7/16*

U.S. Cl. 328—235 **16 Claims**



1. A synchrotron radiation source comprising:

a charged particle beam bending duct forming a vacuum chamber through which a charged particle beam circulates and encompassed with a bending electromagnet;

at least one SR guide duct extending from the outer circumferential wall of said bending duct, for guiding synchrotron radiation of the outside of said bending duct;

an SR beam line duct connected said SR guide duct through a gate valve, for guiding the radiation to an object to be worked; and

a vacuum pump disposed on the side, close to an orbit of the charged particle beam, of said gate valve.

13. A synchrotron radiation source according to claim 1 wherein the outer circumferential wall of said bending duct protrudes beyond the outer circumferential edge of said bending electromagnet, and a plurality of vacuum pumps are mounted to said bending duct outwardly of a core forming said bending electromagnet.

4,853,641

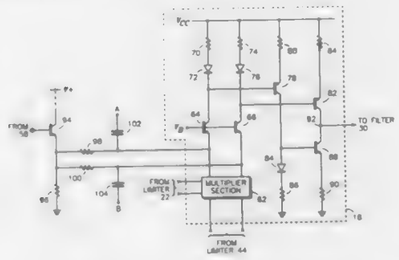
DIFFERENTIAL PHASE REDUCTION CIRCUIT FOR A VIDEO DEMODULATING SYSTEM AND METHOD

Michael McGinn, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 29, 1988, Ser. No. 161,555

Int. Cl.[4] H03D *3/18*

U.S. Cl. 329—50 **6 Claims**



1. In a video demodulating system of a television including an intermediate frequency (IF) filter, a phase locked loop comprising a phase detector and a voltage controlled oscillator (VCO) coupled to the output of the phase detector, a limiter stage coupled between the filter and the phase detector and a video demodulator coupled between the output of the filter and the VCO and having an output, the improvement comprising a circuit for reducing differential phase errors including:

first circuit means resistively coupling the video demodulator output to the phase detector for providing a current proportional to the demodulated video signal appearing at the output of the video demodulator to the phase detector to reduce the differential phase error established through the limiter stage; and

second circuit means capacitively coupling the output of the video demodulator to the phase detector for providing a related current of correct polarity to the phase detector to reduce the differential phase error established by the IF filter.

4,853,642

PHASE CONTROLLED DEMODULATOR FOR DIGITAL COMMUNICATIONS SYSTEM

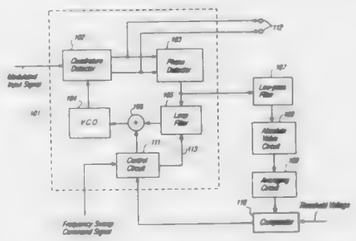
Susumu Otani, and Motoya Iwasaki, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jan. 30, 1988, Ser. No. 213,368

Claims priority, application Japan, Jan. 30, 1987, 62-162668; Dec. 17, 1987, 62-317508

Int. Cl.[4] H03D *3/00*

U.S. Cl. 329—124 **10 Claims**



1. A phase controlled demodulator, comprising:

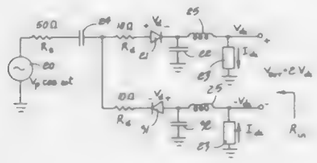
a voltage controlled oscillator for recovering a carrier, means for demodulating a modulated input signal with the recovered carrier to produce demodulated quadrature signals, a phase difference detector, coupled to the demodulating means, for detecting a phase difference between said demodulated quadrature signals, a loop filter connected to the output of said phase difference detector, means for supplying an output signal of said loop filter to said voltage controlled oscillator when said demodulator is phase-locked with a received carrier and supplying a frequency sweep control voltage to said voltage controlled oscillator when said demodulator is out of phase with said received carrier, means for detecting the magnitude of the output of said phase difference detector, and means for comparing the detected magnitude with a predetermined threshold value and terminating said frequency sweep control voltage when said detected magnitude exceeds said threshold value.

4,853,643

HIGH SIGNAL TO NOISE RATIO AMPLITUDE DETECTOR

Earl C. Herleikson, Otis Orchards, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 26, 1988, Ser. No. 263,142
Int. Cl.[4] H03D *1/10*
U.S. Cl. 329—204 10 Claims



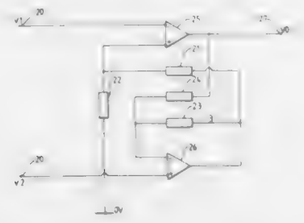
1. A low noise floor amplitude detector for a radio frequency signal, comprising:
a pair of semiconductor diodes oriented oppositely to one another within parallel circuits adapted to be operatively connected to a radio frequency source;
a first capacitor operably connected between one side of one diode and ground;
a second capacitor operably connected between one side of the remaining diode and ground; and
terminating means connected across the parallel circuits for biasing each diode at a predetermined conduction angle causing each diode to conduct in sequence during a predetermined percent of each radio frequency signal cycle while matching the radio frequency load impedance of the amplitude detector to the radio frequency impedance of a signal source, the signal terminating means having an output at which a demodulated signal is produced having an amplitude proportional to the amplitude of any low frequency signal present in a radio frequency signal directed to the amplitude detector.

4,853,644

DIFFERENTIAL AMPLIFIER CIRCUIT

Thomas K. Hemingway, Hertfordshire, United Kingdom, assignor to British Aerospace Public Limited Company, London, England

Filed Feb. 23, 1988, Ser. No. 159,101
Claims priority, application United Kingdom, Feb. 23, 1987, 8704193
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—69 7 Claims



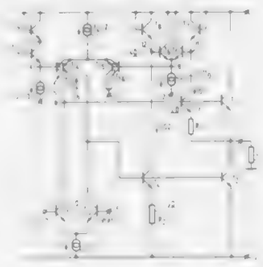
1. A circuit for the differential amplification of a first and a second received signal, the circuit comprising:
first, second, third and fourth electrical conductor portions for receiving said first signal between the first and third portions and said second signal between the second and third portions, the fourth portion being for supplying an output signal of the circuit;
first and second operational amplifiers each having an inverting input, a non-inverting input and an output, the inverting input of the first amplifier being coupled to said first electrical conductor portion, the non-inverting input of the second amplifier being coupled to said second electrical conductor portion, and the output of the first amplifier being coupled to the fourth electrical conductor portion;
first circuit means defining a resistive path having a first resistance value between the non-inverting input of the first amplifier and the output of the second amplifier;
second circuit means defining a resistive path having a second resistance value between the non-inverting input of the first amplifier and said third electrical conductor portion;
third circuit means defining a resistive path having a third resistance value between the inverting input and output of the second amplifier; and
fourth circuit means defining a resistive path having a fourth resistance value between the output of the first amplifier and the inverting input of the second amplifier;
the ratio of the second to the first resistance value being substantially equal to the ratio of the fourth to the third resistance value.

4,853,645

AMPLIFIER ARRANGEMENT WITH QUIESCENT CURRENT CONTROL

Evert Seevinck, Eindhoven; Willem De Jager, Enschede, and Pieter Buitendijk, Nijmegen, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 162,921, Mar. 2, 1988. This application Sep. 26, 1988, Ser. No. 249,623
Claims priority, application Netherlands, Sep. 23, 1987, 8702262
Int. Cl.[4] H03F *3/26*
U.S. Cl. 330—255 20 Claims



1. An amplifier arrangement comprising
a first and a second output transistor each having a first main terminal, a second main terminal and a control terminal, whose main current paths are arranged in series between two power supply terminals and are further coupled to an output for connecting a load,
drive means for driving the first and the second transistor, said drive means having a first output which is coupled to the control terminal of the first transistor and a second output which is coupled to the control terminal of the second transistor,
quiescent current means for causing a quiescent current to flow through the first and the second output transistor, said quiescent current means having first and second current measuring means for generating a first and a second measuring current which are a measure of the current flowing through the first and the second output transistor, respectively, and having feedback means for controlling the quiescent current flowing through the first and the second output transistor by way of the first and the second measuring current,

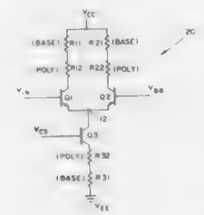
characterized in that the feedback means comprise
a first differential amplifier having a third and a fourth transistor each having a control terminal, a first main terminal and a second main terminal, the second main terminals being coupled to a common point which is coupled to a first current source, the control terminal of the third transistor being coupled to a first point for conveying a voltage which is proportional to the first measuring current and the control terminal of the fourth transistor being coupled to a second point for conveying a voltage which is proportional to the second measuring current,
a reference circuit comprising a second current source and a fifth transistor having a first main terminal, a second main terminal and a control terminal which is coupled to the first main terminal, and
a second differential amplifier having a sixth and a seventh transistor each having at least one first main terminal, at least one second main terminal and a control terminal, the control terminal of the sixth transistor being coupled to the second main terminal of the fifth transistor, the control terminal of the seventh transistor being coupled to the common point of the first differential amplifier, and two of the first main terminals of the sixth and the seventh transistor being coupled to the first and the second output of the drive means.

4,853,646

TEMPERATURE COMPENSATED BIPOLAR CIRCUITS

Terry J. Johnson, Cape Elizabeth, and Timwah Lak, Scarborough, both of Me., assignors to Fairchild Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 19, 1988, Ser. No. 221,322
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—256 14 Claims



1. In a temperature compensated bipolar technology circuit comprising active nodes switching between high and low potential, and active node circuit transistor elements and circuit resistances, the improvement comprising:
each active node circuit resistance comprising a pair of opposite polarity temperature coefficient resistors effectively forming a single functional active node circuit resistance, said pair of opposite temperature coefficient resistors being selected to provide the specified total resistance of the respective active node circuit resistance while substantially temperature compensating and stabilizing the active node during switching over a specified temperature range.

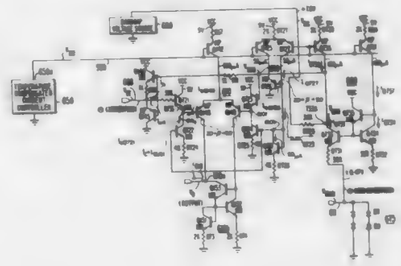
4,853,647

CURRENT GAIN COMPENSATION ARRANGEMENT

Michael L. Low, Old Bridge, and Jack Craft, Bridgewater, both of N.J., assignors to RCA Licensing Corp., Princeton, N.J.

Filed May 2, 1988, Ser. No. 188,996
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—256 13 Claims

1. An amplifier, comprising:
first and second transistors that are coupled to form a differential amplifier;
an input stage coupled at a first junction terminal to a control electrode of said second transistor for establishing a voltage level at said control electrode of said second transistor in accordance with a voltage that is developed at an input terminal of said input stage such that an output current flowing in said input stage is coupled to said first junction terminal;
a source of a first current;
a third transistor having a current gain characteristic that is representative of a current gain characteristic of said second transistor for generating a control electrode current of said third transistor that is combined with said first current to produce a combined second current, said second current having a first portion derived from said first current and a second portion derived from said control electrode current of said third transistor; and



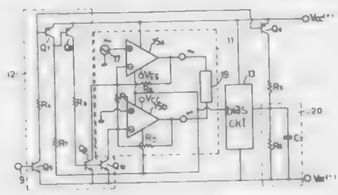
a current mirror arrangement responsive to said second current for generating in said current mirror arrangement a third current that is coupled to said first junction terminal, said third current having a first portion derived from said first current of generating said output current of said input stage and a second portion derived from said control electrode current of said third transistor for generating a control electrode current of said second transistor, wherein a deviation of said current gain characteristic of said second transistor from a nominal value thereof that produces a corresponding deviation in said control electrode current of said second transistor is compensated by said control electrode current of said third transistor so as to substantially prevent such current deviation from affecting said output current of said input stage.

4,853,648

POWER AMPLIFIER CIRCUIT WITH A STAND-BY STATE

Kazuo Imanishi, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jul. 6, 1988, Ser. No. 215,482
Claims priority, application Japan, Jul. 13, 1987, 62-172828
Int. Cl.[4] H03F *3/26, 1/14*
U.S. Cl. 330—273 7 Claims



1. A power amplifier circuit, comprising:
amplifier means responsive to a first power source of a first

potential and a second power source of a second potential, for amplifying an input signal and supplying the amplified input signal to a load; and

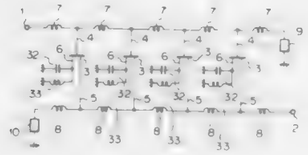
mode switching means for selectively changing the amplifier means between an operational state wherein the amplifier means is supplied with a bias current and the input signal is amplified, and a stand-by state wherein the bias current to the amplifier means is turned off and the input signal is not amplified, including bias means for supplying the bias current to the amplifier means, timing means for delaying the change of the amplifier means to the stand-by state for a predetermined time after the stand-by state is selected by turning off the bias current to the amplifier means after the predetermined time, and means for supplying a predetermined potential to the amplifier means in response to the selection of the stand-by state.

4,853,649

DISTRIBUTED FET AMPLIFIER AND BIAS VOLTAGE SUPPLY CIRCUIT THEREFOR

Kiyoharu Seino; Tadashi Takagi; Fumio Takeda, and Yukio Ikeda, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki, Tokyo, Japan

Filed Feb. 2, 1988, Ser. No. 151,625
Claims priority, application Japan, Feb. 12, 1987, 62-30553
Int. Cl.[4] H03F *3/60*
U.S. Cl. 330—277 29 Claims



1. A distributed FET amplifier comprising an array of FET elements each having a gate terminal, a drain terminal and a source terminal, first inductor means interconnecting the gate terminals of the adjacent FET elements, second inductor means interconnecting the drain terminals of the adjacent FET elements, an input terminal connected to supply a microwave to said array, an output terminal to be supplied with an amplified microwave, a first terminating means connected between the drain terminal of the FET element positioned at the left end of said array and the ground, and a second terminating means connected between the gate terminal of the FET positioned at the right end of said array and the ground, characterized in that capacitor means having a capacitance greater than the gate-source capacitance of each of said FET elements and inductance element means for grounding the direct current are connected in parallel to each other between the source terminal of each of said FET elements and the ground.

4,853,650

SYMMETRIC WAVEGUIDE JUNCTION COMBINER

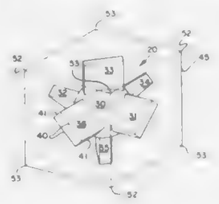
Donald R. Bowling, and Charles F. Smith, both of Ridgecrest, Calif., assignors to The United States of America as represented by The Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1988, Ser. No. 254,554
Int. Cl.[4] H03F *3/60*
U.S. Cl. 330—287 20 Claims

1. A microwave power combiner comprising a body defining;

a hollow, generally spherical combining region, and

a plurality of hollow waveguide regions extending radially from the combining region in mutually orthogonal directions, each waveguide region having a generally rectangular cross section with a pair of shorter sides and a pair of longer sides, the longer sides of each pair of waveguide



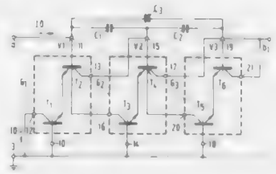
regions which are diametrically opposite the combining region being orthogonally related.

4,853,651

DELAY CIRCUIT WITH ALL-PASS NETWORK

Johannes O. Voorman; Pieter J. Snijder, and Johannes S. Vromans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 8, 1987, Ser. No. 94,471
Claims priority, application Netherlands, Sep. 15, 1986, [illegible]
Int. Cl.[4] H03F *1/34*
U.S. Cl. 330—294 4 Claims



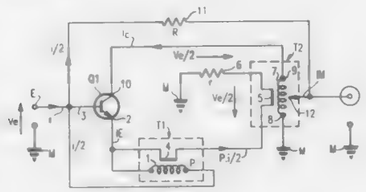
1. A delay circuit comprising at least one all-pass network which has an input terminal for receiving an input signal, an output terminal for supplying an output signal, and a reference terminal for carrying a reference potential and which comprises an at least second-order filter section comprising first, second and third transconductors, which each have a first input, a second input, a first output and a second output, the first input of each of the three transconductors being coupled to the reference terminal, the second input of the first transconductor being coupled to the input terminal, the second input of the second transconductor being coupled to the second output of the first transconductor and to the first output of the third transconductor, the second input of the third transconductor being coupled to the second output of the second transconductor and to the output terminal, said filter section further comprising a first capacitor coupled between the second inputs of the first transconductor and the second transconductor and a second capacitor coupled between the second inputs of the first transconductor and the third transconductor, wherein the filter section further comprises a third capacitor coupled between the second inputs of the second transconductor and the third transconductor, each of the transconductors comprises a linearized differential amplifier comprising at least two emitter-coupled transistors with a bias-current source, the bases of the transistors constituting the first input and the second input and the collectors constituting the first output and the second output, and each of the transconductors comprises two differential amplifiers which are arranged in parallel and which each comprise two transistors having unequal emitter areas, the bases and the collectors of each pair of two transistors having unequal emitter areas being interconnected.

4,853,652

WIDE BAND AND LOW NOISE AMPLIFIER FOR METRIC WAVES

Robert Collin, Cholet, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 17, 1988, Ser. No. 169,461
Claims priority, application France, Mar. 20, 1987, 87 03923
Int. Cl.[4] H03F *1/34*
U.S. Cl. 330—294 5 Claims



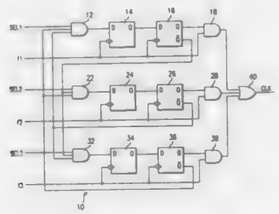
1. A wide band low noise amplifier for metric waves, comprising a transistor connected by its emitter to the ground of the amplifier through two secondary windings, connected in series, of a first and second transformer, and coupled between its base and its emitter by the primary winding of the first transformer, one end of the primary winding of the second transformer being connected to the collector of the transistor, the output signal of the amplifier being taken from all or part of the primary of the second transformer and the number of turns of the secondaries of the transformers being very low so as to limit the leak inductance, and further comprising a first resistor connected in series with the two secondary windings and a second resistor connected between the output of the amplifier and the transistor base.

4,853,653

MULTIPLE INPUT CLOCK SELECTOR

Steven C. Maher, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 25, 1988, Ser. No. 184,849
Int. Cl.[4] H03K *17/16*
U.S. Cl. 331—49 15 Claims



1. A clock selector, comprising:

first and second initial logic gates for receiving, respectively, first and second select signals;

first and second final logic gates for receiving, respectively, first and second oscillator signals;

a first flip-flop connected in series between said first initial and final logic gates;

a second flip-flop connected in series between said second initial and final logic gates; and

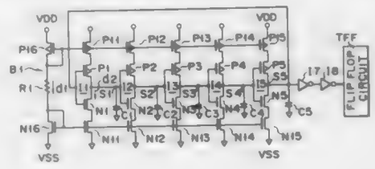
an output from said first flip-flop connected to said second initial logic gate and an output from said second flip-flop connected to said first initial logic gate.

4,853,654

MOS SEMICONDUCTOR CIRCUIT

Takayasu Sakurai, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 13, 1987, Ser. No. 72,443
Claims priority, application Japan, Jul. 17, 1986, 61-168539
Int. Cl.[4] H03B *5/00, 5/24;* H03L *1/00, 1/02*
U.S. Cl. 331—57 20 Claims



1. A MOS semiconductor circuit comprising:

first and second voltage terminals;

cascade-connected logical circuits;

a first MOS transistor circuit having at least one first MOS transistor coupled between said first voltage terminal and the output node of one of said logical circuits;

a second MOS transistor having the same conductivity type as said first MOS transistor and having a gate coupled to a gate of said first MOS transistor and a drain coupled to said gate of said second MOS transistor; and

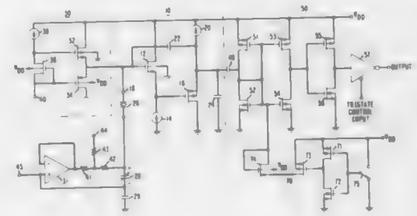
a current control circuit including a polysilicon resistor coupled to said drain of said second MOS transistor, for causing a predetermined current to flow through the source-drain path of said second MOS transistor.

4,853,655

HIGH FREQUENCY CMOS OSCILLATOR

David M. Embree, Hampstead, N.H., and Shawn M. Logan, Andover, Mass., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 27, 1987, Ser. No. 126,131
Int. Cl.[4] H03B *5/36*
U.S. Cl. 331—116 FG 9 Claims



1. An electronic oscillator comprising:

a first amplifying stage having a first CMOS transistor;

a second amplifying stage having a second transistor of opposite polarity from said first CMOS transistor; and feedback means connected between the output of said second stage and the input of said first stage;

characterized in that said first stage is connected in source follower configuration; and

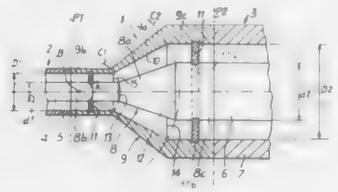
the gain of said second stage is substantially greater than that of said first.

4,853,656

DEVICE FOR CONNECTING TOGETHER TWO ULTRA-HIGH FREQUENCY STRUCTURES WHICH ARE COAXIAL AND OF DIFFERENT DIAMETERS

Bernard P. Y. Guillou, Aubin du Medoc, and Pierre V. A. Lahitte, Salaunes, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Bld DeMontmorency, France

Filed Jul. 29, 1988, Ser. No. 225,784
Claims priority, application France, Aug. 3, 1987, 87 11010
Int. Cl.[4] H03H 7/38; H01P 5/103
U.S. Cl. 333—34 11 Claims



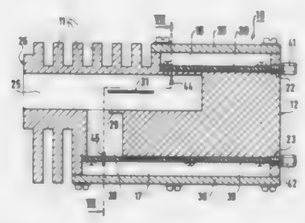
1. A tapered, coaxial device for connecting together two ultra-high frequency coaxial structures of different diameters, each of said coaxial structures being formed of a central core and a peripheral sheath, said tapered, coaxial device comprising a central core in the shape of a truncated cone, whose circular bases have sections respectively identical to those of the central cores of said coaxial structures to be connected together, as well as a peripheral sheath, whose internal wall is a truncated cone shaped surface, whose circular bases have sections respectively identical to the internal sections of the peripheral sheaths of said coaxial structures to be connected together, wherein the small bases of the truncated cones of said central core and of said peripheral sheath are two parallels of the same sphere centered on the apex of the truncated cone surface of said internal wall and the large bases of the truncated cones of said central core and of said peripheral sheath are two parallels of a second sphere concentric to the first one.

4,853,657

ORTHOGONAL-POLARIZATION DUPLEX SEND-RECEIVE MICROWAVE HEAD

Jean-Claude Cruchon, Bouffemont; Franck Fontaine, Nogent Sur Marne, and Michel Brugidou, Le Vesinet, all of France, assignors to Societe anonyme dite: Alcatel Thomson Faisceaux Hertziens, Cedex, France

Filed Jun. 16, 1988, Ser. No. 207,564
Claims priority, application France, Jun. 18, 1987, 87 08520
Int. Cl.[4] H01P 1/161, 5/16
U.S. Cl. 333—137 8 Claims



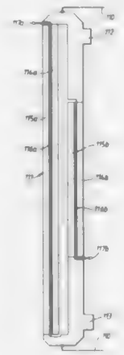
1. An orthogonal polarization duplex send-receive microwave head comprising: an elongate housing provided at one end with a longitudinal bore extending partially through said housing and terminating in an inside end and forming a first waveguide, a transverse bore forming a second waveguide having a free end and an end opening out into the first waveguide, a receive antenna situated in said first waveguide at a location between the inside end of said first waveguide and the location at which said second waveguide opens out therein, a transmit antenna situated in the second waveguide at said free end, a coaxial connector connected respectively to each of said antennas, and a metal plate disposed longitudinally in the first waveguide between two transverse planes containing the two antennas.

4,853,658

MICROWAVE PHASE SHIFTERS

Anthony A. Lane, Northampton, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Jun. 27, 1988, Ser. No. 211,705
Claims priority, application United Kingdom, Aug. 6, 1987, 8718651
Int. Cl.[4] H01P 9/00, 1/18, 5/04
U.S. Cl. 333—164 5 Claims



1. A transmission line, for transmitting microwave signals in which it is desired to produce a predetermined substantially constant phase shift, comprising two Gallium Arsenide Field Effect Transistor, in parallel, serially included in the line, a first section of the line terminating at the source electrodes of the two transistors and a second section of the line originating at the drain electrodes of the two transistors, and control means for applying a potential to the gate electrode of the first or the second transistor to switch the transistor on or off, as required, to introduce a shift of phase in a transmitted microwave signal.

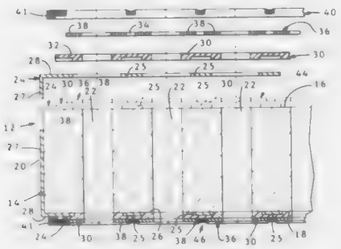
4,853,659

PLANAR PI-NETWORK FILTER ASSEMBLY HAVING CAPACITORS FORMED ON OPPOSING SURFACES OF AN INDUCTIVE MEMBER

John P. Kling, Mt. Joy, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 17, 1988, Ser. No. 169,513
Int. Cl.[4] H01P 13/648
U.S. Cl. 333—184 10 Claims

1. A planar filter assembly comprising:
a generally planar inductive member having upper and lower surfaces and a plurality of apertures for receiving electrical terminal members therethrough, said apertures extending between said surfaces;
first electrically conductive layers respectively disposed on first selected locations of said upper and lower surfaces, said first conductive layers being spaced from respective ends of said apertures to provide respective exposed upper and lower surface portions about said apertures, said first conductive layers on said respective upper and lower surfaces being adapted to be electrically engageable with grounding means;
dielectric layers respectively disposed on said first conductive layers and extending over said exposed upper and lower surface portions about said apertures; and
second electrically conductive layers respectively disposed on isolated second selected locations on said dielectric layers and extending to respective ends of said apertures and overlying respective said dielectric layers thereby forming respective conductive pad portions surrounding said ends of said apertures, each said pad portion being capable of being electrically engaged with an electrical



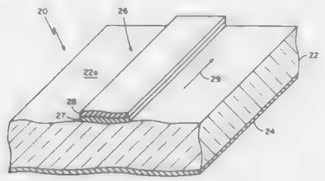
terminal member upon insertion thereof into the aperture associated with said pad portion;
said first conductive layers, dielectric layers and second conductive layers thus forming a plurality of respective pairs of upper and lower capacitors, one capacitor pair being formed at respective ends of each said aperture;
whereby each respective pair of capacitors and said inductive member therebetween forms a pi-network filter with an electrical terminal member upon insertion thereof into said aperture associated therewith.

4,853,660

INTEGRATABLE MICROWAVE DEVICES BASED ON FERROMAGNETIC FILMS DISPOSED ON DIELECTRIC SUBSTRATES

Ernst F. R. A. Schloemann, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 30, 1988, Ser. No. 213,669
Int. Cl.[4] H01P 1/203, 1/11, 7/08
U.S. Cl. 333—204 22 Claims



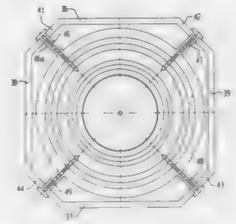
1. A microwave circuit element, comprising:
a dielectric substrate;
a ground plane conductor disposed over a first surface of said substrate;
a patterned composite strip conductor disposed over a second opposing surface said substrate, said patterned composite strip conductor, comprising:
a first layer comprising a magnetic material disposed on said substrate and having a pair of easy axes disposed in the plane of said second opposing surface of said substrate;
a second layer of a conductive nonmagnetic material, disposed over said layer of magnetic material;
means for providing a magnetic field parallel to at least a portion of said pattern composite strip conductor; and wherein said patterned, composite conductor is disposed parallel to one of the easy axis of said magnetic material.

4,853,661

SUPERCONDUCTING MAGNET WITH SEPARATE SUPPORT SYSTEM

Alex Palkovich, Oxford, United Kingdom, assignor to Elscint Ltd., Haifa, Israel

Filed Jun. 17, 1988, Ser. No. 207,860
Claims priority, application Israel, Jun. 22, 1987, 82950
Int. Cl.[4] H01F 7/22
U.S. Cl. 335—216 11 Claims



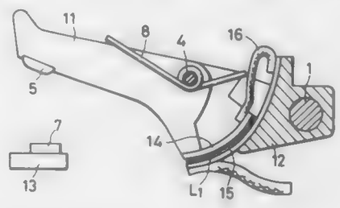
1. A superconducting magnet arrangement for MRI systems comprising:
a vacuum vessel,
a liquid helium vessel within said vacuum vessel,
magnetic coils for accomplishing magnetic resonance imaging (MRI), said coils being located within said liquid helium vessel,
a nitrogen vessel within said vacuum vessel located further from the center of said vacuum vessel than said helium vessel,
said vacuum vessel functioning to maintain an internal vacuum but being non-supportive of the vessels therein and separate from the vessels therein, and
separate support means attached to said vacuum vessel for supporting said vacuum vessel and the contents of said vacuum vessel.

4,853,662

CONTACTOR APPARATUS

Kiyoshi Kandatsu, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Oct. 28, 1987, Ser. No. 113,521
Claims priority, application Japan, Oct. 29, 1986, 61-257520
Int. Cl.[4] H01H 3/00
U.S. Cl. 335—185 5 Claims



1. A contactor apparatus, comprising:
a contactor support having a first conductor portion;
a movable contactor arm, having a contact portion and a second conductor portion pivotably mounted on said support to pivot between an open and closed position;
a fixed contact disposed to be engaged by said contact portion of said movable contactor arm in the closed position

and separated from said contact portion in the open position;

said first and second conductor portions having opposing respective convex or concave surfaces, said surfaces being movable relative to one another and spaced from each other during pivoting of said contactor arm between said open or closed position;

means for connecting said first conductor portion adjacent one end thereof to a voltage source; and

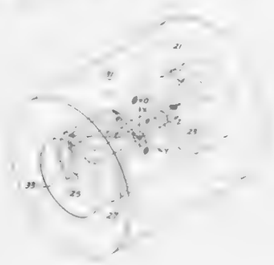
a flexible conductor connecting said first conductor portion adjacent the end opposite the connecting means to the second conductor portion adjacent said opposite ends of the first conductor portion for reversing the direction of current flow between the first conductor portion and the movable contactor arm.

4,853,663

PASSIVE SHIMS FOR CORRECTION OF (3,2) AND (3,-2) HARMONIC TERMS IN MAGNETIC RESONANCE MAGNETS

Mark E. Vermilyea, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1988, Ser. No. 288,346
Int. Cl.[4] H01F *7/00*
U.S. Cl. 335—301 **12 Claims**



1. A shim set for passively shimming (3,2) and (3,−2) harmonic terms in the field of a magnetic resonance magnet having a cylindrical bore, comprising:

four shims of ferromagnetic material, each of said shims being the same size and secured to the cylindrical bore of the magnet, each of the shims being longer than they are wide, the first two of said shims being situated diametrically opposite one another towards one end of the cylindrical bore, with the length of each of the shims extending circumferentially, one of the first two shims being situated to create a polar angle between the axial centerline of the cylindrical bore and a line passing through the center of the cylindrical bore and the center bf the first of the two shims, of about 30–44° , the second two of the four shims symmetrically positioned about the midplane of the cylinder relative to the first two shims and then rotated 90°.

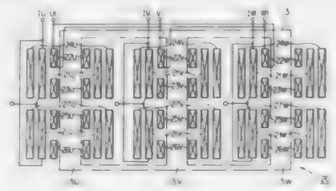
4,853,664

THREE-PHASE TRANSFORMER FOR CYCLOCONVERTER

Masakatsu Asakura, Ako, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 26, 1987, Ser. No. 112,215
Claims priority, application Japan, Dec. 22, 1986, 61-303816
Int. Cl.[4] H01F *33/00*
U.S. Cl. 336—12 **3 Claims**

1. A three-phase transformer for a cycloconverter comprising three inputs, each input for receiving one of the phases of a three-phase input current, and eighteen outputs, the outputs comprising six output groups, each output group having three members, for supplying six three-phase output currents, wherein each of said inputs comprises one of the primary windings of said transformer and each of said outputs comprises one of eighteen secondary windings of said transformer, six of said secondary windings being electromagnetically coupled to each of said primary windings, and wherein each output group includes three interconnected secondary windings, each of said secondary windings in an output group being electromagnetically coupled to a different one of said three primary windings whereby DC components of the three-phase current supplied in each of said output groups cancel.

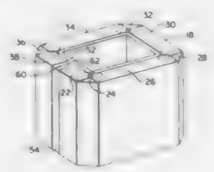


4,853,665

NOISE SUPPRESSING ISOLATION TRANSFORMER

John Olesak, Elkhorn, Wis., assignor to General Signal Corporation, Stamford, Conn.

Filed Oct. 28, 1988, Ser. No. 264,474
Int. Cl.[4] H01F *15/04*
U.S. Cl. 336—84 C **25 Claims**



1. A transformer apparatus which comprises:

a core;

first and second coils which are magnetically coupled to said core, each coil being generally cylindrical and having a circumferential surface and first and second axial extremities; and

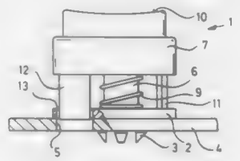
shield disposed around at least said first coil comprising a web shaped metallic, non-magnetic, electrically conductive generally rectangular member, said member having a first portion extending around substantially the entire circumferential extent of said one coil, said member further including second and third portions extending respectively about a substantial portion of each of said first and second axial extremities said second and third portions include a plurality of slits whereby rectangular tabs are defined in each of said second and third portions.

4,853,666

PUSH BUTTON FOR AN INDUCTIVE VALUE INPUT KEYBOARD

Hugo Feecameier, Braünlingen; Oskar Zumkeller, Villingen-Schwenningen; Werner Schneider, and Hans Grieser, both of Oberndorf, all of Fed. Rep. of Germany, assignors to Mannesmann Kienzle GmbH, VS-Villingen, Fed. Rep. of Germany

Filed May 31, 1988, Ser. No. 200,623
Claims priority, application Netherlands, May 29, 1987, 8707707
Int. Cl.[4] H01F *21/00*
U.S. Cl. 336—130 **7 Claims**



1. A push button and printed circuit board for an inductive value input keyboard, comprising:

a push-button socket;

a push-button head guided in the push-button socket;

a compression spring which acts between the push-button socket and the push-button head;

stop means which limits the stroke of the push button in the non-actuated state; and

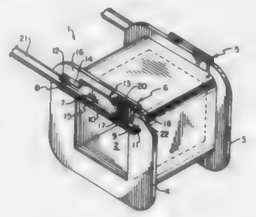
a rod-shaped iron core fastened to the push-button head for interaction with an induction coil formed by conductor paths upon the printed circuit board on which the push button is arranged, wherein a sleeve is molded at the push-button head, the sleeve having a non-cylindrical aperture therethrough and being elastically deformable transverse to its axis within which the iron core is clamped.

4,853,667

WIRE ROBBIN FOR INDUCTIVE DEVICES

Lothar Freimuth, Franklin Lakes, N.J., and Raymond H. Van Wagener, Darien, Conn., assignors to Magnetek Universal Manufacturing Corp., Paterson, N.J.

Filed Apr. 28, 1988, Ser. No. 187,369
Int. Cl.[4] H01F *15/10*
U.S. Cl. 336—192 **7 Claims**



1. A wire bobbin for an inductive device which includes a central core about which a wire is windable, including at least one side wall disposed normal to the central core for retaining the wire on the core, with the wire being windable about the core and having an end which is extendable through a passage in the side wall, with the end being connectable to a lead wire, the wire bobbin further including end termination means on at least one side wall comprising:

a first channel disposed on the side wall, parallel thereto, and sized to retain a lead wire therein, the channel being open at one end and having an end wall at the other end, the end wall having an aperture sized to pass a stripped lead wire end therethrough;

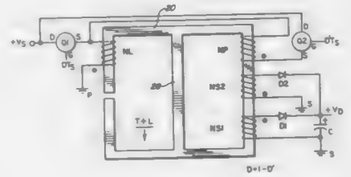
a second channel adjacent to the first channel and in communication with the first channel through the apertured end wall of the first channel, the wire extendable through the passage in the side wall, into the second channel, wherein a lead wire is disposable within the first channel and the stripped lead end is extendable through the aperture, with the lead wire end being combinable with the wire end, the combined wires being bendable into a U-shape and positionable in the second channel both of the channels being generally U-shaped in cross section with an open lateral side, and the second channel is essentially L-shaped with a short leg adjacent the first open end.

4,853,668

INTEGRATED MAGNETIC CONVERTER CORE

Gordon E. Bloom, 115 Duran Dr., San Rafael, Calif. 94903

Filed Dec. 23, 1987, Ser. No. 137,548
Int. Cl.[4] H01F *27/24*
U.S. Cl. 336—214 **28 Claims**



16. In a power converter with integrated magnetics, a core having only two winding windows comprising: two ferrite core parts which when brought together form said core having in cross-section two winding windows of unequal area, at least one of said core parts having one leg which is adapted to carry the windings of a transformer about its winding axis, having another leg which has a winding axis which is parallel to and spaced apart from said winding axis of said one leg and which is adapted to carry the windings of an inductor, and having coupled means, generally surrounding the exterior of said one leg and said another leg, for magnetically coupling and shielding said one leg and said another leg, the windings of said transformer passing through the smaller winding window and the windings of said inductor passing through the larger winding window, said one leg having a cross-sectional area less than that of said another leg.

4,853,669

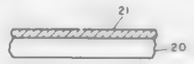
SEALED CAVITY SEMICONDUCTOR PRESSURE TRANSDUCERS AND METHOD OF PRODUCING THE SAME

Henry Guckel, and David W. Burns, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 855,806, Apr. 24, 1986, Pat. No. 4,744,863, which is a continuation-in-part of Ser. No. 727,909, Apr. 26, 1985, abandoned. This application Mar. 29, 1988, Ser. No. 174,821

Int. Cl.[4] G01L 1/22

U.S. Cl. 338—4 13 Claims



1. A pressure transducer structure comprising:
(a) a substrate having an upper surface;
(b) a layer of soiled material on the substrate upper surface having a central portion defining a deformable membrane which is spaced from the substrate to define a cavity between the membrane and the substrate, and having peripheral portions bonded to the upper surface of the substrate with channels extending through the peripheral portions from the cavity to the perimeter of the layer; and
(c) solid material deposited from a gas phase of the material in the channels and the cavity in the layer which seals the channels such that atmospheric gases cannot enter or exit the cavity through the channels.

4,853,670

SURGE ARRESTER

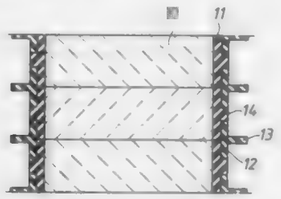
Peter Stengard, Ludvika, Sweden, assignor to Asea Brown Boveri AB, Vasteras, Sweden

Filed Feb. 19, 1988, Ser. No. 159,036

Claims priority, application Sweden, Feb. 23, 1987, 8700732

Int. Cl.[4] H01C 7/10

U.S. Cl. 338—21 9 Claims



1. A surge arrester comprising, an active part including at least one substantially cylindrical surge arrester element of metal oxide varistor material arranged between two end fittings, and a retaining part including at least one rod of insulating material extending between the end fittings for mechanically holding the surge arrester together, both the active part and the retaining part being exposed to the environment surrounding the surge arrester, means on the active part and on the retaining part for together providing an extended creep distance between the end fittings, said means on said retaining part being defined by said rod having external threads such that the creep distance therealong between the end fittings of the surge arrester is at least 30% longer compared to a corresponding rod having a smooth circular-cylindrical shape.

4,853,671

ELECTRIC LAMINAR RESISTOR AND METHOD OF MAKING SAME

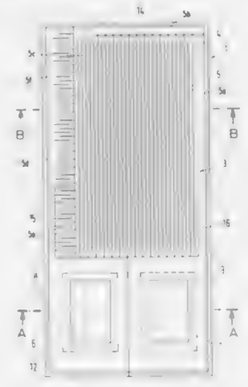
Kristian Iversen, Sonderborg, and Per G. Zacho, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Jun. 27, 1988, Ser. No. 211,991

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1987, 3722576

Int. Cl.[4] H01C 1/012

U.S. Cl. 338—308 6 Claims



1. An electric laminar resistor, comprising a substrate having a first surface made of an electrical non-conductive material, an electrically conductive film on the substrate having separating recesses to form a meandering resistance track that has a first and a second end and a first and a second connecting zone connected to the track first and second end respectively, each zone having at least one connecting recess opening therethrough that opens to the substrate first surface, and a first and a second conductive element covering the first and second zone respectively opposite the substrate, the first and second conductive element each having a portion extended through the first and second connecting recess respectively and adhered to the substrate first surface and a protective layer adhered to the substrate and covering the conductive film.

4,853,672

STEERING ANGLE DETECTOR

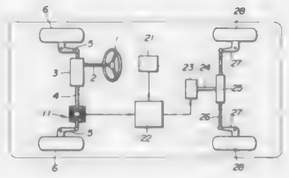
Toru Yasuda; Yoshimichi Kawamoto; Masaru Abe, and Takashi Kohata, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1987, Ser. No. 88,909

Claims priority, application Japan, Aug. 22, 1986, 61-196703; Feb. 25, 1987, 62-26965[U]

Int. Cl.[4] B60Q 1/00

U.S. Cl. 340—465 12 Claims



1. A steering angle detector in a vehicle body including knuckle arms for rotatably supporting steerable wheels, comprising:
a rod member extending substantially transversely of the vehicle body and axially movable in response to steering action of the vehicle body, opposite ends of said rod member being connected to said knuckle arms;
a metallic core mounted around or mounted directly on said rod member; and
primary and secondary coils disposed around said core in slightly spaced relation thereto.

4,853,673

SHIFT INDICATOR SYSTEM FOR VEHICLE

Yoshinobu Kido, and Toshihiro Yamada, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Tokyo, Japan

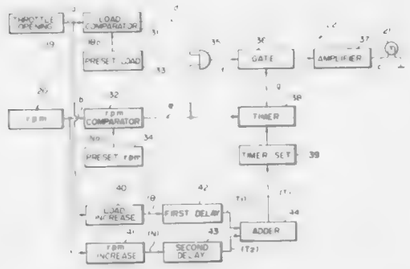
Filed Jul. 29, 1986, Ser. No. 890,289

Claims priority, application Japan, Jul. 30, 1985, 60-169308

The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.

Int. Cl.[4] B60Q 1/00

U.S. Cl. 340—439 13 Claims



1. A shift indicator system for a vehicle comprising an engine speed detecting means, an engine speed comparator means for comparing the engine speed detected by the engine speed detector with a preset value, an indicating means which provides an indication for directing upshifting when the engine speed is not lower than the preset value, a delay means for inhibiting the indicating means from providing the indication for directing upshifting for a predetermined time interval, an engine speed increasing rate detecting means for detecting the rate of increase of the engine speed, an engine load increasing rate detecting means for detecting the rate of increase of the engine load, and a delay time setting means which receives outputs of the engine speed increasing rate detecting mans and the engine load increasing rate detecting means, and comprises a first correction means for making the predetermined time interval shorter as the engine speed increasing rate increases and a second correction means for making the predetermined time interval longer as the engine load increasing rate increases.

4,853,674

SIGNALLING APPARATUS FOR HEARING IMPAIRED PERSONS

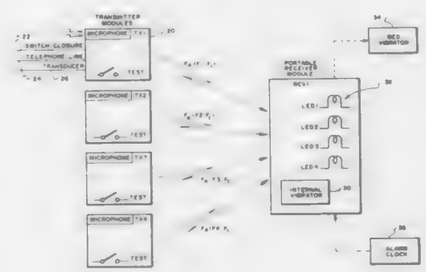
Michael Z. Kiss, 1116-A 8th St., Suite 245, Manhattan Beach, Calif. 90266

Continuation-in-part of Ser. No. 887,272, Jul. 21, 1986. This application Jun. 18, 1987, Ser. No. 63,651

Int. Cl.[4] G08B 3/00

U.S. Cl. 340—407 9 Claims

1. A system useful by hearing impaired persons for monitoring a predetermined set of events to nonaudibly signal the occurrence of one of said events, said system comprising:
a first transmitter module including means responsive to the occurrence of a monitored event for producing an RF carrier signal of frequency F_R modulated by an identification signal of frequency F1 and a common signal of frequency F_C;
a second transmitter module including means responsive to the occurrence of a monitored event for producing an RF carrier signal of frequency F_R modulated by and identification signal of frequency F2 and a common signal of frequency F_C;
a receiver module packaged in a pocket sized unit which can be readily carried by a hearing impaired person, said receiver module including first and second visual signalling means and analog circuit means responsive to an RF carrier signal of frequency F_R modulated by signals of frequencies F1 and F_C for activating said first visual signalling means and responsive to an RF carrier signal of frequency F_R modulated by signals of frequencies F2 and F_C for activating said second visual signalling means;
said analog circuit means including RF detecting means and modulating signal decoding means, said decoding means including a signal F_C decoder circuit, a signal F1 decoder circuit, and a signal F2 decoder circuit;
battery means mounted in said receiver module package for supplying electric energy;



means connecting said battery means to substantially continually power said RF detecting means and said signal F_C decoder circuit while in a standby state;
means for activating said signal F_C decoder circuit responsive to an RF carrier signal of frequency F_R modulated by said signal of frequency F_C;
switch means responsive to the activation of said signal F_C decoder circuit for connecting said battery means to power said signal F1 and F2 decoder circuits;
means for activating said signal F1 decoder circuit responsive to an RF carrier signal of frequency F_R modulated by said signal F1 to illuminate said first visual signalling means; and
means for activating said signal F2 decoder circuit responsive to an RF carrier signal of frequency F_R modulated by said signal F2 to illuminate said second visual signalling means.

4,853,675

APPARATUS FOR DETERMINING IMPACT FORCE UPON A VEHICLE IN TRAVELING A CURVE

Asa D. Foster, 5947 Xerxes Ave. S., Minneapolis, Minn. 55410

Filed May 12, 1988, Ser. No. 193,729

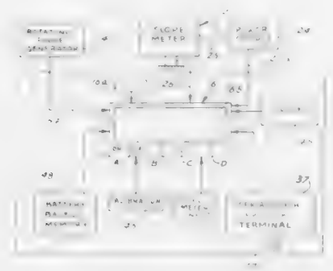
Int. Cl.[4] B60Q 1/00

U.S. Cl. 340—429 7 Claims

1. An electronic apparatus mounted upon a vehicle measuring the ilt of the vehicle and the impact force upon the vehicle in passing through a curve to ascertain the upper safe speed limit of travel therethrough for the purpose of posting the curve, having in combination
speed detecting means having an operating connection with the transmission of the vehicle generating timed electrical pulses indicating distance traveled responsive to the rotation of the drive shaft of the vehicle,
a tilt indicating means carried by said vehicle sensing the tilt of the vehicle at each different rate of speed in passing through a curve,

a microprocessor in circuit with said speed detecting means and said tilt indicating means,

said microprocessor having an internal clock and a calibration table counting said pulses to ascertain the distance traveled and the speed of travel, said pulses having first been counted over a pre-measured distance to determine the distance of travel indicated by each pulse.



said microprocessor having a tilt input table interpreting the sensed tilt of said vehicle at each different speed as a degree of tilt, and

said microprocessor outputting a composite factor indicating impact force in digital form and representing the degree of safety experience, in passing through a curve.

4,853,676

SECURITY DEVICE

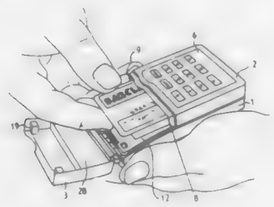
Jacques B. Kitts, South Croydon, England, assignor to Cardgard Ltd., Gloucester, England

Filed Mar. 23, 1988, Ser. No. 172,327

Claims priority, application United Kingdom, Mar. 27, 1987, 8707339

Int. Cl.[4] E05B *45/06*; H01H *47/00*

U.S. Cl. 340—543 **16 Claims**



1. A security device arranged to hold at least one credit card, charge card, cash card and the like comprising a container having a lid, at least one compartment for cards in said container, locking means arranged to secure said lid to said container until said locking means are released, a waterproof pyrotechnic solution coated on the internal surfaces of said at least one compartment for destroying said cards, trigger means arranged to be activated by said locking means for triggering said pyrotechnic solution, and counting means for permitting a predetermined number of incorrect attempts at operating said locking means before said locking means activates said trigger means to trigger said pyrotechnic solution.

4,853,677

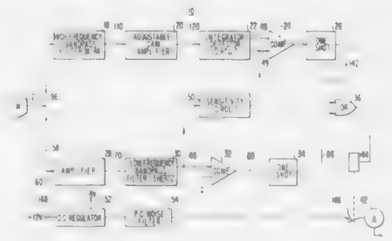
PORTABLE INTRUSION ALARM

Alfred E. Yarbrough, 1194 Hondo, DCBE, Granbury, Tex. 76048, and Jerry O. Ball, 6315 Rosemont, Fort Worth, Tex. 76116

Filed Jul. 20, 1988, Ser. No. 221,615

Int. Cl.[4] G08B *13/20*

U.S. Cl. 340—544 **13 Claims**



1. An intrusion alarm system, comprising:

a microphone operative to detect changes in ambient atmospheric pressure;

low frequency filter means responsive to the detected ambient pressure changes operative to generate an output at times when the frequency of the pressure changes correspond to the opening of either a door or window;

first circuit means responsive to the output of the low frequency filter means operative to generate a first output signal upon the detected pressure changes reaching a first predetermined threshold;

high frequency filter means responsive to the detected atmospheric pressure changes operative to generate an output at times when the frequency of the detected pressure changes correspond to the sound of breaking glass;

second circuit means responsive to the output of the high frequency filter means operative to generate a second output signal upon the detected pressure changes reaching a second predetermined threshold;

sensitivity circuit means responsive to the output of the low frequency filter means for decreasing effectively the second predetermined threshold; and

alarm circuit means responsive to either one of the first and second output signals for generating a discernible alarm.

4,853,678

ADVERTISING DEVICE

Chester O. Bishop, Jr., 218 Don Buck Rd., Massey; Malcolm I. Dennis, 20 Cadman Ave., One Tree Hill; Peter S. Riley, 41 Finch St., Mt. Albert; Christopher C. Richardson, 14 St. Leonards Rd., Kelston, and Vincent P. Shaw, 6 Metcalfe Rd., Ranui, all of Auckland, New Zealand

Filed Feb. 1, 1988, Ser. No. 149,076

Claims priority, application New Zealand, Feb. 5, 1987, 219198

Int. Cl.[4] G08B *23/00*

U.S. Cl. 340—573 **3 Claims**

1. An advertising apparatus comprising:

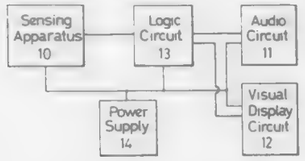
(a) a casing;

(b) a power source arranged in said casing;

(c) passive infra-red detection means arranged within said casing and connected with said power source for detecting the presence of at least one person in an area of detection comprising a substantially triangular field having an apex at said detection means, and an angle of at least 5 degrees at said apex;

(d) display means connected with said casing and said power source, said display means being directed toward said area of detection; and,

(e) control means arranged in said casing and connected with said display means for activating and controlling said display means in response to operation of said detection means,



whereby said display means is operable to display a message to an individual when the individual enters said area of detection.

4,853,679

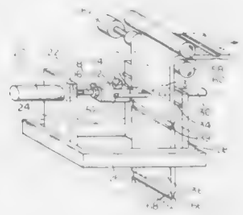
METHOD AND APPARATUS FOR DETECTING SURFACE DISCONTINUITIES

Stanislaw K. Duda, 205 Pavonia Ave., Jersey City, N.J. 07302

Filed Apr. 1, 1988, Ser. No. 176,424

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—675 **7 Claims**



1. In a machine having a frame and a sensing device mounted on the frame for providing a signal in the presence of a surface discontinuity in fabric transported through the device, the improvement comprising:

a. a metallic fabric follower positioned on one surface of the fabric;

b. means for biasing the follower toward the fabric;

c. sensing means for monitoring the distance between itself and said follower and providing a signal when said distance changes.

4,853,680

GROOVE CUTTING TOOL BREAK EVENT DETECTING METHOD AND SYSTEM

Charles E. Thomas, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 12, 1988, Ser. No. 142,979

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—680 **2 Claims**

1. A system for detecting cutting tool break events while machining a groove in a workpiece comprising:

(a) means positioned on a machine tool for sensing vibrations generated at the interface of a carbide groove tool and workpiece and converting said vibrations to an electrical analog signal;

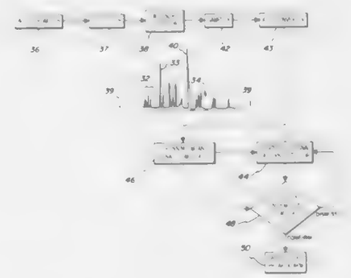
(b) processing means for filtering said analog signal to discriminate against low frequency machine noise, and to rectify and detect the energy of said signal in a band around a resonant frequency of the vibration sensing means and to provide a unipolar output signal;

(c) means for sampling said unipolar output signal and converting each sample to digital form;

(d) digital means for detecting major groove tool break events capable of marring the workpiece in which a groove is being machined, including computation means for calculating a running mean signal level of a preselected number of previous signal samples, a suspicious signal pattern detector to detect a consecutive series of several signal samples having an increase in signal level that is a predetermined multiple above the running mean signal level and may have its source in a major groove tool break event, and a suspicion configuration/dismissal logic circuit to compare the running mean signal level before and after detection of a suspicious signal pattern and confirm the suspicion when there is a shift in the running mean signal level that exceeds prechosen limits and persists for longer than a predetermined confirmation period, and otherwise dismissing the suspicion; and

(e) means for generating a groove tool break alarm after confirming the suspicion;

wherein said shift in the running mean signal level to confirm the suspicion is biased to be more sensitive to level drops than to level increases.



4,853,681

IMAGE FRAME COMPOSING CIRCUIT UTILIZING COLOR LOOK-UP TABLE

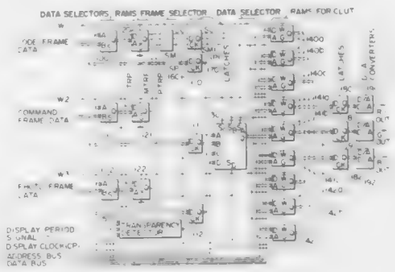
Shigekazu Takashima, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 10, 1987, Ser. No. 72,227

Claims priority, application Japan, Jul. 17, 1986, 61-166640; Sep. 29, 1986, 61-228243

Int. Cl.[4] G09G *1/28*

U.S. Cl. 340—703 **6 Claims**



1. An image frame composing circuit comprising:

first input means, for individually inputting the data of a plurality of image frames, the data of each frame representing entry addresses capable of causing a predetermined number of color designations including transparency designation;

second input means, for inputting color value data representing a plurality of primary color signals corresponding to the predetermined number of colors designated by said entry addresses;

a plurality of look-up table means for setting said color value data from said second input means in a predetermined address, addressable one by one, by said entry addresses from said first input means for each primary color, corresponding to said plurality of image frames;

transparency designation detect means for outputting a transparency designation signal when a predetermined value corresponding to said transparency designation is detected from said color value data from said second input means;

a plurality of transparency designation storing/read-out means for storing said transparency designation signal from said transparency designation detect means in the same address as that for said plurality of primary color signals to be set in said plurality of look-up table means, corresponding to said plurality of image frames, and for reading out the transparency designation signal stored, when the data of said plurality of image frames from said first input means correspondingly accesses an entry address corresponding to said transparency designation;

frame select means for outputtng a frame select signal, to select an image frame to be displayed for each pixel, according to said transparency designation signals read out from said plurality of transparency designation storing/-read-out means and the display priorities order of said plurality of image frames from said first input means;

data select means for selecting an entry address, corresponding to said image frame to be displayed, from the data of said plurality of image frames from said first input means, according to said frame select signal from said frame select means, for accessing said plurality of look-up table means by means of the entry address selected, and for activating only the look-up table means corresponding to said image frame to be displayed according to said frame select signal from said frame select means; and

data composing means for composing output signals from said plurality of look-up table means for each primary color, to output a plurality of primary color signals of said image frame to be activated and displayed.

4,853,682

DATA STORED DISPLAY DEVICE

Kazuhiro Asano; Yosuke Yoshida; Yoichi Fujioka; Kazuhisa Takazawa; Masao Ishizaki; Yasuo Sakami, and Junichi Tsubouchi, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Japan

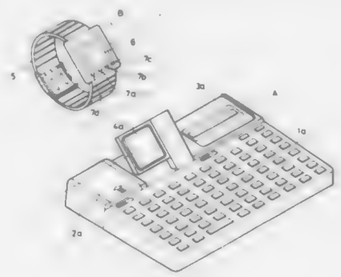
Continuation of Ser. No. 607,419, May 7, 1984, abandoned. This application Dec. 11, 1987, Ser. No. 132,718

Claims priority, application Japan, May 6, 1983, 79794; May 6, 1983, 79795; May 6, 1983, 79796

Int. Cl.[4] G09G *3/00*

U.S. Cl. 340—706 **8 Claims**

1. A data storing means for storing data and for displaying said data at the request of an operator, comprising: a portable data display device for displaying data, said display device including a casing having a front face and a rear face spaced from the front face, first memory means for storing a control program, a first processing unit for generating control signals according to said control program and control signals from the outside, first receiving and transmitting means disposed within the casing for receiving airwave data and control signals from the outside and for transmitting data and control signals to the outside by airwave and having a first coil comprised of loops lying in a plane which is opposed to the rear face, a first capacitor connected electrically in parallel with said first coil, first modulating means for modulating data and control signals to electric signals to be transmitted to the outside, first demodulating means for demodulating electric signals generated by said first coil to data and control signals, and first switching means responsive to said first processing unit for activating said first demodulating means, second memory means for storing said data received by said first processing unit, switch means for requesting said first processing unit to display said data stored in said second memory means, display control means coacting with said first processing unit for generating display control signals representative of said data stored in said second memory means, and display means disposed adjacent to the front face in the casing and responsive to said display control signals for displaying on a display face thereof said data; and an external controller for inputting data to be inputted in said display device, said controller including a keyboard for entering data to be set in said display device, third memory means for storing a control program, a second processing unit for generating control signals from said display device, second receiving and transmitting means for receiving airwave data and control signals from said display device and for transmitting data and control signals to said display device by airwave



and having a second coil, a second capacitor connected electrically in parallel with said second coil, second modulating means for modulating data and control signals to electric signals to be transmitted to said display device, second demodulating means for demodulating electric signals generated by said second coil, and second switching means responsive to said second processing unit for activating said second demodulating means, fourth memory means for storing said data received by said second processing unit, and a holder having means for accommodating therein the second coil and for supporting thereon the rear face of the casing of said display device when said external controller transmits said data and control signals to said display device so that the display face of said display device can be viewed by an operator through the front face of the casing to enable the operator to view said inputted data and so that the first coil is closely electrically coupled to the second coil through the rear face of the casing.

4,853,683

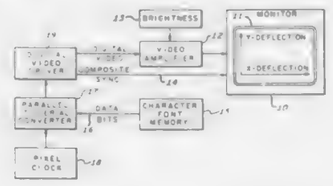
ENHANCED CAPACITY DISPLAY MONITOR

George S. Anton, Piscataway, N.J., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Jan. 25, 1988, Ser. No. 147,965

Int. Cl.[4] G09G *1/06*

U.S. Cl. 340—720 **6 Claims**



1. A method for enhancing the character display capacity of a display monitor with a video channel having a frequency bandwidth with a high frequency band edge, each character being displayed as selectively illuminated pixels in a character matrix, said display monitor being driven by a pixel clock having a clock frequency that determines the number of pixels displayed on a line of said monitor, comprising

operating said pixel clock at a frequency at which beam narrowing occurs so that adjacent pixels are substantially distinct from each other, said pixel clock frequency being at a higher frequency than the clock frequency at which pixel smearing occurs, said clock frequency at which pixel smearing occurs being at a higher frequency than the clock frequency that results in operation of said monitor at said band edge, and

arranging said character matrix so that at least a two pixel inter-character spacing is provided,

thereby providing a legible display with enhanced character display capacity.

4,853,684

REMOTE CONTROL SYSTEM FOR VENDING MACHINES

Harold F. Hoppstadter, 1432 56 St. South, Gulfport, Fla.

Continuation of Ser. No. 818,234, Jan. 13, 1986, abandoned. This application Jan. 15, 1988, Ser. No. 144,374

Int. Cl.[4] G06F *7/04, 7/08*

U.S. Cl. 340—825.35 **6 Claims**



1. A control system for vending machines comprising an operator actuated control box including a frequency operated transmitter and a single motion operator actuated button switch, a credit light, an inventory counter, an electrical power supplied control center including a frequency operated receiver free from wired interconnection with the transmitter, wherein upon actuation of the actuator a signal is transmitted between the transmitter and receiver for operation of the system, an article vend operative control mechanism connected to the control center effective upon actuation of the system to place a vend on the vending machine so that a customer operated article release mechanism associated with the article vend operated mechanism can be actuated by a customer to dispense the desired article, whereupon the system returns to a non-dispense condition, and wherein upon the actuation of the system placing the machine in a vend condition the credit light is turned on indicating the machine is in a vend condition and wherein upon the operation of the article release mechanism the credit light is turned off and the inventory control registers a vend operation.

4,853,685

SWITCH MONITORING ARRANGEMENT WITH REMOTE ADJUSTMENT CAPABILITY HAVING DEBOUNCE CIRCUITRY FOR ACCURATE STATE DETERMINATION

William R. Vogt, Rockaway, N.J., assignor to Baker Industries, Inc., Parsippany, N.J.

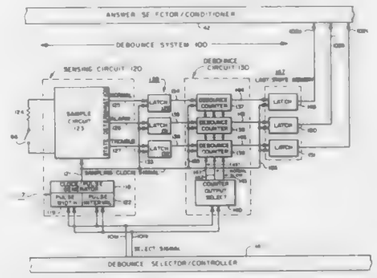
Filed Apr. 29, 1988, Ser. No. 188,323

Int. Cl.[4] H04Q *9/00;* **H03K** *17/56*

U.S. Cl. 340—825.170 **9 Claims**

1. A transmitter/receiver operable to receive first signals and transmit second signals, and switch means having at least two states, in which the transmitter/receiver includes:

a debounce circuit, coupled to said switch means, and operable to utilize a preset time period in determining the state of the switch means; and



means, operable in response to a received first signal, to provide to the debounce circuit a select signal for establishing said preset time period.

4,853,686

METHOD AND APPARATUS FOR ESTABLISHING A CONNECTION IN SHORTWAVE RADIO NETWORKS

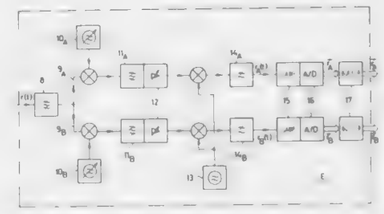
Roland Kueng, Hombrechtikon, and Hanspeter Widmer, Zurich, both of Switzerland, assignors to Zellweger Telecommunications Ltd., Hombrechtikon, Switzerland

Filed Apr. 29, 1987, Ser. No. 44,104

Claims priority, application Switzerland, Apr. 30, 1986, 01773/68

Int. Cl.[4] H04Q *1/00*

U.S. Cl. 340—825.210 **35 Claims**



1. A method of providing a signal for establishing a connection link set up in a short wave radio network having several stations with at least one of a transmitter and a receiver, including the step of:

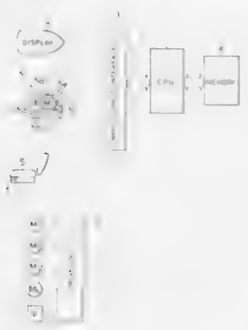
sending out a call signal via a transmission channel, said call signal including a synchronization signal and an address signal, said synchronization signal including narrow band mark and space signals forming component signals of a diversity pair, the said mark and space signals being keyed on/off separated in time by a keying signal having a frequency which is a power of two supporting fast Fourier transform algorithms in the receiver.

4,853,687

PROGRAMMABLE ADJUSTING SEAT CONTROL APPARATUS

Toru Isomura; Tomohiro Yamaji, and Chikamasa Ikeda, all of Ayase, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Dec. 23, 1987, Ser. No. 137,332
Claims priority, application Japan, Dec. 24, 1986, 61-197435
Int. Cl.[4] G05B *19/42;* **H04Q** *3/02*
U.S. Cl. 340—825.300 **7 Claims**



1. A seat control apparatus, comprising:
a plurality of seat attitude control means;
means for storing seat attitude data appropriate to figures of specified occupants separately for each of said occupants, said seat attitude data being derived through said seat attitude control means;
means for reconfiguring the attitude of the seat on the basis of said seat attitude data stored in said storage means;
means for erasing said seat attitude data stored separately for each of said occupants;
display means for displaying actions of said seat attitude control means and indicating said specified occupant; and
manipulation means which comprises a switch array including four control switches and one memory switch, said four control switches serving for a plurality of adjustments of the attitude of said seat and said memory switch serving to register said specified occupants and the corresponding seat attitude data, two of said control switches and serving to select control modes for controlling said plural seat attitude control means from a control mode menu sequentially from the first to the last control modes or reversely.

4,853,688

PAGING RECEIVER DISPLAYING PLACE OF ORIGIN OF PAGES

Andrew A. Andros, Spring, Tex., and Thomas J. Campana, Chicago, Ill., assignors to Telefind Corp., Coral Gabels, Fla.

Filed Oct. 20, 1987, Ser No. 110,522
Int. Cl.[4] H04Q *7/00* **G08B** *5/22*
U.S. Cl. 340—825.440 **9 Claims**

1. A RF paging receiver for receiving and displaying a place of origin of a page as either originating from an area in which the page is received or originating from another area which is displaced from the area in which the page is received, the page containing a paging receiver identification code identifying the paging receiver, a command controlling display of the place of origin of the page as being either from the area in which the page is received or from the another area, a decoding process used for decoding the page and display of characters within the page comprising:
(a) a RF tuner for receiving the commands;
(b) a display for displaying a place of origin of a page as either originating from the area in which the page was received or originating from the another area and for displaying the characters within the page accompanying the command; and
(c) a controller, coupled to the RF tuner, for decoding the at



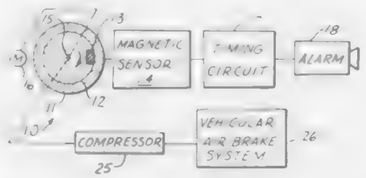
least one command accompanying the page, controlling the decoding of the page in accordance with the decoded command, the display of the place of origin of the page and the display of the page on the display.

4,853,689

AIR BRAKE COMPRESSOR FAILURE WARNING SYSTEM

William M. Gray, 150 Happy Acres Rd., Los Gatos, Calif. 95030, and John H. Otteman, 4005 Hecker Pass Hwy., Gilroy, Calif. 95020

Filed Jun. 25, 1987, Ser. No. 66,895
Int. Cl.[4] B60Q *9/00*
U.S. Cl. 340—453 **9 Claims**



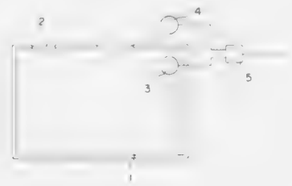
1. In combination: a vehicular air brake system which includes air pressure actuated brakes and a compressor for supplying compressed air to operate said brakes, said system including a rotary element whose rotation is concurrent with rotation of compression means in the compressor; and
warning means comprising: sensor means responsive to rotation of said rotary element, said sensor means being adapted to produce a signal indicative of rotation of said rotary element when said element rotates, timing circuitry responsive to said signal, adapted to determine whether a signal respective to said rotation has or has not been received within a predetermined increment of time, and alarm means adapted to be actuated by said timing circuit if and when such signal is not received within said predetermined increment of time.

4,853,690

SECURITY ALARM PROCESS AND APPARATUS

Hans-Dieter Mayer, Baltmannsweiler, and Klaus Hirrlinger, Esslingen, both of Fed. Rep. of Germany, assignors to Richard Hirschmann Radiotechnisches Werk, Fed. Rep. of Germany

Filed Apr. 1, 1987, Ser. No. 32,615
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1986, 3611184
Int. Cl.[4] G08B *13/20, 21/00*
U.S. Cl. 340—544 **24 Claims**



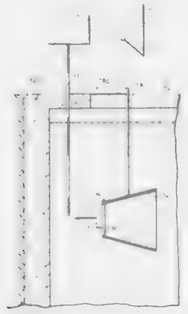
1. A method of securing an enclosed area comprising the steps of:
monitoring air passage resistance of an enclosed area; and
actuating an alarm when air passage resistance falls below a predetermined level;
wherein the step of monitoring includes the steps of measuring air pressure in said enclosed area, measuring air pressure outside of said enclosed area, and evaluating the difference between air pressure in the enclosed area and air pressure outside the enclosed area.

4,853,691

METHOD OF AND APPARATUS FOR THE ACOUSTIC SIGNALLING OF CASES OF DROWNING IN SWIMMING POOLS

Klaus-Peter Kolbatz, Langenauer Weg 21, D-1000 Berlin 27, Fed. Rep. of Germany

Filed Dec. 21, 1987, Ser. No. 136,039
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1987, 3709384
Int. Cl.[4] G08B *13/20*
U.S. Cl. 340—566 **3 Claims**



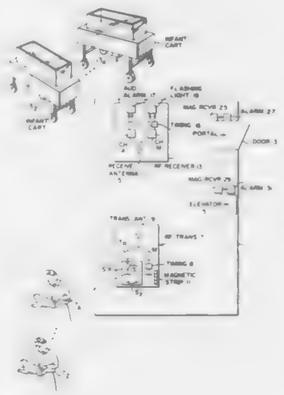
1. A system for monitoring a swimming pool having water therein to a selected surface level, the system activating an audible warning device in response to a person jumping or falling into the swimming pool, the system comprising:
a hollow, frusto-conical disturbance collector having a first end opening which is relatively wide and a second end opening which is relatively narrow;
means for supporting the collector beneath the surface level of the water in the pool with the axis of the collector extending horizontally and the collector positioned in spaced relation to a wall of the pool with the first end opening facing away from the wall and the second end opening facing the wall;
a flap pivoted by a horizontal hinge adjacent the second end opening of the collector for pivoting upon impact by a submerged pressure wave generated upon a person jumping or falling into the pool, the flap being isolated by the frusto-conical collector from small surface disturbances created by leaves, stones or the like falling into the pool;
a switching element secured to the flap for emitting a signal upon moving with the flap;
circuit means connected to the switching element for detecting the signal; and
alarm means connected to the circuit means for emitting an audible alarm upon the circuit means detecting the signal.

4,853,692

INFANT SECURITY SYSTEM

Barry M. Wolk, 58 Graymoor La., Olympia Fields, Ill. 60461, and Edward H. Newman, 2371 Bryden Rd., Columbus, Ohio 43209

Filed Dec. 7, 1987, Ser. No. 129,627
Int. Cl.[4] G08B *23/00, 13/14*
U.S. Cl. 340—573 **57 Claims**



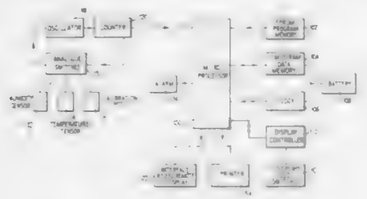
1. An infant security system for thwarting the kidnapping of infants from a children's ward or maternity ward of a hospital or the like having at least one exit through which an infant may be transported, said infant security system comprising:
at least one transmitting means for transmitting infant security indicating signals,
said at least one transmitting means being securably attached to an infant to be monitored, and including tamper signal generator means for generating at least a first unique coded tamper signal indicative of tampering with said at least one transmitting means, and including means for periodically generating a second unique coded signal;
at least one receiving means associated with said at least one transmitting means for detecting said unique signals and for generating alarm condition signals in response to the detection of the first unique signal and the failure to detect the second unique signal;
said means for periodically generating including maintenance signal generator means for periodically generating said second unique coded signal indicative of the infant being within a predetermined distance of said at least one said receiving means and not being shielded from said at least one receiving means; and
alarm means, responsive to said alarm condition signals, for providing an indication of said alarm condition.

4,853,693

AIR CONDITION MONITOR UNIT FOR MONITORING AT LEAST ONE VARIABLE OF THE AMBIENT AIR

Raymond H. Eaton-Williams, "Heathers", Farnaby Drive, Sevenoaks, Kent, England TN13 2LQ

Filed May 8, 1987, Ser. No. 47,118
Claims priority, application United Kingdom, May 9, 8611368
Int. Cl.[4] G08B *17/00*
U.S. Cl. 340—588 13 Claims



12. An air condition monitor unit for monitoring at least one variable of the ambient air, comprising (a) a sensor which provides an indication of the actual value of said at least one variable, (b) a plurality of memory means capable of retaining set values of respective thresholds comprising at least the maximum and minimum acceptable values of said at least one variable, (c) a first switch connected to said plurality of memory means, operation of which switch changes a set value retained in said plurality of memory means, (d) a second switch in co-operation with said first switch and connected to said plurality of memory means, successive operation of which second switch changes the memory means for the time being addressed by said first switch from one memory means to the next in a predetermined cycle, and (e) warning means connected to said sensor and said plurality of memory means to provide a warning signal in the event that one of the actual values of a given variable as indicated by said sensor passes a corresponding one of the retained values in said plurality of memory means, wherein said plurality of memory means includes one for retaining a set threshold value of the rate of change of a variable of the ambient air, address of that one of said plurality of memory means being included in said predetermined cycle, and in which rate of change measuring means are provided to give a measure of the actual value of said rate of change, the warning means also being connected to said rate of change mesuring means to provide a warning signal in the event that the actual rate of change exceeds the set threshold value of said rate of change, adn wherein said rate of change measuring means comprises a timing device which provides a succession of signals each spaced in time by a predetermined period of time, a plurality of value memory means connected to said timing device and to said sensor to receive a signal indicative of the value of said at least one variable for each of a plurality of successive such predetermined periods of time and to store the value associated with that signal in respective ones of said plurality of value memory means, and difference means connected to said plurality of value memory means to provide an output signal which is indicative of the difference between the current value of said at least one variable and that one of the values stored in the said plurality of value memory means which differs most from said current value.

4,853,694

ELECTRONIC TANK LEVEL MONITORING DEVICE

Jerry Tomecek, Rt. 3 Box 11A, Fairhope, Ala. 36532

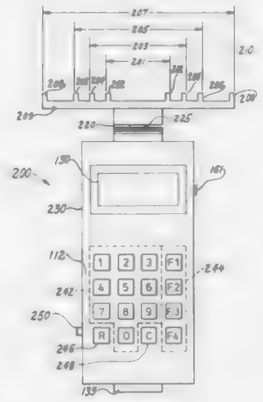
Filed Dec. 1, 1987, Ser. No. 127,192
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—621 19 Claims

1. An electronic liquid level monitoring apparatus for a storage tank having a substantially vertical fill pipe comprising:

an ultrasonic transducer for converting a transmit electrical impulse into ultrasonic sound and for converting ultrasonic sound into a corresponding receive electrical impulse;

a fill pipe head device having a set of concentric circular ridges with said ultrasonic transducer mounted in the center thereof for positioning said ultrasonic transducer at a fixed position relative to the fill pipe of the storage tank, said set of concentric circular ridges enabling accommodation of a plurality of differing fill pipe diameters;

a control device pivotally coupled to said fill pipe head device and electrically connected to said ultrasonic transducer for



transmitting a transmit electrical impulse to said ultrasonic transducer,

receiving a receive electrical impulse from said transducer indicating the receipt of ultrasonic sound by said transducer,

measuring the length of time from the transmitting of said transmit electrical impulse to the receiving of said receive electrical impulse, and

generating a distance signal indicating the distance from said ultrasonic transducer to a liquid level based upon said measured length of time.

4,853,695

DATA INPUT DEVICE HAVING SWITCH MATRIX SCANNING MEANS

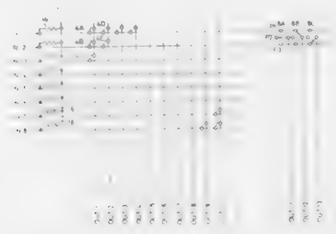
Hideo Ueno, Nagoya; Satoshi Shibata, and Keiko Yamada, both of Aichi, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed May 13, 1988, Ser. No. 193,795
Claims priority, application Japan, May 19, 1987, 62-122224
Int. Cl.[4] H03M *11/00;* G06F *3/02*
U.S. Cl. 341—26 8 Claims

1. A data input device having a plurality of key switches which produce corresponding output signals while the key switches are held in an operated position, and at least one position-hold switch each of which has a plurality of stable positions and is selectively placed in one of said stable positions, comprising:

a first matrix comprising a plurality of second signal lines, said first and second signal lines crossing each other in a lattice, so as to provide first intersecting points, each of said key switches being connected between said first and second signal lines at a corresponding one said first intersecting points;

a second matrix comprising at least one third signal line, and at least one fourth signal lines which corresponds to said at least one position-hold switch, said at least one third signal line and said at least one fourth signal line crossing each other in a lattice, so as to provide second intersecting points, each of said at least one position-hold switch being connected between said third and fourth signal lines at a corresponding one of said second intersecting points, at least one of said plurality of first signal lines of said first matrix or at least one of said plurality of second signal lines acting as said at least one third signal line or said at least one fourth signal line, respectively, and



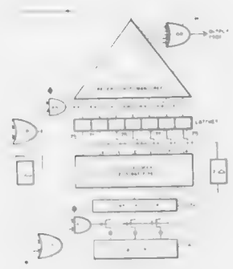
matrix scanning means for scanning said first matrix and thereby determining whether each of said plurality of key switches has been operated, and then scanning said second matrix and thereby determining one of said plurality of stable positions in which each said position-hold switch is placed, only when a scanning of said first matrix indicates that the number of said key switches which has been operated is equal to or smaller than a predetermined reference value.

4,853,696

CODE CONVERTER FOR DATA COMPRESSION/DECOMPRESSION

Amar Mukherjee, Maitland, Fla., assignor to University of Central Florida, Orlando, Fla.

Filed Apr. 13, 1987, Ser. No. 38,039
Int. Cl.[4] H03M *7/40*
U.S. Cl. 341—65 22 Claims



1. A code converter for converting binary signal representations of characters between representations of said character in a first coding scheme and representations of said characters in a second variable-length coding scheme, comprising:

a logic network comprising a plurality of logic circuit elements connected together in reverse binary tree-like fashion to form a plurality of logic paths extending between an element in a common root node position and elements in other node positions which corresponds to different ones of said plurality of characters;

input means for passing electrical signals for processing by said elements along said logic paths in accordance with a character signal representation in one of the first and second coding means, said input means comprising a decoder having an input and a plurality of output terminals, with each output terminal connected to a respective one of said elements in said other node positions;

output means for receiving electrical signals from said logic elements along said logic paths in the form of representation of the character in the other of said first and second coding schemes, said output means comprising means for receiving output signals from said connections between elements along said logic paths that correspond to "1" branches of a reverse binary tree corresponding to said logic network; and

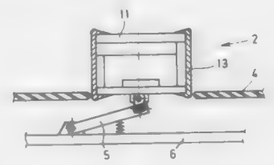
a buffer for storing one of said sequence of character representations in said first coding scheme prior to conversion, and means responsive to completion of the conversion of another of said sequence of character representations for transferring said one of said sequence of character representations to said decoder input for conversion.

4,853,697

KEYBOARD WITH MANUAL-CONTROL KEYS COMBINED WITH A DISPLAY SYSTEM

Paolo Pellizzari, Amherst, and Richard Perry, Milford, both of N.H., assignors to Kiel Corporation, Nashua, N.H.

PCT No. PCT/FR85/00324, § 371 Date Jul. 6, 1987, § 102(e) Date Jul. 6, 1987, PCT Pub. No. WO87/03113, PCT Pub. Date May 21, 1987
PCT Filed Nov. 19, 1985, Ser. No. 80,536
Int. Cl.[4] H03M *11/00;* H03K *17/969*
U.S. Cl. 341—23 15 Claims



1. A keyboard having manual control keys combined with a display system, comprising:

a series of parallel bars capable of mechanical displacement by a downward thrust under the pressure of a user's fingers,

a luminous display system in which a tactile electric control screen forms the top of said bars,

circuits for producing control orders from at least bar data and key data, said bar data being selected according to the parallel bars depressed,

electronic means for assigning specific key functions to screen zones of a certain number of the parallel bars said screen zones being disposed at intervals along said bars,

means for controlling through said display system a visual representation related to each key function in the corresponding screen zone,

locating means for detecting a key selected according to the position of contact of the fingers which press a bar on said screen zones, and

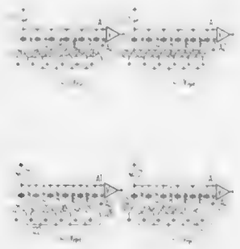
means for producing said key data as a function of the key selected and of the corresponding key function.

4,853,698

PROCESS FOR THE DIGITAL TO ANALOG CONVERSION OF DIGITAL INFORMATION IN BIPOLAR ANALOG SIGNALS

Bernward Roessler, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 12, 1986, Ser. No. 906,367
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1985, 3533874
Int. Cl.[4] H03M 1/78
U.S. Cl. 341—150 3 Claims



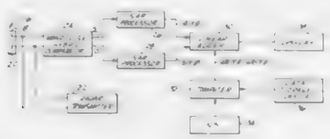
1. A process for the digital to analog conversion of digital information in bipolar analog signals by means of a network comprising capacitors which are binary-stepped in their capacitance and a further capacitor having the same capacitance as the lowest value capacitor, whereof the lower terminals, depending on the binary value of the digital information bit to which said lower terminals are respectively allocated, are coupled to ground potential or to a reference voltage source providing voltage of one polarity only and thereby codetermine or do not codetermine the value of the network output voltage representing the analog signal after a charge has been redistributed, wherein the same capacitors always take part in the charge redistribution for generating positive and negative analog values of the same amount.

4,853,699

METHOD FOR CANCELLING AZIMUTH AMBIGUITY IN A SAR RECEIVER

James K. Easton, Marina del Rey, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 13, 1987, Ser. No. 119,938
Int. Cl.[4] G01S 13/90
U.S. Cl. 342—25 4 Claims



1. A method for cancelling azimuth ambiguity in a SAR receiver obtaining radar return signals from cells of an azimuth-range grid on board a moving craft comprising the steps of:

transmitting radar pulses toward the grid at a pulse repetition rate less than $(2v)/l \sin \phi$, where v is the speed of the craft, l is the total antenna length, and ϕ is a squint angle between the direction of craft motion and the direction of transmission;

receiving on board the craft radar returns with an antenna having first and second apertures to produce corresponding first and second return signals;

processing the first return signal over a given time period to generate a first series of component SAR signals representing radar returns from the respective cells of said azimuth-range grid;

processing the second return signal over a given time period to generate a second series of component SAR signals representing the radar returns from the respective cells of the grid;

additively combining the respective component signal individually weighted to produce a third signal component SAR signals representing the radar returns from the respective cells of the grid; and

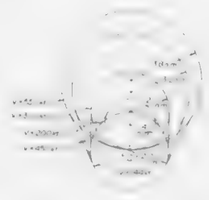
visually displaying the third series of resultant SAR signals in the form of the azimuthrange grid.

4,853,700

INDICATING SYSTEM FOR WARNING AIRSPACE OR THREATENING AIRCRAFT IN AIRCRAFT COLLISION AVOIDANCE SYSTEM

Chubei Funatsu, Kanagawa, and Kazuyuki Kita, Tokyo, both of Japan, assignors to Toyo Communication Equipment Co., Ltd., Samu Kawa, Japan

PCT No. PCT/JP85/00579, § 371 Date Jun. 30, 1986, § 102(e) Date Jun. 30, 1986, PCT Pub. No. WO86/02761, PCT Pub. Date May 9, 1986
PCT Filed Oct. 17, 1985, Ser. No. 882,977
Claims priority, application Japan, Oct. 29, 1984, 59-227285
Int. Cl.[4] G01S 3/02
U.S. Cl. 342—30 6 Claims



1. A warning airspace indicating system belonging to an aircraft collision avoidance system of a subject aircraft having a function of determining the existence of danger of aircraft collision by receiving response signals from other aircraft in response to interrogation signals delivered from said subject aircraft, said indicating system for warning airspace or threatening aircraft in said aircraft collision avoidance system including a means for defining a warning airspace arranged around said subject aircraft, wherein the range of the warning airspace expands and contracts along the flight direction of said subject aircraft in dependence upon the speed of said subject aircraft, said warning airspace defined to have a shape including a cylindrical shape of fixed diameter centered on said subject aircraft and another cylindrical shape of variable diameter which varies in accordance with the speed of the subject aircraft and whose center is disposed along the flight direction of said subject aircraft at a distance from said subject aircraft which varies in dependence upon the speed of said subject aircraft.

4,853,701

PULSE COMPRESSION METHOD EMPLOYING SPACE-CODING, AND ITS APPLICATION TO A RADAR

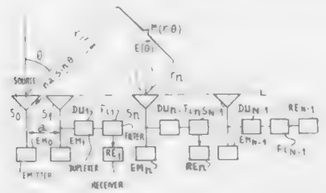
Serge Drabowitch, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 29, 1983, Ser. No. 528,458
Claims priority, application France, Aug. 27, 1982, 82 14736
Int. Cl.[4] G01S 13/42, 13/28
U.S. Cl. 342—139 10 Claims

1. A pulse compression radar method, comprising the steps of:

simultaneously transmitting, from N antenna elements of an antenna array, N coded pulse signals, one pulse signal being transmitted from each antenna element, each pulse signal having a duration τ_1, the frequencies of the N signals each being different from one another and uniformly graded in frequency from one antenna element to the next element of the array by an increment of Δf, equal to $1/\tau_1$, the transmitted pulse signals being in phase with one another at times separated by time intervals of τ_1;

reflecting from a target the transmitted pulsed signals;



receiving, at the N antenna elements, the target reflected signals, the received signals being spatially compressed by a factor of N, each of the received signals having a duration $\tau_2=\tau_1/N$; and

processing the signals received at each antenna element through N separate band-pass filters, each band-pass filter filtering the signal from a single one of said N antenna elements, each filter having a frequency width of $N\times\Delta f$, to produce target range and angle information.

4,853,702

RADIO WAVE RECEIVING SYSTEM

Takayasu Shiokawa, Japan; Koji Yasukawa, both of Tokyo, and Yoshio Karasawa, Tanashi, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 355,949, Mar. 8, 1982, Pat. No.
Claims priority, application Japan, Mar. 27, 1981, 56-044100
Int. Cl.[4] H01Q 21/24, 25/00
U.S. Cl. 342—363 11 Claims



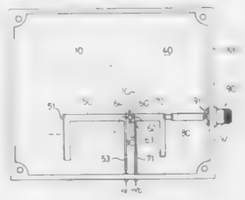
1. A radio wave receiving system for use with a shipborne antenna in a maritime satellite communication system, comprising a circularly polarized antenna having two independent linearly polarized antenna elements disposed to intersect each other perpendicularly, each of said antenna elements being inclined at an angle of about 45° relative to the major axis of the polarization characteristics of an undesired wave reflected from the surface of the sea, two pairs of feeders connected respectively to said two independent linearly polarized antenna elements, a 90° phase shifting circuit connected through one of said pairs of feeders to one of said linearly polarized antenna elements, a phase shifter serially connected to said 90° phase shifting circuit for controlling the mutual phase between said two linearly polarized antenna elements and operative to adjust the axial ratio of the polarization characteristics of said circularly polarized antenna, and a combiner for combining the output signal of said phase shifter and the signal received by the other of said linearly polarized antenna elements which has been forwarded to said combiner via the other of said pairs of feeders, whereby reception of the said undesired reflected wave is avoided by selecting the amount of phase shift of said phase shifter and causing the polarization characteristics of said circularly polarized antenna to intersect perpendicularly the polarizing characteristics of said undesired wave.

4,853,703

MICROSTRIP ANTENNA WITH STRIPLINE AND AMPLIFIER

Yuichi Murakami, and Kiyokazu Ieda, both of Tokyo, Japan, assignors to Aisin Seiki Kabushikikaisha, Aichi, Japan

Filed Mar. 17, 1987, Ser. No. 26,705
Claims priority, application Japan, Mar. 17, 1986, 61-58692
Int. Cl.[4] H01Q 1/38
U.S. Cl. 343—700 MS 8 Claims



1. An antenna device comprising:

a microstrip antenna formed on a first dielectric member, said microstrip antenna including feeder means and further including a radiating conductor member disposed on a first major surface of said first dielectric member, and a grounded conductor member disposed on an opposing major surface of said first dielectric member;

a second dielectric member disposed on an opposite side of said grounded conductor member from said first dielectric member, such that said grounded conductor member is sandwiched between first and second dielectric members; and

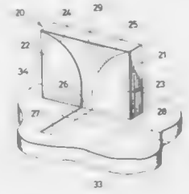
a high frequency circuit mounted on a surface of said second dielectric member which faces away from said grounded conductor member, said high frequency circuit comprising a high frequency amplifier and a strip conductor member constituting a strip line with said second dielectric member and said grounded conductor member for electrically matching said high frequency amplifier with said feeder means of said microstrip antenna.

4,853,704

NOTCH ANTENNA WITH MICROSTRIP FEED

Leopoldo J. Diaz, Golden; Daniel B. McKenna, Broomfield, and Todd A. Pett, Longmont, all of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed May 23, 1988, Ser. No. 197,250
Int. Cl.[4] H01Q 13/08
U.S. Cl. 343—767 25 Claims



1. A broadband antenna comprising a strip conductor lying in a first plane, a ground plane separated from and lying parallel to said strip conductor, said ground plane having a slot therein, said slot extending transverse to said strip conductor,

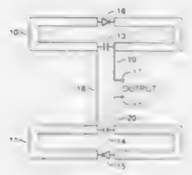
two substantially planar conductive elements positioned in a substantially common plane that transverses said slot and is substantially orthogonal to said first plane and said ground plane, each of said conductive elements having at least one curved surface extending upwardly and outwardly from said slot, one of said conductive elements contacting said ground plane on one side of said slot and the other of said conductive elements contacting said ground plane on the other side of said slot, wherein during use said strip conductor and said slot are capacitively coupled.

4,853,705

BEAM POWERED ANTENNA

Jeremy A. Landt, Los Alamos, N. Mex., assignor to Amtech Technology Corporation, Santa Fe, N. Mex.

Filed May 11, 1988, Ser. No. 192,827
Int. Cl.[4] H01Q 9/26
U.S. Cl. 343—803 16 Claims



1. An antenna for receiving and modulating transmitted signals having very low power density on the order of below about 1 watt per meter squared, at a selected center frequency above 2000 MHz, comprising:

a folded planar dipole section having two separated oppositely disposed U-shaped elements, each of said elements having a pair of ends;

a capacitor series coupled between two oppositely disposed ends of said two elements;

a diode having a high impedance at said selected center frequency, series coupled between the other two oppositely disposed ends of said two elements;

a metallic backplane mounted parallel to said planar folded dipole section and spaced therefrom by a predetermined distance selected to reduce the antenna impedance, the impedance of said diode, the shape of said folded planar dipole section and the predetermined amount of spacing of said backplane from said planar folded dipole section all being selected to increase the d.c. power output of the antenna.

4,853,706

TRANSPARENCY WITH JETTED COLOR INK AND METHOD OF MAKING SAME

R. Hugh Van Brimer, 287 N. Poverty Rd., Southbury, Conn. 06488; Donald Allred, 23 Laurel Dr., Brookfield, Conn. 06804; Theodore M. Cooke, 25 Washington St., Danbury, Conn. 06810; An C. R. Lin, 1 Patricia La., Newtown, Conn. 06470, and Julia E. Rubbo, 585 Park Rd., Bldg. 10, Unit 6, Waterbury, Conn. 06708

Filed Sep. 17, 1987, Ser. No. 97,945
Int. Cl.[4] G01D 15/16
U.S. Cl. 346—1.1 16 Claims

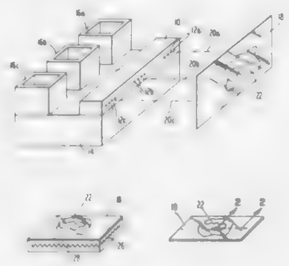
1. A process for creating a color transparency using an ink jet apparatus comprising the following steps:

heating hot melt ink comprising an ink vehicle and a substantially translucent dye to a temperature above the melting point of said hot melt ink;

ejecting small volumes of said hot melt ink from the ink jet apparatus toward a substantially transparent support, each said volume including a first substantially planar surface at its interface with said support, and a second surface opposed to said first surface extending outwardly from said support;

cooling the small volumes to the solid state on the support;

spreading and flattening said second surface of each of the



small volumes on the support including the step of heating the support and the small volumes; and

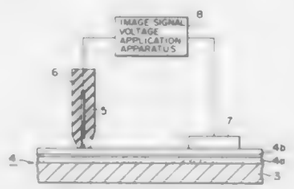
cooling the support and the small volumes so as to solidify the small volumes in a spread and flattened condition on the support.

4,853,707

NON-IMPACT ELECTROTHERMIC RECORDING METHOD

Toshiyuki Kawanishi, Numazu, and Yukio Tabata, Shizuoka, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 894,376, Aug. 6, 1986, abandoned, which is a continuation of Ser. No. 748,123, Jun. 21, 1985, abandoned, which is a continuation-in-part of Ser. No. 398,788, Jul. 16, 1982, abandoned. This application Aug. 11, 1988, Ser. No. 231,205
Claims priority, application Japan, Jul. 17, 1981, 56-112757
Int. Cl.[4] G01D 15/10
U.S. Cl. 346—1.1 10 Claims



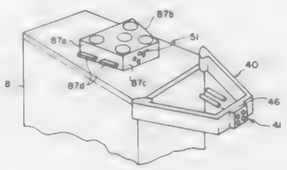
1. In a non-impact electrothermic recording method comprising the steps of superimposing on a recording medium an ink sheet comprising an electroconductive thermal-transferable ink material; placing a recording electrode and a return electrode in close contact with said ink sheet, said return electrode disposed at a predetermined distance from the recording electrode, with the contact area with said ink sheet of said recording electrode being smaller than the contact area with said ink sheet of said return electrode; applying between said recording electrode and said return electrode either (i) image-delineating voltage signals with a fixed application time, with the voltage of said image-delineating signals changed in accordance with the image density of images to be reproduced on said recording medium, or (ii) image-delineating voltage signals with a fixed voltage, with the application time changed in accordance with the image density of images to be reproduced on said recording medium, so as to generate Joule's heat in the portions in said ink sheet immediately below said recording electrode; and transferring said electroconductive thermal-transferable ink material from said ink sheet to said recording medium, the improvement wherein an ink sheet essentially consists of an electroconductive base layer, an electroconductive thin layer formed on said electroconductive base layer, and an electroconductive image transfer ink layer formed on said electroconductive thin layer, with the effective resistance of said ink sheet being in the range of from 50 ohms to 20 kilohms, is employed.

4,853,708

INK CARTRIDGE AND HOUSING CONSTRUCTION FOR MULTICOLOR INK JET PRINTING APPARATUS

Michael A. Walters, Kettering, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 3, 1988, Ser. No. 163,491
Int. Cl.[4] G01D 15/18
U.S. Cl. 346—75 6 Claims



1. For use with multicolor continuous ink jet printing apparatus of the kind having: (i) a plurality of ink circulation subsystems, each including an ink supply means for feeding ink to a predetermined print head assembly and ink return means for returning ink from that print head assembly and (ii) a cartridge housing, an ink cartridge comprising:

(a) side, top and bottom wall means forming an ink supply and return reservoir;

(b) means in one of said wall means for defining an ink supply port and an ink return port which are constructed and located for respective engagements with the supply and return means of such circulation subsystems; and

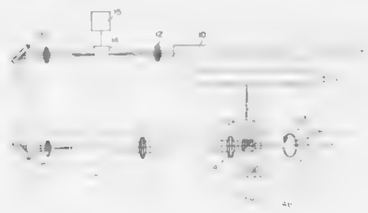
(c) a key system component, formed on one of said wall means at a location for interfitting with a printer key system component formed in such cartridge housing, and constructed to have a shape that uniquely identifies the color of ink within said ink cartridge.

4,853,709

INTERNAL DRUM PLOTTER

Amnon Stein, Ramat Gan, and Michael Nagler, Tel Aviv, both of Israel, assignors to Scitex Corporation Ltd., Herzlia Bet., Israel

Filed Sep. 29, 1987, Ser. No. 102,330
Claims priority, application Israel, Oct. 7, 1986, 80241
Int. Cl.[4] G01D 9/42; G02B 26/08
U.S. Cl. 346—108 15 Claims



13. An internal drum plotter comprising:

a laser source producing a laser beam output;

means for modulating the laser beam output to apply information content thereto;

means for supporting laser recording material in a generally circular cylindrical configuration about a cylinder axis;

scanning means for receiving the modulated laser beam and reflecting it onto the laser recording material, said scanning means comprising a stabilized reflector;

automatic means for feeding and removing the recording material in association with the apparatus for supporting, thereby enabling the internal drum plotter to be operated outside of a darkroom environment; and

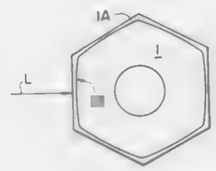
means for displacing the scanning means axially along the cylinder axis and for synchronizing the axial motion of the scanner means with the rotation of the stabilized reflector, the means for displacing including leaner bearings.

4,853,710

IMAGING BY LASER BEAM SCANNING

Kazuyuki Shimada, Tokyo; Tomohiro Nakajima, Matsudo; Hiroaki Kotabe, Funabashi; Kouji Yamanobe, Tokyo, and Kozo Yamazaki, Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1986, Ser. No. 936,079
Claims priority, application Japan, Nov. 29, 1985, 60-267243; Jan. 31, 1986, 61-19908; Mar. 7, 1986, 61-48673; Mar. 17, 1986, 61-57101; Mar. 27, 1986, 61-69524
Int. Cl.[4] G01D 15/14
U.S. Cl. 346—108 13 Claims



10. A light beam deflecting device for use in a light beam scanning system, said device comprising:

a light source for emitting a light beam modulated by image information;

a rotating polygon mirror for deflecting said light beam over a predetermined angle repetitively onto a scanning surface, said polygon mirror having a rotating axis and a plurality of reflecting surfaces arranged circumferentially with respect to said rotating axis;

means for rotating said polygon mirror in a predetermined direction at a selected rotationals speed to thereby scan said light beam onto said scanning surface at a selected scanning speed;

each of said reflecting surfaces of said polygon mirror being defined by a curved surface having a radius of curvature denoted by R which is related as follows to a rotating angle D of said polygon mirror and a deflecting angle 2θ of said deflected light beam,

$$\sin\theta=((1-(A/R))\sin D$$

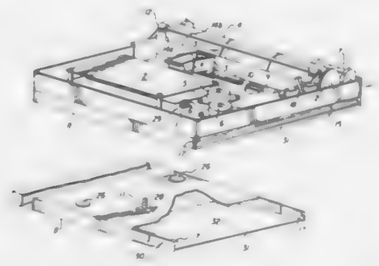
where, A is the radius of a largest circle inscribable within said polygon mirror,

first means for determining a first signal by detecting an intensity level of said light beam emitted from said light source and comparing said detected intensity level with a predetermined reference level;

second means for generating an image scanning clock signal whose frequency varies as a function of said scanning speed of said light beam on said scanning surface and a second signal which is a selected function of the frequency of said image scanning clock; and

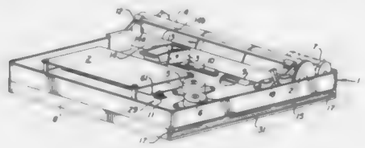
third means for producing a third signal in response to said first and second signals, said third signal being applied to said emitting means as a drive signal thereof.

4,853,711
COMPACT PRINTER WITH ADJUSTABLE SHEET STORAGE CASSETTE
Michael J. Piatt, Enon, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 11, 1988, Ser. No. 192,568
Int. Cl.[4] G01D *15/28;* G03B *27/58;* B65H *1/08*
U.S. Cl. 346—134 9 Claims



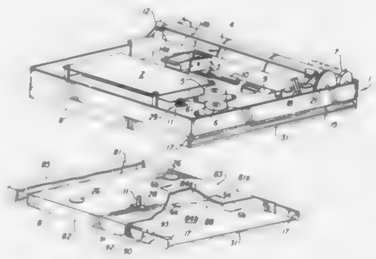
9. In a compact printer of the kind having a housing, means mounted in said housing for printing on lines of sheet media moved through a print zone and means for moving sheets from a sheet supply station to and through said print zone, an improved sheet storage and supply assembly comprising:
(a) a sheet cassette having wall portions of periphery substantially corresponding to the side wall periphery of said printer housing; and
(b) means for coupling said sheet cassette and said printer housing so that said cassette is manually rotatable with respect to said housing from a storage-carrying position with its side walls flush with the side walls of said printer housing to a sheet feed position wherein supported sheets are operatively aligned with said print zone.

4,853,712
SHEET FEED SYSTEM FOR CONPACT PRINTER
Michael J. Piatt, Enon, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 11, 1988, Ser. No. 192,570
Int. Cl.[4] G01D *15/28;* G03B *27/58;* B65H *1/08;* B41J *3/20*
U.S. Cl. 346—134 5 Claims



5. In a compact printer of the kind having a housing, means defining a sheet media print path to and through a print zone, and means for printing on media at said print zone, a sheet media supply system comprising:
(a) a sheet cassette coupled to the bottom of said housing and rotatable on an axis generally normal to the bottom of said printer housing between: (i) a storage carrying position wherein cassette edges are generally flush with the side walls of said printer and (ii) a sheet feeding position wherein the length dimension of a supported sheet media stack is operatively aligned with said print path; and
(b) means for feeding sheets from an aligned stack into said print path including:
(i) a media transport platen rotatably mounted in said housing so that its periphery moves through said print zone;
(ii) selectively activatable motor means mounted in said housing at a location spaced from said platen;
(iii) a platen gear train, located along a side wall of said housing, for drivingly coupling said platen to said motor means;
(iv) a sheet feed roller rotatably mounted in said housing at a location for feeding sheets from said casssette toward said platen and having an integral drive gear located along said housing side wall; and
(v) idler gear means rotatably mounted in said housing and selectively movable to and from a position drivingly coupling said feed roller drive gear to said platen gear train.

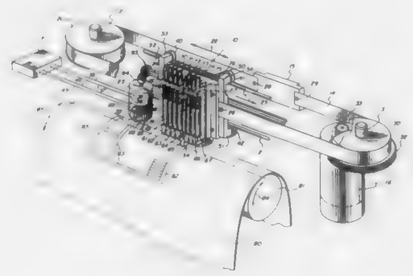
4,853,713
COMPACT PRINTER HAVING IMPROVED SHEET CASSETTE
Michael J. Piatt, Enon, and Kevin L. Houser, Kettering, both of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed May 11, 1988, Ser. No. 192,569
Int. Cl.[4] G01D *15/28;* G03B *27/58;* B65H *1/08*
U.S. Cl. 346—134 7 Claims



1. In a compact printer of the kind having a housing, a top, bottom and side walls of generally sheet size perimeter, means for feeding a sheet from a sheet supply space to, and through, a print zone and means for printing on sheet media at said print zone, an improved sheet supply cassette comprising:
(a) top, bottom and side wall means forming a supply space having a generally sheet-size perimeteral outline and height sufficient to receive a stack of sheet media, said bottom wall means comprising a hinge-type construction wherein cantilever spring means couple and upwardly bias a movable front segment with respect to a fixed rear segment; and
(b) means for rotatably coupling said cassette top wall to said bottom wall of said printer housing.

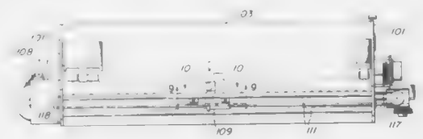
4,853,714
AUTOMATIC PEN TYPE SENSOR FOR GRAPHIC RECORDER
Robert H. Niemeyer, III, Beaverton, Oreg., assignor to AM International Corporation, Chicago, Ill.
Continuation-in-part of Ser. No. 75,430, Jul. 20, 1987, Pat. No. 4,794,406. This application Jun. 16, 1988, Ser. No. 206,707
Int. Cl.[4] G01D *15/24, 9/30;* G06K *15/00*
U.S. Cl. 346—139 R 11 Claims

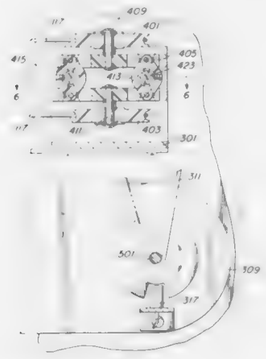
1. In a graphic recorder having a recording pen and motor drive means for moving said recording pe to and from contact with recording media, servo control means operative upon the motor drive means to control recording pen motion, and pen positioning means for establishing a pen to media contact reference point, an automatic pen type sensor comprising:
means initiating pen motion toward the media causing said recording pen to contact the media and be obstructed from further movement thereby;
reference means establishing a pen to media contact reference point when said obstruction is sensed; and



pen type recognition means determining recording pen type in response to said media contact reference point.

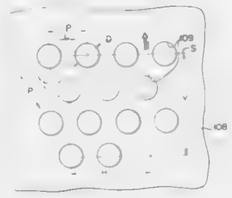
4,853,715
PLOTTER HEAD CONTROL DEVICE
Albert E. Paschkis, Gwynedd Valley, Pa., assignor to Numonics Corporation, Montgomeryville, Pa.
Filed Jun. 17, 1988, Ser. No. 207,862
Int. Cl.[4] G01D *9/42;* F16H *15/00*
U.S. Cl. 346—139 R 9 Claims





1. An X-Y plotter, comprising;
a. a frame,
b. a platform attached to said frame for supporting a web,
c. a pen carriage slideably supported above said frame and said web movable in opposite lateral directions,
d. a pen pivotally affixed to said pen carriage, movable between a first position of web contact and a second retracted position,
e. first and second cable segments connected to opposite sides of said pen carriage,
f. a cable drive drum connected to said first and second cable segments,
g. two idler pulleys mounted to one side of said platform for controlling the direction and movement of said first cable segment,
h. a pulley shifter affixed to said idler pulleys and including mechanical relations whereby said idler pulleys are simultaneously moved in equal but opposite directions, toward and away from said carriage,
i. pen lift means affixed to said carriage and actuated by said first cable segment by shifting said idler pulleys,
j. first drive means for actuating said pulley shifter,
k. second drive means for rotating said cable drive drum.

4,853,716
PRINTER HAVING SPECIALLY ARRAYED INK HOLES
Goro Oda, Sagamihara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 868,031, May 29, 1986, abandoned. This application Oct. 19, 1988, Ser. No. 262,091
Claims priority, application Japan, May 29, 1985, 60-115921
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R 17 Claims

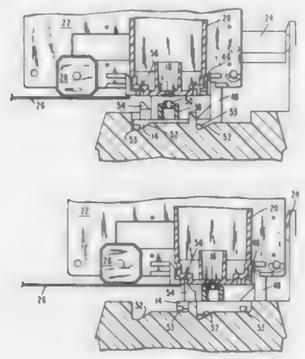


1. A printer, which forms an image on a moving sheet by ejecting ink onto the sheet in accordance with an image signal, comprising:
a thermal head having heating elements heated in accordance with the image signal;
a transfer medium in which a plurality of holes to be filled with ink are formed, and which generates bubbles from the hole when ink is heated and ejects the ink due to pressure from the bubbles, wherein when a diameter of the hole formed in said transfer medium is given as D, a pitch between two adjacent holes is given as P, a width of said heating element in a direction perpendicular to a moving direction of said transfer medium is given as H, and a width of said heating element in the moving direction of said transfer medium is given as V, relations $H \geqq 2P$ and $V \geqq 2P+D$ are satisfied;
holding means for holding said transfer medium and feeding it in the same direction as the sheet moves toward said heating elements of said thermal head with a feeding speed which is at least one-fourth of the sheet feeding speed; and
ink supply means for supplying the ink to said transfer medium.

4,853,717
SERVICE STATION FOR INK-JET PRINTER
J. Paul Harmon; Peter J. Keboe; John D. Rhodes, and Martin D. Hash, all of Vancouver, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif
Filed Oct. 23, 1987, Ser. No. 113,044
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R 19 Claims

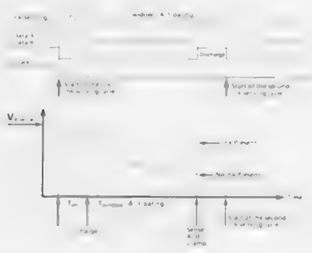
1. A service station (10) for use in an ink-jet printer, the printer including a bidirectionally movable carriage (22) supporting in secured alignment a print cartridge (20) having a printhead (18) for printing onto a print medium, the carriage being driven by a controlled motor, the service station being fixed at one end of travel of the print carriage and comprising:
(a) pump means (12) for priming the printhead;

(b) a sled (**14**) to actuate the service station and having means (**50**) to seal the printhead;
(c) wiping means (**58**) for cleaning the printhead;
(d) said sled including cap means (**50**) for sealing the printhead nozzles;
(e) said cap means being maintained on a cap chamber (**38**)



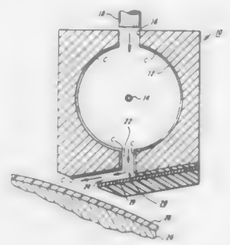
supported on said sled to which said pump means is operatively connected;
(f) said sled being movably supported on a ramp (**52**) and being provided with engageable means (**48**) associated with the carriage such that upon engagement by motion of the carriage; and
(g) said sled moving toward along said ramp to seal the printhead nozzles with said cap means.

4,853,718
ON CHIP CONDUCTIVE FLUID SENSING CIRCUIT
Abdul M. ElHatem, Hawthorne, and Steven A. Buhler, Redondo Beach, both of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Aug. 15, 1988, Ser. No. 232,409
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **4 Claims**



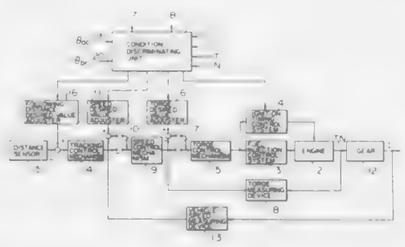
1. In an ink jet printing system, an ink sensor in an ink jet array device comprising:
a capacitor comprising first and second conducting plates separated by a dielectric insulator, the area of said first plate electrically coupled to the ink, the second plate coupled resistively to ground,
means for charging said capacitor by applying a voltage waveshape to said second plate for a first predetermined time, and
means for determining the voltage remaining on said second plate a second predetermined time after the end of said first predetermined time, a higher voltage indicating the presence of ink, a lower voltage indicating an absence of ink.

4,853,719
COATED ION PROJECTION PRINTING HEAD
Louis Reale, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 14, 1988, Ser. No. 284,225
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—155 **18 Claims**



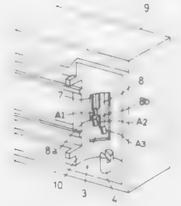
1. A fluid flow assisted ion projection printing head comprising:
an electrically conductive metal body defining an elongated ion generation chamber,
a conductive corona wire supported within said chamber for generating ions,
an entrance channel in the body for introducing transport fluid to said chamber,
an exit channel at least a portion of which is defined by the body for directing transporting fluid with entrained ions from said chamber,
modulation means for neutralizing ions in selected portions of the exiting entraining fluid, and
said printing head having substantially all surfaces thereof affected by extended exposure to the chemistry of the corona discharge coated with a substantially continuous thin conductive film of aluminum hydroxide containing conductive particles.

4,853,720
CONDITION ADAPTIVE-TYPE CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES
Mikihiko Onari, Kokubunji; Teruji Sekozawa, Kawasaki; Motohisa Funabashi, Sagamihara, and Takeshi Atago, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed May 6, 1987, Ser. No. 46,388
Claims priority, application Japan, May 9, 1986, 61-104650
Int. Cl.[4] F02D *9/08*
U.S. Cl. 364—431.07 **13 Claims**



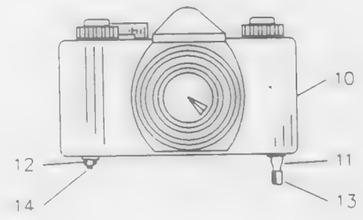
1. A condition adaptive-type control method for an internal combustion engine mounted on an automotive vehicle having a torque transmission mechanism, a brake pedal and an accelerator pedal, comprising the steps of:
categorizing driver's intents and vehicle conditions, respectively, into a plurality of categories, and preparing different engine control methods for different combinations of said categories;
detecting a driver's intent in accordance with the state of engagement or disengagement of said torque transmission mechanism, the angle of said brake pedal and the angle of said accelerator pedal;
detecting said vehicle condition from the speed of said vehicle; and
selecting one of said engine control methods in accordance with a combination of the categories to which said detected driver's intent and vehicle condition belong.

4,853,721
AUTOMATIC FILM INFORMATION READING METHOD AND DEVICE
Haruo Kobayashi; Akira Yoshizaki, both of Osaka; Takeo Hoda, Kawachinagano, and Masataka Kashima, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Dec. 23, 1987, Ser. No. 137,078
Claims priority, application Japan, Dec. 24, 1986, 61-310593; Dec. 24, 1986, 61-310592
Int. Cl.[4] G03B *7/00*
U.S. Cl. 354—21 **15 Claims**



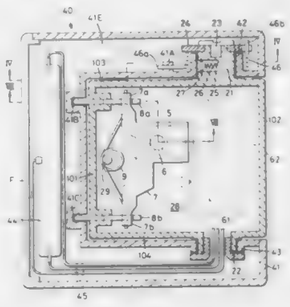
12. An automatic film information reading device for reading film sensitivity from film information code patterns on a peripheral surface of a film cartridge, the film sensitivity being encoded by arranging conducting areas and non-conductive areas axially on the film cartridge to correspond to film information, said device comprising:
a cartridge chamber for accommodating said film cartridge,
probe means for contacting said film information code patterns and having a plurality of electric contacts for contacting said film information code patterns, said probe means including a plurality of segments formed of a resilient material, each of said segments arranged to be approximately along the axis of said cartridge when loaded in the cartridge chamber, with one end of each segment being fixed and another free end being disposed relatively adjacent to a rewinding shaft provided in said cartridge chamber, and movable radially of said cartridge chamber, said free end projecting into said cartridge chamber to contact said peripheral surface of said film cartridge mounted in said cartridge chamber, said electric contacts being formed on said free ends, and
a film information readout circuit connected to said probe means for reading said film sensitivity from conduction and non-conduction states between said electric contacts provided by said film information code patterns.

4,853,722
METHOD AND APPARATUS FOR EXTENDING THE DEPTH RANGE OF UNDERWATER EQUIPMENT
Harold A. Gell, Jr., Silver Spring, Md., assignor to Sea Fathoms Industries, Silver Spring, Md.
Continuation-in-part of Ser. No. 113,913, Oct. 29, 1987, Pat. No. 4,771,299, and a continuation-in-part of Ser. No. 85,336, Aug. 13, 1987, Pat. No. 4,771,320, and a continuation-in-part of Ser. No. 85,336, Aug. 14, 1987. This application Sep. 12, 1988, Ser. No. 243,596
Int. Cl.[4] G03B *17/08*
U.S. Cl. 354—64 **38 Claims**



1. An apparatus, for use with a self-contained underwater breathing apparatus of the type which includes a pressure demand regulator, for extending the operational depth of an underwater device of the class which includes a waterproof, pressure hull, comprising:
means for sealing the breathing outlet of said regulator for creating a pressure chamber within the body of said regulator;
a pneumatic port pressure compensating said pressure hull; and
means for pneumatically connecting said pneumatic port to said regulator chamber.

4,853,723
CAMERA WITH FLASH DEVICE
Jun Akabane; Ken Moro, both of Tokyo; Masayasu Yamamoto, Kawasaki; Masaharu Hara, and Yoshio Sekine, both of Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan
Continuation of Ser. No. 55,150, May 28, 1987, abandoned. This application Dec. 9, 1988, Ser. No. 283,021
Claims priority, application Japan, May 30, 1986, 61-81842[U]
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—145.1 **33 Claims**



29. A single-lens reflex camera, comprising:

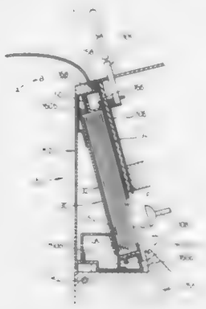
a pentagonal prism;
an eyepiece optical system for guiding light from said pentagonal prism to an observer;
first housing means housing said pentagonal prism and said eyepiece optical system;
a flash lamp for emitting flash light;
second housing means having a main body and two arm means protruding from said main body, said flash lamp being provided in said second housing means;
a pair of support members for supporting said two arm means with respect to said first housing means such that said second housing means is movable between a first position and a second position, one of said pair of support members having a first opening, one of said two arm means having a second opening;
an electric circuit provided in said first housing means;
line means passing through said first and second openings for electrically connecting said flash lamp to said electric circuit; and
biasing means for biasing said second housing means from said first position toward said second position, said biasing means being disposed adjacent to the other of said pair of support members.

4,853,724

SHEET FILM PACKAGE AND DEVICE FOR LOADING SHEET FILMS

Kenji Tajima; Motoaki Takahashi; Hideo Watanabe; Takashi Shoji, and Noboru Arai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 7,249, Jan. 27, 1987, Pat. No. 4,727,391.
This application Nov. 17, 1987, Ser. No. 123,619
Claims priority, application Japan, Jan. 24, 1986, 61-14486; Feb. 12, 1986, 61-18604[U]; Mar. 5, 1986, 61-50038; Mar. 5, 1986, 61-50039; Mar. 5, 1986, 61-50040; Mar. 5, 1986, 61-50041; Mar. 5, 1986, 61-50037; Mar. 5, 1986, 61-33088[U]; Mar. 12, 1986, 61-55489; Mar. 12, 1986, 61-36888[U]
Int. Cl.[4] G03B *17/26*
U.S. Cl. 354—277 **20 Claims**



1. A film loading device for loading therein a sheet film package storing a stack of sheet films and having a film access opening openably closed by an access opening cover member, said film loading device comprising a loading slot for loading the sheet film package therein, a base for mounting the sheet film package thereon, a loading slot cover for closing said loading slot with one end of the access opening cover member being exposed out of the film loading device, and light-shielding means for holding the sheet film package with the film access opening being opened in a light-shielding condition, wherein said light-shielding means is disposed on one of said loading slot cover and said loading slot which coacts with a first engaging portion of said access opening cover member for gripping said access opening cover member in a light-shielding condition.

4,853,725

CONNECTOR FOR A CAMERA

Mutsuhide Matsuda; Masao Aoyagi, both of Kanagawa; Hiroshi Furukawa, and Masami Shimizu, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 136,732, Dec. 22, 1987, abandoned.
This application Nov. 14, 1988, Ser. No. 271,363
Claims priority, application Japan, Dec. 27, 1986, 61-312678; Dec. 27, 1986, 61-312679; Dec. 27, 1986, 61-312681; Jan. 6, 1987, 62-705; Jan. 12, 1987, 62-4516
Int. Cl.[4] G03B *17/12*
U.S. Cl. 354—286 **49 Claims**



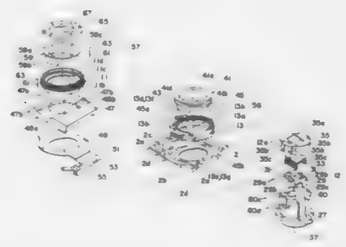
1. A camera having a bayonet mount on a camera body and on an accessory, said camera body and said accessory being interconnected by rotating said mounts relative to each other and being disconnected by reversely rotating said mounts, a group of contact members being arranged at a camera body connector to be slidingly brought into contact with a group of contact members arranged at an accessory connector by the rotating action of mounting said accessory on said camera body, said group of contact members at said accessory connector being in contact with said group of contact members at said camera body connector to permit communication between said camera body and said accessory upon completion of said mounting action, said camera comprising:
a first conductive member arranged to be electrically connected in parallel with a first contact member among said group of contact members arranged at one of said connectors, said first contact member coming into sliding contact with only one member of said group of contact members arranged at the other of said connectors while said two mounts are rotated relative to each other for mounting said accessory on said camera body; and
a second conductive member arranged at said other of said connectors to abut said first conductive member upon completion of said mounting action and to be electrically connected in parallel to a second contact member which is arranged at said other of said connectors and abuts said first contact member upon completion of said mounting action.

4,853,726

CAMERA

Kunio Kawamura; Toshihiko Taniguchi, both of Sakai; Tetsuro Oya, Minamikawachi; Masatake Niwa, Sakai; Masaaki Nakai, Kawachinagano, and Akihiko Fujino, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 7, 1986, Ser. No. 882,363
Claims priority, application Japan, Jul. 10, 1985, 60-152825; Jul. 10, 1985, 60-152645; Jul. 10, 1985, 60-152646; Jul. 10, 1985, 60-152647; Jul. 11, 1985, 60-106552[U]
Int. Cl.[4] G03B *17/18*
U.S. Cl. 354—289.1 **14 Claims**



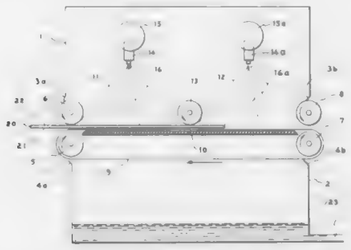
1. A camera comprising:
a display device fixedly arranged and indicating a plurality of kinds of exposure information; and
an exposure mode selecting device having a rotary operation means surrounding the display device for selecting an exposure mode by rotation of said rotary operation means around said display device and causing said display device to indicate exposure information corresponding to the selected mode, said exposure selecting device having a window for permitting the indicated information displayed on the display device to be seen therethrough.

4,853,727

PROCESS AND DEVICE FOR TREATING A PHOTOGRAPHIC RECORDING MATERIAL

Jürgen Ganzke, Dietzenbach; Dieter Jahn, Neu-Isenburg, and Bruno Kritzner, Büttelborn, all of Fed. Rep. of Germany, assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Aug. 29, 1988, Ser. No. 237,172
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1987, 3734097
Int. Cl.[4] G03D *5/04*
U.S. Cl. 354—319 **18 Claims**



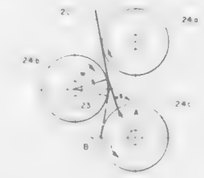
1. A process for treating a photosensitive recording material comprising a carrier layer and at least one photosensitive recording layer hardened in the likeness of an image wherein the areas of the recording layer which are free of any image are removed by treatment with washing agent, the recording material being conveyed beneath an arrangement of one or more rows of jets which spray the washing agent essentially vertically downward, the improvement wherein the recording material is sequentially conveyed essentially flat through at least two wash sections bounded by separating elements and separated from each other, each wash section provided with separate jet arrangements, the jets being shaped and arranged so that each surface unit area of the recording layer is sequentially struck by at least two wash spray cones, the wash spray cones not coming into contact with each other prior to impacting the recording layer, and the amount of washing agent impacting a unit area of the recording material per unit time and its impact velocity are selected so that all image-free areas but none of the image-carrying areas of the recording layer are removed.

4,853,728

X-RAY FILM PROCESSOR RACK

Douglas O. Hall, Farmington, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 29, 1988, Ser. No. 149,795
Int. Cl.[4] G03D *3/13*
U.S. Cl. 354—320 **3 Claims**



1. A method of achieving an optimal balance of wrap angle, strike angle, and film driving force parameters in a roller transport film processor to optimize the performance thereof and to attenuate pi line artifacts on film processed therein, including the steps of:
(a) determining empirically a relationship of strike angle as a function of wrap angle;
(b) determining empirically a relationship of film driving force as a function of wrap angle;
(c) preselecting a maximum allowable strike angle;
(d) from the relationship of strike angle to wrap angle, determining a maximum allowable wrap angle corresponding to said maximum allowable strike angle;
(e) preselecting a minimum practical wrap angle corresponding to a minimum practical film driving force; and
(f) establishing horizontal centerline distances between rollers in said roller transport film processor to achieve a wrap angle between said maximum allowable wrap angle and said minimum practical wrap angle.

4,853,729

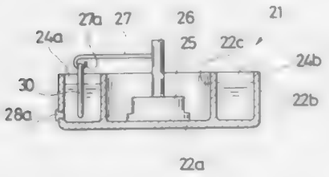
DENTAL X-RAY FILM DEVELOPING MACHINE

Hiroyuki Tanaka, Yokohama, Japan, assignor to Nix Company, Ltd., Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 136,998
Claims priority, application Japan, Oct. 1, 1987, 62-149313[U]
Int. Cl.[4] G03D *3/10*
U.S. Cl. 354—322 **21 Claims**

1. An automatic dental X-ray film developing machine, which comprises:
an annular member having a bottom wall, an outer peripheral wall, an inner peripheral wall and at least one partition wall, said at least one partition wall dividing an annular space, which is defined by the bottom wall, the outer peripheral wall and the inner peripheral wall, into plural compartments;

a film-mounting member having a first end and a second end, the first end having a holding portion for detachably holding a dental X-ray film at a pair of mutually opposing sides;



a support for pivotably and releasably supporting the film-mounting member so as to allow the film to travel successively through the compartments, said support engaging the second end of said film-mounting member; and

drive means for causing a relative angular displacement between the annular member and the support.

4,853,730

CLAMP MOUNTING MECHANISM AND METHOD FOR PHOTOGRAPHIC PROCESSING APPARATUS

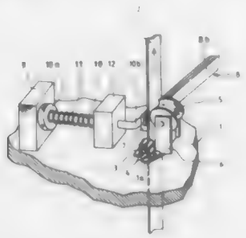
Siegfried Kurths, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 166,871

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1987, 3709412

Int. Cl.[4] G03B *1/56;* **G03D** *13/10;* **B65H** *20/16*

U.S. Cl. 354—340 **33 Claims**



1. A method of mounting a gripping device for photosensitive material on a flexible conveyor belt of a processing apparatus for such material, said belt having a pair of laterally spaced marginal portions and a central portion bounded by said marginal portions, and said device including a pair of spaced engaging elements defining an opening of width less than that of said belt and designed to engage said marginal portions upon entry of the latter into said opening, said method comprising the steps of confining said marginal portions between said device and a pair of spaced support surfaces, the confining step being performed in such a manner said central portion and said opening each at least partially overlap the gap between said support surfaces; bending said central portion while allowing said marginal portions to approach one another so that said marginal portions enter said opening; holding said device against bodily displacement towards said belt at least during the initial part of the bending step; and straightening said central portion so that said marginal portions are firmly engaged by said engaging elements.

4,853,731

AUTOFOCUS CAMERA HAVING AUTOMATIC FOCUS ADJUSTMENT APPARATUS

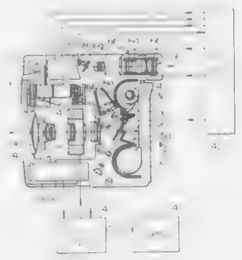
Masao Tsujimura; Masamichi Hirooka; Kazuo Ishikawa, all of Tokyo; Takayoshi Morooka; Masaki Noda, both of Okaya; Mamoru Akiyama, Tokyo; Nobuki Murai, and Seiji Yoshikawa, both of Okaya, all of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Aug. 12, 1988, Ser. No. 232,327

Claims priority, application Japan, Aug. 28, 1987, 62-214361; Sep. 28, 1987, 62-242981; Sep. 28, 1987, 62-242982; Nov. 20, 1987, 62-294519

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—400 **5 Claims**



1. An autofocus camera having a photographing lens, a shutter normally urged in a shutter opening direction and arranged to be opened and closed after it has once been closed prior to a photographing operation, a mirror movable between a view position which allows light passing through said photographing lens and said shutter to be transmitted to a viewfinder optical system and an exposure position which allows light passing through said photographing lens and said shutter to be transmitted to the surface of a film, and an automatic focus adjustment apparatus for automatically adjusting the position of said photographing lens, wherein the improvement comprising a motor-drive control circuit arranged to close said shutter prior to a photographing operation, move said mirror from said view position to said exposure position, cause said shutter to be opened and closed for exposure of said film, cause said film to be wound immediately after completion of the operation of said shutter, move said mirror from said exposure position to said view position, cause said shutter to be opened after the winding of said film has temporarily been stopped, and restart said winding of said film.

4,853,732

AUTOMATIC FOCUSING CAMERA

Noboru Suzuki, and Shigeo Toji, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Jan. 26, 1988, Ser. No. 148,699

Claims priority, application Japan, Feb. 3, 1987, 62-21713

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—402 **15 Claims**

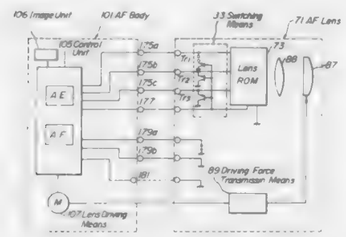
1. An autofocus camera that accepts a plurality of lenses comprising:

a camera body, said camera body having a mode selection switch for selecting a first mode of operation in which when an image of a subject is sharply focused, the shifting of one or more photographic lens elements is stopped and a shutter is ready to be released, or a second mode of operation in which one or more movable photographic lens elements are shifted to follow a subject in such a way that the image of said subject is always kept sharply focused;

means for detecting whether said lens mountd on said camera body is an autofocus lens or a non-autofocus lens;

means for generating an enable-signal when said mode selection switch selects said first mode of operation and said non-autofocus lens has been mounted on said camera body;

a logic circuit for executing logic operations of said enable-signal and a detection output signal said detection output



signal being derived from a decision means for deciding whether the image of the subject is sharply focused or out-of-focus, said logic cicuit producing a shutter driving signal when said image is focused; and

a shutter driving circuit for driving a shutter in response to said shutter driving signal derived from said logic circuit.

4,853,733

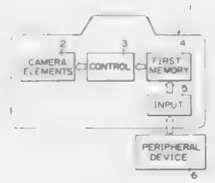
PROGRAM REWRITABLE CAMERA

Youji Watanabe, Sagamihara; Minoru Matsuzaki, and Junichi Itoh, both of Hachioji, all of Japan, assignors to Olympus Optical Company Limited, Japan

Filed Jul. 8, 1988, Ser. No. 216,761

Int. Cl.[4] G03B *7/00*

U.S. Cl. 354—412 **20 Claims**



1. A camera system including a camera which operates in response to coded control orders and a peripheral device of the camera, said camera including camera elements which conduct camera operations, first memory means for storing said coded control orders, input means for rewriting part or all of contents stored in said first memory means from the outside of the camera, and control means for controlling said camera elements in response to control orders stored within said first memory means; characterized in that

said peripheral device comprises second memory means in which is stored at least one control order package for controlling the camera; and

transfer means for transferring part or all of the contents stored in said second memory means through said input means to said first memory means.

4,853,734

DISPOSITION OF A FLEXIBLE PRINTED CIRCUIT BOARD IN A CAMERA

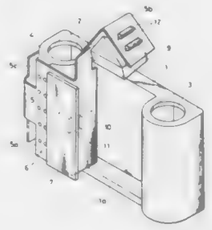
Go Tokura, Inagi; Masanori Ishikawa, Kawasaki, and Akira Yamada, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1987, Ser. No. 131,584

Claims priority, application Japan, Dec. 26, 1986, 61-202979[[U]

Int. Cl.[4] G03B *7/00*

U.S. Cl. 354—485 **9 Claims**



9. A camera having a camera body, a flexible printed circuit board having a storage device which is capable of electrically effecting the writing and erasing of information, said flexible printed circuit board being disposed along a front surface portion and another surface portion of said camera body, and an information writing pad for said storage device, said information writing pad being disposed on said flexible printed circuit board and underlying a cover portion of the camera body.

4,853,735

OZONE REMOVING DEVICE

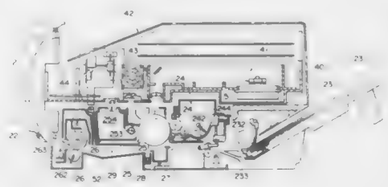
Yutaka Kodama, Tokyo, and Junichi Hirasawa, Yokohama, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1988, Ser. No. 158,340

Claims priority, application Japan, Feb. 21, 1987, 62-36884

Int. Cl.[4] G03G *15/00;* **B67B** *7/00*

U.S. Cl. 355—215 **15 Claims**



1. An ozone removing device comprising:

a container for containing therein a quantity of volatile ozone removing agent; and

controlling means for controlling the rate of volatilization of said volatile ozone removing agent;

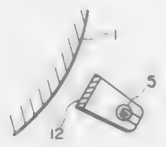
wherein said volatile ozone removing agent includes a mixture of terpenoid (general formula: $C_mH_{2n+14}O_p$, m=9–15, n=0–4, p=0–2) and a glycol family material.

4,853,736

IMAGE FORMING APPARATUS

Koji Goto, Kawasaki, and Teigo Sakakibara, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 208,213
Claims priority, application Japan, Jun. 18, 1987, 62-150184
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—210 **7 Claims**



1. An image-forming apparatus including: a photosensitive member having a photosensitive layer comprising an organic photoconductive material, said apparatus including a charging means, an image exposure means for exposing the photosensitive member to form a latent image, a developing means for developing the latent image with a toner to form a transferable toner image on the surface of the photosensitive member, a pre-transfer exposure means for exposing the photosensitive member carrying the toner image, and a transfer means for transferring the toner image to a transfer material; said charging means, image exposure means, developing means, pre-transfer exposure means, and transfer means being disposed in this order along the moving direction of the photosensitive member;

wherein the light from said pre-transfer exposure means is scattered light and the intensity of the scattered light is two or more times that of the light used for the image exposure exerted by said image exposure means.

4,853,737

ROLL USEFUL IN ELECTROSTATOGRAPHY

Paul A. Hartley, Spencerport; Joseph A. Pavlisko, Pittsford, and Hal E. Wright, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1988, Ser. No. 199,495
Int. Cl.[4] G03G *15/20*
U.S. Cl. 355—289 **15 Claims**

1. A roll comprising a cylindrical core having an outer layer comprising cured fluoroelastomer having pendant polydiorganosiloxane segments that are convalently bonded to the backbone of the fluoroelastomer and have a number average molecular weight in the range of about 1,000 to 20,000.

4,853,738

COLOR QUALITY IMPROVEMENTS FOR ELECTROPHOTOGRAPHIC COPIERS AND PRINTERS

Allen J. Rushing, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 2, 1988, Ser. No. 189,091
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—327 **14 Claims**

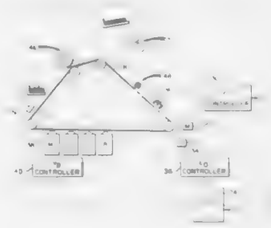
1. In a color image reproduction device, apparatus for automatically adjusting process control parameters to achieve quality color reproductions in terms of color balance, color fidelity, and tone reproduction; said apparatus comprising:

means for producing a plurality of color separations;

means for making a plurality of color separation density measurements across a range of densities for each color separation;

computing means for calculating a set of error signals in accordance with average human visual sensitivities to density and color shifts at various density levels;

means responsive to said set of error signals for calculating a set of process control parameter adjustment signals to minimize a performance index which is a positive function of said error signals; and



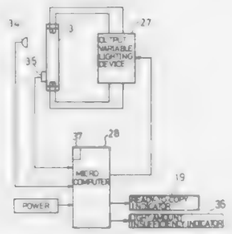
means responsive to said set of parameter adjustment signals for adjusting process control parameters to influence hue, saturation, and lightness of individual colors.

4,853,739

ILLUMINATING DEVICE FOR IMAGE EXPOSURE

Hirohisa Miyamoto, and Yasuyuki Matsuuchi, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 23, 1988, Ser. No. 210,758
Claims priority, application Japan, Jun. 25, 1987, 62-159270; Jun. 25, 1987, 62-159271
Int. Cl.[4] G03G *15/04*
U.S. Cl. 355—229 **11 Claims**



1. An illuminating device for image exposure, which uses a fluorescent lamp whose voltage is variable as an illumination source, the illuminating device comprising:

means for detecting the temperature of the lamp tube wall;

means for detecting the amount of light emitted from the lamp;

means for lighting the lamp prior to copying at a higher voltage than that required for making copies, the higher voltage is determined in accordance with the initial temperature of the lamp tube wall detected by the temperature detecting means; and

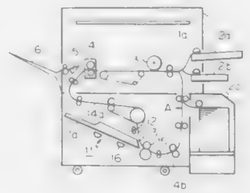
means for terminating the preliminary lighting the detected light amount is equal to or larger than the required amount.

4,853,740

RECORDING APPARATUS CAPABLE OF MULTIPLE RECORDING ON ONE OR BOTH SIDES OF A SHEET

Yukihide Ushio; Hiroshi Hashimoto, both of Tokyo; Kenjiro Hori, Yokohama; Kaoru Seto, Chigasaki, and Toshio Yoshimoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 601,177, Jan. 7, 1987, abandoned. This application Sep. 16, 1988, Ser. No. 245,964
Claims priority, application Japan, Jan. 10, 1986, 61-2236; Jan. 10, 1986, 61-2237
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—319 **13 Claims**



1. A recording apparatus comprising:

recording means for recording an image on a recording material;

first storage means for storing the recording materials;

first feed means for feeding the recording material stored in said first storing means to a recording position of said recording means;

second storage means for storing the recording materials already subjected to image recording on a side thereof;

second feed means for feeding the recording material, which has been stored in said second storage means, again to said recording position;

detecting means for detecting the number of recording materials transferred toward said second storage means; and

control means for controlling the interval of feeding of the recording materials by varying the feed timing of a succeeding recording material in accordance with the output of said detecting means.

4,853,741

DISPOSABLE WEB CLEANING DEVICE FOR ELECTROSTATOGRAPHIC APPARATUS

Wayne W. Ku, Henrietta, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

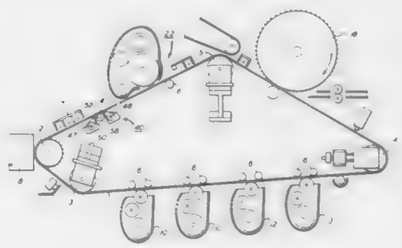
Filed Feb. 23, 1988, Ser. No. 159,011
Int. Cl.[4] G03G *21/00*; A46B *15/00*
U.S. Cl. 355—300 **12 Claims**

1. A cleaning device comprising:

an elongated housing having opposing ends and an elongated aperture between the ends, said opposing ends including means for receiving notches in a film ski upon which the device is to be mounted,

supply and take-up spindles mounted between the ends, and a cleaning web mounted on the spindles and extending across the aperture.

3. An electrostatographic apparatus in which an endless belt imaging element moves through operative relation with a series of stations, said belt being entrained about a series of rollers and at least one nonrotatable film ski, wherein said apparatus includes a cleaning device having an elongated housing having opposing ends and an elongated aperture between the ends, supply and take-up spindles mounted between the ends, and a cleaning web mounted on the spindles and extending across the aperture, said cleaning device being mounted between said at least one film ski and said belt, said film ski being so positioned to guide said cleaning web from the supply spindle out of said aperture into cleaning engagement





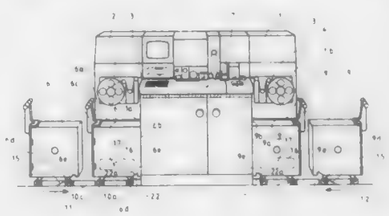
with said belt and back through the aperture to the take-up spindle.

4,853,742

PHOTOGRAPHIC PROCESSING APPARATUS USABLE WITH MOBILE CASSETTES

Bernd Payrhammer, Munich, and Leonhard Huber, Gloun, both of Fed. Rep. of Germany, assignors to Afga-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 30, 1988, Ser. No. 175,160
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1987, 3713170
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—27 **20 Claims**



1. An apparatus for processing photosensitive material, comprising a processing station for such material; a first station to one side of said processing station designed to accommodate a carriage-like cassette for photosensitive material, said first

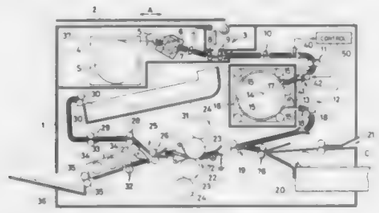
station including cassette guiding and locating means; means for conveying photosensitive material between said processing station and said first station; a second station next to said first station designed to accommodate a carriage-like cassette for photosensitive material preparatory to entry into said first station, said second station including cassette guiding and holding means; and means for moving a cassette from said second station to said first station along a first direction; and means for removing a cassette from said first station along a second direction transverse to said first direction.

4,853,743

MOISTURE-CONTROLLED IMAGE RECORDING APPARATUS

Akihiko Nagumo, and Shigeru Yoshino, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 14, 1988, Ser. No. 181,349
Claims priority, application Japan, Apr. 17, 1987, 62-93381
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—27 **7 Claims**



1. An image recording apparatus comprising:

means for optically exposing a photo-sensitive material to thereby form a latent image in said photo-sensitive material;

a thermal developing means for thermally developing said latent image in said photo-sensitive material to thereby form a developed image therein:

means for conveying said photo-sensitive material along a path from said exposing means to said thermal developer:

means for piling said photo-sensitive material having said developed image therein on an image receiving material and for transferring said developed image to said piled image receiving material:

a housing containing said conveying means and said thermal developing means;

moisture measuring means disposed inside said housing for measuring a moisture and producing a control signal and

preheating means provided along said path upstream of said thermal developing means for preheating said photo-sensitive material in response to said control signal.

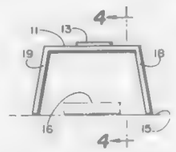
4,853,744

DIFFUSER FOR COLOR ANALYZER

Roger G. Reed, 6704 Hoover Rd., Indianapolis, Ind. 46260

Filed Jun. 29, 1988, Ser. No. 213,130
Int. Cl.[4] G03B *27/80*
U.S. Cl. 355—38 **3 Claims**

1. A light diffusing device which allows selected portions of a projected image to be excluded from a color analysis of photographic film comprising a diffuser with means for positioning said diffuser parallel to a surface upon which an analyzer sensor rests during said analysis at a distance from said diffuser sufficient to cause thorough mixing of all colors of an image projected from said film upon said diffuser and a plural-



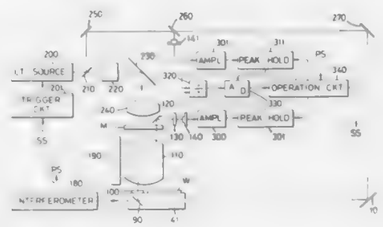
ity of light blockers which block selected portions of said image from said diffuser.

4,853,745

EXPOSURE APPARATUS

Saburo Kamiya, Yokohama; Kazuaki Suzuki, Tokyo, and Akikazu Tanimoto, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 210,808
Claims priority, application Japan, Jul. 3, 1987, 62-165415
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—43 **16 Claims**



1. An exposure apparatus for exposing a substrate by the image of the desired pattern of a mask having a mark and a desired pattern formed thereon by a portion intercepting a light and a portion transmitting the light therethrough, including:

(a) a light source outputting a laser light;

(b) first illuminating means for illuminating said mask by at least part of the laser light from said light source;

(c) a projection optical system for forming the image of said mark on a predetermined surface;

(d) stage means movable along said predetermined surface with said substrate placed thereon;

(e) position detecting means for detecting the relative position between said stage means and said mask and outputting a position signal;

(f) a fiducial member formed integrally with said stage means, said fiducial member having a fiducial pattern disposed so as to be substantially coincident with said predetermined surface and formed by a portion transmitting the light therethrough and a portion intercepting the light;

(g) a second illuminating optical system for illuminating said fiducial pattern from the opposite side of said projection optical system with respect to said fiducial member, said second illuminating optical system having a plurality of reflecting members for directing at least part of the laser light from said light source to said fiducial pattern;

(h) first photodetector means for detecting the intensity of the light and outputting a first detection signal;

(i) means for directing at least part of the laser light from said light source to said first photodetector means;

(j) a detecting optical system disposed on the opposite side of said projection optical system with respect to said mask;

(k) second photodetector means for detecting the intensity of the light from said fiducial pattern passed through said projection optical system, said detecting optical system and said mask and outputting a second detection signal;

(l) normalizing means for normalizing said second detection signal on the basis of said first detection signal; and

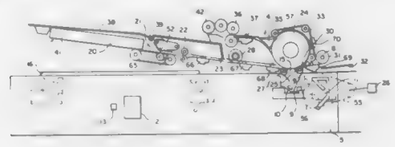
(m) processing means for determining the position of the image of said mark formed on said predetermined surface by said projection optical system, on the basis of said position signal and said second detection signal normalized by said normalizing means.

4,853,746

DOCUMENT SHEET SUPPORT MECHANISM

John Giannetti, Penfield; Jerry F. Sleve, Henrietta, and Timothy H. Kelley, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 24, 1987, Ser. No. 137,777
Int. Cl.[4] G03B *27/48*
U.S. Cl. 355—48 **1 Claim**



1. A document handling device including means for moving a document sheet through an exposure position associated with the object plane of an optical system, said moving means including a pair of rollers, one on each side of the exposure position, a turnover drum engaging said rollers and positioned to guide a document sheet for movement along a path between the rollers and the drum through the exposure position and, hence, around the drum to a turnover position, means for diverting the document sheet from the drum at a first position along the periphery of the drum to a turnover mechanism located at said turnover position and for directing the document sheet back into contact with the turnover drum at a second position along the periphery of the drum for movement toward the exposure position, said diverting means comprising at least one ear or projection continuously positioned in a circumferential recess in said drum to constrain said drum against movement parallel to its axis, and means for urging the drum against the rollers to establish the radial position of the drum according to the position of the rollers.

4,853,747

COPYING APPARATUS EXPOSURE DEVICE

Masashi Horiguchi; Minoru Yakubo, both of Tokyo; Yoshikazu Tamura, and Mamoru Ogasawara, both of Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 13, 1988, Ser. No. 181,125
Claims priority, application Japan, Apr. 13, 1987, 62-90551
Int. Cl.[4] G03B *27/48, 27/50, 27/70*
U.S. Cl. 355—51 **8 Claims**

1. A copying apparatus exposure device for effecting exposure of photosensitive material, said device comprising:

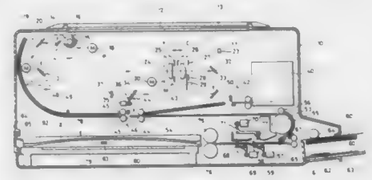
an exposure station, disposed in a path of said photosensitive material during said exposure;

conveyor roller means, disposed in said path on opposite sides of said exposure station for holding said photosensitive material at said exposure station;

means for transporting said photosensitive material over said exposure station;

a shutter disposed in an exposure light path between a table on which an original to be copied is placed and said exposure station: and

control means for opening said shutter when said photosensitive material is grabbed by said conveyor roller means, so as to hold said photosensitive material flat and expose



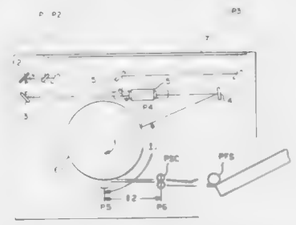
said photosensitive material while said photosensitive material is transported.

4,853,748

VARIABLE MAGNIFICATION COPIER

Yuji Okamoto; Shigeharu Maehara, both of Nara, and Katsuyoshi Fujiwara, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 38,193, Apr. 14, 1987, abandoned. This application Jul. 7, 1988, Ser. No. 217,051
Claims priority, application Japan, Apr. 17, 1986, 61-89773
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—55 **3 Claims**



1. A variable magnification copier comprising

a scanning means for performing an optical scan of an original document and forming on a photoreceptor an image of said original document,

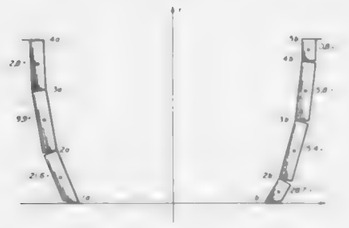
input means for inputting a reference position indicating the position of a target image on said original document, a length value indicating the extension of said target image on said original document in the direction of said scan and a magnification value at which said target image is to be enlarged or contracted by said copier,

paper transporting means for delivering a copy paper sheet to an image transfer position,

image transfer means for transferring an image from said photoreceptor to a copy paper sheet at said image transfer position,

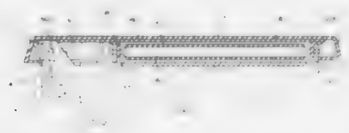
control means for automatically controlling the timing by which said paper transporting means delivers a copy paper sheet to said image transfer position with respect to the timing at which said scan is performed according to said reference position, said length value and said magnification value inputted through said input means such that an image of said target image formed on a copy paper sheet delivered by said paper transporting means at a magnification indicated by said magnification value inputted through said input means is not lost at all from said copy paper sheet.

4,853,749
AREA EXPOSURE MACHINE
Kai Sorensen, Lyngby, Denmark, assignor to Eskofot A/S, Ballerup, Denmark
Filed Mar. 24, 1988, Ser. No. 172,573
Claims priority, application Denmark, Mar. 25, 1987, 1523/87
Int. Cl.[4] G03B *27/72*
U.S. Cl. 355—71 4 Claims



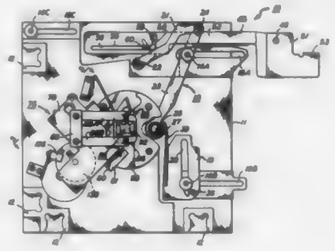
1. An area exposure machine for reproduction equipment, comprising;
an oblong light source; and
a reflector, said reflector comprising at least four reflector members, each being shaped substantially as a respective involute curve.

4,853,750
DOCUMENT HOLDER FOR A COPIER AND HINGE MECHANISM THEREFOR
Mitshiro Murata, Nara; Naofumi Okada, Tenri; Kazutoshi Yamamoto, Nara; Takuharu Tanimoto, and Tokuyasu Inoue, both of Hiroshima, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Feb. 25, 1988, Ser. No. 160,139
Claims priority, application Japan, Feb. 26, 1987, 62-46150; Feb. 27, 1987, 62-46336
Int. Cl.[4] G03B *27/62*
U.S. Cl. 355—75 9 Claims



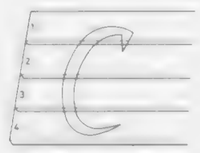
1. In a document holder including a document holding member for holding a document sheet on a document table at the top of a housing structure having a side surface and hinge mechanisms by which said document holding member can be opened and closed with respect to said document table, the improvement wherein said hinge mechanisms each comprise
a first hinge plate affixed onto said side surface of said housing structure,
a second hinge plate attached rotatably to said first hinge plate and affixed to said document holding member, and
biasing means supported by said first hinge plate for applying a generally upward biasing force on said second hinge plate in the direction of opening said document holding member.

4,853,751
DISC FILM AND LENS SUPPORTING UNIT
James D. Riall, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 30, 1987, Ser. No. 126,810
Int. Cl.[4] G03B *27/62*
U.S. Cl. 355—76 35 Claims



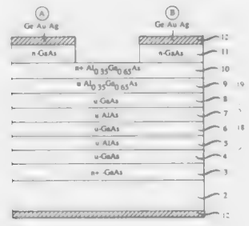
1. A disc film and lens supporting unit comprising:
a structural base plate;
an exposure aperture extending through said structural base plate;
a spindle to support a disc film in register with said exposure aperture;
means to move the disc film and the spindle laterally between first and second spaced positions;
means to move the disc film rotationally about said spindle relative to said exposure aperture;
film engaging means normally engaged to flatten the disc film transversely of said exposure aperture; and,
means connected to said lateral spindle movement means and to said rotational disc movement means to disengage said film engaging means from the disc film and to prevent movement of the disc film before disengagement.

4,853,752
IMAGE PROCESSING METHOD
Tohru Takahashi, Tokyo; Nobuo Kitajima, Toride, and Naoto Kawamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 928,621, Nov. 4, 1986, abandoned, which is a continuation of Ser. No. 846,493, Mar. 26, 1986, abandoned, which is a continuation of Ser. No. 753,257, Jul. 9, 1985, abandoned. This application Jan. 27, 1988, Ser. No. 149,892
Claims priority, application Japan, Jul. 13, 1984, 59-146213
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—77 21 Claims



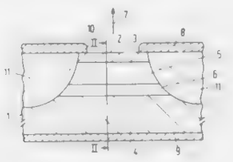
1. An image processing method for reproducing a larger image than an original image by enlarging image data of divisional areas of the original image and sequentially printing out the enlarged divisional image data on respective print sheets.

4,853,753
RESONANT-TUNNELING DEVICE, AND MODE OF DEVICE OPERATION
Federico Capasso, Westfield; Alfred Y. Cho, Summit, and Susanta Sen, Scotch Plains, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Continuation-in-part of Ser. No. 68,974, Jul. 1, 1987. This application Nov. 5, 1987, Ser. No. 117,583
Int. Cl.[4] H01L *29/88*
U.S. Cl. 357—4 2 Claims



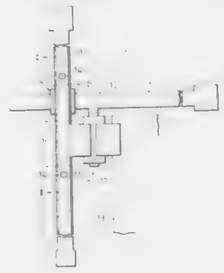
1. A device comprising a resonant-tunneling structure, said structure comprising a quantum-well layer between quantum-barrier layers on a substrate, with emitter and collector contacts on opposite sides of said resonanttunneling structure, said device further comprising an essentially undoped accelerator-region layer between said emitter contact and said resonant-tunneling structure.

4,853,754
SEMICONDUCTOR DEVICE HAVING COLD CATHODE
Gerardus G. P. Van Gorkom, and Henri F. J. Van 'T Blik, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.
Filed Mar. 5, 1987, Ser. No. 21,938
Claims priority, application Netherlands, Mar. 17, 1986, [illegible]
Int. Cl.[4] H01L *29/161*
U.S. Cl. 357—16 9 Claims



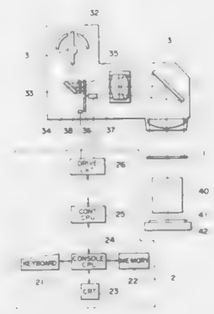
1. A semiconductor device for generating an electron beam by means of a cathode comprising a semiconductor body having an n-type surface region and an underlying a p-type region, in which electrons leaving the semiconductor body can be generated in said body by giving the n-type region a positive bias with respect to the p-type region, characterized in that a substantially intrinsic semiconductor region is present between the n-type surface region and the underlying p-type region, the band gap of the intrinsic semiconductor material at the area of the transition between the intrinsic semiconductor material and the p-type region being smaller than that at the area of the transition between the intrinsic semiconductor material and the n-type surface region.

4,853,755
METHOD FOR MANUFACTURING A THIN-FILM TRANSISTOR ARRAY AND A THIN-FILM TRANSISTOR ARRAY MANUFACTURED BY THE METHOD
Kazuya Okabe, Moriya; Hideyuki Matsuda, Iwaki; Chisato Iwasaki, and Satoshi Fujimoto, both of Furukawa, all of Japan, assignors to Alps Electric Co., Ltd., Japan
Filed Mar. 17, 1988, Ser. No. 170,996
Claims priority, application Japan, Apr. 23, 1987, 62-100909
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.7 1 Claim



1. A thin-film transistor array wherein a plurality of gate buses and a plurality of source buses are formed on a substrate in such a manner that said gate buses are intersected with said source buses at crossover portions, and a plurality of thin-film transistors are formed on the substrate adjacent to the crossover portion, which are connected to said gate buses and source buses for a driving purpose, characterized in that an auxiliary bus is formed on either the gate buses, or source buses, shortcircuited portions of which are cut out by means of laser trimming, so as to conduct said gate buses or source buses.

4,853,756
PROJECTION EXPOSURE APPARATUS
Toshio Matsuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 25, 1988, Ser. No. 147,796
Claims priority, application Japan, Jan. 28, 1987, 62-15999
Int. Cl.[4] G03B *27/72*
U.S. Cl. 355—71 8 Claims



1. A projection exposure apparatus selectively usable with first and second originals having patterns of different linewidths, said apparatus comprising:
an illumination system providing light having a central wavelength;

a projection lens system cooperable with said illumination system for projecting a pattern upon a workpiece; and

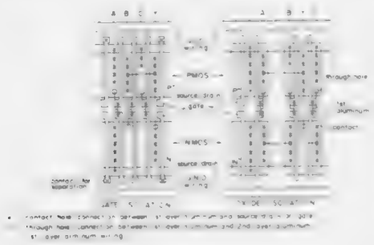
a bandwidth selector operable, when the first and second originals as selectively used are irradiated with the light from said illumination system, to change the bandwidth of the light such that the first and second originals are irradiated with light of different bandwidths, but of substantially the same central wavelength.

4,853,757

SEMICONDUCTOR INTEGRATED CIRCUIT

Yoichi Kuramitsu, and Takahiko Arakawa, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 31,731, Mar. 30, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 287,525
Claims priority, application Japan, May 7, 1986, 61-104293
Int. Cl.[4] H01L 27/10
U.S. Cl. 357—45 3 Claims



1. A large scale semiconductor integrated circuit comprising:

a substrate;

a gate region formed on said substrate;

an I/O region formed at a periphery of said gate region; and

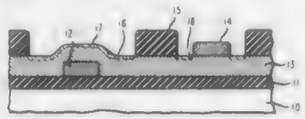
a plurality of cell arrays formed in said gate region and said I/O region, the cell arrays in said gate region being formed as logic elements which can function as either of I/O cells and gate cells, some of the cell arrays in said gate region functioning as said I/O cells.

4,853,758

LASER-BLOWN LINKS

Frederick H. Fischer, Lower Macungie Township, Lehight County, Pa., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 12, 1987, Ser. No. 84,531
Int. Cl.[4] H01L 27/02, 23/48
U.S. Cl. 357—51 9 Claims



1. A solid state circuit comprising a lower interconnect level having a conductive link adapted to being rendered non-conductive by the application of radiant energy thereto, wherein said interconnect level is overlaid by a dielectric layer that is overlaid by an upper interconnect level which crosses over said lower interconnect level at crossover locations,

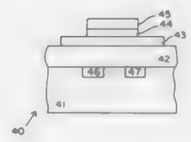
CHARACTERIZED in that an etch-resistant masking layer is formed over at least said crossover locations, and the thickness of said dielectric layer over said link in the lower interconnect level is substantially less than the thickness of said dielectric layer under said etch-resistant masking layer.

4,853,759

INTEGRATED CIRCUIT FILTER WITH REDUCED DIE AREA

Yusuf A. Haque, San Jose, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Continuation of Ser. No. 912,645, Sep. 29, 1986, abandoned, which is a continuation of Ser. No. 622,414, Jun. 20, 1984, abandoned. This application Apr. 28, 1988, Ser. No. 188,190
Int. Cl.[4] H01L 27/02
U.S. Cl. 357—51 5 Claims



1. A semiconductor structure comprising:

a semiconductor substrate of first conductivity type;

a resistor formed within said substrate, said resistor being a diffused region, said diffused region being of a second conductivity type opposite said first conductivity type;

an insulation layer formed above said resistor; and

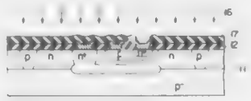
a nonparasitic capacitor formed on said insulation layer above said resistor diffusion, said capacitor having a first capacitive plate formed on said insulation layer, said first capacitive plate substantially covering said resistor diffusion, a dielectric layer formed on said first capacitive plate, and a second capacitive plate formed on said dielectric layer, said first and second capacitive plates being of respective areas to provide a desired capacitance.

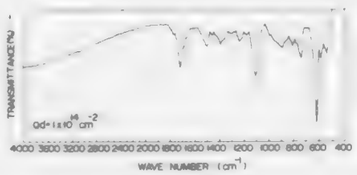
4,853,760

SEMICONDUCTOR DEVICE HAVING INSULATING LAYER INCLUDING POLYIMIDE FILM

Masahiro Abe, Yokohama; Masaharu Aoyama, Fujisawa; Jiro Ohshima, Yokohama, and Takashi Ajima, Kamakura, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaka, Japan

Continuation of Ser. No. 429,435, Sep. 30, 1982, abandoned. This application Aug. 25, 1987, Ser. No. 89,959
Claims priority, application Japan, Dec. 12, 1981, 56-199501
Int. Cl.[4] H01L 29/34, 29/167, 23/48
U.S. Cl. 357—52 8 Claims





1. A semiconductor device, comprising:

a semiconductor substrate;

at least one semiconductor element formed in one main surface region of the substrate by means of impurity diffusion;

an insulating film formed on the main surface of the substrate;

a first wiring layer selectively formed on the insulating film and connected to the semiconductor element formed in the substrate by at least one through-hole made in the insulating film;

a polymide film formed as an insulating layer to cover both the first wiring layer and the exposed surface of the insulating film, said polymide film being provided with at least one through-hole positioned over a part of the first wiring layer, and said polyimide film having implanted therein a controlled dose of ions of an inert element for suppression of polarization; and

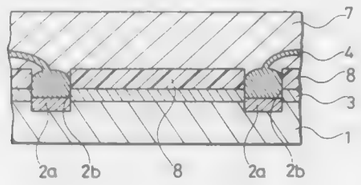
a second wiring layer selectively formed on said polyimide film having ions of the inert element implanted therein and connected via the through-hole made in said polyimide film to said part of the first wiring layer, said semiconductor device being designed to have a potential difference applied between the substrate and said second wiring layer.

4,853,761

SEMICONDUCTOR DEVICE

Shingo Ikeda, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1987, Ser. No. 25,824
Claims priority, application Japan, Mar. 14, 1986, 61-57468
Int. Cl.[4] H01L 23/28, 23/30
U.S. Cl. 357—72 3 Claims



1. A plastic molded ultraviolet ray erasable type EPROM semiconductor device which comprises:

a semiconductor chip having an element region;

wire bonding electrodes operatively connected to said semiconductor chip;

a surface protection film formed on said semiconductor chip;

an ultraviolet ray transparent resin film comprising polyimide formed on said surface protection film so as to cover at least said element region and the surface of said semiconductor chip except for said wire bonding electrodes; and

molding material formed on said resin film, said wire bonding electrodes, and said surface protection film so as to cover said semiconductor chip, wherein said EPROM semiconductor device is one time programmable so as to have one time only earsing and writing functions, and wherein said resin film reduces stresses arising between said semiconductor chip and said molding material

2. A semiconductor device as defined in claim 1, further comprising a differential amplifier disposed on said element region of said semiconductor chip.

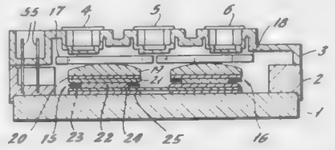
3. A semiconductor device as defined in claim 2, wherein said semiconductor chip includes electrode windows formed therein so as to provide for said wire bonding electrodes.

4,853,762

SEMI-CONDUCTOR MODULES

Peter R. Ewer, Hurst Green, and Jeffrey R. Ellard, Burgess Hill, both of England, assignors to International Rectifier Corporation, El Segundo, Calif.

Filed Mar. 20, 1987, Ser. No. 28,681
Claims priority, application United Kingdom, Mar. 27, 1986, 8607654; Apr. 2, 1986, 8608094
Int. Cl.[4] H01L 23/16, 23/32, 23/42
U.S. Cl. 357—79 12 Claims



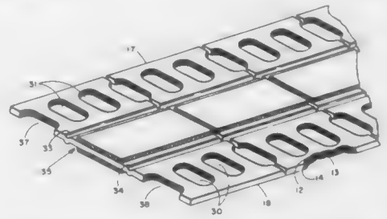
1. A semi-conductor element module having a housing containing at least one semi-conductor junction having electrodes electrically connected to respective external terminals by compression assembly, the semi-conductor junction and a pair of internal terminals forming elements of a stack contained in the housing; said stack further comprising at leas tone solid strain buffer having one side adjacent one side of the semi-conductor junction, at least one electrical isolation member dielectrically spacing the stack from the housing, and at least one electrically insulating compression member having a domed surface and being limited in maximum thickness to 4 mm; one of said internal terminals being adjacent another side of the semi-conductor junction and the other internal terminal being adjacent another side of said strain buffer; compression forces being applied to the stack by at least one plate spring means pressing upon said domed surface, the height of said stack being less than 15 mm.

4,853,763

MOUNTING BASE PAD MEANS FOR SEMICONDUCTOR DEVICES AND METHOD OF PREPARING SAME

David C. DeGree, Burnsville; Dallas R. Humphrey, Golden Valley; Carl R. Bergquist, Minnetonka, and Roger A. West, Woodbury, all of Minn., assignors to The Bergquist Company, Minneapolis, Minn.

Division of Ser. No. 625,140, Jun. 27, 1984, abandoned. This application Dec. 22, 1986, Ser. No. 944,947
Int. Cl.[4] H01L 23/12, 23/14, 23/36
U.S. Cl. 357—81 4 Claims



1. Mounting means for use in combination with solid-state semiconductive translating devices and comprising:

(a) a generally rigid deformable sheet element having at least one metal foil layer and including means defining a centrall disposed base pad having edge surfaces including oppused ends and opposed sides, and flange walls coupled to the opposed side edges and extending away from said base pad;

(b) an adhesive menas secured to said sheet element and defining at least one first mounting pad means secured to the surface of said base pad and being composed of a thin layer of silicone base rubber to facilitate the direct mount-

ing of a solid-state semiconductive device to said base pad; and

(c) a second mounting pad means secured to said base pad on a side of the base pad opposite said first mounting pad means, for mounting said base pad with respect to a circuit board.

4,853,764

METHOD AND APPARATUS FOR SCREENLESS PANORAMIC STEREO TV SYSTEM

Hans E. Sutter, Lima, Peru, assignor to Pedalo, Inc., West New York, N.J.

Filed Sep. 16, 1988, Ser. No. 245,403
Int. Cl.[4] H04N *15/00*
U.S. Cl. 358—3 **37 Claims**

1. A screenless or screen independent color and stereo television system, for providing a high definition panoramic image comprising:

means for selectively receiving and controlling video and associated audio signals, including means for selectively providing on separate output channels, right and left components of said audio signals, right and left green, red, and blue video components of color video signals, and power for video display means;

a pair of goggles included as part of a headset including:

means for mounting said headset on a user's head;

earphone means for receiving said right and left components of said audio signals and reproducing the sound content thereof for presentation directly to a right and a left ear of a user, respectively;



right and left video display means associated with a user's right and left eyes, respectively, mounted in said pair of goggles, respectively, for projecting said right and left video signals, respectively, said right and left video display means each including three mini monochrome display means for receiving and displaying video images associated with respective green, red, and blue video components, color superimposition means for superimposing said video images, and at least one stage of optical image amplification means, for providing video images to said right and left eyes, respectively, for effecting a panoramic stereo vision to a user or viewer; and

multicable means for electrically connecting said audio and video signals, and said power from said receiving means to said headset.

4,853,765

SEQUENTIAL SCANNING CONVERTER WITH FRAME COMB FILTER AND FREEZE FRAME FEATURE

Kenji Katsumata; Masato Sugiyama; Takaaki Matono; Shigeru Hirahata; Isao Nakagawa, all of Yokohama; Kazuo Ishikura, Hachioji, and Sunao Suzuki, Kamakura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 26, 1988, Ser. No. 186,164
Claims priority, application Japan, Apr. 30, 1987, 62-104331
Int. Cl.[4] H04N *11/02, 7/01*
U.S. Cl. 358—11 **5 Claims**

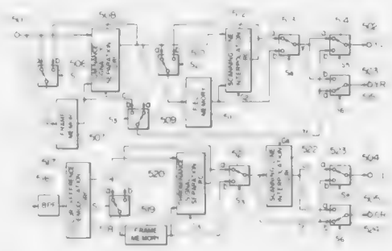
1. A video signal processing circuit capable of reproducing a still picture from a color video signal, comprising:

luminance signal/chrominance signal separation means arranged for receiving a color video signal;

scanning line interpolation means in an electrical connection to receive the output of said separation means;

first memory means in an electrical connection to receive and store therein the output of said separation means;

second memory means in an electrical connection to receive



and store therein the output of said interpolation means; and

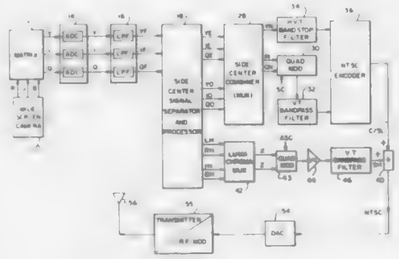
first and second switching means each connected to receive the outputs of said first and second memory means through switches, said first and second switching means being operable so that said first switching means delivers therethrough the outputs of said first and second memory means alternately and said second switching means delivers therethrough the outputs of said second and first memory means alternately, the alternation for said delivery by said first and second switching means being effected at a frequency identical with the field frequency of said video signal.

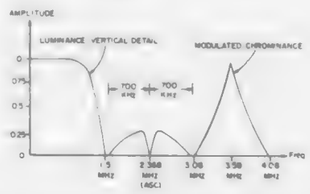
4,853,766

WIDESCREEN VIDEO SIGNAL PROCESSOR WITH AUXILIARY MODULATED BY WIDESCREEN INFORMATION

Michael A. Isnardi, Plainsboro, and Chandrakant B. Patel, Hopewell, both of N.J., assignors to General Electric Company, Princeton, N.J.

Filed Jul. 27, 1987, Ser. No. 78,340
Int. Cl.[4] H04N *11/12, 7/08*
U.S. Cl. 358—12 **19 Claims**





1. Apparatus for encoding a television type video signal, comprising:

means for generating a television type video signal containing widescreen image information for providing an image aspect ratio greater than that of standard video image information, said video signal comprising a luminance image component including vertical image detail information occupying a first frequency band and a chrominance subcarrier component modulated with color image information occupying a second frequency band;

means for providing an alternate subcarrier signal with a frequency between said first and second frequency bands; and

means for modulating said alternate subcarrier signal with said widescreen image information

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4,853,767

COLOR GRAPHIC IMAGE PROCESSING SYSTEM INVOLVING DATA COMPRESSION USING REFERENCE SAMPLES

Toshiyuki Sakai, Takatsuki; Yoshihiro Okada, Kyoto, and Keiichiro Hyodo, Kobe, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Feb. 20, 1987, Ser. No. 16,918
Claims priority, application Japan, Feb. 20, 1986, 61-36041
Int. Cl.[4] H04N *1/46*
U.S. Cl. 358—78 **6 Claims**





1. A color graphic image processing method comprising the steps of:

reading a color graphic image by utilization of a color image input device with the color image input device transforming that which is read into image data,

coding the image data in accordance with section dividing means which acts to compress the image data by dividing a density region of each color in the color graphic image into sections represented by 4 through 6 codes with the codes being based upon data obtained by measuring a plurality of reference color samples with said color image input device,

converting the coded data to a color image output signal in accordance with conversion means in which a code corresponding to a reference color sample is related to a color image output signal which is determined so as to cause a color image output device to output a color substantially the same as said reference color sample,

providing the color image output signal to the color image output device to reproduce a color graphic image.

4,853,768

COLOR IMAGE PROCESSING APPARATUS WITH LINEAR MASKING CIRCUIT HAVING COEFFICIENTS WHICH VARY IN ACCORDANCE WITH THE LEVELS OF COLOR COMPONENT SIGNALS

Akio Suzuki, Tokyo; Masaharu Ohkubo, and Yoshihiro Takada, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 945,945
Claims priority, application Japan, Dec. 26, 1985, 60-292154; Jun. 5, 1986, 61-130704
Int. Cl.[4] G03F *3/08*; H04N *1/46*
U.S. Cl. 358—80 **13 Claims**

1. A color processing apparatus comprising:

input means for receiving a plurality of color component signals;

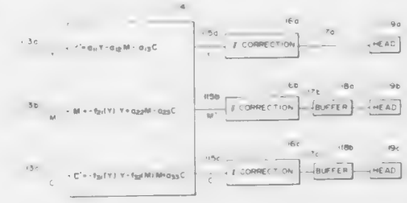
a masking circuit for performing a linear masking process for said plurality of color component signals, said masking process utilizing a plurality of coefficients, each having a value; and

varying means for varying the value of at least one of the coefficients of said masking circuit in accordance with the level of at least one of the plurality of color component signals.

8. A color image processing apparatus comprising:

recording means for sequentially recording a plurality of kinds of colorants in an area of a material;

means for discriminating a signal level corresponding to an



amount of one kind of colorant recorded in the area prior to the recording of other kinds of colorants in the area; and

correcting means for correcting a signal level corresponding to an amount of at least one of said other kinds of colorants to be recorded in the area after the recording of said one kind of colorant in the area in accordance with the discrimination of said discriminating means.

4,853,769

TIME MULTIPLEXED AUTO-STEREOSCOPIC THREE-DIMENSIONAL IMAGING SYSTEM

Joel S. Kollin, Somerville, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 16, 1987, Ser. No. 62,904
Int. Cl.[4] H04N *13/00*
U.S. Cl. 358—88 **53 Claims**

1. Display apparatus for presenting a three-dimensional display to a viewer comprising:

an image generator for generating a sequence of images in a common display field to be viewed by a viewer; and

a directional scanner between the display field and viewer for directing collimated light from the images in the common display field such that successive images are viewed

from different angles, the images being generated and the collimated light being scanned at a sufficient rate to create



a perception by the viewer of a single three-dimensional view through the common display field.

4,853,770

VIDEO SYSTEM FOR VIEWING MICROSCOPIC SPECIMENS

Joe Schneller, 310 E. Dairy, Monett, Mo. 65708

Filed Mar. 1, 1988, Ser. No. 162,646

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—93 **6 Claims**

1. A video system for viewing a specimen comprising:

microscope means for providing a magnified view of said specimen;

means on said microscope means for associating a video camera means with said microscope means;

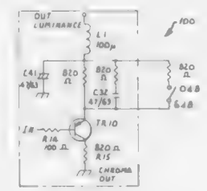
said video camera means having circuitry therein for receiving a signal indicative of said specimen field as viewed by said microscope means;

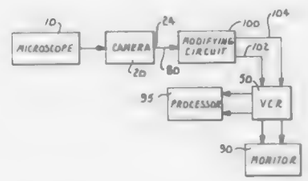
circuit means associated with said circuitry of said video camera means for modifying a normal integral video signal emanating from said video camera circuitry indicative of said specimen, said circuit means splitting said integral signal into a first carrying luminance characteristics of said signal and a second signal carrying chroma characteristics of said signal;

means for modifying said circuitry of said video camera means to allow a greater passthrough of said chroma characteristics of said split signal through said camera means to a downstream component;

lead means for delivering said first and second signals from said circuit means of said camera means to a downstream VCR component;

VCR means having circuitry therein for receiving said first and second indicative signals and recording the same onto respective first and second tracks of a video tape;





means for modifying said circuitry of said VCR means to allow a greater passthrough of said chroma characteristics of said split signal through said VCR prior to recording said signals onto said tracks of said video tape.

4,853,771

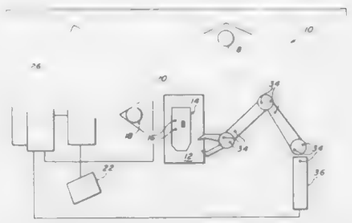
ROBOTIC VISION SYSTEM

Norman M. Witriol; William H. Brumage, and David H. Cowling, all of Ruston, La., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 883,249, Jul. 9, 1986, abandoned. This application Apr. 8, 1988, Ser. No. 179,327

Int. Cl.[4] H04N *7/18, 7/00*

U.S. Cl. 358—93 **27 Claims**



1. An apparatus for robotic vision to enable an object to be located and moved by a robot, whether the object is situated correctly or not, comprising:

a luminescent fiduciary code which identifies the position and orientation of the object to be moved by the robot, the fiduciary code being marked on the object and on the robot;

luminescent means for causing the fiduciary code to luminesce, said luminescent means being an ultraviolet or infrared light;

sensing means for detecting the position of the fiduciary code wherein the sensing means is a first and a second videocon aimed at the object and positioned to each receive a scene containing the object including, at times, the luminescence of the fiduciary code, said first and second videocons having a first and a second signal, respectively, which signals are representative of luminescent and non-luminescent images seen by both the first and the second videocons;

computing means for determining the position and orientation of any portion of the object in relation to the robot in real time; and

connection means to pass the first and second signals of the first and second videocons, respectively, to the computing means where image subtraction is performed by subtracting a luminescent image from a non-luminescent image or vice versa.

4,853,772

ELECTRONIC ENDOSCOPE APPARATUS HAVING ISOLATED PATIENT AND SECONDARY CIRCUITRY

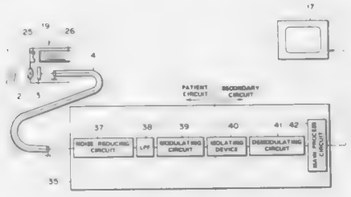
Kenichi Kikuchi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1988, Ser. No. 158,958

Claims priority, application Japan, Jun. 24, 1987, 62-158427; Feb. 26, 1988, 63-043578

Int. Cl.[4] H04N *9/18*

U.S. Cl. 358—98 **21 Claims**



1. An electronic endoscope apparatus, comprising:

an endoscope having an imaging means for converting a light information of an object to be imaged to an electric signal; and

a signal processing means having an isolating means for isolating and transmitting the information from the imaging means from a patient circuit side to a secondary circuit side, and a converting means for converting the signal from said imaging means to a signal adapted to be transmitted by said isolating means and delivering the adapted signal to said isolating means, and processing the output signal of said imaging means.

4,853,773

ENDOSCOPE SIGNAL PROCESSING APPARATUS USING SEQUENTIAL AND SYNCHRONOUS IMAGING DEVICES

Hiroki Hibino, Hachioji; Kenji Kimura, Tachikawa, and Teruo Eino, Hachioji, all of Japan, assignors to Olympus Optical, Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 150,259

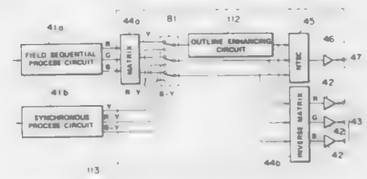
Claims priority, application Japan, Jan. 31, 1987, 62-21460; Feb. 17, 1987, 62-34029; Feb. 17, 1987, 62-34027; Mar. 17, 1987, 62-61603

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—98 **54 Claims**

1. An endoscope signal processing apparatus to which an endoscope provided with a field sequential type color imaging means and an endoscope provided with a synchronous type color imaging means can be commonly connected, said endoscope signal processing apparatus comprising:

a first processing means for processing a signal for said field sequential type color imaging means; and



a second signal processing means for processing a signal for said synchronous type color imaging means.

4,853,774

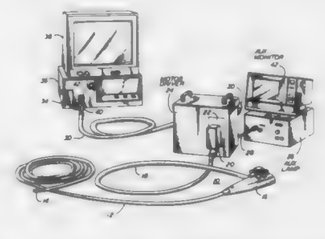
AUXILIARY LIGHT APPARATUS FOR BORESCOPE

Dominick A. Danna, Syracuse; Jon Salvati, Skaneateles, and Joseph A. Ciarlei, Marcellus, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Oct. 28, 1988, Ser. No. 264,257

Int. Cl.[4] H04N *7/18;* A61B *1/04*

U.S. Cl. 358—98 **4 Claims**



1. Auxiliary illumination apparatus for extending the working distance between a remote target area and a video processor unit for a video borescope or endoscope of the type which includes an elongated flexible insertion tube, a video camera disposed at a distal end of the insertion tube, an interface module coupled to a proximal end of said insertion tube for connecting to a mating receptacle coupler in said video processor unit for supplying power, synchronizing signals, and auxiliary signals from said video processor device to said video camera and to receive and process video signals produced by said video camera, and further including an optical interface for coupling an illumination source in said video processor unit to a proximal end of a fiber optic bundle within said insertion tube which carries illumination to the distal end of said insertion tube to illuminate said target area; said auxiliary apparatus comprising

a housing;

receptacle means in said housing for receiving said interface module;

a multiple contact connector mounted on said housing;

electrical harness means within the housing including a plurality of conductors at least certain ones of which terminate at said receptacle means and also terminate at said multiple contact connector;

an illumination generating device within said housing including an optical interface disposed at said receptacle means for supplying illumination through said fiber optic bundle to said target area; and

an umbilical which includes a flexible elongated sheath, a plurality of conductors within said sheath, a distal end connector which mates with said multiple contact connector to couple said plurality of conductors to said electrical harness means, an auxiliary interface module at a proximal end of said umbilical which mates with said mating recep-

tacle coupler in said video processor unit and connected to at least certain predetermined conductors of said plurality of conductors for providing power synchronizing signals, and auxiliary signals over said conductors and through said electrical harness and said insertion tube to said camera and to carry the video signals from said camera to said video processor unit.

4,853,775

METHOD AND DEVICE TO ESTIMATE MOTION IN A SEQUENCE OF MOVING PICTURES

Bernard Rouvrais, Vezin Le Coquet; Michel Kerdranvat, and Philippe Robert, both of Rennes, all of France, assignors to Thomson-CSF, Paris, France

Filed Mar. 22, 1988, Ser. No. 171,835
Claims priority, application France, Mar. 23, 1987, 87 03991; Dec. 11, 1987, 87 17289
Int. Cl.[4] H04N 7/12
U.S. Cl. 358—105 24 Claims



1. A method to estimate motion in a sequence of television type moving pictures, where each picture is formed by a determined number of light spots located at intersections of lines and columns, said method of the type where motion is estimated by performing a gradient algorithm which minimizes a mean square deviation between local variations in luminance of a current pel of the picture and those of a pel in a similar position to the current pel in the prior image, said method comprising the steps of:

initializing an algorithm by displacement values estimated according to several directions within a close causal neighborhood of the current pel and of the propagation of each estimate in a scanning direction of picture lines,

choosing a propagating direction for the algorithm depending on a position, in the picture, of a line to which the current pel belongs,

calculating a modulus of a gradient of the current pel and comparing the result with a pre-determined threshold value,

choosing a displacement for the present pel in the causal neighborhood of this pel when the modulus of the gradient obtained is below the pre-determined threshold value, and

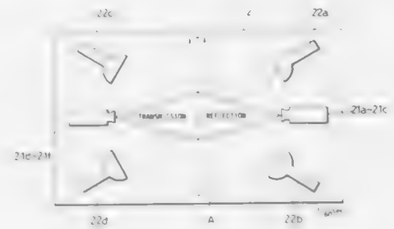
choosing the displacement that gives the smallest displaced frame difference, or estimating a new displacement when the gradient modulus obtained is above the predetermined threshold.

4,853,776

FABRIC INSPECTING METHOD AND APPARTUS FOR DETECTING FLAWS

Hisao Itaya; Toshihiko Okada; Morishige Hata; Shunji Koike, and Takahiro Onishi, all of Kyoto, Japan, assignors to Gunze Ltd., Kyoto, Japan

Filed Apr. 1, 1988, Ser. No. 176,540
Claims priority, application Japan, Apr. 3, 1987, 62-083383
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—106 6 Claims



1. A method of inspecting a fabric in strip form to find flaws comprising the steps of;

transporting the fabric through a space between a plurality of strobes and image pickup elements, and alternately causing the strobes at one side of the fabric and the strobes at the other side to emit light,

causing the image pickup elements at both sides of the fabric to read strobe light passing through the fabric and strobe light reflected by the fabric at times of light emission from the strobes,

detecting a flaw on the fabric by electrically processing images provided by the image pickup elements, and

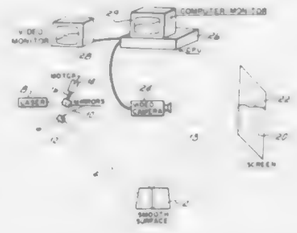
marking the fabric at a position of the flaw.

4,853,777

METHOD FOR EVALUATING SMOOTH SURFACES

Stephen S. Hupp, Dublin, Ohio, assignor to Ashland Oil, Inc., Russell, Ky.

Continuation-in-part of Ser. No. 74,886, Jul. 7, 1987, abandoned. This application Jan. 29, 1988, Ser. No. 150,136
Int. Cl.[4] H04N 7/18; G01B 11/24
U.S. Cl. 358—107 10 Claims



5. A method for quantitatively determining the long-term waviness of a reflective smooth surface comprising:

impinging lines of laser radiation onto the surface to create discrete images which reflect from said surface;

detecting said reflected images by a video camera;

digitizing said detected reflected images to create data points;

storing said data points; and

determining said long-term waviness by first generating a reduced line for each said reflected image, fitting each said reduced line mathematically to a polynomial which determines an idealized line fit, calculating the standard deviation of each said reduced line from said corresponding idealized line, and calculating an average standard deviation based on each said standard deviation.

6. A method for quantitatively determining the short-term waviness and long-term waviness of a reflective smooth surface comprising:

impinging lines of laser radiation onto the surface at an angle relative to the plane of said surface to create discrete images which reflect from said surface;

detecting said reflected images by a video camera;

digitizing said detected reflected images to create data points;

storing said data points

determining said short-term waviness by first calculating the average height of each said reflected image and then calculating the overall average based on each said average height; and

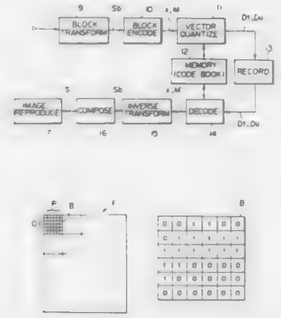
determining said long-term waviness by first generating a reduced line for each said reflected image, fitting each said reduced line mathematically to a polynomial which determines an idealized line fit, calculating the standard deviation of each said reduced line from said corresponding idealized line, and calculating an average standard deviation based on each said standard deviation.

4,853,778

METHOD OF COMPRESSING IMAGE SIGNALS USING VECTOR QUANTIZATION

Nobuyuki Tanaka, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Feb. 25, 1988, Ser. No. 160,377
Claims priority, application Japan, Feb. 25, 1987, 62-42112; Feb. 24, 1988, 62-41714
Int. Cl.[4] H04N 7/12
U.S. Cl. 358—133 3 Claims



1. A method of compressing image signals by:

(i) dividing original image signals representing a two-dimensional image into blocks, each of said blocks being composed of a plurality of samples,

(ii) converting the original image signals at respective picture elements in each of the blocks into an n-valued system where each of the plurality of samples has one of the n-values and, where n denotes an integer of 2 or larger,

(iii) calculating mean values $m_1, m_2, \ldots, m_n$ of the original image signals at the respective picture element in the block that have the common n-valued signals, and

(iv) encoding the mean values $m_1, m_2, \ldots, m_n$ and the n-valued signals,

wherein the improvement comprises the steps of:

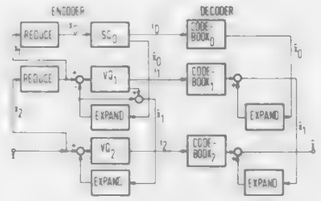
(a) carrying out vector quantization of said mean values $m_1, m_2, \ldots m_n$ and/or said n-valued signals in each of said blocks.

4,853,779

METHOD FOR DATA REDUCTION OF DIGITAL IMAGE SEQUENCES

Bernard Hammer, Pfaffing, and Achim von Brandt, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 7, 1988, Ser. No. 178,567
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 3711627
Int. Cl.[4] H04N 7/12
U.S. Cl. 358—133 9 Claims



1. A method for data reduction of digital image sequences in hierarchic fashion by means of a multi-stage coder on the basis of vector quantizing and movement compensation as well as reconstruction of these image sequences by means of a multi-stage decoder, comprising the steps of

representing an input image signal in a plurality of image signals having different spatial resolution on the basis of a cascade of L identical quantizers having subsequent subscanning, whereby the spatial resolution and the data volume of the input image signal are respectively reduced by a factor R in the horizontal and in the vertical directions in every cascade stage and whereby the input image signal is referenced "resolution level L" and the low-pass-filtered image signal having the smallest resolution is referenced "resolution level 0";

representing the chronologically preceding, reconstructed, movement-compensated image signal by a plurality of image signals having different spatial resolution in the same way;

subdividing the samples of the resolution levels into blocks, whereby the "resolution level 0" has the block size "1×1" and, for the following, the block size is horizontally and vertically increased by the factor R with every further size N×N;

successively comparing, beginning with "resolution level 0", corresponding image signals of the input image signal and of the reconstructed, movement-compensated image signal, with each other, the said comparison being executed block-by-block;

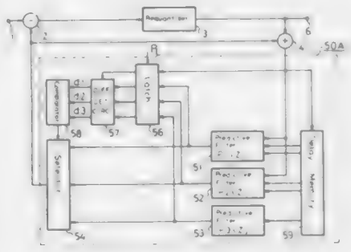
switching the coding mode as soon as the difference between corresponding image signals exceeds a prescribed threshold, and forming, beginning from the current resolution level of the input image signal, the difference from the interpolated, preceding resolution level of the input image signal, whereby the interpolation is performed in multi-stage fashion, and the difference is quantized and produced as an output as soon as the difference to be formed next exceeds a prescribed threshold, whereby the difference is scalarly quantized in the "resolution level 0" and the difference is vector quantized in all other "resolution levels 1 . . . L".

4,853,780

METHOD AND APPARATUS FOR PREDICTIVE CODING

Yuichi Kojima, and Naohisa Kitazato, both of Kanagawa, Japan, assignors to Sony Corp., Tokyo, Japan

Filed Feb. 11, 1988, Ser. No. 154,881
Claims priority, application Japan, Feb. 27, 1987, 62-044413
Int. Cl.[4] H04N 7/12
U.S. Cl. 358—136 11 Claims



1. In a predictive encoding method for transmitting a residual signal determined by the difference between an input signal, which represents image information having field and frame intervals, and a predictive signal, the steps of:

applying a comparative signal based on said input signal to a plurality of predictors which include at least an in-field predictor, an inter-frame predictor and an inter-field predictor, and which have difference respective predictive functions;

comparing said comparative signal with each of a plurality of predictive output signals from said predictors, respectively, so as to obtain a plurality of respective difference signals;

selecting, with a predetermined time delay, the one of said predictors corresponding to the smallest of said difference signals; and

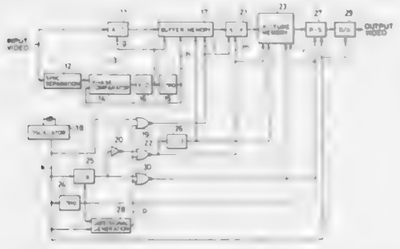
subtracting said predictive output signal of said one predictor from the current input signal for determining said residual signal to be transmitted.

4,853,781

VIDEO FORMAT SIGNAL PROCESSING SYSTEM

Takashi Okano; Toru Akiyama, and Masao Kanda, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 10, 1988, Ser. No. 166,350
Claims priority, application Japan, Mar. 16, 1987, 62-61495
Int. Cl.[4] H04N 5/04
U.S. Cl. 358—148 12 Claims



1. A system for processing an input video format signal having a time-base fluctuation and having a horizontal synchronizing signal portion, comprising:

means for synchronizing a first timing signal with the time-base fluctuation of the input video format signal;

means for sampling the input video format signal according to said synchronized first timing signal;

first and second memory means;

means for writing the sampled input video format signal into said first memory means according to said synchronized first timing signal so that the written sampled input video format signal has no time-base fluctuation;

means for reading-out data from said first memory means according to a second timing signal, said second timing signal having a frequency equal to N times a frequency of the horizontal synchronizing signal of the input video format signal;

means for writing M samples of data read-out from said first memory means into said second memory means;

means for reading-out data from said second memory means such that an output video format signal read-out from said second memory means has a phase which is different from that of the input video format signal; and

means for activating said means for reading-out data from said first memory means and said means for reading-out data from said second memory means; and

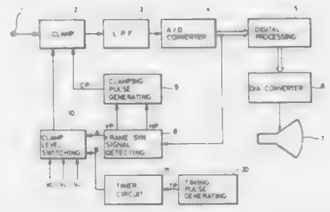
means for simultaneously inhibiting both said means for reading-out data from said first memory means and said means for writing data into said second memory means, said inhibiting means being activated within at least one horizontal scanning period after said means for reading-out data from said second memory means is activated, and said inhibiting means being activated for a period of time equal to R+kM samples of the input format video signal, wherein R is an integer remainder of N divided by M, and wherein k is one of a positive integer and zero.

4,853,782

CLAMPING CIRCUIT FOR CLAMPING VIDEO SIGNAL

Yoshikazu Asano, and Kazuo Naganawa, both of Kakamigahara, Japan, assignors to Sanyo Electric Co., Osaka, Japan

Filed Mar. 9, 1988, Ser. No. 165,691
Claims priority, application Japan, Mar. 12, 1987, 62-57486
Int. Cl.[4] H04N 5/04
U.S. Cl. 358—148 7 Claims



1. A clamping circuit for clamping at a predetermined potential an analogue video signal of a positive polarity synchronization type in which a frame synchronizing signal exists in the range of the level of a video signal, comprising:

frame synchronizing signal detecting means for detecting said frame synchronizing signal from said analogue video signal,

clamping pulse generating means responsive to an output of said frame synchronizing signal detecting means for generating a clamping pulse,

clamp potential switching means for periodically selecting a different one of a plurality of different clamp potentials when said frame synchronizing signal is not detected by said frame synchronizing signal detecting means, and selecting a predetermined clamp potential when said frame synchronizing signal is detected by said frame synchronizing signal detecting means, and

clamping means responsive to said clamping pulse for clamping said analogue video signal on a clamp potential selected by said clamp potential switching means.

4,853,783

VIDEO SIGNAL PROCESSING CIRCUIT

Hidetoshi Ozaki, Chofu, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Sep. 16, 1987, Ser. No. 96,997
Claims priority, application Japan, Sep. 16, 1986, 61-217839; Sep. 16, 1986, 61-217840
Int. Cl.[4] H04N 5/14
U.S. Cl. 358—162 3 Claims



1. A video signal processing circuit for aperture correction or picture quality restoration comprising:

high frequency range emphasis means for producing a high frequency range emphasized signal obtained by delaying an input video signal by a predetermined delay time and by emphasizing a high frequency range of said input video signal;

delay means for delaying the input video signal to produce a plurality of delayed signals having different delay times;

selector means for selecting the maximum and the minimum level signals from among said input video signal and said plurality of delayed signals having different delay times; and

limiter means for limiting in level said high frequency range emphasized signal by using said maximum and minimum level signals selected by said selector means as an upper limit and a lower limit, respectively.

4,853,784

VIDEO SWITCHER WITH INDEPENDENT PROCESSING OF SELECTED VIDEO SIGNALS

John Abt; Ronnie D. Barnett; James E. Blecksmith, all of Nevada City; Kevin D. Windrem, Grass Valley; Neil R. Olmstead; Richard A. Jackson, both of Nevada City; Peter D. Symes, Grass Valley; Richard S. Bannister, Grass Valley; Thomas A. Grancey, Grass Valley, and Richard A. Frasier, Grass Valley, all of Calif., assignors to The Grass Valley Group, Inc., Grass Valley, Calif.

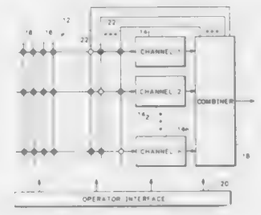
Filed Feb. 19, 1988, Ser. No. 157,675
Int. Cl.[4] H04N 5/268, 5/272, 9/74
U.S. Cl. 358—181 11 Claims

1. A video switcher comprising:

a source selector having a plurality of input terminals for connection to a plurality of video sources respectively, for receiving respective external video signals, and at least first and second output terminals at which selected external video signals may be made available.

at least first and second processing channels having input terminals connected to the output terminals respectively of the source selector and each having an output terminal, each of the processing channels comprising a circuit for acting on a video signal received by the processing channel to limit the video signal in at least one of the amplitude domain and the spatial domain without transforming the video signal in the spatial domain, and

video combiner means having video signal input terminals



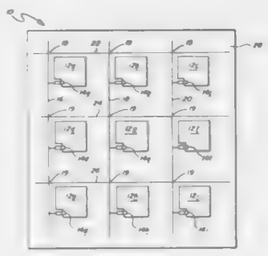
connected to the output terminals of the processing channels, the video combiner means being operative to combine the output signals provided by the processing channels in dependence upon a priority signal.

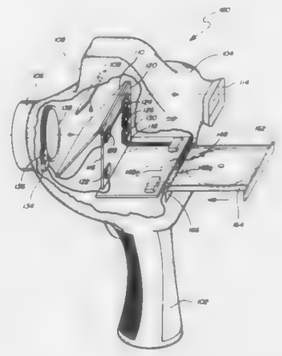
4,853,785

ELECTRONIC CAMERA INCLUDING ELECTRONIC SIGNAL STORAGE CARTRIDGE

Stanford R. Ovshinsky, Bloomfield Hills, Mich., and Lawrence G. Norris, Sterling, Va., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 918,952, Oct. 15, 1986, Pat. No. 4,788,594. This application May 23, 1988, Ser. No. 197,353
The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213.11 30 Claims





1. An electronic imaging system, said system including a

camera for (1) sensing and digitizing images and (2) writing said digitized images onto a storage media; said camera including:

a two dimensional thin film photosensor array for reading a pattern of information corresponding to an image incident thereupon and generating detectable electrical signals corresponding thereto;

said array including a plurality of small area photoresponsive elements, each of said elements capable of photogenerating an electrical signal in response to illumination incident thereupon and including at least one layer of a semiconductor alloy material chosen from the group consisting essentially of: amorphous silicon alloy materials, amorphous germaium alloy materials, amorphous silicon carbon alloy materials and amorphous silicon germanium alloy materials;

lens means for optically projecting a pattern of information corresponding to an image onto said photosensor array;

means for triggering the reading of the pattern of information projected onto said photosensor array;

means for storing said detectable electrical signals generated by said photosensor array, said storing means including optical storage media; and

means for writing said detectable electrical signals onto said storing means.

4,853,786

CSD IMAGE SENSOR AND METHOD OF DECREASING SMEAR BY THE USER THEREOF

Masao Yamawaki, Hyogo, and Hiroshi Kawashima, Itami, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1987, Ser. No. 119,660

Claims priority, application Japan, Nov. 13, 1986, 61-270699

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213.29 **11 Claims**



1. In a solid image pickup element provided with CSD photoelectric conversion elements arrayed in two dimensions, a CSD scanning circuit for selecting each photoelectric conversion element to scan, a vertical transfer means and a horizontal transfer means for transferring a charge of the selected photoelectric conversion element vertically and horizontally respectively, a storage part for storing the transferred charge temporarily, the improvement comprising a driving means for transferring the charge from said photoelectric conversion elements to the storage part during a horizontal blanking period.

4,853,787

STILL VIDEO CAMERA HAVING A VIEWFINDER WITH SUPERIMPOSED IMAGES

Guenther V. Kurth, Scottsville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 6, 1988, Ser. No. 240,302

Int. Cl.[4] G03B *7/08;* **H04N** *5/30*

U.S. Cl. 358—224 **2 Claims**

1. An electronic camera including:

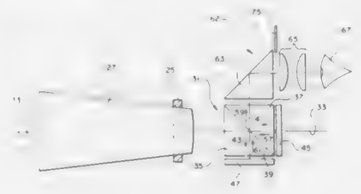
means for mounting an objective lens for creating an image of an object;

a beamsplitter disposed to split the beam transmitted by a lens mounted in the mounting means into a transmitted beam and a reflected beam;

first solid state image sensor means disposed in the focal plane of the transmitted beam and for creating an electrical analog of the optical image on the first sensor means;

second solid state image sensor means disposed in the focal plane of the reflected beam and for creating an electrical analog of the optical image on the second sensor means;

a view finder;



means for directing light reflected by the first solid state image sensor and by the beamsplitter, and light reflected by the second solid state image sensor and transmitted by the beamsplitter, into said viewfinder, whereby the two images viewed through said viewfinder are superimposed;

means for capturing the electrical analogs of the optical images; and

means for preventing ambient light outside the viewfinder entering the camera through the viewfinder during the capture of the electrical analogs of optical images on the first and second sensor means, which analogs are to be read for recreation of a desired image.

4,853,788

AUTOMATIC FOCUSING CIRCUIT SELECTIVELY USING MULTIPLE FOCUS EVALUATING CURVES HAVING DIFFERING CHARACTERISTICS

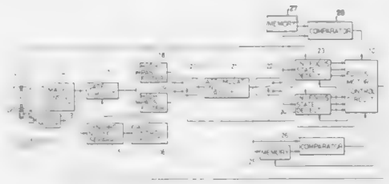
Hirotsugu Murashima, Yamatotakada, and Satoru Maeda, Hirakata, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 16, 1988, Ser. No. 155,900

Claims priority, application Japan, Feb. 18, 1987, 62-34764; Feb. 18, 1987, 62-34766; Mar. 4, 1987, 62-49512

Int. Cl.[4] H04N *5/232*

U.S. Cl. 358—227 **13 Claims**



1. An automatic focusing circuit for automatically matching the focus relative to an object in response to a video signal obtained from image sensing means having a focusing lens and an image sensor, comprising:

relative position changing means (2, 3) for changing the relative position in the direction of an optical axis of said focusing lens relative to said image sensor,

first focus evaluating value detecting means (15, 16, 17, 18, 21) for detecting a level of a first pre-determined high frequency component of the video signal obtained from said image sensing means every constant time period,

converting the level into a first focus evaluating value which is steeply changes at a first slope in response to the change of the relative position of said focusing lens and supplying the same,

second focus evaluating value detecting means (15, 16, 17, 19, 21) for detecting a level of a second pre-determined high frequency component of the video signal obtained from said image sensing means every constant time period, converting the level into a second focus evaluating value which is gently changes at a second slope in response to the change of the relative position of said focusing lens and supplying the same, wherein the value of the second slope is generally less than the value of the first slope;

both said first and second focus evaluating values being a focus evaluating value the absolute value of which takes the maximum value in the in-focus position,

first control means (23, 10) responsive to said first focus evaluating value for controlling said relative position changing means so that the relative position of said focusing lens is driven to the position where the absolute value of said first focus evaluating value takes the maximum value,

second control means (24, 10) responsive to said second focus evaluating value for controlling said relative position changing means so that the relative position of said focusing lens is driven to the position where the absolute value of said second focus evaluating value takes the maximum value,

means (27, 28) for determining that the absolute value of said first focusing evaluating value is larger than a predetermined reference value, and

switching control means (10, 20, 22) responsive to an output of said determining means for selecting said first control means or said second control means to control said relative position changing means such that said second control means is selected to control said relative position changing means; when the absolute value of said first focus evaluating value is smaller than said reference value and said first control means is selected to control said relative position changing means means when the absolute value of said first focus evaluating value is larger than said reference value.

4,853,789

AUTOMATIC FOCUSING CIRCUIT USING A TWO PERIOD DETECTION INTERVAL TO COMPENSATE FOR MOTION OCCURRING WITHIN A FIELD OF VIEW

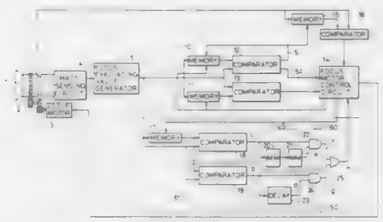
Hirotsugu Murashima, Yamatotakada, and Satoru Maeda, Hirakata, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 16, 1988, Ser. No. 155,901

Claims priority, application Japan, Feb. 18, 1987, 62-34767

Int. Cl.[4] H04N *5/232*

U.S. Cl. 358—227 **18 Claims**



1. An automatic focusing circuit for automatically matching the focus relative to an object in response to a video signal obtained from image sensing means having a focusing lens and an image sensor, comprising:

relative position changing means (2, 3) for changing the relative position in the direction of an optical axis of said focusing lens relative to said image sensor,

focus evaluating value detecting means (5) for detecting at constant time periods a level of a pre-selected high frequency component of the video signal obtained from said image sensing means, converting the level into either a focus evaluating value which takes the maximum value in the in-focus position or a focus evaluating value which takes the minimum value in the in-focus position and sequentially supplying the same,

control means (10, 11, 12, 13, 14, 15, 16) responsive to the focus evaluating value supplied from said focus evaluating value detecting means for controlling said relative position changing means such that the relative position of said focusing lens is once fixed in the position where said focus evaluating value takes the maximum value or the minimum value, and

object change detecting means (50) responsive to the change of the focus evaluating value supplied from said focus evaluating value detecting means for detecting the change of said object after the relative position of said focusing lens is fixed by said control means,

said object change detecting means comprising

first memory means (17) for holding as a reference value said focus evaluating value at a time point when the relative position of said focusing lens is fixed by said control means,

first detecting means (61) for determining that the focus evaluating value supplied from said focus evaluating value detecting means is decreased to a predetermined level with respect to the reference value held in said first memory means within a predetermined first time period,

second detecting means (60) for determining that the focus evaluating value supplied from said focus evaluating value detecting means remains at a level less than said predetermined level over a predetermined second time period which is longer than said first time period after the focus evaluating value is decreased to said predetermined level within said first time period, and

means (25) for supplying outputs of said first and second detecting means to said control means,

said control means being responsive to outputs of said first and second detecting means for resuming control of the relative position of said focusing lens.

4,853,790

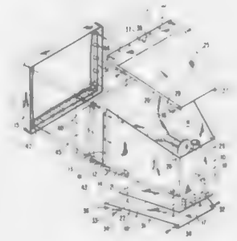
ELECTROMAGNETIC AND ELECTROSTATIC SHIELDING FOR ELECTRONIC EQUIPMENT

Robert G. Dickie, 15 Valley Trail, Rural Route #1, Newmarket, Ontario, Canada L3Y 4V8

Filed May 5, 1988, Ser. No. 190,371

Int. Cl.[4] H04N *5/64, 5/645*

U.S. Cl. 358—245 **5 Claims**



1. A shielded electronic equipment cabinet comprising

a sheet metal cage enclosing all of the electronic equipment in said cabinet except for one face thereof,

a conductive mesh for enclosing said one face,

a nonconductive bezel having an inner-facing lip contoured to match said one face such that, when assembled to said cabinet, said mesh is in position on said one face,

said bezel also including a plurality of bosses for engaging fastening members which, when assembled, secure said cage and said mesh in intimate conductive contact with each other, and

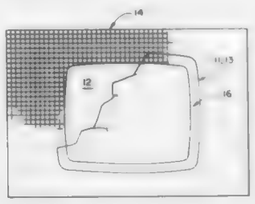
said bezel also including a stepped setback on its rear edge for engaging a nonconductive housing surrounding said cage and attached to said cage.

4,853,791

ELECTROMAGNETIC EMISSION SHIELD FOR CATHODE RAY TUBE DISPLAY

Joseph G. Ginther, Jr., Derwood, Md., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 29, 1988, Ser. No. 228,351
Int. Cl.[4] H04N 5/65
U.S. Cl. 358—247 **7 Claims**



1. An electromagnetic emission shield for reducing electromagnetic emanations from a video display device comprising:

a first optically transparent plate coated on one surface with an optically transparent, electrically conductive coating;

an electrically conductive wire mesh larger in area than said first optically transparent plate having an open area smaller than said first optically transparent plate aligned with respect to said first optically transparent plate so that said conductive coating and said electrically conductive wire mesh overlap at the edge of said optically transparent plate;

means for securing said wire mesh to said first optically transparent plate so that said wire mesh is electrically connected to said conductive coating.

4,853,792

IMAGE SIGNAL BINARY ENCODER

Yuji Katsuta, and Hiroshi Kamata, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 10,705, Feb. 4, 1987, abandoned. This application Nov. 17, 1988, Ser. No. 273,629
Int. Cl.[4] H04N 1/40
U.S. Cl. 358—455 **12 Claims**

1. An image signal binary encoder for converting analog image signals into binary signals comprising

averaging means which calculate an average density value of a specified image area near a given point of interest,

first binary data generating means which generate a binary signal according to the size relationship between the density value at said point of interest and said average density value if said density value at said point of interest and said average density value are very different according to a predetermined criterion, and

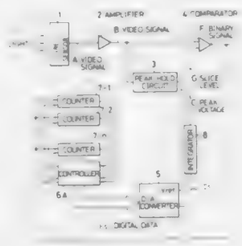
second binary data generating means which generate a binary signal according to said density value at said point of interest or said average density value if said density value at said point of interest and said average density value are not very different according to said predetermined criterion.

4,853,793

CIRCUIT FOR CONVERTING A VIDEO SIGNAL PRODUCED BY A LINE IMAGE SENSOR INTO A BINARY SIGNAL ON THE BASIS OF REFERENCE LEVELS DETERMINED FOR SECTIONS OF THE LINE IMAGE SENSOR USING RESPECTIVE COUNTERS

Osamu Ishikawa; Mikihiko Sone, and Yoshimi Suzuki, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1987, Ser. No. 116,863
Claims priority, application Japan, Nov. 14, 1986, 61-269789; Nov. 14, 1986, 61-269788
Int. Cl.[4] H04N 1/40, 5/228
U.S. Cl. 358—464 **11 Claims**



1. A circuit for converting a video signal comprising a series of pixel signals into a binary video signal comprising a series of binary signals, said pixel signals being obtained by photoelectrically reading an object having an effective area in which information to be read is present and a marginal area outside the effective area, an average brightness level of the marginal area being about the same as a highest brightness level of the effective area, said circuit comprising:

a line image sensor comprising a plurality of sensor elements for photoelectrically reading said object line by line to produce pixel signals indicative of brightness levels of pixels forming each line of the object, each pixel signal being produced by a corresponding one of the sensor elements;

means responsive to the pixel signals produced by the line image sensor for setting respective reference levels for sections into which the line image sensor is divided, each section consisting of a plurality of adjacent ones of the sensor elements; and

a comparator for comparing each pixel signal with the reference level for the section to which the sensor element which produced the pixel signal belongs to produce a corresponding binary signal;

wherein said reference level setting means comprises;

means for determining respective white levels for said sections; and

means for determining each of said reference levels from the white level for the respective section;

wherein said white level determining means comprises;

means for setting respective slice levels for the sections while line image sensor is reading the marginal area, the slice levels being initially set to arbitrary values when the line image sensor begins to read the marginal area and being input to the comparator as the reference levels while the white level determining means determines the white levels; and

respective counters provided for said sections, each counter counting the number of binary signals produced by said comparator while the image sensor is reading a line of the marginal area which indicate that the corresponding pixel signals exceeded the respective slice level;

wherein said slice level setting means changes the slice level for each section for which the count value of the respective counter is not equal to a predetermined value;

wherein said counters and said slice level setting means repeat the processes of counting and changing the slice levels while the line image sensor is reading succeeding lines of the marginal area until the count values of all of the counters become equal to said predetermined value; and

wherein the slice levels which are set when the count values of all of the counters become equal to said predetermined value are determined to be the white levels for the respective sections.

10. A circuit for converting a video signal comprising a series of pixel signals into a binary video signal comprising a series of binary signals, comprising:

a line image sensor comprising a plurality of sensor elements for photoelectrically reading an object to produce said pixel signals, each pixel signal being produced by a corresponding one of the sensor elements;

means for setting respective reference levels for sections into which said line image sensor is divided, each section consisting of a plurality of adjacent ones of the sensor elements; and

a comparator for comparing each pixel signal with the reference level for the section to which the sensor element which produced the pixel signal belongs to produce a corresponding binary signal;

wherein said reference level setting means comprises:

means for determining respective white levels for said sections, wherein each white level is determined to be equal to the value of the pixel signal having the m-th highest value among the pixel signals produced by the sensor elements in the respective section, where m is an integer greater than one;

means for determining the reference level for each section from the white level for the respective section;

means for producing digital reference level data representing the reference levels; and

a D/A converter for converting said digital reference level data into analog reference level signals representing the reference levels and for inputting the analog reference level signals into the comparator.

11. A circuit for converting a video signal comprising a series of pixel signals into a binary video signal comprising a series of binary signals, comprising:

a line image sensor comprising a plurality of sensor elements for photoelectrically reading an object to produce said pixel signals, each pixel signal being produced by a corresponding one of the sensor elements;

means for setting respective reference levels for sections into which said line image sensor is divided, each section consisting of a plurality of adjacent ones of the sensor elements; and

a comparator for comparing each pixel signal with the reference level for the section to which the sensor element which produced the pixel signal belongs to produce a corresponding binary signal;

wherein said reference level setting means comprises:

means for producing digital reference level data representing the respective reference level for each section;

means for selecting for each of the sections the one of the digital reference level data for the section and the digital reference level data for a corresponding next one of the sections which has the smaller value;

a D/A converter for converting the selected digital reference level data into analog reference level signals; and

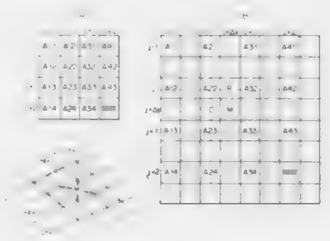
an integrator for integrating the analog reference level signals to produce integrated analog reference level signals representing the reference levels and for inputting the integrated analog reference level signals into the comparator.

4,853,794

METHOD AND IMAGE PROCESSING SYSTEM FOR RECONSTRUCTION OF AN IMAGE

Masatoshi Fukumoto, Matsudo; Soichi Kubo, Chiba; Yoichi Miyake, Sakura; Norishige Tsukada, Kashiwa; Kiyoshi Kasutani, Tokyo, and Kenji Okamori, Misato, all of Japan, assignors to Sakata Inksu Kabushikikaisha, Osaka, Japan

Filed Nov. 23, 1987, Ser. No. 124,021
Claims priority, application Japan, Dec. 1, 1986, 61-286351; Dec. 1, 1986, 61-286352; Aug. 31, 1987, 62-217419
Int. Cl.[4] H04N 1/40
U.S. Cl. 358—447 **4 Claims**



1. A method for reconstruction of a first image composed of n×m pixels to obtain a second image composed of more than n×m pixels, said first image having n pixels in the direction of X axis and m pixels in the direction of Y axis, said method includes:

(i) a step of inputting image data of at least two nearest pixels which are nearest to a position $(i+\Delta x, j+\Delta y)$ $[1 \leqq i \leqq n$; and $1 \leqq j \leqq m$ with the exception that $i=n$ and $j=m$, $0 \leqq x < 1$; and $0 \leqq y < 1$ with the exception that $\Delta x = \Delta y = 0]$ of an additional pixel to be added to the input image and those of neighbor pixels located on extension lines of segments drawn between the position of the additional pixel and that of each of the nearest pixels of which the image data being inputted;

(ii) a step of estimating the value of the image data of the additional pixel on the basis of the inputted image data of at least two pairs of the nearest and corresponding neighbor pixels by using a linear extrapolation and average method.

4,853,795

FORWARD LOOK AHEAD TECHNIQUES FOR TRACKING BACKGROUND AND NOISE LEVELS IN SCANNED VIDEO IMAGES

Roger R. A. Morton, Rochester, N.Y., and Scott Lewis, Ann Arbor, Mich., assignors to Eastman Kodak Company, Rochester, N.J.

Filed Jul. 24, 1987, Ser. No. 77,530
Int. Cl.[4] H04K *1/40*
U.S. Cl. 358—447 21 Claims



1. In a system for enhancing scanned video images, apparatus comprising:

means, responsive to a value of an incoming pixel situated on a current scan line and to first and second prior output values, for filtering said incoming pixel value so as to provide an output filtered value, wherein said filtering means comprises a two-dimensional non-linear filter;

first means for delaying said output filtered value by a first pre-defined amount so as to provide said first prior output value, wherein said first prior output value is the output filtered value associated with a first pre-selected pixel located on a pre-determined one of a plurality of prior scan lines and situated to the right of said current pixel; and

first means for delaying said output filtered value by a second pre-defined amount so as to provide said second prior output value, wherein said second prior output value is the output filtered value associated with a second pre-selected pixel situated on the current scan line and located to the left of said current pixel.

4,853,796

RECORDING/REPRODUCING APPARATUS FOR DIGITAL COMPOSITE VIDEO SIGNAL WITH MEANS FOR SYNCHRONIZING COLOR SUBCARRIER PHASE

Kunio Suesada, Ikoma, and Toshiaki Koya, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 21, 1988, Ser. No. 171,032
Claims priority, application Japan, Mar. 19, 1987, 62-64561
Int. Cl.[4] H04N *5/76, 9/79*
U.S. Cl. 358—324 24 Claims

1. A recoding/reproducing apparatus for digital composite video signal, comprising:

(a) an analog-to-digital converter for converting a first analog composite video signal into a first digital composite video signal;

(b) a phase sync circuit means for synchronizing color subcarrier phases in said digital composite video signal such that the position of the first sample of a digital active line in every field is shifted at most two samples in the horizontal direction in the NTSC system;

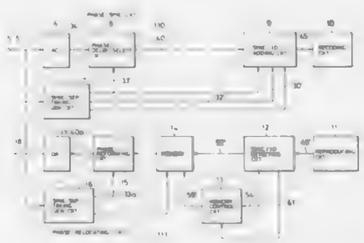
(c) a sync/ID adding circuit means for adding a sync pattern and an ID pattern to a given group of data indicative of an output signal from said phase sync circuit means, thereby producing a sync block having said sync pattern, said ID pattern, and said given group of data;

(d) a recording circuit means for recording said sync block on a recording medium;

(e) a reproducing circuit means for reproducing said sync block from said recording medium;

(f) a sync/ID detecting circuit means for detecting said sync pattern and said ID pattern included in said sync block from said reproducing means, for producing a block distinguishing signal and a block period signal, and for outputting said given group of data included in said sync block form said reproducing means;

(g) a memory control circuit means for producing an address signal in accordance with said block distinguishing signal and said block period signal;



(h) a memory means for storing said given group of data in accordance with said address signal, and for outputting said given group of data included in said sync block from said reproducing means;

(i) a phase relocating circuit means for obtaining a second digital composite video signal from said given group of data from said memory means; and

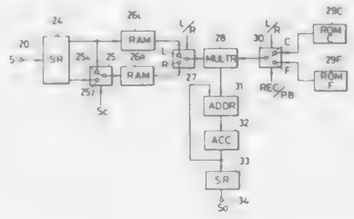
(j) a digital-to-analog converter for converting said second digital composite video signal into a second analog composite video signal.

4,853,797

FIR TYPE DIGITAL FILTER FOR RECORDING AND REPRODUCING APPARATUS

Makoto Yamada, and Kentaro Odaka, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,483
Claims priority, application Japan, Feb. 26, 1987, 62-P043808; Aug. 21, 1987, 62-P207860
Int. Cl.[4] G11B *20/10, 20/22, 5/09*
U.S. Cl. 360—32 7 Claims



1. A digital filter for a recording/reproducing apparatus comprising:

analog-to-digital and digital-to-analog converter means for 2-channel signals;

means for storing first and second multiplication coefficient groups which provide predetermined filter characteristics and are in interpolated relation to each other; and

signal processing means operative, in a recording mode, to employ the first multiplication coefficient group for processing one of said 2-channel signals and to employ the second multiplication coefficient group for processing the other of said 2-channel signals, said signal processing means being operative, in a reproducing mode to employ the second multiplication coefficient group for processing said one channel signal, and to employ the first multiplication coefficient group for processing said other channel signal.

4,853,798

METHOD AND APPARATUS FOR REPRODUCING DIGITAL OR ANALOG SIGNALS

Yujio Fukuju, Yokohama, and Makoto Niiro, Sagamihar, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 21, 1983, Ser. No. 515,820
Int. Cl.[4] G11B *5/09, 5/02;* G06F *11/00*
U.S. Cl. 360—38.1 14 Claims



1. Apparatus for reproducing from a recording medium having recorded thereon encoded digital data and a corresponding analog signal, the apparatus comprising:

error-detecting means for providing a detecting signal indicating the existence of errors in the encoded digital data being reproduced from the medium;

initial error signal generating means responsive to said detecting signal for generating an initial error signal when said detecting signal indicates that at least a predetermined proportion of the digital data contains errors;

decoding means for accepting the encoded digital data and generating, in response thereto and at a predetermined delay after reproduction thereof, corresponding error-corrected decoded information and a remaining error signal indicating the presence of uncorrectable errors in the decoded information;

switch means for selectively providing to an output line of the apparatus either the analog signal reproduced from the medium or said decoded information; and

switching signal generating means for providing a switching signal to actuate said switch means to provide the analog signal being reproduced from the medium to the output line only in response to the simultaneous generation of said initial error signal and said remaining error signal.

4,853,799

MAGNETIC DISK APPARATUS CAPABLE OF WRITING AT TWO DIFFERENT TRACK DENSITIES

Shinichi Aikawa, Mitaka, Japan, assignor to Teac Corporation, Tokyo, Japan

Filed Jun. 12, 1987, Ser. No. 61,694
Claims priority, application Japan, Jun. 16, 1986, 61-139738
Int. Cl.[4] G11B *5/09, 5/03, 21/10*
U.S. Cl. 360—48 3 Claims

1. A data transfer apparatus capable of writing either on a first magnetic disk at a first track density or on a second magnetic disk at a second track density which is an integral multiple of the first track density, only the second magnetic disk having track servo patterns prerecorded thereon, the apparatus comprising:

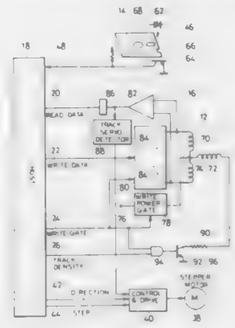
(a) disk drive means for imparting rotation to the first or second magnetic disk;

(b) a magnetic head assembly comprising a read/write head for reading and writing data on the magnetic disk by creating concentric data tracks thereon, and erase means so arranged with respect to the read/write head as to erase a pair of opposite edge portions of each data track created by the read/write head;

(c) an amplifier;

(d) a track servo detector circuit connected to the read/write head via the amplifier for detecting the track servo patterns on the second magnetic disk;

(e) head positioning means for incrementally transporting the head assembly in a radial direction of the magnetic disk, the head positioning means being capable of transporting the head assembly at such increments that the read/write head can create the data tracks at a selected one of the first and second track densities, the head positioning means being coupled to the track servo detector circuit for repositioning, as required, the head assembly on the data tracks on the second magnetic disk during data transfer therewith in response to the track servo patterns detected by the track servo detector circuit; and



(f) switch means for holding the erase head means in operation when the read/write head is writing on the first magnetic disk at the first track density, and for holding the erase head means out of operation when the read/write head is writing on the second magnetic disk at the second track density, so that only each data track being written on the first magnetic disk has its opposite edge portions erased by the erase head means.

4,853,800

METHOD AND CIRCUIT FOR RECORDING BROADBAND SIGNALS ON A MAGNETIC RECORD MEDIUM

Axel Schulz, Bickenbach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

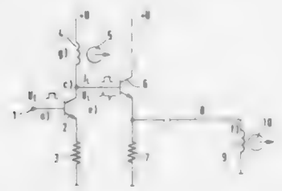
Filed Nov. 17, 1987, Ser. No. 121,701
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1986, 3642316
Int. Cl.[4] G11B *5/09*
U.S. Cl. 360—46 13 Claims

1. Method of applying broadband signals to a magnetic recording head with low signal distortion comprising the steps of:

using a signal voltage to control a current source to produce a corresponding signal current;

supplying said signal current to another magnetic head of the same general type as the magnetic recording head used for recording, whereby said other magnetic head is utilized as a equivalent circuit corresponding to said magnetic recording head used for recording, and

using a voltage that appears across said other magnetic head of the same general type as the magnetic recording head used for recording to control a voltage source connected



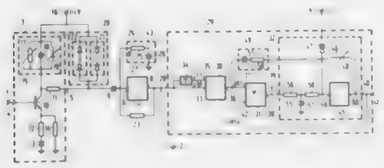
for applying signal to said magnetic head used for recording in order to record signals on a magnetic record medium.

4,853,801

DEVICE FOR REGENERATING A BINARY DIGITAL SIGNAL, FOR EXAMPLE A BI-PHASE ENCODED SIGNAL

Johannes B. Horsten, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 10, 1987, Ser. No. 61,232
Claims priority, application Netherlands, Jun. 11, 1986, 8601514; Oct. 8, 1986, 8602517
Int. Cl.[4] G11B *5/09*
U.S. Cl. 360—46 23 Claims



1. A device for regenerating a binary digital signal from an electric signal read from a transmission channel, comprising:

a. an equalising unit having an input coupled to receive the electric signal and an output;

b. a limiter circuit having an input coupled to the output of the equalising unit and an output;

c. an output terminal coupled to the output of the limiter circuit for supplying the regenerated digital signal;

d. a clipper circuit coupled between the output of the equalising unit and a first point of constant potential;

e. an impedance which couples the output of the limiter circuit to its input; and

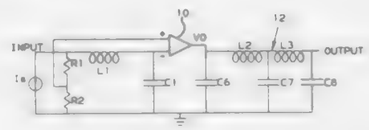
f. an integrating element which further couples the input of the limiter circuit to a second point of constant potential.

4,853,807

SINGLE STAGE FEEDFORWARD EQUALIZER

Dean R. Kukson, Byron, Minn.; Constantin M. Melas, Los Gatos, Calif., and Joey M. Poss, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1987, Ser. No. 114,478
Int. Cl.[4] G11B *15/14, 5/09*
U.S. Cl. 360—65 7 Claims



1. An apparatus for conditioning read-back signals from a data storage media representing digital data including a feedforward equalizer means for equalizing the pulse signals comprising

a single stage RLC circuit connected to the input of a differential amplifier having a first means for amplitude equalization and a second means for phase equalization;

said first means comprising a resistor divider circuit and said second means comprising a capacitance/inductance circuit; and

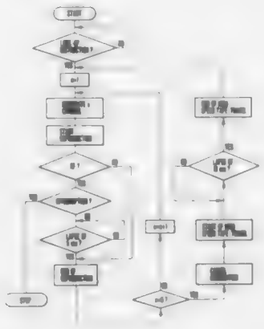
wherein said second means is adjustable to attain phase equilization and said first means is thereafter adjustable to attain amplitude equalization without disturbing the adjustment achieved by said second means.

4,853,803

MULTI-MODE AND MULTI-CHANNEL REPRODUCING APPARATUS WITH CHANNEL CHANGE COORDINATED WITH MODE CHANGE

Tsutomu Fukatsu; Taizou Hori; Toshiyuki Masui, all of Kanagawa; Takashi Kobayashi, Tokyo; Tetsuya Wakui, Chiba, and Koji Takahashi, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1986, Ser. No. 944,578
Claims priority, application Japan, Dec. 27, 1985, 60-292537; Dec. 27, 1985, 60-292538; May 6, 1986, 61-102128; May 15, 1986, 61-109688
Int. Cl.[4] G11B *15/20, 27/22*
U.S. Cl. 360—72.2 13 Claims



1. An apparatus for reproducing information signals from a tape-shaped record bearing medium on which a plurality of channels of information signals are recorded, comprising:

(a) reproducing means for reproducing an information signal of a selected channel among the plurality of channels from said tape-shaped record bearing medium;

(b) moving means for moving said tape-shaped record bearing medium in the longitudinal direction thereof;

(c) mode changing means for automatically changing the apparatus alternately between a first mode in which the information signal is reproduced by said reproducing means and said tape-shaped record bearing medium is moved by said moving means at a predetermined speed and a second mode in which said reproducing means does not reproduce the information signal and said moving means moves said medium at a speed faster than said predetermined speed; and

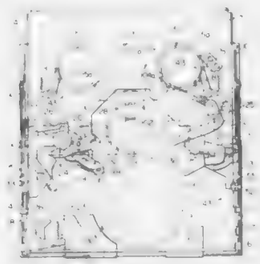
(d) channel changing means for changing the channel from which the information signal is reproduced by said reproducing means from said selected channel to another channel in response to the changing of the mode of the apparatus by said mode changing means.

4,853,804

MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

Hisashi Suwa; Seiji Sato; Susumu Matsubara, all of Kanagawa; Eiji Yano, Tokyo, and Katsuyuki Koizumi, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,439
Claims priority, application Japan, Mar. 26, 1987, 62-72590
Int. Cl.[4] G11B *5/027*
U.S. Cl. 360—85 14 Claims



1. A magnetic recording and/or reproducing apparatus for a tape cassette having a pair of tape reels and a magnetic tape, comprising:

a chassis base plate;

a rotary magnetic head device;

a reel block base plate mounted on said chassis base plate so as to be horizontally reciprocable with respect to said rotary magnetic head device, said reel block base plate including a pair of rotatable reel blocks provided so as to be engageable with the pair of tape reels of the tape cassette;

a cassette holder;

supporting arm means for supporting said cassette holder on said chassis base plate so that said cassette holder is vertically movable with respect to said reel block base plate;

an operating mode changeover lever for selecting operating modes of the magnetic tape which is extractable out of the tape cassette and loadable onto a predetermined tape route, said operating modes including constant speed running, rapid feed and rewind modes;

a drive motor;

a drive gear driven into rotation by said drive motor, said drive gear being associated with said supporting arm means and said reel block base plate, and being provided so that when driven into rotation said drive gear causes vertical movement of said cassette holder and reciprocation of said reel block base plate; and

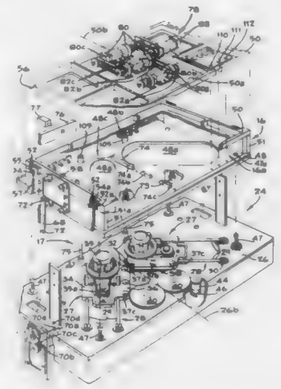
an operating lever adapted to be turned by said drive gear and provided so as to be operatively associated with said operating mode changeover lever, said operating lever when turned causing actuation of said operating mode changeover lever to select one of said operating modes.

4,853,805

MULTI-CASSETTE INDEXING MECHANISM FOR A TAPE TRANSPORT

Antoni S. Baranski, San Carlos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Nov. 5, 1987, Ser. No. 117,771
Int. Cl.[4] G11B *15/02*
U.S. Cl. 360—94 18 Claims



1. A magnetic recording and reproducing apparatus capable of receiving cassettes of varying size, one at a time, for play including:

first and second turntables for supporting first and second rotary spindles respectively mounted thereon to engage first and second reels of an associated magnetic tape cassette;

an elevator supporting a cassette for engagement with said turntables;

a turntable support assembly for receiving said turntables for translatory movement thereon to change the distance between the centers of said rotary spindles; and

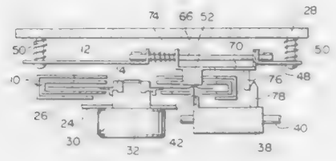
an indexing mechanism associated with said turntables comprising an alignment of indexing members provided on each turntable, with each member on one turntable having a complementary member on the second turntable, and a pair of engaging members provided on the elevator to engage a complementary pair of indexing members on the turntables to fix a center-to-center distance for the spindles corresponding to a center-to-center distance for the reels of the cassette loaded into the apparatus for play, with said turntables movable to align each complementary pair of indexing members with said pair of engaging members so as to define a new center-to-center distance corresponding to a different size cassette at each defined distance.

4,853,806

APPARATUS FOR REGULATING THE FORCE RENDERED TO A MAGNETIC DISC BY A MAGNETIC HEAD IN A ROTARY MAGNETIC DISC DEVICE

Kazukiyo Tamada, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1986, Ser. No. 913,757
Claims priority, application Japan, Oct. 11, 1985, 60-226326; Oct. 11, 1985, 60-226328
Int. Cl.[4] G11B *5/54, 17/32*
U.S. Cl. 360—99.06 5 Claims



1. A rotary magnetic disc device, wherein magnetic recording or reproducing is performed on a magnetic disc rotatably housed in a magnetic disc pack, comprising:

a head carriage including a magnetic head, for moving in a radial direction of said magnetic disc to make magnetic recording into and magnetic reproducing from said magnetic disc through said magnetic head;

a rotary driving shaft provided on a main body of apparatus;

a holder for receiving said magnetic disc pack, for guiding said magnetic disc pack to a position where a center core formed in a rotary center portion of said magnetic disc housed in said magnetic disc pack is coupled to said rotary driving shaft;

a regulating plate located in a position opposed to said magnetic head, interposing therebetween said magnetic disc, for making said magnetic disc lie along said magnetic head;

said regulating plate being mounted on a movable member connected to said head carriage to make said regulating plate follow said magnetic head in movement; and

a position regulating surface provided on the head carriage for positionally regulating in the vertical direction said regulating plate wherein the regulating plate is supported by said position regulating surface to restrict a force of the regulating plate against said magnetic disc.

4,853,807

ATTACHABLE HARD-DISK DRIVE AND HOUSING THEREFOR

Dennis Trager, 542 Marine World Pkwy., #4203, Redwood City, Calif. 94065

Filed Aug. 7, 1987, Ser. No. 82,639
Int. Cl.[4] G11B *5/012*
U.S. Cl. 360—97.01 8 Claims

1. An attachable hard-disk drive for a personal computer having a display screen, a cabinet with a rear wall having a power supply switch, a power connector, a main power cord, and a battery compartment, the hard-disk drive comprising:

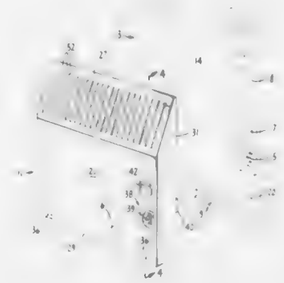
(a) a housing having a plurality of walls, one of which is contoured to fit generally flush in vertical orientation against the rear wall of a personal computer, said contoured wall being structurally complementary in configuration to the rear wall of such a personal computer, said contoured wall having projections and detents that substantially mate with the surface contours of such a rear wall, the remainder of the walls of the housing forming an extension of the cabinet of such a personal computer;

(b) a hard-disk drive unit mounted within the housing, said hard-disk drive unit having a storage disk, the plane of the storage disk oriented generally parallel to said one wall;

(c) vent means formed through at least one other wall of said housing to permit air to circulate past the disk drive unit;

(d) means to connect the housing to the rear wall of a personal computer;

(e) connector means attached to said housing to receive the main power cord for a personal computer and to conduct power through the housing to the power connector of such a personal computer to which the hard-disk drive



may be attached, said connector means electrically interconnected to the disk drive unit within the housing;

(f) a power switch mounted on the outside of said housing and electrically connected to said connector means to control power to such a personal computer; and

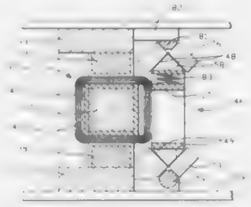
(g) a connector to communicate data and control signals to a personal computer, said connector attached to said housing and said disk-drive unit within the housing.

4,853,808

LINEAR ACTUATOR FOR DISC DRIVE

Frank T. Lutz, Cardiff, Calif., assignor to Cardiff Technology Inc., Cardiff, Calif.

Filed Oct. 30, 1987, Ser. No. 115,124
Int. Cl.[4] G11B *5/55, 21/08*
U.S. Cl. 360—98.01 15 Claims



1. A linear actuator, comprising first and second spaced-apart longitudinal plates, a magnetic structure mounted between the spaced-apart plates and having a pole piece extending in the longitudinal direction, a coil movably mounted on the pole piece and adapted to be moved longitudinally of the pole piece, a pair of spaced-apart parallel guide rails positioned adjacent to one side of said magnetic structure, and a carriage assembly including roller means on said one side for engaging said guide rails, said coil being exclusively secured to one side of said carriage assembly whereby said coil moves longitudinally on said pole piece as said carriage assembly moves along said guide rails.

4,853,809

APPARATUS FOR REPRODUCING VIDEO SIGNALS AS SLOW-MOTION PICTURES

Shoji Nemoto, Kanagawa, Japan, assignor to Sony Corp., Tokyo, Japan

Filed May 20, 1987, Ser. No. 51,612
Claims priority, application Japan, Jun. 10, 1986, 61-134679
Int. Cl.[4] H04N *5/783*
U.S. Cl. 360—10.3 13 Claims



1. An apparatus for slow-motion reproduction of a video signal having successive fields thereof, along with respective pilot signals, recorded in successive parallel tracks extending obliquely on a magnetic tape, the pilot signals recorded in a predetermined number of said tracks constituting a group thereof having respective different frequencies in an order that is repeated cyclically for each said group of tracks on the tape, the apparatus comprising:

rotary magnetic head means for reproducing a field of the video signal and a respective pilot signal by scanning substantially along one of said tracks;

capstan means coupled with a capstan motor for transporting the magnetic tape with reference to said rotary magnetic head means;

tracking error signal generating means for producing, based on pilot signals reproduced from the magnetic tape by said rotary magnetic head means, a tracking error signal varying in accordance with tracking errors of said rotary magnetic head means in relation to the one of said tracks being scanned thereby;

driving means made intermittently operative for causing said capstan motor and capstan means to transport the magnetic tape from one still-picture reproducing state, in which the tape is at rest and a field of the video signal is repeatedly reproduced by said rotary magnetic head means repeatedly scanning an initial one of said oblique tracks on the magnetic tape, to another still-picture reproducing state, in which the tape is again at rest and another field of the video signal is repeatedly reproduced by said rotary magnetic head means repeatedly scanning a succeeding one of said oblique tracks; and

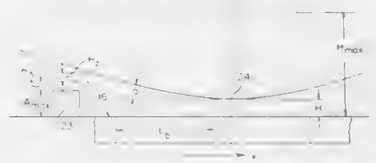
control means for controlling acceleration of said capstan motor by said driving means at the initiation of each said transport of the magnetic tape in response to said tracking error signal corresponding to the tracking errors of said rotary magnetic head means relative to a middle portion, considered in the longitudinal direction, of said initial track in said one still-picture reproducing state prior to said transport of the magnetic tape so that deviation of said rotary magnetic head means with reference to the middle portion, considered in the longitudinal direction, of said succeeding oblique track is minimized in said other still-picture reproducing state after said transport of the magnetic tape.

4,853,810

METHOD AND APPARATUS FOR CONTROLLING THE FLYING HEIGHT OF THE HEAD IN A MAGNETIC STORAGE UNIT

Wolfgang D. Pohl, Adliswil; James K. Gimzewski, Zurich, and Paul R. Muralt, Gommiswald, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 909,799, Sep. 22, 1986, abandoned. This application Nov. 23, 1987, Ser. No. 124,137
Claims priority, application European Pat. Off., Nov. 19, 1985, 85114668.8
Int. Cl.[4] G11B *5/60, 15/62, 17/32*
U.S. Cl. 360—103 9 Claims



2. An apparatus for controlling the flying height of a magnetic head above the surface of a rotating magnetic recording disk in a disk file of the type wherein the magnetic head is supported on an aerodynamic slider, the slider being movable generally radially across the disk for access of the data tracks on the disk, and wherein the surface of the disk is electrically conductive, the apparatus comprising:

an electrically conductive tunnel electrode attached to the slider and facing the disk surface;

a source of electrical potential connected to the tunnel electrode and the disk surface;

means for measuring the tunnel current flowing between the tunnel electrode and the disk surface and for sensing deviations of the measured tunnel current from a predetermined essentially constant value corresponding to a predetermined head flying height; and

means connecting the head and tunnel electrode to the slider for positioning the head and tunnel electrode toward or away from the disk surface in response to the sensed tunnel current deviations, whereby the flying height of the head is maintained essentially constant.

4,853,811

MAGNETIC DISK DRIVE WITH LOW PROFILE HEAD-SUSPENSION SYSTEM

William W. Brooks, Jr., Oronoco, Minn.; Curtis J. Clemen, Sioux Falls, S. Dak.; Jerome T. Coffey, Oronoco, Minn.; Timothy P. Coffield, Boyne City, Mich., and David R. Larson, Byron, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 3, 1987, Ser. No. 81,204
Int. Cl.[4] G11B *5/60, 5/48*
U.S. Cl. 360—103 18 Claims

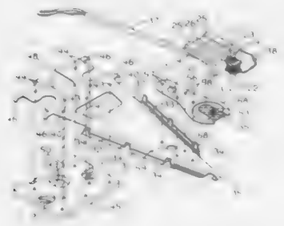
1. A magnetic transducer assembly for writing data to and reading data from a magnetic recording media surface during relative movement between the transducer assembly and the magnetic media surface, said assembly comprising

a magnetic slider according a single piece body portion presenting an air bearing surface means along the surface the confronts the media for supporting said slider in closely confronting relation to said media surface;

said slider including a front portion or leading edge at the end which first approaches surface portions of said media during relative motion between media and slider when reading or writing data and a rear portion or trailing edge which is opposite said front portion or leading edge and is the final portion of the slider to confront the associated

media surface during relative motion between slider and media when reading or writing data;

said slider body having a full height portion disposed to the rear of the vertical axis through the center of area of said air bearing surface and a reduced height portion extending



from said full height portion to the leading edge of said slider body; and

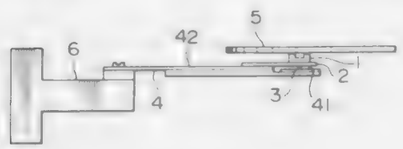
a magnetic core cooperating with said full height portion and forming a transducing gap adjacent the trailing edge of said slider body portion.

4,853,812

STRUCTURE FOR SUPPORTING MAGNETIC HEAD

Hiroshi Daito, Kanagawa, and Sigeo Hara, Minami-ashigara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 153,099
Claims priority, application Japan, Feb. 10, 1987, 62-27088
Int. Cl.[4] G11B 5/48
U.S. Cl. 360—104 3 Claims



1. A magnetic head supporting structure, comprising:

a gimbal member supporting a core slider and having a loading projection at a first portion;

and a loading beam member having first and second surfaces at one end thereof, said gimbal member having a second portion being secured to said loading beam member at said second surface and said loading beam member contacting said loading projection at said first surface to urge said core slider towards a recording medium, said first surface being offset from said second surface to reduce a difference in height between said second surface and a centroid of said core slider, and said gimbal member having an inclined portion extending from said first portion to said second portion.

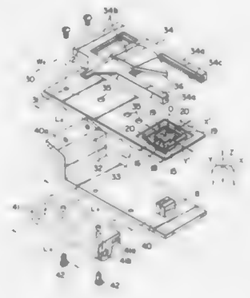
3. A magnetic head supporting structure comprising a loading beam member including a first resilient spring section and a second section having flanges formed along opposite sides thereof to increase the rigidity thereof, a core slider, and a gimbal member supporting said core slider and having a loading projection, said gimbal member being mounted on said second section of said loading beam member, said loading beam member having a first surface in contact with said loading projection, said second section of said loading beam member having a second surface on which said gimbal member is mounted, said first surface os offset from said second surface by a dimension substantially equal to a height of said loading projection, and a notch being formed in said loading beam member between said first and second surfaces.

4,853,813

MAGNETIC HEAD SUPPORTING DEVICE

Hiroshi Yamanouchi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 879,373, Jun. 27, 1986, abandoned. This application May 2, 1988, Ser. No. 189,317
Claims priority, application Japan, Jun. 29, 1985, 60-143256
Int. Cl.[4] G11B 17/32, 5/48
U.S. Cl. 360—104 11 Claims



1. In a recording and reproducing device of the type in which a transducing head mounted on a carriage is selectively positionable to read or write data on a recording surface of a flat recording medium, the improvement of a transducing head supporting device comprising:

an L-shaped head carriage comprised of a long leg extending parallel to the recording surface of the flat recording medium and a short leg extending perpendicular to the recording surface of the flat recording medium;

means movable across the recording surface of the recording medium for mounting the head carriage;

a flat spring for carrying the head and for resiliently biasing the head with respect to the long leg of the head carriage, the spring including three integrally formed portions, namely a hinge end portion attached to a distal end of the short leg of the head carriage, an arm portion extending generally parallel to the long leg of the head carriage and a head mounting portion for mounting the transducing head;

reinforcement means for encasing at least the side edges of the arm portion and the head mounting portion of the first spring so as to leave exposed the area of the head mounting portion immediately surrounding the head to allow the hinge portion and the head mounting portion to flex while restricting flexure and waving of the arm portion, the reinforcement means further including a protrusion aligned with and adjacent to the head for lightly depressing the head relative to the flat spring and for providing a pivot point support for the head on its side opposite to the recording medium.

4,853,814

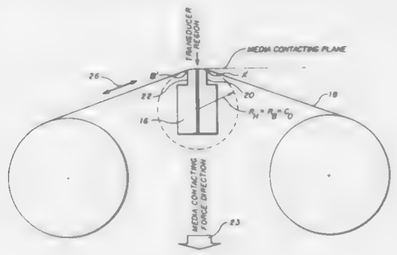
MAGNETIC HEAD WITH CONSTANT AREA WEAR PROFILE

Richard J. McClure, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 138,756, Dec. 28, 1987, abandoned. This application Dec. 23, 1988, Ser. No. 288,927
Int. Cl.[4] G11B 5/22
U.S. Cl. 360—122 1 Claim

1. A magnetic head for use in recording signal information on or reproducing signal information from a magnetic tape medium, said head having a constant radius of curvature (RH) along the entire head-to-medium interface, the tape medium having a natural bending radius of curvature (R_B), the head

and tape radii of curvature being substantially identical with $R_H = R_B$, so that, during recording or reproducing signal information, said natural bending radius of said tape medium substantially and uniformly contacts said head radius of curvature and applies a uniform pressure across the full areal dimension of said mutually contacting surfaces, said head further having leading and trailing medium-contacting edges which are or-



thogonal to the direction of tape travel and which extend into leading and trailing surfaces which are parallel to each other and normal to the direction of tape travel,

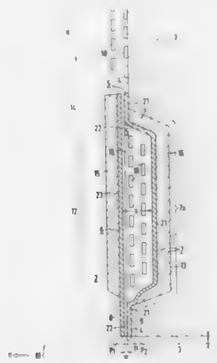
thereby to lessen the entrainment of air between said medium and said head while simultaneously preserving the aforesaid uniform contact between said head and said medium so as to insure a uniform wear profile across said head-to-medium interface.

4,853,815

MAGNETIC THIN-FILM HEAD ON A NONMAGNETIC SUBSTRATE FOR VERTICAL MANGETIZATION

Heinrich Diepers, Höchstadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 9, 1985, Ser. No. 806,770
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446996
Int. Cl.[4] G11B 5/147
U.S. Cl. 360—126 4 Claims



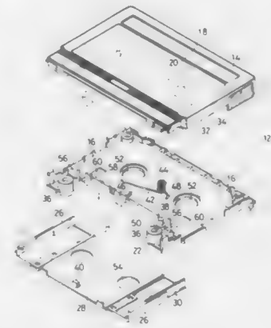
1. A magnetic thin-film head for a recording medium that can be magnetized vertically, having a magnetic conduction body for carrying magnetic flux, said body being applied to a nonmagnetic substrate, said head being of ring head-like shape and comprising two magnet legs having end pole pieces, said end pole pieces facing the recording medium and being arranged one after the other as viewed in the direction of relative motion of the head and the medium, and having a predetermined small gap width therebetween, said magnet legs further having leg parts spaced farther than the gap width and defining a space in as region of said head distant from said pole pieces and through which space the turns of a write read coil winding extend, the substrate having a depression formed directly in the substrate wherein at least a substantial portion of a part of one of said magnet legs and the turns of the write/read coil winding are disposed, the magnet leg which faces the substrate and which is disposed in the depression and the turns of the write/-read coil winding which is embedded in insulating material form, at least approximately, a common plane outer surface, the other magnet leg being arranged spaced therefrom by an insulating layer, said magnet legs each being provided with a magnetic reinforcement layer except for in the vicinity of the pole pieces, said reinforcement layers forming respective outer sides of the magnetic conduction body, the reinforcement layer for the magnet leg which faces the substrate being provided completely in said depression.

4,853,816

CASING FOR CASSETTE MAGNETIC TAPE

Takateru Satoh; Kimio Tanaka, and Morimasa Sasaki, all of Nagano, Japan, assignors to TDK Corporation, Japan

Filed Jun. 29, 1987, Ser. No. 67,933
Claims priority, application Japan, Jun. 27, 1986, 61-97749
Int. Cl.[4] G11B 23/02
U.S. Cl. 360—132 7 Claims



1. A tape cassette casing, comprising

an upper casing member and a lower casing member adapted to be joined together to define a space therebetween,

at least one tapping boss provided on said lower casing member,

a slider slidably mounted upon said casing and positioned to cover at least a part of a bottom and lateral sides of said lower casing member,

a torsion spring arranged on said casing and disposed to act upon said slider, and

means for supporting said torsion spring on said lower casing member,

wherein said torsion spring comprises two ends and a coil-like portion situated therealong between said ends thereof,

one of said ends of said spring being engaged with said slider,

said tapping boss comprising an engagement portion for receiving said other end of said spring and securely retaining said other end within said engagement portion;

said support means positioned to support said coil-like portion of said spring and comprising a supporting boss mounted upon said lower casing member and positioned to receive said coil-like portion of said spring thereabout, and

said coil-like portion of said torsion spring being closer to said end thereof received by said tapping boss than said end thereof engaged with said slider,

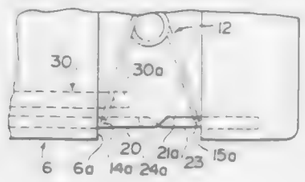
whereby stroke of said torsion spring is maintained as steadily as possible and said slider is stately actuated.

4,853,817

MAGNETIC DISK CARTRIDGE

Akira Mizuta, and Morio Fujiwara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 27, 1988, Ser. No. 186,840
Claims priority, application Japan, Apr. 27, 1987, 62-63686[U]
Int. Cl.[4] G11B *23/033*
U.S. Cl. 360—133 4 Claims



1. A magnetic disk cartridge provided with:

(i) a shell constituted by a magnetic disk, an upper shell half and a lower shell half, provided with a hole for insertion of a magnetic head, and housing said magnetic disk therein,

(ii) a shutter fitted to extend over an edge face of said shell for sliding movement between a hole closing position at which said shutter closes said hole provided for insertion of the magnetic head and a hole opening position at which said shutter opens said hole provided for insertion of the magnetic head, and

(iii) a shutter spring provided with bent portions, each of which is formed at an extremity of each of two arms and is bent vertically at an angle approximately normal to each of said arms, and inserted into said shell from a hole, which is provided for insertion of said shutter spring and is opened at said edge face of said shell, with said shutter being positioned at said hole closing position, so that one of said bent portions is engaged with an engagement means formed in said shell and the other of said bent portions is engaged with an engagement means formed on said shutter, whereby said shutter spring urges said shutter to said hole closing position,

wherein the improvement comprises:

(a) a spring guide on the inner surface of said upper shell half or said lower shell half, whichever is positioned on the extremity side of said bent portion of said shutter spring on the side engaged with said shutter, at the position corresponding to said hole provided for insertion of said shutter spring, said spring guide being provided with a tapered portion which enters the inside of said shell toward said shutter, and extending from said tapered portion at least to the edge of said shutter, which is present at said hole closing position, on the side of said hole provided for insertion of said shutter spring, and

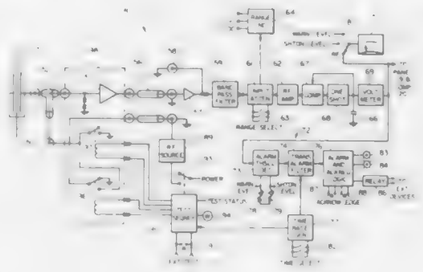
(b) the thickness h from the inner surface of said spring guide at the region overlapping said edge of said shutter, which is present at said hole closing position, on the side of said hole provided for insertion of said shutter spring to the outer surface of said shell half provided with said spring guide being not smaller than the internal dimension g of said bent portion of said shutter spring on the side engaged with said shutter.

4,853,818

SYSTEM AND METHOD FOR DETECTING ARCING IN DYNAMOELECTRIC MACHINES

Franklin T. Emery, Pittsburgh, and Ronald T. Harrold, Murrysville Boro, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 947,197, Dec. 29, 1986, Pat. No. 4,771,355. This application Jun. 23, 1988, Ser. No. 211,541
Int. Cl.[4] H02H *7/00*
U.S. Cl. 361—33 22 Claims



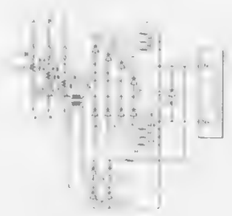
1. In a system for detecting an arcing fault in a dynamoelectric machine having a neutral grounding lead: a radio frequency voltage coupler coupled to the neutral lead, a radio frequency monitor coupled to the voltage coupler for monitoring radio frequency voltage in the neutral lead, and an alarm circuit coupled to the radio frequency monitor for providing a warning signal in response to a change in the radio frequency voltage and a shutdown signal in response to a radio frequency voltage greater than a predetermined level.

4,853,819

OVERCURRENT TRIPPING UNIT FOR A CIRCUIT BREAKER

Takeshi Suwa, Osaka, and Takafumi Kuroda, Nara, both of Japan, assignors to Terasaki Denki Sangyo Kabushiki Kaisha, Osaka, Japan

Filed May 18, 1988, Ser. No. 195,500
Claims priority, application Japan, May 22, 1987, 62-126390
Int. Cl.[4] H02H *3/32*
U.S. Cl. 361—47 5 Claims



1. An overcurrent tripping unit for a circuit breaker which operates to break a main circuit when a main current flowing through the main circuit exceeds a predetermined set value and a predetermined time condition is satisfied, comprising:

control means for activating the circuit breaker;

current transformer means, having secondary outputs from star connected secondary sides, for detecting the main current flowing through each phase of the main circuit;

a plurality of rectifying means, each having an output terminal outputting a positive/negative direct voltage, for rectifying a corresponding phase of one of the secondary outputs of said current transformer means to provide multiphase full-wave rectifying;

a plurality of resistance means, respectively connected to the output terminal of one of said rectifying means, for detecting, independently of others of said resistance means, current in the corresponding phase of the one of the secondary outputs of said current transformer means and for applying a phase current signal to said control means; and

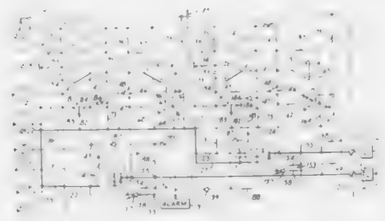
ground fault current detecting means for detecting the ground fault current from a composite of the secondary outputs of said current transformer means for all phases to apply a ground fault signal to said control means.

4,853,820

ELECTRONIC CIRCUIT BREAKER SYSTEMS

Howard M. Ham, Jr., Santa Ynez, and James J. Keenan, Santa Barbara, both of Calif., assignors to Hendry Mechanical Works, Goleta, Calif.

Continuation-in-part of Ser. No. 48,936, May 11, 1987. This application Sep. 16, 1988, Ser. No. 245,722
Int. Cl.[4] H02H *3/08*
U.S. Cl. 361—59 43 Claims



1. An electronic circuit breaker for preventing damage to a load from overload conditions while minimizing downtime after cessation of such a condition, comprising in combination:

means for interrupting flow of overload currents to the load, including means for instantaneously reducing electric current flow from a power supply to the load to a harmless residual current when that electric current flow exceeds a predetermined value;

means for sensing said overload currents;

means for connecting at least part of said means for sensing said overload currents and said means for interrupting flow of overload currents in series in a main electric current path to the load;

means connected to said electric current flow reducing means for electronically monitoring said residual current;

means connected to said monitoring means for indicating when it is safe to restore electric operating current flow to the load; and

means for restoring flow of electric operating current from the power supply to the load in response to the latter indication.

4,853,821

ALTERNATING CURRENT POWER SENSING DEVICE FOR PREVENTING START-UP AT POWER RESTORATION

Dennis E. Lewis, 22 Birkshire Cir., Ware, Mass. 01082

Filed Nov. 29, 1988, Ser. No. 277,238
Int. Cl.[4] H02H *3/24*
U.S. Cl. 361—92 9 Claims

1. Safety start-up apparatus for sensing an electrically powered device coupled to an AC power source to prevent the start-up of the device after power interruption upon an attempt to restore power to the device when the device is in its "ON" operative condition, said apparatus comprising:

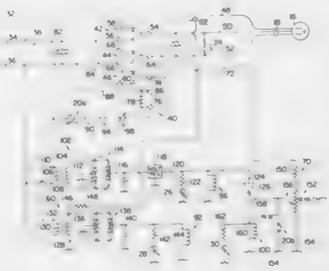
means for electrically coupling said apparatus to an AC power source;

means for receiving a power cord associated with a device to be electrically powered, said receiving means being electrically coupled to said apparatus;

means for producing a sensing current;

means for sensing an electrically powered device connected to said receiving means by detecting the presence of said sensing current passing through the electrically powered device;

means for providing an electrical circuit path between said AC power coupling means and said power cord receiving means, said circuit path providing means having a first and second operative state wherein said first state provides a first electrical circuit path between said AC power coupling means and said power cord receiving means to operate said device and said second state provides a second electrical circuit path between said power cord receiving means and said means for sensing a device;



means for verifying the presence of said sensing current to be used by said sensing means;

means responsive to the removal of AC power to said apparatus for causing said circuit path providing means to become an open-circuit thereby introducing a first discontinuity in the circuit path between the AC power source and the power device, and

means responsive to said means for sensing a device for detecting the connection of the power device when said power device is in an "ON" condition to prevent the start-up of the power device when AC power is restored to said apparatus by introducing a second discontinuity.

4,853,822

CIRCUIT BREAKER

Kenichi Kamijo, Matsumoto, Japan, assignor to Izumi Seimitsu Kogyo Kabushiki Kaisha, Matsumoto, Japan

Filed Oct. 27, 1987, Ser. No. 114,161
Claims priority, application Japan, Mar. 13, 1987, 62-058093
Int. Cl.[4] H02H *3/16*
U.S. Cl. 361—100 3 Claims

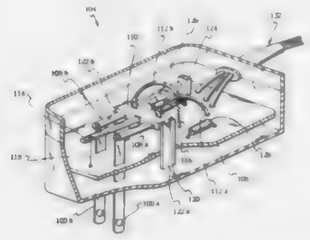
1. A circuit breaker arrangement for connection between a power source and an electric device to prevent a user of the electric device from receiving an electric shock upon immersion of the electric device in water, comprising,

an electric circuit including power input terminals and switching elements connected to apply electric power to the electric device from the power input terminals;

means for biasing said switching elements in a direction to interrupt the electric circuit connection between the power input terminals and the electric circuit;

a series circuit of a meltable material and a gate connected between said power input terminals, said meltable material being mounted to hold said switching elements in a position to close the electric circuit connection between said power input terminals and said electric device, said melt-

able material holding said switching elements against the force of said biasing means, said meltable material having a first end connected to the electric circuit and a second end connected to one end of an arm of a rotatable element, said rotatable element having another end connected to the electric circuit by said biasing means, whereby electric power for said electric device is interrupted by melting of



said meltable material when current passes therethrough; and

a terminal piece in said electric device and connected to the electric circuit by a conductor, said terminal piece being connected to trigger said gate to a conductive state in response to the receipt of leakage current thereto received upon immersion of the electric device in water.

4,853,823

SAFETY RECEPTACLE

Joe R. Arechavaleta, Gilbert; William D. Berg, Glendale, both of Ariz., and Frank P. Dola, Hudson, Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 922,500, Oct. 23, 1986, abandoned.
This application Mar. 21, 1988, Ser. No. 170,590
Int. Cl.[4] H02H *11/00*
U.S. Cl. 361—100 **16 Claims**



6. An electrical receptacle for use in alternating current circuitry, interconnectable with a matable three pin electrical plug, comprising:

first receptacle means having first pin receiving contact means electrically interconnected to first conductor connecting means;

second receptacle means having second pin receiving contact means and second conductor connecting means, the second pin receiving contact means being electrically isolated from the second conductor connecting means;

third receptacle means having third pin receiving contact means and third conductor connecting means electrically interconnected to the third pin receiving contact means;

switching means, comprising a semiconductor switch serially located between the second contact means and the second conductor connecting means and controlled by a gate means for electrically connecting and disconnecting said second contact means and said second conductor connecting means, allowing a switched condition through the switching means, between the second connecting means and the second contact means; and

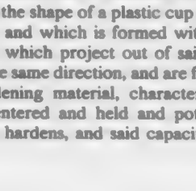
means, located adjacent to one of said receptacle means, for detecting the presence of the matable electrical plug, the detecting means being electrically connected in series between said second pin receiving contact means and said gate means and controlling the switched condition of the switching means thereby effecting said electrical interconnection between the second pin receiving contact means and the second conductor connecting means.

4,853,824

THROUGH-TYPE CAPACITOR

Mamoru Tsuzurahara, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,710
Claims priority, application Japan, Jun. 5, 1987, 62-139735; Jun. 26, 1987, 62-157636
Int. Cl.[4] H01G *4/42*; H03H *7/00*
U.S. Cl. 361—302 **14 Claims**



1. A through-type capacitor comprising:

a dielectric member having a hole formed substantially through the center thereof;

a first electrode surface formed on the outer peripheral surface of the dielectric member;

a second electrode surface formed on the inner peripheral surface of the through hole of the dielectric member, thereby forming a capacitor;

a central conductor having a section passable through the through hole of the dielectric member and inserted in the through hole;

a solder member for connecting the central conductor electrically to the second electrode surface the solder member partially filling a clearance between the second electrode surface and the central conductor so as to at least partially delimit a space to enable the solder member to expand between the central conductor and the second electrode surface.

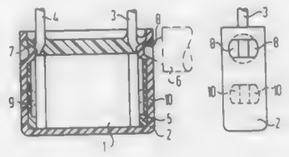
4,853,825

CAPACITOR MOUNTED IN A PLASTIC CUP AND METHOD FOR MANUFACTURING SUCH DEVICE

Ferdinand Utner, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,883
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1987, 3705868
Int. Cl.[4] H05K *1/04, 5/06*; H01G *9/00*
U.S. Cl. 361—306 **10 Claims**

1. A composite electrical capacitor which has a substantially rectangular cross-section and is centered when mounted in a housing which has the shape of a plastic cup (2) with a rectangular cross-section and which is formed with an opening for power leads (3, 4) which project out of said opening of the plastic cup (2) in the same direction, and are fixed to the plastic cup (2) with hardening material, characterized in that the capacitor (1) is centered and held and potted with casting material (5) which hardens, and said capacitor is centered in said cup and is fixed by centering impressions (12, 13) formed in the plastic cup (2), characterized in that said capacitor (1) is centered and fixed by centering impressions (7, 8) formed in at



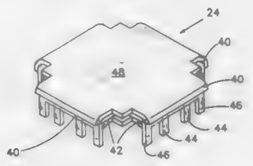
least two lateral surfaces of said plastic cup (2), and characterized in that the capacitor (1) is centered and fixed by at least one centering impression (8) formed in the plastic cup (2) in at least one side and which encloses at least one power lead.

4,853,826

LOW INDUCTANCE DECOUPLING CAPACITOR

Jorge M. Hernandez, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Aug. 1, 1988, Ser. No. 226,602
Int. Cl.[4] H01G *1/14*
U.S. Cl. 361—306 **27 Claims**



1. A decoupling capacitor comprising:

a capacitive element having a pair of opposed surfaces;

a first multi-sided conductor on one of said opposed surfaces of said capacitive element;

a second multi-sided conductor on the other of the said opposed surfaces of said capacitive element;

a plurality of first skirt means extending outwardly and downwardly from said first conductor, one each of said first skirt means extending from at least two of said sides of said first conductor; and

a plurality of second skirt means extending outwardly and downwardly from said second conductor, one each of said second skirt means extending from at least two of said sides of said second conductor.

4,853,827

HIGH DIELECTRIC MULTILAYER CAPACITOR

Jorge M. Hernandez, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Continuation-in-part of Ser. No. 226,619, Aug. 1, 1988. This application Dec. 29, 1988, Ser. No. 291,520
Int. Cl.[4] H01G *4/10, 4/38*
U.S. Cl. 361—321 **16 Claims**

1. A multi-layer capacitor comprising:

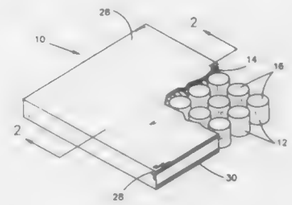
(1) a plurality of spaced, discrete dielectric sheets, each of said discrete dielectric sheets including;

(a) an array of spaced high dielectric chips arranged in a single layer, each of said chips having side, top and bottom surfaces;

(b) a flexible polymeric binder between said side surfaces of said chips and binding said chips to define a cohesive sheet having opposed first and second planar surfaces with said top and bottom surfaces of said chips being exposed on said respective first and second surfaces;

(c) a first metallized layer o said first planar surface; and

(d) a second metallized layer on said second planar surface;



(2) at least a pair of electrically isolated conductive electrodes, each of said electrodes being electrically connected to respective first and second metallized layers on said plurality of discrete dielectric sheets; and

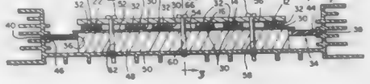
(3) electrically insulative material between said spaced plurality of discrete dielectric sheets.

4,853,828

SOLID STATE DEVICE PACKAGE MOUNTING APPARATUS

Paul E. Penn, Indianapolis, Ind., assignor to Dart Controls, Inc., Zionsville, Ind.

Division of Ser. No. 768,318, Aug. 22, 1985, Pat. No. 4,756,081. This application Jan. 19, 1988, Ser. No. 145,396
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 **18 Claims**



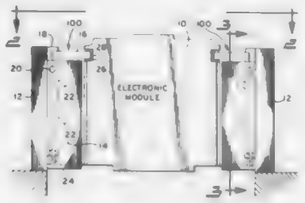
1. Apparatus for mounting on a heat sink a solid state device package housing a solid state device having multiple electric terminals, the device package having an electrically conductive, heat dissipating portion which is common with one of the electrical terminals and an electrically insulative portion, the electrically conductive and heat dissipating portion including an opening therethrough intended to be used in mounting the device package to a heat sink, the apparatus comprising a board for facilitating contact to the device terminals, the board including an opening therethrough adjacent the device mounting location, the device package adapted to be oriented so that the heat dissipating portion of the device package extends into alignment with the opening in the board, means for mounting the board to the heat sink, a first bar of heat conductive material, the first bar adapted to be oriented in the opening between the device package and the heat sink, an electrically insulative and thermally conductive material interposed between the first bar and the device package, a second bar of heat conductive material, the second bar adapted to be oriented on the electrically insulative and thermally conductive material, the first bar and the heat sink, fastening means for positioning in the aligned passageways but not so that the fastening means extends into the opening in the electrically conductive and heat dissipating portion of the device package, said fastening means clamping the device package in position between the electrically insulative and thermally conductive material and the second bar.

4,853,829

ELECTRONIC MODULE LOCKING MECHANISM

Dennis K. Buzzelli, Old Bethpage, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 9, 1988, Ser. No. 269,082
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 10 Claims



1. A locking mechanism for securing an electronic module between a pair of spaced-apart plates with at least one of the plates comprising a chill plate against which one of opposite sides of the module is held in heat transfer contacting relationship therewith, said mechanism comprising;

a slide track having at least a pair of substantially parallel spaced-apart side walls secured to the chill plate and extending therefrom towards and ending in spaced-apart relationship to the module side facing theretowards,

a heat conductive slide block disposed between the slide track side walls,

means for supporting and for enabling the slide block to move along the slide track towards and away from the module side facing theretowards,

an elongate open-sided slot disposed along an end of the slide block adjacent the chill plate and in substantial parallel alignment with the slide track side walls,

a shaft member disposed in the slide block slot adjacent the chill plate,

first resilient biasing means supporting the shaft member in the slot,

second resilient biasing means disposed between the shaft member and a surface of the slide block within the slot facing towards the chill plate,

an aperture extending through at least one of the slide track side walls in proximity to the chill plate,

resiliently biased releasable locking means supported on at least one side of opposed sides of the shaft member in substantial transverse relationship to the second biasing means, said locking means registerable with the slide track side wall aperture and operable to extend thereinto and lockingly secure the shaft member to the slide track when the first biasing means is compressed a prescribed amount,

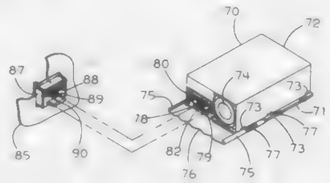
and said locking mechanism operable such that receipt of the shaft member into the slide block slot adjacent the chill plate causes the second biasing means to urge the slide block along the slide track towards the module side for a distance sufficient to establish the heat transfer contacting relationship therebetween and compression of the first biasing means the prescribed amount by pressing upon the shaft member causes the locking means to enter the side wall aperture and lockingly secure the shaft member to the slide track and hold the slide block in secured heat transfer contacting engagement with the module side and compression of the locking means through the aperture towards the shaft member a prescribed amount causes the locking means to release from the side wall enabling removal of the shaft member from the slide block slot and movement of the slide block along the slide track in a direction away from the module side.

4,853,830

THREE STAGE SELF ALIGNMENT STRUCTURE AND METHOD

William D. Corfits; John T. Gallicksrud, both of Rochester; Bradley L. Martin, Byron; Robert W. McCutcheon, Pine Island; Jerry R. Rasmussen, Rochester; Gordon W. Westphal, Rochester, and Stephen E. Wheeler, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1988, Ser. No. 169,638
Int. Cl.[4] H02B *1/20*
U.S. Cl. 361—391 13 Claims



1. A three stages self-docking structure receiving and electrically connecting a component, wherein said component carries an electrical connector, said component mounted within a system enclosure wherein the component is supported for operation and including a mating electrical connector in said enclosure comprising:

coarse positioning means including a pair of guide rails supported by one of said system enclosure and said component and cooperating guideway means, in which said guide rails are slidably received, carried by the other of said system enclosure and said component;

biasing means for urging said component in a direction to maintain engagement between one guide rail and its cooperating guideway means;

intermediate positioning means including a projection on one of said component and said enclosure and a cooperating receiving opening carried by the other of said component and said enclosure with at least one of said projection and said opening including a tapered portion wherein the total taper substantially aligns said electrical connector and the cooperating mating electrical connector from within the tolerance of said coarse positioning means; and

fine positioning means formed as a plurality of tapered surfaces on at least one of said electrical connector and said cooperating mating electrical connector to guide said electrical connectors to an electrically connected condition as said component is guided to the operating position within said enclosure.

4,853,831

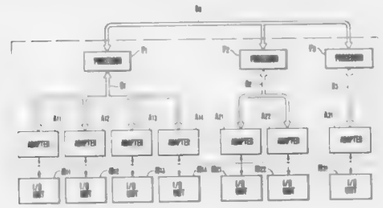
BUS CONNECTION STRUCTURE FOR INTERRUPTION CONTROL SYSTEM

Masaki Tsuchiya, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 10, 1988, Ser. No. 154,583
Claims priority, application Japan, Feb. 12, 1987, 62-30917; Feb. 12, 1987, 62-30918
Int. Cl.[4] H05K *5/00*
U.S. Cl. 361—39.4 6 Claims

1. A bus connection structure for an interruption control system which comprises, in a single cabinet, a plurality of processors connected to a common bus, and at least one input-/output control adapter connected to an internal bus of each of said processors, and in which each of said adapters outputs an interruption signal to the corresponding one of said processors, and each of said processors outputs an interruption response signal to the corresponding adapter, comprising:

a plurality of elongated connectors which are arranged on a backboard provided inside said cabinet and have an identical structure, each of said connectors having first and second terminal arrays consisting of the same numbers of terminals along a longitudinal direction thereof and being provided in one-to-one correspondence with said plurality of processors and said plurality of adapters, and connectors corresponding to adapters belonging to a given processor being arranged on one side of a connector corresponding to the given processor;



a plurality of interconnector wirings which are formed on said backboard to connect the opposing terminals of said connectors in one-to-one correspondence; and

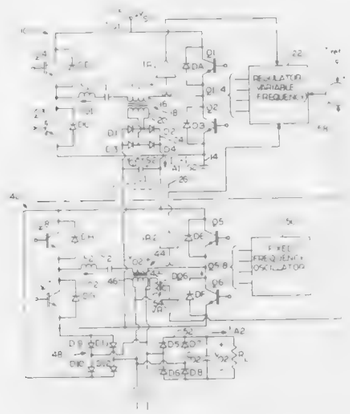
internal wirings which are formed between said first and second terminal arrays of said connectors excluding connectors corresponding to said processors, so that a predetermined number of terminals of each of the connectors corresponding to said adapters and a predetermined number of terminals of each of the connectors corresponding to said processors are connected through said interconnector wirings.

4,853,832

CASCADED RESONANT BRIDGE CONVERTERS

Thomas A. Stuart, Maumee, Ohio, assignor to University of Toledo, Toledo, Ohio

Filed Aug. 1, 1988, Ser. No. 226,941
Int. Cl.[4] H02M *3/337*
U.S. Cl. 363—17 14 Claims



1. A converter for converting a direct current power source at an input voltage to an alternating current output at an output voltage comprising:

a first stage converter for converting said direct current power source to a direct current first stage output at a first stage output voltage;

a second stage converter for receiving said direct current first stage output and for converting said first stage output to said alternating current output;

said first stage having first and second switching means, a first transformer having a primary winding connected in series with said first and second switching means, first inductance means and first capacitance means connected in series with said primary winding of said first transformer, said first transformer further having a secondary winding, said first stage further having rectifier means for receiving transformer alternating current power from said secondary winding of said first transformer to provide said direct current first stage output therefrom, and means for sequentially operating said first switching means and said second switching means to sequentially reverse current flow from said direct current power source through said primary winding of said first transformer;

said second stage having third and fourth switching means, connector means connected in series with said third and fourth switching means, said connector means having second inductance means and second capacitance means connected in series and fixed frequency oscillator means for sequentially operating said third and fourth switching means to sequentially reverse current flow through said connector means to provide said alternating current output, said alternating current output having a fixed frequency; and

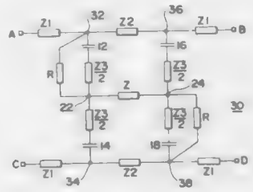
second stage sensing means for sensing current flow in said connector means, said means for sequentially operating said first switching means and said second switching means being responsive to said second stage sensing means and being adapted to discontinue the operation of said means for sequentially operating said first switching means and said second switching means when said current flow in said connector means exceeds a predetermined value.

4,853,833

FILTER UNIT WITH ELECTROCHEMICAL CAPACITORS FOR A STATIC POWER CONVERTER

Jean-Noël Florina, Seyssinet Pariset, and Hervé Denis, Echirolles, both of France, assignors to Merlin Gerin, France

Filed Mar. 2, 1988, Ser. No. 163,255
Claims priority, application France, Mar. 16, 1987, 87 03712
Int. Cl.[4] H02M *1/14*
U.S. Cl. 363—47 7 Claims



1. A filter unit having power supply terminals for electrical connection to a static power converter for a static power converter, comprising a plurality of electrochemical capacitors formed by coils with parallel axes, positioned on a mechanical support (52), and cooperating at the opposite end with an electrical connecting device (62), said capacitors being divided into first and second groups of capacitors connected in parallel to the power supply terminals, each group comprising at least two series-mounted capacitors (12, 14; 16, 18), having a midpoint (22,24) which is connected to a voltage divider with balancing resistors R, the mechanical support (52) comprising a base (54) made of moulded insulating material, having a quadrilateral profile on which four identical capacitors (12,14; 16,18) are mounted forming a standard module (50) with the connecting device (64) equipped with a first bar (66) of positive

polarity, and a second bar (68) of negative polarity, the voltage divider comprising:

a first balancing resistor R electrically connected between the mid-point (22) of the first group of capacitors (12, 14) and the first bar (66) of positive polarity;

a second balancing resistor R of the same value as the first, and electrically connected between the mid-point (24) of the second group of capacitors (16, 18) and the second bar (68) of negative polarity;

and a first connecting impedance Z electrically inserted between the two mid-points (22, 24) of the first and second groups of capacitors, the value of the impedance Z being chosen so that said mid-points (22, 24) are in parallel for direct current, but are not for alternating current to be filtered.

4,853,834

DEVICE FOR MAINTAINING THE CUT-OFF SWITCHING STATE OF A THYRISTOR THAT CAN BE TURNED OFF

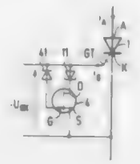
Michael Peppel, Weinheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 10, 1987, Ser. No. 84,412

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1986, 3627935

Int. Cl.[4] H02H *7/125*

U.S. Cl. 363—54 **11 Claims**



1. A device coupled to a gate-turn-off thyristor having an anode, cathode and gate, for maintaining a switching state of the thyristor interrupting current flow between the anode and cathode in the event of a failure of a negative control voltage causing and maintaining said switching state in normal operation between the gate and cathode of the thyristor, comprising:

a low resistance shunt comprising a self-conducting n-channel field-effect transistor that can be coupled to the thyristor, said transistor having a gate electrode, a source electrode and a drain electrode, the drain and source electrode, respectively, of the field-effect transistor being connected to the gate and cathode, respectively of the thyristor; and

a diode arranged in a forward direction from the gate electrode of the field-effect transistor to the gate of the thyristor.

4,853,835

PROTECTIVE APPARATUS FOR INVERTER

Takeshi Furuhashi, Inagi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 3, 1987, Ser. No. 92,518

Claims priority, application Japan, Sep. 5, 1986, 61-207667

Int. Cl.[4] H02H *7/122*

U.S. Cl. 363—58 **7 Claims**

1. A protective apparatus for an inverter connected to a DC power supply whose voltage rises during light load operation, said inverter comprising self-extinguishing type switching elements connected with snubber circuits including snubber capacitors, respectively, said apparatus being used for protecting said switching elements from an overvoltage generated at a turn-off operation, said protective apparatus comprising:

voltage detection means for detecting a voltage of said DC power supply;

load current detection means for detecting a load current outputted from said inverter;

level setting means for setting a reference overcurrent detection level;

overcurrent detection means for outputting an overcurrent detection signal when the load current detected by said load current detection means reaches said reference overcurrent detection level set by said level setting means



while the DC voltage detected by said voltage detection means is less than a predetermined value, and when the load current detected by said load current detection means reaches a level lower than said reference overcurrent detection level set by said level setting means while the DC voltage detected by said voltage setting means is larger than said predetermined value; and

means responsive to said overcurrent detection signal from said overcurrent detection means for turning off said inverter.

4,853,836

SNUBBER ENERGY REGENERATING CIRCUIT

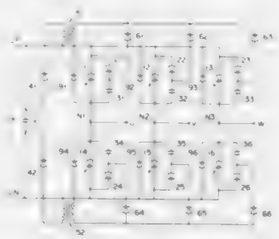
Takeshi Furuhashi, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 30, 1988, Ser. No. 175,291

Claims priority, application Japan, Mar. 31, 1987, 62-78601

Int. Cl.[4] H02H *7/122*

U.S. Cl. 363—58 **14 Claims**



1. A snubber energy regenerating circuit for an inverter comprising one or more switching element arms each including a plurality of switching elements, comprising:

a plurality of snubber capacitor circuits respectively connected to said plurality of switching elements, each snubber capacitor circuit being charged by a voltage applied to a switching element when said switching element connected thereto is kept off; and

regenerating means, commonly connected to two or more of said plurality of snubber capacitor circuits, for, when said switching elements connected to said snubber capacitor circuits are turned on, discharging charges accumulated in said snubber capacitor circuits so that the discharged

energy is regenerated to power supply circuits of the inverter.

4,853,837

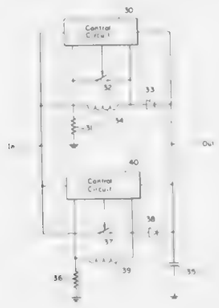
SYNCHRONOUS SWITCHING POWER SUPPLY WITH FLYBACK CONVERTER

Zdzislaw Gulczynski, P.O. Box 441, Winchester, Mass. 01890

Filed Aug. 8, 1988, Ser. No. 229,915

Int. Cl.[4] H02M *7/04, 7/217*

U.S. Cl. 363—80 **9 Claims**



1. Switching power supply for converting AC input signal into DC output signal, comprising:

an inductive means coupled to ground for attaining a current;

a switch means coupled between the AC input signal and inductive means for selectively applying the AC input signal of one polarity to the inductive means;

a rectifying means coupled to the inductive means for conducting the current and providing a first DC signal;

a converter means for converting the AC input signal of the opposite polarity into a second DC signal having the same polarity as the first DC signal; and

a capacitor means for receiving the first and second DC signals and providing the DC output signal.

4,853,838

DISPLAY AND DATA-INSERTION MODULE HAVING MULTIPLE ASSEMBLY POSSIBILITIES

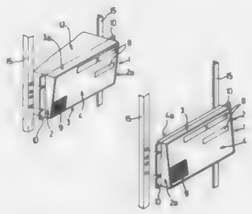
Alexis Westermann, Paris, France, assignor to M.P.I.Metrologie Pesage International, France

Filed Mar. 8, 1988, Ser. No. 165,215

Claims priority, application France, Mar. 12, 1987, 87 03425

Int. Cl.[4] G06F *1/00;* **H05K** *7/16*

U.S. Cl. 364—189 **8 Claims**



1. A data input and display module capable of horizontal and vertical mounting, comprising:

a right-prism shaped casing having:

equally dimensioned first and second spaced apart trapezoidally shaped sides;

unequally dimensioned third and fourth spaced apart rectangularly shaped sides;

edges of the first and second sides being attached to edges of the third and fourth sides such that the first, second, third and fourth sides define a perimeter of the casing;

unequally dimensioned fifth and sixth spaced apart rectangularly shaped sides;

the fifth side being attached at right angles to a lower edge of the first, second, third and fourth sides to form a casing bottom;

the sixth side being removably attached to an upper edge of the first, second, third and fourth sides to form a casing top, inclined with respect to the casing bottom;

the sixth side being attachable to the casing in a first position and in a second position wherein the sixth side is rotated 180° in its own plane with respect to the first position;

means for inputting data, mounted on the sixth side;

means for displaying data, mounted on the sixth side;

wherein when the module is positioned on a horizontal support, the sixth side may be attached to the casing in a chosen first or second position such that the means for inputting data and the means for displaying data are inclined in a chosen orientation with respect to a user, providing thereby access and visibility to the user; and

wherein when the module is positioned on a vertical support, the sixth side may be attached to the casing in a chosen first or second position such that the means for inputting data and the means for displaying data are inclined in a chosen orientation with respect to a user;

access to and visibility of the means for inputting data and the means for displaying data being provided to the user irrespective of horizontal or vertical module orientation.

4,853,839

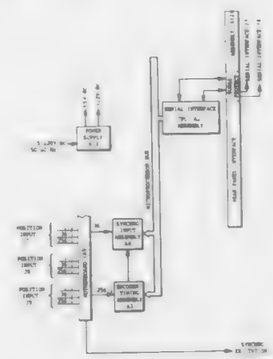
ANTENNA POSITION TRACKING APPARATUS AND METHODS

Steven R. Nichols, Duluth; Robert C. Hyers, Tucker; Walter M. Stovall, Atlanta, and Charles D. Trawick, Doraville, all of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Continuation of Ser. No. 782,553, Oct. 1, 1985, abandoned. This application Sep. 29, 1988, Ser. No. 251,665

Int. Cl.[4] G05B *15/02;* **G05D** *3/20*

U.S. Cl. 364—167.01 **15 Claims**



7. Apparatus for indicating the position of a device to which angle-sensing transducer means are connected, comprising:

(a) synchro-input means for accepting, conditioning and digitizing synchro analog information from the transducer means connected to the device and relating to the position of the device;

(b) encoder processor means for accepting, conditioning and digitizing encoded information from the transducer means connected to the device and relating to the position of the device;

(c) processor means for accepting:

(i) information relating to the position of the device from the synchro-input means and the encoder processor means; and

(ii) information relating to the simulated position of the device;

to calculate tracking velocity information according to the following formula:

$$V_{Tn,n+1} = \frac{P_n - P_{n-1}}{dt} + \frac{P_{sn} - P_n}{dt}$$

where:

P_n = information to the position of the device for a predetermined time interval;

P_{n-1} = information relating to the position of the device for the time interval immediately preceding the predetermined time interval;

P_{sn} = information relating to the simulated position of the device for the predetermined time interval;

dt = information relating to the length of the predetermined time interval; and

$V_{Tn,n+1}$ = tracking velocity information calculated by the processor means for the time interval immediately following the predetermined time interval; and

(d) input/out means for accepting the tracking velocity information from the processor means, calculating therefrom information relating to the simulated position of the device, and providing simulated position information to the processor means and for output.

13. A method for indicating the position of an antenna that is connected to angle-sensing transducer means, comprising the steps of:

(a) transducing, in the transducer means, information relating to the position of the antenna into analog electrical information and providing the analog electrical information as transducer means output;

(b) converting the analog electrical information to digital format;

(c) utilizing the digital formatted information, digital information relating to the simulated position of the antenna for a predetermined time increment and digital formatted information for the time increment immediately preceding the predetermined time increment to calculate tracking velocity information for the time increment immediately following the predetermined time increment;

(d) utilizing the tracking velocity information to:

(i) predict future values of the transducer means output; and

(ii) determine, for successive predetermined time increments, simulated position information for use in calculating tracking velocity information; and

(e) providing for output the predicted future values of the transducer means output to indicate position of the antenna.

4,853,840

INSTRUCTION PREFETCHING DEVICE INCLUDING A CIRCUIT FOR CHECKING PREDICTION OF A BRANCH INSTRUCTION BEFORE THE INSTRUCTION IS EXECUTED

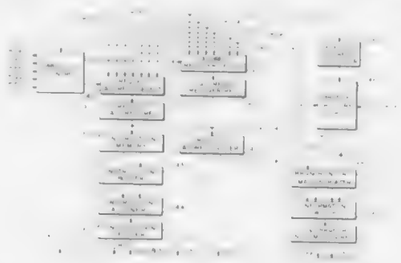
Toshiteru Shibuya, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 5, 1987, Ser. No. 427

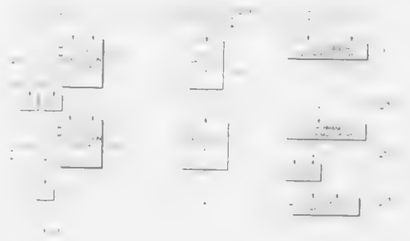
Claims priority, application Japan, Jan. 7, 1986, 61-321; Jan. 7, 1986, 61-322; Jan. 7, 1986, 61-323; Jan. 7, 1986, 61-324; Jan. 7, 1986, 61-325; Jan. 7, 1986, 61-326

Int. Cl.⁴ G06F *9/38, 9/42*

U.S. Cl. 364—200 **21 Claims**







1. An instruction prefetching device for use in combination with a data processing system including executing means for executing a sequence of instructions with each instruction processed successively in a plurality of stages which include an executing stage, said instruction prefetching device carrying out prefetching of instructions from said sequence and including predicting means, responsive to a particular instruction address, for producing branch information obtained when an instruction similar to said particular instruction, having an instruction address identical to an address in said particular instruction, was processed in said executing stage in an instruction execution prior to the prefetch of said particular instruction, said predicting means producing said branch information as predicted branch information, said instruction prefetching device comprises:

prediction checking means, coupled to said predicting means and to said executing means, for carrying out a check prior to said executing stage for said particular instruction, said check determining whether said predicted branch information is correct or incorrect; and

prefetch controlling means, coupled to said predicting means and to said prediction checking means, for allowing continuance of the prefetch of a subsequent instruction in compliance with said predicted branch information when said predicted branch information is correct, said prefetch controlling means correcting said continuance when said predicted branch information is incorrect, said subsequent instruction following said particular instruction in said sequence.

4,853,841

ARRANGEMENT FOR THE INDIVIDUAL ADAPTATION OF A SERIAL INTERFACE OF A DATA PROCESSING SYSTEM TO A DATA TRANSMISSION SPEED OF A COMMUNICATION PARTNER

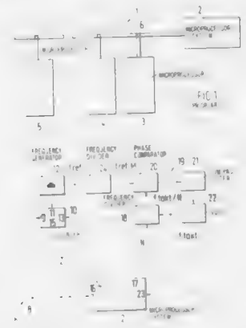
Axel Richter, Wimsheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Oct. 20, 1986, Ser. No. 920,454

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1985, 3537477

Int. Cl.⁴ H04L *25/40, 7/00;* **G06F** *3/00*

U.S. Cl. 364—200 **20 Claims**



20. An arrangement for adapting a serial interface of a data processing system to an unknown data transmission speed of data transmission signals from a communication partner, comprising:

reference frequency generator means for generating a reference frequency signal;

counter means for counting pulses of said reference frequency signal for a period set by and related to the unknown data transmission speed of said data transmission signals;

microprocessor means connected to said counter means for reading from said counter means a counting result determined by said period set by the unknown date transmission speed of said data transmission signal and for calculating an adjustment signal based on said counting result;

variable clock frequency generating means connected to said microprocessor means for outputting an adjustable clock frequency to said microprocessor means;

adjustment means for receiving said adjustment signal from said microprocesor means and for adjusting said adjustable clock frequency generating means in response to said adjustment signal to produce an adjusted clock frequency signal corresponding to a matching data transmission speed which matches said unknown data transmission speed; and

derivation means in said microprocessor means for deriving said matching data transmission speed from said adjusted clock frequency signal.

4,853,842

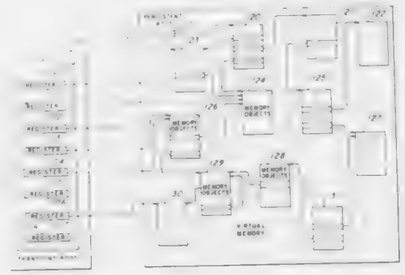
COMPUTER MEMORY SYSTEM HAVING PERSISTENT OBJECTS

Satish M. Thatte, Richardson, and Donald W. Oxley, Carrollton, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 774,826, Sep. 11, 1985, abandoned. This application Feb. 19, 1988, Ser. No. 159,467

Int. Cl.⁴ G06F *12/00*

U.S. Cl. 364—200 **11 Claims**



1. A persistent memory for a computer system, comprising:

a linear address space having a plurality of consecutively numbered memory locations;

a plurality of memory blocks allocated within said linear address space, wherein each block consists of at least one memory location, wherein each block has one associated location addressable by pointers, and wherein a plurality of said blocks contain pointers to other memory blocks; and

a persistent root located in said linear address space, wherein said persistent root can contain a pointer to one of said allocated memory blocks, and wherein all allocated memory blocks which are in a transitive closure of said persistent root are not subject to reclamation by the computer system;

wherein the computer system can access said memory blocks only through pointers pointing at the associated addressable location, and can access a selected memory location only by calculating an offset from an addressable location associated with one of said memory blocks.

4,853,843

SYSTEM FOR MERGING VIRTUAL PARTITIONS OF A DISTRIBUTED DATABASE

Denise J. Ecklund, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 18, 1987, Ser. No. 136,174

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 364—200 **18 Claims**

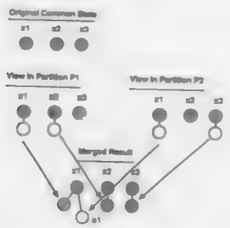
1. For a data base system providing a plurality of separate virtual partitions, each storing separate instances of an initial data base comprising an initial set of versions of data objects and initial directory data indicating primary and alternate paths of decendency relating successive versions of each data object,

each virtual partition independently executing group updates with respect to a referenced group of data objects by adding descendant data object versions to paths of data objects of the referenced group, each virtual partition

maintaining a separate change list describing all group updates that it executes,

a method for execution by a virtual partition for providing a merged data base reflecting changes to the initial data base resulting from group updates described by change lists maintained by said plurality of separate virtual partitions, the method comprising the steps of:

selecting a collection of group updates from among the group updates described by said change lists according to predetermined selection criteria subject to a restriction that when the collection includes a plurality of group updates adding data object versions to any one path of a data object, said plurality of group updates must all be



described by a change list maintained by one of said plurality of separate virtual partitions;

executing the collection of group updates on versions of data objects included in said initial data base to produce a resulting set of data object versions;

generating additional data object versions, each additional data object version resulting from group updates described by said change lists other than group updates included in said collection; and

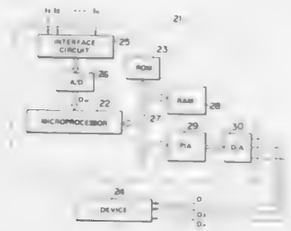
altering said initial directory data so that it indicates that the additional data object versions relate to data object versions of said resulting set by alternate paths of decendency.

4,853,844

DATA PROCESSING SYSTEM ADAPTABLE TO USING EQUIVALENT INTEGRATED CIRCUITS

Hiromi Kono, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 15, 1986, Ser. No. 885,883
Claims priority, application Japan, Jul. 18, 1985, 60-157048
Int. Cl.⁴ G06F *1/00*
U.S. Cl. 364—200 **4 Claims**



1. A method of controlling a data processing system having at least one microprocessor for processing input data in accordance with a stored program, in which said microprocessor is selected from a predetermined plurality of microprocessors which have identical pin assignments and use identical machine language, but not identical address assignments of respective registers, said method comprising steps of:

storing in a memory means a discriminating program and a data processing program, said discriminating program to be executed normally by any selected microprocessor and being able to discriminate on the basis of the difference in the address assignments of the respective registers from among the predetermined plurality of microprocessors which type of microprocessor has been selected and used, said data processing program providing the correct execution of a prescribed data processing operation by the selected microprocessor when only information concerning the type of the microprocessor in use is provided;

executing said discriminating program during initialization of the system by the selected microprocessor to discriminate what type of microprocessor is used in the data processing system, said executing step including:

a. writing a prescribed data to a predetermined address of the register of the selected microprocessor;

b. reading out the data stored in the address to which the prescribed data is written by said writing step; and

c. comparing the prescribed data with the data read out in said reading step, thereby discriminating the type of microprocessor the selected microprocessor is in accordance with the result of said comparing step;

producing discrimination data indicating the type of microprocessor which is currently in use in response to the result of the discrimination obtained by the execution of the discriminating program; and

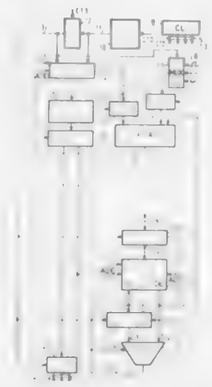
controlling the execution of said data processing program in response to the discrimination data so as to adapt the data processing program to the type of microprocessor in use at that time.

4,853,845

DATA PROCESSING APPARATUS FOR TIME-INTERLEAVED EXECUTION OF A PLURALITY OF PROCESSES

Günther A. H. Zimmer, Hamburg, Fed. Rep. of Germany; Dirk H. Braune, Paris, France, and Cecil H. Kaplinsky, Palo Alto, Calif., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 27, 1986, Ser. No. 900,870
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1985, 3532481
Int. Cl.⁴ G06F *9/40*
U.S. Cl. 364—200 **29 Claims**



1. An integrated circuit data processing apparatus for time-interleaved quasi-parallel execution of a plurality of processes, said apparatus comprising:

a clock for generating a sequence of multi-pulse clock cycles, each cycle having a sequencer-controlling pulse;

a sequencer under control of said sequencer-controlling clock pulse for recurrently stepping through a set of sequence control signals stored therein, each different sequence control signal corresponding to a different process;

an instruction memory having a plurality of addressable locations for storing a set of instructions;

an address memory for storing a plurality of instruction memory addresses for addressing said instruction memory locations, said address memory having an address input and a control input for receiving said sequence control signals, said address memory outputting an instruction memory address under control of a sequence control signal and a first address received on said address input;

said instruction memory having an input for receiving an instruction memory address from said address memory and means for outputting an instruction stored in the addressed location;

an instruction register receiving the output of said instruction memory for storing an instruction received from said instruction memory, and said instruction register having an output;

an address generator receiving addresses from said address memory and having further condition/data inputs for generating said first address of a set of addresses stored therein for forwarding to said address input of said address memory a next following instruction memory address;

an arithmetic and logic element having two data inputs and having a first control input for receiving control signals from said instruction register for under control of a current control signal executing a combining operation on two words received on said data inputs and a data output for outputting the result of said combining operation;

a buffer memory having a data input for receiving the result from said data output of said arithmetic and logic element and for storing said result, said buffer memory having a data output for feeding a predetermined one of said two data inputs of said arithmetic and logic element, said buffer memory having a plurality of memory locations each addressable by a corresponding sequence control signal and having an address input for receiving said sequence control signals from said sequence under control of at least a part of said sequence control signal for accessing a corresponding memory location;

a data memory having a plurality of addressable memory locations and an address input connected to the output of said instruction register responsive to part of an instruction from said instruction register for addressing a data memory location, a data input for receiving the result from said data output of said arithmetic and logic element and a data output for feeding the other one of said two data inputs of said arithmetic logic unit;

a first dedicated connector for connecting said data memory to said instruction register and a second dedicated connector for connecting said buffer memory to said instruction register;

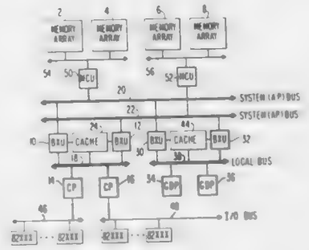
a bidirectional connection circuit means having a control input for receiving sequence control signals from said sequencer, said connection circuit means being bidirectionally connected between said data memory and an external connection under control of a further part of said sequence control signal for controlling a data exchange between said data memory and the external connection.

4,853,846

BUS EXPANDER WITH LOGIC FOR VIRTUALIZING SINGLE CACHE CONTROL INTO DUAL CHANNELS WITH SEPARATE DIRECTORIES AND PREFETCH FOR DIFFERENT PROCESSORS

David B. Johnson, Portland; Ronald J. Ebersole, Beaverton; Joel C. Huang, Portland, all of Oreg.; Manfred Neugebauer, Erlangen, Fed. Rep. of Germany; Steven R. Page, Hillsboro, and Keith S. Self, Aloha, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jul. 29, 1986, Ser. No. 890,859
Int. Cl.⁴ G06F *12/00, 12/02, 12/08, 12/12*
U.S. Cl. 364—200 **4 Claims**



1. For use in a bus expander unit (10) which is part of a data processing system in which a first processor (14) and a second processor (16) communicate over a local bus (18) with a plurality of memories (2, 4) connected to one or more system buses (20, 22),

said bus expander unit (10) providing an interface between said local bus (18) and said system bus (20),

said bus expander unit including local bus control logic (68) for controlling access to said local bus (18),

said bus expander unit including system bus control logic (60) for controlling access to said system bus (20); and,

a cache data-array (24) connected to said bus expander unit (10) and to said local bus (18);

said local bus carrying a bus address (67) comprised of a tag portion, a set portion, and a line portion, a line consisting of a plurality of data bytes, said line being the basic unit of data transferred between said cache (24) and said memories (2, 4);

the combination comprising:

control logic in said bus expander unit for controlling references to said cache data-array;

said control logic including a cache directory (62), said cache directory including an address store (65) for storing tag fields, each tag field identifying a memory location in one of said memories that is associated with an address block (69) stored in said cache (24);

said directory including means for generating a cache data-array address (73) comprised of a set portion identical to said set portion of said bus address (67), a line portion identical to said line portion of said bus address (67), and a way portion (75);

a plurality of address blocks stored in said address store (65), each address block describing a physical address of a number of contiguous lines of data stored in said cache data-array;

a plurality of valid bits stored in said address store (65), each valid bit being associated with each one of said lines of data within said address block in said address store (65), such that if a particular line of data is present in said cache, then the valid bit for that line is on, and if a particular line is not present in said cache, then the valid bit for that line is off;

said cache directory (62) is being configured into a plurality groups of storage locations (ways 0, 1, 2, 3), each way providing storage for said tag fields and said valid-bits for

facilitating the associative searching of said directory for a particular tag field;

said directory (62) including a decoder (71) connected to said address bus (67) and to said address store (65);

said address store (65) being divided into a plurality of sets (SET 0-SET 63), each set being a grouping of said address blocks consisting of one address block from each way, all of the address blocks in a set being simultaneously selected by said decoder (71) in response to the decoding of said set portion of said bus address;

first means (64) connected to said local bus control logic (68) and to said cache directory (62), said first means including first configuration control means (102) for specifying the number of ways enabled in said cache directory and second configuration control means (100) for specifying the number of lines enabled in one of said address blocks;

a number of compare circuits (70, 72, 74, 76) equal to the number of said ways, said compare circuits being connected to said bus address (67) and to said address store (65) such that simultaneous comparisons are made in said compare circuits (70–76) between said tag portion of said bus address (67) and said tag fields in said number of ways specified by said first configuration control means (102) to determine if the data corresponding to said bus address (67) is in said cache data-array, a hit occuring when the tag field of an address block matches said tag portion of said bus address and the valid bit of the line specified in said bus address is on; and,

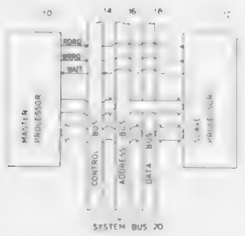
encoding means (77) responsive to said compare circuits (70, 72, 74, 76), for generating at an output (75), said output (75) being said way portion of said cache data array address (73).

4,853,847

DATA PROCESSOR WITH WAIT CONTROL ALLOWING HIGH SPEED ACCESS

Mitsuroo Ohuchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 23, 1987, Ser. No. 41,516
Claims priority, application Japan, Apr. 23, 1986, 61-95565
Int. Cl.[4] G06F *13/14, 13/20, 3/14*
U.S. Cl. 364—200 6 Claims



1. A data processor for executing a read/write operation in response to a read/write request signal from a master processor, comprising:

first means coupled to the master processor to receive the read/write request signal from the master processor and for performing a write operation during a predetermined period of time from the moment a first write request signal is brought to an inactive condition from an active condition, and

second means coupled to the master processor to receive the read/write request signal from the master processor and for generating, when another access request signal such as a second write request signal or a read request signal is made active during said predetermined period of time, an active wait signal requiring the master processor to maintain said another access request signal in an active condition, the second means also operating to delay an operation indicated by said another access request signal wherein the second means includes a read/write controller receiving the read request signal or the second write request signal and generating the active wait signal to the master processor only when a write operation is executed and when a read request signal or a write request signal is further inputted during the predetermined period of time from the moment the first write request signal is brought to the inactive condition;

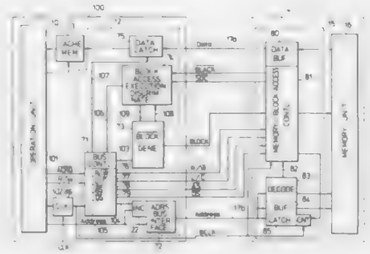
said data processor further includes an internal register, a read data register coupled between the internal register and a data bus for temporarily holding data read from the internal register, a write data register coupled between the internal register and the bus for temporarily holding data to be written to the internal register, and an address register coupled between the internal register and an address bus for holding an address of the internal register to be accessed from the master processor, said internal register, said read data register, said write data register, and said address register being controlled by the read/write controller.

4,853,841

BLOCK ACCESS SYSTEM USING CACHE MEMORY

Masato Mitsuhashi, Hiratsuka, and Takeshi Kitahara, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 3, 1988, Ser. No. 163,911
Claims priority, application Japan, Mar. 10, 1987, 62-54901
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 14 Claims



1. A block access system using a cache memory comprising:

main memory means for storing data;

operation means for carrying out operations and producing a single memory address and an access request to read out data stored in the main memory means;

cache memory means for storing the data read out from the main memory means;

a bus for connecting the cache memory means with the main memory means;

first control means for producing a block access request for requesting read-out of all data included in a block of a predetermined size in response to the access request from the operation means and inputting the data read out from the main memory means into the cache memory; and

second control means for reading out data from the main memory means and sending back to the first control means a response signal which indicates one of execution and cancellation of the requested block access in response to the block access request from the first control means;

the first control means comprising first address supply means for supplying the single memory address from the operation means to the second control means when the response signal indicates the execution of the requested block access and for supplying the single memory address and memory addresses necessary to read out all the data of one block to the second control means when the response signal indicates the cancellation of the requested block access;

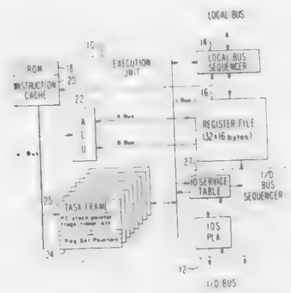
the second control means comprising second address supply means for supplying the main memory means with the single memory address and memory addresses necessary to read out all the data of one block when the requested block address is executed and for supplying the main memory means with the addresses provided from the first control means when the requested block address is cancelled.

4,853,849

MULTI-TASKING REGISTER SET MAPPING SYSTEM WHICH CHANGES A REGISTER SET POINTER BLOCK BIT DURING ACCESS INSTRUCTION

William L. Bain, Jr., Beaverton, Oreg.; Marcos de Oliveira Camargo, Lodi, Calif.; Robert C. Duzett, Hillsboro, Oreg.; Artur H. Lederhofer, Herzogenaurach, Fed. Rep. of Germany; Craig B. Peterson, Portland, and John L. Wipfli, Hillsboro, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 17, 1986, Ser. No. 942,608
Int. Cl.[4] G06F *9/28*
U.S. Cl. 364—200 3 Claims



1. For use in an I/O processor including a register file (16) comprised of a plurality of register sets accessible indirectly through groups of register set pointers (50) assigned to each task running on said processor, a register set pointer (24) containing the physical address (52) of one of said register sets, an I/O bus sequencer (12), and a local bus sequencer (14) and, means (20) for decoding instructions, one of said instructions being an ACCESS instruction, said ACCESS instruction having a number of fields, one of said fields (41) being a pointer to a parameter register (42), said parameter register (42) being comprised of a number of fields, the improvement comprising:

A. means (25) for storing said parameter register fields including positions for storing:

a sequencer code (82) identifying one of said sequencers (12, 14) to or from which data is to be moved in a data transfer,

a logical byte-type (92), first bits (53) of which specifying a particular register set pointer of said register set pointers (50) and second bits (54) of which specifying a byte address within a register set pointed to by the physical register set address (52) in said particular register set pointer, a reply register-set pointer (84) to register set in said register file (16) designated to receive a reply to said ACCESS instruction, and, length means (90) specifying the number of bytes to move in said data transfer;

B. instruction-register means including means for storing said parameter register;

C. a register set mapper (104) connected to said parameter register (42) responsive to said logical byte (92) for producing a physical register address (56) of said register file by combining said physical register set address (52) in said particular register set pointer specified by said first bits (53) with said second bits (54) specifying the byte address within the register set pointed to by the physical register set address (52) in said particular register set pointer;

said register set pointer (24) including a valid bit (51) and a block bit (55);

D. means for setting said block bit (55) upon the condition that said ACCESS instruction attempts to access a register set whose valid bit (51) is not set; and

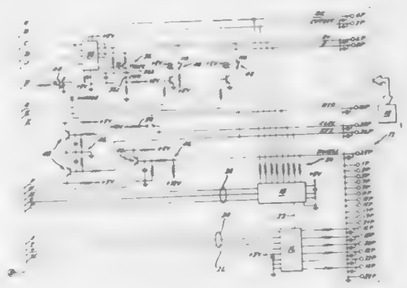
E. means for resetting said block bit (55) upon the condition that the task which is executing said ACCESS instruction attempts to access a register set whose block and valid bits are set.

4,853,950

VEHICLE COMPUTER DIAGNOSTIC INTERFACE APPARATUS

James E. Kraus, Jr., 921 Canterbury, Grosse Pointe Woods, Mich. 48236, and James F. Neely, 61989 Romeo Plank, Washington, Mich. 48094

Filed Sep. 10, 1985, Ser. No. 774,348
Int. Cl.[4] G06F *13/00, 13/42*
U.S. Cl. 364—200 22 Claims



8. A communications adapter circuit for plugging directly into a bus structure of a test computer which is programmed to analyze data from an on-board vehicle computer, comprising:

a microcomputer-based controller;

first interface means for transmitting a command signal of variable amplitude to said on-board vehicle computer under the direction of said controller which will cause said on-board computer to transmit a stream of unprocessed data to said communications adapter circuit;

second interface means in communication with said controller for receiving said stream of unprocessed data from said on-board vehicle computer in response to said command signal;

third interface means for connecting said communications adapter circuit directly to said bus structure of said test computer, such that said communications adapter circuit shares said bus structure of said test computer;

first memory means connected to said controller and to said second interface means for storing said stream of unprocessed data transmitted from said on-board vehicle computer, said first memory means enabling said controller to preprocess data from said unprocessed stream of data;

dual-ported memory means connected to said second and third interface means for enabling a direct transfer of said stored preprocessed data to a data bus in said bus structure of said test computer; and

addressing control means connected to said dual-ported memory means for assigning said dual-ported memory means a predetermined range of address locations in a memory map of said test computer which will enable said

test computer to access data stored in said dual-ported memory means.

4,853,851

SYSTEM FOR DETERMINING THE CODE COVERAGE OF A TESTED PROGRAM BASED UPON STATIC AND DYNAMIC ANALYSIS RECORDINGS

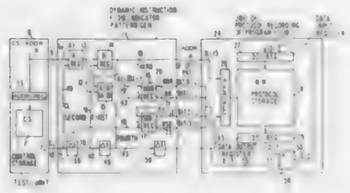
Axel Horsch, Boeblingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1986, Ser. No. 942,307

Claims priority, application European Pat. Off., Dec. 30, 1985, 85116652.0

Int. Cl.[4] G06F *11/00, 7/04, 15/36*

U.S. Cl. 364—300 **9 Claims**



1. A method of measuring the ratio between the number of functions executed in a computer program during testing of said computer program with a test program, and the total number of functions in said program to be tested, comprising:

executing said test program in said computer where said number of functions are executed;

determining from each instruction address of said computer program which is called for during execution of said test program a dynamic instruction flow indicator pattern, based on the address of a current and previous executed instruction, said pattern identifying:

(a) no branch instruction, NBR;

(b) branch instruction, BR;

(c) sequential instruction, SE;

(d) non-sequential instruction, NSE;

logging said dynamic instruction flow indicator patterns as they are developed in a logging device, each pattern representing an address of an instruction which produced said pattern;

determining a static instruction flow indicator pattern for each called instruction during testing from an operational code of said called instruction, said static instruction flow indicator pattern indicating whether said instruction is:

(a) no branch instruction, NBR;

(b) branch instruction, BR;

(c) instruction reached by an internal entry (ILBL);

(d) instruction reached by an external entry (ELBL); and

comparing said static instruction flow indicator pattern with said dynamic instruction flow indicator pattern to determine a portion of all instructions of said computer program which have been tested.

4,853,852

MEANS FOR MARKETING

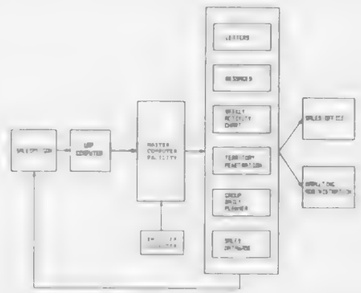
Nathan C. Rosen, Mystic, Conn., assignor to Combined Information Technologies, Inc., Mystic, Conn.

Continuation of Ser. No. 825,528, Feb. 3, 1986, abandoned. This application Jun. 30, 1988, Ser. No. 213,678

Int. Cl.[4] G06F *15/21*

U.S. Cl. 364—401 **2 Claims**

1. A mechanism for a marketing system comprising portable means for recording data of a visit made by a salesman of an employer on a customer, means for transmitting data of said visit from said portable means to a master processing means, and means responsive to said master processing means to prepare a letter to the customer acknowledging the visit, said master processing means comprising means for periodically automatically preparing a planning chart showing the location where customers are to be visited, said master processing means further comprising means for periodically preparing a customer call activity chart showing the visits a salesman has made, and a territory penetration chart showing the number of



visits made in a territory, means for sending said acknowledgment letter on the letterhead of said employer, said responsive means having a mechanism for receiving information and data from an employer's computer means concerning the employer's stationery logo and means for automatically directing reproduction of the logo on the acknowledgment letter.

4,853,853

ELECETRONIC CASH REGISTER

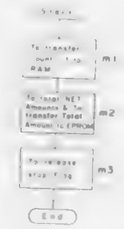
Sigeyuki Yamamura, Tenri, and Yasuhide Nakamura, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 795,904, Nov. 7, 1985, abandoned. This application Apr. 18, 1988, Ser. No. 185,282

Claims priority, application Japan, Nov. 7, 1984, 59-168831 [U]; Nov. 9, 1984, 59-170843[U]

Int. Cl.[4] G06F *15/21*

U.S. Cl. 364—405 **4 Claims**



1. An electronic cash register comprising

a volatile memory including means for the storage of the total amount of sales from the first day of a period through the i-th day of the period, to thereby give a storage of the gross amount of sales for this period,

a non-volatile memory including means for the storage of said total amount of sales for the first day of the period and for the storage of the total amount of sales for each day until the i-th day,

means for correcting said gross amount of sales stored in said volatile memory to coincide with a summation of the total amounts of daily sales stored in said non-volatile memory if these amounts do not coincide upon comparing said gross amount and said summation, and

means for displaying data stored in said volatile memory and data stored in said non-volatile memory.

4,853,854

HUMAN BEHAVIOR MODIFICATION WHICH ESTABLISHES AND GENERATES A USER ADAPTIVE WITHDRAWAL SCHEDULE

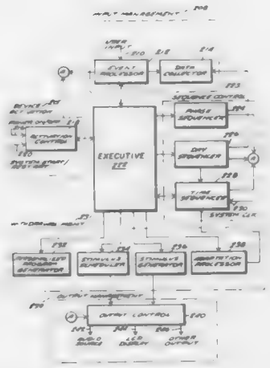
Albert Behar; Orna Behar, both of Reston; Lee W. Frederiksen, McLean, all of Va.; Donald A. Howard-Link, Columbia, Md., and Catherine Timmerman, Washington, D.C., assignors to Health Innovations, Inc., Reston, Va.

Filed Dec. 26, 1985, Ser. No. 813,401

Int. Cl.[4] A24F *47/00;* **G04G** *13/02*

U.S. Cl. 364—413.01 **31 Claims**





1. A smoking reduction method for scheduling time intervals between active inducement of user smoking events so as to gradually reduce a user's smoking habit, said method comprising:

tracking errant smoking event occurrences of the user with respect to said scheduled time intervals;

establishing and generating a user adaptive withdrawal schedule which schedules and displays the time intervals between permitted smoking events over a plurality of days and in response to said errant smoking event occurrences; and

visually indicating to the user the number of days left to go in said schedule.

17. A smoking reduction method for scheduling time intervals between user smoking events so as to gradually reduce a user's smoking habit, said method comprising:

generating an event signal representing occurrence of an actual user smoking event;

generating a personalized program of future time intervals between said smoking events including a programmed schedule of future smoking event occurrence times;

signalling a user at scheduled future smoking event occurrence times; and

temporarily suppressing further changes in the time intervals between future scheduled smoking events responsive to a comparison of the timing of actual smoking events and scheduled smoking events over a period of time.

19. A smoking reduction method for scheduling time intervals between user smoking events so as to gradually reduce a user's smoking habit, said method comprising:

generating an event signal representing occurrence of an actual user smoking event;

generating a personalized daily program of future timing intervals between said smoking events including a programmed daily schedule of future smoking event occurrence times;

deducing a user's probable personal daily waking and sleeping pattern and using such daily pattern to vary the daily schedule of future smoking event occurrence times as a function of the relative time within such waking and sleeping pattern;

signaling a user at scheduled future smoking event occurrence times; and

including use in said deducing step of an on/off switch activated by the user in correspondence with the user's waking/sleeping pattern.

20. A smoking reduction method for scheduling time intervals between user smoking events so as to gradually reduce a user's smoking habit, said method comprising:

generating an event signal representing occurrence of an actual user smoking event;

generating a personalized daily program of future timing intervals between said smoking events including a programmed daily schedule of future smoking event occurrence times;

deducing a user's probable personal daily waking and sleeping pattern and using such daily pattern to vary the daily schedule of future smoking event occurrence times as a function of the relative time within such waking and sleeping pattern; and

signaling a user at scheduled future smoking event occurrence times;

wherein said deducing step is responsive to the occurrence of time periods during which no event signals are generated.

31. Apparatus for actively stimulating human behavior modification, said apparatus comprising:

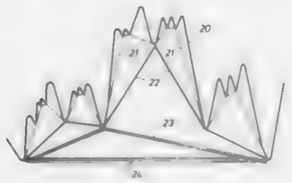
event sensor means for generating an event signal representing the occurrence of a discrete event associated with a predetermined pattern of habitual human behavior;

modification programming means connected to receive said event signals over a first time span during which the habitual behavior naturally occurs and to responsively generate a personalized program for modification of said habitual behavior including a programmed schedule of future occurrence times for actively prompting said events to occur over a second time span; and

output means connected to actively signal a human user to engage in another occurrence of said discrete event by outputting a humanly sensible stimulus at said scheduled future occurrence times, which stimulus is capable of interrupting the human user activity to actively stimulate such further occurrence even though the apparatus may be out of the user's sight;

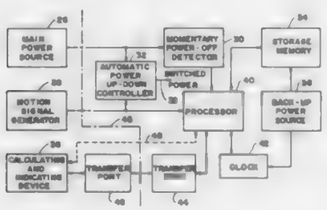
wherein said predetermined pattern of human behavior is a time sequence of cigarette smoking events and wherein said modification programming means monitors the existing pattern of cigarette smoking events over said first time span comprising a first plurality of days and then schedules a graduated reduction in the frequency of scheduled future cigarette smoking events over a subsequent second time span comprising a second plurality of days, the elapsed time between scheduled future events increasing according to a prescribed first withdrawal curve from day-to-day and increasing in accordance with a second withdrawal curve within each day of the second time span.

4,853,855
DIPMETER PROCESSING TECHNIQUE
Mark G. Kerzner, Houston, Tex., assignor to Halliburton Logging Services Inc., Houston, Tex.
Filed Jun. 18, 1987, Ser. No. 63,608
Int. Cl.[4] G01V *3/18*
U.S. Cl. 364—422 13 Claims



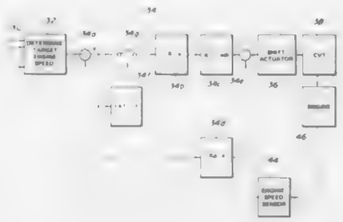
1. A method of correlating a pair of dipmeter curves comprising the steps of:
(a) defining a segmentation tree for one of a pair of dipmeter curves;
(b) converting segmentation tree into an event tree by deleting curve events falling outside an event criteria;
(c) determining correlation coefficients between the pair of curves using said event trees;
(d) optimizing the correlation coefficient between the curves to obtain correlation; and
(e) determining formation dip from the correlated curves.

4,853,856
VEHICLE MOTION LOGGER
John R. Hanway, Fairmont, W. Va., assignor to United Engineering Corporation, Fairmont, W. Va.
Filed Dec. 2, 1985, Ser. No. 803,531
Int. Cl.[4] G06F *13/00*; G08B *23/00*
U.S. Cl. 364—424.01 19 Claims



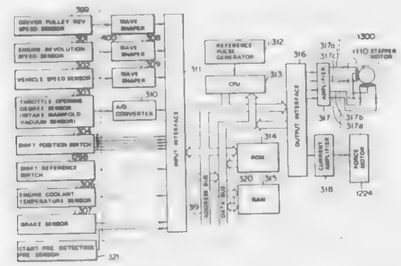
1. Vehicle motion logging apparatus comprising:
means for acquiring electrical information responsive to the motion of the vehicle;
means for classifying said information into a plurality of groups of data, with each group containing data about the motion of the vehicle which occurred between at least two stops of the vehicle;
memory means for storing data for later retrieval;
means for placing a plurality of said classified data groups into said memory means; and
means for merging together groups of classified data contained in said memory means, with said merging placing a group of data corresponding to a particular stop into the data of another group which corresponds to a stop of duration which is longer than said particular stop;
said merging of data dividing the memory means into data groups corresponding to the longest stops of the vehicle.

4,853,857
RATIO CONTROL FOR CONTINUOUSLY VARIABLE TRANSMISSION
Katsunori Oshiage, Yokohama, and Haruyoshi Kumura, Kamakura, both of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan
Filed Jun. 24, 1987, Ser. No. 66,048
Claims priority, application Japan, Jul. 1, 1986, 61-152697
Int. Cl.[4] B60K *41/18*
U.S. Cl. 364—424.1 11 Claims



1. A ratio control system for a continuously variable transmission for a motor vehicle having an engine which the continuously variable transmission is drivingly connected to, the continuously variable transmission having a shift actuator and being shiftable to a reduction ratio corresponding to an operating position of the shift actuator, comprising:
means for generating a target value indicative signal indicative of a target value of a predetermined variable which varies with the reduction ratio of the continuously variable transmission;
means for measuring an actual value of said predetermined variable and generating an actual value indicative signal indicative of said actual value measured;
means for calculating a difference between said target value indicative signal and said actual value indicative signal and generating an error indicative signal indicative of said difference calculated;
means for integrating said error indicative signal with respect to time to determine an integral control factor and generating an integral control factor indicative signal indicative of the integral control factor;
means, responsive to said error indicative signal, for generating a proportional control factor indicative signal which is proportional to said error indicative signal;
means for generating a command signal in response to said integral control factor indicative signal and said proportional control factor indicative signal, said command signal having a first component variable with said integral control factor indicative signal and having a second component variable with said proportional control factor indicative signal and controlling the shift actuator in response to said command signal; and
means responsive to said error indicative signal for restricting said first component of said command signal from varying with said integral control factor indicative signal after an absolute value of said error indicative signal has exceeded a predetermined value such that said first component of said command signal is held at a non-zero constant after said absolute value has exceeded said predetermined value.

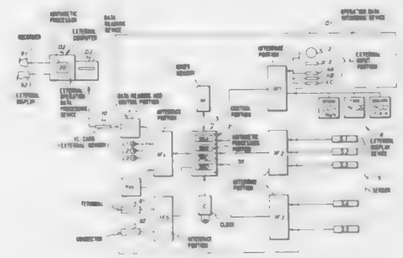
4,853,858
CONTROL FOR CONTINUOUSLY VARIABLE TRANSMISSION
Haruyoshi Kumura, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Feb. 12, 1987, Ser. No. 13,932
Claims priority, application Japan, Feb. 13, 1986, 61-27937; Feb. 18, 1986, 61-32022
Int. Cl.[4] G06F *15/20*; B60K *41/12*
U.S. Cl. 364—424.1 15 Claims



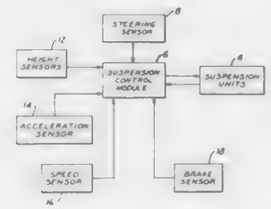
1. A control for a continuously variable transmission of a vehicle, wherein a shift in reduction ratio in the transmission is controlled by a shift actuator, the control comprising:
means for detecting a vehicle speed of the vehicle and generating a vehicle speed indicative signal;
means for determining a target value of a predetermined variable indicative of the reduction ratio in the continuously variable transmission;
means for detecting an actual value of the predetermined reduction ratio indicative variable;
means for determining a feed-forward control value of the shift actuator in response to at least said vehicle speed indicative signal;
means for calculating an error between said target value determined and said actual value detected, and for generating said calculated error as an error indicative signal when said calculated error falls in a first predetermined range which is defined by a first predetermined limit value and a second predetermined limit value, said error calculating means generating one of said first and second limit values as said error indicative signal when said calculated error fails to fall in said first predetermined range;
means for determining a feed-back control value based on said error indicative signal, said feed-back control value including a proportional term variable with said error indicative signal; and
means for controlling the shift actuator in response to a sum of said feed-forward and feed-back control values.

4,853,859
OPERATION DATA RECORDING SYSTEM
Izuru Moritz; Shoji Tozawa; Tsuneo Hisatake, and Tadasi Atoso, all of Tokyo, Japan, assignors to Shin Caterpillar Mitsubishi Ltd., Tokyo, Japan
Continuation of Ser. No. 820,982, Jan. 21, 1986, abandoned. This application Nov. 8, 1988, Ser. No. 270,479
Claims priority, application Japan, Jan. 24, 1985, 60-11529; Jan. 24, 1985, 60-11528; Jan. 24, 1985, 60-11527
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—424.04 10 Claims

1. An operation data recording system for apparatus having an engine and a working machine on a vehicle, comprising detecting means on board the apparatus comprising a plurality of sensors comprising a first sensor for detecting engine operation conditions, second sensor for detecting vehicle operation conditions and a third sensor for detecting working machine operation conditions,
engine operation judging circuit means connected with said first sensor, vehicle operation circuit means connected with said second sensor, and working condition judging circuit means connected with said third sensor,
idling operation judging means connected with said engine operation judging circuit means, said vehicle operation circuit means and said working condition judging means for indicating idling operation when said first sensor indicates that the engine is operating, said second sensor indicates that the vehicle is not operating and said third sensor indicates non-transportation, judging means connected with said vehicle operation circuit means and with said working condition judging circuit means for indicating transportation operation when said second sensor indicates vehicle operation and said third sensor indicates non-operation of said working machine.



4,853,860
CONTROL SYSTEM FOR ADJUSTABLE AUTOMOTIVE SUSPENSION UNIT
Kurt F. Achenbach, Milford, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Nov. 18, 1987, Ser. No. 122,313
Int. Cl.[4] B60G *17/00*
U.S. Cl. 364—424.05 21 Claims



1. A control system for an adjustable automotive vehicle suspension unit comprising:
first means for calculating the instantaneous angular rate of a steering handwheel associated with said automotive vehicle;
second means for comparing said calculated angular rate with an initiation value and for generating a first signal whenever said angular rate exceeds said initiation value;
third means responsive to said first signal for determining, during a predetermined time period after said first signal is generated, the excursion angle through which said handwheel is moved;
fourth means for comparing said excursion angle to critical and threshold reference values and for generating a second signal when said excursion angle exceeds either said critical reference value at any time during said predeter-

mined time period or said threshold reference value at the conclusion of said predetermined time period; and

fifth means responsive to said second signal for adjusting said adjustable suspension unit.

4,853,861

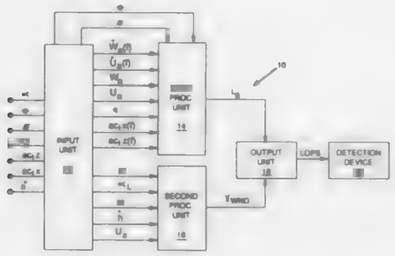
WINDSHEAR MEASUREMENT SYSTEM

Douglas W. Ford, Hillsboro, Oreg.; Walter A. Johnson, San Pedro, Calif., and Shahram Daneshmandi, Portland, Oreg., assignors to Flight Dynamics, Inc., Portland, Oreg.

Filed Sep. 1, 1987, Ser. No. 92,088

Int. Cl.[4] G01P *5/00, 15/00*

U.S. Cl. 364—424.06 **22 Claims**



5. An avionics system for detecting windshear and related downdraft conditions encountered by an aircraft that is characterized in flight by a downward acceleration, a forward acceleration, and a pitch rate, comprising:

means for generating a downward windshear signal corresponding to a difference between an aerodynamically derived downward acceleration and an inertially derived downward acceleration of said aircraft;

means for generating a forward windshear signal corresponding to a difference between an aerodynamically derived forward acceleration and an inertially derived forward acceleration of said aircraft;

means for correcting said downward and forward windshear signals to account for downward and forward pitch rate induced coriolis accelerations; and

means for generating from said corrected downward and forward windshear signals a longitudinal windshear signal corresponding to windshear along a heading axis of said aircraft.

4,853,862

METHOD AND APPARATUS FOR CONTROLLING AIR-FUEL RATIO IN AN INTERNAL COMBUSTION ENGINE BY CORRECTIVE FEEDBACK CONTROL

Takashi Shiraishi, Katsuta, and Taiji Hasegawa, Nakaminato, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 22, 1986, Ser. No. 820,739

Claims priority, application Japan, Jan. 23, 1985, 60-9061

Int. Cl.[4] F02D *41/14, 41/26*; F02M *51/00*

U.S. Cl. 364—431.05 **9 Claims**

1. An air-fuel ratio control system for an engine comprising:

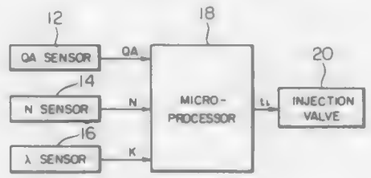
exhaust gas sensor means for detecting a state of exhaust gas so as to produce an output signal indicating a state of an air-fuel ratio of the engine;

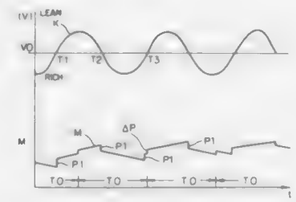
a processor unit for calculating a control value on the basis of the state of the exhaust gas by:

(a) comparing said output signal of said exhaust gas sensor with a predetermined value so as to produce a comparison result;

(b) generating in response to said comparison result a control signal having a first proportional correction component at a first period and a predetermined integral slope; and

(c) correcting said control signal by periodically adding a second proportional correction component thereto at a second period which is longer than said first period; and





means for controlling said air-fuel ratio on the basis of said corrected control signal.

4,853,863

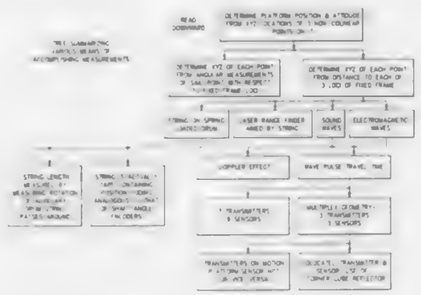
DEVICE TO MEASURE THE RELATIVE POSITION AND ATTITUDE OF TWO BODIES

Edwin Cohen, Five Crestmont Rd., Binghamton, N.Y. 13905, and Brian J. Woycechowsky, 2633 Purdue Dr., Vestal, N.Y. 13850

Filed Apr. 17, 1987, Ser. No. 39,172

Int. Cl.[4] G06F *15/31*

U.S. Cl. 364—460 **30 Claims**



1. A method of determining the position and attitude of a first body, with respect to a second body, comprising:

(a) establishing three reference points which are not colinear on the first body;

(b) independently establishing three reference points which are not colinear on the second body;

(c) measuring at least six geometric parameters describing the relationship between reference points on said first body and reference points on the second body; and

(d) computing from said geometric parameters the position and attitude of said first body with respect to said second body.

4,853,864

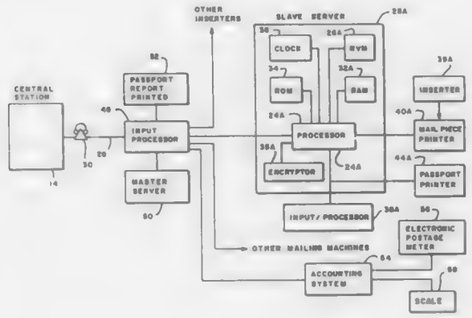
MAILING SYSTEMS HAVING POSTAL FUNDS MANAGEMENT

William G. Hart, Stamford; Michelle S. Breault, Fairfield; Ronald P. Sansone, Weston; Michael P. Taylor, Norwalk, and Terrence M. Doeberl, West Redding, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 813,445, Dec. 26, 1985. This application Sep. 5, 1986, Ser. No. 904,526

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—464.02 **14 Claims**



1. A system for accounting for postage funds comprising:

means at a central station for processing information;

a plurality of means remote from said central station for respectively securely accounting for postage funds crediting transactions, each of said accounting means accounting for postage funds used in processing respective batches of mail, each of said accounting means including means for debiting postage funds used from postage funds credited for reducing postage funds credited;

means for establishing communication between said information processing means and each of said plurality of secure accounting means to communicate accounting information including information concerning postage funds used to said information processing means for accumulating mail processing information thereat, and

means for automatically processing postage funds crediting transactions for at least one of said secure accounting means when postage funds credited therein are reduced to a predetermined minimum.

4,853,865

MAILING SYSTEM WITH POSTAGE VALUE PRINTING CAPABILITY

Ronald P. Sansone, Weston, and Guy L. Fougere, Easton, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Division of Ser. No. 813,459, Dec. 26, 1985, Pat. No. 4,760,532. This application Apr. 15, 1988, Ser. No. 182,270

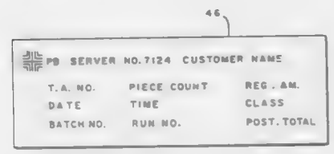
Int. Cl.[4] G06F *15/20*; G06G *7/48*; G06K *19/06*

U.S. Cl. 364—464.02 **14 Claims**

1. In a postage device of the type including a descending register for storing postage value remaining to be printed, the improvement comprising:

printing means, and

processor means in communication with said printing means for causing said printing means to print the value of postage value stored by said descending register and available to be dispensed.



4,853,866

METHOD AND APPARATUS FOR MATCHING PANELS TO BE CUT FROM PATTERNED FABRICS

Mario Andrada Galan; Antonio Romero Lledo, and Vincente Calzado Requena, all of Madrid, Spain, assignors to Investronica S.A., Madrid, Spain

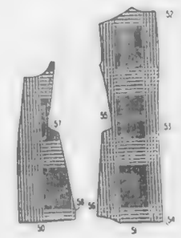
Filed Mar. 19, 1987, Ser. No. 27,817

Claims priority, application Spain, Apr. 2, 1986, 553.646

Int. Cl.[4] G06F *15/00*

U.S. Cl. 364—470 **2 Claims**





2. A matching apparatus for the automatic cutting of patterned fabrics by an integrated marking and cutting system comprising:

a means for defining matching points in each of a plurality of patterns of panels to be cut, a means for digitizing the matching points, and a means for recording a set of coordinates and also a respective identification code for each of the digitized points in a memory of the system;

a means for defining matching relationships for the matching points which unequivocally fix the position which the design must be in at each of the matching points, and a means for digitizing these relationships and recording them in said memory of said integrated marking and cutting system;

a means for establishing separation margins between said

panels, either automatically or interactively, on the basis of said matching relationships which have been defined;

a means for initially assigning a position to each of said panels to be cut on a spread piece of the patterned fabric and for distributing said panels to the assigned positions;

a means for automatically positioning a vision sensor device over the spread patterned fabric which is to be cut, at the positions of said matching points which have been defined for each one of the said panels which have been distributed;

a means for determining a relative design position with respect to a reference position at each of said matching point positions at which said vision sensor is positioned; and

a means for obtaining a position correction for each panel with respect to the initially assigned position based on said relative design position and said defined matching relationships, wherein all of said panels which are to be cut are matched prior to proceeding with their cutting operation.

4,853,867

SIMULTANEOUS FOUR-AXIS LATHE MACHINING TIME BAR-GRAPH DISPLAY METHOD

Teruyuki Matsumura, Tokyo, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

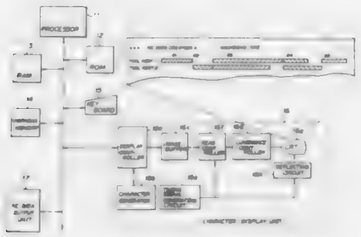
PCT No. PCT/JP87/00100, § 371 Date Oct. 20, 1987, § 102(e) Date Oct. 20, 1987, PCT Pub. No. WO87/04961, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 17, 1987, Ser. No. 112,714

Claims priority, application Japan, Feb. 25, 1986, 61-039809

Int. Cl.[4] G06F *15/46*; G05B *19/18*

U.S. Cl. 364—474.22 **7 Claims**



5. A method of displaying machining times of synchronized processes in a machine tool having first and second tool rests controlled by first and second NC programs, respectively, comprising the steps of:

(a) determining, for each synchronized process, the one of the first and second tool rests having the longer machining time;

(b) obtaining a total machining time by adding the longer machining time for each synchronized process as determined in said step (a), to obtain a total machining time;

(c) calculating a machining time per character by dividing the total machining time determined in said step (b) by a number of characters used for a bar graph display;

(d) dividing the machining times of each of the synchronized processes for each of the first and second tool rests by the machining time per character calculated in said step (c) to determine a number of characters necessary for displaying the machining times of each of the synchronized processes; and

(e) displaying the machining times of the synchronized processes for each of the first and second tool rests in the form of a bar graph based on the number of characters for each synchronized process determined in said step (d).

4,853,868

METHOD FOR SIMULATING LAYUP OF PREPREG MATERIALS FOR THREE-DIMENSIONAL MOLDING OF COMPOSITE PARTS

Steven J. Medwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 23, 1987, Ser. No. 113,025

Int. Cl.[4] G06F *15/46*; G05B *19/00*

U.S. Cl. 364—476 **6 Claims**



1. A computer-aided method for simulating the initial thicknesses needed for initial area units of a fiber reinforced resin sheet material needed to provide a predetermined final thickness for said initial unit areas after said fiber reinforced resin sheet material and said initial unit areas have been stretched into a three-dimensional shape in a compression mold having male and female portions, said method comprising:

stretching a thin elastic sheet material over the male portions of the mold, said elastic sheet material having indicia thereon dividing said elastic material into said initial unit areas;

compressing the stretched thin elastic material with a transparent replica of the female portion of said mold;

determining the final unit areas of each of said initial unit areas after the thin elastic sheet has been stretched and compressed;

averaging said final unit areas in a plurality of regions of the thin elastic sheet;

determining the initial unit thicknesses needed for the initial unit areas of said fiber reinforced resin sheet material according to the following relationship

$$T_I = A_F / A_I \times T_F$$

wherein

T_I is the initial thickness needed at each location of the sheet material before compression molding;

A_F is the average of the unit areas within a region on said thin elastic sheet material after it has been stretched and compressed;

A_I is the area of the initial unit areas on the thin elastic sheet material before it has been stretched; and

T_F is the predetermined final thickness for said initial unit areas after said fiber reinforced resin sheet material has been stretched into said three-dimensional shape; and

generating a graphic display of said fiber reinforced resin sheet material to be used with said compression mold for molding said three-dimensional shape, said display incorporating the initial thickness needed at initial unit areas on said fiber reinforced resin sheet material to mold said three-dimensional shape.

4,853,869

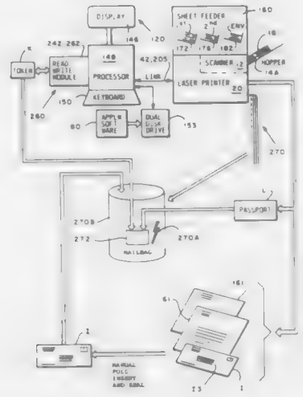
SYSTEM AND METHOD FOR PROCESSING A LETTER FOR BULK MAILING

Robert T. Durst, Jr., Monroe; Guy L. Fougere, Easton; Kevin D. Hunter, Stratford, and Alfred C. Schmidt, Wilton, all of Conn., assignors to Pitney Bowes, Inc., Stamford, Conn.

Filed Mar. 13, 1987, Ser. No. 25,545

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—478 **32 Claims**



1. A system for processing a letter for bulk mailing, said system comprising:

a. printing means;

b. means for supplying stationery items;

c. computer means, said computer means including means for receiving letter data corresponding to information for at least one letter, said information for said at least one letter including a plurality of parts, said computer means including means for formatting said letter data for said at least one letter, said formatted letter data including a plurality of parts, said information parts for said at least one letter corresponding one-for-one with said data parts, said computer means including means for causing said supplying means to supply at least one stationery item to said printing means, said computer means including means for causing said printing means to print at least one information part on said at least one stationery item, said computer means including means for storing a predetermined code, said computer means including means for causing said printing means to print said code on said at least one stationery item;

d. means for receiving said at least one stationery item, said receiving means including a mailpouch, said mailpouch including a mark thereon identifying said mailpouch as a bulk mail mailpouch; and

e. said computer means including means for causing said printing means to print a postage value on said at least one stationery item.

4,853,870

ELECTRON BEAM EXPOSURE SYSTEM

Nobuyuki Yasutake; Jun-ichi Kai, both of Tokyo; Hiroshi Yasuda, Yokohama, and Kenichi Kawashima, Segamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 27, 1987, Ser. No. 54,782

Claims priority, application Japan, May 27, 1986, 61-120235

Int. Cl.[4] G06F *15/62*

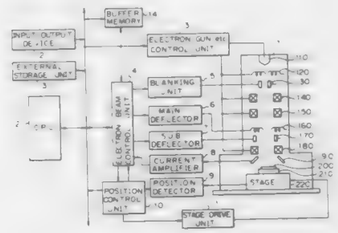
U.S. Cl. 364—490 **9 Claims**

1. An electron beam exposure system controlled by a computer, comprising:

electron optics means for generating electron beams and for irradiating said electron beams to a sample on a stage through electron lens means, main deflection means, and sub deflection electrode means, to form predetermined circuit patterns on said sample;

position control means for controlling a drive of said stage based on a stage position coordinate designated by said computer, detecting an actual stage position coordinate, and calculating an error value between said designated stage position coordinate and said actual stage position coordinate, said error value being divided into two components of an upper bits portion having a relatively large error value and a lower bits portion having a relatively small error value, said upper bits portion being input to a main deflection means for correcting a direction of said electron beams to a relatively large extent, and said lower bits portion being input to a sub deflection means for correcting a direction of said electron beams to a relatively small extent; and

a deflection control means for controlling a direction of said electron beams based on main pattern data corrected by said upper bits portion and sub pattern data corrected by said lower bits portion, and based on selected main and sub wait times determined by an exposure and non-exposure timing.



4,853,871

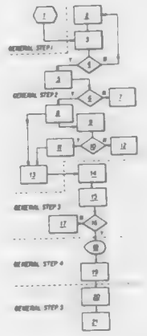
COMPUTER-BASED METHOD FOR DESIGNING STABLIZED PROTEINS

Michael W. Pantoliano, Germantown, and Robert C. Ladner, Ijamsville, both of Md., assignors to Genex Corporation, Gaithersburg, Md.

Filed Apr. 6, 1987, Ser. No. 34,966

Int. Cl.[4] G06F *15/46*; G01N *33/00*

U.S. Cl. 364—496 **19 Claims**



1. A computer based method for evaluating a protein's structure to determine whether said protein contains at least two target amino acid residues, replacement of at least one of which with a cysteine residue would be sufficient to permit

formation of at least one potentially protein-stabilizing disulfide bond; said method comprising the steps:

(1) examining each selected pair of amino acid residues in said protein to determine if they contain certain atoms whose relative three-dimensional positions possess a geometric conformation similar to a geometric conformation possessed by atoms of a disulfide bond,

(2) examining any pair of amino acids found to contain said certain atoms identified in step (1) to determine whether said disulfide bond can be accommodated without creating unacceptable steric hindrance,

(3) permitting an expert operator (i) to view any possible disulfide bond which can be accommodated without creating unacceptable steric hindrance, and (ii) to rank said viewed possible disulfide bond from most likely to stabilize an engineered protein to least likely to stabilize said protein, and

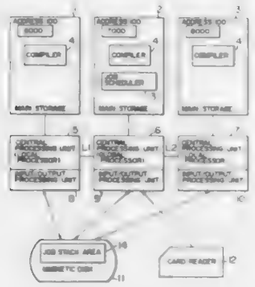
(4) evaluating said ranked possible disulfide bond according to expert rule criterion.

4,853,872

PROGRAM EXECUTION METHOD IN A SYSTEM HAVING PLURAL COMPUTERS

Kenji Shimoi, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 2, 1985, Ser. No. 782,901
Claims priority, application Japan, Oct. 3, 1984, 59-206233
Int. Cl.⁴ G06F *15/00*
U.S. Cl. 364—300 **5 Claims**



1. A method for executing a program in a computer system including a plurality of computers which operate under different loads at different times, said computers being capable of executing a plurality of first common object codes, and at least a first one of said computers being capable of executing second object codes which are unexecutable in at least one of the other computers, wherein the method comprises the steps of:

(a) compiling, by means of one of the computers, a source program into an object program comprised of:

(i) a first object program section comprised of said first common object codes and corresponding to a section of the source program which is not executable by said second object codes in said first one of said computers;

(ii) at least one group of second object program sections respectively to be executed by respective computers and corresponding to a same section of said source program which is executable by said second object codes by said first one of said computers, one of said second object program sections to be executed by said first computer including said second object codes for said first one of said computers;

(iii) at least one third object program section which is comprised of said first object codes, and detects, at an execution of said object program by the computer system, which one of said computers is selected so as to execute said object program and selects one of said second object program sections corresponding to said detected computer;

(b) selecting one of said computers which is to execute the object program, by means of execution of a scheduling program preloaded in a predetermined one of said computers; and

(c) executing said object program by said selected computer, whereby said first and third object program sections and one of said second object program sections corresponding to said selected computer are executed;

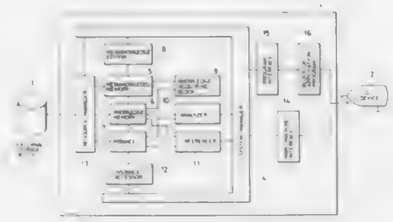
wherein said selection of said selected computer for executing said object program is effected such that one of said computers which has a load lower than any other of said computers in the system is selected.

4,853,873

KNOWLEDGE INFORMATION PROCESSING SYSTEM AND METHOD THEREOF

Hiroshi Tsuji, Kawasaki; Chizuko Yasunobu, Yokohama, and Tetsuya Masuishi, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 8, 1987, Ser. No. 59,609
Claims priority, application Japan, Jun. 11, 1986, 61-135473
Int. Cl.⁴ G06F *15/24*
U.S. Cl. 364—513 **15 Claims**



1. In an information processing system which has processing means, memory means, and input/output means, a knowledge information processing system comprising:

memory means for storing meta-knowledge including a knowledge structure information of an alterable part and unalterable part necessary for acquiring knowledge; and

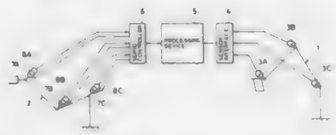
a processing means for acquiring new knowledge utilizing said meta-knowledge stored in said memory means.

4,853,874

MASTER-SLAVE MANIPULATORS WITH SCALING

Taro Iwamoto, Mito; Tatsu Aoki; Kichio Nakajima, both of Ibaraki, and Hiroshi Yamamoto, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 20, 1987, Ser. No. 123,276
Claims priority, application Japan, Dec. 12, 1986, 61-294832
Int. Cl.⁴ B25J *3/00*
U.S. Cl. 364—513 **19 Claims**



1. In a manipulator equipped with a master arm having a plurality of links connected to one another by joints to provide a terminal end which is moveable within a reference coordinate system and a slave arm having a plurality of links connected to one another by joints, a controlling apparatus for controlling said slave arm to follow the motion of said master arm comprising:

position sensors each for sensing a displacement of each of said joints of said master arm and for providing displacement data indicative thereof;

processing means for calculating the position of the terminal end of said master arm in said reference coordinate system on the basis of said displacement data, for executing expansion or reduction scale conversion of the result of said calculation and for determining a reference displacement value for each of said joints of said slave arm on the basis of a scale-converted result of calculation; and

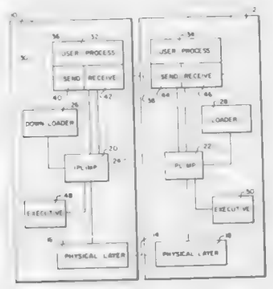
servo controller means for controlling each of said joints of said slave arm in accordance with a reference displacement value from said processing means.

4,853,875

IMAGE-CAPABLE INTERPROCESSOR LINK COMMUNICATIONS PROTOCOL

Robert W. Brown, Batavia, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 19, 1988, Ser. No. 145,842
Int. Cl.⁴ G06F *15/16*
U.S. Cl. 364—514 **7 Claims**



1. In an image-capable communications system having first and second processor connected by an interprocessor link, said first and second processors including a communication module, a plurality of higher level service modules, and one or more lower level modules connectable to said communication module and to a physical communication channel, an image communication protocol method for transferring image data from one of said processors (sender) to the other (receiver), comprising the steps of:

(a) prior to transferring image data, establishing a line of communication by executing a three-way handshake to exchange status information between the sender and receiver;

(b) when transferring image data initiated by the sender processor, the sender communication module executing the steps of,

(1.) receiving from a higher level service module a user specified buffer address, buffer size and time out period for completing the transfer of date,

(2.) initiating a timer for a period equal to one-half the user specified time out period;

(3.) if a ready indication is received from a lower level module prior to time out of the timer, transmitting the data in the specified buffer over the link;

(4.) if the timer times out prior to receipt of a ready indication, or prior to completion of the transmission of the data in the specified buffer address, initiating a timer for the remainder of the user specified time out period, and sending a ready to send message to the receiver; if a clear to send message is received from the receiver, waiting for a ready indication, and restarting data transmission when the ready indication is received,

(5.) if the entire user specified time out period expires prior to completing the transmission, returning a time out error signal to a higher level service module in the sender processor;

(c) when transferring image data initiated by the receiver processor, the receiver communication module executing the steps of,

(1.) receiving a user specified buffer address, buffer size and time out period for completing the transfer of data from higher level service module,

(2.) initiating a timer for a period equal to one-half the user specified time out period,

(3.) indicating readiness to receive data, and attempting to fill the user specified buffer with data from the sender,

(4.) if the timer times out before the specified buffer is filled, starting a timer for the remaining user timeout period and sending a ready to receive command, after receiving a clear to receive command from the sender, restarting the attempt to fill the buffer,

(5.) if the entire user specified time out period expires without obtaining a clear to receive command and completing the data transfer, returning a time out error to a higher leel service module in the receiver processor,

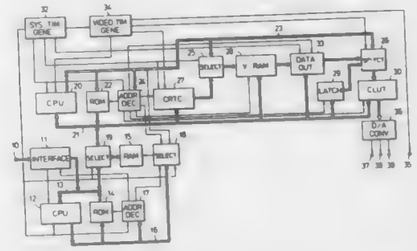
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4,853,876

PICTURE PRODUCING APPARATUS

Chitoshi Hibino, Yamato; Atsushi Arimoto, Isehara, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 23, 1986, Ser. No. 867,235
Claims priority, application Japan, May 28, 1985, 60-115045
Int. Cl.⁴ G06F *3/14*
U.S. Cl. 64—518 **10 Claims**



1. A picture producing apparatus comprising:

a first central processing unit for receiving an information which is transmitted and comprises a series of packs of information, for arranging each pack into a predetermined format, and for performing an error detection and an error correction with respect to each pack to obtain a picture information and writing the picture information into a first memory;

a second central processing unit for decoding control data of the picture information stored in said first memory and writing picture data of the picture information into a second memory;

picture data read-out means for successively reading out the picture data stored in said second memory;

timing generator means for producing clock signals for said first and second central processing units and said picture data read-out means, said clock signals being representative of first and second operation time periods which are mutually exclusive;

selector means responsive to the clock signal for coupling said first central processing unit to said first memory and

coupling said picture data read-out means to said second memory exclusively in the first operation time period and for coupling said second central processing unit to said first and second memories exclusively in the second operation time period so that said second central processing unit performs the decoding and writing with respect to a first pack of said series of pack while said first central processing unit performs the error detection and the error correction with respect to a second pack following said first pack and receives and arranges a third pack following said second pack;

color converting means for converting the picture data read out by said picture data read-out menas into color data; and

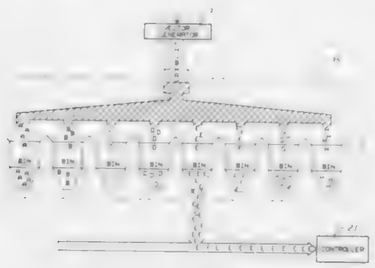
digital-to-analog converter means for converting the color data into an analog video signal.

4,853,877

APPARATUS AND METHOD FOR EFFICIENT PLOTTING

Anthony D. Parkhurst, Oceanside, and Thomas J. Halpeany, Escondido, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 854,217, Apr. 21, 1986, abandoned.
This application Nov. 1, 1988, Ser. No. 266,333
Int. Cl.[4] G05B *19/19*
U.S. Cl. 364—520 18 Claims



1. A plotter for plotting lines on a sheet in response to commands from a host processor indicating locations and attributes of the lines, the plotter comprising:

generation means, connectable to the host processor, for generating from the commands a string of instructions indicative of the lines to be plotted;

sorter means, coupled to the generation means, for sorting the instructions by line attribute into bins of a memory;

controller means, coupled to the memory, for selecting one selected bin at a time and for presenting instructions stored in the selected bin at an output;

plotting means, coupled to the controller means output for plotting on the sheet with a pen selected in response to the instructions; and

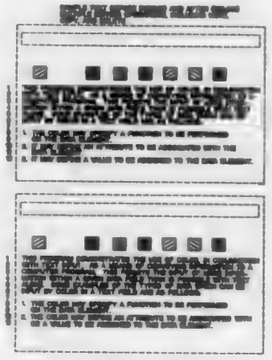
wherein the controller means and the plotting means operate concurrently with receipt of the commands from the host processor and with operation of the generation means and the sorter means so that the plotter is capable of plotting the lines concurrently with receiving the commands from the host processor.

4,853,878

COMPUTER INPUT BY COLOR CODING

Max R. Brown, Pleasanton, Calif., assignor to International Business Machines Corp., Armonk, N.Y.

Filed May 1, 1987, Ser. No. 45,054
Int. Cl.[4] G06F *3/023*
U.S. Cl. 364—521 10 Claims



1. A method for inputting data to a computer program comprising the steps of:

associating a different color with each of a plurality of data including operations, attributes or values to be input by a user to the computer program;

storing within a specific data field a color code corresponding to said color in a display memory and displaying the color;

in response to the user specifying a color corresponding to the data to be input to the computer program;

reading the color code stored in said specific data field of the display memory by said computer program; and

processing by the computer program the read color code as input data to the computer program.

4,853,879

AUTOMATED PAINT FILM CHARACTERIZATION SYSTEM

Robert J. Matzoll, Jr., 711 Kentucky St., Rochester Hills, and Deborah C. Pawlaczyk, 345 Terry St., Rochester, both of Mich. 48063

Filed Apr. 3, 1987, Ser. No. 33,656
Int. Cl.[4] G06F *15/46;* G01N *21/00*
U.S. Cl. 364—552 17 Claims

16. A system for characterizing and monitoring a painted surface, said system including:

a sensor head including four sensor units therein for measuring the characteristics of gloss, distinctness of image, film build and color respectively, and each operative to provide a signal corresponding to a particular one of said characteristics, said sensor head further including a display device operative to display the values of said characteristics, buffer means for storing the signals corresponding to said characteristics and transmit means operative to send said signals to downstream signal processing means;

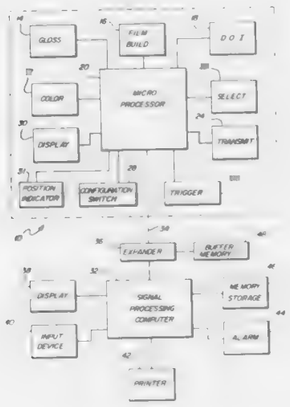
signal processing means including a computer, display device, input device and data storage means, said signal processing means operative to:

(a) receive the signal provided by the sensor head;

(b) analyze the signal to determine the values of gloss, distinctness of image, film build and color;

(c) compare at least one of said determined values with data from said storage means so as to assess the acceptability of the painted surface;

(d) store the result of the comparison in said storage means; and



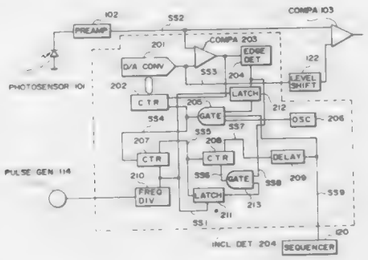
(e) provide an indication if the coated surface is not acceptable.

4,853,880

DEVICE FOR POSITIONING A SEMI-CONDUCTOR WAFER

Takahiro Akamatsu, Machida; Hiroshi Nakazato, Ohme; Takashi Matsumura, Yokohama, and Kenji Fukui, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1986, Ser. No. 898,222
Claims priority, application Japan, Aug. 23, 1985, 60-183972; Aug. 23, 1985, 60-183975; Oct. 22, 1985, 60-234506
Int. Cl.[4] G01B *11/00;* B65H *9/20*
U.S. Cl. 364—559 4 Claims



2. A device for positioning a wafer having a cut formed at a peripheral edge thereof, comprising:

means for rotating the wafer;

sensing means having a sensing region and being disposed so that portion of the edge of the wafer is positioned within said sensing region, said sensing means providing an output signal corresponding to the position of the edge of the wafer in said sensing region, said output signal varying with changes in position of the edge of the wafer in said sensing region of said sensing means due to the rotation of said wafer by said rotation means;

means for discriminating between first and second cuts formed on the peripheral edge of the wafer, the first cut being different from the second cut, said discriminating means including means for detecting the rate of change with respect to time of the variations in the output signal of said sensing means, said discriminating means further including means for comparing the detected rate of change with respect to time of the variations in the output signal of said sensing means with a predetermined reference for discriminating between the first cut and the second cut formed on the peripheral edge of the wafer;

means for binary-coding the output signal of said sensing means after the passage of at least one of the first and second cuts of the wafer through said sensing region of said sensing means is determined; and

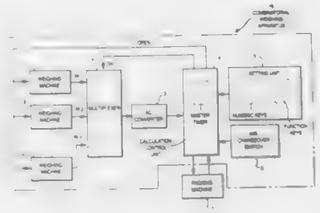
control means for controlling the rotational movement of the wafer on the basis of the binary-coded signal.

4,853,881

COMBINATORIAL WEIGHING SYSTEM

Seiji Yamada, Kyoto, Japan, assignor to Ishida Scales Mfg. Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 726,601, Apr. 23, 1985, abandoned.
This application Oct. 7, 1988, Ser. No. 256,170
Claims priority, application Japan, Apr. 25, 1984, 59-83484
Int. Cl.[4] G01G *13/02, 19/22*
U.S. Cl. 364—567 5 Claims



1. A combinatorial weighing system comprising:

a combinatorial weighing apparatus including:

a plurality of weighing machines for sensing the weight of articles supplied thereto and for producing weight data indicative of the sensed weights; and

a calculation control unit for performing a combinatorial calculation based on the weight data from the weighing machines and for causing weighing machines corresponding to an optimum combination to discharge their articles, said calculation control unit being capable of receiving a first signal or transmitting a second signal;

a packing machine positioned for packing the articles discharged from said combinatorial weighing apparatus; and

master/slave changeover means, connected to said calculation control unit, for selecting a slave mode when said combinatorial weighing apparatus is to be driven in response to the first signal from said packing machine and for selecting a master mode when said combinatorial weighing apparatus is to drive said packing machine by transmission of the second signal to said packaging machine, whereby said combinatorial weighing apparatus and said packing machine are each controlled in a master/slave relation.

4,853,882

SYSTEM AND METHOD FOR PROTECTING AGAINST REDUNDANT MAILINGS

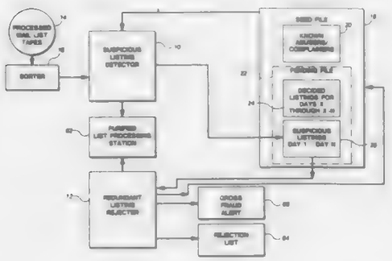
Robert Marshall, El Paso, Tex., assignor to A. C. Nielsen Company, Northbrook, Ill.

Filed Nov. 2, 1987, Ser. No. 115,696
Int. Cl.[4] G06F *15/21, 7/20*
U.S. Cl. 364—570 55 Claims

1. A system for purifying a mailing list to protect against redundant mailings, said mailing list having a plurality of listings comprising:

automated means for identifying suspicious listings in said

mailing list according to a first statistically significant event; and



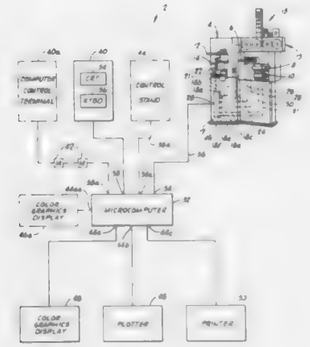
automated redundant listing identifying means for analyzing said suspicious listings according to a second statistically significant event to identify redundant mailings.

4,853,863

APPARATUS AND METHOD FOR USE IN SIMULATING OPERATION AND CONTROL OF A RAILWAY TRAIN

Stephen K. Nickles, 1223 Peck; Jim B. Surjaatmadja, 2309 N. West Club Rd.; John E. Haley, 5420 Day, and Lynn K. Wiesck, 4417 N. Odom Dr., all of Duncan, Okla. 73533

Filed Nov. 9, 1987, Ser. No. 118,841
Int. Cl.[4] G05B *17/02*; G05D *13/00*; G06F *13/00*
U.S. Cl. 364—578 6 Claims



1. An apparatus for use in simulating operation and control of a railway train, comprising:

a control station including:

a plurality of train operating controls, each for providing a respective signal related to the degree of operation thereof by a control station operator; and

a first computer connected to said plurality of train operating controls so that a plurality of signal transmission circuits, over which the respective signals from said train operating controls are communicable to said first computer, are defined;

display means for displaying alphanumeric data and graphical representations to depict the operation and control of a railway train to be simulated;

a second computer including an output connected to said display means; and

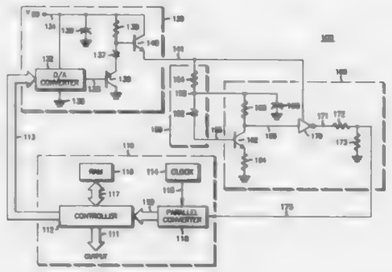
serial communication link means for connecting said first computer and said second computer so that a serial signal communication circuit, over which any of the respective signals communicable to said first computer are communicable to said second computer from said first computer, is defined between said first and second computers.

4,853,894

RANDOM NUMBER GENERATOR WITH DIGITAL FEEDBACK

Daniel P. Brown, Elmhurst; Carl M. Danielsen, Lake Zurich, and Ezzat A. Dabbish, Buffalo Grove, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 11, 1987, Ser. No. 95,088
Int. Cl.[4] G06V *1/00*; G06F *7/58*; H03B *29/00*
U.S. Cl. 364—602 25 Claims



1. A random number generator having a controlled degree of randomness comprising:

noise source means for producing an analog noise signal having a statistical distribution exhibiting a particular degree of randomness determined in response to an input control signal;

pulse shaping means for generating random binary data in response to said analog noise signal;

feedback means for monitoring said random binary data and for producing said input control signal in response to the difference between the degree of randomness of said binary data and that of a predetermined statistical distribution; and

control means for outputting said random binary data only when it is within prescribed limits of said degree of randomness of said predetermined statistical distribution.

4,853,885

METHOD OF COMPRESSING CHARACTER OR PICTORIAL IMAGE DATA USING CURVE APPROXIMATION

Satoshi Naoi, Tokyo; Akira Inoue, Kawaguchi; Katsuhiko Nishikawa, and Shigemi Nagata, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 21, 1987, Ser. No. 52,431
Claims priority, application Japan, May 23, 1986, 61-117485; May 23, 1986, 61-118920; Sep. 18, 1986, 61-220400; Apr. 14, 1987, 62-091805
Int. Cl.[4] G06F *15/353*
U.S. Cl. 364—718 11 Claims

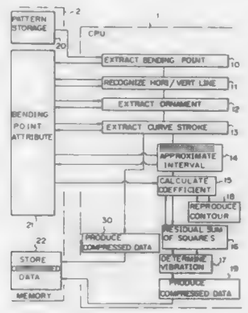
1. A method for compressing image data, representing an image containing at least one curve portion, by generating coded data defining an outline of the curved portion, the coded data being decodable to reproduce the image, said method comprising the steps of:

(a) extracting bending points of the outline from the image data, the bending points dividing the outline into segments;

(b) classifying the segments using a four-quadrant directional classification system, each segment having a single classification associated therewith;

(c) grouping each series of consecutive segments having identical classification into an arc; and

(d) calculating an approximate curve to represent the outline of the curved portion; using a curve approximation function having a curve approximation interval defined by the end points of each arc.

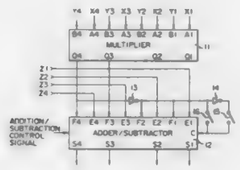


4,853,886

DIGITAL SIGNAL PROCESSING CIRCUIT

Hiroshi Shigehara, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 18, 1987, Ser. No. 16,125
Claims priority, application Japan, Feb. 21, 1986, 61-36664
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—745 4 Claims



1. A circuit for multiplying first and second binary data in 2's complement format to obtain a multiplication result, generating a third data in 2's complement format from that result, and adding or subtracting the third data to or from a fourth data in 2's complement format, comprising:

a multiplier for multiplying said first and second binary data in 2's complement format and deleting a predetermined number of least significant bits of the actual multiplication result to obtain a virtual multiplication result;

an adder/subtractor for performing addition/subtraction of said third binary data and said fourth binary data in 2's complement format in response to a control signal, the most significant bits of said third binary data being said virtual multiplication result and a plurality of lower bits of said third binary data being an inverted most significant bit of said virtual multiplication result; and

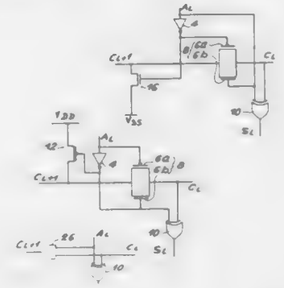
means for supplying to said adder/subtractor said inverted most significant bit of said virtual multiplication result as the least significant bit when said adder/subtractor operates in an adder mode, and for supplying to said adder/subtractor said most significant bit of said virtual multiplication result as the least significant bit when said adder/subtractor operates in a subtractor mode.

4,853,887

BINARY ADDER HAVING A FIXED OPERAND AND PARALLEL-SERIAL BINARY MULTIPLIER INCORPORATING SUCH AN ADDER

Francis Jutand, 167 Rue Etienne Dolet, 94230 Cachan; Nicolas Demassieux, 4 Impasse Reille, 75014 Paris, and Michel Dana, 53 rue de la Colonie, 75013 Paris, all of France

Filed Sep. 11, 1987, Ser. No. 95,214
Claims priority, application France, Sep. 22, 1986, 86 13222
Int. Cl.[4] G06F *7/50*, *7/52*
U.S. Cl. 364—784 7 Claims



1. A binary adder for adding a first operand A of n bits $A_{n-1}, \ldots, A_0$ having a random binary value to a second operand B of n bits $B_{n-1}, \ldots, B_0$ of predetermined binary value, said adder comprising:

n addition cells $CA_{n-1}, \ldots, CA_0$, each cell being provided with a data input for receiving a bit A_i, $0 \leq i \leq n-1$ from the first operand, a carry input for receiving a carry bit C_i, a data output S_i and a carry output for supplying a carry bit C_{i+1}, the carry output of the addition cell of rank j, $0 \leq j \leq n-2$ being connected to the carry input of the addition cell of rank j+1, wherein each addition cell CA_i, $0 \leq i \leq n-1$ is wired as a function of the value of bit B_i of the operand B;

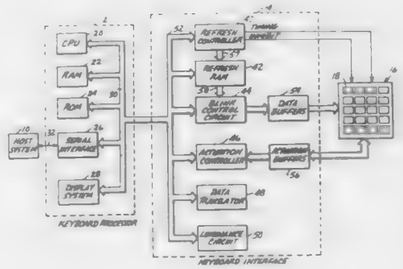
wherein each addition cell associated with a bit B_i of logic value "1" of the fixed operand B comprises an OR gate receiving bits A_i and C_i and supplying the carry bit C_{i+1}; and an inverter receiving bit A_i and a XOR gate receiving bit C_i and the bit supplied by the inverter and supplying the sum bit S_i.

4,853,888

PROGRAMMABLE MULTIFUNCTION KEYBOARD

Walter J. Lata, Renton, Wash., and Michael S. Trupiano, Burnsville, Minn., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 31, 1984, Ser. No. 687,911
Int. Cl.[4] G06F *3/02*; G09G *3/00*
U.S. Cl. 364—900 7 Claims



1. A multi-function keyboard system, comprising:

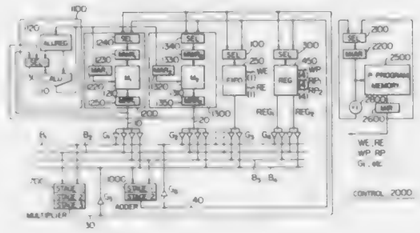
(a) keyboard means including a plurality of switches and display means for receiving legend data and for displaying a plurality of legends specified by the legend data, the legends being positioned adjacent the switches such that each legend is visually associated with a single switch;
(b) actuation control means electrically connected to the keyboard means formonitoring the switches and providing, when one of these switches is actuated, an actuation signal identifying the actuated switch;
(c) processor means comprising
(i) means for storing a database comprising a plurality of data groups, each data group comprising legend data specifying a legend for at least one of the switches for display by the keyboard means and routing data specifying a next data group functionally associated with at least one of the switches;
(ii) means for designating one of the data groups as the active data groups;
(iii) means for receiving the actuation signal; and
(iv) means responsive to receipt of an actuation signal identifying that a selected switch has been actuated for designating the data group specified by the routing data of the current active data group corresponding to the selected switch as the new active data group; and
(d) means for causing the legend data of the active data group to be transmitted to the keyboard means;
said actuation control means comprising means for electronically sensing that a switch is inoperative and for producing a corresponding electronic switch signal that identifies the inoperative switch, said processor means comprising means for receiving the switch signal and reconfiguration means including means for responding to the switch signal by reconfiguring each active data group such that legend data and routing data in the active data group is not associated with switches identified by the switch signal as inoperative.

4,853,890

VECTOR PROCESSOR

Shigeo Abe, Hitachi; Tadaaki Bandoh, Ibaraki; Kotaro Hirasawa, Hitachi, and Jushi Ide, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 15, 1983, Ser. No. 485,396
Claims priority, application Japan, Apr. 16, 1982, 57-62566
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 10 Claims



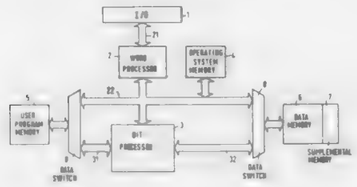
1. A vector processor capable of processing components of a vector by repetitive operations, comprising:
at least one pipeline operation unit, including at least two processing stages capable of synchronous operation, each processing stage having logic circuit means for performing a logic operation, and register means for holding an output of said processing stages;
at least one first-in first-out (FIFO) memory connected to said pipeline operation units for temporarily storing sequentially generated intermediate operation results of said arithmetic operations in the order such results are generated;
bus means for transferring vector data from said pipeline operation unit to said FIFO memory and from said FIFO memory to said pipeline operation unit;
control means for controlling said pipeline operation unit and said FIFO memory in synchronism under microinstruction control, so that in one repetitive loop of a repetitive operation, one data element of one vector obtained in a pipeline operation unit at one machine cycle is written into said FIFO memory through said bus means, and data later machine cycle which occurs before or at the same time said one data element is read out of said FIFO memory, another data element of the same vector is written into said FIFO memory through said bus means; and
a register file having at least one input port and at least two output ports, wherein said bus means includes a connection between said register file and said pipeline operation unit, said register file being capable of writing at least one data element and reading at least two data elements simultaneously in response to one microinstruction.

4,853,891

MEMORY-PROGRAMMABLE CONTROLLER

Dieter Wollscheid, Erlangen; Peter Nissenmann, Rottenbach; Siegfried Stoll, Wilhermsdorf, and Waldemar Wenzel, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 4, 1984, Ser. No. 568,115
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1983, 3302909
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—900 1 Claim



1. In a memory-programmable controller of the type having a cyclically traversed user control program having a plurality of control commands for controlling a peripheral process including a processor for processing control commands from the control program and operating system commands from an operating system program, a user program memory wherein the control program including the operating system commands is stored and a data memory, each of said memories coupled to the processor, image signals comprising input and output signals of the process being stored in the data memory in the form of data one bit wide, the image signals being transferred between the peripheral process and the data memory and being processed under control of the control program, the improvement comprising:
a supplemental memory coupled in parallel with the data memory, each of said data and supplemental memory having a plurality of addresses and being bit addressable and containing data one bit wide at each address, a supplemental bit being stored at each address of said supplemental memory, each supplemental bit being associated with corresponding ones of the bit wide data stored in the data memory, the state of the supplemental bit determining whether the bit wide data in the data memory can be changed or is to remain unchanged in a transfer of the image signals between the peripheral process and the data memory and during processing of the image signals under control of the control program.

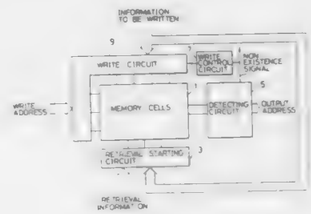
4,853,892

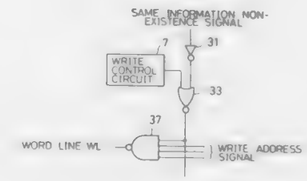
ASSOCIATIVE MEMORY DEVICE INCLUDING WRITE INHIBIT CIRCUITRY

Chikahiro Hori, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 16, 1987, Ser. No. 4,004
Claims priority, application Japan, Jan. 17, 1986, 61-6382
Int. Cl.[4] G11C *15/00*
U.S. Cl. 365—49 4 Claims

1. An associative memory device which comprises:
associative memory cells for storing addresses in which information corresponding to retrieval information has possibly been stored;
retrieval means for applying said retrieval information to said memory cells and retrieving said addresses;
detecting means for detecting whether or not the same information corresponding to the retrieval information has been stored and for producing a same information non-existence signal if the same information has not been stored;
write control circuit means responsive to said non-existence signal for producing a write acknowledge signal;
writing means for storing write information into a predetermined memory cell among the associative memory cells in





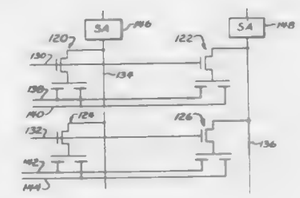
accordance with said write acknowledge signal produced by said write control circuit means; and
a word line control circuit having a NOR circuit, one input terminal of which is connected to said write control means and another input terminal of which is connected to receive the same information non-existence signal through an inverter, and a NAND circuit having a plurality of input terminals, one of which is connected to the output terminal of said NOR circuit so as to control a word line.

4,853,893

DATA STORAGE DEVICE AND METHOD OF USING A FERROELECTRIC CAPACITANCE DIVIDER

S. Sheffield Eaton, Jr., and Michael Parris, both of Colorado Springs, Colo., assignors to Ramtron Corporation, Colorado Springs, Colo.

Filed Jul. 2, 1987, Ser. No. 69,389
Int. Cl.[4] G11C *11/22, 11/24, 7/00*
U.S. Cl. 365—145 20 Claims



1. A method for non-volatile storage and retrieval of digital data using a capacitor divider formed by first and second ferroelectric capacitors, with a first common node between

them and first and second poles corresponding to the first and second capacitors, the method comprising the steps of:

storing the data, including applying a voltage representing the data to said common node, holding said poles at a first voltage while said voltage representing the data is being applied to the common node, thereby polarizing ferroelectric material in the capacitors in a direction to correspond to the data; and

retrieving the data, including maintaining said first pole at said first voltage while applying a voltage transition to said second pole, and sensing the voltage developed on said common node, said developed voltage being indicative of said digital data.

4,853,894

STATIC RANDOM-ACCESS MEMORY HAVING MULTILEVEL CONDUCTIVE LAYER

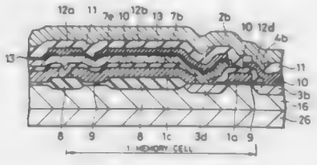
Toshiaki Yamanaka, Houya; Norio Suzuki, Koganei; Yoshio Sakai, Shinayama; Yoshifumi Kawamoto, Shiroyama; Osamu Minato, Hinodemachi; Koichiro Ishibashi, Tokyo; Nobuyuki Moriwaki, Kodaira, and Satoshi Meguro, Hinodemachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 9, 1987, Ser. No. 71,749

Claims priority, application Japan, Jul. 9, 1986, 61-159790

Int. Cl.⁴ G11C *11/00, 11/34*

U.S. Cl. 365—154 **24 Claims**



1. A semiconductor memory having static cells each composed of two driver MOS transistors formed on a semiconductor substrate and two transfer MOS transistors and two load resistors, which are formed on said substrate and are connected to the drains of said driver MOS transistors, respectively, said memory further comprising a capacitance element formed on said substrate, said capacitance element having two electrodes being electrically connected in said memory so as to supply a charge stored in said capacitance element to a storage node of said memory, said memory also including a conductive film for fixing the sources of said driver MOS transistors to a ground voltage, said conductive film being formed above said semiconductor substrate, said conductive film defining one electrode of said capacitance element formed on said substrate, said memory further comprising a conductive film for supplying a power supply voltage to said memory, said conductive film for supplying a power supply voltage being electrically coupled to the load resistors, the other of the two electrodes of the capacitance element being electrically connected to the load resistors.

18. A semiconductor memory comprising:

first and second driver MOS transistors, first and second transfer MOS transistors, and first and second load resistors;

the gate electrode of said first driver MOS transistor, one terminal of said second load resistor, one of the source and drain of said second transfer MOS transistor and one of the drain and source of said second driver MOS transistor being electrically connected together;

the gate electrode of said second driver MOS transistor, one terminal of said first load resistor, one of the source and drain of said first transfer MOS transistor and one of the drain and source of said first driver MOS transistor being electrically connected together;

the other terminals of said first and second load resistors being connected to a first predetermined power supply line;

the gate electrodes of said first and second transfer MOS transistors being mutually defined by a first-level conductive layer including polycrystalline silicon, said gate electrode acting as a word line;

one of the sources and drains of each of said first and second driver MOS transistors being mutually connected to a second predetermined power supply line;

one of the drains and sources of each of said first and second transfer MOS transistors being connected to first and second data lines, respectively;

said first and second load resistors and said second predetermined power supply line being defined by a second-level conductive layer including polycrystalline silicon;

said first predetermined power supply line being defined by a third-level conductive layer including polycrystalline silicon; and

said second- and third-level conductive layers including polycrystalline silicon forming in combination a capacitance element, said capacitance element being electrically connected in said memory so as to supply a charge stored in said capacitance element to a storage node of said memory.

4,853,895

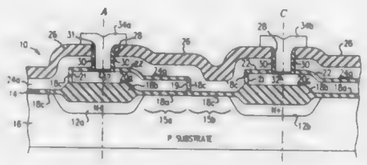
EEPROM INCLUDING PROGRAMMING ELECTRODE EXTENDING THROUGH THE CONTROL GATE ELECTRODE

Allan T. Mitchell, Garland, and Bert R. Riemenschneider, Murphy, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 30, 1987, Ser. No. 126,443

Int. Cl.⁴ G11C *11/40*; H01L *29/78*

U.S. Cl. 365—185 **15 Claims**



1. An electrically erasable, programmable memory cell formed on a substrate having a semiconductor surface area which exhibits a first conductivity type and has a column line of a second conductivity type adjacent an active region, said memory cell comprising:

a first insulating layer overlying the substrate surface area;

a floating gate layer overlying said first insulating layer and having a portion thereof extending over the active region;

an erase window overlying a first portion of said floating gate layer at a location remote from the active region in the substrate;

a second insulating layer overlying a second portion of said floating gate layer;

a control gate layer overlying said second insulating layer;

a third insulating layer overlying said control gate layer; and

a programming electrode overlying said third insulating layer and extending through said third insulating layer and said control gate layer, said programming electrode coupled to said floating gate through said erase window such that read operations of said memory cell do not apply voltage to said erase window.

4,853,896

WRITE DRIVER CIRCUIT OF SEMICONDUCTOR MEMORY DEVICE

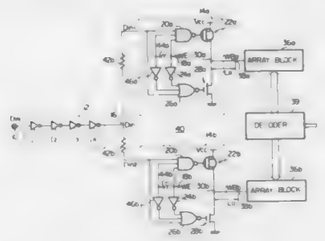
Takashi Yamaguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 10, 1987, Ser. No. 60,146

Claims priority, application Japan, Jan. 10, 1986, 61-135304

Int. Cl.⁴ G11C *7/00, 11/40*

U.S. Cl. 365—189.02 **8 Claims**



1. A write driver circuit of a semiconductor memory device having a read/write memory cell array including a plurality of read/write cell blocks each having an input terminal, comprising

(a) driver input terminals including a first driver input terminal at which a first driver input signal is to appear and a second driver input terminal at which a second driver input signal is to appear, each of the first and second driver input signals being shiftable between discrete first and second voltage levels, said driver input terminals further including third and fourth driver input terminals at which third and fourth driver input signals complementary to each other and each shiftable substantially between said first and second voltage levels are respectively applied and

(b) a plurality of driver circuit sections each having input terminals at said first and second driver input terminals, respectively, and an output terminal connected to the input terminal of a different one of said read/write cell blocks,

(c) each of said driver circuit sections being operative to activate its associated one of said read/write cell blocks in the copresence of said first, second and third driver input signals of said first voltage level at said first, second and third driver input terminals, respectively, and said fourth driver input signal of said second voltage level at said fourth driver input terminal.

4,853,897

COMPLEMENTARY SEMICONDUCTOR MEMORY DEVICE

Kazutaka Nogami, Kawasaki, and Takayasu Sakurai, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 4, 1987, Ser. No. 128,946

Claims priority, application Japan, Dec. 10, 1986, 61-293751; Mar. 19, 1987, 62-65017

Int. Cl.⁴ G11C *11/40, 7/00*

U.S. Cl. 365—189.11 **10 Claims**

1. A semiconductor memory device comprising:

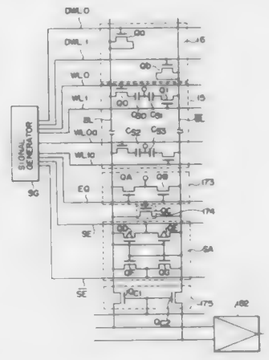
a semiconductor substrate of a first conductive type;

a plurality of well regions of a second conductivity type, formed in said semiconductor substrate;

a memory cell array formed in a given one of said plurality of well regions, said memory cell array including a plurality of memory cells each having a MOS transistor for a transfer gate, one of the source and drain of which is connected to a first or second bit line, and the gate of which is connected to one of a plurality of word lines, and a data storing capacitor,

a bit line driver and a dummy cell formed in one of said plurality of well regions, different from said well region in which said memory cell array is formed, said dummy cell including a first dummy cell having a first MOS transistor, at least one of the source and drain of which is connected to said first bit line, and the gate of which is connected to a first dummy word line, and a second dummy cell including a second MOS transistor, at least one of the source and drain of which is connected to said second bit line, and the gate of which is connected to a second dummy word line,

during a period in which said memory cell of said memory cell array connected to said first bit line is selected, a potential of a work line connected to said memory cell is changed to a first potential, a potential of said first dummy line is changed to a second potential, in synchronism with



a change in potential of said word line, a potential of said word line is changed to the second potential after the selection period of said memory cell is completed, and a potential of said dummy word line is changed to a third potential, in synchronism with a change in potential of said word line, and

during a period in which said memory cell of said memory cell array connected to said second bit line is selected, a potential of a word line connected to said memory cell is changed to the first potential, a potential of said second dummy word line is changed to the second potential, in synchronism with a change in potential of said word line, a potential of said word line is changed to the second potential after the selection period of said memory cell is completed, and a potential of said second dummy word line is changed to the third potential, in synchronism with a change in potential of said word line.

4,853,898

BIPOLAR RAM HAVING STATE DEPENDENT WRITE CURRENT

A. David Hashemi, Santa Clara, and Robert M. Reinschmidt, Los gatos, both of Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 11, 1988, Ser. No. 155,021

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—189.11 **12 Claims**

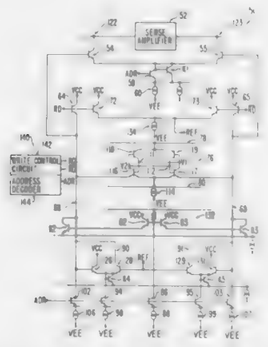
1. A bipolar random access memory, comprising:

(a) at least one pair of bit lines;

(b) at least one memory cell connected between said pair of bit lines, with each memory cell having a present memory state that is a first memory state representing a first data value or a second memory state representing a second data value;

(c) means for selecting said at least one memory cell for a read operation or a write operation; and

(d) means for writing data values to said at least one memory cell by shifting said present memory state using a first write current of a first magnitude when said data value



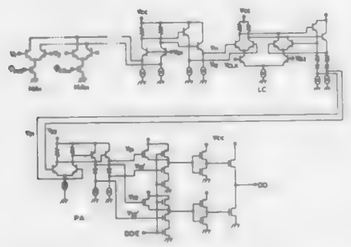
does not correspond to said present memory state, and by not shifting said present memory state using a second write current having a lower magnitude than said first magnitude when said data value corresponds to said present memory state.

4,853,899

SEMICONDUCTOR MEMORY HAVING AMPLIFIER INCLUDING BIPOLAR TRANSISTOR

Goro Kitsukawa, Tokyo; Takao Watanabe, Kokubunji; Ryoichi Hori, Tokyo, and Kiyoo Itoh, Higashikurume, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 929,345, Nov. 12, 1986, abandoned.
This application Nov. 28, 1988, Ser. No. 276,947
Claims priority, application Japan, Nov. 15, 1985, 60-254747
Int. Cl.[4] G11C *11/40, 7/00*
U.S. Cl. 365—207 **5 Claims**



1. A semiconductor dynamic memory comprising:

a plurality of first data lines;

a plurality of word lines disposed in such a manner as to intersect said first data lines;

dynamic memory cells disposed at the intersections between said word lines and said first data lines, wherein each of said dynamic memory cells includes a MOS transistor connected at its gate electrode to a corresponding word line, and a capacitor connected at one electrode thereof to a corresponding first data line through a drain-source path of said MOS transistor;

a sense amplifier and active restore circuit means coupled to said first data lines for amplifying signals stored in said dynamic memory cells, said sense amplifier and active restore circuit means being formed by MOS transistors, wherein amplifying and active restoring operations of said sense amplifier and active restore circuit means are started by a first control signal;

a second data line connected to said first data lines through switching means so that read signals from said dynamic memory cells are provided to said second data line through said switching means, wherein turn-on and turn-off operations of said switching means are controlled by a second control signal;

an amplifier circuit connected to said second data line for detecting the read signal appearing on the second data line; and

a write circuit for applying a write signal to the memory cell,

wherein said amplifier circuit includes at least a first bipolar transistor, a second bipolar transistor, and a current source, wherein at least a base of one of the first and second bipolar transistors is electrically coupled to the second data line, an emitter of each of the first and second bipolar transistors is electrically coupled to the current source, and a collector of each of the first and second bipolar transistors is electrically coupled to an output circuit,

wherein said switching means is controlled to its turn-on condition by said second control signal after said amplifying and active restoring operations of said sense amplifier and active restore circuit means have been started by said first control signal, so that an amplified signal from said sense amplifier and active restore circuit means is transmitted to a base electrode of said one bipolar transistor of said amplifier circuit through said switching means and said second data line,

wherein said output circuit includes a third bipolar transistor, an emitter of which is coupled to said collector of said first bipolar transistor, a fourth bipolar transistor, an emitter of which is coupled to said collector of said second bipolar transistor, a first load means coupled between a collector of said third bipolar transistor and an operating potential, a second load means coupled between a collector of said fourth bipolar transistor and said operating potential, a fifth bipolar transistor, a base of which is coupled to said collector of said third bipolar transistor and a collector of which is coupled to said operating potential, and a sixth bipolar transistor, a base of which is couple to said collector of said fourth bipolar transistor and a collector of which is coupled to said operating potential,

wherein bases of said third and said fourth bipolar transistors are supplied with a predetermined bias voltage, and

further wherein signals are obtained from emitters of said fifth and said sixth bipolar transistors.

4,853,900

STABILIZED SUSPENSION FOR IMMERSIBLE APPARATUS

Martha E. Snyderwine, Holland, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 19, 1987, Ser. No. 111,844
Int. Cl.[4] H04B *1/59*
U.S. Cl. 367—4 **4 Claims**

1. Apparatus for suspending at least one instrument on a cable along a substantially vertical axis in a liquid having a flow field associated therewith and wherein the improvement comprises:

at least one sleeve for enclosing about said cable and instruments along said axis to provide isolation therefor from the vibrational effects caused by vortex shedding on said cable and instruments due to the flow field of the liquid, each said sleeve presenting top and bottom ends along said axis and said sleeves being filled with the liquid during deployment of said instruments; and

an elastic cable to which said cable is connected for suspension; and

at least one hydraulic valve disposed in at least one of said sleeves for precluding flow therethrough after deployment of said instruments, said hydraulic valves being effective to substantially increase drag along said axis and



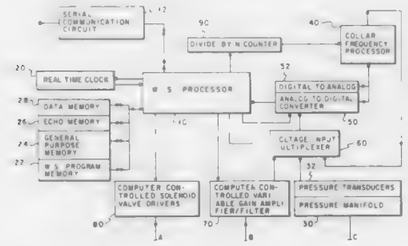
thereby reduce the vertical motion encountered by said cable and instruments when surface swells occur in the liquid.

4,853,901

AUTOMATIC LIQUID LEVEL RECORDING DEVICE

Dennis D. Barber, Dallas, Tex., assignor to Diagnostic Services, Inc., Dallas, Tex.

Continuation of Ser. No. 829,945, Feb. 18, 1986, abandoned.
This application Oct. 3, 1988, Ser. No. 253,405
Int. Cl.[4] G01S *1/00*
U.S. Cl. 367—27 **29 Claims**



1. Apparatus for collecting and retaining information from a well drilled through the substrata of the earth in order to determine the location of the liquid surface in said well which comprises:

a. a source of pressure pulses coupled to said well;

b. a transient pressure transducer coupled to said well which generates an electrical output in response to the downhole reflection of pressure pulses produced by said source;

c. means responsive to the output of said transducer for recording all of said reflections; which comprises a microprocessor in communication with ROM and RAM which by comparing the relative energy levels integrating the values of said recorded reflections in said RAM determines the set of recorded reflecting values with the largest relative, energy level which represents the liquid surface reflection;

d. means operably connected to said recording means for discriminating between liquid surface reflection and other reflections in said well;

e. further means operably connected to said discriminating means for determining the average pressure pulse velocity in said well;

f. an additional means operably connected to said discriminating means for determining the travel time in said well of said liquid surface reflections; and

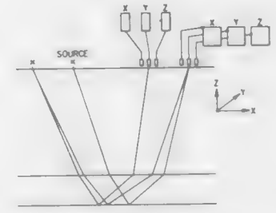
g. an additional means operably connected to said discriminating and determining means for retaining all of said information obtained by said means.

4,853,902

PREDICTIVE NOISE FILTERING OF MULTI-COMPONENT SEISMIC DATA

Dennis Corrigan, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 7, 1988, Ser. No. 164,977
Int. Cl.[4] G01V *1/36*
U.S. Cl. 367—44 **13 Claims**



1. In a method of treating seismic data which:

a. source energy is input at the surface of the earth;

b. a plurality of reflection records are made of the reflection of said source energy from subterranean strata; the improvement comprising:

c. recording each of said reflection records with at least two components along respective orthogonal axes, said two components being first and second components;

d. discriminating from each of said respective first and second reflection record components a noise portion, for each reflection record said respective noise portion of said respective first component being discriminated by filtering said respective second component with a spatial filter, said spatial filter being determined from a correlation of all of said first and second components, for each reflection record said respective noise portion of said respective second component being discriminated by filtering said respective first component with said spatial filter; and

e. subtracting said respective noise portions from said respective reflection records to thereby more clearly delineate a desired signal portion.

4,853,903

METHOD AND APPARATUS FOR REMOVING SINUSOIDAL NOISE FROM SEISMIC DATA

Andrew F. Linville, Jr., Dallas; Thomas E. Shirley, Richardson, and Paul G. Griffith, Farmers Branch, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 19, 1988, Ser. No. 259,941
Int. Cl.[4] G01V *1/28, 1/36*
U.S. Cl. 367—46 **22 Claims**

1. A method for removing sinusoidal noise from a data trace comprising the steps of:

determining a line frequency for said sinusoidal noise;

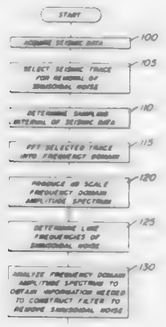
determining an exact autocorrelation function for said sinusoidal noise of said determined frequency;

producing a convolutional filter from said exact autocorrelation function; and

applying said filter to said data trace to remove said sinusoidal noise; and

wherein the step of determining an exact autocorrelation function for said sinusoidal noise of said determined frequency further comprises the steps of:

producing a frequency domain amplitude spectrum for said data trace;
determining a notch width from said amplitude spectrum;
determining a filter order comprised of a plurality of filter weights from said notch width; and



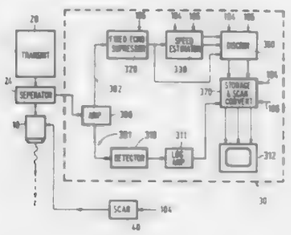
determining the exact autocorrelation function for said sinusoidal noise of said determined frequency from said filter order.

4,853,904

APPARATUS FOR EXAMINING A MOVING OBJECT BY MEANS OF ULTRASOUND ECHOGRAPHY

Patrick R. A. Pesque, Perigny, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 15, 1987, Ser. No. 97,224
Claims priority, application France, Sep. 19, 1986, 86 13140
Int. Cl.[4] G01S *15/58*
U.S. Cl. 367—89 **9 Claims**



1. Apparatus for examining a moving object which has a velocity of means of ultrasound echography to enable the measurement of a projection of the velocity of said object on an axis of a beam of ultrasound pulses which propagate toward the object with a propagation velocity, C, comprising:
means which periodically transmit said ultrasound pulses toward the object using a repetition period, T; and
means which receive and process echographic signals which include a plurality of echoes of said pulses which are returned to the apparatus from the object wherein as an improvement said means which receive and process include:
a circuit (330) for estimating said projection of the velocity, $v_{iR}(t)$, which circuit comprises:
first calculating means (340) for producing an output corresponding to a time shift, $\tau_i(t)$, between two successive echoes $e_i(t)$ and $e_{i+1}(t)$ in said echographic signal which function to solve for $\tau_i(t)$ the equation:

$$e_{i+1}(t) = \sum_{n=0}^{p} \frac{(-1)^n}{n!} e_i^{(n)}(t) \cdot \tau_i^n(t)$$

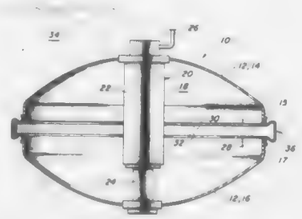
where $e_i^{(n)}(t)$ is a derivative of order n with respect to time of the echo $e_i(t)$ and
second calculating means (350) connected to multiply the output of the first calculating means for C/2T in order to produce an output representing $V_{iR}(t)$.

4,853,905

SEAL FOR MARINE SEISMIC SOURCE

Wilbur J. Myers, Davis, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Feb. 5, 1988, Ser. No. 152,513
Int. Cl.[4] H04R *23/00*
U.S. Cl. 367—143 **17 Claims**



1. A marine seismic vibrator, comprising:
a housing including first and second housing portions defining an internal chamber therebetween;
energizing means, connected between said first and second housing portions, for maintaining said first and second housing portions in a spaced apart, non-contacting relationship and for moving said first and second housing portions relative to each other to generate acoustic waves in a body of water surrounding said vibrator; and
annular flexible seal means, connected between said first and second housing portions, for isolating said internal chamber from said body of water, said seal means including:
first and second flexible web portions sealingly connected to said first and second housing portions, respectively; and
rigid hoop means for supporting said sealed means against pressure differential between said internal chamber and said body of water; and
an intermediate portion defined between and integrally formed with said first and second web portions from a flexible material, said hoop means being completely embedded in said intermediate portion of said seal means.

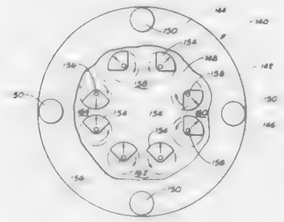
4,853,906

APPARATUS FOR GENERATING ELLIPTICALLY POLARIZED SHEAR WAVES

Jack H. Cole, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Division of Ser. No. 897,434, Aug. 18, 1986, abandoned. This application Jun. 13, 1988, Ser. No. 207,935
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—189 **9 Claims**

1. Apparatus for generation of elliptically polarized shear waves in an earth medium, comprising:
baseplate means including an earth engaging surface which is generally equally omni-directionally resistant to movement relative to said earth medium;
at least one pair of counter-rotating shafts affixed generally centrally to said baseplate means in spaced, parallel alignment for journaled rotation in said baseplate means;
at least one pair of eccentric masses with each mass secured on a respective one of a said shafts in mirror-image alignment;
drive means for counter-rotating the at least one pair of said



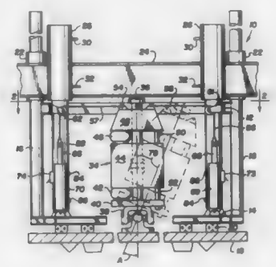
shafts at controlled rotational speed to generate a force directed radially outward against the omni-directional resistance of said baseplate means and generally parallel to the earth engaging surface, which radially directed force is instantaneously linear but rotating at a predetermined angular velocity relative to a point within said earth engaging surface of said baseplate means.

4,853,907

INCLINABLE VIBRATORY SEISMIC SOURCE

Marvin G. Bays, Ponca City, Okla., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 17, 1989, Ser. No. 312,129
Int. Cl.[4] G01V *1/02*
U.S. Cl. 367—189 **13 Claims**



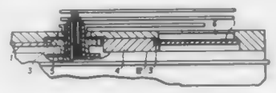
1. Vibratory apparatus for imparting seismic vibratory signals to the earth along a selected vector path, said apparatus being suitable for mounting on a vehicle frame for transportation and comprising:
a ground-engaging base plate;
lift means including a lift frame connectable with the vehicle frame and said base plate whereby said base plate can be moved from a transport position out of engagement with the ground to an operating position engaging said ground;
vibratory means for producing said vibratory signals, said vibratory means including a shaft having an axial centerline, a first end moveably mounted on said base plate whereby said axial centerline can be located within preselected angles and at preselected azimuths, a second end, a vibratory mass mounted for limited reciprocating movement on said shaft intermediate said ends for imparting vibratory motion to said shaft and a substantially vibration free reaction mass moveably located on said shaft between said vibratory mass and said second end; and
control means connecting said second end with said lift frame for positioning the axial centerline of said vibratory means at desired inclinations and at desired azimuths, said control means including variable length means, means for selectively and independently changing the length of each variable length means, and generating means for transmitting a signal to cause said variable length means to change length to position said vibratory means at a selected inclination and azimuth.

4,853,908

TIMING MECHANISM WITH TIDE INDICATOR

Francis Bourquin, P.O. Box 852, 2501 Bienne, Switzerland, and Ira Krieger, 407 Lincoln Rd., Suite 10-B, Miami Beach, Fla. 33139

Filed Aug. 10, 1988, Ser. No. 230,369
Claims priority, application Switzerland, Mar. 31, 1988, 1225/88
Int. Cl.[4] G04B *19/26*
U.S. Cl. 368—19 **8 Claims**





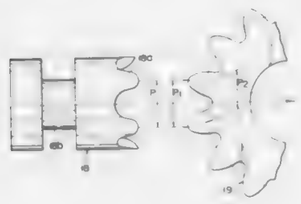
1. A timing mechanism including a tide indicator and having a watch movement and an analog display for the solar hour, said mechanism comprising:
a. at least one flat, annular wheel including at least one indicator sign on an exposed surface thereof,
b. a gear structure formed on an interior circumferential edge of said annular wheel and a semi-circular plate fixed to the watch movement and disposed within said annular wheel and including a diameter corresponding through that of said annular wheel,
c. at least one gear wheel having gear teeth formed along an outer peripheral edge thereof and activated by the watch movement and disposed within said annular wheel in a space not occupied by said semi-circular plate,
d. said gear structure of said annular plate disposed in meshing engagement with said gear teeth of said one gear wheel and said annular wheel rotatable thereby about said plate upon activation and rotation of said gear wheel,
e. a dial face including an open window formed therein and disposed in overlying relation to said exposed surface of said annular plate and in aligned, exposed relation to said one indicator sign as it rotates with said annular plate relative to said window,
f. an index means formed on the dial adjacent a periphery of said window for indicating time of travel of said one indicator sign,
g. said gear wheel and said gear structure defining a gear ratio therebetween sufficient to define passage of said one indicator sign pasing relative to said window and said index means to indicate a time of both high tide and low tide at a given geographical location.

4,853,909

TIME CORRECTION MECHANISM FOR AN ANALOG TIMEPIECE USING PLASTIC GEARS FOR TRANSMITTING THE ROTATION OF THE MANUAL OPERATION MEMBER TO THE HANDS

Masaru Shoji, Saitama, and Mitsunobu Yatabe, Tokyo, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1988, Ser. No. 175,155
Claims priority, application Japan, Apr. 9, 1987, 62-54038[U]; Apr. 9, 1987, 62-54040[U]
Int. Cl.[4] G04B *27/02*
U.S. Cl. 368—190 20 Claims



1. A time-setting mechanism for an analog timepiece, the mechanism comprising:

an operation member movable in the axial direction thereof at least between a first position and a second position;

a pinion movable for a first position to a second position in an interlocked relation to the movement of said operation member from said first position to said second position and rotatable, together with said operation member, when said operation member is turned; and

an external torque-transmission gear normally rotated in an interlocked relation to the movement of hands;

actuating means for bringing the external torque-transmission gear into mesh with said pinion to transmit a torgue, produced by rotation of said operation member and transmitted from said operation member to said pinion, to the hands when said pinion is moved to said second position with movement of said operation member to said second position;

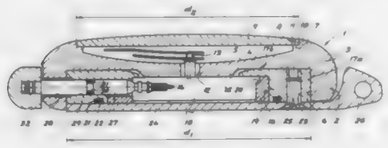
said pinion and said external torque-transmission gear being made of synthetic resins, and said pinion is made of a resin material having a higher flexibility than the resin material of said external torque-transmission gear.

4,853,910

TIMEPIECE HAVING CASE FORMED OF ROCK-LIKE MATERIAL

Elmar Mock, both of Bienne, Switzerland, assignor to ETA SA Fabriques d'Ebauches, Granges, Switzerland

Division of Ser. No. 847,369, Apr. 2, 1986, Pat. No. 4,692,033. This application Aug. 5, 1987, Ser. No. 81,970
Claims priority, application Switzerland, Oct. 7, 1985, 4325/85
Int. Cl.[4] G04B *37/00, 29/00*
U.S. Cl. 368—300 13 Claims



1. A timepiece comprising a case (1) and a movement (18) received in said case.

(a) said case comprising a first caseband (16), a second caseband (3), a back cover (24) and a crystal (9),

(b) said first caseband being formed of comparatively easily machinable metal and receiving said movement, said first caseband comprising means (23) for fixing the back cover thereto,

(c) said second caseband being made of a comparatively brittle and difficult to machine hard natural or artificial mineral material, said second caseband being assembled to said first caseband by gluing and comprising, integrally formed with said second caseband;

(i) a hub portion (4) providing a timepiece dial, and

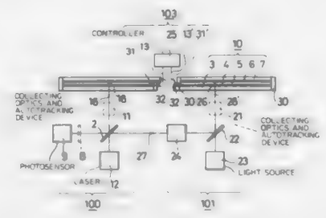
(ii) means (8) for positioning and fastening said crystal, said crystal positioning and fastening means extending continuously around the periphery of said hub portion (4) and retaining said crystal (9) by gluing.

4,853,911

OPTICAL DISC MEMORY SYSTEM UTILIZING A SMECTIC CHIRAL LIQUID CRYSTAL

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Jun. 13, 1986, Ser. No. 874,102
Int. Cl.[4] G11B *11/14;* G11C *13/04*
U.S. Cl. 369—13 4 Claims



1. An information recording and reading system comprising:

an optical disc memory including (a) a pair of substrates provided in parallel with an interval in between, at least one of which is transparent and (b) a chiral smectic liquid crystal layer disposed between said substrates in which liquid crystal molecules are arranged in parallel to the substrates with their dipole moments perpendicular to said substrates, wherein a number of domains are defined in said liquid crystal layer of the optical disc memory;

means for applying to said liquid crystal layer a strong electric field, the strength of the strong electric field being such as to direct the dipole moments of the liquid crystal molecules uniformly in one direction perpendicular to said substrates, said one direction of the dipole moments remaining after removal of the strong electric field;

means for subjecting, subsequent to the removal of the strong electric field, at least said particular domains to a weak electric field opposite in direction to said strong electric field, the strength of said weak electric field being such as not to change the directions of the electric dipole moments established by the strong electric field in the absence of said irradiating of the particular domains, the directions of the dipole moments at the particular domains being changed in response to the particular domains being irradiated and the weak electric field being applied thereto to thus write and store information in the optical disc memory; and

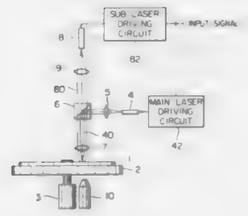
means for reading information stored in said optical disc memory including (a) means for applying light to a polarizing element spaced from the optical disc memory and out of the path of the light utilized by the irradiating means to thus apply polarized light to the optical disc memory and (b) means sensing light which passes through predetermined domains in the liquid crystal layer corresponding to the polarized light to thus read the information stored in the optical disc.

4,853,912

PROCESS AND APPARATUS FOR SIMULTANEOUS ERASURE AND RECORDING IN MAGNETO-OPTICAL RECORDING

Hideki Akasaka, Yokohama, and Masatoshi Sato, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 729,795, May 2, 1985, abandoned. This application Dec. 8, 1987, Ser. No. 131,327
Claims priority, application Japan, May 8, 1984, 59-91360
Int. Cl.[4] G11B *11/12, 13/04, 5/02*
U.S. Cl. 369—73 14 Claims





1. An apparatus for recording information signals in recording tracks separated by determined separating areas in a magnetic recording medium having magnetic anisotropy perpendicular to the surface thereof, comprising:

(a) means for irradiating a part of one of said recording tracks with a main energy beam of a determined intensity sufficient for heating said part to a temperature for substantially dissipating the coercive force in said part;

(b) means for irradiating a part located in said separating areas adjacent to said one recording track and in the vicinity of the first-mentioned part irradiated by said main energy beam, with a subsidiary energy beam of an intensity modulated by said information signals, simultaneously with the irradiation with said main energy beam, whereby the direction of vertical magnetization in said part, irradiated by said subsidiary energy beam, in said separating area is inverted corresponding to said information signals; and

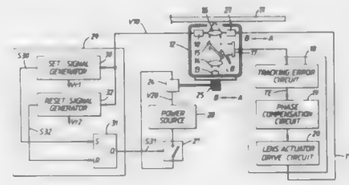
(c) means for causing relative movement between said recording medium and said main energy beam thereby displacing said part, irradiated by said main energy beam in said recording tracks.

4,853,913

PICK-UP CONTROL CIRCUITS FOR DISC INFORMATION REPRODUCING APPARATUS

Satoru Maeda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jun. 17, 1986, Ser. No. 875,110
Claims priority, application Japan, Jun. 17, 1985, 60-131251; Jun. 17, 1985, 60-131254
Int. Cl.[4] G11B *17/22*
U.S. Cl. 369—32 10 Claims



1. A pick-up control circuit for use in an apparatus for reproducing information from an optical record disc using a light beam, wherein said information is recorded in a spiral track or a plurality of concentric tracks on one side of said disc, said pick-up control circuit comprising:

a movable carriage;

a source of said light beam, said source being mounted on said carriage;

means for focussing said light beam on said disc, said light beam focussing means being mounted in a standard position in said carriage and being movable by a predetermined range from said standard position;

a first means for actuating said light beam focussing means to deviate from said standard position in response to a tracking error signal so that said light beam following said concentric tracks or said spiral track;

a second means for actuating said carriage to move in a radial direction with respect to said disc, said light beam focussing means being moved to said standard position in said carriage relative to a movement of said carriage;

means associated with said light beam focussing means for detecting a deviation of said light beam focussing means from said standard position and producing a deviation signal in response thereto;

a power source for applying a drive voltage to said second actuating means;

a switch means connected between said power source and said second actuating means;

means responsive to said deviation signal for controlling said switch means to apply said drive voltage to said second actuating means, wherein said light beam focussing means is moved to said standard position on or before reaching an end of said movable range; and

means for producing said tracking error signal responsive to a deviation of said light beam from a center of said concentric or spiral track, and wherein said deviation detecting means comprises a circuit means connected to said tracking error signal producing means for detecting a DC component of said tracking error signal.

4,853,914

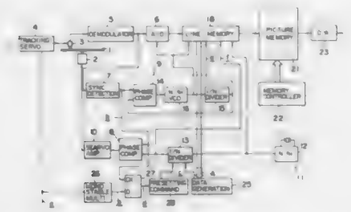
TIME BASE CORRECTION SYSTEM WITH COARSE AND FINE CORRECTION

Takashi Okano; Toru Akiyama, and Masao Kanda, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 15, 1988, Ser. No. 168,246
Claims priority, application Japan, Mar. 16, 1987, 62-61494
Int. Cl.[4] G11B *7/00;* H04N *5/76*
U.S. Cl. 369—32 5 Claims

1. A time base control method in which, in effecting a coarse

control and a fine control of time base in accordance with a relative speed between a recording medium and a signal reading means for reading a signal from said recording medium, a read signal obtained by said signal reading means is written into a memory successively from a predetermined address of said memory by using a write reset signal synchronized in phase with a predetermined signal component contained in said read signal, and said read signal written in said memory is



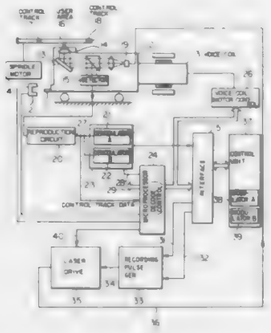
read-out successively from said predetermined address by using a read-out reset signal generated at predetermined intervals, said time base control method being characterized by changing phases of generation of said read-out reset signal before and after a starting of a track jump operation by which a signal detection point of said signal reading means moves from a track section to another track section of said recording medium.

4,853,915

OPTICAL RECORDING/REPRODUCING METHOD AND APPARATUS FOR OPTICAL DISK MEDIUM HAVING UNIQUE CONTROL PARAMETERS

Masahiro Takasago, and Shinichi Arai, both of Odawara, Japan, assignors to Hitachi, Ltd., Chiyoda, Japan

Filed Oct. 20, 1987, Ser. No. 110,358
Claims priority, application Japan, Oct. 24, 1986, 61-251628
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—32 **18 Claims**



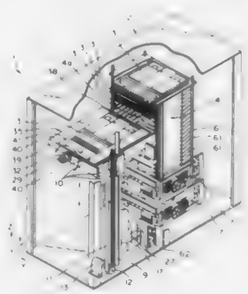
1. An optical recording/reproducing apparatus comprising:
(a) an optical disk medium including a plurality of tracks of information comprising a first set of specific tracks that store, as control parameter information, an optical condition, associated with that disk, for a light beam for recording/reproducing to the optical disk medium and a second set of tracks on which data is to be recorded on and reproduced from;
(b) an optical head, movable in the radius direction of said optical disk medium, that is capable of reading from said optical disk medium by irradiating the disk with a light beam;
(c) means for detecting that said optical head has been positioned where a portion of said first set of specific tracks is irradiated with the light beam;
(d) first means for demodulating the data from that portion of the light beam reflected from said second set of tracks of said optical disk medium irradiated by said light beam through said optical head;
(e) second means for demodulating the control parameter information from that portion of the light beam reflected from said specific tracks of said optical disk medium irradiated by said light beam through said optical head; and
(f) means, responsive to a result of the operation of said second means for demodulating, for controlling said first means for demodulating, said means for controlling further controlling the optical condition of the light beam for reproducing the data from said second set of tracks.

4,853,916

DISC PLAYER FOR PLAYING DISC CONTAINED IN CARTRIDE

Toshihiko Tomita, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 20, 1988, Ser. No. 184,011
Claims priority, application Japan, Jun. 15, 1987, 62-91567[U]
Int. Cl.[4] G11B *5/48, 17/00*
U.S. Cl. 369—36 **13 Claims**



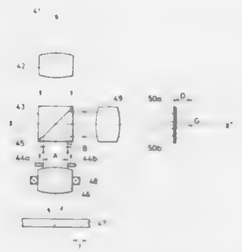
1. A cartridge disc player which comprises: a holder for holding a plurality of cartridges, each of said cartridges having at least one end, each cartridge containing therein a recording disc and having an access aperture through which a pickup can access to said disc; playback means for playing a cartridge disc loaded thereon; and cartridge transfer means for drawing a selected one of the cartridges from said holder, and for transferring and loading the selected cartridge to said playback means, said cartridge transfer means including:
a base carrier movable along said holder in a first direction in which said cartridges are arranged in order;
base carrier positioning means for positioning said base carrier at positions corresponding to a selected one of said cartridges and to said playback means;
a movable chassis mounted on said base carrier so as to be movable in a second direction substantially perpendicular to said first direction between a first position close to said holder and a second position remote from said holder;
a single catch arm assembly including at least one pair of catch arms swingably mounted on said movable chassis to swing in opposite directions to each other between a pinch position when said movable chassis is in said first position in which said catch arms are close to each other to pinch one of said cartridges at one end thereof and a release position when said movable chassis is in said second position in which said catch arms are remote from each other, and suppress means for suppressing the movement of said catch arms; and
movable chassis drive means for driving said movable chassis with respect to said base carrier by urging said catch arm assembly in said second direction.

4,853,917

OPTICAL INFORMATION PROCESSING APPARATUS PROVIDED WITH A PHOTODETECTOR DISPOSED OUTSIDE PART OF THE EFFECTIVE DIAMETER OF A LENS SYSTEM AND ADAPTED TO BE MOVABLE WITH THE LENS SYSTEM TO THEREBY DETECT THE POSITION OF THE LENS SYSTEM

Osamu Koyama, Kawasaki; Kazuo Uzuki; Makoto Shiho, both of Yokohama, and Shigeru Aoi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1987, Ser. No. 41,348
Claims priority, application Japan, Apr. 25, 1986, 61-96175; Apr. 28, 1986, 61-96864; Jun. 16, 1986, 61-138344
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—44 **9 Claims**



1. An optical information processing apparatus comprising:
a light source for providing a light beam;
a lens system for condensing the light beam from said light source as a minute spot on a track of a recording medium;
tracking signal detecting means for receiving the light beam from said spot modulated by said recording medium to thereby detect a positional deviation of said spot relative to the track in a tracking direction crossing the track and for providing an output signal corresponding to the positional deviation;
correcting means for moving said lens system in the tracking direction in response to at least the output signal from said tracking signal detecting means to thereby correct the positional deviation; and
lens position detecting means including at least one photoelectric converting element, provided outside the effective diameter of said lens system so as to be movable with said lens system, for directly receiving part of the light beam from said light source to thereby detect the position of said lens system in the tracking direction.

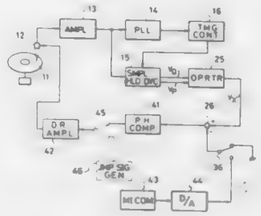
4,853,918

TRACKING SERVO USES TANGENT FUNCTION TO DETERMINE TRACKING ERROR SIGNAL

Seiji Kobayashi, Tokyo, and Norio Nishida, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,308
Claims priority, application Japan, Jan. 22, 1987, 62-12716
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—44 **6 Claims**

1. A tracking servo apparatus for performing tracking servo of a beam spot with respect to a recording medium having recording tracks, said apparatus comprising:
circuit means for generating a tracking error signal and a first signal having a phase shift of 90° with respect to the tracking error signal and producing a displacement signal based on said tracking error signal and said first signal proportional to a displacement of said beam spot from a given one of said recording tracks in a track pitch direction; and
means responsive to said displacement signal for performing



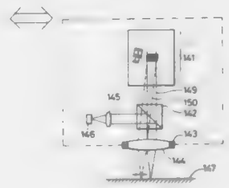
tracking servo, where the tracking error signal is Asin 2 (x_2/p) and the first signal is Acos 2 (x/p), p being the track pitch and x being the displacement of the beam spot from said given recording track.

4,853,919

INFORMATION PROCESSING APPARATUS IN WHICH A DEFLECTED LIGHT AND O-ORDER LIGHT ARE RESPECTIVELY USED FOR INFORMATION RECORDING/REPRODUCTION AND TRACKING, AND A METHOD THEREFOR

Mamoru Miyawaki, Tokyo, and Kazuya Matsumoto, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 651,780, Sep. 18, 1984, abandoned. This application Jan. 13, 1988, Ser. No. 144,686
Claims priority, application Japan, Sep. 22, 1983, 58-175376
Int. Cl.[4] G11B *7/09*
U.S. Cl. 369—46 **8 Claims**



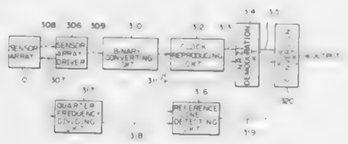
1. An information processing apparatus, comprising:
a light deflector for deflecting light by utilizing diffraction;
optical means for applying the deflected light and O-order light from said light deflector to a recording medium, said optical means applying the O-order light to guide track on the recording medium, applying the deflected light to data track locations and performing information recording or reproduction by said deflected light;
detecting means for detecting the O-order light reflected by the recording medium and for obtaining a tracking signal; and
adjusting means for controlling said optical means in accordance with said tracking signal to cause said O-order light to be applied to the guide track.

4,853,920

INFORMATION RECORDING MEDIUM AND REPRODUCING METHOD THEREFOR

Hideki Hosoya, Yokohama; Akio Aoki, Tokyo, and Masahiko Enari, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 830,747, Feb. 19, 1986, abandoned.
This application Mar. 22, 1988, Ser. No. 170,030
Claims priority, application Japan, Feb. 20, 1985, 60-31867
Int. Cl.[4] G11B *7/00, 5/09*
U.S. Cl. 369—59 6 Claims



1. An apparatus for reproducing information from an information track having information recorded thereon by a self-clocking modulation system, comprising:

sensor means for receiving a projection of an information track desired to be read and at least a portion of an information track other than said desired information track;

means for producing a reproducing clock from a signal received by said sensor means from said portion of said information track other than said desired information track; and

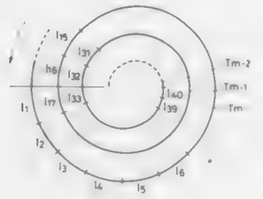
means for reproducing information received by said sensor means from said desired information track using said reproducing clock.

4,853,921

METHOD FOR STORING DATA IN ROTARY TYPE RECORDING MEDIA

Haruo Takeda, Kawasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 20, 1987, Ser. No. 39,748
Claims priority, application Japan, Apr. 18, 1986, 61-87919
Int. Cl.[4] G11B *19/02*
U.S. Cl. 369—59 7 Claims



1. A method for storing data in a rotary type recording medium rotating in a predetermined direction in which reading of information from a plurality of adjacent tracks is conducted at a higher speed when a head is moved in a first radial direction of said recording medium than that when said head is moved in a second radial direction opposite to said first radial direction, comprising the steps of:

rotating said recording medium in said predetermined direction;

obtaining a first address for indicating a location of the newest data block within a predetermined storage area including a plurality of tracks defined on said recording medium;

determining from said first address a second address for indicating a location to store a subsequent data block to be added to said storage area so that a plurality of data blocks are located to pass sequentially from the newest one through said head when said head is moved in said first direction; and

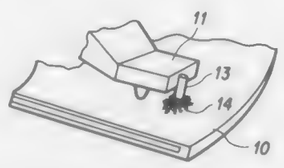
writing the new data block into said recording medium by positioning said head at the location of said second address.

4,853,922

METHOD OF CLEANING THE SURFACE OF AN OPTICAL DISC AND A CLEANING DEVICE

Yoshinori Funaki, Himeji, Japan, assignor to Daicel Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 924,726, Oct. 30, 1986, abandoned.
This application Apr. 21, 1988, Ser. No. 184,564
Claims priority, application Japan, Oct. 30, 1985, 60-242399
Int. Cl.[4] G11B *23/50, 3/58*
U.S. Cl. 369—72 3 Claims



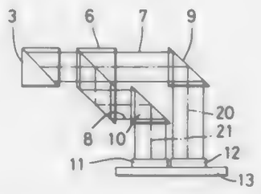
1. A cleaning device for cleaning a surface of an optical high density information recording carrier having a transparent plastic substrate and a recording layer supported on a first surface of said transparent plastic substrate, said cleaning device comprising a support member, which is a stationary portion of a writing/reading unit, and feathers supported by said supporting member, wherein said feathers are adapted to contact with a second surface of said transparent substrate which is opposite to said first surface on which said recording layer is supported, and further wherein said feathers have a compression resiliency of a least 40 percent under a load of 200 g.

4,853,923

MANETO-OPTICAL RECORDING APPARATUS WITH PATH LENGTH COMPENSATED DUAL PHOTO-ELECTRIC CONVERSION

Tomoaki Yamada, Yokohama, and Yuwa Ishii, Kawasaki, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Dec. 8, 1986, Ser. No. 939,026
Claims priority, application Japan, Dec. 12, 1985, 60-279589
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—120 3 Claims



1. An apparatus for projecting a beam of linearly polarized light onto a magnetooptical recording medium and detecting the light coming from said magnetooptical recording medium, comprising:

(a) first photo-electric conversion means;

(b) second photo-electric conversion means;

(c) a substrate on which said first and second photo-electric conversion means are disposed so that said first and second photo-electric conversion means are positioned on a predetermined same plane of said substrate;

(d) reproducing means for producing a reproducing signal on the basis of outputs of said first and second photo-electric conversion means; and

(e) optical means for dividing the light from said magnetooptical recording medium into two light components which have different planes of polarization, said optical means having a first optical system for guiding one of said two light components to said first photo-electric conversion means and a second optical system for guiding the other of said two light components to said second photo-electric conversion means so that the optical axes of said two light components are parallel to each other and substantially perpendicular to said predetermined plane, said first and second optical systems being constructed to cause the difference in the optical path length between said two light components to be limited within a predetermined range, whereby Common Mode Rejection Ratio with respect to said reproducing signal is optimum, wherein said optical means satisfies the following condition:

$$d \leqq 5 \times 10^8 / fmax \ (mm)$$

wherein,

d is the difference between said two optical path lengths; and

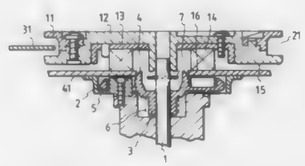
fmax is the maximum frequency contained in said reproducing signal.

4,853,924

DISK CLAMPING DEVICE

Junji Takahashi, and Isami Kenmotsu, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 8, 1988, Ser. No. 203,833
Claims priority, application Japan, Aug. 28, 1987, 62-215973
Int. Cl.[4] G11B *17/028*
U.S. Cl. 369—270 6 Claims



1. A disk clamping device comprising: a turntable for mounting a selected one of a first disk and a second disk, said first disk having a greater thickness than said second disk, a hub for centering the disk mounted on said turntable, a clamper having a first surface for pressing said first disk and a second surface parallel to said first surface projecting in a clamping direction further than said first surface for pressing said second disk, and a magnet constituting at least a part of at least one of said second surface of said clamper and a surface of said turntable for generating a force urging said clamper against said turntable.

4,853,925

INFORMATION MEMORY UNIT

Kazuo Kaneuchi, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 28, 1987, Ser. No. 90,371
Claims priority, application Japan, Sep. 1, 1986, 61-205309
Int. Cl.[4] G11B *23/03*
U.S. Cl. 369—291 19 Claims

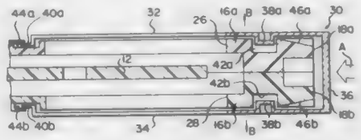
1. An information memory unit comprising:

an information memory medium; and

a cartridge rotatably containing the information memory medium therein,

said cartridge including a cartridge body containing the memory medium, the cartridge body having first and second surface walls facing each other at a predetermined distance and each having side edges, a first opening portion formed in the first surface wall so that part of the memory medium is exposed through the first opening portion, a second opening portion formed in the second surface wall and facing the first opening portion, and a guide groove formed on the first surface wall and extending along one of the side edges of the first surface wall; and

a shutter slidably attached to the cartridge body, said shutter



including a first shielding portion slidably located on the first surface wall, for opening and closing the first opening portion, a second shielding portion slidably located on the second surface wall, for opening and closing the second opening portion, a coupling portion connecting the first and second shielding portions, and a guide projection protruding from the first shielding portion and engaging the guide groove, thereby guiding the shutter in sliding action,

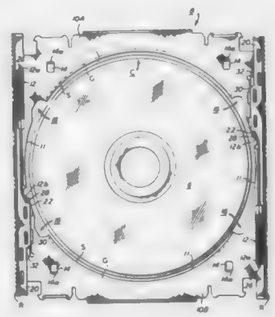
said cartridge body having a fitting groove formed on the first surface wall and extending from the edge of the guide groove to the side edge of the first surface wall so as to decline toward the second surface wall, for guiding the guide projection to the guide groove when the shutter is attached to the cartridge body.

4,853,926

SPLIT CARRIER FOR DATA STORAGE DISKS

Roger G. Covington, Rochester; Thomas D. Jensen, Himrod; Stephen H. Miller, and Craig B. Wilson, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 16, 1988, Ser. No. 208,190
Int. Cl.[4] G11B *23/02;* B65D *85/02*
U.S. Cl. 369—291 10 Claims



1. A carrier for releasably retaining a data storage disk, said carrier comprising:

(a) a pair of identically shaped crescent-shaped frame members which cooperate to define a generally circular aperture for receiving a data storage disk, said frame members

being slidably coupled to vary the size of said circular aperture, said circular aperture being defined, at least in part, by arcuate surfaces on each of said frame members, said arcuate surfaces defining an arcuate groove which is adapted to engage and support the peripheral region of a data storage disk, each of said frame members comprising a pair of parallel leg members, both of said leg members having integral tongue and groove structure which is adapted to mate with the tongue and groove structure of the leg members of the other said frame members to slidably couple said frame members together; and

(b) means for urging said frame members together so that the arcuate groove-defining surfaces of said frame members cooperate to engage the peripheral region of the data storage disk positioned in said aperture.

4,853,927

METHOD AND CIRCUIT ARRANGEMENT FOR DECENTRALIZED CONTROLLED TRANSMISSION REROUTING

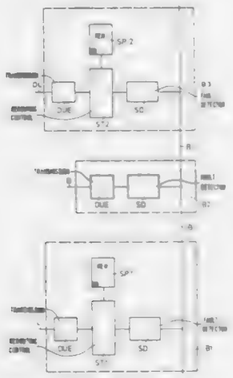
Robert Wenzel, Obermichelbach, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 9, 1987, Ser. No. 130,820

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642141

Int. Cl.⁴ H04J *3/14*; H04L *1/00*

U.S. Cl. 370—16 **5 Claims**



1. A message transmission network comprising:

(a) a plurality of zones (BZ), each respective zone comprising:

(i) a respective plurality of operating stations (B1, . . . , Bm), and

(ii) a single respective rerouting control device (ST1, . . . , STn) arranged within one of the respective operating stations of the respective zone which store at least a map of a network of restoration links for the respective zone and adjacent zones;

(b) a plurality of operating paths (B) for transmitting messages between the operating stations,

(c) a plurality of restoration links (E) for carrying rerouted messages between the operating stations (B1, . . . , Bm) in case of a fault in transmission via the operating paths, and

(d) a plurality of data lines DL for fully meshing the respective rerouting control devices,

wherein each respective rerouting control device controls transmission rerouting for any fault occurring adjacent to the respective rerouting control device independently of the other rerouting control devices.

4,853,928

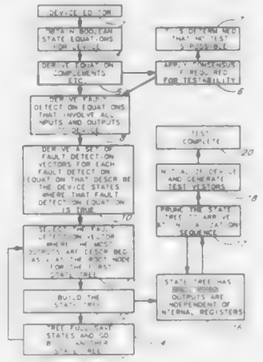
AUTOMATIC TEST GENERATOR FOR LOGIC DEVICES

Wayne R. Williams, Boulder, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 28, 1987, Ser. No. 90,869

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 371—15 **11 Claims**



10. A method of constructing a state tree to describe a sequence of states of a logic device comprising the steps of:

deriving a root state of said logic device;

sequentially deriving previous states of said device;

defining states of said device as product vectors;

placing said product vectors as nodes at levels in accordance with a time sequence in which said states were sequentially derived such that each level contains nodes defining possible states of said logic device at a specified time;

pruning irrelevant nodes from said state tree as each previous state is derived by eliminating nodes that have redundant output assignments and have output assignments that are covered by output assignments in successor state nodes.

4,853,929

ELECTRONIC CIRCUIT DEVICE ABLE TO DIAGNOSE STATUS-HOLDING CIRCUITS BY SCANNING

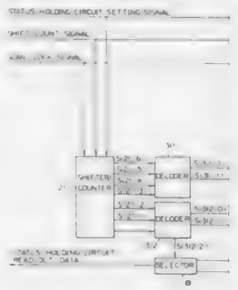
Isao Azuma, Fujiidera; Miyuki Ishida, and Naozumi Aoki, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 4, 1988, Ser. No. 164,483

Claims priority, application Japan, Mar. 6, 1987, 62-051562; May 9, 1987, 62-112963

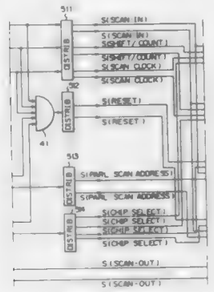
Int. Cl.⁴ G01R *31/28*

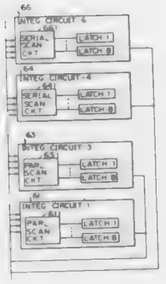
U.S. Cl. 371—25 **13 Claims**



1. An electronic circuit device able to diagnose a status-holding circuit by scanning, said device comprising:

a first plurality of integrated circuits each including a serial scan circuit and a plurality of status-holding circuits to be





scanned, said serial scan circuit receiving serial data, generating an address value of a target status-holding circuit as parallel data from the received serial data, and selecting the target status-holding circuit having the generated address value;

a second plurality of integrated circuits each including a parallel scan circuit and a plurality of status-holding circuits to be scanned, said parallel scan circuit receiving an address value of a target status-holding circuit as parallel data and selecting the target status-holding circuit having the received address value;

a serial-parallel converter means for receiving a serially supplied address signal and converting the received signal into a parallel address signal,

a first decoder means, connected to said serial-parallel converter means, for decoding a first part of said parallel address signal and providing a plurality of chip select signals each corresponding to one of said first and second plurality of integrated circuits, respectively;

a first distributing means for receiving a second part of said parallel address signal and distributing this second part to each of said second plurality of integrated circuits, and

a second distributing means for receiving said serially supplied address signal and distributing this signal to each of said first plurality of integrated circuits.

4,853,930

ERROR-CORRECTING BIT-SERIAL DECODER

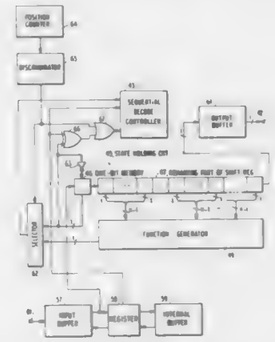
Michio Shimada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 22, 1987, Ser. No. 99,801

Claims priority, application Japan, Sep. 22, 1986, 61-225403; Dec. 22, 1986, 61-303941

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—43 **9 Claims**



1. In an error-correcting decoder for use as a counterpart of an error-correction encoder for encoding an information symbol sequence into a code symbol sequence which comprises said information symbol sequence and a redundancy bit sequence in accordance with a predetermined rule, said decoder comprising an encoder replica responsive to an input code sequence corresponding to said code symbol sequence for producing a replica output signal with reference to said predetermined rule and a sequential decode controller for executing a sequential decoding algorithm on said input code sequence and said replica output signal to supply said encoder replica with a control signal for use in making said encoder replica decode said input code sequence into a decoded symbol sequence which gives a reproduction of said information symbol sequence, the improvement wherein:

said encoder replica comprises:

a one-bit memory;

input means for delivering consecutive bits of said input code sequence to said one-bit memory to make said one-bit memory successively memorized said consecutive bits;

output means for producing replica output bits in response to the consecutive bits successively memorized in said one-bit memory and for delivering said replica output bits in bit series to said sequential decode controller as said replica output signal produced with reference to said predetermined rule;

said encoder replica being responsive to said control signal to produce said decoded symbol sequence in response to the consecutive bits successively memorized in said one-bit memory;

bit position counting means responsive to said control signal for counting positions of the respective consecutive bits in said input code sequence to produce a bit position count signal representative of said positions; and

a discriminator responsive to said bit position count signal for producing a first and a second discrimination signal, said first discrimination signal being indicative of positions of span bits collectively corresponding in said input code sequence to said information symbol sequence, said second discrimination signal being indicative of positions of intermittent bits collectively corresponding in said input code sequence to said redundancy bit sequence;

said output means comprising a replica output selector responsive to said first discrimination signal for selecting, as tentatively predicted bits, the consecutive bits succes-

sively memorized in said one-bit memory, said replica output selector being responsive to said second discrimination signal for selecting, as parity bits, the produced bits with reference to said predetermined rule, said replica output selector being for delivering said tentatively predicted bits and said parity bits in bit series to said sequential decode controller as said replica output signal.

4,853,931

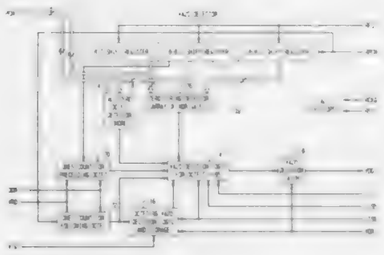
VIOLATING ALL ZERO OCTET (VAZO) DETECTOR FOR A ZERO BYTE TIME SLOT INTERCHANGE (ZBTSI) ENCODER

Steven S. Gorshe, Phoenix, Ariz., assignor to Siemens Transmission Systems, Inc., Phoenix, Ariz.

Filed Apr. 15, 1988, Ser. No. 181,785

Int. Cl.[4] H04Q *7/00*

U.S. Cl. 371—55 **13 Claims**



1. A VAZO detector circuit for implementation on an integrated circuit chip for ZBTSI data transmission systems, comprising:

input shift register means for receiving scrambled PCM data, including means for temporarily storing a current octet having an information content and two adjacent octets of said current octet in said scrambled PCM data, said adjacent octets also having an information content;

decision logic circuit means for examining said information content of the current octet of a block of 96 8-bit channels and said two adjacent octets to determine whether their combination with said current octet is a violation of a predetermined logic criteria, said decision logic circuit including means for deriving an output signal representative of said violation of said criteria when said current octet is all-zeros and combines with said adjacent octets such that any one of the following criteria occurs;

(a) said all-zero octet is not Octet **1**, **95** or **96** and combines with said adjacent octets to form a data string of at least fifteen consecutive zeros;

(b) said all-zero octet is not Octet **1**, **95** or **96** and the data in either of said adjacent octets contains less than two logic ones;

(c) said all-zero octet is either Octet **1** or **95**;

(d) said all-zero octet is Octet **96** and there is at least one other VAZO in the 96-octet group or the data in Octet **1** contains less than two logic ones.

4,853,932

METHOD OF MONITORING AN ERROR CORRECTION OF A PLURALITY OF COMPUTER APPARATUS UNITS OF A MULTI-COMPUTER SYSTEM

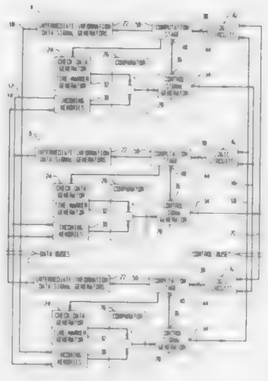
Werner Nitschke, Ditzingen; Hugo Weller, Oberriexingen; Wolfgang Drobny, Besigheim, and Peter Taufer, Renningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 9, 1987, Ser. No. 107,386

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3639055

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—68 **18 Claims**



1. Method of monitoring and error-correcting a plurality of computer apparatus units (A,B,C), forming a part of a multi-computer system, which process data in data processing cycles,

wherein each of said units process data and wherein data buses (**10,12,14**) and control buses (**16,18,20**; **46,48**) are provided, interconnecting the plurailty of computer apparatus units (A,B,C) and synchronizing operation of the respective units, comprising the steps of

generating intermediate information data in each of said units at predetermined time intervals;

transmitting said intermediate information data generated in any one unit to each of the others of said units in the system;

comparing said intermediate information data with check data generated within the respective units and, if the comparison in any one of the units between the intermediate information data and the check data

(a) determine coincidence, continuing processing the data in the units, or

(b) detects a deviation, suppressing a subsequent computation cycle of only that one unit or those of the units in which the deviation was detected, and commanding repetition of at least one preceding computation cycle by said at least one of the units in which the deviation was detected, and further including the steps of placing those computer units from which coincidence has been detected, in a "set-and-hold" mode.

4,853,933

NON-TRANSFORM LIMITED PULSE LOCKED RADIATION MODE RADIATION GENERATOR WITH EXTERNAL CAVITY HAVING NON-LINEAR TRANSMISSION CHARACTERISTIC IMPROVING MODE LOCKING

Keith J. Blow, and David C. Wood, both of Woodbridge, England, assignors to British Telecommunications, London, England

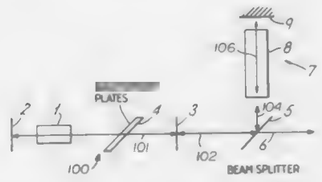
PCT No. PCT/GB87/00072, § 371 Date Sep. 30, 1987, § 102(e) Date Sep. 30, 1987, PCT Pub. No. WO87/04871, PCT Pub. Date Aug. 13, 1987

PCT Filed Feb. 2, 1987, Ser. No. 113,820

Claims priority, application United Kingdom, Feb. 3, 1986, 8602578; Jul. 24, 1986, 8618117

Int. Cl.[4] H01S *3/098*

U.S. Cl. 372—18 **10 Claims**



1. A radiation generator in which substantially all radiation modes are locked with respect to one another, comprising:

a radiation generating cavity means for generating a continuous train of non-transform limited pulses of coherent radiation; and

an external cavity adjacent and coupled to said radiation generating cavity coupling between the radiation generating cavity means and the external cavity permitting radiation to pass in both directions between the radiation generating cavity means and the external cavity, the external cavity including a medium having a non-linear loss characteristic which predominates over any non-linear refractive index property of said medium for radiation from the radiation generating cavity means, and having a radiation path length such that pulses fed into the external cavity are fed back to the radiation generating cavity means in synchronism with a later pulse from the radiation generating cavity means.

4,853,934

SEMICONDUCTOR LASER CONTROL APPARATUS

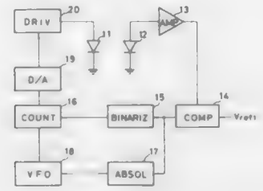
Tatsuaki Sakurai, Machida, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 270,523

Claims priority, application Japan, Nov. 20, 1987, 62-293608

Int. Cl.[4] H01S *3/13*

U.S. Cl. 372—29 **19 Claims**



1. A semiconductor laser control apparatus for controlling an optical output of a semiconductor laser, said semiconductor laser control apparatus comprising:

light receiving means for receiving a laser beam emitted from the semiconductor laser and for outputting an output signal by carrying out a photoelectric conversion;

comparator means for comparing the output signal of said light receiving means and a reference signal and for outputting an error signal indicative of an error between the two compared signals, said reference signal having a level corresponding to a desired target value of the optical output which is to be obtained from said semiconductor laser;

clock generating means for generating clock pulses;

up-down counter means for counting the clock pulses from said clock generating means, said up-down counter carrying out one of an up-count and a down-count responsive to a first control signal;

control means for controlling said clock generating means and said up-down counter means responsive to the error signal from said comparator means; and

driving means for driving the semiconductor laser by supplying a current proportional to a counted value of said up-down counter means,

said control means outputting the first control signal which determines one of the up-count and the down-count of said up-down counter depending on whether a level of the output signal of said light receiving means is lower or higher than the level of said reference signal and ouputting a second control signal which is supplied to said clock generating means and variably controls a frequency of the clock pulses depending on an absolute value of the error signal from said comparator means.

4,853,935

FREQUENCY STABILIZATION OF GAS LASERS

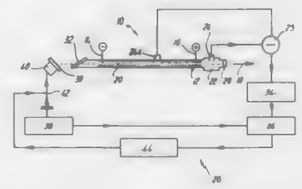
Derek C. Lainé, Keele, England, and Mohammad I. A. Taha, Abu Deis, Israel, assignors to University of Keele, Keele, England

Filed Aug. 22, 1988, Ser. No. 235,062

Claims priority, application United Kingdom, Aug. 25, 1987, 8720022

Int. Cl.[4] H01S *3/13*

U.S. Cl. 372—32 **19 Claims**



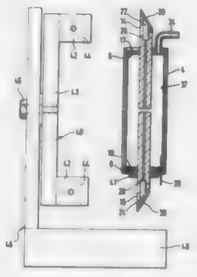
1. A gas laser comprising a gas-filled enclosure and excitation means operable to excite said gas within said enclosure to emit laser radiation, said excitation means exciting a plasma in a first region of said enclosure, and said enclosure having a second substantially plasma-free region, said laser further comprising pressure sensing means located in said second region, said pressure sensing means detecting pressure changes associated with absorption of laser radiation by said gas within said second region, said laser further comprising feedback means operative in response to the output of said pressure sensing means to control the frequency of said emitted laser radiation.

4,853,936
INDEX GUIDED SEMICONDUCTOR LASER DEVICE
Sadayoshi Matsui, Tenri; Shinji Kaneiwa; Taiji Morimoto, both of Nara; Masahiro Yamaguchi, Tenri; Mototaka Taneya, Tsukuba, and Mitsuhiro Matsumoto, Nara, all of Japan, assignors to 501 Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 13, 1988, Ser. No. 181,016
Claims priority, application Japan, Apr. 15, 1987, 62-94081
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 8 Claims



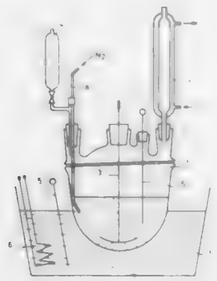
1. In a VSIS index guided semiconductor laser device having a substrate with a striped V-channel and an active layer disposed above said substrate, a difference between the effective refractive index of the region of said active layer positioned outside of said striped V-channel and the effective refractive index of the region of said active layer positioned over said striped V-channel being created within said active layer, resulting in a striped optical waveguide within said active layer, which corresponds to said striped-channel, wherein said laser device comprises at least a part of said waveguide having continuous indentations at the interface between the waveguide and the outside of the waveguide, whereby only laser light of a high-order transverse mode is radiated from said waveguide to the outside of the waveguide and only laser light of the fundamental transverse mode is propagated within said waveguide.

4,853,938
HE—NE GAS DISCHARGE TUBE
Rudolf F. W. Neubauer, Braunschweig; Werner W. Jungbluth, Königslutter, and Dieter H. Laschinski, Braunschweig, all of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany
Filed Feb. 2, 1988, Ser. No. 151,393
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1987, 3703304
Int. Cl.[4] H01S *3/03*
U.S. Cl. 372—65 5 Claims



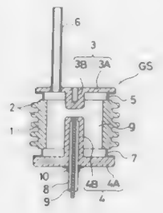
1. A He—Ne gas discharge tube comprising a cylindrical tube body having opposite ends, a tubular cathode cylinder having opposite ends received in coaxial relation in said tube body so that the ends of said cathode cylinder are spaced inwardly from the ends of said tube body, a pair of substantially planar, circular, disk-like end walls snugly received in the opposite ends of said tube body, each of said end walls having a hole therethrough and having an inwardly facing inner side and an outwardly facing outer side, at least one of said end walls engaging the adjacent end of said cathode cylinder so that said cathode cylinder functions as a stop for positioning said at least one end wall in said tube body, a pair of glass capillary tubes aligned along a common axis, each of said capillary tubes being received in the hole in a different one of said end walls and extending outwardly from the respective end wall thereof terminating in an outer end, an exhaust pipe sealingly mounted in one of said end walls so that it communicates with the interior of said cathode cylinder, Brewster windows closing the outer ends of said capillary tubes, anode elements in said capillary tubes adjacent the outer ends thereof, a connecting pin connected to said cathode cylinder and extending through one of said end walls, said tube body, said end walls and said capillary tubes each consisting of either calcium alkalisilicate glass or calcium alumosilicate glass, and glass solder applied to the inner side of one of said end walls and to the outer side of the other of said end walls, said glass solder sealingly connecting said end walls to said tube body and to the respective capillary tubes thereof, said glass solder also sealingly connecting one of said end walls to said exhaust pipe and sealingly connecting one of said end walls to said connecting pin.

4,853,937
LASER-ACTIVE AQUEOUS DISPERSION OF A LASER DYE
Monika Rinke, Weingarten, and Hans Guesten, Spever, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Fed. Rep. of Germany
Filed Nov. 15, 1988, Ser. No. 271,455
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1987, 3738933
Int. Cl.[4] H01S *3/20*
U.S. Cl. 372—53 19 Claims



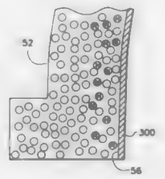
1. A laser-active dispersion of a laser dye which can be excited to laser emission by a pumping laser, comprising: microparticles containing a laser dye, an aqueous liquid having a refractive index substantially the same as that of the microparticles, and wherein the microparticles are suspended in the aqueous liquid.

4,853,939
GAP SWITCH
Masashi Kokawa, Minami, Japan, assignor to Horiba, Ltd., Kyoto, Japan
Filed Apr. 26, 1986, Ser. No. 186,448
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—81 16 Claims



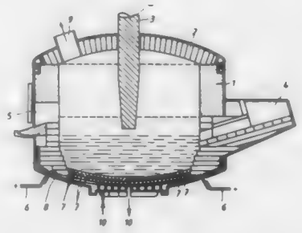
1. In a pulse discharge-type gas laser device, an improved starting assembly constituting a gap switch, comprising:
an insulated vessel filled with hydrogen gas which is present at about two to three atmospheres of pressure so as to maximize ion extension and maximize a breakdown voltage;
a first electrode in a T-shaped configuration extending interiorly of said vessel, and covering an open end of said vessel said first electrode being connected to a discharge electrode of said laser device;
a second electrode in a T-shaped configuration also extending interiorly of said vessel and covering another open end of said vessel such that said first electrode and second electrode are aligned end-to-end with one another so that an appointed distance between them within said vessel is minimized, said second electrode being connected to a condenser electrode of said laser device; and
a trigger pin in said second electrode which receives a pulsed voltage.

4,853,940
LASER CATHODE COMPOSED OF EMBEDDED LASER GAS MOLECULES
Carol M. Ford, Columbia Heights, and Theodore J. Podgorski, Maplewood, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 30, 1988, Ser. No. 292,273
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—87 16 Claims



1. A cathode for a laser generator employing a selected lasing gas, said cathode being comprised of a body having an active surface in communication with said lasing gas, said active surface of said cathode is embedded with molecules of at least one selected element of said lasing gas.

4,853,941
D.C. ARC FURNACE HAVING ELECTRICALLY CONDUCTIVE HEARTH AND METHOD FOR MAKING SAME
Bo Rappinger, and Sven-Einar Stenkvist, both of Västerås, Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden
Continuation-in-part of Ser. No. 829,296, Feb. 13, 1986, abandoned. This application Mar. 16, 1988, Ser. No. 168,899
Claims priority, application Sweden, Feb. 21, 1985, 8500837
Int. Cl.[4] B29C *71/02*; F27D *1/04, 1/16*
U.S. Cl. 373—72 3 Claims

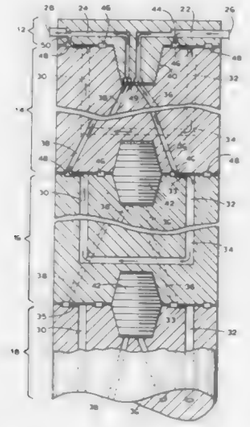


1. A d.c. arc furnace having a depending arcing electrode disposed above a bottom electrode, the arc furnace having a hearth made on top of the bottom electrode and disposed below the arcing electrode, said hearth being electrically conductive and being made of bricks laid on the bottom electrode, the bricks being electrically conductive tempered magnesite-graphite bricks containing volatile material having a volatile component and having an initial resistivity prior to heat treating the bricks before being used in the hearth being heat treated at temperatures both coking the material having the volatile component and reducing the electrical resistivity of the bricks below the initial electrical resistivity, the conductive brick hearth being composed from top to bottom of said heat treated magnesite-graphite bricks and being in electrical contact with the bottom electrode and molten metal when the furnace is in use.

4,853,942
GRAPHITE ELECTRODE WITH INTERNAL COOLING FOR ELECTRIC ARC FURNACES
Juan Celada-Salmon, Garza Garcia, Mexico, assignor to Hylsa, S.A. De C.V., Monterrey, Mexico
Filed Aug. 5, 1987, Ser. No. 81,838
Claims priority, application Mexico, Aug. 5, 1986, 3383
Int. Cl.[4] H05B *7/12, 7/14*
U.S. Cl. 373—91 19 Claims

1. A consumable graphite electrode for electric arc furnaces and the like, which comprises at least three graphite sections coupled to each other by connecting means, at least two of said sections being internally cooled by means of a cooling fluid flowing therethrough, each section having a main graphite body with a plurality of cooling conduits formed therein with said cooling conduits having at least an inlet and an outlet for the cooling fluid, a first cooling fluid supplying conduits coupled to said cooling conduits of the main graphite body, a second cooling fluid supplying conduit to lead said cooling fluid as a bypass from one end to the other end of the main graphite body and positioned to communicate at said other end with the first cooling fluid supplying conduit for any next section, a first cooling fluid collecting conduit coupled to said cooling conduits, and a second cooling fluid collecting conduit

to lead said cooling fluid as a bypass back from the other end to the one end of said main graphite body and positioned to



communicate at said other end with the first cooling fluid collecting conduit for any next section.

4,853,943

MANCHESTER CODE CLOCK AND DATA RECOVERY SYSTEM

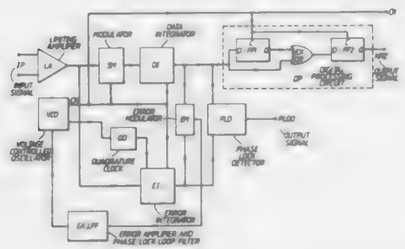
Peter G. Laws, Wiltshire, Great Britain, assignor to Plessey Overseas Limited, Ilford, England

Filed Feb. 16, 1988, Ser. No. 156,496

Claims priority, application United Kingdom, Feb. 26, 1987, 8704530

Int. Cl.[4] H03D *3/04*

U.S. Cl. 375—87 6 Claims



1. A Manchester code clock and data recovery system, comprising input means for receiving an encoded input signal having clock and data dependent transitions, a signal modulator connected to the input means, integration means for receiving modulated versions of the input signal from the signal modulator including a data integrator to which the signal modulator is connected and from which a Manchester biphase coded signal is generated and an error integrator connected to the input means, error modulation means connected to the data integrator and the error integrator for producing an error signal, loop circuit means connected to the error modulation means and the integration means for obtaining correct phase lock on the encoded input signal by distinguishing between said clock and data dependent transitions in the encoded input signal under control of the error signal, including a voltage controlled oscillator, first output means operatively connecting the voltage controlled oscillator to the data integrator for sampling over substantially a full bit period, and second output means operatively connecting the voltage controlled oscillator to the error integrator for sampling over substantially a half bit period to enable recovery of a clock signal from the first output means reflecting said clock dependent transitions in the encoded input signal and recovery of data from the Manchester biphase coded signal generated by the data integrator.

4,853,944

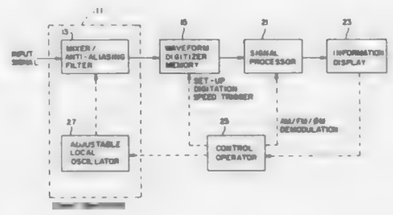
DIGITAL AM/FM/ϕM DEMODULATOR

Pei-hwa Lo, Ramsey; James M. Sokolich, Cliffside Park, and Ardis M. Matesick, Englewood Cliffs, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Mar. 10, 1988, Ser. No. 133,104

Int. Cl.[4] H04L *27/06*

U.S. Cl. 375—94 9 Claims



1. Demodulator for signals which may have different forms of modulation of carriers, in which the modulation is converted to a digital form, characterized by:

means to receive the signals;

adjustable local oscillator signal means;

mixer, connected to the means to receive and to the local oscillator means, in order to down-convert the carriers and provide a down-converted signal output;

means to sample the down-converted signal;

means to digitize the down-converted sampled signal output;

means to resolve the sampled signal to thereby provide a modulation component of the digitized signal;

means to prepare an output corresponding to the modulation;

control means, the control means connected to the means to sample and to the means to resolve, the control means providing a signal for causing the means to sample to provide a sample of the digitized signal and for causing the means to resolve to provide the modulation component of the sample;

means to filter the sampled signal in order to provide a band limited sampled signal;

the means to resolve the sampled signal including means to extract peak value of the sampled signal; and

means to interpolate the extracted peak value in order to provide a waveform model representative of the modulating signal.

4,853,945

SCINTILLATION MULTIPLEXER

Arthur Rich, and Bernard W. Agranoff, both of Ann Arbor, Mich., assignors to The University of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 906,173, Sep. 11, 1986, Pat. No. 4,771,444. This application Jun. 7, 1988, Ser. No. 203,789

The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.

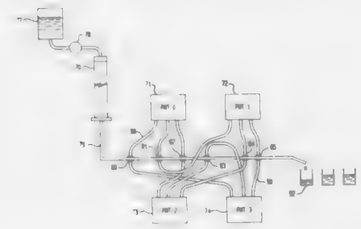
Int. Cl.[4] G01T *1/208*

U.S. Cl. 377—10 17 Claims

1. An arrangement for monitoring scintillation events at each of a plurality of monitoring points along a flow path of a continuously flowing effluent, the arrangement comprising:

flow tube means for defining the flow path, said flow tube means having m monitoring points therealong, where $m \geq 5$;

n sensor means arranged in the vicinity of the flow path for receiving indications of the scintillation events and producing responsive output electrical signals, where $n < m$;



light guide means for coupling optically each of said monitoring points to two of said sensor means; and

coincidence-determining means for identifying a one of said monitoring points at which a scintillation event occurred.

4,853,946

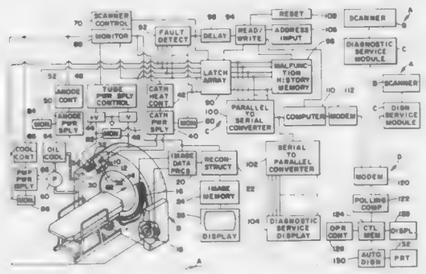
DIAGONOSTIC SERVICE SYSTEM FOR CT SCANNERS

Richard J. Elliott, Akron; Walter A. Dupuis, and Theodore A. Resnick, both of Cleveland Hts., all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Continuation of Ser. No. 931,548, Nov. 14, 1986, abandoned. This application Jun. 2, 1988, Ser. No. 201,405

Int. Cl.[4] H05G *1/60*

U.S. Cl. 378—4 21 Claims



12. A method of monitoring a medical electronic apparatus for malfunctions, the method comprising:

(a) continuously, transiently monitoring a plurality of ambient operating conditions of the medical electronic apparatus;

(b) in response to a detected malfunction, instantaneously freezing each of the ambient monitored conditions in temporary storage;

(c) transferring the frozen monitored conditions from temporary storage into a memory to create a malfunction history, such that the frozen monitored conditions provide a snap shot of the monitored conditions at each failure.

4,853,947

METHOD OF GENERATING AN X-RAY LAYER IMAGE OF AN EXAMINATION ZONE, AND DEVICE FOR PERFORMING THE METHOD

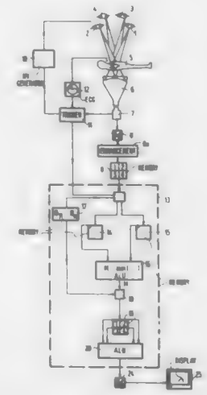
Paul R. Haaker, Hamburg; Erhard P. A. Klotz, Halstenbek; Reiner H. Koppe, Hamburg, and Rolf E. Linde, Haseldorf, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1987, Ser. No. 99,569

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1986, 3632833

Int. Cl.[4] H05G *1/64*

U.S. Cl. 378—99 5 Claims



4. In a device which generates x-ray layer images, of the type comprising means for projecting x-rays through an examination zone from a plurality of spatially diverse source points to produce projection images of the examination zone from the plurality of distinct perspectives and

means for combining corresponding points in each of the projection images to form a single layer image, the improvement wherein

the means for combining comprises means which store corresponding image point values from each of the projection images and which select, from the values of corresponding points in each of the projection images, the next to the lowest of said values for use as the value at a corresponding point in the layer image.

4,853,948

X-RAY DIAGNOSTICS INSTALLATION FOR OPTIONAL TRANSILLUMINATION OR EXPOSURE OF AN EXAMINATION SUBJECT

Gerd Huettenrauch, Uttenreuth, and Erhard Jenner, Heusdorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 6, 1988, Ser. No. 202,816

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1987, 3721590

Int. Cl.[4] G03B *41/18*

U.S. Cl. 378—177 11 Claims

9. An x-ray diagnostics installation for optional transillumination or exposure of an examination subject comprising:

an x-ray source;

an x-ray image intensifier;

means for supporting a patient between said x-ray source and said x-ray image intensifier;

carrier means supporting said x-ray source and said x-ray image intensifier on opposite sides of said means for supporting a patient;

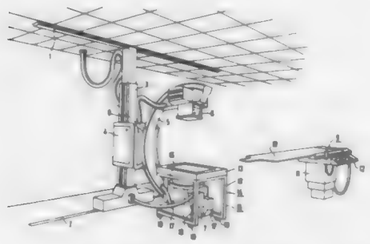
means for moving said carrier means in a plurality of direc-

tions so that said x-ray source and said x-ray image intensifier are moved in common relative to said means for supporting a patient;

control means for operating said means for moving to selectively position said x-ray source and said x-ray image intensifier relative to said means for supporting a patient;

a sheet film changer;

a carriage supporting said sheet film changer which is independently moveable relative to said carrier means, said carriage shaped to surround said x-ray image intensifier to permit positioning of said sheet film changer supported on said carriage in an x-ray beam path in front of said x-ray image intensifier;



means for coupling said sheet film changer to said x-ray image intensifier so that said sheet film changer moves with said x-ray image intensifier as said carrier means is moved;

means in said control means for preventing movement of said carrier means during coupling of said sheet film changer to said x-ray image intensifier; and

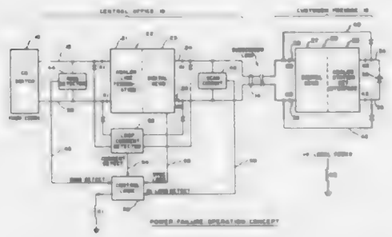
means in said control means for restricting movement of said carrier means to a longitudinal direction relative to said means for supporting a patient as long as said sheet film changer is coupled to said x-ray image intensifier.

4,853,948

FAIL SAFE VOICE SYSTEM FOR INTEGRATED SERVICES FOR DIGITAL NETWORK SUBSCRIBERS

Ian A. Schorr, Chicago; Gregory P. Pucci, Batavia; John P. Dorth, Downers Grove, and Bruce R. Miller, Aurora, all of Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 24, 1988, Ser. No. 173,228
Int. Cl.[4] H04M *11/06*
U.S. Cl. 379—2 16 Claims



1. A fail safe voice system for digital telephone networks and for providing for operation of voice telephone equipment at a customer location when a fault occurs at the customer location, the system having a central office having means for coding/decoding connected to subscriber loop lines and at least one customer location having means for coding/decoding connected to the subscriber loop lines comprising:

first means for connecting the voice telephone equipment to the subscriber loop lines and bypassing the customer's means for coding/decoding in response to a fault at the customer's premises; and

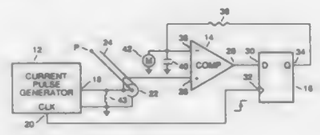
second means for connecting a means for determining loop current to the subscriber loop lines and bypassing the central office's means for coding/decoding in response to a loss of synchronization of the central office's means for coding/decoding with the customer's location means for coding/decoding.

4,853,950

IMPEDANCE MEASURING APPARATUS FOR R.F. BASEBAND SIGNALS OVER TWO WIRE TELEPHONE LINES

Ronald C. Crane, Mountain View, Calif., assignor to 3Com Corporation, Santa Clara, Calif.

Filed Oct. 29, 1987, Ser. No. 114,330
Int. Cl.[4] H04B *3/46*; G01R *31/02, 31/11*
U.S. Cl. 379—24 10 Claims



1. An apparatus for measuring the characteristic impedance of wire media at a preselected electrical distance from a measuring point comprising:

a current pulse generator for applying a repeating step pulse of current to the wire media;

means for adjusting a time delay, said time delay corresponding to the time at which a desired measurement is to occur relative to said applying step and being proportional to said preselected electrical distance from the output of a current pulse generator;

means for sampling instantaneous voltage across the wire media at the output of the current pulse generator after said adjusted time delay immediately following said repeating step pulse to obtain an instantaneous sample comparison;

means for integrating said instantaneous sample comparison over an averaging period of time to obtain an average instantaneous voltage for use as a comparison reference and as an output value representing said instantaneous voltage, said output value being directly representative of the characteristic impedance.

4,853,951

CORDLESS TELEPHONE WITH IN-RANGE MONITORING

Peter Bauer, Fürth, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1987, Ser. No. 133,700
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1986, [illegible]
Int. Cl.[4] H04Q *7/04*
U.S. Cl. 379—62 3 Claims

1. A cordless telephone unit including a fixed station having means for accessing a telephone network, and a cordless, battery-powered handset,

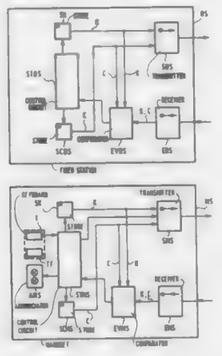
said handset comprising first means controllable by a user for transmitting an identification number, and

means in the fixed station for receiving said identification number and, responsive to receipt of said number, for attempting to access said network,

characterized by comprising second means in the handset, controllable by a user, for activating transmission of said identification number and a code,

means in the fixed station for storing a code signal,

means in the fixed station for receiving said identification number and code, and for comparing the received code with said stored code signal, and



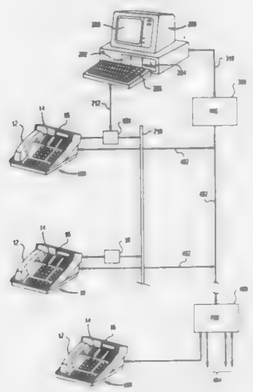
means in the fixed station, responsive to said means for comparing, for transmitting an acknowledgement signal to acknowledge receipt of said code without attempting to access said network.

4,853,952

METHOD AND APPARATUS FOR VISUAL INDICATION OF STORED VOICE SIGNALS

Emil F. Jachmann, Greenwich; Jeremy Saltzman, Norwalk, and David B. Chamberlin, Monroe, all of Conn., assignors to Dictaphone Corporation, Stratford, Conn.

Filed Dec. 3, 1987, Ser. No. 128,254
Int. Cl.[4] H04M *3/50, 11/00*
U.S. Cl. 379—88 50 Claims



23. Apparatus for storage and retrieval of voice signals comprising:

(a) voice mail means for storage and retrieval of said voice signals;

(b) station means connected to said voice mail means for output of stored voice signals, said station means further comprising means for displaying text messages;

(c) means responsive to signals input by originators of said voice signals for transmitting said text messages to said station means, said text messages each corresponding to one of said voice signals;

(d) means responsive to signals input by a user of said station means for selecting a particular one of said text messages for display by said display means;

(e) means responsive to said display means and second signals input by said user of said station means for generating voice signal retrieval signals in accordance with said particular displayed text message and transmitting said voice signal retrieval signals to said voice mail means; and

(f) said voice mail means being further for responding to said voice signal retrieval signals to output the one of said stored voice signals corresponding to said particular displayed text message to said station means.

49. In a voice mail system of the type wherein users are provided with a personal identification signal for identification of voice signals input by said users, a method of identifying voice signals belonging to a predetermined class, comprising the steps of:

(a) providing said users of said system with a common, secondary identification signal which said users may substitute for their personal identification signals prior to input of voice signals;

(b) responding to input of a voice signal together with said secondary identification signal to store said voice signal for later access by an addressee and associating said stored voice signal with said predetermined class; and

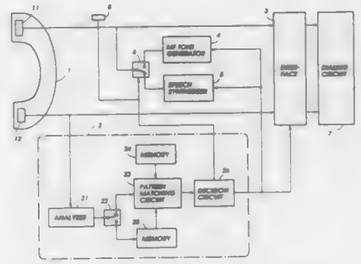
(c) prior to outputting said stored voice signal to said addressee outputting information to said addressee identifying said stored voice signal as belonging to said predetermined class.

4,853,953

VOICE CONTROLLED DIALER WITH SEPARATE MEMORIES FOR ANY USERS AND AUTHORIZED USERS

Hisashi Fujisaki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 7, 1988, Ser. No. 255,651
Claims priority, application Japan, Oct. 8, 1987, 62-255881; Oct. 21, 1987, 62-263937
Int. Cl.[4] H04M *1/515*
U.S. Cl. 379—88 9 Claims



1. A voice controlled automatic dialer comprising:

sound input means;

a speech analyzer connected to said sound input means for generating a signal representative of characteristic patterns of an input utterance entered through said sound input means;

a first memory for storing a plurality of reference signals representative of predetermined characteristic patterns of utterances of dialing numbers and command words, said predetermined characteristic patterns being representative of utterances common to any users;

a second memory for storing a plurality of reference signals representative of specific characteristic patterns of utterances of dialing names defined by authorized users and

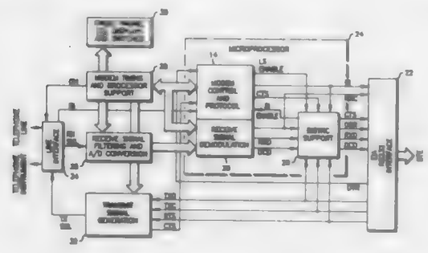
entered through said sound input means to said speech analyzer after a training process;
decision means for comparing the output signal of said speech analyzer with the reference signals stored in said first and second memories and generating a decision output representative of least distances between the characteristic patterns of the input utterance and the characteristic patterns represented by said reference signals;
manually operated switch means for coupling the output of said speech analyzer to said second memory when the reference signal representing said dialing names is stored thereinto and coupling the output of said speech analyzer to said decision means during a full-digit dialing mode or abbreviated dialing mode; and
means responsive to said decision output for generating a dialing signal for transmission to a switched network.

4,853,954

DIAL-UP LINE MODEM DIRECTLY COMPATIBLE WITH MAINFRAME HOST HAVING BISYNCHRONOUS COMMUNICATION PROTOCOL

John C. Richards, Huntsville, Ala., assignor to Universal Data Systems, Inc., Huntsville, Ala.

Filed Jan. 28, 1987, Ser. No. 8,713
Int. Cl.[4] H04M *15/32*
U.S. Cl. 379—93 **17 Claims**



7. A method for maintaining bisynchronous (bisync) communications between a Host and a modem connected to the Host comprising the steps of:
converting digital data from the Host into transmission signals and converting received signals received by the modem into digital data that is transferred to the Host;
determining if digital data from the Host consists of a bisync message to which the Host expects a valid reply according to bisync protocol; and
sending a valid reply to the Host in response to said bisync message when the modem is not in communication with a remote modem in order to maintain communication between the modem and Host by satisfying the bisync protocol.

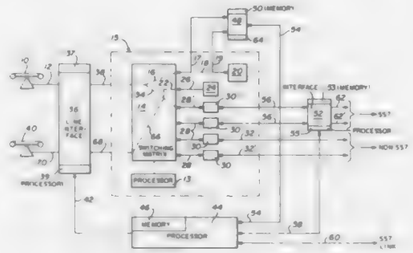
4,853,955

APPARATUS AND METHOD FOR PROVIDING EXISTING TELEPHONE SWITCHING EQUIPMENT WITH THE CAPABILITY OF USING THE SS7 PROTOCOL

David W. Thorn, Richardson; Rajendra Patel, Plano; Gerald Coley, Terrell; Ashok Trivedi, and Girish Patel, both of Plano, all of Tex., assignors to Network Access Corporation, Richardson, Tex.

Filed Apr. 27, 1988, Ser. No. 186,610
Int. Cl.[4] H04M *7/06, 7/12*
U.S. Cl. 379—230 **31 Claims**

26. A method of controlling the connection, management and disconnection of incoming and outgoing telephone calls on SS7 trunk circuits using an SS7 link and the SS7 protocol comprising the steps of:
receiving a called number and generating a first signal identifying the specific call and the type of trunk circuit required as SS7 or non-SS7 and generating a second signal representing the called number and the specific call;
in response to the first signal, routing a calling subscriber line to the identified trunk circuit and generating a trunk circuit identification signal related to the specific call;
coupling an incoming telephone circuit to a SS7 trunk circuit selected in accordance with the first signal; and



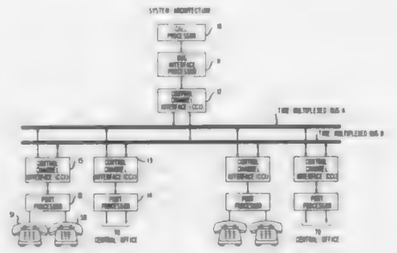
in processor means, generating the calling number for the specific call, receiving the second signal representing the called number for the specific call, receiving the trunk circuit indentification signal for the specific call, and transmitting the calling number, the called number and the trunk circuit identification signal on the SS7 link to switching equipment coupled to the receiving subscriber.

4,853,956

COMMUNICATION SYSTEM DISTRIBUTED PROCESSING MESSAGE DELIVERY SYSTEM

Robert H. Astmann, Eatontown, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed May 20, 1983, Ser. No. 496,484
Int. Cl.[4] H04Q *9/00*
U.S. Cl. 379—269 **21 Claims**



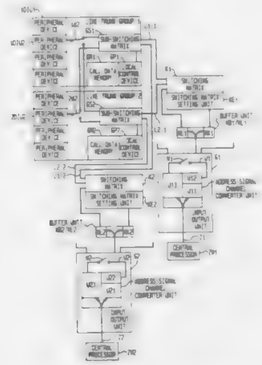
1. A data processing or distributed control or telecomputing or telecommunications or telephone network system having a plurality of processors and a bus for communicating messages among said processors, said system comprising
means in a transmitting one of said processors for forming one such message to include a single header and a plurality of sub-messages, said header including a context byte and each sub-message comprising a qualifier code, said qualifier code of each sub-message and said context byte of said header jointly identifying for each sub-message a respective one of a plurality of system operations to be performed, and
means in a receiving one of said processors for determining for said one message the system operation associated with each sub-message, each determination being jointly responsive to the qualifier code of a different sub-message and said context byte of said header.

4,853,957

TELECOMMUNICATION SWITCHING SYSTEMS WITH A CENTRAL SWITCHING AND LOCAL SUB-SWITCHING

Helmut Seeger, Wolfratshausen; Axel Leichum, and Anthony Maher, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,536
Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717386
Int. Cl.[4] H04M *3/00*
U.S. Cl. 379—279 **2 Claims**



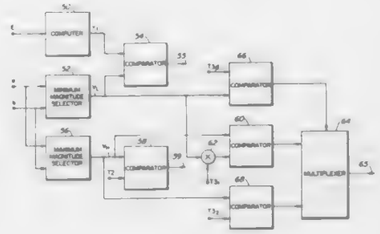
1. A circuit arrangement for centrally controlled telecommunication switching systems, in which a central switching matrix serving for interconnection, together with a program controlled central processor serving, at least, for its control and the required switch identifier processing, and in which a multiplicity of local trunk line groups, each group with a sub-switching matrix for the connection of external trunk and/or subscriber lines, and equipped with a local programmable control unit for the reception of switch identifiers from said lines, for switch identifier pre-processing and for forwarding switch identifiers to the central processor and for the transmission of switch identifiers on said lines is provided, and in which sub-switching matrices within said trunk line groups are internally connected via groups of link lines, separated in groups, with switching terminations of the central switching matrix, and in which the line trunk groups are allocated to each other in pairs, and wherein, line units, primarily connected to their sub-switching matrix and within the respective line trunk group serving for the external connection of subscriber and/or trunk lines, are switchable in a manner in which the line units of respectively a first of these two line trunk groups is additionally switched to the sub-switching matrix of the respective other, whereupon the corresponding switch identifier processing as well as the sub-switching matrix setting for the calls to be interconnected via the switched-over line units is likewise executed by the local control unit of the second line trunk group, characterized in that a call data memory is allocated to each local control unit in which call data is stored per interconnected call, the data regarding which external sub-switching matrix respectively connected with its like within the same line trunk group, or in another line trunk group, that on the basis of a switch-over preparation identifier provided for one line trunk group pair and one line trunk group therein, the appertaining two local control units are blocked against the establishment of new user calls, in particular the calls still in the processor for being established are blocked as well as the local control unit of the first line trunk group that transmits the call data stored in its memory to the control unit of the second line trunk group and that this in conjunction with the call data that is buffered in the call memory of the second line trunk group establishes partial connections via the appertaining sub-switching matrix, the central switching matrix and the same or an another sub-switching matrix, such that these partial connections from such external sub-switching matrix terminations are connectable with those of the first line trunk group through the switch-over.

4,853,958

LPC-BASED DTMF RECEIVER FOR SECONDARY SIGNALLING

Rafi Rabipour; Michael G. Beyrouti, both of Verdun, and Paul Mermelstein, Montreal, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 2, 1988, Ser. No. 201,154
Int. Cl.[4] H04J *3/12;* **H04M** *3/22*
U.S. Cl. 379—386 **9 Claims**



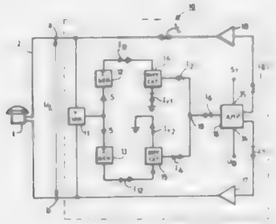
6. A method of detecting the presence of dual tone multifrequency (DTMF) signals, comprising one of a specified group of low frequencies and one of a specified group of high frequencies, comprising the steps of:
(i) storing frames of a data signal successively;
(ii) performing a linear prediction coefficient (LPC) analysis upon an instant frame to produce an all-pole model of the spectrum of said data signal for such instant frame;
(iii) computing LPC analysis filter coefficients corresponding to said all-pole model;
(iv) computing for each of said group of low frequencies and said group of high frequencies a set of FRMs each corresponding to one of the DTMF frequencies;
(v) determining which of said FRMs in each said group has the smallest magnitude; and
(vi) determining which of the two smallest magnitude FRMs from the low-group and high-group, respectively, is the smaller, comparing such smaller FRM with a reference threshold, and indicating the presence of a DTMF signal if the magnitude of such smaller FRM is equal to or less than such reference threshold.

4,853,959

METHOD AND APPARATUS FOR FEEDING POWER TO A TELEPHONE LINE SUCH THAT FOR RESTRICTED BATTERY VOLTAGE THERE IS ENABLED THE TRANSMISSION OF AN UNDISTORTED SPEECH SIGNAL

Hans V. Johansson, Bergshamra, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE87/00262, § 371 Date Feb. 18, 1988, § 102(e) Date Feb. 18, 1988, PCT Pub. No. WO88/00420, PCT Pub. Date Jan. 14, 1988
PCT Filed May 26, 1987, Ser. No. 158,271
Claims priority, application Sweden, Jan. 27, 1986, 8602889
Int. Cl.[4] H04M *19/00*
U.S. Cl. 379—413 2 Claims



1. A method of feeding power to a telephone line such that an undistorted speech signal may be transmitted thereon without encountering a limiting battery voltage, comprising the steps of:

sensing a line voltage between connections of the telephone line;

generating a first current proportional to said line voltage;

generating a first reference current and a first difference current, said first difference current being the difference between said first current and said first reference current;

generating a second current proportional to said line voltage;

generating a second reference current and a second difference current, said second difference current being proportional to the difference between said second current and said second reference current when said second current is greater than said second reference current and being substantially equal to zero when said second reference current is greater than said second current;

generating a third difference current proportional to the difference between the first difference current and the second difference current; and

amplifying said third difference current to obtain a line current that is fed to the telephone line;

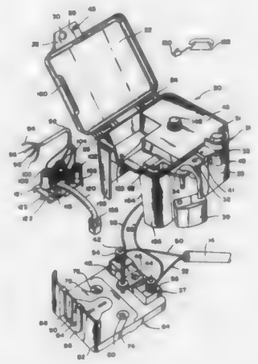
whereby, when the line has large resistance causing said line voltage to be similarly large, the line current is restricted by the second difference current, restricting in turn said line voltage, and leaving signal space between said line voltage and said battery voltage for said speech signal.

4,853,960

STATION INTERFACE AND PROTECTOR APPARATUS

Thomas J. Smith, Bay Shore, N.Y., assignor to TII Industries Inc., Copiague, N.Y.

Filed Jul. 31, 1987, Ser. No. 80,003
The portion of the term of this patent subsequent to Nov. 25, 2003, has been disclaimed.
Int. Cl.[4] H04M *9/00;* H01R *9/24*
U.S. Cl. 379—437 5 Claims



1. A station interface and protector apparatus for use on an incoming telephone line pair connected to a subscriber's telephone line pair, comprises in combination:

A. protector means including;

(i) a pair of terminals adapted to receive thereon said incoming telephone line pair,

(ii) a ground terminal adapted to receive thereon a ground wire,

(iii) an overvoltage protection device connected between each said line terminals and said ground terminal, and

(iv) insulated base means having only one wall, said wall being adapted to receive said telephone line pairs therethrough means for mounting to a surface and adapted to receive said overvoltage protection device, said ground terminal being affixed in said base means; and means for mounting to a surface and adapted to receive said overvoltage protection device;

B. cover means for covering said base means and said protector means, said cover means including;

(i) receptacle means of the type adapted to receive a plug disposed on the distal end of a plug-in telephone line cord and having at least two terminals,

(ii) connection means for electrically connecting said receptacle terminals to said line terminals,

(iii) at least two station terminals disposed in said cover means, said station terminals being adapted to receive said subscriber telephone line pair,

(iv) cable connection means having a plurality of wires therein, one end of each of said wires being connected to each of said station terminals, the other distal ends of said wires being terminated in a plug similar to said plug disposed on the distal end of said plug-in telephone line cord so that when either of said plugs is placed in said receptacle said telephone line pair is continued,

(v) attaching means cooperating with said ground terminal for removably attaching said cover means to said protector means and completely covering said base means,

(vi) hinge means disposed on one edge of said cover means, and

(vii) outwardly extending lip means said lip means being disposed on another edge opposite said hinge means, said lip means being provided with a threaded receptacle adapted to receive a threaded bolt therein;

C. cap means, said cap means having;

(i) means for cooperating with said cover hinge means disposed along one edge thereof for completely covering said cover means, and

(ii) outwardly extending lip means, said lip means being disposed on another edge opposite said hinge cooperating means and displaced from said cover means lip means when said cap means covers said cover means, said lip means including a pair of through apertures, one of said apertures being adapted to receive a locking device therethrough, the other aperture being adapted to clear a screw therethrough; and

D. bracket means, said bracket means having;

(i) a first portion extending beneath said cap means extending lip means, said first portion having a first aperture aligned with said cap means locking device aperture and a second threaded aperture adapted to receive said screw therein when said cap means rests against said cover means, and

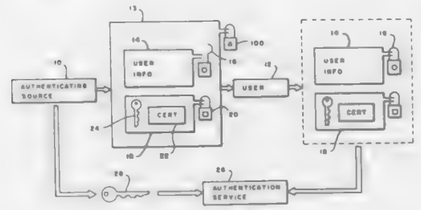
(ii) a second portion extending above said cover means lip means said second portion having a clearance aperture adapted to clear said threaded bolt therethrough when said cap means rests upon said cover means.

4,853,961

RELIABLE DOCUMENT AUTHENTICATION SYSTEM

Jose Pastor, Westport, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 18, 1987, Ser. No. 136,251
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—21 17 Claims



1. A method for authenticating documents sent by a user to an authentication service, comprising the steps of:

(a) generation by a third party of a first pair of encryption keys E_1, D_1 and at least a second pair of encryption keys E_i, D_i;

(b) said third party:

(b1) maintaining said key E_1 in privacy;

(b2) providing said key E_i to said user;

(b3) providing said key D_1 to said authentication service;

(b4) encrypting a message M with said key E_1, said message M comprising said key Di;

(b5) providing said encrypted message E_1 [M] to said user;

(c) said user:

(c1) incorporating said encrypted message E_1 [M] into said document;

(c2) encrypting additional information P with said key E_i;

(c3) incorporating said additional encrypted information E_i [P] into said document; and,

(c4) delivering said document to said authentication service; and

(d) said authentication service:

(d1) decrypting said encrypted message E_1 [M] with said key D_1 to obtain said key D_i; and

(d2) decrypting said additional encrypted information E_i[P] with said key D_i.

4,853,962

ENCRYPTION SYSTEM

Robert T. Brockman, Houston, Tex., assignor to Universal Computer Consulting, Inc.

Filed Dec. 7, 1987, Ser. No. 129,306
Int. Cl.[4] H04L *9/02;* H04K *1/00*
U.S. Cl. 380—44 10 Claims

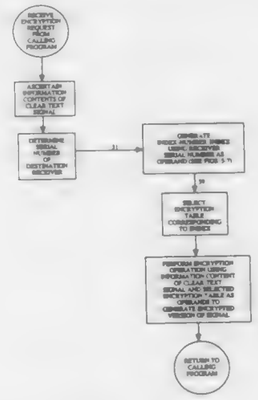
1. A method for encrypting a signal for transmission to a receiver,

said signal having a known length representable by a length number comprising one or more digits,

said receiver having a known identifying number comprising one or more digits,

the method comprising the steps of:

generating a hash number by performing a specified hashing operation using the identifying number as an operand;



generating a single-digit index number by adding the units digit of the signal length number to the hash number and performing a specified generation operation; and

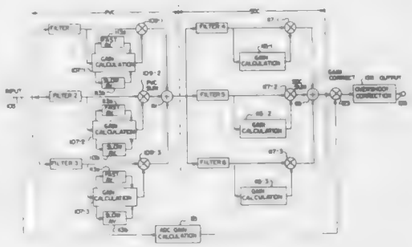
encrypting the signal in accordance with an encryption table corresponding to said index number.

4,853,963

DIGITAL SIGNAL PROCESSING METHOD FOR REAL-TIME PROCESSING OF NARROW BAND SIGNALS

Graham P. Bloy, St. Louis, and William Ball, Chesterfield, both of Mo., assignors to Metme Corporation, St. Louis, Mo.

Filed Apr. 27, 1987, Ser. No. 42,690
Int. Cl.[4] G10L *3/02*
U.S. Cl. 381—31 17 Claims



1. A method of solely microprocessor-implemented digital signal processing comprising the steps of

(1) providing an input sample of a digital signal to be processed;

(2) processing the sample within a plurality m of different frequency sub-bands to provide a primary voltage compression (PVC) function by

(2.1) submitting the sample to digital filtering within each of the m sub-bands,

(2.2) multiplying the digitally filtered sample within each of the sub-bands by a respective gain factor to provide for each sub-band a gain product;

(2.3) digitally summing the gain products so obtained to

provide a primary sum constituting a primarily compressed sample;

(3) processing the primarily compressed sample within a plurality n of different frequency sub-bands to provide a secondary voltage compression (SVC) function by

(3.1) submitting the primary sum to digital filtering within each of the n sub-bands,

(3.2) multiplying the digitally filtered sample within each of the n sub-bands by a respective gain factor to provide for each sub-band a gain product;

(3.3) digitally summing the gain products so obtained to provide a secondary sum constituting a secondarily compressed sample;

(4) multiplying the secondary sum by a gain control factor to provide a gain-corrected digital output signal;

(5) continuously repeating steps (2) through (4) for successive input samples to provide successive processing

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4,853,964

ELECTROACOUSTIC APPARATUS FOR REPRODUCING LOWEST TO MEDIUM FREQUENCIES

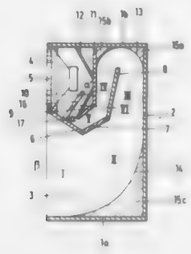
Joachim Weckler, Rockenberg, Fed. Rep. of Germany, assignor to Institut Lucius, Eckzell; Eric Eggebrecht, Mainz; Marcus Schulte, Griesheim; Moritz Daser, Haibach; Johannes Giessler, Mannheim and Christoph Schmitz, Bad Homburg, all of, Fed. Rep. of Germany, a part interest to each

Filed Jan. 7, 1988, Ser. No. 142,671

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1987, 3700539

Int. Cl.[4] H05K *5/00*

U.S. Cl. 381—156 **6 Claims**



1. An electroacoustic apparatus for reproducing lowest to medium frequencies comprising: a housing having an upper cover (**1***b*), a bottom (**1***a*), a rear side (**2**), a front side and two sides (**3**), a loudspeaker mounted on said housing beneath said upper cover on a support in front of said housing, a folded horn combined with the loudspeaker, said horn being placed in said housing and being provided with four plane horn walls for approximation to an ideal exponential horn curve by means of a mutli-stage polygonal course, the first horn wall (**11**) extending from said upper cover substantially parallel to the front side of said housing and spaced therefrom, a second horn wall (**6**) extending beneath the loudspeaker from said support and downwardly inclined, a third upwardly inclined horn wall (**7**) joined to said second horn wall, a fourth horn wall (**8**) joined to said third horn wall and extending below and behind said first horn wall, a fifth horn wall (**9**) connected to said first horn wall at one end and inclined towards said second horn wall, whereby said horn is prolonged towards said second horn wall wherein said horn has a throat and sound energy supplied by way of the horn throat and defined between said fifth and second horn walls is prevented from being reflected into the space between said loudspeaker and said first horn wall.

4,853,965

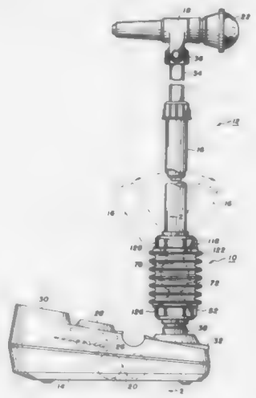
FLEXIBLE JOINT MECHANISM

Chester J. Blonski, Hamburg, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 5, 1988, Ser. No. 152,742

Int. Cl.[4] H04R *1/02;* **F16C** *11/06;* **F16D** *1/12;* **F16M** *13/00*

U.S. Cl. 381—205 **17 Claims**



1. A flexible joint mechanism for joining two parts together comprising:

a female joint member having an axis and a substantially dish-shaped end surface;

a male joint member having an axis and a substantially spherical end surface received by the dish-shaped end surface to allow pivotal slidable movement therebetween through a conical area;

elastic means for biasing the female and male joint members together; and

detent means interposed between the dish-shaped and spherical end surfaces for releasably holding the joint members with the axes thereof in an aligned position.

4,853,966

SPEAKER MOUNTING SYSTEM

Gary E. Skrzycki, 770 Orion Rd. #434, Lake Orion, Mich. 48035

Filed Oct. 29, 1987, Ser. No. 114,047

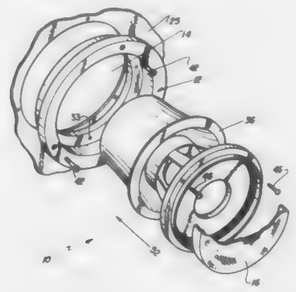
Int. Cl.[4] H04R *1/02*

U.S. Cl. 381—188 **13 Claims**

1. A bracket for mounting an audio speaker to a wall panel of a vehicle, the wall panel having an opening, the speaker being insertable into and through the opening from a front direction, the bracket being attachable to the wall panel from the front direction, the bracket comprising:

a main body section, having a hollow center portion;

a collar being mountable to the speaker by fastening means, the collar having a shape, the fastening means being securable to the speaker from the front direction, the collar extending inwardly from the main body section, the collar being essentially normal to the plane of the main body portion; and



a flange being mountable to the surface of the wall panel by securing means, the securing means being securable to the wall panel from the front direction, the flange extending outwardly in an essentially orthogonal direction from the main body section, enabling the bracket and the speaker to be inserted into the wall panel from the front direction, the flange having a shape which is generally the same as the shape of the collar.

4,853,967

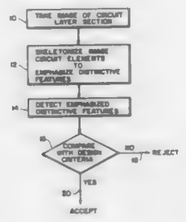
METHOD FOR AUTOMATIC OPTICAL INSPECTION ANALYSIS OF INTEGRATED CIRCUITS

Jon R. Mandeville, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 70,631, Jul. 6, 1987, abandoned, which is a continuation of Ser. No. 626,552, Jun. 29, 1984, abandoned. This application Apr. 6, 1988, Ser. No. 177,807

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—8 **1 Claim**



1. An automatic method for optical inspection of integrated circuits, using an automatic inspection processor, comprising loading the processor with a design list of permissible distinctive feature positions, each permissible distinctive feature position including a feature type parameter and location parameter so as to identify the desired circuit in terms of a composite statement of features at appropriate locations, the method including the following steps:

(a) taking a pixel image of the circuit layer section in terms of pixels at coordinate locations;

(b) modifying selectively, by controlled skeletonization, the pixel image to emphasize features of the pixel image of the integrated circuit by thinning by a finite series of thinning steps resulting in skeletonization thin enough to contrast the pixel image by an amount for causing a circuit element of less than the minimum permitted circuit element width to disappear, and thinning enough to skeletonized original maximum width circuit elements, leaving features identifiable as T-joints, blob-joints and terminal ends at locations wherein the circuit element was appropriate in form to the feature type;

(c) identifying emphasized features n the pixel image in terms of a position list of feature designations each including feature type parameter and feature location parameter further including detecting such T-joints, blob-joints and terminal ends as distinctive features from which violations may be inferred upon unfavorable comparison with the design list;

(d) comparing the position list with the design list to infer violations and terminate upon occurrence of violation or proceed absent violation for pad verification;

(e) thinning by an additional amount to provide total thinning sufficient to achieve the smallest residue blob-joint for a pad of minimum allowable area;

(f) detecting T-joints, blob-joints, terminal ends and isolated pixel distinctive features, and

(g) comparing the position list with the design list, includes detecting such T-joints, blob-joints, terminal ends and isolated pixel features as distinctive features from which pad violations may be inferred upon unfavorable comparison with the design list.

4,853,968

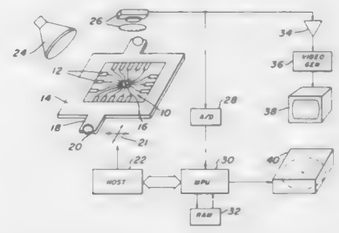
PATTERN RECOGNITION APPARATUS AND METHOD

George M. Berkin, Yardley, Pa., assignor to Kalicke & Soffa Industries, Inc., Willow Grove, Pa.

Filed Sep. 21, 1987, Ser. No. 99,398

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—8 **36 Claims**



1. Method of operating a vision system of the type employing a camera means for providing an image of at least a portion of an object viewed by the camera means, the image comprising a plurality of adjacent pixels, comprising the steps of:

(a) viewing at least a portion of the object with the camera means and generating a target signature form the image;

(b) comparing at least a portion of the target signature to a plurality of sub pixel signatures, each sub pixel signature corresponding to a unique sub pixel position between pixel positions;

(c) determining which sub pixel signature most closely matches the target signature based upon the result of the comparison; and

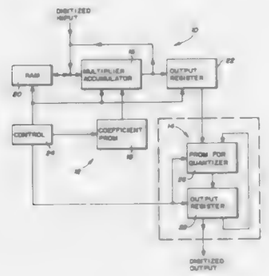
(d) providing an indication of position of the object based upon the sub pixel signature determined to most closely match the target signature.

4,853,969

QUANTIZED DIGITAL FILTER

William E. Weideman, Arlington, Tex., assignor to Recognition Equipment Incorporated, Irving, Tex.

Continuation of Ser. No. 2,728, Jan. 13, 1987, abandoned. This application May 10, 1988, Ser. No. 195,428
Int. Cl.[4] G06K 9/40
U.S. Cl. 382—54 4 Claims



1. A signal processing filter for enhancing an original digital signal including a plurality of samples, each sample having a predetermined number of bits comprising:

means for filtering the original digital signal and for generating a filtered digital signal including a plurality of samples, each sample corresponding to one of the samples of the original digital signal, said filtered digital signal representing the original digital signal in an enhanced format, said filtering means having coefficients with a number of bits per sample, such that the number of bits per sample of said filtered digital signal includes the total of the number of bits per sample of the original digital signal plus at least one of the bits per sample of the coefficients of said filtering means; and

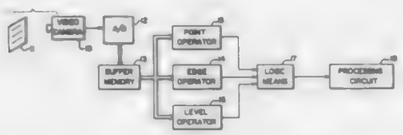
means connected to said filtering means for reducing the number of bits per sample in said filtered digital signal to the number of bits per sample of the original digital signal, said reducing means receiving a plurality of said samples of said filtered digital signal including means for adaptively quantizing said samples of said filtered digital signal to generate an adaptively quantized filtered digital signal having a number of samples without compressing the original digital signal, such that each sample of said adaptively quantized filtered digital signal is dependent on the corresponding sample of said filtered digital signal and the previous corresponding sample of said filtered digital signal.

4,853,970

APPARATUS FOR PROCESSING DIGITIZED IMAGES

David M. Ott, and Cynthia D. Ott, both of El Cerrito, Calif., assignors to Integrated Automation, Berkeley, Calif.

Continuation of Ser. No. 592,665, Mar. 24, 1984, abandoned. This application Nov. 24, 1987, Ser. No. 129,383
Int. Cl.[4] G06K 9/40
U.S. Cl. 382—54 11 Claims



1. Apparatus for use in enhancing boundaries between light and dark regions of a video image depicting both continuously varying tones of gray or other color as well as two tone text or graphics or the like, said video image being represented by an array of pixels, each pixel of which has an intensity value associated therewith indicative of gray level or the like, a light and a dark region of said image being separated by a transition region wherein said image varies rapidly between light and dark, said apparatus comprising:

neighborhood-defining means receiving said array of pixels and, for pixels in regions depicting two tones as well as for pixels in regions depicting continuously varying tones, presenting a center pixel and a plurality of pixels forming a two-dimensional neighborhood of said center pixel;

edge operator means receiving said center pixel and said neighborhood and determining therefrom whether said center pixel lies in a transition region, said edge operator means providing an edge bit value indicative of the disposition of said center pixel with respect to said transition region;

point operator means for providing a binary representation of transition regions, said point operator means receiving said center pixel and said neighborhood and assigning a point bit value to said center pixel indicating whether said center pixel is dark or light based on the intensity values of said neighborhood;

level operator means for providing a binary representation of regions of continuously varying tones, said level operator means receiving said center pixel and assigning a level bit value thereto indicating whether said center pixel is dark or light based on the continuously varying tone level being represented; and

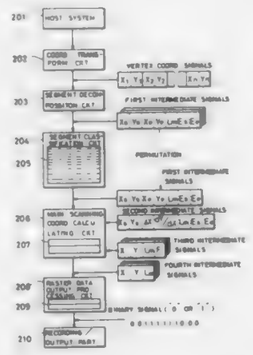
logic means receiving said edge bit value, said point bit value, and said level bit value, said logic means passing said point bit value to an output thereof when said edge bit value indicates said center pixel lies in a transition region and passing said level bit value to said output otherwise.

4,853,971

METHOD AND APPARATUS FOR PROCESSING IMAGE DATA

Akihiro Nonura, Osaka, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Mar. 11, 1986, Ser. No. 838,553
Claims priority, application Japan, Mar. 18, 1985, 60-55503; Aug. 15, 1985, 60-180200
Int. Cl.[4] G06K 9/36
U.S. Cl. 382—56 25 Claims



1. A method of processing image data to obtain raster output for filling inner regions of one or more polygons along a sequence of scanning lines thereby to record images, said method comprising the steps of:

inputting coordinate data of terminal points of segments forming respective sides of said polygons;

providing, on the basis of said coordinate data, mode data for each of said segments to identify for points on said segment at intersections with said scanning lines a mode datum having one of a plurality of values, a first value defining a raster start mode, a second value defining a raster end mode, and a third value defining a raster start and end mode;

along each scanning line, summing values of said mode data provided for points on polygon segments intersecting said scanning line and, for each said point at an intersection of said scanning line with one of said segments, storing said summed value of said mode data in a memory means; and

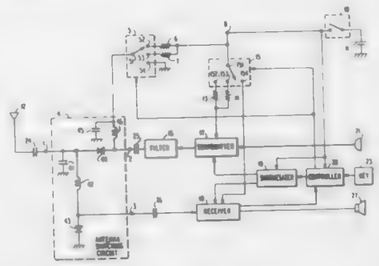
reading said stored mode data stored in said memory means along scanning lines, thereby to obtain raster outputs for filling said inner regions of said polygons at each point on said scanning lines in accordance with said summed values of said mode data.

4,853,972

RADIO TRANSCEIVER INCLUDING AN ANTENNA SWITCHING CIRCUIT CAPABLE OF CHANGING RECEPTION SENSITIVITY

Hideki Ueda, and Sotoaki Babano, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 7, 1987, Ser. No. 35,321
Claims priority, application Japan, Apr. 9, 1986, 61-80138
Int. Cl.[4] H04B 1/44, 1/38
U.S. Cl. 455—83 11 Claims



1. A radio transceiver comprising an antenna, a transmitter, a receiver, an antenna switching circuit including switching diodes for coupling said transmitter and said receiver to said antenna in response to a transmit mode and a receive mode, respectively, and means for changing the resistances of said switching diodes in response to another receive mode to reduce the level of a received signal supplied from said antenna to said receiver.

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DESIGN PATENTS

GRANTED AUG. 1, 1989

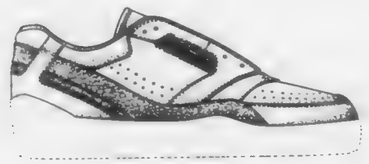
ERRATA

For CLASS	See PATENT NO.
D11-081	302,523

302,484
COMBINED VISOR AND HAIR PIECE
Dorothy U. Egan, 5221 Cleveland Pl., Metairie, La. 70003
Filed Aug. 15, 1986, Ser. No. 896,828
Term of patent 14 years
U.S. Cl. D2—248



302,485
SHOE UPPER
Miza Mourad, and Mona McCrea, both of Portland, Oreg., assignors to Avia Group International, Inc., Canton, Mass.
Filed Sep. 6, 1988, Ser. No. 240,580
Term of patent 14 years
U.S. Cl. D2—314





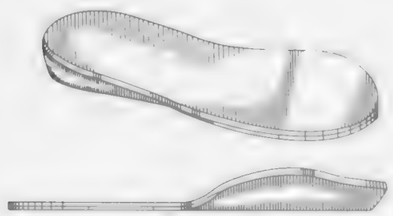




302,486
SHOE UPPER
Paul D. Brown, Hingham, and Christopher Kittle, Cohasset, both of Mass., assignors to Reebok International Ltd., Canton, Mass.
Filed Dec. 5, 1988, Ser. No. 280,262
Term of patent 14 years
U.S. Cl. D2—314

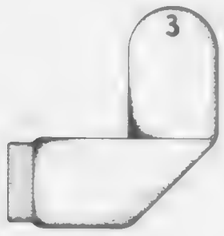


302,487
INNERSOLE WITH SHOCK-ABSORBING INSERTS
Richard B. Fox, Mashpee, Mass., assignor to Atlantic Thermoplastics Co., Inc., Blackstone, Mass.
Filed Oct. 9, 1985, Ser. No. 785,861
The portion of the term of this patent subsequent to Aug. 2, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D2—318

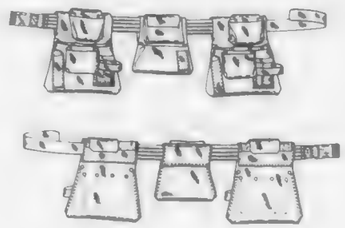


302,488
SOCK
Billy R. Clark, 719 West Oak, Jonesboro, Ark. 72401
Filed Jul. 24, 1986, Ser. No. 888,834
Term of patent 14 years
U.S. Cl. D2—332





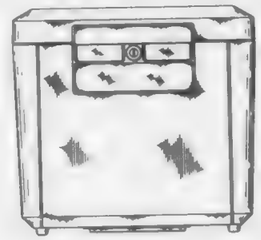
302,489
TOOL BELT
Gilmore D. Stone, 215 Camino de las Flores, Encinitas, Calif. 92024, and Steven G. Leisersen, 10845-C Wheatlands Ave., Santee, Calif. 92071
Filed Sep. 5, 1986, Ser. No. 904,302
Term of patent 14 years
U.S. Cl. D2—630

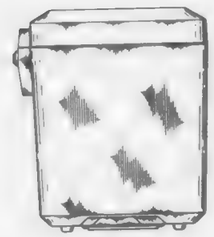


302,490
SHOE HORN
Charles T. Denney, 100 Edgewood Ave., Warner Robins, Ga. 31088
Filed Sep. 25, 1986, Ser. No. 911,632
Term of patent 14 years
U.S. Cl. D2—642

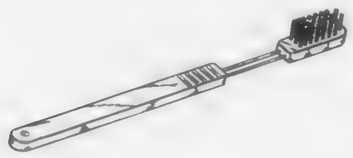


302,491
PORTABLE FIRE RESISTANT CASE
John D. Brush, Jr., Webster, and David G. Chase, Skaneateles, both of N.Y., assignors to John D. Brush & Co., Inc., Rochester, N.Y.
Filed Apr. 3, 1986, Ser. No. 847,839
Term of patent 14 years
U.S. Cl. D3—30.1





302,492
TOOTHBRUSH
Emilio Ambasz, 295, Central Park West, New York, N.Y. 10024
Filed Dec. 30, 1987, Ser. No. 139,430
Term of patent 14 years
U.S. Cl. D4—104



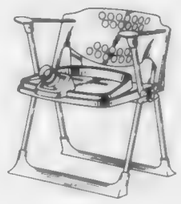
302,493
PAINTBRUSH HANDLE
Daniel Grise, Lorraine, Canada, assignor to Pinceaux Universels Clic Ltee, Trois-Rivières, Canada
Filed Mar. 16, 1987, Ser. No. 26,165
Claims priority, application Canada, Jan. 15, 1987, 15-01-87-4
Term of patent 14 years
U.S. Cl. D4—138



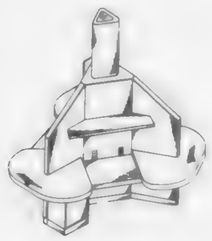
302,494
PAINTBRUSH HANDLE
Daniel Grise, Lorraine, Canada, assignor to Pinceaux Universels Clic Ltee, Trois-Rivières, Canada
Filed May 27, 1987, Ser. No. 54,673
Claims priority, application Canada, Jan. 15, 1987, 15-01-87-4
Term of patent 14 years
U.S. Cl. D4—138



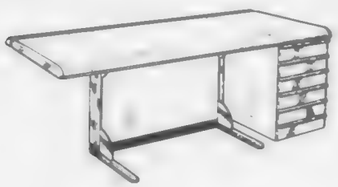
302,495
ADJUSTABLE CHAIR FOR A FISHERMAN
Muneshige Hashihara, Tokyo, Japan, assignor to Takara Marine Service Inc., Kanagawa, Japan
Filed Oct. 24, 1986, Ser. No. 924,347
Claims priority, application Japan, Apr. 25, 1986, 61-15329
Term of patent 14 years
U.S. Cl. D6—367

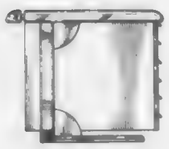


302,496
MULTI-USER WORKSTATION
Margie A. Tingley, P.O. Box 700, San Antonio, Fla. 34266
Filed Apr. 21, 1986, Ser. No. 856,116
Term of patent 14 years
U.S. Cl. D6—421



302,497
DESK
Otto Zapf, Konigstein, Fed. Rep. of Germany, assignor to Allsteel Inc., Aurora, Ill.
Filed Aug. 26, 1986, Ser. No. 901,162
Term of patent 14 years
U.S. Cl. D6—422



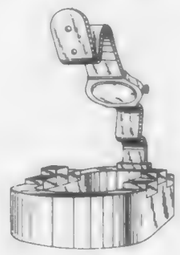


302,498
HUTCH
Paul Bush, Lakewood, N.Y., and Bruce O. Anderson, Talbott, Tenn., assignors to Bush Industries, Inc., Jamestown, N.Y.
Division of Ser. No. 189,693, May 2, 1988. This application Jan. 30, 1989, Ser. No. 303,409
Term of patent 14 years
U.S. Cl. D6—436

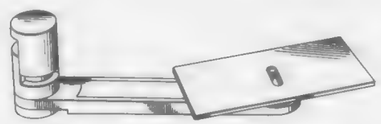


302,499
ENTERTAINMENT CENTER OR SIMILAR ARTICLE
Paul S. Bush, Lakewood, N.Y.; Richard Bova, Corry, Pa., and Bruce Anderson, Jamestown, N.Y., assignors to Bush Industries, Inc., Jamestown, N.Y.
Division of Ser. No. 835,453, Mar. 3, 1986. This application Oct. 31, 1988, Ser. No. 265,128
Term of patent 14 years
U.S. Cl. D6—436

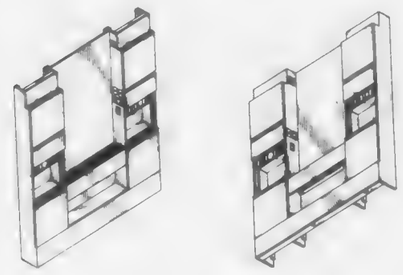
302,500
KIOSK
Archie R. Peltier, Minneapolis, Minn., assignor to North American Carrousel and Cart Manufacturing Company Inc., St. Paul, Minn.
Filed Dec. 4, 1986, Ser. No. 938,113
Term of patent 14 years
U.S. Cl. D6—450



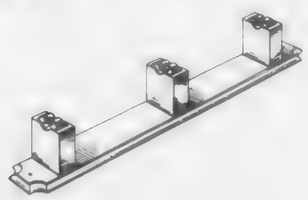
302,501
SUPPORT ARM
Lawrence M. Kuba, Nashua, N.H., and Peter F. Vinciguerra, Amesbury, Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.
Filed Oct. 17, 1986, Ser. No. 920,314
Term of patent 14 years
U.S. Cl. D6—491



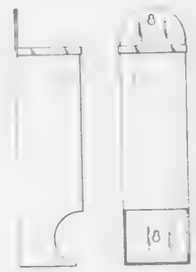
302,502
HEADWALL UNIT FOR HOSPITAL ROOMS
Ira M. Durham, Jr., Houston, Tex., assignor to The Methodist Hospital System, Houston, Tex.
Filed Aug. 7, 1986, Ser. No. 893,967
Term of patent 14 years
U.S. Cl. D6—505



302,503
HOLDER FOR SMALL ARTICLES
Eugene G. Gerry, and Beatrice Gerry, both of 2021 Frantz Ave., La Habra, Calif. 90631
Filed Mar. 30, 1987, Ser. No. 31,118
Term of patent 14 years
U.S. Cl. D6—512



302,504
TOILET PAPER DISPENSER
Joseph Levy, 495 W. 187th St. Apt. 2D, New York, N.Y. 10033
Filed Oct. 27, 1986, Ser. No. 923,759
Term of patent 14 years
U.S. Cl. D6—520



302,505
WALL-INSERTED BATHROOM ACCESSORY HOLDER
Scott G. Lenahan, Canyon Country, Calif., assignor to Gruber Systems, Inc., Valencia, Calif.
Filed Feb. 12, 1987, Ser. No. 13,717
Term of patent 14 years
U.S. Cl. D6—524

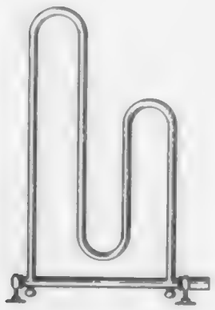


302,506
TOWEL HOLDER
Charles C. Hammond, Union City, and James A. Hammond, Conneautville, both of Pa., assignors to Laura Woods Company, Union City, Pa.
Filed Apr. 1, 1987, Ser. No. 32,706
Term of patent 14 years
U.S. Cl. D6—547

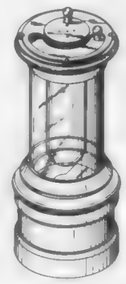


302,507
SWIVEL TOWEL RAIL
Martin J. Herrick, Auckland, New Zealand, assignor to Heirloom Industries Limited, Auckland, New Zealand
Filed Mar. 2, 1987, Ser. No. 20,311
Term of patent 14 years
U.S. Cl. D6—548





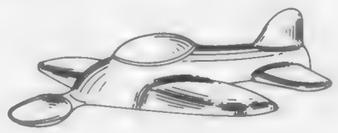
302,508
COMBINED PEPPER MILL AND SALT SHAKER
Paul Persoff, 15 E. 30th St., New York, N.Y. 10016
Filed Feb. 21, 1986, Ser. No. 834,481
Term of patent 14 years
U.S. Cl. D7—57



302,509
INSULATED BOTTLE HOLDER
James E. Byrns, 1072 2nd Ave. S., Clinton, Iowa 52732
Filed Oct. 31, 1986, Ser. No. 926,501
Term of patent 14 years
U.S. Cl. D7—77



302,510
INFANT'S FEEDING SPOON
Mark W. Bergman, 5820 Louis Ave., Minnetonka, Minn. 55345
Filed Apr. 29, 1987, Ser. No. 43,703
Term of patent 14 years
U.S. Cl. D7—141



302,511
TEA KETTLE
V. Lorenzo Porcelli, New York, N.Y., assignor to Dansk International Designs, Ltd., Mount Kisco, N.Y.
Filed Sep. 19, 1986, Ser. No. 909,417
Term of patent 14 years
U.S. Cl. D7—317

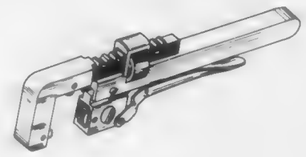




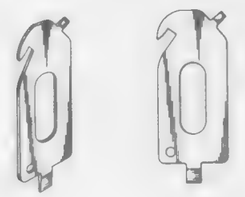
302,512
SOD PLUGGER
John W. Slayton, Jonesboro, Ark., assignor to Sun Coast, Inc., Jonesboro, Ark.
Filed Apr. 6, 1987, Ser. No. 34,571
Term of patent 14 years
U.S. Cl. D8—7



302,513
RATCHETTING PIPE WRENCH
Anthony D. Cohen, 5721 Riverview, St. Louis, Mo. 63147
Filed Jan. 15, 1986, Ser. No. 819,116
Term of patent 14 years
U.S. Cl. D8—22



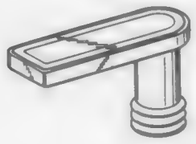
302,514
MULTI-FUNCTIONAL TOOL FOR USE WITH GUNS
Charles H. Gates, 415 W. Pershing Dr., Brooklyn, Iowa 52211
Filed May 23, 1986, Ser. No. 867,286
Term of patent 14 years
U.S. Cl. D8—105



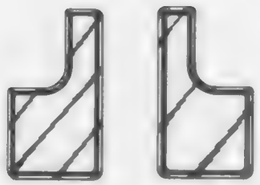
302,515
HANDLE FOR A HAMMER OR THE LIKE
Frederick S. Kandel, Columbia, Md., assignor to Majestic Tool Corporation, Baltimore, Md.
Filed Sep. 14, 1987, Ser. No. 95,873
Term of patent 14 years
U.S. Cl. D8—81



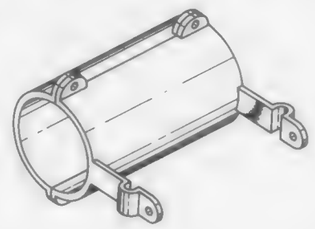
302,516
HANDLE
Franz W. Jans, Offenbach Am Main, Fed. Rep. of Germany, assignor to Jado Bathroom and Hardware Manufacturing Corp., Camarillo, Calif.
Filed Mar. 11, 1987, Ser. No. 24,408
Term of patent 14 years
U.S. Cl. D8—308



302,517
AUTOMOBILE LOCK SCRATCH GUARD
Robert F. Marrinan, Worthington, Ohio, assignor to The D.L. Auld Company, Columbus, Ohio
Filed Dec. 16, 1986, Ser. No. 942,589
Term of patent 14 years
U.S. Cl. D8—350



302,518
BRACKET FOR ATTACHMENT TO A VEHICLE ROLL BAR FOR SUPPORTING A SPEAKER
Terry Ellison, Rte. 1, Levee Rd., Kenton, Tenn. 38233
Filed Jun. 19, 1986, Ser. No. 876,343
Term of patent 14 years
U.S. Cl. D8—354



302,519
MOUNTED BRACKET FOR HOLDING TANKS
Patrick H. Butler, 3824 Division Rd., West Lafayette, Ind. 47906
Filed Sep. 22, 1986, Ser. No. 910,160
Term of patent 14 years
U.S. Cl. D8—373



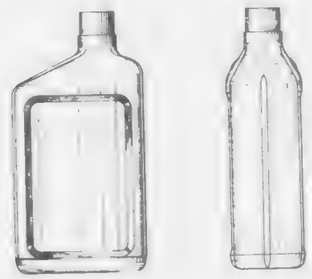
302,520
SCAFFOLDING COUPLING PIN
Richard H. Werner, Atlanta, Ga., assignor to Saf-T-Green Manufacturing Corporation, Atlanta, Ga.
Filed Apr. 7, 1986, Ser. No. 850,882
Term of patent 14 years
U.S. Cl. D8—382



302,521
DUAL COMPARTMENT CONTAINER WITH MEASUREMENT INDICATOR
James E. Grinde, 2401 - 147th La. N.E., Anoka, Minn. 55303
Filed Mar. 13, 1986, Ser. No. 844,747
Term of patent 14 years
U.S. Cl. D9—375



302,522
BOTTLE
Donald B. Charbonean, Chesterfield, and Kenneth M. Lazier, St. Peters, both of Mo., assignors to Sonoco Products Company, Hartsville, S.C.
Filed May 13, 1986, Ser. No. 863,386
Term of patent 14 years
U.S. Cl. D9—375



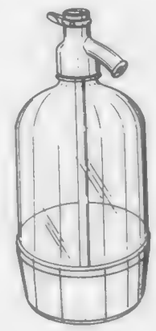
302,523
JUG OR SIMILAR ARTICLE
John I. Suhajda, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Oct. 28, 1985, Ser. No. 791,863
Term of patent 14 years
U.S. Cl. D9—376



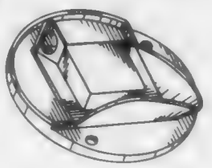
302,524
BOTTLE
Philip C. Best, and Samuel Ross, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 31, 1986, Ser. No. 847,599
Term of patent 14 years
U.S. Cl. D9—376



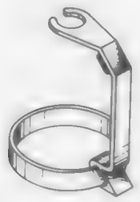
302,525
SIPHON BOTTLE OR SIMILAR ARTICLE
Richard J. Hagan, San Carlos; John McIntyre, Foster City, both of Calif., and Kevin Reeder, Columbus, Ohio, assignors to McKesson Corporation, San Francisco, Calif.
Filed Apr. 10, 1986, Ser. No. 14,681
Term of patent 14 years
U.S. Cl. D9—399



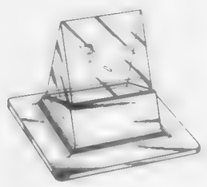
302,526
COMBINED POURING SPOUT AND COVER
John C. Ritter, 12645 Duchess, Detroit, Mich. 48224
Filed Sep. 5, 1986, Ser. No. 904,227
Term of patent 14 years
U.S. Cl. D9—449



302,527
SEPARABLE BOTTLE HANDLE
Kenneth Spies, 105-A River Beach Dr., Ormond Beach, Fla. 32074
Filed Jul. 8, 1986, Ser. No. 883,054
Term of patent 14 years
U.S. Cl. D9—455



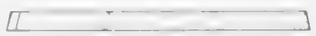
302,528
PRISM CLOCK
Douglas Ritchie, Stowe, Mass., assignor to By Design Corporation, Cambridge, Mass.
Filed Sep. 29, 1986, Ser. No. 912,612
Term of patent 14 years
U.S. Cl. D10—15



302,529
OXYGEN SENSOR
Mark P. Grady, Norristown, Pa., assignor to Seatronics Company, Inc., Hatboro, Pa.
Filed Feb. 24, 1986, Ser. No. 834,859
Term of patent 14 years
U.S. Cl. D10—81



302,530
BASE FOR ROAD SAFETY MARKER
Frank Myers, "Acorns", Oak-Tree Lane, Cook Hill, Alcester, United Kingdom
Filed Dec. 24, 1986, Ser. No. 947,481
Claims priority, application United Kingdom, Jun. 26, 1986, 1034997
Term of patent 14 years
U.S. Cl. D10—121



302,531
WATCH DIAL
Jean Robert, Zurich, Switzerland, assignor to Swatch AG, Vienna, Switzerland
Filed Jan. 19, 1986, Ser. No. 876,339
Claims priority, application World Int. Prop. O., Dec. 20, 1985, DM/006 257
Term of patent 14 years
U.S. Cl. D10—126



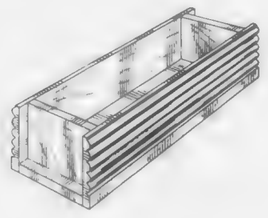
302,532
CHAIM
Stanton Wolf, Philadelphia, Pa., assignor to 1620 Group, Inc., Philadelphia, Pa.
Filed Mar. 19, 1987, Ser. No. 27,811
Term of patent 14 years
U.S. Cl. D11—81



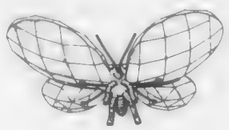
302,533
NON MONETARY COIN
Gerald D. Hagee, Edmond, Okla., assignor to Endless Impressions, Inc., Edmond, Okla.
Filed Jul. 16, 1987, Ser. No. 74,316
Term of patent 14 years
U.S. Cl. D11—104



302,534
PLANTER BOX
Ray L. Granger, 772 Bird Bay Dr., #204, Venice, Fla. 33595
Filed Jan. 10, 1986, Ser. No. 817,617
The portion of the term of this patent subsequent to Nov. 1, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—156

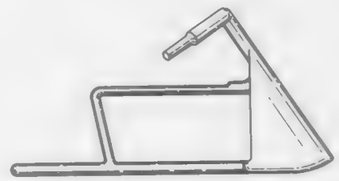


302,535
BUTTERFLY-LIKE ORNAMENT
Bruce F. Ernest, Hexham, United Kingdom, assignor to Hadrian Crystal Limited, Northumberland, England
Filed May 19, 1986, Ser. No. 866,109
Claims priority, application United Kingdom, Nov. 22, 1985, [illegible]
Term of patent 14 years
U.S. Cl. D11—162

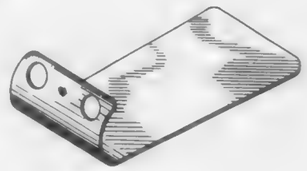




302,536
SLED
James C. Clark, 18622 Griggs, Detroit, Mich. 48221
Filed Jun. 25, 1986, Ser. No. 878,498
Term of patent 14 years
U.S. Cl. D12—10



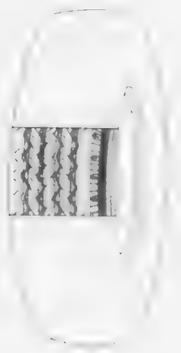
302,537
TOBOGGAN
Ronald C. Casteel, 3336 Columbus Rd., Macon, Ga. 31204
Filed Dec. 15, 1986, Ser. No. 941,948
Term of patent 14 years
U.S. Cl. D12—11



302,538
SEGMENT OF A BICYCLE TIRE
Eiji Fukuchi, Kagawa, Japan, assignor to Mitsuboshi Belting Ltd., Hyogo, Japan
Filed Sep. 22, 1986, Ser. No. 910,701
Term of patent 14 years
U.S. Cl. D12—136



302,539
TIRE
Luigi Malocchi, Vernate Fraz. Moncucco; Italy, assignor to Pirelli Coordinamento Pneumatici S.p.A., Italy
Filed Jan. 30, 1986, Ser. No. 880,324
Claims priority, application Italy, Jan. 24, 1986, 20731/86[U]
Term of patent 14 years
U.S. Cl. D12—143



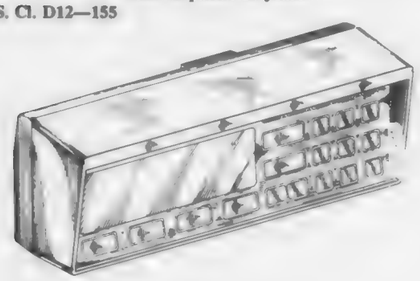
302,541
ANCHOR RING
Roderick S. Hays, 13 St. Martins, Alderney, Channel Islands
Filed Jun. 13, 1986, Ser. No. 874,376
Claims priority, application United Kingdom, Dec. 16, 1985, 1031132
Term of patent 14 years
U.S. Cl. D12—215



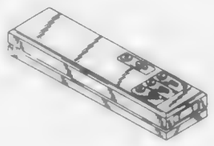
302,542
FLAG SHAPED ELECTRICAL TERMINAL
Francis O'Loughlin, Scotch Plains, N.J., assignor to Thomas & Betts Corporation, Bridgewater, N.J.
Filed Dec. 23, 1985, Ser. No. 812,488
Term of patent 14 years
U.S. Cl. D13—26



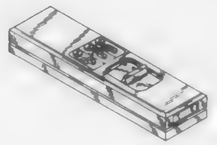
302,540
DRIVER INTERFACE MODULE OR SIMILAR ARTICLE FOR A VEHICLE MONITORING SYSTEM
Robert M. Arenas, Chicago; Timothy D. McCarthy, Arlington Heights, and Robert E. Wayland, Niles, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed May 18, 1987, Ser. No. 51,118
Term of patent 14 years
U.S. Cl. D12—155



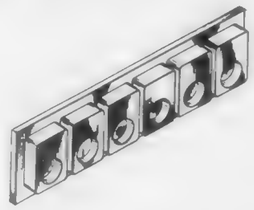
302,543
TRANSMITTER FOR WIRELESS LIGHT SWITCHING SYSTEM
Noel Mayo, Philadelphia; Joel S. Spira, Coopersburg, both of Pa., and Raphael K. T. Tang, Belmont, Mass., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.
Filed Jul. 30, 1987, Ser. No. 79,863
Term of patent 14 years
U.S. Cl. D13—32

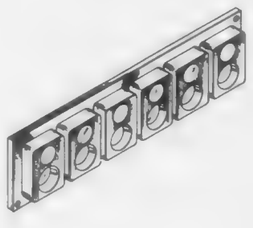


302,544
TRANSMITTER FOR WIRELESS LIGHT DIMMER SYSTEM
Joel S. Spira, Coopersburg, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.
Filed Jul. 30, 1987, Ser. No. 79,746
Term of patent 14 years
U.S. Cl. D13—32

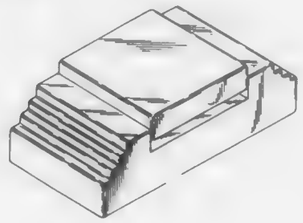


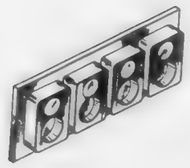
302,546
SWITCH PANEL
Ted J. Ellis, Jr., 60215 Missouri Ave., Goshen, Ind. 46526
Filed Jul. 19, 1985, Ser. No. 757,007
Term of patent 14 years
U.S. Cl. D13—35





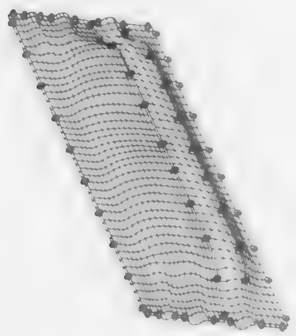
302,545
PUSH BUTTON DOOR CHIME
John H. Drane, London, England, assignor to Bridisco Limited, London, England
Filed Mar. 30, 1988, Ser. No. 175,373
Claims priority, application United Kingdom, Nov. 10, 1987, 1046718
Term of patent 14 years
U.S. Cl. D13—32







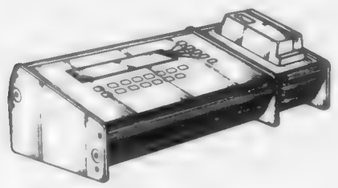
302,547
GUARD FOR AERIAL CABLE CONNECTORS
Jeffery T. Steeley, Cullman, Ala., assignor to Larry Joe Steeley, Birmingham, Ala.
Filed Feb. 18, 1986, Ser. No. 833,770
Term of patent 14 years
U.S. Cl. D13—99



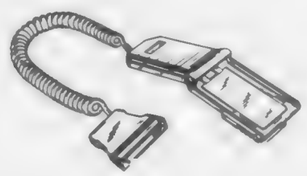
302,549
POCKET COMPUTER
Forrest S. Wright, Rochester, Mich., assignor to Binagraphics, Inc., Rochester, Mich.
Filed Nov. 9, 1987, Ser. No. 118,836
Term of patent 14 years
U.S. Cl. D14—100



302,550
COMBINED DATA ENTRY TERMINAL AND CARD READER
Thomas W. Bear, Allen Park; James L. Jessup, Livonia; Rolf Pielemeier, Southfield, and William J. Pielemeier, Ann Arbor, all of Mich., assignors to Tech-S, Inc., Livonia, Mich.
Filed Aug. 11, 1986, Ser. No. 895,356
Term of patent 14 years
U.S. Cl. D14—105



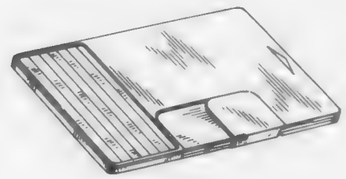
307,548
COMBINED CONTROL UNIT HANDSET HOUSING WITH CORD AND PLUG, FOR A MOBILE RADIOTELEPHONE
Jorma Pitkonen, Turku, Finland, assignor to Mobira OY, Salo, Finland
Division of Ser. No. 850,346, Apr. 4, 1986. This application May 31, 1988, Ser. No. 200,306
Claims priority, application Finland, Oct. 11, 1985, 771/85
Term of patent 14 years
U.S. Cl. D14—138



302,551
DRAFTING PLOTTER
David W. Leong, and Timothy A. Longust, both of San Diego, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 12, 1987, Ser. No. 13,822
Term of patent 14 years
U.S. Cl. D14—107



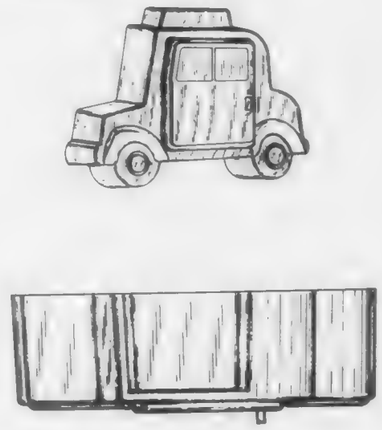
302,552
MAGNETIC DISC
Shin Miyashita, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jan. 27, 1986, Ser. No. 879,564
Claims priority, application Japan, Jan. 17, 1986, 61-1340
Term of patent 14 years
U.S. Cl. D14—114



302,553
MAGNETIC TAPE CASSETTE
Ryuichi Koike, Sagamihara, and Ichitaro Satoh, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Oct. 10, 1985, Ser. No. 786,074
Claims priority, application Japan, Apr. 19, 1985, 60-16106
Term of patent 14 years
U.S. Cl. D14—121



302,554
HOUSING FOR A TAXI CAB CALL BOX OR SIMILAR ARTICLE
Gene McKenna, Reno, Nev., assignor to Baker & Drake, Inc., Las Vegas, Nev.
Filed Dec. 14, 1987, Ser. No. 132,144
Term of patent 14 years
U.S. Cl. D14—143



302,555
INTEGRAL HANDSET TELEPHONE AND DRESS SHOE
David LeBlen, 14 Concord Rd., Westford, Mass. 01886
Filed Oct. 7, 1988, Ser. No. 254,665
Term of patent 14 years
U.S. Cl. D14—143

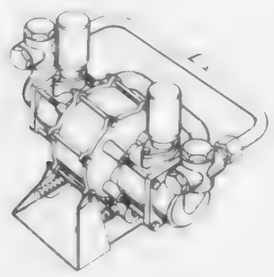




302,556
COMPONENT FOR A VEHICULAR LOUDSPEAKER
Gary S. Weissberg, Long Beach; David Kwang, Pasadena, and Masahiko Yamada, Irvine, all of Calif., assignors to Concept Enterprises, Inc., Vernon, Calif.
Filed Dec. 19, 1986, Ser. No. 943,576
Term of patent 14 years
U.S. Cl. D14—222



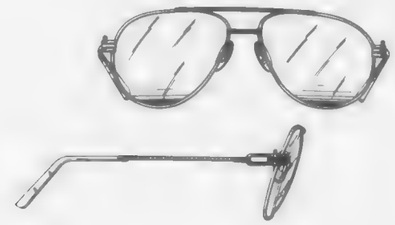
302,557
PUMP
Frederick A. Powers, Maple Grove; Arlon R. Pyle, St. Louis Park, and Sheila S. McKee, St. Paul, all of Minn., assignors to Graco Inc., Minneapolis, Minn.
Filed Feb. 17, 1987, Ser. No. 27,661
Term of patent 14 years
U.S. Cl. D15—7



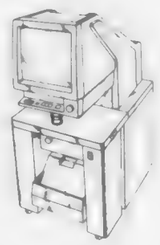
302,558
DEMOLITION HAMMER FOR SKID STEER LOADER
Dennis W. P. Davis, 4624 W. 128th St., Alsip, Ill. 60658, and Timothy Tough, 8400 S. 84th Ct., Hickory Hills, Ill. 60457
Filed Jan. 22, 1986, Ser. No. 821,469
Term of patent 14 years
U.S. Cl. D15—28



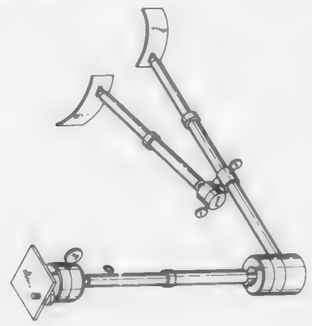
302,559
PAIR OF EYEGLASSES
Henri Samuel, Paris, France, assignor to FRED, Paris, France
Filed Feb. 11, 1987, Ser. No. 14,275
Term of patent 14 years
U.S. Cl. D16—102



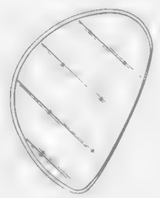
302,560
MICROFILM READER PRINTER
Tatsuo Kojima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 29, 1986, Ser. No. 890,418
Claims priority, application Japan, Jan. 30, 1986, 61-3143
Term of patent 14 years
U.S. Cl. D16—223



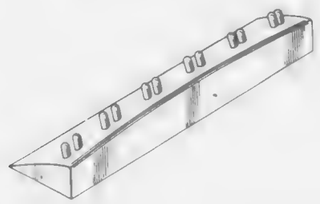
302,561
CAMERA SUPPORT
O. Daniel Goins, 2125 James Downey Rd., Independence, Mo. 64057
Filed May 8, 1986, Ser. No. 862,436
Term of patent 14 years
U.S. Cl. D16—242



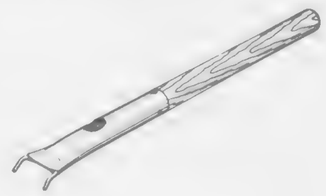
302,562
PICK FOR STRINGED INSTRUMENT
John Pearse, P.O. Box 295, Center Valley, Pa. 18034
Filed Jul. 8, 1986, Ser. No. 883,487
Term of patent 14 years
U.S. Cl. D17—20



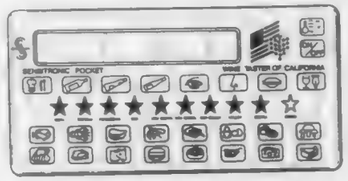
302,563
GUITAR NUT
Thomas D. Sirmon, 5450 Churchill Downs, Theodore, Ala. 36582, and Roger E. Fritz, Jr., 103 N. Rhonda Dr., Mobile, Ala. 36608
Filed Jan. 19, 1989, Ser. No. 299,212
Term of patent 14 years
U.S. Cl. D17—21



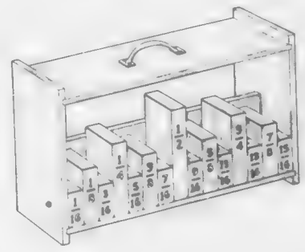
302,564
TJANTING TOOL
Donald Wiener, P.O. Box 14, Somerset, Mass. 02726
Filed Jul. 17, 1985, Ser. No. 755,811
Term of patent 14 years
U.S. Cl. D19—35



302,565
WINE SELECTOR
Hans Bertschmann, 8, route de Florissant, 1206 Geneva, Switzerland
Filed Mar. 18, 1986, Ser. No. 844,777
Term of patent 14 years
U.S. Cl. D19—59



302,566
TEACHING TOOL
Gilbert A. Wolf, Davidsonville, Md., assignor to WHW Construction, Inc., Churchton, Md.
Filed May 30, 1986, Ser. No. 869,059
Term of patent 14 years
U.S. Cl. D19—59



302,567
PAPER CLIP ATTACHMENT FOR VEHICLE DASHBOARD
Richard K. Olson, 9724 Tareytown Ave., San Ramon, Calif. 94583
Filed Jun. 9, 1986, Ser. No. 872,449
Term of patent 14 years
U.S. Cl. D19—65



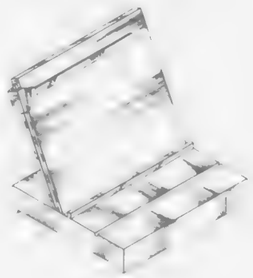


302,568
MAGNETIC DISC CLIP
Andy L. Berger, Palatine, Ill., assignor to Superwares, Inc., Hodgkins, Ill.
Filed May 2, 1986, Ser. No. 859,872
Term of patent 14 years
U.S. Cl. D19—65

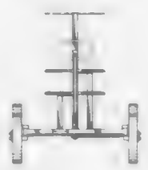




302,569
COPYHOLDER
Eugene V. Albright, Rochester; Arthur D. Ellis, Warren, and John E. Simpson, St. Clair Shores, all of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Sep. 8, 1986, Ser. No. 905,985
Term of patent 14 years
U.S. Cl. D19—91

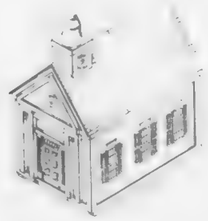


302,570
COASTER
Jack A. McClellan, P.O. Box 316, Burney, Calif. 96013
Filed Dec. 1, 1986, Ser. No. 937,133
Term of patent 14 years
U.S. Cl. D21—76

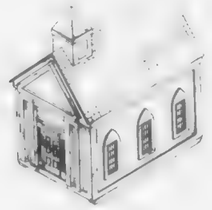




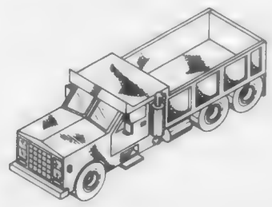
302,571
SCHOOL PLAYHOUSE
Joseph C. Roy, 16 Berry Hill Rd., Columbia, S.C. 29210
Filed Aug. 3, 1987, Ser. No. 80,687
Term of patent 14 years
U.S. Cl. D21—114



302,572
CHURCH PLAYHOUSE
Joseph C. Roy, 16 Berry Hill Rd., Columbia, S.C. 29210
Filed Aug. 3, 1987, Ser. No. 80,684
Term of patent 14 years
U.S. Cl. D21—114



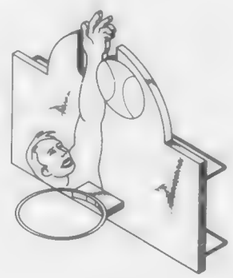
302,573
COAL TRUCK TOY
Billy Blankenship, and Roxanne M. Blankenship, both of HC34 Box 139, Argo, Ky. 41511
Filed Dec. 8, 1986, Ser. No. 939,768
Term of patent 14 years
U.S. Cl. D21—134



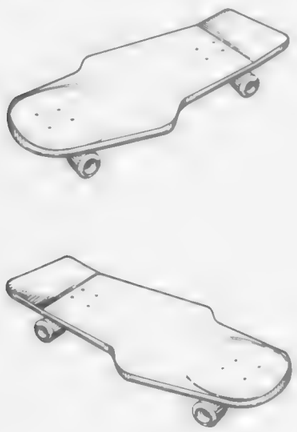
302,574
WHEELED TOY
Jeffrey T. Halter, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jul. 8, 1987, Ser. No. 71,041
Term of patent 14 years
U.S. Cl. D21—136



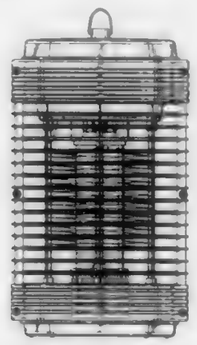
302,575
INDOOR BASKETBALL GOAL
Douglas J. Parrish, P.O. Box 315, Centerville, Utah 84014
Filed Jul. 8, 1986, Ser. No. 883,131
Term of patent 14 years
U.S. Cl. D21—201



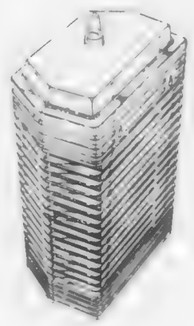
302,576
SKATEBOARD
David B. Woods, 3010 Main St., Apt. A, Morro Bay, Calif. 93442
Filed Mar. 23, 1987, Ser. No. 29,591
Term of patent 14 years
U.S. Cl. D21—227



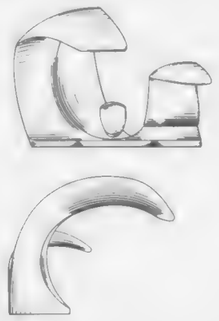
302,577
ELECTRONIC INSECT KILLER
Peter M. H. Lee, Kowloon, Hong Kong, assignor to High Technology Manufacturing Limited, Japan
Filed Sep. 19, 1986, Ser. No. 910,165
Claims priority, application United Kingdom, Jun. 18, 1986, 1,034,855
Term of patent 14 years
U.S. Cl. D22—123



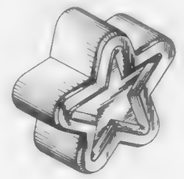
302,578
ELECTRONIC INSECT KILLER
Peter M. H. Lee, Kowloon, Hong Kong, assignor to High Technology Manufacturing Limited, Japan
Filed Sep. 19, 1986, Ser. No. 910,164
Claims priority, application United Kingdom, Jun. 18, 1986, 1,034,856
Term of patent 14 years
U.S. Cl. D22—123



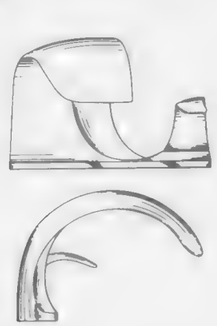
302,579
FAUCET
Roger H. Ramsey, Copley, and Mitchell L. Wilgus, Akron, both of Ohio, assignors to Stanadyne, Inc., Windsor, Conn.
Filed Jan. 13, 1987, Ser. No. 3,311
The portion of the term of this patent subsequent to Aug. 1, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—238



302,580
AUTOMATIC TOILET BOWL CLEANER
Gregory M. Gatarz, East Brunswick, N.J., assignor to Boyle-Midway Household Products, Inc., N.Y.
Filed Oct. 30, 1986, Ser. No. 926,261
Term of patent 14 years
U.S. Cl. D23—208



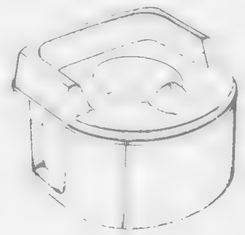
302,581
FAUCET
Roger H. Ramsey, Copley, and Mitchell L. Wilgus, Akron, both of Ohio, assignors to Stanadyne, Inc., Windsor, Conn.
Filed Jan. 13, 1987, Ser. No. 3,304
The portion of the term of this patent subsequent to Aug. 1, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—238



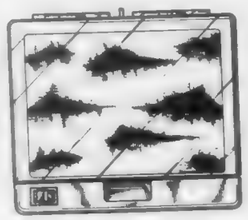
302,582
SPOUT AND FAUCET SET
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.
Division of Ser. No. 46,501, May 4, 1987. This application Jul. 5, 1988, Ser. No. 215,444
Term of patent 14 years
U.S. Cl. D23—252



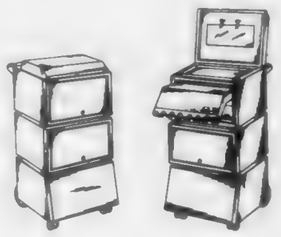
302,583
PORTABLE TRAINING TOILET
Gary R. Lemmeyer, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Nov. 7, 1986, Ser. No. 929,220
Term of patent 14 years
U.S. Cl. D23—296



302,584
TOWELETTE WARMER
Robert A. DeMars, 7932 Maestro Ave., Canoga Park, Calif. 91304
Filed Apr. 21, 1986, Ser. No. 856,103
Term of patent 14 years
U.S. Cl. D23—335



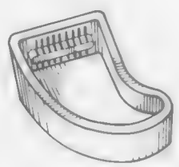
302,585
DENTAL DELIVERY UNIT
Raymond D. Elliott, 1569 S. Pearl St., Denver, Colo. 80210
Filed May 14, 1987, Ser. No. 49,450
Term of patent 14 years
U.S. Cl. D24—4



302,586
DENTAL IRRIGATOR UNIT
Jon R. Zogg, Brooklyn, N.Y., and John P. Curtis, Piscataway, N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.
Filed Jun. 8, 1987, Ser. No. 61,984
Term of patent 14 years
U.S. Cl. D24—15



302,587
STRIATED MOLD FOR A QUADRANT BASE DENTAL CAST
Ronald E. Huffman, Tucson, Ariz., assignor to KV33 Corporation, Tucson, Ariz.
Filed Apr. 13, 1987, Ser. No. 7,825
Term of patent 14 years
U.S. Cl. D24—16



302,588
ORTHODONTIC BRACKET
Arthur W. Jones, Bonsall, Calif., assignor to Lancer Pacific, Carlsbad, Calif.
Filed May 4, 1987, Ser. No. 46,336
Term of patent 14 years
U.S. Cl. D24—16





302,589
SPINAL NEEDLE OR THE LIKE
James P. McMenamy, Warwick, N.Y., and John J. Montferret, Newark, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.
Filed Jul. 29, 1986, Ser. No. 891,502
Term of patent 14 years
U.S. Cl. D24—24



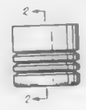


302,590
DISPOSABLE SURGICAL TOOL FOR REMOVAL OF SKIN CANCERS
J. Anthony Trott, 8450 Sepulveda, #104, Los Angeles, Calif. 90045
Filed Mar. 23, 1987, Ser. No. 29,424
Term of patent 14 years
U.S. Cl. D24—28



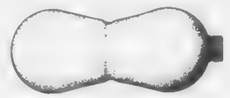


302,591
VIAL SUPPORT SLEEVE
James A. Baxter, London, England, assignor to Chromacol Limited, London, England
Filed Feb. 12, 1987, Ser. No. 13,923
Claims priority, application United Kingdom, Aug. 14, 1986, 1 036 090
Term of patent 14 years
U.S. Cl. D24—29





302,592
THERAPEUTIC TRACTION PILLOW
Kenneth E. Holmes, 16871 Saybrook La., Huntington Beach, Calif. 92649
Filed Dec. 29, 1986, Ser. No. 947,551
Term of patent 14 years
U.S. Cl. D24—64

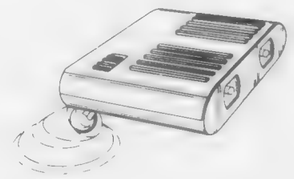




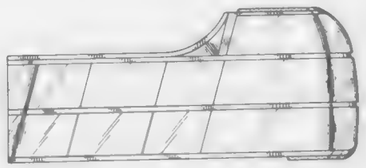
302,593
FRAMEWORK STRUCTURE FOR SHELTER
Finn Haldorsen, Rubbestadneset, Norway, assignor to Rubb Industri, Rubbestadneset, Norway
Filed Nov. 14, 1986, Ser. No. 931,172
Claims priority, application Norway, May 14, 1986, 67,298
Term of patent 14 years
U.S. Cl. D25—61



302,594
PORTABLE TWIN BEAM LIGHT
Pierre Charet, and Duke Kraai, both of Miami, Fla., assignors to Rally Manufacturing, Inc., Miami, Fla.
Filed May 29, 1986, Ser. No. 867,759
Term of patent 14 years
U.S. Cl. D26—60



302,595
REAR LIGHT FOR AN AUTOMOBILE
Ercole Spada, Moncalieri, Italy, and Claus Luthe, Munich, Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Sep. 5, 1986, Ser. No. 904,244
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1986, MR 16573
Term of patent 14 years
U.S. Cl. D26—28



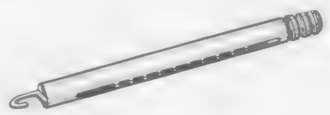
302,596
ASHTRAY
Anthony H. Wolfenden, Elwood, Australia, assignor to The Decor Corporation Proprietary Limited, Scoresby, Australia
Filed Jun. 5, 1987, Ser. No. 58,534
Term of patent 14 years
U.S. Cl. D27—133



302,597
LIGHTER
Alain Cadoux, Lyon, France, assignor to Feudor S.A., France
Filed Aug. 15, 1986, Ser. No. 896,832
Claims priority, application France, Mar. 6, 1986, 802
Term of patent 14 years
U.S. Cl. D27—156



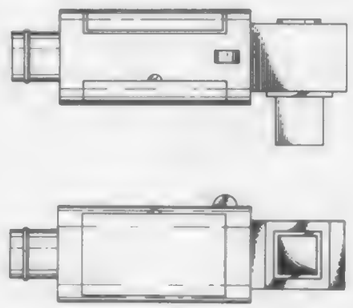
302,598
FLEXIBLE ROLLER FOR HAIR SETTER
Wong F. Keung, Kowloon, Hong Kong, assignor to Motor Electric Mfg. Co., Ltd., Hong Kong
Filed Apr. 20, 1987, Ser. No. 39,904
Claims priority, application United Kingdom, Dec. 23, 1986, 1038957
Term of patent 14 years
U.S. Cl. D28—37



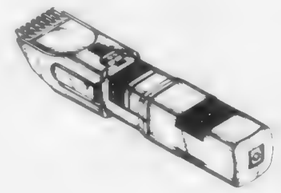
302,599
DRY SHAVER
Willem Anema, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 10, 1986, Ser. No. 884,924
Claims priority, application United Kingdom, Jan. 15, 1986, 1031584
Term of patent 14 years
U.S. Cl. D28—50



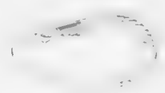
302,600
HAIR CUTTING MACHINE
Richard G. Dangler, 2433 Eagle Dr., Loveland, Colo. 80537
Filed Jul. 10, 1986, Ser. No. 884,264
Term of patent 14 years
U.S. Cl. D28—53



302,601
TRIMMER FOR SCALP AND FACIAL HAIR
Shuhei Uchida, Amamiya Bldg., 1-2-8, Ebisu-Minami, Shibuya-Ku, Tokyo, Japan
Filed Oct. 21, 1986, Ser. No. 921,082
Term of patent 14 years
U.S. Cl. D28—53



302,602
COSMETIC CASE
Karena Bakic, Munich, Fed. Rep. of Germany, assignor to Cosmede Anstalt, Vaduz, Liechtenstein
Filed Jul. 10, 1986, Ser. No. 884,746
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1986, URA39/86
Term of patent 14 years
U.S. Cl. D28—78



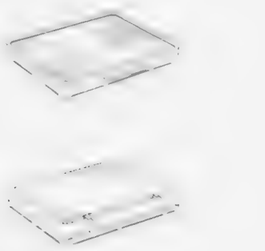


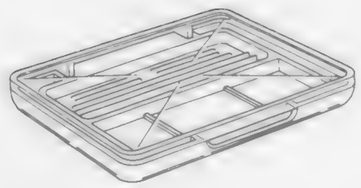
302,603
COMPACT
Herb Whiton, Cedarhurst, N.Y., assignor to Licensing Development Group, Inc., New York, N.Y.
Filed Jun. 15, 1987, Ser. No. 62,828
Term of patent 14 years
U.S. Cl. D28—79





302,604
COSMETIC CASE
Karena Bakic, Munich, Fed. Rep. of Germany, assignor to Cosmede Anstalt, Vaduz, Liechtenstein
Filed May 19, 1986, Ser. No. 866,108
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1985, URA 1443/85
Term of patent 14 years
U.S. Cl. D28—83

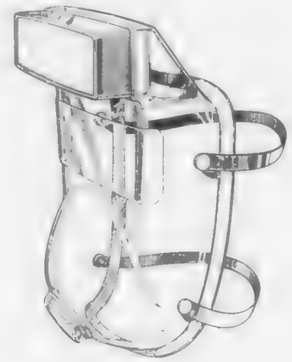




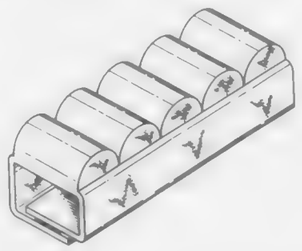
302,605
LIPSTICK
Monika Gebhart, Kurfurstenstrasse 20, D-8000 Munchen 40, Fed. Rep. of Germany
Filed May 7, 1986, Ser. No. 860,765
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1985, 1118/85
Term of patent 14 years
U.S. Cl. D28—87



302,606
PROTECTIVE MASK
Marek Blasiak, S:a Bäckevägen 8, S-433 64 Partille, Sweden
Filed Dec. 2, 1986, Ser. No. 937,189
Claims priority, application Sweden, Jun. 6, 1986, 86-1379
Term of patent 14 years
U.S. Cl. D29—9



302,607
PROTECTIVE PAD FOR A SEAT BELT
Gerald A. Krebs, and Mary B. J. Krebs, both of 3725 Potomac St., Groveport, Ohio 43125
Filed Jun. 25, 1986, Ser. No. 878,495
Term of patent 14 years
U.S. Cl. D29—10



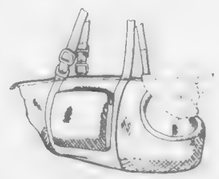
302,608
VISION PROTECTOR ATTACHMENT FOR A CAP
Howard N. LaPierre, 14634 Hawes, Whittier, Calif. 90604
Filed Oct. 21, 1986, Ser. No. 921,371
Term of patent 14 years
U.S. Cl. D29—16



302,609
VISOR
Roland E. Wheeler, 958 E. Lobster Trap, Tempe, Ariz. 85283
Filed Sep. 29, 1986, Ser. No. 913,145
Term of patent 14 years
U.S. Cl. D29—18



302,610
PET CARRIER BAG
Nora Slawinski, 1800 N. Stanton, Apt. 605, El Paso, Tex. 79902
Filed Dec. 8, 1986, Ser. No. 939,485
Term of patent 14 years
U.S. Cl. D30—109



302,611
SPRAY GUN CLEANING DEVICE
Leif E. Stern, Fattershus, S-225 90 Lund, Sweden
Filed Jul. 21, 1986, Ser. No. 887,432
Claims priority, application Sweden, Jan. 20, 1986, 86-0116
Term of patent 14 years
U.S. Cl. D32—1

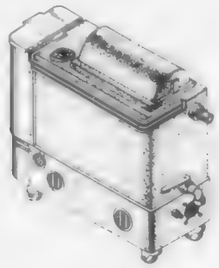




302,612
AUTOMOBILE VACUUM CLEANER
David C. Duran, 1627 Keith Dr., NE., Cedar Rapids, Iowa 52402; John P. Casey, Rural Rte., Shellsburg, Iowa 52332; James G. Marion, 2516 B Ave., NE., Cedar Rapids, Iowa 52402, and M. Allen McGrew, 215 E. Market St., Lisbon, Iowa 52253
Filed Oct. 6, 1987, Ser. No. 106,489
Term of patent 14 years
U.S. Cl. D32—4



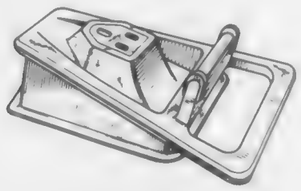
302,613
PORTABLE CLEANING MACHINE FOR CARPETS, DRAPERIES AND UPHOLSTERY
Russell S. Gurstein, Agoura Hills, Calif., assignor to U.S. Products, Inc., Hayden Lake, Id.
Filed Sep. 26, 1986, Ser. No. 911,890
Term of patent 14 years
U.S. Cl. D32—15



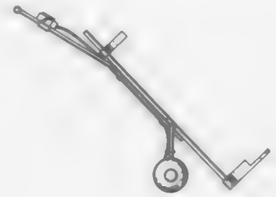
302,614
PAINT TRAY
Jack Beatty, Unionville, Canada, assignor to Beatty Machine and Tool Works Limited, Scarborough, Canada
Filed Apr. 16, 1987, Ser. No. 38,915
Term of patent 14 years
U.S. Cl. D32—53.1



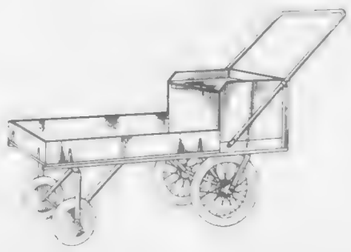
302,615
CORDLESS ELECTRIC IRON BASE
Tomas B. Vildosola, Amana B, 4, Eibar, Spain
Filed May 19, 1986, Ser. No. 866,107
Claims priority, application Spain, Nov. 19, 1985, 109424
Term of patent 14 years
U.S. Cl. D32—73



302,616
GOLF CART WITH ODOMETER
Norman Hartmann, 4015 Arthur, Brookfield, Ill. 60513
Filed Jul. 24, 1986, Ser. No. 888,987
Term of patent 14 years
U.S. Cl. D34—15



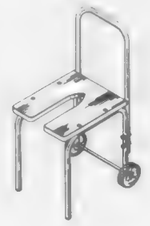
302,617
ULTILITY WAGON
Richard O. Raymond, N. Ferrisburg, Vt., assignor to Country Home Products, Inc., Charlotte, Vt.
Filed Mar. 26, 1987, Ser. No. 30,105
Term of patent 14 years
U.S. Cl. D34—19



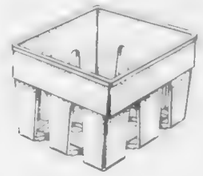
302,618
PAINTER'S SERVICE CART
John C. Gottselig, 405 S. Jackson St., Wilmington, Del. 19805
Filed Nov. 20, 1986, Ser. No. 933,677
Term of patent 14 years
U.S. Cl. D34—23



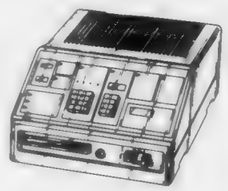
302,619
OUTBOARD MOTOR STORAGE RACK
Robert P. Catonzaro, 5221 Hazelwood Ave., Baltimore, Md. 21206
Filed May 5, 1986, Ser. No. 859,754
Term of patent 14 years
U.S. Cl. D34—26



302,620
BASKET FOR PRODUCE
Paul Quong, 1914 Orangewood Ave., Suite 102, Orange, Calif. 92668
Filed Aug. 28, 1986, Ser. No. 901,460
Term of patent 14 years
U.S. Cl. D34—40



302,621
CASH DISPENSER
Yoshiaki Nishida, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 4, 1986, Ser. No. 903,434
Claims priority, application Japan, Mar. 13, 1986, 61-8788
Term of patent 14 years
U.S. Cl. D99—28



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF AUGUST, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. C. Nielsen Company: *See*—
Marshall, Robert, 4,853,882, Cl. 364-570.000.

A. J. Panneri Enterprises, Inc.: *See*—
Terragnoli, Louis, 4,852,329, Cl. 53-399.000.

A. L. Sandpiper Corporation: *See*—
Mazur, Duane J.; Weinberg, Norman L.; and Abel, Albert E., 4,853,040, Cl. 134-2.000.

A. O. Smith Corporation: *See*—
Nickel, Herbert W., 4,853,060, Cl. 156-172.000.

A/S Fibo: *See*—
Andersen, Bent S.; and Therkildsen, Jens, 4,853,166, Cl. 264-46.500.

AB Volvo: *See*—
Holmer, Ernst, 4,852,353, Cl. 60-605.100.

ABB Stal AB: *See*—
Granqvist, Evert; and Wike, Alf, 4,852,346, Cl. 60-39.464.
Greis, Ingemar, 4,852,345, Cl. 60-39.464.

Abba, William A.: *See*—
Win, Maung H.; Lloyd, William D.; Abba, William A.; and Daponte, Diego H., 4,853,142, Cl. 252-90.000.
Win, Maung H.; Hata, Stephen S.; Abba, William A.; and Olazewski, James, 4,853,281, Cl. 428-286.000.

Abe, Masahiro; Aoyama, Masaharu; Ohshima, Jiro; and Ajima, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device having insulating layer including polyimide film. 4,853,760, Cl. 357-52.000.

Abe, Masaru: *See*—
Yasuda, Toru; Kawamoto, Yoshimichi; Abe, Masaru; and Kohata, Takashi, 4,853,672, Cl. 340-465.000.

Abe, Shigeo; Bandoh, Tadaaki; Hirasawa, Kotaro; and Ide, Jushi, to Hitachi, Ltd. Vector processor. 4,853,890, Cl. 364-900.000.

Abe, Shuzo; Matsunami, Satoshi; Nagamatsu, Sunao; Tanaka, Masaaki; and Matsuno, Masao, to Ube Industries, Ltd. Automatic radioisotope filling apparatus. 4,853,546, Cl. 250-432.0PD.

Abel, Albert E.: *See*—
Mazur, Duane J.; Weinberg, Norman L.; and Abel, Albert E., 4,853,040, Cl. 134-2.000.

Abendroth, Paul; Mathes, Josef; and Holl, Roland, to MAN Roland Druckmaschinen. Sheet transfer drum for a printing press. 4,852,488, Cl. 101-246.000.

Abiko, Shigeo: *See*—
Mori, Yoichi; Abiko, Shigeo; Tsuda, Mikio; and Ichijo, Chikara, 4,853,313, Cl. 430-156.000.

Abkowitz, Stanley; Heussi, Harold L.; Ludwig, Harold P.; and Kraus, Stephen A., to Dynamet Technology Inc. Titanium poppet valve. 4,852,531, Cl. 123-188.0AA.

Abrams/Gentile Entertainment Inc.: *See*—
Gentile, John J.; Gentile, Anthony R.; and Gentile, Christopher T., 4,852,224, Cl. 24-590.000.

Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; Olmstead, Neil R.; Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; and Frasier, Richard A., to Grass Valley Group, Inc., The. Video switcher with independent processing of selected video signals. 4,853,784, Cl. 358-181.000.

Abthoff, Joerb; Schuster, Hans-Dieter; Langer, Hans-Joachim; Strohmer, Erwin; Gabler, Rolf; and Schulte, Roland, to Daimler-Benz Aktiengesellschaft. Arrangement for the removal of soot particles from the exhaust gas stream of a diesel internal combustion engine. 4,852,349, Cl. 60-303.000.

Aburaya, Toshio: *See*—
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Aburaya, Toshio, 4,852,906, Cl. 280-707.000.

Academic Products, Inc.: *See*—
Stoyanoff, Louis J., 4,852,909, Cl. 281-33.000.

Acharya, Arun; and Nowobilski, Jeffert J., to Union Carbide Corporation. Cryogenic combination tunnel freezer. 4,852,358, Cl. 62-63.000.

Achenbach, Kurt F., to Ford Motor Company. Control system for adjustable automotive suspension unit. 4,853,860, Cl. 364-424.050.

Ad-Tec Products, Inc.: *See*—
Whelan, James P., 4,853,126, Cl. 210-469.000.

Adachi, Kenro: *See*—
Ito, Kenichiro; Nojiri, Hiromi; and Adachi, Kenro, 4,852,707, Cl. 192-44.000.

Adam, Wilhelm: *See*—
Staendeke, Horst; Thummler, Ursus; and Adam, Wilhelm, 4,853,288, Cl. 428-402.240.

Adama, Gordon L.: *See*—
Ross, Murray A.; Adama, Gordon L.; and Sully, Michael A., 4,852,659, Cl. 172-789.000.

Adams, Roger W.; Falcon-Steward, Hugh R.; and Pearce, David A., to E.C.C. International Limited. Comminution of material. 4,852,811, Cl. 241-1.000.

Adams, Samuel F.; and Bolz, Hans-Peter, to Sonoco Products Company. Yarn tube with identification means and winding method utilizing such tube. 4,852,823, Cl. 242-125.100.

Adell, Robert. Non-metallic door edge guard having clearance to adjacent body structure. 4,852,301, Cl. 49-462.000.

Adiabatics, Inc.: *See*—
Kamo, Roy; Woods, Melvin E.; and Bryzik, W., 4,852,542, Cl. 123-668.000.

Adlhoch, Wolfgang H.: *See*—
Lambertz, Johannes; Adlhoch, Wolfgang H.; Mittelstadt, Alfred G.; and Hermann, Wolfgang, 4,852,994, Cl. 48-197.00R.

Administrators of the Tulane Educational Fund, The: *See*—
Coy, David H.; Murphy, William A.; and Heiman, Mark L., 4,853,371, Cl. 514-12.000.

Advanced Micro Devices, Inc.: *See*—
Darmawan, Johan A., 4,853,344, Cl. 437-38.000.

Advanced Technology Materials, Inc.: *See*—
Tom, Glenn M.; and Brown, Duncan W., 4,853,148, Cl. 252-194.000.

Advantage Entertainment, Inc.: *See*—
Sleichter, Charles G., III; Danks, Don; and Strong, Dale, 4,852,874, Cl. 272-137.000.

AECI Limited: *See*—
Stiff, Anthony J., 4,853,157, Cl. 558-483.000.

Aerco International, Inc.: *See*—
Cohen, Kenneth W., 4,852,524, Cl. 122-448.00R.

Aerospatiale Societe Nationale Industrielle: *See*—
Allard, Pierre; Lefebvre, Robert; Vallee, Daniel; and Bertou, Pierre, 4,852,348, Cl. 60-270.100.
Guillou, Bernard P. Y.; and Lahitte, Pierre V. A., 4,853,656, Cl. 333-34.000.

Afga-Gevaert Aktiengesellschaft: *See*—
Kurths, Siegfried, 4,853,730, Cl. 354-340.000.
Payrhammer, Bernd; and Huber, Leonhard, 4,853,742, Cl. 355-27.000.

Agee, Lois M. Utility decorator. 4,852,930, Cl. 294-143.000.

Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See*—
Azuma, Nobuyuki; Maeda, Minoru; and Nakamura, Kazuo, 4,853,204, Cl. 423-344.000.

AGF Manufacturing, Inc.: *See*—
McHugh, George J., 4,852,610, Cl. 137-559.000.

AGFA-Gavaert N.V.: *See*—
Tavernier, Serge M.; Marien, August M.; and Uytterhoeven, Herman J., 4,853,311, Cl. 430-106.000.

Agranoff, Bernard W.: *See*—
Rich, Arthur; and Agranoff, Bernard W., 4,853,945, Cl. 377-10.000.

Agrawal, Anoop, to Donnelly Corporation. Encapsulated electrochromic mirror and method of making same. 4,852,979, Cl. 350-357.000.

Agrimont S.p.A.: *See*—
Maccone, Sergio, 4,853,029, Cl. 71-111.000.

Ahner, Mary E., to Exxon Chemical Patents Inc. Pressure sensitive adhesives containing light color, low softening point hydrocarbon resins. 4,853,432, Cl. 524-274.000.

Aiello, Louis L.: *See*—
Charnley, James E.; Cearley, James E.; Dixon, Robert C.; Izzo, Kenneth R.; and Aiello, Louis L., 4,853,176, Cl. 376-333.000.

Aikawa, Shinichi, to Teac Corporation. Magnetic disk apparatus capable of writing at two different track densities. 4,853,799, Cl. 360-48.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Fukuhara, Yuichi; and Ikeda, Tetsuo, 4,852,709, Cl. 192-53.00F.
Karnopp, Dean C.; and Yasui, Yoshiyuki, 4,852,699, Cl. 188-72.200.
Mori, Keiji, 4,852,422, Cl. 74-502.600.
Yasuda, Tomio; and Aoki, Kohji, 4,852,934, Cl. 296-65.100.

Aisin Seiki Kabushikıkaisha: *See*—
Murakami, Yuichi; and Ieda, Kiyokazu, 4,853,703, Cl. 343-700.0MS.

Ajima, Takashi: *See*—
Abe, Masahiro; Aoyama, Masaharu; Ohshima, Jiro; and Ajima, Takashi, 4,853,760, Cl. 357-52.000.

Ajmera, Prakash R., to Owens-Illinois Plastic Products Inc. Method of making partially crystalline biazially oriented heat set containers. 4,853,171, Cl. 264-530.000.

Akabane, Jun; Moro, Ken; Yamamoto, Masayasu; Hara, Masaharu; and Sekine, Yoshio, to Nikon Corporation. Camera with flash device. 4,853,723, Cl. 354-145.100.

Akahane, Kenji: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,853,463, Cl. 530-323.000.

Akamatsu, Takahiro; Nakazato, Hiroshi; Matsumura, Takashi; and Fukui, Kenji, to Canon Kabushiki Kaisha. Device for positioning a semi-conductor wafer. 4,853,880, Cl. 364-559.000.

Akasaka, Hideki; and Seto, Masatoshi, to Nikon Corporation. Process and apparatus for simultaneous erasure and recording in magneto-optical recording. 4,853,912, Cl. 369-73.000.

Akebono Brake Industry Co., Ltd.: *See*—
Kaneko, Kiyokazu, 4,852,702, Cl. 188-196.00D.

Akers, Thomas G.: *See*—
Reimers, Robert S.; Akers, Thomas G.; and Lo, C. Paul, 4,853,208, Cl. 423-659.000.

Akiyama, Mamoru: *See*—
Tsujimura, Masao; Hirooka, Masamichi; Ishikawa, Kazuo; Morooka, Takayoshi; Noda, Masaki; Akiyama, Mamoru; Murai, Nobuaki; and Yoshikawa, Seiji, 4,853,731, Cl. 354-400.000.

Akiyama, Toru: *See*—
Okano, Takashi; Akiyama, Toru; and Kanda, Masao, 4,853,781, Cl. 358-148.000.
Okano, Takashi; Akiyama, Toru; and Kanda, Masao, 4,853,914, Cl. 369-32.000.

Akkerman, Neil H.; and Dewey, Daniel O., to AVA International Corporation. Well installation in which electrical current is supplied for a source at the wellhead to an electrically responsive device located a substantial distance below the wellhead. 4,852,648, Cl. 166-66.400.

Aktiebolaget Bofors: *See*—
Calsson, Staffan; Boberg, Tore; and Sjogvist, Conny, 4,853,052, Cl. 149-109.600.

Aktiebolaget Hassle: *See*—
Lovgren, Kurt I.; Pilbrant, Ake G.; Yasumura, Mitsuru; Morigaki, Satoshi; Oda, Minoru; and Ohishi, Naohiro, 4,853,230, Cl. 424-466.000.

Akzo N.V.: *See*—
Bergfeld, Manfred; and Eisenhuth, Ludwig, 4,853,475, Cl. 556-50.000.
Rorig, Hans; and Porta, Norbert, 4,853,146, Cl. 252-142.000.

Albrecht, Konrad: *See*—
Frisch, Gerhard; and Albrecht, Konrad, 4,853,026, Cl. 71-86.000.

Alcatel NV: *See*—
Kimmich, Klaus; and Groegl, Ferdinand, 4,852,966, Cl. 350-96.230.

Alco Industries, Inc.: *See*—
Goetz, Charles R., 4,852,520, Cl. 119-19.000.

Alderman, Edward M.; Fett, James W.; and Vallee, Bert L., to President and Fellows of Harvard College. Antibodies to angiogenin: immunotherapeutic agents. 4,853,219, Cl. 424-85.800.

Aldrich, Tod: *See*—
Heselton, John; Nelson, Perry; and Aldrich, Tod, 4,852,883, Cl. 273-197.00R.

Alen, Raimo; and Sjostrand, Eero. Method for controlling alkaline pulping process. 4,853,084, Cl. 162-49.000.

Alfano, Robert R.; and Walser, Ardie D. Photomultiplier tube having a transmission strip line photocathode and system for use therewith. 4,853,595, Cl. 313-532.000.

Alferness, Rodney C.; Henry, Charles H.; Kazarinov, Rudolf F.; Olsson, Nils A.; and Orlowsky, Kenneth J., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Narrow-linewidth resonant optical device, transmitter, system, and method. 4,852,960, Cl. 350-96.190.

Alfit Gesellschaft m.b.H.: *See*—
Amann, Reinhard, 4,852,212, Cl. 16-102.000.

Alford Industries, Inc.: *See*—
Basgil, David E.; Shuster, Mark K.; and Pituch, Thomas R., 4,853,063, Cl. 156-238.000.

Allard, Pierre; Lefebvre, Robert; Vallee, Daniel; and Berton, Pierre, to Aerospatiale Societe Nationale Industrielle. Fuel injection system for ramjet engine. 4,852,348, Cl. 60-270.100.

Allen, Charles H., to Davie, Doris L., a part interest. Adjustable latch bolt mechanism. 4,852,918, Cl. 292-169.000.

Allen, John S.; Butler, John P.; and Phillips, Floyd L., Jr., to R. J. Reynolds Tobacco Company. Cigarette package. 4,852,734, Cl. 206-273.000.

Allen, Mark D., to M.D.R. Group, Inc. Viscoelastic vitreous substitute with UV blocker. 4,853,374, Cl. 514-57.000.

Allied-Signal Inc.: *See*—
Brownell, Peter; Borgia, Joseph A.; and Gabrielson, Robert, 4,853,118, Cl. 210-130.000.
Bruckner, Christopher A., 4,853,292, Cl. 428-600.000.
Das, Santosh K.; and Chang, Chin-Fong, 4,853,035, Cl. 75-249.000.
Denk, Joseph, 4,852,245, Cl. 29-596.000.
Hertes, Joris F.; and Louies, Bernard D., 4,853,427, Cl. 524-394.000.
Lo, Pei-hwa; Sokolich, James M.; and Matesich, Ardis M., 4,853,944, Cl. 375-94.000.
Werner, Walter V.; and Lamour, Robert L., 4,852,959, Cl. 350-96.180.
Whalen, Philip J.; Reidinger, Franz; and Antrim, Robert, 4,853,353, Cl. 501-103.000.

Allred, Donald: *See*—
Van Brimer, R. Hugh; Allred, Donald; Cooke, Theodore M.; Lin, An C. R.; and Rubbo, Julia E., 4,853,706, Cl. 346-1.100.

Alps Electric Co., Ltd.: *See*—
Okabe, Kazuya; Matsuda, Hideyuki; Iwasaki, Chisato; and Fujimoto, Satoshi, 4,853,755, Cl. 357-23.700.

Alsip, Allen W.; Robinson, James N.; and Bossert, Clayton E., to Ring, Thomas J. Therapeutic table. 4,852,193, Cl. 5-61.000.

Alten, Michael N. Reconstructive orthopedic devices for cadavers. 4,852,554, Cl. 128-68.000.

Altman, Joseph C.: *See*—
Salaita, George N.; Quarles, Carol A.; and Altman, Joseph C., 4,853,537, Cl. 250-253.000.

ALZA Corporation: *See*—
Theeuwes, Felix, 4,853,229, Cl. 424-455.000.

AM International Corporation: *See*—
Niemeyer, Robert H., III, 4,853,714, Cl. 346-139.00R.

Amann, Reinhard, to Alfit Gesellschaft m.b.H. Set of hardware for mounting a hinged and slidable door on a box unit of furniture. 4,852,212, Cl. 16-102.000.

Amaral, David C. Oil restrictor system. 4,852,534, Cl. 123-196.00R.

Amco Corporation: *See*—
Olson, Ralph; and Kulberah, Irwin, 4,852,501, Cl. 108-111.000.

American Cyanamid Company: *See*—
Morin, Louis G., 4,852,453, Cl. 89-1.110.

American Cyanamid Copany: *See*—
Lewis, Norman J.; and Panzer, Hans P., 4,853,114, Cl. 209-167.000.

American Eagle Fire Apparatus Co., Inc.: *See*—
Lemieux, Michael J., 4,852,937, Cl. 296-183.000.

American Filtrona Corporation: *See*—
Jaisinghani, Rajan A.; Hamade, Thomas A.; and Hawley, Clyde W., 4,853,005, Cl. 55-132.000.

American Home Products Corporation: *See*—
Dolak, Terence M.; Lee, Sung J.; and Bullington, James L., 4,853,389, Cl. 514-275.000.
Ferdinandi, Eckhardt S.; MaJamas, Michael S.; Sestanj, Kazimir; and Sehgal, Surendra N., 4,853,484, Cl. 564-74.000.
Hsiao, Chu-lai; Mason, Bruce B.; and Davis, Alan R., 4,853,333, Cl. 435-256.000.
Wrobel, Jay E.; and Sestanj, Kazimir, 4,853,412, Cl. 514-510.000.

American Microsystems, Inc.: *See*—
Haque, Yusuf A., 4,853,759, Cl. 357-51.000.

American Motors Corporation: *See*—
DeRees, Delbert D., 4,852,426, Cl. 74-607.000.

American National Can Company: *See*—
Mikas, Raymond; Szczerba, Robert M.; and Pulciani, Sam C., 4,852,377, Cl. 72-349.000.

American Technology, Inc.: *See*—
Patrikios, Michael J., 4,852,788, Cl. 228-110.000.

American Telephone and Telegraph Company: *See*—
Astmann, Robert H., 4,853,956, Cl. 379-269.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: *See*—
Alferness, Rodney C.; Henry, Charles H.; Kazarinov, Rudolf F.; Olsson, Nils A.; and Orlowsky, Kenneth J., 4,852,960, Cl. 350-96.190.
Capasso, Federico; Cho, Alfred Y.; and Sen, Susanta, 4,853,753, Cl. 357-4.000.
Ditzel, David R.; and McLellan, Hubert R., Jr., 4,853,889, Cl. 364-900.000.
Embree, David M.; and Logan, Shawn M., 4,853,655, Cl. 331-116.0FG.
Fischer, Frederick H., 4,853,758, Cl. 357-51.000.
Lampert, Norman R., 4,852,963, Cl. 350-96.210.
Mullin, Francis J.; and Reed, William C., 4,852,965, Cl. 350-96.230.
Reed, William A., 4,852,968, Cl. 350-96.330.

Amiot, Jacques H. J.; Fourny, Jacky R. P.; Letournel, Gilles J. M.; and Parise, Vital A. Apparatus for grinding and straining food products, such as fruits or vegetables. 4,852,814, Cl. 241-37.500.

Amoco Corporation: *See*—
Bach, David, 4,853,547, Cl. 250-458.100.
Domeier, Linda A., 4,853,449, Cl. 526-259.000.

AMP Incorporated: *See*—
Arechavaleta, Joe R.; Berg, William D.; and Dola, Frank P., 4,853,823, Cl. 361-100.000.
Ayer, Kenneth N., 4,852,252, Cl. 29-860.000.
Kling, John P., 4,853,659, Cl. 333-184.000.
Noll, Willian B., 4,852,737, Cl. 206-330.000.

Ampex Corporation: *See*—
Baranski, Antoni S., 4,853,805, Cl. 360-94.000.

Amsler, Kurt: *See*—
Schneider, Wolfgang; and Amsler, Kurt, 4,853,455, Cl. 528-108.000.

Amtech Technology Corporation: *See*—
Landt, Jeremy A., 4,853,705, Cl. 343-803.000.

Anadrill, Inc.: *See*—
Falconer, Ian G., 4,852,399, Cl. 73-151.500.

Anaebonam, Aloysius; Clemente, Emmett; Devlin, Theresa; and Ringden, Diane, to Fisons Corporation. Solutions of pentamidine. 4,853,416, Cl. 514-636.000.

Anchor Hocking Corporation: *See*—
Ochs, Charles S., 4,852,753, Cl. 215-271.000.

Anderman, Menahem; and Johnson, Steven L., to W. R. Grace & Co.-Conn. Cathodic electrode. 4,853,305, Cl. 429-212.000.

Anders, Gary H.; and Moran, James A., Jr., to Frito-Lay, Inc. Apparatus for slicing food pieces. 4,852,441, Cl. 83-155.000.

Andersen, Bent S.; and Therkildsen, Jens, to A/S Fibo. Method and an apparatus for producing compound block members, especially building blocks having a heat insulating intermediate layer. 4,853,166, Cl. 264-46.500.

Anderson, Arthur. Bull nose corner piece. 4,852,318, Cl. 52-288.000.

Anderson, Carl E.: *See*—
Killop, James T.; and Anderson, Carl E., 4,852,375, Cl. 72-88.000.

Anderson-Cook, Inc.: *See*—
Killop, James T.; and Anderson, Carl E., 4,852,375, Cl. 72-88.000.

Anderson, James D., to Burndy Corporation. Connector installation station for compact semi-automatic cable assembly system. 4,852,248, Cl. 29-749.000.

Andersson, Lars; Stenlund, Berndt; and Wiberg, Rolf, to Sandvik AB; and Pio AB. Compacted metallic wire element. 4,853,293, Cl. 428-605.000.

Andrada Galan, Mario; Romero Lledo, Antonio; and Calzado Requena, Vincente, to Investronica S.A. Method and apparatus for matching panels to be cut from patterned fabrics. 4,853,866, Cl. 364-470.000.

Andreadakis, Nicholas C., to Bell Communications Research, Inc. Suspended-electrode plasma display devices. 4,853,590, Cl. 313-485.000.

Andrene Associates: *See*—
Asbra, Martin R.; Asbra, Andrew F.; Bovis, Nicholas J.; and Greer, Charles W., 4,852,600, Cl. 137-38.000.

Andrews, Daniel M., to Microelectronics and Computer Technology Corporation. Hermetically sealed package having an electronic component and method of making. 4,852,250, Cl. 29-827.000.

Andros, Andrew A.; and Campana, Thomas J., to Telefind Corp. Paging receiver displaying place of origin of pages. 4,853,688, Cl. 340-825.440.

Annas, Dulin L., Sr, Dulin L.; and Teague, Richard M., to TSA, Inc. Tack strip padding applicator. 4,853,067, Cl. 156-351.000.

Anthony, Thomas C., to Hewlett-Packard. Lift-off process for patterning shields in thin magnetic recording heads. 4,853,080, Cl. 156-637.000.

Anton, George S., to Unisys Corporation. Enhanced capacity display monitor. 4,853,683, Cl. 340-720.000.

Antonio, Monique: *See*—
Julien, Regis; and Antonio, Monique, 4,853,516, Cl. 219-137.900.

Antonucci, Mark. Apparatus for retaining a writing instrument on a pair of spectacles or sunglasses. 4,852,221, Cl. 24-10.00R.

Antrim, Robert: *See*—
Whalen, Philip J.; Reidinger, Franz; and Antrim, Robert, 4,853,353, Cl. 501-103.000.

Aoi, Shigeru: *See*—
Koyama, Osamu; Uzuki, Kazuo; Shiho, Makoto; and Aoi, Shigeru, 4,853,917, Cl. 369-44.000.

Aoki, Akio: *See*—
Hosoya, Hideki; Aoki, Akio; and Enari, Masahiko, 4,853,920, Cl. 369-59.100.

Aoki, Kohji: *See*—
Yasuda, Tomio; and Aoki, Kohji, 4,852,934, Cl. 296-65.100.

Aoki, Naozumi: *See*—
Azuma, Isao; Ishida, Miyuki; and Aoki, Naozumi, 4,853,929, Cl. 371-25.000.

Aoki, Tatsu: *See*—
Iwamoto, Taro; Aoki, Tatsu; Nakajima, Kichio; and Yamamoto, Hiroshi, 4,853,874, Cl. 364-513.000.

Aoyagi, Masao: *See*—
Matsuda, Mutsuhide; Aoyagi, Masao; Furukawa, Hiroshi; and Shimizu, Masami, 4,853,725, Cl. 354-286.000.

Aoyama, Masaharu: *See*—
Abe, Masahiro; Aoyama, Masaharu; Ohshima, Jiro; and Ajima, Takashi, 4,853,760, Cl. 357-52.000.

Apple Computer, Inc.: *See*—
Howard, Robert A.; and Elliman, Robert, 4,852,830, Cl. 248-181.000.

Applied Science Laboratories: *See*—
Velez, Jose; and Borah, Joshua D., 4,852,988, Cl. 351-210.000.

Aqua Fisk A/S: *See*—
Karlsen, Jakob, 4,852,519, Cl. 119-3.000.

Arabori, Noboru; Takahashi, Hideaki; Sakai, Yoshio; and Yoneda, Kenji, to Hitachi, Ltd. Elevator starting compensation method and apparatus. 4,852,694, Cl. 187-115.000.

Arahori, Tsuyoshi: *See*—
Hino, Masao; Yoneda, Kenichi; Miyake, Masato; Otani, Hidehiko; Shingu, Noriya; Isahaya, Tsukasa; Hamada, Shigeshi; and Arahori, Tsuyoshi, 4,853,194, Cl. 423-239.000.

Arai, Noboru: *See*—
Tajima, Kenji; Takahashi, Motoaki; Watanabe, Hideo; Shoji, Takashi; and Arai, Noboru, 4,853,724, Cl. 354-277.000.

Arai, Shinichi: *See*—
Takasago, Masahiro; and Arai, Shinichi, 4,853,915, Cl. 369-32.000.

Arakawa, Masayuki: *See*—
Machida, Minoru; and Arakawa, Masayuki, 4,853,226, Cl. 424-426.000.

Arakawa, Takahiko: *See*—
Kuramitsu, Yoichi; and Arakawa, Takahiko, 4,853,757, Cl. 357-45.000.

Arch, Paul E.: *See*—
Meyer, Bernard H.; Kinslow, Joseph C.; Arch, Paul E.; and Meek, D. Harper, 4,853,445, Cl. 526-190.000.

Arco Chemical Technology, Inc.: *See*—
Hostetler, Donald E.; Cannarsa, Michael J.; Kesling, Haven S., Jr.; and Sun, Hsiang-Ning, 4,853,462, Cl. 528-494.000.
Meyer, Bernard H.; Kinslow, Joseph C.; Arch, Paul E.; and Meek, D. Harper, 4,853,445, Cl. 526-190.000.

Ardco, Inc.: *See*—
Rolek, Matthew, 4,852,303, Cl. 49-504.000.

Arechavaleta, Joe R.; Berg, William D.; and Dola, Frank P., to AMP Incorporated. Safety receptacle. 4,853,823, Cl. 361-100.000.

Arieh, Simon: *See*—
Courvoisier, Guy; and Arieh, Simon, 4,852,222, Cl. 24-68.0SK.

Ariga, Shiro: *See*—
Komine, Isamu; Kobayashi, Masataka; and Ariga, Shiro, 4,852,407, Cl. 73-597.000.

Arimoto, Atsushi: *See*—
Hibino, Chitoshi; Arimoto, Atsushi; and Yoshihara, Kenji, 4,853,876, Cl. 64-518.000.

Arko, Carl M.: *See*—
Rowles, John W.; and Arko, Carl M., 4,852,945, Cl. 297-458.000.

Armbruster, Randy: *See*—
Harris, Clark E.; Armbruster, Randy; Decker, Michael; and Phillipa, Bradley A., 4,852,821, Cl. 242-71.800.

Armstrong International, Inc.: *See*—
Pease, Eugene D., 4,852,292, Cl. 43-27.400.

Armstrong, Richard J. Nutating drive. 4,852,418, Cl. 74-60.000.

Armstrong World Industries, Inc.: *See*—
Blevins, Jack F., 4,853,083, Cl. 162-145.000.

Arndt, Kenneth C.: *See*—
Barresi, James A.; Arndt, Kenneth C.; Young, Michael N.; Bridgeham, Daniel O.; and Hede, Howard H., 4,852,504, Cl. 110-346.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Fukumori, Kunihiko; and Kikuta, Hiroshi, 4,853,269, Cl. 428-43.000.

Asahi Kogaku Kogyo K.K.: *See*—
Suzuki, Noboru; and Toji, Shigeo, 4,853,732, Cl. 354-402.000.

Asai, Kazumitsu: *See*—
Takizawa, Seiichiro; Fukukawa, Mitsuo; Yazawa, Masayuki; Asai, Kazumitsu; and Okamoto, Yoshiharu, 4,852,278, Cl. 37-197.000.

Asai, Yoshiharu; Tsukamoto, Shinji; and Murata, Shuji, to Ishida Scales Mfg. Co., Ltd. Weighing apparatus with radio interference protection. 4,852,673, Cl. 177-25.180.

Asakura, Masakatsu, to Mitsubishi Denki Kabushiki Kaisha. Three-phase transformer for cycloconverter. 4,853,664, Cl. 336-12.000.

Asakura, Yamato: *See*—
Endou, Masao; Asakura, Yamato; Watanabe, Atsushi; Sakagami, Masaharu; Uchida, Shunsuke; Nagase, Makoto; Baba, Tsutomu; and Ohsumi, Katsumi, 4,853,638, Cl. 324-441.000.

Asami, Masahiro: *See*—
Momoki, Yasuhito; Asami, Masahiro; Sakai, Nobuo; and Otani, Shigeaki, 4,853,321, Cl. 430-380.000.

Asanaka, Shinji: *See*—
Morishita, Takuya; Okuda, Atushi; and Asanaka, Shinji, 4,852,208, Cl. 15-339.000.

Asano, Kazuhiro; Yoshida, Yosuke; Fujioka, Yoichi; Takazawa, Kazuhisa; Ishizaki, Masao; Sakami, Yasuo; and Tsubouchi, Junichi, to Seiko Instruments & Electronics Ltd. Data stored display device. 4,853,682, Cl. 340-706.000.

Asano, Yoshikazu; and Naganawa, Kazuo, to Sanyo Electric Co. Clamping circuit for clamping video signal. 4,853,782, Cl. 358-148.000.

Asbeck, Adolf: *See*—
Schmid, Karl-Heinz; Asbeck, Adolf; and Stanislowski, Detlev, 4,853,145, Cl. 252-136.000.

Asbra, Andrew F.: *See*—
Asbra, Martin R.; Asbra, Andrew F.; Bovis, Nicholas J.; and Greer, Charles W., 4,852,600, Cl. 137-38.000.

Asbra, Martin R.; Asbra, Andrew F.; Bovis, Nicholas J.; and Greer, Charles W., to Andrene Associates; and Asbra, Martin R., part interest to each. Air actuated valve system with seismic controller. 4,852,600, Cl. 137-38.000.

ASC Incorporated: *See*—
Varner, Donald, 4,852,935, Cl. 296-146.000.

Asea Brown Boveri AB: *See*—
Rappinger, Bo; and Stenkvist, Sven-Einar, 4,853,941, Cl. 373-72.000.
Stengard, Peter, 4,853,670, Cl. 338-21.000.

Asea Brown Boveri Aktiengesellschaft: *See*—
Dustmann, Cord-Henrich, 4,852,367, Cl. 62-51.100.

Ashizawa, Tadashi: *See*—
Saito, Yutaka; Kasai, Masaji; Shirahata, Kunikatsu; Kono, Motomichi; Morimoto, Makoto; and Ashizawa, Tadashi, 4,853,385, Cl. 514-250.000.

Ashland Oil, Inc.: *See*—
Fechter, Robert B.; and Gardikes, John J., 4,852,629, Cl. 164-16.000.
Henry, Colleen M., 4,852,636, Cl. 164-527.000.
Hupp, Stephen S., 4,853,777, Cl. 358-107.000.

Ashworth Bros., Inc.: *See*—
Roinestad, Gerald C., 4,852,720, Cl. 198-778.000.

Astmann, Robert H., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Communication system distributed processing message delivery system. 4,853,956, Cl. 379-269.000.

AT&T Information Systems Inc.: *See*—
Astmann, Robert H., 4,853,956, Cl. 379-269.000.

Atago, Takeshi: *See*—
Nagano, Masami; and Atago, Takeshi, 4,852,537, Cl. 123-419.000.
Onari, Mikihiko; Sekozawa, Teruji; Funabashi, Motohisa; and Atago, Takeshi, 4,853,720, Cl. 364-431.070.

Atlantic Richfield Company: *See*—
Bays, Marvin G., 4,853,907, Cl. 367-189.000.
Corrigan, Dennis, 4,853,902, Cl. 367-44.000.
Gard, Michael F., 4,853,616, Cl. 324-65.00R.
Horn, Marc C., 4,853,615, Cl. 324-65.00R.
Kolpak, Miroslav M., 4,852,395, Cl. 73-61.10R.

Atono, Tadasi: *See*—
Morita, Izuru; Tozawa, Shoji; Hisatake, Tsuneo; and Atono, Tadasi, 4,853,989, Cl. 364-424.040.

Audi AG: *See*—
Sterler, Georg; and Bader, Heinz, 4,853,623, Cl. 324-158.00R.

Audi, Josef: *See*—
Blank, Kurt; Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Audi, Josef; Kaesmacher, Jakob; Reinicke, Ralf; and Niedenhoff, Udo, 4,853,019, Cl. 65-106.000.

Auerbach, David R., to Pitney Bowes Inc. Envelope opening apparatus. 4,852,334, Cl. 53-569.000.

Ausimont S.p.A.: *See*—
Marchioni, Giuseppe; De Patto, Ugo; Strepparola, Ezio; and Viola, Gian T., 4,853,097, Cl. 204-157.600.

Austin, Robert A.: *See*—
Ryon, Randall C.; and Austin, Robert A., 4,852,507, Cl. 114-39.100.

Auth, Rudolf: *See*—
Hoffken, Erich; Auth, Rudolf; Kaas, Werner; and Seidelmann, Lothar, 4,853,031, Cl. 75-0.50R.

Automation, Inc.: *See*—
Wales, R. Langdon; and Crowley, H. W., 4,852,604, Cl. 137-392.000.

Automobiles Citroen: *See*—
Kerboul, Guy, 4,852,421, Cl. 74-476.000.
Stil, Andre , 4,852,615, Cl. 138-30.000.

Automobiles Peugeot: *See*—
Kerboul, Guy, 4,852,421, Cl. 74-476.000.
Stil, Andre , 4,852,615, Cl. 138-30.000.

Automotive Products plc: *See*—
Leigh-Monstevens, Keith V., 4,852,352, Cl. 60-585.000.

AVA International Corporation: *See*—
Akkerman, Neil H.; and Dewey, Daniel O., 4,852,648, Cl. 175-55. [illegible]

Avalle, Nadia, to Intercos Italiana S.p.A. Ointment for concealing skin blemishes and scars. 4,853,222, Cl. 424-195.100.

Avco Corporation: *See*—
Norris, Richard M.; Rumford, Kimball J.; and Youd, Douglass S., 4,852,343, Cl. 60-79.020.

Axiom Medical, Inc.: *See*—
Wood, Roger, 4,852,580, Cl. 128-693.000.

Ayache, Liliane: *See*—
Shroot, Braham; Le Foyer de Costil, Carole; and Ayache, Liliane, 4,853,379, Cl. 514-179.000.

Ayata, Kenzo: *See*—
Onishi, Toshiyasu; Ayata, Kenzo; Takagi, Hiroshi; Suzuki, Yasuo; Ohta, Yasuhiko; Shiozawa, Takao; Fujiwara, Koichi; and Itashiki, Masakazu, 4,852,635, Cl. 164-468.000.

Ayer, Kenneth N., to AMP Incorporated. Method of terminating wires to terminals. 4,852,252, Cl. 29-860.000.

Azpitarte Bolivar, Domingo F., to Oficina De Investigacion Agrupada, S.A. Water vapor relief device for domestic coffee makers. 4,852,473, Cl. 99-293.000.

Azuma, Isao; Ishida, Miyuki; and Aoki, Naozumi, to Fujitsu Limited. Electronic circuit device able to diagnose status-holding circuits by scanning. 4,853,929, Cl. 371-25.000.

Azuma, Nobuyuki; Maeda, Minoru; and Nakamura, Kazuo, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Method for production of oxidation-resistant silicon nitride material. 4,853,204, Cl. 423-344.000.

Azuma, Yoshiyuki: *See*—
Matsuo, Katsuharu; and Azuma, Yoshiyuki, 4,853,605, Cl. 318-729.000.

Baba, Tsutomu: *See*—
Endou, Masao; Asakura, Yamato; Watanabe, Atsushi; Sakagami, Masaharu; Uchida, Shunsuke; Nagase, Makoto; Baba, Tsutomu; and Obsumi, Katsumi, 4,853,638, Cl. 324-441.000.

Babano, Sotoaki: *See*—
Ueda, Hideki; and Babano, Sotoaki, 4,853,972, Cl. 455-83.000.

Babcock, Clarence O.; and Schneider, George J., to United States of America, Interior. Gauge for in situ measurement of borehole diameter. 4,852,262, Cl. 33-178.00F.

Babcock & Wilcox Company, The: *See*—
Book, Theodore L., Sr., 4,853,175, Cl. 376-216.000.
Pettus, William G., 4,853,177, Cl. 376-418.000.
Woolbert, Gordon D.; Jewett, Scotty Y.; and Robertson, John W., Jr., 4,852,384, Cl. 73-1.00G.

Babirad, Stefan A.; Bacon, Fredrick; Heilmann, Steven M.; Krepski, Larry R.; Kuczma, Andrew S.; and Rasmussen, Jerald K., to Minnesota Mining and Manufacturing Company. Silyl 2-amidoacetate and silyl 3-amidopropionate compositions and optical fiber made therefrom. 4,852,969, Cl. 350-96.340.

Bach, David, to Amoco Corporation. System for radiation detection using a graded index optic element. 4,853,547, Cl. 250-458.100.

Bacherot, Joel: *See*—
Rio, Michel; Iltis, Claude; Louis, Herve ; Buffet, Georges; Joly, Marcel; Goudard, Jean-Francois; Bacherot, Joel; and Ducret, Claude, 4,853,013, Cl. 55-159.000.

Bacon, Fredrick: *See*—
Babirad, Stefan A.; Bacon, Fredrick; Heilmann, Steven M.; Krepski, Larry R.; Kuczma, Andrew S.; and Rasmussen, Jerald K., 4,852,969, Cl. 350-96.340.

Bader, Heinz: *See*—
Sterler, Georg; and Bader, Heinz, 4,853,623, Cl. 324-158.00R.

Badger Pharmacal, Inc.: *See*—
Wundrock, John A.; and Conrardy, Mary L., 4,852,201, Cl. 15-145.000.

Bahr, Bradley C.; Lo, Peter Y.; Lomas, A. Wade; and Romenesko, David J., to Dow Corning Corporation. Cross-linked organopolysiloxanes and emulsions based thereon. 4,853,474, Cl. 556-445.000.

Baier, Dietfried; Grasa, Ivan; and Haas, Rainer, to Hans Hollmuller Maschinenbau GmbH & Co. Machine for etching objects. 4,852,595, Cl. 134-144.000.

Baier, Dietfried; Grasa, Ivan; and Haas, Rainer, to Hans Hollmuller Maschinenbau GmbH & Co. Machine for treating objects with a treating liquid. 4,852,804, Cl. 239-121.000.

Bain, William L., Jr.; de Oliveira Camargo, Marcos; Duzett, Robert C.; Lederhofer, Artur H.; Peterson, Craig B.; and Wipfli, John L., to Intel Corporation. Multi-tasking register set mapping system which changes a register set pointer block bit during access instruction. 4,853,849, Cl. 364-200.000.

Baker Industries, Inc.: *See*—
Vogt, William R., 4,853,685, Cl. 340-825.170.

Baker, John M.; Callegari, Alessandro C.; Lacey, Dianne L.; and Shih, Yih-Cheng, to International Business Machines Corporation. Ohmic contacts for semiconductor devices and method for forming ohmic contacts. 4,853,346, Cl. 437-184.000.

Baker Perkins PLC: *See*—
Hill, Derek A., 4,852,412, Cl. 73-863.850.

Balandrano, Jesus F., deceased: *See*—
Spence, Billy F., deceased; Spence, Eva L., legal representative; and Balandrano, Jesus F., deceased, 4,853,010, Cl. 55-122.000.

Balandrano, Julia, legal representative: *See*—
Spence, Billy F., deceased; Spence, Eva L., legal representative; and Balandrano, Jesus F., deceased, 4,853,010, Cl. 55-122.000.

Bald, Eberhard. Flying shear or stamping apparatus for strip material. 4,852,440, Cl. 83-317.000.

Bald, Hubert, to Paul Forkardt GmbH & Co. KG. Machine tool with a sliding screw drive. 4,852,434, Cl. 82-118.000.

Baldwin, John J.; and Ponticello, Gerald S., to Merck & Co., Inc. β-blocking substituted imidazoles. 4,853,383, Cl. 514-235.800.

Balfour Manufacturing Company: *See*—
McAskie, William, 4,853,233, Cl. 426-74.000.

Balkin, Larry M. Locking garment hanger. 4,852,777, Cl. 223-91.000.

Ball Corporation: *See*—
Diaz, Leopoldo J.; McKenna, Daniel B.; and Pett, Todd A., 4,853,704, Cl. 343-767.000.

Ball, Jerry O.: *See*—
Yarbrough, Alfred E.; and Ball, Jerry O., 4,853,677, Cl. 340-544.000.

Ball, Stephen D.: *See*—
Hirshberg, Gerald P.; Mrozowski, Joseph E.; and Ball, Stephen D., 4,852,938, Cl. 296-214.000.

Ball, William: *See*—
Bloy, Graham P.; and Ball, William, 4,853,963, Cl. 381-31.000.

Ballantyne, Brian R. Mortar collecting device for use in masonry wall construction. 4,852,320, Cl. 52-303.000.

Balthaser, Paul E.: *See*—
Robertson, James D.; and Balthaser, Paul E., 4,852,769, Cl. 222-83.500.

Banahan, Robert J. Fire extinguishing apparatus. 4,852,656, Cl. 169-91.000.

Bando, Thoru: *See*—
Matsuo, Shigeru; Murakami, Tomoyoshi; Bando, Thoru; and Nagatoshi, Kikuo, 4,853,443, Cl. 525-534.000.

Bandoh, Tadaaki: *See*—
Abe, Shigeo; Bandoh, Tadaaki; Hirasawa, Kotaro; and Ide, Jushi, 4,853,890, Cl. 364-900.000.

Bannister, Richard S.: *See*—
Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; Olmstead, Neil R.; Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; and Frasier, Richard A., 4,853,784, Cl. 358-181.000.

Banteli, Willy: *See*—
Poschet, Klaus; and Banteli, Willy, 4,853,506, Cl. 200-463.000.

Bantjes, John H.: *See*—
Donegan, Thomas E.; Bantjes, John H.; and Leary, Timothy G., 4,853,039, Cl. 106-412.000.

Barabas, Eugene S., to GAF Corporation. Water-soluble complexes of water-insoluble organic compounds. 4,853,439, Cl. 525-326.900.

Baranski, Antoni S., to Ampex Corporation. Multi-cassette indexing mechanism for a tape transport. 4,853,805, Cl. 360-94.000.

Baratpour, Shahin; and Ventresca, Salina. Game device. 4,852,885, Cl. 273-237.000.

Barber, Dennis D., to Diagnostic Services, Inc. Automatic liquid level recording device. 4,853,901, Cl. 367-27.000.

Barcelon, Shirley Ann; Oppenheimer, Alfred; and Hussein, Mamoun M., to Warner-Lambert Co. Taste and odor masked edible oil compositioa. 4,853,247, Cl. 426-613.000.

Bard, Martin; Rieger, Roesmarie; and Petzenhauser, Isfried, to Buchtal GmbH. Method for making lead pencils and colored pencils. 4,853,167, Cl. 264-112.000.

Barnes, Garland R.: *See*—
Turner, Robert B.; Jenkines, Randall C.; Serratelli, John F.; and Barnes, Garland R., 4,853,054, Cl. 156-78.000.

Barnes, Michael W.: *See*—
Bennett, S. John; Barnes, Michael W.; and Kolonko, Kenneth J., 4,853,051, Cl. 149-19.400.

Barnett, Ronnie D.: *See*—
Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; Olmstead, Neil R.; Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; and Frasier, Richard A., 4,853,784, Cl. 358-181.000.

Barresi, James A.; Arndt, Kenneth C.; Young, Michael N.; Bridgeham, Daniel O.; and Hede, Howard H., to First Aroostook Corporation. Waste fuel incineration system. 4,852,504, Cl. 110-346.000.

Barry, James D.; and Kennedy, Chandler J., to United States of America, Air Force. Defense to laser light irradiation. 4,852,452, Cl. 89-1.110.

Bartholomew, Donald D., to Proprietary Technology, Inc. Method of affixing a ring to plastic pipe. 4,852,239, Cl. 29-520.000.

Bartlett, Donald R.: *See*—
Ortlieb, Orlen J.; and Bartlett, Donald R., 4,852,735, Cl. 206-320.000.

Bartmann, Gunter; and Brackelmann, Gerd, to Montan-Hydraulik GmbH. Two-stage telescoping hydraulic cylinder. 4,852,464, Cl. 92-53.000.

Bartsch, Klaus, to Blendax-Werke R. Schneider GmbH & Co. Dosing syringe. 4,852,768, Cl. 222-46.000.

BASF Aktiengesellschaft: *See*—
Blum, Rainer; Rehmer, Gerd; Osterloh, Rolf; and Sander, Hans, 4,853,433, Cl. 525-65.000.
Fischer, Rolf; Frank, Juergen; Merger, Franz; Roeper, Michael; and Vagt, Uwe, 4,853,473, Cl. 549-326.000.
Henkelmann, Jochem; Eggersdorfer, Manfred; Grosch, Walter; Schuhmacher, Alfred; and Siegel, Hardo, 4,853,481, Cl. [illegible] 460.000
Merger, Franz; Schleier, Gisbert; and Schlotterbeck, Dietrich, 4,853,454, Cl. 528-59.000.

BASF Corporation: *See*—
Donegan, Thomas E.; Bantjes, John H.; and Leary, Timothy G., 4,853,039, Cl. 106-412.000.
Ely, James E.; and Saylor, Steven D., 4,852,486, Cl. 101-218.000.
Yeh, Ling; and Harrelson, Hugh G., Jr., 4,853,272, Cl. 428-96.000.

Basgil, David E.; Shuster, Mark K.; and Pituch, Thomas R., to Alford Industries, Inc. System for applying outserts to containers. 4,853,063, Cl. 156-238.000.

Bata Limited: *See*—
Hamy, Norbert, 4,852,273, Cl. 36-28.000.

Batchelder, J. Samuel. Method and apparatus for delivering electric currents to remote targets. 4,852,454, Cl. 89-1.110.

Bates, Andrew; and Sujansky, Vladimir, to Ici Australian Operators Pty Ltd. Oil-in-water explosive composition containing asphalt. 4,853,050, Cl. 149-2.000.

Batteux, Jacques; and Sharonizadeh, Ahmad, to Societe Nationale ELF Aquitaine. Process and device for deacidification of a gas containing H_2S and/or CO_2 and mercaptans. 4,853,012, Cl. 55-44.000.

Batzar, Kenneth, to Du Pont de Nemours, E. I., and Company. Coated cookware. 4,853,278, Cl. 428-213.000.

Bauer, Hans J.: *See*—
Bauer, Hans-Peter; and Bauer, Hans J., 4,852,862, Cl. 267-120.000.

Bauer, Hans-Peter; and Bauer, Hans J., to Fritz Bauer and Sohne OHG. Fluid-filled piston-cylinder unit. 4,852,862, Cl. 267-120.000.

Bauer, Peter, to U.S. Philips Corporation. Cordless telephone with in-range monitoring. 4,853,951, Cl. 379-62.000.

Baxter International Inc.: *See*—
Meguro, Jun-ichi; and Nicolaisen, Curtis J., 4,853,059, Cl. 156-157.000.

Bayer Aktiengesellschaft: *See*—
Buding, Hartmuth; and Casper, Rudolf, 4,853,441, Cl. 525-339.000.
Dunwald, Willi; Schlegel, Hans; Haipaap, Reinhard; and Pedain, Josef, 4,853,261, Cl. 427-388.100.
Fuchs, Rainer; and Stendel, Wilhelm, 4,853,477, Cl. 558-398.000.
Jansen, Ulrich; and Ott, Karl-Heinz, 4,853,450, Cl. 526-303.100.
Oeckl, Siegfried; Martinola, Friedrich; and Thomas, Paul, 4,853,135, Cl. 210-757.000.
Rosentreter, Ulrich; Boshagen, Horst; Lieb, Folker; Oediger, Hermann; Niewohner, Ulrich; Seuter, Friedel; Perzborn, Elisabeth; and Fiedler, Volker-Bernd, 4,853,406, Cl. 514-411.000.
Schick, Peter; Jonas, Friedrich; and Leitner, Lutz, 4,853,289, Cl. [illegible] 460.000
Sirrenberg, Wilhelm; Marhold, Albrecht; and Steffens, Robert, 4,853,397, Cl. 514-364.000.

Bayer Do Brasil S.A.: *See*—
Bruening, Wilhelm; Uchdorf, Rudolf; and Mitschker, Alfred, 4,853,191, Cl. 423-226.000.

Bays, Marvin G., to Atlantic Richfield Company. Inclinable vibratory seismic source. 4,853,907, Cl. 367-189.000.

BBC Brown Boveri Aktiengesellschaft: *See*—
Steinleitner, Gunther; Mennicke, Stefan; Feindler, Philbert; Klein, Herbert; and Maldonado-Zagal, Sigisfredo, 4,853,303, Cl. 429-104.000.

Bean, Eric S.: *See*—
Vodian, Morton A.; Bean, Eric S.; and LeMoine, Eric D., 4,853,325, Cl. 435-5.000.

Bear, Don E. Bottled water pressurization system. 4,852,621, Cl. 141-83.000.

Beard, Susan E.: *See*—
Erb, George H.; and Beard, Susan E., 4,853,070, Cl. 156-436.000.

Beardmore, John M.; and Cafeo, John A., to General Motors Corporation. Low noise valve train. 4,852,527, Cl. 123-96.000.

Beasley, Donald R.; and Hanson, Paul J. Trailer hitch positioning apparatus. 4,852,901, Cl. 280-477.000.

Beattie, Robert T. Greeting card holding and displaying apparatus. 4,852,280, Cl. 40-124.000.

Becker, Hubert; Becker, Josef; and Becker, Matthias. Process for treating filamentary or thread textile material. 4,852,332, Cl. 53-436.000.

Becker, Josef: *See*—
Becker, Hubert; Becker, Josef; and Becker, Matthias, 4,852,332, Cl. 53-436.000.

Becker, Matthias: *See*—
Becker, Hubert; Becker, Josef; and Becker, Matthias, 4,852,332, Cl. 53-436.000.

Becker, Werner, to Eselte Meto International Produktions GmbH. Hand labeling device. 4,853,068, Cl. 156-384.000.

Beckius, David A.: *See*—
Burgess, William C.; Jochum, Gary L.; Goetzinger, David; and Beckius, David A., 4,852,748, Cl. 211-70.600.

Bednar, Fred H.; and Lunz, Kenneth G., to Westinghouse Electric Corp. Low level detector monitor. 4,853,174, Cl. 376-254.000.

Bednarz, James W. Water meter lock. 4,852,403, Cl. 73-201.000.

Beebe, James C.: *See*—
Cargould, Barry D.; and Beebe, James C., 4,852,398, Cl. 73-146.000.

Beecham Group, p.l.c.: *See*—
King, Francis D., 4,853,376, Cl. 514-161.000.
King, Francis D.; Martin, Roger T.; and Watts, Eric A., 4,853,394, Cl. 514-329.000.

Behan, Albert S.; Chiang, Robert L.; and Staniulis, Mark T., to UOP. Silica bonding of molecular sieves. 4,853,355, Cl. 502-64.000.

Behar, Albert; Behar, Orna; Frederiksen, Lee W.; Howard-Link, Donald A.; and Timmerman, Catherine, to Health Innovations, Inc. Human behavior modification which establishes and generates a user adaptive withdrawal schedule. 4,853,854, Cl. 364-413.010.

Behar, Orna: *See*—
Behar, Albert; Behar, Orna; Frederiksen, Lee W.; Howard-Link, Donald A.; and Timmerman, Catherine, 4,853,854, Cl. 364-413.010.

Behling, Gerald R.: *See*—
Vincent, Steve M.; Behling, Gerald R.; Hood, Thomas G.; and Gomm, William E., 4,853,264, Cl. 428-34.000.

Behr, Hans; Vetter, Kurt; Schneider, Rolf; and Luderer, Fred, to Behr-Industrieanlagen GmbH & Co. Apparatus for electrostatic coating of objects. 4,852,810, Cl. 239-703.000.

Behr-Industrieanlagen GmbH & Co.: *See*—
Behr, Hans; Vetter, Kurt; Schneider, Rolf; and Luderer, Fred, 4,852,810, Cl. 239-703.000.

Behrens, Milton D.: *See*—
Sung, Rodney L.; Hayden, Thomas; Caggiano, Michael A.; and Behrens, Milton D., 4,852,993, Cl. 44-62.000.

Behrens, Robert N. Drill apparatus having a primary drill and a pilot drill. 4,852,672, Cl. 175-389.000.

Beihoff, Bruce C., to Eaton Corporation. Torque sensor. 4,852,411, Cl. 73-862.360.

Beiser, Wayne; and Bloom, Amy A., to Huffy Corporation. Combination bicycle bag and handbag. 4,852,778, Cl. 224-30.00A.

Beitz, Jurgen; Erren, Karl-Heinz; and Mantz, Ekkehard, to Norddeutsche Faserwerke GMBH. Creel. 4,852,824, Cl. 242-131.100.

Belaidouni, Ali; Benani, Andre ; and Millet, Jean-Marie, to La Telemecanique Electrique. Machine for automatically fitting connectors to the ends of electric conductors. 4,852,241, Cl. 29-564.400.

Belikov, Evgeny V.: *See*—
Minenko, Leonid P.; Osher, Mikhail I.; Belikov, Evgeny V.; and Klyatis, Lev M., 4,852,927, Cl. 294-86.400.

Bell Communications Research, Inc.: *See*—
Andreadakis, Nicholas C., 4,853,590, Cl. 313-485.000.

Bellagamba, Miro D.; and Ohly, Richard L. Golf training apparatus. 4,852,881, Cl. 273-183.00B.

Bellis, Harold E., to Du Pont de Nemours, E. I., and Company. Method for producing monomethylformamide and dimethylformamide. 4,853,485, Cl. 564-215.000.

Belly, Robert T.: *See*—
Mura, Albert J.; Belly, Robert T.; and Lum, Vanessa R., 4,853,186, Cl. 422-55.000.

Beloit Corporation: *See*—
Crouse, Jere W., 4,852,229, Cl. 29-116.200.

Belrose, Frank R. Tire inflation device for emergencies. 4,852,624, Cl. 152-415.000.

Benani, Andre : *See*—
Belaidouni, Ali; Benani, Andre ; and Millet, Jean-Marie, 4,852,241, Cl. 29-564.400.

Bend Research, Inc.: *See*—
McCray, Scott B., 4,853,122, Cl. 210-321.890.

Bendix France: *See*—
Kervagoret, Gilbert, 4,852,952, Cl. 303-110.000.

Benezra, Jeffrey; and Malin, Michael J., to Technicon Instruments Corporation. Cyanide-free hemoglobin reagent. 4,853,338, Cl. 436-66.000.

Benjamin, Charles M. Underwater voice communicator. 4,852,682, Cl. 181-21.000.

Benjamin, Roland J., to Hughes Aircraft Company. Cam-controlled turning machine. 4,852,436, Cl. 82-19.000.

Bennett Automotive Technology Pty. Ltd.: *See*—
Vowles, Robert W., 4,852,529, Cl. 123-143.00B.

Bennett, S. John; Barnes, Michael W.; and Kolonko, Kenneth J., to Morton Thiokol, Inc. Propellant binder prepared from a PCP/HTPB block polymer. 4,853,051, Cl. 149-19.400.

Bennett, Stanley N.; Perry, James T.; and Greene, Ronald D., to Devon Dircet Marketing & Advertising, Inc. Direct mail solicitation device and method for assembly thereof. 4,852,794, Cl. 229-73.000.

Bennitt, Robert A., to Dresser-Rand Company. Fluid control valve. 4,852,608, Cl. 137-516.130.

Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansley, Robert W.; and Newman, Alec T., to General Foods Limited. Beverage packages. 4,853,234, Cl. 426-77.000.
Berardi, Joseph G. Flower mounting pin device. 4,852,220, Cl. 24-6.000.
Berendt, Gerald C.: *See*—
Melanson, Leslie B.; and Berendt, Gerald C., 4,852,214, Cl. 17-1.00F.
Berg, Kevin. Collapsible bike rack for automotive vehicle. 4,852,779, Cl. 224-42.320.
Berg, William D.: *See*—
Arechavaleta, Joe R.; Berg, William D.; and Dola, Frank P., 4,853,823, Cl. 361-100.000.
Berger, Joel G.: *See*—
Petrakis, Konstantinos S.; Berger, Joel G.; and Gold, Elijah H., 4,853,476, Cl. 558-170.000.
Bergfeld, Manfred; and Eisenhuth, Ludwig, to Akzo N.V. Process for synthesizing alkylene bisdithiocarbamates or the ammonia adducts thereof as well as mixtures that can be synthesized thereby. 4,853,475, Cl. 556-50.000.
Bergquist, Carl R.: *See*—
DeGree, David C.; Humphrey, Dallas R.; Bergquist, Carl R.; and West, Roger A., 4,853,763, Cl. 357-81.000.
Bergquist Company, The: *See*—
DeGree, David C.; Humphrey, Dallas R.; Bergquist, Carl R.; and West, Roger A., 4,853,763, Cl. 357-81.000.
Bergsbaken, Carlton K.: *See*—
Subramaniam, Anandaraman; Ozogar, Robert M.; and Bergsbaken, Carlton K., 4,853,232, Cl. 426-35.000.
Berkin, George M., to Kulicke & Soffa Industries, Inc. Pattern recognition apparatus and method. 4,853,968, Cl. 382-8.000.
Bermel Industries, Inc.: *See*—
Melanson, Leslie B.; and Berendt, Gerald C., 4,852,214, Cl. 17-1.00F.
Bernard Engraving Co.: *See*—
Blome, Fred C.; and Bernard, Jack L., 4,852,281, Cl. 40-152.100.
Bernard, Jack L.: *See*—
Blome, Fred C.; and Bernard, Jack L., 4,852,281, Cl. 40-152.100.
Bernhardt, Gunther; and Hanisch, Horst. Water-soluble polymers bearing quaternary ammonium or pyridinium groups and alkoxysilyl groups, a method for their preparation, and the use thereof. 4,853,438, Cl. 525-326.500.
Bernhardt, Siegfried; Knake, Alfred; and Schmiedgen, Hans. Carder for manufacturing non-wovens from fibrous material. 4,852,217, Cl. 19.98.000.
Bernola Gil, Antonio. Seal for the lower edge of doors and the like. 4,852,302, Cl. 49-482.000.
Bernstein, David: *See*—
Olsen, Duane A.; and Bernstein, David, 4,853,335, Cl. 436-527.000.
Bertolini, Guglielmo: *See*—
Roggero, Arnaldo; and Bertolini, Guglielmo, 4,853,440, Cl. 525-338.000.
Berton, Pierre: *See*—
Allard, Pierre; Lefebvre, Robert; Vallee, Daniel; and Berton, Pierre, 4,852,348, Cl. 60-270.100.
Bertrand, Alain: *See*—
Hochart, Paul; Pagnucco, Gilbert; Bertrand, Marceau; and Bertrand, Alain, 4,853,520, Cl. 219-535.000.
Bertrand, Marceau: *See*—
Hochart, Paul; Pagnucco, Gilbert; Bertrand, Marceau; and Bertrand, Alain, 4,853,520, Cl. 219-535.000.
Bertz, Hans-Ulrich, to Hofler, Willy. Method and apparatus for checking or testing the profile of gear flanks, particularly of involute gears. 4,852,402, Cl. 73-162.000.
Besson, Daniel: *See*—
Coulon, Michel; Faron, Robert; and Besson, Daniel, 4,852,645, Cl. 185-180.000.
Best, John W., to Northstar Industries, Inc. Conveyor. 4,852,712, Cl. 193-35.0TE.
Bethlehem Steel Corporation: *See*—
Griffing, Neal R.; and Hand, Evan L., Sr., 4,852,860, Cl. 266-268.000.
Bettendorf, Richard A.; and Morris, Scott S., to Honeywell Bull Inc. Printer paper control apparatus and method. 4,852,785, Cl. 226-42.000.
Betz, C. Friedemann: *See*—
Schlegel, Kurt; and Betz, C. Friedemann, 4,852,457, Cl. 89-6.500.
Betz Laboratories, Inc.: *See*—
Merrell, Gene A.; and Purnell, Deborah L., 4,853,132, Cl. 210-712.000.
Beyrouti, Michael G.: *See*—
Rabipour, Rafi; Beyrouti, Michael G.; and Mermelstein, Paul, 4,853,958, Cl. 379-386.000.
Bezborodov, Vladimir S.; Grinkevich, Oleg A.; Grebenkin, Mikhail F.; Lapanik, Valery I.; Minko, Anatoly A.; Rzhussky, Vitaly V.; Muravsky, Anatoly A.; Petrov, Vladimir F.; and Ivaschenko, Alexandr V., to Nauchno-Issledovatelsky Institut Prikladnykh Fizicheskikh Problem Imeni A. N. Sevchenko. 2-(4,3-Disubstituted phenyl)-5-alkyl-1,3,2-dioxaphosphorinane derivatives and liquid crystal material. 4,853,150, Cl. 252-299.610.
Bhagwat, Pradeep: *See*—
Walter, Richard T.; Bhagwat, Pradeep; and Lipa, George W., 4,853,607, Cl. 320-36.000.
Bhattacharya, Debanshu: *See*—
Jackson, Charles R.; Rellis, Daniel, Jr.; Pielet, Howard M.; Bhattacharya, Debanshu; Frank, Larry A.; Dasgupta, Purnendu; and Knoepke, John R., 4,852,632, Cl. 164-437.000.
Bianchi, Raymond A.; Kistner, David; Oswald, Joseph; and Phelps, Elmer B., to Caterpillar Inc. Impacting mechanism. 4,852,662, Cl. 173-119.000.
Bianchini, William L.; and Duclos, Gary P., to Highland Import Corporation. Shoe having a rigid back part. 4,852,275, Cl. 36-102.000.
Billman, Elizabeth R.: *See*—
Mehrotra, Pankaj K.; Billman, Elizabeth R.; and North, Bernard, 4,852,999, Cl. 51-309.000.
Binet, Jean: *See*—
Manoury, Philippe; Binet, Jean; and Dewitte, Elisabeth, 4,853,387, Cl. 514-272.000.
Bingham, George H. Method for testing relief valve. 4,852,387, Cl. 73-4.00R.
Bircher, AG.: *See*—
Poschet, Klaus; and Banteli, Willy, 4,853,506, Cl. 200-463.000.
Bishop, Arthur E. Rotary valve for internal combustion engines. 4,852,532, Cl. 123-190.0BD.
Bishop, Chester O., Jr.; Dennis, Malcolm I.; Riley, Peter S.; Richardson, Christopher C.; and Shaw, Vincent P. Advertising device. 4,853,678, Cl. 340-573.000.
Bitschkus, Horst; Hofmann, Manfred; Klockner, Karl-Heinz; Nelles, Uwe; and Siewert, Gunther, to Metzeler GmbH. Hydraulic-damping two-chamber engine mount. 4,852,864, Cl. 267-219.000.
BJK Industries, Inc.: *See*—
Krein, Reuben, 4,852,619, Cl. 141-7.000.
Black & Decker Inc.: *See*—
Lessig, William R., III, 4,853,575, Cl. 310-171.000.
Walter, Richard T.; Bhagwat, Pradeep; and Lipa, George W., 4,853,607, Cl. 320-36.000.
Blaison, Serge: *See*—
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Blalock, Travis N.: *See*—
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Blank, Kurt; Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Audi, Josef; Kaesmacher, Jakob; Reinicke, Ralf; and Niedenhoff, Udo, to Saint Gobain Vitrage. Method for the transportation of glass sheets brought to the deformation temperature, its application to bending and device for its implementation. 4,853,019, Cl. 65-106.000.
Blecksmith, James E.: *See*—
Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; Olmstead, Neil R.; Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; and Frasier, Richard A., 4,853,784, Cl. 358-181.000.
Bledsoe, James O., Jr.; and Brust, Bernard, to Union Camp Corporation. Process for purifying exo-2-hydroxy-1,4 cineole. 4,853,089, Cl. 203-38.000.
Blendax-Werke R. Schneider GmbH & Co.: *See*—
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Blevins, Jack F., to Armstrong World Industries, Inc. Method of forming beater-saturated sheet using carbonate ion. 4,853,083, Cl. 162-145.000.
Bloch, Christopher J., to Naylor Industrial Services, Inc. Method and apparatus for cleaning conduits. 4,853,014, Cl. 55-185.000.
Block, Hermann, to Hanse Chemie GmbH. Modified thermosetting resin, a method for its production and its use. 4,853,434, Cl. 525-100.000.
Bloembergen, Steven: *See*—
Tam, Man C.; Bloembergen, Steven; Kovacs, Gregory J.; Jenninga, Carol A.; Loutfy, Rafik O.; Gardner, Sandra J.; and Taylor, Michael G., 4,853,307, Cl. 430-41.000.
Blome, Fred C.; and Bernard, Jack L., to Bernard Engraving Co. Frame. 4,852,281, Cl. 40-152.100.
Blonski, Chester J., to Quaker Oats Company, The. Flexible joint mechanism. 4,853,965, Cl. 381-205.000.
Bloom, Amy A.: *See*—
Beiser, Wayne; and Bloom, Amy A., 4,852,778, Cl. 224-30.00A.
Bloom, Gordon E. Integrated magnetic converter core. 4,853,668, Cl. 336-214.000.
Blow, Keith J.; and Wood, David C., to British Telecommunications. Non-transform limited pulse locked radiation mode radiation generator with external cavity having non-linear transmission characteristic improving mode locking. 4,853,933, Cl. 372-18.000.
Bloy, Graham P.; and Bell, William, to Metme Corporation. Digital signal processing method for real-time processing of narrow band signals. 4,853,963, Cl. 381-31.000.
Blum, Rainer; Rehmer, Gerd; Osterloh, Rolf; and Sander, Hans, to BASF Aktiengesellschaft. Epoxy resin materials having an improved shelf life. 4,853,433, Cl. 525-65.000.
Blume, Dayton G. Flag mounting clips. 4,852,733, Cl. 206-223.000.
Boberg, Ralph E.; Lee, Ronald S.; and Weingart, Richard C., to United States of America, Energy. Ferrite core coupled slapper detonator apparatus and method. 4,852,493, Cl. 102-202.500.
Boberg, Tore: *See*—
Calsson, Staffan; Boberg, Tore; and Sjogvist, Conny, 4,853,052, Cl. 149-109.600.
BOC Group, Inc., The: *See*—
Kaplan, Robert H.; LaCava, Alberto; Shirley, Arthur I.; and Ringo, Steven M., 4,853,004, Cl. 55-25.000.
BOC Group plc, The: *See*—
Watson, Richard W., 4,853,206, Cl. 423-542.000.
Bodem, George B.: *See*—
Henzel, Richard P.; Vanier, Noel R.; and Bodem, George B., 4,853,367, Cl. 503-227.000.

Bodimer, Theodore B., to Joy Manufacturing Company. Crawler-mounted conveying train. 4,852,724, Cl. 198-861.200.
Boehringer Ingelheim Vetmedica GmbH: *See*—
Bomann, Werner; Esser, Franz; Hamel, Ulrich; and Stable, Helmut, 4,853,402, Cl. 514-401.000.
Boehringer Mannheim GmbH: *See*—
Friebe, Walter-Gunar; and Wilhelms, Otto-Henning, 4,853,386, Cl. 514-266.000.
Boeing Company, The: *See*—
Lata, Walter J.; and Trupiano, Michael S., 4,853,888, Cl. 364.900.000.
Vermilye, Michael L., 4,852,805, Cl. 239-265.110.
Viall, Wilton S., Jr., 4,852,917, Cl. 285-353.000.
Wheat, Lawrence M., 4,853,555, Cl. 307-9.100.
Bogatzki, Hans-Ulrich; and Kramer, Felix, to Elpatronic AG. Inspection machine for plastic bottles. 4,852,415, Cl. 73-865.800.
Bogh, Bo B., to Rockwool International A/S. Method and apparatus for packaging a number of packages of generally elastic insulation material. 4,852,331, Cl. 53-399.000.
Bol, Kenneth E., II: *See*—
Young, David A.; and Bol, Kenneth E., II, 4,852,902, Cl. 280-507.000.
Bolin, James A., to Liberty Glass Company. Glassware forming machine. 4,853,023, Cl. 65-323.000.
Bolon, Donald A.: *See*—
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Bolz, Hans-Peter: *See*—
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Bomann, Werner; Esser, Franz; Hamel, Ulrich; and Stable, Helmut, to Boehringer Ingelheim Vetmedica GmbH. Feed additive for improving growth in agricultural animals. 4,853,402, Cl. 514-401.000.
Bombled, Jean, to Neiman. Device for preventing the theft of motor vehicles. 4,852,681, Cl. 180-287.000.
Bond, Bruce E.: *See*—
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Bone, Matthew F.: *See*—
Davey, Anthony B.; and Bone, Matthew F., 4,852,978, Cl. 350-350.00R.
Bong, Yoo E.: *See*—
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Bonnet, Julio C.: *See*—
Tavlarides, Lawrence L.; and Bonnet, Julio C., 4,852,396, Cl. 73-61.10R.
Book, Theodore L., Sr., to Babcock & Wilcox Company, The. Power plant interactive display. 4,853,175, Cl. 376-216.000.
Boone, Bruce T.; Nafziger, Steven; Rak, Thomas A.; and McMennamy, John A., to Movats Incorporated. Ultrasonic testing system with variable angle transducer mount. 4,852,416, Cl. 73-866.500.
Boone, Luc: *See*—
Frankel, Juergen; Mattelin, Antoon; Pecceu, Pol; Quella, Ferdinand; Schmidt, Hans-Fr.; Boone, Luc; Von Tomkewitsch, Sybille; and De Vogelaere, Marc, 4,853,252, Cl. 427-53.100.
Bopp, Cecil W.: *See*—
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Borchardt, John K., to Shell Oil Company. Method to obtain rapid build-up of pressure in a steam foam process. 4,852,653, Cl. 166-272.000.
Borden, Inc.: *See*—
Subramaniam, Anandaraman; Ozogar, Robert M.; and Bergsbaken, Carlton K., 4,853,232, Cl. 426-35.000.
Borello, Kelli J.: *See*—
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Bosch-Siemens Hausgerate GmbH: *See*—
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Boshagen, Horst: *See*—
Rosentreter, Ulrich; Boshagen, Horst; Lieb, Folker; Oediger, Hermann; Niewohner, Ulrich; Seuter, Friedel; Perzborn, Elisabeth; and Fiedler, Volker-Bernd, 4,853,406, Cl. 514-411.000.
Boisio, Claudio, to Societa' Cavi Pirelli S.p.A. Laminated paper-plastic insulating tape and cable including such tape. 4,853,490, Cl. 174-25.00R.
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Boucher, Donald A., to PCI Group Inc. Gripping eyelet die tool assembly. 4,852,251, Cl. 29-845.000.
Boudreaux, Thad: *See*—
Yalamanchili, Bhaskar; Wisniewski, Frank; and Boudreaux, Thad, 4,853,032, Cl. 75-10.490.
Bouillette, Thierry; Olivier, Denis; and Guigou, Bernard, to Etude Recherche Et Development - E.R.D. Sarl. Reconstructed fruit pieces and, process for preparation. 4,853,245, Cl. 426-575.000.
Boulos, Maher; and Jurewicz, Jerzy, to Universite de Sherbrooke. Process of depositing particulate material on a substrate. 4,853,250, Cl. 427-34.000.
Bourquin, Francis; and Krieger, Ira. Timing mechanism with tide indicator. 4,853,908, Cl. 368-19.000.
Boussois S.A.: *See*—
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Bovy, Philippe R.; Gillet, Claude; Lenaers, Albert; Niebes, Paul; Roba, Joseph; and Lambelin, Georges, to G. D. Searle & Co. Spiro-hydantoins as aldose reductase inhibitors. 4,853,401, Cl. 514-389.000.
Bowen, John G.; and Groome, John M., to Bowen, John G. Vaporizing unit. 4,853,517, Cl. 219-271.000.
Bowling, Donald R.; and Smith, Charles F., to United States of America, Navy. Symmetric waveguide junction combiner. 4,853,650, Cl. 330-287.000.
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BP Chemicals Limited: *See*—
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Brackett, Douglas C. Method for treating garbage disposal units. 4,852,813, Cl. 241-30.000.
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Bravo, Francesco, to Bravo S.p.A. Evaporator for coolant fluids. 4,852,368, Cl. 62-515.000.
Bravo, Francesco, to Bravo S.p.A. Tank-type heating apparatus for fluid or doughy food products. 4,853,518, Cl. 219-441.000.
Bravo S.p.A.: *See*—
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Bravo, Francesco, 4,853,518, Cl. 219-441.000.
Brearley, Malcolm; Phillips, Mark I.; Prescott, Robert D.; and Ross, Colin F., to Lucas Industries public limited company. Anti-skid braking systems for vehicles. 4,852,953, Cl. 303-111.000.
Breault, Michelle S.: *See*—
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Breitenbacher, Juergen; Kuehle, Walter; Moenninga, Roland; Neumann, Udo; and Schramm, Wolfgang, to Robert Bosch GmbH. Pneumatic suspension for motor vehicles. 4,852,863, Cl. 267-218.000.
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Brenk, Michael; and Ernst, Renate, to Hoechst Aktiengesellschaft. Aluminum or an aluminum alloy support material for use in offset printing plates. 4,853,093, Cl. 204-37.600.
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Breveglieri, Franklin L., to Geerpres, Inc. Multiple tool holder assembly. 4,852,747, Cl. 211-70.600.
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Bridgestone Corporation: *See*—
Tsukagoshi, Tetsuhito, 4,852,626, Cl. 152-541.000.
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Bright, Danielle A., to ICI Americas Inc. Preparation of alkyl thiosemicarbazides. 4,853,483, Cl. 564-18.000.
Brinkmann, Heinz J., to Dr. W. Ingold AG. Maintenance device for at least partially automatic cleaning and calibration of a probe containing a measured value transmitter. 4,852,385, Cl. 73-1.00R.
Bristol-Myers Company: *See*—
Faber, Nicholas J., Jr., 4,852,714, Cl. 198-347.000.
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British Aerospace Public Limited Company: *See*—
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British Petroleum Company p.l.c., The: *See*—
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British Telecommunications: *See*—
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Brockenbrough, Roger L.; and Douty, Donald L., to USX Corporation. Energy absorption and barrier device for automotive vehicles and method for making the same. 4,852,704, Cl. 188-376.000.

Brockman, Robert T., to Universal Computer Consulting, Inc. Encryption system. 4,853,962, Cl. 380-44.000.

Brockway, Barbara E., to University of Reading of Whiteknights House. Treatment of hair. 4,853,215, Cl. 424-71.000.

Brooks, Albert J. Apparatus for repairing pipes. 4,852,913, Cl. 285-15.000.

Brooks, William W., Jr.; Clemen, Curtis J.; Coffey, Jerome T.; Coffield, Timothy P.; and Larson, David R., to International Business Machines Corporation. Magnetic disk drive with low profile head-suspension system. 4,853,811, Cl. 360-103.000.

Brother Kogyo Kabushiki Kaisha: *See*—
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Brown, Allen C.; Brown, Ray R.; and Suttles, J. Marshall, to Royston Corporation. Step-front cabinet with improved overhanging cover and tray retainer. 4,852,954, Cl. 312-140.400.

Brown, Boveri Reaktor GmbH: *See*—
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Brown, Daniel P.; Danielsen, Carl M.; and Dabbish, Ezzat A., to Motorola, Inc. Random number generator with digital feedback. 4,853,884, Cl. 364-602.000.

Brown, David E.; and Leichter, Louis M., to Minnesota Mining and Manufacturing Company. Triiolide salts of cyanine dyes suitable for sensitization of photoconductive systems. 4,853,310, Cl. 430-83.000.

Brown, Duncan W.: *See*—
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Brown, Max R., to International Business Machines Corp. Computer input by color coding. 4,853,878, Cl. 364-521.000.

Brown, Ray R.: *See*—
Brown, Allen C.; Brown, Ray R.; and Suttles, J. Marshall, 4,852,954, Cl. 312-140.400.

Brown, Robert W., to Eastman Kodak Company. Image-capable interprocessor link communications protocol. 4,853,875, Cl. 364-514.000.

Brown, Shawn E.: *See*—
Holdsworth, Robert S.; Brown, Shawn E.; and Gribens, Joel A., 4,852,754, Cl. 215-347.000.

Brown, Stephen E. Delivery of fuel in internal combustion engines. 4,852,526, Cl. 123-52.0MC.

Brown, Thomas R.; Logan, Richard H.; Hahn, Robert W.; Rodeghiero, Charles D.; and Brekkestran, Kevin L., to J. I. Case Company. Vehicle anti-theft system with remote security module. 4,852,680, Cl. 180-287.000.

Brown, Victor. Low velocity air classifier. 4,853,112, Cl. 209-142.000.

Brownell, Peter; Borgia, Joseph A.; and Gabrielson, Robert, to Allied-Signal Inc. Liquid filter. 4,853,118, Cl. 210-130.000.

Bruckner, Christopher A., to Allied-Signal Inc. Stacked lamination magnetic cores. 4,853,292, Cl. 428-600.000.

Brueckner, Juergen: *See*—
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Bruening, Wilhelm; Uchdorf, Rudolf; and Mitschker, Alfred, to Bayer Do Brasil S.A. Process for the removal of sulfur-containing gases. 4,853,191, Cl. 423-226.000.

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Brum, Roger D., to Southwest Aerospace Corporation. Decoy system. 4,852,455, Cl. 89-1.140.

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Brun, Charles: *See*—
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Brunet, Charles G.; and Watson, Alton. Apparatus for and a method of drilling offset wells for producing hydrocarbons. 4,852,666, Cl. 175-61.000.

Brunner, Felix. Method of operating an autotypical color offset printing machine. 4,852,485, Cl. 101-211.000.

Brunner, Terry C., Sr.: *See*—
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Bruno, Mueller, to Polytex Plastic SA. Scaffolding board formed from plastics materials, a method of producing same, and an apparatus for implementing the method. 4,852,691, Cl. 182-222.000.

Brunswick Corporation: *See*—
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Brust, Bernard: *See*—
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Brust, Hans-Detlef, to Siemens Aktiengesellschaft. Method and apparatus for detecting and imaging a voltage signal of at least one specific frequency at a measuring location. 4,853,622, Cl. 324-158.00R.

Bryden, Norman E.; and Johnson, Philip B. Multi-compartment receptacle for individually packaging and dispensing pairs of gloves for use by health care or emergency rescue personnel. 4,852,783, Cl. 224-253.000.

Bryzik, W.: *See*—
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Buchi, George H.: *See*—
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Buchtal GmbH: *See*—
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Buckland, Paul R.: *See*—
Krishnamurthy, Sundaram; Johnston, Brian H.; Kilminster, Kenneth N.; Vogel, David C.; and Buckland, Paul R., 4,853,319, Cl. 430-387.000.

Buckner, Robert K.; Read, Norman W.; and Ritchie, Donald E., to Dresser Industries, Inc. Wireline hydraulic isolation packer system. 4,852,654, Cl. 166-277.000.

Bucko, Edward P., Sr. Fluid flow control device. 4,852,612, Cl. 137-625.500.

Buding, Hartmuth; and Casper, Rudolf, to Bayer Aktiengesellschaft. Process for hydrogenating nitrile group-containing unsaturated polymers. 4,853,441, Cl. 525-339.000.

Buffet, Georges: *See*—
Rio, Michel; Iltis, Claude; Louis, Herve ; Buffet, Georges; Joly, Marcel; Goudard, Jean-Francois; Bacherot, Joel; and Ducret, Claude, 4,853,013, Cl. 55-159.000.

Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, to Hutschenreuther AG; and Buhler, Eugen. Process for producing press molded articles provided with channels from powdery molding compounds. 4,853,170, Cl. 264-517.000.

Buhler, Steven A.: *See*—
ElHatem, Abdul M.; and Buhler, Steven A., 4,853,718, Cl. 346-140.00R.

Buitendijk, Pieter: *See*—
Seevinck, Evert; De Jager, Willem; and Buitendijk, Pieter, 4,853,645, Cl. 330-255.000.

Bukhman, Yefim; and Witting, Gary F., to Motorola, Inc. Selective metal deposition process. 4,853,347, Cl. 437-192.000.

Bulatovic, Srdjan, to Falconbridge Limited; and Highwood Resources Ltd. Froth Flotation of bastnaesite. 4,853,113, Cl. 209-166.000.

Bullington, James L.: *See*—
Dolak, Terence M.; Lee, Sung J.; and Bullington, James L., 4,853,389, Cl. 514-275.000.

Bulman, Melvin J., to General Electric Company. Liquid propellant weapon system. 4,852,458, Cl. 89-7.000.

Bulman, Melvin J., to General Electric Company. Liquid propellant weapon system. 4,852,459, Cl. 89-7.000.

Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Aburaya, Toshio, to Toyota Jidosha Kabushiki Kaisha. Electronically controlled fluid suspension system. 4,852,906, Cl. 280-707.000.

Bung, Richard: *See*—
Doncker, Francis; Helber, Rolf; Welzel, Gerhard; and Bung, Richard, 4,852,533, Cl. 123-192.00R.

Bures, Pavel: *See*—
Kotrba, Zdenek; Jaros, Frantisek; Burysek, Frantisek; Kubovy, Miloslav; Hejduk, Jiri; and Bures, Pavel, 4,852,340, Cl. 57-301.000.

Burgess, William C.; Jochum, Gary L.; Goetzinger, David; and Beckius, David A., to Deere & Company. Ferris wheel shaped fixture holding apparatus. 4,852,748, Cl. 211-70.600.

Burks, Darnall P., to Sprague Electric Company. Method for making a multilayer ceramic capacitor with buried electrodes and terminations at a castellated edge. 4,852,227, Cl. 29-25.420.

Burndy Corporation: *See*—
Anderson, James D., 4,852,248, Cl. 29-749.000.

Burnes, James E.: *See*—
Callahan, Wayne B.; and Burnes, James E., 4,852,566, Cl. 128-303.00R.

Burns, David W.: *See*—
Guckel, Henry; and Burns, David W., 4,853,669, Cl. 338-4.000.

Burns, Michael E.; and Hardy, Frederick E., to Procter & Gamble Company, The. Bleaching compounds and compositions comprising fatty peroxyacids salts thereof and precursors therefor having amide moieties in the fatty chain. 4,852,989, Cl. 8-107.000.

Burrows, Bruce D. Purified water supply system. 4,853,117, Cl. 210-110.000.

Burton, Willie L., Jr. Handcuff holder. 4,852,784, Cl. 224-255.000.

Burysek, Frantisek: *See*—
Kotrba, Zdenek; Jaros, Frantisek; Burysek, Frantisek; Kubovy, Miloslav; Hejduk, Jiri; and Bures, Pavel, 4,852,340, Cl. 57-301.000.

Buschman Company, The: *See*—
Yu, Thomas C., 4,852,230, Cl. 29-148.40D.

Buss, Anthony D.: *See*—
Parsons, John H.; Hunt, Russell G.; Leach, Susan E.; Buss, Anthony D.; Green, David E.; Mellor, Michael; and Percival, Albert, 4,853,400, Cl. 514-383.000.

Bussard, Janice W. Kit for individualized silk screen printing. 4,852,483, Cl. 101-128.000.

Butler, John D., to Mechtrix Corporation. Interlocking blade pair for stripping insulated electrical conductors. 4,852,433, Cl. 81-9.510.

Butler, John P.: *See*—
Allen, John S.; Butler, John P.; and Phillips, Floyd L., Jr., 4,852,734, Cl. 206-273.000.

Butt, Sheldon H., to Olin Corporation. Chip carrier. 4,853,491, Cl. 174-52.400.

Buzzelli, Dennis K., to Eaton Corporation. Electronic module locking mechanism. 4,853,829, Cl. 361-386.000.

Byren, Robert W.; and Rockwell, David A., to Hughes Aircraft Company. Self-aligning phase conjugate laser. 4,853,[illegible] Cl. 250-203.00R.

Byrne, John V.: *See*—
McMullin, Francis; Byrne, John V.; and Murray, Aengus, 4,853,604, Cl. 318-653.000.

C. R. Bard, Inc.: *See*—
Sinofsky, Edward L., 4,852,567, Cl. 128-303.100.

Cafeo, John A.: *See*—
Beardmore, John M.; and Cafeo, John A., 4,852,527, Cl. 123-96.000.

Caggiano, Michael A.: *See*—
Sung, Rodney L.; Hayden, Thomas; Caggiano, Michael A.; and Behrens, Milton D., 4,852,993, Cl. 44-62.000.

Cahn, Robert P.; and Hurst, Boyd E., to Exxon Research and Engineering Company. Process for removing NO_x and SO_x from a gaseous mixture. 4,853,193, Cl. 423-235.000.

Calaminus, Wolfgang: *See*—
Vogtle, Fritz; and Calaminus, Wolfgang, 4,853,151, Cl. 252-299.610.

Calcomp Inc.: *See*—
Landmeier, Waldo L., 4,853,497, Cl. 178-18.000.
Watson, James S., 4,853,499, Cl. 178-19.000.

Calderone, Nicholas: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; and Fenn, Ronald S., 4,853,369, Cl. 512-25.000.

Callahan, Wayne B.; and Burnes, James E. Device for implantation of intraocular lens. 4,852,566, Cl. 128-303.00R.

Callegari, Alessandro C.: *See*—
Baker, John M.; Callegari, Alessandro C.; Lacey, Dianne L.; and Shih, Yih-Cheng, 4,853,346, Cl. 437-184.000.

Callegari, Michel: *See*—
Minjolle, Louis; Drouet, Michel; Fatta-Barou, Jean-Louis; Callegari, Michel; and Noel, Jacques, 4,853,053, Cl. 156-73.500.

Calsson, Staffan; Boberg, Tore; and Sjogvist, Conny, to Aktiebolaget Bofors. Method for producing a pyrotechnical charge. 4,853,052, Cl. 149-109.600.

Calvat, Claude; Colle, Laurent; Couchaud, Maurice; LeJus, Anne-Marie; Moncorge, Richard; Vivien, Daniel; and Wyon, Christophe, to Commissariat A L'Energie Atomique Center National De La Recherche Scientifique. Mixed lanthanum-magnesium aluminates and lasers using monocrystals of these aluminates. 4,853,354, Cl. 501-119.000.

Calzado Requena, Vincente: *See*—
Andrada Galan, Mario; Romero Lledo, Antonio; and Calzado Requena, Vincente, 4,853,866, Cl. 364-470.000.

Campagnuolo, Carl J.; and Fine, Jonathan E., to United States of America, Army. Charging and detonation device for submunition. 4,852,496, Cl. 102-322.000.

Campana, Thomas J.: *See*—
Andros, Andrew A.; and Campana, Thomas J., 4,853,688, Cl. 340-825.440.

Campanini, Sergio, to Hose America, Inc. Shut-off and locking assembly for swivel gladhand. 4,852,915, Cl. 285-38.000.

Campbell, Ian B.: *See*—
Finch, Harry; Lunts, Lawrence H. C.; Naylor, Alan; Skidmore, Ian F.; and Campbell, Ian B., 4,853,381, Cl. 514-211.000.
Skidmore, Ian F.; Finch, Harry; Naylor, Alan; Lunts, Lawrence H. C.; and Campbell, Ian B., 4,853,382, Cl. 514-212.000.

Canipe, Michael R., to Fasco Controls Corporation. Combination brake and/or clutch pedal operated switch mechanism. 4,853,502, Cl. 200-61.890.

Cannarsa, Michael J.: *See*—
Hostetler, Donald E.; Cannarsa, Michael J.; Kesling, Haven S., Jr.; and Sun, Hsiang-Ning, 4,853,462, Cl. 528-494.000.

Canon Kabushiki Kaisha: *See*—
Akamatsu, Takahiro; Nakazato, Hiroshi; Matsumura, Takashi; and Fukui, Kenji, 4,853,880, Cl. 364-559.000.
Fukatsu, Tsutomu; Hori, Taizou; Masui, Toshiyuki; Kobayashi, Takashi; Wakui, Tetsuya; and Takahashi, Koji, 4,853,803, Cl. 360-72.300.
Goto, Koji; and Sakakibara, Teigo, 4,853,736, Cl. 355-210.000.
Hosoya, Hideki; Aoki, Akio; and Enari, Masahiko, 4,853,920, Cl. 369-59.000.
Ishihara, Shunichi; Ohno, Shigeru; Kanai, Masahiro; Oda, Shunri; and Shimizu, Isamu, 4,853,251, Cl. 427-38.000.
Koike, Shoji; and Tomida, Yasuko, 4,853,036, Cl. 106-20.000.
Koyama, Osamu; Uzuki, Kazuo; Shiho, Makoto; and Aoi, Shigeru, 4,853,917, Cl. 369-44.000.
Matsuda, Mutsuhide; Aoyagi, Masao; Furukawa, Hiroshi; and Shimizu, Masami, 4,853,725, Cl. 354-286.000.
Matsuki, Toshio, 4,853,756, Cl. 355-71.000.
Miyawaki, Mamoru; and Matsumoto, Kazuya, 4,853,919, Cl. 369-44.000.
Muto, Kazuhiko, 4,853,530, Cl. 250-214.00A.
Suda, Shigeyuki, 4,852,981, Cl. 350-413.000.
Suzuki, Akio; Ohkubo, Masaharu; and Takada, Yoshihiro, 4,853,768, Cl. 358-80.000.
Suzuki, Noriyuki, 4,853,494, Cl. 178-18.000.
Takahashi, Sadatoshi; Ogawa, Hideki; and Endo, Hiroshi, 4,852,984, Cl. 350-454.000.
Takahashi, Tohru; Kitajima, Nobuo; and Kawamura, Naoto, 4,853,752, Cl. 355-77.000.
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Tokura, Go; Ishikawa, Masanori; and Yamada, Akira, 4,853,734, Cl. 354-485.000.
Ushio, Yukihide; Hashimoto, Hiroshi; Hori, Kenjiro; Seto, Kaoru; and Yoshimoto, Toshio, 4,853,740, Cl. 355-319.000.

Capasso, Federico; Cho, Alfred Y.; and Sen, Susanta, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Resonant-tunneling device, and mode of device operation. 4,853,753, Cl. 357-4.000.

Carangelo, Martin C. Method for stabilizing stacked load. 4,852,330, Cl. 53-399.000.

Cardgard Ltd.: *See*—
Kitts, Jacques B., 4,853,676, Cl. 340-543.000.

Cardiff Technology Inc.: *See*—
Lutz, Frank T., 4,853,808, Cl. 360-98.010.

Cargill, Incorporated: *See*—
Yalamanchili, Bhaskar; Wisniewski, Frank; and Boudreaux, Thad, 4,853,032, Cl. 75-10.490.

Cargould, Barry D.; and Beebe, James C., to Eagle-Picher Industries, Inc. Tire testing machine having adjustable bead width. 4,852,398, Cl. 73-146.000.

Carl Freudenberg, Firma: *See*—
Grassmuck, Volker; Jorg, Benno; and Sommer, Eberhard, 4,852,424, Cl. 74-574.000.

Carl Schenck AG: *See*—
Kunstmann, Uwe, 4,852,718, Cl. 198-465.300.
Schonfeld, Harald, 4,852,405, Cl. 73-461.000.

Carlingswitch, Inc.: *See*—
Sorenson, Richard W., 4,853,505, Cl. 200-315.000.

Carmen, Ralph, to Superior Electric Company, The. Magnetoresistive sensor having inter-leaved magnetoresistive elements for detecting encoded magnetic information. 4,853,631, Cl. 324-208.000.

Carpenter Technology Corporation: *See*—
Harner, Leslie L.; and Frantz, Earl L., 4,853,298, Cl. 428-630.000.

Carr, F. P.; Dillard, Robert D.; and McCullough, Doris E., to Eli Lilly and Company. Leukotriene antagonists and use thereas. 4,853,398, Cl. 514-381.000.

Carter, Charles G.; Lee, David L.; and Michaely, William J., to Stauffer Chemical Company. Certain 2-(2-substituted benzoyl)-1,3-cyclohexanediones. 4,853,028, Cl. 71-103.000.

Carver, George C.: *See*—
St. Angelo, Stephen; Carver, George C.; Patterson, David W.; and Fremont, Owen K., 4,852,240, Cl. 29-559.000.

Carver, Robert L. Method and apparatus for measuring moisture content of granular material. 4,853,614, Cl. 324-61.00R.

Casio Computer Co., Ltd.: *See*—
Shoji, Masaru; and Yatabe, Mitsunobu, 4,853,909, Cl. 368-190.000.

Casper, Rudolf: *See*—
Buding, Hartmuth; and Casper, Rudolf, 4,853,441, Cl. 525-339.000.

Cassaday, Michael M.: *See*—
Saros, Stephen; Smith, John L.; Cassaday, Michael M.; Herron, Rand E.; and Pelavin, Milton H., 4,853,336, Cl. 436-53.000.

Catalytica Associates: *See*—
Vasilevskis, Janis; De Deken, Jacques C.; Saxton, Robert J.; Wentrock, Paul R.; Fellmann, Jere D.; and Kipnis, Lyubov S., 4,853,357, Cl. 502-165.000.

Catanese, John A., to Westinghouse Electric Corp. Liquid level detector. 4,852,404, Cl. 73-319.000.

Caterpillar Inc.: *See*—
Bianchi, Raymond A.; Kistner, David; Oswald, Joseph; and Phelps, Elmer B., 4,852,662, Cl. 173-119.000.
Gudat, Adam J., 4,852,674, Cl. 177-141.000.
Hardy, Gerald D.; Hoffman, John P.; and Kendrick, Larry E., 4,852,657, Cl. 172-2.000.
Loyd, Calvin D., 4,853,049, Cl. 148-318.000.

Cavalier, Albert R.: *See*—
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Cavin, Dennis: *See*—
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Cearley, James E.: *See*—
Charnley, James E.; Cearley, James E.; Dixon, Robert C.; Izzo, Kenneth R.; and Aiello, Louis L., 4,853,176, Cl. 376-333.000.

Celada-Salmon, Juan, to Hylsa, S.A. De C.V. Graphite electrode with internal cooling for electric arc furnaces. 4,853,942, Cl. 373-91.000.

Ceracon, Inc.: *See*—
Oslin, Brian L., 4,853,178, Cl. 419-23.000.

Cestind - Centro Studi Industriali-S.R.L.: *See*—
Romagnoli, Andrea, 4,853,071, Cl. 156-443.000.

Cetus Corporation: *See*—
Mark, David F.; Lin, Leo S.; and Yu La, Shi-Da, 4,853,332, Cl. 435-252.330.

Chalfant, Terrill L.: *See*—
Smoak, Copley H.; and Chalfant, Terrill L., 4,852,299, Cl. 47-42.000.

Chamberlin, David B.: *See*—
Jachmann, Emil F.; Saltzman, Jeremy; and Chamberlin, David B., 4,853,952, Cl. 379-88.000.

Chamberlin, John M. Thermally-activated drip valve. 4,852,601, Cl. 137-62.000.

Chambers, Brent V.: *See*—
Cornie, James A.; Kattamis, Theodoulos; Chambers, Brent V.; Bond, Bruce E.; and Varela, Raul H., 4,853,182, Cl. 420-129.000.
Champion Road Machinery Limited: *See*—
Ross, Murray A.; Adams, Gordon L.; and Sully, Michael A., 4,852,659, Cl. 172-789.000.
Chan, Lawrence K. M.; Coates, David; Gemmell, Peter A.; Gray, George W.; Lacey, David; Toyne, Kenneth J.; and Young, Daniel J. S., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. 19 -hydroxy carboxylic acid derivatives suitable for use in liquid crystal materials and devices. 4,852,977, Cl. 350-350.00S.
Chandler, Daniel E. Beverage holder for attachment to vehicle heating and cooling vents. 4,852,843, Cl. 248-311.200.
Chane, It S.: *See*—
Swanson, Ernest B.; and Chane, It S., 4,852,296, Cl. 43-112.000.
Chang, Chin-Fong: *See*—
Das, Santosh K.; and Chang, Chin-Fong, 4,853,035, Cl. 75-249.000.
Chang, Yeong-Ho; and Jenkins, Waylon L., to Eastman Kodak Company. Method of isolating copolymers of vinylpyridine and styrene. 4,853,461, Cl. 528-486.000.
Chant, Peter R., to Firan Corporation. Method for producing circuit boards with deposited metal patterns and circuit boards produced thereby. 4,853,277, Cl. 428-209.000.
Charnley, James E.; Cearley, James E.; Dixon, Robert C.; Izzo, Kenneth R.; and Aiello, Louis L., to General Electric Company. Hafnium stainless steel absorber rod for control rod. 4,853,176, Cl. 376-333.000.
Chas s. Lewis & Co., Inc.: *See*—
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Chatterjee, Ananda M., to Shell Oil Company. In-reactor stabilization of polyolefins via coated stabilizers. 4,853,426, Cl. 524-100.000.
Chaudry, Imtiaz A.: *See*—
Yim, Zachary; Zupon, Michael A.; and Chaudry, Imtiaz A., 4,853,218, Cl. 424-85.700.
Chaux, Aurelio, to Pilling Co. Sternal retractor. 4,852,552, Cl. 128-20.000.
Chemfix Technologies, Icc.: *See*—
Reimers, Robert S.; Akers, Thomas G.; and Lo, C. Paul, 4,853,208, Cl. 423-659.000.
Chen, Ching-Shih. Contact lens washing apparatus. 4,852,594, Cl. 134-140.000.
Chen, Shih-Lu; Gadkaree, Kishor P.; and Mash, Joseph F., to Corning Incorporated. Extruded whisker-reinforced ceramic matrix composites. 4,853,350, Cl. 501-9.000.
Cheng, Huan-Sung. Backward driving device for tricycle. 4,852,420, Cl. 74-376.000.
Chernoff, Ira. Device for pinning bone fractures. 4,852,559, Cl. 128-92.0YZ.
Cherukuri, Subraman R.: *See*—
Faust, Steven M.; and Cherukuri, Subraman R., 4,853,212, Cl. 424-48.000.
Chevron Research Company: *See*—
Davis, Bruce W., 4,852,651, Cl. 166-268.000.
Kuehne, Donald L., 4,852,652, Cl. 166-270.000.
Reynolds, John G., 4,853,109, Cl. 208-252.000.
Salaita, George N.; Quarles, Carol A.; and Altman, Joseph C., 4,853,537, Cl. 250-253.000.
Chiang, Robert L.: *See*—
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Chicago Metallic Corporation: *See*—
Dunn, James J.; Jahn, Martin D.; and Vukmanic, Ronald W., 4,852,325, Cl. 52-729.000.
Chicago Pneumatic Tool Company: *See*—
Wittek, Winfried D., 4,852,261, Cl. 30-347.000.
Chilewich, Sandy; and Moskal, Kathy, to Moskal & Chilewich, Inc. Slipper sock construction and method for making same. 4,852,272, Cl. 36-12.000.
Chisso Corporation: *See*—
Goto, Yasuyuki, 4,853,152, Cl. 252-299.630.
Cho, Alfred Y.: *See*—
Capasso, Federico; Cho, Alfred Y.; and Sen, Susanta, 4,853,753, Cl. 357-4.000.
Choi, Sunhee, to Colgate-Palmolive Company. Liquid dishwashing detergent composition for improved hand washing of dishes in cold water. 4,853,147, Cl. 252-174.190.
Chou-Sheng, Huang, to Pecoware Products, Inc. Child's canteen. 4,852,762, Cl. 220-90.200.
Christians, Douglas L.: *See*—
Grubert, Gordon R.; and Christians, Douglas L., 4,852,637, Cl. [illegible].
Chrithian, Oliver; and Brun, Charles, to Usinor Aciers. Method and apparatus for determining the coefficient of internal friction of steel or the like. 4,852,406, Cl. 73-579.000.
Chrysler Motors Corporation: *See*—
Leslie, Michael D., 4,853,075, Cl. 156-584.000.
Lyzohub, Walter A., 4,852,765, Cl. 220-461.000.
Chu, Tak-Kin; and Santiago, Francisco, to United States of America, Navy. Method of sensitizing Pb-salt epitaxial films for schottky diodes. 4,853,339, Cl. 437-2.000.
Chuang, Cliff L. Automatic venting system. 4,852,469, Cl. 98-2.010.
Chugai Ro Co, Ltd.: *See*—
Terasaka, Yoshiyasu; and Tanabe, Masao, 4,852,515, Cl. 118-663.000.
Chugai Seiyaku Kabushiki Kaisha: *See*—
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Ciarlei, Joseph A.: *See*—
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Ciba Corning Diagnostics Corp.: *See*—
Cook, Thomas A.; Love, Walter F.; and Slovacek, Rudolf E., 4,852,967, Cl. 350-96.290.
Ciba-Geigy Corporation: *See*—
Farooq, Saleem, 4,853,396, Cl. 514-333.000.
Graf, Jean-Francois; Hasslin, Hans W.; Schuurman, Hessel J.; Steiner, Theodor; and Wieland, Bruno, 4,853,223, Cl. 424-405.000.
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Kurihara-Bergstrom, Tamie; Good, William R.; and Ebert, Charles D., 4,853,227, Cl. 424-443.000.
Rody, Jean; and Slongo, Mario, 4,853,471, Cl. 548-261.000.
Schafer, Horst; Kossmehl, Gerhard; and Neumann, Walter, 4,853,453, Cl. 528-28.000.
Schneider, Wolfgang; and Amsler, Kurt, 4,853,455, Cl. [illegible].
Zimmermann, Markus, 4,853,393, Cl. 514-318.000.
Cipher Data Products, Inc.: *See*—
McGee, Jeffrey S.; and Kadien, Thomas C., 4,852,825, Cl. 242-195.000.
Citizen Watch Co., Ltd.: *See*—
Kunita, Masao; Koizumi, Michio; and Ohsawa, Seiichi, 4,852,480, Cl. 101-93.050.
Shimizu, Shotaro; and Sakakibara, Yosuke, 4,853,048, Cl. 148-300.000.
Suzuki, Yasushi, 4,852,976, Cl. 350-339.00R.
Ciulli, Paolo. Portable table having a single supporting leg to be anchored to the ground and a tiltable top panel. 4,852,835, Cl. 248-156.000.
Claeys, Ronald W.; and Decamp, Gary S. System for verifying and recording drug administration to a patient. 4,853,521, Cl. 235-375.000.
Clardy, Bobbie. Method of cleaning a carpet. 4,853,041, Cl. 134-6.000.
Clare, Kenneth; McMullen, James H.; Findlay, Medeans; and Gainford, Susan E., to Kelco International Limited. Method of preparing a gelled omelette mix and the product produced thereby. 4,853,244, Cl. 426-573.000.
Clark, Nigel L., to Unilever Patent Holdings B.V. Terpolymer emulsions. 4,853,451, Cl. 526-331.000.
Clarkson, Douglas; and Clifford, Richard P., to W.R. Grace & Co.-Conn. Biocide. 4,853,411, Cl. 514-441.000.
Clayton, R. Paul; and Bowling, Rod A., to Monfort of Colorado, Inc. Animal slaughtering chemical treatment and method. 4,852,216, Cl. 17-50.000.
Clemen, Curtis J.: *See*—
Brooks, William W., Jr.; Clemen, Curtis J.; Coffey, Jerome T.; Coffield, Timothy P.; and Larson, David R., 4,853,811, Cl. 360-103.000.
Clemence, Francois; Guillaume, Jacques; and Hamon, Gilles, to Roussel Uclaf. 4-phenylpropyl-indoles having antiarythmic activity. 4,853,408, Cl. 514-415.000.
Clemente, Emmett: *See*—
Anaebonam, Aloysius; Clemente, Emmett; Devlin, Theresa; and Ringden, Diane, 4,853,416, Cl. 514-636.000.
Clemmensen, Inge D.; and Kluft, Cornelis, to Nederlandse Centrale Organisatie Voor Toegerastnatuurwete Nschappelijk Onderzoek. Protein isolated from blood, process for preparing said protein, aantibodies against said new protein, and pharmaceutical compositions containing said protein or said antibodies. 4,853,220, Cl. 424-101.000.
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Climax Portable Machine Tools, Inc.: *See*—
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Thykeson, Everett, 4,852,730, Cl. 206-145.000.
Coal Industry (Patents) Limited: *See*—
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Coates, David: *See*—
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Coffen, David L.; Schmid, Rudolf; and Sebastian, Mark J., to Hoffmann-La Roche Inc. Vitamin E intermediates. 4,853,472, Cl. 549-407.000.
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Brooks, William W., Jr.; Clemen, Curtis J.; Coffey, Jerome T.; Coffield, Timothy P.; and Larson, David R., 4,853,811, Cl. 360-103.000.
Coffield, Timothy P.: *See*—
Brooks, William W., Jr.; Clemen, Curtis J.; Coffey, Jerome T.; Coffield, Timothy P.; and Larson, David R., 4,853,811, Cl. [illegible].
Cohen, Edwin; and Woycechowsky, Brian J. Device to measure the relative position and attitude of two bodies. 4,853,863, Cl. 364-460.000.
Cohen, Kenneth W., to Aerco International, Inc. Gas fired water heater. 4,852,524, Cl. 122-448.00R.

Colborn, Robert E.: *See*—
Walles, Erik W.; Lupinski, John H.; Markovitz, Mark; Colborn, Robert E.; Presley, James R.; Davis, Michael J.; Minnick, Michael G.; Kubisen, Steven J., Jr.; Hallgren, John E.; Bolon, Donald A.; Eddy, Victoria J.; and Irwin, Patricia C., 4,853,423, Cl. 523-428.000.
Cole, Jack H., to Conoco Inc. Apparatus for generating elliptically polarized shear waves. 4,853,906, Cl. 367-189.000.
Coley, Gerald: *See*—
Thorn, David W.; Patel, Rajendra; Coley, Gerald; Trivedi, Ashok; and Patel, Girish, 4,853,955, Cl. 379-230.000.
Colgate-Palmolive Company: *See*—
Choi, Sunhee, 4,853,147, Cl. 252-174.190.
Crawford, John C., 4,852,774, Cl. 222-545.000.
Taha, Riad A., 4,853,259, Cl. 427-221.000.
Colle, Laurent: *See*—
Calvat, Claude; Colle, Laurent; Couchaud, Maurice; LeJus, Anne-Marie; Moncorge, Richard; Vivien, Daniel; and Wyon, Christophe, 4,853,354, Cl. 501-119.000.
Collett, Robert W.: *See*—
Peterson, James E.; and Collett, Robert W., 4,852,627, Cl. 160-84.100.
Collin, Robert, to Thomson-CSF. Wide band and low noise amplifier for metric waves. 4,853,652, Cl. 330-294.000.
Collins, Truman F. Golf putter head. 4,852,879, Cl. 273-164.000.
Colvin, Howard A.; Cottman, Kirkwood S.; and Parker, Dane K., to Goodyear Tire & Rubber Company, The. Functionalized monomers from 1-(1-isocyanato-1-methlethyl)-3 or 4-(1-methyletheny1) benzene. 4,853,478, Cl. 560-32.000.
Colyer, Emerson K.: *See*—
Liang, Rong-Chang; Colyer, Emerson K.; and Borello, Kelli J., 4,853,364, Cl. 503-216.000.
Combined Information Technologies, Inc.: *See*—
Rosen, Nathan C., 4,853,852, Cl. 364-401.000.
Commissariat A L'Energie Atomique Center National De La Recherche Scientifique: *See*—
Calvat, Claude; Colle, Laurent; Couchaud, Maurice; LeJus, Anne-Marie; Moncorge, Richard; Vivien, Daniel; and Wyon, Christophe, 4,853,354, Cl. 501-119.000.
Comolli, Alfred G.: *See*—
MacArthur, James B.; McLean, Joseph B.; and Comolli, Alfred G., 4,853,111, Cl. 208-421.000.
Companion, John A.; Heyman, Joseph S.; Mineo, Beth A.; Cavalier, Albert R.; and Blalock, Travis N., to United States of America, National Aeronautics and Space Administration. Rapidly quantifying the relative distention of a human bladder. 4,852,578, Cl. 128-661.030.
Composite Panel Manufacturing: *See*—
Webb, William, 4,852,316, Cl. 52-235.000.
Conax Florida Corporation: *See*—
Endres, Merrick A., 4,853,637, Cl. 324-439.000.
Concklin, Barry J.: *See*—
Hill, Lorimer K.; Harnden, James A.; and Concklin, Barry J., 4,853,563, Cl. 307-475.000.
Conoco Inc.: *See*—
Cole, Jack H., 4,853,906, Cl. 367-189.000.
Myers, Wilbur J., 4,853,905, Cl. 367-143.000.
Page, Gary L., 4,852,324, Cl. 52-506.000.
Wolf, Nicholas O.; Hudgins, Roger L.; and Seidner, David S., 4,853,119, Cl. 210-181.000.
Conrardy, Mary L.: *See*—
Wundrock, John A.; and Conrardy, Mary L., 4,852,201, Cl. 15-145.000.
Conry, Ronald D., to Multistack, Inc. Modular refrigeration system. 4,852,362, Cl. 62-175.000.
Conserve, Inc.: *See*—
Harris, Kenneth J., 4,852,366, Cl. 62-238.600.
Consolidated Devices Inc.: *See*—
Grabovac, Bosko; and Kurtovic, Jadranka, 4,852,386, Cl. 73-1.00C.
Conte, John R. Cigarette-lighter holder. 4,852,729, Cl. 206-86.000.
Continental Can Company, Inc.: *See*—
Mohr, Glenn R.; and Roth, Donald J., 4,853,510, Cl. 219-10.790.
Conway, David D., to Marathon Oil Company. Solar enhanced separation of volatile components from a liquid. 4,853,088, Cl. 203-10.000.
Cook, Thomas A.; Love, Walter F.; and Slovacek, Rudolf E., to Ciba Corning Diagnostics Corp. Evanescent wave sensors. 4,852,967, Cl. [illegible].
Cook, William C.: *See*—
Williams, Cleo M.; Sanders, Myron D.; and Cook, William C., 4,853,069, Cl. 156-401.000.
Cooke, Theodore M.: *See*—
Van Brimer, R. Hugh; Allred, Donald; Cooke, Theodore M.; Lin, An C. R.; and Rubbo, Julia E., 4,853,706, Cl. 346-1.100.
Cooper, Kelvin; Cross, Peter E.; Fray, Michael J.; and Richardson, Kenneth, to Pfizer Inc. Fused 1,4-dihydropyridines as antiallergy and antiinflammatory agents. 4,853,392, Cl. 514-311.000.
Cooper, Leonard M., to Manville Corporation. Sling-bottom article carrier. 4,852,731, Cl. 206-167.000.
Coquille, Rene : *See*—
Lambert, Bertrand; Toudic, Yves; and Coquille, Rene , 4,853,077, Cl. 156-605.000.
Cordier, Jean; and Rist, Andre , to Union Siderurgique du Nord et de L'Est de La France. Process for desulfurizing fuel gas containing sulfur. 4,852,995, Cl. 48-197.00R.
Corfits, William D.; Gullicksrud, John T.; Martin, Bradley L.; McCutcheon, Robert W.; Rasmussen, Jerry R.; Westphal, Gordon W.; and Wheeler, Stephen E., to International Business Machines Corporation. Three stage self alignment structure and method. 4,853,830, Cl. 361-391.000.
Cornie, James A.; Kattamis, Theodoulos; Chambers, Brent V.; Bond, Bruce E.; and Varela, Raul H., to Massachusetts Institute of Technology. Method of making metal matrix composites reinforced with ceramic particulates. 4,853,182, Cl. 420-129.000.
Corning Glass Works: *See*—
Martin, Francis W., 4,853,349, Cl. 501-8.000.
Corning Incorporated: *See*—
Chen, Shih-Lu; Gadkaree, Kishor P.; and Mash, Joseph F., 4,853,350, Cl. 501-9.000.
Correll, Daniel J. System for laying communications cable especially adapted for aerially stringing fiber optic cable and adapted for interchangeable use with conventional cable. 4,852,856, Cl. 254-134.30R.
Corrigan, Dennis, to Atlantic Richfield Company. Predictive noise filtering of multi-component seismic data. 4,853,902, Cl. 367-44.000.
Corriveau, Joseph A. Air disperser for air conditioner/heater ducts. 4,852,470, Cl. 98-39.100.
Corwon, Michael E.; and Oliver, Randy L., to Schlumberger Industries, Inc. Omega-shaped, coriolis-type mass flow rate meter. 4,852,410, Cl. 73-861.380.
Cottman, Kirkwood S.: *See*—
Colvin, Howard A.; Cottman, Kirkwood S.; and Parker, Dane K., 4,853,478, Cl. 560-32.000.
Couchaud, Maurice: *See*—
Calvat, Claude; Colle, Laurent; Couchaud, Maurice; LeJus, Anne-Marie; Moncorge, Richard; Vivien, Daniel; and Wyon, Christophe, 4,853,354, Cl. 501-119.000.
Coulon, Michel; Faron, Robert; and Besson, Daniel, to Le Carbone Lorraine; Uranium Pechiney; and Navatome. Thermal transfer layer. 4,852,645, Cl. 165-180.000.
Court, John R. Oral hygiene device. 4,852,728, Cl. 206-63.500.
Courvoisier, Guy; and Arieh, Simon, to Lange International S.A. Tensioning device for a ski boot tightening cable. 4,852,222, Cl. 24-68.0SK.
Covell, Edward H., III. Poultry scalding system and process. 4,852,215, Cl. 17-11.200.
Covert, Charles H.: *See*—
Turner, Kenneth W.; Covert, Charles H.; and Meyer, Karen M., 4,852,761, Cl. 220-85.0VR.
Covington, Roger G.; Jensen, Thomas D.; Miller, Stephen H.; and Wilson, Craig B., to Eastman Kodak Company. Split carrier for data storage disks. 4,853,926, Cl. 369-291.000.
Cowan, Jack C.; Granquist, Victor M.; and House, Roy F., to Venture Chemicals, Inc. Organophilic polyphenolic acid adducts. 4,853,465, Cl. 530-506 000.
Cowan, John D. Combination void drain vent chain. 4,852,319, Cl. 52-302.000.
Cowan, Samuel C., Jr. Case with extendable wheels and handle. 4,852,705, Cl. 190-18.00A.
Cowan, William S.: *See*—
Knerr, Edwin R.; Hart, Robert; and Cowan, William S., 4,852,611, Cl. 137-595.000.
Cowling, David H.: *See*—
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Cox, Mason F.: *See*—
Vosteen, William; and Cox, Mason F., 4,853,639, Cl. 324-457.000.
Coy, David H.; Murphy, William A.; and Heiman, Mark L., to Administrators of the Tulane Educational Fund, The. Therapeutic somatostatin analogs. 4,853,371, Cl. 514-12.000.
Craft, Jack: *See*—
Low, Michael L.; and Craft, Jack, 4,853,647, Cl. 330-256.000.
Craig, Richard; and Wilt, Brian L., to HealthPak, Incorporated. Disposable dental tray. 4,852,738, Cl. 206-369.000.
Crane, Ronald C., to 3Com Corporation. Impedance measuring apparatus for R.F. baseband signals over two wire telephone lines. 4,853,950, Cl. 379-24.000.
Crawford, John C., to Colgate-Palmolive Company. Dispenser with closure cap. 4,852,774, Cl. 222-545.000.
Crompton & Knowles Corporation: *See*—
Feeman, James F., 4,853,466, Cl. 534-617.000.
Cross Company, The: *See*—
DeBruyne, Robert W., 4,852,437, Cl. 82-165.000.
Cross, Peter E.: *See*—
Cooper, Kelvin; Cross, Peter E.; Fray, Michael J.; and Richardson, Kenneth, 4,853,392, Cl. 514-311.000.
Crouse, Jere W., to Beloit Corporation. Self-loading controlled deflection roll. 4,852,229, Cl. 29-116.200.
Crowley, H. W.: *See*—
Wales, R. Langdon; and Crowley, H. W., 4,852,604, Cl. 137-392.000.
Cruchon, Jean-Claude; Fontaine, Franck; and Brugidou, Michel, to Societe anonyme dite: Alcatel Thomson Faisceaux Hertziens. Orthogonal-polarization duplex send-receive microwave head. 4,853,657, Cl. 333-137.000.
Caelik, Frank: *See*—
Hardy, Frederick E.; Caelik, Frank; Pretty, Alastair J.; Young, Kenneth; and Scott, Gerald, 4,853,143, Cl. 252-102.000.
Cullen, John S., to Multiform Desiccants, Inc. Liquid absorbing and immobilizing packet containing a material for treating the absorbed liquid. 4,853,266, Cl. 421-35.700.
Culpepper, Will L.; and Feliks, James J., to Mead Corporation, The. Container sealing apparatus. 4,852,328, Cl. 53-300.000.

Cuppen, Johannes J. M., to U.S. Philips Corporation. Method of reconstructing a nuclear magnetization distribution from a partial magnetic resonance measurement. 4,853,635, Cl. 324-309.000.

Cure, Richard L.; and Meyer, David A., to Water Purification Systems, Inc. Heat sensitive shut-off diverter valve. 4,853,134, Cl. 210-742.000.

Current, Andrew: *See*—
Nimee, George S.; and Current, Andrew, 4,852,919, Cl. 292-251.500.

Curtis Manufacturing Company, Inc.: *See*—
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Cusolar Industries, Inc.: *See*—
Hayes, Mark B.; and Scanlon, Daniel, 4,853,123, Cl. 210-316.000.

Cyngier, Roseann M.: *See*—
Loza, Roman; and Cyngier, Roseann M., 4,853,138, Cl. 252-8.554.

Cytocolor, Inc.: *See*—
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Cytogen Corporaton: *See*—
Quash, Gerard A.; Rodwell, John D.; McKearn, Thomas J.; and Ripoll, Jean P., 4,853,326, Cl. 435-5.000.

Dabbish, Ezzat A.: *See*—
Brown, Daniel P.; Danielsen, Carl M.; and Dabbish, Ezzat A., 4,853,884, Cl. 364-602.000.

Dachtler, John D.: *See*—
Hawkins, Paul; and Dachtler, John D., 4,852,870, Cl. 272-3.000.

Dage, Richard C.: *See*—
Jones, Winton D.; Schnettler, Richard A.; and Dage, Richard C., 4,853,395, Cl. 514-332.000.

Daicel Chemical Industries, Ltd.: *See*—
Funaki, Yoshinori, 4,853,922, Cl. 369-72.000.

Daido Sangyo Co., Ltd.: *See*—
Nakahashi, Yoshinao; Osada, Soichi; Shimizu, Chuji; and Ichida, Shinshichi, 4,852,572, Cl. 128-640.000.

Daidousanso Co., Ltd.: *See*—
Yoshino, Akira, 4,853,015, Cl. 62-40.000.

Daikin Industries, Ltd.: *See*—
Yoshimura, Tatsushiro; Tomihashi, Nobuyuki; and Shimasaki, Shuhei, 4,853,425, Cl. 524-83.000.

Daimler-Benz Aktiengesellschaft: *See*—
Abthoff, Joerb; Schuster, Hans-Dieter; Langer, Hans-Joachim; Strohmer, Erwin; Gabler, Rolf; and Schulte, Roland, 4,852,349, Cl. 60-303.000.
Doncker, Francis; Helber, Rolf; Welzel, Gerhard; and Bung, Richard, 4,852,533, Cl. 123-192.00R.

Daimler-Benz Aktiengesellschaft: *See*—
Kunzer, Adolf; and Klaiber, Thomas, 4,852,429, Cl. 74-866.000.

Dainichiseika Color & Chemicals Mfg. Co., Ltd.: *See*—
Hanada, Kazuyuki; Misaizu, Iwao; Kashimura, Masashi; Goto, Tomoko; and Kuriyama, Katsumi, 4,853,418, Cl. 521-154.000.
Sannan, Takanori; Seki, Mitsutaka; Tsuchida, Shinya; and Horiguchi, Shojiro, 4,853,429, Cl. 524-29.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Nonura, Akihiro, 4,853,971, Cl. 382-56.000.
Shinichi, Nagata, 4,852,980, Cl. 350-432.000.
Wakimoto, Zenji; Nagata, Shinichi; and Katsuyama, Mikizo, 4,852,957, Cl. 350-6.600.

Dairkee, Shahnaz H.: *See*—
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Daito, Hiroshi; and Hara, Sigeo, to Hitachi, Ltd. Structure for supporting magnetic head. 4,853,812, Cl. 360-104.000.

Dakin, John P., to Plessey Overseas Limited. Optical fiber sensing system. 4,853,534, Cl. 250-227.000.

Dakka, Jihad; Zoran, Amikam; and Sasson, Yoel, to Gadot Petrochemical Industries, Ltd.; and Yissum R & D Company of the Hebrew University of Jerusalem. Process for the manufacture of aromatic dicarboxylic acids and derivatives thereof. 4,853,479, Cl. 566-77.000.

D'Ambrisi, Joseph J., to MacDermid, Incorporated. Conversion of manganese dioxide to permanganate. 4,853,095, Cl. 204-82.000.

Dana, Michel: *See*—
Jutand, Francis; Demassieux, Nicolas; and Dana, Michel, 4,853,887, Cl. 364-784.000.

Daneshmandi, Shahram: *See*—
Ford, Douglas W.; Johnson, Walter A.; and Daneshmandi, Shahram, 4,853,861, Cl. 364-424.060.

Danfoss A/S: *See*—
Iversen, Kristian; and Zacho, Per G., 4,853,671, Cl. 338-308.000.

D'Angelo, Philip J.; Hetherington, Richard; and Rogan, Joseph J., to Epicor Incorporated. Method for purifying liquids. 4,853,130, Cl. 210-663.000.

Daniel, Daniel S.; Delton, Mary H.; and Warren, Harold C., III, to Eastman Kodak Company. Lithium ion-selective compositions, electrodes and a method of use. 4,853,090, Cl. 204-1.00T.

Danielsen, Carl M.: *See*—
Brown, Daniel P.; Danielsen, Carl M.; and Dabbish, Ezzat A., 4,853,884, Cl. 364-602.000.

Danks, Don: *See*—
Sleichter, Charles G., III; Danks, Don; and Strong, Dale, 4,852,874, Cl. 272-137.000.

Danna, Dominick A.; Salvati, Jon; and Ciarlei, Joseph A., to Welch Allyn, Inc. Auxiliary light apparatus for borescope. 4,853,774, Cl. 358-98.000.

Dannatt, Hugh S., to Pitney Bowes Inc. Tape module for a modular mailing machine. 4,852,786, Cl. 226-137.000.

Daponte, Diego H.: *See*—
Win, Maung H.; Lloyd, William D.; Abba, William A.; and Daponte, Diego H., 4,853,142, Cl. 252-90.000.

Darmawan, Johan A., to Advanced Micro Devices, Inc. Method of forming isolation region in integrated circuit structure by forming isolation slot, oxidizing walls of isolation slot, growing epitaxial layer over isolation slot, and then locally oxidizing epitaxial layer over isolation slot until oxide grown. 4,853,344, Cl. 437-38.000.

DaRoz Corporation: *See*—
Heath, Roger L., 4,852,585, Cl. 128-798.000.

Dart Controls, Inc.: *See*—
Penn, Paul E., 4,853,828, Cl. 361-386.000.

Das, Santosh K.; and Chang, Chin-Fong, to Allied-Signal Inc. Rapidly solidified high strength, corrosion resistant magnesium base metal alloys. 4,853,035, Cl. 75-249.000.

Daser, Moritz: *See*—
Weckler, Joachim, 4,853,964, Cl. 381-156.000.

Dasgupta, Purnendu: *See*—
Jackson, Charles R.; Rellis, Daniel, Jr.; Pielet, Howard M.; Bhattacharya, Debanshu; Frank, Larry A.; Dasgupta, Purnendu; and Knoepke, John R., 4,852,632, Cl. 164-437.000.

Data Card Corporation: *See*—
Young, James L.; and Patterson, James M., Jr., 4,852,478, Cl. 101-18.000.

Dattagupta, Nanibhushan, to Molecular Diagnostics, Inc. Enhanced phthalazinedione chemiluminescence. 4,853,327, Cl. 435-6.000.

Daugherty, William T., to Magic Spray Inc. Apparatus and method for washing vehicles. 4,852,593, Cl. 134-94.000.

Davey, Anthony B.; and Bone, Matthew F., to STC PLC. Liquid crystal cell utilizing a ferroelectric liquid crystal having a natural pitch length is no longer than the longest wavelength of visible light. 4,852,978, Cl. 350-350.00R.

Davey Roofing, Inc.: *See*—
Flaherty, Brian J., 4,852,692, Cl. 182-231.000.

David, Helmut: *See*—
Schlemenat, Alfred; and David, Helmut, 4,852,644, Cl. 165-158.000.

Davidson, Windell L. Muzzle brake system. 4,852,460, Cl. 89-14.050.

Davie, Doris L.: *See*—
Allen, Charles H., 4,852,918, Cl. 292-169.000.

Davis, Alan R.: *See*—
Hsiao, Chu-lai; Mason, Bruce B.; and Davis, Alan R., 4,853,333, Cl. 435-256.000.

Davis, Bruce W., to Chevron Research Company. Polydialkylsilalkylene polymer useful in enhanced oil recovery using carbon dioxide flooding. 4,852,651, Cl. 166-268.000.

Davis, Harold A.; and Saude, Gerald B., to Willmar Manufacturing, a division of Waycrosse, Inc. Pneumatic spreader. 4,852,809, Cl. 239-654.000.

Davis, Larry: *See*—
Helsley, Grover C.; Davis, Larry; and Olsen, Gordon E., 4,853,384, Cl. 514-255.000.

Davis, Michael J.: *See*—
Walles, Erik W.; Lupinski, John H.; Markovitz, Mark; Colborn, Robert E.; Presley, James R.; Davis, Michael J.; Minnick, Michael G.; Kubisen, Steven J., Jr.; Hallgren, John E.; Bolon, Donald A.; Eddy, Victoria J.; and Irwin, Patricia C., 4,853,423, Cl. 523-428.000.

Davis, Richard: *See*—
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Daylighting, Inc.: *See*—
Peterson, James E.; and Collett, Robert W., 4,852,627, Cl. 160-84.100.

de La Rochefordiere, Denis. Pedal mechanism for keyboard instruments. 4,852,445, Cl. 84-218.000.

DeBruyne, Robert W., to Cross Company, The. Method and apparatus for locating and clamping a workpiece, such as a piston, prior to rotating same in a machining operation. 4,852,437, Cl. 82-165.000.

Decamp, Gary S.: *See*—
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Decker, Michael: *See*—
Harris, Clark E.; Armbruster, Randy; Decker, Michael; and Phillips, Bradley A., 4,852,821, Cl. 242-71.800.

DeCoopman, Christian: *See*—
Demars, Yves; Szalata, Francois; and DeCoopman, Christian, 4,852,219, Cl. 19-305.000.

De Deken, Jacques C.: *See*—
Vasilevskis, Janis; De Deken, Jacques C.; Saxton, Robert J.; Wentrcek, Paul R.; Feilmann, Jere D.; and Kipnis, Lyubov S., 4,853,357, Cl. 502-165.000.

Dedmon, George D. Tufting machine having an individual needle control system. 4,852,505, Cl. 112-80.420.

Deere & Company: *See*—
Burgess, William C.; Jochum, Gary L.; Goetzinger, David; and Beckius, David A., 4,852,748, Cl. 211-70.600.

DeForrest, William, Sr. Self protecting hasp. 4,852,920, Cl. 292-205.000.

Degawa, Takashi: *See*—
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Degesch GmbH: *See*—
Dornemann, Manfred, 4,853,241, Cl. 426-320.000.

Degnan, Thomas F., Jr.; and Varghese, Philip, to Mobil Oil Corporation. Process for catalytic conversion of lube oil bas stocks. 4,853,104, Cl. 208-61.000.

DeGree, David C.; Humphrey, Dallas R.; Bergquist, Carl R.; and West, Roger A., to Bergquist Company, The. Mounting base pad means for semiconductor devices and method of preparing same. 4,853,763, Cl. 357-81.000.

Degussa AG: *See*—
Manner, Reinhard; Schaefer, Hans; Voight, Carl; and Pfeifer, Wolf D., 4,853,190, Cl. 422-197.000.

De Jager, Willem: *See*—
Seevinck, Evert; De Jager, Willem; and Buitendijk, Pieter, 4,853,645, Cl. 330-255.000.

Delaney, John H. Decorative light strip holder. 4,852,832, Cl. 248-65.000.

Delco Electronics Corporation: *See*—
Himelick, James M., 4,853,345, Cl. 437-41.000.

Delevy, Moshe: *See*—
Inbar, Dan; and Delevy, Moshe, 4,852,576, Cl. 128-660.600.

Delton, Mary H.: *See*—
Daniel, Daniel S.; Delton, Mary H.; and Warren, Harold C., III, 4,853,090, Cl. 204-1.00T.

Demars, Yves; Szalata, Francois; and DeCoopman, Christian, to Isover Saint-Gobain. Formation of mineral fibre flakes and use of these flakes to reconstitute insulating mats. 4,852,219, Cl. 19-305.000.

Demassieux, Nicolas: *See*—
Jutand, Francis; Demassieux, Nicolas; and Dana, Michel, 4,853,887, Cl. 364-784.000.

Dempsey, John C.; and Kotrappa, Payasada, to Rad Elec Inc. Ionization chamber for monitoring radioactive gas. 4,853,536, Cl. 250-253.000.

Den Norske stats oljeselskap a.s.: *See*—
Johansen, Trond V.; Ruch, Ola; Naess, Ludvig; Weber, Robert; Veenhoff, Bernd; Porner, Horst; Laurer, Erwin; Strickroth, Erich; and Schabert, Hans-Peter, 4,852,614, Cl. 138-93.000.
Ruch, Ola; Johansen, Trond V.; Naess, Ludvig; Poerner, Horst; Gebhard, Georg; Weber, Robert; and Heller, Max, 4,852,391, Cl. 73-40.50R.

Denis, Herve : *See*—
Fiorina, Jean-Noel; and Denis, Herve , 4,853,833, Cl. 363-47.000.

Denk, Joseph, to Allied-Signal Inc. Toothless stator electrical machine construction method. 4,852,245, Cl. 29-596.000.

Denki Onkyo Co., Ltd.: *See*—
Ohtsu, Shinji; and Yabushita, Haruyasu, 4,853,588, Cl. 313-440.000.

Dennis, Malcolm I.: *See*—
Bishop, Chester O., Jr.; Dennis, Malcolm I.; Riley, Peter S.; Richardson, Christopher C.; and Shaw, Vincent P., 4,853,678, Cl. 340-573.000.

de Oliveira Camargo, Marcos: *See*—
Bain, William L., Jr.; de Oliveira Camargo, Marcos; Duzett, Robert C.; Lederhofer, Artur H.; Peterson, Craig B.; and Wipfli, John L., 4,853,849, Cl. 364-200.000.

De Patto, Ugo: *See*—
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Deppert, Klaus: *See*—
Edrich, Gunter; and Deppert, Klaus, 4,852,865, Cl. 269-48.000.

DeRees, Delbert D., to American Motors Corporation. Axle drive. 4,852,426, Cl. 74-607.000.

Deshais, Richard: *See*—
Peltier, Bertrand; and Deshais, Richard, 4,852,665, Cl. 175-40.000.

Desmura, Jean-Roger; and Ratton, Serge, to Rhone-Poulenc Chimie. Stabilization of mixtures of chlorination of phenol/chlorophenols. 4,853,153, Cl. 252-400.220.

Dettin, Piergiorgio, to F.lli Dettin S.p.a. Hydroextractor for yarns on a reel. 4,852,270, Cl. 34-58.000.

Dettinger, Dietrich: *See*—
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Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
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Devon Dircet Marketing & Advertising, Inc.: *See*—
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DeWald, Raymond C.; and Hong, Paul O., to Occidental Chemical Corporation. Phenothiazine composition for use in reactor scale prevention. 4,853,446, Cl. 526-205.000.

Dewey, Daniel O.: *See*—
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Dewitz, Thomas S., to Shell Oil Company. Removal of particulates from synthesis gas. 4,853,003, Cl. 55-20.000.

Diab-Barracuda AB: *See*—
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Diagnostic Services, Inc.: *See*—
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Diaz, Leopoldo J.; McKenna, Daniel B.; and Pett, Todd A., to Ball Corporation. Notch antenna with microstrip feed. 4,853,704, Cl. 343-767.000.

Dickakian, Ghazi B., to Exxon Chemicals Patents Inc. Blending of hydrocarbon liquids. 4,853,337, Cl. 436-55.000.

Dickie, Robert G. Electromagnetic and electrostatic shielding for electronic equipment. 4,853,790, Cl. 358-245.000.

Dickinson, Ben W. O., III; Dickinson, Robert W.; May, Sherman C.; and Mackey, Charles S., to Dickinson, Ben Wade Oakes, III; and Dickinson, Robert Wayne. Hydraulic drilling apparatus and method. 4,852,668, Cl. 175-67.000.

Dickinson, Ben Wade Oakes, III: *See*—
Dickinson, Ben W. O., III; Dickinson, Robert W.; May, Sherman C.; and Mackey, Charles S., 4,852,668, Cl. 175-67.000.

Dickinson, Robert W.: *See*—
Dickinson, Ben W. O., III; Dickinson, Robert W.; May, Sherman C.; and Mackey, Charles S., 4,852,668, Cl. 175-67.000.

Dickinson, Robert Wayne: *See*—
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Dictaphone Corporation: *See*—
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Diehl, Donald R.: *See*—
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Diehl GmbH & Co.: *See*—
von Laar, Klaus; Sackenreuter, Hans; and Heberlein, Werner, 4,852,461, Cl. 89-46.000.

Diepers, Heinrich, to Siemens Aktiengesellschaft. Magnetic thin-film head on a nonmagnetic substrate for vertical mangetization. 4,853,815, Cl. 360-126.000.

Diesel Kiki Co., Ltd.: *See*—
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DiGangi, Joel D.; and Ross, Kenneth L., to Digangi and Ross. Apparatus for the cleaning of contact lenses. 4,852,592, Cl. 134-57.00R.

Digangi and Ross: *See*—
DiGangi, Joel D.; and Ross, Kenneth L., 4,852,592, Cl. 134-57.00R.

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Dimberio, Donald J. Beverage container cover. 4,852,763, Cl. 220-253.000.

Dines, Elaine, legal representative: *See*—
Schramm, Charles M.; Lane, Robert H.; and Dines, Martin B., deceased, 4,853,358, Cl. 502-167.000.

Dines, Martin B., deceased: *See*—
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Dingeldein, Elvira: *See*—
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Dinkelmann, Friedrich; and Wolf, Horst, to Zinser Textilemaschinen GmbH. Apparatus for ventilating an electric motor for textile spinning mill machines. 4,853,566, Cl. 310-59.000.

Director General of Agency of Industrial Science and Technology: *See*—
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Djiauw, Lie K.: *See*—
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Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
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Dola, Frank P.: *See*—
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Dolak, Terence M.; Lee, Sung J.; and Bullington, James L., to American Home Products Corporation. Diuretic and antihypertensive substituted-5-pyrimidinesulfonylureas. 4,853,389, Cl. 514-275.000.

Domeier, Linda A., to Amoco Corporation. Biamaleimide formulations containing olefinic ether modifiers. 4,853,449, Cl. 526-259.000.

Domnick Hunter Ilblry Limited: *See*—
Le, Minh S.; and Wilkes, John S., 4,853,127, Cl. 210-500.390.

Domoto, Takeshi: *See*—
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Doncker, Francis; Helber, Rolf; Welzel, Gerhard; and Bung, Richard, to Daimler-Benz Aktiengesellschaft. Mounting arrangement for vehicle engine and the like. 4,852,533, Cl. 123-192.00R.

Donegan, Thomas E.; Bantjes, John H.; and Leary, Timothy G., to BASF Corporation. Process for making a phthalocyanine pigment dispersion. 4,853,039, Cl. 106-412.000.

Donnelly Corporation: *See*—
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Donoghue, Teresa; and Vilches, Jose I., to Teresa Donoghue. Collapsible hydraulic polycycle. 4,852,898, Cl. 280-216.000.

Doppstadt, Werner. Composting equipment. 4,852,816, Cl. 241-101.700.

Doris, Gianfederico; Iaetta, Anna M.; Ferrari, Mario; and Trizio, Domenico, to Farmitalia Carlo Erba S.r.l. Condensed pyrazole derivatives, pharmaceutical compositions and use. 4,853,405, Cl. 514-406.000.

Dorleans, Andre M., to TOTAL Compagnie Francaise des Petroles. Pressure relief process for well-drilling. 4,852,667, Cl. 175-65.000.

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Douglas, Keith; and Meyer, Mark Q. Apparatus having capacitive sensor and metal detector for detecting objects concealed behind surfaces. 4,853,617, Cl. 324-67.000.

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Dow Chemical Company, The: *See*—
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Dow Corning Corporation: *See*—
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Doyle, Walter M.; and Hughes, Norman S., to Laser Precision Corporation. Microscope for use in modular FTIR spectrometer system. 4,852,955, Cl. 350-1.200.

Drabowitch, Serge, to Thomson-CSF. Pulse compression method employing space-coding, and its application to a radar. 4,853,701, Cl. 342-139.000.

Draegerwerk Aktiengesellschaft: *See*—
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Dresser Industries, Inc.: *See*—
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Dronet, Jean-Marc: *See*—
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Drummond, Thane M.: *See*—
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Duda, Stanislaw K. Method and apparatus for detecting surface discontinuities. 4,853,679, Cl. 340-675.000.

Duggan, Charles M. Headband structure. 4,852,189, Cl. 2-452.000.

Duhrkoop, Jens, to Voest-Alpine AG. Device for detecting the spatial orientation of excessively heated points. 4,853,541, Cl. 250-347.000.

Duncan, David S., to Wilkinson Sword Limited. Razor blade assembly and its method of manufacture. 4,852,254, Cl. 30-50.000.

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Duncan, Gerald D.: *See*—
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Dunn, James J.; Jahn, Martin D.; and Vukmanic, Ronald W., to Chicago Metallic Corporation. Reinforced bead. 4,852,325, Cl. 52-729.000.

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Du Pont de Nemours, E. I., and Company: *See*—
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Dupuis, Walter A.: *See*—
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Durnin, James E.; and Eberly, Joseph H., to Research Corporation. Diffraction free arrangement. 4,852,973, Cl. 350-162.110.

Durst, Robert T., Jr.; Fougere, Guy L.; Hunter, Kevin D.; and Schmidt, Alfred C., to Pitney Bowes, Inc. System and method for processing a letter for bulk mailing. 4,853,869, Cl. 364-478.000.

Durual, Pierre; Hermant, Marc; and Laviron, Charles, to Societe ATOCHEM. Polyfluorinated amino alcohols and their esters, preparation of these compounds and their use as lubricant additives. 4,853,141, Cl. 252-51.000.

Dustmann, Cord-Henrich, to Asea Brown Boveri Aktiengesellschaft. Magnet system. 4,852,367, Cl. 62-51.100.

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Dynamet Technology Inc.: *See*—
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Dyson, James, to Notetry Limited. Vacuum cleaning apparatus. 4,853,011, Cl. 55-345.000.

E.C.C. International Limited: *See*—
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E. I. Du Pont de Nemour and Company: *See*—
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Eagle-Picher Industries, Inc.: *See*—
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Piatt, Michael J., 4,853,712, Cl. 346-134.000.
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Easton, James K., to Hughes Aircraft Company. Method for cancelling azimuth ambiguity in a SAR receiver. 4,853,699, Cl. 342-25.000.

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Eaton, S. Sheffield, Jr.; and Parris, Michael, to Ramtron Corporation. Data storage device and method of using a ferroelectric capacitance divider. 4,853,893, Cl. 365-145.000.

Eaton-Williams, Raymond H. Air condition monitor unit for monitoring at least one variable of the ambient air. 4,853,693, Cl. 340-588.000.

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Ebner, Walter B.; and Lin, Hsiu-Ping W., to Honeywell, Inc. Electrolyte for secondary non-aqueous cells. 4,853,304, Cl. 429-192.000.

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Ecanow, Charles S.: *See*—
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Effing, Wolfgang, to GAO Gesellschaft fur Automation und Organisation mbH. Data carrier arrangement having an integrated circuit. 4,853,526, Cl. 235-492.000.

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Eizo, Naya; Yoshikazu, Nagata; Toshiaki, Horiuchi; Mitsuhiro, Okumura; Michinosuke, Demizu; Mitsuhiro, Harima; Shigeki, Asakawa; and Masuo, Asakawa, to Mitsubishi Denki Kabushiki Kaisha. Contact material for vacuum interrupter. 4,853,184, Cl. 420-489.000.

Electric Power Research Institute: *See*—
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Electric Power Research Institute, Inc.: *See*—
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Elliott, Richard J.; Dupuis, Walter A.; and Resnick, Theodore A., to Picker International, Inc. Diagonostic service system for CT scanners. 4,853,946, Cl. 378-4.000.

Elliott, Robert S.: *See*—
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Harris, Earl C., Jr., 4,853,273, Cl. 428-116.000.

Elpatronic AG: *See*—
Bogatzki, Hans-Ulrich; and Kramer, Felix, 4,852,415, Cl. 73-865.800.

Elrod, Granville P.; Westbrooks, John W.; and McDonald, Tracy L., to Standex International Corporation. Refrigeration system. 4,852,365, Cl. 62-237.000.

Elscint Ltd.: *See*—
Inbar, Dan; and Delevy, Moshe, 4,852,576, Cl. 128-660.600.
Palkovich, Alex, 4,853,661, Cl. 335-216.000.

Elslager, Edward F.; and Leopold, Wilbur R., III, to Warner-Lambert Company. Method for treating non-small cell lung cancer, head and neck cancers and breast cancer. 4,853,221, Cl. 424-649.000.

ELTECH Systems Corporation: *See*—
Hruska, Louis W.; and Brown, Carl W., Jr., 4,853,101, Cl. 204-295.000.

Elton, Richard K.; and Schultz, William R., Jr., to General Electric Company. Semi-conducting layer for insulated electrical conductors. 4,853,565, Cl. 310-45.000.

Ely, James E.; and Saylor, Steven D., to BASF Corporation. Portable flexographic proofer device. 4,852,486, Cl. 101-218.000.

Embree, David M.; and Logan, Shawn M., to American Telephone and Telegraph Company, AT&T Bell Laboratories. High frequency CMOS oscillator. 4,853,655, Cl. 331-116.0FG.

Emery Corporation: *See*—
Emery, Leo D.; and Taulbee, Meryl, 4,852,236, Cl. 29-402.110.

Emery, Franklin T.; and Harrold, Ronald T., to Electric Power Research Institute, Inc. System and method for detecting arcing in dynamoelectric machines. 4,853,818, Cl. 361-33.000.

Emery, Leo D.; and Taulbee, Meryl, to Emery Corporation. Method of repairing a worn wobbler housing for a constant-speed drive. 4,852,236, Cl. 29-402.110.

Emhart Industries, Inc.: *See*—
Hawkswell, Victor T., 4,852,247, Cl. 29-740.000.

En-tout-cas plc: *See*—
Hawkins, Paul; and Dachtler, John D., 4,852,870, Cl. 272-3.000.

Enari, Masahiko: *See*—
Hosoya, Hideki; Aoki, Akio; and Enari, Masahiko, 4,853,920, Cl. 369-59.000.

Endo, Hiroshi: *See*—
Takahashi, Sadatoshi; Ogawa, Hideki; and Endo, Hiroshi, 4,852,984, Cl. 350-454.000.

Endo Manufacturing Co., Ltd: *See*—
Kobayashi, Kenji, 4,852,880, Cl. 273-169.000.

Endou, Masao; Asakura, Yamato; Watanabe, Atsushi; Sakagami, Masaharu; Uchida, Shunsuke; Nagase, Makoto; Baba, Tsutomu; and Ohsumi, Katsumi, to Hitachi, Ltd. Water quality control method, and method and apparatus for measuring electrical conductivity used in the water quality control. 4,853,638, Cl. 324-441.000.

Endres, Merrick A., to Conax Florida Corporation. Fluid conductivity sensor for actuating an electroexploding device. 4,853,637, Cl. 324-439.000.

Enercept, Inc.: *See*—
Henley, Harold B.; Norberg, Kenneth L.; and Devine, John P., 4,852,310, Cl. 52-90.000.

Energy Conversion Devices, Inc.: *See*—
Ovshinsky, Stanford R.; and Norris, Lawrence G., 4,853,785, Cl. 358-213.110.

Energy Economics & Development, Inc.: *See*—
Warner, Donald F., 4,852,344, Cl. 60-39.182.

Engel, Peter. Advertising device. 4,852,912, Cl. 283-95.000.

Engelhard Corporation: *See*—
Kuznicki, Steven M., 4,853,202, Cl. 423-326.000.

Engelhardt, Edward L.; and Saari, Walfred S., to Merck & Co., Inc. 2-(substituted sulfamyl) derivatives of 4-nitrobenzamide as radiation sensitizers. 4,853,415, Cl. 514-603.000.

Enichem Sintesi, S.p.A.: *See*—
Roggero, Arnaldo; and Bertolini, Guglielmo, 4,853,440, Cl. 525-338.000.

Enitricerche, S.p.A.: *See*—
Roggero, Arnaldo; and Bertolini, Guglielmo, 4,853,440, Cl. 525-338.000.

Enlow, David L.: *See*—
Maier, Gerhard A.; Enlow, David L.; and Ng, Paul T., 4,852,536, Cl. 123-414.000.

Ennis, James F., III, to Genesis Industries, Incorporated. Dispenser for viscous fluids. 4,852,772, Cl. 222-386.000.

Ensar Corporation: *See*—
Sarnoff, Norton; and Fletcher, Carl R., 4,852,760, Cl. 220-85.00H.

Enviro-Gro Technologies, Inc.: *See*—
Glorioso, John D., 4,852,269, Cl. 34-11.000.

Epicor Incorporated: *See*—
D'Angelo, Philip J.; Hetherington, Richard; and Rogan, Joseph J., 4,853,130, Cl. 210-663.000.

Erb, George H.; and Beard, Susan E., to Erblok Associates. Apparatus for making multiple hook fastener media. 4,853,070, Cl. 156-436.000.

Erblok Associates: *See*—
Erb, George H.; and Beard, Susan E., 4,853,070, Cl. 156-436.000.

Erickson, Frederick L.. *See*—
Richeson, William E.; and Erickson, Frederick L., 4,852,528, Cl. 123-90.110.

Eriksson, Bror, to Iggesund Tools AB. Debarking means for rotation ring type barking machines. 4,852,622, Cl. 144-208.00E.

Erion, George T. Ladder leveling accessory. 4,852,689, Cl. 182-204.000.

Ernst, Renate: *See*—
Brenk, Michael; and Ernst, Renate, 4,853,093, Cl. 204-37.600.

Erowa AG: *See*—
Scheider, Rudolf, 4,853,512, Cl. 219-69.150.

Erren, Karl-Heinz: *See*—
Beitz, Jurgen; Erren, Karl-Heinz; and Mantz, Ekkehard, 4,852,824, Cl. 242-131.100.

Ersson, Nils-Olof. Method and device for separating serum/plasma from blood. 4,853,137, Cl. 210-782.000.

Esbofot A/S: *See*—
Sorensen, Kai, 4,853,749, Cl. 355-71.000.

Esco, Incorporated: *See*—
Whitman, Robert W.; and Pellinen, John R., 4,852,266, Cl. 33-366.000.

Esselte Meto International Produktions GmbH: *See*—
Becker, Werner, 4,853,068, Cl. 156-384.000.

Esser, Franz: *See*—
Bomann, Werner; Esser, Franz; Hamel, Ulrich; and Stable, Helmut, 4,853,402, Cl. 514-401.000.

Essex Specialty Products, Inc.: *See*—
Wycech, Joseph S., 4,853,270, Cl. 428-68.000.

Essilor International (Compagnie Generale d'Optique): *See*—
Herbin, Patrick; and Lacroix, Jean-Claude, 4,852,631, Cl. 164-98.000.

Estaque, Michel, to Labavia S.G.E. Armature rotors of electromagnetic retarders. 4,853,574, Cl. 310-105.000.

ETA SA Fabriques d'Ebauches: *See*—
Mock, Elmar, 4,853,910, Cl. 368-300.000.

Etani, Kenji. Method for water treatment. 4,853,131, Cl. 210-696.000.

Etat Francais: *See*—
Lambert, Bertrand; Toudic, Yves; and Coquille, Rene , 4,853,077, Cl. 156-605.000.

Etude Recherche Et Development - E.R.D. Sarl: *See*—
Bouillette, Thierry; Olivier, Denis; and Guigou, Bernard, 4,853,245, Cl. 426-575.000.

Etymotic Research, Inc.: *See*—
Killion, Mead C., 4,852,683, Cl. 181-130.000.

Evans, Robert G. High pressure drum testing apparatus and method. 4,852,392, Cl. 73-41.200.

Evans, Steven; Weber, Helmut; and Diehl, Donald R., to Eastman Kodak Company. Pyrazolidinedione arylidene dye-donor element for thermal dye transfer. 4,853,366, Cl. 503-227.000.

Everett, Richard K.; and Henshaw, William F., to United States of America, Navy. Carbon fiber reinforced metal matrix composites. 4,853,294, Cl. 428-614.000.

EVG Entwicklungs - U. Verwertungs-Gesellschaft M.B.H.: *See*—
Ritter, Klaus; Ritter, Gerhard; and Scherr, Rudolf, 4,853,511, Cl. 219-56.000.

Ewer, Peter R.; and Ellard, Jeffrey R., to International Rectifier Corporation. Semi-conductor modules. 4,853,762, Cl. 357-79.000.

Exothermics-Eclipse Inc.: *See*—
McKenna, Bruce A., 4,852,640, Cl. 165-47.000.

Exxon Chemical Patents Inc.: *See*—
Ahner, Mary E., 4,853,432, Cl. 524-274.000.

Exxon Chemicals Patents Inc.: *See*—
Dickakian, Ghazi B., 4,853,337, Cl. 436-55.000.

Exxon Research and Engineering Company: *See*—
Cahn, Robert P.; and Hurst, Boyd E., 4,853,193, Cl. 423-235.000.
Niedzwiecki, Joseph L.; and Wolfe, Ralph G., 4,853,002, Cl. 55-19.000.

Peiffer, Dennis G., 4,853,447, Cl. 526-229.000.
Singhal, Gopal H.; and Ryan, Daniel F., 4,853,110, Cl. 208-253.000.
Wan, Wankei, 4,853,129, Cl. 210-651.000.

F & B Mfg Co.: *See*—
Safranek, Edward J., 4,852,540, Cl. 123-599.000.

F.lli Dettin S.p.a.: *See*—
Dettin, Piergiorgio, 4,852,270, Cl. 34-58.000.

Faber, Nicholas J., Jr., to Bristol-Myers Company. Accumulator table. 4,852,714, Cl. 198-347.000.

Faggiano, Tom. Glass mountable sign. 4,852,284, Cl. 40-488.000.

Fairchild Semiconductor Corporation: *See*—
Johnson, Terry J.; and Luk, Timwah, 4,853,646, Cl. 330-256.000.

Falcon-Steward, Hugh R.: *See*—
Adams, Roger W.; Falcon-Steward, Hugh R.; and Pearce, David A., 4,852,811, Cl. 241-1.000.

Falconbridge Limited: *See*—
Bulatovic, Srdjan, 4,853,113, Cl. 209-166.000.

Falconer, Ian G., to Anadrill, Inc. Method for determining drilling conditions while drilling. 4,852,399, Cl. 73-151.500.

Fan, John C. C.: *See*—
Tsaur, Bor-Yeu; Fan, John C. C.; and Geis, Michael W., 4,853,076, Cl. 156-603.000.

Fanuc Ltd: *See*—
Matsumura, Teruyuki, 4,853,867, Cl. 364-474.220.

Farmitalia Carlo Erba S.r.l.: *See*—
Doria, Gianfederico; Isetta, Anna M.; Ferrari, Mario; and Trizio, Domenico, 4,853,405, Cl. 514-406.000.

Faron, Robert: *See*—
Coulon, Michel; Faron, Robert; and Besson, Daniel, 4,852,645, Cl. 165-180.000.

Farooq, Saleem, to Ciba-Geigy Corporation. Pesticidal compositions. 4,853,396, Cl. 514-333.000.

Fasco Controls Corporation: *See*—
Canipe, Michael R., 4,853,502, Cl. 200-61.890.

Fatta-Barou, Jean-Louis: *See*—
Minjolle, Louis; Drouet, Michel; Fatta-Barou, Jean-Louis; Callegari, Michel; and Noel, Jacques, 4,853,053, Cl. 156-73.500.

Faust, Anne-Catherine: *See*—
Guth, Jean-Louis; Faust, Anne-Catherine; Raatz, Francis; and Lamblin, Jean-Marc, 4,853,203, Cl. 423-328.000.

Faust, Steven M.; and Cherukuri, Subraman R., to Warner-Lambert Company. Reduced base content chewing gum compositions having anesthetic properties. 4,853,212, Cl. 424-48.000.

Fechter, Robert B.; and Gardikes, John J., to Ashland Oil, Inc. Cold-box process for forming foundry shapes which utilizes certain carboxylic acids as bench life extenders. 4,852,629, Cl. 164-16.000.

Federico, Joseph W.; and Whittenberger, Daniel J., to Herrero, Luis A. Sidewalk edging device. 4,852,260, Cl. 30-292.000.

Federowsky, Robert: *See*—
Soszka, Barbara; Federowsky, Robert; and Mahler, Jacques, 4,853,021, Cl. 65-2.000.

Feeman, James F., to Crompton & Knowles Corporation. Water-soluble disazo reactive dyes and metals complexes (containing phosphonic acid groups) for dyeing cellulosic fibers. 4,853,466, Cl. 534-617.000.

Fein, Michael E., to Spectra-Physics, Inc. Distance simulator. 4,852,983, Cl. 350-453.000.

Feindler, Philbert: *See*—
Steinleitner, Gunther; Mennicke, Stefan; Feindler, Philbert; Klein, Herbert; and Maldonado-Zagal, Sigisfredo, 4,853,303, Cl. 429-104.000.

Fel-Pro Incorporated: *See*—
Wesley, Alan C., 4,852,893, Cl. 277-1.000.

Feliks, James J.: *See*—
Culpepper, Will L.; and Feliks, James J., 4,852,328, Cl. 53-300.000.

Fellmann, Jere D.: *See*—
Vasilevskis, Janis; De Deken, Jacques C.; Saxton, Robert J.; Wentrcek, Paul R.; Fellmann, Jere D.; and Kipnis, Lyubov S., 4,853,357, Cl. 502-165.000.

Fenn, Ronald S.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; and Fenn, Ronald S., 4,853,369, Cl. 512-25.000.

Ferdi, Allan W. Ski and pole carrier. 4,852,931, Cl. 294-147.000.

Ferdinandi, Eckhardt S.; Malamas, Michael S.; Sestanj, Kazimir; and Sehgal, Surendra N., to American Home Products Corporation. N-[[6-methoxy-5-(trifluoromethyl)-1-naphthalenyl]-thioxomethyl]-N-methylglycine S-oxide and the amide thereof. 4,853,484, Cl. 564-74.000.

Ferka, Robert. Insertable cigarette smoke baffle for holders. 4,852,590, Cl. 131-210.000.

Fernandez, Elio M.; and DeVane, Jean. Expandable chaffing dish structure. 4,852,749, Cl. 211-133.000.

Ferob, A.G.: *See*—
Oberle, Ferdinand, 4,852,727, Cl. 206-39.400.

Ferrari, Mario: *See*—
Doria, Gianfederico; Isetta, Anna M.; Ferrari, Mario; and Trizio, Domenico, 4,853,405, Cl. 514-406.000.

Fesenmeier, Hugo; Zumkeller, Oskar; Schneider, Werner; and Grieser, Hans, to Mannesmann Kienzle GmbH. Push button for an inductive value input keyboard. 4,853,666, Cl. 336-130.000.

Fett, James W.: *See*—
Alderman, Edward M.; Fett, James W.; and Vallee, Bert L., 4,853,219, Cl. 424-85.800.

Feucht, Pascal: *See*—
Haldric, Bernard; and Feucht, Pascal, 4,852,380, Cl. 72-402.000.

Fiedler, Volker-Bernd: *See*—
Rosentreter, Ulrich; Boshagen, Horst; Lieb, Folker; Oediger, Hermann; Niewohner, Ulrich; Seuter, Friedel; Perzborn, Elisabeth; and Fiedler, Volker-Bernd, 4,853,406, Cl. 514-411.000.

Field, Frank P. Lockable bracket for attachment to wire grid. 4,852,838, Cl. 248-222.100.

Filho, Waldemiro M.: *See*—
Terry, Dennis C.; Filho, Waldemiro M.; and Turechek, John J., 4,853,065, Cl. 156-292.000.

Filipczak, Gordon J.: *See*—
Sledge, Larry C.; and Filipczak, Gordon J., 4,852,770, Cl. 222-153.000.

Finch, Harry; Lunts, Lawrence H. C.; Naylor, Alan; Skidmore, Ian F.; and Campbell, Ian B., to Glaxo Group Limited. Ethanolamine compounds. 4,853,381, Cl. 514-211.000.

Finch, Harry: *See*—
Skidmore, Ian F.; Finch, Harry; Naylor, Alan; Lunts, Lawrence H. C.; and Campbell, Ian B., 4,853,382, Cl. 514-212.000.

Findag Corporation N.V.: *See*—
Renkl, Hans-Dieter; and Waibel, Rudi, 4,853,022, Cl. 65-170.000.

Findlay, Medeana: *See*—
Clare, Kenneth; McMullen, James H.; Findlay, Medeana; and Gaisford, Susan E., 4,853,244, Cl. 426-573.000.

Fine, Jonathan E.: *See*—
Campagnuolo, Carl J.; and Fine, Jonathan E., 4,852,496, Cl. 102-322.000.

Fiorina, Jean-Noel; and Denis, Herve , to Merlin Gerin. Filter unit with electrochemical capacitors for a static power converter. 4,853,833, Cl. 363-47.000.

Firan Corporation: *See*—
Chant, Peter R., 4,853,277, Cl. 428-209.000.

Firestone Tire & Rubber Company, The: *See*—
Harris, Robert S., 4,852,861, Cl. 267-64.270.
Kartfilt, Henry A., 4,852,323, Cl. 52-410.000.
Williams, Cleo M.; Sanders, Myron D.; and Cook, William C., 4,853,069, Cl. 156-401.000.

First Aroostook Corporation: *See*—
Barresi, James A.; Arndt, Kenneth C.; Young, Michael N.; Bridgeham, Daniel O.; and Hede, Howard H., 4,852,504, Cl. 110-346.000.

Fisch, Alfred C., to Oakland Engineering, Inc. Wheel rim leak detection. 4,852,390, Cl. 73-40.50A.

Fischer, Frederick H., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Laser-blown links. 4,853,758, Cl. 357-51.000.

Fischer & Porter Company: *See*—
Herzl, Peter J., 4,852,409, Cl. 73-861.380.

Fischer, Rolf; Frank, Juergen; Merger, Franz; Roeper, Michael; and Vagt, Uwe, to BASF Aktiengesellschaft. Preparation of 2(5H)-furanones. 4,853,473, Cl. 549-326.000.

Fisher, Brian A., to Tridon Limited. Aerodynamic windshield wiper. 4,852,206, Cl. 15-250.420.

Fisher Group, Inc., The: *See*—
Young, David A.; and Bol, Kenneth E., II, 4,852,902, Cl. 280-507.000.

Fisher & Paykel Limited: *See*—
Smith, Dennis E.; Williams, John J. A.; Duncan, Gerald D.; Thomas, Graeme D.; Borrows, John G.; and Shacklock, Frank W., 4,853,571, Cl. 310-90.000.

Fisons Corporation: *See*—
Anaebonam, Aloysius; Clemente, Emmett; Devlin, Theresa; and Ringden, Diane, 4,853,416, Cl. 514-636.000.

Fitzpatrick, Mark E.: *See*—
Gouldsberry, Gary R.; and Fitzpatrick, Mark E., 4,853,628, Cl. 324-158.00R.

FL Industries, Inc.: *See*—
Singarayer, Santiago, 4,853,599, Cl. 315-119.000.

Flaherty, Brian J., to Davey Roofing, Inc. Roofing safety device. 4,852,692, Cl. 182-231.000.

Flegal, Robert T.: *See*—
Gleason, Kimberly R.; Strid, Eric W.; Flegal, Robert T.; and McCamant, Angus J., 4,853,627, Cl. 324-158.00P.

Fleming, Harry A., Jr.; Foenaught, Edward F.; and Wehman, Robert L., to Pittsburgh Corning Corporation. Translucent end block. 4,852,321, Cl. 52-306.000.

Fletcher, Carl R.: *See*—
Sarnoff, Norton; and Fletcher, Carl R., 4,852,760, Cl. 220-85.00H.

Flight Dynamics, Inc.: *See*—
Ford, Douglas W.; Johnson, Walter A.; and Daneshmandi, Shahram, 4,853,861, Cl. 364-424.060.

Flow Systems, Inc.: *See*—
Murdock, G. Duncan, 4,852,800, Cl. 239-1.000.

Flynn, Steven A.; and Rutter, Paul R., to British Petroleum Company p.l.c., The. Coal dewatering. 4,853,133, Cl. 210-729.000.

FMC Corporation: *See*—
Ross, Jeffrey L.; and Krueger, James W., 4,852,717, Cl. [illegible]

Focke & Co. (GmbH & Co.): *See*—
Focke, Heinz; and Oertel, Wolfgang, 4,852,335, Cl. 53-575.000.

Focke, Heinz; and Oertel, Wolfgang, to Focke & Co. (GmbH & Co.). Apparatus for producing (cigarette) packs from at least one foldable blank. 4,852,335, Cl. 53-575.000.

Fodali, Adolph; and Gering, George, to S & G Tool Aid Corp. Electric wire clip. 4,853,625, Cl. 324-158.00P.

Folsom, Dale. Carrying and storage case for artist's supplies. 4,852,725, Cl. 206-1.700.

Fong, Howard L., to Shell Oil Company. Water removal in a redox process. 4,853,192, Cl. 423-226.000.

Fontaine, Franck: *See*—
Cruchon, Jean-Claude; Fontaine, Franck; and Brugidou, Michel, 4,853,657, Cl. 333-137.000.

For You, Inc.: *See*—
O'Donnell, Jerry L.; and Bopp, Cecil W., 4,852,873, Cl. 272-137.000.

Ford, Carol M.; and Podgorski, Theodore J., to Honeywell Inc. Laser cathode composed of embedded laser gas molecules. 4,853,940, Cl. 372-87.000.

Ford, David A.; Hill, Anthony D.; and Pashby, Ian R., to Rolls-Royce plc. Alloy suitable for making single crystal castings. 4,853,044, Cl. 148-3.000.

Ford, Douglas W.; Johnson, Walter A.; and Daneshmandi, Shahram, to Flight Dynamics, Inc. Windshear measurement system. 4,853,861, Cl. 364-424.060.

Ford Motor Company: *See*—
Achenbach, Kurt F., 4,853,860, Cl. 364-424.050.
Koss, George A.; and Sitzman, Gary W., 4,853,018, Cl. 65-94.000.
Stocker, Raymond, 4,852,425, Cl. 74-586.000.
Theodore, Ares N.; and Killgoar, Paul C., Jr., 4,853,428, Cl. 524-49.000.

Fosnaught, Edward F.: *See*—
Fleming, Harry A., Jr.; Fosnaught, Edward F.; and Wehman, Robert L., 4,852,321, Cl. 52-306.000.

Fost, David L.: *See*—
Williams, Walter J.; and Fost, David L., 4,852,759, Cl. 220-85.00H.

Foster, Asa D. Apparatus for determining impact force upon a vehicle in traveling a curve. 4,853,675, Cl. 340-429.000.

Foster, Gary H., to White Consolidated Industries, Inc. Apparatus for cutting vegetation. 4,852,258, Cl. 30-276.000.

Fougere, Guy L.: *See*—
Durst, Robert T., Jr.; Fougere, Guy L.; Hunter, Kevin D.; and Schmidt, Alfred C., 4,853,869, Cl. 364-478.000.
Sansone, Ronald P.; and Fougere, Guy L., 4,853,865, Cl. 364-464.020.

Fourny, Jacky R. P.: *See*—
Amiot, Jacques H. J.; Fourny, Jacky R. P.; Letournel, Gilles J. M.; and Parise, Vital A., 4,852,814, Cl. 241-37.500.

Foxboro Company, The: *See*—
Freeman, Mark D.; Koukol, John L., Jr.; Koziol, Stanislaw; and Sgourakes, George E., 4,852,466, Cl. 92-104.000.

Francke, Wittko, to Toyo Seikan Kaisha, Ltd. Methods and compositions for controlling the pear leaf blister moth, *Leucoptera scitella*. 4,853,217, Cl. 424-84.000.

Franco, Jack D., to Franco Manufacturing Co., Inc. Transport/display package for magnetic tape cassettes. 4,852,739, Cl. 206-387.000.

Franco Manufacturing Co., Inc.: *See*—
Franco, Jack D., 4,852,739, Cl. 206-387.000.

Frangel, William L. Automatically adjustable threaded cap loosening apparatus and method. 4,852,431, Cl. 81-3.200.

Frank, Juergen: *See*—
Fischer, Rolf; Frank, Juergen; Merger, Franz; Roeper, Michael; and Vagt, Uwe, 4,853,473, Cl. 549-326.000.

Frank, Larry A.: *See*—
Jackson, Charles R.; Rellis, Daniel, Jr.; Pielet, Howard M.; Bhattacharya, Debanshu; Frank, Larry A.; Dasgupta, Purnendu; and Knoepke, John R., 4,852,632, Cl. 164-437.000.

Frank, Thomas P., to Medex, Inc. Pressure transducer with conductive polymer bridge. 4,852,581, Cl. 128-672.000.

Frankel, Juergen; Mattelin, Antoon; Pecceu, Pol; Quella, Ferdinand; Schmidt, Hans-Fr.; Boone, Luc; Von Tomkewitsch, Sybille; and De Vogelaere, Marc, to Siemens Aktiengesellschaft; and Michael Huber GmbH. Method and coating material for applying electrically conductive printed patterns to insulating substrates. 4,853,252, Cl. 427-53.100.

Fransen, Sig T.; and Dye, Wayne K., Jr., to Oregon Marine Floats, Inc. Floating dock having shock-absorbing coupling. 4,852,509, Cl. 114-263.000.

Frantz, Earl L.: *See*—
Harner, Leslie L.; and Frantz, Earl L., 4,853,298, Cl. 428-630.000.

Frantz, John M. Axial reverse flow filter assembly for fluids. 4,853,120, Cl. 210-184.000.

Frasier, Richard A.: *See*—
Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; Olmstead, Neil R.; Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; and Frasier, Richard A., 4,853,784, Cl. 358-181.000.

Frauenknecht, Josef; and Schwer, Dieter, to Sandoz Ltd. Dyeing of polyamide fibers with anionic dyes using a cationic assistant followed by an anionic assistant. 4,852,991, Cl. 8-586.000.

Fray, Michael J.: *See*—
Cooper, Kelvin; Cross, Peter E.; Fray, Michael J.; and Richardson, Kenneth, 4,853,392, Cl. 514-311.000.

Frederiksen, Lee W.: *See*—
Behar, Albert; Behar, Orna; Frederiksen, Lee W.; Howard-Link, Donald A.; and Timmerman, Catherine, 4,853,854, Cl. 364-413.010.

Freeman, Mark D.; Koukol, John L., Jr.; Koziol, Stanislaw; and Sgourakes, George E., to Foxboro Company, The. Floating diaphragm apparatus. 4,852,466, Cl. 92-104.000.

Freimuth, Lothar; and Van Wagener, Raymond H., to Magnetek Universal Manufacturing Corp. Wire robbin for inductive devices. 4,853,667, Cl. 336-192.000.

Fremont, Owen K.: *See—*
St. Angelo, Stephen; Carver, George C.; Patterson, David W.; and Fremont, Owen K., 4,852,240, Cl. 29-559.000.

Freudenschuss, Otto: *See—*
Rollenitz, Leopold; Krenn, Andreas; Schmidt, Harald; and Freudenschuss, Otto, 4,852,535, Cl. 123-357.000.

Friebe, Walter-Gunar; and Wilhelms, Otto-Henning, to Boehringer Mannheim GmbH. N^9-disubstituted purine derivatives, and pharmaceutical compositions containing them, useful for treating allergic diseases, bronchospastic and bronchoconstrictory conditions. 4,853,386, Cl. 514-266.000.

Fried. Krupp Gesellschaft Mit Beschrankter: *See—*
Schwarz, Wilhelm; and Heinz, Winfried, 4,852,857, Cl. 266-99.000.

Friedrich Wilh. Schwing GmbH: *See—*
Schwing, Friedrich, 4,852,467, Cl. 92-128.000.

Frindt, Robert F.: *See—*
Morrison, S. Roy; Frindt, Robert F.; Joensen, Per; Gee, Michael A.; and Miremadi, Bijan K., 4,853,359, Cl. 502-220.000.

Frisch, Gerhard; and Albrecht, Konrad, to Hoechst Aktiengesellschaft. Herbicidal emulsions. 4,853,026, Cl. 71-86.000.

Frito-Lay, Inc.: *See—*
Anders, Gary H.; and Moran, James A., Jr., 4,852,441, Cl. 83-155.000.

Fritz Bauer and Sohne OHG: *See—*
Bauer, Hans-Peter; and Bauer, Hans J., 4,852,862, Cl. 267-120.000.

Fry, David M.; and Fry, Sharon A., to University of Virginia Alumni Patents Foundation, The. Micro slide irrigating unit. 4,852,596, Cl. 134-182.000.

Fry, Jeremy J. Wheelchair steering. 4,852,679, Cl. 180-234.000.

Fry, Sharon A.: *See—*
Fry, David M.; and Fry, Sharon A., 4,852,596, Cl. 134-182.000.

Fu, Shih-Lien: *See—*
Peng, Yu-Yin; and Fu, Shih-Lien, 4,852,854, Cl. 251-129.170.

Fuchi, Masao: *See—*
Yamato, Motoyuki; Ueno, Susumu; Okumura, Kin-ichi; and Fuchi, Masao, 4,853,435, Cl. 525-193.000.

Fuchs, Rainer; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Separation of diastereomers of cyclopropanecarboxylic acid esters. 4,853,477, Cl. 558-398.000.

Fuimefreddo, Anthony J., to Perkin-Elmer Corporation, The. Arc spray gun for coating confined areas. 4,853,513, Cl. 219-76.140.

Fuji Electric Co., Ltd.: *See—*
Kandatsu, Kiyoshi, 4,853,662, Cl. 335-185.000.
Umemoto, Yoshiyuki, 4,853,043, Cl. 136-244.000.

Fuji Koki Manufacturing Co., Ltd.: *See—*
Tanaka, Hazime; Suzuki, Hirayoshi; and Sasaki, Keiji, 4,853,504, Cl. 200-83.00P.

Fuji Photo Film Co., Inc.: *See—*
Yamada, Sadami, 4,852,975, Cl. 250-327.200.

Fuji Photo Film Co., Ltd.: *See—*
Fujita, Yoshihiro; Fujimoto, Hiroshi; Ishikawa, Takatoshi; and Kishimoto, Shinzo, 4,853,318, Cl. 430-380.000.
Horie, Ikutaro; Ishiyama, Masashi; and Tomizuka, Teiichi, 4,853,262, Cl. 428-13.000.
Horiguchi, Masashi; Yakubo, Minoru; Tamura, Yoshikazu; and Ogasawara, Mamoru, 4,853,747, Cl. 355-51.000.
Ikeda, Hideo; Suga, Shuzo; and Miyasaka, Nobuaki, 4,853,323, Cl. 430-567.000.
Makino, Katsumi; Ohashi, Yuichi; Takehara, Hiroshi; Suga, Yoichi; and Shiozawa, Takekimi, 4,853,322, Cl. 430-567.000.
Matsumoto, Takashi, 4,853,633, Cl. 324-210.000.
Mizuta, Akira; and Fujiwara, Morio, 4,853,817, Cl. 360-133.000.
Momoki, Yasuhito; Asami, Masahiro; Sakai, Nobuo; and Otani, Shigeaki, 4,853,321, Cl. 430-380.000.
Nagumo, Akihiko; and Yoshino, Shigeru, 4,853,743, Cl. 355-27.000.
Nakajima, Nobuyoshi, 4,853,540, Cl. 250-327.200.
Okazaki, Masaki; and Inagaki, Yoshio, 4,853,328, Cl. 435-28.000.
Suganuma, Atsushi, 4,853,535, Cl. 250-235.000.
Tajima, Kenji; Takahashi, Motoaki; Watanabe, Hideo; Shoji, Takashi; and Arai, Noboru, 4,853,724, Cl. 354-277.000.
Tamada, Kazukiyo, 4,853,806, Cl. 360-99.060.
Tanaka, Nobuyuki, 4,853,778, Cl. 358-133.000.
Yamada, Makoto, 4,853,312, Cl. 430-138.000.

Fujihara, Tadafumi; Shimada, Yoshihiro; Nagano, Chikara; and Tsukamoto, Katsuo, to Olympus Optical Co., Ltd. Illuminating device for microscopes. 4,852,985, Cl. 350-523.000.

Fujii Seiko Limited: *See—*
Haga, Katutoshi; Yoshida, Hisatoshi; and Mitani, Yushi, 4,852,428, Cl. 74-826.000.

Fujimoto, Hiroshi: *See—*
Fujita, Yoshihiro; Fujimoto, Hiroshi; Ishikawa, Takatoshi; and Kishimoto, Shinzo, 4,853,318, Cl. 430-380.000.

Fujimoto, Satoshi: *See—*
Okabe, Kazuya; Matsuda, Hideyuki; Iwasaki, Chisato; and Fujimoto, Satoshi, 4,853,755, Cl. 357-23.700.

Fujimoto, Teruo: *See—*
Ohata, Masatoshi; Tsutsui, Koichi; Ikedal Shoji; and Fujimoto, Teruo, 4,853,436, Cl. 525-244.000.

Fujimura, Fumio: *See—*
Satake, Toshimi; Minami, Toshiaki; Nagai, Tomoaki; and Fujimura, Fumio, 4,853,361, Cl. 503-201.000.
Satake, Toshimi; Fukuchi, Tadakazu; Minami, Toshiaki; Nagai, Tomoaki; Kaneko, Toshio; and Fujimura, Fumio, 4,853,362, Cl. 503-209.000.
Satake, Toshimi; Minami, Toshiaki; Nagai, Tomoaki; and Fujimura, Fumio, 4,853,363, Cl. 503-210.000.

Fujino, Akihiko: *See—*
Kawamura, Kunio; Taniguchi, Toshihiko; Oya, Tetsuro; Niwa, Masatake; Nakai, Masaaki; and Fujino, Akihiko, 4,853,726, Cl. 354-289.100.

Fujioka, Yoichi: *See—*
Asano, Kazuhiro; Yoshida, Yosuke; Fujioka, Yoichi; Takazawa, Kazuhisa; Ishizaki, Masao; Sakami, Yasuo; and Tsubouchi, Junichi, 4,853,682, Cl. 340-706.000.

Fujisaki, Hisashi, to NEC Corporation. Voice controlled dialer with separate memories for any users and authorized users. 4,853,953, Cl. 379-88.000.

Fujita, Yoshihiro; Fujimoto, Hiroshi; Ishikawa, Takatoshi; and Kishimoto, Shinzo, to Fuji Photo Film Co., Ltd. Process for processing silver halide color photographic material using a developer comprising substantially no benzyl alcohol. 4,853,318, Cl. 430-380.000.

Fujitsu Limited: *See—*
Azuma, Isao; Ishida, Miyuki; and Aoki, Naozumi, 4,853,929, Cl. 371-25.000.
Mitsuhashi, Masato; and Kitahara, Takeshi, 4,853,848, Cl. 364-200.000.
Naoi, Satoshi; Inoue, Akira; Nishikawa, Katsuhiko; and Nagata, Shigemi, 4,853,885, Cl. 364-718.000.
Ogasawara, Nobuo, 4,853,522, Cl. 235-380.000.
Yasutake, Nobuyuki; Kai, Jun-ichi; Yasuda, Hiroshi; and Kawashima, Kenichi, 4,853,870, Cl. 364-490.000.

Fujiwara, Hitoshi, to Mabushi Motor Co., Ltd. Miniature motor. 4,853,568, Cl. 310-68.00C.

Fujiwara, Katsuyoshi: *See—*
Okamoto, Yuji; Machara, Shigeharu; and Fujiwara, Katsuyoshi, 4,853,748, Cl. 355-55.000.

Fujiwara, Koichi: *See—*
Onishi, Toshiyasu; Ayata, Kenzo; Takagi, Hiroshi; Suzuki, Yasuo; Ohta, Yasuhiko; Shiozawa, Takao; Fujiwara, Koichi; and Itashiki, Masakazu, 4,852,635, Cl. 164-468.000.

Fujiwara, Morio: *See—*
Mizuta, Akira; and Fujiwara, Morio, 4,853,817, Cl. 360-133.000.

Fukada, Tetsuji: *See—*
Kawasaki, Osamu; Takeda, Katsu; Inaba, Ritsuo; and Fukada, Tetsuji, 4,853,579, Cl. 310-116.000.

Fukagawa, Yasuo: *See—*
Shibamoto, Norio; Yoshioka, Takeo; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,853,407, Cl. 514-414.000.

Fukatsu, Tsutomu; Hori, Taizou; Masui, Toshiyuki; Kobayashi, Takashi; Wakui, Tetsuya; and Takahashi, Koji, to Canon Kabushiki Kaisha. Multi-mode and multi-channel reproducing apparatus with channel change coordinated with mode change. 4,853,803, Cl. 360-72.200.

Fukayama, Tateki. Readjustable floor system. 4,852,315, Cl. 52-220.000.

Fukuchi, Tadakazu: *See—*
Satake, Toshimi; Fukuchi, Tadakazu; Minami, Toshiaki; Nagai, Tomoaki; Kaneko, Toshio; and Fujimura, Fumio, 4,853,362, Cl. 503-209.000.

Fukuda Denshi Co., Ltd.: *See—*
Inoue, Hirokatsu; and Shimizu, Chuji, 4,852,574, Cl. 128-643.000.
Nakahashi, Yoshinao; Osada, Soichi; Shimizu, Chuji; and Ichida, Shinshichi, 4,852,572, Cl. 128-640.000.

Fukuda, Toshio; Yoneda, Kenji; Ueshima, Takaaki; and Sasaki, Osamu, to Hitachi Ltd. Information device of elevator. 4,852,696, Cl. 187-139.000.

Fukuhara, Yuichi; and Ikeda, Tetsuo, to Aisin Seiki Kabushiki Kaisha. Synchronizing apparatus for a power transmission. 4,852,709, Cl. 192-53.00F.

Fukui, Kazuyuki; and Yokoyama, Chujiro, to Minolta Camera Kabushiki Kaisha. Automatic paper feeding apparatus. 4,852,868, Cl. 271-122.000.

Fukui, Kenji: *See—*
Akamatsu, Takahiro; Nakazato, Hiroshi; Matsumura, Takashi; and Fukui, Kenji, 4,853,880, Cl. 364-559.000.

Fukuju, Yujio; and Niiro, Makoto, to Sony Corporation. Method and apparatus for reproducing digital or analog signals. 4,853,798, Cl. 360-38.100.

Fukukawa, Mitsuo: *See—*
Takizawa, Seiichiro; Fukukawa, Mitsuo; Yazawa, Masayuki; Asai, Kazumitsu; and Okamoto, Yoshiharu, 4,852,278, Cl. 37-197.000.

Fukumori, Kunihiko; and Kikuta, Hiroshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Fabric form consisting of multilayer fabric and composite structure made by using fabric form. 4,853,269, Cl. 428-43.000.

Fukumoto, Masatoshi; Kubo, Soichi; Miyake, Yoichi; Tsukada, Norishige; Kasutani, Kiyoshi; and Okamori, Kenji, to Sakata Inkusu Kabushikikaisha. Method and image processing system for reconstruction of an image. 4,853,794, Cl. 358-447.000.

Fukunaga, Takehito: *See—*
Watanabe, Junji; Ineda, Ken; Fukunaga, Takehito; and Tokutsu, Akihito, 4,852,869, Cl. 271-126.000.

Fukuyoshi, Kenzo, to Toppan Printing Co., Ltd. Electrode plate for color display device. 4,853,296, Cl. 428-623.000.

Fuller, John R. C.: *See—*
Ong, Beng S.; Fuller, John R. C.; and Murti, Dasarao K., 4,853,308, Cl. 430-59.000.

Fuller, Mark W.; and Robinson, Alan S., to Wet Enterprises, Inc. Airpowered water displays. 4,852,801, Cl. 239-12.000.

Funabashi, Motohisa: *See—*
Onari, Mikihiko; Sekozawa, Teruji; Funabashi, Motohisa; and Atago, Takeshi, 4,853,720, Cl. 364-431.070.

Funaki, Yoshinori, to Daicel Chemical Industries, Ltd. Method of cleaning the surface of an optical disc and a cleaning device. 4,853,922, Cl. 369-72.000.

Funatsu, Chuhei; and Kita, Kazuyuki, to Toyo Communication Equipment Co., Ltd. Indicating system for warning airspace or threatening aircraft in aircraft collision avoidance system. 4,853,700, Cl. 343-30.000.

Furuhashi, Takeshi, to Kabushiki Kaisha Toshiba. Protective apparatus for inverter. 4,853,835, Cl. 363-58.000.

Furuhashi, Takeshi, to Kabushiki Kaisha Toshiba. Snubber energy regenerating circuit. 4,853,836, Cl. 363-58.000.

Furukawa Aluminum Co., Ltd.: *See—*
Kawase, Hiroshi, 4,852,233, Cl. 29-157.30R.

Furukawa Electric Co., Ltd.: *See—*
Yoshida, Seikoh; Kikuta, Toshio; and Kashiwayanagi, Yuzo, 4,853,066, Cl. 156-616.400.

Furukawa, Hiroshi: *See—*
Matsuda, Mutsuhide; Aoyagi, Masao; Furukawa, Hiroshi; and Shimizu, Masami, 4,853,725, Cl. 354-286.000.

Futakata, Takashi, to Tokyo Electric Company, Ltd. Electronic weighing machine. 4,852,676, Cl. 177-245.000.

G. D. Searle & Co.: *See—*
Bovy, Philippe R.; Gillet, Claude; Lenaers, Albert; Niebos, Paul; Robe, Joseph; and Lambelin, Georges, 4,853,401, Cl. 514-389.000.

Gabler, Rolf: *See—*
Abthoff, Joerb; Schuster, Hans-Dieter; Langer, Hans-Joachim; Strohmer, Erwin; Gabler, Rolf; and Schulte, Roland, 4,852,349, Cl. 60-303.000.

Gabrielson, Robert: *See—*
Brownell, Peter; Borgia, Joseph A.; and Gabrielson, Robert, 4,853,118, Cl. 210-130.000.

Gadkaree, Kishor P.: *See—*
Chen, Shih-Lu; Gadkaree, Kishor P.; and Mash, Joseph F., 4,853,350, Cl. 501-9.000.

Gadot Petrochemical Industries, Ltd.: *See—*
Dakka, Jihad; Zoran, Amikam; and Sasson, Yoel, 4,853,479, Cl. 566-77.000.

Gadsby, Peter D.; Moore, Martin R.; Olson, Denis E.; and Scott, Barry M., to Marquette Electronics. Disposable biopotential electrode. 4,852,571, Cl. 128-640.000.

GAF Corporation: *See—*
Barabas, Eugene S., 4,853,439, Cl. 525-326.900.
Gershenson, Moshe; and Schell, Thomas, 4,853,030, Cl. 75-0.50A.

Gaisford, Susan E.: *See—*
Clare, Kenneth; McMullen, James H.; Findlay, Medeana; and Gaisford, Susan E., 4,853,244, Cl. 426-573.000.

Gajun, Jury A.: *See—*
Perevozkin, Jury L.; Gajun, Jury A.; Grigorov, Petr K.; Zhurakovsky, Vasily M.; and Samelik, Boris V., 4,853,047, Cl. 148-907.000.

Gambale, Ronald J.; Hathaway, Susan J.; Longley, Kathryn L.; and Ullman, Timothy J., to General Electric Company. Carboxy-functionalized polycarbonate from carboxyphenol. 4,853,458, Cl. 528-198.000.

Gammill, Floyd M. Halter with pop-release fastener means. 4,852,336, Cl. 54-24.000.

Ganzke, Jurgen; Jahn, Dieter; and Kritzner, Bruno, to Du Pont de Nemours, E. I., and Company. Process and device for treating a photographic recording material. 4,853,727, Cl. 354-319.000.

GAO Gesellschaft fur Automation und Organisation mbH: *See—*
Effing, Wolfgang, 4,853,526, Cl. 235-492.000.
Hoppe, Joachim, 4,852,911, Cl. 283-82.000.

Gard, Michael F., to Atlantic Richfield Company. Detection of water saturation in insulation at cased road crossings. 4,853,616, Cl. 324-71.000.

Gardikes, John J.: *See—*
Fechter, Robert B.; and Gardikes, John J., 4,852,629, Cl. 164-16.000.

Gardner, Sandra J.: *See—*
Tam, Man C.; Bloembergen, Steven; Kovacs, Gregory J.; Jennings, Carol A.; Loutfy, Rafik O.; Gardner, Sandra J.; and Taylor, Michael G., 4,853,307, Cl. 430-41.000.

Garfinkle, Marvin. Undercarriage apparatus for vertical-lift aircraft. 4,852,829, Cl. 244-100.00R.

Garlock Inc.: *See—*
Borowski, Richard, 4,852,890, Cl. 277-25.000.

Gartland, Matthew. Method for the production of wood panels. 4,853,062, Cl. 156-219.000.

Gaskell, David J., to Lucas Industries public limited company. Fuel injection nozzles. 4,852,803, Cl. 239-86.000.

Gaskins, Justin: *See—*
Kobrya, Ronald J.; and Gaskins, Justin, 4,852,481, Cl. 101-93.480.

Gasper, Gerhard: *See—*
Kittel, Friedrich; Lutz, Dieter; Nagler, Franz; Oppitz, Horst; and Gasper, Gerhard, 4,852,419, Cl. 74-89.140.

Gay, Christian; and Lasniaz, Philippe, to Valeo. Clutch release bearing with bistable spring washer. 4,852,710, Cl. 192-98.000.

Gazard, Maryse: *See—*
Gombert, Jean; Quinty, Christian; Gazard, Maryse; and Blaison, Serge, 4,853,258, Cl. 427-169.000.

Gazelle Microcircuits, Inc.: *See—*
Gouldsberry, Gary R.; and Fitzpatrick, Mark E., 4,853,628, Cl. 324-158.00R.

Gebhard, Georg: *See—*
Ruch, Ola; Johansen, Trond V.; Naess, Ludvig; Poerner, Horst; Gebhard, Georg; Weber, Robert; and Heller, Max, 4,852,391, Cl. 73-40.50R.

Gebhardt, Edwin J.; Keaton, George H.; Sinar, Michael M.; and Wendt, James N., to USX Corporation. Edge brush for electroplated strip. 4,852,198, Cl. 15-77.000.

Gee, Michael A.: *See—*
Morrison, S. Roy; Frindt, Robert F.; Joensen, Per; Gee, Michael A.; and Miremadi, Bijan K., 4,853,359, Cl. 502-220.000.

Geerpres, Inc.: *See—*
Breveglieri, Franklin L., 4,852,747, Cl. 211-70.600.

Geis, Michael W.: *See—*
Tsaur, Bor-Yeu; Fan, John C. C.; and Geis, Michael W., 4,853,076, Cl. 156-603.000.

Gell, Harold A., Jr., to Sea Fathoms Industries. Method and apparatus for extending the depth range of underwater equipment. 4,853,722, Cl. 354-64.000.

Gemmell, Peter A.: *See—*
Chan, Lawrence K. M.; Coates, David; Gemmell, Peter A.; Gray, George W.; Lacey, David; Toyne, Kenneth J.; and Young, Daniel J. S., 4,852,977, Cl. 350-350.00S.

Genentech, Inc.: *See—*
Goeddel, David V.; Kohr, William J.; Pennica, Diane; and Vehar, Gordon A., 4,853,330, Cl. 435-226.000.

General Electric Company: *See—*
Bulman, Melvin J., 4,852,458, Cl. 89-7.000.
Bulman, Melvin J., 4,852,459, Cl. 89-7.000.
Charnley, James E.; Cearley, James E.; Dixon, Robert C.; Izzo, Kenneth R.; and Aiello, Louis L., 4,853,176, Cl. 376-333.000.
Elton, Richard K.; and Schultz, William R., Jr., 4,853,565, Cl. 310-45.000.
Gambale, Ronald J.; Hathaway, Susan J.; Longley, Kathryn L.; and Ullman, Timothy J., 4,853,458, Cl. 528-198.000.
Heindl, Raymond A.; Reiling, Gilbert H.; and Suster, Albert L., 4,853,597, Cl. 313-638.000.
Isnardi, Michael A.; and Patel, Chandrakant B., 4,853,766, Cl. 358-12.000.
Joyce, Richard P., 4,853,457, Cl. 528-190.000.
Kenworthy, Milton J.; and King, Robert C., 4,852,355, Cl. 60-751.000.
Kure-Jensen, Jens; Westphal, Bernd A. K.; and Drummond, Thane M., 4,853,552, Cl. 290-40.00C.
Levine, Aaron W., 4,853,064, Cl. 156-275.500.
Stewart, Kevin R., 4,853,459, Cl. 528-371.000.
Thomas, Charles E., 4,853,680, Cl. 340-680.000.
Vermilyea, Mark E., 4,853,663, Cl. 335-301.000.
Walles, Erik W.; Lupinski, John H.; Markovitz, Mark; Colborn, Robert E.; Presley, James R.; Davis, Michael J.; Minnick, Michael G.; Kubisen, Steven J., Jr.; Hallgren, John E.; Bolon, Donald A.; Eddy, Victoria J.; and Irwin, Patricia C., 4,853,423, Cl. 523-428.000.

General Foods Limited: *See—*
Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansley, Robert W.; and Newman, Alec T., 4,853,234, Cl. 426-77.000.

General Maintenance Company, Inc.: *See—*
Widerman, John W., Jr., 4,853,042, Cl. 134-6.000.

General Mills, Inc.: *See—*
Langler, James E., 4,853,236, Cl. 426-102.000.

General Motors Corporation: *See—*
Beardmore, John M.; and Cafeo, John A., 4,852,527, Cl. 123-96.000.
Katzman, Abe, 4,852,796, Cl. 229-125.280.
St. Angelo, Stephen; Carver, George C.; Patterson, David W.; and Fremont, Owen K., 4,852,240, Cl. 29-559.000.
Taylor, Edward F., 4,853,055, Cl. 156-108.000.
Turner, Kenneth W.; Covert, Charles H.; and Meyer, Karen M., 4,852,761, Cl. 220-85.0VR.
Turner, Kenneth W.; Simons, Richard H., Jr.; and Paddock, Gordon R., 4,853,009, Cl. 55-387.000.
Weier, Mark D., 4,852,846, Cl. 248-430.000.

General Signal Corporation: *See—*
Olesak, John, 4,853,665, Cl. 336-84.00C.

Genesis Industries, Incorporated: *See—*
Ennis, James F., III, 4,852,772, Cl. 222-386.000.

Genex Corporation: *See—*
Pantoliano, Michael W.; and Ladner, Robert C., 4,853,871, Cl. 364-496.000.

Gentile, Anthony R.: *See—*
Gentile, John J.; Gentile, Anthony R.; and Gentile, Christopher T., 4,852,224, Cl. 24-590.000.

Gentile, Christopher T.: *See—*
Gentile, John J.; Gentile, Anthony R.; and Gentile, Christopher T., 4,852,224, Cl. 24-590.000.

Gentile, John J.; Gentile, Anthony R.; and Gentile, Christopher T., to Abrams/Gentile Entertainment Inc. Ornamental Z-shaped rotary fastening device. 4,852,224, Cl. 24-590.000.

Georgia-Pacific Resins, Inc.: *See—*
Miller, John F., 4,853,431, Cl. 524-608.000.

Gerbrandt, George, to Met-Line Inc. Digging implement or blade therefor. 4,852,279, Cl. 37-252.000.

Gering, George: *See—*
Fodali, Adolph; and Gering, George, 4,853,625, Cl. 324-158.00P.

Gershenson, Moshe; and Schell, Thomas, to GAF Corporation. Method and apparatus for the manufacture of metallic filaments. 4,853,030, Cl. 75-0.50A.

Giannetti, John; Sleve, Jerry F.; and Kelley, Timothy H., to Eastman Kodak Company. Document sheet support mechanism. 4,853,746, Cl. 355-48.000.

Giannotti, Hugo V. Transit refuse resource recovery and incineration system. 4,852,815, Cl. 241-65.000.

Giessler, Johannes: *See—*
Weckler, Joachim, 4,853,964, Cl. 381-156.000.

Gietz, Hanspeter; and Rocali, Manfred, to Maschinenfabrik Gietz AG. Die stamping and punching tool. 4,852,382, Cl. 72-406.000.

Giglio, Felicino. Toilet. 4,852,191, Cl. 4-228.000.

Gilbert, Cynthia J.: *See—*
Gilbert, Eugene; and Gilbert, Cynthia J., 4,852,921, Cl. 292-259.00R.

Gilbert, Eugene; and Gilbert, Cynthia J. Door security device. 4,852,921, Cl. 292-259.00R.

Gillet, Claude: *See—*
Bovy, Philippe R.; Gillet, Claude; Lenaers, Albert; Niebes, Paul; Robe, Joseph; and Lambelin, Georges, 4,853,401, Cl. 514-389.000.

Gilstad, Dennis W.; Branstetter, Ronald L.; and Hill, Ralph H., Jr., to Karl Storz Endoscopy GmbH and Company. Photocharacterization and treatment of normal abnormal and ectopic endometrium. 4,852,579, Cl. 128-665.000.

Gimzewski, James K.: *See—*
Pohl, Wolfgang D.; Gimzewski, James K.; and Muralt, Paul R., 4,853,810, Cl. 360-103.000

Ginther, Joseph G., Jr., to International Business Machines Corp. Electromagnetic emission shield for cathode ray tube display. 4,853,791, Cl. 358-247.000.

Glaxo Group Limited: *See—*
Finch, Harry; Lunts, Lawrence H. C.; Naylor, Alan; Skidmore, Ian F.; and Campbell, Ian B., 4,853,381, Cl. 514-211.000.
Skidmore, Ian F.; Finch, Harry; Naylor, Alan; Lunts, Lawrence H. C.; and Campbell, Ian B., 4,853,382, Cl. 514-212.000.

Gleason, Kimberly R.; Strid, Eric W.; Flegal, Robert T.; and McCamant, Angus J., to TriQuint Semiconductor, Inc. Wafer probes. 4,853,627, Cl. 324-158.00P.

Glidden Company, The: *See—*
Hahn, Kenneth G., Jr., 4,853,422, Cl. 523-310.000.

Glorioso, John D., to Enviro-Gro Technologies, Inc. Combined sewage and lime slude treatment process. 4,852,269, Cl. 34-11.000.

Goans, Kip B., to Lazea, Richard. Anti-extrusion sealing means. 4,852,394, Cl. 73-49.800.

Goda, Hiroshi: *See—*
Kato, Kunioki; Kawamura, Masao; Goda, Hiroshi; Sawada, Kiyoshi; and Hamatani, Kazuhiro, 4,853,158, Cl. 562-46.000.

Goeckeler, William F.: *See—*
Kaplan, Donald A.; and Goeckeler, William F., 4,853,209, Cl. 424-1.100.

Goeddel, David V.; Kohr, William J.; Pennica, Diane; and Vehar, Gordon A., to Genentech, Inc. Human tissue plasminogen activator. 4,853,330, Cl. 435-226.000.

Goerlich, Dieter, to Webasto AG Fahrzeugtechnik. Process for operating a fuel-operated heater and control arrangement for performing the process. 4,852,797, Cl. 237-2.00A.

Goetz, Charles R., to Alco Industries, Inc. Portable pet carrier. 4,852,520, Cl. 119-19.000.

Goetzinger, David: *See—*
Burgess, William C.; Jochum, Gary L.; Goetzinger, David; and Beckius, David A., 4,852,748, Cl. 211-70.600.

Goex, Inc.: *See—*
Hancock, Michael P.; and Hayes, Scott L., 4,852,495, Cl. [02-109.000]

Goineau, Andre M., to Milliken Research Corporation. Composite yarn texturing system. 4,852,226, Cl. 28-220.000.

Gold, Elijah H.: *See—*
Petrakis, Konstaninos S.; Berger, Joel G.; and Gold, Elijah H., 4,853,476, Cl. 558-170.000.

Gold, Milton. Adapter for expanding the volume of a container. 4,852,757, Cl. 220-4.00A.

Goldberg, Neil: *See—*
Ryburg, Jon B.; and Goldberg, Neil, 4,852,500, Cl. 108-105.000.

Gombert, Jean; Quinty, Christian; Gazard, Maryse; and Blaison, Serge, to Thomson-CSF. Method for the impervious metallic coating of an optic fiber and device. 4,853,258, Cl. 427-169.000.

Gomm, William E.: *See—*
Vincent, Steve M.; Behling, Gerald R.; Hood, Thomas G.; and Gomm, William E., 4,853,264, Cl. 428-34.000.

Gonzenbech, Hans U. Selective chlorination of para-tertiary-butytoluene. 4,853,489, Cl. 570-197.000.

Good, William R.: *See—*
Kurihara-Bergstrom, Tamie; Good, William R.; and Ebert, Charles D., 4,853,227, Cl. 424-443.000.

Goodyear Tire & Rubber Company, The: *See—*
Colvin, Howard A.; Cottman, Kirkwood S.; and Parker, Dane K., 4,853,478, Cl. 560-32.000.

Gorshe, Steven S., to Siemens Transmission Systems, Inc. Violating All Zero Octet (VAZO) detector for a zero byte time slot interchange (ZBTSI) encoder. 4,853,931, Cl. 371-55.000.

Gotanda, Motohiro. Electrical shock-preventable key unit. 4,852,374, Cl. 70-456.00R.

Goto, Koji; and Sakakibara, Teigo, to Canon Kabushiki Kaisha. Image forming apparatus. 4,853,736, Cl. 355-210.000.

Goto, Tomoko: *See—*
Hanada, Kazuyuki; Misaizu, Iwao; Kashimura, Masashi; Goto, Tomoko; and Kuriyama, Katsumi, 4,853,418, Cl. 521-154.000.

Goto, Yasuyuki, to Chisso Corporation. Cyclohexane derivative. 4,853,152, Cl. 252-299.630.

Gottsch, Wilhelm: *See—*
Neinhaus, Jurgen; Hopp, Rudolf; Gottsch, Wilhelm; and Oelkers, Egon, 4,853,368, Cl. 512-25.000.

Goudard, Jean-Francois: *See—*
Rio, Michel; Iltis, Claude; Louis, Herve ; Buffet, Georges; Joly, Marcel; Goudard, Jean-Francois; Bacherot, Joel; and Ducret, Claude, 4,853,013, Cl. 55-159.000.

Goudeau, James L. System for retrieving sandblasted cuttings. 4,852,307, Cl. 51-319.000.

Goudy, Paul R., Jr., to Photo Redux Corp. Radiation-emitting devices. 4,853,581, Cl. 313-15.000.

Gouhier, Dany, to Societe Anonyme: Societe Europeenne De Propulsion. Valve operating without friction. 4,852,605, Cl. 137-493.000.

Gouldsberry, Gary R.; and Fitzpatrick, Mark E., to Gazelle Microcircuits, Inc. Apparatus for measuring circuit parameters of a packaged semiconductor device. 4,853,628, Cl. 324-158.00R.

Goulois, Eric: *See—*
Wursch, Pierre; Musso, Francois; and Goulois, Eric, 4,853,248, Cl. 426-634.000.

Grabovac, Bosko; and Kurtovic, Jadranka, to Consolidated Devices Inc. Disposable torque screwdriver tester. 4,852,386, Cl. 73-1.00C.

Graef, Peter A., to Weyerhaeuser Company. Hydrophilic cellulose product and method of its manufacture. 4,853,086, Cl. 162-157.600.

Graf, Jean-Francois; Hasslin, Hans W.; Schuurman, Hessel J.; Steiner, Theodor; and Wieland, Bruno, to Cibe-Geigy Corporation. Control of ectoparasites. 4,853,223, Cl. 424-405.000.

Granata, Samuel J., Jr.; and Woodle, Boyd M., to United States of America, Energy. Fuel cell plates with skewed process channels for uniform distribution of stack compression load. 4,853,301, Cl. 429-39.000.

Grancey, Thomas A.: *See—*
Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; Olmstead, Neil R.; Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; and Frasier, Richard A., 4,853,784, Cl. 358-181.000.

Granquist, Victor M.: *See—*
Cowan, Jack C.; Granquist, Victor M.; and House, Roy F., 4,853,465, Cl. 530-506.000.

Granqvist, Evert; and Wike, Alf, to ABB Stal AB. Power plant with cyclone cleaners having cooled cyclone legs. 4,852,346, Cl. 60-39.464.

Grant, Ace A.; and Grant, Vivian M. Weatherized, baffled, gas filtered, semi-automatic heating system for a poultry house or the like. 4,852,799, Cl. 237-3.000.

Grant, Vivian M.: *See—*
Grant, Ace A.; and Grant, Vivian M., 4,852,799, Cl. 237-3.000.

Grasa, Ivan: *See—*
Baier, Dietfried; Grasa, Ivan; and Haas, Rainer, 4,852,595, Cl. 134-144.000.
Baier, Dietfried; Grasa, Ivan; and Haas, Rainer, 4,852,804, Cl. 239-121.000.

Grass Valley Group, Inc., The: *See—*
Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; Olmstead, Neil R.; Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; and Frasier, Richard A., 4,853,784, Cl. 358-181.000.

Grassmuck, Volker; Jorg, Benno; and Sommer, Eberhard, to Carl Freudenberg, Firma. Flywheel assembly. 4,852,424, Cl. 74-574.000.

Gravrok, Roger J., to University of Minnesota, Regents of the. Family of noise-immune logic gates and memory cells. 4,853,561, Cl. 307-443.000.

Gray, George W.: *See—*
Chan, Lawrence K. M.; Coates, David; Gemmell, Peter A.; Gray, George W.; Lacey, David; Toyne, Kenneth J.; and Young, Daniel J. S., 4,852,977, Cl. 350-350.00S.

Gray, William M.; and Otteman, John H. Air brake compressor failure warning system. 4,853,689, Cl. 340-453.000.

Grayling Industries, Inc.: *See—*
Hittler, Kurt, 4,852,687, Cl. 182-129.000.

Grebenkin, Mikhail F.: *See—*
Bezborodov, Vladimir S.; Grinkevich, Oleg A.; Grebenkin, Mikhail F.; Lapanik, Valery I.; Minko, Anatoly A.; Rzhusaky, Vitaly V.; Muravsky, Anatoly A.; Petrov, Vladimir F.; and Ivaschenko, Alexandr V., 4,853,150, Cl. 252-299.610.

Greco, Vincent. Counterbalance spring retaining means for a roller door. 4,852,378, Cl. 72-379.000.

Green, David E.: *See—*
Parsons, John H.; Hunt, Russell G.; Leach, Susan E.; Buss, Anthony D.; Green, David E.; Mellor, Michael; and Percival, Albert, 4,853,400, Cl. 514-383.000.

Greene, Carl B.; and Greene, Carl B., III, to New Bus Company, Inc., The. Vehicle body and body to frame mounting structure. 4,852,936, Cl. 296-178.000.

Greene, Carl B., III: *See—*
Greene, Carl B.; and Greene, Carl B., III, 4,852,936, Cl. 296-178.000.

Greene, Ronald D.: *See—*
Bennett, Stanley N.; Perry, James T.; and Greene, Ronald D., 4,852,794, Cl. 229-73.000.

Greer, Charles W.: *See—*
Asbra, Martin R.; Asbra, Andrew F.; Bovis, Nicholas J.; and Greer, Charles W., 4,852,600, Cl. 137-38.000.

Greif Bros. Corporation: *See—*
Hale, James A., 4,852,792, Cl. 229-5.500.

Greis, Ingemar, to ABB Stal AB. Method of cooling bed material from a fluidized bed and a power plant with cooling means for bed material. 4,852,345, Cl. 60-39.464.

Grenzendoerfer, Dietmar: *See—*
Tasler, Guenter; Wiendenhoeft, Klaus; Schultheiss, Michael; Schoenfuss, Martin; Ludwig, Theo; Huster, Klaus; and Grenzendoerfer, Dietmar, 4,852,370, Cl. 66-203.000.

Gretzinger, Klaus; and Wombacher, Erich, to Leybold Aktiengesellschaft. Device for inserting and removing the sample in an analysis oven. 4,852,414, Cl. 73-864.850.

Gribens, Joel A.: *See—*
Holdsworth, Robert S.; Brown, Shawn E.; and Gribens, Joel A., 4,852,754, Cl. 215-347.000.

Griesenbeck, Harrell. Bed tent. 4,852,598, Cl. 135-102.000.

Grieser, Hans: *See—*
Fesenmeier, Hugo; Zumkeller, Oskar; Schneider, Werner; and Grieser, Hans, 4,853,666, Cl. 336-130.000.

Griffing, Neal R.; and Hand, Evan L., Sr., to Bethlehem Steel Corporation. Consumable injection lance. 4,852,860, Cl. 266-268.000.

Griffith, Paul G.: *See—*
Linville, Andrew F., Jr.; Shirley, Thomas E.; and Griffith, Paul G., 4,853,903, Cl. 367-46.000.

Grigorov, Petr K.: *See—*
Perevozkin, Jury L.; Gajun, Jury A.; Grigorov, Petr K.; Zhurakovsky, Vasily M.; and Samelik, Boris V., 4,853,047, Cl. 148-905.000.

Grim, Tracy E., to Royce Medical Company. Soft-goods type, formable orthopaedic cast. 4,852,557, Cl. 128-90.000.

Grinkevich, Oleg A.: *See—*
Bezborodov, Vladimir S.; Grinkevich, Oleg A.; Grebenkin, Mikhail F.; Lapanik, Valery I.; Minko, Anatoly A.; Rzhussky, Vitaly V.; Muravsky, Anatoly A.; Petrov, Vladimir F.; and Ivaschenko, Alexandr V., 4,853,150, Cl. 252-299.610.

Groegl, Ferdinand: *See—*
Kimmich, Klaus; and Groegl, Ferdinand, 4,852,966, Cl. 350-96.230.

Groiso, Jorge A. Orthopedic rigid splint-plate orthosis. 4,852,556, Cl. 128-87.00R.

Groome, John M.: *See—*
Bowen, John G.; and Groome, John M., 4,853,517, Cl. 219-271.000.

Grosch, Walter: *See—*
Henkelmann, Jochem; Eggersdorfer, Manfred; Grosch, Walter; Schuhmacher, Alfred; and Siegel, Hardo, 4,853,481, Cl. 167-460.000.

Gross-Given Manufacturing Company: *See—*
Wigg, Martin E.; Peckjian, Bryan M.; and Smith, Judson D., Jr., 4,852,766, Cl. 221-96.000.

Gross, James R., to Kendall Company, The. Multifunction connector for a breathing circuit. 4,852,563, Cl. 128-202.270.

Grove, J. Jay; and Karsner, Grant G., to Mobil Oil Corporation. Delayed coking process. 4,853,106, Cl. 208-131.000.

Grubert, Gordon R.; and Christians, Douglas L., to United Technologies Corporation. Thermostatic controlled system. 4,852,637, Cl. 165-40.000.

GTE Products Corporation: *See—*
Mizuhara, Howard, 4,853,291, Cl. 428-593.000.
Stevens, Chad I.; and Parent, Edward D., 4,853,016, Cl. 65-18.100.
Wolfe, Robert W., 4,853,254, Cl. 427-64.000.

GTE Valenite Corporation: *See—*
Reiterman, Lee, 4,852,438, Cl. 82-131.000.

Guckel, Henry; and Burns, David W., to Wisconsin Alumni Research Foundation. Sealed cavity semiconductor pressure transducers and method of producing the same. 4,853,669, Cl. 338-4.000.

Gudat, Adam J., to Caterpillar Inc. Method for displaying load distribution by monitoring a work vehicle suspension. 4,852,674, Cl. 177-141.000.

Guesten, Hans: *See—*
Rinke, Monika; and Guesten, Hans, 4,853,937, Cl. 372-53.000.

Guigou, Bernard: *See—*
Bouillette, Thierry; Olivier, Denis; and Guigou, Bernard, 4,853,245, Cl. 426-575.000.

Guillaume, Jacques: *See—*
Clemence, Francois; Guillaume, Jacques; and Hamon, Gilles, 4,853,408, Cl. 514-415.000.

Guillou, Bernard P. Y.; and Lahitte, Pierre V. A., to Aerospatiale Societe Nationale Industrielle. Device for connecting together two ultra-high frequency structures which are coaxial and of different diameters. 4,853,656, Cl. 333-34.000.

Gulczynski, Zdzislaw. Synchronous switching power supply with flyback converter. 4,853,837, Cl. 363-80.000.

Gullicksrud, John T.: *See—*
Corfits, William D.; Gullicksrud, John T.; Martin, Bradley L.; McCutcheon, Robert W.; Rasmussen, Jerry R.; Westphal, Gordon W.; and Wheeler, Stephen E., 4,853,830, Cl. 361-391.000.

Gundisch, Gusztav: *See—*
Tatai, Llona; Gundisch, Gusztav; Palotas, Laszlo ; and Subotics, Gyula, 4,852,713, Cl. 198-337.000.

Gunze Ltd.: *See—*
Itaya, Hisao; Okada, Toshihiko; Hata, Morishige; Koike, Shunji; and Onishi, Takahiro, 4,853,776, Cl. 358-106.000.

Guth, Jean-Louis; Faust, Anne-Catherine; Raatz, Francis; and Lamblin, Jean-Marc, to Institut Francais Du Petrole. Ferrierites; their process of manufacture. 4,853,203, Cl. 423-328.000.

Guy, Weldon E. Tubing coupling and method. 4,852,655, Cl. [166-183.000]

Haaker, Paul R.; Klotz, Erhard P. A.; Koppe, Reiner H.; and Linde, Rolf E., to U.S. Phillips Corporation. Method of generating an X-ray layer image of an examination zone, and device for performing the method. 4,853,947, Cl. 378-99.000.

Haarmann & Reimer GmbH: *See—*
Neinhaus, Jurgen; Hopp, Rudolf; Gottsch, Wilhelm; and Oelkers, Egon, 4,853,368, Cl. 512-25.000.

Haas, Rainer: *See—*
Baier, Dietfried; Grasa, Ivan; and Haas, Rainer, 4,852,595, Cl. 134-144.000.
Baier, Dietfried; Grasa, Ivan; and Haas, Rainer, 4,852,804, Cl. 239-121.000.

Haben Corporation Ltd.: *See—*
Wheeler, Daryl, 4,852,234, Cl. 29-261.000.

Hacker, Martin E.: *See—*
Willen, William S.; Savill, Robert F., Jr.; and Hacker, Martin E., 4,853,515, Cl. 219-121.470.

Hackett, Adeline J.; and Dairkee, Shahnaz H., to Peralta Cancer Research Institute. Hybridoma cell line XMMBR-B14 and monoclonal antibody which is specific for a non-cross reactive epitope of CEA. 4,853,464, Cl. 530-387.000.

Hackmack, Alfred. Surface working accessory and method. 4,852,946, Cl. 299-10.000.

Haddad, James H.; and Owen, Hartley, to Mobil Oil Corp. Method and apparatus for removing small catalyst particles in FCC systems. 4,853,107, Cl. 208-152.000.

Haga, Katutoshi; Yoshida, Hisatoshi; and Mitani, Yushi, to Fujii Seiko Limited. Indexing device. 4,852,428, Cl. 74-826.000.

Hagewood, John F.; Niederer, Kurt W.; and McCoy, Daniel W., Sr., to McCoy-Ellison, Inc. Draw warping apparatus. 4,852,225, Cl. 28-187.000.

Haggag, Fahmy M. Field indentation microprobe for structural integrity evaluation. 4,852,397, Cl. 73-82.000.

Hahn, Kenneth G., Jr., to Glidden Company, The. Thermosetting acrylic latexes. 4,853,422, Cl. 523-310.000.

Hahn, Robert W.: *See—*
Brown, Thomas R.; Logan, Richard H.; Hahn, Robert W.; Rodeghiero, Charles D.; and Brekkestran, Kevin L., 4,852,680, Cl. 180-287.000.

Haines, Bernard M. Sensory transmitting membrane device. 4,852,586, Cl. 128-842.000.

Halberschmidt, Friedrich: *See—*
Blank, Kurt; Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Audi, Josef; Kaesmacher, Jakob; Reinicke, Ralf; and Niedenhoff, Udo, 4,853,019, Cl. 65-106.000.

Halder, Mathis; and Joder, Andreas, to LGZ Landis & Gyr Zug AG. Circuit arrangement comprising multiplier circuits to find the sum of electrical power outputs for application in multi-phase electricity meters. 4,853,620, Cl. 324-142.000.

Haldric, Bernard; and Feucht, Pascal, to NACAM. Method and device for shaping by hammering a corrugated tube and the application thereof to tubes for the automobile industry. 4,852,380, Cl. 72-402.000.

Hale, James A., to Greif Bros. Corporation. Self locking cover/bottom for fibre drums. 4,852,792, Cl. 229-5.500.

Haley, John E.: *See—*
Nickles, Stephen K.; Surjaatmadja, Jim B.; Haley, John E.; and Wienck, Lynn K., 4,853,883, Cl. 364-578.000.

Halfacre, J. Wayne, to Sunbeam Plastics Corporation. Tamper indicating container-closure package. 4,852,751, Cl. 215-32.000.

Hall, David J.; Sanderson, Neil E.; and Hall, Edward F. H., to VG Instruments Group Limited. Glow discharge mass spectrometer. 4,853,539, Cl. 250-288.000.

Hall, Douglas O., to Eastman Kodak Company. X-ray film processor rack. 4,853,728, Cl. 354-320.000.

Hall, Edward F. H.: *See—*
Hall, David J.; Sanderson, Neil E.; and Hall, Edward F. H., 4,853,539, Cl. 250-288.000.

Hallgren, John E.: *See—*
Walles, Erik W.; Lupinski, John H.; Markovitz, Mark; Colborn, Robert E.; Presley, James R.; Davis, Michael J.; Minnick, Michael G.; Kubisen, Steven J., Jr.; Hallgren, John E.; Bolon, Donald A.; Eddy, Victoria J.; and Irwin, Patricia C., 4,853,423, Cl. 523-428.000.

Halliburton Logging Services Inc.: *See—*
Hrametz, Andrew A.; and King, William B., 4,852,401, Cl. 73-155.000.
Kerzner, Mark G., 4,853,855, Cl. 364-422.000.

Hallmark, Richard K.; and Moss, Ernest K., to Sloss Industries Corporation. Distilled products of polyethylene terephthalate polymers and polycarboxylic acid-containing polyols and polymeric foams obtained therefrom. 4,853,419, Cl. 521-172.000.

Halpaap, Reinhard: *See—*
Dunwald, Willi; Schlegel, Hans; Halpaap, Reinhard; and Pedain, Josef, 4,853,261, Cl. 427-388.100.

Halpenny, Thomas J.: *See—*
Parkhurst, Anthony D.; and Halpenny, Thomas J., 4,853,877, Cl. 364-520.000.

Ham, Howard M., Jr.; and Keenan, James J., to Hendry Mechanical Works. Electronic circuit breaker systems. 4,853,820, Cl. 361-59.000.

Hamada, Shigeshi: *See—*
Hino, Masao; Yoneda, Kenichi; Miyake, Masato; Otani, Hidehiko; Shingu, Noriya; Isahaya, Tsukasa; Hamada, Shigeshi; and Arahori, Tsuyoshi, 4,853,194, Cl. 423-239.000.

Hamade, Thomas A.: *See—*
Jaisinghani, Rajan A.; Hamade, Thomas A.; and Hawley, Clyde W., 4,853,005, Cl. 55-132.000.

Hamajima, Kaneo; Tanaka, Atsuo; Kubo, Masahiro; and Dohnomoto, Tadashi, to Toyota Jidosha Kabushiki Kaisha. Short fiber preform, method of making it, and composite material manufactured from it. 4,852,630, Cl. 164-761.000.

Hamatani, Kazuhiro: *See*—
Kato, Kunioki; Kawamura, Masao; Goda, Hiroshi; Sawada, Kiyoshi; and Hamatani, Kazuhiro, 4,853,158, Cl. 562-46.000.

Hamel, Ulrich: *See*—
Bomann, Werner; Esser, Franz; Hamel, Ulrich; and Stable, Helmut, 4,853,402, Cl. 514-401.000.

Hamer, Antonius; and Spang, Gerardus, to Sulzer Brothers Limited. Weft yarn store. 4,852,617, Cl. 139-452.000.

Hamlin, John E.: *See*—
Drury, David J.; and Hamlin, John E., 4,853,482, Cl. 562-607.000.

Hamma, Noritaka; Saito, Yoshikazu; Nishizawa, Toshio; and Katsumata, Takashi, to Sumitomo Chemical Company, Limited. Fluorine derivatives of vitamin D_3 and process for producing the same. 4,853,378, Cl. 514-167.000.

Hammel, Joseph J., to PPG Industries, Inc. Porous inorganic siliceous-containing gas enriching material and process of manufacture and use. 4,853,001, Cl. 55-16.000.

Hammer, Bernard; and von Brandt, Achim, to Siemens Aktiengesellschaft. Method for data reduction of digital image sequences. 4,853,779, Cl. 358-133.000.

Hammerl, Gunter, to Boech-Siemens Hausgerate GmbH. Lighting device for an oven to be exposed to microwave energy, in particular a household oven. 4,853,508, Cl. 219-10.55R.

Hamon, Gilles: *See*—
Clemence, Francois; Guillaume, Jacques; and Hamon, Gilles, 4,853,408, Cl. 514-415.000.

Hamy, Norbert, to Bata Limited. Sole arrangement for footware. 4,852,273, Cl. 36-28.000.

Han Chi Hang Co., Ltd.: *See*—
Huang, Kou-Cherng, 4,853,161, Cl. 261-81.000.

Hanabusa, Hisao, to Toyoda Gosei Co., Ltd. Fluid chamber having a tubular filter and a securing recess for mounting the same. 4,853,125, Cl. 210-172.000.

Hanada, Kazuyuki; Misaiza, Iwao; Kashimura, Masashi; Goto, Tomoko; and Kuriyama, Katsumi, to Dainichiseika Color & Chemicals Mfg. Co., Ltd.; and Ukima Colour & Chemicals Mfg. Co., Ltd. Polyurethane emulsion, sheet-like porous material making use of the emulsion and production process of the material. 4,853,418, Cl. 521-154.000.

Hancock, Michael P.; and Hayes, Scott L., to Goex, Inc. Shaped charge detonating cord retainer arrangement. 4,852,495, Cl. 102-306.000.

Hand, Evan L., Sr.: *See*—
Griffing, Neal R.; and Hand, Evan L., Sr., 4,852,860, Cl. 266-268.000.

Hanisch, Horst: *See*—
Bernhardt, Gunther; and Hanisch, Horst, 4,853,438, Cl. 525-326.500.

Hans Hollmuller Maschinenbau GmbH & Co: *See*—
Baier, Dietfried; Grasa, Ivan; and Haas, Rainer, 4,852,595, Cl. 134-144.000.
Baier, Dietfried; Grasa, Ivan; and Haas, Rainer, 4,852,804, Cl. 239-121.000.

Hanse Chemie GmbH: *See*—
Block, Hermann, 4,853,434, Cl. 525-100.000.

Hansen, Robert S. Binding hole reinforcement, method and apparatus. 4,853,268, Cl. 428-42.000.

Hanson, Paul J.: *See*—
Beasley, Donald R.; and Hanson, Paul J., 4,852,901, Cl. 280-477.000.

Hanway, John R., to United Engineering Corporation. Vehicle motion logger. 4,853,856, Cl. 364-424.010.

Hanyuda, Toshiaki: *See*—
Shibata, Jouji; Ohtani, Kazuo; Shinohara, Norio; and Hanyuda, Toshiaki, 4,853,279, Cl. 428-267.000.

Haque, Yusuf A., to American Microsystems, Inc. Integrated circuit filter with reduced die area. 4,853,759, Cl. 357-51.000.

Hara, Masaharu: *See*—
Akabane, Jun; Moro, Ken; Yamamoto, Masayasu; Hara, Masaharu; and Sekine, Yoshio, 4,853,723, Cl. 354-145.100.

Hara, Mitsuhiro: *See*—
Komeya, Seiji; and Hara, Mitsuhiro, 4,852,932, Cl. 296-37.900.

Hara, Sigeo: *See*—
Daito, Hiroshi; and Hara, Sigeo, 4,853,812, Cl. 360-104.000.

Harandi, Mohsen N., to Mobil Oil Corporation. Lube catalytic dewaxing-hydrotreating process. 4,853,103, Cl. 208-58.000.

Harao, Noriyuki: *See*—
Takahashi, Kenichiroh; Harao, Noriyuki; and Tanoue, Hiromi, 4,853,578, Cl. 310-315.000.

Harara, Mitsuhiko: *See*—
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; and Tatemoto, Minoru, 4,852,903, Cl. 280-649.000.
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; and Tatemoto, Minoru, 4,852,905, Cl. 280-707.000.

Harata, Mitsuru: *See*—
Shiraki, Kouji; Niwa, Minoru; Itou, Kuniyasu; Yamamoto, Tadashi; and Harata, Mitsuru, 4,852,907, Cl. 280-731.000.

Harboon, John, to Plastmo Ltd. Window frame assembly. 4,852,312, Cl. 52-126.300.

Hardy, Frederick E.; Cachik, Frank; Pretty, Alastair J.; Young, Kenneth; and Scott, Gerald, to Procter & Gamble Company, The. Bleach activator compositions containing an antioxidant. 4,853,143, Cl. 252-102.000.

Hardy, Frederick E.: *See*—
Burns, Michael E.; and Hardy, Frederick E., 4,852,989, Cl. 8-107.000.

Hardy, Gerald D.; Hoffman, John P.; and Kendrick, Larry E., to Caterpillar Inc. Apparatus for selectively positioning movable work element with preselected maximum velocity control. 4,852,657, Cl. 172-2.000.

Hario Kabushiki Kaisha: *See*—
Murakami, Tatsuo, 4,853,509, Cl. 219-10.55E.

Harman, Nancy W., to Union Camp Corporation. Long open assembly time vinyl-bonding polyamide from dimer acid. 4,853,460, Cl. 528-339.300.

Harmand, Pierre. Toolholder device for a machine tool. 4,852,306, Cl. 51-241.0VS.

Harmon, J. Paul; Kehoe, Peter J.; Rhodes, John D.; and Hash, Martin D., to Hewlett-Packard Company. Service station for ink-jet printer. 4,853,717, Cl. 346-140.00R.

Harmon, Raymond E.; and McCown, William R. E., to Rexnord Holdings Inc. Vertical access adjustable latching mechanism externally accessible adjustable keeper mechanism. 4,852,923, Cl. 292-341.180.

Harnden, James A.: *See*—
Hill, Lorimer K.; Harnden, James A.; and Concklin, Barry J., 4,853,563, Cl. 307-475.000.

Harner, Leslie L.; and Frantz, Earl L., to Carpenter Technology Corporation. Thermally stable super invar and its named article. 4,853,298, Cl. 428-630.000.

Harp, Hans-Jurgen: *See*—
Manusch, Christoph; Harp, Hans-Jurgen; and van Swieten, Roy, 4,853,074, Cl. 156-577.000.

Harrelson, Hugh G., Jr.: *See*—
Yeh, Ling; and Harrelson, Hugh G., Jr., 4,853,272, Cl. 428-96.000.

Harrick, Nicolas J.: *See*—
Miloseevic, Milan; and Harrick, Nicolas J., 4,853,542, Cl. 250-353.000.

Harrington, J. J., to Mariculture Equipment Development, Inc. Amphibious aquaculture feed distribution machine. 4,852,521, Cl. 119-51.040.

Harris, Clark E.; Armbruster, Randy; Decker, Michael; and Phillips, Bradley A., to Eastman Kodak Company. Spool for web-shaped film. 4,852,821, Cl. 242-71.800.

Harris, Earl C., Jr., to Elmatco Products, Incorporated. Drill board and method of making the same. 4,853,273, Cl. 428-116.000.

Harris, Kenneth J., to Conserve, Inc. Heat pump and system. 4,852,366, Cl. 62-238.600.

Harris, Mickey. Work station with fume collecting means. 4,852,468, Cl. 98-115.300.

Harris, Robert S., to Firestone Tire & Rubber Company, The. End cap assembly for air spring. 4,852,861, Cl. 267-64.270.

Harris Semiconductor Patents, Inc.: *See*—
Schade, Heinrich, Jr., 4,853,610, Cl. 323-316.000.

Harrold, Ronald T.: *See*—
Emery, Franklin T.; and Harrold, Ronald T., 4,853,818, Cl. 361-33.000.

Harshbarger, John H., Jr.; and Harshbarger, John H., III, to Visual Information Institute, Inc. Heat pump control system. 4,852,360, Cl. 62-126.000.

Harshbarger, John H., III: *See*—
Harshbarger, John H., Jr.; and Harshbarger, John H., III, 4,852,360, Cl. 62-126.000.

Hart, Anthony J., to Mansign Engineering Limited. Cable handling chain. 4,852,342, Cl. 59-78.100.

Hart, Paul V.: *See*—
Viles, Joseph M.; and Hart, Paul V., 4,853,324, Cl. 435-2.000.

Hart, Robert: *See*—
Knerr, Edwin R.; Hart, Robert; and Cowan, William S., 4,852,611, Cl. 137-595.000.

Hart, William G.; Breault, Michelle S.; Sansone, Ronald P.; Taylor, Michael P.; and Doeberl, Terrence M., to Pitney Bowes Inc. Mailing systems having postal funds management. 4,853,864, Cl. 364-464.020.

Hartley, Paul A.; Pavliako, Joseph A.; and Wright, Hal E., to Eastman Kodak Company. Roll useful in electrostatography. 4,853,737, Cl. 355-289.000.

Hartmann, Theo, to VS Vereinigte Spezialmobelfabriken Verwaltungs GmbH. Seating furniture, more particularly chair. 4,852,944, Cl. 297-445.000.

Hartwig, Carl S. M.; and Johansson, Sven H., to Institut Cerac S.A. Starting device. 4,853,554, Cl. 290-46.000.

Harvey, Thomas D.: *See*—
Winter, Russell K.; Harvey, Thomas D.; Kain, Richard S.; and Savas, Nedim, 4,852,839, Cl. 248-225.100.

Harwardt, Irene: *See*—
Schubring, Reinhard; Witt, Juergen; Harwardt, Irene; Neumann, Sigrd; Schneider, Christoph; Mieth, Gerhard; Raue, Wolfgang; and Brueckner, Juergen, 4,852,477, Cl. 99-450.200.

Hasegawa, Katsumi; Ohno, Michio; and Kadotsuji, Akira, to Toray Industries. Yarn winder. 4,852,819, Cl. 242-18.00R.

Hasegawa, Taiji: *See*—
Shiraishi, Takashi; and Hasegawa, Taiji, 4,853,862, Cl. 364-431.050.

Hash, Martin D.: *See*—
Harmon, J. Paul; Kehoe, Peter J.; Rhodes, John D.; and Hash, Martin D., 4,853,717, Cl. 346-140.00R.

Hashemi, A. David; and Reinschmidt, Robert M., to Digital Equipment Corporation. Bipolar ram having state dependent write current. 4,853,898, Cl. 365-189.110.

Hashimoto, Hiroshi: *See*—
Ushio, Yukihide; Hashimoto, Hiroshi; Hori, Kenjiro; Seto, Kaoru; and Yoshimoto, Toshio, 4,853,740, Cl. 355-319.000.

Hasler AG: *See*—
Kislovski, Andre, 4,853,611, Cl. 323-335.000.

Hasalin, Hans W.: *See*—
Graf, Jean-Francois; Hasalin, Hans W.; Schuurman, Hessel J.; Steiner, Theodor; and Wieland, Bruno, 4,853,223, Cl. 424-405.000.

Hata, Morishige: *See*—
Itaya, Hisao; Okada, Toshihiko; Hata, Morishige; Koike, Shunji; and Onishi, Takahiro, 4,853,776, Cl. 358-106.000.

Hata, Stephen S.: *See*—
Win, Maung H.; Hata, Stephen S.; Abba, William A.; and Olszewski, James, 4,853,281, Cl. 428-286.000.

Hathaway, Susan J.: *See*—
Gambale, Ronald J.; Hathaway, Susan J.; Longley, Kathryn L.; and Ullman, Timothy J., 4,853,458, Cl. 528-198.000.

Hauser, Hans P.: *See*—
Zeltner, Urs; and Hauser, Hans P., 4,853,600, Cl. 315-241.00P.

Havera, Herbert J.; Humphreys, John D.; and Jazdzewski, Joan M., to Miles Inc. Stabilization of microbial rennet. 4,853,329, Cl. 435-183.000.

Hawera Probst GmbH & Co.: *See*—
Peetz, Wolfgang; and Moser, Bernhard, 4,852,670, Cl. 166-323.000.

Hawkins, Paul; and Dachtler, John D., to En-tout-cas plc. Substitute ground surface material. 4,852,870, Cl. 272-3.000.

Hawkswell, Victor T., to Emhart Industries, Inc. Suction pick-up apparatus for electrical or electronic components. 4,852,247, Cl. 29-740.000.

Hawley, Clyde W.: *See*—
Jaisinghani, Rajan A.; Hamade, Thomas A.; and Hawley, Clyde W., 4,853,005, Cl. 55-132.000.

Hawley, Gil R.: *See*—
Inkrott, Kenneth E.; and Hawley, Gil R., 4,853,444, Cl. 526-119.000.

Hayakawa, Takashi; Nojima, Hideo; Kojima, Yoshimi; Narikawa, Shiro; Matsuyama, Toshiro; Imada, Eiji; and Ehara, Shaw, to Sharp Kabushiki Kaisha. Photoreceptor for electrophotography with a-Si layers having a gradient concentration of doped atoms and sandwiching the photoconductive layer therebetween. 4,853,309, Cl. 430-65.000.

Hayashi, Chihiro: *See*—
Kojima, Masayasu; and Hayashi, Chihiro, 4,852,736, Cl. 206-328.000.

Hayashi, Ryutaro: *See*—
Kimura, Yukio; Yoshino, Toshikazu; and Hayashi, Ryutaro, 4,853,260, Cl. 427-240.000.

Hayden, Thomas: *See*—
Sung, Rodney L.; Hayden, Thomas; Caggiano, Michael A.; and Behrens, Milton D., 4,852,993, Cl. 44-62.000.

Hayes, Donald J., to Microfab Technologies, Inc. Method and apparatus for serializing printed circuit boards and flex circuits. 4,853,317, Cl. 430-318.000.

Hayes, Mark B.; and Scanlon, Daniel, to Cusolar Industries, Inc. Completely sealed fuel filter and method of making same. 4,853,123, Cl. 210-316.000.

Hayes, Michael E., to Union Camp Corporation. Polyamide resin dispersions and method for the manufacture thereof. 4,853,421, Cl. 523-223.000.

Hayes, Scott L.: *See*—
Hancock, Michael P.; and Hayes, Scott L., 4,852,495, Cl. 102-306.000.

Hayes, Stanley K., to Ransburg Corporation. Powder recovery system. 4,852,513, Cl. 118-326.000.

Haynes International, IMC.: *See*—
Rothman, Michael F.; Klarstrom, Dwaine L.; and Lai, George Y., 4,853,185, Cl. 420-584.000.

Health Innovations, Inc.: *See*—
Behar, Albert; Behar, Orna; Frederiksen, Lee W.; Howard-Link, Donald A.; and Timmerman, Catherine, 4,853,854, Cl. 364-413.010.

HealthPak, Incorporated: *See*—
Craig, Richard; and Wilt, Brian L., 4,852,738, Cl. 206-369.000.

Heath, Roger L., to DaRox Corporation. Tin-stannous chloride electrode element. 4,852,585, Cl. 128-798.000.

Heberlein, Werner: *See*—
von Laar, Klaus; Seckenreuter, Hans; and Heberlein, Werner, 4,852,461, Cl. 89-46.000.

Heckman, Russell W.; Miller, Robert C.; and Nickey, George A., to Owens-Illinois Glass Container Inc. Preheat oven for glass containers. 4,852,271, Cl. 34-105.000.

Hede, Howard H.: *See*—
Barresi, James A.; Arndt, Kenneth C.; Young, Michael N.; Bridgeham, Daniel O.; and Hede, Howard H., 4,852,504, Cl. 110-346.000.

Heibel, Helmut, to Lucas Industries public limited company. Spot-type disk brake. 4,852,700, Cl. 188-73.430.

Heid, Rudolf: *See*—
Peter, Gerhard; Kempkensteffen, Heinz; and Heid, Rudolf, 4,852,243, Cl. 29-568.000.

Heidelberger Druckmaschinen AG: *See*—
Pfizenmaier, Wolfgang, 4,852,492, Cl. 101-424.100.

Heilmann, Steven M.: *See*—
Babirad, Stefan A.; Bacon, Fredrick; Heilmann, Steven M.; Krepski, Larry R.; Kuczma, Andrew S.; and Rasmussen, Jerald K., 4,852,969, Cl. 350-96.340.

Heim, Richard C.: *See*—
Rubin, Richard H.; Petrone, Benjamin J.; Heim, Richard C.; and Pawenski, Scott M., 4,852,516, Cl. 118-715.000.

Heiman, Mark L.: *See*—
Coy, David H.; Murphy, William A.; and Heiman, Mark L., 4,853,371, Cl. 514-12.000.

Heimann GMBH: *See*—
Lausch, Michael, 4,853,596, Cl. 313-632.000.

Heindl, Raymond A.; Reiling, Gilbert H.; and Suster, Albert L., to General Electric Company. Rapid restrike metal halide lamp and a method of operating such. 4,853,597, Cl. 313-638.000.

Heinrich, Hans J.; and Oelbermann, Max, to Rittershaus & Blecher GmbH. Chamber filter press. 4,853,121, Cl. 210-225.000.

Heinz, Winfried: *See*—
Schwarz, Wilhelm; and Heinz, Winfried, 4,852,857, Cl. 266-99.000.

Hejduk, Jiri: *See*—
Kotrba, Zdenek; Jaros, Frantisek; Burysek, Frantisek; Kubovy, Miloslav; Hejduk, Jiri; and Bures, Pavel, 4,852,340, Cl. 57-301.000.

Helber, Rolf: *See*—
Doncker, Francis; Helber, Rolf; Welzel, Gerhard; and Bung, Richard, 4,852,533, Cl. 123-192.00R.

Heller, Max: *See*—
Ruch, Ola; Johansen, Trond V.; Naess, Ludvig; Poerner, Horst; Gebhard, Georg; Weber, Robert; and Heller, Max, 4,852,391, Cl. 73-40.50R.

Helsley, Grover C.; Davis, Larry; and Olsen, Gordon E., to Hoechst-Roussel Pharmaceuticals Inc. 1-carbonyl derivatives of 4-aryl-4-aryloxypiperidines. 4,853,384, Cl. 514-255.000.

Hemingway, Thomas K., to British Aerospace Public Limited Company. Differential amplifier circuit. 4,853,644, Cl. 330-69.000.

Hemphill, Raymond M.: *See*—
Wert, David E.; and Hemphill, Raymond M., 4,853,181, Cl. 420-111.000.

Henderson, Regina H.: *See*—
Marsh, Renee H.; Henderson, Regina H.; and Rearwin, Earle W., 4,852,188, Cl. 2-250.000.

Hendry Mechanical Works: *See*—
Ham, Howard M., Jr.; and Keenan, James J., 4,853,820, Cl. 361-59.000.

Heneker, Stephen R. Fluid flow control apparatus. 4,852,606, Cl. 137-495.000.

Henery, Vera A., to PPG Industries, Inc. Chemical vapor deposition of tin oxide on float glass in the tin bath. 4,853,257, Cl. 427-166.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Schmid, Karl-Heinz; Asbeck, Adolf; and Stanislowski, Detlev, 4,853,145, Cl. 252-136.000.
Wisotzki, Klaus-Dieter; Schaab, Udo; Reitz, Hans-Joachim; and Orczech, Juergen, 4,852,591, Cl. 134-57.00R.

Henkelmann, Jochem; Eggersdorfer, Manfred; Grosch, Walter; Schuhmacher, Alfred; and Siegel, Hardo, to BASF Aktiengesellschaft. Preparation of alkyl-substituted aromatic ketones. 4,853,481, Cl. 562-460.000.

Henley, Harold B.; Norberg, Kenneth L.; and Devine, John P., to Enercept, Inc. Insulated building construction. 4,852,310, Cl. 52-90.000.

Hennessey, James R. Bilateral tremolo apparatus. 4,852,448, Cl. 84-313.000.

Henry, Charles H.: *See*—
Alferness, Rodney C.; Henry, Charles H.; Kazarinov, Rudolf F.; Olsson, Nils A.; and Orlowsky, Kenneth J., 4,852,960, Cl. 350-96.190.

Henry, Colleen M., to Ashland Oil, Inc. Process for preparing foundry shapes and castings utilizing certain polyurethane binders. 4,852,636, Cl. 164-527.000.

Henshaw, William F.: *See*—
Everett, Richard K.; and Henshaw, William F., 4,853,294, Cl. 428-614.000.

Henzel, Richard P.; Vanier, Noel R.; and Bodem, George B., to Eastman Kodak Company. Particulate polypropylene waxes for dye-donor element used in thermal dye transfer. 4,853,367, Cl. 503-227.000.

Herbin, Patrick; and Lacroix, Jean-Claude, to Essilor International (Compagnie Generale d'Optique). Method and apparatus for fixing a metal block on a face of an ophthalmic lens, by casting molten metal thereon. 4,852,631, Cl. 164-98.000.

Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., to Mobil Oil Corporation. Multiple riser fluidized catalytic cracking process utilizing hydrogen and carbon-hydrogen contributing fragments. 4,853,105, Cl. 208-74.000.

Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., to Mobil Oil Corporation. Apparatus to reduce NO_x emissions from a fluid catalytic cracking unit. 4,853,187, Cl. 422-144.000.

Hercules Incorporated: *See*—
Lukach, Carl A.; and Sau, Arjun C., 4,853,437, Cl. 525-54.210.
Nguyen, Tuyen T., 4,853,442, Cl. 525-471.000.

Herleikson, Earl C., to Hewlett-Packard Company. High signal to noise ratio amplitude detector. 4,853,643, Cl. 329-204.000.

Herman Miller, Inc.: *See*—
Ryburg, Jon B.; and Goldberg, Neil, 4,852,500, Cl. 108-105.000.

Hermann Henscheidt Maschinenfabrik GmbH & Co.: *See*—
Krieger, Karl, deceased; Reinelt, Werner; and Kobow, Wolfgang, 4,852,852, Cl. 251-78.000.
Hermann, William J., Jr.; and Zanek, John R., to 501 North American Biotechnology, Inc. Toxicology specimen collection system. 4,852,560, Cl. 128-762.000.
Hermann, Wolfgang: *See*—
Lambertz, Johannes; Adlhoch, Wolfgang H.; Mittelstadt, Alfred G.; and Hermann, Wolfgang, 4,852,994, Cl. 48-197.00R.
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Hernandez, Jorge M., to Rogers Corporation. Low inductance decoupling capacitor. 4,853,826, Cl. 361-306.000.
Hernandez, Jorge M., to Rogers Corporation. High dielectric multilayer capacitor. 4,853,827, Cl. 361-321.000.
Herrero, Luis A.: *See*—
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Herrnstadt, Corinna; and Wilcox, Edward, to Mycogen Corporation. Cloning and expression of *Bacillus thuringiensis* toxin gene toxic to beetles of the order Coleoptera. 4,853,331, Cl. 435-252.100.
Herron, Rand E.: *See*—
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Herten, Joris F.; and Louies, Bernard D., to Allied-Signal Inc. Composition and method to process polymers including ultrahigh molecular weight polyethylene. 4,853,427, Cl. 524-394.000.
Herzl, Peter J., to Fischer & Porter Company. Signal recovery system for mass flowmeter. 4,852,409, Cl. 73-861.380.
Heselton, John; Nelson, Perry; and Aldrich, Tod. Apparatus for practising golf stroke. 4,852,883, Cl. 273-197.00R.
Hetherington, Richard: *See*—
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Heussi, Harold L.: *See*—
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Hewlett-Packard: *See*—
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Hewlett-Packard Company: *See*—
Harmon, J. Paul; Kehoe, Peter J.; Rhodes, John D.; and Hash, Martin D., 4,853,717, Cl. 346-140.00R.
Herleikson, Earl C., 4,853,643, Cl. 329-204.000.
Johnson, Loren E.; Norton, Kenneth A.; Pawlowski, Norman E.; and Wooding, Margaret L., 4,853,037, Cl. 106-22.000.
Parkhurst, Anthony D.; and Halpenny, Thomas J., 4,853,877, Cl. 364-520.000.
Tella, Richard P.; and Lerner, Stuart D., 4,852,242, Cl. 29-568.000.
Williams, Wayne R., 4,853,928, Cl. 371-15.000.
Heyman, Joseph S.: *See*—
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Hibino, Chitoshi; Arimoto, Atsushi; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. Picture producing apparatus. 4,853,876, Cl. 84-518.000.
Hibino, Hiroki; Kimura, Kenji; and Eino, Teruo, to Olympus Optical, Co., Ltd. Endoscope signal processing apparatus using sequential and synchronous imaging devices. 4,853,773, Cl. 358-98.000.
Hick, Hargreaves & Company Limited: *See*—
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Hidaka, Takayoshi: *See*—
Shiraishi, Tadayoshi; Imai, Naohiro; Domoto, Takeshi; Kameyama, Keiji; Katsumi, Ikuo; Hidaka, Takayoshi; Hosoe, Kazunori; and Watanabe, Kiyoshi, 4,853,403, Cl. 514-404.000.
Highfill, Louis A. Moisturized compositions of hydrate-forming phosphates and methods for preparation thereof. 4,853,144, Cl. 252-135.000.
Highland Import Corporation: *See*—
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Higuchi, Haruo: *See*—
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Hildebrand, Reinhard; and Riedel, Friedrich, to Siemens Aktiengesellschaft. Air conditioning and heating unit for automotive vehicles. 4,852,638, Cl. 165-42.000.
Hill, Anthony D.: *See*—
Ford, David A.; Hill, Anthony D.; and Pashby, Ian R., 4,853,044, Cl. 148-3.000.
Hill, Derek A., to Baker Perkins PLC. Sampling the contents of pressurised vessels. 4,852,412, Cl. 73-863.850.
Hill, Lorimer K.; Harnden, James A.; and Coucklin, Barry J., to Siliconix Incorporated. Switch interface circuit for power mosfet gate drive control. 4,853,563, Cl. 307-475.000.
Hill, Ralph H., *Jr.*: *See*—
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Hilacher, Jean-Claude; Kehr, Wolfgang; Saner, Gerhard; Schneider, Herbert; and Wachtel, Helmut, to Schering Aktiengesellschaft. (2-Haloergolinyl)-N'-N'-diethylurea compounds useful as medicinal agents E.G., as neuroleptics. 4,853,390, Cl. 514-288.000.
Himelick, James M., to Delco Electronics Corporation. Process for manufacture of a vertical DMOS transistor. 4,853,345, Cl. 437-41.000.
Hino, Masao; Yoneda, Kenichi; Miyake, Masato; Otani, Hidehiko; Shingu, Noriya; Isahaya, Tsukasa; Hamada, Shigeshi; and Arabori, Tsuyoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for treating exhaust gas. 4,853,194, Cl. 423-239.000.
Hirahata, Shigeru: *See*—
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Hirasawa, Junichi: *See*—
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Hirasawa, Kotaro: *See*—
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Hirshberg, Gerald P.; Mrozowski, Joseph E.; and Bell, Stephen D., to Nissan Design International, Inc. Transparent roof convertible automobile with retractable sunshade. 4,852,938, Cl. 296-214.000.
Hisanaga, Naogi: *See*—
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Hisatake, Tsuneo: *See*—
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Hitachi, Ltd.: *See*—
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Arabori, Noboru; Takahashi, Hideaki; Sakai, Yoshio; and Yoneda, Kenji, 4,852,694, Cl. 187-115.000.
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Endou, Masao; Asakura, Yamato; Watanabe, Atsushi; Sakagami, Masaharu; Uchida, Shunsuke; Nagase, Makoto; Baba, Tsutomu; and Ohsumi, Katsumi, 4,853,638, Cl. 324-441.000.
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Iwamura, Masahiro; Maejima, Hideo; and Masuda, Ikuro, 4,853,560, Cl. 307-296.100.
Katsumata, Kenji; Sugiyama, Masato; Matono, Takaaki; Hirahata, Shigeru; Nakagawa, Isao; Ishikura, Kazuo; and Suzuki, Sunao, 4,853,765, Cl. 358-11.000.
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Matsumoto, Manabu; Ikeguchi, Takashi; Ueda, Shinjiroo; Sonobe, Tadasi; Murashita, Toru; Ido, Satoshi; Kuroishi, Kazuo; Kazawa, Yoshiaki; Kakiuchi, Shunji; and Kobari, Toshiaki, 4,853,640, Cl. 328-235.000.
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Onari, Mikihiko; Sekozawa, Teruji; Funabashi, Motohisa; and Atago, Takeshi, 4,853,720, Cl. 364-431.070.
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Yanagisawa, Akira; and Nakamura, Kazumitsu, 4,853,549, Cl. 250-491.100.
Hitachi Service Engineering, Ltd.: *See*—
Matsumoto, Manabu; Ikeguchi, Takashi; Ueda, Shinjiroo; Sonobe, Tadasi; Murashita, Toru; Ido, Satoshi; Kuroishi, Kazuo; Kazawa, Yoshiaki; Kakiuchi, Shunji; and Kobari, Toshiaki, 4,853,640, Cl. 328-235.000.
Hitachi, Yuzo, to Usui Kokusai Sangyo Kabushiki Kaisha. Method for manufacturing the metallic carrier base material for maintaining a catalyst for exhaust gas purification. 4,853,360, Cl. 502-439.000.
Hittler, Kurt, to Grayling Industries, Inc. Method and apparatus for hazardous material containment and disposal. 4,852,687, Cl. 182-129.000.

Hiwatashi, Katsumi: *See*—
Karakawa, Koichi; Yoshimatsu, Tatsuhiko; Tsuchimoto, Hideyuki; and Hiwatashi, Katsumi, 4,852,484, Cl. 101-170.000.
Hochart, Paul; Pagnucco, Gilbert; Bertrand, Marceau; and Bertrand, Alain, to Boussois S.A. Device for fixing a window-pane on a rigid frame. 4,853,520, Cl. 219-535.000.
Hochfeld, Stanley, to Leonard Holtz. Device for opening a wrapped roll of coins. 4,852,255, Cl. 30-102.000.
Hoda, Takeo: *See*—
Kobayashi, Haruo; Yoshizaki, Akira; Hoda, Takeo; and Kashima, Masataka, 4,853,721, Cl. 354-21.000.
Hoeberechts, Arthur M. E.; and Van Gorkom, Gerardus G. P., to U.S. Philips Corporation. Display device with multiplicity of closely spaced electron beams. 4,853,585, Cl. 313-422.000.
Hoechst Aktiengesellschaft: *See*—
Brenk, Michael; and Ernst, Renate, 4,853,093, Cl. 204-37.600.
Frisch, Gerhard; and Albrecht, Konrad, 4,853,026, Cl. 71-86.000.
Muller, Werner H.; and Schneller, Arnold, 4,853,448, Cl. 526-254.000.
Ruckert, Hans; and Ohlenmacher, Ralf, 4,853,314, Cl. 430-191.000.
Staendeke, Horst; Thummler, Ursus; and Adam, Wilhelm, 4,853,288, Cl. 428-402.240.
Staendeke, Horst; and Scharf, Daniel, 4,853,424, Cl. 523-506.000.
Stuhler, Herbert; Reng, Alwin; Skrypzak, Werner; and Quack, Jochen M., 4,853,430, Cl. 524-604.000.
Wilski, Hans; and Schmidt, Hermann, 4,852,732, Cl. 206-204.000.
Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Helsley, Grover C.; Davis, Larry; and Olsen, Gordon E., 4,853,384, Cl. 514-255.000.
Strupczewski, Joseph T., 4,853,470, Cl. 546-199.000.
Hoehne, Dennis L.: *See*—
Seener, G. Thomas; and Hoehne, Dennis L., 4,852,364, Cl. 62-225.000.
Hoffken, Erich; Auth, Rudolf; Kaas, Werner; and Seidelmann, Lothar, to Thyssen Stahl AG. Process for preparing binderfree hot briquettes for smelting purposes. 4,853,031, Cl. 75-0.50R.
Hoffman, Allan C. Method of making tennis ball with a single core and cover bonding cure. 4,853,056, Cl. 156-147.000.
Hoffman, John P.: *See*—
Hardy, Gerald D.; Hoffman, John P.; and Kendrick, Larry E., 4,852,657, Cl. 172-2.000.
Hoffmann, Allan C. Method of making tennis balls or the like. 4,853,057, Cl. 156-147.000.
Hoffmann-La Roche Inc.: *See*—
Coffen, David L.; Schmid, Rudolf; and Sebastian, Mark J., 4,853,472, Cl. 549-407.000.
Ruttimann, August; and Buchi, George H., 4,853,156, Cl. 260-396.00R.
Hofler, Willy: *See*—
Bertz, Hans-Ulrich, 4,852,402, Cl. 73-162.000.
Hofmann, Frieder K.: *See*—
Wrasidlo, Wolfgang J.; Hofmann, Frieder K.; and DeWinter, Dirk M., 4,853,128, Cl. 210-636.000.
Hofmann, Manfred: *See*—
Bitschkus, Horst; Hofmann, Manfred; Klockner, Karl-Heinz; Nelles, Uwe; and Siewert, Gunther, 4,852,864, Cl. 267-219.000.
Hokkai Can Co., Ltd.: *See*—
Homma, Yoshihiro; Nakata, Akira; Matsumoto, Shiroh; Yoshimura, Kunitoshi; and Minato, Masahiko, 4,852,793, Cl. 229-5.500.
Holbus, Edward. Automatic vehicle washing apparatus. 4,852,199, Cl. 15-97.00B.
Holcomb, Richard A., to Mid-State Drainage Products, Inc. Corrugated pipe. 4,852,616, Cl. 138-173.000.
Holcombe, Glenn C.: *See*—
Papenbrock, Francis X.; and Holcombe, Glenn C., 4,852,308, Cl. 52-12.000.
Holdsworth, Robert S.; Brown, Shawn E.; and Gribens, Joel A., to W. R. Grace & Co. Hot melt gaskets and method of forming same. 4,852,754, Cl. 215-347.000.
Holl, Roland; and Dettinger, Dietrich, to M.A.N.-Roland Druckmaschinen. Device for the in-register transfer of sheets between the printing units of a multicolor press. 4,852,491, Cl. 101-408.000.
Holl, Roland: *See*—
Abendroth, Paul; Mathes, Josef; and Holl, Roland, 4,852,488, Cl. 101-246.000.
Holladay, John T., to Packaging Corporation of America. Shipping container. 4,852,756, Cl. 220-4.00F.
Holland, Floyd H., to Phillips Petroleum Company. Apparatus for conversion of oils to hydrocarbon products. 4,853,189, Cl. 422-140.000.
Holland, John W.; and Weiss, Ronald J., to Storm Products Co. Fiber optic coil cord. 4,852,964, Cl. 350-96.230.
Holley, John E. F. Particle counter with variable sized aperture. 4,853,618, Cl. 324-71.400.
Holling, Ronald W.: *See*—
Williams, Robert R.; and Holling, Ronald W., 4,852,544, Cl. 126-39.0BA.
Holly, Henry M., III, to Westinghouse Electric Corp. Semi-rigid spacer for diamond area of dynamoelectric machine. 4,853,577, Cl. 340-260.000.
Holmer, Ernst, to AB Volvo. Method and an arrangement for controlling the working cycle of a turbocharged internal combustion engine. 4,852,353, Cl. 60-605.100.
Holotek Ltd.: *See*—
Kramer, Charles J., 4,852,956, Cl. 350-3.710.
Homma, Yoshihiro; Nakata, Akira; Matsumoto, Shiroh; Yoshimura, Kunitoshi; and Minato, Masahiko, to Hokkai Can Co., Ltd. Sealed container and process of manufacture thereof. 4,852,793, Cl. 229-5.500.
Hommes, William J.; and Keegan, John J., Jr., to Du Pont de Nemours, E. I., and Company. System for using synchronous secondaries of a linear motor to biaxially draw plastic films. 4,853,602, Cl. 318-38.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Mikami, Tetsuo; Ohmika, Yasushi; and Miyazaki, Hidetoshi, 4,852,423, Cl. 74-551.900.
Shiina, Haruo, 4,853,179, Cl. 419-28.000.
Wakatsuki, Goroei, 4,852,701, Cl. 188-181.00A.
Yamaguchi, Ken, 4,852,678, Cl. 180-219.000.
Yasuda, Toru; Kawamoto, Yoshimichi; Abe, Masaru; and Kohata, Takashi, 4,853,672, Cl. 340-465.000.
Honda, Katsuo; and Sawafuji, Susumu, to Tokyo Seimtsu Co., Ltd. Apparatus and method for slicing a wafer. 4,852,304, Cl. 51-5.00C.
Honda, Masaru: *See*—
Weigand, Eckehard; Kihara, Yoshinori; and Honda, Masaru, 4,853,417, Cl. 521-131.000.
Honders, Anthonie; Horstik, Alfred J.; and Van Eyden, Gerbrand J. M., to Shell Internationale Research Maatschappij B.V. Process for the electrolytic production of metals from a fused salt melt with a liquid cathode. 4,853,094, Cl. 204-64.00R.
Honeywell Bull Inc.: *See*—
Bettendorf, Richard A.; and Morris, Scott S., 4,852,785, Cl. 226-42.000.
Honeywell, Inc.: *See*—
Ebner, Walter B.; and Lin, Hsiu-Ping W., 4,853,304, Cl. 429-192.000.
Ford, Carol M.; and Podgorski, Theodore J., 4,853,940, Cl. 372-87.000.
Lodin, David W., 4,852,925, Cl. 294-2.000.
Martin, Ronald L., 4,852,196, Cl. 7-165.000.
Stauffer, Norman L., 4,853,532, Cl. 250-221.000.
Hong, Paul O.: *See*—
DeWald, Raymond C.; and Hong, Paul O., 4,853,446, Cl. 526-205.000.
Hood, Thomas G.: *See*—
Vincent, Steve M.; Behling, Gerald R.; Hood, Thomas G.; and Gomm, William E., 4,853,264, Cl. 428-34.000.
Hoogovens Groep B.V.: *See*—
van Laar, Jacobus; Niemeijer, Frank T.; and Stokman, Ronald J., 4,852,859, Cl. 266-197.000.
Hoover, Alan A.; and Osborne, Gary T. Electro-mechanical transducer which couples positive acoustic feedback into an electric amplified guitar body for the purpose of sustaining played notes. 4,852,444, Cl. 84-1.050.
Hoover Universal, Inc.: *See*—
Zeilinger, Randy A., 4,852,228, Cl. 29-91.100.
Hopkins, Harry C.: *See*—
Wallace, Terry A.; Wallace, Lyvone; and Hopkins, Harry C., 4,852,290, Cl. 43-17.000.
Hopkins, John W.; and Knoell, Peter P., to Textron Inc. Debris collector frame and assembly. 4,852,338, Cl. 56-202.000.
Hopp, Rudolf: *See*—
Neinhaus, Jurgen; Hopp, Rudolf; Gottach, Wilhelm; and Oelkers, Egon, 4,853,368, Cl. 512-25.000.
Hoppe, Joachim, to GAO Gesellschaft fur Automation und Organisation mbH. Identification card having a magnetic track covered by color and methods for producing it. 4,852,911, Cl. 283-82.000.
Hoppstadter, Harold F. Remote control system for vending machines. 4,853,684, Cl. 340-825.350.
Hori, Chikahiro, to Kabushiki Kaisha Toshiba. Associative memory device including write inhibit circuitry. 4,853,892, Cl. 365-49.000.
Hori, Kenjiro: *See*—
Ushio, Yukihide; Hashimoto, Hiroshi; Hori, Kenjiro; Seto, Kaoru; and Yoshimoto, Toshio, 4,853,740, Cl. 355-319.000.
Hori, Ryoichi: *See*—
Kitsukawa, Goro; Watanabe, Takao; Hori, Ryoichi; and Itoh, Kiyoo, 4,853,899, Cl. 365-207.000.
Hori, Taizou: *See*—
Fukatsu, Tsutomu; Hori, Taizou; Masui, Toshiyuki; Kobayashi, Takashi; Wakui, Tetsuya; and Takahashi, Koji, 4,853,803, Cl. 360-72.200.
Horiba, Ltd.: *See*—
Kokawa, Masashi, 4,853,939, Cl. 372-81.000.
Horie, Ikutaro; Ishiyama, Masashi; and Tomizuka, Teiichi, to Fuji Photo Film Co., Ltd. Cover film for microscopy. 4,853,262, Cl. 428-13.000.
Horiguchi, Hyosei; Tezuka, Akira; and Seki, Shuuichi, to Hitachi, Ltd. Air conditioning system for vehicle. 4,852,639, Cl. 165-42.000.
Horiguchi, Masashi; Yakubo, Minoru; Tamura, Yoshikazu; and Ogasawara, Mamoru, to Fuji Photo Film Co., Ltd. Copying apparatus exposure device. 4,853,747, Cl. 355-51.000.
Horiguchi, Shojiro: *See*—
Sannan, Takanori; Seki, Mitsutaka; Tsuchida, Shinya; and Horiguchi, Shojiro, 4,853,429, Cl. 524-29.000.
Horiuchi, Mitsuaki: *See*—
Tateishi, Hideki; Saito, Hiroshi; Sasaki, Shinji; and Horiuchi, Mitsuaki, 4,853,102, Cl. 204-298.000.
Horn, Marc C., to Atlantic Richfield Company. Detection of water saturation in insulation at cased road crossings. 4,853,615, Cl. 324-65.00R.

Horsch, Axel, to International Business Machines Corporation. System for determining the code coverage of a tested program based upon static and dynamic analysis recordings. 4,853,851, Cl. 364-300.000.

Horsten, Johannes B., to U.S. Philips Corporation. Device for regenerating a binary digital signal, for example a bi-phase encoded signal. 4,853,801, Cl. 360-46.000.

Horstik, Alfred J.: *See*—
Honders, Anthonie; Horstik, Alfred J.; and Van Eyden, Gerbrand J. M., 4,853,094, Cl. 204-64.00R.

Hose America, Inc.: *See*—
Campanini, Sergio, 4,852,915, Cl. 285-38.000.

Hosie, Alan P. Dual mode diesel electric power system for vehicles. 4,853,553, Cl. 290-40.00C.

Hosman, Reo, to Oeppco, Inc. Universal mounting post assembly. 4,852,834, Cl. 248-156.000.

Hosoe, Kazunori: *See*—
Shiraishi, Tadayoshi; Imai, Naohiro; Domoto, Takeshi; Kameyama, Keiji; Katsumi, Ikuo; Hidaka, Takayoshi; Hosoe, Kazunori; and Watanabe, Kiyoshi, 4,853,403, Cl. 514-404.000.

Hosoya, Hideki; Aoki, Akio; and Enari, Masahiko, to Canon Kabushiki Kaisha. Information recording medium and reproducing method therefor. 4,853,920, Cl. 369-59.000.

Hostetler, Donald E.; Cannarsa, Michael J.; Kesling, Haven S., Jr.; and Sun, Hsiang-Ning, to Arco Chemical Technology, Inc. Preparation of discrete particles of polyalkylene carbonate. 4,853,462, Cl. 523-494.000.

House, Roy F.: *See*—
Cowan, Jack C.; Granquist, Victor M.; and House, Roy F., 4,853,465, Cl. 530-506.000.

Houseman, J. D., to Quipp Incorporated. Single gripper conveyor system. 4,852,722, Cl. 198-803.700.

Houser, Kevin L.: *See*—
Piatt, Michael J.; and Houser, Kevin L., 4,853,713, Cl. 346-134.000.

Houston, John S. Magnetic position sensor having spaced toroidal magnets in a state of equilibrium. 4,853,630, Cl. 324-208.000.

Howard, Billy G., to Martin Sprocket & Gear, Inc. Method of manufacturing bushings with powdered metals. 4,853,180, Cl. 419-66.000.

Howard-Link, Donald A.: *See*—
Behar, Albert; Behar, Orna; Frederiksen, Lee W.; Howard-Link, Donald A.; and Timmerman, Catherine, 4,853,854, Cl. 364-413.010.

Howard, Robert A.; and Elliman, Robert, to Apple Computer, Inc. Computer monitor stand. 4,852,830, Cl. 248-183.000.

Howie, Robin M., to Coal Industry (Patents) Limited. Helmet. 4,852,562, Cl. 128-201.250.

Hrametz, Andrew A.; and King, William B., to Halliburton Logging Services Inc. Well fluid flow velocity measuring apparatus including a spinner cartridge assembly. 4,852,401, Cl. 73-155.000.

HRI, Inc.: *See*—
MacArthur, James B.; McLean, Joseph B.; and Comolli, Alfred G., 4,853,111, Cl. 208-421.000.

Hruska, Louis W.; and Brown, Carl W., Jr., to ELTECH Systems Corporation. Porous separator comprising inorganic/polymer composite fiber and method of making same. 4,853,101, Cl. 204-296.000.

Hsiao, Chu-lai; Mason, Bruce B.; and Davis, Alan R., to American Home Products Corporation. Production of rotavirus in yeast. 4,853,333, Cl. 435-256.000.

Hsu, Michael S. High performance electrochemical energy conversion systems. 4,853,100, Cl. 204-256.000.

Huang, Frank, to Worthington Foods, Inc. Method of treating liquid egg and egg white with microwave energy to increase refrigerated shelf life. 4,853,238, Cl. 426-241.000.

Huang, Joel C.: *See*—
Johnson, David B.; Ebersole, Ronald J.; Huang, Joel C.; Neugebauer, Manfred; Page, Steven R.; and Self, Keith S., 4,853,846, Cl. 364-200.000.

Huang, Koa-Cherng, to Han Chi Hang Co., Ltd. Auto turning-off humidifier. 4,853,161, Cl. 261-81.000.

Huang, Ming-Chi: *See*—
Wu, Ko-Lee; and Huang, Ming-Chi, 4,852,782, Cl. 224-226.000.

Hubbard, David W., to Pitney Bowes Inc. Postage meter having a worm gear drive. 4,852,479, Cl. 101-91.000.

Hubbard, L. James: *See*—
Kobryn, Ronald J.; and Gaskins, Justin, 4,852,481, Cl. 101-93.480.

Hubbard, Virginia M.: *See*—
Kobryn, Ronald J.; and Gaskins, Justin, 4,852,481, Cl. 101-93.480.

Hubele, Adolf, to Ciba-Geigy Corporation. Microbicidal triazolyl phenylethanone ketals. 4,853,399, Cl. 514-383.000.

Huber, Leonhard: *See*—
Payrhammer, Bernd; and Huber, Leonhard, 4,853,742, Cl. 355-27.000.

Huck Manufacturing Company: *See*—
Suhov, Boris P., 4,852,376, Cl. 72-391.000.

Hudgins, Roger L.: *See*—
Wolf, Nicholas O.; Hudgins, Roger L.; and Seidner, David S., 4,853,119, Cl. 210-181.000.

Huels Aktiengesellschaft: *See*—
Leithaeuser, Horst; Reese, Dirk; and Trautmann, Walter, 4,853,038, Cl. 106-243.000.

Huettenrauch, Gerd; and Jenner, Erhard, to Siemens Aktiengesellschaft. X-ray diagnostics installation for optional transillumination or exposure of an examination subject. 4,853,948, Cl. 378-177.000.

Huffy Corporation: *See*—
Beiser, Wayne; and Bloom, Amy A., 4,852,778, Cl. 224-30.00A.

Hughes Aircraft Company: *See*—
Benjamin, Roland J., 4,852,436, Cl. 82-19.000.

Byren, Robert W.; and Rockwell, David A., 4,853,528, Cl. 250-203.000R.
Easton, James K., 4,853,699, Cl. 342-25.000.
Wreede, John E.; and Scott, James E., 4,853,306, Cl. 430-1.000.

Hughes, Norman S.: *See*—
Doyle, Walter M.; and Hughes, Norman S., 4,852,955, Cl. 350-1.200.

Humphrey, Dallas, to Edina Technical Products, Inc. Vending machine dispenser. 4,852,767, Cl. 221-241.000.

Humphrey, Dallas R.: *See*—
DeGree, David C.; Humphrey, Dallas R.; Bergquist, Carl R.; and West, Roger A., 4,853,763, Cl. 357-81.000.

Humphreys, John D.: *See*—
Havera, Herbert J.; Humphreys, John D.; and Jazdzewski, Joan M., 4,853,329, Cl. 435-183.000.

Hunt, Christopher, to Climax Portable Machine Tools, Inc. Portable flange facer. 4,852,435, Cl. 82-113.000.

Hunt, Clive W., to Steel Engineering Company Limited, The. Hydraulic percussive machines. 4,852,663, Cl. 173-134.000.

Hunt, Russell G.: *See*—
Parsons, John H.; Hunt, Russell G.; Leach, Susan E.; Buss, Anthony D.; Green, David E.; Mellor, Michael; and Percival, Albert, 4,853,400, Cl. 514-383.000.

Hunter, Kevin D.: *See*—
Durst, Robert T., Jr.; Fougere, Guy L.; Hunter, Kevin D.; and Schmidt, Alfred C., 4,853,869, Cl. 364-478.000.

Hupp, Stephen S., to Ashland Oil, Inc. Method for evaluating smooth surfaces. 4,853,777, Cl. 358-107.000.

Hurst, Boyd E.: *See*—
Cahn, Robert P.; and Hurst, Boyd E., 4,853,193, Cl. 423-235.000.

Hussein, Mamoun M.: *See*—
Barcelon, Shirley Ann; Oppenheimer, Alfred; and Hussein, Mamoun M., 4,853,247, Cl. 426-613.000.

Hussey, Carl L. Electric transmission conductor support insulators. 4,853,492, Cl. 174-174.000.

Huster, Klaus: *See*—
Tasler, Guenter; Wiendenhoeft, Klaus; Schultheiss, Michael; Schoenfuss, Martin; Ludwig, Theo; Huster, Klaus; and Grenzendoerfer, Dietmar, 4,852,370, Cl. 66-203.000.

Hutschenreuther AG: *See*—
Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, 4,853,170, Cl. 264-517.000.

Hyde, Gilbert F.: *See*—
Wilhelm, Peter L.; and Hyde, Gilbert F., 4,852,850, Cl. 251-28.000.

Hydromatik GmbH: *See*—
Wagenseil, Ludwig, 4,852,463, Cl. 91-488.000.

Hydropress Wallander & Co.: *See*—
Wallander, Carl O., 4,853,116, Cl. 210-104.000.

Hyers, Robert C.: *See*—
Nichols, Steven R.; Hyers, Robert C.; Stovall, Walter M.; and Trawick, Charles D., 4,853,839, Cl. 364-167.010.

Hylsa, S.A. De C.V.: *See*—
Celada-Salmon, Juan, 4,853,942, Cl. 373-91.000.

Hyodo, Keiichiro: *See*—
Sakai, Toshiyuki; Okada, Yoshihiro; and Hyodo, Keiichiro, 4,853,767, Cl. 358-78.000.

Hyodo, Kenji: *See*—
Makishima, Hideo; and Hyodo, Kenji, 4,853,274, Cl. 428-143.000.

ICE Cryogenic Engineering Ltd.: *See*—
Unger, Rueven Z.; and Kushnir, Mark, 4,852,356, Cl. 62-6.000.

Icenogle, Ronald D.; and Djiauw, Lie K., to Shell Oil Company. Low smoke polypropylene insulation compositions. 4,853,154, Cl. 252-602.000.

Ichida, Shinshichi: *See*—
Nakahashi, Yoshinao; Osada, Soichi; Shimizu, Chuji; and Ichida, Shinshichi, 4,852,572, Cl. 128-640.000.

Ichihashi, Toshihiko, to Idemitsu Kosan Co., Ltd. Lubricating oil composition having improved temperature characteristics. 4,853,139, Cl. 252-32.70E.

Ichijo, Chikara: *See*—
Mori, Yoichi; Abiko, Shigeo; Tsuda, Mikio; and Ichijo, Chikara, 4,853,313, Cl. 430-156.000.

ICI Americas Inc.: *See*—
Bright, Danielle A., 4,853,483, Cl. 564-18.000.

Ici Australian Operators Pty Ltd.: *See*—
Bates, Andrew; and Sujansky, Vladimir, 4,853,050, Cl. 149-2.000.

Ide, Jushi: *See*—
Abe, Shigeo; Bandoh, Tadaaki; Hirasawa, Kotaro; and Ide, Jushi, 4,853,890, Cl. 364-900.000.

Idemitsu Kosan Co., Ltd.: *See*—
Ichihashi, Toshihiko, 4,853,139, Cl. 252-32.70E.
Matsuo, Shigeru; Murakami, Tomoyoshi; Bando, Thoru; and Nagatoshi, Kikuo, 4,853,443, Cl. 525-534.000.

Ido, Satoshi: *See*—
Matsumoto, Manabu; Ikeguchi, Takashi; Ueda, Shinjiroo; Sonobe, Tadasi; Murashita, Toru; Ido, Satoshi; Kuroishi, Kazuo; Kazawa, Yoshiaki; Kakiuchi, Shunji; and Kobari, Toshiaki, 4,853,640, Cl. 328-235.000.

Ieda, Kiyokazu: *See*—
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Iggesund Tools AB: *See*—
Eriksson, Bror, 4,852,622, Cl. 144-208.00E.

Igguiden, Jerry: *See*—
Igguiden, Jerry R.; Streck, Donald A.; and Pender, Joseph W., 4,852,802, Cl. 239-64.000.

Iggulden, Jerry R.; Streck, Donald A.; and Pender, Joseph W., to Iggulden, Jerry; Pender, Joseph; and Streck, Donald A. Smart irrigation sprinklers. 4,852,802, Cl. 239-64.000.

Ihm, James M.: *See*—
Pietrzak, Edward; and Ihm, James M., 4,852,706, Cl. 192-8.00R.

Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, to Kissei Pharmaceutical Co., Ltd. Amino acid derivatives. 4,853,463, Cl. 530-323.000.

Ikeda Bussan Co., Ltd.: *See*—
Isomura, Toru; Yamaji, Tomohiro; and Ikeda, Chikamasa, 4,853,687, Cl. 340-825.300.

Ikeda, Chikamasa: *See*—
Isomura, Toru; Yamaji, Tomohiro; and Ikeda, Chikamasa, 4,853,687, Cl. 340-825.300.

Ikeda, Hideo; Suga, Shuzo; and Miyasaka, Nobuaki, to Fuji Photo Film Co., Ltd. Silver halide emulsion. 4,853,323, Cl. 430-569.000.

Ikeda, Shingo, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 4,853,761, Cl. 357-72.000.

Ikeda, Tetsuo: *See*—
Fukuhara, Yuichi; and Ikeda, Tetsuo, 4,852,709, Cl. 192-53.00F.

Ikeda, Yukio: *See*—
Seino, Kiyoharu; Takagi, Tadashi; Takeda, Fumio; and Ikeda, Yukio, 4,853,649, Cl. 330-277.000.

Ikedal Shoji: *See*—
Ohata, Masatoshi; Tsutsui, Koichi; Ikedal Shoji; and Fujimoto, Teruo, 4,853,436, Cl. 525-244.000.

Ikeguchi, Takashi: *See*—
Matsumoto, Manabu; Ikeguchi, Takashi; Ueda, Shinjiroo; Sonobe, Tadasi; Murashita, Toru; Ido, Satoshi; Kuroishi, Kazuo; Kazawa, Yoshiaki; Kakiuchi, Shunji; and Kobari, Toshiaki, 4,853,640, Cl. 328-235.000.

Illy, Ernesto, to Illycaffe' S.p.A. Method for making a ground coffee discoid pad. 4,852,333, Cl. 53-436.000.

Illycaffe' S.p.A.: *See*—
Illy, Ernesto, 4,852,333, Cl. 53-436.000.

Iltis, Claude: *See*—
Rio, Michel; Iltis, Claude; Louis, Herve ; Buffet, Georges; Joly, Marcel; Goudard, Jean-Francois; Bacherot, Joel; and Ducret, Claude, 4,853,013, Cl. 55-159.000.

IMA-NORTE Maschinenfabriken Klessmann GmbH & Co.: *See*—
Peter, Gerhard; Kempkensteffen, Heinz; and Heid, Rudolf, 4,852,243, Cl. 29-568.000.

IMA-Norte Mashinenfabriken Klessmann GmbH & Co.: *See*—
Riesmeier, Wilhelm; and Rose, Martin, 4,853,058, Cl. 156-153.000.

Imada, Eiji: *See*—
Hayakawa, Takashi; Nojima, Hideo; Kojima, Yoshimi; Narikawa, Shiro; Matsuyama, Toshiro; Imada, Eiji; and Ehara, Shaw, 4,853,309, Cl. 430-65.000.

Imai, Naohiro: *See*—
Shiraishi, Tadayoshi; Imai, Naohiro; Domoto, Takeshi; Kameyama, Keiji; Katsumi, Ikuo; Hidaka, Takayoshi; Hosoe, Kazunori; and Watanabe, Kiyoshi, 4,853,403, Cl. 514-404.000.

Imanishi, Kazuo, to Kabushiki Kaisha Toshiba. Power amplifier circuit with a stand-by state. 4,853,648, Cl. 330-273.000.

Imperial Chemical Industries PLC: *See*—
Robson, Michael J.; and Williams, John, 4,853,414, Cl. 514-531.000.

In-Albon, Jean-Paul; and Eicher, Heinz-Anton. Apparatus for preparing coffee. 4,852,472, Cl. 99-289.00R.

Inaba, Ritsuo: *See*—
Kawasaki, Osamu; Takeda, Katsu; Inaba, Ritsuo; and Fukada, Tetsuji, 4,853,579, Cl. 310-116.000.

Inagaki, Yoshio: *See*—
Okazaki, Masaki; and Inagaki, Yoshio, 4,853,328, Cl. 435-28.000.

Inamura, Katsumasa. Heat-resistant case for an ionization-type smoke detector and method of making the same. 4,853,544, Cl. 250-385.100.

Inax Corporation: *See*—
Kurushima, Toyokazu, 4,853,276, Cl. 428-187.000.

Inbar, Dan; and Delevy, Moshe, to Elscint Ltd. Time gain compensation for ultrasonic medical imaging systems. 4,852,576, Cl. 128-660.600.

Industrial Technology Research Institute: *See*—
Peng, Yu-Yin; and Fu, Shih-Lien, 4,852,854, Cl. 251-129.170.

Ines, Veronica L. Pet's excrement collector. 4,852,924, Cl. 294-1.500.

Information Packaging Corp.: *See*—
Sellar, James R.; Reisdorf, James E.; Lappies, Mark F.; and Valle, Mark S., 4,852,740, Cl. 206-444.000.

Inkrott, Kenneth E.; and Hawley, Gil R., to Phillips Petroleum Company. Magnesium halide hydrates and polymerization catalysts prepared therefrom. 4,853,444, Cl. 526-119.000.

Inland Steel Co.: *See*—
Jackson, Charles R.; Rellis, Daniel, Jr.; Pielet, Howard M.; Bhattacharya, Debanshu; Frank, Larry A.; Dasgupta, Purnendu; and Knoepke, John R., 4,852,632, Cl. 164-437.000.

Inoue, Akira: *See*—
Naoi, Satoshi; Inoue, Akira; Nishikawa, Katsuhiko; and Nagata, Shigemi, 4,853,885, Cl. 364-718.000.

Inoue, Hirokatsu; and Shimizu, Chuji, to Fukuda Denshi Co., Ltd. Electrocardiogram electrode pad. 4,852,574, Cl. 128-643.000.

Inoue, Hirom, to Sony Corporation. Cathode-grid support structure for CRT electron gun. 4,853,584, Cl. 313-417.000.

Inoue, Hiroshi: *See*—
Mizutani, Toshiaki; Yonezawa, Takeyuki; Inoue, Hiroshi; Tsuge, Akihiko; and Ohnuma, Yoshiyuki, 4,853,299, Cl. 428-698.000.

Inoue, Osamu; and Kawashima, Syunichiro, to Matsushita Electric Industrial Co., Ltd. Method for producing crystalline complex perovskite compounds. 4,853,199, Cl. 423-594.000.

Inoue, Tokuyasu: *See*—
Murata, Mitshiro; Okada, Naofumi; Yamamoto, Kazutoshi; Tanimoto, Takuharu; and Inoue, Tokuyasu, 4,853,750, Cl. 355-75.000.

Inoue, Yoshimasa: *See*—
Taguchi, Masahiro; Kondo, Hirosato; Inoue, Yoshimasa; Kawahata, Yoshihiro; and Tsukamoto, Goro, 4,853,469, Cl. 544-99.000.

Institut Cerac S.A.: *See*—
Hartwig, Carl S. M.; and Johansson, Sven H., 4,853,554, Cl. 290-46.000.

Institut Francais Du Petrole: *See*—
Guth, Jean-Louis; Faust, Anne-Catherine; Raatz, Francis; and Lamblin, Jean-Marc, 4,853,203, Cl. 423-328.000.

Institut fuer Hochseefischerei und Fischverarbeitung-Betrieb des VEB Fischkombinat Rostock: *See*—
Schubring, Reinhard; Witt, Juergen; Harwardt, Irene; Neumann, Sigrd; Schneider, Christoph; Mieth, Gerhard; Raue, Wolfgang; and Brueckner, Juergen, 4,852,477, Cl. 99-450.200.

Institut Lucius: *See*—
Weckler, Joachim, 4,853,964, Cl. 381-156.000.

Integrated Automation: *See*—
Ott, David M.; and Ott, Cynthia D., 4,853,970, Cl. 382-54.000.

Integrated Fluidics, Inc.: *See*—
Webster, Milo E., 4,852,851, Cl. 251-61.100.

Intel Corporation: *See*—
Bain, William L., Jr.; de Oliveira Camargo, Marcos; Duzett, Robert C.; Lederhofer, Artur H.; Peterson, Craig B.; and Wipfli, John L., 4,853,849, Cl. 364-200.000.
Johnson, David B.; Ebersole, Ronald J.; Huang, Joel C.; Neugebauer, Manfred; Page, Steven R.; and Self, Keith S., 4,853,846, Cl. 364-200.000.

Intercos Italiana S.p.A.: *See*—
Avalle, Nadia, 4,853,222, Cl. 424-195.100.

Interflex Satensysteme GmbH: *See*—
Vogt, Werner; and Schuhwerk, Anton, 4,853,525, Cl. 235-469.000.

International Business Machines Corporation: *See*—
Baker, John M.; Callegari, Alessandro C.; Lacey, Dianne L.; and Shih, Yih-Cheng, 4,853,346, Cl. 437-184.000.
Brooks, William W., Jr.; Clemen, Curtis J.; Coffey, Jerome T.; Coffield, Timothy P.; and Larson, David R., 4,853,811, Cl. 360-103.000.
Brown, Max R., 4,853,878, Cl. 364-521.000.
Corfits, William D.; Gullicksrud, John T.; Martin, Bradley L.; McCutcheon, Robert W.; Rasmussen, Jerry R.; Westphal, Gordon W.; and Wheeler, Stephen E., 4,853,830, Cl. 361-391.000.
Ginther, Joseph G., Jr., 4,853,791, Cl. 358-247.000.
Horsch, Axel, 4,853,851, Cl. 364-300.000.
Kukson, Dean R.; Meias, Constantin M.; and Poss, Joey M., 4,853,802, Cl. 360-65.000.
Mandeville, Jon R., 4,853,967, Cl. 382-8.000.
McKean, Dennis R.; Miller, Robert D.; Walsh, Joseph G.; and Willson, Carlton G., 4,853,315, Cl. 430-192.000.
Mlynko, Walter E., 4,853,081, Cl. 156-643.000.
Pohl, Wolfgang D.; Gimzewski, James K.; and Muralt, Paul R., 4,853,810, Cl. 360-103.000.

International Flavors & Fragrances Inc.: *See*—
Katz, Ira; and Withycombe, Donald A., 4,853,413, Cl. 514-526.000.
Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; and Fenn, Ronald S., 4,853,369, Cl. 512-25.000.

International Pharmaceutical Products: *See*—
Schwartz, Paul, 4,853,380, Cl. 514-184.000.

International Rectifier Corporation: *See*—
Ewer, Peter R.; and Ellard, Jeffrey R., 4,853,762, Cl. 357-79.000.

Investronica S.A.: *See*—
Andrada Galan, Mario; Romero Lledo, Antonio; and Calzado Requena, Vincente, 4,853,866, Cl. 364-470.000.

Irvine, Thomas F., Jr.: *See*—
Park, Noh-Aeok; and Irvine, Thomas F., Jr., 4,852,388, Cl. 73-32.00R.

Irwin, Patricia C.: *See*—
Walles, Erik W.; Lupinski, John H.; Markovitz, Mark; Colborn, Robert E.; Presley, James R.; Davis, Michael J.; Minnick, Michael G.; Kubisen, Steven J., Jr.; Hallgren, John E.; Bolon, Donald A.; Eddy, Victoria J.; and Irwin, Patricia C., 4,853,423, Cl. 523-428.000.

Isahaya, Tsukasa: *See*—
Hino, Masao; Yoneda, Kenichi; Miyake, Masato; Otani, Hidehiko; Shingu, Noriya; Isahaya, Tsukasa; Hamada, Shigeshi; and Arahori, Tsuyoshi, 4,853,194, Cl. 423-239.000.

Iseda, Ken: *See*—
Watanabe, Junji; Iseda, Ken; Fukunaga, Takehito; and Tokutsu, Akihito, 4,852,869, Cl. 271-126.000.

Isetta, Anna M.: *See*—
Doria, Gianfederico; Isetta, Anna M.; Ferrari, Mario; and Trizio, Domenico, 4,853,405, Cl. 514-406.000.

Ishibashi, Koichiro: *See*—
Yamanaka, Toshiaki; Suzuki, Norio; Sakai, Yoshio; Kawamoto, Yoshifumi; Minato, Osamu; Ishibashi, Koichiro; Moriwaki, Nobuyuki; and Meguro, Satoshi, 4,853,894, Cl. 365-154.000.

Ishida, Hitoshi: *See*—
Kawai, Kazuaki; Ishida, Hitoshi; and Yamauchi, Noriyoshi, 4,852,634, Cl. 164-457.000.

Ishida, Miyuki: *See*—
Azuma, Isao; Ishida, Miyuki; and Aoki, Naozumi, 4,853,929, Cl. 371-25.000.

Ishida Scales Mfg. Co., Ltd.: *See—*
Asai, Yoshiharu; Tsukamoto, Shinji; and Murata, Shuji, 4,852,673, Cl. 177-25.180.
Yamada, Seiji, 4,853,881, Cl. 364-567.000.

Ishida, Shiro, to Isuzu Motors Limited. Combustion chamber in internal combustion engine. 4,852,525, Cl. 123-256.000.

Ishihara, Shunichi; Ohno, Shigeru; Kanai, Masahiro; Oda, Shunri; and Shimizu, Isamu, to Canon Kabushiki Kaisha. Process for forming deposited film including carbon as a constituent element. 4,853,251, Cl. 427-38.000.

Ishii, Takashi; Kohama, Hajime; and Yabe, Hisao, to Kabushiki Kaisha Toshiba. Mechanical part. 4,853,284, Cl. 428-335.000.

Ishii, Yuwa: *See—*
Yamada, Tomoaki; and Ishii, Yuwa, 4,853,923, Cl. 369-120.000.

Ishikawa, Katsukiyo: *See—*
Matsumura, Akira; Nozaki, Yasuo; and Ishikawa, Katsukiyo, 4,853,092, Cl. 204-18.100.

Ishikawa, Kazuo: *See—*
Tsujimura, Masao; Hirooka, Masamichi; Ishikawa, Kazuo; Morooka, Takayoshi; Noda, Masaki; Akiyama, Mamoru; Murai, Nobuaki; and Yoshikawa, Seiji, 4,853,731, Cl. 354-400.000.

Ishikawa, Kiyomitsu: *See—*
Yamaguchi, Masami; Ishikawa, Shunichi; Tamura, Hideo; Tanaka, Hirokazu; Nakaya, Tomio; and Ishikawa, Kiyomitsu, 4,853,524, Cl. 235-468.000.

Ishikawa, Masanori: *See—*
Tokura, Go; Ishikawa, Masanori; and Yamada, Akira, 4,853,734, Cl. 354-485.000.

Ishikawa, Osamu; Sone, Mikihiko; and Suzuki, Yoshimi, to Oki Electric Industry Co., Ltd. Circuit for converting a video signal produced by a line image sensor into a binary signal on the basis of reference levels determined for sections of the line image sensor using respective counters. 4,853,793, Cl. 358-464.000.

Ishikawa, Shunichi: *See—*
Yamaguchi, Masami; Ishikawa, Shunichi; Tamura, Hideo; Tanaka, Hirokazu; Nakaya, Tomio; and Ishikawa, Kiyomitsu, 4,853,524, Cl. 235-468.000.

Ishikawa, Takatoshi: *See—*
Fujita, Yoshihiro; Fujimoto, Hiroshi; Ishikawa, Takatoshi; and Kishimoto, Shinzo, 4,853,318, Cl. 430-380.000.

Ishikura, Kazuo: *See—*
Katsumata, Kenji; Sugiyama, Masato; Matono, Takaaki; Hirahata, Shigeru; Nakagawa, Isao; Ishikura, Kazuo; and Suzuki, Sunao, 4,853,765, Cl. 358-11.000.

Ishikura, Tomoyuki: *See—*
Shibamoto, Norio; Yoshioka, Takeo; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,853,407, Cl. 514-414.000.

Ishiyama, Masashi: *See—*
Horie, Ikutaro; Ishiyama, Masashi; and Tomizuka, Teiichi, 4,853,262, Cl. 428-13.000.

Ishizaki, Masao: *See—*
Asano, Kazuhiro; Yoshida, Yosuke; Fujioka, Yoichi; Takazawa, Kazuhisa; Ishizaki, Masao; Sakami, Yasuo; and Tsubouchi, Junichi, 4,853,682, Cl. 340-706.000.

Isnardi, Michael A.; and Patel, Chandrakant B., to General Electric Company. Widescreen video signal processor with auxiliary modulated by widescreen information. 4,853,766, Cl. 358-12.000

Isomura, Toru; Yamaji, Tomohiro; and Ikeda, Chikamasa, to Ikeda Bussan Co., Ltd. Programmable adjusting seat control apparatus. 4,853,687, Cl. 340-825.300.

Isover Saint-Gobain: *See—*
Demara, Yves; Szalata, Francois; and DeCoopman, Christian, 4,852,219, Cl. 19-305.000.

Isozumi, Shuzoo; and Tanaka, Toshinori, to Mitsubishi Denki Kabushiki Kaisha. Coaxial engine starter with hollow shaft clutch. 4,853,570, Cl. 310-78.000.

Isuzu Motors Limited: *See—*
Ishida, Shiro, 4,852,525, Cl. 123-256.000.

Itashiki, Masakazu: *See—*
Onishi, Toshiyasu; Ayata, Kenzo; Takagi, Hiroshi; Suzuki, Yasuo; Ohta, Yasuhiko; Shiozawa, Takao; Fujiwara, Koichi; and Itashiki, Masakazu, 4,852,635, Cl. 164-468.000.

Itaya, Hisao; Okada, Toshihiko; Hata, Morishige; Koike, Shunji; and Onishi, Takahiro, to Gunze Ltd. Fabric inspecting method and apparatus for detecting flaws. 4,853,776, Cl. 358-106.000.

Ito, Kenichiro; Nojiri, Hiromi; and Adachi, Kenro, to NTN Toyo Bearing Co., Ltd. Reversible self-locking clutch. 4,852,707, Cl. 192-44.000.

Ito, Michiyasu: *See—*
Narimatsu, Osamu; Ito, Michiyasu; Komatsu, Kazuyoshi; and Shibata, Yasuhiro, 4,853,286, Cl. 428-343.000.

Ito, Toshikazu; and Degawa, Takashi, to Hitachi, Ltd. Air conditioning apparatus for a motor vehicle. 4,852,798, Cl. 237-2.00A.

Itoh, Junichi: *See—*
Watanabe, Youji; Matsuzaki, Minoru; and Itoh, Junichi, 4,853,733, Cl. 354-412.000.

Itoh, Kiyoo: *See—*
Kitsukawa, Goro; Watanabe, Takao; Hori, Ryoichi; and Itoh, Kiyoo, 4,853,899, Cl. 365-207.000.

Itou, Kuniyasu: *See—*
Shiraki, Kouji; Niwa, Minoru; Itou, Kuniyasu; Yamamoto, Tadashi; and Harata, Mitsuru, 4,852,907, Cl. 280-731.000.

It's A Peach, Inc.: *See—*
Marsh, Renee H.; Henderson, Regina H.; and Rearwin, Earle W., 4,852,188, Cl. 2-250.000.

ITT Electro Optical Products, A Division of ITT Corporation: *See—*
Drinkwine, Monte J., 4,853,098, Cl. 204-192.280.
Sink, Ronald A., 4,853,020, Cl. 65-4.100.

Ivaschenko, Alexandr V.: *See—*
Bezborodov, Vladimir S.; Grinkevich, Oleg A.; Grebenkin, Mikhail F.; Lapanik, Valery I.; Minko, Anatoly A.; Rzhussky, Vitaly V.; Muravsky, Anatoly A.; Petrov, Vladimir F.; and Ivaschenko, Alexandr V., 4,853,150, Cl. 252-299.610.

Iversen, Kristian; and Zacho, Per G., to Danfoss A/S. Electric laminar resistor and method of making same. 4,853,671, Cl. 338-308.000.

Iwai, Ichiro: *See—*
Otsuka, Tatsuo; Iwai, Ichiro; and Yamaguchi, Noboru, 4,852,791, Cl. 228-183.000.

Iwamoto, Taro; Aoki, Tatsu; Nakajima, Kichio; and Yamamoto, Hiroshi, to Hitachi, Ltd. Master-slave manipulators with scaling. 4,853,874, Cl. 364-513.000.

Iwamura, Masahiro; Maejima, Hideo; and Masuda, Ikuro, to Hitachi, Ltd. Logic circuit and semiconductor integrated circuit device capable of operating by different power supplies. 4,853,560, Cl. 307-296.100.

Iwasaki, Chisato: *See—*
Okabe, Kazuya; Matsuda, Hideyuki; Iwasaki, Chisato; and Fujimoto, Satoshi, 4,853,755, Cl. 357-23.700.

Iwasaki, Motoya: *See—*
Otani, Susumu; and Iwasaki, Motoya, 4,853,642, Cl. 329-124.000.

Izumi Seimitsu Kogyo Kabushiki Kaisha: *See—*
Kamijo, Kenichi, 4,853,822, Cl. 361-100.000.

Izzo, Kenneth R.: *See—*
Charnley, James E.; Cearley, James E.; Dixon, Robert C.; Izzo, Kenneth R.; and Aiello, Louis L., 4,853,176, Cl. 376-333.000.

J. I. Case Company: *See—*
Brown, Thomas R.; Logan, Richard H.; Hahn, Robert W.; Rodeghiero, Charles D.; and Brekkestran, Kevin L., 4,852,680, Cl. 180-287.000.

J & L Instruments Corporation: *See—*
Park, Noh-Aeok; and Irvine, Thomas F., Jr., 4,852,388, Cl. 73-32.00R.

J. M. Voith GmbH: *See—*
Wohrle, Albert, deceased, 4,852,514, Cl. 118-410.000.

J. P. Stevens & Co., Inc.: *See—*
Tracy, Charles R.; and Elliott, Robert S., 4,853,275, Cl. 428-178.000.

JAC Creative Foods, Inc.: *See—*
Suzuki, Teisuke; and Matsuhara, Hiroshi, 4,853,239, Cl. 426-249.000.

Jacaruso, Gary J.; and Leoni, Peter B., to United Technologies Corporation. Method of fabricating tubular composite structures. 4,853,172, Cl. 264-571.000.

Jachmann, Emil F.; Saltzman, Jeremy; and Chamberlin, David B., to Dictaphone Corporation. Method and apparatus for visual indication of stored voice signals. 4,853,952, Cl. 379-88.000.

Jackson, Charles R.; Rellis, Daniel, Jr.; Pielet, Howard M.; Bhattacharya, Debanshu; Frank, Larry A.; Dasgupta, Purnendu; and Knoepke, John R., to Inland Steel Co. Apparatus for preventing undissolved alloying ingredient from entering continuous casting mold. 4,852,632, Cl. 164-437.000.

Jackson, Isaac S.: *See—*
Sheridan, David S.; and Jackson, Isaac S., 4,852,564, Cl. 128-202.270.

Jackson, John, to U.S. Philips Corp. Radiation detector arrangements and methods. 4,853,538, Cl. 250-336.200.

Jackson, Richard A.: *See—*
Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; Olmstead, Neil R.; Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; and Frasier, Richard A., 4,853,784, Cl. 358-181.000.

Jacobs, Johannes W. M.; and Rikken, Johannes M. G., to U.S. Philips Corporation. Method of locally providing metal on a surface of a substrate. 4,853,320, Cl. 430-413.000.

Jacuzzi, Remo; and Smith, Eugene C., to Jason International, Inc. Double cascade spout. 4,852,190, Cl. 4-192.000.

Jahn, Dieter: *See—*
Ganzke, Jurgen; Jahn, Dieter; and Kritzner, Bruno, 4,853,727, Cl. 354-319.000.

Jahn, Martin D.: *See—*
Dunn, James J.; Jahn, Martin D.; and Vukmanic, Ronald W., 4,852,325, Cl. 52-729.000.

Jaisinghani, Rajan A.; Hamade, Thomas A.; and Hawley, Clyde W., to American Filtrona Corporation. Electrically stimulated filter method and apparatus. 4,853,005, Cl. 55-132.000.

Jakhete, Rajendra S.: *See—*
Sequeira, Hermann B.; Trippe, Michael W.; and Jakhete, Rajendra S., 4,853,613, Cl. 324-58.00R.

Jakubowicz, Raymond F.; and Porte, Johannes J., to Eastman Kodak Company. Pipette with inverted bellows. 4,852,620, Cl. 141-25.000.

James River II, Inc.: *See—*
Yanidis, Apostol, 4,853,290, Cl. 428-516.000.

Jansen, Ulrich; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Terpolymer latices. 4,853,450, Cl. 526-303.100.

Jaros, Frantisek: *See—*
Kotrba, Zdenek; Jaros, Frantisek; Burysek, Frantisek; Kubovy, Miloslav; Hejduk, Jiri; and Bures, Pavel, 4,852,340, Cl. 57-301.000.

Jason International, Inc.: *See—*
Jacuzzi, Remo; and Smith, Eugene C., 4,852,190, Cl. 4-192.000.

Jazdzewski, Joan M.: *See—*
Havera, Herbert J.; Humphreys, John D.; and Jazdzewski, Joan M., 4,853,329, Cl. 435-183.000.

Jenkines, Randall C.: *See—*
Turner, Robert B.; Jenkines, Randall C.; Serratelli, John F.; and Barnes, Garland R., 4,853,054, Cl. 156-78.000.

Jenkins, Waylon L.: *See—*
Chang, Yeong-Ho; and Jenkins, Waylon L., 4,853,461, Cl. 528-486.000.

Jenner, Erhard: *See—*
Huettenrauch, Gerd; and Jenner, Erhard, 4,853,948, Cl. 378-177.000.

Jennings, Carol A.: *See—*
Tam, Man C.; Bloembergen, Steven; Kovaca, Gregory J.; Jennings, Carol A.; Loutfy, Rafik O.; Gardner, Sandra J.; and Taylor, Michael G., 4,853,307, Cl. 430-41.000.

Jenninga, Jr.; Alfred R.; and Stowe, Lawrence R., to Mobil Oil Corporation. Hydraulic fracturing with a refractory proppant combined with salinity control. 4,852,650, Cl. 166-250.000.

Jensen, Thomas D.: *See—*
Covington, Roger G.; Jensen, Thomas D.; Miller, Stephen H.; and Wilson, Craig B., 4,853,926, Cl. 369-291.000.

Jervis B. Webb Company: *See—*
Ellens, Daniel S., 4,852,723, Cl. 198-860.500.

Jesco Products Company, Inc.: *See—*
Standlick, Ronald E.; and Standlick, David A., 4,852,773, Cl. 222-504.000.

Jewett, Scotty Y.: *See—*
Woolbert, Gordon D.; Jewett, Scotty Y.; and Robertson, John W., Jr., 4,852,384, Cl. 73-1.00G.

Jochum, Gary L.: *See—*
Burgess, William C.; Jochum, Gary L.; Goetzinger, David; and Beckius, David A., 4,852,748, Cl. 211-70.600.

Joder, Andreas: *See—*
Halder, Mathis; and Joder, Andreas, 4,853,620, Cl. 324-142.000.

Joensen, Per: *See—*
Morrison, S. Roy; Frindt, Robert F.; Joensen, Per; Gee, Michael A.; and Miremadi, Bijan K., 4,853,359, Cl. 502-220.000.

Johansen, Trond V.; Ruch, Ola; Naess, Ludvig; Weber, Robert; Veenhoff, Bernd; Porner, Horst; Laurer, Erwin; Strickroth, Erich; and Schabert, Hans-Peter, to Den Norske stats oljeselskap a.s. Shut-off device which can be inserted into a pipeline. 4,852,614, Cl. 138-93.000.

Johansen, Trond V.: *See—*
Ruch, Ola; Johansen, Trond V.; Naess, Ludvig; Poerner, Horst; Gebhard, Georg; Weber, Robert; and Heller, Max, 4,852,391, Cl. 73-40.50R.

Johansson, Eva. Piece of material for an article of clothing and use of the piece of material for production of an article of clothing. 4,852,187, Cl. 2-69.000.

Johansson, Hans V., to Telefonaktiebolaget L M Ericsson. Method and apparatus for feeding power to a telephone line such that for restricted battery voltage there is enabled the transmission of an undistorted speech signal. 4,853,959, Cl. 379-413.000.

Johansson, Sven H.: *See—*
Hartwig, Carl S. M.; and Johansson, Sven H., 4,853,554, Cl. 290-46.000.

Johdai, Akiyoshi; Kinoshita, Keichi; and Matsui, Toshio, to Minolta Camera Kabushiki Kaisha. Copying apparatus having an automatic document feeder with document circulating function and a paper container with paper binding function. 4,852,867, Cl. 270-53.000.

John, Manolis. Air pollution control electrocatalytic converter. 4,852,530, Cl. 123-145.00A.

Johnson, David B.; Ebersole, Ronald J.; Huang, Joel C.; Neugebauer, Manfred; Page, Steven R.; and Self, Keith S., to Intel Corporation. Bus expander with logic for virtualizing single cache control into dual channels with separate directories and prefetch for different processors. 4,853,846, Cl. 364-200.000.

Johnson, Keith D. High temperature vacuum probe. 4,852,916, Cl. 285-187.000.

Johnson, Loren E.; Norton, Kenneth A.; Pawlowski, Norman E.; and Wooding, Margaret L., to Hewlett-Packard Company. Low glycol inks for plain paper printing. 4,853,037, Cl. 106-22.000.

Johnson, Philip B.: *See—*
Bryden, Norman E.; and Johnson, Philip B., 4,852,783, Cl. 224-253.000.

Johnson, Steven L.: *See—*
Anderman, Menahem; and Johnson, Steven L., 4,853,305, Cl. 429-212.000.

Johnson, Terry J.; and Luk, Timwah, to Fairchild Semiconductor Corporation. Temperature compensated bipolar circuits. 4,853,646, Cl. 330-256.000.

Johnson, Thomas E.; and McBroom, John K., Jr., to Chas s. Lewis & Co., Inc. Air meltable castable corrosion resistant alloy and its process thereof. 4,853,183, Cl. 420-454.000.

Johnson, Walter A.: *See—*
Ford, Douglas W.; Johnson, Walter A.; and Daneshmandi, Shahram, 4,853,861, Cl. 364-424.060.

Johnston, Brian H.: *See—*
Krishnamurthy, Sundaram; Johnston, Brian H.; Kilminster, Kenneth N.; Vogel, David C.; and Buckland, Paul R., 4,853,319, Cl. 430-387.000.

Johnstone, Norman E.; and Kehoe, John R., to United States Gypsum Company. Neutral sized paper for use in the production of gypsum wallboard. 4,853,085, Cl. 162-128.000.

Joly, Marcel: *See—*
Rio, Michel; Iltis, Claude; Louis, Herve ; Buffet, Georges; Joly, Marcel; Goudard, Jean-Francois; Bacherot, Joel; and Ducret, Claude, 4,853,013, Cl. 55-159.000.

Jonas, Friedrich: *See—*
Schick, Peter; Jonas, Friedrich; and Leitner, Lutz, 4,853,289, Cl. 428-408.000.

Jones, Eifion R. Lifting seats. 4,852,849, Cl. 248-575.000.

Jones, Larry, to Midmark Corporation. Adjustable debris tray assembly for podiatry chairs. 4,852,941, Cl. 297-188.000.

Jones, Philip, to Pitcraft Summit Limited. Operating head with phased fluid delivery. 4,852,947, Cl. 299-81.000.

Jones, Robert E. Building arrangement and method for view site. 4,852,313, Cl. 52-169.300.

Jones, Winton D.; Schnettler, Richard A.; and Dage, Richard C., to Merrell Dow Pharmaceuticals Inc. Certain 3-carboxylate or 3-carbamyl-5-acyl-2-(1H)-pyridinones having cardiotonic properties. 4,853,395, Cl. 514-332.000.

Jongewaard, Susan K.; and Sills, Julia A., to Minnesota Mining and Manufacturing Company. Thermal dye transfer-dye receptor construction. 4,853,365, Cl. 503-227.000.

Jorg, Benno: *See—*
Grassmuck, Volker; Jorg, Benno; and Sommer, Eberhard, 4,852,424, Cl. 74-574.000.

Joseph, Alan W., Jr.; and Joseph, Timothy E., to Joseph, Alan W., Jr. Scuba whistle. 4,852,510, Cl. 116-140.000.

Joseph, Timothy E.: *See—*
Joseph, Alan W., Jr.; and Joseph, Timothy E., 4,852,510, Cl. 116-140.000.

Joy Manufacturing Company: *See—*
Bodimer, Theodore B., 4,852,724, Cl. 198-861.200.

Joyce, Richard P., to General Electric Company. Preparation of spirobiindane polyarylates, and spirobiindane polyarylate-polyethylene terephthalate copolymers, via melt polymerization. 4,853,457, Cl. 528-190.000.

Judd, Thomas W., to Curtis Manufacturing Company, Inc. Lap top computer work station. 4,852,498, Cl. 108-43.000.

Jujo Paper Co., Ltd.: *See—*
Satake, Toshimi; Minami, Toshiaki; Nagai, Tomoaki; and Fujimura, Fumio, 4,853,361, Cl. 503-201.000.
Satake, Toshimi; Fukuchi, Tadakazu; Minami, Toshiaki; Nagai, Tomoaki; Kaneko, Toshio; and Fujimura, Fumio, 4,853,362, Cl. 503-209.000.
Satake, Toshimi; Minami, Toshiaki; Nagai, Tomoaki; and Fujimura, Fumio, 4,853,363, Cl. 503-210.000.

Julien, Regis; and Antonio, Monique, to Julien, Regis; and Antonio, Monique. Electric cable primarily for welding equipment and welding device including the same. 4,853,516, Cl. 219-137.900.

Jungbluth, Werner W.: *See—*
Neubauer, Rudolf F. W.; Jungbluth, Werner W.; and Laschinski, Dieter H., 4,853,938, Cl. 372-65.000.

Juranitch, John C. Fishhook sharpener. 4,852,305, Cl. 51-59.00R.

Jurewicz, Jerzy: *See—*
Boulos, Maher; and Jurewicz, Jerzy, 4,853,250, Cl. 427-34.000.

Jutand, Francis; Demassieux, Nicolas; and Dana, Michel. Binary adder having a fixed operand and parallel-aerial binary multiplier incorporating such an adder. 4,853,887, Cl. 364-784.000.

JVJ Enterprises, Inc.: *See—*
Lansing, James P., 4,852,471, Cl. 99-330.000.

K-Tube Corporation: *See—*
Karlinski, Herbert E., 4,852,790, Cl. 228-148.000.

Kaas, Werner: *See—*
Hoffken, Erich; Auth, Rudolf; Kaas, Werner; and Seidelmann, Lothar, 4,853,031, Cl. 75-0.50R.

Kable, Robert G.: *See—*
Schlosser, Philip A.; and Kable, Robert G., 4,853,493, Cl. 178-18.000.

Kabushiki Kaisha Asaplan: *See—*
Maekawa, Kengo; Suzuki, Moitsu; Nakano, Yukiya; and Tani, Hisahiko, 4,852,685, Cl. 181-175.000.

Kabushiki Kaisha Daikin Seisakusho: *See—*
Kitano, Seiichi; and Yamaguchi, Toshiki, 4,852,711, Cl. 192-107.00C.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Onishi, Toshiyasu; Ayata, Kenzo; Takagi, Hiroshi; Suzuki, Yasuo; Ohta, Yasuhiko; Shiozawa, Takao; Fujiwara, Koichi; and Itashiki, Masakazu, 4,852,635, Cl. 164-468.000.

Kabushiki Kaisha Osaka Packing Seizosho: *See—*
Takahashi, Akira; Shibahara, Kazuo; Morimoto, Katsuhiro; Samma, Hiromasa; and Kubo, Kazuhiko, 4,853,351, Cl. 501-87.000.

Kabushiki Kaisha Tiyoda Seisakusho: *See—*
Toya, Matsumi, 4,853,188, Cl. 422-104.000.

Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See—*
Nishimura, Yuji, 4,852,908, Cl. 280-804.000.

Kabushiki Kaisha Toshiba: *See—*
Furuhashi, Takeshi, 4,853,835, Cl. 363-58.000.
Furuhashi, Takeshi, 4,853,836, Cl. 363-58.000.
Hori, Chikahiro, 4,853,892, Cl. 365-49.000.
Imanishi, Kazuo, 4,853,648, Cl. 330-273.000.
Ishii, Takashi; Kohama, Hajime; and Yabe, Hisao, 4,853,284, Cl. 428-335.000.
Kaneuchi, Kazuo, 4,853,925, Cl. 369-291.000.
Maeda, Satoru, 4,853,913, Cl. 369-32.000.
Matsuo, Katsuharu; and Azuma, Yoshiyuki, 4,853,605, Cl. 318-729.000.

Mizutani, Toshiaki; Yonezawa, Takeyuki; Inoue, Hiroshi; Tsuge, Akihiko; and Ohnuma, Yoshiyuki, 4,853,299, Cl. 428-698.000.
Nogami, Kazutaka; and Sakurai, Takayasu, 4,853,897, Cl. 365-189.110.
Oda, Goro, 4,853,716, Cl. 346-140.00R.
Oike, Hiroshi, 4,852,361, Cl. 62-131.000.
Sakurai, Takayasu, 4,853,654, Cl. 331-57.000.
Shigehara, Hiroshi, 4,853,886, Cl. 364-745.000.
Taka, Shin-ichi; and Ohshima, Jiro, 4,853,342, Cl. 437-31.000.
Takashima, Shigekazu, 4,853,681, Cl. 340-703.000.
Watanabe, Junji; Iseda, Ken; Fukunaga, Takehito; and Tokutsu, Akihito, 4,852,869, Cl. 271-126.000.

Kadia Diamond Hone Corporation: *See*—
Kopp, Oswald, 4,852,998, Cl. 51-309.000.

Kadien, Thomas C.: *See*—
McGee, Jeffrey S.; and Kadien, Thomas C., 4,852,825, Cl. 242-195.000.

Kadotsuji, Akira: *See*—
Hasegawa, Katsumi; Ohno, Michio; and Kadotsuji, Akira, 4,852,819, Cl. 242-18.00R.

Kadow, John F.: *See*—
Vyas, Dolatrai M.; Saulnier, Mark G.; and Kadow, John F., 4,853,467, Cl. 536-17.900.

Kaesmacher, Jakob: *See*—
Blank, Kurt; Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Audi, Josef; Kaesmacher, Jakob; Reinicke, Ralf; and Niedenhoff, Udo, 4,853,019, Cl. 65-106.000.

Kahn, Marvin L.; and Lynch, Robert J., to Rich Products Corp. Freezer stable whipped ice cream and milk shake food products. 4,853,243, Cl. 426-564.000.

Kai, Jun-ichi: *See*—
Yasutake, Nobuyuki; Kai, Jun-ichi; Yasuda, Hiroshi; and Kawashima, Kenichi, 4,853,870, Cl. 364-490.000.

Kain, Richard S.: *See*—
Winter, Russell K.; Harvey, Thomas D.; Kain, Richard S.; and Savas, Nedim, 4,852,839, Cl. 248-225.100.

Kajima Corporation: *See*—
Takizawa, Seiichiro; Fukukawa, Mitsuo; Yazawa, Masayuki; Asai, Kazumitsu; and Okamoto, Yoshiharu, 4,852,278, Cl. 37-197.000.

Kajima Press Industry Co., Ltd.: *See*—
Komeya, Seiji; and Hara, Mitsuhiro, 4,852,932, Cl. 296-37.900.

Kajima Road Company: *See*—
Takizawa, Seiichiro; Fukukawa, Mitsuo; Yazawa, Masayuki; Asai, Kazumitsu; and Okamoto, Yoshiharu, 4,852,278, Cl. 37-197.000.

Kajimoto, Shinshi: *See*—
Tanaka, Takahiko; Hisanaga, Naogi; Yamamoto, Takeshi; Okazaki, Susumu; and Kajimoto, Shinshi, 4,852,205, Cl. 15-250.170.

Kajiyama, Masashi: *See*—
Takahashi, Teruhisa; and Kajiyama, Masashi, 4,853,297, Cl. 428-623.000.

Kakiuchi, Shunji: *See*—
Matsumoto, Manabu; Ikeguchi, Takashi; Ueda, Shinjiroo; Sonobe, Tadasi; Murashita, Toru; Ido, Satoshi; Kuroishi, Kazuo; Kazawa, Yoshiaki; Kakiuchi, Shunji; and Kobari, Toshiaki, 4,853,640, Cl. 328-235.000.

Kamata, Hiroshi: *See*—
Katsuta, Yuji; and Kamata, Hiroshi, 4,853,792, Cl. 358-455.000.

Kameyama, Keiji: *See*—
Shiraishi, Tadayoshi; Imai, Naohiro; Domoto, Takeshi; Kameyama, Keiji; Katsumi, Ikuo; Hidaka, Takayoshi; Hosoe, Kazunori; and Watanabe, Kiyoshi, 4,853,403, Cl. 514-404.000.

Kamijo, Kenichi, to Izumi Seimitsu Kogyo Kabushiki Kaisha. Circuit breaker. 4,853,822, Cl. 361-100.000.

Kamijo, Tetsuhide: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,853,463, Cl. 530-323.000.

Kaminski, Ronald S., to Owens-Illinois Plastic Products Inc. Method for applying labels to blow molded articles. 4,853,169, Cl. 264-509.000.

Kamiya, Saburo; Suzuki, Kazuaki; and Tanimoto, Akikazu, to Nikon Corporation. Exposure apparatus. 4,853,745, Cl. 355-43.000.

Kamman, Gordon W.: *See*—
Mertes, Barry; and Kamman, Gordon W., 4,852,837, Cl. 248-188.000.

Kamo, Roy; Woods, Melvin E.; and Bryzik, W., to Adiabatics, Inc. Thin thermal barrier coating for engines. 4,852,542, Cl. 123-668.000.

Kampf, Hans; and Lochmahr, Karl, to Sueddeutsche Kuehlerfabrik, Julius Fr., Behr GmbH & Co. KG. Air conditioner humidity control system. 4,852,363, Cl. 62-176.600.

Kanai, Masahiro: *See*—
Ishihara, Shunichi; Ohno, Shigeru; Kanai, Masahiro; Oda, Shunri; and Shimizu, Isamu, 4,853,251, Cl. 427-38.000.

Kanda, Masao: *See*—
Okano, Takashi; Akiyama, Toru; and Kanda, Masao, 4,853,781, Cl. 358-148.000.
Okano, Takashi; Akiyama, Toru; and Kanda, Masao, 4,853,914, Cl. 369-32.000.

Kandatsu, Kiyoshi, to Fuji Electric Co., Ltd. Contactor apparatus. 4,853,662, Cl. 335-185.000.

Kando, Akiyoshi, to Yoshida Kogyo K. K. Parts supply hopper. 4,852,771, Cl. 222-169.000.

Kanebo, Ltd.: *See*—
Taguchi, Masahiro; Kondo, Hirosato; Inoue, Yoshimasa; Kawahata, Yoshihiro; and Tsukamoto, Goro, 4,853,469, Cl. 544-99.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Shiraishi, Tadayoshi; Imai, Naohiro; Domoto, Takeshi; Kameyama, Keiji; Katsumi, Ikuo; Hidaka, Takayoshi; Hosoe, Kazunori; and Watanabe, Kiyoshi, 4,853,403, Cl. 514-404.000.

Kaneiwa, Shinji: *See*—
Matsui, Sadayoshi; Kaneiwa, Shinji; Morimoto, Taiji; Yamaguchi, Masahiro; Taneya, Mototaka; and Matsumoto, Mitsuhiro, 4,853,936, Cl. 372-45.000.

Kaneko, Kiyokazu, to Akebono Brake Industry Co., Ltd. Automatic adjuster for operation gap of brake. 4,852,702, Cl. 188-196.00D.

Kaneko, Toshio: *See*—
Satake, Toshimi; Fukuchi, Tadakazu; Minami, Toshiaki; Nagai, Tomoaki; Kaneko, Toshio; and Fujimura, Fumio, 4,853,362, Cl. 503-209.000.

Kaneuchi, Kazuo, to Kabushiki Kaisha Toshiba. Information memory unit. 4,853,925, Cl. 369-291.000.

Kanigowski, Andrzej S., to Weber Aircraft Corporation. Stowable table system. 4,852,940, Cl. 297-145.000.

Kanzaki Paper Mfg. Co., Ltd.: *See*—
Onishi, Takami; and Dotani, Satoshi, 4,853,255, Cl. 427-148.000.

Kaplan, Donald A.; and Goeckeler, William F., to Dow Chemical Company, The. Bone marrow suppressing agents. 4,853,209, Cl. 424-1.100.

Kaplan, Robert H.; LaCava, Alberto; Shirley, Arthur I.; and Ringo, Steven M., to BOC Group, Inc., The. Method for densely packing molecular sieve adsorbent beds in a PSA system. 4,853,004, Cl. 55-25.000.

Kaplinsky, Cecil H.: *See*—
Zimmer, Gunther A. H.; Braune, Dirk H.; and Kaplinsky, Cecil H., 4,853,845, Cl. 364-200.000.

Karakawa, Koichi; Yoshimatsu, Tatsuhiko; Tsuchimoto, Hideyuki; and Hiwatashi, Katsumi, to Kyokuto International Corporation. Method and apparatus for printing on a traveling web. 4,852,484, Cl. 101-170.000.

Karasawa, Yoshio: *See*—
Shiokawa, Takayasu; Yasukawa, Koji; and Karasawa, Yoshio, 4,853,702, Cl. 342-363.000.

Karl Storz Endoscopy GmbH and Company: *See*—
Gilstad, Dennis W.; Branstetter, Ronald L.; and Hill, Ralph H., Jr., 4,852,579, Cl. 128-665.000.

Karl Storz GmbH & Co.: *See*—
Koller, Roland; and Dittrich, Horst, 4,852,550, Cl. 128-4.000.

Karlinski, Herbert E., to K-Tube Corporation. Apparatus and method for continuous manufacture of armored optical fiber cable. 4,852,790, Cl. 228-148.000.

Karlsen, Jakob, to Aqua Fisk A/S. Process and device for medical treatment of fish. 4,852,519, Cl. 119-3.000.

Karnopp, Dean C.; and Yasui, Yoshiyuki, to Aisin Seiki Kabushiki Kaisha. Disk brake assembly. 4,852,699, Cl. 188-72.200.

Karsner, Grant G.: *See*—
Grove, J. Jay; and Karsner, Grant G., 4,853,106, Cl. 208-131.000.

Kartfilt, Henry A., to Firestone Tire & Rubber Company, The. Non-penetrating roof membrane fastening system. 4,852,323, Cl. 52-410.000.

Kasai, Masaji: *See*—
Saito, Yutaka; Kasai, Masaji; Shirahata, Kunikatsu; Kono, Motomichi; Morimoto, Makoto; and Ashizawa, Tadashi, 4,853,385, Cl. 514-250.000.

Kasai, Masayoshi: *See*—
Kurobe, Toshio; Kasai, Masayoshi; and Kayano, Masanori, 4,853,211, Cl. 424-44.000.

Kashiki, Hajime: *See*—
Onoue, Kazuhiko; and Kashiki, Hajime, 4,853,603, Cl. 318-568.150.

Kashima, Masataka: *See*—
Kobayashi, Haruo; Yoshizaki, Akira; Hoda, Takeo; and Kashima, Masataka, 4,853,721, Cl. 354-21.000.

Kashimura, Masashi: *See*—
Hanada, Kazuyuki; Misaizu, Iwao; Kashimura, Masashi; Goto, Tomoko; and Kuriyama, Katsumi, 4,853,418, Cl. 521-154.000.

Kashiwayanagi, Yuzo: *See*—
Yoshida, Seikoh; Kikuta, Toshio; and Kashiwayanagi, Yuzo, 4,853,066, Cl. 156-616.400.

Kass, Lawrence, to Cytocolor, Inc. Method of staining cells with a diazo dye and compositions thereof. 4,853,210, Cl. 424-3.000.

Kastl, Roland: *See*—
Klein, Lutz; Panofski, Ernst; and Kastl, Roland, 4,853,591, Cl. 313-493.000.

Kasutani, Kiyoshi: *See*—
Fukumoto, Masatoshi; Kubo, Soichi; Miyake, Yoichi; Tsukada, Norishige; Kasutani, Kiyoshi; and Okamori, Kenji, 4,853,794, Cl. 358-447.000.

Kato, Hisaaki; and Mori, Hideshi, to Murata Kikai Kabushiki Kaisha. Belt type false twister. 4,852,341, Cl. 57-328.000.

Kato, Kunioki; Kawamura, Masao; Goda, Hiroshi; Sawada, Kiyoshi; and Hamatani, Kazuhiro, to Seitetsu Kagaku Co., Ltd. Process for preparing N,N-dialkylaniline salt of 5-acetyl-2-alkylbenzene sulfonic acid. 4,853,158, Cl. 562-46.000.

Katoh, Koichiroh, to Director General of Agency of Industrial Science and Technology. Method of activating surface of shaped body formed of synthetic organic polymer. 4,853,253, Cl. 427-54.100.

Katsumata, Kenji; Sugiyama, Masato; Matono, Takaaki; Hirahata, Shigeru; Nakagawa, Isao; Ishikura, Kazuo; and Suzuki, Sunao, to Hitachi, Ltd. Sequential scanning converter with frame comb filter and freeze frame feature. 4,853,765, Cl. 358-11.000.

Katsumata, Takashi: *See*—
Hamma, Noritaka; Saito, Yoshikazu; Nishizawa, Toshio; and Katsumata, Takashi, 4,853,378, Cl. 514-167.000.

Katsumi, Ikuo: *See*—
Shiraishi, Tadayoshi; Imai, Naohiro; Domoto, Takeshi; Kameyama, Keiji; Katsumi, Ikuo; Hidaka, Takayoshi; Hosoe, Kazunori; and Watanabe, Kiyoshi, 4,853,403, Cl. 514-404.000.

Katsuta, Yuji; and Kamata, Hiroshi, to Sharp Kabushiki Kaisha. Image signal binary encoder. 4,853,792, Cl. 358-455.000.

Katsuyama, Mikizo: *See*—
Wakimoto, Zenji; Nagata, Shinichi; and Katsuyama, Mikizo, 4,852,957, Cl. 350-6.600.

Kattamis, Theodoulos: *See*—
Cornie, James A.; Kattamis, Theodoulos; Chambers, Brent V.; Bond, Bruce E.; and Varela, Raul H., 4,853,182, Cl. 420-129.000.

Katz, Ira; and Withycombe, Donald A., to International Flavors & Fragrances Inc. Repelling animals with compositions comprising citronellyl nitrile, citronellol and, optionally methyl terpenyl ether, lemon oil, caryophyllene, isopulegol, isopulegyl acetate and quinine or one or more of its salts. 4,853,413, Cl. 514-526.000.

Katzman, Abe, to General Motors Corporation. Display container. 4,852,796, Cl. 229-125.280.

Kawabata, Curt M.: *See*—
Reynolds, Hugh M.; and Kawabata, Curt M., 4,852,347, Cl. 60-253.000.

Kawahata, Yoshihiro: *See*—
Taguchi, Masahiro; Kondo, Hirosato; Inoue, Yoshimasa; Kawahata, Yoshihiro; and Tsukamoto, Goro, 4,853,469, Cl. 544-99.000.

Kawai, Kazuaki; Ishida, Hitoshi; and Yamauchi, Noriyoshi, to Ryobi Ltd. Gas venting arrangement in injection molding apparatus and method for venting gas in the injection molding apparatus. 4,852,634, Cl. 164-457.000.

Kawamoto, Yoshifumi: *See*—
Yamanaka, Toshiaki; Suzuki, Norio; Sakai, Yoshio; Kawamoto, Yoshifumi; Minato, Osamu; Ishibashi, Koichiro; Moriwaki, Nobuyuki; and Meguro, Satoshi, 4,853,894, Cl. 365-154.000.

Kawamoto, Yoshimichi: *See*—
Yasuda, Toru; Kawamoto, Yoshimichi; Abe, Masaru; and Kohata, Takashi, 4,853,672, Cl. 340-465.000.

Kawamura, Kunio; Taniguchi, Toshihiko; Oya, Tetsuro; Niwa, Masatake; Nakai, Masaaki; and Fujino, Akihiko, to Minolta Camera Kabushiki Kaisha. Camera. 4,853,726, Cl. 354-289.100.

Kawamura, Masao: *See*—
Kato, Kunioki; Kawamura, Masao; Goda, Hiroshi; Sawada, Kiyoshi; and Hamatani, Kazuhiro, 4,853,158, Cl. 562-46.000.
Uchida, Akihisa; Okada, Daisuke; Takakura, Toshihiko; Ogiue, Katsumi; Tamaki, Yoichi; and Kawamura, Masao, 4,853,343, Cl. 437-33.000.

Kawamura, Naoto: *See*—
Takahashi, Tohru; Kitajima, Nobuo; and Kawamura, Naoto, 4,853,752, Cl. 355-77.000.

Kawanishi, Hiroshi: *See*—
Ouchi, Tomonori; Wakamatsu, Otsuro; Kawanishi, Hiroshi; and Yasui, Masao, 4,853,495, Cl. 178-18.000.

Kawanishi, Toshiyuki; and Tabata, Yukio, to Ricoh Company, Ltd. Non-impact electrothermic recording method. 4,853,707, Cl. 346-1.100.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Onoue, Kazuhiko; and Kashiki, Hajime, 4,853,603, Cl. 318-568.150.

Kawasaki, Osamu; Takeda, Katsu; Inaba, Ritsuo; and Fukada, Tetsuji, to Matsushita Electric Industrial Co., Ltd. Drive method for ultrasonic motor providing enhanced stability of rotation. 4,853,579, Cl. 310-116.000.

Kawasaki Steel Corp.: *See*—
Koshida, Takahisa; Uchimura, Ryoji; and Ogasawara, Takeshi, 4,853,196, Cl. 423-290.000.
Nikaido, Hideyuki; Takayuki, Naoi; Komori, Atsushi; and Nihei, Mitsuo, 4,852,383, Cl. 72-407.000.

Kawase, Hiroshi, to Furukawa Aluminum Co., Ltd. Method of manufacturing extruded flat multihole aluminum tube for heat-exchanger. 4,852,233, Cl. 29-157.30R.

Kawashima, Hiroshi: *See*—
Yamawaki, Masao; and Kawashima, Hiroshi, 4,853,786, Cl. 358-213.290.

Kawashima, Kenichi: *See*—
Yasutake, Nobuyuki; Kai, Jun-ichi; Yasuda, Hiroshi; and Kawashima, Kenichi, 4,853,870, Cl. 364-490.000.

Kawashima, Syunichiro: *See*—
Inoue, Osamu; and Kawashima, Syunichiro, 4,853,199, Cl. 423-594.000.

Kawazoe, Michio. Tripod. 4,852,836, Cl. 248-168.000.

Kayaba Kogyo K.K.: *See*—
Nishimoto, Yukio, 4,852,703, Cl. 188-284.000.

Kayano, Masanori: *See*—
Kurobe, Toshio; Kasai, Masayoshi; and Kayano, Masanori, 4,853,211, Cl. 424-44.000.

Kazarinov, Rudolf F.: *See*—
Alferness, Rodney C.; Henry, Charles H.; Kazarinov, Rudolf F.; Olsson, Nils A.; and Orlowsky, Kenneth J., 4,852,960, Cl. 350-96.190.

Kazawa, Yoshiaki: *See*—
Matsumoto, Manabu; Ikeguchi, Takashi; Ueda, Shinjiroo; Sonobe, Tadasi; Murashita, Toru; Ido, Satoshi; Kuroishi, Kazuo; Kazawa, Yoshiaki; Kakiuchi, Shunji; and Kobari, Toshiaki, 4,853,640, Cl. 328-235.000.

Keast, Alfred W. Stacking gates or doors. 4,852,300, Cl. 49-102.000.

Keaton, George H.: *See*—
Gebhardt, Edwin J.; Keaton, George H.; Sinar, Michael M.; and Wendt, James N., 4,852,198, Cl. 15-77.000.

Keegan, John J., Jr.: *See*—
Hommes, William J.; and Keegan, John J., Jr., 4,853,602, Cl. 318-38.000.

Keenan, James J.: *See*—
Ham, Howard M., Jr.; and Keenan, James J., 4,853,820, Cl. 361-59.000.

Kehoe, John R.: *See*—
Johnstone, Norman E.; and Kehoe, John R., 4,853,085, Cl. 162-128.000.

Kehoe, Peter J.: *See*—
Harmon, J. Paul; Kehoe, Peter J.; Rhodes, John D.; and Hash, Martin D., 4,853,717, Cl. 346-140.00R.

Kehr, Wolfgang: *See*—
Hilscher, Jean-Claude; Kehr, Wolfgang; Sauer, Gerhard; Schneider, Herbert; and Wachtel, Helmut, 4,853,390, Cl. 514-288.000.

Kelco International Limited: *See*—
Clare, Kenneth; McMullen, James H.; Findlay, Medeana; and Gaisford, Susan E., 4,853,244, Cl. 426-573.000.

Kelley, Timothy H.: *See*—
Giannetti, John; Sleve, Jerry F.; and Kelley, Timothy H., 4,853,746, Cl. 355-48.000.

Kemp, Richard A., to Shell Oil Company. Process for hydrotreating hydrocarbon feeds. 4,853,108, Cl. 208-216.00R.

Kempkensteffen, Heinz: *See*—
Peter, Gerhard; Kempkensteffen, Heinz; and Heid, Rudolf, 4,852,243, Cl. 29-568.000.

Kendall Company, The: *See*—
Gross, James R., 4,852,563, Cl. 128-202.270.

Kendrick, Larry E.: *See*—
Hardy, Gerald D.; Hoffman, John P.; and Kendrick, Larry E., 4,852,657, Cl. 172-2.000.

Kenmotsu, Isami: *See*—
Takahashi, Junji; and Kenmotsu, Isami, 4,853,924, Cl. 369-270.000.

Kennametal Inc.: *See*—
Mehrotra, Pankaj K.; Billman, Elizabeth R.; and North, Bernard, 4,852,999, Cl. 51-309.000.

Kennedy, Chandler J.: *See*—
Barry, James D.; and Kennedy, Chandler J., 4,852,452, Cl. 89-1.110.

Kennedy, Davis E. Two-in-one banjo tone ring. 4,852,446, Cl. 84-272.000.

Kennedy, Philip R. Implantable neural electrode. 4,852,573, Cl. 128-642.000.

Kennel, George W.; and Rollberg, Matthew J., to Dorr-Oliver Incorporated. Rake classifier. 4,853,115, Cl. 209-173.000.

Kensey, Kenneth, to Kensey Nash Corporation. Method and apparatus for sealing an opening in tissue of a living being. 4,852,568, Cl. 128-325.000.

Kensey Nash Corporation: *See*—
Kensey, Kenneth, 4,852,568, Cl. 128-325.000.

Kenworthy, Milton J.; and King, Robert C., to General Electric Company. Dispensing arrangement for pressurized air. 4,852,355, Cl. 60-751.000.

Kerboul, Guy, to Automobiles Peugeot; and Automobiles Citroen. Control device for an automobile vehicle gearbox. 4,852,421, Cl. 74-476.000.

Kerdranvat, Michel: *See*—
Rouvrais, Bernard; Kerdranvat, Michel; and Robert, Philippe, 4,853,775, Cl. 358-105.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Rinke, Monika; and Guesten, Hans, 4,853,937, Cl. 372-53.000.

Kerr, Donald: *See*—
McLennan, Jim; Davis, Richard; and Kerr, Donald, 4,852,875, Cl. 273-29.00A.

Kerr, Earnest M.: *See*—
Payne, Charles C.; and Kerr, Earnest M., 4,853,140, Cl. 252-34.000.

Kerr Measurement Systems, Inc.: *See*—
Kerr, Wayne L., 4,852,263, Cl. 33-133.000.

Kerr, Wayne L., to Kerr Measurement Systems, Inc. Method for determining cable length in a well bore. 4,852,263, Cl. 33-133.000.

Kervagoret, Gilbert, to Bendix France. Hydraulic brake circuit for motor vehicle, having a dual circuit in the form of a cross and a wheel anti-lock device. 4,852,952, Cl. 303-110.000.

Kerzner, Mark G., to Halliburton Logging Services Inc. Dipmeter processing technique. 4,853,855, Cl. 364-422.000.

Kesling, Haven S., Jr.: *See*—
Hostetler, Donald E.; Cannarsa, Michael J.; Kesling, Haven S., Jr.; and Sun, Hsiang-Ning, 4,853,462, Cl. 528-494.000.

Key Concepts, Inc.: *See*—
Duncan, Donald A.; and Tripp, Jeffrey B., 4,852,443, Cl. 84-1.040.

Kiang, Joseph K.; Tsou, Patrick K. C.; and Vogdes, Christine E., to Raychem Corporation. Method of producing high strength fibers. 4,853,164, Cl. 264-22.000.

Kido, Yoshinobu; and Yamada, Toshihiro, to Mazda Motor Corporation. Shift indicator system for vehicle. 4,853,673, Cl. 340-439.000.

Kiel Corporation: *See*—
Pellizzari, Paolo; and Perry, Richard, 4,853,697, Cl. 341-23.000.

Kihara, Yoshinori: *See*—
Weigand, Eckehard; Kihara, Yoshinori; and Honda, Masaru, 4,853,417, Cl. 521-131.000.

Kikuchi, Kenichi, to Olympus Optical Co., Ltd. Electronic endoscope apparatus having isolated patient and secondary circuitry. 4,853,772, Cl. 358-98.000.

Kikuta, Hiroshi: *See*—
Fukumori, Kunihiko; and Kikuta, Hiroshi, 4,853,269, Cl. 428-43.000.

Kikuta, Toshio: *See*—
Yoshida, Seikoh; Kikuta, Toshio; and Kashiwayanagi, Yuzo, 4,853,066, Cl. 156-616.400.

Killgoar, Paul C., Jr.: *See*—
Theodore, Ares N.; and Killgoar, Paul C., Jr., 4,853,428, Cl. 524-49.000.

Killion, Mead C., to Etymotic Research, Inc. Earplug with improved audibility. 4,852,683, Cl. 181-130.000.

Killop, James T.; and Anderson, Carl E., to Anderson-Cook, Inc. Rack assembly for forming splines in thin-wall member. 4,852,375, Cl. 72/88.000.

Kilminster, Kenneth N.: *See*—
Krishnamurthy, Sundaram; Johnston, Brian H.; Kilminster, Kenneth N.; Vogel, David C.; and Buckland, Paul R., 4,853,319, Cl. 430-387.000.

Kimata, Masafumi: *See*—
Tsubouchi, Natsuro; and Kimata, Masafumi, 4,853,348, Cl. 437-203.000.

Kimberly-Clark Corporation: *See*—
Win, Maung H.; Lloyd, William D.; Abba, William A.; and Daponte, Diego H., 4,853,142, Cl. 252-90.000.
Win, Maung H.; Hata, Stephen S.; Abba, William A.; and Olszewski, James, 4,853,281, Cl. 428-286.000.

Kimmich, Klaus; and Groegl, Ferdinand, to Alcatel NV. Optical cable element and optical cable. 4,852,966, Cl. 350-96.230.

Kimoto, Masaaki, to Kimoto Sign Co. Ltd. Luminous gas-discharge sign panel. 4,852,285, Cl. 40-542.000.

Kimoto Sign Co. Ltd.: *See*—
Kimoto, Masaaki, 4,852,285, Cl. 40-542.000.

Kimura, Kenji: *See*—
Hibino, Hiroki; Kimura, Kenji; and Eino, Teruo, 4,853,773, Cl. 358-98.000.

Kimura, Yukio; Yoshino, Toshikazu; and Hayashi, Ryutaro, to Pioneer Electronic Corporation. Optical disk and process for producing the same. 4,853,260, Cl. 427-240.000.

King, Christine A.: *See*—
Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansley, Robert W.; and Newman, Alec T., 4,853,234, Cl. 426-77.000.

King, Francis D., to Beecham Group, p.l.c. Benzamides and benzoates having anti-emetic activity. 4,853,376, Cl. 514-161.000.

King, Francis D.; Martin, Roger T.; and Watts, Eric A., to Beecham Group p.l.c. N-('-B-hydroxyethylpiperid-4-yl esters and amides. 4,853,394, Cl. 514-329.000.

King, Robert C.: *See*—
Kenworthy, Milton J.; and King, Robert C., 4,852,355, Cl. 60-751.000.

King, William B.: *See*—
Hrametz, Andrew A.; and King, William B., 4,852,401, Cl. 73-155.000.

Kinoshita, Keichi: *See*—
Johdai, Akiyoshi; Kinoshita, Keichi; and Matsui, Toshio, 4,852,867, Cl. 270-53.000.

Kinslow, Joseph C.: *See*—
Meyer, Bernard H.; Kinslow, Joseph C.; Arch, Paul E.; and Meek, D. Harper, 4,853,445, Cl. 526-190.000.

Kipnis, Lyubov S.: *See*—
Vasilevskis, Janis; De Deken, Jacques C.; Saxton, Robert J.; Wentrcek, Paul R.; Fellmann, Jere D.; and Kipnis, Lyubov S., 4,853,357, Cl. 502-165.000.

Kishimoto, Shinzo: *See*—
Fujita, Yoshihiro; Fujimoto, Hiroshi; Ishikawa, Takatoshi; and Kishimoto, Shinzo, 4,853,318, Cl. 430-380.000.

Kislovski, Andre, to Hasler AG. Inductive, electrically-controllable component. 4,853,611, Cl. 323-335.000.

Kiso, Yoshiaki: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,853,463, Cl. 530-323.000.

Kiss, Michael Z. Signalling apparatus for hearing impaired persons. 4,853,674, Cl. 340-407.000.

Kissei Pharmaceutical Co., Ltd.: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,853,463, Cl. 530-323.000.

Kistner, David: *See*—
Bianchi, Raymond A.; Kistner, David; Oswald, Joseph; and Phelps, Elmer B., 4,852,662, Cl. 173-119.000.

Kita, Kazuyuki: *See*—
Funatsu, Chuhei; and Kita, Kazuyuki, 4,853,700, Cl. 342-30.000.

Kitagawa, Tooru: *See*—
Teshima, Toshio; Kitagawa, Tooru; Suzuki, Mikio; Masaoka, Toshio; Mori, Takashi; and Okimoto, Kazutaka, 4,852,633, Cl. 164-437.000.

Kitahara, Takeshi: *See*—
Mitsuhashi, Masato; and Kitahara, Takeshi, 4,853,848, Cl. 364-200.000.

Kitajima, Nobuo: *See*—
Takahashi, Tohru; Kitajima, Nobuo; and Kawamura, Naoto, 4,853,752, Cl. 355-77.000.

Kitajima, Tatsuya: *See*—
Mashimo, Satoshi; Kitajima, Tatsuya; Tanaka, Masayuki; and Kuramoto, Shinji, 4,852,625, Cl. 152-511.000.

Kitano, Masao; Ueno, Tsunemasa; Kojima, Kouichi; and Morimoto, Yutaka, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Method for production of dithiodialdehyde. 4,853,486, Cl. 568-22.000.

Kitano, Seiichi; and Yamaguchi, Toshiki, to Kabushiki Kaisha Daikin Seisakusho. Clutch disc. 4,852,711, Cl. 192-107.00C.

Kitazato, Naohisa: *See*—
Kojima, Yuichi; and Kitazato, Naohisa, 4,853,780, Cl. 358-136.000.

Kitrell, John V. Visual signal device for a bicycle. 4,852,970, Cl. 350-99.000.

Kitrell, John V. Fender mounted visual signal device for a bicycle. 4,852,971, Cl. 350-99.000.

Kitsukawa, Goro; Watanabe, Takao; Hori, Ryoichi; and Itoh, Kiyoo, to Hitachi, Ltd. Semiconductor memory having amplifier including bipolar transistor. 4,853,899, Cl. 365-207.000.

Kittel, Friedrich; Lutz, Dieter; Nagler, Franz; Oppitz, Horst; and Gasper, Gerhard, to Sachs Systemtechnik GmbH. Control device, in particular for a motor-vehicle friction clutch. 4,852,419, Cl. 74-89.140.

Kitts, Jacques B., to Cardgard Ltd. Security device. 4,853,676, Cl. 340-543.000.

Klaiber, Thomas: *See*—
Kunzer, Adolf; and Klaiber, Thomas, 4,852,429, Cl. 74-866.000.

Klarstrom, Dwaine L.: *See*—
Rothman, Michael F.; Klarstrom, Dwaine L.; and Lai, George Y., 4,853,185, Cl. 420-584.000.

Klatt, Richard J. Location marking stake. 4,852,512, Cl. 116-209.000.

Klein, Arno, to Labex GmbH. Suspension system for folding door. 4,852,628, Cl. 160-199.000.

Klein, Herbert: *See*—
Steinleitner, Gunther; Mennicke, Stefan; Feindler, Philbert; Klein, Herbert; and Maldonado-Zagal, Sigisfredo, 4,853,303, Cl. 429-104.000.

Klein, Lutz; Panofski, Ernst; and Kastl, Roland, to Patent Treuhand Gesellschaft fur elektrische Gluhlampen mbH. Multiple-tube compact low-pressure discharge fluorescent lamp. 4,853,591, Cl. 313-493.000.

Kleinewefers GmbH: *See*—
Svenka, Peter; and Rauf, Richard, 4,852,209, Cl. 15-308.000.

Kling, John P., to AMP Incorporated. Planar pi-network filter assembly having capacitors formed on opposing surfaces of an inductive member. 4,853,659, Cl. 333-184.000.

Klingberg, Sven; and Persson, Sixten. Safety box for safeguarding documents and the like. 4,852,502, Cl. 109-25.000.

Klockner, Karl-Heinz: *See*—
Bitschkus, Horst; Hofmann, Manfred; Klockner, Karl-Heinz; Nelles, Uwe; and Siewert, Gunther, 4,852,864, Cl. 267-219.000.

Klotz, Erhard P. A.: *See*—
Haaker, Paul R.; Klotz, Erhard P. A.; Koppe, Reiner H.; and Linde, Rolf E., 4,853,947, Cl. 378-99.000.

Kluft, Cornelis: *See*—
Clemmensen, Inge D.; and Kluft, Cornelis, 4,853,220, Cl. 424-101.000.

Klyatis, Lev M.: *See*—
Minenko, Leonid P.; Oaher, Mikhail I.; Belikov, Evgeny V.; and Klyatis, Lev M., 4,852,927, Cl. 294-86.400.

Kmetz, Joseph J., to London & Egazarian Associates, Inc. Conveyor system for document-type package distribution. 4,852,715, Cl. 198-370.000.

Knake, Alfred: *See*—
Bernhardt, Siegfried; Knake, Alfred; and Schmiedgen, Hans, 4,852,217, Cl. 19-98.000.

Knerr, Edwin R.; Hart, Robert; and Cowan, William S., to National Oil Well (U.K.) Limited. Wellhead connection of hydraulic control lines. 4,852,611, Cl. 137-595.000.

Knoell, Peter P.: *See*—
Hopkins, John W.; and Knoell, Peter P., 4,852,338, Cl. 56-202.000.

Knoepke, John R.: *See*—
Jackson, Charles R.; Rellis, Daniel, Jr.; Pielet, Howard M.; Bhattacharya, Debanshu; Frank, Larry A.; Dasgupta, Purnendu; and Knoepke, John R., 4,852,632, Cl. 164-437.000.

Knop, Klaus; Wolters, Gunter; and Kubiak, Helmut, to Man Gutehoffnungshuette GmbH. Process for gasifying coal. 4,852,996, Cl. 48-197.00R.

Kobari, Toshiaki: *See*—
Matsumoto, Manabu; Ikeguchi, Takashi; Ueda, Shinjiroo; Sonobe, Tadasi; Murashita, Toru; Ido, Satoshi; Kuroishi, Kazuo; Kazawa, Yoshiaki; Kakiuchi, Shunji; and Kobari, Toshiaki, 4,853,640, Cl. 328-235.000.

Kobayashi, Haruo; Yoshizaki, Akira; Hoda, Takeo; and Kashima, Masataka, to Minolta Camera Kabushiki Kaisha. Automatic film information reading method and device. 4,853,721, Cl. 354-21.000.

Kobayashi, Kenji, to Endo Manufacturing Co., Ltd. Head structure for gold clubs. 4,852,880, Cl. 273-169.000.

Kobayashi, Masataka: *See*—
Komine, Isamu; Kobayashi, Masataka; and Ariga, Shiro, 4,852,407, Cl. 73-597.000.

Kobayashi, Seiji; and Nishida, Norio, to Sony Corporation. Tracking servo uses tangent function to determine tracking error signal. 4,853,918, Cl. 369-44.000.

Kobayashi, Shinichi, to NEC Corporation. RF power control circuit. 4,853,612, Cl. 323-354.000.

Kobayashi, Takashi: *See*—
Fukatsu, Tsutomu; Hori, Taizou; Masui, Toshiyuki; Kobayashi, Takashi; Wakui, Tetsuya; and Takahashi, Koji, 4,853,803, Cl. 360-72.200.

Kobow, Wolfgang: *See*—
Krieger, Karl, deceased; Reinelt, Werner; and Kobow, Wolfgang, 4,852,852, Cl. 251-78.000.

Kobryn, Ronald J.; and Gaskins, Justin, to Hubbard, L. James; and Hubbard, Virginia M. Print hammer mechanism. 4,852,481, Cl. 101-93.480.

Kodama, Seiki; Murase, Shigenobu; Matsuo, Haruyuki; Maruhashi, Hideki; Murata, Shigemi; and Miyaji, Hidetoshi, to Mitsubishi Denki Kabushiki Kaisha. Distributor for internal combustion engine. 4,852,541, Cl. 123-617.000.

Kodama, Yutaka; and Hirasawa, Junichi, to Ricoh Co., Ltd. Ozone removing device. 4,853,735, Cl. 355-215.000.

Kodato, Shinichi: *See*—
Takamura, Norio; Oda, Kuniyuki; Kodato, Shinichi; Yamaguchi, Isao; and Yano, Koji, 4,853,404, Cl. 514-406.000.

Kohama, Hajime: *See*—
Ishii, Takashi; Kohama, Hajime; and Yabe, Hisao, 4,853,284, Cl. 428-335.000.

Kohata, Takashi: *See*—
Yasuda, Toru; Kawamoto, Yoshimichi; Abe, Masaru; and Kohata, Takashi, 4,853,672, Cl. 340-465.000.

Kohno, Hideki: *See*—
Yamamoto, Etsuji; Ogura, Yukiko; and Kohno, Hideki, 4,853,636, Cl. 324-309.000.

Kohr, William J.: *See*—
Goeddel, David V.; Kohr, William J.; Pennica, Diane; and Vehar, Gordon A., 4,853,330, Cl. 435-226.000.

Koike, Shoji; and Tomida, Yasuko, to Canon Kabushiki Kaisha. Ink for ink-jet recording and ink-jet recording process using the same. 4,853,036, Cl. 106-20.000.

Koike, Shunji: *See*—
Itaya, Hisao; Okada, Toshihiko; Hata, Morishige; Koike, Shunji; and Onishi, Takahiro, 4,853,776, Cl. 358-106.000.

Koizumi, Katsuyuki: *See*—
Suwa, Hisashi; Sato, Seiji; Matsubara, Susumu; Yano, Eiji; and Koizumi, Katsuyuki, 4,853,804, Cl. 360-85.000.

Koizumi, Michio: *See*—
Kunita, Masao; Koizumi, Michio; and Ohsawa, Seiichi, 4,852,480, Cl. 101-93.050.

Koji, Ito: *See*—
Toshio, Kamimura; and Koji, Ito, 4,852,853, Cl. 251-129.070.

Kojima, Kouichi: *See*—
Kitano, Masao; Ueno, Tsunemasa; Kojima, Kouichi; and Morimoto, Yutaka, 4,853,486, Cl. 568-22.000.

Kojima, Masayasu; and Hayashi, Chihiro, to Sumitomo Metal Industries. Metal case for housing an IC and a manufacturing method therefor. 4,852,736, Cl. 206-328.000.

Kojima, Yoshimi: *See*—
Hayakawa, Takashi; Nojima, Hideo; Kojima, Yoshimi; Narikawa, Shiro; Matsuyama, Toshiro; Imada, Eiji; and Ehara, Shaw, 4,853,309, Cl. 430-65.000.

Kojima, Yuichi; and Kitazato, Naohisa, to Sony Corp. Method and apparatus for predictive coding. 4,853,780, Cl. 358-136.000.

Kokawa, Masashi, to Horiba, Ltd. Gap switch. 4,853,939, Cl. 372-81.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Shiokawa, Takayasu; Yasukawa, Koji; and Karasawa, Yoshio, 4,853,702, Cl. 342-363.000.

Kolb, Walter: *See*—
Leidinger, Gustav; Proll, Gunther; and Kolb, Walter, 4,852,660, Cl. 172-795.000.

Kolbatz, Klaus-Peter. Method of and apparatus for the acoustic signalling of cases of drowning in swimming pools. 4,853,691, Cl. 340-566.000.

Koller, Roland; and Dittrich, Horst, to Karl Storz GmbH & Co. Instrument for insertion into an endoscope shaft. 4,852,550, Cl. 128-4.000.

Kollin, Joel S., to Massachusetts Institute of Technology. Time multiplexed auto-stereoscopic three-dimensional imaging system. 4,853,769, Cl. 358-88.000.

Kollmorgen Technologies Corporation: *See*—
McMullin, Francis; Byrne, John V.; and Murray, Aengus, 4,853,604, Cl. 318-653.000.

Kolodziej, Helmut: *See*—
Muskulus, Willi; Kolodziej, Helmut; and Nitsch, Helmut, 4,852,249, Cl. 29-825.000.

Kolonko, Kenneth J.: *See*—
Bennett, S. John; Barnes, Michael W.; and Kolonko, Kenneth J., 4,853,051, Cl. 149-19.400.

Kolpak, Miroslav M., to Atlantic Richfield Company. Three phase fluid flow measuring system. 4,852,395, Cl. 73-61.10R.

Komatsu, Kazuyoshi: *See*—
Narimatsu, Osamu; Ito, Michiyasu; Komatsu, Kazuyoshi; and Shibata, Yasuhiro, 4,853,286, Cl. 428-343.000.

Komatsu, Michio, to NEC Corporation. Semiconductor device isolated by a pair of field oxide regions. 4,853,340, Cl. 437-20.000.

Kombinat "Korabostroene": *See*—
Mihailov, Mihail V., 4,852,643, Cl. 165-113.000.

Komeya, Seiji; and Hara, Mitsuhiro, to Kajima Press Industry Co., Ltd. Container device used in a vehicle. 4,852,932, Cl. 296-37.900.

Komine, Isamu; Kobayashi, Masataka; and Ariga, Shiro, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for determining length of pipe utilizing sound waves. 4,852,407, Cl. 73-597.000.

Komori, Atsushi: *See*—
Nikaido, Hideyuki; Takayuki, Naoi; Komori, Atsushi; and Nihei, Mitsuo, 4,852,383, Cl. 72-407.000.

Kondo, Hirosato: *See*—
Taguchi, Masahiro; Kondo, Hirosato; Inoue, Yoshimasa; Kawahata, Yoshihiro; and Tsukamoto, Goro, 4,853,469, Cl. 544-99.000.

Kono, Hiromi, to Diesel Kiki Co., Ltd. Data processing system adaptable to using equivalent integrated circuits. 4,853,844, Cl. 364-200.000.

Kono, Motomichi: *See*—
Saito, Yutaka; Kasai, Masaji; Shirahata, Kunikatsu; Kono, Motomichi; Morimoto, Makoto; and Ashizawa, Tadashi, 4,853,385, Cl. 514-250.000.

Kopp, Oswald, to Kadia Diamond Hone Corporation. Method for manufacturing metal wires partially covered with abrasive particles for cutting tools. 4,852,998, Cl. 51-309.000.

Koppe, Reiner H.: *See*—
Haaker, Paul R.; Klotz, Erhard P. A.; Koppe, Reiner H.; and Linde, Rolf E., 4,853,947, Cl. 378-99.000.

Kormendi, Kalman; Lampart, Dieter; Mannherz, Fritz; and Scheurenbrand, Dieter, to Schmalbach-Lubeca AG. Plastic fuel tank. 4,852,758, Cl. 220-20.500.

Kortec AG: *See*—
Weber, Ralph, 4,852,858, Cl. 266-175.000.

Koshida, Takahisa; Uchimura, Ryoji; and Ogasawara, Takeshi, to Kawasaki Steel Corp. Water-soluble boron containing impurity reduced hexagonally crystalline boron nitride and process for production thereof. 4,853,196, Cl. 423-290.000.

Koslo, Randy J.; and Lukacsko, Alison B., to Bristol-Myers Company. Process and composition for the topical application of alpha$_1$ adrenergic agonist for pilomotor effects. 4,853,216, Cl. 424-73.000.

Koss, George A.; and Sitzman, Gary W., to Ford Motor Company. Method and apparatus for forming a glass sheet. 4,853,018, Cl. 65-94.000.

Kossmehl, Gerhard: *See*—
Schafer, Horst; Kossmehl, Gerhard; and Neumann, Walter, 4,853,453, Cl. 528-28.000.

Kotabe, Hiroaki: *See*—
Shimada, Kazuyuki; Nakajima, Tomohiro; Kotabe, Hiroaki; Yamanobe, Kouji; and Yamazaki, Kozo, 4,853,710, Cl. 346-108.000.

Kotrappa, Payasada: *See*—
Dempsey, John C.; and Kotrappa, Payasada, 4,853,536, Cl. 250-253.000.

Kotrba, Zdenek; Jaros, Frantisek; Burysek, Frantisek; Kubovy, Miloslav; Hejduk, Jiri; and Bures, Pavel, to Vyzkumny ustav bavlnarsky. Fiber separating device. 4,852,340, Cl. 57-301.000.

Kouken Co., Ltd.: *See*—
Matsumoto, Kesafumi, 4,853,621, Cl. 324-158.00R.

Koukol, John L., Jr.: *See*—
Freeman, Mark D.; Koukol, John L., Jr.; Koziol, Stanislaw; and Sgourakes, George E., 4,852,466, Cl. 92-104.000.

Kovacs, Gregory J.: *See*—
Tam, Man C.; Bloembergen, Steven; Kovacs, Gregory J.; Jennings, Carol A.; Loutfy, Rafik O.; Gardner, Sandra J.; and Taylor, Michael G., 4,853,307, Cl. 430-41.000.

Kowalenko, Wladimir: *See*—
Sherman, Victor; Zborovsky, Ilya; Sanchez, William; and Kowalenko, Wladimir, 4,852,545, Cl. 126-39.00H.

Koya, Toshiaki: *See*—
Suesada, Kunio; and Koya, Toshiaki, 4,853,796, Cl. 358-324.000.

Koyama, Hiroshi: *See*—
Nishioka, Tadashi; Mashiko, Yoji; Morimoto, Hiroaki; and Koyama, Hiroshi, 4,853,341, Cl. 437-24.000.

Koyama, Ikuo: *See*—
Takashima, Yasuji; Koyama, Ikuo; Maki, Tooru; and Nakamori, Katsu, 4,853,249, Cl. 427-3.000.

Koyama, Osamu; Uzuki, Kazuo; Shiho, Makoto; and Aoi, Shigeru, to Canon Kabushiki Kaisha. Optical information processing apparatus provided with a photodetector disposed outside part of the effective diameter of a lens system and adapted to be movable with the lens system to thereby detect the position of the lens system. 4,853,917, Cl. 369-44.000.

Koziol, Stanislaw: *See*—
Freeman, Mark D.; Koukol, John L., Jr.; Koziol, Stanislaw; and Sgourakes, George E., 4,852,466, Cl. 92-104.000.

Krajicek, Stephen W. Wet mop with interchangeable scrubbing pad and cloth wipe. 4,852,210, Cl. 15-228.000.

Kramer, Charles J., to Holotek Ltd. Hologan scanner system. 4,852,956, Cl. 350-3.710.

Kramer, Felix: *See*—
Bogatzki, Hans-Ulrich; and Kramer, Felix, 4,852,415, Cl. 73-865.800.

Kranz, Walter, to Messerschmitt-Bolkow-Blohm GmbH. Apparatus for controlling a projectile. 4,852,827, Cl. 244-3.220.

Krass, James E., Jr.; and Neely, James F. Vehicle computer diagnostic interface apparatus. 4,853,850, Cl. 364-200.000.

Kraus, Stephen A.: *See*—
Abkowitz, Stanley; Heussi, Harold L.; Ludwig, Harold P.; and Kraus, Stephen A., 4,852,531, Cl. 123-188.0AA.

Krause, Joachim; Wachtler, Andreas; Scheuble, Bernhard; and Weber, Georg, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Heterocyclic liquid crystal compounds. 4,853,149, Cl. 252-299.610.

Krauska, Bernard J., to Orthokinetics, Inc. Device for converting a recliner chair to a recliner-lift chair. 4,852,939, Cl. 297-71.000.

Krein, Reuben, to BJK Industries, Inc. Seat cover inverter. 4,852,619, Cl. 141-7.000.

Krenn, Andreas: *See—*
Rollenitz, Leopold; Krenn, Andreas; Schmidt, Harald; and Freudenschuss, Otto, 4,852,535, Cl. 123-357.000.

Krepski, Larry R.: *See—*
Babirad, Stefan A.; Bacon, Fredrick; Heilmann, Steven M.; Krepski, Larry R.; Kuczma, Andrew S.; and Rasmussen, Jerald K., 4,852,969, Cl. 350-96.340.

Krieger, Hildegard, legal representative: *See—*
Krieger, Karl, deceased; Reinelt, Werner; and Kobow, Wolfgang, 4,852,852, Cl. 251-78.000.

Krieger, Ira: *See—*
Bourquin, Francis; and Krieger, Ira, 4,853,908, Cl. 368-19.000.

Krieger, Karl, deceased (by Krieger, Hildegard, legal representative); Reinelt, Werner; and Kobow, Wolfgang, to Hermann Henscheidt Maschinenfabrik GmbH & Co. Hydraulic valve actuating device. 4,852,852, Cl. 251-78.000.

Krishnamurthy, Sundaram; Johnston, Brian H.; Kilminster, Kenneth N.; Vogel, David C.; and Buckland, Paul R., to Eastman Kodak Company. Photographic silver halide element and process. 4,853,319, Cl. 430-387.000.

Krisko, Peter. Energy generator. 4,852,350, Cl. 60-325.000.

Kristoff, Louis D. Vise adapter for threaded objects. 4,852,866, Cl. 269-47.200.

Kritzner, Bruno: *See—*
Ganzke, Jurgen; Jahn, Dieter; and Kritzner, Bruno, 4,853,727, Cl. 354-319.000.

Krueger, James W.: *See—*
Ross, Jeffrey L.; and Krueger, James W., 4,852,717, Cl. 206-462.000.

Krupin, Theodore; and Stone, Richard A., to University of Pennsylvania, The Trustees of the. Method of lowering intraocular (eye) pressure. 4,853,375, Cl. 514-152.000.

Ku, Wayne W., to Eastman Kodak Company. Disposable web cleaning device for electrostatographic apparatus. 4,853,741, Cl. 355-300.000.

Kubiak, Helmut: *See—*
Knop, Klaus; Wolters, Gunter; and Kubiak, Helmut, 4,852,996, Cl. 48-197.00R.

Kubisen, Steven J., Jr.: *See—*
Walles, Erik W.; Lupinski, John H.; Markovitz, Mark; Colborn, Robert E.; Presley, James R.; Davis, Michael J.; Minnick, Michael G.; Kubisen, Steven J., Jr.; Hallgren, John E.; Bolon, Donald A.; Eddy, Victoria J.; and Irwin, Patricia C., 4,853,423, Cl. 523-428.000.

Kubo, Kazuhiko: *See—*
Takahashi, Akira; Shibahara, Kazuo; Morimoto, Katsuhiro; Samma, Hiromasa; and Kubo, Kazuhiko, 4,853,351, Cl. 501-87.000.

Kubo, Masahiro: *See—*
Hamajima, Kaneo; Tanaka, Atsuo; Kubo, Masahiro; and Dohnomoto, Tadashi, 4,852,630, Cl. 164-761.000.

Kubo, Soichi: *See—*
Fukumoto, Masatoshi; Kubo, Soichi; Miyake, Yoichi; Tsukada, Norishige; Kasutani, Kiyoshi; and Okamori, Kenji, 4,853,794, Cl. 358-447.000.

Kubota, Tetsuhiro: *See—*
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,853,463, Cl. 530-323.000.

Kubovy, Miloslav: *See—*
Kotrba, Zdenek; Jaros, Frantisek; Burysek, Frantisek; Kubovy, Miloslav; Hejduk, Jiri; and Bures, Pavel, 4,852,340, Cl. 57-301.000.

Kucera, Richard J. Pipe vibration reducer. 4,852,848, Cl. 248-559.000.

Kuczma, Andrew S.: *See—*
Babirad, Stefan A.; Bacon, Fredrick; Heilmann, Steven M.; Krepski, Larry R.; Kuczma, Andrew S.; and Rasmussen, Jerald K., 4,852,969, Cl. 350-96.340.

Kuehle, Walter: *See—*
Breitenbacher, Juergen; Kuehle, Walter; Moenninga, Roland; Neumann, Udo; and Schramm, Wolfgang, 4,852,863, Cl. 267-218.000.

Kuehne, Donald L., to Chevron Research Company. Chemical flooding with improved injectivity. 4,852,652, Cl. 166-270.000.

Kueng, Roland; and Widmer, Hanspeter, to Zellweger Tellecommunications Ltd. Method and apparatus for establishing a connection in shortwave radio networks. 4,853,686, Cl. 340-825.210.

Kueschall, Rainer. Lightweight wheelchair adjustable for a specific balance. 4,852,899, Cl. 280-250.100.

Kuka: *See—*
Tradt, Hans-Richard; and Schillmeier, Hans, 4,852,237, Cl. 29-407.000.

Kukson, Dean R.; Melas, Constantin M.; and Poss, Joey M., to International Business Machines Corporation. Single stage feedforward equalizer. 4,853,802, Cl. 360-65.000.

Kulbersh, Irwin: *See—*
Olson, Ralph; and Kulbersh, Irwin, 4,852,501, Cl. 108-111.000.

Kulicke & Soffa Industries, Inc.: *See—*
Berkin, George M., 4,853,968, Cl. 382-8.000.

Kulik, Helmut. Wheelchair handbrakes with actuator tube and replaceable brake stopper. 4,852,697, Cl. 188-2.00F.

Kumura, Haruyoshi, to Nissan Motor Co., Ltd. Control for continuously variable transmission. 4,853,858, Cl. 364-424.100.

Kumura, Haruyoshi: *See—*
Oshiage, Katsunori; and Kumura, Haruyoshi, 4,853,857, Cl. 364-424.100.

Kunita, Masao; Koizumi, Michio; and Ohsawa, Seiichi, to Citizen Watch Co., Ltd. Dot line printer with individually replaceable printing head. 4,852,480, Cl. 101-93.050.

Kunka, Blair S.: *See—*
Vandenbergh, Peter A.; and Kunka, Blair S., 4,853,334, Cl. 435-262.000.

Kunstmann, Uwe, to Carl Schenck AG. Conveyor system. 4,852,718, Cl. 198-465.300.

Kunzer, Adolf; and Klaiber, Thomas, to Daimler-Benz Aktiengesellschaft. Method and apparatus for controlling the steplessly variable transmission ratio of a continuously variable transmission, especially of a cone disk belt transmission, in a motor vehicle. 4,852,429, Cl. 74-866.000.

Kuramitsu, Yoichi; and Arakawa, Takahiko, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit. 4,853,757, Cl. 357-45.000.

Kuramoto, Shinji: *See—*
Mashimo, Satoshi; Kitajima, Tatsuya; Tanaka, Masayuki; and Kuramoto, Shinji, 4,852,625, Cl. 152-511.000.

Kurasawa, Morio, to Kurasawa Optical Industry Co., Ltd. Electrically conductive synthetic resin composition. 4,853,155, Cl. 252-512.000.

Kurasawa Optical Industry Co., Ltd.: *See—*
Kurasawa, Morio, 4,853,155, Cl. 252-512.000.

Kure-Jensen, Jens; Westphal, Bernd A. K.; and Drummond, Thane M., to General Electric Company. Steam turbine control with megawatt feedback. 4,853,552, Cl. 290-40.00C.

Kurihara-Bergstrom, Tamie; Good, William R.; and Ebert, Charles D., to Ciba-Geigy Corporation. Transdermal administration of a systemic active agent to a premature neonatal infant. 4,853,227, Cl. 424-443.000.

Kurihara, Takashi: *See—*
Uchida, Koh; Kurihara, Takashi; and Miyoshi, Makoto, 4,852,462, Cl. 91-375.00A.

Kuriyama, Katsumi: *See—*
Hanada, Kazuyuki; Misaizu, Iwao; Kashimura, Masashi; Goto, Tomoko; and Kuriyama, Katsumi, 4,853,418, Cl. 521-154.000.

Kurkowski, Frank; and Lucht, Manfred, to Philips and DuPont Optical Company. Machine for assembling a container. 4,852,327, Cl. 53-201.000.

Kurobe, Toshio; Kasai, Masayoshi; and Kayano, Masanori, to Eisai Co., Ltd. Stable, effervescent vaginal suppositories. 4,853,211, Cl. 424-44.000.

Kuroda, Takafumi: *See—*
Suwa, Takeshi; and Kuroda, Takafumi, 4,853,819, Cl. 361-47.000.

Kuroishi, Kazuo: *See—*
Matsumoto, Manabu; Ikeguchi, Takashi; Ueda, Shinjiroo; Sonobe, Tadasi; Murashita, Toru; Ido, Satoshi; Kuroishi, Kazuo; Kazawa, Yoshiaki; Kakiuchi, Shunji; and Kobari, Toshiaki, 4,853,640, Cl. 328-235.000.

Kurt H. Volk, Inc.: *See—*
Volk, Kurt E., Jr., 4,852,795, Cl. 229-92.000.

Kurth, Guenther V., to Eastman Kodak Company. Still video camera having a viewfinder with superimposed images. 4,853,787, Cl. 358-224.000.

Kurtha, Siegfried, to Afga-Gevaert Aktiengesellschaft. Clamp mounting mechanism and method for photographic processing apparatus. 4,853,730, Cl. 354-340.000.

Kurtovic, Jadranka: *See—*
Grabovac, Bosko; and Kurtovic, Jadranka, 4,852,386, Cl. 73-1.00C.

Kurushima, Toyokazu, to Inax Corporation. Marble-translucent thin resilient decorative sheet. 4,853,276, Cl. 428-187.000.

Kushnir, Mark: *See—*
Unger, Rueven Z.; and Kushnir, Mark, 4,852,356, Cl. 62-6.000.

Kusko, Alexander; and Medora, Noshirwan K., to Kusko, Alexander. Fluorescent lamp controlling. 4,853,598, Cl. 315-101.000.

Kusumoto, Shigehiro: *See—*
Okuyama, Hideaki; Kusumoto, Shigehiro; Watanabe, Keisuke; and Nagai, Kiyoshi, 4,852,958, Cl. 350-96.130.

Kuznicki, Steven M., to Engelhard Corporation. Large-pored crystalline titanium molecular sieve zeolites. 4,853,202, Cl. 423-326.000.

Kuzuya, Yasuhisa: *See—*
Nagata, Takuji; and Kuzuya, Yasuhisa, 4,853,263, Cl. 428-31.000.

Kwik Kool, Inc.: *See—*
Robertson, James D.; and Balthaser, Paul E., 4,852,769, Cl. 222-83.500.

Kyocera Corporation: *See—*
Nakamura, Katsumi; and Yamamoto, Tadahisa, 4,853,271, Cl. 428-41.000.
Tsujimura, Masao; Hirooka, Masamichi; Ishikawa, Kazuo; Morooka, Takayoshi; Noda, Masaki; Akiyama, Mamoru; Murai, Nobuaki; and Yoshikawa, Seiji, 4,853,731, Cl. 354-400.000.

Kyokuto International Corporation: *See—*
Karakawa, Koichi; Yoshimatsu, Tatsuhiko; Tsuchimoto, Hideyuki; and Hiwatashi, Katsumi, 4,852,484, Cl. 101-170.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Saito, Yutaka; Kasai, Masaji; Shirahata, Kunikatsu; Kono, Motomichi; Morimoto, Makoto; and Ashizawa, Tadashi, 4,853,385, Cl. 514-250.000.

La Telemecanique Electrique: *See—*
Belaidouni, Ali; Benani, Andre ; and Millet, Jean-Marie, 4,852,241, Cl. 29-564.400.

Labavia S.G.E.: *See—*
Estaque, Michel, 4,853,574, Cl. 310-105.000.

Labbe, Francis A. M., to Molins PLC. Cigarette making machine. 4,852,589, Cl. 131-84.300.

LaBelle, Charles E. Paint edger for the application of paint. 4,852,203, Cl. 15-210.00R.

Labex GmbH: *See—*
Klein, Arno, 4,852,628, Cl. 160-199.000.

LaCava, Alberto: *See—*
Kaplan, Robert H.; LaCava, Alberto; Shirley, Arthur I.; and Ringo, Steven M., 4,853,004, Cl. 55-25.000.

Lacey, David: *See—*
Chan, Lawrence K. M.; Coates, David; Gemmell, Peter A.; Gray, George W.; Lacey, David; Toyne, Kenneth J.; and Young, Daniel J. S., 4,852,977, Cl. 350-350.00S.

Lacey, Dianne L.: *See—*
Baker, John M.; Callegari, Alessandro C.; Lacey, Dianne L.; and Shih, Yih-Cheng, 4,853,346, Cl. 437-184.000.

Lacroix, Jean-Claude: *See—*
Herbin, Patrick; and Lacroix, Jean-Claude, 4,852,631, Cl. 164-98.000.

Ladner, Robert C.: *See—*
Pantoliano, Michael W.; and Ladner, Robert C., 4,853,871, Cl. 364-496.000.

Lahitte, Pierre V. A.: *See—*
Guillou, Bernard P. Y.; and Lahitte, Pierre V. A., 4,853,656, Cl. 333-34.000.

Lai, George Y.: *See—*
Rothman, Michael F.; Klarstrom, Dwaine L.; and Lai, George Y., 4,853,185, Cl. 420-584.000.

Laine, Derek C.; and Taha, Mohammad I. A., to University of Keele. Frequency stabilization of gas lasers. 4,853,935, Cl. 372-32.000.

L'Air Liquide: *See—*
Roussel, Jacques; and Cochet, Xavier, 4,853,136, Cl. 210-761.000.

L'Air Liquide, Societe Anonyme Pour L'etude et Exploitation des Procedes Georges Claude: *See—*
Rio, Michel; Iltis, Claude; Louis, Herve ; Buffet, Georges; Joly, Marcel; Goudard, Jean-Francois; Bacherot, Joel; and Ducret, Claude, 4,853,013, Cl. 55-159.000.

Laitram Corporation, The: *See—*
Lapeyre, James M., 4,852,719, Cl. 198-666.000.

Lamarque, Etienne, to Thomson-Brandt Armements. Device to brake the unfolding of a fin and guided missile fitted with a device of this type. 4,852,828, Cl. 244-3.290.

Lambelin, Georges: *See—*
Bovy, Philippe R.; Gillet, Claude; Lenaers, Albert; Niebes, Paul; Robs, Joseph; and Lambelin, Georges, 4,853,401, Cl. 514-389.000.

Lambert, Bertrand; Toudic, Yves; and Coquille, Rene , to Etat Francais. Process for the preparation of mono-crystalline 3-5 semi-insulating materials by doping and use of the semi-insulating materials thus obtained. 4,853,077, Cl. 156-605.000.

Lambertz, Johannes; Adlhoch, Wolfgang H.; Mittelstadt, Alfred G.; and Hermann, Wolfgang, to Rheinische Braunkohlenwerke AG. Process for the production of gas containing hydrogen and carbon monoxide from solid fuel. 4,852,994, Cl. 48-197.00R.

Lamblin, Jean-Marc: *See—*
Guth, Jean-Louis; Faust, Anne-Catherine; Raatz, Francis; and Lamblin, Jean-Marc, 4,853,203, Cl. 423-328.000.

Lamour, Robert L.: *See—*
Werner, Walter V.; and Lamour, Robert L., 4,852,959, Cl. 350-96.180.

Lampart, Dieter: *See—*
Kormendi, Kalman; Lampart, Dieter; Mannherz, Fritz; and Scheurenbrand, Dieter, 4,852,758, Cl. 220-20.500.

Lampert, Norman R., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical fiber biconic connector. 4,852,963, Cl. 350-96.210.

Lamport, Daphne L.; and Woodhead, Alfred W., to U.S. Philips Corporation. Flat cathode ray display tube with periodic beam refocusing means. 4,853,587, Cl. 313-422.000.

Lancaster, Gerald M.: *See—*
Pham, Tu-Anh; and Lancaster, Gerald M., 4,853,420, Cl. 521-50.500.

Landis, Timothy J. Combined visor and protective shield. 4,852,186, Cl. 2-9.000.

Landmeier, Waldo L., to Calcomp Inc. Shielding techique for digitizers. 4,853,497, Cl. 178-18.000.

Landt, Jeremy A., to Amtech Technology Corporation. Beam powered antenna. 4,853,705, Cl. 343-803.000.

Lane, Anthony A., to Plessey Overseas Limited. Microwave phase shifters. 4,853,658, Cl. 333-164.000.

Lane, Robert H.: *See—*
Schramm, Charles M.; Lane, Robert H.; and Dines, Martin B., deceased, 4,853,358, Cl. 502-167.000.

Langan, Jeffrey M. Safety barrier for small children. 4,852,194, Cl. 5-427.000.

Lange International S.A.: *See—*
Courvoisier, Guy; and Arieh, Simon, 4,852,222, Cl. 24-68.0SK.

Langer, Hans-Joachim: *See—*
Abthoff, Joerb; Schuster, Hans-Dieter; Langer, Hans-Joachim; Strohmer, Erwin; Gabler, Rolf; and Schulte, Roland, 4,852,349, Cl. 60-303.000.

Langler, James E., to General Mills, Inc. Dual textured food piece of enhanced stability. 4,853,236, Cl. 426-102.000.

Langli, Ola K. Strike trap for catching mice and rats. 4,852,294, Cl. 43-81.000.

Lansing, James P., to JVJ Enterprises, Inc. Semiautomatic frying machine and air filter apparatus therefor. 4,852,471, Cl. 99-330.000.

Lanxide Technology Company, LP: *See—*
Newkirk, Marc S.; and Zwicker, Harry R., 4,853,352, Cl. 501-88.000.

Lapanik, Valery I.: *See—*
Bezborodov, Vladimir S.; Grinkevich, Oleg A.; Grebenkin, Mikhail F.; Lapanik, Valery I.; Minko, Anatoly A.; Rzhussky, Vitaly V.; Muravsky, Anatoly A.; Petrov, Vladimir F.; and Ivaschenko, Alexandr V., 4,853,150, Cl. 252-299.610.

Lapeyre, James M., to Laitram Corporation, The. Modular screw conveyor. 4,852,719, Cl. 198-666.000.

Lappies, Mark F.: *See—*
Sellar, James R.; Reisdorf, James E.; Lappies, Mark F.; and Valle, Mark S., 4,852,740, Cl. 206-444.000.

Larson, David R.: *See—*
Brooks, William W., Jr.; Clemen, Curtis J.; Coffey, Jerome T.; Coffield, Timothy P.; and Larson, David R., 4,853,811, Cl. 360-103.000.

Laschinski, Dieter H.: *See—*
Neubauer, Rudolf F. W.; Jungbluth, Werner W.; and Laschinski, Dieter H., 4,853,938, Cl. 372-65.000.

Laser Precision Corporation: *See—*
Doyle, Walter M.; and Hughes, Norman S., 4,852,955, Cl. 350-1.200.

Lassiaz, Philippe: *See—*
Gay, Christian; and Lassiaz, Philippe, 4,852,710, Cl. 192-98.000.

Lata, Walter J.; and Trupiano, Michael S., to Boeing Company, The. Programmable multifunction keyboard. 4,853,888, Cl. 364-900.000.

Laurel Bank Machines Co., Ltd.: *See—*
Uchida, Shinya, 4,852,253, Cl. 30-2.000.

Laurer, Erwin: *See—*
Johansen, Trond V.; Ruch, Ola; Naess, Ludvig; Weber, Robert; Veenhoff, Bernd; Porner, Horst; Laurer, Erwin; Strickroth, Erich; and Schabert, Hans-Peter, 4,852,614, Cl. 138-93.000.

Lausch, Michael, to Heimann GMBH. Flash discharge lamp with sintered cathode member. 4,853,596, Cl. 313-632.000.

Laviron, Charles: *See—*
Durual, Pierre; Hermant, Marc; and Laviron, Charles, 4,853,141, Cl. 252-51.000.

Laws, Peter G., to Plessey Overseas Limited. Manchester code clock and data recovery system. 4,853,943, Cl. 375-87.000.

Lazes, Richard: *See—*
Goans, Kip B., 4,852,394, Cl. 73-49.800.

Le Carbone Lorraine: *See—*
Coulon, Michel; Faron, Robert; and Besson, Daniel, 4,852,645, Cl. 165-180.000.

Le, Minh S.; and Wilkes, John S., to Domnick Hunter Ilblry Limited. Microporous membrane. 4,853,127, Cl. 210-500.390.

Lea, Sandra. Roof structures. 4,852,311, Cl. 52-92.000.

Leach, Susan E.: *See—*
Parsons, John H.; Hunt, Russell G.; Leach, Susan E.; Buss, Anthony D.; Green, David E.; Mellor, Michael; and Percival, Albert, 4,853,400, Cl. 514-383.000.

Leary, Timothy G.: *See—*
Donegan, Thomas E.; Bantjes, John H.; and Leary, Timothy G., 4,853,039, Cl. 106-412.000.

Lederhofer, Artur H.: *See—*
Bain, William L., Jr.; de Oliveira Camargo, Marcos; Duzett, Robert C.; Lederhofer, Artur H.; Peterson, Craig B.; and Wipfli, John L., 4,853,849, Cl. 364-200.000.

Ledwitz, Kenenth W. Toothbrush with angled bristles. 4,852,202, Cl. 15-167.100.

Lee, Chung J., to Occidental Chemical Corporation. Novel soluble polyimidesiloxanes and methods for their preparation using a flourine containing anhydride. 4,853,452, Cl. 528-26.000.

Lee, David L.: *See—*
Carter, Charles G.; Lee, David L.; and Michaely, William J., 4,853,028, Cl. 71-103.000.

Lee, Genius. Multiple water color combination set. 4,852,726, Cl. 206-1.900.

Lee, Jae S.: *See—*
Min, Sung-Ki; and Lee, Jae S., 4,853,559, Cl. 307-270.000.

Lee, Ronald S.: *See—*
Boberg, Ralph E.; Lee, Ronald S.; and Weingart, Richard C., 4,852,493, Cl. 102-202.500.

Lee, Sung J.: *See—*
Dolak, Terence M.; Lee, Sung J.; and Bullington, James L., 4,853,389, Cl. 514-275.000.

Lee, Yong N. Heat exchange device. 4,852,642, Cl. 165-109.100.

Lefebvre, Robert: *See—*
Allard, Pierre; Lefebvre, Robert; Vallee, Daniel; and Bertoo, Pierre, 4,852,348, Cl. 60-270.100.

Le Foyer de Costil, Carole: *See—*
Shroot, Braham; Le Foyer de Costil, Carole; and Ayache, Liliane, 4,853,379, Cl. 514-179.000.

Legave, Marie-Noelle: *See—*
Nadler, Guy; Le Polles, Jean-Bernard; and Legave, Marie-Noelle, 4,853,391, Cl. 514-294.000.

Legrand, Franz: *See—*
Wautier, Henri; Legrand, Franz; and Lerot, Luc, 4,853,207, Cl. 423-592.000.

Lehto, John M., to Northern States Power Company. Flue gas scrubber system. 4,853,195, Cl. 423-242.000.

Leichter, Louis M.: *See—*
Brown, David E.; and Leichter, Louis M., 4,853,310, Cl. 430-83.000.

Leichum, Axel: *See—*
Seeger, Helmut; Leichum, Axel; and Maher, Anthony, 4,853,957, Cl. 379-279.000.

Leidinger, Gustav; Proll, Gunther; and Kolb, Walter, to O & K Orenstein & Koppel Aktiengesellschaft. Grader blade having a pressurized float position. 4,852,660, Cl. 172-795.000.

Leigh-Monstevens, Keith V., to Automotive Products plc. Manual override for relief of pulsator circuit with reservoir ball valve. 4,852,352, Cl. 60-585.000.

Leithaeuser, Horst; Reese, Dirk; and Trautmann, Walter, to Huels Aktiengesellschaft. Process for the preparation of low viscosity aqueous dispersion of glycerol esters of long-chain fatty acids, and their use. 4,853,038, Cl. 106-243.000.

Leitner, Lutz: *See—*
Schick, Peter; Jonas, Friedrich; and Leitner, Lutz, 4,853,289, Cl. 428-408.000.

LeJus, Anne-Marie: *See—*
Calvat, Claude; Colle, Laurent; Couchaud, Maurice; LeJus, Anne-Marie; Moncorge, Richard; Vivien, Daniel; and Wyon, Christophe, 4,853,354, Cl. 501-119.000.

Lemaire, Didier; and Dronet, Jean-Marc, to E. P. Remy & Cie. Apparatus for automatically eliminating a group of articles to be treated of which at least one is missing or defective. 4,852,745, Cl. 209-588.000.

Lemelson, Jerome H. Beam apparatus and method. 4,853,514, Cl. 219-121.120.

Lemieux, Michael J., to American Eagle Fire Apparatus Co., Inc. Common grooved and slotted structural members for a truck body. 4,852,937, Cl. 296-183.000.

LeMoine, Eric D.: *See—*
Vodian, Morton A.; Bean, Eric S.; and LeMoine, Eric D., 4,853,325, Cl. 435-5.000.

Lenaers, Albert: *See—*
Bovy, Philippe R.; Gillet, Claude; Lenaers, Albert; Niebes, Paul; Roba, Joseph; and Lambelin, Georges, 4,853,401, Cl. 514-389.000.

Lenaertz, Pierre J., to Societe Anonyme Des Ateliers Houget Duesberg Bosson. Process and apparatus for automatically changing drums which are to receive wicks delivered by textile machines. 4,852,218, Cl. 19-159.00A.

Lenden, David G. B. Latch for a hook setting mechanism for fishing rods. 4,852,289, Cl. 43-15.000.

Lener, Lawrence I., to Lenox Incorporated. Hanger clamp with inclined frame. 4,852,845, Cl. 248-316.100.

Lenox Incorporated: *See—*
Lener, Lawrence I., 4,852,845, Cl. 248-316.100.

Leonard Holtz: *See—*
Hochfeld, Stanley, 4,852,255, Cl. 30-102.000.

Leonhard, Rolf; and Schutz, Peter, to Robert Bosch GmbH. Soot reservoir for an exhaust gas scrubbing system for an internal combustion engine. 4,853,007, Cl. 55-337.000.

Leoni, Peter B.: *See—*
Jacaruso, Gary J.; and Leoni, Peter B., 4,853,172, Cl. 264-571.000.

Leopold, Wilbur R., III: *See—*
Elslager, Edward F.; and Leopold, Wilbur R., III, 4,853,221, Cl. 424-649.000.

Le Polles, Jean-Bernard: *See—*
Nadler, Guy; Le Polles, Jean-Bernard; and Legave, Marie-Noelle, 4,853,391, Cl. 514-294.000.

Lerner, Stuart D.: *See—*
Tella, Richard P.; and Lerner, Stuart D., 4,852,242, Cl. 29-568.000.

Lerot, Luc: *See—*
Wautier, Henri; Legrand, Franz; and Lerot, Luc, 4,853,207, Cl. 423-592.000.

Leslie, Michael D., to Chrysler Motors Corporation. Apparatus for automated assembly of a harness retainer stud. 4,853,075, Cl. 156-584.000.

Lessard, William W.: *See—*
Levene, Martin M.; and Lessard, William W., 4,852,439, Cl. 83-19.000.

Lessig, William R., III, to Black & Decker Inc. Tachometer generator. 4,853,575, Cl. 310-171.000.

Letournel, Gilles J. M.: *See—*
Amiot, Jacques H. J.; Fourny, Jacky R. P.; Letournel, Gilles J. M.; and Parise, Vital A., 4,852,814, Cl. 241-37.500.

Leung, Pak T., to Uniroyal Plastics Company, Inc. Polyurethane adhesive thermoforming lamination process employing water-based. 4,853,061, Cl. 156-216.000.

Levenberg, Nat. Metal forming methods and products formed thereby. 4,852,379, Cl. 72-384.000.

Levene, Martin M.; and Lessard, William W. Vacuum die cutting method and apparatus. 4,852,439, Cl. 83-19.000.

Levine, Aaron W., to General Electric Company. Method of forming a structural bond employing indirect exposure of a light responsive adhesive. 4,853,064, Cl. 156-275.500.

Levine, Alfred B. Comparative medical-physical analysis. 4,852,570, Cl. 128-630.000.

Levine, Lance R.; and Pratt, Clarence A., Jr., to MFI International, Inc. Fishing accessory container. 4,852,293, Cl. 43-54.100.

Lewis, Dennis E. Alternating current power sensing device for preventing start-up at power restoration. 4,853,821, Cl. 361-92.000.

Lewis, Maurice W.: *See—*
Obringer, Thomas J.; Siegel, Louis F.; and Lewis, Maurice W., 4,853,256, Cl. 427-152.000.

Lewis, Norman J.; and Panzer, Hans P., to American Cyanamid Copany. Method for the depressing of hydrous, layered silicates. 4,853,114, Cl. 209-167.000.

Lewis, Scott: *See—*
Morton, Roger R. A.; and Lewis, Scott, 4,853,795, Cl. 358-447.000.

Lewus, Alexander J. Noise suppression circuit for capacitor motors. 4,853,569, Cl. 310-68.00E.

Leybold Aktiengesellschaft: *See—*
Gretzinger, Klaus; and Wombacher, Erich, 4,852,414, Cl. 73-864.850.

LGZ Landis & Gyr Zug AG: *See—*
Halder, Mathis; and Joder, Andreas, 4,853,620, Cl. 324-142.000.

Li, Jian X. Method of playing a three in a row game. 4,852,887, Cl. 273-264.000.

Liang, Rong-Chang; Colyer, Emerson K.; and Borello, Kelli J., to Mead Corporation, The. Developer composition comprising phenol resins and vinylic or acrylic resins. 4,853,364, Cl. 503-216.000.

Liberty Glass Company: *See—*
Bolin, James A., 4,853,023, Cl. 65-323.000.

Lichter, Robert J. Sliding door safe with anti-intrusion lock device. 4,852,503, Cl. 109-59.00R.

Lieb, Folker: *See—*
Rosentreter, Ulrich; Boshagen, Horst; Lieb, Folker; Oediger, Hermann; Niewohner, Ulrich; Seuter, Friedel; Perzborn, Elisabeth; and Fiedler, Volker-Bernd, 4,853,406, Cl. 514-411.000.

Liljestrom, William P.: *See—*
Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrom, William P., 4,852,818, Cl. 241-301.000.

Lin, An C. R.: *See—*
Van Brimer, R. Hugh; Allred, Donald; Cooke, Theodore M.; Lin, An C. R.; and Rubbo, Julia E., 4,853,706, Cl. 346-1.100.

Lin, Hsiu-Ping W.: *See—*
Ebner, Walter B.; and Lin, Hsiu-Ping W., 4,853,304, Cl. 429-192.000.

Lin, Leo S.: *See—*
Mark, David F.; Lin, Leo S.; and Yu Lu, Shi-Da, 4,853,332, Cl. 435-252.330.

Lindberg, Christer, to Diab-Barracuda AB. Dummy aeroplane. 4,852,326, Cl. 52-745.000.

Linde, Rolf E.: *See—*
Haaker, Paul R.; Klotz, Erhard P. A.; Koppe, Reiner H.; and Linde, Rolf E., 4,853,947, Cl. 378-99.000.

Ling, Chong-Kuan. Randomly engageable combination locking device. 4,852,372, Cl. 70-312.000.

Linville, Andrew F., Jr.; Shirley, Thomas E.; and Griffith, Paul G., to Mobil Oil Corporation. Method and apparatus for removing sinusoidal noise from seismic data. 4,853,903, Cl. 367-46.000.

Lipa, George W.: *See—*
Walter, Richard T.; Bhagwat, Pradeep; and Lipa, George W., 4,853,607, Cl. 320-36.000.

Lipinski, Christopher A., to Pfizer Inc. Hydroxyacetic acid derivatives for the treatment of diabetic complications. 4,853,410, Cl. 514-432.000.

Lipsztajn, Marek; McGilvery, James D.; and Twardowski, Zbigniew, to Tenneco Canada Inc. Production of chlorine dioxide in an electrolytic cell. 4,853,096, Cl. 204-101.000.

Littell, Edmund R. Vacuum cup construction. 4,852,926, Cl. 294-64.100.

Little, James A.; and Cavin, Dennis, to Simco-Ramic Corp. Defect detection system with quick-release modules. 4,853,533, Cl. 250-223.00R.

Liu, Wen H. Centrifugal cooling device. 4,853,162, Cl. 261-89.000.

Livingston, William S. Therapeutic treatment for arthritic condition. 4,853,373, Cl. 514-46.000.

Lloyd, William D.: *See—*
Win, Maung H.; Lloyd, William D.; Abba, William A.; and Daponte, Diego H., 4,853,142, Cl. 252-90.000.

Lo, C. Paul: *See—*
Reimers, Robert S.; Akers, Thomas G.; and Lo, C. Paul, 4,853,208, Cl. 423-659.000.

Lo, Pei-hwa; Sokolich, James M.; and Matesich, Ardis M., to Allied-Signal Inc. Digital AM/FM/ϕM demodulator. 4,853,944, Cl. 375-94.000.

Lo, Peter K. Exercise bicycle for exercising arms and legs. 4,852,872, Cl. 272-73.000.

Lo, Peter Y.: *See—*
Bahr, Bradley C.; Lo, Peter Y.; Lomas, A. Wade; and Romenesko, David J., 4,853,474, Cl. 556-445.000.

Lochmahr, Karl: *See—*
Kampf, Hans; and Lochmahr, Karl, 4,852,363, Cl. 62-176.600.

Lockwood, Larry E. Paint brush holder. 4,852,833, Cl. 248-110.000.

Lodige Fordertechnik GmbH: *See—*
Stille, Volker, 4,852,721, Cl. 198-782.000.

Lodin, David W., to Honeywell Inc. Lamp replacement tool. 4,852,925, Cl. 294-2.000.

Loebig, Craig K.: *See—*
Mayer, Daniel W.; Loebig, Craig K.; and Savick, Wayne K., 4,852,389, Cl. 73-38.000.

Logan, Richard H.: *See—*
Brown, Thomas R.; Logan, Richard H.; Hahn, Robert W.; Rodeghiero, Charles D.; and Brekkestran, Kevin L., 4,852,680, Cl. 180-287.000.

Logan, Shawn M.: *See—*
Embree, David M.; and Logan, Shawn M., 4,853,655, Cl. 331-116.0FG.

Lohmann, Wolfgang. Device for measuring eye lens opacity. 4,852,987, Cl. 351-221.000.

Lomas, A. Wade: *See—*
Bahr, Bradley C.; Lo, Peter Y.; Lomas, A. Wade; and Romenesko, David J., 4,853,474, Cl. 556-445.000.

London & Egazarian Associates, Inc.: *See—*
Kmetz, Joseph J., 4,852,715, Cl. 198-370.000.

Longley, Kathryn L.: *See—*
Gambale, Ronald J.; Hathaway, Susan J.; Longley, Kathryn L.; and Ullman, Timothy J., 4,853,458, Cl. 528-198.000.

Look, Art; and Valenti, Joseph. Portable traffic barrier. 4,852,511, Cl. 116-63.00P.

Loomis International: *See—*
Pate, Charles D.; Young, Bob R.; and Plata, Hector, 4,852,393, Cl. 73-49.500.

Looser, Gottlieb. Winding method and apparatus. 4,852,820, Cl. 242-56.00R.

Louies, Bernard D.: *See—*
Herten, Joris F.; and Louies, Bernard D., 4,853,427, Cl. 524-394.000.

Louis, Herve : *See—*
Rio, Michel; Iltis, Claude; Louis, Herve ; Buffet, Georges; Joly, Marcel; Goudard, Jean-Francois; Bacherot, Joel; and Ducret, Claude, 4,853,013, Cl. 55-159.000.

Loutfy, Rafik O.: *See—*
Tam, Man C.; Bloembergen, Steven; Kovacs, Gregory J.; Jennings, Carol A.; Loutfy, Rafik O.; Gardner, Sandra J.; and Taylor, Michael G., 4,853,307, Cl. 430-41.000.

Love, Walter F.: *See—*
Cook, Thomas A.; Love, Walter F.; and Slovacek, Rudolf E., 4,852,967, Cl. 350-96.290.

Lovgren, Kurt I.; Pilbrant, Ake G.; Yasumura, Mitsuru; Morigaki, Satoshi; Oda, Minoru; and Ohishi, Naohiro, to Aktiebolaget Hassle. Pharmaceutical formulations of acid labile substances for oral use. 4,853,230, Cl. 424-466.000.

Low, Michael L.; and Craft, Jack, to RCA Licensing Corp. Current gain compensation arrangement. 4,853,647, Cl. 330-256.000.

Loyd, Calvin D., to Caterpillar Inc. Nitriding grade alloy steel article. 4,853,049, Cl. 148-318.000.

Loza, Roman; and Cyngier, Roseann M., to Standard Oil Company, The. C-branched zwitterionic surfactants and enhanced oil recovery method using same. 4,853,138, Cl. 252-8.554.

Lu, Shih-Lai; and Wong, Andrew H., to Minnesota Mining and Manufacturing Company. Easy open closure system. 4,853,267, Cl. 428-35.700.

Lucas Industries public limited company: *See—*
Brearley, Malcolm; Phillips, Mark I.; Prescott, Robert D.; and Ross, Colin F., 4,852,953, Cl. 303-111.000.
Gaskell, David J., 4,852,803, Cl. 239-86.000.
Heibel, Helmut, 4,852,700, Cl. 188-73.430.
Price, Anthony G., 4,852,351, Cl. 60-545.000.

Lucasey Manufacturing Company, Inc.: *See—*
O'Neill, Edward, 4,852,842, Cl. 248-280.100.

Lucht, Manfred: *See—*
Kurkowski, Frank; and Lucht, Manfred, 4,852,327, Cl. 53-201.000.

Luderer, Fred: *See—*
Behr, Hans; Vetter, Kurt; Schneider, Rolf; and Luderer, Fred, 4,852,810, Cl. 239-703.000.

Ludwig, Harold P.: *See—*
Abkowitz, Stanley; Heussi, Harold L.; Ludwig, Harold P.; and Kraus, Stephen A., 4,852,531, Cl. 123-188.0AA.

Ludwig, Theo: *See—*
Tasler, Guenter; Wiendenhoeft, Klaus; Schultheiss, Michael; Schoenfuss, Martin; Ludwig, Theo; Huster, Klaus; and Grenzendoerfer, Dietmar, 4,852,370, Cl. 66-203.000.

Luk, Timwah: *See—*
Johnson, Terry J.; and Luk, Timwah, 4,853,646, Cl. 330-256.000.

Lukach, Carl A.; and Sau, Arjun C., to Hercules Incorporated. Water- and caustic-insoluble, inswellable, fibrous, particulate crosslinked polymer. 4,853,437, Cl. 525-54.210.

Lukacsko, Alison B.: *See—*
Koslo, Randy J.; and Lukacsko, Alison B., 4,853,216, Cl. 424-73.000.

Lukas, Helmut H., to Northern Telecom Limited. Optical fiber stripping and breaking apparatus. 4,852,244, Cl. 29-566.300.

Luke, Hans-Wolfgang: *See—*
Segerstrom, Clifford C.; Sternling, Charles V.; Luke, Hans-Wolfgang; and Wu, Hsi L., 4,852,997, Cl. 48-210.000.

Lum, Vanessa R.: *See—*
Mura, Albert J.; Belly, Robert T.; and Lum, Vanessa R., 4,853,186, Cl. 422-55.000.

Lumel, Inc.: *See—*
Simopoulos, Nicholas T.; Simopoulos, George N.; and Simopoulos, Gregory N., 4,853,079, Cl. 156-633.000.

Lunts, Lawrence H. C.: *See—*
Finch, Harry; Lunts, Lawrence H. C.; Naylor, Alan; Skidmore, Ian F.; and Campbell, Ian B., 4,853,381, Cl. 514-211.000.
Skidmore, Ian F.; Finch, Harry; Naylor, Alan; Lunts, Lawrence H. C.; and Campbell, Ian B., 4,853,382, Cl. 514-212.000.

Lunz, Kenneth G.: *See—*
Bednar, Fred H.; and Lunz, Kenneth G., 4,853,174, Cl. 376-254.000.

Lupinski, John H.: *See—*
Walles, Erik W.; Lupinski, John H.; Markovitz, Mark; Colborn, Robert E.; Presley, James R.; Davis, Michael J.; Minnick, Michael G.; Kubisen, Steven J., Jr.; Hallgren, John E.; Bolon, Donald A.; Eddy, Victoria J.; and Irwin, Patricia C., 4,853,423, Cl. 523-428.000.

Luttermoser, Donald L.: *See—*
Ross, Donald K.; and Luttermoser, Donald L., 4,852,888, Cl. 273-373.000.

Lutz, Dieter: *See—*
Kittel, Friedrich; Lutz, Dieter; Nagler, Franz; Oppitz, Horst; and Gasper, Gerhard, 4,852,419, Cl. 74-89.140.

Lutz, Frank T., to Cardiff Technology Inc. Linear actuator for disc drive. 4,853,808, Cl. 360-98.010.

Lyall, Lucian H., to Milfuse Systems, Inc. Plastic pipeline having rapidly fusible joints and method of making same. 4,852,914, Cl. 285-21.000.

Lynch, Robert J.: *See—*
Kahn, Marvin L.; and Lynch, Robert J., 4,853,243, Cl. 426-564.000.

Lyon, John E.: *See—*
Stahlheber, N. Earl; and Lyon, John E., 4,853,200, Cl. 423-309.000.

Lyzohub, Walter A., to Chrysler Motors Corporation. Fuel tank with bladder. 4,852,765, Cl. 220-461.000.

M.A.N.-Roland Druckmaschinen: *See—*
Holl, Roland; and Dettinger, Dietrich, 4,852,491, Cl. 101-408.000.

M.D.R. Group, Inc.: *See—*
Allen, Mark D., 4,853,374, Cl. 514-57.000.

M.P.I.Metrologie Pesage International: *See—*
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M&R Marking Systems, Inc.: *See—*
Wall, Alexander C.; and Sculler, Leonard H., 4,852,489, Cl. 101-334.000.

Mabuchi Motor Co., Ltd.: *See—*
Mayumi, Etsuo; and Hiromasa, Kunio, 4,853,576, Cl. 310-239.000.

Mabushi Motor Co., Ltd: *See—*
Fujiwara, Hitoshi, 4,853,568, Cl. 310-68.00C.

MacArthur, James B.; McLean, Joseph B.; and Comolli, Alfred G., to HRI, Inc. Two-stage co-processing of coal/oil feedstocks. 4,853,111, Cl. 208-421.000.

Maccone, Sergio, to Agrimont S.p.A. Compoeitions of methyl-3-(3'methylphenyl-carbamoyloxy phenylcarbamate, stable in an aqueous emulsion. 4,853,029, Cl. 71-111.000.

MacDermid, Incorporated: *See—*
D'Ambrisi, Joseph J., 4,853,095, Cl. 204-82.000.

Machida, Minoru; and Arakawa, Masayuki, to Chugai Seiyaku Kabushiki Kaisha. Sustained-release particulate preparation and process for preparing the same. 4,853,226, Cl. 424-426.000.

Machine Technology, Inc.: *See—*
Rubin, Richard H.; Petrone, Benjamin J.; Heim, Richard C.; and Pawenski, Scott M., 4,852,516, Cl. 118-715.000.

Mackey, Charles S.: *See—*
Dickinson, Ben W. O., III; Dickinson, Robert W.; May, Sherman C.; and Mackey, Charles S., 4,852,668, Cl. 175-67.000.

MacMahon, Alistair J.: *See—*
Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansley, Robert W.; and Newman, Alec T., 4,853,234, Cl. 426-77.000.

Maeda, Minoru: *See—*
Azuma, Nobuyuki; Maeda, Minoru; and Nakamura, Kazuo, 4,853,204, Cl. 423-344.000.

Maeda, Satoru, to Kabushiki Kaisha Toshiba. Pick-up control circuits for disc information reproducing apparatus. 4,853,913, Cl. 369-32.000.

Maeda, Satoru: *See—*
Murashima, Hirotsugu; and Maeda, Satoru, 4,853,788, Cl. 358-227.000.
Murashima, Hirotsugu; and Maeda, Satoru, 4,853,789, Cl. 358-227.000.

Machara, Shigeharu: *See—*
Okamoto, Yuji; Machara, Shigeharu; and Fujiwara, Katsuyoshi, 4,853,748, Cl. 355-55.000.

Maejima, Hideo: *See—*
Iwamura, Masahiro; Maejima, Hideo; and Masuda, Ikuro, 4,853,560, Cl. 307-296.100.

Maekawa, Kengo; Suzuki, Moitsu; Nakano, Yukiya; and Tani, Hisahiko, to Kabushiki Kaisha Asaplan. Dripping sound generating apparatus. 4,852,685, Cl. 181-175.000.

Magic Spray Inc.: *See—*
Daugherty, William T., 4,852,593, Cl. 134-94.000.

Magnavox Government and Industrial Electronics Company: *See—*
Richeson, William E.; and Erickson, Frederick L., 4,852,528, Cl. 123-90.110.

Magnetek Universal Manufacturing Corp.: *See—*
Freimuth, Lothar; and Van Wagener, Raymond H., 4,853,667, Cl. 336-192.000.

Maher, Anthony: *See—*
Seeger, Helmut; Leichum, Axel; and Maher, Anthony, 4,853,957, Cl. 379-279.000.

Maher, Steven C., to Rockwell International Corporation. Multiple input clock selector. 4,853,653, Cl. 331-49.000.

Mahler, Jacques: *See—*
Soszka, Barbara; Federowsky, Robert; and Mahler, Jacques, 4,853,021, Cl. 65-2.000.

Mahlich, Gotthard C.; and Borgmann, Michael, to Robert Krups Stiftung & Co. KG. Espresso machine with cappuccino making attachment. 4,852,474, Cl. 99-293.000.

Maier, Gerhard A.; Enlow, David L.; and Ng, Paul T., to Outboard Marine Corporation. Trigger system for ignition system for internal combustion engines. 4,852,536, Cl. 123-414.000.

Maki, Tooru: *See—*
Takashima, Yasuji; Koyama, Ikuo; Maki, Tooru; and Nakamori, Katsu, 4,853,249, Cl. 427-3.000.

Makino, Katsumi; Ohashi, Yuichi; Takehara, Hiroshi; Suga, Yoichi; and Shiozawa, Takekimi, to Fuji Photo Film Co., Ltd. Light-sensitive silver halide emulsion and color photographic materials using the same. 4,853,322, Cl. 430-567.000.

Makishima, Hideo; and Hyodo, Kenji, to Mitsubishi Paper Mills, Ltd. Thermal transfer material. 4,853,274, Cl. 428-143.000.

Malamas, Michael S.: *See*—
Ferdinandi, Eckhardt S.; Malamas, Michael S.; Sestanj, Kazimir; and Sehgal, Surendra N., 4,853,484, Cl. 564-74.000.

Maldonado-Zagal, Sigisfredo: *See*—
Steinleitner, Gunther; Mennicke, Stefan; Feindler, Philbert; Klein, Herbert; and Maldonado-Zagal, Sigisfredo, 4,853,303, Cl. 429-104.000.

Malin, Michael J.: *See*—
Benezra, Jeffrey; and Malin, Michael J., 4,853,338, Cl. 436-66.000.

Man Design Co., Ltd.: *See*—
Shimizu, Giichiro; Okuyama, Toshiharu; and Wakatsuki, Yoshio, 4,852,264, Cl. 33-832.000.

Man Gutehoffnungshuette GmbH: *See*—
Knop, Klaus; Wolters, Gunter; and Kubiak, Helmut, 4,852,996, Cl. 48-197.00R.
Schlemenat, Alfred; and David, Helmut, 4,852,644, Cl. 165-158.000.

MAN Roland Druckmaschinen: *See*—
Abendroth, Paul; Mathes, Josef; and Holl, Roland, 4,852,488, Cl. 101-246.000.

Mandeville, Jon R., to International Business Machines Corporation. Method for automatic optical inspection analysis of integrated circuits. 4,853,967, Cl. 382-8.000.

Mangnall, Keith, to Hick, Hargreaves & Company Limited. Liquid deaerating apparatus. 4,853,006, Cl. 55-185.000.

Manser, Reinhard; Schaefer, Hans; Voight, Carl; and Pfeifer, Wolf D., to Degussa AG. Process & apparatus for the production of hydrogen cyanide. 4,853,190, Cl. 422-197.000.

Mannesmann Kienzle GmbH: *See*—
Feesenmeier, Hugo; Zumkeller, Oskar; Schneider, Werner; and Grieser, Hans, 4,853,666, Cl. 336-130.000.

Mannherz, Fritz: *See*—
Kormendi, Kalman; Lampart, Dieter; Mannherz, Fritz; and Scheurenbrand, Dieter, 4,852,758, Cl. 220-20.500

Manoury, Philippe; Binet, Jean; and Dewitte, Elisabeth, to Synthelabo. Piperidine derivatives, and their application in therapy. 4,853,387, Cl. 514-272.000.

Manserra, Pasquale M. Straight edge cutter guide. 4,852,259, Cl. 30-289.000.

Manservisi, Renato: *See*—
Piana, Maurizio; and Manservisi, Renato, 4,852,588, Cl. 131-84.100.

Mansign Engineering Limited: *See*—
Hart, Anthony J., 4,852,342, Cl. 59-78.100.

Mantz, Ekkehard: *See*—
Beitz, Jurgen; Erren, Karl-Heinz; and Mantz, Ekkehard, 4,852,824, Cl. 242-131.100.

Manusch, Christoph; Harp, Hans-Jurgen; and van Swieten, Roy, to PELIKAN Aktiengesellschaft. Device for transferring a film from a carrier tape. 4,853,074, Cl. 156-577.000.

Manville Corporation: *See*—
Cooper, Leonard M., 4,852,731, Cl. 206-167.000.

Manzotti, Ermanno J. Process and apparatus for making clear ice cubes. 4,852,359, Cl. 62-68.000.

Marathon Oil Company: *See*—
Conway, David D., 4,853,088, Cl. 203-10.000.

Marchetti, Augusto. Adhesive tape cutting device for taping unit. 4,853,073, Cl. 156-510.000.

Marchionni, Giuseppe; De Patto, Ugo; Strepparola, Ezio; and Viola, Gian T., to Ausimont S.p.A. Perfluoropolyethers free from peroxidic oxygen and containing perfluoroepoxy groups positioned along the perfluoropolyether chain, and their derivatives. 4,853,097, Cl. 204-157.600.

Marhold, Albrecht: *See*—
Sirrenberg, Wilhelm; Marhold, Albrecht; and Steffens, Robert, 4,853,397, Cl. 514-364.000.

Mariculture Equipment Development, Inc.: *See*—
Harrington, J. J., 4,852,521, Cl. 119-51.040.

Marien, August M.: *See*—
Tavernier, Serge M.; Marien, August M.; and Uytterhoeven, Herman J., 4,853,311, Cl. 430-106.000.

Mark, David F.; Lin, Leo S.; and Yu Lu, Shi-Da, to Cetus Corporation. Structural genes, plasmids and transformed cells for producing cysteine depleted muteins of biologically active proteins. 4,853,332, Cl. 435-252.330.

Mark, Irving L.; and Soni, Varun, to Medline Industries, Inc. Crutch design. 4,852,597, Cl. 135-69.000.

Markos, Peter. Portable cold frame. 4,852,298, Cl. 47-17.000.

Markovitz, Mark: *See*—
Walles, Erik W.; Lupinski, John H.; Markovitz, Mark; Colborn, Robert E.; Presley, James R.; Davis, Michael J.; Minnick, Michael G.; Kubisen, Steven J., Jr.; Hallgren, John E.; Bolon, Donald A.; Eddy, Victoria J.; and Irwin, Patricia C., 4,853,423, Cl. 523-428.000.

Marks, Dale H. Clamp for mounting a device to a tubular. 4,852,840, Cl. 248-229.000.

Marquette Electronics: *See*—
Gadsby, Peter D.; Moore, Martin R.; Olson, Denis E.; and Scott, Barry M., 4,852,571, Cl. 128-640.000.

Marsh, Renee H.; Henderson, Regina H.; and Rearwin, Earle W., to It's A Peach, Inc. Panty-type garments with security pocket. 4,852,188, Cl. 2-250.000.

Marshall, Robert, to A. C. Nielsen Company. System and method for protecting against redundant mailings. 4,853,882, Cl. 364-570.000.

Martin, Bradley L.: *See*—
Corfits, William D.; Gullicksrud, John T.; Martin, Bradley L.; McCutcheon, Robert W.; Rasmussen, Jerry R.; Westphal, Gordon W.; and Wheeler, Stephen E., 4,853,830, Cl. 361-391.000.

Martin, Francis W., to Corning Glass Works. Glass-ceramics suitable for dielectric substrates. 4,853,349, Cl. 501-8.000.

Martin Marietta Corporation: *See*—
Sequeira, Hermann B.; Trippe, Michael W.; and Jakhete, Rajendra S., 4,853,613, Cl. 324-58.00R.

Martin, Maurice. Shooters head immobilizing apparatus. 4,852,287, Cl. 42-90.000.

Martin, Roger T.: *See*—
King, Francis D.; Martin, Roger T.; and Watts, Eric A., 4,853,394, Cl. 514-329.000.

Martin, Ronald L., to Honeywell Inc. Combination drill and screwdriver. 4,852,196, Cl. 7-165.000.

Martin Sprocket & Gear, Inc.: *See*—
Howard, Billy G., 4,853,180, Cl. 419-66.000.

Martinola, Friedrich: *See*—
Oeckl, Siegfried; Martinola, Friedrich; and Thomas, Paul, 4,853,135, Cl. 210-757.000.

Maruhashi. Hideki: *See*—
Kodama, Seiki; Murase, Shigenobu; Matsuo, Haruyuki; Maruhashi, Hideki; Murata, Shigemi; and Miyaji, Hidetoshi, 4,852,541, Cl. 123-617.000.

Marvin Glass & Associates: *See*—
Zaruba, John V.; Rosenwinkel, Donald A.; and Breslow, Jeffrey D., 4,852,886, Cl. 273-249.000.

Masaoka, Toshio: *See*—
Teshima, Toshio; Kitagawa, Tooru; Suzuki, Mikio; Masaoka, Toshio; Mori, Takashi; and Okimoto, Kazutaka, 4,852,633, Cl. 164-437.000.

Maschinenfabrik Gietz AG: *See*—
Gietz, Hanspeter; and Roesli, Manfred, 4,852,382, Cl. 72-406.000.

Mash, Joseph F.: *See*—
Chen, Shih-Lu; Gadkaree, Kishor P.; and Mash, Joseph F., 4,853,350, Cl. 501-9.000.

Mashiko, Yoji: *See*—
Nishioka, Tadashi; Mashiko, Yoji; Morimoto, Hiroaki; and Koyama, Hiroshi, 4,853,341, Cl. 437-24.000.

Mashimo, Satoshi; Kitajima, Tatsuya; Tanaka, Masayuki; and Kuramoto, Shinji, to Mitsubishi Belting Ltd. Tire for two-wheeled vehicle in which individual cord belts contain both adhesive and reinforcing cords. 4,852,625, Cl. 152-511.000.

Mason, Bruce B.: *See*—
Hsiao, Chu-lai; Mason, Bruce B.; and Davis, Alan R., 4,853,333, Cl. 435-256.000.

Massachusetts Institute of Technology: *See*—
Cornie, James A.; Kattamis, Theodoulos; Chambers, Brent V.; Bond, Bruce E.; and Varela, Raul H., 4,853,182, Cl. 420-129.000.
Kollin, Joel S., 4,853,769, Cl. 358-88.000.
Tsaur, Bor-Yeu; Fan, John C. C.; and Geis, Michael W., 4,853,076, Cl. 156-603.000.

Mastodon, Inc.: *See*—
Patton, Marilyn, 4,852,776, Cl. 222-570.000.

Masuda, Ikuro: *See*—
Iwamura, Masahiro; Maejima, Hideo; and Masuda, Ikuro, 4,853,560, Cl. 307-296.100.

Masui, Toshiyuki: *See*—
Fukatsu, Tsutomu; Hori, Taizou; Masui, Toshiyuki; Kobayashi, Takashi; Wakui, Tetsuya; and Takahashi, Koji, 4,853,803, Cl. 360-72.200.

Masuishi, Tetsuya: *See*—
Tsuji, Hiroshi; Yasunobu, Chizuko; and Masuishi, Tetsuya, 4,853,873, Cl. 364-513.000.

Masuo, Asakawa: *See*—
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Matesich, Ardis M.: *See*—
Lo, Pei-hwa; Sokolich, James M.; and Matesich, Ardis M., 4,853,944, Cl. 375-94.000.

Mathes, Josef: *See*—
Abendroth, Paul; Mathes, Josef; and Holl, Roland, 4,852,488, Cl. 101-246.000.

Matono, Takaaki: *See*—
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Matsubara, Susumu: *See*—
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Matsuda, Hideyuki: *See*—
Okabe, Kazuya; Matsuda, Hideyuki; Iwasaki, Chisato; and Fujimoto, Satoshi, 4,853,755, Cl. 357-23.700.

Matsuda, Mutsuhide; Aoyagi, Masao; Furukawa, Hiroshi; and Shimizu, Masami, to Canon Kabushiki Kaisha. Connector for a camera. 4,853,725, Cl. 354-286.000.

Matsuda, Toshiro, to Nissan Motor Co., Ltd. Anti-skid brake control system with feature for assuring derivation of vehicle speed representing value precisely reflecting actual vehicle speed. 4,852,951, Cl. 303-109.000.

Matsuhara, Hiroshi: *See*—
Suzuki, Teisuke; and Matsuhara, Hiroshi, 4,853,239, Cl. 426-249.000.

Matsui, Sadayoshi; Kaneiwa, Shinji; Morimoto, Taiji; Yamaguchi, Masahiro; Taneya, Mototaka; and Matsumoto, Mitsuhiro, to 501 Sharp Kabushiki Kaisha. Index guided semiconductor laser device. 4,853,936, Cl. 372-45.000.

Matsui, Toshio: *See*—
Johdai, Akiyoshi; Kinoshita, Keichi; and Matsui, Toshio, 4,852,867, Cl. 270-53.000.

Matsuki, Toshio, to Canon Kabushiki Kaisha. Projection exposure apparatus. 4,853,756, Cl. 355-71.000.

Matsumoto, Kazuya: *See*—
Miyawaki, Mamoru; and Matsumoto, Kazuya, 4,853,919, Cl. 369-46.000.

Matsumoto, Kesafumi, to Kouken Co., Ltd. Water resistance load system. 4,853,621, Cl. 324-158.00R.

Matsumoto, Manabu; Ikeguchi, Takashi; Ueda, Shinjiroo; Sonobe, Tadasi; Murashita, Toru; Ido, Satoshi; Kuroishi, Kazuo; Kazawa, Yoshiaki; Kakiuchi, Shunji; and Kobari, Toshiaki, to Hitachi, Ltd.; Nippon Telephone & Telegraph; and Hitachi Service Engineering, Ltd. Synchrotron radiation source. 4,853,640, Cl. 328-235.000.

Matsumoto, Mitsuhiro: *See*—
Matsui, Sadayoshi; Kaneiwa, Shinji; Morimoto, Taiji; Yamaguchi, Masahiro; Taneya, Mototaka; and Matsumoto, Mitsuhiro, 4,853,936, Cl. 372-45.000.

Matsumoto, Shiroh: *See*—
Homma, Yoshihiro; Nakata, Akira; Matsumoto, Shiroh; Yoshimura, Kunitoshi; and Minato, Masahiko, 4,852,793, Cl. 229-5.500.

Matsumoto, Takashi, to Fuji Photo Film Co., Ltd. Magnetic head electromagnetic conversion efficiency measuring method and element therefor. 4,853,633, Cl. 324-210.000.

Matsumura, Akira; Nozaki, Yasuo; and Ishikawa, Katsukiyo, to Nippon Paint Co., Ltd. Production of multicolor display. 4,853,092, Cl. 204-18.100.

Matsumura, Takashi: *See*—
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Matsumura, Teruyuki, to Fanuc Ltd. Simultaneous four-axis lathe machining time bar-graph display method. 4,853,867, Cl. 364-474.220.

Matsunami, Satoshi: *See*—
Abe, Shuzo; Matsunami, Satoshi; Nagamatsu, Sunao; Tanaka, Masaaki; and Matsuno, Masao, 4,853,546, Cl. 250-432.0PD.

Matsuno, Masao: *See*—
Abe, Shuzo; Matsunami, Satoshi; Nagamatsu, Sunao; Tanaka, Masaaki; and Matsuno, Masao, 4,853,546, Cl. 250-432.0PD.

Matsuo, Haruyuki: *See*—
Kodama, Seiki; Murase, Shigenobu; Matsuo, Haruyuki; Maruhashi, Hideki; Murata, Shigemi; and Miyaji, Hidetoshi, 4,852,541, Cl. 123-617.000.

Matsuo, Katsuharu; and Azuma, Yoshiyuki, to Kabushiki Kaisha Toshiba. Load state detecting apparatus of an induction motor for controlling the spin dryer of a washing machine. 4,853,605, Cl. 318-729.000.

Matsuo, Shigeru; Murakami, Tomoyoshi; Bando, Thoru; and Nagatoshi, Kikuo, to Idemitsu Kosan Company, Limited. Polycyanoaryl ether with thermoplastic resin. 4,853,443, Cl. 525-534.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
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Kawasaki, Osamu; Takeda, Katsu; Inaba, Ritsuo; and Fukada, Tetsuji, 4,853,579, Cl. 310-116.000.
Suesada, Kunio; and Koya, Toshiaki, 4,853,796, Cl. 358-324.000.
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Matsuyama, Toshiro: *See*—
Hayakawa, Takashi; Nojima, Hideo; Kojima, Yoshimi; Narikawa, Shiro; Matsuyama, Toshiro; Imada, Eiji; and Ehara, Shaw, 4,853,309, Cl. 430-65.000.

Matsuzaki, Minoru: *See*—
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Mattelin, Antoon: *See*—
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Matzoll, Robert J., Jr.; and Pawlaczyk, Deborah C. Automated paint film characterization system. 4,853,879, Cl. 364-552.000.

May, Sherman C.: *See*—
Dickinson, Ben W. O., III; Dickinson, Robert W.; May, Sherman C.; and Mackey, Charles S., 4,852,668, Cl. 175-67.000.

Mayer, Daniel W.; Loebig, Craig K.; and Savick, Wayne K., to Modern Controls, Inc. System for controlled humidity tests. 4,852,389, Cl. 73-38.000.

Mayer, Hans-Dieter; and Hirrlinger, Klaus, to Richard Hirschmann Radiotechnisches Werk. Security alarm process and apparatus. 4,853,690, Cl. 340-544.000.

Maytag Corporation: *See*—
Ortlieb, Orlen J.; and Bartlett, Donald R., 4,852,735, Cl. 206-120.000.

Mayumi, Etsuo; and Hiromasa, Kunio, to Mabuchi Motor Co., Ltd. Miniature motor. 4,853,576, Cl. 310-239.000.

Mazda Motor Corporation: *See*—
Kido, Yoshinobu; and Yamada, Toshihiro, 4,853,673, Cl. 340-439.000.
Takatani, Teruhiko; Yamada, Muneharu; and Miyamoto, Tomomi, 4,852,897, Cl. 280-91.000.
Tanaka, Takahiko; Hisanaga, Naogi; Yamamoto, Takeshi; Okazaki, Susumu; and Kajimoto, Shinshi, 4,852,205, Cl. 15-250.170.
Yamamoto, Tadanobu, 4,852,904, Cl. 280-701.000.

Mazur, Duane J.; Weinberg, Norman L.; and Abel, Albert E., to A. L. Sandpiper Corporation. Processes for decontaminating polluted substrates. 4,853,040, Cl. 134-2.000.

McAskie, William, to Balfour Manufacturing Company. Ruminant feedstuffs, their production and apparatus for use therein. 4,853,233, Cl. 426-74.000.

McBroom, John K., Jr.: *See*—
Johnson, Thomas E.; and McBroom, John K., Jr., 4,853,183, Cl. 422-45.000.

McCamant, Angus J.: *See*—
Gleason, Kimberly R.; Strid, Eric W.; Flegal, Robert T.; and McCamant, Angus J., 4,853,627, Cl. 324-158.00P.

McClure, Richard J., to Eastman Kodak Company. Magnetic head with constant area wear profile. 4,853,814, Cl. 360-122.000.

McCown, William R. E.: *See*—
Harmon, Raymond E.; and McCown, William R. E., 4,852,923, Cl. 292-341.180.

McCoy, Daniel W., Sr.: *See*—
Hagewood, John F.; Niederer, Kurt W.; and McCoy, Daniel W., Sr., 4,852,225, Cl. 28-187.000.

McCoy-Ellison, Inc.: *See*—
Hagewood, John F.; Niederer, Kurt W.; and McCoy, Daniel W., Sr., 4,852,225, Cl. 28-187.000.

McCoy, Roger J.: *See*—
Meadows, Robert D.; and McCoy, Roger J., 4,853,498, Cl. 178-19.000.

McCray, Scott B., to Bend Research, Inc. P-xylylenediamide/diimide composite RO membranes. 4,853,122, Cl. 210-321.890.

McCreary, John C. Clothing cord securing clamp. 4,852,223, Cl. 24-115.00G.

McCullough, Doris E.: *See*—
Carr, F. P.; Dillard, Robert D.; and McCullough, Doris E., 4,853,398, Cl. 514-381.000.

McCutcheon, Robert W.: *See*—
Corfits, William D.; Gullicksrud, John T.; Martin, Bradley L.; McCutcheon, Robert W.; Rasmussen, Jerry R.; Westphal, Gordon W.; and Wheeler, Stephen E., 4,853,830, Cl. 361-391.000.

McDermid, Dicky W., to West-Isle Industries Inc. Wooden I-beam with integrated insulating foam. 4,852,322, Cl. 52-404.000.

McDonald, Tracy L.: *See*—
Elrod, Granville P.; Westbrooks, John W.; and McDonald, Tracy L., 4,852,365, Cl. 62-237.000.

McEachern, David A., to T. D. Wright, Inc. Magnetic cylinder having rigid support for magnet cover. 4,852,490, Cl. 101-378.000.

McGee, Jeffrey S.; and Kadien, Thomas C., to Cipher Data Products, Inc. Extraction and insertion mechanism for a leader block of a tape cartridge. 4,852,825, Cl. 242-195.000.

McGilvery, James D.: *See*—
Lipaztajn, Marek; McGilvery, James D.; and Twardowski, Zbigniew, 4,853,096, Cl. 204-101.000.

McGinn, Michael, to Motorola, Inc. Differential phase reduction circuit for a video demodulating system and method. 4,853,641, Cl. 329-50.000.

McGough, Gerald B., to Palco Telecom Inc. Lock protector assembly. 4,852,373, Cl. 70-417.000.

McHugh, George J., to AGF Manufacturing, Inc. Valve and arrangement for fire suppression water sprinkler system. 4,852,610, Cl. 137-559.000.

McKean, Dennis R.; Miller, Robert D.; Walsh, Joseph G.; and Willson, Carlton G., to International Business Machines Corporation. O-quinone diazide sulfonic acid monoesters useful as sensitizers for positive resists. 4,853,315, Cl. 430-192.000.

McKearn, Thomas J.: *See*—
Quash, Gerard A.; Rodwell, John D.; McKearn, Thomas J.; and Ripoll, Jean P., 4,853,326, Cl. 435-5.000.

McKenna, Bruce A., to Exothermics-Eclipse Inc. Recuperative heat exchanger. 4,852,640, Cl. 165-47.000.

McKenna, Daniel B.: *See*—
Diaz, Leopoldo J.; McKenna, Daniel B.; and Pett, Todd A., 4,853,704, Cl. 343-767.000.

McKinnon, Robert M. Riser check valve. 4,852,602, Cl. 137-68.100.

McLean, Joseph B.: *See*—
MacArthur, James B.; McLean, Joseph B.; and Comolli, Alfred G., 4,853,111, Cl. 208-421.000.

McLellan, Hubert R., Jr.: *See*—
Ditzel, David R.; and McLellan, Hubert R., Jr., 4,853,889, Cl. 364-900.000.

McLennan, Jim; Davis, Richard; and Kerr, Donald. Racquet swing training apparatus. 4,852,875, Cl. 273-29.00A.

McMennamy, John A.: *See*—
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McMullen, James H.: *See*—
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McMullin, Francis; Byrne, John V.; and Murray, Aengus, to Kollmorgen Technologies Corporation. Position and speed sensors. 4,853,604, Cl. 318-653.000.

Mc Namara, Thomas, to Random Wheels, Inc. Portable shelter frame structure. 4,852,599, Cl. 135-102.000.

McShane, James E., to Plough, Inc. Method for dyeing eggs using a water soluble dyeing composition in a shaped container. 4,853,240, Cl. 426-250.000.

Mead Corporation, The: *See—*
Culpepper, Will L.; and Feliks, James J., 4,852,328, Cl. 53-300.000.
Liang, Roag-Chang; Colyer, Emerson K.; and Borello, Kelli J., 4,853,364, Cl. 503-216.000.

Meadows, Robert D.; and McCoy, Roger J., to Tektronix, Inc. Position measurement apparatus for capacitive touch panel system. 4,853,498, Cl. 178-19.000.

Mechtrix Corporation: *See—*
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Medex, Inc.: *See—*
Frank, Thomas P., 4,852,581, Cl. 128-672.000.

Medical Engineering Corporation: *See—*
Trick, Robert E., 4,852,555, Cl. 128-79.000.

Medline Industries, Inc.: *See—*
Mark, Irving L.; and Soni, Varun, 4,852,597, Cl. 135-69.000.

Medora, Noshirwan K.: *See—*
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Medwin, Steven J., to Du Pont de Nemours, E. I., and Company. Method for simulating layup of prepreg materials for three-dimensional molding of composite parts. 4,853,868, Cl. 364-476.000.

Meek, D. Harper: *See—*
Meyer, Bernard H.; Kinslow, Joseph C.; Arch, Paul E.; and Meek, D. Harper, 4,853,445, Cl. 526-190.000.

Meguro, Jun-ichi; and Nicolaisen, Curtis J., to Baxter International Inc. Apparatus and process for manufacturing cuvetter belts. 4,853,059, Cl. 156-157.000.

Meguro, Satoshi: *See—*
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Mehrotra, Pankaj K.; Billman, Elizabeth R.; and North, Bernard, to Kennametal Inc. Cutting tool. 4,852,999, Cl. 51-309.000.

Meier, Werner A.; and Voogt, Stratford. Automotive alternator power generator for welding or use of power tools. 4,853,557, Cl. 307-10.100.

Melanson, Leslie B.; and Berendt, Gerald C., to Bermel Industries, Inc. Link separator guide. 4,852,214, Cl. 17-1.00F.

Melas, Constantin M.: *See—*
Kukson, Dean R.; Melas, Constantin M.; and Poss, Joey M., 4,853,802, Cl. 360-65.000.

Mellor, Michael: *See—*
Parsons, John H.; Hunt, Russell G.; Leach, Susan E.; Buss, Anthony D.; Green, David E.; Mellor, Michael; and Percival, Albert, 4,853,400, Cl. 514-383.000.

Melzig, Manfred; and Effer, Erhard, to Optische Werke G. Rodenstock. Anti-reflection film for an optical element consisting of an organic material. 4,852,974, Cl. 350-165.000.

Mendonca, Jose M., Jr., to United States of America, Air Force. Method of controlling discharge of stored electric charge in plastic objects and forming Lichtenberg figures in plastic objects. 4,853,163, Cl. 264-22.000.

Mengo, Alfred, to Mengo Industries, Inc. Fishing rod holder mount kit. 4,852,291, Cl. 43-21.200.

Mengo Industries, Inc.: *See—*
Mengo, Alfred, 4,852,291, Cl. 43-21.200.

Mennicke, Stefan: *See—*
Steinleitner, Gunther; Mennicke, Stefan; Feindler, Philbert; Klein, Herbert; and Maldonado-Zagal, Sigisfredo, 4,853,303, Cl. 429-104.000.

Mercer, William C.: *See—*
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Merck & Co., Inc.: *See—*
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Engelhardt, Edward L.; and Saari, Walfred S., 4,853,415, Cl. 514-603.000.
Williams, James B.; and Nesbitt, Russell U., 4,853,372, Cl. 514-30.000.

Merck Patent Gesellschaft Mit Beschrankfter Haftung: *See—*
Vogtle, Fritz; and Calaminus, Wolfgang, 4,853,151, Cl. 252-299.610.

Merck Patent Gesellschaft Mit Beschrankter Haftung: *See—*
Krause, Joachim; Wachtler, Andreas; Scheuble, Bernhard; and Weber, Georg, 4,853,149, Cl. 252-299.610.
Wahlig, Helmut; Dingeldein, Elvira; Rothe, Johannes; and Stille, Wolfgang, 4,853,225, Cl. 424-423.000.

Merger, Franz; Schleier, Gisbert; and Schlotterbeck, Dietrich, to BASF Aktiengesellschaft. Preparation of storage-stable, moisture-cured, single-component polyurethane systems and their uses. 4,853,454, Cl. 528-59.000.

Merger, Franz: *See—*
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Merlin Gerin: *See—*
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Mermelstein, Paul: *See—*
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Merrell Dow Pharmaceuticals Inc.: *See—*
Jones, Winton D.; Schnettler, Richard A.; and Dage, Richard C., 4,853,395, Cl. 514-332.000.

Merrell, Gene A.; and Purnell, Deborah L., to Betz Laboratories, Inc. Paint spray booth treatment. 4,853,132, Cl. 210-712.000.

Merrill, Jeffrey C. Toy blocks for multiple puzzles and games of varying skill levels. 4,852,878, Cl. 273-156.000.

Merten, Barry; and Kamman, Gordon W., to Quaker Oats Company, The. Removable leg assembly. 4,852,837, Cl. 248-188.000.

Mesdan S.p.A.: *See—*
Premi, Mauro, 4,852,339, Cl. 57-22.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Kranz, Walter, 4,852,827, Cl. 244-3.220.

Met-Line Inc.: *See—*
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Metme Corporation: *See—*
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Metzeler GmbH: *See—*
Bitschkus, Horst; Hofmann, Manfred; Klockner, Karl-Heinz; Nelles, Uwe; and Siewert, Gunther, 4,852,864, Cl. 267-219.000.

Meyer, Bernard H.; Kinslow, Joseph C.; Arch, Paul E.; and Meek, D. Harper, to Arco Chemical Technology, Inc. Dibutylin compounds in styrene monomer polymerization. 4,853,445, Cl. 526-190.000.

Meyer, David A.: *See—*
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Meyer, Karen M.: *See—*
Turner, Kenneth W.; Covert, Charles H.; and Meyer, Karen M., 4,852,761, Cl. 220-85.0VR.

Meyer, Mark Q.: *See—*
Douglas, Keith; and Meyer, Mark Q., 4,853,617, Cl. 324-67.000.

Meyers, Brad E. Light level responsive control for light intensifier in night vision system. 4,853,529, Cl. 250-213.0VT.

MFI International, Inc.: *See—*
Levine, Lance R.; and Pratt, Clarence A., Jr., 4,852,293, Cl. 43-54.100.

Michael Huber GmbH: *See—*
Frankel, Juergen; Mattelin, Antoon; Pecceu, Pol; Quella, Ferdinand; Schmidt, Hans-Fr.; Boone, Luc; Von Tomkewitsch, Sybille; and De Vogelaere, Marc, 4,853,252, Cl. 427-53.100.

Michael Pfeiffer Design und Marketing GmbH: *See—*
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Michaely, William J.: *See—*
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Michel, Douglas D.: *See—*
Michel, Robert C.; and Michel, Douglas D., 4,852,755, Cl. 220-4.00D.

Michel, Robert C.; and Michel, Douglas D. Cooking vessel with expansible cover. 4,852,755, Cl. 220-4.00D.

Michinosuke, Demizu: *See—*
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Micro-Pak, Inc.: *See—*
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Microelectronics and Computer Technology Corporation: *See—*
Andrews, Daniel M., 4,852,250, Cl. 29-827.000.

Microfab Technologies, Inc.: *See—*
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Microlife Technics, Inc.: *See—*
Vandenbergh, Peter A.; and Kunka, Blair S., 4,853,334, Cl. 435-262.000.

Micromeritics Instrument Corporation: *See—*
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Mid-State Drainage Products, Inc.: *See—*
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Midmark Corporation: *See—*
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Mieth, Gerhard: *See—*
Schubring, Reinhard; Witt, Juergen; Harwardt, Irene; Neumann, Sigrd; Schneider, Christoph; Mieth, Gerhard; Raue, Wolfgang; and Brueckner, Juergen, 4,852,477, Cl. 99-450.200.

Mihailov, Mihail V., to Kombinat "Korabostroene". Vacuum condensor with condensate catch. 4,852,643, Cl. 165-113.000.

Mikami, Tetsuo; Ohmika, Yasushi; and Miyazaki, Hidetoshi, to Honda Giken Kogyo Kabushiki Kaisha. Cap attaching structure of handle grip. 4,852,423, Cl. 74-551.900.

Mikas, Raymond; Szczerba, Robert M.; and Pulciani, Sam C., to American National Can Company. Tool pack. 4,852,377, Cl. 72-349.000.

Miles Inc.: *See—*
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Milfuse Systems, Inc.: *See—*
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Miller, Bruce R.: *See—*
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Miller, John F., to Georgia-Pacific Resins, Inc. Method for stabilizing aqueous solutions of cationic thermosetting polyamide-epichlorohydrin resins. 4,853,431, Cl. 524-608.000.

Miller, Robert C.: *See—*
Heckman, Russell W.; Miller, Robert C.; and Nickey, George A., 4,852,271, Cl. 34-105.000.

Miller, Robert D.: *See—*
McKean, Dennis R.; Miller, Robert D.; Walsh, Joseph G.; and Willson, Carlton G., 4,853,315, Cl. 430-192.000.

Miller, Stephen H.: *See—*
Covington, Roger G.; Jensen, Thomas D.; Miller, Stephen H.; and Wilson, Craig B., 4,853,926, Cl. 369-291.000.

Millet, Jean-Marie: *See—*
Belaidouni, Ali; Benani, Andre ; and Millet, Jean-Marie, 4,852,241, Cl. 29-564.400.

Milliken Research Corporation: *See—*
Goineau, Andre M., 4,852,226, Cl. 28-220.000.

Mills, S. Dwight. Golf equipment carrier with rotating club reducing frame. 4,852,896, Cl. 280-47.180.

Milosevic, Milan; and Harrick, Nicolas J., to Harrick, Nicolas J. Collecting hemispherical attachment for spectrophotometry. 4,853,542, Cl. 250-353.000.

Min, Sung-Ki; and Lee, Jae S., to Samsung Semiconductor and Telecommunications Co., Ltd. High voltage and power BiCMOS driving circuit. 4,853,559, Cl. 307-270.000.

Minami, Toshiaki: *See—*
Satake, Toshimi; Minami, Toshiaki; Nagai, Tomoaki; and Fujimura, Fumio, 4,853,361, Cl. 503-201.000.
Satake, Toshimi; Fukuchi, Tadakazu; Minami, Toshiaki; Nagai, Tomoaki; Kaneko, Toshio; and Fujimura, Fumio, 4,853,362, Cl. 503-209.000.
Satake, Toshimi; Minami, Toshiaki; Nagai, Tomoaki; and Fujimura, Fumio, 4,853,363, Cl. 503-210.000.

Minato, Masahiko: *See—*
Homma, Yoshihiro; Nakata, Akira; Matsumoto, Shiroh; Yoshimura, Kunitoshi; and Minato, Masahiko, 4,852,793, Cl. 229-5.500.

Minato, Osamu: *See—*
Yamanaka, Toshiaki; Suzuki, Norio; Sakai, Yoshio; Kawamoto, Yoshifumi; Minato, Osamu; Ishibashi, Koichiro; Moriwaki, Nobuyuki; and Meguro, Satoshi, 4,853,894, Cl. 365-154.000.

Minenko, Leonid P.; Osher, Mikhail I.; Belikov, Evgeny V.; and Klyatis, Lev M. Device for gripping necks of packed sacks. 4,852,927, Cl. 294-86.400.

Mineo, Beth A.: *See—*
Companion, John A.; Heyman, Joseph S.; Mineo, Beth A.; Cavalier, Albert R.; and Blalock, Travis N., 4,852,578, Cl. 128-661.030.

Minjolle, Louis; Drouet, Michel; Fatta-Barou, Jean-Louis; Callegari, Michel; and Noel, Jacques, to Societe Anonyme Dite: Ceraver. Method of welding two halves of a hollow ceramic component. 4,853,053, Cl. 156-73.500.

Minko, Anatoly A.: *See—*
Bezborodov, Vladimir S.; Grinkevich, Oleg A.; Grebenkin, Mikhail F.; Lapanik, Valery I.; Minko, Anatoly A.; Rzhussky, Vitaly V.; Muravsky, Anatoly A.; Petrov, Vladimir F.; and Ivaschenko, Alexandr V., 4,853,150, Cl. 252-299.610.

Minnesota Mining and Manufacturing Company: *See—*
Babirad, Stefan A.; Bacon, Fredrick; Heilmann, Steven M.; Krepski, Larry R.; Kuczma, Andrew S.; and Rasmussen, Jerald K., 4,852,969, Cl. 350-96.340.
Brown, David E.; and Leichter, Louis M., 4,853,310, Cl. 430-83.000.
Jongewaard, Susan K.; and Sills, Julia A., 4,853,365, Cl. 503-227.000.
Lu, Shih-Lai; and Wong, Andrew H., 4,853,267, Cl. 428-35.700.
Packard, Thomas J., 4,852,684, Cl. 181-131.000.
Sanders, James F., 4,853,316, Cl. 430-272.000.

Minnick, Michael G.: *See—*
Walles, Erik W.; Lupinski, John H.; Markovitz, Mark; Colborn, Robert E.; Presley, James R.; Davis, Michael J.; Minnick, Michael G.; Kubisen, Steven J., Jr.; Hallgren, John E.; Bolon, Donald A.; Eddy, Victoria J.; and Irwin, Patricia C., 4,853,423, Cl. 523-428.000.

Minolta Camera Kabushiki Kaisha: *See—*
Fukui, Kazuyuki; and Yokoyama, Chujiro, 4,852,868, Cl. 271-122.000.
Johdai, Akiyoshi; Kinoshita, Keichi; and Matsui, Toshio, 4,852,867, Cl. 270-53.000.
Kawamura, Kunio; Taniguchi, Toshihiko; Oya, Tetsuro; Niwa, Masatake; Nakai, Masaaki; and Fujino, Akihiko, 4,853,726, Cl. 354-289.100.
Kobayashi, Haruo; Yoshizaki, Akira; Hoda, Takeo; and Kashima, Masataka, 4,853,721, Cl. 354-21.000.
Miyamoto, Hirohisa; and Matsuuchi, Yasuyuki, 4,853,739, Cl. 355-229.000.
Yamanaka, Akira; and Yamazaki, Keiji, 4,853,302, Cl. 429-99.000.

Miremadi, Bijan K.: *See—*
Morrison, S. Roy; Frindt, Robert F.; Joensen, Per; Gee, Michael A.; and Miremadi, Bijan K., 4,853,359, Cl. 502-220.000.

Misaizu, Iwao: *See—*
Hanada, Kazuyuki; Misaizu, Iwao; Kashimura, Masashi; Goto, Tomoko; and Kuriyama, Katsumi, 4,853,418, Cl. 521-154.000.

Mishina, Yoshihiko: *See—*
Yamamoto, Takashi; Mishina, Yoshihiko; and Oda, Masaaki, 4,852,982, Cl. 350-413.000.

Mita Industrial Co., Ltd.: *See—*
Sakai, Toshiyuki; Okada, Yoshihiro; and Hyodo, Keiichiro, 4,853,767, Cl. 358-78.000.

Mitani, Yushi: *See—*
Haga, Katutoshi; Yoshida, Hisatoshi; and Mitani, Yushi, 4,852,428, Cl. 74-826.000.

Mitchell, Allan T.; and Riemenschneider, Bert R., to Texas Instruments Incorporated. EEPROM including programming electrode extending through the control gate electrode. 4,853,895, Cl. 365-185.000.

Mitschker, Alfred: *See—*
Bruening, Wilhelm; Uchdorf, Rudolf; and Mitschker, Alfred, 4,853,191, Cl. 423-226.000.

Mitsubishi Belting Ltd.: *See—*
Mashimo, Satoshi; Kitajima, Tatsuya; Tanaka, Masayuki; and Kuramoto, Shinji, 4,852,625, Cl. 152-511.000.

Mitsubishi Denki Kabushiki: *See—*
Seino, Kiyoharu; Takagi, Tadashi; Takeda, Fumio; and Ikeda, Yukio, 4,853,649, Cl. 330-277.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Asakura, Masakatsu, 4,853,664, Cl. 336-12.000.
Eizo, Naya; Yoshikazu, Nagata; Toshiaki, Horiuchi; Mitsuhiro, Okumura; Michinosuke, Demizu; Mitsuhiro, Harima; Shigeki, Asakawa; and Masuo, Asakawa, 4,853,184, Cl. 420-489.000.
Ikeda, Shingo, 4,853,761, Cl. 357-72.000.
Isozumi, Shuzoo; and Tanaka, Toshinori, 4,853,570, Cl. 310-78.000.
Kodama, Seiki; Murase, Shigenobu; Matsuo, Haruyuki; Maruhashi, Hideki; Murata, Shigemi; and Miyaji, Hidetoshi, 4,852,541, Cl. 123-617.000.
Kuramitsu, Yoichi; and Arakawa, Takahiko, 4,853,757, Cl. 357-45.000.
Nishioka, Tadashi; Mashiko, Yoji; Morimoto, Hiroaki; and Koyama, Hiroshi, 4,853,341, Cl. 437-24.000.
Tanaka, Toshinori, 4,852,417, Cl. 74-7.00E.
Tsubouchi, Natsuro; and Kimata, Masafumi, 4,853,348, Cl. 437-203.000.
Yamawaki, Masao; and Kawashima, Hiroshi, 4,853,786, Cl. 358-213.290.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; and Tatemoto, Minoru, 4,852,903, Cl. 280-689.000.
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; and Tatemoto, Minoru, 4,852,905, Cl. 280-707.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Hino, Masao; Yoneda, Kenichi; Miyake, Masato; Otani, Hidehiko; Shingu, Noriya; Isahaya, Tsukasa; Hamada, Shigeshi; and Arahori, Tsuyoshi, 4,853,194, Cl. 423-239.000.

Mitsubishi Paper Mills, Ltd.: *See—*
Makishima, Hideo; and Hyodo, Kenji, 4,853,274, Cl. 428-143.000.

Mitsubishi Rayon Co., Ltd.: *See—*
Orii, Koichi; Ohshima, Iwao; and Watanabe, Naotake, 4,853,198, Cl. 423-335.000.
Yamamoto, Takashi; Mishina, Yoshihiko; and Oda, Masaaki, 4,852,982, Cl. 350-413.000.

Mitsuhashi, Masato; and Kitahara, Takeshi, to Fujitsu Limited. Block access system using cache memory. 4,853,848, Cl. 364-200.000.

Mitsuhiro, Harima: *See—*
Eizo, Naya; Yoshikazu, Nagata; Toshiaki, Horiuchi; Mitsuhiro, Okumura; Michinosuke, Demizu; Mitsuhiro, Harima; Shigeki, Asakawa; and Masuo, Asakawa, 4,853,184, Cl. 420-489.000.

Mitsuhiro, Okumura: *See—*
Eizo, Naya; Yoshikazu, Nagata; Toshiaki, Horiuchi; Mitsuhiro, Okumura; Michinosuke, Demizu; Mitsuhiro, Harima; Shigeki, Asakawa; and Masuo, Asakawa, 4,853,184, Cl. 420-489.000.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Narimatsu, Osamu; Ito, Michiyasu; Komatsu, Kazuyoshi; and Shibata, Yasuhiro, 4,853,286, Cl. 428-343.000.

Mittelstadt, Alfred G.: *See—*
Lambertz, Johannes; Adlhoch, Wolfgang H.; Mittelstadt, Alfred G.; and Hermann, Wolfgang, 4,852,994, Cl. 48-197.00R.

Mitutoyo Corporation: *See—*
Tezuka, Kazusaku, 4,852,267, Cl. 33-503.000.

Miyaji, Hidetoshi: *See—*
Kodama, Seiki; Murase, Shigenobu; Matsuo, Haruyuki; Maruhashi, Hideki; Murata, Shigemi; and Miyaji, Hidetoshi, 4,852,541, Cl. 123-617.000.

Miyake, Masato: *See—*
Hino, Masao; Yoneda, Kenichi; Miyake, Masato; Otani, Hidehiko; Shingu, Noriya; Isahaya, Tsukasa; Hamada, Shigeshi; and Arahori, Tsuyoshi, 4,853,194, Cl. 423-239.000.

Miyake, Yoichi: *See—*
Fukumoto, Masatoshi; Kubo, Soichi; Miyake, Yoichi; Tsukada, Norishige; Kasutani, Kiyoshi; and Okamori, Kenji, 4,853,794, Cl. 358-447.000.

Miyamoto, Hirohisa; and Matsuuchi, Yasuyuki, to Minolta Camera Kabushiki Kaisha. Illuminating device for image exposure. 4,853,739, Cl. 355-229.000.

Miyamoto, Kenji: *See—*
Sugiura, Hidemi; Ukai, Mikio; and Miyamoto, Kenji, 4,852,891, Cl. 277-212.0FB.

Miyamoto, Tomomi: *See—*
Takatani, Teruhiko; Yamada, Muneharu; and Miyamoto, Tomomi, 4,852,897, Cl. 280-91.000.

Miyasaka, Nobuaki: *See—*
Ikeda, Hideo; Suga, Shuzo; and Miyasaka, Nobuaki, 4,853,323, Cl. 430-569.000.

Miyawaki, Mamoru; and Matsumoto, Kazuya, to Canon Kabushiki Kaisha. Information processing apparatus in which a deflected light and O-order light are respectively used for information recording/reproduction and tracking, and a method therefor. 4,853,919, Cl. 369-46.000.

Miyazaki, Hidetoshi: *See*—
Mikami, Tetsuo; Ohmika, Yasushi; and Miyazaki, Hidetoshi, 4,852,423, Cl. 74-551.900.
Miyazaki, Kenji, to Sumitomo Electric Industries, Ltd. Process for growing a multi-component crystal. 4,853,078, Cl. 156-616.400.
Miyoshi, Makoto: *See*—
Uchida, Koh; Kurihara, Takashi; and Miyoshi, Makoto, 4,852,462, Cl. 91-375.00A.
Mizuhara, Howard, to GTE Products Corporation. Gold-palladium-nickel-copper-manganese filler metal for joining superalloy. 4,853,291, Cl. 428-593.000.
Mizuta, Akira; and Fujiwara, Morio, to Fuji Photo Film Co., Ltd. Magnetic disk cartridge. 4,853,817, Cl. 360-133.000.
Mizutani, Toshiaki; Yonezawa, Takeyuki; Inoue, Hiroshi; Tsuge, Akihiko; and Ohnuma, Yoshiyuki, to Kabushiki Kaisha Toshiba. Silicon carbide sintered body and method of manufacturing the same. 4,853,299, Cl. 428-698.000.
Mlynko, Walter E., to International Business Machines Corporation. Process for removing contaminant. 4,853,081, Cl. 156-643.000.
Mobil Oil Corporation: *See*—
Degnan, Thomas F., Jr.; and Varghese, Philip, 4,853,104, Cl. 208-61.000.
Grove, J. Jay; and Karsner, Grant G., 4,853,106, Cl. 208-131.000.
Haddad, James H.; and Owen, Hartley, 4,853,107, Cl. 208-152.000.
Harandi, Mohsen N., 4,853,103, Cl. 208-58.000.
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,853,105, Cl. 208-74.000.
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,853,187, Cl. 422-144.000.
Jennings, Jr.; Alfred R.; and Stowe, Lawrence R., 4,852,650, Cl. 166-250.000.
Linville, Andrew F., Jr.; Shirley, Thomas E.; and Griffith, Paul G., 4,853,903, Cl. 367-46.000.
Mock, Elmar, to ETA SA Fabriques d'Ebauches. Timepiece having case formed of rock-like material. 4,853,910, Cl. 368-300.000.
Modern Controls, Inc.: *See*—
Mayer, Daniel W.; Loebig, Craig K.; and Savick, Wayne K., 4,852,389, Cl. 73-38.000.
Moennings, Roland: *See*—
Breitenbacher, Juergen; Kuehle, Walter; Moennings, Roland; Neumann, Udo; and Schramm, Wolfgang, 4,852,863, Cl. 267-218.000.
Moffitt, Don. Dolly. 4,852,895, Cl. 280-47.131.
Mohaupt, Henry H. Wire line hold down device. 4,852,647, Cl. 166-63.000.
Mohr, Glenn R.; and Roth, Donald J., to Continental Can Company, Inc. Induction heating coil. 4,853,510, Cl. 219-10.790.
Moisan, Gerald L. Maneuvering device for heavy flat plates. 4,852,855, Cl. 254-131.000.
Molecular Diagnostics, Inc.: *See*—
Dattagupta, Nanibhushan, 4,853,327, Cl. 435-6.000.
Molins PLC: *See*—
Labbe, Francis A. M., 4,852,589, Cl. 131-84.300.
Momoki, Yasuhito; Asami, Masahiro; Sakai, Nobuo; and Otani, Shigeaki, to Fuji Photo Film, Co., Ltd. Method of forming a color image and silver halide color photographic material using developer with substantially no benzyl alcohol and low bromide concentration. 4,853,321, Cl. 430-380.000.
Moncorge, Richard: *See*—
Calvat, Claude; Colle, Laurent; Couchaud, Maurice; LeJus, Anne-Marie; Moncorge, Richard; Vivien, Daniel; and Wyon, Christophe, 4,853,354, Cl. 501-119.000.
Monfort of Colorado, Inc.: *See*—
Clayton, R. Paul; and Bowling, Rod A., 4,852,216, Cl. 17-50.000.
Monforte, Mathew L., to Multivisions Corporation. Robotic end effectors. 4,852,928, Cl. 294-88.000.
Monroe Electronics, Inc.: *See*—
Vosteen, William; and Cox, Mason F., 4,853,639, Cl. 324-457.000.
Monsanto Company: *See*—
Riley, Dennis P.; and Rivers, Willie J., Jr., 4,853,159, Cl. 562-17.000.
Stahlheber, N. Earl; and Lyon, John E., 4,853,200, Cl. 423-309.000.
Montan-Hydraulik GmbH: *See*—
Bartmann, Gunter; and Brackelmann, Gerd, 4,852,464, Cl. 92-53.000.
Montedison S.p.A.: *See*—
Ungarelli, Raffaele; and Sogli, Loris, 4,853,488, Cl. 570-184.000.
Mooch Domsjo Aktiebolag: *See*—
Samuelson, Hans O., 4,853,082, Cl. 162-38.000.
Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; and Fenn, Ronald S., to International Flavors & Fragrances Inc. Schiff base reaction product of ethyl vanillin and methyl anthranilate and organoleptic uses thereof. 4,853,369, Cl. 512-25.000.
Moore, Kenneth D. Skill saw rip guide. 4,852,257, Cl. 30-373.000.
Moore, Martin R.: *See*—
Gadsby, Peter D.; Moore, Martin R.; Olson, Denis E.; and Scott, Barry M., 4,852,571, Cl. 128-640.000.
Moore, Thomas W., Jr. Prefabricated insulating and ventilating panel. 4,852,314, Cl. 52-199.000.
Moran, James A., Jr.: *See*—
Anders, Gary H.; and Moran, James A., Jr., 4,852,441, Cl. 83-155.000.
Moren, Douglas L. Method and article of manufacture for producing mushrooms from self contained vessels. 4,852,297, Cl. 47-1.100.
Morgan, George R. External combustion closed regenerative cycle piston engine. 4,852,354, Cl. 60-682.000.
Mori, Hideshi: *See*—
Kato, Hisaaki; and Mori, Hideshi, 4,852,341, Cl. 57-328.000.
Mori, Kei. Light ray radiation device for administering oral medical treatment to diseased gums. 4,852,549, Cl. 128-395.000.
Mori, Keiji, to Aisin Seiki Kabushiki Kaisha. Driving cable connection. 4,852,422, Cl. 74-502.600.
Mori, Takashi: *See*—
Teshima, Toshio; Kitagawa, Tooru; Suzuki, Mikio; Masaoka, Toshio; Mori, Takashi; and Okimoto, Kazutaka, 4,852,633, Cl. 164-437.000.
Mori, Yoichi; Abiko, Shigeo; Tsuda, Mikio; and Ichijo, Chikara, to Toray Industries, Inc. Printing plate. 4,853,313, Cl. 430-156.000.
Morigaki, Satoshi: *See*—
Lovgren, Kurt I.; Pilbrant, Ake G.; Yasumura, Mitsuru; Morigaki, Satoshi; Oda, Minoru; and Ohishi, Naohiro, 4,853,230, Cl. 424-466.000.
Morimoto, Hiroaki: *See*—
Nishioka, Tadashi; Mashiko, Yoji; Morimoto, Hiroaki; and Koyama, Hiroshi, 4,853,341, Cl. 437-24.000.
Morimoto, Katsuhiro: *See*—
Takahashi, Akira; Shibahara, Kazuo; Morimoto, Katsuhiro; Samma, Hiromasa; and Kubo, Kazuhiko, 4,853,351, Cl. 501-87.000.
Morimoto, Makoto: *See*—
Saito, Yutaka; Kasai, Masaji; Shirahata, Kunikatsu; Kono, Motomichi; Morimoto, Makoto; and Ashizawa, Tadashi, 4,853,385, Cl. 514-250.000.
Morimoto, Taiji: *See*—
Matsui, Sadayoshi; Kaneiwa, Shinji; Morimoto, Taiji; Yamaguchi, Masahiro; Taneya, Mototaka; and Matsumoto, Mitsuhiro, 4,853,936, Cl. 372-45.000.
Morimoto, Yutaka: *See*—
Kitano, Masao; Ueno, Tsunemasa; Kojima, Kouichi; and Morimoto, Yutaka, 4,853,486, Cl. 568-22.000.
Morin, Louis G., to American Cyanamid Company. Chaff comprising metal coated fibers. 4,852,453, Cl. 89-1.110.
Morishita, Takuya; Okuda, Atushi; and Asanaka, Shinji, to Sanyo Electric Co., Ltd. Vacuum cleaner. 4,852,208, Cl. 15-339.000.
Morita, Izuru; Tozawa, Shoji; Hisatake, Tsuneo; and Atono, Tadasi, to Shin Caterpillar Mitsubishi Ltd. Operation data recording system. 4,853,859, Cl. 364-424.040.
Moriwaki, Nobuyuki: *See*—
Yamanaka, Toshiaki; Suzuki, Norio; Sakai, Yoshio; Kawamoto, Yoshifumi; Minato, Osamu; Ishibashi, Koichiro; Moriwaki, Nobuyuki; and Meguro, Satoshi, 4,853,894, Cl. 365-154.000.
Moro, Ken: *See*—
Akabane, Jun; Moro, Ken; Yamamoto, Masayasu; Hara, Masaharu; and Sekine, Yoshio, 4,853,723, Cl. 354-145.100.
Morooka, Takayoshi: *See*—
Tsujimura, Masao; Hirooka, Masamichi; Ishikawa, Kazuo; Morooka, Takayoshi; Noda, Masaki; Akiyama, Mamoru; Murai, Nobuaki; and Yoshikawa, Seiji, 4,853,731, Cl. 354-400.000.
Morrill, Wayne J. Electric motor assembly. 4,853,572, Cl. 310-90.000.
Morris, Scott S.: *See*—
Bettendorf, Richard A.; and Morris, Scott S., 4,852,785, Cl. 226-42.000.
Morrison, S. Roy; Frindt, Robert F.; Joensen, Per; Gee, Michael A.; and Miremadi, Bijan K., to Simon Fraser University. Novel transition metal dichalcogenide catalysts. 4,853,359, Cl. 502-220.000.
Morton, Roger R. A.; and Lewis, Scott, to Eastman Kodak Company. Forward look ahead techniques for tracking background and noise levels in scanned video images. 4,853,795, Cl. 358-447.000.
Morton Thiokol, Inc.: *See*—
Bennett, S. John; Barnes, Michael W.; and Kolonko, Kenneth J., 4,853,051, Cl. 149-19.400.
Moser, Bernhard: *See*—
Peetz, Wolfgang; and Moser, Bernhard, 4,852,670, Cl. 166-323.000.
Moskal & Chilewich, Inc.: *See*—
Chilewich, Sandy; and Moskal, Kathy, 4,852,272, Cl. 36-12.000.
Moskal, Kathy: *See*—
Chilewich, Sandy; and Moskal, Kathy, 4,852,272, Cl. 36-12.000.
Moss, Ernest K.: *See*—
Hallmark, Richard K.; and Moss, Ernest K., 4,853,419, Cl. 521-172.000.
Mosser, Kenneth J. Sling apparatus. 4,852,543, Cl. 124-20.00R.
Motorola, Inc.: *See*—
Brown, Daniel P.; Danielsen, Carl M.; and Dabbish, Ezzat A., 4,853,884, Cl. 364-602.000.
Bukhman, Yefim; and Witting, Gary F., 4,853,347, Cl. 437-192.000.
McGinn, Michael, 4,853,641, Cl. 329-50.000.
Movats Incorporated: *See*—
Boone, Bruce T.; Nafziger, Steven; Rak, Thomas A.; and McMennamy, John A., 4,852,416, Cl. 73-866.500.
Mrozowski, Joseph E.: *See*—
Hirshberg, Gerald P.; Mrozowski, Joseph E.; and Ball, Stephen D., 4,852,938, Cl. 296-214.000.
Mukherjee, Amar, to University of Central Florida. Code converter for data compression/decompression. 4,853,696, Cl. 341-65.000.
Muller, Werner H.; and Schneller, Arnold, to Hoechst Aktiengesellschaft. Perfluoroalkyl group-containing copolymers. 4,853,448, Cl. 526-254.000.
Mullin, Francis J.; and Reed, William C., to American Telephone and Telegraph Company AT&T Bell Laboratories. Composite service and distribution communications media. 4,852,965, Cl. 350-96.230.
Multiform Desiccants, Inc.: *See*—
Cullen, John S., 4,853,266, Cl. 421-35.700.

Multistack, Inc.: *See*—
Conry, Ronald D., 4,852,362, Cl. 62-175.000.
Multivisions Corporation: *See*—
Monforte, Mathew L., 4,852,928, Cl. 294-88.000.
Mund, Konrad; Preidel, Walter; Rao, J. Raghavendra; and Richter, Gerhard, to Siemens Aktiengesellschaft. Method and apparatus for the electrochemical determination of oxygen concentration. 4,853,091, Cl. 204-1.00T.
Mura, Albert J.; Belly, Robert T.; and Lum, Vanessa R., to Eastman Kodak Company. Water-compatible reducible compounds and their use in analytical compositions and methods. 4,853,186, Cl. 422-55.000.
Murai, Hiroyuki: *See*—
Sato, Yasuyuki; Sugata, Masaki; and Murai, Hiroyuki, 4,853,582, Cl. 313-141.000.
Murai, Nobuaki: *See*—
Tsujimura, Masao; Hirooka, Masamichi; Ishikawa, Kazuo; Morooka, Takayoshi; Noda, Masaki; Akiyama, Mamoru; Murai, Nobuaki; and Yoshikawa, Seiji, 4,853,731, Cl. 354-400.000.
Murakami, Tatsuo, to Hario Kabushiki Kaisha. Rice cooker for microwave ranges. 4,853,509, Cl. 219-10.55E.
Murakami, Tomoyoshi: *See*—
Matsuo, Shigeru; Murakami, Tomoyoshi; Bando, Thoru; and Nagatoshi, Kikuo, 4,853,443, Cl. 525-534.000.
Murakami, Yuichi; and Ieda, Kiyokazu, to Aisin Seiki Kabushikikaisha. Microstrip antenna with stripline and amplifier. 4,853,703, Cl. 343-700.0MS.
Murakami, Zensaku, to Toyota Jidosha Kabushiki Kaisha. Vehicle braking system capable of preventing rock-back motion of driver/-passenger upon vehicle stopping. 4,852,950, Cl. 303-100.000.
Muralt, Paul R.: *See*—
Pohl, Wolfgang D.; Gimzewski, James K.; and Muralt, Paul R., 4,853,810, Cl. 360-103.000.
Muramatsu, Yasuhiko; Ohta, Susumu; Takagi, Toshiyuku; Higuchi, Haruo; and Nikaido, Mitsuhiro, to Yokogawa Electric Corporation. Direct drive motor. 4,853,567, Cl. 310-67.00R.
Murase, Shigenobu: *See*—
Kodama, Seiki; Murase, Shigenobu; Matsuo, Haruyuki; Maruhashi, Hideki; Murata, Shigemi; and Miyaji, Hidetoshi, 4,852,541, Cl. 123-617.000.
Murashima, Hirotsugu; and Maeda, Satoru, to Sanyo Electric Co., Ltd. Automatic focusing circuit selectively using multiple focus evaluating curves having differing characteristics. 4,853,788, Cl. 358-227.000.
Murashima, Hirotsugu; and Maeda, Satoru, to Sanyo Electric Co., Ltd. Automatic focusing circuit using a two period detection interval to compensate for motion occurring within a field of view. 4,853,789, Cl. 358-227.000.
Murashita, Toru: *See*—
Matsumoto, Manabu; Ikeguchi, Takashi; Ueda, Shinjiroo; Sonobe, Tadasi; Murashita, Toru; Ido, Satoshi; Kuroishi, Kazuo; Kazawa, Yoshiaki; Kakiuchi, Shunji; and Kobari, Toshiaki, 4,853,640, Cl. 328-235.000.
Murata Kikai Kabushiki Kaisha: *See*—
Kato, Hisaaki; and Mori, Hideshi, 4,852,341, Cl. 57-328.000.
Murata, Mitshiro; Okada, Naofumi; Yamamoto, Kazutoshi; Tanimoto, Takuharu; and Inoue, Tokuyasu, to Sharp Kabushiki Kaisha. Document holder for a copier and hinge mechanism therefor. 4,853,750, Cl. 355-75.000.
Murata, Shigemi: *See*—
Kodama, Seiki; Murase, Shigenobu; Matsuo, Haruyuki; Maruhashi, Hideki; Murata, Shigemi; and Miyaji, Hidetoshi, 4,852,541, Cl. 123-617.000.
Murata, Shuji: *See*—
Asai, Yoshiharu; Tsukamoto, Shinji; and Murata, Shuji, 4,852,673, Cl. 177-25.180.
Muravsky, Anatoly A.: *See*—
Bezborodov, Vladimir S.; Grinkevich, Oleg A.; Grebenkin, Mikhail F.; Lapanik, Valery I.; Minko, Anatoly A.; Rzhussky, Vitaly V.; Muravsky, Anatoly A.; Petrov, Vladimir F.; and Ivaschenko, Alexandr V., 4,853,150, Cl. 252-299.610.
Murdock, G. Duncan, to Flow Systems, Inc. Method and apparatus for stablizing flow to sharp edges orifices. 4,852,800, Cl. 239-1.000.
Muri, Jakob: *See*—
Oppliger, Walter; and Muri, Jakob, 4,852,430, Cl. 76-27.000.
Murphy, William A.: *See*—
Coy, David H.; Murphy, William A.; and Heiman, Mark L., 4,853,371, Cl. 514-12.000.
Murray, Aengus: *See*—
McMullin, Francis; Byrne, John V.; and Murray, Aengus, 4,853,604, Cl. 318-653.000.
Murti, Dasarao K.: *See*—
Ong, Beng S.; Fuller, John R. C.; and Murti, Dasarao K., 4,853,308, Cl. 430-59.000.
Muskulus, Willi; Kolodziej, Helmut; and Nitsch, Helmut, to Statomat-Globe Maschinenfabrik GmbH. Method and apparatus for cutting cables to length from a cable supply and processing the cable ends. 4,852,249, Cl. 29-825.000.
Musso, Francois: *See*—
Wursch, Pierre; Musso, Francois; and Goulois, Eric, 4,853,248, Cl. 426-534.000.
Muto, Kazuhiko, to Canon Kabushiki Kaisha. Reverse biased photosensing semiconductor and op amp arrangement wherein the two load resistors of the operational amplifier unbalance the two transistors. 4,853,530, Cl. 250-214.00A.
Mycogen Corporation: *See*—
Herrnstadt, Corinna; and Wilcox, Edward, 4,853,331, Cl. 435-252.100.
Myers, Wilbur J., to Conoco Inc. Seal for marine seismic source. 4,853,905, Cl. 367-143.000.
NACAM: *See*—
Haldric, Bernard; and Feucht, Pascal, 4,852,380, Cl. 72-402.000.
Nadler, Guy; Le Polles, Jean-Bernard; and Legave, Marie-Noelle. Pyrido[1,2-a]indoles and their use as cardiovascular. 4,853,391, Cl. 514-294.000.
Naess, Ludvig: *See*—
Johansen, Trond V.; Ruch, Ola; Naess, Ludvig; Weber, Robert; Veenhoff, Bernd; Porner, Horst; Laurer, Erwin; Strickroth, Erich; and Schabert, Hans-Peter, 4,852,614, Cl. 138-93.000.
Ruch, Ola; Johansen, Trond V.; Naess, Ludvig; Poerner, Horst; Gebhard, Georg; Weber, Robert; and Heller, Max, 4,852,391, Cl. 73-40.50R.
Nafziger, Steven: *See*—
Boone, Bruce T.; Nafziger, Steven; Rak, Thomas A.; and McMennamy, John A., 4,852,416, Cl. 73-866.500.
Nagai, Kiyoshi: *See*—
Okuyama, Hideaki; Kusumoto, Shigehiro; Watanabe, Keisuke; and Nagai, Kiyoshi, 4,852,958, Cl. 350-96.130.
Nagai, Tomoaki: *See*—
Satake, Toshimi; Minami, Toshiaki; Nagai, Tomoaki; and Fujimura, Fumio, 4,853,361, Cl. 503-201.000.
Satake, Toshimi; Fukuchi, Tadakazu; Minami, Toshiaki; Nagai, Tomoaki; Kaneko, Toshio; and Fujimura, Fumio, 4,853,362, Cl. 503-207.000.
Satake, Toshimi; Minami, Toshiaki; Nagai, Tomoaki; and Fujimura, Fumio, 4,853,363, Cl. 503-210.000.
Nagaishi, Hatsuo, to Nissan Motor Co., Ltd. Fuel injection control system for internal combustion engine. 4,852,538, Cl. 123-492.000.
Nagamatsu, Sunao: *See*—
Abe, Shuzo; Matsunami, Satoshi; Nagamatsu, Sunao; Tanaka, Masaaki; and Matsuno, Masao, 4,853,546, Cl. 250-432.0PD.
Naganawa, Kazuo: *See*—
Asano, Yoshikazu; and Naganawa, Kazuo, 4,853,782, Cl. 358-148.000.
Nagano, Chikara: *See*—
Fujihara, Tadafumi; Shimada, Yoshihiro; Nagano, Chikara; and Tsukamoto, Katsuo, 4,852,985, Cl. 350-523.000.
Nagano, Masami; and Atago, Takeshi, to Hitachi, Ltd. Ignition timing control apparatus for internal combustion engine. 4,852,537, Cl. 123-419.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Side-pull type caliper brake. 4,852,698, Cl. 188-24.190.
Nagano, Yoosuke; Sekizawa, Sadao; and Seki, Toshio, to Hitachi, Ltd. Apparatus for magnetically detecting a position of a movable magnetic body. 4,853,632, Cl. 324-208.000.
Nagase, Makoto: *See*—
Endou, Masao; Asakura, Yamato; Watanabe, Atsushi; Sakagami, Masaharu; Uchida, Shunsuke; Nagase, Makoto; Baba, Tsutomu; and Ohsumi, Katsumi, 4,853,638, Cl. 324-441.000.
Nagata, Shigemi: *See*—
Naoi, Satoshi; Inoue, Akira; Nishikawa, Katsuhiko; and Nagata, Shigemi, 4,853,885, Cl. 364-718.000.
Nagata, Shinichi: *See*—
Wakimoto, Zenji; Nagata, Shinichi; and Katsuyama, Mikizo, 4,852,957, Cl. 350-6.600.
Nagata, Takuji; and Kuzuya, Yasuhisa, to Toyoda Gosei Co., Ltd. Molding with fitting and retainer means. 4,853,263, Cl. 428-31.000.
Nagatoshi, Kikuo: *See*—
Matsuo, Shigeru; Murakami, Tomoyoshi; Bando, Thoru; and Nagatoshi, Kikuo, 4,853,443, Cl. 525-534.000.
Nagler, Franz: *See*—
Kittel, Friedrich; Lutz, Dieter; Nagler, Franz; Oppitz, Horst; and Gasper, Gerhard, 4,852,419, Cl. 74-89.140.
Nagler, Michael: *See*—
Stein, Amnon; and Nagler, Michael, 4,853,709, Cl. 346-108.000.
Nagumo, Akihiko; and Yoshino, Shigeru, to Fuji Photo Film Co., Ltd. Moisture-controlled image recording apparatus. 4,853,743, Cl. 355-27.000.
Nahschewski, Vladimir W. Foot guards for all terrain vehicles. 4,852,900, Cl. 280-291.000.
Nakagawa, Hideshi: *See*—
Tanaka, Seiji; and Nakagawa, Hideshi, 4,853,519, Cl. 219-497.000.
Nakagawa, Isao: *See*—
Katsumata, Kenji; Sugiyama, Masato; Matono, Takaaki; Hirahata, Shigeru; Nakagawa, Isao; Ishikura, Kazuo; and Suzuki, Sunao, 4,853,765, Cl. 358-11.000.
Nakahashi, Yoshinao; Osada, Soichi; Shimizu, Chuji; and Ichida, Shinshichi, to Fukuda Denshi Co., Ltd.; and Daido Sangyo Co., Ltd. Multi-electrode type electrocardiographic electrode structure. 4,852,572, Cl. 128-640.000.
Nakai, Masaaki: *See*—
Kawamura, Kunio; Taniguchi, Toshihiko; Oya, Tetsuro; Niwa, Masatake; Nakai, Masaaki; and Fujino, Akihiko, 4,853,726, Cl. 354-289.100.
Nakai, Shinichi, to Ryobi Limited. Secondary battery quick charging circuit. 4,853,606, Cl. 320-36.000.
Nakajima, Kichio: *See*—
Iwamoto, Taro; Aoki, Tatsu; Nakajima, Kichio; and Yamamoto, Hiroshi, 4,853,874, Cl. 364-513.000.
Nakajima, Nobuyoshi, to Fuji Photo Film Co., Ltd. Apparatus for recording a radiation image of an object on a stimulable phosphor sheet to facilitate later reconstruction of an arbitrary tomographic image of the object. 4,853,540, Cl. 250-327.200.

Nakajima, Tomohiro: *See—*
Shimada, Kazuyuki; Nakajima, Tomohiro; Kotabe, Hiroaki; Yamanobe, Kouji; and Yamazaki, Kozo, 4,853,710, Cl. 346-108.000.

Nakajima, Yoshiaki; Suzuki, Tadashi; and Wada, Yoneji, to Takano Corporation. Lubrication monitoring apparatus for machine. 4,852,693, Cl. 184-6.400.

Nakamori, Katsu: *See—*
Takashima, Yasuji; Koyama, Ikuo; Maki, Tooru; and Nakamori, Katsu, 4,853,249, Cl. 427-3.000.

Nakamura, Katsumi; and Yamamoto, Tadahisa, to Kyocera Corporation. Ceramic substrate for semiconductor package. 4,853,271, Cl. 428-81.000.

Nakamura, Kazumitsu: *See—*
Yanagisawa, Akira; and Nakamura, Kazumitsu, 4,853,549, Cl. 250-491.100.

Nakamura, Kazuo: *See—*
Azuma, Nobuyuki; Maeda, Minoru; and Nakamura, Kazuo, 4,853,204, Cl. 423-344.000.

Nakamura, Yasuhide: *See—*
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Nakano, Yukiya: *See—*
Maekawa, Kengo; Suzuki, Moitsu; Nakano, Yukiya; and Tani, Hisahiko, 4,852,685, Cl. 181-175.000.

Nakata, Akira: *See—*
Homma, Yoshihiro; Nakata, Akira; Matsumoto, Shiroh; Yoshimura, Kunitoshi; and Minato, Masahiko, 4,852,793, Cl. 229-5.500.

Nakaya, Tomio: *See—*
Yamaguchi, Masami; Ishikawa, Shunichi; Tamura, Hideo; Tanaka, Hirokazu; Nakaya, Tomio; and Ishikawa, Kiyomitsu, 4,853,524, Cl. 235-468.000.

Nakazato, Hiroshi: *See—*
Akamatsu, Takahiro; Nakazato, Hiroshi; Matsumura, Takashi; and Fukui, Kenji, 4,853,880, Cl. 364-559.000.

Nalco Chemical Company: *See—*
Payne, Charles C.; and Kerr, Earnest M., 4,853,140, Cl. 252-34.000.

Naoi, Satoshi; Inoue, Akira; Nishikawa, Katsuhiko; and Nagata, Shigemi, to Fujitsu Limited. Method of compressing character or pictorial image data using curve approximation. 4,853,885, Cl. 364-718.000.

Narikawa, Shiro: *See—*
Hayakawa, Takashi; Nojima, Hideo; Kojima, Yoshimi; Narikawa, Shiro; Matsuyama, Toshiro; Imada, Eiji; and Ehara, Shaw, 4,853,309, Cl. 430-65.000.

Narimatsu, Osamu; Ito, Michiyasu; Komatsu, Kazuyoshi; and Shibata, Yasuhiro, to Mitsui Toatsu Chemicals, Incorporated. Wafer processing film. 4,853,286, Cl. 428-343.000.

Nasu, Atsushi. Combustion aids. 4,852,992, Cl. 44-50.000.

National Oil Well (U.K.) Limited: *See—*
Knerr, Edwin R.; Hart, Robert; and Cowan, William S., 4,852,611, Cl. 137-595.000.

National Starch and Chemical Corporation: *See—*
Eden, James; and Trksak, Ralph M., 4,853,168, Cl. 264-180.000.

Nauchno-Issledovatelsky Institut Prikladnykh Fizicheskikh Problem Imeni A. N. Sevchenko: *See—*
Bezborodov, Vladimir S.; Grinkevich, Oleg A.; Grebenkin, Mikhail F.; Lapanik, Valery I.; Minko, Anatoly A.; Rzhussky, Vitaly V.; Muravsky, Anatoly A.; Petrov, Vladimir F.; and Ivaschenko, Alexandr V., 4,853,150, Cl. 252-299.610.

Nauchno-Proizvodstvennoe Obiedinenie Po Tekhnologii Mashinostroenia Dlya Zhivotnovodstva I Kormoproizvodstva "RostNIITM": *See—*
Perevozkin, Jury L.; Gajun, Jury A.; Grigorov, Petr K.; Zhurakovsky, Vasily M.; and Samelik, Boris V., 4,853,047, Cl. 148-905.000.

Navatome: *See—*
Coulon, Michel; Faron, Robert; and Besson, Daniel, 4,852,645, Cl. 165-180.000.

Naylor, Alan: *See—*
Finch, Harry; Lunts, Lawrence H. C.; Naylor, Alan; Skidmore, Ian F.; and Campbell, Ian B., 4,853,381, Cl. 514-211.000.
Skidmore, Ian F.; Finch, Harry; Naylor, Alan; Lunts, Lawrence H. C.; and Campbell, Ian B., 4,853,382, Cl. 514-212.000.

Naylor Industrial Services, Inc.: *See—*
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NCR Corporation: *See—*
Obringer, Thomas J.; Siegel, Louis F.; and Lewis, Maurice W., 4,853,256, Cl. 427-152.000.
Porter, Warren W., 4,852,357, Cl. 62-50.400.

Nebel, David J.: *See—*
Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrom, William P., 4,852,818, Cl. 241-301.000.

NEC Corporation: *See—*
Fujisaki, Hisashi, 4,853,953, Cl. 379-88.000.
Kobayashi, Shinichi, 4,853,612, Cl. 323-354.000.
Komatsu, Michio, 4,853,340, Cl. 437-20.000.
Ohuchi, Mitsurou, 4,853,847, Cl. 364-200.000.
Otani, Susumu; and Iwasaki, Motoya, 4,853,642, Cl. 329-124.000.
Shibuya, Toshiteru, 4,853,840, Cl. 364-200.000.
Shimada, Michio, 4,853,930, Cl. 371-43.000.
Tsuchiya, Masaki, 4,853,831, Cl. 361-39.400.
Ueda, Hideki; and Babano, Sotoaki, 4,853,972, Cl. 455-83.000.
Yamada, Shitaka, 4,853,562, Cl. 307-465.000.
Yamaguchi, Takashi, 4,853,896, Cl. 365-189.020.

Nederlandse Centrale Organisatie Voor Toegerastnatuurwete Nschappelijk Onderzoek: *See—*
Clemmensen, Inge D.; and Kluft, Cornelis, 4,853,220, Cl. 424-101.000.

Neely, James F.: *See—*
Kraus, James E., Jr.; and Neely, James F., 4,853,850, Cl. 364-200.000.

Neiman: *See—*
Bombled, Jean, 4,852,681, Cl. 180-287.000.

Neinhaus, Jurgen; Hopp, Rudolf; Gottsch, Wilhelm; and Oelkers, Egon, to Haarmann & Reimer GmbH. Methylcyclododecatri-2,5,9-en-1-ols, a process for their preparation, and their use. 4,853,368, Cl. 512-25.000.

Nelles, Uwe: *See—*
Bitschkus, Horst; Hofmann, Manfred; Klockner, Karl-Heinz; Nelles, Uwe; and Siewert, Gunther, 4,852,864, Cl. 267-219.000.

Nelson, Perry: *See—*
Heselton, John; Nelson, Perry; and Aldrich, Tod, 4,852,883, Cl. 273-197.00R.

Nemoto, Shoji, to Sony Corp. Apparatus for reproducing video signals as slow-motion pictures. 4,853,809, Cl. 360-10.300.

Nesbitt, Russell U.: *See—*
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Nestec S.A.: *See—*
Wursch, Pierre; Musso, Francois; and Goulois, Eric, 4,853,248, Cl. 426-634.000.

Network Access Corporation: *See—*
Thorn, David W.; Patel, Rajendra; Coley, Gerald; Trivedi, Ashok; and Patel, Girish, 4,853,955, Cl. 379-230.000.

Neubauer, Rudolf F. W.; Jungbluth, Werner W.; and Laschinski, Dieter H., to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. He—Ne gas discharge tube. 4,853,938, Cl. 372-65.000.

Neugebauer, Manfred: *See—*
Johnson, David B.; Ebersole, Ronald J.; Huang, Joel C.; Neugebauer, Manfred; Page, Steven R.; and Self, Keith S., 4,853,846, Cl. 364-200.000.

Neumann, Sigrd: *See—*
Schubring, Reinhard; Witt, Juergen; Harwardt, Irene; Neumann, Sigrd; Schneider, Christoph; Mieth, Gerhard; Raue, Wolfgang; and Brueckner, Juergen, 4,852,477, Cl. 99-450.200.

Neumann, Udo: *See—*
Breitenbacher, Juergen; Kuehle, Walter; Moennings, Roland; Neumann, Udo; and Schramm, Wolfgang, 4,852,863, Cl. 267-218.000.

Neumann, Walter: *See—*
Schafer, Horst; Kossmehl, Gerhard; and Neumann, Walter, 4,853,453, Cl. 528-28.000.

New Bus Company, Inc., The: *See—*
Greene, Carl B.; and Greene, Carl B., III, 4,852,936, Cl. 296-178.000.

Newkirk, Marc S.; and Zwicker, Harry R., to Lanxide Technology Company, LP. Method of making self-supporting ceramic materials and materials made thereby. 4,853,352, Cl. 501-88.000.

Newman, Alec T.: *See—*
Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansley, Robert W.; and Newman, Alec T., 4,853,234, Cl. 426-77.000.

Newman, Edward H.: *See—*
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Newport Corporation: *See—*
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Ng, Paul T.: *See—*
Maier, Gerhard A.; Enlow, David L.; and Ng, Paul T., 4,852,536, Cl. 123-414.000.

Nguyen, Tuyen T., to Hercules Incorporated. Amine-terminated polysulfone sulfide, useful as epoxy curing agent. 4,853,442, Cl. 525-471.000.

Nichols, Steven R.; Hyers, Robert C.; Stovall, Walter M.; and Trawick, Charles D., to Scientific-Atlanta, Inc. Antenna position tracking apparatus and methods. 4,853,839, Cl. 364-167.010.

Nicia, Antonius J. A., to U.S. Philips Corporation. Optical fiber switch using nematic crystal to switch unpolarized optical signals. 4,852,962, Cl. 350-96.200.

Nickel, Herbert W., to A. O. Smith Corporation. Method of forming a composite tubular structure. 4,853,060, Cl. 156-172.000.

Nickey, George A.: *See—*
Heckman, Russell W.; Miller, Robert C.; and Nickey, George A., 4,852,271, Cl. 34-105.000.

Nickles, Stephen K.; Surjaatmadja, Jim B.; Haley, John E.; and Wienck, Lynn K. Apparatus and method for use in simulating operation and control of a railway train. 4,853,883, Cl. 364-578.000.

Nicolaisen, Curtis J.: *See—*
Meguro, Jun-ichi; and Nicolaisen, Curtis J., 4,853,059, Cl. 156-157.000.

Niebes, Paul: *See—*
Bovy, Philippe R.; Gillet, Claude; Lensers, Albert; Niebes, Paul; Roba, Joseph; and Lambelin, Georges, 4,853,401, Cl. 514-389.000.

Niedenhoff, Udo: *See—*
Blank, Kurt; Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Audi, Josef; Kaesmacher, Jakob; Reinicke, Ralf; and Niedenhoff, Udo, 4,853,019, Cl. 65-106.000.

Niederer, Kurt W.: *See—*
Hagewood, John F.; Niederer, Kurt W.; and McCoy, Daniel W., Sr., 4,852,225, Cl. 28-187.000.

Niedzwiecki, Joseph L.; and Wolfe, Ralph G., to Exxon Research and Engineering Company. Process for removing hydrogen sulfide from waste water. 4,853,002, Cl. 55-19.000.

Niemeijer, Frank T.: *See—*
van Laar, Jacobus; Niemeijer, Frank T.; and Stokman, Ronald J., 4,852,859, Cl. 266-197.000.

Niemeyer, Robert H., III, to AM International Corporation. Automatic pen type sensor for graphic recorder. 4,853,714, Cl. 346-139.00R.

Niewohner, Ulrich: *See—*
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Nihei, Mitsuo: *See—*
Nikaido, Hideyuki; Takayuki, Naoi; Komori, Atsushi; and Nihei, Mitsuo, 4,852,383, Cl. 72-407.000.

Niiro, Makoto: *See—*
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Nikaido, Hideyuki; Takayuki, Naoi; Komori, Atsushi; and Nihei, Mitsuo, to Kawasaki Steel Corporation; and Hitachi, Ltd. Press apparatus for reducing widths of hot slabs. 4,852,383, Cl. 72-407.000.

Nikaido, Mitsuhiro: *See—*
Muramatsu, Yasuhiko; Ohta, Susumu; Takagi, Toshiyuku; Higuchi, Haruo; and Nikaido, Mitsuhiro, 4,853,567, Cl. 310-67.00R.

Nikon Corporation: *See—*
Akabane, Jun; Moro, Ken; Yamamoto, Masayasu; Hara, Masaharu; and Sekine, Yoshio, 4,853,723, Cl. 354-145.100.
Akasaka, Hideki; and Sato, Masatoshi, 4,853,912, Cl. 369-73.000.
Kamiya, Saburo; Suzuki, Kazuaki; and Tanimoto, Akikazu, 4,853,745, Cl. 355-43.000.
Yamada, Tomoaki; and Ishii, Yuwa, 4,853,923, Cl. 369-120.000.

Nikoonahad, Mehrdad, to North American Philips Corporation. Ultrasound flow measurement apparatus. 4,852,575, Cl. 128-660.010.

Nimee, George S.; and Current, Andrew, to Schlage Lock Company. Door magnet improvement. 4,852,919, Cl. 292-251.500.

Ninnemann, Peter: *See—*
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Nippon Kokan Kabushiki Kaisha: *See—*
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Nippon Paint Co., Ltd.: *See—*
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Ohata, Masatoshi; Tsutsui, Koichi; Ikedal Shoji; and Fujimoto, Teruo, 4,853,436, Cl. 525-244.000.
Sobata, Tamotsu; Takimoto, Masaaki; and Yoshida, Yuichi, 4,853,285, Cl. 428-336.000.

Nippon Pneumatic Manufacturing Co., Ltd.: *See—*
Terada, Hiromu; and Okada, Hiroshi, 4,852,664, Cl. 173-134.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
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Nippon Steel Corporation: *See—*
Shindo, Yoshio; Wada, Koichi; and Yamazaki, Fumio, 4,853,295, Cl. 428-621.000.

Nippon Telephone & Telegraph: *See—*
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Nippon Zeon Co., Ltd.: *See—*
Yamato, Motoyuki; Ueno, Susumu; Okumura, Kin-ichi; and Fuchi, Masao, 4,853,435, Cl. 525-193.000.

Nippondenso Co., Ltd.: *See—*
Sato, Yasuyuki; Sugata, Masaki; and Murai, Hiroyuki, 4,853,582, Cl. 313-141.000.
Yamamoto, Yoshihisa, 4,852,808, Cl. 239-533.300.

Nishida, Norio: *See—*
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Nishikawa, Katsuhiko: *See—*
Naoi, Satoshi; Inoue, Akira; Nishikawa, Katsuhiko; and Nagata, Shigemi, 4,853,885, Cl. 364-718.000.

Nishimoto, Yukio, to Kayaba Kogyo K.K. Shock absorber. 4,852,703, Cl. 188-284.000.

Nishimura, Yuji, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Webbing driving device for use in seat belt apparatus. 4,852,908, Cl. 180-804.000.

Nishioka, Tadashi; Mashiko, Yoji; Morimoto, Hiroaki; and Koyama, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Process for forming electrodes for semiconductor devices using focused ion beams. 4,853,341, Cl. 437-24.000.

Nishizawa, Toshio: *See—*
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Niskin, Deborah E., executor: *See—*
Niskin, Shale, deceased; and Niskin, Deborah E., executor, 4,852,413, Cl. 73-864.670.

Niskin, Shale, deceased; and by Niskin, Deborah E., executor. Water sampler rosette. 4,852,413, Cl. 73-864.670.

Nissan Design International, Inc.: *See—*
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Nissan Motor Co., Ltd.: *See—*
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Matsuda, Toshiro, 4,852,051, Cl. 303-109.000.
Nagaishi, Hatsuo, 4,852,538, Cl. 123-492.000.
Oshiage, Katsunori; and Kumura, Haruyoshi, 4,853,857, Cl. 364-424.100.
Uchida, Koh; Kurihara, Takashi; and Miyoshi, Makoto, 4,852,462, Cl. 91-375.00A.

Nitsch, Helmut: *See—*
Muskulus, Willi; Kolodziej, Helmut; and Nitsch, Helmut, 4,852,249, Cl. 29-825.000.

Nitschke, Werner; Weller, Hugo; Drobny, Wolfgang; and Taufer, Peter, to Robert Bosch GmbH. Method of monitoring an error correction of a plurality of computer apparatus units of a multi-computer system. 4,853,932, Cl. 371-68.000.

Nitta Industries Corporation: *See—*
Otsuka, Kazuhiko; and Nobiraki, Koji, 4,852,882, Cl. 273-183.00B.

Nitto Chemical Industry Co., Ltd: *See—*
Orii, Koichi; Ohshima, Iwao; and Watanabe, Naotake, 4,853,198, Cl. 423-335.000.

Niwa, Masatake: *See—*
Kawamura, Kunio; Taniguchi, Toshihiko; Oya, Tetsuro; Niwa, Masatake; Nakai, Masaaki; and Fujino, Akihiko, 4,853,726, Cl. 354-289.100.

Niwa, Minoru: *See—*
Shiraki, Kouji; Niwa, Minoru; Itou, Kuniyasu; Yamamoto, Tadashi; and Harata, Mitsuru, 4,852,907, Cl. 280-731.000.

Nix Company, Ltd.: *See—*
Tanaka, Hiroyuki, 4,853,729, Cl. 354-322.000.

NKK Corporation: *See—*
Teshima, Toshio; Kitagawa, Tooru; Suzuki, Mikio; Masaoka, Toshio; Mori, Takashi; and Okimoto, Kazutaka, 4,852,633, Cl. 164-437.000.

Nobiraki, Koji: *See—*
Otsuka, Kazuhiko; and Nobiraki, Koji, 4,852,882, Cl. 273-183.00B.

Noble, Bradley T. Plasma bag support rack. 4,852,641, Cl. 165-80.100.

Noda, Masaki: *See—*
Tsujimura, Masao; Hirooka, Masamichi; Ishikawa, Kazuo; Morooka, Takayoshi; Noda, Masaki; Akiyama, Mamoru; Murai, Nobuaki; and Yoshikawa, Seiji, 4,853,731, Cl. 354-400.000.

Noel, Jacques: *See—*
Minjolle, Louis; Drouet, Michel; Fatta-Barou, Jean-Louis; Callegari, Michel; and Noel, Jacques, 4,853,053, Cl. 156-73.500.

Nogami, Kazutaka; and Sakurai, Takayasu, to Kabushiki Kaisha Toshiba. Complementary semiconductor memory device. 4,853,897, Cl. 365-189.110.

Noguchi, Tadashi: *See—*
Numata, atsuo; and Noguchi, Tadashi, 4,853,609, Cl. 323-312.000.

Nojima, Hideo: *See—*
Hayakawa, Takashi; Nojima, Hideo; Kojima, Yoshimi; Narikawa, Shiro; Matsuyama, Toshiro; Imada, Eiji; and Ehara, Shaw, 4,853,309, Cl. 430-65.000.

Nojiri, Hiromi: *See—*
Ito, Kenichiro; Nojiri, Hiromi; and Adachi, Kenro, 4,852,707, Cl. 192-44.000.

Nokami, Junzo: *See—*
Torii, Sigeru; Uneyama, Kenji; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,853,468, Cl. 540-215.000.

Noll, Willian B., to AMP Incorporated. Packaging system for electrical connectors. 4,852,737, Cl. 206-330.000.

Nonn, Alain, to Rhone-Poulenc Chimie. Process for the preparation of hydroxybiphenyls. 4,853,487, Cl. 568-730.000.

Nonura, Akihiro, to Dainippon Screen Mfg. Co., Ltd. Method and apparatus for processing image data. 4,853,971, Cl. 382-56.000.

Norberg, Kenneth L.: *See—*
Henley, Harold B.; Norberg, Kenneth L.; and Devine, John P., 4,852,310, Cl. 52-90.000.

Norddeutsche Faserwerke GMBH: *See—*
Beitz, Jurgen; Erren, Karl-Heinz; and Mantz, Ekkehard, 4,852,824, Cl. 242-131.100.

Norris, Lawrence G.: *See—*
Ovshinsky, Stanford R.; and Norris, Lawrence G., 4,853,785, Cl. 358-213.110.

Norris, Richard M.; Rumford, Kimball J.; and Youd, Douglass S., to Avco Corporation. Method of operating anti-icing valve. 4,852,343, Cl. 60-79.020.

North American Philips Corporation: *See—*
Nikoonahad, Mehrdad, 4,852,575, Cl. 128-660.010.

North, Bernard: *See—*
Mehrotra, Pankaj K.; Billman, Elizabeth R.; and North, Bernard, 4,852,999, Cl. 51-309.000.

Northern States Power Company: *See—*
Lehto, John M., 4,853,195, Cl. 423-242.000.

Northern Telecom Limited: *See—*
Lukas, Helmut H., 4,852,244, Cl. 29-566.300.
Rabipour, Rafi; Beyrouti, Michael G.; and Mermelstein, Paul, 4,853,958, Cl. 379-386.000.
Rabjohn, Gordon G., 4,853,624, Cl. 324-158.00P.

Northrop Corporation: *See—*
Thornburg, Francis L., 4,852,456, Cl. 89-1.510.

Northrup, Scott R.: *See—*
Eberle, Douglas J.; and Northrup, Scott R., 4,853,017, Cl. 65-2.000.

Northstar Industries, Inc.: *See—*
Best, John W., 4,852,712, Cl. 193-35.0TE.

Norton, Kenneth A.: *See*—
Johnson, Loren E.; Norton, Kenneth A.; Pawlowski, Norman E.; and Wooding, Margaret L., 4,853,037, Cl. 106-22.000.
Notetry Limited: *See*—
Dyson, James, 4,853,008, Cl. 55-345.000.
Dyson, James, 4,853,011, Cl. 55-345.000.
Novak, Ralph. Fingerboard for a stringed instrument. 4,852,450, Cl. 84-314.00R.
Nowobilski, Jeffert J.: *See*—
Acharya, Arun; and Nowobilski, Jeffert J., 4,852,358, Cl. 62-63.000.
Nozaki, Yasuo: *See*—
Matsumura, Akira; Nozaki, Yasuo; and Ishikawa, Katsukiyo, 4,853,092, Cl. 204-18.100.
NTN Toyo Bearing Co., Ltd.: *See*—
Ito, Kenichiro; Nojiri, Hiromi; and Adachi, Kenro, 4,852,707, Cl. 192-44.000.
Numata, atsuo; and Noguchi, Tadashi, to Pioneer Electronic Corporation. Distortion-free, opposite-phase current source. 4,853,609, Cl. 323-312.000.
Numonics Corporation: *See*—
Paschkis, Albert E., 4,853,715, Cl. 346-139.00R.
O & K Orenstein & Koppel Aktiengesellschaft: *See*—
Leidinger, Gustav; Proll, Gunther; and Kolb, Walter, 4,852,660, Cl. 172-795.000.
Oakland Engineering, Inc.: *See*—
Fisch, Alfred C., 4,852,390, Cl. 73-40.50A.
Oberle, Ferdinand, to Ferob, A.G. Device for holding credit cards and bank check cards. 4,852,727, Cl. 206-39.400.
Obisco Trading & Consulting S.A.: *See*—
Schlegel, Kurt; and Betz, C. Friedemann, 4,852,457, Cl. 89-6.500.
Obringer, Thomas J.; Siegel, Louis F.; and Lewis, Maurice W., to NCR Corporation. Two ply thermal paper and method of making. 4,853,256, Cl. 427-152.000.
Occidental Chemical Corporation: *See*—
DeWald, Raymond C.; and Hong, Paul O., 4,853,446, Cl. 526-205.000.
Lee, Chung J., 4,853,452, Cl. 528-26.000
Ore, Fernando; and Richards, Thomas E., 4,853,201, Cl. 423-320.000.
Occidental Research Corporation: *See*—
Schramm, Charles M.; Lane, Robert H.; and Dines, Martin B., deceased, 4,853,358, Cl. 502-167.000.
Oce-Nederland B.V.: *See*—
Stienstra, Jan B., 4,852,487, Cl. 101-232.000.
Ochs, Charles S., to Anchor Hocking Corporation. Closure cap and thin walled container. 4,852,753, Cl. 215-271.000.
Oda, Goro, to Kabushiki Kaisha Toshiba. Printer having specially arrayed ink holes. 4,853,716, Cl. 346-140.00R.
Oda, Kuniyuki: *See*—
Takamura, Norio; Oda, Kuniyuki; Kodato, Shinichi; Yamaguchi, Isao; and Yano, Koji, 4,853,404, Cl. 514-406.000.
Oda, Masaaki: *See*—
Yamamoto, Takashi; Mishina, Yoshihiko; and Oda, Masaaki, 4,852,982, Cl. 350-413.000.
Oda, Minoru: *See*—
Lovgren, Kurt I.; Pilbrant, Ake G.; Yasumura, Mitsuru; Morigaki, Satoshi; Oda, Minoru; and Ohishi, Naohiro, 4,853,230, Cl. 424-466.000.
Oda, Shunri: *See*—
Ishihara, Shunichi; Ohno, Shigeru; Kanai, Masahiro; Oda, Shunri; and Shimizu, Isamu, 4,853,251, Cl. 427-38.000.
Odaka, Kentaro: *See*—
Yamada, Makoto; and Odaka, Kentaro, 4,853,797, Cl. 360-32.000.
Odenthal, Conrad J, to Tektronix, Inc. Multiple beam electron discharge tube having bipotential acceleration and convergence electrode structure. 4,853,601, Cl. 315-368.000.
Oderbolz, Fredi: *See*—
Zollinger, Hans; and Oderbolz, Fredi, 4,852,618, Cl. 139-453.000.
O'Donnell, Jerry L.; and Bopp, Cecil W., to For You, Inc. Exercise device. 4,852,873, Cl. 272-137.000.
Oeckl, Siegfried; Martinola, Friedrich; and Thomas, Paul, to Bayer Aktiengesellschaft. Catalyst resins for the catalytic reduction of oxygen in aqueous media, the preparation of the catalyst resins, and new catalyst resins. 4,853,135, Cl. 210-757.000.
Oediger, Hermann: *See*—
Rosentreter, Ulrich; Boshagen, Horst; Lieb, Folker; Oediger, Hermann; Niewohner, Ulrich; Seuter, Friedel; Perzborn, Elisabeth; and Fiedler, Volker-Bernd, 4,853,406, Cl. 514-411.000.
Oelbermann, Max: *See*—
Heinrich, Hans J.; and Oelbermann, Max, 4,853,121, Cl. 210-225.000.
Oelkers, Egon: *See*—
Neinhaus, Jurgen; Hopp, Rudolf; Gottsch, Wilhelm; and Oelkers, Egon, 4,853,368, Cl. 512-25.000.
Oertel, Wolfgang: *See*—
Focke, Heinz; and Oertel, Wolfgang, 4,852,335, Cl. 53-575.000.
Oficina De Investigacion Agrupada, S.A.: *See*—
Azpitarte Bolivar, Domingo F., 4,852,473, Cl. 99-293.000.
Ogasawara, Mamoru: *See*—
Horiguchi, Masashi; Yakubo, Minoru; Tamura, Yoshikazu; and Ogasawara, Mamoru, 4,853,747, Cl. 355-51.000.
Ogasawara, Nobuo, to Fujitsu Limited. System for permitting access to data field area in IC card for multiple services. 4,853,522, Cl. 235-380.000.
Ogasawara, Takeshi: *See*—
Koshida, Takahisa; Uchimura, Ryoji; and Ogasawara, Takeshi, 4,853,196, Cl. 423-290.000.
Ogawa, Hideki: *See*—
Takahashi, Sadatoshi; Ogawa, Hideki; and Endo, Hiroshi, 4,852,984, Cl. 350-454.000.
Ogiue, Katsumi: *See*—
Uchida, Akihisa; Okada, Daisuke; Takakura, Toshihiko; Ogiue, Katsumi; Tamaki, Yoichi; and Kawamura, Masao, 4,853,343, Cl. 437-33.000.
Ogura, Yukiko: *See*—
Yamamoto, Etsuji; Ogura, Yukiko; and Kohno, Hideki, 4,853,636, Cl. 324-309.000.
Ohashi, Yuichi: *See*—
Makino, Katsumi; Ohashi, Yuichi; Takehara, Hiroshi; Suga, Yoichi; and Shiozawa, Takekimi, 4,853,322, Cl. 430-567.000.
Ohata, Masatoshi; Tsutsui, Koichi; Ikedal Shoji; and Fujimoto, Teruo, to Nippon Paint Co., Ltd. Graft polymerization of substituted styrene polymers having pendant vinylidene groups. 4,853,436, Cl. 525-244.000.
Ohishi, Naohiro: *See*—
Lovgren, Kurt I.; Pilbrant, Ake G.; Yasumura, Mitsuru; Morigaki, Satoshi; Oda, Minoru; and Ohishi, Naohiro, 4,853,230, Cl. 424-466.000.
Ohkubo, Masaharu: *See*—
Suzuki, Akio; Ohkubo, Masaharu; and Takada, Yoshihiro, 4,853,768, Cl. 358-80.000.
Ohlenmacher, Ralf: *See*—
Ruckert, Hans; and Ohlenmacher, Ralf, 4,853,314, Cl. 430-191.000.
Ohly, Richard L.: *See*—
Bellagamba, Miro D.; and Ohly, Richard L., 4,852,881, Cl. 273-183.00B.
Ohmika, Yasushi: *See*—
Mikami, Tetsuo; Ohmika, Yasushi; and Miyazaki, Hidetoshi, 4,852,423, Cl. 74-551.900.
Ohno, Michio: *See*—
Hasegawa, Katsumi; Ohno, Michio; and Kadotsuji, Akira, 4,852,819, Cl. 242-18.00R.
Ohno, Shigeru: *See*—
Ishihara, Shunichi; Ohno, Shigeru; Kanai, Masahiro; Oda, Shunri; and Shimizu, Isamu, 4,853,251, Cl. 427-38.000.
Ohnuma, Yoshiyuki: *See*—
Mizutani, Toshiaki; Yonezawa, Takeyuki; Inoue, Hiroshi; Tsuge, Akihiko; and Ohnuma, Yoshiyuki, 4,853,299, Cl. 428-698.000.
Ohsawa, Seiichi: *See*—
Kunita, Masao; Koizumi, Michio; and Ohsawa, Seiichi, 4,852,480, Cl. 101-93.050.
Ohshima, Iwao: *See*—
Orii, Koichi; Ohshima, Iwao; and Watanabe, Naotake, 4,853,198, Cl. 423-335.000.
Ohshima, Jiro: *See*—
Abe, Masahiro; Aoyama, Masaharu; Ohshima, Jiro; and Ajima, Takashi, 4,853,760, Cl. 357-52.000.
Taka, Shin-ichi; and Ohshima, Jiro, 4,853,342, Cl. 437-31.000.
Ohsumi, Katsumi: *See*—
Endou, Masao; Asakura, Yamato; Watanabe, Atsushi; Sakagami, Masaharu; Uchida, Shunsuke; Nagase, Makoto; Baba, Tsutomu; and Ohsumi, Katsumi, 4,853,638, Cl. 324-441.000.
Ohta, Susumu: *See*—
Muramatsu, Yasuhiko; Ohta, Susumu; Takagi, Toshiyuku; Higuchi, Haruo; and Nikaido, Mitsuhiro, 4,853,567, Cl. 310-67.00R.
Ohta, Yasuhiko: *See*—
Onishi, Toshiyasu; Ayata, Kenzo; Takagi, Hiroshi; Suzuki, Yasuo; Ohta, Yasuhiko; Shiozawa, Takao; Fujiwara, Koichi; and Itashiki, Masakazu, 4,852,635, Cl. 164-468.000.
Ohtani, Kazuo: *See*—
Shibata, Jouji; Ohtani, Kazuo; Shinohara, Norio; and Hanyuda, Toshiaki, 4,853,279, Cl. 428-267.000.
Ohtsu, Shinji; and Yabushita, Haruyasu, to Denki Onkyo Co., Ltd. Deflection yoke apparatus with means for reducing unwanted radiation. 4,853,588, Cl. 313-440.000.
Ohuchi, Mitsurou, to NEC Corporation. Data processor with wait control allowing high speed access. 4,853,847, Cl. 364-200.000.
Ohwa, Nobutaka: *See*—
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Aburaya, Toshio, 4,852,906, Cl. 280-707.000.
Oike, Hiroshi, to Kabushiki Kaisha Toshiba. Refrigerator with a malfunction detection system. 4,852,361, Cl. 62-131.000.
Okabe, Kazuya; Matsuda, Hideyuki; Iwasaki, Chisato; and Fujimoto, Satoshi, to Alps Electric Co., Ltd. Method for manufacturing a thin-film transistor array and a thin-film transistor array manufactured by the method. 4,853,755, Cl. 357-23.700.
Okada, Daisuke: *See*—
Uchida, Akihisa; Okada, Daisuke; Takakura, Toshihiko; Ogiue, Katsumi; Tamaki, Yoichi; and Kawamura, Masao, 4,853,343, Cl. 437-33.000.
Okada, Hiroshi: *See*—
Terada, Hiromu; and Okada, Hiroshi, 4,852,664, Cl. 173-134.000.
Okada, Naofumi: *See*—
Murata, Mitshiro; Okada, Naofumi; Yamamoto, Kazutoshi; Tanimoto, Takuharu; and Inoue, Tokuyasu, 4,853,750, Cl. 355-75.000.
Okada, Toshihiko: *See*—
Itaya, Hisao; Okada, Toshihiko; Hata, Morishige; Koike, Shunji; and Onishi, Takahiro, 4,853,776, Cl. 358-106.000.

Okada, Yoshihiro: *See*—
Sakai, Toshiyuki; Okada, Yoshihiro; and Hyodo, Keiichiro, 4,853,767, Cl. 358-78.000.
Okamori, Kenji: *See*—
Fukumoto, Masatoshi; Kubo, Soichi; Miyake, Yoichi; Tsukada, Norishige; Kasutani, Kiyoshi; and Okamori, Kenji, 4,853,794, Cl. 358-447.000.
Okamoto, Yoshiharu: *See*—
Takizawa, Seiichiro; Fukukawa, Mitsuo; Yazawa, Masayuki; Asai, Kazumitsu; and Okamoto, Yoshiharu, 4,852,278, Cl. 37-197.000.
Okamoto, Yuji; Maehara, Shigeharu; and Fujiwara, Katsuyoshi, to Sharp Kabushiki Kaisha. Variable magnification copier. 4,853,748, Cl. 355-55.000.
Okano, Takashi; Akiyama, Toru; and Kanda, Masao, to Pioneer Electronic Corporation. Video format signal processing system. 4,853,781, Cl. 358-148.000.
Okano, Takashi; Akiyama, Toru; and Kanda, Masao, to Pioneer Electronic Corporation. Time base correction system with coarse and fine correction. 4,853,914, Cl. 369-32.000.
Okazaki, Mamoru, to Tsubakimoto Chain Co. Guiding method for autonomous traveling vehicle. 4,852,677, Cl. 180-169.000.
Okazaki, Masaki; and Inagaki, Yoshio, to Fuji Photo Film Co., Ltd. Reagent for assaying hydrogen peroxide and method of quantitative assay for hydrogen peroxide. 4,853,328, Cl. 435-28.000.
Okazaki, Susumu: *See*—
Tanaka, Takahiko; Hisanaga, Naogi; Yamamoto, Takeshi; Okazaki, Susumu; and Kajimoto, Shinshi, 4,852,205, Cl. 15-250.170.
Oki Electric Industry Co., Ltd.: *See*—
Ishikawa, Osamu; Sone, Mikihiko; and Suzuki, Yoshimi, 4,853,793, Cl. 358-464.000.
Okuyama, Hideaki; Kusumoto, Shigehiro; Watanabe, Keisuke; and Nagai, Kiyoshi, 4,852,958, Cl. 350-96.130.
Okimoto, Kazutaka: *See*—
Teshima, Toshio; Kitagawa, Tooru; Suzuki, Mikio; Masaoka, Toshio; Mori, Takashi; and Okimoto, Kazutaka, 4,852,633, Cl. 164-437.000.
Okuda, Atushi: *See*—
Morishita, Takuya; Okuda, Atushi; and Asanaka, Shinji, 4,852,208, Cl. 15-339.000.
Okumura, Kin-ichi: *See*—
Yamato, Motoyuki; Ueno, Susumu; Okumura, Kin-ichi; and Fuchi, Masao, 4,853,435, Cl. 525-193.000.
Okuyama, Hideaki; Kusumoto, Shigehiro; Watanabe, Keisuke; and Nagai, Kiyoshi, to Oki Electric Industry Co., Ltd. Optical matrix switch having optimized crosstalk characteristics and uniform optical output intensity. 4,852,958, Cl. 350-96.130.
Okuyama, Toshiharu: *See*—
Shimizu, Giichiro; Okuyama, Toshiharu; and Wakatsuki, Yoshio, 4,852,264, Cl. 33-832.000.
Olesak, John, to General Signal Corporation. Noise suppressing isolation transformer. 4,853,665, Cl. 336-84.00C.
Olin Corporation: *See*—
Butt, Sheldon H., 4,853,491, Cl. 174-52.400.
Oliver, Randy L.: *See*—
Corwon, Michael E.; and Oliver, Randy L., 4,852,410, Cl. 73-861.380.
Olivier, Denis: *See*—
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Olmstead, Neil R.: *See*—
Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; Olmstead, Neil R.; Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; and Frasier, Richard A., 4,853,784, Cl. 358-181.000.
Olsen, Duane A.; and Bernstein, David. Colloidal gold particle concentration immunoassay. 4,853,335, Cl. 436-527.000.
Olsen, Gordon E.: *See*—
Helsley, Grover C.; Davis, Larry; and Olsen, Gordon E., 4,853,384, Cl. 514-255.000.
Olson, David V. Protective face shield. 4,852,185, Cl. 2-9.000.
Olson, Denis E.: *See*—
Gadsby, Peter D.; Moore, Martin R.; Olson, Denis E.; and Scott, Barry M., 4,852,571, Cl. 128-640.000.
Olson, Ralph; and Kulbersh, Irwin, to Amco Corporation. Adjustable rack of shelves. 4,852,501, Cl. 108-111.000.
Olsson, Nils A.: *See*—
Alferness, Rodney C.; Henry, Charles H.; Kazarinov, Rudolf F.; Olsson, Nils A.; and Orlowsky, Kenneth J., 4,852,960, Cl. 350-96.190.
Olszewski, James: *See*—
Win, Maung H.; Hata, Stephen S.; Abba, William A.; and Olszewski, James, 4,853,281, Cl. 428-286.000.
Olympus Optical Co., Ltd.: *See*—
Fujihara, Tadafumi; Shimada, Yoshihiro; Nagano, Chikara; and Tsukamoto, Katsuo, 4,852,985, Cl. 350-523.000.
Hibino, Hiroki; Kimura, Kenji; and Eino, Teruo, 4,853,773, Cl. 358-98.000.
Kikuchi, Kenichi, 4,853,772, Cl. 358-98.000.
Watanabe, Youji; Matsuzaki, Minoru; and Itoh, Junichi, 4,853,733, Cl. 354-412.000.
Onari, Mikihiko; Sekozawa, Teruji; Funabashi, Motohisa; and Atago, Takeshi, to Hitachi, Ltd. Condition adaptive-type control method for internal combustion engines. 4,853,720, Cl. 364-431.070.
O'Neill, Edward, to Lucasey Manufacturing Company, Inc. Appliance support apparatus. 4,852,842, Cl. 248-280.100.
Ong, Beng S.; Fuller, John R. C.; and Murti, Dasarao K., to Xerox Corporation. Photoresponsive imaging members with fluorene hole transporting layers. 4,853,308, Cl. 430-59.000.
Onishi, Takahiro: *See*—
Itaya, Hisao; Okada, Toshihiko; Hata, Morishige; Koike, Shunji; and Onishi, Takahiro, 4,853,776, Cl. 358-106.000.
Onishi, Takami; and Dotani, Satoshi, to Kanzaki Paper Mfg. Co., Ltd. Process for controlling curl in coated papers. 4,853,255, Cl. 427-148.000.
Onishi, Toshiyasu; Ayata, Kenzo; Takagi, Hiroshi; Suzuki, Yasuo; Ohta, Yasuhiko; Shiozawa, Takao; Fujiwara, Koichi; and Itashiki, Masakazu, to Kabushiki Kaisha Kobe Seiko Sho. Method of electromagnetic stirring in continuous metal casting process. 4,852,635, Cl. 164-468.000.
Onoue, Kazuhiko; and Kashiki, Hajime, to Kawasaki Jukogyo Kabushiki Kaisha. Control of an industrial robot. 4,853,603, Cl. 318-568.150.
Opie, Eric A.; and Silverstein, Fred E., to Opielab, Inc. Contamination-free endoscope valves for use with a disposable endoscope sheath. 4,852,551, Cl. 128-4.000.
Opielab, Inc.: *See*—
Opie, Eric A.; and Silverstein, Fred E., 4,852,551, Cl. 128-4.000.
Oppenheimer, Alfred: *See*—
Barcelon, Shirley Ann; Oppenheimer, Alfred; and Hussein, Mamoun M., 4,853,247, Cl. 426-613.000.
Oppitz, Horst: *See*—
Kittel, Friedrich; Lutz, Dieter; Nagler, Franz; Oppitz, Horst; and Gasper, Gerhard, 4,852,419, Cl. 74-89.140.
Oppliger, Walter; and Muri, Jakob. Band saw straightening apparatus. 4,852,430, Cl. 76-27.000.
Optische Werke G. Rodenstock: *See*—
Melzig, Manfred; and Effer, Erhard, 4,852,974, Cl. 350-165.000.
Orczech, Juergen: *See*—
Wisotzki, Klaus-Dieter; Schaab, Udo; Reitz, Hans-Joachim; and Orczech, Juergen, 4,852,591, Cl. 134-57.00R.
Ore, Fernando; and Richards, Thomas E., to Occidental Chemical Corporation. Recovery of P_2O_5 values from phosphoric acid hemihydrate crystals. 4,853,201, Cl. 423-320.000.
Oregon Marine Floats, Inc.: *See*—
Fransen, Sig T.; and Dye, Wayne K., Jr., 4,852,509, Cl. 114-263.000.
Orii, Koichi; Ohshima, Iwao; and Watanabe, Naotake, to Nitto Chemical Industry Co., Ltd; and Mitsubishi Rayon Co., Ltd. Process for producing unsintered cristobalite silica. 4,853,198, Cl. 423-335.000.
Orlowsky, Kenneth J.: *See*—
Alferness, Rodney C.; Henry, Charles H.; Kazarinov, Rudolf F.; Olsson, Nils A.; and Orlowsky, Kenneth J., 4,852,960, Cl. 350-96.190.
Orr, Thomas V., to Procter & Gamble Company, The. Antiperspirant creams containing volatile silicones. 4,853,214, Cl. 424-69.000.
Orthokinetics, Inc.: *See*—
Krauska, Bernard J., 4,852,939, Cl. 297-71.000.
Ortlieb, Orlen J.; and Bartlett, Donald R., to Maytag Corporation. Breakaway crate base. 4,852,735, Cl. 206-320.000.
Osada, Soichi: *See*—
Nakahashi, Yoshinao; Osada, Soichi; Shimizu, Chuji; and Ichida, Shinshichi, 4,852,572, Cl. 128-640.000.
Osajima, Katsuhiro: *See*—
Osajima, Kazuharu; and Osajima, Katsuhiro, 4,853,231, Cl. 426-7.000.
Osajima, Kazuharu; and Osajima, Katsuhiro. Method for preparation of tastable matters consisting primarily of low molecular weight peptides. 4,853,231, Cl. 426-7.000.
Osborne, Gary T.: *See*—
Hoover, Alan A.; and Osborne, Gary T., 4,852,444, Cl. 84-1.050.
Osher, Mikhail I.: *See*—
Minenko, Leonid P.; Osher, Mikhail I.; Belikov, Evgeny V.; and Klyatis, Lev M., 4,852,927, Cl. 294-86.400.
Oshiage, Katsunori; and Kumura, Haruyoshi, to Nissan Motor Company, Ltd. Ratio control for continuously variable transmission. 4,853,857, Cl. 364-424.100.
Oslin, Brian L., to Ceracon, Inc. Electrical heating of graphite grain employed in consolidation of objects. 4,853,178, Cl. 419-23.000.
Osppco, Inc.: *See*—
Hosman, Reo, 4,852,834, Cl. 248-156.000.
Osterloh, Rolf: *See*—
Blum, Rainer; Rehmer, Gerd; Osterloh, Rolf; and Sander, Hans, 4,853,433, Cl. 525-65.000.
Ostrowiecki, Morris. Elevator control system. 4,852,695, Cl. 187-121.000.
Oswald, Joseph: *See*—
Bianchi, Raymond A.; Kistner, David; Oswald, Joseph; and Phelps, Elmer B., 4,852,662, Cl. 173-119.000.
Ota, Akiho, to Yoshino Kogyosho Co., Ltd. Neck structure of synthetic resin bottle-shaped container. 4,852,752, Cl. 215-31.000.
Otani, Hidehiko: *See*—
Hino, Masao; Yoneda, Kenichi; Miyake, Masato; Otani, Hidehiko; Shingu, Noriya; Isahaya, Tsukasa; Hamada, Shigeshi; and Arahori, Tsuyoshi, 4,853,194, Cl. 423-239.000.
Otani, Shigeaki: *See*—
Momoki, Yasuhito; Asami, Masahiro; Sakai, Nobuo; and Otani, Shigeaki, 4,853,321, Cl. 430-380.000.
Otani, Susumu; and Iwasaki, Motoya, to NEC Corporation. Phase controlled demodulator for digital communications system. 4,853,642, Cl. 329-124.000.

Otis Engineering Corporation: *See—*
Young, Carter R., 4,852,649, Cl. 166-189.000

Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See—*
Torii, Sigeru; Uneyama, Kenji; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,853,468, Cl. 540-215.000.

Otsuka, Kazuhiko; and Nobiraki, Koji, to Nitta Industries Corporation. Device for golf practicing. 4,852,882, Cl. 273-183.00B

Otsuka, Tatsuo; Iwai, Ichiro; and Yamaguchi, Noboru, to Showa Aluminum Kabushiki Kaisha. Method for making corrosion resistance heat exchangers. 4,852,791, Cl. 228-183.000.

Ott, Cynthia D.: *See—*
Ott, David M.; and Ott, Cynthia D., 4,853,970, Cl. 382-54.000.

Ott, David M.; and Ott, Cynthia D., to Integrated Automation. Apparatus for processing digitized images. 4,853,970, Cl. 382-54.000.

Ott, Karl-Heinz: *See—*
Jansen, Ulrich; and Ott, Karl-Heinz, 4,853,450, Cl. 526-303.100.

Otteman, John H.: *See—*
Gray, William M.; and Otteman, John H., 4,853,689, Cl. 340-453.000.

Ouchi, Tomonori; Wakamatsu, Otsuro; Kawanishi, Hiroshi; and Yasui, Masao, to Shimizu Construction Co., Ltd. Electronic blackboard and electronic blackboard system. 4,853,495, Cl. 178-18.000.

Outboard Marine Corporation: *See—*
Maier, Gerhard A.; Enlow, David L.; and Ng, Paul T., 4,852,536, Cl. 123-414.000.
Wood, LeRoy T., 4,853,160, Cl. 261-41.500.

Outerbridge, Howard K. G. Compressible bone staple. 4,852,558, Cl. 128-92.0YF.

Ovshinsky, Stanford R.; and Norris, Lawrence G., to Energy Conversion Devices, Inc. Electronic camera including electronic signal storage cartridge. 4,853,785, Cl. 358-213.110.

Owen, Hartley: *See—*
Haddad, James H.; and Owen, Hartley, 4,853,107, Cl. 208-152.000.
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,853,105, Cl. 208-74.000.
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,853,187, Cl. 422-144.000.

Owens-Corning Fiberglas Corporation: *See—*
Eberle, Douglas J.; and Northrup, Scott R., 4,853,017, Cl. 65-2.000.
Seng, Stephen, 4,853,024, Cl. 65-335.000.

Owens-Illinois Glass Container Inc.: *See—*
Heckman, Russell W.; Miller, Robert C.; and Nickey, George A., 4,852,271, Cl. 34-105.000.

Owens-Illinois Plastic Products Inc.: *See—*
Ajmera, Prakash R., 4,853,171, Cl. 264-530.000.
Kaminski, Ronald S., 4,853,169, Cl. 264-509.000.

Oxley, Donald W.: *See—*
Thatte, Satish M.; and Oxley, Donald W., 4,853,842, Cl. 364-200.000.

Oy Sinebrychoff AB: *See—*
Prinkkila, Helena M.; and Pajunen, Esko J., 4,853,237, Cl. 426-590.000.

Oya, Tetsuro: *See—*
Kawamura, Kunio; Taniguchi, Toshihiko; Oya, Tetsuro; Niwa, Masatake; Nakai, Masaaki; and Fujino, Akihiko, 4,853,726, Cl. 354-289.100.

Ozaki, Hidetoshi, to Victor Company of Japan, Ltd. Video signal processing circuit. 4,853,783, Cl. 358-162.000.

Ozdemir, Phillip. Method and apparatus for detecting a tracer gas using a single laser beam. 4,853,543, Cl. 250-372.000.

Ozogar, Robert M.: *See—*
Subramaniam, Anandaraman; Ozogar, Robert M.; and Bergsbaken, Carlton K., 4,853,232, Cl. 426-35.000

Ozols, Ilmars. Adjustable folding table for vehicles. 4,852,499, Cl. 108-44.000.

Packaging Corporation of America: *See—*
Holladay, John T., 4,852,756, Cl. 220-4.00F.
Stone, James L., 4,852,764, Cl. 220-315.000.

Packard, Thomas J., to Minnesota Mining and Manufacturing Company. Compressible ear tip. 4,852,684, Cl. 181-131.000.

Paddock, Gordon R.: *See—*
Turner, Kenneth W.; Simons, Richard H., Jr.; and Paddock, Gordon R., 4,853,009, Cl. 55-387.000.

Page, Gary L., to Conoco Inc. Variable angle refractory anchor for connecting surfaces. 4,852,324, Cl. 52-506.000.

Page, Steven R.: *See—*
Johnson, David B.; Ebersole, Ronald J.; Huang, Joel C.; Neugebauer, Manfred; Page, Steven R.; and Self, Keith S., 4,853,846, Cl. 364-200.000.

Pagel, John R. Releasable mailbox mounting apparatus. 4,852,847, Cl. 248-548.000.

Pagnucco, Gilbert: *See—*
Hochart, Paul; Pagnucco, Gilbert; Bertrand, Marceau; and Bertrand, Alain, 4,853,520, Cl. 219-535.000.

Pajunen, Esko J.: *See—*
Prinkkila, Helena M.; and Pajunen, Esko J., 4,853,237, Cl. 426-590.000.

Palco Telecom Inc.: *See—*
McGough, Gerald B., 4,852,373, Cl. 70-417.000.

Palkovich, Alex, to Elscint Ltd. Superconducting magnet with separate support system. 4,853,661, Cl. 335-216.000.

Palotas, Laszlo : *See—*
Tatai, Llona; Gundisch, Gusztav; Palotas, Laszlo ; and Subotics, Gyula, 4,852,713, Cl. 198-337.000.

Pankow, Chester W. Supplemental air valve for internal combustion engine. 4,852,539, Cl. 123-587.000.

Panofski, Ernst: *See—*
Klein, Lutz; Panofski, Ernst; and Kastl, Roland, 4,853,591, Cl. 313-493.000.

Pantaleon-Stemberg, Gerd: *See—*
Schlor, Georg; and Pantaleon-Stemberg, Gerd, 4,853,087, Cl. 162-383.000.

Pantoliano, Michael W.; and Ladner, Robert C., to Genex Corporation. Computer-based method for designing stablized proteins. 4,853,871, Cl. 364-496.000.

Panzer, Hans P.: *See—*
Lewis, Norman J.; and Panzer, Hans P., 4,853,114, Cl. 209-167.000.

Papenbrock, Francis X.; and Holcombe, Glenn C. Gutter assembly with cleaning system. 4,852,308, Cl. 52-12.000.

Paragon Electric Company, Inc.: *See—*
Skarivoda, Edwin L., 4,853,558, Cl. 307-141.000.

Parent, Edward D.: *See—*
Stevens, Chad I.; and Parent, Edward D., 4,853,016, Cl. 65-18.100.

Parise, Vital A.: *See—*
Amiot, Jacques H. J.; Fourny, Jacky R. P.; Letournel, Gilles J. M.; and Parise, Vital A., 4,852,814, Cl. 241-37.500.

Park, Noh-Aeok; and Irvine, Thomas F., Jr., to J & L Instruments Corporation. Method for measuring density of Newtonian and non-Newtonian fluids. 4,852,388, Cl. 73-32.00R.

Parker, Dane K.: *See—*
Colvin, Howard A.; Cottman, Kirkwood S.; and Parker, Dane K., 4,853,478, Cl. 560-32.000.

Parkhurst, Anthony D.; and Halpenny, Thomas J., to Hewlett-Packard Company. Apparatus and method for efficient plotting. 4,853,877, Cl. 364-520.000.

Parkhurst, Charles. Spring shield for starter drives for internal combustion engines. 4,852,708, Cl. 192-45.000.

Parris, Michael: *See—*
Eaton, S. Sheffield, Jr.; and Parris, Michael, 4,853,893, Cl. 365-145.000.

Parsons, John H.; Hunt, Russell G.; Leach, Susan E.; Buss, Anthony D.; Green, David E.; Mellor, Michael; and Percival, Albert, to Schering Agrochemicals Limited. Fungicides. 4,853,400, Cl. 514-383.000.

Paschkis, Albert E., to Numonics Corporation. Plotter head control device. 4,853,715, Cl. 346-139.00R.

Pashby, Ian R.: *See—*
Ford, David A.; Hill, Anthony D.; and Pashby, Ian R., 4,853,044, Cl. 148-3.000.

Pasteris, Robert J.; and Thompson, Mark E., to E. I. Du Pont de Nemour and Company. Benzylsulfonylureas and arylsulfamoylureas. 4,853,025, Cl. 71-91.000.

Pastor, Jose, to Pitney Bowes Inc. Reliable document authentication system. 4,853,961, Cl. 380-21.000.

Pate, Charles D.; Young, Bob R.; and Plata, Hector, to Loomis International. Pipe segment pressure tester and process of use. 4,852,393, Cl. 73-49.500.

Patel, Chandrakant B.: *See—*
Isnardi, Michael A.; and Patel, Chandrakant B., 4,853,766, Cl. 358-12.000.

Patel, Girish: *See—*
Thorn, David W.; Patel, Rajendra; Coley, Gerald; Trivedi, Ashok; and Patel, Girish, 4,853,955, Cl. 379-230.000.

Patel, Kanu M.; and Powell, James E., to Du Pont de Nemours, E. I., and Company. Phytotoxic 2-alkyl-5-(heterocyclic)-pyrrole-3,4-dicarboxylates. 4,853,027, Cl. 71-94.000.

Patel, Rajendra: *See—*
Thorn, David W.; Patel, Rajendra; Coley, Gerald; Trivedi, Ashok; and Patel, Girish, 4,853,955, Cl. 379-230.000.

Patent Treuhand Gesellschaft fur elektrische Gluhlampen mbH: *See—*
Klein, Lutz; Panofski, Ernst; and Kastl, Roland, 4,853,591, Cl. 313-493.000.

Patrikios, Michael J., to American Technology, Inc. Method and apparatus of ultrasonic gang welding. 4,852,788, Cl. 228-110.000.

Patterson, David W.: *See—*
St. Angelo, Stephen; Carver, George C.; Patterson, David W.; and Fremont, Owen K., 4,852,240, Cl. 29-559.000.

Patterson, James M., Jr.: *See—*
Young, James L.; and Patterson, James M., Jr., 4,852,478, Cl. 101-18.000.

Patterson, James R., to Virkler Company, The. Process for bleaching denim fabrics and garments. 4,852,990, Cl. 8-108.100.

Patton, Marilyn, to Mastodon, Inc. Drinking spout for a beverage can. 4,852,776, Cl. 222-570.000.

Paul Forkardt GmbH & Co. KG: *See—*
Bald, Hubert, 4,852,434, Cl. 82-118.000.

Paulsen, Brian; and Vignolo, Joseph, to R. T. Engineering Service, Inc. Digital panel meter. 4,853,619, Cl. 324-115.000.

Pavio, Anthony M.: *See—*
Smith, Mark A.; and Pavio, Anthony M., 4,853,564, Cl. 307-492.000.

Pavlisko, Joseph A.: *See—*
Hartley, Paul A.; Pavlisko, Joseph A.; and Wright, Hal E., 4,853,737, Cl. 355-289.000.

Pawenski, Scott M.: *See—*
Rubin, Richard H.; Petrone, Benjamin J.; Heim, Richard C.; and Pawenski, Scott M., 4,852,516, Cl. 118-715.000.

Pawlaczyk, Deborah C.: *See—*
Matzoll, Robert J., Jr.; and Pawlaczyk, Deborah C., 4,853,879, Cl. 364-552.000.

Pawlowski, Norman E.: *See—*
Johnson, Loren E.; Norton, Kenneth A.; Pawlowski, Norman E.; and Wooding, Margaret L., 4,853,037, Cl. 106-22.000.

Payne, Charles C.; and Kerr, Earnest M., to Nalco Chemical Company. Lubricating fluids for slicing silicon ingots. 4,853,140, Cl. 252-34.000.

Payne, H. Dwaine; and Brunner, Terry C., Sr. Articulated wild game decoy. 4,852,288, Cl. 43-2.000.

Payrhammer, Bernd; and Huber, Leonhard, to Afga-Gevaert Aktiengesellschaft. Photographic processing apparatus usable with mobile cassettes. 4,853,742, Cl. 355-27.000.

PCI Group Inc.: *See—*
Boucher, Donald A., 4,852,251, Cl. 29-845.000.

Pearce, David A.: *See—*
Adams, Roger W.; Falcon-Steward, Hugh R.; and Pearce, David A., 4,852,811, Cl. 241-1.000.

Pearlman, Dale L. Method for treating psoriasis with cytotoxic agents. 4,853,388, Cl. 514-274.000.

Pease, Eugene D., to Armstrong International, Inc. Cable terminal. 4,852,292, Cl. 43-27.400.

Pecceu, Pol: *See—*
Frankel, Juergen; Mattelin, Antoon; Pecceu, Pol; Quella, Ferdinand; Schmidt, Hans-Fr.; Boone, Luc; Von Tomkewitsch, Sybille; and De Vogelaere, Marc, 4,853,252, Cl. 427-53.100.

Peckjian, Bryan M.: *See—*
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Pecoware Products, Inc.: *See—*
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Pedain, Josef: *See—*
Dunwald, Willi; Schlegel, Hans; Halpaap, Reinhard; and Pedain, Josef, 4,853,261, Cl. 427-388.100.

Pedalo, Inc.: *See—*
Sutter, Hans E., 4,853,764, Cl. 358-3.000.

Peerlkamp, Erik R., to Stamicarbon B.V. Multi-layer polyamide moulded article. 4,853,282, Cl. 428-323.000.

Peetz, Wolfgang; and Moser, Bernhard, to Hawera Probst GmbH & Co. Drilling tool with an exchangeable feed helix. 4,852,670, Cl. 166-323.000.

Peiffer, Dennis G., to Exxon Research and Engineering Company. Polymerization of cationic N,N-dimethylalkylamine type monomers. 4,853,447, Cl. 526-229.000.

Pelavin, Milton H.: *See—*
Saros, Stephen; Smith, John L.; Cassaday, Michael M.; Herron, Rand E.; and Pelavin, Milton H., 4,853,336, Cl. 436-53.000.

PELIKAN Aktiengesellschaft: *See—*
Manusch, Christoph; Harp, Hans-Jurgen; and van Swieten, Roy, 4,853,074, Cl. 156-577.000.

Pell, Donald M. Method and kit for measuring the effectiveness of bronchodilators. 4,852,582, Cl. 128-716.000.

Pellinen, John R.: *See—*
Whitman, Robert W.; and Pellinen, John R., 4,852,266, Cl. 33-366.000.

Pellizzari, Paolo; and Perry, Richard, to Kiel Corporation. Keyboard with manual-control keys combined with a display system. 4,853,697, Cl. 341-23.000.

Peltier, Bertrand; and Deshais, Richard, to Schlumberger Technology Corporation. Method for monitoring the operations of the rotary drilling of a well. 4,852,665, Cl. 175-40.000.

Pender, Joseph: *See—*
Iggulden, Jerry R.; Streck, Donald A.; and Pender, Joseph W., 4,852,802, Cl. 239-64.000.

Pender, Joseph W.: *See—*
Iggulden, Jerry R.; Streck, Donald A.; and Pender, Joseph W., 4,852,802, Cl. 239-64.000.

Peng, Yu-Yin; and Fu, Shih-Lien, to Industrial Technology Research Institute. Electromagnetic permeable-shell-free diaphragm valve. 4,852,854, Cl. 251-129.170.

Penn, Paul E., to Dart Controls, Inc. Solid state device package mounting apparatus. 4,853,828, Cl. 361-386.000.

Penner, Reuben. Apparatus and method for preparing fragments from tire casings. 4,852,812, Cl. 241-24.000.

Pennica, Diane: *See—*
Goeddel, David V.; Kohr, William J.; Pennica, Diane; and Vehar, Gordon A., 4,853,330, Cl. 435-226.000.

Peppel, Michael, to Siemens Aktiengesellschaft. Device for maintaining the cut-off switching state of a thyristor that can be turned off. 4,853,834, Cl. 363-54.000.

Peralta Cancer Research Institute: *See—*
Hackett, Adeline J.; and Dairkee, Shahnaz H., 4,853,464, Cl. 530-387.000.

Percival, Albert: *See—*
Parsons, John H.; Hunt, Russell G.; Leach, Susan E.; Buss, Anthony D.; Green, David E.; Mellor, Michael; and Percival, Albert, 4,853,400, Cl. 514-383.000.

Perevozkin, Jury L.; Gajun, Jury A.; Grigorov, Petr K.; Zhurakovsky, Vasily M.; and Samelik, Boris V., to Nauchno-Proizvodstvennoe Obiedinenie Po Tekhnologii Mashinostroenia Dlya Zhivotnovodstva I Kormoproizvodstva "RostNIITM". Work-performing member for farm machines. 4,853,047, Cl. 148-905.000.

Peri-Oral Dental Products, Inc.: *See—*
Thame, Neville, 4,853,213, Cl. 424-58.000.

Perkin-Elmer Corporation, The: *See—*
Fuimefreddo, Anthony J., 4,853,513, Cl. 219-76.140.
Willen, William S.; Savill, Robert F., Jr.; and Hacker, Martin E., 4,853,515, Cl. 219-121.470.

Perko, John. Hand exercise device. 4,852,871, Cl. 272-67.000.

Perry, James T.: *See—*
Bennett, Stanley N.; Perry, James T.; and Greene, Ronald D., 4,852,794, Cl. 229-73.000.

Perry, Richard: *See—*
Pellizzari, Paolo; and Perry, Richard, 4,853,697, Cl. 341-23.000.

Persson, Sixten: *See—*
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Perzborn, Elisabeth: *See—*
Rosentreter, Ulrich; Boshagen, Horst; Lieb, Folker; Oediger, Hermann; Niewohner, Ulrich; Seuter, Friedel; Perzborn, Elisabeth; and Fiedler, Volker-Bernd, 4,853,406, Cl. 514-411.000.

Pesque, Patrick R. A., to U.S. Philips Corporation. Apparatus for examining a moving object by means of ultrasound echography. 4,853,904, Cl. 367-89.000.

Peter, Gerhard; Kempkensteffen, Heinz; and Heid, Rudolf, to IMA-NORTE Maschinenfabriken Klessmann GmbH & Co. Tool changer for drill press. 4,852,243, Cl. 29-568.000.

Peters, Petrus J. M., to U.S. Philips Corporation. Vacuum tube including an electron-optical system. 4,853,586, Cl. 313-422.000.

Peterson, Craig B.: *See—*
Bain, William L., Jr.; de Oliveira Camargo, Marcos; Duzett, Robert C.; Lederhofer, Artur H.; Peterson, Craig B.; and Wipfli, John L., 4,853,849, Cl. 364-200.000.

Peterson, James E.; and Collett, Robert W., to Daylighting, Inc. Closed loop control system for shade assembly. 4,852,627, Cl. 160-84.100.

Peterson, Thomas K. M. Method and apparatus for removing aquatic plants. 4,852,337, Cl. 56-8.000.

Petrakis, Konstaninos S.; Berger, Joel G.; and Gold, Elijah H., to Schering Corporation. Phosphorus containing compounds as inhibitors of enkephalinases. 4,853,476, Cl. 558-170.000.

Petrone, Benjamin J.: *See—*
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Petrov, Vladimir F.: *See—*
Bezborodov, Vladimir S.; Grinkevich, Oleg A.; Grebenkin, Mikhail F.; Lapanik, Valery I.; Minko, Anatoly A.; Rzhussky, Vitaly V.; Muravsky, Anatoly A.; Petrov, Vladimir F.; and Ivaschenko, Alexandr V., 4,853,150, Cl. 252-299.610.

Pett, Todd A.: *See—*
Diaz, Leopoldo J.; McKenna, Daniel B.; and Pett, Todd A., 4,853,704, Cl. 343-767.000.

Pettus, William G., to Babcock & Wilcox Company, The. Void plug for annular fuel pellets. 4,853,177, Cl. 376-418.000.

Petzenhauser, Isfried: *See—*
Bard, Martin; Rieger, Rosemarie; and Petzenhauser, Isfried, 4,853,167, Cl. 264-112.000.

Pfalzgraf, Manfred; and Ungermann, Heinz, to VDO Adolf Schindling AG. Electrical desired-value transmitter, particularly for an electronic gas-pedal system. 4,853,556, Cl. 307-10.100.

Pfeifer, Wolf D.: *See—*
Manner, Reinhard; Schaefer, Hans; Voight, Carl; and Pfeifer, Wolf D., 4,853,190, Cl. 422-197.000.

Pfeiffer, Michael, to Michael Pfeiffer Design und Marketing GmbH. Lockable portable container, especially suitcase, board case, file case, file case or the like. 4,852,371, Cl. 70-70.000.

Pfizenmaier, Wolfgang, to Heidelberger Druckmaschinen AG. Device for aftertreating a coated or printed material web. 4,852,492, Cl. 101-424.100.

Pfizer Inc.: *See—*
Cooper, Kelvin; Cross, Peter E.; Fray, Michael J.; and Richardson, Kenneth, 4,853,392, Cl. 514-311.000.
Lipinski, Christopher A., 4,853,410, Cl. 514-432.000.
Showell, Henry J., 4,853,409, Cl. 514-418.000.

Pham, Tu-Anh; and Lancaster, Gerald M., to Dow Chemical Company, The. Foamable thermoplastic polymers and a method for foaming. 4,853,420, Cl. 521-50.500.

Phelps, Elmer B.: *See—*
Bianchi, Raymond A.; Kistner, David; Oswald, Joseph; and Phelps, Elmer B., 4,852,662, Cl. 173-119.000.

Philippot, Jean: *See—*
Wallach, Donald F. H.; and Philippot, Jean, 4,853,228, Cl. 424-450.000.

Philips and DuPont Optical Company: *See—*
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Phillips, Bradley A.: *See—*
Harris, Clark E.; Armbruster, Randy; Decker, Michael; and Phillips, Bradley A., 4,852,821, Cl. 242-71.800.

Phillips, Floyd L., Jr.: *See—*
Allen, John S.; Butler, John P.; and Phillips, Floyd L., Jr., 4,852,734, Cl. 206-273.000.

Phillips, James L.; Richardson, Dale W.; and Silverman, Lawrence M., to Richardson & Associates, Ltd. Device for cleaning electric knives. 4,852,200, Cl. 15-104.00R.

Phillips, Mark I.: *See—*
Brearley, Malcolm; Phillips, Mark I.; Prescott, Robert D.; and Ross, Colin F., 4,852,953, Cl. 303-111.000.

Phillips Petroleum Company: *See—*
Holland, Floyd H., 4,853,189, Cl. 422-140.000.
Inkrott, Kenneth E.; and Hawley, Gil R., 4,853,444, Cl. 526-119.000.

Photo Redux Corp.: *See—*
Goudy, Paul R., Jr., 4,853,581, Cl. 313-15.000.

PHR Furniture Limited: *See—*
Roper, Lewis P., 4,852,943, Cl. 297-302.000.

Piana, Maurizio; and Manservisi, Renato, to SASIB S.p.A. Rod deflecting and breaking device in a cigarette making machine. 4,852,588, Cl. 131-84.100.
Piatt, Michael J., to Eastman Kodak Company. Compact printer with adjustable sheet storage cassette. 4,853,711, Cl. 346-134.000.
Piatt, Michael J., to Eastman Kodak Company. Sheet feed system for compact printer. 4,853,712, Cl. 346-134.000.
Piatt, Michael J.; and Houser, Kevin L., to Eastman Kodak Company. Compact printer having improved sheet cassette. 4,853,713, Cl. 346-134.000.
Picker International, Inc.: *See*—
Elliott, Richard J.; Dupuis, Walter A.; and Resnick, Theodore A., 4,853,946, Cl. 378-4.000.
Pielet, Howard M.: *See*—
Jackson, Charles R.; Rellis, Daniel, Jr.; Pielet, Howard M.; Bhattacharya, Debanshu; Frank, Larry A.; Dasgupta, Purnendu; and Knoepke, John R., 4,852,632, Cl. 164-437.000.
Pietrzak, Edward; and Ihm, James M. Gate operator. 4,852,706, Cl. 192-8.00R.
Pike, Roscoe A., to United Technologies Corporation. Amorphous hydrated metal oxide primer for organic adhesively bonded joints. 4,853,300, Cl. 428-702.000.
Pilbrant, Ake G.: *See*—
Lovgren, Kurt I.; Pilbrant, Ake G.; Yasumura, Mitsuru; Morigaki, Satoshi; Oda, Minoru; and Ohishi, Naohiro, 4,853,230, Cl. 424-466.000.
Pilling Co.: *See*—
Chaux, Aurelio, 4,852,552, Cl. 128-20.000.
Pio AB: *See*—
Andersson, Lars; Stenlund, Berndt; and Wiberg, Rolf, 4,853,293, Cl. 428-605.000.
Pioneer Electronic Corporation: *See*—
Kimura, Yukio; Yoshino, Toshikazu; and Hayashi, Ryutaro, 4,853,260, Cl. 427-240.000.
Numata, atsuo; and Noguchi, Tadashi, 4,853,609, Cl. 323-312.000.
Okano, Takashi; Akiyama, Toru; and Kanda, Masao, 4,853,781, Cl. 358-148.000.
Okano, Takashi; Akiyama, Toru; and Kanda, Masao, 4,853,914, Cl. 369-32.000.
Takahashi, Junji; and Kenmotsu, Isami, 4,853,924, Cl. 369-270.000.
Tomita, Toshihiko, 4,853,916, Cl. 369-36.000.
Pitcraft Summit Limited: *See*—
Jones, Philip, 4,852,947, Cl. 299-81.000.
Pitney Bowes Inc.: *See*—
Auerbach, David R., 4,852,334, Cl. 53-569.000.
Dannatt, Hugh S., 4,852,786, Cl. 226-137.000.
Durst, Robert T., Jr.; Fougere, Guy L.; Hunter, Kevin D.; and Schmidt, Alfred C., 4,853,869, Cl. 364-478.000.
Hart, William G.; Breault, Michelle S.; Sansone, Ronald P.; Taylor, Michael P.; and Doeberl, Terrence M., 4,853,864, Cl. 364-464.020.
Huboard, David W., 4,852,479, Cl. 101-91.000.
Pastor, Jose, 4,853,961, Cl. 380-21.000.
Sansone, Ronald P.; and Fougere, Guy L., 4,853,865, Cl. 364-464.020.
Storace, Anthony, 4,852,482, Cl. 101-110.000.
Talmadge, Paul C., 4,853,523, Cl. 235-492.000.
Pittsburgh Corning Corporation: *See*—
Fleming, Harry A., Jr.; Fosnaught, Edward F.; and Wehman, Robert L., 4,852,321, Cl. 52-306.000.
Pituch, Thomas R.: *See*—
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Plasson Maagan Michael Industries Ltd.: *See*—
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Plastmo Ltd.: *See*—
Harbom, John, 4,852,312, Cl. 52-126.300.
Plata, Hector: *See*—
Pate, Charles D.; Young, Bob R.; and Plata, Hector, 4,852,393, Cl. 73-49.500.
Plessey Overseas Limited: *See*—
Dakin, John P., 4,853,534, Cl. 250-227.000.
Lane, Anthony A., 4,853,658, Cl. 333-164.000.
Laws, Peter G., 4,853,943, Cl. 375-87.000.
Plough, Inc.: *See*—
McShane, James E., 4,853,240, Cl. 426-250.000.
Podgorski, Theodore J.: *See*—
Ford, Carol M.; and Podgorski, Theodore J., 4,853,940, Cl. 372-87.000.
Poeppinghausen, Klaus-Jurgen V., to Warner-Lambert Company. Process for producing a fish food. 4,853,242, Cl. 426-516.000.
Poerner, Horst: *See*—
Ruch, Ola; Johansen, Trond V.; Naess, Ludvig; Poerner, Horst; Gebhard, Georg; Weber, Robert; and Heller, Max, 4,852,391, Cl. 73-40.50R.
Pohl, Wolfgang D.; Gimzewski, James K.; and Muralt, Paul R., to International Business Machines Corporation. Method and apparatus for controlling the flying height of the head in a magnetic storage unit. 4,853,810, Cl. 360-103.000.
Pollack, Robert L. Method and composition for increasing production of serotonin. 4,853,377, Cl. 514-161.000.
Polytex Plastic SA: *See*—
Bruno, Mueller, 4,852,691, Cl. 182-222.000.
Pond, Robert B., Sr. Process for modifying the surface of metal or metal alloy substrates and surface modified products produced thereby. 4,852,789, Cl. 228-198.000.
Ponticello, Gerald S.: *See*—
Baldwin, John J.; and Ponticello, Gerald S., 4,853,383, Cl. 514-235.800.
Porner, Horst: *See*—
Johansen, Trond V.; Ruch, Ola; Naess, Ludvig; Weber, Robert; Veenhoff, Bernd; Porner, Horst; Laurer, Erwin; Strickroth, Erich; and Schabert, Hans-Peter, 4,852,614, Cl. 138-93.000.
Porta, Norbert: *See*—
Rorig, Hans; and Porta, Norbert, 4,853,146, Cl. 252-142.000.
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Jakubowicz, Raymond F.; and Porte, Johannes J., 4,852,620, Cl. 141-25.000.
Porter, Warren W., to NCR Corporation. Cryogenic liquid pump. 4,852,357, Cl. 62-50.400.
Poschet, Klaus; and Banteli, Willy, to Bircher, AG. Pressure actuated snap switch. 4,853,506, Cl. 200-463.000.
Poss, Joey M.: *See*—
Kukson, Dean R.; Melas, Constantin M.; and Poss, Joey M., 4,853,802, Cl. 360-65.000.
Poteet, William C., to Dow Chemical Company, The. Releasable polyurethane backed textiles. 4,853,280, Cl. 428-286.000.
Potter, John L. Process and composition for a metal polish. 4,853,000, Cl. 51-309.000.
Pottorff, Earl T. Self-sharpening perforator for plastic film. 4,852,442, Cl. 83-697.000.
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PPG Industries, Inc.: *See*—
Hammel, Joseph J., 4,853,001, Cl. 55-16.000.
Henery, Vern A., 4,853,257, Cl. 427-166.000.
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Preidel, Walter: *See*—
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Premi, Mauro, to Mesdan S.p.A. Splicing device operating with compressed air admixed with a liquid, for splicing threads for textile yarns. 4,852,339, Cl. 57-22.000.
Prescott, Robert D.: *See*—
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President and Fellows of Harvard College: *See*—
Alderman, Edward M.; Fett, James W.; and Vallee, Bert L., 4,853,219, Cl. 424-85.800.
Presley, James R.: *See*—
Walles, Erik W.; Lupinski, John H.; Markovitz, Mark; Colborn, Robert E.; Presley, James R.; Davis, Michael J.; Minnick, Michael G.; Kubisen, Steven J., Jr.; Hallgren, John E.; Bolon, Donald A.; Eddy, Victoria J.; and Irwin, Patricia C., 4,853,423, Cl. 523-428.000.
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Tippetts, John R.; and Priestman, Geoffrey H., 4,852,613, Cl. 137-805.000.
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Procter & Gamble Company, The: *See*—
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Hardy, Frederick E.; Cselik, Frank; Pretty, Alastair J.; Young, Kenneth; and Scott, Gerald, 4,853,143, Cl. 252-102.000.
Orr, Thomas V., 4,853,214, Cl. 424-69.000.
Proll, Gunther: *See*—
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Pucci, Gregory P.: *See*—
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Pulciani, Sam C.: *See*—
Mikas, Raymond; Szczerba, Robert M.; and Pulciani, Sam C., 4,852,377, Cl. 72-349.000.
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Merrell, Gene A.; and Purnell, Deborah L., 4,853,132, Cl. 210-712.000.
Quack, Jochen M.: *See*—
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Quaker Oats Company, The: *See*—
Blonski, Chester J., 4,853,965, Cl. 381-205.000.
Merten, Barry; and Kamman, Gordon W., 4,852,837, Cl. 248-188.000.
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Quarles, Carol A.: *See*—
Salaita, George N.; Quarles, Carol A.; and Altman, Joseph C., 4,853,537, Cl. 250-253.000.
Quash, Gerard A.; Rodwell, John D.; McKearn, Thomas J.; and Ripoll, Jean P., to Cytogen Corporaton. Carbohydrate perturbations of viruses or viral antigens and utilization for diagnostic prophylactic and/or therapeutic applications. 4,853,326, Cl. 435-5.000.
Quella, Ferdinand: *See*—
Frankel, Juergen; Mattelin, Antoon; Pecceu, Pol; Quella, Ferdinand; Schmidt, Hans-Fr.; Boone, Luc; Von Tomkewitsch, Sybille; and De Vogelaere, Marc, 4,853,252, Cl. 427-53.100.
Quigley, Joseph R. Method of ladle desulfurizing molten steel. 4,853,034, Cl. 75-58.000.
Quinn, Michael H.; and Quinn, Paul H. Traction control system. 4,852,949, Cl. 303-100.000.
Quinn, Paul H.: *See*—
Quinn, Michael H.; and Quinn, Paul H., 4,852,949, Cl. 303-100.000.
Quinty, Christian: *See*—
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Quipp Incorporated: *See*—
Houseman, J. D., 4,852,722, Cl. 198-803.700.
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R & R Engineering, Inc.: *See*—
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Rabipour, Rafi; Beyrouti, Michael G.; and Mermelstein, Paul, to Northern Telecom Limited. LPC-based DTMF receiver for secondary signalling. 4,853,958, Cl. 379-386.000.
Rabjohn, Gordon G., to Northern Telecom Limited. Tunable microwave wafer probe. 4,853,624, Cl. 324-158.00P.
Rad Elec Inc.: *See*—
Dempsey, John C.; and Kotrappa, Payasada, 4,853,536, Cl. 250-253.000.
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Rak, Thomas A.: *See*—
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Ramtron Corporation: *See*—
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Mc Namara, Thomas, 4,852,599, Cl. 135-102.000.
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Hayes, Stanley K., 4,852,513, Cl. 118-326.000.
Rao, J. Raghavendra: *See*—
Mund, Konrad; Preidel, Walter; Rao, J. Raghavendra; and Richter, Gerhard, 4,853,091, Cl. 204-1.00T.
Rappinger, Bo; and Stenkvist, Sven-Einar, to Asea Brown Boveri AB. D.C. arc furnace having electrically conductive hearth and method for making same. 4,853,941, Cl. 373-72.000.
Rasmussen, Jerald K.: *See*—
Babirad, Stefan A.; Bacon, Fredrick; Heilmann, Steven M.; Krepski, Larry R.; Kuczma, Andrew S.; and Rasmussen, Jerald K., 4,852,969, Cl. 350-96.340.
Rasmussen, Jerry R.: *See*—
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Raychem Corporation: *See*—
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Rosenzweig, Nachum; and Soni, Pravin L., 4,853,165, Cl. 264-27.000.
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Read, Norman W.: *See*—
Buckner, Robert K.; Read, Norman W.; and Ritchie, Donald E., 4,852,654, Cl. 166-277.000.
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Recognition Equipment Incorporated: *See*—
Weideman, William E., 4,853,969, Cl. 382-54.000.
Reed, Roger G. Diffuser for color analyzer. 4,853,744, Cl. 355-38.000.
Reed, William A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical fiber comprising a refractive index trench. 4,852,968, Cl. 350-96.330.
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Mullin, Francis J.; and Reed, William C., 4,852,965, Cl. 350-96.230.
Reemers, Herman A. J.: *See*—
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Rehmer, Gerd: *See*—
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Reid, Richard M. Convenient dual fuel tank system. 4,852,892, Cl. 280-834.000.
Reidinger, Franz: *See*—
Whalen, Philip J.; Reidinger, Franz; and Antrim, Robert, 4,853,353, Cl. 501-103.000.
Reiling, Gilbert H.: *See*—
Heindl, Raymond A.; Reiling, Gilbert H.; and Suster, Albert L., 4,853,597, Cl. 313-638.000.
Reimers, Robert S.; Akers, Thomas G.; and Lo, C. Paul, to Chemfix Technologies, Icc. Method of binding wastes in alkaline silicate matrix. 4,853,208, Cl. 423-659.000.
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Reinicke, Ralf: *See*—
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Blank, Kurt; Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Audi, Josef; Kaesmacher, Jakob; Reinicke, Ralf; and Niedenhoff, Udo, 4,853,019, Cl. 65-106.000.
Reinschmidt, Robert M.: *See*—
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Reitz, Hans-Joachim: *See*—
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Rellis, Daniel, Jr.: *See*—
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Renken, Terry L.: *See*—
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Research Corporation: *See*—
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Resler, Edwin W., to Xilinx, Inc. Emulator probe assembly for programmable logic devices. 4,853,626, Cl. 324-158.00F.
Resnick, Theodore A.: *See*—
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Rexnord Holdings Inc.: *See*—
Harmon, Raymond E.; and McCown, William R. E., 4,852,923, Cl. 292-341.180.
Reynolds, Hugh M.; and Kawabata, Curt M., to United States of America, Air Force. Advanced composite polar boss. 4,852,347, Cl. 60-253.000.
Reynolds, John G., to Chevron Research Company. Demetalation of hydrocarbonaceous feedstocks using dibasic carboxylic acids and salts thereof. 4,853,109, Cl. 208-252.000.
Rheinische Braunkohlenwerke AG: *See*—
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Riall, James D., to Eastman Kodak Company. Disc film and lens supporting unit. 4,853,751, Cl. 355-76.000.

Rich, Arthur; and Agranoff, Bernard W., to University of Michigan, The. Scintillation multiplexer. 4,853,945, Cl. 377-10.000.

Rich Products Corp.: *See—*
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Richard Hirschmann Radiotechnisches Werk: *See—*
Mayer, Hans-Dieter; and Hirrlinger, Klaus, 4,853,690, Cl. 340-544.000.

Richards, John C., to Universal Data Systems, Inc. Dial-up line modem directly compatible with mainframe host having bisynchronous communication protocol. 4,853,954, Cl. 379-93.000.

Richards, Thomas E.: *See—*
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Richardson & Associates, Ltd.: *See—*
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Richardson, Christopher C.: *See—*
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Richardson, Dale W.: *See—*
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Richardson, Kenneth: *See—*
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Richeson, William E.; and Erickson, Frederick L., to Magnavox Government and Industrial Electronics Company. Pneumatic actuator with permanent magnet control valve latching. 4,852,528, Cl. 123-90.110.

Richter, Axel, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Arrangement for the individual adaptation of a serial interface of a data processing system to a data transmission speed of a communication partner. 4,853,841, Cl. 364-200.000.

Richter, Gerhard: *See—*
Mund, Konrad; Preidel, Walter; Rao, J. Raghavendra; and Richter, Gerhard, 4,853,091, Cl. 204-1.00T.

Ricoh Company, Ltd.: *See—*
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Kodama, Yutaka; and Hirasawa, Junichi, 4,853,735, Cl. 355-215.000.
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Shimada, Kazuyuki; Nakajima, Tomohiro; Kotabe, Hiroaki; Yamanobe, Kouji; and Yamazaki, Kozo, 4,853,710, Cl. 346-108.000.

Ridders, Johannes A. M.; and Reemers, Herman A. J., to U.S. Philips Corporation. Low-pressure mercury vapor discharge lamp having a lamp cap with walls for guiding electrode leads past starter means disposed therein. 4,853,583, Cl. 313-318.000.

Ridgeway, Louis H. Membrane packing. 4,852,743, Cl. 206-583.000.

Riedel, Friedrich: *See—*
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Rieger, Rosemarie: *See—*
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Riesmeier, Wilhelm; and Rose, Martin, to IMA-Norte Maschinenfabriken Kleasmann GmbH & Co. Apparatus and method for adhering tape to nonstraight workpiece edge. 4,853,058, Cl. 156-153.000.

Rikken, Johannes M. G.: *See—*
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Riley, Dennis P.; and Rivers, Willie J., Jr., to Monsanto Company. Process for producing N-phosphonomethylglycine. 4,853,159, Cl. 562-17.000.

Riley, Peter S.: *See—*
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Ringden, Diane: *See—*
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Ringo, Steven M.: *See—*
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Rinke, Monika; and Guesten, Hans, to Kernforschungszentrum Karlsruhe GmbH. Laser-active aqueous dispersion of a laser dye. 4,853,937, Cl. 372-53.000.

Rio, Michel; Iltis, Claude; Louis, Herve ; Buffet, Georges; Joly, Marcel; Goudard, Jean-Francois; Bacherot, Joel; and Ducret, Claude, to L'Air Liquide, Societe Anonyme Pour L'etude et Exploitation des Procedes Georges Claude. Filtering structure for a vent device and device including said structure. 4,853,013, Cl. 55-159.000.

Ripoll, Jean P.: *See—*
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Rist, Andre : *See—*
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Ritter, Gerhard: *See—*
Ritter, Klaus; Ritter, Gerhard; and Scherr, Rudolf, 4,853,511, Cl. 219-56.000.

Ritter, Klaus; Ritter, Gerhard; and Scherr, Rudolf, to EVG Entwicklungs - U. Verwertungs-Gesellschaft M.B.H. Apparatus for the feeding of transverse wires to the welding line of a grid welding machine. 4,853,511, Cl. 219-56.000.

Rittershaus & Blecher GmbH: *See—*
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Rivers, Willie J., Jr.: *See—*
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Roba, Joseph: *See—*
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Robert Bosch GmbH: *See—*
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Leonhard, Rolf; and Schutz, Peter, 4,853,007, Cl. 55-337.000.
Nitschke, Werner; Weller, Hugo; Drobny, Wolfgang; and Taufer, Peter, 4,853,932, Cl. 371-68.000.
Schulz, Axel, 4,853,800, Cl. 360-46.000.

Robert G. Evans: *See—*
Schurr, Robert E., 4,852,238, Cl. 29-453.000.

Robert Krups Stiftung & Co. KG: *See—*
Mahlich, Gotthard C.; and Borgmann, Michael, 4,852,474, Cl. 99-293.000.

Robert, Philippe: *See—*
Rouvrais, Bernard; Kerdranvat, Michel; and Robert, Philippe, 4,853,775, Cl. 358-105.000.

Robertson, James D.; and Balthaser, Paul E., to Kwik Kool, Inc. Refrigerant charging tool. 4,852,769, Cl. 222-83.500.

Robertson, John W., Jr.: *See—*
Woolbert, Gordon D.; Jewett, Scotty Y.; and Robertson, John W., Jr., 4,852,384, Cl. 73-1.00G.

Robinson, Alan S.: *See—*
Fuller, Mark W.; and Robinson, Alan S., 4,852,801, Cl. 239-12.000.

Robinson, James N.: *See—*
Alsip, Allen W.; Robinson, James N.; and Bossert, Clayton E., 4,852,193, Cl. 5-61.000.

Robson, Michael J.; and Williams, John, to Imperial Chemical Industries PLC. Halogenated esters. 4,853,414, Cl. 514-531.000.

Roche, James B. Apparatus for separating logs. 4,852,716, Cl. 198-443.000.

Rochester, D. Eugene. Method of insulating a field winding coil. 4,852,246, Cl. 29-596.000.

Rockwell, David A.: *See—*
Byren, Robert W.; and Rockwell, David A., 4,853,528, Cl. 250-203.00R.

Rockwell International Corporation: *See—*
Maher, Steven C., 4,853,653, Cl. 331-49.000.
Schorr, Ian A.; Pucci, Gregory P.; Dorth, John P.; and Miller, Bruce R., 4,853,949, Cl. 379-2.000.
Strathman, Lyle R., 4,853,592, Cl. 313-495.000.

Rockwool International A/S: *See—*
Bogh, Bo B., 4,852,331, Cl. 53-399.000.

Rodeghiero, Charles D.: *See—*
Brown, Thomas R.; Logan, Richard H.; Hahn, Robert W.; Rodeghiero, Charles D.; and Brekkestran, Kevin L., 4,852,680, Cl. [illegible].

Rodrigues, John M. Extension table for a table saw. 4,852,623, Cl. 144-287.000.

Rodriquez Salcedo, Manuel de Jesus. Bottle cap opener. 4,852,432, Cl. 81-3.080.

Rodwell, John D.: *See—*
Quash, Gerard A.; Rodwell, John D.; McKearn, Thomas J.; and Ripoll, Jean P., 4,853,326, Cl. 435-5.000.

Rody, Jean; and Slongo, Mario, to Ciba-Geigy Corporation. 2-(2-Hydroxyphenyl)-benztriazoles, their use as UV-absorbers and their preparation. 4,853,471, Cl. 548-261.000.

Roeper, Michael: *See—*
Fischer, Rolf; Frank, Juergen; Merger, Franz; Roeper, Michael; and Vagt, Uwe, 4,853,473, Cl. 549-326.000.

Roesli, Manfred: *See—*
Gietz, Hanspeter; and Roesli, Manfred, 4,852,382, Cl. 72-406.000.

Roessler, Bernward, to Siemens Aktiengesellschaft. Process for the digital to analog conversion of digital information in bipolar analog signals. 4,853,698, Cl. 341-150.000.

Rogan, Joseph J.: *See—*
D'Angelo, Philip J.; Hetherington, Richard; and Rogan, Joseph J., 4,853,130, Cl. 210-663.000.

Rogers Corporation: *See—*
Hernandez, Jorge M., 4,853,826, Cl. 361-306.000.
Hernandez, Jorge M., 4,853,827, Cl. 361-321.000.
Thomas, Alan C., 4,853,594, Cl. 313-503.000.

Rogers, Ronald O. Powder level sensing device. 4,852,451, Cl. [illegible].

Roggero, Arnaldo; and Bertolini, Guglielmo, to Enitricerche, S.p.A.; and Enichem Sintesi, S.p.A. Polymeric stabilizer compounds and process for their preparation. 4,853,440, Cl. 525-338.000.

Roinestad, Gerald C., to Ashworth Bros., Inc. Positive drive helical conveyor system. 4,852,720, Cl. 198-778.000.

Rolek, Matthew, to Ardco, Inc. Refrigerator door frame with insulated mullion. 4,852,303, Cl. 49-504.000.

Rollberg, Matthew J.: *See—*
Kennel, George W.; and Rollberg, Matthew J., 4,853,115, Cl. 209-173.000.

Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrom, William P., to T.D.J. Co., Inc. Material comminutor. 4,852,818, Cl. 241-301.000.

Rollenitz, Leopold; Krenn, Andreas; Schmidt, Harald; and Freudenschuss, Otto, to Steyr-Daimler-Puch AG. Automatic control method for moving a final control element. 4,852,535, Cl. 123-357.000.

Rolls-Royce plc: *See—*
Ford, David A.; Hill, Anthony D.; and Pashby, Ian R., 4,853,044, Cl. 148-3.000.

Romagnoli, Andrea, to Cestind - Centro Studi Industriali-S.R.L. Apparatus for the conditioning in envelopes of individual dual-use filter sachets in amchines for the continuous production of such filter sachets. 4,853,071, Cl. 156-443.000.

Romenesko, David J.: *See—*
Bahr, Bradley C.; Lo, Peter Y.; Lomas, A. Wade; and Romenesko, David J., 4,853,474, Cl. 556-445.000.

Romero Lledo, Antonio: *See—*
Andrada Galan, Mario; Romero Lledo, Antonio; and Calzado Requena, Vincente, 4,853,866, Cl. 364-470.000.

Roper, Lewis P., to PHR Furniture Limited. Pedestal chairs. 4,852,943, Cl. 297-302.000.

Rops, Paul G., to Eaton Corporation. Hall-Effect position sensing system and device. 4,853,629, Cl. 324-208.000.

Rorig, Hans; and Porta, Norbert, to Akzo N.V. Thickening compositions and thickened aqueous acid solutions. 4,853,146, Cl. 252-142.000.

Rose, Harald, to Siemens Aktiengesellschaft. Particle beam apparatus for low-error imaging of line-shaped subjects. 4,853,545, Cl. 250-396.00R.

Rose, Martin: *See—*
Riesmeier, Wilhelm; and Rose, Martin, 4,853,058, Cl. 156-153.000.

Rosen, Nathan C., to Combined Information Technologies, Inc. Means for marketing. 4,853,852, Cl. 364-401.000.

Rosengren, Gary W., to Tol-O-Matic, Inc. Carrier bracket for power cylinder. 4,852,465, Cl. 92-88.000.

Rosentreter, Ulrich; Boshagen, Horst; Lieb, Folker; Oediger, Hermann; Niewohner, Ulrich; Seuter, Friedel; Perzborn, Elisabeth; and Fiedler, Volker-Bernd, to Bayer Aktiengesellschaft. Polyhydrobenzi[c,d]indolesulphonamides. 4,853,406, Cl. 514-411.000.

Rosenwinkel, Donald A.: *See—*
Zaruba, John V.; Rosenwinkel, Donald A.; and Breslow, Jeffrey D., 4,852,886, Cl. 273-249.000.

Rosenzweig, Nachum; and Soni, Pravin L., to Raychem Corporation. Method of using heat-recoverable articles comprising conductive polymer compositions. 4,853,165, Cl. 264-27.000.

Ross, Colin F.: *See—*
Brearley, Malcolm; Phillips, Mark I.; Prescott, Robert D.; and Ross, Colin F., 4,852,953, Cl. 303-111.000.

Ross, Donald K.; and Luttermoser, Donald L. Electrically scoring dart board. 4,852,888, Cl. 273-373.000.

Ross, Jeffrey L.; and Krueger, James W., to FMC Corporation. Computer controlled light contact feeder. 4,852,717, Cl. 198-462.000.

Ross, Kenneth L.: *See—*
DiGangi, Joel D.; and Ross, Kenneth L., 4,852,592, Cl. 134-57.00R.

Ross, Murray A.; Adams, Gordon L.; and Sully, Michael A., to Champion Road Machinery Limited. Motor grader with high-lift and lock arrangement. 4,852,659, Cl. 172-789.000.

Roth, Donald J.: *See—*
Mohr, Glenn R.; and Roth, Donald J., 4,853,510, Cl. 219-10.790.

Rothe, Johannes: *See—*
Wahlig, Helmut; Dingeldein, Elvira; Rothe, Johannes; and Stille, Wolfgang, 4,853,225, Cl. 424-423.000.

Rothman, Michael F.; Klarstrom, Dwaine L.; and Lai, George Y., to Haynes International, IMC. Nitrogen strengthened Fe-Ni-Cr alloy. 4,853,185, Cl. 420-584.000.

Roussel, Jacques; and Cochet, Xavier, to L'Air Liquide. Process for oxidizing substances dissolved or in suspension in an aqueous solution. 4,853,136, Cl. 210-761.000.

Roussel Uclaf: *See—*
Clemence, Francois; Guillaume, Jacques; and Hamon, Gilles, 4,853,408, Cl. 514-415.000.

Rouvrais, Bernard; Kerdranvat, Michel; and Robert, Philippe, to Thomson-CSF. Method and device to estimate motion in a sequence of moving pictures. 4,853,775, Cl. 358-105.000.

Rowles, John W.; and Arko, Carl M. Comprehensive contour chair apparatus. 4,852,945, Cl. 297-458.000.

Royce Medical Company: *See—*
Grim, Tracy E., 4,852,557, Cl. 128-90.000.

Royston Corporation: *See—*
Brown, Allen C.; Brown, Ray R.; and Suttles, J. Marshall, 4,852,954, Cl. 312-140.400.

Rozendaal, Ewoud, to U.S. Philips Corporation. Method for the manufacture of rare earth transition metal alloy magnets. 4,853,045, Cl. 148-103.000.

Rubbo, Julia E.: *See—*
Van Brimer, R. Hugh; Allred, Donald; Cooke, Theodore M.; Lin, An C. R.; and Rubbo, Julia E., 4,853,706, Cl. 346-1.100.

Rubin, Richard H.; Petrone, Benjamin J.; Heim, Richard C.; and Pawenski, Scott M., to Machine Technology, Inc. Modular processing apparatus for processing semiconductor wafers. 4,852,516, Cl. 118-715.000.

Ruch, Ola; Johansen, Trond V.; Naess, Ludvig; Poerner, Horst; Gebhard, Georg; Weber, Robert; and Heller, Max, to Den Norske Stats Oljeselskap A.S. Pipeline vehicle. 4,852,391, Cl. 73-40.50R.

Ruch, Ola: *See—*
Johansen, Trond V.; Ruch, Ola; Naess, Ludvig; Weber, Robert; Veenhoff, Bernd; Porner, Horst; Laurer, Erwin; Strickroth, Erich; and Schabert, Hans-Peter, 4,852,614, Cl. 138-93.000.

Ruckert, Hans; and Ohlenmacher, Ralf, to Hoechst Aktiengesellschaft. Positive-working radiation-sensitive coating solution and positive photoresist material with monoalkyl ether of 1,2-propanediol as solvent. 4,853,314, Cl. 430-191.000.

Rule, Mark: *See—*
Tustin, Gerald C.; Smith, Kyle C.; and Rule, Mark, 4,853,480, Cl. 170-100.000.

Rumford, Kimball J.: *See—*
Norris, Richard M.; Rumford, Kimball J.; and Youd, Douglass S., 4,852,343, Cl. 60-79.020.

Rushing, Allen J., to Eastman Kodak Company. Color quality improvements for electrophotographic copiers and printers. 4,853,738, Cl. 355-327.000.

Russell William, Ltd.: *See—*
Winter, Russell K.; Harvey, Thomas D.; Kain, Richard S.; and Savas, Nedim, 4,852,839, Cl. 248-225.100.

Rutke, Ronald F.: *See—*
Radtke, Dale F.; and Rutke, Ronald F., 4,852,787, Cl. 226-142.000.

Rutter, Paul R.: *See—*
Flynn, Steven A.; and Rutter, Paul R., 4,853,133, Cl. 210-729.000.

Ruttimann, August; and Buchi, George H., to Hoffmann-La Roche Inc. Process for the manufacture of quinone derivatives. 4,853,156, Cl. 260-396.00R.

Ryan, Daniel F.: *See—*
Singhal, Gopal H.; and Ryan, Daniel F., 4,853,110, Cl. 208-253.000.

Ryburg, Jon B.; and Goldberg, Neil, to Herman Miller, Inc. Integrated computer implement work area. 4,852,500, Cl. 108-105.000.

Ryobi Ltd.: *See—*
Kawai, Kazuaki; Ishida, Hitoshi; and Yamauchi, Noriyoshi, 4,852,634, Cl. 164-457.000.
Nakai, Shinichi, 4,853,606, Cl. 320-36.000.

Ryon, Randall C.; and Austin, Robert A., to Ryon, Randall C. Sailwing and controls for a sail craft. 4,852,507, Cl. 114-39.100.

Rzhussky, Vitaly V.: *See—*
Bezborodov, Vladimir S.; Grinkevich, Oleg A.; Grebenkin, Mikhail F.; Lapanik, Valery I.; Minko, Anatoly A.; Rzhussky, Vitaly V.; Muravsky, Anatoly A.; Petrov, Vladimir F.; and Ivaschenko, Alexandr V., 4,853,150, Cl. 252-299.610.

S & D Products, Inc.: *See—*
Selman, William A., 4,852,282, Cl. 40-159.000.

S & G Tool Aid Corp.: *See—*
Fodali, Adolph; and Gering, George, 4,853,625, Cl. 324-158.00P.

Saari, Walfred S.: *See—*
Engelhardt, Edward L.; and Saari, Walfred S., 4,853,415, Cl. 514-603.000.

Sachs Systemtechnik GmbH: *See—*
Kittel, Friedrich; Lutz, Dieter; Nagler, Franz; Oppitz, Horst; and Gasper, Gerhard, 4,852,419, Cl. 74-89.140.

Sackenreuter, Hans: *See—*
von Laar, Klaus; Sackenreuter, Hans; and Heberlein, Werner, 4,852,461, Cl. 89-46.000.

Safranek, Edward J., to F & B Mfg Co. High-efficiency charging and regulating system. 4,852,540, Cl. 123-599.000.

St. Angelo, Stephen; Carver, George C.; Patterson, David W.; and Fremont, Owen K., to General Motors Corporation. Method of loading an arm of a robot with a loop of weather stripping. 4,852,240, Cl. 29-559.000.

St. Denis, Carroll R. String arrangement for a musical instrument. 4,852,447, Cl. 84-297.00R.

Saint Gobain Vitrage: *See—*
Blank, Kurt; Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Audi, Josef; Kaesmacher, Jakob; Reimicke, Ralf; and Niedenhoff, Udo, 4,853,019, Cl. 65-106.000.

Saito, Hiroshi: *See—*
Tateishi, Hideki; Saito, Hiroshi; Sasaki, Shinji; and Horiuchi, Mitsuaki, 4,853,102, Cl. 204-298.000.

Saito, Norio: *See—*
Torii, Sigeru; Uneyama, Kenji; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,853,468, Cl. 540-215.000.

Saito, Yoshikazu: *See—*
Hamma, Noritaka; Saito, Yoshikazu; Nishizawa, Toshio; and Katsumata, Takashi, 4,853,378, Cl. 514-167.000.

Saito, Yutaka; Kasai, Masaji; Shirahata, Kunikatsu; Kono, Motomichi; Morimoto, Makoto; and Ashizawa, Tadashi, to Kyowa Hakko Kogyo Co., Ltd. 7-N,8-N-Ethylenemitomycin 8-imines. 4,853,385, Cl. 514-250.000.

Sakagami, Masaharu: *See—*
Endou, Masao; Asakura, Yamato; Watanabe, Atsushi; Sakagami, Masaharu; Uchida, Shunsuke; Nagase, Makoto; Baba, Tsutomu; and Ohsumi, Katsumi, 4,853,638, Cl. 324-441.000.

Sakai, Nobuo: *See—*
Momoki, Yasuhito; Asami, Masahiro; Sakai, Nobuo; and Otani, Shigeaki, 4,853,321, Cl. 430-380.000.

Sakai, Toshiyuki; Okada, Yoshihiro; and Hyodo, Keiichiro, to Mita Industrial Co., Ltd. Color graphic image processing system involving data compression using reference samples. 4,853,767, Cl. 358-78.000.

Sakai, Yoshio: *See—*
Arabori, Noboru; Takahashi, Hideaki; Sakai, Yoshio; and Yoneda, Kenji, 4,852,694, Cl. 187-115.000.
Yamanaka, Toshiaki; Suzuki, Norio; Sakai, Yoshio; Kawamoto, Yoshifumi; Minato, Osamu; Ishibashi, Koichiro; Moriwaki, Nobuyuki; and Meguro, Satoshi, 4,853,894, Cl. 365-154.000.

Sakakibara, Teigo: *See—*
Goto, Koji; and Sakakibara, Teigo, 4,853,736, Cl. 355-210.000.

Sakakibara, Yosuke: *See—*
Shimizu, Shotaro; and Sakakibara, Yosuke, 4,853,048, Cl. 148-300.000.

Sakami, Yasuo: *See—*
Asano, Kazuhiro; Yoshida, Yosuke; Fujioka, Yoichi; Takazawa, Kazuhisa; Ishizaki, Masao; Sakami, Yasuo; and Tsubouchi, Junichi, 4,853,682, Cl. 340-706.000.

Sakata Inkusu Kabushikikaisha: *See—*
Fukumoto, Masatoshi; Kubo, Soichi; Miyake, Yoichi; Tsukada, Norishige; Kasutani, Kiyoshi; and Okamori, Kenji, 4,853,794, Cl. 358-447.000.

Sakura Seiki Kabushiki Kaisha: *See—*
Toya, Matsumi, 4,853,188, Cl. 422-104.000.

Sakurai, Takayasu, to Kabushiki Kaisha Toshiba. MOS semiconductor circuit. 4,853,654, Cl. 331-57.000.

Sakurai, Takayasu: *See—*
Nogami, Kazutaka; and Sakurai, Takayasu, 4,853,897, Cl. 365-189.110.

Sakurai, Tatsuaki, to Ricoh Company, Ltd. Semiconductor laser control apparatus. 4,853,934, Cl. 372-29.000.

Salaita, George N.; Quarles, Carol A.; and Altman, Joseph C., to Chevron Research Company. Measurement of the effective photo-electric absorption cross section of rock samples. 4,853,537, Cl. 250-253.000.

Salganik, Felix. Multi-needle walking-foot chain stitch sewing machine. 4,852,506, Cl. 112-220.000.

Salmi, James A., to Simon Ladder Towers, Inc. Aerial ladder tower with pretensioned truss members. 4,852,690, Cl. 182-219.000.

Saltzman, Jeremy: *See—*
Jachmann, Emil F.; Saltzman, Jeremy; and Chamberlin, David B., 4,853,952, Cl. 379-88.000.

Salvati, Jon: *See—*
Danna, Dominick A.; Salvati, Jon; and Ciarlei, Joseph A., 4,853,774, Cl. 358-98.000.

Sam Sung Electronic Co. Ltd.: *See—*
Sung, Yuhn K.; and Bong, Yoo E., 4,853,501, Cl. 200-38.0FA.

Samardzija, Nikola, to Du Pont de Nemours, E. I., and Company. Apparatus for microwave separation of emulsions. 4,853,507, Cl. 219-10.55A.

Samelik, Boris V.: *See—*
Perevozkin, Jury L.; Gajun, Jury A.; Grigorov, Petr K.; Zhurakovsky, Vasily M.; and Samelik, Boris V., 4,853,047, Cl. 148-90.000.

Samma, Hiromasa: *See—*
Takahashi, Akira; Shibahara, Kazuo; Morimoto, Katsuhiro; Samma, Hiromasa; and Kubo, Kazuhiko, 4,853,351, Cl. 501-87.000.

Samsung Semiconductor and Telecommunications Co., Ltd.: *See—*
Min, Sung-Ki; and Lee, Jae S., 4,853,559, Cl. 307-270.000.

Samuelson, Hans O., to Mooch Domsjo Aktiebolag. Process for the activation and delignification of cellulose pulp. 4,853,082, Cl. 162-38.000.

Sanchez, Raymond. Barbecue apparatus. 4,852,476, Cl. 99-443.00R.

Sanchez, William: *See—*
Sherman, Victor; Zborovsky, Ilya; Sanchez, William; and Kowalenko, Wladimir, 4,852,545, Cl. 126-39.00H.

Sander, Hans: *See—*
Blum, Rainer; Rehmer, Gerd; Osterloh, Rolf; and Sander, Hans, 4,853,433, Cl. 525-65.000.

Sanders, Gary G., to Scott Fetzer Company. Stop for integrated circuit diaphragm. 4,852,408, Cl. 73-718.000.

Sanders, James F., to Minnesota Mining and Manufacturing Company. Subbed supports for imaging materials. 4,853,316, Cl. 430-272.000.

Sanders, Jerroll M. Pacifier shield. 4,852,569, Cl. 128-360.000.

Sanders, Myron D.: *See—*
Williams, Cleo M.; Sanders, Myron D.; and Cook, William C., 4,853,069, Cl. 156-401.000.

Sanderson, Neil E.: *See—*
Hall, David J.; Sanderson, Neil E.; and Hall, Edward F. H., 4,853,539, Cl. 250-288.000.

Sandlofer, Michael. Open water live trap for pinnipeds and other marine animals. 4,852,295, Cl. 43-100.000.

Sandoz Ltd.: *See—*
Frauenknecht, Josef; and Schwer, Dieter, 4,852,991, Cl. 8-586.000.

Sandstrom, Wayne R. Pipe support system. 4,852,831, Cl. 248-58.000.

Sandvik AB: *See—*
Andersson, Lars; Stenlund, Berndt; and Wiberg, Rolf, 4,853,293, Cl. 428-605.000.

Sanford, Carlton E., to Texas Instruments Incorporated. Pressure switch apparatus having improved longevity and widened tolerance for location of stationary contact. 4,853,503, Cl. 200-83.00P.

Sannas, Takanori; Seki, Mitsutaka; Tsuchida, Shinya; and Horiguchi, Shojiro, to Dainichiseika Color & Chemicals Mfg. Co. Ltd. Seed colorant. 4,853,429, Cl. 524-29.000.

Sanraku Incorporated: *See—*
Shibamoto, Norio; Yoshioka, Takeo; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,853,407, Cl. 514-414.000.

Sanshin Kogyo Kabushiki Kaisha: *See—*
Sougawa, Masafumi, 4,852,686, Cl. 181-229.000.

Sansone, Ronald P.; and Fougere, Guy L., to Pitney Bowes Inc. Mailing system with postage value printing capability. 4,853,865, Cl. 364-464.020.

Sansone, Ronald P.: *See—*
Hart, William G.; Breault, Michelle S.; Sansone, Ronald P.; Taylor, Michael P.; and Doeberl, Terrence M., 4,853,864, Cl. 364-464.020.

Santiago, Francisco: *See—*
Chu, Tak-Kin; and Santiago, Francisco, 4,853,339, Cl. 437-2.000.

Sanyo Electric Co.: *See—*
Asano, Yoshikazu; and Naganawa, Kazuo, 4,853,782, Cl. 358-148.000.

Sanyo Electric Co., Ltd.: *See—*
Morishita, Takuya; Okuda, Atushi; and Asanaka, Shinji, 4,852,208, Cl. 15-339.000.
Murashima, Hirotsugu; and Maeda, Satoru, 4,853,788, Cl. 358-227.000.
Murashima, Hirotsugu; and Maeda, Satoru, 4,853,789, Cl. 358-227.000.

Sarnoff, Norton; and Fletcher, Carl R., to Ensar Corporation. Oven pan holder and combination of oven pan holder with oven pan. 4,852,760, Cl. 220-85.00H.

Saros, Stephen; Smith, John L.; Cassaday, Michael M.; Herron, Rand E.; and Pelavin, Milton H., to Technicon Instruments Corporation. Single channel continuous flow system. 4,853,336, Cl. 436-53.000.

Sasaki, Keiji: *See—*
Tanaka, Hazime; Suzuki, Hirayoshi; and Sasaki, Keiji, 4,853,504, Cl. 200-83.00P.

Sasaki, Morimasa: *See—*
Satoh, Takateru; Tanaka, Kimio; and Sasaki, Morimasa, 4,853,816, Cl. 360-132.000.

Sasaki, Osamu: *See—*
Fukuda, Toshio; Yoneda, Kenji; Ueshima, Takaaki; and Sasaki, Osamu, 4,852,696, Cl. 187-139.000.

Sasaki, Shinji: *See—*
Tateishi, Hideki; Saito, Hiroshi; Sasaki, Shinji; and Horiuchi, Mitsuaki, 4,853,102, Cl. 204-298.000.

Sasaoka, Michio: *See—*
Torii, Sigeru; Uneyama, Kenji; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,853,468, Cl. 540-215.000.

SASIB S.p.A.: *See—*
Piana, Maurizio; and Manservisi, Renato, 4,852,588, Cl. 131-84.100.

Sasson, Yoel: *See—*
Dakka, Jihad; Zoran, Amikam; and Sasson, Yoel, 4,853,479, Cl. 566-77.000.

Satake, Toshimi; Minami, Toshiaki; Nagai, Tomoaki; and Fujimura, Fumio, to Jujo Paper Co., Ltd. Heat- and light-sensitive recording material. 4,853,361, Cl. 503-201.000.

Satake, Toshimi; Fukuchi, Tadakazu; Minami, Toshiaki; Nagai, Tomoaki; Kaneko, Toshio; and Fujimura, Fumio, to Jujo Paper Co., Ltd. Heat-sensitive recording sheet. 4,853,362, Cl. 503-209.000.

Satake, Toshimi; Minami, Toshiaki; Nagai, Tomoaki; and Fujimura, Fumio, to Jujo Paper Co., Ltd. Heat-sensitive recording material. 4,853,363, Cl. 503-210.000.

Sato, Jun, to Shimano Industrial Company Limited. Fishing reel having improved cover and seal structure drag mechanism. 4,852,826, Cl. 242-270.000.

Sato, Masatoshi: *See—*
Akasaka, Hideki; and Sato, Masatoshi, 4,853,912, Cl. 369-73.000.

Sato, Seiji: *See—*
Suwa, Hisashi; Sato, Seiji; Matsubara, Susumu; Yano, Eiji; and Koizumi, Katsuyuki, 4,853,804, Cl. 360-85.000.

Sato, Yasuyuki; Sugata, Masaki; and Murai, Hiroyuki, to Nippondenso Co., Ltd. Spark plug for use in internal combustion engine. 4,853,582, Cl. 313-141.000.

Satoh, Takateru; Tanaka, Kimio; and Sasaki, Morimasa, to TDK Corporation. Casing for cassette magnetic tape. 4,853,816, Cl. 360-132.000.

Sau, Arjun C.: *See—*
Lukach, Carl A.; and Sau, Arjun C., 4,853,437, Cl. 525-54.210.

Saude, Gerald B.: *See—*
Davis, Harold A.; and Saude, Gerald B., 4,852,809, Cl. 239-654.000.

Sauer, Gerhard: *See—*
Hilscher, Jean-Claude; Kehr, Wolfgang; Sauer, Gerhard; Schneider, Herbert; and Wachtel, Helmut, 4,853,390, Cl. 514-288.000.

Saulnier, Mark G.: *See—*
Vyas, Dolatrai M.; Saulnier, Mark G.; and Kadow, John F., 4,853,467, Cl. 536-17.900.

Savas, Nedim: *See—*
Winter, Russell K.; Harvey, Thomas D.; Kain, Richard S.; and Savas, Nedim, 4,852,839, Cl. 248-225.100.

Savick, Wayne K.: *See—*
Mayer, Daniel W.; Loebig, Craig K.; and Savick, Wayne K., 4,852,389, Cl. 73-38.000.

Savill, Robert F., Jr.: *See—*
Willen, William S.; Savill, Robert F., Jr.; and Hacker, Martin E., 4,853,515, Cl. 219-121.470.

Savoca, Samuel E.: *See—*
Savoca, Sebastian E.; and Savoca, Samuel E., 4,852,276, Cl. 36-136.000.

Savoca, Sebastian E.; and Savoca, Samuel E. Shoe having a replaceable logo. 4,852,276, Cl. 36-136.000.

Sawada, Kiyoshi: *See—*
Kato, Kunioki; Kawamura, Masao; Goda, Hiroshi; Sawada, Kiyoshi; and Hamatani, Kazuhiro, 4,853,158, Cl. 562-46.000.

Sawafuji, Susumu: *See—*
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Saxton, Robert J.: *See—*
Vasilevskis, Janis; De Deken, Jacques C.; Saxton, Robert J.; Wentrcek, Paul R.; Fellmann, Jere D.; and Kipnis, Lyubov S., 4,853,357, Cl. 502-165.000.

Saylor, Steven D.: *See—*
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Scalf, John H. Golf putter. 4,852,877, Cl. 273-77.00R.

Scanlon, Daniel: *See—*
Hayes, Mark B.; and Scanlon, Daniel, 4,853,123, Cl. 210-316.000.

Scaramucci, John P. Swing check valve with secured cartridge. 4,852,603, Cl. 137-316.000.

Scaramucci, John P. Support for check valve disc. 4,852,607, Cl. 137-515.700.

Schaab, Udo: *See—*
Wisotzki, Klaus-Dieter; Schaab, Udo; Reitz, Hans-Joachim; and Orczech, Juergen, 4,852,591, Cl. 134-57.00R.

Schabert, Hans-Peter: *See—*
Johansen, Trond V.; Ruch, Ola; Naess, Ludvig; Weber, Robert; Veenhoff, Bernd; Porner, Horst; Laurer, Erwin; Strickroth, Erich; and Schabert, Hans-Peter, 4,852,614, Cl. 138-93.000.

Schade, Heinrich, Jr., to Harris Semiconductor Patents, Inc. Precision temperature-stable current sources/sinks. 4,853,610, Cl. 323-316.000.

Schaefer, Hans: *See—*
Manner, Reinhard; Schaefer, Hans; Voight, Carl; and Pfeifer, Wolf D., 4,853,190, Cl. 422-197.000.

Schafer, Horst; Kossmehl, Gerhard; and Neumann, Walter, to Ciba-Geigy Corporation. Modified silicone rubber and its use as a material for optical lenses and optical lenses made from this material. 4,853,453, Cl. 528-28.000.

Scharf, Daniel: *See—*
Staendeke, Horst; and Scharf, Daniel, 4,853,424, Cl. 523-506.000.

Scharr Industries Inc.: *See—*
Skolnick, Barry, 4,853,283, Cl. 428-335.000.

Schawbel Corporation, The: *See—*
Zaborowski, Thaddeus, 4,852,546, Cl. 126-403.000.

Scheider, Rudolf, to Erowa AG. Spark erosion machining apparatus. 4,853,512, Cl. 219-69.150.

Schell, Thomas: *See—*
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Schering Agrochemicals Limited: *See—*
Parsons, John H.; Hunt, Russell G.; Leach, Susan E.; Buss, Anthony D.; Green, David E.; Mellor, Michael; and Percival, Albert, 4,853,400, Cl. 514-383.000.

Schering Aktiengesellschaft: *See—*
Hilscher, Jean-Claude; Kehr, Wolfgang; Sauer, Gerhard; Schneider, Herbert; and Wachtel, Helmut, 4,853,390, Cl. 514-288.000.

Schering Corporation: *See—*
Petrakis, Konstaninos S.; Berger, Joel G.; and Gold, Elijah H., 4,853,476, Cl. 558-170.000.
Yim, Zachary; Zupon, Michael A.; and Chaudry, Imtiaz A., 4,853,218, Cl. 424-85.700.

Scherr, Rudolf: *See—*
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Scheuble, Bernhard: *See—*
Krause, Joachim; Wachtler, Andreas; Scheuble, Bernhard; and Weber, Georg, 4,853,149, Cl. 252-299.610.

Scheurenbrand, Dieter: *See—*
Kormendi, Kalman; Lampart, Dieter; Mannherz, Fritz; and Scheurenbrand, Dieter, 4,852,758, Cl. 220-20.500.

Schiavello, Antonino; and Ramsdell, Richard A., to Schiavello Bros. (Vic.) Pty. Ltd. Demountable panel system. 4,852,317, Cl. 52-239.000.

Schiavello Bros. (Vic.) Pty. Ltd.: *See—*
Schiavello, Antonino; and Ramsdell, Richard A., 4,852,317, Cl. 52-239.000.

Schick, Peter; Jonas, Friedrich; and Leitner, Lutz, to Bayer Aktiengesellschaft. Magnetic lacquer dispersions, process for their production and their use. 4,853,289, Cl. 428-408.000.

Schillmeier, Hans: *See—*
Tradt, Hans-Richard; and Schillmeier, Hans, 4,852,237, Cl. 29-407.000.

Schipper, Paul H.: *See—*
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,853,105, Cl. 208-74.000.
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,853,187, Cl. 422-144.000.

Schirmer, Henry G., to W. R. Grace & Co. Highly formable laminates. 4,853,287, Cl. 428-349.000.

Schlage Lock Company: *See—*
Nimee, George S.; and Current, Andrew, 4,852,919, Cl. 292-251.500.

Schlegel, Hans: *See—*
Dunwald, Willi; Schlegel, Hans; Halpaap, Reinhard; and Pedain, Josef, 4,853,261, Cl. 427-388.100.

Schlegel, Kurt; and Betz, C. Friedemann, to Obisco Trading & Consulting S.A. Small-arm and ammunition in shot form for the same. 4,852,457, Cl. 89-6.500.

Schleier, Gisbert: *See—*
Merger, Franz; Schleier, Gisbert; and Schlotterbeck, Dietrich, 4,853,454, Cl. 528-59.000.

Schlemenat, Alfred; and David, Helmut, to Man Gutehoffnungshuette GmbH. Tubular heat exchanger. 4,852,644, Cl. 165-158.000.

Schloemann, Ernst F. R. A., to Raytheon Company. Integratable microwave devices based on ferromagnetic films disposed on dielectric substrates. 4,853,660, Cl. 333-204.000.

Schlor, Georg; and Pantaleon-Stemberg, Gerd, to Draegerwerk Aktiengesellschaft. Process and apparatus for producing a filter with multiple folds. 4,853,087, Cl. 162-383.000.

Schlosser, Philip A.; and Kable, Robert G., to Scriptel Holding, Inc. Electrographic apparatus. 4,853,493, Cl. 178-18.000.

Schlotterbeck, Dietrich: *See—*
Merger, Franz; Schleier, Gisbert; and Schlotterbeck, Dietrich, 4,853,454, Cl. 528-59.000.

Schlumberger Industries, Inc.: *See—*
Corwon, Michael E.; and Oliver, Randy L., 4,852,410, Cl. 73-861.380.

Schlumberger Technology Corporation: *See—*
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Schmalbach-Lubeca AG: *See—*
Kormendi, Kalman; Lampart, Dieter; Mannherz, Fritz; and Scheurenbrand, Dieter, 4,852,758, Cl. 220-20.500.

Schmid, Karl-Heinz; Asbeck, Adolf; and Stanislowski, Detlev, to Henkel Kommanditgesellschaft auf Aktien. Alkyl and alkenyl diethanolamine compounds as solubilizers for low-foam surfactants. 4,853,145, Cl. 252-136.000.

Schmid, Rudolf: *See—*
Coffen, David L.; Schmid, Rudolf; and Sebastian, Mark J., 4,853,472, Cl. 549-407.000.

Schmidt, Alfred C.: *See—*
Durst, Robert T., Jr.; Fougere, Guy L.; Hunter, Kevin D.; and Schmidt, Alfred C., 4,853,869, Cl. 364-478.000.

Schmidt, Hans-Fr.: *See—*
Frankel, Juergen; Mattelin, Antoon; Pecceu, Pol; Quella, Ferdinand; Schmidt, Hans-Fr.; Boone, Luc; Von Tomkewitsch, Sybille; and De Vogelaere, Marc, 4,853,252, Cl. 427-53.100.

Schmidt, Harald: *See—*
Rollenitz, Leopold; Krenn, Andreas; Schmidt, Harald; and Freudenschuss, Otto, 4,852,535, Cl. 123-357.000.

Schmidt, Hermann: *See—*
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Schmiedgen, Hans: *See—*
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Schmitz, Christoph: *See—*
Weckler, Joachim, 4,853,964, Cl. 381-156.000.

Schneider, Christoph: *See—*
Schubring, Reinhard; Witt, Juergen; Harwardt, Irene; Neumann, Sigrd; Schneider, Christoph; Mieth, Gerhard; Raue, Wolfgang; and Brueckner, Juergen, 4,852,477, Cl. 99-450.200.

Schneider, George J.: *See—*
Babcock, Clarence O.; and Schneider, George J., 4,852,262, Cl. 33-178.00F.

Schneider, Herbert: *See—*
Hilscher, Jean-Claude; Kehr, Wolfgang; Sauer, Gerhard; Schneider, Herbert; and Wachtel, Helmut, 4,853,390, Cl. 514-288.000.

Schneider, Rolf: *See—*
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Schneider, Werner: *See—*
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Schneider, Wolfgang; and Amsler, Kurt, to Ciba-Geigy Corporation. Selected phosphoric acid esters as hardeners for epoxy resins. 4,853,455, Cl. 528-108.000.

Schneller, Arnold: *See—*
Muller, Werner H.; and Schneller, Arnold, 4,853,448, Cl. 526-254.000.

Schneller, Joe. Video system for viewing microscopic specimens. 4,853,770, Cl. 358-93.000.

Schnettler, Richard A.: *See—*
Jones, Winton D.; Schnettler, Richard A.; and Dage, Richard C., 4,853,395, Cl. 514-332.000.

Schoenauer, Anton. Sump pump adaptor. 4,852,609, Cl. 137-565.000.

Schoenfuss, Martin: *See—*
Tasler, Guenter; Wiendenhoeft, Klaus; Schultheiss, Michael; Schoenfuss, Martin; Ludwig, Theo; Huster, Klaus; and Grenzendoerfer, Dietmar, 4,852,370, Cl. 66-203.000.

Schoettler, Hans, to Westmark Schulte & Co. KG. Device for cutting mushrooms into slices. 4,852,256, Cl. 30-114.000.

Schon & CIE. GmbH: *See—*
Edrich, Gunter; and Deppert, Klaus, 4,852,865, Cl. 269-48.000.

Schonfeld, Harald, to Carl Schenck AG. Machine for mass-centering rotors. 4,852,405, Cl. 73-461.000.

Schorr, Ian A.; Pucci, Gregory P.; Dorth, John P.; and Miller, Bruce R., to Rockwell International Corporation. Fail safe voice system for integrated services for digital network subscribers. 4,853,949, Cl. 379-2.000.

Schrade, Chester. AC voltage regulator. 4,853,608, Cl. 323-258.000.

Schramm, Charles M.; Lane, Robert H.; and Dines, Martin B., deceased (by Dines, Elaine, legal representative), to Occidental Research Corporation. Method of making inorganically crosslinked layered compounds. 4,853,358, Cl. 502-167.000.

Schramm, Wolfgang: *See—*
Breitenbacher, Juergen; Kuehle, Walter; Moennings, Roland; Neumann, Udo; and Schramm, Wolfgang, 4,852,863, Cl. 267-218.000.

Schubring, Reinhard; Witt, Juergen; Harwardt, Irene; Neumann, Sigrd; Schneider, Christoph; Mieth, Gerhard; Raue, Wolfgang; and

Brueckner, Juergen, to Institut fuer Hochseefischerei und Fischverarbeitung-Betrieb des VEB Fischkombinat Rostock. Apparatus for the manufacture of textured meat and fish products. 4,852,477, Cl. 99-450.100.
Schuhmacher, Alfred: *See*—
Henkelmann, Jochem; Eggersdorfer, Manfred; Grosch, Walter; Schuhmacher, Alfred; and Siegel, Hardo, 4,853,481, Cl. 562-460.000.
Schuhwerk, Anton: *See*—
Vogt, Werner; and Schuhwerk, Anton, 4,853,525, Cl. 235-469.000.
Schulman, David A. Fluid pressurized cushion. 4,852,195, Cl. 5-453.000.
Schulte, Marcus: *See*—
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Schulte, Roland: *See*—
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Schultheiss, Michael: *See*—
Tasler, Guenter; Wiendenhoeft, Klaus; Schultheiss, Michael; Schoenfuss, Martin; Ludwig, Theo; Huster, Klaus; and Grenzendoerfer, Dietmar, 4,852,370, Cl. 66-203.000.
Schultz, William R., Jr.: *See*—
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Schulz, Axel, to Robert Bosch GmbH. Method and circuit for recording broadband signals on a magnetic record medium. 4,853,800, Cl. 130-45.000.
Schulz, Wolfgang, to Brown, Boveri Reaktor GmbH. Device for irradiating an object with a transportable source generating thermal neutrons. 4,853,550, Cl. 250-493.100.
Schurr, Robert E., to Robert G. Evans. Drum closure and method of making. 4,852,238, Cl. 29-453.000.
Schuster, Hans-Dieter: *See*—
Abthoff, Joerb; Schuster, Hans-Dieter; Langer, Hans-Joachim; Strohmer, Erwin; Gabler, Rolf; and Schulte, Roland, 4,852,349, Cl. 60-303.000.
Schutz, Peter: *See*—
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Schuurman, Hessel J.: *See*—
Graf, Jean-Francois; Hasslin, Hans W.; Schuurman, Hessel J.; Steiner, Theodor; and Wieland, Bruno, 4,853,223, Cl. 424-405.000.
Schwartz, Henry L.: *See*—
Rando, Joseph F.; and Schwartz, Henry L., 4,852,265, Cl. 33-227.000.
Schwartz, Paul, to International Pharmaceutical Products. Coordination complexes of platinum useful as antiproliferative agents. 4,853,380, Cl. 514-184.000.
Schwarz, Wilhelm; and Heinz, Winfried, to Fried. Krupp Gesellschaft Mit Beschrankter. Protective device for submersible lance in steel making or the like. 4,852,857, Cl. 266-99.000.
Schwarzmeier, Karl: *See*—
Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, 4,853,170, Cl. 264-517.000.
Schwer, Dieter: *See*—
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Schwing, Friedrich, to Friedrich Wilh. Schwing GmbH. Spool valve for concrete pumps. 4,852,467, Cl. 92-128.000.
Scientific-Atlanta, Inc.: *See*—
Nichols, Steven R.; Hyers, Robert C.; Stovall, Walter M.; and Trawick, Charles D., 4,853,839, Cl. 364-167.010.
Scioscia, David M. Tennis net height extender. 4,852,876, Cl. 273-29.00A.
Scitex Corporation Ltd.: *See*—
Stein, Amnon; and Nagler, Michael, 4,853,709, Cl. 346-108.000.
Scott, Barry M.: *See*—
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Scott Fetzer Company: *See*—
Sanders, Gary G., 4,852,408, Cl. 73-718.000.
Scott, Gerald: *See*—
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Scott, James E.: *See*—
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Scriptel Holding, Inc.: *See*—
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Sculler, Leonard H.: *See*—
Wall, Alexander C.; and Sculler, Leonard H., 4,852,489, Cl. 101-334.000.
Scuorzo, Kathleen. Kit assembly for oral hygiene care. 4,852,742, Cl. 206-362.000.
Sea Fathoms Industries: *See*—
Gell, Harold A., Jr., 4,853,722, Cl. 354-64.000.
Sebastian, Mark J.: *See*—
Coffen, David L.; Schmid, Rudolf; and Sebastian, Mark J., 4,853,472, Cl. 549-407.000.
Sebring, John P. Device for clamping the edge of a table. 4,852,841, Cl. 248-231.500.
Seeger, Helmut; Leichum, Axel; and Maher, Anthony, to Siemens Aktiengesellschaft. Telecommunication switching systems with a central switching and local sub-switching. 4,853,957, Cl. 379-279.000.
Seener, G. Thomas; and Hoehne, Dennis L., to Sporlan Valve Company. Expansion and check valve combination. 4,852,364, Cl. 62-225.000.
Seevinck, Evert; De Jager, Willem; and Buitendijk, Pieter, to U.S. Philips Corporation. Amplifier arrangement with quiescent current control. 4,853,645, Cl. 330-255.000.
Segerstrom, Clifford C.; Sternling, Charles V.; Luke, Hans-Wolfgang; and Wu, Hsi L., to Shell Oil Company. Slag water bath process. 4,852,997, Cl. 48-210.000.
Sehgal, Surendra N.: *See*—
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Seidelmann, Lothar: *See*—
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Seidner, David S.: *See*—
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Seiko Instruments & Electronics Ltd.: *See*—
Asano, Kazuhiro; Yoshida, Yosuke; Fujioka, Yoichi; Takazawa, Kazuhisa; Ishizaki, Masao; Sakami, Yasuo; and Tsubouchi, Junichi, 4,853,682, Cl. 340-706.000.
Seino, Kiyoharu; Takagi, Tadashi; Takeda, Fumio; and Ikeda, Yukio, to Mitsubishi Denki Kabushiki. Distributed fet amplifier and bias voltage supply circuit therefor. 4,853,649, Cl. 330-277.000.
Seitetsu Kagaku Co., Ltd.: *See*—
Kato, Kunioki; Kawamura, Masao; Goda, Hiroshi; Sawada, Kiyoshi; and Hamatani, Kazuhiro, 4,853,158, Cl. 562-46.000.
Seki, Mitsutaka: *See*—
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Sekozawa, Teruji: *See*—
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Selby, Charles R. Fluid collection tube with a safety funnel at its open end. 4,852,584, Cl. 128-760.000.
Self, Keith S.: *See*—
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Sellar, James R.; Reisdorf, James E.; Lappies, Mark F.; and Valle, Mark S., to Information Packaging Corp. Holder for flat objects such as computer disks. 4,852,740, Cl. 206-444.000.
Sellstrom, Kathy B.; and Renken, Terry L., to Texaco Chemical Company. Amidoamine co-curatives in epoxy thermoset adhesives. 4,853,456, Cl. 528-111.000.
Selman, William A., to S & D Products, Inc. Magnetic calendar frame. 4,852,282, Cl. 40-159.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
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Sen, Susanta: *See*—
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Seng, Stephen, to Owens-Corning Fiberglas Corporation. Scrap recovery apparatus. 4,853,024, Cl. 65-335.000.
Sequeira, Hermann B.; Trippe, Michael W.; and Jakhete, Rajendra S., to Martin Marietta Corporation. Calibration method for apparatus evaluating microwave/millimeter wave circuits. 4,853,613, Cl. 324-58.00R.
Serratelli, John F.: *See*—
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Sestanj, Kazimir: *See*—
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Wrobel, Jay E.; and Sestanj, Kazimir, 4,853,412, Cl. 514-510.000.
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Shacklock, Frank W.: *See*—
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Shafir, Grace C. Free standing tweezer. 4,852,929, Cl. 294-99.200.
Share, Mark. Protective shield and restraining device. 4,852,587, Cl. 128-869.000.

Sharonizadeh, Ahmad: *See*—
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Sharp Kabushiki Kaisha: *See*—
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Katsuta, Yuji; and Kamata, Hiroshi, 4,853,792, Cl. 358-455.000.
Murata, Mitshiro; Okada, Naofumi; Yamamoto, Kazutoshi; Tanimoto, Takuharu; and Inoue, Tokuyasu, 4,853,750, Cl. 355-75.000.
Okamoto, Yuji; Machara, Shigeharu; and Fujiwara, Katsuyoshi, 4,853,748, Cl. 355-55.000.
Tanaka, Seiji; and Nakagawa, Hideshi, 4,853,519, Cl. 219-497.000.
Yamamoto, Osamu; and Yoshida, Toshihiko, 4,852,961, Cl. 350-96.190.
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Dewitz, Thomas S., 4,853,003, Cl. 55-20.000.
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Kemp, Richard A., 4,853,108, Cl. 208-216.00R.
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Sheridan, David S.; and Jackson, Isaac S., to Sheridan Catheter Corp. Flexible connectors for medico-surgical tubes. 4,852,564, Cl. 128-202.270.
Sherman, Victor; Zborovsky, Ilya; Sanchez, William; and Kowalenko, Wladimir. Apparatus for cooking food. 4,852,545, Cl. 126-39.00H.
Shewchuk, Peter. Releasable extruded hinge. 4,852,213, Cl. 16-266.000.
Shibahara, Kazuo: *See*—
Takahashi, Akira; Shibahara, Kazuo; Morimoto, Katsuhiro; Samma, Hiromasa; and Kubo, Katuhiko, 4,853,351, Cl. 501-87.000.
Shibamoto, Norio; Yoshioka, Takeo; Fukagawa, Yasuo; and Ishikura, Tomoyuki, to Sanraku Incorporated. Aminoethylcysteine derivatives. 4,853,407, Cl. 514-414.000.
Shibata, Jouji; Ohtani, Kazuo; Shinohara, Norio; and Hanyuda, Toshiaki, to Showa Highpolymer Co., Ltd. Curable composition for a fiber-reinforced resin. 4,853,279, Cl. 428-267.000.
Shibata, Satoshi: *See*—
Ueno, Hideo; Shibata, Satoshi; and Yamada, Keiko, 4,853,695, Cl. 341-26.000.
Shibata, Yasuhiro: *See*—
Narimatsu, Osamu; Ito, Michiyasu; Komatsu, Kazuyoshi; and Shibata, Yasuhiro, 4,853,286, Cl. 428-343.000.
Shibuya, Toshiteru, to NEC Corporation. Instruction prefetching device including a circuit for checking prediction of a branch instruction before the instruction is executed. 4,853,840, Cl. 364-200.000.
Shigehara, Hiroshi, to Kabushiki Kaisha Toshiba. Digital signal processing circuit. 4,853,886, Cl. 364-745.000.
Shigeki, Asakawa: *See*—
Eizo, Naya; Yoshikazu, Nagata; Toshiaki, Horiuchi; Mitsuhiro, Okumura; Michinosuke, Demizu; Mitsuhiro, Harima; Shigeki, Asakawa; and Masuo, Asakawa, 4,853,184, Cl. 420-489.000.
Shih, Nan C. Tubular door lock with a bell. 4,852,922, Cl. 292-336.300.
Shih, Yih-Cheng: *See*—
Baker, John M.; Callegari, Alessandro C.; Lacey, Dianne L.; and Shih, Yih-Cheng, 4,853,346, Cl. 437-184.000.
Shiho, Makoto: *See*—
Koyama, Osamu; Uzuki, Kazuo; Shiho, Makoto; and Aoi, Shigeru, 4,853,917, Cl. 369-44.000.
Shiina, Haruo, to Honda Giken Kogyo Kabushiki Kaisha. Method of manufacturing heat resistant, high-strength structural members of sintered aluminum alloy. 4,853,179, Cl. 419-28.000.
Shiley Inc.: *See*—
Eisele, Robert F., 4,852,565, Cl. 128-207.140.
Shimada, Kazuyuki; Nakajima, Tomohiro; Kotabe, Hiroaki; Yamanobe, Kouji; and Yamazaki, Kozo, to Ricoh Co., Ltd. Imaging by laser beam scanning. 4,853,710, Cl. 346-108.000.
Shimada, Michio, to NEC Corporation. Error-correcting bit-serial decoder. 4,853,930, Cl. 371-43.000.
Shimada, Yoshihiro: *See*—
Fujihara, Tadafumi; Shimada, Yoshihiro; Nagano, Chikara; and Tsukamoto, Katsuo, 4,852,985, Cl. 350-523.000.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,852,698, Cl. 188-24.190.
Sato, Jun, 4,852,826, Cl. 242-270.000.
Shimasaki, Shuhei: *See*—
Yoshimura, Tatsuhiro; Tomihashi, Nobuyuki; and Shimasaki, Shuhei, 4,853,425, Cl. 524-83.000.
Shimek, Daniel C.: *See*—
Shimek, Ronald J.; and Shimek, Daniel C., 4,852,548, Cl. 126-518.000.
Shimek, Ronald J.; and Shimek, Daniel C. Universal fireplace assembly. 4,852,548, Cl. 126-518.000.
Shimizu, Chuji: *See*—
Inoue, Hirokatsu; and Shimizu, Chuji, 4,852,574, Cl. 128-643.000.
Nakahashi, Yoshinao; Osada, Soichi; Shimizu, Chuji; and Ichida, Shinshichi, 4,852,572, Cl. 128-640.000.
Shimizu Construction Co., Ltd.: *See*—
Ouchi, Tomonori; Wakamatsu, Otsuro; Kawanishi, Hiroshi; and Yasui, Masao, 4,853,495, Cl. 178-18.000.
Shimizu, Giichiro; Okuyama, Toshiharu; and Wakatsuki, Yoshio, to Man Design Co., Ltd. Distance measuring device with transmitter. 4,852,264, Cl. 33-832.000.
Shimizu, Isamu: *See*—
Ishihara, Shunichi; Ohno, Shigeru; Kanai, Masahiro; Oda, Shunri; and Shimizu, Isamu, 4,853,251, Cl. 427-38.000.
Shimizu, Masami: *See*—
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Shimizu, Shotaro; and Sakakibara, Yosuke, to Citizen Watch Co., Ltd. Permanent magnetic alloy comprising gold, platinum and cobalt. 4,853,048, Cl. 148-300.000.
Shimoi, Kenji, to Hitachi, Ltd. Program execution method in a system having plural computers. 4,853,872, Cl. 364-300.000.
Shin Caterpillar Mitsubishi Ltd.: *See*—
Morita, Izuru; Tozawa, Shoji; Hisatake, Tsuneo; and Atomo, Tadasi, 4,853,859, Cl. 364-424.040.
Shindo, Yoshio; Wada, Koichi; and Yamazaki, Fumio, to Nippon Steel Corporation. Surface treated steel material particularly electroplated steel sheet. 4,853,295, Cl. 428-621.000.
Shingu, Noriya: *See*—
Hino, Masao; Yoneda, Kenichi; Miyake, Masato; Otani, Hidehiko; Shingu, Noriya; Isahaya, Tsukasa; Hamada, Shigeshi; and Arahori, Tsuyoshi, 4,853,194, Cl. 423-239.000.
Shinichi, Nagata, to Dainippon Screen Manufacturing Co., Ltd. Optical system. 4,852,980, Cl. 350-432.000.
Shinohara, Norio: *See*—
Shibata, Jouji; Ohtani, Kazuo; Shinohara, Norio; and Hanyuda, Toshiaki, 4,853,279, Cl. 428-267.000.
Shiokawa, Takayasu; Yasukawa, Koji; and Karasawa, Yoshio, to Kokusai Denshin Denwa Kabushiki Kaisha. Radio wave receiving system. 4,853,702, Cl. 342-363.000.
Shiozawa, Takao: *See*—
Onishi, Toshiyasu; Ayata, Kenzo; Takagi, Hiroshi; Suzuki, Yasuo; Ohta, Yasuhiko; Shiozawa, Takao; Fujiwara, Koichi; and Itashiki, Masakazu, 4,852,635, Cl. 164-468.000.
Shiozawa, Takekimi: *See*—
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Saito, Yutaka; Kasai, Masaji; Shirahata, Kunikatsu; Kono, Motomichi; Morimoto, Makoto; and Ashizawa, Tadashi, 4,853,385, Cl. 514-250.000.
Shiraishi, Tadayoshi; Imai, Naohiro; Domoto, Takeshi; Kameyama, Keiji; Katsumi, Ikuo; Hidaka, Takayoshi; Hosoe, Kazunori; and Watanabe, Kiyoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. 3-phenylthiomethylstyrene derivative, process for preparing the same, and antiallergic agent and tyrosinekinase inhibiting agent containing the same. 4,853,403, Cl. 514-404.000.
Shiraishi, Takashi; and Hasegawa, Taiji, to Hitachi, Ltd. Method and apparatus for controlling air-fuel ratio in an internal combustion engine by corrective feedback control. 4,853,862, Cl. 364-431.050.
Shiraki, Kouji; Niwa, Minoru; Itou, Kuniyasu; Yamamoto, Tadashi; and Harata, Mitsuru, to Toyoda Gosei Co., Ltd. Pad for air bag device. 4,852,907, Cl. 280-731.000.
Shirley, Arthur I.: *See*—
Kaplan, Robert H.; LaCava, Alberto; Shirley, Arthur I.; and Ringo, Steven M., 4,853,004, Cl. 55-25.000.
Shirley, Thomas E.: *See*—
Linville, Andrew F., Jr.; Shirley, Thomas E.; and Griffith, Paul G., 4,853,903, Cl. 367-46.000.
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Shoji, Masaru; and Yatabe, Mitsunobu, to Casio Computer Co., Ltd. Time correction mechanism for an analog timepiece using plastic gears for transmitting the rotation of the manual operation member to the hands. 4,853,909, Cl. 368-190.000.
Shoji, Takashi: *See*—
Tajima, Kenji; Takahashi, Motoaki; Watanabe, Hideo; Shoji, Takashi; and Arai, Noboru, 4,853,724, Cl. 354-277.000.
Showa Aluminum Kabushiki Kaisha: *See*—
Otsuka, Tatsuo; Iwai, Ichiro; and Yamaguchi, Noboru, 4,852,791, Cl. 228-183.000.
Showa Highpolymer Co., Ltd.: *See*—
Shibata, Jouji; Ohtani, Kazuo; Shinohara, Norio; and Hanyuda, Toshiaki, 4,853,279, Cl. 428-267.000.
Showell, Henry J., to Pfizer Inc. 3-substituted-2-oxindole-1-carboxamides for suppressing T-cell function. 4,853,409, Cl. 514-418.000.
Shroot, Braham; Le Foyer de Costil, Carole; and Ayache, Liliane, to Societe Anonyme dite: L'Oreal. Stable hydrocortisone-based composition for use in local corticotherapy. 4,853,379, Cl. 514-179.000.

Shulan, John L.: *See—*
Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrom, William P., 4,852,818, Cl. 241-301.000.
Shurnick, Carl W.; and Bradley, Sabrina M. Runner's portable fluid supply container. 4,852,781, Cl. 224-148.000.
Shuster, Mark K.: *See—*
Basgil, David E.; Shuster, Mark K.; and Pituch, Thomas R., 4,853,063, Cl. 156-238.000.
Siegel, Hardo: *See—*
Henkelmann, Jochem; Eggersdorfer, Manfred; Grosch, Walter; Schuhmacher, Alfred; and Siegel, Hardo, 4,853,481, Cl. 562-440.000.
Siegel, Louis F.: *See—*
Obringer, Thomas J.; Siegel, Louis F.; and Lewis, Maurice W., 4,853,256, Cl. 427-152.000.
Siemens Aktiengesellschaft: *See—*
Brust, Hans-Detlef, 4,853,622, Cl. 324-158.00R.
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Frankel, Juergen; Mattelin, Antoon; Peccen, Pol; Quella, Ferdinand; Schmidt, Hans-Fr.; Boone, Luc; Von Tomkewitsch, Sybille; and De Vogelaere, Marc, 4,853,252, Cl. 427-53.100.
Hammer, Bernard; and von Brandt, Achim, 4,853,779, Cl. 358-133.000.
Hildebrand, Reinhard; and Riedel, Friedrich, 4,852,638, Cl. 165-42.000.
Huettenrauch, Gerd; and Jenner, Erhard, 4,853,948, Cl. 378-177.000.
Mund, Konrad; Preidel, Walter; Rao, J. Raghavendra; and Richter, Gerhard, 4,853,091, Cl. 204-1.00T.
Peppel, Michael, 4,853,834, Cl. 363-54.000.
Roessler, Bernward, 4,853,698, Cl. 341-150.000.
Rose, Harald, 4,853,545, Cl. 250-396.00R.
Seeger, Helmut; Leichum, Axel; and Maher, Anthony, 4,853,957, Cl. 379-279.000.
Stein, Karl-Ulrich, 4,853,593, Cl. 313-500.000.
Utner, Ferdinand, 4,853,825, Cl. 361-306.000.
Wollscheid, Dieter; Ninnemann, Peter; Stoll, Siegfried; and Wenzel, Waldemar, 4,853,891, Cl. 364-900.000.
Siemens Transmission Systems, Inc.: *See—*
Gorshe, Steven S., 4,853,931, Cl. 371-55.000.
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Bitschkus, Horst; Hofmann, Manfred; Klockner, Karl-Heinz; Nelles, Uwe; and Siewert, Gunther, 4,852,864, Cl. 267-219.000.
SIFCO Industries, Inc.: *See—*
Smith, Gary W., 4,853,099, Cl. 204-224.00R.
Silicomix Incorporated: *See—*
Hill, Lorimer K.; Harnden, James A.; and Concklin, Barry J., 4,853,563, Cl. 307-475.000.
Sills, Julia A.: *See—*
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Silverman, Lawrence M.: *See—*
Phillips, James L.; Richardson, Dale W.; and Silverman, Lawrence M., 4,852,200, Cl. 15-104.00R.
Silverstein, Fred E.: *See—*
Opie, Eric A.; and Silverstein, Fred E., 4,852,551, Cl. 128-4.000.
Simco-Ramic Corp.: *See—*
Little, James A.; and Cavin, Dennis, 4,853,533, Cl. 250-223.00R.
Simon Fraser University: *See—*
Morrison, S. Roy; Frindt, Robert F.; Joensen, Per; Gee, Michael A.; and Miremadi, Bijan K., 4,853,359, Cl. 502-220.000.
Simon Ladder Towers, Inc.: *See—*
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Simons, Richard H., Jr.: *See—*
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Simopoulos, George N.: *See—*
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Simopoulos, Gregory N.: *See—*
Simopoulos, Nicholas T.; Simopoulos, George N.; and Simopoulos, Gregory N., 4,853,079, Cl. 156-633.000.
Simopoulos, Nicholas T.; Simopoulos, George N.; and Simopoulos, Gregory N., to Lumel, Inc. Method for making electroluminescent panels. 4,853,079, Cl. 156-633.000.
Sinar, Michael M.: *See—*
Gebhardt, Edwin J.; Keaton, George H.; Sinar, Michael M.; and Wendt, James N., 4,852,198, Cl. 15-77.000.
Singarayer, Santiago, to FL Industries, Inc. Cycling limiting circuitry and method for electrical apparatus. 4,853,599, Cl. 315-119.000.
Singhal, Gopal H.; and Ryan, Daniel F., to Exxon Research and Engineering Company. Method for separating arsenic and/or selenium from shale oil. 4,853,110, Cl. 208-253.000.
Sink, Ronald A., to ITT Electro Optical Products, A Division of ITT Corporation. Method of making a channel type electron multiplier. 4,853,020, Cl. 65-4.100.
Sinofsky, Edward L., to C. R. Bard, Inc. Laser tipped catheter. 4,852,567, Cl. 128-303.100.
Sirrenberg, Wilhelm; Marhold, Albrecht; and Steffens, Robert, to Bayer Aktiengesellschaft. Substituted furazans and insecticidal and acaricidal use. 4,853,397, Cl. 514-364.000.
Sitzman, Gary W.: *See—*
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Sjogvist, Conny: *See—*
Calsson, Staffan; Boberg, Tore; and Sjogvist, Conny, 4,853,052, Cl. 149-109.600.
Sjostrand, Eero: *See—*
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Skarivoda, Edwin L., to Paragon Electric Company, Inc. Programmable timer with skip cycle. 4,853,558, Cl. 307-141.000.
Skidmore, Ian F.; Finch, Harry; Naylor, Alan; Lunts, Lawrence H. C.; and Campbell, Ian B., to Glaxo Group Limited. Aminophenol derivatives. 4,853,382, Cl. 514-212.000.
Skidmore, Ian F.: *See—*
Finch, Harry; Lunts, Lawrence H. C.; Naylor, Alan; Skidmore, Ian F.; and Campbell, Ian B., 4,853,381, Cl. 514-211.000.
Skolnick, Barry, to Scharr Industries Inc. Light reflective laminate. 4,853,283, Cl. 428-335.000.
Skrypzak, Werner: *See—*
Stuhler, Herbert; Reng, Alwin; Skrypzak, Werner; and Quack, Jochen M., 4,853,430, Cl. 524-604.000.
Skrzycki, Gary E. Speaker mounting system. 4,853,966, Cl. 381-188.000.
Sledge, Larry C.; and Filipczak, Gordon J., to Specialty Packaging Licensing Co. Child-resistant dispensing closure. 4,852,770, Cl. 222-153.000.
Sleichter, Charles G., III; Danks, Don; and Strong, Dale, to Advantage Entertainment, Inc. Portable isokinetic exercising device. 4,852,874, Cl. 272-137.000.
Sleve, Jerry F.: *See—*
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Slongo, Mario: *See—*
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Hallmark, Richard K.; and Moss, Ernest K., 4,853,419, Cl. 521-172.000.
Slovacek, Rudolf E.: *See—*
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Smith, Charles F.: *See—*
Bowling, Donald R.; and Smith, Charles F., 4,853,650, Cl. 330-287.000.
Smith, Dennis E.; Williams, John J. A.; Duncan, Gerald D.; Thomas, Graeme D.; Borrows, John G.; and Shacklock, Frank W., to Fisher & Paykel Limited. Intermediate bearing drives for clothes washing machines. 4,853,571, Cl. 310-90.000.
Smith, Dwight L.; and Elkins, Marvin. Insect trapping mat. 4,852,517, Cl. 119-1.000.
Smith, Eugene C.: *See—*
Jacuzzi, Remo; and Smith, Eugene C., 4,852,190, Cl. 4-192.000.
Smith, Gary W., to SIFCO Industries, Inc. Selective electroplating apparatus. 4,853,099, Cl. 204-224.00R.
Smith, John L.: *See—*
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Smith, Judson D., Jr.: *See—*
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Smith, Kyle C.: *See—*
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Smith, Mark A.; and Pavio, Anthony M., to Texas Instruments Incorporated. GaAs monolithic true logarithmic amplifier. 4,853,564, Cl. 307-492.000.
Smith, Stephen W.; and Trahey, Gregg E., to United States of America, Health and Human Services. High speed adaptive ultrasonic phased array imaging system. 4,852,577, Cl. 128-660.070.
Smith, Thomas J., to TII Industries Inc. Station interface and protector apparatus. 4,853,960, Cl. 379-437.000.
Smoak, Copley H.; and Chalfant, Terrill L. Self releasing tree support strap. 4,852,299, Cl. 47-42.000.
Snijder, Pieter J.: *See—*
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Snyderwine, Martha E., to United States of America, Navy. Stabilized suspension for immersible apparatus. 4,853,900, Cl. 367-4.000.
Sobata, Tamotsu; Takimoto, Masaaki; and Yoshida, Yuichi, to Nippon Paint Co., Ltd. Corrosion resistant, coated metal laminate, its preparation and coating materials. 4,853,285, Cl. 428-336.000.
Societa' Cavi Pirelli S.p.A.: *See—*
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Societe Anonyme Des Ateliers Houget Duesberg Bosson: *See—*
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Societe anonyme dite: Alcatel Thomson Faisceaux Hertziens: *See—*
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Societe Anonyme Dite: Ceraver: *See—*
Minjolle, Louis; Drouet, Michel; Fatta-Barou, Jean-Louis; Callegari, Michel; and Noel, Jacques, 4,853,053, Cl. 156-73.500.
Societe Anonyme dite: L'Oreal: *See—*
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Gouhier, Dany, 4,852,605, Cl. 137-493.000.
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Durual, Pierre; Hermant, Marc; and Laviron, Charles, 4,853,141, Cl. 252-51.000.
Societe Nationale ELF Aquitaine: *See—*
Batteux, Jacques; and Sharonizadeh, Ahmad, 4,853,012, Cl. 55-44.000.
Sofy, Hugh M. Transfer mechanism for punch presses. 4,852,381, Cl. 72-405.000.

Sogli, Loris: *See—*
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Sokolich, James M.: *See—*
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Mark, Irving L.; and Soni, Varun, 4,852,597, Cl. 135-69.000.
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Sonoco Products Company: *See—*
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Fukuju, Yujio; and Niiro, Makoto, 4,853,798, Cl. 360-38.100.
Inoue, Hirom, 4,853,584, Cl. 313-417.000.
Kobayashi, Seiji; and Nishida, Norio, 4,853,918, Cl. 369-44.000.
Kojima, Yuichi; and Kitazato, Naohisa, 4,853,780, Cl. 358-136.000.
Nemoto, Shoji, 4,853,809, Cl. 360-10.300.
Suwa, Hisashi; Sato, Seiji; Matsubara, Susumu; Yano, Eiji; and Koizumi, Katsuyuki, 4,853,804, Cl. 360-85.000.
Yamada, Makoto; and Odaka, Kentaro, 4,853,797, Cl. 360-32.000.
Yamanouchi, Hiroshi, 4,853,813, Cl. 360-104.000.
Sorensen, Kai, to Eskofot A/S. Area exposure machine. 4,853,749, Cl. 355-71.000.
Sorenson, Richard W., to Carlingswitch, Inc. Miniature illuminated rocker switch. 4,853,505, Cl. 200-315.000.
Soszka, Barbara; Federowsky, Robert; and Mahler, Jacques, to Vetrotex Saint-Gobain. Process and apparatus for producing coated single twist glass yarns. 4,853,021, Cl. 65-2.000.
Sougawa, Masafumi, to Sanshin Kogyo Kabushiki Kaisha. Silencer for outboard engine. 4,852,686, Cl. 181-229.000.
Southland, Stephen G., to Diamant Boart-Stratabit (USA) Inc. Diamond cutting element. 4,852,671, Cl. 175-329.000.
Southwall Technologies: *See—*
Vincent, Steve M.; Behling, Gerald R.; Hood, Thomas G.; and Gomm, William E., 4,853,264, Cl. 428-34.000.
Southwest Aerospace Corporation: *See—*
Brum, Roger D., 4,852,455, Cl. 89-1.140.
SpaceLabs, Inc.: *See—*
Walker, Arthur H., 4,852,583, Cl. 128-716.000.
Spalding & Evenflo Companies, Inc.: *See—*
Sullivan, Michael J., 4,852,884, Cl. 273-230.000.
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Hamer, Antonius; and Spang, Gerardus, 4,852,617, Cl. 139-452.000.
Specialty Packaging Licensing Co.: *See—*
Sledge, Larry C.; and Filipczak, Gordon J., 4,852,770, Cl. 222-153.000.
Spector, Saul R., to Steco, Inc. Solid waste carrier tailgate-sidewall closure reinforcing latch means. 4,852,933, Cl. 296-50.000.
Spectra-Physics, Inc.: *See—*
Fein, Michael E., 4,852,983, Cl. 350-453.000.
Rando, Joseph F.; and Schwartz, Henry L., 4,852,265, Cl. 33-227.000.
Spence, Billy F., deceased; by Spence, Eva L., legal representative; and Balandrano, Jesus F., deceased (Balandrano, Julia, legal representative). Multi stage gas scrubber. 4,853,010, Cl. 55-122.000.
Spence, Eva L., legal representative: *See—*
Spence, Billy F., deceased; Spence, Eva L., legal representative; and Balandrano, Jesus F., deceased, 4,853,010, Cl. 55-122.000.
Sperry, Charles R. Inhalation device. 4,852,561, Cl. 128-200.230.
Sporlan Valve Company: *See—*
Seener, G. Thomas; and Hoehne, Dennis L., 4,852,364, Cl. 62-225.000.
Sprague Electric Company: *See—*
Burks, Darnall P., 4,852,227, Cl. 29-25.420.
Stable, Helmut: *See—*
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Staendeke, Horst; Thummler, Ursus; and Adam, Wilhelm, to Hoechst Aktiengesellschaft. Stabilized red phosphorus and process for making it. 4,853,288, Cl. 428-402.240.
Staendeke, Horst; and Scharf, Daniel, to Hoechst Aktiengesellschaft. Flame-retardant polymer compositions. 4,853,424, Cl. 523-506.000.
Stahlheber, N. Earl; and Lyon, John E., to Monsanto Company. Continuous process for preparing sodium orthophosphate slurries from natural soda ash orthophosphoric acid. 4,853,200, Cl. 423-309.000.
Stamicarbon B.V.: *See—*
Peerlkamp, Erik R., 4,853,282, Cl. 428-323.000.
Stamp, Homer M., Sr. Modular porch for a mobile home. 4,852,309, Cl. 52-79.600.
Standard Oil Company, The: *See—*
Loza, Roman; and Cyngier, Roseann M., 4,853,138, Cl. 252-8.554.
Standex International Corporation: *See—*
Elrod, Granville P.; Westbrooks, John W.; and McDonald, Tracy L., 4,852,365, Cl. 62-237.000.
Standlick, David A.: *See—*
Standlick, Ronald E.; and Standlick, David A., 4,852,773, Cl. 222-504.000.
Standlick, Ronald E.; and Standlick, David A., to Jesco Products Company, Inc. Adjustable flow applicator for a positive displacement constant flow-rate dispenser. 4,852,773, Cl. 222-504.000.
Stanislowski, Detlev: *See—*
Schmid, Karl-Heinz; Asbeck, Adolf; and Stanislowski, Detlev, 4,853,145, Cl. 252-136.000.
Staniulis, Mark T.: *See—*
Behan, Albert S.; Chiang, Robert L.; and Staniulis, Mark T., 4,853,355, Cl. 502-64.000.
Stanley Electric Co., Ltd.: *See—*
Yamaguchi, Masami; Ishikawa, Shunichi; Tamura, Hideo; Tanaka, Hirokazu; Nakaya, Tomio; and Ishikawa, Kiyomitsu, 4,853,524, Cl. 235-468.000.
Statomat-Globe Maschinenfabrik GmbH: *See—*
Muskulus, Willi; Kolodziej, Helmut; and Nitsch, Helmut, 4,852,249, Cl. 29-825.000.
Stauffer Chemical Company: *See—*
Carter, Charles G.; Lee, David L.; and Michaely, William J., 4,853,028, Cl. 71-103.000.
Stauffer, Norman L., to Honeywell Inc. Specular surface inhibit. 4,853,532, Cl. 250-221.000.
STC PLC: *See—*
Davey, Anthony B.; and Bone, Matthew F., 4,852,978, Cl. 350-350.00R.
Steco, Inc.: *See—*
Spector, Saul R., 4,852,933, Cl. 296-50.000.
Steel Engineering Company Limited, The: *See—*
Hunt, Clive W., 4,852,663, Cl. 173-134.000.
Steffens, Robert: *See—*
Sirrenberg, Wilhelm; Marhold, Albrecht; and Steffens, Robert, 4,853,397, Cl. 514-364.000.
Stein, Amnon; and Nagler, Michael, to Scitex Corporation Ltd. Internal drum plotter. 4,853,709, Cl. 346-108.000.
Stein, Karl-Ulrich, to Siemens Aktiengesellschaft. Light emitting diode (LED) display. 4,853,593, Cl. 313-500.000.
Steiner, Theodor: *See—*
Graf, Jean-Francois; Hasslin, Hans W.; Schuurman, Hessel J.; Steiner, Theodor; and Wieland, Bruno, 4,853,223, Cl. 424-405.000.
Steinleitner, Gunther; Mennicke, Stefan; Feindler, Philbert; Klein, Herbert; and Maldonado-Zagal, Sigisfredo, to BBC Brown Boveri Aktiengesellschaft. Electrochemical storage cell. 4,853,303, Cl. 429-104.000.
Stenbacka, Rolf. Method of producing fusion reactions and apparatus for a fusion reactor. 4,853,173, Cl. 376-123.000.
Stendel, Wilhelm: *See—*
Fuchs, Rainer; and Stendel, Wilhelm, 4,853,477, Cl. 558-398.000.
Stengard, Peter, to Asea Brown Boveri AB. Surge arrester. 4,853,670, Cl. 338-21.000.
Stenkvist, Sven-Einar: *See—*
Rappinger, Bo; and Stenkvist, Sven-Einar, 4,853,941, Cl. 373-72.000.
Stenlund, Berndt: *See—*
Andersson, Lars; Stenlund, Berndt; and Wiberg, Rolf, 4,853,293, Cl. 428-605.000.
Sterler, Georg; and Bader, Heinz, to Audi AG. Method for testing airbag system release circuit. 4,853,623, Cl. 324-158.00R.
Sternling, Charles V.: *See—*
Segerstrom, Clifford C.; Sternling, Charles V.; Luke, Hans-Wolfgang; and Wu, Hsi L., 4,852,997, Cl. 48-210.000.
Stevens, Brian. Ultrasensitive radiation dosimeter and dosimetry system. 4,853,548, Cl. 250-484.100.
Stevens, Chad I.; and Parent, Edward D., to GTE Products Corporation. Process for consolidation of silicon monoxide fines. 4,853,016, Cl. 65-18.100.
Stevens, Robert F., to Tetra Pak Inc. Sweetened high protein milk product and process for producing same. 4,853,246, Cl. 426-580.000.
Stewart, Kevin R., to General Electric Company. Preparation of linear polycarbonates from cyclic oligomer compositions using metal chelate catalyst. 4,853,459, Cl. 528-371.000.
Steyr-Daimler-Puch AG: *See—*
Rollenitz, Leopold; Krenn, Andreas; Schmidt, Harald; and Freudenschuss, Otto, 4,852,535, Cl. 123-357.000.
Stienstra, Jan B., to Oce-Nederland B.V. Method and device for printing images on halves of both sides of sheets. 4,852,487, Cl. 101-232.000.
Stiff, Anthony J., to AECI Limited. Process for the manufacture of nitric acid esters. 4,853,157, Cl. 558-483.000.
Stil, Andre , to Automobiles Peugeot; and Automobiles Citroen. Hydropneumatic accumulator. 4,852,615, Cl. 138-30.000.
Stille, Volker, to Lodige Fordertechnik GmbH. Ball-type conveyor. 4,852,721, Cl. 198-782.000.
Stille, Wolfgang: *See—*
Wahlig, Helmut; Dingeldein, Elvira; Rothe, Johannes; and Stille, Wolfgang, 4,853,225, Cl. 424-423.000.
Stocker, Raymond, to Ford Motor Company. Variable length rod assembly having locking adjustment mechanism. 4,852,425, Cl. 74-586.000.

Stokman, Ronald J.: *See—*
van Laar, Jacobus; Niemeijer, Frank T.; and Stokman, Ronald J., 4,852,859, Cl. 266-197.000.

Stoll, Siegfried: *See—*
Wollscheid, Dieter; Ninnemann, Peter; Stoll, Siegfried; and Wenzel, Waldemar, 4,853,891, Cl. 364-900.000.

Stone, James L., to Packaging Corporation of America. Pour spout closure. 4,852,764, Cl. 220-315.000.

Stone, Richard A.: *See—*
Krupin, Theodore; and Stone, Richard A., 4,853,375, Cl. 514-152.000.

Stoody, William R. Neoteric simplified aerosol valve. 4,852,807, Cl. 239-337.000.

Stoppazzini, Benito, to E.M.M., S.R.L. Device for mounting and controlling the switch retaining and pressing means in automatic flat knitting machines. 4,852,369, Cl. 66-64.000.

Storace, Anthony, to Pitney Bowes Inc. Automatic printwheel setting system. 4,852,482, Cl. 101-110.000.

Storm Products Co.: *See—*
Holland, John W.; and Weiss, Ronald J., 4,852,964, Cl. 350-96.230.

Stovall, Walter M.: *See—*
Nichols, Steven R.; Hyers, Robert C.; Stovall, Walter M.; and Trawick, Charles D., 4,853,839, Cl. 364-167.010.

Stowe, Lawrence R.: *See—*
Jennings, Jr.; Alfred R.; and Stowe, Lawrence R., 4,852,650, Cl. [illegible]

Stoyanoff, Louis J., to Academic Products, Inc. Storage receptacle adapted for facile content reference. 4,852,909, Cl. 281-33.000.

Strathman, Lyle R., to Rockwell International Corporation. Flat panel display having pixel spacing and luminance levels providing high resolution. 4,853,592, Cl. 313-495.000.

Strausak, Benedikt. Automatic pool cleaner. 4,852,211, Cl. 15-1.700.

Streck, Donald A.: *See—*
Iggulden, Jerry R.; Streck, Donald A.; and Pender, Joseph W., 4,852,802, Cl. 239-64.000.

Strepparola, Ezio: *See—*
Marchionni, Giuseppe; De Patto, Ugo; Strepparola, Ezio; and Viola, Gian T., 4,853,097, Cl. 204-157.600.

Strickroth, Erich: *See—*
Johansen, Trond V.; Ruch, Ola; Naess, Ludvig; Weber, Robert; Veenhoff, Bernd; Porner, Horst; Laurer, Erwin; Strickroth, Erich; and Schabert, Hans-Peter, 4,852,614, Cl. 138-93.000.

Strid, Eric W.: *See—*
Gleason, Kimberly R.; Strid, Eric W.; Flegal, Robert T.; and McCamant, Angus J., 4,853,627, Cl. 324-158.00P.

Strobel, Klaus: *See—*
Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, 4,853,170, Cl. 264-517.000.

Strohmer, Erwin: *See—*
Abthoff, Joerb; Schuster, Hans-Dieter; Langer, Hans-Joachim; Strohmer, Erwin; Gabler, Rolf; and Schulte, Roland, 4,852,349, Cl. 60-303.000.

Strohmeyer, Robert W., Sr. Collapsible ladder assembly. 4,852,688, Cl. 182-199.000.

Strong, Dale: *See—*
Sleichter, Charles G., III; Danks, Don; and Strong, Dale, 4,852,874, Cl. 272-137.000.

Strupczewski, Joseph T., to Hoechst-Roussel Pharmaceuticals, Inc. 3-(piperidinyl)- and 3-(pyrrolidinyl)-1H-indazoles. 4,853,470, Cl. 546-199.000.

Stuart, Thomas A., to University of Toledo. Cascaded resonant bridge converters. 4,853,832, Cl. 363-17.000.

Stuhler, Herbert; Reng, Alwin; Skrypzak, Werner; and Quack, Jochen M., to Hoechst Aktiengesellschaft. Method of increasing viscosity with fatty acid-modified polyesters and highly viscous compositions obtained thereby. 4,853,430, Cl. 524-604.000.

Subotics, Gyula: *See—*
Tatai, Llona; Gundisch, Gusztav; Palotas, Laszlo ; and Subotics, Gyula, 4,852,713, Cl. 198-337.000.

Subramaniam, Anandaraman; Ozogar, Robert M.; and Bergsbaken, Carlton K., to Borden, Inc. Non-bitter enzyme modified cheese flavoring material and spray dried product. 4,853,232, Cl. 426-35.000.

Suda, Shigeyuki, to Canon Kabushiki Kaisha. Imaging lens system comprising a distributed index lens and a plano-convex lens. 4,852,981, Cl. 350-413.000.

Sueddeutsche Kuehlerfabrik, Julius Fr., Behr GmbH & Co. KG: *See—*
Kampf, Hans; and Lochmahr, Karl, 4,852,363, Cl. 62-176.600.

Suesada, Kunio; and Koya, Toshiaki, to Matsushita Electric Industrial Co., Ltd. Recording/reproducing apparatus for digital composite video signal with means for synchronizing color subcarrier phase. 4,853,796, Cl. 358-324.000.

Suga, Shuzo: *See—*
Ikeda, Hideo; Suga, Shuzo; and Miyasaka, Nobuaki, 4,853,323, Cl. [illegible]

Suga, Yoichi: *See—*
Makino, Katsumi; Ohashi, Yuichi; Takehara, Hiroshi; Suga, Yoichi; and Shiozawa, Takekimi, 4,853,322, Cl. 430-567.000.

Suganuma, Atsushi, to Fuji Photo Film Co., Ltd. Light beam scanning device generating a stable synchronizing signal. 4,853,535, Cl. 250-235.000.

Sugata, Masaki: *See—*
Sato, Yasuyuki; Sugata, Masaki; and Murai, Hiroyuki, 4,853,582, Cl. 313-141.000.

Sugiura, Hidemi; Ukai, Mikio; and Miyamoto, Kenji, to Toyoda Gosei Co., Ltd. Plastic boots and method of manufacturing the same. 4,852,891, Cl. 277-212.0FB.

Sugiyama, Masato: *See—*
Katsumata, Kenji; Sugiyama, Masato; Matono, Takaaki; Hirahata, Shigeru; Nakagawa, Isao; Ishikura, Kazuo; and Suzuki, Sunao, 4,853,765, Cl. 358-11.000.

Suhov, Boris P., to Huck Manufacturing Company. Lockbolt installation tool with cartridge feed. 4,852,376, Cl. 72-391.000.

Sujansky, Vladimir: *See—*
Bates, Andrew; and Sujansky, Vladimir, 4,853,050, Cl. 149-2.000.

Sula, Stanley J., to Tektronix, Inc. Piezoelectric pulse generator. 4,853,580, Cl. 310-339.000.

Sullivan, Michael J., to Spalding & Evenflo Companies, Inc. Use of metal carbamate accelerator in peroxide-cured golf ball center formulation. 4,852,884, Cl. 273-230.000.

Sully, Michael A.: *See—*
Ross, Murray A.; Adams, Gordon L.; and Sully, Michael A., 4,852,659, Cl. 172-789.000.

Sulzer Brothers Limited: *See—*
Hamer, Antonius; and Spang, Gerardus, 4,852,617, Cl. 139-452.000.
Zollinger, Hans; and Oderbolz, Fredi, 4,852,618, Cl. 139-453.000.

Sumitomo Bayer Urethane Co., Ltd: *See—*
Weigand, Eckehard; Kihara, Yoshinori; and Honda, Masaru, 4,853,417, Cl. 521-131.000.

Sumitomo Chemical Company, Limited: *See—*
Hasuma, Noritaka; Saito, Yoshikazu; Nishizawa, Toshio; and Katsumata, Takashi, 4,853,378, Cl. 514-167.000.

Sumitomo Electric Industries, Ltd.: *See—*
Miyazaki, Kenji, 4,853,078, Cl. 156-616.400.

Sumitomo Metal Industries: *See—*
Kojima, Masayasu; and Hayashi, Chihiro, 4,852,736, Cl. 206-328.000.

Sun, Hsiang-Ning: *See—*
Hostetler, Donald E.; Cannarsa, Michael J.; Kesling, Haven S., Jr.; and Sun, Hsiang-Ning, 4,853,462, Cl. 528-494.000.

Sunbeam Plastics Corporation: *See—*
Halfacre, J. Wayne, 4,852,751, Cl. 215-32.000.

Sung, Rodney L.; Hayden, Thomas; Caggiano, Michael A.; and Behrens, Milton D., to Texaco Inc. ORI-inhibited and deposit-resistant motor fuel composition. 4,852,993, Cl. 44-62.000.

Sung, Yuhn K.; and Bong, Yoo E., to Sam Sung Electronic Co. Ltd. Power control device for microwave oven. 4,853,501, Cl. 200-38.0FA.

Superior Electric Company, The: *See—*
Carmen, Ralph, 4,853,631, Cl. 324-208.000.

Surface Combustion, Inc.: *See—*
Verhoff, Stephen H.; and Tackett, Garrol, 4,853,046, Cl. 148-16.500.

Surjaatmadja, Jim B.: *See—*
Nickles, Stephen K.; Surjaatmadja, Jim B.; Haley, John E.; and Wienck, Lynn K., 4,853,883, Cl. 364-578.000.

Suster, Albert L.: *See—*
Heindl, Raymond A.; Reiling, Gilbert H.; and Suster, Albert L., 4,853,597, Cl. 313-638.000.

Sutherland, Brenda A.: *See—*
Sutherland, Ronald G.; and Sutherland, Brenda A., 4,852,268, Cl. 33-562.000.

Sutherland, Ronald G.; and Sutherland, Brenda A. Lottery ticket template. 4,852,268, Cl. 33-562.000.

Sutter, Hans E., to Pedalo, Inc. Method and apparatus for screenless panoramic stereo TV system. 4,853,764, Cl. 358-3.000.

Suttles, J. Marshall: *See—*
Brown, Allen C.; Brown, Ray R.; and Suttles, J. Marshall, 4,852,954, Cl. 312-140.400.

Suwa, Hisashi; Sato, Seiji; Matsubara, Susumu; Yano, Eiji; and Koizumi, Katsuyuki, to Sony Corporation. Magnetic recording and/or reproducing apparatus. 4,853,804, Cl. 360-85.000.

Suwa, Takeshi; and Kuroda, Takafumi, to Terasaki Denki Sangyo Kabushiki Kaisha. Overcurrent tripping unit for a circuit breaker. 4,853,819, Cl. 361-47.000.

Suzuki, Akio; Ohkubo, Masaharu; and Takada, Yoshihiro, to Canon Kabushiki Kaisha. Color image processing apparatus with linear masking circuit having coefficients which vary in accordance with the levels of color component signals. 4,853,768, Cl. 358-80.000.

Suzuki, Hirayoshi: *See—*
Tanaka, Hazime; Suzuki, Hirayoshi; and Sasaki, Keiji, 4,853,504, Cl. 200-83.00P.

Suzuki, Kazuaki: *See—*
Kamiya, Saburo; Suzuki, Kazuaki; and Tanimoto, Akikazu, 4,853,745, Cl. 355-43.000.

Suzuki, Mikio: *See—*
Teshima, Toshio; Kitagawa, Tooru; Suzuki, Mikio; Masaoka, Toshio; Mori, Takashi; and Okimoto, Kazutaka, 4,852,633, Cl. 164-437.000.

Suzuki, Moitsu: *See—*
Maekawa, Kengo; Suzuki, Moitsu; Nakano, Yukiya; and Tani, Hisahiko, 4,852,685, Cl. 181-175.000.

Suzuki, Noboru; and Toji, Shigeo, to Asahi Kogaku Kogyo K.K. Automatic focusing camera. 4,853,732, Cl. 354-402.000.

Suzuki, Norio: *See—*
Yamanaka, Toshiaki; Suzuki, Norio; Sakai, Yoshio; Kawamoto, Yoshifumi; Minato, Osamu; Ishibashi, Koichiro; Moriwaki, Nobuyuki; and Meguro, Satoshi, 4,853,894, Cl. 365-154.000.

Suzuki, Noriyuki, to Canon Kabushiki Kaisha. Information processing apparatus for inputting coordinate data selectively from either the obverse or the reverse surface of an input tablet. 4,853,494, Cl. 178-18.000.

Suzuki, Sunao: *See—*
Katsumata, Kenji; Sugiyama, Masato; Matono, Takaaki; Hirahata, Shigeru; Nakagawa, Isao; Ishikura, Kazuo; and Suzuki, Sunao, 4,853,765, Cl. 358-11.000.

Suzuki, Tadashi: *See—*
Nakajima, Yoshiaki; Suzuki, Tadashi; and Wada, Yoneji, 4,852,693, Cl. 184-6.400.

Suzuki, Teisuke; and Matsuhara, Hiroshi, to JAC Creative Foods, Inc. Method for producing a fish slurry into edible products. 4,853,239, Cl. 426-249.000.

Suzuki, Yasuo: *See—*
Onishi, Toshiyasu; Ayata, Kenzo; Takagi, Hiroshi; Suzuki, Yasuo; Ohta, Yasuhiko; Shiozawa, Takao; Fujiwara, Koichi; and Itashiki, Masakazu, 4,852,635, Cl. 164-468.000.

Suzuki, Yasushi, to Citizen Watch Co., Ltd. Liquid crystal display device. 4,852,976, Cl. 350-339.00R.

Suzuki, Yoshimi: *See—*
Ishikawa, Osamu; Sone, Mikihiko; and Suzuki, Yoshimi, 4,853,793, Cl. 358-464.000.

Svenka, Peter; and Rauf, Richard, to Kleinewefers GmbH. Apparatus for cleaning calender rolls and the like. 4,852,209, Cl. 15-308.000.

Swanson, Ernest B.; and Chane, It S. Device for attracting and electrocuting flying insects. 4,852,296, Cl. 43-112.000.

Symes, Peter D.: *See—*
Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; Olmstead, Neil R.; Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; and Frasier, Richard A., 4,853,784, Cl. 358-181.000.

Synbiotics Corporation: *See—*
Vodian, Morton A.; Bean, Eric S.; and LeMoine, Eric D., 4,853,325, Cl. 435-5.000.

Synthelabo: *See—*
Manoury, Philippe; Binet, Jean; and Dewitte, Elisabeth, 4,853,387, Cl. 514-272.000.

Synthetic Blood Corporation: *See—*
Ecanow, Bernard; and Ecanow, Charles S., 4,853,370, Cl. 514-6.000.

Syracuse University: *See—*
Tavlarides, Lawrence L.; and Bonnet, Julio C., 4,852,396, Cl. 73-61.10R.

Szalata, Francois: *See—*
Demars, Yves; Szalata, Francois; and DeCoopman, Christian, 4,852,219, Cl. 19-305.000.

Szczerba, Robert M.: *See—*
Mikas, Raymond; Szczerba, Robert M.; and Pulciani, Sam C., 4,852,377, Cl. 72-349.000.

T.D.J. Co., Inc.: *See—*
Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrom, William P., 4,852,818, Cl. 241-301.000.

T. D. Wright, Inc.: *See—*
McEachern, David A., 4,852,490, Cl. 101-378.000.

Tabata, Yukio: *See—*
Kawanishi, Toshiyuki; and Tabata, Yukio, 4,853,707, Cl. 346-1.100.

Tackett, Garrol: *See—*
Verhoff, Stephen H.; and Tackett, Garrol, 4,853,046, Cl. 148-16.500.

Taffer, Jon. Apparatus and method for selecting and playing music. 4,852,910, Cl. 283-67.000.

Taguchi, Masahiro; Kondo, Hirosato; Inoue, Yoshimasa; Kawahata, Yoshihiro; and Tsukamoto, Goro, to Kanebo, Ltd. Quinolinecarboxylic acid derivative starting compounds. 4,853,469, Cl. 544-99.000.

Taha, Mohammad I. A.: *See—*
Laine, Derek C.; and Taha, Mohammad I. A., 4,853,935, Cl. 372-32.000.

Taha, Riad A., to Colgate-Palmolive Company. Process for manufacturing particulate built nonionic synthetic organic detergent composition comprising polyacetal carboxylate and carbonate and bicarbonate builders. 4,853,259, Cl. 427-221.000.

Taisho Pharmaceutical Co., Ltd.: *See—*
Takashima, Yasuji; Koyama, Ikuo; Maki, Tooru; and Nakamori, Katsu, 4,853,249, Cl. 427-3.000.

Tajima, Kenji; Takahashi, Motoaki; Watanabe, Hideo; Shoji, Takashi; and Arai, Noboru, to Fuji Photo Film Co., Ltd. Sheet film package and device for loading sheet films. 4,853,724, Cl. 354-277.000.

Taka, Shin-ichi; and Ohshima, Jiro, to Kabushiki Kaisha Toshiba. Method of manufacturing semiconductor integrated circuit device having transistor. 4,853,342, Cl. 437-31.000.

Takada, Shigeyuki. Underwater window for vessels. 4,852,508, Cl. 114-177.000.

Takada, Yoshihiro: *See—*
Suzuki, Akio; Ohkubo, Masaharu; and Takada, Yoshihiro, 4,853,768, Cl. 358-80.000.

Takagi, Hiroshi: *See—*
Onishi, Toshiyasu; Ayata, Kenzo; Takagi, Hiroshi; Suzuki, Yasuo; Ohta, Yasuhiko; Shiozawa, Takao; Fujiwara, Koichi; and Itashiki, Masakazu, 4,852,635, Cl. 164-468.000.

Takagi, Tadashi: *See—*
Seino, Kiyoharu; Takagi, Tadashi; Takeda, Fumio; and Ikeda, Yukio, 4,853,649, Cl. 330-277.000.

Takagi, Toshiyuku: *See—*
Muramatsu, Yasuhiko; Ohta, Susumu; Takagi, Toshiyuku; Higuchi, Haruo; and Nikaido, Mitsuhiro, 4,853,567, Cl. 310-67.00R.

Takahashi, Akira; Shibahara, Kazuo; Morimoto, Katsuhiro; Samma, Hiromasa; and Kubo, Kazuhiko, to Kabushiki Kaisha Osaka Packing Seizosho. Silica shaped bodies and process for preparing same. 4,853,351, Cl. 501-87.000.

Takahashi, Hideaki: *See—*
Arabori, Noboru; Takahashi, Hideaki; Sakai, Yoshio; and Yoneda, Kenji, 4,852,694, Cl. 187-115.000.

Takahashi, Junji; and Kenmotsu, Isami, to Pioneer Electronic Corporation. Disk clamping device. 4,853,924, Cl. 369-270.000.

Takahashi, Kenichiroh; Harao, Noriyuki; and Tanoue, Hiromi, to Matsushita Electric Industrial Co., Ltd. Driving apparatus for ultrasonic motor. 4,853,578, Cl. 310-315.000.

Takahashi, Koji: *See—*
Fukatsu, Tsutomu; Hori, Taizou; Masui, Toshiyuki; Kobayashi, Takashi; Wakui, Tetsuya; and Takahashi, Koji, 4,853,803, Cl. 360-72.200.

Takahashi, Motoaki: *See—*
Tajima, Kenji; Takahashi, Motoaki; Watanabe, Hideo; Shoji, Takashi; and Arai, Noboru, 4,853,724, Cl. 354-277.000.

Takahashi, Sadatoshi; Ogawa, Hideki; and Endo, Hiroshi, to Canon Kabushiki Kaisha. Telephoto lens of large aperture ratio. 4,852,984, Cl. 350-454.000.

Takahashi, Teruhisa; and Kajiyama, Masashi, to Usui Kokusai Sangyo Kaisha Ltd. Multilayer coated corrosion resistant metal pipe. 4,853,297, Cl. 428-623.000.

Takahashi, Tohru; Kitajima, Nobuo; and Kawamura, Naoto, to Canon Kabushiki Kaisha. Image processing method. 4,853,752, Cl. 355-77.000.

Takakura, Toshihiko: *See—*
Uchida, Akihisa; Okada, Daisuke; Takakura, Toshihiko; Ogiue, Katsumi; Tamaki, Yoichi; and Kawamura, Masao, 4,853,343, Cl. 437-33.000.

Takamura, Norio; Oda, Kuniyuki; Kodato, Shinichi; Yamaguchi, Isao; and Yano, Koji, to Tanabe Seiyaku Co., Ltd. Phenoxyacetic acid derivatives composition and use. 4,853,404, Cl. 514-406.000.

Takano Corporation: *See—*
Nakajima, Yoshiaki; Suzuki, Tadashi; and Wada, Yoneji, 4,852,693, Cl. 184-6.400.

Takasago, Masahiro; and Arai, Shinichi, to Hitachi, Ltd. Optical recording/reproducing method and apparatus for optical disk medium having unique control parameters. 4,853,915, Cl. 369-32.000.

Takashima, Shigekazu, to Kabushiki Kaisha Toshiba. Image frame composing circuit utilizing color look-up table. 4,853,681, Cl. 340-703.000.

Takashima, Yasuji; Koyama, Ikuo; Maki, Tooru; and Nakamori, Katsu, to Taisho Pharmaceutical Co., Ltd. Method of preparing sustained-release pharmaceutical/preparation. 4,853,249, Cl. 427-3.000

Takatani, Teruhiko; Yamada, Muneharu; and Miyamoto, Tomomi, to Mazda Motor Corporation. Layout of steering mechanism for four-wheel steering vehicle. 4,852,897, Cl. 280-91.000.

Takayuki, Naoi: *See—*
Nikaido, Hideyuki; Takayuki, Naoi; Komori, Atsushi; and Nibei, Mitsuo, 4,852,383, Cl. 72-407.000.

Takazawa, Kazuhisa: *See—*
Asano, Kazuhiro; Yoshida, Yosuke; Fujioka, Yoichi; Takazawa, Kazuhisa; Ishizaki, Masao; Sakami, Yasuo; and Tsubouchi, Junichi, 4,853,682, Cl. 340-706.000.

Takeda, Fumio: *See—*
Seino, Kiyoharu; Takagi, Tadashi; Takeda, Fumio; and Ikeda, Yukio, 4,853,649, Cl. 330-277.000.

Takeda, Haruo, to Hitachi, Ltd. Method for storing data in rotary type recording media. 4,853,921, Cl. 369-59.000.

Takeda, Katsu: *See—*
Kawasaki, Osamu; Takeda, Katsu; Inaba, Ritsuo; and Fukada, Tetsuji, 4,853,579, Cl. 310-116.000.

Takeda, Osamu: *See—*
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Aburaya, Toshio, 4,852,906, Cl. 280-707.000.

Takehara, Hiroshi: *See—*
Makino, Katsumi; Ohashi, Yuichi; Takehara, Hiroshi; Suga, Yoichi; and Shiozawa, Takekimi, 4,853,322, Cl. 430-567.000.

Takimoto, Masaaki: *See—*
Sobata, Tamotsu; Takimoto, Masaaki; and Yoshida, Yuichi, 4,853,285, Cl. 428-336.000.

Takizawa, Seiichiro; Fukukawa, Mitsuo; Yazawa, Masayuki; Asai, Kazumitsu; and Okamoto, Yoshiharu, to Kajima Corporation; and Kajima Road Company. Method and apparatus for grading and measuring a surface having a curved profile. 4,852,278, Cl. 37-197.000.

Takizawa, Shozo: *See—*
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; and Tatemoto, Minoru, 4,852,903, Cl. 280-689.000.
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; and Tatemoto, Minoru, 4,852,905, Cl. 280-707.000.

Talmadge, Paul C., to Pitney Bowes Inc. Vault cartridge having capacitive coupling. 4,853,523, Cl. 235-492.000.

Tam, Man C.; Bloembergen, Steven; Kovacs, Gregory J.; Jennings, Carol A.; Loutfy, Rafik O.; Gardner, Sandra J.; and Taylor, Michael G., to Xerox Corporation. Imaging member containing a copolymer of styrene and ethyl acrylate. 4,853,307, Cl. 430-41.000.

Tamada, Kazukiyo, to Fuji Photo Film Co., Ltd. Apparatus for regulating the force rendered to a magnetic disc by a magnetic head in a rotary magnetic disc device. 4,853,806, Cl. 360-99.060.

Tamaki, Yoichi: *See—*
Uchida, Akihisa; Okada, Daisuke; Takakura, Toshihiko; Ogiue, Katsumi; Tamaki, Yoichi; and Kawamura, Masao, 4,853,343, Cl. 437-33.000.

Tamura, Hideo: *See—*
Yamaguchi, Masami; Ishikawa, Shunichi; Tamura, Hideo; Tanaka, Hirokazu; Nakaya, Tomio; and Ishikawa, Kiyomitsu, 4,853,524, Cl. 235-468.000.

Tamura, Yoshikazu: *See—*
Horiguchi, Masashi; Yakubo, Minoru; Tamura, Yoshikazu; and Ogasawara, Mamoru, 4,853,747, Cl. 355-51.000.

Tanabe, Masao: *See—*
Terasaka, Yoshiyasu; and Tanabe, Masao, 4,852,515, Cl. 118-663.000.

Tanabe Seiyaku Co., Ltd.: *See—*
Takamura, Norio; Oda, Kuniyuki; Kodato, Shinichi; Yamaguchi, Isao; and Yano, Koji, 4,853,404, Cl. 514-406.000.

Tanaka, Atsuo: *See—*
Hamajima, Kaneo; Tanaka, Atsuo; Kubo, Masahiro; and Dohnomoto, Tadashi, 4,852,630, Cl. 164-761.000.

Tanaka, Hazime; Suzuki, Hirayoshi; and Sasaki, Keiji, to Fuji Koki Manufacturing Co., Ltd. Triple action pressure switch apparatus. 4,853,504, Cl. 200-83.00P.

Tanaka, Hideo: *See—*
Torii, Sigeru; Uneyama, Kenji; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, 4,853,468, Cl. 540-215.000.

Tanaka, Hirokazu: *See—*
Yamaguchi, Masami; Ishikawa, Shunichi; Tamura, Hideo; Tanaka, Hirokazu; Nakaya, Tomio; and Ishikawa, Kiyomitsu, 4,853,524, Cl. 235-468.000.

Tanaka, Hiroyuki, to Nix Company, Ltd. Dental X-ray film developing machine. 4,853,729, Cl. 354-322.000.

Tanaka, Kimio: *See—*
Satoh, Takateru; Tanaka, Kimio; and Sasaki, Morimasa, 4,853,816, Cl. 360-132.000.

Tanaka, Masaaki: *See—*
Abe, Shuzo; Matsunami, Satoshi; Nagamatsu, Sunao; Tanaka, Masaaki; and Matsuno, Masao, 4,853,546, Cl. 250-432.0PD.

Tanaka, Masayuki: *See—*
Mashimo, Satoshi; Kitajima, Tatsuya; Tanaka, Masayuki; and Kuramoto, Shinji, 4,852,625, Cl. 152-511.000.

Tanaka, Nobuyuki, to Fuji Photo Film Co., Ltd. Method of compressing image signals using vector quantization. 4,853,778, Cl. 358-133.000.

Tanaka, Seiji; and Nakagawa, Hideshi, to Sharp Kabushiki Kaisha. Heating apparatus for heating in a plurality of heating modes. 4,853,519, Cl. 219-497.000.

Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; and Tatemoto, Minoru, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Vehicle suspension apparatus. 4,852,903, Cl. 280-689.000.

Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; and Tatemoto, Minoru, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Vehicle suspension apparatus. 4,852,905, Cl. 280-707.000.

Tanaka, Takahiko; Hisanaga, Naogi; Yamamoto, Takeshi; Okazaki, Susumu; and Kajimoto, Shinshi, to Mazda Motor Corporation. Controlling circuit for window wiper accommodating apparatus. 4,852,205, Cl. 15-250.170.

Tanaka, Toshinori, to Mitsubishi Denki Kabushiki Kaisha. Starter for engine. 4,852,417, Cl. 74-7.00E.

Tanaka, Toshinori: *See—*
Isozumi, Shuzoo; and Tanaka, Toshinori, 4,853,570, Cl. 310-78.000.

Taneya, Mototaka: *See—*
Matsui, Sadayoshi; Kaneiwa, Shinji; Morimoto, Taiji; Yamaguchi, Masahiro; Taneya, Mototaka; and Matsumoto, Mitsuhiro, 4,853,936, Cl. 372-45.000.

Tani, Hisahiko: *See—*
Maekawa, Kengo; Suzuki, Moitsu; Nakano, Yukiya; and Tani, Hisahiko, 4,852,685, Cl. 181-175.000.

Taniguchi, Toshihiko: *See—*
Kawamura, Kunio; Taniguchi, Toshihiko; Oya, Tetsuro; Niwa, Masatake; Nakai, Masaaki; and Fujino, Akihiko, 4,853,726, Cl. 354-289.100.

Taniguchi, Yasutaka: *See—*
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; and Tatemoto, Minoru, 4,852,903, Cl. 280-689.000.
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; and Tatemoto, Minoru, 4,852,905, Cl. 280-707.000.

Taniishi, Shinnosuke, to Canon Kabushiki Kaisha. Acoustic coordinate input device using a roughened surface to attenuate the surface wave component. 4,853,496, Cl. 178-18.000.

Tanimoto, Akikazu: *See—*
Kamiya, Saburo; Suzuki, Kazuaki; and Tanimoto, Akikazu, 4,853,745, Cl. 355-43.000.

Tanimoto, Takuharu: *See—*
Murata, Mitshiro; Okada, Naofumi; Yamamoto, Kazutoshi; Tanimoto, Takuharu; and Inoue, Tokuyasu, 4,853,750, Cl. 355-75.000.

Tanoue, Hiromi: *See—*
Takahashi, Kenichiroh; Harao, Noriyuki; and Tanoue, Hiromi, 4,853,578, Cl. 310-315.000.

Tansley, Robert W.: *See—*
Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansley, Robert W.; and Newman, Alec T., 4,853,234, Cl. 426-77.000.

Tasler, Guenter; Wiendenhoeft, Klaus; Schultheiss, Michael; Schoenfuss, Martin; Ludwig, Theo; Huster, Klaus; and Grenzendoerfer, Dietmar, to VEB Kombinat Textima. Warp-knitting machine, particularly stitch knitting machine. 4,852,370, Cl. 66-203.000.

Tatai, Llona; Gundisch, Gusztav; Palotas, Laszlo ; and Subotics, Gyula, to Taurus Gumiipari Vallalat. Escalator hand-rail made of elastic material. 4,852,713, Cl. 198-337.000.

Tateishi, Hideki; Saito, Hiroshi; Sasaki, Shinji; and Horiuchi, Mitsuaki, to Hitachi, Ltd. Sputtering process and an apparatus for carrying out the same. 4,853,102, Cl. 204-298.000.

Tatemoto, Minoru: *See—*
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; and Tatemoto, Minoru, 4,852,903, Cl. 280-689.000.
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; and Tatemoto, Minoru, 4,852,905, Cl. 280-707.000.

Taufer, Peter: *See—*
Nitschke, Werner; Weller, Hugo; Drobny, Wolfgang; and Taufer, Peter, 4,853,932, Cl. 371-68.000.

Taulbee, Meryl: *See—*
Emery, Leo D.; and Taulbee, Meryl, 4,852,236, Cl. 29-402.110.

Taurus Gumiipari Vallalat: *See—*
Tatai, Llona; Gundisch, Gusztav; Palotas, Laszlo ; and Subotics, Gyula, 4,852,713, Cl. 198-337.000.

Tavernier, Serge M.; Marien, August M.; and Uytterhoeven, Herman J., to AGFA-Gavaert N.V. Fusible electrostatically attractable toner. 4,853,311, Cl. 430-106.000.

Tavlarides, Lawrence L.; and Bonnet, Julio C., to Syracuse University. Self-calibrating ultrasonic measurement of dispersed phase volumetric holdup in liquid/liquid dispersions. 4,852,396, Cl. 73-61.10R.

Taylor, Edward F., to General Motors Corporation. Flush glass installation process. 4,853,055, Cl. 156-108.000.

Taylor, Michael G.: *See—*
Tam, Man C.; Bloembergen, Steven; Kovacs, Gregory J.; Jennings, Carol A.; Loutfy, Rafik O.; Gardner, Sandra J.; and Taylor, Michael G., 4,853,307, Cl. 430-41.000.

Taylor, Michael P.: *See—*
Hart, William G.; Breault, Michelle S.; Sansone, Ronald P.; Taylor, Michael P.; and Doeberl, Terrence M., 4,853,864, Cl. 364-464.020.

Taylor, Raymond F.: *See—*
Dighe, Shyam V.; and Taylor, Raymond F., 4,853,033, Cl. 75-10.220.

TDK Corporation: *See—*
Satoh, Takateru; Tanaka, Kimio; and Sasaki, Morimasa, 4,853,816, Cl. 360-132.000.

Teac Corporation: *See—*
Aikawa, Shinichi, 4,853,799, Cl. 360-48.000.

Teague, Richard M.: *See—*
Annas, Dulin L., Sr, Dulin L.; and Teague, Richard M., 4,853,067, Cl. 156-351.000.

Technicon Instruments Corporation: *See—*
Benezra, Jeffrey; and Malin, Michael J., 4,853,338, Cl. 436-66.000.
Saros, Stephen; Smith, John L.; Cassaday, Michael M.; Herron, Rand E.; and Pelavin, Milton H., 4,853,336, Cl. 436-53.000.

Teijin Seiki Co., Ltd.: *See—*
Toshio, Kamimura; and Koji, Ito, 4,852,853, Cl. 251-129.070.

Tektronix, Inc.: *See—*
Ecklund, Denise J., 4,853,843, Cl. 364-200.000.
Meadows, Robert D.; and McCoy, Roger J., 4,853,498, Cl. 178-19.000.
Odenthal, Conrad J, 4,853,601, Cl. 315-368.000.
Sula, Stanley J., 4,853,580, Cl. 310-339.000.

Telefind Corp.: *See—*
Andros, Andrew A.; and Campana, Thomas J., 4,853,688, Cl. 340-825.440.

Telefonaktiebolaget L M Ericsson: *See—*
Johansson, Hans V., 4,853,959, Cl. 379-413.000.

Tella, Richard P.; and Lerner, Stuart D., to Hewlett-Packard Company. Tool coupling apparatus and method. 4,852,242, Cl. 29-568.000.

Teng, Hsieh-Yih. Rotatably-twisting display device. 4,852,283, Cl. 40-476.000.

Tenneco Canada Inc.: *See—*
Lipaztajn, Marek; McGilvery, James D.; and Twardowski, Zbigniew, 4,853,096, Cl. 204-101.000.

Terada, Hiromu; and Okada, Hiroshi, to Nippon Pneumatic Manufacturing Co., Ltd. Hydraulic impact tool. 4,852,664, Cl. 173-134.000.

Terada Pump Mfg. Co., Ltd.: *See—*
Terada, Seisaku, 4,853,124, Cl. 210-242.200.

Terada, Seisaku, to Terada Pump Mfg. Co., Ltd. Device for producing bubbling stream of water in bathtub. 4,853,124, Cl. 210-242.200.

Terasaka, Yoshiyasu; and Tanabe, Masao, to Chugai Ro Co, Ltd. Device for automatically controlling coating amount for use in coating machine. 4,852,515, Cl. 118-663.000.

Terasaki Denki Sangyo Kabushiki Kaisha: *See—*
Suwa, Takeshi; and Kuroda, Takafumi, 4,853,819, Cl. 361-47.000.

Teresa Donoghue: *See—*
Donoghue, Teresa; and Vilches, Jose I., 4,852,898, Cl. 280-216.000.

Terragnoli, Louis, to A. J. Panneri Enterprises, Inc. Method and apparatus for holding a plurality of objects in a tape-wrapped bundle. 4,852,329, Cl. 53-399.000.

Terry, Dennis C.; Filho, Waldemiro M.; and Turechek, John J., to Newport Corporation. Method of manufacturing clean-room compatible honeycomb tables. 4,853,065, Cl. 156-292.000.

Teshima, Toshio; Kitagawa, Tooru; Suzuki, Mikio; Masaoka, Toshio; Mori, Takashi; and Okimoto, Kazutaka, to NKK Corporation. Immersion nozzle for continuous casting of steel. 4,852,633, Cl. 164-437.000.

Tetra Pak Inc.: *See—*
Stevens, Robert F., 4,853,246, Cl. 426-580.000.

Texaco Chemical Company: *See—*
Sellstrom, Kathy B.; and Renken, Terry L., 4,853,456, Cl. 528-111.000.

Texaco Inc.: *See—*
Sung, Rodney L.; Hayden, Thomas; Caggiano, Michael A.; and Behrens, Milton D., 4,852,993, Cl. 44-62.000.

Texas Instruments Incorporated: *See—*
Mitchell, Allan T.; and Riemenschneider, Bert R., 4,853,895, Cl. 365-185.000.
Sanford, Carlton E., 4,853,503, Cl. 200-83.00P.
Smith, Mark A.; and Pavio, Anthony M., 4,853,564, Cl. 307-492.000.
Thatte, Satish M.; and Oxley, Donald W., 4,853,842, Cl. 364-200.000.

Textron Inc.: *See—*
Hopkins, John W.; and Knoell, Peter P., 4,852,338, Cl. 56-202.000.

Tezuka, Akira: *See—*
Horiguchi, Hyosei; Tezuka, Akira; and Seki, Shuuichi, 4,852,639, Cl. 165-42.000.

Tezuka, Kazusaku, to Mitutoyo Corporation. Coordinate measuring machine having a guide section for a column of a measuring member support body. 4,852,267, Cl. 33-503.000.

Thame, Neville, to Peri-Oral Dental Products, Inc. Use of periwinkle in oral hygiene. 4,853,213, Cl. 424-58.000.

Thatte, Satish M.; and Oxley, Donald W., to Texas Instruments Incorporated. Computer memory system having persistent objects. 4,853,842, Cl. 364-200.000.

Theeuwes, Felix, to ALZA Corporation. Method for adminstering tiny pills. 4,853,229, Cl. 424-455.000.

Theodore, Ares N.; and Killgoar, Paul C., Jr., to Ford Motor Company. Elastomer compositions with superior low temperature flexibility. 4,853,428, Cl. 524-49.000.

Therkildsen, Jens: *See—*
Andersen, Bent S.; and Therkildsen, Jens, 4,853,166, Cl. 264-46.500.

Thomas, Alan C., to Rogers Corporation. Electroluminescent lamp. 4,853,594, Cl. 313-503.000.

Thomas, Charles E., to General Electric Company. Groove cutting tool break event detecting method and system. 4,853,680, Cl. 340-680.000.

Thomas, Graeme D.: *See—*
Smith, Dennis E.; Williams, John J. A.; Duncan, Gerald D.; Thomas, Graeme D.; Borrows, John G.; and Shacklock, Frank W., 4,853,571, Cl. 310-90.000.

Thomas, Joseph R., Jr. Apparatus for trafficking people through airports or like transit terminals. 4,852,197, Cl. 14-71.500.

Thomas, Paul: *See—*
Oeckl, Siegfried; Martinola, Friedrich; and Thomas, Paul, 4,853,135, Cl. 210-757.000.

Thomason, Harry E. Heat storage. 4,852,547, Cl. 126-427.000.

Thompson Corrugated Systems, Inc.: *See—*
Thompson, Frederick H., 4,853,072, Cl. 156-470.000.

Thompson, Frederick H., to Thompson Corrugated Systems, Inc. Corrugating machines. 4,853,072, Cl. 156-470.000.

Thompson, Keith: *See—*
Wells, Eugene M.; and Thompson, Keith, 4,852,746, Cl. 211-13.000.

Thompson, Mark E.: *See—*
Pasteris, Robert J.; and Thompson, Mark E., 4,853,025, Cl. 71-91.000.

Thomson-Brandt Armements: *See—*
Lamarque, Etienne, 4,852,828, Cl. 244-3.290.

Thomson-CSF: *See—*
Collin, Robert, 4,853,652, Cl. 330-294.000.
Drabowitch, Serge, 4,853,701, Cl. 342-139.000.
Gombert, Jean; Quinty, Christian; Gazard, Maryse; and Blaison, Serge, 4,853,258, Cl. 427-169.000.
Rouvrais, Bernard; Kerdranvat, Michel; and Robert, Philippe, 4,853,775, Cl. 358-105.000.

Thorn, David W.; Patel, Rajendra; Coley, Gerald; Trivedi, Ashok; and Patel, Girish, to Network Access Corporation. Apparatus and method for providing existing telephone switching equipment with the capability of using the SS7 protocol. 4,853,955, Cl. 379-230.000.

Thornburg, Francis L., to Northrop Corporation. Decoy system. 4,852,456, Cl. 89-1.510.

Thummler, Ursus: *See—*
Staendeke, Horst; Thummler, Ursus; and Adam, Wilhelm, 4,853,288, Cl. 428-402.240.

Thykeson, Everett, to Clorox Company, The. Locking container carrier. 4,852,730, Cl. 206-145.000.

Thyssen Industrie AG: *See—*
Zeimes, Manfred, 4,852,523, Cl. 122-14.000.

Thyssen Stahl AG: *See—*
Hoffken, Erich; Auth, Rudolf; Kaas, Werner; and Seidelmann, Lothar, 4,853,031, Cl. 75-0.50R.

Tidwell, Samuel V.: *See—*
Wagner, Jack J.; and Tidwell, Samuel V., 4,853,551, Cl. 250-515.100.

TII Industries Inc.: *See—*
Smith, Thomas J., 4,853,960, Cl. 379-437.000.

Timmerman, Catherine: *See—*
Behar, Albert; Behar, Orna; Frederiksen, Lee W.; Howard-Link, Donald A.; and Timmerman, Catherine, 4,853,854, Cl. 364-413.010.

Tippetts, John R.; and Priestman, Geoffrey H., to United Kingdon Atomic Energy Authority. Fluidic pump control systems. 4,852,613, Cl. 137-805.000.

Tipton, Walter E. Machine for breaking up food containers and for recovering food product therefrom. 4,852,817, Cl. 241-260.100.

Toji, Shigeo: *See—*
Suzuki, Noboru; and Toji, Shigeo, 4,853,732, Cl. 354-402.000.

Tokura, Go; Ishikawa, Masanori; and Yamada, Akira, to Canon Kabushiki Kaisha. Disposition of a flexible printed circuit board in a camera. 4,853,734, Cl. 354-485.000.

Tokutsu, Akihito: *See—*
Watanabe, Junji; Iseda, Ken; Fukunaga, Takehito; and Tokutsu, Akihito, 4,852,869, Cl. 271-126.000.

Tokyo Electric Company, Ltd.: *See—*
Futakata, Takashi, 4,852,676, Cl. 177-245.000.

Tokyo Seimtsu Co., Ltd.: *See—*
Honda, Katsuo; and Sawafuji, Susumu, 4,852,304, Cl. 51-5.00C.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Abe, Masahiro; Aoyama, Masaharu; Ohshima, Jiro; and Ajima, Takashi, 4,853,760, Cl. 357-52.000.

Tol-O-Matic, Inc.: *See—*
Rosengren, Gary W., 4,852,465, Cl. 92-88.000.

Tolley, William K.; and Whitehead, Alton B., to United States of America, Interior. Supercritical fluid metal halide separation process. 4,853,205, Cl. 423-472.000.

Tom, Glenn M.; and Brown, Duncan W., to Advanced Technology Materials, Inc. Process and composition for drying of gaseous hydrogen halides. 4,853,148, Cl. 252-194.000.

Tomczak, Bernard. Installation for ball game with return panel. 4,852,889, Cl. 273-411.000.

Tomecek, Jerry. Electronic tank level monitoring device. 4,853,694, Cl. 340-621.000.

Tomida, Yasuko: *See—*
Koike, Shoji; and Tomida, Yasuko, 4,853,036, Cl. 106-20.000.

Tomihashi, Nobuyuki: *See—*
Yoshimura, Tatsushiro; Tomihashi, Nobuyuki; and Shimasaki, Shuhei, 4,853,425, Cl. 524-83.000.

Tomita, Toshihiko, to Pioneer Electronic Corporation. Disc player for playing disc contained in cartride. 4,853,916, Cl. 369-36.000.

Tomizuka, Teiichi: *See—*
Horie, Ikutaro; Ishiyama, Masashi; and Tomizuka, Teiichi, 4,853,262, Cl. 428-13.000.

Tomomatsu, Hideo, to Quaker Oats Company, The. Color-changing cereals and confections. 4,853,235, Cl. 426-93.000.

Toppan Printing Co., Ltd.: *See—*
Fukuyoshi, Kenzo, 4,853,296, Cl. 428-623.000.

Toray Industries: *See—*
Hasegawa, Katsumi; Ohno, Michio; and Kadotsuji, Akira, 4,852,819, Cl. 242-18.00R.

Toray Industries, Inc.: *See—*
Mori, Yoichi; Abiko, Shigeo; Tsuda, Mikio; and Ichijo, Chikara, 4,853,313, Cl. 430-156.000.

Torii, Sigeru; Uneyama, Kenji; Tanaka, Hideo; Nokami, Junzo; Sasaoka, Michio; Saito, Norio; and Shiroi, Takashi, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Process for the preparation of cephem derivatives. 4,853,468, Cl. 540-215.000.

Tornblom, Bengt H., to Tornbloms Kvalitetskontroll AB. Device for crack detection on hot cast billets and suppressing the effects of magnetic regions. 4,853,634, Cl. 324-225.000.

Tornbloms Kvalitetskontroll AB: *See—*
Tornblom, Bengt H., 4,853,634, Cl. 324-225.000.

Toshiaki, Horiuchi: *See—*
Eizo, Naya; Yoshikazu, Nagata; Toshiaki, Horiuchi; Mitsuhiro, Okumura; Michinosuke, Demizu; Mitsuhiro, Harima; Shigeki, Asakawa; and Masuo, Asakawa, 4,853,184, Cl. 420-489.000.

Toshio, Kamimura; and Koji, Ito, to Teijin Seiki Co., Ltd. Pressure balance type solenoid controlled valve. 4,852,853, Cl. 251-129.070.

TOTAL Compagnie Francaise des Petroles: *See—*
Dorleans, Andre M., 4,852,667, Cl. 175-65.000.

Toudic, Yves: *See—*
Lambert, Bertrand; Toudic, Yves; and Coquille, Rene , 4,853,077, Cl. 156-605.000.

Toya, Matsumi, to Kabushiki Kaisha Tiyoda Seisakusho; and Sakura Seiki Kabushiki Kaisha. Cell for placing solid matters on a slide glass under centrifugal force. 4,853,188, Cl. 422-104.000.

Toyne, Kenneth J.: *See—*
Chan, Lawrence K. M.; Coates, David; Gemmell, Peter A.; Gray, George W.; Lacey, David; Toyne, Kenneth J.; and Young, Daniel J. S., 4,852,977, Cl. 350-350.00S.

Toyo Communication Equipment Co., Ltd.: *See—*
Funatsu, Chuhei; and Kita, Kazuyuki, 4,853,700, Cl. 342-30.000.

Toyo Seikan Kaisha, Ltd.: *See—*
Francke, Wittko, 4,853,217, Cl. 424-84.000.

Toyoda Gosei Co., Ltd.: *See—*
Hanabusa, Hisao, 4,853,125, Cl. 210-172.000.
Nagata, Takuji; and Kuzuya, Yasuhisa, 4,853,263, Cl. 428-31.000.
Shiraki, Kouji; Niwa, Minoru; Itou, Kuniyasu; Yamamoto, Tadashi; and Harata, Mitsuru, 4,852,907, Cl. 280-731.000.
Sugiura, Hidemi; Ukai, Mikio; and Miyamoto, Kenji, 4,852,891, Cl. 277-212.0FB.

Toyota Jidosha Kabushiki Kaisha: *See—*
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Aburaya, Toshio, 4,852,906, Cl. 280-707.000.
Hamajima, Kaneo; Tanaka, Atsuo; Kubo, Masahiro; and Dohnomoto, Tadashi, 4,852,630, Cl. 164-761.000.
Murakami, Zensaku, 4,852,950, Cl. 303-100.000.

Tozawa, Shoji: *See*—
Morita, Izuru; Tozawa, Shoji; Hisatake, Tsuneo; and Atono, Tadasi, 4,853,859, Cl. 364-424.040.
Tracy, Charles R.; and Elliott, Robert S., to J. P. Stevens & Co., Inc. Cushioned strap. 4,853,275, Cl. 428-178.000.
Tradt, Hans-Richard; and Schillmeier, Hans, to Kuka. Method and apparatus for mounting windshields on vehicles. 4,852,237, Cl. 29-407.000.
Trager, Dennis. Attachable hard-disk drive and housing therefor. 4,853,807, Cl. 360-97.010.
Trahey, Gregg E.: *See*—
Smith, Stephen W.; and Trahey, Gregg E., 4,852,577, Cl. 128-660.070.
Trautmann, Walter: *See*—
Leithaeuser, Horst; Reese, Dirk; and Trautmann, Walter, 4,853,038, Cl. 106-243.000.
Trawick, Charles D.: *See*—
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Trease, Dwaine A.; and Trease, Leroy E. Bearing puller. 4,852,235, Cl. 29-263.000.
Trease, Leroy E.: *See*—
Trease, Dwaine A.; and Trease, Leroy E., 4,852,235, Cl. 29-263.000.
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Trick, Robert E., to Medical Engineering Corporation. Inflatable penile prosthesis. 4,852,555, Cl. 128-79.000.
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Troncoso, Robert; and Troncoso, Fernando, Jr. Detachable gun trigger safety device. 4,852,286, Cl. 42-70.070.
Trupiano, Michael S.: *See*—
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TSA, Inc.: *See*—
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Tsaur, Bor-Yeu; Fan, John C. C.; and Geis, Michael W., to Massachusetts Institute of Technology. Semiconductor thin films. 4,853,076, Cl. 156-603.000.
Tsou, Patrick K. C.: *See*—
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Tsubakimoto Chain Co.: *See*—
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Tsubouchi, Natsuro; and Kimata, Masafumi, to Mitsubishi Denki Kabushiki Kaisha. Process for manufacture of a semiconductor memory device. 4,853,348, Cl. 437-203.000.
Tsuchida, Shinya: *See*—
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Tsui, Ye-Ming. Toy for demostrating magnetic force and the effects of air pressure. 4,852,497, Cl. 104-138.100.
Tsuji, Hiroshi; Yasunobu, Chizuko; and Masuishi, Tetsuya, to Hitachi, Ltd. Knowledge information processing system and method thereof. 4,853,873, Cl. 364-513.000.
Tsujimura, Masao; Hirooka, Masamichi; Ishikawa, Kazuo; Morooka, Takayoshi; Noda, Masaki; Akiyama, Mamoru; Murai, Nobuaki; and Yoshikawa, Seiji, to Kyocera Corporation. Autofocus camera having automatic focus adjustment apparatus. 4,853,731, Cl. 354-400.000.
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Turner, James E. Piston wrist pin installation and removal device and method of using. 4,852,231, Cl. 29-156.50A.
Turner, Kenneth W.; Covert, Charles H.; and Meyer, Karen M., to General Motors Corporation. In tank vapor storage canister. 4,852,761, Cl. 220-85.0VR.
Turner, Kenneth W.; Simons, Richard H., Jr.; and Paddock, Gordon R., to General Motors Corporation. Multi orientation fuel vapor storage canister assembly. 4,853,009, Cl. 55-387.000.
Turner, Robert B.; Jenkines, Randall C.; Serratelli, John F.; and Barnes, Garland R., to Dow Chemical Company, The. Process for preparing polyurethane carpet backings based on high equivalent weight polyols. 4,853,054, Cl. 156-78.000.
Tustin, Gerald C.; Smith, Kyle C.; and Rule, Mark, to Eastman Kodak Company. Oxyiodination incorporating an iodine generator for the conversion of methyl iodide to iodine. 4,853,480, Cl. 170-100.000.
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Uchida, Koh; Kurihara, Takashi; and Miyoshi, Makoto, to Nissan Motor Co., Ltd. Operating noise-free fluid flow distributor circuit for variable assist power steering system. 4,852,462, Cl. 91-375.00A.
Uchida, Shinya, to Laurel Bank Machines Co., Ltd. Cutting device for wrapped coin stack. 4,852,253, Cl. 30-2.000.
Uchida, Shunsuke: *See*—
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Ueno, Hideo; Shibata, Satoshi; and Yamada, Keiko, to Brother Kogyo Kabushiki Kaisha. Data input device having switch matrix scanning means. 4,853,695, Cl. 341-26.000.
Ueno, Susumu: *See*—
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Ungarelli, Raffaele; and Sogli, Loris, to Montedison S.p.A. Process for the preparation of (2,2)-paracyclophane and derivatives thereof. 4,853,488, Cl. 570-184.000.
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Ungermann, Heinz: *See*—
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Van Brimer, R. Hugh; Allred, Donald; Cooke, Theodore M.; Lin, An C. R.; and Rubbo, Julia E. Transparency with jetted color ink and method of making same. 4,853,706, Cl. 346-1.100.

Vandenbergh, Peter A.; and Kunka, Blair S., to Microlife Technics, Inc. Method for the degradation of volatile chlorinated aliphatic hydrocarbons using pseudomonas fluorescens. 4,853,334, Cl. 435-262.000.

van der Veen, Siebren C., to Van Doorne's Transmissie B.V. Transmission. 4,852,427, Cl. 74-689.000.

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Vehar, Gordon A.: *See*—
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Velez, Jose; and Borah, Joshua D., to Applied Science Laboratories. Visor and camera providing a parallax-free field-of-view image for a head-mounted eye movement measurement system. 4,852,988, Cl. 351-210.000.

Ventresca, Salina: *See*—
Baratpour, Shahin; and Ventresca, Salina, 4,852,885, Cl. 273-237.000.

Venture Chemicals, Inc.: *See*—
Cowan, Jack C.; Granquist, Victor M.; and House, Roy F., 4,853,465, Cl. 530-506.000.

Verhoff, Stephen H.; and Tackett, Garrol, to Surface Combustion, Inc. Ion carburizing. 4,853,046, Cl. 148-16.500.

Vermilye, Michael L., to Boeing Company, The. Hybrid thrust reverser cascade basket and method. 4,852,805, Cl. 239-265.110.

Vermilyea, Mark E., to General Electric Company. Passive-shims for correction of (3,2) and (3,-2) harmonic terms in magnetic resonance magnets. 4,853,663, Cl. 335-301.000.

Vetrotex Saint-Gobain: *See*—
Soszka, Barbara; Federowsky, Robert; and Mahler, Jacques, 4,853,021, Cl. 65-2.000.

Vetter, Kurt: *See*—
Behr, Hans; Vetter, Kurt; Schneider, Rolf; and Luderer, Fred, 4,852,810, Cl. 239-703.000.

VG Instruments Group Limited: *See*—
Hall, David J.; Sanderson, Neil E.; and Hall, Edward F. H., 4,853,539, Cl. 250-288.000.

Viall, Wilton S., Jr., to Boeing Company, The. Tubing connector with floating spool. 4,852,917, Cl. 285-353.000.

Victor Company of Japan, Ltd.: *See*—
Hibino, Chitoshi; Arimoto, Atsushi; and Yoshihara, Kenji, 4,853,876, Cl. 64-518.000.
Ozaki, Hidetoshi, 4,853,783, Cl. 358-162.000.

Viegener, Rodolfo J. Faucet assembly plumbing fixture. 4,852,192, Cl. 4-191.000.

Vignolo, Joseph: *See*—
Paulsen, Brian; and Vignolo, Joseph, 4,853,619, Cl. 324-115.000.

Vilches, Jose I.: *See*—
Donoghue, Teresa; and Vilches, Jose I., 4,852,898, Cl. 280-216.000.

Viles, Joseph M.; and Hart, Paul V. Liver assist device employing transformed cell lines. 4,853,324, Cl. 435-2.000.

Villavecea, James W. Device for aiding in preparation of intravenous therapy. 4,852,844, Cl. 248-314.000.

Vincent, Steve M.; Behling, Gerald R.; Hood, Thomas G.; and Gomm, William E., to Southwall Technologies. Curved triple-pane glazing. 4,853,264, Cl. 428-34.000.

Viola, Gian T.: *See*—
Marchionni, Giuseppe; De Patto, Ugo; Strepparola, Ezio; and Viola, Gian T., 4,853,097, Cl. 204-157.600.

Virtler Company, The: *See*—
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Visionex: *See*—
Wong, Vernon G., 4,853,224, Cl. 424-427.000.

Visual Information Institute, Inc.: *See*—
Harshbarger, John H., Jr.; and Harshbarger, John H., III, 4,852,360, Cl. 62-126.000.

Vivien, Daniel: *See*—
Calvat, Claude; Colle, Laurent; Couchaud, Maurice; LeJus, Anne-Marie; Moncorge, Richard; Vivien, Daniel; and Wyon, Christophe, 4,853,354, Cl. 501-119.000.

Vodian, Morton A.; Bean, Eric S.; and LeMoine, Eric D., to Synbiotics Corporation. Saliva test for feline leukemia virus. 4,853,325, Cl. 435-5.000.

Voest-Alpine AG: *See*—
Duhrkoop, Jens, 4,853,541, Cl. 250-347.000.

Vogdes, Christine E.: *See*—
Kiang, Joseph K.; Tsou, Patrick K. C.; and Vogdes, Christine E., 4,853,164, Cl. 264-22.000.

Vogel, David C.: *See*—
Krishnamurthy, Sundaram; Johnston, Brian H.; Kilminster, Kenneth N.; Vogel, David C.; and Buckland, Paul R., 4,853,319, Cl. 430-387.000.

Vogt, Werner; and Schuhwerk, Anton, to Interflex Satensysteme GmbH. Forgery proof optoelectric code card reader. 4,853,525, Cl. 235-469.000.

Vogt, William R., to Baker Industries, Inc. Switch monitoring arrangement with remote adjustment capability having debounce circuitry for accurate state determination. 4,853,685, Cl. 340-825.170.

Vogtle, Fritz; and Calaminus, Wolfgang, to Merck Patent Gesellschaft Mit Beschrankfter Haftung. Dispirotetradecanes. 4,853,151, Cl. 252-299.610.

Voight, Carl: *See*—
Manner, Reinhard; Schaefer, Hans; Voight, Carl; and Pfeifer, Wolf D., 4,853,190, Cl. 422-197.000.

Volk, Kurt E., Jr., to Kurt H. Volk, Inc. Mailing cover with reply envelope and response device made from integral web. 4,852,795, Cl. 229-71.000.

von Brandt, Achim: *See*—
Hammer, Bernard; and von Brandt, Achim, 4,853,779, Cl. 358-133.000.

von Laar, Klaus; Sackenreuter, Hans; and Heberlein, Werner, to Diehl GmbH & Co. Armored vehicle with top-mounted barreled weapon. 4,852,461, Cl. 89-46.000.

Von Tomkewitsch, Sybille: *See*—
Frankel, Juergen; Mattelin, Antoon; Pecceu, Pol; Quella, Ferdinand; Schmidt, Hans-Fr.; Boone, Luc; Von Tomkewitsch, Sybille; and De Vogelaere, Marc, 4,853,252, Cl. 427-53.100.

Voogt, Stratford: *See*—
Meier, Werner A.; and Voogt, Stratford, 4,853,557, Cl. 307-10.100.

Voorman, Johannes O.; Snijder, Pieter J.; and Vromans, Johannes S., to U.S. Philips Corp. Delay circuit with all-pass network. 4,853,651, Cl. 330-294.000.

Vosteen, William; and Cox, Mason P., to Monroe Electronics, Inc. Non-contacting voltage metering apparatus. 4,853,639, Cl. 324-457.000.

Vowles, Robert W., to Bennett Automotive Technology Pty. Ltd. Laser energy ignition system. 4,852,529, Cl. 123-143.00B.

Voykin, William J. Self-administering reflex massage therapy apparatus. 4,852,553, Cl. 128-25.00B.

Vrijsaen, Gerardus A. H. M., to U.S. Philips Corporation. Electron beam device having an electron gun and a method of making the electron gun. 4,853,589, Cl. 313-477.00R.

Vromans, Johannes S.: *See*—
Voorman, Johannes O.; Snijder, Pieter J.; and Vromans, Johannes S., 4,853,651, Cl. 330-294.000.

VS Vereinigte Spezialmobelfabriken Verwaltungs GmbH: *See*—
Hartmann, Theo, 4,852,944, Cl. 297-445.000.

Vukmanic, Ronald W.: *See*—
Dunn, James J.; Jahn, Martin D.; and Vukmanic, Ronald W., 4,852,325, Cl. 52-729.000.

Vyas, Dolatrai M.; Saulnier, Mark G.; and Kadow, John F., to Bristol-Myers Company. Nitrogen containing derivatives of epipodophyllotoxin glucosides. 4,853,467, Cl. 536-17.900.

Vyzkumny ustav bavinarsky: *See*—
Kotrba, Zdenek; Jaros, Frantisek; Burysek, Frantisek; Kubovy, Miloslav; Hejduk, Jiri; and Bures, Pavel, 4,852,340, Cl. 57-301.000.

W. R. Grace & Co.: *See*—
Holdsworth, Robert S.; Brown, Shawn E.; and Gribens, Joel A., 4,852,754, Cl. 215-347.000.
Schirmer, Henry G., 4,853,287, Cl. 428-349.000.

W. R. Grace & Co.-Conn.: *See*—
Anderman, Menahem; and Johnson, Steven L., 4,853,305, Cl. 429-212.000.
Clarkson, Douglas; and Clifford, Richard P., 4,853,411, Cl. 514-441.000.
Warren, Thomas C., 4,853,265, Cl. 428-34.900.

Wachtel, Helmut: *See*—
Hilscher, Jean-Claude; Kehr, Wolfgang; Sauer, Gerhard; Schneider, Herbert; and Wachtel, Helmut, 4,853,390, Cl. 514-288.000.

Wachtler, Andreas: *See*—
Krause, Joachim; Wachtler, Andreas; Scheuble, Bernhard; and Weber, Georg, 4,853,149, Cl. 252-299.610.

Wada, Koichi: *See*—
Shindo, Yoshio; Wada, Koichi; and Yamazaki, Fumio, 4,853,295, Cl. 428-621.000.

Wada, Yoneji: *See*—
Nakajima, Yoshiaki; Suzuki, Tadashi; and Wada, Yoneji, 4,852,693, Cl. 184-6.400.

Wagenseil, Ludwig, to Hydromatik GmbH. Axial piston machines whose pistons are formed as stepped pistons. 4,852,463, Cl. 91-488.000.

Wagner, Jack J.; and Tidwell, Samuel V., to Micromeritics Instrument Corporation. Safety interlock for x-ray particle size analyzer. 4,853,551, Cl. 250-515.100.

Wah Lo, Allen K. Method of controlling variation of density of images in 3-D pictures. 4,852,972, Cl. 350-131.000.

Wahlig, Helmut; Dingeldein, Elvira; Rothe, Johannes; and Stille, Wolfgang, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Process for implanting a medicament depot. 4,853,225, Cl. 424-423.000.

Waibel, Rudi: *See*—
Renkl, Hans-Dieter; and Waibel, Rudi, 4,853,022, Cl. 65-170.000.

Wakamatsu, Otsuro: *See*—
Ouchi, Tomonori; Wakamatsu, Otsuro; Kawanishi, Hiroshi; and Yasui, Masao, 4,853,495, Cl. 178-18.000.

Wakatsuki, Goroei, to Honda Giken Kogyo Kabushiki Kaisha. Rear wheel braking system for motorcycle. 4,852,701, Cl. 188-181.00A.

Wakatsuki, Yoshio: *See*—
Shimizu, Giichiro; Okuyama, Toshiharu; and Wakatsuki, Yoshio, 4,852,264, Cl. 33-832.000.

Wakimoto, Zenji; Nagata, Shinichi; and Katsuyama, Mikizo, to Dainippon Screen Mfg. Co., Ltd. Optical system for flying spot scanning apparatus. 4,852,957, Cl. 350-6.600.

Wakui, Tetsuya: *See*—
Fukatsu, Tsutomu; Hori, Taizou; Masui, Toshiyuki; Kobayashi, Takashi; Wakui, Tetsuya; and Takahashi, Koji, 4,853,803, Cl. 360-72.200.

Wales, R. Langdon; and Crowley, H. W., to Automation, Inc. Ink monitor system. 4,852,604, Cl. 137-392.000.

Walker, Arthur H., to SpaceLabs, Inc. Airway adapter. 4,852,583, Cl. 128-716.000.

Walker, Thomas A. Directional downhole drill apparatus. 4,852,669, Cl. 175-73.000.

Wall, Alexander C.; and Sculler, Leonard H., to M&R Marking Systems, Inc. Self-inking stamping device. 4,852,489, Cl. 101-334.000.

Wallace, Lyvone: *See*—
Wallace, Terry A.; Wallace, Lyvone; and Hopkins, Harry C., 4,852,290, Cl. 43-17.000.

Wallace, Terry A.; Wallace, Lyvone; and Hopkins, Harry C., to Wallace, Terry A. Fishing rod holder. 4,852,290, Cl. 43-17.000.

Wallach, Donald F. H.; and Philippot, Jean, to Micro-Pak, Inc. Method of manufacturing unilamellar lipid vesicles. 4,853,228, Cl. 424-450.000.

Wallander, Carl O., to Hydropress Wallander & Co. Device for collecting and discharging solid matter. 4,853,116, Cl. 210-104.000.

Walles, Erik W.; Lupinski, John H.; Markovitz, Mark; Colborn, Robert E.; Presley, James R.; Davis, Michael J.; Minnick, Michael G.; Kubisen, Steven J., Jr.; Hallgren, John E.; Bolon, Donald A.; Eddy, Victoria J.; and Irwin, Patricia C., to General Electric Company. Curable polyphenylene ether-polyepoxide compositions useful in printed circuit board production. 4,853,423, Cl. 523-428.000.

Walser, Ardie D.: *See*—
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Walsh, Joseph G.: *See*—
McKean, Dennis R.; Miller, Robert D.; Walsh, Joseph G.; and Willson, Carlton G., 4,853,315, Cl. 430-192.000.

Walter, Richard T.; Bhagwat, Pradeep; and Lipa, George W., to Black & Decker Inc. Non-isolated thermally responsive battery charger. 4,853,607, Cl. 320-36.000.

Walters, Michael A., to Eastman Kodak Company. Ink cartridge and housing construction for multicolor ink jet printing apparatus. 4,853,708, Cl. 346-75.000.

Wan, Wankei, to Exxon Research & Engineering Company. Modified regenerated cellulose membrane for non-aqueous separations. 4,853,129, Cl. 210-651.000.

Wang, Hsug-Fang. Apparatus for intermediate transmission of sensed oil pressure in a scale. 4,852,675, Cl. 177-208.000.

Ward, Arthur A. Backhoe scraper apparatus. 4,852,277, Cl. 37-117.500.

Warner, Donald F., to Energy Economics & Development, Inc. Waste disposal method and apparatus. 4,852,344, Cl. 60-39.182.

Warner-Lambert Co.: *See*—
Barcelon, Shirley Ann; Oppenheimer, Alfred; and Hussein, Mamoun M., 4,853,247, Cl. 426-613.000.
Elslager, Edward F.; and Leopold, Wilbur R., III, 4,853,221, Cl. 424-649.000.
Faust, Steven M.; and Cherukuri, Subraman R., 4,853,212, Cl. 424-48.000.
Poeppinghausen, Klaus-Jurgen V., 4,853,242, Cl. 426-516.000.

Warren, Harold C., III: *See*—
Daniel, Daniel S.; Delton, Mary H.; and Warren, Harold C., III, 4,853,090, Cl. 204-1.00T.

Warren, Thomas C., to W. R. Grace & Co.-Conn. Eva based multilayer, heat-shrinkable, packaging film and bags made therefrom. 4,853,265, Cl. 428-34.900.

Watanabe, Atsushi: *See*—
Endou, Masao; Asakura, Yamato; Watanabe, Atsushi; Sakagami, Masaharu; Uchida, Shunsuke; Nagase, Makoto; Baba, Tsutomu; and Ohsumi, Katsumi, 4,853,638, Cl. 324-441.000.

Watanabe, Hideo: *See*—
Tajima, Kenji; Takahashi, Motoaki; Watanabe, Hideo; Shoji, Takashi; and Arai, Noboru, 4,853,724, Cl. 354-277.000.

Watanabe, Junji; Iseda, Ken; Fukunaga, Takehito; and Tokutsu, Akihito, to Kabushiki Kaisha Toshiba. Feed apparatus capable of feeding image forming media by relatively small drive power. 4,852,869, Cl. 271-126.000.

Watanabe, Keisuke: *See*—
Okuyama, Hideaki; Kusumoto, Shigehiro; Watanabe, Keisuke; and Nagai, Kiyoshi, 4,852,958, Cl. 350-96.130.

Watanabe, Kiyoshi: *See*—
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Watanabe, Naotake: *See*—
Orii, Koichi; Ohshima, Iwao; and Watanabe, Naotake, 4,853,198, Cl. 423-335.000.

Watanabe, Takao: *See*—
Kitsukawa, Goro; Watanabe, Takao; Hori, Ryoichi; and Itoh, Kiyoo, 4,853,899, Cl. 365-207.000.

Watanabe, Youji; Matsuzaki, Minoru; and Itoh, Junichi, to Olympus Optical Company Limited. Program rewritable camera. 4,853,733, Cl. 354-412.000.

Water Purification Systems, Inc.: *See*—
Cure, Richard L.; and Meyer, David A., 4,853,134, Cl. 210-742.000.

Watson, Alton: *See*—
Brunet, Charles G.; and Watson, Alton, 4,852,666, Cl. 175-61.000.

Watson, James S., to Calcomp Inc. Ground switching technique for silkscreened digitizer grids. 4,853,499, Cl. 178-19.000.

Watson, Richard W., to BOC Group plc, The. Treatment of waste material. 4,853,206, Cl. 423-542.000.

Watts, Eric A.: *See*—
King, Francis D.; Martin, Roger T.; and Watts, Eric A., 4,853,394, Cl. 514-329.000.

Wautier, Henri; Legrand, Franz; and Lerot, Luc, to Solvay & Cie (Societe . Process for the manufacture of vitreous metal oxides. 4,853,207, Cl. 423-592.000.

Webasto AG Fahrzeugtechnik: *See*—
Goerlich, Dieter, 4,852,797, Cl. 237-2.00A.

Webb, William, to Composite Panel Manufacturing. Exterior wall panel. 4,852,316, Cl. 52-235.000.

Weber Aircraft Corporation: *See*—
Kanigowski, Andrzej S., 4,852,940, Cl. 297-145.000.

Weber, Georg: *See*—
Krause, Joachim; Wachtler, Andreas; Scheuble, Bernhard; and Weber, Georg, 4,853,149, Cl. 252-299.610.

Weber, Helmut: *See*—
Evans, Steven; Weber, Helmut; and Diehl, Donald R., 4,853,366, Cl. 503-227.000.

Weber, Ralph, to Kortec AG. Charging material preheater for preheating charging material for a metallurgical smelting unit. 4,852,858, Cl. 266-175.000.

Weber, Robert: *See*—
Johansen, Trond V.; Ruch, Ola; Naess, Ludvig; Weber, Robert; Veenhoff, Bernd; Porner, Horst; Laurer, Erwin; Strickroth, Erich; and Schabert, Hans-Peter, 4,852,614, Cl. 138-93.000.
Ruch, Ola; Johansen, Trond V.; Naess, Ludvig; Poerner, Horst; Gebhard, Georg; Weber, Robert; and Heller, Max, 4,852,391, Cl. 73-40.50R.

Webster, Milo E., to Integrated Fluidics, Inc. Valve with flexible sheet member. 4,852,851, Cl. 251-61.100.

Weckler, Joachim, to Institut Lucius; Eggebrecht, Eric; Schulte, Marcus; Daser, Moritz; Giesaler, Johannes; and Schmitz, Christoph, a part interest to each. Electroacoustic apparatus for reproducing lowest to medium frequencies. 4,853,964, Cl. 381-156.000.

Wehman, Robert L.: *See*—
Fleming, Harry A., Jr.; Fosnaught, Edward F.; and Wehman, Robert L., 4,852,321, Cl. 52-306.000.

Weideman, William E., to Recognition Equipment Incorporated. Quantized digital filter. 4,853,969, Cl. 382-54.000.

Weier, Mark D., to General Motors Corporation. Method and apparatus of a conventional fore and aft vehicle seat adjuster convertible into an easy entry seat adjuster slide. 4,852,846, Cl. 248-430.000.
Weigand, Eckehard; Kihara, Yoshinori; and Honda, Masaru, to Sumitomo Bayer Urethane Co., Ltd. Process for manufacturing rigid polyurethane foam. 4,853,417, Cl. 521-131.000.
Weinberg, Norman L.: *See—*
Mazur, Duane J.; Weinberg, Norman L.; and Abel, Albert E., 4,853,040, Cl. 134-2.000.
Weingart, Richard C.: *See—*
Boberg, Ralph E.; Lee, Ronald S.; and Weingart, Richard C., 4,852,493, Cl. 102-202.500.
Weiss, Ronald J.: *See—*
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Welch Allyn, Inc.: *See—*
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Weller, Hugo: *See—*
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Wells, Dennis L., to United States of America, National Aeronautics and Space Administration. Nozzle fabrication technique. 4,852,232, Cl. 29-157.00C.
Wells, Eugene M.; and Thompson, Keith. Orientation and storage apparatus for remote control unit. 4,852,746, Cl. 211-13.000.
Welzel, Gerhard: *See—*
Doncker, Francis; Helber, Rolf; Welzel, Gerhard; and Bung, Richard, 4,852,533, Cl. 123-192.00R.
Wendt, James N.: *See—*
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Wenman, Herbert W.: *See—*
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Wentrcek, Paul R.: *See—*
Vasilevskis, Janis; De Deken, Jacques C.; Saxton, Robert J.; Wentrcek, Paul R.; Fellmann, Jere D.; and Kipnis, Lyubov S., 4,853,357, Cl. 502-165.000.
Wenzel, Robert, to U.S. Philips Corporation. Method and circuit arrangement for decentralized controlled transmission rerouting. 4,853,927, Cl. 370-16.000.
Wenzel, Waldemar: *See—*
Wollscheid, Dieter; Ninnemann, Peter; Stoll, Siegfried; and Wenzel, Waldemar, 4,853,891, Cl. 364-900.000.
Werner, Walter V.; and Lamour, Robert L., to Allied-Signal Inc. Adjustable fiber optic bulk polarizer. 4,852,959, Cl. 350-96.180.
Wert, David E.; and Hemphill, Raymond M. Hot work tool steel. 4,853,181, Cl. 420-111.000.
Wesley, Alan C., to Fel-Pro Incorporated. Elastomeric coated perforated metal core composite gasket and method of making same. 4,852,893, Cl. 277-1.000.
Wessel, Edward O.: *See—*
Wessel, Lloyd E.; and Wessel, Edward O., 4,852,658, Cl. 172-14.000.
Wessel, Lloyd E.; and Wessel, Edward O. Mounted edger. 4,852,658, Cl. 172-14.000.
West-Isle Industries Inc.: *See—*
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West, Roger A.: *See—*
DeGree, David C.; Humphrey, Dallas R.; Bergquist, Carl R.; and West, Roger A., 4,853,763, Cl. 357-81.000.
Westbrooks, John W.: *See—*
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Westermann, Alexis, to M.P.I.Metrologie Pesage International. Display and data-insertion module having multiple assembly possibilities. 4,853,838, Cl. 364-189.000.
Westinghouse Canada Inc.: *See—*
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Westinghouse Electric Corp.: *See—*
Bednar, Fred H.; and Lunz, Kenneth G., 4,853,174, Cl. 376-254.000.
Catanese, John A., 4,852,404, Cl. 73-319.000
Holly, Henry.M., III, 4,853,577, Cl. 340-260.000.
Wilhelm, Peter L.; and Hyde, Gilbert F., 4,852,850, Cl. 251-28.000.
Westmark Schulte & Co. KG: *See—*
Schoettler, Hans, 4,852,256, Cl. 30-114.000.
Westphal, Bernd A. K.: *See—*
Kure-Jensen, Jens; Westphal, Bernd A. K.; and Drummond, Thane M., 4,853,552, Cl. 290-40.00C.
Westphal, Gordon W.: *See—*
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Weyerhaeuser Company: *See—*
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Whalen, Philip J.; Reidinger, Franz; and Antrim, Robert, to Allied-Signal Inc. Method for preventing low-temperature degradation of tetragonal zirconia containing materials. 4,853,353, Cl. 501-103.000.
Wheat, Lawrence M., to Boeing Company, The. Electrical power transfer system for aircraft passenger entertainment system. 4,853,555, Cl. 307-9.100.
Wheeler, Daryl, to Haben Corporation Ltd. Puller assembly. 4,852,234, Cl. 29-261.000.
Wheeler, Stephen E.: *See—*
Corfits, William D.; Gullicksrud, John T.; Martin, Bradley L.; McCutcheon, Robert W.; Rasmussen, Jerry R.; Westphal, Gordon W.; and Wheeler, Stephen E., 4,853,830, Cl. 361-391.000.
Whelan, James P., to Ad-Tec Products, Inc. Paint strainer. 4,853,126, Cl. 210-469.000.
Whirlpool Corporation: *See—*
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White Consolidated Industries, Inc.: *See—*
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Whitehead, Alton B.: *See—*
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Whitman, Robert W.; and Pellinen, John R., to Essco, Incorporated. Angle measuring adapter. 4,852,266, Cl. 33-366.000.
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Wiberg, Rolf: *See—*
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Widerman, John W., Jr., to General Maintenance Company, Inc. Process for removing asbestos or other friable coating from a surface. 4,853,042, Cl. 134-6.000.
Widmer, Hanspeter: *See—*
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Wigg, Martin E.; Peckjian, Bryan M.; and Smith, Judson D., Jr., to Gross-Given Manufacturing Company. Apparatus for automatically dispensing a liquid into a container including a member for blocking access to the interior of the apparatus. 4,852,766, Cl. 221-96.000.
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Wilcox, Edward: *See—*
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Wilhelm, Peter L.; and Hyde, Gilbert F., to Westinghouse Electric Corp. Valve system with adjustable seating force. 4,852,850, Cl. 251-28.000.
Wilhelms, Otto-Henning: *See—*
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Duncan, David S., 4,852,254, Cl. 30-50.000.
Willen, William S.; Savill, Robert F., Jr.; and Hacker, Martin E., to Perkin-Elmer Corporation, The. Plasma gun extension for coating slots. 4,853,515, Cl. 219-121.470.
Williams, Cleo M.; Sanders, Myron D.; and Cook, William C., to Firestone Tire & Rubber Company, The. Elastomeric structures having controlled surface release characteristics. 4,853,069, Cl. 156-401.000.
Williams, James B.; and Nesbitt, Russell U., to Merck & Co., Inc. Non-aqueous ivermectin formulation with improved antiparasitic activity. 4,853,372, Cl. 514-30.000.
Williams, John: *See—*
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Williams, John J. A.: *See—*
Smith, Dennis E.; Williams, John J. A.; Duncan, Gerald D.; Thomas, Graeme D.; Borrows, John G.; and Shacklock, Frank W., 4,853,571, Cl. 310-90.000
Williams, Robert A. Explosively actuated switch. 4,852,494, Cl. 102-263.000
Williams, Robert R.; and Holling, Ronald W., to Whirlpool Corporation. Self-cleaning oven temperature control with multiple redundant oven temperature sensing elements. 4,852,544, Cl. 126-39.0BA.
Williams, Walter J.; and Fost, David L. Paint trim tray apparatus. 4,852,759, Cl. 220-85.00H.
Williams, Wayne R., to Hewlett-Packard Company. Automatic test generator for logic devices. 4,853,928, Cl. 371-15.000.
Willmar Manufacturing, a division of Waycrosse, Inc.: *See—*
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Willson, Carlton G.: *See—*
McKean, Dennis R.; Miller, Robert D.; Walsh, Joseph G.; and Willson, Carlton G., 4,853,315, Cl. 430-192.000.
Wilski, Hans; and Schmidt, Hermann, to Hoechst Aktiengesellschaft. Package for dry-resist material. 4,852,732, Cl. 206-204.000.
Wilson, Craig B.: *See—*
Covington, Roger G.; Jensen, Thomas D.; Miller, Stephen H.; and Wilson, Craig B., 4,853,926, Cl. 369-291.000.
Wilson, Harold. Windshield wiper structure. 4,852,204, Cl. 15-250.070.

Wilson, James T. Therapeutic shoe. 4,852,274, Cl. 36-29.000.
Wilson, Stephen T.; and Mercer, William C., to UOP. Crystalline metal aluminophosphates. 4,853,197, Cl. 423-306.000.
Wilt, Brian L.: *See—*
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Win, Maung H.; Lloyd, William D.; Abba, William A.; and Daponte, Diego H., to Kimberly-Clark Corporation. High melting temperature laundry detergent sheet. 4,853,142, Cl. 252-90.000.
Win, Maung H.; Hata, Stephen S.; Abba, William A.; and Olszewski, James, to Kimberly-Clark Corporation. Uniformly moist wipes. 4,853,281, Cl. 428-286.000.
Windrem, Kevin D.: *See—*
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Wingrave, James A., to Du Pont de Nemours, E. I., and Company. Method and apparatus for determining physical integrity of geological strata. 4,852,400, Cl. 73-153.000.
Winter, Russell K.; Harvey, Thomas D.; Kain, Richard S.; and Savas, Nedim, to Russell William, Ltd. Tubular support display system. 4,852,839, Cl. 248-225.100.
Wipfli, John L.: *See—*
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Wisconsin Alumni Research Foundation: *See—*
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Wisniewski, Frank: *See—*
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Wisotzki, Klaus-Dieter; Schaab, Udo; Reitz, Hans-Joachim; and Orczech, Juergen, to Henkel Kommanditgesellschaft auf Aktien. Apparatus for the care of contact lenses. 4,852,591, Cl. 134-57.00R.
Withycombe, Donald A.: *See—*
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Witriol, Norman M.; Brumage, William H.; and Cowling, David H., to United States of America, Navy. Robotic vision system. 4,853,771, Cl. 358-93.000.
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Wohrle, Albert, deceased (by Wohrle, Ingrid, executor), to J. M. Voith GmbH. Coating device. 4,852,514, Cl. 118-410.000.
Wohrle, Ingrid, executor: *See—*
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Wolcott, John H.; and Wenman, Herbert W., to Eaton Corporation. Eddy current brake assembly. 4,853,573, Cl. 310-105.000.
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Wolf, Nicholas O.; Hudgins, Roger L.; and Seidner, David S., to Conoco Inc. Microwave emulsion treater with internal coalescer. 4,853,119, Cl. 210-181.000.
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Wolfe, Robert W., to GTE Products Corporation. Process for binding pigment particles to phosphor particles. 4,853,254, Cl. 427-64.000.
Wolk, Barry M.; and Newman, Edward H. Infant security system. 4,853,692, Cl. 340-573.000.
Wollscheid, Dieter; Ninnemann, Peter; Stoll, Siegfried; and Wenzel, Waldemar, to Siemens Aktiengesellschaft. Memory-programmable controller. 4,853,891, Cl. 364-900.000.
Wolters, Gunter: *See—*
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Wombacher, Erich: *See—*
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Wood, Roger, to Axiom Medical, Inc. Catheter for measuring bioimpedance. 4,852,580, Cl. 128-693.000.
Woodbury, Wayne F. Gun rack. 4,852,780, Cl. 224-42.45R.
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Wooding, Margaret L.: *See—*
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Woolbert, Gordon D.; Jewett, Scotty Y.; and Robertson, John W., Jr., to Babcock & Wilcox Company, The. Automatic calibration and control system for a combined oxygen and combustibles analyzer. 4,852,384, Cl. 73-1.00G.
Worthington Foods, Inc.: *See—*
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Wreede, John E.; and Scott, James E., to Hughes Aircraft Company. Method and apparatus for dehydrating dichromatic gelatin holograms. 4,853,306, Cl. 430-1.000.
Wright, Hal E.: *See—*
Hartley, Paul A.; Pavlisko, Joseph A.; and Wright, Hal E., 4,853,737, Cl. 355-289.000.
Wrobel, Jay E.; and Sestanj, Kazimir, to American Home Products Corporation. N-[[6-methoxy-5-(trifluoromethyl)-1-naphthalenyl]-[substituted imino]methyl]-n-methylglycines. 4,853,412, Cl. 514-510.000.
Wu, Hsi L.: *See—*
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Wu, Ko-Lee; and Huang, Ming-Chi. Equipment for playing golf. 4,852,782, Cl. 224-226.000.
Wundrock, John A.; and Conrardy, Mary L., to Badger Pharmacal, Inc. Toilet bowl cleaner. 4,852,201, Cl. 15-145.000.
Wursch, Pierre; Musso, Francois; and Goulois, Eric, to Nestec S.A. Food product of leguminous seeds and process for making it. 4,853,248, Cl. 426-634.000.
Wycech, Joseph S., to Essex Specialty Products, Inc. Knee blocker for automotive application. 4,853,270, Cl. 428-68.000.
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Yabushita, Haruyasu: *See—*
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Yakubo, Minoru: *See—*
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Yalamanchili, Bhaskar; Wisniewski, Frank; and Boudreaux, Thad, to Cargill, Incorporated. Process for producing low carbon steel for cold drawing. 4,853,032, Cl. 75-10.490.
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Yamada, Makoto, to Fuji Photo Film Co., Ltd. Material with pH not higher than 7 containing silver halide, reducing agent and polymerizable compound. 4,853,312, Cl. 430-138.000.
Yamada, Makoto; and Odaka, Kentaro, to Sony Corporation. Fir type digital filter for recording and reproducing apparatus. 4,853,797, Cl. 360-32.000.
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Yamada, Sadami, to Fuji Photo Film Co., Inc. Irradiation image erase unit for use with stimulable phosphor sheet. 4,852,975, Cl. 250-327.200.
Yamada, Seiji, to Ishida Scales Mfg. Co., Ltd. Combinatorial weighing system. 4,853,881, Cl. 364-567.000.
Yamada, Shitaka, to NEC Corporation. Programmable logic array using single transistor to generate true or complement signal. 4,853,562, Cl. 307-465.000.
Yamada, Tomoaki; and Ishii, Yuwa, to Nikon Corporation. Maneto-optical recording apparatus with path length compensated dual photo-electric conversion. 4,853,923, Cl. 369-120.000.
Yamada, Toshihiro: *See—*
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Yamaguchi, Isao: *See*—
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Yamaguchi, Masami; Ishikawa, Shunichi; Tamura, Hideo; Tanaka, Hirokazu; Nakaya, Tomio; and Ishikawa, Kiyomitsu, to Stanley Electric Co., Ltd. Optical identification card system. 4,853,524, Cl. 235-468.000.

Yamaguchi, Noboru: *See*—
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Yamaguchi, Takashi, to NEC Corporation. Write driver circuit of semiconductor memory device. 4,853,896, Cl. 365-189.020.

Yamaguchi, Toshiki: *See*—
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Yamamoto, Etsuji; Ogura, Yukiko; and Kohno, Hideki, to Hitachi, Ltd. NMR imaging method. 4,853,636, Cl. 324-309.000.

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Yamamoto, Osamu; and Yoshida, Toshihiko, to Sharp Kabushiki Kaisha. Nonlinear optical waveguide device including grating for changing of the wavelength of light. 4,852,961, Cl. 350-96.190.

Yamamoto, Tadahisa: *See*—
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Yamamoto, Takashi; Mishina, Yoshihiko; and Oda, Masaaki, to Mitsubishi Rayon Co., Ltd. Graded index lens array. 4,852,982, Cl. 350-413.000.

Yamamoto, Takeshi: *See*—
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Yamamoto, Yoshihisa, to Nippondenso Co., Ltd. Fuel injection valve used in fuel injection apparatus for internal combustion engine. 4,852,808, Cl. 239-533.300.

Yamamura, Sigeyuki; and Nakamura, Yasuhide, to Sharp Kabushiki Kaisha. Elecetronic cash register. 4,853,853, Cl. 364-405.000.

Yamanaka, Akira; and Yamazaki, Keiji, to Minolta Camera Kabushiki Kaisha. Battery compartment. 4,853,302, Cl. 429-99.000.

Yamanaka, Toshiaki; Suzuki, Norio; Sakai, Yoshio; Kawamoto, Yoshifumi; Minato, Osamu; Ishibashi, Koichiro; Moriwaki, Nobuyuki; and Meguro, Satoshi, to Hitachi, Ltd. Static random-access memory having multilevel conductive layer. 4,853,894, Cl. 365-154.000.

Yamane, Izumi. Mop squeezer. 4,852,207, Cl. 15-262.000.

Yamanobe, Kouji: *See*—
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Yamanouchi, Hiroshi, to Sony Corporation. Magnetic head supporting device. 4,853,813, Cl. 360-104.000.

Yamato, Motoyuki; Ueno, Susumu; Okumura, Kin-ichi; and Fuchi, Masao, to Nippon Zeon Co., Ltd. Process for preparing thermosetting resin. 4,853,435, Cl. 525-193.000.

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Yamawaki, Masao; and Kawashima, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. CSD image sensor and method of decreasing smear by the user thereof. 4,853,786, Cl. 358-213.290.

Yamazaki, Fumio: *See*—
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Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Optical disc memory system utilizing a smectic chiral liquid crystal. 4,853,911, Cl. 369-13.000.

Yanagisawa, Akira; and Nakamura, Kazumitsu, to Hitachi, Ltd. Electron beam drawing method. 4,853,549, Cl. 250-491.100.

Yananton, Patrick. Odorless animal litter unit. 4,852,518, Cl. 119-1.000.

Yang, Chen-shi. Continuous processing machine assembly for frying raw materials. 4,852,475, Cl. 99-404.000.

Yanidis, Apostol, to James River II, Inc. Polypropylene laminate having an EMA-EAA tie layer. 4,853,290, Cl. 428-516.000.

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Yasuda, Tomio; and Aoki, Kohji, to Aisin Seiki Kabushiki Kaisha. Attitude control apparatus for onboard seat. 4,852,934, Cl. 296-65.100.

Yasuda, Toru; Kawamoto, Yoshimichi; Abe, Masaru; and Kohata, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Steering angle detector. 4,853,672, Cl. 340-465.000.

Yasui, Masao: *See*—
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Yoshikazu, Nagata: *See*—
Eizo, Naya; Yoshikazu, Nagata; Toshiaki, Horiuchi; Mitsuhiro, Okumura; Michinosuke, Demizu; Mitsuhiro, Harima; Shigeki, Asakawa; and Masuo, Asakawa, 4,853,184, Cl. 420-489.000.

Yoshimatsu, Tatsuhiko: *See*—
Karakawa, Koichi; Yoshimatsu, Tatsuhiko; Tsuchimoto, Hideyuki; and Hiwatashi, Katsumi, 4,852,484, Cl. 101-170.000.

Yoshimoto, Toshio: *See*—
Ushio, Yukihide; Hashimoto, Hiroshi; Hori, Kenjiro; Seto, Kaoru; and Yoshimoto, Toshio, 4,853,740, Cl. 355-319.000.

Yoshimura, Kunitoshi: *See*—
Homma, Yoshihiro; Nakata, Akira; Matsumoto, Shiroh; Yoshimura, Kunitoshi; and Minato, Masahiko, 4,852,793, Cl. 229-5.500.

Yoshimura, Tatsushiro; Tomihashi, Nobuyuki; and Shimasaki, Shuhei, to Daikin Industries, Ltd. Melt-processable fluorine-containing resin composition. 4,853,425, Cl. 524-83.000.

Yoshino, Akira, to Daidousanso Co., Ltd. High purity nitrogen and oxygen gas production equipment. 4,853,015, Cl. 62-40.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Ota, Akiho, 4,852,752, Cl. 215-31.000.

Yoshino, Shigeru: *See*—
Nagumo, Akihiko; and Yoshino, Shigeru, 4,853,743, Cl. 355-27.000.

Yoshino, Toshikazu: *See*—
Kimura, Yukio; Yoshino, Toshikazu; and Hayashi, Ryutaro, 4,853,260, Cl. 427-240.000.

Yoshioka, Takeo: *See*—
Shibamoto, Norio; Yoshioka, Takeo; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,853,407, Cl. 514-414.000.

Yoshizaki, Akira: *See*—
Kobayashi, Haruo; Yoshizaki, Akira; Hoda, Takeo; and Kashima, Masataka, 4,853,721, Cl. 354-21.000.

Youd, Douglass S.: *See*—
Norris, Richard M.; Rumford, Kimball J.; and Youd, Douglass S., 4,852,343, Cl. 60-79.020.

Young, Bob R.: *See*—
Pate, Charles D.; Young, Bob R.; and Plata, Hector, 4,852,393, Cl. 73-49.500.

Young, Carter R., to Otis Engineering Corporation. Packer seal means and method. 4,852,649, Cl. 166-189.000.

Young, Daniel J. S.: *See*—
Chan, Lawrence K. M.; Coates, David; Gemmell, Peter A.; Gray, George W.; Lacey, David; Toyne, Kenneth J.; and Young, Daniel J. S., 4,852,977, Cl. 350-350.00S.

Young, David A.; and Bol, Kenneth E., II, to Fisher Group, Inc., The. Towing hitch cover. 4,852,902, Cl. 280-507.000.

Young, James L.; and Patterson, James M., Jr., to Data Card Corporation. Apparatus for imprinting a document with secure, machine readable information. 4,852,478, Cl. 101-18.000.

Young, Kenneth: *See*—
Hardy, Frederick E.; Caelik, Frank; Pretty, Alastair J.; Young, Kenneth; and Scott, Gerald, 4,853,143, Cl. 252-102.000.

Young, Michael N.: *See*—
Barresi, James A.; Arndt, Kenneth C.; Young, Michael N.; Bridgeham, Daniel O.; and Hede, Howard H., 4,852,504, Cl. 110-346.000.

Yu Lu, Shi-Da: *See*—
Mark, David F.; Lin, Leo S.; and Yu Lu, Shi-Da, 4,853,332, Cl. 435-252.330.

Yu, Thomas C., to Buschman Company, The. Method of fabricating rollers for use in roller conveyor systems. 4,852,230, Cl. 29-148.40D.

Yu, Zhou. Automobile rear-view mirror. 4,852,986, Cl. 350-603.000.

Zaborowski, Thaddeus, to Schawbel Corporation, The. Hair roller heating device. 4,852,546, Cl. 126-403.000.

Zacho, Per G.: *See*—
Iversen, Kristian; and Zacho, Per G., 4,853,671, Cl. 338-308.000.

Zanek, John R.: *See*—
Hermann, William J., Jr.; and Zanek, John R., 4,852,560, Cl. 128-762.000.

Zaruba, John V.; Rosenwinkel, Donald A.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Board game with stackable tokens and random moving disrupter. 4,852,886, Cl. 273-249.000.

Zborovsky, Ilya: *See*—
Sherman, Victor; Zborovsky, Ilya; Sanchez, William; and Kowalenko, Wladimir, 4,852,545, Cl. 126-39.00H.

Zeilinger, Randy A., to Hoover Universal, Inc. Method of Manufacturing a vehicle seat with mold-in-face suspension system. 4,852,228, Cl. 29-91.100.

Zeimes, Manfred, to Thyssen Industrie AG. Atmospheric gas boiler. 4,852,523, Cl. 122-14.000.

Zeitler, Walter, to Wilfer, Hans-Peter. Neck rod member for stringed instruments. 4,852,449, Cl. 84-293.000.

Zellweger Telecommunications Ltd.: *See*—
Kueng, Roland; and Widmer, Hanspeter, 4,853,686, Cl. 340-825.210.

Zeltner, Urs; and Hauser, Hans P. Flash apparatus with color temperature control. 4,853,600, Cl. 315-241.00P.

Zeman, David. Spray structures for use in watering plants. 4,852,806, Cl. 239-276.000.

Zhurakovsky, Vasily M.: *See*—
Perevozkin, Jury L.; Gajun, Jury A.; Grigorov, Petr K.; Zhurakovsky, Vasily M.; and Samelik, Boris V., 4,853,047, Cl. 148-905.000.

Zimmer, Gunther A. H.; Braune, Dirk H.; and Kaplinsky, Cecil H., to U.S. Philips Corporation. Data processing apparatus for time-interleaved execution of a plurality of processes. 4,853,845, Cl. 364-200.000.

Zimmermann, Markus, to Ciba-Geigy Corporation. 3,5-Diacyl-4-aryl-1,4 dihydropyridine derivatives, their uses and compositions. 4,853,393, Cl. 514-318.000.

Zinser Textilemaschinen GmbH: *See*—
Dinkelmann, Friedrich; and Wolf, Horst, 4,853,566, Cl. 310-59.000.

Zlotek, Marek. Element for dressing shelves and display composed of such elements. 4,852,750, Cl. 211-183.000.

Zollinger, Hans; and Oderbolz, Fredi, to Sulzer Brothers Limited. Weft yarn selector for a loom. 4,852,618, Cl. 139-453.000.

Zoran, Amikam: *See*—
Dakka, Jihad; Zoran, Amikam; and Sasson, Yoel, 4,853,479, Cl. 566-77.000.

Zordan, Daniele. Pouring cover for paints, enamels and the like. 4,852,775, Cl. 222-569.000.

Zumkeller, Oskar: *See*—
Fesenmeier, Hugo; Zumkeller, Oskar; Schneider, Werner; and Grieser, Hans, 4,853,666, Cl. 336-130.000.

Zupon, Michael A.: *See*—
Yim, Zachary; Zupon, Michael A.; and Chaudry, Imtiaz A., 4,853,218, Cl. 424-85.700.

Zwicker, Harry R.: *See*—
Newkirk, Marc S.; and Zwicker, Harry R., 4,853,352, Cl. 501-88.000.

3Com Corporation: *See*—
Crane, Ronald C., 4,853,950, Cl. 379-24.000.

501 North American Biotechnology, Inc.: *See*—
Hermann, William J., Jr.; and Zanek, John R., 4,852,560, Cl. 128-762.000.

501 Sharp Kabushiki Kaisha: *See*—
Matsui, Sadayoshi; Kaneiwa, Shinji; Morimoto, Taiji; Yamaguchi, Masahiro; Taneya, Mototaka; and Matsumoto, Mitsuhiro, 4,853,936, Cl. 372-45.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF AUGUST, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Adolph Coors Company: *See*—
Dugan, Larry M., Re. 33,003, Cl. 92-84.000.

Akutsu, Koichi: *See*—
Hataya, Fumio; Izumiya, Masakiyo; Ohshima, Yoshikuni; Akutsu, Koichi; Ueda, Syuzo; Ishikawa, Masaaki; Kusuhara, Yuji; and Shiraishi, Iwao, Re. 33,006, Cl. 165-134.100.

Alco Chemical Corporation: *See*—
Ruffner, Charles G.; and Wilkerson, John M., III, Re. 33,008, Cl. 526-270.000.

American Sterilizer Company: *See*—
Bier, Mark E., Re. 33,007, Cl. 203-12.000.

Bier, Mark E., to American Sterilizer Company. Method of vaporizing multicomponent liquids. Re. 33,007, Cl. 203-12.000.

Brick, Francis M., to F. M. Brick Industries, Inc. High-power rescue tool. Re. 33,002, Cl. 30-134.000.

Bryce, J. Robert, to Crane Electronics, Inc. Electrical connector. Re. 33,005, Cl. 439-78.000.

Crane Electronics, Inc.: *See*—
Bryce, J. Robert, Re. 33,005, Cl. 439-78.000.

Derouane, E. G.; Dessau, R. M.; Heilweil, I. J.; and Kerr, G. T., to Mobil Oil Corporation. Method for preparing crystalline zirconium phosphates. Re. 33,009, Cl. 556-14.000.

Dessau, R. M.: *See*—
Derouane, E. G.; Dessau, R. M.; Heilweil, I. J.; and Kerr, G. T., Re. 33,009, Cl. 556-14.000.

Dugan, Larry M., to Adolph Coors Company. Joint system. Re. 33,003, Cl. 92-84.000.

F. M. Brick Industries, Inc.: *See*—
Brick, Francis M., Re. 33,002, Cl. 30-134.000.

Hataya, Fumio; Izumiya, Masakiyo; Ohshima, Yoshikuni; Akutsu, Koichi; Ueda, Syuzo; Ishikawa, Masaaki; Kusuhara, Yuji; and Shiraishi, Iwao, to Hitachi, Ltd.; and Kawasaki Steel Corporation. Feedwater heater comprising low C-Cr-Mo steel components used under wet steam. Re. 33,006, Cl. 165-134.100.

Heilweil, I. J.: *See*—
Derouane, E. G.; Dessau, R. M.; Heilweil, I. J.; and Kerr, G. T., Re. 33,009, Cl. 556-14.000.

Hitachi, Ltd.: *See*—
Hataya, Fumio; Izumiya, Masakiyo; Ohshima, Yoshikuni; Akutsu, Koichi; Ueda, Syuzo; Ishikawa, Masaaki; Kusuhara, Yuji; and Shiraishi, Iwao, Re. 33,006, Cl. 165-134.100.

Imperial Chemical Industries PLC: *See*—
Kirby, Ian; Mitchell, Michael; and Stratton, Andrew, Re. 33,004, Cl. 102-200.000.

Ishikawa, Masaaki: *See*—
Hataya, Fumio; Izumiya, Masakiyo; Ohshima, Yoshikuni; Akutsu, Koichi; Ueda, Syuzo; Ishikawa, Masaaki; Kusuhara, Yuji; and Shiraishi, Iwao, Re. 33,006, Cl. 165-134.100.

Izumiya, Masakiyo: *See*—
Hataya, Fumio; Izumiya, Masakiyo; Ohshima, Yoshikuni; Akutsu, Koichi; Ueda, Syuzo; Ishikawa, Masaaki; Kusuhara, Yuji; and Shiraishi, Iwao, Re. 33,006, Cl. 165-134.100.

Kawasaki Steel Corporation: *See*—
Hataya, Fumio; Izumiya, Masakiyo; Ohshima, Yoshikuni; Akutsu, Koichi; Ueda, Syuzo; Ishikawa, Masaaki; Kusuhara, Yuji; and Shiraishi, Iwao, Re. 33,006, Cl. 165-134.100.

Kerr, G. T.: *See*—
Derouane, E. G.; Dessau, R. M.; Heilweil, I. J.; and Kerr, G. T., Re. 33,009, Cl. 556-14.000.

Kirby, Ian; Mitchell, Michael; and Stratton, Andrew, to Imperial Chemical Industries PLC. Apparatus and method for selectively activating plural electrical loads at predetermined relative times. Re. 33,004, Cl. 102-200.000.

Kusuhara, Yuji: *See*—
Hataya, Fumio; Izumiya, Masakiyo; Ohshima, Yoshikuni; Akutsu, Koichi; Ueda, Syuzo; Ishikawa, Masaaki; Kusuhara, Yuji; and Shiraishi, Iwao, Re. 33,006, Cl. 165-134.100.

Mitchell, Michael: *See*—
Kirby, Ian; Mitchell, Michael; and Stratton, Andrew, Re. 33,004, Cl. 102-200.000.

Mobil Oil Corporation: *See*—
Derouane, E. G.; Dessau, R. M.; Heilweil, I. J.; and Kerr, G. T., Re. 33,009, Cl. 556-14.000.

Ohshima, Yoshikuni: *See*—
Hataya, Fumio; Izumiya, Masakiyo; Ohshima, Yoshikuni; Akutsu, Koichi; Ueda, Syuzo; Ishikawa, Masaaki; Kusuhara, Yuji; and Shiraishi, Iwao, Re. 33,006, Cl. 165-134.100.

Ruffner, Charles G.; and Wilkerson, John M., III, to Alco Chemical Corporation. Acrylic emulsion copolymers for thickening aqueous systems and copolymerizable surfactant monomers for use therein. Re. 33,008, Cl. 526-270.000.

Shiraishi, Iwao: *See*—
Hataya, Fumio; Izumiya, Masakiyo; Ohshima, Yoshikuni; Akutsu, Koichi; Ueda, Syuzo; Ishikawa, Masaaki; Kusuhara, Yuji; and Shiraishi, Iwao, Re. 33,006, Cl. 165-134.100.

Stratton, Andrew: *See*—
Kirby, Ian; Mitchell, Michael; and Stratton, Andrew, Re. 33,004, Cl. 102-200.000.

Ueda, Syuzo: *See*—
Hataya, Fumio; Izumiya, Masakiyo; Ohshima, Yoshikuni; Akutsu, Koichi; Ueda, Syuzo; Ishikawa, Masaaki; Kusuhara, Yuji; and Shiraishi, Iwao, Re. 33,006, Cl. 165-134.100.

Wilkerson, John M., III: *See*—
Ruffner, Charles G.; and Wilkerson, John M., III, Re. 33,008, Cl. 526-270.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Banta, Maynard A., to Minnesota Mining and Manufacturing Company. Apparatus and method for masking surfaces. B1 4,263,347, 8-1-89, Cl. 427-282.000.

Bradley, David J., to International Business Machines Corp. Apparatus and method for reading and writing text characters in a graphics display. B1 1,032,201, 8-1-89, Cl. 340-747.000.

Consolidated-Bathurst Inc.: *See*—
Larive, Rene ; and Walker, Osman J., B1 4,384,514, Cl. 100-38.000.

Culp, David W., to MSI Data Corporation. Self-contained, portable data entry terminal. B1 4,471,218, 8-1-89, Cl. 235-472.000.

Dienes, Zoltan B.; and Mineur, Thomas L., to Thomas & Betts Corporation. Method of sealing pressurized electrical cable while under pressure. B1 4,545,830, 8-1-89, Cl. 156-48.000.

International Business Machines Corp.: *See*—
Bradley, David J., B1 1,032,201, Cl. 340-747.000.

Larive, Rene ; and Walker, Osman J., to Consolidated-Bathurst Inc. Nip control method and apparatus. B1 4,384,514, 8-1-89, Cl. 100-38.000.

Mineur, Thomas L.: *See*—
Dienes, Zoltan B.; and Mineur, Thomas L., B1 4,545,830, Cl. 156-48.000.

Minnesota Mining and Manufacturing Company: *See*—
Banta, Maynard A., B1 4,263,347, Cl. 427-282.000.

MSI Data Corporation: *See*—
Culp, David W., B1 4,471,218, Cl. 235-472.000.

Thomas & Betts Corporation: *See*—
Dienes, Zoltan B.; and Mineur, Thomas L., B1 4,545,830, Cl. 156-48.000.

Walker, Osman J.: *See*—
Larive, Rene ; and Walker, Osman J., B1 4,384,514, Cl. 100-38.000.

LIST OF DESIGN PATENTEES

Albright, Eugene V.; Ellis, Arthur D.; and Simpson, John E., to United States of America, Army. Copyholder. 302,569, 8-1-89, Cl. D19-91.000.

Allsteel Inc.: *See*—
Zapf, Otto, 302,497, Cl. D6-422.000.

Ambasz, Emilio. Toothbrush. 302,492, 8-1-89, Cl. D4-104.000.

Anderson, Bruce: *See*—
Bush, Paul S.; Bova, Richard; and Anderson, Bruce, 302,499, Cl. D6-436.000.

Anderson, Bruce O.: *See*—
Bush, Paul; and Anderson, Bruce O., 302,498, Cl. D6-436.000.

Anema, Willem, to U.S. Philips Corporation. Dry shaver. 302,599, 8-1-89, Cl. D28-50.000.

Arenas, Robert M.; McCarthy, Timothy D.; and Wayland, Robert E., to Motorola, Inc. Driver interface module or similar article for a vehicle monitoring system. 302,540, 8-1-89, Cl. D12-155.000.

Atlantic Thermoplastics Co., Inc.: *See*—
Fox, Richard B., 302,487, Cl. D2-318.000.

Avia Group International, Inc.: *See*—
Mourad, Miza; and McCrea, Mona, 302,485, Cl. D2-314.000.

Baker & Drake, Inc.: *See*—
McKenna, Gene, 302,554, Cl. D14-143.000.

Bakic, Karena, to Cosmede Anstalt. Cosmetic case. 302,602, 8-1-89, Cl. D28-78.000.

Bakic, Karena, to Cosmede Anstalt. Cosmetic case. 302,604, 8-1-89, Cl. D28-83.000.

Baxter, James A., to Chromacol Limited. Vial support sleeve. 302,591, 8-1-89, Cl. D24-29.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Spada, Ercole; and Luthe, Claus, 302,595, Cl. D26-28.000.

Bear, Thomas W.; Jessup, James L.; Pielemeier, Rolf; and Pielemeier, William J., to Tech-S, Inc. Combined data entry terminal and card reader. 302,550, 8-1-89, Cl. D14-105.000.

Beatty, Jack, to Beatty Machine and Tool Works Limited. Paint tray. 302,614, 8-1-89, Cl. D32-53.100.

Beatty Machine and Tool Works Limited: *See*—
Beatty, Jack, 302,614, Cl. D32-53.100.

Becton, Dickinson and Company: *See*—
McMenamy, James P.; and Montferret, John J., 302,589, Cl. D24-24.000.

Berger, Andy L., to Superwares, Inc. Magnetic disc clip. 302,568, 8-1-89, Cl. D19-65.000.

Bergman, Mark W. Infant's feeding spoon. 302,510, 8-1-89, Cl. D7-141.000.

Bertschmann, Hans. Wine selector. 302,565, 8-1-89, Cl. D19-59.000.

Best, Philip C.; and Ross, Samuel, to Procter & Gamble Company, The. Bottle. 302,524, 8-1-89, Cl. D9-376.000.

Binagraphics, Inc.: *See*—
Wright, Forrest S., 302,549, Cl. D14-100.000.

Blankenship, Billy; and Blankenship, Roxanne M. Coal truck toy. 302,573, 8-1-89, Cl. D21-134.000.

Blankenship, Roxanne M.: *See*—
Blankenship, Billy; and Blankenship, Roxanne M., 302,573, Cl. D21-134.000.

Blasiak, Marek. Protective mask. 302,606, 8-1-89, Cl. D29-9.000.

Bova, Richard: *See*—
Bush, Paul S.; Bova, Richard; and Anderson, Bruce, 302,499, Cl. D6-436.000.

Boyle-Midway Household Products, Inc.: *See*—
Gatarz, Gregory M., 302,580, Cl. D23-208.000.

Bridisco Limited: *See*—
Drane, John H., 302,545, Cl. D13-32.000.

Brown, Paul D.; and Kittle, Christopher, to Reebok International Ltd. Shoe upper. 302,486, 8-1-89, Cl. D2-314.000.

Brush, John D., Jr.; and Chase, David O., to John D. Brush & Co., Inc. Portable fire resistant case. 302,491, 8-1-89, Cl. D3-30.100.

Bush Industries, Inc.: *See*—
Bush, Paul; and Anderson, Bruce O., 302,498, Cl. D6-436.000.
Bush, Paul S.; Bova, Richard; and Anderson, Bruce, 302,499, Cl. D6-436.000.

Bush, Paul; and Anderson, Bruce O., to Bush Industries, Inc. Hutch. 302,498, 8-1-89, Cl. D6-436.000.

Bush, Paul S.; Bova, Richard; and Anderson, Bruce, to Bush Industries, Inc. Entertainment. center or similar article. 302,499, 8-1-89, Cl. D6-436.000.

Butler, Patrick H. Mounted bracket for holding tanks. 302,519, 8-1-89, Cl. D8-373.000.

Byrns, James E. Insulated bottle holder. 302,509, 8-1-89, Cl. D7-77.000.

Cadoux, Alain, to Feudor S.A. Lighter. 302,597, 8-1-89, Cl. D27-136.000.

Canon Kabushiki Kaisha: *See*—
Kojima, Tatsuo, 302,560, Cl. D16-223.000.

Casey, John P.: *See*—
Duran, David C.; Casey, John P.; Marion, James G.; and McGrew, M. Allen, 302,612, Cl. D32-4.000.

Casteel, Ronald C. Toboggan. 302,537, 8-1-89, Cl. D12-11.000.

Catonzaro, Robert P. Outboard motor storage rack. 302,619, 8-1-89, Cl. D34-26.000.

Charboneau, Donald B.; and Lazier, Kenneth M., to Sonoco Products Company. Bottle. 302,522, 8-1-89, Cl. D9-375.000.

Charet, Pierre; and Kraai, Duke, to Rally Manufacturing, Inc. Portable twin beam light. 302,594, 8-1-89, Cl. D26-60.000.

Chase, David O.: *See*—
Brush, John D., Jr.; and Chase, David O., 302,491, Cl. D3-30.100.

Chromacol Limited: *See*—
Baxter, James A., 302,591, Cl. D24-29.000.

Clark, Billy R. Sock. 302,488, 8-1-89, Cl. D2-332.000.

Clark, James C. Sled. 302,536, 8-1-89, Cl. D12-10.000.

Cohen, Anthony D. Ratchetting pipe wrench. 302,513, 8-1-89, Cl. D8-22.000.

Colgate-Palmolive Company: *See*—
Zogg, Jon R.; and Curtis, John P., 302,586, Cl. D24-15.000.

Concept Enterprises, Inc.: *See*—
Weissberg, Gary S.; Kwang, David; and Yamada, Masahiko, 302,556, Cl. D14-222.000.

Cosmede Anstalt: *See*—
Bakic, Karena, 302,602, Cl. D28-78.000.
Bakic, Karena, 302,604, Cl. D28-83.000.

Country Home Products, Inc.: *See*—
Raymond, Richard O., 302,617, Cl. D34-19.000.

Curtis, John P.: *See*—
Zogg, Jon R.; and Curtis, John P., 302,586, Cl. D24-15.000.

D.L. Auld Company, The: *See*—
Marrinan, Robert F., 302,517, Cl. D8-350.000.

Dangler, Richard G. Hair cutting machine. 302,600, 8-1-89, Cl. D28-53.000.

Dansk International Designs, Ltd.: *See*—
Porcelli, V. Lorenzo, 302,511, Cl. D7-317.000.

Davis, Dennis W. P.; and Tough, Timothy. Demolition hammer for skid steer loader. 302,558, 8-1-89, Cl. D15-28.000.

Decor Corporation Proprietary Limited, The: *See*—
Wolfenden, Anthony H., 302,596, Cl. D27-133.000.

DeMars, Robert A. Towelette warmer. 302,584, 8-1-89, Cl. D23-335.000.

Denney, Charles T. Shoe horn. 302,490, 8-1-89, Cl. D2-642.000.

Design Corporation: *See*—
Ritchie, Douglas, 302,528, Cl. D10-15.000.

Drane, John H., to Bridisco Limited. Push button door chime. 302,545, 8-1-89, Cl. D13-32.000.

Duran, David C.; Casey, John P.; Marion, James G.; and McGrew, M. Allen. Automobile vacuum cleaner. 302,612, 8-1-89, Cl. D32-4.000.

Durham, Ira M., Jr., to Methodist Hospital System, The. Headwall unit for hospital rooms. 302,502, 8-1-89, Cl. D6-505.000.

Egan, Dorothy U. Combined visor and hair piece. 302,484, 8-1-89, Cl. D2-248.000.

Elliott, Raymond D. Dental delivery unit. 302,585, 8-1-89, Cl. D24-4.000.

Ellis, Arthur D.: *See*—
Albright, Eugene V.; Ellis, Arthur D.; and Simpson, John E., 302,569, Cl. D19-91.000.

Ellis, Ted J., Jr. Switch panel. 302,546, 8-1-89, Cl. D13-35.000.

Ellison, Terry. Bracket for attachment to a vehicle roll bar for supporting a speaker. 302,518, 8-1-89, Cl. D8-354.000.

Endless Impressions, Inc.: *See*—
Hagee, Gerald D., 302,533, Cl. D11-104.000.

Ernest, Bruce F., to Hadrian Crystal Limited. Butterfly-like ornament. 302,535, 8-1-89, Cl. D11-162.000.

Feudor S.A.: *See*—
Cadoux, Alain, 302,597, Cl. D27-156.000.

Fox, Richard B., to Atlantic Thermoplastics Co., Inc. Innersole with shock-absorbing inserts. 302,487, 8-1-89, Cl. D2-318.000.

FRED: *See*—
Samuel, Henri, 302,559, Cl. D16-102.000.

Fritz, Roger E., Jr.: *See*—
Sirmon, Thomas D.; and Fritz, Roger E., Jr., 302,563, Cl. D17-21.000.

Fukuchi, Eiji, to Mitsuboshi Belting Ltd. Segment of a bicycle tire. 302,538, 8-1-89, Cl. D12-136.000.

Gatarz, Gregory M., to Boyle-Midway Household Products, Inc. Automatic toilet bowl cleaner. 302,580, 8-1-89, Cl. D23-208.000.

Gates, Charles H. Multi-functional tool for use with guns. 302,514, 8-1-89, Cl. D8-105.000.

Gebhart, Monika. Lipstick. 302,605, 8-1-89, Cl. D28-87.000.

Gerry, Beatrice: *See*—
Gerry, Eugene G.; and Gerry, Beatrice, 302,503, Cl. D6-512.000.

Gerry, Eugene G.; and Gerry, Beatrice. Holder for small articles. 302,503, 8-1-89, Cl. D6-512.000.

Goins, O. Daniel. Camera support. 302,561, 8-1-89, Cl. D16-242.000.

Gottselig, John C. Painter's service cart. 302,618, 8-1-89, Cl. D34-23.000.

Graco Inc.: *See*—
Powers, Frederick A.; Pyle, Arlon R.; and McKee, Sheila S., 302,557, Cl. D15-7.000.

by Grady, Mark P., to Seatronics Company, Inc. Oxygen sensor. 302,529, 8-1-89, Cl. D10-81.000.

Granger, Ray L. Planter box. 302,534, 8-1-89, Cl. D11-156.000.

Grinde, James E. Dual compartment container with measurement indicator. 302,521, 8-1-89, Cl. D9-375.000.

Grise, Daniel, to Pinceaux Universels Clic Ltee. Paintbrush handle. 302,493, 8-1-89, Cl. D4-138.000.

Grise, Daniel, to Pinceaux Universels Clic Ltee. Paintbrush handle. 302,494, 8-1-89, Cl. D4-138.000.

Gruber Systems, Inc.: *See*—
Lenahan, Scott G., 302,505, Cl. D6-524.000.

Gurstein, Russell S., to U.S. Products, Inc. Portable cleaning machine for carpets, draperies and upholstery. 302,613, 8-1-89, Cl. D32-15.000.
Hadrian Crystal Limited: *See*—
Ernest, Bruce F., 302,535, Cl. D11-162.000.
Hagan, Richard J.; McIntyre, John; and Reeder, Kevin, to McKesson Corporation. Siphon bottle or similar article. 302,525, 8-1-89, Cl. D9-399.000.
Hagee, Gerald D., to Endless Impressions, Inc. Non monetary coin. 302,533, 8-1-89, Cl. D11-104.000.
Haldorsen, Finn, to Rubb Industri. Framework structure for shelter. 302,593, 8-1-89, Cl. D25-61.000.
Halter, Jeffrey T., to Quaker Oats Company, The. Wheeled toy. 302,574, 8-1-89, Cl. D21-136.000.
Hammond, Charles C.; and Hammond, James A., to Laura Woods Company. Towel holder. 302,506, 8-1-89, Cl. D6-547.000.
Hammond, James A.: *See*—
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Hartmann, Norman. Golf cart with odometer. 302,616, 8-1-89, Cl. D34-15.000.
Hashihara, Muneshige, to Takara Marine Service Inc. Adjustable chair for a fisherman. 302,495, 8-1-89, Cl. D6-367.000.
Hays, Roderick S. Anchor ring. 302,541, 8-1-89, Cl. D12-215.000.
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Herrick, Martin J., to Heirloom Industries Limited. Swivel towel rail. 302,507, 8-1-89, Cl. D6-548.000.
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High Technology Manufacturing Limited: *See*—
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Lee, Peter M. H., 302,578, Cl. D22-123.000.
Holmes, Kenneth E. Therapeutic traction pillow. 302,592, 8-1-89, Cl. D24.64.000.
Huffman, Ronald E., to KV33 Corporation. Striated mold for a quadrant base dental cast. 302,587, 8-1-89, Cl. D24-16.000.
Jado Bathroom and Hardware Manufacturing Corp.: *See*—
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Kabushiki Kaisha Toshiba: *See*—
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Koike, Ryuichi; and Satoh, Ichitaro, to Sony Corporation. Magnetic tape cassette. 302,553, 8-1-89, Cl. D14-121.000.
Kojima, Tatsuo, to Canon Kabushiki Kaisha. Microfilm reader printer. 302,560, 8-1-89, Cl. D16-223.000.
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Lee, Peter M. H., to High Technology Manufacturing Limited. Electronic insect killer. 302,578, 8-1-89, Cl. D22-123.000.
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Lenahan, Scott G., to Gruber Systems, Inc. Wall-inserted bathroom accessory holder. 302,505, 8-1-89, Cl. D6-524.000.
Leong, David W.; and Longust, Timothy A., to Hewlett-Packard Company. Drafting plotter. 302,551, 8-1-89, Cl. D14-107.000.
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Parrish, Douglas J. Indoor basketball goal. 302,575, 8-1-89, Cl. D21-201.000.
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Paul, Stanley M., to Paul Associates, Inc. Spout and faucet set. 302,582, 8-1-89, Cl. D23-252.000.
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Spies, Kenneth. Separable bottle handle. 302,527, 8-1-89, Cl. D9-455.000.
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Werner, Richard H., to Saf-T-Green Manufacturing Corporation. Scaffolding coupling pin. 302,520, 8-1-89, Cl. D8-382.000.
Wheeler, Roland E. Visor. 302,609, 8-1-89, Cl. D29-18.000.
Whiton, Herb, to Licensing Development Group, Inc. Compact. 302,603, 8-1-89, Cl. D28-79.000.
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Wolf, Gilbert A., to WHW Construction, Inc. Teaching tool. 302,566, 8-1-89, Cl. D19-59.000.
Wolf, Stanton, to 1620 Group, Inc. Charm. 302,532, 8-1-89, Cl. D11-81.000.
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Woods, David B. Skateboard. 302,576, 8-1-89, Cl. D21-227.000.
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Fiala, John L., 6,957, Cl. 34.000.
Fiala, John L., 6,958, Cl. 34.000.

Egger, Janet N., to Mitsuwa Nursery, Inc. Verbena plant called Verbena "A" . 6,963, 8-1-89, Cl. 68.000.

Ellison, J. Howard; and Kinelski, John J., to Rutgers University. Asparagus plant — 'Jersey General' . 6,965, 8-1-89, Cl. 89.000.

Ellison, J. Howard; and Kinelski, John J., to Rutgers University. Asparagus plant—'Tara'. 6,966, 8-1-89, Cl. 89.000.

Ellison, J. Howard; and Kinelski, John J., to Rutgers University. Asparagus plant—'Louise'. 6,967, 8-1-89, Cl. 89.000.

Ellison, J. Howard; and Kinelski, John J., to Rutgers University. Asparagus plant—'Kathryn'. 6,968, 8-1-89, Cl. 89.000.

Ellison, J. Howard; and Kinelski, John J., to Rutgers University. Asparagus plant—'Jersey Titan'. 6,969, 8-1-89, Cl. 89.000.

Ellison, J. Howard; and Kinelski, John J., to Rutger Univ. Asparagus plant—Jersey Gem. 6,970, 8-1-89, Cl. 89.000.

Fiala, John L., to Chas. Klehm & Son. Crabapple tree named Satin Cloud. 6,956, 8-1-89, Cl. 34.000.

Fiala, John L., to Chas. Klehm & Son. Crabapple tree named Serenade. 6,957, 8-1-89, Cl. 34.000.

Fiala, John L., to Chas. Klehm & Son. Crabapple tree named Spring Song. 6,958, 8-1-89, Cl. 34.000.

Georgusis, James J., to Oglesby Plant Laboratories, Inc. Spathiphyllum cultivar 'Gorgusis No. 1' . 6,964, 8-1-89, Cl. 88.000.

Hortech: *See*—
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Kiddle, Kenneth W., to Stark Brothers Nurseries and Orchards Company. Apple tree — Galaxy cultivar. 6,955, 8-1-89, Cl. 34.000.

Kinelski, John J.: *See*—
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Ellison, J. Howard; and Kinelski, John J., 6,969, Cl. 89.000.
Ellison, J. Howard; and Kinelski, John J., 6,970, Cl. 89.000.

Lowe, Hubert G. Variegated evergreen Azalea plant. 6,961, 8-1-89, Cl. 55.000.

MacKenzie, David S., to Hortech. Periwinkle plant named Ralph Shugert. 6,960, 8-1-89, Cl. 54.000.

Mitsuwa Nursery, Inc.: *See*—
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Monrovia Nursery Company: *See*—
Resendez, Gilbert N., 6,959, Cl. 54.000.

Oglesby Plant Laboratories, Inc.: *See*—
Georgusis, James J., 6,964, Cl. 88.000.

Resendez, Gilbert N., to Monrovia Nursery Company. Bougainvillea hybrid cv. Monka. 6,959, 8-1-89, Cl. 54.000.

Rutger Univ.: *See*—
Ellison, J. Howard; and Kinelski, John J., 6,970, Cl. 89.000.

Rutgers University: *See*—
Ellison, J. Howard; and Kinelski, John J., 6,965, Cl. 89.000.
Ellison, J. Howard; and Kinelski, John J., 6,966, Cl. 89.000.
Ellison, J. Howard; and Kinelski, John J., 6,967, Cl. 89.000.
Ellison, J. Howard; and Kinelski, John J., 6,968, Cl. 89.000.
Ellison, J. Howard; and Kinelski, John J., 6,969, Cl. 89.000.

Stark Brothers Nurseries and Orchards Company: *See*—
Kiddle, Kenneth W., 6,955, Cl. 34.000.

Zampini, James W. *Ilex glabra* named 'Chamzin'. 6,962, 8-1-89, Cl. 65.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 1ST DAY OF AUGUST, 1989

: *See*—
Saito, Toshio; Kabasawa, Akihiko; Ishikura, Masami; Miyazawa, Sadayuki; Suzuki, Nobuo; and , H662, Cl. 430-564.000.

Bell Telephone Laboratories, Incorporated: *See*—
Knolle, William R.; and Osenbach, John W., H665, Cl. 357-52.000.

Bowling, Donald R.: *See*—
Kinman, Darry M.; and Bowling, Donald R., H664, Cl. 331-56.000.

Breckenridge, Robert W.; and Hosmer, Thomas P., to United States of America, Air Force. High effectiveness all metal heat exchanger. H658, 8-1-89, Cl. 165-154.000.

Burgess, James S.: *See*—
Cameron, Roy L.; and Burgess, James S., H657, Cl. 73-1.00C.

Cameron, Roy L.; and Burgess, James S., to United States of America, Army. Torque calibrator. H657, 8-1-89, Cl. 73-1.00C.

Dodson, Karen E.: *See*—
Tallent, Othar K.; Dodson, Karen E.; and McDaniel, Earl W., H660, Cl. 252-628.000.

Dueber, Ross E., to United States of America, Air Force. Cathode container for sodium-sulfur cells. H661, 8-1-89, Cl. 429-104.000

Haas, Paul A., to United States of America, Energy. Process for electrolytically preparing uranium metal. H659, 8-1-89, Cl. 204-1.500.

Hosmer, Thomas P.: *See*—
Breckenridge, Robert W.; and Hosmer, Thomas P., H658, Cl. 165-154.000.

Ishikura, Masami: *See*—
Saito, Toshio; Kabasawa, Akihiko; Ishikura, Masami; Miyazawa, Sadayuki; Suzuki, Nobuo; and , H662, Cl. 430-564.000.

Kabasawa, Akihiko: *See*—
Saito, Toshio; Kabasawa, Akihiko; Ishikura, Masami; Miyazawa, Sadayuki; Suzuki, Nobuo; and , H662, Cl. 430-564.000.

Kinman, Darry M.; and Bowling, Donald R., to United States of America, Navy. Power combiner for microwave sources. H664, 8-1-89, Cl. 331-56.000.

Knolle, William R.; and Osenbach, John W., to Bell Telephone Laboratories, Incorporated. Resistive field shields for high voltage devices. H665, 8-1-89, Cl. 357-52.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Saito, Toshio; Kabasawa, Akihiko; Ishikura, Masami; Miyazawa, Sadayuki; Suzuki, Nobuo; and , H662, Cl. 430-564.000.

Massopust, Dan. High density probe head for chip testing. H663, 8-1-89, Cl. 324-158.00F.

McDaniel, Earl W.: *See*—
Tallent, Othar K.; Dodson, Karen E.; and McDaniel, Earl W., H660, Cl. 252-628.000.

Milton, Robert W., to United States of America, Army. Circuit for measuring absolute time lapse between impact and detonation. H666, 8-1-89, Cl. 368-110.000.

Miyazawa, Sadayuki: *See*—
Saito, Toshio; Kabasawa, Akihiko; Ishikura, Masami; Miyazawa, Sadayuki; Suzuki, Nobuo; and , H662, Cl. 430-564.000.

Osenbach, John W.: *See*—
Knolle, William R.; and Osenbach, John W., H665, Cl. 357-52.000.

Saito, Toshio; Kabasawa, Akihiko; Ishikura, Masami; Miyazawa, Sadayuki; Suzuki, Nobuo; and , to Konishiroku Photo Industry Co., Ltd. Process for producing silver halide emulsion in equipment made of stainless steel containing molybdenum. H662, 8-1-89, Cl. 430-564.000.

Suzuki, Nobuo: *See*—
Saito, Toshio; Kabasawa, Akihiko; Ishikura, Masami; Miyazawa, Sadayuki; Suzuki, Nobuo; and , H662, Cl. 430-564.000.

Tallent, Othar K.; Dodson, Karen E.; and McDaniel, Earl W., to United States of America, Energy. Method and composition for immobilization of waste in cement-based materials. H660, 8-1-89, Cl. 252-628.000.

United States of America
Air Force: *See*—
Breckenridge, Robert W.; and Hosmer, Thomas P., H658, Cl. 165-154.000.
Dueber, Ross E., H661, Cl. 429-104.000.
Army: *See*—
Cameron, Roy L.; and Burgess, James S., H657, Cl. 73-1.00C.
Milton, Robert W., H666, Cl. 368-110.000.
Energy: *See*—
Haas, Paul A., H659, Cl. 204-1.500.
Tallent, Othar K.; Dodson, Karen E.; and McDaniel, Earl W., H660, Cl. 252-628.000.
Navy: *See*—
Kinman, Darry M.; and Bowling, Donald R., H664, Cl. 331-56.000.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 1, 1989

NOTE.—First number, class; second number, subclass; third number, patent number

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559 4,852,240
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[illegible] 4,852,249
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239 4,852,317
[illegible] 4,852,318
302 4,852,319
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[illegible] 4,853,018
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[illegible] 4,852,405
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718 4,852,408
861.38 4,852,409
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862.36 4,852,411
863.85 4,852,412
864.67 4,852,413
[illegible] 4,852,414
[illegible] 4,852,415
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[illegible] 4,852,418
89.14 4,852,419
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586 4,852,425
607 4,852,426
689 4,852,427
[illegible] 4,852,428
[illegible] 4,852,429

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1.7 4,852,725
1.9 4,852,726
39 4 4,852,727
63 5 4,852,728
[illegible] 4,852,729
145 4,852,730
167 4,852,731
204 4,852,732
223 4,852,733
273 4,852,734
320 4,852,735
328 4,852,736
330 4,852,737
369 4,852,738
387 4,852,739
[illegible] 4,852,740
558 4,852,741
568 4,852,742
583 4,852,743
586 4,852,744

CLASS 208

58 4,853,103
61 4,853,104
74 4,853,105
131 4,853,106
152 4,853,107
216 R 4,853,108
252 4,853,109
253 4,853,110
421 4,853,111

CLASS 209

142 4,853,112
166 4,853,113
167 4,853,114
173 4,853,115
588 4,852,745

CLASS 210

104 4,853,116
110 4,853,117
130 4,853,118
172 4,853,125
181 4,853,119
[illegible] 4,853,120
225 4,853,121
242 2 4,853,124
316 4,853,123
321.89 4,853,122
469 4,853,126
500.39 4,853,127
636 4,853,128
651 4,853,129
663 4,853,130
696 4,853,131
712 4,853,132
729 4,853,133
742 4,853,134
757 4,853,135
761 4,853,136
782 4,853,137

CLASS 211

13 4,852,746
70.6 4,852,747
4,852,748
133 4,852,749
183 4,852,750

CLASS 215

31 4,852,752
32 4,852,751
271 4,852,753
347 4,852,754

CLASS 219

10.55 A 4,853,507
10.55 E 4,853,509
10.55 R 4,853,508
10 79 4,853,510
[illegible] 4,853,511
69.15 4,853,512
76.14 4,853,513
121.12 4,853,514
121.47 4,853,515
137 9 4,853,516
271 4,853,517
441 4,853,518
497 4,853,519
535 4,853,520

CLASS 220

4 A 4,852,757
4 D 4,852,755
4 F 4,852,756
20 5 4,852,758
[illegible] 4,852,759
4,852,760
85 VR 4,852,761
90 2 4,852,762
253 4,852,763
315 4,852,764
[illegible] 4,852,765

CLASS 221

96 4,852,766
241 4,852,767

CLASS 222

[illegible] 4,852,768
83 5 4,852,769
153 4,852,770
169 4,852,771
386 4,852,772
504 4,852,773
545 4,852,774
569 4,852,775
570 4,852,776

CLASS 223

91 4,852,777

CLASS 224

30 A 4,852,778
42.32 4,852,779
42.45 R 4,852,780
148 4,852,781
226 4,852,782
253 4,852,783
255 4,852,784

CLASS 228

42 4,852,785
137 4,852,786
142 4,852,787

CLASS 228

110 4,852,788
148 4,852,790
183 4,852,791
198 4,852,789

CLASS 229

5.5 4,852,792
4,852,793
73 4,852,794
92 4,852,795
125.28 4,852,796

CLASS 235

375 4,853,521
[illegible] 4,853,522
[illegible] 4,853,524
[illegible] 4,853,525
472 B1 4,471,218
492 4,853,523
4,853,526

CLASS 237

2 A 4,852,797
4,852,798
3 4,852,799

CLASS 239

1 4,852,800
12 4,852,801
[illegible] 4,852,802
[illegible] 4,852,803
121 4,852,804
265.11 4,852,805
276 4,852,806
337 4,852,807
533.3 4,852,808
654 4,852,809
703 4,852,810

CLASS 241

1 4,852,811
24 4,852,812
[illegible] 4,852,813
37.5 4,852,814
65 4,852,815
101.7 4,852,816
260 1 4,852,817
[illegible] 4,852,818

CLASS 242

18 R 4,852,819
56 R 4,852,820
71.8 4,852,821
96 4,852,822
125.1 4,852,823
131.1 4,852,824
195 4,852,825
270 4,852,826

CLASS 244

3 22 4,852,827
3.29 4,852,828
100 R 4,852,829

CLASS 248

58 4,852,831
65 4,852,832
110 4,852,833
156 4,852,834
4,852,835
168 4,852,836
183 4,852,830
[illegible] 4,852,837
222.1 4,852,838
225 1 4,852,839
230 4,852,840
231 5 4,852,841
280 1 4,852,842
311 2 4,852,843
314 4,852,844
316.1 4,852,845
430 4,852,846
548 4,852,847
559 4,852,848
575 4,852,849

CLASS 250

202 4,853,527
203 R 4,853,528
213 VT 4,853,529
214 A 4,853,530
221 4,853,531
4,853,532
223 R 4,853,533
227 4,853,534
235 4,853,535
253 4,853,536
4,853,537
288 4,853,539
327.2 4,852,975
4,853,540
336.2 4,853,538
347 4,853,541
353 4,853,542
372 4,853,543
385.1 4,853,544
396 R 4,853,545
432 PD 4,853,546
458.1 4,853,547
484.1 4,853,548
491.1 4,853,549
493.1 4,853,550
515.1 4,853,551

CLASS 251

28 4,852,850
61.1 4,852,851
78 4,852,852
129.07 4,852,853
129.17 4,852,854

CLASS 252

8.554 4,853,138
32.7 E 4,853,139
34 4,853,140
51 4,853,141
90 4,853,142
102 4,853,143
135 4,853,144
136 4,853,145
142 4,853,146
174.19 4,853,147
194 4,853,148
299.61 4,853,149
4,853,150
4,853,151
299.63 4,853,152
400 22 4,853,153
512 4,853,155
602 4,853,154

CLASS 254

131 4,852,855
134.3 R 4,852,856

CLASS 260

396 R 4,853,156

CLASS 261

41.5 4,853,160
81 4,853,161
89 4,853,162

CLASS 264

22 4,853,163
4,853,164
27 4,853,165
46.5 4,853,166
112 4,853,167
180 4,853,168
[illegible] 4,853,169
517 4,853,170
530 4,853,171

571 4,853,172

CLASS 280

99 4,852,857
175 4,852,858
197 4,852,859
268 4,852,860

CLASS 267

64.27 4,852,861
120 4,852,862
218 4,852,863
219 4,852,864

CLASS 269

48 4,852,865
87.2 4,852,866

CLASS 270

53 4,852,867

CLASS 271

122 4,852,868
126 4,852,869

CLASS 272

3 4,852,870
67 4,852,871
73 4,852,872
137 4,852,873
4,852,874

CLASS 273

29 A 4,852,875
4,852,876
77 R 4,852,877
156 4,852,878
164 4,852,879
169 4,852,880
183 B 4,852,881
4,852,882
197 R 4,852,883
230 4,852,884
237 4,852,885
249 4,852,886
264 4,852,887
373 4,852,888
411 4,852,889

CLASS 277

1 4,852,893
25 4,852,890
212 FB 4,852,891

CLASS 280

[illegible] 4,852,894
47.131 4,852,895
47.18 4,852,896
91 4,852,897
216 4,852,898
250.1 4,852,899
291 4,852,900
477 4,852,901
507 4,852,902
[illegible] 4,852,903
701 4,852,904
707 4,852,905
4,852,906
731 4,852,907
[illegible] 4,852,908
[illegible] 4,852,892

CLASS 281

33 4,852,909

CLASS 283

67 4,852,910
82 4,852,911
95 4,852,912

CLASS 285

15 4,852,913
21 4,852,914
38 4,852,915
187 4,852,916
353 4,852,917

CLASS 287

40 C 4,853,552
4,853,553
46 4,853,554

CLASS 292

169 4,852,918
205 4,852,920
251.5 4,852,919
259 R 4,852,921
336.3 4,852,922
341.18 4,852,923

CLASS 294

1.5 4,852,924
[illegible] 4,852,925
64.1 4,852,926
[illegible] 4,852,927
88 4,852,928
99.2 4,852,929
143 4,852,930
147 4,852,931

CLASS 296

37.9 4,852,932
50 4,852,933
65.1 4,852,934
146 4,852,935
178 4,852,936
183 4,852,937
214 4,852,938

CLASS 297

71 4,852,939
145 4,852,940
188 4,852,941
195 4,852,942
302 4,852,943
445 4,852,944
[illegible] 4,852,945

CLASS 299

10 4,852,946
81 4,852,947

CLASS 301

44 T 4,852,948

CLASS 303

100 4,852,949
4,852,950
109 4,852,951
110 4,852,952
111 4,852,953

CLASS 307

9.1 4,853,555
10.1 4,853,556
4,853,557
141 4,853,558
270 4,853,559
296 1 4,853,560
443 4,853,561
465 4,853,562
475 4,853,563
492 4,853,564

CLASS 310

45 4,853,565
[illegible] 4,853,566
67 R 4,853,567
68 C 4,853,568
68 E 4,853,569
[illegible] 4,853,570
[illegible] 4,853,571
4,853,572
105 4,853,573
4,853,574
116 4,853,579
171 4,853,575
239 4,853,576
315 4,853,578
339 4,853,580

CLASS 312

140.4 4,852,954

CLASS 313

15 4,853,581
141 4,853,582
318 4,853,583
417 4,853,584
422 4,853,585
4,853,586
4,853,587
[illegible] 4,853,588
477 R 4,853,589
485 4,853,590
493 4,853,591
495 4,853,592
500 4,853,593
503 4,853,594
532 4,853,595
632 4,853,596
638 4,853,597

CLASS 315

[illegible] 4,853,598
119 4,853,599
241 P 4,853,600
368 4,853,601

CLASS 318

38 4,853,602
568.15 4,853,603
653 4,853,604
729 4,853,605

CLASS 330

36 4,853,606
4,853,607

CLASS 323

258 4,853,608
312 4,853,609
316 4,853,610
335 4,853,611
354 4,853,612

CLASS 324

58 R 4,853,613
61 R 4,853,614
65 R 4,853,615
4,853,616
67 4,853,617
71.4 4,853,618
115 4,853,619
142 4,853,620
158 F 4,853,626
158 P 4,853,624
4,853,625
4,853,627
158 R 4,853,621
4,853,622
4,853,623
[illegible] 4,853,628
[illegible] 4,853,629
4,853,630
4,853,631
4,853,632
210 4,853,633
225 4,853,634
[illegible] 4,853,635
4,853,636
439 4,853,637
441 4,853,638
457 4,853,639

CLASS 328

235 4,853,640

CLASS 329

[illegible] 4,853,641
124 4,853,642
[illegible] 4,853,643

CLASS 330

[illegible] 4,853,644
255 4,853,645
256 4,853,646
4,853,647
273 4,853,648
277 4,853,649
287 4,853,650
294 4,853,651
4,853,652

CLASS 331

49 4,853,653
57 4,853,654
116 FG 4,853,655

CLASS 333

34 4,853,656
137 4,853,657
164 4,853,658
184 4,853,659
204 4,853,660

CLASS 335

185 4,853,662
216 4,853,661
301 4,853,663

CLASS 336

12 4,853,664
84 C 4,853,665
130 4,853,666
192 4,853,667
214 4,853,668

CLASS 338

4 4,853,669
21 4,853,670
308 4,853,671

CLASS 340

[illegible] 4,853,577
407 4,853,674
429 4,853,675
439 4,853,673
453 4,853,689
465 4,853,672
543 4,853,676
544 4,853,677
4,853,690
566 4,853,691
573 4,853,678
4,853,692
[illegible] 4,853,693
621 4,853,694
675 4,853,679
[illegible] 4,853,680
703 4,853,681
706 4,853,682
720 4,853,683
747 B1 Re.32,201
825.170 4,853,685
825.210 4,853,686
825.300 4,853,687
825.35 4,853,684
825.440 4,853,688

CLASS 341

23 4,853,697
26 4,853,695
65 4,853,696
150 4,853,698

CLASS 342

25 4,853,699
[illegible] 4,853,700
139 4,853,701
363 4,853,702

CLASS 343

700 MS 4,853,703
767 4,853,704
803 4,853,705

CLASS 344

1.1 4,853,706
4,853,707
75 4,853,708
[illegible] 4,853,709
4,853,710
134 4,853,711
4,853,712
4,853,713
139 R 4,853,714
4,853,715
140 R 4,853,716
4,853,717
4,853,718
155 4,853,719

CLASS 350

1.2 4,852,955
3.71 4,852,956
6.6 4,852,957
96.13 4,852,958
96.18 4,852,959
96.19 4,852,960
4,852,961
96.20 4,852,962
96.21 4,852,963
96.23 4,852,964
4,852,965
4,852,966
96.29 4,852,967
96.33 4,852,968
96.34 4,852,969
[illegible] 4,852,970
4,852,971
131 4,852,972
162.11 4,852,973
165 4,852,974
339 R 4,852,976
350 R 4,852,978
350 S 4,852,977
357 4,852,979
413 4,852,981
4,852,982
432 4,852,980
453 4,852,983
454 4,852,984
523 4,852,985
[illegible] 4,852,986

CLASS 351

210 4,852,988
221 4,852,987

CLASS 354

21 4,853,721
[illegible] 4,853,722
145.1 4,853,723
277 4,853,724
[illegible] 4,853,725
289.1 4,853,726
319 4,853,727
320 4,853,728
322 4,853,729
[illegible] 4,853,730
[illegible] 4,853,731
[illegible] 4,853,732
412 4,853,733
[illegible] 4,853,734

CLASS 355

27 4,853,742
4,853,743
[illegible] 4,853,744
43 4,853,745
[illegible] 4,853,746
51 4,853,747
55 4,853,748
71 4,853,749
4,853,756
75 4,853,750
76 4,853,751
77 4,853,752
210 4,853,736
215 4,853,735
229 4,853,739
[illegible] 4,853,737
[illegible] 4,853,741
319 4,853,740
327 4,853,738

CLASS 357

4 4,853,753
16 4,853,754
23.7 4,853,755
45 4,853,757
51 4,853,758
4,853,759
52 4,853,760
72 4,853,761
79 4,853,762
[illegible] 4,853,763

CLASS 358

3 4,853,764
11 4,853,765
12 4,853,766
[illegible] 4,853,767
[illegible] 4,853,768
88 4,853,769
93 4,853,770
4,853,771
98 4,853,772
4,853,773
4,853,774
105 4,853,775
106 4,853,776
107 4,853,777
133 4,853,778
4,853,779
136 4,853,780
148 4,853,781
4,853,782
162 4,853,783
181 4,853,784
213.11 4,853,785
213.29 4,853,786
224 4,853,787
227 4,853,788
4,853,789
245 4,853,790
247 4,853,791
324 4,853,796
447 4,853,794
4,853,795
455 4,853,792
[illegible] 4,853,793

CLASS 360

10.3 4,853,809
32 4,853,797
38.1 4,853,798
[illegible] 4,853,800
4,853,801
[illegible] 4,853,799
[illegible] 4,853,802
72.2 4,853,803
[illegible] 4,853,804
[illegible] 4,853,805
97.01 4,853,807
98.01 4,853,808
[illegible] 4,853,806
103 4,853,810
4,853,811
104 4,853,812
4,853,813
122 4,853,814
126 4,853,815
132 4,853,816
133 4,853,817

CLASS 361

33 4,853,818
39.4 4,853,831
47 4,853,819
59 4,853,820
92 4,853,821
[illegible] 4,853,822
4,853,823
302 4,853,824
[illegible] 4,853,825
4,853,826
321 4,853,827
386 4,853,828
4,853,829
391 4,853,830

CLASS 363

17 4,853,832
47 4,853,833
[illegible] 4,853,834
[illegible] 4,853,835
4,853,836
80 4,853,837

CLASS 364

167.01 4,853,83-
[illegible] 4,853,838
200 4,853,840
4,853,841
4,853,842
4,853,843
4,853,844
4,853,845
4,853,846
4,853,847
4,853,848
4,853,849
4,853,850
4,853,851
4,853,872
[illegible] 4,853,852
[illegible] 4,853,853
413.01 4,853,854
422 4,853,855
424.01 4,853,856
424.04 4,853,859
424.05 4,853,860
424.06 4,853,861
424.1 4,853,857
4,853,858
431.05 4,853,862
431.07 4,853,720
[illegible] 4,853,863
464.02 4,853,864
4,853,865
470 4,853,866
474.22 4,853,867
476 4,853,868
478 4,853,869
[illegible] 4,853,870
[illegible] 4,853,871
513 4,853,873
4,853,874
514 4,853,875
[illegible] 4,853,877
521 4,853,878
552 4,853,879
559 4,853,880
567 4,853,881
570 4,853,882
578 4,853,883
[illegible] 4,853,884
718 4,853,885
745 4,853,886
[illegible] 4,853,887
[illegible] 4,853,888
4,853,889
4,853,890
4,853,891

CLASS 365

[illegible] 4,853,892
145 4,853,893
154 4,853,894
[illegible] 4,853,895
189.02 4,853,896
189.11 4,853,897
4,853,898
207 4,853,899

CLASS 367

[illegible] 4,853,900
27 4,853,901
[illegible] 4,853,902
[illegible] 4,853,903
89 4,853,904
143 4,853,905
[illegible] 4,853,906
4,853,907

CLASS 368

19 4,853,908
190 4,853,909
[illegible] 4,853,910

CLASS 369

13 4,853,911
32 4,853,913
4,853,914
4,853,915
36 4,853,916
44 4,853,917
[illegible] 4,853,919
59 4,853,920
4,853,921
72 4,853,922
73 4,853,912
120 4,853,923
270 4,853,924
291 4,853,925
4,853,926

CLASS 370

16 4,853,927

CLASS 371

15 4,853,928
25 4,853,929
43 4,853,930
55 4,853,931
68 4,853,932

CLASS 372

18 4,853,933
29 4,853,934
32 4,853,935
45 4,853,936
53 4,853,937
65 4,853,938
87 4,853,940

CLASS 373

72 4,853,941
91 4,853,942

CLASS 375

87 4,853,943
94 4,853,944

CLASS 376

123 4,853,173
216 4,853,175
254 4,853,174
333 4,853,176
418 4,853,177

CLASS 377

10 4,853,945

CLASS 378

4 4,853,946
99 4,853,947
177 4,853,948

CLASS 379

2 4,853,949
24 4,853,950
62 4,853,951
88 4,853,952
4,853,953
93 4,853,954
230 4,853,955
269 4,853,956
279 4,853,957
386 4,853,958
413 4,853,959
437 4,853,960

CLASS 380

21 4,853,961
44 4,853,962

CLASS 381

31 4,853,963
156 4,853,964
188 4,853,966
205 4,853,965

CLASS 382

8 4,853,967
4,853,968
54 4,853,969
4,853,970
56 4,853,971

CLASS 419

23 4,853,178
28 4,853,179
66 4,853,180

CLASS 420

111 4,853,181
129 4,853,182
454 4,853,183
489 4,853,184
584 4,853,185

CLASS 421

35.7 4,853,266

CLASS 422

55 4,853,186
104 4,853,188
140 4,853,189
144 4,853,187
197 4,853,190

CLASS 423

226 4,853,191
4,853,192
235 4,853,193
239 4,853,194
242 4,853,195
290 4,853,196
306 4,853,197
309 4,853,200
320 4,853,201
326 4,853,202
328 4,853,203
335 4,853,198
344 4,853,204
472 4,853,205
542 4,853,206
592 4,853,207
594 4,853,199
659 4,853,208

CLASS 424

1.1 4,853,209
3 4,853,210
44 4,853,211
48 4,853,212
58 4,853,213
69 4,853,214
71 4,853,215
73 4,853,216
84 4,853,217
85.7 4,853,218
85.8 4,853,219
101 4,853,220
195.1 4,853,222
405 4,853,223
423 4,853,225
426 4,853,226
427 4,853,224
443 4,853,227
450 4,853,228
455 4,853,229
466 4,853,230
649 4,853,221

CLASS 426

7 4,853,231
35 4,853,232
74 4,853,233
77 4,853,234
93 4,853,235
102 4,853,236
241 4,853,238
249 4,853,239
250 4,853,240
320 4,853,241
516 4,853,242
564 4,853,243
573 4,853,244
575 4,853,245
580 4,853,246
590 4,853,237
613 4,853,247
634 4,853,248

CLASS 427

3 4,853,249
34 4,853,250
38 4,853,251
53.1 4,853,252
54.1 4,853,253
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01	:	4,852,373	4,852,517	4,853,109	4,853,970		4,853,961		4,852,616
		4,852,746	4,852,552	4,853,117	4,263,347	10	: 4,853,025		4,852,687
		4,853,694	4,852,565	4,853,120	4,471,218		4,853,027		4,852,749
		4,853,954	4,852,580	4,853,128	08 : Re.33,003		4,853,333		4,852,777
02	:	4,852,190	4,852,583	4,853,164	4,852,216		4,853,352		4,852,895
		4,852,780	4,852,590	4,853,165	4,852,262		4,853,442		4,852,954
		4,852,831	4,852,592	4,853,176	4,852,286		4,853,485		4,852,963
04	:	4,852,354	4,852,600	4,853,178	4,852,584		4,853,507		4,852,965
		4,852,539	4,852,623	4,853,201	4,852,586		4,853,602		4,852,972
		4,852,621	4,852,646	4,853,224	4,852,627		4,853,868		4,852,990
		4,852,672	4,852,647	4,853,229	4,852,641	11	: 4,852,784		4,853,246
		4,852,843	4,852,651	4,853,239	4,852,855	12	: 4,852,197		4,853,280
		4,852,925	4,852,652	4,853,244	4,853,088		4,852,260		4,853,460
		4,853,347	4,852,668	4,853,264	4,853,134		4,852,269		4,853,551
		4,853,497	4,852,692	4,853,268	4,853,374		4,852,274		4,853,839
		4,853,499	4,852,699	4,853,290	4,853,532		4,852,314	16	: 4,852,194
		4,853,569	4,852,728	4,853,291	4,853,704		4,852,413		4,852,521
		4,853,641	4,852,729	4,853,306	4,853,893		4,852,476	17	: 4,852,193
		4,853,823	4,852,730	4,853,315	4,853,928		4,852,481		4,852,303
		4,853,826	4,852,743	4,853,325	09 : 4,852,204		4,852,489		4,852,325
		4,853,827	4,852,744	4,853,330	4,852,248		4,852,582		4,852,359
		4,853,931	4,852,781	4,853,331	4,852,330		4,852,587		4,852,377
05	:	4,852,231	4,852,790	4,853,332	4,852,334		4,852,601		4,852,436
		4,852,526	4,852,801	4,853,357	4,852,343		4,852,682		4,852,501
		4,852,619	4,852,802	4,853,358	4,852,350		4,852,733		4,852,511
		4,852,712	4,852,807	4,853,373	4,852,448		4,852,769		4,852,536
		4,852,799	4,852,822	4,853,388	4,852,479		4,852,776		4,852,540
		4,852,834	4,852,825	4,853,464	4,852,482		4,852,850		4,852,563
		4,852,921	4,852,830	4,853,500	4,852,715		4,852,866		4,852,568
06	:	4,852,186	4,852,838	4,853,528	4,852,772		4,852,871		4,852,585
		4,852,221	4,852,842	4,853,533	4,852,786		4,852,875		4,852,597
		4,852,223	4,852,844	4,853,537	4,852,788		4,852,881		4,852,609
		4,852,242	4,852,848	4,853,563	4,852,795		4,852,896		4,852,642
		4,852,245	4,852,874	4,853,626	4,852,856		4,852,930		4,852,656
		4,852,265	4,852,878	4,853,628	4,852,912		4,852,933		4,852,657
		4,852,277	4,852,892	4,853,630	4,853,095		4,852,937		4,852,662
		4,852,280	4,852,894	4,853,650	4,853,148		4,853,089		4,852,674
		4,852,284	4,852,909	4,853,668	4,853,172		4,853,334		4,852,680
		4,852,297	4,852,914	4,853,674	4,853,273		4,853,419		4,852,683
		4,852,300	4,852,920	4,853,689	4,853,300		4,853,421		4,852,735
		4,852,313	4,852,923	4,853,699	4,853,327		4,853,492		4,852,738
		4,852,318	4,852,938	4,853,718	4,853,409		4,853,548		4,852,751
		4,852,347	4,852,940	4,853,759	4,853,410		4,853,577		4,852,760
		4,852,357	4,852,945	4,853,784	4,853,467		4,853,637		4,852,783
		4,852,376	4,852,955	4,853,805	4,853,505		4,853,684		4,852,817
		4,852,386	4,852,983	4,853,807	4,853,523		4,853,696		4,852,886
		4,852,387	4,853,028	4,853,808	4,853,594		1,032,201		4,852,893
		4,852,450	4,853,055	4,853,814	4,853,706	13	: 4,852,257		4,852,910
		4,852,451	4,853,056	4,853,820	4,853,852		4,852,282		4,852,919
		4,852,452	4,853,057	4,853,877	4,853,864		4,852,328		4,852,926
		4,852,455	4,853,059	4,853,878	4,853,865		4,852,416		4,852,964
		4,852,493	4,853,065	4,853,898	4,853,869		4,852,505		4,852,986
		4,852,503	4,853,080	4,853,950	4,853,952		4,852,573		4,853,049

	4,853,072		4,853,660	4,852,214	4,852,837		4,853,214		4,853,287
	4,853,085		4,853,769	4,852,516	4,852,887		4,853,238	46	: 4,852,310
	4,853,098		4,853,821	4,852,518	4,852,890		4,853,256	47	: Re.33,008
	4,853,140		4,853,837	4,852,524	4,852,918		4,853,364		4,852,365
	4,853,200	26	: 4,852,189	4,852,697	4,852,956		4,853,395		4,852,397
	4,853,235		4,852,200	4,852,739	4,852,967		4,853,422		4,852,566
	4,853,370		4,852,228	4,852,757	4,852,973		4,853,478		4,852,593
	4,853,491		4,852,239	4,852,792	4,852,993		4,853,493		4,852,756
	4,853,692		4,852,240	4,852,794	4,853,004		4,853,597		4,853,240
	4,853,884		4,852,292	4,852,845	4,853,009		4,853,614		4,853,461
	4,853,949		4,852,352	4,852,898	4,853,030		4,853,708		4,853,480
18	: Re.33,007		4,852,375	4,852,928	4,853,040		4,853,711	48	: 4,852,232
	4,852,198		4,852,381	4,852,929	4,853,090		4,853,712		4,852,250
	4,852,323		4,852,390	4,852,959	4,853,115		4,853,713		4,852,258
	4,852,444		4,852,425	4,852,960	4,853,186		4,853,777		4,852,263
	4,852,510		4,852,426	4,852,968	4,853,197		4,853,832		4,852,288
	4,852,513		4,852,437	4,853,002	4,853,227		4,853,946		4,852,293
	4,852,528		4,852,438	4,853,035	4,853,232	40	: 4,852,324		4,852,298
	4,852,542		4,852,470	4,853,063	4,853,243		4,852,456		4,852,301
	4,852,632		4,852,483	4,853,064	4,853,266		4,852,557		4,852,393
	4,852,688		4,852,500	4,853,103	4,853,319		4,852,603		4,852,395
	4,852,763		4,852,527	4,853,105	4,853,336		4,852,607		4,852,399
	4,852,861		4,852,544	4,853,106	4,853,338		4,852,785		4,852,401
	4,853,061		4,852,706	4,853,107	4,853,346		4,852,936		4,852,403
	4,853,069		4,852,723	4,853,111	4,853,349		4,853,023		4,852,441
	4,853,185		4,852,747	4,853,147	4,853,350		4,853,119		4,852,494
	4,853,345		4,852,764	4,853,168	4,853,355		4,853,444		4,852,495
	4,853,398		4,852,765	4,853,187	4,853,366		4,853,883		4,852,560
	4,853,572		4,852,773	4,853,193	4,853,367		4,853,905		4,852,579
	4,853,744		4,852,846	4,853,212	4,853,389		4,853,906		4,852,598
	4,853,828		4,852,902	4,853,213	4,853,392		4,853,907		4,852,602
19	: 4,852,748		4,852,913	4,853,216	4,853,423	41	: 4,852,435		4,852,648
	4,852,818		4,852,935	4,853,218	4,853,452		4,852,509		4,852,649
	4,852,873		4,852,979	4,853,247	4,853,457		4,853,037		4,852,650
	4,853,324		4,853,017	4,853,259	4,853,458		4,853,122		4,852,653
	4,853,592		4,853,018	4,853,278	4,853,459		4,853,498		4,852,654
	4,853,653		4,853,039	4,853,283	4,853,483		4,853,521		4,852,655
20	: 4,852,915		4,853,075	4,853,292	4,853,513		4,853,580		4,852,671
	4,853,000		4,853,123	4,853,353	4,853,515		4,853,601		4,852,705
21	: 4,852,658		4,853,209	4,853,369	4,853,536		4,853,627		4,852,840
	4,852,689		4,853,221	4,853,372	4,853,542		4,853,714		4,852,942
	4,852,877		4,853,270	4,853,384	4,853,552		4,853,843		4,852,997
22	: 4,852,210		4,853,329	4,853,412	4,853,565		4,853,846		4,853,003
	4,852,238		4,853,428	4,853,413	4,853,595		4,853,849		4,853,010
	4,852,307		4,853,474	4,853,439	4,853,639		4,853,861		4,853,014
	4,852,392		4,853,629	4,853,447	4,853,663	42	: Re.33,002		4,853,032
	4,852,394		4,853,785	4,853,449	4,853,680		4,852,252		4,853,041
	4,852,666		4,853,850	4,853,470	4,853,719		4,852,276		4,853,054
	4,852,719		4,853,860	4,853,472	4,853,728		4,852,308		4,853,108
	4,852,731		4,853,879	4,853,476	4,853,737		4,852,321		4,853,110
	4,853,208		4,853,945	4,853,484	4,853,738		4,852,388		4,853,112
	4,853,371		4,853,966	4,853,514	4,853,741		4,852,400		4,853,180
	4,853,432	27	: 4,852,185	4,853,543	4,853,746		4,852,404		4,853,189
	4,853,465		4,852,195	4,853,590	4,853,751		4,852,409		4,853,192
	4,853,771		4,852,305	4,853,610	4,853,774		4,852,520		4,853,317
23	: 4,852,504		4,852,337	4,853,625	4,853,787		4,852,610		4,853,337
	4,852,813		4,852,389	4,853,631	4,853,795		4,852,669		4,853,344
	4,852,949		4,852,465	4,853,647	4,853,829		4,852,690		4,853,420
	4,853,646		4,852,471	4,853,667	4,853,863		4,852,704		4,853,426
24	: 4,852,215		4,852,490	4,853,679	4,853,875		4,852,724		4,853,437
	4,852,299		4,852,543	4,853,683	4,853,926		4,852,737		4,853,456
	4,852,496		4,852,548	4,853,685	4,853,960		4,852,755		4,853,564
	4,852,534		4,852,624	4,853,753	4,853,965		4,852,766		4,853,615
	4,852,547		4,852,767	4,853,766	4,853,967		4,852,829		4,853,616
	4,852,570		4,852,809	4,853,889	37	: 4,852,188		4,852,860	4,853,677
	4,852,577		4,852,883	4,853,944	4,852,225		4,852,924		4,853,688
	4,852,789		4,852,969	4,853,956	4,852,236		4,852,948		4,853,842
	4,852,839		4,853,195	4,545,830	4,852,290		4,852,999		4,853,855
	4,853,042		4,853,236	35	: 4,853,705	4,852,338		4,853,001	4,853,882
	4,853,305		4,853,267	36	: Re.33,005	4,852,486		4,853,033	4,853,895
	4,853,339		4,853,310		4,852,191	4,852,714		4,853,034	4,853,901
	4,853,380		4,853,365		4,852,220	4,852,734		4,853,083	4,853,902
	4,853,510		4,853,561		4,852,224	4,852,876		4,853,104	4,853,903
	4,853,575		4,853,675		4,852,255	4,853,067		4,853,130	4,853,955
	4,853,607		4,853,763		4,852,272	4,853,275		4,853,132	4,853,962
	4,853,613		4,853,802		4,852,295	4,853,502		4,853,174	4,853,969
	4,853,722		4,853,811		4,852,316	39	: 4,852,230	4,853,181	49 : 4,853,051
	4,853,791		4,853,830		4,852,329	4,852,271		4,853,202	4,853,205
	4,853,871		4,853,940		4,852,344	4,852,281		4,853,254	50 : 4,852,458
25	: 4,852,251	28	: 4,853,599		4,852,358	4,852,319		4,853,257	4,852,459
	4,852,275	29	: 4,852,309		4,852,378	4,852,355		4,853,298	4,852,561
	4,852,443		4,852,364		4,852,379	4,852,360		4,853,301	4,853,070
	4,852,466		4,852,431		4,852,396	4,852,366		4,853,304	4,853,081
	4,852,469		4,852,569		4,852,442	4,852,384		4,853,375	51 : 4,852,468
	4,852,531		4,852,722		4,852,453	4,852,398		4,853,377	4,852,478
	4,852,546		4,852,879		4,852,454	4,852,408		4,853,383	4,852,578
	4,852,567		4,853,144		4,852,506	4,852,554		4,853,415	4,852,596
	4,852,604		4,853,159		4,852,507	4,852,581		4,853,445	4,852,720
	4,852,637		4,853,401		4,852,530	4,852,629		4,853,446	4,852,770
	4,852,754		4,853,770		4,852,545	4,852,636		4,853,462	4,853,005
	4,852,841		4,853,963		4,852,559	4,852,640		4,853,466	4,853,020
	4,852,851	30	: 4,852,612		4,852,564	4,852,753		4,853,659	4,853,175
	4,852,884	31	: 4,852,235		4,852,575	4,852,778		4,853,715	4,853,177
	4,852,885		4,852,661		4,852,599	4,852,888		4,853,758	4,853,294
	4,852,988		4,852,970		4,852,608	4,852,931		4,853,818	4,853,854
	4,853,076		4,852,971		4,852,620	4,852,941		4,853,900	53 : 4,852,296
	4,853,100	32	: 4,852,779		4,852,725	4,852,989		4,853,968	4,852,336
	4,853,126		4,852,806		4,852,740	4,853,024	44	: 4,853,118	4,852,551
	4,853,131	33	: 4,852,227		4,852,741	4,853,046		4,853,448	4,852,716
	4,853,182		4,852,287		4,852,742	4,853,079		4,853,503	4,852,800
	4,853,219		4,852,498		4,852,761	4,853,099	45	: 4,852,226	4,852,805
	4,853,228		4,853,016		4,852,774	4,853,101		4,852,246	4,852,901
	4,853,416		4,853,163		4,852,796	4,853,138		4,852,410	4,852,916
	4,853,547		4,853,655		4,852,815	4,853,169		4,852,823	4,852,917
	4,853,598		4,853,697		4,852,821	4,853,171		4,853,265	4,853,086
	4,853,619	34	: 4,852,202		4,852,832	4,853,210		4,853,272	4,853,154

4,853,335	4,852,446	4,852,229	4,852,571	4,853,060	4,853,558
4,853,431	4,853,356	4,852,266	4,852,684	4,853,142	4,853,573
4,853,529	4,853,856	4,852,291	4,852,717	4,853,160	4,853,581
4,853,555	55 : 4,852,196	4,852,411	4,852,787	4,853,183	4,853,665
4,853,643	4,852,199	4,852,433	4,852,847	4,853,281	4,853,669
4,853,717	4,852,201	4,852,512	4,852,939	4,853,316	56 : 4,852,460
4,853,888	4,852,203	4,852,555			

DESIGN PATENTS

01 :	302,547		302,590		302,568	26 :	302,526		302,492	40	302,533
	302,563		302,592		302,616		302,536		302,498	41	302,485
04 :	302,587		302,608	18 :	302,519		302,549		302,499	42	302,506
	302,609		302,613		302,546		302,550		302,504		302,529
05 :	302,488		302,620	19 :	302,509		302,569		302,508		302,532
	302,512	08 : 302,585			302,514	27 :	302,500		302,511		302,543
06 :	302,489		302,600		302,612		302,510		302,574		302,544
	302,503	10 : 302,618		21 :	302,573		302,521		302,582		302,562
	302,505	12 : 302,496		22 :	302,484		302,557		302,583	45	302,571
	302,525		302,527	24 :	302,515	29 :	302,513		302,586		302,572
	302,551		302,534		302,566		302,522		302,589	47	302,518
	302,556		302,594		302,619		302,561		302,603	48	302,502
	302,567	13 : 302,490		25 :	302,486	32 :	302,554	39 :	302,517		302,610
	302,570		302,520		302,487	33 :	302,501		302,524	49	302,575
	302,576		302,537		302,528	34 :	302,542		302,579	50	302,617
	302,584	17 : 302,540			302,555		302,580		302,581	55	302,523
	302,588		302,558		302,564	36 :	302,491		302,607		

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06	6,959	26 : 6,960	6,967		6,970	39	6,956	6,958
	6,963	34 : 6,965	6,968					
12	6,964	6,966	6,969	37	6,961		6,957	6,962

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August 8, 1989 Volume 1105 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1101 O.G. 56 on Apr. 25, 1989.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	550.00
—Corresponding prior U.S. national application filed:	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority.	400.00
—Additional examination fee, per additional invention	130.00
—Searching Authority not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee:	436.00
Basic Supplemental fee (for each page over 30) :	9.00
Designation fee per country or region for the first 10 national or regional offices:	106.00
Designation fee for 11th and subsequent designations :	No Charge
Handling fee:	134.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	165.00	330.00
USPTO was ISA but no IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

May 3, 1989. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on August 5, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents . 4,603,439 through 4,604,757
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on August 3, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,342,121 through 4,343,043
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant..... $495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small entity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MAY 21, 1989
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,517,688	06/519,782	05/21/85
4,517,689	06/356,832	05/21/85
4,517,694	06/547,499	05/21/85
4,547,698	06/438,392	05/21/85
4,517,701	06/597,570	05/21/85
4,517,706	06/507,577	05/21/85
4,517,711	06/469,190	05/21/85
4,517,719	06/368,998	05/21/85
4,517,722	06/543,044	05/21/85
4,517,723	06/600,197	05/21/85
4,517,729	06/421,543	05/21/85
4,517,741	06/379,900	05/21/85
4,517,746	06/499,275	05/21/85
4,517,747	06/506,748	05/21/85
4,517,750	06/590,069	05/21/85
4,517,753	06/375,033	05/21/85
4,517,755	06/515,017	05/21/85
4,517,759	06/587,509	05/21/85
4,517,760	06/546,303	05/21/85
4,517/761	06/463,715	05/21/85
4,517,772	06/560,416	05/21/85
4,517,773	06/441,683	05/21/85
4,517,774	06/406,425	05/21/85
4,517,778	06/437,681	05/21/85
4,517,780	06/473,252	05/21/85
4,517,781	06/481,343	05/21/85
4,517,787	06/408,918	05/21/85
4,517,789	06/519,848	05/21/85
4,517,798	06/499,581	05/21/85
4,517,808	06/594,830	05/21/85
4,517,826	06/373,971	05/21/85
4,517,829	06/469,895	05/21/85
4,517,831	06/554,606	05/21/85
4,517,834	06/589,444	05/21/85
4,517,839	06/510,759	05/21/85
4,517,861	06/516,577	05/21/85
4,517,864	06/525,243	05/21/85
4,517,865	06/568,681	05/21/85
4,517,866	06/414,963	05/21/85
4,517,876	06/611,073	05/21/85
4,517,884	06/481,401	05/21/85
4,517,885	06/591,065	05/21/85
4,517,898	06/419,253	05/21/85
4,517,900	06/512,778	05/21/85
4,517,903	06/499,949	05/21/85
4,517,921	06/505,244	05/21/85
4,517,923	06/511,528	05/21/85
4,517,927	06/379,812	05/21/85
4,517,953	06/460,125	05/21/85
4,517,956	06/529,545	05/21/85
4,517,959	06/426,382	05/21/85
4,517,963	06/455,575	05/21/85
4,517,981	06/502,208	05/21/85
4,517,986	06/586,550	05/21/85
4,517,990	06/589,504	05/21/85
4,517,991	06/604,213	05/21/85
4,517,993	06/417,792	05/21/85
4,517,998	06/584,129	05/21/85
4,518,010	06/447,625	05/21/85
4,518,013	06/444,977	05/21/85
4,518,015	06/621,145	05/21/85
4,518,021	06/576,813	05/21/85
4,518,022	06/427,837	05/21/85
4,518,028	06/325,433	05/21/85
4,518,036	06/445,779	05/21/85
4,518,037	06/329,181	05/21/85
4,518,045	06/504,002	05/21/85
4,518,046	06/390,435	05/21/85
4,518,060	06/479,180	05/21/85
4,518,067	06/341,802	05/21/85
4,518,080	06/530,665	05/21/85
4,518,082	06/568,362	05/21/85
4,518,090	06/409,222	05/21/85
4,518,092	06/571,787	05/21/85
4,518,094	06/285,598	05/21/85
4,518,095	06/616,130	05/21/85
4,518,097	06/613,613	05/21/85
4,518,098	06/439,268	05/21/85
4,518,100	06/450,993	05/21/85
4,518,116	06/608,931	05/21/85
4,518,117	06/486,190	05/21/85
4,518,124	06/578,983	05/21/85
4,518,131	06/441,556	05/21/85
4,518,141	06/426,715	05/21/85
4,518,150	06/529,850	05/21/85
4,518,158	06/332,948	05/21/85
4,518,163	06/423,560	05/21/85

Patent Number	Serial Number	Issue Date
4,518,171	06/541,710	05/21/85
4,518,183	06/583,751	05/21/85
4,518,185	06/533,232	05/21/85
4,518,188	06/387,763	05/21/85
4,518,189	06/458,837	05/21/85
4,518,194	06/554,504	05/21/85
4,518,198	06/294,994	05/21/85
4,518,203	06/557,489	05/21/85
4,518,205	06/550,811	05/21/85
4,518,213	06/499,694	05/21/85
4,518,221	06/446,035	05/21/85
4,518,223	06/519,292	05/21/85
4,518,224	06/522,345	05/21/85
4,518,233	06/564,349	05/21/85
4,518,236	06/388,960	05/21/85
4,518,241	06/499,151	05/21/85
4,518,251	06/491,965	05/21/85
4,518,266	06/517,681	05/21/85
4,518,267	06/510,229	05/21/85
4,518,270	06/480,171	05/21/85
4,518,273	06/491,824	05/21/85
4,518,275	06/511,765	05/21/85
4,518,277	06/387,646	05/21/85
4,518,280	06/603,907	05/21/85
4,518,299	06/469,398	05/21/85
4,518,300	06/441,379	05/21/85
4,518,308	06/354,780	05/21/85
4,518,309	06/302,708	05/21/85
4,518,313	06/352,228	05/21/85
4,518,327	06/522,160	05/21/85
4,518,328	06/508,539	05/21/85
4,518,341	06/585,528	05/21/85
4,518,352	06/649,151	05/21/85
4,518,358	06/404,549	05/21/85
4,518,365	06/367,871	05/21/85
4,518,366	06/475,856	05/21/85
4,518,367	06/543,408	05/21/85
4,518,372	06/544,539	05/21/85
4,518,373	06/481,094	05/21/85
4,518,386	06/527,980	05/21/85
4,518,393	06/553,447	05/21/85
4,518,396	06/471,157	05/21/85
4,518,405	06/562,421	05/21/85
4,518,409	06/526,159	05/21/85
4,518,412	06/433,130	05/21/85
4,518,414	06/457,186	05/21/85
4,518,418	06/503,376	05/21/85
4,518,450	06/559,213	05/21/85
4,518,457	06/358,975	05/21/85
4,518,467	06/633,198	05/21/85
4,518,490	06/597,627	05/21/85
4,518,495	06/577,994	05/21/85
4,518,503	06/594,926	05/21/85
4,518,506	06/454,969	05/21/85
4,518,507	06/531,750	05/21/85
4,518,518	06/580,034	05/21/85
4,518,527	06/523,787	05/21/85
4,518,528	06/577,068	05/21/85
4,518,533	06/423,350	05/21/85
4,518,539	06/515,355	05/21/85
4,518,542	06/238,639	05/21/85
4,518,549	06/547,793	05/21/85
4,518,550	06/494,895	05/21/85
4,518,551	06/605,242	05/21/85
4,518,555	06/504,159	05/21/85
4,518,562	06/506,790	05/21/85
4,518,567	06/416,993	05/21/85
4,518,572	06/570,087	05/21/85
4,518,598	06/569,151	05/21/85
4,518,607	06/514,409	05/21/85
4,518,614	06/546,654	05/21/85
4,518,638	06/572,527	05/21/85
4,518,641	06/466,775	05/21/85
4,518,674	06/592,752	05/21/85
4,518,691	06/607,348	05/21/85
4,518,694	06/414,552	05/21/85
4,518,697	06/449,415	05/21/85
4,518,708	06/586,640	05/21/85
4,518,732	06/611,914	05/21/85
4,518,737	06/349,466	05/21/85
4,518,738	06/387,887	05/21/85
4,518,756	06/551,763	05/21/85
4,518,762	06/530,177	05/21/85
4,518,783	06/498,786	05/21/85
4,518,785	06/437,683	05/21/85
4,518,792	06/526,579	05/21/85
4,518,799	06/386,466	05/21/85
4,518,823	06/539,648	05/21/85
4,518,834	06/529,949	05/21/85
4,518,835	06/525,172	05/21/85
4,518,858	06/451,220	05/21/85
4,518,872	06/467,620	05/21/85
4,518,888	06/453,333	05/21/85
4,518,911	06/459,134	05/21/85
4,518,920	06/384,611	05/21/85
4,518,938	06/585,164	05/21/85
4,518,939	06/599,498	05/21/85
4,518,951	06/391,617	05/21/85
4,518,953	06/499,712	05/21/85
4,518,956	06/366,387	05/21/85
4,518,963	06/371,799	05/21/85
4,518,986	06/454,446	05/21/85
4,518,990	06/512,516	05/21/85
4,518,998	06/384,476	05/21/85
4,519,008	06/430,671	05/21/85
4,519,015	06/525,766	05/21/85
4,519,019	06/602,492	05/21/85
4,519,023	06/496,378	05/21/85
4,519,046	06/293,225	05/21/85
4,519,059	06/553,189	05/21/85
4,519,062	06/390,737	05/21/85
4,519,063	06/278,037	05/21/85
4,519,067	06/487,027	05/21/85
4,519,069	06/437,165	05/21/85

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,453,047	06/427,079	6/06/84	9/29/82	06/20/89

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,859,292, Re. S. N. 367,412, Filed June 16, 1989, Cl. 546/19, N-HALOACYCL (2-SPIROCYCLOALTPHATIC) OXAZOLIDINER, Kenneth P. Dorschner, et al., Owner of Record: *SCM Glidco Organics, Corp., Cleveland, Ohio*, Attorney or Agent: Edwin H. Baker, Ex. Gp.: 129

4,304,895, Re. S. N. 369,241, Filed June 20, 1989, Cl. 526/313, ULTRAVIOLET ABSORBING CORNEAL CONTACT LENSES, Samuel Loshaek, Owner of Record: *Schering Corp., Kenilworth, N. J.*, Attorney or Agent: David J. Oldenkamp, Ex. Gp.: 155

4,518,132, Re. S. N. 368,189, Filed June 19, 1989, Cl. 242/107.4A, COMBINATION SEAT BELT RETRACTOR MECHANISM, Timothy J. Schmidt, Owner of Record: *General Safety Corp., St. Clair, Mich*, Attorney or Agent: Steven L. Oberholtzer, Ex. Gp.: 245

4,641,692, Re. S. N. 308,863, Filed Feb. 9, 1989, Cl. 141/095, BEVERAGE DISPENSER WITH AUTOMATIC CUP-FILLING CONTROL, Clay Bennett, Owner of Record; *Cornelius Co., Anoka, Minn.*, Attorney or Agent: Henery C. Kovar, Ex. Gp.: 243

4,647,159, Re. S. N. 317,957, Filed Mar. 2, 1989, Cl. 350/413, GRADIENT INDEX TYPE SINGLE LENS, Takesha Baba, Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent; Michael K. O'Neil, Ex. Gp.: 257

4,653,931, Re. S. N. 329,916, Filed Mar. 28, 1989, Cl. 368/205, SELF-CHARGING ELECTRONIC TIME PIECE, Keigo Takeda, Owner of Record: *Shiojiri Kogyo Kabushiki Kaisha, Nagand-Ken, Japan*, Attorney or Agent: Harold I. Kaplan, Ex. Gp.: 217

4,665,850, Re. S. N. 356,704, Filed Apr. 14, 1989, Cl. 112/231, ROTARY HOOK ASSEMBLY, Hiromitsu Shimizu, Owner of Record: *Tokuzo Hirose, Ashiya, Japan*, Attorney or Agent: Jeffrey Nolton, Ex. Gp.: 247

4,666,505, Re. S. N. 369,585, Filed June 21, 1989, Cl. 71/92, 1-(2-OXYAMINOSULPHONLYPHENYLSULFONYL)-3 HETEROARYL-UREAS, Hans-Toachim Diehr, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany*, Attorney or Agent: Leonard Horn, Ex. Gp.: 129

4,672,358, Re. S. N. 364,472, Filed June 9, 1989, Cl. 338/226, SURFACE-MOUNTED POWER, Theodore S. Pryst, et al., Owner of Record: *North American Phillips Corp, New York, N. Y.*, Attorney or Agent: John J. Held, Ex. Gp.: 216

4,673,973, Re. S. N. 367,300, Filed June 16, 1989, Cl. 358/93, SPLIT-IMAGE, MULTI-POWER MICROSCOPIC IMAGE DISPLAY SYSTEM AND METHOD, Robert Sledley, Owner of Record: *National Biomedical Research Foundation, Washington, D. C.*, Attorney or Agent: Joseph G. Seeber, Ex. Gp.: 262

4,673,995, Re. S. N. 371,416, Filed June 15, 1989, Cl. 360/93, CARTRIDGE TAPE DRIVE WITH FRICTION ROLLER TO OPEN CARTRIDGE DOOR, Wolfgang Spiegistein, Owner of Record: *Shugart Corp., Irvine, Calif.*, Attorney or Agent: Michael H. Jester, Ex. Gp. 233

4,675,515, Re. S. N. 367,476, Filed June 16, 1989, Cl. 235/381, DRIVE THROUGH CREDIT CARD PAYMENT DEVICE, James A. Lucero, Owner of Record: *Inventor*, Attorney or Agent: H. Duane Switzer, Ex. Gp.: 235

4,676,378, Re. S. N. 369,459, Filed June 21, 1989, Cl. 206/554, BAG PACK, William H. Baxley, et al., Owner of Record: *Sanoco Products Co., Hartsville, S. C.*, Attorney or Agent: Bias P. Arroyo, Ex. Gp.: 241

4,676,869, Re. S. N. 371,246, Filed June 23, 1989, Cl. 156/643, INTEGRATED CIRCUITS HAVING STEPPED DIELECTRIC REGIONS, Kuo-Hua Lee, et al., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hills, N. J.*, Attorney or Agent: J. H. Fox, Ex. Gp.: 133

4,693,368, Re. S. N. 367,382, Filed June 16, 1989, Cl. 206/287, COMBINATION GARMENT BAG AND PACKING CASE LUGGAGE ARTICLE, William L. King, et al., Owner of Record: *Samsonite Corp., Denver, Colo.*, Attorney or Agent: John R. Ley, Ex Gp.: 241

4,725,156, Re. S. N. 369,391, Filed June 21, 1989, Cl. 400/680, METHOD AND STRUCTURE FOR PROPERLY ALIGNING FORM IN A PRINTER, Thomas A. Proulx, et al., Owner of Record: *Intuit, Polo Alto, Calif.*, Attorney or Agent: Gideon Gimlan, Ex. Gp.: 337

4,751,012, Re. S. N. 370,356, Filed June 22, 1989, Cl. 252/52A, LUBRICANTS FOR RECIPROCATING AIR COMPRESSOR, Eldon L. Ward, et al., Owner of Record: *Dow Chemical Co., Midland, Mich.*, Attorney or Agent: Benjamin G. Colley, Ex. Gp.: 118

4,767,805, Re. S. N. 369,496, Filed June 21, 1989, Cl. 523/468, INTERMEDIATE FOR COMPOSITE MATERIALS, Hisashi Tada, et al., Owner of Record: *Mitsubishi Rayon Co., Tokyo, Japan*, Attorney or Agent: Peter D. Olexy, Ex. Gp.: 151

4,775,884, Re. S. N. 368,842, Filed June 20, 1989, Cl. 357/51, INTEGRATED CIRCUIT HAVING PERMANENT ADJUSTMENT CIRCUITRY WHICH REQUIRES LOW ADJUSTMENT CURRENT, George Erdi, Owner of Record: *Inventor*, Attorney or Agent: Stephen C. Shear, Ex. Gp.: 253

REEXAM APPLICATIONS FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,264,083, Reexam. No. 90/001,798, Requested June 22, 1989, Cl. 280/154.509, SPLASH GUARD, Kenneth S. Matthew, et al., Owner of Record: *Custom Accessories, Inc., Lincolnwood, Ill.*, Attorney or Agent: Wallenstein, Wagner, Hattis, et al., Ex. Gp.: 310, Requester: Pretty Products, Inc., Coshocton, Ohio

4,662,899, Reexam. No. 90/001,796, Requested June 22, 1989, Cl. 114/103, AIR POLLUTION CONTROL SYSTEM METHOD AND APPARATUS, Jag S. Tandon, Owner of Record: *American Environmental International, Inc., Northbrook, Ill.*, Attorney or Agent: Wallenstein, Wagner, Hattis, et al., Ex. Gp.: 310, Requester: MMT Environmental Services, Inc., St. Paul, Minn.

4,708,080, Reexam. No. 90/001,795, Requested June 22, 1989, Cl. 55/80, COMPOSITE THREAD LINE SAILS, Peter G. Conrad, Owner of Record: *CTL, Inc., Saybrook. Conn.*, Attorney or Agent: Curtis, Morris & Safford, Ex. Gp.: 130, Requester: North Sails Group, Milford, Conn.

Extension of Time for Filing Notices of Opposition to Marks Published in the Official Gazette Dated June 27, 1989

Copies of the Trademark Official Gazette dated June 27, 1989 were not mailed until July 7, 1989. Therefore, for marks published in the Trademark Official Gazette dated June 27, 1989, Notices of Opposition filed by August 7, 1989 will be considered timely.

July 12, 1989

JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Part 1
[Docket No. 90114-9135]
RIN: 0651-AA42
Patent Term Extension for Animal Drug Products

Agency: Patent and Trademark Office, Commerce

Action: Final Rule

Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent cases directed to the extension of patent term. These amendments implement the patent term restoration provisions of Pub. L. No. 100-670, 102 Stat. 3971 (November 16, 1988) which permits owners of patents relating to new animal drugs or veterinary biological products that are not biotechnology-generated to apply for extension of the terms of such patents in the same manner as owners of patents relating to human drugs, medical devices, food additives, or color additives are permitted to do under 35 U.S.C. 156.

Effective Date: August 22, 1989

For Further Information Contact: Charles E. Van Horn by telephone at [703] 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: Pub. L. No. 100-670 has made it possible for owners of patents directed to new animal drugs and to veterinary biological products that are not biotechnology-generated to apply for extension of the term of such patents in a manner similar to the owners of patents directed to human drugs, food additives, color additives, and medical devices. A new animal drug or veterinary biological product is biotechnology-generated if it is primarily manufactured using recombinant DNA, recombinant RNA, hybridoma technology, or other processes including site specific genetic manipulation techniques. The primary purpose of this rule change is to revise the present regulations contained in 37 CFR Part 1, Subpart F, to include the two additional categories of subject matter that can now form the basis of patent term extension. These regulations set forth procedures that govern the content and submission of applications for the extension of a patent term to the PTO, and procedures governing the extension determination and issuance of patent term extension certificates by the PTO.

Initial guidelines directed to the preparation and filing of applications for patent term extension as authorized by Pub. L. No. 100-670 were published as "Guidelines For Extension of Patent Term For New Animal Drugs or Veterinary Biological Products Under 35 U.S.C. 156 as Amended" in the Official Gazette. 1097 *Official Gazette* 63 (December 27, 1988). A notice of proposed rulemaking was published in the *Federal Register* on March 7, 1989, at 54 FR 9507 and in the Official Gazette. 1100 *Official Gazette* 128 (March 28, 1989). No oral hearing was conducted on these proposed rules. One written comment was received.

The only written comment received was directed to the proposed amendment to § 1.710(a). The proposed amendment indicated that a patent is eligible for extension of the patent term if the patent claims a product either alone or in combination with other ingredients that read on a composition that received permission for commercial marketing or use. The proposed modification was objected to because of the implication that patent term extension would not be available for composition patents where the claimed compositions do not read on the composition (new drug) approved by the FDA. Such an interpretation, it was argued, would unfairly and narrowly interpret the statute. The comment noted that where a marketing applicant seeks approval for multiple dosage forms or compositions of a new drug, the right to obtain patent term extension is triggered at the time the first new drug application is approved. In a typical situation, an injectable dosage form to be used for acute indications will require a lesser development time and be approved more rapidly than the oral dosage form of the same active ingredient intended for chronic administration. It was represented in the comment that justification for the drug development program might hinge on the expectation of an extension of an oral composition patent. If there were patents on both the injectable dosage form and the oral administration form containing the same active ingredient, which were mutually exclusive for the purposes of this illustration, the new drug holder, it is argued, should have a choice of which patent term to extend based on the first approval of a new chemical entity (NCE) drug. Finally, the comment suggested that the proposed amendment to § 1.710(a) with respect to composition patents stands in marked contrast to the situation which applies in the case of method of use patents. It is alleged, in the comment, that the rule in effect allows an extension of a method of use patent whenever the claimed method of use embraces the use of the active ingredient. According to the comment, where an NCE drug is first approved for the treatment of arthritis, a patent limited to an analgesic use of the NCE drug may be extended. (Note the requirement in § 1.740(a)(4) to identify the use for which the product was approved.)

These remarks made in this comment raise a substantive issue relating to the eligibility of patents for patent term extension under 35 U.S.C. 156 that is not addressed in the rules. The exercise of the Commissioner's rulemaking authority under 35 U.S.C. 6 and 156 can neither enlarge nor reduce the scope of eligibility of a patent for patent term extension under 35 U.S.C. 156. Secondly, the proposed amendment to § 1.710(a) is clearly couched in terms which are permissive without either explicitly or implicitly excluding other possibilities. The proposed amendment was made in response to many inquiries received over the years since enactment of 35 USC 156 as to whether a formulation or composition claim in a patent could form a basis for eligibility for patent term extension. Finally, the PTO has a long-standing policy of not addressing an issue in advance of receiving an application presenting the issue for determination. The issue of whether a patent is eligible for patent term extension that could not be enforced in either the original or extended term against the approved formulation or use that allegedly would give rise to eligibility has not been addressed yet by the PTO.

PTO experience to date did involve consideration of two applications that were filed based on approval of the human drug product OCUFEN Ophthalmic Solution, which contains the active ingredient Flurbiprofen [2-(2-fluoro-4-biphenylyl) propionic acid]. Relevant claims from the two patents that were the subject of the applications for patent term extension were as follows:

I. Patent 3,755,427 (issued August 28, 1973)
Claim 2. 2-(2-fluoro-4-biphenylyl) propionic acid.

II. Patent 3,793,457 (issued February 19, 1974)
Claim 1. A therapeutic composition useful in the treatment of pain, inflammation, and pyretic conditions which comprises a compound selected from the group consisting of 2-(2-fluoro-4-biphenylyl) propionic acid, 2-(2'-fluoro-4-biphenylyl) propionic acid, and 2-(2,2'-difluoro-4-biphenylyl) propionic acid in association with a pharmaceutically acceptable excipent the amount of said compound present in said composition being an amount effective against at least one of said conditions.

Claim 2 of the earlier issued patent is directed to the active ingredient per se, whereas claim 1 of Patent No. 3,793,457 is directed to a formulation which can contain Flurbiprofen in an amount which was effective in the treatment of pain, inflammation, and pyretic conditions.

However, since the approved indication for Ocufen was for the inhibition of intraoperative miosis, it was not immediately apparent to the PTO whether the '457 patent claimed the product within the meaning of 35 U.S.C. 156. Our view was that the 1984 Act was intended to restore to those patent owners a portion of the enforceable term of an appropriate patent of their choice which was lost due to Government required regulatory review for the product covered by the patent prior to the commercial marketing of the claimed product or the use thereof. If the patent could not be enforced against an infringer who was making, using, or selling an ophthalmic solution containing Flurbiprofen for the treatment of intraoperative miosis, it was questioned how the restoration of the lost patent term due to the regulatory process for the approved product is appropriate under the statute.

In this case, the applicant for patent term extension submitted evidence that Flurbiprofen, in an amount of 0.0004% to 0.1%, has anti-inflammatory activity in the eye when topically administered. The approved label showed that Ocufen contained 0.03% of the active ingredient and stated that the product is "a topical nonsteroidal anti-inflammatory product for ophthalmic use." The specification of the '457 patent indicated that

useful compositions preferably contain 0.1-90% by weight of a compound of the invention. Thus, the dosage of the active ingredient for the indicated use clearly overlapped the effective dosages specified in the functional language of claim 1 of the '457 patent. On the basis of this evidence, the PTO concluded that the later issued patent claimed the product. As both patents were determined to be eligible for patent term extension, applicant was permitted to choose the single patent term to be extended. 35 U.S.C. 156(c)(4).

Discussion of Specific Rules

Section 1.710(a) specifically sets forth the existing policy and practice relating to eligibility of patents claiming a composition or formulation that includes the active ingredient. A patent is considered to claim the product at least in those situations where the patent claims the active ingredient per se, or claims a composition or formulation which contains the active ingredient(s) and reads on the composition or formulation approved for commercial marketing or use.

Section 1.710(b) revises the definition of human drug product in paragraph (b)(1) to make the definition conform to Pub. L. No. 100-670. A new paragraph (b)(2) is added to expand the definition of "product" in § 1.710(a) to include a new animal drug and a veterinary biological product, but not one that is primarily manufactured using recombinant DNA, recombinant RNA, hybridoma technology, or other processes including site specific genetic manipulation techniques. Present paragraph (b)(2) is redesignated as paragraph (b)(3). It should be understood that the discussion here of new animal drugs and veterinary biological products is limited to the animal drugs and products defined in Pub. L. No. 100-670.

Paragraph (e)(2) of section 1.720 is revised to indicate that the conditions given therein concern a patent for a product other than one recited in section 1.710(b)(2), due to the exclusion of biotechnology-generated new animal drugs and veterinary biological products in Pub. L. No. 100-670. A new paragraph (e)(3) is added to Section 1.720 directed to the provision in 35 U.S.C. 156(a)(5)(C), which permits the term of a patent directed to a new animal drug or veterinary biological product to be extended based on a second or subsequent approval of the active ingredient provided all the following conditions exist: (a) the patent claims the drug or product, (b) the drug or product is not covered by the claims in any other patent that has been extended ("covered by the claims" means that the drug or product would infringe a claim in the other patent), (c) the patent term was not extended on the basis of the regulatory review period for use in non-food-producing animals, and (d) the second or subsequent approval was the first permitted commercial marketing or use of the drug or product for administration to a food-producing animal. A new pertion is added to paragraph(f) directed to the case where eligibility is to be based on 35 U.S.C. 156 (a)(5)(C). In this latter case, the application must be filed within 60 days of the first approval for administration to a food-producing animal.

Paragraph (a)(4) of § 1.740(a) is amended to (1) eliminate "human" as a modifier for "product," (2) add the Public Health Service Act and the Virus-Serum-Toxin Act to the list of appropriate statutes, and (3) add a requirement to indicate the use for which the product was approved. The first two amendments are necessary to comply with terms of 35 U.S.C. 156 as amended, and the third amendment is necessary to a determination of eligibility where, for example, the application is based on a second or subsequent approval of an active ingredient, but the first approval for administration to a food-producing animal. Paragraph (a)(9) is amended to eliminate the requirement to set forth the statement, beginning on a new page, that the patent for which patent term extension is sought claims the approved product or a method of using or making same, and the required showing listing each applicable claim of the patent and demonstrating the manner in which each applicable claim reads on the approved product or a method of using or making same. This change is made because the information required by this paragraph is within the province of PTO review and there is no need to have such information recited in a readily segregable section of the application. Paragraph (a)(10) is amended to indicate that, as appropriate, the Secretary of Health and Human Services or the Secretary of Agriculture will determine the applicable regulatory review period. Paragraph (a)(10)(i) is amended to recite that a Product License Application is a type of application that may be recited in an application for term extension of a patent claiming a human biological product. New paragraphs (a)(10)(ii) and (a)(10)(iii) are added to set forth the type of tests or applications that are to be considered for determination of the applicable regulatory review period for patents claiming a new animal drug or a veterinary biological product. Present paragraphs (a)(10)(ii) and (a)(10)(iii) are redesignated as paragraphs (a)(10)(iv) and (a)(10)(v), respectively. Paragraph (a)(10)(v) has been amended to reflect that approval of a medical device could be made through the use of a product development protocol. Paragraph (a)(13) is amended to indicate that the duty to disclose any information material to the determination of entitlement to the extension sought applies also to the Secretary of Agriculture where the regulatory review was conducted by the USDA.

Section 1.741(a)(2) is amended to acknowledge that regulatory review may take place under more than one Federal statute and that each appropriate statute should be listed. This amendment is intended to apply to a situation where a human biological product is tested under an investigational new drug (IND) application pursuant to the Federal Food, Drug, and Cosmetic Act, but is approved under the Public Health Service Act. The amendment is not intended to include a situation where approval is sought for use of a particular medical device with a specific drug product which may require approval under more than a single provision of law. The product that forms the basis of an application for patent term extension must be either a medical device or a drug product; it cannot be a combination of those separate products. See the file history of U.S. Patent No. 4,428,744 for an example of the application of this principle.

Section 1.741(a)(5) is amended to recognize that the Secretary of Agriculture may determine the length of the regulatory review period where the regulatory review of the product takes place at the USDA. The section is further modified to point out that a determination of the length of the regulatory review period is made under 35 U.S.C. 156(g), and not the length of the patent term extension that is made by the PTO under 35 U.S.C. 156(c).

Section 1.765(a) is amended to recite that a duty of candor and good faith is owed to the Secretary of Agriculture in patent term extension proceedings wherein the USDA is involved.

The title of § 1.775 is amended to reflect that the section is directed to calculating patent term extension for human drug, antibiotic drug, and human biological products. Paragraphs (a), (b), (c), and (d) are amended to indicate that the determinations are being made for any of a human drug, an antibiotic drug, or a human biological product. Sections (c)(1) and (c)(2) are amended to refer merely to a "product" rather than to a "human drug product" or a "drug product" in order to make the sections clearer.

Section 1.778 is added to set forth the manner of calculation of the patent term extension for an animal drug product.

Paragraph (a) specifies that the extension will run from the original expiration date of the patent as shortened by any terminal disclaimer.

Paragraph (b) of § 1.778 provides that the patent term will be extended by the regulatory review period for the product but reduced, where appropriate, by the time periods provided in paragraph (d).

Paragraph (c) defines how the regulatory review period is to be calculated. The period is determined by counting

(1) the number of days in the period beginning on the earlier of the dates a major health or environmental effects test was initiated on the drug or an exemption under subsection (j) of section 512 of the Federal Food, Drug, and Cosmetic Act became effective for the drug and ending on the date an application was initially submitted for the drug under section 512 of the Federal Food, Drug, and Cosmetic Act; and

(2) the number of days in the period beginning on the date the application was initially submitted for the approved drug under subsection (b) of section 512 of the Federal Food, Drug, and Cosmetic Act and ending on the date the application was approved under the section.

The added total of the days determined in subparagraphs (c)(1) and (c)(2) constitutes the regulatory review period, which is then reduced, where appropriate, by the time periods described in paragraph (d).

Paragraph (d) of § 1.778 modifies the term of the patent extension by indicating that

(1) the time period determined from paragraph (c) would be reduced, where appropriate, by--

(i) the number of days in the period of paragraphs (c)(1) and (c)(2) of section 1.778 that were before the date on which the patent issued;

(ii) the number of days in paragraphs (c)(1) and (c)(2) of section 1.778 during which it is determined under 35 U.S.C. 156(d)(2)(B) that applicant did not act with due diligence; and

(iii) the number of days equal to one-half the number of days remaining in paragraph (c)(1) after the paragraph (c)(1) determination has been reduced in accordance with parapraphs (d)(1)(i) and (d)(1)(ii) of section 1.778 (half days to be ignored for subtraction purposes);

(2) adding the number of days determined in paragraph (d)(1) to the original expiration date of the patent as shortened by any terminal disclaimer;

(3) adding 14 years to the date of approval of the application under section 512 of the Federal Food, Drug, and Cosmetic Act;

(4) comparing the dates obtained from paragraphs (d)(2) and (d)(3) with each other and selecting the earlier date;

(5) if the original patent issued after November 16, 1988, by--

(i) adding 5 years to the original expiration date of the patent as shortened by any terminal disclaimer; and

(ii) comparing the dates obtained from paragraphs (d)(4) and (d)(5)(i) with each other and selecting the earlier date;

(6) if the original patent issued before November 16, 1988, and

(i) if no major health or environmental effects test on the drug was initiated and no request was submitted for an exemption under subsection (j) of section 512 of the Federal Food, Drug, and Cosmetic Act before November 16, 1988, by--

(A) adding 5 years to the original expiration date of the patent as shortened by any terminal disclaimer; and

(B) comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) with each other and selecting the earlier date; or

(ii) if a major health or environmental effects test was initiated or a request for an exemption under subsection (j) of section 512 of the Federal Food, Drug, and Cosmetic Act was submitted before November 16, 1988, and the application for commercial marketing or use of the drug was not approved before November 16, 1988, by--

(A) adding 3 years to the original expiration date of the patent as shortened by any terminal disclaimer; and

(B) comparing the dates obtained from paragraphs (d)(4) and (d)(6)(ii)(A) with each other and selecting the earlier date.

Section 1.779 is added to set forth the manner of calculation of the patent term extension for a veterinary biological product.

Paragraph (a) specifies that the extension runs from the original expiration date of the patent as shortened by any terminal disclaimer.

Paragraph (b) of § 1.779 provides that the patent term would be extended by the regulatory review period for the product but reduced, where appropriate, by the time periods provided in paragraph (d).

Paragraph (c) defines how the regulatory review period is to be calculated. The period is determined by counting

(1) the number of days in the period beginning on the date the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act became effective and ending on the date an application for a license was submitted under the Virus-Serum-Toxin Act; and

(2) the number of days in the period beginning on the date an application for a license was initially submitted under the Virus-Serum-Toxin Act and ending on the date a license was issued.

The added total of the days determined in paragraphs (c)(1) and (c)(2) constitutes the regulatory review period, which is then reduced, where appropriate, by the time periods described in paragraph (d).

Paragraph (d) of § 1.779 defines the term of the patent extension by indicating that

(1) the time period determined from paragraph (c) would be reduced, where appropriate, by--

(i) the number of days in the periods of paragraphs (c)(1) and (c)(2) that were on and before the date on which the patent issued;

(ii) the number of days in the periods of paragraphs (c)(1) and (c)(2) during which it is determined under 35 U.S.C. 156(d)(2)(B) that the applicant did not act with due diligence; and

(iii) one-half the number of days remaining in the period defined by paragraph (c)(1) after that period is reduced in accordance with paragraphs (d)(1)(i) and (d)(1)(ii) (half days being ignored for purposes of subtraction);

(2) adding the number of days determined in paragraph (d)(1) to the original term of the patent as shortened by any terminal disclaimer;

(3) adding 14 years to the date of the issuance of a license under the Virus-Serum-Toxim Act;

(4) comparing the dates for the ends of the periods obtained pursuant to paragraphs (d)(2) and (d)(3) and selecting the earlier date;

(5) if the patent was issued after November 16, 1988, by--

(i) adding 5 years to the original expiration date of the patent as shortened by any terminal disclaimer; and

(ii) comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(5)(i) with each other and selecting the earlier date;

(6) if the original patent issued before November 16, 1988, and

(i) if no request for the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act was submitted before November 16, 1988, by--

(A) adding 5 years to the original expiration date of the patent as shortened by any terminal disclaimer; and

(B) comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) with each other and selecting the earlier date; or

(ii) if a request for the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act was submitted before November 16, 1988, and the commercial marketing or use of the product was not approved before November 16, 1988, by--

(A) adding 3 years to the original expiration date of the patent as shortened by any terminal disclaimer; and

(B) comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(ii)(A) and selecting the earlier date.

Section 1.785(b) is amended to indicate that, in those instances where an applicant is seeking patent term extension for two or more patents based upon the same regulatory review period, the applicant will have the right to elect which patent is to have its term extended. In the absence of an election by applicant, the Commissioner will extend that patent having the earliest date of issuance.

Other Considerations

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. No. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities [Regulatory Flexibility Act, Pub. L. 96-354]. The rule change setting forth procedures allowing owners of patents directed to new animal drugs and veterinary biological products to apply for extension of patent term would not be expected to result in any adverse economic impact on small entities because patented drugs are generally not commercialized by small entities.

The PTO has determined that this rule change is not a major rule under Executive Order 12291. The annual effect to the economy will be less that $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the abilbity of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The PTO has also determined that this notice has no federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The rule change contains a collection of information subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* which has been approved by the Office of Management and Budget under control number 0651-0020. Preparation of an application for patent term extension is estimated to take approximately sixty hours, including time for reviewing instructions, gathering and maintaining data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of Management and Organization, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington D.C. 20503. (Paperwork Reduction Project 0651-0020) No comments regarding this burden estimate or any other aspect of this collection of information were received in response to the notice of proposed rulemaking.

List of Subjects in 37 CFR Part 1. Subpart F

Administrative practice and procedure, Authority delegations (Government agencies), Conflict of interest, Courts, Inventions and patents, Lawyers.

For the reasons given in the preamble and pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 156, the PTO is amending Title 37 of the Code of Federal Regulations as set forth below.

Subpart F--Extension of Patent Term

1. The authority citation for 37 CFR Part 1, Subpart F, continues to read as follows:

Authority: 35 U.S.C. 6 and 156.

2. Section 1.710 is revised to read as follows:

§ 1.710 Patents subject to extension of the patent term.

(a) A patent is eligible for extension of the patent term if the patent claims a product as defined in paragraph (b) of this section, either alone or in combination with other ingredients that read on a composition that received permission for commercial marketing or use, or a method of using such a product, or a method of manufacturing such a product, and meets all other conditions and requirements of this subpart.

(b) The term "product" referred to in paragraph (a) of this section means--

(1) The active ingredient of a new human drug, antibiotic drug, or human biological product (as those terms are used in the Federal Food, Drug, and Cosmetic Act and the Public Health Service Act) including any salt or ester of the active ingredient, as a single entity or in combination with another active ingredient; or

(2) The active ingredient of a new animal drug or veterinary biological product (as those terms are used in the Federal Food, Drug, and Cosmetic Act and the Virus-Serum-Toxin Act) that is not primarily manufactured using recombinant DNA, recombinant RNA, hybridoma technology, or other processes including site specific genetic manipulation techniques, including any salt or ester of the active ingredient, as a single entity or in combination with another active ingredient; or

(3) Any medical device, food additive, or color additive subject to regulation under the Federal Food, Drug, and Cosmetic Act.

3. Section 1.720 is amended by revising paragraphs (e)(2) and (f) and adding paragraph (e)(3) to read as follows:

§1.720 Conditions for extension of patent term.

* * * * *

(e) The product has received permission for commercial marketing or use and--

* * * * *

(2) In the case of a patent other than one directed to subject matter within § 1.710(b)(2) claiming a method of manufacturing the product that primarily uses recombinant DNA technology in the manufacture of the product, the permission for the commercial marketing or use is the first received permission for the commercial marketing or use of a product manufactured under the process claimed in the patent, or

(3) In the case of a patent claiming a new animal drug or a veterinary biological product that is not covered by the claims in any other patent that has been extended, and has received permission for the commercial marketing or use in non-food-producing animals and in food-producing animals, and was not extended on the basis of the regulatory review period for use in non-food-producing animals, the permission for the commercial marketing or use of the drug or product after the regulatory review period for use in food-producing animals is the first permitted commercial marketing or use of the drug or product for administration to a food-producing animal.

(f) The application is submitted within the sixty-day period beginning on the date the product first received permission for commercial marketing or use under the provisions of law under which the applicable regulatory review period occurred; or in the case of a patent claiming a method of manufacturing the product which primarily uses recombinant DNA technology in the manufacture of the product, the application for extension is submitted within the sixty-day period beginning on the date of the first permitted commercial marketing or use of a product manufactured under the process claimed in the patent; or in the case of a patent that claims a new animal drug or a veterinary biological product that is not covered by the claims in any other patent that has been extended, and said drug or product has received permission for the commercial marketing or use in non-food-producing animals, the application for extension is submitted within the sixty-day period beginning on the date of the first permitted commercial marketing or use of the drug or product for administration to a food-producing animal;

* * * * *

4. Section 1.740 is amended by revising paragraphs (a)(4), (a)(9), (a)(10)(i) and (a)(13), adding paragraphs (a)(10)(ii) and (a)(10)(iii), and redesignating present paragraphs (a)(10)(ii) and (a)(10)(iii) as (a)(10)(iv) and (a)(10)(v), respectively, to read as follows:

§ 1.740 Application for extension of patent term.

(a) An application for extension of patent term must be made in writing to the Commissioner of Patents and Trademarks. A formal application for the extension of patent term shall include:

* * * * *

(4) In the case of a drug product, an identification of each active ingredient in the product and as to each active

ingredient, a statement that it has not been previously approved for commercial marketing or use under the Federal Food, Drug, and Cosmetic Act, the Public Health Service Act, or the Virus-Serum-Toxin Act, or a statement of when the active ingredient was approved for commercial marketing or use (either alone or in combination with other active ingredients), the use for which it was approved, and the provision of law under which it was approved.

* * * * *

(9) A statement that the patent claims the approved product or a method of using or manufacturing the approved product, and a showing which lists each applicable patent claim and demonstrates the manner in which each applicable patent claim reads on the approved product or method of using or manufacturing the approved product;

(10) A statement, beginning on a new page, of the relevant dates and information pursuant to 35 U.S.C. 156(g) in order to enable the Secretary of Health and Human Services or the Secretary of Agriculture, as appropriate, to determine the applicable regulatory review period as follows:

(i) For a patent claiming a human drug, antibiotic, or human biological product, the effective date of the investigational new drug (IND) application and the IND number; the date on which a new drug application (NDA) or a Product License Application (PLA) was initially submitted and the NDA or PLA number and the date on which the NDA was approved or the Product License issued;

(ii) For a patent claiming a new animal drug, the date a major health or environmental effects test on the drug was initiated and any available substantiation of the date or the date of an exemption under subsection (j) of section 512 of the Federal Food, Drug, and Cosmetic Act became effective for such animal drug; the date on which a new animal drug application (NADA) was initially submitted and the NADA number; and the date on which the NADA was approved;

(iii) For a patent claiming a veterinary biological product, the date the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act became effective; the date an application for a license was submitted under the Virus-Serum-Toxin Act; and the date the license issued;

(iv) For a patent claiming a food or color additive, the date a major health or environmental effects test on the additive was initiated and any available substantiation of that date; the date on which a petition for product approval under the Federal Food, Drug, and Cosmetic Act was initially submitted and the petition number; and the date on which the FDA published the Federal Register notice listing the additive for use;

(v) For a patent claiming a medical device, the effective date of the investigational device exemption (IDE) and the IDE number, if applicable, or the date on which the applicant began the first clinical investigation involving the device if no IDE was submitted and any available substantiation of that date; the date on which the application for product approval or notice of completion of a product development protocol under section 515 of the Federal Food, Drug, and Cosmetic Act was initially submitted and the number of the application or protocol; and the date on which the application was approved or the protocol declared to be completed.

* * * * *

(13) A statement that applicant acknowledges a duty to disclose to the Commissioner of Patents and Trademarks and the Secretary of Health and Human Services or the Secretary of Agriculture any information which is material to the determination of entitlement to the extension sought (see § 1.765);

* * * * *

5. Section 1.741 is amended by revising paragraphs (a)(2) and (a)(5) to read as follows:

§ 1.741 Filing date of the application.

(a) * * *

(2) An identification of each Federal statute under which regulatory review occurred.

* * * * *

(5) Sufficient information to enable the Commissioner to determine under 35 U.S.C. 156 subsections (a) and (b) the eligibility of a patent for extension and the rights that will be derived from the extension and information to enable the Commissioner and the Secretary of Health and Human Services or the Secretary of Agriculture to determine the length of the regulatory review period; and

* * * * *

6. Section 1.765 is amended by revising paragraph (a) to read as follows:

§ 1.765 Duty of Disclosure in patent term extension proceedings.

(a) A duty of candor and good faith toward the Patent and Trademark Office and the Secretary of Health and Human Services or the Secretary of Agriculture rests on the patent owner or its agent, on each attorney or agent who represents the patent owner and on every other individual who is substantively involved on behalf of the patent owner in a patent term extension proceeding. All such individuals who are aware, or become aware, of material information adverse to a determination of entitlement to the extension sought, which has not been previously made of record in the patent term extension proceeding must bring such information to the attention of the Office or the Secretary, as appropriate, in accordance with paragraph (b) of this section, as soon as it is practical to do so after the individual becomes aware of the information. Information is material where there is a substantial likelihood that the Office or the Secretary would consider it important in determinations to be made in the patent term extension proceeding.

* * * * *

7. Section 1.775 is amended by revising the title and paragraphs (a), (b), (c), and (d) introductory text to read as follows:

§ 1.775 Calculation of patent term extension for a human drug, antibiotic drug or human biological product.

(a) If a determination is made pursuant to § 1.750 that a patent for a human drug, antibiotic drug or human biological product is eligible for extension, the term shall be extended by the time as calculated in days in the manner indicated by this section. The patent term extension will run from the original expiration date of the patent or any earlier date set by terminal disclaimer (§ 1.321).

(b) The term of the patent for a human drug, antibiotic drug or human biological product will be extended by the length of the regulatory review period for the product as determined by the Secretary of Health and Human Services, reduced as appropriate pursuant to paragraphs (d)(1) through (d)(6) of this section.

(c) The length of the regulatory review period for a human drug, antibiotic drug or human biological product will be determined by the Secretary of Health and Human Services. Under 35 U.S.C. 156(g)(1)(B), it is the sum of--

(1) The number of days in the period beginning on the date an exemption under subsection (i) of section 505 or subsection (d) of section 507 of the Federal Food, Drug, and Cosmetic Act became effective for the approved product and ending on the date the application was initially submitted for such product under those sections or under section 351 of the Public Health Service Act; and

(2) The number of days in the period beginning on the date the application was initially submitted for the approved product under section 351 of the Public Health Service Act, subsection (b) of section 505 or section 507 of the Federal Food, Drug, and Cosmetic Act and ending on the date such application was approved under such section.

(d) The term of the patent as extended for a human drug, antibiotic drug or human biological product will be determined by--

* * * * *

8. Section 1.778 is added to read as follows:

§ 1.778 Calculation of patent term extension for an animal drug product.

(a) If a determination is made pursuant to § 1.750 that a patent for an animal drug is eligible for extension, the term shall be extended by the time as calculated in days in the manner indicated by this section. The patent term extension will run from the original expiration date of the patent or any earlier date set by terminal disclaimer (§ 1.321).

(b) The term of the patent for an animal drug will be extended by the length of the regulatory review period for the drug as determined by the Secretary of Health and Human Services, reduced as appropriate pursuant to paragraphs (d)(1) through (d)(6) of this section.

(c) The length of the regulatory review period for an animal drug will be determined by the Secretary of Health and Human Services. Under 35 U.S.C. 156(g)(4)(B), it is the sum of--

(1) The number of days in the period beginning on the earlier of the date a major health or environmental effects test on the drug was initiated or the date an exemption under subsection (j) of section 512 of the Federal Food, Drug, and Cosmetic Act became effective for the approved animal drug and ending on the date an application was initially submitted for such animal drug under section 512 of the Federal Food, Drug, and Cosmetic Act; and

(2) The number of days in the period beginning on the date the application was initially submitted for the approved animal drug under subsection (b) of section 512 of the Federal Food, Drug, and Cosmetic Act and ending on the date such application was approved under such section.

(d) The term of the patent as extended for an animal drug will be determined by--

(1) Subtracting from the number of days determined by the Secretary of Health and Human Services to be in the regulatory review period:

(i) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section that were on and before the date on which the patent issued;

(ii) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section during which it is determined under 35 U.S.C. 156(d)(2)(B) by the Secretary of Health and Human Services that applicant did not act with due diligence;

(iii) One-half the number of days remaining in the period defined by paragraph (c)(1) of this section after that period is reduced in accordance with paragraphs (d)(1)(i) and (ii) of this section; half days will be ignored for purposes of subtraction;

(2) By adding the number of days determined in paragraph (d)(1) of this section to the original term of the patent as shortened by any terminal disclaimer;

(3) By adding 14 years to the date of approval of the application under section 512 of the Federal Food, Drug, and Cosmetic Act;

(4) By comparing the dates for the ends of the periods obtained pursuant to paragraphs (d)(2) and (d)(3) of this section with each other and selecting the earlier date;

(5) If the original patent was issued after November 16, 1988, by--

(i) Adding 5 years to the original expiration date of the patent or any earlier date set by terminal disclaimer; and

(ii) Comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(5)(i) of this section with each other and selecting the earlier date;

(6) If the original patent was issued before November 16, 1988, and

(i) If no major health or environmental effects test on the drug was initiated and no request was submitted for an exemption under subsection (j) of section 512 of the Federal Food, Drug, and Cosmetic Act before November 16, 1988, by--

(A) Adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer; and

(B) Comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) of this section with each other and selecting the earlier date; or

(ii) If a major health or environmental effects test was initiated or a request for an exemption under subsection (j) of section 512 of the Federal Food, Drug, and Cosmetic Act was submitted before November 16, 1988, and the application for commercial marketing or use of the animal drug was not approved before November 16, 1988, by--

(A) Adding 3 years to the original expiration date of the patent or earlier date set by terminal disclaimer, and

(B) Comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(ii)(A) of this section with each other and selecting the earlier date.

9. Section 1.779 is added to read as follows:

§ 1.779 Calculation of patent term extension for a veterinary biological product.

(a) If a determination is made pursuant to § 1.750 that a patent for a veterinary biological product is eligible for extension, the term shall be extended by the time as calculated in days in the manner indicated by this section. The patent term extension will run from the original expiration date of the patent or any earlier date set by terminal disclaimer (§ 1.321).

(b) The term of the patent for a veterinary biological product will be extended by the length of the regulatory review period for the product as determined by the Secretary of Agriculture, reduced as appropriate pursuant to paragraphs (d)(1) through (d)(6) of this section.

(c) The length of the regulatory review period for a veterinary biological product will be determined by the Secretary of Agriculture. Under 35 U.S.C. 156(g)(5)(B), it is the sum of--

(1) The number of days in the period beginning on the date the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act became effective and ending on the date an application for a license was submitted under the Virus-Serum-Toxin Act; and

(2) The number of days in the period beginning on the date an application for a license was initially submitted for approval under the Virus-Serum-Toxin Act and ending on the date such license was issued.

(d) The term of the patent as extended for a veterinary biological product will be determined by--

(1) Subtracting from the number of days determined by the Secretary of Agriculture to be in the regulatory review period:

(i) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section that were on and before the date on which the patent issued;

(ii) The number of days in the periods of paragraphs (c)(1) and (c)(2) of this section during which it is determined under 35 U.S.C. 156(d)(2)(B) by the Secretary of Agriculture that applicant did not act with due diligence;

(iii) One-half the number of days remaining in the period defined by paragraph (c)(1) of this section after that period is reduced in accordance with paragraphs (d)(1)(i) and (ii) of this section; half days will be ignored for purposes of subtraction;

(2) By adding the number of days determined in paragraph (d)(1) of this section to the original term of the patent as shortened by any terminal disclaimer;

(3) By adding 14 years to the date of the issuance of a license under the Virus-Serum-Toxin Act;

(4) By comparing the dates for the ends of the periods obtained pursuant to paragraphs (d)(2) and (d)(3) of this

section with each other and selecting the earlier date;
(5) If the original patent was issued after November 16, 1988, by--
(i) Adding 5 years to the original expiration date of the patent or any earlier date set by terminal disclaimer; and
(ii) Comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(5)(i) of this section with each other and selecting the earlier date;
(6) If the original patent was issued before November 16, 1988, and
(i) If no request for the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act was submitted before November 16, 1988, by--
(A) Adding 5 years to the original expiration date of the patent or earlier date set by terminal disclaimer; and
(B) Comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(i)(A) of this section with each other and selecting the earlier date; or
(ii) If a request for the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act was submitted before Novemver 16, 1988, and the commercial marketing or use of the product was not approved before November 16, 1988, by--
(A) Adding 3 years to the original expiration date of the patent or earlier date set by terminal disclaimer; and
(B) Comparing the dates obtained pursuant to paragraphs (d)(4) and (d)(6)(ii)(A) of this section with each other and selecting the earlier date.

10. Section 1.785 is amended to revise paragraph (b) to read as follows:

§ 1.785 Multiple applications for extension of terms of the same patent or of different patents for the same regulatory review period for a product.

* * * * *

(b) If more than one application for extension is filed by a single applicant which seeks the extension of the term of two or more patents based upon the same regulatory review period, and the applications are otherwise eligible for extension pursuant to the requirement of this subpart, in the absence of an election by applicant, the certificate of extension of patent term, if appropriate, will be issued upon the application for extension of the patent term having the earliest date of issuance of those patents for which extension is sought.

May 31, 1989

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Cambria-Clover Mercantile Co., Philadelphia, Pa., reg. No. 1,056,779, for the mark "JEAN JOINT", Con. Use No. 728

Access Engineering Corp., Reston, Va., Reg. No. 1,353,787, for the mark "SPAN", Canc. No. 17,860

ERMA S. BROWN
Administrator, Trademark Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Patents Available for License or Sale

Inquiries about the patents listed below should be directed to Shirk, Reist, Wyagenseller and Shirk, K.S. Shirk, Jr., Esquire at P.O. Box 1552, Lancaster, Pa. 17603

3,758,097	AUTOMATIC VISE JAW
3,792,851	AUTOMATIC VISE JAW
3,845,565	ANGLE MEASURING DEVICE
3,860,110	PIN ORIENTING, ALIGNING AND TAPING MACHINE
4,184,347	AIR HEATING ANDCIRCULATING FIREPLACEGRATE

Inquiries about the patents listed below should be directed to Ladas & Parry, 3600 Wilshire Boulevard, Los Angeles, Calif. 90010-2634

4,761,442	RUST-INHIBITING PRIMER COMPOSITION
4,540,427	METHOD FOR IMPROVING WATER RETENTION QUALITIES OF SOIL AND AN AGENT FOR PERFORMING THIS METHOD.

4,266,112 WEB-CUTTING PROCESS, William P. Niedermeyer, 1024 Mount Mary Drive, Green Bay, Wisc. 54301

4,576,178 AUDIO SIGNAL GENERATOR, David Johnson, Box 68, 436 East 69th Street, New York, N. Y. 10021

4,742,839 SHAKE OR VIBRATION ACTIVATE VALVE OPERATING MECHANISM, Robert Stock, 886 S. Ponderosa St., Orange, Calif. 92666

4,762,198 IMPROVED VEHICLE ANTI-THEFT SYSTEM Richard Raheb, 1900 Horatio Avenue Merrick, N. Y. 11566

07/271,430 QUICK CHANGE DRILL BITS AND HOLDER, William W. Morgan, 8903 Granada Hills Drive, Austin, Tex. 78737

PATENT NOTICES

Certificates of Correction For Week of August 8, 1989

PP. 6,540	4,766,776	4,787,322	4,799,372
D. 293,413	4,767,983	4,787,406	4,799,849
4,467,958	4,768,654	4,787,803	4,800,151
4,582,089	4,769,283	4,788,286	4,800,311
4,586,166	4,770,340	4,788,314	4,800,338
4,594,538	4,771,518	4,788,608	4,800,974
4,595,908	4,771,621	4,788,735	4,801,042
4,638,496	4,772,348	4,789,266	4,801,441
4,643,577	4,772,599	4,789,772	4,801,554
4,656,825	4,773,113	4,790,110	4,801,964
4,661,267	4,773,356	4,790,990	4,802,006
4,662,000	4,774,178	4,791,340	4,802,169
4,683,201	4,774,260	4,791,398	4,803,195
4,683,426	4,774,338	4,791,978	4,803,247
4,690,089	4,775,384	4,792,036	4,803,280
4,691,718	4,777,014	4,792,690	4,803,630
4,700,255	4,777,283	4,792,785	4,803,642
4,701,257	4,777,477	4,792,850	4,803,651
4,706,553	4,777,498	4,792,940	4,804,250
4,713,446	4,778,202	4,793,172	4,806,064
4,714,620	4,778,499	4,793,567	4,806,661
4,719,575	4,778,587	4,793,669	4,806,923
4,731,848	4,778,911	4,793,675	4,806,965
4,732,134	4,778,935	4,793,989	4,807,648
4,745,031	4,779,258	4,794,456	4,807,728
4,749,270	4,779,316	4,794,548	4,807,983
4,749,688	4,779,321	4,794,564	4,808,055
4,750,650	4,779,430	4,794,580	4,808,930
4,752,178	4,779,932	4,794,603	4,809,104
4,754,862	4,780,600	4,794,886	4,809,846
4,760,608	4,780,808	4,795,224	4,810,046
4,760,768	4,781,782	4,795,440	4,813,155
4,762,831	4,782,144	4,795,698	4,815,233
4,763,242	4,782,625	4,796,607	4,821,575
4,763,424	4,783,085	4,796,979	4,824,525
4,763,504	4,783,578	4,797,764	4,825,207
4,764,916	4,783,654	4,797,945	4,825,691
4,765,878	4,783,659	4,798,173	4,826,852
4,765,983	4,784,996	4,798,641	
4,766,606	4,785,262	4,798,663	
4,766,751	4,785,331	4,798,757	

Disclaimers

Des. 291,295— *Allan W. Lund*, Minneapolis, Minn. WINDSHIELD VISOR FOR TRUCKS. Patent dated August 11, 1987. Disclaimer filed Jun. 8, 1989, by the assignee, Lund Industries Inc.

The term of this patent subsequent to February 17, 2001, has been disclaimed.

4,491,000.—*Paul E. Dornbusch*, Roanoke, Va. METHOD AND APPARATUS FOR IMPROVED SENSING OF ROLL SEPARATION FORCE IN A ROLLING MILL. Patent dated Jan. 1, 1985. Disclaimer filed June 7, 1989, by the assignee, General Electric Company.

Hereby enters this disclaimer to claims 1 and 5 of said patent.

4,623,071— *Donald A. Malcolm*, Roanoke Rapids, N.C. HINGE FOR BLOW-MOLDED CASES. Patent dated Nov. 18, 1986. Disclaimer filed Jan. 23, 1989, by the assignee, W.R. Grace & Co.

Hereby enters this disclaimer to claims 1, 3, 5, 7, 8, and 9 of said patent.

4,684,406— *Yutaka Matsuura*, Ibaraki; *Masato Sagawa*, Nagaokakyo; *Setsuo Fujimura*, Kyoto, all of Japan. PERMANENT MAGNET MATERIALS. Patent dated Aug. 4, 1987. Disclaimer filed May 9, 1989, by the assignee, Sumitomo Special Metals Co., Ltd.

The term of this patent subsequent to July 1, 2003, has been disclaimed.

Dedication

4,766,413— *James Reavell*, Campbellford, Ontario, Canada. SCHOOL BUS STOP SIGN CONTROL APPARATUS. Patent dated Aug. 23, 1988. Dedication filed May 30, 1989, by the assignee, School Bus Parts Co. of Canada Inc.

Hereby dedicates to the Public the remaining term of said patent.

Disclaimer and Dedication

4,250,838— *Jerry E. Ott*, Kinston, N.C. METHOD FOR SYSTEMIC CONTROL OF PARASITIC INSECTS. Patent dated Feb. 17, 1981. Disclaimer and Dedication filed Mar. 27, 1989, by the assignee, The Dow Chemical Company.

Hereby disclaims and dedicates to the Public the remaining term of said patent.

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	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse	(408) 730-7290
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	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
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	Columbus: Ohio State University Libraries	(614) 292-6175
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Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State University	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5330
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
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	Nashville: Vanderbilt University Library	(615) 322-2775

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	Houston: The Fondren Library, Rice University	(713) 572-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF July 1, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director.	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	6-4-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. SHAW, Acting Director	5-12-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-27-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-17-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	6-23-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—D. G. KELLY, Director	1-13-88
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SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-24-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-1-88

Expiration of patents: The patents within the range of numbers indicated below expire during July 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,673,609 to 3,680,148 inclusive
Plant Patents ..... 3,224 to 3,244 inclusive

REEXAMINATIONS

AUGUST 8, 1989

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,141,973 (1113th)

ULTRAPURE HYALURONIC ACID AND THE USE THEREOF

Endre A. Balazs, Riverdale, N.Y., assignor to Biotrics, Inc., Riverside, N.Y.

Reexamination Request Nos. 90/000,770, Apr. 30, 1985 and 90/001,013, May 27, 1986 and 90/001,205, Mar. 26, 1987.
Reexamination Certificate for Patent No. 4,141,973, issued Feb. 27, 1979, Ser. No. 844,833, Oct. 25, 1977.
Continuation of Ser. No. 623,333, Oct. 17, 1975, abandoned.
Int. Cl.[4] A61K *31/715;* **C07H** *5/04, 5/06*
U.S. Cl. 514—54

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–11** is confirmed.

1. A sterile, pyrogen-free, protein-free, non-antigenic, hyaluronic acid fraction having an average molecular weight of at least about 750,000, a protein content of less than 0.5% by weight, ultraviolet light absorbance of a 1% solution of the sodium salt thereof of less than 3.0 at 257 nanometers wavelength and less than 2.0 at 280 nanometers wavelength, a kinamatic viscosity of a 1% solution of the sodium salt thereof in physiological buffer of greater than about 1000 centistokes and a molar optical rotation of a 0.1–0.2% solution of the sodium salt thereof in physiological buffer of less than $-11=10^3$ degree—cm^2/mole (of disaccharide) measured at 220 nanometers; and which is characterized by infiltration by no more than about 200 white blood cells per mm^3 of aqueous humor of the owl monkey eye when one milliliter of a 1% solution of the sodium salt of said fraction dissolved in physiological buffer is implanted in the vitreous replacing about one-half the existing liquid vitreous.

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,010

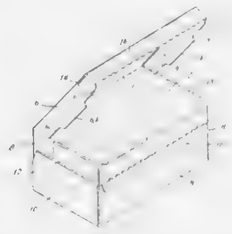
FOLDING ICE-CREAM CARTON, CARTON BLANK, AND METHOD

Thomas W. Froom, Pittsford, N.Y., assignor to Somerville Packaging Corporation, Newport News, Va.

Original No. 4,431,129, dated Feb. 14, 1984, Ser. No. 331,557, Dec. 17, 1981. Division of Ser. No. 158,167, Jun. 10, 1980, Pat. No. 4,328,656, which is a division of Ser. No. 842,747, Oct. 17, 1977, Pat. No. 4,239,115. Application for reissue Mar. 9, 1987, Ser. No. 23,846

Int. Cl.[4] B65D *5/02*

U.S. Cl. 229—151 14 Claims



1. An integral blank for forming a top-opening carton having a front panel, a bottom panel, a rear panel, a cover panel, and a front cover sealing flap; said panels being articulated to one another in the order named, said front cover sealing flap being articulated to said cover panel, and said front cover sealing flap being adapted to overlie said front panel and to be sealed thereto to form said panels into a tube having a rectangular transverse cross section in opened-up position; said front and rear panels having laterally-projecting, inner end wall-forming flaps articulated thereto; sand bottom panel having a laterally-projecting, outer end wall-forming flap articulated to a side thereof and adapted to be bent up to a position to overlie said inner end wall-forming flaps; said cover panel having a laterally-extending side cover flap articulated to a side edge thereof and adapted to overlie the inner end wall-forming flaps when the carton is erected; and the front cover *sealing* flap having an extension articulated to a side edge thereof by a score line, which extension is adapted to be adhered to said side cover flap to form, with said cover panel, a cover hinged to said rear panel and adapted to overlie the [side] *inner end wall-forming flaps* and front [panels] *panel* of the assembled carton; the improvement in which said extension is attached to the end of said front cover *sealing* flap adjacent said side-cover flap by a vertical score line offset sufficiently to permit the said extension to overlie the side-cover flap in the erected carton and to be adhered thereto whereby, in the assembled carton, the side cover flap lies flat against the outermost inner end wall-forming flap surfaces [said last-named flap] *substantially throughout the length of said side cover flap.*

Re. 33,011

TENNIS RACKET FRAME MADE OF METAL OXIDE FIBERS AND CERAMIC PARTICLES

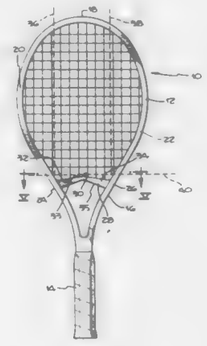
David Fernandez, 1457 Dara St., Camarillo, Calif. 93010

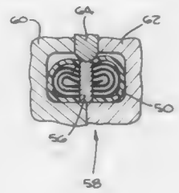
Original No. 4,614,341, dated Sep. 30, 1986, Ser. No. 632,453, Jul. 19, 1984. Application for reissue Feb. 17, 1987, Ser. No. 943,560

Int. Cl.[4] A63B *49/10*

U.S. Cl. 273—73 C 12 Claims

5. A [tennis] racket frame comprising a head portion, a handle portion and a neck portion extending between said head and handle portions and wherein said head portion is adapted to be strung; said frame comprising a shell comprising poly-





crystalline metal oxide fibers in a resin matrix wherein each of said metal [and] oxide fibers consists essentially of aluminum oxide, boron oxide and silicon dioxide.

Re. 33,012

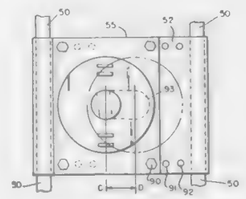
TRAILER COUPLING MEANS

Durrell U. Howard, 306 Krameria Dr., San Antonio, Tex. 78213

Original No. 39,945,100, dated Nov. 30, 1976, Ser. No. 489,217, Jul. 17, 1974. Division of Ser. No. 198,378, Nov. 12, 1971, Pat. No.

Int. Cl.[4] B62D *53/08*

U.S. Cl. 280—432 16 Claims



7. Coupling apparatus for joining a first towing vehicle to a second trailer vehicle comprising:

first means on one of said first and second vehicles, second means on the other of said first and second vehicles moving

relative to said first means as said first and second vehicles turn relative to each other about at least one of their yaw and roll axes,

turning resistance means for providing a variably controllable resistance to turning of said first vehicle relative to said second vehicle about at least one of their roll and yaw axes,

and vehicle speed responsive means for varying the resistance to turning provided by said turning resistance means in accordance with the speed of the joined vehicles to provide low resistance to said turning at low vehicle speeds so as to permit sharp turning maneuvers at said low speeds and a substantially higher degree of yaw stiffness during normal vehicle cruising conditions.

Re. 33,013
MULTI-CHANNEL BODY

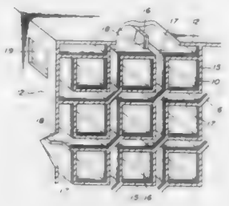
Yukihisa Takeuchi, and Tadasha Fujita, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Original No. 4,533,584, dated Aug. 6, 1985, Ser. No. 596,013, Apr. 2, 1984. Continuation of Ser. No. 799,841, Nov. 19, 1985, abandoned. Application for reissue Jun. 10, 1987, Ser. No. 60,944

Claims priority, application Japan, Apr. 5, 1983, 58.752

Int. Cl.[4] B32B *3/12*

U.S. Cl. 438—116 **7 Claims**



1. A multi-channel body comprising:

an outer wall;

a plurality of parallelly situated independent *longitudinal* channels located inside of said outer wall, each of said independent *longitudinal* channels being defined by *longitudinal* partition walls having an inner surface and an outer surface and each parallelly situated independent *longtudinal* channel does not share any portion of any *longitudinal* partition wall with any other parallelly situated independent *longitudinal* channel, *whereby* a first fluid passes through said parallelly situated independent *longitudinal* channels in contact with inner surfaces of said *longitudinal* partition walls;

a plurality of *longitudinal* connecting walls [for] *formed integrally with said longitudinal channels, each of said longitudinal connecting walls having a plane which does not transversely intersect the plane of said longitudinal partitions walls, and each of said connecting walls* connecting *two of* said parallelly situated independent *longitudinal* channels, and at least one *longitudinal* connecting wall communicates with one *longitudinal* partition wall of each independent *longitudinal* channel, whereby a plurality of continuous *longitudinal* passages are formed throughout said multi-channel body around said plurality of parallelly situated independent *longitudinal* channels, said continuous *longitudinal* passages being defined by outer surfaces of said *longitudinal* partition walls, said connecting walls and said outer wall of the [multi-channel] *multi-longitudinal channel* body, *such that a major portion of said continuous longitudinal passages are made up of said outer surface of said longitudinal partition walls and a minor portion of said continuous longitudinal passages are made up of said longitudinal connecting walls,* thereby permitting a second fluid to pass through said plurality of continuous *longitudinal* passages in contact with outer surfaces of said *longitudinal* partition walls;

at least one inlet in said outer wall of the multi-channel body communicating with said continuous *longitudinal* passages to permit said second fluid to enter said continuous *longitudinal* passages; and

at least one outlet in said outer wall of the multi-channel body communicating with said continuous *longitudinal* passages to permit said second fluid to exit said continuous longitudinal passages.

Re. 33,014
CABLE DEPLOYMENT UNIT

Atef R. Tadros, Brampton, Canada, assignor to Sparton of Canada, Ltd., London, Canada

Original No. 4,727,520, dated Feb. 23, 1988, Ser. No. 1,030, Jan. 7, 1987. Application for reissue Nov. 17, 1988, Ser. No. 272,406

Claims priority, application Canada, Jan. 8, 1986, 499,205

Int. Cl.[4] H04B *1/59;* **B63B** *22/18*

U.S. Cl. 367—4 **5 Claims**



1. Apparatus for deploying an immersible unit at some selected depth from a surface platform floating in a body of water, comprising:

a cable deployment unit from which is payed out a cable, said immersible unit being secured to said cable deployment unit;

an anchoring unit above said cable deployment unit and releasably secured to said cable deployment unit by a tie means;

a cable engaging means for gradually tightening about said cable, extending between said cable deployment unit and said anchoring unit;

means for actuating said anchoring unit at a predetermined depth, said predetermined depth being a function of said selected depth, wherein actuation of said anchoring unit causes said cable engaging means to engage said cable at said anchoring unit and said tie means to be severed, said anchoring unit increasing its distance from said cable deployment unit when said tie means is severed, thereby causing said cable engaging means to tighten with increasing frictional force about said cable along the length of said cable and said cable deployment unit to halt its descent at said selected depth for said immersible unit.

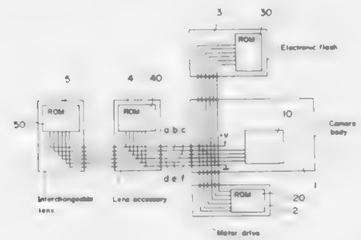
Re. 33,015
CAMERA SYSTEM OPERABLE IN ACCORDANCE WITH STORED MEMORY

Masaaki Nakai, Nara; Masayoshi Sahara, Sennan, and Nobuyuki Taniguchi, Tondabayashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Original No. 4,477,164, dated Oct. 16, 1984, Ser. No. 448,834, Dec. 10, 1982. Application for reissue Oct. 15, 1986, Ser. No. 919,835

Int. Cl.[4] G03B *17/00*

U.S. Cl. 354—286 **26 Claims**



4. In a camera system operable in accordance with stored memory data by means of carrying the memory data from a camera accessory to a camera body, the camera body comprising:

first means for transmitting electric power toward the camera accessory;

second means for transmitting a train of clock pulses toward the camera accessory;

third means for serially transmitting address data toward the camera accessory;

fourth means for serially receiving the memory data from the camera accessory;

fifth means for transmitting an initiating signal toward the camera accessory to control the timing of reading the memory data corresponding to the address data;

means for generating the clock pulses;

means for converting the serially received memory data into parallel data in response to the clock pulses;

means for serially providing the address data in response to the clock pulses;

means for originating an operation signal in response to a manual operation of the camera;

means for supplying the electric power in response to the operation signal;

means for producing the initiating signal in response to the operation signal; and

means for storing the parallel data.

Re. 33,016
PROTECTIVE DEVICE FOR AUTOMATIC FOCUSING CAMERA

Norio Ishikawa, Osaka, and Yukio Miki, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Original No. 4,477,167, dated Oct. 16, 1984, Ser. No. 442,187, Nov. 16, 1982. Application for reissue Oct. 16, 1986, Ser. No. 920,047

Claims priority, application Japan, Nov. 16, 1981, 56-183948

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—400 **16 Claims**

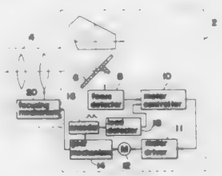
1. An automatic focusing device in a camera body capable of being coupled with an objective lens which is mountable on the camera body and which has a focusing lens unit movable along an optical axis of the objective lens by a focusing mechanism for focusing and which further has means for preventing the focusing lens unit from moving beyond either an infinity focusing position or its closest focusing position, said automatic focusing device comprising:

means for detecting the focusing condition of the objective lens relative to an object and producing a defocus signal indicating at least the defocus direction of the focusing lens unit with respect to its in-focus condition;

means for driving the focusing lens unit in a predetermined direction in response to said defocus signal;

means for transmitting the driving force of said driving means to the focusing mechanism provided in the objective lens in order to move the focusing lens unit along the optical axis for focusing;

means for detecting any overload condition in which the load for said driving means is increased over a predetermined level to produce an overload signal when the overload condition is detected;



means for interrupting the driving force to said driving means in response to said overload signal;

means for storing said defocus signal when said overload condition is detected, and

means for comparing a second defocus signal from said focusing condition detecting means with said stored defocus signal, whereby, if the second defocus signal is different from the stored one, said driving means is actuated for starting to drive the focusing lens unit in correspondence with the second defocus signal.

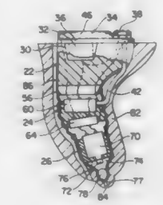
Re. 33,017
HEARING AID

Gaspare Bellafiore, 58 Stevens Rd., Cranston, R.I. 02910

Original No. 4,617,429, dated Oct. 14, 1986, Ser. No. 698,072, Feb. 4, 1985. Application for reissue May 26, 1987, Ser. No. 54,877

Int. Cl.[4] H04R *25/02;* **B29C** *33/40*

U.S. Cl. 381—68.6 **8 Claims**



1. A hearing aid for insertion into the auditory canal of a user and having a plurality of components mounted therein, said hearing aid further comprising an outer shell that defines a plug that has an exterior configuration that has been preshaped to snugly fit into the auditory canal of the user's ear, an assembly including an outer member, an intermediate member and an [innter] *inner* member in which said components are mounted, said outer, intermediate, and inner members being preassembled together prior to being fixed in said shell and being interfitted together such that the connecting portions of the members are initially pivotally movable relative to each other to [pre-shape] *preshape* the assembly into a configuration that generally corresponds to the configuration of the auditory canal of the user, and said outer shell being formed around said preshaped assembly to embed said assembly therein.

PLANT PATENTS

GRANTED AUGUST 8, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,971

ROSE PLANT JACSTOP

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Aug. 4, 1988, Ser. No. 228,398
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class substantially as herein shown and described, characterized particularly as to novelty by clear red flower color with 35 to 40 petals, resistance to powdery mildew, long straight stems, high cut flower production, sparse foliage, short time between flower cycles, reduced thorniness and long vase life.

6,972

ROSE PLANT JACLOY

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Aug. 4, 1988, Ser. No. 228,595
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—24 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class substantially as herein shown and described, characterized particularly as to novelty by high production of medium length stems, bright non-fading yellow color, pointed ovoid bud, dull medium green powdery mildew susceptible foliage, and an abundance of very sharp reddish thorns.

6,973

WALNUT TREE NAMED VESTER

Dennis N. Madison, 23672 Maple La., Romulus, Mich. 48174

Filed Sep. 14, 1988, Ser. No. 244,036
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—32 **1 Claim**

1. A new and distinct variety of cultivar of Persian Walnut Tree as herein described and illustrated and characterized by being of a medium size, having a moderate to dense foliage, a vigorous growth with spreading branches producing a tree about as broad as it is high, elliptical leaves about 7 to 9 per lateral, that flowers abundantly on both laterals and terminals, produces a very early crop of abundant fruit on both laterals and terminals with some large clusters, with shells which are thin and smooth and well sealed and of a rounded oblate shape and a yellowish brown color, and which are small to medium in size with a high percentage of full plump kernels of a mild sweet taste and good quality, the tree being hardy and resistant to cold.

6,974

CRABAPPLE TREE NAMED RED SWAN

John L. Fiala, Medina, Ohio, assignor to Chas. Klehm & Son, South Barrington, Ill.

Filed Jun. 30, 1988, Ser. No. 214,649
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—34 **1 Claim**

1. A new and unique flowering crabapple tree named Red Swan, as illustrated and described.

6,975

PLUM TREE, "MAJESTIC M"

Merle R. Butts, 6770 S. Reed Ave., Reedley, Calif. 93654

Filed Jun. 6, 1988, Ser. No. 202,599
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of Plum Tree, substantially as illustrated and described which is somewhat similar in its physical characteristics to the Angeleno Plum Tree (U.S. Plant Pat. No. 2,747) but from which is distinguished therefrom and characterized principally as to novelty by bearing fruit which are ripe for commercial harvesting and shipment from October 15 through October 20, the date of harvesting being approximately two or three weeks later than the Angeleno Plum Tree and which further bears fruit which have a substantially uniform shape and excellent storage and handling characteristics.

6,976

VALLEY GEM

Paul E. Hansche, Davis, Calif., assignor to The Regents of The University of California, Berkeley, Calif.

Filed Oct. 9, 1987, Ser. No. 107,121
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—43 **1 Claim**

1. The new and distinct variety of peach tree herein described and illustrated and identified by the characteristics enumerated above.

6,977

RED MAPLE — LANDSBURG CULTIVAR

Roger B. Landsburg, Brainerd, Minn., assignor to Bailey Nurseries, Inc., St. Paul, Minn.

Filed Apr. 18, 1988, Ser. No. 182,423
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct cultivar of *Acer rubrum* tree, characterized particularly as to novelty by the following combination of characteristics:

(a) assumes a broad oval configuration as a young tree and maintains this configuration to maturity,
(b) exhibits a vigorous growth habit,
(c) forms brilliant red foliage coloration in the fall,
(d) exhibits superior winter hardiness which is generally comparable to that of the Northwood and Morgan cultivars, and
(e) generally assumes its fall coloration earlier than other red maples,

substantially as illustrated and described.

6,978

ILEX×ATACLERENSIS 'WIGHT SELECTION' VARIETY

Martin C. Langmaid, Cairo, Ga., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Feb. 8, 1988, Ser. No. 153,734
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—65 **1 Claim**

1. A new and distinct variety of *Ilex×altaclerensis* substantially as shown and described, characterized by:

a. having ovate to oblong-lanceolate leaves with a length generally in the range of 60–82 mm long and 26–42 mm wide with about 1–16 marginal spines,
b. a round fruit 8–10 mm in diameter produced only in moderate quantities, and
c. an outstanding tolerance to summer day temperatures exceeding 90° F. and night temperatures often exceeding 70° F. while having a cold hardiness at least suitable for USDA Zone 8 (10°–20° F.).

6,979

BROMELIACEAE PLANT

Harvey R. Bullis, Jr., 12420 SW. 248th St., Princeton, Fla.

Filed Jul. 15, 1988, Ser. No. 219,648
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim

1. The new plant variety of the Bromeliaceae family as shown and described herein.

6,980

DISTINCT VARIETY OF POINSETTIA NAMED RED SAILS

Milhem Sawaya, Simcoe, and Michael J. Howe, Delhi, both of Canada, assignors to Fernlea Flowers, Ltd., Delhi, Canada

Filed Aug. 19, 1988, Ser. No. 234,429
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—86 1 Claim

1. A new and distinct variety of Poinsettia plant as herein shown and described, and particularly characterized by its brilliant crimson bracts against a background of dark green foliage, its strong, fixed stems, its long lasting keeping qualities in the home, its excellent resistance to fade, vigorous growth habits and its branch and bract production.

PATENTS

GRANTED AUG. 8, 1989

ERRATA

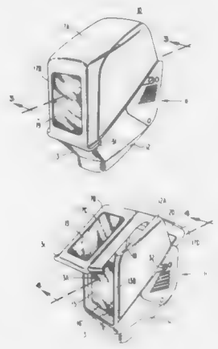
For CLASS	See PATENT NO.
206-616	4,854,454
229-131	4,854,492
562-817	4,855,087
369-047	4,855,654
388-820	4,855,655
200-038	4,856,096
219-010	4,856,097
324-207	4,856,098
341-133	4,856,099
342-051	4,856,100
358-245	4,856,101
361-330	4,856,102
362-340	4,856,103
364-470	4,856,104
364-474	4,856,105
365-203	4,856,106
367-150	4,856,107
369-046	4,856,108

PATENTS

GRANTED AUGUST 8, 1989

GENERAL AND MECHANICAL

4,853,973
WELDING HELMET
E. L. Boochard, Kent, Mich., assignor to Jackson Products, Inc., Belmont, Mich.
Filed Mar. 18, 1988, Ser. No. 169,887
Int. Cl.[4] A61F *9/06*
U.S. Cl. 2—8 **21 Claims**



1. A welding helmet of the type having a protective shell with an opening therein adapted to receive the head of the wearer, said shell being mountable to the head of the wearer, said helmet comprising:

(a) a protective shell having an opaque front wall extending in front of the face of the wearer and two side walls extending rearwardly from said front wall along the sides of the face of the wearer, said front wall including relatively transparent viewing means for allowing the wearer to see beyond said front wall;

(b) a visor for removably covering said viewing means with a relatively non-transparent welder's glass and for protecting the top of said welders head; and

(c) means contained substantially within said protective shell for mounting said visor to said protective shell for movement between a lowered position in which said welder's glass covers at least a substantial portion of said viewing means and a raised position in which said welder's glass does not substantially cover said viewing means.

4,853,974
FRAMELESS FACE PROTECTOR
Marvin J. Olim, 20735 Castle Bend, Katy, Tex. 77450
Filed Mar. 3, 1988, Ser. No. 163,671
Int. Cl.[4] A61F *9/04, 9/06*
U.S. Cl. 2—9 **4 Claims**

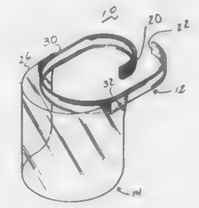
1. A comfortable to wear frameless face protector, comprising:

a transparent lightweight shield sufficiently flexible and deformable to easily match the shape of a user's head and to deflect upon accidental contact with a hard body;

a flexible, non-elastic headband for deftly and adjustably securing said shield to at least two positions on said headband; fastener means carried by said headband and by said shield for reusably and deftly attaching the opposite ends of said headband around the head of said user, and for reusably attaching the fastener means on said shield to said fastener means on said headband so as to establish a sufficiently large opening between said headband and said shield, whereby ample and unobstructed air circulation can take place through said opening to and from the nostrils of said user along the posterior side of said shield;

said headband being made of a woven absorbent material;

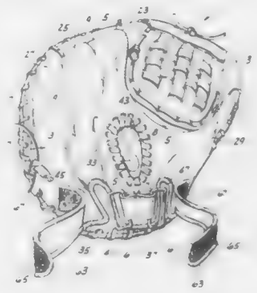
said fastener means including pairs of woven strips, one strip carrying woven hooks, and the other strip carrying woven loops;



said shield being suspended from said fastener means on said headband by the mechanical interaction between said hooks and loops, and said shield being positioned substantially parallel to the user's face; and

said fastener means on said shield and on said headband being easily deformable to adjust to the shape of the head of the user and to the shape of said shield.

4,853,975
CATCHER'S MITT
Robert L. Clevenhagen, Ava, Mo., assignor to Figgie International Inc., Richmond, Va.
Filed Apr. 11, 1988, Ser. No. 180,084
Int. Cl.[4] A41D *13/08*
U.S. Cl. 2—19 **6 Claims**



1. A baseball catcher's mitt having front and back walls secured at the periphery of the mitt to form a mitt body, a back panel member secured to the back wall of the mitt for substantially covering the back of the hand and forming, in conjunction with the back wall of the mitt, finger stall means for receiving the fingers of the hand and a thumb stall for receiving the thumb of the hand, said back panel member and body of the mitt having unconnected lower edge margins defining a hand opening at the bottom of the mitt through which the hand may be inserted up into the mitt between the back panel member and the back wall of the glove, a first slot in the back panel member extending upwardly from the lower edge margin thereof toward said finger stall means, a second slot in the back panel member spaced laterally from the first slot in the direc-

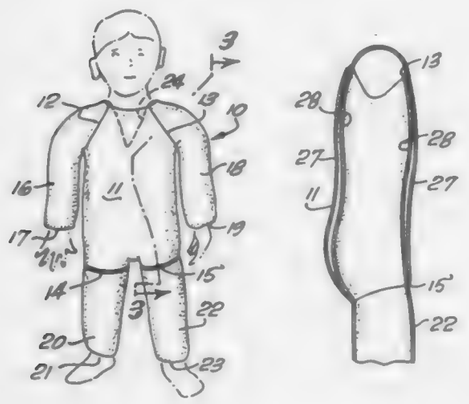
tion toward the thumb side of the mitt and extending upwardly from the lower edge margin of the back panel member, said first and second slots being expansible in width to enlarge the size of the hand opening and contractible in width to reduce the size of the hand opening, first quick-operating means adapted for adjusting the width of the first slot to a selected width when the hand is in the mitt and for releasably maintaining the first slot at said selected width, and second quick-operating metals adapted for adjusting the width of the second slot to a selected width when the hand is in the mitt and for releasably maintaining the second slot at said selected width, said first and second slots and respective quick-operating means being independently operable with respect to one another to adjust the size of the hand opening.

4,853,976

INSULATIVE SWIMMING SUITS FOR CHILDREN

Gail Mertz, 592 Fairfield Rd., Simi Valley, Calif. 3065

Filed Feb. 26, 1988, Ser. No. 160,767
Int. Cl.[4] A41D *7/00*
U.S. Cl. 2—67 **8 Claims**



1. A swimming suit for infants and children which reduces body heat loss to the water, said suit comprising:
- a body portion extending from the shoulders to the tops of the legs, said body portion being fabricated from double-layered material, said body portion including a front and a back;
- right and left arm portions attached to said body portion and extending about to the wrist area; and
- right and left leg portions attached to the body portion and extending to at least beyond the knee area.

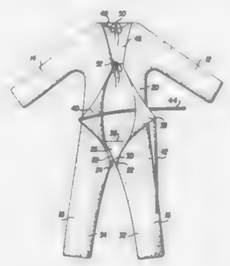
4,853,977

PATIENT GARMENT

Vivian S. Foreman, 6467 Knox Rd., Norfolk, Va. 23513

Filed Nov. 9, 1987, Ser. No. 118,079
Int. Cl.[4] A41B *9/00*
U.S. Cl. 2—114 **4 Claims**

1. A one-piece garment for use by incapacitated patients, said one-piece garment including;
- an upper portion for extending about shoulders of a patient for supporting said one-piece garment on said patient;
- first and second pants legs for respectively enclosing each leg of said patient separately, said pants legs being joined near a crotch area of the garment;
- a midriff section interconnecting the upper portion and pants legs for covering the midriff portion of the patient;
- said one-piece garment having a front section for covering the front of said patient and having a rear section for cover the rear of said patient said rear section defining a rear slit extending vertically from said crotch area through said upper portion for opening to allow said patient to enter said one-piece garment;
- said two pants legs each defining a longitudinal crotch slit at the inside thereof near the crotch with material with the front of one pants leg adjacent the crotch slit extending to overlap material adjacent the crotch slit from the front of the other pants leg in the front section at the crotch area and material from the back of one of the pants legs adjacent the crotch slit extending to overlap material adjacent the crotch slit from the back of the other pants leg in the



rear section at the crotch area and, said rear slit and said crotch slit being continuous one with the other to form a composite slit extending completely down the back section, around the crotch, and partially up the front section, there being overlapping material in both said front section and said rear section at said crotch area said overlapping material in said front section being sewn together along an approximately lateral line above the crotch area to cause said overlapping material in said front section to hang naturally in an overlapping configuration;
- whereby overlapping material at either the front, back, or both of the garment can be easily pulled open to allow a patient to perform evacuative functions, however, when they are not pulled open the garment remains closed at the front and rear of the crotch, so that a person can easily move about without exposing evacuative-function organs.

4,853,978

ANTIMICROBIAL MEDICAL GLOVE

Glenn F. Stockum, Arlington, Tex., assignor to Surgikos, Inc., Arlington, Tex.

Filed Jul. 24, 1987, Ser. No. 77,543
Int. Cl.[4] A41D *19/00;* **A61M** *35/00*
U.S. Cl. 2—167 **4 Claims**

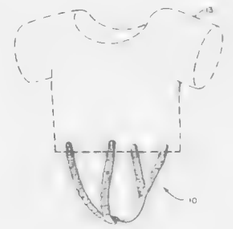
1. An antimicrobial medical glove consisting essentially of an outer elastomeric body in the shape of a hand and an inner coating containing an antimicrobial agent, said inner coating being capable of slowly releasing said antimicrobial agent in an amount and over a period of time sufficient to maintain an essentially bacteria-free and fungus-free environment within said glove after said glove has been donned, wherein said inner coating comprises cross-linked starch, and wherein said antimicrobial agent is selected from the group consisting of chlorhexidine, or salts thereof, biguanides or salts thereof, chlorinated phenols, nitrophenyl acetate, phenyl hydrazine, and polybrominated salicylanilides.

4,853,979

RELEASABLE SECURING MEANS FOR AN INFANT'S [redacted]

Judith A. Ryder, 5064 Gaviota Ave., Encino, Calif. 91436

Filed May 23, 1988, Ser. No. 197,706
Int. Cl.[4] A41F *17/00*
U.S. Cl. 2—326 **2 Claims**



1. An infant shirt securing device for use on an infant wearing a diaper, comprising:
- a first part including,
- a first elastic strip folded onto itself forming two arms arranged in a generally V-shape,
- a button and loop connector secured to each end of the strip for releasable interconnection with the front of the shirt, and
- a nonelastic strip having an end secured to the folded over part of the elastic strip and extending oppositely of the arms,
- a second part including
- a second elastic strip longer than the first elastic strip folded onto itself forming two arms arranged in a generally V-shape, and
- a button and loop connector secured to each end of the elastic strip for releasable interconnection with the back of shirt; and
- a first half of a hook-and-loop connector secured to a surface of the nonelastic strip;
- a second half of a hook-and-loop connector complementary to the first connector half secured to the second elastic where it is folded onto itself; and
- each elastic strip is enclosed within a separate fabric tube made of a material that has an external surface that is smooth to the touch.

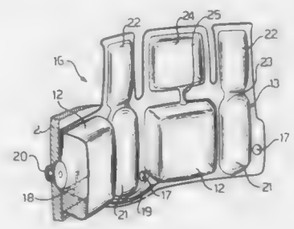
4,853,980

PROTECTIVE BUFFER PADDING ELEMENT

Claudio Zarotti, Milan, Italy, assignor to Sonda S.r.l., Milan, Italy

Filed Aug. 19, 1986, Ser. No. 902,409
Claims priority, application Italy, Dec. 21, 1984, 24164 A/84
Int. Cl.[4] A42B *3/02*
U.S. Cl. 2—413 **14 Claims**

1. A protective buffer padding element adapted to be worn in external contact with a human body comprising:
- a deformable blister, said blister containing a fluid which is capable of being in a saturated vapor state with the padding element after the padding element is worn for a sufficient period of time to raise the fluid temperature to a temperature approaching normal human body temperature; and



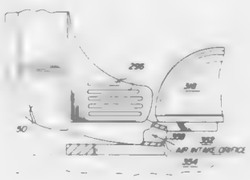
- means for retaining the padding element in external contact with a human body.

4,853,981

VENTILATED WATER CLOSET

Clyde J. Hunnicutt, Jr., 3026 E. Garfield St., Phoenix, Ariz. 85008

Continuation of Ser. No. 840,436, Mar. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 693,365, Jan. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 584,268, Feb. 27, 1984, abandoned. This application Nov. 20, 1987, Ser. No. 123,609
Int. Cl.[4] E03D *9/04*
U.S. Cl. 4—213 **11 Claims**



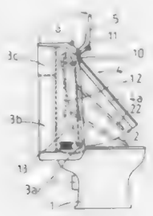
1. In a water closet air ventilating system including
- a seat spaced above the upper surface of a toilet bowl and defining an air space therebetween,
- a lid for selectively covering said seat,
- hinge means having an axis of rotation for coupling said lid to said bowl for movement between a substantially horizontal closed position and an upright open position, and
- air flow means including an air pathway carried by said lid, improvements therein for efficient entrance of air into said air flow means when said lid is in the open position, said improvements comprising:
- a. an inlet conduit depending from said lid and communicating with said air pathway; and
- b. said inlet conduit terminating in a spout defining an air inlet opening for receiving air from said toilet bowl, said inlet opening residing remotely from said air space between the upper surface of said bowl and said seat when said lid is in the closed position, and
- said inlet opening residing below said seat and within said air space between said seat and the upper surface of said bowl when said lid is in the open position.

4,853,982

TOILET APPARATUS WITH DEVICE FOR WASHING, DISINFECTING AND DRYING TOILET SEATS

Andre Martinval, 22 D rue du Trey, Le Parc Buffon, Besancon, Doubs, France

Filed Jul. 7, 1987, Ser. No. 71,547
Claims priority, application France, Jul. 11, 1986, 86 10714
Int. Cl.[4] A47K *13/00*
U.S. Cl. 4—233 **18 Claims**



1. A toilet apparatus with a device for washing, disinfecting, and drying the toilet seat comprising:
- a toilet having two seats, a chamber, and a bowl located below said chamber;
- said chamber including a flushing water tank, a disinfecting tank, and a means for removing one seat after use and replacing the used seat with the other seat;
- said means comprising two endless chains, a drive motor for driving said chains, said chains connected to each seat at the back edge thereof;
- rails for guiding the seats along their travel in the chamber;
- means for controlling the opening of a door in the chamber through which the seats pass;
- means inside the chamber for washing each seat;
- said means for washing comprising a spraying ramp inside the chamber;
- locking means on the door and the chamber to lock the door in the closed position;
- a seal inserted between the door and the box;
- unlocking means to neutralize said locking means carried on at least one chain
- wherein said means to control opening the door and to lock the door in the open position comprise at least one bent rocker having a first end and a second end;
- said rocker being coupled by the first end by means of a rod to the upper edge of the door and mounted to pivot around a median axis;
- a cam acting on the second end of said rocker;
- said rocker being adapted to make the door pivot upwardly when acted on by a profile of said cam;
- a catch working with apart of said rocker to lock it in the door opening position.

4,853,983

MECHANIZED TOILET SEAT

Denis A. Grant, Glasvey House, Ballykelly, Londonderry, Northern Ireland

Filed Sep. 2, 1987, Ser. No. 92,211
Int. Cl.[4] A47K *13/10*
U.S. Cl. 4—251 **12 Claims**

1. An apparatus operable to move a toilet seat or toilet lid between raised and lowered positions about an axis of rotation relative to an associated toilet bowl, comprising:
- a housing mounted adjacent to the toilet bowl;
- an actuating lever disposed within the housing and non-rotatably connected to a hinge carrying the seat or lid, rotation of the actuating lever being effective to cause a corresponding rotation of the seat or lid;
- a first inflatable bag disposed within the housing and operable to act on one side of the actuating lever to cause it to rotate the seat or lid in one direction;
- a second inflatable bag also disposed within the housing and operable to act on the opposite side of the actuating lever



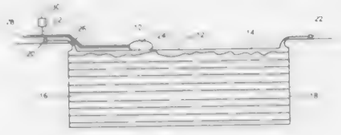
to cause it to rotate the seat or lid in the other direction; and
- manually-controllable means for supplying fluid under pressure to the first and second bags.

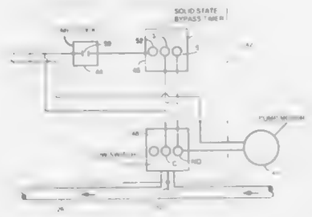
4,853,984

SYSTEM AND METHOD FOR MAINTAINING A SWIMMING POOL COVER DRAINED OF ACCUMULATED PRECIPITATION

Eugene Celiano, 2623 River Rd., Manasquan, N.J. 08736

Filed Feb. 25, 1987, Ser. No. 18,707
Int. Cl.[4] E04H *3/18*
U.S. Cl. 4—496 **18 Claims**





1. A system for maintaining a swimming pool cover drained of accumulated precipitation, said system comprising:
- a pump having an intake disposable in a fluid trap defined by an upper surface of the swimming pool cover, said pump having a discharge port disposable outside of said trap for pumping fluid from the trap to a location outside of the pool to drain the fluid from the trap;
- a fluid flow switch having a sensor member disposed in a flow path of the discharge port of said pump for detecting the presence of fluid flow from said pump; and
- a control unit including a clock unit operatively coupled to said pump for periodically operating said pump for a predetermined time interval, said control unit being operatively coupled to said flow switch for continuing to operate said pump beyond said interval upon said flow switch detecting, at the termination of said interval, fluid flow through said pump, and for subsequently terminating operation of said pump only upon said flow switch detecting a cease of fluid flow through said pump.

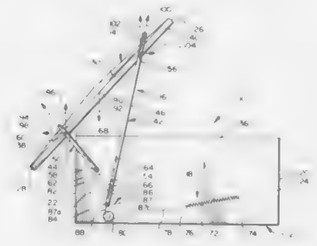
14. The method defined in claim 13 wherein said step of disposing a discharge port comprises the step of extending a discharge line of said pump from said housing of said pump in said trap to a point outside of said area.

4,853,985

COVER FOR A HOT TUB OR THE LIKE

Cliff R. Perry, 934 S. 259th Pl., Federal Way, Wash. 98003

Filed Mar. 31, 1988, Ser. No. 175,746
Int. Cl.[4] E05F *1/14*; E05D *15/32*; B65D *43/16, 43/24*
U.S. Cl. 4—498 **29 Claims**



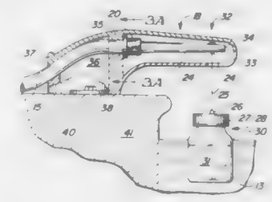
1. A cover assembly for a base structure such as a hot tub, the cover assembly having a forward end and rear end, the cover assembly comprising:
- a. a base support structure;
- b. a cover member mounted to the base structure for movement between a first covering position and a second open position;
- c. mounting arm means by which said cover member is mounted for rotational movement between said open and covering positions;
- d. said mounting arm means being arranged relative to the cover member so that the cover member travels along a path from the covering position to the open position, said path having a first path portion extending between said covering position and an intermediate location area of said cover member, and a second path portion extending between the open position and the intermediate location area;
- e. the cover member being arranged relative to the mounting arm means in a manner that with the cover member on a first side of the intermediate location area in the first path portion, gravitational force on the cover assembly tends to move the cover member to the covering position and with the cover member on a second side of the intermediate location area in the second path portion, gravitational force on the cover assembly tends to move the cover member to the open position;
- f. spring means operatively connected in the cover assembly in a manner that with the cover member in either the first path portion or the second path portion, said spring means urges the cover member toward the intermediate location area so as to oppose the gravitational force on the cover member and thus permit the cover member to be more easily moved between the covering and open positions; and
- g. said mounting arm means comprising at least one movable mounting arm connected to the cover member at a first connecting location and mounted to the base structure at a first pivot location, said spring means acting on said movable mounting arm at a spring connecting location spaced from said pivot location to exert a first moment on said movable mounting arm in a first rotational direction when said cover member is in said first path portion, and to exert a second moment on said movable mounting arm in a second opposite rotational direction when said cover member is in said second path portion.

4,853,986

WATER LEVEL CONTROL

D. Mason Allen, Altamonte Springs, Fla., assignor to The Awareness Marketing Corporation, Jacksonville, Fla.

Filed Jan. 2, 1986, Ser. No. 815,647
Int. Cl.[4] E04H *3/18*
U.S. Cl. 4—508 **9 Claims**



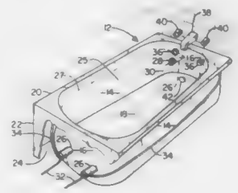
1. A water level control apparatus for controlling the water level of a swimming pool, comprising in combination:
- a water nozzle having a hose connector on one end thereof and a water outlet from the other end thereof;
- a valve formed in said water nozzle for blocking the flow of water therethrough until said nozzle is bent by a predetermined distance;
- a nozzle support means for supporting said nozzle adjacent a body of water, said water nozzle means comprising a water nozzle support encasing said water nozzle and having an opening in the end portion thereof for allowing the escape of water therethrough; and
- a weighted float connected to said water nozzle and having a predetermined mass to apply a gravitational force to said water nozzle sufficient to actuate said valve to allow the flow of water therethrough and having a predetermined floatation to reduce the gravitational force applied to said nozzle when said weighted float is immersed in water to a predetermined level to thereby close said valve and stop the flow of water therethrough, said weighted float being connected to said water nozzle with an adjustable, elongated, flexible cord, the length of which is adjustable to determine a predetermined level of water in a body of water whereby said water level control apparatus can monitor the flow of water through said valve until the water level in said body of water rises to a predetermined level on said weighted float.

4,853,987

UNITIZED HYDROTHERAPY JET AND PUMP ASSEMBLY

William R. Jaworski, 7909 Penn Ave. N., Minneapolis, Minn. 55444

Filed Sep. 14, 1987, Ser. No. 95,909
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—542 **14 Claims**



1. A hydrotherapy jet and water pump assembly for a hot tub, spa, bathtub, whirlpool or pool, said assembly comprising,

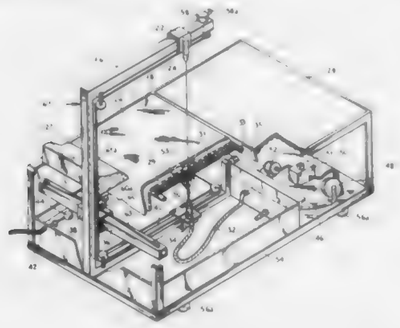
a unitized water pump, water inlet and hydrotherapy jet outlet nozzle connected together and being mountable through a hole in the wall of said hot tub, spa, bathtub, whirlpool or pool below a functional water line thereof and adapted to extend outwardly from the wall,
said assembly having a means for sealing the assembly in the hole in said hot tub, spa, bathtub, whirlpool or pool,
said jet outlet nozzle and said inlet being within the assembly adjacent the hole in the hot tub, spa, bathtub, whirlpool or pool wall and both communicating with the interior of the hot tub, spa, bathtub, whirlpool or pool through the hole,
whereby water is withdrawn from the hot tub, spa, bathtub, whirlpool or pool through the inlet, the direction of flow thereof is then redirected within the assembly and the water is forced by means of the pump back into the hot tub, spa, bathtub, whirlpool or pool through the jet outlet nozzle in proximity to the water inlet and through the same hole from which water was withdrawn from the hot tub, spa, bathtub, whirlpool or pool into the assembly.

4,853,988

OVERWATER PRESSURE JET MASSAGE APPARATUS

Theodor Mützell, 7 Senator Street, Hobart, Australia

Continuation-in-part of Ser. No. 556,708, Nov. 25, 1983, Pat. No. 4,757,562. This application Feb. 23, 1988, Ser. No. 159,097
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1981, 3147798
Int. Cl.[4] A61H *23/04*
U.S. Cl. 4—615 **7 Claims**



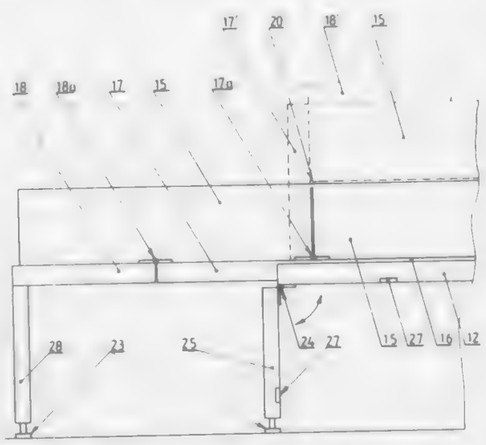
1. An apparatus for massaging a selected portion of the body of an individual, comprising:
an upwardly open water-collection vessel;
an openwork support spaced above said water-collection vessel;
a water-impermeable flexible layer overlying said openwork support and deformable upwardly therefrom, said flexible layer having an upper surface upon which the body of an individual to be massaged can repose with a selected portion of the body of the individual resting against said surface;
at least one nozzle located beneath said layer and training at least one water jet upwardly against an underside of said layer so that the water jet deforms said layer and massages said individual;
an indicator operatively coupled with said nozzle and displaying the portion of said body directly overlying the portion of said layer against which said jet is trained; and
means for displacing said nozzle below layer in accordance with the display afforded by said indicator so that said jet effects massage of said selected portion of the body through said layer and water used in said massage collects in said vessel, said means for displacing including:
a carriage on which said nozzle is mounted,
an upright connected to said carriage,
a cantilever arm connected to and overhanging said layer and carrying said indicator,
said nozzle being displaceable along said carriage and said indicator being displaceable along said arm,
a flexible element on said carriage, said upright and said arm for interconnecting said indicator and said nozzle for joint movement,
pulleys on said carriage, said upright and said arm for defining two passes of said flexible element respectively connected to said indicator and said nozzle for moving same in the same direction,
a motor coupled to said flexible element for displacing same, and
another motor operatively connected to said carriage for displacing same transversely to said upright and said arm.

4,853,989

DEVICE FOR FOLDING OR RETRACTING A BED, OR ITS ANALOGUE INTO A FALSE CEILING

Michel Garcia, "Rabajou Bellevue"—Saint Marcel Saint Sylvestre, 47140 Pennes D'Angenais, France

Filed Jul. 22, 1988, Ser. No. 222,923
Claims priority, application France, Jul. 22, 1987, 87 10510
Int. Cl.[4] A47C *17/84*
U.S. Cl. 5—10 B **23 Claims**



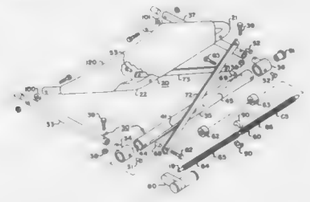
1. A device to unfold and retract furniture into a false ceiling which comprises:
a panel pivoting about a first axis of articulation between a horizontal, closed position and a vertical, open position, said panel defining a part of said false ceiling; a fixed frame, mounted on the internal face of said panel;
a mobile frame slidably mounted on said fixed frame and parallel to said panel;
a furniture frame attached to said furniture, said furniture frame being articulably mounted around a second axis, located at the end of said mobile frame opposite from said panel's first axis of articulation.

4,853,990

MECHANICAL BACKLIFT

William H. Elder, Mandeville; Ries B. Hansen, and André W. Olivier, both of New Orleans, all of La., assignors to Mechanical Backrest, Inc., Mandeville, La.

Continuation-in-part of Ser. No. 947,267, Dec. 29, 1986, abandoned. This application Feb. 3, 1989, Ser. No. 306,910
Int. Cl.[4] A47C *20/04*; A61G *7/06*
U.S. Cl. 5—71 **13 Claims**



1. A device for raising and supporting a portion of a person, comprising:
(a) a frame means comprising a first sub-assembly having first and second ends and a second sub-assembly having first and second ends, the first sub-assembly being pivotally attached adjacent the first end thereof to the second sub-assembly;
(b) a linear actuator comprising:
(i) a lead screw contained within a tube in the second sub-assembly adjacent the second end of the second sub-assembly; and
(ii) means for rotating the lead screw,
the lead screw having first and second halves, the first half having right-hand threads therein and the second half having left-hand threads, the tube having slot means therein;
(c) first and second support members, each having a first end and a second end, the first ends of the support members being pivotally attached to the first sub-assembly adjacent the second end of the first sub-assembly;
(d) first and second threaded collar members, the first being threadably disposed on the first half of the lead screw and the second being threadably disposed on the second half of the lead screw;
(e) means for attaching the second end of the first support member to the first collar member through the slot means; and
(f) means for attaching the second end of the second support member to the second collar member through the slot means,
wherein rotation of the lead screw in a first direction causes the second ends of the support members to move relative to one another such that the second ends of the first and second sub-assemblies move away from one another and rotation of the lead screw in a direction opposite the first direction causes the second ends of the support members to move relative to one another such that the second ends of the first and second sub-assemblies move toward one another.

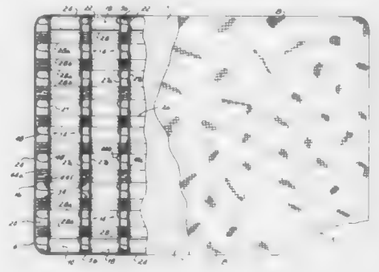
4,853,991

BEDDING FOUNDATION HAVING MULTIPLE-SPAN SINUOUS WIRE SPRINGS

Chester R. Yates, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Mar. 10, 1988, Ser. No. 166,117
Int. Cl.[4] A47C *23/04*
U.S. Cl. 5—247 **14 Claims**

2. A bedding foundation assembly comprising,
a bottom, substantially rectangular, base frame having side and end members,
a substantially planar rectangular top wire grid, said grid comprising a border wire and first and second sets of wires, said first set of wires comprising a plurality of longitudinally extending, spaced, parallel wires, said second set of wires comprising a plurality of transversely extending, spaced, parallel wires, the ends of both said first and second sets of wires fixedly connected to said border wire,
a plurality of sinuous wire springs interconnecting said base frame and said wire grid, said sinuous wire springs each comprising a sinuous spring strip made from wire bent back and forth upon itself to form oppositely facing edge loops interconnected by straight torsion bar sections, said spring strip being formed into a plurality of at least four substantially vertical legs and at least two substantially flat horizontal platform sections, said flat horizontal platform sections of each of said sinuous wire springs being secured



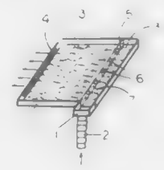
to said wire grid and the ends of said vertical legs of each of said sinuous springs remote from said flat platform sections being fixedly secured to said base frame, and
each of said substantially vertical legs of each of said sinuous wire springs consisting of three edge loops interconnected by a pair of straight torsion bars, the one of the edge loops most remote from the flat platform sections being connected to a bottom straight torsion bar, said most remote loops from the flat platform sections of at least two of said vertical legs being connected to a common torsion bar, and said flat platform sections of each of said sinuous wire springs consisting of a pair of edge loops and three straight torsion bars.

4,853,992

AIR COOLED/HEATED SEAT CUSHION

Kaung H. Yu, 13618 Braeswest Dr., Houston, Tex. 77082

Filed Jul. 22, 1988, Ser. No. 222,932
Int. Cl.[4] A47C *21/04*
U.S. Cl. 5—423 **8 Claims**



1. An air cooled/heated seat cushion for providing a cooling/heating sensation to a person, comprising:
a flexible envelope with an air distributing channel located inside one edge of said envelope, said channel includes a flexible partitioning wall connected to said envelope, said partitioning wall having a plurality of holes,
padding means embedded inside said envelope and said channel, said padding being flexible and having void spaces for diffusing air within said channel and said envelope,
means defining an air inlet opening formed at one end of said

channel for permitting air to enter said channel and diffuse through said envelope,

means defining an air discharge opening formed at the other edges of said envelope for discharging air out of said envelope, said air discharge opening being approximately opposite to said air inlet opening,

an air tube, having one end connected to said air inlet opening,

and a coupling means for connecting the other end of said air tube to an air source for providing motive air to said envelope,

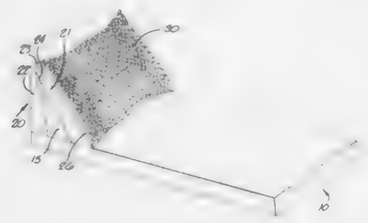
whereby the person sitting on said cushion can have a cooling/heating sensation when cooled/heated air flows through said cushion.

4,853,993

ADJUSTABLE BODY POSITIONER

Arline Walpin, and Lionel A. Walpin, both of Los Angeles, Calif., assignors to Roloke Company, Culver City, Calif.

Filed Apr. 11, 1988, Ser. No. 180,095
Int. Cl.[4] A47C *20/04*
U.S. Cl. 5—431 3 Claims



1. An adjustable body positioner comprising a foundation and an insert, said foundation being of a one piece construction and manufactured from a foam material and comprising an edge, a top piece and a bottom piece; said top and bottom pieces and said insert having substantially triangular cross sections and said insert being removeably interleaved between said top and said bottom piece, said top piece and said bottom piece are hinged along said edge of said foundation; said foundation further comprising an uppermost surface, a concave contour along the dimension parallel to said edge, a first arm support and a second arm support; said arm supports are attached to said uppermost surface forming said concave contour.

4,853,994

PILLOW BOOK

Penny S. Ekstein, New York, N.Y., assignor to P.S.E. Marketing, Inc., New York, N.Y.

Filed May 2, 1988, Ser. No. 188,904
Int. Cl.[4] A47C *20/00*
U.S. Cl. 5—437 6 Claims



4. A pillow book comprising:

a plurality of leaves, the first and last of said leaves constituting cover leaves of the book;

said cover leaves being padded to form padded pillows;

an unpadded central portion connected to inboard edges of said padded cover leaves;

said leaves between said padded pillow cover leaves being unpadded sheet-like leaves connected to said central portion along an edge of each of said unpadded leaves;

said cover leaves being the sole padded leaves of the pillow book;

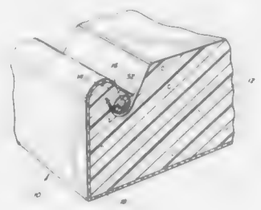
said pillow book being foldable between an open state in which said padded cover leaves are deployed in side-by-side relation separated by said central portion and a closed state in which said padded cover leaves are disposed in overlying relation with said sheet-like leaves sandwiched therebetween.

4,853,995

MOLDED CUSHION ARTICLE

George L. Bethell, Rock Island, Ill.; Donald F. Burch, Coralville, and Lysle R. Hinkhouse, Wilton, both of Iowa, assignors to Sears Manufacturing Company, Danvenport, Iowa

Filed Sep. 15, 1982, Ser. No. 418,395
Int. Cl.[4] A47C *27/14, 27/22;* B23D *27/04*
U.S. Cl. 5—481 9 Claims



1. A composite molded seat cushion assembly or the like which can be secured in place onto a seat support without additional attaching means, comprising:

foam body molded in the shape of a desired seat cushion with a peripheral portion complementary to the peripherly of the seat support;

a cloth cover molded integrally with said foam body; and

securing means molded integrally with the seat cushion in the area of the peripheral portion thereof and sized relative to the seat support to secure the entire seat cushion assembly over the seat support without additional attaching means and for providing ready replacement of the entire seat cushion assembly.

9. A composite molded seat cushion assembly or the like which can be snapped in place onto a seat support without additional attaching means, comprising:

a foam body molded in the shape of a desired seat cushion with a peripheral portion complementary to the periphery of the seat support, the peripheral portion including a peripheral lip projecting beneath said foam body;

a cloth cover molded integrally with said foam body and extending completely around the underside of said peripheral lip; and

a snap-ring member molded integrally with the seat cushion in the area of the peripheral portion thereof and sized relative to the seat support to snap the entire seat cushion assembly over the seat support without additional attaching means and for providing ready replacement of the entire seat cushion assembly.

4,853,996

PATIENT BED RESTRAINT

Linda M. Harrigan, 201 Eric Ct., Rohnert Park, Calif. 94928, and Marlene H. Jaworski, 906 Smith, Alturas, Calif. 96101

Continuation-in-part of Ser. No. 178,635, Apr. 7, 1988, abandoned. This application Oct. 3, 1988, Ser. No. 252,145
Int. Cl.[4] A61F *13/00*
U.S. Cl. 5—494 2 Claims



1. A bed restraint device for human use comprising;

a fabric mattress covering, horizontally oriented lengthwise having a head end and foot end correspondingly positioned with a rectangular mattress having a head end a foot end and sides extending between; there being a flat substantially rectangular top panel having a rectangular opening adjacent said head end thereof affixed with a soft pliable material structured as a upper torso fitting garment having a head-sized aperture between two arm-sized apertures; a wide strap fitted crosswise in said rectangular opening beneath said garment with said strap sized to be positioned behind the shoulders of a human with said human in said garment; a substantially rectangular fabric leg panel affixed centrally to the underside of said top panel between said garment and said foot end of said bed restraint having two horizontal side by side leg openings adjacent a lower distal end of said leg panel; there being affixed edgewardly to said top panel two downwardly vertically positioned lengthwise rectangular side panels adjacent said sides of said mattress and one downwardly vertically positioned front end panel adjacent said head end of said mattress; there being attached to a bottom lower edge of said front end panel and to lower bottom edges of said side panels adjacent said head end of said mattress a rectangular transverse horizontal end panel; there being two rectangular parallel horizontal bottom panels endwardly attached to said transverse horizontal end panel and lengthwise attached at outer edges thereof to said lower edges of said side panels with inner edges of said bottom panels interfacing centrally under said mattress; there being a long tie strap affixed to corners of said interfacing inner edges at said foot end of said parallel horizontal bottom panels for securing said restraint to framing members supporting said mattress.

4,853,997

MACHINE FOR LASTING SIDE PORTIONS OF SHOE UPPERS

Gerhard Giebel, Bad Soden, Fed. Rep. of Germany, assignor to DVSG Patentverwaltungs GmbH, Frankfurt am Main, Fed. Rep. of Germany

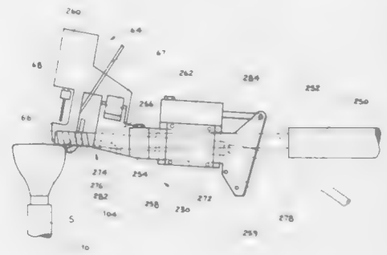
Continuation of Ser. No. 130,737, Dec. 9, 1987, abandoned. This application Dec. 28, 1988, Ser. No. 290,874
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642239
Int. Cl.[4] A43D *21/00*
U.S. Cl. 12—8.3 10 Claims

1. A machine for lasting side portions of shoe uppers, said machine including:

a shoe support for supporting a shoe which includes a shoe upper on a last and an insole on the bottom of the last, said machine having two side lasting instrumentalities arranged one at each side of the shoe support, wherein each side lasting instrumentality comprises a wiper assembly comprising a lasting roll rotatable about an axis extending transversely of the bottom of a shoe supported by said shoe support and having a helical wiping element which engages the shoe upper for effecting an in-wiping force thereon as the roll rotates, which roll is supported by a housing mounted on a support for displacement movement relative thereto in a direction extending along the axis of rotation of said roll;

means for effecting rotation of said roll;

displacement means for effecting displacement movement of the housing relative to the support between an initial, retracted position and an advanced position, as aforesaid;



means for effecting relative movement between the shoe support and the supports carrying the housings for the lasting rolls to bring the lasting rolls, while each housing is in its retracted position, into operative engagement with the upper of a shoe supported by the shoe support and thereafter to cause said rolls to operate progressively along opposite side portions of the shoe bottom; and

control means for controlling actuation of each of the displacement means whereby in accordance with a selected mode of operation, at least one of the housings, and thus the lasting rolls supported thereby, is moved at a predetermined region of the shoe bottom, inwardly towards the other housing from its retracted position to its advanced position and in so moving causes its lasting roll to effect an additional in-wiping force on the shoe upper at said region.

4,853,998

SYSTEM FOR SPREADING AND DEPOSITING A SPANNING BEAM FROM A VEHICLE SUCH AS AN ARMORED VEHICLE OF THE ENGINEER CORPS FOR CLEARING AN OBSTACLE

Jean Bernard, and Roger Brunet, both of La Seyne sur Mer, France, assignors to Constructions Industrielles de la Mediterranee (C.N.I.M.), France

Filed Feb. 29, 1988, Ser. No. 161,920
Claims priority, application France, Feb. 27, 1987, 87 02707
Int. Cl.[4] E01D *13/00*
U.S. Cl. 14—2.4 18 Claims

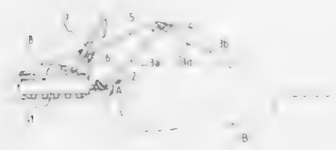
1. A system for spreading and depositing a spanning beam from a vehicle for clearing a breach,

the spanning beam pivoting vertically and occupying a transport position on the vehicle and having two successive main elements,

one inner extreme element and one outer extreme element folded down against the inner extreme element along the same, mounted in hinged relationship with respect to each other towards their adjacent ends through a hinge axis substantially perpendicular to a longitudinal axis of the spanning beam which is secured at one point of one of the

inner and outer extreme elements to one working cable winding on one winch disposed on the armoured vehicle,

wherein in said transport position the spanning beam has a position lowered towards the ground and is retained in this lowered position by said working cable, the outer extreme element is supported by a support element of a mobile support device of the vehicle formed of a hollow blade similar to that of a bulldozer, said support device occupying a raised position, and said outer extreme element is pivotally maintained at its free end to the support element by locking means assembled to the support element, and the inner extreme element rests on the outer extreme element along the same;



the spanning beam can be raised through winding of the working cable on the winch into a raised position which is approximately vertical and where the inner extreme element is pivotally supported at its free end by the support element with concomitant release of the free end of the outer extreme element from the support element obtained by unlocking of the locking means when the free end of the inner extreme element is caused to rest on the support element;

the support device is then lowered towards a bearing position on the ground to cause the outer extreme element to move from the inner extreme element thus permitting the spreading of the beam; and

the working cable is unwound from the winch to lower and deposit the spanning beam over the breach.

4,853,999

TAIL BRIDGE

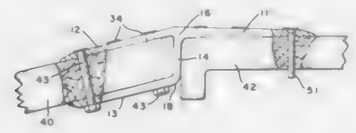
Edward Smith, 53 Belcher Rd., Blairstown, N.J. 07825

Continuation-in-part of Ser. No. 9,916, Feb. 27, 1987, Pat. No. 4,727,612. This application Feb. 29, 1988, Ser. No. 161,917

Claims priority, application Mexico, Jan. 28, 1988, 10242

Int. Cl.[4] E01D *1/00*

U.S. Cl. 14—69.5 **20 Claims**



1. A tail bridge for bridging a tail end of a motor vehicle and the ground with a ramp rail comprising a foot part for the tail bridge including

a lower section plate to be placed on the ground for supporting the tail bridge;

an upper section plate solidly joined to the lower section plate to provide an about V-shape, with the apex of the V to be disposed remote relative to the ramp rail;

an upper extension plate joined to the end of the upper section plate remote from the apex of the V along a straight uninterrupted junction line and extending at an edge of a first plate and forming an angle of from about 30 to 70 degrees relative to the first plate;

a lower extension plate joined to the end of the lower section plate remote from the apex of the V such that the upper extension plate and the lower extension plate are about parallel with an angle of less than about 5 degrees between them and where the middle plane between the upper extension plane and the lower extension plane forms an angle of less than about 20 degrees with the bisector of the V and such that a second end of the ramp rail can be placed between the upper and the lower extension plates;

a hole in the upper extension plate;

a hole in the lower extension plate such that a bolt can be placed jointly through the hole in the upper section plate and in the lower extension plate for solidly attaching the ramp rail to the lower extension plate and to the upper extension plate.

4,854,000

CLEANER OF REMOTE-CONTROL TYPE

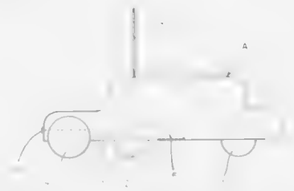
Nobuko Takimoto, No.6-19, Higashi Takasago-cho, Urawa-shi, Saitama-ken, Japan

Filed Nov. 7, 1988, Ser. No. 268,542

Claims priority, application Japan, May 23, 1988, 63-67808[U]

Int. Cl.[4] A47L *9/00*

U.S. Cl. 15—3 **1 Claim**



1. A cleaner of remote-control type comprising a cleaner body A which includes a movement means having front wheels 2 and rear wheels 3, a dust collecting means 4 comprising an adhesive-backed roller provided at the front lower portion of the cleaner body, and a receiver 7, and a transmitter B which includes a power means 8 such as a battery, a power switch 9, a movement controller 10 for controlling forward, stop and backward movements and a direction controller 11 for controlling left-turn, straight drive and right-turn.

4,854,001

DISKETTE CLEANER

Lee R. Mannheimer, 3219 W. Sierra Dr., Westlake Village, Calif. 91362, and A. Lody De Ridder, 433 Bradrick Dr., Carson, Calif. 90745

Filed May 21, 1987, Ser. No. 53,132

Int. Cl.[4] G11B *3/58;* **B08B** *11/02*

U.S. Cl. 15—97 R **4 Claims**

1. A device for cleaning a diskette comprising:

a base;

a lid pivotally mounted to said base;

a pair of cleaning pads, one of said cleaning pads being fixedly mounted to said base, and the other of said cleaning pads being fixedly mounted to said lid, said pads being adapted to clean opposing sides of a diskette; and

means for rotating a diskette relative to said pads.



4,854,002

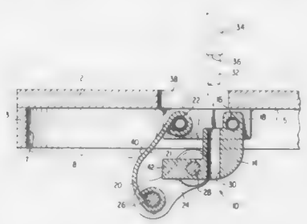
GUTTER BROOM WITH LOCKING MECHANISM

Keith E. Smith, 1612 S. Combee Rd., Lakeland, Fla. 33801

Filed Mar. 24, 1987, Ser. No. 43,606

Int. Cl.[4] A46B *13/02, 17/02*

U.S. Cl. 15—176.6 **14 Claims**



1. A holder for a broom comprising plate means providing a first surface extending in a first direction, edge means extending transversely to said first surface and connected to said plate means to form a cavity for receiving a broom block, and latch means for engaging said broom block when said broom block is in said cavity, said latch means comprising actuator means pivotally attached to said plate means and resilient means having one part pivotally attached to said actuator means and a second part pivotally attached to said plate means, said resilient means engaging said broom block to hold said broom block in said cavity when said actuator means is in a first position and to hold said actuator in said first position and releasing said broom block from said cavity when said actuator means is in a second position.

4,854,003

FLEXIBLE RECEPTACLE FOR COLLECTING AND TRANSPORTING LOOSE DEBRIS

John W. Roberts, 9908 E. Bexhill Dr., Kensington, Md. 20895

Filed Jun. 8, 1988, Ser. No. 204,112

Int. Cl.[4] B65D *33/06*

U.S. Cl. 15—257.5 **13 Claims**

1. A flexible receptacle for collecting and transporting loose debris comprising:

(a) a closed end;

(b) a mouth end opposite said closed end having an upper and a lower lip;

(c) a harness attached to said upper lip for securing said upper lip to the upper body of a person raking lawn debris; and

(d) stirrups attached to said lower lip adapted to receive such person's feet;

such person thereby acting as a prop, when wearing said harness and stirrups, to support said flexible receptacle mouth end in an open position and to position said lower lip in sufficient proximity to the ground whereby loose debris can be readily introduced into the flexible receptacle, said flexible receptacle mouth end being located and oriented by such person's forward movement.



4,854,004

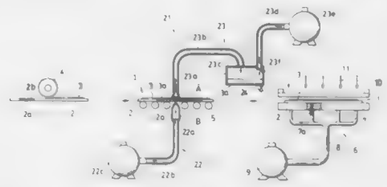
DEVICE FOR CLEARING THE HOLE BLOCKAGE OF A LIQUID RESIST SUBSTRATE

Tadao Omata, and Naoshi Kozu, both of Tokyo, Japan, assignors to ORC Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,159

Int. Cl.[4] B08B *5/02, 5/04*

U.S. Cl. 15—304 **1 Claim**



1. A device for clearing the hole blockage of a liquid resist substrate, the liquid resist substrate having a substrate formed with holes and coated on its upper surface with a liquid resist, the device comprising:

a pointed nozzle for blowing out portions of said liquid resist in said holes; and

A funnel-shaped nozzle located proximate to said liquid resist substrate for aspirating said portions of said liquid resist in said holes of said liquid resist substrate.

4,854,005

AUTOMATIC FLOOR SCRUBBING MACHINE WITH SQUEEGEE ASSEMBLY AND ADJUSTABLE WHEELS

Martin E. Wiese, 53070 Haddington, South Bend, Ind. 46635, and Dexter K. Lehman, 23184 C.R. 26 East, Elkhart, Ind. 46517

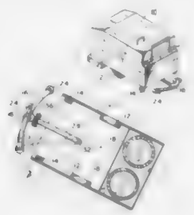
Filed Nov. 3, 1988, Ser. No. 266,838

Int. Cl.[4] A47L *11/202*

U.S. Cl. 15—320 **4 Claims**

1. In an automatic scrubbing machine having a housing, cleaning liquid application and recovery tanks for applying said cleaning liquid to a floor, scrubbing brushes rotatably mounted on said housing for scrubbing said floor after said cleaning liquid has been applied, the improvement comprising:

a mopping device in combination with and in tandem with said scrubbing machine including a squeegee assembly having an elongated bar provided with a pivot joint mounted at or near the geometric center of said housing and a wheeled carriage



mounted on said bar adjacent to the center of said squeegee, whereby said squeegee assembly is constrained to follow the turning movements of said scrubbing machine without drifting laterally off to the side of the path of movement of said machine.

4,854,006

FLOOR NOZZLE FOR VACUUM CLEANER

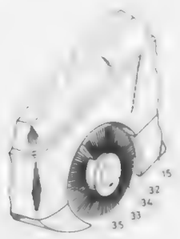
Hiroshi Nishimura, Gamou, and Yasutaka Hirayama, Kouka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 29, 1988, Ser. No. 174,922

Claims priority, application Japan, Mar. 30, 1987, 62-76756; Mar. 30, 1987, 62-76757

Int. Cl.[4] A47L *5/30*

U.S. Cl. 15—375 13 Claims



1. A floor nozzle for a vacuum cleaner comprising:

a nozzle case having sides, a bottom, a suction compartment therein, an elongated nozzle mouth in said bottom extending between said sides and opening to said compartment and a notch-like aperture in one of said sides extending upward from the lower edge thereof at one end of said mouth;

a main brush rotatably mounted in said compartment with its axis generally coaxial with said aperture and its tufts extending through said mouth and slightly therebeyond;

at least one auxiliary brush in said compartment connected by torque limiting means to one end of said main brush and rotatable therewith with the tips of the tufts of said auxiliary brush rotating closely adjacent at least a major portion of the edge of said aperture; and

means for rotating said main brush.

4,854,007

DUST-PROOF CASTER WITH A BRAKE MECHANISM

Chih-Jen Cheng, No. 69-10, Ta Fung Road, San Ming Dist., Kaohsiung City, Taiwan

Filed Jul. 19, 1988, Ser. No. 221,414

Int. Cl.[4] B60B *33/00*

U.S. Cl. 16—18 A 5 Claims



1. A dust-proof caster with a brake mechanism, comprising:

a caster having a wheel hub extending inwardly thereof;

a casing comprising a bearing extending inwardly thereof which is fitly received in said wheel hub, a supporting sleeve extending outwardly thereof, and an annular flange formed on a periphery of said casing;

a bracket board having a rotary shaft fitly rotatably received in said supporting sleeve;

an external wheel circle provided around a periphery of said caster for increasing the strength thereof, the diameter of said external wheel circle being reduced from an inner end to an outer end along the axis thereof and consequently, when the peripheral surface of said wheel circle is in full contact with the ground, said bearing together with said wheel hub are inclined with respect to the horizontal, thus the laterally slanting moment exerted upon said caster can be reduced due to the effective force normal to said bearing being reduced;

an annular recess formed on a periphery of said caster for fitly accommodating said annular flange of said casing when said caster is assembled with said casing for forming a tight seal between said caster and said casing for preventing dust or fragmental threads from getting into the fissure between said wheel hub and said bearing;

a shoulder defined around said rotary shaft of said bracket board, abutting against an upper end of said supporting sleeve to form a joint therebetween when said rotary shaft is inserted thereinto; and

a separate cover hoop provided around said shoulder with an inner peripheral flange closely surrounding said supporting sleeve and covering the joint between the supporting sleeve and the shoulder for preventing dust or fragmental threads from getting into the fissure between said rotary shaft and said supporting sleeve.

4,854,008

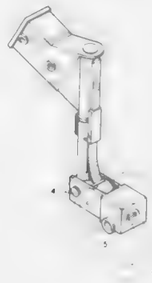
DETACHABLE CASTOR SUPPORT FOR A BABY CARRIAGE

Jason Kuo, No. 15, Lane 37, Fu Hsing Street,, I Chia Tsun, Jen Te Hsiang, Tainan Hsien, Taiwan

Filed Dec. 2, 1988, Ser. No. 279,076

Int. Cl.[4] B60B *33/00*

U.S. Cl. 16—30 1 Claim



1. A detachable castor support for a baby carriage comprising:

a body portion having a vertical shaft with a pivot hole and a first protuberance at a lower end thereof;

a stand having a rectangular recess having two sides each formed with a semicircular notch at a lower part thereof and an elongated slot at a front part thereof;

a U-shaped member including a horizontal bottom wall and two vertically extending sidewalls and extending from and being formed as one piece with a rear part of said stand and having a hole in each said U-shaped member sidewall and a semicircular notch in the bottom thereof, said bottom semicircular notch receiving a lower end of the vertical shaft of said body portion;

a separate, removably attached connector, having a tubular lug at both sides and a second protuberance at the front side, fixedly disposed within said stand recess with the tubular lugs engaged within the semicircular notch as of said stand and the second protuberance fitted into the elongated slot of said stand; and

a rivet extending through the hole of said U-shaped member and the pivot hole in the lower end of the vertical shaft of said body portion, an axle means having wheels thereon extending through the lugs in the connector, and a spring being located between the first protuberance and the bottom of the U-shaped member.

4,854,009

UNHINGEABLE DOOR HINGE FOR MOTOR VEHICLE DOORS HAVING A HINGE PIN DIVIDED INTO TWO BOLT-LIKE HALVES NON ROTATABLY FASTENED TO A HINGE PORTION

Ernst Brockhaus, Remscheid-Hasten, Fed. Rep. of Germany, assignor to Ed. Scharwächter GmbH & Co. KG., Remscheid, Fed. Rep. of Germany

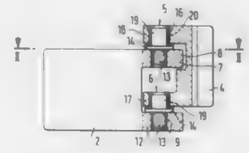
Filed Nov. 25, 1987, Ser. No. 125,557

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1986, 3644576

Int. Cl.[4] E05D *7/10*

U.S. Cl. 16—263 21 Claims

1. A removable door hinge for motor vehicle doors, the door hinge including two hinge portions, one of the hinge portions adapted for being fastened to a structural part of a motor vehicle door and the other hinge portion adapted for being fastened to a motor vehicle body, each hinge portion having upper and lower eye portions defining eye bores, the eye portions meshing with each other in the assembled state of the hinge and a hinge pin extending through the eye bores, means for securing the hinge against unintentional separation over a permissible pivoting range of the hinge, the securing means being formed by meshing at least one projection and at least one recess arranged alternatingly on the hinge portions, the improvement comprising that the hinge pin is divided into two



bolt-like halves which are each non-rotatably fastened to the eye portions of one of the hinge portions, the recess forming part of the securing means being provided in the hinge portion to be fixed to the motor vehicle door, the recess being located immediately adjacent the upper eye portion of the hinge portion to be fixed to the motor vehicle door.

4,854,010

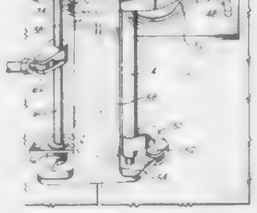
HINGE MEHANISM FOR AIRCRAFT DOOR

Alex Maraghe, and Miloslav Puncoch, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 20, 1987, Ser. No. 123,599

Int. Cl.[4] E05D *15/30*

U.S. Cl. 16—360 4 Claims



1. A hinge mechanism for mounting a door to an entryway in a wall, comprising:

an idler crank arm having first and second ends, said first end being pivotally connected to said wall;

a goose-neck member having first and second ends, wherein said first end of said member is pivotally connected to said idler crank arm's second end, and wherein said second end of said member is pivotally connected to said door near a side edge of said door;

a guide arm having first and second ends, wherein one of said guide arm ends is pivotally connected to said door at a position nearer the side edge of said door than the position where said second end of said goose-neck member is pivotally connected to said door, in a manner so that said guide arm moves in response to opening and closing movement of said door, said guide arm being supportably connected to said idler crank arm in a manner so that said guide arm may both pivot and translate as said guide arm moves;

an "S"-shaped track connected to said wall; and

cam follower means for causing the other end of said guide arm to follow the direction of said track's shape as said guide arm moves.

4,854,011

METHOD FOR AUTOMATICALLY COMPENSATING DENSITY OR THICKNESS VARIATIONS OF FIBER MATERIAL AT TEXTILE MACHINES, SUCH AS CARDS, DRAW FRAMES AND THE LIKE

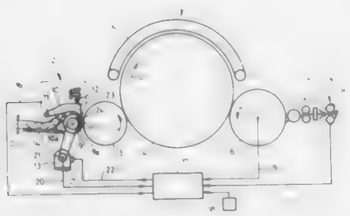
Paul Stäheli, Wilen b.Wil; Robert Demuth, Nürensdorf, and Peter Fritzsche, Winterthur, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Dec. 10, 1987, Ser. No. 132,274

Claims priority, application Switzerland, Dec. 12, 1986, 04951/86

Int. Cl.[4] D01G *15/36, 15/40*

U.S. Cl. 19—105 23 Claims



1. A method of automatically compensating density variations of fiber material at a textile machine, comprising the steps of:

infeeding a mass of fiber material to a fiber infeed means possessing cooperating feed elements defining therebetween a nipping zone having an essentially invariable size during operation of the fiber infeed means when detecting density variations of the infed mass of fiber material;

generating by means of one of said cooperating feed elements signals representative of density variations of the throughpassing mass of fiber material in the essentially invariable size nipping zone;

processing the mass of fiber material in the textile machine and obtaining a processed fiber material at an outlet side of the textile machine;

detecting density variations of the processed fiber material at the outlet side of the textile machine;

generating signals representative of density variations of the processed fiber material at the outlet side of the textile machine;

processing at least the generated signals representative of the density variations of the throughpassing mass of fiber material in the essentially invariable size nipping zone and the generated signals representative of density variations of the processed fiber material at the outlet side of the textile machine to obtain control signals; and

utilizing the obtained control signals for substantially compensating density variations of the throughpassing mass of fiber material in the essentially invariable size nipping zone to produce at the outlet side of the textile machine processed fiber material of essentially a desired density.

4,854,012

SAW TOOTH WIRE OF A SAW TOOTH-CARD CLOTHING FOR A TEXTILE MACHINE PRODUCING RANDOMLY ORIENTED FIBRE FLEECES

Ralph A. Graf, Freienbach, Switzerland, assignor to Graf & Cie Ag, Rapperswil, Switzerland

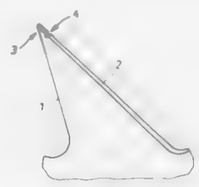
Filed Mar. 28, 1988, Ser. No. 174,098

Claims priority, application European Pat. Off., Dec. 29, 1987, 87119297.7

Int. Cl.[4] D01G *15/88*

U.S. Cl. 19—114 7 Claims

1. A saw tooth wire of a saw tooth card clothing of a textile machine for the production of a randomly oriented fibre fleece, which saw tooth wire includes a plurality of saw teeth, each having a leading edge, a trailing edge and a saw tooth tip section located therebetween, said saw tooth tip section comprising a fibre flow obstacle member, operative to delay the sliding-off of any fibres engaged by such tooth at the trailing



edge thereof, whereby the delivery of th fibres from the main carding cylinder onto the doffer roller is delayed and an increased random orientation of the fibres in the fibre fleece produced thereby is attained.

4,854,013

DEVICE FOR FINE-OPENING AND CLEANING FIBER MATERIAL, ETC.

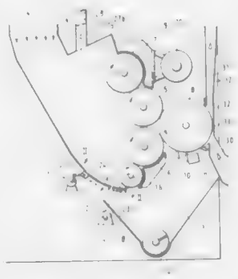
Akiva Pinto, Neubulach, and Guenter Lucassen, Haltern, both of Fed. Rep. of Germany, assignors to Hergeth Hollingsworth GmbH, Duelman, Fed. Rep. of Germany

Filed Apr. 1, 1988, Ser. No. 176,528

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 3711642

Int. Cl.[4] D02J *7/00*

U.S. Cl. 19—200 22 Claims



1. Textile apparatus for fine-opening and cleaning textile fiber material in which the fiber material is fed to a filling chamber, a number of opening rollers in superposed arrangement disposed at a side of said filling chamber, said opening rollers followed by a take-off roller cooperating with a cleaning means by which said fiber material is conveyed by an air suction current through a channel to be supplied to a textile processing machine characterized in that a supply roller is disposed within said filling chamber adjacent one of said opening rollers, and said supply roller has a smaller diameter and rotates at a substantially slower speed than said superposed opening rollers.

4,854,014

FASTENER

Hideyuki Ueno, Yokohama, Japan, assignor to Toaka Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,474

Claims priority, application Japan, Sep. 11, 1987, 62-226251

Int. Cl.[4] B65D *63/00*

U.S. Cl. 24—16 PB 5 Claims



1. In a fastener having a filament, a head at one end of the filament and a socket at the other end of the filament with an insertion hole therein, these parts being integrally formed of synthetic resin, the invention characterized by:

the head having an axially extending, collapse-facilitating groove;

a skirt on the head extending therearound and being interrupted by the groove;

an annular flange in the insertion hole of the socket for engagement beneath the skirt when the head is pressed through the insertion hole;

wherein the head is provided with a rib disposed in the groove for limiting collapse of the head.

4,854,015

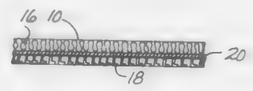
ADJUSTABLE LOOP CLAMP

Lawrence M. Shaull, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 10, 1988, Ser. No. 205,192

Int. Cl.[4] B65D *63/00*

U.S. Cl. 24—16 R 16 Claims



1. A flexible loop clamp, comprising;

a rigid base member including a mounting portion means for connecting to a support structure, to in that manner fix the base member in position on the support structure, a strap attachment portion having opposite ends, a through opening positioned between the mounting portion means and the strap attachment portion, and connector portions extending between and interconnecting the mounting portion means and the opposite ends of the strap attachment portion and outward bounding said opening;

a flexible clamping strap comprising a flexible fabric body having first and second ends, said first end of the strap being attached to said strap attachment portion of the rigid base member, to extend from it in a direction generally opposite the mounting portion;

said opening being sized to receive and pass said flexible strap, so that said flexible strap can be looped around an article and then inserted through said opening, to form said strap into a loop portion which encircles the article and a tail portion which extends outwardly from the opening and which includes said second end;

complementary connector elements extending over a substantial area of an inner surface of the tail portion of the strap and a confronting outer surface of the loop portion of the strap, wherein the connector elements on one of said surfaces are upstanding hook elements and the connector elements on the other surface are upstanding loop elements;

said strap attachment portion including bearing surface means for bearing against said strap contiguous the first end of the strap, along which said strap may slide while the second end of the strap is being pulled through the opening positioned between the mounting portion means and the strap attachment portion to tighten the loop about the article;

said loop portion of the strap defining a closed loop which starts from said strap attachment portion of the base member, then extends away from said base member and the support structure to which it is connected, around the article, then back to said base member, through said opening, and against said bearing surface means; and

said bearing surface means located substantially on an outer boundary of said closed loop, so that following a pulling on the second end of the strap to tighten the loop portion of the strap, and while maintaining said tightening pull on said strap, the tail portion of the strap can be swung inwardly toward and against an outer surface of the loop portion of the strap to, in that manner, cause connecting engagement of the connector elements on the tail portion of the strap with the connector elements on the confronting loop portion of the strap.

4,854,016

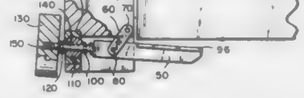
DEVICE FOR CLAMPING THE EDGE OF A TABLE TOP

Paul Rice, c/o XRE Corp., 300 Foster St., Littleton, Mass. 01460

Filed Nov. 24, 1987, Ser. No. 124,908

Int. Cl.[4] A41F *1/00*

U.S. Cl. 24—495 16 Claims



1. Device for clamping the edge of a diagnostic table top comprising:

a clamping block means having an inside face for abutting the side edge of the table top;

a first jaw means connected to the clamping block means having an inner face for abutting one of the top or the bottom surfaces of the table top;

a second jaw means pivotably connected to the clamping block means having an inner face for abutting the other of the top or bottom surfaces of the table top;

the second jaw means being connected to the clamping block means by a link means and a shaft means, wherein the link means is pivotably connected to the second jaw means and wherein the shaft means is movably mounted in the block means such that when the shaft means is moved, the second jaw means articulates between a clamping position and an open position;

the shaft means being connected to the second jaw means and movably mounted in a ball joint means, the ball joint means being pivotably mounted in the clamping block means and the link means being pivotably connected to the second jaw means such that one of longitudinal and rotatable movement of the shaft means within the ball joint means causes the shaft means, the second jaw means, the ball joint means and the link means to simultaneously pivot.

4,854,017

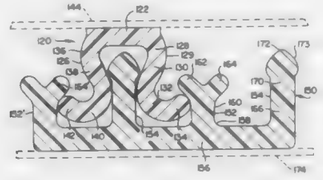
MULTIPOSITION INTERLOCKING CLOSURE FASTENING DEVICE

Ewald A. Kamp, Chicago, Ill., assignor to First Brands Corporation, Danbury, Conn.

Continuation of Ser. No. 887,912, Jul. 22, 1986, abandoned. This application Nov. 17, 1987, Ser. No. 122,589

Int. Cl.[4] B65D *33/24*

U.S. Cl. 24—587 6 Claims



1. A closure fastening device comprising a first closure element and a second closure element; said first closure element having a generally omega-shaped profile portion comprising a generally straight bottom portion attached to a base and having two spaced apart inwardly projecting arm potions with sections close to said bottom portion extending outwardly from opposite ends of said bottom portion, said inwardly projecting arm portions being curved inwardly towards each other in the section closest to said bottom portion having an underside and thereafter curving outwardly and terminating in outwardly facing curvilinear hook portions; said second closure element comprising a profile having a generally straight bottom portion attached to a base and having a plurality of rod-shaped portions having stem portion extending in a generally perpendicular direction from said bottom portion and having a generally rounded extremity with a portion of enlarged width located anteriorly of said extremity, each of said rod-shaped portions being flanked on either side by a generally Y-shaped profile having the stem portion extending in a generally perpendicular direction from said bottom portion and having an overall length which is shorter than that of said rod-shaped portions, said first and second closure elements forming an interlocked closure fastening device when they are occluded together.

4,854,018

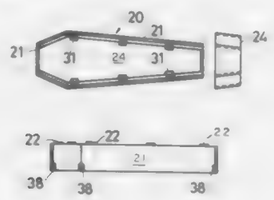
CASKET LINERS

Marmaduke G. Von Bratt, 24 Claremont Terrace, Otumoetai, Tauranga, New Zealand

Filed Jul. 6, 1987, Ser. No. 70,073

Int. Cl.[4] A01N *1/00*

U.S. Cl. 27—19 6 Claims



1. A casket assembly comprising an outer casket and a liner arranged to nest securely within said outer casket, the peripheral walls of said outer casket, being tapered downwardly and inwardly and provide an open bottom area of cross section less than the top area of cross section of the liner, thus providing support therefor, whereby the assembly can be raised with the liner supported within the outer casket and means for release, of the liner support whereby the outer casket can be removed from around the liner.

4,854,019

TEXTURIZING NOZZLE FOR ENDLESS FILAMENT THREADS

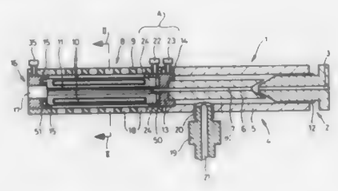
Werner Nabulon, Rüdlingen, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Mar. 11, 1988, Ser. No. 167,017

Claims priority, application Switzerland, Mar. 16, 1987, [illegible]

Int. Cl.[4] D02G *1/12, 1/16*

U.S. Cl. 28—255 7 Claims



1. A texturizing nozzle for endless filament threads moving therethrough in a predeterminate direction of travel, comprising:

a thread infeed portion for infeeding endless filament threads;

a treatment portion following and adjoining said thread infeed portion;

said treatment portion containing means for infeeding a treatment fluid for drawing the endless filament threads through the thread infeed portion into the treatment portion and for heating the endless filament threads in said treatment portion;

a crimping portion following the treatment portion with respect to the predeterminate direction of travel of the endless filament threads;

said crimping portion having an outlet side for the endless filament threads;

a connector element connecting the treatment portion with the crimping portion;

a mouth portion provided at the outlet side of the crimping portion;

lamellae provided for the crimping portion;

each of said lamellae having an upper end and a lower end;

said connector element being provided with substantially radially arranged slots for receiving the upper ends of the lamellae;

each of said substantially radially arranged slots of said connector element having a slot base;

said mouth portion being provided with substantially radially arranged slots for receiving the lower ends of the lamellae;

each of said substantially radially arranged slots of said mouth portion having a slot base;

said upper ends of said lamellae being insertably retained in the substantially radially arranged slots of the connector element and the lower ends of the lamellae being insertably retained in the substantially radially arranged slots of the mouth portion;

said connector element being divided into two substantially equal parts which are separable from one another;

said mouth portion being divided into two substantially equal parts which are separable from one another;

said substantially radially arranged slots of each part of said connector element being connected together at said slot bases by a half-circular-shaped cleaning groove which is open in the separated condition of the connector element; and

said substantially radially arranged slots of each part of said mouth portion being connected together at said slot bases by a half-circular-shaped cleaning groove which is open in the separated condition of the mouth portion.

4,854,020

PROCESS FOR TREATMENT OF FILAMENT CABLE

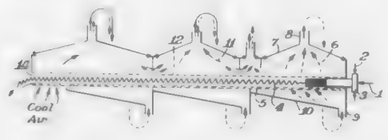
Wolfram Wagner; Dieter Paulini, and Peter Widder, all of Dormagen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 19, 1988, Ser. No. 145,574

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1987, 3702543

Int. Cl.[4] D02G *1/12, 1/16*

U.S. Cl. 28—255 2 Claims



1. A process for treating a filament cable of from 5 to 500 ktex in a treatment apparatus that includes an enclosed chamber comprising the steps of introducing the filament cable into the enclosed chamber of the apparatus through an aerodynamic crimping device mounted gas tight at one endface of the enclosed chamber and forming a product inlet gate, crimping the filament cable to form a crimp cake with a compression factor of 2–100, passing the crimp cake through the enclosed chamber with a transport speed of 0.2 to 5 m/min over a gas permeable, stationary and horizontal screen bottom plate having perforations therein, impinging gas on the crimp cake from a gas distribution chamber below the bottom plate by flowing the gas through the plate with a gas velocity of 0.3 to 3 m/sec, moving the cake over the plate with minimum contact therewith, treating the crimp cake during a residence time of 2–15 minutes over the plate, and removing the treated crimp cake with surface weights of 1.5 to 20 kg/m from the enclosed chamber of the treatment apparatus, and wherein the enclosed chamber of the treatment apparatus is subdivided into several treatment zones and the gas treatment medium is drawn off by a ventilator above the crimp cake, passing the withdrawn gas treatment medium over a heat exchanger and through restrictor valves, reintroducing the medium into the treatment zone from below in order to maintain the crimp cake minimum contact with the plate and wherein the treatment zones include cooling zones provided with fresh air introduced in countercurrent fashion.

4,854,021

STUFFERBOX CRIMPER AND PROCESS FOR PREPARING CRIMPED SYNTHETIC FIBERS

Ulrich Reinehr, Dormagen; Christian Pieper, Neuss; Rolf-Burkhard Hirsch, Dormagen; Hermann-Josef Jungverdorben, Dormagen, and Jakob Breuer, Dormagen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 8, 1987, Ser. No. 93,735

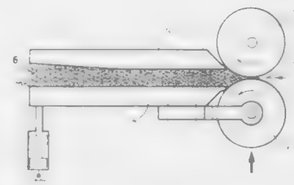
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1986, 3631905

Int. Cl.[4] D02G *1/12*

U.S. Cl. 28—263 3 Claims

1. An apparatus for crimping acrylic fiber tows having high tow weights above 100,000 dtex and production speeds above 200 m/min comprising a stufferbox without heating means and a pair of feed rollers constructed and arranged to feed fiber tows into the stufferbox, the stufferbox including a floor, a lid and opposed side walls, the stufferbox having an inlet opening and an unobstructed outlet opening larger than the inlet opening, pivot mounting means near the inlet opening whereby at least one of the lid and floor is movable relative to the other, the floor, lid and opposed side walls of the stufferbox defining a first zone adjacent the inlet opening and a second zone extending downstream therefrom, and the stufferbox having dimensions whereby the lid and floor are generally parallel to one another in the first zone and the lid and floor gradually move apart from one another in the second zone up to the unobstructed outlet opening.

3. A process for crimping acrylic fiber tows having high weights above 100,000 dtex with an apparatus comprising a pair of feed rollers and a stufferbox having a floor, lid and opposed walls that define an inlet opening and an unobstructed outlet opening, introducing the acrylic fiber tows into the stufferbox at a rate of at least 200 m/min, moving at least one of the lid and floor toward one another about a pivot point near the inlet opening while the opposed side walls are fixed, moving the acrylic fiber tow through a first zone in the stufferbox adjoining the inlet opening, and then through a second adjoining stufferbox zone, the lid and floor being generally parallel to one another in the first zone and the distance from the lid to the floor in the second zone gradually increasing in the direction of the unobstructed outlet opening, in the working position of the stufferbox the distance between the lid and floor being smaller at the inlet opening than the distance between the lid and floor at the unobstructed outlet opening, the area of the side walls of the second stufferbox zone amounting to at least 85% of the area of the side walls of the first stufferbox zone, and the floor in the two stufferbox zones being planar, the acceleration factor V_2 formed from the ratio of the two speed v (m/min) with a residence time t(sec) in the crimping box being less than 100, the ratio V_3 of throughout weight m (g/sec) and residence time t(sec) being smaller than 50, and wherein the material density is



$$\frac{\text{crimping box contents (g)}}{\text{crimping box capacity (cm}^3\text{)}}$$

and is greater than 0.2.

4,854,022

DEVICE FOR THE FORMATION OF A CORNER OF FLEXIBLE SPACERS FOR GLASS PLATES

Peter Lisec, Bahnhofstrasse 34, A-3363 Amstetten-Hausmening, Austria

Filed Oct. 20, 1987, Ser. No. 111,415

Claims priority, application Austria, Nov. 3, 1986, A 2927/86

Int. Cl.[4] B23P *21/00;* B32B *31/18*

U.S. Cl. 29—33 K 14 Claims

1. Device for the formation of a corner of a flexible spacer attached to a glass plate, wherein one end of the spacer protrudes beyond the glass plate, with a clamp holding the spacer during formation of the corner in the latter and being pivotable relatively to the glass plate about an axis perpendicular to the glass plate, which clamp has means which are brought into contact with the spacer from both sides, characterized in that the clamp (11) which has means (12, 13) which are brought into contact with the end (7) of the spacer (2) protruding beyond the glass plate (1) is mounted to be pivoted, after seizing the end (7) of the spacer (2) with the glass plate (1) being at a standstill, by 90° from a horizontal position (FIG. 1) into a

vertical position (FIG. 2); and that a pressure ram (20) advanceable (arrow 18) perpendicularly to the plane of the glass



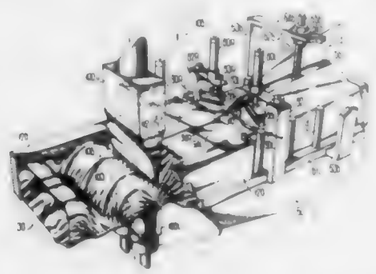
plate (1) is provided for pressing the end (7) of the spacer (2), bent by the clamp (11), against the glass plate (1).

4,854,023

METHOD FOR PROVIDING POCKETED COIL STRINGS HAVING A FLAT OVERLAP SIDE SEAM

Walter Stumpf, Dunwoody, Ga., assignor to Simmons U.S.A. Corporation, Atlanta, Ga.

Filed Jun. 13, 1988, Ser. No. 205,920
Int. Cl.[4] B68G *7/00*
U.S. Cl. 29—91 24 Claims



1. A method of forming pocketed coil strings, comprising the steps of:
(a) forming an elongate tube of fabric having a longitudinal axis;
(b) forming a first transverse seam across said tube;
(c) inserting a spring into said elongate tube and positioning said spring adjacent to said transverse seam; and
(d) forming a second transverse seam across said tube, said second transverse seam being positioned adjacent to said spring such that said first and second transverse seams are on opposite sides of said spring, and said spring is substantially enclosed by said fabric.

4,854,024

METHOD OF MAKING MULTI-STREAM THIN EDGE ORIFICE DISKS FOR VALVES

John H. Grieb; J. M. Joseph, both of Newport News; Richard D. Weaver, Williamsburg, and George T. Bata, Grafton, all of Va., assignors to Siemens-Bendix Automotive Electronics L.P., Troy, Mich.

Continuation-in-part of Ser. No. 937,658, Dec. 4, 1986, abandoned. This application Dec. 23, 1987, Ser. No. 137,497
Int. Cl.[4] B21K *1/20*
U.S. Cl. 29—156.7 R 9 Claims



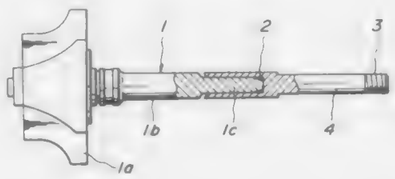
2. A process for manufacturing a multi-stream thin edge orifice disk comprising the steps of:
procuring a piece of thin stock;
punching in the stock the nominal size of at least two thin edge orifices;
coining one surface surrounding each of the thin edge orifices
forming an embossment including said at least two thin edge orifices such that each of said orifices is positioned along the surface of the embossment.
punching the outside diameter of the disk; and then
removing the completed disk from the stock.

4,854,025

METHOD OF PRODUCING A TURBINE ROTOR

Isao Oda, Nagoya, and Nobuo Tsuno, Kasugai, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Division of Ser. No. 867,538, May 28, 1986, Pat. No. 4,761,117. This application May 10, 1988, Ser. No. 192,366
Claims priority, application Japan, Jun. 12, 1985, 60-126293
Int. Cl.[4] B21K *3/00*; B23P *15/00*
U.S. Cl. 29—156.8 R 11 Claims



1. A method of producing a turbine rotor comprising a turbine vane wheel made of ceramics, a ceramic shaft formed integrally with the vane wheel and a metallic shaft bonded to the ceramic shaft, said method comprising making a part of or the whole part of the metallic shaft from a precipitation hardenable type alloy, bonding the metallic shaft to the ceramic shaft, hardening the part of the metallic shaft made of the precipitation hardenable type alloy through precipitation hardening treatment, softening the part of or the whole part of the compressor wheel-fitting shaft portion of the metallic shaft through heating again at a solution treating temperature, wherein the hardness of a part of or the whole part of the compressor wheel-fitting shaft portion is made smaller than that of the metallic shaft located on the turbine vane wheel side

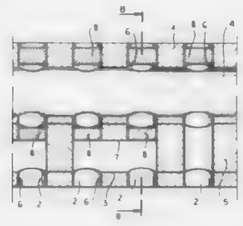
apart from said part of the compressor wheel-fitting shaft portion.

4,854,026

METHOD OF PRODUCING A PRESS PLATEN

Günter Averdick, and Herbert Sandten, both of Krefeld, Fed. Rep. of Germany, assignors to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

PCT No. PCT/DE87/00153, § 371 Date Aug. 19, 1987, § 102(e) Date Aug. 19, 1987, PCT Pub. No. WO87/06167, PCT Pub. Date Oct. 22, 1987
PCT Filed Apr. 7, 1987, Ser. No. 134,777
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1986, 3611839
Int. Cl.[4] B23P *15/26*
U.S. Cl. 29—157.3 R 4 Claims



1. A method of making a press platen adapted to be traversed by a fluid medium for a platen press used in making pressed board, said method comprising the steps of:
(a) in a press platen forming a plurality of fluid medium channels extending parallel to one another in one direction;
(b) thereafter inserting in said channels respective cores dimensioned to fit said channels;
(c) then drilling bores in said platen perpendicular to said channels and through said channels and the cores received therein to provide passages communicating with said channels, while forming bores in said cores;
(d) thereafter withdrawing said cores from said channels and, outside said platen, forming said cores with fluiddeflecting elements at least in part by the bores formed in said cores and inserting therein plugs for controlling fluid flow through said passages; and
(e) reinserting said cores in the respective channels for control of fluid flow between said channels and said passages and between said passages.

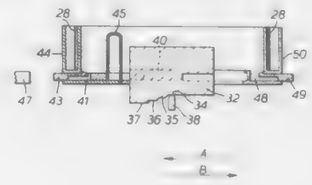
4,854,027

MANUFACTURE OF IMPACT PRINTING RIBBON CARTRIDGE

Michael J. Smith, Bracknell; George R. W. Sully, Woking, and Martin Crisp, Bracknell, all of United Kingdom, assignors to Data Recording Instrument Company Limited, Staines, England

Division of Ser. No. 705,450, Feb. 25, 1985, Pat. No. 4,729,676. This application Mar. 2, 1988, Ser. No. 163,276
Claims priority, application United Kingdom, Mar. 1, 1984, [redacted]
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—434 11 Claims

1. A method of manufacturing a print ribbon cartridge loaded with a length of print ribbon comprising a first step of manufacturing a cartridge body comprising walls defining a ribbon storage region, and performing selectively second and third steps;
said second step comprising forming first means on said cartridge body operative to co-act with a first ribbon shift mechanism on a printer on which the cartridge is to be mounted and loading a length of ribbon carrying a single color of ink into said ribbon storage region; and said third step comprising mounting, on said cartridge, a second ribbon shift mechanism selectively operable to co-act with



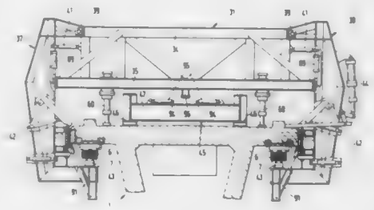
abutment means on a printer on which the cartridge is to be mounted and loading a length of ribbon carrying different colored inks in a plurality of bands extending parallel to one another along the length of said ribbon into said storage space.

4,854,028

METHOD OF LOCATING OPERATIONAL SURFACES OF A TRACK FOR ELECTROMAGNETICALLY LEVITATED VEHICLES

Wilhelm Büchler, Haar; Walter Lippert, Münich, and Lorenz Maier, Otterfing, all of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft

Filed May 16, 1988, Ser. No. 194,383
Claims priority, application Fed. Rep. of Germany, May 15, 1987, 3716260
Int. Cl.[4] B21D *39/00*
U.S. Cl. 29—452 7 Claims



1. Method of aligning and securing operating surfaces of a running track for electromagnetically levitated vehicles formed of and elongated beam-like support member having a generally horizontal upper surface over which the vehicles run and an oppositely directed lower surface and upwardly extending outer sides extending between the upper and lower surfaces in the elongated direction of the support member, and where the operating surfaces are formed by stators and side guide rails, with the stators in position on the lower surface of the support member with each stator located adjacent to and extending generally parallel along one of the outer sides of the support members, comprising the steps of positioning and holding a side guide rail extending in the direction of each of the outer sides, moving each of the held side guide rails adjacent to a different one of the outer sides thereof and locating the held side guide rails relative to the support member in a predetermined spacing relative to one another, positioning the held and spaced side guide rails in the vertical direction relative to a downwardly facing surface on the adjacent stator, and the positioning the held and spaced side guide rails relative to the support member by placing one of the held and spaced side guide rails at accurately positioned points on the corresponding outer side which automatically positions the other guide

rail relative to the other outer side, and thereafter securing the held and spaced side guide rails to the support member.

4,854,029

METHOD OF FIXING A PART FOR TRANSMITTING TORQUE TO A PLATE OF A CLUTCH

Jacky Naudin, Ermont, France, assignor to Valeo, Paris, France

Filed Oct. 26, 1988, Ser. No. 262,782
Claims priority, application France, Oct. 28, 1987, 87,14901
Int. Cl.[4] B23P *25/00;* **B21D** *35/00*
U.S. Cl. 29—458 **4 Claims**



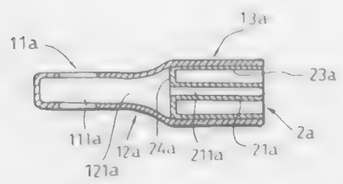
1. In a clutch suitable for an automobile vehicle, a method of fixing at least one part for transmitting the torque of the clutch to a clutch plate by means of a fixing element adapted to pass through an opening in said part for transmitting torque and to engage in a blind hole in said plate, comprising providing a stud as the fixing element, depositing adhesive in said blind hole and/or on inserting the stud, the stud with a slight play in the blind hole and against an end wall thereof after passing through the opening in said part, and permanently deforming by means of a tool the projecting end of the stud which spreads said projecting end to clamp said part and radially expands the stud in said behind hole.

4,854,030

PROCESS OF MANUFACTURING A HOSE FITTING

Masayuki Nishikawa, Inazawa; Takeshi Miyazaki; Terumitsu Shigeki, both of Nagoya; Satoshi Mizutani, Kuwana, and Toru Isono, Katamihara, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Mar. 2, 1988, Ser. No. 163,098
Claims priority, application Japan, Mar. 30, 1987, 62-47581[U]; Mar. 31, 1987, 62-78853; Mar. 31, 1987, 62-78854
Int. Cl.[4] B21D *39/00;* **B23P** *11/00*
U.S. Cl. 29—510 **2 Claims**



1. A process for manufacturing a hose fitting, comprising the following steps of:

a first step of manufacturing a cylindrical test tube-shaped element whose opening end is to be a sleeve and whose bottom closed end is to be a head portion by a plastic deformation on a flat plate metallic raw material;

a second step of forming flat top and bottom surfaces by pressing the cylindrical surface of said test tube-shaped element at the bottom closed end while leaving space inside thereof;

a third step of forming a through hole into which a bolt is to be inserted by punching said flat top and bottom surfaces at the center;

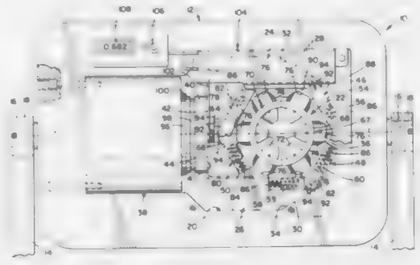
a fourth step of fixing a nipple having a coaxial fluid delivery hole with the opening end of said test tube-shaped element on the inner circumferential surface of the opening end of said test tube-shaped element to be said sleeve with an outer portion of said nipple spaced from an inner portion of said opening end.

4,854,031

HOSE CRIMPER AND METHOD OF USING SAME

George W. Eisenzimmer, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 9, 1989, Ser. No. 307,906
Int. Cl.[4] B21D *39/00;* **B23P** *11/00, 19/04*
U.S. Cl. 29—508 **13 Claims**



1. A hose crimper for radially compressing a sleeve against an exterior of a hose, comprising a frame having an opening for positioning said hose with said sleeve thereon, a die pusher assembly mounted in said opening, said die pusher assembly including more than two crimping segments mounted for radial movement into engagement with said sleeve, at least one of said crimping segments being in engagement with a pusher member in said opening, said pusher member having a sloping surface in sliding engagement with a sloped surface of said frame in said opening for moving said pusher member toward said sleeve on the exterior of said hose to drive said at lest one of said crimping segments into engagement therewith to crimp said sleeve into said hose upon movement of said pusher member transversely toward one side of said opening into sliding engagement with said sloped surface on said frame and power means in engagement with said pusher member for exerting pressure on said pusher member causing movement of said pusher member toward said one side of said opening.

13. A method of crimping a sleeve on a hose with crimping segments positioned in an opening of a frame wherein a die pusher assembly is mounted in said opening and said die pusher assembly includes more than two crimping segments mounted for radial movement into engagement with said sleeve, at least one of said crimping segments being in engagement with a pusher member positioned in said opening, said pusher member having a sloping surface in sliding engagement with a sloped surface of said frame in said opening comprising moving said pusher member toward said sleeve to drive said at least one of said crimping segments into engagement therewith to crimp said sleeve into said hose by moving said pusher member transversely toward one side of said opening into sliding engagement with said sloped surface on said frame causing movement of said pusher member toward said one side of said sleeve.

4,854,032

METHOD OF MANUFACTURING A STEEL WIRE WITH HIGH TENSILE STRENGTH

Paul Dambre, Kemmel, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Division of Ser. No. 884,678, Jul. 17, 1986, Pat. No. 4,737,392. This application Mar. 15, 1988, Ser. No. 168,443
Claims priority, application United Kingdom, Dec. 5, 1983, [redacted]
Int. Cl.[4] B21C *9/00*
U.S. Cl. 29—527.4 **32 Claims**

1. A method of manufacturing a high strength steel wire having improved resistance to torsional and bending failures, said method comprising the steps of:

providing a steel consisting essentially of from about 0.4% to about 1.4% by weight carbon, from about 0.1% to about 1.0% by weight manganese, between 0.1% and 0.4% by weight silicon, less than 0.015% by weight sulfur, less than 0.005% by weight aluminum, not more than 3% by weight of any element selected from the group consisting of nickel, chromium, cobalt, molybdenum and copper; and the remainder being iron and incidental impurities;

drawing said steel into a wire having a patenting diameter;

patenting said drawn wire to a fine pearlitic structure; and

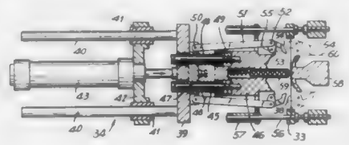
drawing said patented wire to a final wire diameter ranging from 0.05 to 0.50 mm and a tensile strength in N/mm^2 of above 2250–1130 log d, d being the wire diameter in millimeters.

4,854,033

INSERTING INSULATING MATERIAL INTO ELECTRIC MOTOR STATORS

Sabatino Luciani, and Luciano Santandrea, both of Florence, Italy, assignors to AXIS USA Inc., Peabody, Mass.

Continuation of Ser. No. 212,266, Jun. 27, 1988, Pat. No. 4,831,716. This application Feb. 6, 1989, Ser. No. 306,673
Int. Cl.[4] H02K *15/10*
U.S. Cl. 29—596 **16 Claims**



8. The method of shaping a sheet of insulating material into a shape having a modified C-shaped cross section, the modification of the C-shape being such that the free end portions of the C-shape are inclined toward the back of the C-shape in the direction toward each free end, said method comprising the steps of:

providing a form member having an exterior surface having said modified C-shape;

pushing a central portion of said sheet against a first portion of said exterior surface which corresponds to the back of said modified C-shape, said sheet having a marginal portion on each side of said central portion which does not contact said first portion;

deflecting each of said marginal portions so that it extends beyond said exterior surface in the direction from said first portion toward second portions of said exterior surface which correspond to said free end portions of said modified C-shape; and

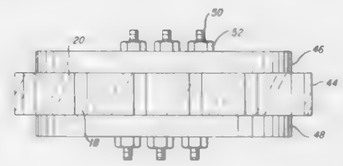
folding each of said marginal portions in against a respective one of said second portions by reaching around from the side of said form member having said first portion of said exterior shape.

4,854,034

METHOD FOR PRODUCING A STACK OF LAMINATIONS WITH SKEWED CONDUCTOR SLOTS

James B. Archibald, Schenectady, and Steven L. Adams, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 27, 1988, Ser. No. 199,645
Int. Cl.[4] H02K *15/02*
U.S. Cl. 29—596 **7 Claims**



1. A method for forming a stator of a dynamoelectric machine comprising:

providing a stacking guide having a skew angle;

stacking lamellae of a magnetic metal on said stacking guide to form a stack, whereby said lamellae are given askew equal to said skew angle;

securing said stack against movement;

machining guide elements in an exterior surface of said stack; and

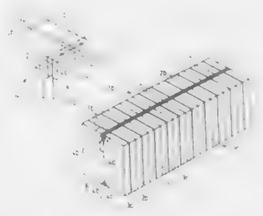
installing said stack in a stator frame upon guide members mating with said guide elements.

4,854,035

METHOD OF MANUFACTURING A MAGNETIC HEAD

Horst Gukkenberger, Zirndorf, and Karl Eberle, Cadolzburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 29, 1987, Ser. No. 81,213
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1986, 3621873
Int. Cl.[4] G11B *5/127*
U.S. Cl. 29—603 **4 Claims**



1. A method of manufacturing a magnetic head comprising the following steps

laminating together core supports with core halves of amorphous metal therebetween to form first and second laminated half blocks, each half block having a gap face and opposed front and rear surfaces, said gap face having a gap area at said front surface and a short circuit area at said rear surface,

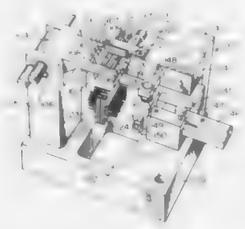
providing each core support with a connection member in the gap face at the gap area and a connection member in the gap face at the short circuit area of each laminated half block, said connection members extending between core halves,

providing at least one of the gap faces with a non-magnetic gap material,

pressing together the gap faces of the half blocks with the

core halves aligned in pairs and defining a non-magnetic gap between the core halves of each pair,
welding together the half blocks by forming welding spots between adjacent connection members on the front and rear surfaces of respective half blocks, two welding spots being formed in the front surfaces for each gap, one on each side thereof,
separating an individual head by dividing the core supports between core halves, each head having a pair of opposed side faces, one on each side of said gap,
welding the connection members on each side face,
removing the welding spots formed on the front surfaces.

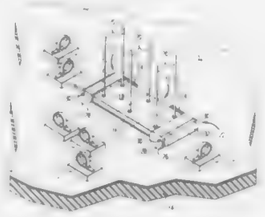
4,854,036
APPARATUS FOR ASSEMBLING MAGNETIC TAPE DRIVE READ/WRITE READ MODULES
Germano DiGregorio, Arvada, Colo., assignor to Storage Technology Corporation, Louisville, Colo.
Filed Aug. 12, 1988, Ser. No. 231,826
Int. Cl.[4] G11B *5/42*
U.S. Cl. 29—744 **10 Claims**



1. Apparatus for assembling magnetic tape drive read head and write head modules comprising:
means for securing a rectangular-shaped read/write head frame, wherein said read/write head frame has a rectangular shaped opening for placing said read head and write head therein;
means for magnetically suspending a read head and a write head in said rectangular-shaped opening in said read/-write head frame;
means for adjusting the position of said read head and said write head with respect to two opposite inner walls of said read/write head frame;
means for clamping said positioned read head and write head against a third one of said inner walls of said read/write head frame.

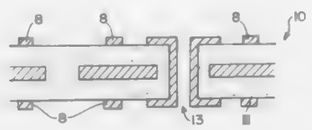
4,854,037
HOOK AND LOOP HOLDING STRENGTH MAXIMIZING APPARATUS
Joseph J. DeSanto, 14 Hillcrest Rd., Belle Mead, N.J. 08502
Continuation-in-part of Ser. No. 860,004, May 5, 1986, Pat. No. 4,711,025. This application Dec. 3, 1987, Ser. No. 128,105
Int. Cl.[4] H01R *43/00;* **A44B** *18/00*
U.S. Cl. 29—755 **10 Claims**

2. An apparatus for increasing the holding strength of a first and second type of material which are matable with each other and in which said second type of material is attachable to a structure, said apparatus comprising:
a platform attached to said first type of material; and,
at least two displacement means attached to said platform for displacing said first and second type of materials in opposite directions after initial engagement of said first and second types of materials; and
object holding means attached to said platform and located on the side of said platform opposite from the side attached to said first type of material,
wherein one of said materials comprises a hook type material and the other of said materials comprises a loop type material for engaging said hook type material and wherein said displacement means tensions said hook and loop type



materials with respect to each other to more firmly engage each other but not so much as to cause a substantial disengagement of said hook and loop type materials.

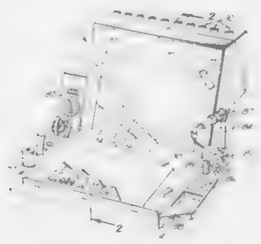
4,854,038
MODULARIZED FABRICATION OF HIGH PERFORMANCE PRINTED CIRCUIT BOARDS
John P. Wiley, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 16, 1988, Ser. No. 168,947
Int. Cl.[4] H05K *3/36, 1/14*
U.S. Cl. 29—830 **15 Claims**



1. A high performance printed circuit board assembly, comprising at least two modularized circuitized power plane subassemblies adjacently laminated to each other and characterized by X and Y signal planes disposed about an internal power plane, each of said sub-assemblies having a dielectric between said signal and power planes to bond said signal and power planes, and vias disposed within each sub-assembly for providing electrical communication between said signal planes, and whereby a dielectric layer is located between the signal plane in one of the sub-assemblies and an adjacent signal plane in an adjacent sub-assembly.

5. A method of constructing a high performance printed circuit board assembly utilizing a modular construction technique, comprising the steps of:
(a) fabricating a first circuitized power core sub-assembly having X-Y signal planes disposed about an internal plane and separated therefrom by means of a dielectric layer; and wherein said X-Y signal planes are electrically connected by plated vias;
(b) repeating step (a) to form a number of sub-assemblies;
(c) laminating at least two sub-assemblies together to form a composite whereby a signal plane of one sub-assembly is adjacent to a signal plane of another sub-assembly; and
(d) constructing a printed circuit board assembly by building a multi-laminate structure using said composite.

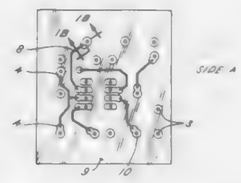
4,854,039
PROTOTYPE CIRCUIT BOARD AND METHOD OF TESTING
Barry M. Wendt, Maple Grove, Minn., assignor to The Technology Congress, Ltd., Minnetonka, Minn.
Filed May 4, 1988, Ser. No. 190,046
Int. Cl.[4] H05K *3/30, 5/00*
U.S. Cl. 29—832 **15 Claims**



1. A method for examining the circuitry of a printed circuit board having a plurality of parallel, interactive circuit planes thereon, the method comprising the steps of:
forming a printed circuit board from transparent material so that each circuit plane thereon is viewable from a first or second opposite side of the circuit board;
placing the circuit board, first side down, on a top side of a translucent circuit board work surface; and
providing an illumination source on a bottom side of the translucent circuit board work surface whereby all of the circuit planes of the circuit board are illuminated and viewable from the second side of the circuit board.

9. A circuit board for use in developing prototype circuit designs and permitting modifications thereto comprises a dielectric substrate having a plurality of parallel circuit planes defined thereon, each circuit plane, defined by a plurality of conductive circuit traces with selected traces between circuit planes being electrically connected, the dielectric substrate being transparent and each of the circuit traces being formed to be at least partially visible and thus accessible from one side of the circuit board after a circuit plane located furthest from the substrate has been populated with circuit components.
providing a supporting substrate having copper layer on at least one side thereof,
etching said copper layer to produce an array of solder pads for receiving said components to be mounted on the circuit board,
said step of etching including forming conductive tails in the copper layer connected to the solder pads for providing protected electrical connections thereto,
depositing a dielectric layer over the copper layer while leaving said tails and pads exposed to insulate the copper layer except for said tails and pads,
applying conductive polymer traces between selected ones of said tails, thereby to electrically interconnect the associated solder pads,
applying a solder mask over the polymer layers leaving said pads exposed but covering said tails thereby to shield the polymer, and
solder dipping the completed circuit board to apply a layer of solder to said exposed solder pads.

4,854,040
METHOD OF MAKING MULTILAYER PC BOARD USING POLYMER THICK FILMS
Joseph A. Turek, Downers Grove, Ill., assignor to Poly Circuits, Inc., Bensenville, Ill.
Division of Ser. No. 34,791, Apr. 3, 1987, Pat. No. 4,775,573. This application Jun. 27, 1988, Ser. No. 212,321
Int. Cl.[4] H05K *3/02*
U.S. Cl. 29—847 **10 Claims**



1. A method of producing a multiple layer circuit board, for mounting and electrically connecting a plurality of components, the method comprising the steps of

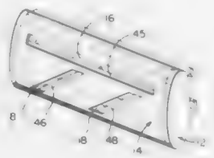
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4,854,041
METHOD OF MANUFACTURING A SWITCH BASE
Akira Saito; Teisuke Nukada, and Michio Ito, all of Tokyo, Japan, assignors to Nihon Kaiheiki Industrial Co., Ltd., Tokyo, Japan
Filed Feb. 17, 1988, Ser. No. 156,860
Claims priority, application Japan, Sep. 1, 1987, 62-216420
Int. Cl.[4] H01H *11/00, 65/00*
U.S. Cl. 29—884 **4 Claims**



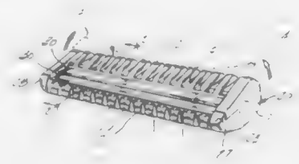
1. A method of manufacturing a switch base having fixed contact portions and terminal portions integrally formed from a metal plate, the fixed contact portions and the terminal portions projecting from top and bottom sides, respectively, of the switch base, said method comprising the steps of:
(a) preparing blanked members each having a common strip formed at a lower part thereof, a plurality of finger-shaped pieces extending from said common strip and equidistantly arrayed in a single row, fixed contact portions formed on distal end portions of respective ones of said finger-shaped pieces and spaced apart in a direction perpendicular to the direction in which the plurality of finger-shaped pieces are arrayed, and terminal portions situated between respective ones of said fixed contact portions and said common strip;
(b) superimposing said common strips of identically shaped blanked members in such a manner that the fixed contact portions of said blanked members are spaced away from one another, and assembling said superimposed common strips together with said fixed contact portions being arrayed equidistantly in a plurality of rows and said terminal portions being arrayed equidistantly in a single row;
(c) forming a base by molding a resin between said fixed contact portions and said terminal portions of said blanked members; and
(d) cutting away the common strips of said blanked members.

4,854,042
DIAGONAL BLADE CARTRIDGE
John J. Byrne, 73 Andrews Rd., Quincy, Mass. 02170
Filed Jul. 14, 1986, Ser. No. 885,466
Int. Cl.[4] E21C 9/00
U.S. Cl. 30—34.1 4 Claims



1. A shaving razor comprising a razor blade cartridge and a handle, the handle having cartridge engagement means associated therewith, the razor blade cartridge having a first razor blade and a second razor blade attached thereto and having a plane, the first razor blade in angular relation to the plane, the razor blade cartridge including a base portion and a cap piece, the base portion having a support element, the first and second razor blades attached to the support element and the cap piece superimposed on the support element, the base portion including a first end portion and a second end portion, the support element comprising a rectangular top piece, an intermediate strip, a first diagonal strip, a second diagonal strip and a bottom piece, the intermediate strip spaced from the top piece and in parallel relation therewith; the first diagonal strip extends from the lower edge of the intermediate strip to the upper edge of the bottom piece adjacent the first end portion and the second diagonal strip extends from the lower edge of the intermediate strip to the upper edge of the bottom piece, the first and second diagonal strips are in spaced parallel relation to each other and are in angular relation to the top, intermediate and bottom pieces, the first and second diagonal strips, each have an upper surface and a midline, the top piece has an upper surface and a midline, a series of first engagement studs extend from the upper surface of the top piece, the first engagement studs are in spaced relation to each other along the midline of the top piece, second engagement studs extend from the upper surface of the first diagonal strip; third engagement stud elements extend from the upper surface of the second diagonal strip, the third engagement studs and second engagement studs are in spaced relation to each other along the midline of their respective diagonal strips, a first rectangular slot extending from the first end portion to the second end portion, is formed between the top piece and the intermediate strip, the first and second razor blades attached to the support element through the first and second engagement studs and the cap piece includes a top edge a bottom edge, a first side edge and a second side edge, the top edge and the bottom edge having terminal ends and are connected at their terminal ends by the first side edge and the second side edge, the first side edge and the second side edge in spaced, parallel relation to each other, a second slot is formed between the bottom edge and the top edge, the second slot is in spaced, parallel relation to the top edge and the bottom edge, first and second diagonal slots are formed through the cap piece between the second slot and the bottom edge and in spaced, angular relation therewith, the first diagonal slot is proximate the first side edge, the second diagonal slot is proximate the second side edge, through apertures are formed in the first and second blades, the apertures are spaced from each other and are longitudinally aligned on their respective blades; the first blade is superimposed on the top piece and a second blade on the first diagonal strips; the second blade in superimposed, abutting relationship with the first diagonal, the cap piece in superimposed, abutting relation with the support element and the first and second razor blades.

4,854,043
FLEXIBLE RAZOR HEAD
Evan N. Chen, Fairfield, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Oct. 30, 1987, Ser. No. 115,781
Int. Cl.[4] B26B 21/16
U.S. Cl. 30—50 4 Claims



1. A flexible razor head comprising in combination:
(a) a cap having spaced areas of reduced thickness positioned across its length;
(b) pin means extending downward from a position near each longitudinal underside and center of said cap for assembly of said razor head;
(c) a blade support positioned beneath said cap providing a planar blade support having;
(i) a segmented guard bar extending outwardly therefrom, the spacing between said segments aligned with the areas of reduced thickness of said cap;
(ii) pin receiving means positioned below said pin means; said blade support positions corrugated between said pin receiving means to provide an expanded length when subjected to downward force; and
(d) a blade package including at least one blade with pin receiving holes greater in area than the cross-sectional area of said pin means when said head is in its unstressed conditions positioned between said cap and said blade support portion, said blade package having at least 15% to 30% open area.

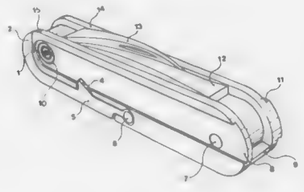
4,854,044
KNIFE AND SHEATH
Walter W. Collins, North, S.C., assignor to Wenoka Seastyle-Div. of Schur, Inc., West Palm Beach, Fla.
Filed Oct. 30, 1987, Ser. No. 115,059
Int. Cl.[4] B26B 29/02
U.S. Cl. 30—151 4 Claims



1. A tool and sheath combination having releasably interlocking means comprising:

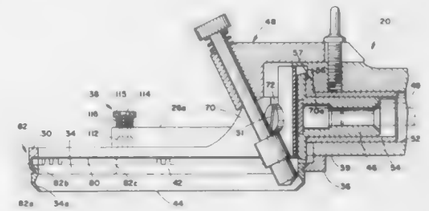
said tool having a handle with a hole extending through said handle,
a lock bolt positioned in said hole for axial movement thereof to and from a position in which one end of said lock bolt projects beyond a sidewall of said handle, and
said sheath having opposite walls with one wall having a hole aligned with and normally receiving said one end of said lock bolt when said tool is fully inserted in siad sheath, and means on the other wall of said sheath for engaging and normally urging the other end of said lock bolt to siad position comprising a resilient flexible wall section having leaf spring-like function whereby said one end of said lock bolt engages said hole in said one wall.

4,854,045
MODULAR POCKETKNIFE
Michael Schaub, Basel, Switzerland, assignor to Wenger SA, Delémont, Switzerland
PCT No. PCT/CH86/00001, § 371 Date Aug. 25, 1986, § 102(e) Date Aug. 25, 1986, PCT Pub. No. WO86/04010, PCT Pub. Date Jul. 17, 1986
PCT Filed Jan. 6, 1986, Ser. No. 908,705
Claims priority, application Switzerland, Jan. 1, 1985, 85/3
Int. Cl.[4] B26B 3/06, 11/00
U.S. Cl. 30—155 6 Claims



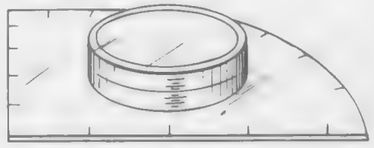
1. A pocketknife having a handle and at least one blade, wherein the improvement comprises;
first and second cover modules;
intermediate modules disposed between said first and second cover modules said intermediate modules including at least a first outer intermediate module and an opposite second outer intermediate module;
each of said intermediate modules including first and second side plates disposed on opposite sides of each of said intermediate modules, said first and second side plates of at least one of said intermediate modules being connected to each other and being spaced apart from each other by an arbor extending transversely through one end of said at least one intermediate module, said one blade being contained in said at least one intermediate module between said first and second plates thereof and being pivotable about said arbor;
said intermediate modules each having first connecting means for providing a detachable sliding connection thereof either to an adjacent one of said intermediate modules or to an associated adjacent one of said cover modules, said first and second cover modules each having second connecting means for providing a detachable sliding connection thereof to an associated adjacent one of said first and second outer intermediate modules;
said first and second connecting means slidingly connecting said first and second outer intermediate modules and said first and second cover modules together;
said first and second connecting means also permitting said first and second outer intermediate modules and said first and second cover modules to be slidingly separated apart from each other after having been connected together;
said first connecting means of said first and second outer intermediate modules being provided on said first and second side plates, respectively;
said first connecting means of said first side plate of said first outer intermediate module and said second connecting means of said first cover module being a longitudinally extending dovetail undercut, groove-like recess;
said first connecting means of said second side plate of said second outer intermediate module and said second connecting means of said second cover module being a protruding dovetail shaped connection element corresponding to each said recess so that each said protruding connection element is detachably slidingly received in an associated said recess for connection therebetween; and
said intermediate modules and said first and second cover modules forming the handle of the pocketknife when the blade is pivoted outwardly from said at least one intermediate module.

4,854,046
ROTARY HAND TRIMMING KNIFE
Richard B. Decker, and Richard P. Bozzi, both of Vermilion, Ohio, assignors to Bettcher Industries, Inc., Birmingham, Ohio
Filed Oct. 7, 1987, Ser. No. 106,051
Int. Cl.[4] B26B 7/00
U.S. Cl. 30—276 17 Claims



1. For use in a hand knife of the type having a ring-like blade housing and used for cutting meat and the like, a ring-like blade having a larger outside diameter at one axial end than the other, gear teeth formed in the larger diameter axial end and a circular cutting edge formed at the other, a circular groove in an outside peripheral surface of the blade, spaced from the axial ends, the outside periphery of the blade being smaller in diameter from the groove to the cutting edge than from the groove to the larger diameter end, and the groove being formed in part by a frusto-conical surface facing away from the larger diameter axial end.

4,854,047
INCLINOMETER OF LIQUID IN THIN GRADUATED CYLINDER
Virgilio D. Conanan, 475 Graphic Blvd., New Milford, N.J. 07646
Filed Jun. 16, 1988, Ser. No. 207,243
Int. Cl.[4] G01C 9/36
U.S. Cl. 33—377 7 Claims



1. An inclinometer comprising: a thin transparent hollow cylinder of a first volume having a closed bottom end and an open top end; said top end; said top end having an internal

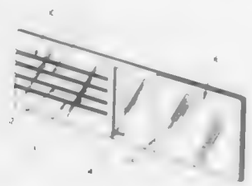
circumferential groove for accepting a thin cover member in a fluid tight manner, said hollow cylinder having an insert fluid therein whose volume is precisely one half the said first volume, said bottom of said hollow cylinder is substantially centrally mounted on a flat transparent base member having the configuration of a quarter circle with two edges being perpendicular to each other and graduated in English and metric units and the arcuate edge being graduated from 0 to 90 degrees, said hollow cylinder having a 0 to 360 degree scale imprinted on the external surface of the bottom end thereof and a 0 to plus and minus 3 degrees scale imprinted on the external surface of the wall of said cylinder with the zero of said last mentioned scale coinciding with level of said fluid in said cylinder, so that when said inclinometer is applied in horizontal or vertical orientation to any object various angles and lengths can be determined.

4,854,048

TEMPLATE FOR DRIVER'S DAILEY LOG BOOK

Benoit Goulet, 7725 Belcher Rd., Pinellas Park, Fla. 34665

Filed Apr. 4, 1988, Ser. No. 177,103
Int. Cl.[4] B43L *13/00*
U.S. Cl. 33—443 **14 Claims**



1. A template for daily log books used by commercial drivers, comprising:
- a flat sheet material of predetermined composition;
- said sheet material forming a top part of said template;
- said top part having a width substantially equal to the width of a page in a driver's daily log book;
- a plurality of parallel, elongate slot members formed in said top part for guiding a marking instrument;
- said slot members having a length substantially equal to the width of the top part;
- a vertically extending window means disposed in orthogonal relation to said elongate slot members;
- each of said elongate slot members having a common height dimension sufficient to receive the distal free end of a marking instrument so that said marking instrument free end is constrained by a slot member within which it is inserted to follow a linear path of travel over a page of said log book;
- a second flat sheet material forming a bottom part of said template;
- said top and bottom parts being integral to one another, and being joined at a sharp return bend.

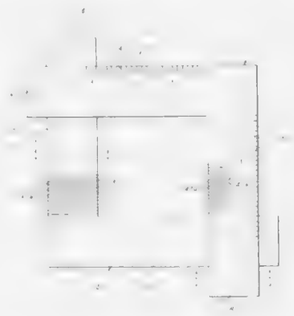
4,854,049

MAGNETIC CROPPER

John N. Kuhtik, 735 Garden St., Hoboken, N.J. 07030

Filed Nov. 27, 1987, Ser. No. 126,117
Int. Cl.[4] G03D *15/00*
U.S. Cl. 33—464 **10 Claims**

1. An assembly including in combination a pair of relatively movable opposable members, each of said members having a plurality of parallel strips of similarly magnetized material that are regularly spaced from one another perpendicularly of their lengths, strips of one of said members registering with strips of the other of said members at predetermined relative displacements of said members to permit continuous relative adjustment of said members parallel to said strips while effecting



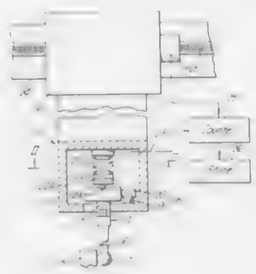
relative adjustment of said members perpendicularly of said strips in steps corresponding to said displacements.

4,854,050

CONTACT-SENSING PROBE

David R. McMurtry, Wotton-Under-Edge, Great Britain, assignor to Renishaw plc, England

Continuation of Ser. No. 84,142, Aug. 12, 1987, which is a continuation of Ser. No. 897,767, Jul. 28, 1986, Pat. No. 4,702,013. This application Aug. 5, 1988, Ser. No. 228,739
Claims priority, application United Kingdom, Dec. 17, 1984, 8431746
Int. Cl.[4] G01B *7/28*
U.S. Cl. 33—558 **38 Claims**



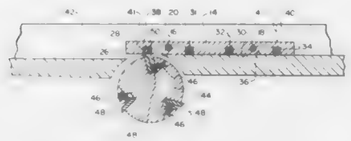
1. A contact-sensing probe for use in apparatus for measuring the dimensions of a workpiece, comprising:
- a fixed part adapted to be mounted in the apparatus;
- a movable part, including a base portion and a stylus having a free end for engaging the workpiece during a measuring operation, the free end being supported in a position having a fixed relationship relative to the base portion via a support path extending from the base portion to the free end;
- support means for supporting the base portion so that the movable part is in a rest position on the fixed part;
- bias means for urging the movable part into said rest position; and
- sensing means for sensing a pressure wave transmitted through the stylus caused by engagement of the free end of the stylus with the workpiece, the sensing means comprising an accelerometer having opposing first and second portions, said first portion being supported by said movable part so that the accelerometer lies outside said support path and said first portion receives said pressure wave, said second portion being free relative to said support path, thereby permitting said sensing while maintaining said fixed relationship between said stylus free end and said base portion,
- said contact-sensing probe being arranged such that an urging force of said bias means is transmitted to said movable part through the accelerometer.

4,854,051

JIG FOR ALIGNING CUTTER BLADES

George D. Hessenthaler, 585 W. 3900 South, Murray, Utah 84123

Filed May 13, 1988, Ser. No. 194,048
Int. Cl.[4] B27G *23/00*
U.S. Cl. 33—628 **3 Claims**



1. A jig for aligning cutter blades comprising
- a pair of spaced apart, parallel straight bars having a generally rectangular configuration and each having a flat undersurface in a common plane;
- means comprising spaced apart parallel metal rods each inserted into one of said bars and projecting therefrom and projecting through the other of said bars, holding said bars in spaced apart parallel relationship with the undersurfaces in said common plane;
- a plurality of stabilizing magnets spaced along each bar from one end thereof, said stabilizing magnets being equally spaced from one another along the bars and with a surface of each stabilizing magnet flush with the undersurface of the bar in which said magnet is mounted;
- a holding magnet inserted into each of said bars adjacent the other end thereof;
- a score mark formed on an inside surface and continued onto an upper surface of each end of one of said bars, the score mark on the other end being aligned with a centerline through the holding magnet, and the score lines at each end of the bar being adapted to be aligned with a score mark on a fence of a cutter machine.

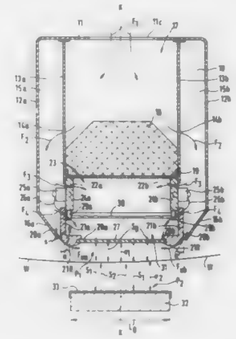
4,854,052

FLOATER RADIATION DRYER

Matti Korpela, Turku, Finland, assignor to Valmet Oy, Finland

PCT No. PCT/FI87/00034, § 371 Date Oct. 16, 1987, § 102(e) Date Oct. 16, 1987, PCT Pub. No. WO87/05644, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 13, 1987, Ser. No. 113,181
Claims priority, application Finland, Mar. 14, 1986, 861086
Int. Cl.[4] F26B *23/04;* **D21F** *5/16, 5/18*
U.S. Cl. 34—68 **22 Claims**

1. Apparatus for drying a moving, web-shaped material (W), comprising
- at least one radiation/gas blow unit (**10**) shaped in the form of a blow box and positionable to have a contact-free carrier surface (**27**) on a side thereof facing the moving material (W),
- means defining a pair of nozzle apertures (**20***a*, **20***b*) positioned to open at opposite edges (**21***a*, **21***b*) of said carrier surface (**27**) from one another, positioned to direct components of gas jets (Fua, Fub) exiting therethrough substantially parallel to said carrier surface (**27**), and oriented to direct the gas jets (Fua, Fub) exiting therethrough against one another and at an angle (a) with respect to a plane substantially perpendicular to a plane substantially parallel to the material (W), and generate an over-pressure region (P_1) between said carrier surface (**27**) and the moving material (W),
- an element (**30**) for generating radiation which is positioned in said unit (**10**),
- a window (**27**) positioned to form at least part of said carrier surface (**27**) and through which radiation (S_0) released by said element (**30**) passes and is directed at the moving material (W),



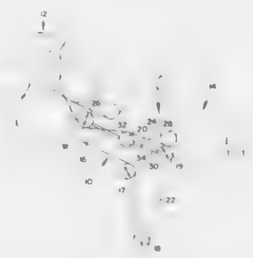
- means for directing a gas flow (F_1) through said unit (**10**) in a direction to cool said radiation element (**30**), and
- two holders (**21***a*, **21***b*) in which said window (**27**) is mounted, each said holder (**21***a*, **21***b*) comprising a curved surface (**21R**) facing the moving material (W) and positioned with respect to a respective nozzle aperture (**20***a*, **20***b*) to constitute a Coanda surface and deflect the gas jets (Fua, Fub) exiting from said respective nozzle aperture (**20***a*, **20***b*) toward said over-pressure region (P_1).

4,854,053

TRANSFER APPARATUS

Borgeir Skaugen, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Apr. 30, 1987, Ser. No. 44,390
Int. Cl.[4] D06F *58/00*
U.S. Cl. 34—117 **10 Claims**



1. A transfer apparatus for transferring a web from a press section to a dryer section, said apparatus comprising:
- a plurality of rotatable rolls disposed between the press section and the dryer section;
- a transfer felt movably supported by said plurality of rolls for transporting the web from the press section towards the dryer section;
- said plurality of rolls including:
- a rotatable guide roll disposed adjacent to the press section for guiding the web from the press section towards the dryer section;
- a rotatable turning roll cooperating with the dryer section

such that said transfer felt disposed between said guide roll and said turning roll defines a transfer section;

said transfer section supporting the web along the entire length of said transfer section from said guide roll to said turning roll, said felt and the web separating relative to each other during passage around said turning roll and departing from said turning roll in different directions; and

a rotatable lead-in roll forming a nip with said guide roll and physically contacting the web and bringing the web into initial contact with said transfer felt as said web and said transfer felt pass said guide roll such that in use of the apparatus, the web emerging from the press section is guided between said guide roll and said cooperating lead-in roll so that the web is guided and supported by said transfer felt, the web moving at the same speed and in the same direction as said transfer felt, thereby inhibiting dusting of the pressed web.

4,854,054

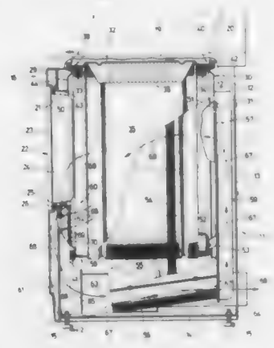
FABRIC DRYER AIRFLOW SYSTEM

Thomas M. Johnson, Newton, Iowa, assignor to Maytag Corporation, Newton, Iowa

Filed Jun. 27, 1988, Ser. No. 211,830

Int. Cl.[4] F26B *11/04*

U.S. Cl. 34—133 **11 Claims**



1. A fabric drying apparatus, the combination comprising: cabinet means including a front panel having an access opening therethrough; means defining a chamber for tumbling articles including a rotatable peripheral wall and a stationary bulkhead juxtaposed the front end thereof; tunnel-like wall structure extending between said bulkhead and said front panel defining a passageway between said chamber and the access opening in said front panel; first outlet means through said bulkhead defining a first airflow egress from said chamber; second outlet means through said tunnel-like wall structure defining a second airflow egress from said chamber; duct means including housing means defining a first opening in airflow communication with said first outlet means and a second opening in airflow communication with said second outlet means for conducting airflow away from said chamber; means for producing an airflow through said chamber and said first and seocnd outlet means into said duct means; door means for selectively closing said access opening; and means disposed within said tunnel-like wall structure for providing a generally protected airflow path from said chamber to said second airflow egress.

4,854,055

SPORTS SHOE

Yasunori Sugiyama, Kobe, and Satoru Nakata, Akashi, both of Japan, assignors to Asics Corporation, Hyogo, Japan

Filed Sep. 3, 1987, Ser. No. 92,552

Claims priority, application Japan, Sep. 5, 1986, 61-137047

Int. Cl.[4] A43B *5/00, 23/08*

U.S. Cl. 36—127 **3 Claims**





1. A sports shoe having an upper portion, a sole portion fitted to said upper portion, and a wheel counter fitted to said upper portion and said sole portion, wherein said heel counter comprises:

a folded wall part disposed between said upper portion and said sole portion, said folded wall part consists of two curve formed wall parts extending forwardly along the periphery of said sole portion, one of said wall parts being longer than the other, wherein said longer wall part extends to a longitudinally middle position of said sole portion;

a side wall member projected upwardly from one surface of said folded wall part, said side wall member extending along an outer edge of said folded wall part so as to surround a part of said upper portion; and

a stationary plate member having a thickness larger than that of said side wall member, projected downwardly from the other surface of said folded wall part, said stationary plate member extending from a rear end of said sole portion to said longitudinally middle position along the outer edge of said folded wall part.

4,854,056

UNIVERSAL SHOE SLING

Eleanor B. Levin, Box 223, R.D. Country Club Rd., Herkimer, N.Y. 13350

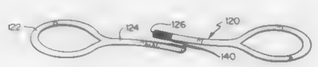
Filed Nov. 25, 1987, Ser. No. 125,217

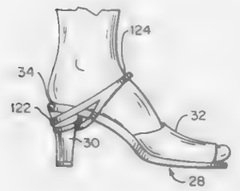
Int. Cl.[4] A43B *23/28, 3/12*

U.S. Cl. 36—58.5 **20 Claims**

1. A universal shoe sling for employment with a conventional shoe, comprising;

(a) a pair of loop-shaped members for slidably engaging the heel of said shoe; and





(b) means, cooperating with said pair of loop-shaped members, for strapping a shoe wearer's foot to said shoe.

4,854,057

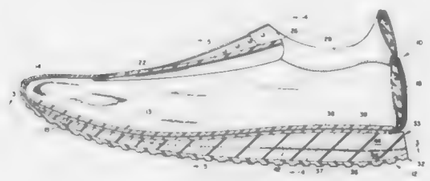
DYNAMIC SUPPORT FOR AN ATHLETIC SHOE

Kenneth W. Misevich, Fairfield, Conn.; Rob R. McGregor, Concord, Mass., and Anthony J. Corrao, Lewiston, Me., assignors to Tretorn AB, Helsingborg, Sweden

Continuation of Ser. No. 878,066, Jun. 24, 1986, abandoned, which is a continuation of Ser. No. 456,820, Jan. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 347,632, Feb. 10, 1982, abandoned. This application Jul. 15, 1988, Ser. No. 223,671

Int. Cl.[4] A43B *5/00, 5/06, 13/42*

U.S. Cl. 36—114 **10 Claims**



1. A sliplasted athletic shoe comprising a sliplasted upper having a closed fabric bottom, a shoe bottom underlying the upper, and insole overlying the fabric bottom of the upper, said shoe bottom having an outsole coupled to a midsole and said midsole coupled to the fabric bottom of the upper, said midsole comprising an upper and lower midsole layers, each midsole layer is of foam shock absorbing material and a force dispersing substantially thin, planar and stiff plate which includes resin containing fiberglass material positioned between said midsole layers and coupled to each of said midsole layers, said plate extends substantially throughout the rear foot region of the shoe so that when the shoe is worn the plate underlies the entire calcaneus of the wearer's foot.

4,854,058

DREDGING APPARATUS HAVING A DIVER-OPERATED HAND-HELD DREDGE HEAD FOR QUASI-CLOSED LOOP SYSTEM

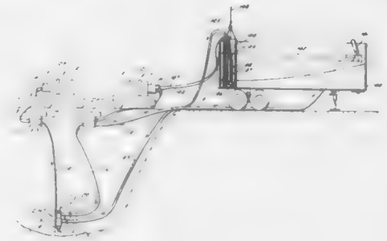
Owen K. Sloan, and Albert H. Sloan, both of Ft. Lauderdale, Fla., assignors to Sloan Pump Company, Inc., Ft. Lauderdale, Fla.

Continuation-in-part of Ser. No. 47,220, May 8, 1987, Pat. No. 4,807,373. This application Jun. 20, 1988, Ser. No. 208,474

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[4] E02F *3/88*

U.S. Cl. 37—63 **13 Claims**



1. Dredging apparatus forming a dredging quasi-closed loop circuit comprising:

a diver-operator controlled hand-held dredge head having a tubular suction nozzle for continuously dredging a mixture of solids and water from adjacent the bottom of a first body of water,

a hydraulic motor driven dredge pump floating adjacent the surface of said first body of water, a suction conduit connected to said dredge head for sucking said mixture therefrom, a pressurized fluid power source located on shore and connected to said dredge pump hydraulic motor for pumping said mixture from said head and said first body of water and to a second, separate body of water which is spaced a distance from said first body of water and for depositing and allowing the solids to settle out from the mixture at one portion of said second body of water;

a hydraulically driven water return pump located in said second body of water and spaced from said one portion of said second body of water to thereby pump relatively clear water from said second body of water, a return water pressurized fluid power source located on shore and connected to said water return pump for driving the latter, said water return pump having a return water conduit for returning relatively clear water from said second body of water and to the hand held dredge head nozzle in said first body of water, whereby the returned dredge water is again used to convey more solids from said first body of water to said second body of water, thereby continually reusing and pumping the dredged water in a loop circuit to convey solids from the first body of water to said second body of water.

4,854,059

STEAM IRON SOLE PLATE WITH PLUG INSERT

Costantino Ronchi, Via Giordano 5, 20090 Trezzano Sul Naviglio, Milan, Italy

Filed Mar. 7, 1988, Ser. No. 165,051

Claims priority, application Italy, Mar. 9, 1987, 21064/87[U]

Int. Cl.[4] D06F *75/10*

U.S. Cl. 38—93 **20 Claims**

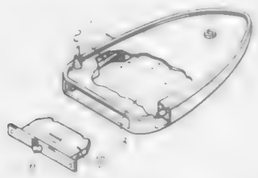
1. Steam iron sole plate with plug insert or the like comprising,

at least one body, said body being substantially flat,

at least one electric resistor incorporated in said body,

a rear face defined by said body,

at least one cavity defined in said body and being open at said rear face,
at least one insert adapted for closing said cavity at said rear face of said body,
a lower ironing face defined by said body,
a plurality of holes formed in said lower ironing face of said body and communicating with said cavity, and,



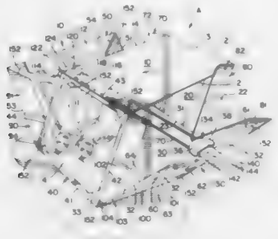
at least one inlet, said inlet being defined on said insert, communicating with said cavity, and being adapted for permitting introduction of at least one fluid selected from among water and steam into said cavity wherein said body defines at least one tip zone, at least one central zone, and a plurality of lateral zones, and wherein said plurality of holes are formed in said tip zone, in said central zone, and in said plurality of lateral zones.

4,854,060

SELF-ERECTING PHOTO DISPLAY

Thomas E. Corbo, Gates Mills; Richard J. Cisek, Jr., Lagrange; Kathryn M. Matthews, Westlake, and George K. Sehringer, Rocky River, all of Ohio, assignors to Manco Inc., Cleveland, Ohio

Continuation of Ser. No. 19,659, Feb. 27, 1987, abandoned. This application May 6, 1988, Ser. No. 198,603
Int. Cl.[4] A47G *1/06*; G09F *1/12*
U.S. Cl. 40—152.1 **1 Claim**



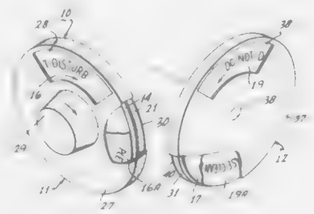
1. A self-erecting cuboid photo display device fabricated from thin sheet material comprising:
four rectangular band panels foldably connected to one another in an endless band including a first band panel and second and third band panels connected to said first band panel, said band having a first continuous edge and a second continuous edge;
a first rectangular side panel having four edges, one of said edges being connected to said first band panel at said first continuous edge and a pair of said edges extending perpendicularly to said continuous edge;
a second rectangular side panel having four edged, one of said edges being connected to said first band panel at said second continuous edge and a pair of said edges extending perpendicularly to said continuous edge;
a first margin means connecting said first side panel to said second band panel, said first margin means comprising a first L-shaped margin panel having a first elongated section extending along and foldably connected to said first side panel at one of said perpendicular edges and a second elongated section extending along and foldably connected to said second band panel at said continuous edge, said first elongated section being foldably connected to said second elongated section along an inwardly folding line oriented at 45° to said edges, and a first triangular aperture formed in said material having sides of said triangle defined by said one perpendicular edge and said continuous edge;
a second margin means connecting said second band panel to said second side panel, said second margin means comprising a second L-shaped margin panel formed in the mirror image of said first L-shaped margin panel including said inwardly folding line and being likewise foldably connected to said side and band panels, and including a second triangular aperture oppositely located in the mirror image of said first triangular aperture;
a third margin means connecting said second side panel to said third band panel, said third margin means comprising a third L-shaped margin panel formed in the mirror image of said second L-shaped margin panel including said inwardly folding line and being likewise foldably connected to said side and band panels, and including a third triangular aperture oppositely located in the mirror image of said second triangular aperture;
a fourth margin means connecting said third band panel to said firs side panel, said fourth margin means comprising a fourth L-shaped margin panel formed in the mirror image of said third L-shaped margin panel including said inwardly folding line and being likewise foldably connected to said side and band panels, and including a fourth triangular aperture oppositely located in the mirror image of said third triangular aperture;
elastic band engagement means disposed on both said side panels;
an elastic band engaging both said engagement means thereby urging said side panels toward one another and said display device into the erected state, and
said elastic band extending in a direction perpendicular to said continuous edges.

4,854,061

DOOR SIGN DEVICE

Kamran Khoshkish, 25081 Devon, Mission Viejo, Calif. 92691

Filed Jan. 13, 1988, Ser. No. 143,737
Int. Cl.[4] G09F *11/04*
U.S. Cl. 40—495 **17 Claims**



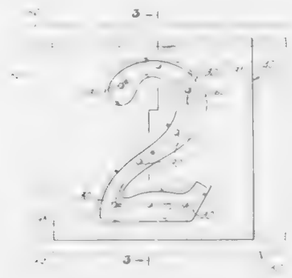
1. A door sign device, comprising:
an actuator assembly, the actuator assembly including an actuator and first mounting means for mounting the actuator on the inner door surface of a door that has inner and outer door surfaces so that a user can move the actuator between first and second actuator positions;
a follower assembly, the follower assembly including a follower and second mounting means for mounting the follower on the outer door surface so that the follower can be move between first and second follower positions that each correspond to a respective one of the first and second actuator positions;
coupling means for coupling the actuator to the follower magnetically so that when the actuator is moved to the first actuator position the follower moves to the first follower position and when the actuator is moved to the second actuator position the follower moves to the second follower position; and
a predetermined sign located on the follower assembly; and
sign-indicating means responsive to the follower being in the first follower position for indicating that the predetermined sign applies.

4,854,062

ILLUMINATED HOUSE NUMBER DEVICE

Luis E. Bayo, 211 SW. 119 Ave., Miami, Fla. 33184

Filed Jan. 25, 1988, Ser. No. 148,038
Int. Cl.[4] G09F *13/28*
U.S. Cl. 40—551 **6 Claims**



1. A device for illuminating numbers being connected to the contacts of a normally open momentary switch of a doorbell, comprising:
A. an elongated and flat bracket assembly having two electrodes mounted thereon, said electrodes being respectively connected to each one of said contacts and include each an elongated conductor longitudinally extending along said bracket assembly and being disposed in a spaced apart relationship so that the connection to the respective of said circuit is facilitated;
B. a plurality of symbol assemblies having substantially a square shape and a back surface and removably mounted to said bracket assembly and each one of said symbol assemblies including a circuit comprising a plurality of LED members connected in series and said circuit having two ends that are each connected to said electrodes and said LED members define a predetermined symbol and further includes reflective means following said defined symbol contour so that the display of said symbol is thereby enhanced, and said symbol assemblies further including two contact pads mounted on said back surface and connected electrically to said circuit ends and said pads being slidably connected to said electrodes and said pads being positioned on opposite corners so that said symbol assemblies can be arranged vertically or horizontally to display said symbols while maintaining the electrical contact between said pads and said electrodes.

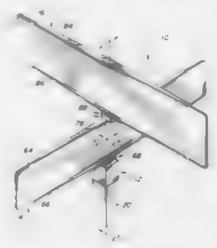
4,854,063

STREET IDENTIFICATION SIGN ASSEMBLY

Alejandro Brunell, Chapultepec 1836 Ote., Monterrey, Nuevo Leon, Mexico

Filed Dec. 22, 1987, Ser. No. 136,702
Int. Cl.[4] G09F *15/00*
U.S. Cl. 40—607 **12 Claims**

1. A street identification sign assembly of the type mountable on the top of a vertical tubular sign post, said street sign assembly comprising in combination:
(a) a post cap for mounting on the top of the sign post, said post cap including a top wall and a downwardly opening blind bore for axially receiving the top end of the sign post;
(b) an expandable locking means mounted in said blind bore for engaging the bore of the sign post and including means for expanding said expandable locking means into frictional gripping engagement with the bore of the sign post to lockingly attach said post cap;
(c) an elongated street sign for displaying street identification indicia, said street sign including upper and lower longitudinal edges and a lower mounting pad proximate said lower longitudinal edge;
(d) interconnection means disposed on said top wall and on said lower mounting pad for mounting said street sign on said post cap, said interconnection means including jam



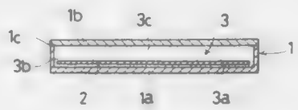
means disposed on said top wall and on said mounting pad for inhibiting disassembly of said street sign from said post cap;
(e) said top wall including a spaced apart pair of arcuate openings formed on diametrically opposed sides of the center of said top wall each of said openings being of key-hole shape with a relatively wide end and an opposite relatively narrow end; and
(f) a pair of hooks depending from said mounting pad, said pair of hooks being aligned with said openings and freely passable through the relatively wide ends thereof and being in hooked engagement with said wall when said first street sign is rotated relatively to said post cap to move said hooks from the wide ends of said openings into the narrow ends thereof.

4,854,064

INTEGRATED ARTICLE BEARING INDICIA AND MANUFACTURING PROCESSES THEREFOR

Takashi Yamaguchi, Fujisawa, Japan, assignor to Kabushiki Kaisha Sebun Shiizu, Kanagawa, Japan

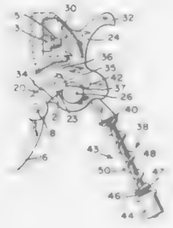
Continuation of Ser. No. 850,187, Apr. 10, 1986, abandoned. This application Aug. 4, 1988, Ser. No. 228,782
Int. Cl.[4] G09F *3/10*
U.S. Cl. 40—630 **3 Claims**



1. An integrated article bearing indicia comprising:
a hard enclosing container, which is transparent at least at a front wall, and is composed of a lower container and a covering member sealed thereto by a sealing means;
a metallic plate bearing the indicia located in the lower container leaving a space between the metallic plate and an interior surface of the enclosing container; and
an enclosing layer of visco-elastic gel located in the space and interposed between the metallic plate and the enclos-

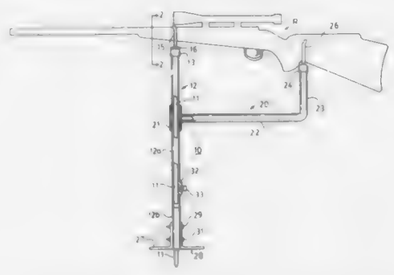
ing container, the enclosing layer enclosing an upper surface, a lower surface and peripheral side surfaces of the metallic plate.

4,854,065
HAMMER BLOCK DEVICE
Kendrick L. French, Lebanon, Me., and Mark C. Laney, Lee, N.H., assignors to K.W. Thompson Tool Company, Inc., Rochester, N.H.
Filed Oct. 7, 1988, Ser. No. 254,953
Int. Cl.[4] F41C *17/00*
U.S. Cl. 42—65 10 Claims



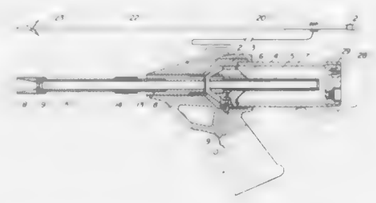
1. A firearm:
(a) which has a frame and a barrel,
(b) a trigger which is pivotally connected to the frame for pivoting movement relative to the frame about a first pivot point between a forward position and a rearward position,
(c) first biasing means for biasing said trigger toward said forward position,
(d) a hammer block which is fixed to the trigger and which extends from said first pivot point in the opposite direction from said trigger so that when the trigger is in said forward position, the hammer block is in a rearward position and when the trigger is in its rearward position, the hammer block is in a forward position,
(e) a hammer which is pivotally connected to the frame at a second pivot point which is rearward of said trigger for pivoting movement relative to the frame between a forward firing position and a rearward cocked position, said hammer engaging said hammer block when said hammer block is in its rearward position and said trigger is in its forward position and said hammer is in an intermediate position between said forward firing position and said rearward cocked position to prevent said hammer from reaching said forward firing position,
(f) second biasing means for biasing said hammer toward its forward position,
(g) an actuator which is fixed to said hammer and which extends from said second pivot point in the opposite direction from said hammer for engaging said hammer block and moving said hammer block forwardly and said trigger rearwardly to an intermediate position between the forward and rearward positions of said trigger and said hammer block when said hammer is moved to its rearward position, and
(h) latching means associated with said hammer block and said actuator for locking said hammer in its rearward position against forward motion and said trigger in its intermediate position against forward motion, said latching means being rendered ineffective to lock, said hammer in its rearward position upon movement of said trigger to its rearward position so that said hammer is moved to its forward firing position by said second biasing means.

4,854,066
ADJUSTABLE RIFLE REST
Randall L. Canterbury, Sr., R.R. 1, Box 2895, Berryville, Va. 22611
Filed Dec. 14, 1988, Ser. No. 284,184
Int. Cl.[4] F41C *29/00*
U.S. Cl. 42—94 8 Claims



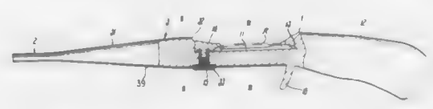
1. An adjustable rifle rest comprising: a cylindrical standard implantable into the ground; a rotatable front rifle support mounted on the upper end of said standard; a sleeve snugly but rotatably and slidingly engaging said standard; a member having a horizontal portion with one end thereof fixed to said sleeve and the other end terminating in an upwardly extending vertical portion; and a rear rifle support fixedly mounted on the upper end of the vertical portion of said member.

4,854,067
HYDROPNEUMATIC HARPOON
Kostadin G. Tersiev, and Mitko V. Kamenov, both of Sofia, Bulgaria, assignors to Stiemge, Sofia, Bulgaria
Filed Jul. 6, 1988, Ser. No. 215,692
Int. Cl.[4] A01K *81/04*
U.S. Cl. 43—6 4 Claims



1. A hydropneumatic harpoon comprising
an arrow, a base and a body, said body having a hydraulic chamber;
said hydraulic chamber having a rear portion with a pneumoaccumulator, and a front portion with a rubber membrane;
said rubber membrane having a front part placed on a discharge grid and a rear part mounted on a mobile barrel;
a rubber ring between the base and the front part of the hydraulic chamber;
a barrel attached to said base, and a trigger valve mounted perpendicularly to the axis of said discharge grid;
said barrel being extensible by connection with an intermediate barrel, said intermediate barrel and said barrel end with an attachment containing an arrow seal, said intermediate barrel and said barrel being connectible to each other by means of a transitional element;
said arrow comprising a stem and being similarly extensible by connection with an intermediate stem, said stem and said intermediate stem being connectable to an arrow point.

4,854,068
FISHING ROD AND A MANUFACTURING METHOD THEREFOR
Yoshimi Maeda, Osaka, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Continuation of Ser. No. 835,785, Mar. 3, 1986, abandoned, which is a division of Ser. No. 620,939, Jun. 15, 1984, Pat. No. 4,601,127. This application Jan. 12, 1988, Ser. No. 144,668
Claims priority, application Japan, Jul. 28, 1983, 58-118137; Nov. 22, 1983, 58-180823; Nov. 24, 1983, 58-181846; Dec. 5, 1983, 58-230434; Dec. 29, 1983, 58-249850; Apr. 24, 1984, 59-80241
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.[4] A01K *87/00*
U.S. Cl. 43—18.5 20 Claims



1. A fishing rod, comprising:
a handle having a coupling portion, a reel mounting portion and a grip, said reel mounting portion (i) being elongated, (ii) having a substantially planar reel mounting surface and (iii) comprising means for releasably mounting a fishing reel thereon,
a rod body having a large diameter root end and a tip end and being tapered from said root end toward said tip end, said coupling portion having an outer diameter greater than said diameter of said root end, and
a tubular fitting portion joining said rod body with said handle, said tubular fitting portion having (i) a small diameter tubular portion in continuation of said root end, (ii) a fitting portion having an inner diameter fitted onto an outer periphery of said coupling portion, and (iii) a tapered portion which is disposed between said small diameter tubular portion and said fitting portion, which increases in diameter from said small diameter tubular portion toward said fitting portion at a rate of change greater than that of said rod body and which has a length sufficient to allow stress to be dispersed therealong, said fitting portion having an edge portion shaped to enable said reel mounting portion to be exposed to an exterior, said edge portion being disposed close to said reel mounting portion, said rod body comprising a prepreg of high strength fiber permeated with synthetic resin, and said tubular fitting portion being in continuation of said rod body and formed integrally with said prepreg forming said rod body.

4,854,069
FISHING POLE SUPPORT APPARATUS
Ellis D. Smith, 217 Sargent St., and Tyrone Smith, Jr., P.O. Box 321, both of Kendallville, Ind. 46755
Filed Jul. 6, 1988, Ser. No. 215,606
Int. Cl.[4] A01K *97/10, 87/04;* A47B *91/00*
U.S. Cl. 43—21.2 29 Claims

1. A fishing pole support apparatus comprising:
a body;
first clamp means for attaching said body to a fishing pole;
two legs detachably attached to said body; and,



second clamp means attached to said body for selectively clamping and supporting said legs on said body when said legs are detached from said body.

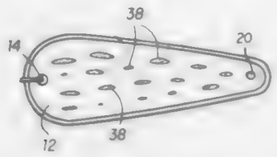
4,854,070
SURE SET HOOK
Gary M. Young, 1991 Sturgeon Bay Tr., Levering, Mich. 49755
Filed Nov. 7, 1988, Ser. No. 267,942
Int. Cl.[4] A01K *83/00, 83/02*
U.S. Cl. 43—34 3 Claims



1. A fish hook that is self-setting, comprising:
a fish hook shank portion;
a barbed hook portion extending from a first axial extent of said shank portion and disposed on one lateral side of said shank portion;
a latch member disposed on the lateral side of said shank portion opposite said barbed hook portion and comprising a slightly upturned hook portion at the extent of said latch member removed from said shank;
a spring member acting as a part of said shank portion;
a latch retaining member operably disposed on said shank portion;
said latch retaining member being engageable with said latch member in a latched position to bend the first axial extent of said shank portion, and the associated barbed hook portion, towards said opposite lateral side of said shank portion;
the bending of said shank causing a stress in said spring member that creates a biasing force tending to bias said shank and said barbed hook back to an unlatched position;
said fish hook shank portion comprises an eyelet portion at a second axial extent;
said barbed hook portion, said latch member, said spring member and said hook shank portion eyelet being formed as one piece;
said eyelet portion being adapted so as to receive a fishing line;
said latch retaining member being connected to said eyelet portion of said shank portion, said latch retaining member comprising a first eyelet at a first axial extent, a second eyelet at the opposite axial extent, an elongate portion integrally interconnecting said first and said second eyelets, said first eyelet being secured into said eyelet portion

of said shank, said second eyelet being engageable with said latch member; and
said spring member is a coil spring.

4,854,071
PLASTIC FISHING SPOON TYPE LURE
Jay Kendall, 163 Collingwood Cove, Sherwood Park, Alberta, Canada T8C 1H2
Continuation-in-part of Ser. No. 871,476, Jun. 6, 1986, abandoned. This application Dec. 8, 1987, Ser. No. 131,772
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.33 2 Claims



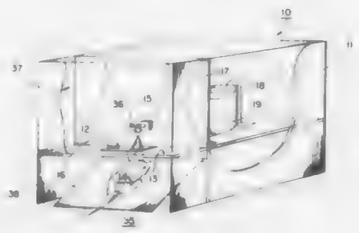
1. A fishing lure for trolling, casting or jigging comprising an ovate body of translucent material, said body having at least one zone of colored, translucent material, said colored translucent material being selected to substantially match the coloration of selected fish larva so that light rays passing through said body of translucent material and said at least one zone of colored translucent material create the coloration effect of said selected fish larva, at least one opaque zone embedded within said body of translucent material to simulate the skeletal structure of an older fish larva, said body further having means at one end to attach a fish hook and means at the opposite end to attach a line.

4,854,072
FISHING BLADE ASSEMBLY
Gerald D. Pecor, 162 Cooper Rd., Milton, Vt. 05468
Filed Oct. 4, 1988, Ser. No. 253,079
Int. Cl.[4] A01K *89/00, 91/00*
U.S. Cl. 43—43.12 3 Claims



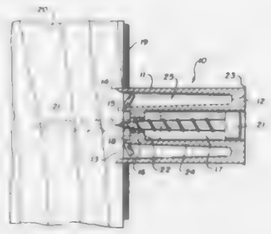
1. A fishing blade assembly, for use when trolling with downrigger equipment, comprising:
clamping means;
said clamping means having means for coupling to a downrigger cable;
said clamping means having wire means attached thereto;
blade means;
said blade means comprising a plurality of flattened plates for drawing attention of the fish;
said blades being fastened to said wire at various points along said wire;
release means;
said release means being affixed to said wire at the end opposite said clamping means; and
said release means having holding means for permitting predetermined transitory attachment of a fishing line.

4,854,073
MOUSE EXTERMINATING DEVICE AND METHOD
Ralph A. Ball, 2821 Stratford Dr., Greensboro, N.C. 27408
Filed Aug. 15, 1988, Ser. No. 232,220
Int. Cl.[4] A01M *23/38*
U.S. Cl. 43—75 11 Claims



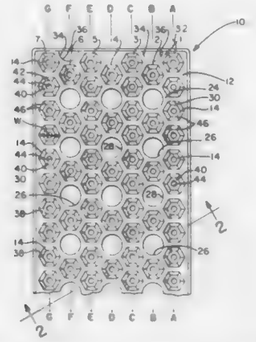
1. A mouse exterminating device comprising: a housing, electrical circuitry, said circuitry positioned within said housing, a bait switch, said switch joined to said circuitry, a thermal switch, said thermal switch joined to said circuitry a blade, said blade mounted on said housing and connected to said bait switch whereby contact with said bait switch by a mouse will activate said blade causing the same to thereby dispatch the mouse and said thermal switch will prevent overheating.

4,854,074
INJECTION CAPSULE FOR TREATING TREES
Robert E. Johnson, West Vancouver, and William R. Dinsmore, Burnaby, both of Canada, assignors to Powertech Labs Inc., Surrey, Canada
Filed Apr. 6, 1988, Ser. No. 178,094
Int. Cl.[4] A01G *29/00*
U.S. Cl. 47—57.5 4 Claims



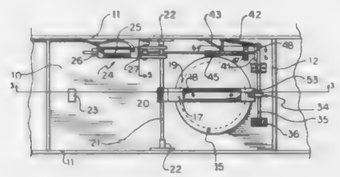
1. An injection capsule to treat trees and woody plants comprising a receptacle portion to hold a chemical to treat trees and woody plants, said receptacle having a closed end and an open end, said open end having a sharpened edge, and said closed end being formed with a stem extending through the receptacle portion from said closed end to said open end, said stem having a sharpened edge adjacent said open end and having an internal bore extending therethrough housing fastening means movable along the length of said bore and guided by the walls of said bore to allow the injection capsule to be attached to a tree or woody plant, said bore being formed with a narrow diameter section to limit the travel of said fastening means whereby said fastening means is pushed through said internal bore and driven into a tree or woody plant in order to hold and seal the open end of said injection capsule tightly against said tree or woody plant, said sharpened edges of said open end and said stem acting to cut an annular hole in the tree or woody plant.

4,854,075
PLANT TRAY
Gene E. Grelling, Longwood, Fla., assignor to Grelling Farms Inc., Denmark, Wis.
Filed Dec. 3, 1987, Ser. No. 128,393
Int. Cl.[4] A01G *23/02*
U.S. Cl. 47—73 10 Claims



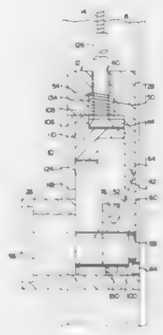
1. A plant tray comprising a flat sheet of moldable material, a plurality of cups formed in said flat sheet, each of said cups having upper edges in the surface of said flat sheet, cups being disposed in rows, said rows having axes which are substantially parallel and include a first row, a second row and a third row, said second row being positioned between said first row and said third row, said cups in said second row are offset in the direction of the axes of said rows from said cups in said first row and said third air openings in said flat sheet, each of said air openings extending through said flat sheet and having an edge adjacent a portion of said upper edges of said cups adjacent each of said openings to supply air to plants growing in said cups in said plant tray, said spaces being located in said second row and each of said cups of said second row being separated from the next one of said cups of said second row by one of said spaces for providing air openings between each of said cups of said second row.

4,854,076
REMOTELY OPERATED HATCH COVERS FOR TANK TRUCKS AND THE LIKE
Murray K. Sieben, Box 9, and Gordon L. Rohs, Box 122, both of Denzil, Saskatchewan, Canada S0L 0S0
Filed Jul. 15, 1988, Ser. No. 219,450
Int. Cl.[4] E05F *15/00*
U.S. Cl. 49—280 20 Claims



1. An opening and closing assembly for hatch covers and the like comprising in combination a hatch cover, supporting structure and means to hinge said cover adjacent one edge thereof, to said supporting structure for movement between a closed position covering an opening and an open position uncovering the opening and vice versa, means for moving said hatch cover from the closed and open positions to an over centre position whereby said cover then moves by gravity from said over centre position to the open and closed positions respectively, piston and cylinder means including a piston rod for operating said last mentioned means, latch means for detachably securing said hatch cover in the closed position, further means for disengaging said latch means from said cover prior to opening said cover and means to engage said latch means with said cover when said cover moves to the closed position.

4,854,077
FAIL-SAFE TIP-LOCK SHOE
Tracy G. Rogers, Rochester, N.Y.; Michael R. Nier, Harrisburg, Pa., and John Moran, Rochester, N.Y., assignors to Schlegel Corporation, Rochester, N.Y.
Filed Oct. 13, 1988, Ser. No. 257,742
Int. Cl.[4] E05D *13/00, 15/00*
U.S. Cl. 49—322 20 Claims



1. A tip-lock shoe for a window sash and the like, comprising:
a hollow body adapted to slidably travel in a track;
first means disposed in the body and movable between a retracted position enabling the body to slide freely in the track and an extended position for engaging the track and preventing movement of the body;
second means disposed in the body for engaging the window sash and for urging the first means from the retracted position to the extended position responsive to tilting of the window sash and the like; and,
third means disposed in the body for engaging a counterbalance system for supporting the body in the track and for urging the track engaging means from the retracted position to the extended position independently of the second means and automatically responsive to a loss of counterbalance force,
whereby the window sash and the like can be slidably and tiltably operated in normal fashion as long as the counterbalance system is operating properly but the window sash and the like is prevented from accidental movement upon catastrophic failure of the counterbalance system.

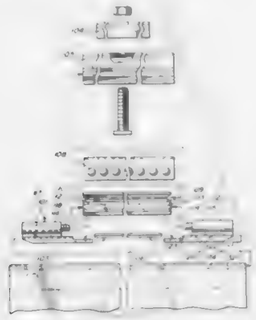
4,854,078
CURVED SLIDING DOOR ASSEMBLY AND METHOD OF REPAIR
George R. DePrima, Libertyville, Ill., assignor to Morton Manufacturing Co., Libertyville, Ill.
Filed Feb. 6, 1989, Ser. No. 306,689
Int. Cl.[4] E05D *15/06*
U.S. Cl. 49—409 5 Claims

1. A curved sliding door assembly for a rail passenger car comprising a car frame,
a vertically elongated generally rectangular door having a vertical curvature mounted in said frame for a horizontal sliding movement,
said door along its upper edge being equipped with a hori-

zontally elongated slot defined by inner and outer walls of said door with integral downwardly and interiorly extending flanges terminating a spaced distance from each other to provide a generally T-shape to said slot in cross-section adapted to receive a horizontally elongated hanger bar, said slot being open at least at one horizontal end thereof, a wedge-ended, T-shaped hanger bar slidably mounted in said slot and inserted therein from said one end, said hanger bar having chamfered upper longitudinal side portions confronting said flanges,

releasable wedge lock means in said slot adjacent said one end closing said slot and confining said hanger bar in said slot, said hanger bar being equipped with a pair of integral, horizontally spaced apart pivot blocks,

said pivot blocks projecting upwardly beyond said door upper edge, each pivot block being equipped with horizontal bore, a pivot pin mounted in each pivot block bore and projecting horizontally outwardly of said pivot block toward the other pivot pin,



a hanger assembly mounted on said frame above said door and equipped with a pair of horizontally opposed raceway portions for ball bearings, a horizontally elongated hanger member positioned in said hanger assembly and equipped with longitudinally extending raceway portions on opposite vertical sides thereof arranged to cooperate with the hanger assembly raceway portions in defining a pair of raceways, a plurality of ball bearings in said pair of raceways for supporting said hanger member for horizontal movement relative to said hanger assembly,

said hanger member extending substantially between said pivot block and at each end being equipped with a bore for the receipt of a projecting part of the pivot pin of each pivot block whereby said pivot blocks are adapted to pivot about a horizontal axis defined by said pivot pins below said pair of raceways,

one of said block bores extending horizontally through the block whereby the pivot pin in said one bore is axially movable to disengage said door from said hanger member alternative to removing said wedge lock means for disengaging said door from hanger bar.

4,854,079

WEATHER STRIP

Tamiharu Karibe, Yuki, and Noboru Kunii, Utsunomiya, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 28, 1987, Ser. No. 78,215

Claims priority, application Japan, Jul. 30, 1986, 61-179474

Int. Cl.[4] E06B *7/16*

U.S. Cl. 49—479 **11 Claims**

1. A weather strip formed of bonded sections comprising:

an extruded first section made of elastomeric material, said first section including a first sealing portion which has a first inner surface defining a first hollow portion in said first sealing portion;

a molded second section made of elastomeric material, said second section including a second sealing portion which has a second inner surface defining a second hollow portion in the second sealing portion; and

means for joining said first and second sections at end portions thereof by thermal fusion bonding to form a joint section, said means including a bead formed at said joint



section and on the first and second inner surfaces of said first and second sections, said bead bridging said first and second sections, said bead being integral with said second inner surface and bonded to said first inner surface by thermal fusion bonding, said bead being formed during molding of said second section.

4,854,080

APPARATUS FOR SHARPENING PERIODONTAL INSTRUMENTS

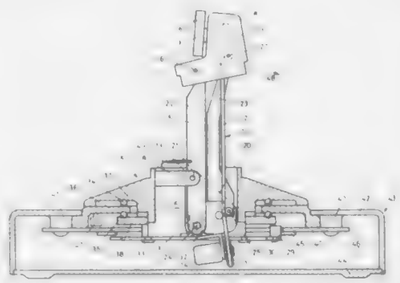
Ludwig Römhild, Am Kugelfeld 3, Berchtesgaden, Fed. Rep. of Germany; Erwin Hartmann, Möriken, and Peter Reinhard, Spreitenbach, both of Switzerland, assignors to Mikrona, AG, Spreitenbach, Switzerland and Ludwig Römhild, Berchtesgaden, Fed. Rep. of Germany

Filed Sep. 24, 1988, Ser. No. 244,724

Claims priority, application Switzerland, Sep. 17, 1987, 3593/87

Int. Cl.[4] B24B *9/04, 19/16*

U.S. Cl. 51—55 **15 Claims**



1. Apparatus for sharpening a cutter of a scaler and other periodontal instruments fixed in a holder, comprising a motor-driven grinding wheel mounted to a swivel head by means of four joints, a base supporting two of said joints and carried by a first carrier and a second carrier which form a parallelogram connection with said four joints, said four joints including two upper joints arranged in the base and two lower joints provided on said first and second carrier, respectively, a vertical support plate supporting said lower joints and being rotatably mounted on a support arm fixed to said swivel head, a link displaceably mounted on said swivel head and connected in articulated manner to a lower end of the first carrier, and at least one fixed template, said link being guided along the fixed template during rotation of the swivel head to transfer its movement to the first and second carriers and consequently adjust an angular position of the base and the grinding wheel with respect to the cutter of a periodontal instrument fixed in the holder.

4,854,081

DEVICE FOR TREATING PRINTED CIRCUIT BOARDS, IN PARTICULAR FOR PUMICING AND TRIMMING

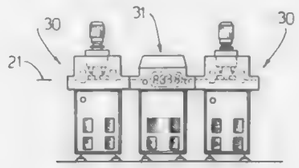
Carlo Pola, and Giacinto Massa, both of Ovada, Italy, assignors to Pola E Massa S.N.C. Di Pola C. E M. & Massa G., Ovada, Italy

Filed Mar. 11, 1988, Ser. No. 165,167

Claims priority, application Italy, Mar. 13, 1987, 19706 A/87

Int. Cl.[4] B24B *7/00, 9/00*

U.S. Cl. 51—76 R **7 Claims**



1. Apparatus for treating the surfaces of printed circuit boards comprised of

first and second treatment means in series, each said treatment means including at least one row of rotatable brushes,

means to feed an abrasive treatment liquid to said brushes,

means to convey said printed circuit boards to said first and second treatment means in a manner which permits contact between said brushes of said first and second treatment means and an adjacent surface of said printed circuit boards,

means to impart translational movement ot said at least one row of brushes in a direction perpendicular to the direction of conveyance of said printed circuit boards, and

means to invert said printed circuit boards positioned between said first and second treatment means, said inverting means comprising a series of opposing rollers, at least some of which are driven, said rollers being mounted on an invertable carriage which is rotatable 180° about an axis perpendicular to and residing within the plane of conveyance of said printed circuit boards to permit a printed circuit board received from said first treatment means to be inverted and passed to said second treatment means.

4,854,082

APPARATUS FOR GRINDING TOOTH REPLACEMENT PRIMARY CROWN CASTINGS

Christian Frank, and Helmut Knosp, both of Pforzheim, Fed. Rep. of Germany, assignors to C. Hafner, Pforzheim, Fed. Rep. of Germany

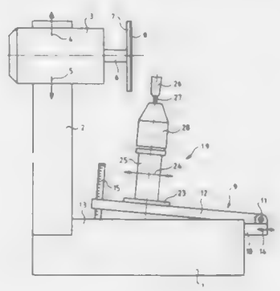
Filed Mar. 4, 1988, Ser. No. 164,109

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 8703394[U]; Sep. 22, 1987, 8712740[U]

Int. Cl.[4] B24B *7/02, 55/06, 55/12*

U.S. Cl. 51—109 R **12 Claims**

1. An apparatus for the grinding or polishing of cylindrical or conical primary crown castings which have a pin extending from their top sides in axial alignment with the centerline of the castings (0° position) which pin is formed by the casting channel supplying the casting material during casting of the crown, said apparatus comprising a base, a support column mounted on said base, an electric motor mounted on said support column such that the shaft of said motor extends parallel to said base, said shaft carrying a grinding and polishing disc, an adjustable table mounted on said base so as to permit adjustment of the angle of said table relative to said base and a receptacle supported on said table so as to be movable toward and from said column, said receptacle being adapted to receive and engage the pin projecting from said casting for secure guided movement of said casting toward said disc for grinding or



polishing the surface of said casting at a predetermined angle, said electric motor and said grinding disc being closely surrounded by a shroud so as to provide an air flow space between said motor and said shroud, and said support column being hollow and in communication with the air flow space formed by said shroud, said column further being provided with a suction nozzle for connection to a suction line for the removal of grinding or polishing dust from said grinding disc through said air flow space.

4,854,083

POLISHING MACHINE USING SUPER ABRASIVE GRAINS

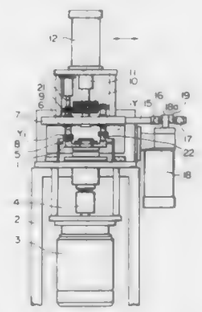
Hiroshi Ishizuka, Tokyo, and Toshio Togano, Hiratsuka, both of Japan, assignors to The Ishizuka Research Institute, Kanagawa, Japan

Filed Mar. 24, 1988, Ser. No. 172,465

Claims priority, application Japan, Apr. 20, 1987, 62-59725[U]

Int. Cl.[4] B24B *7/22*

U.S. Cl. 51—131.4 **1 Claim**



1. A polishing machine comprising: a rotary abrasive tool having a flat circuit working face which comprises a mass of super abrasive grains, said face drivable by a motor to rotate about an axis and said tool being supported by a stationary framework, several arbors which, each, have an inversed cup-

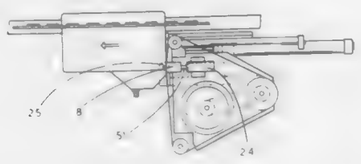
shaped work holder detachably mounted at a lower end and a minor gear in an upper portion thereof, said work holders being arranged in such relation that the open end of each of said work holders is opposite, at least partly, to said tool working face, said minor gears being engaged slidably in a vertical direction along- and with a major gear which in turn is driven by a second motor, each said arbor being engaged with a pressing device capable of pressing the work in order to keep in good contact with the working face, a mobile upper portion, on which said arbors, pressing devices, and the second motor are supported and which is engaged in a slidable and guided relation with the framework, and a device to cause a cyclic motion of said mobile upper portion in parallel with the working face.

4,854,084

EQUIPMENT FOR SANDING THE ROUNDED CORNERS OF BOARDS AUTOMATICALLY

Romano Sparacca, Pesaro, and Gianfranco Caldari, Riccione, both of Italy, assignors to Technolegno S.R.L., Pesaro, Italy

Filed May 12, 1988, Ser. No. 193,104
Claims priority, application Italy, May 22, 1987, 3490 A/87
Int. Cl.[4] B24B *21/16*
U.S. Cl. 51—139 2 Claims



1. Equipment for sanding the rounded corners of boards automatically, utilizing a feeder band to feed overhanging boards along a first direction and at a predetermined feed speed, and a sanding unit that comprises:

a carriage, mounted slidably along a parallel trajectory to said first direction;

an actuator operatively coupled to said carriage for moving said carriage at a regulated traverse speed in a parallel trajectory to the first direction;

a first slide supported by said carriage, which enables transverse movements of the sanding unit toward and away from the edge of each board:

at least two rollers, one of which is power driven;

an abrasive belt looped around said rollers;

a pressure pad situated to contact the abrasive belt and to urge the abrasive belt against the rounded corner of a board during the sanding operation, said pad being located close to one of the two rollers in such a way that the sanding unit can pivot bodily about the rounded corner; and

sensing means for matching the predetermined feed speed of the boards and the traverse speed of the carriage and sanding unit, and thereupon to enable said traverse movements and pivoting movements of the sanding unit about the rounded corner of the board.

4,854,085

RANDOM ORBITAL SANDER

Paul W. Huber, Lancaster, N.Y., assignor to Dynabrade, Inc., Tonawanda, N.Y.

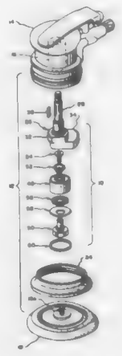
Filed Sep. 24, 1987, Ser. No. 100,588
Int. Cl.[4] B24B *23/00*
U.S. Cl. 51—170 MT 5 Claims

1. An assembly for connecting a sanding pad or the like to drive means having an axis of rotation, whereby to support said sanding pad for free rotational movement about a second axis disposed parallel to said axis of rotation as said second axis is caused to orbit about said axis of rotation, said assembly including in combination:

a balanced shaft having means for attachment to said drive means for rotation about said axis of rotation and a mounting recess having an axis disposed coincident with said second axis;

a bearing device formed with an outer race fixed within said mounting recess and an inner race rotatably supported by said outer race for relative rotational movement about said second axis;

a connection means for attaching said sanding pad to said inner race for rotation therewith, said connecting means including a shaft portion connected to said inner race and having an outer surface and an enlarged head portion having a surface extending radially outwardly from adjacent a juncture thereof with said outer surface and arranged to face towards said bearing device;



a bearing shield carried by said balanced shaft adjacent an outer end of said mounting recess, said bearing shield having a radially inner edge disposed in close proximity to said juncture to form a constricted passageway between said bearing shield and said connecting means, said bearing shield cooperates with said surface of said head portion to define an entrance leading to said constricted passageway, and said entrance converges radially inwardly towards said second axis; and

a bearing seal arranged within said mounting recess axially intermediate said bearing device and said bearing shield to project generally radially of said second axis, and said bearing seal having radially inner and outer edge portions supported by said outer surface of said connecting means and said bearing shield, respectively.

4,854,086

ABRASIVE DISC

Leroy M. Kubsh, and Donald R. Schile, both of Roscoe, Ill., assignors to Litton Industrial Automation Systems, Inc., Del.

Continuation of Ser. No. 303,722, Sep. 21, 1981, abandoned. This application Oct. 17, 1983, Ser. No. 542,085
Int. Cl.[4] B23F *21/03*
U.S. Cl. 51—209 R 2 Claims

1. An abrasive disc comprising:

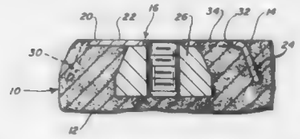
a bonded abrasive body having a substantially flat mounting surface,

a plurality of anchoring means each including a cup-shaped metallic washer having a flat top surface portion substantially flush with said flat mounting face and an annular outwardly inclined skirt portion embedded within said abrasive body,

each said washer including

an internally threaded portion communicating with an opening in said flat top surface portion for receiving a bolt,

a plurality of apertures in said skirt portion surrounding said top surface opening whereby integral portions of said bonded abrasive body extending therethrough lock said washer in position within said bonded abrasive, and



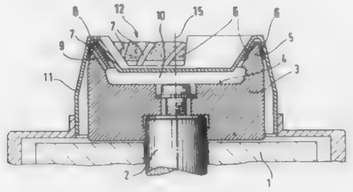
a plurality of apertures in said flat top surface portion surrounding said top surface for decreasing the metallic surface area of said washer bottom surfaces wherein bonded abrasive fills said plurality of apertures in said flat top surface portion.

4,854,087

GRINDING DISC

Werner Riha, Passau, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Fed. Rep. of Germany

Filed Feb. 19, 1988, Ser. No. 157,861
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1987, 3706511
Int. Cl.[4] B24D *7/10*
U.S. Cl. 51—209 R 7 Claims



1. A grinding device including a rotating grinding disc comprising a supporting body having grinding surfaces (6), coated with an abrasive material, which are interrupted by cooling oil grooves (7) extending across the direction of rotation, said supporting body having bores extending from the axis of rotation toward the periphery of said grinding disc, said bores providing cooling oil to said cooling oil grooves when desired, characterized in that a covering hood (11) surrounds and closely covers all of the grinding disc except for a working area (12) of the grinding surfaces (6) and said cooling oil grooves (7) extend completely across the working surfaces (6), whereby said covering hood (11) retains the cooling oil on said grinding surfaces (6) and prevents the cooling oil from being centrifuged therefrom prior to reaching the working area (12) of the grinding disc.

4,854,088

IN-TRACK RAIL BASE GRINDING METHOD

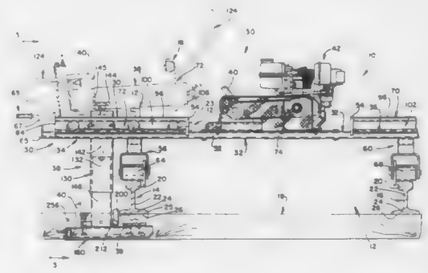
George K. Clem, Chesterton, Ind., assignor to Holland Company, Chicago Heights, Ill.

Division of Ser. No. 000,047, Jan. 2, 1987, Pat. No. 4,751,794.
This application Nov. 16, 1987, Ser. No. 121,132
Int. Cl.[4] B24B *1/00, 7/12*
U.S. Cl. 51—281 R 4 Claims

1. For use with railroad track of the continuous rail type in which the individual rails of the track are made up of rail lengths butt welded together end to end, in joint forming relation, in between a pair of ties, the method of rail grinding the rail base at each such joint to remove excess weld metal protruding from the individual rail joints at the base of the rail after removal of sufficient ballast from below the joint to expose the rail base at such joint,

the rail grinding process comprising:

disposing a rotary grinding wheel having a flat annular upper grinding surface in a plane at an angle relative to the rail base that lies in the range of from about one degree to about five degrees, with the elevationally uppermost portion of the grinding wheel having a position of grinding contact with the rail base in which it is



in grinding engagement with the rail base excess weld metal at the inside edge of the rail,

moving said grinding wheel laterally of the rail base for at least the width of the rail base, while maintaining the grinding engagement of the grinding wheel with the unground portion of the rail base,

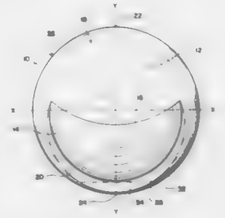
and sequentially raising the grinding wheel for reestablishing said grinding engagement of the wheel with the rail base at the inside edge of the rail, and repeating said moving step, until the rail joint base matches the original profile of the rail before butt welding at such joints.

4,854,089

METHOD OF MAKING A RIGID GAS PERMEABLE BIFOCAL CONTACT LENS

Heriberto Morales, Scottsdale, Ariz., assignor to Sola U.S.A. Inc., Sunnyvale, Calif.

Continuation of Ser. No. 720,192, Apr. 5, 1985, abandoned. This application Mar. 16, 1988, Ser. No. 171,155
Int. Cl.[4] B24B *13/00*
U.S. Cl. 51—284 R 7 Claims



1. A method for making a bifocal contact lens from a polymer button having an anterior surface, a posterior surface, a circumferential edge, and a geometric center defined by the intersection of a horizontal axis and a vertical axis, said axes being parallel to the planes of said anterior and posterior surfaces, said method comprising the steps of:

(a) rotating the button about a first axis of rotation, said first axis being perpendicular to the intersection of said hori-

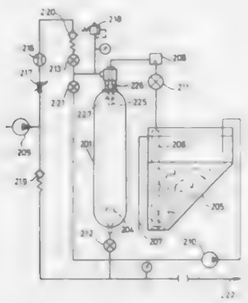
zontal and vertical axes and offset from said geometric center along said vertical axis;
(b) forming a base curve in said posterior surface, said base curve being defined as a continuous arc centered about a point selected along said first axis of rotation;
(c) rotating the button about a second axis of rotation, said second axis being parallel to said first axis and passing through said geometric center;
(d) forming a near vision optical zone on said anterior surface, said near vision optical zone being defined as a continuous arc centered about a second point selected along said second axis of rotation, said near vision optical zone being restricted over a predetermined area of said anterior surface;
(e) covering the anterior surface with a protective coating;
(f) rotating the button about a third axis of rotation, said third axis being parallel to said first and second axes and offset from said geometric center along said vertical axis in a direction opposite of said first axis; and
(g) forming a distance vision optical zone on said anterior surface, said distance vision optical zone being defined as a continuous arc centered about a point selected along said third axis of rotation, said distance vision optical zone being restricted over a predetermined area of said anterior surface.

4,854,090

FEEDING ABRASIVE MATERIAL

Roger A. Heron, Stagsden; David H. Saunders, Olney, and Robert M. Fairhurst, Mears Ashby, all of England, assignors to The British Hydromechanics Research Association, Bedford, England

PCT No. PCT/GB86/00613, § 371 Date Jun. 8, 1987, § 102(e) Date Jun. 8, 1987, PCT Pub. No. WO87/02290, PCT Pub. Date Apr. 23, 1987
PCT Filed Oct. 10, 1986, Ser. No. 80,671
Claims priority, application United Kingdom, Oct. 10, 1985, 8524982; Feb. 11, 1986, 8603292
Int. Cl.[4] B24C *7/00*
U.S. Cl. 51—410 **16 Claims**



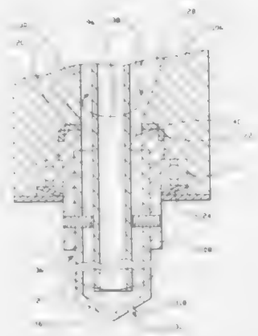
1. High pressure jetting apparatus comprising an abrasive cutting nozzle, a hopper for a supply of abrasive material, a container for forming a mixture of abrasive material and a carrier liquid at a point remote from the nozzle, a closable conduit for conducting said mixture at high pressure from the container to the nozzle to form a high velocity abrasive jet, means providing an endless circulating path through the container and the hopper when the closable conduit is closed for circulating carrier liquid between the container and the hopper to charge the container with abrasive material from the hopper and carrier liquid and thereby form said mixture, said means including an inlet conduit to the container, an outlet conduit from the container and means for selectively connecting and disconnecting the inlet and outlet conduits to and from the hopper, and means for supplying carrier liquid under pressure to the container through the outlet conduit to force said mixture from the container to the nozzle when the inlet and outlet conduits have been disconnected from the supply hopper and the closable conduit is open.

4,854,091

ABRASIVE SWIVEL ASSEMBLY AND METHOD

Mohamed Hashish, Kent, and Mark Marvin, Tacoma, both of Wash., assignors to Flow Industries, Inc., Kent, Wash.

Filed Nov. 16, 1987, Ser. No. 120,865
Int. Cl.[4] B24C *5/04*
U.S. Cl. 51—439 **13 Claims**



1. A method of providing a rotating, particle-laden liquid jet, comprising the steps of:
(a) providing a tube including a straight tubular section thereof and an outer circumferential member positioned concentrically around and radially spaced from a segment of said tube section so as to define a longitudinally extending cavity therebetween;
(b) rotating said straight tube section and said circumferential member around the longitudinal axis of said tubular member;
(c) causing a particle-free stream of liquid to pass through said tube including said tubular section from an up-stream pressurized source;
(d) introducing particles into said cavity;
(e) combining said introduced particles and said particle-free stream in order to produce a particle-laden liquid stream; and
(f) directing said particle-laden liquid stream through a nozzle connected to said tube and circumferential member for rotation, whereby to provide a rotating, particle-laden liquid jet.

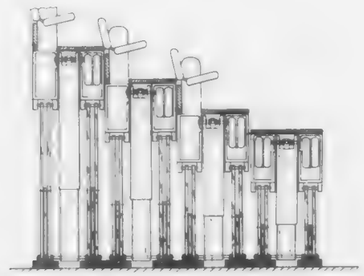
2. An assembly for providing a rotating, particle-laden fluid jet, comprising:
(a) tube means including straight tubular section thereof for containing within its interior a stream of particle-free fluid which flows from an upstream pressurized source of said fluid through the tube means including said straight section,
(b) means for rotating said straight tubular section of said tube means about the longitudinal axis of said straight tubular section;
(c) means for introducing solid particles into said particle-free fluid stream at a point along said rotating straight tubular section, whereby to produce a particle-laden fluid stream, said means for introducing said particles into said stream including means defining a longitudinally extending annular cavity circumscribing a segment of said tube means and in fluid communication with the straight tubular section of said tubular means, and means defining at least one entry port in fluid communication with said cavity for directioning said particles from an external supply thereof into said cavity for passage into said particle-free stream.

4,854,092

MOBILE STRUCTURE FOR MEETING HALLS OR AUDITORIUMS

Catherine M. Chatenay épouse, 70 Rue Mouffetard, 75005 Paris, France

Filed Nov. 25, 1987, Ser. No. 125,362
Claims priority, application France, Dec. 3, 1986, 86 16913
Int. Cl.[4] E04H *3/12*
U.S. Cl. 52—10 **11 Claims**



1. A modifiable floor structure for a public hall or premises, said modifiable floor structure comprising a plurality of modular platforms, whereby said modifiable floor structure allows a space within said public hall or premises to be adapted and optimized for varying events, each of said modular platforms, comprising:
(a) a plurality of rectangular horizontal panels, each of said panels having two longer sides and two shorter sides;
(b) a supporting framework formed by two rectangular box girders each having two longer sides and two shorter sides, said girders being attached to and supporting said rectangular horizontal panels, the two box girders being disposed in parallel along the two longer sides of said platform, said girders being separated by a gap;
(c) mechanical means provided within said gap for vertically displacing said modular platform, whereby during said vertical displacement said modular platform remains horizontal;
(d) a plurality of foldable seats;
(e) a plurality of housings disposed within said box girders, each housing being adapted to contain at least one seat in folded position, said seats being adapted to be removable from said housing and brought into active position above the plane of said panels, said housings also being adapted such that when said chairs are folded and stored within said housing said modular platform will be totally clear.

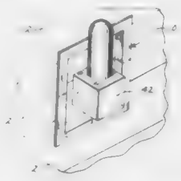
4,854,093

FIXTURE MOUNT

Gary J. Kellom, 3182 Lower Woodland Dr., Colgate, Wis. 53017

Filed Sep. 2, 1988, Ser. No. 239,705
Int. Cl.[4] E04F *19/00*
U.S. Cl. 52—28 **9 Claims**

8. In combination with siding for a building structure, said siding comprising long strips of material and having gaps to accommodate fixtures, a reversible fixture mount disposed adjacent said gap and comprising a pair of mating members each having a base defined by a front face engaging said structure and a rear face and side walls extending therefrom, a flange extending outwardly from the margins of the side walls opposite the base and overlapping the gaps in said siding, support means formed on one of said members and extending from the rear face to the plane defined by said flange, and joint means formed on the other member and engaging the first member adjacent said support, said rear faces of said members



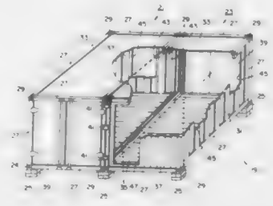
being constructed and arranged to support a fixture adjacent said structure and recessed relative to said siding.

4,854,094

METHOD FOR CONVERTING ONE OR MORE STEEL SHIPPING CONTAINERS INTO A HABITABLE BUILDING AT A BUILDING SITE AND THE PRODUCT THEREOF

Phillip C. Clark, 10245 SW. 124th Ave., Miami, Fla. 33186

Filed Nov. 23, 1987, Ser. No. 123,885
Int. Cl.[4] E04H *5/06*
U.S. Cl. 52—79.1 **11 Claims**



1. A habitable building comprising at least two steel shipping containers, each of said containers including a box-like frame of steel members, a bottom wall and a top wall connected to said frame, two opposed sidewalls of corrugated steel sheet welded to said frame, and two opposed steel endwalls connected to said frame, said containers being mounted on weight-bearing foundations located under said endwalls and being joined together in adjacent, side-by-side relationship, the adjacent inner sidewalls of said containers having portions thereof removed leaving at least a narrow flange extending inwardly from the edges thereof, said removed portions providing access between said containers, a roof over and attached to the top walls of said containers, a common raised floor over and attached to the bottom walls of said containers, said floor enclosing the flanges extending inwardly from said bottom walls, at least one window and at least one door in the walls of said containers.

4,854,095

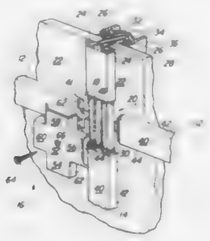
COLOR CAP SYSTEM FOR LOCKING STRIP GASKETS

John J. Michlovic, Avon Lake, Ohio, assignor to The Standard Products Company, Cleveland, Ohio

Filed Oct. 29, 1987, Ser. No. 114,580
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—235 **16 Claims**

1. A system for adding color to a resilient gasket curtainwall system having a plurality of vertical and horizontal gasket strips, each gasket strip having an outer periphery and said vertical and horizontal gasket strips forming intersections at their junctions, said color system comprising:
means for entirely covering said vertical and horizontal gasket strips, said covering means having an inner periph-

ery having a shape substantially corresponding to the outer periphery of said gasket strips and adapted to abut said outer periphery of said gasket strips so that said covering means covers the entire outer periphery of said gasket strips;



means projecting from said inner periphery of said covering means for securing said covering means into locking strip cavities of said gasket strips; and

pigmented means coupled with said covering means for providing said covering means with a tinted aesthetic appearance.

4,854,096

WALL ASSEMBLY

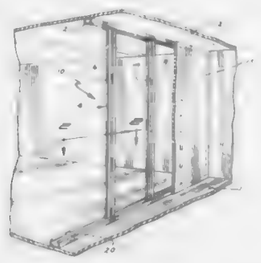
Robert A. Smolik, 670 W. Seventh St., St. Paul, Minn. 55102

Continuation of Ser. No. 851,087, Apr. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 542,526, Oct. 17, 1983, abandoned. This application Dec. 21, 1987, Ser. No. 135,991

The portion of the term of this patent subsequent to Feb. 21, 2006, has been disclaimed.

Int. Cl.[4] E04C *3/04*

U.S. Cl. 52—241 **19 Claims**



1. A wall assembly comprising:

a framework formed of a plurality of longitudinal wall studs of the type formed of resiliently deflectable material having a generally C-shaped cross-sectional profile with a major side member, first and second end members disposed in generally perpendicular relationship to the major side member, first and second lips extended inward a short distance from opposite edges of the end members parallel to the major side member, each stud having a cross-sectional length of the outside distance between the end members and a cross-sectional width of the outside distance between the major side member and the lips;

a first support beam having a longitudinal axis and formed of a resiliently deflectable material, said beam having a base wall, first and second side walls extended perpendicularly from the base wall forming a channel having a width generally coresponding to the cross-sectional length of the wall studs;

said support beam having a plurality of pockets for retention of longitudinal ends of the wall studs disposed generally perpendicular to the support beam, said pockets corresponding generally in shape to the cross-sectional shape of the wall studs with the cross-sectional length of the wall stud oriented perpendicular to the longitudinal axis of the beam;

said plurality of wall studs assembled to the support beam each with a longitudinal end installed in one of said pockets;

boundaries of each of said pockets formed by first, second, third and fourth flat, cantilever retaining members including first and second co-planar retaining members having edges with facing edges spaced apart on the first side wall a distance generally corresponding to the cross-sectional width of the wall stud and extending inward of the channel, third and fourth retaining members on the second side wall of the support beam with facing edges spaced apart in symmetrical co-planar relationship to the first and second retaining members and extending inward of the support beam, each said retaining member being formed from a flat multi-sided tabular section cut out of a side wall, said tabular section being bent inwardly of the support beam channel to a position generally perpendicular to the side wall and parallel to the support beam and extending into the channel wherein two of the sides of the multi-sided section form a bending axis and the facing edge of the retaining pocket, said retaining members being spaced apart on the first and second side walls with a distance between diagonally opposed members smaller than an undeflected cross-sectional length of the vertical wall stud and large enough to permit passage of a vertical wall stud from an orientation diagonally disposed with respect to said support beam channel to a position seated in the pocket upon deflection between the support beam side walls and the wall stud when the wall stud is twisted against the retaining members to move it in position into the pocket whereby the size of the retaining members may be selected according to the gauge of the deflectable material.

4,854,097

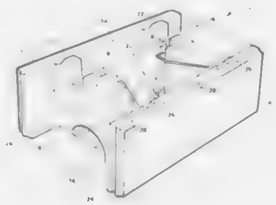
INSULATED INTERLOCKING BUILDING BLOCKS

Juan Haener, 8215 Harton Pl., San Diego, Calif. 92123

Filed Feb. 1, 1988, Ser. No. 151,238

Int. Cl.[4] E04C *1/00*

U.S. Cl. 52—309.11 **15 Claims**



1. A high strength, insulating building block having no thermal bridges of block structural material from one side to the other which comprises:

first and second spaced substantially planar sidewalls having substantially parallel outer faces;

said first sidewall having upstanding integral webs extending toward said second sidewall;

said first webs having first lateral end portions extending substantially parallel to said outer faces;

interlock means attached to the inner surface of said second sidewall and extending toward said first sidewall;

said interlock means including second lateral end portions extending substantially parallel to said outer faces and overlapping said first lateral end portions in a manner restricting separating movement of said sidewalls along a line substantially perpendicular to said outer faces;

said overlapping first and second lateral end portions being spaced from each other; and

an insulating foam material filling at least part of the volume between said sidewalls including the space between said overlapping first and second lateral end portions and maintaining the spacing thereof.

4,854,098

FACADE STRUCTURE

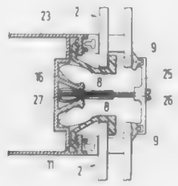
Hans Emmer, Liestal, Switzerland, assignor to Eltreva AG, Aesch, Switzerland

Filed Sep. 16, 1987, Ser. No. 97,140

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1986, 3631566

Int. Cl.[4] E04B *1/60*

U.S. Cl. 52—398 **14 Claims**



1. A facade structure, comprising:

an inner bearing member which defines a portion of the periphery of an opening;

a plate element constituting a front surface, a back surface and a lateral edge, said back surface covering said opening;

means for automatically centering said plate element, said means being a holder which engages an edge region of said plate element by means of a retaining projection;

means for pivotally mounting said holder onto said inner bearing member such that the holder is pivotable about an axis which extends parallel to said edge region of said plate element;

means for resiliently pivoting said holder about said axis and for pressing the holder within the plane of said plate element against the lateral edge of the plate element so that said retaining projection engages behind said edge region at a constant depth;

the holder comprises a plastic strip-shaped form extending along a substantial portion of the edge region on said plate element; and

said pivotal mounting means comprises a beaded edge on said holder and a groove which matches the outer contour of the beaded edge located in the bearing member.

4,854,099

FLOOR STRUCTURE

Kaj Kristoffersen, Soro, Denmark, assignor to Junckers Industrier A/S, Koge, Denmark

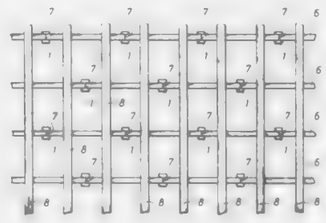
Continuation of Ser. No. 881,357, Jun. 23, 1986, abandoned. This application Sep. 8, 1987, Ser. No. 96,231

Claims priority, application Denmark, Oct. 22, 1984, 5032/84; Aug. 13, 1985, 3673/85

Int. Cl.[4] E04F *15/14*

U.S. Cl. 52—403 **2 Claims**

1. A floor structure comprising a supporting floor (2) a flooring (10) located on top of a first, lower layer (6) and a second, upper layer (8) of parallel, spaced joists, the joists of one of said layers extending substantially perpendicularly to the joists of the other of said layers, and said first layer (6) being located on top of chocking means (1) in abutment with and permanently supported at regular intervals directly on a suporting floor, and resilient spring elements (9) separating the two layers of joists being positioned at intersections of said two layers of joists, said second layer of joists (8) also being provided with at least one transverse slot (12) immediately above said spring elements, and mutual distance and cross-sectional dimensions of said joists being such that the following formula applies:



$$L_1E_1K_1 = K.L_2E_2I_2$$

where I is a structure constant varying between 0.1 and 1.5, but preferably between 0.55 and 0.65, E is the elasticity module, L is the distance between the joists, I is the moment of inertia, 1 refers to the upper layer of joists and 2 to the lower layer of joists.

4,854,100

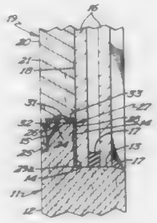
CONCEALED SNAP-IN GRILL CLIP

Jack C. La See, 308 West Cedar, Abbotsford, Wis. 54405

Filed Sep. 2, 1988, Ser. No. 239,944

Int. Cl.[4] E06B *3/68*

U.S. Cl. 52—456 **4 Claims**



1. In combination with a window including a generally rectangular-shaped frame having a generally convex inner frame surface portion, a glass window pane mounted in the frame and having inner and outer surfaces,

a grill comprised of a plurality of grill bars interconnected with each other in right angular relation, and each grill bar having an outer surface and an inner surface, said outer surface engaging the inner surface of the glass pane, each grill bar having concave end surfaces contoured to mate with the convex inner frame surface portion of the frame, each concave end surface of each grill bar having a semispherical recess therein spaced from the inner surface of the grill bar,

a plurality of identical one-piece grill engaging clips, each clip including a substantially flat body portion having one end thereof pointed and being insertable between the frame and the glass pane, each clip including a flat coupling portion integral with and extending in substantially right angular relation from the other end of said body portion, a major portion of said coupling portion being

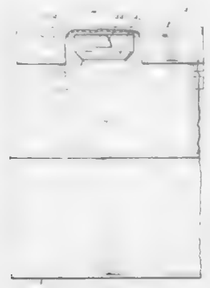
shaped to define a semi-spherical coupling element projecting therefrom, the recesses at opposite ends of each grill bar engaging the coupling element of a pair of clip members with snap coupling effect to secure the grill to the frame and against the inner surface of the pane.

4,854,101

MOUNTING CLIP FOR INSTALLING SIDING

Wendel J. Champagne, 21823 W. Champagne Cir., Tomball, Tex. 77375

Filed May 27, 1987, Ser. No. 54,519
Int. Cl.[4] E04D *1/00, 1/34*
U.S. Cl. 52—520 **5 Claims**



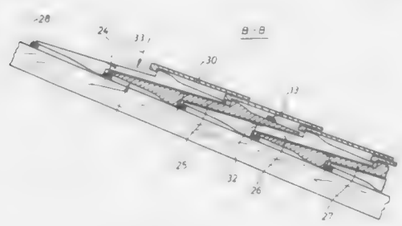
1. In combination with siding panels and a trim strip, said panels being elongated profiled members of metallic or plastics material, said trim strip being an elongated member of like material defining a panel edge receiving cavity and being fixedly attached to a building structure, a clip formed from metal and profiled to a channel shape to be received on edge portion of said panel with first and second portions of said clip lying to either side of said panel, an edge portion of said first portion of said clip projecting outwardly to grippingly engage said trim strip, a crimp deforming both said first and second portions of said clip and a portion of the panel lying therebetween in sandwich fashion, said clip maintaining said crimp against relaxation by the material of said panel.

4,854,102

SUB-ROOF FOR A ROOF COVERED WITH ROOFING BOARDS

Eugen Feil, Lange Strasse 29, D-7084 Westhausen; Gerd Neumann, Attenzell 50, D-8079 Kipfenberg; Wolfgang Graser, Mittelsetzring 56, D-8729 Zeil, and Horst Friedrich, Kriegsreuth, D-8662 Helmbrechts, all of Fed. Rep. of Germany

Filed Jul. 9, 1987, Ser. No. 71,756
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1986, 3623428
Int. Cl.[4] E04B *1/88*
U.S. Cl. 52—535 **13 Claims**



1. A sub-roof having a ridge and eaves, comprising a plurality of overlapping generally rectangular insulating boards, each of which comprises:

(a) a central section having upper and lower surfaces extending parallel to each other, and having a uniform thickness;

(b) a lower edge section extending in the direction of said eaves, having a lower surface integral with, and extending in the same plane as, the lower surface of said central section and an upper surface tapering to the edge of said lower edge section and having a thickness at the point said lower section joins said central section which is greater than the thickness of said central section to form a step on said upper surface of said lower edge section; and

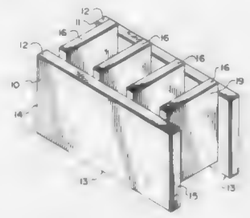
(c) an upper edge section extending in the direction of said ridge, having an upper surface integral with, and extending in the same plane as, the upper surface of said central section and a lower surface tapering to the edge of said upper edge section and having a thickness at the point said upper section joins said central section which is greater than the thickness of said central section to form a step on said lower surface of said upper edge section.

4,854,103

BUILDING SYSTEM WITH INTERLOCKING BLOCKS

Kyle Klym, 11 Melmar Place, Winnipeg, Manitoba, Canada R2G 0P3

Filed Nov. 12, 1987, Ser. No. 119,841
Int. Cl.[4] E04C *1/10*
U.S. Cl. 52—593 **10 Claims**



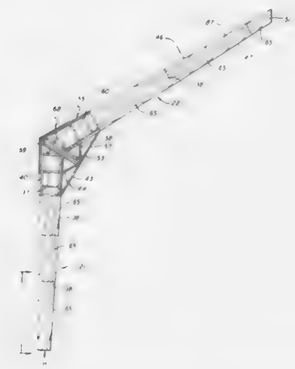
1. A set of building blocks for use in an interlocking building system, the set comprising a plurality of basic blocks each formed from an integrally molded aggregate material to define two spaced rectangular block sides of the same dimensions with edges of one side being aligned with corresponding edges of the other side and a plurality of spaced transverse webs interconnecting said one side to said other side such that a width of the block transverse to the sides is less than a length of the block along the sides, each web extending from one side to the other side and being arranged to include an upwardly projecting portion above aligned upper edges of the sides and a correspondingly shaped recess upwardly of aligned lower edges of the sides, the webs being equidistantly spaced along the block with outermost ones of the webs being spaced from respective end edges of the sides by distance equal to one half of the spacing between adjacent webs and arranged such that when two blocks are placed directly on top of one another and when two blocks are placed on top of one another offset longitudinally by the length of one half of a block, the webs of an upper one of the blocks lie directly upon and aligned with the webs of a lower one of the blocks with the projecting portions of the lower webs extending into and filling the recesses of the upper webs, and a plurality of corner blocks each of said corner blocks being formed from an integrally molded aggregate material to define two spaced rectangular block sides of the same dimensions with edges of one side being aligned with corresponding edges of the other side and a plurality of spaced transverse webs interconnecting said sides such that a width transverse to the sides of each block is less than a length along the sides of the block, each web extending from one side to the other side and being arranged to include an upwardly projecting portion above aligned upper edges of the sides and a correspondingly recess upwardly of aligned lower edges of the sides, the webs being spaced along the length of the block with an outermost one of the webs at one end of the block being spaced from respective end edges of the sides and an outermost one of the webs at the other end of the block being arranged directly interconnecting respective end edges of the sides, both of said block sides having an recess in said lower edge thereof of the same shape as the projecting portions of the webs and arranged adjacent to but spaced from said other end edges of the sides by a distance no greater than the thickness of a side of the block.

4,854,104

ROOF TRUSS ASSEMBLY

Patrick G. Pomento, 802 W. Embargo St., Rome, N.Y. 13440

Filed Oct. 18, 1988, Ser. No. 259,170
Int. Cl.[4] E04B *1/343;* **E04C** *3/00*
U.S. Cl. 52—639 **14 Claims**



1. A wooden truss member that includes a vertically disposed column section and an upwardly and inwardly pitched roof section angularly disposed from the column section to form a corner therebetween, each of said sections including a hollow frame that is enclosed on each side by cover panels, a connecting means at the corner that includes flange means that extend from the outside of said corner beyond the inside of said, corner and a brace means having 2 opposed ends and a mid-region mounted on the inside of the corner, said brace means being at either end to one of the sections and at its mid-region to the extended end of the flange means, a corner panel on either side of said truss member that spans the corner to cover the flange means and the brace means and which is in abutting contact with adjacent cover panels whereby the truss member is completely enclosed by said panels, and means to attach the panels to the frame of each of said sections.

4,854,105

ROOFING MEMBRANE ANCHOR

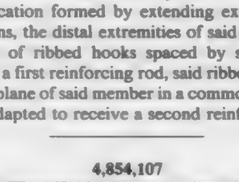
Roger L. Delisle, 125 S. Gray St., Manchester, N.H. 03103

Filed May 10, 1988, Ser. No. 192,204
Int. Cl.[4] E04B *1/38*
U.S. Cl. 52—698 **4 Claims**

1. An anchor for releasably anchoring a membrane to a surface comprising:

(a) a base member (**44**) including means for attaching said base member to the surface, said base member including a post (**46**) thereon having a groove (**54**) therearound, and

(b) a fastening assembly including, as separate cooperating elements, a fastening member (**60**), a radially deformable ring (**76**) housed in a groove (**70**) in said fastening member (**60**) to freely fit over said base member with a said membrane (**90**) thereover when not deformed radially inwardly, said ring (**76**) being capable of inward deformation to cooperate with said groove with a said membrane



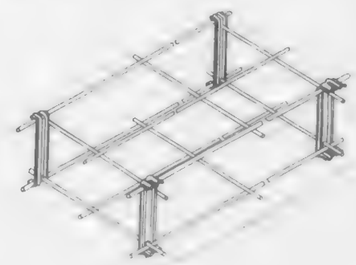
therebetween to captively hold said assembly on said base member, and a deforming means (**78, 80**) arranged to cooperate with said fastening member (**60**) to deform said ring (**76**) inwardly into said cooperation and to maintain said cooperation.

4,854,106

CLIP AND SPACER FOR REINFORCING RODS

Bela Bogar, 12 Collings Street, Pearce, Act, 2607, Australia

Continuation of Ser. No. 6,955, Jan. 27, 1987, abandoned. This application Jun. 29, 1988, Ser. No. 214,898
Int. Cl.[4] E04C *5/16*
U.S. Cl. 52—719 **1 Claim**



1. A unitary clip device for spacing and securing reinforcing rods which are used in concrete construction, comprising an elongated member having a flat central elongated portion flanked by elongated margin portions formed with reinforcing ribs, the extremities of said central portion being undercut to define a bifurcation formed by extending extremities of said margin portions, the distal extremities of said margin portions defining pairs of ribbed hooks spaced by said bifurcations which receive a first reinforcing rod, said ribbed hooks extending out of the plane of said member in a common direction, said bifurcations adapted to receive a second reinforcing rod.

4,854,107

BEAM FRAMING SYSTEM AND PROCESS

Gary L. Roberts, 639 Sedgefield Dr., Newport News, Va. 23605

Filed Jan. 28, 1988, Ser. No. 149,382
Int. Cl.[4] E04C *3/36, 3/34*
U.S. Cl. 52—725 **3 Claims**

1. A framing structure for attaching protective wallboard covering to a H- or I-beam structural member comprising:

an elongated sheet metal corner element extending the length of the structural member to be covered and having an essentially "E" shaped cross-sectional area,

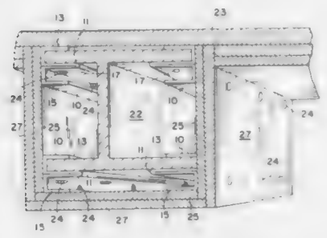
said "E" shaped cross-sectional area of said corner element having a straight back section, a first leg perpendicularly

extending from one end of said straight back section and forming one end of said "E" shaped cross-sectional area,

a second leg perpendicularly extending from the other end of said straight back section and in the same direction as said first leg and forming the other end of said "E" shaped cross-sectional area,

a third lege perpendicularly extending from said straight back section and disposed in spaced relationship between said first and said second legs,

said third leg forming the center of said "E" shaped cross-sectional area and being longer than said first and said second legs,



said first leg, said third leg and a portion of said straight back forming a first open section in said "E" shaped cross-sectional area of said corner element,

said first open section of said corner element being configured to frictionally engage a flange edge of a H- or I-beam structural member,

said second leg, said third leg and a portion of said straight back forming a second open section in said "E" shaped cross-sectional area of said corner element,

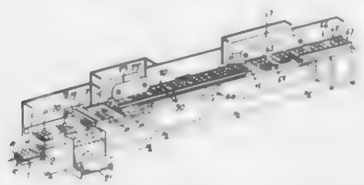
said second open section of said corner element extending laterally from said H-or I-beam and forming a squared open corner structure for attachment of protective wallboard thereto.

4,854,108

AUTOMATIC WRAPPING MACHINE

Paolo Cassoli, Casalecchio di Reno, Italy, assignor to Cassoli Macchine Automatiche Confezionatrici S.r.l., Casalecchio di Reno, Italy

Filed May 12, 1988, Ser. No. 193,078
Claims priority, application Italy, May 20, 1987, 12490 A/87
Int. Cl.[4] B65B *11/22*
U.S. Cl. 53—209 **6 Claims**



1. A machine for wrapping products (P) consisting of a plurality of cylindrical articles (R), comprising:

first feeding means (1-2) of feeding the product (P) to a first conveyor (3-103-4-5) which moves the product in a longitudinal direction substantially coinciding with the longitudinal axis of the articles (R) and which delivers the product (P) onto elevator and counter-elevator means (22-22') for raising the the product therefrom;

wrapper feeding means (16) for feeding a wrapper sheet (15) in the longitudinal direction above the product carried by said first conveyor (3-5) so that said product (P) is delivered to said elevator and counter-elevator means with the wrapper sheet (15) positioned thereon, said wrapper sheet (15) presented side flaps (115, 215) drooping at sides of the product;

a guide channel (30-31-30'-31') receiving the product and wrapper sheet (P, 15) from said elevator and counter-elevator means (22-22'), and continuing the advancing movement of same in the longitudinal direction, said guide channel presenting lower fixed guide members (41) for correctly supporting the product (P);

first folding means (43-43'-46) for folding the wrapper side flaps (115-215) onto a bottom of the product (P) causing the superposition of edges of said side flaps;

first sealing means (53) for sealing together the superposed edges of the side flaps (115-215), thus giving origin to a tubular shaped open ended wrapper enclosing the product (P);

rotating means (59-60-61) for imparting to the product enclosed in the tubular shaped open ended wrapper a 90° rotation, and for continuing its advancement in the longitudinal direction, so as to subject open ends of the tubular wrapper to the action of a second folding means (63-64-65) and a second sealing means (66-67);

said first feeding means comprising a guide (3) presenting an ascending stretch (103), such that into an initial portion of said guide a suitable means (1-2) feeds cyclically the product (P) which is timely engaged by one of a plurality of cross bars (4) of a parallel-chains conveyor (5) which carries said product longitudinally along said guide;

said wrapper feeding means comprising opposite feeding belts (16) which transport, longitudinally and above the product being advanced on said guide (3), the wrapper sheet (15) having been severed by cutting means (17) from a film unwound from a reel (21), in such a manner that at an end of the ascending stretch (103), the wrapper sheet is suitably positioned on said product and is held laterally by said opposite feeding belts (16);

said elevator (22) and counter-elevator (22') means being provided at the end of the ascending stretch (103), whereby the product (P) is positioned on an elevator (22) thereof and is held thereon by a counter-elevator (22') thereof which timely clamps on said product the wrapping sheet (15) released by the opposite feeding belts and whose side flaps hang down on a perimeter of said product, which product is progressively raised by the elevator and counter-elevator acting as a unit and which is introduced into said guide channel which is aligned longitudinally, whereafter said elevator/counter-elevator unit is deactivated and repeats a new working cycle;

said guide channel comprising a pair of moving lateral flat belts (30-30') having an outer face with high-friction coefficient, and comprising at its sides a pair of moving round-section lateral lower belts (31-31') which progressively are inserted below the product, these lateral lower belts being synchronized with the lateral flat belts, and said guide channel being provided at its bottom with stationary, round-sectioned said guide members (41) parallel to said lateral flat and lateral lower belts, which said lateral flat and lateral lower belts engage the product in lower empty spaces between the adjacent cylindrical articles and which are mounted so that end portions thereof are overhanging to avoid interfering with the elevator (22) and to avoid interfering thereafter with the first folding means which act on the wrapping sheet;

said first folding means (43-43'-46) acts below the product moving along said guide channel and spreads the opposite side flaps (115-215) of the wrapping sheet onto the bottom of said product, so as to superpose said side flaps and to form the tubular shaped wrapper;

said first sealing means comprising opposite pairs of opposite upper and lower conveyor belts (48-48'-51-5') acting on the product as it leaves said lower guide members (41) and is still held laterally by the lateral flat and lateral lower conveyor belts (30-30'-31-31'), a lower portion and an upper portion of the product with the tubular shaped wrapper being engaged by said opposite pairs of said opposite upper and lower belts (48-48'-51-51') which travel in the same direction and at the same speed as said lateral belts, one of said opposite lower belts being arranged so as to engage the superposed flaps of the tubular-shaped wrapper, being made of suitable heat-transmitting material, and being urged against said sheet by heating means (53) which effect the continuous heat-sealing of said superposed flaps; and

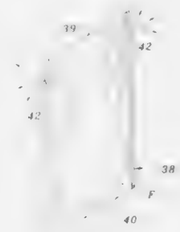
said rotating means comprising a station (57) which takes over the product thus sealed in a tubular open ended wrapper and which, while advancing it in the original longitudinal direction of travel, causes its rotation 90° about a vertical axis, to subject the open ends of the tubular wrapper to the action of said second folding means, (63-63'-64-65) and of said second sealing means (67-67') to finally close the said open ends of the tubular wrapper.

4,854,109

APPARATUS AND METHOD FOR FORMING FOAM CUSHIONS FOR PACKAGING PURPOSES

Talat I. Pinarer, Seymour, and German Gavronsky, Stamford, both of Conn., assignors to Sealed Air, Saddle Brook, N.J.

Filed Aug. 22, 1988, Ser. No. 235,013
Int. Cl.[4] B65B *9/02, 3/18*
U.S. Cl. 53—397 **17 Claims**



1. An apparatus for successively forming foam cushions for packaging purposes wherein each cushion comprises a closed plastic bag filled with foam and having a ventilation opening along at least one side edge thereof for escapement of gas generated during foam formation, said apparatus comprising:

supply means for each of two webs of plastic film;

a housing having a relatively narrow longitudinal opening therein for receiving the two webs of plastic film from said supply means, said longitudinal opening including means for guiding the webs into said housing while forming a mouth between the webs into which a foamable composition may be directed;

means within said housing for advancing the two webs of plastic film along a predetermined substantially horizontal path of travel perpendicular to said longitudinal opening from said supply means and into said opening in said housing and for guiding said webs into opposing face-to-face contact;

first heat sealing means positioned within said housing and along said path of travel for heat sealing longitudinal side edges of the advancing plastic webs while they are in opposing face-to-face contact;

means positioned above said housing and above said longitudinal opening therein for periodically introducing a predetermined amount of foamable composition between the opposing webs, said foamable composition introducing means being positioned in a vertical plane defined by the longitudinal dimension of said opening and at an angle within said plane which is nonperpendicular to said substantially horizontal path of travel so that foamable composition deposited into each bag being formed avoids splashing directly upwardly from the mouth of the bag and instead is encouraged to splash into the bag as the webs are being advanced and sealed along said longitudinal side edges;

control means for periodically and momentarily interrupting operation of said first heat sealing means to provide a ventilation opening along at least one side edge of each bag being formed to thereby allow gas generated during foam formation to escape from within each bag; and

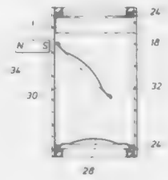
second heat sealing means positioned within said housing and along said path of travel for heat sealing said webs together transversely thereof to form a sealed top edge of a foam filled bag while also forming the sealed bottom edge of the next succeeding bag and for severing each formed bag from the next succeeding bag.

4,854,110

AUTO SEALING PRESSURE CONTAINER

William H. Korcz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 14, 1988, Ser. No. 167,760
Int. Cl.[4] B65B *3/02*
U.S. Cl. 53—452 **8 Claims**



1. A method of making a pressure container for food or beverage packaging which comprises the steps of:

fabricating a vessel;

cutting said vessel to a desired length;

placing a means of end cap support in the bottom of said vessel;

applying a sealant material to said means of support to form a sealant bed at the bottom of said vessel;

placing a bottom end onto said sealant bed within said vessel;

placing a top end onto said bottom end within said vessel, said top end containing at least a small amount of a magnetic material;

placing a second means of support at the top of said vessel;

applying a sealant material to said second means of support to form a sealant bed at the top of said vessel;

filling said vessel with contents; and

drawing said top end to a position contiguous to said sealant bed at the top of said vessel by magnetic means, and sealing said vessel.

4,854,111

APPARATUS FOR CONVEYING AND PACKAGING GROUPS OF ARTICLES

John T. Roberts, Clover; Philip L. Reid, Duncan; Philip S. LaChappell, Tega Cay, and Danny R. Williams, Clover, all of S.C., assignors to Roberts Systems, Inc., Charlotte, N.C.

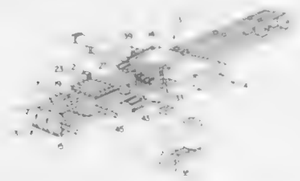
Continuation-in-part of Ser. No. 925,565, Oct. 31, 1986, abandoned, which is a continuation of Ser. No. 666,046, Oct. 29, 1984, Pat. No. 4,633,653. This application Jan. 28, 1987, Ser. No. 7,624
Int. Cl.[4] B65B *35/50*
U.S. Cl. 53—500 **7 Claims**

1. An apparatus for packaging a plurality of articles, comprising:

a first-belted conveyor formed of a plurality of belts having spaces therebetween;

detector means for determining passage along said conveyor of a predetermined member of articles;

lugs positioned within said spaces between said belts for moving between said belts and forming a first group from predetermined number of articles and moving said first group independently of other articles on said conveyor;



means for moving said first group transversely of said conveyor;

elevator means for receiving said first group;

means for lowering said elevator means for receiving a subsequent group moved transversely atop said first group to form a stacked grouping; and

means for moving said stacked group into said carton.

4,854,112

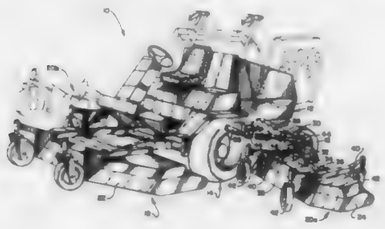
TURF MAINTENANCE APPARATUS

Charles C. Holley, Bloomington; Walter J. Petersen, Eden Prairie, and Michael N. Zenner, Lakeville, all of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Sep. 4, 1987, Ser. No. 93,349

Int. Cl.[4] A01D *34/66*

U.S. Cl. 56—6 **14 Claims**



1. For use with a mower having a traction vehicle and a wing cutting unit, a system for supporting the wing cutting unit relative to the traction vehicle, comprising:

(a) a lift arm assembly suitable for pivotally interconnecting the traction vehicle and the cutting unit, wherein the cutting unit can yaw relative to the traction vehicle;

(b) a breakaway assembly; and

(c) means for connecting the breakaway assembly to the cutting unit and to the traction vehicle, wherein during normal mowing operations the breakaway assembly prevents substantial yawing of the cutting unit relative to the traction vehicle but when the cutting unit strikes an immovable object the breakaway assembly releases to allow the cutting unit to yaw to prevent damage to the mower, and wherein the breakaway assembly can be automatically reset by raising the wing cutting unit with the lift arm assembly.

4,854,113

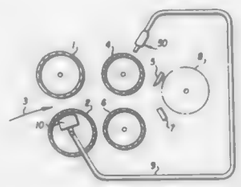
DIGITAL NOISE CANCELLATION IN A METAL DETECTOR

Richard P. Strosser, Akron, and Carl E. Bohman, New Holland, both of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Dec. 29, 1987, Ser. No. 138,985

Int. Cl.[4] A01D *75/18*

U.S. Cl. 56—10.2 **16 Claims**



1. A method of filtering from the output signal of a metal detector the cyclically recurring noise signal induced therein by ferrous machine parts moving within the sensing field of the detector, said method comprising:

obtaining sample signals by repeatedly sampling the output signal from the metal detector at intervals during one cycle of said cyclically recurring noise signal; and,

subtracting said sample signals from the output signal of said metal detector during the next succeeding cycle of said cyclically recurring noise signal.

4,854,114

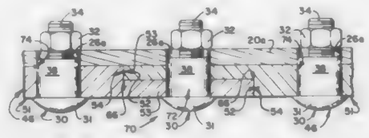
SECTIONAL SICKLE BAR

Cleo T. Speck, Indianola, Iowa, assignor to Herschel Corporation, Indianola, Iowa

Filed Mar. 31, 1988, Ser. No. 176,094

Int. Cl.[4] A01D *34/02*

U.S. Cl. 56—296 **14 Claims**



1. A sectional sickle bar comprising:

(a) a plurality of elongated bar segments, each of said bar segments having a center and at least one joining end adjacent to said center; each of said joining ends having a bar portion, a step portion, an end portion, and a shoulder portion; said bar portion separating and being adjacent to both the center and the shoulder portion; said step portion separating and being adjacent to both the shoulder portion and the end portion; and

(b) means for releasably joining adjacent joining ends of adjacent bar segments; said joining means including a special section and at least three fasteners; each fastener including a bolt, a nut, and a reciprocal thread means for screwing said nut into said bolt; said special section having an upper surface, a lower surface, and at least three oblong fastener receiving section openings extending through said section; each of said joining ends have an oblong fastener receiving bar portion opening and an oblong fastener receiving step portion opening; wherein a lap joint is formed when joining ends of two bar segments are joined together; said lap joint including adjacent joining ends of adjacent bar segments joined together by said joining means such that said adjacent bar segments are substantially in alignment with one another and such that the respective step portions of said adjacent joining ends overlap one another; wherein each of said oblong section openings are individually aligned either with one of said oblong bar portion openings, or simultaneously with the oblong step portion openings of the overlapping step portions of said adjacent ends; wherein the oblong bar portion openings and the oblong step portion openings of said adjacent joining ends are aligned such that the greatest length of the oblong openings are aligned with the greatest length of the bar segments; said bolt including a head portion having sufficient size dimensions so that it will not pass into or through any of the openings, a threaded end portion having a circular end portion cross-section, said end portion cross-section having a center, and an oblong shank portion interconnecting said head portion to said threaded end portion, said shank portion having a shank portion cross-section, said shank portion cross-section having a center, said shank portion having sufficient length to extend through an interface between fastener receiving openings when said bolt is received in at least two of said openings, said center of said end portion cross-section being offset from said center of said shank portion cross-section; said lap joint being fastened together by said fasteners, each of which individually pass through one of said section openings and one of said bar portion openings or both of said step portion openings of said adjacent joining ends; wherein only one fastener passes through said step portions of said adjacent joining ends; said nut of each fastener being tightened down onto said bolt of each fastener such that said section is held firmly in place upon said adjacent bar segments, sufficient compression being created that the lap joint exhibits a high resistance to movement between the adjacent step portions and between the bar portions of the adjacent joining ends and the special section.

4,854,115

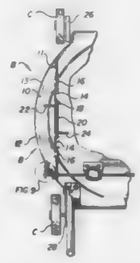
APPARATUS FOR CUTTING GRASS AND THE LIKE

Dallas W. Jones, New Hartford, and Lauren Young, Poland, both of N.Y., assignors to Trim-A-Lawn Corporation, Utica, N.Y.

Continuation of Ser. No. 80,269, Jul. 31, 1987, abandoned. This application Sep. 16, 1988, Ser. No. 245,969

Int. Cl.[4] A01D *34/68*

U.S. Cl. 56—320.1 **25 Claims**



1. An apparatus for cutting grass and the like, comprising:

(a) a housing including front, rear and sides;

(b) a cutting means operably associated with said housing;

(c) at least a front wheel and at least a rear wheel operably associated with one of said sides of said housing;

(d) said front and rear wheels associated with said one of said sides of said housing each having inner and outer surfaces, said inner surfaces being positioned adjacent said housing and said outer surfaces being removed therefrom;

(e) said housing including a main body portion and an adjustable portion on one of said side;

(f) said adjustable portion being positioned intermediate said front and rear wheels;

(g) means for displacing said adjustable portion between first and second positions;

(h) said housing including a shield for forming an impermeable shroud over and around said cutting means;

(i) said adjustable portion forming a part of said shield when said adjustable portion is in said first position;

(j) said adjustable portion exposing at least a portion of said cutting means and permitting said at least a portion of said cutting means to extend beyond said outer surfaces of said front and rear wheels when said adjustable portion is in said second position;

(k) said main body portion of said housing intermediate said front and rear wheels extending a distance outwardly not to exceed the outer surfaces of said front and rear wheels; and

(l) said adjustable portion extending outwardly from said outer surfaces of said front and rear wheels.

4,854,116

A SPINDLE ROTOR ADAPTED FOR USE IN A SPINDLE OF A TEXTILE THREAD PROCESSING MACHINE

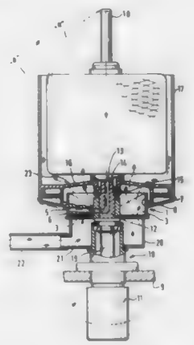
Rainer Lorenz, Nettetal-Breyell; Gustav Frenzen, Willich, and Ulrich Lossa, Krefeld, all of Fed. Rep. of Germany, assignors to Palitex Project Company GmbH, Krefeld, Fed. Rep. of Germany

Filed Jun. 22, 1988, Ser. No. 209,869

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1987, 3721364

Int. Cl.[4] D01H *7/86, 11/00, 13/04, 13/30*

U.S. Cl. 57—58.84 **8 Claims**



1. A spindle rotor adapted (1) for use in a spindle of a textile thread processing machine, such as a two-for-one twister, in which the running thread being processed passes through an axially and radially extending thread passageway in the spindle anf forms a rotating balloon around the spindle and includes means for supplying a flow of thread conditioning medium, fibrous material or other medium adapted to flow in a generally axial direction through the spindle and (2) to receive, guide and enhance the flow while performing the thread processing functions; said spindle rotor comprising a hub member for rotatably mounting said spindle rotor in the machine spindle, a plurality of spaced-apart guide blades attached to said hub member and extending radially outwardly therefrom in a spoke-like manner for receiving the thread conditioning medium, and a radially extending thread passageway through said hub and one of said pulse blades for receiving the running thread being processed.

4. In a spidle of two-for-one twister textile thread processing machine having a driven rotating shaft, a non-rotating shaft mounted on and above said rotating shaft in axial alignment therewith, a supply of thread carried on said non-rotating

shaft, a protective cage carried by said non-rotating shaft and surrounding said thread supply, and a yarn passageway extending axially through said non-rotating shaft and partially through said rotating shaft and extending radially out of said rotating shaft for receiving a running thread therethrough from said thread supply; the combination therewith of:

a spindle rotor comprising a hub member mounted on said rotating shaft for rotation therewith below said protective cage, a plurality of spaced-apart guide blades attached to said hub member and extending radially outwardly in a spoke-like manner, and a radially extending thread passageway through said hub and one of said guide blades and communicating with said radially extending thread passage in said rotating shaft for receiving the running thread therethrough and for forming a rotating balloon of the running thread around said protective cage; and

means mounted on said spindle below said rotor for supplying a flow of thread conditioning medium in a generally upward axial direction for being received, guided and enhanced by said guide blades of said spindle rotor to flow into said protective cage.

4,854,117

FRICTION SPINNING APPARATUS WITH SLUB CLEARING MEANS

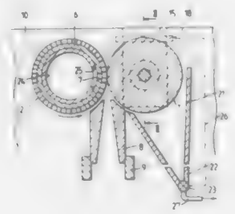
Peter J. Barratt, Accrington; Douglas O. Clough; Peter J. Dickinson, both fo Rossendale, and William M. Farnhill, Burnley, all of England, assignors to Hollingsworth (U.K.), Ltd., Accrington, England

Continuation-in-part of Ser. No. 791,388, Oct. 25, 1985, abandoned. This application Jan. 12, 1987, Ser. No. 5,371

Claims priority, application United Kingdom, Oct. 26, 1984, [redacted]

Int. Cl.[4] D01H *7/882, 11/00*

U.S. Cl. 57—301 **7 Claims**



1. A friction spinning unit including:

(a) first and second friction spinning rollers defining a yarn formation nip;

(b) means for opening the spinning unit for gaining access in order to remove fibrous debris in the event of a yarn break;

(c) debris receptacle means positioned alongside said first friction spinning roller to receive debris from the yarn formation nip;

(d) suction means effective to attract debris into said debris receptacle means;

(e) means actuating said suction means when the friction spinning unit is shut down for cleaning in the event of a yarn break;

(f) means for removing collected debris from said receptacle means; and

(g) shield means integral with said debris receptacle means and closely following the periphery of said first friction spinning roller over a sector thereof for confining the application of suction to the periphery of said first friction spinning roller.

4,854,118

METHOF OF, AND APPARATUS FOR, PRODUCING A FRICTION SPUN YARN

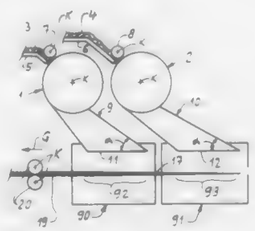
Emil Briner, Winterthur; Urs Keller, Seuzach, and Herbert Stalder, Kollbrunn, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Division of Ser. No. 789,902, Oct. 10, 1985, Pat. No. 4,753,066. This application Mar. 11, 1988, Ser. No. 167,026

Claims priority, application Switzerland, Oct. 15, 1984, [redacted]

Int. Cl.[4] D01H *7/882*

U.S. Cl. 57—401 **13 Claims**



1. A method of producing a yarn or the like, comprising the steps of:

separating fibers from two fiber strands;

transferring said separated fibers to two spacedly arranged friction spinning means each having a respective yarn forming location at different transfer rates towards related ones of said yarn forming locations;

forming a friction spun yarn at said yarn forming locations of said two spacedly arranged friction spinning means;

during said step of forming said friction spun yarn, drawing-in by suction an air stream through a respective perforated surface into each of said two spacedly arranged friction spinning means and thereby transferring said separated fibers to said perforated surfaces;

withdrawing said friction spun yarn in a predetermined yarn withdrawal direction;

during said step of transferring said separated fibers to said two spacedly arranged friction spinning means, transferring said separated fibers of said two fiber strands at least at two fiber delivery locations in a respective predeterminate direction to each of said spacedly arranged friction spinning means; and

imparting different twist directions to the separated fibers at each respective yarn forming location.

4,854,119

ARRANGEMENT FOR OPEN-END ROTOR SPINNING

Fritz Stahlecker, Bad Überkingen; Hans Stahlecker, Süssen, and Wolfgang Feuchter, Deggingen-Reichenbach, all of Fed. Rep. of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Feb. 8, 1988, Ser. No. 153,443

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 3705318; Sep. 3, 1987, 3729425

Int. Cl.[4] D01H *7/882, 1/135*

U.S. Cl. 57—417 **33 Claims**

1. Open-end rotor spinning apparatus comprising:

spinning rotor means for forming yarn including an open side;

cover means for covering said open-side of said spinning rotor means;

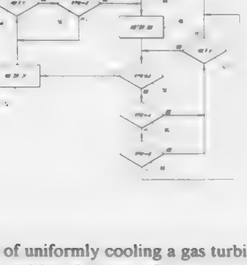
projection means disposed at said cover means for projecting into said open side of said spinning rotor means;

fiber feeding duct means disposed in said projection means for feeding fibers to said spinning rotor means;

yarn withdrawal duct means disposed in said projection means for providing a pathway for formed yarn being withdrawn form said spinning rotor means;

yarn withdrawal nozzle means projecting from said yarn withdrawal duct means into said spinning rotor means open side; and

holding means other than said yarn withdrawal duct means for holding said yarn withdrawal nozzle means on said projection means,



wherein said spinning rotor means includes a sliding wall for receiving fibers from said fiber feeding duct means, said fiber feeding duct means being provided laterally at said projection means opposite said sliding wall of said spinning rotor means, and

wherein said fiber feeding duct means extends across a radial projection of the yarn withdrawal duct means at a first area on said projection means, said holding means being mounted at said cover means in an area outside said first area.

4,854,120

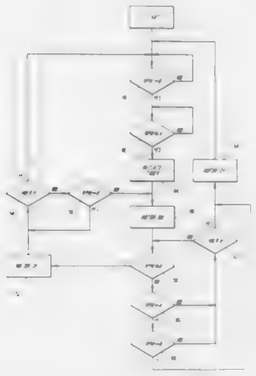
PERFORMANCE ENVELOPE EXTENSION METHOD FOR A GAS TURBINE ENGINE

Neil M. Nelson, Winterhaven; William A. Sponzilli, Sarasota, and Quitman W. Lott, Lakeland, all of Fla., assignors to CEF Industries, Inc., Haines City, Fla.

Division of Ser. No. 911,870, Sep. 28, 1986, Pat. No. 4,723,529. This application Dec. 14, 1987, Ser. No. 132,181

Int. Cl.[4] F02C *7/00;* **F01D** *25/36*

U.S. Cl. 60—39.02 **13 Claims**



1. A method of uniformly cooling a gas turbine engine having a spool, comprising the steps of:

determining when the engine is shutdown;

turning on an auxiliary motor to rotate the spool after the engine is shutdown;

determining if an external force in preventing the auxiliary motor form rotating the spool;

turning off the auxiliary motor if such an external force is detected and allowing the external force to rotate the spool;

determining when a predetermining time period after turbine shutdown has elapsed; and turning the auxiliary motor off after the time period has elapsed if the auxiliary motor is on at that time.

4,854,121

COMBINED CYCLE POWER PLANT CAPABLE OF CONTROLLING WATER LEVEL IN BOILER DRUM OF POWER PLANT

Michio Arii; Yoshihisa Kamataki; Shirou Hino, and Shoji Matsui, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 6, 1987, Ser. No. 105,126

Claims priority, application Japan, Oct. 9, 1986, 61-154347[U]; Jan. 30, 1987, 62-11432[U]; Mar. 19, 1987, 62-62504

Int. Cl.[4] F02C *6/18*

U.S. Cl. 60—39.182 **3 Claims**



1. A combined cycle power plant capable of controlling a water level in a boiler drum of the power plant comprising:

a gas turbine system equipped with a gas turbine;

a steam turbine system equipped with a steam turbine and condenser;

a waste heat recovery system which thermally links said gas turbine system to said steam turbine and is equipped with a waste heat recovery boiler for generating steam to drive said stem turbine in utilization of waste heat from said gas turbine system, said waste heat recovery boiler being provided with a drum containing feed water therein; and

a water level control system for controlling a water level in said drum so as to stably maintain the water level in case of an ordinary operation time, an operation stop time, and a flameout of fire of said gas turbine system, said drum water level control system comprising

a drum water level setter for outputting a predetermined drum water level setting signal in response to a signal representing the fact of the flameout of the gas turbine system,

a comparator for comparing the drum water level setting signal with an actual drum water level detecting signal transmitted from the water level detector provided for said drum and for transmitting a deviation signal based on the comparison of said drum water level setting signal and said actual drum water detecting signal, and

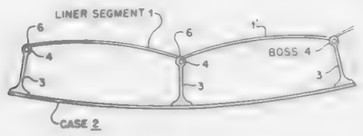
a valve controller operatively connected to said comparator for operating said deviation signal thereby to transmit a valve open-close signal.

4,854,122

AUGMENTOR CURTAIN LINER ASSEMBLY FOR SHARING TENSILE LOADING

Paul R. Belling, Stuart, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 28, 1988, Ser. No. 151,373
Int. Cl.[4] F02K 3/10
U.S. Cl. 60—261 3 Claims



1. In a jet engine having a longitudinal engine axis, an improved circumferential segmented augmentor liner assembly anchored to a cylindrical case of said engine comprising:

(a) a plurality of liner anchor means affixed to said cylindrical case at circumferentially spaced inside portions thereof, each anchor means having coupling means for coupling terminal side portions of a pair of adjacent liner segments to said anchor means along the length thereof extending parallel to said engine axis; and

(b) wherein said coupling means comprises hinge pin means including at least one elongated pin laterally resilient in directions substantially perpendicular to said longitudinal engine axis for supporting terminal side portions of said adjacent liner segments; and

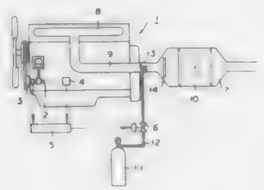
(c) wherein each anchor means includes a plurality of discrete pin support means having spaces therebetween for permitting side portions of said liner segments to be coupled

4,854,123

METHOD FOR REMOVAL OF NITROGEN OXIDES FROM EXHAUST GAS OF DIESEL ENGINE

Akira Inoue, Hirakata, Japan, assignor to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Jan. 27, 1988, Ser. No. 148,877
Claims priority, application Japan, Jan. 27, 1987, 62-15290
Int. Cl.[4] F01N 3/20
U.S. Cl. 60—274 8 Claims



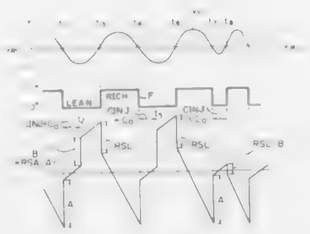
1. A method for the removal of nitrogen oxides from the exhaust gas of a diesel engine through catalytic reduction by the use of a honeycomb catalyst in the presence of ammonia, which method comprises feeding ammonia into said exhaust gas proportionately to the product of the revolution speed of said diesel engine multiplied by the transmitted torque of said diesel engine.

4,854,124

DOUBLE AIR-FUEL RATIO SENSOR SYSTEM HAVING DIVIDED-SKIP FUNCTION

Masanobu Tamura, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 7, 1988, Ser. No. 216,099
Claims priority, application Japan, Jul. 10, 1987, 62-171258
Int. Cl.[4] F02B 75/10; F02D 41/14
U.S. Cl. 60—274 8 Claims



1. A method for controlling the air-fuel ratio in an internal combustion engine having a catalyst converter for removing pollutants in the exhaust gas thereof, and upstream-side and downstream-side air-fuel ratio sensors disposed upstream and downstream, respectively, of said catalyst converter for detecting a concentration of a specific component in an exhaust gas, comprising the steps of:

gradually changing an air-fuel ratio correction amount in accordance with the output of said upstream-side air-fuel ratio sensor;

calculating a skip amount in accordance with the output of said downstream-side air-fuel ratio sensor;

shifting said air-fuel ratio correction amount by said skip amount when the output of said upstream-side air-fuel ratio sensor is switched from the rich side to the lean side or vice versa; and

adjusting an actual air-fuel ratio of said engine in accordance with said air-fuel ratio correction amount,

said shifting step comprising the steps of:

determining whether or not said skip amount is larger than a predetermined value;

performing one skip operation upon said air-fuel ratio correction amount by said skip amount when said skip amount is not larger than said predetermined value; and

performing a plurality of skip operations upon said air-fuel ratio correction amount by dividing said skip amount into a plurality of amounts when said skip amount is larger than said predetermined value.

4,854,125

HYDROSTATICALLY OPERATED CONTINUOUSLY VARIABLE TRANSMISSION

Kazuo Inoue, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1988, Ser. No. 156,727
Claims priority, application Japan, Feb. 20, 1987, 62-37547; Feb. 20, 1987, 62-37548
Int. Cl.[4] F16D 39/00
U.S. Cl. 60—489 9 Claims

1. A hydrostatically operated continuously variable transmission for use with an engine, comprising:

a transmission shaft adapted to be coupled to the engine;

a cylinder block centrally coupled to said transmission shaft;

a swash-plate-type axial-piston hydraulic pump having a group of pump plungers;

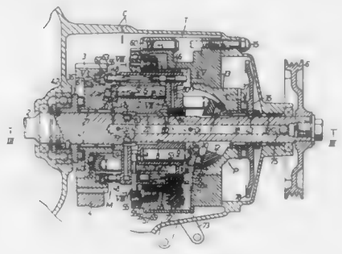
a hydraulic motor having a group of motor plungers;

a closed hydraulic circuit by which said hydraulic pump and said hydraulic motor are interconnected;

said groups of pump and motor plungers being disposed in annular patterns in said cylinder block;

said groups of pump and motor plungers being disposed concentrically such that one of said groups surrounds the other group, and being positionally displaced in the circumferential direction of said cylinder block such that a circle inscribed in said one group passes through said other group; and

a plurality of distribution valves disposed annularly in said cylinder block and aligned to reciprocate along a direction parallel to the axis of said cylinder block for distributing working oil between said pump and said motor.



4,854,126

CENTRIFUGAL COMPRESSOR DIFFUSER SYSTEM AND METHOD OF MAKING SAME

Robert W. Chevis, Coventry, England, and Reginald G. Keetley, Daphne, Ala., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 728,038, Apr. 29, 1985, abandoned. This application Oct. 29, 1987, Ser. No. 115,599
Int. Cl.[4] F02C 1/00
U.S. Cl. 60—726 6 Claims



1. In a turbine engine having a turbine casing, a turbine shaft disposed in said casing, a centrifugal compressor secured to said shaft, and a combustor chamber contained in said casing; a diffuser structure fluidly connecting said compressor and said combustor chamber, comprising:

an annular hub receiving said shaft therein;

a radially extending surface portion on said turbine casing, and an axially extending surface portion on said turbine casing depending from said radially extending surface portion;

a flange extending radially from said hub possessing annular radially extending surface and an annular axially extending surface, each of said radially and axially extending flange surfaces facing towards said radially and axially extending surface portions of said turbine casing, respectively; said flange surfaces and casing surface portions together defining a diffuser passageway therebetween, open to said compressor and said combustor chamber;

a plurality of first diffuser vanes disposed on said radially extending flange surface, extending to said radially extending surface portion of said turbine casing; and

a plurality of said diffuser vanes disposed on said axially extending flange surface, extending to said axially extending surface portion of said turbine casing;

wherein said hub, said flange, and said first and second plurality of vanes are of a one piece construction; and

further comprising means for removably securing said continuously composed hub, flange, and vanes to said turbine casing;

wherein said first and second plurality of vanes each include end surfaces opposite said radially and axially extending flange surfaces, respectively, said vane end surfaces abutting against and sealing with said respective radially and axially extending surface portions of said turbine casing when said securing means secures said continuously composed hub, flange and vanes to said turbine casing; said continuously composed hub, flange, and vanes being axially slidable with respect to said casing when not secured to said casing by said securing means; and

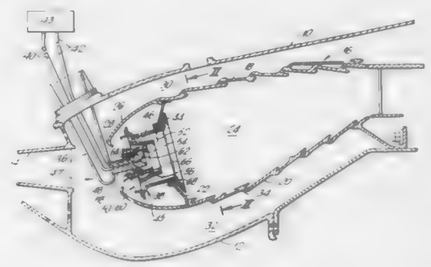
wherein said securing means comprises an axially aligned throughbore in at least some of said first diffuser vanes and a fastener connected to said intake portion disposed in each throughbore.

4,854,127

BIMODAL SWIRLER INJECTOR FOR A GAS TURBINE COMBUSTOR

John W. Vinson, Cincinnati, Ohio; Stephen J. Howell, Georgetown, and Elias H. Lampes, Lynn, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Jan. 14, 1988, Ser. No. 143,792
Int. Cl.[4] F23R 3/00
U.S. Cl. 60—742 17 Claims



1. An improved swirler and fuel injector for a gas turbine combustor of the type having means supplying air to an upstream inlet end thereof, said gas turbine combustor also including a source of fuel and fuel flow control means, said improved swirler and fuel injector comprising:

annular flow directing means mounted in said inlet end;

a fuel injector body centrally disposed within said annular flow directing means and being connectable to said source of fuel;

a tubular member disposed mutually coaxial with and spaced between said fuel injector body and said annular flow

directing means and defining respectively therewith an inner annulus and an outer annulus;

primary air swirler means and secondary air swirler means for swirling air entering said inner and outer annuli respectively;

fuel channeling means disposed in said fuel injector body for channeling fuel from said fuel source into said inner annulus as primary fuel and into said outer annulus as secondary fuel downstream of said secondary air swirler means during only a preselected portion of operation of said combustor to support combustion in said secondary recirculation zone; and

said tubular member having a downstream and disposed downstream beyond a terminating enf of said fuel channeling means to define a primary recirculation zone radially within said tubular member for receiving a mixture of said primary fuel from said fuel channeling means and air from said primary air swirler means, and to define a secondary recirculation zone radially surrounding said tubular member for receiving a mixture of said secondary fuel from said fuel channeling means and air from said secondary air swirler means.

4,854,128

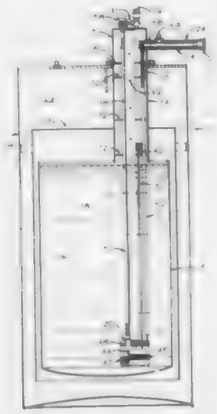
CRYOGEN SUPPLY SYSTEM

Geoffrey H. Zeamer, Holliston, Mass., assignor to Zeamer Corporation, Hopkinton, Mass.

Filed Mar. 22, 1988, Ser. No. 171,691

Int. Cl.[4] F17C *7/02*

U.S. Cl. 62—50.1 **16 Claims**



16. A cryogen supply system comprising:

A. a fluid container for containing a volume of liquid cryogen, said fluid container having a gas region containing a gas in fluid communication with said liquid cryogen;

B. an exterior housing external to said fluid container, the volume between said exterior housing and said fluid container defining a vacuum space, said exterior housing having a vacuum port to facilitate evacuation of said vacuum space;

C. a radiation shield exterior to said fluid container and interior to said exterior housing to shield said fluid container from thermal radiation;

D. support means for supporting said radiation shield within said exterior housing in spaced apart relation;

E. a fluid chamber support for supporting said fluid chamber within said exterior housing;

F. a fluid input tube extending from the interior of said fluid chamber through said exterior housing for facilitating the introduction of liquid cryogen into said fluid chamber from outside said exterior housing; and

G. a gas input tube extending from the gas region of said fluid container through said exterior housing for facilitating the introduction of gas into said gas region to, in turn, facilitate the forcing the flow of gas into said gas inlet and through said cooling module;

H. a gas inlet for facilitating the input of gas into said gas region of said fluid container to thereby force the flow of gas into said gas inlet and through said cooling module;

I. an outlet; and

J. a cooling module positioned within said fluid container comprising:

i. a heat exchanger comprising a tubular heat conductive helix formed within an elongated ring of thermally-conductive material located in said fluid container so as to be normally immersed in said liquid cryogen;

ii. a gas inlet positioned in said gas region for facilitating flow of gas from said gas region to said heat exchanger;

iii. an exit connected to said outlet;

iv. a gas control valve for controlling the flow of gas between said heat exchanger and said exit to facilitate flow of gas from said gas region to said outlet through said heat exchanger to facilitate cooling of said gas by said liquid cryogen; and

v. a liquid transfer element comprising a liquid input positioned so as to be normally immersed in said liquid cryogen and a liquid control valve for controlling the flow of liquid cryogen between said liquid input and said exit;

K. a gas valve control means extending from said gas control valve through said exterior housing for facilitating the control of said gas control valve;

L. a liquid valve control means extending from said liquid control valve through said exterior housing for facilitating the control of said liquid control valve; and

M. a controllable heater connected to said outlet for controllably heating the gas expelled through said outlet, comprising:

i. a conduit having a heater inlet connected to said fluid outlet, a heater outlet and means defining a helical passageway between said heater inlet and said heater outlet, comprising:

a. an exterior cylinder in thermal contact with said heating means and having an interior surface;

b. an interior cylinder situated interiorly of said exterior cylinder and having a helical groove defined in its exterior surface for defining, in combination with the interior surface of said exterior cylinder, said passageway

ii. controllable heating means situated exteriorly of said conduit in thermal contact therewith for heating said conduit to thereby heat the interior of said passageway;

iii. thermal sensing means proximate said conduit for sensing the temperature of said gas passing therethrough; and

iv. temperature control means responsive to said thermal control means for controlling said heating means.

4,854,129

COOLING PROCESS AND APPARATUS

Pieter Hickley, 268 Bridle Park, Randburg, Transvaal Province, and Cornelius J. Claassen, 14 Harrington Street, Schoemansville, Transvaal Province, both of South Africa

Filed Jun. 6, 1988, Ser. No. 202,671

Claims priority, application South Africa, Jun. 11, 1987, 87/4207

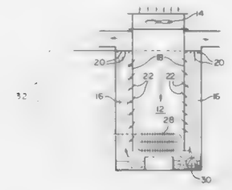
Int. Cl.[4] F28D *5/00*

U.S. Cl. 62—304 **11 Claims**

1. A method of cooling air which includes:

passing primary air through at least one primary chamber to provide secondary air at an outlet of the primary chamber, passing the secondary air in a counterflow direction through at least one secondary chamber which is in direct heat exchange relationship with the primary chamber via a common wall,

applying an evaporative fluid to all of a downstream portion of the primary air in the primary chamber and to the



secondary air in the secondary chamber to cause cooling of the downstream portion of the primary air and of the secondary air and of the evaporative fluid and thereby simultaneously to cause cooling of the primary air in the primary chamber by reason of the heat exchange relationship between the primary and secondary chambers.

4,854,130

REFRIGERATING APPARATUS

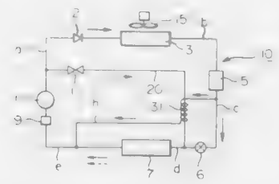
Nobutaka Naruse, and Katsunobu Minari, both of Toyoake, Japan, assignors to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Aug. 26, 1988, Ser. No. 237,256

Claims priority, application Japan, Sep. 3, 1987, 62-219075; Sep. 3, 1987, 62-219076

Int. Cl.[4] F25C *5/10*

U.S. Cl. 62—352 **2 Claims**



1. A refrigerating apparatus including a closed coolant circulation circuit in which a compressor, a condenser, an expansion valve and an evaporator, each having a coolant inlet port and a coolant outlet port, are serially interconnected in order of a flow of coolant during a refrigerating operation of said apparatus, comprising:

a check valve interposed between the outlet port of said compressor and the inlet port of said condenser;

a hot gas bypass circuit extending from a junction located between said check valve and the outlet port of said compressor to a junction located between the outlet port of said expansion valve and the inlet port of said evaporator; and

a liquid bypass circuit extending from a junction between the outlet port of said condenser and the inlet port of said expansion valve to a junction between the outlet port of said evaporator and the inlet port of said compressor in heat exchange relationship with said hot gas bypass circuit.

4,854,131

VERY LOW TEMPERATURE REFRIGERATOR

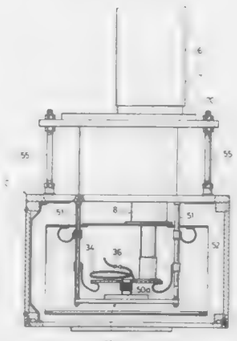
Katsumi Sakitani; Yoon M. Kang; Shinichiro Shinozaki; Shoichi Taneya; Kazuo Miura; Tadashi Ogura, and Satoshi Noguchi, all of Osaka, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 50,474, May 18, 1987, abandoned. This application Nov. 7, 1988, Ser. No. 268,605

Claims priority, application Japan, May 16, 1986, 61-113334

Int. Cl.[4] F25B *19/00*

U.S. Cl. 62—51.2 **13 Claims**



1. A cryogenic refrigerator for maintaining an object to be cooled at a cryogenic level, said refrigerator comprising:

a cryostat in which the cryogenic level is established to cool the object;

support means within said cryostat for supporting the object to be cooled in a state generally isolated from vibrations imparted to said cryostat;

a compressor for compressing refrigerant gas, and an expander supported by said cryostat and operatively connected to said compressor for expanding the gas compressed by said compressor thereby lowering the temperature of the refrigerant gas,

said expander including heat stations disposed within said cryostat and which are maintained at respective lowered temperatures of the refrigerant gas;

a J-T circuit in a heat exchange relationship with the heat stations of said expander for undergoing heat exchange therewith to precool refrigerant gas in the J-T circuit, a J-T valve operatively connected in the circuit downstream from the location therein at which the heat exchange with said heat stations occurs for Joule-Thomson expanding the precooled refrigerant gas into a gas/liquid state, a refrigeration stage operatively connected in the circuit downstream of the J-T valve and in which the liquid of the refrigerant gas existing in a gas/liquid state after the expansion thereof by said J-T valve evaporates to generate the cryogenic level at said refrigeration stage, and flexible piping connecting said J-T valve and said refrigeration stage in the circuit.

4,854,132

EARRING FOR THE 2 HOLE EAR

Irene S. Blumkin, 5 Meyer Dr., Putnam Valley, N.Y. 10579, and George Spector, 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Mar. 14, 1986, Ser. No. 839,627

Int. Cl.[4] A44C *7/00*

U.S. Cl. 63—12 **3 Claims**

1. Earrings for an earlobe having spaced pierced holes wherein each of said earrings includes an ornament on a post in combination with means for adjusting each said ornament relative to each other to provide varying aesthetic relation-

ships, said means including said ornaments having adjoining sides with means for nesting with each other at varying relative positions thus providing an assembled ornament of variable shape further including said ornaments having means for slid-



ably mounting said post to said ornament so that said ornaments are transversely adjustable relative to said posts to provide relative transverse movement of each ornament relative to each post.

4,854,133
COIN SUPPORTS

Eric Irwin, Fairlawns, Station Lane, Mickle Trafford, Chester, England

Filed May 8, 198., Ser. No. 860,918
Claims priority, application United Kingdom, May 8, 1985, 8511581
Int. Cl.[4] A44C *9/00*
U.S. Cl. 63—15 7 Claims

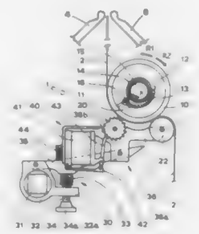


5. A coin support comprising:
a body of a decorative ring for a person's finger,
two coaxially aligned annular and circular rings mounted in said body and spaced from each other,
one of said two rings being a complete ring and the other of said two rings including two curved segments, one of said two curved segments being secured to said one ring in a spaced relation from said one ring to define a pocket for receipt of a coin between said one ring and said one segment and the other of said two curved segments being secured to an interior curved surface of said body, said one ring being pivotally mounted on said body at diametrically opposed locations so as to be pivoted between a completed position where said one segment is coplanar with said other segment and said one ring lies over said two curved segments and defines a protective surface about an entire peripheral edge of a coin inserted in said pocket and an open position where said one ring projects partially from and above said body for receipt of a coin in said pocket.

4,854,134
DEVICE FOR EFFECTING AND MAINTAINING THE VERTICAL TENSION OF THE FABRIC IN AUTOMATIC FLAT KNITTING MACHINES

Benito Stoppazzini, Sala Bolognese, Italy, assignor to E.M.M. S.R.L., Italy

Filed Sep. 28, 1988, Ser. No. 250,768
Claims priority, application Italy, Oct. 2, 1987, 3628 A/87
Int. Cl.[4] D04B *15/88*
U.S. Cl. 66—152 5 Claims

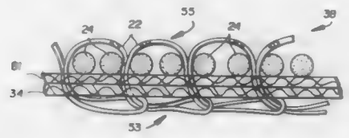


1. A device for effecting and maintaining the vertical tension of fabric in an automatic flat knitting machine, said knitting machine comprising two flat longitudinal needle beds with said knitted fabric descending below said needel beds and said device comprising:
a row of coaxial drums supported so that they are able to turn by an axle, said axle being located below and parallel to said needle beds, as well as said axle being made to rotate with constant torque in a predetermined direction;
first elastic means located inside each of said drums as a mechanical connection between said drum and said axle, in order to exert a torque upon said drums that corresponds to and is in accordance with the torque subjecting said axle;
at least two pressure rollers, respectively first roller and second roller for each of said drums, said rollers being supported so that they are able to turn by mounting means, with said mounting means keeping said rollers in contact with a related drum with a predetermined pressure, due to an action exerted by second elastic means;
actuator means provided for each pair of said pressure rollers designed to rotate at least said first pressure roller by a predetermined amount, in order to cause said related drum to rotate by a corresponding amount in accordance with the direction of the action of said pair of pressure rollers acting on the aforementioned axle, in synchrony with the formation of a corresponding portion of last row of said fabric, with said fabric placed between said row of drums and said related pairs of pressure rollers.

4,854,135
ANTIQUE SATIN WEFT INSERTED WARP KNIT DRAPERY FABRIC

Vaclav Petracek, Bayside, N.Y., and Julius Schnegg, Burlington, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 784,555, Oct. 4, 1985, Pat. No. 4,682,480. This application Mar. 24, 1987, Ser. No. 29,555
Int. Cl.[4] D04B *7/12*
U.S. Cl. 66—190 57 Claims

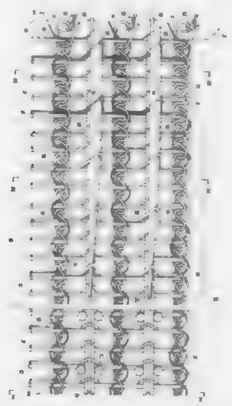


55. A dry cleanable self-lined unfinished lustrous drapery having good hand, good crease resistance, and a woven look comprising a multiple substrate stitch bonded antique satin fabric.

4,854,136
TEXTILE MANUFACTURED ARTICLE FOR CONTACT FASTENER

Giuliano Coslovi, Brugherio, and Italo Casalegno, Merate, both of Italy, assignors to Ausonia S.p.A., Milan, Italy

Filed Jan. 26, 1988, Ser. No. 148,647
Claims priority, application Italy, Jan. 30, 1987, 19220 A/87
Int. Cl.[4] D04B *7/12*
U.S. Cl. 66—191 7 Claims

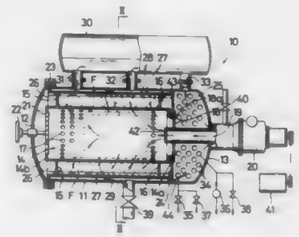


1. Textile manufactured article for a contact fastener, formed by a textile support in which is interwoven at least one effect yarn defining a plurality of hooking elements protruding from one side of the support, characterized in that the textile support is formed by a plurality of warp yarns interlaced in such a way as to form a triplet of warp chains, the warp chains being tied at a plurality of tying points by at least a first weft yarn, the triplet of warp chains defining two side-by-side pairs of warp chains sharing a central warp chain of said triplet, a corresponding effect yarn being interlaced in each of the warp chain pairs in a prescribed path configuration such that each of said effect yarns is tied with an even number of consecutive shrunk stitches alternately formed along each chain of the warp chain pair at said weft yarn tying points, the effect yarns of each of the warp chain triplet extending along said prescribed path a substantially similar distance in the direction of the warp prior to alternating between corresponding warp chains of said warp chain triplet pairs, said warp chains, said effect yarns, and said weft yarn being comprised of yarns, said yarns comprising said warp chains and said effect yarns being constituted by materials having a coefficient of thermal shrinkage which is considerably larger than that of the material constituting said weft yarn.

4,854,137
PERFORATED BEAM APPARATUS

Isao Sugimoto, Mie, and Tomoaki Kasai, Kurobe, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo and Nissen Corporation, Aichi, both of, Japan

Filed Jan. 27, 1989, Ser. No. 302,605
Claims priority, application Japan, Jan. 29, 1988, 63-9688[U]
Int. Cl.[4] D06B *5/18*
U.S. Cl. 68—15 5 Claims



1. A perforated beam apparatus for dyeing or otherwise treating fabric materials which comprises:
(a) a horizontally mounted cylindrical treatment vessel having a dished end cover at one end and a rear end wall at the opposite end;
(b) a perforated cylindrical beam concentrically mounted within said treatment vessel and provided at opposite ends with outwardly extending annular rims defining therebetween a material winding zone in which the fabric is wound on said beam;
(c) a vertically disposed partition disc member having a pair of diametrically opposed peripheral recesses and defining with the rear end wall of said vessel a heat exchange chamber, separating this chamber from a treatment chamber extending the majority of the beam length;
(d) a pair of perforated flow rectifier plates fitted respectively in said peripheral recesses and extending horizontally between said disc member and the inlet end of said vessel and defining with the inner wall of said vessel an upper and a lower flow rectifier zone, said rectifier plates being spaced apart from the outer surface of the fabric on the beam;
(e) a recycle pump for feeding a treatment liquor through a feed tube extending horizontally into the interior of said beam; and
(f) a pressure reserve tank communicating with the interior of said vessel and supported in position above said upper rectifier zone.

4,854,138
RESTRAINING DEVICE

Robert S. Charland, 52 Park Ter., Sherrill, N.Y. 13461

Filed Feb. 11, 1988, Ser. No. 155,091
Int. Cl.[4] E05B *75/00*
U.S. Cl. 70—16 7 Claims

1. A restraining device for use in limiting the movement of a person sought to be restrained comprising
a loop formed from a flexible non-stretchable material for encircling a portion of extremity of the person sought to be restrained,

a locking block carried by said loop of material and having at least tow locking aperture means formed therein through which said material is movable through each of said locking aperture means only in a first direction,

each one of said two locking aperture means being formed as an integral portion of said locking block and including lock means positioned therein to engage said material when passing therethrough,

said lock means including a cantilevered jaw member secured at one end to a wall defining in part said locking aperture means, and



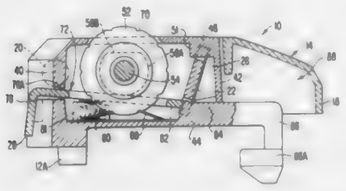
said cantilevered jaw member extending across said locking aperture means towards an opposite wall of said locking block forming in part said locking aperture means for forming a one-way throat through which said material loop may pass in first direction of movement to tighten said loop about the portion or extremity of the person sought to be restrained, but which will automatically engage said material preventing the movement thereof in a reverse direction to prevent the loosening of said loopafter being tightened about the person sought to be restrained.

4,854,139

ZIPPER LOCKING APPARATUS FOR LUGGAGE CASES

Stephen S. Scelba, Clifton, N.J., assignor to Presto Lock, Inc., Garfield, N.J.

Filed Feb. 27, 1987, Ser. No. 19,946
Int. Cl.[4] E05B *37/02*
U.S. Cl. 70—68 **32 Claims**



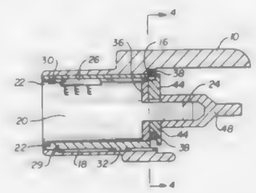
1. Apparatus comprising, in combination, a combination lock and a latch mechanism controlled thereby, said combination lock including a plurality of combination elements rotatably supported on a shaft and selectively adjustable to off-combination and on-combination positions, a bolt member supported for pivotal movement about a pivot axis parallel to said shaft in response to rotation of at least one of said combination elements and also for translational movement substantially transverse to said pivotal axis and relative to said combination elements while said combination elements are immobile, said bolt member having a first pivotal position whenever any one of said combination elements is in its off-combination position and having a second pivotal position whenever all of said combination elements are in their on-combination positions, and means for preventing said translational movement of said bolt member when said bolt member is in its first position but for permitting said translational movement when said bolt member is in its second position, said latch mechanism including a latch member movable between latching and unlatching positions, said bolt member having means operable only when said bolt member is in its second position for moving said latch member to its unlatching position in response to translational movement of said bolt member.

4,854,140

PLUNGER LOCK MECHANISM

Steve F. Goodman, Wyoming, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed Feb. 4, 1988, Ser. No. 152,260
Int. Cl.[4] E05B *65/08*
U.S. Cl. 70—100 **4 Claims**



1. A plunger lock mechanism comprising a casing, a shell supported within the casing for reciprocal movement relative thereto between an inner locked position and an outer unlocked position, a plug lock carried within the shell and having an extension projecting coaxially therefrom beyond an inner end of the shell, the plug lock being adapted to receive insertion of a key and being rotatable relative to the shell upon insertion of an appropriate key, bolt means carried by the extension in nonrotational relation thereto, whereby the bolt means is rotatable with the plug lock relative to the shell, the bolt means being slidable radially relative to the extension between a latching position projecting outwardly of the shell and a retracted position inwardly of the latching position, means biasing the bolt means in the direction of the latching position, and latch means disposed in the casing for engagement by the bolt means in the latching position to hold the shell against movement away from the inner locked position and toward the outer unlocked position, the casing being provided with cam means disposed for engagement by the bolt means upon rotation of the plug lock to urge the bolt means to the retracted position and out of engagement with the latch means, whereby to release the shell for movement to the outer unlocked position.

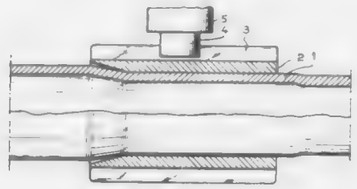
4,854,141

ANTI-ROTATION LOCKING DEVICE INCLUDING A TORQUE LIMITATION FOR A MOTOR VEHICLE STEERING COLUMN

Bernard Haldric; Gregorio Benedi, both of Vendome, and Sylvie Baudon née Chardon, Naveil, all of France, assignors to NACAM, Vendome, France

Continuation of Ser. No. 868,360, May 29, 1989, abandoned.
This application Dec. 4, 1987, Ser. No. 129,955
Claims priority, application France, May 31, 1985, 85 08262
Int. Cl.[4] B60R *25/02*; F16C *3/00*
U.S. Cl. 70—182 **3 Claims**

1. A torque-limitation type anti-rotation locking device for a vehicle having a steering column metallic shaft, said locking device comprising, in combination, two elements consisting of said steering column metallic shaft as a first element and a metallic sleeve as a second element disposed circumferentially of a selected length, of said steering column metallic shaft in direct contact therewith along substantially cylindrical surfaces, the metallic sleeve having circumferentially disposed recesses for receiving a locking bolt selectively insertable into one of said recesses for locking and preventing rotation of the steering column shaft, said metallic sleeve being mounted on the steering column metallic shaft with a radially directed tight fit effected solely by the metallic sleeve and the steering column metallic shaft for effectively preventing rotation of the steering column metallic shaft when locked and for developing solely as a function of said radially directed tight fit a plastic



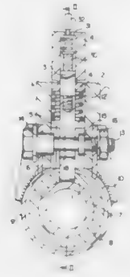
deformation beyond the elastic limit alternatively of the material of the metallic sleeve or the material of the steering column metallic shaft upon rotation of the metallic shaft when locked, and the metallic sleeve having a length selected as a function of the characteristic of the residual elasticity of whichever of said first element and said second element is selected to undergo said plastic deformation.

4,854,142

ANTIREMOVAL DEVICE FOR A LOCKING MECHANISM

Karl Peitzmeier, Neuhausen, and Reinhard Steinkämper, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 15, 1987, Ser. No. 73,723
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 3626014
Int. Cl.[4] B60R *25/02*
U.S. Cl. 70—186 **7 Claims**



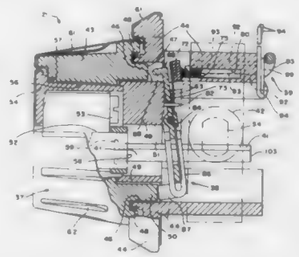
1. Antiremoval device for a steering wheel locking mechanism for motor vehicles, especially passenger cars, in which, in a specific key position, a displaceable catch means which in one displaceable position locks the steering wheel locking mechanism and in another displaceable position unlocks the steering wheel locking mechanism, said displaceable catch means is connected operatively to a locking cylinder and also prevents the release of housing parts which are releasably secured to one another around the displaceable catch means for support thereof and which prevents tampering with the locking mechanism, wherein a fastening member is provided which engages the housing parts to releasably secure these parts to one another and the catch means such that the fastening member is prevented from being disengaged from the housing parts and the catch means because its abuts against the catch means in at least one displaceable position of the catch means.

4,854,143

BOLT ASSEMBLY AND METHOD

Thomas E. Corder, Danville, and John F. Stewart, San Jose, both of Calif., assignors to Intelock Corporation, Pleasanton, Calif.

Filed Aug. 7, 1987, Ser. No. 83,621
Int. Cl.[4] E05B *13/10*
U.S. Cl. 70—218 **23 Claims**



1. A method of operating a bolt assembly having a movable exterior handle means, movable bolt means, movable transfer means transmitting motion of said handle means to move said bolt means, and electromagnet means responsive to user input for energization of the same, said method including the steps of:

biasing said transfer means to a position in which motion of said handle cannot be transmitted to said bolt means;

moving said transfer means by said handle means against said biasing means to a motion transmitting position;

energizing said electromagnet means by user input to hold said transfer means against said biasing means in said motion transmitting position; and

moving said handle means while said transfer means is held in said motion transmitting position until said transfer means is moved by said handle means to produce movement of said bolt means.

4,854,144

VEHICLE IMMOBILIZATION DEVICE

Phillip Davis, New York, N.Y., assignor to Double Helix Enterprises, New York, N.Y.

Filed Aug. 17, 1987, Ser. No. 86,385
Int. Cl.[4] B60R *25/00*
U.S. Cl. 70—226 **9 Claims**

1. A one piece, light weight, vehicle immobilization device useful to prevent theft of a vehicle, or to prevent driving of said vehicle by its owner, comprising

A. a hub shield member having means for attaching a left arm and a right arm, said hub shield functioning to prevent access to at least one lug nut of a tire of said vehicle,

B. locking housing integral with said hub shield,

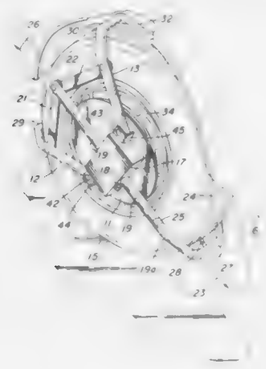
C. locking means in said housing,

D. an adjustable arm slidably mounted through said housing permitting adjusting said device to the size of the circumference of said tire, said adjustable arm having lock engaging means which function to prevent sliding of said adjustable arm when said locking means is engaged,

E. means for interconnecting said left arm, said right arm, and said adjustable arm for simultaneous movement of said left and right arms when said adjustable arm is slid through said housing,

F. each of said right, left, and adjustable arms having ends

which are adapted to traverse the tread of said tire and engage the inside of said tire so as to prevent removal of



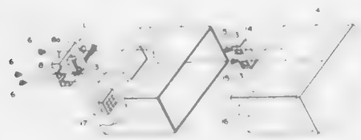
said device when it is adjusted to the circumference of said tire and locked.

4,854,145

LOCK DEVICE FOR EQUIPMENT LOADED TO VEHICLE

Hisao Arai, Kawagoe; Keisuke Sonehara, Tokyo; Satoshi Yasumura, Tokyo, and Junji Kobayashi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Kenwood, Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 159,279
Claims priority, application Japan, Feb. 23, 1987, 62-24231[U]
Int. Cl.⁴ E05B *65/12*
U.S. Cl. 70—258 **4 Claims**



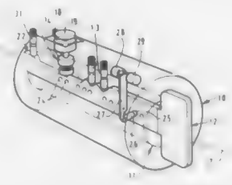
1. A lock device for an on-vehicle apparatus comprising:
- a first locking member mounted on a case which receives the on-vehicle apparatus and is mounted in the vehicle;
- a second locking member mounted on the on-vehicle apparatus, said first and second locking members mechanically engaging each other when said on-vehicle apparatus is received within the case;
- means responsive to the turning off of an ignition switch of the vehicle for generating an unlocking signal having a predetermined time period after the ignition switch has been turned off; and
- electrical actuator means responsive to said unlocking signal for disengaging said first locking member from said second locking member during said predetermined time period.

4,854,146

SECURITY DEVICE AND METHOD

John O'Connell, West Midland; Roy S. Jefferies, and Hugh Trevor-Jones, both of Bridgnorth, all of United Kingdom, assignors to Lowe and Fletcher Limited, West Midlands, England

PCT No. PCT/GB86/00247, § 371 Date Jul. 31, 1987, § 102(e) Date Jul. 31, 1987, PCT Pub. No. WO87/02735, PCT Pub. Date May 7, 1987
PCT Filed May 8, 1986, Ser. No. 75,748
Int. Cl.⁴ E05B *47/00*
U.S. Cl. 70—277 **22 Claims**



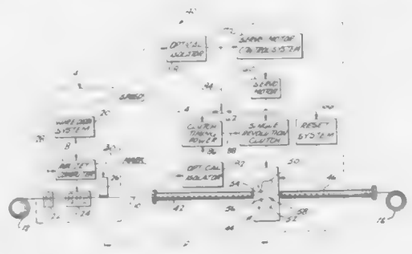
1. A security device comprising two relatively movable members, relative movement of which is required to be restrained at some time and control means for selectively obstructing relative movement of said members, wherein the control means comprises an electrically energisable device having an output element which is moved when the device is energised and an obstructing element movable between an obstructing position in which the obstructing element obstructs said relative movement of said members, a releasing position in which the obstructing element does not so obstruct relative movement of said members, wherein the obstructing element is arranged to be moved by the output element in at least one direction between its obstructing and releasing positions and wherein the obstructing element, when in one of its obstructing and releasing positions, is movable with one of said members relative to said electrically energisable device.

4,854,147

WIRE PINCH MARK APPLICATOR

Richard J. Buckwitz, Issaquah, and Alfred E. Walter, Jr., Everett, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 843,307, Mar. 24, 1986, abandoned.
This application Dec. 28, 1987, Ser. No. 140,868
Int. Cl.⁴ B21F *23/00*
U.S. Cl. 72—7 **20 Claims**



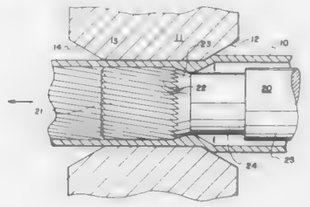
1. An apparatus for applying pinch marks at selected target positions at infinitely varying intervals along the length of a wire moving along a wire path at a wire speed, the apparatus comprising:
- means for sensing the wire speed and for producing a signal indicative thereof;
- means for storing wire specification data, the wire specification data defining variable lengths between pinch marks to be applied to the wire;
- means responsive to the signal indicative of wire speed and to the wire specification data for producing a series of first signals representing respective target positions where pinch marks will be applied at varying intervals along the wire;
- pinch means, including a die mounted for movement to and from a pinch station along the wire path, the die being adapted when at the pinch station to apply a pinch mark to the wire; and,
- coupling means responsive to the first signals and thus to the wire speed, for causing the die to move to the pinch station such that the die is at the pinch station when each target position on the wire is at the pinch station, producing a variable length between pinch marks, said variable length being dependent upon the first signals.

4,854,148

COLD DRAWING TECHNIQUE AND APPARATUS FOR FORMING INTERNALLY GROOVED TUBES

Dean L. Mayer, Fremont, Ind., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 19, 1987, Ser. No. 64,048
Int. Cl.⁴ B21C *1/24*
U.S. Cl. 72—68 **7 Claims**



1. A method of cold drawing an elongated tube shell in a single continuous draw pass to form a cold finished tube having an internal surface with a plurality of longitudinally extending grooves. which comprises: longitudinally drawing the tube shell along a mandrel, sinking the tube shell to reduce the diameter of the interanl surface of the tube shell to a dimension below the minor diameter of the grooves to be formed, then progressively enlarging the reduced internal surface of the tube shell, and next longitudinally retarding the longitudinal movement of a portion of the reduced internal surface of the tube shell at a plurality of circumferentially spaced intervals to effect formation of the grooves while concurrently, with the formation of the grooves, reducing the outer diameter of the tube shell by at least 9% and reducing the wall thickiness of the tube shell by at least 20% along the same portion of the reduced internal surface of the tube shell.

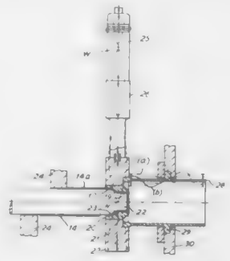
4,854,149

REDUCING THE DIAMETER OF TUBULAR BODIES

Paul Porucznik, Oxford, and Christopher F. Cheers, Swindon, both of England, assignors to Metal Box plc, Reading, England

Filed Jun. 29, 1988, Ser. No. 213,056
Claims priority, application United Kingdom, Jun. 30, 1987, 8715270
Int. Cl.⁴ B21D *41/04*
U.S. Cl. 72—352 **16 Claims**

1. A method of reducing the cross-section of a terminal portion of a tubular body, said method comprising the steps of providing an external die which defines a convergent work surface therein of like shape to the exterior of the reduced cross-section to be produced; providing a plug having a work surface thereon of like shape to the interior of the reduced cross-section to be produced; locating the plug within the die to define therebetween a pass gap having the shape of the reduced cross-section to be produced and a radial width substantially equal to the thickness of the tubular body; entering the terminal portion of the tubular body into the pass gap; and simultaneously causing the die to vibrate in a radial mode at an ultrasonic frequency while the terminal portion is progressively deformed to the shape of the pass gap.

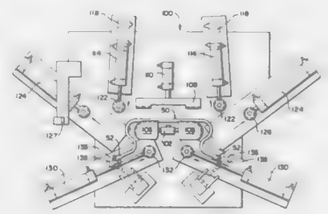


4,854,150

METHOD OF BENDING AND FORMING HEATED TUBULAR WORKPIECES

Peter A. Brown, Cambridge; Kenneth N. Jenkins, and Paul A. Pouget, both of Chatham, all of Canada, assignors to Rockwell International Suspension Systems Company, Ontario, Canada

Division of Ser. No. 943,468, Dec. 19, 1986, Pat. No. 4,781,054.
This application Sep. 28, 1988, Ser. No. 250,234
Int. Cl.⁴ B21D *11/04*
U.S. Cl. 72—369 **9 Claims**



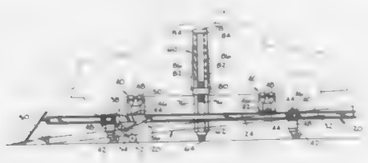
1. A method of bending and forming heated tubular workpieces having a straight central portion and double sigmoid curved opposed end portions, including:
- heating an elongated tubular workpiece and clamping the heated workpiece at its midsection between a pair of central anvil elements;
- longitudinally extending opposed ends of one of said anvil elements having first sigmoid curvatures along the length of the clamped workpiece;
- first bending the workpiece over the ends of the one anvil element forming a generally trapezoidal shape between the workpiece center and its distal ends;
- second bending the ends of the firstly bent workpiece completely around the first sigmoid curvatures of the ends of the one anvil element forming the ends into first sigmoid curves conforming to the sigmoid curvatures of the ends of the one anvil element; and
- third bending the distal end areas of the workpiece into reverse, second sigmoid curves.

4,854,151

APPARATUS FOR REALIGNING VEHICLE BODY AND FRAME MEMBERS

Richard J. Belgarde, 4440 Waimea Ct., San Jose, Calif. 95118

Filed Nov. 16, 1987, Ser. No. 121,096
Int. Cl.[4] B21D *1/12*
U.S. Cl. 72—447 6 Claims



1. In combination with a vehicle support having a pair of spaced tracks for receiving the rear and front wheels of a motor vehicle having a pair of spaced front wheels and a pair of spaced rear wheels, one such track receiving and supporting the wheels on one side of the vehicle and the other track receiving and supporting the wheels on the other side of the vehicle,

a pulling structure comprising a horizontal, longitudinally extended member having a front end and a rear end, said structure also comprising a pair of spaced parallel posts having bottom ends fixed to the rear of the horizontal member and having top ends, and having an inner side facing in the same direction as the horizontal member and having an oppositely facing side

means for moving the pulling structure to various positions in relation to the vehicle support with the front end of the horizontal member beneath the upper surface of said tracks

means for securing the pulling structure in any of a number of desired positions and at any of several desired angles in relation to the tracks

a collar surrounding and embracing said posts, such collar being movable up and down said posts to any of a number of desired positions, said collar having an outer portion adjacent the outer sides of said posts and an inner portion adjacent the inner sides of said posts

a first rotary member mounted on and above the outer portion of said collar and a second rotary member mounted on and below the inner portion of said collar, the mounting of said first rotary member permitting vertical movement thereof in relation to the collar, said rotary members rotating about parallel axes

power actuated means for moving said first rotary member upwardly

an elongated flexible pulling member fixed at one end to the outer portion of said collar below said first rotary member, said flexible member being trained over said first rotary member extending between said posts and being trained under said second rotary member, said pulling member having means for connecting its other end to a part of a motor vehicle mounted on said tracks, such connection being either direct or indirect, whereby when said power actuated means is operated said flexible member is pulled upwardly over said first rotary member.

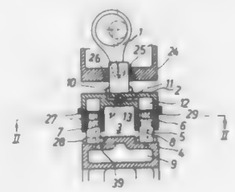
4,854,152

RAM GUIDING APPARATUS FOR A PUNCH PRESS

August T. Portmann, Arbon, Switzerland, assignor to Bruderer Ag, Frasnacht-Arbon, Switzerland

Filed May 5, 1988, Ser. No. 190,538
Claims priority, application Switzerland, May 22, 1987, 2001/87
Int. Cl.[4] B21D *37/12*
U.S. Cl. 72—456 8 Claims

1. A ram guiding apparatus for a punch press which punch press includes a ram and at least one connecting rod driving said ram, a base plate defining the lower limit of a punching work space and guide columns operative to guide said ram, in which said ram comprises a plurality of guide sleeves projecting therefrom towards said base plate; in which every guide column is mounted to said base plate and projects into a respective guide sleeve; and in which every guide column is provided with pistons rings sealing against the respective sleeve, each piston ring having a joint portion which is not aligned in an upright direction with the joint portion on an adjacent piston ring.

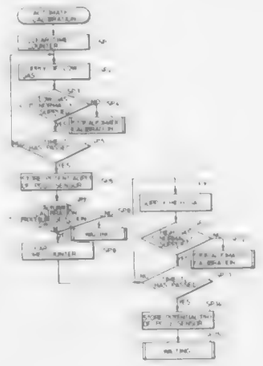


4,854,153

AUTOMATIC CALIBRATION APPARATUS FOR A PARTIAL GAS PRESSURE MEASURING SENSOR

Yuichi Miyagawa; Kiwamu Yoneda; Kazuhiro Kuwa, and Katsuyuki Kogo, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 2, 1987, Ser. No. 128,402
Claims priority, application Japan, Dec. 5, 1986, 61-291356; Dec. 5, 1986, 61-291357
Int. Cl.[4] G01N *27/00*
U.S. Cl. 73—1 G 15 Claims



1. An automatic calibration apparatus for a partial gas pressure measuring sensor, for calibrating said sensor in atmospheres of at least two kinds of standard gases, comprising standard gas suppliers for supplying said at least two kinds of standard gases, sensor support means on which said partial gas pressure measuring sensor to be calibrated is placed, for exposing said sensor to the atmospheres of said standard gases, gas supply path means for individually introducing said at least two kinds of standard gases from said standard gas suppliers to said sensor support means, detection means coupled to said gas supply path means for detecting an abnormal supply of said standard gases, gas selection means connected to said gas supply path means for selecting any one of said at least two kinds of standard gases to be supplied from said standard gas suppliers and supplying the selected gas to said sensor support means, storing means for storing an output to said partial gas pressure measuring sensor, and control means for normally storing the output of said partial gas pressure measuring sensor in said storing means when the partial gas measuring sensor placed on said sensor support means, is exposed to the atmospheres of the standard gases, said control means stopping the storage of the output of said partial gas pressure measuring sensor in said storing means when said detection means detects that the supply of the standard gases does not meet set conditions thereby indicating said abnormal supply.

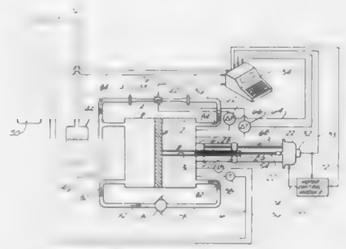
15. An automatic calibration method for a partial gas pressure measuring sensor, for calibrating said sensor in atmospheres of at least two kinds of standard gases, comprising the steps of: placing said partial gas pressure measuring sensor to be calibrated on sensor support means, supplying any one of said at least two kinds of standard gases to said sensor support means to expose said sensor to the atmosphere of the supplied standard gas, inputting an input signal signifying that said partial gas pressure measuring sensor is placed on said sensor support means, determining whether a calibration is performed in response to said input signal, and measuring, while a calibration is not being performed, an intermittent supply time interval of said standard gases, determining the standard gas to be supplied each time a predetermined time interval has been measured, and intermittently performing said supplying of the determined standard gas into a reservoir in said sensor support means in accordance with said intermittent supply time interval for improving the measuring precision and reducing the consumption of standard gas.

4,854,154

APPARATUS AND METHOD FOR DETERMINING THE FLOW CHARACTERISTICS OF A VOLUMETRIC FLOWMETER

Michael W. Halpin, Chandler, Ariz., assignor to Flow Technology, Inc., Phoenix, Ariz.

Filed May 2, 1988, Ser. No. 188,978
Int. Cl.[4] G01F *25/00*
U.S. Cl. 73—3 5 Claims



1. A flowmeter calibrator comprising:

a fluid displacement measuring cylinder having at its respective ends an inlet and an outlet;

a fluid displacement measuring piston adapted to travel through the measuring cylinder as a fluid barrier;

a rod connected to only one side of the piston and extending only from the one side of the piston to the exterior of the measuring cylinder;

means external to the measuring cylinder for displacing the rod to drive the measuring piston through the measuring cylinder thereby inducing fluid flow during a test run;

reservoir means connected to the measuring cylinder, the reservoir means being capable of receiving fluid from or supplying fluid to the measuring cylinder in response to changes in the free volume of the measuring cylinder caused by displacement of the rod as the measuring piston is driven through the measuring cylinder;

means for sensing the displacement of the measuring piston as it is driven through the measuring cylinder;

a fluid line external of the measuring cylinder connected between the inlet and outlet thereof to form a closed loop; and

a flowmeter connected in the fluid line.

4,854,155

COMBUSTIBLE GAS DETECTOR HAVING CATALYTIC SENSOR STABILIZING NETWORK

Albert A. Poli, Pittsburgh, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Oct. 19, 1988, Ser. No. 259,760
Int. Cl.[4] G01N *27/18*
U.S. Cl. 73—27 R 6 Claims



1. A catalytic gas detector circuit comprising:

a bridge circuit having four branches and having input and output terminals wherein said input terminals are connected to a power source means and said output terminals are connected to a means to measure an imbalance in said bridge;

said first branch is a catalytic gas sensing element that is reactive to combustible gases;

said second branch is a compensating element;

said third and fourth branches are resistors;

a current changing means to temporarily increase a normal operating current of said circuit for a predetermined period of time sufficient to exceed the normal operating temperature of said catalytic gas sensing element off and remove inhibitors from said catalytic gas sensing element wherein said current changing means is connected between said bridge and said power source; and,

a timer means to activate said current changing means for said predetermined period of time.

4,854,156

PNEUMATIC SURFACE-FOLLOWING CONTROL SYSTEM

James D. Hoeffel, Centerville; Richard E. Elliott; Wally C. Hoppe, both of Dayton, and James S. Nevitt, Bellbrook, all of Ohio, assignors to Systems Research Laboratories, Inc., Dayton, Ohio

Filed Jan. 3, 1989, Ser. No. 292,789
Int. Cl.[4] G01B *13/04*
U.S. Cl. 73—37.5 6 Claims

1. Apparatus for maintaining the end of a probe a predetermined distance from a workpiece, said apparatus comprising

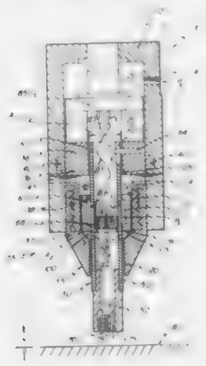
a hollow housing including means for forming first and second chambers therein and means for introducing a gas under pressure into said first chamber,

a piston positioned within said housing, said piston having one end thereof provided with a first surface having a first area exposed to said first chamber, whereby the pressure of the gas in said first chamber acts on said first area to urge the piston toward the workpiece,

means forming an orifice between said first chamber and said second chamber for permitting a restricted flow of the gas to pass into said second chamber thereby permitting the pressures in said chambers to be different,

means on said piston forming a second surface having a second area, larger than said first surface, exposed to the gas in said second chamber,

means forming a sensing port at the probe end of said piston for directing a stream of the gas from said second chamber toward the workpiece whereby the pressure of gas in said



second chamber will be function of the distance between the probe end of said piston and the workpiece,

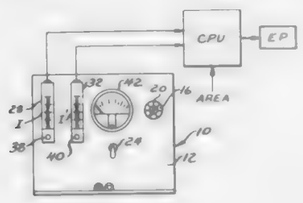
whereby the piston will assume a position within said housing where the force acting on the first surface balance the force acting on the second surface, thus maintaining the probe end of the piston a constant distance from the workpiece.

4,854,157

DEVICE FOR MEASURING EFFECTIVE POROSITY

Earl Wilson, Ingleside, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Mar. 7, 1988, Ser. No. 164,679
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—38 32 Claims



1. A device for measuring the effective porosity of a sample, comprising:

means for sealing a predetermined surface area on one side of the sample;

means for measuring the internal pressure on the sealed one side of the sample;

means for passing a gas to the sealed one side of the sample;

means for adjusting the flow rate of the passing means until a predetermined value of the internal pressure is obtained in the one side of the sample; and

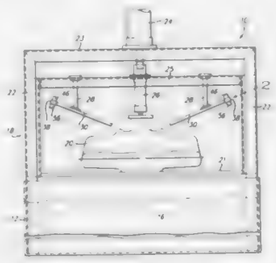
means for calculating the effective porosity in Gurley Seconds.

4,854,158

METHOD AND APPARATUS FOR LEAK TESTING A FLUID CONTAINING CHAMBER

Donald C. Gates, Troy, Mich., assignor to Expertek, Inc., Detroit, Mich.

Filed Aug. 22, 1988, Ser. No. 234,805
Int. Cl.[4] G01M *3/06*
U.S. Cl. 73—45.5 28 Claims



1. An apparatus for leak testing at least a portion of a fluid containing chamber by detecting bubbles of a gas rising from said portion when pressurized and submerged in a liquid comprising:

means positionable in said liquid above said chamber for deflecting said bubbles past one of a plurality of predetermined locations;

photoelectric means adjacent said predetermined locations for detecting said bubbles passing said predetermined locations and producing an electrical signal in response thereto; and

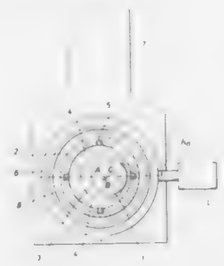
means for counting the number of electrical signals.

4,854,159

JOURNAL BEARING SIMULATOR

Terence W. Bates, Ince, England, assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 15, 1988, Ser. No. 231,938
Claims priority, application United Kingdom, Aug. 28, 1987, 8720377
Int. Cl.[4] G01N *33/26*
U.S. Cl. 73—64 12 Claims



1. An apparatus for measuring the load bearing capacity of engine lubricants under temperatures and shear rates typical of those applicable to journal bearings of operating engines, comprising an arrangement of two cylinders consisting of an outer non-rotating vertical cylinder (stator) and an inner, vertical cylindrical rotor, which, in use, is rotating about a vertical axis which is off-centre from both its own centre axis and that of the centre of the stator, means for measuring the horizontal force exerted by the lubricant on the stator, a means for controlling the temperature, and a means for displacing the stator

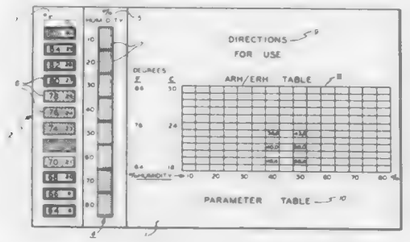
from the centre of rotation of the rotor, and a means for measuring a minimum gap between the rotor and stator.

4,854,160

EQUILIBRIUM AND AMBIENT RELATIVE HUMIDITY INDICATOR

Otto G. Glatt, 18 Mary Dr., Towaco, N.J. 07082

Continuation-in-part of Ser. No. 8,479, Jan. 29, 1987, abandoned. This application Jan. 22, 1988, Ser. No. 146,855
Int. Cl.[4] G01N *25/56;* G01W *1/02*
U.S. Cl. 73—73 10 Claims



1. A relative humidity indicating device for measuring relative humidity of paper sheets and the surrounding air comprising:

a first thin flat strip including temperature sensing means providing a graduated temperature scale for measuring the temperature of sheets of papers and the ambient air surrounding said paper;

a second thin flat strip including humidity sensing means providing a graduated humidity scale for measuring the humidity of said paper and the ambient air surrounding said paper;

a thin flat sheet supporting and securing said first and second strips thereon; and

thin flat tabular means having printed rows and columns of predetermined figures indicative of relative humidity values of said paper and ambient air, a first axis of said tabular means having a graduated temperature scale corresponding to that of said first strip and a second axis having a graduated humidity scale corresponding to that of said second strip with the intersection of measured readings from said temperature and humidity scales for said paper and for said ambient air representing the respective relative humidity values of said paper and said ambient air.

4,854,161

METHOD FOR DIAGNOSING CUTTING TOOL DULLNESS

Vladimir Dritz, Minnetonka, Minn., assignor to Innovex Inc., Hopkins, Minn.

Filed Jun. 28, 1988, Ser. No. 212,563
Int. Cl.[4] G01N *3/58*
U.S. Cl. 73—104 4 Claims

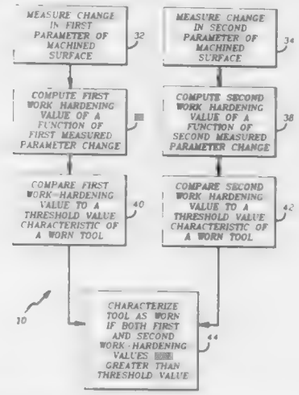
1. A method for determining wear of a cutting tool used to machine a surface of a workpiece, including:

measuring a change in a first parameter of a machined surface of a workpiece caused by a cutting tool;

calculating a first work-hardening value of the machined surface of the workpiece as a function of the measured change in the first parameter;

measuring a change in a second parameter of the machined surface of the workpiece caused by the cutting tool;

calculating a second work-hardening value of the machined surface of the workpiece as a function of the measured change in the second parameter; and



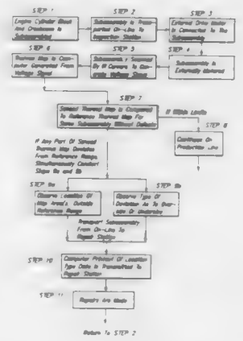
characterizing wear of the cutting tool as a function of the first and second work-hardening values.

4,854,162

METHOD OF LOCATING FRICTION GENERATING DEFECTS IN A MULTIPLE BEARING ASSEMBLY

Daniel Yerace, Belleville, and Alexander J. Zinkosky, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 27, 1988, Ser. No. 212,360
Int. Cl.[4] G01M *15/00;* G01N *25/72*
U.S. Cl. 73—119 R 14 Claims



1. A method of determining the location and type of dimensional defects in an assembly having certain sliding or rolling contact surfaces during simulated operation of such assembly and before any damage results to such assembly, comprising:

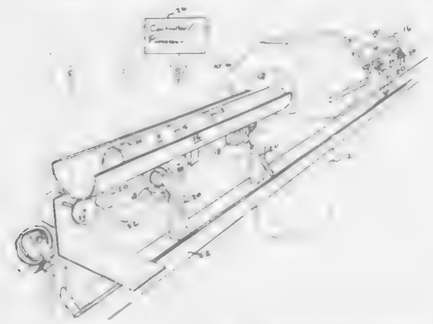
(a) initiating simulated operation of said assembly;

(b) sensing any change in the temperature of said assembly surrounding the location of each said certain sliding or rolling contact surface (i) with a resolution power of 0.02–1.0 C° and (ii) during a time span of 2–10 seconds measured from such initiation to provide separated voltage signals for each location;

(c) digitizing said signals; and

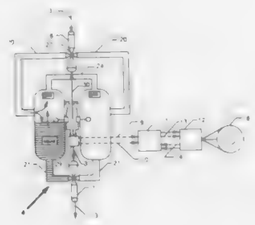
(d) comparing the sensed digitized signals with reference digitized signals for such an assembly without defects operated during the same time span and adjusted to compensate for any differing ambient thermal conditions, any deviations detected by such comparison representing defects.

4,854,163
BELTLESS CORE CONVEYOR SYSTEM FOR WELLSITE ANALYSIS
Houston B. Mount, II, and Michael L. Snoddy, both of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.
Filed Sep. 28, 1987, Ser. No. 101,461
Int. Cl.[4] E21B *49/02*
U.S. Cl. 73—153 23 Claims



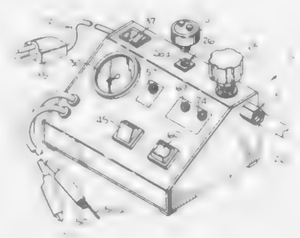
1. A beltless system for conveying and analyzing sections of core comprising:
a core trough comprising a receptacle portion for receiving a section of core and a drive engaging portion for engaging and being engaged by at least two spaced apart drivers and for being self-disengaging from a driver when the driver has driven the core trough a distance about equal to length of the drive engaging portion of the core trough;
drive means comprising at least two spaced apart drivers each having means for engaging the drive engaging portion of the core trough and for imparting linear motion to the core trough and for driving the core trough along a path adjacent an analysis means for analysis of core supported therein and for being self-disengaging from the core trough after driving the core through a distance about equal to length of the driver engaging portion of the core trough;
analysis means adjacent the path for analyzing a section of core supported in the core trough as the drive means drives the core trough along the path.

4,854,164
ROD PUMP OPTIMIZATION SYSTEM
Benjamin J. Rhoads, Dallas, Tex., assignor to N/COR Inc., Arlington, Tex.
Filed May 9, 1988, Ser. No. 191,381
Int. Cl.[4] E21B *44/00*
U.S. Cl. 73—155 22 Claims



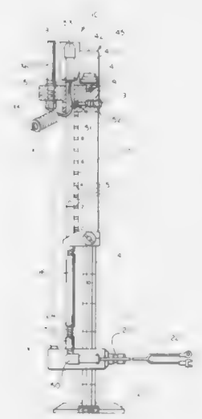
1. A liquid measurement apparatus for measuring liquid quantities in a fluid flow stream containing both liquids and gases and comprising
two containers each of which has an inlet and outlet line for the flowing fluids and a connecting conduit between the two containers to allow any gases contained in said fluid flow stream to separate in either of said two containers to pass to the other while accumulating liquids in one of said two containers and
a mechanism on the said inlet and outlet lines of the said two containers to alternately divert said flowing fluids to and from the said two containers such that fluid is flowing into one of said two containers while simultaneously discharging from the other and
a sensing means located in each of the said two containers to detect when a quantity of liquids accumulate in the one of said two containers into which fluids are flowing and to provide a signal when said quantity of liquids has accumulated and
a control and recording means to accept said signals alternately from both said sensing means to record said liquid quantity signals when liquids alternately accumulate in each of said two containers to divert said flowing fluids to and from the opposite of the said two containers when said control and recording means receives a signal from said sensing means from either of said two containers.

4,854,165
APPARATUS FOR TESTING ELECTRICAL COMPONENTS
Steven P. Jay, Windsor, Calif., assignor to Danford A. Jay, San Jose, Calif.
Filed Jun. 1, 1987, Ser. No. 56,245
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—168 7 Claims



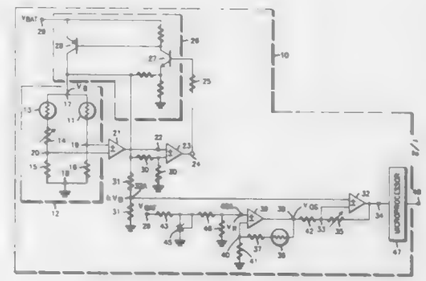
1. Apparatus for testing an electrical switch operatively responsive to fluid pressure, said switch when operating properly being arranged to be actuated in response to being subjected to a predetermined fluid pressure within a prescribed range, said apparatus comprising:
(A) means communicating with said switch and conducting fluid under pressure for applying to said switch a predetermined fluid pressure within said prescribed range; and
(B) electrical circuit means connected to said electrical switch for indicating whether said switch has been actuated in response to said fluid pressure within said prescribed range,
(C) said electrical circuit means comprising an indicator network to indicate whether said switch has been actuated, said network comprising:
(a) a Zener diode having a threshold voltage;
(b) a light emitting diode connected to said Zener diode, said light emitting diode being illuminated in response to said Zener diode conducting and being extinguished in response to said Zener diode being in a non-conducting state; and
(c) a load resistor connected to said Zener diode for controlling the conduction of said Zener diode, the current flow through said load resistor being sufficient to overcome the threshold voltage of said Zener diode in response to one state of said switch and being insufficient to overcome the threshold voltage of said Zener diode in response to another state of said switch.

4,854,166
LIGHTWEIGHT WADING ROD FOR STREAM FLOW MEASUREMENTS
James C. Futrell, II, Picayune, Miss., assignor to United States of America, as represented by the Secretary of the Interior, Washington, D.C.
Filed Nov. 10, 1987, Ser. No. 124,533
Int. Cl.[4] G01F *1/5*
U.S. Cl. 73—170 A 8 Claims



1. A wading rod for use in measuring current flow velocity in streams, rivers, and the like comprising:
a base;
a lightweight, non-metallic front rod extending from said base and having gradations along its shaft which indicate depth of the stream;
a lightweight, adjustable non-metallic sliding rod disposed rearwardly of said front rod;
means for adjustably mounting said sliding rod on said front rod for sliding movement therealong so as to permit the distance between the sliding rod and the base to be varied;
locking means for setting the position of said sliding rod along said front rod;
a current meter for generating a signal which is proportional to flow velocity;
current meter receiving means located at the lower end of said sliding rod for mounting said current meter on the wading rod;
a current meter digitizer for providing a digitized readout of the signal generated by said current meter;
signal transmission means for receiving a said signal from said current meter and for transmitting said signal to said current meter digitizer, said signal transmission means comprising a plurality of electrical wires constituting the main electrical connections of the wading rod disposed inside of said non-metallic sliding rod;
support means provided at the upper end of said wading rod for supporting said current meter digitizer;
a level indicator for indicating whether or not the wading rod is perpendicular to a stream bed in which the wading rod is placed.

4,854,167
MASS FLUID FLOW SENSOR
Walter S. Czarnocki, Schaumburg; Peter W. Harper, Crystal Lake; Kevin S. Moran, Algonquin, and Steven W. Alexander, Schaumburg, all of Ill., assignors to Motorola Inc., Schaumburg, Del.
Filed Sep. 9, 1987, Ser. No. 94,953
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204.19 20 Claims



1. A mass fluid flow sensor operative to provide a signal indicative of sensed fluid flow rate over an entire predetermined range of expected fluid flow rates, comprising:
a heater resistor positioned in a predetermined fluid, the flow rate of which is to be measured by said mass fluid flow sensor over said entire predetermined range of fluid flow rates;
sense circuit means coupled to said heater resistor for developing, in response to heat transfer between said heater resistor and said fluid, a sense signal which has an amplitude which varies as a function of the flow rate of said fluid, the rate of change of said sense signal as a function of flow rate over a substantial range of said entire predetermined range of fluid flow rates to be measured being substantially independent of fluid temperature but said sense signal amplitude varying as a function of fluid temperature;
correction circuit means coupled to and separate from said sense circuit means for receiving and utilizing said sense signal and a received predetermined reference signal to provide an output signal, the amplitude of said output signal being related to the fluid flow rate to be measured but being substantially less dependent on fluid temperature than said sense signal;
a compensating temperature variable circuit element, separate from said sense circuit, positioned in said fluid, the flow rate of which is measured by said sense circuit means, and having an electrical characteristic varying as a function of the temperature of said fluid but independent of said fluid flow rate;
reference circuit means coupled to said compensating temperature variable circuit element to provide in response thereto a temperature variable signal, as said predetermined reference signal, said temperature variable signal having an amplitude varying as a function of the electrical characteristic of said compensating temperature variable circuit element, said temperature variable signal being independent of said fluid flow rate.

4,854,168

METHOD FOR BALANCING A ROTOR, IN PARTICULAR A MOTOR VEHICLE WHEEL, IN TWO PLANES

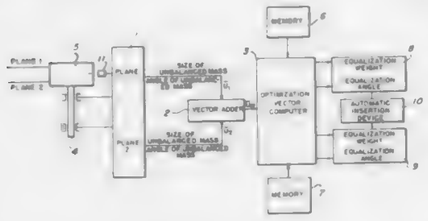
Gunther Himmler, Darmstadt, Fed. Rep. of Germany, assignor to Hofmann Werkstatt-Technik GmbH, Pfungstadt, Fed. Rep. of Germany

Filed Aug. 5, 1988, Ser. No. 228,705

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1987, 3726024

Int. Cl.[4] G01M *1/14*

U.S. Cl. 73—459 7 Claims



1. A method of balancing a rotor in two planes comprising the steps of:

measuring a first imbalance vector for said rotor in a first plane;

measuring a second imbalance vector for said rotor in a second plane;

forming a static imbalance vector from said first and second imbalance vectors;

fixing balance weights on the rotor in said first and second plane so as to reduce the magnitude of said static imbalance vector.

4,854,169

ACCELEROMETER

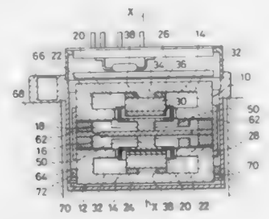
Kazuhiro Sakuma; Hirohito Itoh; Mitsuaki Kazou, and Kenji Kuramoto, all of Akishima, Japan, assignors to Japan Aviation Electronics Industry Ltd., Tokyo, Japan

Filed Jun. 1, 1988, Ser. No. 201,080

Claims priority, application Japan, Jun. 15, 1987, 62-146950; Jul. 6, 1987, 62-166883; Jul. 6, 1987, 62-166884

Int. Cl.[4] G01P *15/00, 1/02*

U.S. Cl. 73—517 B 9 Claims



1. An accelerometer for detecting the acceleration of an object to which it is attached, comprising

a pair of magnetic structures each of which includes a disk-like permanent magnet and a housing for containing said permanent magnet therein;

a flapper flexurally mounted between said magnetic structures;

two bobbins mounted on the upper and lower surfaces of said flapper;

a torquer coil wound on each of said bobbins;

said disk-like permanent magnet being mounted on said housing through a spacer made of a magnetic material having a similar coefficient of thermal expansion to that of said permanent magnet;

said spacer being secured to said housing at a cylindrical contact surface formed in said spacer;

said bobbin being secured to the surfaces of said flapper through a disk-like base member made of a material having the same coefficient of thermal expansion as the material of said flapper;

a disk-like protrusion formed at a central portion of the inner end wall of said housing;

said spacer being in the form of an annular configuration having an opening for inserting said protrusion; and

the outer peripheral wall of said protrusion and the peripheral wall of said opening in said spacer are secured to each other.

4,854,170

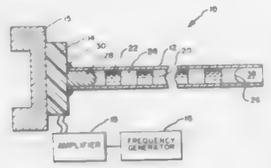
APPARATUS AND METHOD FOR USING ULTRASOUND TO DETERMINE HEMATOCRIT

Owen D. Brimhall, West Valley City; Stephen C. Peterson, Salt Lake City; Charles D. Baker, Sandy, and Merwyn D. Riddle, Salt Lake City, all of Utah, assignors to Separation Technology, Inc., Salt Lake City, Utah

Filed Oct. 12, 1988, Ser. No. 256,731

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—570 7 Claims



1. An apparatus for determining hematocrit comprising:

a microhematocrit capillary tube;

a blood sample in the microhematocrit capillary tube;

an ultrasound transducer for producing ultrasound energy;

a frequency generator means for generating a preselected frequency signal for the ultrasound transducer;

amplifier means for amplifying the frequency signal from the frequency generator and transmitting the amplified signal to the ultrasound transducer;

coupling means for coupling the ultrasound energy from the ultrasound transducer into the blood sample; and

a meniscus formed at the end of the blood sample, the meniscus forming a reflector for ultrasound energy in the blood sample thereby creating a standing wave in the ultrasound energy in the blood sample.

4,854,171

APPARATUS FOR DETECTING EXTRANEOUS COMPONENTS IN A TEXTILE FIBER PREPARATION INSTALLATION

Hubert Hergeth, Kockerellstrasse 3, 5100 Aachen, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 164,105

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708188

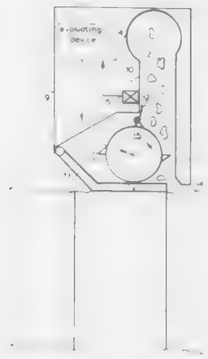
Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—572 4 Claims

1. An apparatus for detecting the presence of extraneous components in textile fiber which comprises in combination:

a bale plucker having a plucker roller adapted to contact a bale of said textile fiber for removing tufts of the textile fiber from said bale and means for entraining the removed tufts away from said bale, strands of extraneous components attaching to said roller and generating impacts upon rotation thereof, said means for entraining including a duct having a wall impacted by said strands attaching to said roller;

sensing means selected from a vibration sensor and a displacement sensor on a wall of said duct for automatically



detecting impacts generated by strands attached to said roller; and

means connected to said sensing means for stopping said plucker upon detection of a frequency of impacts greater than a predetermined intensity which exceeds the speed of the roller.

4,854,172

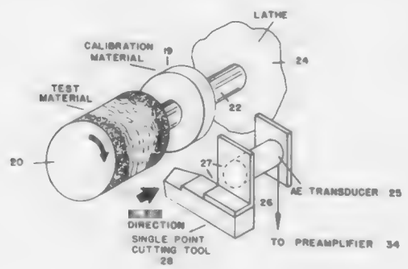
METHOD AND APPARATUS FOR MEASUREMENT OF DENSITY PROFILES IN WOOD COMPOSITES, USING ACOUSTIC EMISSION

Richard L. Lemaster, Pinole, and David A. Dornfeld, Berkeley, both of Calif., assignors to Regents of the University of California, Berkeley, Calif.

Filed Sep. 22, 1988, Ser. No. 247,872

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—587 14 Claims



1. A method of evaluating the density profile of a wood-derived specimen, comprising

mounting a sample of the wood-derived specimen on a lathe,

rotating the specimen at high speed,

coupling a transducer to a cutting tool and bringing the cutting tool into contact with the specimen sample to produce an acoustic emission signal from the wood-derived specimen sample, as the tool is moved across the thickness of the rotating sample,

transferring the acoustic emission signal into an electric signal,

amplifying the resultant electrical signal with a first amplifier,

transmitting the amplified electrical signal to a second amplifier and further amplifying said electrical signal, and

analyzing said transmitted signal.

4,854,173

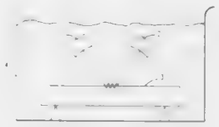
MEASUREMENT OF INTERGRANULAR ATTACK IN STAINLESS STEEL USING ULTRASONIC ENERGY

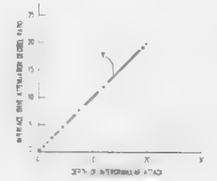
Gerry Mott, Pittsburgh; Mustan Attaar, and Rick D. Rishel, both of Monroeville, all of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 2, 1988, Ser. No. 163,360

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—600 8 Claims





1. A method for determining depth of intergranular attach at the surfaces, in a stainless steel specimen having at least two spaced-apart surfaces, comprising the steps of:

transmitting a first acoustic test wave toward a first surface of a stainless steel test specimen and receiving a reflection of said first test wave from said first surface;

measuring the amplitude of said reflected first test wave;

establishing an interface wave attenuation decibel ration between a predetermined reference value, corresponding to a value of said reflected first test wave assuming no intergranular attack in said test specimen, and said amplitude of said reflected first test wave;

empirically deriving a relationship between interface wave attentuation decibel ratio and depth of intergranular attach in the first surface of a stainless steel specimen corresponding in composition to said test specimen;

deriving the depth of intergranular attach in said first surface said relationship between interface wave attenuation decibel ratio and depth of intergranular attack;

transmitting a second acoustic test wave toward said test specimen and reflecting said second test wave from said test specimen as a plurality of beams, wherein one of said beams is from said first surface, and all other said beams are from a second surface;

measuring the amplitude of a first received transmissive beam and a second received transmissive beam and deriving the ratio of the two said amplitudes of said beams to obtain a total reverberation echo decibel ratio resulting from both said surfaces;

empirically deriving a relationship between reverberation echo decibel ratio and interface wave attenuation decibel ratio for a stainless steel specimen corresponding in composition to said test specimen;

deriving a first surface echo decibel ratio from said relationship between reverbation echo decibel ratio and interface wave attenuation decibel ratio;

subtracting said first surface echo decibel ratio from said total reverberation echo decibel ratio to obtain a second surface echo decibel ratio;

deriving a second surface interface wave attenuation decibel ratio from said relationship between reverberation echo decibel ratio and interface wave attenuation decibel ratio; and

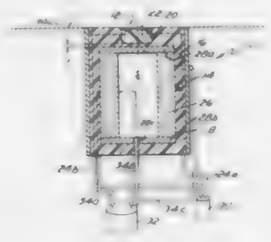
deriving the depth of intergranular attach in said second surface from said relationship between interface wave attenuation decibel ratio and depth of intergranular attack.

4,854,174

COLINEAR FLUCTUATING WALL SHEAR STRESS AND FLUCTUATING PRESSURE TRANSDUCER

William L. Keith, Ashaway, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1988, Ser. No. 185,728
Int. Cl.[4] G01D *21/02*
U.S. Cl. 73—714 **6 Claims**



1. An apparatus for simultaneous measurement of fluctuating wall shear stress and fluctuating pressure in a turbulent boundary layer fluid flow field, comprising:

shear stress gauge means, having a cylindrical shape and a first longitudinal axis, for measuring shear stress in the fluid being monitored;

piezoelectric transducer means, having a cylindrical shape and a second longitudinal axis, positioned physically below said shear stress sensing means, said second axis being colinear with said fist axis, for converting fluctuating pressure signals to corresponding electrical signals;

a first cable, having first and second insulated leads conductively connected to said shear stress sensing means, for providing power thereto;

a second cable, having third, fourth and fifth insulated leads, said third and fourth leads being conductively connected to said piezoelectric transducer means, for receiving and transmitting the electrical signal output thereof;

a cylindrical metal shell, having a first end, a second end and a third longitudinal axis, said shell enclosing said shear stress gauge means, said transducer means and said first and second cable leads, said third longitudinal axis being colinear with said first and second axes, said cylindrical metal shell further being conductively connected to said fifth lead of said second cable, for providing a grounded protective shield thereabout; and

potting compound, filling all remaining volume within said shell, for maintaining relative component spacing;

said first shell end, said potting compound and said shear stress gauge means forming a coplanar surface for flush mounting with respect to a containment wall for the fluid being monitored.

4,854,175

SIMPLE SHEAR DEVICE FOR TESTING EARTHEN MATERIALS AND POWDERS

Muniram Budhu, Williamsville, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.

Filed Feb. 29, 1988, Ser. No. 161,859
Int. Cl.[4] G01N *3/24*
U.S. Cl. 73—841 **26 Claims**



2. A simple shear device for testing earthen samples and powders comprising:

(a) a cuboidal sample containing means comprising a rubber membrane reinforced by a stacked plurality of plates which are slidably movable laterally relative to one another and have a hollow cuboidal central area for holding the sample;

(b) spaced lower and upper platens parallel to one another between which the plurality of plates containing the sample may be placed;

(c) means for applying a vertical load to said upper platen urging it toward the lower platen to compress said specimen therebetween;

(d) means for applying a shear load or shear displacement to the lower platen;

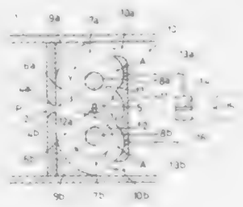
(e) means for monitoring the resulting stresses and strains in a central section of said sample, when force is applied to said sample while confined between said platens.

4,854,176

FLUIDIC FLOWMETER

Makoto Okabayashi, Osaka, Japan, assignor to Osaka Gas Co., Ltd., Osaka, Japan

Filed Jun. 16, 1988, Ser. No. 207,749
Claims priority, application Japan, Jun. 16, 1987, 62-149492; Nov. 6, 1987, 62-170206[U]; Nov. 7, 1987, 62-170199[U]; Nov. 9, 1987, 62-171817[U]; Mar. 3, 1988, 63-50886
Int. Cl.[4] G01F *1/20*
U.S. Cl. 73—861.19 **10 Claims**



1. A fluidic flowmeter comprising:

a reduced diameter pipe portion, a discharge nozzle and an enlarged diameter pipe portion disposed in a series in said order in a fluid flow direction;

a pair of control nozzles formed on a boundary between said discharge nozzle and said enlarged diameter pipe portion and oriented substantially normal to a discharge direction of said discharge nozzle, said control nozzles facing each other;

a pair of return flow passages connecting between said respective control nozzles and a downstream side of said enlarged diameter pipe portion;

a target for stabilizing of fluid flow direction at said enlarged pipe portion;

a flow amount measuring sensor for detecting a variation in one of a pressure and a flow amount due to a variation in the flow direction of discharged fluid from said discharged nozzle;

a pair of first partition walls for sectioning said enlarged diameter pipe portion, said control nozzles and said return flow passages;

a second partition wall for forming discharge passages (togetherwith) together with said first partition walls;

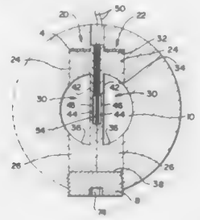
wherein a face of said target directed towards said discharge nozzle is positioned between a straight line interconnecting center portions of outer peripheral faces of said first partition walls and another straight line interconnecting upstream ends of said first partition walls at said control nozzle side.

4,854,177

PIEZOELECTRIC VORTEX FLOW METER

Jackie M. Phipps, 1337 Rutherford Dr., Mesquite, Tex. 75149, and Ronald B. Barrier, 15595 Lea Valley Cir., Dallas, Tex. 75248

Filed Jun. 3, 1987, Ser. No. 56,886
Int. Cl.[4] G01F *1/32*
U.S. Cl. 73—861.24 **12 Claims**



1. An apparatus for use with a vortices generating means for determining the rate of fluid flow by monitoring the frequency of the vortices produced via the vortices generating means, said apparatus comprising

(a) a main body;

(b) said main body includes a pair of like members of unitary construction;

(c) each member including upper and lower portions connected by a vortex generating and sensing portion;

(d) each of said members including an inner planar surface which surfaces are in contiguous relationship;

(e) the sensing portion of each of member including interior and exterior surfaces;

(f) said interior surface of each member including interior and exterior surfaces;

(g) said interior surface of each member being provided with a circular recess extending transversely from the interior surface thereof and terminating short of the exterior surface thereof, thereby forming sensing surfaces on a portion of the exterior surface of each sensing portion;

(h) a sensing means disposed in the circular recess of each member, said sensing means being disposed in opposed relation to each other;

(h) an axially extending groove extending from each of said circular recesses through said members;

(i) and electric wire connected at one end to the sensing means of each member, said wire being disposed in the axially extending groove of each of said members;

(j) said vortex generating portion including a plate substantially planar and perpendicular to the liquid flow, and

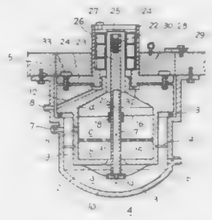
(k) means for securing the planar surfaces of said members together.

4,854,178

FLOWMETER FOR DANGEROUS FLUIDS

Jacques Dollfus, Les Essarts le Roi, France, assignor to Société Anonyme: Societe Generale Pour les Techniques Nouvelles - SGN, France

Filed Feb. 17, 1988, Ser. No. 156,724
Claims priority, application France, Feb. 20, 1987, 87 02277
Int. Cl.[4] G01F *1/24*
U.S. Cl. 73—861.58 **19 Claims**



1. A flowmeter for dangerous fluids, using the deformation, under the effect of a pressure variation on opposite sides of a resilient, deformable diaphragm, which pressure variation is caused by a liquid flow, said flowmeter being placed behind a protective plate, wherein said flowmeter is comprised of:

a substantially hollow bowl secured to said protective plate and having a lower inlet connection piece for receiving fluid from a first conduit and an upper outlet connection piece for ultimately delivering fluid entering said bowl to a second conduit;

a substantially hollow, substantially cylindrical-shaped inner body fixedly secured between said protective plate and said bowl and defining a hollow interior region between the exterior of said inner body and the interior of said bowl;

barrier means provided in said hollow interior region and dividing said interior region into upper and lower regions for preventing fluid flow from said inlet connection piece directly to said outlet connection piece through said hollow interior region;

said inlet connection piece communicating said first conduit with said lower interior region;

said outlet connection piece communicating said second conduit with said upper interior region;

a resilient metallic diaphragm provided within the interior of said inner body and dividing said interior into first and second compartments;

the lower face of said inner body being provided with a calibrated orifice for introducing fluid into one of said compartments;

the lateral face of said inner body being provided with an outlet opening communicating said one of side compartments with the upper interior region to deliver fluid to said outlet connection piece;

a hollow pin secured to said diaphragm;

the lower end of said pin extending into said calibrated orifice;

detection means having a pin receiving region;

the opposite end of said pin extending into said detection means and being arranged for slidable movement therein;

said hollow pin having an opening in the end extending into said calibrated orifice for receiving fluid introduced into said bowl and having an outlet orifice communicating with the remaining one of said compartments;

the pressure difference on opposite sides of said diaphragm, which is a function of the velocity of the fluid passing through said first and second conduits, displacing said diaphragm to thereby move said pin;

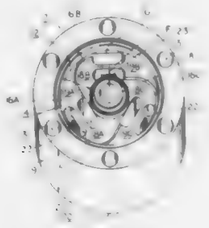
said detection means detecting the displacement of said pin in said pin receiving region to provide an indication of liquid velocity.

4,854,179

COAXIAL LOAD CELL

Rolf P. Höggström, East Walpole, Mass., assignor to BLH Electronics, Inc., Canton, Mass.

Filed Oct. 2, 1987, Ser. No. 104,797
Int. Cl.[4] G01L *1/22*
U.S. Cl. 73—862.66 **11 Claims**



6. A load cell comprising substantially coaxial center and outer load-receiving and load-supporting portions constituting action and reaction members for loading applied substantially along an axis about which said portions are coaxial, said portions being radially separated by an annular region therebetween, a plurality of sensing beam elements having gage-mounting surfaces, said beam elements being disposed in said region at spaced angular positions about said axis each with a direction of elongation substantially transverse to said axis and to a radius from said axis, a plurality of end connections some of which project substantially radially outward from the center portion in said region and others of which project substantially radially inward from the outer portion in said region, opposite ends of each of said beam elements being fixed with and held by end connections which extend radially inward and outward, respectively, and strain gage means fixed with surfaces of said beam elements so as to be responsive to elastic deformations thereof induced by load transmitted between said center and outer portions.

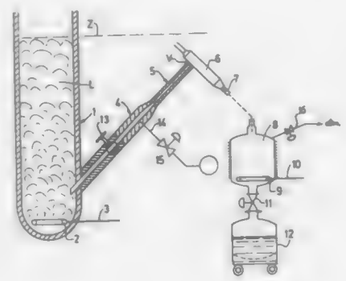
4,854,180

SYSTEM FOR THE SAMPLING IN AN ENCLOSURE OF SOLID PARTICLES IN A FLUIDIZED BED

Jean-Louis Mauleon, Merly-Le-Roi; Francois Ville, Paris, and Charles Mengus, Grisheim-Souffel, all of France, assignors to Compagnie De Raffinage et de Distribution Total France, Levallois-Perret, France

Filed Oct. 21, 1988, Ser. No. 261,038
Claims priority, application France, Oct. 21, 1987, 87 14538
Int. Cl.[4] G10N *1/00*
U.S. Cl. 73—863.86 **11 Claims**

1. An apparatus for sampling particles from an enclosure adapted to contain at at least a given level a fluidized bed of solid particles, comprising a sampling riser pipe external to the enclosure and communicating by its lower end with the enclosure below the given level so as to form an extension of any fluidized bed contained therein, a restriction in said sampling riser pipe adapted to limit the sampling flow rate, and means for injecting a compressed gas at an adjustable flow rate into the sampling riser pipe between the enclosure and the restriction for controlling, by appropriate regulation of the flow rate of the gas, the quantity of particles withdrawn.

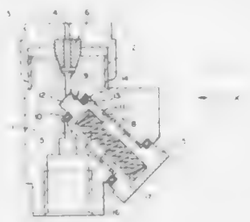


4,854,181

SAMPLE INJECTION OR EXTRACTION HEAD FOR GASEOUS OR LIQUID FLUIDS

Eberhard Gerstel, Heerstr. 4, D-4330 Mülheim a.d. Ruhr 14, Fed. Rep. of Germany

Filed Feb. 22, 1988, Ser. No. 158,934
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1987, 8715782[U]
Int. Cl.[4] G01N *1/00, 30/16*
U.S. Cl. 73—863.86 **9 Claims**



1. A head used for gaseous or liquid fluids to perform at least one of sample injection and extraction, comprising:

an inner bore within the head sized to accommodate a syringe needle thereinto;

an inlet valve means having a closed position for blocking the inner bore and including a substantially cylindrical valve body which is sealingly spring biased toward said inner bore and having a protrusion member extending into recess means of said head and being displaceable by a syringe needle being inserted into said inner bore for moving said valve means against said spring bias in a direction along the valve body axis which forms an angle in the range of greater than 90° up to less than 180° with the axis of the inner bore through which the syringe needle passes toward said recess means;

a cylindrical guide means within the head for said valve body, said guide means ending in said recess means of said head, which recess means extends across and in communication with said inner bore and provides an annular sealing surface means; and

said cylindrical protrusion member of the valve body supporting a sealing ring which, in the closed position of said valve means, is in sealing engagement with said sealing surface means;

wherein said protrusion member extends into said recess means so that upon the introduction of a syringe needle its tip first impinges onto the front face of said protrusion member and displaces said valve body together with said sealing ring out of said recess means.

4,854,182

ALIQUOTING OF SERIAL LIQUID SAMPLES

Will G. Ryan, 906 South Laflin, Chicago, Ill. 60607, and Norman E. Bullock, 320 South Home Ave., Oak Park, Ill. 60302

Filed Jan. 27, 1988, Ser. No. 148,927
Int. Cl.[4] G01N *1/28, 1/18*
U.S. Cl. 73—864.64 **17 Claims**



1. A liquid aliquoting apparatus for obtaining an aliquot of a series of liquid samples comprising: a liquid collection container forming a liquid collection chamber; an aliquot container forming at least one aliquot storage chamber vertically below said liquid collection chamber; a generally vertical aliquot tube forming at least one aliquot measurement chamber, each said aliquot measurement chamber having a cross-sectional area in the same relation to the cross-sectional area of said liquid collection chamber as the quantity of said aliquot is desired to bear to said liquid samples and a bottom in approximately the same horizontal plane as a bottom of said liquid collection container; and aliquot valve means in a first position placing each said aliquot measurement chamber in communication only with said liquid collection chamber and in a second position placing each said aliquot measurement chamber in communication only with each corresponding said aliquot storage chamber.

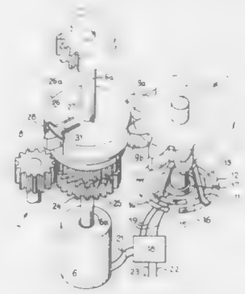
4,854,183

CYCLIC ELECTROMECHANICAL PROGRAM CONTROL FOR CONTROLLING ELEMENTS, SUCH AS FOR EXAMPLE OPENABLE ROOFS OF VEHICLES

Pierre Periou, Cergy Pontoise, and Michel Boilley, Paris, both of France, assignors to Rockwell-CIM, France

Filed Sep. 9, 1988, Ser. No. 243,399
Claims priority, application France, Sep. 15, 1987, 87 12774
Int. Cl.[4] F16H *27/10, 55/12;* B60J *7/057*
U.S. Cl. 74—113 **11 Claims**

1. An electromechanical cyclic program control for an element shiftable in accordance with a programmable shifting cycle, said control comprising an electric motor, a gear train drivenly connected to the motor and including an impulse gear and an output gear, at least one driving means for said element having a programmable shifting cycle drivenly engaged with said output gear, a driven gear cooperative with said gear train for receiving impulses from said gear train for controlling said programmable cycle of said element, an electrical circuit associated with said driven gear, electrical conductive means connecting the electrical circuit to said motor for transmitting to the motor instructions corresponding to the nature of the impulses received by said driven gear, means for causing said impulse gear to deliver impulses solely in predetermined useful zones of said programmable cycle of said element, said gear



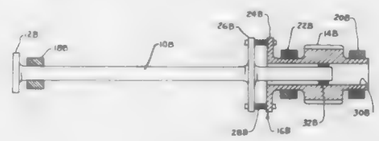
train being a differential gear train without a gearing down between said impulse gear and said output gear.

4,854,184

SUPPORT SYSTEM FOR SHAFT

Thurman W. Jessup, 130 Jeanine Way, Anaheim, Calif. 92806

Filed Nov. 7, 1983, Ser. No. 538,711
Int. Cl.[4] B63H *23/34;* F16D *3/64;* F16H *57/00*
U.S. Cl. 74—411 **6 Claims**



1. Support system for a substantially horizontal shaft with gear coupled thereto, comprising:

a shaft mounted for rotation about its geometric longitudinal axis;

shaft bearing means adjacent one end of said shaft;

a gear adjacent the other end of said shaft having an axis of rotation and an axial bore;

a pair of gear bearings, one at each side of said gear, for mounting said gear coaxially of said shaft;

said shaft extending into said bore at least substantialy midway between said bearings;

coupling means for connecting said shaft and said gear to impart rotation therebetween;

annular support means circumjacent said shaft, spaced axially from said coupling means and within said bore substantially midway between said gear bearings, for transmitting the weight of said shaft to said gear bearings.

4,854,185

MANUALLY OPERATED AND LOCKED CONDUIT LENGTH ADJUSTER SYSTEM

Norman B. Lichtenberg, Troy, Mich.; Harold P. Sponseller, Maumee, Ohio, and Jeffrey E. Totten, Trenton, Mich., assignors to Babcock Industries Inc., Fairfield, Conn.

Filed Oct. 17, 1988, Ser. No. 258,630
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—501.5 R **40 Claims**

1. A manually locked conduit length adjuster system comprising

a plastic body having an opening therethrough,

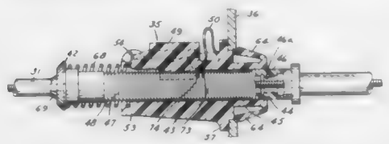
a plastic slider extending through the plastic body and having an opening therethrough,

a conduit adapted to have one end fixed,

a cable extending through said conduit and said slider,
said slider having a plurality of annular longitudinally spaced teeth about a portion of the periphery thereof,
a plastic locking member connected to said body by an integral flexible hinge,
said locking member having a plurality of longitudinally spaced arcuate teeth adapted to engage the teeth on said slider,
said locking member being movable manually through a side wall of the body into locking engagement with said slider, and
interengaging means between the locking member and the body for holding the locking member in locked position.

31. A manually locked conduit length adjuster mechanism comprising

a plastic body having an opening therethrough, a portion of said opening defining a first cylindrical surface, another



portion of said opening defining a second cylindrical surface and having a transverse opening therein,
a plastic slider including a cylindrical portion extending through the opening of the plastic body and engaging said cylindrical surfaces of the opening in the body for guiding the slider for longitudinal movement relative to said body,
said slider having a plurality of annular longitudinally spaced teeth about a portion of the periphery thereof,
a plastic locking member connected to said body by an integral flexible hinge,
said locking member having a plurality of longitudinally spaced arcuate teeth adapted to engage the teeth on said slider,
said locking member being movable manually through the transverse opening of the body into locking engagement with said slider, and
interengaging means between the locking member and the body for holding the locking member in locked position.

4,854,186

APPARATUS FOR ADJUSTING THE LENGTH OF A BOWDEN CABLE

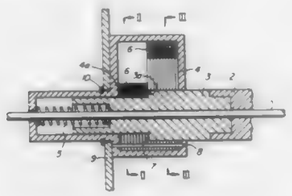
Willi Jakob, Ehringshausen, and Klaus Marscholl, Ehringshausen-Breitenbach, both of Fed. Rep. of Germany, assignors to Küster & Co. GmbH, Ehringshausen, Fed. Rep. of Germany

Filed Dec. 2, 1988, Ser. No. 279,165

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1987, 3740776

Int. Cl.[4] **F16C** *1/22*

U.S. Cl. 74—501.5 R **9 Claims**



1. An apparatus for adjusting the length of a sheath of a bowden having a sheath axis, said sheath guiding therein a cable of the bowden cable for tensioning between an actuation element and a gearing component to be driven, said apparatus comprising a structure fixed housing having an axial bore through which passes an end of said sheath, a compression spring mounted between said housing and said sheath stressing said sheath toward expulsion from said axial bore, a set of mutually parallel spacer panes (**6**, **106***a*, **106***b*) resting in initial positions on said sheath (**2**, **103**) which are displaceable transversely to said sheath axis and which sequentially drop in front of a collar on said end of said sheath when said end of said sheath on account of an operationally-caused shortening of the sheath or lengthening of the cable is being expelled from said axial bore by said compression spring (**5**, **105**), said spacer panes then resting on the one hand against said collar of said sheath (**2**, **103**) and on the other hand against said housing (**4**, **104**).

4,854,187

HAND BRAKE ASSEMBLY FOR A VEHICLE

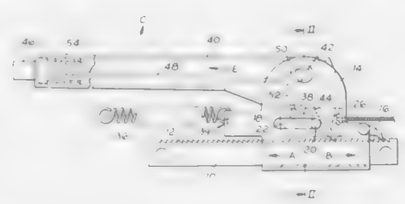
John E. Walters, Bulwell, United Kingdom, assignor to Metallifacture, Ltd., Nottingham, England

Filed Nov. 4, 1988, Ser. No. 267,532

Claims priority, application United Kingdom, Nov. 7, 1987, 8726133

Int. Cl.[4] **G05G** *5/06*

U.S. Cl. 74—535 **9 Claims**



1. A hand brake assembly for a vehicle comprising a base member adapted to be secured to a body of the vehicle, a carriage mounted for movement lengthwise of the base member, a first retaining means mounted on the carriage and biased into operative releasable retaining engagement with the base member, an anchor member mounted for movement relative to the carriage and the base member lengthwise of the base member, the anchor member comprising means for attaching a brake operating link thereto, the link being movable lengthwise of the base member in a first direction to apply the brakes and in a second direction opposite the first direction to release the brakes, biasing means adapted in the use of the assembly to urge the carriage in the first direction, the carriage being adapted to urge the anchor member in said first direction with a pre-selected force which is insufficient to apply the brakes but sufficient to take up slack between the attachment of the brake-operating link to the anchor member and the brakes, the carriage being retained to the position to which it has been urged by the biasing means by engagement of the first retaining means with the base member, a second retaining means mounted on the anchor member and biased into releasable operative retaining engagement with the base member, and brake-operating means mounted on the carriage and including applying means operable to move the anchor member in said first direction to apply the brakes, the anchor member being retained in the position to which it has been moved by engagement of the second retaining means with the base member and release means by which the second retaining means can be released from engagement with the base member to allow the anchor member to move in the second direction to release the brakes.

4,854,188

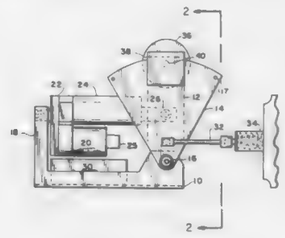
REMOTELY ENGAGABLE POWER ACTUATOR

Edward E. Griffiths, 3446 W. Hacienda, Las Vegas, Nev. 89118

Filed May 2, 1988, Ser. No. 189,347

Int. Cl.[4] **G05G** *11/00*; **F16D** *11/00, 27/00*

U.S. Cl. 74—625 **5 Claims**



1. A remotely controlled linear power actuator with remotely controllable power disengagement means for permitting free manual movement of said actuator, said linear actuator comprising:
a drive plate rotatable around a pivot at a first end thereof:
motor means for rotating said drive plate around said pivot in accordance with an applied remote signal;
a remotely controlled solenoid mounted at the second end of said plate and on a first surface, said solenoid having an actuating pin movable through said drive plate in a hole normal to the first surface thereof;
a spherical ball within said actuating pin hole and movable by said actuating pin;
an inverted U-shaped anvil on the first surface of said drive plate at the position of the actuating pin hole through said drive plate;
a driven plate pivotally coupled for free rotation parallel to said drive plate, said driven plate having an arcuate portion centered at the pivot point on said drive plate and having an arcuate periphery movable within the opening in said U-shaped anvil, said driven plate having a surface indentation adjacent its arcuate periphery and coaxial with said actuating pin hole for receiving a portion of said spherical ball for interlocking said driven plate with said drive plate; and
a linearly movable output shaft pivotally coupled to said driven plate at a point on a line between its pivot point and actuating pin indentation, said shaft being substantially perpendicular to said line and the axis of said pivot.

4,854,189

ROTARY/LINEAR ACTUATOR

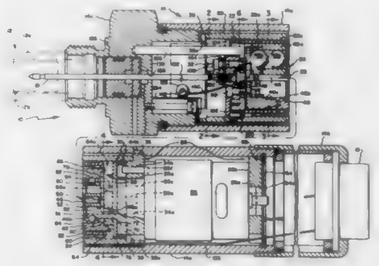
Otmar M. Ulbing, Fairport, N.Y., assignor to Windwinder Corporation, Tipp City, Ohio

Filed Sep. 4, 1987, Ser. No. 92,955

Int. Cl.[4] **F16H** *37/00*

U.S. Cl. 74—640 **19 Claims**

1. A rotary/linear actuator comprising in combination:
a resiliently deformable inner sleeve having an externally screw threaded portion;
means for constraining said inner sleeve against rotary movement;
an outer sleeve having an internally screw threaded portion;
means for constraining said outer sleeve against rotary and linear movement;
rotary means arranged inwardly of said inner sleeve for engagement with an inner surface thereof for resiliently deforming peripherally separate portions of said externally screw threaded portion into engagement with said internally screw threaded portion, whereby upon rotation of said rotary means relative to said inner sleeve, said inner sleeve is linearly displaced relative to said outer sleeve, said rotary means having an effective axial length thereof disposed in engagement with said inner sleeve, said externally screw threaded portion having a length as measured axially of said inner sleeve approximately equal



to said effective axial length plus the desired extent of linear displacement of said inner sleeve; and
means for constraining said rotary means against linear movement relative to said outer sleeve.

4,854,190

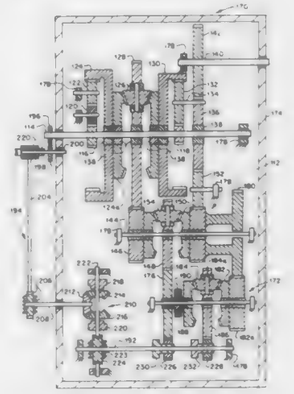
CONTINUOUSLY VARIABLE GEAR DRIVE TRANSMISSION

Vann Yuen Won, Sacramento, Calif., assignor to United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 20, 1987, Ser. No. 52,641

Int. Cl.[4] **F16H** *37/06, 37/08, 3/44, 57/10*

U.S. Cl. 74—695 **20 Claims**



1. A variable speed drive assembly comprising:
(a) floating gear assembly having an input and an output shaft;
(b) a primary differential gear assembly mechanically interconnected with said floating gear assembly such that a mechanical feedback loop is established between said floating gear assembly and said primary differential gear assembly for controlling speed of said output shaft; and
(c) a control means comprising a control gear directly interconnected with said primary differential gear assembly such that rotation of said control means controls the rotational speed of said output shaft wherein said output shaft is held stationary when said control gear is stationary.

4,854,191

SPEED CHANGE DEVICE FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 11, 1988, Ser. No. 217,335
Claims priority, application Japan, Jul. 13, 1987, 62-174246
Int. Cl.[4] F16H *5/04, 57/10*
U.S. Cl. 74—750 B 6 Claims



1. A speed change device for a bicycle, said speed change device comprising:

(a) a crank shaft adapted to be supported to rotate relative to a frame of the bicycle;

(b) a fixed shaft adapted to be fixed to said frame of the bicycle

(c) a plurality of sun gears having a different number of teeth from each other and supported to said fixed shaft to be independently rotatable relative to said fixed shaft,

(d) a driving member supported to be rotatable integrally with said crank shaft,

(e) a plurality of gears each having a different number of teeth from each other and engageable with teeth of said sun gears and supported to rotate relative to said driving member,

(f) a driven rotary member including an inner periphery having internal teeth engageable with teeth of one of said planetary gears and an outer periphery including at least one sprocket, said driven rotary member being supported to rotate relative to said driving member,

(g) a plurality of lock pawls swingably supported to said fixed shaft to lock or unlock rotation of said sun gears relative to said fixed shaft,

(h) a control member supported movably relative to said fixed shaft and having a plurality of clutch pawls, said control member being movably operated to move said clutch pawls away from or toward said lock pawls to control positioning of said lock pawls in locking and unlocking positions relative to said sun gears,

(i) a pawl control provided at the outer periphery of said crank shaft such that said pawl control, when said crank shaft rotates, actuates said clutch pawls to contact said lock pawls to move said lock pawls in an unlocking direction with respect to said sun gears, and

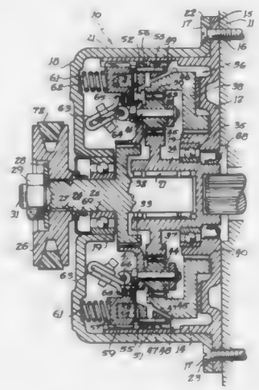
(j) release position holding means for holding said lock pawls at an unlocking position such that said lock pawls are unlocked with respect to said sun gears.

4,854,192

CENTRIFUGALLY CONTROLLED TWO-SPEED ACCESSORY DRIVE

Bruce A. Churchill, Ithaca, N.Y., and Jeffery D. Raugh, Grosse Ile, Mich., assignors to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Nov. 18, 1987, Ser. No. 124,532
Int. Cl.[4] F16H *3/70, 57/10*
U.S. Cl. 74—752 E 12 Claims



1. A two-speed gear box adapted to be mounted on the face of an accessory to be driven, comprising a housing, an input shaft in said housing operatively connected to a vehicle engine, an output shaft in said housing driving the accessory, a planetary gear train in said housing operatively connecting the input and output shafts and including a sun gear connected to said output shaft, a ring gear rotatably mounted in said housing and encompassing said output shaft, a plurality of planetary gears meshing with said sun gear and ring gear, a planet carrier for said planetary gears rotatable with said input shaft, an axially movable cone clutch mounted in said housing to ground said ring gear to alter the driving relationship between the input and output shafts, said ring gear having a conical clutch surface engaged by said cone clutch, a stationary annular fulcrum in said housing, and a Belleville spring in said housing having an inner edge and an outer edge, said outer edge operatively connected to said cone clutch, said annular fulcrum contacting a central portion of said Belleville spring.

4,854,193

KEY INTERLOCK SYSTEM FOR AUTOMATIC FLOOR MOUNTED TRANSMISSION SHIFTER

Gordon A. Newman, Adrian, and William J. Gilmore, Manitou Beach, both of Mich., assignors to Babcock Industries Inc., Fairfield, Conn.

Filed Mar. 25, 1988, Ser. No. 173,368
Int. Cl.[4] G05G *9/16*
U.S. Cl. 74—850 5 Claims

1. In an automatic floor mounted transmission shifter adapted to be used with an ignition key located in the steering column and adapted to translate a key actuator slide upon rotation of the key through a pinion acting on a gear rack on the actuator slide, a key interlock system comprising

a cable assembly including a conduit and a strand,

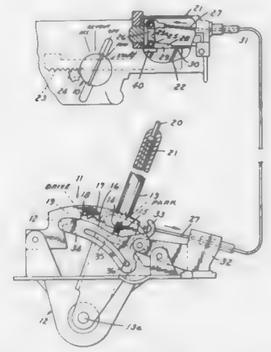
said conduit being fixed at one end adjacent the ignition key and at the other end adjacent the automatic floor mounted transmission shifter,

a spring loaded pawl yieldingly urged into contact with a first surface of the key actuator slide when the slide is in the key out position and with a groove in the key actuator slide when the key is in the start, run or off position,

a cam plate pivotally mounted adjacent said shifter,

said strand being connected at one end to said spring loaded pawl and at the opposite end to said cam plate,

interengaging means between said shifter and said cam plate operable such that when the key is in the out position, the pawl engages the first surface of the key actuator slide placing the strand in tension so that the cam plate prevents the shifter from moving from a park position; when the key is advanced to the start, run or off positions the pawl engages the groove in the key actuator slide allowing the shifter cam plate to be moved from park to a desired drive



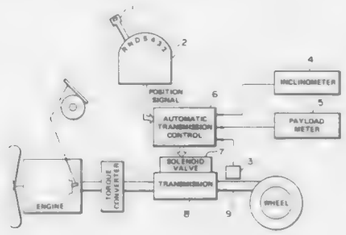
gear position; and when the shifter is advanced to a drive position, the cam plate is held in a position by said interengaging means so that the pawl cannot return to a position which will permit the key actuator slide to move to a key out position due to the engagement of the pawl with a shoulder of the groove in the key actuator slide, and upon return of the shifter to park position, the cam plate relieves the tension on the pawl so that it will move out of engagement with the shoulder on the key actuator slide, permitting the key to be turned and returned to the key out or accessory position.

4,854,194

STARTING SPEED STAGE SELECTOR IN AUTOMATIC TRANSMISSION CONTROL SYSTEM

Kiyoshi Kaneko, Kawasaki, and Yoshiaki Kato, Fuchu, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP87/00281, § 371 Date Mar. 1, 1988, § 102(e) Date Mar. 1, 1988, PCT Pub. No. WO87/06988, PCT Pub. Date Nov. 19, 1987
PCT Filed May 7, 1987, Ser. No. 150,367
Claims priority, application Japan, May 8, 1986, 61-105146
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—866 15 Claims



1. In an automatic transmission system in which a speed of a transmission having speed stages is sequentially shifted up or down on a step-by-step basis in response to load conditions of a vehicle to change said transmission at an optimum one of said speed stages; a starting speed stage selector comprising:

means for detecting a start mode of the vehicle;

means for detecting the load conditions of the vehicle;

means for detecting an inclined angle of the vehicle with respect to a front and rear direction;

means for selecting an optimum one of said speed stages in the start mode of the vehicle on the basis of outputs of said load condition detecting means and said inclined angle detecting means;

speed control means for controllably changing the speed stage of said transmission to the optimum speed selected by said starting-speed-stage selecting means in the start mode of the vehicle when said start mode detecting means detects the start mode;

setting means for setting predetermined accelerations each corresponding to each speed stage; and

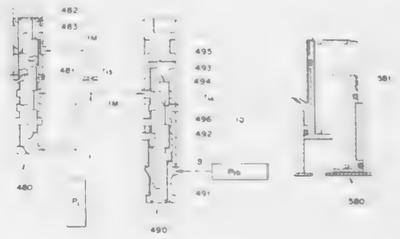
speed modifier means for checking an acceleration condition of the vehicle after starting the vehicle with the selected optimum speed stage, checking a change in gradient on the basis of an output of said inclined angle detecting means when the acceleration of the vehicle does not exceed the predetermined acceleration corresponding to the selected optimum speed stage, and shifting down the speed stage of said transmission by one stage from the optimum speed stage selected in the start mode by said starting speed stage selecting means when a checked gradient change exceeds a predetermined angle.

4,854,195

HYDRAULIC CONTROL SYSTEM FOR VEHICULAR AUTOMATIC TRANSMISSION WITH TWO ACCUMULATOR CONTROL VALUES TO VARY BACK PRESSURE TO ACCUMULATOR TO FOLLOW THE CHANGE IN ENGINE TORQUE

Shuzo Moroto, Handa; Koji Sumiya, Nishio; Yoshikazu Sakaguchi, Anjo; Seitoku Kubo, Toyota, and Yutaka Taga, Aichi, all of Japan, assignors to Aisin-Warner Limited, Japan

Filed Jul. 29, 1985, Ser. No. 759,828
Claims priority, application Japan, Jul. 31, 1984, 59-161911
Int. Cl.[4] B60K *41/16*
U.S. Cl. 74—867 1 Claim



1. A hydraulic control system for a vehicular automatic transmission comprising:

an oil source,

a hydraulic servo of friction coupling element for selectively engaging to change shifts, and

an accumulator control circuit provided between the oil source and the hydraulic servo, said accumulator control circuit having

a line pressure conduit connected between the oil source and the hydraulic servo,

an accumulator provided in the line pressure conduit to accumulate a hydraulic pressure to the hydraulic servo,

a back pressure supply conduit connected between the oil source and the accumulator, and

first and second accumulator control valves provided in the back pressure supply conduit,

said first accumulator control valve, connected between the oil source and a first output conduit leading to the second accumulator control valve, including a first spool, a first spring biasing the first spool, a lower oil chamber in which a line pressure is supplied to bias the first spool against the force of the first spring and an upper land on which a line pressure is supplied via the first output conduit to bias the first spool for the force of the first spring,

said second accumulator control valve, connected between the first output conduit and a second output conduit leading to the accumulator, including a second spool, a second spring biasing the second spool, a lower land on which a throttle pressure according to an engine output shaft torque is supplied to bias the second spool for the force of the second spring, and an upper oil chamber connected to the first output conduit, in which a fluid pressure via the first output conduit is supplied to bias the second spool against the force of the second spring.

4,854,196

METHOD OF FORMING TURBINE BLADES WITH ABRADABLE TIPS

Richard L. Mehan, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 25, 1988, Ser. No. 198,526
Int. Cl.[4] B21K *3/04*
U.S. Cl. 76—101 R **1 Claim**

1. Method for imparting abrasive properties to the tip of a turbine blade which comprises coating aluminum oxide powder with platinum metal to increase the density of the powder to a density greater than that of the metal of the tip of the turbine blade,

heating the tip of the turbine blade to cause a localized melting at the tip,

applying the platinum coated powder to the molten tip of the blade, and

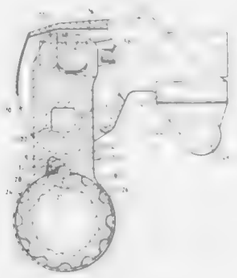
freezing the melt at the blade tip to embed the aluminum oxide abrasive material into the tip of the turbine.

4,854,197

TORQUE WRENCHES

John N. Walton, Whitley Bay, England, assignor to Hedley Purvis Limited, Northumberland, England

Filed Jan. 20, 1988, Ser. No. 145,915
Claims priority, application United Kingdom, Jan. 20, 1987, 8701194
Int. Cl.[4] B25B *13/46*
U.S. Cl. 81—57.39 **14 Claims**



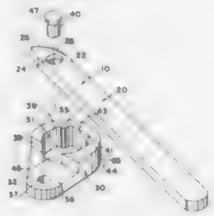
1. A torque wrench comprising a housing, means rotatable in the housing for holding an exchangeable socket for a polygonal member to be rotated by the wrench, a drive lever extending radially and pivotable coaxially with the said holding means, a ratchet connection between the drive lever and the said holding means and a reciprocating fluid piston-cylinder arrangement having a piston rod which actuates the drive lever wherein a slot with parallel sides is formed in the drive lever at or near the end remote from the said holding means, a shoe is located in the slot to be guided by the parallel sides of the slot, and the end of the piston rod is pivotally mounted to the shoe by a pin which passes through the shoe and is guided at each end in guide channels which are fixed in position in relation to the wrench housing.

4,854,198

HAND WRENCHING TOOL

Ronald W. Batten, 5618 White Ct., Torrance, Calif. 90503

Continuation-in-part of Ser. No. 887,054, Jul. 18, 1986, abandoned. This application Aug. 11, 1987, Ser. No. 84,580
Int. Cl.[4] B25B *13/28*
U.S. Cl. 81—98 **11 Claims**



1. A wrenching tool for removing and securing frangible fasteners onto a work surface, and having:

(a) a socket head having a top surface and planar bottom surface, a first end of a first thickness and an opposite end of reduced thickness providing a single planar surface land with a single- vertical shoulder between said planar surface land and said top surface, a single through socket traversed by said vertical shoulder to provide an open central area of said shoulder which is open to said socket, and a single through aperture through said reduced thickness end;

(b) an elongated handle having a thickness which is substantially equal to the reduction of thickness of said head and having a jaw end with an arcuate end having a radius center, a plurality of teeth on said end, and a distal aperture at a center offset from said radius center, and with one side of said jaw end received on said land with said distal aperture aligned with said single through aperture of said head and the opposite side of said jaw end flush with said top surface of said head, a bend intermediate the length of said handle to permit placement of the jaw end of said handle flush against a work surface while providing hand gripping clearance and preventing reversal of said tool to place said top surface of said socket head flush against said work surface;

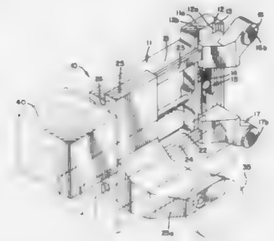
(c) an assembly pin received in said single through aperture of said socket head and said distal aperture of said handle to pivotally attach said handle to said head, with said apertures located on their respective head and handle to permit said toothed end edge of said handle to rotate into said open central area of said shoulder when said handle is pivoted on said head.

4,854,199

PORTABLE BRAKE DISC RESURFACING TOOL

John S. Norman, Waukegan, Ill., assignor to Ammco Tools, Inc., North Chicago, Ill.

Filed Sep. 23, 1988, Ser. No. 248,167
Int. Cl.[4] B23B *5/04*
U.S. Cl. 82—112 **5 Claims**



1. In a portable brake disc resurfacing tool fixture adapted to be mounted on an automobile brake caliper mounting bracket for resurfacing a brake disc adjacent said bracket without removing the disc from its mounted position on an automobile, said resurfacing tool including:

a framework, adjustable means for mounting said framework on a brake caliper mounting bracket, opposed dual cutting tools for cutting opposing surfaces on a brake disc, tool mounting means for selectably mounting said cutting tools thereon, and means for slidably mounting said tool mounting means on said framework,

the improvement wherein said adjustable means for mounting said framework on said brake caliper mounting bracket comprises:

a pair of opposed mounting arms, each arm including a first aperture therethrough adjacent a distal end thereof for aligned mounting with one of two apertures on a brake caliper mounting bracket, a base end spatially related from said distal end and including a pair of opposing surfaces adapted for slidably mounting said base end along a first channel on said framework, means for adjustably fixedly securing each said arm along said channel, and means for limiting the travel of one of said arms along said channel relative to the travel of the other of said arms along said channel.

4,854,200

PORTABLE FACING AND THREADING MACHINE HAVING AN INTERCHANGEABLE TAPER MEANS

Charles R. Mynhier, 5730 Centralcrest, Houston, Tex. 77092

Continuation-in-part of Ser. No. 881,456, Jul. 2, 1986, Pat. No. 4,753,143. This application Oct. 19, 1987, Ser. No. 109,991
Int. Cl.[4] B23B *3/22*
U.S. Cl. 82—110 **43 Claims**

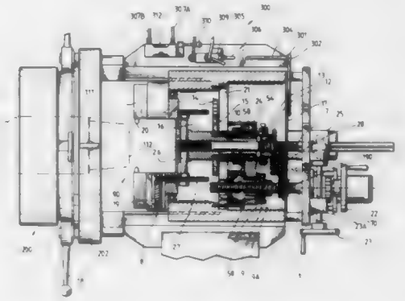
1. A portable apparatus for resurfacing or rethreading pipe, comprising:

a main frame;

a body mounted within and longitudinally movable relative to said main frame, said body comprising a main shaft, a linear feed means, and a taper assembly, said main shaft carried by said body for rotation and longitudinal movement relative to a central longitudinal axis C, said taper assembly operatively disposed between said linear feed means and said main shaft such as to translate linear movement of said linear feed means to axial movement of said main shaft, said taper assembly being adjustable between an engaging and a nonengaging position relative said main shaft and said linear feed means; said linear feed means adapted to move the body longitudinally relative the frame;

attachment means for detachably securing said frame to the end of said pipe so that the central axis C and the axis of the pipe are substantially coaxial;

a cutting tool assembly comprising a tool mounting means and a radial feed means, said tool mounting means rotatably coupled to said body to rotate relative to the body,



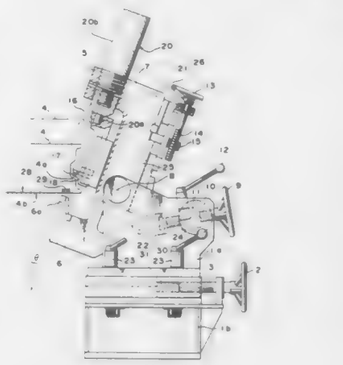
said radial feed means operatively disposed between the main shaft and the tool mounting means to move the tool mounting means radially relative to the central axis in response to longitudinal movement of said shaft relative to the body.

4,854,201

VALVE HOLE PUNCHING APPARATUS FOR A WHEEL

Yusaku Shinozawa, Tokyo, and Shin Sugiura, Toyokawa, both of Japan, assignors to Topy Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1987, Ser. No. 117,553
Int. Cl.[4] B21D *28/30*
U.S. Cl. 83—140 **10 Claims**



1. A valve hole punching apparatus for punching out a valve hole in wheel, the wheel comprising an annular member having radially outwardly projecting end portions and an intermediate portion, the valve hole being punched put in a portion of the intermediate portion inclined with respect to an axis of the wheel, said apparatus comprising: a frame,

a guide;

means adjustably mounting said guide on said frame for changing the inclination of said guide relative to said frame;

a longitudinally extending U-shaped member mounted on said guide for movement therewith, said U-shaped member including upper and lower jaws and a connecting

portion connecting said upper and lower jaws, said lower jaw including an upwardly extending bill;

means, located between said guide and said U-shaped member, for adjusting the position of said U-shaped member relative to said guide;

a punch mounting block slidably mounted on said connecting portion of said U-shaped member so as to be slidable with respect to said U-shaped member between said upper and lower jaws, said punch mounting block including a first surface portion extending in parallel with said connecting portion of said U-shaped member and second and third surface portions provided at upper and lower ends of said first portion, respectively, extending in a direction substantially at right angles to said connecting portion of said U-shaped member, said punch mounting block being slidably coupled to said connecting portion of said U-shaped member at said first portion;

driving means including a piston attached to a piston rod and a cylinder, for moving said punch mounting block relative to said U-shaped member, said upper jaw being connected to said cylinder of said driving means, said second portion of said punch mounting block being connected to said piston rod; and

a punch, mounted on said punch mounting block at said third portion of said punch mounting block, for punching out a valve hole in an inclined portion of an intermediate portion of a wheel in cooperation with said bill,

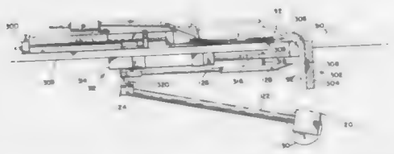
said guide, said U-shaped member and said punch mounting block being operatively coupled whereby prior to operating the apparatus, said guide may be adjusted in inclination so as to extend in a direction perpendicular to a wheel wall portion where a valve hole is to be punched out and an initial position of said punch may be adjusted by said U-shaped member position adjusting means so as to be located a little higher than said wheel wall portion where a valve hole is to be punched out, and i operating the apparatus, first said between said punch mounting block and said U-shaped member up to a position where said punch engages a wheel wall, then said bill may be moved obliquely upward through sliding movement between said punch mounting block and said U-shaped member up to a position where said bill engages said wheel wall portion, and then said punch and said bill may be further moved relative to each other to punch out a valve hole in said wheel wall portion.

4,854,202

APPARATUS FOR PROVIDING BEVELED EDGE PADS

Donald R. McNab, 4407 S. 173rd, Seattle, Wash. 98188, and Floyd D. Smith, Kent, Wash., assignors to Donald R. McNab, Seattle, Wash.

Filed Dec. 21, 1987, Ser. No. 136,019
Int. Cl.[4] B26D *3/02*
U.S. Cl. 83—153 **15 Claims**



8. Apparatus for cutting paper pads of the type which include a plurality of stacked sheets of paper arranged in a substantially planar configuration and having opposed first and second ends, said apparatus being constructed for cutting the pad in a manner such that the cut pad includes a beveled edge at the second end thereof, said apparatus comprising:

a gripping assembly for gripping the first end of the pad such that the sheets of paper are unable to move relative to one another, said gripping assembly including first and second jaw members coupled to a jaw frame, said second jaw member being substantially stationary relative to said jaw frame and said first jaw member being pivotally connected to said jaw frame, said first and second jaw members extending beyond said jaw frame to receive the pad therebetween with the pad abutting said jaw frame, said first jaw member being pivotal with respect to said second jaw member to selectively and releasably grip the pad between said first and second jaw members, said gripping assembly further including a gripping cylinder coupled to a coupling member of said first jaw member for imparting bi-directional motion to said coupling member to pivot said first jaw member with respect to said second jaw member;

a horizontal support surface having opposed first and second ends, said gripping assembly being mounted upon said support surface;

a stationary bending assembly spaced from the first end of said support surface, said bending assembly including a substantially planar cutting bar and a curvature plate positioned at an upper portion of said cutting bar, said cutting bar being positioned substantially perpendicular to said support surface and extending below said support surface, said curvature plate extending upward from said cutting bar and above said support surface and bending toward said gripping assembly to define a slot between said support surface and said bending assembly for receiving the pad;

a ram assembly for bi-directionally moving said gripping assembly between a first position located at said first end of said support surface and a second position such that when a gripped pad is moved toward the first position it engages said bending assembly and is deflected through the slot along said cutting bar;

a compression assembly for compressing the pad against said cutting bar for cutting of the pad, said compression assembly including a compression head positioned opposite said cutting bar for engaging the pad when the pad is in the first position between said compression head and said cutting bar and a compression cylinder selectively providing constant compressive force to said compression head;

a knife for cutting the pad when the pad is at the first position; and

a knife drive assembly for selectively imparting bi-directional motion to said knife for moving said knife toward the pad for cutting engagement therewith and away from the pad, the cut being made along a direction which is perpendicular to the pad sheets when the pad is at the first position such that when the pad is returned to its original planar configuration, the cut end of the pad is beveled.

4,854,203

CONTINUOUS MOTION PERFORATOR

Albrecht Wever, Bergen, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 25, 1988, Ser. No. 223,816
Int. Cl.[4] B26F *1/06*
U.S. Cl. 83—321 **9 Claims**

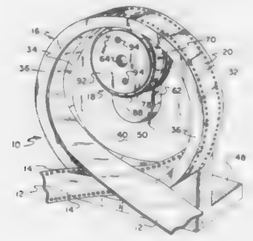
1. A continuous motion perforator comprising:

a first drum having a cylindrical inner surface,

a second drum having a generally cylindrical outer surface, the surface of the second drum having a diameter that is smaller than the diameter of the inner surface of the first drum, the second drum being positioned within the opening of the first drum with the axis of the surface of the second drum being offset from the axis of the surface of the first drum and with the surfaces located relative to each other to define a nip within the outer drum,

a plurality of punches and dies located on the surfaces so that the punches can enter the dies in response to movement of the drums,

means for effecting rotation of the drums in the same direction about their respective axes so that the punches enter the dies in response to rotation of the drums about their



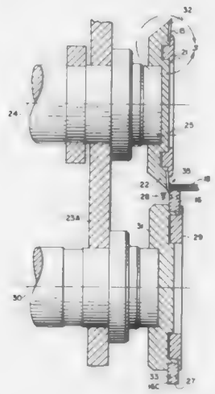
respective axes, whereby a web in the nip between the surfaces is perforated by the punches and dies.

4,854,204

ROTARY KNIFE PAPER TRIMMER WITH LONG LIFE SHEARING SURFACES FOR TRIMMING THICK AND SHINGLED PAPER PRODUCTS

Hans G. Faltin, York, Pa., assignor to AM International Incorporated, Chicago, Ill.

Filed Mar. 3, 1988, Ser. No. 163,830
Int. Cl.[4] B26D *1/24*
U.S. Cl. 83—500 **3 Claims**



1. In a paper trimming system having two substantially circular knives rotatable about respective axes of rotation and mounted to overlap over an arc at a shearing station for receiving, transporting, and shearing a multiple sheet paper product, the improvement for reducing cutting blade wear; reduction of friction, heat and power; and for better cutting action with thick paper products comprising,

a rotary bed knife with a substantially cylindrical outer circumferential portion upon which the paper product rides and a substantially planar cutting surface disposed substantially normally to its axis of rotation,

rotary bed knife holder means for rotatably mounting said bed knife to present an outer circumferential arc at said shearing station,

a cutting knife blade comprising a circular annular disc with cutting teeth on the outer circumference for presenting a substantially planar circumferential cutting surface for mating with the cutting surface of the bed knife in a sliding relationship at said shearing station,

rotary cutting knife blade holder means for rotatably mounting said cutting knife blade to overlap the rotary bed knife in said arc at the shearing station in sliding contact, and

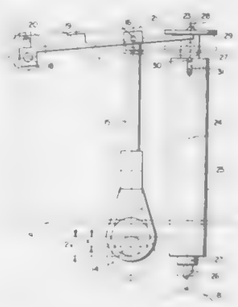
clamping means for changing the configuration of said cutting knife blade from an initial configuration to a generally frustro-conical dished configuration which is different than the initial configuration and for holding the cutting knife blade on the rotary cutting knife blade holder means in the frustro-conical dished configuration deflected inwardly from the outer circumference in a direction away from the bed knife, thereby to engage the cutting surface of the bed knife only at a narrow circumferential band about the cutting knife to reduce friction and heat, said cutting knife blade having a ground circumferential surface band which slidably engages the cutting surface on said rotary bed knife and a bevel surface which intersects said ground circumferential surface band and is disposed on a side of said cutting knife blade opposite from said ground circumferential surface band, said rotary cutting knife blade holder means having a support surface which engages said cutting knife blade at a location adjacent to an inner edge of the bevel surface to resist deflection of the cutting blade away from its sliding contact with said bed knife in the presence of paper products being cut.

4,854,205

SIGN CUTTING DEVICE

Gerold Anderka, Ellerbek, Fed. Rep. of Germany, assignor to Rotring-werke Riepe KG, Hamburg, Fed. Rep. of Germany

Filed May 10, 1988, Ser. No. 192,078
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1987, 3729208
Int. Cl.[4] B26D *5/08*
U.S. Cl. 83—529 **32 Claims**



1. In a cutting device comprising a support roller (8) freely rotatable in both directions and able to absorb the pressure of cutting, a carrier (9) movable in the direction of the longitudinal axis of the support roller (8) that further comprises a cutting tool (26, 27) adapted to be pushed into contact with a portion of a roll of material to be cut that is present over the support roller (8), the improvement which comprises a means for lowering the cutting tool (26, 27) into an operating position and for raising from the operating position that comprises a rotatable eccentric element (14, 34) that is rotated against a returning force from a normal position that corresponds to a raised position of said cutting tool (26, 27), and said eccentric element is coupled with a pivotable straight arm (17) that is adapted to support the cutting tool (26, 27), wherein said means for lowering limits a raising and lowering movement of the cutting tool, and further comprises a leaf spring (21) that is fixed on the arm (17) with a free end braced against the upper end (28) of the cutting tool (26, 27), so that the vertical distance between a front tip and the upper end (28) of the cutting tool (26, 27) is greater than the minimum vertical distance between the support roller (8) and that portion of leaf spring (21), which

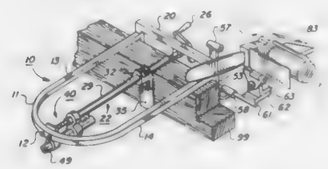
normally rests against on the upper end (28) of the cutting tool (26, 27), when the spring is relaxed because the cutting tool (26, 27) is absent.

4,854,206

ADJUSTABLE TOOL SUPPORTING DEVICE

Donald G. Wilfong, 1017 S. Stoner, Payson, Ariz. 85541

Filed Feb. 3, 1988, Ser. No. 151,709
Int. Cl.[4] B27B *17/00, 27/08*
U.S. Cl. 83—745 10 Claims



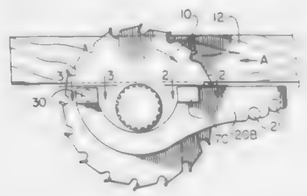
1. An adjustable tool supporting device comprising a frame member; a micro-adjustment assembly mounted to said frame member and coactive therewith to clamp a timber therebetween; and a chain saw mounting assembly attached to said frame member for mounting a chain saw thereto for cutting said timber secured thereby; said chain saw mounting assembly having a J-shaped bracket secured to said frame member and having a hook portion extending outwardly therefrom; a first and second tube member secured to and disposed transversely of said J-shaped bracket member at opposite ends thereof; a first rod member insertable into one of said tube members; a base plate secured to said first rod member and extending outwardly therefrom adjacent one end thereof; an L-shaped member pivotally secured to said base plate; a Y-bracket member pivotally secured to said L-shaped member, said Y-bracket member having an upper end and a lower end and spaced axially aligned cylindrical portions adjacent said upper end; a saw mount plate having a rectangular body portion, a first end, a second end, means for securing a chain saw thereto and a cylindrical portion disposed adjacent said first end for axial alignment with said spaced axially aligned cylindrical portions of said Y-bracket member; and a second rod member axially insertable through all of said axially aligned cylindrical portions to provide a hinge pin therefor.

4,854,207

CIRCULAR SAW BLADE GUIDE AND VIBRATION DAMPER

Eberhard Kirbach, Richmond, and David A. Sykes, Vancouver, both of Canada, assignors to Forintek Canada Corp., Vancouver, Canada

Filed Jan. 13, 1988, Ser. No. 143,190
Int. Cl.[4] B26D *5/00;* B26B *7/00*
U.S. Cl. 83—823 6 Claims



1. A guide assembly for a movable saw blade in a sawing system, comprising:

(a) a pair of guide units;

(b) a first one of said pair of guide units positioned at a location adjacent a first face of the saw blade;

(c) a second one of said pair of guide units positioned to a location adjacent a second face of the saw blade and generally opposite to said first guide unit; and

(d) each of said first and second guide units including:

(i) a guide block having a face engageable with the corresponding face of the blade;

(ii) a guide housing having said guide block reciprocally mounted thereon;

(iii) resilient means urging said guide block on said guide housing in a direction towards the corresponding face of the blade; and

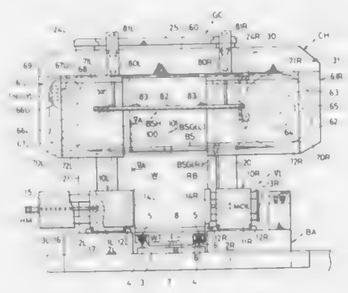
(iv) means limiting reciprocal movement of said guide block in at least one direction of its reciprocal movement.

4,854,208

TWO-WAY BAND SAW MACHINE

Minoru Aoyagi, Hatano, Japan, assignor to Amada Company, Limited, Japan

Filed Jul. 31, 1987, Ser. No. 79,998
Claims priority, application Japan, Jul. 31, 1986, 61-180518
Int. Cl.[4] B23D *53/04;* B26D *1/54*
U.S. Cl. 83—862 11 Claims



10. A two-way band saw machine having a worktable (WT) for mounting a workpiece (W) thereon; a cutting head (CH) for supporting an endless band saw (BS), and a base (BA) for supporting the worktable, which comprises:

(a) means (BSG) for selectively twisting part of endless band saw teeth toward a first cutting direction and a second cutting direction;

(b) means for providing a first relative cutting motion between the cutting head and the worktable in the first cutting direction;

(c) means for providing a second relative cutting motion between the cutting head and the worktable in the second cutting direction;

which further comprises a guide column (GC) comprising:

(a) a main guide post (20) vertically disposed on a base (BA);

(b) a subguide post (21) vertically disposed apart from the main guide post in the right and left direction of the machine;

(c) a pair of rear subguide posts (22R, 22L) arranged a distance apart from the main and subguide post, respectively, in the rearward direction;

(d) a pair of lower link members (23R, 23L) connected between the main guide post and the rear subguide post and between the subguide post and the rear subguide post, respectively, at the lower portion thereof;

(e) a pair of upper link members (24R, 24L) connected between the main guide post and the rear subguide post and between the subguide post and the rear subguide post, respectively, at the upper portion thereof; and

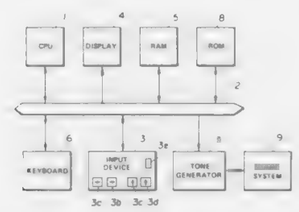
(f) an intermediate link member (25) connected between the two upper link members extending in the right and left direction of the machine.

4,854,209

ELECTRONIC MUSICAL INSTRUMENT WITH KEY SCALING USING MULTIPLE SET POINTS

Akinori Matsubara; Kenichi Tsutsumi; Youji Kaneko; Takashi Akutsu, and Naofumi Tateishi, all of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed May 31, 1988, Ser. No. 200,763
Claims priority, application Japan, Jun. 4, 1987, 62-86157; Apr. 28, 1988, 63-104214
Int. Cl.[4] G10H *1/057, 7/00*
U.S. Cl. 84—1.01 7 Claims



1. A user-programmable key scaling apparatus for use in an electronic musical instrument and for providing a key scaling response over an entire pitch range, comprising:

play input means for supplying a key number which corresponds to a musical note for musical performance;

tone generator means coupled to said play input means for generating a musical sound whose pitch is designated by the key number supplied from said play input means;

reference data input means for selectively designating at least three different key numbers, and for inputting key scaling data corresponding to said at least three different key numbers as reference data of a key scaling operation;

interpolator means coupled to said reference data input means and to said play input means for computing another key scaling data at a key number designated by said play input means other than said at least three different key numbers according to a musical performance by executing an interpolation calculation based on the reference data supplied from said reference data input means and said key number designated by said play input means; and

tone control means coupled to said tone generator means for controlling said tone generator means in accordance with the key scaling data computed by said interpolator means for generating said musical sound having a characteristic determined by said key scaling data corresponding to the key number inputted by said play input means.

4,854,210

DETACHABLE ELECTRIC GUITAR PICK-UP SYSTEM

Nicholas P. Palazzolo, P.O. Box 1926, Lomita, Calif. 90717-5926

Filed Aug. 26, 1987, Ser. No. 89,401
Int. Cl.[4] G10H *3/18;* G10D *1/08*
U.S. Cl. 84—1.15 12 Claims

1. A detachable electric stringed instrument pickup system for an electrical stringed instrument of the type including a body, a neck having a head, a bridge assembly connected to the body, and a plurality of strings positioned between the head and the bridge assembly, that comprises:

a mounting fixture having an opening wherein said mounting fixture is attached to a body of an electrical stringed instrument under a plurality of strings; and

a base plate attached by height adjustment screws to said mounting fixture; and

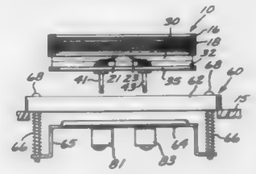
a height adjustment spring biasing said base plate away from said mounting fixture; and

a first connector means for electrical connection mounted on said base plate; and

an assembly mount; and

a second connector means for electrical connection mounted on said assembly mount and detachably pluggable into said first connector means through said opening in said mounting fixture; and

a means for electromagnetic pickup mounted on said assembly mount and having at least one magnet and at least one conducting coil of wire having a beginning and an end, wound around said magnet with the beginning and end of said conducting coil of wire electrically connected to said second connector means.

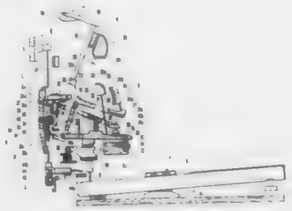


4,854,211

ACTION MECHANISM OF AN UPRIGHT PIANO

Hajime Tanaka, Yamaguchi, and Shiro Saito, Shizuoka, both of Japan, assignors to Tanaka International Co., Ltd., Yamaguchi, Japan

Filed Sep. 8, 1987, Ser. No. 93,707
Claims priority, application Japan, Sep. 9, 1986, 61-212427; Sep. 9, 1986, 61-138348[U]
Int. Cl.[4] G10C *3/18*
U.S. Cl. 84—240 3 Claims



1. An action mechanism of an upright piano for transmitting thrust between a key and a hammer of the piano, said action mechanism comprising:

a piano key pivotally mounted in the piano about a fulcrum point between normal and depressed positions;

an L-shaped hammer pivotally mounted in the piano and movable between a string-striking position at which the hammer contacts a string and a rest position, said L-shaped hammer including a horizontal arm extending generally horizontally when the hammer is at said string-striking position and a vertical arm extending generally vertically when the hammer is at said string-striking position, and said L-shaped hammer biased to said rest position;

a pillar projecting from said piano key:

a wippen pivotally mounted in the piano and disposed between said piano key and said hammer for transmitting thrust from the piano key to the hammer when the hammer is depressed;

a wippen heel extending from said wippen toward said pillar;

a stationary shaft spaced from said wippen heel, said shaft

having a longitudinal axis and mounted in the piano with said longitudinal axis immovably fixed in the piano;

a wippen joint pivotally mounted in the piano via said stationary shaft about the longitudinal axis thereof,

said wippen joint extending between said pillar and said wippen heel, contacing said wippen heel, and pivotable as the piano key is moved from said normal position to said depressed position to transmit thrust from the piano key that pivots the wippen;

a double escapement mechanism supported by said wippen and operatively connected to said L-shaped hammer for transmitting pivotal movement of the wippen to the L-shaped hammer,

said double escapement mechanism including first and second escapement means,

said second escapement means for pivoting said hammer only a first predetermined amount between said rest and said string-striking positions during pivotal movement of said wippen, and said first escapement means for pivoting said hammer only a second predetermined amount between said rest and said string-striking positions after the hammer has been pivoted said first predetermined amount by said second escapement means,

said first and said second predetermined amounts being less by a third pivotal amount than the total pivotal amount which said hammer is pivotal between said rest and said string-striking positions; and

a back-check mechanism for checking the hammer at a temporary position located between said string-striking position and said rest position when said hammer has pivoted from said string-striking position toward said rest position by said third pivotal amount as the piano key moves from said depressed position toward said normal position,

said back-check mechanism including a back-check member and a first resilient wire connected between said back-check member and the horizontal arm of said hammer, a hammer-check member and a second resilient wire connected between said hammer-check member and said wippen,

said back-check member being inclined with respect to the horizontal from said horizontal arm toward the strings of the piano, and said hammer-check member being inclined with respect to the horizontal from said wippen toward the strings of the piano,

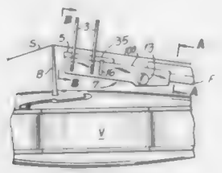
said back-check member engagng said hammer-check member when the hammer has pivoted from said string-striking position toward said rest position by said third pivotal amount as the piano key is moved from said depressed position toward said normal position.

4,854,212

BOWING GUIDE FOR STRINGED INSTRUMENT

Zaida Levin, P.O. Box 242, and Keith Hovis, P.O. Box 216, both of Croton Falls, N.Y. 10519

Filed May 6, 1988, Ser. No. 191,076
Int. Cl.[4] G10D *1/02*
U.S. Cl. 84—283 **7 Claims**



1. A bow guide means for a stringed instrument having a resonating body, a fingerboard, strings and a bridge for supporting the strings above the fingerboard, the bridge being separated from the proximal end of the fingerboard, so as to define a gap between the bridge and the fingerboard, the bow guide means comprising a base and at least one guide piece removably secured to the base; the base comprising an elongated guide platform adapted to extend longitudinally along the gap between the fingerboard and the bridge and positioned intermediate the strings and the resonating body, a pair of clamp arms extending longitudinally outwardly from the guide platform and adapted to engage the sides of the fingerboard at a location adjacent the proximal end of the fingerboard, tightening means adapted to cause the arms to be clamped to the sides of the fingerboard for supporting the guide platform therefrom, and guide piece securing surfaces on the base; the guide piece comprising a substantially planar transparent guide surface member, guide supporting means adapted to support the guide surface member above the strings and base receiving surfaces on the guide supporting means, removably mating with the guide piece securing surfaces, for supporting the guide piece on the base, so that the guide piece extends laterally outwardly from the guide platform, the guide supporting means being of sufficient length such that the guide surface will extend, above and across the strings when the base is clamped to the fingerboard, and the base being adapted to be located wholly between the strings and the resonating body when secured to the fingerboard.

4,854,213

MUSIC STRING

Peter Infeld, Vienna, Austria, assignor to Dr. Thomastik und Mitarbeiter Offene Handelsgesellschaft, Vienna, Austria

Filed Dec. 29, 1988, Ser. No. 291,686
Claims priority, application Austria, Feb. 26, 1988, A500/88
Int. Cl.[4] G10D *3/10*
U.S. Cl. 84—297 S **3 Claims**



1. A musical string consisting of a core composed of aramide fibers and a wound sheath on a core, wherein said sheath is composed of a metal wire.

4,854,214

ILLUMINATED WIND CHIME

Donald J. Lowe, 201 W. Vineyard #183, Oxnard, Calif. 93030

Filed Sep. 9, 1988, Ser. No. 242,224
Int. Cl.[4] G10D *13/08*
U.S. Cl. 84—404 **8 Claims**

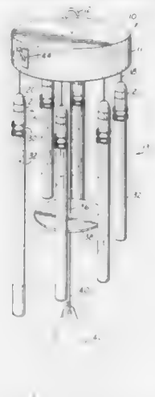
1. An illuminated wind chime apparatus, comprising:

a plurality of resonating members for producing audible sound;

means for loosely supporting said resonating members spaced from one another such that each said resonating member is free to resonate when struck;

means for randomly striking said resonating members when said wind chime apparatus is introduced into a wind current;

a plurality of lights, each said light associated with a respective one of said resonating members; and



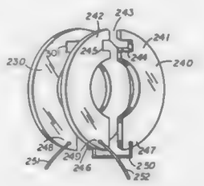
means for illuminating each said light when its respective resonating member is struck.

4,854,215

ELECTROMAGNETIC INJECTOR/RAILGUN

Louis J. Jasper, Jr., Ocean, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 141,365, Dec. 28, 1987, which is a continuation of Ser. No. 910,915, Sep. 22, 1986, abandoned. This application Aug. 15, 1988, Ser. No. 257,370
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 **5 Claims**



1. A device for accelerating a projectile comprising:

first and second rails, parallel spaced a predetermined distance apart;

a conductor connecting said first and second rails;

the first said rail having a gap therethrough dimensioned to closely receive said projectile, said gap severing said frst rail; and

the second said rail having a hole for admitting said projectile, and

means for applying a voltage across said first and second rails so that presence of said projectile in said gap produces acceleration of said projectile from said gap away from said rails;

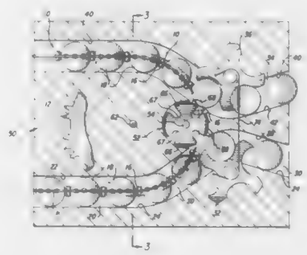
said first and second rails being circular.

4,854,216

AMMUNITION HANDLING APPARATUS

Eugene B. Raymond, Essex Junction, and Edward A. Proulx, Burlington, both of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Jul. 11, 1988, Ser. No. 220,759
Int. Cl.[4] F41D *10/04*
U.S. Cl. 89—33.16 **17 Claims**



1. An ammunition handling apparatus comprising, in combination:

A. a driven chain ladder conveyor having a pair of parallel, spaced chains interconnected by a succession of transverse carrier members spaced apart along a length of said conveyor to accommodate therebetween ammunition rounds for conveyance;

B. a driven set of turnaround sprockets about which said conveyor is trained in a folded loop at a round transfer zone;

C. first and second inner guide surfaces disposed in gapped relation and extending generally in opposite directions away from said round transfer zone;

D. a first outer guide surface situated in opposed, spaced relation with said first inner guide surface to retain the ammunition rounds between said carrier members during conveyance by said conveyor along a first conveyor path, said first outer guide surface situated in opposed, spaced relation to said second inner guide surface to guide ammunition round movement along a first transfer path beyond said round transfer zone from said first conveyor path; and

E. at least one ammunition round control member mounted within said conveyor loop for driven rotation in synchronism with said turnaround sprockets, said member carrying a plurality of angularly spaced, control surfaces cooperating with said first outer guide surface at the gap between said first and second inner guide surfaces to control a transfer of successive ammunition rounds between said first conveyor path and said first transfer path through said round transfer zone.

4,854,217

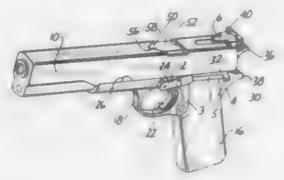
BREECH LOCK FOR FIREARMS

Charles R. Ransom, 134 South Horizon Cir., Prescott, Ariz. 86302

Filed Feb. 22, 1988, Ser. No. 158,783
Int. Cl.[4] F41C *5/06*
U.S. Cl. 89—163 **2 Claims**

1. In a firearm of the type that has elements including a barrel and a slide, the slide and the barrel being relatively movable, the said elements having portions to provide locking engagement between the slide and the barrel, the said portions including a portion carried by one of the said elements and a portion which is a formation of the other element, the said portions being configured whereby to provide locking engagement between the elements so as to lock in a fore-and aft direction and to also lock with respect to relative lateral movements of the elements, one of the elements including a recess

having a shape and the other of the portions having a shape to interfit with said recess, wherein the said recess is of a V-shape



and the said formation is of a pointed configuration to fit snugly into the recess.

4,854,218

PISTON AND CYLINDER UNIT

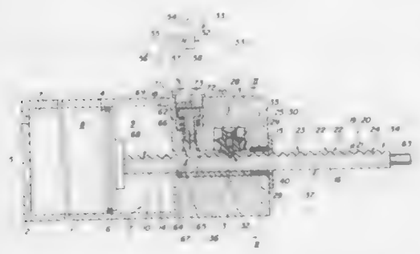
Kurt Stoll, Lenzhalde 72, D-7300 Esslingen, Fed. Rep. of Germany

Filed Oct. 1, 1986, Ser. No. 913,984

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1985, 3535704

Int. Cl.[4] F15B *11/04, 11/12, 15/28, 15/08*

U.S. Cl. 91—1 **24 Claims**



1. In a piston and cylinder unit having a cylinder body comprising a tube with end caps; a piston mounted for controlled axial displacement in the tube; a piston rod extending along part of the tube with a portion of the piston rod mounted to extend through one end cap externally of the body in sealing engagement with the one end cap for axial movement relative thereto with an external end of the portion free for coupling to a power take-off; a rack having a toothed portion extending along the portion of the piston rod from a location external of the body through the one end cap into said tube part; and, a pinion gear in operative engagement with the toothed portion of the rack throughout the working stroke of the piston rod, piston rod movement control means connected with the pinion gear means to connect a supply of pressure fluid to said part of the tube, the pinion gear being mounted inside the cylinder body with the pinion gear in operative engagement with a toothed portion of the rack inside the cylinder body.

4,854,219

OPTICAL CONTROL SYSTEM

Bruce D. Hockaday, Vernon, and Kenneth D. Taylor, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 10, 1988, Ser. No. 204,661

Int. Cl.[4] F15B *13/16;* **F15C** *1/04*

U.S. Cl. 91—367 **5 Claims**

1. An optical control loop for establishing a desired position of an actuator comprising:

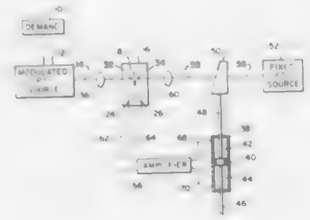
a fluid driven piston actuator, said piston having two sides;

an optical fluidic interface transducer;

a plurality of laminar proportional amplifiers receiving fluid from said optical fluidic interface transducer and delivering fluid pressure to each side of said piston;

demand means for establishing an optical demand signal;

an optical attenuation means connected to said actuator and varying an optical signal in attenuation in proportion to



the position of said actuator, thereby producing an attenuated signal;

summing means for optically summing said optical demand signal and said attenuated signal; and

means for modulating said optical fluidic interface transducer in response to said summed signal.

4,854,220

PULL-TYPE BOOSTER

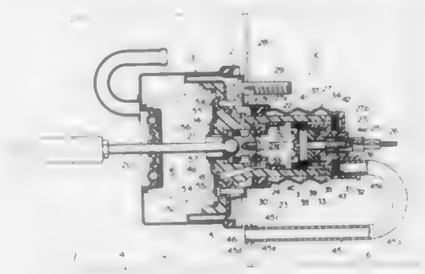
Mamoru Imayoshi, Yokosuka, Japan, assignor to Nippon Air Brake Co., Ltd., Japan

Continuation of Ser. No. 817,902, Jan. 10, 1986, abandoned. This application Jan. 6, 1988, Ser. No. 143,293

Claims priority, application Japan, Jan. 18, 1985, 60-5118[U]

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—376 R **7 Claims**



1. A pull-type booster adapted to be mounted on a partition wall mounted on a body of a vehicle to divide the interior of the body into a first engine and a second passenger room, said booster comprising:

(a) a hollow body having an axis therethrough;

(b) a movable wall received in said hollow body to divide an interior thereof into a negative pressure source and a pressure-variable chamber, said movable wall being movable relative to said body along the axis thereof and including a tubular portion extending outwardly of said body, said tubular portion having an axial internal bore, said tubular portion being adapted to extend through the partition wall into the first room, said movable wall having a passageway communicating said pressure-variable chamber with said internal bore;

(c) a tubular cover member mounted around said tubular portion to cover it, said cover member having an inlet in communication with said internal bore;

(d) an air tube having one end connected to said inlet, the other end of said air tube being adapted to be secured to said partitional wall and to have an opening into said second passenger room whereby air from said second passenger room can enter said air tube through said opening;

(e) an input member extending into said body for movement along the axis thereof;

(f) valve means mounted within said internal bore and connected to said input member for communicating said inlet with said pressure-variable chamber through said internal bore and said passageway to introduce the air in the second room into said pressure-variable chamber via said air tube when said input member is moved in a direction away from said body, thereby moving said movable wall along the axis of said body due to a pressure differential between said negative pressure chamber and said pressure-variable chamber;

(g) an output member operatively connected to said movable wall for movement therewith, said connection occurring by means of a connecting portion comprising a screw fastener capable of making a length adjustment, said connecting portion being located in the interior of a block, a seal ring is fitted around said output member to prevent washing water from intruding into the connecting portion;

(h) said block is of stepped cylindrical shape and is received in a front end portion of said tubular portion.

4,854,221

PILOT-CONTROLLED VALVE FOR BRAKING OR SPEED LIMITATION IN A HYDRAULIC CIRCUIT

Maurice Tardy, Loire, France, assignor to Bennes Marrel, France

Filed Jul. 27, 1983, Ser. No. 517,726

Claims priority, application France, Jul. 27, 1982, 82 13436

Int. Cl.[4] F15B *13/042;* **F16K** *20/00*

U.S. Cl. 91—420 **14 Claims**



1. A braking valve for retaining a load pressure P_1 in a hydraulic circuit comprising:

a pilot-controlled valve for retaining the load pressure P_1 in said hydraulic circuit in response to a pilot-control pressure P_p; and

a pressure reducing valve connected to said hydraulic circuit for providing said pilot-control pressure P_p to said pilot-controlled valve, said pressure reducing valve having means responsive to the sum of said load pressure P_1 and said pilot-control pressure P_p having a predetermined value for controlling the value of said pilot-control pressure P_p as an inverse function of said load pressure P_1.

4,854,222

LOAD COMPENSATED SERVO SYSTEM TO CONTROL FLOW RATE AS A FUNCTION OF COMMAND

Ralph L. Vick, Granada Hills, Calif., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Aug. 22, 1988, Ser. No. 234,979

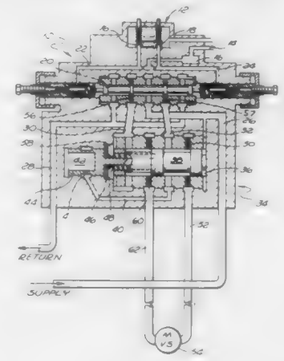
Int. Cl.[4] F15B *13/043*

U.S. Cl. 91—447 **10 Claims**

1. A hydraulic servo system to control flow rate as a function of an input command including a spool-type pilot valve and input means controlling said pilot valve, a spool-type flow control valve having a plurality of lands connected to said pilot valve, a motor and first and second conduits connecting said motor to said flow control valve, a third conduit connected to a source of fluid under high system pressure, to one end of said flow control valve to urge said flow control valve in a first direction, and to said pilot valve;

a fourth conduit connecting said pilot valve with a low pressure source;

fifth and sixth conduits connecting said pilot valve with chambers between lands of said flow control valve:



characterized in that said system includes a shuttle valve member including an extension capable of urging said flow control valve in a direction opposite to the direction it is urged by said high system pressure, a chamber on the side of said shuttle valve member opposite said extension and first passage means connecting said shuttle valve chamber with said fifth conduit, resilient means located between said shuttle valve and said flow control valve, and second passage means connecting said sixth conduit with the opposite end of said flow control valve whereby said flow control valve is exposed to the difference between system pressure and the control pressure requested by said pilot valve.

4,854,223

PNEUMATIC OR HYDRAULIC DRIVE FOR OPENING AND CLOSING OF DOORS

Martin Fink, Waidhofen a.d. Ybbs, Austria, assignor to IFE Industrie-Einrichtungen Fertigungs-Aktiengesellschaft, Austria

PCT No. PCT/AT87/00002, § 371 Date Nov. 9, 1987, § 102(e) Date Nov. 9, 1987, PCT Pub. No. WO87/04483, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 20, 1987, Ser. No. 103,549

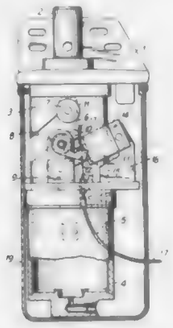
Claims priority, application Austria, Jan. 20, 1986, A125/86

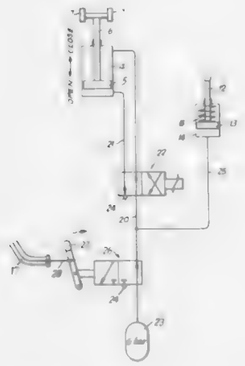
Int. Cl.[4] F15B *15/26;* **E05F** *15/00*

U.S. Cl. 92—17 **3 Claims**

1. A device for securing a door in a closed position, the door being supported by a spindle secured in axial direction and the door being connected to a pneumatic or hydraulic drive for opening and closing the door, the drive comprising a double-acting piston and a pressure line for supplying a pressure medium, the pressure medium acting on the piston, a first piston rod and a helical gear assembly for converting the linear motion of the piston into a rotary motion of the spindle, a blocking lever mounted so as to be pivotable about a stationary axis, the blocking lever being movable between a closed end position and an open end position, a member connected to the piston being movable along a path of movement, the blocking lever being in the path of movement of the member in the open end position thereof and the blocking lever being away from the

path of movement of the member in the closed end position thereof, a single-acting power cylinder with a second piston rod, the single-acting power cylinder being connected exclusively to the pressure line of the drive, the blocking lever being





connected to the second piston rod in an articulated manner, the blocking lever being movable in the open end position against the force of a spring when pressure medium is admitted to the single-acting power cylinder.

4,854,224

AIR CLEANING APPARATUS AND CONSTRUCTION OF CLEAN ROOM WITH THE SAME

Shoji Hirayama, No. 3-12-14, Chuorinkan, Yamato-Shi, Kanagawa-Ken, Japan

Division of Ser. No. 132,670, Dec. 10, 1987, which is a continuation of Ser. No. 867,623, May 27, 1986, abandoned, which is a continuation of Ser. No. 778,730, Sep. 20, 1985, abandoned, which is a continuation of Ser. No. 506,541, Jun. 21, 1983, abandoned. This application Jun. 14, 1988, Ser. No. 206,346

The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.

Int. Cl.[4] F24F *7/00*

U.S. Cl. 98—31.5 5 Claims

1. A method for obtaining a clean room with at least one air cleaning apparatus comprising the steps of:

fixedly securing a columnar body along a peripheral wall of said room between a floor and ceiling of said room, said columnar body defining an elongated upright duct having an air outlet arranged adjacent the ceiling and an air inlet port spaced from and facing the floor of the room;

extending a transverse duct having side and lower faces from the body completely across said room along the ceiling of the room to another peripheral wall, said transverse duct fluidly communicating with the air outlet of said upright duct of said columnar body;

drawing air into the air inlet port and directing air toward said air outlet;

uniformly cleaning the air by passing the air through an air cleaning dust collector arranged at a predetermined position between said air inlet port and said air outlet;



providing a continuous outlet of clean air by directing the air through a linear length of said transverse duct to air diffuser ports formed in said transverse duct substantially over the entire surfaces the lower face and at least one side face of said transverse duct for the linear length of said duct, and

feeding the clean air from said air diffuser ports into the room to be cleaned in sufficient quantities to clean same.

4,854,225

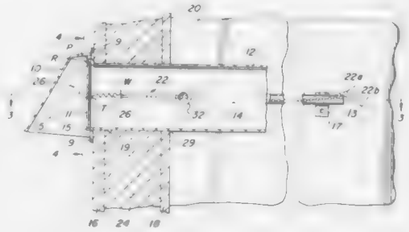
VENTING CONTROL DEVICE

Richard J. Liebel, 343 Norman Ave., Hatfield, Pa. 19440

Filed Apr. 4, 1988, Ser. No. 177,051

Int. Cl.[4] F23L *17/02*

U.S. Cl. 98—116 7 Claims



1. A system for expelling a fluid via a blower and including a collection means for directing said fluid into a venting means having a hinged closure means into the atmosphere, the improvement comprising:

(a) means in a form of a relatively long tube and having a first and second terminus connected into an opening provided by said fluid collection means;

(b) retention means formed in said tube means at its first terminus;

(c) a single spring means having a specified spring rate directly connected to said hinged closure means;

(d) means positioned internally said tube means adapted to attach to said retention means and connected to said hinged closure means through said spring means, wherein said internally positioned means and said tube means comprise a low friction control means for opening said hinged means after said internally positioned means is released from said retention to cause said spring means to assume an unstretched state, and for allowing a facile expelling of said fluid into the atmosphere upon impinging upon the hinged means, and

(e) said internally positioned means being pulled against said spring means for placing said last mentioned means under tension by stretching a specified amount to obtain a sealing action of said hinged closure means against said venting means, and retaining said sealing action by engagement of said internally positioned means with said retention means; and

(f) said hinged closure means being partially opened to the atmosphere by an additional second stretching of said spring means due to an increase in fluid back pressure caused by gases and unburned hydrocarbons in said collection means; and

(g) said second stretching of said spring means and partial opening acting as a safety enhancement.

4,854,226

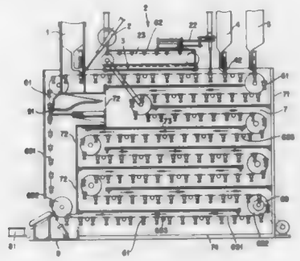
CONTINUOUS PROCESSING MACHINES FOR BAKING BUNS

Tasi A. Chen, 201 Sec. 3 Ba-Dar Road, Taipei, Taiwan

Filed Apr. 7, 1988, Ser. No. 178,984

Int. Cl.[4] A47J *37/00*

U.S. Cl. 99—353 9 Claims



1. A continuous processing machine for baking buns comprising:

(a) feed means for feeding firm paste into a plurality of baking molds to form paste covers, said baking molds having recesses formed therein for insert of said firm paste;

(b) handling means for inserting and removing upper molds from said baking molds prior to and subsequent to said baking molds passing through a heating chamber for heating said paste covers into crusts, said handling means including setting arm means for removing said upper molds from an endless conveyor and inserting said upper molds into said baking molds prior to passage through said heating chamber, and picking arms means for removing said upper molds from said baking molds and positioning said upper molds on said endless conveyor;

(c) feed means for feeding bun fillings into said crusts of said buns subsequent to passage of said baking molds through said heating chamber;

(d) supply means located adjacent said feed means for providing said filled crusts of said buns with conjugate upper covers to complete said buns;

(e) bake means for baking said completed buns, said bake means having baking heaters and isolator plates located therein;

(f) extruding means located adjacent said bake means for extruding baked buns from said baking molds; and,

(g) conveyor means for continuously and sequentially displacing said baking molds through said feed means, said heating chamber, said handling means, said feed means, said supply means, said bake means and said extruding means.

4,854,227

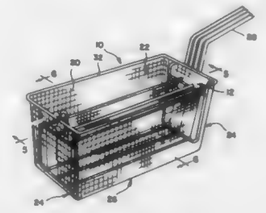
APPARATUS FOR FRYING FOOD PRODUCTS

R. Nelson Koopman, Hinsdale, Ill., assignor to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Nov. 18, 1987, Ser. No. 121,988

Int. Cl.[4] A47J *37/12*

U.S. Cl. 99—416 1 Claim



1. An apparatus for cooking in a heated cooking fluid a plurality of moisture containing chicken nuggets having at least one minor dimension comprising:

a fry basket having an open top and defined by side wire walls and a flat bottom wire portion;

a plurality of compartments defined by generally vertical, spaced apart interior wire walls in said fry basket and said side wire walls, said spacing between said wire walls is from about 0.575 to about 1.5 inches for orienting the minor dimension of said chicken nuggets generally horizontally and for spacing said chicken nuggets horizontally close ot each other to provide generally vertical convection channels for convection circulation of said cooking fluid adjacent and in contact with said chicken nuggets, whereby vapor escaping from said chicken nuggets passes into said vertical convection channels, augmenting upward vertical convection of said cooking fluid through said vertical convection channels adjacent and in contact with said chicken nuggets; and

said side wire walls extending above said interior wire walls to provide a holding area allowing said chicken nuggets to be placed along the top of said interior wire walls.

4,854,228

DEVICE FOR THE MANUFACTURE OF FOOD PRODUCTS, PARTICULARLY CONFECTIONERY WAFER PRODUCTS

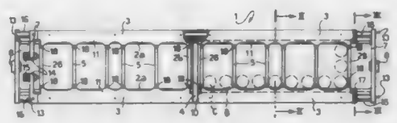
Pietro Ferrero, Brussels, Belgium, assignor to Ferrero S.p.A., Alba, Italy

Filed Oct. 16, 1987, Ser. No. 109,151

Claims priority, application Italy, Oct. 29, 1986, 67814 A/86

Int. Cl.[4] A21B *5/02;* A21C *11/10;* A23G *3/20*

U.S. Cl. 99—450.6 12 Claims



1. A device for the manufacture of food products made by joining together first and second wafers, in which at least the first wafer includes a perimeter portion bordering a core portion, the core portion containing cells opening onto one face of the wafer and generally closed on an other face of the wafer, comprising:

(a) a frame means for receiving and holding said wafers, the frame means comprising frame members extending only along the perimeter portion of the wafers and thus defin-

ing an empty central sector corresponding to and for receiving the core portion of the wafers; and

(b) a plurality of clamping means for selectively engaging only a perimeter portion of the wafers in order to secure the same to the frame members, said clamping means being pivoted relative to the frame members between a closed position in which the clamping means engage a perimeter portion of the wafers to secure the same to the frame members and an open position in which the clamping means are disengaged with the wafers thereby allowing the wafers to be inserted in and removed from said frame means.

4,854,229

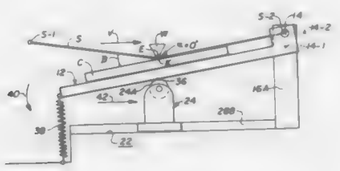
SCREEN PRINTER APPARATUS

Eustathios Vassiliou, Newark, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Jun. 10, 1987, Ser. No. 60,333

Int. Cl.[4] B41F *15/14, 15/42*

U.S. Cl. 101—123 **15 Claims**



1. In a screen printer apparatus for applying a thick film composition onto the surface of a substrate, the screen printer apparatus being of the type comprising a screen having a pattern of open and closed areas thereon, a wiper applicator, and an actuator for moving the applicator across the screen from a first end toward a second end, wherein the improvement comprises:

a support plate for carrying the substrate, the plate being pivotally mounted about a pivot axis;

means for biasing the plate for pivotal movement about the pivot axis;

a brace for contacting the plate along a line of abutting support spaced from the pivot axis, the brace being movable with respect to the plate; and

means for moving the brace with respect to the plate in synchronism with the movement of the applicator across the screen, whereby the plate pivots about the pivot axis such that a portion of the screen forwardly of the applicator is maintained in predetermined close proximity to the surface of the substrate throughout the movement of the applicator thereby to minimize migration of the composition under the closed areas of the pattern.

4,854,230

SCREEN PRINTING APPARATUS

Kenichi Niki; Tetsuro Makita, and Hayato Takasago, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 939,136, Dec. 8, 1986, abandoned. This application May 11, 1988, Ser. No. 193,222

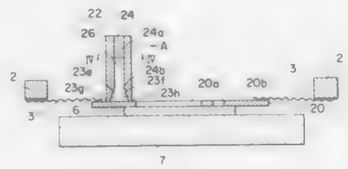
Claims priority, application Japan, Dec. 24, 1985, 60-289397

Int. Cl.[4] B41L *13/18;* **B05C** *1/00*

U.S. Cl. 101—123 **12 Claims**

1. A screen printing apparatus comprising a substantially flat screen having at least one opening forming a desired print pattern and having a lower surface being positioned adjacent to a substrate to be printed, wherein the screen is fixed relative to the substrate, and

a non flexible squeegee having a cavity formed therein for containing a liquid material to be printed on the substrate, the cavity being defined by surfaces of surrounding non-flexible walls extending generally vertically and extending to a lower extremity of the squeegee, said nonflexible walls being in direct contact with an upper surface of the screen,



whereby while the squeegee travels with respect to the screen and the substrate, the material to be printed flows from the cavity into the at least one opening of the screen, and thereby onto the substrate.

4,854,231

SHEET-FED ROTARY PRINTING PRESSES FOR MULTI-COLOR PRINTING

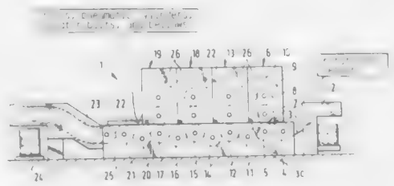
Hans-Georg Jahn, Wiesenbach, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Filed Apr. 4, 1988, Ser. No. 177,584

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1987, 3712703

Int. Cl.[4] B41F *5/16*

U.S. Cl. 101—177 **21 Claims**



3. A printing press for multicolor printing, said printing press comprising:

a plurality of printing units arranged in series, each of said printing units comprising a plate cylinder, a blanket cylinder and an inking mechanism;

a base frame having mounted therein a plurality of impression cylinders with a transfer drum between each pair of impression cylinders, said plurality of impression cylinders being greater in number than said plurality of printing units said base frame having a longitudinal direction;

each of said plurality of printing units being mounted in a printing unit frame;

said printing unit frames each having a width, said widths of said printing unit frames being disposed along said longitudinal direction of said base frame; and

each of said printing unit frame being displaceable along said longitudinal direction of said base frame such that each of said printing units may be selectively disposed adjacent more than one of said plurality of impression cylinders for providing a space between at least two of said printing units, said base frame having a length in said longitudinal direction for providing said space between at least two of said printing units, said space being located above one of said impression cylinders having a width which is substantially similar to the width of a printing unit frame.

4,854,232

METHOD AND APPARATUS FOR MULTI-COLOR PRINTING

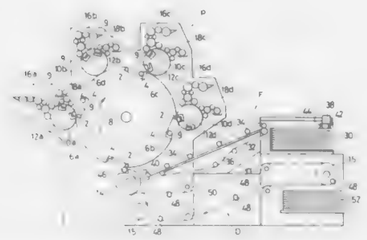
Osamu Oda, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co. Ltd., Japan

Filed Oct. 9, 1987, Ser. No. 107,264

Claims priority, application Japan, Oct. 13, 1986, 61-241398; Oct. 17, 1986, 61-245189; Feb. 25, 1987, 62-40398; Feb. 25, 1987, 62-40399

Int. Cl.[4] B41M *1/14*

U.S. Cl. 101—211 **7 Claims**



1. A method of multi-color offset printing wherein:

each of a plurality of blankets is contacted with respective corresponding color printing plates so as to transfer a different, respectively-colored ink to each of said blankets, said transferred ink on said blankets intended to collectively form a complete image on printing paper, and said blankets intended to be successively contacted to printing paper in a predetermined order;

each of said blankets is contacted the respective printing plates the colors of which are intended to be printed preceding that of each of said blankets, so that color ink of the respective preceding color printing plates is transferred to each of said blankets so as to reduce the tendency of a previously printed ink from adhering to each blanket which is thus provided with the same color ink; and

said blankets are successively pressed in a predetermined order onto a sheet of printing paper to transfer the ink on each of said blankets to the printing paper.

4,854,233

PROTECTIVE DEVICE ON ROTARY PRINTING PRESSES

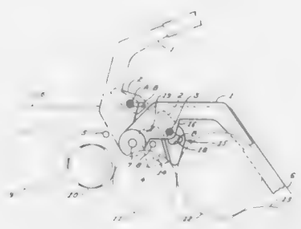
Janko Despot, and Ulrich Krober, both of Offenbach am Main, Fed. Rep. of Germany, assignors to M.A.N. Roland, Offenbach am Main, Fed. Rep. of Germany

Filed Jun. 2, 1986, Ser. No. 869,320

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1985, 3519648

Int. Cl.[4] B41F *5/00*

U.S. Cl. 101—216 **5 Claims**



1. A protective device for a rotary printing press comprising

a protective cover hingedly connected to said press for pivotal movement between open and closed positions,

a mechanical interlock mechanism associated with said protective cover for releasably maintaining said cover in an open position,

said interlock mechanism including a pawl fixed to said press and an interlock element carried by said cover,

pivot means on said cover upon which said interlock element is supported,

said pawl being formed with an interlock element receiving recess, and

means for shifting the center of gravity of said interlock element relative to said pivot means in response to raising and lowering of said cover to permit automatic positioning of said interlock element for engagement with said pawl recess when said cover is to be maintained in an open condition and to facilitate automatic disengagement of said interlock element from said pawl recess when said cover is to be closed, said interlock element being formed with a slot for receiving said pivot means, said pivot means being movable between opposite ends of said slot as an incident to raising and lowering said cover, the center of gravity of said interlock element being disposed on opposite sides of said pivot means as said pivot means is moved from one end of said slot to the other.

4,854,234

INK FOUNTAIN CLOSURE SYSTEM

David C. Emery, York, Me.; David G. Field, and Derek C. Leck, both of Dover, N.H., assignors to Harris Graphics Corporation, Dover, N.H.

Filed Apr. 4, 1988, Ser. No. 177,060

Int. Cl.[4] B41F *31/06*

U.S. Cl. 101—364 **9 Claims**



1. A fluid metering apparatus comprising:

a fountain roll rotatable relative to a supply of fluid;

means for metering fluid on said fountain roll as said fountain roll rotates, said metering means including a fountain blade adjacent to said fountain roll and defining a gap between said blade and said roll;

means for closing completely the gap between said blade and said roll, comprising an inflatable bladder operable when inflated to force said blade against said roll;

at least one ink key means for moving said blade to vary the gap between said blade and said roll, said ink key means being settable at a plurality of settings; and

at least one actuating lever interposed between said ink key means and said blade and operable by said ink key means to move said blade;

said actuating lever also being operable by said inflatable bladder, independently of said ink key means, to move said blade against said roll to close completely the gap between said blade and said roll, regardless of and without changing the setting of said ink key means.

4,854,235

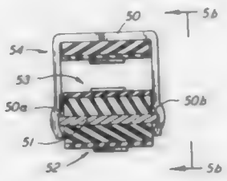
PORTABLE HAND-OPERATED STAMPS

Donald A. Lyon, R.D. 4, Box 2A, Norwich, N.Y. 13815

Continuation of Ser. No. 798,808, Nov. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 627,686, Jul. 5, 1984, abandoned. This application Aug. 24, 1987, Ser. No. 88,708

Int. Cl.[4] B41F *27/02;* B41K *1/56*

U.S. Cl. 101—389.1 16 Claims



1. A portable hand-operated stamp assembly, comprising a hand-grippable handle member of magnetically permeable metal and a pair of stops, extending parallel to each other, said handle member having a generally flat receiving surface, said stops extending away from said handle member beyond said receiving surface; and a plurality of magnetic rubber strip assemblies adapted to magnetically and detachably adhere to said receiving surface of said handle member at positions fixed in a first dimension by said stops, each of said magnetic rubber strip assemblies comprising a flexible sheet of non-magnetized rubber affixed to a flexible sheet of magnetized rubber, each said sheet of non-magnetized rubber carrying raised printing indicia, each of said stops having a surface extending substantially perpendicularly away from said receiving surface, whereby said magnetic rubber strip assemblies may be moved toward and away from said receiving surface in a direction substantially perpendicular to said receiving surface, said hand-grippable handle member comprising a generally U-shaped member of magnetically attractable material having a pair of spaced-apart legs, and a plate of magnetically attractable material extended between said legs at a position intermediate the ends of said legs, said U-shaped member and said plate forming a rectangular cavity for storing at least one of said magnetic strip assemblies.

4,854,236

TRANSMISSION SYSTEM FOR FORMING CYCLICAL MOTION FROM ROTATIONAL MOTION PRINTING PRESS WITH COUNTERBALANCE FOR TORQUE FLUCTUATION OF GRIPPER FEED DRUM

Norbert Thünker, Groossachsen; Nikolaus Spiegel, Walldorf; Roland Lorenz, Heidelberg, and Werner Joos, Linkenheim, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

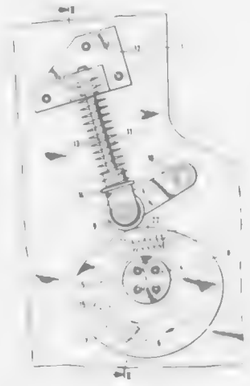
Filed Jul. 31, 1987, Ser. No. 80,426

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1986, 3626185

Int. Cl.[4] B41F *21/10*

U.S. Cl. 101—411 5 Claims

1. Sheet-fed printing press having a register feed drum having sheet grippers thereon including a transmission system for forming cyclical motion from rotational motion so as to produce movement of said grippers located on the register feed drum including a device having a rotation part and at least one control lever set into cyclical motion by rotational motion of the rotating part, said one control lever being connected to said grippers, the one control lever and the rotating part being in cooperative engagement whereby a varying force resulting from nonuniformly acting forces and displaced masses of said grippers is applied to the control lever producing a torque fluctuation in the rotational motion, comprising another device for producing cyclical motion, said other device having a rotary cam in operative engagement with the rotating part, so as to rotate therewith, another control lever having a cam roller engaging with and rolling on said rotary cam and compressive spring means abutting a frame of the printing press and applying a force to and through said cam roller to the rotating part so as to counterbalance said acting forces and displaced masses of said grippers and compensate for the torque fluctuation, wherein the first-mentioned device further includes a cam disposed on the rotating part, and the one



control lever has a roller in rolling contact with the cam of the first-mentioned device, and wherein said rotary cam is mounted on the rotating part, said cam roller being located on said other control lever, and wherein said compressive spring means applies a force to said roller of said other control lever so that a torque acting via said rotary cam on the rotating part is opposite in phase to a torque acting via the cam of the first-mentioned device disposed on the rotating part.

4,854,237

PRINTING MACHINE CYLINDER UNDERLAY HOLDING ARRANGEMENT

Klaus Theilacker, Friedberg, Fed. Rep. of Germany, assignor to MAN - Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 27, 1987, Ser. No. 31,687

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1986, 3614541

Int. Cl.[4] B41F *27/02*

U.S. Cl. 101—415.1 5 Claims



1. In a printing machine,

a cylinder (2, 16, 27) formed with an axial groove (5, 17, 28), and including a ferromagnetic surface located in the groove,

an underlay holding arrangement to secure an underlay (4, 19, 30) of non-magnetic material beneath a printing surface cover (3,18, 29) placed on the cylinder over the underlay.

said underlay having an angled edge portion (6,22,32) adapted for attachment over a surface (1,15, 26) of the printing cylinder (2, 16, 27) of the printing machine,

said arrangement comprising

magnetic strip means (7, 8, 23, 24, 33) engaging said angled edge portion of the non-magnetic underlay (4, 19, 30) and being magnetically attached to a side wall (9,20, 34) of the groove (5, 17, 28) including said ferrogmagnetic surface and located within the axial groove (5, 17, 28); and

wherein the magnetic strip means comprises a first strip element (7, 23) and a second strip element (8, 24),

said edge portion (6, 22, 32) of the underlay being retained between said first and second magnetic strip elements, and clamped by interacting magnetic forces of said first and second strip elements;

and wherein one of said magnetic strips is in engagement with said ferromagnetic surface and magnetically retained thereon.

4,854,238

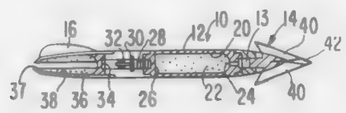
SHARK PROJECTILE

Sam A. Vaice, 752 Gettysburg Way, Gilroy, Calif. 95020

Filed May 11, 1988, Ser. No. 192,455

Int. Cl.[4] F41C *9/06;* A01K *81/00;* F42B *15/24*

U.S. Cl. 102—371 7 Claims



1. A shark projectile comprising:

a tubular body having a front end and a rear end;

an explosive head having pointed segments at the front end of the body, there being means on the body for pivotally mounting the segments on the body to move from a pointed configuration with the head segments adjacent to each other to an expanded configuration with the segments extending away from each other, said segments being movable into said expanded configuration when the head penetrates a shark, whereby the segments keep the body from passing through the shark;

means defining a first chamber in the body, said first chamber containing a searing agent to sear the wound in a shark caused by the head entering the shark to thereby eliminate bleeding of the wound, said first chamber having means for opening the first chamber to release the searing agent therefrom when the head enters a shark;

means defining a second chamber in the body, said second chamber including a propellant and a rear exit nozzle near the rear end of the body; and

means coupled with the body for releasing the propellant in a gaseous form to cause the body to be launched and to move toward a target.

4,854,239

SELF-STERILIZING SAFE-ARM DEVICE WITH ARM/FIRE FEATURE

Peter H. Van Sloun, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 12, 1988, Ser. No. 256,445

Int. Cl.[4] F42B *23/26;* F42C *15/14, 19/00*

U.S. Cl. 102—426 19 Claims

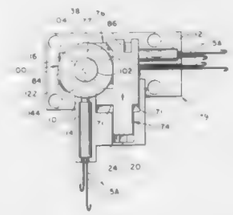
1. Apparatus for a portable munition comprising:

(a) a rotor having a circular shape and opposed pivot means extending from the center thereof and having a pair of aligned connected retaining holes extending completely through said rotor, in a plane perpendicular to a pivot axis through the pivot means; with said motor having a bar attached thereto as a portion containing a pivot axis with the bar extending radially outward from the pivot axis and in a plane perpendicular to the pivot axis;

(b) a detonator and firing pin mounted within the aligned connected retaining holes in said rotor with the retaining holes being dimensioned to fit said detonator and to slideably fit said firing pin respectively;

(c) an enclosure having circular shaped interior rotor space oriented and dimensioned to accommodate said rotor, said rotor being pivotably mounted therein by the opposed pivot means; and having interior base space interconnected to the rotor space adjacent to the axis of said rotor containing the attached bar; and having an outside opening through a wall of said enclosure adjacent said rotor;

(d) a cam located within the base space having first guide means within the base space relative to said enclosure with the first guide means and the cam dimensioned located and arranged such that said cam can be guided along a linear first guide path by the first guide means, which is located in a guide plane perpendicularly oriented to the pivot axis, with the first guide path extending from a first location which is more distant from the pivot axis than said rotor, thence along a line adjacent to the pivot axis and near said rotor to a second location, which is beyond said rotor; with the first guide path, said cam, said rotor and the bar dimensioned and located such that as said cam moves from said first location to said second location, said cam will strike the bar only, and cause said rotor to rotate from a first angular position to a second angular position relative to said enclosing means; and with the retaining holes within said rotor oriented with respect to said en-



closing means such that with said rotor located in said second angular position, relative to said enclosing means, said retaining holes are oriented generally parallel to said first guide path with the opening for said firing pin retaining hole facing in the general direction of the first position of the first guide path;

(e) first rotor stop means comprising an extension from said enclosure within said base space arranged to prevent said rotor from rotating beyond the second angular position with respect to said enclosure;

(f) first actuator means located within the base space and attached to said enclosure adjacent to said cam, when said cam is in said first position in said first guide path; and first actuator means arranged such that when activated said first actuator means can drive said cam along said first guide path from said first position to said second position;

(g) a tang extending from said cam along a line generally parallel to said pivot axis and directed toward said rotor, with said tang offset from said first guide path toward said pivot axis; having said tang, said cam, said bar, said first guide path, and said firing pin dimensioned and located such that, as said cam traverses the first guide path from the first position to the second position said tang will be carried along a tang path which is parallel to the first guide path but which will intersect the pivot axis, such that after said cam has struck the bar and rotated said rotor to the second angular position; said tang will then strike the end of said firing means facing towards the first position of the first guide path and drive said firing pin against and explode said detonator;

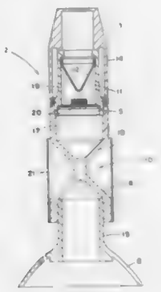
(h) said enclosure outside opening being aligned with said detonator when said rotor is located in the second angular position;
(i) explosive means located outside the enclosure adjacent the outside opening arranged such that, when said rotor is located in the second angular position, a detonator explosion will cause said explosive means to explode.

4,854,240

TWO-STAGE SHAPED CHARGE PROJECTILE

Eitan Hirsch, Netanya; Alexander Gutmann, Raanana; Ana Schwartz, Ramat Hasharon; Eliezer Goren, Even Yehuda; Nikolai Perimuter, Netanya, and Reuven Tal, Kiron, all of Israel, assignors to The State of Israel, Ministry of Defence, Israel Military Industries, Israel

Filed Dec. 21, 1987, Ser. No. 136,095
Claims priority, application Israel, Dec. 25, 1986, 81097
Int. Cl.[4] F42B *13/12*
U.S. Cl. 102—476 **8 Claims**



1. A two-staged shaped charge projectile, comprising
an aft body section holding an aft, principal shaped charge,
an aligned head body section holding a fore, secondary shaped charge that is smaller than said principal shaped charge,
an initiator-fuse assembly adapted to initiate said aft and fore shaped charges sequentially such that the fore shaped charge is first initiated and the aft shaped charge is initiated after a predetermined time delay, and
means for activating said initiator-fuse assembly at a predetermined stand-off of the projectile from a target,
the improvement comprising
connector means provided for connecting said aft and fore body sections and holding the same at a desired distance from one another,
said connector means comprising a substantially X-profiled double cone structure with fore and aft conical chambers serving as guard members,
said aft guard member being designed for shielding the aft shaped charge from rearward expanding combustion gases and rearward flying debris, while said fore guard member is designed for being burst by the rearward expanding propellant gases of the detonated for shaped charge,
whereby said gases and debris escape to the surrounding atmosphere.

4,854,241

SPIN STABILIZED CARRIER PROJECTILE

Reinhard Synofzik, Juchen; Rolf Hellwig, Neuss, and Klaus D. Karius, Juchen, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 16, 1987, Ser. No. 135,509
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, 3643291
Int. Cl.[4] F42B *13/50*
U.S. Cl. 102—489 **11 Claims**



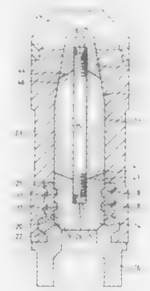
1. A spin stabilized carrier projectile comprising:
a projectile body having a rear end;
at least one submunition projectile disposed in, and ejectable from, said projectile body; and
a projectile bottom disposed at, and ejectable from, said rear end of said projectile body, said projectile bottom having a side surface facing said submunition projectile and containing a recess, and a folded, expandable deceleration means for reducing the velocity and spin of said projectile bottom upon ejection from said projectile body, said deceleration means including a sheet of material fastened in said recess for producing air resistance, and said deceleration means being deployable from a folded condition to an expanded condition with the aid of rotation of said projectile bottom.

4,854,242

SABOT PROJECTILE CONTAINING A PROJECTILE CORE AND A SABOT JACKET

Harald Katzmann, Neuenhof, Switzerland, assignor to Wekzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed May 9, 1988, Ser. No. 191,694
Claims priority, application Switzerland, May 21, 1987, 01 972/87
Int. Cl.[4] F42B *13/00, 13/16*
U.S. Cl. 102—522 **6 Claims**



1. A sabot projectile, comprising:
a projectile core;
a sabot jacket surrounding the projectile core;
said sabot jacket having a front portion and a rear portion;
a sabot tail secured at the sabot jacket at the rear portion thereof;
a sabot hood member secured at the sabot jacket at the front portion thereof;
the projectile core comprising three components fabricated from different materials;
one of said three components constituting the intermediate component of the projectile core;
said intermediate component being made of a material which is frangible upon impact;
a tie rod extending through said intermediate component for interconnecting said three components of said projectile core;
prestressing means cooperating with said tie rod for prestressing said frangible material and thereby preventing premature fracturing of said frangible material of said intermediate component in the assembled state of said projectile core;
the other two of said three components respectively constituting a core nose and a core tail;
said intermediate component comprising two substantially conically shaped end faces, each of which possess a cone angle α smaller than 180°;
said core nose bearing against one of said two substantially conically shaped end faces and said core tail bearing against the other one of said two substantially conically shaped end faces;
said core nose comprising a substantially conically shaped end face which possesses a cone angle β larger than 180° and bearing against said one substantially conically shaped end face of said intermediate component;
said core tail comprising a substantially conically shaped end face which possesses a cone angle β larger than 180° and bearing against said other substantially conically shaped end face of said intermediate component; and
said cone angle α and said cone angle β complementing one another to form 360°.

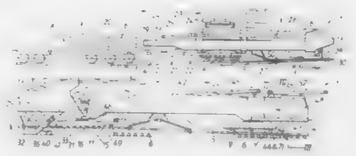
6. A projectile core structure, comprising:
projectile core means;
the projectile core means comprising three components;
one of said three components constituting the intermediate component of the projectile core;
said intermediate component being made of a material which is frangible upon impact;
a tie rod extending through said intermediate component for interconnecting said three components of said projectile core means;
prestressing means cooperating with said tie rod for prestressing said frangible material and thereby preventing premature fracturing of said frangible material of said intermediate component in the assembled state of said projectile core means;
the other two of said three components respectively constituting a core nose and a core tail;
said intermediate component comprising two substantially conically shaped end faces, each of which possess a cone angle α smaller than 180° measured through the intermediate component;
said core nose bearing against one of said two substantially conically shaped end faces and said core tail bearing against the other one of said two substantially conically shaped end faces;
said core nose comprising a substantially conically shaped end face which possesses a cone angle β larger than 180° measured through the core nose and bearing against said one substantially conically shaped end face of said intermediate component;
said core tail comprising a substantially conically shaped end face which possesses a cone angle β larger than 180° measured through the core tail and bearing against said other substantially conically shaped end face of said intermediate component; and
said cone angle α and said cone angle β complementing one another to form 360°.

4,854,243

MOBILE TRACK RENEWAL MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed May 26, 1987, Ser. No. 54,182
Claims priority, application European Pat. Off., Jul. 25, 1986, 86 890 218.0
Int. Cl.[4] E01B *27/11*
U.S. Cl. 104—7.3 **16 Claims**



1. A mobile machine comprising an elongated, bridge-like machine frame mounted on a track consisting of two rails fastened to successive ties supported on a ballast bed for mobility in an operating direction for continuously renewing the track by replacing the rails and ties of the existing track by new rails and ties, the machine frame comprising
(a) a front machine frame part having a front end and a rear end,
(b) a rear machine frame part having a front end and a rear end, the rear end of the front machine frame part and the front end of the rear machine frame part facing each other,
(c) a front undercarriage supporting the front end of the front machine frame part on the track,
(d) a rear undercarriage supporting the rear end of the rear machine frame part on the track,
(e) coupling means pivotally connecting the facing ends of the machine frame parts at lower ends thereof close to the ballast bed,
(f) hydraulic pivoting and clocking drive means interconnecting the facing ends of the machine frame parts an effective to spread the facing machine frame part ends apart at upper ends thereof remote from the ballast bed in a horizontal direction whereby the lower ends of the facing machine frame part ends are pivoted about the coupling means and raised in a vertical direction, and the raised facing machine frame part ends are blocked in their raised position,
(g) an intermediate undercarriage supporting the facing machine frame part ends on the track and being raised off the track when the lower ends of the facing machine frame part ends are pivoted about the coupling means and raised in a vertical direction,
(h) means mounted on the elongated, bridge-like machine frame between the front and rear undercarriages for
(1) lifting the rails of the existing track off the ballast bed and spreading the lifted rails apart,
(2) lifting the ties of the existing track off the ballast bed whereby residual mounds of ballast remain on the ballast bed between areas thereof where the lifted ties were embedded in the ballast bed,
(3) planing the ballast bed from which the ties have been lifted by removing the residual mounds of ballast, the ballast bed planing means being constituted by a ballast excavating and planing chain arranged to excavated the residual ballast mounds and to smooth the ballast bed,
(4) laying the new ties on the smooth ballast bed, and
(5) spreading and laying the new rails on the new ties,
(i) a ballast conveyor means mounted on the rear machine fame part, the ballast conveyor means having an input end facing the ballast excavating and planing chain for receiving the excavated ballast therefrom, and an output end for discharging the excavated ballast, and
(j) a ballast redistributing device arranged behind the rear undercarriage for receiving the excavated ballast discharged from the output end of the ballast conveyor means and for

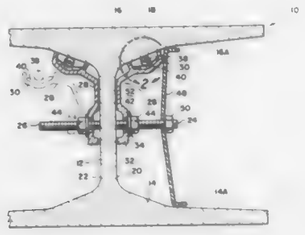
redistributing the excavated ballast on the smooth ballast bed on which the new ties and new rails have been laid.

4,854,244

TRANSIT RAIL DEICING SYSTEM

Thomas R. Rhodes, and Thomas J. Brennan, both of Tulsa, Okla., assignors to General Signal Corporation, Stamford, Conn.

Filed Apr. 29, 1988, Ser. No. 187,944
Int. Cl.[4] E01B 7/24
U.S. Cl. 104—279 18 Claims



1. A system for use with a rail for carrying a moving conveyance, the rail having a web portion with opposed sides, a base portion and an increased width top portion, the system serving to provide means to heat the rail top portion to decrease the accumulation of snow and ice thereon, comprising:

stud means secured at spaced intervals along at least one side of the rail web portion and below the rail top portion;

a plurality of aligned elongated carrier members each defined in cross section normal the length thereof by an upper trough forming portion and a lower retention portion, the retention portion having openings spaced along the length thereof in register with and arranged to receive said studs;

a heating cable received in said aligned carrier member's trough portions; and

locking means on said stud means to retain each said carrier member in a first position wherein said trough forming portion is exposed to receive said heating cable therein and in a second position wherein said trough forming portion holds said heating cable in close proximity to the rail top portion.

4,854,245

ARRANGEMENT FOR INCREASED PASSENGERS UTILIZATION IN MOBILE UNITS

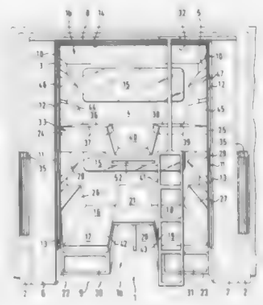
Wolfgang P. Platzer, Hedströmsgatan 1, Helsingborg, Sweden S-252 51

Filed Nov. 18, 1987, Ser. No. 122,137
Claims priority, application Sweden, Dec. 30, 1986, 8605623
Int. Cl.[4] B61D 1/08
U.S. Cl. 105—317 10 Claims

1. An arrangement for increased utilization of a passenger accommodation in a mobile unit, such as a coach or a train, during day and night, which arrangement comprises:

(a) a ceiling element partially defining a passenger accommodation space, the ceiling element being moveable downwardly to a lower position for dividing the accommodation space into upper and lower compartments; and

(b) the ceiling element including an upper legroom space formed therein and at least one upper seat, the upper seat including at least one upper berth element and being convertible into at least one upper berth in the upper compartment by disposing the upper berth element in the upper legroom space.

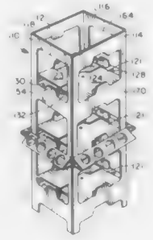


4,854,246

DISPLAY DEVICE AND METHOD OF ASSEMBLY

Martin P. Belokin, and Normal P. Belokin, both of P.O. Box 1907, Denton, Tex. 76201

Filed Apr. 1, 1987, Ser. No. 32,790
Int. Cl.[4] A47B 3/00
U.S. Cl. 108—111 17 Claims



1. A display device comprising:

a continuous wall structure defining a space wherein articles can be placed for display,

there being at least two, facing, flat wall pairs on said wall structure;

a first flat shelf portion on one of the flat walls and foldable relative to the one flat wall about a fold line between a collapsed position wherein the first flat shelf portion is substantially parallel to the one flat wall and a display position wherein the first shelf portion is transverse to the one flat wall;

a second flat shelf portion on a second of the flat walls and foldable relative to the second flat wall about a fold line between a collapsed position wherein the second flat shelf portion is substantially parallel to the second flat wall and a display position wherein the second shelf portion is transverse to the second flat wall; and

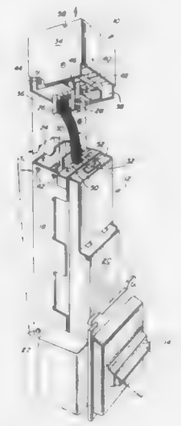
means for fixedly connecting said first and second flat shelf portions to each other and for causing said first and second flat shelf portions to be automatically simultaneously moved out of their collapsed position to their display position upon the facing walls of one of the wall pairs being moved away from each other.

4,854,247

LOCK TYPE SEALED PAPER CURRENCY COLLECTOR AND SECURITY DEVICE

Michael J. Sciortino, and Wendel Schmidt, both of Mt. Prospect, Ill., assignors to Glenview Security Systems, Inc., Glenview, Ill.

Filed Oct. 19, 1987, Ser. No. 110,374
Int. Cl.[4] E05G 3/00; B65H 5/22, 1/00
U.S. Cl. 109—1 R 18 Claims



10. A device for sealingly securing paper currency accumulated into a sheaf in a secured holding or validating device, comprising:

means for sealingly and lockingly clamping said sheaf of paper currency in a locking device while secured within the validating device;

means for releasing said sheaf of paper currency and said locking device from said validating device once said sheaf is securely locked and clamped; and

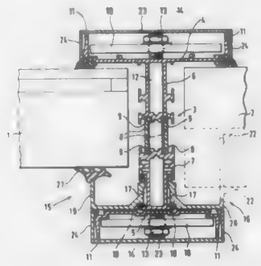
means for unsealing, unlocking and releasing said clamped sheaf of paper currency from said locking device remote from said validating device.

4,854,248

BLAST RESISTANT COMPOSITE FRAMING SECTION

Heinrich Salzer, Industriestrabe 4, 3550 Marburg,Wehrda, Fed. Rep. of Germany

Filed May 26, 1988, Ser. No. 199,207
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 3719117
Int. Cl.[4] E04B 2/02
U.S. Cl. 109—79 5 Claims



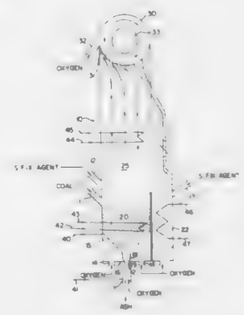
1. An elongated blast resistant composite section for framing planar panels comprising a spaced pair of hollow stay segments having opposed aligned pockets, a spaced pair of insulator members spanning said pockets, a U-shaped part having a central web and outwardly directed legs at the end of each said stay remote from said pocket, a reinforcement member disposed between the legs of each of said U-shaped parts, and threaded stud members extending between said reinforcement members and passing through said webs, said stays and between said insulator members, to thereby compress said reinforcement members against said webs and said stays against said insulator members.

4,854,249

TWO STAGE COMBUSTION

Mark J. Khinkis, Morton Grove; Jitendra G. Patel, Naperville, and William A. Sandstrom, Chicago, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 80,792, Aug. 3, 1987, which is a continuation-in-part of Ser. No. 865,356, May 20, 1986, abandoned. This application May 19, 1988, Ser. No. 196,363
Int. Cl.[4] F23B 7/00; F23C 11/02
U.S. Cl. 110—342 29 Claims



1. A process for combusting sulfur and nitrogen containing carbonaceous materials in a two stage combustion process comprising:

introducing sulfur and nitrogen containing carbonaceous materials and sulfur fixation agent particulates selected from the group consisting of metallic carbonates, metallic oxides, and mixtures thereof into a first combustion stage single fluidized bed supported upon and maintained fluidized by fluidizing gas introduced through a perforated sloping bed support grid within a single combustor having a density/size selective solids withdrawal conduit at a base portion of said bed with upflowing withdrawal gas;

combusting said carbonaceous materials in said fluidized bed under substoichiometric oxygen conditions at temperatures of about 1600° to 2000° F. producing ash and reducing gases forming a reducing region in a major portion of said single fluidized bed,.said reducing gases comprising gaseous sulfur compounds;

reacting said gaseous sulfur compounds with oxides of said sulfur fixation agent in said reducing region of said single fluidized bed to form an intermediate solid metallic sulfur compound;

converting said nitrogen contained in said carbonaceous materials into molecular nitrogen in said reducing region of said single fluidized bed;

reacting said intermediate solid metallic sulfur compound in an oxidizing region maintained at a base portion of said fluidized bed and the upper portion of said selective solids withdrawal conduit by said upflowing withdrawal gas to form a stable, solid, environmentally acceptable sulfur-containing compound;

agglomerating said ash in said oxidizing region to form easy

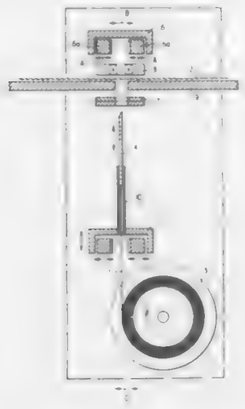
transportable, non-leachable, environmentally acceptable ash;
withdrawing said agglomerated ash and said stable, solid, environmentally acceptable sulfur-containing compound from said single fluidized bed through said selective solids withdrawal conduit;
passing said reducing gases, fine particulates of uncombusted said carbonaceous materials and fine particulates of said sulfur fixation agent from said fluidized bed and tangentially introducing said reducing gases and said particulates into a second combustion stage cyclonic combustor;
burning said reducing gases and said uncombusted carbonaceous materials in said second stage cyclonic combustor under excess stoichiometric oxygen conditions at temperatures of about 1800° to 2200° F.;
reacting said fine particulates of said sulfur fixation agent with sulfur oxides formed during said burning in said second stage cyclonic combustor to form a stable, solid, environmentally acceptable sulfur-containing compound;
separating solid fines in said second combustion stage cyclonic combustor and recycling said fines to said first combustion stage fluidized bed; and
removing from said second stage combustor flue gases comprising environmentally acceptable amount of CO, NO_x, SO_x, and THC content.

4,854,250

PROCESS FOR THE DRAWING OF OPTICAL FIBERS THROUGH TEXTILES, AND A DEVICE FOR THE CARRYING OUT OF THE PROCESS

Claus-Peter Stüvecke, Stresemann Allee 90, D-2000 Hamburg 54, and Johann Götz, Groden 7, D-2212 Brunsbüttel, both of Fed. Rep. of Germany

Filed Nov. 5, 1986, Ser. No. 2,628
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1985, 3508252; PCT Int'l Appl., Mar. 4, 1986, PCT/EP86/00113
Int. Cl.⁴ D05C *15/20*
U.S. Cl. 112—80.16 **11 Claims**



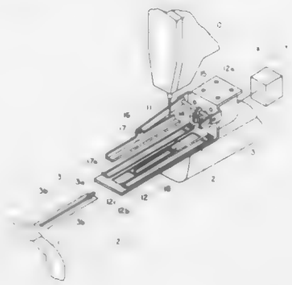
1. A method of drawing an optical fiber through a fabric having opposite first and second sides, comprising the following steps:
(a) pushing a hollow needle, together with the optical fiber whose end is situated inside the needle in the zone of the needle tip, through the fabric from the first side to the second side until the needle tip is situated between open jaws of a grasping device on said second side; said hollow needle being telescopically supported by a guidance tube and being in an extended state relative to said guidance tube during the pushing step;
(b) pulling, simultaneously with said pushing step, the optical fiber from a fiber supply with a clamping device; said hollow needle, said guidance tube and said clamping device moving as a unit during said pushing step;
(c) withdrawing said hollow needle from between said jaws of the grasping device into said guidance tube relative to said clamping device;
(d) maintaining, simultaneously with said withdrawing step, said optical fiber stationary by said clamping device, whereby said end of the optical fiber remains between said jaws of the grasping device;
(e) grasping the end of said optical fiber by said jaws of said grasping device;
(f) releasing said optical fiber by said clamping device;
(g) pulling, subsequent to said releasing step, said optical fiber by said grasping device through said fabric until a predetermined pulled-through length of optical fiber is obtained on said second side;
(h) moving the clamping device, the guidance tube and the hollow needle withdrawn therein, as a unit away from the fabric on the first side thereof;
(i) severing the optical fiber by a cutting device at the fabric on said first side between the hollow needle and the fabric;
(j) extending said hollow needle out of said guidance tube until the optical fiber is situated entirely within said hollow needle;
(k) clamping the optical fiber with said clamping device; and
(l) repeating steps (a) through (k) at different locations of the fabric.

4,854,251

AUTOMATIC SEWING MACHINE EXCLUSIVELY USED FOR SEWING ZIPPER ON WORKPIECE

Tohru Hiramatsu; Kazuya Tami, and Torao Ohchi, all of Tokyo, Japan, assignors to Okyo Juki Industrial Co., Ltd., Chofu, Japan

PCT No. PCT/JP84/00509, § 371 Date Jun. 24, 1986, § 102(e) Date Jun. 24, 1986, PCT Pub. No. WO86/02672, PCT Pub. Date May 9, 1986
PCT Filed Oct. 25, 1984, Ser. No. 882,884
Int. Cl.⁴ D05B *21/00, 23/00, 35/06*
U.S. Cl. 112—121.12 **5 Claims**



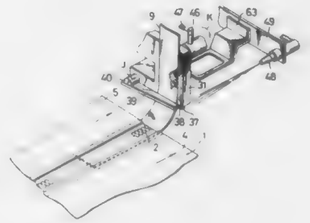
1. A sewing machine having a needle for use in sewing a zipper on a flapped workpiece, said sewing machine comprising a movable gripper assembly for clamping the zipper and workpiece in a side-by-side relationship with the flap extending across the zipper, said gripper assembly including a base having an opening with longitudinally extending sides, first gripper means extending along a first longitudinal side of the opening in said base for gripping a first longitudinally extending side of the zipper and the workpiece, and second gripper means extending along a second longitudinal side of the opening in said base for gripping a second longitudinally extending side of the zipper and the workpiece, and drive means for moving said gripper assembly relative to the needle in a first direction along a first path length extending parallel to a longitudinal axis of the zipper with the needle in vertical alignment with the opening in said base during the sewing of a first seam along one side of the zipper, for moving said gripper assembly relative to the needle along a second path length extending perpendicular to the first path length, and for moving said gripper assembly relative to the needle in a second direction opposite to the first direction along a third path length extending parallel to the first path length and the longitudinal axis of the zipper during the sewing of a second seam along a second side of the zipper, said first gripper means includes a first member for pressing the first side of the zipper against said base, said second gripper means including a second member for pressing the second side of the zipper against said base, said first gripper means including a third member for pressing the workpiece against said first member, said second gripper means including a fourth member for pressing the workpiece against the second member.

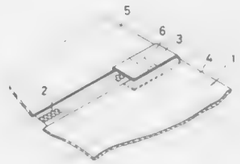
4,854,253

METHOD AND APPARATUS FOR APPLYING PROTECTIVE STRIP TO END OF SLIDE FASTENER

Akio Yunoki, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Division of Ser. No. 212,238, Jul. 27, 1988. This application Jan. 17, 1989, Ser. No. 297,393
Claims priority, application Japan, Jun. 30, 1987, 62-173700
Int. Cl.⁴ D05B *97/00, 3/12*
U.S. Cl. 112—265.2 **5 Claims**





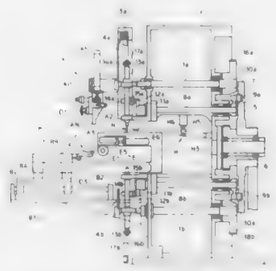
1. A method of applying a protective strip to an end of a slide fastener, comprising the steps of:
(a) feeding a continuous protective tape downwardly toward a supplying portion on a base of a sewing machine located upstream of a sewing position in the sewing machine while keeping one surface of the protective tape facing opposite to a direction of feed of a slide fastener facing toward the sewing position until a leading end portion of the protective tape overlays the upper surface of the base by a predetermined length;
(b) bending the leading end portion of protective tape toward the upstream side of the supply position along the upper surface of the base;
(c) then feeding a slide fastener in said feed direction until a leading end of the slide fastener reaches the sewing position, thereby causing the leading end portion of the protective tape to bend into a U-shape extending from the back to the face of the slide fastener around the leading end thereof;
(d) thereafter cutting off the U-shaped leading end portion from the protective tape, thereby forming a U-shaped protective strip extending around the leading end of the slide fastener; and
(e) sewing the U-shaped protective strip and the leading end portion of the slide fastener together by operating the sewing machine.

4,854,252

METHOD FOR BUTTON SEWING

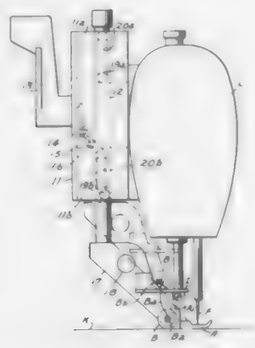
Hideo Asao, Mitaka; Satoru Yamazi, and Seiichi Saibe, both of Kashihara, all of Japan, assignors to Juki Corporation and Takatori Machinery Manufacturing Co., Ltd., both of Tokyo, Japan

Filed May 12, 1988, Ser. No. 193,333
Claims priority, application Japan, May 11, 1987, 62-115492
Int. Cl.⁴ D05B *97/02, 3/14*
U.S. Cl. 112—265.1 **1 Claim**



1. In a button sewing machine having a driving device to traverse a needle provided with the predetermined length of thread for sewing attached thereto comprising an upper-needle-bar and a lower-needle-bar which are arranged to conduct relative up-down motion, and a moving device which moves a workpiece with a button attached thereto in an X–Y direction, a method of button-neck-wrapping after sewing both a stay button, and a surface button comprising the steps of:
(a) turning a surface button to be positioned aside from needle's passage-way so that the needle may penetrate upward into a work piece and be received into an upper-needle-bar,
(b) guiding a thread into a guide formed under a needle, and pressing the thread between clampers to stretch the thread when pulled, and releasing surface button chucking, and
(c) driving a X–Y mover to perform circular motion horizontally to conduct button-neck-wrapping.

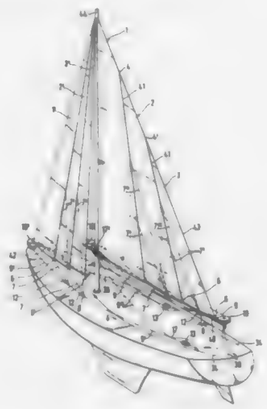
4,854,254
PULL ROLLER MOUNT FOR SEWING MACHINES
Hsiau C. Hsing, No. 9, Alley 41, Lane 11, Hua Cheng, Taipei R.O.C., Taiwan
Filed Mar. 31, 1987, Ser. No. 32,269
Int. Cl.[4] D05B *27/10*
U.S. Cl. 112—305 4 Claims



1. A material tensioning device for a sewing machine having a pressure foot comprising:
a pull roller for tensioning material being sewn;
means for rotating said pull roller;
connecting plate means for shifting said roller upwardly when the presser foot is lifted; and
means for guiding said roller during upward and downward movement, said guide means including first and second guide tracks supported by the sewing machine, said second guide track having a curved portion thereon, and first and second sliding members attached to said roller and mounted for sliding engagement with said first and second guide tracks, respectively, whereby said roller is shifted outwardly away from said presser foot during upward movement.

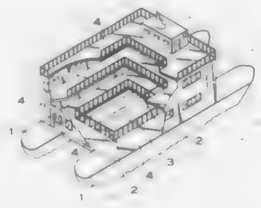
4,854,255
SAILING PROVISIONS INCLUDING RELEASE TO PREVENT CAPSIZING
Horst Kief, Loadoner Ring 105, D-6700 Ludwigshafen, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 828,138, Feb. 10, 1986, abandoned, which is a continuation-in-part of Ser. No. 571,468, Jan. 17, 1984, abandoned. This application Nov. 25, 1987, Ser. No. 125,387
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1983, 8301133[U]
Int. Cl.[4] B63H *9/04*
U.S. Cl. 114—39.1 24 Claims

1. A sailing means comprising
a vessel;
a multiprofile sail including a plurality of individual profiles for wind interaction, which profiles are disposed sequentially relative to a forward direction of the vessel, and which profiles overlap each other as seen in a side projection of the vessel such that the rear end of a profile overlaps with the front end of a following profile and which individual profiles can be varied in their angle formed with the forward direction and thereby the profiles are variable in their distance as measured in a direction perpendicular to the plane of respective profiles from each other;
linking ropes linked to the individual profiles near a lower outer side point of the profile and disposed toward the stern side of the vessel, where the linking of individual profiles is independent of the overall angular position of the sails formed by the profiles; and



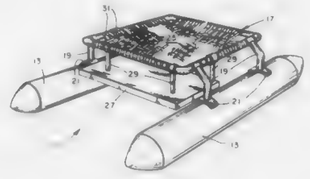
a surrounding rope running about along the sides of the vessel and connected to the linking ropes wherein by activation of the surrounding ropes the sequentially disposed profiles can be jointly adjusted.

4,854,256
AQUATIC SHOW BOAT
Takeshi Hayashi, No. 85-3, Mitsuicho, Bezaiten, Muya-cho, Naruto-shi, Tokishima-ken, Japan 772
Filed Dec. 8, 1987, Ser. No. 130,300
Claims priority, application Japan, Dec. 11, 1986, 61-296203
Int. Cl.[4] B63B *35/00*
U.S. Cl. 114—61 9 Claims



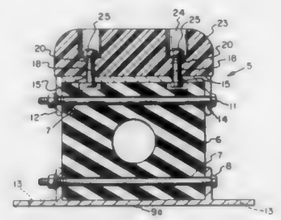
1. An aquatic show boat comprising:
a pair of long, narrow, spaced opposed, parallel port and starboard hulls for floating on a body of water;
a plurality of connecting pieces interconnecting said pair of hulls, said plurality of connecting pieces and said pair of hulls jointly defining an open activity area, having an upwardly open opening, and said at least one activity area being in fluid communication with the body of water when the show boat is in the body of water;
at least one observation deck attached to at least one of said plurality of connecting pieces and of said pair of hulls, and said at least one observation deck being adjacent to said opening of said at least one open activity area for providing viewing of said at least one activity area; and
means attached to said at least one observation deck for varying the size of said opening of said at least one activity area, and said means for varying the size of said opening of said at least one activity area including at least one substantially horizontally slidably attached activity area deck for covering and uncovering said opening.

4,854,257
YACHT TENDER/BOARDING VESSEL
James L. Grayson, 1211 S. Washington Ave., Glendora, Calif. 91740
Filed Apr. 18, 1988, Ser. No. 182,405
Int. Cl.[4] B63B *7/00*
U.S. Cl. 114—61 7 Claims



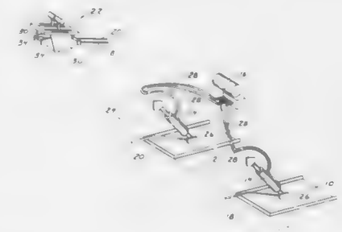
1. A vessel adapted to float on a body of water as a yacht tender with a seat when in an upright position and as a boarding device with a step for swimmers when in an inverted position, comprising:
a parallel pair of spaced elongated flotation structures;
a relatively broad dual function central platform structure disposed between and above said parallel structures and used as a broad yacht tender floor structure when said vessel is in its upright position, and said platform disposed below the water surface and used as a safety zone swimmer's support when in said vessels inverted position;
superstructure attached to said parallel structures and supporting said central platform; and
a relatively smaller area intermediate dual function seat/step structure supported below only a portion of said central platform and used as a seat above the surface of the water when said vessel is floating in its upright position and as a swimmer's step when said vessel is in its inverted position.

4,854,258
BUMPER RUB STRIP ASSEMBLY
George J. Hausmann, St. Marys, Ohio, and Donald E. Patton, Jr., Pleasant Hill, Calif., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Mar. 1, 1985, Ser. No. 707,369
Int. Cl.[4] B63B *59/02*
U.S. Cl. 114—219 5 Claims



1. A bumper assembly for use on a dock comprising an impact surface composed of a ultraviolet resistant ultra-high molecular weight polyethylene member attached to an upper member, that rests over said rubber member said upper member being attached to a rubber member, said rubber member being attached to a dock by a lower member to permit a force imparted to the polyethylene member to be transmitted to the dock through the rubber member.

4,854,259
IMPROVED TRIM-TAB CONTROL SYSTEM FOR POWER BOATS
George Cluett, Sarasota, Fla., assignor to Sta-Rite Industries, Inc., Milwaukee, Wis.
Filed Oct. 14, 1988, Ser. No. 257,942
Int. Cl.[4] B63B *1/22*
U.S. Cl. 114—285 20 Claims



1. In a trim-tab system of the type with means on the trim tab to move it in first and second opposite directions and means to control the movement means, the improvement wherein the control means comprises:
a frame;
a yoke movably secured with respect to the frame;
means to link the yoke to the trim tab such that the yoke and trim tab move in unison;
a lever pivotably mounted with respect to the yoke and having first and second engagement surfaces and a limited range of pivot motion with respect to the yoke;
first and second switch means on the yoke in position for engagement with the first and second engagement surfaces, respectively, to actuate the movement means to move the trim tab in the first and second opposite directions, respectively,
whereby trim-tab adjustment is carried out by continuing movement of the lever with respect to the yoke and the yoke moves in response to trim-tab adjustment.

4,854,260
CONFIGURATION OF DISCHARGE TUBES, EJECTION TUBES OR RECEPTACLES IN SUBMARINES
Richard Woidich, Altenholz, and Werner Toobe, Kiel, both of Fed. Rep. of Germany, assignors to Krupp MaK Maschinenbau GmbH, Kiel, Fed. Rep. of Germany
Filed Mar. 29, 1988, Ser. No. 174,767
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1987, 3711059
Int. Cl.[4] B63G *8/28*
U.S. Cl. 114—316 18 Claims



1. A launch apparatus for a submarine for launching a weapon, said launch apparatus comprising:
launch tube means having an interior cavity for receiving a weapon;
said interior cavity having an inner surface region;

said launch tube means having means for mounting said launch tube means in a submarine;

means being disposed within said interior cavity in an annular space between said tube and a weapon and making contact with said inner surface region of said launch tube and also for making contact with and holding a weapon disposed in said tube;

said annularly disposed means comprising annularly disposed resilient means for resiliently holding a weapon within said interior cavity of said launch tube means; and

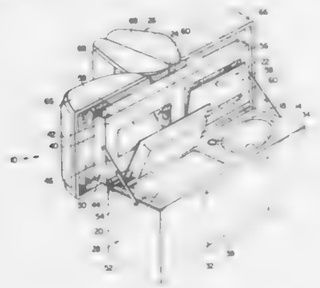
an elastic body being disposed at an inner portion of said launch tube means for resiliently, axially loading a rear portion of a weapon along a longitudinal axis of a weapon disposed in said tube means, said elastic body being disposed for making contact over a substantial part of a rear portion of a weapon disposed in said tube means.

4,854,261

COMBINATION SEAT FOR BOATS

Howard G. Goldsmith, Cranston, R.I., assignor to Todd Enterprises, Inc., Cranston, R.I.

Filed Apr. 5, 1988, Ser. No. 177,596
Int. Cl.[4] A47C *17/64*
U.S. Cl. 114—343 **2 Claims**



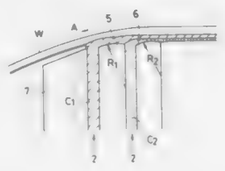
1. A combination seat for a boat comprising a housing including hingeably connected lower and upper housing sections, said lower housing section including a sidewall portion and an upwardly facing upper wall portion, said upper housing section being movable between a closed position wherein said upper housing section is received in substantially covering relation on said lower housing section and an open position wherein said upper wall is substantially exposed, a sink mounted in said lower housing section upper wall, a water tank in said lower housing section, dispensing means connected to said water tank for dispensing water from said tank into said sink, a thermally insulated container member in said lower housing section adapted for receiving articles therein and accessible through said lower housing section upper wall and seating means mounted on said upper housing section, said seating means including a back portion and a seat portion and being operative for supporting a person thereon when said upper housing section is in the closed position thereof, and compartment means in said upper housing section, said compartment means having an access opening therein and including a door portion for covering said access opening, said access opening facing downwardly toward said lower housing section when said upper housing section is in the closed position thereof.

4,854,262

COATING APPARATUS

Naoyoshi Chino; Yasuhito Hiraki, and Tsunehiko Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1987, Ser. No. 102,921
Claims priority, application Japan, Sep. 30, 1986, 61-230173
Int. Cl.[4] B05C *3/02*
U.S. Cl. 118—411 **6 Claims**



1. A coating apparatus including an extrusion type head having a back edge, at least a first doctor edge and a second doctor edge, and at least two slots formed between said back edge and said doctor edges in which each of said first and second doctor edges is shaped to have a convex curvature in cross section taken along a direction of movement of a support to which a coating composition is to be applied through said slots,

wherein said first doctor edge is disposed nearer to said back edge than said second doctor edge and a radius of curvature R_1 of said first doctor edge and a radius of curvature R_2 of said second doctor edge satisfy a first set of relations:

$-3\ mm \leqq R_2 - R_1 \leqq 15\ mm$

$R_1 \geqq 2\ mm$, and

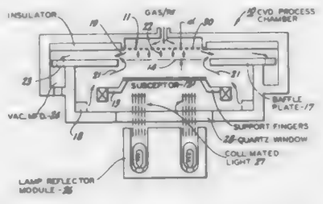
$R_2 \geqq 2\ mm$.

4,854,263

INLET MANIFOLD AND METHODS FOR INCREASING GAS DISSOCIATION AND FOR PECVD OF DIELECTRIC FILMS

Mei Chang; David N. K. Wang, both of Cupertino; John M. White, Hayward, and Dan Maydan, Los Altos Hills, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Aug. 14, 1987, Ser. No. 85,424
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—715 **11 Claims**



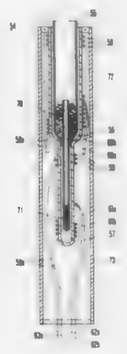
1. In an RF vacuum deposition chamber system, a gas inlet manifold which is an RF electrode and includes at least a plurality of gas inlet holes therein, each hole comprising an outlet at the processing side of the gas inlet manifold and an inlet spaced from the processing side, said outlet being larger than said inlet, for increasing the dissociation by RF energy applied to the gas inlet manifold of gas passing through the holes.

4,854,264

VACUUM EVAPORATING APPARATUS

Hiroshi Noma, Yaizu, and Hiroshi Fujiyasu, Hamamatsu, both of Japan, assignors to Fuji Seiki Inc., Kanagawa, Japan

Filed Dec. 10, 1987, Ser. No. 131,009
Claims priority, application Japan, Dec. 10, 1986, 61-294510; Mar. 6, 1987, 62-51605
Int. Cl.[4] C23C *14/00*
U.S. Cl. 118—719 **4 Claims**



1. A vacuum evaporating apparatus for depositing thin films on a substrate comprising:

(a) a vacuum tank;

(b) a plurality of hot-wall furnaces disposed in said vacuum tank for heating and evaporating a plurality of evaporation source materials for depositing as a thin film on a substrate, each one of said plurality of hot-wall furnaces including:

(1) an interchangeable substantially vertical crucible vessel for holding an evaporation source material, said crucible vessel being a heat-resistant transparent or semitransparent tube, said crucible vessel having a plurality of coaxial vertically spaced subcrucibles for holding a plurality of evaporation source materials;

(2) a heating tube mating with and detachably holding said interchangeable crucible vessel, and said heating tube being a heat-resistant transparent or semi-transparent tube;

(3) a plurality of heaters, each one of said plurality of heaters substantially surrounding a portion of the outer peripheral surface of said heating tube and adjacent to a respective one of said plurality of subcrucibles for heating thereof;

(4) a first electrical connecting pin attached to each one of said plurality of heaters;

(5) a plurality of thermocouples, each one of said plurality of thermocouples being adjacent to one of sail plurality of heaters for independently operating each one thereof for independently controlling the temperature of each one of said plurality of subcrucibles;

(6) a second electrical connecting pin attached to each one of said plurality of thermocouples;

(7) a first plurality of electrical connecting pin-receiving means in the bottom of each said hot-wall furnace for detachably receiving each said first electrical connecting pin; and

(8) a second plurality of electrical connecting pin-receiving means in the bottom of each said hot-wall furnace for detachably receiving each said second eletrical connecting pin;

(c) a turn table rotatably attached to said vacuum tank, said turn table being inside said vacuum tank and vertically spaced above said plurality of hot-wall furnaces, means on said turn table for releasably holding a plurality of substrates above said plurality of hot-wall furnaces for having thin films of evaporation source materials deposited on a plurality of substrates thereby, substrate heating means on said turn table for preliminarily heating a plurality of substrates for preparing a plurality of substrates to have a thin film deposited thereon by said plurality of hot-wall furnaces, and means attached to said turntable for non-continuously rotating said turn table for non-continuously moving one of a plurality of substrates held by said turn table from a depositing position directly above one of said plurality of hot-wall furnaces to a rest position between adjacent ones of said plurality of hot-wall furnaces for controlling the depositing of a thin film on a plurality of substrates;

(d) an auxiliary vacuum chamber fluidly connected to said vacuum tank; and

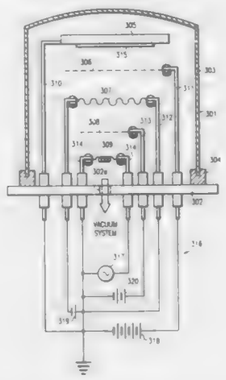
(e) a substrate exchanging means adjacent to said auxiliary vacuum chambers for exchanging a new substrate for a substrate having a thin film deposited thereon releasably held by said turn table through said auxiliary vacuum chamber.

4,854,265

THIN FILM FORMING APPARATUS

Wasaburo Ohta, Yokohama; Tadao Katuragawa, Yamato, and Mikio Kinoshita, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

PCT No. PCT/JP87/00398, § 371 Date Feb. 10, 1988, § 102(e) Date Feb. 10, 1988, PCT Pub. No. WO87/07916, PCT Pub. Date Dec. 30, 1987
PCT Filed Jun. 18, 1987, Ser. No. 167,850
Claims priority, application Japan, Jun. 18, 1986, 61-142197; Sep. 29, 1986, 61-232731; Feb. 5, 1987, 62-25196; Feb. 5, 1987, 62-25197
Int. Cl.[4] C23C *14/48*
U.S. Cl. 118—723 **8 Claims**



1. A thin film forming apparatus comprising:

a vacuum tank capable of introducing a gas thereinto;

a source of evaporable substance for evaporating an evaporable substance in the tank;

a counter electrode disposed in the tank and holding a substrate on which a thin film is to be formed so that the substrate is opposite to the source of evaporable substance;

first grid disposed between the source of evaporable substance and the counter electrode, and allowing evaporated substances from said source of evaporable substance to pass therethrough;

a filament disposed between the first grid and the source of evaporable substance for generating thermal electrons;

a second grid disposed between the filament and the source

of evaporable substance, and allowing the evaporated substance to pass therethrough; and

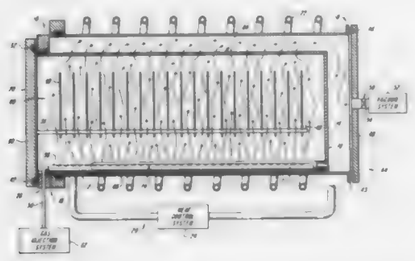
power source means for putting the first and second grids, the counter electrode, and the filament in such a predetermined electric potential relationship that the first grid is positive in potential relative to the counter electrode and the second grid is at a predetermined positive, negative or zero potential relative to the counter electrode.

4,854,266

CROSS-FLOW DIFFUSION FURNACE

Morris Simson, Framingham; John H. Fabricius, Westford, both of Mass.; Ronnie Browne, Derry, N.H.; Arthur Waugh, Winchester, Mass.; Robert F. Sarkozy, Westford, Mass., and Chiu K. S. Lai, Wellesley, Mass., assignors to BTU Engineering Corporation, North Billerica, Mass.

Filed Nov. 2, 1987, Ser. No. 115,884
Int. Cl.[4] C23C *16/44*; B05C *13/02*
U.S. Cl. 118—728 7 Claims



1. A cross-flow diffusion furnace for processing semiconductor wafers, comprising;

a cylindrical diffusion tube defining a cylindrical reaction chamber

an apertured cylindrical cross-flow liner disposed within said cylindrical diffusion tube and having one end open and one end closed and having an operative locale across which CVD takes place;

a boat loader extending through said cross-flow liner open end into said cross-flow liner;

means for removably fastening said boat loader in air tight sealing engagement to one end of said cylindrical diffusion tube;

means coupled to said cylindrical diffusion tube for controllably heating said reaction chamber;

a vacuum source;

means for connecting said vacuum source to the other end of said cylindrical diffusion tube, the vacuum source producing a greater negative pressure interior to said cylindrical diffusion tube and exterior to said cross-flow liner than within said cross-flow liner; and

means for injecting gas locally and axially along the operative locale of said cross-flow liner.

4,854,267

MECHANICAL CAT LITTER BOX

Dan Morrow, 16711 Marsh Creek Rd., #67, Clayton, Calif. 94517

Filed Jul. 15, 1988, Ser. No. 219,393
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 13 Claims

1. A litter box for cats and other household pets comprising:

(a) a container having walls and a bottom with holes for draining liquids;

(b) a substantially impervious granular material contained in the container covering the bottom of the container and sized larger than the container bottom holes;

(c) a screen member with screening elements spaced to pass the granular material and collect solid waste material typically discharged from a household pet using the litter box, the screen member being positioned over the container bottom under the granular material;

(d) liquid receiving means for receiving liquids discharged into the container and passing through the holes in the container bottom;



(e) waste collection means for receiving solids from the container and liquids from the liquid collection means;

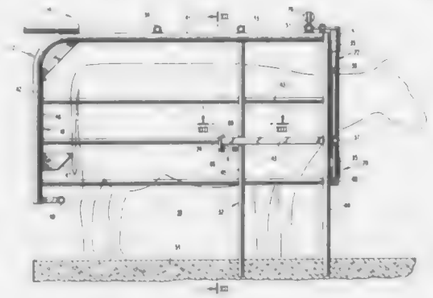
(f) actuation and deposit means for actuating the screening of solids from the container and the draining of liquids from the liquid collection means, and depositing screened solids and drained liquids into the waste collection means.

4,854,268

MILKING PLANT AND SORTING SYSTEM

H. Kenneth Kipe, 3791 Church Rd., Chambersburg, Pa. 17201

Filed Jan. 13, 1988, Ser. No. 205,657
Int. Cl.[4] A01K *1/12*
U.S. Cl. 119—14.03 17 Claims



14. A milking system comprising

(a) at least one parlor including a stationary floor, a plurality of stalls fixedly juxtaposed along the floor, animal entrance means to each stall and animal exit means disposed along an exit side of at least one parlor;

(b) said at least one parlor including an animal ingress entry opening at one end thereof, a distal end barrier means at the other end thereof, and gutter means laterally spaced from the exit side to define one side of an animal passageway from the animal ingress entry end to the distal end barrier means;

(c) said stalls being defined by fixed wall partitions rigidly secured to vertically disposed post means immovably fixed to the floor at the parlor exit side;

(d) said fixed wall partitions extending toward the gutter means inwardly from the parlor exit side by substantially the same amount with respect to each other and having entrance ends laterally spaced from the gutter means to define another opposing side of said animal passageway;

(e) said animal exit means including a gate member pivotally mounted to the fixedly disposed post means at each stall to swing outwardly from said parlor exit side between a closed position and an opened position;

(f) each gate member including frame means defining an aperture through which protrudes the head and neck portion of an animal confined within a parlor stall;

(g) said frame means including a neck portion contacting section which precludes forward or backward animal movement within the stall and animal head movement to any position which might otherwise interrupt the milking of the animal.

(h) fixed overhead frame means extending in a direction parallel to the fixed wall partitions from the vertically disposed post means at the parlor exit side rearwardly to the gutter means which extend downwardly from the overhead frame means, and

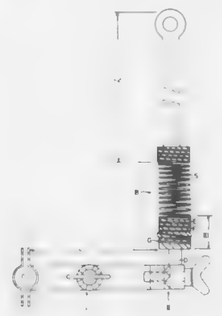
(i) the gutter means is effective to catch animal waste at an elevated location above the parlor floor.

4,854,269

MEANS FOR EXERCISING DOGS FROM A BICYCLE

Sven Arntzen, Lofsrudhogda 235, N-1281 Oslo 12, Norway

PCT No. PCT/NO87/00047, § 371 Date Jan. 4, 1988, § 102(e) Date Jan. 4, 1988, PCT Pub. No. WO87/07834, PCT Pub. Date Dec. 30, 1987
PCT Filed Jun. 12, 1987, Ser. No. 143,849
Claims priority, application Norway, Jun. 12, 1986, 86.2400; Feb. 13, 1987, 87.2339
Int. Cl.[4] A01K *15/02*
U.S. Cl. 119—29 19 Claims



1. Apparatus for exercising a dog from a moving vehicle comprising:

(a) bracket means adapted to be attached to the vehicle;

(b) first bar means mounted to the bracket means and extending outward away from the vehicle;

(c) second bar means;

(d) resilient means connected at one end to the first bar means and at an opposed end to the second bar means end; and

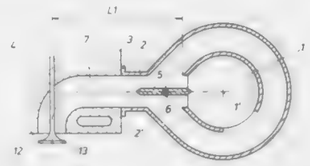
(e) attachment means connected to the second bar means and adapted to have releasably attached thereto a leash of the dog, wherein when a force is exerted by the leash on the dog sufficient to cause injury, said leash is adapted to be disengaged from the attachment means thereby disengaging the dog from the apparatus, and wherein when a force is exerted by the leash on the dog said resilient means is adapted to move in the direction of the force being applied to the dog to thereby at least reduce the force conveyed to the dog.

4,854,270

INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINES

Helmut Melde-Tuczai; Johann Wagner, both of Graz, and Günter Fraidl, Pirka, all of Austria, assignors to A V L Gesellschaft fur Verbrennungskraftmaschinen Und Messtechnik M.B.H., Prof. Dr.Dr.h.c. Hans List, Graz, Austria

Filed Sep. 9, 1988, Ser. No. 242,204
Claims priority, application Austria, Sep. 11, 1987, 2311/87
Int. Cl.[4] F02B *75/18*
U.S. Cl. 123—52 M 3 Claims



1. An intake system for internal combustion engines with two suction pipes of different lengths departing from a main intake pipe, said suction pipes are connected individually, in accordance with the engine speed to an intake passage in a cylinder head leading to an intake valve, said main intake pipe being connected to each of said intake passages by a connecting piece defining an axis, and said suction pipes of different lengths departing from said main intake pipe opening into said connecting piece having entry openings situated on opposite sides of said axis of said connecting piece, a butterfly control valve being arranged in said connecting piece, being positioned on a shaft parallel to said main intake pipe, said control valve in two extreme positions establishes a flow connection between one of said suction pipes and said intake passage and disconnects a flow connection between the other of said suction pipes and said intake passage, wherein a direct flow connection is established between said main intake pipe and said connecting piece, situated between said entry openings of said suction pipes into said connecting piece, and wherein said control valve is mounted so as to be centered on said shaft (butterfly-type), thus providing a center position in addition to said extreme positions, such that a shortest flow-connection is established between said main intake pipe and said intake passage in said cylinder head.

4,854,271

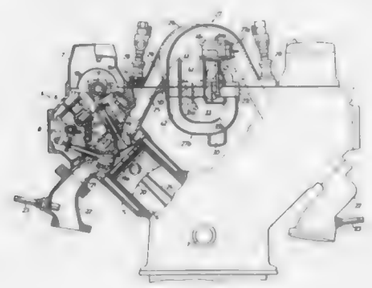
INTAKE MANIFOLD ASSEMBLY FOR ENGINES

Hideyo Miyano, and Yasuo Kitami, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 904,924, Sep. 8, 1986, abandoned. This application Dec. 20, 1988, Ser. No. 287,679
Claims priority, application Japan, Sep. 9, 1985, 60-199073
Int. Cl.[4] F02B *75/22*; F02M *35/10*
U.S. Cl. 123—52 MV 9 Claims

1. An intake manifold assembly for use with an engine having at least one row of intake ports extending in a longitudinal direction, comprising: a branch passage body for conducting air from an upstream end thereof to a downstream end thereof, said branch passage body being adapted to be connected at said downstream end to each of the intake ports and at said upstream end to a main throttle valve for controlling air drawn into the branch passage body; said branch passage body having at said upstream end an intake chamber extending in the longitudinal direction along the row of intake ports, a plurality of shorter passages equal in number to the intake ports and ex-

tending upwardly from said intake chamber, each shorter passage having an auxiliary throttle valve mounted therein and separate from each longer passage for selectively opening and closing each said shorter passage for controlling air flow therethrough, a plurality of longer passages equal in number to the intake ports, each said longer passage extending from said intake chamber around a lower side of said intake chamber in



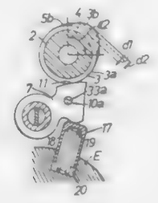
a direction transverse to the longitudinal direction and upwardly to a location above said shorter passage, each said shorter and longer passage having downstream ends joined to each other at a junction and with a further passage extending from said junction in a direct line for a distance greater than the length of said shorter passage for connecting directly to an intake port for providing an air charging at the intake port.

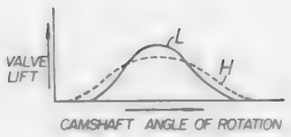
4,854,272

VALVE OPERATING DEVICE FOR INTERNAL COMBUSTION ENGINE

Tsuneo Kouno, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1988, Ser. No. 194,388
Claims priority, application Japan, May 15, 1987, 62-119876
Int. Cl.[4] F01L *1/04, 1/26*
U.S. Cl. 123—90.17 **6 Claims**





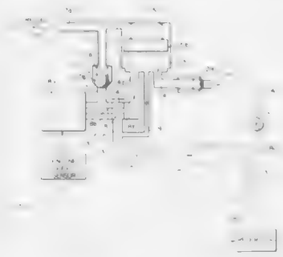
1. A valve operating device for an internal combustion engine, including a plurality of cams having cam profiles corresponding to operating conditions of the engine and disposed on a camshaft for opening and closing an intake valve according to the operating conditions of the engine, comprising, a cam lobe of a high-speed cam on the camshaft for high-speed operation of the engine projecting from a base-circle portion coaxial with the axis of rotation of the camshaft by a distance smaller than a distance by which a cam lobe of a low-speed cam on the camshaft for low-speed operation of the engine projects from a base-circle portion, and said cam lobe of the high-speed cam subtending a larger angle along the circumference of the base portion of the camshaft than an angle on the base-circle portion subtended by the cam lobe of the low-speed cam.

4,854,273

OIL PRESSURE CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Tatsuya Uesugi, and Eiji Nakai, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 12, 1988, Ser. No. 142,934
Claims priority, application Japan, Jan. 13, 1987, 62-5270
Int. Cl.[4] F01L *1/08, 1/34, 1/24*
U.S. Cl. 123—90.17 **16 Claims**



1. An oil pressure control apparatus for an internal combustion engine, comprising:

a pump;

hydraulic actuator means for actuating an element of the engine when receiving operating oil from the pump supplied thereto above a predetermined pressure;

an oil supply passage for supplying oil from said pump to the hydraulic actuator means; and

control valve means interposed in said oil supply passage for controlling the pressure of operating oil supplied to the hydraulic actuator means in accordance with engine operating conditions, said control valve means including a relief oil passage, a bypass oil passage for bypassing the control valve means and connecting the pump to the hydraulic actuator means, an oil pressure regulating valve provided in the relief oil passage for relieving the oil pressure to below the predetermined value, and a valve member between a first position, wherein operating oil from the pump is supplied only through the bypass oil passage and pressure of the operating oil supplied to the hydraulic actuator means is relieved to below the predetermined value, and a second position, wherein operating oil from the oil pump is supplied through the valve member to the hydraulic actuator means directly at a pressure above the predetermined pressure; wherein

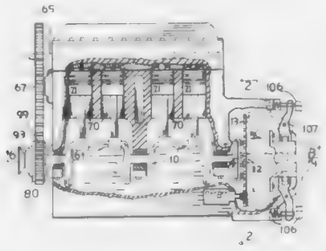
said valve member in the first position connects the relief oil passage to the bypass so that the operating oil from the pump is relieved, regulated by the oil pressure regulating valve, through the bypass oil passage and the relief oil passage, and said valve member in the second position closes the relief oil passage and destroys the oil pressure regulating valve.

4,854,274

POWER BOOSTER INTERNAL COMBUSTION ENGINE FLYWHEEL

Billy E. Dingess, 117 Railroad Ave., Ferrellsburg, W. Va. 25513

Filed Feb. 25, 1988, Ser. No. 161,111
Int. Cl.[4] F16D *3/10, 3/80;* **F02B** *75/06*
U.S. Cl. 123—192 R **15 Claims**



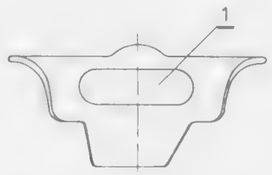
1. A flywheel apparatus for an internal combustion engine where said engine comprises a crankshaft, a cam shaft, a means of advancing said crankshaft in rotation on the power strokes to that of said flywheel, means of retarding said crankshaft on the compression strokes said flywheel, said apparatus further comprising, a first flywheel, linkage means connecting a flywheel shaft to said crankshaft, a first flywheel housing, bearing means of linking said first flywheel to said flywheel shaft, a plurality of cylinders housed to said first flywheel housing, a plurality of nitrogen charged bladders housed within said cylinders, a plurality of cam action rods housed within said cylinders, a cam housed to said flywheel shaft, linkage means linking said cam action rods to said bladders, second linkage means linking said cam action rods by way of a cam roller to said cam, a freewheeling flywheel housing, bearing means linking said freewheeling flywheel to said flywheel shaft, third linkage means linking a freewheeling clutch between said freewheeling flywheel housing and said flywheel shaft, a shifter apparatus comprising means of locking said first flywheel housing to said freewheeling flywheel housing in a first position, means of connecting said flywheel shaft and said freewheeling flywheel housing by way of said freewheeling clutch in a second position, a front flywheel comprising means of driving said cam shaft at a balanced rotational speed from said crankshaft when said crankshaft is rotating at varying rotational speeds within each revolution of said crankshaft.

4,854,275

CYLINDER HEAD FOR A COMBUSTION ENGINE

Alfred Dobner, Rosstal, Fed. Rep. of Germany, assignor to Alcan International Ltd., Montreal, Quebec, Canada

Filed Jun. 20, 1988, Ser. No. 209,051
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1987, 3721029
Int. Cl.[4] F02F *1/36*
U.S. Cl. 123—193 H **8 Claims**



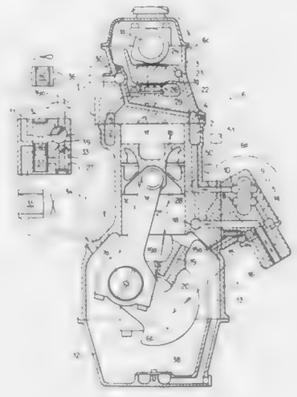
1. Cylinder head for a combustion engine which has at least one web insert in the bridge region of its wall delimiting the combustion chamber located between the inlet and outlet valves, which web insert consists of a cast-in component and is embedded in said wall in such manner that it extends with its major dimension substantially perpendicularly to the surface thereof, wherein the web insert has at least one opening, window or lateral cutout.

4,854,276

INTERNAL COMBUSTION ENGINE WITH COMBINED COOLING AND LUBRICATING SYSTEM

Ludwig Elsbett; Günter Elsbett, and Klaus Elsbett, all of Industriestrasse 14-16, D-8543 Hilpoltstein, Fed. Rep. of Germany

Filed Nov. 6, 1987, Ser. No. 118,186
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1986, 3638437
Int. Cl.[4] F01M *1/00*
U.S. Cl. 123—196 AB **22 Claims**



1. An internal combustion engine comprising a housing including at least one cylinder; a source of lubricant in said housing; a plurality of mobile components in said housing including a piston in said cylinder, at least one valve, a crankshaft and a connecting rod between said crankshaft and said piston; first conduit means defining a first path for the flow of lubricant in said housing from and back to said source and for lubrication and cooling of said mobile components; second conduit means defining a second path for the flow of lubricant from and back to said source and for external cooling of said cylinder and at least one of said mobile components, said second path being at least substantially sealed from said first path; and means for circulating the lubricant along said paths, comprising discrete first and second pumps respectively arranged to circulate lubricant along said first and second paths.

4,854,277

APPARATUS AND METHOD FOR FLUSHING THE CRANKCASE OF AN INTERNAL COMBUSTION ENGINE

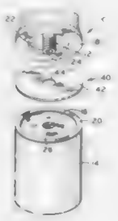
Robert D. Kenney, 519 W. Highland Ave., Marion, Ind. 46952

Filed Jul. 13, 1988, Ser. No. 218,142
Int. Cl.[4] F01M *1/00*
U.S. Cl. 123—196 A **20 Claims**

1. In an internal combustion engine of the type having a spin-on oil filter mounting assembly including an outflow passage, an inflow passage, a threaded pipe portion on which a spin-on oil filter can be removably mounted, and an internal pressure bypass valve between said outflow passage and said inflow passage to permit internal oil flow therebetween when oil flow through a mounted oil filter becomes restricted, an

apparatus for use during flushing of the engine crankcase, comprising;

liquid flow blocking means, attachable to said mounting assembly, for intentionally blocking flow of liquid be-



tween said outflow passage and said inflow passage, thereby causing liquid to flow between said outflow passage and said inflow passage through said internal pressure bypass valve.

4,854,278

VEHICLE WITH A NOISE-DAMPED DRIVE ASSEMBLY

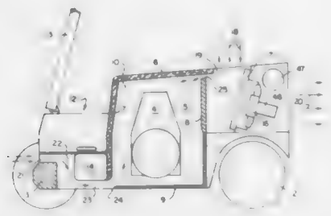
Günter Honecker, Seligenstadt, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 8, 1988, Ser. No. 179,588

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 3711945

Int. Cl.[4] F02B *77/11;* **F01N** *7/00;* **B60K** *11/08;* **B60R** *13/08*

U.S. Cl. 123—198 E **6 Claims**



1. A vehicle with a noise-damped drive assembly, comprising a liquid cooled internal combustion engine having a drive assembly connected thereto, said drive assembly surrounded by a noise-damping case having at least one air inlet opening located in a lower front portion of said case in a direction of travel of the vehicle and at least one air outlet opening located in an upper back portion of the case in said direction of travel, said engine having a radiator connected thereto with a cooling fluid running therethrough and located in a stream of air, said engine further having an exhaust manifold connected thereto, said radiator and exhaust manifold located outside of the case, said radiator being located in an air channel that has at least one air inlet opening and at least one air outlet opening, and the air outlet opening of the case empties into the air channel in a zone in which an air stream flowing through the air channel has a low pressure.

4,854,279

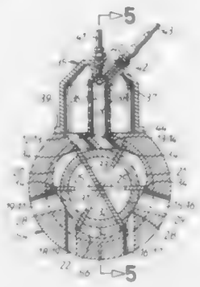
THREE CHAMBER CONTINUOUS COMBUSTION ENGINE

Cornelio L. Seno, Merryland Village, 375 J. Rizal Street, 1501 Mandaluyong, Metro Manila, Philippines

Continuation-in-part of Ser. No. 135,704, Dec. 21, 1987, abandoned. This application Sep. 27, 1988, Ser. No. 265,022

Int. Cl.[4] F02B *53/00*

U.S. Cl. 123—204 **1 Claim**



1. A three chamber continuous combustion engine comprising:

a. a generally spool-shaped segmented rotor which is rotatably and concentrically mounted inside a sealed housing assembly; and which is made up of:

i. six arched segments fastened at both ends to two end plates

ii. said two end plates having arched holes for reception of the ends of the arched segments, and rectangular radial notches slidably carrying the transverse edges of the blades perpendicular to the axis of the rotor

iii. two shafts in the central axes of the end plates that transmit rotative mechanical energy;

b. said housing assembly having:

i. a circumferential internal surface which is generally an equilateral triangle whose corners are replaced with circular arcs, and which forms jointly with the rotor three crescent shaped static chambers;

ii. three sets of intake and discharge ports corresponding to the three crescent shaped static chambers;

iii. two end walls with recesses for journalling the end plates for rotation, and with two center holes with bearings for journalling the shafts for rotation;

c. the first crescent shaped static chamber serving as a compressor that takes in air from the atmosphere at constant pressure and temperature, and compresses it at constant entropy;

d. an air tank that houses a flame tube, that receives pressurized air from the first crescent shaped static chamber, and that stores air at constant pressure, volume, temperature and entropy;

e. said flame tube being a hollow cylinder with several holes for air passage, having a fuel nozzle for the introduction of fuel and a spark plug for starting combustion, and serving as the combustion chamber where fuel and air are mixed properly and continuous combustion takes place at constant pressure and volume;

f. the second crescent shaped static chamber serving as an expander that receives the high pressure products of combustion from the flame tube, that generates mechanical power during expansion of dynamic chambers at constant pressure, temperature and entropy, that decompresses the dynamic chambers at constant volume, and that rids the dynamic chambers of exhaust gases at constant pressure and temperature;

g. the third crescent shaped static chamber serving as an oil pump that takes in and discharges oil functioning as lubricant, coolant and sealant; and

h. three intersecting blades of which one is H shaped and the other two are U shaped, having square edges and axial extensions at their outward corners, as well as being inserted slidably in the rotor slots thereby dividing the engine interior into six dynamic chambers carrying combustion media or oil.

4,854,280

TWO-STROKE INTERNAL COMBUSTION ENGINE AND CYLINDER HEAD FOR THE LATTER

Jean F. Melchior, 126 Bld du Montparnasse, 75014 Paris, France

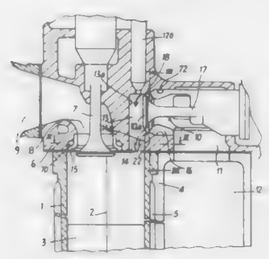
PCT No. PCT/FR86/00451, § 371 Date Jul. 31, 1987, § 102(e) Date Jul. 31, 1987, PCT Pub. No. WO87/04217, PCT Pub. Date Jul. 16, 1987

PCT Filed Dec. 31, 1986, Ser. No. 72,244

Claims priority, application France, Dec. 31, 1985, 85 19506

Int. Cl.[4] F02B *25/18*

U.S. Cl. 123—257 **24 Claims**



1. A two-stroke internal combustion engine having a cylinder head (6), at least one cylinder (1) with a reciprocating piston (3), and a device in said cylinder head (6) for exchanging burnt gases with air and having a plane of symmetry containing an axis (2) of the cylinder (1),

said device comprising a group of at least one intake valve (10) and a group of at least one exhaust valve (7), said intake valve having a seat (16) disposed in a wall of a scavenging and precombustion chamber (13),

said device characterized in that the precombustion chamber (13) communicates with the cylinder (1) through a transfer passageway (14) having a wall (14*a*) at least partially substantially parallel to the axis of the cylinder (1) and whose cross-section perpendicular to said axis opens out to form a substantially oblong shape tangentially to a surface of said cylinder and, said intake valve (10) cooperates, practically without clearance (32), with an end wall part (18) of said precombustion chamber (13) which is in a substantially opposed relationship to said transfer passageway (14), and

said device also characterized in that a portion of the wall of the precombustion chamber (13) in which the seat (16) associated with said intake valve (10) is located extends tangent to the surface of the cylinder (1).

4,854,281

INTERNAL COMBUSTION ENGINE

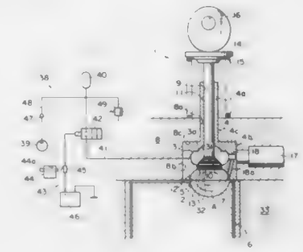
Kisichiro Hareyama, and Shokichi Hareyama, both of Iwate Pref., Japan, assignors to Kabushiki Kaisha Hareyama Giken, Japan

Filed Jan. 21, 1988, Ser. No. 146,738

Claims priority, application Japan, Jan. 21, 1987, 62-11982; Jan. 21, 1987, 62-11983; Jan. 21, 1987, 62-11984; Jan. 23, 1987, 62-13682; Nov. 10, 1987, 62-283934

Int. Cl.[4] F02B *19/02*

U.S. Cl. 123—292 **16 Claims**



1. An internal combustion engine comprising a fuel activation chamber disposed near a main combustion chamber and a valve disposed between said fuel activation chamber and said main combustion chamber to open and close therebetween, and valve control means for opening and closing said valve at an ignition timing in a low speed operation and maintaining said valve open in a medium and high speed operation.

4,854,282

DEVICE FOR SECURING CONTROL MAGNETS ON INJECTION PUMPS FOR DIESEL FUEL

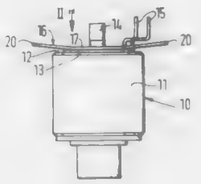
Peter Knorreck, Weissach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 9, 1987, Ser. No. 106,218

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1986, 3636747

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—357 **3 Claims**



1. A device for securing a control magnet onto an injection pump for Diesel fuel, which comprises:

a stepped, cylindrical housing (11) have a face end (12);

a control magnet (10) including a magnetic core (13) supported in said stepped, cylindrical housing with one end protruding beyond said face end of said stepped, cylindrical housing;

a rod-like reciprocating device (14) extending upwardly and protruding from said control magnet and controlled thereby;

a holder element embodied as a leaf spring adjacent said protruding end of said magnetic core;

said leaf spring having a middle section with outwardly extending arms (20) having outer ends and a central open-

ing (18) through which said rod-like reciprocating device reciprocates;

said outwardly extending arms of said leaf spring are pre-stressed and disposed in such a way that said outer ends of said arms (20), in a nonsecured state of said arms, are directed away from said face end of said stepped, cylindrical housing;

said middle section (17) of said leaf spring (16) including said central opening (18) is secured to said protruding end of said magnet core (13) with said rod-like reciprocating device extending through said central opening (18);

each arm (20) of said leaf spring (16) adapted to be secured to a cap (24) of a control mechanism of an injection pump by means of screws (29); and

said lead spring (16), in its functional state, rests flush on both the magnet core (13) and the cap (24) to which it is to be secured.

4,854,283

THROTTLE VALVE CONTROL APPARATUS

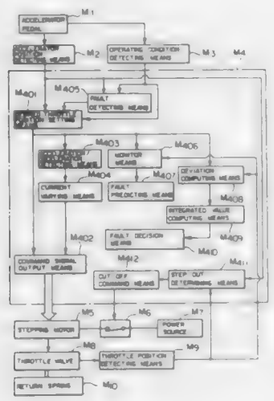
Masashi Kiyono, Anjo; Kanji Takeuchi, Gamagori; Tomoaki Abe, Oba, and Mitsunori Takao, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 25, 1987, Ser. No. 126,880

Claims priority, application Japan, Nov. 28, 1986, 61-284876; Dec. 1, 1986, 61-286430; Dec. 11, 1986, 51-295399; Dec. 11, 1986, 61-295401; Dec. 12, 1986, 61-297402

Int. Cl.[4] F02D *9/02, 41/14*

U.S. Cl. 123—361 56 Claims



1. A throttle valve control apparatus comprising:

a throttle valve for adjusting the amount of air drawn into an internal combustion engine;

control parameter detecting means for detecting a control parameter for controlling a position of said throttle valve;

a stepping motor for operating said throttle valve to a given position;

a return spring for applying to said throttle valve a force tending to close the same;

throttle valve position commanding means responsive to a control parameter detected by said control parameter detecting means to generate a command signal for bringing said throttle valve to a given position;

stepping motor driving means responsive to the command signal from said throttle valve position commanding means to drive said stepping motor;

throttle valve acceleration/deceleration detecting means for detecting at least one of an acceleration in a direction tending to open said throttle valve and a deceleration in a direction tending to close said throttle valve; and

current varying means for increasing a driving current to said stepping motor when said throttle valve acceleration/deceleration detecting means detects at least one of an acceleration in said throttle valve opening direction and a deceleration in said throttle valve closing direction.

4,854,284

ROTATION ANGLE MEASURING APPARATUS

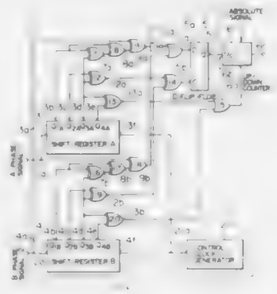
Seiichiro Hara, Katsuta, and Yoshikazu Hoshi, Ibaraki, both of Japan, assignors to Hitachi, Ltd. and Hitachi Automotive Engineering Co., Ltd., both of Tokyo, Japan

Filed Apr. 11, 1988, Ser. No. 179,988

Claims priority, application Japan, Apr. 10, 1987, 62-86898

Int. Cl.[4] F02P *5/15*

U.S. Cl. 123—414 9 Claims



1. A rotation angle measuring apparatus for measuring the rotation angle of a rotatory body by two phase signals with a phase difference therebetween generated for each predetermined rotation angle of the rotatory body, comprising means for discriminating the direction of rotation of the rotatory body each time the counting is made by said two phase signals and outputting as information of the rotation angle an output of a counter which performs its counting operation after the rotation direction has been determined.

4,854,285

ELECTRONIC CONTROL CIRCUIT FOR INTERNAL-COMBUSTION ENGINES

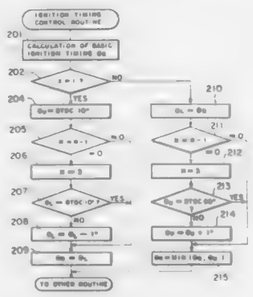
Yoshiaki Kanno, and Ryoji Nishiyama, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1987, Ser. No. 133,889

Claims priority, application Japan, Dec. 17, 1986, 61-301988

Int. Cl.[4] F02D *9/02*

U.S. Cl. 123—418 7 Claims



1. An electronic control device for internal-combustion

engines comprising a means for sensing the number of revolutions of engine; a means for sensing the speed of a motor vehicle; a means for sensing a loaded condition of engine; a control means for changing the ignition timing from a first ignition timing to a second ignition timing when the number of revolutions of engine is below a specific value, a vehicle speed is within a specific range, and when the loaded condition of engine is below a specific value; and an ignition timing change means for gradually changing the ignition timing at the time of at least one of a change from the first ignition timing to the second ignition timing and a chamge from the second ignition timing to the first ignition timing.

4,854,286

DEVICE FOR ADAPTING THE AIR/FUEL METERING SYSTEM AND THE IGNITION SYSTEM OF AN INTERNAL COMBUSTION ENGINE TO ENABLE THE ENGINE TO RUN WITH ALL NORMALLY AVAILABLE GRADES OF PETROL (GASOLINE) FUEL

Eberhard Chemnitzer, Lehrensteinsfeld, Fed. Rep. of Germany, assignor to Audi AG, Fed. Rep. of Germany

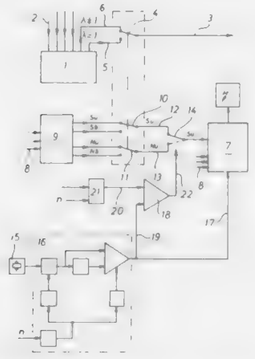
PCT No. PCT/DE87/00400, § 371 Date Apr. 6, 1988, § 102(e) Date Apr. 6, 1988, PCT Pub. No. WO88/02069, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 3, 1987, Ser. No. 187,523

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1986, 3630907

Int. Cl.[4] F02P *5/14;* F02M *37/04*

U.S. Cl. 123—425 8 Claims



1. Device for adapting the fuel/air metering system and the ignition system of an internal combustion engine to enable the engine to run with all normally available grades of petrol (gasoline) fuel,

with a fuel/air metering system capable of being switched over from a fuelair map for $\lambda=1$ (combustion with a stoichiometric ratio; operation with 3-way catalytic converter and λ sensor (oxygen sensor) with unleaded fuel) to a fuel/air map for $\lambda\neq1$,

with an ignition system with several pre-programmed ignition timing maps and a facility for switching over between timing maps,

characterised in that,

four ignition timing maps (s_u, n_u, s_b, n_b) are programmed in the memory, one being suited for operation with premium unleaded fuel (s_u), one for regular unleaded fuel (n_u), one for premium leaded fuel (s_b) and a fourth for regular leaded fuel (n_b),

and that the fuel/air metering system (1) can be switched over with a hand-operated switch (4) or a plug and an initial switch-over can be made between the two pairs of ignition timing maps s_u/s_b and n_u/n_b (switches 10,11), so that the air/fuel map $\lambda=1$ and the ignition timing maps s_u and n_u are available when the combustion engine is operated with unleaded fuel, and the air/fuel map $\lambda\neq1$ and the ignition timing maps s_b and n_b are available when the engine is run on leaded fuel,

and that a further automatic switch-over unit (14), which becomes effective after the first switch-over between the ignition timing maps, is provided, and this switch-over unit, depending on the position of the first switch-over (10, 11), switches over between the ignition timing maps s_u and n_u, or s_b and n_b, according to the output of at least one threshold sensor (18) for at least one operating parameter of the internal combustion engine.

4,854,287

APPARATUS FOR LEARNING AND CONTROLLING AIR/FUEL RATIO IN INTERNAL COMBUSTION ENGINE

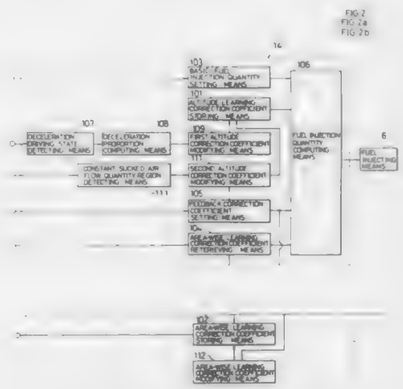
Naoki Tomisawa, Isesaki, Japan, assignor to Japan Electronic Control Systems Co., Ltd., Isesaki, Japan

Filed Sep. 17, 1987, Ser. No. 98,038

Claims priority, application Japan, Oct. 21, 1986, 61-248315; Oct. 22, 1986, 61-249565

Int. Cl.[4] F02D *41/12, 41/14*

U.S. Cl. 123—489 10 Claims



1. An apparatus for learning and controlling an air/fuel ratio in an internal combustion engine comprising:

engine driving state detecting means for detecting an engine driving state including at least one area and at least one parameter having an impact on quantity of air sucked into said engine;

air/fuel ratio detecting means for detecting an exhaust component of said engine and thereby detecting said air/fuel ratio in an air/fuel mixture sucked in said engine;

basic fuel injection quantity setting means for setting a basic fuel injection quantity based on said parameter detected by said engine driving state detecting means;

rewritable altitude learning correction coefficient storing means which stores therein an altitude learning correction coefficient for indiscriminately correcting said basic fuel injection quantity set by said basic fuel injection quantity setting means for all of said areas of said engine driving state based on the altitude at which said engine is located;

rewritable area-wise learning correction coefficient storing means which stores therein an area-wise learning correction coefficient for correcting said basic fuel injection quantity for respective areas of said engine driving state;

area-wise learning correction coefficient retrieving means for retrieving an area-wise learning correction coefficient for a corresponding area of said engine driving state from

said area-wise learning correction coefficient storing means based on actual engine driving state;

feedback correction coefficient setting means for comparing said air/fuel ratio detected by said air/fuel ratio detecting means with a desired air/fuel ratio while said engine is driven in a predetermined driving state and adjusting by a predetermined quantity a feedback correction coefficient for correcting said basic fuel injection quantity to bring actual air/fuel ratio close to said desired air/fuel ratio;

fuel injection quantity computing means for computing said fuel injection quantity based on said basic fuel injection quantity set by said basic fuel injection quantity setting means, said altitude learning correction coefficient stored in said altitude learning correction coefficient storing means, said area-wise learning correction coefficient retrieved by said area-wise learning correction coefficient retrieving means and said feedback correction coefficient set by said feedback correction coefficient setting means;

fuel injection means for injecting and supplying a fuel to said engine in an on-off manner according to a driving pulse signal corresponding to said fuel injection quantity computed by said fuel injection quantity computing means;

deceleration driving state detecting means for detecting a deceleration driving state of said engine;

deceleration proportion computing means for computing a deceleration proportion which is a proportion of a deceleration driving state period or number in a predetermined period based on said deceleration driving state detected by said deceleration driving state detecting means;

altitude learning correction coefficient modifying means for modifying and rewriting said altitude learning correction coefficient stored in said altitude learning correction coefficient storing means according to said deceleration proportion computed by said deceleration proportion computing means; and

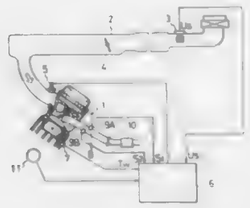
area-wise learning correction coefficient modifying means for learning deviation of the feedback correction coefficient from a reference value for said respective areas of the engine driving state and modifying and rewriting the area-wise learning correction coefficient of said area-wise learning correction coefficient storing means so as to reduce said deviation.

4,854,289

AIR-FUEL RATIO CONTROL APPARATUS IN INTERNAL COMBUSTION ENGINE

Akira Uchikawa, Isesaki, Japan, assignor to Japan Electronic Control Systems Co., Gunma, Japan

Filed Apr. 8, 1988, Ser. No. 179,535
Claims priority, application Japan, Apr. 14, 1987, 62-89851
Int. Cl.[4] F02M *51/00*
U.S. Cl. 123—489 11 Claims



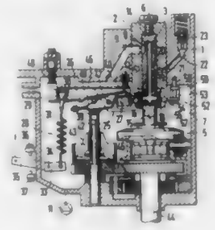
1. An air-fuel ratio control apparatus for controlling the air-fuel ratio of an air-fuel mixture in an internal combustion engine, which comprises first air-fuel ratio sensing means for sensing a first level of the air-fuel ratio and outputting a reversed signal when the air-fuel ratio of the air-fuel mixture supplied to the engine is at the first level of a theoretical air-fuel ratio or leaner than the theoretical air-fuel ratio, second air-fuel ratio sensing means for sensing a second level of the air-fuel ratio and outputting a reversed signal when the second level of the air-fuel ratio of the air-fuel mixture is richer than the first air-fuel ratio, large nitrogen oxide discharge quantity region-detecting means for detecting the driving region where the quantity of nitrogen oxide discharged from the engine is larger than a set amount, first air-fuel ratio feedback control means for performing feedback control of the air-fuel ratio in the vicinity of the first level of the air-fuel ratio, where the output level of the first air-fuel ratio sensing means is reversed, based on a signal from said first air-fuel ratio sensing means when the engine is in at least a part of a region other than the driving region of the large nitrogen oxide discharge quantity detected by said detecting means, and second air-fuel ratio feedback control means for performing feedback control of the air-fuel ratio, where the output level of the air-fuel ratio sensing means is reversed, based on a signal from said second air-fuel ratio sensing means when the engine is in the driving region of the large nitrogen oxide discharge quantity detected by said large nitrogen oxide discharge quantity region-detecting means.

4,854,3[illegible]

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Franz Eheim, deceased, late of Stuttgart, Fed. Rep. of Germany (by Helga Eheim, heir), and Gerald Hofer, Bad Aibling, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 8, 1987, Ser. No. 130,701
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1986, 3644584
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—503 23 Claims



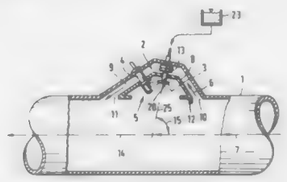
1. A fuel injection pump for internal combustion engines having a pump cylinder, a pump piston (4) simultaneously reciprocating and rotating in said pump cylinder (3) which serves as a distributor for the pumped fuel to feed a plurality of fuel injection locations, the pump piston defining a pump work chamber (6) in the pump cylinder, a relief conduit in said piston connecting said pump work chamber to an outlet on said pump piston, an annular slide on said pump piston for varying the fuel injection quantity pumped by the pump piston by controlling said outlet (16) on the pump piston circumference of said relief conduit (14), said relief conduit in the pump piston leading from the pump work chamber (6) to a relief chamber (7), by means of said annular slide (18), said annular slide is axially displaceable on the pump piston, a fuel injection quantity regulator (25) inside the relief chamber for controlling said said annular slide via a governor lever (39), said annular slide (18) having a first control edge (19) located in a plane perpendicular to the piston axis, a second control edge (51) controlling said outlet arranged relative to said first control edge by which communication of the pump work chamber (6) with the relief chamber (7) can be established, whereas effectiveness of said second control edge can be changed or stopped by changing the rotational position of said annular slide, said quantity regulator including a first coupling device located between the annular slide (18) and the governor lever (39), said first coupling device comprising first guide faces located in a plane perpendicular to the pump piston axis, said first coupling device including a coupling element (40) guided on said first guide faces which allows a rotation of said annular slide without an axial change in stroke of the first control edge (19), a second coupling device, located between the annular slide (18) and a pivoting device (53) of a torque device (52) for adjusting a rotational position of the annular slide, said second coupling device comprising a groove including second guide faces (57) extending in a direction of the pump piston axis which allows an axial change in stroke without rotation of the annular slide, a sliding element guided along said second guide faces, an adjusting lever (35) connected with said fuel injection quantity regulator of the fuel injection pump and moveable between an idling stop (37) and a full load stop (36), said adjusting lever serves to input a desired torque at the fuel injection quantity regulator (25), adjusting means for adjusting said second coupling device, said adjusting means being linked to said adjusting lever (35) which, upon a pivot movement of said adjusting lever over a preset pivot angle beginning at said idling stop, a rotation of the annular slide (18) is effected and in a subsequent pivot range of said adjusting lever the rotational position of said annular slide reached at an end of said preset pivot angle is retained.

4,854,290

AIR PREHEATING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Karl-Heinz Richardt, Lohmar, Fed. Rep. of Germany, assignor to Kloeckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Sep. 25, 1987, Ser. No. 100,924
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1986, 3633512
Int. Cl.[4] F02M *27/08, 31/04*
U.S. Cl. 123—556 13 Claims



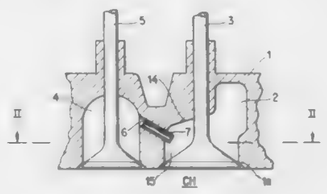
1. An air preheating device for an internal combustion engine having an air intake pipe comprising: a casing (8, 16) in said intake pipe bifurcating intake air flowing in said intake pipe into a main air current and a partial air current (6), said casing and intake pipe defining an air channel therebetween and said casing being curved to form a burning cavity open to the interior of said intake pipe and forming a zone (5) of stabilized intake air flow, an ultrasonic atomizer (2) mounted on said intake pipe and extending through an opening in said casing and into said cavity, said atomizer including an atomizer element operable to produce an atomized stream (3) in said zone (5) of stabilized flow and an ignition device (4) mounted on said intake pipe with an ignitor end extending through an opening in said casing and into said cavity, said ignition device being operable to ignite said atomized stream (3) in the zone (5) of the stabilized flow, said ultrasonic atomizer (2) being so positioned that said intake air (7) circulates around said atomizer element and cools it.

4,854,291

CYLINDER HEAD FOR USE IN DIESEL ENGINES

Ludwig Elsbett; Günter Elsbett, and Klaus Elsbett, all of Industriestrasse 14-16 D-8543 Hilpoltstein, Fed. Rep. of Germany

Filed Nov. 6, 1987, Ser. No. 118,187
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1986, 3638029
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—569 14 Claims



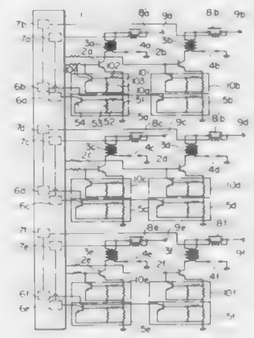
7. A cylinder for use in internal combustion engines, particularly in diesel engines, comprising a head having an air-admitting first passage and a second passage for evacuation of combustion products, and a bore drilled into said head and connecting said passages so as to admit combustion products into said first passage.

4,854,292

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Noriyoshi Urushiwara, Katsuta; Noboru Sugiura, Mito; Yasunori Fujino, Hiroshima, and Ryoichi Kobayashi, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,676
Claims priority, application Japan, Mar. 27, 1987, 62-71486
Int. Cl.[4] F02P *1/00*
U.S. Cl. 123—630 6 Claims



1. An ignition system for an internal combustion engine, comprising:

a plurality of power switching devices

a control unit connected to said power switching devices for controlling the on/off operation of said power switching devices;

a plurality of ignition coils, each connected to a respective one of said power switching devices and including a primary winding with the primary current flowing therein controlled by an interruption signal from the power switching device and a secondary winding across which a high voltage is generated by controlling the primary current flowing in the primary winding;

shorting detection means for detecting a shorting breakdown of a power switching device; and

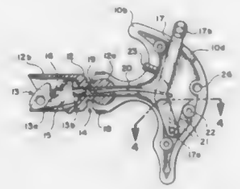
power supply separation means responsive to said shorting detection means for separating an ignition coil from a power supply upon detection of a shorting breakdown of the power switching device connected to said ignition coil.

4,854,293

ARCHERY BOWSTRING DRAWBACK AND RELEASE DEVICE

Kent S. Roberts, American Fork, Utah, assignor to Roberts Mfg., Inc., American Fork, Utah

Filed Sep. 29, 1988, Ser. No. 250,558
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—35 A 10 Claims



1. A bowstring release device, comprising in combination bow string-engaging structure having string-engaging catch means pivotally mounted in a supporting member; a handle member; a ball and socket joint universally coupling said supporting member and said handle member together; a trigger pivotally mounted in said handle member; means resiliently biasing said trigger; a transversely segmented, longitudinal, composite rod extending between said trigger and said string-engaging catch means, one longitudinal end segment of said rod being rigid and adapted to engage said catch means, the other longitudinal end segment being stiffly flexible and secured to said trigger; slideway means laterally confining said rigid end segment of said composite rod; and resilient means acting against said trigger to normally urge said rigid end segment of said rod means into engagement with said catch means, said trigger being movable against the urge of said resilient means when pulled to withdraw said rigid end segment of said composite rod from said catch means for releasing the bowstring from said string holder, the said other end segment of the rod being unrestrained laterally and free to flex transversely while still transmitting movement longitudinally.

4,854,294

PRESSURE-ASSISTED BLOW GUN

Anthony S. Lala, c/o Unified Concepts, Inc., 1654 Springfield St., Dayton, Ohio 45403

Filed Dec. 11, 1987, Ser. No. 131,967
Int. Cl.[4] F41B *1/00*
U.S. Cl. 124—62 19 Claims

15. In a blow gun which propels darts, said gun comprising a blow gun tube and a mouthpiece, the improvement comprising:

means for preventing a projectile loaded into said loading end of said blow gun tube from entering said mouthpiece;

a source of pressurized gas; means for communicating said source of pressurized gas with said blow gun tube; and

means responsive to a user's breath for utilizing said source of pressurized gas to blow a projectile loaded into said loading end of said blow gun out of said discharge end of



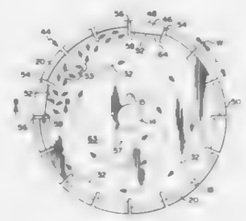
said blow gun tube with a greater pressure than that of a user's breath alone.

4,854,295

WEAR RESISTANT ABRASIVE CUTTING WHEEL

Metin Sakarcan, Kansas City, Mo., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Jun. 1, 1988, Ser. No. 201,646
Int. Cl.[4] B24D *5/06*
U.S. Cl. 125—15 1 Claim



1. A cutting wheel for cutting asphalt, green concrete and the like and for generating turbulent flow within a slurry formed of blade coolant and abrasive particles, said wheel comprising:

a disc-shaped blade core having a center and a predetermined width and having an outer periphery defining a plurality of circumferentially alternating gullets and support segments;

a plurality of arcuate abrasive cutting segments respectively fixed to a plurality of said support segments, said cutting segments having a predetermined radial extent; and

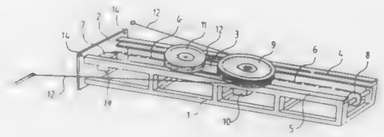
several radially enlarged abrasive cutting segments respectively fixed to several of said support segments at spaced intervals around the circumference of said cutting wheel, said radially enlarged abrasive cutting segments having a cutting width greater than said predetermined width of said blade core for transversely stabilizing said wheel during cutting, said radially enlarged abrasive cutting segments having a radially extending leading surface and a radially extending trailing surface, said leading surface extending further radially inwardly than said trailing surface and further radially inwardly than said predetermined radial extent of said plurality of arcuate abrasive cutting segments in order to generate turbulent flow within said slurry, said radially enlarged abrasive cutting segments having a radially varying undersurface extending between said leading and trailing surfaces for creating a pressure drop within said slurry adjacent said undersurface to further generate turbulence within said slurry so as to reduce undercutting of said blade core.

4,854,296

MACHINE FOR CUTTING BUILDING MATERIALS BY MEANS OF AN ABRASIVE CABLE OR WIRE

Guy Pittet, Geneva, Switzerland, assignor to Forbeton-Betonbohr S.A., Troinex, Switzerland

Filed Mar. 31, 1988, Ser. No. 177,914
Int. Cl.[4] B28D *1/08*
U.S. Cl. 125—21 9 Claims



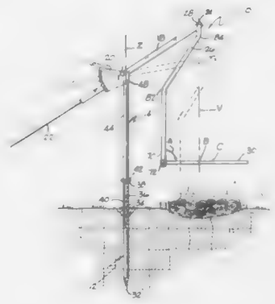
1. A machine for cutting building materials by means of an abrasive cable or wire (12) forming a closed loop driven in a rotational movement and under traction as result of a shift of a rotational drive means, defined in that it comprises an elongate frame (1), on which is mounted a movable carriage (3) carrying a grooved driving pulley (9) and a grooved idle pulley (11) which are mounted next to one another and round which the abrasive cable or wire (12) is wound a predetermined number of times, a motor (10) for driving the driving pulley, and a device for linearly driving the carriage (6, 7), thereby providing a change in the length of the loop of cable or wire formed between the carriage and the material to be cut by changing the number of winding turns of the cable or wire round the pulleys.

4,854,297

PORTABLE GRILL ASSEMBLY

Joseph L. Shuman, 2755 E. Bates Ave., Denver, Colo. 80210

Filed Jul. 19, 1988, Ser. No. 221,439
Int. Cl.[4] F24B *3/00*
U.S. Cl. 126—30 20 Claims



1. A cooking assembly comprising:

a food support;

upright post means;

arm means having a support end portion and a midsection portion for mounting on said upright post means for pivotal movement of said arm means about a first pivot point;

lock means for securing said arm means at one of a plurality of different angled positions about said first pivot point; and

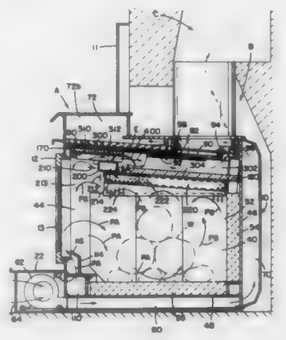
suspension means for suspending said food support from said support end portion, said suspension means including a single rigid one-piece suspension member having an upper end supported for free pivotal movement from said support end portion about a second pivot point, said suspension member also having a lower end rigidly attached to an edge portion of said food support which extends under said second pivot, said suspension member and food support being free to pivot at said second pivot while food is placed on said food support and during cooking to maintain said food support in a substantially horizontal position.

4,854,298

SECONDARY COMBUSTION DEVICE FOR WOODBURNING STOVE

Richard D. Craver, Orrville, Ohio, assignor to Orrville Products, Inc., Orrville, Ohio

Continuation of Ser. No. 859,336, May 5, 1986, Pat. No. 4,672,946. This application May 26, 1987, Ser. No. 53,490
The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.
Int. Cl.[4] F24C *1/14*
U.S. Cl. 126—77 1 Claim



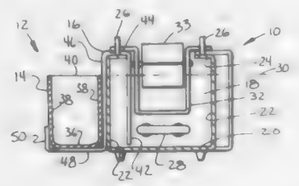
1. In a wood burning stove including an exhaust flue opening, a combustion chamber for primary combustion having an access door, a support for wood to be burned and a primary air inlet means for supplying air to support primary combustion of said wood to produce flue gases containing combustible particulate material, plenum means for directing said flue gases in a direction from said combustion chamber to said flue opening in a preselected path, and secondary combustion means for burning said particulate material in said flue gases before said flue gases pass through said exhaust flue opening, the improvement comprising: said combustion chamber having a flue gas exit opening extending laterally across the top of said combustion chamber and communicating said combustion chamber with said plenum means, an elongated manifold extending laterally across and above said combustion chamber substantially coextensively with said flue gas exit opening, a number of air opening spaced longitudinally along said manifold and facing opposite said direction of said flue gases closely adjacent said flue gas exit opening, and an air inlet means for supplying ambient, secondary combustion air to said manifold for counterflow thereof from said openings into said path of said flue gases in a plurality of distinct jets.

4,854,299

DEEP FAT FOOD COOKER HAVING A FAT PRE-WARMER

Edward M. Anderson, 2620 East Medicine Lake Blvd., Minneapolis, Minn. 55441

Filed May 21, 1984, Ser. No. 612,580
Int. Cl.[4] A47J *27/00*
U.S. Cl. 126—380 **5 Claims**



1. A cooking fat pre-warmer for a deep fat food cooker having upright side walls forming a central hot cooking oil vat having cooking oil therein, comprising:

(a) a thermally conductive and discrete metal pre-warmer container for cooking fat; and

(b) an elongate thermally conductive metal container support for the container, said support being structurally discrete and separable from the container and having;

(1) a cradle having a flat upright facing surface upon which said container is removably supportable, with a bottom of the container being in direct and heat exchange contact with said cradle,

(2) an upright support wall extending upward from an inner side of the cradle, said upright wall being integral with said cradle and having a height greater than a height of said container,

(3) a cap integral with the upright support wall and the cradle and extending transversely from a top of the wall and in a direction away from said cradle,

(4) biasing means on the cradle and spaced transversely outward from the upright wall for engaging and biasing the fat container against said upright wall, and

(5) a downward extending thermally conductive dip member extending downward from the cap and being extendable into the vat and being submersible in said cooking oil in the cooker vat, said dip member being structurally and thermally integral with said cap and said upright wall, said dip member being spaced transversely from said upright wall and being in thermal communication with said container through said cap, upright wall and cradle for extracting heat directly from the hot oil in the vat and for conducting the extracted heat to oil in the container via the cap, upright wall, cradle and lastly through the container, with

(c) said container being removable with warm oil therein from said container support while said container support remains upon the food cooker with the dip member in the vat and in hot oil, and with said container support resting upon a side wall of the cooker.

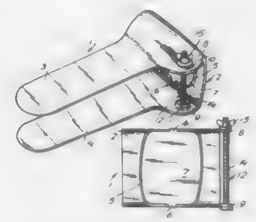
4,854,300

DISCARDABLE ADJUSTABLE VAGINAL SPECULUM

Antonino Corbo, Av. La Plata 1460, 2nd Floor, 1250 Buenos Aires, Argentina

Filed Mar. 25, 1988, Ser. No. 173,467
Claims priority, application Argentina, Mar. 26, 1987, 307124
Int. Cl.[4] A61B *1/30*
U.S. Cl. 128—3 **10 Claims**

1. A vaginal speculum comprising two separator tongs, a transversal wall from which said tongs extend facing each other, said wall having a window therein adapted for observation and passage of instruments, and means for initially closing said window, said means comprising a safety seal which once



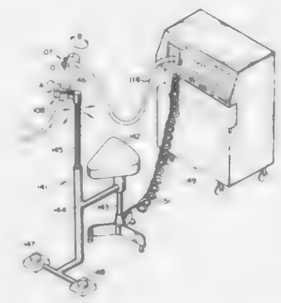
removed may not be replaced thereby providing evidence of prior use of the speculum.

4,854,301

ENDOSCOPE APPARATUS HAVING A CHAIR WITH A SWITCH

Shigeru Nakajima, Fuchu, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1987, Ser. No. 119,742
Claims priority, application Japan, Nov. 13, 1986, 61-270637; Feb. 6, 1987, 62-025943
Int. Cl.[4] A61B *1/04*
U.S. Cl. 128—4 **12 Claims**



1. An endoscope chair apparatus comprising:

an endoscope having an operating part, an insertable part for insertion into a patient, and a universal cord for connecting the endoscope to an endoscope peripheral apparatus;

an endoscope peripheral apparatus directly connected to said endoscope by said universal cord; and

a chair remote from said endoscope peripheral apparatus and operatively connected by only an electrical cord to said endoscope peripheral apparatus, said chair having mounted thereon at least an operating switch for said endoscope peripheral apparatus, said switch being connected to said electrical cord.

4,854,302

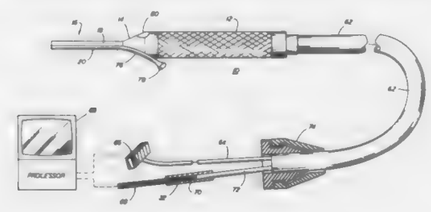
VIDEO EQUIPPED ENDOSCOPE WITH NEEDLE PROBE

Jimmie B. Allred, III, Skaneateles, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Nov. 12, 1987, Ser. No. 119,707
Int. Cl.[4] A61B *1/00, 1/06*
U.S. Cl. 128—6 **15 Claims**

1. A compact needle-probe video endoscopic instrument for examining a remote target area through an opening that includes a main housing;

an elongated probe that is insertable through a very small opening into a target area and including an elongated rigid sleeve that is rigidly attached onto said main housing, and a distal end; optical means contained within said sleeve for carrying an optical image of the target area from the distal end of the sleeve into the interior of the housing, and a fiber optic illumination bundle extending continuously from a remote source of illumination to a distal end of said sleeve for carrying illumination through said sleeve into said target area; a self-contained solid state imager assembly permanently disposed within said main housing and in



intimate contact with a proximal end of said optical means, and an imaging element and associated focusing optics along an optic axis of said optical means, arranged for directly focusing the optical image from said optical means onto said imaging element, the latter producing a video output signal corresponding to the image of the target area that is carried by said optical means; coupling means for coupling the video output signal from the imager assembly to a video display device; and means for coupling said fiber optic bundle to said source of illumination and a guide tube affixed onto said sleeve for introducing and guiding a tool into the target area of said probe.

4,854,303

HAIR CIRCLE FOR CONJUGAL AFFECTION

Dao-Pin Chang, 55, Hou Hu, Hu Pei Tsun, Lin Kow Hsiang, Taipei Hsien, Taiwan

Filed Oct. 21, 1987, Ser. No. 111,436
Int. Cl.[4] A61H *7/00*
U.S. Cl. 128—62 R **8 Claims**



1. A hair circle for conjugal affection comprising:

a circular elastic base member having a plurality of mutually spaced round holes extending radially therethrough, the holes being disposed in a predetermined pattern extending around the circumference of said base member;

a plurality of tufts of soft hair, an end of each tuft extending through one of said holes so that an end of a tuft extends through each hole with a single tuft having ends extending through a pair of holes;

an adhered film coating the inner surface of base member to secure said tufts.

4,854,304

IMPLANT FOR THE OPERATIVE CORRECTION OF SPINAL DEFORMITY

Klaus Zielke, Bad Wildungen, Fed. Rep. of Germany, assignor to Oscobal AG, Selzach, Switzerland

Filed Mar. 15, 1988, Ser. No. 168,514
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1987, 8704134[U]
Int. Cl.[4] A61F *5/00*; A61B *17/00*
U.S. Cl. 128—69 **2 Claims**



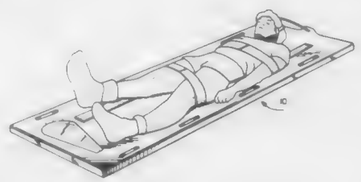
1. An implant for the operative correction of spinal deformity, in particular scoliosis, kyphosis, and lordosis, comprising a rod, said rod having at one of its end a ratchet part formed by circumferential saw notches conically broadening toward the top and ending in a flat surface for receiving spinal hooks, a cylindrical part followed by a threaded part, said threaded part being built for receiving the heads of bone screws fixed by nuts, wherein said ratchet part of the rod is used for distraction and said threaded part of the rod is used for compression as well as distraction of the deformed spine.

4,854,305

RADIOLUCENT TRANSPORT AND DIAGNOSTIC PROCEDURE BOARD

Ross L. Bremer, Atlantic Beach, Fla., assignor to Bremer Brace of Florida, Inc., Jacksonville, Fla.

Filed Oct. 20, 1987, Ser. No. 110,445
Int. Cl.[4] A61H *1/02*; A61F *5/04, 13/00*
U.S. Cl. 128—75 **16 Claims**



14. A carrying board for a patient and which board is compatible for use with radiolucent machines and procedures, comprising:

an elongated substantially rigid board having a core formed of a plastic material;

means defining an elongated opening in said board extending lengthwise thereof;

an elongated flexible element extending through said opening means;

traction applying and indicating means carried by said board and connected to one end of said flexible element;
traction connecting means for connecting with the head of a patient lying on the board and connected to the opposite end of said flexible element;
means carried by said board for substantially immobilizing a patient on the board;
said traction applying and indicating means, said traction connecting means, said element, and said board being formed of materials compatible for use with radiolucent machines and procedures;
said immobilizing means including a pair of strips secured to said board at laterally spaced positions therealong and at least one strap for disposition about a patient, each of said strap and said strips carrying cooperating connecting means for releasably connecting said strap and said strips one to the other, said strips being elongated and extending lengthwise of said board;
a pair of straps for disposition about a patient, each of said pairs of straps and said elongated strips carrying cooperating connecting means for releasably connecting said straps and said strips one to the other at selected longitudinal positions along said board, said releasable connecting means comprising hooks and loops carried by respective ones of said straps and said strips;
said traction indicating means including an elongated indicator blade extending generally transversely of said board;
means for securing one end of said indicator blade against translational movement relative to said board leaving a portion of said blade free for movement away from a null position;
means for connecting one end of said element to said blade portion, means for biasing said blade portion for movement toward said null position upon movement thereof away from said null position;
indicia carried by said traction indicating means whereby, when said element is placed under tension and said blade portion is moved away from said null position, said biasing means maintains said element under tension, said blade portion being in registration with said indicia to indicate the magnitude of the traction applied to the patient; said board having upper and lower generally parallel surfaces;
said traction indicating means lying between the upper and lower surfaces of said board with said blade portion being moved in a plane generally parallel to the planes defining said upper and lower surfaces; and
said traction indicating means including a translucent cover whereby at least a portion of said indicating means is exposed to view through said translucent cover.

4,854,306
CERVICAL/OCCIPITAL SUPPORT
Charles Pujals, Jr., 119 Fayette St., Bridgeton, N.J. 08302
Continuation-in-part of Ser. No. 816,883, Jan. 7, 1986, Pat. No. 4,708,129, which is a continuation-in-part of Ser. No. 563,160, Dec. 19, 1983, Pat. No. 4,562,833. This application Nov. 16, 1987, Ser. No. 121,787
The portion of the term of this patent subsequent to Jan. 7, 2003, has been disclaimed.
Int. Cl.[4] A61F *5/01, 5/04*
U.S. Cl. 128—75 **22 Claims**

1. A head and neck support comprising a semi-rigid preformed U-shaped anterior chin supporting shell fabricated of a resilient material, said shell having a chin support area with a front opening, a lower front edge engagable against the user's chest and preformed vertical and semi-circular contours to enhance the rigidity of the shell, said vertical contour extends upwardly from a central portion of said chest engaging front



edge, and said semi-circular curved contour curves upwardly from opposing lateral sides of said chest engaging front edge.

4,854,307
APPLYING LIQUID ADHESIVE TO UPPER EYELID TO COUNTERACT DROOPING
Bettye Elfenbein, 18041 Biscayne Blvd., #405 Tower 4 South, North Miami Beach, Fla. 33160
Filed May 6, 1988, Ser. No. 191,129
Int. Cl.[4] A61H *5/00;* **A61F** *13/12*
U.S. Cl. 128—76.5 **10 Claims**

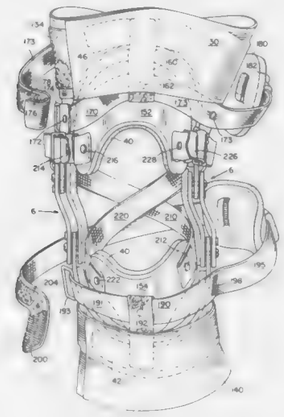


1. A method of non-surgically making a tuck or fold in loose foldable skin of an upper eyelid comprising selecting a liquid adhesive that does not harm the eyelid or the eye and is non-allergenic to humans and is not carried by any other member unfolding the upper eyelid to provide a lower portion and an upper portion of the upper eyelid applying to the outer surface of the upper eyelid while unfolded an essentially horizontally extending, elongated area of said liquid adhesive and folding the upper eyelid essentially along the elongated area of application of said adhesive to enable the liquid adhesive to directly adhere the lower portion of the upper eyelid to the upper portion thereof.

4,854,308
KNEE ORTHOSIS HAVING OFFSET WITHIN HINGES AND ANTI-ROTATION STRAPS
Robert C. Drillio, 41 Whitehall Ln., Reading, Mass. 01867
Continuation-in-part of Ser. No. 2,269, Dec. 29, 1986, abandoned. This application Dec. 28, 1987, Ser. No. 138,805
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—80 C **32 Claims**

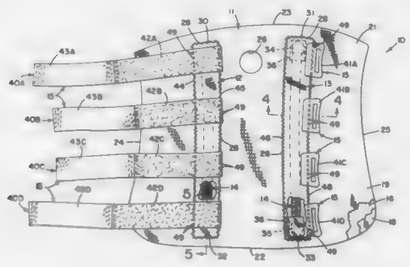
1. A knee orthosis comprising:
a proximal cuff engageable with a wearer's leg above the knee,
a distal cuff engageable with the wearer's leg below the knee,
a pair of polycentric hinges,
each hinge having a proximal portion pivotally attached to the proximal cuff and a distal portion spaced from the proximal portion and pivotally attached to the distal cuff,
the proximal portion of both hinges being offset laterally in the same direction relative to the distal portion to prevent pressure to the fibula head,

the proximal portion of the hinge which is adjacent the outside of the leg being further from the medial of the leg than the distal portion of that hinge and the proximal



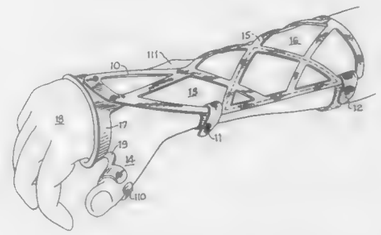
portion of the hinge which is adjacent the inside of the leg being closer to the medial of the leg than the distal portion of that hinge.

4,854,309
FLEXIBLE WRIST SPLINT
Denise M. Elsey, Greensburg, Ohio, assignor to Akron City Hospital, Akron, Ohio
Filed May 6, 1988, Ser. No. 190,876
Int. Cl.[4] A61F *5/04, 13/00*
U.S. Cl. 128—87 R **15 Claims**



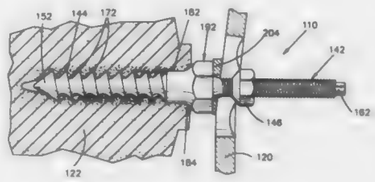
1. A flexible wrist splint comprising:
flexible panel means adapted to encircle the wrist area of a person, said panel means having inner and outer sides, proximal and distal edges, opposed lateral edges and first and second expandable skin layers and a foam core therebetween;
first and second opposed pockets carried on said outer side extending between said proximal and distal edges;
said first and second opposed pockets having first and second expandable skin layers and a foam core therebetween;
flexible and resilient stay means carried within said first and second pockets;
means provided between said first and second opposed pockets for the insertion of a thumb;
said means for inserting of a thumb being a hole in said flexible panel means;
fastening means for securing said panel means about the wrist, maintaining said inner side thereagainst;
said fastening means being contiguously affixed with said first and second opposed pockets and further being a plurality of strips affixed along at least one edge of said first pocket and a like plurality of rings are affixed along one edge of said second pocket engageable with said strips, each said strip and ring forming a pair; and
said hole for the insertion of a thumb being located between one said strip and one said ring of one said pair.

4,854,310
PERFORATED SPLINT
Lawrence L. Lee, 3776 Martha St., San Diego, Calif. 92117
Continuation-in-part of Ser. No. 832,589, Feb. 25, 1986. This application Jun. 2, 1988, Ser. No. 201,630
The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—87 A **9 Claims**



1. A splint to immobilize part of a limb comprising a rigid perforated sheet that fits over one side of said limb;
said sheet comprising a plurality of intersecting strips that are rigidly connected together at their positions of intersections;
said strips being greater in width than in thickness; said strips being oriented with their widths along the surface of said sheet;
some said strips being positioned along an edge of said sheet, and some other said strips intersecting the edge forming at least one triangle to increase the rigidity of said sheet.

4,854,311
BONE SCREW
Arthur D. Steffee, Moreland Hills, Ohio, assignor to Acro Med Corporation, Cleveland, Ohio
Continuation-in-part of Ser. No. 817,344, Jan. 9, 1986. This application Jan. 21, 1988, Ser. No. 146,739
Int. Cl.[4] A61B *17/58*
U.S. Cl. 128—92 YM **16 Claims**



5. A bone screw for connecting a bone portion with a bone connecting member, said bone screw comprising:
an elongated shank having a longitudinal central axis, a first externally threaded portion for receiving an internally threaded nut and a second externally threaded portion for threaded engagement with a surface defining an opening

in the bone portion to attach the bone screw to the bone portion; and

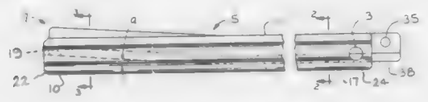
means integral with said shank and having a transverse cross-section at least equal to the transverse cross-section of the opening in the bone portion for projecting into the opening and for engaging a portion of the surface defining the opening in the bone portion to restrict movement of said bone screw relative to the bone portion in a direction transverse to the longitudinal central axis of said shank and to block effluence from the opening in the bone portion, said means being located intermediate said first externally threaded portion and said second externally threaded portion.

4,854,312

EXPANDING INTRAMEDULLARY NAIL

Demetrios D. Raftopoulos, Ida, Mich., and James D. Baril, Toledo, Ohio, assignors to The University of Toledo, Toledo, Ohio

Filed Apr. 13, 1988, Ser. No. 181,117
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 YY 7 Claims



1. A fixation device for insertion into a medullary cavity of a bone comprising:

a first elongate member of generally irregular cross section and having an articulated channel therein that is T-shaped in cross section and extending the length of said member,

said T-shaped channel including a substantially straight base section extending parallel to the longitudinal axis of said member over a substantial length of said member and a ramp section including an arcuate configuration at a distal end portion diverging laterally of said axis and disposed adjacent said base section,

said channel including a slot opening on the surface of the first member which extends longitudinally along its surface a distance at least equal to the length of said ramp section,

a second elongate member that is T-shaped in cross section and is slidingly engaged in said channel, said second member being substantially straight longitudinally, the distal end portion of the channel and said second member being divergent in their engagement in said distal end portion of the channel to extend the second member through said slot and fix the device within the cavity of the bone, said second member bowing in its sliding movement along said distal end portion of the channel, whereby the friction between them maintains the relative position between the first and second members.

4,854,313

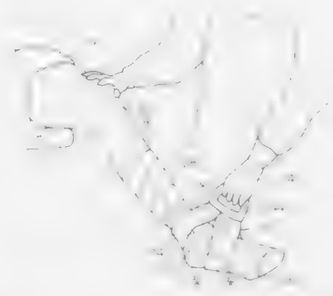
SURGICAL LEG STRESSING DEVICE

Paul A. Kloepper, 2014 Robin Hill La., Carrollton, Tex. 75010

Filed Jul. 16, 1986, Ser. No. 887,177
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—882 12 Claims

1. Apparatus for providing controlled stress support for a limb having a joint on which arthroscopic surgery is to be performed and comprising in combination:

(a) a sling of substantially inelastic fabric composition adapted to be positioned about a selected location of the limb displaced from the joint on which surgery is to be conducted, said sling being comprised of two juxtaposed sections at least one of which is adjustable for changing the length thereof relative to the other section whereby to conform each section to the limb location on which it is to be positioned; and



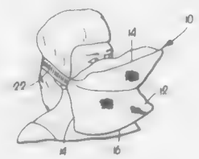
(b) handle means secured transversely to an upper portion of said sling enabling the sling to be hand held and manipulated while the limb is elevated to impose a required stress on the joint during the course of the surgery.

4,854,314

SAFETY PILLOW FOR PREVENTING SMOKE INHALATION

Roy E. Martin, 1202 W. Third; John H. Parr, P.O. Box 901, both of Lee's Summit, Mo. 64063, and C. Gray McCullah, 9316 W. Lake Highland Dr., Dallas, Tex. 75218

Continuation of Ser. No. 891,567, Aug. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 770,990, Aug. 30, 1985, abandoned. This application Nov. 13, 1987, Ser. No. 122,539
Int. Cl.[4] A62B *7/00*
U.S. Cl. 128—205.27 4 Claims



1. A yieldable, metal free covering adapted to readily conform to the shape of the face when placed across the face against the nose and mouth and use while breathing therethrough in a smoky atmosphere to protect the respiratory system against undue smoke inhalation, said covering comprising:

a closed, pillow-like bag of soft, flexible, air permeable material; and

a filling of relatively small, loose, discrete, individually shiftable, substantially dust free, bodies enveloped in said bag,

said bodies comprised of a synthetic resinous material,

said bodies being incapable of inhalation from the bag during said breathing and being lightly coated with a substance having an oily consistence,

said substance being selected from the group which consists of derivatives of petroleum, animal fats and plant,

said substance being a liquid at room temperature,

said bodies being substantially roundish and generally spherical and, wherein the diameters of the bodies comprise a mixture of sizes with three parts by volume of diameters within the range of from 0.125 inch to 0.0625 inch and one part by volume of bodies having diameters within the range of from 0.0625 inch to 0.0313 inch.

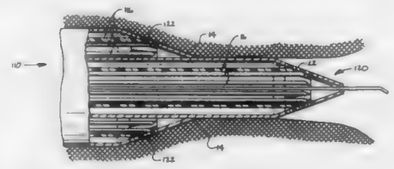
said bodies being shiftable within said bag during initial placement of said covering across the face of the user for rolling and self-shifting of the bodies to a tightly packed configuration and for conforming to the user's face while permitting airflow therethrough.

4,854,315

LASER CATHETER

Richard S. Stack, 6913 Falcon Bridge Rd., Chapel Hill, N.C. 27514, and Myron Wolbarsht, 1435 Acadia St., Durham, N.C. 27701

Filed Jun. 25, 1987, Ser. No. 66,346
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 12 Claims



1. A laser catheter assembly comprising:

a tubular main body member having a distal end and a proximal end, said distal end having a smoothly tapered forward face from a minimum diameter at a forwardmost portion thereof to a maximum diameter proximally of said forwardmost portion;

laser conducting means mounted within said tubular main body member for conducting at least one mid-infrared laser beam generated proximally of said main body member through said main body member to said distal end; and

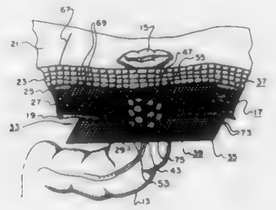
at least one window means mounted to said smoothly tapered forward face adjacent a distal most end of said conducting means for passing mid-infrared laser beams conducted through said conducting means outwardly and distally relative to said main body member.

4,854,316

APPARATUS AND METHOD FOR REPAIRING AND PREVENTING PARA-STOMAL HERNIAS

Emsley A. Davis, 1616 Colcord Ave., Waco, Tex. 76707

Filed Oct. 3, 1986, Ser. No. 915,041
Int. Cl.[4] A61B *17/04;* A61F *1/00, 2/12*
U.S. Cl. 128—334 R 7 Claims



1. A device for use in repairing and preventing a para-stomal hernia in a human, the stoma resulting from the rerouting of a portion of the gastrointestinal tract of the human through an opening in the abdominal wall, said device comprising:

a sheet-like inner member having an opening formed therethrough,

a tubular member having two opposite ends with an opening extending therethrough between said two ends,

said inner member being connected to said tubular member at or near one end thereof such that a passage extends through said openings of said inner member and of said tubular member, said tubular member being adapted to be located in the opening of the abdominal wall inward of the outer skin of the abdominal wall with said inner member being adapted to be attached to an inner portion of the abdominal wall near the opening thereof inward of the other end of said tubular member,

said passage of said device having a size sufficient to receive and support a portion of the gastrointestinal tract located in the opening of the abdominal wall inward of the outer skin and when said inner member is attached to an inner portion of the abdominal wall near the opening thereof inward of the other end of said tubular member,

a sheet-like outer member having an opening formed therethrough, said outer member being connected to said tubular member at or near its other end such that said passage extends through said opening of said outer member,

said outer member being adapted to be attached to an outer portion of the abdominal wall near the opening thereof inward of the outer skin,

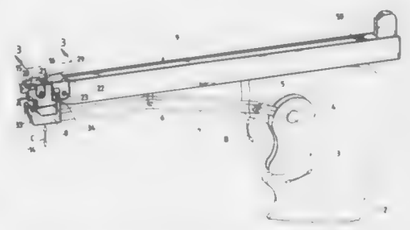
said inner member, said tubular member, and said outer member being formed of prothetic mesh comprising a material that is relatively flexible; is suitable for surgical application; is suturable to abdominal wall tissue; and is acceptable to a human biological system.

4,854,317

APPLICATOR FOR C-SHAPED SCALP CLIPS

Karl Braun, Talheim, Fed. Rep. of Germany, assignor to Aesculap-Werke AG Vormals Jetter & Scheerer, Tuttlingen, Fed. Rep. of Germany

Filed Feb. 5, 1988, Ser. No. 152,761
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1987, 3704760
Int. Cl.[4] A61B *17/00, 17/12, 17/04*
U.S. Cl. 128—334 R 4 Claims



1. An applicator for C-shaped scalp clips which have two legs joined by a bridge and facing clamping jaws at their front ends, rearwardly protruding application surfaces at the regions where the legs and bridge meet and laterally projecting edge regions adjoining the application surfaces, said applicator comprising:

two applying instruments having laterally protruding movable and stationary edges, respectively, for engaging the application surfaces of a scalp clip and moving towards each other to open said scalp clip;

a magazine for holding a plurality of scalp clips arranged one behind the other, with the free ends of one scalp clip resting against the bridge of the adjacent scalp clip, said magazine being open at the end to which the free ends of the legs of the scalp clips point;

an elastic energy storing means for displacing the scalp clips in the longitudinal direction towards the open end of said magazine;

said applying instruments, in a first position in which said instruments are apart from each other, protruding down-

wardly and upwardly into the advance path of said scalp clips at the open end of said magazine, such that the laterally projecting edge regions adjoining the application surface of the one of said scalp clips which has been advanced past said applying instruments by said elastic energy storing means rests against the laterally protruding movable and stationary edges of the applying instruments;

said applying instruments, in a second position being closer together than in said first position with said instruments pressing on the application surfaces of said one of said scalp clips held between them thereby bending said one of said scalp clips open, wherein the invention comprises:

a retaining element which is simultaneously pivotable together with said movable edge and which dips into the path of advance of said scalp clips and is displaceable out of said path into an open position, said retaining element being disposed before said applying instruments by approximately the length of one scalp clip and being operable to hold back a scalp clip which follows adjacent the scalp clip gripped by said applying instruments;

said retaining element being simultaneously pivotable together with said movable edge from an initial position, said movable edge being coupled with the pivotable retaining element by a slip coupling such that when said movable edge is brought closer to said stationary edge during movement of the instruments into an intermediate position between said first and second position, said retaining element is fixed in its open position, and when the instruments are moved to their first position, said movable edge immediately returns said retaining element to its submerged position.

4,854,318

BLOOD VESSEL HOLDER AND METHOD OF USING IN ANASTOMOSIS

Jan O. Solem, Bjarred; Christian Olin, Lund, both of Sweden, and Timothy M. Scanlan, St. Paul, Minn., assignors to Scanlan International, St. Paul, Minn.

Filed Dec. 18, 1987, Ser. No. 135,146
Int. Cl.[4] A61B *17/00, 17/28*
U.S. Cl. 128—346 **19 Claims**



1. A blood vessel holder comprising:

an elongate slender barrel having a substantially straight longitudinal axis from a distal handle end to a proximal tapered open cavity tip, for insertion into an opening in a blood vessel; and

a clamping means in clamping alignment with the barrel convex surface of said cavity for providing secure, atraumatic, releasable attachment of the opening of the blood vessel to the proximal tip posterior convex surface.

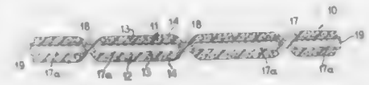
4,854,319

COOLING APPAREL

Callie S. Tobin, Phoenix, Ariz., assignor to Chilly Bones, Inc., Scottsdale, Ariz.

Filed Nov. 20, 1987, Ser. No. 123,306
Int. Cl.[4] A61N *3/00*
U.S. Cl. 128—380 **8 Claims**

1. Therapeutic sports wearing apparel which comprises a tube of plastics sheet material having an inner nonabsorbent, nonporous smooth faced flexible film layer and an integral outer moisture impervious foam layer composed of particles covering and bonded to said film layer forming a blister-like lattice surface on the film, a refrigerant gel material encased in said tube, and means on the ends of the tube for wrapping the tube directly around the skin of a user to engage the lattice surface with the skin to form therewith pockets trapping moisture from the skin to provide a cool moist zone on the skin, said



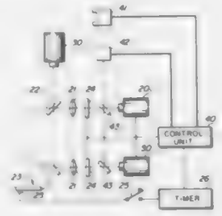
outer foam layer being effective to meter heat transfer from the gel to the skin preventing cold shock and said lattice surface accommodating evaporation of moisture trapped in the pockets as the cooling capacity of the refrigerant gel diminishes thereby prolonging the cooling capacity of the apparel.

4,854,320

LASER HEALING METHOD AND APPARATUS

Douglas K. Dew, Maitland; Long S. Hsu, Orlando, and Steven J. Halpern, Winter Park, all of Fla., assignors to Laser Surgery Software, Inc., Maitland, Fla.

Continuation-in-part of Ser. No. 539,527, Oct. 6, 1983, Pat. No. 4,672,969. This application Jun. 16, 1987, Ser. No. 62,861
Int. Cl.[4] A61N *5/06*
U.S. Cl. 128—397 **20 Claims**



1. Apparatus for the automatically controlled application of optical energy in the reconstruction of biological tissue to cause the formation of a proteinaceous framework from denatured protein in the vicinity of the biological tissue, the framework approximating the biological tissue to be reconstructed, said apparatus comprising:

an optical energy source for producing a beam of optical energy;

guide means for directing said beam of optical energy to a spot on a biological tissue to be reconstructed, said guide means having a distalmost end remote from said optical energy source and from which said optical energy is emitted;

data conversion means, responsive to a user input signal representative of a characteristic of the tissue, for generating an output signal representative of corresponding appropriate settings of control parameters of said beam to cause the amount of optical energy delivered by said source to said tissue to be within a tissue nondestructive range bounded by a minimum rate at which the tissue forms a collagenous substance and a maximum rate at which water in the tissue would boil; and

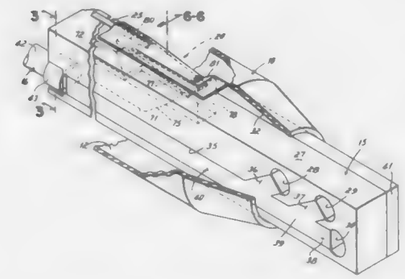
means operatively connected to said optical energy source and to said data conversion means, and responsive to said output signal, for controlling said beam in accordance with said beam parameter settings; whereby proteinaceous components of the tissue are denatured.

4,854,321

INTEGRATED OPTIC SYSTEM FOR MONITORING BLOOD GASES

Anthony A. Bolarski, Columbus, Ohio, assignor to Medex, Inc., Hilliard, Ohio

Continuation of Ser. No. 875,587, Jun. 18, 1986, abandoned. This application Dec. 2, 1988, Ser. No. 282,961
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—634 **11 Claims**



1. A probe for in vivo monitoring constituents of the blood comprising,

a base having a surface,

at least one dye well and one channel formed in said base and opening at the surface of said base, said channel also opening into said dye well;

a first optical fiber having a first end mounted in said channel and a second end opposite said first end,

a waveguide of optically conducting formed in said medium channel and forming an optical coupling between said fiber and said dye well,

a dye in said dye well whose optical characteristics change in the presence of a constituent,

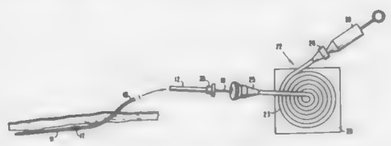
means, permeable to said constituent, for containing said dye within said dye well.

4,854,322

CAPILLARY FILTRATION AND COLLECTION DEVICE FOR LONG-TERM MONITORING OF BLOOD CONSTITUENTS

Stephen R. Ash, Lafayette, and Elsa M. Jaale-Swain, West Lafayette, both of Ind., assignors to Ash Medical Systems, Inc., West Lafayette, Ind.

Division of Ser. No. 18,616, Feb. 25, 1987, Pat. No. 4,777,953. This application Sep. 18, 1987, Ser. No. 98,400
Int. Cl.[4] A61B *5/05*
U.S. Cl. 128—635 **18 Claims**



1. A capillary filtration and collection system for monitoring a physiological constituent of blood, comprising:

a filtration means for filtering a plasma ultrafiltrate from blood capillaries in an interstitial space inside a body, said filtration means including a porous filter made of a material compatible for long-term patency inside the body, said filter adapted to be implanted inside the body in fluid communication with blood capillaries in the interstitial space and having pores sized not greater than approximately 300,000 dalton;

an ultrafiltrate collector including an elongate tube connected to said filter in fluid communication therewith and adapted to extend externally of the body with said filter implanted inside the body; and

a negative pressure generating means for generating a negative pressure relative to atmospheric for withdrawing the plasma ultrafiltrate through said filter and into said ultrafiltrate collector.

4,854,323

ELECTROCARDIOGRAPH HARNESS

Lawrence A. Rubin, 58-29 155th St., Flushing, N.Y. 11355

Filed Jun. 2, 1988, Ser. No. 201,552
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—644 **13 Claims**



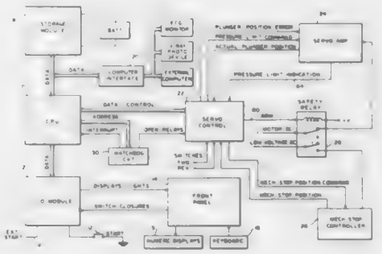
1. An electrocardiograph harness comprising a fully flexible tube capable of being shaped by hand and having at least one electrode secured thereto, a lead wire electrically attached to each of said at least one electrode, and a flexible tube shaping and shape retaining means for allowing a repeated selective bending of said tube by a shaper's hands into a desired shape and holding said desired shape even after removal of the shaper's hands until a following bending into a new desired shape.

4,854,324

PROCESSOR-CONTROLLED ANGIOGRAPHIC INJECTOR DEVICE

Alan D. Hirschman; David M. Reilly, both of Glenshaw; Ross H. Potter, Oakmont; John Stalen, Pittsburgh; Eric M. Toft, Pittsburgh, and John G. Clark, Pittsburgh, all of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 575,591, Jan. 31, 1984, abandoned. This application Feb. 24, 1988, Ser. No. 161,434
Int. Cl.[4] A61M *37/00*
U.S. Cl. 128—655 **37 Claims**



1. An angiographic device for injecting contrast media into the vascular system of a patient, said device comprising: a syringe having a reservoir containing the contrast media, a

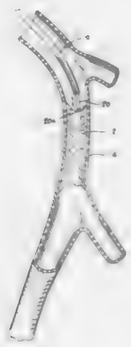
discharge port through which the media is discharged, piston means for forcing the media through the discharge port from the reservoir, drive means including a d.c. servo motor operatively connected to the piston means for effecting said discharge of the media, receiving means for receiving at least one injection control parameter, and processor control means for generating at least one injection control signal as a function of said at least one injection parameter supplied thereto and for supplying said at least one control signal to said drive means to effect controlled discharge of the media, a servo system governed by a processor position command signal produced by said processor control means, pressure limit means responsive to a pre-established pressure limit signal for inhibiting control of said servo system by the position command signal when pressure in said reservoir exceeds a value represented by said pre-established limit signal, said pressure limit means including means to receive said pre-established pressure limit signal in units of PSI, KPA, KG or ATU, switch means cooperatively interconnected with the means to receive for selecting one of said units of said pre-established pressure limit signal, said processor control means including means for supplying to said d.c. servo motor a d.c. current derived from a pulse-width-modulated drive current and means for establishing a duty cycle proportional to the difference between the actual and the desired positions of said piston means during injection of the media, and mechanical stop controller means interconnected with the processor control means and responsive to a pre-established forward limit of said piston means determined by the processor control means for inhibiting said drive means from discharging the media from the reservoir of the syringe, said mechanical stop controller means comprising a stop member and a d.c. control motor operatively connected to said stop member, means for monitoring the position of said piston means, means for producing a stop command signal when the position of said piston means reaches said forward limit, and means responsive to said stop command signal to actuate said control motor and thereby selectively advance said stop member to mechanically prevent forward movement of the piston means.

4,854,325

RECIPROCATING GUIDEWIRE METHOD

Robert C. Stevens, P.O. Box 250, Williston, Fla. 32696

Filed Nov. 9, 1987, Ser. No. 118,544
Int. Cl.[4] A61B *6/00*
U.S. Cl. 128—657 **5 Claims**



1. A method for positioning a guidewire in a subject passageway comprising the steps of:

(a) inserting an elongated guidewire into a subject and monitoring passage of a distal tip of said guidewire through a subject passageway on a viewing screen; and

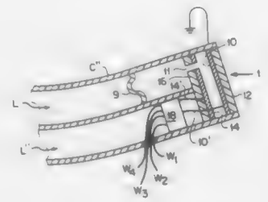
(b) in the event difficulty is encountered while positioning said guidewire, attaching a reciprocating drive to a portion of the guidewire located outside the subject and actuating the drive to reciprocate the guidewire back and forth a distance of from 1/32 to ¼ inch at a frequency of from 1000 to 5000 cycles per minute to move the distal end of the guidewire back and forth into contact with an obstruction causing the difficulty while continuing to position the guidewire in the obstruction.

4,854,326

ESTABLISHING A ZERO REFERENCE FOR INVASIVE PRESSURE SENSORS

Edwin B. Merrick, Stow, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 38,427, Apr. 14, 1987, abandoned, which is a continuation of Ser. No. 802,296, Nov. 27, 1985, abandoned. This application Dec. 22, 1988, Ser. No. 290,818
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—675 **4 Claims**



1. An apparatus for deriving a signal corresponding to liquid pressure in a patient comprising:

means defining a passageway,

a pressure to electric signal transducer mounted in one end of said passageway, said transducer having a diaphragm with an active side to which fluid pressure from a patient can be coupled and a reference side, said reference side being such that pressure applied to it via said passageway opposes pressure applied to said active side, said passageway having liquid between the reference side of said diaphragm and the end of said passageway that is remote from said transducer; and

compliance means located within the means defining said passageway so as to damp oscillations that might result from interaction between the liquid, the means defining said passageway and said diaphragm in response to motion of said diaphragm thereby reducing the effect of such oscillation on the movement of said diaphragm.

4,854,327

NON-INVASIVE AND CONTINUOUS CARDIAC PERFORMANCE MONITORING DEVICE

Horst E. Kunig, P.O. Box 577, R.D. #1, Saltsburg, Pa. 15681

Filed Mar. 7, 1988, Ser. No. 165,018
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—713 **17 Claims**

1. A non-invasive cardiac monitoring device for determining cardiac pumping performance of an individual, comprising:

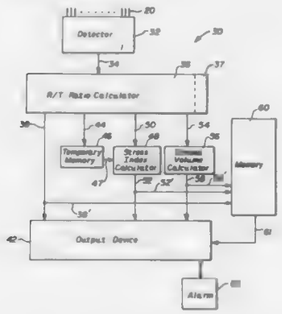
electrocardiogram sensing means for sensing and generating a signal indicative of an electrocardiogram waveform of the individual;

R-wave amplitude measuring means for measuring the amplitude of an R-wave component of the electrocardiogram waveform;

T-wave amplitude measuring means for measuring the amplitude of a T-wave component of the electrocardiogram waveform;

ratio calculating means for determining the ratio of the amplitude of the R-wave component to the amplitude of the T-wave component and for generating a ratio signal indicative of said ratio;

stroke volume calculating means for generating a stroke volume signal indicative of the stroke volume of an individual as a function of said ratio signal generated by the ratio calculating means; and



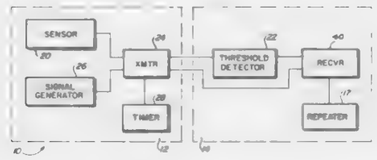
output means for displaying values of said ratio signal and said stroke volume signal.

4,854,328

ANIMAL MONITORING TELLTALE AND INFORMATION SYSTEM

Philip Pollack, 2644 W. Gregg Dr., Chandler, Ariz. 85224

Filed Mar. 23, 1987, Ser. No. 29,140
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—736 **15 Claims**



1. An implantable telltale monitoring system for measuring a physiological parameter in an animal comprising:

(a) a housing containing circuit means, said circuit means including a sensor for monitoring said parameter and operatively connected to a transmitter within said housing which emits a signal representative of the measured parameter of a predetermined magnitude, said housing configured to be placed at an implantable location on the animal; and

(b) a receiver unit having attachment means adapted to secure the receiver unit to the animal at a location proximate the transmitter and further including indicating means, said indicating means responsive to said signal received by said receiver unit and emitted by aid transmitter to provide a localized indication perceivable by an attendant of said measured parameter being of said predetermined magnitude.

4,854,329

APPARATUS AND METHOD FOR NONINVASIVE TESTING OF VOLUNTARY AND INVOLUNTARY MOTOR RESPONSE PATTERNS

James C. Walruff, 3638 W. Villa Rita Dr., Phoenix, Ariz. 85308

Filed Jul. 21, 1987, Ser. No. 75,955
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—745 **12 Claims**

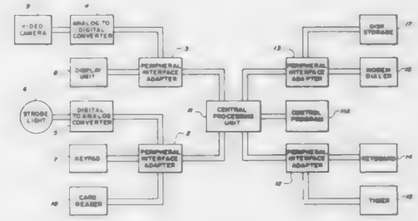
1. Testing apparatus for on-site testing of motor response impairment of a subject, wherein voluntary and involuntary response baseline parameters along with an identification code are stored on a data card suitable for convenient conveyance by said subject, said testing apparatus comprising:

data entry means for manually entering data in said testing apparatus, said subject entering subject code in said testing apparatus by means of said data entry means;

voluntary response means for measuring voluntary response parameters resulting from manipulation of said data entry means according to a predetermined pattern;

involuntary response means for measuring involuntary response parameters associated with changes in a pupil of said eye resulting from a transient light stimulus;

card reading means for entering data from said data card into said apparatus; and



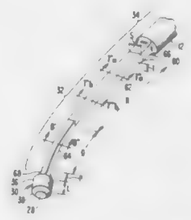
comparison means for comparing said subject code with said identification code; a positive comparison between said subject code and said identification code permitting further operation of said comparison means, said comparison means for comparing said voluntary and involuntary response baseline parameters stored on said data card with measured voluntary and involuntary response parameters from said voluntary response means and said involuntary response means, said comparison means providing a signal indicating when said subject's voluntary and involuntary response parameters meet preselected criteria without operator intervention.

4,854,330

FORMED CORE CATHETER GUIDE WIRE ASSEMBLY

Russell M. Evans, III, Lower Burrell; James E. Machek, Valencia, and Kevin P. Cowan, Allison Park, all of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 883,943, Jul. 10, 1986, abandoned. This application Sep. 9, 1988, Ser. No. 244,610
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—772 **11 Claims**



1. A formed core catheter guide wire assembly comprising:

a smooth surfaced wound wire casing having a closed end and an open end, and

an elongated, resilient metal core wire having a distal end and a proximal region, with a portion of said proximal region extending beyond said open end of said casing, said core wire being slidably mounted in said casing and having a preformed, continuously curved section adjacent said distal end, said preformed, continuously curved sec-

tion being flexible and said preformed, continuously curved section maintaining a curved configuration when in a relaxed state for steering of the guide wire assembly through the vascular system of the body,

said preformed, continuously curved section having a first part that has a longitudinally attenuated, generally rectangular cross-sectional area and a second part having a substantially uniform, generally rectangular cross-sectional area extending from said first part to said distal end, said proximal region having a substantially circular cross-sectional area, and said core wire including a continuously curved first transitional slope between the circular proximal region and the rectangular first part of said curved section and including a continuously curved second transitional slope between the uniform rectangular second part of said curved section and said distal end.

4,854,331

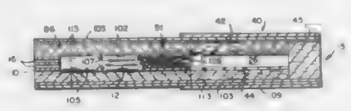
SMOKING ARTICLE

Chandra K. Banerjee, Pfafftown; Ernest G. Farrier, Winston-Salem; James L. Harris, Westfield; Alan B. Norman, Clemmons; James L. Resce, Yadkinville; John H. Reynolds, IV, Winston-Salem; Henry T. Ridings, Lewisville; Andrew J. Sensabaugh, Jr.; Michael D. Shannon, both of Winston-Salem, and Gary R. Shelar, Greensboro, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation-in-part of Ser. No. 650,604, Sep. 14, 1984, Ser. No. 684,537, Dec. 21, 1984, and Ser. No. 769,532, Aug. 26, 1985. This application Nov. 20, 1985, Ser. No. 800,064

Int. Cl.[4] A24D *1/18, 1/00*

U.S. Cl. 131—194 **83 Claims**



1. A smoking article comprising:

(a) a carbonaceous fuel element;

(b) a physically separate aerosol generating means longitudinally disposed behind the fuel element, including an aerosol forming material; and

(c) a heat conducting member for conducting heat from the fuel element to the aerosol generating means, the conducting member being spaced behind the lighting end of the fuel element.

4,854,332

CIGARETTE HAVING THERMOCHROMOGENIC PORTIONS THEREON

Niichi Hanakura, Osaka, Japan, assignor to Sakura Color Products Corp., Osaka, Japan

Filed Jul. 6, 1987, Ser. No. 70,229

Claims priority, application Japan, Jul. 3, 1986, 61-102905[U]; Jun. 19, 1987, 62-153883

Int. Cl.[4] A24D *1/02*

U.S. Cl. 131—365 **10 Claims**



1. A cigarette having thereon a reversible thermochromogenic portion which changes color at a temperature in the range of about 40°–80° C. on the surface except the free end area which makes contact with lips of a smoker, the portion including a thermochromogenic composition which comprises:

(a) an electron donating organic compound as a chromogenic compound;

(b) an aromatic compound having at least one phenolic hydroxyl, or at least one carboxyl connected directly to the aromatic nucleus, or both, or a metal salt of these, as a color developer;

(c) a desensitizer which melts at a temperature in the range of about 40°–80° C. and

wherein said thermochromogenic composition changes color reversibly at a temperature at or near the temperature at which the desensitizer melts.

4,854,333

STABLE ANTIDANDRUFF SHAMPOO COMPOSITIONS

Everett Inman, Cincinnati, Ohio; Nancy J. Roberts, Baton Rouge, La., and Prem S. Juneja, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 187,107, Apr. 28, 1988, abandoned. This application Dec. 20, 1988, Ser. No. 287,645

Int. Cl.[4] A45D *7/00;* **A61K** *7/06, 33/40*

U.S. Cl. 132—209 **26 Claims**

1. A lotion dandruff shampoo composition comprising:

(a) from about 10% to about 30% of a synthetic surfactant;

(b) from about 0.1% to about 5.0% of selenium sulfide having an average particle size of less than about 25 μm;

(c) from about 0.005% to about 0.9% of a peroxy oxidizing agent; and

(d) from about 20% to about 84% water.

4,854,334

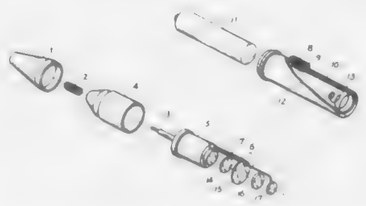
NAIL TRIMMER

Hsiu-Kuei Su, No. 75 Chih Hsing Road, Peitou District, Taipei City, Taiwan

Filed Nov. 19, 1987, Ser. No. 122,932

Int. Cl.[4] A45D *29/05*

U.S. Cl. 132—73.6 **1 Claim**



1. A nail trimmer comprising:

a frame means having a housing and a cap sealing said housing;

a driving means having a motor held in a first end portion in said housing;

a power supply means for powering said driving means stored in a second end portion in said housing opposite to said first end portion of said housing;

a switch means operatively switching said power supply means for driving or stopping a rotation of said motor of said driving means; and

a trimming means secured to a shaft of said motor protruding outwardly from said first end portion of said housing for trimming a nail;

said trimming means including a cylindrical body having a plurality of longitudinal grooves longitudinally formed in a cylindrical surface circumferentially disposed around a longitudinal axis of said cylindrical body, said longitudinal grooves being parallel with one another and parallel to said longitudinal axis of said cylindrical body,

the improvement comprising: each said longitudinal groove defining a notch recessed from a cylindrical surface of said cylindrical body as viewed from a cross section of said cylindrical body, each notch recessed radially towards said axis from said cylindrical surface of said cylindrical body to form a configuration having each said longitudinal groove followed by a longitudinal arcuate surface which circumferentially defines the cylindrical surface of said cylindrical body of said trimming means and is convex from each neighboring longitudinal groove, said longitudinal groove followed by said longitudinal arcuate surface to be subsequently circumferentially disposed on said cylindrical body of said trimming means to have said longitudinal grooves intermittently distributed on said cylindrical surface of said trimming means, whereby an user's nail may tangentially move along each longitudinal arcuate surface of said cylindrical body to be subsequently filed against each longitudinal groove of said cylindrical body of said trimming means for smooth safer trimming of the nail.

4,854,335

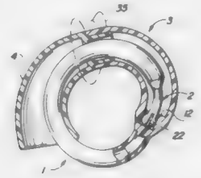
HAIR CURLER SYSTEM

Norma Lycett, 1007 E. Orange Dr., Phoenix, Ariz. 85014

Filed Feb. 19, 1988, Ser. No. 159,550

Int. Cl.[4] A45D *2/08*

U.S. Cl. 132—247 **3 Claims**



1. A hair curler system for selectively curling an individual curl to substantially different incremental diameters along the curl length, said hair curler system comprising:

(A) a first flare member, said first flare member including:

1. a hollow primary body portion having first and second ends, said primary body portion characterized by an outer surface which is normally circular in cross section and an inner surface which is normally circular in cross section, and a wall of flexible material extending between said inner and outer surfaces, said first end of said primary body portion effecting a first end of said first flare member, said primary body portion extending between a first, larger diameter of said outer surface at said first end thereof and a second, smaller diameter of said outer surface at said second end thereof;

2. a hollow secondary body portion having first and second ends, said first end thereof joining said primary body portion at said second end thereof, said secondary body portion having a cylindrical outer surface, said cylindrical outer surface having a diameter which is smaller than the diameter of said first end of said primary body portion; and

3. a reduced diameter neck region of said inner surface of said primary body portion situated intermediate the length of said primary body portion;

(B) a male coupling member having first and second body portions;

1. said first body portion of said male coupling member having a cylindrical outer surface of a diameter the same as the diameter of said cylindrical outer surface of said secondary body portion of said first flare member; and

2. said second body portion of said male coupling member having first and second ends, said first end thereof joining said first body portion of said male coupling member and said second end thereof terminating in a bulbous coupling element dimensioned and configured to be manually snapped through said reduced diameter neck region of said first flare member and retained thereby until manually withdrawn past said reduced diameter neck region; and

(C) a length of flexible tubing having first and second ends and an inside diameter sufficient to receive and frictionally engage said cylindrical outer surface of said secondary body portion of said first flare member and said cylindrical outer surface of said first body portion of said male coupling member;

whereby, said secondary body portion of said first flare member may be inserted into said first end of said length of flexible tubing and said first body portion of said male coupling member may be inserted into said second end of said length of flexible tubing to effect a hair curler assembly having outside diameters along its length which decrease from said first end of said first flare member to said length of flexible tubing such that a curl having different diameters along its length may be wound onto said hair curler assembly after which said hair curler assembly may be formed into a looped configuration by inserting said bulbous element into said first end of said first flare member and manually snapping said bulbous element past said reduced diameter neck region to maintain said hair curler assembly in the looped configuration during a perming process.

4,854,336

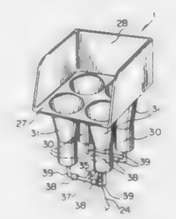
TEAT CUP DISINFECTANT SYSTEM

Martin Byzitter, P.O. Box 668, Rocky Mountain House, Alberta TOM 1TO, Canada

Filed Jul. 29, 1988, Ser. No. 225,932

Int. Cl.[4] B08B *3/04*

U.S. Cl. 134—104.1 **3 Claims**



1. A system for cleaning test cups in a plurality of individual stalls in a milking parlor comprising:

a cleaning solution mixing and supply station;

means for delivering cleaning solution from said mixing and supply station to each of said stalls, and valve means associated with each stall for controlling the delivery of cleaning solution to each said stall;

each said stall having a casing mounted on a support, said casing including a plurality of wells for receiving individual teat cups; said casing including an upper support plate having an upstanding reinforcing flange thereon, each of said wells comprising a cylindrical cup connected to said support plate through an inverted frustoconical top portion, means defining fluid communication with said valve means for introducing cleaning solution into said well at the bottom thereof, a drain opening in the bottom of each said well, whereby fluid may flow into said wells at a

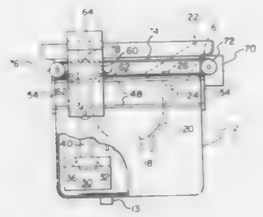
faster rate than it may flow out of said opening for filling said wells and will drain completely from said wells when the flow of incoming fluid is stopped by said valve means.

4,854,337

APPARATUS FOR TREATING WAFERS UTILIZING MEGASONIC ENERGY

Joachim Bunkenburg, Victor, and Peter M. Hammond, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 24, 1988, Ser. No. 197,867
Int. Cl.[4] B08B *3/12*
U.S. Cl. 134—184 **12 Claims**



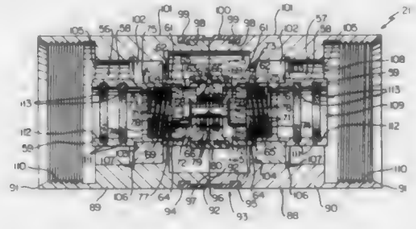
1. Apparatus for treating the surfaces of a plurality of wafers comprising a container means arranged to hold a body of treatment fluid, said container means having an open upper side for accepting a casette containing a plurality of vertically disposed wafers, means for supporting said cassette from the open upper side of said container with the wafers carried thereby beneath the surface of the treatment fluid in said container, a transducer carrier suspended from the open upper side of said container in said container, said carrier being suspended above the bottom of said container beneath the wafers and having a megasonic transducer arranged to project a beam of ultrasonic energy upwardly over the vertical surfaces of said wafers, said transducer carrier having a width substantially less than the width of said cassette, means for energizing said megasonic transducer to oscillate at a frequency of between about 0.2 and 5 Mhz, and means for moving said transducer carrier transversely of its width parallel with the wafer surfaces and transversely of the container whereby said ultrasonic energy beam contacts and treats the entire surface of the wafers therein.

4,854,338

BREAKAWAY COUPLING, CONDUIT SYSTEM UTILIZING THE COUPLING AND METHODS OF MAKING THE SAME

Rodger P. Grantham, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Filed Jun. 21, 1988, Ser. No. 209,661
Int. Cl.[4] F16L *37/28*
U.S. Cl. 137—68.1 **8 Claims**



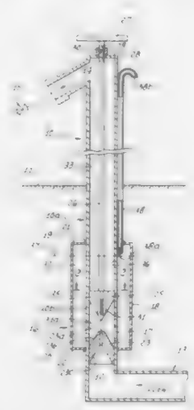
1. In a breakaway coupling for incorporation into a conduit system and comprising a pair of tubular coupling members each having opposed end means one of which is adapted to be interconnected to a part of said conduit system and the other of which is held in sealing and coupling engagement with the other end means of the other coupling member until uncoupled therefrom by a certain axial force means being created therebetween, said breakaway coupling having frangible means holding said coupling members in their coupling engagement until said certain axial force means breaks said frangible means to thereby uncouple said coupling members, said frangible means comprising a tubular sleeve means having opposed ends and an annular frangible section intermediate said ends of said sleeve means that breaks in an annular manner when said certain axial force means is applied between said coupling members, said frangible section comprising a tubular sleeve that is disposed in telescoped relation on said sleeve means, said sleeve having an annular frangible area between said ends of said sleeve, said sleeve means having two parts respectively provided with free ends disposed adjacent each other and respectively having said opposed ends of said sleeve means outboard of said free ends, said sleeve having said ends thereof provided with means respectively interconnected to said free ends of said two parts, the improvement wherein said sleeve is threaded onto said sleeve means.

4,854,339

FREEZE VALVE APPARATUS

Herbert W. Hoeptner, III, 15085 Venetian Way, Morgan Hill, Calif. 95037

Filed Jan. 17, 1989, Ser. No. 297,124
Int. Cl.[4] E03B *7/12, 9/14*
U.S. Cl. 137—282 **11 Claims**



1. In freeze resisting valve apparatus, for controlling water flow, the combination comprising:

(a) a vertically elongated, hollow valve body having a lower portion adapted for installation underground, the body having a lower water inlet associated with said lower portion, and an upper water outlet, for passing a stream of pressurized water through said body,

(b) a water reservoir adapted for installation underground and having communication with said body lower portion via an ejector port,

(c) a valve seat projecting in said lower portion of the body and having a narrowed passage extending upwardly and positioned to increase pressurized water flow velocity in proximity to said port, said ejector port being proximate the level of said seat,

(d) and a downwardly tapered stopper valve member having flutes thereon projecting radially to loosely center the stopper member in the body, the stopper member tapering downwardly toward an apex always remaining in alignment with said narrowed passage as the stopper member moves toward and away from the seat to effect drainage of water in the valve body downwardly past the stopper between the flutes to the reservoir when the stopper is closed on the seat with said apex at said narrow passage, and to effect inducing of water flow from the reservoir through said ejector port and into said stream and then upwardly between the flutes when the stopper is retracted upwardly from the seat,

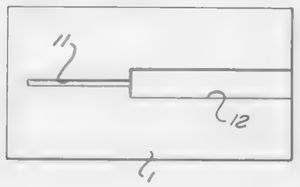
(e) said reservoir being substantially coaxial with the stopper valve member and seat.

4,854,340

TOILET-TANK FLOAT-BOOSTER

John P. Pavlik, 20411 Lassen St., Chatsworth, Calif. 91311

Filed May 9, 1988, Ser. No. 191,889
Int. Cl.[4] F16K *31/18, 33/00*
U.S. Cl. 137—425 **4 Claims**



1. A water saving device for use with a toilet flush tank having float operated control valve means for regulating the water level in the tank, a water buoyant float and rod operatively connecting the float with the control valve means, which comprises a water buoyant body, flexible means for surrounding said buoyant body and said float and for attaching said water buoyant body to the underside of said toilet tank float, stabilizing means extending from said float rod and through said buoyant body for limiting lateral-rotational movement of said tank float and said buoyant body while maintaining said buoyant body in a stabilized position, markings on buoyant body for enabling material on said buoyant body to be cut off to fit in different size float tanks and for reducing the buoyancy of said buoyant body, whereby said buoyant body, being positioned under said tank float for a greater buoyancy boost effect for a given amount of material that is has been in contact with and attached to said tank float, can boost said tank float at varying intensities dependent on the size of said buoyant body to cause closure of said control valve means at varying levels of water in said flush tank without malfunction due to lateral-rotational movement of said buoyant body and said tank float.

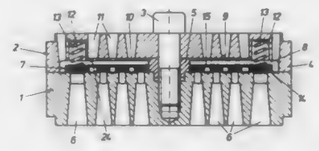
4,854,341

PLATE VALVE

Friedrich Bauer, Vienna, Austria, assignor to ENFO Grundlagenforschungs AG, Döttingen, Switzerland

Filed Jun. 29, 1988, Ser. No. 213,158
Claims priority, application Austria, Jul. 1, 1987, 1656/87
Int. Cl.[4] F16K *15/08*
U.S. Cl. 137—514 **9 Claims**

1. A compressor plate valve, comprising a valve seat, a valve guard and a valve plate which comprises an outer ring and at least one inner ring and controls flow passages in the valve seat, the rings being joined together by radial webs, and for the valve plate a spring system comprising springs disposed over the outer ring and supported against the valve guard, and acting only on the outer ring, wherein the valve plate (7) comprises a closure plate (14) of soft material such as plastics, and a guide plate (15) of hard flexible material such as steel, the two plates (14, 15) lying one on the other with the closure plate (14) facing the valve seat (1) and the guide plate (15) facing the valve guard (2), and wherein the outer ring (16) of both plates



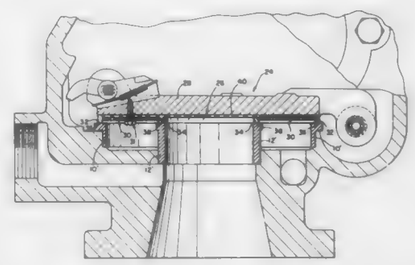
(14, 15), this alone being loaded by the springs (13), is wider than the inner rings (17).

4,854,342

CLAPPER SEAL FOR DRY PIPE VALVE

George S. Polan, Harleysville, Pa., assignor to Central Sprinkler Corporation, Lansdale, Pa.

Filed Sep. 14, 1988, Ser. No. 244,208
Int. Cl.[4] F16K *15/03*
U.S. Cl. 137—516.29 **9 Claims**



3. Clapper seal for a pipe valve having a clapper valve body, an air ring having a seat portion, and a water ring having a seat portion and disposed radially inwardly of said air ring, comprising:

a disc-shaped resilient compressible gasket secured to said clapper valve body so as to cap said air ring and water ring when said clapper valve body is in a closed position, said gasket having an outer sealing ring depending therefrom and in sealing contact with said air ring seat portion when said clapper valve body is in said closed position, and an inner sealing ring depending thererfrom and in sealing contact with said water ring seal seat portion when said clapper valve body is in said closed position.

4,854,343

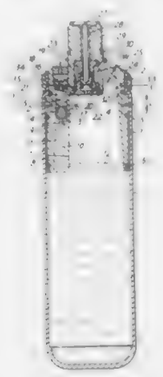
FLUID CONTAINERS

John W. Rilett, Hilltop House, Old Quarry,, Bibury, Gloucestershire, United Kingdom

Continuation-in-part of Ser. No. 904,065, Sep. 5, 1986, which is a continuation of Ser. No. 448,904, Dec. 3, 1982. This application Feb. 25, 1988, Ser. No. 160,276
Claims priority, application United Kingdom, Apr. 6, 1981, 8110733
Int. Cl.[4] B65D *83/14*
U.S. Cl. 137—543.19 **58 Claims**

1. A pressure-relief valve assembly for operating under conditions at which gaseous carbon dioxide might otherwise change to solid phase and designed to ensure that any phase change is to liquid rather than to solid phase, the valve assembly comprising a chamber with two ends, having at one end a fixed valve seat and a valve orifice which communicates with

a source of carbon dioxide under a container pressure and having at the other end an outlet restrictor orifice, a valve member movable within the chamber and biased against the container pressure toward a closed position against the valve seat, at which the valve orifice is closed off and means to control pressure in said chamber, the means being responsive, upon displacement of the valve member to an open position away from the said valve seat, to the carbon dioxide when the



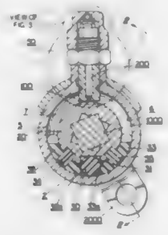
container pressure exceeds a predetermined limit, in order to return said valve member to the closed position, thus causing the valve member to move between the open and closed positions until said container pressure falls below the predetermined limit at which said means to control pressure maintains the pressure of said carbon dioxide between the valve member and the outlet restrictor orifice above 5.3 absolute atmospheres to prevent solidification of the carbon dioxide within the assembly.

4,854,344

SLOW-CLOSE APPARATUS FOR MINIMIZING WATER HAMMER AND/OR SHOCK WAVES RESULTING FROM CLOSURE OF VALVE MEANS

Dennis E. Schnipke, Wooster, Ohio, assignor to Premier Industrial Corporation, Cleveland, Ohio

Filed Oct. 14, 1987, Ser. No. 108,150
Int. Cl.[4] F16K *47/02*
U.S. Cl. 137—606 **15 Claims**



1. Apparatus for minimizing water hammer and/or shock waves resulting from closure of a valve disposed for movement into and out of closing arrangement in valve means included within a fluid flow system, comprising

a. Body means, having oppositely disposed first and second outer faces, wherein a substantially cylindrical internal passage extends longitudinally therethrough and between said faces, at least a part of the surface of said internal passage comprising at least one continuous channel means, disposed circumferentially along and within said surface, having a substantially constant cross section for the full circumference of the surface, extending uniformly into said body below said surface, such that said channel means generally defines a path laterally disposed to the longitudinal axis of said substantially cylindrical passage;

b. sleeve means, having oppositely disposed first and second outer faces, and a continuous cylindrical outer surface rotatably disposed for rotation about its longitudinal axis within said substantially cylindrical internal passage in said body means, having an outer surface disposed towards and in bearing relationship with the surface of said internal passage, which outer surface in coaction with said continuous channel means of said body defines a closed, annular fluid chamber;

c. projecting means extending outwardly from said outer surface of said sleeve means, configured to fit substantially within and continuously sealingly coact with said continuous channel means in said internal passage of said body means, whereby said projecting means sweeps the volume of said continuous channel means on rotation of said sleeve;

d. adjustable orifice means, adjustably disposed in said body to extend inwardly from the exterior of said body into said internal passage and into said continuous channel means in said body, such that its distal end projects into said channel means, and arranged to adjustably coact with the continuous cylindrical outer surface of said sleeve means to form an orifice between the distal end of said orifice means and said outer surface;

e. valve connection means for effecting connection between said sleeve means and said valve means, whereby displacement of the valve in said valve means results from rotational movement of said sleeve means about its longitudinal axis; and

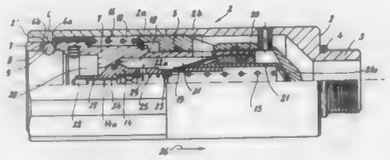
f. means for effecting externally applied rotational movement to said sleeve means.

4,854,345

VALVE COUPLER WITH DECOMPRESSION

Jean-Pierre Badoureaux, Haute-Savoie, France, assignor to Parker Hannifin RAK, Annemasse, France

Continuation of Ser. No. 866,023, May 21, 1986, Pat. No. 4,702,278. This application Nov. 10, 1986, Ser. No. 929,257
Int. Cl.[4] F16L *37/28*
U.S. Cl. 137—614.05 **4 Claims**



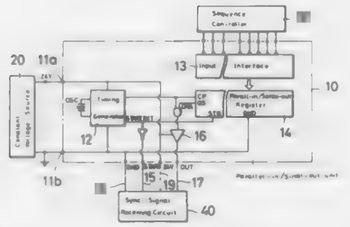
1. Coupler with decompression valves, of the type including an outer tubular body (2), equipped at one of its ends (2″), with rigid connection means (3) to a source of fluid under pressure, and at the other end, of which is made the female fitting (7′) of the coupler, this female fitting (7′), which contains the valve (14), situated on the feed circuit side, and its return spring (15), being arranged to permit the engagement and locking, in its bore, of the male fitting (11) of this coupler, which in turn, contains a valve (13), situated on the user side of fluid under pressure, having a bore (14*a*), supporting an auxiliary valve (22), so arranged that its opening puts in communication the spaces (28) and (31), situated on either side of the seat (18) of the main valve (14), and being constantly subject to the action of a return spring (25) in closed position, with the distinction that the return spring (25) of the auxiliary valve (22) is weaker than that of the main valve (14), so as to permit it to be pushed back into the open position by the valve (13) of the male fitting (11) as soon as this latter exerts a push against it, and consequently, before the opening of the main valve (14).

4,854,346

CONTROL APPARATUS FOR MANIFOLD TYPE ELECTROMAGNETIC VALVE DEVICE

Koji Nakanishi; Mitsu Yoshino, both of Chiba, and Yoshitane Saito, Kyoto, all of Japan, assignors to Kuroda Seiko Co. Ltd., Kanagawa and Nakamura Kiki Engineering Co., Kyoto, both of, Japan

Filed Aug. 22, 1988, Ser. No. 234,745
Claims priority, application Japan, Aug. 31, 1987, 62-230734
Int. Cl.[4] F16K *11/10*
U.S. Cl. 137—624.11 **8 Claims**



1. An apparatus for controlling a plurality of electromagnetic valves of manifold type comprising:

means for generating parallel control signals for a plurality of electromagnetic valves;

a constant voltage source for producing a constant voltage;

a parallel-in/serial-out unit for converting said parallel control signals into a serial data signal and generating a composite control signal including said serial data signal, a start synchronous signal synchronized with said serial data signal and a driving voltage formed from said constant voltage;

at least one synchronous signal receiving circuit arranged on a manifold, said synchronous signal receiving circuit generating a start signal in response to said control start synchronous signal supplied from said parallel-in/serial-out unit;

a plurality of driver circuits each arranged on respective electromagnetic valves, a first driver circuit receiving said start signal supplied from said synchronous signal receiving circuit to convert the serial control signal into parallel control signals for driving the relevant electromagnetic valves and after driving the electromagnetic valves, said driver circuit producing an end signal;

at least one synchronous signal transmitting circuit arranged on said manifold, said synchronous signal transmitting circuit receiving said end signal and supplying the synchronous signal; and

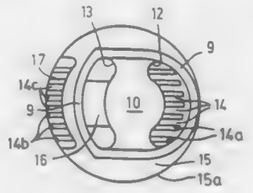
means for transmitting the composite signal, start signal, end signal and synchronous signal among said parallel-in/serial-out unit, synchronous signal receiving circuit and synchronous signal transmitting circuit.

4,854,347

FAUCET VALVE WITH NOISE REDUCING SLOTS AND BLADES IN PRECLOSING APERTURES

Alfons Knapp, Biberach an der Riss, Fed. Rep. of Germany, assignor to Masco Corporation, Taylor, Mich.

PCT No. PCT/US86/01015, § 371 Date Jun. 1, 1987, § 102(e) Date Jun. 1, 1987, PCT Pub. No. WO86/07123, PCT Pub. Date Dec. 4, 1986
PCT Filed May 9, 1986, Ser. No. 56,085
Claims priority, application Italy, May 28, 1985, 67487 A/85
Int. Cl.[4] F16K *47/02, 11/078*
U.S. Cl. 137—625.4 **6 Claims**



1. A faucet valve characterized by:

a fixed valve seat means having at least one passage opening in communication with at least one supply line;

a movable valve plate slidably mounted on said fixed valve seat means to selectively close or open said at least one passage;

a slide member fixed to said movable valve plate having a cavity in communication with said at least one passage when said valve plate is positioned to open said at least one passage and an outlet from said cavity;

a control guide member for guiding said slide member and having a window therein in communication with said outlet of said slide member;

said window having a slotted section with alternating blades and slots positioned sufficiently close together to reduce noise as liquid flows therethrough and being positioned to be selectively intercepted by said slide member to be substantially closed off by said slide member from an outlet space exteriorly positioned from said slide member when said slide member is positioned to move said valve plate to substantially close off said at least one passage; and

a control means for moving said slide member.

4,854,348

SINGLE CYLINDER TYPE SWITCHING VALVE FOR MIXING HOT AND COLD WATERS

Shigeo Tochikubo, 11-12, Noukendai 1-chome, Kanazawa-ku, Yokohama-shi, Kanagawa, Japan

Filed Aug. 4, 1987, Ser. No. 83,946
Claims priority, application Japan, Aug. 6, 1986, 61-184731; Aug. 9, 1986, 61-187557
Int. Cl.[4] F16K *11/00*
U.S. Cl. 137—625.17 **8 Claims**

1. A single cylinder type switching valve for mixing hot and cold waters, comprising:

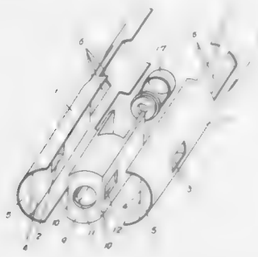
a cylinder opened with inlets for hot and cold waters and an outlet for hot and cold mixture water,

a smooth guide sliding surface including the openings in the inlets for the hot and cold waters inside the cylinder and formed along the axial direction of the cylinder,

a smooth sliding surface opposed to the smooth guide sliding surface formed inside the cylinder,

a switching valve opened with switching inlets for the hot and cold waters corresponding to the inlets for the hot and cold waters in the cylinder and slidably provided to the axial direction of the cylinder on the sliding surfaces, and

a mixture valve for opening or closing the switching inlets for the hot and cold waters inside the switching valve;



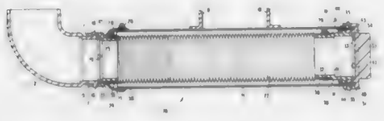
wherein said switching valves are separately formed at hot and cold water side switching valves.

4,854,349

SEWAGE DRAINING DEVICE FOR RECREATIONAL VEHICLES OR THE LIKE

Dennis Foreman, R.R. 3, Box 15, Fairland, Ind. 46126

Filed Apr. 28, 1987, Ser. No. 54,439
Int. Cl.[4] F16K *27/12*
U.S. Cl. 138—89 2 Claims



1. A sewage draining device for use with a vehicle having an outlet coupling for the exit of sewage from within the vehicle, comprising:

a flexible, extendable sewer hose;

first coupling means for providing permanent fluid-tight relation between a first end of said hose and the outlet coupling;

a tubular housing suspended from said vehicle and fixed at a first end to said first coupling means;

a dual closure cap for sealing shut both said hose and said housing, whether said cap has second coupling means for connecting said cap in fluid-tight closing relation to the second end of said hose and has third coupling means, exterior of said second coupling means, for connecting said cap in closing relation with the second end of said housing;

wherein said second coupling means includes a second fitting connected to the second end of said hose, wherein said second coupling means includes first bayonet means extending from said fitting and from said cap for lockingly engaging and drawing said cap in fluid-tight, closing relation with said second fitting, and wherein said second coupling means further includes an O-ring disposed between the end of said second fitting and said cap and wherein said first bayonet means is sized to create fluid-tight sealing among said second fitting, said O-ring and said cap when the device is in a storage position;

wherein said third coupling means includes second bayonet means extending from the second end of said housing and from said cap for lockingly engaging and drawing said cap in closing relation with said housing; and,

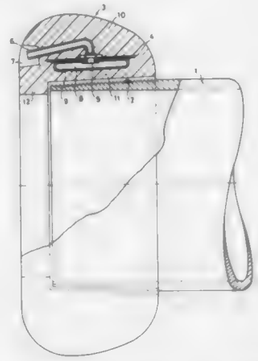
wherein said draining device has first and second positions, said first position being a storage position characterized by said hose being fully retracted within said housing and said dual closure cap removably coupled in fluid-tight, closing relation to a second end of said hose and coupled in closing relation to a second end of said housing, said second position being a drainage position characterized by said hose being substantially extended exterior of said housing with said dual closure cap being disengaged from said housing.

4,854,350

PIPE-END PROTECTOR

Peter Budde, Waterleidingstraat 1, 3134 KC Vlaardingen, Netherlands

PCT No. PCT/NL86/00040, § 371 Date Aug. 21, 1987, § 102(e) Date Aug. 21, 1987, PCT Pub. No. WO87/03270, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 19, 1986, Ser. No. 83,784
Claims priority, application Netherlands, Nov. 21, 1985, 8503211
Int. Cl.[4] B65D *59/06*
U.S. Cl. 138—96 R 7 Claims



1. A pipe-end protector, consisting of a plastic body provided with a bore for accommodating the pipe-end to be protected and having an interior cavity connecting by means of a filling duct with a filling connection which is accessible from the outside and is provided with a one-way valve, in order to clamp, by means of a pressure rise inside said cavity the wall of the bore of said body against the pipe-end, a metal ring preventing the outward expansion of said body, characterised in that said body (3) consists of one piece of an elastic and strong plastic material, in particular a polymeric material such as polyurethane, in that the metal ring (4) is a closed ring completely embedded in the plastic and being sufficiently flexible for following elastic deformations of the plastic body, an opening (5) formed in said ring (4), the body portion (10) outside said ring (4) having a sufficient thickness for providing an elastic thrust protection, in that the expansion cavity (8) is defined by the inner wall of said ring (4), in that the filling duct (6) is situated at the outer side of said ring (4), and communicates, through said opening (5) in said ring (4) with said cavity (8), and in that a depression (7) is formed in an end face (11) of said body (3), the filling connection for said duct (6) provided with said one-way valve (14) is situated in said depression (7).

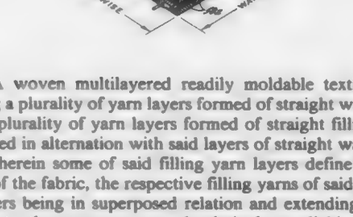
4,854,351

CONTACT BAR FOR THE WARP STOP MOTION

Ernst Steiner, Richterswil, Switzerland, assignor to Grob & Co. Akt., Richterswil, Switzerland

Filed Apr. 6, 1988, Ser. No. 178,219
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 3711597
Int. Cl.[4] D03D *51/30*
U.S. Cl. 139—353 5 Claims

1. A contact bar adapted for use in an electrical warp stop motion device of a textile machine, said bar comprising two electrical conductive carriers extending parallel and being insulated from each other, and adapted to project as one assembly through contact slots of numerous drop wires of the warp stop motion device which are hanging from warp ends in the textile machine, said carriers capable of coming into electrical connection in the event of a breakage of one warp end by means of the associated drop wire which results, due to the electrical connection, in a switch being tripped which consequently stops the textile machine, wherein one of said carriers is a U-profile outer bar and the inner carrier which fits into said U-profile outer bar comprises at least two parts which are



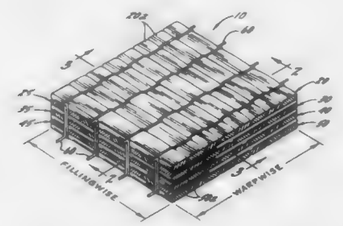
shaped for complementary intermeshing with one part being arranged in the other part, so as to for together a longitudinally extending structure in which the top edges of the parts are adjacent and in a straight line and which parts are separated along partition planes extending parallel to the top edge of the inner part and in a transverse direction and being insulated from each other along said partition planes and from the U-profile outer bar surrounding the parts thereby allowing a detecting of a drop wire of the stop motion device which drops on one of said parts in the event of a breakage of one warp end, which parts are electrically connected with indicating instruments.

4,854,352

TEXTILE FABRICS HAVING A PLURALITY OF WARP AND FILLING LAYERS AND ATTENDANT METHOD OF MAKING

Charles M. Combier, Aiken, S.C., assignor to J. B. Martin Company, Leesville, S.C.

Continuation-in-part of Ser. No. 12,062, Feb. 6, 1987, Pat. No. 4,748,996. This application Jun. 6, 1988, Ser. No. 202,943
Int. Cl.[4] D03D *11/00*
U.S. Cl. 139—408 7 Claims



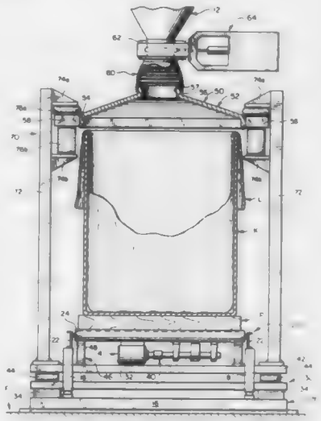
1. A woven multilayered readily moldable textile fabric having a plurality of yarn layers formed of straight warp yarns and a plurality of yarn layers formed of straight filling yarns arranged in alternation with said layers of straight warp yarns and wherein some of said filling yarn layers define opposite faces of the fabric, the respective filling yarns of said plurality of layers being in superposed relation and extending at right angles to the warp yarns, and relatively small binder warp yarns interconnecting the respective straight warp and filling yarns of said layers, the straight warp yarns in each layer being very close to each other and separated and spaced apart only by said relatively small binder yarns, said binder yarns also serving for maintaining said filling yarns in said superposed relation and being arranged in cooperating pairs with one binder yarn of each pair being woven in opposition to the other binder yarn of each pair so that one binder yarn extends over all of certain superposed filling yarns and under all of certain other superposed filling yarns and the other binder yarn of each pair extends under said certain superposed filling yarns and over said certain other superposed filling yarns.

4,854,353

BULK CONTAINER FILLING APPARATUS

Raymond L. Russell, Cedar Falls, Iowa, assignor to Container Corporation of America, Clayton, Mo.

Filed Mar. 9, 1988, Ser. No. 197,368
Int. Cl.[4] B65B *1/04*
U.S. Cl. 141—74 7 Claims



1. Apparatus for vibrating, weighing, and filling an open top, bulk container with particulate material said apparatus comprising:

(a) a base:

(b) a weighing assembly supported by said base;

(c) a vibrating assembly supported by the weighing assembly;

(d) a fixed material dispensing spout;

(e) a hood adopted to be positioned between a container and said spout and having a domed upper wall with a central filling opening connected by a non-rigid connection to said spout;

(f) said hood being mounted for limited vertical movement and including:

(i) a vertical flange, extending downwardly from said upper wall, and adapted to enclose an upper end of a container;

(ii) a horizontal flange, extending laterally outward beyond said vertical flange;

(g) means for moving said hood vertically between an upper open position and a lower closed position;

(h) said moving means including at least one pair of pneumatic actuating devices positioned immediately above and below said hood horizontal flange for engagement therewith.

4,854,354

DOSING ARRANGEMENT INCLUDING A RETURN SUCKING DEVICE

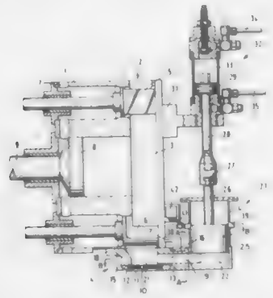
Dieter Moeller, Haan, Fed. Rep. of Germany, assignor to Benz & Hilgers GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 20, 1987, Ser. No. 75,378

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1986, 3624592

Int. Cl.[4] B65B *3/32*

U.S. Cl. 141—116 8 Claims



1. An improved arrangement for filling of liquid nutrient materials into containers, in particular, liquid products having chunky solid constituents, having a housing with a product inlet, a mouthpiece as well as a dosing piston-cylinder unit, and independently controlled inlet and outlet valves, as well as a return sucking device which includes a second piston-cylinder unit, the improvement comprising;

said return sucking device is operatively mounted in said housing adjacent to said mouth piece;

wherein said return sucking device includes a cylinder and a piston reciprocally movably mounted therein, and an adjusting arrangement operatively connected to said return sucking device, said adjusting arrangement and return sucking device being mounted laterally adjacent to said housing.

4,854,355

STEPWISE ADVANCING ROTARY CONVEYOR AND INSTALLATION FOR TAKING LIQUID SAMPLES INCORPORATING SUCH A CONVEYOR

Henri Chazot, Les Angles; Gérard Cauquil, Bagnols Sur Ceze, and Jean-Paul Muller, Orsan, all of France, assignors to Cogema-Compagnie Generale Des Matieres Nucleaires, France

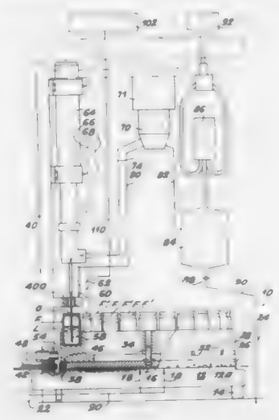
Filed Mar. 31, 1988, Ser. No. 175,779

Claims priority, application France, Apr. 9, 1987, 87 04998

Int. Cl.[4] G01N *1/14*

U.S. Cl. 141—130 10 Claims

1. An installation for taking liquid samples from bottles (F) sealed by caps (O), characterized in that said installation comprises a stepwise advancing rotary conveyor (10) comprising a fixed base (12) having a horizontal upper face (12*a*) onto which issues a first injector (18) communicating with pressurized gas supply means (22), a rotary plate (24) resting by gravity on the upper face of the base and cooperating with said face by means (16, 26*a*) for centering the plate about a fixed vertical axis. said plate having a circular outer edge (26*c*, 28*b*), an upper face provided with receptacles (36) distributed in ring-like manner about said axis and a lower face (26*b*) defining with the upper face (12*a*) of the base a central support chamber (30), at least one passage (32) oriented in a direction inclined with respect to a radius through said axis being formed in the plate (24) in order to connect the central support chamber and the outer edge of the plate in order to ensure rotation of the latter when the supply means (22) are actuated, the plate having a weight such that the rotation is instantaneously stopped when the supply means are stopped, remote detection means (38, 42, 44) operatively associated with said plate for the remote detection of the presence of one of said receptacles (36) in a given angular position about said axis, and control means (122, 120) operatively connected with said detection means sensitive to signals supplied by the detection means (44) in order to control the stoppage of the supply means (22) when said one of said receptacles (36) is present in said angular position, the bottles being placed in receptacles (36) of said plate, and whereby sad installation also incorporates a fixed lateral gantry (40) supporting a vertical sampling needle (58) via means (64) for displacing said



needle vertically between an upper position authorizing the rotation of the plate and a lower sampling position, in which the cap is perforated by the needle, and a chromatographic valve (70) having a plurality of inlets and equipped with a sampling loop (72), whereby said valve can occupy either a sampling position in which two first inlets (6,5) of said plurality of inlets, respectively communicating with the needle (58) and with a suction venturi (86), are interconnected across said loop (72), or a sample discharge position, in which two other inlets (2,3) of said plurality of inlets of the valve, communicating respectively with means (78) for ejecting a sample taken and with a sample discharge tube (80), are interconnected across said loop (72).

4,854,356

SAFETY APPARATUS FOR TIRE

Theodore Koutsoupidis, Kecropos 39, Glyfada Athens 166-75, Greece

Continuation of Ser. No. 759,253, Jul. 26, 1985, abandoned. This application Jul. 13, 1987, Ser. No. 72,468

Int. Cl.[4] B60C *17/04*

U.S. Cl. 152—158 5 Claims

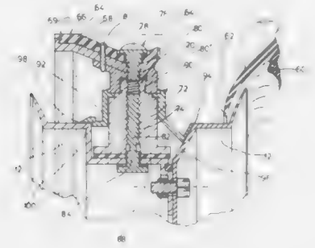
1. A safety device adapted for use with a vehicle wheel assembly mounted on a vehicle, said wheel assembly comprising a one-piece rim and a pneumatic tubeless tire, said safety device capable of supporting the weight of said vehicle and retaining said tire on said rim in the event of loss of pressure in said tire, said safety device comprising:

a plurality of resilient tire support means circumferentially disposed around an innermost rim of said wheel for supporting an inner surface of said tire in the event of loss of pressure therein, said tire support means comprising a plurality of semiwheels including:

first and second contact arms including first and second contact surfaces, said first contact surface for engaging a sloped portion of said rim, said second contact surface for engaging a right angle portion of said rim, said first and second contact surfaces further comprising first and second bead engaging recesses, said recesses retaining said tire on said wheel in the event of loss of pressure in said tire;

an elastomeric contact surface comprising arcuate V-shaped support means for supporting said tire in the event of loss of pressure therein; and

compression gasket means disposed substantially between said first and second contact arms and said rim, said gasket



maintaining said first and second contact arms and said rim in a spaced apart relationship when said tire is pressurized, and yielding to the weight of said vehicle when said tire is not pressurized, thereby enabling the contact of said first and second contact arms with said rim and the support of said tire by said elastomeric surface means and the retention of said tire on said rim by said bead engaging recesses in the event of loss of pressure in said tire.

4,854,357

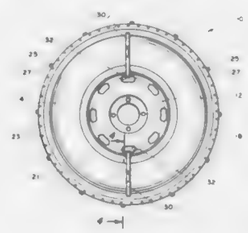
WHEEL ACCESSORY FOR ADDITIONAL TRACTION

Maher A. H. Mostafa Taha, 3833 College Ave., Culver City, Calif. 90230

Filed Mar. 12, 1987, Ser. No. 24,975

Int. Cl.[4] B60C *27/20*

U.S. Cl. 152—181 11 Claims



1. An apparatus for use with an automotive wheel including a tire to provide additional traction on a surface comprising:

a first and a second ring member fabricated of hard grooved metal material, each having a sufficient diameter and held in a spaced-apart parallel relation by a plurality of transversely oriented angled bar members rigidly connected at each end and equally spaced along the circumference of said rings to said rings so as to be adapted to receive therein and therebetween the tire, said angled bar members having a convex portion member oriented towards the tire and a concave portion oriented away from the tire; and

at least one selectively adjustable strap for connecting both of said ring members to the wheel in a rotationally fixed, but removable relation, said selectively adjustable strap having sufficient length to engage both said ring members and the wheel in a compressive relation.

4,854,358

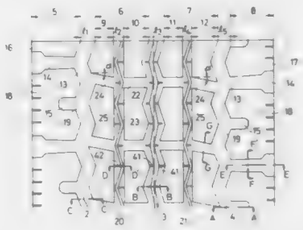
TREAD PATTERN FOR A HEAVY LOAD PNEUMATIC TIRE WHICH CHANGES FROM A BLOCK PATTERN TO A RIB PATTERN WITH WEAR

Akihiro Takeuchi, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Japan

Continuation of Ser. No. 748,904, Jun. 26, 1985, abandoned. This application May 22, 1987, Ser. No. 53,532

Int. Cl.[4] B60C *11/06*

U.S. Cl. 152—209 R 3 Claims



1. A tread pattern for a pneumatic tire, comprising:

a multi-depth tread with an unworn configuration having a plurality of circumferentially continuously extending longitudinal grooves having at least one zig-zag longitudinal groove and at least two straight longitudinal grooves and a multiplicity of transverse grooves extending generally axially of the tire and joining said longitudinal grooves to define a block pattern occupying 40 to 60% of the tread width when the tread is not worn;

the longitudinal grooves in said unworn configuration having an initial total width equal to 15 to 35% of the tread width and a total later width equal to 10 to 25% of the tread width when the tread has worn by 35 to 75%, said total widths of the longitudinal grooves being measured parallel to the axis of the tire;

each of the at least two straight longitudinal grooves having a straight longitudinal first width configuration extending radially inwardly only to a first depth and a second narrower width configuration being in a zig-zag pattern and extending radially inwardly in a stepped fashion from said first depth to a second depth,

the at least one zig-zag longitudinal groove having a zig-zag longitudinal first width configuration extending radially inwardly only to a first depth and a second narrower width configuration also being of a zig-zag configuration extending radially inwardly in a stepped fashion from said first depth to said second depth;

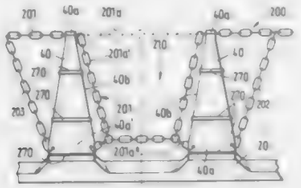
said transverse grooves being in two groups, a majority group and a remainder group with said majority group having only a first depth, approximately equal to the first depth of the longitudinal grooves, and the grooves of said remainder group being open to an adjacent longitudinal groove at only one end and having both a first depth and a second depth, the arrangement being such that when the tread pattern wears by 35–75% down to the first depth then the grooves of said majority group will disappear to form a rib pattern and the straight portion of said at least two longitudinal straight grooves will also disappear so that the tread pattern will have visible only the second depth of the longitudinal grooves and the second depth of said remainder group of the transverse grooves.

4,854,359

ANTISKID DEVICE, PARTICULARLY FOR PNEUMATICALLY TIRED VEHICLE WHEELS ON SNOW AND ICE SURFACES

Heiko Ippen, Wilhelmshofallee 140, D-4150 Krefeld, and Werner Preusker, Kleine Nisterstrasse 15, D-5239 Atzelgift, both of Fed. Rep. of Germany

Filed Dec. 30, 1985, Ser. No. 814,451
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1985, 8502229[U]; Feb. 7, 1985, 8503359[U]; Oct. 29, 1985, 8530686[U]
Int. Cl.[4] B60C 27/14
U.S. Cl. 152—216 33 Claims



1. An antiskid device, particularly for pneumatically tired vehicle wheels on snow and ice, said device comprising:
- a circular supporting disk;
- means for releasably attaching said supporting disk to a vehicle wheel rim;
- a plurality of support arms extending radially from said supporting disk and adapted to extend over the tread surface of a tire mounted on a vehicle wheel rim to which said supporting disk is attached; and
- a snow chain grid including an outer chain in attachment with the outer ends of said radially extending support arms, said chain grid further including a plurality of further chain portions, each further chain portion having a first end attached to said outer chain and a second end attached to one of said support arms, said outer chain being an endless chain extending in a manner positioning said endless outer chain essentially entirely about the periphery formed by the outer ends of said support arms except for a length of said outer chain secured between an adjacent pair of support arms in a manner positioning said length of said outer chain closely adjacent to the inner edge of each of said adjacent pair of support arms and the peripheral edge of said supporting disk between said adjacent pair of support arms so as to form a U-shaped configuration in said length of said outer chain, whereby the U-shape configuration forms a fitting opening which enables said antiskid device to be fitted in a completely operative position over a tire on a vehicle wheel rim without having to rotate the wheel.

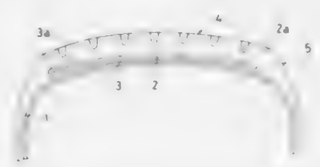
4,854,360

PNEUMATIC RADIAL TIRE ARRANGEMENT FOR VEHICLE

Tadanobu Nagamo; Sadakazu Takei, and Yukio Tozawa, all of Hiratsuka, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1987, Ser. No. 75,023
Claims priority, application Japan, Jul. 25, 1986, 61-173711
Int. Cl.[4] B60C 9/26
U.S. Cl. 152—529 2 Claims

1. A four-wheel automotive vehicle including two front wheels adapted for steering the vehicle and two rear wheels, each of said front and rear wheels having an inner side facing the vehicle, an outer side facing away from the vehicle and a pneumatic tire mounted thereon, wherein the improvement comprises: four essentially identical pneumatic radial tires mounted on said wheels, each of said pneumatic radial tires having a belt structure comprised of a belt layer made of steel cords and a belt layer made of aromatic polyamide fiber cords, wherein one of said belt layers constitutes a lower belt layer of said belt structure and the other of said belt layers constitutes an upper belt layer of said belt structure, said lower belt layer is folded back at one end thereof in the widthwise direction towards a tread side to form a folded-back portion and to enclose one end of the upper belt layer therein, the other end



of said upper belt layer of said belt structure is folded back in the widthwise direction towards the tread side, and each of said pneumatic radial tires is mounted on one of said wheels with the folded-back portion of said belt layer made of steel cords located towards said outer side of the wheel, whereby said tires reduce steering pull during high speed performance of the vehicle.

4,854,361

PNEUMATIC TIRES

Chester J. Gasowski, Uniontown; Michael A. Kolowski, Mogadore; John C. Smithkey, North Canton, and Thomas L. Ford, Mogadore, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 877,940, Jun. 24, 1986, abandoned.
This application Dec. 21, 1987, Ser. No. 135,497
Int. Cl.[4] B60C 15/00
U.S. Cl. 152—552 4 Claims



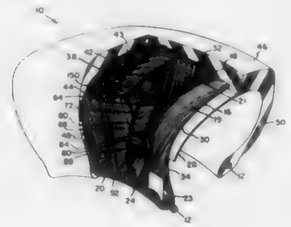
1. A pneumatic tire having a bead portion comprising:
(a) an annular bead core comprising a plurality of metallic filaments;
(b) a carcass ply anchored around said bead core, said carcass ply having a main portion and a turn-up portion; and
(c) a clamping member disposed radially outwardly of said bead core and extending circumferentially thereabout, the turn-up portion of the carcass ply being radially interposed between and directly adjacent to both the clamping member and the bead core, said clamping member being adjacent to only the turn-up portion of the carcass ply and comprising a tape of an elastomeric material containing at least one cord of a non metallic heat shrinkable material which has permanent thermal shrinkage of at least 2%, said tape being directly wrapped circumferentially about the bead core and turn-up portion of the carcass ply a plurality of times, the only elastomeric substance interposed between the turn-up portion of the carcass ply and the bead core being the same as any elastomeric substance which is interposed between the filaments of the bead core, the radially outer edge of the turn-up portion of the carcass ply being in contact with the main portion of the carcass ply.

4,854,362

PNEUMATIC TIRE

Russell A. Carolla, and Nathan A. Gammon, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 23, 1988, Ser. No. 197,524
Int. Cl.[4] B60C 9/04
U.S. Cl. 152—554 6 Claims



1. A pneumatic tire for use on paved road surfaces, the pneumatic tire comprising:
- a pair of axially-spaced annular tensile members;
- first and second carcass plies extending between the annular tensile members, each of the first and second carcass plies having a central portion and lateral edge portions, the central portion of the second carcass ply being located outwardly of the central portion of the first carcass ply, and each lateral edge portion of the first and second carcass plies being folded axially and radially outwardly around one of the annular tensile members;
- a belt structure extending circumferentially about the first and second carcass plies; the lateral edges of the first carcass ply being interposed between the central portion of the second carcass ply and the belt structure; and
- a pair of shoulder plies, each shoulder ply being symmetrically positioned with respect to the other on axially opposed sides of the tire and at least the majority of each such shoulder ply being disposed axially and radially outwardly of the central portion of the second carcass ply and axially and radially inwardly of the lateral edge portions of the first carcass ply, the cords of each shoulder ply forming an angle of at least five degrees with respect to the cords in the adjacent central portion of the second carcass ply and also with respect to the cords in the adjacent lateral edge portion of the of the first carcass ply, each shoulder ply extending from a point located between the equatorial plane of the tire and the lateral edges of the belt structure to a point radially inward of the section width line.

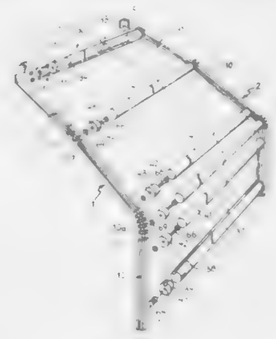
4,854,363

DEVICE FOR SUPPORTING MOVABLE COVER ELEMENTS

Jean M. Fouquet, 27 avenue Paul Verlaine Domaine de Villarceau, 77330 Lesigny, France

Continuation-in-part of Ser. No. 907,999, Sep. 16, 1986, abandoned. This application Apr. 19, 1988, Ser. No. 185,260
Claims priority, application France, Sep. 17, 1985, 85 13765
Int. Cl.[4] E06B 3/32
U.S. Cl. 160—98 9 Claims

1. A device for supporting a movable cover element comprising:
- at least two uprights each of which extends longitudinally in a respective one of spaced apart substantially vertical planes, each of said uprights comprising a series of discrete sections,
- each of said sections having a longitudinal axis, the same cross-sectional shape taken perpendicular to said axis as do the other said sections, a throughway cavity defined therein and extending in the same direction as said axis, and grooves extending parallel to said cavity so that a continuous cavity extends through and continuous grooves extend along each of said uprights,
- said continuous cavity and said continuous grooves defined by the throughway cavities and the grooves, respectively, of the discrete sections of each of said series of discrete sections;
- elongate connecting means extending through a portion of said continuous cavity extending through each of said uprights for aligning said discrete sections of each said series in an assembled configuration and for maintaining said discrete sections in alignment with one another in said configuration,
- each of said discrete sections of each said series having transverse end faces which abut with respective said end faces of adjacent ones of said discrete sections aligned in said configuration, said end faces of each said discrete section each being oriented relative to said longitudinal axis thereof so as to conform to said configuration when abutting adjacent ones of said discrete sections;



- an intermediate structure extending transversely between said two uprights comprising spaced apart parallel members each having a pair of ends slidably mounted to said uprights in said continuous grooves extending therealong; and
- fixing means slidable in said continuous grooves with the ends of at least some of said parallel members for releasably fixing said ends of at least some of said parallel members to said uprights,
- each of said uprights comprising rectilinear parts and at least one curvilinear part interconnecting the rectilinear parts, the rectilinear parts each consisting of a single discrete section of said series, and the curvilinear part comprising a plurality of small discrete sections of said series which have the end faces thereof divergent away from the center of the radius of a curve extending along the curvilinear part, said small sections each extending tangentially to the curve.

4,854,364

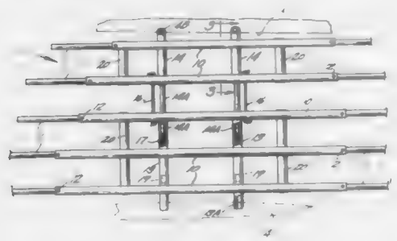
PET BARRIER FOR CAR WINDOW INSTALLATION

Belva J. Junker, 2150 Laura Space 68, Springfield, Oreg. 97477

Filed Jan. 22, 1988, Ser. No. 147,290
Int. Cl.[4] E06B 3/32
U.S. Cl. 160—105 4 Claims

1. A pet barrier for installation in a vehicle window opening defined by vehicle body or door structure, said barrier including,
- a multitude of vertically spaced elongate main horizontal members, at least some of said members including multiple telescopic extensions each independently and adjustably carried at the ends of said some of said members for independent horizontal positioning into endwise abutment

with vehicle structure, locking means on said main horizontal members and engageable with said telescopic extensions to retain same in place in adjusted endwise abutment with said vehicle structure, and



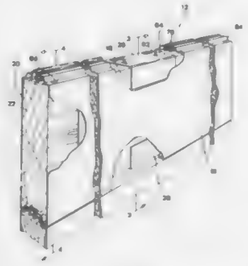
support means including upright posts interconnecting said main horizontal members and engageable with vehicle structure, said posts being of adjustable length and including segments which carry at least one of said horizontal members, said segments being spring biased to urge same into engagement with vehicle structure.

4,854,365

SECTIONAL-TYPE DOOR

Pierre Juneau, 8000, 19e avenue, Ville Saint-Michel, Montreal, Quebec, Canada

Filed Mar. 9, 1988, Ser. No. 166,061
Int. Cl.[4] E06B *3/12*
U.S. Cl. 160—232 **7 Claims**



1. A sectional-type door consisting of a plurality of adjacent hingedly connected sections, each section comprising:

(a) a unitary expanded core fabricated of heat insulating material and having a rectangular shape with top, bottom and side edges;

(b) at least one U-shaped member fixedly mounted to said top and bottom edges of said core; said members displaying, on an intermediate wall thereof, at least one pair of outwardly projecting retaining means;

(c) first and second spaced elongated metal panel members of identical cross-sectional shape; each panel member having a main surface adhesively bonded to said core, and first and second horizontal edges; said first horizontal edges of said panel members being formed to provide a tongue area and said second horizontal edges of said panel members being formed to provide a recessed area; said tongue area being insertable in said recessed area of an adjacent section;

each of said first horizontal edges including: a first inwardly projecting portion adjacent said main surface; an inclined portion extending from said first portion; a second inwardly projection portion extending from said inclined portion; a straight portion extending perpendicularly to said second inwardly projecting portion and rearwardly towards said core; and a reverse bend portion at the end of said straight portion;

each of said second horizontal edges including: a first inwardly projecting portion adjacent said main surface; an inclined portion extending from said inwardly projecting portion; a second inwardly projecting portion extending from said inclined portion and a reverse bend portion at the end of said second inwardly projecting portion, said reverse bend portion being bent rearwardly towards said core;

said first and second inwardly projecting portions and said inclined portions of both first and second horizontal edges being substantially parallel to one another with little clearance therebetween to provide minimum air infiltration in said areas while allowing limited relative movement therebetween;

said reverse bend portions of said first horizontal edges being spaced from each other and said reverse bend portions of said second horizontal edges being spaced from each other to prevent contact between said panel members; said reverse bend portions of said first and second horizontal edges engaging said retaining means of said U-shaped members;

said main surfaces of said panel members being larger than said core so as to define a cavity at each opposite side edges of said core;

(d) a structural member received in each said cavity; and

(e) a resilient weather seal extending the entire length of said section between said first horizontal edges of said panel members of one section and said second horizontal edges of said panel members of an adjacent section; said weather seal extending and being retained between said straight portions of said first horizontal edges and said reverse bend portions of said second horizontal edges.

4,854,366

METHOD OF MAKING A MOULDED ARTICLE

James Wallbank, Birmingham, United Kingdom, assignor to Austin Rover Group Limited, England

Filed Jul. 22, 1988, Ser. No. 223,228
Claims priority, application United Kingdom, Aug. 5, 1987, [illegible]
Int. Cl.[4] B22C *7/00, 1/22*
U.S. Cl. 164—16 **6 Claims**

1. In a process of manufacture of a moulded article including the steps of:

forming a pattern with the shape of the moulded article to be manufactured;

using the pattern by providing the surface thereof with a layer of silicone release agent;

packing a composition of a mixture of granular filler and an acid-curing synthetic resin against the pattern;

curing in situ the synthetic resin in contact with the pattern in the presence of a gas adapted to form a said moulded article separating the pattern from the moulded article so formed; and

repeatedly re-using the pattern as above and periodically cleaning same by washing with a non-abrasive cleaning agent to remove build up of deposits formed thereon.

4,854,367

REFRACTORY COMPOSITIONS AND EVAPORATIVE PATTERN CASTING PROCESS USING SAME

Robert L. Snook, Houston, Tex., assignor to Ashland Oil, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 90,758, Aug. 28, 1987, Pat. No. 4,785,870, and Ser. No. 90,760, Aug. 28, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 264,030
The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.
Int. Cl.[4] B22C *7/02, 9/04*
U.S. Cl. 164—34 **16 Claims**

1. An improvement in the process for the preparation of metallic castings by the evaporative pattern casting process wherein an expendable pattern is coated with refractory material prior to the pouring of molten metal to form a casting of the desired shape which comprises coating the expendable pattern with a refractory composition comprising a sufficient amount of substantially spherical refractory material and an inorganic binder selected from the group consisting of aluminium phosphate, sodium silicate and potassium silicate to support the pattern during the pouring of the metal and to vent the gases formed by the evaporation of the pattern so as to obtain a casting of the desired shape and surface.

4,854,368

LOST FOAM CASTING METHOD

Edward Vezirian, P.O. Box 2255, Vista, Calif. 92083

Filed Dec. 27, 1988, Ser. No. 290,522
Int. Cl.[4] B22C *7/02, 9/04*
U.S. Cl. 164—34 **11 Claims**

1. An environmentally clean method for lost foam casting comprising the steps of:

providing a polymeric foam pattern cluster,

investing said pattern cluster in a refractory mold,

evaporating said pattern cluster from said refractory mold in a low temperature vacuum kiln, and

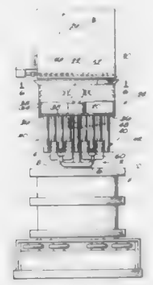
pouring said refractory mold with a selected molten metal.

4,854,369

APPARATUS FOR SURROUNDING A FOAM PATTERN CLUSTER WITH SAND

Francis V. Bailey, Racine, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 171,575, Mar. 22, 1988, abandoned. This application Jan. 30, 1989, Ser. No. 303,976
Int. Cl.[4] B22C *5/12, 9/04*
U.S. Cl. 164—159 **26 Claims**



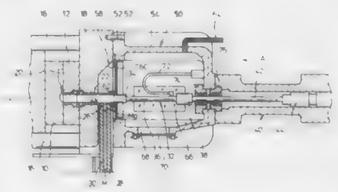
1. An apparatus for surrounding a mold pattern with sand in a mold flask, said apparatus comprising a plurality of generally vertically extending tubes, means for securing the pattern to said tubes to form a tube and pattern assembly, means for causing relative movement of the assembly and the flask so that the assembly is located in the flask, and means for depositing sand through said tubes and into the flask.

4,854,370

DIE CASTING APPARATUS

Hiromi Nakamura, Zama, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 4,646, Jan. 20, 1987, abandoned. This application Sep. 2, 1988, Ser. No. 239,691
Claims priority, application Japan, Jan. 20, 1986, 61-10676
Int. Cl.[4] B22D *27/00*
U.S. Cl. 164—259 **7 Claims**



1. A die casting apparatus comprising:

a sleeve having one end communicating with a die cavity defined by a movable die and a fixed die and connected to a feed pipe;

a plunger slidably fitted in said sleeve for forcing molten metal supplied from said feed pipe through said sleeve into said die cavity;

driver means for moving said plunger in said sleeve;

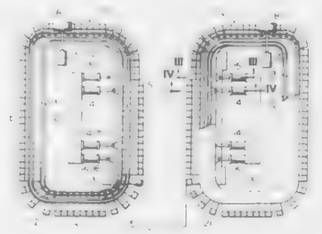
supply means communicating with said sleeve for supplying an inert gas to a passage defined in said sleeve and also to said feed pipe, said supply means comprising a closed casing and a gas feed pipe for supplying the inert gas into said closed casing, said casing being connected to an opposite end of said sleeve in covering relation thereto, said casing having a window for visually checking the interior of the casing therethrough; said casing has an opening defined in a bottom thereof for removing small metal pieces from said casing.

4,854,371

TWIN BELT TYPE CONTINUOUS CASTING MACHINE

Keiichi Katahira; Kiyomi Shio, both of Kitakyushu, and Noriyuki Kanai, Oita, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 287,240
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—431 **9 Claims**



1. A twin belt type continuous casting machine of the type that includes a pair of endless belts movable in the directions of their lengths and a pair of endless loops each formed by a plurality of short-side dam blocks and movable in the direction of the length of the loop, said endless belts having spaced and substantially parallel runs movable in the same directions, said endless loops of dam blocks having spaced and substantially parallel runs each sandwiched between adjacent side edges of said parallel runs of said endless belts and movable substan-

tially in synchronism therewith, said parallel runs of said endless belts and said parallel runs of said endless loops of dam blocks cooperating together to form a continuous casting mold having a substantially rectangular cross-section, said endless belt parallel runs and said endless loop parallel runs constituting the long side faces and the short side faces of the mold, respectively, said mold continuously receiving molten metal to cast a thin and continuous slab, the improvement comprising:

pairs of substantially endless inner and outer guide rails for guiding said endless loops, respectively;

rail moving means for shifting said inner and outer guide rails independently to shift said runs of said endless loops of dam blocks in the widthwise directions of the slab being cast;

each of said pair of endless loops of dam blocks comprising a first group of short-side dam blocks guided by at least one of said inner and outer guide rails of one of the pairs and a second group of short-side dam blocks guided by at least the other guide rail of the one pair, said first and second groups of short-side dam blocks being connected to form said endless loop, said first and second groups of short-side dam blocks being formed by short-side dam blocks of a number extending over a dimension longer than a dimension required for said short-side dam blocks to contact with said slab;

first and second short-side dam block support means for engaging said first and second groups of short-side dam blocks with associated guide rails so that said short-side dam blocks are supported by said guide rails;

said inner and outer guide rails being movable by said rail moving means to respectively shift, through said first and second short-side dam block support means, said first and second groups of short-side dam blocks in directions widthwise of said slab;

said inner and outer guide rails and said first and second short-side dam block support means being arranged such that pressures applied by the metal being cast and by a cast slab to said short-side mold blocks in contact with the metal and said slab are transmitted to said inner and outer guide rails substantially along a plane extending through a substantially thicknesswise center of said slab and substantially in parallel with the widthwise direction of said slab.

4,854,372

CORRUGATED HEAT PIPE

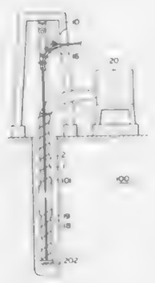
Masuji Sakaya, Narahino; Tsuneaki Motai, Yachiyo; Masataka Mochizuki, Nagareyama, and Kouichi Mashiko, Tokyo, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Division of Ser. No. 164,560, Mar. 7, 1988. This application Jan. 26, 1989, Ser. No. 302,764

Claims priority, application Japan, Mar. 11, 1987, 62-53975; Apr. 10, 1987, 62-86989; May 15, 1987, 62-117168

Int. Cl.⁴ F28D *15/02*

U.S. Cl. 165—46 **8 Claims**



1. A corrugated heat pipe sealed at both ends, having a longitudinally corrugated peripheral wall and containing operating liquid therein, said corrugated heat pipe comprising at least one rope-like tension member extending along its outer peripheral surface, in the longitudinal direction thereof, and secured at both ends.

4,854,373

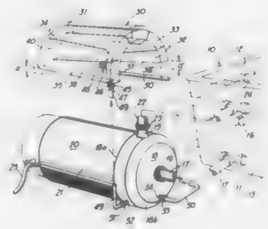
HEAT EXCHANGER FOR A PUMP MOTOR

Gordon G. Williams, 5291 Georgia Hwy. 3, Space No. 3, Hampton, Ga. 30228

Division of Ser. No. 175,198, Mar. 30, 1988. This application Jan. 26, 1989, Ser. No. 302,568

Int. Cl.⁴ F28F *7/00*; **H02K** *9/00, 9/02*; **F04B** *17/00*

U.S. Cl. 165—46 **6 Claims**



1. A heat exchanger for a motor of the type having a concaved upper surface, said heat exchanger comprising:

a housing having a hollow interior said housing having an inner surface which conforms to the shape of said motor and subtends slightly more than 180° so that said heat exchanger will snap onto the upper surface of said motor, said heat exchanger deforming slightly as it passes the mid portion of said motor and said housing having means for connecting said heat exchanger to a source of heat transfer fluid.

4,854,374

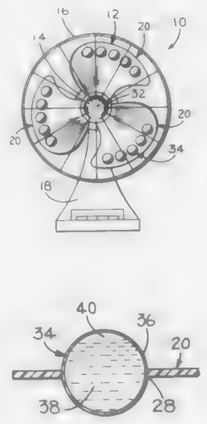
TEMPERATURE CONTROLLING APPARATUS

Frank Harrison, P. O. Box 1824, Kansas City, Mo. 64141

Filed Feb. 2, 1988, Ser. No. 151,590

Int. Cl.⁴ F24H *7/00*; **F25D** *3/00*

U.S. Cl. 165—47 **7 Claims**



1. Temperature controling apparatus comprising:

a propeller for a fan having a rotatable hub and a plurality of blades extending radially from the hub, each blade having at least one opening extending therethrough and

at least one self-contained temperature controlling means having a high heat storage capacity mounted in the opening in each blade whereby said self-contained temperature controlling means can be placed in a hot or cold environment prior to use to regenerate the same.

4,854,375

OVERHANGING BLOW-CONVECTOR FOR INDOOR SPACE AIR-CONDITIONING

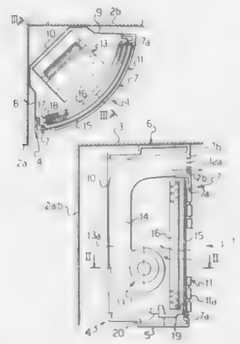
Daniele Farina, Monza; Guglielmo Colombo, Casatenovo, and Lorenzo Bonfanti, Usmate, all of Italy, assignors to Delchi/-Carrier S.p.A., Milan, Italy

Filed Jul. 8, 1987, Ser. No. 71,171

Claims priority, application Italy, Jul. 16, 1986, 2254586[U]

Int. Cl.⁴ F24D *5/10*

U.S. Cl. 165—53 **5 Claims**



1. A blow-convector for indoor space air-conditioning which comprises

a box-type structure, including parallel bottom and top bases, having a substantially right circular segmental shape, with an arcuate front adjoining two sidewalls converging toward each other at right angles,

a suction port and a delivery port formed in said arcuate front of said box-type structure, and

a blower and heat exchanger supported within said box-type structure.

4,854,376

WALL MOUNTED AIR CONDITIONER WITH DISCHARGERS IN SEPARATE ROOMS

Shouji Tunekawa, Nitta; Wazoh Yamada; Yoshitaka Hara, both of Gunma, and Fujio Suzuki, Ohta, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

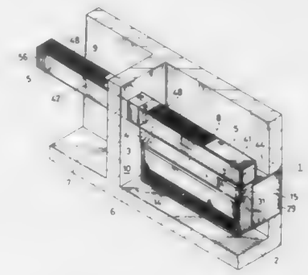
Filed Jul. 20, 1987, Ser. No. 75,614

Claims priority, application Japan, Jul. 24, 1986, 61-174562

Int. Cl.⁴ F24F *3/00, 13/06, 13/10*

U.S. Cl. 165—54 **8 Claims**

1. An air-conditioning system including an air conditioner incorporating a heat exchanger and a fan therein, and duct means connected to the air conditioner for supplying conditioned air to a specific room equipped with the air conditioner and to another room, the system being characterized in that the air conditioner comprises a cabinet installed in and extending through a wall separating off the interior of the specific room from outside and having a front opening positionable inside the specific room, a bottom plate put into the cabinet through the front opening and contacting the bottom of the cabinet and having the heat exchanger and the fan mounted thereon, and a front cover having an air inlet and an air outlet and removably attached to the cabinet for covering the front opening; the duct means comprising an auxiliary duct removably attached to the front cover by connecting means and a main duct separably connected to the auxiliary duct to extend from the specific room to said another room and having air outlet portions for supplying air to the respective room, the auxiliary duct being removable without removal of any portion of the main duct and having an air channel for guiding the air discharged from the air outlet of the front cover into the main duct.



4,854,377

LIQUID COOLING SYSTEM FOR INTEGRATED CIRCUIT CHIPS

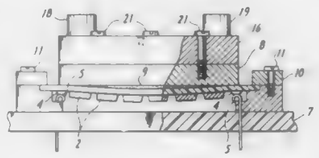
Mitsuo Komoto; Youichi Matsuo, and Toshifumi Sano, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Nov. 18, 1986, Ser. No. 931,847

Claims priority, application Japan, Nov. 19, 1985, 60-257570; Nov. 19, 1985, 60-257571; Nov. 19, 1985, 60-257572

Int. Cl.⁴ F28F *7/00*; **H05K** *7/20*

U.S. Cl. 165—80.4 **10 Claims**



1. A cooling system for an electronic system comprising:

a substrate having a first surface and a second surface opposite to the first surface;

a plurality of integrated circuit chips mounted on the first surface of said substrate;

a heat conductive means having a first surface and a second, flat surface opposite to the first surface;

a layer of thermally conductive bonding material disposed between the second surface of said substrate and the first surface of said heat conductive means for bonding the second surface of said substrate to the first surface of said heat conductive means;

a heat exchanger having a flat surface and provided with inlet and outlet means to permit liquid coolant to flow through said heat exchanger in contact with the flat surface of said heat exchanger; and

mounting means for removably mounting said heat exchanger to said heat conductive means with said flat surface of said heat exchanger being in close proximity to said second surface of said heat conductive means.

4,854,378

HEAT TRANSFER AND FLUID HEATING DEVICE

Joseph M. Zappia, 235 N. W. 26th Ave., Miami, Fla. 33125

Filed Oct. 27, 1986, Ser. No. 923,295
Int. Cl.[4] F28D *15/00*
U.S. Cl. 165—104.19 5 Claims



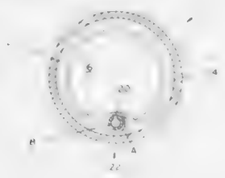
1. A heat transfer assembly comprising:
(A) a tubular member comprising walls having low heat conductivity therethrough,
(B) heater cap means sealed to one end of said tubular member, said heater cap means comprising walls having high heat conductivity therethrough,
(C) heat emitter cap means sealed to another end of said tubular means, said emitter cap means comprising walls having high heat conductivity therethrough,
(D) fibrous blanket means lining said heater cap means,
(E) fibrous wick means extending continuously through said heater cap means and said tubular means, and
(F) heat transfer liquid completely filling said assembly and saturating said blanket and said wick means.

4,854,379

VAPOR RESISTANT ARTERIES

Robert M. Shaubach; Peter Dussinger, both of Lititz, and Matthew T. Buchko, Lancaster, all of Pa., assignors to Thermacore, Inc., Lancaster, Pa.

Division of Ser. No. 101,361, Sep. 25, 1987, Pat. No. 4,815,528.
This application Feb. 15, 1989, Ser. No. 311,621
Int. Cl.[4] F28D *15/02*
U.S. Cl. 165—104.26 3 Claims



1. A heat pipe comprising:
a sealed casing;
capillary wick means located adjacent to the inside surface of the casing;
vaporizable heat transfer fluid within the sealed casing; and
at least one artery located within and surrounded by the capillary wick means, the artery constructed of walls of solid material and including at least one opening within the solid walls, the opening being oriented so that it is in a surface of the artery which is remote from a heat source applied to the heat pipe.

4,854,380

HEAT EXCHANGER

Takayuki Yoshida; Kiyoshi Sakuma, both of Shizuoka; Yu Seshimo, and Masao Hujii, both of Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP86/00521, § 371 Date Aug. 25, 1987, § 102(e) Date Aug. 25, 1987, PCT Pub. No. WO87/02762, PCT Pub Date May 7, 1987
PCT Filed Oct. 9, 1986, Ser. No. 71,230
Claims priority, application Japan, Oct. 25, 1985, 60-240077; Oct. 25, 1985, 60-240078; Oct. 25, 1985, 60-240081; Oct. 25, 1985, 60-240083
Int. Cl.[4] F28D *1/02*
U.S. Cl. 165—152 13 Claims



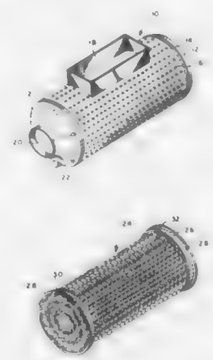
1. A heat exchanger comprising a plurality of heat-transfer elements placed side by side each of which has more than one through-hole and which are cyclically bent in a generally trapezoidal waveform in the direction of the flow of a fluid, the bends in one heat-transfer element being out of phase with those in an adjacent heat-transfer element by one half cycle in such a manner that the main stream of said fluid will flow not through the holes in each of said heat-transfer elements but through the passage formed by adjacent heat-transfer elements.

4,854,381

HEAT EXCHANGER DEVICE

Paul Mikula, 9427 Hyde Park Dr., Twinsburg, Ohio 44087

Filed Apr. 11, 1988, Ser. No. 180,335
Int. Cl.[4] F28F *9/02*
U.S. Cl. 165—158 6 Claims



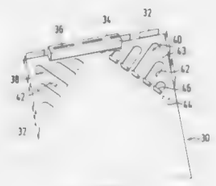
1. A heat exchanger device for use in the flue interconnecting a forced air furnace to an exhaust stack, comprising:
oppositely disposed end members, one of said end members being connectable to the portion of the flue attached to the exhaust stack, the other of said end members being connectable to the portion of the flue connected to the furnace;
a shroud having substantially tubular configuration and having a plurality of perforations positioned in substantially parallel rows around the periphery therof permitting the passage of surrounding air therein, said shroud being interposed between said end members;
a heat exchanger assembly received within said shroud and positioned so as to be substantially parallel to the longitudinal axis of said shroud and interposed between said ends members, said heat exchanger assembly allowing the passage of flue gasses therethrough from the furnace to the exhaust stack causing an increase in the temperature of said heat exchanger assembly resulting in the heating of said surrounding air passing into said shroud; and
outlet means attached to said shroud connecting to the cold air return portion of the furnace permitting said heated air to pass through said heat exchanger device to the furnace.

4,854,382

PLATE HEAT EXCHANGER

Karl-Heinz Funke, Gronau/Leine, Fed. Rep. of Germany, assignor to Funke Warmeaustauscher Apparatebau GmbH, Gronau/Leine, Fed. Rep. of Germany

Filed Dec. 1, 1987, Ser. No. 127,482
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1986, 3641458
Int. Cl.[4] F28F *3/08*
U.S. Cl. 165—167 4 Claims



1. In a plate heat exchanger comprising
(a) a series of flat heat transfer plates;
(b) profiled turbulence plates interposed between said heat transfer plates to provide a flow slit therebetween;
(c) a pair of spaced openings at the top and the bottom of each of said plates, said openings being aligned to provide a fluid passage through said plates, normal to the plane of said plates;
(d) gasket seals surrounding diagonally-opposed openings in said turbulence plates, said gasket seals being disposed in sealing contact with margins of adjacent heat transfer plates so that fluid flow from said openings to said flow slits is in opposite directions in adjacent flow slits; and
(e) means for compressing said plates into a unitary heat exchanger, the improvement in which
said openings in said heat exchange plates consist of a series of diagonal slots in the corners of said plates, said slots being of such size and shape as to form a triangular configuration at said corners.

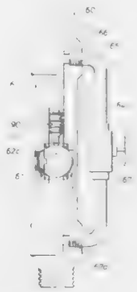
4,854,383

MANIFOLD ARRANGEMENT FOR USE WITH A TOP DRIVE POWER UNIT

Ronald D. Arnold, Missouri City, Tex.; Gerald R. Atol, Eagle River, Ak., and Samuel F. Baker, Conroe, Tex., assignors to Texas Iron Works, Inc., Houston, Tex.

Filed Sep. 27, 1988, Ser. No. 249,838
Int. Cl.[4] E21B *33/05, 33/13*
U.S. Cl. 166—70 2 Claims





1. A manifold arrangement for connecting between the hollow, rotatable stem extending through a top drive power unit and a well string for conducting fluid circulation and cementing operations employing cementing pump down plug means comprising:
assembly means for conducting a pumpable substance such as cement to the well string without first conducting it through the top drive power unit rotatable stem, said assembly including:
an outer tubular member;
a rotatable inner tubular member with a longitudinal passage therethrough;
said rotatable inner tubular member and longitudinal passage therethrough extending through said outer tubular member;
said rotatable inner tubular member having connection means connectable with the hollow stem for communicating the longitudinal passage in said inner tubular member with the hollow stem beneath the top drive power unit and with the well string;
said outer tubular member having lateral flow passage means to communicate with the longitudinal passage extending through said inner tubular member;
said rotatable inner tubular member having a circumferential groove on its outer surface intersecting said lateral flow passage means and said outer tubular member having a mating circumferential groove formed on its inner surface which groove means cooperate to form a continuous fluid flow passage in each said inner and outer tubular members communicating with said lateral passage means;
bearing means to accommodate rotation of said inner tubular member by the top drive power unit relative to said outer tubular member; and seal means between said rotatable inner tubular member and outer tubular member on each side of said lateral flow passage means;
first upper connection means (60) having a longitudinal passage extending therethrough with an open upper end connected with the top drive power unit rotatable stem for communicating the rotatable stem of the top drive power unit longitudinally into and through said first upper connection means;
first lower connection means (70) having a longitudinal passage extending therethrough with an open upper end

connected with the lower end of said first upper connection means (6);

a valve (61) intersecting the longitudinal passage in said first upper connection means (60) and a valve (62*a*) intersecting the longitudinal passage in said first lower connection means (70);

second upper connection means (64) having passage means therethrough connected with said first upper connection means at a point above and below said valve (61) in said first upper connection means (6) for bypassing fluid flow from the top drive power unit around said valve (61) when it is closed with a cement plug means supported therein;

second lower connection means (69) having passage means therethrough connected with said first lower connection means (70) to intersect the longitudinal passage in said first lower connection means (70) at a point above and below said valve (62*a*) in said first lower connection means (70) for bypassing fluid flow from the top drive unit around said first valve (62*a*) when it is closed with a cement plug means supported therein;

a valve in the passage means formed by said second upper connection means (64) which when in open position accommodates fluid flow around said closed valve (61) in said first upper connection means (60) with the cementing plug means supported thereon and when in closed position closes flow through said second upper connection means to thereby direct flow longitudinally into said first upper connection means (60) for propelling the cementing plug means through said open valve (61) in said first upper connection means (6) and into the well string; and

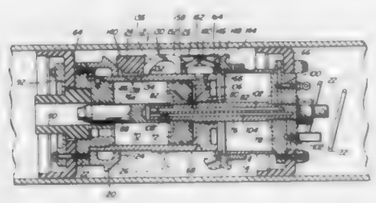
a valve in the passage means formed by said second lower connection means (69) which when in open position accommodates fluid flow around said closed valve (62*a*) in said first lower connection means (70) with the cementing plug means supported thereon and when in closed position closes flow through said second lower connection means (69) to thereby direct flow into said first lower connection means (70) for propelling the cementing plug means through said open valve (62*a*) in said first lower connection means (70) and into the well string.

4,854,384

PIPELINE PACKER

Douglas C. Campbell, Edmonton, Canada, assignor to Dawsue Industries Limited, Alberta, Canada

Filed Nov. 2, 1987, Ser. No. 115,866
Claims priority, application Canada, Apr. 7, 1987, 534015
Int. Cl.[4] E21B *23/06, 33/129*
U.S. Cl. 166—122 **23 Claims**



9. A fluid propelled pipeline packer for plugging a pipeline at a selected location therein and comprising:

(a) a main body adapted for propulsion through the pipeline in an axial direction;

(b) brake means mounted on said main body to releasably fix the main body at a selected location along the pipeline;

(c) fluid pressure activated brake actuator means on said main body operatively connected to said brake means;

(d) said brake actuator means including a piston and a piston rod means movable within a cylinder means located in said main body;

(e) said piston and piston rod means together with said cylinder means defining two fully enclosed chambers, said piston rod means arranged such that as the piston and piston rod means move relative to said cylinder means the sum total of the volumes of said two fully enclosed chambers remains substantially constant;

(f) fluid passage means communicating with both of said enclosed chambers, for admitting or releasing brake activating fluid to or from one of said enclosed chambers to effect said relative motion in a direction such as to activate or deactivate the brake means and fix or release said main body to the pipeline while at the same time said fluid is released or admitted from or to the other said chamber whereby, as one of said enclosed chambers is made to increase or decrease in volume the other said chamber undergoes a corresponding decrease or increase respectively in volume and acts as a reservoir for the activating fluid.

14. A fluid propelled pipeline packer for plugging a pipeline at a selected location therein and comprising:

(a) a main body adapted for propulsion through the pipeline;

(b) a brake shoe support assembly on said main body;

(c) a plurality of circumferentially spaced brake shoes capable of gripping the interior wall of the pipeline mounted to said brake shoe support assembly;

(d) means associated with said brake shoe support assembly for urging said brake shoes into gripping engagement with said interior wall of the pipeline, said means including wedging surfaces on said brake shoe support assembly engaged with said brake shoes and relatively movable toward and away from one another to effect outward or inward radial movement of said brake shoes;

(e) said wedging surfaces having plural slopes thereon such that during a first portion of said relative motion of said wedging surfaces toward each other said brake shoes are moved radially outwardly by a selected distance and during a second equal portion of said relative motion said brake shoes are moved radially outwardly into engagement with said interior pipeline wall by substantially less than said selected distance to thus provide a desired mechanical wedging advantage as said shoes come into gripping engagement with the pipeline wall while minimizing the overall amount of relative motion required between said wedging surfaces to provide the total amount of radial motion of the brake shoes.

4,854,385

OIL RECOVERY PROCESS UTILIZING GRAVITATIONAL FORCES

B. George Hurd, Coppell; Lloyd G. Jones, Dallas, and Lloyd K. Strange, Grand Prairie, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 265, Jan. 2, 1987, Pat. No. 4,741,399. This application Apr. 27, 1988, Ser. No. 186,528
The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—273 **61 Claims**

1. A method of recovering oil from an offshore subterranean oil formation having the vertical thickness of at least about 40 feet, comprising an oil column which is a portion of the formation containing the oil, the formation containing at least one injection well and at least one production well spaced-apart from said injection well, comprising the consecutive steps of:

(1) injecting a surfactant slug formulated with sea water into the lower 50 to 75% vertical thickness of the oil column;

(2) injecting a slug of a mobility control polymer formulated with sea water into the upper 50 to 75% portion of the vertical thickness of the oil column;

(3) injecting a slug of a drive fluid formulated with sea water

over substantially the entire vertical thickness of the oil column; and,

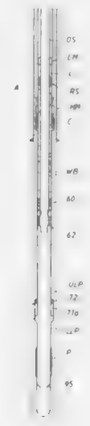
(4) recovering oil from the production well.

4,854,386

METHOD AND APPARATUS FOR STAGE CEMENTING A LINER IN A WELL BORE HAVING A CASING

Samuel F. Baker, Conroe, and Britt O. Braddick, Houston, both of Tex., assignors to Texas Iron Works, Inc., Houston, Tex.

Filed Aug. 1, 1988, Ser. No. 226,898
Int. Cl.[4] E21B *33/14*
U.S. Cl. 166—289 **47 Claims**



1. Apparatus for stage cementing a liner in a well bore having a casing comprising:

a liner;

a running tool including:

a member having a longitudinal bore therethrough;

releasable connecting means for releasably connecting said running tool member to the liner;

inhibiting means to inhibit premature actuation of said releasable connecting means;

retrievable seal means sealing between said running tool member and said liner to accommodate axial movement of said running tool member relative to the liner while avoiding communication between the inside and outside of the liner throughout the length of the liner below said retrievable seal means and above where cement is discharged from the liner into the well bore;

said liner having longitudinally aligned, telescopically arranged upper and lower liner portions with seal means therebetween and port means in each of said portions for communicating the interior of the liner with the well bore; and

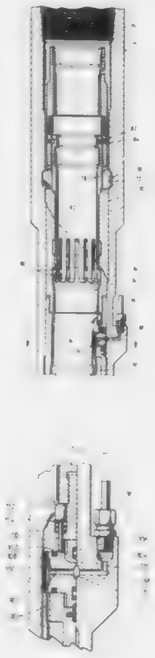
releasable lock means to lock said liner portions against relative longitudinal movement and thereby avoid premature communication through the port means in said upper liner portion, said releasable lock means responsive to relative movement between said liner portions to release for accommodating relative longitudinal movement between said portions whereby the port means in said upper liner portion may communicating with the well bore for discharge of the cement from the liner to the well bore.

4,854,387

LARGE BORE RETRIEVABLE WELL SAFETY VALVE

Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Oct. 11, 1988, Ser. No. 255,818
Int. Cl.[4] E21B *34/10*
U.S. Cl. 166—321 **11 Claims**



1. A retrievable well subsurface safety valve for controlling the fluid flow through a well conduit comprising,

a tubular housing having an axial bore therethrough, said housing including a first means for connecting to the inside of the well conduit,

a valve seat positioned on the bottom of the housing,

an arcuate valve closure member moving between open and closed positions relative to the valve seat for controlling the fluid flow through the bore, said valve closure member pivotally connected to the bottom of the housing,

a longitudinal tubular member telescopically movable in an through the bottom of the housing for controlling the movement of the valve closure member,

hydraulic piston and cylinder means in the housing connected to and actuating the tubular member,

a nose separate from the housing, said nose including a second means for connecting to the inside of the well conduit for setting the nose in the conduit below the bottom of the housing.

4,854,388

FIRE EXTINGUISHING APPARATUS

Donald H. Wyatt, Charleston, Tenn., assignor to American Safety Products, Cleveland, Tenn.

Filed May 28, 1987, Ser. No. 55,171
Int. Cl.[4] A62C *35/12*
U.S. Cl. 169—26 **14 Claims**

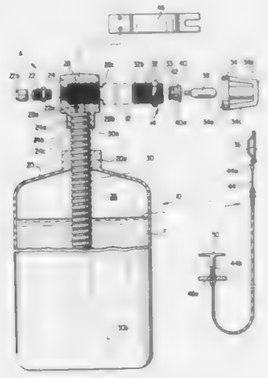
1. A fire extinguishing apparatus, including:

a container forming an interior chamber for storing a fire

extinguishing fluid under pressure and having an opening for providing communication with said chamber;

a discharge head securable in said opening and having means for sealing said discharge head with said container to enable pressurization of said chamber, said discharge head having a flow opening formed therethrough for enabling communication of said chamber through said discharge head, said flow opening having an inlet opening communicating with said interior chamber and an outlet opening disposed externally of said container;

a discharge nozzle assembly operably communicating with



said outlet opening of said discharge head for forming a desired discharge flow stream of a predetermined pattern of the pressurized fluid from said chamber for extinguishing a fire;

said discharge nozzle having a plurality of arms for forming openings therebetween to provide a desired discharge pattern of a discharge stream of gas having entrained droplets; and

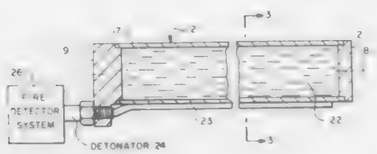
a deflector comprising a closure member operable to seal said outlet opening in a closed position, and operable to deflect said gas and droplets toward said openings in an open position.

4,854,389

LINEAR FIRE EXTINGUISHER

Donald E. Warren, Berkeley, and Maurice E. Tyler, Orinda, both of Calif., assignors to Systron Donner Corp., Concord, Calif.

Filed Apr. 29, 1987, Ser. No. 43,928
Int. Cl.[4] A62C *35/08, 35/12*
U.S. Cl. 169—28 **12 Claims**



1. A linear fire extinguisher for aircraft and other similar applications where a linear uniform distribution of a fire extinguishing agent is necessary along a long linear distance comprising:

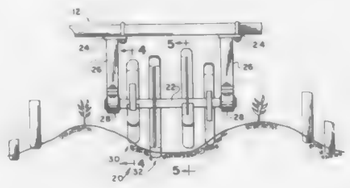
a closed, elongated high strength metal tubular container having an axis along which it is elongated and having its interior volume substantially totally filled with a fire extinguishant and pressurized, means for explosively cutting said container along a line substantially parallel to said axis and extending the length of said container as measured along said axis, said cutting means including a linear shaped explosive charge in substantial contact with said container along substantially all of said line to thereby provide a uniform raidal distribution of extinguishant with a fan-like spreading along the length of said container within a time period of less than ten (10) milliseconds of explosively cutting said container.

4,854,390

SAND FIGHTER FOR BED PLANTING

Sammy L. Stevens, Lamesa, Tex., assignor to Sam Stevens, Inc., Lamesa, Tex.

Filed Mar. 6, 1989, Ser. No. 320,287
Int. Cl.[4] A01B *73/04, 79/00, 39/14, 39/08*
U.S. Cl. 172—1 **17 Claims**



1. The method of fighting sand in a furrowed field having a crop growing upon the top of the beds comprising:

a. forming divots in the furrows and on the side of the beds between the growing crops,

b. said divots on the side of the bed being at least about 6" from the growing crop,

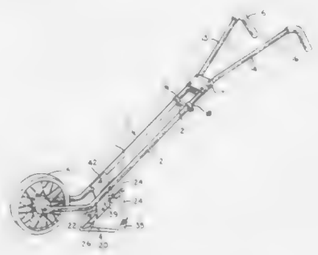
c. said divots being not more than about 2 divots per square foot of the area of the furrow inside of the bed wherein the divots are made, which is approximately 65% of the total area of the field.

4,854,391

HAND PROPELLED SOIL CULTIVATION TOOL

Alan L. Johnson, RR 1, Box 815, Pine River, Minn. 56474

Filed Feb. 29, 1988, Ser. No. 161,719
Int. Cl.[4] A01B *3/02;* **B62B** *1/20*
U.S. Cl. 172—354 **6 Claims**



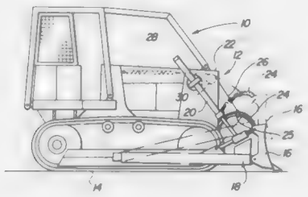
1. A soil cultivator device comprising a frame having a pair of laterally spaced frame members with forward and rearward ends, a gauge wheel rotatably mounted on an axle connected to the forward end of the frame members, rearwardly extending handles carried by the frame, a downwardly projecting implement support secured rigidly to the frame members, said implement support detachably securing an implement shank for an implement attachment, said implement support including rigid side plates, said rigid side plates extending downward on either side of said implement shank to form an implement shank slot to restrict lateral movement of the implement shank, said side plates each having an aperture which accepts an implement retaining pin or bolt, said implement shank pivotally mounted on said retaining pin or bolt, said implement support restraining pivotal movement of said implement shank upon said implement retaining pin or bolt by means of a shank stop which acts upon an edged of said implement shank, said shank stop oriented parallel to the implement shank when said implement shank is secured in said shank slot.

4,854,392

HOSE POSITIONING ASSEMBLY

Claude M. Frisbee, Schofield, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Mar. 28, 1988, Ser. No. 174,256
Int. Cl.[4] B05B *15/06*
U.S. Cl. 172—813 **1 Claim**



1. A hose positioning and tensioning assembly for a vahicle having an engine compartment and a transverse blade supported on the forward end of said vehicle, said blade being movable relative to said vehicle, a plurality of flexible hydraulic fluid lines extending from a lower forward end of said vehicle in an upwardly extending arch to a rearward portion of said blade in a downwardly extending arch, and said hose positioning and tensioning assembly comprising adjustable and flexible tensioning means for holding said plurality of hydraulic fluid lines in an upright position during movement of the blade relative to the vehicle and maintaining tension on said plurality of hydraulic fluid lines during any movement of said blade or changes in the arch formed by said fluid lines;

said hose positioning and tensioning assembly comprises means for holding said plurality of hydraulic fluid lines in a group, connection means connected between a resilient means and said holding means, and means for rotatably supporting said connection means along its length; and

wherein said resilient means and rotatable support means are mounted within said engine compartment and said holding means being connected to said plurality of hydraulic fluid lines at a location between said upwardly extending arch and said downwardly extending arch.

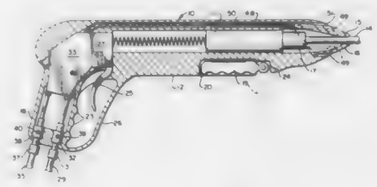
4,854,393

COMBINATION AIR HAMMER, WATER STREAM BLASTER AND LIQUID MIST DUST SUPPRESSOR

Timothy J. Palet, 4100 Highcrest, Irving, Tex. 75062

Filed Dec. 3, 1987, Ser. No. 128,166
Int. Cl.[4] B25D *17/16, 17/20*
U.S. Cl. 173—62 **14 Claims**

1. A combination air hammer, water stream blaster and liquid mist dust suppressor tool comprising: an air hammer powered debris material work headed tool with a body having a forward working end and a rear control end; air misting outlet means at said forward working end of the tool body; high speed water stream outlet means at said forward working end of the tool body; pressured water source connection means and air pressure source connection means at said rear control end of the tool body; air valve control means for valved feeding of air to said air hammer; and water and air control valve containing means in the rear control end of said body connected to said pressure water source connection means and to said air pressure source connection means for feeding said air



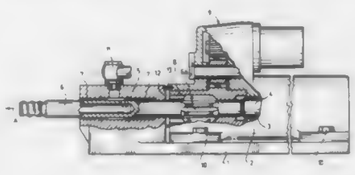
misting outlet means and for feeding pressured water to said high speed water stream outlet means.

4,854,394

ARRANGEMENT FOR SUPPORTING OF A SHANK OF A DRILLING MACHINE

Jarmo Heinonen, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Apr. 27, 1987, Ser. No. 43,162
Claims priority, application Finland, May 9, 1986, 861940
Int. Cl.[4] E21B *6/00*
U.S. Cl. 173—105 **10 Claims**



1. An apparatus for mounting and supporting shank of a drilling machine comprising:

a body;

a carriage adjacent to the body;

a first fastening means attaching the body rigidly to the carriage;

a percussion means mounted in the body; and

a supporting housing portioned by a front portion of the body, wherein the shank, rotatable and axially slidable in the supporting housing, axially extends from the percussion means so as to be axially supported by the supporting housing, and wherein the shank is independently supported by the support housing separate from the support of the body by the first fastening means.

4,854,395

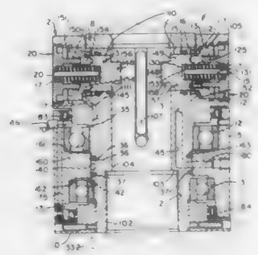
HYDRAULIC KELLY BAR CHUCK

Charles L. Rassieur, St. Louis County, Mo., and Raymond W. Burns, Madison County, Ill., assignors to Central Mine Equipment Company, St. Louis, Mo.

Filed Jun. 16, 1988, Ser. No. 207,392
Int. Cl.[4] E21B *3/04*
U.S. Cl. 173—163 **14 Claims**

1. In a rotary drilling apparatus wherein a rotary table is adapted to be moved axially while rotating, said rotary table including a spindle having an axially directed passage through its center of rotation, a kelly bar extending through said passage, means carried by the rotary table for transmitting positive rotational force from the rotary table to the kelly bar, said kelly bar having axially spaced upper and lower shoulder surfaces defining a plurality of axially spaced channels, elongated plunger means moveable radially with respect to said spindle passage carried by said rotary table, for selectively engaging and disengaging said kelly bar shoulder surfaces, actuating

means for causing said plunger means to engage with and disengage from said shoulder surfaces, a tubular housing held against rotation but to permit axial movement of said housing with said table, the improvement comprising a chuck body connected to said spindle, said chuck body having an axial bore to receive said kelly bar and a radially extending cylinder cavity, in which said plunger means are mounted, said plunger means having a nose on a radially inner end, said nose selectively extending within said kelly bar channels for engaging said kelly bar shoulder surfaces, a cylindrically intermediate



portion and an enlarged annular piston part radially outward of said intermediate portion, said cylinders in said body in which said plungers reciprocate having a configuration complementary to said plunger intermediate portion and said piston part to receive them closely but slidably, said housing having a fluid passage through it communicating with an annular manifold channel, and said body having fluid passages associated with each cylinder communicating at one end with said manifold channel and at another end with said cylinder radially inboard of said piston part.

4,854,396

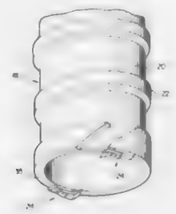
PIVOTING CUTTER FOR ICE CORING AUGER

William E. Burch, Windsor, Vt., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 21, 1988, Ser. No. 287,432

Int. Cl.[4] E21B *10/02, 10/62, 25/14;* **F25C** *5/04*

U.S. Cl. 175—18 **5 Claims**



1. In an ice coring auger for cutting an ice core specimen from a sheet or block of ice, the auger having an auger head defining a hollow auger barrel, the improvement comprising:

cutter means pivotally mounted to the distal end of the auger head for cutting an ice core specimen from the ice as the auger is fed into the ice, the cutter means assuming a first cutting position during feeding of the auger into the ice; and,

actuator means formed on the auger for pivoting the cutter means to a second, inwardly disposed cutting position on discontinuation of feeding of the auger into the ice, the cutter means acting to cut a reduced-in-diameter neck portion in the ice core specimen while in the second cutting position, thereby facilitating breakage of the ice core specimen from the ice at the neck portion of the specimen so formed.

5. A method for cutting and retrieving an ice core specimen from a sheet or block of ice having an ice coring auger having cutter elements capable of pivoting movement from an outward disposed cutting position to an inwardly disposed cutting position relative to the head of the auger, the auger head defining a hollow barrel portion comprising the steps of:

feeding the auger into the ice to cut an ice core specimen, the reaction forces caused by the ice on feeding of the auger into the ice causing the cutter elements to be pivoted outwardly to a position whereby the specimen is cut into a substantially cylindrical cone which is received into the barrel portion of the auger head as cutting occurs;

discontinuing feed of the auger into the ice while continuing rotation of the auger head;

pivoting the cutter elements inwardly of the auger head and cutting a reduced-in-diameter neck portion of the ice core specimen on assumption of inwardly disposed positions of the cutter elements;

canting the auger head to break off the ice core specimen at the neck portion of the specimen; and,

maintaining the ice core specimen within the barrel portion of the auger head on retrieval of the auger from the ice, the inwardly disposed locations of the cutter elements acting to hold the ice core specimen within the barrel portion of the auger.

4,854,397

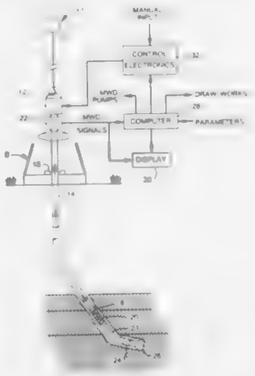
SYSTEM FOR DIRECTIONAL DRILLING AND RELATED METHOD OF USE

Tommy M. Warren, Coweta, and Warren J. Winters, Tulsa, both of Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Sep. 15, 1988, Ser. No. 244,770

Int. Cl.[4] E21B *7/04, 44/00, 47/022*

U.S. Cl. 175—26 **4 Claims**



1. A method of controlling the path of a drillstring during directional drilling operations that utilizes downhole data collection and transmission means and drill bit rotation means connected adjacent a drill bit on a lower end of the drillstring, and with drillstring rotation means connected adjacent an upper end of the drillstring, the method comprises:

(a) inputting permitted limits of variance from a preselected drillstring azimuthal direction into memory means associated with a programmable digital computer;

(b) controlling the drillstring rotation means to maintain a fixed desired drillstring azimuthal orientation, and while drilling the wellbore utilizing the drill bit rotation means, transmitting a value of the downhole drillstring azimuthal direction to memory means associated with the programmable digital computer;

(c) if the transmitted value of step (b) is outside of the permitted limits, calculating within the programmable digital computer the required direction and degrees of rotation of the drillstring required to bring the transmitted value within the permitted limits; and

(d) utilizing the programmable digital computer to momentarily activate the drillstring rotation means to incrementally rotate the drillstring in accordance with step (c).

3. An automatic directional drilling system for use in drilling operations utilizing a downhole data collection and transmission means and drill bit rotation means connected adjacent a drill bit on a lower end of a drillstring, and with hydraulic drillstring rotation means connected adjacent the upper end of the drillstring, the system comprises:

means associated with a programmable digital computer for storing permitted limits of variance from a selected drillstring azimuthal direction and comparing received values of the downhole drillstring azimuthal direction;

means associated with the programmable digital computer for calculating any required direction and degrees of rotation of the drillstring required to bring the received values within the permitted limits; and

means associated with the programmable digital computer for controlling hydraulic servocontrol valve means associated with the drillstring rotation means to effectuate the calculated direction and incremental degrees of rotation of the drillstring.

4,854,398

LOCATING DEVICES FOR SOIL DISPLACEMENT HAMMERS

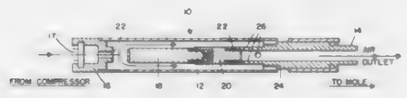
David E. Holloway, Wern House, Mount Street, Goweton, West Glamorgan, United Kingdom

Filed Apr. 4, 1988, Ser. No. 176,935

Claims priority, application United Kingdom, Mar. 2, 1987, 8707936; Nov. 20, 1987, 8727218

Int. Cl.[4] E21B *47/024*

U.S. Cl. 175—45 **20 Claims**



1. A locating device for a soil displacement hammer for boring through an earth formation in a manner substantially parallel to the surface of the earth formation, comprising:

(a) a substantially axially symmetrical, substantially radio wave transparent housing adapted to be fitted between an air line for said hammer and said hammer itself so as to permit air communication through said housing; and

(b) a substantially axially symmetrical radio transmitter mounted in said housing substantially along the axis thereof for transmitting radio signals which are used to locate the location of said soil displacement hammer in said earth formation.

4,854,399

TUBULAR ELEMENT FOR USE IN A ROTARY DRILLING ASSEMBLY

Djurre H. Zijsling, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 6, 1988, Ser. No. 141,173

Claims priority, application United Kingdom, Apr. 16, 1987, 8709279

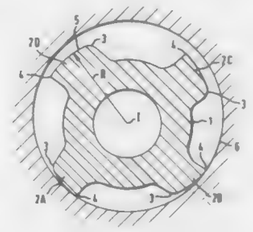
Int. Cl.[4] E21B *7/04, 17/22*

U.S. Cl. 175—61 **19 Claims**

1. A selectively rotatable tubular element for use in a rotary drilling assembly, the element comprising an outer surface which faces the borehole wall during drilling, said surface having a ratchetted profile in a plane cross-axial to a longitudinal axis of the element, said ratcheted profile presenting a leading edge and a following edge in relation to the normal rotation of the tubular element in which the leading edge is substantially smooth and gradually increases in protrusion from the outer surface in the direction from said leading edge to said following edge.

19. A continuous bit steering method comprising:

providing a selectively rotatable tubular element in a drill string such that an outer surface thereof presents a ratchetted profile to the borehole wall with a smooth leading



edge and a sharp following edge with respect to the driving rotation of the drill string;

orienting a directional downhole motor mounted on the end of the drill string adjacent the tubular element by rotating the drill string in the direction of the smooth leading edge of the ratchetted profile of the tubular member; and

drilling in an orienting mode by not rotating the drill string and engaging the directional downhole motor, transferring the reactive torque fluctuations to the borehole wall by engagement of the sharp following edge of the ratchetted profile of the tubular element to the borehole wall.

4,854,400

WELL DRILLING

Brian K. Simpson, Bristol, Great Britain, assignor to DRG (UK) Limited, United Kingdom

Filed Dec. 14, 1987, Ser. No. 132,562

Claims priority, application United Kingdom, Dec. 17, 1986, 8630096

Int. Cl.[4] E21B *19/14*

U.S. Cl. 175—85 **15 Claims**

1. Apparatus for handling elongate tubular elements that are to be assembled together on a drilling axis for use in a well-forming operation, comprising drilling rig means from which said tubular elements are suspended on a drilling axis, transfer means for transferring successive tubular elements from a generally horizontal position to a generally upright position for the tubular elements to be secured together on the drilling axis, the transfer means comprising an elongate arm, a basal support for said arm, first and second pivot mounting means between said arm and said basal support for movement of the arm on said first pivot mounting means between said generally horizontal and upright positions, and for movement of the arm on said second pivot mounting means about an upwardly extending axis, clamping means carried by said arm for holding an individual tubular element, displacement means between the clamping means and the elongate arm for displacing the clamping means toward and away from a longitudinal axis of the arm, whereby, when the arm is in a horizontal position, its clamping means are extendable downwards to engage the tubular element and, when the arm is in an upright position and rotated to put the tubular element facing the drilling axis, the clamping means are extendable to advance the upright tubular element to the drilling axis for connection to a further tubular element on said axis.

4,854,401

DRILL BIT DIRECT DRIVE FOR DEEP WELL DRILLING TOOLS

Volker Kruger, Celle, and Heinrich Daenicke, Wienhausen, both of Fed. Rep. of Germany, assignors to Eastman Christensen Company, Salt Lake City, Utah

Filed Mar. 24, 1988, Ser. No. 172,590

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1987, 37098403

Int. Cl.[4] E21B *4/02;* F16C *27/08*

U.S. Cl. 175—107 19 Claims



1. Drill bit direct drive for deep well drilling tools with a tubular casing, a rotary machine that can be driven by oil well fluid flowing through it and is mounted inside the casing, a radially mounted shaft joined to this rotary machine and to a rotary drill bit and with at least one friction bearing that is exposed to the oil well fluid and is provided for axial mounting of the shaft and includes at least one trace ring supported on the shaft plus at least one bearing ring supported on the casing so it interacts with one trace ring and has a number of bearing segments distributed regularly around its periphery and including a bearing body supported with respect to the bearing ring so it can be tilted and shifted axially to a limited extent against the action of a restoring force, characterized by the fact that each bearing segment includes a support part mounted in an axial bore of the bearing ring and a slender axial straight compression spring rod supporting the supporting part in the middle on the rear and in turn arranged in an axial bore of the bearing ring which has a reduced diameter than that within which said support part is mounted and secured against buckling in the axial bore and supported with its end that faces away from the support part on an abutment.

4,854,402

SHAFT SINKING RIG

Giovanni Mazzalupi, Edenvale, and Bruno Onofri, Kempton Park, both of South Africa, assignors to Delfos & Atlas Copco Limited, Transvaal, South Africa

Filed Jun. 12, 1987, Ser. No. 61,300

Claims priority, application South Africa, Jun. 12, 1986, 86/4393

Int. Cl.[4] E21B *7/02*

U.S. Cl. 175—171 8 Claims

1. A shaft drilling rig comprising

(a) a rig head having means whereby it may be attached to a cable so as to be raised and lowered within a shaft being sunk;

(b) a central column depending from the rig head;

(c) a base member at the lower end of the column;

(d) a rig support comprising:

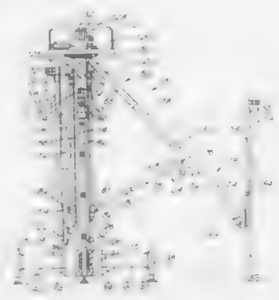
(d)(i) retractable arms, each having an inner and an outer end, the said inner ends being pivottally carried on the said base member to move from a retracted storage position to an extended operative carrying position; and

(d)(ii) rig supporting feet carried respectively by the said outer ends of the said retractable arms;

(e) a plurality of booms, each boom having an upper end and an outer end, each said boom

(e)(i) being carried at its upper end by the central column near the rig head to pivot relative to the column, and

(e)(ii) having an extendable section located between the said upper and outer ends and being arranged to extend the length thereof;



(f) a feed holder carried at the outer end of each boom, the feed holder having means to support a beam to carry a rock drill; and

(g) a plurality of support members respectively associated with the booms, each such support member having an upper and and a lower end, each such support member

(g)(i) being carried at its lower end by the central column near the base member to pivot relative to the column and

(h)(ii) at its upper end pivotally engaging its associated boom at a pivot location between said extendable section and the said outer end of the boom.

4,854,403

STABILIZER FOR DEEP WELL DRILLING TOOLS

Alfred Ostertag, and Hans Schillinger, both of Celle, Fed. Rep. of Germany, assignors to Eastman Christensen Company, Salt Lake City, Utah

Filed Apr. 8, 1988, Ser. No. 179,273

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1987, 3711909

Int. Cl.[4] E21B *7/00, 17/10*

U.S. Cl. 175—325 18 Claims

1. A stabilizer for deep well drilling tools, comprising:

a tubular outer casing insertable into a drilling shaft and defining a plurality of slit openings distributed around its periphery;

a tubular adjusting mandrel supported in the casing in axially movable relation with the casing in response to well fluid pressure applied to the well;

a separate elongated ribbed body movably fitted in each slit opening, said ribbed body having a rear wedge face facing opposite to said relative motion of said mandrel;

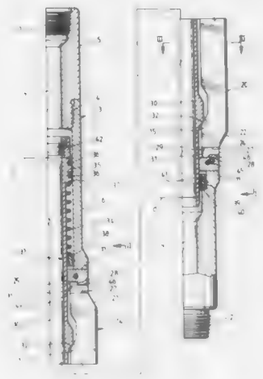
said mandrel having a separate mating wedge face for the rear wedge of each said ribbed body;

each said ribbed body capable of outward movement in its respective slit opening in response to contact between said mating wedges upon said axial movement of said mandrel relative to said casing responsive to said fluid pressure;

each said ribbed body and its respective slit opening configured to define gaps between the longitudinal sides thereof;

an axially projecting guide projection at each end of said ribbed body terminating in a reduced dimension at its end and having parallel side guide faces; and,

a separate securing piece for each guide projection adapted



to be inserted through a slit from outside the casing and configured to reach over its respective guide projection and to fit between its guide projection and the casing to hold its guide projection in the casing.

4,854,404

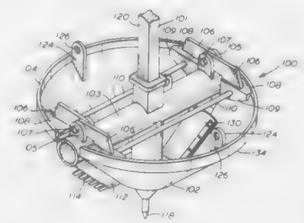
BUCKET AUGER

David R. Weber, and Russell L. Weber, both of 10822 Sageyork, Houston, Tex. 77089

Filed Dec. 5, 1988, Ser. No. 279,764

Int. Cl.[4] E21B *10/40;* A01B *33/06*

U.S. Cl. 175—327 17 Claims



1. A bucket auger useful for preparing excavations for planting trees, comprising in combination:

(a) a cutting frame having cutting edges on either side and bottom;

(b) a vertical shaft disposed through and secured to said frame, the upper end of said shaft being adapted for attachment to a rotational drive mechanism for rotating said shaft and said frame; and

(c) bucket members disposed on either side of said frame to collect the earth excavated as said bucket auger is rotated.

4,854,405

CUTTING TOOLS

Donald S. Stroud, Houston, Tex., assignor to American National Carbide Company, Tomball, Tex.

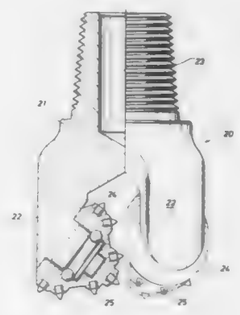
Filed Jan. 4, 1988, Ser. No. 140,539

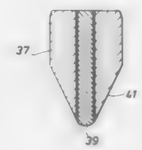
Int. Cl.[4] F21B *10/52*

U.S. Cl. 175—374 3 Claims

1. In a drill bit having at least one roller with hard metal inserts having inner ends installed within and outer ends extending from holes about the roller, each said insert comprising inner and outer bodies having particles of carbide or other highly abrasive material separately sintered in a binder of cobalt or other less abrasive, but tougher metal, and being joined to one another with the outer body surrounding the inner body,

said bodies having wear surfaces on their outer tends which





are contoured to define a tip on the outer end of the inner body; and

the particle size and/or chemical composition of the bodies being such that the inner body is harder, but less tough, than the outer body, whereby the general contour of their wear surfaces in maintained during use.

4,854,406

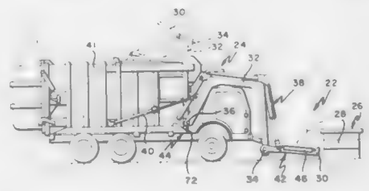
WEIGHING SYSTEM

Gregory H. Appleton, Gardner, and Paul D. Mikelk, Berlin, both of Mass., assignors to Breakthru Industries, Inc., Clinton, Mass.

Continuation-in-part of Ser. No. 50,321, May 14, 1987, Pat. No. 4,771,837, which is a continuation-in-part of Ser. No. 922,064, Oct. 20, 1986, Pat. No. 4,714,122. This application Jul. 18, 1988, Ser. No. 220,794

Int. Cl.[4] G01G *19/08, 19/10*

U.S. Cl. 177—139 29 Claims



1. Weighing system for a refuse truck having a refuse receptacle which has an inlet opening and lifting means for engaging a refuse container which contains refuse and which has a top opening, said container being moved by said lifting means through a dumping cycle which comprises lifting the full refuse container from a resting position to an inverted position

above said inlet opening to permit said refuse to fall through said inlet opening into said refuse receptacle, and lowering the empty refuse container to said resting position, said weighing system comprising:

(a) circuitry for said weighing system and a source of electrical power for energizing the circuitry of said weighing system,

(b) a transducer which is operatively connected to said lifting means for sensing the weight of the refuse container when the container is engaged by the lifting means, said transducer being effective for generating primary electrical analog signals which vary in intensity in accordance with the variation in intensity of the force which is exerted by said lifting mechanism,

(c) a position indicator for sensing the position of the container relative to the refuse truck and for providing a secondary digital signal when the container reaches a predetermined position relative to the refuse truck,

(d) electrical digitizing means for converting said primary analog signal to a primary digital signal, and

(e) a programmed central processing unit which is operatively connected to said electrical digitizing means and said position indicator for receiving said primary and secondary digital signals and for calculating the weight of the full refuse container based on the value of said primary digital signal when said secondary digital signal is received during the lifting portion of said dumping cycle, for calculating the weight of the empty refuse container based on the value of said primary digital signal when said secondary digital signal is received during the lowering portion of said dumping cycle, and for calculating the weight of refuse in said container by subtracting the weight of said empty refuse container from the weight of said full refuse container.

4,854,407

SYSTEM FOR MEASURING AIR PRESSURE ON DRIVE AXLES OF ROAD TRACTOR TRAILERS AND LOAD DISTRIBUTION

William C. Wagner, 2622A Lafayette, St. Louis, Mo. 63104

Filed Aug. 30, 1988, Ser. No. 238,765

Int. Cl.[4] G01G *19/10*; B62D *53/00*

U.S. Cl. 177—141 **16 Claims**





1. A system for adjusting the load distribution on a vehicle provided with an air bag employed during operation of the vehicle to cushion the load upon an axle of the vehicle, said system comprising a calibration pressure gauge having an air pressure gauge in communication through an air line to sense air pressure in said air bag responsive to a load placed upon said vehicle by said load, said calibration pressure gauge having an air pressure indicating dial for reading air pressure thereon from an air pressure indicating needle, a load indicating dial for the axle provided with said air bag and a load indicating dial for another axle of said vehicle spaced on an opposite side of said load from said first named axle provided with said air bag.

4,854,408

OBSTACLE SURMOUNTING AID FOR TRACKED VEHICLE

David R. Beard; Peter J. Gibson, and Christopher B. Hinchey, all of Surrey, England, assignors to The Secretary of State for Defence in her Majesty's Government of the United Kingdom of Great Britian and Northern Ireland, London, England

PCT No. PCT/GB86/00664, § 371 Date Aug. 7, 1987, § 102(e) Date Aug. 7, 1987, PCT Pub. No. WO87/02634, PCT Pub. Date May 7, 1987

PCT Filed Oct. 27, 1986, Ser. No. 91,066

Claims priority, application United Kingdom, Oct. 29, 1985, [redacted]

Int. Cl.[4] B62D *55/06*

U.S. Cl. 180—9.32 **8 Claims**



1. A tracked vehicle comprising

two independently drivable parallel tracks each having a track base;

a chassis supported on the parallel tracks;

an obstacle surmounting aid comprised by at least one rearwardly extendable ram slidable in a cylinder mounted above the chassis; and

a pneumatic energising means for thrusting the ram rearwards of the cylinder when the vehicle is in motion.

4,854,409

LIFT AXLE CONTROL SYSTEM

Robert D. Hillebrand, Grand Rapids, and Charles W. Wilson, Muskegon, both of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Nov. 19, 1987, Ser. No. 122,399

Int. Cl.[4] B62D *61/12*

U.S. Cl. 180—24.02 **23 Claims**

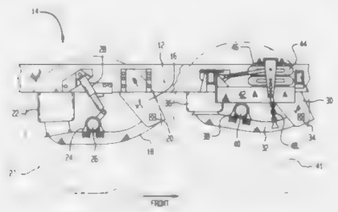
1. In a control system for a lift axle in a two-axle suspension for wheeled vehicles wherein:

first and second axles are connected in tandem to a vehicle frame through first and second suspensions, respectively;

said second suspension having means to mount said second axle for movement between a raised position and a lowered position, and actuation means for moving said second axle between said raised and lowered positions;

said second axle having wheels for supporting engagement with the ground when the second axle is in the lowered position and said wheels being out of contact with the ground when said second axle is in a raised position;

control means having a means to detect a load on the first axle and for automatically raising said second axle to said raised position when the load on the first axle is below a first predetermined value, and a means for automatically lowering said second axle to said lower position when the load on said first axle is above a second predetermined value which is greater than the first predetermined value, and means to delay the operation of said actuation means



to lower said second axle upon detection of a load on said first axle to compensate for road bumps;

the improvement which comprises:

said load-detecting means comprising electrical sensing means and said control means comprising electrical circuit means to control said activation means responsive to a signal from said electrical sensing means.

4,854,410

METHOD OF INCORPORATING FOUR-WHEEL STEERING SYSTEM IN VEHICLE AND FOUR-WHEEL STEERING SYSTEM

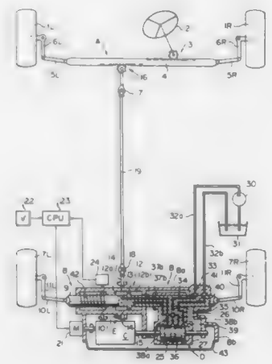
Hirotaka Kanazawa; Koushun Note; Yasuhiro Nakashima; Yoshiaki Mukai; Shunji Sakamoto, and Shigeo Okamizu, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 22, 1988, Ser. No. 158,921

Claims priority, application Japan, Feb. 20, 1987, 62-37355; Feb. 23, 1987, 62-39769; Feb. 19, 1988, 63-37006

Int. Cl.[4] B62D *9/00*

U.S. Cl. 180—140 **31 Claims**



1. A method of incorporating in a vehicle a four-wheel steering system having a front wheel turning mechanism for turning front wheels in response to operation of a steering wheel, a rear wheel turning mechanism for turning rear wheels, a control means for controlling the rear wheel turning mechanism to turn the rear wheels according to preset four-wheel steering characteristics and a connecting means which is connected to the control means to transmit front wheel turning information to the control means, thereby operatively connecting the front wheel turning mechanism with the rear wheel turning mechanism, comprising

the steps of causing the front wheel turning mechanism and the rear wheel turning mechanism to bring the front wheels and the rear wheels to respective reference positions while the connecting means is operatively disconnected from the control means, bringing the control means into a reference state, and connecting the connecting means to the control means, the reference position of the front wheels and the reference position of the rear wheels corresponding to each other on the basis of the preset four-wheel steering characteristics, the reference state of the control means being a state corresponding to the reference positions of the front and rear wheels on the basis of the preset four-wheel steering characteristics.

4,854,411

DEVICE FOR DETERMINING WHETHER A MOTOR VEHICLE IS ON AN UPHILL ROAD UPON STARTING OF THE VEHICLE

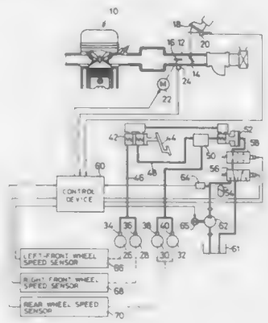
Kiyotaka Ise, Susono; Sinichi Matsumoto, and Hiroharu Miyazaki, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 8, 1988, Ser. No. 165,291

Claims priority, application Japan, Mar. 10, 1987, 62-55080

Int. Cl.[4] B60K *28/16*

U.S. Cl. 180—197 **5 Claims**



1. A device for determining whether a motor vehicle is on an uphill road upon starting of the vehicle, comprising:

vehicle-speed detecting means for detecting a running speed of the vehicle;

timing detecting means for detecting a specific point of time during a starting acceleration period of the vehicle in which the vehicle is continuously accelerated after the starting thereof; and

judging means for comparing the running speed of the vehicle detected by said vehicle-speed detecting means, with a predetermined threshold value, when said timing detecting means detects said specific point of time, and determining that the vehicle is on the uphill road, if said detected running speed is lower than said predetermined threshold value.

4,854,412

FORK STABILIZER FOR MOTORCYCLE

Kelly Tidwell, 5842 McFaddea, Suite O, Huntington Beach, Calif. 92647

Continuation-in-part of Ser. No. 58,170, Jun. 4, 1987, Pat. No. 4,742,885. This application Mar. 2, 1988, Ser. No. 163,267

Int. Cl.[4] B62K *99/24*

U.S. Cl. 180—219 **10 Claims**

1. A fork stabilizer for the front-end fork assembly of a motorcycle of the type having brackets connected adjacent to the upper ends of the bottom case prongs of the fork assembly,

each bracket having a substantially flat upper face substantially parallel to the corresponding upper face of the other bracket and substantially a flat transverse face substantially parallel to the corresponding transverse face of the other bracket, said transverse face extending at an angle of approximately 90° relative to said substantially flat upper face; each bracket also having two bracket mounting holes through each upper face thereof collectively arranged in a predetermined pattern, said fork stabilizer comprising;

an elongate member comprised of unitary metallic material having a substantially solid cross-sectional area, said elongate member having first and second substantially coplanar mounting surfaces adjacent each end thereof, each mounting surface for positioning flat against said upper faces of said fork brackets, said elongate member having a pair of stabilizer mounting holes therethrough adjacent each end thereof and passing through a respective mounting surface, said elongate member also having third and fourth substantially coplanar mounting surfaces, said third and fourth surfaces extending at an angle of approximately



90° relative to said first and second mounting surfaces, respectively, said stabilizer mounting holes being arranged in said predetermined pattern and having a diameter to provide a snug fit with mounting bolts for passing therethrough into the brackets of the fork assembly, said elongate member having first and second ends accurately proportioned and spaced to fit closely between and partially capture the upper ends of the bottom case prongs of the front-end fork assembly of the motorcycle,

whereby the bottom case prongs are maintained substantially parallel during braking, turning and other disturbing influences by the rigidity of the fork stabilizer in torsion, the entrapment of the upper ends of the prongs of the bottom cases by the fork stabilizer, the resistance to independent flexing of the bottom case prongs provided by the first, second, third and fourth mounting surfaces, and by the fastening of the fork stabilizer to the brackets with bolts which prevent slippage with respect thereto to prevent the upper ends of the bottom case prongs from at least partially slipping out of the fork stabilizer ends.

4,854,413

TRANSFER CASE SHIFTING APPARATUS FOR PART-TIME FOUR-WHEEL DRIVE VEHICLE

Osamu Kameda, and Shigeo Tabata, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 27, 1988, Ser. No. 186,995

Claims priority, application Japan, Apr. 27, 1987, 62-103653

Int. Cl.[4] B60K *17/34*

U.S. Cl. 180—247 **14 Claims**

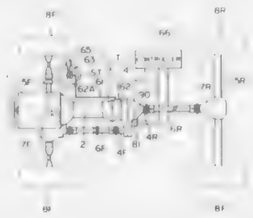
1. A transfer case operating apparatus for shifting a drive mode of operation of a transfer case used in a four-wheel drive vehicle, said transfer case having a transfer gear assembly shiftable between a high-speed and a low-speed drive gear assembly shiftable between a high-speed and a low-speed drive mode of operation and a center-differential gear assembly shiftable between at least two drive modes of operations, said apparatus comprising:

first shift means for shifting said transfer gear assembly between said high and low speed drive modes of operation;

second shift means for shifting said center-differential gear assembly between said at least two drive modes of operation;

drive mode selecting means operated by a driver in a driver's compartment of said vehicle for selecting a desired drive mode of operation of said transfer case; and

shift control means operationally connected to and placed in different positions by said drive mode selecting means for



selecting one shift means of said first and second shift means through mechanically actuating means directly connected therewith and selecting the other shift means of said first and second shift means through electric actuating means to shift said transfer case into a desired drive mode of operation selected through said drive mode selecting means, said mechanical actuating means being able to operationally disconnect said shift control means and said one shift means when said shift control means selects said other shift means.

4,854,414

ELECTRIC CONTROL APPARATUS FOR TRANSFER DEVICE IN PART-TIME FOUR-WHEEL DRIVE VEHICLE

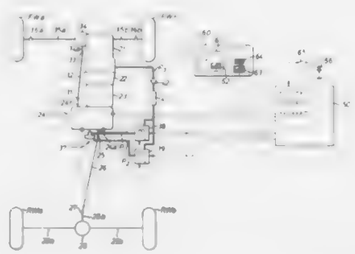
Toshikazu Koide; Shuichiro Ida; Toshio Yoshinaka; Shuji Nagano, and Shoji Haga, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 29, 1987, Ser. No. 78,990

Claims priority, application Japan, Jul. 29, 1986, 61-116141[U]; Jul. 29, 1986, 61-116142[U]; Jul. 29, 1986, 61-116143[U]

Int. Cl.[4] B60K *17/34*

U.S. Cl. 180—249 **6 Claims**



1. An electric control apparatus for a part-time four-wheel drive vehicle having a transfer device united with a power transmission and including an input shaft driven by the transmission, a first output shaft drivingly connected to the input shaft for continuously driving a first set of road wheels through a first propeller shaft, a second output shaft connectable to the input shaft and drivingly connected to a second set of road wheels through a second propeller shaft, and a clutch mechanism shiftable between a first position where it is disengaged to disconnect the second output shaft from the input shaft thereby to provide a two-wheel drive mode and a second position where it is engaged to connect the second output shaft to the input shaft thereby to provide a four-wheel drive mode, the electric control apparatus comprising:

a manual operation switch of the momentary contact type for selecting the two-wheel drive mode or the four-wheel drive mode at said transfer device;

switchover means arranged to be activated in response to operation of said operation switch for switching over said clutch mechanism from the first position to the second position;

first detecting means for detecting rotational speed of said first propeller shaft to produce a first speed signal indicative of the rotational speed of said first propeller shaft;

second detecting means for detecting rotational speed of said second propeller shaft to produce a second speed signal indicative of the rotational speed of said second propeller shaft;

third detecting means for detecting the position of said clutch mechanism to produce a position signal indicative of the position of said clutch mechanism; and

control means responsive to operation of said operation switch, said speed signals and said position signal for permitting activation of said switchover means only when said operation switch is operated in a condition where said clutch mechanism is in the first position and where the rotational speed of said first propeller shaft is lower than a predetermined speed or in a condition where said clutch mechanism is in the first position and where the rotational speed of said second propeller shaft is substantially equal to the rotational speed of said first propeller shaft and for prohibiting activation of said switchover means in a condition where the rotational speed of said first propeller shaft is higher than the predetermined speed and where the rotational speed of said second propeller shaft is lower than the rotational speed of said first propeller shaft.

4,854,415

HEARING AID WHOSE COMPONENTS ARE MOUNTED IN A HEARING AID HOUSING

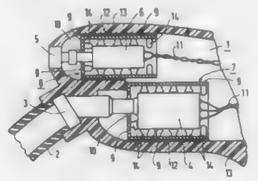
Bernd Goschke, Hannberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 3, 1988, Ser. No. 163,554

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1987, 8704315[U]

Int. Cl.[4] H04R *25/02*

U.S. Cl. 181—130 **7 Claims**



1. A hearing aid and said inwardly projecting sound absorbing material serving to accomodate various sized component parts in a hearing aid housing, comprising at least one part of the component parts being releasably held in an interior portion of the mounts, said mounts being fashioned as box-shaped, each having five rigid interconnecting walls and a remaining, uncovered side serving as an opening for an insertion of the component parts, an inside of each wall of said mounts having an inwardly projecting pillow of elastic, sound absorbing material that is rigidly connected to the mounts constituted by component parts held by mounts.

4,854,416

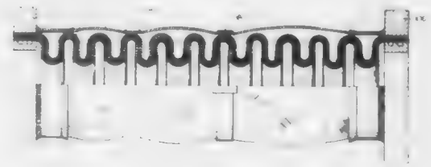
TUNED SELF-DAMPING CONVOLUTED CONDUIT

James M. Lalikos, Springfield, and Harold K. Waite, East Longmeadow, both of Mass., assignors to Titeflex Corporation, Springfield, Mass.

Continuation-in-part of Ser. No. 873,836, Jun. 9, 1986, which is a continuation-in-part of Ser. No. 828,279, Feb. 11, 1986. This application Jul. 11, 1986, Ser. No. 884,312

Int. Cl.[4] F16F *15/00*

U.S. Cl. 181—207 **39 Claims**



1. A tuned conduit for use in an automotive exhaust system, said conduit being tuned to greatly reduce vibration therein at specific frequencies which occur during operation of an automotive vehicle having said exhaust system, said conduit comprising at least one coaxial layer forming a conduit wall for carrying said exhaust, a stocking made of a flexible material loosely surrounding and in contact with the conduit, said stocking extending along a length of the conduit, and at least one tuning band surrounding said stocking for securing it to said conduit at a selected location, said selected location being where a loop naturally forms as a result of vibrations in said system at said specific frequencies.

4,854,417

EXHAUST MUFFLER FOR AN INTERNAL COMBUSTION ENGINE

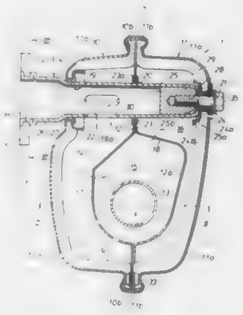
Naomoto Uesugi; Hideo Takahashi, and Tetsuro Ikeno, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 225,061

Claims priority, application Japan, Aug. 3, 1987, 62-194213; Feb. 16, 1988, 63-019005[U]; Feb. 16, 1988, 63-19006[U]

Int. Cl.[4] F01N *1/10*

U.S. Cl. 181—272 **9 Claims**



1. An exhaust muffler for an internal combustion engine, comprising:

a casing defining a hollow space in an interior thereof;

an exhaust inlet tube having a first end adapted to be fixedly attached to an exhaust port of an internal combustion engine and a second end fitted into the interior of the casing from a hole provided in a wall of the casing;

an exhaust outlet passage associated with said hollow space

and communicating the interior of the casing with the atmosphere;

the second end of the exhaust inlet tube being provided with first thread means which cooperates with second thread means provided externally of the casing so as to pull the exhaust inlet tube into the casing, and an intermediate part of the exhaust inlet tube being provided with an annular should surface which is adapted to fit the exhaust inlet tube into the hole in a substantially air tight fashion.

4,854,418

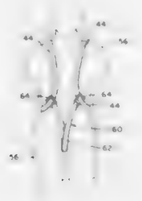
SAFETY HARNESS

Gary M. Hengstenberger, 948 Impala Dr., Akron, Ohio 44319, and John I. Montavon, 1000 Jean Ave., Akron, Ohio 44310

Continuation-in-part of Ser. No. 832,326, Feb. 24, 1986, Pat. No. 4,682,671. This application Jun. 4, 1987, Ser. No. 58,124

Int. Cl.[4] A65B *35/00*

U.S. Cl. 182—3 **1 Claim**



1. A safety apparatus, comprising:

a continuous loop of material connected to itself at a point to define a first larger loop and a second smaller loop;

a jacket having an outer shell and an inner liner said larger loop passing within said jacket between liner around a back portion of said jacket and said smaller loop extending out from said jacket and being maintained at a neck portion thereof, said larger loop passing from said back portion of said jacket to a front portion of said jacket below a point where arms extend from said jacket, said larger loop thence returning to said neck portion of said jacket; and

a lifting strap having the ends thereof slidably looped over a part of said larger loop disposed at said back portion of said jacket, and for having said ends slidably fastened by connection means over said larger loop disposed at sides of said jacket after said strap passes between a wearer's legs.

4,854,419

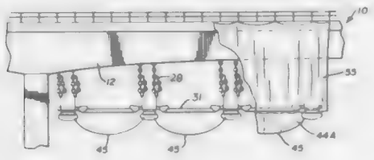
PARTICULATE CONTAINMENT CONTROL METHOD AND PLATFORM DEVICE

Louis G. Lyras, 2220 Stewart Rd., and Gus G. Lyras, 676 S. Hubbard Rd., both of Lowellville, Ohio 44436

Filed Dec. 19, 1988, Ser. No. 286,266

Int. Cl.[4] E04G *21/30*

U.S. Cl. 182—129 **6 Claims**



1. A method of establishing a self-contained mobile containment area under an existing structure for the capture and removal of spend sandblast abrasive and intrained contaminate within, the method comprising defining an enclosed space beneath and connected to the structrue using the existing structure support elements to define at least one portion of said enclosed space, establishing a support and containment interlocking platform grid supported by multiple pairs of spaced cable hook assemblies from said structure, sealing said enclosed space between said interlocking platform grid and said structure support, removing the spent sandblast abrasive and entrained contaminate from said enclosed space.

4,854,420

SECURING MEANS FOR A DOUBLE STEP LADDER

Yuan C. Juang, No. 106-1, Chungshan Rd., Wu Jih Hsiang, Taichung Hsien, Taiwan

Filed Nov. 15, 1988, Ser. No. 271,535

Int. Cl.[4] E04C *1/30*

U.S. Cl. 182—166 **3 Claims**



1. A securing means for a double step ladder comprising a U-shaped element to encompass a first leg of said step ladder, a coupling element to be interposed between said first and a second legs of said ladder, a flap, a retaining rod, and a cap to engage with said retaining rod, wherein

said U-shaped element has a plurality of holes to receive respective securing pins which insert through said ladder to secure said U-shaped element and ladder together; openings are provided on lateral ends of two lateral walls of said U-shaped element to receive said retaining rod;

said coupling element comprises a main part and two side parts extending from said main part; a stop means is provided on upper and lower rims of said side parts to clamp said lateral walls to secure said coupling element thereon without sliding movement;

said flap is pivotedly provided on one of said lateral walls; a slot is provided on said flap to receive said retaining rod;

said retaining rod has two horizontally protruding plates thereon, a respective hole is provided on said horizontally protruding plates to receive a cylindrical pivot piece; said retaining rod has a threaded rod which is engaged with said cap from the outside of said U-shaped element to retain said first and second legs within said securing means; and

said pivot piece lodged between said protruding plates has an eccentric protrusion provided on upper and lower surfaces thereof and a cavity provided on a cylindrical surface thereof to receive a pivot rod for rotating said pivot piece urging against said U-shaped element.

4,854,421

SYSTEM FOR LIFTING A VEHICLE FOR REPAIR THEREOF

Hiroyuki Kawada, Hekinan, Japan, assignor to Sugiyasu Industries Co., Ltd., Japan

Filed Feb. 9, 1988, Ser. No. 153,730

Claims priority, application Japan, Feb. 10, 1987, 62-18152

Int. Cl.[4] B60S *13/00*

U.S. Cl. 187—8.71 **3 Claims**

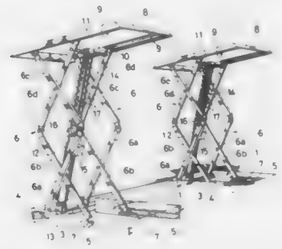
1. A system for lifting a vehicle for repair thereof, compris-

ing (A) a pair of parallel pits made in a floor; (B) a passage within the floor extending perpendicular to the pits and connecting the pits with each other; (C) a pair of spaced-apart parallel scissor jacks, each jack being supported in one of the pits and including

(i) a pair of spaced-apart, parallel, vertically-extensible scissor constructions which ae supported within one of the pits and are retractable or foldable into their respective pit,

(ii) a vehicle support means supported on said scissor constructions, and

(iii) an actuating means for extending or retracting said scissor constructions, each said scissor constructions having (a) first and second lower ends located in the pit and (b) first and second upper ends which support said vehicle support means; (D) an elongate member for connecting together the first lower ends of the scissor constructions of both of said scissor jacks, said elongate member extending through the entire length of the passage and projecting into both of said pits, each portion of the elongate member extending into the pits being fixed to the first lower ends of said scissor constructions of each said scissor jack; (E) each said scissor jack further including



(iv) means for slideably supporting the second lower ends of said scissor constructions,

(v) means for pivotally connecting the first upper ends of said scissor constructions to said vehicle support means,

(vi) means for slideably supporting the second upper ends of said scissor construction against said vehicle support means,

(vii) means for pivotally connecting a lower end of said actuating means to the portion of said elongate member which projects into the pit, and

(viii) means for connecting an upper end of said actuating means to upper portions of said scissor constructions; and

(F) means for supporting the elongate member in such a manner that said elongate member rotates about a central axis thereof at the same time when the scissor constructions of one of said scissor jacks are extended or retracted, thereby extending or retracting the scissor constructions of the other scissors jacks simultaneously with the scissor constructions of said one of said scissor jacks.

4,854,422

HAND-OPERATED LIFT TRUCK

Hiroyuki Kawada, and Kiminori Niwa, both of Takahamashi, Japan, assignors to Sugiyasu Iron Work· Inc., Japan

Filed Nov. 4, 1986, Ser. No. 926,798

Claims priority, application Japan, Dec. 27, 1985, 60-203161[U]; Apr. 11, 1986, 61-53516[U]

Int. Cl.[4] B66B *9/20*

U.S. Cl. 187—9 R **2 Claims**

2. A hand-operated lift truck comprising:

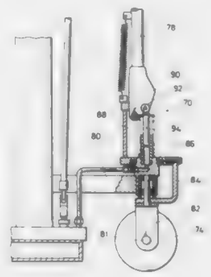
a. a chassis having a front end with a pair of opposed wheels and a rear end with a pair of opposed wheels;

b. an upright hydraulic cylinder mounted on the chassis;

c. a horizontal fork mounted on the chassis and adapted for vertical movement by the cylinder;

d. a pump means, comprising a pump and a pumping handle, connected to and disposed above one of the rear wheels, the pump means also connected to the cylinder for supplying pressurized fluid thereto to facilitate vertical movement of the fork; and

e. link means for connecting one of the rear wheels with the



pumping handle to enable the wheel and the pumping handle to be integrally rotatable with each other about a vertical axis, said link means including

i. a plate rotatably mounted on an upper surface of a bracket which is supported by said chassis,

ii. a generally L-shaped arm connected at one end to a means for supporting one of the rear wheels and at the other end to one side of the plate, and

iii. a generally U-shaped frame member mounted to the plate and to which the pumping handle is journalled.

4,854,423

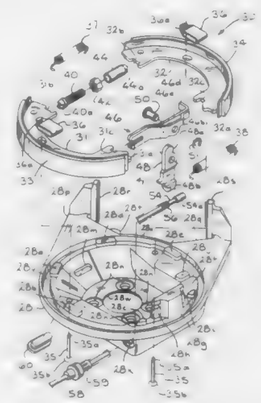
HYDRAULIC DISC BRAKE DRUM-IN-HAT PARKING BRAKE ASSEMBLY

Anthony C. Evans, and Larry L. Last, Northville, both of Mich., assignors to Kelsey Hayes Company, Romulus, Mich.

Filed Jul. 26, 1988, Ser. No. 224,096

Int. Cl.[4] F16D *63/00*

U.S. Cl. 188—70 R **7 Claims**



1. In combination with a flanged non-rotatably mounted axle and a wheel mounting flange rotatably mounted on said axle, the wheel mounting flange having a plurality of arcuately spaced studs adapted to receive a wheel mountable therein, a

hydraulic disc brake and drum-in-hat parking brake assembly comprising a casting including a generally circular portion and a pair of opposed spaced arms extending from a generally semicircular section of the circular portion, said circular portion having a central aperture for receiving said axle and being non-rotatably mounted along with a flange of said axle, a generally hat-shaped disc including a hat section and a friction disc portion, said disc being mounted by said hat section on the studs of said wheel mounting flange, a pair of arcuate brake shoes each having an arcuate rim secured to an arcuate outer edge of a flat web and an arcuate friction pad bonded to the rim, said brake shoes being mounted on said casting and disposed within said hat section of said disc for operative engagement of an inner cylindrical surface thereof by said friction pads, a friction pad wear-adjusting mechanism disposed between one arcuate end portion of each of the webs of said brake shoes in operative engagement respectively therewith and including a screw, a sleeve mounted on said screw, and an apertured internally threaded starwheel mounted on said screw for adjusting the combined length of said screw and sleeve, a first tension spring connected at opposite ends respectively to said one arcuate end portion of each of the webs of said brake shoes and urging the webs of said brake shoes toward each other and into engagement respectively with opposite ends of said wear-adjusting mechanism, said casting including a rotation-preventing abutment engaged on opposite sides respectively by another arcuate end portion of each of the webs of said brake shoes, a second tension spring connected at opposite ends respectively to said another arcuate end portion of each of the webs of said brake shoes and urging the webs of said brake shoes toward each other and into engagement respectively with opposite sides of said abutment, a bracket loosely connected to the web of one of said brake shoes adjacent said another arcuate end portion thereof, a brake operating lever pivotally mounted on said bracket and engageable at one end with the web of the other of said brake shoes adjacent said another arcuate end portion thereof, a cable connected to an opposite end of said lever and operable to pivot said lever, move said brake shoes apart against the force of said second tension spring, and press said friction pads against said inner cylindrical surface of said hat section, said casting including a pair of generally cylindrical anchoring ears disposed respectively adjacent said arms and respectively having axially extending internally threaded holes, a generally C-shaped caliper straddling said friction disc portion of said disc and having an outboard leg and an inboard leg disposed respectively on opposite sides of said friction disc portion, an outboard backing plate mounted on said outboard leg on a side thereof facing said friction disc portion, a friction pad bonded to said outboard backing plate for operative engagement with an outboard side of said friction disc portion, said inboard leg including a hydraulic cylinder open at one end and a pair of apertured mounting lugs disposed respectively on opposite sides of said cylinder, a pair of sleeves disposed respectively in said mounting lugs, said mounting lugs being reciprocable on said sleeves, a pair of bolts extending respectively through said sleeves and threaded respectively into said cylindrical ears to mount said sleeves and thereby the caliper on said casting, a piston reciprocably mounted in said hydraulic cylinder and having an exposed end at the open end of the cylinder, an inboard backing plate secured to the exposed end of the piston, a friction pad bonded to said inboard backing plate for operative engagement with an inboard side of said friction disc portion, said arms of said casting respectively including a pair of arcuately spaced guide rails straddling said friction disc portion, each of said backing plates being operatively engaged respectively at opposite ends with said guide rails for reciprocal movement therealong, and said outboard leg having projections respectively adjacent opposite arcuate ends and operatively engaged respectively with said guide rails to absorb braking friction torque in accordance with the direction of rotation of said disc.

4,854,424

PIEZOELECTRIC BRAKE DEVICE

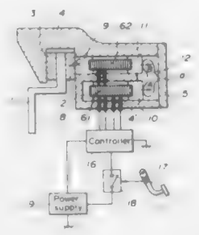
Kouhei Yamatoh; Masami Ogura; Katunori Kanbe, and Yuji Isogai, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1988, Ser. No. 182,964

Claims priority, application Japan, Apr. 17, 1987, 62-94927; Apr. 17, 1987, 62-94928

Int. Cl.[4] F16D *55/08;* **B60L** *7/00;* **B60T** *8/58;* **H01L** *41/08*

U.S. Cl. 188—72.1 **6 Claims**



1. A brake device including a piezoelectric element array having a stack of a plurality of piezoelectric elements which act to press a friction member against a member to be braked, under the action of a deformation of said piezoelectric element aray caused by applying DC voltage thereto, thereby producing a braking force,

said brake device comprising a plurality of piezoelectric element arrays which are arranged in a parallel relationship with each other and are connected together by a displacement transmitting mechanism so that the deformations of the respective piezoelectric element arrays are added together to produce the braking force.

4,854,425

SELF-ENERGIZING DISC BRAKE SHOE

Robert Sevadio, 3721 Parkview Ave., Pittsburgh, Pa. 15213

Continuation-in-part of Ser. No. 658,502, Nov. 5, 1984, abandoned. This application Dec. 12, 1985, Ser. No. 808,283

Int. Cl.[4] B62L *1/12*

U.S. Cl. 188—72.2 **1 Claim**



1. A self-energizing disc brake assembly comprising a rectangular receptacle, having end flanges, a backing plate mounted in said receptacle, a brake shoe, said backing plate and brake shoe being longitudinally tapered to effect wedging application of said brake shoe, a pair of pockets extending from the longitudinal ends of said backing plate and brake shoe to less than half the lengths thereof, each pocket containing a stem having a threaded head screw threaded to a threaded opening leading from the end of said backing plate and shoe into its pocket, and a helical return spring surrounding each of said stems, a pair of integral projections extending from the confronting surfaces of said plate and brake shoe having radial openings which surround said stems, and being positioned and shaped so as to be seated in the ends of said pockets whereby movement of said brake shoe against a disc brake will cause relative longitudinal sliding between said backing plate and brake shoe resisted by the compression of said return springs.

4,854,426

HANDBRAKE COMPENSATOR FOR MOTOR VEHICLES

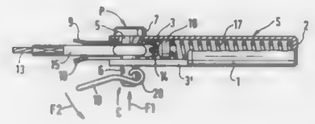
Victorino Solano, and Antonio Trilla, both of Barcelona, Spain, assignors to Pujol Y Tarrago S.A., Rubi, Spain

Filed Jun. 22, 1988, Ser. No. 209,857

Claims priority, application Spain, Jul. 10, 1987, 8702034

Int. Cl.[4] F16D *65/44*

U.S. Cl. 188—196 M **12 Claims**



1. A handbrake compensator for motor vehicles, comprising support means having an axis of elongation and including a substantially tubular body closed at one end thereof and including at an opposite end two parallel flanges; load distributor means including two superimposed parallel wings positioned between said flanges; spring means accommodated in said tubular body and being maintained in a compressed position against said load distributor means; a cap screw extending through said flanges and said wings; a primary cable having a terminal inserted in said load distributor means; at least one secondary cable connected to said load distributor means, said screw holding said terminal of said primary cable in the handbrake compensator; and closing and retaining means provided on said cap screw, said wings each including an elongated slot through which said cap screw passes, one of said slots having two opposite toothed edges extended along said axis of elongation and adapted to snugly receive a portion of said cap screw, said cap screw being insertable into said one slot in an initial position in which said load distributor means applies against said spring means a predetermined force to compress said spring means, said cap screw being removable from said one slot by pushing said cap screw so as to change a position of said load distributor means along said axis and thus adjust a tension of said primary cable relative to said secondary cable by a residual force of said spring means, said cap screw being reinsertable into said one slot between said toothed edges in a new adjusted position in which said cap screw is retained by said closing and retaining means.

4,854,427

VEHICLE AXLE AND BRAKE SUPPORT ASSEMBLY

Robert J. Baroni, West Bloomfield, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 26, 1985, Ser. No. 748,900

Int. Cl.[4] F16D *51/22*

U.S. Cl. 188—205 R **3 Claims**

1. An axle and brake support assembly for a vehicle comprising

a vehicle axle including a spindle for rotatably mounting a wheel at each end thereof, each end of said axle including a cylindrical surface adjacent said spindle, and

a brake support assembly at each end of said axle, each said brake support assembly including a stamped metal plate having a substantially planar and circular mounting portion,

diametrically opposed, planar first and second support portions substantially parallel to and off-set in opposite directions from said mounting portion,

first and second transition sections respectively joining said first and second support portions to said mounting portion,

a pair of reinforcing ribs with each rib extending continuously along opposite edges of said plate from said first support portion across said mounting portion to said second support portion and projecting from said plate in the direction of the spindle at that end of said axle,

a bracket extending across said second mounting portion in spaced relation thereto and secured by laterally spaced edges welded to said ribs,

a pair of laterally spaced apertures through said second mounting portion of said plate,

a pair of laterally spaced apertures through said bracket with each aperture through said bracket axially aligned with



and of the same diameter as one of said apertures through said second support portion of said plate,

an aperture through said first support portion of said plate,

a bushing retainer having a cylindrical bore therethrough and a cylindrical external surface concentric with said bore, said cylindrical external surface oif said bushing seated in said aperture through said first support portion of said plate, and

a circular aperture through said mounting portion of said plate and defining an edge between the opposite surfaces of said mounting portion, said mounting portion of said metal plate extending substantially normal to the axis of said axle with said edge of said circular aperture press-fit to said cylindrical surface of said axle and secured by means of a weld joint between each of the opposite surfaces of said mounting portion of said plate and said cylindrical surface of said axle.

4,854,428

DOUBLE-ACTING HYDRAULIC PISTON-AND-CYLINDER DEVICE

Eduard Horvath, Wien, Austria, assignor to Otto Bock Orthopadische Industrie Besitz- und Verwaltungs-KG, Duderstadt, Fed. Rep. of Germany

Filed Sep. 22, 1988, Ser. No. 247,896

Claims priority, application Austria, Sep. 22, 1987, 2399/87

Int. Cl.[4] F16F *9/10, 9/36;* **F16J** *3/04*

U.S. Cl. 188—298 **5 Claims**

1. A double-acting piston-and-cylinder hydraulic unit which comprises:

means for forming a cylinder;

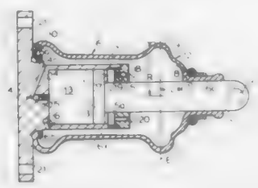
a piston axially shiftable in said cylinder and defining therein respective hydraulic-fluid-containing chambers on opposite sides of said piston;

a piston rod connected to said piston and extending axially out of said cylinder;

an elastically deformable boot surrounding said cylinder and said rod while forming therewith a hydraulic-fluid-pressu-

rized variable-volume compartment, said boot having a generally cylindrical segment sealingly connected to said cylinder, an outwardly widening segment diverging from and sealingly connected to said rod, and a transition segment connecting said widening segment to said generally cylindrical segment,

said transition segment having, in an extended position of said piston rod, an outwardly convex shape and having a greater diameter than that of said generally cylindrical segment,



a ratio between the radius (R) of said transition segment at said greater diameter than said generally cylindrical segment and an axial distance (L) between a plane of said transition segment at its greatest diameter and a location closest to said cylinder at which said boot is sealingly connected to said rod being given by the relation:

$3:1 \geqq R/L \geqq 1:2$; and

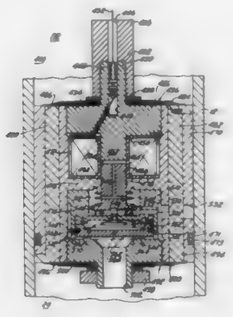
means for fluid communication between each of said chambers and said variable-volume compartment.

4,854,429

VARIABLE RATE SHOCK ABSORBER AND SYSTEM THEREFOR

Gary L. Casey, 3173 Roxbury, Troy, Mich. 48084

Filed Dec. 18, 1987, Ser. No. 134,497
Int. Cl.[4] F16F *9/46*
U.S. Cl. 188—299 **18 Claims**



1. A shock absorber for a vehicle comprising:

a casing, a hollow strut reciprocatively received in the casing, a piston including an opening, carried by the strut for dividing the interior of the casing into upper and lower chambers containing fluid, a plurality of flap valves for damping in concert with other openings in the piston motion of the strut at determinable levels in extension and compression, the strut further including a cross-hole for communicating fluid to and from the upper chamber and its interior,

means for selectively reducing the damping of the strut from the predetermine levels comprising:

solenoid valve means positioned within and carried by the strut comprising:

a main valve including an armature movable in responsive to an electromagnetic force to selectively open and close a first flow passage defining a first valve seat at one end thereof, the first flow passage being formed within a cross-member of a retainer, the retainer cooperating with the interior of the strut to define a first fluid chamber about the armature and a second fluid passage for permitting fluid to flow to and from the first fluid chamber,

the retainer further includes a wall defining an open end, which is recessed from the interior of the strut and which extends axially away from the cross-member;

the solenoid valve means further comprises a valve seat member defining a lower passage for communicating fluid between the lower chamber, through the piston, into the interior of the strut, including at one end thereof a second valve seat;

a poppet valve, movable in response to a pressure differential thereacross, relative to the second valve seat for controlling the flow of fluid through the lower passage, including a cylindrical wall slidably received in the retainer wall, a bottom formed at one end of the cylindrical wall including a narrow bleed passage therethrough, the bleed passage being narrower than the second fluid passage of the retainer;

the retainer and poppet valve cooperates to define a pressure chamber therebetween, wherein when the pressure of the fluid in the lower chamber is greater than the pressure in the upper chamber and with the armature deactivated and positioned on the first valve seat fluid within the lower chamber is permitted to migrate through the bleed passage into the pressure chamber to develop a force on the poppet valve uring it onto the second valve seat,

when the armature is activated and positioned off of the first valve seat fluid in the pressure chamber is communicated to the first chamber creating a pressure differential across the poppet valve urging it off from the second valve seat permitting flow from the lower chamber to the upper chamber to thereby lesen the damping of the strut from the determinable levels;

when the pressure in the upper chamber is greater than the pressure in the lower chamber, with the armature deactivated and positioned on the first valve seat to prohibit flow through the second fluid passage, the incresed pressure fluid acts upon the bottom of the poppet valve to urge same from the second valve seat to permit flow fluid to flow from the upper chamber to the lower chamber through lower passage in the valve seat member to reduce the damping of the strut and with the armature activated and position off of the first valve seat pressurized fluid is permitted to flow through the second fluid passage into the pressure chamber to urge the poppet valve onto the second valve seat to restrict flow through the lower passage.

4,854,430

EXPANDABLE CARRYING CASE WITH EXTERNAL EXPANSION CONTROL MEANS

Laverne Peterson, 98-2060 Kikala St., Aiea, Hi. 96701

Filed Mar. 2, 1988, Ser. No. 163,085
Int. Cl.[4] A45C *7/00, 13/04*
U.S. Cl. 190—105 **8 Claims**

1. An expandable carrying case comprising: a pair of hinged case sections;

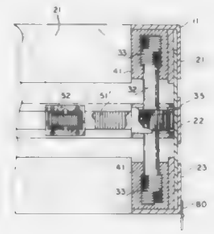
each case section having three frame members comprising a stationary number and a pair of shell members;

each said shell member having inner and outer walls which are generally parallel to each other, defining a channel therebetween;

said three frame members having at each corner thereof, a pair of nuts and a screw having opposite-hand-threaded screw portions at each end in cooperative engagement therewith;

said nuts and screw having a gear housing, a common drive pinion gear mounted integral with and disposed between the ends of said screw for rotation therewith;

said stationary member being slidably disposed within said channels of said shell members; and



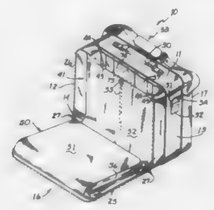
means for actuating said drive pinion gear; whereby rotation of said common drive pinion gear causes the plurality of shell members to move with relation to said stationary member, thereby expanding or contracting the case sections as desired.

4,854,431

SUITCASE WITH COMPARTMENT FOR A FOLDABLE GARMENT BAG

John V. Pulichino, Jr., Providence, R.I., and Joy Tong, New York, N.Y., assignors to American Tourister, Inc., Warren, R.I.

Filed May 27, 1988, Ser. No. 199,424
Int. Cl.[4] A45C *3/00, 13/02;* **B65D** *85/18*
U.S. Cl. 190—108 **11 Claims**



1. A suitcase comprising,

a generally rectangular container,

a partition dividing said container into two compartments,

a full length garment bag having at least one clothes hanger,

said garment bag consisting of an elongated fabric sheath for enclosing a suit or dress and including means for opening said bag while it is unfolded with a garment hanging freely in it and thereafter closing said bag upon a garment, said garment bag being folded upon itself in one of said compartments,

means in said one compartment for securing said garment bag in said compartment,

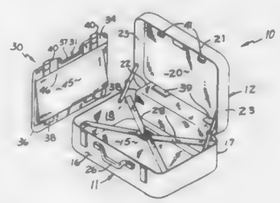
and means in said container for providing access respectively to said two compartments.

4,854,432

SUITCASE HAVING REMOVABLE DIVIDER WITH CLOTHING POCKETS

Lester E. Carpenter, Middletown, and Charles E. Waddell, Jr., Bristol, both of R.I., assignors to American Tourister, Inc., Warren, R.I.

Filed Jul. 6, 1988, Ser. No. 215,556
Int. Cl.[4] A45C *3/12, 13/02, 13/04*
U.S. Cl. 190—110 **2 Claims**



1. A suitcase comprising,

a hollow box,

a hollow lid hinged to said box,

a divider including means for removably hinging said divider to one of said box and lid, said divider having multiple pockets on each side thereof for clothing articles and accessories, said divider comprising:

a generally rectangular frame,

a two-ply fabric stretched across said frame,

the lower half of one of said sides of said divider having two shoe pockets with facing openings, said openings being gathered and having a hem containing elastic,

a zippered pocket above said shoe pockets,

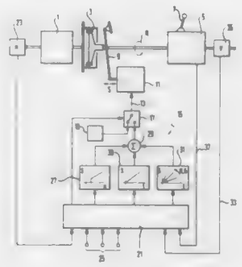
and a gusseted zippered pocket on the side of said divider opposite said shoe pockets.

4,854,433

AUTOMATIC CLUTCH ACTUATION SYSTEM WITH PROGRAM CONTROL USING PLURAL FUNCTION GENERATORS

Rudy Tellert, Schweinfurt, Fed. Rep. of Germany, assignor to Sachs-Systemtechnik GmbH

Filed Apr. 5, 1983, Ser. No. 482,158
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1982, 3214494
Int. Cl.[4] B60K *41/22, 41/28*
U.S. Cl. 192—0.033 **9 Claims**



1. Automatic clutch actuation system for a motor vehicle, comprising a combustion engine (1), a change speed gearbox (5) with an input shaft and an output shaft, wherein said gearbox (5) is shiftable between a reverse gear and a plurality of forward gears with the ratios of the gear output shaft rotation rate to the gear input shaft rotation gear being different from one another, a friction clutch (3) arranged in the torque trans-

mission path between said combustion engine (1) and said input shaft of said change-speed gearbox (5), said friction clutch (3) comprises an actuating element (9) and a positioning servo-drive (11) for moving said actuating element (9) between a released position in which said clutch (3) is disengaged and an engaged position in which said clutch (3) is completely engaged, and also affords adjustment within a slipping position range of clutch positions between a torque transmission commencing position and said engaged position, a first tachometer for producing first rotation rate signal corresponding to the rotation rate of said combustion engine, a second tachometer (21, 33, 35) for producing a second rotation rate signal corresponding to the rotation rate of said input shaft of said change-speed gearbox (5), means (37) for controlling the gear position of said change-speed gearbox (5), a positioning control means (17, 19, 21) for controlling the position of said positioning servo-drive (11), said position control means (17, 19, 21) being responsive to said first tachometer (23) and said second tachometer (21, 33, 35) and to said gear position control means (37), a first function generator (27) for said positioning control means (17, 19, 21) for producing predetermined rotation rate characteristic between the rotation rate of said combustion engine (1) and the clutch position, wherein said positioning control means (17, 19, 21) for starting in reverse gear or in forward gear with the smallest ratio of output shaft rotaton rate to input shaft rotation rate, responds to said first function generator (27) and said actuating element (9) adjusts in said slipping range in dependence upon the rotation rate of said combustion engine (1) and providing a position of said actuating member (9) determined by means of a predetermined rotation rate position characteristic assigned to each rotation rate of said combustion engine (1), and a second function generator (31) for said positioning control means (17, 19, 21), providing a plurality of predetermined position characteristics for adjusting the clutch position as a function of time over the slipping position range of clutch positions, said positioning control means (17, 19, 21) responds to said second function generator (31) when changing the forward gears and adjusts said actuating element (9) in dependence on a first one of said predetermined position characteristics when the rotation rate of said input shaft and in dependence on a second one of said predetermined position characteristics whereby said actuating member (9) is moved more slowly over the slipping position range of clutch positions than during the first one of said predetermined position characteristics when the rotation rate of said combustion engine (1) is smaller than the rotation rate of said input shaft.

4,854,434

HUB CLUTCH

Sakuo Kurihara, Tochigi, Japan, assignor to Tochigi-Fuji Sangyo Kabushiki Kaisha, Tochigi, Japan

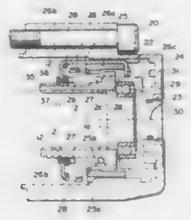
Filed Feb. 1, 1988, Ser. No. 151,091

Claims priority, application Japan, Feb. 4, 1987, 62-15124[U]

The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.

Int. Cl.[4] F16D *11/00, 43/00*

U.S. Cl. 192—35 **8 Claims**



1. A hub clutch for selectively transmitting torque between a drive shaft extending in an axial direction and a wheel hub, said hub clutch comprising:

a hollow housing fixed to the wheel hub so as to rotate therewith;

said housing having an inner peripheral surface, and outer end, a spline extending along said inner peripheral surface, and an opening extending through said outer end;

a manually operable knob rotatably mounted to a casing in the opening extending therethrough, said knob having a boss section extending in said casing, said boss section defining a cam surface;

a drive gear secured to the drive shaft at an end thereof,

said drive gear having both a gear section and a spline extending on the outer periphery thereof;

a clutch ring in splined engagement with the spline of said housing so as to be movable along the inner peripheral surface of said housing in the axial direction between a clutch-off position at which said clutch ring is out of engagement with said drive gear and a clutch-on position at which said clutch ring engages said drive gear at the gear section thereof,

said clutch-off position located inwardly of said clutch-off position in the hub clutch with respect to the axial direction;

a retainer mounted to said housing for rotating therewith,

said retainer slidable in the axial direction relative to said housing and operatively connected to said clutch ring so that said clutch ring moves in the axial direction with said retainer, and

said retainer having a claw section engageable with the cam surface of said knob, and a bent section disposed inwardly of said claw section in the hub clutch with respect to the axial direction;

a return spring extending between either the bent section of said retainer and said drive gear or between the claw section of said retainer and said housing for urging said retainer inwardly in the hub clutch in the axial direction;

a shift spring extending between the bent section of said retainer and said clutch ring; and

a locking member for limiting inward axial movement of said retainer in the hub clutch,

said locking member bearing the urging force exerted by said return spring when said clutch ring is in the clutch-off position thereof.

4,854,435

DOUBLE-NOTCHED SPRAG OUTER RETAINER

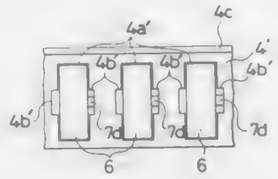
Noboru Kitamura, and Norio Komatsubara, both of Fujisawa, Japan, assignors to NSK-Warner Kabishiki Kaisha, Japan

Filed Jan. 19, 1988, Ser. No. 145,010

Claims priority, application Japan, Jan. 16, 1987, 62-6147

Int. Cl.[4] F16D *41/07*

U.S. Cl. 192—41 A **5 Claims**



1. An outer retainer for use in a double retainer type one-way clutch assembly including a ribbon string provided with a plurality of tabs for applying a bias force to associated sprags, said retainer being generally in the shape of a ring and formed with a plurality of sprag insertion holes at a predetermined pitch arranged in a circumferential direction of the ring, each of said sprag insertion holes being generally rectangular in shape and formed with a pair of identical notches facing each other at opposite side edges of said hole in alignment in said circumferential direction, each of said notches being formed substantially at the center of a corresponding side edge to provide a relief space for a corresponding tab of a ribbon spring.

4,854,436

CLUTCH RELEASE BEARING

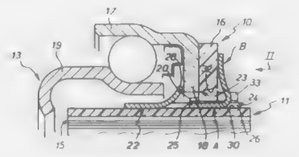
Philippe Lassiaz, Boulogne, France; Gino Villata, Buttegliera, and Carlo Beccaris, Turin, both of Italy, assignors to Valeo, Paris, France

Filed Dec. 29, 1987, Ser. No. 139,200

Claims priority, application France, Dec. 29, 1986, 8618294

Int. Cl.[4] F16D *23/14*

U.S. Cl. 192—98 **17 Claims**



1. A clutch release bearing of the kind comprising an operating element adapted to be acted on by a control device, and a drive element adapted to act on the release device of a clutch connected to the operating element by axially-acting elastic means formed by a plurality of separate elastic clamps operable to apply said drive element axially against said operating element, said operating element being provided transversely, for the axial application of the drive element, with a flange, and said drive element itself carrying transversely a flanged edge co-operating axially with said flange, wherein each of the said elastic clamps comprises an axial part applied axially to the drive element and a radial part elastically deformable and applied axially to the operating element, said axial part has a radially elastically deformable tongue extending towards said radial part with which the tongue cooperates to clamp said drive element axially against said operating element, said axial part extending across said flange through an opening therein, and two axial channels being provided in said operating element to locate said elastic clamp radially with respect to the assembly, said channels being disposed respectively on two sides of said opening in said operating element, and said axial part of the respective elastic clamp being at least locally engaged therewith.

4,854,437

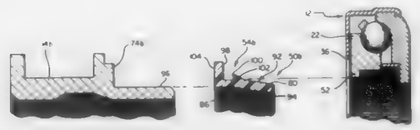
RADIALLY ADJUSTABLE CLUTCH RELEASE BEARING ASSEMBLY

Richard F. Harrington, Lincolnwood, and James Selgrad, Des Plaines, both of Ill., assignors to Aetna Bearing Company, Chicago, Ill.

Division of Ser. No. 878,568, Jun. 25, 1986, Pat. No. 4,724,943. This application Nov. 10, 1987, Ser. No. 119,164

Int. Cl.[4] F16D *23/14*

U.S. Cl. 192—98 **6 Claims**



1. A self-aligning clutch release bearing and carrier sleeve assembly including a carrier sleeve which defines a first axis and a bearing adapted to be brought into engagement with rotating clutch fingers or the like of a clutch mechanism, which clutch fingers rotate about a second axis which may not be exactly coincidental with said first axis, aid bearing and carrier sleeve assembly being adapted to adjust the rotational orientation of the bearing to coincide with the second axis of rotation of said clutch fingers, said bearing and carrier sleeve assembly comprising: a bearing including a generally annular thrust face for engagement with said clutch fingers and an annular radially inwardly extending shoulder portion; and mounting means for grippingly engaging said shoulder portion for mounting the bearing to said carrier sleeve; said mounting means defining recess means of complementary form for receiving said shoulder portion therewithin; said shoulder portion terminating at a position radially spaced apart from a radially innermost end of said recess means for permitting a predetermined amount of radial movement of said bearing relative to said carrier sleeve while substantially preventing axial movement of said bearing relative to said carrier sleeve; said mounting means comprising a generally annular mounting member having an inner surface adapted for non-rotatable engagement with said carrier sleeve and a radially outer surface defining said recess means for engagement with said shoulder portion of said bearing; and said annular mounting member including a first, generally frustoconical elastically deformable portion defining a frustoconical inner surface of lesser minimum diameter than the outer diameter of said carrier sleeve and elastically outwardly deformable for engagement thereover, and an outer surface defining a pair of axially spaced apart radially extending abutment surfaces defining said recess means therebetween, and a cam lead-in surface axially spaced from said recess means in the direction of said thrust face, said lead-in surface defining ramp means for guiding said shoulder portion thereover and into engagement with said

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4,854,438

CLUTCH DISC FOR A FRICTION DISC CLUTCH

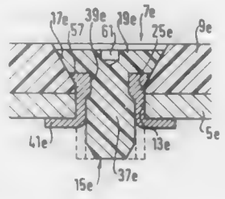
Helmuth Weisseaberger, Waigolshausen, and Peter Huditz, Ingolstadt, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed May 12, 1988, Ser. No. 193,408

Claims priority, application Fed. Rep. of Germany, May 29, 1987, 3718147

Int. Cl.[4] F16D *13/68*

U.S. Cl. 192—107 R **8 Claims**



1. A clutch disc for a friction disc clutch comprising

(a) a hub,

(b) a lining carrier of disc form held on the hub,

(c) friction linings on both sides of the lining carrier, and

(d) connection elements consisting at least partly of synthetic plastics material which anchor the friction linings in holes of the lining carrier, each connection element comprising

a shank passing through the hole, anchoring members carried on the shank on the side of the lining carrier remote from the friction lining and engaging behind the edge of the hole, wherein each connection element carries, for securing on the friction lining, a synthetic plastics material

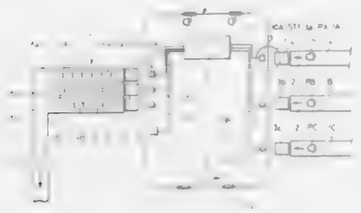
head widening conically away from the lining carrier, which head is seated in a matching tapered opening of the friction lining, the shank comprises a hollow rivet consisting of metal and anchored in the synthetic plastics material head, which rivet is expanded, especially upset or crimped over, on the side of the lining carrier remote from the friction lining for the formation of the anchoring members.

4,854,439

DOFFED PACKAGE TRANSPORTING SYSTEM

Yutaka Ueda, Nara, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Aug. 7, 1986, Ser. No. 894,286
Claims priority, application Japan, Aug. 14, 1985, 60-178884
Int. Cl.[4] B65G 47/46
U.S. Cl. 198—350 6 Claims



1. A system for transporting different types of yarn packages, comprising:

a plurality of automatic yarn winders, each of said automatic yarn winders being operable for producing a corresponding one of said different types of yarn packages randomly with respect to the others of said plurality of automatic yarn winders;

a yarn package storage station having a plurality of yarn package receiving lines, each of said receiving lines being operable to receive a corresponding one of said different types of yarn packages;

a conveying means disposed adjacent said automatic winders and said yarn package storage station operable for conveying yarn packages, as the yarn packages are randomly produced by said automatic winders, to said package storage station;

memory means, associated with each yarn package conveyed by said conveying means, for recording the type of yarn package associated therewith;

writing means for writing indicia on said memory means, said indicia indicating the type of yarn package associated with said memory means;

reading means for reading the indicia and for determining the type of each yarn package conveyed by said conveying means to said package storage station;

unloading means, responsive to the type of yarn package determined by said reading means, for unloading each of said types of packages from said conveying means onto a separate one of said receiving lines;

an erasing device for erasing a mark written on said memory means, said relasing device being located between said winders and said package storage station and adjacent the conveying means;

a plurality of package supporting members, each package supporting member having an L-shaped package supporting hook and a guide plate provided in an integral relationship with the hook, wherein said memory means in disposed on the guide plate;

wherein said conveying means comprises a guide rail for supporting a plurality of said L-shaped package supporting hooks; and

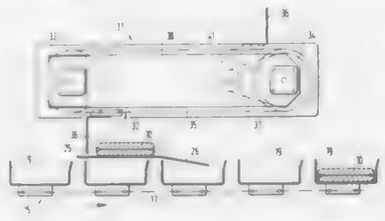
wherein said system further comprising a pair of rotatable guide roller supported by said guide rail for controlling the horizontal position of said guide plate of the package supporting members, whereby the memory means may be positioned to correspond with the writing device.

4,854,440

APPARATUS FOR TRANSFERRING ARTICLES TO A PACKAGING MACHINE CONVEYOR APPARATUS

Ludwig Laube, Konstanz; Helmut Leypold, Ditzingen, and Erhard Ploch, Schmiden, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 29, 1988, Ser. No. 213,058
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724693
Int. Cl.[4] B65G 37/00
U.S. Cl. 198—357 9 Claims



1. An apparatus for transferring articles to successive buckets of a continuously operating conveyor apparatus of a packaging machine having at least one device for readying articles, and one transfer apparatus associated with each of said at least one readying device and the conveyor apparatus at one time, each said transfer apparatus comprising an endless conveyor having outwardly extending dogs and extending above an outlet end of a readying device and above said conveyor apparatus, each transfer apparatus transferring one readied article to a successive bucket of said conveyor apparatus, each transfer apparatus (31) including a first drive that is separate from a second drive of said conveyor apparatus (15), said first drive including a highly dynamic, variable-speed electric motor (41–44), a guidance system including a programmable process computer (45) associated with each of said electric motors, said guidance system controlling a rotational speed of each of said electric motors as a function of a phase location of said conveyor apparatus (15), said guidance system controlling said electric motor such that the speed of each of said dogs is slowed shortly before it reaches one of said readied articles and thereafter is accelerated to match a speed of the conveyor apparatus and to accelerate said readied article to substantially the speed of the conveyor apparatus to transfer said article to a bucket (19) of the conveyor apparatus (15) at a virtually synchronous speed.

4,854,441

BOTTLE DUSTER

William J. McBrady, 2902 Bob-O-Link Rd., Flossmoor, Ill. 60422, and Julian P. Avelis, Crete, Ill., assignors to William J. McBrady, Flossmoor, Ill.

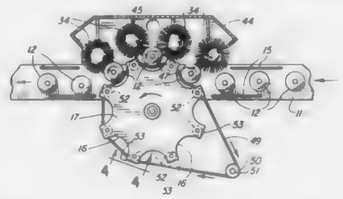
Division of Ser. No. 792,518, Oct. 29, 1985, Pat. No. 4,701,973, which is a continuation-in-part of Ser. No. 644,240, Aug. 27, 1984, abandoned. This application Oct. 13, 1987, Ser. No. 83,451
Int. Cl.[4] B65G 47/24
U.S. Cl. 198—384 6 Claims

1. A device for imparting rotational motion to a bottle moving on a conveyor comprising:

A. a resilient surface arranged along one side of said conveyor;

B. position-controlling means, arranged over said conveyor, for (1) controlling the position of said bottle as it moves on said conveyor against said resilient surface, said position-controlling means including a wheel lying in a horizontal plane and having a generally circular configuration with indentations on it slightly larger than the cross-sectional area of said bottles;

C. a flexible belt, coupled to said position-controlling means



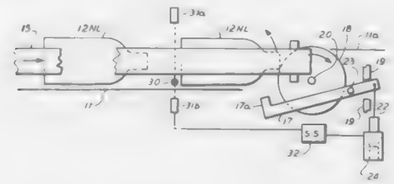
and with a portion of said belt being in contact with said bottle on the side opposite to said resilient surface, said belt extending substantially across the openings of said indentations and having sufficient flexibility to allow the entrance of said bottle into said indentation; and motive means, coupled to said belt, for imparting to said portion of said belt a motion relative to said conveyor and to said wheel.

4,854,442

BOTTLE STAND UP APPARATUS

Robert J. Krooss, 105 Lake Dr., Mountain Lakes, N.J. 07046

Filed Mar. 25, 1988, Ser. No. 173,078
Int. Cl.[4] B65G 47/24, 43/08
U.S. Cl. 198—400 21 Claims



1. Bottle orientation apparatus for uprighting each bottle of a plurality of bottles from a lying down position to a standing position, standing on its base, whether a bottle is in neck leading or base leading lying down position, said bottle orientation apparatus comprising:

(a) grasping means for grasping each bottle of said plurality of bottles and conveying each said bottle along a path in a direction parallel to an axis extending between the neck and the base of said bottle, each said bottle following behind the bottle in front of it;

(b) a bottle trip means selectively positionable into and out of said path along which each said bottle is conveyed, said bottle trip means cooperating with said grasping means for stalling a portion of said bottle when said bottle is conveyed in a base leading lying down position, said bottle being pivoted on a part of its base at a point of said stalling for uprighting said bottle to a standing position, standing on its base;

(c) rotating wheel means positioned in the path of conveyance of each said bottle and having a portion of the perimeter of said rotating wheel means extending into the path of conveyance of each said bottle, said rotating wheel means coacting with said grasping means for lifting the neck of said bottle conveyed along said path in a neck leading lying down position, said last mentioned bottle being arcuately moved from a lying down position to an upright position, standing on its base; and

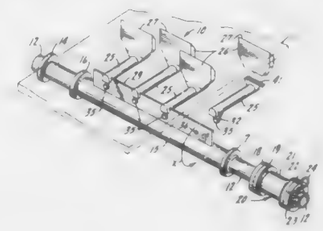
(d) means for detecting the position of each bottle individually while in said grasping means but before coming in contact with said trip means for determining whether the detected bottle is in a neck leading or base leading orientation.

4,854,443

CONVEYOR BELT CLEANER

James R. Gordon, Benton, Ill., assignor to Gordon Belt Scrapers, Inc., Benton, Ill.

Filed Nov. 10, 1988, Ser. No. 269,574
Int. Cl.[4] B65G 45/00
U.S. Cl. 198—497 7 Claims



1. An improved blade and support arm construction for a conveyor belt cleaner of the kind comprising:

an elongated mounting plate of given thickness extending in transverse spaced relation to a conveyor belt and having a plurality of anchor apertures therethrough at regularly spaced positions along the mounting plate length,

a plurality of elongated blade support arms each of molded, resilient resin, each support arm having an anchor end for mounting the arm on the mounting plate, and a blade end for supporting a cleaner blade,

and a plurality of cleaner blades, each mounted on the blade end of a support arm and extending therefrom into engagement with the conveyor belt;

the improvement comprising:

the mounting end of each blade support arm having a first transverse slot, complementary to the configuration of one edge of the mounting plate and fitting closely over the one edge of the mounting plate, an elongated leg extending from the support arm as an extension of one side of the first transverse slot, and an anchor lug projecting from a free end of the leg a distance at least equal to the plate thickness, through one of the anchor apertures in the mounting plate;

the blade end of the support arm having a second transverse slot;

each cleaner blade including an elongated key element fitting into the second transverse slot of the support arm in a keyed interference fit to afford a firm but displaceable mounting of the blade on the blade end of the support arm in a predetermined fixed orientation relative to the blade support arm;

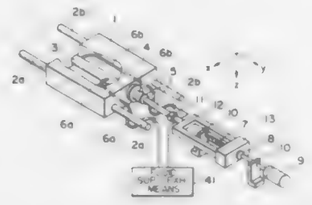
and a metal reinforcement molded into one end of each support arm, extending along and reinforcing one of the transverse slots.

4,854,444

PRECISE FEEDING MECHANISM

Kazunori Iwamoto, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 875,302, Jun. 17, 1986, abandoned. This application Nov. 14, 1988, Ser. No. 271,365
Claims priority, application Japan, Jun. 24, 1985, 60-135945; Jun. 24, 1985, 135946; Jun. 24, 1985, 60-135947; Jun. 24, 1985, [illegible]
Int. Cl.[4] B65G *25/04*
U.S. Cl. 198—750 2 Claims



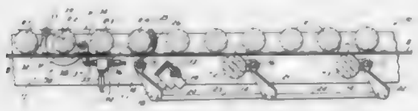
1. A device for moving a stage in a predetermined direction, said device comprising:
- a guide for guiding the movement of the stage in said predetermined direction;
- piston means coupled to the stage and having a cylinder and a piston rod, said piston rod being movable relative to said cylinder, said piston means being operable to move the stage along said guide by the relative movement of said piston rod and said cylinder;
- means for locking said cylinder with said piston rod for preventing the relative movement between said cylinder and said piston rod; and
- moving means operable, when the relative movement between said cylinder and said piston rod is prevented by said locking means, to move said piston means to thereby move the stage along said guide.

4,854,445

WIDE RANGE ACCUMULATOR CONVEYOR

Daniel T. Eaton, and George W. Benningfield, both of Louisville, Ky., assignors to Figgie International Inc., Westlake, Ohio

Continuation of Ser. No. 796,866, Nov. 12, 1985, abandoned. This application Sep. 18, 1987, Ser. No. 98,504
Int. Cl.[4] B65G *13/07*
U.S. Cl. 198—781 17 Claims



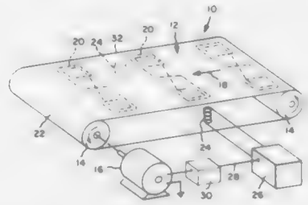
1. In an accumulator conveyor having a plurality of belt driven, live rollers disposed in a plurality of selectively driven accumulation zones, for conveying and accumulating articles in a pass line, and having fluid control means and fluid actuation means for said accumulation zones, and operating at a common pressure, the combination of an improved means for sensing articles in said zones and a fluid control valve operated by said sensor means wherein said valve comprises a stem extending therefrom for actuation by said sensor means, and said sensor means comprising:
- a pivot shaft, rotatably mounted about a pivot axis disposed between two of said live rollers;
- at least one curved bracket secured to said pivot shaft and mounted for rotation therewith about said pivot axis;
- an article sensing element on one end of said bracket spaced from said pivot axis and disposed in an article pass line, said one bracket end extending upwardly between one of said two live rollers and another downstream live roller;
- a valve stem actuator paddle mounted on said pivot shaft and mounted for rotation therewith about said pivot axis;
- said valve stem actuator paddle engaging said stem at a point spaced from said pivot axis;
- a straight line distance from said pivot axis to said end of said curved bracket being at least about twice the length of a straight line from said pivot axis to said point of valve stem engagement on said paddle;
- wherein said fluid control valve is a normally open valve open for fluid flow in its non-activated condition and closed against fluid flow when activated, said normally open valve being actuable to a closed condition, against the pressure exerted by a fluid flowing in said normally open valve, upon rotation of said pivot shaft by said bracket when an article is sensed and the consequent depression of said valve stem by said actuator paddle; and
- further including a single source of fluid at a common pressure for both fluid control and fluid actuation of said accumulation zones, said normally open valve being connected to selectively pass pressurized fluid to said fluid actuation means;
- said conveyor being operable to uniformly accumulate mixed articles of weights varying from less than one pound to about 100 pounds during a constant common fluid pressure.

4,854,446

ELECTRICAL CONDUCTOR

Don S. Strader, Fairfield Glade, Tenn., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 3, 1988, Ser. No. 227,922
Int. Cl.[4] B65G *43/00*
U.S. Cl. 198—810 26 Claims



1. An endless conveyor belt having a direction of travel comprising:
- (a) an elastomeric body having a load carrying surface and a parallel pulley engaging surface;
- (b) a reinforcement ply disposed within said elastomer body;
- (c) a conductor, disposed within said belt in a predetermined pattern forming a closed current path; and wherein said conductor comprises a plurality of strength filaments or strands of a first metal wrapped about a conductive core of a second metal, said strength filaments or strands having a higher fatigue resistance than the conductive core, for increasing the fatigue resistance of the conductive core.

4,854,447

BELT CONVEYOR SYSTEM

Rolf Johansson, Föreaingsgatan 13, S-703 63 Örebro, Sweden

Continuation-in-part of Ser. No. 923,145, Oct. 14, 1986, Pat. No. 4,738,353. This application Apr. 18, 1988, Ser. No. 182,498
Claims priority, application Sweden, Feb. 14, 1985, 8500683
The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.
Int. Cl.[4] B65G *15/10*
U.S. Cl. 198—817 6 Claims



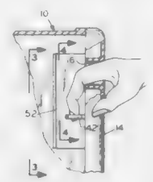
1. A belt conveyor with dual upper runs and dual lower runs for building materials or the like, said conveyor comprising an elongate central body, a conveyor belt, belt drive rollers on said central body and belt guide rollers on the central body remote from the drive rollers, said drive rollers and said guide rollers defining opposed ends of the conveyor, said belt being a single continuous belt defining the dual upper runs and the dual lower runs, each of said runs extending linearly for the length of the conveyor between a drive roller and a guide roller, and guide means for the lower runs positioned to control the crossing of said lower runs to maintain said runs in vertical spaced relation to each other whereby contact therebetween is avoided for movement of each lower run unencumbered by the other crossing lower run, the upper runs extending parallel and generally coplanar to each other, one on each side of the central body, said runs moving synchronously during operation.

4,854,448

CHILD PROOF CONTAINER

John Hair, II, Walla Walla, Wash., assignor to Child Safety Products, Walla Walla, Wash.

Filed Apr. 25, 1988, Ser. No. 185,886
Int. Cl.[4] B65D *55/02*
U.S. Cl. 206—1.5 5 Claims



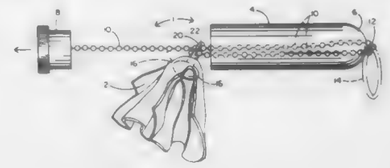
1. A child proof container comprising:
- (a) wall structure defining a receptacle and an access opening,
- (b) a closure member for the receptacle configured and dimensioned for mounting across the opening,
- (c) a finger-entry opening in the closure member, and
- (d) finger operated latch means latchably interconnecting the closure member and the wall structure,
- (e) the latch means being positioned apart from the opening by a spaced distance predetermined to prevent latch operation by individuals with short fingers,
- (f) the latch means comprising a striker and a keeper, and mounting means for mounting one of them adjustably in a selected position toward or away from the opening as required to adjust the spaced distance therebetween to the finger length of the authorized operator.

4,854,449

CONTAINER IN WHICH TO CARRY A REUSABLE LENS CLEANING MATERIAL

Michael A. Fitzhugh, 1089 Vallejo Cir., Costa Mesa, Calif. 92627

Filed Jul. 29, 1988, Ser. No. 225,739
Int. Cl.[4] A45C *11/00*
U.S. Cl. 206—37 15 Claims



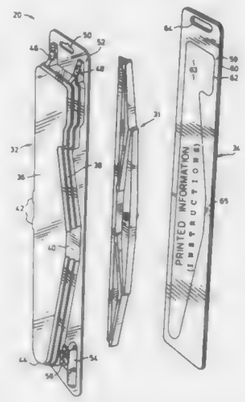
1. A container in which a lens cleaning material is to be carried, said container comprising a hollow housing having an open end, an end plug detachably secured across the open end of said housing, a lens cleaning material removably received within said container housing, and linking means by which to link said lens cleaning material to said end plug, such that said material is removed, but not separated, from said housing at the same time that said end plug is detached from the open end of and removed from said housing.

4,854,450

BLISTER PACKAGE

Brian A. Fisher, Burlington, Canada, assignor to Tridon Limited, Oakville, Canada

Filed Apr. 22, 1987, Ser. No. 41,063
Claims priority, application Canada, Apr. 24, 1986, 507541
Int. Cl.[4] B65D *73/00*
U.S. Cl. 206—469 16 Claims



1. A package for displaying a product, the packaging comprising:
- a transparent blister defining a main cavity for containing the product and a peripheral flange lying in a plane about the cavity;
- a laminated substrate proportioned so that the blister and the substrate have substantially coextensive peripheries, the substrate being readily delaminated and having a first layer attached permanently to the flange and defining an

inner surface, and a second layer defining an outer surface, the inner surface of the first layer having an area in registration with the cavity and printed with information to be retained for use by a purchaser after opening the package and a score line penetrating the first layer at the edge of said area, and the outer surface being uninterrupted and carrying promotional information, so that on opening the package by delamination, the substrate will separate about said area by delamination and the score line will interrupt the delamination leaving the area attached to the second layer and available intact for the user to inspect the printed information on said area.

9. A package for displaying a product, the package comprising:

a transparent blister defining a main cavity for containing the product and a peripheral flange lying in a plane about the cavity;

a laminated substrate proportioned so that the blister and the substrate have substantially coextensive peripheries, the substrate being readily delaminated and having a first layer attached permanently to the flange and defining an inner surface, and a second layer, defining an outer surface, the inner surface of the first layer having an area in registration with the cavity and printed with information to be retained for use by a purchaser after opening the package and a score line penetrating the first layer at the edge of said area, and the outer surface being uninterrupted and carrying promotional information, so that on opening the package by delamination, the substrate will separate about said area by delamination and the score line will interrupt the delamination leaving the area attached to the second layer and available intact for the user to inspect the printed information on said area;

a header made up of portions of the flange and the substrate, the header defining an opening for suspending the package from the projection engaged through the opening, and the main cavity including two buttresses spaced apart and extending to the header at either side of the opening to rigidify the header against bending forces.

15. A package for displaying a product, the package comprising:

a transparent blister defining a main cavity for containing the product and a flange lying in a plane about the product and defining side edges of which at least two edges converge to define a first corner; and

a substrate attached to the blister at the flange and having side edges in registration with the corresponding side edges of the blister, the substrate having a second corner corresponding to the first corner defined by converging side edges of the substrate, the second corner being dimensioned so that at this corner of the package, the blister extends outwardly beyond the substrate a distance sufficient to protect the substrate against forces which would tend to damage the substrate and thereby detract from the appearance of the package.

4,854,451

APPARATUS FOR THE MANUFACTURE OF BLOCK-SEALED SIDE-GUSSETTED BAGS

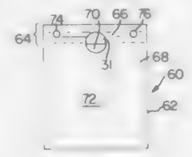
Harold A. Jensen, 31 Annadea Rd., Brockton, Mass. 02402

Division of Ser. No. 942,605, Dec. 17, 1986, Pat. No. 4,767,391. This application Aug. 4, 1988, Ser. No. 229,159
Int. Cl.[4] B65D *1/34*
U.S. Cl. 206—554 **7 Claims**

1. A bundle of bags arranged in facing relationship which comprises:

a plurality of bags each of the bags being a side-gussetted bag and having an upper portion, the upper portions of said bags joined one to the other each bag having a first outer side and a second facing side;

release lines formed in the sides intermediate the upper portions and the bottom of the bag;



an opening formed in the outer side of each bag and a tab corresponding to the size of the opening joined to the upper portion at the seal line.

4,854,452

BILL RECEIVING, DISCRIMINATING, AND DISPENSING MACHINE

Shinya Uchida, Chigasaki; Akira Hirata, Kawagoe; Hideyuki Ebihara, Tokyo; Eiichi Yoshikawa, Hasuda; Eisaku Sano, and Kazuhiro Uehara, both of Tokyo, Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1987, Ser. No. 113,237
Claims priority, application Japan, Oct. 27, 1986, 61-255441
Int. Cl.[4] B07C *5/34*
U.S. Cl. 209—534 **1 Claim**



1. A bill receiving and dispensing machine comprising:

bill discriminating means for discriminating bills;

transaction port means for respectively receiving bills from outside of the bill receiving and dispensing machine, bills discriminating by said bill discriminating means and fed from said bill discriminating means and bills to be dispensed, and temporarily storing the received bills, said transaction port means communicating with the outside of the bill receiving and dispensing machine and having a mechanism for feeding the bills received from outside of the bill receiving and dispensing machine;

said bill discriminating means discriminating whether the bills received from outside of the bill receiving and dispensing machine via said transaction port means are genuine and whether the denominations of the bills discriminated as genuine by said bill discriminating means and received from said transaction port means coincide with a predetermined bill denomination;

bill receiving route means for receiving bills fed from said bill discriminating means;

bill pooling means for receiving bills discriminated by said bill discriminating means as having the same denominations as the predetermined bill denomination and fed from said bill discriminating means via said bill receiving route means and temporarily pooling the bills therein, said bill pooling means being positioned elow said bill discriminating means and a center of the bill receiving and dispensing machine;

received bill containing means for receiving bills discriminated by said bill discriminating means as having denominations other than the predetermined bill denomination and fed from said bill discriminating means via said bill receiving route means and holding the bills therein, said receiving bill containing means being positioned just behind the back of a front door of the bill receiving and dispensing machine and in front of said bill pooling means;

said bill receiving route means connecting said bill discriminating means to said bill pooling means and said received bill containing means;

at least one dispensation bill containing means positioned below said bill pooling means and said received bill containing means, each of said at least one dispensation bill containing means holding bills having different denominations from each other and from the predetermined bill denomination and other than received through said transaction port means, said dispensation bill containing means being inclined toward said front door of the bill receiving and dispensing machine;

bill taking out means for taking out the bills from said bill pooling means and said dispensation bill containing means;

common route means for receiving bills from a plurality of route means;

bill dispensing route means for receiving the bills from said bill taking out means and feeding them to said common route means;

bill delivering means for feeding bills to said transaction port means;

said common route means connected to said bill discriminating means and said bill dispensing route means for feeding the bills received from said bill discriminating means and said bill dispensing route means to said bill delivering means; and

said bill delivering means receiving the bills from said common route means and temporarily pooling the bills to feed the bills to said transaction port means.

4,854,453

ARTICLE SELECTING AND CONVEYING SYSTEM

Yutaka Ueda, Nara, and Masaharu Kiriake, Kyoto, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Division of Ser. No. 557,068, Dec. 2, 1983, Pat. No. 4,681,231. This application Jul. 20, 1987, Ser. No. 75,597
Claims priority, application Japan, Dec. 8, 1982, 57-186217; Rep. of Korea, May 25, 1983, 83262/83
Int. Cl.[4] B07C *5/36*
U.S. Cl. 209—583 **4 Claims**

2. A cop selecting and conveying apparatus in a system having a plurality of spinning frames, an automatic winder divided into a plurality of winding sections for winding up different kinds of cops at each winding section, a cop supplying passage connecting the spinning frames and the winder for conveying carriers on which different kinds of cops fed from the spinning frames are placed, and an ejecting passage for conveying carriers ejected from the winder to the spinning frame, said cop selecting and conveying apparatus comprising:

a conveying passage,

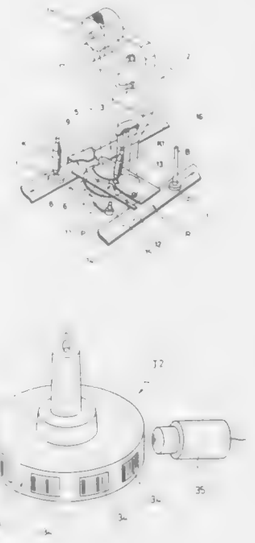
a carrier configured to be transferred on the conveying passage, said carrier comprising:

a base having an outer circumference,

a platform disposed on the base, and

a substantially upright peg positioned adjacent the center of the platform and configured to fit a cop thereon so that the cop and the carrier are conveyed together between the winder and the spinning frame,

a cop discriminating mark comprising at least one bar code label positioned on the outer circumference of said base, and



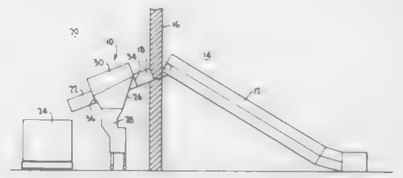
a sensor disposed adjacent the conveying passage for detecting the discriminating mark.

4,854,454

APPARATUS AND METHOD FOR SEGREGATING PARTS

Larry C. Dahlby, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 13,085, Feb. 10, 1987, Pat. No. 4,752,007, which is a continuation-in-part of Ser. No. 821,661, Jan. 23, 1986, Pat. No. 4,676,380. This application Mar. 3, 1988, Ser. No. 163,914
Int. Cl.[4] B07C *5/04*
U.S. Cl. 209—616 **3 Claims**



1. An apparatus for segregating artivcles of predetermined dimensions from a jumbled flow of such articles and unwanted pieces longer than said predetermined dimensions, comprising:

path means, including a chute having a cylindrical inside surface defining a lateral opening therethrough, for restricting the jumbled flow to a fixed flow space along a flow length, the cylindrical surface defining the fixed flow space, the fixed flow space being inclined for gravity flow therethrough;

a three-dimensional array of pickup fingers substantially filling the fixed flow space and extending therebeyond, distal end portions of said pickup fingers being spaced apart by distances greater than the predetermined dimensions of the articles, the distal end portions of the pickup

fingers being so disposed in the chute as to contact both the articles and the unwanted pieces passing therethrough;
retaining means overlying a portion of the cylindrical surface and biased thereagainst;
means to continuously move successive distal portions of the pickup finger array out of and into the fixed flow space, for selectively picking up and removing the unwanted pieces from the cylindrical inside surface of the chute and thereby urging the unwanted pieces along and retaining them between the retaining means and the cylindrical surface; and stationary means so located along the flow length as to be disposed between the adjacent pickup fingers and extending from the fixed flow space laterally to a position adjacent thereto, for receiving the unwanted pieces from the pickup-finger array thereby stripping the unwanted pieces from said pickup fingers during pickup-finger array movement, the stationary stripping means extending through the cylindrical surface lateral opening.

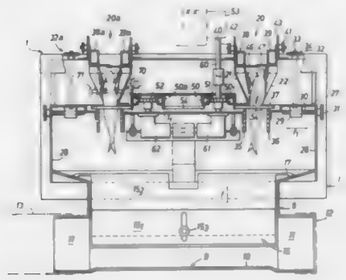
4,854,455

MACHINE FOR GRADING AND SORTING FISH, IN PARTICULAR FISH FROM THE SALMONIDAE FAMILY

Claude Faivre, Baume Les Dames, France, assignor to Société à Responsabilité Limitée: Etablissements Faivre, Baume Les Dames, France

Filed Dec. 15, 1987, Ser. No. 133,382
Claims priority, application France, Dec. 15, 1986, 86 17702
Int. Cl.[4] B07B *13/07*
U.S. Cl. 209—678 **9 Claims**





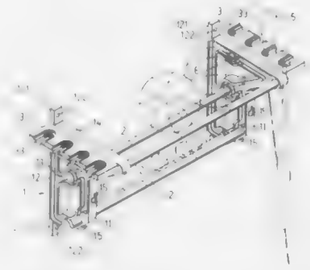
1. A machine for grading and sorting fish comprising:
(a) a frame including an upper part and a lower part;
(b) an elongate tank supported at the lower part of the frame, the tank being defined by a plurality of successive transversal compartments along the longitudinal axis of the tank, each compartment being provided with an outlet tube;
(c) at least one longitudinal grading channel disposed at the upper part of the frame, the channel including a passage section for advancing the fish along a given direction, an upper portion, an open lower end in communication with the compartments, sloping side walls for causing displacement of the fish with their tails directed downwardly through the open lower end, an adjustable cross-section which increases in the given direction, means for spraying fluid on the fish, and overlapping plates for closing off the upper portion to prevent the fish from jumping vertically therethrough;
(d) a supply tank for supplying live fish to be graded and sorted, one end of the channel being in communication with the supply tank for receiving live fish therefrom; and
(e) an endless conveyor belt associated with the channel and including a plurality of thrust bars, the thrust bars being caused to successively arrive in transversal position along the length of the passage section for advancing fish therethrough in the given direction.

4,854,456

RACK STRUCTURE FOR BALLS AND RELATED EQUIPMENT

Juang J. Lee, 6F-1, 49, Sec. 2, Chang An E. Rd., Taipei, Taiwan

Filed Aug. 10, 1988, Ser. No. 230,755
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—14 **6 Claims**



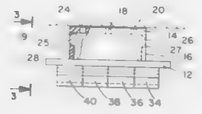
1. A rack structure for balls and related equipment comprising:
two frame plates having a wide upper portion and a narrow lower portion, a front side of each said frame plate having an indented edge with a plurality of stepped indentations, and being connected together with a rear side of each said frame plate, and a supporting arm attached to and extending between said front side and said rear side;
means for forming a variety of different storage spaces including a plurality of rod-inserting holes of the same diameter defined in said lower portion, in said supporting arm, and in said upper portion, collectively, of each said frame plate, and a plurality of horizontal rods, each one of said plurality of horizontal rods including a plurality of sections detachably assembled together, and the diameter of each one of said plurality of horizontal rods being substantially the same as the diameter of said plurality of rod-inserting holes in said two frame plates for mating therewith, one of the variety of different storage spaces being bounded by a wall, a first horizontal rod, and a second horizontal rod which is spaced horizontally and vertically away from said first horizontal rod;
two side plates being fixedly inserted into the outside of said upper portions of said two frame plates respectively, and a plurality of rigid slots defined in each one of said two side plates;
a plurality of detachable hooks, each one of said plurality of detachable hooks having two spaced opposed ends, a hook portion at each one of said spaced opposed ends of each one of said plurality of detachable hooks, each said hook portion being symmetrical to the other one of said hook portions, and each one of said plurality of detachable hooks being detachably attached to one of said plurality of horizontal rods by one of said hook portions of said plurality of detachable hooks and the other one of said hook portions being free for hanging something thereon; and
wherein, each one of said plurality of horizontal rods after being assembled from said plurality of sections is inserted into respective ones of said plurality of rod-inserting holes to form said rack structure with a required space, said rack structure then being fixedly attachable to the wall at a suitable height, and then said rack structure being complete for use.

4,854,457

HYGIENIC TOOTHBRUSH HOLDER

Robert Perler, 25 Lockwood Ave., New Rochelle, N.Y. 10801

Filed Oct. 20, 1987, Ser. No. 110,411
Int. Cl.[4] A47B *81/02*
U.S. Cl. 211—65 **9 Claims**



1. A toothbrush holder, comprising:
(a) first holding means for supporting a respective dental utensil with bristles mounted vertical to the length of the utensil in a utensil base, said utensil being supported in a bristles down orientation whereby said bristles are oriented to drain liquid away from said utensil base;
(b) base means for supporting said first holding means;
(c) securing means for mounting said base means to a surface, said securing means comprising:
(i) attachment means for attaching to a wall;
(ii) engagement means secured to said attachment means; and
(iii) mating engagement means secured to said base means and mating with said engagement means; and
(d) second holding means for supporting a second dental utensil in bristles down orientation, said first and second holding means being positioned to allow said bristles to drain over different areas when a dental utensil is in each of said first and second holding means, said first and second holding means being resilient clips, each of said clips comprising a pair of resilient arms spaced from each other a distance substantially equal to the thickness of the shank of the handle of a dental utensil to be held, the extremities of said arms being closer to each other than said thickness,
(e) wherein said engagement means is a hole and said mating engagement means is a resiliently mounted stud.

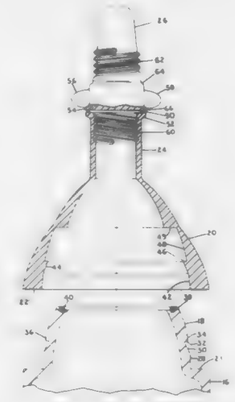
4,854,458

RECLOSABLE TAMPER-PROOF SPECIMEN BOTTLE

Dennis J. Differ, Rte. 6, Box 374, Fort Payne, Ala. 35967

Filed Aug. 30, 1988, Ser. No. 238,623
Int. Cl.[4] B65D *41/48*
U.S. Cl. 215—253 **11 Claims**

1. A tamper-proof closure system for a fluid sampling container or the like, said system comprising an annular open dome formed at the upper end of said container, said dome having interior and exterior peripheral surfaces, a first annular detent disposed about the exterior peripheral surface of said dome, a closure member comprising a lower hollow dome shaped portion including a peripheral rim adapted for disposition about the dome of said container and an interior wall surface having substantially the same configuration as the exterior surface of the dome of said container for abutting therewith when said closure member is disposed on said container, a second annular detent disposed about said interior wall surface, said second annular detent being a mirror image of said first annular detent for interlocking therewith when the closure member is forcibly urged into abutment with the dome of said container to seal said container, said closure member having an elongated hollow neck extending from the dome of said closure member, a cap, frangible wall means connecting said cap to said neck for permitting breaking-away of said cap from said neck to remove said fluid from said container through said neck subsequent to closing of said container, said neck adjacent said frangible wall means having first connecting



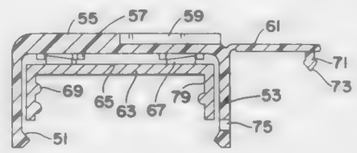
means disposed about the interior periphery thereof, and said cap having second connecting means disposed about the exterior periphery thereof, said second connecting means being receivable within said neck subsequent to breaking-away of said cap therefrom for cooperating with said first connecting means to reclose said container.

4,854,459

CONVERTIBLE CHILDPROOF/NON-CHILDPROOF CAP AND CONTAINER

Antonia R. DeJonge, Clinton Township, Hunterdon County, N.J., assignor to Primary Delivery Systems, Inc., Annandale, N.J.

Filed Nov. 18, 1988, Ser. No. 272,814
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—220 **15 Claims**



1. A container and a cap therefor which is generally childproof, which comprises:
(a) a container having a cylindrical neck at the top and threads molded about the exterior of said neck;
(b) an inner cap having a top and a cylindrical sidewall, having threads molded about the interior of said sidewall to interlock or mate with the threads of said container, said inner cap having ratchet type segments located on its exterior; and
(c) an outer cap having a top and a cylindrical sidewall, said top having ratchet type segments located on its interior so as to be engageable with the ratchet type segments of said inner cap, said outer cap being of a sidewall height greater than the inner caps, said outer cap being located and fitted loosely about the inner cap, said outer cap having an

opening in said sidewall at a level near the bottom of the sidewall of said inner cap, said outer cap also having integrally attached thereto a flexible connector and a stop located so as to permit the stop to be inserted into said opening and push up said inner cap to lock it into a position wherein the inner cap and outer cap ratchet type segments are engaged and the outer cap can no longer be freely rotatable about the inner cap, thus,

(i) being a childproof container and cap when said stop is not inserted due to the free rotation of the outer cap about the inner cap except when the outer cap is pushed down onto the inner cap and simultaneously rotated; and,

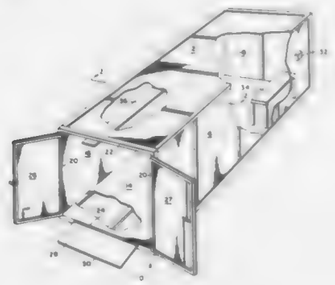
(ii) being a non-childproof container and cap when the stop is inserted into the opening to lock the inner cap and outer cap into a ratchet type segment engaged position.

4,854,460

PORTABLE STORAGE CONTAINER WITH INTEGRAL RAMP

Charles R. Josephs, Fort Worth, Tex., assignor to Rent-A-Vault, Inc., Fort Worth, Tex.

Filed Feb. 12, 1988, Ser. No. 155,305
Int. Cl.[4] B65D *19/00*
U.S. Cl. 220—1.5 8 Claims



1. A portable storge container, comprising:

a plurality of walls, including a top wall, a bottom wall, two side walls and an end wall, said walls defining an oblong, rectilinear, unitary enclosure having two rectangular ends, with said enclosure being closed at one said end and open at the other said end, and said enclosure being freely supported on an underlying stationary surface by said bottom wall;

said open end being defined by horizontal upper and lower edges and two vertical side edges;

a pair of rectangular doors hingedly connected to said side edges such that said doors are pivotable about vertical axes between open and closed positions, said doors being of substantially equal width and height;

said doors in said closed position having upper edges closely spaced with said upper edge of said open end, lower edges closely spaced with said lower edge of said open end, outer edges closely spaced with said side edges of said open end, and inner edges closely spaced to one another, such that said doors substantially entirely seal said open end when in their said closed positions; and

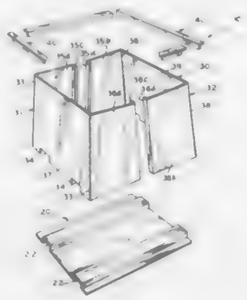
a rectangular ramp hingedly connected to said lower edge of said open end for movements between a stowed, upright position and a lowered position, said ramp in said raised position being substantially adjacent to and supported by said doors when in their said closed positions, and said ramp having an outer edge being substantially adjacent to said stationary surface when said ramp is in said lowered position wherein the inner edge of the ramp is substantially flush with an inner floor surface of the container when the ramp is in its lower position; further comprising means for locking the doors in their closed position; said locking means includes outside lock means for locking and unlocking a first one of said two doors to be enclosure from the exterior thereof and inside lock means operable from the interior of said enclosure for locking and unlocking the second one of said doors to said enclosure from the interior thereof; said outside lock means inludes at least a first lock bar slidably mounted to the interior of said first door for movements between extended and retracted positions, and walls defining an opening in said enclosure registered with said lock bar for receiving said first lock bar in its said extended position, and a handle movably mounted to the exterior of said first door and connected to said first lock bar is movable between said extended and said retracted positions by movement of said handle; and means for guarding the means for locking, said means for guarding including a partial enclosure for the means for locking fixed to an external surface of one of the doors.

4,854,461

STORAGE BOX

Aaron E. Daniel, Nampa, and Daniel P. Rule, Caldwell, both of Id., assignors to Rule Steel Tanks, Inc., Caldwell, Id.

Filed Nov. 21, 1988, Ser. No. 273,833
Int. Cl.[4] B65D *6/00*
U.S. Cl. 220—4 R 11 Claims



9. A storage box comprising:

a base member constructed of sheet steel;

two unitary sections constructed of sheet steel, each of said sections being folded to define an end wall tapered from bottom to top and two portions of opposing, laterally spaced side walls, tapered from bottom to top; said portions of said side walls of one section welded to portions of said side walls of another section and said endwalls and side walls welded to said base member to define a box having four walls tapered from bottom to top; and

a stacking flange affixed to and about the upper periphery of said walls.

4,854,462

TANK CONTAINER

Helmut Gerhard, Weitefeld, Fed. Rep. of Germany, assignor to Westerwaelder Eisenwerk Gerhard GmbH., Weitefeld, Fed. Rep. of Germany

Filed Mar. 30, 1988, Ser. No. 175,301
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1987, 8704690[U]
Int. Cl.[4] B65D *88/06*
U.S. Cl. 220—5 A 20 Claims

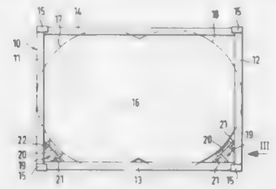
1. A tank container comprising

a tank having an envelope formed of a plurality of interconnected part cylindrical shells extending with parallel axes,

first end frame means at a first axial end of the tank, said first end frame means including a first corner upright and a first transverse interconnected with one another to form a first corner frame support,

a first saddle structure means connecting the first corner frame support to the tank, said first saddle structure means including:

a U-bar formed with two U-bar legs interconnected by a U-bar web, said U-bar extending substantially parallel to



the tank shell axes and having end edges of its legs attached to a respective shell with its U-bar web spaced from the shell and inclined with respect to the first corner upright, and

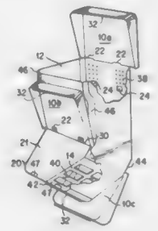
first and second L-bars which each have a pair of legs extending outwardly from a common apex, said first L-bar being attached to the U-bar at one of its legs and being attached to the first transverse at both of its legs, said second L-bar being attached to the U-bar at one of its legs and being attached to the first upright at both of its legs.

4,854,463

POTATOE DRAWER

Michel L. Cyr, 1228, L'Achigan Nord, L'Epiphanie, Canada J0K 1J0

Filed Oct. 7, 1987, Ser. No. 105,208
Int. Cl.[4] B65D *85/52, 51/04*
U.S. Cl. 220—18 8 Claims



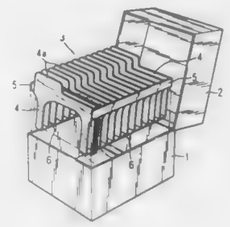
1. A generally upright container for storing and dispensing potatoes and the like having a substantially rectangular cross-section, the said container having a front and a rear face, said rear face having means for hanging the container on a wall, the said container having a substantially horizontal opening at its upper end and a first hinged cover for closing said horizontal opening, a bottom opening at the lower end of said container said bottom opening being forwardly slanted, a screen extending across said bottom opening, said screen having large apertures, a second cover for closing said bottom opening, said second cover being hingingly mounted adjacent said rear face, an apron extending upwardly and forwardly from said screen for defining a forwardly slanted front opening with the front face of the container, said front opening giving access to said screen and vertically located above the front part of said screen, a third cover hingingly mounted about said front face for closing said front opening projects forwardly and downwardly, whereby the potatoes introduced in the upper opening falls on the screen and are adapted to roll below the front opening.

4,854,464

PHOTOGRAPH KEEPING BOX

Hae J. Kim, Seoul, Rep. of Korea, assignor to KMB Industries, Corp., Kyunggi-Do, Rep. of Korea

Filed Dec. 23, 1987, Ser. No. 137,254
Claims priority, application Rep. of Korea, Jan. 13, 1987, 292/1987
Int. Cl.[4] B65D *1/36, 25/04, 85/30*
U.S. Cl. 220—22 3 Claims



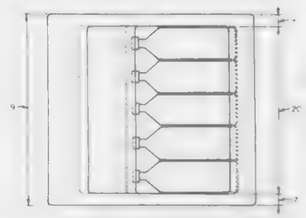
1. A box for keeping photographs comprising a hexahedral body having an opened top, a lid pivotally connected to the body, and an inner case mounted in the body, said inner case comprising a plurality of partition plates arranged side by side at a predetermined angle, side plates attached to opposite sides of said partition plates to securely maintain the plates in their spaced and inclined conditions, and base plates attached in parallel with each other to undersides of said partition plates to further enhance a structural steadiness of said inner case and to support the photographs, each of said partition plates having at its upper side a raised portion.

4,854,465

CONTAINER HAVING DEPRESSION FOR CONFINING SMALLER CONTAINERS

Dann M. Reilly, 523 Chinoe Rd., Lexington, Ky. 40502, and Robert H. Wiedo, 1251 Harry Wise Rd., Lawrenceburg, Ky. 40342

Filed Jul. 27, 1987, Ser. No. 48,417
Int. Cl.[4] B65D *21/02, 81/36;* B65B *39/00*
U.S. Cl. 220—23.4 1 Claim



1. A one-piece, semi-rigid self-supporting container which includes a bottom wall and surrounding side walls, said bottom and side walls being hollow, said container having a depression formed by the upper surface of said bottom wall and the interior surfaces of said side walls, said depression being configured to provide confinement for at least one smaller container, said depression having projections formed by said interior surfaces, said projections overlying said bottom wall and dimensioned to engagingly confine said at least one smaller

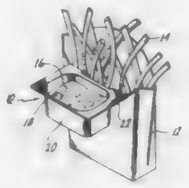
container beneath said projections and within said depression, but allowing manipulative disengagement of said at least one smaller container therefrom, said depression being sloped toward a sealable hole therein, said hole accessing the hollow interior of the one-piece container.

4,854,466

HANGING PACKAGING CUP

William A. Lane, Jr., P.O. Box 2345, Lake Arrowhead, Calif. 92352

Filed Feb. 12, 1988, Ser. No. 155,563
Int. Cl.[4] B65D *17/28*; B65B *61/14*
U.S. Cl. 220—23.83 19 Claims



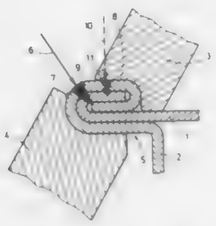
1. A hanging packaging cup which comprises:
a resilient body having a product reservoir and a lip integrally formed together, said reservoir having a periphery surrounding an opening into said reservoir and said lip formed as a continuous essentially planar flange extending from the periphery of said reservoir;
a lid for sealing said reservoir, said lid covering said reservoir opening and sealed to said lip around the totality of said periphery of said reservoir; and
at least a portion of said lip formed as a first support finger, a portion of said support finger disjoined from said lip along at least one elongated slit between said lip and said support finger and a remaining portion of said support finger joined to said lip along a connecting area between said support finger and said lip, said support finger bendable with respect to said lip about said connecting area so as to locate said support finger at an angle to the plane of said lip.

4,854,467

CONTAINER OF SHEET METAL

Bernd Büdenbender, Schubertweg 5, 2160 Stade, Fed. Rep. of Germany

Filed Feb. 26, 1988, Ser. No. 161,160
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706916; Jan. 24, 1988, 3802000
Int. Cl.[4] B65D *8/20*
U.S. Cl. 220—67 10 Claims



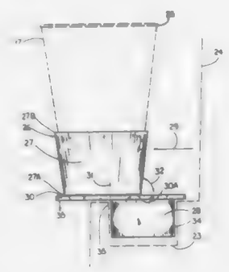
1. A container of sheet metal including a side wall and an end wall extending transversely the side wall, the side wall and the end wall having rim portions and an edge extending along each said rim portion, the rim portions being connected by means of a fold, the fold including an outer, exposed fold surface on said rim portion of one of said side wall and end wall and formed by an outer layer of said fold with an inner layer within said fold formed by the other one of said side wall and end wall and in surface contact with said outer layer, the edges of said side wall and end wall located within said fold, a pair of spaced apart circular arcs formed in said fold by said outer and inner layers and spaced from said edges, and comprising a first circular arc and a second circular arc spaced apart along the outer, exposed fold surface with said first circular arc located closer to the edge of said outer layer, said fold being additionally reinforced, and said outer and inner layers being secured and sealed by a welding seam, the welding seam being arranged along the outer, exposed fold surface and extending within the fold from the outer layer to the inner layer where said outer and inner layers are in surface contact, and said welding seam being spaced from said edge of said side and end walls.

4,854,468

CUPHOLDER ADAPTIVE DEVICE

Charles W. Dahlquist, II, 10312 S. Vilas Dr., and Vaughn N. North, 2486 E. 10375 S., both of Sandy, Utah 84092

Filed Apr. 14, 1987, Ser. No. 38,220
Int. Cl.[4] B65D *90/12*
U.S. Cl. 220—85 H 10 Claims



1. A device for stabilizing and supporting a cup of large base diameter over a cup-holder recess having a smaller diameter than the base of the cup, said device comprising:
a tubular support base having a diameter slightly smaller than the diameter of the cup-holder recess and having an axis with axial length of at least approximately one half inch;
a truncated support cone having a top rim and smaller base rim, said base rim having a diameter greater in size than the tubular diameter, said support cone having an axis with axial length of at least approximately one inch;
a support plate coupled at one side to a top rim of the tubular support base, the remaining side of the support plate being coupled to the base rim of the truncated cone, said support plate being thereby disposed intermediate between the respective tubular support base and truncated cone;
the axes of the respective support cone and tubular support base being in offset but parallel vertical alignment.

4,854,[illegible]

POLLUTION CONTROL APPARATUS FOR MARINE FUEL TANKS

Thomas S. Hargest, P.O. Box 21118, Charleston, S.C. 29413

Filed Oct. 3, 1988, Ser. No. 252,809
Int. Cl.[4] B65D *11/22*
U.S. Cl. 220—86 R 18 Claims

16. A fuel pollution control apparatus to be connected in fluid communication with the interior of a fuel tank chamber of a marine craft powered by an internal combustion engine, the apparatus comprising:
(a) means for housing fuel overflowing from said fuel tank chamber when said fuel tank is being filled past its capacity, said overflow fuel housing means including:
(i) a top wall, a bottom wall, and
(ii) a side wall connecting said top and bottom walls;
(b) means for conveying to said overflow fuel housing means fuel overflowing from said fuel tank chamber when said fuel tank is being filled past capacity, said conveying means including:
(i) at least one fuel inlet opening defined through said bottom wall,
(ii) a conduit having one end communicating with each said fuel inlet opening and having an opposite end communicating with an uppermost portion of said fuel tank chamber, and
(iii) a fuel inlet tube having one end connected to said fuel inlet opening and an opposite end being a free end disposed within said overflow fuel housing means at a predetermined height above said bottom wall of said overflow fuel housing means;
(c) means for returning to said fuel tank chamber liquid fuel overflowing from said fuel tank chamber when said fuel tank is being filled past capacity, said liquid fuel return means communicating with said overflow fuel housing means and with said fuel tank chamber, said liquid fuel return means including:
(i) a sloped floor disposed above said bottom wall of said overflow fuel housing means,
(ii) at least one liquid fuel outlet opening defined in said fuel inlet tube so as to be at the same level as said sloped floor in the vicinity nearest said fuel inlet tube, and



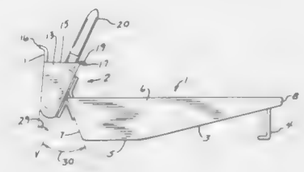
(iii) said floor being configured to slope toward each said liquid fuel outlet opening;
(d) means for venting to atmosphere volatile vapors from fuel being stored in said fuel tank, said fuel vapor venting means being connected to said overflow fuel housing means and being in communication with said fuel tank chamber, said fuel vapor venting means including at least one vapor opening defined in said top wall of said overflow fuel housing means, said vapor opening communicating with the atmosphere;
(e) means for preventing escape of liquid fuel from said overflow fuel housing means, said liquid fuel escape prevention means including:
(i) at least one separation baffle being disposed inside said overflow fuel housing means so as to physically separate the liquid fuel entering said overflow fuel housing means from each said vapor opening, said separation baffle having one end attached to said top wall of said overflow fuel housing means and extending downwardly towards said bottom wall until reaching approximately the height of the free end of said fuel inlet tube and extending downwardly towards said bottom wall and away from said liquid fuel outlet opening, and
(ii) a flow turning baffle being disposed within said overflow fuel housing means on the same side of said separation baffle as each said vapor opening, said flow turning baffle being configured to cause vapor to turn at least 180° before exiting through one of said vapor openings; and
(f) means for permitting visual observation of fuel overflowing from said fuel tank chamber and entering said overflow fuel housing means, said visual observation permitting means including a transparent section defined in said overflow fuel housing means and disposed therein to permit visual observation of fuel entering said overflow fuel housing means.

4,854,470

PAINT BRUSH HOLDER

Russ L. Ireland, 1335 N. 37th Place, Milwaukee, Wis. 53208

Filed Sep. 16, 1988, Ser. No. 245,043
Int. Cl.[4] B65D *25/00*
U.S. Cl. 220—90 6 Claims



1. A multipurpose painting aid for use as a paint brush holder attachable to a paint tray as well as a portable, self-supporting, hand holdable receptacle for paint and paint brushes independent of said paint tray, comprising:
an open top receptacle having a base, a front wall, a rear wall inclined at an acute angle with respect to said front wall, and opposite side walls interconnecting said front wall, rear wall and base to form said receptacle for holding a paint brush, each of said walls includes an upper edge to form said open top;
scraper means disposed at the upper edge of said rear wall for the removal of excess paint from a paint brush; and
bracket means on said rear wall for removably attaching said receptacle to a paint tray, said bracket means includes a pair of spaced apart legs projecting rearwardly from said rear wall and inclined at an acute angle with respect to said rear wall, said legs defining a tray-receiving slot therebetween for attaching said receptacle to a paint tray so that said scraper means extends above and over a paint tray, and said base and one of said legs being spaced apart sufficiently to support said receptacle in an upright manner when detached from a paint tray.

4,854,471

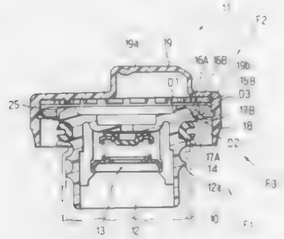
FUEL CAP

Joji Kasugai, Ichinomiya; Satoshi Toki, Inazawa, and Masayuki Ide, Toyota, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Sep. 30, 1988, Ser. No. 251,395
Claims priority, application Japan, Oct. 15, 1987, 62-260524
Int. Cl.[4] B65D *41/34*
U.S. Cl. 220—288 6 Claims

1. A fuel cap comprising;
(a) a cap body;
(b) a flange member projecting outward in radial direction on upper side of said cap body; and
(c) a weak portion being easily broken and provided at said flange member so as to enable separation of the flange member from the cap body, said weak portion being formed by a plurality of V-like grooves at upper surface side which are formed on the upper surface of the flange

member in concentric relation and a plurality of V-like grooves at lower surface side which are formed on the



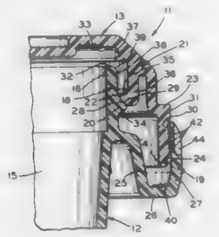
lower surface of the flange member in concentric relation and adjacent to the V-like grooves at upper surface side.

4,854,472

TAMPER RESISTANT WIDE MOUTH PACKAGE WITH DYNAMIC SEAL

Frank E. Semersky, Toledo, Ohio, assignor to Plastic Technologies, Inc., Toledo, Ohio

Filed Jun. 10, 1988, Ser. No. 204,752
Int. Cl.[4] B65D *41/18*
U.S. Cl. 220—306 13 Claims



1. A tamper resistant package comprising:
a container having a side wall defining an open end and a closed end wall attached to said side wall;
a closure formed of a flexible material and having a depending annular skirt adapted to securely fit onto said open end of said container;
a static seal defined by the abutment of a radially extending sealing surface formed on said side wall at said open end and a radially extending sealing surface formed on an inner surface of said closure;
cooperating means formed on an outer surface of said side wall and on said inner surface of said closure for retaining said closure on said container; and a dynamic seal defined by an outwardly facing annular sealing surface formed on said side wall and an inwardly extending annular lip formed on said inner surface of said closure.

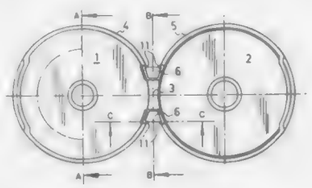
4,854,473

SINGLE-PIECE SNAP HINGE CLOSURE

Werner F. Dubach, Maur, Switzerland, assignor to Alfatechnic AG, Switzerland

Filed May 3, 1988, Ser. No. 189,787
Claims priority, application Switzerland, May 13, 1987, 01834/87
Int. Cl.[4] B65D *43/24*
U.S. Cl. 220—335 7 Claims

1. In a single-piece snap hinge closure having vertical casing walls with a generally rounded periphery of plastic comprising a lower part (1) and an upper part (2), each of which has one of said casing walls (4, 5), whereby both said casing walls (4, 5), in a closed condition of the hinge closure, matching vertically above one another, and whereby said lower part (1) is connected with said upper part (2) by means of at least one film hinge (3), and by means of two tension bands (6) positioned on each side of said at least one film hinge (3), in said closed condition of the hinge closure, said tension bands (6) are tensioned and are positioned in recesses (11) in said casing walls, the improvement comprising: said tension bands (6) being elastically stretchable and distally positioned on both sides of said at least one film hinge (3), and said tension bands (6) having a trapezoidal cross-sectional shape of approximately uniform thickness over an entire length of each said tension band (6).

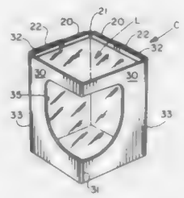


4,854,474

COMPOSITE DRINKING CUP

Lowell C. Murray, and Frederick Wyss, both of Fort Wayne, Ind., assignors to Container Corporation of America, Clayton, Mo.

Filed Sep. 22, 1988, Ser. No. 247,686
Int. Cl.[4] B65D *25/16, 5/46*
U.S. Cl. 220—462 15 Claims



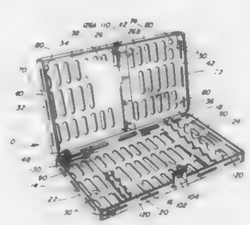
1. A collapsible, self-standing, liquid tight, partially transparent, disposable, drinking cup formed from a composite blank of plastic film and paperboard, comprising:
(a) pair of paperboard front and rear side wall members interconnected to form a tubular structure open at its upper and lower ends;
(b) a plastic film liner adhesively secured to inner surfaces of and extending between said side wall members to form a bottom wall member for closing the lower end of said structure;
(c) said side wall members having central portions spaced from each other and having side portions joined to each other to form with said bottom wall member a liquid receiving cavity;
(d) each of said side wall members including:
(i) a pair of major panels having inboard side edges foldably joined to each other and having outboard side edges;
(ii) minor panels foldably joined to the outboard side edges of said major panels;
(e) the minor panels of said rear side wall member being reverse folded to lie against rear surfaces of adjacent major panels of said rear side wall member;
(f) the minor panels of said front side wall member being folded around and adhesively secured to the respective minor and major panels of said rear side wall member;
(g) portions of said plastic film liner being adhesively secured to each other and being sandwiched between minor panels of respective side wall members.

4,854,475

INSTRUMENT CASSETTE

Roy Riihimaki, and Richard D'Amico, both of Libertyville, Ill., assignors to Hu-Friedy Manufacturing Co., Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 757,789, Jul. 22, 1985, abandoned. This application Feb. 22, 1988, Ser. No. 158,384
Int. Cl.[4] B65D *43/14*
U.S. Cl. 220—337 16 Claims



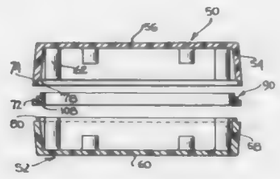
1. A cassette comprising:
a lower tray member and an upper cover member cooperating to form an enclosure;
a hinge mchanism for hinging said tray and cover members together for opening and closing rotative motion of said cover member relative to said tray member;
said hinge means including first J-shaped hinge means on at least one of said members and second hinge means on the other of said members arranged to be encircled by said first hinge means to prevent separation of said cover member from said tray member over a range of rotative cover member positions from fully closed to partially open relative to said tray; and to permit separation of said cover member from said tray member upon continued rotation of said cover member past said partially open position.

4,854,476

CONTAINER AND PERIMETER SEAL THEREFOR

Donald L. Serio, Jr., Fontana, Calif., assignor to Serco Mold, Inc., Covina, Calif.

Filed Jul. 25, 1988, Ser. No. 223,416
Int. Cl.[4] B65D *43/08*
U.S. Cl. 220—357 22 Claims



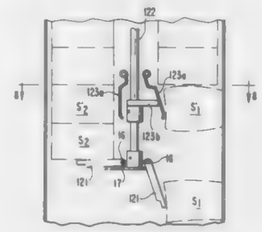
1. A multi-shelled container capable of use with a sealing member between the shells of the container or without the sealing member therebetween, said container comprising:
(a) a first shell having a first peripheral rim section,
(b) a second shell having a second peripheral rim section capable of being engaged with said first peripheral rim section when the first and second shells are connected together to form an enclosed interior chamber,
(c) a first outwardly struck peripheral flange on said first peripheral rim,
(d) a second outwardly struck peripheral flange on said second peripheral rim and being spaced apart from said first peripheral flange by a predetermined distance when said first and second container shells are connected together,
(e) a first surface on said first peripheral rim section adjacent said first flange and facing an edge of said second peripheral flange when said first and second shells are connected together, said first surface contacting an edge of said second flange when said shells are abutted together without a sealing member between the two shells,
(f) a second surface on said second peripheral rim section adjacent said second flange and facing an edge of the first peripheral flange when said first and second shells are connected together, said second surface contacting an edge of the first flange when said shells are abutted together without a sealing member therebetween, and
(g) a sealing member provided for optional use with said container and capable of being disposed between the first and second rim sections when the interior chamber is to be provided with a liquid tight seal, said sealing member having a predefined thickness to fit in the space between the first and second flanges when employed and to allow it to fit between and to be snugly engaged by the first surface and the edge of the second peripheral flange and also to be snugly engaged by the second surface and the edge of the first peripheral flange.

4,854,477

CONTROL DEVICE FOR A VENDING MACHINE DISPENSING MECHANISM

Akihito Kurosawa; Kazuyuki Suzuki; Osamu Anazawa, and Masayuki Yoshihara, all of Gunma, Japan, assignors to Sanden Corporation, Gunma, Japan

Continuation of Ser. No. 875,108, Jun. 17, 1986, abandoned. This application Nov. 25, 1987, Ser. No. 129,408
Claims priority, application Japan, Jun. 17, 1985, 60-90026[U]
Int. Cl.[4] G07F *11/10;* B65G *59/06*
U.S. Cl. 221—1 11 Claims



10. A method for dispensing goods from a dispense mechanism is response to a dispense request, said dispense mechanism including a rotating shaft, a flapper for dispensing goods which are stacked upon the flapper, the flapper being supported in a horizontal position by a control plate coupled to the rotating shaft when the control plate is in a support position such that goods are not dispensed, said flapper being free to pivot when the control plate is displaced a first predetermined angle from the support position such that goods may be dispensed, the method comprising the steps of:
(a) waiting to receive a dispense request and, thereafter, performing step b:
(b) rotating the control plate in a forward direction;
(c) monitoring the position of the shaft while the control plate is being rotated to determine whether the shaft rotates through a second predetermined angle within a predetermined time interval and, if so, discontinuing rota-

tion of the control plate, terminating the dispense operation and repeating step a and, if not, performing step d; and

(d) rotating the control plate in a reverse direction until the control plate is displaced the first predetermined angle from the support position and, thereafter, repeating step (b).

4,854,478

TABLET DISPENSER

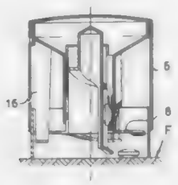
Gabor Gyimothy, Kilchberg, Switzerland, assignor to Alfatechnic AG, Switzerland

Filed Mar. 18, 1988, Ser. No. 170,174

Claims priority, application Switzerland, Mar. 20, 1987, 01081/87

Int. Cl.[4] B65D *83/04*

U.S. Cl. 221—190 **16 Claims**



1. A tablet dispenser with a tablet storage space, at least one tablet separating channel, and one tablet issuing mechanism positioned in a successively descending direction from one another, tablets to be dispensed moving under the influence of gravity, from the starting point in said tablet storage space to said tablet issuing mechanism, said tablet dispenser comprising: at least two portions secured to prevent rotation with respect to one another, said portions fitting into one another in a form-locking manner, capable of being moved relative to one another in the direction of the longitudinal axis; an upper portion located upwardly relative to the direction of discharge, said upper portion forming a funnel-shaped tablet supply space in its interior, a lower tubular extension of said funnel-shaped tablet supply space forming the outer of two concentric ring-shaped walls, a lower portion having an upstanding central column forming the inner of said ring-shaped walls, said two walls being relatively movable with respect to each other, said two ring s-shaped walls defining a tablet orienting space and said tablet separating channel, said tablet orienting space direction and orienting the tablets into said tablet separating channel, said inner concentric wall having a closed top forming a column, said column sliding in and out of said tablet supply space during the relative motion of said upper and lower portions.

4,854,479

ADJUSTABLE CUP DISPENSING ASSEMBLY

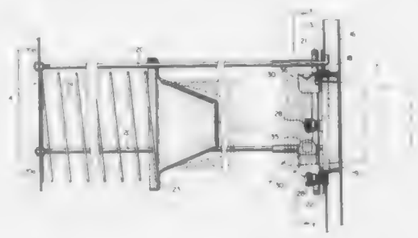
David T. Callahan, and Barry A. Moorefield, both of Lynchburg, Va., assignors to Allen-Morrison, Inc., Lynchburg, Va.

Filed Aug. 16, 1988, Ser. No. 232,685

Int. Cl.[4] A47F *1/08*

U.S. Cl. 221—304 **16 Claims**

13. A cup dispenser for dispensing a stacked array of cups comprising a housing for enclosing a plurality of cups arranged in a stack along an axis, the housing including a front wall member perpendicular to said axis having a discharge opening through which a bottom cup in the stack extends to be grasped and withdrawn through the discharge opening, a plurality of at least three parallel rods extending inwardly of the housing from said wall member parallel to said axis disposed in surrounding relation to the stack of cups, a pusher guided by said rods for engaging the stack of cups at the end of the stack opposite said discharge opening having associated spring means for urging the stack of cups toward the discharge opening, and an adjustable ring assembly inwardly adjacent said discharge opening for releasably restraining cups of different size, the ring assembly comprising a ring member having a plurality of slots therein coactive with and rotatably supported relative to a border portion of said front wall member bounding said discharge opening, and a plurality of finger members each having a mounting end portion pivoted about a pin extending from said a border portion and provided with a pin extending through selected slots of said ring member and



having holding end portions at an end of each finger member opposite the mounting end portion provided with holding formations for engaging the rim of the lowermost cup in said stack, and said selected slots extending in such direction that rotation of said ring member causes relative movement of the pins and slots through which they extend effecting caming movement of the holding end portions of the finger members toward and away from said axis, and manually operable means for releasably fastening the ring against movement relative to the associated border portion at positions to which it is circumferentially relatively adjusted.

4,854,480

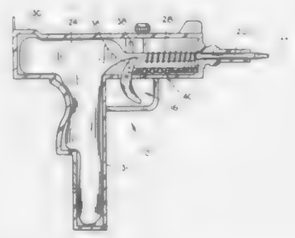
LONG RANGE TRIGGER-ACTUATED SQUIRT GUN

Robert S. Shindo, 4862 Grant St., Omaha, Nebr. 68104

Filed Jan. 4, 1988, Ser. No. 140,711

Int. Cl.[4] A63H *3/18;* **B65D** *37/00*

U.S. Cl. 222—79 **7 Claims**



1. A squirt gun, comprising:

a substantially housing having a hollow interior and a passageway communicating from said hollow interior to the exterior of the squirt gun;

said housing and hollow interior having an irregular shape of a gun having a barrel arranged forwardly of and generally parallel to a stock portion and a handle portion extending downwardly from said stock portion,

said passageway being located in said gun barrel;

an expandable elastomeric tube having an open end and a closed end, mounted within said housing, said tube being expandable from a normally collapsed tubular condition to an expanded condition substantially filling the irregularly shaped interior of said housing and expanding into the handle portion, the open end of said tube being mounted within said passageway for communication with the exterior of said aquirt gun; and

an operable trigger mounted on said housing and adapted for exterior actuation, said trigger having means for selectively restraining the flow of fluid from within said expandable tube.

4,854,481

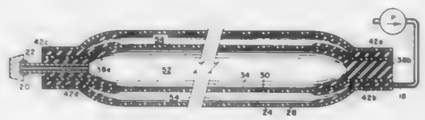
COLLAPSIBLE FLUID STORAGE RECEPTACLE

Aleck Bohl, Denver, and Leandro Valdez, Arvada, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed May 9, 1988, Ser. No. 191,317

Int. Cl.[4] B65D *35/16*

U.S. Cl. 222—94 **17 Claims**



1. A collapsible fluid storage receptacle comprising:

a generally cylindrical elastomeric reinforced inner bladder having a flattened ramped end portion and interior and exterior sidewalls, a substantial portion of the interior sidewall of the inner bladder defining an interior reservoir;

a generally cylindrical elastomeric reinforced outer casing having a pinched ramp-end and an interior sidewall that substantially surrounds the inner bladder, the flattened ramped end portion being interposed in the pinched ramp-end, a substantial portion of the exterior sidewall of the inner bladder and a substantial portion of the interior sidewall of the outer casing defining an outer reservoir;

means for permitting fluid communication between the interior reservoir and the exterior of the fluid storage receptacle; and

means for permitting fluid communication between the outer reservoir and the exterior of the fluid storage receptacle.

4,854,482

DISPENSING DEVICE FOR FLOWABLE MASSES

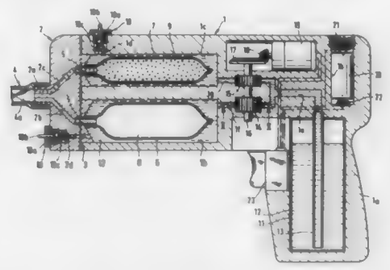
Arndt Bergner, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Feb. 23, 1988, Ser. No. 159,325

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1987, 3705741

Int. Cl.[4] B67D *5/52*

U.S. Cl. 222—94 **6 Claims**



1. Device for dispensing metered quantities of flowable multi-component masses, comprising means forming at least two separate closed chambers, a flexible bag containing a component of a multi-component mass positioned within each said chamber, a reservoir containing a fluid propellant, conduit means interconnecting said reservoir and said separate chambers, a device in communication with said conduit means for conveying the fluid propelant from the reservoir into the separate chambers for dispensing metered amounts of each of the components to an outlet where the components are mixed, said device for conveying the fluid propellant comprises pumps with a volumetric output, said conduit means comprises a separate conduit line for each of said chambers, and one said pump in each of said conduit lines for withdrawing fluid propellant from said reservoir and delivering the fluid propellant into said chambers, and said pumps in each of said conduit lines are coupled to one another.

4,854,483

PACKAGES FOR CARBONATED BEVERAGES

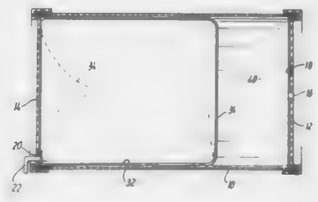
John A. Haggart, Rugby, England, assignor to Corrugated Products Limited, United Kingdom

Continuation-in-part of Ser. No. 831,472, Feb. 20, 1986, Pat. No. 4,771,918. This application Mar. 14, 1988, Ser. No. 167,365

Claims priority, application United Kingdom, Feb. 26, 1985, 8504930

Int. Cl.[4] B65D *37/00;* **G01F** *11/08;* **B67D** *5/08*

U.S. Cl. 222—95 **9 Claims**



1. A container for liquids comprising:

(a) a tubular outer casing;

(b) a bag for the liquid within the casing, said bag having a pouring tap which in use projects from the casing;

(c) end members for the casing, at least one of which end members is separable but fixed in use to the casing and has such dimensions that a filled bag may pass through the casing end closable by a separable end member; and

(d) a diaphragm of resilient material which is flat when undeformed and is fixed at or near said end of the casing and extends across the end of the casing to trap the bag between itself and the separable end member, the dimensions of the casing having a ratio of the area of the diaphragm when undeformed to the internal surface area of the casing of between 1:4 and 1:6 for exerting a pressure on the bag at all stages as the bag is emptied and returning substantially to its undeformed state when the bag is empty.

4,854,484

VISCOUS PRODUCT DISPENSER

James L. Gentile, Orange; Joseph P. LaRosa, Danbury, and Dean R. Rainey, Clinton, all of Conn., assignors to Chesebrough-Pond's Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 8,024, Jan. 28, 1987, abandoned. This application Jul. 27, 1987, Ser. No. 77,913

The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.

Int. Cl.[4] G01F *11/00;* **B67D** *5/40*

U.S. Cl. 222—256 **7 Claims**

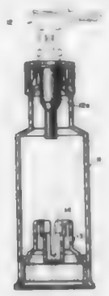
1. A dispenser for a highly viscous non flowable product which comprises:

(a) a generally tubular container body to hold the product;

(b) a liquid pump dispenser, at the upper portion of the container body, which comprises a hand depressible, spring-biased piston/cylinder pumping mechanism in a

housing having a product inlet section which extends at least partially into the interior of the container body; and

(c) a take-up piston at the lower portion of the container body which responds to discharge of product from the container body by shifting its position towards the upper end of the container so as to decrease the internal volume of the container body holding the product by an amount corresponding to the volume of product discharged, the take-up piston comprising:



(i) a depression in its upper surface into which at least a portion of the housing of the pump dispenser can fit when the take-up piston advances into the upper portion of the container body; and

(ii) transverse slot means communicating with the depression (i) and the side walls of the container body to allow any entrapped air to bleed off from the space within the container between the take-up piston and the housing of the pump dispenser.

4,854,485

PISTONS FOR PRESSURE-DISPENSING CONTAINERS

Malcolm G. Collins, Wantage, United Kingdom, assignor to Metal Box p.l.c., Reading, United Kingdom

Filed Nov. 9, 1987, Ser. No. 118,406

Claims priority, application United Kingdom, Nov. 12, 1986, 8626945

Int. Cl.[4] B67D *5/42*

U.S. Cl. 222—386 22 Claims



1. A thermoplastics piston for a pressure-dispensing container, which comprises a closure panel, and a tubular skirt which extends generally in a backward direction from integral attachment to the closure panel periphery and has an external surface which surrounds said integral attachment of said skirt with said closure panel in axial correspondence therewith and which is adapted to provide sealing and guidance for the piston by engagement with the bore of a said container in which said piston is received, wherein said closure panel has a central portion for receiving axially directed extrusion forces imposed on the piston for dispensing product from said container, and an annular portion connecting said central portion peripherally to said skirt, said central portion having a front face for contact with the product and being rigid so as to withstand said axially imposed extrusion forces and the resultant reaction forces of the product without any substantial distortion thereof, said annular portion having a dimension radially of said piston substantially less than the corresponding dimension of said central portion, and said annular portion being inclined and extending forwardly and outwardly towards said skirt so as to transmit the said extrusion forces to said skirt with a radially outward component by which said skirt may be expanded to bring its said external surface into sealing engagement with said container.

4,854,486

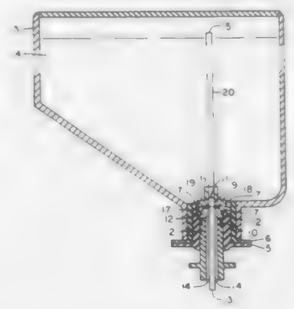
RESEALABLE CONTAINER FOR DISPENSING LIQUID

Richard J. Daley, Walpole, and Robert S. Potts, Sherborn, both of Mass., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.

Continuation of Ser. No. 48,280, May 11, 1987, abandoned. This application Jan. 5, 1989, Ser. No. 294,930

Int. Cl.[4] B67D *3/00*

U.S. Cl. 222—484 16 Claims



1. A seal assembly for a liquid delivery system positioned below the level of the liquid in a container, comprising an upper elastomeric member in contact with the liquid in a container, said upper elastomeric member having at least one liquid passage and at least one air passage separate from the liquid passage, and having means for preventing the liquid from entering the air passage; and a seating member disposed below and in contact with the upper elastomeric member, said seating member being configured to receive a dispensing probe, and having means to seal the liquid passage and means for engaging and retaining a dispensing probe within the seal assembly.

4,854,487

MOLTEN STEEL POURING NOZZLE

Mitsuru Ando, and Toshikazu Takasu, both of Gifu, Japan, assignors to Akechi Ceramics Co., Ltd., Gifu, Japan

Filed Dec. 5, 1988, Ser. No. 280,379

Claims priority, application Japan, Dec. 21, 1987, 62-193579

Int. Cl.[4] B22D *41/08*

U.S. Cl. 222—606 1 Claim

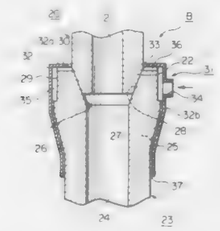
1. A molten steel pouring nozzle, comprising:

an upper nozzle (**20**) made of a refractory, having along the center axis thereof an upper bore (**21**), an upper end portion of said upper nozzle (**20**) inserted into an opening in a bottom wall of a molten steel receiving vessel;

a lower nozzle (**23**) made of a refractory, having along the center axis thereof a lower bore (**24**) aligning with said upper bore (**21**), and having, on an upper end portion (**25**) thereof, a recess (**26, 26'**) for receiving a lower end portion (**22**) of said upper nozzle (**20**), said lower bore (**24**) of said lower nozzle (**23**) forming a vertical path (**27**) for molten steel in cooperation with said upper bore (**21**) of said upper nozzle (**20**); and

an open air shutoff means (**31**) for preventing an open air from penetrating through an interface (**28, 28'**) between said lower end portion (**22**) of said upper nozzle (**20**) and said recess (**26, 26'**) of said lower nozzle (**23**) into said vertical path (**27**) for molten steel, said open air shutoff means comprising:

a steel shell (**32**) covering said upper end portion (**25**) of said lower nozzle (**23**), said steel shell having, at the center of an upper surface (**32***a*) thereof, an opening (**33**) having a size slightly larger than that of said recess (**26, 26'**) of said lower nozzle (**23**), for receiving said lower end portion (**22**) of said upper nozzle (**20**), and said steel shell (**32**) having, on a side surface (**32***b*) thereof, an inert gas feed port (**34**);



an annular equalizing chamber (**35**), provided between said upper end portion (**25**) of said lower nozzle (**23**) and said side surface (**32***b*) of said steel shell (**32**), over the entire circumference of said upper end portion (**25**) of said lower nozzle (**23**), said annular equalizing chamber communicating with said inert gas feed nozzle (**34**) of said steel shell (**32**); and

a plurality of grooves (**36**, **36***a*, **36***b*, **36***c*, **36***d*) formed at prescribed intervals in the circumferential direction of said lower nozzle (**23**) between an upper end surface (**30**) of said lower nozzle (**23**) and said upper surface (**32***a*) of said steel shell (**32**), said plurality of grooves being directed toward said lower end portion (**22**) of said upper nozzle (**20**), one end of each of said plurality of grooves communicating with said annular equalizing chamber (**35**), and the other end thereof communicating with said recess (**26, 26'**) of said lower nozzle (**23**).

4,854,488

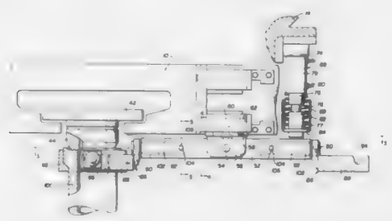
SHROUD TUBE SUPPORT AND CHANGING DEVICE

Charles Trenkle, and James B. Sears, Jr., both of Riverview, Mich., assignors to National Steel Corporation, Pittsburgh, Pa. and Gladwin Corporation, Taylor, Mich.

Filed Mar. 8, 1988, Ser. No. 165,283

Int. Cl.[4] B22D *37/00*

U.S. Cl. 222—607 15 Claims



1. An apparatus for use in a metal teeming operation in which molten metal is teemed through a throttle valve and shroud tube from a bottom opening in a teeming vessel into a receiving vessel positioned beneath the bottom opening, the throttle valve having a downwardly directed sealing surface and the shroud tube having an open top end terminating in an upwardly directed sealing surface for engaging and forming a seal with the downwardly directed sealing surface on the throttle valve, a shroud tube supporting and changing apparatus comprising:

coupling means mounted on the teeming vessel in laterally spaced relation to said bottom opening,

an elongated arm mounted on an supported by said coupling means, said coupling means including pivot means engaging and supporting said elongated arm at its midpoint for limited pivotal movement about a first generally horizontal axis and for free rotation about a generally vertical axis,

a pair of universal shroud tube supports mounted one on each end of said arm for movement therewith, said shroud tube supports each including means engaging and supporting a shroud tube adjacent its open top end and permitting limited free pivotal movement of the shroud tube about an axis parallel to said elongated arm and about a second generally horizontal axis extending generally perpendicular to said longitudinal arm whereby a shroud tube supported on one of said shroud tube supports may be rotated with said arm about said generally vertical axis to position the shroud tube beneath and in alignment with the bottom opening in the teeming vessel and pivoted with said elongated arm about said generally horizontal axis to engage the upwardly directed sealing surface on the shroud tube with the downwardly directed sealing surface on the throttle valve, and

power means mounted on said teeming vessel, said power means including means operable to engage said elongated arm to pivot said arm and a shroud tube supported thereon about said first horizontal axis in a direction to urge the sealing surfaces on the throttle valve and the shroud tube into sealing relation with one another when the shroud tube is positioned in axial alignment with the bottom opening in the teeming vessel, said universal shroud tube support permitting pivotal movement of the shroud tube to assure accurate sealing engagement between said upwardly directed and said downwardly directed sealing surfaces.

4,854,489

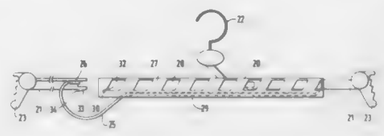
GARMENT HANGER

Anthony E. Radcliffe, Chorley, United Kingdom, assignor to Pendy Plastic Products Limited, United Kingdom

Filed Nov. 4, 1987, Ser. No. 117,284

Int. Cl.[4] A47G *25/44, 25/62*

U.S. Cl. 223—95 10 Claims



1. A garment hanger comprising:

a middle section with a hanging member mounted thereon;

two end sections with means for engaging a garment, at least one of the end sections being arranged for sliding telescopic movement relative to the middle section, between a retracted position and an extended position;

a single elastomeric band arranged to urge said slidable end section towards the extended position, a section of said elastomeric band extending from the vicinity of the end of the end section to the vicinity of the end of the middle section and back along the middle section towards the middle thereof; and

guide means around which the elastomeric band is guided in a non-linear path such that, as the end section is retracted, the material of the band slidingly moves around the guide means, along the length of the band, so that an increasing proportion of the material of the band extends between the one section and the middle section, thereby reducing the rate of increase of tension force to said end section towards the extended position.

4,854,490

AMMUNITION CARRIER

William J. Bieber, 21901 Adler Dr., California City, Calif. 93505

Filed Mar. 14, 1988, Ser. No. 167,521

Int. Cl.[4] A45F *3/02*

U.S. Cl. 224—202 **8 Claims**



1. An ammunition carrier for storing and dispensing cartridges associated with a rifle having a tubular magazine, comprising in combination:

a flexible tube formable into a loop for wearing over the shoulder and under an arm of a person and having a passage formed to slidably receive along the length thereof a quantity of the cartridges end to end, said tube being insertable at one end thereof in the muzzle end of the magazine for discharging the cartridges, said tube further including holes spaced from each other along said tube a distance corresponding to the space occupied by a selected maximum number of said cartridges to be dispensed at any one time;

a plurality of escapement means carried by said tube adjacent to selected ones of said holes, said escapement means including means removably projecting into said passage for selectively blocking and unblocking said passage thereat; and

connecting means connected to said tube for enabling the tube to be formed into said loop for carrying about the person and to be straightened for loading and unloading cartridges.

4,854,491

RIVETING

Udo-Henning Stoewer, Bremen, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Bermen, Fed. Rep. of Germany

Filed May 13, 1988, Ser. No. 194,420

Claims priority, application Fed. Rep. of Germany, May 13, 1987, 3715927

Int. Cl.[4] B21J *15/12*

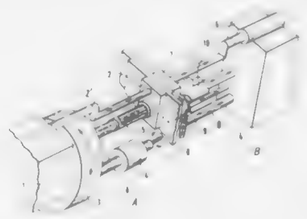
U.S. Cl. 227—58 **5 Claims**

1. Two component apparatus for drilling rivet bores in construction parts to be interconnected by riveting, comprising:

a first one of the two components including (i) a first guide structure, (ii) means for mounting, guiding and holding a first pressure plate in the first guide structure, (iii) drill means movably disposed in the guide structure; (iv) rivet pin holding and guiding means movably disposed in the first guide structure, such that the rivet pin can be aligned with a drilled bore as drilled by the drill means;

a second one of the two components including (i) a second guide structure; (ii) means for mounting, guiding, and holding a second pressure plate in the second guide structure (iii) a rivet pin holder; (iv) a closure ring or sleeve feeding, holding, and positioning device; (v) and a closure ring or sleeve setting device; and

the first and the second one of the components being mounted and positioned such that (a) the two pressure



plates are aligned whereupon (b) the rivet pin holder is aligned with the rivet pin holding means, through a bore as drilled by the drill means, and the closure ring or sleeve feeding device is alignable with the rivet pin holder as to holding of rivet pin in concentric relation to each other, and in concentric relation to the rivet ring a sleeve setting device.

4,854,492

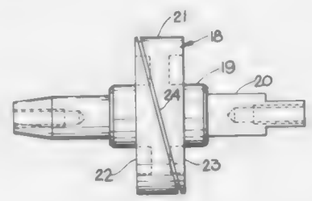
FLYWHEEL FOR AN ELECTROMECHANICAL FASTENER DRIVING TOOL

Robert B. Houck, and Arnold L. McGuffey, both of Cincinati, Ohio, assignors to Sencorp, Cincinnati, Ohio

Filed Oct. 14, 1988, Ser. No. 257,681

Int. Cl.[4] B25C *1/06*

U.S. Cl. 227—131 **26 Claims**



25. In an electromechanical fastener driving tool having a thin blade-like driver with first and second faces, an electrically driven flywheel with a peripheral working surface, said working surface of said flywheel being adjacent said first face of said driver, a support element said second face of said driver and means to cause engagement of said second driver face by said support means and to cause engagement of said first driver face by said flywheel working surface with a line contact therebetween to move said driver through a working stroke, the improvement comprising at least one groove formed in and extending along said working surface of said flywheel, said at least one groove traversing said line contact between said first driver face and said flywheel working surface to transversely wipe said first driver face during said working stroke.

4,854,493

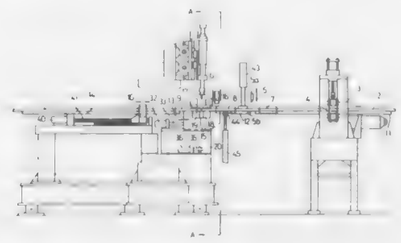
METHOD AND APPARATUS FOR CUTTING WELDING STEEL STRIPS

Mamoru Fujii, Kurashiki; Kazuo Noda, Kobe; Shoji Nagasaka, Kobe; Hiroshi Tajika, Kobe, and Koji Ono, Kobe, all of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Division of Ser. No. 92,913, Dec. 28, 1983. This application Dec. 13, 1988, Ser. No. 283,705

Int. Cl.[4] B23K *26/00, 26/02, 26/10*

U.S. Cl. 228—5.7 **4 Claims**



1. An apparatus for cutting and welding steel strips, comprising:

a work table provided in a continuous processing line, in which facing ends of preceding and succeeding steel strips are cut and the cut end surfaces are caused to abut as butt surfaces and welded along the butt line formed by the abutting, said work table being capable of being moved along the center line of said continuous processing line and provided on part of the surface with a back bar;

a welding torch provided on said work table, capable of being moved in a direction perpendicular to said center line and capable of being moved vertically toward and away from said back bar;

a revolving table for supporting said work table for revolution in part of said work table for revolution in part of said torch running line;

a cutting provided in said continuous processing line upstream said work table, for cutting said facing ends of said two steel strips along a line perpendicular or substantially perpendicular to said center line;

a feeder provided in said continuous processing line upstream of said cutting unit for feeding said steel strips to the downstream side;

at least one electromagnetic chuck provided on said work table and upstream of downstream of said torch running line, on which side said torch running line is not contained, for attracting and holding the facing end of one of said two steel strips; and raising means provided upstream said work table, for raising the facing end of said other steel strip toward the cut end surface of said facing end of said one steel strip attracted to and held on said work table by said electromagnetic chuck such that said cut end surface is directed obliquely and downwardly.

4,854,494

MONITORING BOND PARAMETERS DURING THE BONDING PROCESS

Klaus-Ulrich von Raben, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

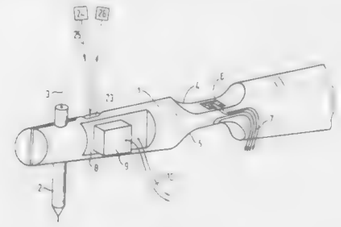
Filed Dec. 31, 1987, Ser. No. 140,122

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1987, 3701652

Int. Cl.[4] B23K *20/10*

U.S. Cl. 228—102 **15 Claims**

1. A method for continuous and simultaneous monitoring of bonding parameters of at least a bonding force and of an ultrasound amplitude during bonding processes with semi-automatic and fully automatic bonding machines, comprising the steps of: attaching at least two measuring devices on opposed sides of a bonding arm for acquiring a bonding force parameter, these measuring devices measuring a bending mode in the vertical direction of the bonding arm which is proportional to the bonding force; and providing a piezo-electric sensor for measuring ultrasound amplitude, said sensor attached to a lateral milled portion on the bonding arm and



producing an ultrasound signal; and supplying all measured values of the bending mode in the vertical direction and ultrasound amplitude to a means for data acquisition and evaluation after amplification of the measured values; and combining all the measured parameters to one single value which characterizes the bonding process and enables one to control the bonding machine.

4,854,495

SEALING STRUCTURE, METHOD OF SOLDERING AND PROCESS FOR PREPARING SEALING STRUCTURE

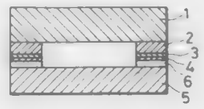
Akihiko Yamamoto; Akiomi Kohno; Toshihiri Yamada; Motohiro Satou; Keiji Taguchi, and Kazuaki Yokoi, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 18, 1987, Ser. No. 63,419

Claims priority, application Japan, Jun. 20, 1986, 61-143033; Jul. 15, 1986, 61-164612; Aug. 27, 1986, 61-198844

Int. Cl.[4] B23K *1/03*

U.S. Cl. 228—124 **31 Claims**



10. A method of soldering at least two members selected from the group consisting of ceramics and metals,

which comprises heat jointing aluminum and/or aluminum alloy to one of said two members, heat jointing a material selected from the group consisting of zinc, zinc alloy, magnesium, and magnesium alloy to the surface of said aluminum and/or aluminum alloy, and soldering the other member thereto.

4,854,496

POROUS METAL COATED IMPLANT AND METHOD FOR PRODUCING SAME

Clifford M. Bugle, Library, Pa., assignor to Dynamet, Inc., Washington, Pa.

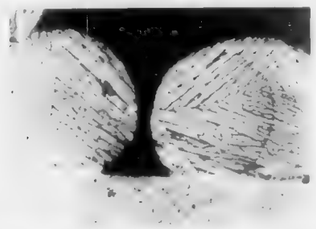
Continuation of Ser. No. 3,942, Jan. 16, 1987, abandoned. This application Sep. 14, 1988, Ser. No. 244,139

Int. Cl.[4] A61F *1/24*

U.S. Cl. 228—193 **14 Claims**

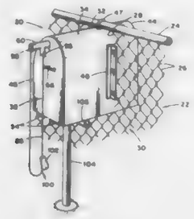
1. A method of producing a porous metal coated substrate by diffusion bonding metal powder to a substrate comprising the steps of:

(A) providing a substrate having a surface to which said powder is to be bonded;
(B) providing a preformed porous metal powder coating shape having a bonding surface for contacting said substrate surface;
wherein said preformed porous metal powder coating shape is produced by:
(a) disposing metal powder particles in a mold having a cavity of the shape of the desired coating;
(b) presintering said powder particles at a time and temperature to form said porous metal powder shape;
(c) removing said metal powder shape from the mold;



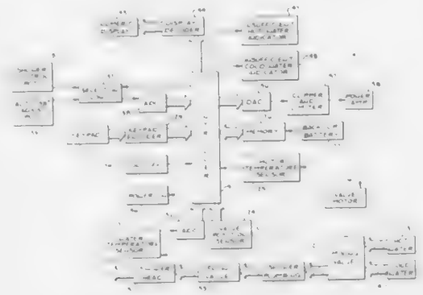
(d) sintering said metal powder shape at high temperature to achieve the required particle bond strength and porosity; and
(e) flattening the particles on only one surface of the porous metal powder coating shape by removing a portion thereof to form the bonding surface of the porous metal powder shape;
(C) contacting the bonding surface of the porous coating shape to the substrate surface; and
(D) in a non-reactive atmosphere, applying heat and pressure to cause the contact surfaces to diffusion bond to one another below the beta-transus of the substrate.

4,854,497
TRASH COLLECTION UNIT
Billy J. Smith, 2412 Magnolia Ave., Knoxville, Tenn. 37919
Filed Nov. 14, 1988, Ser. No. 271,095
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—43.4 16 Claims



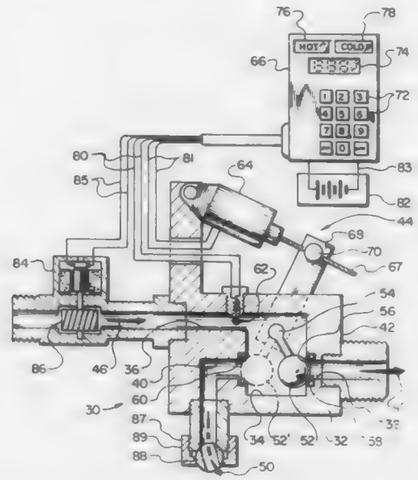
1. A trash collection unit comprising:
a receptacle including an elongated housing having opposite open front and rear ends, a rear door connected to said housing at the rear end thereof providing access to the housing interior for placement of trash into the receptacle, and a front door connected to the housing at the front end thereof providing access to the interior of the housing for removal of trash from the receptacle, each of the front and rear doors being movable between an opened position and a closed position; and
means for releasably locking both the front and rear doors in their closed positions at the rear of the housing.

4,854,498
SHOWER TEMPERATURE CONTROL SYSTEM
L. Dean Stayton, 8520 W. 88th St., Overland Park, Kans. 66212
Filed Jun. 8, 1988, Ser. No. 203,881
Int. Cl.[4] G05D *23/185*
U.S. Cl. 236—12.12 19 Claims



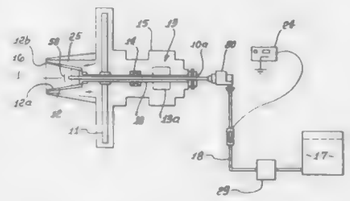
1. A shower water temperature control system for use with hot and cold water sources to control the temperature of water exiting a shower head comprising:
(a) hot/cold mixing valve means connected between hot and cold water sources and a shower head, said mixing valve including a mixing valve operator positionable to control the proportions of hot and cold water transferred from said hot and cold water sources to said shower head to thereby vary the temperature of water existing therefrom;
(b) motor means drivingly connected to said mixing valve operator and operable to position same;
(c) water temperature sensor means positioned to sense the temperature of water exiting said shower head;
(d) water temperature set means operable to set a desired shower water temperature;
(e) shower temperature control means having said motor means, said sensor, and said set means interconnected therewith, said control means initially controlling said motor means to position said mixing valve to cause the maintenance of a selected safe default temperature;
(f) upon the operation of said temperature set means, said control means comparing a sensed temperature sensed by said sensor means with a set temperature set by said set means and controlling said motor means to position said mixing valve means such that said sensed temperature equals said set temperature;
(g) said water temperature set means including:
(1) a numeric keypad having numeric keys thereon; and
(2) a keypad encoder connecting said keypad to said shower temperature control means, generating numerically coded key signals upon the operation of said numeric keys, and applying said key signals to said control means which are interpreted by said control means as the setting of said set temperature;
(h) said control means including memory means to store a plurality of numeric values respectively representing stored set temperatures;
(i) said keypad including a memory set key which, upon being operated, causes a set temperature entered by operation of said numeric keys to be stored in said memory means; and
(j) said keypad including a plurality of memory selection keys corresponding to said stored set temperatures, the operation of one of said memory selection keys causing said control means to maintain a set temperature equal to a stored set temperature corresponding to said one of said memory selection keys.

4,854,499
TEMPERATURE SENSITIVE SHOWER DIVERTER VALVE AND METHOD FOR DIVERTING SHOWER WATER
Eli Neuman, 6 Masada Street, Magdiel, Israel
Continuation of Ser. No. 807,861, Dec. 11, 1985, abandoned. This application May 8, 1987, Ser. No. 47,697
Int. Cl.[4] G05D *23/00*
U.S. Cl. 236—93 B 10 Claims



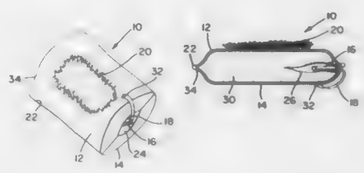
1. A diverter valve means for coupling a wall outlet pipe to a shower head, comprising:
a housing defining an internal cavity, an inlet port for connecting to the wall outlet pipe, a first outlet port having a circular entrance from the lateral cavity for connecting to the shower head, a second outlet port having circular entrance from the lateral cavity having the same axis as the first outlet port, and the inlet and first and second outlet ports passing form an outer surface of the housing to the internal cavity;
temperature sensitive directing means for directing the water entering the inlet port to the first outlet port when the temperature of the water is within a range between first and second temperature and for directing the water to the second outlet port when the temperature of the water is outside of the range, the temperature sensitive directing means including:
a rotatable stem passing from the outer surface of the housing to the internal cavity, the axis of the rotational stem mounted equidistant from the entrances of the first and second outlet ports;
a spherical closure means coupled to the stem between the first and second outlet ports for selectively closing one of the first and second outlet ports;
electric motor actuator means for rotating the stem to position the closure means;
a temperature sensor capable of translating the temperature of the water into an electronic parameter; and
controller means for controlling the actuator means according to the electronic parameter produced by the temperature sensor;
whereby the positioning of the spherical closure means at the entrance to the first outlet port directs the water to the second outlet port and the positioning of the spherical closure means at the entrance to the second outlet port directs the water to the first outlet port.

4,854,500
APPARATUS AND METHOD TO PRODUCE CHARGED FOG
C. V. Mathai, Rowland Heights, Calif.; Lyle A. Rathbun, Kennewick, Wash., and John S. Kinsey, Lee's Summit, Mo., assignors to Aerovironment, Inc., Monrovia, Calif.
Continuation of Ser. No. 341,861, Jan. 22, 1982, abandoned. This application Jul. 30, 1984, Ser. No. 611,875
Int. Cl.[4] B05B *3/08, 3/10, 5/04*
U.S. Cl. 239—3 18 Claims



1. Apparatus to produce electrically charged fog, comprising
(a) means including a cup defining a rotating inner annular surface having an axis of rotation, said surface flaring forwardly in the direction of said axis and having a terminal circular edge, said surface facing said axis, said surface consisting of insulative material,
(b) means supplying electrostatically charged liquid to said rotating surface whereby the liquid forms a layer on the rotating surface and moves forwardly on said surface toward said edge, and
(c) means supplying a high velocity gas stream flowing forwardly about the cup and past said edge to impact the liquid moving off said edge and to produce fine charged droplets of the liquid forming a fog.
(d) said means supplying charged liquid including a hollow insulative tube and a hollow shaft receiving said tube, there being a motor rotating said shaft,
(e) and a baffle in said cup, the shaft having an end facing the baffle and spaced therefrom, and said tube projecting in the cup to terminate proximate and openly facing the baffle, said edge spaced forwardly of said baffle.

4,854,501
FRAGRANCE SACK
Fannie Ricci, 129 Trail East, Hendersonville, Tenn. 37075
Continuation of Ser. No. 906,693, Sep. 11, 1986, abandoned, which is a continuation of Ser. No. 673,713, Nov. 21, 1984, abandoned. This application Jun. 14, 1988, Ser. No. 210,138
Int. Cl.[4] A61L *9/12*
U.S. Cl. 239—54 1 Claim



1. A fragrance holder for selectively scenting the surrounding area and items in the surrounding area by permeation of scents into the air and nearby materials comprising:
a soft, compressibly flexible porous sack having
an outer surface and a periphery defining an enclosed, bounded area, and a portion of said sack periphery form-

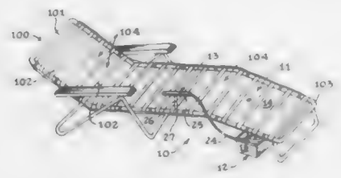
ing indenting pocket extending inwardly from said periphery and defining
an opening in said periphery;
a stuffing material within said sack and about said pocket;
a unitary rechargeable scenting element;
an elongated flexible ribbon connector means having a first end releasably secured to said outer surface and a second end secured to said scenting element, said ribbon having a length sufficient to insert said scenting element into said pocket and also to operatively retrieve said scenting element from said pocket for presence outside thereof while remaining connected to a portion of said sack via said connector means;
said ribbon connector means and said scenting element extending into said cavity opening through said opening whereby said scenting element is separated form said stuffing material by said pocket.

4,854,502

RECYCLING SPRAY APPARATUS FOR LOUNGE

Roger D. Cox, 1264 Twin Oak Dr., Winston Salem, N.C. 27105

Filed Sep. 29, 1988, Ser. No. 250,667
Int. Cl.[4] A47C *7/74*; B05B *17/00*
U.S. Cl. 239—124 **9 Claims**



1. A recycling spraying apparatus for use in combination with a conventional lounge chair having a framework and slats defining openings wherein the apparatus comprises:
a collection unit including a collection member adapted to be suspended beneath said lounge chair framework wherein the collection member is provided with a fluid outlet formed at the lowest point of the collection member.
a sump pump unit including a sump receptacle containing a pump member and system fluid; and,
a spraying unit adapted to be operatively connected in fluid communication with said pump member whereby system liquid propelled by said spraying unit will flow by gravity, through the openings in the slats, onto the collection member, through the fluid outlet of the collection member and back into the sump receptacle.

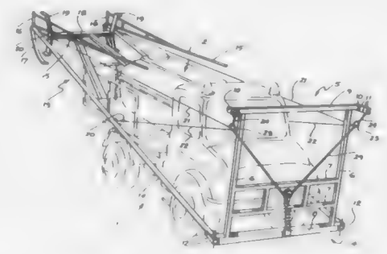
4,854,503

BOOM SPRAYING APPARATUS

Henry M. T. Little, 2 Taylor Street, Esperence, and John W. Hagon, Suite 509, Eastpoint Tower, 235-287 New South Head Rd., Edgecliff 2027, New South Wales, both of Australia

Filed Jun. 6, 1988, Ser. No. 202,414
Int. Cl.[4] B05B *1/20*
U.S. Cl. 239—167 **11 Claims**

1. Apparatus comprising a vehicle having opposite sides, a fluid holder such as a tank on said vehicle, a boom assembly on said vehicle, opposite end-portions of said boom assembly extending horizontally away from opposite sides of said vehicle, means extending longitudinally of said boom assembly and for discharging fluid from said holder downwardly onto the ground or target area, beneath said boom assembly, pipe connections extending from said holder to said boom assembly, and support means holding said boom end-portions in parallel space relationship with the ground, wherein the improvement comprises forming the support means with:
(a) a universal joint between the vehicle and each end-portion of the boom assembly;
(b) swinging means pendantly supporting guy support points at a level above the boom assembly and which are swingable transversely of the direction of movement of the vehicle;



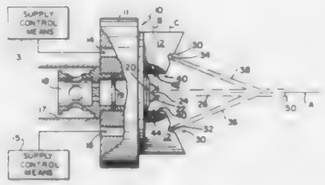
(c) a guying system providing load-supporting guys extending upwardly from said end-portions of the boom assembly to the support points;
(d) means interconnecting the support points to equalise the guy tensions; and
(e) ground followers on respective boom end-portions and to which their weight can be temporarily transferred when the vehicle rocks or the terrain alters.

4,854,504

FIBERGLASS SPRAY NOZZLE

James E. Hedger, Jr., and Joseph G. Charette, both of Goshen, Ind., assignors to Graves Spray Supply Co., Inc., Clearwater, Fla.

Continuation of Ser. No. 872,503, Jun. 10, 1986, abandoned, which is a continuation of Ser. No. 548,632, Nov. 4, 1983, Pat. No. 4,618,098. This application Oct. 5, 1987, Ser. No. 104,783
Int. Cl.[4] B05B *7/08*
U.S. Cl. 239—294 **13 Claims**



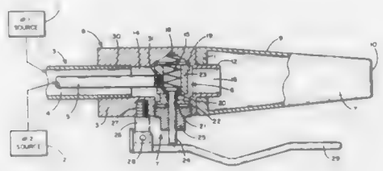
1. A spray nozzle arrangement for use with airless, low pressure, external spray mixing of resin and catalyst comprising:
resin nozzle means having an oval shape opening for low pressure, airless spraying of resin fluid as a resin stream initially flattened by said oval shape opening;
catalyst nozzle means for spraying a catalyst as a catalyst stream that intersects and thoroughly intermixes with said resin stream at a first predetermined distance from said oval shape opening; and
control air nozzle means for directing control air flow to intersect said resin stream at a second predetermined distance from said oval shape opening and spaced apart along the longitudinal axis of said resin stream from said intersection of said catalyst stream with said resin stream such that said resin stream is further flattened by said control air stream to form a continuous configuration without tail or split flows and the catalyst stream does not intersect the control air flow before intersecting said resin stream.

4,854,505

INJECTION VALVE FOR LAWN TREATMENT SYSTEM

M. Joseph LaVine, Jr., Niles, Mich., assignor to Ag-Chem Equipment Co., Inc., Minneapolis, Minn.

Filed Sep. 4, 1987, Ser. No. 93,036
Int. Cl.[4] B05B *7/04*
U.S. Cl. 239—304 **3 Claims**



1. An agricultural treatment system for applying a first chemical and selectively applying a second chemical through an injection valve, comprising in combination:
(a) a pressurized source of said first chemical; and
(b) a pressurized source of said second chemical;
(c) a length of hose having an upstream end and downstream end, a first larger diameter conduit and a second smaller diameter conduit which is concentric with the larger diameter conduit along a substantial portion of the hose;
(d) an injection valve having a first flow path and a second flow path concentric therewith which merges with said first flow path, and an actuable valving means having an open position and closed position in the second flow path at a point just upstream of the point where the first and second flow paths merge;
(e) means for connecting the upstream end of said first conduit to the pressurized source of said first chemical and the downstream end of said first conduit to the first flow path of said injection valve to form a communicating passage which permits said first chemical to continuously flow through said valve whether said valve is the opened or closed position; and
(f) means for connecting the upstream end of said second conduit to the pressurized source of said second chemical and the downstream end of said second conduit to the second flow path of said valve to form a communicating passage which permits the second chemical to flow through the valve only when the valve is in the open position and precludes the second chemical from flowing through the valve when the valve is in the closed position.

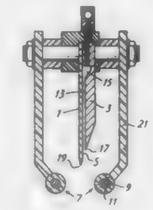
4,854,506

ELECTROSTATIC SPRAYING

Timothy J. Noakes, Hampshire, and Nevil E. Hewitt, Surrey, both of England, assignors to Imperial Chemical Industries plc, London, England

Continuation of Ser. No. 811,445, Dec. 20, 1985, abandoned. This application Dec. 21, 1987, Ser. No. 139,142
Claims priority, application United Kingdom, Dec. 20, 1984, 8431774
Int. Cl.[4] B05B *5/00*
U.S. Cl. 239—691 **18 Claims**

1. Electrostatic spraying apparatus comprising, an electrostatic sprayhead, means for applying a first electrical potential to liquid which emerges from the sprayhead, an electrode mounted adjacent the sprayhead, and means for applying a second electrical potential to the electrode such that an intense electrical field is developed between the emerging liquid and the electrode, the intensity of the field being sufficient to cause atomization of the emerging liquid, the electrode comprising a core of conducting or semiconducting material contained in a tubular sheath, characterized in that the sheath has a wall and



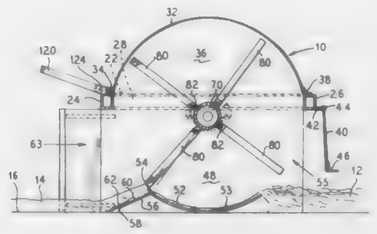
the resistance of a section of the wall of said sheath which is 1 cm in length is within the range of 5×10^{10} to 5×10^{12} ohm cm.

4,854,507

METHOD AND APPARATUS FOR CONDITIONING THE LITTER ON THE FLOOR OF A POULTRY REARING FACILITY

Gordon Smith, Rte. 3, Box 134, Hope, Ark. 71801

Filed Oct. 11, 1988, Ser. No. 255,265
Int. Cl.[4] B02C *21/02*
U.S. Cl. 241—27 **18 Claims**



1. An apparatus for conditioning the floor of a poultry rearing area having a layer of material to be conditioned covering said floor, comprising:
(a) a housing having left and right bottom end walls attached to left and right longitudinal frame bar members and adapted to be moved across the floor, a contoured bed attached to bottom edges of said end walls and having an arcuate concave section extending through an arcuate curve of approximately 40°,
a forwardly slanting plate member extending between said end walls and forming an inlet area for said contoured bed, but terminating at its free edge short of the floor surface,
a scraper blade attached to the top surface of said forwardly slanting plate and extending beyond said free edge to the elevation of the floor, whereby material scraped from the floor is directed into the inlet area of the contoured bed;
(b) conditioning means in said housing for conditioning said material and including a rotatable shaft member extending between said end walls and having a plurality of flail elements pivotally mounted on a surface thereof, said flail elements being sized and pivotally hinged to have the ends thereof closely spaced to said arcuate concave section of said contoured bed positioned beneath said shaft member and having an arcuate path that follows an arc scribed by said flail elements in close adjacency thereto, as said shaft rotates;
(c) means adapted for driving said shaft member connected to said shaft member; and

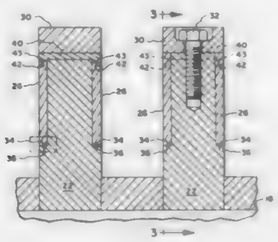
(d) vertical deflector panel means hingedly mounted on said housing for deflecting material discharged from the contoured bed and forming an outlet with the rear portion of the contoured bed for reconditioned material evenly on the floor.

4,854,508

TIRE SHREDDING MACHINE

John Dicky, North Tonawanda, N.Y., assignor to Columbus McKinnon Corporation, Amherst, N.Y.

Filed Oct. 6, 1988, Ser. No. 254,218
Int. Cl.[4] B02C *4/08, 4/30*
U.S. Cl. 241—236 7 Claims



1. A machine for shredding scrap automotive tires or the like of the type including a pair of oppositely rotating rotors having interdigitated tire cutting discs keyed thereon and replaceable abrasion resistant wearing plates extending radially alongside opposite sides of said discs, and the improvement comprising:

said plates being positionally anchored at their radially inner ends against the sides of said discs by means of tongue and groove interconnecting surfaces, and anchored at their radially outer ends against the sides of said discs by means of transversely disposed locking pins residing in complementary shaped grooved portions of the outer end surfaces of said discs and said wearing plates; said pins having enlarged head portions at opposite ends thereof locking said wear plates relative to said discs.

4,854,509

METHOD AND DEVICE FOR INTERMITTENTLY STORING AND RETURNING YARN DURING THE WINDING OF CONICAL BOBBINS FED WITH YARN AT CONSTANT SPEED

Giorgio Boller, Treviso; Francesco Ferro, and Luigi Colli, both of Pordenone, all of Italy, assignors to Savio, S.p.A., Pordenone, Italy

Filed Mar. 17, 1988, Ser. No. 169,317
Claims priority, application Italy, Mar. 19, 1987, 19757 A/87
Int. Cl.[4] B65H *54/06, 54/10*
U.S. Cl. 242—18 R 3 Claims

1. A yarn storage and return device for yarn being wound on a conical bobbin driven at a constant speed comprising:

(a) a lever system including a shaft and a pair of arms, which are connected to and move with each other, through which said shaft passes, and which can swing around the axis defined by said shaft, wherein said pair of arms includes a first arm having a deflecting roller acting as a yarn storage and return means and a second arm acting as a driven element for transmitting a swing motion;

(b) a sensor for measuring the tension of yarn to be wound on the bobbin for generating a series of corresponding electrical signals for indicating the tension thereof;

(c) an electronic control processor unit for converting said series of electrical signals from said sensor into control signals; and

(d) a drive source activated by said control signals from said electronic control processor unit for generating a constantly regulated swing movement and connected by an articulated means to said driven element to adjust the



movement of the storage arm for restoring the yarn tension to within a predetermined preset tension range.

4,854,510

DEVICE AND METHOD FOR STORING AND RETURNING YARN DURING THE WINDING OF CONICAL BOBBINS FED WITH YARN AT CONSTANT SPEED

Bruno Romanin, Cordenons; Francesco Ferro, and Luigi Colli, both of Pordenone, all of Italy, assignors to Savio, S.p.A., Pordenone, Italy

Filed Mar. 18, 1988, Ser. No. 169,855
Claims priority, application Italy, Mar. 19, 1987, 19759 A/87
Int. Cl.[4] B65H *54/42, 59/22, 59/38*
U.S. Cl. 242—18 DD 6 Claims



1. A yarn storage and return device for yarn being wound on a conical bobbin driven at a constant speed by drive means in contact therewith, comprising:

(a) a lever system including a shaft, an elastic element, and a pair of arms, which are connected to and move with each other through which said shaft passes, and which can swing around the axis defined by said shaft, one of said arms having a deflecting roller and acting as a yarn storage and return means and a tension compensator and a regulator for the wound yarn, and the other of said arms being connected to said elastic element for generating a balancing counterforce to the tension of said wound yarn;

(b) sensing means for sensing the position of said storage and return arm which define a predetermined preset swing range of said yarn storage and return arm for generating one or more electrical signals when the range of swing of said storage and return arm deviates from said preset range;

(c) an electronic control processor unit for receiving and processing said electric signal from said sensing means for generating a control signal;

(d) a disc yarn tensioner for adjusting the tension of the yarn being wound;

(e) a pressure variator operatively connected to said disc yarn tensioner for increasing or decreasing the pressure on said disc yarn tensioner for restoring the range of swing of said storage arm to within the preset range defined by said positional sensors; and

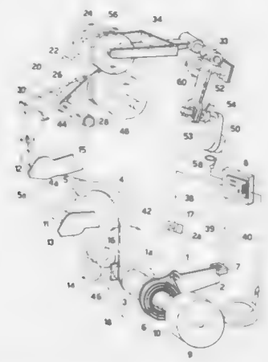
(f) a bidirectional drive unit responsive to said sensing means for displacing the contact between the bobbin and its drive means by inclining the axis of the bobbin for obtaining a variation in the average yarn winding speed for restoring the swing of said storage and return arm within its preset range.

4,854,511

DEVICE AND METHOD FOR INTERMITTENTLY STORING AND RETURNING YARN DURING THE WINDING OF CONICAL BOBBINS FED WITH YARN AT CONSTANT SPEED

Sergio Montali, Roveredo in Piano; Giorgio Boller, Treviso, and Luigi Colli, Pordenone, all of Italy, assignors to Savio SpA, Pordenone, Italy

Filed Mar. 18, 1988, Ser. No. 170,279
Claims priority, application Italy, Mar. 19, 1987, 19762 A/87
Int. Cl.[4] B65H *54/42, 59/38*
U.S. Cl. 242—18 DD 5 Claims



1. A yarn storage and return device for yarn being wound on a conical bobbin driven at a constant speed by drive means in contact therewith, comprising:

(a) a lever system including a shaft, an elastic element, and a pair of arms, which are connected to and move with each other, through which said shaft passes, and which can swing around the axis defined by said shaft, one of said arms having a deflecting roller and acting as a yarn storage and return means and a tension compensator and a regulator for the wound yarn, and a second arm operating as a linear positioning element for controlling and monitoring the effective length of yarn stored during the entire bobbin formation;

(b) a transducer responsive to the position of said second arm for converting the position of the first storage and return arm into one or more signals for indicating the position of said first storage and return arm;

(c) an electronic comparator for comparing said electrical signal of said transducer with one or more reference signals which define the predetermined range of swing of said first storage and return arm for generating a control signal when the range of swing is outside the predetermined range;

(d) an electronic control processor unit for converting said control signal generated by said comparator into an activating signal;

(e) a drive source for adjusting the loading on said elastic element according to said activating signal from said electronic control processor unit for varying the tension of said first storage and return arm to restore the swing of said arm to within its predetermined range; and

(f) a bidirectional drive unit responsive to said electronic control processor unit for displacing the contact between the bobbin and its drive means by inclining the axis of the bobbin for obtaining a variation in the average yarn winding speed for restoring the swing of said storage and return arm within its preset range.

4,854,512

METHOD AND DEVICE FOR INTERMITTENTLY STORING AND RETURNING YARN DURING THE WINDING OF CONICAL BOBBINS FED WITH YARN AT CONSTANT SPEED

Sergio Montali, Roveredo In Piano; Giorgio Boller, Treviso, and Luigi Colli, Pordenone, all of Italy, assignors to Savio, S.p.A., Pordenone, Italy

Filed Mar. 17, 1988, Ser. No. 169,322
Claims priority, application Italy, Mar. 19, 1987, 19755 A/87
Int. Cl.[4] B65H *54/42, 59/38*
U.S. Cl. 242—18 DD 6 Claims



1. A yarn storage and return device for yarn being wound on a conical bobbin driven at a constant speed by drive means in contact therewith, comprising:

(a) a lever system including a shaft, an elastic element, and a pair of arms, which are connected to and move with each other, through which said shaft passes, and which can swing around the axis defined by said shaft, one of said arms, having a deflecting roller and acting as a yarn storage and return means and a tension compensator and a regulator for the wound yarn, and the other of said arms being connected to said elastic element, for generating a balancing counterforce to the tension of said wound yarn;

(b) two sensing means for sensing the position of said storage and return arm, which define a predetermined preset wing range of said yarn storage and return arm for generating one or more electrical signals when the range of swing of said storage and return arm deviates from said preset range;

(c) an electronic control processor unit for receiving and processing said electric signal from said sensing means for generating a control signal;

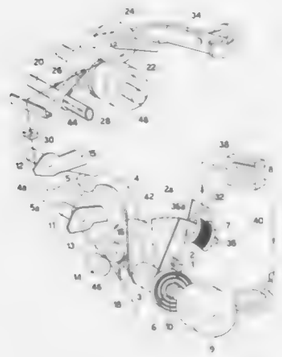
(d) a bidirectional drive unit responsive to said sensing means for displacing the contact between the bobbin and its drive means by inclining the axis of the bobbin for obtaining a variation in the average yarn winding speed for restoring the swing of said storage and return arm to within its preset range.

4,854,513

DEVICE AND METHOD FOR INTERMITTENTLY STORING AND RETURNING YARN DURING THE WINDING OF CONICAL BOBBINS FED WITH YARN AT CONSTANT SPEED

Giorgio Boller, Treviso; Sergio Montali, Roveredo In Piano, and Luigi Colli, Pordenone, all of Italy, assignors to Savio, S.p.A., Pordenone, Italy

Filed Mar. 17, 1988, Ser. No. 169,396
Claims priority, application Italy, Mar. 19, 1987, 19754 A/87
Int. Cl.[4] B65H *54/06, 54/10*
U.S. Cl. 242—18 R **4 Claims**



1. A yarn storage and return device for yarn being wound on a conical bobbin driven at a constant speed comprising:

(a) a lever system including a shaft, an elastic element, and a pair of arms, which are connected to and move with each other, through which said shaft passes, and which can swing around the axis defined by said shaft, wherein said pair of arms include a first arm acting as a yarn storage and return means and a tension compensator and a regulator for the wound yarn, and a second arm acting as a linear positioning means for controlling and maintaining the effective length of the yarn stored by said first arm during the entire bobbin formation;

(b) a transducer responsive to the position of said second arm for converting the position of the end of said first storage and return arm into one or more signals for indicating the position of said first storage and return arm;

(c) an electric comparator for comparing said electrical signal of said transducer with one or more reference signals which define the predetermined range of swing of said first storage and return arm, for generating a control signal when the range of swing is outside the predetermined range;

(d) an electronic control processor unit for converting said control signal generated by said comparator into an activating signal; and

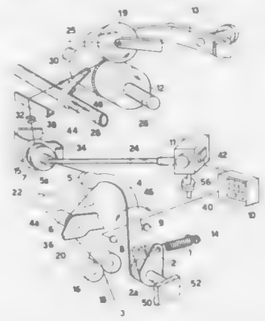
(e) a drive source for adjusting the loading on said elastic element according to said activating signal from said electronic control processor unit for varying the tension of said first storage and return arm to restore the swing of said arm to within its predetermined range.

4,854,514

DEVICE AND METHOD FOR STORING AND RETURNING YARN DURING THE WINDING OF CONICAL BOBBINS FED WITH YARN AT CONSTANT SPEED

Bruno Romanin, Cordenons; Francesco Ferro, Pordenone, and Luigi Colli, Pordenone, both of Italy, assignors to Savio, S.p.A., Pordenone, Italy

Filed Mar. 18, 1988, Ser. No. 170,278
Claims priority, application Italy, Mar. 19, 1987, 1975 A/87
Int. Cl.[4] B65H *54/06, 54/10, 59/22*
U.S. Cl. 242—18 R **4 Claims**



1. A yarn storage and return device for yarn being wound on a conical bobbin driven at a constant speed comprising:

(a) a lever system including a shaft, an elastic element, and a pair of arms which are connected to and move with each other, through which said shaft passes, and which can swing around the axis defined by said shaft, one of said arms having a deflecting roller and acting as a yarn storage and return means and a tension compensator and a regulator for the wound yarn, and the other of said arms being connected to said elastic element for generating a balancing counterforce to the tension of said wound yarn;

(b) sensing means for sensing the position of said storage and return arm, which define a predetermined preset swing range of said yarn storage and return arm for generating one or more electrical signals when the range of swing of said storage and return arm deviates from said preset range;

(c) an electronic control processor unit for receiving and processing said electric signal from said sensing means for generating a control signal;

(d) a disc yarn tensioner for adjusting the tension of the yarn being wound; and

(e) a pressure variator operatively connected to said disc yarn tensioner for increasing or decreasing the pressure on said disc yarn tensioner for restoring the range of swing of said storage arm to within the preset range defined by said positional sensors.

4,854,515

WINDING CONTROLLING METHOD FOR AN AUTOMATIC WINDER

Shoichi Tone, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Feb. 22, 1988, Ser. No. 158,309
Claims priority, application Japan, Feb. 26, 1987, 62-43810
Int. Cl.[4] B65H *54/02, 63/00*
U.S. Cl. 242—36 **20 Claims**

1. A winding controlling method for an automatic winder, said method comprising the steps of:

setting an upper limit value for the yarn cut frequency which is defined as a yarn cut frequency per unit amount of yarn during winding,

setting a lower limit value for the yarn cut frequency which is defined by an amount of yarn for which the condition continues wherein no yarn cutting occurs,

detecting the yarn cut frequency occurring during winding and



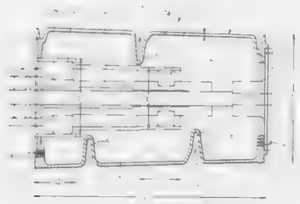
stopping winding of a winding unit at a point of time when either the upper limit value for the yarn cut frequency or the lower limit value for the yarn cut frequency is detected on said winding unit during winding.

4,854,516

TRAVERSE DRUM

Shoji Yamada, Inuyama, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 774,296, Sep. 10, 1985, abandoned. This application Jul. 28, 1987, Ser. No. 80,236
Claims priority, application Japan, Sep. 12, 1984, 59-191258
Int. Cl.[4] B65H *59/00*
U.S. Cl. 242—43.2 **3 Claims**



1. A traverse drum for surface driving a take-up package in an automatic yarn winder having a yarn supply package, said traverse drum being formed of an iron metal and having at least one yarn guide groove in the exterior wall thereof for guiding yarn from said supply package to said take-up package, said traverse drum having thin walls, wherein the thickness of the wall of the guide groove and the cylindrical body is approximately 1.5 to 2.5 mm.

4,854,517

APPARATUS HAVING MEANS FOR UNLOOSENLY WINDING A TAPE TO REELS OF A TAPE CASSETTE

Toshihiro Watanabe, and Shiro Fujiwara, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

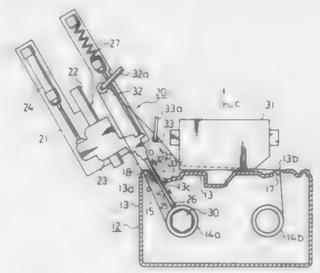
Filed May 12, 1988, Ser. No. 193,094
Claims priority, application Japan, May 29, 1987, 62-135539
Int. Cl.[4] B65H *21/00, 19/00*
U.S. Cl. 242—56 R **4 Claims**

1. An apparatus for smoothly winding a magnetic tape on reels of a tape cassette comprising:

(a) cassette holder means for holding thereon a tape cassette in which a pair of reels are rotatably incorporated and a leader tape is wound at its opposite end walls on said pair of reels;

(b) reel drive means engageable with one of said pair of reels when said tape cassette is loaded on said cassette holder means;

(c) means including a pair of guide rollers initially located in the vicinity of said tape cassette loaded in said cassette holder means and being movable away from said tape



cassette for withdrawing said leader tape from said tape cassette;

(d) splice means for cutting said withdrawn leader tape and for splicing one end of said cut leader tape to a magnetic tape supplied from the outside; and

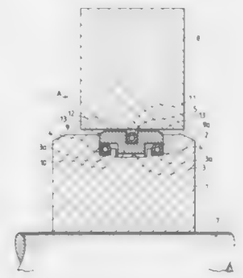
(e) winding smoothing means operable to come in contact with a tape winding face on said one reel and with successive turns of said magnetic wound on said face so that said magnetic tape is regularly and smoothly wound on said reel.

4,854,518

HUB SETTING DEVICE

Tsuneo Yamazaki; Tomoki Saito, and Hideo Ayabe, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 30, 1988, Ser. No. 213,561
Claims priority, application Japan, Jul. 3, 1987, 62-165514
Int. Cl.[4] B65H *75/18*
U.S. Cl. 242—56.9 **5 Claims**



1. A device for setting a hub around which a magnetic tape is to be wound, comprising: a boss member which engages an inner circumferential surface of said hub so as to transmit driving force of a rotary shaft to said hub, a recess portion being formed in an outer circumferential surface of said boss member; at least one elastic member; and a divided ring retained in said recess portion and urged toward said hub by said at least one elastic member so that an outer surface of said

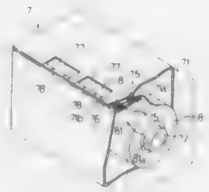
divided ring and an inner surface of said hub are in face-to-face contact with each other, wherein said at least one elastic member comprises a pair of rubber tube arranged so as to support said divided ring at its lower widthwise opposite ends.

4,854,519

MAGAZINE FOR CONTAINING STRIP OF RECORDING MEDIUM

Yutaka Maeda, Isehara, and Hiroyuki Makiyama, Tokyo, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 18, 1987, Ser. No. 86,943
Claims priority, application Japan, Aug. 22, 1986, 61-197877
Int. Cl.[4] G03B *1/04*; B65D *85/66*
U.S. Cl. 242—71.1 **7 Claims**



1. A magazine containing a strip of recording medium as wound around a tubular core, said magazine comprising:

a case for accommodating the recording medium therein;

a support shaft fixedly provided in the case and supporting the inner periphery of the tubular core for rendering the recording medium rotatable,

said case having an opening portion defined therein for placing the interior of the case in communication with the outside and through which the recording medium is paid off from the case; and

reverse rotation preventing means associated with said support shaft for permitting rotation of the tubular core in a forward direction when the recording medium is paid off through the opening portion and for preventing the tubular core from rotating in a winding direction that is opposite to the forward direction,

said reverse rotation preventing means including at least one projecting member which is in frictional contact with the inner periphery of the tubular core for providing resistance at the inner periphery of the core that inhibits the rotation of the tubular core in the winding direction, each said projecting member projecting from the outer periphery of the support shaft in a direction extending substantially tangential to the outer periphery of the support shaft and toward the inner periphery of the tubular core.

4,854,520

APPARATUS FOR FORMING CENTER-UNWINDABLE ROLLS OF PERFORATED PLASTIC FILM

James R. Gavin, Pittsford, and James F. Roeland, Clifton Springs, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 83,908, Aug. 6, 1987, Pat. No. 4,771,962, which is a continuation of Ser. No. 808,972, Dec. 16, 1985, abandoned. This application Sep. 14, 1988, Ser. No. 244,434
Int. Cl.[4] B65H *18/10*
U.S. Cl. 242—72 B **9 Claims**

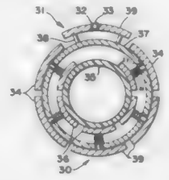
1. A bare expandable winding shaft for winding transversely perforated plastic film to form a plurality of center-unwindable rolls at a plurality of winding positions, said shaft comprising:

A. a plurality of elongated leaves forming a generally cylindrical outer surface upon which said rolls are wound;

B. an intermediate tubular shaft body having apertures for radially movable buttons;

C. an elongated central air bladder which is arranged axially within said shaft body, said bladder being adapted to move said buttons radially for changing the effective diameter of said outer surface through an expansion range of at least about 0.25 inch between an expanded diameter and a relaxed diameter, said expanded diameter being at least about 3 inches;

D. a vacuum leaf which replaces one of said movable leaves at said expanded diameter and is immovably supported in fixed radial position on said tubular shaft body;



E. a plurality of roll winding locations that are spaced axially apart along said shaft, each said roll location having an axially grouped plurality of holes in said vacuum leaf for contacting said plastic film when said rolls are being wound on said shaft at said expanded diameter;

F. a vacuum means which is:

(1) aligned with the axis of said expandable shaft,

(2) capable of being rapidly connected to a high-capacity vacuum source, and

(3) in fluid communication with said holes in said outer surface of said vacuum leaf; and

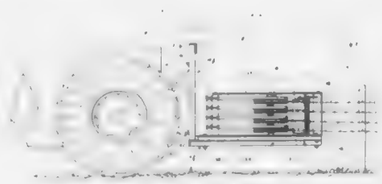
G. a friction-reducing means on said outer surface for imparting a selected maximum coefficient of friction between said outer surface and said plastic film.

4,854,521

FENCING WIRE UNWINDER AND TENSIONER

Fred L. Farnsworth, 4635 W. 5100 South, Hooper, Utah 84315

Continuation-in-part of Ser. No. 408,725, Aug. 17, 1982. This application Jul. 14, 1988, Ser. No. 219,089
The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.
Int. Cl.[4] B65H *59/16*
U.S. Cl. 242—86.5 R **13 Claims**



1. An apparatus for construction of wire fences from rolls of fencing wire, each roll having a free end by which the wire may be unwound from the roll thereof, said apparatus comprising:

generally horizontal platform means adapted to be drawn along over the ground by a vehicle;

means for securing at least one roll of fencing wire rotatably upon the platform, so that the free end of the wire may be attached to a fencing post or the like and the wire unwound from the roll as the platform travels over the ground along a line of such posts; and

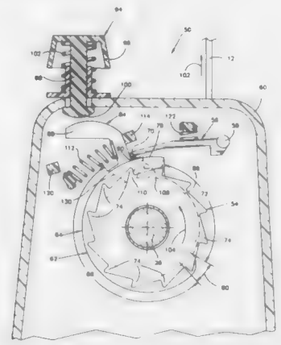
brake means carried by the platform adapted to continuously tension the unwound portion of the wire after it is unwound from the roll thereof, so that the wire remaining on said roll is not tightened, and so that the wire may be attached in tensioned condition to successive fence posts of the line thereof as the platform is carried along over the ground.

4,854,522

SAFETY APPARATUS

Louis R. Brown, Livonia, and Wallace C. Higbee, Romeo, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Tyndhurst, Ohio

Filed Apr. 4, 1988, Ser. No. 177,077
Int. Cl.[4] B60R *22/34*
U.S. Cl. 242—107.7 **15 Claims**



4. An apparatus for use in association with a vehicle safety belt, said apparatus comprising:

rotatable reel means for storing the belt;

spring means for urging said reel means to rotate in a belt retraction direction;

tension relieving means operable between an engaged condition blocking rotation of said reel means in the belt retraction direction under the influence of said spring means and allowing rotation of said reel means in the belt withdrawal direction and a disengaged condition in which said tension relieving means is ineffective to block rotation of said reel means under the influence of said spring means;

said tension relieving means including manually actuatable means separate from the belt for initiating operation of said tension relieving means from the disengaged condition to the engaged condition and means for blocking operation of said tension relieving means from the disengaged condition to the engaged condition until the belt has been at least partially withdrawn from said reel means and said reel means rotated back in the belt retraction direction through at least a major portion of a revolution of said reel means.

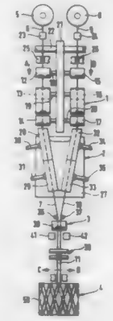
4,854,523

TWISTED YARN FEED SPOOL AND PROCESS FOR PRODUCING SAME

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, and Hans Stahlecker, Haidenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany

Filed Jan. 4, 1988, Ser. No. 140,760
Claims priority, application Fed. Rep. of Germany, Jan. 6, 1987, 3700186
Int. Cl.[4] B65H *55/00*; D01H *5/28, 1/13*
U.S. Cl. 242—166 **2 Claims**

1. A feed spool of prestrengthened slivers for a subsequent yarn twisting operation comprising a pair of prestrengthened slivers disposed in side by side parallel relationship, each of said prestrengthened slivers comprising a core made up of core fibers extending in a longitudinal direction of the prestrengthened sliver, and fiber ends wound around the core in a helical manner with a predominate part of the fiber ends extending at



a helical angle of slope with respect to a radial plane through the core which is 45° and greater,

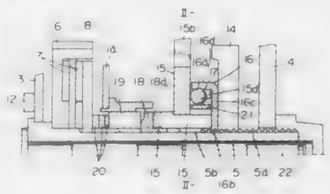
wherein said fiber ends are wound around continuously and uniformly along the length of the respective cores.

4,854,524

DRAG MECHANISM FOR A DOUBLE-BEARING FISHING REEL

Shinichi Morimoto, Nishiomiya, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Mar. 22, 1988, Ser. No. 171,893
Claims priority, application Japan, Mar. 26, 1987, 62-45196[U]
Int. Cl.[4] A01K *89/02*
U.S. Cl. 242—268 **10 Claims**



1. A fishing reel comprising:

(a) a reel body;

(b) a handle shaft supported rotatably relative to said reel body;

(c) a spool supported rotatably relative to said reel body;

(d) a main gear supported rotatably relative to said handle shaft; and

(e) a drag mechanism for applying a braking force against rotation of said spool relative to said reel body, said drag mechanism comprising:

(i) a plurality of drag members provided between said handle shaft and said main gear;

(ii) a setting means, screwably engaged with said handle shaft, for setting a slipping rotation starting load on spool by said drag members; and

(iii) an adjuster means for adjusting within a predetermined range said slipping rotation starting load on said spool set by said setting means, said adjuster means including means for establishing a reference position for said adjuster means corresponding to said slipping rotation starting load on said spool set by said setting means and means for indicating when said adjuster means, after adjusting the slipping rotation starting load on said

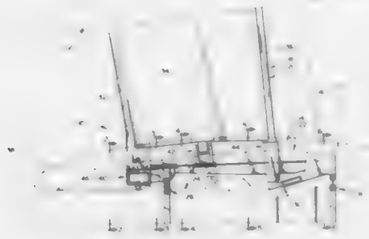
spool set by said setting means, has returned to said reference position.

4,854,525

ENGINE MOUNTING ASSEMBLY

Wan T. Chee, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 19, 1987, Ser. No. 52,761
Int. Cl.[4] B64D *27/12*
U.S. Cl. 244—54 7 Claims



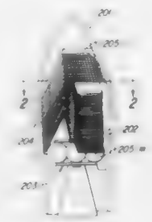
1. An engine mounting assembly having a longitudinal axis, a horizontal transverse axis, a vertical axis, a forward end and a rear end, said assembly comprising:
(a) an engine housing having a longitudinally extending engine axis and adapted to carry transverse loads and thrust loads, said housing also being adapted to carry engine developed torque loads and to transmit such torque loads at a predetermined torque transmitting housing location along said engine axis,
(b) an engine mounting means operatively connected to said engine housing to carry said transverse loads, thrust loads and torque loads, said engine mounting means comprising:
1. a base support structure adapted to carry said transverse loads and thrust loads and having a predetermined torque load receiving location at which said base support structure is particularly configured and arranged to carry said torque loads,
2. a longitudinally extending torque beam having a lengthwise axis and being mounted to said base support structure, said beam having:
i. a first beam to housing load transmitting connection means at a first beam to housing connecting location which is adjacent to said torque transmitting housing location and through which at least a major portion of said beam receives torque loads from the engine housing:
ii. a second beam to housing load transmitting connection means at a second beam to housing connecting location which is spaced from said first beam to housing connecting location along the lengthwise axis of the beam, said second beam to housing connection means transmitting to said beam no more than a minor portion of the torque loads from the engine housing,
iii. a third beam to base structure load transmitting connection means at a third beam to base structure connecting location which is adjacent to the torque load receiving location of the base structure and through which said beam transmits at least a major portion of torque loads received by the beam to the base structure,
iv. a fourth beam to base structure load transmitting connection means at a fourth beam to base structure connecting location which is spaced from said third beam to base structure connecting location along said beam axis, said fourth beam to base structure connecting means transmitting to said base structure no more than a minor portion of the torque loads from the beam.

4,854,526

SPACECRAFT DESIGN ENABLING THE COMPACT NESTING OF MULTIPLE SPACECRAFT IN THE LAUNCH VEHICLE

Mark G. Rochefort, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 10, 1987, Ser. No. 83,492
Int. Cl.[4] B64G *1/10, 1/44*
U.S. Cl. 244—158 R 17 Claims



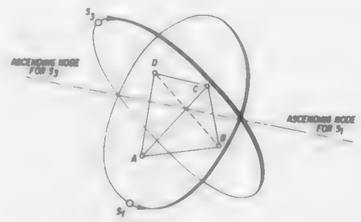
1. A spacecraft body comprising:
a base member having a perimeter; and
a plurality of side wall members, each coupled at a boundary thereof to a portion of the perimeter of the base member and each extending at an angle greater than zero to a plane containing the base member perimeter, thereby resulting in a substantially cup-shaped spacecraft structure and a hollow inner cavity opening outwardly at boundaries of the side walls remote from the side wall boundaries coupled to the base member, each side wall member providing a surface to which is attached an array of photovoltaic devices and an antenna.

4,854,527

TETRAHEDRAL MULTI-SATELLITE CONTINUOUS-COVERAGE CONSTELLATION

John E. Draim, 9310 Telfer Ct., Vienna, Va. 22180

Filed Jul. 19, 1985, Ser. No. 756,635
Int. Cl.[4] B64G *1/10*
U.S. Cl. 244—158 R 14 Claims



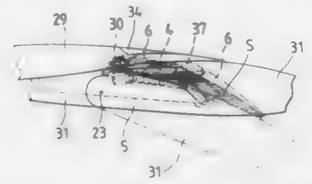
1. A communication system comprising a constellation of inclined elliptic artificial satellites orbiting earth for providing continuous global line-of-sight visibility and having communication means for providing communication via the means of at least one satellite at all times with all points on the earth ; said constellation comprising four common-period elliptic-orbit satellites, said satellites having orbital parameters of period, inclination angle, eccentricity, right ascension of ascending nodes, arguments of perigee, and mean anomaly relationship, two of said satellites having perigees in one hemisphere and the other two of said satellites having perigees in the other hemisphere, said satellites continuously defining a tetrahedron which completely encloses the earth and whose planes do not intersect the earth's surface so as to assure said continuous visibility.

4,854,528

COVER FOR FLAP GUIDE RAILS IN AIRCRAFT WINGS

Hanns-Gerhard Hofrichter, Bremen, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Bremen, Fed. Rep. of Germany

Filed Dec. 2, 1987, Ser. No. 127,943
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641247
Int. Cl.[4] B64C *3/50, 21/02*
U.S. Cl. 244—215 5 Claims



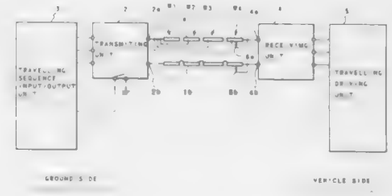
1. In an aircraft wing having a landing flap, guide rails and a flap carriage for holding the flap, the carriage being driven by a drive and being guided in the rails, a cover structure for the rails for avoiding any formation of gaps unfavorable for aerodynamic flow over and around the wing, the improvement comprising:
a tri-parted, aerodynamically contoured cover body having an upstream cover body, a middle cover body and a downstream cover body;
said upstream body being secured to said wing;
said middle body being hinged to the upstream body;
said downstream body being in an upstream portion, hinged to the carriage, and in a downstream portion the downstream body is connected to the flap;
the downstream body being telescoped into the middle body and they are interconnected through pins extending from sides of the middle body to rails in sides of the downstream body; and
the flap being carried by the carriage in an upstream location, the carriage as being driven by said drive thereby controlling motion of the flap as well as of the middle and downstream bodies.

4,854,529

VEHICLE CONTROL SYSTEM HAVING TWO TRACKSIDE SIGNAL LINES

Shuichi Osada; Satoru Hayashi; Masaru Goto, and Kiyoshi Godo, all of Hyogo, Japan, assignors to Tsubakimoto Chain Co., Japan

Filed Apr. 6, 1988, Ser. No. 178,239
Claims priority, application Japan, Apr. 10, 1987, 62-55304[U]; May 29, 1987, 62-85063[U]
Int. Cl.[4] G05D *13/00*
U.S. Cl. 246—187 B 10 Claims



5. A vehicle travelling apparatus for starting, speed changing and stopping of a vehicle which travels relative to a track by means of a signal provided from the ground side, comprising;
at the ground side,
a signal line disposed along said track for conveying signals;
a speed command unit outputting to said signal being a speed command signal whose voltage level varies corresponding to the command speed; and at the vehicle side;
a speed signal detection unit which reads said speed command signal from said signal line and discriminates the command speed to control the travelling speed of the vehicle, and
a travelling signal detection unit which reads said speed command signal from said signal line and detects the presence of the signal;

whereby the vehicle travels according to said speed command signal in the case where both of said speed signal detection unit and travelling signal detection unit detect signals.

4,854,530

HANGER SYSTEM FOR FLEXIBLE PLASTIC BAGS

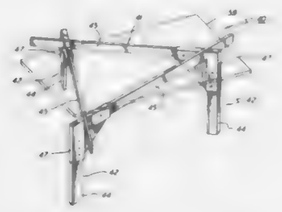
Thomas P. Baglio, 1060 E. Grand Ave., Escondido, Calif. 92025

Continuation-in-part of Ser. No. 101,974, Sep. 28, 1987. This application Dec. 2, 1988, Ser. No. 279,450
Int. Cl.[4] B65B *67/12*
U.S. Cl. 248—95 19 Claims



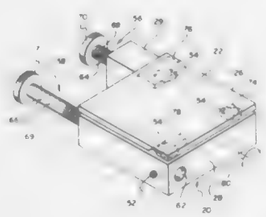
1. A hanger for a reclosable bag having a substantially straight marginal seal that presents greater thickness than is presented by bag regions located away from the marginal seal, the hanger comprising:
a flat supporting member formed with a plurality of elongated fingers (i) longitudinally extending from a rear portion thereof sufficiently far so as to span the length of the bag along its marginal seal and (ii) spaced parallel at a separation, one to the next, that is sufficient to permit the bag to be slid along lesser thickness regions of the bag located away from its marginal seal in directions in and out of a slot formed between adjacent elongated fingers, but that is insufficient to pass the greater thickness of the bag's marginal seal;
wherein the plastic bag may be slid within a slot between adjacent elongated fingers and suspended downhanging by the greater thickness of its marginal seal resting upon the adjacent elongated fingers.

4,854,531
THREE LEGGED WORKBENCH
Joseph R. Esposito, 315 Greenway Ave., Syracuse, N.Y. 13206
Filed Aug. 12, 1988, Ser. No. 231,829
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—165 7 Claims



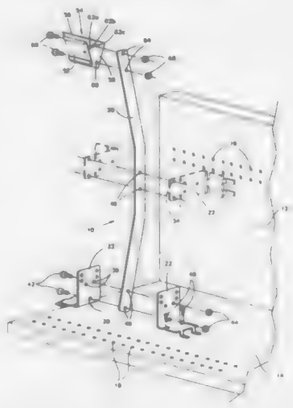
1. A workbench having an adjustable three legged support frame consisting of three interlocking leg and beam sections, each interlocking section including;
- a corner bracket that includes a pair of perpendicularly aligned hollow arms, said arms comprising a vertical disposed arm having an opening for receiving a leg member therein and horizontally disposed arm having an opening for receiving a beam member therein;
- a leg member removably received in said vertically disposed bracket opening so that the leg stands upright on a support surface;
- a beam member removably received in said horizontally disposed bracket opening;
- an angularly disposed open top notch passing downwardly through the top of said corner bracket a depth equal to the height of a beam member and forming an angle of 60 degrees with one side wall of the corner bracket to allow the distal end of a second beam member to be slidably received so that three of said leg and beam sections can be joined in assembly to form an adjustable triangular workbench frame by placing one end of a beam member in the horizontal arm of each bracket and the other end of each beam member in the notch of another bracket and a leg member in the vertical arm of each bracket.

4,854,532
DEVICES FOR MOUNTING A LOAD AND ORIENTING THE LOAD IN TWO ORTHOGONAL DIRECTIONS
Joseph R. Trovato, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 19, 1988, Ser. No. 286,202
Int. Cl.[4] F16M *11/04*
U.S. Cl. 248—178 6 Claims



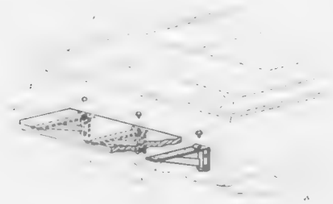
1. A device for mounting a load and orienting the load in two orthogonal senses, said device including:
- first and second elements facing one another, one of said elements being adapted to be associated with the load and the other of said elements being adapted to be associated with a base;
- a first of said elements having three contact zones;
- the second of said elements having three spheres for contacting said three contact zones of said first element;
- said second element having first, second and third seats in which said three spheres are disposed, respectively, each of said seats having a center;
- said first, second and third seats being so disposed that a line joining the center of the first seat and the center of the second seat is orthogonal to a line joining the center of the first seat and the center of the third seat;
- said second element having means for displacing the sphere in the second seat whereby said sphere is displaceable towards said first element for changing the orientation of the first element in a first sense;
- said second element having means for displacing the sphere in the third seat whereby the sphere in said seat is displaceable towards said first element for changing the orientation of the first element in a second sense;
- said contact zones of said first element being so disposed on said first element as to contact said three spheres;
- the contact zone which contacts the sphere in the first seat conforming to a cone;
- the contact zone which contacts the sphere in the second seat being planar; and
- the contact zone which contacts the sphere in the third seat having a vee-.groove form with the length of the groove being generally parallel to the line intersecting the centers of the first and third seats.

4,854,533
ASSEMBLY FOR MOUNTING A DISPLAY SIGN
Anthony V. Sainato, Glenview, Ill., assignor to Creative Products Merchandising, Inc., Elk Grove Village, Ill.
Filed Nov. 9, 1987, Ser. No. 118,770
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.
Int. Cl.[4] E04G *5/06*
U.S. Cl. 248—221.1 17 Claims



1. An assembly, for mounting a display sign on a vertical support panel or a horizontal support panel, said assembly comprising:
- a sign holder for holding the display sign;
- a brace for supporting said sign holder; and
- an attachment bracket for detachably attaching said brace to a support panel;
- said brace having first and second opposite ends and an intermediate portion extending between said first and second opposite ends, said sign holder being connectable with one of said first and second opposite ends;
- said attachment bracket having first means connectable with the other of said first and second opposite ends of said brace for attaching said brace to the horizontal support panel, and said attachment bracket having second means connectable with the other of said first and second opposite ends of said brace or said intermediate portion for attaching said brace to the vertical support panel.

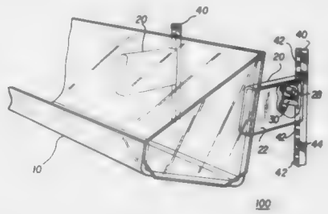
4,854,534
TOP RELEASE PLATFORM BRACKET
Stuart J. Porter, 2181 Mill Rd., Novato, Calif. 94947
Filed May 20, 1988, Ser. No. 196,955
Int. Cl.[4] E04G *5/06*
U.S. Cl. 248—222.1 4 Claims



1. A platform bracket for supporting a swim board from a boat transom, said platform bracket comprising:
- a wall portion including a transom plate member for attachment to a transom, said transom plate member having upper and lower flange members oriented generally horizontally when said transom plate member is attached to a transom, said lower flange member having a connector portion, and said upper flange member having a hole;
- a shelf portion including a support plate member for attachment to a swim board, and a vertical support member connected to said support plate member, said vertical support member having a vertical axis and a base portion configured to engage said transom plate lower flange member connector portion, and enable said shelf portion to swing about said vertical support member vertical axis, and said support plate member having a hole conditioned for alignment with said transom plate upper flange member hole; and
- a locking mechanism to engage said transom plate upper flange member hole and said support plate member hole to connect said shelf portion to said wall portion.

4,854,535
SHELF MOUNTING SYSTEM
Russell K. Winter, Crownsville; Thomas D. Harvey, Rockville; Nedim Savas, Bethesda, and Richard S. Kain, Woodbine, all of Md., assignors to Russell William, Ltd., Odenton, Md.
Filed Sep. 17, 1987, Ser. No. 97,683
Int. Cl.[4] E04G *5/06*
U.S. Cl. 248—225.2 16 Claims

1. A shelf mounting system for releasably coupling at least one shelf member to a substantially vertical planar surface, comprising:
- a. a pair of horizontally displaced bracket members each having a substantially vertically directed slot formed on a first end thereof; each of said bracket members being adapted for coupling to said substantially vertical planar surface on a second end thereof; and,
- b. adapter means for releasably coupling said shelf member to said pair of bracket members, said adapter means including (1) a pair of socket members each being fixedly coupled to said shelf member on a first end thereof, and releasably coupled to a respective bracket member within said slot formed in said first end of said bracket member, and (2) a pair of pin members for reversibly engaging said pair of bracket members within said slot formed in said first end of each said bracket members, each of said pair of pin members being coupled to a second end of a respective one said socket members, each of said socket members having a closed contour cross-section having a substantially planar end for bearing against said substantially vertical planar surface for dispersing load bearing forces over an extended area of said socket members, said closed contour cross-section is defined in part by a pair of opposing wall members having a pair of aligned through openings passing therethrough, each of said pin members being coupled to a respective one of said socket members by passing through said pair of aligned through openings, whereby said pair of opposing wall members define a space therebetween for compensation of variations in said horizontal displacement of said bracket members.



4,854,536
CONTAINER HOLDER
Brian S. Lorence, Warren, and David N. Grabowski, Rochester Hills, both of Mich., assignors to Chivas Products Limited, Sterling Heights, Mich.
Filed Mar. 31, 1988, Ser. No. 175,555
Int. Cl.[4] A47K *1/08*
U.S. Cl. 248—311.2 14 Claims



1. A beverage container holder for holding a beverage container, said container holder adapted to be mounted to an armrest support, the container having a transverse dimension, comprising:
- a frame supported by said support for movement between a retracted position and an operational, extended position; and
- said frame having an outer peripheral edge defining a longitudinal peripheral edge, said frame having a partially enclosed open area for receiving said container, said open area intersecting said longitudinal peripheral edge, said open area having a longitudinal dimension parallel to the movement of said frame and a transverse dimension perpendicular to the movement of said frame, the longitudinal dimension being greater than the transverse dimension

so that the container which can be accommodated within said open area includes a cross-sectional dimension greater than the transverse dimension of the open area.

4,854,537
DISH DRAINER PLATFORM
Barry P. Welch, 122 S. Pine, Arcola, Ill. 61910
Filed Apr. 8, 1988, Ser. No. 179,307
Int. Cl.[4] A47B *91/00*
U.S. Cl. 248—346 **2 Claims**



1. A dish drainer platform comprising a rectangular tray defined by two spaced upstanding side walls, two spaced upstanding end walls, and a flat lower wall extending across the space circumscribed by said upstanding walls; said flat lower wall having a slight downward slope measured from one of the tray end walls to the other tray end wall, such that the flat upper face of said sloped wall serve as a liquid drain surface; a discharge spout extending away from said other tray end wall for conveying liquid from the sloped lower wall into a sink; said discharge spout comprising two spaced-apart upstanding side walls extending angularly from said other tray end wall at locations thereon spaced inwardly from the tray side walls, a liquid transport wall (**34**) extending as a smooth straight line continuation of the tray lower wall, and a downwardly extending terminal wall section (**36**) forming a smooth downward flow continuation of said liquid transport wall; the space between the spout side walls being unobstructed so that liquid can drain from the tray lower wall onto the liquid transport wall without encoutering any obstructions in the flow path; the spacing between the upstanding side walls of the discharge spout being substantially less than the spacing between the tray side walls so that the width of the spout is substantially less than the width of the tray; upper inner surface areas of the tray end walls and tray side walls being recessed to form a continuous horizontal ledge above the plane of the tray lower wall; and a perforated leveling plate removably disposed in the tray, with peripheral edge areas thereof resting on said horizontal ledge; said tray lower wall and liquid transport wall being spaced a significant distance above the lower edges of the tray end walls and side walls, so that an unobstructed free space is formed directly below the liquid transport wall; said platform being adapted for positionment on a horizontal sink counter surface, with the terminal wall section of the discharge spot located within the sink in near adjacency to a sink side wall; said unobstructed free space proving a clearance between the discharge spout and an upwardly projecting rim bordering the sink.

4,854,538
APPLIANCE MOUNTING DEVICE
Craig Von Schalscha, 629 Vendola Dr., San Rafael, Calif. 94903
Filed Jun. 24, 1988, Ser. No. 211,257
Int. Cl.[4] A47B *91/00*
U.S. Cl. 248—346 **3 Claims**

1. A device for mounting an appliance in a motor vehicle having an elevated tunnel and a seat adjacent to said tunnel, said device comprising:

a support element having a support surface adapted for operative association with said appliance and for providing support for said appliance;

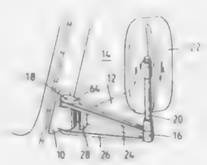
first stabilizing means including a plate connected to said support element and extending from said support element, said plate positionable between said tunnel and said seat;

second stabilizing means connected to said support element and adapted to engage said tunnel on opposed tunnel sides in front of said seat when said mount is positioned on said tunnel with said support surface being disposed over said tunnel, said second stabilizing means comprising a plurality of stabilizing elements having a generally thin, fin-like configuration attached to said support element and extending generally downwardly therefrom, said plurality



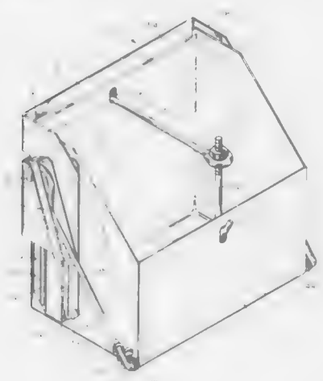
of stabilizing elements including first and second stabilizing elements spaced from one another and attached to opposed sides of said support element, said plate extending away from said first and second stabilizing elements and generally perpendicular thereto, and said first and second stabilizing means cooperable to resist movement of said support element relative to said tunnel, and additionally comprising adjustable connector means interconnecting said plate and said support element whereby said plate may be selectively moved relative to said support element said adjustable connector means including a first bracket member secured to said plate and a second bracket member secured to said support element said first and second bracket members being selectively positionable relative to each other in at least one direction.

4,854,539
EXTERIOR REAR VIEW MIRROR
William J. Glue, Chichester, England, assignor to Britax Wingard Limited, England
Filed Jun. 24, 1988, Ser. No. 211,348
Claims priority, application United Kingdom, Jun. 26, 1987, 8714991
Int. Cl.[4] A47G *1/24*
U.S. Cl. 248—479 **1 Claim**



1. An exterior rear view mirror assembly comprising a base member adapted to be fixed to the body of a vehicle and carrying a first detent formation located at a predetermined radius from a substantially vertical axis, a mirror support member pivotally mounted on the base member for angular movement about said vertical axis and carrying a second detent formation confronting said first detent formation at the same radius from said vertical axis, and resilient means for urging said detent formations into abutment with each other to retain the mirror support member at a predetermined orientation relative to the base member, one of the detent formations being mounted on a detent carrier which is angularly movable about said vertical axis, and a bowed element having one end engaging with an abutment on the member carrying said detent formation and the other end having a locking formation arranged to engage with a complementary locking formation on the detent carrier in a multiplicity of alternative relative positions, and thrust means acting on the bowed element at an intermediate position between its ends so as to tend to straighten the bowed element and thereby urge the locking formations into engagement with each other, thus securing said one detent formation to the member on which it is carried at a selected one of a multiplicity of orientations relative thereto.

4,854,540
VEHICLE BATTERY MOUNTING APPARATUS
Lynn A. Balek, Mason City, Iowa, assignor to LIL Industries Ltd., Mason City, Iowa
Filed Feb. 29, 1988, Ser. No. 161,731
Int. Cl.[4] A47B *97/00;* **B60R** *18/02*
U.S. Cl. 248—503 **6 Claims**



1. An apparatus for holding a battery of a vehicle, comprising:

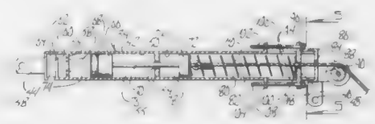
(a) a mounting frame for attachment to the vehicle;

(b) a box for receiving the battery;

(c) coacting guide means on said frame and said box to semi-permanently secure said box to said frame in a slidable relationship with one another to permit linear movement therebetween;

(d) means on said frame and said box for semi-permanently retaining said box in at least one position relative to said frame, said coacting guide means permits vertical linear movement between said box and said frame, and said retaining means is adapted to alternatively secure said box in an upper or a lower position with respect to said frame, said retaining means includes a pair of spring biased hook members mounted on said box and a corresponding pair of stop members mounted on said frame for receiving and releasably retaining said hook members.

4,854,541
POWER LINE SUPPORT
Kenneth G. McConnell, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa
Filed Aug. 8, 1988, Ser. No. 229,310
Int. Cl.[4] H02G *7/14;* **F16L** *3/00*
U.S. Cl. 248—565 **10 Claims**



1. A support for a power line and adapted for use on a support tower having a lower end supported on the ground and an upper end, said support comprising:

an elongated cylindrical housing having mounting means thereon for mounting said housing to said upper end of said support tower;

said cylindrical housing having a partition therein separating said housing into first and second cylindrical compartments; said partition having an opening therein providing communication between said first and second compartments;

said cylindrical housing having a first end wall provided with at least one air aperture therein for providing air communication from said first chamber to the exterior of said housing, said housing having a second end wall opposite from said first end wall and provided with an opening extending therethrough;

an elongated piston rod extending through said opening in said partition and having a first rod end within said first compartment and a second rod end within said second compartment;

a first piston on said first end of said rod and dividing said first compartment into first and second chambers;

a second piston on said second end of said rod and dividing said second compartment into third and fourth chambers; said first chamber being between said first end wall and said first piston, said second and third chambers being on opposite sides of said partition, and said fourth chamber being between said second piston and said second end wall;

an elongated flexible member connected to said second piston and extending through said fourth chamber and through said opening in said second wall for supporting connection to said power line;

spring means within said fourth chamber yieldably holding said second piston in a predetermined axial position within said second compartment;

said opening in said partition being larger than said piston rod so as to provide limited air passage back and fourth between said second and third chambers during reciprocating movement of said piston rod and said first and second pistons within said housing.

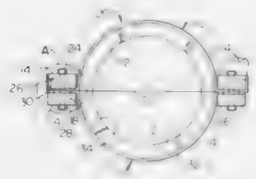
4,854,542
CONCRETE COLUMN FORM
M. B. Pruett, 4599 Trails Dr., Sarasota, Fla. 34232
Filed Oct. 3, 1988, Ser. No. 252,908
Int. Cl.[4] E04G *13/02*
U.S. Cl. 249—48 **8 Claims**

1. A concrete column form structured to supportively receive a quantity of uncured concrete for hardening therein into a building column, said form comprising:

a pair of mating form portions each including a generally flat and rectangular sheet of relatively thin, resilient material

and an elongated, rigid, straight edge bar connected along, and generally coextensive with, opposing side margins of each said sheet;

each said sheet flexibly contoured from a first flat configuration for storage into a second configuration wherein said sheet forms a curvilinear surface along its length, said



edge bar of one of said pair of mating form portions being rotated opposingly through approximately ninety degrees to said edge bar of the other of said pair of mating form portions;

at least one retention strap being connected transversely to said form portions between said edge bars for holding said form portions in said second configuration.

4,854,543

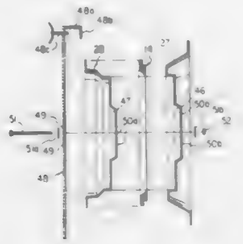
APPARATUS FOR FORMING AN OPENING WITH A GASKET IN A MASONRY MANHOLE

Clement Daigle, Saint-Jean Chrysostome, and Emile Gauthier, St.-Henri, both of Canada, assignors to Les Industries Fortier Ltee, Canada

Division of Ser. No. 777,613, Sep. 19, 1985, Pat. No. 4,693,482. This application Jun. 9, 1987, Ser. No. 60,037

Int. Cl.[4] B28B *7/28, 23/00*

U.S. Cl. 249—95 **2 Claims**



1. An assembly for installing a resilient gasket having a projecting, pipe-engaging portion and an anchoring portion fixed in the peripheral wall of a circular opening in a masonry wall, said masonry wall having an inner face and an outer face, said assembly consisting of:

(a) an inner mold disc consisting of a main, dish-shaped central circular area provided with a central aperture and defined by an annular rim, said rim being provided with a radially-inwardly extending portion, and an annular rim portion, said annular rim portion directly abutting a flat face of said resilient gasket;

(b) an outer mold disc consisting of a main central dish-shaped circular area provided with a central aperture, said main dish-shaped central circular area of said outer mold disc coinciding with the main dish-shaped circular area of said inner mold disc, said circular area of said outer mold disc being defined by an annular rim directly abutting the annular rim of said inner mold disc; and

(c) a rectangular fixing bar including a plurality of longitudinally spaced-apart holes therein, and bolts passed through aligned selected apertures in said rectangular fixing bar, in said inner mold disc and in said outer mold disc, thereby forming said assembly where said inner mold disc is temporarily secured to said outer mold disc with said elastomeric gasket locked therebetween, and means at the upper end of said rectangular fixing bar for suspending said assembly from said masonry wall.

4,854,544

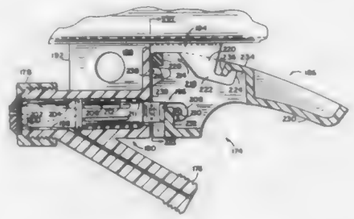
FLUID FLOW CONTROL VALVE

Michael R. Blase; Henry J. Rosendall, and Gordon W. Goodrich, all of Grand Rapids, Mich., assignors to Bissell, Inc., Grand Rapids, Mich.

Division of Ser. No. 28,613, Mar. 20, 1987. This application Apr. 11, 1988, Ser. No. 179,857

Int. Cl.[4] F16K *31/60*

U.S. Cl. 251—245 **5 Claims**



1. A fluid flow control means comprising:

a base, a valve member, a trigger member and attachment means for attaching said trigger member to said valve member;

said base comprising a first portion rigidly attached to said valve member and a second portion adjacent said first portion, said second portion having surface means defining a generally horizontal throat extending in a first direction away from said first portion with an inner end portion and a downwardly opening mouth portion, said second portion further having a first flange extending away from said first portion including means defining a generally upwardly facing surface of said first flange;

said valve member comprising a stem longitudinally movable between a first position and a second position; means biasing said stem toward said first position in a direction generally opposite said first direction and establishing means associated with said stem for establishing no liquid flow when said stem is in said first position and for establishing maximum liquid flow when said stem is in said second position; and

said trigger member comprising a laterally extending pin located in said throat and having a surface configured to rotate against said inner end portion of said surface means defining said horizontal throat, a second flange extending toward said pin and including means defining a downwardly facing surface overlapping said upwardly facing surface of said first flange and an actuating portion extending in said first direction away from said second flange and said pin;

whereby said valve member biasing means acts in a direction through said attachment means to pull said actuating portion downwardly such that the second flange downwardly facing surface engages the first flange upwardly facing surface for retaining said pin in said throat.

4,854,545

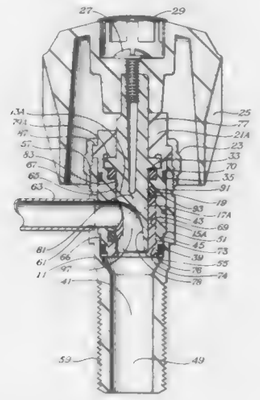
FAUCET VALVE WITH DIAGONAL SEALING RING

John J. Pezzarossi, P.O. Box 3033, Abilene, Tex. 79604

Filed Jun. 27, 1988, Ser. No. 211,998

Int. Cl.[4] F16K *5/04*

U.S. Cl. 251—310 **5 Claims**



1. A faucet valve comprising:

a. a valve body having a bottom fluid inlet passage and a side fluid discharge passage having a central axis;

b. upper and lower sleeve member disposed in said inlet passage,

i. said upper and lower sleeve members each having an interior cylindrical surface of the same diameter,

ii. said upper and lower sleeve members having complimentary oppositely facing diagonal grooves for receiving and retaining a diagonal sealing ring, said lower sleeve member having at its bottom a peripheral, radially interiorly and exteriorly extending flange that protects against the deleterious effects of incoming fluid;

c. a diagonal sealing ring having a central axis and disposed in said grooves,

i. the configuration and orientation of said grooves being such that the central axes of said discharge passage and said sealing ring intersect and said sealing ring is symmetrically disposed about an imaginary cylindrical projection of said discharge passage;

d. a flow control member having,

i. a flow control portion having a stem portion with a cylindrical exterior surface that is matingly received within said interior cylindrical surfaces of said upper and lower sleeve members and having length sufficient to extend beyond the upper and lower extremities of said diagonal sealing ring,

ii. a flow control portion having a lower end portion that includes a flow direction transition surface, and having a cylindrical skirt portion that encompasses said transition surface and is conformingly received within said lower sleeve member for improved axial stability, and

iii. an intermediate flange having relatively large outside diameter and being trappingly received for improved axial stability;

e. said control member being rotatable substantially 180 degrees from a full open position to a full closed position and vice versa, with said sealing ring being in contact with the exterior surface of said control member flow control portion over a major portion of the sealing ring inner periphery during the initial stages of opening of the valve when differential pressure is high, and with metering of fluid flow extending over a major portion of the control member rotational range;

f. a retaining member having a generally cylindrical surface and shape and having a cylindrical exterior surface that mates with the upper bore of said valve body and having an interiorly disposed groove trappingly receiving said intermediate flange of said flow control member;

g. first positive connection intermediate the top portion of said upper sleeve and said retaining member for eliminating mating slots and co-engaging members and facilitating assembly; and

h. second positive connection intermediate said lower portion of said lower sleeve and said lower portion of said upper sleeve member for eliminating mating slots and co-engaging members and facilitating assembly;

whereby there is obviated the need for a retaining washer to facilitate assembly, and mating slots and co-engaging members to facilitate assembly and whereby there is provided a faucet with a combination of a static, diagonally disposed seal and a flow control portion that is rotatable and throttling throughout the major portion of its rotation and without moving any control past the diagonal sealing ring so as to prevent seal damage due to cutting, chaffing and excessive wear and so as to prevent seal blowout due to high differential pressure of relatively narrow throttling range, and having the advantages of having protection against incoming fluid and any contaminants therein and having improved axial stability and ease of assembly.

4,854,546

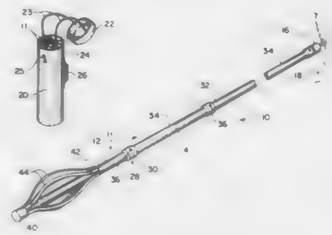
CABLE INSTALLATION AND PLACEMENT IMPLEMENT

Cary A. C. Vea, Santa Martin, Calif., assignor to Polytron Corporation, San Martin, Calif.

Filed Jun. 20, 1988, Ser. No. 209,222

Int. Cl.[4] B65H *59/00*

U.S. Cl. 254—134.3 R **18 Claims**



1. A cable installation and placement implement comprising:

a basket segment including a central shaft portion having first connecting means situated at least one end thereof and further having radially flexible basket means formed around said central shaft portion so as to support said central shaft portion a distance from adjacent surfaces and to facilitate movement and placement of the basket segment by permitting the basket segment to be rolled upon said basket means;

one or more extendor segments, each extendor portion including an elongated shaft portion similar to said central shaft portion of the basket segment, said elongated shaft portion being provided with a second connecting means, adapted to detachably mate with said first connecting means in a colinear manner, situated at one end thereof, and one of said first connecting means situated on the opposing end thereof; and

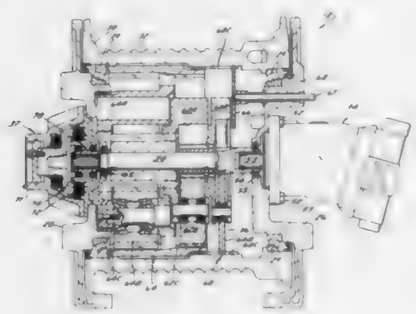
a terminal grasping segment including one of said second connecting means and cable attachment means for attaching items to the implement.

4,854,547

VEHICLE-MOUNTED RETRIEVAL WINCH AND CONTROL MEANS THEREFOR

Larry J. Oliphant, Swisher, Iowa, assignor to Harnischfeger Corporation, Brookfield, Wis.

Filed Aug. 24, 1987, Ser. No. 88,809
Int. Cl.[4] B66D *1/08, 1/22, 1/50*
U.S. Cl. 254—271 9 Claims



1. In combination:
a rotatable winch drum adapted to have a plurality of layers of cable wrapped therearound;
said cable being connected to said drum and connectable to a load;
a motor including a motor control means connected to a rotatable drive said drum in a direction wherein said drum exerts a pulling force on said cable;
said motor being of a type wherein motor torque delivered to said drum can be varied;
sensing means for providing an indication of the number of cable layers wrapped around said drum;
a source of variable pressure hydraulic fluid;
hydraulic control means having a connection to the hydraulic fluid source and operative independently of the motor and motor control means and responsive to the sensing means to produce a plurality of discrete hydraulic pressure values in said fluid, each pressure value being indicative of a different one of the cable layers; and
said motor control means is connected to the hydraulic control means and is operable in response to said hydraulic pressure values to vary the torque of said motor in accordance with each one of the discrete pressure values so as to maintain a predetermined constant maximum pulling force on said cable and said load regardless of the number of layers of cable wrapped around said drum.

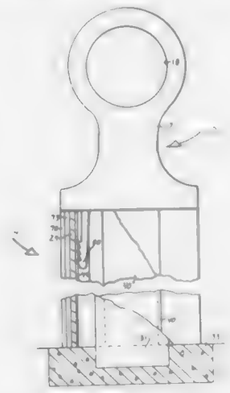
4,854,548

DECORATIVE POSTS FOR CROWD CONTROL

Glenn J. Wylie, 114 West Deane Park Drive, Islington, Ontario, Canada M9B253

Filed Apr. 21, 1986, Ser. No. 854,445
Int. Cl.[4] E04H *17/14*
U.S. Cl. 256—65 7 Claims

1. A rail structure, said rail structure comprising:
a polygonal extruded member,
at least a pair of inwardly extending locking means extending from opposing walls of said extruded member,
a plurality of parallel, longitudinally extending, inwardly directed wedge shaped locking means on each of said inwardly extending locking means,
further comprising a rail support bracket, said rail support bracket being an extruded member having a rail receiving opening and a pair of legs, each of said legs having a plurality of parallel locking wedge means, said locking wedge means being transverse to said legs, said legs being received in said rail structure with said locking wedge means being at right angles to and in engagement with said plurality of parallel, longitudinally extending, inwardly directed wedge shaped locking means of said inwardly extending locking means.

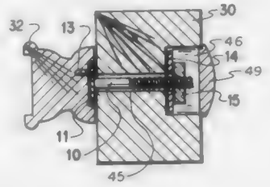


4,854,549

NEWEL POST FASTENER AND RAIL ATTACHMENT

William F. Roberts, Talent, and Truman D. Collins, Shady Cove, both of Oreg., assignors to Cascade Wood Products Incorporated, White City, Oreg.

Filed May 19, 1987, Ser. No. 51,513
Int. Cl.[4] E04H *17/14*
U.S. Cl. 256—69 2 Claims



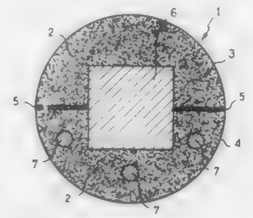
1. A combination newel post and angled stair rail assembly, comprising in combination:
an upright newel post having a lateral elongate hollow chamber therethrough for receiving and holding a bolt;
a stair railing having a beveled end attached to the newel post, said beveled end having a recessed hollow space in the face thereof;
a metal plate having a plurality of apertures around the periphery thereof for accommodating screws, said plate being secured by the screws to the stair railing within the recessed hollow space of the beveled end of the stair railing; and
a metal bolt with two ends, having one end threaded and the opposite end attached to the center of said metal plate, so that said bolt extends laterally through the elongate hollow chamber of the newel post and is secured thereto by nut means.

4,854,550

STOPPER FOR RETAINING SLAG AND PROCESS FOR IMPLEMENTATION AND MANUFACTURE THEREOF

Jean C. Daussan, Metz; Gérard Daussan, and André Daussan, both of Longeville-Les-Metz, all of France, assignors to Daussan et Compagnie, Woippy, France

Filed Nov. 9, 1987, Ser. No. 118,427
Claims priority, application France, Nov. 13, 1986, 86 15739
Int. Cl.[4] C21C *5/46*
U.S. Cl. 266—45 9 Claims



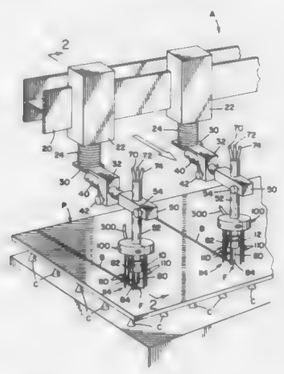
1. Process for blocking a metallurgical container containing liquid metal and with slag floating on top at the end of pouring, consisting in placing in the said container a floating stopper the lowest part of which is submerged in the bath of metal below the bed of slag, the stopper comprising an external envelope (2) which is substantially spherical, and is produced in an unsintered slightly malleable thermal refractory insulating material which sinters at the temperatures prevailing in the container (8) and composed of inorganic refractory particles embedded in a binder and a heavy core (6) giving the stopper (1) a density such that it floats on the liquid metal (12) and is sufficiently submerged in the metal (12) to stop the pouring orifice (14) at the end of pouring before the passage of slag (13), the exposed outer surface of the stopper consisting of said unsintered slightly malleable thermal refractory insulating material.

4,854,551

DEVICE FOR CONTROLLING OPERATING GAP OF CUTTING HEAD AND METHOD OF USING SAME

Elmer L. Griebeler, Streetsboro, Ohio, assignor to Cleveland Machine Controls, Inc., Cleveland, Ohio

Division of Ser. No. 95,401, Sep. 10, 1987, Pat. No. 4,773,946.
This application Apr. 28, 1988, Ser. No. 187,549
Int. Cl.[4] B23K *7/10*
U.S. Cl. 266—76 7 Claims



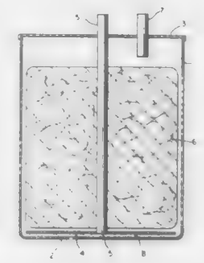
1. A Corona discharge feeler for use in an ultra-high voltage device for controlling the operating gap between a cutting head and a plate being cut, said feeler comprising an elongated electrically conductive member, a means on an upper one end of said member for mounting said member in position on a support means and a Corona discharge sustaining end on the lower other end of said member for directing current from an ultra-high voltage generator from said member to said plate, and said member including an impedance increasing means located therein adjacent said lower other end for controlling the discharge of said current from said member to said plate.

4,854,552

APPARATUS FOR RECOVERY OF SILVER FROM SPENT, WASTE, ACIDIC PROCESSING FLUIDS

James E. Williams, Fletcher, N.C., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 925,296, Oct. 31, 1986, Pat. No. 4,740,244.
This application Dec. 1, 1987, Ser. No. 127,277
Int. Cl.[4] C22B *13/03, 15/12*
U.S. Cl. 266—170 9 Claims



1. An improved apparatus for the recovery of silver from spent, waste acidic silver halide photographic processing fluid comprising
A. a vessel made of material inert to the processing fluid having a flat bottom and a top;
B. a plate located in the bottom of the vessel capable of distributing the fluid to insure even flow of the fluid throughout the vessel;
C. finely divided iron at least substantially filling the vessel;
D. an inlet and an outlet to the vessel arranged so that processing fluid will enter the vessel through the inlet, flow under the bottom plate, and flow through the finely divided iron prior to exiting through the outlet;
E. the improvement wherein prior to flow of the processing fluid through the vessel there is present in the vessel, below plate (B), means for further enhancing the recovery of silver, said enhancing means comprising a minor amount with respect to the amount of finely divided iron of a metal salt wherein the metal is selected from the group consisting of copper and cadmium, and the ratio of finely divided iron to metal salt is 25 to 1 to 4 to 1.

4,854,553

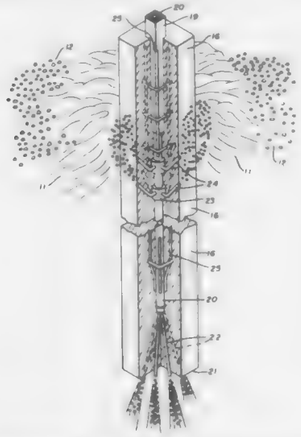
SELF SHIELDING LANCE

Micheal D. Labate, 115 N. Hazen Ave., Ellwood City, Pa. 16117

Filed Jun. 3, 1988, Ser. No. 201,838
Int. Cl.[4] C21C *5/32*
U.S. Cl. 266—266 7 Claims

1. A lance for use in treating a bath of molten metal comprising an elongated refractory body, a bore axially of said elongated refractory body, a tube communicating with said bore and extending out of a first end thereof, said bore terminating inwardly of a second end of said refractory body, a plurality of small tubes defining passageways embedded in said refractory body communicating with said bore and extending therefrom to said second end and to the sides of said refractory body, support means engaging said bore adjacent said first end of said refractory body which said lance may be supported and con-

nected with a source of gas to be directed therethrough, at least a portion of each of said small tubes being formed in a



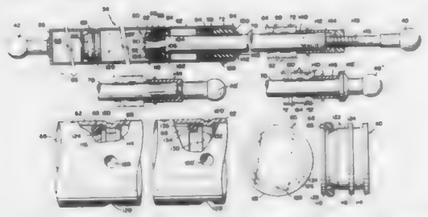
narrow passageway whereby a controlled discharge rate of gas at a controlled pressure can be discharged thereby.

4,854,554

PNEUMATIC SPRING STRUCTURE WITH DIAL OUTPUT FORCE AND PRESSURE DECAY COMPENSATION AND METHOD OF OPERATION

George C. Ladwig, Marion, S.C., assignor to Maremont Corporation, Carol Stream, Ill.

Division of Ser. No. 946,203, Dec. 19, 1986, Pat. No. 4,788,747.
This application Sep. 20, 1988, Ser. No. 246,682
Int. Cl.[4] F16F *5/00, 9/43;* E05F *3/00;* F16J *15/40*
U.S. Cl. 267—64.11 4 Claims



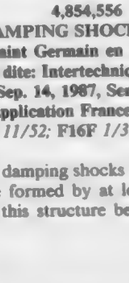
1. A pneumatic spring link comprising: a cylinder assembly with a closed end; a piston assembly in said cylinder with a piston shaft extending from the other end of said cylinder, bushing means on said shaft, an annular seal means around said shaft, a piston means fixed on the end of said shaft; the other end of said cylinder having means to retain said bushing means within said cylinder; said shaft seal means providing a seal against the cylinder, and a dynamic seal around said shaft; a predetermined small quantity of oil being contained in said cylinder; a predetermined accurate quantity of gas under at least several atmospheres of pressure in said cylinder; and wall means within said cylinder, at a location between the retracted position of said piston means and said closed end, fixed relative to said cylinder wall providing a partition wall dividing said cylinder into plural chambers, the chamber closest to said closed end being a fixed volume chamber; said wall means having a peripheral seal means engaging the inner surface of said cylinder and providing a seal against gas flow at least from said fixed volume chamber past the sealing engagement of said peripheral seal means into the remaining space of said cylinder; said fixed volume chamber containing a predetermined quantity of gas under greater pressure than the gas in the remaining space of said cylinder when the shaft is in a retracted condition; said annular shaft seal means and said peripheral seal means having specific gas permeability characteristics, whereby said wall means and the fixed volume chamber with gas under greater pressure provides a pressure decay compensation means aiding maintenance of desired pressure in the cylinder space occupied by said piston shaft.

4,854,555

DIAPHRAGM TYPE AIR SPRINGS

Fujio Ohkawa; Akira Higashidani, and Hiroyuki Maeda, all of Yokohama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 877,709, Jun. 23, 1986, abandoned, which is a continuation of Ser. No. 658,255, Oct. 19, 1984, abandoned. This application Oct. 26, 1987, Ser. No. 113,406
Claims priority, application Japan, Oct. 7, 1983, 58-186886; Nov. 16, 1983, 58-214059; Dec. 3, 1983, 58-227834; Dec. 5, 1983, 58-228347
Int. Cl.[4] B60G *11/26;* F16F *9/04*
U.S. Cl. 267—64.24 5 Claims



1. A diaphragm type air spring, comprising:
large and small piston members integrally connected to each other by a piston rod so as to bear a load of a vibration system at a side of said large piston member;
large and small outer shells coaxially arranged with said piston members and integrally connected to each other with a common partition, each of said large and small outer shells having a diameter larger than that of each of said respective large and small piston members;
first and second diaphragms airtightly connecting each of said large and small outer shells to each of said respective large and small piston members and secured at one end to an outward end portion of each of said large and small outer shells, between which said first and second diaphragms support a springing portion of said vibration system by at least one of said outer shells at its outer periphery; and
an orifice formed in at least a portion of said partition excluding a regiin from a through-hole of said partition and said piston rod so as to establish fluid communication between a small air chamber defined by said small piston member, said small outer shell, said second diaphragm and said partition and, a large air chamber defined by said large piston member, said large outer shell, said first diaphragm and said partition, and said orifice having an opening area So and an axial length l satisfying: $l/\sqrt{So} \leqq 4$.

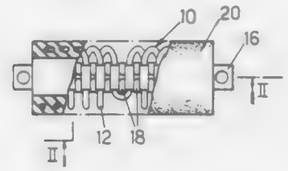
4,854,556

DEVICE FOR DAMPING SHOCKS AND VIBRATIONS

Patrick Pietrzak, Saint Germain en Laye, France, assignor to Societe Anonyme dite: Intertechnique, Plaisir, France

Filed Sep. 14, 1987, Ser. No. 95,713
Claims priority, application France, Sep. 12, 1986, 86 12801
Int. Cl.[4] B60G *11/52;* F16F *1/36, 3/08;* F16M *13/00*
U.S. Cl. 267—33 5 Claims

1. In a device for damping shocks and vibrations comprising an elastic structure formed by at least one spring, fastening means for placing this structure between two elements, the elastic structure being embedded in a mass of elastomeric material which adheres to the structure, the improvement wherein said device comprises a multidirectional damping device, the mass of elastomeric material is traversed by at least



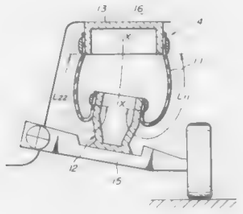
one bore and has an approximately constant internal and external thickness, and is multidirectionally free, such that the elastic deformations sustained by the structure causes the elastomeric material to work multidirectionally in at least one of compression and shear.

4,854,557

AIR SPRINGS

Norio Goshima, and Isao Watanabe, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Mar. 28, 1988, Ser. No. 173,908
Claims priority, application Japan, Apr. 3, 1987, 62-81289
Int. Cl.[4] B60G *11/28;* F16F *9/04*
U.S. Cl. 267—64.27 6 Claims



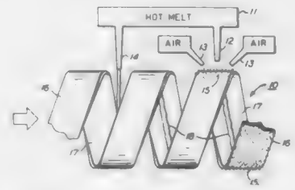
1. Apparatus defining an air spring comprising; a flexible air sleeve of a substantially tapered form as a whole, a piston airtightly connected to a small-diameter end portion of the air sleeve at its inwardly turned-up state and an end cap airtightly connected to a large-diameter end portion of the air sleeve, said air sleeve having a freely deformable portion defined as a length between connected portions of the air sleeve to the piston and the end cap and is longest at a position in the peripheral direction of the air sleeve, shortest at a position opposite to the longest position in the radial direction and gradually changes between the longest position and the shortest position when an axis of the piston and an axis of the end cap are aligned in a straight line with each other and the air sleeve is filled with an internal pressure, and wherein the air spring is mounted so that the axis of the piston and the axis of the end cap cross with each other at a deflection angle under a service load and the piston and the end cap to move on a curved axial line of the air sleeve.

4,854,558

SOUND DEADENER FOR WINDOW COUNTERBALANCE SPRING

William P. Newton, Spencerport, N.Y., assignor to Caldwell Manufacturing Company, Rochester, N.Y.

Filed Jul. 7, 1988, Ser. No. 216,224
Int. Cl.[4] F16F *9/00, 1/36;* E05D *13/00;* B32B *15/00*
U.S. Cl. 267—74 17 Claims



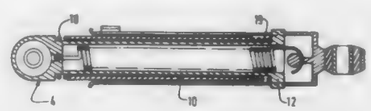
1. A sound deadened window counterbalance spring comprising:
a. a spring cover arranged around said window counterbalance spring;
b. a thermoplastic hot melt adhesive adhered to an outward facing surface of said window counter-balance spring;
c. said thermoplastic hot melt adhesive covering a covered portion of said outward facing surface of said window counterbalance spring, and leaving uncovered a bare portion of said outward facing surface of said window counter-balance spring; and
d. said thermoplastic hot melt adhesive on said outward facing surface of said window counter-balance spring being interposed between said spring cover and said outward facing surface of said window counterbalance spring to deaden any rattle sound resulting from contact between said outward facing surface of said window counterbalance spring and an inward facing surface of said spring cover.

4,854,559

SUSPENSION ARM FOR THE TUB OF A LAUNDRY WASHING MACHINE

Bernard Fialon, Ailly-Sur-Somme, France, assignor to U.S. Philips Corp., New York, N.Y.

Filed Oct. 8, 1987, Ser. No. 107,072
Claims priority, application France, Oct. 17, 1986, 86 14440
Int. Cl.[4] F16F *1/06, 3/04;* D06F *35/00*
U.S. Cl. 267—74 3 Claims



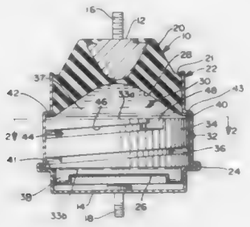
1. An extensible suspension arm for damping vibrations of a laundry washing and drying machine, comprising a tension spring whose ends are attached to two suspension members, which tension spring is disposed in a tube of a first suspension member, which tube constitutes a first element of a damping means and is adapted to slide in a cylindrical casing which is rigidly connected to a second suspension member and which constitutes a second element of the damping means, wherein the damping means comprise a substantially cylindrical body which is adapted to slide longitudinally along the tube, the travel of said body being limited by at least one stop on said tube, and a clamping means of said casing whereby said cylindrical body is clampingly engaged by said casing.

4,854,560

HYDRAULIC MOUNT WITH RECIPROCAL PARTITION

Saiman Lun, Englewood, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 25, 1988, Ser. No. 185,642
Int. Cl.[4] F16M *5/00, 13/00;* F16F *7/10*
U.S. Cl. 267—140.1 3 Claims



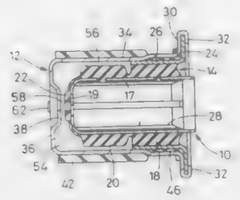
1. A hydraulic mount comprising a pair of mounting members, an elastomeric body connecting said members, an elastomeric diaphragm connected to one of said members and cooperating with said elastomeric body to define a closed cavity, a partition dividing said cavity into a chamber that is enclosed by one side of said partition and said elastomeric body and another chamber that is enclosed by the other side of said partition and said diaphragm, a liquid filling said chambers, and a damping orifice connecting said chambers, characterized by a cylindrical sleeve interconnecting said elastomeric body and said one mounting member and also sealingly peripherally clamping said diaphragm to said one mounting member independent of the partition, said partition comprising a rigid singular body coextensive with said chambers mounted at an annular surface thereof for unrestrained reciprocal movement between spaced stops in an interior annular wall on said sleeve thereby to solely separate said chambers and effect limited cyclic volumetric change in said chambers so that the liquid then is not forced to flow through said damping orifice.

4,854,561

ELASTIC BUSHING FILLED WITH VISCOUS FLUID

Ryouji Kanda, Komaki, Japan, assignor to Tokai Rubber Industries, Ltd., Aichi and Nissan Motor Company, Limited, Kanagawa, both of, Japan

Filed Aug. 10, 1988, Ser. No. 230,776
Int. Cl.[4] F16F *15/04*
U.S. Cl. 267—140.1 6 Claims



1. An elastic bushing filled with a viscous fluid, for flexible connection of a shaft member to support structure, comprising:

a tubular inner sleeve which is closed at one of opposite axial ends thereof and open at the other end, said shaft member being fixedly inserted in said inner sleeve;

a tubular outer sleeve which is closed at one of opposite axial ends thereof and open at the other end, which is disposed radially outwardly of said inner sleeve such that an annular space is formed between an outer circumferential surface of said inner sleeve and an inner circumferential surface of said outer sleeve and such that a cylindrical space is formed between opposed surfaces of bottom walls at the closed ends of said inner and outer sleeves, said outer sleeve being secured to said support structure;

a cylindrical elastic connecting member which fluid tightly fills a portion of said annular space adjacent to the open ends of said inner and outer sleeves, and thereby cooperates with said inner and outer sleeves to define a fluid chamber which includes a remaining portion of said annular space and said cylindrical space, said fluid chamber being filled with said fluid;

a first elastic operating member formed on one of said outer and inner circumferential surfaces of said inner and outer sleeves, so as to occupy a part of said remaining portion of said annular space and cooperate with the other of said outer and inner circumferential surfaces to define therebetween an annular first restricted portion of said fluid chamber; and

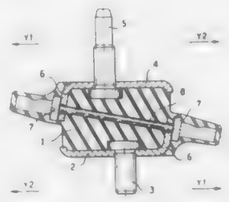
a second elastic operating member formed on one of said opposed surfaces of said bottom walls of said inner and outer sleeves, so as to occupy a part of said cylindrical space and cooperate with the other of said opposed surfaces to define therebetween a planar second restricted portion of said fluid chamber which extends in a radial direction of the bushing.

4,854,562

ELASTIC MOUNTING WITH RIGIDITY BLOCKED IN ONE DIRECTION BY THE TENSION OF A CABLE EMBEDDED IN ELASTOMER

de Fontenay: Etienne, Decize, and Patrick Parisot, Elancourt, both of France, assignors to S.A. dite: Caoutchouc Manufacture et Plastiques, Versailles, France

Filed Mar. 1, 1988, Ser. No. 162,746
Claims priority, application France, Oct. 28, 1987, 87 14897
Int. Cl.[4] B60G *13/02, 11/22;* F16F *7/00*
U.S. Cl. 267—292 18 Claims



1. An elastic mounting comprising:

two rigid elements;

fastening means for attaching each of said rigid elements;

connecting means, having a first strength in tension in a first direction and a second substantially lower strength in compression along at least one other direction, connecting said two rigid elements for restraining movement of said rigid elements in substantially at least said first direction;

elastomeric material means being disposed at least about said connecting means;

said connecting means being held in a substantially unrelaxed position by said elastomeric material means as substantially zero external forces are applied to the elastic mounting;

said connecting means being substantially relaxed along said at least one other direction as said two rigid elements move toward compression of said connecting means; and

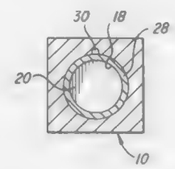
said connecting means being in tension in said first direction as said two rigid elements move in said first direction to produce said tension on said connecting means.

4,854,563

SUPPORT UNIT

Franco Tosi, Hainstrasse 13, D-6305 Alten-Buseck, Fed. Rep. of Germany

Continuation of Ser. No. 936,757, Dec. 2, 1986, abandoned. This application Jun. 27, 1988, Ser. No. 212,138
Int. Cl.[4] B23Q *3/08*
U.S. Cl. 269—25 5 Claims



1. A support unit comprising a movable carriage and a base, said base having longitudinal bearing surfaces which guide the carriage thereon, said base having an interior portion, an inside surface of which defines a bore, a wall of which bore encloses a double acting drive cylinder therein, a piston dividing the cylinder into a front and a rear cylinder chamber, a piston rod extending through the cylinder at its rear end and being connected to the carriage such that the carriage moves along the base, with and parallel to the rod,

a first pressure fluid connection for the front cylinder chamber, which connection is arranged at the front end of the cylinder, and a second pressure fluid connection for the rear cylinder chamber, said second pressure fluid connection also being arranged at the front end of the cylinder,

a sleeve located in the bore, the sleeve being a separate element from the said interior portion, a pressure fluid channel extending from the second pressure fluid connection to the rear cylinder chamber, said sleeve being cylindrical and lining the bore substantially completely in contact with said wall to define the inside of the cylinder, and said pressure fluid channel being formed as a longitudinal groove, said groove being defined by a longitudinally extending space of enlarged cross-section bounded in part by the sleeve and in part by the said interior portion of the base, the enlarged cross-section being formed into at least one of said bore wall or said sleeve.

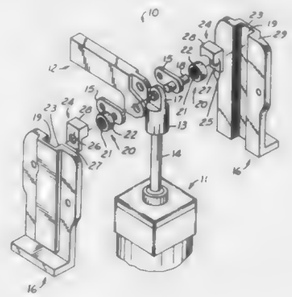
4,854,564

POWER CLAMP WITH TRACK WIPER

Alexander W. McPherson, Farmington Hills, and Larry M. Witt, Rochester, both of Mich., assignors to Delaware Capital Formation, Inc., Wilmington, Del.

Filed Aug. 29, 1988, Ser. No. 237,441
Int. Cl.[4] B23Q *3/03;* B25B *1/04*
U.S. Cl. 269—32 5 Claims

1. Power clamp means comprising clamp base means provided with reaction guide track means, said base means being constructed with two pieces secured in parallel facing relation, each piece having a straight rectangular cross section reaction guide track with its facing side open extending to an open end of each base piece, track follower means, clamp arm means pivotally connected to said base means, actuating linkage means having spaced pivots respectively confined to said guide track means by said track follower means and having an actuating connection with said clamp arm means, coupling means adapted for connection to a reciprocable power source for actuating said track follower means along said track means and, through said linkage means, to provide pivotal movement of said arm means to respective clamp and release positions, stop means limiting said movement to a locked clamping position of said linkage means, said track follower means including anti-friction bearing means with a cylindrical rolling element for engaging each of said guide tracks with close perimeter clearance relation, said stop means limiting the travel of each rolling element when said lock clamping position is reached to a position spaced from said open end of said track, said rolling element being narrower in width than depth of its guide track, a bearing shaft extending through and beyond said rolling element, track wiping means mounted on said extending shaft,



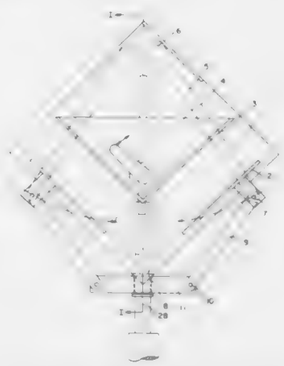
said wiping means having a rectangular track scraping portion substantially equal in cross-section to said rectangular track cross-section substantially filling the space beyond said rolling element at the extremity of its travel, said wiping means having a projection from said rectangular portion for engaging said extending shaft in clearance space of said track beyond said rolling element.

4,854,565

CLAMPING DEVICE

Ingomar Ritsch, Hopfgarten, Austria, assignor to Bessey & John GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 62,515, Jun. 16, 1987, abandoned. This application Sep. 30, 1988, Ser. No. 252,040
Claims priority, application Austria, Jun. 16, 1986, 1619/86
Int. Cl.[4] B25B *5/14*
U.S. Cl. 269—41 9 Claims



1. A clamp for holding elongated workpieces in angular abutment with each other comprising:

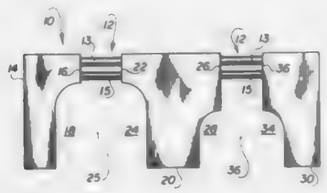
a base;

a pair of first clamping jaws for engaging each of the respective first of opposed first and second sides of each of a pair of workpieces in angular abutment, said jaws being two sides of an angular member, said sides of said angular member forming therebetween an angle defining an angular sector;

guide means on said base for guiding displacement of said

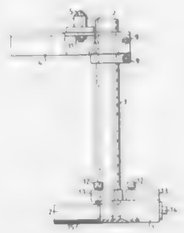
angular member relative to said base along a line bisecting said angle;
locking means for locking said angular member relative to said base along said line bisecting said angle;
a clamping member displaceable relative to said base along a line parallel to said line bisecting said angle;
actuating means for displacing said clamping member parallel to said line bisecting said angle;
a pair of first and second levers, each lever having opposed first and second ends, wherein each of said respective first levers is pivotally coupled at its first end to said base and pivotally coupled at its second end to the first end of a respective second lever, the respective second ends of said second levers are pivotally coupled to said clamping member, the respective first ends of said first levers are pivotally coupled to said base at separate locations lying within said sector and the respective second ends of said second levers are attached to said clamping member at separate locations; and
a pair of second clamping jaws for engaging each of the respective second sides of each of said workpieces, wherein each of said second clamping jaws is pivotally connected to one of the pairs of first and second levers.

4,854,566
ORTHOPEDIC DEVICE
Arnold S. Broudy, Pittsburgh, and Cheryl A. Shank, Monroeville, both of Pa., assignors to ABC Orthoproducts, Inc., Pittsburgh, Pa.
Filed Jan. 15, 1988, Ser. No. 144,236
Int. Cl.[4] B25B *1/20*
U.S. Cl. 269—44 **8 Claims**



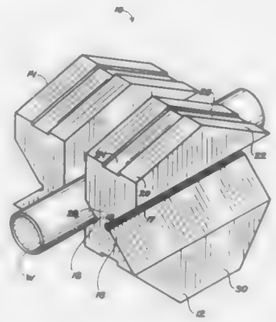
1. An orthopedic device for immobilizing an appendage of a patient comprising:
a linkage;
a first member fixedly secured to the linkage, said first member having a side and an open region defined in the side; and
a second member slidingly secured to the linkage, said second member capable of sliding along the linkage to be positioned adjacent to the first member, said second member having a first side and a first open region defined in the first side with said first open region communicating with the open region of the first member when the second member is adjacent to the first member such that the first and second members are capable of being positioned about the appendage through the open region of the first member and the first open region of the second member.

4,854,567
DEVICE FOR LOCALIZING AND/OR HOLDING AN OBJECT
Jan Persson, Olofström, and Jan Rangståhl, Bromölla, both of Sweden, assignors to AB Volvo, Gothenburg, Sweden
Filed Feb. 4, 1988, Ser. No. 159,420
Claims priority, application Sweden, Feb. 13, 1987, 8700585
Int. Cl.[4] B23Q *1/04*
U.S. Cl. 269—71 **12 Claims**



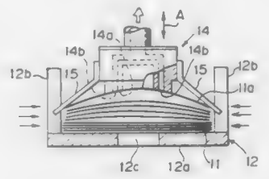
1. An assembly suitable for use for localizing or holding an object firmly in place, said device comprising
positioning means comprising two legs defining two vertically-oriented abutment surfaces angularly displaced with respect to one another,
means to attach said positioning means to a supporting surface,
a base member comprising two vertically-oriented abutment surfaces configured to permit mating engagement with said abutment surfaces of said positioning means,
a spacing arm fixed to and extending vertically from said base, and
object localizing means extending from said spacing arm and spaced vertically from said base.

4,854,568
UNIVERSAL ANGLE V-BLOCK WORK HOLDING FIXTURE
Sam Baeza, 156 Juanita, and Hector Pulido, 8764 Winchester, both of El Paso, Tex. 79907
Filed May 20, 1988, Ser. No. 196,504
Int. Cl.[4] B25B *1/24*
U.S. Cl. 269—268 **3 Claims**



1. A new and improved universal angle V-block work holding fixture for holding a cylindrical work piece at a variety of predetermined angular orientations during a machining operation, comprising:
a first block having parallel opposed front and back surfaces connected by at least five planar side surfaces;
at least one V-groove formed in one of said front and back surfaces;
and
a second block having mirror symmetry with said first block, and
wherein said first block has seven side surfaces,
and
wherein said first block is provided with two V-grooves extending in parallel relations, one formed in each of said front and back surfaces, and
wherein said first block has seven side surfaces, said side surfaces forming angles with a horizontal reference of 15, 30, 90, 60, 0, 45 and 90 degrees.

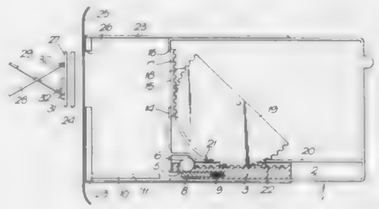
4,854,569
APPARATUS FOR TAKING OUT FLEXIBLE WORK
Akira Mizuta, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 11, 1988, Ser. No. 154,714
Claims priority, application Japan, Feb. 12, 1987, 62-30381
Int. Cl.[4] B65H *3/08*
U.S. Cl. 271—98 **6 Claims**



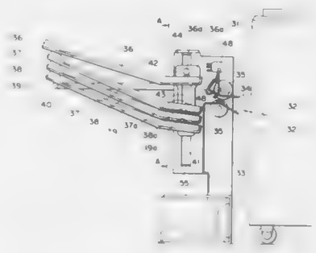
1. An apparatus for taking out flexible works one by one from a stack of the same comprising:
an air blow means which is disposed on at least one side of the stack of flexible works and blows air onto the side of the stack of flexible works;
a suction means which has a cylindrical concave suction surface and is adapted to such a substantially central portion of the uppermost one of the flexible works, and
a pressing means, which extends below the suction surface of the suction means so as to contact the uppermost flexible work before the suction surface, presses the periphery of the uppermost flexible work below the central portion thereof when the uppermost flexible work is sucked by the suction means.

4,854,570
SHEET FEEDING SYSTEM
Harvey G. Martin, West Sussex; Roger Pilling, and Steven M. Hosking, both of Hampshire, all of England, assignors to De La Rue Systems, Ltd., England
Filed Oct. 7, 1987, Ser. No. 106,239
Claims priority, application United Kingdom, Oct. 8, 1986, 8624192; Jan. 13, 1987, 8700704
Int. Cl.[4] B65H *1/00*
U.S. Cl. 271—162 **8 Claims**

5. A sheet feeding system, comprising:
(A) a sheet feeding store and a sheet store support, said sheet feeding store being insertable into and removable from said sheet store support;
(B) said sheet feeding store including;
(1) a housing for storing sheets; an opening formed in said housing;
(2) a shutter moveable between a closed position wherein it covers said opening and an open position wherein it uncovers said opening;
(3) a first interlock member mounted on said housing and operatively coupled to said shutter and moveable between a first position wherein said shutter is in said closed position and a second position wherein said shutter is in said open position; and
(4) locking means for locking said first interlock member in said first position when said store is removed from said support;
(C) said sheet store support including:
(1) support means for supporting said store;
(2) a second interlock member which cooperates with said locking means to unlock said first interlock member from said first position and move said first interlock member into said second position when said store is inserted into said support;
(D) said locking means including a lock member linearly movable between a first position in which it engages and locks said first interlock member to said housing, and a second position in which it engages and locks said first and second interlock members together while allowing said first and second interlock members to move as a unit relative to said housing so that said shutter may be moved to said open position.



4,854,571
SHEET SORTING DEVICE
Tadayuki Kitajima, Yokahama; Toshiyuki Asakawa, Sagamihara; Masataka Naito, Yokohama; Kazuhiro Matsuo, and Toshiaki Murayama, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 12, 1986, Ser. No. 838,826
Int. Cl.[4] B65H *39/10*
U.S. Cl. 271—293 **12 Claims**



1. A sheet sorting device comprising:
a plurality of bin trays provided in a multiple stage;
a plurality of cam followers, one cam follower provided on the sheet carry-in side of each of said bin trays to maintain a spacing between said plurality of bin trays to prevent them from abutting each other;
spiral cam means having a second sloping lead portion for engaging a first one of said cam followers to enlarge the spacing between said bin trays on the sheet carry-in side thereof and moving said first cam follower upwardly, said spiral cam means also having a first lead portion sloping in the same direction as said second sloping lead portion and

engageable with a second cam follower overlying said first cam follower to thereby move said second cam follower upwardly; and

force transmitting means for transmitting the upward movement force of said second cam follower by said first lead portion to other cam followers underlying said first cam follower, so that said other cam followers are raised to be engaged with said spiral cam means.

4,854,572

PHYSICAL TRAINING ACCESSORY

Eric A. Knight, 17 Lakeshore Dr., Apt. B-1, Farmington, Conn.

[redacted]

Continuation-in-part of Ser. No. 923,388, Oct. 27, 1986, abandoned. This application Dec. 16, 1987, Ser. No. 133,525

Int. Cl.[4] A63B *23/04*

U.S. Cl. 272—70 **15 Claims**



1. A physical training accessory comprising:

a gatherable sail having a wind-catching surface and being dimensioned and configured to be freely deployable between a slack condition and a billowed conditioned substantially independently of the movement and positioning of the wearer's arms, the sail being deployable to the billowed condition solely by ground level air velocity relative to the wearer such that the billowed condition of the sail serves to increase air resistance to ground locomotion of the wearer; and

an entirely flexible securement means for securing the gatherable sail to the torso of the wearer

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4,854,573

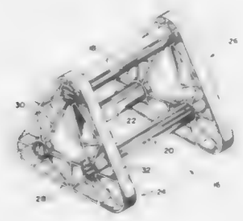
EXERCISING DEVICE

Gerald G. Johannson, Abbotsford, and Gordon R. Trea, Coquitlam, both of Canada, assignors to International Power Blocks Holdings Ltd., Coquitlam, Canada

Filed Feb. 3, 1988, Ser. No. 151,933

Int. Cl.[4] A63B *1/00*

U.S. Cl. 272—93 **14 Claims**



9. An exercising apparatus for use on a surface, the apparatus comprising:

(a) a first handle having first and second end portions, the first end portion including a keyway;

(b) a first support having first means for supporting said first end portion of said handle, said first means for supporting including a first collar having an opening for receiving said first end portion of said first handle and a first keying member extending inward of said collar for engagement with said keyway on said first end portion of said first handle, the first support further including a first side and a second side, the first side being located at a first distance from said first end portion of said handle, the second side being located at a second distance from said first end portion of said handle, said second distance being different from said first distance;

(c) a second support spaced apart from said first support the second support having respective first means for supporting said second end portion of said handle, the second support further including a respective first and a respective second sides, the respective first side being located at said first distance from said second end portion of said handle, the respective second side being located at said second distance from said second end portion of said handle; whereby the first and second supports may be oriented to place the first side and the respective first side on said surface thereby positioning said handle at said first distance from said surface or said first and second supports may be oriented to place the second side and respective second side on said surface thereby positioning said handle at said second distance from said surface, and wherein rotation of said first handle is prevented by the engagement of said keyway on said first end portion with said key member on said first collar.

4,854,574

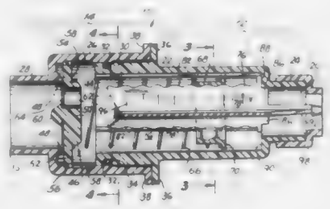
INSPIRATOR MUSCLE TRAINER

Douglas A. Larson, River Forest, Ill., and Thomas L. Clanton, Worthington, Ohio, assignors to 501 Healthcan, Inc., Cedar Grove, N.J.

Filed Mar. 15, 1988, Ser. No. 168,203

Int. Cl.[4] A63B *23/00;* **A62B** *9/02*

U.S. Cl. 272—99 **16 Claims**



1. A lung/diaphragm exerciser device comprising a tubular body defining a chamber having open first and second opposed ends therein, movable sealing means mounted within said chamber for movement between a first position restricting the passage of air from said second end to said first end and a second position whereby said restriction is removed; bias means mounted within said chamber to resist motion of said sealing means from said first position to said second position, and valve means mounted within said chamber allowing the free passage of air from said first end to said second end while prohibiting the passage of air from said second end to said first end.

4,854,575

FLUID FILLABLE, COLLAPSIBLE DUMBBELLS

Robert D. Wilson, Irvington-on-Hudson, N.Y.; Douglas W. Grigg, South Orange, N.J., and Donald G. Gialanella, New York, N.Y., assignors to Wilson Water Weights, Inc., Irvington-On-Hudson, N.Y.

Filed Jan. 14, 1988, Ser. No. 144,280

Int. Cl.[4] A63B *11/00*

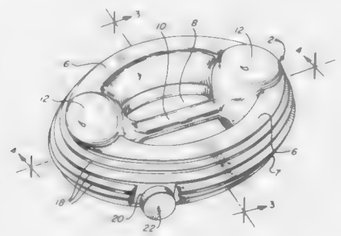
U.S. Cl. 272—122 **10 Claims**

1. A dumbbell which is collapsible for storage and expandable upon introduction of fluid therein, said dumbbell comprising in combination:

a doughnut-shaped collapsible tubular container for receiving fluid;

a hollow handle traversing the inner ring of said doughnut-shaped container and attached at either end to the wall thereof;

the interior of said handle being in direct fluid receiving communication at either end thereof with the interior of said container;



the outer peripheral wall of said container being formed into accordion pleats resiliently biased into the folded position but expandable against said bias under the influence of pressure generated solely by introduction of fluid into said container to vary the volume of said container to accommodate said fluid and permit variation of the weight of said dumbbell without introducing significant amounts of air into said container;

an inlet port in the wall of said container; and

removable plug means for sealing said inlet port.

4,854,576

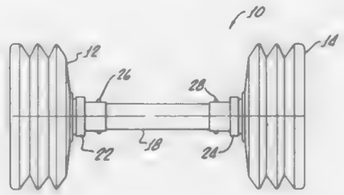
COLLAPSIBLE WEIGHT SYSTEM

Richard J. McWain, 56 W. Chapman Ave., Orange, Calif. 92668

Filed Jun. 6, 1988, Ser. No. 202,328

Int. Cl.[4] A63B *13/00*

U.S. Cl. 272—123 **9 Claims**



1. A collapsible weight system comprising:

collapsible diaphragm means for containing a liquid;

a closed hub disposed on an end of said collapsible diaphragm means;

open hub means for enabling filing of said collapsible diaphragm with a liquid, said open hub means being disposed on an opposite end of the collapsible diaphragm means and in a coaxial relationship with said closed hub; and

cap means, sized for passing through said open hub means and engaging said closed hub, for both sealing said open hub means and for providing a rigid axial support to said collapsible diaphragm means;

said cap means being further operative for controlling the expansion of the collapsible diaphragm in order to control the filled weight of the collapsible diaphragm, said cap means comprising a plurality of caps having different lengths, each length defining a different amount of expansion of the collapsible diaphragm when inserted through the open hub means, sealed thereto and engaging said closed hub.

4,854,577

EXERCISE MEANS

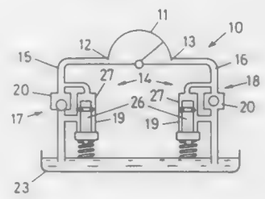
Anthony M. Sims, Murray Bridge, Australia, assignor to Titan Fitness Products Pty., Ltd., Blair Athol, Australia

Filed Mar. 3, 1988, Ser. No. 163,949

Claims priority, application Australia, Mar. 3, 1987, PI0643

Int. Cl.[4] F16F *5/00*

U.S. Cl. 272—130 **8 Claims**



1. A hydraulic device for an exercise machine, comprising a double-acting hydraulic pump having two hydraulic outlets, a valve having a valve body, and two conduits respectively interconnecting said pump outlets and valve body,

the valve body containing two conduit extension passages therein in fluid flow communication respectively with said conduits, an upper passage which crosses said extension passages to provide interconnection with each extension passage, a lower passage, a pair of non-return valves opening to the lower passage and having their pressure sides in fluid flow communication respectively with said extension passages,

a pair of pressure regulating valves comprising valve members in the respective conduit extension passages which normally close the interconnections between those passages and the upper passage but which are independently movable upon application of pressure to open said interconnections, spring means bearing against said valve members urging them toward their normally closed positions,

and a reservoir space within the valve body which opens into both said upper and lower passages intermediate their ends,

so arranged that flow of pressure fluid from the pump through each said conduit is through a respective said pressure regulating valve, and consequential return flow to the pump through the other said conduit is through a respective said non-return valve.

4,854,578

MULTI-PURPOSE EXERCISE MACHINE

Kent B. Fulks, 9710 Amberly, Dallas, Tex. 75243

Filed Aug. 1, 1988, Ser. No. 226,892

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—134 **10 Claims**

1. An adjustable exercise arm arrangement for use with a multiple purpose exercise machine comprising;

a support frame;

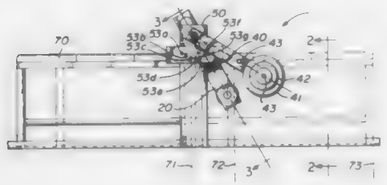
a shaft rotatably mounted on said support frame, said shaft having first and second ends;

a gear with a reduced diameter hub fixed to said shaft with said hub at or near said first end thereof;

an exercise lever arm having proximal and distal ends wherein an exercise bar having a plurality of hub fitting holes is fixedly attached at or near said distal end in a substantially perpendicular relationship to said exercise lever arm;

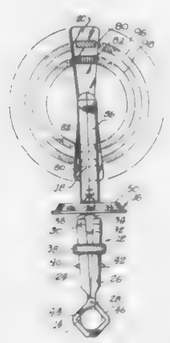
said plurality of hub fitting holes having bore axes parallel to

said exercise bar, each said hole being located near said proximal end at a different distance from said exercise bar; and,



tooth fitting means integral to said exercise arm adapted for engaging at lease one tooth of said gear when any said hub fitting hole is placed over said hub.

4,854,579
WIND INDICATOR FOR GOLFERS
G. Matthew Baxter, 589 Sheridan Rd., Glencoe, Ill. 60022
Filed Aug. 17, 1988, Ser. No. 233,070
Int. Cl.[4] A63B *57/00*
U.S. Cl. 273—32 H **9 Claims**



5. A wind indicator for use by a golfer comprising a base, a propeller, means for mounting said propeller on said base for rotation about a generally horizontal axis and for movement about a generally vertical axis relative to said base in accordance with wind direction, and observable indicia on said propeller, said indicia varying in observable appearance in accordance with the speed of the propeller and thus the wind velocity for thereby providing an indication of wind velocity, providing the appearance of a colored circular band during rotation of the propeller, the observable color intensity of said band varying and decreasing as the speed of the propeller and thus wind velocity increases.

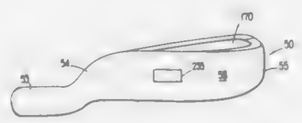
4,854,580
GOLF CLUB
Kenji Kobayashi, Niigata, Japan, assignor to Endo Manufacturing Co., Ltd., Japan
Filed Feb. 17, 1988, Ser. No. 156,899
Claims priority, application Japan, Sep. 22, 1987, 62-237670
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—77 A **3 Claims**

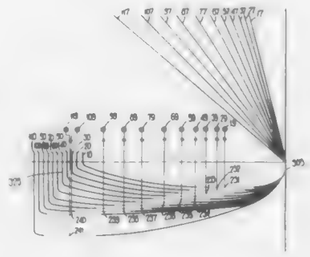
1. A set of golf clubs, each comprising:
a shaft, a head with a loft angle, and a sole with a ridge which extends longitudinally in the direction of heel to toe, is located intermediate the rear of the club head and the frontmost point of the striking face at the bottom of the club head, and projects outwardly from the plane of the sole;
the loft angle of each club head decreasing inversely relative to the other clubs in proportion to the length of its respective shaft;



and the ridge of each club being located back from the leading edge of the sole a distance, relative to the other clubs, inversely proportional to the length of its respective shaft.

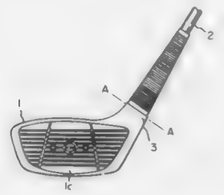
4,854,581
GOLF IRONS
D. Clayton Long, Albany, Ga., assignor to MacGregor Golf Company, Albany, Ga.
Division of Ser. No. 66,077, Jun. 24, 1987, Pat. No. 4,802,672.
This application May 13, 1988, Ser. No. 193,925
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—77 A **2 Claims**





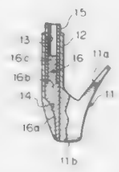
1. In a set of golf irons having long irons and short irons, each iron having a head with a sole having a center of mass, a toe, a heel, a leading edge, and a trailing edge, the improvement comprising a planar segment on the sole, the planar segment centered below the center of mass to cause the head to sit squarely at address.

4,854,582
HEAD CONNECTING DEVICE IN GOLF CLUBS
Kunio Yamada, 5-14, 4 chome, Hibarigao Kita Houya shi, Tokyo, Japan
Filed Jul. 29, 1987, Ser. No. 79,474
Int. Cl.[4] A63B *53/02*
U.S. Cl. 273—80.2 **6 Claims**



1. A device for connecting a cast iron golf club head to a golf club shaft comprising; a cylindrical sleeve on one end of said cast iron golf club head; a tubular sleeve shaped setting part being mounted on said said sleeve part of said golf club head; said tubular sleeve shaped setting part having a lengthwise bore at an incline to the overall axis of said tubular sleeve shaped setting part for receiving the end of said golf club shaft; means for rotating said tubular sleeve shaped setting part; whereby the angle of a face on said cast iron golf club head is varied with respect to the said shaft.

4,854,583
CONSTRUCTION OF PORTION CONNECTING GOLF CLUB-HEAD AND GOLF CLUB SHAFT
Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 77,930, Jul. 27, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 298,278
Claims priority, application Japan, Aug. 29, 1986, 61-201763
Int. Cl.[4] A63B *53/02*
U.S. Cl. 273—80.8 **9 Claims**



1. A connection structure between a golf club shaft and a club head comprising:
a golf club head having a neck member, said neck member being provided with a substantially vertical hole having an opening at a top end of said neck member, said hole having an upper large diameter section and a lower narrow section, said lower narrow section being displaced laterally from a vertical central axis of said large diameter section;
a hollow golf club shaft inserted into said upper diameter section, an outer diameter of said shaft being substantially identical to an inner diameter of said upper large section; and
a reinforcing pin made of a material having a greater strength than that of said club head, said reinforcing pin having an enlarged cylindrical middle portion, a first fitting portion projecting from one end of said middle portion and a second fitting portion projecting from the other end of said middle portion and being displaced laterally from a vertical central axis of said middle portion, said first fitting portion being a cylindrical portion having an outer diameter being substantially identical to an inner diameter of said hollow golf club shaft, an outer diameter of said middle portion being substantially identical to said inner diameter of said upper large diameter section of said hole and an outer configuration of said second fitting portion being substantially identical to an inner configuration of said lower narrow section,
wherein said reinforcing pin and hollow golf club shaft are inserted into said hole in that order in a manner such that said second fitting portion of said reinforcing pin engages within said lower narrow section of said hole, said enlarged cylindrical middle portion of said reinforcing pin engages within a lower end of said upper large diameter section of said hole, and said hollow golf club shaft engages within a clearance between said upper large diameter section of said hole and said first fitting portion of said reinforcing pin and further wherein said hollow golf club shaft, said portions and said sections are fixed tightly therein so as to constitute an integrally connected part with substantially no clearance therebetween.

4,854,584
GOLF REMINDER DEVICE
Etienne R. Soucy, 20 Ferncrest Ave., Coventry, R.I. 02816
Filed Aug. 1, 1988, Ser. No. 227,068
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—183 B **1 Claim**



1. A golf reminder device comprising a resilient band adapted to frictionally engage and extend across the top of a wearer's head from a point generally near the top front of one ear to a point generally near the top front of the other ear, means permitting ready adjustment of the length of said band, an arm member connected to and extending forwardly from one end of said band, means permitting ready adjustment of the length of said arm member, and a pad portion at the free end of said arm member, said arm member being normally biased toward the face of the wearer so that said pad portion makes pressurized engagement with the wearer's face at substantially the cheek area thereof, said arm member being rotatably connected to said band, whereby the direction in which said arm member extends from said band may be selectively reversed.

4,854,585
GOLF SWING TRAINING DEVICE
Alfred E. Koch, 17032 Woodleaf Rd., and Robert C. Koch, 15555 Grosse Point Oval, both of Strongsville, Ohio 44136
Filed Jan. 21, 1988, Ser. No. 146,396
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—193 B **6 Claims**

1. A golf swing training device comprising: comprising:
an elongated shaft having a grip at a first end and a club head at an opposed, second end;

a hinge mechanism interposed between said first and second ends, said hinge mechanism including a female member having a generally hollow, cylindrical portion at one end and axially extending first and second yoke portions at the other end defining a cavity therebetween, terminal ends of said first and second yoke portions having smooth arcuate surfaces to permit two-way movement of the hinge mechanism, an adjusting screw threadably received in said hollow portion for selective axial movement therein;

a biasing means received in said hollow portion having one end operatively engaging said adjusting screw;

a generally spherical member operatively engaging the other end of said biasing means, said spherical member being urged axially toward said cavity;



a male member having a smooth arcuate surface received in said female member cavity to permit selective articulation of the hinge mechanism such that said second shaft end is displaceable out of line from said first shaft end both rearwardly and forwardly in either one of two opposing directions relative to the longitudinal axis passing through the elongated shaft, said male member arcuate surface including a generally spherical recess disposed in a central external surface portion thereof for receipt of said spherical member at an area opposite said biasing means;

means for interconnecting said hinge mechanism to said elongated shaft; and,

means for pivotally securing said male and female member of said hinge mechanism.

4,854,586

MODIFIED CRIBBAGE GAME UTILIZING CARDS AND DICE

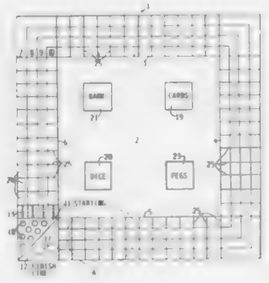
Vicki M. Morse, P.O. Box 135, St. Albans, Me. 04971

Filed Nov. 26, 1987, Ser. No. 124,684

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—249 **17 Claims**

1. A combination card and die game for playing an improved game of cribbage, comprising a game board having a central zone and margin zones surrounding said central zone, a number of parallel tracks in each of said margin zones, first means designating a starting line at a beginning of each of said tracks, second means designating a finish line at an end of said tracks, a plurality of action locations arranged in a row long each track for keeping a score for each player along his or her track, third means defining different characteristics for at least some of said action locations, a deck of conventional playing cards comprising four suits of cards with diamonds, spades, clubs and hearts wherein an ace equals one pint, two to ten equal face value, and jacks, queens, and kings are equal to ten points each for introducing first chance elements into playing the game, conventional die means for introducing second chance elements into playing the game, and at least two game bits for each player, said different characteristics of said action locations having a random distribution along each track for introducing third chance elements into playing the game, said random distribution being the same for each track so that each track is the equivalent of any of the other tracks, said deck of playing cards, said conventional die means, and said different characteristics of said action locations as defined by said third



means being used in combination for determining the advance or retreat of said game bits along their respective track of each player, wherein any one of the characteristics of an action location in combination with a die score or a specified card combination or card in combination with a die score provide additional score points.

4,854,587

POP-UP PRACTICE BATTING TEE

Keith N. Groves, 3200 McLeod Dr., Apt. 210, Las Vegas, Nev. 89121

Filed Mar. 14, 1988, Ser. No. 167,495

Int. Cl.[4] A63B *69/40*

U.S. Cl. 273—26 R **6 Claims**



1. A quickly self righting practice batting tee comprising an upright adapted at one terminal end to holding a ball which may be placed thereon, and the other end being attached to an upright pear shaped container the bottom end of which is flat for a sufficient length to permit the said container to stand upright by itself with the edges of said bottom end curving upward to permit said container to be displaced downward when the batting tee is hit, and said bottom of the container being weighted so that said weight forces the container to quickly assume an upright position after it has been tilted from the upright position; locking means at the top of the side of the container to hold the pedestal firmly to the container when placed therein.

4,854,588

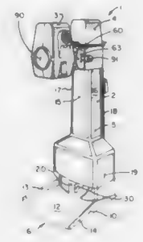
TABLE TENNIS BALL SERVING DEVICE

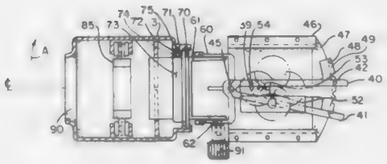
Gary Gatchel, Rockford, Ill.; Joseph E. Newgarden, 10931 Griffing Blvd., Biscayne Park, Fla. 33161, and Gordon E. Lynn, Carol City, Fla., assignors to Joseph E. Newgarden, Biscayne Park, Fla.

Continuation of Ser. No. 719,872, Apr. 3, 1985. This application Jan. 13, 1988, Ser. No. 143,566

Int. Cl.[4] A63B *39/00*

U.S. Cl. 273—30 **7 Claims**





1. An automatic ball serving device, comprising:

an enclosure having a ball feed passage through it, said enclosure having a head structure at one end and a ball entrance at its other end interconnected by said feed passage;

means for feeding balls to said feed passage;

powered expelling means mounted in said head structure for expelling balls therefrom; and

means for providing predetermined multi-directional movement of the head structure relative to said enclosure, including:

a transverse, horizontal axis pivot means permitting selective positioning of said head structure to a predetermined setting to vary the elevation of a ball expelled from said head structure about said transverse, horizontal axis;

means for automatically continuously changing the horizontal direction of a ball expelled from the head structure about a vertical axis according to a predetermined setting including a cam follower and cam devices for defining a plurality of limits for movement of said head structure; and

means for permitting selected rotation of said head structure relative to said enclosure about an axis which is substantially parallel to the path of a ball moving from said enclosure through said head structure to impart a varying angle of spin on a ball expelled from the head structure by said powered expelling means.

4,854,589

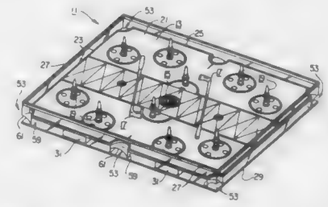
GAME

Emsley A. Davis, 1616 Colcord Ave., Waco, Tex. 76707

Filed Sep. 2, 1987, Ser. No. 92,183

Int. Cl.[4] A63F *7/00, 7/06*

U.S. Cl. 273—123 R **4 Claims**



1. A game, comprising:

a rectangular board having a top surface and edge surfaces, said top surface having markings dividing the top surface into areas, said areas comprising two rectangular areas of play, with said areas of play separated from one another by a neutral area, said markings further delineating zones within each area of play,

side wall means extending along said side edge surfaces and oriented transversely to said top surface, said side wall means extending at least above board edge surfaces,

a playing ball,

scoring pocket means comprising openings formed in said board edge surfaces, said openings being large enough to receive said playing ball, said scoring pocket means bordering said areas of play, with the number of scoring pocket means of one area of play being equal to the number of scoring pocket means of the other area of play,

a plurality of stick means for use in striking the ball,

said playing ball comprising wall structure having a dimension in one plane which is greater than its dimension in a plane transverse to said one plane, said playing ball having an interior space within said wall structure with a plurality of openings formed through said wall structure so as to allow communication between said interior space of said playing ball and the exterior of said playing ball, with said playing ball having a smaller ball located within said interior space.

4,854,590

CASH REGISTER GAMING DEVICE

Daniel Jolliff, Moore; Michael W. Hahn, Oklahoma City, and Dean C. Oldham, Moore, all of Okla., assignors to Continental Brokers and Consultants, Inc., Moore, Okla.

Filed May 8, 1987, Ser. No. 47,939

Int. Cl.[4] A63B *71/00*

U.S. Cl. 273—138 A **11 Claims**

1. A gaming device for use in combination with a cash register comprising:

interface means conducting an actuation input from said cash register upon ring-up of a valid sale function;

computing means connected to said interface means and functioning in real time, said computing means being programmed to commence gaming operation upon receiving said actuation input to generate a selected indication from a predetermined group of indications which include a plurality of winning indications of differing prize value and a plurality of losing indications and to store retrievably said indications;

display means controlled by said computing means to convey notice selectively proximate the cash register of all such winning and losing selected indications; and

means including a printer for querying said computer means

periodically to retrieve the stored indications and for printing out a record of all winning and losing indications



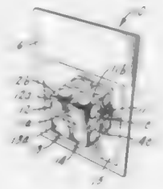
including prize value for a predetermined period preceding the query.

4,854,591

THREE DIMENSIONAL PUZZLE EMPLOYING A REFLECTIVE SURFACE

Mark Setteducati, 218 E. 17th St., New York, N.Y. 10011

Filed Feb. 6, 1987, Ser. No. 11,965
Int. Cl.[4] A63F 9/12
U.S. Cl. 273—157 R 8 Claims



1. A three-dimensional puzzle comprising a plurality of geometric forms with visual material on a plurality of the exterior surfaces of said forms, wherein the visual material on each of said geometric forms is unique with respect to the visual material on at least one other of said geometric forms, and a reflective surface wherein said visual material is such that in a redetermined arrangement of said forms on said reflective surface the visual material, and the image of the visual material as they appear in the reflective surface, together form a predetermined design.

4,854,592

GOLF CLUB WITH INTERNAL SAND RAKE

Alex J. Milovic, 9501 Florence Cir., Villa Park, Calif. 92667

Filed Sep. 26, 1988, Ser. No. 249,410
Int. Cl.[4] A63B 53/00
U.S. Cl. 273—162 F 23 Claims

13. A golf club, comprising:

a tubular shaft having a first end connected to a club head, and a second end;



rake means situated within the shaft and slidably extendable therefrom through the shaft second end; and

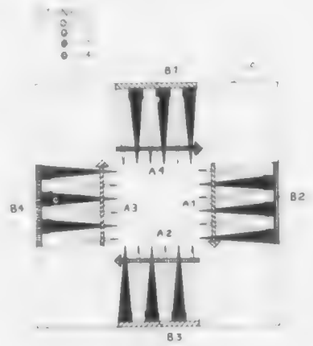
means for securing the rake means within the shaft.

4,854,593

FOUR PLAYER BACKGAMMON

Dennis S. Riley, and Jo F. Riley, both of 1461 John Ringling Pkwy., Sarasota, Fla. 33577

Filed Feb. 26, 1987, Ser. No. 19,504
Int. Cl.[4] A63F 3/00
U.S. Cl. 273—248 2 Claims



1. A four player backgammon game board comprising:

four groups of six adjacent isosceles triangles of two alternating colors, the bases of said isosceles triangles being oriented along the edges of the game board and the apexes of said isosceles triangles being oriented toward the center of the game board, and

four different color coded rectangular shaped bands, each having a length approximately equal to the length of the sum of the bases of one of said groups of six adjacent isosceles triangles and a width approximately equal to one third the width of the base of one isosceles triangle, the location of each of said bands being between the bases of chosen groups of six isosceles triangles and the corresponding edge of the game board, the placement of said color coded bands determines the location of each players inner table from which he bears off his respective colored stones in a race to win the game, and

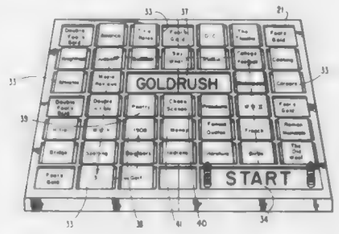
four different color coded arrows of colors matching the colors of said four different color coded bands and of lengths approximately equal to the lengths of said four different color coded bands, the location of each arrow being adjacent to the apexes of chosen groups of six isosceles triangles, the placement of said arrows on the game board determines the location of each players outer table on to which each player must enter his respective colored stones to begin the game, said arrows providing a means to determine the direction of movement of each player's respective colored stones.

4,854,594

METHOD OF PLAYING A BOARD GAME

Ronald E. Eaton, 7284 Monon Ct., Indianapolis, Ind. 46256

Filed Aug. 9, 1988, Ser. No. 230,051
Int. Cl.[4] A63F 3/00
U.S. Cl. 273—249 7 Claims



1. A method for playing a game on a board having a substantially flat top surface on which is delineated a grid defining a plurality of contiguous spaces disposed with replaceable game question cards, a starting block and a center hub, the game question cards including regular question cards and game-ending question cards, said contiguous spaces are arranged in a defined path from said starting block to said game-ending question cards, the game further including a game piece for each player wherein the method of play comprises:

(a) placing each player's game piece in the starting block;

(b) asking the first list question of to all the players;

(c) each player preparing a list of responses in answer to said first list question;

(d) each player moving in turn from the starting block to a move-ending game board square based upon the number of correct responses to said first list question;

(e) restricting movement of said game pieces to only horizontal and vertical directions thereby preventing diagonal moves and further restricting said movement such that contact with any square is limited to one time by any piece as part of any one move;

(f) requiring a different question to be answered correctly by each player for the player's corresponding game piece to remain on the corresponding move-ending game board square, the question to be asked corresponding to the game question card exposed on the square occupied by the particular game piece;

(g) removing each game question card from its corresponding game board square when the corresponding question is answered correctly, thereby leaving the game board square void of any game question cards;

(h) replacing each game question card with a new game question card when the corresponding question is not answered correctly;

(i) after each player has made its initial move and responded to the particular question, asking another list question of all players;

(j) each player preparing a list of responses in answer to said another list question;

(k) each player moving in turn from its then-present position to a move-ending game board square based on the number of correct responses to said another list question; and

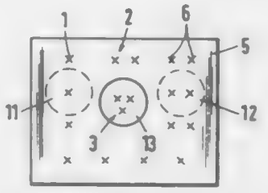
(l) repeating steps (e), (f), (g), (h), (i), (j) and (k) until a first game-ending question is answered correctly.

4,854,595

FIREARM AIMING SIMULATOR DEVICE

Kurt Eichweber, Hamburg, Fed. Rep. of Germany, assignor to Precitronic Gesellschaft für Feinmechanic und Electronic mbH, Fed. Rep. of Germany

Continuation of Ser. No. 15,594, Feb. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 781,159, Sep. 27, 1985, abandoned. This application Sep. 3, 1987, Ser. No. 93,053
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1985, 3507007
Int. Cl.[4] F41J 5/02
U.S. Cl. 273—312 15 Claims



1. A system for practicing aiming a firearm at a target comprising:

a target having first and second target areas with first and second degrees vulnerability, respectively;

first and second groups of retroreflectors mounted to the first and second target areas, respectively, the first and second groups of retroreflectors arranged in first and second visually distinguishable patterns with first and second densities, respectively; and

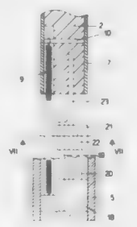
an optical aiming system for directing an electromagnetic beam at the target and for receiving electromagnetic radiation reflected back from one of the groups of retroreflectors.

4,854,596

TENNIS RACKET WITH ANGULARLY ADJUSTABLE HANDLE AND FIXED ANATOMIC GRIP

Italo Carbonetti, 11 Via Prassitele, 00125 AXA Acilia Sud RM, Italy

Filed Dec. 8, 1987, Ser. No. 130,316
Claims priority, application Italy, May 25, 1987, 47978 A/87
Int. Cl.[4] A63B 49/00, 53/14
U.S. Cl. 273—73 J 3 Claims



1. In a tennis racket having a strung frame portion and a handle portion, said handle portion being formed with a stud integral with said frame portion of the racket, a tubular sleeve pivotally and telescopically engaged with said stud to assume a plurality of angular attitudes with respect to said stud about the axis thereof, spring means connecting said stud and said tubular sleeve which stress said tubular sleeve in the direction of the frame portion of the racket, means for securing in a disengageable manner the sleeve with respect to said stud, the improvement of means for indexing the angular attitude of the

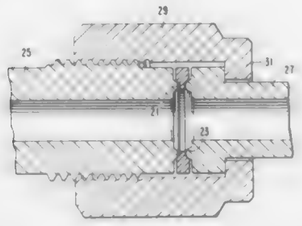
sleeve comprising: a turnable member integrally fixed inside the sleeve and engaged with an end of said spring, said turnable member being provided with first angular set means and a pivot integral therewith; a fixed member integral with said stud and provided with second set means to be engaged with said first set means, said fixed member being pivotally and slidingly coupled to said pivot, and an anatomic grip integral with said sleeve for the hold of a player's hand, so that the frame portion of the racket can be made to assume a plurality of angularly shifted attitudes with respect to the grip.

4,854,597

METAL GASKET HAVING CONICAL AND RADIAL SEALING SURFACES AND METHOD OF USING THE GASKET WITH A TUBULAR ELEMENT

Charles Leigh, Washington Township, Morris County, N.J., assignor to General Components, Inc., Rockville, Md.

Filed Jan. 22, 1988, Ser. No. 147,181
Int. Cl.[4] F16J *15/08*
U.S. Cl. 277—1 10 Claims



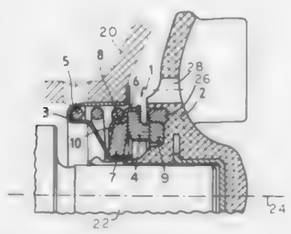
1. A gasket comprising an outer section in the form of a circular annulus defining a central axis, an inner section in the form of a circular annular concentric with the annulus of said outer section and having an axial dimension shorter than the axial dimension of said outer section, a tapered section connecting said outer section with said inner section, said tapered section having conical faces directed inwardly toward the axis of said circular annuluses, wherein said outer section has faces perpendicular to said central axis, and said axial dimension of said outer section is constant throughout said outer section.

4,854,598

SLIDE RING SEAL WITH CARRIER BODY

Hans Deuring, Burscheid, Fed. Rep. of Germany, assignor to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Dec. 1, 1988, Ser. No. 278,474
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1987, 3740694
Int. Cl.[4] F16J *15/38*
U.S. Cl. 277—87 6 Claims



1. A slide ring seal, comprising:

an annular housing having an axis, the housing including an axially oriented and radially inwardly disposed arm;

a carrier body having a radially oriented arm portion;

a compression spring in the housing, the spring urging the carrier body in the axial direction;

a slide ring having a rear face with first and second portions, the radially oriented arm portion of the carrier body lying directly at the first portion of the rear face of the slide ring so as to axially support the slide ring; and

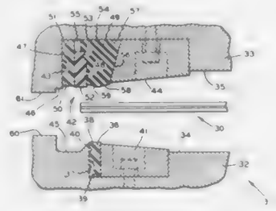
an elastomer ring having a portion which is sealed against the inwardly disposed arm of the housing, the elastomer ring having another portion which lies under axial tension directly at the second portion of the rear face of the slide ring.

4,854,599

SEAL CONSTRUCTION FOR A MOLD STRUCTURE FOR ENCAPSULATING GLASS WITH A GASKET

Werner W. Barteck, La Salle, Mich., assignor to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Aug. 21, 1987, Ser. No. 88,123
Int. Cl.[4] B29C *39/18, 39/28;* F16J *15/00*
U.S. Cl. 277—227 7 Claims



1. A seal assembly, for a mold for encapsulating a window assembly, comprising:

(A) a first seal element, formed of a non-deformable, non-compressible material, including a first surface adapted to sealingly contact a window assembly, a second surface, and a third surface;

(B) a second seal element, formed of a deformable non-compressible material, including a first surface abutting the second surface of the first seal element, the second seal element responsive to pressure applied to the first seal element for adjusting the position of the first seal element in the mold, thereby accommodating thickness variations in the window assembly contacting the first surface of the first seal; and

(C) a third seal element, formed of a non-deformable, non-compressible material, including a first surface abutting the third surface of the first seal element.

4,854,600

PRESSURE BALANCED METALLIC S-SEAL

Horace P. Halling, Laurel; Robert A. Barrett, Crofton, and Mark E. Woozley, Beltsville, all of Md., assignors to EG&G Pressure Science, Inc., Beltsville, Md.

Division of Ser. No. 5,954, Jan. 21, 1987, Pat. No. 4,813,692.
This application Aug. 17, 1988, Ser. No. 233,019
Int. Cl.[4] F16J *15/28, 15/08*
U.S. Cl. 277—236 8 Claims

1. A sealing ring, the combination comprising:

a ring having a longitudinal axis and a resilient and continuous cross section,

said cross section comprising

a first convolution opening in a first axial direction,

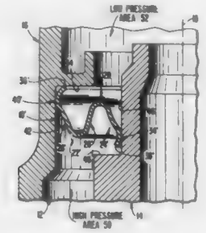
a second convolution opening in a second axial direction opposite said first axial direction,

a first leg extending generally in said first axial direction from said first convolution and having a first free distal edge,

a second leg extending from said first convolution to said second convolution, and

a third leg extending generally in said second axial direction from said second convolution and having a second free distal edge,

said second convolution being spaced farther from said longitudinal axis than said first convolution,



said first leg having an outer surface defining a first substantially circular sealing line facing generally radially inwardly and being spaced from said first convolution,

said third leg having an outer surface defining a second substantially circular sealing line facing generally radially outwardly and being spaced from said second convolution,

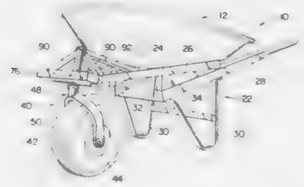
said second sealing line being axially offset along said longitudinal axis from said first sealing line.

4,854,601

SWIVEL WHEEL WHEELBARROW

George W. Herndon, 806 N. Dawson St., Thomasville, Ga. 31792

Filed Apr. 25, 1988, Ser. No. 185,486
Int. Cl.[4] B62B *1/18*
U.S. Cl. 280—47.31 16 Claims



1. Support structure for a single-wheeled portable vehicle, comprising:

spaced beams;

a wheel fork having spaced legs defining a logitudinal axis and a post projecting from the legs, the post defining a longitudinal axis, the post including a lower portion adjacent the legs and an upper portion removed from the legs;

a lower yoke support rigidly connected to, and extending laterally between, the beams, the lower yoke support being connected to the lower portion of the post;

an upper yoke support in the form of a cap secured to the upper end of the post spaced from the lower yoke support and connected to the upper portion of the post; and

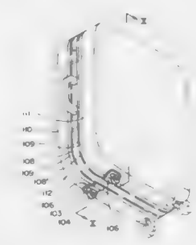
braces connecting the upper yoke support to the beams.

4,854,602

CASE SUCH AS SUITCASE AND ITS IMPROVEMENT

Tadao Takeuchi, Tokyo, Japan, assignor to Matsuzaki Seisan Kabusiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1988, Ser. No. 142,723
Claims priority, application Japan, Jan. 9, 1987, 62-1862; Jan. 13, 1987, 62-3443; Jan. 13, 1987, 62-3442; Jan. 13, 1987, 62-3444; Feb. 28, 1987, 62-29656
Int. Cl.[4] B62B *1/00*
U.S. Cl. 280—79.11 3 Claims



1. A suitcase comprising a castor body (106) and a suitcase body (112), said castor body comprising a castor (104) being fixed with a screw (105) on the lower surface of a portion near the top end of a square, semi-hard plastic planar board (103) having a groove portion (101) of the same shape as the outer surface of a protector (109) on the upper surface of a base end fringe portion and also said board (103) having an inverted mountain-shape ridge (102), said castor (104) being fixed by said screw (105) in a portion of said board (103), and said body and lid members (110), (111) comprising metal peripheral frames (108), (108') attached to the open mouth peripheries of said members (110), (111) and semi-hard plastic protectors (109) having an outer surface like a tray, mounted on said peripheries of said frames (108), (108'); wherein

said castor body (106) arranged on the outer surface of a ground contact side wall in said body and lid members (110), (111) with the outer surface coming in contact with the upper surface of a board (103) while also engaging a recess groove portion (101) with said protector (109),

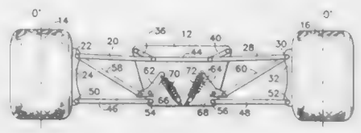
mounting screws (113) are screwed in from the inside of said frames (108), (108') to secure portions corresponding to said recess groove portion (101), in said frames (108), (108') and protectors (109), whereby tops of said mounting screws (113) are screwed onto the bottom surface of said recess groove portion (101) and said castor body (106) is fixed onto said body and lid members (110), (111).

4,854,603

CONSTANT CAMBER SUSPENSION SYSTEM

Onofrio Scaduto, 1623 S. 56th Ct., Cicero, Ill. 60650

Filed Jun. 24, 1988, Ser. No. 212,218
Int. Cl.[4] B62D *9/02*
U.S. Cl. 280—112.1 17 Claims



1. A vehicle suspension system comprising:

a lower control arm for connecting a wheel assembly to one side of the chassis of a vehicle;

an upper control member for connecting an upper portion of said wheel assembly to said vehicle chassis;

a float link connecting one of said upper control member and lower control arm to said chassis for maintaining a wheel of said wheel assembly at a substantially constant camber in response to movement about the roll axis of said chassis; and

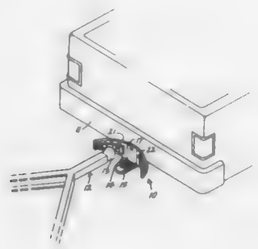
a tie link connecting the inner end of one of said upper member and said lower control arm to a respective opposite like control member and control arm.

4,854,604

SELF-CENTERING HITCH

Bradley E. Stallsworth, R.R. #2, Box 81, Mt. Carmel, Ill. 62863

Filed May 19, 1988, Ser. No. 196,050
Int. Cl.[4] B60D *1/00*
U.S. Cl. 280—477 **5 Claims**



1. A self-centering trailer hitch for use in combination with a towing vehicle for coupling a trailer to said towing vehicle comprising,

a horizontal outwardly directed tongue rigidly secured to said towing vehicle including a hitching ball integrally secured orthogonally to said tongue, and

a concave arcuate guide means for deflecting a trailer socket onto said hitching ball integrally secured to said tongue and extending upwardly of said tongue and extending horizontally of said tongue to form a right concave surface and a left concave surface, and

said guide means further including an alarm means comprising a right and left alarm means secured through said right and left concave surface of said guide means for indicating a compression of said alarm means by impact with said trailer socket, and

wherein said right and left alarm means each include an outwardly directed pressure pad directed outwardly of said guide means of a forward face oriented toward said hitching ball and including a securement plate secured to said guide means to a rear surface of said guide means between said towing vehicle and said guide means.

4,854,605

SKI BINDING FOR MOUNTAIN SKIING

Kenneth D. Emerson, 3205 395 North, Carson City, Nev. 89701

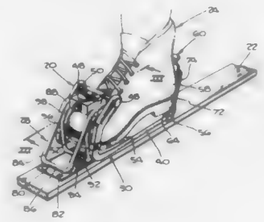
Filed Jun. 29, 1988, Ser. No. 213,118
Int. Cl.[4] A63C *9/08*
U.S. Cl. 280—615 **12 Claims**

1. In a ski binding for use with a ski boot and a ski member, the combination of:

means including a frame structure having a bottom portion adapted to be fixed to a ski member, and an end portion extending upwardly and rearwardly away from said bottom portion in spaced relation to said ski member, said frame structure forming a recessed area which is adapted to receive a toe portion of a boot,

said end portion carrying pivot support means;

a boot carrying structure including pivot means and pin means cooperable with said pivot support means and clamp means adapted to engage a heel portion of the boot for securing the boot to said boot carrying structure;



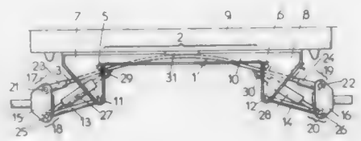
said pivot means, pin means, and pivot support means providing a pivot axis located above said ski boot rearwardly of the toe portion of said ski boot and forwardly of a ball of a skier's foot in the ski boot.

4,854,606

VEHICLE SUSPENSION ASSEMBLY

Louis de Goncourt, Voisins-le-Bretonneux, and Kenneth H. Sayers, Rambouillet, both of France, assignors to Bertin & CIE, Plaisir, France

PCT No. PCT/FR87/00211, § 371 Date Feb. 16, 1988, § 102(e) Date Feb. 16, 1988, PCT Pub. No. WO87/07564, PCT Pub. Date Dec. 17, 1987
PCT Filed Jun. 11, 1987, Ser. No. 162,332
Claims priority, application France, Jun. 16, 1986, 86 08639
Int. Cl.[4] B60G *3/00*
U.S. Cl. 280—699 **7 Claims**



1. A vehicle suspension assembly including a transverse leaf spring, two symmetrically spaced mountings, two wheel supports and two rigid connecting arms, said leaf spring contructed and arranged for connection to a vehicle frame with said two symmetrically spaced mountings and being pivoted at its opposite ends to said two wheel supports respectively, and said two rigid connecting arms extending parallely to opposed outer portions of said leaf spring and operatively pivoted to the vehicle frame and wheel supports respectively, wherein said leaf spring is made of unidirectional composite material of constant cross-sectional area, the thickness and the width of each outer portion of which increases and decreases respectively from each of said mountings towards the respective end of said leaf spring, whereby said end portion is rigid and constitutes a deformable parallelogram together with the corresponding connecting arm and wheel support, and wherein a shock absorber is operatively mounted substantially diagonally between opposite ends of said connecting arm and outer portion of said leaf spring of said deformable parallelogram.

4,854,607

HARNESS FOR SMALL CHILDREN

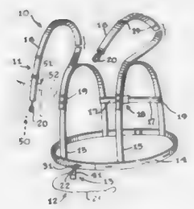
Charles D. Mandracchia, and Janet A. Mandracchia, both of 51 Van Cedar St., Brentwood, N.Y. 11717

Filed Sep. 15, 1988, Ser. No. 244,383
Int. Cl.[4] B60R *21/10*
U.S. Cl. 280—801 **5 Claims**

1. A safety harness apparatus adapted to secure a child to an

independent structure such as a shopping cart; wherein, the harness apparatus comprises:

a harness unit comprising a belt member operatively secured to a pair of shoulder strap members wherein the belt member comprises an apertured belt element having a cable member running along the length of the belt member and disposed in a surrounding relationship with respect to a plurality of elongated apertures that are formed on one end of the belt element; wherein, the other end of the belt





member has a discrete ring member that is secured to said cable member; and wherein, the discrete ring member is dimensioned to pass through a selected one of said plurality of elongated apertures;

a tether unit comprising an elongated length of flexible cable having closed loops formed on both ends; and,

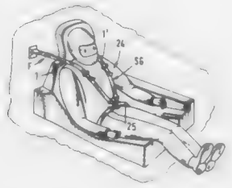
a locking means disposed intermediate the harness unit and the tether unit whereby the harness unit may be operatively connected to an independent structure.

4,854,608

SAFETY BELT

Jacques Barral, Monaco, Monaco, assignor to Carl F. Schroth GmbH.

Filed Apr. 22, 1988, Ser. No. 185,133
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1987, 3735077
Int. Cl.[4] B60R *22/28*
U.S. Cl. 280—805 **6 Claims**



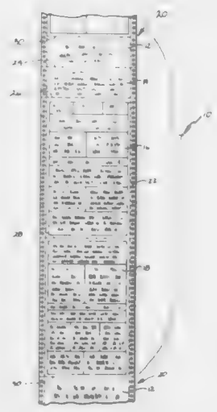
1. In a safety belt to be worn by a driver of a car, the safety belt including two shoulder belts and a lap belt, and a buckle for coupling the lap belt to the shoulder belt, wherein the belts are at least indirectly fastened to the car frame, the improvement comprising the shoulder belts including means for converting the kinetic energy resulting from an impact of the car to a different extent and for converting the kinetic energy in the two shoulder belts in time periods which are shifted relative to each other, so that the two shoulder belts are elongated asymmetrically and permit a rotation of the torso of the driver and a subsequent forward displacement of one shoulder of the driver relative to the other shoulder.

4,854,609

BUSINESS FORM FEEDING LEADER SYSTEM

James C. Blakewood, Savanah, assignor to Blakewood Business Forms, Inc., Ga.

Filed May 17, 1988, Ser. No. 194,922
Int. Cl.[4] B42D *3/00, 17/20;* **B41L** *1/20;* **B65D** *27/100*
U.S. Cl. 281—2 **5 Claims**



1. A form system for feeding into computer controlled printers comprising a plurality of folding leader sets, each folding leader set including first and second leader sections with each having a leading and trailing edge connected to each other at their trailing and leading edges, respectively, through a line of perforations, a plurality of separate form sets, each of said form sets having at least two successive sheets of substantially equal length with each sheet having a leading and trailing edge, the successive sheets being joined together at their trailing and leading edges, respectively, by a line of perforations, the trailing edge of said second leader in each set being joined to the leading edge of each form set by a line of perforations and the trailing edge of the second of said two successive sheets in each form set being joined to the leading edge of another leader set by a line of perforations so that the system of forms can be folded in successive sets of repeating layers, each repeating set including a first layer comprised of at least the first leader section, a second layer comprised of the second leader section and the first of said two successive sheets and a third layer including at least the second of said two successive sheets.

4,854,610

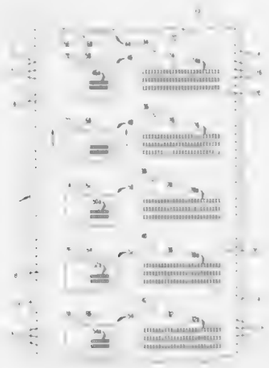
METHOD OF MAKING LAMINATED ARTICLES AND ARTICLES MADE THEREFROM

Alfred Kwiatek, Swanton, Vt., assignor to Bertek, Inc., Swanton, Vt.

Filed Feb. 10, 1988, Ser. No. 154,951
Int. Cl.[4] B41L *1/20;* **B42D** *19/00, 15/00;* **B44C** *1/18*
U.S. Cl. 282—11.5 A **6 Claims**

1. A method of manufacturing adhesive backed sheet components having release liners attached to and covering the adhesive backs thereof, comprising the steps of providing an elongate, marginally punched, continuous sheet substrate having a series of consecutive panels thereon that are separable from one another along transverse score lines positioned therebetween; applying a layer of release coating material to at least a corresponding predetermined portion of each of said panels; applying a layer of pressure sensitive adhesive to at least a portion of said layer of release coating material within a minor portion of each of said panels; applying a sheet component atop said pressure sensitive adhesive layer at least partially within said minor portion of each or said panels to adhere said sheet component to said panel; providing score lines about the pe-

riphery of said minor portion of each of said panels, said score lines being constructed and arranged to allow said sheet component, said pressure sensitive adhesive layer, the portion of said release coating layer in said minor portion of said panel, and said minor portion of said panel itself to be removed from the remainder of said panel as an integral laminate unit; and, removing said integral laminate unit from the remainder of each of said panels, each of said integral laminate units thereafter comprising said sheet component, said pressure sensitive adhesive attached thereto, and said release-coated minor portion of said panel adhered to and covering said pressure sensitive adhesive, said minor portion of said panel functioning as a releasable liner on said integral laminate unit, which releasable liner, when removed, exposes the pressure sensitive adhesive attached to the sheet component, facilitating subsequent adhesion of the sheet component to another object.

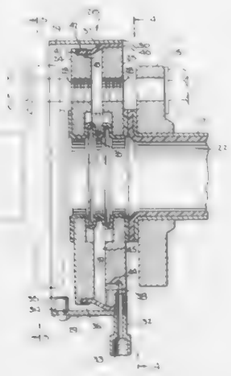


4,854,611

FAIL-SAFE BELLOWS ASSEMBLY

Irving D. Press, West Orange, N.J., assignor to Unidynamics Corporation, New York, N.Y.

Filed Sep. 24, 1987, Ser. No. 100,467
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—3 **34 Claims**



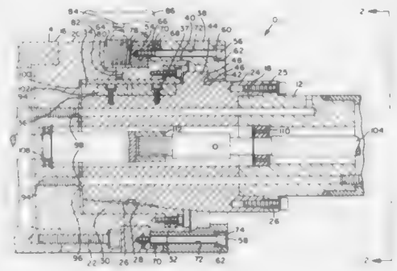
1. A fail-safe bellows assembly comprising in combination with first and second spaced apart pipe flanges and a bellows element interconnecting said flanges, a cylindrical substantially rigid, form-stable guard completely encircling said bellows element and flanges, generally concentric therewith, the inside diameter of said guard where it overlies one of said flanges being sufficiently larger than the outside diameter of said one flange to permit both lateral misalignment and angular deflection between said flanges, means coupling said guard to said flanges for maintaining said guard in position bridging the space between said flanges and at least partially overlapping each flange around the entire periphery thereof while permitting said lateral misalignment and angular deflection as well as limited axial movement of said flanges relative to one another, said limited movement being restricted to a safe magnitude to protect said bellows element against excessive elongation and articulation.

4,854,612

TIRE BUILDING DRUM SHAFT CONNECTION

Robert Cubric, Ettelbruck, and John K. Roedseth, Bissen, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 180,281, Apr. 11, 1988, abandoned. This application Dec. 6, 1988, Ser. No. 280,361
Int. Cl.[4] F16L *35/00, 55/00;* **F16D** *1/00;* **F16B** *7/00*
U.S. Cl. 285—18 **21 Claims**



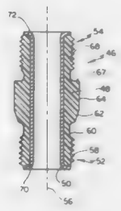
1. A shaft connection between two coaxial shafts comprising a sleeve member for mounting on an end of one of said shafts, an end piece for mounting on an end of the other of said shafts, said sleeve member having a generally conical inside surface, said end piece having a generally conical outside surface for insertion into engagement with said inside surface of said sleeve member, a clamping ring mounted on said sleeve member for limited axial movement and rotation relative to said sleeve member, said clamping ring having at least two circumferentially spaced outer lugs extending inwardly toward said end piece, said end piece having at least two circumferentially spaced inner lugs extending outwardly toward said sleeve member for overlapping engagement and disengagement with said outer lugs upon rotation of said clamping ring, a segmental ring mounted on said sleeve member for relative rotation at a fixed axial position of said sleeve member, connecting members extending between said clamping ring and said segmental ring for rotating said clamping ring in response to rotation of said segmental ring, resilient means for biasing said clamping ring toward said segmental ring so that upon engagement of said outer lugs with said inner lugs said end piece will be urged into said sleeve member to provide a tight fit between said conical inside surface of said sleeve member and said conical outside surface of said end piece.

4,854,613

COMPOSITE CONNECTING MEMBER FOR HYDRAULIC FLUID LINES

Marvin P. Reece, Dana Point; Wilhelm F. Schepergerdes, El Toro, and Frampton Renfrow, Costa Mesa, all of Calif., assignors to Rexnord Holdings Inc., Torrance, Calif.

Filed Jan. 27, 1988, Ser. No. 148,900
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—39 **10 Claims**



1. A connecting member for connecting a hydraulic tube to a base material or to a second hydraulic tube, the connecting member comprising:

an annular body formed from a plastic material extending a substantial length of the connecting member, having an interior surface defining a passageway, and including thread means along a surface of a first portion of the body for threadably connecting the connecting member to a hydraulic tube through a coupling nut and thread means along a surface of a second portion of the body for threadably connecting the connecting member to the base material or to the second hydraulic tube and further including an end surface at each end of the body wherein each end surface extends outward at least radially from the passage to the respective surface having the thread means; and

a sleeve comprised of a metallic material extending through the passageway substantially the length of the connecting member, comprising an internal surface defining a conduit through which hydraulic fluid may pass, and comprising a pair of ends, wherein each end of the sleeve extends at least partially radially outwardly from the sleeve relative to a central longitudinal axis of the sleeve over a respective end surface of the body.

4,854,614

CABLE INSERT NOZZLE

Masaaki Torichigai, and Keiichi Iwamoto, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1987, Ser. No. 7,896
Claims priority, application Japan, Jan. 30, 1986, 61-11932[U]; Apr. 23, 1986, 61-6015[U]; Sep. 12, 1986, 61-140341[U]
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—93 **8 Claims**

1. A cable insert nozzle of the two-part type for use in inserting a cable into heat-exchanger tubes for the non-destructive inspection thereof, said nozzle comprising:

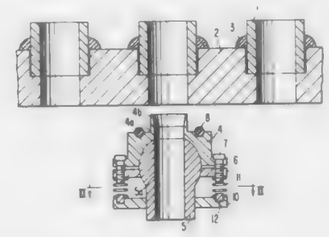
a male nozzle member having therethrough a cable insert hole extending in an axial direction, said male nozzle member having a partially spherical exterior surface;

a female nozzle member having an axially extending tube insertion portion to be inserted into a heat exchanger tube, said female nozzle member having therethrough a cable insert hole extending in an axial direction through said tube insertion portion, and said female nozzle member having a partially spherical interior surface complementary to said partial exterior surface of said male nozzle member;

said male and female nozzle members being in coupled engagement with said male nozzle member inserted into said female nozzle with said partially spherical exterior and interior surfaces thereof, respectively, in engagement and defining a spherical seat about which said male and female nozzle members are relatively swivelly movable;

nozzle holder member means, releasably fixed to said female nozzle member and bearing against said male nozzle member, for maintaining said male and female nozzle members in said coupled engagement, and

restoring means, operable between said male and female nozzle members, for urging said female nozzle member to a predetermined position relative to said male nozzle member whereat said cable insert holes through said male and female nozzle members are aligned coaxially, and thereby for ensuring that, upon withdrawal of said tube insertion portion from one heat exchanger tube being inspected, said tube insertion portion will be sufficiently aligned with the opening of another heat exchanger tube to be inspected by movement of said cable insertion nozzle in a direction perpendicular to said axial direction of said cable insert hole through said male nozzle member, said restoring means comprising at least one coil spring compressed between said male and female nozzle members and located to not interfere with insertion of a cable through said cable insertion holes.



4,854,615

METAL SEALED JOINT FOR LARGE DIAMETER ROCKET MOTOR CASINGS

Robert E. Smith, III, Stafford, Tex., assignor to National Coupling Company, Inc., Stafford, Tex.

Continuation of Ser. No. 801,477, Nov. 25, 1985, Pat. No. 4,694,859. This application Sep. 1, 1987, Ser. No. 91,829
Int. Cl.[4] G16J *15/46*
U.S. Cl. 285—331 **9 Claims**

1. A joint forming a sealed junction between two large diameter radially flexible cylinders, comprising:

an annular groove in an end of a first cylinder;

an annular tongue on an end of a second cylinder, the tongue configured to fit within the groove when the ends of the first and second cylinders are joined;

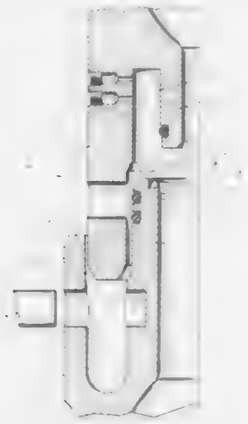
an annular shoulder on the tongue, the shoulder forming an annular region between the tongue and the groove; and

a flexible metal seal for positioning on the shoulder and for entrapment in the annular region between the tongue and the groove,

the seal including a cavity exposed to pressure within the cylinders,

the seal engageable with the surfaces of the tongue and groove and being responsive to pressure within the cavity

to be urged to expand radially to seal against the tongue and groove and maintain the radial seal during flexing



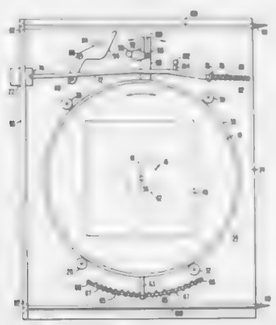
and/or bulging of the cylinders in response to internal temperature and/or pressure.

4,854,616

DOOR LATCH ASSEMBLY WITH SEE-THROUGH CAPABILITIES

Peter C. Edmondson, 16 Stadler, Woodside, Calif. 94062

Filed Sep. 18, 1987, Ser. No. 98,577
Int. Cl.[4] E05C *1/12*
U.S. Cl. 272—173 22 Claims



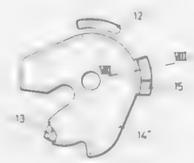
1. A latch assembly for a door having a mortise, an end face and a pair of aligned holes on opposite sides of the mortise comprising:
a support having an end margin;
a latch plate at the end margin of the support, said support being of a size sufficient to allow the support to be inserted into the mortise in the door with the latch plate extending along the end face of the door, said support having a hole therethrough for alignment with the holes of the door when the support is in the mortise;
a member of a material permitting light to pass therethrough;
means mounting the member for rotation about an axis extending through the hole in the support;
means coupled with the member for permitting rotation of the member, said hole in the support being larger than the area of coupling of the knob means to the member, whereby light from one side of the support can pass directly through the member and the hole in the support;
a latch bolt shiftably mounted on the latch plate and movable from an extended position to a retracted position;
means coupled with the latch bolt for shifting the latch bolt into its retracted position in response to the rotation of the member about said axis in either direction; and
means coupled with the latch bolt for biasing the lattter into said extended position.

4,854,617

DOOR LOCK FOR AUTOMOTIVE VEHICLES

Shigeru Hayakawa, Chiryu; Daiichi Shiraishi, Seto, and Hisakazu Murakami, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Jun. 24, 1987, Ser. No. 66,070
Claims priority, application Japan, Jun. 28, 1986, 61-99442[U]; Jul. 29, 1986, 61-116105[U]
Int. Cl.[4] E05C *3/26*
U.S. Cl. 292—216 9 Claims



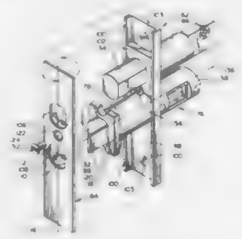
1. A door lock for an automotive vehicle, comprising:
a door lock striker fixedly secured to a body of the vehicle;
a base disposed on a door of the vehicle and including a first arcuate projection;
a latch freely rotatably supported on said base by a pin and adapted to engage and disengage said striker;
a silencer covering a peripheral portion of said latch and having an outer surface said silencer including a second arcuate projection extending from said outer surface of said silencer toward said base;
said second arcuate projection being pivoted into engagement with said first arcuate projection to urge said latch away from said base when the door in fully closed.

4,854,618

MULTI POSITION REVERSIBLE LATCHING ASSEMBLY

Desmond E. C. Webster, 346 - 7th Ave. SW., Box 430, Ephrata, Wash. 98823

Filed Jun. 24, 1987, Ser. No. 66,832
Int. Cl.[4] E05B *15/02*
U.S. Cl. 292—244 13 Claims



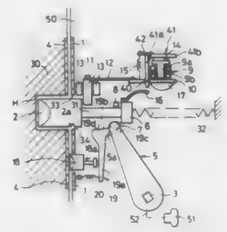
1. A multiple positionable latch assembly adapted to be mounted to a door having a front side, a rear side, and a lateral edge surface, said latch assembly further having a front to rear longitudinal horizontal axis, a vertical axis, and a lateral axis perpendicular to the longitudinal and vertical axes, said latch assembly comprising:
a. a plate means adapted to be mounted to the edge surface of the door, said plate means comprising a plate member having first and second oppositely positioned major surfaces, an upper end, a lower end and two side edge portions, said plate member further having a vertical center axis and first and second vertically spaced through openings;
b. a first bolt mechanism adapted to be positioned in said door and having a first bolt member to extend laterally through the first opening of the plate member;
c. a second bolt mechanism adapted to be positioned in said door and having a second bolt member to extend laterally through the second opening of the plate member;
d. said assembly being characterized in that the second bolt member is an asymmetrical bolt member which is asymmetrical about said vertical axis of the plate member and said second opening is an asymmetrical opening and is contoured similarly to said asymmetrical bolt member;
e. said assembly being arranged in a manner that said plate member can be positioned in its operating position in the door in a manner that when its upper and lower ends are positioned at upper and lower locations of the assembly, respectively, either of said first and second surfaces can be facing laterally outwardly from said latching assembly, so that the plate member is at either of first and second plate positions, respectively;
f. said second bolt member and the second bolt mechanism being characterized in that with said plate member in said first plate position, said second bolt member can be positioned in a first second bolt member position so that said second bolt member fits in the second opening of the plate member, and with said plate member in said second plate position, said second bolt member can be rotated one half of a revolution about a laterally extending axis of said second bolt member to a second position of said second bolt member, so that
said second bolt member fits properly in said second opening of the plate member;
whereby said second bolt member is able to have a first orientation relative to said longitudinal axis in said first second bolt member position with the plate member in said first plate position, and is able to have a second opposite orientation relative to said longitudinal axis by positioning said second bolt member in said second position of the second bolt member and changing said plate member from said first plate position to said second plate position.

4,854,619

ELECTRIC KEY

Shunsaku Nakauchi, Mitaka, Japan, assignor to RYOBI Ltd., Japan

Filed Feb. 18, 1988, Ser. No. 156,753
Claims priority, application Japan, Feb. 23, 1987, 62-39727
Int. Cl.[4] E05B *47/00*
U.S. Cl. 292—335 6 Claims



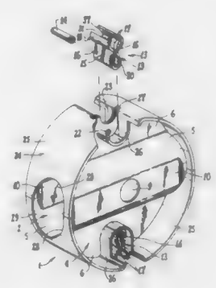
1. An electric key having a latch head movable into and out of a key hole, and locking means for locking said latch head, said electric key comprising:
(a) movable means for supporting said locking means thereon so that said locking means is moved between a position where said latch head is locked in said key hole and a position where said latch head is released from said key hole;
(b) self-holding type electromagnetic means for attracting said movable means thereto in its nonconductive state so that said locking means is urged into the position where the latch head is locked and for releasing said movable means in its conductive state so that said locking means is moved into the position where said latch head is released from the key hole; and
(c) returning means for returning said movable means from a position where said movable means is released from said electromagnetic means so that said locking means releases said latch head to a position where said movable means is attracted by said electromagnetic means so that said locking means is urged toward the direction where said locking means locks said latch head in a state wherein said locking means releases said latch head, said returning means being moved together with said latch head when said latch is operated by rotation of a door knob.

4,854,620

DOOR SET MOUNTING

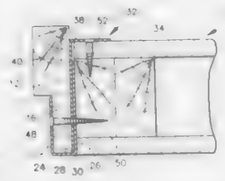
Gerald F. Dunphy, Glen Waverley, and Lance E. Best, Vermont South, both of Australia, assignors to Ogden Industries Pty., Ltd., Australia

Filed Aug. 22, 1986, Ser. No. 899,623
Claims priority, application Australia, Aug. 22, 1985, PH 2085
Int. Cl.[4] E05B *9/06*
U.S. Cl. 292—337 26 Claims



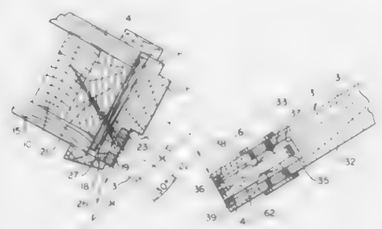
1. A mounting for a door set including a mounting member formed of two substantially circular plate-like members arranged in face-to-face engagement and being adapted to fit within and substantially close a hole formed through a support member, such as a door, an opening formed through each said plate-like member for passage of a drive spindle of a latch actuator, a receptacle formed between said plate-like members and being arranged to receive part of a housing for a latch so that the said latch can be operated through said drive spindle, a substantially cylindrical tubular shroud which extends around said mounting member so as to be substantially coaxial therewith and is formed of two part-cylindrical parts, an opening formed through said shroud and aligned with said receptacle to allow passage of said latch housing, and securing means which retains said plate-like members in face-to-face engagement and includes two clips, each of which straddles said plate-like members to hold them in said engagement, and each said clip also coacts with a respective said shroud part to hold that shroud part in assembly with the mounting member.

4,854,621
REINFORCED DOOR SECURITY ASSEMBLY
Robert L. Baldwin, 14149 Jim Bridger, El Paso, Tex. 79935
Filed Jan. 19, 1988, Ser. No. 145,060
Int. Cl.[4] E05C *21/00*
U.S. Cl. 292—340 7 Claims



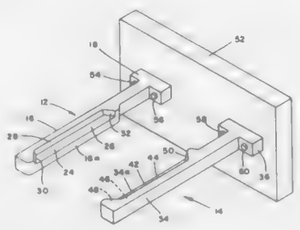
1. A door security assembly for reinforcing a door frame in the vicinity of a door lock opening in the frame, comprising:
a generally U-shaped striker plate having a pair of side arms connected by a web portion adapted to fit transversely around a side edge of a door jamb, a first one of the arms having an opening for alignment with a door lock opening in an outer, exposed face of the door jamb;
an L-shaped tie plate comprising means for securing the striker plate to an outer face of a wall adjacent a doorway opening, the longer leg of the tie plate being of length at least equal to the second arm of the striker plate and comprising means for extending between an inner, concealed face of a door jamb and the second arm of the striker plate, and the shorter leg of the tie plate comprising means for resting against an outer face of a wall adjacent the door jamb;
first securing means for extending transversely through the side arms of the striker plate and the longer leg of the tie plate to secure the tie plate to the striker plate and to secure both plates to the underlying door frame; and
second securing means for extending through the shorter leg of the tie plate and underlying wall surface into an underlying structural member.

4,854,622
DOOR ASSEMBLY INCORPORATING MEANS TO INCREASE RESISTANCE TO FORCED ENTRY
Anthony R. Lozano, 3139 Loma Verde Dr., Unit #38, San Jose, Calif. 95117
Continuation of Ser. No. 706,350, Feb. 27, 1985, abandoned.
This application Jul. 29, 1988, Ser. No. 226,514
Int. Cl.[4] E05C *1/16*
U.S. Cl. 292—340 14 Claims



1. As an article of manufacture, a door assembly constituting a closure for a passageway through a wall, the passageway being defined by vertical wall members, comprising:
(a) a door frame having a head, a hinge jamb and a lock jamb adapted to be anchored in a passageway;
(b) a door having a hinge stile and a lock stile including interior and exterior surfaces;
(c) a plurality of hinges operatively interposed between said hinge stile and said hinge jamb to pivotally support said door on said door frame;
(d) a lock assembly mounted on said lock stile and including an apertured face plate;
(e) a strike plate mounted on said lock jamb in operative association with said lock assembly;
(f) a strike plate recess formed in said lock jamb and a first pair of screw fasteners anchoring said strike plate in said strike plate recess, said screw fasteners passing through said strike plate and said lock jamb and into the vertical wall members of the passageway at an angle of other than 90° to the face of the strike plate;
(g) a recess formed in said lock stile in association with said face plate and having a depth, a width and a length greater than said face plate;
(h) a reinforcement plate having a width no greater than the thickness of said door nested snugly in said recess in said lock stile, said reinforcement plate having a planar front surface and having a rabbetted recess therein having a bottom wall displaced from said planar front surface, said bottom wall having an aperture which is aligned with the aperture in said face plate and a front surface of the face plate lying flush with the planar front surface of the reinforcement plate when said face plate is fitted snugly in said rabbetted recess;
(i) means including a second pair of screw fasteners with at least one screw fastener passing through said reinforcement plate adjacent each end and extending into said lock stile at an angle other than 90° to the planar front surface of said reinforcement plate and detachably securing said reinforcement plate to said lock stile within said recess; and
(j) a third pair of screw fasteners detachably securing said face plate to the bottom wall of said recess formed in said reinforcement plate and within said rabbetted recess whereby the apertures in said face plate and reinforcement plate are retained in alignment.

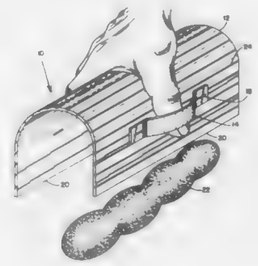
4,854,623
END EFFECTOR
James S. Molinaro, Whitehall, Pa., assignor to UOP, Des Plaines, Ill.
Filed Jan. 29, 1988, Ser. No. 150,048
Int. Cl.[4] B65D *25/28, 71/00*
U.S. Cl. 294—1.1 2 Claims



1. A passive cassette robotic end effector for handling an end of a wafer cassette for semiconductor substrates comprising:
a. a pair of spaced end effector arms, each a mirror image of the other, and each of said end effector arms including a longitudinal member perpendicular to a mounting flange, said mounting flange secured to a robotic handle mounting plate, and a cavity means therein for accommodation of the opposing reinforcement bars of the wafer cassette; and,
b. said cavity means including a planar surface upon which the reinforcement bar of the wafer cassette engages,

ramped vertical walls with a longer ramped vertical wall and two shorter ramped vertical walls which intersect said planar surface, said ramped longer vertical wall and said ramped shorter vertical walls guide the wafer cassette reinforcement bars to rest on said planar surface, said shorter walls are angled with respect to said longer walls providing for engagement with the reinforcement bars.

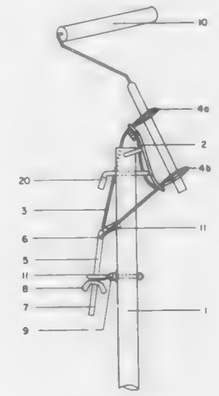
4,854,624
DEVICE FOR PICKING UP ANIMAL FECES
Sharon R. Baymiller, 170 John St., Apt. 3A, New York, N.Y. 10038
Filed Apr. 4, 1988, Ser. No. 176,938
Int. Cl.[4] A01K *29/00*
U.S. Cl. 294—1.3 3 Claims



1. Device for picking up animal feces, comprising:
a sheet of paperboard having a pair of opposite straight edges, said sheet having a first side facing said axis and a second side opposite;
a pair of finger holders; and
means for attaching said finger holders to said second side, one of said finger holders being nearer one of said edges than the other edge and the other of said finger holders being nearer the other edge than said one edge, said sheet including between each set of one of said finger holders and the straight edge nearest said one finger holder, means for bending arcuately on contact with ground about an axis generally parallel with said edges, said bending means bending significantly easier in one direction than a direction opposite.

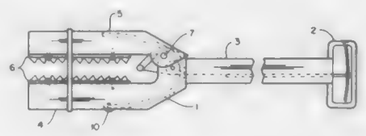
4,854,625
MULTI-PURPOSE TOOL HOLDER FOR EXTENSION HANDLE
Furney Eubanks, and Randy Eubanks, both of Rte. 2, Box 361, Trenton, N.C. 28585
Filed May 11, 1988, Ser. No. 192,550
Int. Cl.[4] A47F *13/06*
U.S. Cl. 294—19.1 5 Claims

1. A tool holder for holding various tools on the end of an extension handle, comprising:
a. an extension handle;
b. a support plate connected to one end of said extension handle;
c. a support post extending from said extension handle, said post being attached at one end to said handle, and having hole at other end,
d. a guide bar being inserted through hole of said post, having at one end a threaded portion with suitable threaded nut and hole at other end;
e. a cable for holding tool firmly against said support plate, said cable being connected to one upper corner of said plate and thereafter passing through hole in other upper corner of said plate to form first loop, thereafter passing through hole in said guide bar, thereafter passing through hole in one lower corner of said plate extending upward and then downward through hole in other lower corner to form second loop, where



f. the handle of tool to be held is inserted through said first loop and said second loop, and said cable is tightened down securing handle against said plate by turning said nut on said guide.

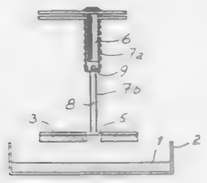
4,854,626
FISH RETRIEVING TOOL
Roger S. Duke, 713 N. 32nd, E. St. Louis, Ill. 62205
Filed Jan. 26, 1988, Ser. No. 148,664
Int. Cl.[4] B25J *1/00*
U.S. Cl. 294—19.1 5 Claims



1. A fish retrieving tool, comprising:
(a) an integrally formed main frame having a hollow handle with an essentially rectangular perimeter at one end, a lightweight, hollow shaft in the center and a hollow lower jaw having an essentially square cross-section at the opposite end of said shaft;
(b) An upper jaw with an essentially square cross-section pivotably attached to said main frame at a first pivot point , wherein said upper and lower jaws form two parallel opposing flat surfaces;
(c) a set of upper and lower interchangeable jaw teeth detachably secured to the opposing surfaces of said upper and lower jaws, wherein different sets of teeth may be interchangeably attached to said jaws depending upon the uses and types of fish being retrieved;
(d) A spring means comprising at least one flat tension spring attached at a second tensioning spring pivot point for biasing said jaws in an open position;
(e) A closing means for pivotting said upper jaw to a closed position, comprising: a closing lever pivotably attached to said handle; a short closing rod having one end pivotably attached to said lever and the other end attached to one end of a flexible connecting member, said flexible connecting member looping around a pulley that is rotatably secured about said second pivot point, the other end of said flexible connecting member being attached to a clos-

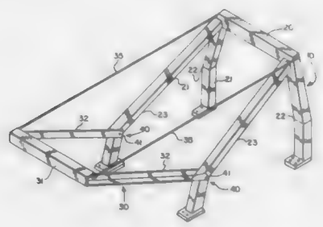
ing arm, said closing arm being fixedly attached to the upper jaw of the tool;
whereby said retrieving tool may be easily closed by movement of said closing lever.

4,854,627
METHOD AND A DEVICE FOR APPLYING OBJECTS ONTO A SURFACE
Magnus Ericsson, Stockholm, Sweden, assignor to AB Biodisk, Solna, Sweden
Filed Aug. 19, 1987, Ser. No. 87,647
Claims priority, application Sweden, Aug. 28, 1986, 8603632
Int. Cl.[4] B66C *1/07*
U.S. Cl. 294—64.1 7 Claims



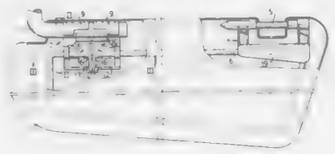
1. A device for applying at least one object (5) such as an antibiotic patch onto a receiving surface (1) such as the surface of a culture, said device comprising a support (3) for the objects (5) to be applied, said support (3) being arranged above the receiving surface (1) in a placed relationship and holes (4) being made in said support (3) through which the objects can be passed down to the receiving surface (1), characterized in that at least one applying means (6, 7) is arranged to retain the object (5) by means of a negative pressure during the transfer from the support (3) to the receiving surface (1), said applying means (6, 7) also being arranged to generate the negative pressure during the transfer by way of a fixed interior piston (6) and a tubular member (7) movable in the longitudinal direction of the piston (6) and enclosing said piston, said piston internally lying close to the tubular member (7) in a substantially sealing relationship.

4,854,628
CARRYING RACK FOR A VEHICLE
Laurie L. Halberg, St. Cloud, Minn., assignor to Custom Products of Litchfield, Inc., Litchfield, Minn.
Filed Oct. 21, 1987, Ser. No. 111,872
Int. Cl.[4] B60D *3/00*
U.S. Cl. 296—3 9 Claims



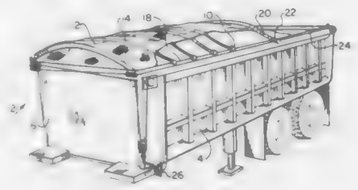
1. A rack mountable on a vehicle comprising:
a forward rack member;
frame means for mounting the forward rack member to the vehicle;
a rear rack section including a generally transverse rear rack member; and
connection means for pivotally connecting the rear rack section to the frame means and permitting movement of the rear rack section from a rearward, extend position to a forward position wherein the rear rack member lays generally adjacent to the forward rack member.

4,854,629
SUN VISOR FOR MOTOR VEHICLES AND PROCESS FOR ITS MANUFACTURE
Robert Hagström, Malung, Sweden, assignor to Autopart Sweden AB, Malung, Sweden
Filed Sep. 28, 1987, Ser. No. 102,041
Claims priority, application Sweden, Oct. 6, 1986, 8604243
Int. Cl.[4] B60J *3/02*
U.S. Cl. 296—97.13 5 Claims



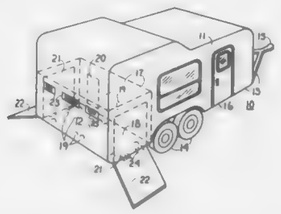
1. Sun visor for motor vehicles, comprising a plate of a compressible material with a stiffening metal wire frame, a main bearing joined to the wire frame for a main shaft and a shaft holder for a second bearing as well as a spring device with at least one spring tongue in contact with a portion of the main shaft, said portion having a non-circular cross section, characterized in that the main bearing and the spring device are made of metal of one-piece construction having means for fixing mutually adjacent ends of the wire frame to the unit, the wire frame having abutting, bent end portions, which are fixed by tongues gripping the wire, said tongues being stamped-out portions of the metal unit of one-piece construction.

4,854,630
BOW CONNECTOR DEVICE FOR TARPAULIN COVER
Vito Biancale, R.R #2, Dundas, Ontario, Canada
Filed Feb. 5, 1988, Ser. No. 152,627
Claims priority, application Canada, Jul. 23, 1987, 542788
Int. Cl.[4] B62D *25/06*
U.S. Cl. 296—100 4 Claims



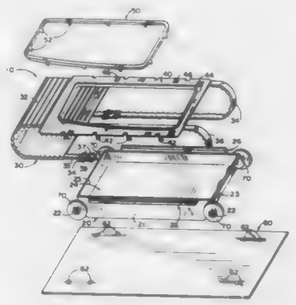
1. In a collapsible tarpaulin cover system for open-top truck bodies, trailers and the like, the system comprising a tarpaulin with a plurality of transversely extending tubular intermediate bows, the ends of which are slidably mounted on a pair of spaced, horizontally extending non-moving linear semi-rigid support means positioned on either side of the truck body or trailer, the bows secured in spaced fashion to the tarpaulin, and a transversely extending tubular lead bow secured to one end of the tarpaulin with its ends fixedly secured to a movable cable means whereby movement of the cable means in one direction draws the lead bow, intermediate bows and tarpaulin longitudinally across the truck body or trailer to its back end to cover it and movement of the cable means in the other direction draws the lead bow, intermediate bows and tarpaulin in the longitudinal direction to the front end to open the truck body or trailer top, the improvement wherein connector devices are provided to mount the ends of the intermediate bows on the semi-rigid linear support means, the connector device for each of the ends of the bows comprising a plug portion to releasably snugly fit inside one end of the bow, securing means to releasably lock that plug portion in position in that end of the bow and a body portion secured to the plug portion to be seated outside the end of the bow, the body portion provided with a linear aperture for slidably receiving the semi-rigid linear support means, at least a pair of the connector devices being adapted for the ends of the lead bow and the body portion of each being further provided with another linear aperture for receiving the cable means, and securing means associated with the body portion of each to releasably secure the connector to the cable means and thereby prevent relative sliding movement of the body portion with respect to the cable means.

4,854,631
COMBINATION RECREATIONAL TRANSPORT AND CAMPER VEHICLE
Darlene Laursen, 2480 Sunrise Rim, Boise, Id. 83705
Filed Nov. 3, 1987, Ser. No. 116,222
Int. Cl.[4] B60R *27/00;* B60P *3/07*
U.S. Cl. 296—158 1 Claim



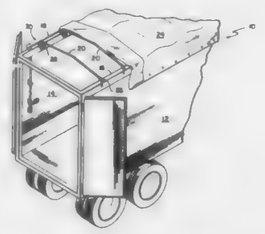
1. A combination recreational and transport vehicle comprising:
travel trailer means enclosing living quarters and a transport storage means extending to each side of said travel trailer [illegible]
said transport storage means having multiple fire rated wall and deck means defining said transport storage means, an all terrain vehicle stored in said transport storage means;
a pair of load bearing doors located opposite one another hinged to said deck means and disposed to provide direct access to said transport storage means from either side of said travel trailer means, said doors further configured to be lowerable into loading ramp positions to provide ramps for loading said transport storage means from either side;
a fire rated access door located to provide interior communication means between said living quarters and said transport storage means;
a plurality of multiple tie down means disposed within said transport storage means for securing said all terrain vehicle therein; and
a plurality of venting means disposed within said transport storage means for ventilating the same.

4,854,632
STORAGE COMPARTMENT
Kenneth D. Kreuze, and Eric D. Rennie, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.
Filed May 8, 1987, Ser. No. 47,297
Int. Cl.[4] B60R *7/06*
U.S. Cl. 296—37.12 14 Claims



14. A covered recessed storage compartment for mounting downwardly in a panel of a vehicle comprising:
a storage container having a trapezoidal-shaped top for conforming to the shape of a vehicle panel, said container including a guide track extending along upper edges thereof and wheels at lower corners of said container;
flexible endless loop cover means including a cover segment extending over said open top, said cover means including spaced tabs projecting outwardly therefrom for engaging said guide track and said wheels for guided movement of said cover means partially around said container between open and closed positions; and
means for mounting said container and cover means downwardly in a vehicle instrument panel.

4,854,633
ROOF BOW LOCKING SYSTEM
Kenneth N. Kraft, and Daniel Powers, both of Evansville, Ind., assignors to George Koch Sons, Inc., Evansville, Ind.
Filed Apr. 6, 1988, Ser. No. 178,187
Int. Cl.[4] B60J *7/00*
U.S. Cl. 296—104 11 Claims



1. A roof bow system for supporting a cover for a trailer unit, the trailer unit having spaced-apart, generally parallel, upstanding first and second walls, the system comprising:
a plurality of bow members, each having a first end and a second end and each extendable between the first wall and the second wall to support the cover,
means for mounting the first end of each of the bow members to the first wall for horizontal pivotal movement thereon,
means for supporting the second end of each of the bow

members to the second wall such that each bow member extends between the first wall and the second wall,

said supporting means receiving said bow member upon said horizontal pivoting away from the first wall,

means for locking the second end of each of the bow members in the supporting means, and

means for activating each locking means such that the second end of each bow member is locked and unlocked substantially simultaneously.

4,854,634

UPPER BODY STRUCTURE FOR A CONVERTIBLE VEHICLE

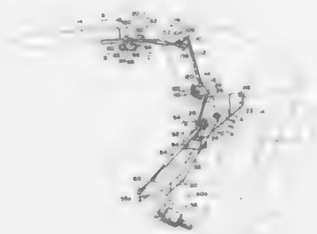
Noriaki Shiraishi; Sigeru Kamiyama; Shigenori Amioka, and Akiyoshi Okada, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 30, 1987, Ser. No. 103,060

Claims priority, application Japan, Oct. 2, 1986, 61-234760

Int. Cl.[4] B60J *7/14*

U.S. Cl. 296—108 19 Claims



1. A vehicle body structure including a body having a passenger compartment and a rear body section, retractable roof means for moving between an extended position wherein said roof means covers a top portion of the passenger compartment and a retracted position wherein the roof means is retracted into the rear body section, said roof means having a first rigid roof panel and a second rigid roof panel each having an inner side which faces said passenger compartment when the roof means is in said extended position, folding means for interconnecting said first rigid roof panel at a rear edge portion with a front edge portion of said second rigid roof panel, said second rigid roof panel being mounted on said body for swingable movement about a swingable axis, a linkage having one end connected with said body and the other end connected with said folding means so that said first rigid roof panel is swingably moved with respect to the second rigid roof panel to have the inner side of the first rigid roof panel opposed to the inner side of the second rigid roof panel when the second rigid roof panel is swingably moved in a rearward direction, said first rigid roof panel and said second rigid roof panel being pivotably connected, said folding means being gear means provided on said first and second rigid roof panels, said linkage comprises means for rotating the gear means when the second roof panel is moved toward the retracted position so that the first rigid roof panel is moved with respect to the second rigid roof panel.

19. A vehicle body structure including a body having a passenger compartment and a rear body section, retractable roof means for moving between an extended position wherein said roof means covers a top portion of the passenger compartment and a retracted position wherein the roof means is retracted into the rear body section, said roof means having a first rigid roof panel and a second rigid roof panel each having an inner side which faces said passenger compartment when the roof means is in said extended position, folding means for interconnecting said first rigid roof panel at a rear edge portion with a front edge portion of said second rigid roof panel, said second rigid roof panel being mounted on said body for swingable movement about a swingable axis, a linkage having one end connected with said body and the other end connected with said folding means so that said first rigid roof panel is swingably moved with respect to the second rigid roof panel to have the inner side of the first rigid roof panel opposed to the inner side of the second rigid roof panel when the second rigid roof panel is swingably moved in a rearward direction, the second rigid roof panel being connected at an intermediate portion with the body with regard to a longitudinal direction of the body, a front end portion of the second rigid roof panel being positioned in a attitude with the front end portion thereof being higher than a rear end thereof when the second rigid roof panel is in the retracted position, the first rigid roof panel and second rigid roof panel being arranged substantially parallel with each other in the retracted position thereof.

4,854,635

DRIVE MECHANISM FOR AN AIR GUIDE ARRANGEMENT

Juergen Durm, Ditzingen, and Constantin Brin, Stuttgart, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 1, 1988, Ser. No. 214,386

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1987, 3722202

Int. Cl.[4] B62D *37/02*

U.S. Cl. 296—180.5 20 Claims



1. A drive mechanism for moving an air guide means provided at a motor vehicle from a retracted rest position into an extended operating position and vice versa, comprising toothed segment means rotatably supported about an axis, said toothed segment means being operatively connected with an adjusting lever means, the toothed segment means and the adjusting lever means being supported separate of one another on the axis and being retained in a predetermined relative position relative to one another by a spring means disposed therebetween, entrainment means at said toothed segment means cooperating with a slot opening provided in the adjusting lever means in such a manner that during the extension of the air guide means into the operating position a rigid force transmission takes place between the toothed segment means and the adjusting lever means whereas during the end phase of the closing operation of the air guide means the entrainment means is decoupled from an upper boundary edge of the slot opening and moves toward a lower boundary edge of the slot opening while overcoming the spring tension of the spring

4,854,636

EDGE-ENCAPSULATED GLAZING MODULE

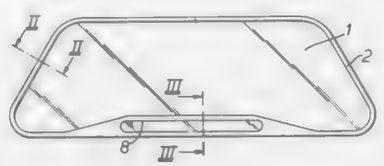
Geoffrey Greenhalgh, Orrell; Peter Morris, Garswood; John N. Bearon, Aughton, all of England, and Guenter Armbruster, Krefeld, Fed. Rep. of Germany, assignors to Pilkington plc, St. Helens, England

Filed Jun. 19, 1987, Ser. No. 64,056

Claims priority, application United Kingdom, Jun. 26, 1986, 8615077

Int. Cl.[4] B60J *1/00*

U.S. Cl. 296—201 15 Claims



1. An edge-encapsulated glazing module for a vehicle, comprising an encapsulation molded-in-place around an edge of a glazing material wherein the molded-in-place encapsulation embodies means to provide an auxiliary function other than the fitting of the module to a vehicle body, the molded-in-place encapsulation embodying means for mounting a lighting unit.

4,854,637

SEAT CUSHION BACK PACK

LaVan McCree, 3172 Marathon Dr., San Diego, Calif. 92123

Filed Nov. 9, 1987, Ser. No. 118,536

Int. Cl.[4] A47C *9/10*

U.S. Cl. 297—188 9 Claims



1. A seat cushion back pack comprising:

a padded portion adapted to be selectively placed on a seat in a cushion configuration and carried in a back pack configuration;

strap means secured to said padded portion for carrying said padded portion on a person's back in the back pack configuration;

first flexible flap means connected to said padded portion, said first flap means being formed with at least one first pocket therein having an opening, said first flap means being folded against said padded portion when in the back pack configuration and hanging downwardly from the seat when in the cushion configuration, with said first opening being oriented upwardly when in either the cushion configuration or the back pack configuration; and

second flexible flap means connected to said first flap means, said second flap means being formed with at least one second pocket therein having an opening, said second flap means being folded against said first flap means when in the back pack configuration and hanging downwardly from the seat with said opening therein oriented upwardly when in the cushion configuration;

whereby the contents of said first pockets are readily available to a person when on said cushion, and when the person is so positioned said cushion retains said first flap means and pocket contents securely in place hanging from the seat.

4,854,638

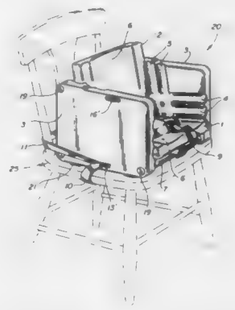
PORTABLE ADJUSTABLE CHILD'S CHAIR

Kenneth N. Marcus, Tipp City, and Phillip L. Brookshire, Cincinnati, both of Ohio, assignors to Dolly, Inc., Tipp City, Ohio

Filed Nov. 14, 1988, Ser. No. 270,742

Int. Cl.[4] A47C *1/08*

U.S. Cl. 297—250 19 Claims



1. A portable adjustable child's chair, comprising:

(a) a seat panel;

(b) a back panel;

(c) two side panels having on their inner surfaces facing each other a plurality of generally horizontal grooves or channels to slidably receive said seat panel whereby said seat panel may be raised or lowered, said side panels further having on their inner surfaces facing each other a plurality of generally vertical grooves or channels to slidably receive said back panel, whereby said back panel location may be adjusted forward or rearward; and

(d) a stable rigid frame which is formed in part from said side panels and which along with said seat panel and said back panel provides a body supporting feature, said stable rigid frame being self-supporting and free-standing, whereby said child's chair is readily portable and easily stored.

4,854,639

CHILD'S SAFETY SEAT

David W. Burleigh, and Andrew J. Assinder, both of Bognor Regis, England, assignors to Britax-Excelsior Limited, England

Filed Jan. 23, 1989, Ser. No. 300,958

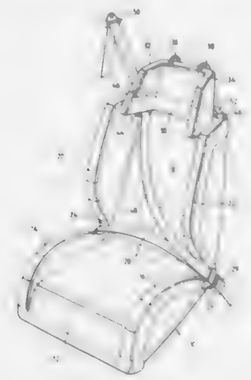
Claims priority, application United Kingdom, Jan. 26, 1988, 8801716

Int. Cl.[4] A47C *1/08*

U.S. Cl. 297—250 9 Claims

1. A child's safety seat comprising a seat body having a seat portion, a back rest, vertically extending side walls projecting forwardly from the side edges of the back rest, first and second guide means adjacent to the junction between the seat portion and the back rest for locating a lap portion of an adult seat belt, a head rest mounted on the back rest, means for mounting the

head rest on the back rest so as to permit adjustment of the distance between the head rest and the seat portion, and third



guide means for guiding the shoulder portion of an adult belt between the back rest and the head rest.

4,854,640

APPARATUS FOR RAISING SEAT OF CHAIR

Toshio Yokoyama, Tokyo, Japan, assignor to Kabushiki Raisha Kotobuki, Tokyo, Japan

Filed Mar. 14, 1988, Ser. No. 167,523
Claims priority, application Japan, Nov. 6, 1987, 62-169660
Int. Cl.[4] A47C *1/12*
U.S. Cl. 297—333 6 Claims



1. An apparatus for raising a seat of a chair comprising:

a pair of spaced arms each having an L-shaped cross-section form including a vertical portion, said arms being adapted to receive a pivotally mounted seat therebetween,

a stationary shaft extending between said arms,

a position determining sleeve turnably mounted on said stationary shaft, said position determining sleeve being composed of a first sleeve portion disposed remote from the vertical portion of one of the arms, a second sleeve portion disposed by the vertical portion of the arm and an intermediate portion located between said first sleeve portion and said second sleeve portion,

first spring means fitted onto the first sleeve portion of the position determining sleeve to normally urge the seat in such a direction that the seat is raised up to a neutral nonuse position, one end of said first spring means being engaged to the stationary shaft and the other end of the same being engaged to the position determining sleeve, and

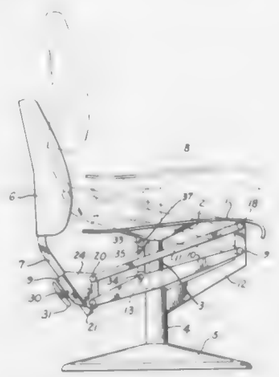
second spring means fitted on the second sleeve portion of the position determining sleeve to normally urge the seat toward the neutral position in the opposite direction to the first spring means, said second spring means having a lower intensity of resilient force than that of the first spring means, one end of the second spring means being engaged to a part of the first spring means and other end of the same being engaged to a part of the arms.

4,854,641

ADJUSTABLE CHAIR

Richard G. Reineman, 3698 Zola St., San Diego, Calif. 92106, and George P. Carver, 26 Linda Isle, Newport Beach, Calif. [illegible]

Filed Jan. 23, 1989, Ser. No. 300,398
Int. Cl.[4] A47C *3/20*
U.S. Cl. 297—345 2 Claims



1. A chair adjustable to fit a range of people of different sizes, the chair including a base, a support column mounted in the base, a vertically extendable post within the support column, a seat, a seat support mounted on the moveable post, a moveable back rest and back rest support, a constrained linkage having stationary link pins connected with a plurality of moveable links and pins, the linkages operating to adjust the seat back support in relationship with the seat as the seat support is moved relative to the chair base, the improvement comprising:

a system of linkages located underneath the seat support, two linkage bars, an upper and a lower, the bars extending approximately in a horizontal direction, the upper and lower linkage bars extending from front to rear on the chair underneath the seat support, the linkages having two vertically spaced hinge points located to the front of the seat support, and two vertically spaced hinge points located to the rear of the seat support, the two forward linkage hinge points fixed at an elevation relative to the floor, these fixed-position linkage hinge points held by pins in a fixed member, the fixed member extending upward and outward from the support column, a post pin fixed to move vertically with the movement of the seat, the lower linkage bar having an opening formed along its length, the opening containing the post pin,

the rear two linkage hinge points located in the lower portion of the moveable back rest support, the opening in the lower linkage bar positioned at a distance X from the front hinge point of that bar, the rear hinge point of the lower linkage bar located a distance Y to the rear of the opening in the lower linkage bar, the post pin restraining the lower bar and the front two linkage hinge points acting as a pivot for the total linkage system such that:

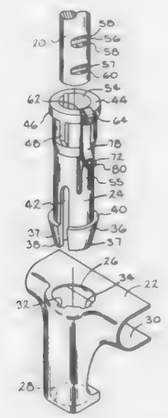
raising the moveable post causes the linkage system to rotate toward the front of the chair raising the rear linkages and raising the back rest support relative to the seat support, the degree of relative movement between the seat and the back support being a function of the ratio of the X and Y distances, this distance ratio being set to cause chages in the back height above the seat as the seat height above the floor is changed with the two changes occuring according to proportions for humans of various sizes, the result being a chair in which the back rest position rises an increased distance above the seat in accordance with the change of different persons' seat-region-to-lumbar-region distances as different persons' comfortable seat heights from the floor are different due to different persons' overall height differences.

4,854,642

HEAD RESTRAINT GUIDE ASSEMBLY

Mohan P. Vidwans, Saline, and Kenji Ino, Birmingham, both of Mich., assignors to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Jan. 15, 1988, Ser. No. 144,377
Int. Cl.[4] A47C *7/36*
U.S. Cl. 297—410 8 Claims



1. An assembly for enabling a head restraint pad to be moved with respect to a motor vehicle seat comprising:

at least one post connected to and supporting the head restraint pad, said post forming a retainer notch on its outer surface,

a tubular bushing mounted to the seat and having an inside bore for receiving said post,

latch means coupled to said tubular bushing having a lug engagable with said retainer notch and biased into engagement with said retainer notch for inhibiting the withdrawal of said post from said bushing, and

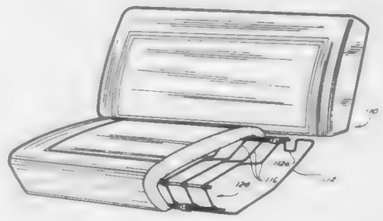
a release member having a body section with a first end engaging said lug, and a second end extending from one end of said bushing, wherein said release member second end is depressed against said one end of said bushing, said first end of said release member produces compressive loading of said lug and causes said lug to be displaced out of engagement with said retainer notch enabling said post to be withdrawn from said bushing, said bushing forming a ramp surface acting on said release member to position said first end radially outward of said second end, whereby when said second end is depressed said body section is loaded in compression and said first end is urged to move radially outward.

4,854,643

SEAT CONSTRUCTION

Brian S. Cojocari, Walnut, Calif., and Joseph R. Shivers, Novi, Mich., assignors to Wickes Manufacturing Company, Southfield, Mich.

Continuation of Ser. No. 53,185, May 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 801,530, Nov. 25, 1985, abandoned. This application Aug. 15, 1988, Ser. No. [illegible]
Int. Cl.[4] F16F *3/02*
U.S. Cl. 297—452 4 Claims



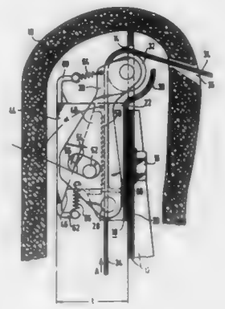
1. A self-contained vehicle seat suspension system comprising generally parallel spaced front and rear border wires, a bolster wire located outwardly of and above the front border wire, a plurality of spaced, generally parallel stringer wires being interconnected at their ends by double wrap attachment to the border wires, the stringer wires being interconnected intermediate their ends only by double-wrap attachment to the bolster wire to divide the stringer wires into pairs of legs such that the legs form an acute angle, and a wire frame attached to the border wires, thus enabling the suspension system to be attached as a unit to a vehicle supporting structure.

4,854,644

DEFLECTION CLAMPING DEVICE

Hans-Hellmut Ernst, Sülfeld, Fed. Rep. of Germany, assignor to Britax-Kole GmbH & Co., Dachau, Fed. Rep. of Germany

PCT No. PCT/EP87/00477, § 371 Date Apr. 25, 1988, § 102(e) Date Apr. 25, 1988, PCT Pub. No. WO88/01582, PCT Pub. Date Mar. 10, 1988
PCT Filed Aug. 24, 1987, Ser. No. 192,509
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1986, 3629091
Int. Cl.[4] A62B *35/00*
U.S. Cl. 297—476 11 Claims



1. A deflection clamping device for a safety belt system comprising a stationary clamping member and a movable clamping member which is brought into clamping engagement with the belt in response to a predetermined belt-pulling load, said belt being brought into clamping engagement with the

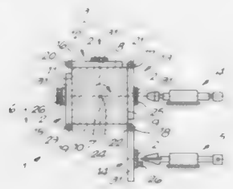
stationary clamping member, characterized in that the movable clamping member is a clamping wedge (48) that supports itself on a stationary guide ramp (44), which has, in the direction of extraction of the belt (A) and in the direction towards the stationary clamping member 22), a sloped sliding surface (46) for the clamping wedge (48), said deflection clamping device being further characterized in that a control lever (30), supporting a belt deflection member (32) and being rotatable about a stationary axis (28), operates together with a control member 52), said control lever acting via an active surface (56) upon the clamping wedge (48), said active surface being oriented at an angle to the direction (A) of extraction of the belt, said angle set such that the clamping wedge (48), influenced by the extraction of the belt, has a velocity component in the direction of belt extraction (A) that is equal to the belt extraction sped at the appropriate moment.

4,854,645

BRUSH MANUFACTURING MACHINE

Leonel Boucherie, Roeselare-Rumbeke, Belgium, assignor to Firma G. B. Boucherie, naamloze vennootschap, Izegem, Belgium

Filed Mar. 3, 1988, Ser. No. 163,837
Claims priority, application Belgium, Mar. 13, 1987, 8700252
Int. Cl.[4] A46D *3/00*
U.S. Cl. 300—10 **17 Claims**



1. A brush-manufacturing machine comprising:
a rotatable drum for the transportation of brush bodies to different processing stations,
a plurality of removable brush body holders attached to said drum, and
means on said drum for revolving said brush body holders away from said drum about respective axes of rotation so that at least two of said brush body holders are simultaneously arranged opposite at least two successive processing stations.

4,854,646

RIM FOR A MOTOR VEHICLE WHEEL

Ulrich Schempp, Tiefenbronn, and Volker Ruehr, Stuttgart, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 11, 1987, Ser. No. 131,503
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1986, 3642504
Int. Cl.[4] B60B *21/00*
U.S. Cl. 301—65 **14 Claims**

1. A motor vehicle wheel rim having a wheel disc, the wheel disc having a front surface, several through-opening means arranged on the front surface of the wheel disc substantially at a concentric aperture circle of the wheel and circumferentially with respect to a wheel brake means and each forming an air inlet and outlet for directing cooling air flow directly onto and away from the wheel brake means, the opening means being constructed of substantially semi-circular shape and include an accurately shaped outer boundary surface and an accurately shaped inner boundary surface, the outer boundary surface being defined by a section of a circle concentric with the wheel rim and located at a rim dish portion of the wheel rim which provides an inner area for a tire placed on the wheel rim while the inner boundary surface adjoins said section, the arc of the inner boundary surface extending up to a substantially concentric inner circle of the wheel which has a predetermined radius, the inner and outer boundary surfaces forming an approximately axial air guide channel with an inclination to the wheel



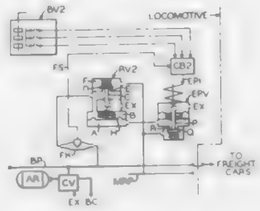
center axis at a predetermined angle, and wherein the inner boundary surface is constructed as semi-circle with a radius whose center point is located approximately at a circumferential mid point of the respective opening taken along a circle concentric with the wheel center point.

4,854,647

AUTOMATIC AIR BRAKE SYSTEMS WITH ACCELERATED EXHAUSTION OF THE BRAKE LINE

Yasuo Nakao, Kobe, Japan, assignor to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Jun. 23, 1988, Ser. No. 210,545
Claims priority, application Japan, Jul. 15, 1987, 62-176515
Int. Cl.[4] B60T *15/52*
U.S. Cl. 303—69 **7 Claims**



1. An automatic brake control system for a railway train comprising, a brake line running the length of the train, a brake valve located in the locomotive for allowing a brake application and a brake release, a relay valve having output and pilot chambers, a flow rate detector disposed between the brake line and the output chamber, a controller receiving a digital signal from the brake valve and a flow signal from the flow rate detector, an electropneumatic conversion valve controlled by the controller to exhaust the pilot chamber to accelerate the exhaustion of the brake line during a brake application.

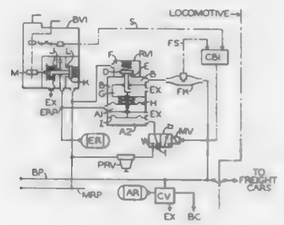
4,854,648

AUTOMATIC AIR BRAKING SYSTEM

Yasuo Nakao, Kobe, Japan, assignor to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Jun. 23, 1988, Ser. No. 210,544
Claims priority, application Japan, Jul. 15, 1987, 62-176516
Int. Cl.[4] B60T *15/52*
U.S. Cl. 303—69 **12 Claims**

1. An automatic air braking system for a railway train comprising, a flow detector being connected to the brake line for sensing the flow of pressurized air in a brake line during a brake release command time, a pilot chamber being located in a relay valve being pressurized when a flow signal from said flow detector exceeds a first predetermined pressure value and which stops the pressurization when the flow signal drops below a second predetermined pressure value, said brake line running from the lead unit or locomotive of the train and through the railway vehicle or freight cars connected to and pulled by said lead unit or locomotive, said relay valve being an automatic-lapping-type valve and being located in said lead



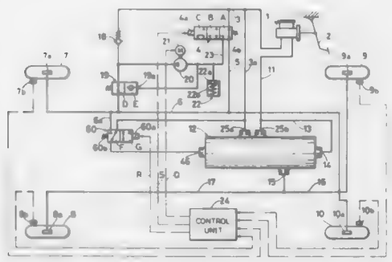
unit or locomotive in which said pilot chamber being exhausted in response to the reception of a brake command and which is pressurized in response to the reception of a brake release command, an output chamber being located in said relay valve and being connected to said brake line of said lead unit or locomotive, and said output chamber being pressurized in response to the pressurization of said pilot chamber and being exhausted in response to the exhaustion of the pilot chamber so as to accelerate the brake operation along the length of the train.

4,854,649

ANTI-SKID CONTROL APPARATUS FOR A VEHICLE BRAKING SYSTEM

Tetsuro Arikawa, Kanagawa, Japan, assignor to Nippon A B S, Ltd., Japan

Filed Jan. 13, 1988, Ser. No. 143,650
Claims priority, application Japan, Jan. 14, 1987, 62-007721; Jan. 16, 1987, 62-008692
Int. Cl.[4] B60T *8/34, 8/64, 8/88*
U.S. Cl. 303—113 **10 Claims**



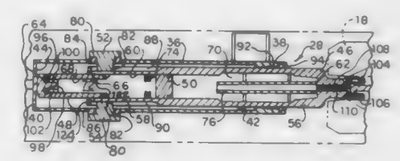
1. In an anti-skid control apparatus for a vehicle braking system comprising:
(A) a fluid pressure generating source to which two brake conduit circuits are connected;
(B) a fluid pressure valve whose output side is connected to a wheel cylinder that is connected to one of said two brake conduit circuits to control fluid pressure of the wheel cylinder;
(C) a valve apparatus for controlling fluid pressures of a wheel cylinder connected to the other of said two brake conduit circuits, said valve apparatus comprising a casing having first and second input ports and an output port, a piston, a control chamber and a volume chamber formed at both sides of said piston, a valve part arranged between said first input port and said volume chamber, and a pre-loading means which always presses in a direction to open said valve part, said first input port being connected to one fluid pressure generating chamber of said fluid pressure generating source, said second input port being connected to said control chamber, and said output port being connected to said volume chamber and to said wheel cylinder connected to the other of said two brake conduit circuits; the improvements in which changeover valve means is connected to said
second input port of the casing of the valve apparatus, said changeover valve means taking a first position in which said control chamber connects with another fluid pressure generating chamber of said fluid pressure generating source and is cut off from said wheel cylinder connected to one of said two brake conduit circuits, and taking a second position in which said control chamber is connected to said wheel cylinder that is connected to one of said two brake conduit circuits and is cut off from another fluid pressure generating chamber of said fluid pressure generating source when a skid signal to release the brake or to maintain the braking force constant is generated from said wheel cylinder connected to the other of the two brake conduit circuits wherein, when said changeover valve means takes said first position, said valve part is open due to said pre-loading means, and when said changeover valve means takes said second position and said fluid pressure control valve is operated, said piston is moved toward said control chamber by the difference in pressure between said control chamber and said volume chamber to close said valve part to cut off said first input port from said volume chamber and change the volume of said volume chamber with the movement of said piston.

4,854,650

TRACK RECOIL AND TENSIONING MECHANISM

Marvin G. Getz; Brian D. McFeeters, both of Morton, and Robert J. Purcell, Washington, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Apr. 4, 1988, Ser. No. 177,230
Int. Cl.[4] B62D *55/00*
U.S. Cl. 305—10 **10 Claims**



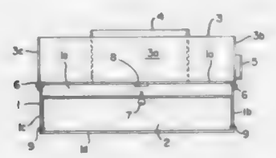
1. A recoil assembly for controllably resisting movement of an idler of a belted track vehicle, comprising:
a cylinder having first and second end portions and an open chamber in said first end portion;
an actuator having first and second end portions and an open chamber in said second end portion, said actuator first end portion being connectable to said idler and said actuator second end portion being slidably positioned within said cylinder chamber;
a closure having first and second end portions and an open chamber in said closure second end portion, said closure first end portion being seated in said cylinder second end portion and said closure second end portion being slidably positioned within said actuator chamber;
a piston positioned within and slidably movable along said actuator chamber; and
inlet and outlet valves communicating with said actuator

chamber, and inlet and outlet valves communicating with said closure chamber.

4,854,651
VIDEO CASSETTE RECORDER PROTECTOR AND ORGANIZER

Douglas W. Geiste, 31 Roger Ave., North Haven, Conn. 06473, and James C. Andrew, 409 Ocean Ave., West Haven, Conn. 06516

Filed Jul. 6, 1987, Ser. No. 69,849
Int. Cl.[4] A47B *81/06*
U.S. Cl. 312—9 3 Claims



1. A device for protecting a video cassette recorder and for storing and organizing video cassette tapes comprising, in combination:

(a) a main body including a top and a bottom panel and two side panels forming an enclosure for receiving said video cassette recorder, said main body having an open front end and said top panel having a front edge adjacent to said open front end and a back edge;

(b) an optically clear, front access door covering said open front end of said main body;

(c) means for hingably attaching said front access door to said two side panels at a point adjacent to said bottom panel so that said door can be swung downward to expose said open front end;

(d) a locking mechanism on said front door adapted to engage a latch on the bottom of said top panel adjacent to said front edge thereof;

(e) a rack for storing and organizing video cassette tapes positioned on top of said main body including a back wall and two side walls, said back wall standing upright on said top panel at a location close to said back edge thereof, providing together with said top panel and said side walls an open storage space in front of said back wall for receiving said video cassette tapes;

(f) means for mechanically fastening said two side walls of said rack to said two side panels of said main body;

(g) a rear wall member affixed to the back of said back wall of said rack forming a separate storage compartment; and

(h) a holder affixed to one of said side walls of said rack for holding a remote control unit for said video cassette recorder.

4,854,652
DUAL VOTING BOOTH PACKAGE

John E. Ahmann, 1400 Dubig Rd., Napa, Calif. 94558

Filed May 12, 1988, Ser. No. 192,945
Int. Cl.[4] A47B *96/18*
U.S. Cl. 312—140.2 14 Claims

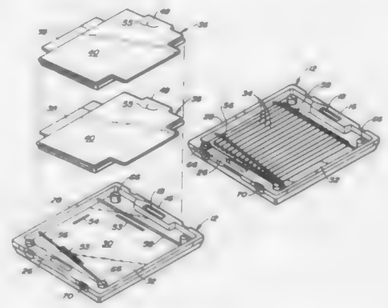
1. A portable dual voting booth assembly comprising:

a pair of generally rectangular base members, each in the form of a molded one-piece structure having side wall and end wall portions surrounding a central recessed portion and including means for forming four open receptacles near its four corners, said base members being connected together to form an enclosure;

a plurality of separable support legs sized at one end to fit within said open receptacles;

a pair of foldable privacy shields having a plurality of panels and adapted to be supported in an upright position on said central portion; and

means attached to said base member for holding said support

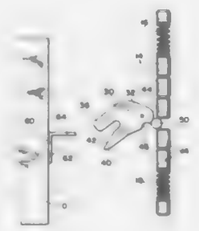


legs within said central recessed portion of at least one of said base members when said assembly is in storage and for holding each said privacy shield in its upright position on a base member when said assembly is erected for use.

4,854,653
MULTIPLE INTERLOCKING SYSTEM FOR FILE CABINETS, E.G.

Matthew L. Lakso, Westminster, Mass., assignor to Engineered Security Products Corporation, Leominster, Mass.

Filed Sep. 4, 1987, Ser. No. 93,260
The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.
Int. Cl.[4] E05C *7/06*
U.S. Cl. 312—223 15 Claims



1. A locking system, comprising:

a plurality of small, discrete elements;

means for confirming said elements in a string;

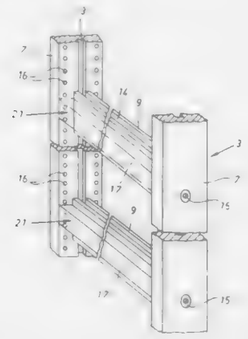
means for biasing said string into a first, contiguous state; and

at least two interposing means at spaced positions along said string and aligned with a junction of two elements when said string is in said first state, each said interposing means interacting with amovable device to be locked and being interjected between two elements when the device is moved from an unlocking to a locking position to divide the string and move the elements away from the interjected interposing means into a second, displaced state in which said other junctions are shifted to prevent interjection into the string of any of the remaining interposing means.

4,854,654
COLLAPSIBLE CABINET

Jaakko Korpela, Savonlinna, Finland, assignor to Proxy Oy, Helsinki, Finland

PCT No. PCT/FI86/00103, § 371 Date Jun. 2, 1987, § 102(e) Date Jun. 2, 1987, PCT Pub. No. WO87/01917, PCT Pub. Date Apr. 9, 1987
PCT Filed Oct. 1, 1986, Ser. No. 64,945
Claims priority, application Finland, Oct. 3, 1985, 853828; Oct. 3, 1985, 853829
Int. Cl.[4] A47B *43/00*
U.S. Cl. 312—265.1 8 Claims



1. A collapsible cabinet, comprising end ladder structures which form gables of a cabinet, and door frame structures, both structures including upright posts with broad sides and narrow sides and horizontal braces with broad sides and narrow sides positioned therebetween so that the broad sides of said horizontal braces are oriented in the vertical direction to partly expose the broad sides of the upright posts on either side of the ends of the horizontal braces, said horizontal braces being fastened between the upright posts for keeping said upright posts parallel to and spaced a consistent distance from each other, the horizontal braces and upright posts thus defining rectangular areas, whereby the sides of both of the horizontal braces and upright posts facing such rectangular areas are each provided with a groove for receiving cover boards which cover said rectangular areas, wherein said horizontal braces of said end ladders are fastened between the broad sides of said upright posts by means of screws extending through said upright posts, in addition to which the broad sides of said upright posts are provided with arrays of holes extending on either side of the ends of said horizontal braces.

4,854,655
CABINET AND METHOD OF ASSEMBLY OF A BEVERAGE DISPENSER

William J. Saunders, and Samuel C. Crosby, both of Stone Mountain, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

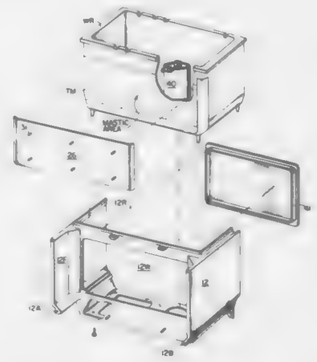
Division of Ser. No. 663,134, Oct. 22, 1985, which is a continuation-in-part of Ser. No. 552,385, Nov. 16, 1983, abandoned. This application Oct. 22, 1984, Ser. No. 663,124
Int. Cl.[4] A47B *43/00*
U.S. Cl. 312—257.1 4 Claims

1. A cabinet for a beverage dispenser apparatus which mixes flavor concentrate and water together to form a post-mix beverage comprising:

(a) a lower housing assembly having upstanding sidewall portions extending from front to back of the cabinet, a valve assembly housing with upwardly-facing sockets for receiving flavor concentrate containers, said valve assembly housing being recessed below the top edges of said sidewalls and disposed adjacent to the front of said cabinet, and an open, substantially U-shaped compartment behind said valve assembly housing between said sidewalls;

(b) an upper housing assembly including sidewall portions which define a flavor concentrate compartment therebetween which opens toward the front of said cabinet;

(c) a tray forming a bottom of said flavor concentrate compartment when disposed on said valve assembly housing between the top edges of the lower housing sidewalls, including openings which register with said upwardly-facing sockets;



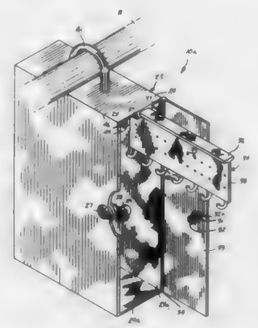
(d) track means between the sidewall portions of said upper and lower housing assemblies, permitting the upper housing assembly to be slid thereon into the substantially U-shaped compartment in the lower housing assembly from the back to the front thereof, to thereby trap said tray between the upper and lower housing assemblies with the openings therein in registry with said upwardly-facing sockets of the valve assembly housing; and

(e) means for securing said upper and lower housing assemblies together.

4,854,656
JEWELRY STORAGE APPARATUS

Ellen O'Keefe, 705 R St., Pt. Townsend, Wash. 98368

Filed Apr. 26, 1988, Ser. No. 186,308
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—345 1 Claim



1. A jewelry storage apparatus comprising a vertically elongate cabinet including a top wall, a bottom wall, a forward wall, a rear wall, and a first side wall defining a cabinet and a jewelry storage means slidably and reciprocatably mounted in said cabinet from a first position within said cabinet to a second position externally of said cabinet for access to a user,

and said storage means mounted to a plurality of spaced depending "L" shaped guide rails secured to an interior surface of said top wall, and

said storage means comprising a "T" shaped beam including an elongate head slidably supported on each of said guide rails and an elongate planar jewelry support integrally and orthogonally depending downwardly from said head of a thickness approximately equal to a spacing between said guide rails, and

said elongate planar jewelry support including a lower terminal edge spaced above bottom wall, and

a door hingedly mounted to said rear wall to enclose said storage means when retracted within said cabinet to said second position, and

wherein said apparatus further comprises a first lock pivotally secured to said forward wall and including an "L" shaped latching means securable to a boss means integrally formed to interior surface of said door, and

wherein said apparatus further comprises a second lock means including a "U" shaped member extending externally of said top wall for securement to an external post wherein said "U" shaped member includes a first leg formed with a reduced shank for interengaging association with an internal latch, said internal latch pivotally secured within said cabinet, and said "U" shaped second lock including a second leg of a length greater than said first leg formed with a head at a terminal end to capture a spring biasing means between said head and surface of said top wall for biasing said "U" shaped second lock means outwardly of said top wall, and

wherein said jewelry support includes a plurality of hooks therebelow, secured to said lower terminal edge thereof for securement of elongate jewelry members and further including plural rows of apertures through said jewelry support for securement of earring posts thereto.

4,854,657

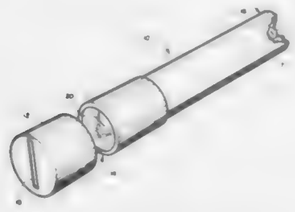
KALEIDOSCOPE WITH RESTRICTIVE APERTURE FOR VISUAL ENHANCEMENT

Brent Scott, 170 Highland Trail, Crest, Calif. 92021

Filed Apr. 5, 1988, Ser. No. 177,924

Int. Cl.[4] G02B *23/00*

U.S. Cl. 350—4.2 **7 Claims**



1. Visual enhancement for a kaleidoscope comprising in combination:

a kaleidoscope having a tubular base portion housing the conventional bits and pieces of colored objects of a conventional kaleidoscope, said housing having a translucent otherwise light restrictive lens at a first end and a viewing port at the opposite second end and a rotatable overlay positioned over said first end for restricting the reception of light into said first end, said overlay having a selective configured opening therethrough, said opening positionable relative to said first end to admit light into said first end therethrough according to the configuration and position of said opening in said overlay.

4,854,658

RADIATION DEFLECTOR ASSEMBLY

Ian W. Stanley, Ipswich, England, assignor to British Telecommunications public limited Company, United Kingdom

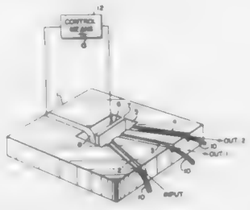
PCT No. PCT/GB86/00630, § 371 Date Jun. 12, 1987, § 102(e) Date Jun. 12, 1987, PCT Pub. No. WO87/02475, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 16, 1986, Ser. No. 80,465

Claims priority, application United Kingdom, Oct. 16, 1985, 8525458; Oct. 16, 1985, 8525459; Oct. 16, 1985, 8525460; Oct. 16, 1985, 8525461; Oct. 16, 1985, 8525462; Oct. 23, 1985, 8526189

Int. Cl.[4] G02B *6/26, 6/42*

U.S. Cl. 350—96.15 **10 Claims**



1. A radiation deflector assembly comprising at least three radiation waveguides; a controllable radiation reflector positioned such that when the reflector is in a first position radiation passes between one combination of two of the waveguides and when the reflector is in a second position radiation passes between another combination of two of the waveguides; and control means responsive to control signals for controlling the position of the reflector characterised in that:

the reflector is integrally formed with a substrate;

the waveguides are in a fixed position relative to the substrate; and

radiation passing between a combination of two of the waveguides, exists one waveguide prior to being reflected to enter another waveguide.

4,854,659

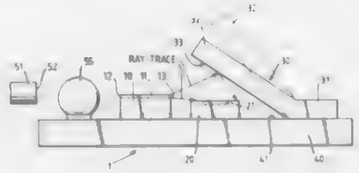
OPTICAL DEVICES

James D. Hamerslag, West Chester, Pa., and Robert W. Musk, Ipswich, Eng'and, assignors to BT&D Technologies, Ltd., Ipswich, United Kingdom

Filed May 31, 1988, Ser. No. 200,392

Int. Cl.[4] G02B *6/36, 6/10, 6/42, 6/26*

U.S. Cl. 350—96.15 **33 Claims**



1. An optical transmitter assembly comprising a support structure (**40**), an optical source (**10**), and an optical detector (**20**), the optical detector (**20**) being arranged to receive light output from the source (**10**) indirectly via light deflections means (**30–33,52**), wherein the light deflection means includes a reflector member (**30**), and wherein the source (**10**), the detector (**20**), and the reflector member (**30**) are mounted on the same support structure (**40**), characterized in that the reflector member (**30**) is a deformable member.

4,854,660

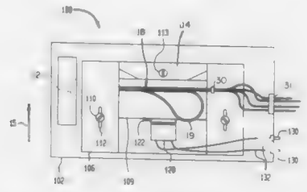
LINEAR TRANSLATION SWITCH WITH OPTICAL FIBERS

Pamela R. Gutterman, Camp Hill; Sherry J. Harms, Humelstown, and John C. Hoffer, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 12, 1988, Ser. No. 217,907

Int. Cl.[4] G02B *6/32*

U.S. Cl. 350—96.18 **11 Claims**



1. An optical fiber switch comprising:

an imaging system having a symmetry,

a group of optical fiber end faces including a first optical fiber end face via which light is transmitted to said imaging system and at least second and third optical fiber end faces, a fourth fiber end face via which light is transmitted to said imaging system, and fifth and sixth fiber end faces being the end faces of an optical fiber loop, and

means for linearly translating said group of fiber end faces and said imaging system relative to one another between a first position and a second position,

in said first position, light from said first fiber end face is imaged into said second fiber end face and light from said fourth fiber end face is imaged into said second fiber end face and light from said fourth fiber end face is imaged into said third fiber end face, and

in said second position, light from said first fiber end face is imaged into said third fiber end face and light from said fourth fiber end face is imaged into said fifth fiber end face, said light imaged into said fifth fiber end face being propagated through said fiber loop to said sixth fiber end face and imaged into said second fiber end face.

4,854,661

SPLICE CRADLE

David A. Cooper, Logan'on, and Robert W. Barlow, Canton, both of Pa., assignors to GTE Service Corporation, Stamford, Conn.

Filed Nov. 5, 1987, Ser. No. 116,851

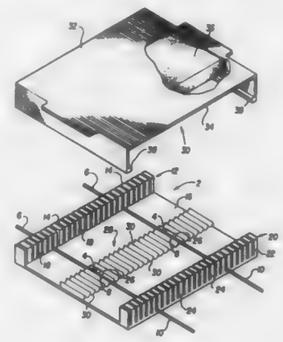
Int. Cl.[4] G02B *6/38*

U.S. Cl. 350—96.20 **8 Claims**

1. A splice cradle comprising:

a base including a first means forming one portion of said base for fixedly aligning an end of at least one fiber relative to an end of at least one other fiber; a second means forming an opposite portion of said base for fixedly aligning said end of said at least one other fiber relative to said end of said at least one fiber; and, third means forming another portion of said base between said first means and said second means for supporting, without constraining, a splice which joins said end of said at least one fiber and said end of said at least one other fiber; and,

means forming a lid to said base for protecting and cushioning each splice when said lid is in a closed position and for



providing access to said base when said lid is in an open position.

4,854,662

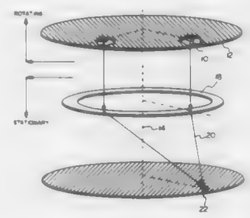
OPTICAL DATA SIGNAL APPARATUS FOR OPTICALLY COUPLING A PLURALITY OF DATA CHANNELS BETWEEN STATIONARY AND ROTATING SYSTEMS

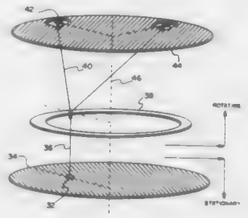
Marvin F. Estes, Oakfield, and Arnold W. Langershausen, West Henrietta, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.J.

Filed Sep. 27, 1988, Ser. No. 249,820

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 **8 Claims**





1. Optical data signal apparatus comprising:

an optical data signal transmitter, an optical data signal receiver, and means for mounting said transmitter and said receiver for relative rotation with respect to one another about a rotational axis in a plane which is perpendicular to said rotational axis, wherein said transmitter and said receiver are axially spaced from one another and each of which is radially spaced from said axis; and

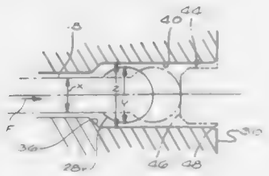
an annular, substantially planar, optical coupling element which has a central axis coincident with said rotational axis, which is spaced from and located between said transmitter and receiver and which causes a collimated optical data signal, which is transmitted by said transmitter along a path perpendicular to said element, to be focused along a path to said receiver.

4,854,663

LENSED OPTIC FIBER TERMINUS AND METHOD

Leslie M. Borsuk, Los Alamitos, and Bruce Coutts, Costa Mesa, both of Calif., assignors to ITT Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 937,573, Dec. 4, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 142,650
Int. Cl.[4] G02B 7/26
U.S. Cl. 350—96.20 6 Claims



1. Apparatus for mounting an optic fiber having a first diameter along most of its length and having a front end with a lens of a second diameter that is larger than said first diameter comprising:

a contact having front and rear ends and having an elongated hole extending between said ends, said hole having front and rearward portions, said front portion of said hole having a diameter greater than that of said rearward portion of said holes, said hole providing a forwardly facing shoulder between said rearward and forward hole portions;

said rearward portion of said hole having a diameter larger than said first diameter but smaller than said second diameter, said rearward portion of said hole having a diameter slightly larger than said first diameter to closely surround said fiber to maintain the lateral position of said lens in a direction perpendicular to the length of said hole while allowing the fiber and lens to slide along said hole, said forward portion of said hole extending to said front end of said contact; and

positioning tool means having a lens-engaging portion which fits onto said front hole portion from said front end of said contact, and having abutting portion which abuts said front end of said contact, the distance between said shoulder and said lens-engaging portion of said tool means when said contact abutting portion abuts said front end of said contact being greater than the axis extent of said lens whereby when said lens-engaging portion engages said lens in said contact, said lens will be spaced forward of said shoulder.

4,854,664

MULTI-FIBER OPTIC CABLE CONNECTOR AND CABLE APPARATUS

Ronald L. McCartney, Orange, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

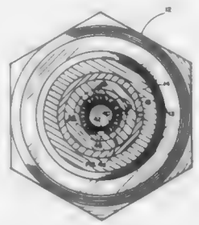
Filed Nov. 17, 1986, Ser. No. 44,087
Int. Cl.[4] G02B 6/40
U.S. Cl. 350—96.22 30 Claims

1. An apparatus for aligning and terminating more than one optical fiber, having a compressible cover, of a first fiber optic cable to more than one optical fiber, having a compressible cover, of a second fiber optic cable along a predetermined axis comprising:

first and second mateable rigid tubular body parts each respectively having an exterior surface and a cylindrical interior surface constructed to receive a first and a second fiber optic cable;

a compressible split alignment sleeve having an inner diameter less than the diameter of said exterior surface;

a threaded alignment sleeve holder having two ends and a central aperture dimensioned for receiving said compressible split alignment sleeve, said compressible split alignment sleeve being adapted for a forced insertion into said threaded alignment sleeve holder to firmly grip said first and second rigid tubular body parts to dispose optical fibers each respectively having a compressible cover,



along said predetermined axis upon receipt of said first and said second mateable rigid tubular body parts within said compressible split alignment as held by said sleeve holder;

means for mechanically securing said first and said second rigid tubular body parts together; and

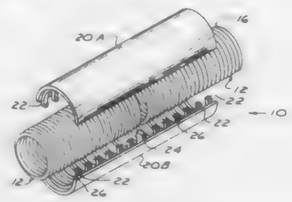
means for concentrically aligning more than one said optical fiber of said first fiber optic cable to more than one said optical fiber of said second fiber optic cable, said means for concentrically aligning including a compression pin constructed and arranged so as to engage said optical fibers to create an interference contact between each of said optical fibers, an interference contact between said compression pin and said fibers and interference contact between each of said fibers and said respective rigid tubular body parts.

4,854,665

COUPLING FOR JOINING AXIAL SECTIONS OF DUCT FOR FIBER OPTIC CABLES

Bernard Gagnon, Manchester, Conn., assignor to Endot Industries, Inc., Denville, N.J.

Filed Sep. 17, 1984, Ser. No. 651,096
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 13 Claims



1. Apparatus for coupling the axial extremities of two associated inner ducts used for housing at least one fiber optic cable, said coupling comprising: first and second cylindrical sections, each having inner concave faces;

means for engaging the axial extremities of the associated inner ducts, said means for engaging being disposed on the inner face of said cylindrical sections; and means for providing mutual gripping between said first and second cylindrical sections, said means for providing mutual gripping between said first and second cylindrical sections being disposed on said first and second cylindrical sections, said first and second axial sections being substantially identical.

4,854,666

PHOTOSETTING RESIN COMPOSITION

Yoshiaki Kohara, Yokohama, and Kazuya Shinkoda, Kanagawa, both of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jan. 27, 1988, Ser. No. 148,985
Claims priority, application Japan, Feb. 4, 1987, 62-22439
Int. Cl.[4] C08F 2/50, 26/02, 20/18
U.S. Cl. 350—96.34 10 Claims

1. A photosetting resin composition comprising a urethane-modified (meth)acrylate and a monoacrylate represented by the following general formula [I]:

$$CH_2{=}CHCO(OC_2H_4)_nOCH_2CH(C_2H_5)(CH_2)_3CH_3 \quad [I]$$

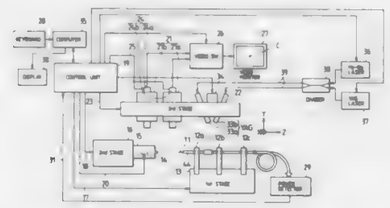
wherein n stands for an integer of 1–8.

4,854,667

OPTICAL FIBER ALIGNMENT AND FIXING METHOD AND APPARATUS THEREFOR

Genji Ebata, Akigawa; Koji Tanabe, Tanashi, and Takahiro Saito, Tokyo, all of Japan, assignors to Japan Aviation Electronics Industry Limited, Tokyo, Japan

Filed Oct. 25, 1988, Ser. No. 261,867
Claims priority, application Japan, Oct. 30, 1987, 62-276923
Int. Cl.[4] G02B 6/36, 7/26, 6/38
U.S. Cl. 350—96.20 12 Claims



1. An optical fiber alignment and fixing apparatus comprising:

a first translation stage for holding one end portion of an optical fiber extending in a Z-axis direction, said first translation stage being movable in the Z-axis direction and in X- and Y-axis directions perpendicular to the Z-axis direction;

a second translation stage for holding a laser diode package housing a laser diode, said second translation stage being movable in the X-, Y- and Z-axis directions;

a third translation stage movable in the X-, Y- and Z-axis directions;

microscope means mounted on said third translation stage, for observing said laser diode and said optical fiber;

laser head means mounted on said third translation means and capable of radiating laser light into said laser diode package;

control means for controlling the movement of said first, second and third translation stages;

video camera head means attached to said microscope means;

a video display device connected to said video camera head means;

an optical power detector connected to the other end of said optical fiber; and

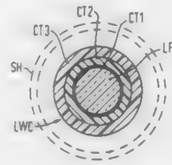
laser source means connected to said laser head means, for supplying the laser light thereto.

4,854,668

LIGHT WAVEGUIDE HAVING THREE PROTECTIVE LAYERS OF PLASTIC MATERIAL AND A METHOD OF MANUFACTURE

Ernst Mayr, Starnberg; Ulrich Oestreich, and Erich Weil, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 4, 1988, Ser. No. 177,173
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1987, 3712660
Int. Cl.[4] G02B 6/10
U.S. Cl. 350—96.30 14 Claims



1. In a light waveguide having a plurality of layers of plastic material applied on an optical fiber, the improvement comprising an inside layer being directly applied to a bare optical fiber and being composed of a material which is stretched onto the bare fiber in a longitudinal direction.

4,854,669

OPTICAL IMAGE PROCESSOR WITH HIGHLY SELECTABLE MODULATION TRANSFER FUNCTION

Curtis Birnbach, Bronx, and Fu Kuo Hsu, South Huntington, both of N.Y., assignors to Quantum Diagnostics Ltd., Hauppauge, N.Y.

Continuation of Ser. No. 19,648, Feb. 27, 1987, abandoned. This application Jan. 17, 1988, Ser. No. 211,218
Int. Cl.[4] G02B 27/46; G02F 1/05; G06K 9/36
U.S. Cl. 350—162.12 20 Claims

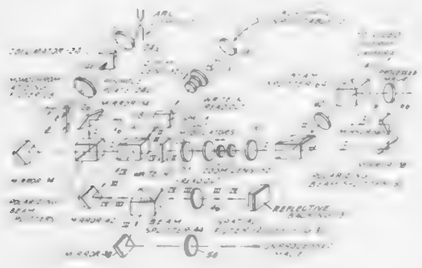
1. An optical image processor comprising:

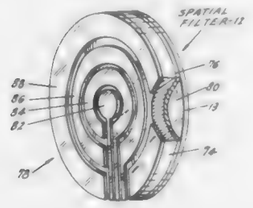
input means for providing an image to be processed. p1 first transmission means for receiving an image beam, imparting partial coherence to the image beam, and optically transmitting the image beam along a first path to a spatial filter for processing; and

second transmission means for receiving an image beam processed by said spatial filter and optically transmitting the image beam along a second path to an output port;

said spatial filter containing a layer of electro-optic material with electrodes arranged thereon to form a plurality of individually-addressable, concentric annular bands of

different radii, said annular bands being selectively changeable in transmissivity in a continuous spectrum





from transparent to opaque in response to an electrical signal on the respective electrodes of the bands.

4,854,670

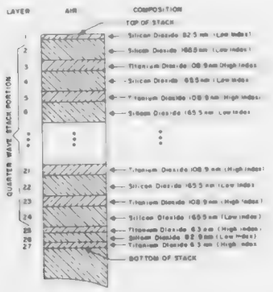
WIDE ANGLE OPTICAL FILTERS

Charles E. Mellor, Salem, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Continuation-in-part of Ser. No. 943,274, Dec. 17, 1986, abandoned. This application Mar. 29, 1988, Ser. No. 178,790

Int. Cl.[4] G02C *5/22, 5/28*

U.S. Cl. 350—166 7 Claims



1. A thin-film optical interference filter having high-transmission of blue light and high-reflectance of infrared light, said filter having a predetermined design wavelength, said filter comprising:

(a) a glass substrate;

(b) a first or bottom coating of a high-refractive index material applied on said substrate, said first coating having a first thickness of less than one-sixteenth of said design wavelength;

(c) a second coating of a low-refractive index material applied on said first coating, said second coating having a second thickness greater than one-sixteenth and less than three-sixteenths of said design wavelength;

(d) a third coating of a high-refractive index material applied on said second coating, said third coating having a third thickness of less than one-sixteenth of said design wavelength; and

(e) a quarterwave stack applied on said third coating, said quarterwave stack including a plurality of layers of alternating high- and low-refractive index materials, said quarterwave stack having a design wavelength being matched approximately to said predetermined design wavelength of said filter.

4,854,671

MOUNT FOR OPTICAL ELEMENTS

Peter Hanke, Eichenau, and Rolf D. Grimminger, Oberschleissheim, both of Fed. Rep. of Germany, assignors to Optische Werke G. Rodenstock, Munich, Fed. Rep. of Germany

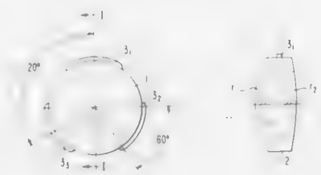
PCT No. PCT/DE86/00252, § 371 Date Feb. 11, 1987, § 102(e) Date Feb. 11, 1987, PCT Pub. No. WO86/07470, PCT Pub. Date Dec. 18, 1986

PCT Filed Jun. 14, 1986, Ser. No. 31,009

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1985, 3521640

Int. Cl.[4] G02B *7/02*

U.S. Cl. 350—252 12 Claims



1. A mount for an optical element comprising an optical element having a cylindrical circumferential rim and at least three ribs formed of a material having a highly elastic property provided on the cylindrical circumferential rim, each rib having a predetermined length and being disposed at a predetermined distance from one another along the cylindrical circumferential rim of the optical element, each rib having an inner peripheral thereof in continuous contact with an outer periphery of the cylindrical circumferential rim of the optical element, the ribs being compressed on assembly of the optical element into the mount.

4,854,672

OPTICAL SYSTEM FOR COPIER

Akihiro Daikoku, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 11, 1988, Ser. No. 142,682

Claims priority, application Japan, Jan. 20, 1987, 62-10908; Jan. 20, 1987, 62-10909

Int. Cl.[4] G02B *7/04;* G03B *27/36*

U.S. Cl. 350—255 8 Claims

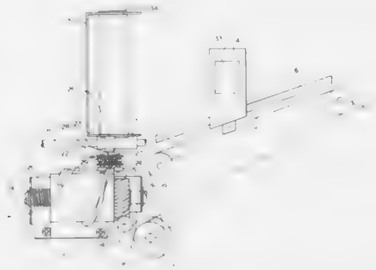
1. In an optical system for a copier for projecting an image of an original on a recording medium, said optical system including a lens with a fixed focal length adapted to be moved according to a selected magnification, and mirrors adapted to be moved simultaneously along a light path within said optical system, the improvement wherein said optical system further comprises

a power source which causes said lens to move,

a cylindrical cam adapted to be rotated by said power source,

guide means having two opposite side surfaces and formed on said cylindrical cam, and

a mechanism having a holder rotatably supported and connected to said mirrors, two compressing members attached to said holder for engagingly sandwiching said guide means therebetween and being compressed on said two side surfaces, and a biasing means for applying a biasing force on said compressing members to compress said side surfaces of said guide means, said mechanism



being adapted to move said mirrors along said light path within said optical system controlled by said guide means, said guide means being so shaped that said mechanism moves said mirrors to maintain an appropriate optical path length between said original and said recording medium according to said selected magnification.

4,854,673

LENS PHOTOGRAPHING DISTANCE RANGE LIMITING DEVICE

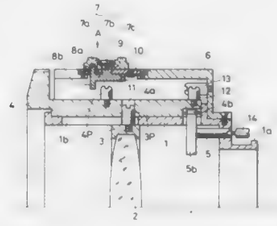
Hitoshi Tanaka, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1987, Ser. No. 112,984

Claims priority, application Japan, Oct. 27, 1986, 61-164394[U]

Int. Cl.[4] G02B *7/04*

U.S. Cl. 350—255 9 Claims



1. In a lens photographing distance range limiting device the improvement wherein:

a limiting protrusion is formed on a rotary ring which is rotated in the focusing operation of an interchangeable lens in such a manner that the limiting protrusion is protruded radially;

a switching member which can be externally turned about a rotary shaft perpendicular to the optical axis of said interchangeable lens is provided on a stationary ring which covers said rotary ring, and

a limiting part is provided on said switching member at a position away from the center of the rotation of said switching member so that, in response to an operation of said switching member, said limiting part is moved to either one of an interference position where said limiting part interferes with said limiting protrusion, and a noninterference position where said limiting part does not interfere with said limiting protrusion.

4,854,674

PROCESS FOR IMPROVING HOLOGRAPHIC EFFICIENCY

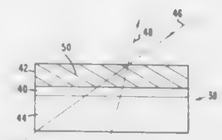
John E. Wreede, Monrovia, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 27, 1985, Ser. No. 706,054

The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.

Int. Cl.[4] G02B *5/32*

U.S. Cl. 350—320 12 Claims



1. Method for making slant fringe holograms having increased efficiency comprising:

applying a layer of light sensitive holographic recording medium to a single surface of a substrate;

forming a distinct inter-layer region only between the recording medium and said substrate surface only on the side of the recording medium adjacent to said substrate surface having substantially lower light sensitivity than said recording medium; and

exposing the recording medium to coherent light to record a slant fringe pattern therein.

4,854,675

LIGUID CRYSTAL DEVICE HAVING ELECTRODE STRIPS IN THE SEAL WITHOUT APPLIED VOLTAGE

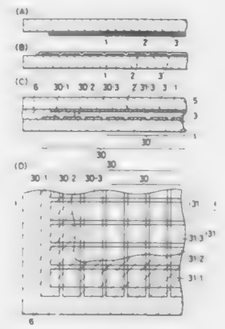
Shunpei Yamazaki, Tokyo; Akira Mase, Atsugi, and Hiroyuki Sakayori, Machida, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Aug. 7, 1987, Ser. No. 82,544

Claims priority, application Japan, Aug. 8, 1986, 61-186201

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—336 5 Claims



1. A liquid crystal device comprising:

a transparent substrate;

a plurality of first normally voltage applied electrode strips provided on said transparent substrate, elongated along a X direction and electrically isolated with respect to each other;

an opposed substrate;

a plurality of second normally voltage applied electrode strips provided on said opposed substrate, elongated along

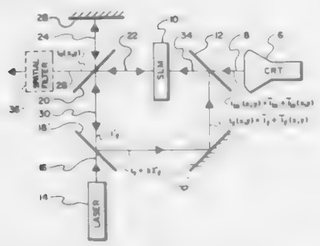
a Y direction and electrically isolated with respect to each other;
a liquid crystal layer disposed between said substrates; and
a sealing member for sealing the perimeter of said substrates;
said device characterized in that said first and second electrode strips are provided also on the perimeter sealed by said sealing member and wherein said electrode strips that are sealed along the length thereof have no voltage applied thereto.

4,854,676
BISTABLE OPTICAL DEVICES
Palaiyur S. Kalyanaraman, Fanwood, N.J., and Anthony F. Garito, Radnor, Pa., assignors to Hoechst Celanese Corp., Sommerville, N.J.
Filed Apr. 19, 1988, Ser. No. 183,077
Int. Cl.[4] G02F 1/35
U.S. Cl. 350—354 22 Claims



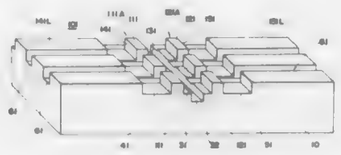
1. A bistable optical device to amplify variations in optical signals of a given wavelength comprising a cavity formed by at least two surfaces that reflect light of the given wavelength together with means for introducing light into the cavity and extracting light from the cavity, and which surfaces are separated at least in part by an organic nonlinear optical medium comprising a naphthalocyanine dye, which separation is of such a value and which organic nonlinear optical medium is maintained under such conditions, that either the dispersive properties of the optical medium or the selected absorptive properties dominate at the given wavelength depending on the light pulse duration, and such that there is a single valued relationship between the intensities of the incident and transmitted optical signals which exhibits gain.

4,854,677
INTERFEROMETRIC/FEEDBACK SPATIAL LIGHT MODULATION SYSTEM AND METHOD
Thomas R. O'Meara, Malibu, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Dec. 21, 1987, Ser. No. 135,857
Int. Cl.[4] G02F 1/01
U.S. Cl. 350—355 20 Claims



1. A spatial light modulation system for spatially encoding a coherent readout beam with information from a noncoherent input light beam, comprising:
a light modulator adapted to receive a noncoherent input light beam and a coherent readout light beam, and to spatially encode the input spatial light pattern onto the readout beam,
means responsive to the readout beam for forming a feedback beam having a spatial encoding which varies in a negative fashion with respect to spatial variations in the input beam, and
means for combining the feedback beam with the input beam in a negative feedback loop, thereby enhancing the responsivity of the readout beam to variations in the input beam.

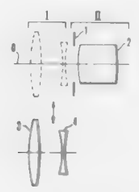
4,854,678
ELECTRO-OPTICAL LIGHT SHUTTER DEVICE
Hirohisa Kitano, Takatsuki; Itaru Saito, Itami; Kouichi Shingaki; Ken Matsubara, both of Takatsuki, and Tomohiko Masuda, Amagasaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Oct. 14, 1987, Ser. No. 108,588
Claims priority, application Japan, Oct. 17, 1986, 61-248204; Dec. 23, 1986, 61-313606
Int. Cl.[4] G02F 1/01, 1/03
U.S. Cl. 350—356 18 Claims



1. An electro-optical light shutter device for use in electrophotographic printers or the like, comprising:
an elongated plate having an electro-optical effect, the plate having a first groove extending longitudinally thereof, a second groove positioned parallel to the first groove by a predetermined distance, the second groove having a smaller depth than the first groove, and a plurality of third grooves extending in a direction across the first and second grooves and having a smaller depth than the first groove but a larger depth than the second groove, the plate being provided with a plurality of projections divided by the first, second and third grooves and aligned longitudinally of the plate;
a common electrode provided on the wall of said first groove for each of the plurality of projections in common;
individual electrodes provided on the wall portions of said second groove corresponding to the respective projections individually;
a drive circuit connecting to said common electrode and to said individual electrodes for selectively applying an electric field to the projections;
a polarizer disposed on the light incident side of said plate; and
an analyzer disposed on the light emergent side of said plate.

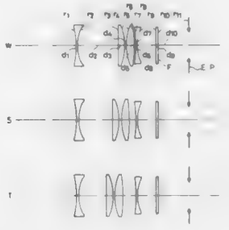
4,854,679
PHOTOGRAPHIC SYSTEM HAVING FRONT CONVERSION LENS
Sadahiko Tsuji, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 18, 1987, Ser. No. 122,217
Claims priority, application Japan, Nov. 20, 1986, 61-179613; Nov. 20, 1986, 61-179614; Nov. 20, 1986, 61-179615; Nov. 20, 1986, 61-179616
Int. Cl.[4] G02B 15/06
U.S. Cl. 350—422 10 Claims

1. A photographic lens system comprising:
a master lens unit comprising a plurality of lenses and having a positive refractive power and a predetermined image forming plane;
an aperture stop positioned on the object side of said master lens unit to determine an F-number; a conversion lens unit attachable and



detachable in front of said aperture stop for changing the focal length without changing the position of said predetermined image forming plane of said master lens unit.

4,854,680
ZOOM VIEW FINDER
Juro Kikuchi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Mar. 10, 1988, Ser. No. 166,552
Claims priority, application Japan, Mar. 11, 1987, 62-053993
Int. Cl.[4] G02B 15/14; G03B 13/02, 13/10
U.S. Cl. 350—423 7 Claims



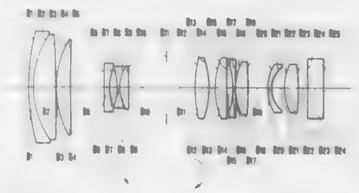
1. A zoom finder comprising a first lens unit arranged on the extreme object side and having negative refractive power, a third lens unit arranged on the extreme image side and having negative refractive power, and a second lens unit arranged between said first and third lens unit and having positive lens units, for performing variation of focal length by shifting at least one of said lens units along the optical axis, and so designed as to satisfy the following conditions (1) and (2)

$$1000 > \frac{(\nu_{max} - \nu_{min}) \cdot \nu_{min}}{\sqrt{z}} > 500 \quad (1)$$

$$P(\Delta\gamma)_{min} < 0 < P(\Delta\gamma)_{max} \quad (2)$$

wherein the reference symbol z represents the zoom of said view finder, the reference symbol ν_{max} designates the maximum Abbe's number out of Abbe's numbers of the lens units, the reference symbol ν_{min} denotes the minimum Abbe's number out of Abbe's numbers of the lens units, the reference symbol $P(\Delta\gamma)_{max}$ represents the maximum value out of percentages of the chromatic aberrations of angular magnification relative to angular magnifications and the reference symbol $P(\Delta\gamma)_{min}$ designates the minimum value out of percentages of the chromatic aberrations of angular magnification relative to angular magnifications.

4,854,681
COMPACT ZOOM LENS
Masatake Kato; Sadahiko Tsuji; Muneharu Sugiura, and Kazuo Tanaka, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 14, 1986, Ser. No. 931,537
Claims priority, application Japan, Nov. 25, 1985, 60-264372
Int. Cl.[4] G02B 9/64, 15/14
U.S. Cl. 350—427 13 Claims



1. A zoom lens comprising, from front to rear, first, second, third and fourth lens units,
said first lens unit having a positive refractive power and movable for focusing;
said second lens unit having a negative refractive power and linearly movable along an optical axis for zooming;
said third lens unit having a positive refractive power and axially movable for zooming, said movement being performed in such a way that, when zooming is effected from the wide-angle end, said third lens unit first advances toward the rear and then returns toward the front;
said fourth lens unit having a positive refractive power for imaging; and
a diaphragm fixedly positioned between said second and said third lens units.

4,854,682
COMPACT HIGH VARI-FOCAL RATIO ZOOM LENS SYSTEM
Takanori Yamanashi, Kokubunji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Nov. 10, 1988, Ser. No. 269,609
Claims priority, application Japan, Nov. 13, 1987, 62-285453
Int. Cl.[4] G02B 15/14, 13/08
U.S. Cl. 350—427 2 Claims



1. A compact high vari-focal lens system comprising, in the order from the object side, a first lens group having positive refractive power, a second lens group having positive refractive power and a third lens group having negative refractive power, so adapted as to perform zooming by shifting the first lens group integrally with the third lens group along the optical axis and shifting the second lens group in a different locus in conjunction with the shift of the first lens group and the third lens group, and so designed as to satisfy the following conditions (1), (2) and (3):

$$0.2 < \phi_1/\phi_W < 0.9 \quad (1)$$

$$1.1 < \phi_{12W}/\phi_W < 1.9 \quad (2)$$

$$1.5<\beta_{3T}/\beta_{3W}<2.8 \quad (3)$$

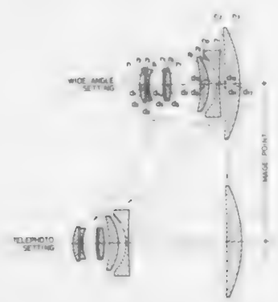
wherein the reference symbol ϕ_W represents refractive power of the zoom lens system as a whole at the wide position thereof, the reference symbol ϕ_1 designates refractive power of the first lens group, the reference symbol ϕ_{12W} denotes total refractive power of the first lens group and the second lens group at the wide position, the reference symbol β_{3W} represents lateral magnification of the third lens group at the wide position, and the reference symbol β_{3T} designate lateral magnification of the third lens group at the tele position.

4,854,683

ZOOM LENS

Toshiro Ozawa, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 17, 1987, Ser. No. 15,389
Claims priority, application Japan, Feb. 14, 1986, 61-28890
Int. Cl.[4] G02B *15/14*
U.S. Cl. 350—427 6 Claims



1. A zoom lens comprising, in order from an object, a first lens unit having positive refracting power, a second lens unit having negative refracting power, and a third lens unit having positive refracting power, said second lens unit having a paraxial lateral magnification m_2 greater than 1 at all times, said third lens unit being fixed in position, the arrangement being such that the distance X between the principal points of said first lens unit and said second lens unit and the distance Y between the principal points of said second lens unit and said third lens unit vary continuously so as to substantially satisfy the conditions given by:

$$X=f_1-f_2(1/m_2-1)$$

and

$$Y=f_2(1-m_2)-f_3(1/m_3-1),$$

where f_1 is the focal length of the first lens unit, f_2 is the focal length of the second lens unit, f_3 is the focal length of the third lens unit, and m_3 is the paraxial lateral magnification of the third lens unit and that the paraxial lateral magnification m_2 varies continuously, the zoom lens meeting the following conditions:

$$0.65<f_1/F_W<0.9$$

$$1.0<|f_2|/f_1<1.5$$

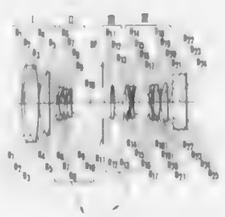
where F_W is the focal length of the overall zoom lens at the wide-angle end, f_1, f_2 are the focal lengths of said first lens unit and said second lens unit.

4,854,684

COMPACT ZOOM LENS

Akihisa Horiuchi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1987, Ser. No. 63,434
Claims priority, application Japan, Jun. 27, 1986, 61-151225; Jun. 27, 1986, 61-151226
Int. Cl.[4] G02B *15/16*
U.S. Cl. 350—427 9 Claims



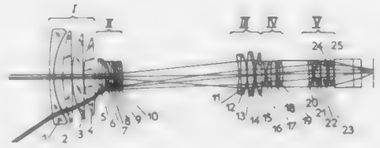
1. A compact zoom lens comprising, from front to rear, a first lens unit for focusing having a positive refractive power, a second lens unit having a negative refractive power and axially movable for varying the image magnification, a third lens unit axially movable for compensating for the shift of an image plane resulting from the variation of the image magnification, and a fourth lens unit of positive refractive power having an image forming function which remains stationary relative to a focal plane, said fourth lens unit including, from front to rear, a first lens of positive refractive power with a front surface of stronger refractive power than a rear surface thereof, a second lens of negative refractive power with front and rear lens surfaces that are concave, a third lens of negative refractive power having a meniscus shape convex towards the front, a fourth lens of positive refractive power with front and rear surfaces that are convex and a fifth lens of positive power with a front surface of stronger refractive power than a rear surface thereof.

4,854,685

VARIABLE-FOCUS OBJECTIVE-LENS DEVICE AND A METHOD FOR THE CONTROL OF SAID DEVICE

Gérard Corbasson, Saint-Heand, France, assignor to Etablissements Pierre Angenieux, Saint-Heand, France

Filed Apr. 28, 1988, Ser. No. 191,029
Claims priority, application France, Apr. 29, 1987, 87 06074
Int. Cl.[4] G02B *7/10, 15/16*
U.S. Cl. 350—427 3 Claims



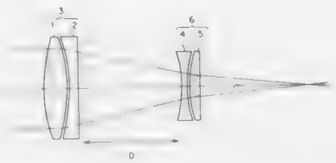
1. A method of control of a variable-focus objective lens system comprising two groups of lenses which are capable of moving along the optic axis so as to produce variations in the focal lengths as initiated by the operator while the final image remains stationary during these variations, and also comprising two other groups which carry out focusing by displacement and the position of which is defined as a function of two variables consisting of focal length and focusing distance, wherein the displacements of the two movable groups forming a variator are controlled by means of a computer and these groups are accordingly subjected not only to the necessary displacements of each group for the progressive variations of focal length but also to a complementary longitudinal displacement for applying to the objective-lens system a focal-length multiplier coefficient having a value chosen by the operator, another function of the computer being accordingly to produce the required variation of the iris and the complementary displacements of the focusing groups in respect of each focal length.

4,854,686

APOCHROMAT TYPE OBJECTIVE LENSES

Minoru Oda, Hoygo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1988, Ser. No. 190,111
Claims priority, application Japan, Jun. 5, 1987, 62-141851
Int. Cl.[4] G02B *13/02, 9/36*
U.S. Cl. 350—456 4 Claims



1. An apochromat type objective lens comprising a semiapochromatic first lens system composed of a two-lens one group lens comprising a convex lens and a concave lens, and an achromatic second lens system composed of a two-lens one group lens comprising a concave lens and a convex lens and which is arranged at the rear of said semiapochromatic first lens system in a spaced apart relation, said semiapochromatic lens system and said achromatic lens system being fulfilled with the following condition:

$$\frac{K_2}{K_1}=\frac{f_1\cdot f_2}{(f_1-L)^2}$$

where,

f_1, f_2: the focal length of said first and second lens systems,

K_1, K_2: the proportion of residual secondary chromatic aberration of said first and second lens systems, and

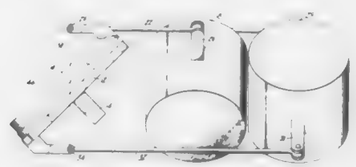
L: the mutual spacing between respective lens systems.

4,854,687

BEAM STEERING MIRROR CONSTRUCTION

Keith Fletcher, West Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 4, 1988, Ser. No. 152,218
Int. Cl.[4] G02B *26/08, 5/08*
U.S. Cl. 350—486 6 Claims



1. A reactionless beam steering mirror apparatus comprising:

a support structure;

a beam steering mirror;

a mirror support frame supporting said mirror;

a two axis gimbal support centrally supporting said mirror, having a two axis pivot point located at the center of gravity of said mirror and frame, and secured to said frame and said mirror support;

a first torque motor having counterrotating masses;

a first pair of connecting members pivotally connected to said first torque motor and gimballed on two axes to said mirror support frame at two diagonally opposed first locations;

a second torque motor having counterrotating masses;

a second pair of connecting members pivotally connected to said second torque motor and gimballed on a two axis gimbal to said mirror support frame at two diagonally opposed second locations intermediate said first locations.

4,854,688

OPTICAL ARRANGEMENT

Michael J. Hayford, Monrovia, and Donald G. Koch, Burbank, both of Calif., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 14, 1988, Ser. No. 181,612
Int. Cl.[4] G02B *27/14, 3/00, 17/00*
U.S. Cl. 350—571 10 Claims



1. An optical arrangement with a folded optical path, said optical arrangement comprising: means for producing an intermediate image at a selected location along said optical path, and means for folding said optical path at said selected location, said means for folding comprising a reflective flat surface and a spherical lens surface substantially centered about said selected location.

4,854,689

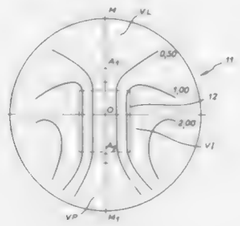
PROGRESSIVE OPHTHALMIC LENS

Maurice Dufour, Paris, and Gérard Obrecht, Issy Les Moulineaux, both of France, assignors to Essilor International Compagnie Generale d'Optique, Creteil, France

Filed Oct. 8, 1986, Ser. No. 916,748
Claims priority, application France, Oct. 23, 1985, 85 15726
Int. Cl.[4] G02C *7/06*
U.S. Cl. 351—169 5 Claims

1. A progressive ophthalmic lens with a continuous progressive surface comprising a substantially constant power first area matched to far vision, a substantially constant power second area matched to near vision and a progressively variable power third area between said first and second areas defined by a central part extending to both sides of the main progression meridian, said central part having lines parallel to said main progression meridian, and each of said parallel lines being of constant astigmatism along its' length, the overall

width of said central part being at least 15 millimeters, and said main progression meridian being substantially umbilical



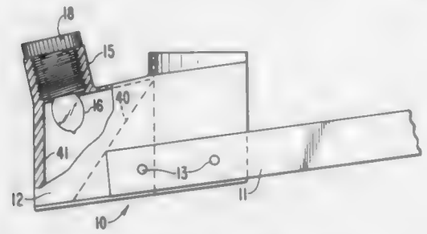
wherein, at each point on it, the principal radii are substantially equal.

4,854,690

EYE SIGHT RESTORER DEVICE AND METHOD

Fred E. Mehr, P.O. Box 1117, Hilo, Hi. 96721

Filed Feb. 26, 1988, Ser. No. 160,830
Int. Cl.[4] A61B *3/10*; A61F *5/08*
U.S. Cl. 351—203 6 Claims



1. A device for relieving eye strain, comprising a light source adapted to be placed in proximity to and centrally of and to project light toward the closed eyes of a person who seeks eye strain relief, means for periodically switching said at least one light source on and off when the person's eyes are closed, including a low voltage portable direct current power supply, and means for retaining said light source on the head of the person and excluding ambient light from the closed eyes of the person.

4,854,691

LASER BEAM SCANNING TYPE EYE FUNDUS CAMERA

Akihiko Sekine; Shinji Wada; Takashi Yokokura; Kazuo Numokawa, and Masayuki Hideshima, all of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,716
Claims priority, application Japan, May 27, 1987, 62-130832
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—221 15 Claims

1. A laser beam scanning type eye fundus camera, for observing and photographing an eye fundus having blood vessels capable of carrying a fluorescent substance, the eye fundus camera comprising:

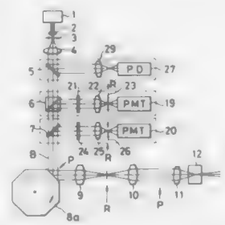
a laser beam generator for generating a laser beam;

an illuminating system for illuminating the fundus of an eye to be tested by scanning the laser beam generated by said laser beam generator on the eye fundus;

first and second light receiving portions for receiving a reflecting light of the laser beam reflected by the eye fundus and generating first and second light intensity signals, respectively, in response thereto;

a first light receiving system for guiding the reflecting light of the laser beam reflected by the eye fundus to said first light receiving portion;

a second light receiving system for guiding fluorescence excited radiation generated by exciting a fluorescent substance in the eye fundus blood vessels with the laser beam to the second light receiving portion; and



an electronic circuit for forming an eye fundus image on a monitor TV according to an output signal coming from said first and second light receiving portions.

4,854,692

OPHTHALMIC EXAMINATION APPARATUS

Kouji Kobayashi, Hino, Japan, assignor to Kowa Company Ltd., Japan

Filed Aug. 22, 1988, Ser. No. 234,809
Claims priority, application Japan, Aug. 31, 1987, 62-215028
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—221 18 Claims



1. An ophthalmic examination apparatus in which a laser beam is deflected at an eye fundus under examination to scan said eye fundus two-dimensionally, and light reflected back from said eye fundus is detected for photoelectric conversion to obtain information about the eye fundus, said apparatus comprising:

a laser light source for producing said laser beam of a single or plurality of wavelength;

a first non-mechanical optical deflector for deflecting said laser beam to scan said eye fundus in one direction at a predetermined frequency;

a second mechanical optical deflector for deflecting said laser beam to scan said eye fundus in a direction perpendicular to the scanning direction of said first optical deflector at a frequency that is lower than the frequency of said first optical deflector;

a detection slit having an aperture which extends perpendicularly to the scanning direction of said second optical deflector and which is disposed at a position optically conjugate or substantially conjugate with said eye fundus under examination;

optical means for deflecting light reflected from said eye fundus relative to the scanning direction of said second optical deflector in such a manner that the reflected light is deflected in a direction parallel to the detection slit, but stationary in a direction that is perpendicular to the slit; and

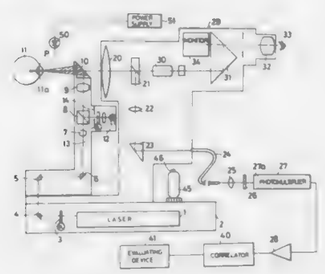
light receiving elements for detecting light passing through said detection slit which serves to remove unrequired scattered light from the optical system for examining the eye to obtain said eye fundus information.

4,854,693

OPHTHALMIC DISEASE DETECTION APPARATUS

Tadashi Ichihashi, Toyohashi; Koichiro Kakizawa, Okazaki, and Masunori Kawamura, Aichi, all of Japan, assignors to Kowa Company Ltd., Japan

Continuation of Ser. No. 866,579, May 22, 1986, abandoned.
This application Sep. 29, 1988, Ser. No. 253,346
Claims priority, application Japan, May 22, 1985, 60-108298
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—221 6 Claims



1. An apparatus for detecting ophthalmic diseases in the lens of a patient's eye comprising:

a laser for producing a laser beam;

means for focussing said laser beam at a selected spot in the lens of the patient's eye;

a light source for illuminating a slit in order to produce a slit light image effective to determine the selected spot;

photoelectric converting means for receiving light scattered by protein particles contained within the lens and converting said scattered light into an electrical signal;

means for evaluating the electrical signal from said photoelectric converting means in order to measure the protein particles indicative of the existence of ophthalmic dis-

an optical filter movable for insertion into or extraction from an optical path for decreasing or increasing the quantity of the laser beam emitted from said laser; a first shutter movable for insertion into or extraction from an optical path for blocking or unblocking slit light from said light source which illuminates the slit;

a second shutter movable for insertion into or extraction from an optical path for blocking or unblocking the scattered light received by said photoelectric converting means; and

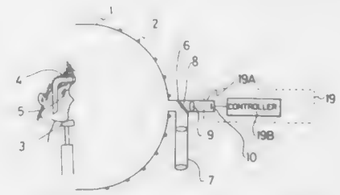
means for selectively and simultaneously operating said filter and said first and second shutters so that, during an observation mode in which the selected spot is determined, said filter is inserted into the optical path to decrease the quantity of said laser beam, said first shutter is extracted from the optical path to unblock said slit light, and said second shutter is inserted into the optical path to block the scattered light impinging on said photoelectric converting means, and so that, during a measuring mode in which the protein particles are measured, said filter is extracted from the optical path to increase the quantity of said laser beam, said first shutter is inserted into the optical path to block said slit light, and said second shutter is extracted from the optical path to permit the scattered light to impinge on said photoelectric converting means.

4,854,694

EYE FIXATION MONITOR

Takashi Hirano, Shiki, and Atsushi Kojima, Hino, both of Japan, assignors to Kowa Company Limited, Japan

Filed Jun. 8, 1987, Ser. No. 59,736
Claims priority, application Japan, Jun. 6, 1986, 61-130062
Int. Cl.[4] A61B *3/02*
U.S. Cl. 351—224 8 Claims



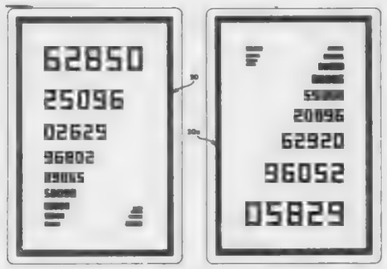
1. An eye fixation monitor comprising: a plurality of photoelectric transducers receptive of an image of an eye thereon for producing signals corresponding thereto; means for producing a deviation signal corresponding to the movement of the eye which is imaged on the transducers; and means for producing a signal when the deviation signal exceeds a predetermined value, the means for producing the deviation signal comprising first adder means for adding the signals from each two adjacent transducers, subtracter means for subtracting the outputs from the adders to obtain subtracted outputs, the subtractor means including an initial value zeroing holding circuit receptive of the initial output of the subtractor means to provide a reference value when the eye to be examined is in a fixation state reference position, second ladder means for summing the outputs of all of the first adder means, third adder means for summing the outputs from the subtractor means to obtain a signal corresponding to a deviation of the image of the eye from the reference position and divider means for dividing the output of the third adder means by the output of the second adder means to produce the deviation signal.

4,854,695

VISUAL ACUITY TESTING

John M. Lewis, Crestwood, Mo., assignor to Stereo Optical Company, Inc., Chicago, Ill.

Filed Sep. 26, 1986, Ser. No. 912,398
Int. Cl.[4] A61B *3/02*
U.S. Cl. 351—246 4 Claims



1. A method for testing vision, said method comprising:

selecting an optotype gridwork of rectangular configuration and sub-dividing said optotype gridwork into rectangular unit areas;

selectively varying the coloration or contrast properties of only generally horizontally oriented and generally vertically oriented rectangular unit areas in order to provide

background rectangular units of one color or contrast property and in order to provide character-forming rectangular units of a contrasting color or different contrast property;

positioning said character-forming rectangular units with respect to each other in order to form recognizable optotype characters, said positioning step including combining peripheral and internal character-forming color rectangular units which form the numeral 8 character and replacing one or more selected generally horizontal or generally vertical character-forming color rectangular units with background rectangular units to define other characters, said replacing step including replacing not more than two of the character-forming units to form background units, and said positioning and replacing steps provide peripheral character-forming rectangular units that define only characters having substantially the same external dimensions and overall configuration; and

evaluating visual acuity of a subject by having the subject view the characters thus defined, said evaluating step being substantially independent of an ability of the subject to recognize differences in shapes or patterns of shape.

4,854,696

METHOD AND APPARATUS FOR PLACING INDICIA ON CINEMATIC FILM

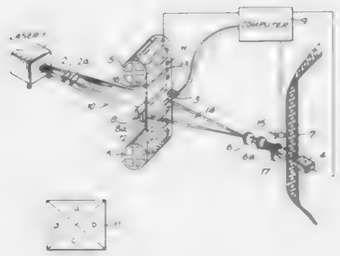
Moshe Guez, 95 Bridle Path Cir., Randolph, Mass. 02368

Continuation-in-part of Ser. No. 521,731, Sep. 9, 1983, and a continuation-in-part of Ser. No. 610,937, May 17, 1984, and a continuation-in-part of Ser. No. 833,522, Feb. 24, 1986, abandoned, said Ser. No. 610,937, is a continuation-in-part of Ser. No. 592,933, Mar. 23, 1984, abandoned. This application Mar. 16, 1987, Ser. No. 26,417

Claims priority, application Israel, Sep. 6, 1982, 66817

Int. Cl.⁴ G03B *21/32*

U.S. Cl. 352—90 **17 Claims**



1. An apparatus for applying indicia to processed cinematic films, said film comprising a cellulosic substrate layer and at least one emulsion layer, said apparatus comprising:

a UV pulse laser for generating a laser beam capable of vaporizing said emulsion;

means for directing said beam to said emulsion;

mask means interposed between said laser and said film, said mask means having UV-transparent portions in shape of said indicia, said portions allowing said beam to pass through said mask means and impinge upon said film and vaporize said emulsion in the shape of said indicia;

modulating means for controlling the intensity and duration of said beam responsive to said indicia;

film transport means;

alignment for aligning said laser with said indicia and with a frame of said film; and

means responsive to said indicia for transporting said film to bring a desired film frame in alignment with said laser and said mask means.

4,854,697

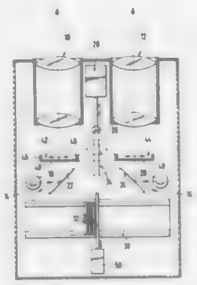
SLIDES PROJECTOR

Hermann Kronbauer, Aschheim; Hermann Kupper, and Christian Rehm, both of Munich, all of Fed. Rep. of Germany, assignors to Reflecta GmbH Foto-Flim Projection, Schwabach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 49,595, May 14, 1987, abandoned. This application Mar. 28, 1988, Ser. No. 173,830

Int. Cl.⁴ G03B *21/14, 23/04*

U.S. Cl. 353—89 **6 Claims**



1. A mixing projector comprising: first and second image projector means forming a projection assembly and each comprising an objective lens, a slide projection position and lighting system; a guide means for mounting a common slide magazine for accommodating a plurality of slides, said guide means extending transversely with respect to the optical axes of the first and second projector means; a main slider member arranged between the first and second projector means , said main slider member displaceable in parallel relationship to said optical axes, for taking a respective slider from said magazine for projection thereof and for introducing a respective slide into the magazine after projection thereof; a slide turning means disposed in the path of displacement of the main slider member, said slide turning means being rotatable about an axis at least substantially perpendicular to the path of displacement of said main slider member, for turning the slides introduced into the turning means through 90°; and a respective transverse slider member operatively associated with each said slide projection position for changing a respective slide between the respective slide projection position and said turning means.

4,854,698

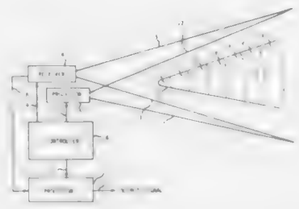
3-D MEASUREMENT VIA MULTIPLE GATING

Richard Q. Schmidt, Huntington, N.Y., assignor to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Oct. 5, 1987, Ser. No. 105,592

Int. Cl.⁴ G01C *3/08;* **G01B** *11/24;* **H04N** *3/12*

U.S. Cl. 356—5 **10 Claims**



6. An arrangement for time encoding detected data from an electro-magnetic energy sensing array comprising: a sensing array of detecting sites, each site having output means emitting an output signal; an array of discharge paths gated in accordance with a time-encoded pattern signal, one from each detecting site output means of said sensing array; and an array of memory elements capable of being reset by a control signal and being set by said detecting site output signals, each memory element recording the output signal of one detecting site.

4,854,699

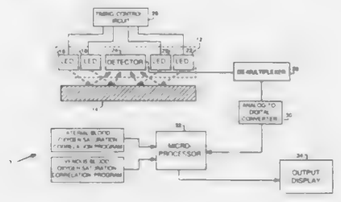
BACKSCATTER OXIMETER

Reuben W. Edgar, Jr., San Antonio, Tex., assignor to Nippon Colin Co., Ltd., Komaki, Japan

Filed Nov. 2, 1987, Ser. No. 115,204

Int. Cl.⁴ G01N *33/49;* **A61B** *5/00*

U.S. Cl. 356—41 **8 Claims**



1. A blood oxygen saturation monitoring system comprising:

a source of electromagnetic radiation at first, second, third and fourth wavelengths;

means for positioning said source of electromagnetic radiation to illuminate a sample of blood;

sensing means for receiving electromagnetic radiation reflected by said sample of blood and producing an electrical output signal corresponding to the components of the reflected portions of said electromagnetic radiation at said first, second, third, and fourth wavelengths;

means for calculating a product of said electrical signals, said product being in the form of a quadratic equation relating said reflected portions of said electromagnetic radiation at said first, second, third, and fourth wavelengths to the oxygen saturation in said blood and for correlating said product with the oxygen saturation of said blood.

4,854,700

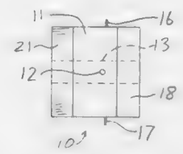
COLUMN HOLDER FOR ON-COLUMN PHOTOMETRIC DETECTION

Sergio S. Cutie; Martin A. Langhorst, and Stewart P. Wood, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 15, 1988, Ser. No. 207,699

Int. Cl.⁴ G01N *30/74*

U.S. Cl. 356—72 **2 Claims**



1. A column holder for on-column photometric detection capillary liquid chromatography, comprising:

(a) a body, the body having a first passageway therethrough, so that a capillary liquid chromatography column can be inserted through the first passageway and can be retracted therefrom by hand, the first passageway having a longitudinal axis, the body also having a second passageway therethrough, the second passageway having an inlet end and an outlet end, the second passageway being transverse and intersecting with the first passageway so that light can be shown into the inlet end of the second passageway, can pass through such a column inserted through the first passageway and then can pass out of the outlet end of the second passageway;

(b) a pair of straight edges, the straight edges attached to the body, the straight edges being separated to form an optical slit between the pair of straight edges, the optical slit positioned in or adjacent the second passageway and adjacent the first passageway, the optical slit having a longitudinal axis along the optical slit, the longitudinal axis along the optical slit being aligned along the longitudinal axis of the first passageway.

4,854,701

ARRANGEMENT FOR INSPECTING LIGHT WAVEGUIDE END FACES

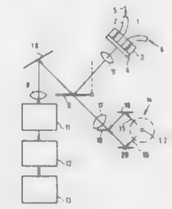
Joachim J. Noll, Quickborn; Vladimir Blazek, and Hans-Jürgen Schmitt, both of Aachen, all of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Dec. 21, 1987, Ser. No. 135,877

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1986, 3643694

Int. Cl.⁴ G01N *21/88;* **G01B** *11/27*

U.S. Cl. 356—73.1 **19 Claims**



1. An arrangement for inspecting light waveguide end faces by observing the interference pattern formed by means of measuring light in the airgap between a plane transparent plate and the end face of a light waveguide abutting on said plate, wherein the measuring light is led towards the end faces to be observed via the light waveguides (1, 2, 23, 24).

4,854,702

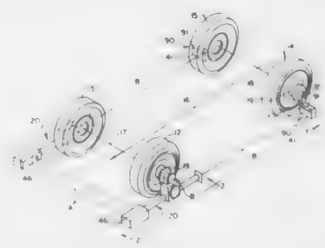
VEHICLE WHEEL ALIGNMENT APPARATUS AND METHOD OF USE

Michael T. Stieff, Wentzville, Mo., assignor to Hunter Engineering Company, Bridgeton, Mo.

Filed Dec. 14, 1987, Ser. No. 132,881

Int. Cl.⁴ G01B *11/275*

U.S. Cl. 356—155 **14 Claims**



1. The combination of active and passive instruments for use

in determining the alignment relationship between the front and rear wheels of a four wheel vehicle, the instruments of the combination comprising:

(a) passive instruments on each of the rear wheels, each having a light beam reflecting mirror and scales; and

(b) active instruments on each of the front wheels, each of said active instruments including:

1. an elongated body pivotably carried by the front wheel in position to point one end toward a passive instrument on the same side of the vehicle, and to extend an opposite end beyond the front wheel so as to be in line of sight with a similar end of a similar elongated body carried by the companion front wheel;
2. A source of light in said body for projecting a first light beam in a direction toward the passive instrument, and for projecting a second light beam internally toward said opposite end of said body;
3. light beam reflecting means pivotably mounted in and adjacent said opposite end of said body for receiving the internally projected light beam and reflecting that internal beam laterally outwardly of said body at an angle to the internally projected light beam for striking a similar body on the companion steerable wheel;
4. first manipulative means operably mounted adjacent said elongated body carried by that front wheel for effecting pivoting movement of said elongated body in a horizontal plane;
5. second manipulative means operably mounted on said opposite end of said elongated body for pivoting said light beam reflecting means mounted therein for changing the angular direction of light beam reflection; and
6. visual means associated with said elongated body and being rendered responsive to said first and second manipulative means for mutual cooperation in visually displaying the extent and direction of pivoting movement of said elongated body in the horizontal plane, as well as the extent and direction of pivotal movement of said light beam reflecting means.

4,854,703

LASER BEAM LEVELLING INSTRUMENTS

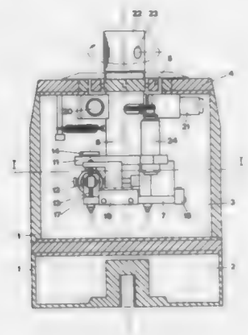
Hans-Rudolf Ammann, Breitenach, 8580 Amriswil, Switzerland

Filed Jan. 4, 1988, Ser. No. 140,730

Claims priority, application Switzerland, Jan. 19, 1987, 179/87

Int. Cl.[4] G01C 9/02

U.S. Cl. 356—248 7 Claims



1. A laser-beam levelling instrument comprising a rotational shaft, a self-levelling surveying plate, means for producing a vertical laser beam and rotatable reflection means for deflecting said vertical laser beam into a horizontal beam, said beam deflecting means being mounted on said rotational shaft and said shaft being suspended vertically and pivotable in a horizontal plane, means being provided for the automatic levelling of the surveying plate in a horizontal plane and said surveying plate being able to be inclined in two axes facing away from one another at right angles, a joint provided at the point of intersection of said two axes consisting of a casing which is arranged horizontally around one of said axes and which is open at least at the top and in which there is mounted a centre member which is rotatable about the other of said axes, the casing being mounted on one of said surveying plate and rotational shaft and the centre member being connected to the other of said rotational shaft and surveying plate.

4,854,704

OPTICAL AUTOMATIC LEVELLING APPARATUS

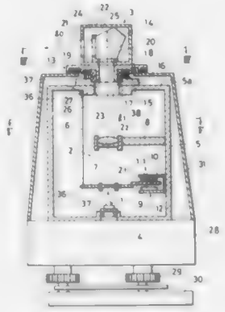
Ichizi Funazaki, and Haruo Tani, both of Hadano, Japan, assignors to Sokkisha Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1988, Ser. No. 143,892

Claims priority, application Japan, Jan. 20, 1987, 62-9065

Int. Cl.[4] G01C 9/12

U.S. Cl. 356—250 7 Claims



1. An optical automatic levelling apparatus, comprising:

a mounting bed;

a light source positioned so as to face upwardly on said mounting bed;

a support member upwardly extending from said mounting bed;

lens means for converting light rays emitted from said light source to parallel rays of light which are perpendicular to a true horizontal plane, said lens means comprises a concave lens and a convex lens;

a plurality suspension wires for suspending said concave lens from said support member above said light source;

means attached to said support member for supporting said convex lens above said concave lens;

a rotatable reflector means mounted on said support member above said lens means for reflecting said parallel rays of light from said lens means in a horizontal direction; and

a driving means on said support member for rotating said reflector means, wherein a distance L_2 of said suspension wires for suspending said concave lens is selected in such a manner as to satisfy the following equation:

$$L_2 = d_1 + \left(1 + \frac{d_1}{d_2}\right) f_2$$

where

d_1 is distance between said convex lens and said concave lens,

d_2 is distance between said concave lens and said light source,

f_2 is a focal length of said concave lens, and the distance L_1 between said convex lens and said light source is selected in such a manner as to satisfy the following equation:

$$L_1 = f_1 - \frac{f_2}{f_1} \cdot F\left(1 - \frac{F_1}{F}\right)^2$$

where

F is a focal length of synthetic lens having said convex lens and said concave lens, wherein $F = f_1 f_2/(f_1 + f_2 - d_1)$, and

f_1 is a focal length of said convex lens.

4,854,705

METHOD AND APPARATUS TO DETERMINE THE SIZE AND VELOCITY OF PARTICLES USING LIGHT SCATTER DETECTION FROM CONFOCAL BEAMS

William D. Bachalo, Los Altos Hills, Calif., assignor to Aerometrics, Inc., Sunnyvale, Calif.

Filed Apr. 5, 1988, Ser. No. 177,630

Int. Cl.[4] G01N 15/14, 21/47

U.S. Cl. 356—336 28 Claims



1. An apparatus employing laser light scattering for determining the size of a particle, comprising:

laser beam generation means for generating first and second laser beams having Gaussian beam intensities;

beam expansion means in optical alignment with said first laser beam for expanding the diameter of said first beam;

light directing means for directing said first and second beams and combining said beams such that said second beam is disposed within and coaxial with said first beam;

focussing means in optical alignment with said light directing means for focussing said first and second beams such that they converge and said first beam is disposed within and coaxial with said second beam, thereby forming a sample volume;

collection means for sensing light scattered by a particle passing through said sample volume, said collection means converting said scattered light into electrical signals;

amplitude means coupled to said collection means for determining the amplitude of said electrical signals representing said scattered light;

trajectory determining means coupled to said amplitude means for calculating the trajector (x_p) of a particle passing through said sample volume, said trajectory being defined by:

$$x_p = \left\{ \pm \frac{(b_1^2\, b_2^2)}{(b_1^2 - b_2^2)} \ln\left[\frac{(I_{scc1})}{I_{scc2}} \frac{(I_{02})}{I_{01}} \frac{(Q_2(d))}{Q_1(d)} \right] \right\}^{\frac{1}{2}}$$

where:

x_p = distance from the center of said second beam in said sample volume;

b_1 = distance from the maximum intensity of said second beam in said sample volume;

b_2 = distance from the maximum intensity of said first beam in said sample volume;

I_{o1} = peak intensity of said first beam;

I_{02} = peak intensity of said second beam;

I_{scc1} = scattered light intensity of said first beam;

I_{scc2} = scattered light intensity of said second beam;

Q_1 = scattering parameter of said first beam;

Q_2 = scattering parameter of said second beam;

sizing means coupled to said trajectory determining means for determining the diameter of said particle from said particle's trajectory;

whereby the size of said particle is determined.

4,854,706

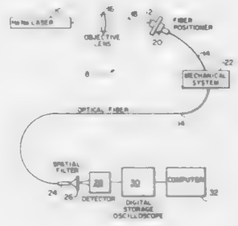
MODAL DOMAIN OPTICAL FIBER SENSORS

Richard O. Claus, Christiansburg, and K. D. Bennett, Blacksburg, both of Va., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Filed Jul. 27, 1987, Ser. No. 77,931

Int. Cl.[4] G01B 9/02

U.S. Cl. 356—345 20 Claims



1. A modal domain optical fiber sensor for detecting movements of a mechanical system, said sensor comprising:

(a) laser means for producing a coherent beam of light having a first wavelength;

(b) an optical fiber having a single mode cut-off at a second wavelength, said second wavelength being greater than said first wavelength;

(c) means for directing said beam of light into one end of said optical fiber;

(d) means for securing a portion of said optical fiber to said mechanical system for moving said portion in response to movement of said mechanical system;

(e) detecting means for detecting a portion of a speckle pattern created at the other end of said optical fiber as said beam emerges from said other end, said first and second wavelengths being chosen so that said speckle pattern has a plurality of lobes, the position of said speckle pattern changing in response to the movement of said portion of said optical fiber; and

(f) means for filtering said speckle pattern so that said portion of said speckle pattern constitutes one of said lobes.

4,854,707

METHOD AND APPARATUS FOR THE OPTICAL ELECTRONIC MEASUREMENT OF A WORKPIECE

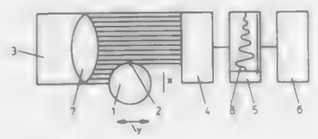
Manfred Ring, Radolfzell; Jürgen Weber, Hamburg, and Helmut Ackermann, Norderstedt, all of Fed. Rep. of Germany, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Continuation of Ser. No. 810,930, Dec. 18, 1985, abandoned. This application Jun. 27, 1988, Ser. No. 213,502

Claims priority, application Switzerland, Dec. 20, 1985, 6071/84

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—356 14 Claims



1. An optical electronic method for measuring or testing a workpiece comprising the steps:

(a) illuminating at least one edge of the workpiece with a coherent monochromatic light source to generate an actual diffraction pattern;

(b) directly sensing the actual diffraction pattern including a zero order intensity maximum with at least one line of sensors to convert said actual diffraction pattern into electrical signals to produce a first set of data representative of the intensity of light of said actual diffraction pattern as a function of spatial position;

(c) maintaining a second set of data representative of the intensity of light of a predetermined diffraction pattern as a function of spatial position; and

(d) correlating said first and second sets of data to compare said actual and said predetermined diffraction patterns.

4,854,708

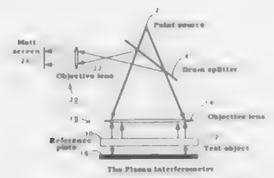
OPTICAL EXAMINATION APPARATUS PARTICULARLY USEFUL AS A FIZEAU INTERFEROMETER AND SCHLIEREN DEVICE

Oded Kafri, Beersheva, and Kathi M. Kreske, Petah Tikva, both of Israel, assignors to Rotlex Optics Ltd., BeerSheba, Israel

Filed Nov. 23, 1987, Ser. No. 123,671

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—359 13 Claims



1. Optical examination apparatus for determining properties of an object, comprising:

a point source of light producing a diverging beam of direct light;

a first optical system located such that, when it includes the object to be examined and receives the beam of direct light, it retraces the light in the form of a converging beam of reflected light from the examined object back towards the point source of light;

means for intercepting the converging beam of reflected light;

a viewing device;

a second optical system located to receive said intercepted beam of reflected light, to collimate it, and to direct the collimated beam to said viewing device;

said first optical system including a partial transmittance reference plate, whereby a contour map of the object topography is obtained from the interference between the direct light beam and the reflected light beam;

said second optical system including a schlieren filter at the focal point of the reflected beam to cut down the Fourier transform of the image, whereby a schlieren image is produced at said viewing device;

and means for selectively locating said partial transmittance reference plate or said schlieren filter in its respective position in said first and second optical systems.

4,854,709

ARRANGEMENT FOR MEASURING THE DISTANCE OF A MARKING ELEMENT ON A DISPLACEABLE BODY FROM A REFERENCE MARKING ELEMENT

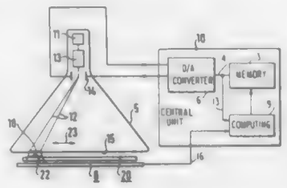
Walter Mehnert, Ottobrunn, and Thomas Theil, Feldafing, both of Fed. Rep. of Germany, assignors to MITEC Moderne Industrietechnik GmbH, Ottobrunn, Fed. Rep. of Germany

Filed Mar. 17, 1987, Ser. No. 26,711

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1986, 3608884

Int. Cl.[4] G01B *11/00*

U.S. Cl. 356—375 13 Claims



1. A measuring arrangement for determining the distance between a marking element which is provided on a surface of a body displaceable relative to the measuring arrangement in a determined direction of movement, and a reference marking element,

wherein said measuring arrangement comprises

an electron beam tube being arranged immovably to said reference marking element and comprising an electron gun, a deflector unit and a screen, said electron gun emitting an electron beam by means of which at least one spot of impact is generated on said screen, said at least one spot of impact illuminating said surface of said body by generating at least one scanning spot thereon, and said deflector unit being provided with a deflecting voltage from a deflecting voltage generator, which changes the value of said deflecting voltage in a controlled manner so that said at least one spot of impact and thereby said at least one scanning spot are moved independently of a relative movement between said electron beam tube and said body, thereby said at least one scanning spot passing over said marking element,

a receiver receiving radiation influenced by said marking element from said at least one scanning spot and converting it into an electrical output signal, and

a storage and computing unit which by means of the output signal of the receiver determines the respective spacing between said marking element and said reference marking element.

4,854,710

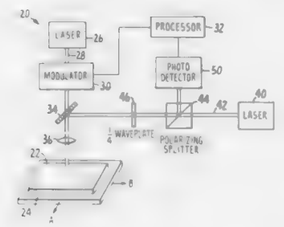
METHOD AND APPARATUS FOR EVALUATING SURFACE AND SUBSURFACE FEATURES IN A SEMICONDUCTOR

Jon Opsal, Livermore; Allan Rosencwaig, Danville, and Walter L. Smith, Livermore, all of Calif., assignors to Therma-Wave, Inc., Fremont, Calif.

Continuation of Ser. No. 707,485, Mar. 1, 1985, abandoned. This application Jul. 23, 1987, Ser. No. 76,876

Int. Cl.[4] G01N *21/41, 25/00*

U.S. Cl. 356—432 34 Claims



1. An apparatus for evaluating surface and subsurface conditions in a semiconductor sample comprising:

a periodic excitation source for supplying energy to the surface of the sample sufficient to create an electron-hole plasma having a density sufficient to cause changes in the optical reflectivity of the sample;

a probe for emitting a beam of radiation of a fixed wavelength selected to allow focusing in the micron range;

means for focusing the radiation probe beam to a radius in the micron range and for directing the focused probe beam within a portion of the surface of the sample which has been periodically excited in a manner such that said probe beam is reflected;

means for monitoring the modulated intensity changes in said reflected probe beam resulting from the variations in the optical reflectivity of the sample due principally to the presence of the electron-hole plasma; and

means for processing the measured intensity changes of the reflected probe beam to evaluate the sample.

4,854,711

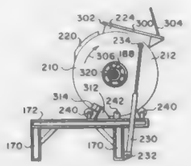
APPARATUS AND METHOD FOR MIXING CONCRETE

Vincent de P. Hagan, Dallas, Tex., assignor to The Vince Hagan Company, Dallas, Tex.

Filed Jan. 25, 1988, Ser. No. 147,431

Int. Cl.[4] B28C *5/14, 7/16*

U.S. Cl. 366—46 7 Claims



1. A mixing apparatus, comprising:

a horizontal mixer support platform;

two spaced shaft supports extending upwardly from the mixer support platform;

a bearing fixed to each shaft support at a location spaced above the mixer support platform;

a shaft extending between the bearings and being supported thereby for rotation about a horizontal axis;

a plurality of arms fixed to the shaft and extending radially therefrom for corotation with the shaft;

mixing blades fixed to the arms;

power means for causing controlled rotation of the shaft, arms and blades;

a mixing drum defined by two disk-shaped end plates and a substantially tubular intermediate member between the end plates and having exterior and interior walls being cylindrical about a central axis;

the shaft extending through central apertures in the end plates such that the mixing drum central axis is coaxial with the shaft;

the arms and blades and an intermediate portion of the shaft being enclosed by the interior walls of the mixing drum;

the bearings being exterior to the mixing drum;

the mixing drum being rotatable about its central axis between a first position for loading the mixing drum and a second position for discharging the mixing drum; and

the mixing drum being supported by drum support means for supporting the mixing drum, the drum support means being fixed to the mixer support platform, such that the mixing drum is substantially entirely supported by the drum support means, with the shaft, arms and mixing blades being substantially entirely supported by the shaft supports.

4,854,712

MULTI-COLOR LUMINOUS STIRRER

Yasumasa Mori, Nagano, Japan, assignor to Chikuma Kouki Co., Ltd., Nagano, Japan

Filed Apr. 14, 1988, Ser. No. 181,645

Claims priority, application Japan, Jun. 2, 1987, 62-86116

Int. Cl.[4] B01F *15/00*

U.S. Cl. 366—129 5 Claims



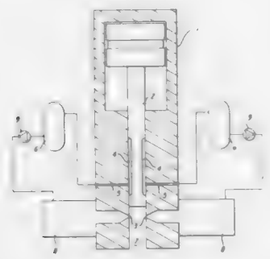
1. A multi-color luminous stirrer comprising:

a plurality of illuminants housed in the tip portion of a tubular-shaped shank supported by a handle and protected by a transparent or translucent sealing material; and

a battery housed in said handle so as to cause said illuminants to randomly emit light by supplying electricity therefrom; and

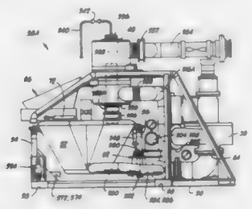
wherein said tubular-shaped shank is constructed by mechanically coupling two tubular-shaped electrodes through an insulating ring and electrically coupling said electrodes to said battery so that a switching circuit for causing said illuminants to randomly emit light is provided with electricity from said battery when tubular-shaped electrodes are submerged in a liquid.

4,854,713
IMPINGEMENT MIXING DEVICE WITH PRESSURE CONTROLLED NOZZLE ADJUSTMENT
Wolfgang Soechtig, Germering, Fed. Rep. of Germany, assignor to Krauss-Maffei A.G., Fed. Rep. of Germany
Filed Nov. 10, 1987, Ser. No. 119,127
Int. Cl.[4] B01F *15/02*
U.S. Cl. 366—132 7 Claims



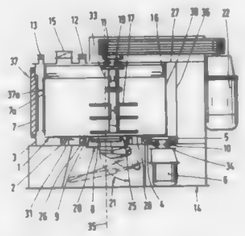
1. An impingement mixing apparatus comprising:
an impingement mixing head for mixing at least two components;
a circulation loop feed branch leading from a component reservoir to a input port of said mixing head and a circulation loop return branch from a recirculation port of said mixing head to said component reservoir;
a component pump arranged in said circulation loop;
a closed feedback loop means for adjusting impingement pressure including means for monitoring pressure connected to said circulation loop, control means for evaluating monitored pressure responsive to said means for monitoring, and means for changing a cross-section of said circulation loop feed branch connected to said circulation loop and responsive to said control means.

4,854,714
BLENDER VEHICLE APPARATUS
Gail F. Davis; Robert L. Baker; Dale E. Bragg, and Calvin L. Stegemoeller, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.
Filed May 27, 1988, Ser. No. 199,961
Int. Cl.[4] B01F *15/02, 7/18;* B28C *5/16, 7/12*
U.S. Cl. 366—132 11 Claims



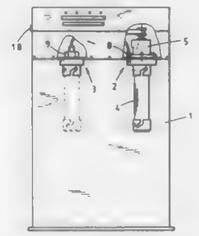
1. A blender vehicle apparatus, comprising:
a vehicle including a vehicle frame;
an internal combustion engine driven hydraulic power package mounted on said vehicle frame;
a plurality of liquid additive storage tanks mounted on said vehicle frame adjacent said power package;
an operator's work platform, including a control station, mounted on said vehicle frame adjacent said storage tanks on a side thereof opposite said power package;
a hydraulically powered blender assembly including:
a blender assembly base;
a blender tub supported from said base;
one and only one blender pump means, supported from said base, for drawing base fluid from a fluid supply, for drawing blended fluid from said blender tub, for recirculating a portion of a combined base fluid and blended fluid to said blender tub, and for discharging another portion of said combined base fluid and blended fluid away from said blender assembly; and
automatic level control means, operably associated with said blender tub and said blender pump means, for controlling a fluid level in said blender tub; and
a hydraulically powered lifting means, mounted on said vehicle frame, for moving said blender assembly between a lowered position and a raised position, said raised position being located above said vehicle frame and adjacent said work platform on a side thereof opposite said storage tanks, said lifting means being further characterized as a means for placing said blender assembly at ground level for operation thereof to thereby minimize an elevation of a suction inlet of said blender pump means.

4,854,715
PRESSURE-RESISTANT MIXER
Paul Eirich, Bahnhofstr. 11; Hubert Eirich, Sandweg 16, and Walter Eirich, Spessartweg 16, all of 6969 Hardheim, Fed. Rep. of Germany
Filed Jun. 4, 1986, Ser. No. 870,439
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520409
Int. Cl.[4] B01F *9/12, 13/06, 15/02;* B29B *7/16*
U.S. Cl. 366—139 14 Claims



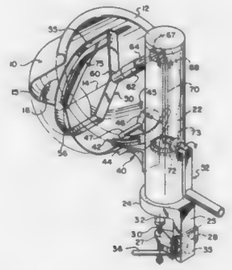
1. A pressure resistant mixing apparatus, which comprises rotatable container means for mixing material, said container means comprising a side wall and a bottom wall with a drainage opening, pressure vessel means for enclosing said container means, means for mixing material in said container means, said mixing means being positioned eccentrically to the axis of said container means, and drive means for selectively driving said mixing means and said container means, said pressure vessel means comprising a side wall, a cover, and a bottom wall with a through-opening coaxial with the drainage opening in said container means.

4,854,716
DEVICE FOR PROCESSING BONE CEMENT
Edeltraud Ziemann, Holz, and Andreas Ziemann, Erding, both of Fed. Rep. of Germany, assignors to Sulzer Brothers Ltd., Winterthur and Allo Pro AG, Baar, both of, Switzerland
Filed May 9, 1988, Ser. No. 191,389
Claims priority, application Switzerland, May 14, 1987, 1852/87
Int. Cl.[4] B01F *13/06, 7/24*
U.S. Cl. 366—139 20 Claims
1. A device for processing bone cement comprising
a mixing arrangement including a mixing container for receiving bone cement ingredients, a stirrer for mixing the ingredients, and a motor for driving said stirrer;
a vacuum pump for selectively evacuating said container; and



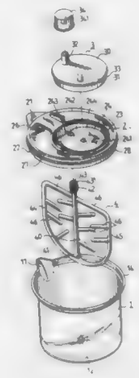
a control means connected to said motor and said pump for controlling mixing of the ingredients in said container, said means including a time counter for monitoring time intervals during mixing and signal means for indicating the end of each said time interval.

4,854,717
FOOD MIXER/FOLDER
Herbert R. Crane, Troy, Ohio, and Margaret G. Liddell, Orlando, Fla., assignors to Hobart Corporation, Troy, Ohio
Filed Jan. 11, 1988, Ser. No. 142,157
Int. Cl.[4] B01F *7/04;* A47J *43/07*
U.S. Cl. 366—197 3 Claims



1. A mixing device for food prepration comprising
a post,
means supporting said post on a generally vertical axis,
a mixing bowl having means defining a central axis and a cylindrical side, a generally open top, and a rounded bottom formed symmetrically about said axis extending through said open top,
means supporting said bowl from said post with said bowl axis located along a line which extends downward and away from said post,
a mixing arm rotatably supported within said bowl and a mixer shaft extending along said bowl axis from said arm upward toward said post,
a crank supported on said post and connected to rotate said shaft,
a spatula-like folding member on said arm and having an edge conforming to and following the inner contour of said bowl and extending in the forward direction of rotation of said shaft, and
a knife edge on said arm located on the opposite side of said arm from said folding member spaced inwardly from said side of said bowl and facing the direction of rotation of said folding member so as to cut through the material in the bowl and gently mix with a smearing action as the materials are further mixed and blended.

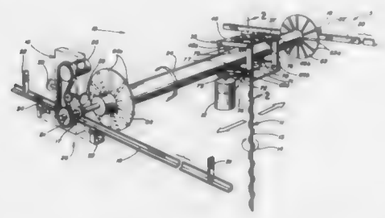
4,854,718
MANUAL BLENDER
Yen-Flui Wang, No. 1, Lane 182, Sin-E St., Yun-Kang District, Tainen Hsien, Taiwan
Filed Jun. 9, 1988, Ser. No. 204,517
Int. Cl.[4] B01F *7/20*
U.S. Cl. 366—252 2 Claims



1. A manual blender comprising:
a vessel body for material storage having a spout formed in the upper portion;
a lid suitable for closing the space defined by the vessel body including a plate and a first circumferential wall extending downwardly from the periphery of said plate with a circular recess eccentrically located in the plate and a hollow circular platform coaxially disposed in the recess, the platform including an open therethrough;
a spinning means including a disc member and a second circumferential wall having an annular gear formed in an inner side of the wall, extending downwardly from the bottom of the disc member, a knob, means for eccentrically and rotatably securing the knob on the disc member and means for coaxially and rotatably securing the spinning means over the platform of the lid; and
a masher means including an axle, a pair of oppositely disposed bent arms and essential beating rod members properly disposed on the axle and the bent arms, a gear engaged with the annular gear of the spinning means through said opening, coaxially provided on the top end of the axle and means for coaxially and rotatably securing the masher means under the lid and means for supporting it in the vessel body.

4,854,719
GRAIN STIRRING APPARATUS
Eugene G. Sukup, Beeds Lake, Hampton, Iowa 50441
Filed Mar. 10, 1988, Ser. No. 166,326
Int. Cl.[4] B01F *7/24;* F16H *21/16*
U.S. Cl. 366—261 10 Claims
1. Apparatus for stirring grain stored in a grain bin and including a stirrer for extending downwardly into grain in said bin, and a traversing mechanism for extending over said grain and moving said stirrer in a horizontal direction through the grain, said traversing mechanism including a generally horizontal shaft, means for rotating said shaft in at least one direction about a longitudinal shaft axis, a carrier structure arranged to carry said stirrer and supported by said shaft for reciprocable rectilinear movement along said shaft between a pair of

longitudinally spaced limit positions, stirrer drive motor means supported by said carrier structure for rotating said stirrer about a generally vertical axis during reciprocable movement by said traversing mechanism, a roller, means on said carrier structure supporting said roller on top of the shaft for rotation with the periphery thereof frictionally engaged with the upper side of said shaft, said roller supporting means being shiftable between first and second conditions for effecting selective movement of said carrier structure in opposite directions during rotation of said shaft in one direction about a longitudinal axis thereof, and reversing means operative in each of said conditions and at a corresponding one of said limit positions for shifting the supporting means to the other of said conditions, said roller supporting means comprising: a support member journaling said roller, and bearing means for said support member acting directly between said support member and said carrier structure to journal said support member for shiftable pivotal movement between said first and second conditions



and about a shift axis in substantially fixed relation to said carrier structure, and said reversing means comprising: a pair of rotating of engagement means disposed in longitudinally spaced relation along said shaft to define said opposite limit positions, a pair of force transmitting means on said carrier structure for operating said roller supporting means from one of said conditions to the other, said support member having gear teeth thereon, and said force transmitting means including a pair of members which have gear teeth intermeshed with said gear teeth of said support member and which are journaled on said carrier structure for pivotal movement about a pair of pivot axes fixed relative to the carrier structure and in spaced parallel relation to said shift axis and spaced therefrom in opposite longitudinal directions, said gear teeth of said support member and said gear teeth of said pair of members being at fixed pitch radii with respect to the respective axes of said members, the force transmitting means engaging the engagement means to shift the support member between the first and second conditions.

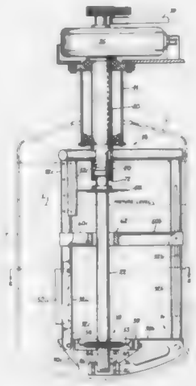
4,854,720

DISPERSER APPARATUS WITH TWO COAXIAL DRIVE SHAFTS

George R. Schold, 8460 Macoma Dr., NE., St. Petersburg, Fla. 33702

Filed Jul. 15, 1983, Ser. No. 514,322
Int. Cl.[4] B01F *7/20, 7/26*
U.S. Cl. 366—294 7 Claims

1. Apparatus for dispersing solid particles carried in suspension in a liquid vehicle comprising:
- a motor driven assembly for driving a pair of coaxially disposed drive shafts;
- a mounting frame for carrying said motor drive assembly;
- a pair of coaxially disposed impeller drive shafts of unequal length connected to be driven by said motor drive assembly;
- low speed impeller means including a plurality of impeller blades connected to and driven by the shorter of said drive shafts;
- high speed impeller means connected to and driven by the longer of said drive shafts;
- means connecting said low speed impeller means to the shorter of said drive shafts including
  - a plurality of laterally extending arms connected to said shorter drive shaft;
  - a substantially vertically extending rod attached at the outer end of each of said laterally extending arms;
  - a central hub surrounding the longer of said drive shafts and disposed at the lower end thereof;
- each low speed impeller blade being connected at its radial outer end to the lower end of one of said vertically extending rods and at its radial inner end to said central hub;



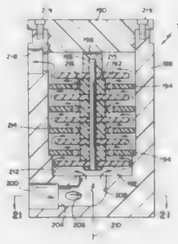
- said high speed impeller means including a continuously extending first ring member formed on the outer periphery of said impeller means;
- said low speed impeller means including a continuously extending second ring member attached thereto and spaced radially inwardly from the outer periphery of said impeller blades; and
- said ring members being spaced a relatively small distance from each other;

4,854,721

BLENDING AND DISPENSING BEVERAGES

Ronald W. Hume, Tierra Verde, Fla., assignor to Equip-Mark, Inc., Clearwater, Fla.

Filed Mar. 25, 1986, Ser. No. 843,784
Int. Cl.[4] B01F *5/06*
U.S. Cl. 366—340 15 Claims



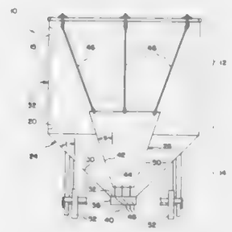
1. Apparatus for mixing liquids containing fibrous pulp comprising
- a housing defining an inlet and outlet and a flow path therethrough,
- a plurality of restriction plates provided along said flow path to repeatedly provide increased velocity to said liquid, and
- a plurality of flow diverters after respective said restriction plates to divert the flow of liquid directed to them at increased velocity from said restriction plates, said plurality of restriction plates having flow apertures through them through which said liquid flows, all said flow apertures being elongated flow apertures, said elongated flow apertures having flow passages elongated along restriction axes transverse to the direction of flow through them, said apertures being sufficiently long to pass fibrous pulp in said liquid without clogging, said apertures being sufficiently narrow to provide restricted overall flow area, the flow diverters being diverter plates comprising stationary, unapertured plates.

4,854,722

APPARATUS FOR DISPENSING PARTICULATE MATERIAL

Miles Jackson, Cobourg, Canada, assignor to General Foods Inc., Ontario, Canada

Filed Aug. 22, 1988, Ser. No. 234,866
Int. Cl.[4] B01F *5/00*
U.S. Cl. 366—341 17 Claims



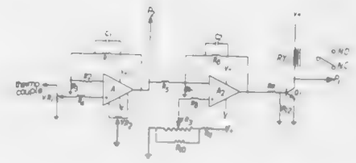
1. An apparatus for dispensing a composition of coarse and fine particles comprising:
- a bin section for holding a supply of the blended composition, and having an inlet for receiving the composition from the bin section; and a cone section located below the bin section, and including
- (i) an outer cone connected to and extending downward from the bin section, and having a first frusto-conical, annularly closed and downwardly inwardly sloping interior surface, and
- (ii) an inner cone supported within the outer cone, and having a second frusto-conical, annularly closed and downwardly sloping interior surface to conduct downward a first portion of the composition discharged from the bin section,
- the inner and outer cones forming an outer annulus therebetween to conduct downward a second portion of the composition discharged from the bin section,
- the outer cone including a bottom edge forming an outlet opening to discharge the composition from the cone section, the inner cone including a bottom edge forming an outlet opening to discharge said first portion of the composition from the inner cones, and
- the outlet opening of the inner cone having a diameter between 11 and 13 inches and being three to five inches above the outlet opening of the outer cone, and the interior surface of the inner cone forming an angle between 16° and 20° with the vertical.

4,854,723

FULL-RANGE TEMPERATURE INDICATOR DEVICE AND CIRCUITRY

Fwu-Long Her, No. 13, Kuang Fu Road, Chia Tai Industrial Dist., Tai Pao Hsiang, Chiayi Hsien, Taiwan

Filed Nov. 18, 1987, Ser. No. 122,711
Int. Cl.[4] G01K *7/02*
U.S. Cl. 374—179 1 Claim



1. A full-range temperature indicator device and circuitry comprising
- an IC amplification circuit having positive and negative inputs and an output;
- a thermocouple whose temperature is to be detected connected to said positive input of said amplification circuit;
- a feedback circuit including a pair of resistors and a condensor connecting said negative input to said output of said amplification circuit;
- an IC comparison circuit having positive and negative inputs and an output;
- said negative input of said comparison circuit connected to said output of said amplification circuit;
- a temperature dependent rheostat connected to at least said positive input of said comparison circuit;
- a first on-off transistor having a base and a collector;
- said base of said first transistor connected said output of said comparison circuit;
- a first relay connected in series with said collector of said first transistor;
- a plurality of parallel connected LED indicators and a plurality of series connected one-way diodes and a plurality of second transistors, collector of each of said second transistors connected to one of said LED indicators and an emitter of each of said second transistors connected to one of said diodes;
- circuit means to flash designated LED indicators with pulse signals which flashes turn to steady illumination as heating of said thermocouple reaches a set level but which flashes resume as a temperature drop occurs
- whereby a temperature scale of the detected temperature is a function of the number of indicators steadily illuminated, the temperature an any instant being restricted by upper and lower limits determined by said rheostat.

4,854,724

METHOD OF AND APPARATUS FOR THERMOGRAPHIC EVALUATION OF SPOT WELDS

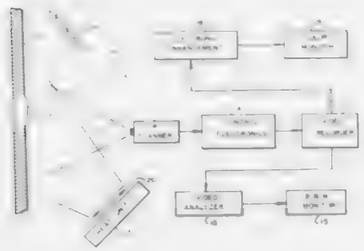
Mark J. Adams, Kennesaw, Ga., and Elton M. Crisman, Jr., St. Cloud, Fla., assignors to Lockheed Corporation, Calabasas, Calif.

Continuation-in-part of Ser. No. 629,069, Jul. 9, 1984, Pat. No. 4,647,220. This application Mar. 5, 1986, Ser. No. 836,366
The portion of the term of this patent subsequent to Jul. 9, 2001, has been disclaimed.
Int. Cl.[4] G01N *25/72*
U.S. Cl. 374—5 19 Claims

1. A method of inspecting welds joining metal objects, said welds having a weld surface, comprising the steps of:
- (a) heating the welds by directing pulsating infrared radiation onto the weld surface so that the temperature of said welds is raised above ambient;
- (b) scanning the surface of said welds with a sensing device synchronously with the heating of the weld to detect and

record any temperature differentials which might be present on the surface of said welds;

(c) sensing said temperature differentials and converting said temperature differentials into a signal representative of the intensity and location of said temperature differentials;



(d) transmitting said signal to a video display means; and

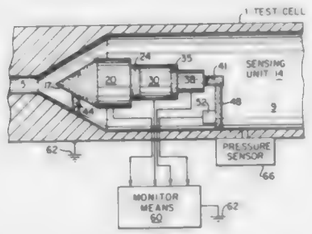
(e) displaying the signal in real time on said video display means in the form of a thermal map of the weld surface, so that the quality of the welds may be determined.

4,854,725

MULTI-SENSOR STEAM QUALITY MONITORING MEANS AND METHOD

Jackie C. Sims; Donald J. Dowling, and Theodore W. Nussbaum, all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 10, 1988, Ser. No. 205,241
Int. Cl.[4] G01N *25/60*
U.S. Cl. 374—42 **11 Claims**



1. A system for monitoring the quality of steam flowing in a pipeline comprising:

a test cell means, configured for in-line connections in the pipeline, for having the steam flow through the test cell means,

a plurality of electrode means located within the test cell means for cooperating with the test cell means to provide capacitance signals corresponding to the capacitance of the steam passing between the electrode means and the test cell means, the electrode means being spaced different distances from an interior wall of the test cell means,

temperature sensing means for sensing the temperature of the flowing steam and providing a temperature signal corresponding to the sensed temperature,

pressure sensing means for sensing the pressure of the flowing steam and providing a pressure signal representative of the sensed pressure, and

measuring means connecting to the test cell means, to all the electrode means, to the temperature sensing means and to the pressure sensing means for measuring the quality of the steam in accordance with the temperature signal, the pressure signal and at least one of the capacitance signals.

7. A method of monitoring the quality of steam flowing in a pipeline comprising the steps of:

connecting a test cell in-line with the pipeline,

having the steam flow through the test cell,

spacing a plurality of electrodes within the test cell and at different distances from an interior wall of the test cell for cooperation with the test cell to provide capacitance signals corresponding to the capacitance of the steam passing between the electrodes and the test cell interior wall,

sensing the temperature of the flowing steam,

providing a temperature signal corresponding to the sensed temperature,

sensing the pressure of the flowing steam

providing a pressure signal representative of the sensed pressure, and

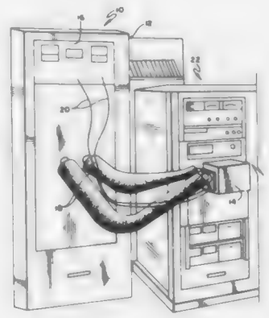
measuring the quality of the steam in accordance with the temperature signal, the pressure signal and at least one of the capacitance signals.

4,854,726

THERMAL STRESS SCREENING SYSTEM

Arthur M. Lesley, Woodland Hills, and William Jaron, Camarillo, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed May 29, 1986, Ser. No. 868,413
Int. Cl.[4] G01N *25/00*
U.S. Cl. 374—45 **5 Claims**



1. Apparatus for conducting thermal stress screening of a part being tested, comprising:

a chamber;

a temperature sensor located in said chamber;

an electronic control unit electrically coupled to said temperature sensor;

first means for providing an intake plenum and an output plenum in communication with one another;

second means for blowing gas whereby gas is moved from said intake plenum to said output plenum, said second means being coupled to said first means;

third means for providing heat to said intake plenum;

fourth means for providing cool dry gas to said output plenum;

a first passageway coupling said output plenum to said chamber and a second passageway coupling said chamber to said input plenum;

said electronic control unit being electrically coupled to said third means for controlling the amount of heat provided to said intake plenum (and eventually to said chamber); and also electrically coupled to said fourth means for controlling the amount of cool dry gas provided to said output plenum; and

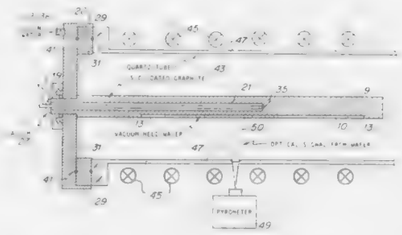
wherein said fourth means further comprises a source of liquified gas coupled to a delivery tube for delivering cool dry gas to said output plenum, and a cryogenic valve having an input port coupled to said source of liquified gas and its output port coupled to said delivery tube for controlling the flow of cool dry gas from said source to said delivery tube; said cryogenic valve having a small hole therethrough so as to permit a constant controlled flow of cool dry gas therethrough even when said valve is in its closed position, whereby a positive pressure is maintained in said plenum and in said chamber.

4,854,727

EMISSIVITY CALIBRATION APPARATUS AND METHOD

Michel Pecot, Palo Alto, and Jaim Nulman, Sunnyvale, both of Calif., assignors to AG Processing Technologies, Inc., Sunnyvale, Calif.

Filed Oct. 26, 1987, Ser. No. 114,542
Int. Cl.[4] G01N *3/60, 17/00*
U.S. Cl. 374—57 **7 Claims**



1. Temperature sensing apparatus for operation within a processing chamber, the apparatus comprising:

susceptor means having a substantially planar surface for receiving thereon a component to be positioned with the susceptor means within the processing chamber;

a passage within the susceptor means extending to a location adjacent the substantially central location on the surface;

sensing means disposed within said passage at said location for producing an output representative of the temperature at said location within the passage;

support means disposed to support the susceptor means thereon for insertion into the processing chamber; and

means in fluid communication with said surface for connection to a source of vacuum to retain a component on the surface of the susceptor means in response to pressure differential across such component.

4,854,728

SEAWATER PROBE

George Baron, Rochester; William H. Vreeland, Scituate, and Neil L. Brown, Woods Hole, all of Mass., assignors to Sippican Ocean Systems, Inc., Marion, Mass.

Filed May 18, 1987, Ser. No. 61,075
Int. Cl.[4] G01D *3/02;* G01K *13/00*
U.S. Cl. 374—136 **10 Claims**

1. Apparatus for measuring conductivity and temperature of seawater, said apparatus comprising

a seawater probe comprising

a housing,

a conductivity cell mounted on said housing so as to be exposed to seawater,

a thermistor or other means for measuring temperature, mounted on said housing so as to be exposed to seawater,

one or more stable reference resistors,

power supply means for supplying an AC current to said conductivity cell, thermistor, and reference resistors,

multiplexer means for alternately sampling the AC voltage across said conductivity cell, thermistor, and reference resistors,

circuit means for converting the multiplexed AC voltage output of said multiplexer means into an output signal for transmission across said wire,

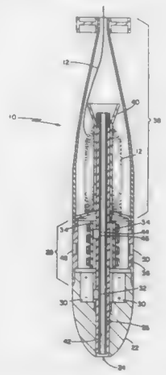
means for storing on or in said probe unique characterization data for said probe in a manner accessible from outside said probe prior to launch thereof, said characterization data comprising data points relating actual conductivity to voltage at said conductivity cell and actual temperature to voltage at said thermistor, and

circuitry external to said probe (e.g., onboard ship) for receiving and analyzing said output signal, said circuitry comprising

means for receiving said characterization data prior to launch of said probe

means for processing said output signal to determine said voltages sampled across said conductivity cell and thermistor, by comparing output signals corresponding to samples taken at said conductivity cell and thermistor to output signals for samples taken across said reference resistors,

means for using said characterization data to convert said voltage measurements to actual conductivity and temperature measurements.

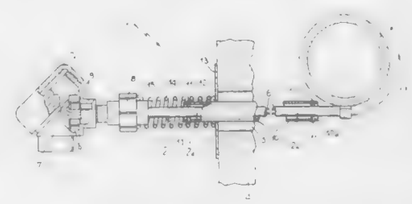


4,854,729

TEMPERATURE DETECTING APPARATUS FOR PIPES IN REFINERY FURNACES AND THE LIKE

Vittorio Lovato, Voghera, Italy, assignor to AGIP Petroli S.P.A., Rome, Italy

Filed May 3, 1988, Ser. No. 189,613
Claims priority, application Italy, Aug. 31, 1987, 21758 A/87
Int. Cl.[4] G01K *1/14, 7/04*
U.S. Cl. 374—141 **3 Claims**



1. A temperature detecting apparatus for pipes in refinery surfaces and the like of the type comprising a thermocouple (2) provided with a thermocouple rod with a sensing end and (2a)

passing through one wall (4) of a furnace and terminating in a detection end (2*b*) fastened to the surface of a pipe (5) located inside the furnace, wherein the thermocouple rod (2*a*) is freely arranged through an opening (3) formed in said wall (4) and is outerly provided with a tubular protection element (10) which extends coaxially with and along said rod (2*a*), crosses said opening (3) and has one end (10*a*) in the vicinity of said pipe (5), the inner diameter of said tubular element (10) being slightly bigger than the maximum diameter of said rod (2*a*) in order to create an air space (12) between the tubular element and the rod through which cooling air is capable of being drawn into said furnace and is passed throughout.

4,854,730

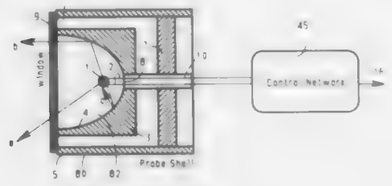
RADIATION THERMOMETER AND METHOD FOR MEASURING TEMPERATURE

Jacob Fraden, 72 Hampton Rd., Hamden, Conn. 06518

Filed Aug. 13, 1987, Ser. No. 84,818

Int. Cl.[4] G01K *7/00*

U.S. Cl. 374—164 **17 Claims**



1. An electronic infrared radiation thermometer for determining temperature of an object, said thermometer comprising:

a body including an opening adapted for radiating infrared energy toward an object;

a self-heating, temperature sensitive resistor;

means for supporting said resistor in said opening for said radiating of said infrared energy, and

means for thermally insulating said resistor from said body; an electronic control circuit, connected to said resistor for maintaining temperature and resistance of said resistor constant by adjusting electrical power through the resistor, and for providing a signal that is representative of said adjusted power;

computational means, connected to said electronic control circuit for receiving said signal for calculating the temperature of said object by using said signal.

4,854,731

TEMPERATURE SENSING APPARATUS

James O. M. Jenkins, Swansea, United Kingdom, assignor to Siliconix Limited, Wales, United Kingdom

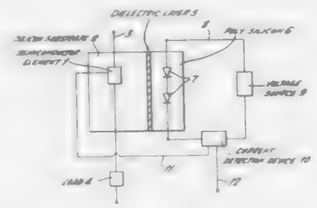
Filed Aug. 3, 1987, Ser. No. 80,890

Claims priority, application United Kingdom, Aug. 18, 1986, 8620031; Jun. 19, 1987, 8714380

Int. Cl.[4] G01K *7/00, 7/22*

U.S. Cl. 374—178 **9 Claims**

1. Temperature sensing apparatus comprising a substrate, a semiconductor element on the substrate; at least one semiconductor device on the substrate for sensing the temperature of the semiconductor element; and means providing both electrical isolation and thermal contact between the device and the element, the means the device and the element comprising an integrated circuit; and circuit means connected to the device and arranged to provide a signal solely in dependence on the



electrical conductivity of the device indicative of the temperature of the element.

4,854,732

UNSINKABLE BAG PROVIDED WITH FLOTATION ELEMENTS IN THE HANDLES AND BAG COMPARTMENTS

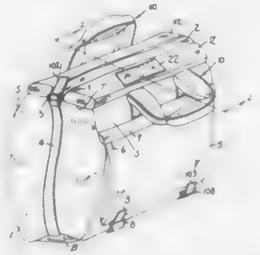
Rino Italici, San Lazzaro di Savena, Italy, assignor to Lucas International S.R.L., Granarolo dell'Emilia, Italy

Filed Oct. 16, 1987, Ser. No. 108,953

Claims priority, application Italy, Dec. 5, 1986, 15297/86[U]

Int. Cl.[4] A45C *3/10, 11/22, 13/26*

U.S. Cl. 383—6 **2 Claims**



1. A bag made of waterproof fabric, of the type comprising

a bottom wall (B),

two opposed sidewalls (S),

two opposed end walls (E),

a longitudinal top wall (T),

a pair of handles (10,110) oriented in the longitudinal direction of the top wall (T) and respectively secured in proximity of a respective intersection between the top wall and the respective sidewalls, each handle (10,110) including two end portions (16,116), and intermediate portion (216) serving as a grip, and suitable floatation elements (17) provided in the said end portions (16,116),

a bag closure means (1) extending longitudinally along a centerline of the top wall (T),

a pair of auxiliary pockets (12,112) provided in the top wall (T) and extending longitudinally between a respective handle (10,110) and the closure means (1), and

a floatation insert (13) provided in each respective auxiliary pocket to render the bag unsinkable.

4,854,733

PORTABLE PACKING BAG HAVING A TWO SECTION LOOP HANDLE

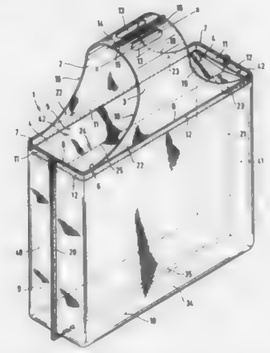
Georg Schwinn, Gronau, Fed. Rep. of Germany, assignor to M u. W Verpackungen, Gronau, Fed. Rep. of Germany

Filed Nov. 12, 1986, Ser. No. 930,360

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 3626303; Aug. 30, 1986, 3629563

Int. Cl.[4] B65D *33/10*

U.S. Cl. 383—29 **13 Claims**



1. In a portable packing bag made of plastic film for carrying flexible and/or folded produces, said bag comprising approximately rectangular front and rear side panel sections which are joined, one to the other, at their vertical edges to provide lateral side panel sections, (b) joined at their upper edges to provide a top cover section, and (c) initially unconnected at their lower edges to permit said bag to be filled but are thereafter joined at such edges, after filling, to form a completely closed bag,

said cover section having upstanding edges that define a shallow trough at the top of said bag,

said bag further comprising a handle formed as a U-shaped loop which extends across said cover section and is attached at its opposite ends at said side panel sections,

the improvement wherein said handle comprises a pair of substantially equally dimensioned, discrete sections which are joined to form said U-shaped loop along a seam at the apex of said loop, wherein said opposite ends of said handle are attached to the opposite inner sides of said upstanding edges of said trough and wherein said handle is made of sealable plastic, flexible, sheet material.

4,854,734

FLEXIBLE CONTAINERS

Ian M. Anderson, Sandringham, Australia, assignor to Courtaulds Packaging Australia Limited, Victoria, Australia

Filed Jan. 13, 1988, Ser. No. 143,573

Claims priority, application Australia, Feb. 4, 1987, PI0181

Int. Cl.[4] B65D *33/16*

U.S. Cl. 383—66 **3 Claims**

1. In a flexible container for use in aseptic filling and storage and dispensing of liquids and including flexible wall portions sealed together and an inlet/outlet orifice of predetermined configuration and dimensions in one of said wall portions and including a collar surrounding said inlet/outlet orifice and being supported in fixed relationship with said one of said wall portions; the combination therewith of plug means of similar configuration and dimensions as said orifice and disposed internally of said container for being moved into and out of sealing engagement with said collar for sealing and opening said orifice and said container for storage of liquids and for filling and dispensing of liquids, said plug means including a plurality of equally-spaced flexible connector means connecting said plug means to said collar for moving said plug means into and out of sealing engagement with said collar and for ensuring proper



seating of said plug means in sealing engagement with said collar.

4,854,735

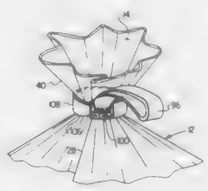
PLASTIC FILM BAG WITH INTEGRAL PLASTIC FILM TIE ELEMENT, AND ASSOCIATED FABRICATION METHODS

Gary L. Rutledge, Dallas, Tex., assignor to Ironclad, Corporation, Tustin, Calif.

Filed Nov. 4, 1987, Ser. No. 117,209

Int. Cl.[4] B65D *33/28*

U.S. Cl. 383—72 **10 Claims**



1. A plastic film bag comprising:

an open upper end;

a closed lower end;

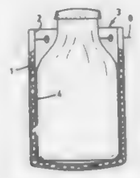
a pair of opposite side edge portions each defined by a plurality of plastic film layers;

a pair of opposite side walls interconnecting said side edge portions and said lower end;

an elongated plastic film tie element, a relatively large end portion area of said tie element and at least two plastic film layers of one of said side edge portions adjacent said upper end being weldingly intersecured to form a multilayer weld area of substantial size, said plastic film tie element having an elongated free end portion extending outwardly from said multi-layer weld area; and

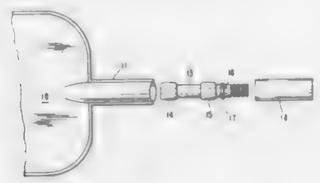
an aperture formed through said multi-layer weld area and adapted to have passed therethrough said free end portion of said tie element, whereby an upper end portion of said bag may be tightly closed by passing said free end portion of said tie element around said upper end portion to form a loop therearound, passing said free end portion through said aperture, and then pulling on said free end portion to tighten the loop around said upper end portion.

4,854,736
INSULATED CARRY BAG
Martin L. McVeigh, "Wyuna", 51 Woods Street, Manly 2095, New South Wales, Australia
PCT No. PCT/AU87/00193, § 371 Date Feb. 18, 1988, § 102(e) Date Feb. 18, 1988, PCT Pub. No. WO88/00160, PCT Pub. Date Jan. 14, 1988
PCT Filed Jul. 1, 1987, Ser. No. 191,148
Claims priority, application Australia, Jul. 2, 1986, PH6697
Int. Cl.[4] B65D *30/08, 81/38*
U.S. Cl. 383—76 4 Claims



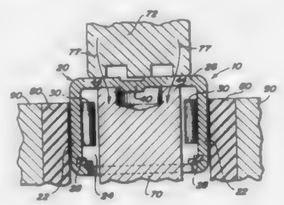
1. An insulated carry bag with substantially no resistance to manual reformation from a substantially cylindrical shape which is the normal expanded configuration of the carry bag to a shape corresponding to that of an article or an aggregation of articles housed in the carry bag, said carry bag comprising an outer bag part made of flexible sheet material and of generally cylindrical shape when expanded and which is closed at one end and open at the other end, an inner bag part of generally cylindrical shape when expanded and which is closed at one end and open at the other end, the inner bag part being smaller in diameter and shorter in length than the outer bag part and the perimeters of the open ends of the inner and outer bag parts being joined to form a mouth for the carry bag and the only connection between the outer and inner bag parts, drawstring closure, thermal insulating material in particulate form being provided in the hollow region defined by the outer bag part and inner bag part, the quantity of said particulate being at least sufficient to form a layer of insulation over the exterior surface of the inner bag part when it is expanded to cylindrical shape but less than the difference in volume of the region between the expanded form of the inner and outer bag parts.

4,854,737
BAGS FOR CONTAINING LIQUIDS
Peter L. Steer, and Graham E. Steer, both of Reigate, England, assignors to E. R. Squibb and Sons, Inc., Princeton, N.J.
Filed Dec. 4, 1987, Ser. No. 128,760
Claims priority, application United Kingdom, Jan. 12, 1987, 8700590
Int. Cl.[4] B65D *30/00*
U.S. Cl. 383—127 13 Claims



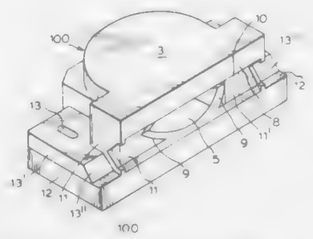
1. A bag for containing liquids including a neck portion, an outlet tube fitting partially within said neck portion, a sleeve fitting over said outlet tube and said neck portion to urge the neck portion into substantially fluid tight engagement with the tube, and an "O" ring seal on said outlet tube spaced apart from and outside said neck portion, said seal for effecting a seal between the sleeve and a portion of the tube.

4,854,738
TEMPERED NEEDLE BEARING WITH DIMPLE
Elmer H. Linnemeier, Washington Depot, Conn., assignor to The Torrington Company, Torrington, Conn.
Filed Jul. 18, 1988, Ser. No. 220,579
Int. Cl.[4] F16C *17/04, 21/00, 33/58;* F16D *3/20*
U.S. Cl. 384—127 3 Claims



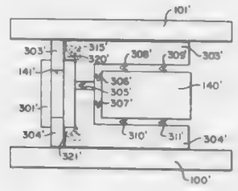
1. A drawn cup for a bearing, said cup comprising a cylindrical sleeve portion having an open end and a covered end, a protuberance projecting axially inwardly from said covered end so as to provide a bearing surface, and a spring-tempered annular region surrounding said protuberance so as to allow said covered end to withstand lied axial forces without cracking, said covered end is made of carburized martensite having a Rockwell C hardness within a range of about 60 to 62, except within said annular region which is made of tempered martensite having a Rockwell C hardness within a range of about 48 to 52.

4,854,739
BEARINGS FOR SLIDE SYSTEMS
Gervase L. Forster, Jordans, England, assignor to Hepco Slide Systems, Ltd., England
Filed Mar. 17, 1988, Ser. No. 169,502
Claims priority, application United Kingdom, Mar. 20, 1987, 8706660
Int. Cl.[4] F16C *29/00*
U.S. Cl. 384—13 15 Claims



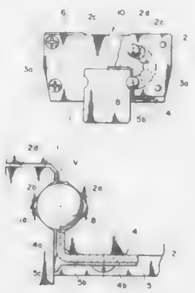
1. A seal device for a bearing, comprising:
(i) a body;
(it) the body being adapted to enclose the bearing in use;
(iii) the body defining an orifice whereby a part of a bearing surface of the bearing is exposed for cooperation with a bearing surface of a member which in use is supported by the bearing; and
wherein the orifice is complementary is external configuration to the external configuration of the respective bearing surfaces, and wherein the orifice is elongate and of substantially V-shape in transverse cross-section.

4,854,740
WEAR REDUCTION MEMBER FOR ENGINE
Ping Yang, 8220 Dorothy St., Rosemead, Calif. 91770
Division of Ser. No. 939,079, Dec. 8, 1986, Pat. No. 4,802,449, which is a continuation-in-part of Ser. No. 753,670, Jul. 10, 1985, Pat. No. 4,651,690, which is a continuation-in-part of Ser. No. 646,773, Sep. 4, 1984, abandoned. This application Jul. 15, 1988, Ser. No. 219,187
Int. Cl.[4] F16C *29/02*
U.S. Cl. 384—42 2 Claims



1. A wear-reducing member for reducing the wear of a movable wall provided with slots along top, bottom and side edges and bounded with stationary walls along said top and bottom edges and with another movable wall along said side edge, said member comprising a U-shaped member provided with means in the bight of said U for cooperatively engaging in said slots of said movable wall to urge portions of said member outward against said stationary walls and further provided with means for urging portions of said member inward against said movable wall which is adjacent thereto.

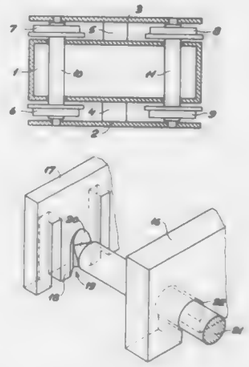
4,854,741
HOLDING DEVICE OF RECTILINEAR MOTION ROLLING GUIDE UNIT
Tatsuo Mottate, Mitaka, and Toshiaki Geka, Shiroimachi, both of Japan, assignors to Nippon Thompson Co., Ltd., Tokyo, Japan
Filed Jul. 7, 1988, Ser. No. 216,208
Claims priority, application Japan, Oct. 26, 1987, 62-270040
Int. Cl.[4] F16C *29/06*
U.S. Cl. 384—45 9 Claims



1. In a two-way loader type linear bearing having a sliding unit atop a rail with corresponding grooves in parallel sides of the sliding unit and the rail forming a path for ball bearings, the improvement wherein the portions of said sliding unit above each of said grooves extends towards the rail beyond the vertical plane passing through the center of the ball bearings, and wherein the portions of said sliding unit below each of said grooves terminates short of said vertical plane.

2. A holding device of a rectilinear motion rolling guide unit, comprising:
a long rail;
first track grooves formed on both side wall surfaces in the longitudinal direction of said rail;
a saddle-shaped slide unit which is formed with an inner concave portion and is slidably mounted on said rail;
second track grooves formed on the surface of said inner concave portion at the positions opposite to said first track grooves of the rail;
a number of rolling members inserted between the first and second track grooves, thereby enabling the slide unit to be slidably moved on the rail in the longitudinal direction thereof through the rolling of said rolling members;
a holding portion to hold the rolling members formed at the inner concave portion of the slide unit so as to project beyond the rail side of a bisector which passes through the center of the rolling member arranged between the first and second track grooves and which divides the first and second track grooves between the rail side and slide unit side; and
a holding plate formed at the inner concave portion in the direction opposite to said holding portion so as to be located on the slide unit side of said bisector, and said holding plate is fixed to the inner concave portion so as to be projected to the side of the rail by exceeding said bisector,
whereby the rolling members are held between said first and second track grooves by at least the holding plate and holding portion.

4,854,742
WHEEL BEARING, IN PARTICULAR FOR TOY VEHICLES
Erik Bach, Billund, Denmark, assignor to Interlego A. G., Baar, Switzerland
Filed Nov. 25, 1987, Ser. No. 125,345
Claims priority, application Denmark, Nov. 26, 1986, 5679/86
Int. Cl.[4] A63H *19/22;* B61F *13/00;* F16C *41/04, 17/00*
U.S. Cl. 384—129 3 Claims



1. A wheel bearing, in particular for toy vehicles comprising a bearing bracket for rotatable reception of a plurality of wheel axles, wherein two sets of cooperating bearing faces are provided for each wheel axle, said bearing faces having mutually different radii of curvature, and the axle and the bracket are mutually moveable in a direction transversely to the axle between a position in which the axle is just journalled in bearing faces having a relatively small radius of curvature, and an extreme position in which the axle cooperates with bearing faces having a relatively large radius of curvature, and through-going wheel axles with a pair of wheels in the vicinity of the ends of the axles, characterized in that the outer ends of the wheel axle have a reduced diameter, and that these ends are

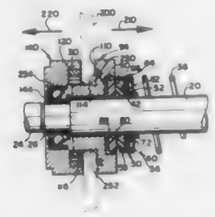
journalled in a bearing plate secured to the bracket in such manner that a certain elastic travel of said bearing plate is possible, and that the bracket has fixed bearing pedestals opposite the relatively thick portion of the axle, said bearing pedestals limiting the elastic travel area of the axle to define the extreme position of the axle.

4,854,743

REAR SEAL ASSEMBLY FOR A CHAMBER HOLDING A PARTIALLY FROZEN BEVERAGE

Rodney N. Sexton, Laguna Hills; Floyd S. Woolf, Lake Matthews, and Timothy W. Rand, Laguna Hills, all of Calif., assignors to ICEE USA Corporation, Anaheim, Calif.

Filed May 9, 1988, Ser. No. 192,236
Int. Cl.[4] F16C *33/74, 33/76, 43/00*
U.S. Cl. 384—130 15 Claims



1. A seal assembly for a rotatable shaft having an axial end passing through a wall comprising:

a first resilient seal means for sealing, fitted onto said shaft, said first seal means including a circumferentially disposed, slightly axially movable portion;

means for axially biasing said movable portion outboard towards said axial end of said shaft;

a first member fitted on said first seal means and having a first, axial end face, bearing surface spaced from said shaft;

a second member spaced from said shaft and having a second, axial end face, bearing surface that interfaces with said first bearing surface;

a seal housing having a passage therethrough for said shaft, an axially outboard male threaded extension, an axially outboard wall abutment surface at the base of said extension, and an axially inboard receiving bore;

a second resilient sealing means, disposed within said receiving bore, for holding said second member and for sealing said second member with respect to said seal housing;

a retaining ring having a threaded outer circumference and a threaded through bore that is complementary to said male threaded extension of said seal housing, and having an axially inboard wall abutment face; and

a bearing housing within which is disposed a bearing assembly having an inner assembly surface adapted to be mounted onto said shaft, said bearing housing having an axially inboard bore with a threaded bore surface complementary to said threaded outer circumference of said retaining ring.

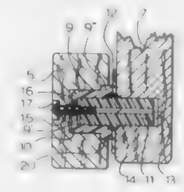
4,854,744

BEARING ASSEMBLY FOR ROCKING CHAIR

André Thibodeau, 323 - R.R. 4, Danville, Quebec, Canada J0A 1A0

Filed May 17, 1988, Ser. No. 194,997
Int. Cl.[4] F16C *33/20, 17/10*
U.S. Cl. 384—295 1 Claim

1. A bearing assembly for mounting two members adapted to pivot relative to each other, comprising: in combination with said two members, a bushing made of plastic material and fitted into a hole provided in one of said members; said bushing having an end wall and a central aperture provided in the end wall, and a first radial flange at the opposite end of the bushing; a shaft made of plastic material and having a mid-length second radial flange intermediate the two ends of the shaft; one end of said shaft fitted into another hole provided in the other said member; the other said end of said shaft pivotally inserted into said bushing; the shaft further having a longutudinal through-



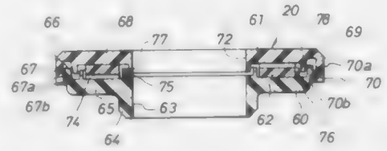
bore; said one member having a small bore in registry with said aperture and said through-bore, and a self-threading screw extending through said small bore and said aperture and screwed into said through-bore to prevent axial separation of said bushing and said shaft.

4,854,745

THRUST BEARING MADE OF SYNTHETIC RESIN

Hiroto Kamimura, Fujisawa; Shuichi Kubota, Yokohama, and Masaru Iwakura, Ayase, all of Japan, assignors to Oiles Industry Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1987, Ser. No. 89,127
Claims priority, application Japan, Sep. 1, 1986, 61-133931[U]; Sep. 1, 1986, 61-133932[U]; Dec. 23, 1986, 61-196803[U]; Dec. 23, 1986, 61-196804[U]; Jan. 19, 1987, 62-5956[U]; Jan. 19, 1987, 62-5957[U]; Jan. 27, 1987, 62-10127[U]
Int. Cl.[4] F16C *17/04, 33/74*
U.S. Cl. 384—420 3 Claims



1. A thrust bearing for use with an automobile thrust-strut type suspension having a strut incorporating a shock absorber, a piston rod inserted in the shock absorber, a mounting member for supporting the piston rod to the automobile body, and an upper spring seat loosely engaging the piston rod, the mounting member and the upper spring seat having opposed, substantially planar surfaces offset from each other and defining an annular space between them, said bearing being adapted to be received in the annular space between the upper spring seat and the mounting member and adapted to receive the piston rod therethrough, said bearing comprising:

a lower casing made of synthetic resin and having a longitudinal axis, said lower casing including:

a cylindrical portion having a substantially planar upper surface, a lower surface, an outer circumferential surface, a penetration aperture of circular cross-section coaxial with said longitudinal axis of said lower casing, and an annular inner lower lip portion extending upwardly from said upper surface adjacent and offset stepwise from said penetration aperture, said penetration aperture being adapted to receive the piston rod of the suspension therein, said inner lower lip defining a cylindrical aperture having a diameter slightly greater than that of said penetration aperture, and said inner lower lip portion having a

distal end offset from said upper surface of said cylindrical portion; and

a collar portion extending outwardly from and formed integrally with said outer circumferential surface of said cylindrical portion, said collar portion having substantially planar upper and lower surfaces and an outer circumferential surface, said lower surface of said collar portion being substantially offset from said lower surface of said cylindrical portion and adapted to matingly engage the upper surface of the upper spring seat of the suspension, and said collar portion including an annular protruded portion extending upwardly from said upper surface of said collar portion and formed integrally with said outer circumferential surface of said cylindrical portion, said protruded portion having an outer circumferential surface and an outwardly extending engaging portion formed on said outer circumferential surface of said protruded portion, and said collar portion further including an annular outer lower lip portion extending upwardly from said upper surface of said collar portion coaxial with said longitudinal axis of said lower casing and defining an inner annular groove in cooperation with said inner lower lip portion and an outer annular groove with said protruded portion, said outer lower lip portion having a distal end offset from said upper surface of said collar portion, and said inner annular groove having a bottom surface;

said inner annular lower lip having an outer diameter "d1" and said outer annular lower lip having an inner diameter "d2", respectively, "d1" being smaller than "d2";

an upper casing made of synthetic resin and having a longitudinal axis, said upper casing comprising a disk-like portion having substantially planar upper and lower surfaces, an outer circumferential edge, a circular aperture formed at the center thereof coaxial with said longitudinal axis of said upper casing and defining an inner circumferential edge, an annular inner upper lip portion extending downwardly from said lower surface of said disk-like portion and formed integrally with said inner circumferential edge of said disk-like portion, an annular outer upper lip portion extending downwardly from said lower surface of said disk-like portion coaxial with said longitudinal axis of said upper casing, an annular suspended portion extending downwardly from said lower surface of said disk-like portion and forged integrally with said outer circumferential edge of said disk-like portion, said upper surface of said disk-like portion being adapted to matingly engage the lower surface of the mounting member of the suspension, said circular aperture being adapted to receive the piston rod of the suspension therein, said inner and outer upper annular lip portions each having a distal end offset from said lower surface of said disk-like portion, and said suspended portion having a distal end offset from said lower surface of said disk-like portion and an engaging hook portion formed at said distal end for cooperation with said engaging portion of said protruded portion; and

a bearing piece made of synthetic resin and comprising an annular plate having upper and lower surfaces and an inner diameter greater than "d1" and an outer diameter less that "d2", said bearing piece being received in said inner annular groove of said lower casing;

said hook portion of said suspended portion of said upper casing being snap-fitted with said engaging portion of said protruded portion of said lower casing to define a snap-fit portion, whereby said upper casing is fitted rotatably to said lower casing, said upper surface of said bearing piece being slidably abutted against said lower surface of said disk-like portion, said distal ends of said inner and outer upper lip portions being overlapped radially with said distal ends of said inner and outer lower lip portions, respectively, to define inner and outer overlapped portions, respectively, and said lower surface of said bearing piece being slidably abutted against said bottom surface of said inner annular groove, whereby tight seals are formed at said snap-fit portion and said inner and outer overlapped portions.

4,854,746

CRANKSHAFT BEARING CAP LOCATION SCHEME

James D. Baugh, Greensburg, and Francis M. Hager, Columbus, both of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jun. 28, 1985, Ser. No. 749,742
Int. Cl.[4] F16C *35/02*
U.S. Cl. 384—432 11 Claims



1. An improved bearing assembly for journaling a shaft of the type including a saddle member and a bearing cap, each of which includes shaft-receiving, semi-cylindrical recesses whose ends are mutually alignable to define a shaft-receiving cylindrical bore when the saddle member and bearing cap are assembled together, wherein the improvement comprises mounting shoulders on either end of the bearing cap which are receivable within alignment slots on either side of the shaft-receiving recess of the saddle member of generally the same shape as the shoulders they receive, with the mounting shoulders are unsymmetrical in shape relative to the axis of rotation of the semi-cylindrical recess of the bearing cap in order to provide only one possible fitting orientation between the mounting shoulders and the alignment slots of the saddle member which receive them when said member and cap are assembled, wherein said bearing cap contains a first bore opening into one of said shoulders which is aligned with a second bore contained in said saddle member when said saddle member and bearing cap are fitted together, and a first bolt having a pilot portion whose outer diameter is formed to mate with the inner diameter of said bore for providing proper positioning of the saddle member and the bearing cap along the center of curvature of the respective semi-cylindrical recesses, and further including a third bore opening into the other of said shoulders which is aligned with a fourth bore contained in the saddle member when said saddle member and bearing cap are fitted together, and a second bolt whose diameter is less than the diameter of the third bore for clamping said other shoulder into said alignment slot and thereby completing the assembly of the bearing.

4,854,747

ECCENTRIC BEARING AND HANGER

Craig Siebert, Briarcliff Manor, N.Y., and Martin Scott, Brewster, Mass., assignors to Metallized Carbon Corporation, Ossining, N.Y.

Filed Nov. 17, 1987, Ser. No. 121,475
Int. Cl.[4] F16C *19/50, 35/06, 43/04*
U.S. Cl. 384—447 9 Claims



1. A ball bearing having a top and a bottom comprising a substantially circular inner race, a substantially circular outer race substantially surrounding said inner race, a first pair of axially spaced apart flanges extending radially outwardly from said inner race and/or a second pair of axially spaced apart flanges extending radially inwardly from said outer race, there being a gap between said first pair and said outer race, said second pair and said inner race, or said first pair and said second pair, said gap being narrower at or adjacent the top of said bearing than at or adjacent the bottom of said bearing substantially constantly during rotation of said bearing, rollable balls at least partially between said first pair, said second pair, or both, said balls bearing on said inner race and said outer race, said inner race having a first center, said outer race having a second center, a non-rotating one of said first pair and said second pair of flanges terminating in edges which define a substantial circle having a third center, said first and second centers being coincident, and said third center being above said first and second centers when said edges are on said first pair of flanges and below said first and second centers when said edges are on said second pair of flanges.

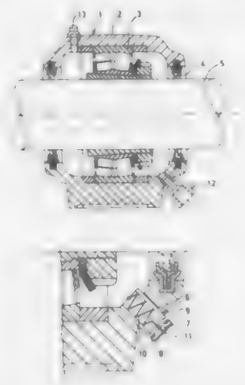
4,854,748

SHAFT BEARING ASSEMBLY

Antonio Gebelli, Briljanthof, and Hendrik Dolfsma, Strijpweg, both of Netherlands, assignors to SKF Industrial Trading and Development Co. B.V., Nieuwegein, Netherlands

Filed Mar. 7, 1988, Ser. No. 164,815
Claims priority, application Netherlands, Mar. 12, 1987, 8700595
Int. Cl.[4] F16C *33/66, 41/00*
U.S. Cl. 384—466 6 Claims

1. Shaft bearing assembly comprising a bearing housing having at least one rolling bearing therein, through which a shaft protrudes on at least one side, which housing is provided with an inlet opening for the supply of lubricant and an outlet opening for excess spent lubricant and shaft and outlet opening sealing means, characterized in that the bearing housing is provided with a temperature-and pressure-sensitive outlet valve for draining excess lubricant from the housing, which outlet valve opens at a predetermined temperature and closes



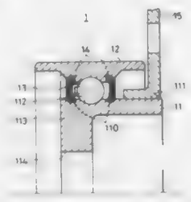
when the temperature falls below said predetermined temperature.

4,854,749

BEARING SEALING DEVICE

Minoru Kohigashi; Toshihiko Shiraki, and Akito Tsujimoto, all of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Continuation of Ser. No. 936,157, Dec. 1, 1986, abandoned. This application Feb. 14, 1989, Ser. No. 310,508
Claims priority, application Japan, Nov. 29, 1985, 60-184665[U]
Int. Cl.[4] F16C *33/78*
U.S. Cl. 384—482 8 Claims



1. A bearing seal device for a bearing having inner and outer rings, including inner and outer surfaces respectively separated by a space and rolling elements disposed in said space, comprising:

annular sealing means disposed around the rolling elements having first and second ends, said first end of said annular sealing means affixed to the inner surface of said outer ring, said second end of said annular sealing means formed as a bifurcated lip and extending toward the inner ring, said bifurcated lip including an inner lip facing said rolling elements, and an outer lip facing away from said rolling elements, each of said inner and outer lips having inner and outer edges and wherein said bifurcated lip includes an expansion portion from where said inner and outer lips extend downwardly toward the outer surface of the inner ring to the inner surface of the inner ring representing the height of said outer sidewall,

the outer surface of the inner ring having a groove for receiving said bifurcated lip, said groove including a bottom wall, inner and outer side walls, the distance between the top edges of said inner and outer side walls defining a groove opening width, said outer edge of said inner lip being disposed in substantially opposing relationship with said inner side wall and said outer edge of said outer lip is disposed in substantially opposing relationship with said outer side wall, the distance between said outer edges of said inner and outer lips being at most equal to said groove opening width and wherein a first diameter, measured from the outer surface to the inner surface of the inner ring, represents the height of said inner side wall extending in said space and a second diameter, measured from the outer surface to the inner surface of the inner ring, represent the height of said outer side wall and said first and second diameters being substantially equal;

said inner and outer lips extending substantially the same distance into said groove to maintain a small clearance between said inner and outer lips and said bottom wall of said groove and,

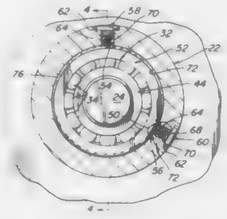
a third diameter, measured from the bottom of said expansion portion to the outer surface of the inner ring, said third diameter being at least equal to said first and second diameters.

4,854,750

ZERO CLEARANCE BEARING SYSTEM

Aaron M. Lavin, 3500 Davisville Rd., Hatboro, Pa. 19040

Filed Oct. 6, 1988, Ser. No. 254,287
Int. Cl.[4] F16C *19/08, 23/10*
U.S. Cl. 384—500 22 Claims



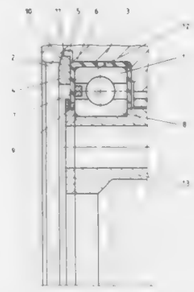
1. A bearing assembly supporting a rotatable member for rotation about a longitudinal axis thereof, said bearing assembly comprising a support member, at least three outer races, a plurality of uniformly sized, precision rolling elements, and at least three inner races, each of said outer races comprising a circular surface of a respective ring member, each of said inner races comprising a respective circular outer surface formed in said rotatable member, said circular outer surfaces being substantially concentric with one another and disposed laterally of one another along said axis, said axis opposite to respective ones of said inner races to form therebetween respective annular spaces, a plurality of said rolling elements being located within each of said annular spaces, a first of said ring members being arranged to be adjustably moved by first means inward radially with respect to said axis from a first point on the circumference thereof to reduce the thickness of said annular space at said first point to substantially take up the clearances between said inner race, said rolling elements, and said outer race at said first point, a second of said ring members being arranged to be adjustably moved by second means inward radially with respect to said axis from a second point on the circumference thereof located approximately 120 degrees from said first point to reduce the thickness of said annular space at said second point to substantially take up the clearances between said inner race, said rolling elements, and said outer race at said second point, the thickness of the annular space between said inner and outer races at a third point on the circumference thereof located approximately 120 degrees from said first and second points also being reduced so that the clearances between said inner race, said rolling elements, and said outer race at said third point is substantially taken up, whereupon there is virtually no clearance between the inner and outer races and the rolling elements interposed therebetween at said first, second, and third points.

4,854,751

ANTIFRICTION BEARING

Volker Grassmuck; Benno Jörg, both of Weinheim, and Eberhard Sommer, Weinheim-Laudenbach, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/-Bergstr., Fed. Rep. of Germany

Filed May 10, 1988, Ser. No. 192,367
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724752
Int. Cl.[4] F16C *43/00, 33/76*
U.S. Cl. 384—537 3 Claims



1. An antifriction bearing comprising:

an inner ring supported in a first bore of a rotating machine part;

an outer ring supported in a second bore of a rotating machine part, said second bore having a circumferential groove serving said outer ring;

a retaining ring against axial displacement, said retaining ring being snapped into said circumferential groove of said second bore; and

a gasket of a polymeric material, which bridges a gap between said outer ring and said inner ring and lies under elastic pretension against a side surface of said inner ring, being disposed between said retaining ring and a side surface of said outer ring;

said retaining ring in the installed state on the one hand being supported on a side of said groove facing away from a side surface of said outer ring on at least one conical surface and, on the other, being at a radial distance from the bottom of said groove;

said retaining ring having a supporting surface, which faces a side surface of the outer ring, being constructed flat and extending in a radial direction;

said supporting surface extending inwardly in a radial direction and bridging at least partially said gap between the said outer ring and said inner ring.

4,854,752

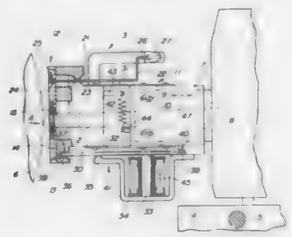
CONVERTIBLE PRINT HEAD

Stephane Rossopoulos, Yverdon-les-Bains, Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland

Continuation of Ser. No. 16,857, Feb. 20, 1987, abandoned. This application Aug. 15, 1988, Ser. No. 233,838
Claims priority, application Switzerland, Mar. 21, 1986, 1157/86
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 8 Claims

1. A convertible needle-type print head comprising two columnar rows of needles mounted on guiding tracks of a front bracket comprised of two portions; first means for permitting relative displacement between said two portions of said front

bracket in a vertical first direction for aligning the position of one columnar row of needles with respect to the position of the other columnar row of needles to permit offsetting the relative position of the two columnar rows of needles; second means for moving said two portions of said front bracket simultaneously in said first direction, said front bracket being attached to a first end of at least two flexible members, wherein a first portion of said two portions is mounted slidably on a second portion of said two portions which is attached to said first end of said at least two flexible members, a second end of said at least two flexible members being connected to an assembly



part mounted by means of a sliding device slidable in a second direction perpendicular to said first vertical direction to a rear portion of said head, which is rigidly affixed to a printing carriage, said second means comprising a lever mounted to pivot about a pivot located on said assembly part between an electromagnet affixed to said assembly part and said second portion of the front bracket in such a manner that the end of said lever operating jointly with said second portion makes a displacement at least twice as small as an opposite end of said lever when said electromagnet is energized, stop means engageable with said opposite end of said lever for limiting the displacement of said first and second portions.

4,854,753

PRINTER

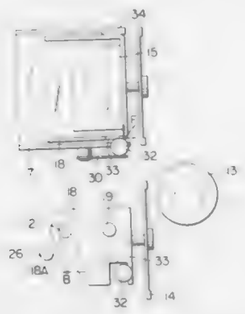
Yoshihiro Kobata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 861,112, May 6, 1986, abandoned, which is a continuation of Ser. No. 582,560, Feb. 22, 1984, abandoned. This application Dec. 23, 1987, Ser. No. 139,080

Claims priority, application Japan, Feb. 25, 1983, 58-31170

Int. Cl.[4] B41J *1/04*

U.S. Cl. 400—144.2 **10 Claims**



1. An impact printer comprising:

a frame having an open front, a first side wall and a second side wall, said first and second side walls being perpendicular to said front and parallel to each other;

a print mechanism removably mounted to said frame for printing on a print medium in accordance with a print command, said print mechanism having a positioning guide on one side, wherein said print mechanism can be moved in a direction parallel to said side walls and between a print position and a retracted position;

a frame member located on said first side wall of said frame for positioning said print mechanism tightly at said print position and loosely at said retracted position, wherein said frame member consists of a projection formed on said first side wall of said frame, said projection having a major substantially planar surface smaller in area than said first side wall, and said major surface being finished with a predetermined precision relative to said first side wall sufficient to position said print mechanism; and

actuation means located on said second side wall of said frame for pressing said print mechanism against said major surface of said projection in a direction substantially normal to the impact direction of said print mechanism, wherein said actuation means consists of a rotatable member connected to said print mechanism for moving the print mechanism and a plate spring member to resiliently urge said rotatable member into said positioning guide for fixing said print mechanism at said print position,

wherein said projection is located so as to contact said print means tightly at said print position and contact said print means loosely at said retracted position.

4,854,754

RECORDING APPARATUS

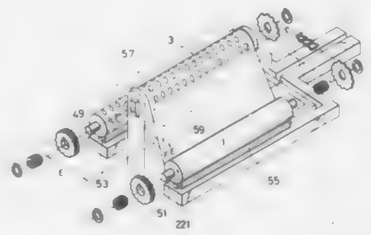
Kunihiko Miura, Hiratsuka, and Takefumi Nosaki, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jan. 28, 1987, Ser. No. 7,792

Claims priority, application Japan, Jan. 31, 1986, 61-19725

Int. Cl.[4] B41J *31/14, 31/00*

U.S. Cl. 400—802.2 **9 Claims**



1. A recording apparatus for recording pre-recorded data, said data comprised of printing dots, on a member positioned for recording, wherein each of the printing dots is comprised of a plurality of ink drops, said apparatus comprising:

an ink retaining film having therein multiple orifices containing recording ink, each of the orifices corresponding to one of the plurality of ink drops;

heating means for simultaneously increasing a pressure of said ink contained in a first plurality of said orifices in said film to effect a transfer of ink from the first plurality of the orifices onto said positioned member during data recording for printing said dots, each dot covering a distinct area of the member;

means when activated for moving said ink-retaining film relative said member;

driving means for driving said heating means in accordance with said prerecorded data;

control means when activated for controlling said driving means to repeat the printing of each of said dots on said distinct area of the member during operation of the moving means, for increasing the pressure of the ink in a second plurality of said orifices, wherein the plurality of said ink drops comprising each of said dots is increased; and

generating means for generating a plural number of printing control signals for activating said control means.

4,854,755

RELOADABLE RIBBON CASSETTE SYSTEM

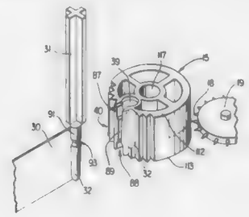
Heinz Lange; Hans-Peter Heins, both of Wilhelmshaven, and Hermann Jendricke, Varel, all of Fed. Rep. of Germany, assignors to AEG Olympia Aktiengesellschaft, Wilhelmshaven, Fed. Rep. of Germany

Filed Feb. 18, 1988, Ser. No. 157,200

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1987, 3705058; Dec. 17, 1987, 3742860

Int. Cl.[4] B41J *32/00*

U.S. Cl. 400—208.1 **28 Claims**



1. A reloadable ribbon cassette system, comprising:

a bottom member;

a foldable cover for the bottom member;

a reloadable supply spool core;

a ribbon having an end, the ribbon initially being wound on the supply spool core;

a first bearing pin to receive the supply spool core and rotatably mount the supply spool core in the bottom member;

an element having a contact surface and having a second bearing pin which extends from the contact surface, the element being mounted in the bottom member;

means carried by the bottom member for defining a plurality of ribbon guide points;

a reloadable take-up spool core having a bearing bore, a bearing surface, and an eccentrically disposed receiving bore, the take-up spool core being rotatably mountable on the element so that the second pin extends through the bearing bore and the bearing surface rests on the contact surface; and

a fastening element at the free end of the ribbon for insertion into the receiving bore of the take-up spool core after the ribbon has been threaded around the ribbon guide points,

the contact surface of the element being disposed closely beneath the receiving bore of the take-up spool core to limit the insertion distance of the fastening element into the receiving bore of the take-up spool core.

4,854,756

ADAPTIVE PRINT HAMMER TIMING SYSTEM

Kenneth A. McCrimmon, Jr., El Toro, and Matthew M. Chu, Santa Ana, both of Calif., assignors to Printronix, Inc., Irvine, Calif.

Filed Aug. 3, 1987, Ser. No. 80,769

Int. Cl.[4] B41J *3/12*

U.S. Cl. 400—322 **16 Claims**

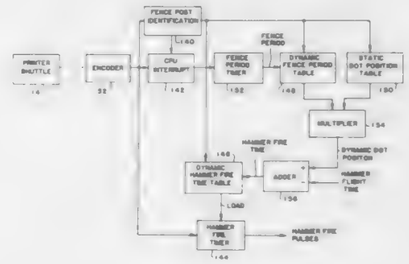
1. In a printer in which a plurality of hammers on a reciprocating shuttle are selectively fired to perform impact printing, a timing circuit for determining hammer firing positions during each stroke of the reciprocating shuttle comprising the combination of:

means for sensing the actual position of the shuttle at each of a succession of locations along a path of movement thereof;

means for defining successive intervals of movement of the shuttle between the succession of locations along the path of movement in response to said sensing of the actual position of the shuttle during each stroke;

means responsive to startup of the printer for storing separate values of the time interval of travel of the shuttle through each of the successive intervals of movement; and

means responsive to arrival of the shuttle at each of the succession of locations along the path of movement therefor representing the beginning of the successive intervals of movement of the shuttle during each stroke and responsive to the stored separate value of the time interval of travel of the shuttle through that interval of movement for providing hammer firing position signals, the hammer firing position signals being adjusted in terms of their time of occurrence in accordance with the stored separate values.



4,854,757

AUTOMATIC SHEET FEEDER MOVABLE BETWEEN ACTIVE AND INACTIVE POSITIONS

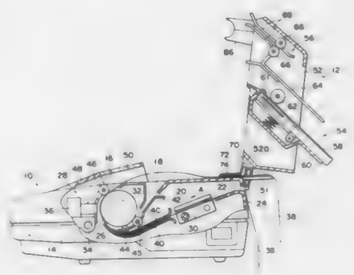
Kiyoji Kikuchi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 13, 1987, Ser. No. 107,413

Claims priority, application Japan, Oct. 13, 1986, 61-242689

Int. Cl.[4] B41J *11/00, 13/00, 15/00*

U.S. Cl. 400—605 **11 Claims**



1. An automatic sheet feeder for a printer capable of printing continuous paper and cut sheets, the printer including a case with an upper wall, a printing mechanism arranged in the case, the upper wall having a cut sheet supply port and a paper discharge port, near to the printing mechanism, and a continuous paper feeding mechanism arranged in the case, for feeding continuous paper toward the printing mechanism, printed-on continuous paper being discharged from the case through the paper discharge port and transferred on the upper wall, said automatic sheet feeder comprising:

a main body arranged on the upper wall of the case of the printer to be movable between an actuating position, where the main body covers the cut sheet supply port and the paper discharge port, and a non-actuating position, where a discharge path, through which the discharged

continuous paper is transferred, is defined between the main body and the upper wall of the case;

a cut sheet feeding mechanism arranged in the main body, for feeding a cut sheet through the cut sheet supply port to the printing mechanism, when the main body is moved to the actuating position; and

a cut sheet stacking mechanism arranged in the main body, for stacking cut sheets discharged through the paper discharge port, when the main body is moved to the actuating position.

4,854,758

RETRACTABLE APPLICATOR DEVICE FOR NAIL VARNISHES WITH FLOW CONTROL

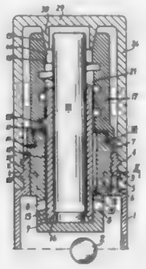
Simone Morel, Montmirail, France, assignor to Societe de Conseils et D'Etudes des Emballages SCEE, Dammartin en Goele, France

Continuation of Ser. No. 26,508, Mar. 17, 1987, abandoned. This application Oct. 6, 1988, Ser. No. 253,901

Claims priority, application France, Mar. 17, 1986, 86 03752

Int. Cl.[4] A45D *34/00*

U.S. Cl. 401—116 **10 Claims**



1. An applicator device for nail varnishes and similar liquid products placed in a container having a neck at an exit end thereof, said device comprising:

a socket-shaped support piece fit in an air tight manner within the neck and having a bottom portion extending into the container, at least one port adjacent said bottom portion which communicates an inner cavity of said support piece with the container and a longitudinal slot defined in an inner surface thereof;

a sliding sleeve slideably dispoeed within the inner cavity of said support piece for selectively opening and closing said at least one port and containing a wick having a first end adapted to extend into the inner cavity and a second end which protrudes above an upper end of said sleeve, an outer surface of said sleeve including at least one finger segment extending therefrom and at least one key extending therefrom adapted to slide longitudinally along the slot in the inner surface of said support piece for axially guiding said sleeve;

a sheath rotatably mounted on an upper end of said support piece for controlling the sliding motion of said sleeve, said sheath including an internal screw thread on an inner surface thereof for receiving said at least one key such that when said sheath is rotated, said sleeve is axially guided by engagement of said at least one key in said internal screw thread; and

wherein said sleeve is slideably moveable between a withdrawn position in which said at least one port is closed in an air tight manner by said sleeve and an extended position in which said at least one port is opened and the liquid product can flow from the container into the inner cavity to be brought into contact with the wick.

4,854,759

DEVICE FOR APPLYING A LIQUID, PRODUCT, IN PARTICULAR FOR APPLYING NAIL POLISH

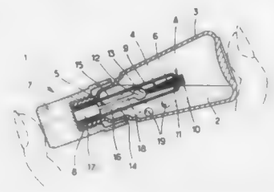
Bruno Morane, Neuilly, and Gérard Joulia, Paris, both of France, assignors to L'Oreal, Paris, France

Filed Jul. 7, 1988, Ser. No. 216,205

Claims priority, application France, Jul. 10, 1987, 87 09819

Int. Cl.[4] A45D *34/00*; **A46B** *11/00*

U.S. Cl. 401—119 **6 Claims**



1. A device for applying a liquid product contained in a bottle, containing an applicator brush including a rod provided with applicator means such as bristles, the rod being carried by a cap intended for closing the neck of the bottle, the cap being integrally joined to a sheath arranged to surround the rod and project into the interior of the bottle, when the cap is fixed on the neck, with the brush situated inside the bottle, characterized in that the rod of the brush is mounted displaceably in the sheath with respect to the cap, the sheath including, at its end remote from the cap, a restriction through which the applicator means can pass, the rod of the brush including an enlargement arranged to come into contact with the restriction under the influence of gravity, when the brush is oriented downwardly, in such a manner as to retain the rod and close the restriction, the sheath including at least one opening near the cap which permits the entry of the liquid into the sheath when the bottle, closed by the cap, is inverted, a free space existing between the inside surface of the sheath and the surface of the rod to define a liquid reservoir, the length of the sheath being greater than that of the rod, such that the rod can retract inside the sheath, which assures the opening of the restriction.

4,854,760

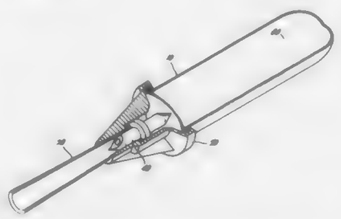
DISPOSABLE CONTAINER WITH APPLICATOR

Brian R. Pike, Oceanside; Patrick J. Furlong, La Costa, and John W. Moers, Fallbrook, all of Calif., assignors to Unidec, Carlsbad, Calif.

Filed Mar. 13, 1987, Ser. No. 25,609

Int. Cl.[4] A46B *11/00*; **A45D** *34/00*; **A61M** *35/00*

U.S. Cl. 401—134 **13 Claims**



13. A dispenser comprising a compressible hollow body having a closed end and an open end, said open end being sealed by a non-fracturable membrane and having attached thereto a stationary fitted housing, said fitted housing having a means for applying a liquid and membrane piercing means so that when said hollow body containing said liquid is compressed said membrane is pierced and said liquid can be supplied to said means for applying a liquid.

4,854,761

NAIL POLISH REMOVER WAND CONTAINING DISPOSABLE PADS

Louise Smith, 805 E. Butler, Phoenix, Ariz. 85020, and Frank W. Kautman, P.O. Box 47837, Phoenix, Ariz. 85068

Continuation-in-part of Ser. No. 123,238, Nov. 20, 1987, abandoned. This application Mar. 3, 1988, Ser. No. 163,622

Int. Cl.[4] A45D *29/17*

U.S. Cl. 401—196 **18 Claims**



1. A nail polish removing wand comprising:

a hollow elongated housing open at opposite ends thereof,

an assembly of individual applicators mounted in said housing along its length in a common direction, each applicator comprising a substantially first part secured, to a second part comprising an absorbent pad which can be saturated with a nail polish solvent,

a pressure applying actuator means mounted within one end of said housing for urging the movement of said applicators out of the other end of said housing, and

flange means forming at least a part of the periphery of said other end of said housing for restricting the movement of said applicators out of said housing,

said applicators each being provided with an indentation at a common point along its length for engaging with said flange means for holding each applicator as it passes through said other end of said housing in a position partially outside of said housing until said actuator means is again sequentially actuated by a user to force a juxtapositioned applicator into flange holding position in said other end of said housing and simultaneously dislodging from said wand the previously held actuator

said applicators are arranged whereby when the housing flange means engages an applicator indentation, the absorbent pad of the applicator extends beyond the housing and is held in place allowing the pad to be rubbed on a nail with the housing acting as a handle.

4,854,762

DISPOSABLE MARKER AND ADAPTER FOR PEN-DRIVEN INTEGRATOR

James R. Hubbard, Morrestown, N.J., assignor to Graphic Controls Corporation, Buffalo, N.Y.

Filed Jan. 14, 1987, Ser. No. 3,131

Int. Cl.[4] B43K *31/00*

U.S. Cl. 401—199 **5 Claims**

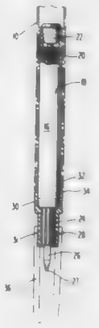
1. Disposable marker and adapter for use with a pen body holder having a sleeve,

said marker comprising a cylindrical marker body having a closed rear end, a fibrous ink reservoir contained therein, a nib holder extending from the forward end of said body, said nib holder having external flutes and of external diameter smaller than said body and a nib retained in and projecting from the forward end of said nib holder,

said adapter comprising a cylindrical member having a forward segment, a rearward segment and a rearward subsegment

said rearward segment including means for being retained in said pen body holder, said means being said subsegment of said rearward segment having an internal diameter adapted to frictionally receive and retain the internal surface of said pen body holder sleeve,

said rearward segment having an internal diameter adapted to receive the forward end of said marker body, and



said forward segment having an internal diameter and threads adapted to receive and retain said nib holder, said forward segment internal diameter forming an internal shoulder against which said marker body abuts upon maximum threadable engagement of said nib holder in said forward segment, positively positioning said marker body in said adapter.

4,854,763

DEVICE FOR THE IMPALING OF LOOSE LEAVES

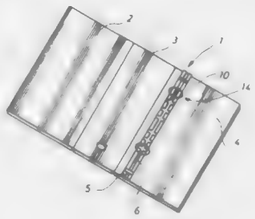
Magnus Jonsson, Lund, Sweden, assignor to Inter-Ikea A/S, Denmark

Filed May 10, 1988, Ser. No. 192,295

Claims priority, application Denmark, May 11, 1987, 2376/87

Int. Cl.[4] B42F *13/20, 3/04, 13/26*; **A47F** *7/00*

U.S. Cl. 402—32 **10 Claims**



1. A device for gathering loose leaves comprising a loose leaf binder having at least one rail mounted thereon, at least two holding means provided with rings detachably fastened to said rail, said holding means being mutually displaceable with respect to said rail and said rings being adapted to be opened and closed, and means for detachably fastening said holding means to said rail comprising locking means placed on the holding means having a resilient web, at least one part of which is easily accessible to a user from above the rail facing the holding means, said locking means being meshable between two projections of a row of projections positioned on one side of said rail facing said holding means so that said holding means is retainable in a desired position, the meshing being substantially dependent on the position of the holding means.

4,854,764

COUPLING DEVICE BETWEEN TWO ELEMENTS

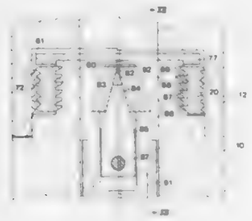
Kurt H. A. E. Faber; Ute M. I. Faber, both of Sandviken; Knut Faber, Västerås; Inken A. H. Faber, Stockholm, and Andrea J. Faber, Sandviken, all of Sweden, assignors to AB Sandvik Coromant, Sandviken, Sweden

Filed Mar. 25, 1987, Ser. No. 29,807

Claims priority, application Sweden, Mar. 25, 1986, 8601370; Nov. 26, 1986, 8605062

Int. Cl.[4] B25G *3/00*; F16L *55/00*

U.S. Cl. 403—13 7 Claims



1. In combination, first and second elements, and means coupling said first and second elements together:

said first element comprising an external circumferential surface containing a radially outwardly open generally circumferential groove,

said second element comprising an internal circumferential surface sized to receive said external surface, said internal surface containing a radially inwardly open generally circumferential groove opposing said outwardly open groove,

one of said grooves including a first end surface extending substantially perpendicularly relative to a longitudinal axis defined by said internal and external surfaces, the other of said grooves including a second end surface oriented at an acute angle relative to said longitudinal axis and spaced longitudinally from said first end surface,

a split ring member disposed partially in said first groove and partially in said second groove, said ring member including a split region defined by mutually opposing end walls, wherein relative movement of said end walls in a circumferential direction is opposed by an elastic bias of said ring, said ring member having a wedge-shaped cross-section formed by first and second locking surfaces, said first locking surface disposed parallel to, and in engagement with, said first end surface, said second locking surface disposed parallel to, and in engagement with, said second end surface, and

actuator means for applying circumferentially directed forces to said ends of said ring member in a manner deforming said ring member in a radial direction, against said elastic bias, for maintaining engagement between said first end surface and said first locking surface and between said second end surface and said second locking surface for preventing withdrawal of said first element from said second element.

4,854,765

REVERSIBLE THERMAL COMPENSATION JOINT

Daniel N. Giles, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 13, 1987, Ser. No. 72,512

Int. Cl.[4] F16B *1/00, 17/00*

U.S. Cl. 403—30 2 Claims

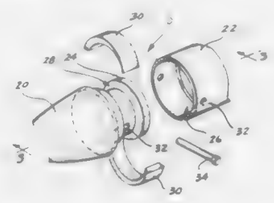
1. A reversible thermal compensation joint for joining a first structural member to a second structural member, the first structural member being constructed of material having a lesser coefficient of thermal expansion than the second structural member, the compensation joint comprising:

(a) a cylindrical protrusion formed on the first structural member;

(b) a cavity formed in the second structural member for slidably receiving the protrusion;

(c) a groove circumscribing the exterior surface of said protrusion, said groove having inwardly converging sides and a bottom surface, the inwardly converging sides forming an angle having an apex that is coincident with the longitudinal axis of said protrusion;

(d) two arcuate ring sections, each of said arcuate ring sections having an arc that is less than one-half the circumference of said protrusion and each arcuate ring section being



seated within said groove and constructed of material having the same coefficient of expansion as the second structural members, each expansion member having a trapezoidal cross-sectional configuration with two converging sides tha form an angle identical to the angle formed by the sides of said groove and that cooperate with the sides of said groove so that upon heating of the compensation joint, said expansion members expand to slide up the sides of said groove to maintain a tight fit between said projection and the second structural member; and

(e) coupling means for coupling the first structural member to the second structural member.

4,854,766

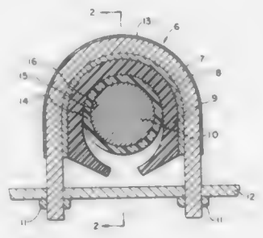
SLIP BEARING FOR A SWAY BAR CLAMP

Richard D. Hein, Wabash, Ind., assignor to GenCorp Inc., Fairlawn, Ohio

Filed May 12, 1988, Ser. No. 193,014

Int. Cl.[4] F16C *11/00*

U.S. Cl. 403—224 14 Claims



1. A clamp for resiliently mounting a cylindrical metal part, such as a sway bar, comprising:

(a) a generally cylindrically-shaped elastomeric innerliner which is designed to at least partially surround the outer cylindrical surface of a cylindrical metal part;

(b) means coacting between the innerliner and part for shifting the interface of slippage between the clamp and part away from the outer metallic surface of the part to the inner cylindrical surface of the innerliner closest the part, the means including:

(c) a hollow cylindrical elastomeric sleeve which is separate from the innerliner and which surrounds and is interspersed between the part and innerliner; and

(d) means coacting with the sleeve for decreasing frictional engagement between the sleeve and innerliner to a level which is substantially lower than the frictional engagement level between the sleeve and metal part.

4,854,767

ASSEMBLY-TYPE BARRICADE

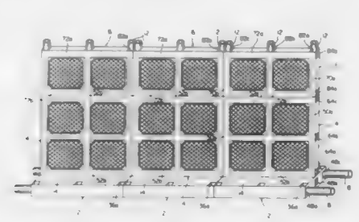
Mitsuo Sasaki, Yamato, Japan, assignor to Just Japan Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1988, Ser. No. 149,278

Claims priority, application Japan, Feb. 13, 1987, 62-29560

Int. Cl.[4] E01F *13/00*

U.S. Cl. 404—6 2 Claims



1. An assembly-type barricade comprising a base stand which is set as desired, and an upright wall which is mounted detachably on the base stand, wherein

a plurality of assembling protrusions spaced from each other in a predetermined direction are provided in the bottom surface of the upright wall,

a plurality of assembling through holes spaced from each other in a predetermined direction are formed in the base stand in correspondence to the plural assembling protrusions

linking lateral holes are formed respectively in the plural assembling protrusions so as to extend therethrough, linking lateral holes are formed in the upper end portion of the upright wall so as to extend therethrough, and linking lateral holes are formed in the plural assembling through holes of the base stand so as to extend therethrough,

linking vertical holes extending vertically through the upright wall and the plural protrusions are formed in the upright wall in correspondence to the plural protrusions,

said plural protrusions of the upright wall being detachably insertable through the plural through holes of the base stand to a position where the linking lateral holes formed in the plural assembling protrusions and the linking lateral holes formed in the base stand are aligned laterally, and at the same time the plural linking vertical holes communicate with the plural through holes of the base stand,

said plural protrusions of the upright wall being detachably insertable through the plural linking vertical holes of another said upright wall to a position where the linking lateral holes formed in the plural protrusions of the upright wall and the linking lateral holes formed in said another upright wall are aligned laterally, and at the same time the plural linking vertical holes of the upright wall and the plural linking vertical holes of said another upright wall communicate with each other vertically.

4,854,768

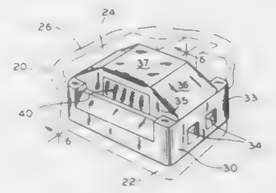
DEPRESSIBLE ROADWAY MARKER

Robert M. Flanagan, Lincolnshire, and Sidney A. Heenan, Park Ridge, both of Ill., assignors to Amerace Corporation, Parsippany, N.J.

Continuation-in-part of Ser. No. 778,491, Sep. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 728,835, Apr. 30, 1985, abandoned. This application Jun. 4, 1987, Ser. No. 58,037

Int. Cl.[4] E01F *9/06*

U.S. Cl. 404—11 17 Claims



1. A reflector assembly for use in an associated metal housing to provide a road surface marker, the associated metal housing having a generally rectangular cavity with a horizontal base formed therein, front and rear walls structured and dimensioned to the positioned perpendicular to the direction of traffic when said metal housing is secured to the road surface, and opposed side walls provided with integral attachment fingers extending into the cavity, said reflector assembly comprising:

a resilient elastomeric core structured and dimensioned to be removably positioned in said metal housing and to extend in a normal operative position above said metal housing,

said core being formed of Neoprene which includes a lubricant therewithin,

said core including a hollow base portion of generally rectangular cross-section, and an upper lens housing portion,

said hollow base portion having a front wall, a rear wall, and a pair of oppositely disposed side walls, each said side wall having apertures therein structured and dimensioned to register with and receive said opposing pairs of attachment fingers of said metal housing side walls when said core is positioned in said metal housing cavity;

said lens housing portion including generally parallel front and rear walls parallel to said front and rear walls of said metal housing and including opposed inwardly inclined side walls extending upwardly from said base side walls and joined to a generally flat upper wall,

at least one of said front or rear walls of said wall portion being provided with an inwardly extending wiper blade extending substantially from one side wall to the other side wall;

a lens retainer block integral with said lens housing portion, said retainer block having a recess therein structured and dimensioned to receive an elongated lens member,

said lens member having a generally flat front face terminating in a radiused lowermost edge and being provided on the rear face thereof with a plurality of cube-corner type reflecting elements for reflecting light incident on said front face generally parallel and back to the source thereof,

said lens member being formed of a synthetic organic resin and further being provided with an outer light transmitting protective surface generally coextensive with the reflective area of said lens member, said outer surface being formed of a more abrasion resistant material than said lens member, whereby upon placement of said core in the associated metal housing, engagement of said upper lens housing portion by a vehicle tire will cause said upper body portion to be forced through a range of movement

into said hollow are provided by said base member and into the cavity defined by said associated housing,

said lens member and the associated abrasive resistant surface thereon effecting a wiping and debris cleaning movement against said wiping blade formed on said base member during said movement,

said lens housing portion resiliently returning to said normal operative position thereof when disengaged by said vehicle tire.

4,854,769

SYSTEM FOR PAVING INCLINED AND/OR CURVED SURFACES

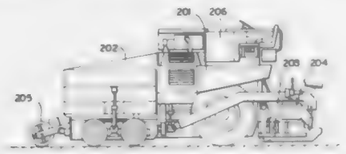
Mitsuo Fukukawa, Saitama; Masayuki Yazawa, Chiba; Kazumitsu Asai; Yoshiharu Okamoto, both of Saitama, and Koubei Mio, Kanagawa, all of Japan, assignors to Kajima Corporation, Tokyo, Japan and Kazima Road Company, Tokyo, Japan

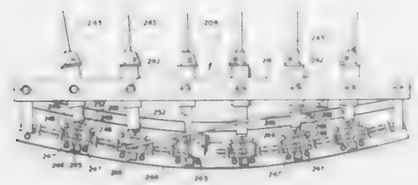
Filed Feb. 16, 1988, Ser. No. 155,905

Claims priority, application Japan, Feb. 26, 1987, 62-41500; Feb. 26, 1987, 62-26428[U]

Int. Cl.[4] E01C *19/00, 19/22, 23/07*

U.S. Cl. 404—72 10 Claims





1. A method for paving a three-dimensional curved surface with a crawler truck which is associated with a travel distance measuring means for providing distance-indicating output signals which are indicative of the position of the crawler truck along its path of travel, pavement laying means attached to the crawler truck for uniformly laying a paving material,

said pavement laying means having a surface which is curved in a vertical plane tranverse to said path of travel and a plurality of jacks which are vertically movable, transversely pivotable, and are operable to adjust the shape of the curved surface, and a microcomputer means provided with stored curved surface shape data which correspond to measuring points along the travel path of the pavement laying means,

said method including the steps of receiving, at said microcomputer means, said output signals from the travel distance measuring means; generating computer output signals based on said curved surface shape data; and, controlling the jacks based on said computer output signals to change the curvature of said curved surface.

5. A system for paving a three dimensional curved surface comprising a crawler truck, a travel distance measuring means for providing output signals indicating the position of the crawler truck along its path of travel, and pavement laying means attached to the crawler truck for uniformly laying a paving material,

said pavement laying means having a surface which is curved in a vertical plane traverse to said path of travel, and a plurality of jacks which are vertically movable, transversely pivotable, and are operable to adjust the shape of the curved surface,

a microcomputer means provided with stored curved surface shape data which correspond to measuring points along the travel path of the pavement laying means,

said microcomputer means receiving said output signals from the travel distance measuring means,

said microcomputer means also generating computer output signals which control the jacks based on said stored curved surface shape data to change the curvature of said curved surface.

4,854,770

METHOD AND APPARATUS FOR REMOVAL OF SURFACE MATERIAL

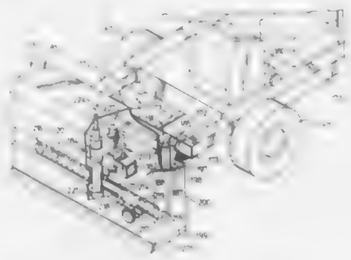
Ryszard J. Pachala, Scarborough, and Stephen J. Miko, Toronto, both of Canada, assignors to Indescor Hydrodynamics Inc., Concord, Canada

Continuation-in-part of Ser. No. 722,454, Apr. 12, 1985, Pat. No. 4,640,644. This application Dec. 31, 1986, Ser. No. 948,133

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.[4] E01C *23/12*

U.S. Cl. 404—75 27 Claims



1. Apparatus for removing material from a work surface and for use in association with a source of water at a pressure within the range of from about 10,000 to about 25,000 psi, which apparatus comprises:

a support structure adapted to be stationarily disposed on a supporting surface;

extendible arm means mounted on said support structure for movement along a first linear path in only a first direction generally parallel to the work surface and away from and toward said support structure with said support structure stationarily disposed on the supporting surface;

power operated extension means attached to said support structure and to said arm means and operable to extend and retract said arm means relative to said support structure along said first linear path;

nozzle support means secured to said arm means at a position spaced apart from said support structure and in such a manner that said nozzle support means is retained in a fixed position relative to said arm means on operation of said extension means, and said nozzle support means extending angularly to said arm means in a second direction angularly oriented with respect to said first direction;

a rotatable nozzle means mounted on said nozzle support means for rotation about a nozzle axis angularly disposed with respect to the work surface and for movement along said nozzle support means in said second direction, at least one discharge orifice being provided in said nozzle means for the discharge of water under pressure therefrom in a direction angularly disposed with respect to said nozzle axis whereby water, on discharge from said nozzle means and on rotation of said nozzle means about said nozzle axis, defines an expanding cone-shaped configuration for impingement on the work surface;

a nozzle drive means attached to said rotatable nozzle means and to said nozzle support means and adapted to move said rotatable nozzle means in both directions along a second linear path in said second direction generally parallel to the work surface with said nozzle means in spaced apart disposition relative to the work surface and with said support structure stationarily disposed on the supporting surface;

spacing means for maintaining said nozzle means at a desired separation from the work surface on operation of both said extension means and said nozzle drive means; and

control means operatively associated with said extension means and said nozzle drive means to cause said nozzle drive means to move said rotatable nozzle means alternately in opposite directions along said second linear path and to move said arm means along said first linear path so that water discharging from said nozzle means impinges the work surface in sequential bands.

16. A method for removing material from a work surface which comprises the steps of:

pressurizing water to a pressure within the range of from about 10,000 to about 25,000 psi;

discharging said water under pressure through a movable and rotatable nozzle means supported on a stationary structure by an extendable arm means mounted on said stationary structure for movement along a first linear path in a first direction generally parallel to the work surface and away from and toward said stationary structure and by a nozzle support means secured to said arm means at a position spaced apart from said stationary structure and extending angularly to said arm means in a second direction angularly oriented with respect to said first linear path, said arm means being secured to said stationary structure and said nozzle support means being secured to said arm means in such a manner that said nozzle support means is retained in a fixed position relative to said arm means on movement of said arm means along said first linear path, said stationary structure being disposed on a supporting surface, and said nozzle means being spaced apart from said work surface and having at least one water discharge orifice disposed so that said discharge occurs in a direction angularly oriented with respect to an axis of said nozzle means;

rotating said nozzle means about said axis thereof whereby said water on said discharge from said nozzle means defines an expanding cone-shaped configuration impinging said work surface;

moving said nozzle means relative to said stationary structure along a second linear path in said second direction generally parallel to the work surface between extreme positions therealong so that said water discharging from said nozzle means impinges said work surface in a first band;

moving said nozzle means relative to said stationary structure along a first linear path in said first direction and generally parallel to the work surface and angularly disposed with respect to said second linear path;

again moving said nozzle means across said work surface along a said second linear path to define a second band;

repeating said movements of said nozzle means along said first and second linear paths a predetermined number of times until the entire work surface has been treated; and

maintaining said nozzle means at a predetermined distance from said work surface throughout the entire treatment of said work surface.

4,854,771

METHOD OF INSTALLING PREFORMED PAVEMENT MATERIALS INTO ASPHALT SURFACES

Maxwell H. Corbin, Jr., 6234 Deeside Dr., Dublin, Ohio 43017, and Peter D. Butler, 2063 W. Lane Ave., Columbus, Ohio 43211

Filed May 9, 1988, Ser. No. 191,665

Int. Cl.[4] E01C *7/06*

U.S. Cl. 404—79 4 Claims

1. A method of installing preformed pavement marking material on an asphalt surface which comprises exposing the area of said asphalt surface which is to receive said preformed pavement marking material to a source of infrared radiation at an energy level and for a sufficient period of time to raise the temperature of said area of said asphalt surface to a temperature sufficient to soften said area of said asphalt surface to an extent such that said preformed pavement marking material may be pressed into said area of said softened asphalt surface to a depth of approximately 50 percent to 75 percent of the thickness of said preformed pavement marking material, removing said source of infrared radiation, and then pressing said preformed pavement marking material into said softened asphalt surface to a depth of approximately 50 percent to 75 percent of the thickness of said preformed pavement marking material.

4,854,772

METHOD TO MANUFACTURE COMPACTOR AND COMPACTOR MANUFACTURED BY THE METHOD, AND COMPACTOR SERIES

Matti Sinkkonen, Vaajakoski, Finland, assignor to Tana Jyra Ky, Finland

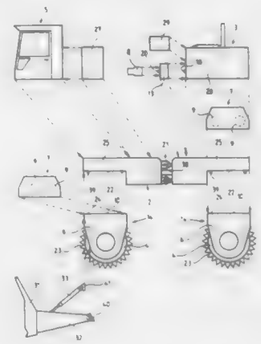
PCT No. PCT/FI85/00060, § 371 Date Mar. 19, 1986, § 102(e) Date Mar. 19, 1986, PCT Pub. No. WO86/00654, PCT Pub. Date Jan. 30, 1986

PCT Filed Jun. 28, 1985, Ser. No. 847,180

Claims priority, application Finland, Jul. 4, 1984, 842678

Int. Cl.[4] E02D *3/026*

U.S. Cl. 404—121 16 Claims



1. A method of providing a series of diverse sizes of compacting vehicles for use in compacting earth, tailings, and the like, each such vehicle consisting essentially of four types of sub-assemblies, namely a chassis, an engine, cylinder shaped drums, and a power transmission sub-assembly for transmitting rotary motion of the engine to one or more of the drums, wherein the size of each vehicle is the total weight of the sub-assemblies constituting the vehicle, each sub-assembly adapted for modular mounting to one or more sub-assemblies of a different type so as to form a said vehicle of the series, wherein the method includes the steps of providing at least two sizes of each of said drum and engine sub-assemblies, and providing, for each compactor vehicle of the series, the following sub-assemblies:

an engine of a size substantially directly proportional to the size of the vehicle,

drums, the width dimension of each said drum being selected to that the combined widths of the drums of the vehicle are substantially directly proportional to the size of the vehicle; and

a power transmission sub-assembly comprising one or more substantially identical power transmission units, wherein the number of such units is in direct proportion to the size of the said compactor,

wherein the proportion of vehicle size to the size, combined drum widths or number, of its engine, drums or power transmission sub-assemblies, respectively, is a constant which is substantially the same for all different vehicles of the series, and wherein the largest vehicle of the series weighs at least about 1.5 times the weight of the smallest vehicle of the series.

6. A compactor vehicle for compacting refuse and other compacting tasks, the essential parts of the compactor being chassis, engine, cylinder-shaped drums, and a power transmission assembly for transmitting rotary motion of the engine to one or more drums, wherein the said essential parts of the compactor are provided in a plurality of different sizes or plural parts each adapted for assembly together with other said essential components so as to form compactors of different sizes, the size of a said vehicle being the total weight of the essential parts forming the vehicle, and wherein a said compactor is assembled of said essential components selected such that:

the size of the engine of the compactor vehicle is substantially directly proportional to the size of the vehicle;

the combined width dimensions of the drums of the vehicle are substantially directly proportional to the size of the vehicle; and

the power transmission assembly comprises a plurality of identical power transmission units, the number of such units being selected in direct proportion to the size of the vehicle, wherein the range of different sizes of said essential parts is such that at least one further vehicle of a different size may be assembled by selecting at least some different essential parts while maintaining substantially identical proportions of vehicle size to the engine size, combined width dimensions of the drums, and number of power transmission units, respectively, of said at least one further vehicle; and wherein the range of different sizes of said essential parts is such that two vehicles of different sizes may be assembled therefrom having total weights in the ratio of at least about 1.5:1.

4,854,773

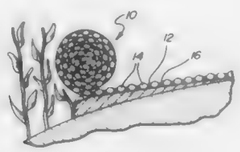
BEACH CARPET

James D. Nicoll, 829 Randall, Troy, Mich. 48098

Filed Jun. 20, 1988, Ser. No. 208,999

Int. Cl.[4] E02B *3/12*

U.S. Cl. 405—19 **7 Claims**



1. A flexible, rollable mat adapted to be unrolled along a surface supporting a body of water, said mat comprising:

a flexible, generally sheet-like matrix fabricated from a polymeric material and having a plurality of discrete particles of a weighting material retainably embedded therein, the density and amount of said weighting material being sufficient to cause the mat to sink beneath the body of water; said mat further including a plurality of spaced apart openings extending therethrough and configured to allow passage of water and gas therethrough.

4,854,774

PROCESS FOR IMPLANTATION OF AQUATIC ARTIFICIAL SUBSTRATES, STRUCTURES FOR THE IMPLANTATION, AND DEVICE FOR OPERATING THE PROCESS

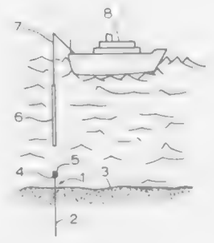
Antonius Streicheuberger, St Pourcain sur Besbre, 03290 Allier, France

Filed Mar. 9, 1987, Ser. No. 23,188

Claims priority, application France, Mar. 28, 1986, 86 04732

Int. Cl.[4] E02B *3/00;* **A01K** *61/00*

U.S. Cl. 405—25 **11 Claims**



1. A method for implantation of an artificial substrate into a sedimentary water bottom comprising the steps of

attaching a first end of a long flexible mooring element to an artificial substrate unit;

positioning an excavating pipe adjacent the long flexible mooring element and substrate unit;

detachably connecting a second end of the long flexible mooring element to a lower end of the excavating pipe;

lowering the excavating pipe with the mooring element and substrate unit connected thereto into the sedimentary water bottom while forcing fluid through the pipe and out the lower end;

discontinuing the forcing of fluid through the pipe and stopping the lowering of the excavating pipe with the mooring element when the artificial substrate unit is positioned at a predetermined level above the sedimentary water bottom;

detaching the mooring element from the excavating pipe; and

raising the pipe out from the sedimentary water bottom allowing sediment to encompass and secure the long flexible mooring element.

4,854,775

PRECAST CONCRETE CULVERT SYSTEM

William D. Lockwood, Dayton, Ohio, assignor to Con/Span Culvert Systems, Inc., Dayton, Ohio

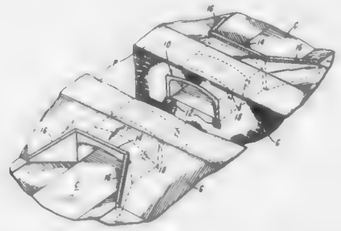
Continuation-in-part of Ser. No. 86,064, Aug. 17, 1987, Pat. No. 4,797,030, which is a continuation-in-part of Ser. No. 853,206, Apr. 17, 1986, Pat. No. 4,687,371, which is a continuation of Ser. No. 566,438, Dec. 28, 1983, Pat. No. 4,595,314. This application Feb. 29, 1988, Ser. No. 161,499

The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.

Int. Cl.[4] E01F *5/00*

U.S. Cl. 405—126 **12 Claims**

1. A concrete culvert assembly comprising a set of parallel spaced elongated footers, a plurality of precast concrete culvert sections supported by said footers in predetermined alignment, each of said culvert sections having an open bottom and including parallel spaced vertical side walls having bottom surfaces supported by said footers, an arcuate concrete top wall integrally connected to each of said side walls of each said section, said side walls of each said section having opposing inner surfaces defining a span substantially greater than the length of said side and top walls, said arcuate top wall of each section having a generally uniform thickness with a curved inner surface having a radius of curvature at least twice the rise between the top center of said curved inner surface and said bottom surfaces of said side walls, each of said side walls of each said section having a generally uniform thickness and a substantially flat vertical outer surface with a vertical height between fifty-five and ninety percent of said rise and less than



fifty percent of said radius of curvature, said concrete top wall of each said section having a curved outer surface forming a relatively sharp corner with said outer surface of each said side wall, reinforcing members embedded in said concrete of each said section and extending generally parallel to said outer surfaces of said top and side walls, and said inner surface of each said side wall and said inner surface of said top wall of each said section being connected by a surface cooperating with said relatively sharp corner to define a corner thickness substantially greater than the uniform thickness of said side and top wall.

4,854,776

PROCESS AND APPARATUS FOR LINING A TUNNEL WITH CONCRETE

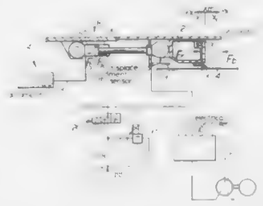
Volker Hentschel, Hildesheim-Itzum; Clemens Versteegen, Essen; Olaf Mahmens, Essen-Heisingen, and Siegmund Babendererde, Lübeck-Travemünde, all of Fed. Rep. of Germany, assignors to Hochtief Aktiengesellschaft Vorm. Gebr. Helfmann, Essen, Fed. Rep. of Germany

Filed Jul. 12, 1988, Ser. No. 218,240

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723625

Int. Cl.[4] E21D *9/06, 11/00*

U.S. Cl. 405—147 **5 Claims**



3. An apparatus for lining a tunnel with concrete, comprising:

a tunneling head advanced in a subterranean structure to form a tunnel wall, said head being provided with a shield lying generally along said wall and having an inner surface;

a tunnel-lining form spaced inwardly from said wall and extending therealong so that an outer surface of said tunnel-lining form defines with said wall a lining compartment into which concrete is pumped;

a form front disposed between said inner and outer surfaces, movable with said head and displaceable independently thereof along said surfaces in a direction of advance of said head, said form front having seals engaging said inner and outer surfaces with friction forces;

hydraulic means braced between said head and form front for applying countervailing force to said form front to balance said direction forces so that said form front is displaced in said direction substantially exclusively by the pressure of concrete pumped into said compartment;

means for measuring a force required to displace said form front in said direction upon termination of the pumping of concrete into said compartment and advance of said shield whereby the determined force is a measure of said friction forces; and

means for adjusting said hydraulic means in response to the measurement of the friction forces so that upon further pumping of concrete into said compartment, said form front is displaced substantially exclusively by the pressure of the concrete pumped into said compartment.

4,854,777

MECHANICAL CONNECTOR

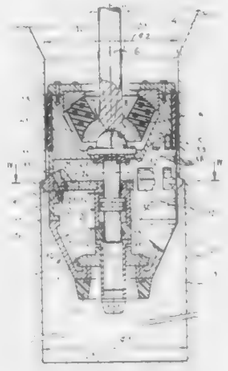
Francois Lemoine, Nantes, and René Rathouit, Saint Sebastien, both of France, assignors to Alsthom, Cedex, France

Filed Jan. 13, 1988, Ser. No. 143,536

Claims priority, application France, Jan. 13, 1987, 87 00272

Int. Cl.[4] E02B *17/02*

U.S. Cl. 405—202 **8 Claims**



1. A mechanical connector for securing a tension-leg platform tether to an anchoring point, said connector consisting of a male connector linked to the tether and penetrating a female receptacle forming part of the anchoring point and having a top rim and a necked upper portion forming a circular internal shoulder, said male connector including a cylindrical body comprising means for connection to said tether, the improvement wherein said cylindrical body comprises a cylindrical wall defining an internal cavity, means forming a circular series of openings within the cylindrical wall to the outside, a dog receivable in each opening, said dog having at least a top face and a bottom face, said dog being operable to assume a first, extended position radially abutting the wall of said body and bearing upon the bottom surface of said wall at said opening, in which position said dog projects radially beyond the cylindrical outside wall of the male connector and elastic, radially outthrusting means for urging said dog radially beyond the cylindrical outside wall, each dog having an external inclined face sloping such that one moves away from the male connector's centerline in moving up said inclined face, said dog

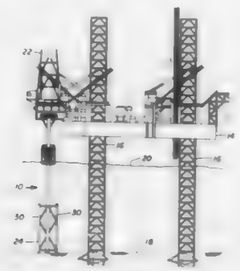
being operable to assume a second position, of automatic retraction during connector descent, by said inclined face of said dog bearing against the top rim of the female receptacle, each dog further comprising an inclined ramp acting as a cam and a drive pin operatively engaging said ramp whereby vertical upward motion, by said pin's pushing and sliding against said ramp, causes the dog to retract, and means connected to all the pins for enabling their common vertical displacement.

4,854,778

CAISSON TOWER PLATFORM AND METHOD OF SETTING SAME

Ernesto D. Valenzuela, Houston, Tex., assignor to Cameron Iron Works USA, Inc., Houston, Tex.

Filed Sep. 4, 1987, Ser. No. 93,303
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—204 **15 Claims**



1. The method of setting a caisson structure for a subsea production well comprising the steps of

locating a jackup rig on the water surface in position over a preselected subsea well site with its legs on bottom,

delivering a caisson structure to the jackup rig,

said caisson structure having a central caisson which is tubular, a base with a plurality of tubular legs spaced around said central caisson, support braces extending between said legs and said central caisson, said central caisson being sufficiently long to extend from the subsea production well on the bottom to a position above the surface of the water and sufficiently large in diameter to allow drilling therethrough and to accommodate a plurality of production strings extending therethrough,

picking said caisson structure up with said jackup rig so that it is vertically positioned,

lowering said caisson structure to the bottom with its central caisson in surrounding relationship to said preselected subsea well site,

setting piles through the tubular legs of said caisson structure,

connecting production strings extending through said central caisson to production equipment above the water surface at the upper end of said caisson structure,

filling the interior of said central caisson around the exterior of the production strings positioned therein with cement to strengthen the central caisson with the added strength of the production strings.

4,854,779

INSTALLATION OF MULTIPIECE JACKETS USING MATING PINS

William H. Luyties, Kingwood, Tex., assignor to Shell Offshore Inc., Houston, Tex.

Filed Dec. 14, 1987, Ser. No. 132,749
Int. Cl.[4] E02B *17/00*; E02D *21/00*
U.S. Cl. 405—205 **25 Claims**

1. An offshore platform mating system for joining on site a prefabricated jacket upper section to a prefabricated jacket lower section in the installation of an offshore platform, said system comprising:

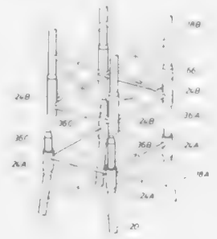
a plurality of upwardly open lower receptacles, each provided as an upper extension of one of a plurality of first leg portions of the jacket lower section;

a plurality of mating pins, each receivable within one of the lower receptacles to project upwardly a docking pole from the first leg portions of the jacket lower section;

a plurality of downwardly open upper receptacles, each provided as a lower extension of one of a plurality of second leg portions of the jacket upper section and disposed to receive one of the upwardly projecting docking poles; and

means for securing the jacket upper section to the jacket lower section.

16. A method for assembling an offshore platform upon a floor of a body of water, comprising:



A. securing a jacket lower section having a plurality of first-stage leg portions to the floor of the body of water;

B. installing a plurality of mating pins into a plurality of corresponding substantially vertical upwardly open lower receptacles presented upon the tops of the first-stage leg portions of the jacket lower section, the mating pins being installed so as to project a docking pole upwardly from the jacket lower section;

C. mating a jacket upper section to the jacket lower section by lowering a plurality of downwardly open upper receptacles presented on the lower end of second-stage leg portions over the docking poles and seating the jacket upper section upon the jacket lower section; and

D. securing the jacket upper section to the jacket lower section.

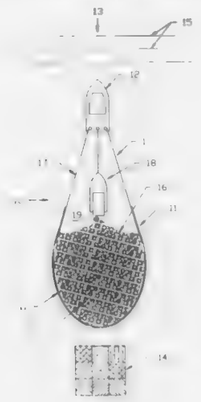
4,854,780

SYSTEM AND METHOD OF DAMPING WAVES ON A BODY OF WATER USING TOWABLE FIELD OF ICE PIECES OF RANDOM SIZES

Winston G. Hewlings, R.R. 1, Box 448, Rte. 36, Swainton, Vt. [redacted]

Filed Dec. 14, 1987, Ser. No. 132,607
Int. Cl.[4] E02B *3/04*
U.S. Cl. 405—211 **20 Claims**

1. A wave damping system for use on a water surface, said system comprising a floating collar structure capable of being oriented to define a restraining area, shield means connected to said collar structure to maintain ice pieces in said restraining area, attachment means for securing said collar structure to a positioner element to maintain said collar structure in a substantially stationary location on a body of water at a predetermined position relative to an offshore or onshore element to be protected, an ice making device positionable relative to said collar structure for making and releasing said ice pieces inside said restraining area to form a stabilizing field of said ice pieces in at least a portion of said restraining area whereby to dampen



waves in said restraining area by said field of ice pieces to dampen waves in the direction of said offshore element.

4,854,781

VARIABLE RIGIDITY ELEMENT FOR TRANSFER COLUMN FOOT

Charles Sparks, Le Vesinet, and Pierre Odru, Fontenay Sous Bois, both of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Jun. 17, 1988, Ser. No. 208,211
Claims priority, application France, Jun. 18, 1987, 87 08563
Int. Cl.[4] E02D *5/74, 5/54*
U.S. Cl. 405—224 **5 Claims**



1. A variable rigidity element allowing for connection between an extremity of a line and a fixed installation comprising:

a plurality of shells each having an elongated form to extend along said line a distance from said installation and a cross section at the installation which has one side longer than another side;

said shells having upper parts shaped so that two successive shells have a given circumference, said upper parts that are extremities of the shells and further from said installation being separated to avoid touching each other; and

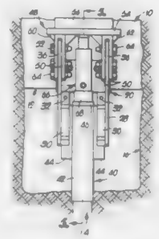
the upper part of at least one shell having an ogive shape.

4,854,782

APPARATUS FOR LIFTING STRUCTURES

Donald R. May, Independence, Mo., assignor to Sandra L. May, Independence, Mo.

Filed Nov. 25, 1987, Ser. No. 125,188
Int. Cl.[4] E02D *27/48*
U.S. Cl. 405—230 **1 Claim**



1. Apparatus for lifting and supporting a building structure having a base comprising:

a vertically positioned pier driven in the ground adjacent the building structure and having an upper end proximal to the base of the building structure;

a sleeve fitted over the upper end of the pier, said sleeve including a pair of opposed, vertically oriented plates extending laterally from said sleeve;

a shoe attached to the base of the structure, said shoe including means mating with said plates for inhibiting lateral movement of said shoe relative to said sleeve during vertical movement of said shoe along said sleeve;

temporary lifting means between the sleeve and the shoe; and

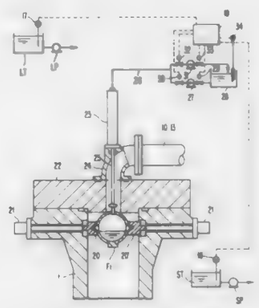
permanent supporting means including means connected to said mating means for abutting said plate to support the structure in its final, desired position.

4,854,783

VERTICAL HYDRO-HOIST WITH ADJUSTABLE FLOATS AND METHOD OF OPERATING THE SAME

Kenji Uchida, Kashiwa; Nobuyuki Banba, Ibaraki; Minoru Kuroiwa, Abiko; Makoto Saito, Ibaraki, and Yukishige Kamino, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,476
Claims priority, application Japan, Mar. 20, 1987, 62-63817
Int. Cl.[4] B65G *51/34*
U.S. Cl. 406—13 **14 Claims**



4. A specific gravity adjusting apparatus for a float means in a hydro-hoist, the apparatus comprising:

means for temporarily holding said float means at a predeter-

mined position in a chamber means of said hydro-hoist, and

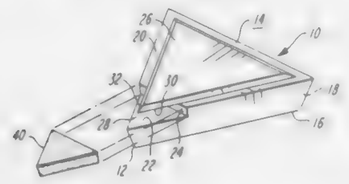
means for supplying and discharging a specific gravity adjusting liquid into and out of said float means.

4,854,784

DIAMOND TIPPED CHIP CONTROL INSERT

Gerald D. Murray, Raleigh, N.C.; Shelby R. Gibson; Keith J. Carpenter; Kenneth E. Carpenter, and Michael R. Carpenter, all of Liberty Center, Ohio, assignors to Kennametal Inc., Latrobe, Pa.

Filed Oct. 19, 1988, Ser. No. 259,690
Int. Cl.[4] B23B *27/20, 27/22*
U.S. Cl. 407—114 9 Claims



1. An improved metalcutting insert comprising a substrate defining a forward end, an upper surface, a bottom surface and means defining a substantially continuous side wall therebetween, said upper surface having a first portion, a second portion and a third portion, said first portion being of a predetermined first elevation relative to said bottom surface and defining a rake face, said second portion being at a second elevation relative to said bottom surface and defining a floor portion and said third portion being at a third elevation and defining chip breaking means integral with the remainder of said substrate; said first, second and third portions of said upper surface defining therein means forming a slot between said integral chip breaking means and floor portion, said slot extending rearwardly from said forward end; and means defining a cutting edge adapted to be mounted in said slot means, so that at least a portion of said cutting edge means forms said rake face and at least a portion of said integral chip breaking means extends over said cutting edge means.

4,854,785

SCALLOPED THREADER CUTTING INSERT

Tony Lowe, Royal Oak, and Thomas Bernadic, Madison Hts., both of Mich., assignors to GTE Valenite Corporation, Troy, Mich.

Filed Aug. 17, 1987, Ser. No. 85,840
The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.
Int. Cl.[4] B23B *27/16*
U.S. Cl. 407—115 1 Claim



1. A thread-cutting insert comprising a pair of parallel faces and a plurality of peripheral side surfaces extending therebetween,

a plurality of outwardly projecting cutting teeth being formed by at least one peripheral surface intermediate said pair of parallel faces, each tooth comprises a forward cutting edge and a pair of side cutting edges whereby a plurality of said forward cutting edges and respective side edges form respective teeth, and a plurality of rearward edges for joining respective side cutting edges of successive teeth,

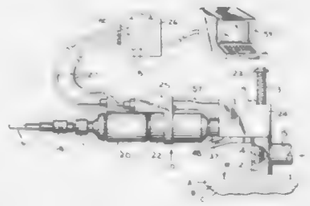
a plurality of scallops, each scallop having a bottom surface extending rearwardly of a pair of adjacent forward cutting edges and an arcuate backwall extending upwardly from said bottom wall to one of said parallel faces whereby a respective arcuate backwall of one scallop intersects a respective arcuate back of an adjacent scallop at a position located at least partially on a cutting tooth closely adjacent said cutting edge for controlling the flow of chips away from the cutting edge, said peripheral side surface being at an acute angle with said bottom wall for forming a positive rake at said forward cutting edges.

4,854,786

COMPUTER CONTROLLED AUTOMATIC SHIFT DRILL

Robert H. Alexander, Columbia; Thomas M. Osmer, Lexington, and James W. Neely, Columbia, all of S.C., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed May 26, 1988, Ser. No. 199,065
Int. Cl.[4] B23B *47/24, 35/00*
U.S. Cl. 408—1 R 20 Claims



1. A mechanism for forming a workpiece with a tool comprising:

a means for rotationally driving the tool at one of two speeds;

a means for sensing a force applied to the tool;

a first means for comparing the sensed force to a first threshold value;

means for shifting the speed of said means for driving in response to the first means for comparing; and

means, responsive to the sensed force, for periodically redefining the first threshold value.

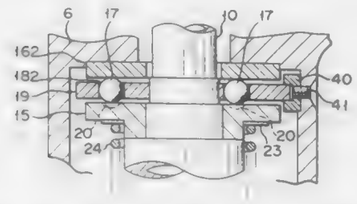
4,854,787

BORING DEVICE

Yasumasa Ooki; Osamu Asano, and Toshio Mikiya, all of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Division of Ser. No. 082,339, Aug. 6, 1987, Pat. No. 4,770,569.
This application Jun. 2, 1988, Ser. No. 203,292
Claims priority, application Japan, Sep. 9, 1986, 61-210601; Sep. 9, 1986, 61-210602; Sep. 9, 1986, 61-210605
Int. Cl.[4] B23B *47/34*
U.S. Cl. 408—17 2 Claims

1. A boring device having a casing, a tool spindle supported in said casing and movable in axial directions thereof, one direction being a feed direction and the other direction being a return direction, said tool spindle having an axis and being biased in said return direction, said tool spindle holding a cutter having cutting edges, and spindle moving means disposed between said casing and said spindle intermittently moving said tool spindle in said return direction every time said tool spindle rotates through a predetermined angle about said axis of said tool spindle for breaking a chip at a predetermined length, said spindle moving means comprising at least three rolling elements, first thrust means disposed coaxially with said tool spindle and having a track surface extending circumferentially of said first thrust means, said track surface having a single track, said rolling elements being arranged to roll on said single track, and recesses being formed complementary to said rolling elements and having such a depth that said cutting edges of said cutter are separated from a surface being cut of a



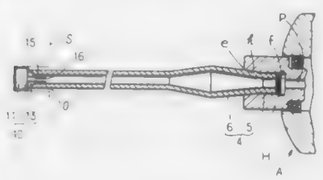
workpiece when said rolling elements are received in said recesses, second thrust means cooperating with said rolling elements, and rolling element retaining means for maintaining equal central angles defined by adjacent ones of said rolling elements with respect to said axis of said tool spindle, one of said first and second thrust means being fixed to said tool spindle, the other one of said first and second thrust means being fixed to said casing, and a guide tip provided between said casing and said rolling element retaining ring for guiding rotation of said rolling element retaining ring.

4,854,788

DRILL

Hiroaki Okinaga, Tokyo, Japan, assignor to Nikken Tool Co., Ltd. and Yoshino Seiki Inc., both of, Japan

Filed Aug. 28, 1987, Ser. No. 90,666
Int. Cl.[4] B23B *51/04, 51/06*
U.S. Cl. 408—59 2 Claims



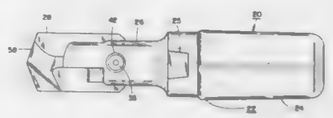
1. A drill comprising a hollow drill shank having a fluid passage and a substantially cone shaped leading end, and a cutting bit provided at the leading end of said drill shank and having a through hole communicating with said fluid passage of the drill shank, said drill shank being provided on a rear end portion thereof with a fitting portion composed of a threaded portion and a taper portion which is adjacent to said threaded portion and has an outer diameter which gradually increases toward the leading end of said drill shank, and said cutting bit being composed of two halves of cutting portions which are divided by a slit and a substantially cone-shaped connecting portion joining said cutting portions and connecting said cutting bit to said drill.

4,854,789

CUTTING TOOL ASSEMBLY

Nicholas Evseenko, Jr., Bayshore, N.Y., assignor to NYTD Industries Inc., Ronkonkoma, N.Y.

Filed Oct. 27, 1987, Ser. No. 114,120
Int. Cl.[4] B23B *27/16, 51/00*
U.S. Cl. 408—125 5 Claims



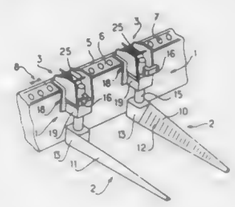
1. A cutting tool assembly, particularly for rail drills utilized for the drilling of holes through track rail; comprising; in combination; a generally cylindrical solid tool holder having a first end fastened in a rotary drive of said rail drill; a longitudinally extending slot being formed in a second end of said holder; clamping means extending transversely through said slot for selectively narrowing the width of said slot responsive to actuation of said clamping means; a cutting tool having a shank portion insertable into said slot for mounting said cutting tool on said holder, said clamping means fastening said cutting tool to said holder upon tightening of said clamping means, said slot having longitudinally extending groove means formed in facing surfaces of said slot, said shank portion of the cutting tool having opposite flat surfaces extendable into said slot in close surface proximity to the facing surfaces of said slot; and longitudinally extending beads being formed on said opposite flat surfaces of said cutting tool shank portion, said beads extending into said groove means in closely-fitted surface contact therewith, said clamping means including a screw member having a threaded screw portion threadingly engaged with a threaded bore in said cutting tool shank portion on one side of said slot remote from the head of said screw member, whereby tightening of said clamping means causes said cutting tool to be precisely aligned relative to the tool holder and minimize run out of said cutting tool during drilling operations.

4,854,790

VEHICLE WHEEL SUPPORT AND FASTENING DEVICE

Jean-luc Andre, Dangolsheim, France, assignor to Lohr Industrie, Haugenbieten, France

Filed Jan. 19, 1988, Ser. No. 145,619
Claims priority, application France, Jan. 16, 1987, 87 00816
Int. Cl.[4] B60P *3/07*
U.S. Cl. 410—30 14 Claims



1. A system for restraining a vehicle by its wheels, comprising:

stationary support structure;

at least one bracket adjustably movable along said support structure;

means defined between said at least one bracket and said support structure for locking said at least one bracket at a predetermined position along said support structure;

a restraining arm pivotably mounted upon said at least one bracket about an axis between a first storage position and

a second operative position at which said restraining arm engages one of said vehicle wheels; and

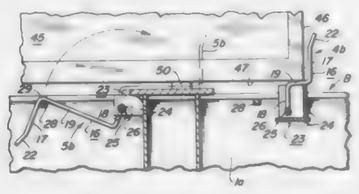
means integrally mounted upon said restraining arm for engaging said at least one bracket so as to limit the pivotal movement of said restraining arm from said storage position to said operative restraining position such that said restraining arm engages said vehicle wheel at said operative restraining position.

4,854,791

CONTAINER DOOR BARRICADE

James T. Brown, Central City, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 18, 1988, Ser. No. 182,598
Int. Cl.[4] B60P *7/13*; B61D *45/00*
U.S. Cl. 410—52 **15 Claims**



1. A container door barricade system for use with rectangular, end door cargo containers loaded on a freight deck of a freight vehicle, said container door barricade system comprising:

(a) a fixed door barricade assembly at the front and back ends of the freight deck, and

(b) at least one pivotal door barricade assembly positioned along the length of said freight deck between said fixed door barricade assemblies, said pivotal door barricade assembly capable of being rotated about a horizontal axis to an upstanding position above said freight deck and parallel to said fixed door barricade assemblies thereby blocking the doors of the cargo container or rotated about a horizontal axis to an inactive stored position at or below the level of the freight deck.

4,854,792

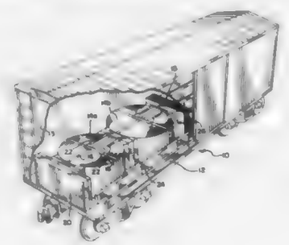
BRACING AND CUSHIONING SYSTEM AND METHOD FOR TRANSPORTING MASSIVE LOADS

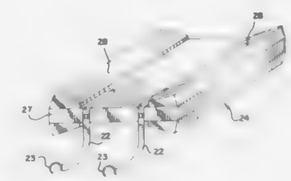
Mark A. Cottone, Bloomingdale, Ill., assignor to Cougar Package Designers, Inc., Elmhurst, Ill.

Filed Dec. 15, 1986, Ser. No. 941,627
Int. Cl.[4] B61D *45/00*
U.S. Cl. 410—118 **20 Claims**

11. A device for damping loads created by the sudden deceleration of massive and movable coils of sheet metal arranged in a row in a transport vehicle, comprising:

a non-inflatable reusable preformed resilient pad formed of elastomeric material having a base layer with two faces and a concave contour of said elastomeric material formed on at least one face shaped to generally match the contour of a side of a coil to generally surround the coil side, said pad having a density and thickness adapted to cushion and





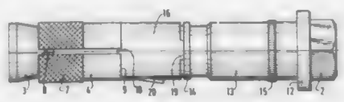
dampen the force of impact generated by a coil upon sudden deceleration of the transport vehicle.

4,854,793

CONE EXPANSION WALL PLUG

Jean Ollivier, Valence, and Roland Almeras, Tournon, both of France, assignors to Societe de Prospection et d'Inventions Techniques, Valence, France

Filed May 14, 1986, Ser. No. 863,066
Int. Cl.[4] F16B *13/06*
U.S. Cl. 411—49 **24 Claims**



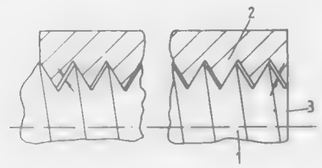
1. A cone expansion wall plug comprising a rod, at on end thereof a cone adapted for being driven with a translational movement by the rod and causing expansion of an expansible socket disposed about the rod and, disposed about the rod, a spacer and an intermediate ring in abutment against the space and the expansible socket, for immobilizing the socket, during expansion thereof against translation with respect to the rod, wherein said intermediate ring is axially and radially rigid and said expansible socket having an annular resilience groove which provides a portion of reduced outer diameter and forms a radial bearing shoulder for said intermediate ring, said expansion socket having at least one longitudinal slit extending through an end of said socket opposite said intermediate ring, said intermediate ring having anti-rotation indexing means extending into said slit.

4,854,794

CONNECTOR OF THE NUT-AND-BOLT TYPE

Klaus Oertel, Osterode/Harz, Fed. Rep. of Germany, assignor to Kamax-Werke Rudolf Kellermann GmbH & Co. KG, Osterode/Harz, Fed. Rep. of Germany

Filed Jan. 16, 1987, Ser. No. 3,734
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1986, 3601389
Int. Cl.[4] F16B *39/30*
U.S. Cl. 411—307 **10 Claims**



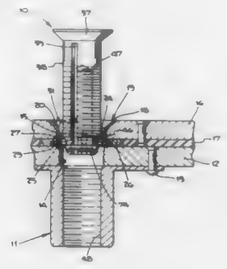
1. A fastening connector of the nut-and-bolt type, comprising: a bolt with an external thread; a nut with an internal thread; locking means providing frictional torque resisting any unscrewing torque and comprising said external thread and said internal thread having pitches differing by substantially 1% to 2%, said external thread and said internal thread extending over one another sufficiently for said frictional torque to occur when flank clearance between said external thread and said internal thread is completely occupied and exceeded due to forces occurring only during elastic resilient deformation of the external thread and the internal thread, so that said locking means is continuously reuseable; said locking means preventing unintended loosening of the nut and bolt; overlying thread portions of said bolt and said nut lying against one another only at two end regions and in opposite directions when said nut is screwed onto said bolt in absence of a workpiece between bolt and nut, threads between said end regions being free from abutting against each other and thereby being free from load carrying function.

4,854,795

SPRING FORM CAPTIVE PANEL FASTENER ASSEMBLY

John A. Duran, Glendora, Calif., assignor to Avibank Mfg., Inc., Burbank, Calif.

Filed Dec. 23, 1987, Ser. No. 138,723
Int. Cl.[4] F16B *21/18*
U.S. Cl. 411—352 **13 Claims**



1. In a captive panel fastener assembly comprising a bolt having an enlarged head at one end and a nose at the other end, a threaded shank on said bolt between said nose and said head, the improvement comprising:

a plurality of slots extending along said shank through the nose of said bolt;

a rigid washer having a plurality of inwardly extending tabs riding in said slots, the total number thereof being related to the total number of said slots;

an annular groove in said bolt adjacent the nose of said bolt and extending into the path of said slots;

an internal bore in said bolt extending from said nose to a point remote from said head with at least a pair of diametrically opposed grooves formed on the inner wall of said bore extending from said nose upwardly into said bore;

a bore slot in the wall of said bore communicating the interior of said bore with the exterior of said bolt;

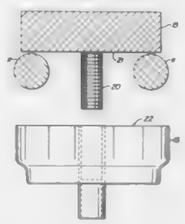
a hold out spring having an elongated portion fitting into said grooves in said inner wall of said bore with an integral hook portion extending out of said bore slot beyond the outer surface of said bolt, said washer being disposed between said curved portion and said ring portion, the downward movement of said washer off of said bolt being arrested by engagement of said washer with a stop ring mounted in said annular groove.

4,854,796

REVERSIBLE SCREW CLAMP FOR A GAPPED WALL

Robert D. Wise, Akron, Ohio, assignor to Century Products Company, Macedonia, Ohio

Filed Oct. 7, 1987, Ser. No. 106,081
Int. Cl.[4] F16B *35/00*
U.S. Cl. 411—366 **3 Claims**



1. A reversible attachment for securing an object to a gapped wall, comprising:

a block having a threaded screw extending therefrom, said block and screw forming a single piece; and

a knob terminating in first and second substantially flat external faces in opposing relation, a recess in said first face, a hollow shaft protruding from said second face, said recess and said hollow shaft each being internally threaded to mate with said threaded screw, and a wall separating said recess from the interior of said hollow shaft.

4,854,797

THREADED FASTENER WITH RESILIENT LINKING MEANS

James T. Gourd, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1988, Ser. No. 256,351
Int. Cl.[4] F16B *35/02, 35/00*
U.S. Cl. 411—383 **23 Claims**

1. A threaded fastener comprising:

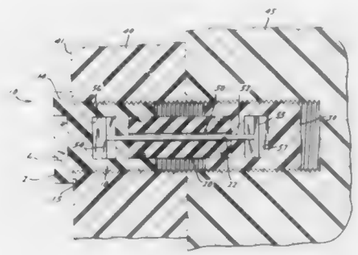
a head component for the application of torque to the fastener;

an externally threaded shank portion coaxial with said head component;

resilient linking means for resiliently interconnecting said head component and said shank portion a certain axial distance apart when said threaded fastener is in a free state, and for resiliently biasing against axial displacement

of said shank portion from said head component a distance other than said certain axial distance; and

torque transmitting means for transmitting torque from said head component to said shank portion, said torque transmitting means being coaxial with said head component and said shank portion and being able to transmit sufficient



torque from said head component to said shank portion to cause axial displacement of said shank portion in an aperture in a work piece against the resilient biasing of said resilient linking means to elongate said resilient linking means in axial tension, and said torque transmitting means comprising at least one member distinct from said resilient linking means.

4,854,798

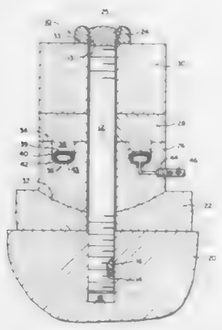
IN-PLACE TENSIONING WASHER

David A. Sayder, North Hungtingdon, Pa., and David M. Glosecki, Taylor Springs, Ill., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 29, 1987, Ser. No. 55,568

Int. Cl.[4] F16B *37/00*

U.S. Cl. 411—434 **20 Claims**



1. An in-place tensioning washer apparatus for stressing a power plant pressure chamber cover retaining stud to apredetermined stress level for installing and removing a pressure chamber cover and for maintaining the pressure chamber cover retaining stud at the predetermined stress level between installation and removal of the cover during periods of exposure of the stud, pressure chamber and the tensioning washer apparatus to temperatures up to 1000° F. and internal pressurization of the pressure chamber resulting from steam production as the power plant is operated, the stud having a first end in engagement with the pressure chamber, an annular ledge being attached proximate a second end of the stud, the second end being opposite the first end in engagement with the pressure chamber, said apparatus comprising:

fluid driven tensioning means for applying force against the annular ledge and against the pressure chamber to tension the portion of the stud between the annular ledge and the pressure chamber to the predetermined stress level, said tensioning means comprising an upper portion, a lower portion, and an annular toroid, the toroid being comprised of a high temperature resistant material and being adapted to expand under pressurized fluid to force the upper portion a first predetermined distance apart from the lower portion to create a gap between the upper and the lower portions, movement of the upper portion apart from the lower portion by the first predetermined distance acting to force the annular ledge away from the first end of the stud in engagement with the pressure chamber and to tension the portion of the stud between the annular ledge and the pressure chamber to the predetermined stress level, the tensioning means remaining between the annular ledge and the pressure chamber between installation and removal of the cover, the toroid being adapted to withstand the high temperatures associated with steam production during operation of the power plant, and shim means for maintaining the gap after depressurization of the toroid, said shim means being adapted for insertion into the gap when the toroid is in the expanded condition, maintenance of the gap acting to maintain the upper portion apart from the lower portion by the first predetermined distance and to maintain the tension in the stud at the predetermined stress level.

4,854,799

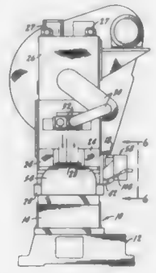
DUAL LANE CONVERSION SYSTEM

Frank J. Herdzina, Schaumburg, and Rollie M. Goodrich, Palatine, both of Ill., assignors to Service Tool Die & Mfg. Co., Elk Grove Village, Ill.

Division of Ser. No. 143,585, Jan. 13, 1988. This application Oct. 6, 1988, Ser. No. 254,142

Int. Cl.[4] B21D *51/44*

U.S. Cl. 413—66 **2 Claims**



1. A press for converting work pieces into parts, comprising a bed, a plurality of columns mounted on the bed having a way attached to each column, main drive means mounted on the columns, a ram slidable upon the ways and driven by the main drive means to reciprocate toward and away from the bed, upper and lower tooling means attached to the ram and bed, respectively, having a plurality of stations for processing said work pieces into parts, conveyor drive means mounted on the bed, and conveyor means mounted on the conveyor drive means for carrying work pieces into and through the tooling means stations, a feeder carrier mounted on a column opposite the tooling means and pivotable about a hinge line away from the tooling means to provide service access thereto, stock feed means mounted on the feeder carrier for feeding a strip stock into the stations of the tooling means, feeder drive means connected to the main drive means for driving said stock feed means, the feeder drive means including a drive shaft mounted coaxially with the hinge line so as to permit pivoting of the feeder carrier without disconnecting the feeder drive means from the stock feed means.

4,854,800

OPEN SEA TRANSFER OF ARTICLES

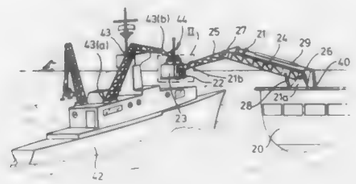
Heinz E. Frick, and Dennis J. Mottram, both of Surrey, England, assignors to British Aerospace Public Limited Company, London, England

Continuation of Ser. No. 768,142, Aug. 22, 1985, abandoned. This application May 19, 1988, Ser. No. 196,893

Claims priority, application United Kingdom, Aug. 22, 1984, 8421322

Int. Cl.[4] B65G *67/62*

U.S. Cl. 414—138.2 **18 Claims**



1. An arrangement for open sea transfer of articles between one vessel and another, both being subject to movement in the pitch, roll, yaw, heave and sway senses includes a first gantry having one end carried by a first vessel and a free end having carrying means adapted for carrying an article with a generally upwardly directed engagement means, the first gantry being articulated such that the carrying means can be stabilised in space whereby it maintains a generally constant position or course in space irrespective of the motion of the first vessel, a second gantry having one end carried by a second vessel and a free end having generally downwardly directed engagement means having a fixed portion and a movable portion for engaging said upwardly directed engagement means, the second gantry being articulated such that the downwardly directed engagement means can be substantially stabilised in space whereby it maintains a generally constant position or course in space irrespective of the motion of the second vessel, said first gantry being articulated such that the upwardly directed engagement means can be positioned generally below said downwardly directed engagement means when an article is to be transferred, the movable portion of said downwardly directed engagement means having means to effect downward movement to effect mating engagement with said upwardly directed engagement means.

4,854,801

BULK STORAGE BIN WITH PNEUMATICALLY ASSISTED DISCHARGE

Timothy C. Bonerb, East Aurora, N.Y., assignor to Flexair, Inc., East Aurora, N.Y.

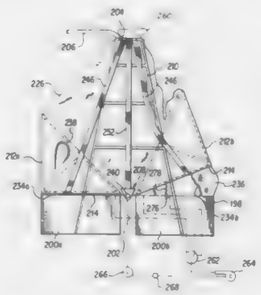
Continuation-in-part of Ser. No. 33,744, Apr. 3, 1987, Pat. No. 4,722,655. This application Jan. 11, 1988, Ser. No. 142,744

The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.

Int. Cl.[4] B60P *1/16, 1/56*

U.S. Cl. 414—291 **20 Claims**

1. A bin for storing and handling bulk material, the bin having a fill opening through which material is introduced into the bin for storage, and a discharge opening in a bottom portion of the bin through which material stored in the bin is discharged, the bin further including a primary bin support frame, the bin having at least one dump assembly with a bin floor panel that is hinged adjacent the discharge opening of the bin and pivotable from a position at rest for loading the bin to a position inclined toward the discharge opening for dumping bulk material into the discharge opening, the dump assembly including a rigid secondary frame connected to the bin floor panel and pivotable with the bin floor panel, the bin further including a flexible bin wall portion connected to the primary and secondary frames and to the bin floor panel to form an enclosure for storage of bulk materials, the flexible bin wall portion being supported in an erect configuration by the primary and secondary frames for storage and discharge of bulk



materials, the bin further including an inflatable bag underlying the bin floor panel, for inclining the floor panel toward the discharge opening and thereby directing bulk material stored in the bin through said discharge opening.

4,854,802

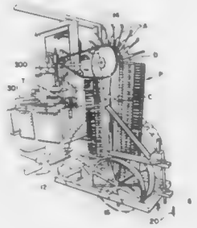
PLANT TRANSFER MECHANISM

Peter F. deGroot, Monterey, Calif., assignor to Bud Antle, Inc., Salinas, Calif.

Continuation-in-part of Ser. No. 900,942, Aug. 27, 1986. This application Aug. 24, 1987, Ser. No. 88,759

Int. Cl.[4] A01C *11/00*

U.S. Cl. 414—404 **6 Claims**



1. Apparatus for transferring plants from a high density incubating tray containing said plants in rows to a planted disposition in a transplant location, each said plant including foilage, a stem, and a root bound soil mass, said plants for transfer to a continuously passing line of conveyed planting fingers having the same spacing as said plants in said rows; said apparatus comprising:

a continuously passing line of conveyed planting fingers, each said finger configured for grasping one of said plants by a stem;

said continuously passing line of conveyed planting fingers moving from a plant receiving a station to a transplanting location,

means for oscillating said tray parallel to the direction of said continuously passing line of conveyed planting fingers including a first stroke in opposition to the direction of said passing fingers and a second stroke synchronized to the speed of said passing fingers;

means for opening a group of fingers in said continuously passing line of conveyed planting fingers for receiving said plants at said stem during a first part of said second stroke synchronized to the speed of said passing fingers

and closing said group of fingers in said continuously passing line of conveyed planting fingers to grasp said plants at said stem during a second part of said second stroke synchronized to the speed of said passing fingers;

means for extracting said incubating tray from said plants in said fingers during said second part of said second stroke synchronized to the speed of said passing fingers whereby said plants are transferred to said planting fingers and held by said stem with said root bound soil mass depending from said stem,

means for oscillating said tray to and from said planting fingers normal to the direction of said continuously passing line of conveyed planting fingers along a plane normal to a row of plants in said tray, said oscillation being towards said planting fingers during the time said planting fingers are open and being away from said planting fingers during the time said plants are extracted from said tray whereby said tray is moved away from plants within said planting fingers to prevent interference between the root bound soil mass of said plants in said fingers and the foliage of plants remaining in said tray.

4,854,803

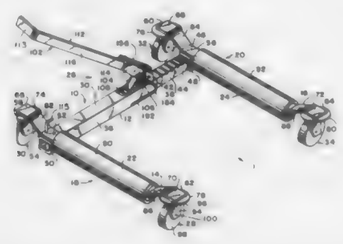
APPARATUS AND METHOD FOR JACKING AND DOLLYING AN AFFIXED VEHICLE WHEEL ASSEMBLY

Albert V. Coccaro, 9 Capricorn La., Mount Kisco, N.Y. 10549

Filed Nov. 16, 1987, Ser. No. 120,871

Int. Cl.[4] B60B *29/00*

U.S. Cl. 414—429 **20 Claims**



1. Apparatus for jacking and dollying a vehicle wheel assembly, the wheel assembly including a tire, wheel and axle, the apparatus comprising: structural means for forming an apparatus framework, the structural means including a body section having a first body member and a second body member, wherein the first and second body members are movable relative to one another, and wherein the structural means also includes a first arm member and a second arm member, the first arm member being connected to the body section first member and the second member being connected to the body section second arm member;

transport means for enabling movement of the apparatus;

engaging means for interacting with the wheel assembly, the engaging means, including at least a first roller assembly connected to one of the arm members; and

actuator means for driving the engaging means against the wheel assembly to lift the wheel assembly and form the framework into a carriage for receiving the wheel assembly, the actuator means including a lever means, a drive member, a brace member and means for receiving the drive member and brace member, the actuator means being mounted on the body section such that the lever means, drive member and brace member are connected to one body section member, and the lever means is coupled to the drive member and brace member, and the means for receiving the drive member and brace member is connected to the other body section member, so that when the lever means is operated a portion of one body section member is driven towards a portion of the other a predetermined distance and thereafter, braced against separation from the other, so that the engaging means may be successively driven against the tire on different sides of the wheel assembly centerline to lift the wheel assemble with repeated resetting and actuation of the lever means.

4,854,804

LIFTING AND CARRYING HEAVY LOADS

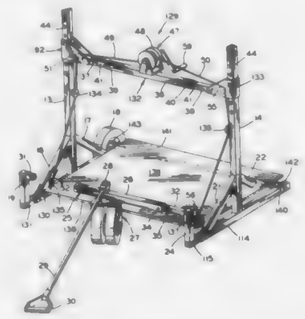
Steven R. Mayle, 153 St. Thomas Dr., Fremont, Ohio 43420

Continuation-in-part of Ser. No. 151,919, Feb. 3, 1988, which is a continuation-in-part of Ser. No. 23,723, Mar. 9, 1987, Pat. No. 4,740,131. This application Mar. 1, 1988, Ser. No. 156,486

The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

Int. Cl.[4] B60P *3/00*

U.S. Cl. 414—469 **16 Claims**



1. An apparatus for lifting and carrying loads comprising:

a generally horizontally extending support beam;

a pair of generally vertically extending posts each attached at a lower end to one of a pair of generally horizontally extending side beams, and releasably attached to opposite ends of said support beam;

a plurality of ground engaging wheels coupled to said side beams;

means for releasably engaging and lifting a load attached to said support beam; and

means for supporting a load coupled to said means for releasably engaging and lifting including, a pan pivotally connected to said side beams, said pan including a front frame section having a front edge coupled to said means for releasably engaging and lifting, a rear frame section having a rear edge pivotally attached to said side beams, and means for releasably attaching said front and rear frame sections together, and each of said front and rear frame sections is generally C-shaped with a center portion connected between a pair of legs and an inner pair of legs connected to said center portion, each of said legs of one of said frame sections adapted to telescopically engage a connector tube with a corresponding one of said legs of the other one of said frame sections.

4,854,805

APPARATUS FOR TRANSPORTING LOADS

Karl-Heinz Althoff, Bad Oeynhausen; Werner Knaick, Löhne; Manfred Munstermann; Uwe Voss, both of Bad Oeynhausen, all of Fed. Rep. of Germany, and Werner Glanz, Edmonton, Canada, assignors to O & K Orenstein & Koppel AG, Dortmund, Fed. Rep. of Germany

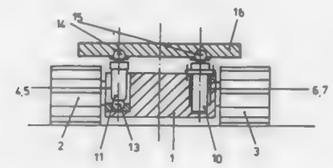
PCT No. PCT/EP86/00609, § 371 Date Sep. 4, 1987, § 102(e) Date Sep. 4, 1987, PCT Pub. No. WO87/03862, PCT Pub. Date Jul. 2, 1987

PCT Filed Oct. 22, 1986, Ser. No. 112,567

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1985, 3546103

Int. Cl.[4] B60P *1/02;* **B65G** *7/02*

U.S. Cl. 414—495 **3 Claims**



1. An apparatus for transporting load units and for relocating belt drive systems, comprising:

a drive system means for moving said apparatus, said drive system means including a drive system carrier;

a lifting platform;

a plurality of substantially vertically extending lifting elements, each of said lifting elements extending between said lifting platform and said drive system carrier;

a plurality of upper connecting means for connecting the end of each of said lifting elements adjacent said lifting platform to said lifting platform and allowing movement of each of said lifting elements in all directions on one side of a plane defined by said lifting platform;

a first lower connecting means for connecting the end of one of said lifting elements adjacent said drive system carrier to said drive system carrier, said first lower connecting means forming a rigid connection between said one of said lifting elements and said drive system carrier;

a second lower connecting means for connecting the end of another of said lifting elements adjacent said drive system carrier to said drive system carrier and allowing movement of said another of said lifting elements about a horizontal axis; and

further lower connecting means for connecting the end of each remaining lifting element adjacent said drive system carrier to said drive system carrier.

4,854,806

DEVICE FOR LOADING OR UNLOADING PAPER ROLLS ONTO OR FROM A ROLL STAND OF A WEB-FED ROTARY PRINTING PRESS

Peter Gertsch, Niederscherli, and Arnold Kohler, Oberdiessbach, both of Switzerland, assignors to Maschinenfabrik Wifag, Switzerland

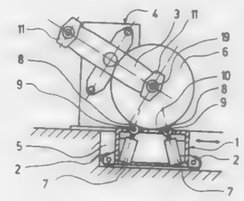
Filed Mar. 16, 1987, Ser. No. 26,277

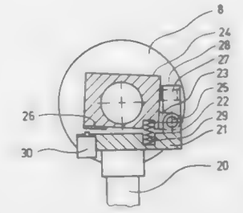
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1986, 3609086

Int. Cl.[4] B60P *3/00*

U.S. Cl. 414—495 **6 Claims**

1. An apparatus for loading and unloading a paper roll on a roll stand of a web-fed printing press, comprising, a support floor, a roll stand mounted on said support floor and having a pair of spaced-apart pivotal support arms, a roll-bearing axle supported between said arms, an excavation in said floor underlying said support arms of said roll stand and extending outwardly therefrom, a travelling platform movable in said excavation toward and away from said roll stand and into a loading position below said support arms, a pair of lifting elements mounted on said travelling platform so as to extend radially obliquely with respect to each other, each lifting element including a telescopic portion which is extensible and retractible, each telescopic portion having an outer end with a support roller which may be positioned below a paper roll engaged on said paper roll supporting arms and being extensible in directions radial to the axis of said paper roll to engage





the paper roll and lift it above the ground, said travelling platform being movable beneath the paper roll when it is held between the support arms and when said extensible portions of said lifting elements are retracted, said lifting elements including an outer extensible part having a plate thereon, a roller axle support pivoted to said plate and carrying an axle of said rollers, stop means for limiting the pivotal movement of said axle support.

4,854,807

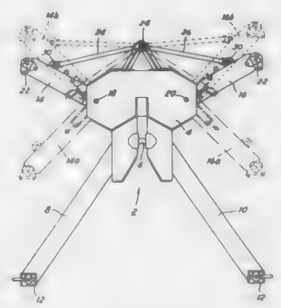
FREIGHT CONTAINER LIFTING MEANS

Frank W. Bishop, Norwich, England, assignor to George Blair Public Limited Company, Newcastle upon Tyne, England

Filed Jan. 4, 1988, Ser. No. 141,409

Int. Cl.[4] B60P *1/64*

U.S. Cl. 414—498 **7 Claims**



1. An adapter for a hook-lift vehicle, having hydraulically-operated lifting mechanism on the chassis thereof, to load and

unload freight containers having conventional corner fittings at the corners thereof, said adapter comprising:

an adapter frame for attachment to, and movable by, a hook of the lifting mechanism, and including a pair of opposed, releasable securing means for co-operation one with each of the two lower corner fitting of one end of a freight container;

said adapter frame further including a pair of adjustable arm members each of which is pivotally mounted, adjacent one end thereof, to a body portion, of the adapter frame a further releasable securing means for co-operation one with each of the two upper corner fittings at the one end of the container being carried by the other end of each arm member;

said adapter further including a pair of laterally-spaced support surfaces for location adjacent the rear of the vehicle chasis, one on each side of said chassis, said support surfaces being pivotal about a substantially horizontal axis extending transversely of the chasis and being spaced apart by a distance substantially equal to the width of the container;

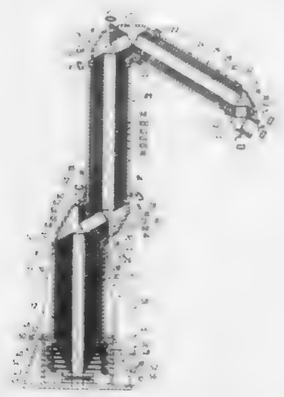
the adapter arrangement being such that, subsequent to securing of the adaptor frame to the front end of a container on the ground and on actuation of the mechanism, the front end of the container is drawn upwardly and forwardly relative to the vehicle chassis until the outer lower side regions of the container engage said opposed support surfaces, the floor of the container and the support surfaces making an acute angle with the horizontal, continued actuation of the lifting mechanism drawing the container over said pivotable support surfaces and onto the chassis.

[illegible]

MULTI-ARTICULATED INDUSTRIAL ROBOT WITH SEVERAL DEGREES OF FREEDOM OF MOVEMENT

Bisiach Bruno, Via Mentana 23 bis, 10133, Turin, Italy

Filed Jun. 24, 1988, Ser. No. 211,344
Claims priority, application Italy, Jul. 10, 1987, 67593-A/87
Int. Cl.[4] B25J *18/00*
U.S. Cl. 414—680 **20 Claims**



1. A multi-articulated industrial robot with several degrees of freedom of movement, comprising:

a first group of n coaxial hollow shafts rotatably supported in respect of each other about their axis in a column, connected at one end to a group of n helical gears coupled to motor driven means for transmitting motion, the outermost one of said hollow shafts being connected at the opposite end to a first rotation support with slanted axis, each of the remaining n-1 inner shafts carrying a bevel [illegible]

a first articulated joint comprising a first group of n−1 coaxial bushes, rotatably mounted in respect of each other about an axis which is slanted in respect of the axis of said first group of n hollow shafts in said first rotation support, and coupled at one end with bevel gears to said n−1 inner hollow shafts of said first group of hollow shafts, and provided at the opposite end, but for the outermost bush, with n−2 bevel gears, the outermost bush carrying instead a second rotation support;

a second group of n−2 coaxial hollow shafts rotatably supported in respect of each other about their axis in a third rotation support which is secured to said second rotation support, coupled at one ends to said n−2 bevel gears of said first group of bushes, and at the opposite end the outermost one of said hollow shafts being connected to a fourth rotation support with slanted axis, and each of the n−3 inner hollow shafts carrying a bevel gear;

a second articulated joint comprising a second group of n−3 coaxial bushes, rotatably mounted in respect of each other about an axis which is slanted in respect of the axis of said second group of n−2 hollow shafts in said fourth rotation support, and coupled at one end through bevel gears to said n−3 inner hollow shafts of said second group of hollow shafts, and provided at the opposite end, but for the outermost bush, with n−4 bevel gears, the outermost bush carrying instead a fifth rotation support;

a third group of n−4 coaxial hollow shafts, rotatably mounted in respect of each other about their axis in a sixth rotation support fastened to said fifth rotation support, and coupled at one end to said n−4 bevel gears of said second group of bushes, and the outermost one of said shafts being connected at the opposite end to a seventh rotation support with slanted axis, and each of the n−5 inner hollow shafts carrying a bevel gear;

a third articulated joint comprising a third group of n−5 coaxial bushes, rotatably mounted in respect of each other about an axis slanted in respect of the axis of said third group of n−4 hollow shafts in said seventh rotation support, and coupled at one end through bevel gears to said n−5 inner hollow shafts of said third group of hollow shafts, the outermost bush carrying at the opposite end an eighth rotation support, and the n−6 inner bushes carrying n−6 bevel gears coupled to n−6 end bushes rotating about an axis which is offset but parallel to the axis of said third group of hollow shafts and provided with respective bevel gears for supporting and/or actuating the robot tools.

[illegible]

HAY BALE ELEVATOR APPARATUS

Jim L. Rhodes, RR #5, Albia, Iowa 52531

Filed May 3, 1988, Ser. No. 189,794
Int. Cl.[4] B66C *1/10*
U.S. Cl. 414—685 **7 Claims**

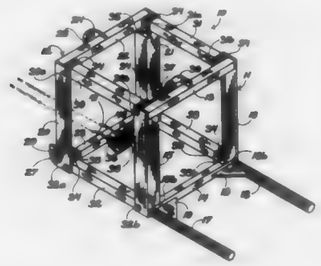
1. A hay bale elevator apparatus for use in combination with a farm tractor for lifting hay bales, said apparatus comprising,

a forward framework means mounted for parallel movement to a rear framework means;

said forward framework means including a first cradle means and a second cradle means operatably associated together for supportingly carrying a hay bale thereon, and

power means coupled to said rear framework means and said forward framework means for lifting said forward framework means relative to said rear framework means to said tractor, and

wherein said forward framework means further includes an "L" shaped right side member and a parallel "L" shaped left side member with a top member integrally secured within notches formed proximate upper terminal side of said respective right and left side members with a lower member integrally secured within notches formed within lower terminal ends of said right and left side members,



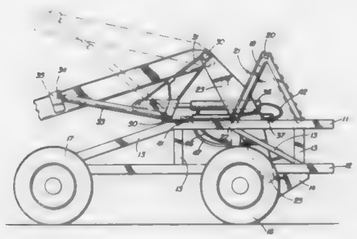
and wherein said first and second cradle means are orthogonally and integrally secured to said lower member projecting outwardly of said forward framework means.

4,854,810

PARALLEL TRANSLATION MECHANISM

Keith E. Ramsey, Pleasant Lake, Mich., assignor to Sellick Equipment Limited, Harrow, Ontario, Canada

Continuation of Ser. No. 838,724, Mar. 11, 1986, abandoned.
This application Jul. 16, 1987, Ser. No. 74,185
Claims priority, application Canada, Jan. 20, 1986, 499855
Int. Cl.[4] B66F *9/06*
U.S. Cl. 414—710 **12 Claims**



1. A mechanism for maintaining a link in a fixed angular orientation relative to a connected body during movement of the link relative to the body, the mechanism comprising:

(a) a first arm having its one end pivotally connected to a first position on the body so as to be rotatable around that one end;

(b) a second arm pivotally connected generally centrally of its length to the other end of the first arm, one end of the second arm being restrained for movement generally along a line, a projection of that line extending through the first position on the body, the other end of the second arm being pivotally connected to a first position on the link;

(c) a first extendable member having its one end pivotally connected to a second position on the link and its other end pivotally connected to a first generally central position on the second arm;

(d) a second extendable member having its one end pivotally connected to a second position on the body and its other end pivotally connected to a second generally central position on the second arm, the second extendable member being in an operative relationship with the first extendable member such that extension or contraction of the first extendable member results in a defined ratio of contraction or extension respectively of the second extendable member; and

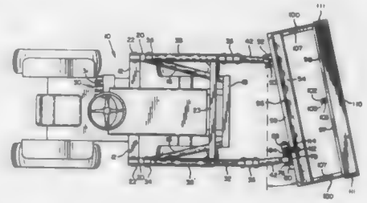
(e) a control system for controlling extension or contraction of the extendable members, said control system including a first active hydraulic system for extending or contracting one of the extendable members and a second passive hydraulic system for extending or contracting the other extendable member and for maintaining the defined ratio of the extendable members; whereby actuation of either the first or second extendable member to extend or contract that member results in movement of the link relative to the body at the fixed angular orientation.

4,854,811

BUCKET-BLADE ATTACHMENT FOR TRACTORS

Jeff M. Veys, 123 Talkeetna Heights Rd., Longview, Wash. 98632

Filed Jun. 5, 1989, Ser. No. 58,810
Int. Cl.[4] E02F *3/74*
U.S. Cl. 414—718 **10 Claims**



1. An earth moving attachment for a tractor having a forward direction of movement and a substantially horizontal base plane on which the tractor sits, said attachment providing angular adjustment of a ground engaging means such as a blade or bucket, the attachment comprising:

(a) a frame attached to the tractor;

two arms pivotally mounted on the frame, one on each side of the tractor;

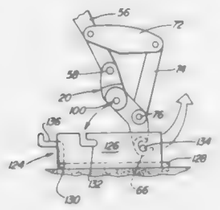
(b) means for pivoting the arms in a plane generally forwardly and upwardly;

(c) two telescoping members, one extending from each of the arms;

(d) means for extending and retracting each of the telescoping members directly forwardly when the ground engaging means is in a ground engaging position, wherein the telescoping members are extendable and retractable together or independently; and

(e) ground engaging means attached to the telescoping members by joint means for allowing the ground engaging means to skew with respect to a line perpendicular to the forward direction of the tractor when one telescoping member is extended further than the other, wherein the ground engaging means may be tilted at an angle with respect to the base plane, the attachment further comprising pivot means mounting one of the telescoping members to one end of the ground engaging means, and slider means mounting the other telescoping member to the other end of the ground engaging means, and extension means connected between the other telescoping member and the ground engaging means and being controllable to set the position of the slider to determine the angle of tilt throughout a range of angles with respect to the base plane.

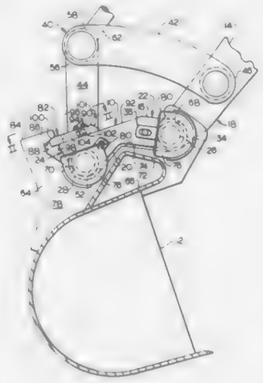
4,854,812
QUICK COUPLER ASSEMBLY
Wayne G. Smith, Burlington; David V. Martinez, Fort Madison; Robert E. Mozingo, and Charles B. Hanson, both of Burlington, all of Iowa, assignors to J. I. Case Company, Racine, Wis.
Division of Ser. No. 876,594, Jun. 20, 1986, Pat. No. 4,761,113.
This application Jun. 20, 1988, Ser. No. 208,940
Int. Cl.[4] B66C *1/10*
U.S. Cl. 414—723 1 Claim



1. A quick attachment and release assembly for attaching an implement to a lift arm, said assembly comprising:
a quick coupler pivotally attached at one end to said lift arm and having an opposite slotted end for selective engagement with a mounting pin on said implement, an intermediate portion of said quick coupler including a transverse coupler pin having opposite end portions which are laterally spaced from the sides of said quick coupler, and an actuating mechanism connected between said lift arm and said quick coupler for rotating said quick coupler relative to said lift arm;
said implement including spaced apart attachment members having slots therein which receive the opposite end portions of said coupler pin and means for locking said coupler pin end portions within said slots; and
said quick coupler being movable into the space between said attachment members such that its slotted end engages the implement mounting pin and the end portions of said coupler pin enter said slots for connecting said quick coupler to said implement; and
wherein said attachment members are attached to pivot members, and said pivot members including locking ends which trap the end portions of said coupler pin within said slots upon movement of said attachment members to a vertical position.

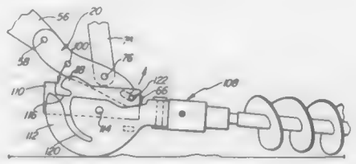
4,854,813
COUPLING APPARATUS
Robert L. Degeeter, Oswego, and Harvey A. Knell, Yorkville, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Continuation of Ser. No. 894,097, Aug. 8, 1986, abandoned, which is a continuation of Ser. No. 665,485, Oct. 29, 1984, abandoned. This application May 6, 1988, Ser. No. 193,123
Int. Cl.[4] E02F *3/81*
U.S. Cl. 414—723 17 Claims

1. A coupling apparatus for use between a pair of support arms having distal ends, and a work implement, comprising:
a pair of hinge plates mounted on the work implement, each defining first and second contoured receptacles that are spaced from one another;
a pair connecting links having a generally uniform length and width and first and second end portions pivotally connected between said distal ends of said support arms and being configured for nesting engagement within the first and second receptacles respectively;
a guide plate secured to each hinge plate at a location that is adjacent one of said first and second receptacles to guide the first end portion of said connecting links into engagement with one of said receptacles and to limit the axial movement of the connecting links with respect to the hinge plates upon completion of said engagement;
locking means associated with the connecting links for selectively locking the end portions into engagement with said receptacles with substantially the entire length and width of each connecting link in direct, linear force transmitting relation therewith;



a first pin member extending between the first end portions of the respective connecting links to pivotally mount said connecting links to one of said support arms; and
a second pin member extending between the second end portions of the connecting links to pivotally mount the connecting links to the other of said support arms, said first and second pin members being the only structural connection between said connecting links.

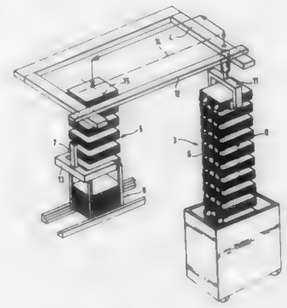
4,854,814
QUICK COUPLER ASSEMBLY
Wayne G. Smith, Burlington; David V. Martinez, Fort Madison; Robert E. Mozingo, and Charles B. Hanson, both of Burlington, all of Iowa, assignors to J.I. Case Company, Racine, Wis.
Division of Ser. No. 876,594, Jun. 20, 1986, Pat. No. 4,761,113.
This application Jun. 20, 1988, Ser. No. 209,135
Int. Cl.[4] B66C *1/10*
U.S. Cl. 414—723 1 Claim



1. A quick attachment and release assembly for attaching an implement to a lift arm, said assembly comprising:
a quick coupler pivotally attached to one end to said lift arm and having an opposite slotted end for selective engagement with a mounting pin on said implement, an intermediate portion of said quick coupler including a transverse coupler pin having opposite end portions which are laterally spaced from the sides of sid quick coupler, and an actuating mechanism connected between said lift arm and said quick coupler for rotating said quick coupler relative to said lift arm;
said implement including spaced apart attachment members having slots therein which receive the opposite end portions of said coupler pin and means for locking said coupler pin end portions within said slots; and

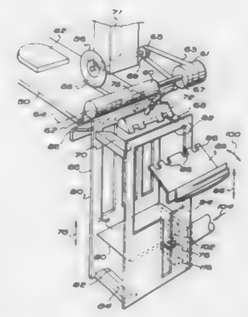
said quick coupler being movable into the space between said attachment members such that its slotted end engages the implement mounting pin and the end portions of said coupler pin enter said slots for connecting said quick coupler to said implement; and
wherein said attachment members are pivotally interconnected to guide plates having guide slots therein, and said guide slots engaging the end portions of said coupler pin upon relative movement between said attachment members and said guide plates for trapping said coupler pin end portions within said attachment member slots.

4,854,815
APPARATUS FOR FEEDING A PACKAGING MACHINE WITH CARDBOARD CUT PIECES STORED IN STACKS
Herbert Augst, Duesseldorf, Fed. Rep. of Germany, assignor to Benz & Hilgers GmbH, Duesseldorf, Fed. Rep. of Germany
Filed Nov. 16, 1987, Ser. No. 120,898
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1986, 3638806
Int. Cl.[4] B65G *57/06*
U.S. Cl. 414—788.4 1 Claim



1. Apparatus for feeding a packaging machine with cardboard carton cut pieces or the like stored in stacks, comprising a first partial stack receiving stack station; a second partial stack receiving stack station; and a transport means operatively connecting both stack stations with each other on one side by horizontally successively moving said partial stacks from the first partial stack receiving station to the second partial stack receiving station;
the first stack station has a first conveyor, and the second stack station has a second conveyor, said first and second conveyors having contrarotating drives;
said first conveyor is arranged lateral and adjacent to the packaging machine on a mobile truck; and the second conveyor is arranged in the area of the packaging machine;
said packaging machine has a longitudinal axis, the transport means comprises a drive chassis having a mobile stack clamp arranged in the area of the first conveyor on the packaging side of the truck;
and wherein a lowering clamp is arranged in the area of the second conveyor on the opposite end from where the drive chassis is located;
the stack clamp first moves along said drive chassis transversely with respect to the longitudinal axis of the packaging machine, and subsequently moves along said drive chassis parallel to the longitudinal axis of said packaging machine.

4,854,816
PRODUCTION OF TEA AND THE LIKE BAGS
James R. Rimmer, and Ronald M. Sweeney, both of Merseyside, England, assignors to Premier Brands U.K. Limited, Birmingham, England
Division of Ser. No. 849,480, Apr. 8, 1986, Pat. No. 4,712,358.
This application Jun. 11, 1987, Ser. No. 61,907
Claims priority, application United Kingdom, Mar. 29, 1984, 8408163
Int. Cl.[4] B65H *31/30*
U.S. Cl. 414—790.3 1 Claim

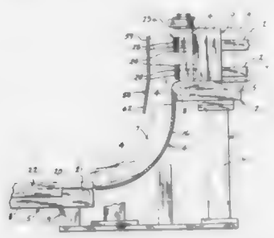


1. A machine for handling tea bags, comprising:
(a) an elevator platform having a horizontal support surface adapted to support a stack of tea bags;
(b) means for moving the elevator platform a first upper platform loading position to a second platform discharge position;
(c) a lead out member located at said discharge position;
(d) pusher means for pushing stacks of tea bags from the platform when it is in the discharge position;
(e) a horizontal lead out surface on said lead out member;
(f) an inclined chamfer surface on said lead out member, said chamfer surface having a free edge;
(g) an inclined chamfer surface on the underside of the platform; and
(h) said platform and said lead out member being positioned and arranged so that when the platform is in said discharge position, said chamfer surfaces of said lead out member and said platform are in face to face overlapping contact, with the chamfer surface of the platform positioned above the chamfer surface of the lead out member and the horizontal support surface of the platform and the horizontal surface of the lead out member are co-planar and with the free edge of the chamfer surface on the lead out member being covered by the chamfer surface on the underside of the platform so that the stack of tea bags can be smoothly pushed by the pusher means from the platform onto and over the horizontal surface of the lead out member.

4,854,817
APPARATUS FOR UNSTACKING ARTICLES
Wolfgang C. Dorner, Oconomowoc, Wis., assignor to Dorner Mfg. Corp., Hartland, Wis.
Filed Oct. 16, 1987, Ser. No. 109,120
Int. Cl.[4] B65G *47/28, 59/00*
U.S. Cl. 414—798.9 6 Claims

1. An apparatus for unstacking articles and feeding the articles in uniformly spaced relation, comprising first conveyor means to convey a plurality of stacks of articles in spaced relation and having a downstream end, said articles disposed edgewise on said first conveyor means and being stacked in side-by side relation in the direction of travel of said first conveyor means, drive means for driving said first conveyor

means, second conveyor means disposed adjacent the downstream end of said first conveyor means and located at a level beneath said first conveyor means, transfer means for transferring each article of each stack from the downstream end of said first conveyor means to said second conveyor means, and speed retarding means disposed immediately adjacent said downstream end of the first conveyor means for retarding the speed of each stack to enable the leading end of each succeeding stack to engage the trailing end of each preceding stack to



eliminate gaps between said stacks and form a composite stack, said speed retarding means comprising a pair of driven cylindrical members, each of the members mounted on a vertical axis and each located on opposite sides of the first conveyor means and disposed to engage the opposite ends of articles in a stack, said transfer means discharging each article

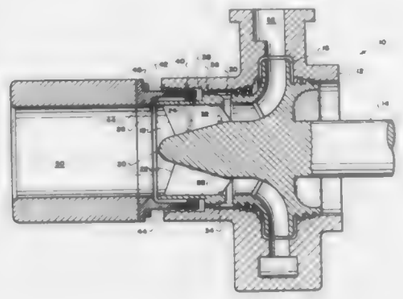
from the composite stack by gravity from the downstream end of said first conveyor means immediately on release of said article from said speed retarding means.

4,854,811

SHROUDED INDUCER PUMP

Sen Y. Meng, Reseda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 28, 1987, Ser. No. 138,465
Int. Cl.[4] F04D *29/66*
U.S. Cl. 415—58.4 3 Claims



1. In a pump having a shrouded inducer including at least one spiral blade circumferentially surrounded by a shroud, the inducer blade being rotatably mounted within a pump housing, said housing having a fluid inlet and a fluid outlet and wherein an annular space defined by an outer periphery of the shroud and an adjacent surface of the housing conveys a recirculation fluid over the shroud during operation of the pump, an improvement for alleviating cavitation damage associated with the recirculation flow, said improvement comprising in combination:

a downstream inducer shroud raised annular lip;

a first seal means formed in the housing and associated with said annular lip;

a structural vane including a second seal means, said second seal means associated with a downstream segment of the shroud;

an annular chamber formed downstream of the inducer blade;

a first vortex cell between said first seal means and said second seal means; and

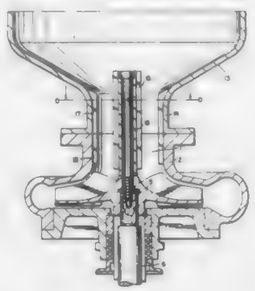
at least one secondary vortex cell formed by a downstream segment of the structural vane and the pump housing, said secondary vortex cell communicating with an annular space formed by said structural vane and said pump housing.

4,854,819

METHOD AND APPARATUS FOR PUMPING FIBRE SUSPENSIONS

Johan Gullichsen, Sinuntio, Finland, assignor to A. Ahlstrom Corporation, Karhula, Finland

Continuation of Ser. No. 848,754, Apr. 4, 1986, Pat. No. 4,780,053, and a continuation-in-part of Ser. No. 275,756, Jun. 22, 1981, abandoned, which is a continuation-in-part of Ser. No. 79,225, Sep. 26, 1979, abandoned, which is a division of Ser. No. 903,494, May 8, 1978, abandoned. This application Dec. 10, 1987, Ser. No. 131,128
Claims priority, application Finland, Apr. 10, 1978, 781071
The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.
Int. Cl.[4] F04D *1/10*
U.S. Cl. 415—143 4 Claims



1. A method for fluidizing a high consistency fiber suspension stored in a vessel having an outlet and for pumping said fiber suspension in the fluidized state by a centrifugal pump including a housing having an inlet, an impeller disposed in said housing, and a non-circular rotor mounted for rotation within said housing inlet, said method comprising the following steps:

(a) connecting said pump housing inlet to said vessel outlet;

(b) rotating said rotor at a speed sufficient to generate a shear force field within said suspension, said shear force field being generated in said pump housing inlet and in said vessel and being of sufficient strength to fluidize said suspension in said housing inlet and said vessel adjacent said housing inlet;

(c) rotating said impeller; and

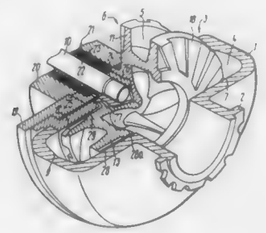
(d) discharging said fluidized suspension from said pump.

4,854,820

CENTRIFUGAL PUMP FOR HANDLING LIQUIDS CARRYING SOLID ABRASIVE PARATICLES

Arkady I. Zolotar, Stremyanny pereulok, 33, kv. 11; David S. Samoilovich, Sakhalinskaya ulitsa, 4, kv. 179; Vladimir K. Karakhanian, 9 Parkovaya ulitsa, 6, korpus 1, kv. 80; Vyacheslav I. Kuznetsov, ulitsa Uchinskaya, 3, kv. 28; Vladimir B. Kopelyansky, Kashirskoe shosse, 7, korpus 1, kv. 139; Oleg V. Kuznetsov, B. Cheremushkinskaya ulitsa, 10, korpus 2, kv. 70, all of Moscow; Vladimir E. Nesterenko, Bobruisk, Internatsionalnaya ulitsa, 41, kv. 45, Mogilevskaya; Nikolai G. Karachaban, Moskovskaya ulitsa, 8, kv. 11; Georgy E. Shmuratov, Komsomolskaya ulitsa, 23, kv. 114, both of Mirny; Evgeny A. Kljuzhin, Berezovaya Alleya, 5, kv. 141, Moscow, and Semen V. Livshits, Oktyabrskaya ulitsa, 151, kv. 22, Bobruisk, all of U.S.S.R.

Filed Dec. 28, 1987, Ser. No. 138,598
Claims priority, application U.S.S.R., Feb. 18, 1987, 4194517
Int. Cl.[4] F04D *29/08*
U.S. Cl. 415—171.1 6 Claims



1. A centrifugal pump for handling liquids carrying solids abrasive particles, comprising:

a casing for converting the kinetic energy of the liquid being pumped into potential energy of pressure;

two side walls of said casing for forming a flow of the liquid being pumped carrying solid abrasive particles, a front and rear walls relative to the incoming flow of the liquid being pumped;

an impeller accommodated in said casing and serving for converting mechanical energy of rotation into kinetic;

a drive shaft of said impeller for imparting a torque to the impeller, disposed in said casing;

a carrying disk of said impeller for imparting a torque to the impeller and forming a flow of the liquid being pumped carrying solid abrasive particles, mounted on said drive shaft;

vanes of said impeller for converting the mechanical energy of rotation into kinetic energy of the kinetic energy of the liquid being pumped, secured on said carrying disk;

a driven disk of said impeller for forming a flow of the liquid being pumped secured on said vanes of said impeller;

a flow-through passage of said impeller for forming a flow of the liquid being pumped and converting into potential energy of pressure, confined by said carrying disk, said vanes, and said driven disk;

a peripheral wall of said casing for forming a flow of the liquid being pumped carrying solid abrasive particles, said peripheral wall being integral with said two side walls of said casing, said peripheral wall having a geometry following the pattern of distribution of solid abrasive particles so that a meridional section of said peripheral wall is inclined downwards to said rear wall and forms an acute angle with the axis of rotation of said impeller, determined by the following relationship:

$$\alpha = \frac{\pi}{2} - \operatorname{arc\,tg}\frac{\theta(\theta + \delta + a)}{f_o S_o}$$

wherein θ is the width of the layer of solid abrasive particles in said flow-through passage of the impeller in the meridional section thereof;

a is the thickness of the carrying disk, 0.02–0.085 (m);

δ is the size of the clearance between said carrying disk and said rear wall of the casing, 0.001–0.005 (m);

f_o is the sectional area of said discharge passage, 0.00345–0.1828 (m^2);

S_o is the volume concentration of solid abrasive particles in the liquid being pumped, up to 0.35;

$\theta = b[1–0.6U\ v^{-1}\sqrt{d}D^{-1}(\rho_z - f_e)\rho_e^{-1}]$, wherein

b is the width of said flow-through passage of the impeller in the meridional section thereof, 0.04–0.3 (m);

U is the peripheral velocity of said impeller at the inlet, 7.5 14.7 (m/sec);

v is the average flow velocity of the liquid being pumped carrying abrasive particles, 3.8-6.9 (m/sec);

d is the average diameter of abrasive particles, up to 0.02 (m);

D is the diameter of said impeller at the inlet, 0.1–0.77 (m);

ρ_z is the density of abrasive particles, up to 4,500 (kg/m^3)

ρ_e is the density of the liquid, 1,000 (kg/m^3);

a discharge passage for collecting the liquid being pumped, converting the energy and conveying the liquid being pumped carrying solid abrasive particles to the user, said discharge passage being confined by said two side walls and said peripheral walls of said casing and communicating with said flow-through passage; and

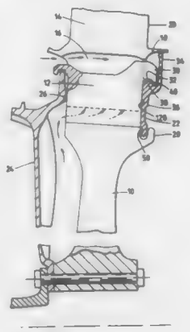
a flow-through portion formed by said flow-through passage of said impeller and said discharge passage for forming a flow of the liquid being pumped carrying solid abrasive particles, converting the kinetic energy of the liquid being pumped into potential energy of pressure, and conveying the liquid being pumped to the user.

4,854,821

ROTOR ASSEMBLY

John D. Kernon, Clevedon; Kenneth R. Langley, Gloucestershire, and Mark R. Thatcher, Gwent, all of England, assignors to Rolls-Royce plc, England

Filed Feb. 25, 1988, Ser. No. 160,316
Claims priority, application United Kingdom, Mar. 6, 1987, 8705715
Int. Cl.[4] F04D *5/18*
U.S. Cl. 416—95 8 Claims



1. A rotor assembly for a gas turbine engine, the assembly comprising:

(a) a rotor disc having a rim;

(b) a first hook means located in the rim, said first hook means having a first reaction surface directed radially inwards of the rim and an axially directed second reaction surface;

(c) a second hook means located on the disc radially inwards of the first hook means and facing the disc;

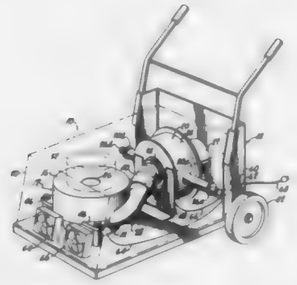
(d) rotor blade retaining means formed in the rim;
(e) a plurality of rotor blades each comprising a root, a platform, and an aerofoil, said blades being attached to the disc by location of the roots in the blade retaining means; and
(f) an annular seal plate for sealing engagement with the blade roots and the disc, said seal plate having:
i. a radially outer portion terminating in a radially outer periphery extending to, but not contacting, the blade platform;
ii. a radially inner portion axially offset from the outer portion and adapted to engage the second hook means and to contact the disc; and
iii. an intermediate portion located between the outer and inner portions, said intermediate portion having an abutment means provided by the axial offset between the inner and outer portions, said abutment means comprising a radially outward facing abutment surface adapted to engage the first reaction surface of the first hook means and an axially facing surface adapted to engage the second reaction surface of the first hook means, thereby to urge the seal plate into sealing engagement with the disc and the blade roots without imposing significant axial or radial loading on the blade platforms.

4,854,822

SERIES IMPELLER AIR PUMP FOR LIQUID SPRAYER

John B. Darroch, Huntington Beach, Calif., assignor to Apollo Sprayers International, Inc., Fountain Valley, Calif.

Filed Aug. 24, 1988, Ser. No. 231,089
Int. Cl.[4] F04B *41/06*
U.S. Cl. 417—62 15 Claims



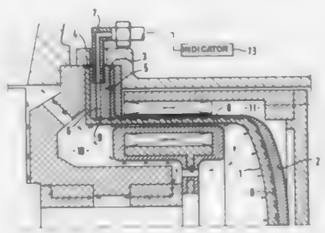
1. High volume, low pressure impeller apparatus for use in the spraying of liquids such as stains, paints, coatings, adhesives and latex, said apparatus comprising:
a first motor;
a second motor;
first air impeller means, interconnected with said first motor and having an air inlet an an air outlet, for producing a sufficient volume of air through the air outlet thereof to drive a liquid atomizing spray gun and for enabling air to be freely passed through the first air impeller means from the inlet to the outlet thereof when the first air means is not driven by the first motor;
second air impeller means, interconnected with said second motor and having an air inlet and an air outlet, for producing a sufficient volume of air through the air oulet thereof to drive a liquid atomizing spray gun and for enabling air to be freely passed through the second air impeller means from the inlet to the outlet thereof when the second air impeller means is not driven by the second motor;
conduit means for interconnecting the first impeller means outlet to the second impeller means inlet; and
control means for selectively causing the first motor to drive the first air impeller means and preventing the second motor from driving the second air impeller means thus enabling the second air impeller means to freely pass the air from the first air impeller means outlet through the second air impeller means, causing the second motor to drive the second air impeller means and preventing the first motor from driving the first air impeller means thus enabling the first air impeller means to freely pass air to the second air impeller means inlet, and causing the first motor to drive the first air impeller means and the second motor to drive the second air impeller means.

4,854,823

LEAK INDICATING DEVICE FOR CENTRIFUGAL PUMP

Paul Hatting, Tumpweg 15, D-4152 Kempen, and Kurt Wienen, Schillerstr. 15, D-4172 Straelen 1, both of Fed. Rep. of Ger[illegible]

Filed Feb. 11, 1988, Ser. No. 154,940
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1987, 37046713
Int. Cl.[4] F04B *49/10*
U.S. Cl. 417—63 11 Claims



1. In a magnetic centrifugal pump having a separating pot which seals against a pumped medium, said separating pot including inner and outer separating pots each having a collar, said inner separating pot being disposed within said outer separating pot and being separated therefrom by a space, a leak indicating device comprising: a ring positioned between the collars of said separating pots, said ring having a radial bore formed therein and connecting the space between said separating pots to an indicator.

4,854,824

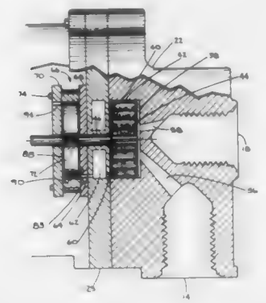
VAPOR SEPARATING AND METERING PUMP

Daniel E. Scholz, Avon, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Feb. 1, 1988, Ser. No. 150,800
Int. Cl.[4] F04C *19/00*
U.S. Cl. 417—69 23 Claims

1. A vapor separating and metering pump for separating vapor from vapor laden liquid and delivering a metered flow of liquid at a flow rate proportional to the rotational velocity of motor means driving said pump, comprising:
a housing including an inlet opening, a metered liquid outlet opening and a vapor outlet opening, said inlet opening in fluid connection with a supply of vapor laden liquid;
a liquid ring chamber enclosed within said housing, said liquid ring chamber in fluid connection with said inlet opening;
a metering chamber enclosed within said housing, said metering chamber having inlet and outlet means for admitting and discharging liquid therefrom respectively, said metering chamber separated from said liquid ring chamber by dividing means inside said housing;
a rotatable shaft extending into said liquid ring and metering chambers, said shaft driven by said motor means;
a liquid ring impeller mounted on said shaft and positioned in said liquid ring chamber, said impeller positioned with

respect to said chamber such that upon rotation of the shaft a ring of vapor-free liquid is formed by centrifugal force in at least one pressurized liquid area in said liquid ring chamber and vapor separated from said liquid is positioned adjacent an axis of rotation of said liquid ring impeller in at least one vapor area, said vapor outlet opening in fluid connection with said vapor area;
fluid conduit means through said dividing means for conducting liquid from said pressurized liquid area to the inlet means of said metering chamber; and



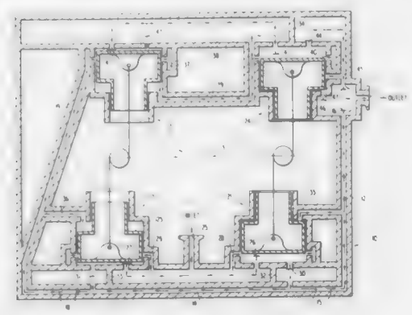
metering impeller means mounted on said shaft and positioned in said metering chamber, said metering impeller means passing liquid from said inlet means to the outlet means of said metering chamber in proportion to rotational displacement of said metering impeller means;
whereby upon rotation of said shaft by said motor means, said pump separates vapor from said vapor laden liquid and delivers liquid at the metered liquid outlet of said housing at a flow rate proportional to the rotational velocity of said shaft.

4,854,825

MULTI-STAGE VACUUM PUMP

Eckhard Bez, Moorabbin, and John L. Farrant, North Balwyn, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Feb. 27, 1987, Ser. No. 19,736
Int. Cl.[4] F04B *3/00, 5/00, 25/02*
U.S. Cl. 417—265 6 Claims



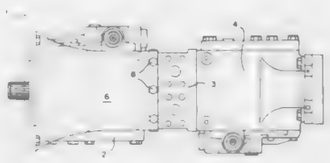
1. A multi-stage recipricatory vacuum pump, comprising:
first, second, third and fourth cylinders each having a first portion closed at one end and a second portion contiguous with, but of smaller diameter than the first portion;
each cylinder being provided with a piston having a cylindrical head portion relatively slideable in the first cylinder portion and a second cylindrical piston portion relatively slideable in the second cylinder portion, said piston head portion having a front face facing the closed cylinder end to define a main pumping chamber and an annular backface to define an annular pumping chamber;
a gas inlet port disposed in each first cylinder portion and adapted to be uncovered when said piston reaches a bottom dead center position of each piston stroke;
common drive means for reciprocating each piston in a respective cylinder;
a first exhaust port in each first cylinder portion for exhaustion of gas from the main pumping chamber by pumping action of the front face of the piston head portion;
a one way valve in said first exhaust port operable to permit exhaustion of gas from the main pumping chamber ahead of the piston head portion;
a second exhaust port in each cylinder for exhaustion of gas from the annular pumping chamber by pumping action of the annular backface of the piston head portion;
common inlet passage means connected to the gas inlet ports of said first and second cylinders;
first and second exhaust passages connected to the first and second exhaust ports of said first and second cylinders respectively;
a common passage interconnecting said first and second exhaust passages and communicating with a first outlet valve and a third exhaust passages connecting the first exhaust port of the third cylinder with the inlet port of the fourth cylinder;
a fourth exhaust passage connecting the second exhaust port of the third cylinder with the third exhaust passage; and
a final exhaust passage connecting the first exhaust valve of the fourth cylinder to a second outlet valve.

4,854,826

ASSEMBLY OF A PRIMARY POWER SOURCE AND SEVERAL AXIAL PISTON PUMPS FLANGED ON IT

Gustav Kleineisel, Mainaschaff, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 28, 1988, Ser. No. 187,282
Claims priority, application Fed. Rep. of Germany, May 15, 1987, 3716374
Int. Cl.[4] F04B *1/12, 23/06*
U.S. Cl. 417—269 2 Claims



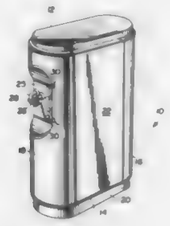
1. A pump assembly including a primary power source having a primary power source connection flange thereon, a first axial piston pump attached to said primary power source flange, said first piston pump having a first pump connection flange thereon, at least one more axial piston pump coaxially connected to said first pump flange, said at least one more axial piston pump also having a connection flange thereon, a generally vertical guide plate positioned on at least one side of the first axial piston pump, said guide plate having a first end connected directly on the primary power source flange, and having an opposite end connected with the connection flange of said at least one more axial piston pump coaxially connected with the first axial piston pump.

4,854,827

SANITARY PUMP STATION

Edward F. McKiernan, Wooster; James Sigler, Perrysville; Richard Sprang, Lakeville; Richard Lewellen, and Mark Geis, both of Wooster, all of Ohio, assignors to Sealand Technology, Inc., Big Prairie, Ohio

Filed Sep. 24, 1987, Ser. No. 101,149
Int. Cl.[4] F04B *15/02*
U.S. Cl. 417—313 22 Claims



1. A sanitary pump station for emptying vehicle waste tanks comprising:

a housing adapted to be mounted on a support surface;

pump means enclosed within said housing, said pump including an inlet, an outlet, and means for driving said pump, wherein each of said inlet and outlet is provided with at least two one way duck bill valves;

waste hose means for connection between said pump inlet and termination valve means associated with a vehicle waste tank; and wherein

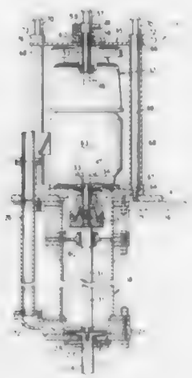
said housing is further provided with a water hose connected to an external water supply for rinsing said vehicle waste tank after it is emptied.

4,854,828

REMOTELY REMOVABLE AND REPLACEABLE MOTOR FOR HAZARDOUS SERVICE PUMP INSTALLATION

Walter D. Haentjens, R.D. 1, Box 121, Sugarloaf, Pa. 18249

Filed May 30, 1986, Ser. No. 868,605
Int. Cl.[4] F04B *9/02*
U.S. Cl. 417—360 10 Claims



1. A vertical pump/motor assembly adapted for service in a hazardous environment in which replacement of a motor unit is performed by remotely operated equipment, comprising:

a pump unit operably mounted in said hazardous environment and having a pump shaft with a first precision coupling half secured to an upper end thereof,

said first coupling half includes a tapered conical projection;

a motor unit supported on said pump unit and having a lifting frame supporting a motor therein, said motor being equipped with a hollow motor shaft and having a second precision coupling half secured to a lower end thereof, wherein said second coupling half includes a self-aligning tapered bore therein, said tapered bore and said tapered conical projection are adapted for precision mating and releasable interconnection;

a pair of bearings rotatably supports said hollow motor shaft in said motor wherein said pump shaft is cantilevered below said motor in a rigid and aligned orientation by means of said first and second coupling halves;

an elongated drawbar extending through said hollow motor shaft and being engageable with said first coupling half whereby said first and second coupling halves are rigidly held together in a driving relationship, said drawbar having a torque transmitting head protruding above said hollow motor shaft and being accessible, whereby said remotely operated equipment may be employed to rotate said drawbar to selectively connect or disconnect said first and second coupling halves;

a plurality of elongated hold down bolts arranged to secure said lifting frame to said pump unit, each hold down bolt having a torque transmitting head portion protruding from said lifting frame and being accessible, whereby said remotely operated equipment may not be employed to selectively tighten down or release said motor unit from said pump unit for replacement of said motor unit in said hazardous environment;

said drive pin means being extensible from one of said coupling halves and is engageable with bore means in the other of said coupling halves so that positive driving between said coupling halves is provided;

said drive pin means including a plurality of spaced drive pins, each being biased by a spring into engagement with a related bore of said bore means whereby exact rotational relationship between coupling halves is unnecessary when replacing said motor unit and said drive pins will automatically seat in said related bores upon initial relative motion between the coupling halves;

said pump shaft being maintained in an aligned vertical orientation by a bushing while awaiting the mating of said coupling halves, and

said bushing having a small clearance relative to said pump shaft when said coupling halves are rigidly interconnected.

4,854,829

STRUCTURE FOR MOTOR-COMPRESSOR UNITS USED WITH REFRIGERANT FLUIDS

Franco Stanzani, Via dei Tigli, 66, Ariccia (Roma), Italy (00040), and Sandro Stanzani, Piazzale Roberto Ardigò, 30, Roma, Italy (00142)

Filed Mar. 10, 1988, Ser. No. 166,110
Claims priority, application Italy, Mar. 16, 1987, 47731 A/87
Int. Cl.[4] F04B *39/14*
U.S. Cl. 417—360 10 Claims

1. A structure for motor-compressor units used with refrigerant fluids comprising:

a casing;

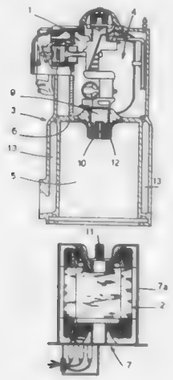
a bulkhead, spanning the interior of the casing transversely and, with said casing, forming a chamber on one side thereof, and a motor housing on the other side thereof, wherein both said chamber and said motor housing reside within the casing, said bulkhead forming a sealed barrier between said chamber and said motor housing;

a compressor, occupying the chamber and having a shaft, the shaft of which passes thru the bulkhead in a fluid-tight fit;

a motor, mounted internally of the housing;

at least one gallery, incorporated into the casing, which is disposed peripherally in relation to the motor housing and

communicates with the chamber occupied by the compressor, said gallery being sealed with respect to said motor housing; and



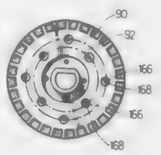
removable coupling means serving to connect the compressor shaft with the motor and enable operation of the unit.

4,854,830

MOTOR-DRIVEN FUEL PUMP

Tadashi Kozawa; Naohiro Natsume; Hirofumi Komatsubara; Yasunori Takaku; Kiyoshi Kato, and Seiichi Harada, all of Obu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

Filed Apr. 28, 1988, Ser. No. 187,516
Claims priority, application Japan, May 1, 1987, 62-67272; May 16, 1987, 62-73155; May 26, 1987, 62-79502
Int. Cl.[4] F04B *39/00*
U.S. Cl. 417—365 1 Claim



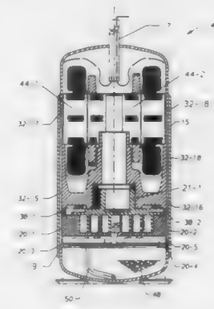
1. In a motor-driven fuel pump including a motor section provided with a driving motor, and a pump section arranged below said motor section and provided with an impeller to be driven by said driving motor; the improvement comprising a plurality of pressure compensation hollows formed on opposite surfaces in a sealing portion of said impeller, said pressure compensation hollows comprise a plurality of round hollows arranged on concentric circles, and a plurality of communication holes formed through said sealing portion for communicating said pressure compensation hollows.

4,854,831

SCROLL COMPRESSOR WITH PLURAL DISCHARGE FLOW PATHS

Shahrokh Etemad, E. Syracuse; Donald Yannascoli, Fayetteville, both of N.Y., and Michael Hatzikazakis, Greenville, S.C., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 125,918, Nov. 27, 1987, abandoned.
This application Jun. 8, 1988, Ser. No. 206,991
Int. Cl.[4] F04B *39/06*; F04C *18/04, 29/04*
U.S. Cl. 417—366 4 Claims



1. A high side hermetic scroll compressor comprising:

casing means having an inlet and an axially extending discharge line extending therethrough;

a fixed scroll means within said casing means having a helical wrap formed therein with said wrap being in fluid communication with said inlet at its outer portion and having an axial discharge at its inner portion;

at least one radially extending discharge bore extending from said axial discharge to a corresponding recessed area in the outer periphery of said fixed scroll which together with said casing means forms a fluid path;

an orbiting scroll means within said casing means having a helical wrap on one side coacting with said wrap of said fixed scroll means to define a plurality of trapped volumes;

crankshaft means having two ends with one end operatively connected for causing movement of said orbiting scroll means;

bearing head means supporting said crankshaft means with the other end of said crankshaft means extending therethrough and including a sleeve portion;

motor means operatively connected to the other end of said crankshaft means for causing rotation thereof and including a rotor and a stator which are at least partially located within said bearing head means;

at least one recessed area in the outer periphery of said sleeve portion and together with said casing means forming a continuation of said fluid path defined between said fixed scroll means and said casing;

a radial notch in said sleeve portion in said recessed area forming continuation of said fluid path whereby said fluid part is diverted inwardly towards said motor means;

anti-rotation means coacting with said orbiting scroll means to limit said orbiting scroll means to orbiting motion with respect to said fixed scroll means;

an oil sump in said casing means;

means for lubricating said scroll compressor;

whereby in operation gaseous refrigerant passes through said inlet into said casing means and between said wraps which coact to established trapped volumes of refrigerant which are compressed and delivered to said axial discharge with at least some of the compressed refrigerant passing into a flow patch which serially includes said at least one radial extending discharge bore, said fluid path between said fixed scroll means and said casing means which are in thermal contact with ambient for heat ex-

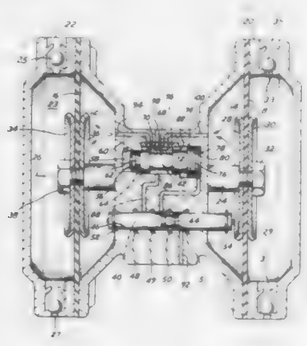
change therewith and the continuation thereof defined between said sleeve portion and said casing, the flow then passing through said radial notch and said gaseous refrigerant passing over and thereby cooling said motor means before passing through said axially extending discharge line.

4,854,832

MECHANICAL SHIFT, PNEUMATIC ASSIST PILOT VALVE FOR DIAPHRAGM PUMP

Richard K. Gardner, Montpelier, and Nicholas Kozumplik, Jr., Bryan, both of Ohio, assignors to The Aro Corporation, Bryan, Ohio

Filed Aug. 17, 1987, Ser. No. 85,802
Int. Cl.[4] F04B *43/06*
U.S. Cl. 417—393 4 Claims



1. A combination mechanical and fluid operated pilot valve construction for a double diaphragm pump comprising, in combination:

a housing defining an axis with first and second axially spaced fluid pressure chambers in a double diaphragm pump;

first and second diaphragms arranged in the first and second pressure chambers, respectively, to define a flexible wall in each of said pressure chambers, said diaphragms generally transverse to the axis, said diaphragms mechanically connected for generally simultaneous, reciprocal movement in the axial direction, said diaphragms each also defining a flexible wall of an adjacent pumping chamber;

a pilot valve assembly having a single fluid inlet, a first outlet to the first chamber and a second outlet to the second chamber, said pilot valve assembly also including a fluid operated slide valve reciprocal to connect the inlet to the first or second outlets; said fluid operated slide valve including a differential surface area fluid actuator having a minor and a major surface area; said assembly also including a mechanically shiftable pilot member projecting axially into the pressure chambers and slidable axially in response to engagement by one of the diaphragms said slide valve and actuator comprising an elongate spool valve translatable axially in the housing, said spool valve including a slide member along one side, said slide member cooperative with the first or second outlets and an intermediate exhaust passage whereby only one or the other outlet is connected to the exhaust passage as the other or one outlet is connected to a pressurized fluid inlet;

first and second fluid pressure passage to the fluid actuator minor and major surface areas, respectively, said first pressure passage communicating directly with the minor surface area, and the second pressure passage communicating through the mechanically shiftable pilot member to the major surface area; and

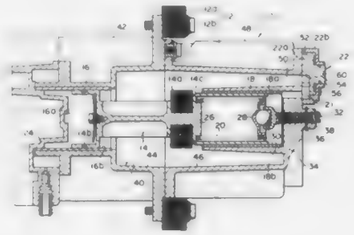
said mechanically shiftable pilot member including a fluid connection passage which interconnects, the first and second pressure passages to provide pressurized fluid flow into the second pressure passage upon mechanical shifting of the pilot member the other diaphragm.

4,854,833

ELECTROMAGNETICALLY RECIPROCATING APPARATUS WITH ADJUSTABLE BOUNCE CHAMBER

Katsuji Kikuchi; Haruki Nakao, and Tamotsu Mori, all of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1988, Ser. No. 207,212
Claims priority, application Japan, Jun. 17, 1987, 62-92058[U]
Int. Cl.[4] F04B *17/04*
U.S. Cl. 417—417 2 Claims



1. An electromagnetically reciprocating apparatus comprising:

an electromagnet which repeats magnetization and demagnetization for one-half cycle of AC current or for one pulse of DC current;

a piston assembly which includes a magnetic material member to be drawn by the electromagnet in a magnetized state, and front and rear pistons disposed before and behind the magnetic material member;

front and rear cylinders for supporting the front and rear pistons of the piston assembly wherein the rear cylinder is formed in a housing the inner space of which communicates with the atmosphere;

a compression coil spring which is compressed by the piston assembly when said piston assembly is moved in a forward direction by the magnetic action of the magnetized electromagnet, and which moves the piston assembly in a backward direction by a compressed elastic force thereof when the electromagnet is demagnetized;

wherein an air hole is provided between a sealed space which is partitioned by a back face off the rear piston in the rear cylinder, and a space which is located behind a back face of the front piston in the front cylinder and is communicated with the outside of the cylinder, the air hole being open at its one side to the sealed space in the rear cylinder in which the compression coil spring is mounted, and being open at its other side to the outer periphery of the rear cylinder and to the inner space of the housing formed in the back face of the front piston in the front cylinder;

manually controlled valve means mounted over the air hole for adjusting resonance frequency of a vibration system comprising the piston assembly and the compression coil spring;

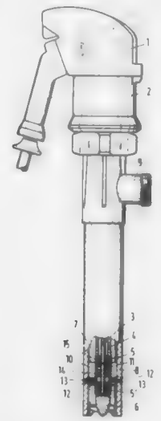
wherein the valve means comprises: a cap-like valve casing hermetically mounted on the outer end face of an end wall of the housing so as to cause an end face opening of the inner space of the valve casing to cover one side of the air hole, which is located in the rear cylinder side, and the other side of the air hole, which is located in the inner space side of the housing; and a valve body arranged in the inner space of the valve casing so as to be movable between a closed position where communication between one side of the air hole and the other side of the inner space of the housing through the inner space of the valve casing is interrupted, and an open position where communication between one side and the other side of the air hole through the inner space of the valve casing is permitted.

4,854,834

PUMP WITH IMPROVED SEAL

Alois Gschwender, Neubulach; Andreas Szeteli, Obere Gärten, and Horst Krüger, Nelkenweg, all of Fed. Rep. of Germany, assignors to Flux-Geräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 9, 1987, Ser. No. 71,396
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1986, 3622963
Int. Cl.[4] F04B *47/02*
U.S. Cl. 417—423.3 20 Claims



1. A pump comprising;

a rotor;

motor means for driving said rotor;

a drive shaft connected at one end to said motor means and at an opposite end to said rotor;

a first pipe surrounding said shaft and extending from said motor means towards said rotor;

support means for supporting said shaft in said first pipe, said support means including a plurality of bearings located between the rotor and motor, one of said bearings being disposed in a region about said rotor proximately to an end of said first pipe;

sealing means for sealing said first pipe, said sealing means including at least one seal having a radial position between said shaft and said first pipe and an axial position between said one of said bearings and another of said bearings adjacent thereto;

a second pipe surrounding said first pipe, said second pipe being radially spaced from said first pipe to form a transport channel for effluent moved by rotation of said rotor, said second pipe being provided with an outlet communicating with said channel, said second pipe being further provided with an opening;

a reduced-pressure chamber in said first pipe in a region about said rotor proximately to an end of said first pipe, said seal being disposed in said chamber; and

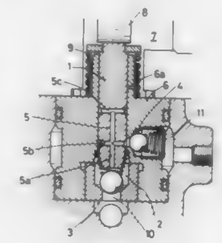
means for connecting said opening with said chamber, whereby said chamber is subjectable to a reduced pressure to evacuate leakage material from said chamber through said opening.

4,854,835

PLUNGER PUMP

Keiichi Onishi, Itami, Japan, assignor to Sumimoto Electric Industries, Ltd., Osaka, Japan

Filed Apr. 26, 1988, Ser. No. 186,298
Claims priority, application Japan, Apr. 28, 1987, 62-64384
Int. Cl.[4] F04B *21/00*
U.S. Cl. 417—435 1 Claim



1. A plunger pump having a pump body, a compression chamber, an intake valve and a discharge valve mounted in said compression chamber, a reservoir space open to the atmosphere and a plunger reciprocably mounted in said pump body and having one end thereof projecting into said compression chamber and the other end projecting into said reservoir space characterized in that said plunger is formed with a narrow air vent passage means having one end thereof open to said compression chamber and the other end adapted to communicate with said reservoir space only when said plunger comes near its top dead point.

4,854,836

COLLAPSIBLE CONDUIT FOR LINEAR PERISTALTIC PUMP AND METHOD OF MAKING THE SAME

Alexander S. Borsanyi, Newport Beach, Calif., assignor to Baxter International Inc., Deerfield, Ill.

Filed Feb. 18, 1986, Ser. No. 830,693
Int. Cl.[4] F04B *43/14, 43/12*
U.S. Cl. 417—474 10 Claims



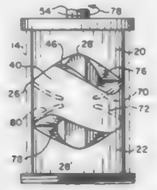
1. A conduit for transmitting fluids, comprising a one-piece, flexible, resilient, non-elastomeric, thermoplastic tube having an inlet portion, an outlet portion, and intermediate portion disposed between said inlet and outlet portions; all of said portions being integral with each other; said inlet and outlet portions having flow passages of the same cross sectional area and walls of the same thickness, respectively; said intermediate portion including an enlarged section having a flow passage of substantially greater cross sectional area, a wall with at least a part thereof having substantially lesser thickness, and a substantially lower resistance to deformation, than those of said inlet and outlet portions; said enlarged section includes a cup-shaped body portion defining a cavity and an integral membrane portion extending over said cavity; said membrane portion having a wall thickness substantially less than that of said body portion; and said membrane portion generally extending along a plane parallel with the longitudinal axis of said conduit when said conduit is in a linear undeformed state.

4,854,837

ROTARY ACTUATED PUMP OR MOTOR

Robert K. Cordray, Broomfield, Colo., assignor to Cordray International Corporation, Broomfield, Colo.

Filed Sep. 15, 1987, Ser. No. 97,542
Int. Cl.[4] F04B 7/06, 39/10
U.S. Cl. 417—492 29 Claims



1. The rotary pump or motor comprising:

housing means having an inner housing which defines a substantially cylindrical cavity having central axis, and an outer housing enclosing said inner housing;

a pair of coaxial stators disposed at each end of said inner housing to enclose said cavity, each said stator having a cam surface with said cam surfaces of said stators being spaced apart and opposed to one another;

a rotor having a length and diameter dimensions disposed for rotation within said cavity between said stators, said rotor including first and second substantially symmetrical end faces configured for mating engagement with oppositely disposed stator cam surfaces;

shaft means connected to said rotor for rotation therewith within said cavity while permitting axial movement between said shaft means and said rotor, said rotor being spaced between said stators to reciprocate along said shaft means between alternating mating engagement with each said stator cam surface during rotation of said rotor to define a pair of chambers between said rotor and each said stator; and

port means disposed in said inner housing to control the intake and discharge of fluid from said pair of chambers defined on each side of said rotor, said reciprocating rotor opening and closing said chambers and said port means as it rotates and reciprocates within said cavity; and wherein further, said ports means comprises a plurality of paired helical slots disposed in said wall of said inner housing, said helical slots being sized and shaped so that as said rotor rotates and reciprocates within said cavity, said rotor functions as a rotary valve that opens and closes said helical slot ports, and with each said chamber being interconnected with a pair of helical slot ports based circumferentially adjacent each other and being of opposite hand with respect to each other.

4,854,838

HYDRAULIC PUMP GATE APPARATUS

David O. Swain, 52 Carriage Hill Lane, Laguna Hills, Calif. 92653

Filed Jul. 14, 1986, Ser. No. 885,153
Int. Cl.[4] F04B 7/00
U.S. Cl. 417—517 25 Claims

1. In combination with an apparatus for feeding coarse granular material, a gate device comprising,

first, second and third planar plate means of substantially the same size and configuration,

said first and second plate means being substantially fixed in position and including at least three aligned apertures therethrough,

said third plate means disposed intermediate said first and second plate means and including at least three apertures therethrough,

said third plate means adapted to be movable relative to said first and second plate means such that the apertures through said third plate means are selectively aligned with less than all of the apertures through said first and second

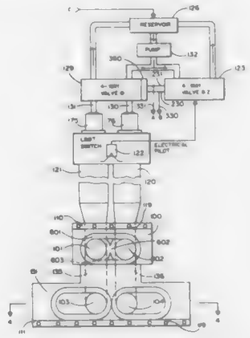


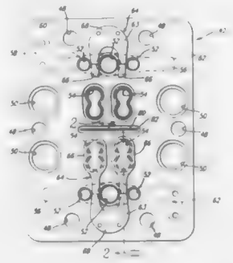
plate means thereby ton control passage of said coarse granular material through said apertures in said first and second plate means.

4,854,839

COMPRESSOR VALVE ASSEMBLY

Michael A. DiFlora, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Filed Jun. 13, 1988, Ser. No. 206,480
Int. Cl.[4] F04B 21/02; F16K 15/14
U.S. Cl. 417—571 13 Claims



1. A valve system for a compressor comprising a compression chamber, a valve plate having a port which extends through said plate and communicates with said compression chamber, and a reed valve secured to said plate and having a deflectable portion for opening and closing said port, said port being generally figure-8 in configuration with a continuous side wall describing two interconnected lobes, one of said lobes being smaller than the other of said lobes.

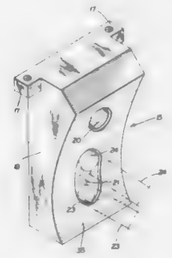
4,854,840

MOLD GATE HAVING MULTIPLE VALVE STEM RECEIVING APERTURES

Stephen B. Hunter, Dardanelle, Ark., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Feb. 25, 1988, Ser. No. 160,386
Int. Cl.[4] B29C 35/02
U.S. Cl. 425—32 20 Claims

1. A hollow mold suitable for curing inner tubes having valve stems, said mold having a slot formed in an interior wall thereof; means defining a mold gate mounted in the wall slot and formed with an inner surface generally matching the contour of the interior wall and having at least two apertures, said apertures each being adapted to selectively receive a valve stem therein; and plug means removably secured in a selective



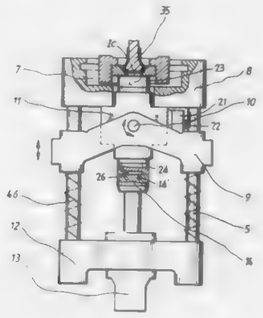
one of said apertures for closing said one aperture with the other of said apertures adapted to receive a valve stem therein for bonding to an inner tube during the molding of said inner tube in said mold.

4,854,841

APPARATUS FOR MANUFACTURE OF AN ARTICLE OF FOOTWEAR HAVING AN OUTER SOLE, AN INNER SOLE AND A LATERAL SOLE

Hans-Joachim Graf, and Wolfgang Koliwer, both of Achim, Fed. Rep. of Germany, assignors to Klöckner Ferromatik Desma GmbH, Malterdingen, Fed. Rep. of Germany

Filed Dec. 21, 1987, Ser. No. 135,369
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1986, 3643820
Int. Cl.[4] B29C 45/16
U.S. Cl. 425—119 4 Claims



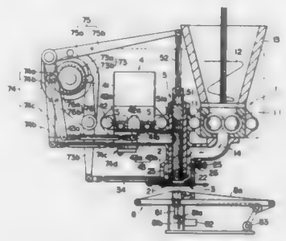
1. Apparatus for molding outer, inner and lateral soles on to shoe uppers, comprising an upstanding frame structure including a vertically movable upper cross block, a mold carrier mounted on said cross block for pivotal movement about a transverse axis, said mold carrier having a first pair of opposed outer surfaces and a second pair of opposed outer surfaces perpendicular to said first surfaces, a pair of opposing lateral mold elements mounted on said frame structure above said upper cross block, a shoe last on a shoe last holder mounted on said frame, said lateral mold elements being spaced apart in a closed position against said last, a heatable first mold part on one of said first surfaces projectable in a first position into the spacing between said lateral mold elements to define therewith a lateral sole mold cavity into which an elastomer is injected to form a lateral sole, said lateral mold elements and said first mold part having heating and cooling channels to effect full vulcanization of said lateral sole except along an edge thereof facing said first mold part, a second mold part on one of said second surfaces engageable in a second position with undersurfaces of said lateral mold elements to define with the interior of the lateral sole and with the shoe last an inner sole cavity into which one of a thermoplastic and a mixture of isocyanate and a polyol reacting into polyurethane is injected to form an inner sole, a third mold part mounted on the other of said second surfaces, a vertically movable lower cross block having a plate engageable in said second position with said third mold part to define therewith an outer sole cavity into which an elastomer is injected to form an outer sole simultaneously with formation of the inner sole, said plate and said third mold part having heating and cooling channels to effect full vulcanization of said outer sole in said second position except at a peripheral portion of said outer sole, said mold part being engageable in a third position with said undersurfaces for placing the outer sole into engagement with said inner and lateral soles, said heating and cooling channels in said third mold part and in said lateral mold elements effecting vulcanization in said third position between said peripheral position of said outer sole and said edge of said lateral sole, and between said outer and inner soles, and means for pivoting said mold carrier between said first, second and third positions.

4,854,842

PRODUCTION APPARATUS TO FORM THE SOLID STATE FOOD MATERIAL COMPLETELY WRAPPED AND SEALED WITH THE CLAYISH STATE FOOD MATERIAL INTO GLOBULAR SHAPE

Masao Kobayashi, 413-2, Nittazaka, Fukui-shi, Fukui-ken, Japan

Filed Feb. 17, 1988, Ser. No. 156,802
Claims priority, application Japan, Feb. 25, 1987, 62-43629
Int. Cl.[4] A21C 3/04
U.S. Cl. 425—133.1 13 Claims



1. An apparatus for wrapping and sealing a solid state food material with a clayish state food material thereby forming a globular product comprising:

a mould having a bottom, a first central chamber for receiving solid state feed material, a second chamber disposed coaxially with and around the first central chamber, and an outlet passage disposed beneath the first and second chambers at the bottom of the mould;

a gate overlying the outlet passage for closing the second chamber and the outlet passage;

means associated with the gate for opening and closing the gate;

first feed means for feeding solid state food material to the first chamber;

second feed means for feeding claying state food material to the second chamber while the gate is closed so that clayish state food material fills the outlet passage and surrounds an outlet end portion of the first chamber;

means for pushing the solid state food material through the outlet passage synchronously with operating the gate opening and closing means, so that the gate gradually opens and closes as the solid stated food material passes

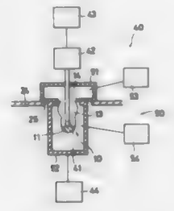
therethrough, thereby enveloping the solid state food material with the clayish state food material.

4,854,841

APPARATUS FOR PRODUCING CAST PRODUCTS

Satoru Takeda; Toshihiro Hayashi, and Hiroshige Kohno, all of Tokyo, Japan, assignors to Asahi Denka Kogyo K. K., Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,430
Claims priority, application Japan, Jun. 13, 1987, 62-147709
Int. Cl.[4] B28B *13/02*
U.S. Cl. 425—437 5 Claims



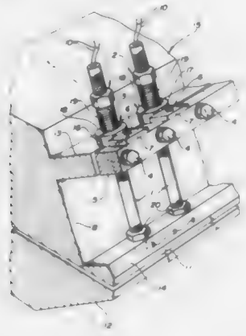
1. Apparatus for producing cast products comprising: a filling unit wherein a non-solid material is filled into an elastic mould having an open bag-shaped filling section, said filling unit including an upper cover and a lower cover movable to positions enclosing said elastic mould and means for evacuating said upper cover and said lower cover at said filling unit, a solidifying unit wherein the filled material is solidified inside the elastic mould, a withdrawal unit wherein the solidified product is withdrawn from the inside of the elastic mould, and conveying means for moving said elastic mould from said filling unit to said solidifying unit and said withdrawal unit, whereby said upper cover is moved to enclose an upper portion of said elastic mould and evacuated to withdraw air from the interior of said bag-shaped filling section and said lower cover is moved to enclose a lower part of said elastic mould and evacuated to expand said bag-shaped filling section.

4,854,844

DIE-LIP ADJUSTING MECHANISM

Richard A. Carlsen, Somerset, N.J., assignor to John Brown, Inc., Warwick, R.I.

Continuation of Ser. No. 844,713, Mar. 27, 1986, abandoned.
This application Jun. 29, 1988, Ser. No. 213,450
Int. Cl.[4] B29C *47/16*
U.S. Cl. 425—141 5 Claims



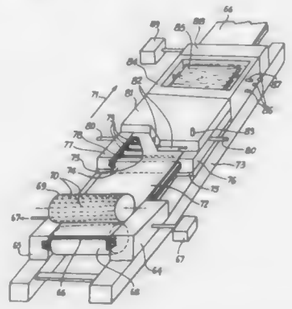
1. A web manufacturing die comprising:
an elongated shaping member for controlling the thickness of the web which is formed along the length of said shaping member;
an elongated support extending parallel to the shaping member;
a plurality of thermal expansion rods mounted on the support and extending into the shaping member;
a plurality of mechanisms for adjustably mounting each of said rods in said support;
each said mechanism supported by said support and including a threaded spool having threads internally formed therein and a slot extending along the length of the spool;
an adjusting nut having internal and external threads formed therein;
the external threads of said adjusting nut engaging the internal threads of the spool;
the internal threads of said adjusting nut engaging said rod;
said adjusting nut having a plurality of slots formed therein; and
adjustable means mounted on said support adjacent to said spool for compressing said spool about said rod.

4,854,845

APPARATUS FOR EMBOSSING SECTIONS OF A CLADDING ELEMENT FOR OUTER FACADES

Pierre Coudere, Neuilly sur Seine, and Henri Corbel, Saint Brevin, both of France, assignors to Elf Isolation, Paris, France

Division of Ser. No. 677,545, Oct. 29, 1984, Pat. No. 4,686,803.
This application Apr. 23, 1987, Ser. No. 41,727
Int. Cl.[4] B29C *43/46, 43/52*
U.S. Cl. 425—363 9 Claims



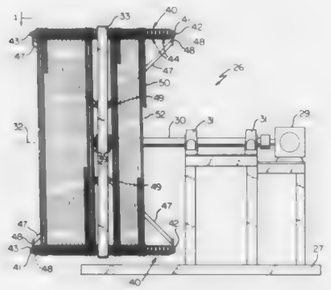
1. Apparatus for embossing an extruded section of a thermoplastic material having a central band edged on both sides by a flange, said apparatus comprising:
(a) an embossing means disposed to receive said extruded section, said embossing means including:
(i) a counter-roller freely mounted on a shaft for rotation and supporting said extruded section;
(ii) an embossing roller mounted above the central band of said extruded section, means for driving said embossing roller at a speed equal to the speed of said extruded section over said counter-roller; and
(iii) primary shaping means comprising two shaping members each disposed adjacent ends of the embossing roller and counter-roller disposed therebetween, said primary shaping means being connected to a vacuum source and being provided with cooling means to cool the flanges of said extruded section and to maintain the shape of said flanges during the embossing of the central band of said extruded section;
(b) secondary shaping and cooling means located downstream from said embossing means and including:
(i) a base resting on a support frame and having two lateral members connected by an elevated central portion having lower suction slots; and
(ii) an opposing base disposed above the base of said secondary shaping and cooling means and having upper section slots;
(c) a tank filled with a cooling liquid disposed downstream from said base and opposing base; and
(d) drying means located downstream from said cooling tank;
wherein said extruded section travels between said base and said opposing base and to said cooling tank before passing into said drying means and wherein said upper and lower suction slots are arranged and connected to suction means and to said tank so as to produce a flow of cooling liquid on both sides of the travelling section in a direction opposite to the direction of travel of said section.

4,854,846

METHOD AND APPARATUS FOR MAKING A PLURALITY OF FLEXIBLE HOSES EACH HAVING A PREFORMED BEND THEREIN

Donald L. Oglesby, Ocala, Fla., assignor to Dayco Products, Inc., Dayton, Ohio

Filed Feb. 8, 1988, Ser. No. 153,757
Int. Cl.[4] B31C *1/00*
U.S. Cl. 425—391 4 Claims



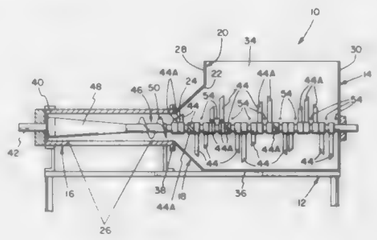
1. An apparatus for making a plurality of flexible hoses each having preformed bend means between opposed ends of said hose that tends to return to the shape of its preformed bend means when unbent therefrom, said apparatus comprising a pair of spaced apart substantially cylindrical post means having opposed ends and about which a continuous length of a hose means can be wound so that a plurality of sections of the hose means extend between said post means whereby a subsequent heat curing of said wound hose means permits the cutting of said plurality of hoses from said cured hose means so that each hose has said preformed bend means therein that was defined by its wound relation with said post means, the improvement comprising means for orbiting said post means in unison about an axis that is substantially parallel to the longitudinal axes of said post means so as to wind said hose means around said post means, and a frame means supporting said post means in said spaced apart relation thereof, said means for orbiting said post means comprising a rotatable shaft means attached to said frame means, said frame means comprising a single elongated beam means having opposed ends, said opposed ends having opening means passing transversely therethrough and respectively receiving medial portions of said post means therein to support said post means in said spaced apart relation thereof, and a plurality of support members having opposed ends that are respectively interconnected to said ends of said post means and to a medial portion of said beam means.

4,854,847

TORTILLA DOUGH FORMING MACHINE

Fausto C. Mendoza, Calzada San Esteban Num 57, Naucalpan de Juarez, Mexico

Filed Jul. 11, 1988, Ser. No. 217,177
Int. Cl.[4] B29C *47/64;* B29B *7/14, 7/16*
U.S. Cl. 425—205 11 Claims



1. A tortilla dough forming machine, comprising:
(a) a support frame;
(b) a hopper mounted on said support frame and having an open top through which a mass of tortilla dough can be received and a dough discharge outlet;
(c) a hollow casing mounted on said support frame in spaced relation to said discharge outlet of said hopper and having a dough entry inlet and an elongated narrow slit defined therethrough and extending longitudinally along a lower portion of said casing;
(d) a hollow extension extending between and connecting said dough discharge outlet of said hopper in communication with said dough entry inlet of said casing;
(e) an elongated shaft rotatably mounted to said casing and hopper and extending axially through said casing, extension and hopper;
(f) a plurality of conveying vanes attached along an upstream portion of said shaft extending through said extension and hopper and being operable to convey dough toward and through said dough discharge outlet of said hopper and through said extension upon rotation of said shaft; and
(g) a screw conveyor and a conical member attached in tandem end-to-end relation along a downstream portion of said shaft extending through said casing, said screw conveyor being disposed upstream of said conical member and adapted to convey dough through said casing toward said conical member upon rotation of said shaft, said conical member being oriented in opposing working relation to said screw conveyor such that axial flow of dough through said casing past said slit is resisted by said conical member thereby causing radial flow of dough from said casing through said slit;
(h) said dough entry inlet of said casing is smaller in size than said dough discharge outlet of said hopper, said extension being truncated conical in shape and extending between and connecting said smaller dough entry inlet of said casing and said larger dough discharge outlet of said hopper.

4,854,848

APPARATUS FOR APPLYING LABELS TO BLOW MOLDED ARTICLES

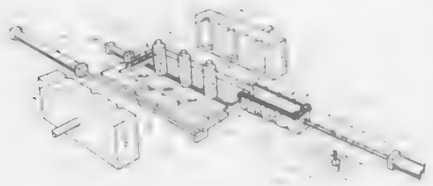
Thomas J. Krall, Toledo, and Robert A. Myers, Perrysburg, both of Ohio, assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Mar. 21, 1988, Ser. No. 170,473
Int. Cl.[4] B29C *49/24, 49/04, 49/70*
U.S. Cl. 425—503 3 Claims

1. In an apparatus for forming articles by blow molding parisons into conformity with cavities of an array of mold

sections wherein an extruder extrudes parisons in the form of tubes into an array of neck molds on a head, means for moving the head axially away from the extruder to define the parisons, said array of mold sections being closeable about the parisons, means for blowing the parisons outwardly, and a take out mechanism having grasping means for grasping blown articles and means for reciprocating movement of said mechanism generally horizontally in a first direction away from and a second direction toward said molds after the mold sections are opened, the improvement for applying labels to the hollow blown plastic articles comprising

a label carrier mounted adjacent said molds for reciprocating movement generally horizontally in said first direction



toward and between the open mold sections and in said second direction generally horizontally away from said molds,

an array of spaced vacuum pick up devices movably supported on said carrier,

means for mounting and moving said carrier for reciprocating movement in said first direction between the longitudinally spaced array of mold sections substantially at the same time as the take out mechanism is moved in said second direction adjacent the mold sections to grasp the blown containers so that the labels are delivered with substantially no delay in cycle time such that the vacuum devices can be actuated to deliver the array of labels to the cavities of the array of open mold sections.

4,854,849

INJECTION MOLD

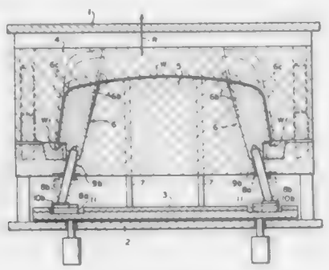
Yoshinori Sudo, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 114,239, Oct. 29, 1987, abandoned. This application Dec. 5, 1988, Ser. No. 282,953

Claims priority, application Japan, Oct. 31, 1986, 61-261584

Int. Cl.[4] B29C *45/44*

U.S. Cl. 425—556 **4 Claims**



1. An injection mold for molding an article having an undercut at at least one end portion thereof comprising stationary and movable mold halves which are adapted to be closed to form a cavity conforming to the shape of the article with the stationary mold half defining an outer surface of the article and the movable mold half defining an inner surface of the article, the movable mold half comprising a slide core which defines the inner surfaces of said one end portion and said undercut, a main body which defines the inner surface of the other portion of the article, and an ejector means which ejects the molded article in a predetermined ejecting direction, the slide core being slidable relative to the main body along an inclined surface which is formed on the main body at an angle to the ejecting direction so that when said ejector means operates to eject the molded article, the slide core is slid along the inclined surface to be moved both in a direction parallel to the ejecting direction and in a direction perpendicular to the ejecting direction thereby permitting the undercut of the molded article to clear the slide core, wherein the improvement comprises that said slide core is divided, at the portion defining the inner surfaces of the end portion and the undercut, into a plurality of core pieces in the direction perpendicular to both said ejecting direction and said direction in which the slide core is moved in perpendicular to the ejecting direction, and at least one of the core pieces is adapted to be slid along an inclined surface which is at an angle to the ejecting direction larger than the angle at which the inclined surface or surfaces of the other core piece or pieces are to the ejecting direction, the article is further provided with a projection from an inner surface of the end portion thereof which extends in a direction perpendicular to the ejecting direction, as defined by a recess means provided on at least one of said core pieces of said slide core, wherein said at least one of said core pieces provided with a recess means is adapted to be slid along an inclined surface which is at an angle to the ejecting direction larger than the angle at which the inclined surface or surfaces of the other core piece of pieces are to the ejecting direction.

4,854,850

DEVICE FOR PRODUCING AND POSITIONING A LABEL ON A THERMOFORMED CONTAINER

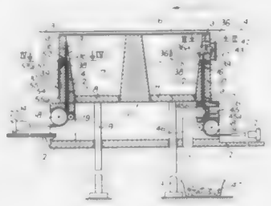
Jean-Claude Hautemont, Gif sur Yvette, France, assignor to Erca Holding, Les Ulis, France

Filed Jul. 13, 1987, Ser. No. 72,687

Claims priority, application France, Jul. 16, 1986, 86 10361

Int. Cl.[4] B29C *51/16*

U.S. Cl. 425—503 **12 Claims**



1. Device for the production and positioning of a label on a thermoformed container, using a thermoplastic band, said device comprising:

inside a thermoforming station including a molding unit having at least one lateral wall and at least one external lateral face, and in which at least one row of containers is simultaneously thermoformed, the axes of said containers defining a vertical plane,

at least one row of upwardly open forming chambers, each said chamber having a lateral wall defining an inner face of the forming chamber and a lower end with a bottom, separate from said lateral wall, and being provided in said molding unit, said molding unit being vertically movable, with respect to the bottom of the chamber, between a high thermoforming position in which the bottoms close off the lower ends of the chambers and a low stripping position in which the top openings of the chambers is situated under the bottoms, and in which the row of thermoformed containers can be moved one step in a direction perpendicular to the plane containing the axes of the containers of one container row, one access opening being provided in the lateral wall of each forming chamber, and said lateral wall being aligned with the lateral wall of the other chambers in the same row of chambers so that said access opening issues onto the inner face of said chamber;

a first vertically movable supporting table, supporting the molding unit and having control means for imparting a vertical reciprocating movement thereto between a high thermoforming position and a low stripping position;

one individual band of labels for every forming chamber, each label of each band of labels having an upper part, and each band having a free end passing into the chamber through the access opening and an outer portion passing to the exterior of the molding unit, said band being guided on its path towards the forming chamber by at least one return and guiding roller and one pair of introduction rollers placed upstream of the access opening, said introduction rollers being arranged so as to create a contact zone therebetween; and

means for at least partially cutting the labels in order to detach them from their individual band, wherein:

the access opening has, in vertical section, an outline which is homothetic to and slightly larger than that of a flat label, said opening comprising a horizontal upper face which constitutes an end-of-run abutment or stop for the free end of the label band, a horizontal lower face adjacent the inner face of the chamber, a vertical face forming part of the inner face of the chamber and a vertical bottom, said opening being connected with the exterior of the molding unit, via a horizontal guiding slot provided in the lateral wall of the molding unit, and having an inlet adjacent the introduction rollers, an aperture having an edge adjacent said opening, a rear face and an opposite front face, said guiding slot issuing onto the lower face of said access opening close to the inner face of the forming chamber and designed to receive an outer portion of the individual label band;

the return rollers and the pairs of introduction rollers are mounted on the molding unit supporting table, the contact zone between the two rollers of each pair of introduction rollers being situated opposite the inlet into the guiding slot and being aligned therewith;

the means for at least partially cutting the labels from one band of labels is provided in a zone situated between the pair of introduction rollers and the aperture of the slot guiding the band into the access opening;

said device further comprising:

a storage roll of master-band mounted in fixed bearings,

a cutting unit for cutting the master-band longitudinally into individual label bands of width equal to the width of the labels,

a second supporting table on which is installed the longitudinal cutting unit, which table is mounted for moving synchronous with the vertical displacements of the first table supporting the molding unit, the introduction rollers and the guiding and return rollers, and,

a tension roller provided on the path of the portion of master-band between the storage roll and the longitudinal cutting unit, said tension roller being applied against the master-band so as to compensate the length variations of said portion of master band which are due to the displacement of the longitudinal cutting unit.

4,854,851

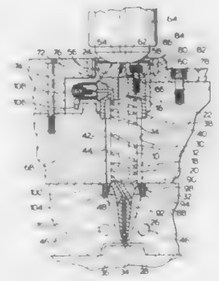
INJECTION MOLDING SYSTEM WITH INSERTABLE INSULATING RING

Jobst U. Gellert, 7A Prince St., Georgetown, Canada L7G 2X1

Filed Jul. 21, 1988, Ser. No. 222,501

Int. Cl.[4] B29C *45/20*

U.S. Cl. 425—549 **5 Claims**



1. In an injection molding system having an elongated heated nozzle with a forward end and a rear end, said nozzle being seated in a well in a cooled mold with minimal contact bridging an insulative air space provided between the heated nozzle and the surrounding cooled mold, the nozzle having a central portion with a generally cylindrical outer surface extending between a collar portion adjacent the rear end and a nose portion adjacent the forward end, the nozzle having a melt bore extending from a central inlet at the rear end through the central portion and the nose portion to convey pressurized melt from the inlet towards at least one gate extending from the well to a cavity, the nozzle having an electrically insulated heating element with a spiral portion which extends integrally in the central portion around the melt bore, the nozzle having a circumferential sealing and locating flange which extends outwardly between the central portion and the nose portion to bridge the insulative air space around the nozzle, the improvement wherein:

a cylindrical insulating ring having an inner surface, and an outer surface is seated in a circumferential seat in the mold in a position whereby the outwardly extending flange of the nozzle is in sealing contact with the inner surface of the ring, the seat in the mold having a cylindrical inner surface and the outer surface of the ring having at least one circumferential groove to form an insulating air space between the outer surface of the ring and the inner surface of the seat in the mold.

4,854,852

SYSTEM FOR REDUNDANTLY PROCESSING A FLAME AMPLIFIER OUTPUT SIGNAL

Paul B. Patton, Rockford, and William R. Landis, Bloomington, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

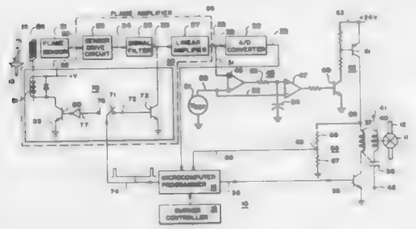
Filed Sep. 21, 1987, Ser. No. 99,379

Int. Cl.[4] F23N *5/00*

U.S. Cl. 431—78 **14 Claims**

1. A control system for processing a flame responsive output signal to insure cut-off control of main fuel valve means, including: a microcomputer flame safeguard control system adapted to operate a fuel burner including main fuel valve means; said flame safeguard control system including a flame sensor adapted to respond to flame at said fuel burner; flame amplifier means having input means connected to said flame sensor and output means providing an analog signal representative of flame at said fuel burner; analog-to-digital converter means having input means connected to receive said analog signal from said flame amplifier means, and having output

means connecting a digital signal to said microcomputer to provide said microcomputer with a digital signal representative of flame at said fuel burner; said microcomputer having output means connected to said fuel valve means to control the energization of said fuel valve means; redundant flame signal detection circuit means having input means connected to said analog signal representative of flame at said fuel burner; said redundant flame signal input means further including a reference voltage; said redundant flame signal detection circuit means including amplifier means comparing said reference voltage and said analog signal; said redundant flame signal



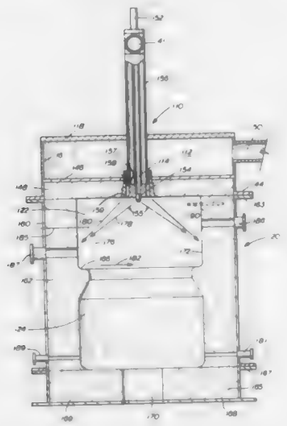
detection circuit means having switched output means connected in a series circuit with said microcomputer output means to redundantly control the energization of said fuel valve means; and voltage divider network means having an input connected to said series circuit and an output connected to said microcomputer to supply said microcomputer with a signal representative of the state of operation of said redundant flame signal detection circuit means; said fuel valve means being capable of being deenergized by the operation of said microcomputer output means, or the operation of said redundant flame signal detection circuit means.

4,854,853

WASTE COMBUSTION SYSTEM

James G. McElroy, Houston, Tex., assignor to Kirox, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 937,948, Dec. 4, 1986, Pat. No. 4,764,105. This application Dec. 30, 1987, Ser. No. 139,684
Int. Cl.[4] F23M *9/00*
U.S. Cl. 431—115 18 Claims



1. A combustion system for burning fluid waste with a fuel and gaseous oxidizer, comprising:

an annular combustion assembly having a primary combustion chamber with an outer peripheral wall and a coaxial secondary combustion chamber;

a burner assembly mounted coaxially on the end of said primary combustion chamber opposite said secondary combustion chamber, said burner assembly having a gaseous oxidizer manifold mounted in said end, a venturi member extending through said end between said manifold and said primary combustion chamber, a waste conduit communicating with a nozzle disposed on said venturi member for atomizing the waste in said primary combustion chamber, and a fuel conduit communicating with ports in said venturi member for mixing the fuel with the gaseous oxidizer;

said venturi having apertures therethrough for the passage of the gaseous oxidizer from said manifold into said primary combustion chamber, said ports communicating with said apertures whereby the fuel is introduced into the stream of gaseous oxidizer passing through said apertures;

said venturi member further including a deflector surface to direct the mixture of fuel and gaseous oxidizer toward said outer peripheral wall for mixing and combustion with the atomized waste form said nozzle;

an annular shoulder formed between said primary and secondary combustion chambers and facing said burner assembly; and

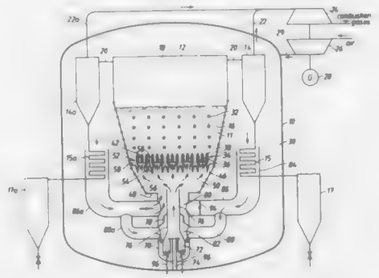
said burner assembly directing the flow of the waste and gaseous oxidizer into said primary combustion chamber whereby the fuel and gaseous oxidizer mixture and atomized waste mix within the primary combustion chamber adjacent said outer peripheral wall and before said shoulder for combustion.

4,854,854

FLUIDIZED BED FUEL-FIRED POWER PLANT

Arne Jonsson, Finspong, Sweden, assignor to ABB Stal AB, [illegible]

Filed May 6, 1988, Ser. No. 190,844
Int. Cl.[4] F23D *19/02*
U.S. Cl. 431—170 9 Claims



1. A power plant for burning fuel in a fluidized bed of a particulate material, comprising:

a bed vessel;

a plurality of parallel spaced-apart air distribution tubes with nozzles spaced apart along each tube, said tubes defining a grate with gaps therein, said grate dividing said bed vessel into an upper part with a combustion space containing the fluidized bed and a lower part forming at least two ash chambers into which ashes and consumed bed material pass through said gaps in said grate;

an air plenum chamber for supplying combustion air to said air distribution tubes, said air plenum chamber being located below said grate, between said ash chambers and transversely to said air distribution tubes; and

at least one thermal sleeve provided between said grate and said air plenum chamber, said sleeve connecting a group of at least two air distribution tubes with said air plenum chamber.

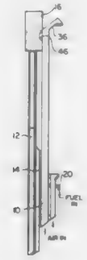
9. In the construction of an air distribution grate in a fluidized bed combustion chamber in which said grate is formed from parallel spaced-apart air distribution tubes, each feeding a plurality of spaced-apart air outlet nozzles, said tubes being fed with air from an underlying walled air plenum chamber, a double-walled air inlet sleeve provided between said air plenum chamber and groups of air distribution tubes, said sleeve including an inner wall and an outer wall, said inner wall being connected at its upper end to said air distribution tube and at its lower end to the outer wall, and the upper end of said outer wall being connected to a wall of said air plenum chamber.

4,854,855

FLARE IGNITER ASSEMBLY

Robert C. Rajewski, P.O. Box 2247, Stettler, Alberta, Canada T0C 2L0

Filed Mar. 18, 1988, Ser. No. 169,779
Int. Cl.[4] F23D *13/20*
U.S. Cl. 431—202 22 Claims



1. A flare igniter assembly, comprising:

an elongated tubing assembly of relatively noncorrodible metal which, when in operative position, is in juxtaposition with the exterior wall of a vertically extending flare stack; said assembly including:

a first air supply conduit;

a fuel gas supply line enclosed with in said first air supply conduit;

said fuel gas supply line being provided with a member having a venturi-type orifice through which fuel gas and intake air pass, said orifice effecting initial mixing of said fuel gas and air;

said fuel gas supply line further including a combustion zone;

means for transferring a fuel gas-air mixture downstream from said orifice to said combustion zone; said combustion zone including an inspirating baffle member firmly positioned within said fuel gas supply line; said baffle member being so constructed as to effect further thorough mixing of said fuel-gas mixture as it passes therethrough prior to combustion of said mixture in said zone; and

a terminal portion inclined at an angle relative to the remainder of said fuel gas supply line;

a second air supply conduit extending parallel to said first air supply conduit and in juxaposition therewith;

said terminal portion of said fuel gas supply line extending into said second air supply conduit within which an ignited flame is burning when said assembly is in operation;

said second air supply conduit being provided with a port hole in the wall opposite to said terminal portion of said igniter and adjacent to a corresponding port hole in said flare stack near the upper end thereof when said assembly is in operative position such as to enable flame from said terminal portion to pass therethrough to ignite combustible waste gases passing through said flare stack;

said second air supply conduit being provided for supplying said terminal portion with an additional amount of air and for protecting the flame of said terminal portion against strong wind;

said flare igniter assembly being of sufficient length to ensure that air drawn into said first and second air supply conduits is substantially uncontaminated with waste gases and pollutant from said flare stack; and

said assembly being retractable from a first, operative position parallel to and in juxaposition with said flare stack near the upper end thereof, to a second position at the base of said flare stack and vice versa.

4,854,856

CONTAINER OPENER AND LIGHTER COMBINATION

Steiger Jr., H. M., Scottsdale, Ariz., and Victor M. Catania, Port Richey, Fla., assignors to V and H Enterprises, Ltd., Buffalo, N.Y.

Filed Jul. 7, 1988, Ser. No. 216,002
Int. Cl.[4] B25F *1/00*; B67B *7/44*
U.S. Cl. 431—253 10 Claims



1. A combination lighter and container opener device, for use with a lighter having a fuel tank portion and an igniter portion, said device comprising:

an elongated handle having a container opener member at one end thereof and a lighter receiving means at the other end thereof;

said lighter receiving means comprising a pair of inwardly turned elongated gripping flanges spaced from and underlying said handle and extending a predetermined distance from said other end of said handle toward said one end, with said flanges oriented with a predetermined taper wider at said other end and narrower toward said one end to frictionally and releasably wedge the bottom of the fuel tank portion of a lighter inserted between said gripping flanges and said handle so that said lighter frictionally engages said flanges and said handle as the bottom of such lighter is pushed toward said one end of said handle, thereby to releasably securing such lighter in said receiving means.

4,854,857

TORCH IGNITOR

William H. Houtman, Ann Arbor, Mich., assignor to Gas Research Institute, Chicago, Ill.

Filed Nov. 23, 1988, Ser. No. 275,775
Int. Cl.[4] F23D *11/36*
U.S. Cl. 431—154 15 Claims

1. An electric spark type torch ignitor having a longitudinal axis and comprising an ignitor housing tube having open axially forward and rear ends, an electric ignitor disposed within said ignitor housing tube such that a fluid passageway is cooperatively defined between the interior of said tube and the exterior of said electric ignitor, said electric ignitor having a forward tip end from which an electric spark is emitted when the electric ignitor is electrically energized, means for intro-

ducing air and gaseous fuel into said fluid passageway and causing the air and gaseous fuel to pass forwardly within the tube as a mixture and over said tip end of said electric ignitor so that the mixture can be combusted by a spark emitted from the tip end of the ignitor when the electric ignitor is electrically energized to ignite the torch ignitor, locating means within said ignitor housing tube for axially locating the electric



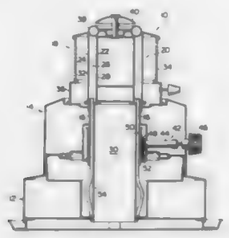
ignitor after the electric ignitor has been inserted into the open rear end of the tube, said locating means comprising an abutment for abutting the electric ignitor to limit the extent to which the electric ignitor can be positioned forwardly within said ignitor housing tube, and means, including resilient means, that acts on the electric ignitor to resiliently urge the electric ignitor forwardly within the ignitor housing tube and against said abutment.

4,854,858

OIL RESERVOIR FOR OIL BURNER

Yutaka Nakanishi, and Toshihiko Yamada, both of Aichi, Japan, assignors to Toyotomi Kogyo Co., Ltd., Japan

Filed Jul. 29, 1988, Ser. No. 226,118
Claims priority, application Japan, Jan. 31, 1987, 62-013638
Int. Cl.[4] F23D *3/24*
U.S. Cl. 431—320 **8 Claims**



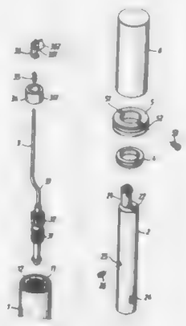
1. An oil reservoir for an oil burner comprising:
a cover plate having a round outer end;
a bottom plate having a round outer end and sealedly connected to a bottom of said cover plate to form a housing in which a closed space is defined; and
an annular partition plate arranged in said housing and connected at an upper end thereof to said cover plate and at a lower end thereof to said bottom plate to divide said closed space into an oil storing chamber and a wick receiving chamber, said partition plate being formed with at least one communication hole for ensuring fluid-communication between said oil storing chamber and said wick receiving chamber;
said partition plate and cover plate being provided with a plurality of spot welding portions at which spot welding is carried out to fix said partition plate and cover plate together;
said partition plate and cover plate being opposite to each other through an annular overlap formed therebetween;
one of said partition plate and cover plate being formed with an annular projection at said overlap, said projection being arranged in a manner to project toward the other of said partition plate and cover plate to forcedly press said partition plate and cover plate against each other;
said overlap being arranged at or near said spot welding portions.

4,854,859

ADJUSTMENT AND POSITIONING STRUCTURE OF THE ELONGATED ROD-LIKE LIGHTER

Anderson Lin, 8 Alley 9, Lane 82, Pa Teh Road, Sec. 1, Taipei, Taiwan

Filed Sep. 1, 1987, Ser. No. 91,958
Int. Cl.[4] F23D *14/28*
U.S. Cl. 431—344 **3 Claims**



1. An elongated rod-like gas lighter, comprisng:
a rod body having an upper end and a lower end for storing gas therein;
an ignition base having a wall and on the upper end of said rod body, said ignition base having a circumferential grooveshaped hole through the wall of said ignition base thereof adjacent the point of attachment to said rod body;
a gas adjustment ring rottably mounted around said ignition base and movably engaged with the upper end of said rod body and having a threaded hole radially therethrough and a gas supply adjusting screw therein extending through said circumferential groove-shaped hole;
a gas nozzle tube within said ignition base having an upper end and a lower end, the upper end of the gas nozzle tube extending upwardly out of said ignition base; and
a rotatably operable gas flow adjusting valve on the upper end of said rod body and receiving the lower end of said gas nozzle tube, said gas supply adjusting screw being engaged with an outer portion of said gas flow adjusting valve for rotating said gas flow adjusting valve when said gas adjusting ring is rotated on said ignition base.

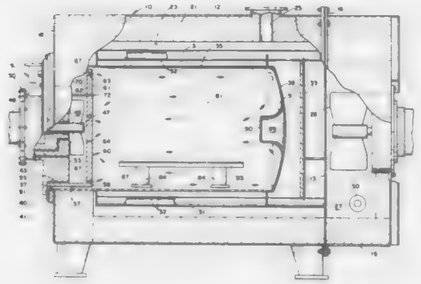
4,854,860

CONVECTIVE HEAT TRANSFER WITHIN AN INDUSTRIAL HEAT TREATING FURNACE

Klaus H. Hemsath, Toledo, Ohio, assignor to Gas Research Institute, Chicago, Ill.

Division of Ser. No. 129,010, Dec. 2, 1987, Pat. No. 4,789,333.
This application Sep. 14, 1988, Ser. No. 244,026
Int. Cl.[4] F27D *5/00*
U.S. Cl. 432—5 **5 Claims**

1. A method for effecting heat transfer within an industrial heat treat furnace having a sealable, cylindrical, imperforate shell member disposed within a furnace casing for receiving workpieces placed therein for heat treating therein, said method comprising the steps of:
(a) changing the temperature of the wall of the shell member so that it is at a temperature different than the temperature of the work within said shell member;
(b) providing a plenum chamber within and at one end of said shell member;
(c) generating an annular jet stream of entrained furnace atmosphere from said plenum chamber through an annular orifice in said plenum chamber having an outside diametrical dimension smaller than the inside diameter of said shell member;
(d) providing an under pressure zone between said annular orifice and said cylindrical shell member;



(e) expanding said jet stream radially outwardly into contact with the interior surface of said shell member as said jet stream travels the length of said shell member from said plenum chamber to the opposite shell end for effecting heat transfer between said shell member and said jet stream, said jet stream when expanded into contact with said shell member forming a laminar flow stream adjacent said cylindrical shell member and a turbulent flow stream radially inwardly of said laminar flow to promote heat transfer of said entrained atmosphere with said shell member.

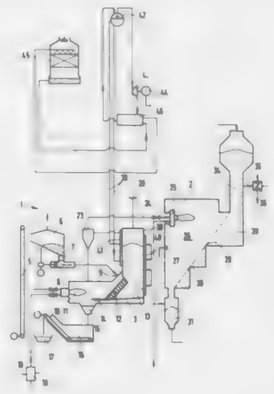
4,854,861

PROCESS FOR CALCINING LIMESTONE

Winfried G. Hartweck, Düsseldorf Wittlaer, and Ulrich Hahn, Franzoseinsiepen, both of Fed. Rep. of Germany, assignors to Deutsche Filterbau GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 12, 1988, Ser. No. 231,893
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727218
Int. Cl.[4] F27B *15/00*
U.S. Cl. 432—14 **13 Claims**

12. A process for using the heat of combustion of waste materials in the calcining of limestone in a kiln supplied with a lean gas produced in a waste material gasification reactor comprising the steps of:
(a) introducing waste material and combustion air into a waste material gasification reactor, the amount and kind of waste material and combustion air introduced being such as to operate the gasification reactor to produce a flow of lean gas and waste slag;
(b) introducing coke into the gasification reactor in a direction counter to the flow of the lean gas to filter the lean gas and to form a coke slag;
(c) cleaning the lean gas of dust to form a cleaned lean gas and separate dust from the lean gas, and introducing the cleaned lean gas into a combustion chamber of a lime kiln where it is burned to form a combustion waste gas and quicklime-like products;
(d) reintroducing the separated dust into the gasification reactor and binding it with the coke and waste slag; and
(e) removing the slag and material bound thereto from the gasification reactor and granulating the slag in a water bath to contain any polluting substances originally present in the waste material.

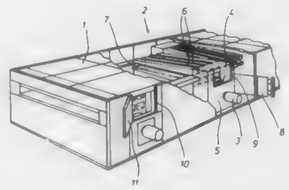


4,854,862

APPARATUS FOR THE HEAT TREATMENT OF A LENGTH OF CONTINUOUSLY MOVING MATERIAL

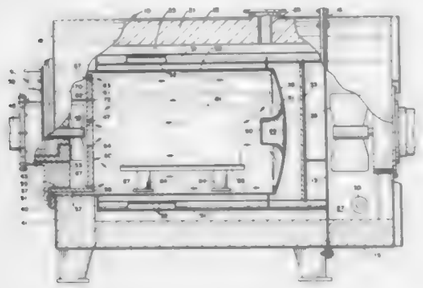
Harry Gresens, Benningen, Fed. Rep. of Germany, assignor to Bruckner Trockentechnik GmbH & Co. KG, Fed. Rep. of Germany

Filed Jul. 28, 1988, Ser. No. 226,409
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1987, 8711119[U]
Int. Cl.[4] F27B *9/28*
U.S. Cl. 432—59 **5 Claims**



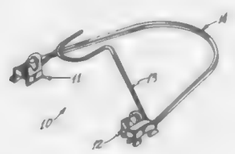
1. Apparatus for the heat treatment of a length of material which is continuously moving through a plurality of succeeding treatment zones within a machine housing comprising:
(a) a fan housing in each of the treatment zones providing a stream of circulating air within each treatment zone;
(b) a fan housing located adjacent the inside of a long wall of the machine in each of the treatment zones, accommodating the fan in a lower region of the fan housing;
(c) a plurality of nozzle casings connected to an upper region of the fan housing within each of the treatment zones for delivering the stream of circulating air from the fan to the length of material;
(d) an upper region of an outer long wall of the fan housing facing an adjacent long wall of the machine housing being provided with a first opening closable by a closure device and through which the interior of the fan housing and the nozzle casings are accessible;
(e) the machine housing being provided in the region of the first opening in the fan housing with a closable second opening through which the closure device for the first opening in the fan housing is accessible.

4,854,863
CONVECTIVE HEAT TRANSFER WITHIN AN INDUSTRIAL HEAT TREATING FURNACE
Klaus H. Hemsath, Toledo, Ohio, assignor to Gas Research Institute, Chicago, Ill.
Division of Ser. No. 129,010, Dec. 2, 1987, Pat. No. 4,789,333.
This application Sep. 14, 1988, Ser. No. 244,089
Int. Cl.[4] F27B *3/22*
U.S. Cl. 432—176 7 Claims



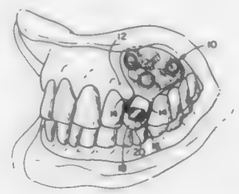
1. A closed loop gas recirculation system contained substantially within an industrial heat treat furnace for effecting substantially convective heat transfer with a workpiece therein comprising:
an imperforate cylindrical shell member with closed ends at a first temperature;
said workpiece within said shell member at a second temperature;
an atmosphere gas within said shell member at a third temperature;
plenum means forming an annular orifice within and circumscribing said cylindrical shell member, said orifice having an annular opening of outside diameter less than the inside diameter of said shell member to define an annular underpressure space therebetween; and
fan means recirculating said atmosphere gas and developing an annular atmosphere gas jet through said orifice travelling towards one end of said shell member to effect heat transfer of said atmosphere gas entrained within said jet with said shell member when said jet expands radially outwardly into contact with said shell member and thereafter to impinge said workpiece in heat transfer contact.

4,854,864
ORTHODONTIC BRACKET AND PALATAL BAR SYSTEM
James D. Cleary, Glendora, Calif., assignor to Unitek Corporation, Monrovia, Calif.
Filed Nov. 9, 1987, Ser. No. 118,794
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—7 13 Claims



1. A palatal bar and bracket system, comprising:
a palatal bar having an upwardly arched center section, and a pair of hooks integrally joined to lower opposite ends of the center section, each hook terminating in an upwardly extending pin with and occlusional axis when the bar is installed in a patient's mouth, each hook further having an antirotation link extending laterally from an occlusal end of the pin; and
an orthodontic bracket, the bracket defining an upwardly extending socket with a generally occlusogingival axis when the bracket is mounted on a maxillary tooth, the bracket further defining a first slot extending laterally from the socket to receive the antirotation link when the palatal bar is raised in the mouth to said the hook pin in the bracket socket, rotation of the hook pin with resect to the socket and lateral movement of the antirotation link being prevented by seating of the antirotation link in the first slot.

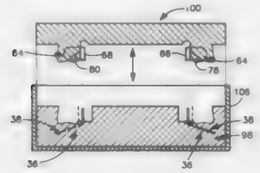
4,854,865
BIOCOMPATIBLE ELECTRODE AND USE IN ORTHODONTIC ELECTROOSTEOGENESIS
Richard B. Beard, Atco, N.J.; Saleem Hasan, Philadelphia, Pa.; Kevin J. Scoles, Ardmore, Pa., and Banu Onaral, Philadelphia, Pa., assignors to Drexel University, Philadelphia, Pa.
Filed Nov. 6, 1987, Ser. No. 118,368
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—18 36 Claims



1. In a method of orthodontic electroosteogenesis, whereby at least one tooth is repositioned in vivo, comprising placing an anode in engagement with epithelial gingiva at a position adjacent to the tooth to be repositioned, placing a cathode in engagement with ephithelial gingiva at a position adjacent to the tooth to be repositioned, and applying electric current between the cathode and anode,
wherein the improvement comprises: providing a biocompatible anode having a noble metal portion in engagement with an electrolytic gel portion comprising agarose and an electrolyte, the gel portion being in engagement with the gingiva at an area of osteoclastic or osteoblastic activity; and
providing a biocompatible cathode having a noble metal portion in engagement with an electrolytic gel portion comprising agarose, an electrolyte and a weak, biocompatible acid, the gel portion being in engagement with the gingiva at an area of osteoblastic or osteoclastic activity.

4,854,866
METHOD AND APPARATUS FOR USE IN CONSTRUCTING AN ORTHODONTIC APPLIANCE
William L. Wilson, 15 Dix St., Winchester, Mass. 01890
Filed Dec. 31, 1987, Ser. No. 140,038
Int. Cl.[4] A61K *7/00*
U.S. Cl. 433—24 22 Claims

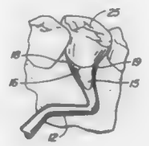
1. A method for constructing a precise orthodontic appliance for a patient's teeth, comprising:
occupying a predetermined point in spaced relative to a patient's teeth using marking means, wherein said predetermined point is interior a space defined by an appliance attached to the patient's teeth;
positioning anchoring means in a positive cast using said marking means wherein said anchoring means defines but does not occupy said point in space; and



fabricating a precise orthodontic appliance for the patient's teeth using said anchoring means and said positive

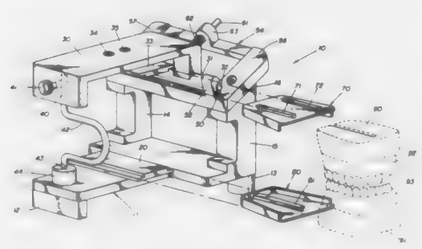
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4,854,867
DENTAL TOOL FOR FACILITATING GINGIVAL RETRACTION
Charles I. Meinershagen, Redding, Calif., assignor to NewTech Products, Inc., Palo Cedro, Calif.
Filed Jan. 28, 1988, Ser. No. 149,311
Int. Cl.[4] A61C *9/00*
U.S. Cl. 433—40 6 Claims



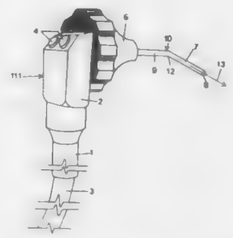
1. A dental tool for facilitating gingival retraction comprising a shank terminating in a working end member, said working end member having a concave face extending along the body axis of said member and terminating in a curved edge shaped to generally conform to the curvature of the root surface of a tooth at the gingival level and to the contour of the marginal gingival, said concave face being laterally concave with respect to said body axis.

4,854,868
DENTAL ARTICULATOR
Evard M. Pitre, 6722 Hendon, Houston, Tex. 77074
Filed Sep. 9, 1987, Ser. No. 94,517
Int. Cl.[4] A61C *11/00*
U.S. Cl. 433—60 14 Claims



5. A model holder for use with a dental articulator, comprising:
a cup member having a bottom portion having an interior side and an exterior side and a single, continuous side portion only partially surrounding the perimeter of its said interior side; and
at least one beam on the interior side of the said bottom portion.
11. A dental articulator, comprising:
a vertical stem section;
a lower base member connected to said vertical stem section;
an upper member pivotally connected to said vertical stem section;
a first cup-like model carrier releasably attached to said upper members; and
a second cup-like model carrier releasably attached to said lower member, each of said cup-like model carriers having an interior side and a single, continuous side portion only partially surrounding the perimeter of its said interior side and each of said model carriers also having at least one beam on its said interior side.

4,854,869
UNILATERAL DIRECTION CONTROL FOR DENTAL SYRINGE
Timothy M. Lawhorn, 626 Whitaker, Missoula, Mont. 59803
Filed Sep. 21, 1987, Ser. No. 99,082
Int. Cl.[4] A61G *17/02*
U.S. Cl. 433—80 3 Claims



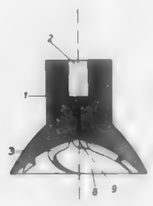
1. A dental syringe including a handle and a nozzle and means to rotate said nozzle with respect to said handle wherein:
said syringe is used to direct and deliver controlled amounts of various agents including air and water,
said nozzle is connected to said syringe so as to allow rotation of said nozzle,
said means to rotate is for rotating said nozzle at said connection,
said nozzle includes a discharge orifice for said agents,
said agents depart said discharge orifice along an exit path, and wherein
said rotation causes redirection of said exit path,
said redirection is relative to said handle of said syringe,
said means to rotate is provided for use by the hand which holds and operates said syringe, and wherein
said means to rotate allows said hand to remain in an operating position while utilizing said means to rotate, and wherein
a grasping means is provided to facilitate said means to rotate, and wherein
said grasping means is removably attached to said nozzle,
said grasping means being provided with means for preventing relative rotation between said nozzle and said grasping means whereby said grasping means and said nozzle rotate as a unit,
said grasping means is of a size to allow operation by said hand, and wherein
said grasping means has a design to prevent slipping of said hand during said rotation.

4,854,870

CLEANING TOOL, ESPECIALLY FOR DENTAL USE

Finn Kofod, Pilegardsvej 3, Rønne, Denmark (3700)

PCT No. PCT/DK86/00079, § 371 Date Mar. 10, 1987, § 102(e) Date Mar. 10, 1987, PCT Pub. No. WO87/00032, PCT Pub. Date Jan. 15, 1987
PCT Filed Jul. 7, 1986, Ser. No. 35,999
Claims priority, application Denmark, Jul. 11, 1985, 3163/85
Int. Cl.[4] A61C *3/06*
U.S. Cl. 433—166 9 Claims



1. A dental cleaning body adpated for removable mounting at an end of a rotary shaft, comprising

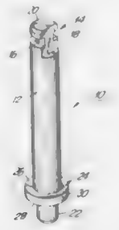
said cleaning body made of an elastically yielding material having a first end provided with a bore for receiving the end of the shaft, a second having a cavity extending from an outer edge thereof in the direction of said first end, curved ribs extending in the cavity from said outer edge inwardly, each said rib having a substantially triangular cross section with a front side turning forwardly in the direction of rotation and a rear side forming a sharp edge on each said rib, said cavity having a concaved configuration so that the entire sharp edge of each said rib rests on a surface of a tooth during the rotation of the cleaning body, a curvature of each said rib differs only slightly from a straight line, an outermost point of each said rib located at the outer edge lies frontmost in the direction of rotation and its radially innermost point rearmost in the direction of rotation.

4,854,871

METHOD AND APPARATUS FOR PROVIDING A LEVEL SURFACE ON A TOOTH ROOT

Bernard Weissman, New York, N.Y., assignor to IPCO Corporation, White Plains, N.Y.

Filed Nov. 23, 1987, Ser. No. 123,747
Int. Cl.[4] A61C *3/06*
U.S. Cl. 433—166 27 Claims



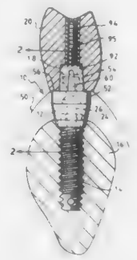
1. A dental tool for leveling at least a portion of the surface of a tooth root having a pre-drilled center bore in preparation for receiving a dental post and core during the fabrication of a superstructure on the tooth root, the tool comprising a rigid elongated cylindrical shank portion, coupling means at one end thereof for securement into a rotating apparatus, a cylindrical rigid stem projecting from another end thereof, an enlarged annular collar intermediate the stem and shank portion, said collar having an undersurface facing said stem and an outer peripheral wall, and abrasion means on said undersurface and said outer peripheral wall, said stem being constructed for insertion into said pre-drilled center bore and positioning said collar over said bore, whereby with the stem inserted in the tooth bore, rotation of the dental tool will provide a level bottomed counterbore at a mouth of the bore and a contoured rim about the counterbore.

4,854,872

PROSTHETIC IMPLANT ATTACHMENT SYSTEM AND METHOD

Steven G. Detsch, 4115 The Hill Rd., Bonita, Calif. 92002

Filed Sep. 24, 1987, Ser. No. 100,578
Int. Cl.[4] A61C *8/00*
U.S. Cl. 433—173 21 Claims



1. A prosthetic implant attachment system for mounting a prosthetic device on the upper end of a tooth root comprising:

a base member having a lower end for seating on the upper end of the root, and an upper end for mounting an artificial tooth on the root;

first securing means for securing the base member to the root;

a prosthetic head for mounting on the upper end of the base member and for securing to a prosthetic device mounted over the prosthetic head, the upper end of the base member and the lower end of the prosthetic head having means for correction of undesired placement of the root comprising interengageable indexing formations for releasably locking the prosthetic head against rotation on the base member in any one of at least three fixed, indexed positions at different fixed angles relative to the base member;

second securing means for releasably securing the prosthetic head to the base member.

4,854,873

ORAL IMPLANT

Harry A. Linden, Santa Barbara, Calif., assignor to Hall Surgical Division of Zimmer, Inc., Carpinteria, Calif.

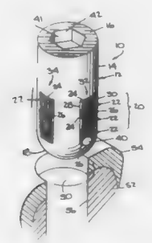
Filed Oct. 13, 1987, Ser. No. 107,321
Int. Cl.[4] A61C *8/00*
U.S. Cl. 433—173 17 Claims

1. An oral implant comprising

(a) a body member having a generally cylindrical surface and a longitudinal axis surrounded by said cylindrical surface, said cylindrical surface being without an exterior spiral thread,

(b) a plurality of shingle-shape projecting members provided on a predetermined portion of said cylindrical surface to project a predetermined amount from said surface, said projecting members each having a predetermined radial extent with respect to said longitudinal axis of less than 360 degrees and a predetermined longitudinal extent, said

projecting member each having proximal and distal end portions with respect to said longitudinal axis, said projecting members each having a tapered surface that tapers toward said longitudinal axis in a direction from said



proximal end portion to said distal end portion, said tapered surface having substantially longitudinally directed flutes, and

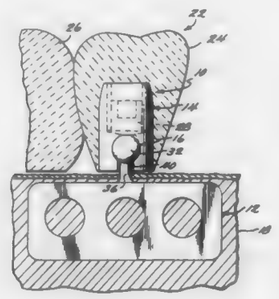
(c) means for holding a dental prosthesis.

4,854,874

ORAL IMPLANT

Peyton S. Neuwirth, Knolls Professional Bldg., 114 Stratford Dr., Peoria, Ill. 61614

Continuation of Ser. No. 330,652, Dec. 14, 1981, abandoned, which is a continuation of Ser. No. 208,223, Dec. 15, 1971, abandoned. This application Mar. 20, 1985, Ser. No. 714,050
Int. Cl.[4] A61C *8/00*
U.S. Cl. 433—176 10 Claims



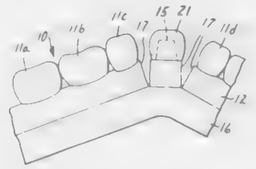
1. An oral implant device for securing a dental prosthesis in the mouth of a patient comprising: an implant part constructed of a single piece of metal and including an implant portion adapted to be completely embedded in teh bone structure of the patient's jaw, a stem projecting from said first portion, said stem being adapted to pass through the tissue overlying the bone structure in which said implant portion is embedded and a ball at the outer end of said stem, said ball having a greater diameter than said stem; and a separate post part for supporting a prosthesis, said post part being releasably connected to said ball by means of an internal socket in said post part and including an adjustable locking and unlocking device having a locking position in which said ball is pressed against the wall of the socket to lock said post part to said ball in any of a variety of pivotal positions and an unlocking position in which said post part is removble from said ball, the arrangement being such that the lower end of said post part is disposed intermediate said ball and said implant portion so that there is sufficient clearance between said lower end of said post part and the tissue overlying the bone structure to permit angular adjustment of said post part relative to said ball.

4,854,875

EXTRA-ORAL DENTAL RESTORATION

Michael M. Dzilki, and Thomas T. Bryan, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 18, 1986, Ser. No. 932,023
Int. Cl.[4] A61C *11/00*
U.S. Cl. 433—213 16 Claims



1. Method useful in restorative dentistry and the like, said method comprising the steps of:

(1) forming a rubbery, heat resistant impression of an object to be duplicated,

(2) partially filling the impression with a thermosetting resin,

(3) at least partially filling said impression with a molten thermoplastic resin whereby heat from the molten thermoplastic resin accelerates the cure of the thermosetting resin to a tough, abrasion- and heat-resistant state,

(4) adhering a flexible, dimensionally stable, hingeable support to said thermoplastic resin,

(5) removing the thermoplastic resin from said impression after the thermoplastic resin solidifies to provide a model of said object on said flexible support,

(6) applying restorative resin to a portion of the model,

(7) shaping or sculpturing the applied restorative resin to a desired contour, and

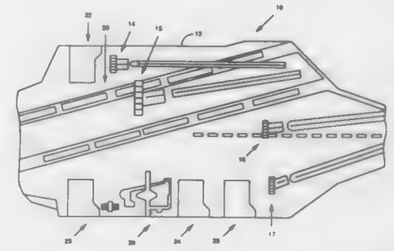
(8) curing the restorative resin to provide a restoration.

4,854,876

AIRCRAFT CARRIER SIMULATOR AND METHOD

William W. Heath, 3077 Gibraltar, Costa Mesa, Calif. 92626, and John C. Cole, P.O. Box 94, Tyler, Tex. 75710-0094

Filed Oct. 13, 1987, Ser. No. 108,240
Int. Cl.[4] G09B *9/08*
U.S. Cl. 434—29 22 Claims



1. An aircraft carrier flight deck simulator for training pilots in aircraft carrier takeoff and landing procedures, comprising:

a slab of a substantially rigid material having a generally elongate rectangular surface thereon marked to define a first runway portion where an aircraft may be launched into flight and marked to define a second runway portion where the aircraft may land as on an aircraft carrier;

means for supporting the slab such that the slab may be rotated in a substantially horizontal plane; and

means for selectively elevating and lowering portions of the

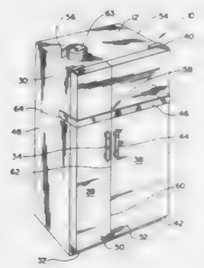
slab to simulate pitch and rolling motions of an aircraft carrier afloat at sea.

4,854,877

METHOD OF PSYCHOLOGICALLY REINFORCING A DIETING REGIMEN

Thomas F. Nedbal, 43W241 Hazelwood Trail, St. Charles, Ill. 60174

Filed Jun. 27, 1988, Ser. No. 212,178
Int. Cl.[4] G09B *19/00*
U.S. Cl. 434—236 9 Claims



1. A method of psychologically reinforcing a dieting regimen, said method comprising the steps of:

providing a container defining a storage space with an opening for gain access to the storage space;

placing edible materials in the storage space;

placing a movable closure over said container access opening in a closed position to prohibit access to the edible materials within said storage space through said container opening,

said closure being movable from its closed position to an open position, wherein access can be gained through aid container opening to the edible material in the storage space by other than relative twisting between said closure and container,

there being adjacent edges on the container and closure with the closure in its closed position; and

adhering a frangible element to the edges on the container and closure so that the frangible element bridges a gap between the edges and is drawn taut and explosively ruptures as an incident of the closure being moved from its closed position to its open position,

whereby a dieter is rudely reminded that the resolve not to eat has been broken,

the tensile strength of the frangible element being chosen so that the frangible element does not significantly inhibit movement of said closure from its closed position to its open position.

4,854,878

TEXTBOOK WITH ANIMATED ILLUSTRATIONS

Albert P. Malvino, Los Altos, and Joanna M. Malvino, Cupertino, both of Calif., assignors to Malvino, Inc., Mountain View, Calif.

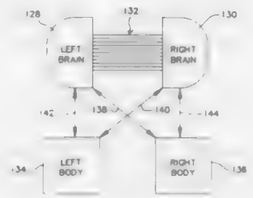
Continuation of Ser. No. 803,016, Nov. 29, 1985, abandoned. This application Mar. 31, 1988, Ser. No. 178,774
Int. Cl.[4] G09B *7/00*
U.S. Cl. 434—335 2 Claims

1. A teaching method for teaching complex and/or abstract concepts by means of both a conventional textbook and complementary animated moving illustrations which provide an animated textbook, said teaching method employing a conventional textbook and a complementary electronic display and comprising,

(a) opening the conventional textbook to a page or pages which describe a selected complex and/or abstract concept so that the student can read and study the text book description of the selected concept,

(b) storing animation data for the selected concept on the electronic display,

(c) operating, by input from the student, the electronic display for displaying the animation data to the student in the form of animated moving illustrations which are complementary to the selected concept described in the conventional textbook and to thereby display the animation data in the form of an animated textbook.



said electronic display being constructed so that the electronic display can be operated in both an initial teaching mode for displaying the animation data in an initial, predetermined sequence and in subsequent drill mode which requires continued participation of the student in order to continue the display and in order to obtain displays of animated illustrations responsive to specific inputs from the student,

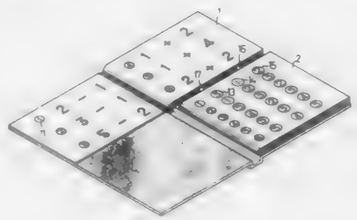
whereby the selected complex and/or abstract concept can be taught by the study of both the conventional textbook and the complementary animated moving illustrations which provide the animated textbook.

4,854,879

SELF-TEACHING BOOK FOR CHILDREN WITH AN ELECTRONIC DEVICE

Dale Chang, 9 Fl., No. 303, Fushing North Rd., Taipei, Taiwan

Filed Aug. 25, 1988, Ser. No. 236,618
Int. Cl.[4] G09B *7/06*
U.S. Cl. 434—339 1 Claim



1. A self-teaching book for children with an electronic device comprising a plurality of question pages and a plurality of electronic teaching units corresponding to said individual question pages; each of said electronic teaching units connected to at least one electronic circuit, which has at least one light circuit and one music generating circuit, wherein:

a plurality of test questions are printed on said question pages and a plurality of correct and incorrect answers corresponding to said questions are provided on said electronic teaching unit;

said electronic teaching unit comprises an answer sheet, at least one upper and one lower conducting layer, at least one upper and one lower insulating layer, a source layer, and a protective covering; said upper and lower insulating layers being respectively adjacent to said upper and lower conducting layers; said source layer being disposed between said upper and lower insulating layers; said lower conducting layer being disposed above and adjacent to said protective covering;

a plurality of slots are arranged within said upper insulating layer to permit a contact between said upper conducting layer and said source layer at answer sites;

a plurality of slots are arranged within said lower insulating layer to permit a contact between said lower conducting layer and said source layer at answer sites;

each of said slots does not overlap and is positioned corresponding to respective sites of said answers; and

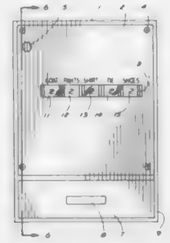
said upper and lower conducting layers are respectively connected to said electronic circuits; and said source layer is connected to a power supply and is contactable with said conducting layers to actuate respectively said electronic circuits.

4,854,880

WARDROBE COLOR COORDINATION KIT

James A. Nasby, 7730 Marth Court, Edina, Minn. 55435

Filed May 3, 1988, Ser. No. 189,821
Int. Cl.[4] G09F *9/00, 11/00, 3/00*
U.S. Cl. 434—395 8 Claims



1. A new and improved wardrobe color coordination kit, comprising;

numbered tag means for association with various clothing articles in order to code them for color coordination;

rotary file means for selectively displaying a variety of possible numbered sequences corresponding to said numbered tag means to indicate color coordinated wardrobe clothing outfits;

said rotary file means including an endless link belt;

a plurality of rows of numbered blocks on said link belt; and

means mounting each of said blocks on said link belt for selective rotation or removal.

4,854,881

ROTARY ELECTRICAL CONNECTOR ASSEMBLY

Albert Ditzig, Hoffman Estates, assignor to Telephone Products, Inc., Wheeling, Ill.

Continuation-in-part of Ser. No. 22,379, Mar. 5, 1987, Pat. No. 4,764,121, which is a continuation-in-part of Ser. No. 809,217, Dec. 16, 1985, Pat. No. 4,673,228. This application Jan. 29, 1988, Ser. No. 150,233
Int. Cl.[4] H01R *39/02, 39/38*
U.S. Cl. 439—26 35 Claims

1. A rotary connector assembly for the handset of a telephone, said assembly comprising:

spindle means comprising axially spaced first and second end portions, and a grooved portion comprising a plurality of axially spaced peripheral grooves each axially spaced from said first end portion;

said spindle means having an axis of rotation;

a plurality of electrical conducting elements each having a ring portion received in a respective one of said peripheral grooves of the spindle means;

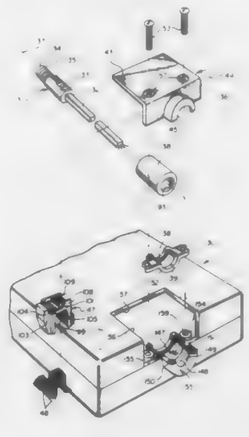
a plurality of electrical contacts;

a U-shaped element comprising means for receiving said grooved portion of the spindle means;

said element also comprising means mounting each of said electrical contacts in a position to engage a respective ring portion when the grooved portion of the spindle means is received by the element;

each electrical contact comprising means for tangentially engaging a respective ring portion at a plurality of peripherally spaced locations on the ring portion;

bearing means for the spindle means;



said bearing means and said spindle means comprising means cooperating to mount said bearing means and said spindle means in mutually rotatable relation;

first mounting means, separate and discrete from said bearing means, for supporting said bearing means;

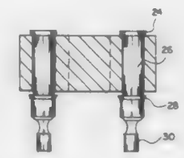
and second mounting means, separate and discrete from said element, for supporting said element in a position to receive the grooved portion of the spindle means when the spindle means is in rotatable relation with the bearing means and the latter is supported by said first mounting means.

4,854,882

FLOATABLE SURFACE MOUNT TERMINAL

Anthony J. Corridori, Worcester, Mass., assignor to Augat Inc., Attleboro, Mass.

Filed Dec. 12, 1988, Ser. No. 283,187
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—83 8 Claims



1. A surface mount socket for removably retaining an electronic component having a plurality of leads, the socket comprising:

a housing of insulative material having a plurality of through holes, each having a diameter sized to receive and retain a respective terminal; and

a plurality of terminals each retained in a respective through hole of the housing, each of the terminals including:

a body section having a head portion on one end and a lead portion on the opposite end;

the body section having an outside diameter slightly smaller than the diameter of the through hole of the housing and an axial length greater than the length of the through hole to permit axial movement of the terminal in the through hole;

the head portion having a diameter larger than the diameter of the through hole; and

the head portion having a diameter larger than the diameter of the through hole; and

at the juncture between the body section and the lead portion and having a diameter greater than the diameter of the through hole.

4,854,883

ELECTRICAL CONNECTOR FOR A PRINTED CIRCUIT

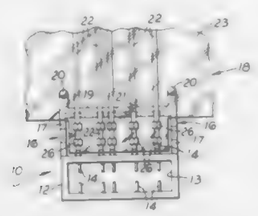
Denis W. Tuckwood, Beeston, United Kingdom, assignor to Pressac Limited, Long Eaton, United Kingdom

Filed Jan. 11, 1988, Ser. No. 142,566

Claims priority, application United Kingdom, Feb. 13, 1987, 8703399

Int. Cl.[4] H01R 9/09, 4/24, 9/07

U.S. Cl. 439—84 7 Claims



1. An electrical connector for a printed circuit comprising a housing having a body portion providing a socket opening in a first direction, and two parallel arms projecting from said body portion in a second direction disposed at right angles to said first direction, said connector also having a plurality of electrical contacts carried by the housing, each said contact having a first portion disposed between said arms and including a back portion projecting from said body portion in the same direction as and generally parallel with said arms and a second portion accommodated within said housing and adapted to engage the contacts of a cooperating male plug portion inserted into the socket to which connection is to be made, each said arm at an end portion remote from said body portion, having a projection projecting at right angles to said arm, each said projection being adapted to be inserted in locator holes in a substrate to locate the housing relative thereto, and the contact carried thereby to register said contacts with corresponding circuit contacts, said first portion of each said contact further having at least one pair of spaced legs projecting, in an open position, from said back portion in the same direction as said projections from said arms, each said pair of legs being adapted to receive a corresponding circuit contact between said legs in the open position when said connector is assembled with a corresponding printed circuit so that said projections are disposed in said locator holes, said legs being deformable from said open position to a closed position to clamp the circuit contact between said back portion and said legs.

4,854,884

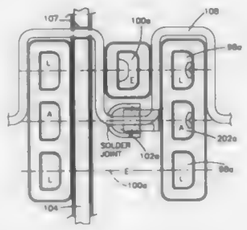
TELEPHONE DISTRIBUTION FRAME CONNECTOR ASSEMBLY FOR USE WITH CENTRAL OFFICE PROTECTOR MODULE HAVING ALARM INDICATOR

John J. Unger, Elmhurst, Ill., assignor to Reliance Comm/Tec Corporation, Chicago, Ill.

Filed Jun. 3, 1988, Ser. No. 202,226

Int. Cl.[4] H01R 4/66

U.S. Cl. 439—92 1 Claim



1. A module field for a frame connector assembly comprising:

(a) a front face;

(b) a rear face;

(c) at least one group of six receptacles in said front face, each of said receptacles for receiving as associated one of six pins of a protector module;

(d) at least one group of six terminals on said rear face, each of said six terminals associated with a respective one of said receptacles, said six terminals arranged in two side-by-side clusters each having three of said terminals; and

(e) grounding means in said rear face, said grounding means following a path around an outer edge of one of said clusters and in between said clusters to a connection with a middle one of said terminals in the other of said clusters.

4,854,885

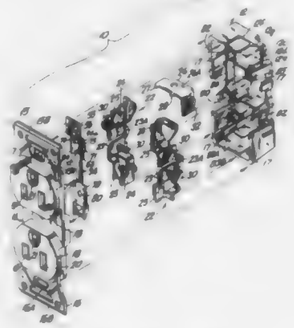
ELECTRICAL OUTLET RECEPTACLE WITH NON-METALLIC MOUNTING STRAP AND AUTOMATIC GROUNDING

Bowden, Jr., Wade R., Northport, and David Herzfeld, Huntington, both of N.Y., assignors to Slater Electric Inc., Glen Cove, N.Y.

Filed Feb. 3, 1987, Ser. No. 10,373

Int. Cl.[4] H01R 4/66

U.S. Cl. 439—107 28 Claims



1. An electrical wiring device adapted to be mounted adjacent a wall member having a hole therein permits the device to be secured to an electrical outlet box mounted behind the wall member, said electrical wiring device comprising:

a device body member adapted to receive and retain electrical terminal assemblies which are adapted to be terminated to the conductors of an electrical power cable;

a cover member proportioned to be affixed to said body member to form a device housing substantially enclosing the electrical terminal assemblies, said cover member having a pair of mounting strap elements formed integrally therewith and projecting from opposite ends thereof, said mounting strap element elongated to the maximum possible length to fit under a wallplate intended for use with the device, such that when said device is mounted adjacent the wall opening, the probability that the mounting strap elements will abut the wall member is maximized so as to substantially reduce the chance of having a "floating" installation.

4,854,886

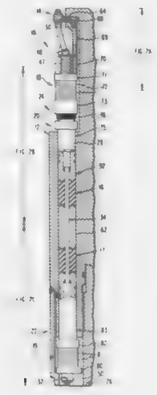
ELECTRICAL PENETRATOR FOR HOT, HIGH PRESSURE SERVICE

David H. Neuroth, Hamden, Conn., assignor to Hubbell Incorporated, Orange, Conn.

Filed Sep. 29, 1986, Ser. No. 912,824

Int. Cl.[4] H01R 4/60

U.S. Cl. 439—192 33 Claims



1. An electrical coupling for conducting electricity between areas of different pressures, the combination comprising:

a hollow housing having first and second open ends, a longitudinal axis, and an inner tubular surface, said first and second open ends being located respectively in areas of different pressures;

an electrical cable extending through said housing along said longitudinal axis thereof, said electrical cable comprising a first electrical conductor extending into said first open end, a second electrical conductor extending into said second open end, and connector means, located in said housing, for electrically connecting said conductors;

seal means, located inside said housing and engaging said inner surface, for sealing said housing and electrical cable between said first and second ends of said housing;

first pressure-equalizing means, coupled to said housing, for maintaining the pressure inside said housing on a first side of said seal means at least equal to the pressure acting on said first end of said housing; and

second pressure-equalizing means, coupled to said housing, for maintaining the pressure inside said housing on a second side of said seal means at least equal to the pressure acting on said second end of said housing,

said first pressure-equalizing means comprising a first longitudinally movable wall exposed to the pressure acting on said first end of said housing, and

said second pressure-equalizing means comprising a second longitudinally movable wall exposed to the pressure acting on said second end of said housing.

4,854,887

PIPE SYSTEM FOR CENTRAL SUCTION CLEANING INSTALLATION

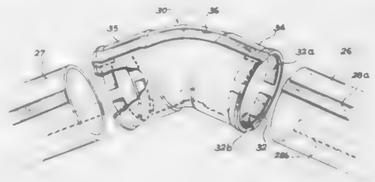
Jean-Claude Blandin, Cholet, France, assignor to S.A. Raccords et Plastiques Nicoll, Cholet, France

Filed Sep. 4, 1987, Ser. No. 93,485

Claims priority, application France, Sep. 12, 1986, 86 12748; May 21, 1987, 87 07110

Int. Cl.[4] H01R 4/64

U.S. Cl. 439—194 10 Claims



1. A pipe system for a central suction cleaning installation for connecting a suction station to at least one suction opening, said pipe system having at least one tube made from plastic and equipped with at least one electric conductor of low voltage capability for the transmission of an electric control signal from the suction station, said pipe system having at least one coupling wherein said electric conductor is in the form of a first thin metallic strip made from an electrically conductive material and which is integral with the tube, said coupling having at least one cylindrical socketlike portion with dimensions enabling the tube and said cylindrical portion to be fitted together, one into the other, and electric connection means connected between the first thin strip and another part of the installation, wherein the electrical connection means comprise a conductive band in the form of a second thin metallic strip made from an electrically conductive material, said conductive band extending over part of the periphery of said cylindrical socketlike portion, whereby the arrangement of the first thin strip and conductive band constituted by the second thin strip is such that by fitting together, one into the other, the tube and cylindrical socketlike portion, said first strip can be made to face and engage the second strip and a conductor can be electrically connected to the conductive band and to said other part of the installation, said first and second strips being formed of flexible material of substantially similar dimensions.

4,854,888

LAMP BASE

Donald M. Cannon, Dover, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed May 31, 1988, Ser. No. 200,216

Int. Cl.[4] H01R 33/02

U.S. Cl. 439—236 4 Claims

1. An adapter for converting a fluorescent lamp bi-pin base to a recessed double contact base, said bi-pin base comprising a shell; a disk of insulating material secured to said shell; and a pair of base pins mounted on said disks, said pins being formed to receive the lead wires from a fluorescent lamp, said adapter comprising:

an insulating housing having a disk-shaped base and a boss projecting therefrom;

a central aperture in said boss;

a pair of peripheral apertures in said boss, one on either side

of said central aperture and having a spacing corresponding to the spacing of said pair of base pins; and

an electrical contact in each of said peripheral apertures, each of said contacts being fixed therein and including a portion which has teeth inwardly directed toward and frictionally engaging a base pin to provide electrical contact and to substantially prevent removal thereof.

4,854,889

MINIATURE ELECTRICAL CONNECTOR

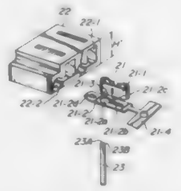
Hiroo Ohtsuka, Utsunomiya; Osamu Hara, Kodaira; Akira Hori, Nagoya, and Minoru Nodoa, Ichinomiya, all of Japan, assignors to Daiichi Denshi Kogyo Kabushiki Kaisha; Iwatsu Electric Co., Ltd. and Tomei Tsushin Kogyo Co., Ltd., all of, Japan

Filed May 24, 1988, Ser. No. 197,853

Claims priority, application Japan, May 28, 1987, 62-79778[U]; May 28, 1987, 62-79779[U]

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—395 **8 Claims**



1. An electrical connector including contacts to be connected to lead wires and a housing having apertures for receiving said contacts, said lead wires being connected to said contacts when the contacts are forced into said apertures of the housing, wherein each of said contacts comprises at one end a contact element to be in contact with an external terminal and at the other end a connection portion formed with a lead aperture through which a lead wire passes and with a slit continuous with said lead aperture, whose edges pierce into an insulating coating of said lead wire and connect with a core of the lead wire under pressure, and said housing is formed with through apertures through each of which said contact element of each of the contacts extend and with receiving apertures each for receiving the lead wire under a condition that said edges of said slit of the connection portion of the contact pierce into the insulating coating of said lead wire and connect with the core of the lead wire under pressure and a remaining insulating coating is doubled, a doubled end of said lead wire received in each of said receiving aperture being positioned by a shoulder formed by a boundary wall between the receiving aperture and the through-aperture, said housing including an oblique portion for facilitating connecting said contact element of each of said contacts to said external terminal and bending said contact element extending from said through-aperture toward said housing to prevent removal of said contact from said housing.

4,854,890

SHIELDED ELECTRICAL CONNECTOR

Ryoji Nishimura, Machida, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 15, 1988, Ser. No. 208,603

Claims priority, application Japan, Jul. 13, 1987, 62-174597

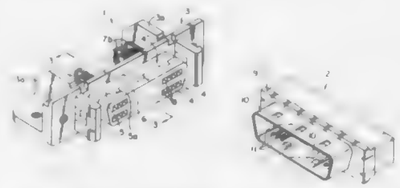
Int. Cl.[4] H01R *13/648*

U.S. Cl. 439—607 **8 Claims**

1. A shielded electrical connector, comprising:

a metal frame member having an opening extending therethrough and metal section means extending outwardly from a front surface of said metal frame member delimiting said opening;

a dielectric housing molded to said metal frame member and having a contact-receiving section within said opening and extending along said metal section means so that said metal section means and said contact-receiving section



define a profiled connecting section having a smooth and continuous exterior surface part of which is formed by said metal section means and the other part is formed by said contact-receiving section.

4,854,891

CONNECTOR BACKSHELL STRUCTURE

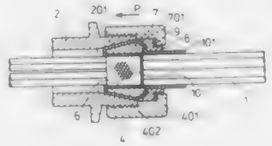
Takeo Kamei, and Katsuyuki Sekine, both of Iruma, Japan, assignors to Yokogawa Aviation Company, Ltd., Iruma, Japan

Filed Aug. 30, 1988, Ser. No. 238,601

Claims priority, application Japan, Sep. 9, 1987, 62-225970

Int. Cl.[4] H01R *13/59, 13/658*

U.S. Cl. 439—462 **6 Claims**



1. A connector backshell structure comprising a connector backshell (2) having an open end provided with a tapered section on the inner periphery thereof and adopted to receive therethrough a cable (1) covered with a shield (101) so that the shield of the cable is peeled to be bent outwardly of the outer periphery of the cable and pressed against the tapered section of the connector backshell;

a ring means (7,6) for holding said shield in pressure contact with the tapered section of said backshell, said ring means comprising a tube (6) having a slit extending from one end thereof to another end thereof, and a wedge shaped ring (7) having at least one slit extending longitudinally along the entire length thereof, wherein said tube surrounds said cable, and said wedge shaped ring surrounds said tube;

a stepped ring (8) for seating said wedge shaped ring;

a spring washer (9) for elastically urging said stepped ring against said wedge shaped ring to urge said tube against said shield and

a cap nut (4) for pressing and fixing said spring washer to the open end of said backshell.

4,854,892

ELECTRICAL CONNECTOR WITH LATCHING MECHANISM

Guido Vignoli, Alta, Italy, assignor to AMP Incorporated, Harrisburg, Pa.

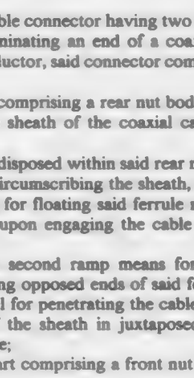
Filed Jul. 25, 1988, Ser. No. 223,578

Claims priority, application United Kingdom, Nov. 16, 1987, 8726806

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—417 **4 Claims**

1. An improved electrical connector of the type in which a conductor can be terminated by forcible insertion transversely of its axis along a conductor receiving slot of a contact member mounted in a cavity in an insulating housing body adjacent one end and retained in the slot by engagement with a cover member movable into latching engagement with the housing body to engage the conductor, where said contact member comprises a conductor connecting end constituted by a pair of interconnected parallel plates joined by a pair of transverse



straps, and a tab or board receiving end, and said cover member comprises first and second latching projections receivable in corresponding eyes or slots to thereby latch the cover member to the housing body, where said cover member is provided with a pair of central projections adapted to be received between straps, and that said projections are provided with latching tabs to engage straps when the cover member is brought into engagement with housing body.

4,854,893

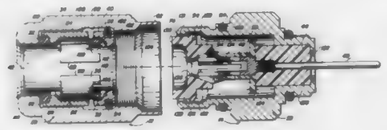
COAXIAL CABLE CONNECTOR AND METHOD OF TERMINATING A CABLE USING SAME

William E. Morris, Mesa, Ariz., assignor to Pyramid Industries, Inc., Phoenix, Ariz.

Filed Nov. 30, 1987, Ser. No. 126,888

Int. Cl.[4] H01R *17/18*

U.S. Cl. 439—578 **27 Claims**



1. A coaxial cable connector having two threadedly engagable parts for terminating an end of a coaxial cable having a sheath and a conductor, said connector comprising in combination:

(a) a first part comprising a rear nut body for receiving and gripping the sheath of the coaxial cable, said nut body including

(1) a ferrule disposed within said rear nut body for at least partially circumscribing the sheath, said ferrule including means for floating said ferrule relative to said rear nut body upon engaging the cable with said rear nut body;

(2) first and second ramp means for radially inwardly compressing opposed ends of said ferrule;

(3) a mandrel for penetrating the cable adjacent the inner surface of the sheath in juxtaposed relationship with said ferrule;

(b) a second part comprising a front nut body for receiving and gripping the conductor of the coaxial cable, said front nut body including

(1) an electrode;

(2) means for interconnecting the conductor with said electrode;

(c) means for translating at least one of said first and second ramp means toward the other one upon threaded engagement of said first and second parts to compress said ferrule; and

(d) visually perceivable means for limiting the extent of threaded engagement between said rear nut body and said front nut body.

22. A method for terminating a dressed end of a coaxial cable having a sheath and a conductor with a coaxial cable connector having a rear body threadedly engagable with a front nut body, said method comprising the steps of:

(a) feeding the dressed end into the rear nut body and through a floating ferrule retained within the rear nut body;

(b) axially realigning the ferrule during said step of feeding to facilitate penetrating engagement by the cable sheath;

(c) inserting in circumscribed relationship a mandrel located in the rear nut body within the sheath in juxtaposed relationship with the ferrule during exercise of said step of feeding;

(d) threadedly engaging the rear nut body with the front nut body;

(e) locating the conductor within a collet in the front nut body during said step of threadedly engaging;

(f) radially inwardly compressing opposed ends of the ferrule to grip the sheath during exercise of said step of threadedly engaging;

(g) constricting the collet to grip the conductor; and

(h) limiting with a mechanical stop the extent of threaded engagement between the rear nut body and the front nut body.

4,854,894

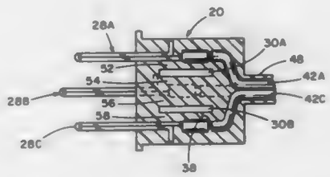
INTERMEDIATE COMPONENT FOR AN ELECTRICAL CONNECTOR AND METHOD OF MANUFACTURE

Timothy J. Harrell, Centerville, Ind., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 23, 1988, Ser. No. 235,319

Int. Cl.[4] H01R *13/504*

U.S. Cl. 439—606 **7 Claims**



1. An intermediate electrical component for application of a molded jacket there around to form an electrical connector such as a plug or a receptacle, said component comprising:

a first conductor having a first core formed of strands of metallic wire surrounded by an insulative jacket, said conductor having a first end from which said insulative jacket has been removed;

a first metallic terminal element mechanically attached to said core at said first end;

a second conductor having a second core formed of strands of metallic wire surrounded by a second insulative jacket, said second conductor having a first end from which said second jacket has been removed;

a second metallic terminal element mechanically attached to

the core of said second conductor at the first end of said second conductor; and

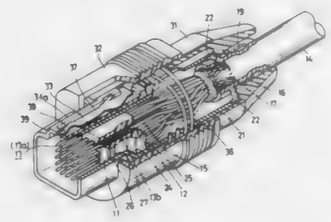
an electrically insulative body of a thermoplastic material molded about the aforementioned conductors and terminals, said body having a first end and a second end and maintaining said first terminal element spaced from said second terminal element, said first and second conductors extending beyond said body at its second end and said first and second terminal elements being accessible adjacent the body first end for engagement with corresponding terminal elements of a mating electrical connector, said body having a window through which air may flow extending substantially therethrough and separating the first terminal element adjacent its location of attachment to the core of said first conductor from the second terminal element adjacent its location of attachment to the core of said second conductor, said window being spaced from said first and second terminal elements by walls of the thermoplastic material forming said body, at least one of said first and second cores having at least one loose strand extending to said window whereby the presence of said window prevents shorting of loose strands of said cores.

4,854,895

SHIELDED CONNECTOR SOCKET FOR CONNECTION WITH A MULTIPIN CONNECTOR PLUG

Yasuhiro Komatsu, Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Division of Ser. No. 151,728, Feb. 3, 1988, Pat. No. 4,810,210.
This application Dec. 16, 1988, Ser. No. 285,262
Claims priority, application Japan, Feb. 12, 1987, 62-19484[U]
Int. Cl.[4] H01R *13/658*
U.S. Cl. 439—610 3 Claims



1. A connector socket for connection with a multipin connector plug comprising:

a square shaped body of an insulating material having a plurality of socket contact holes therein arranged in a matrix form;

a plurality of socket contacts housed in said socket contact holes, respectively, for engagement with a plurality of pin contacts of a multipin connector plug;

a square shaped shielding member made of metal mounted around said square body; and

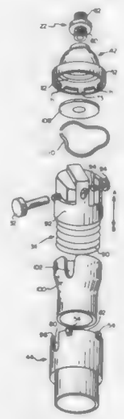
a square shaped case covering said square shaped shielding member, said case having a recess formed in an inner wall surface thereof at the front end portion thereof for receiving part of the multipin connector plug and an engaging step formed in said recess for engagement with said part of said multipin connector plug.

4,854,896

HEAVY-DUTY LAMP SOCKET

Jerome Warshawsky, 1322 Everitt Dr., Hewlett Harbor, N.Y. 11557

Filed Jan. 23, 1987, Ser. No. 6,174
Int. Cl.[4] H01R *17/04*
U.S. Cl. 439—703 10 Claims



8. A lamp socket comprising:

(a) socket sleeve means of substantially cylindrical configuration and predetermined diameter and having a first end and a second end;

(b) lug means formed on an outer circumference of said first end of said socket sleeve means fo a predetermined size and configuration and

proximate said first end of said socket sleeve means;

(c) socket cap means substantially dome-shaped in configuration and having a first end and a second end with an opening formed at said first end and a circumferential lip formed around said second end and szied to align with said first end of said socket sleeve means;

(d) slot means fomed in an inner wall of said circumferential lip of said socket cap means;

(e) a thrust washer of a predetermined diameter for coaction with a shoulder deployed in said socket cap means and said first end of said socket sleeve means;

(f) said lug means of said socket sleeve means passing through said slot means and cooperating with said circumferentail lip to form therewith a releasable securing means for releasably securing said socket cap means and said socket sleeve means together.

4,854,897

ELECTRICAL POWER DISTRIBUTION TERMINAL BLOCK ASSEMBLY

Ronald M. Grobbel, Warren, Mich., assignor to Syndevco, Inc., Southfield, Mich.

Filed Apr. 11, 1988, Ser. No. 179,833
Int. Cl.[4] H01R *9/26*
U.S. Cl. 439—716 6 Claims

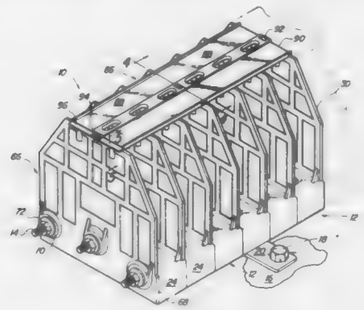
6. A modular electrical terminal block assembly for mounting to a support surface and having a plurality of terminal block modules mounted in side by side relation which can be removed individually for servicing, said assembly comprising:

a plurality of terminal block module bodies each made of an electrically insulating material having a base portion, a terminal mounting portion, and a barrier protion;

a terminal connector fixedly mounted on each said terminal mounting portion;

coacting retaining means on said base portion interengaging with corresponding coacting retaining means on an adjacent module body for removably securing said modules together when said modules are placed in side by side relation;

mounting means for mounting said modules to said support surface whereby said modules are secured together and mounted removably to said surface; and



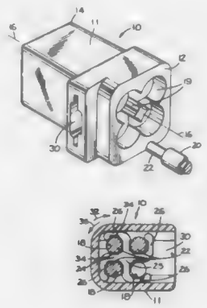
a dead front safety cover comprising a plurality of plate members made of an insulating material positioned over the terminal mounting portions of said modules, said members being removably connected together end to end, said members each having a plurality of retainers engagable with said barrier portions whereby said cover may be disengaged from said module assembly without separating said members from each other.

4,854,898

ELECTRICAL CONNECTOR

Frederick J. Turk, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 8, 1988, Ser. No. 153,239
Int. Cl.[4] H01R *11/09*
U.S. Cl. 439—723 2 Claims



1. An electrical connector for electrically interconnecting a plurality of wires, said connector comprising:

an electrically insulating body having a plurality of parallel passageways, each of said passageways adapted to receive a portion of one wire; and

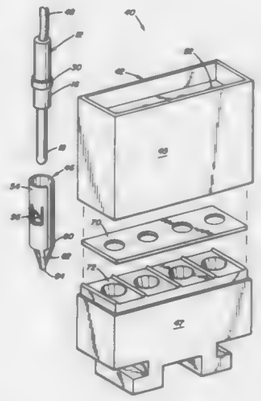
an electrically conductive resilient contact having first and second opposite major surfaces and a peripheral edge surface around said major surfaces, said contact having between said major surfaces a main portion and a plurality of arm portions projecting from said main portion, said contact further including a plurality of pairs of opposing camming surfaces formed on said peripheral edge surface with each pair normally spaced at a distance less than the diameter of the wires to be connected, to enable sliding engagement with one of the wires and at least one of each said pair of opposing camming surfaces located on the peripheral edge surface of an arm portion, said contact being mounted in said body with said major surfaces generally transverse to said passageways and each of said pair of opposed camming surfaces aligned with a different one of said passageways and oriented so that engagement of the end of one of the wires with the camming surfaces in a direction at a right angle to said major surfaces will resiliently bend the adjacent arm portion away from the opposite camming surface in a direction generally parallel to said major surfaces to afford movement of the wire between said opposed camming surfaces of said peripheral edge surface and provide spring biased electrical and mechanical engagement between said contact and the wire.

4,854,899

TERMINAL BUS JUNCTION WITH MULTIPLE, DISPLACED CONTACT POINTS

Russell H. Matthews, Modesto, Calif., assignor to Elcon Products International Company, Fremont, Calif.

Filed Nov. 24, 1987, Ser. No. 124,920
Int. Cl.[4] H01R *4/48*
U.S. Cl. 439—724 13 Claims



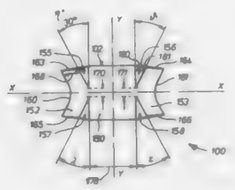
1. A connector, which comprises a housing, an array of socket receptacles in said housing, a plurality of conductive sockets, one of each of said plurality of conductive sockets being positioned in one of the socket receptacles in said array, said plurality of conductive sockets each having a generally cylindrical wall, at least one cantilever spring contact element extending inward from the generally cylindrical wall into each of said plurality of conductive sockets and a plurality of contact fingers extending from a distal end of the generally cylindrical wall at an angle toward a longitudinal axis of the generally cylindrical wall, the at least one cantilever spring contact element and the plurality of contact fingers being radially displaced with respect to one another, the plurality of contact fingers having tips positioned offset from one another, so that both longitudinal and lateral contact wiping takes place upon insertion of a contact pin into each of said plurality of sockets.

4,854,900

PRESS FIT PIN

Carl H. Muhlhoff, Heilbronn, Fed. Rep. of Germany, assignor to Amphenol Corporation, Wallingford, Conn.

Continuation of Ser. No. 713,564, Mar. 18, 1985, abandoned, which is a continuation of Ser. No. 459,155, Jan. 19, 1983, abandoned. This application Dec. 20, 1985, Ser. No. 814,531
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1982, 3201464; Jun. 9, 1982, 3221844
Int. Cl.[4] H01R *13/428*
U.S. Cl. 439—751 8 Claims



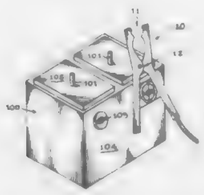
1. A press fit pin with a press fit section insertable with a press fit into a through connection hole in a printed circuit board, said section comprising two narrow sides in the longitudinal direction of the pin and two wide sides in which identifications are provided which define a central section at which lateral sections are arranged opposite each other with respect to the transverse axis of the cross-section of the pin to give the press fit section a predetermined flexibility, wherein the two lateral sections are symmetrical with respect to both the transverse axis and the longitudinal axis of the cross-section extending normal to the transverse axis, the central section has a substantially square cross-section, the sum of the widths of the two lateral sections is approximately equal to the width of the central section and said lateral sections comprise legs having longitudinal and transverse sides, said legs being elastically flexible relative to the central section and being formed by four slots arranged symmetrical to the longitudinal and transverse axes of said press fit section, and wherein the internal angles formed by each of the four slots are substantially equal to one another, and each said angle is equal to about 30°.

4,854,901

SIDE TERMINAL BATTERY CHARGING APPARATUS

Mark D. Vernachio, 347 Delaware Ave., Lansdale, Pa. 19446

Filed Sep. 29, 1988, Ser. No. 250,641
Int. Cl.[4] H01D *4/30*
U.S. Cl. 439—755 6 Claims



1. A battery terminal connector apparatus for diverse batteries equipped with post and/or recessed aperture terminals wherein the apparatus comprises:

a pair of spring biased pivoted jaw members wherein one of the jaw members is operatively attached to an insulated electrical cable; and,

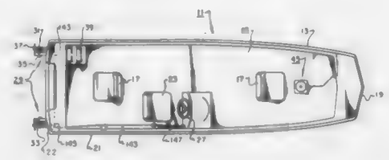
a side terminal unit comprising at least one post member operatively attached to one of said jaw members; wherein, said at least one post member is dimensioned to be received in and engage a portion of the internal periphery of a recessed aperture terminal.

4,854,902

BOAT SPEED AND DIRECTION CONTROL SYSTEM

Felton H. Havins, 300 NE. 6th St., Fort Worth, Tex. 76106

Continuation-in-part of Ser. No. 853,203, Apr. 17, 1986, Pat. No. 4,723,500. This application Jul. 20, 1987, Ser. No. 75,590
Int. Cl.[4] B60L *15/20*
U.S. Cl. 440—7 42 Claims



1. A controller for use by a boat operator in controlling the speed and direction of a boat propelled by electrical propulsion means, said boat having means for energizing electrical systems on said boat, said electrical system including portions of said propulsion means and portions of said controller, comprising:

a. a steering assembly having a first member and a second member positioned relative to said first member such that said first and second members may be rotated about a fixed axis relative to each other,

b. a speed assembly mounted adjacent one of said first or second members, having a third member which is accessible to a boat operator, said third member being movable by said boat operator relative to said steering assembly,

c. first electrical means for controlling the direction of said boat, said first electrical means being actuated by the relative rotational movement between the first and second members, wherein when said first electrical means is actuated, said first electrical means causes said propulsion means to change the direction of said boat,

d. second electrical means for controlling the speed of said boat, said second electrical means being actuated by the movement of the third member, wherein when said second electrical means is actuated said second electrical means changes the amount of electrical energy supplied to said propulsion means thereby changing the speed of said boat,

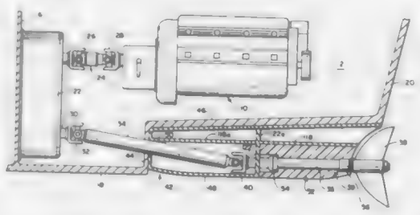
e. said controller adapted to be operable by a foot of said boat operator such that the relative rotational movement between said first and second members and the movement of said third member may be imparted by the foot of said boat operator.

4,854,903

PARALLEL THRUST PROPULSION SYSTEM

William L. Sirois, Miami, Fla., assignor to Copeland-Sirois Enterprises, Inc., Jefferson, La.

Filed Dec. 17, 1987, Ser. No. 134,145
Int. Cl.[4] B63H *23/02*
U.S. Cl. 440—83 22 Claims



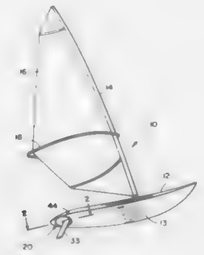
1. A propulsion system for a power boat including a hull, said propulsion system comprising: a drive motor including an output drive shaft; a fixed propellor shaft having a propellor mounted thereon; intermediate drive means for interconnecting the output drive shaft of said drive motor and said propellor shaft; means for mounting said fixed propellor shaft in a fixed, non-adjustable position wherein the shaft extends parallel to the surface of water and such that a substantial portion of the effective blade area of the propellor is out of the water while a substantial portion of the effective blade area extends into the water during normal operating conditions; said drive means including a connecting member arranged at an acute angle with respect to the axis of the propellor shaft and a universal joint disposed between one end of the connecting member and propellor shaft; and said mounting means including a propellor shaft support housing located externally of the hull, a thrust bearing assembly disposed within said housing at the end of the propellor shaft connected to the universal joint, and a further bearing assembly disposed within said housing at the other end of the propellor shaft.

4,854,904

SAILBOARD WITH ADJUSTABLE KEEL MECHANISM

Eric R. Wahl, 613 Carmel Ave., Albany, Calif. 94706

Filed Jun. 29, 1988, Ser. No. 213,268
Int. Cl.[4] A63C *15/06*
U.S. Cl. 441—79 16 Claims



1. A rudderless sailing craft, comprising

a planing hull having thereon a sailing rig disposed to be grasped and manipulated by an operator standing on the hull,

a single hydrofoil-shaped keel projecting from the underside of said hull adjacent the stern thereof, and operative to assist in the steering of said hull, and

means mounting the upper end of said keel on said hull for limited pivotal movement from one position to another in response to oncoming water, and in opposite directions about a substantially vertical axis relative to a centered position in which said keel is disposed in a plane substantially coincident with the longitudinal axis of said hull,

said vertical axis being located rearwardly of the center of said keel, whereby said keel will be forced by the flow of oncoming water to rotate in the windward direction from its centered position.

4,854,905

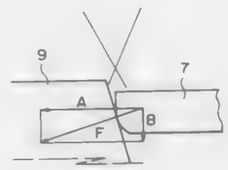
METHOD OF FIXING A COLOR SCREENING STRUCTURE FOR A COLOR PICTURE TUBE

Kiminobu Shibuya, Saitama, and Kenichiro Takayanagi, Aichi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 12, 1988, Ser. No. 243,505
Claims priority, application Japan, Sep. 30, 1987, 62-246971
Int. Cl.[4] H01J *29/07*
U.S. Cl. 445—30 4 Claims

1. A method of fixing a color screening structure having first, second and third supporting spring plates, for a color picture tube, comprising steps of:

mounting the color screening structure on the faceplate of a color picture tube with polygonal through holes formed respectively in the first, second and third supporting spring plates respectively receiving first, second and third metallic pins attached to the middle of a lateral side, one of the right and left sides extending from the opposite ends of the lateral side, and the other side of the faceplate, respectively;



welding the first supporting spring plate to the first metallic pin at a plurality of weld points in a predetermined welding sequence by laser welding; and

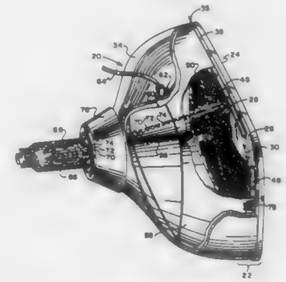
alternately welding the second and third supporting spring plates at a plurality of weld points respectively to the second and third metallic pins in a predetermined welding sequencee by laser welding.

4,854,906

MATERIAL, AND ASSEMBLIES FOR TENSIONED FOIL SHADOW MASKS

Michael Livshultz, Skokie, and Hua Sou Tong, Mundelein, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Division of Ser. No. 127,724, Dec. 2, 1987, abandoned. This application Jun. 22, 1988, Ser. No. 209,821
Int. Cl.[4] H01J *9/00, 29/07;* C21D *9/46*
U.S. Cl. 445—37 31 Claims



26. A process for the manufacture of a foil shadow mask for a tension mask color cathode ray tube which includes a faceplate having a phosphor screen on its inner surface and a support structure for supporting a tensioned foil shadow mask adjacent thereto comprising

providing a hardened nickel-iron alloy foil containing between about 30 and 85 weight percent nickel and at least one of the following in the indicated weight percent: molybdenum 0 and about 5%; vanadium 0 and about 2%; titanium 0 and about 2%; hafnium 0 and about 2% and niobium 0 and about 2%, balance iron and incidental impurities; and

heat treating said hardened foil under conditions which achieve favorable magnetic shielding properties while maintaining strength properties of the hardened material sufficient to withstand normal operating mask tension levels, including heating the foil to an elevated tempera-

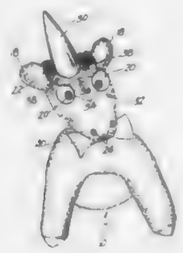
ture below that at which the alloy forms a solid solution and controlling the cooling rate of said foil from said temperature to the temperature at which said alloy is substantially recrystallized to provide a foil having a yield strength in excess of 80 ksi, a permeability in excess of 6000 and a coercivity of 2.5 oersteds or below.

4,854,907
"ESU" FLYING RING
Stephen E. Holmes, 1310 Sanders Dr., Lake City, Ga. 30260
Filed Jan. 27, 1988, Ser. No. 128,022
Int. Cl.[4] A63H *27/00;* B64C *3/00;* A63B *65/10*
U.S. Cl. 446—48 3 Claims



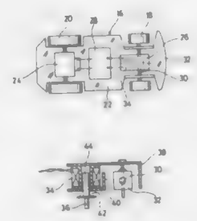
1. A circular gliding ring of unitary construction comprising an outer perimeter face and an inner edge, said outer perimeter face disposed normal to the diameter of said ring and said inner edge disposed midway between those edges defined by said outer perimeter, said ring consisting of a simple isosceles triangular cross section.

4,854,908
STUFFED HORSE CONVERTIBLE TO UNICORN
Nina Shively, P.O. Box 136, South Kent, Conn. 06785
Filed Oct. 5, 1987, Ser. No. 104,778
Int. Cl.[4] A63H *3/16*
U.S. Cl. 446—100 1 Claim



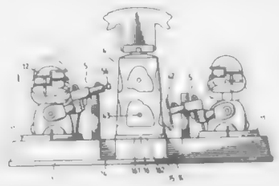
1. The combination of a stuffed horse and an accessory item therefor in the form of a stuffed generally conically shaped horn having a large diameter end removably affixable superficially to the forehead of the horse to convert the horse to a unicorn, the forehead of the horse and the large diameter end of the horn being provided with mating hook and loop type fastening elements for removably affixing said horn to the forehead of said horse, the combination further comprising a pair of eyeglasses removably placeable on the horse, said eyeglasses having a hole therethrough which is sized to receive said large diameter end of said horn to permit engagement of said fastening elements through said hole to hold said pair of eyeglasses in place on said horse.

4,854,909
APPARATUS FOR TRANSFERRING A RUNNING TRACK OF A RACING TOY
Zenichi Ishimoto, Tokyo, Japan, assignor to Nikko Co., Ltd., Tokyo, Japan
Filed Jun. 30, 1987, Ser. No. 68,226
Claims priority, application Japan, Jul. 9, 1986, 61-159824
Int. Cl.[4] A63H *17/39, 33/26;* B61F *11/00*
U.S. Cl. 446—129 2 Claims



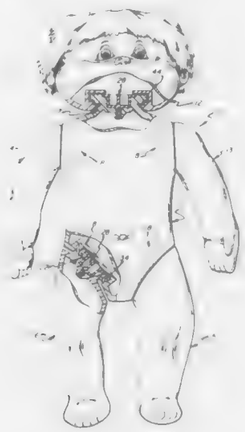
1. In a toy racing car assembly wherein at least one toy running body including a steerable front axle and a motor driven rear axle is propelled about a base having a plurality of guide tracks arranged in parallel, the running body including a guide pin for engaging a guide track on the base and an electromagnetic coil energized by a steering control of the running body for displacing said guide pin to selectively engage and disengage the guide track, the improvement which comprises apparatus for transferring the running body to a different guide track, including
(a) a movable iron core arranged within the electromagnet, a lower portion of said iron core comprising said guide pin which protrudes from said electromagnetic coil for engaging a track;
(b) spring means for normally biasing said guide pin downwardly toward its track-engaging position;
(c) yoke portions connected with said electromagnetic coil and arranged perpendicular to said front axle at either side thereof to define oppositely arranged electrodes having different polarity; and
(d) a rotary, permanent magnet connected with the front axle at the middle portion thereof, said magnet being rotatably supported having an axis defined by its' north and south poles, said axis being parallel to the axle of said front axle, said magnet interacting with said electromagnet to control the steering of the running body in accordance with its polarity as determined by the electromagnetic coil yokes.

4,854,910
SHOOTING TOY
Yug L. Yang, No. 590, Chien Kang 3rd. Street, Tainan, Taiwan
Filed Jul. 12, 1988, Ser. No. 217,896
Int. Cl.[4] A63H *33/04, 33/30, 3/54;* F41J *1/16*
U.S. Cl. 446—177 2 Claims



1. A shooting toy, comprising:
a base plate, having two round plates disposed on opposite sides of a central platform, two walls also disposed on opposite sides of the platform, an inner rotatable shell, two slant troughs one on each side of the platform, a switch and two LEDs, wherein said round plates have thereon corresponding barrels for each accommodating one of two figures each of which has a stand supported on a helical spring;
a transmission device, having a battery, a motor, an inner gear, an outer gear and an idle gear, said motor, inner gear, outer gear and idle gear all being rotatable supported on a foundation plate and covered with said base plate;
an outer rotating shell having several troughs therein for accommodating pictures, the outer shell covering the inner rotating shell;
two guns, each having a casing, a barrel, a spring, a suction cup, a firing pin and a pneumatic tube, wherein each said pneumatic tube has one end connected to one of said round plates and another end connected to a corresponding one of said guns, whereby a downward force on the head of either of the two figures into the the hollow barrel enables the suction cup to be moved forward and to contact and apply suction to a picture to remove the picture out of the trough holding the same on the outer rotating shell.

4,854,911
DOLL WITH WATERPROOF JOINTS
William Berliner, Essex, and Walter Koda, Newtown, both of Conn., assignors to Coleco Industries, Inc., Avon, Conn.
Filed Jan. 29, 1988, Ser. No. 150,225
Int. Cl.[4] A63H *3/46, 3/36*
U.S. Cl. 446—376 7 Claims



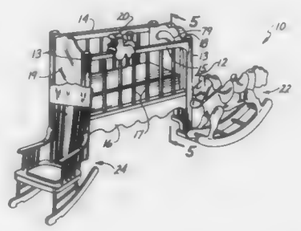
1. A toy figure comprising:
(a) a hollow torso member with portions for receiving simulated arms, legs and head;
(b) hollow extremity members simulating arms and legs, at least one of said portions of said torso having an integrally formed, inwardly extending socket with a cylindrical sidewall and a base wall providing an outwardly opening recess, an end of a cooperating extremity member having an integrally formed socket extending outwardly therefrom with a cylindrical sidewall and a base wall defining an outwardly opening recess, said outwardly extending extremity socket extending into said recess of said inwardly extending torso socket, said base wall of said extremity socket having a depending boss centrally thereof disposed within the hollow cavity defined within the extremity member, said base wall and boss portion of said extremity socket having a passage extending therethrough ;
(c) a plug member snugly seated in said recess of said extremity member socket and having a depending pin portion seated in said passage through said base wall and boss portion of said extremity socket, whereby air pressure in said cavity of said extremity member causes said boss portion to clamp said pin portion said plug member having a flange which supports said extremity socket sidewall in its cooperation with said torso socket sidewall to limit extremity socket deformation and
(d) a connecting member extending about and engaged with said extremity member socket, the outer periphery of said connecting member being engaged with said torso socket to retain said members in assembly and permitting relative rotation between said sockets.

4,854,912
DOLL OF RUSH STALKS
Chang-Am Koh, Rm. No. 1107, 27-dong, Woosung Apt. 101-2, Jamsil-dong, Kangdong-ku, Seoul, Rep. of Korea
Filed Feb. 7, 1984, Ser. No. 577,809
Claims priority, application Rep. of Korea, Feb. 8, 1983, 1118/83; Mar. 30, 1983, 2974/83; Sep. 26, 1983, 8345/83
Int. Cl.[4] A63H *3/46, 3/36;* A01N *1/00*
U.S. Cl. 446—373 10 Claims



1. A rush stalk doll comprising a head, an upper body section of rush stalks and a lower body section having a pleated rush stalk skirt, and means for joining the head and the upper and lower body sections coaxially.

4,854,913
TOY CRIB APPARATUS
William J. Kelley, Torrance, and Daniel G. Hurtienne, Carson, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Jul. 18, 1988, Ser. No. 220,199
Int. Cl.[4] A63H *5/00, 3/52*
U.S. Cl. 446—397 7 Claims



1. Toy crib apparatus comprising,
a housing having a crib interior, at least one hollow rail member defining an internal channel, and one hollow wall member;
a moveable toy member slidably supported on said hollow rail member;

slide means including a sliding member coupled to said moveable toy member and guided by said internal channel in said hollow rail member and a flexible rod member coupled to said sliding member and extending in a path along said hollow rail member and said hollow wall member, and

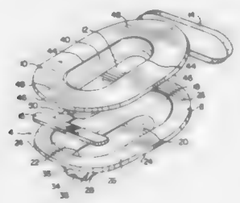
drive means including a crank drive member housed by said hollow wall member and connected to said flexible rod member to impart sliding reciprocal movement to said flexible rod member, said sliding member and said toy member.

4,854,914

TURKEY CALLER

William T. White, Jr., Rte. 3 - Box 393, Abbeville, Ala. 36310

Filed Oct. 13, 1987, Ser. No. 107,543
Int. Cl.[4] A63H *5/00*
U.S. Cl. 446—402 26 Claims



1. A turkey caller including the combination of a base member having a first top surface and a first bottom surface, said first top surface having a dish opening, a separate sounding board cover for said base member having a second bottom surface and a second top surface, said second bottom surface of said sounding board cover being located over said dish opening of said first top surface of said base member and forming a sound chamber therewith, said separate sounding board cover being movable relative to said base member, said sounding board cover having a striker plate means for being vibrated, said striker plate means being fixed to said second top surface, and means for biasing said separate sounding board cover towards said base member.

4,854,915

POST-MASTECTOMY GARMENT

Joyce A. Laedy, 1917 Wedgewood Dr., Carolina Trace, Sanford, N.C. 27330

Filed Sep. 22, 1988, Ser. No. 247,848
Int. Cl.[4] A41C *3/14*
U.S. Cl. 450—31 12 Claims



1. A woman's garment for use with a breast prosthesis in a frontal breast area of the garment, comprising:

(a) a facing piece placed inside the frontal breast area of the garment, said facing piece comprising a breast section, said facing piece connected to the garment at the garment sideseam area; said facing piece not extending to the back of the garment; and

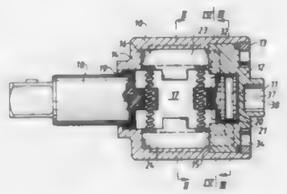
(b) a pocket piece attached inside the breast section of the facing to form a pocket, said pocket being of a size and shape to hold a breast prosthesis, said pocket piece and said facing each being made of soft flexible material, said pocket having an operation for insertion of the breast prosthesis wherein the breast prosthesis used affects the appearance of the frontal breast area of the garment.

4,854,916

HYDRAULIC TORQUE IMPULSE GENERATOR WITH BYPASS MECHANISM

Knut C. Schoeps, Tyresö, and Sven P. J. Westerberg, Saltsjöbaden, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 40,379, Apr. 20, 1987, abandoned. This application Aug. 24, 1988, Ser. No. 236,322
Claims priority, application Sweden, Apr. 22, 1986, 8601834
Int. Cl.[4] B25D *15/00*
U.S. Cl. 464—25 15 Claims



1. Hydraulic torque impulse generator comprising:

a drive member (10;50) coupled to a rotation motor;

a substantially cylindrical fluid chamber (16;51) defined in said drive member (10;50), said fluid chamber (16;51) having end walls (12;54);

an output spindle (18;53) provided with a rear impulse receiving portion (17;52) which extends into said fluid chamber (16;51);

at least two radially slidable vanes (23,24; 58–60) carried by said rear portion of said spindle (17;52) and arranged to sealingly cooperate with corresponding seal portions (25,26; 62–64) on a wall of said fluid chamber (16;51);

at least two axially extending seal ribs (29,30; 65–67) on said fluid chamber wall;

at least two axially extending seal ribs (27,28; 68–70) on said rear spindle portion (17;52) which are arranged to cooperate with said seal ribs (29,30; 65–67) on said fluid chamber wall;

said vanes (23,24; 58–60), said seal portions (25,26; 62–64) and said seal ribs (27–30; 65–70) being arranged to divide said fluid chamber (16;51), during at least two limited intervals of each revolution of said drive member (10;50) relative to said output spindle (18;53), into at least two high pressure compartments (H.P.) and at least two low pressure compartments (L.P.);

first passage means (32–35; 74–78) located in an end wall (12;54) of said fluid chamber (16;51);

second passage means (37,38; 73) located in said output spindle (18;53); and

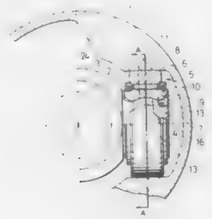
said first and second passage means being arranged to be aligned and form bypass passages between said high pressure compartments (H.P.) and said low pressure compartments (L.P.) during all but one of said limited intervals of each revolution of said drive member (10;50) relative to said output spindle (18;53), thereby generating one torque impulse per revolution.

4,854,917

TRIPOT TYPE CONSTANT VELOCITY UNIVERSAL JOINT

Yasumasa Mizukoshi, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1987, Ser. No. 69,759
Claims priority, application Japan, Dec. 23, 1986, 61-305261
Int. Cl.[4] F16D *3/20*
U.S. Cl. 464—111 3 Claims



1. A tripot type constant velocity universal joint comprising:

a first rotary member provided with three pairs of parallel planar track surfaces,

a second rotary member constituted by a spider having three trunnions corresponding to said track surfaces and branching off in three equally spaced apart directions and from a boss portion of said spider, and

a respective cylindrical roller assembly loosely fitted to each trunnion and engaged with the corresponding track surface pair,

said cylindrical roller assembly comprising a cylindrical outer race rolling on the corresponding track surface pair, an inner race loosely fitted to said trunnion and a plurality of rolling members interposed between said outer race and said inner race,

said inner race having an inner peripheral surface portion of concave spherical shape and said trunnion having an outer peripheral surface portion of convex spherical shape in spherical surface contact with said surface portion of said inner race such that said cylindrical roller assembly is pivotally movable about a point on an axis of said trunnion,

said trunnion and said roller assembly having cooperable pivot controlling means for restricting the pivotal movement of the roller assembly to planes parallel to a plane containing the axes of said three trunnions such that the direction of rolling movement of the roller assembly relative to the corresponding track surface pair is perpendicular to the axis of said trunnion,

said pivot controlling means including a pair of planar surface portions formed on opposite sides of the outer periphery of said trunnion in planes parallel to a plane containing the axes of said three trunnions, and a pair of corresponding guide plates carried by respective internal cutouts of said inner race, said guide plates being held against rotation relative to said inner race and in sliding surface-to-surface engagement with said planar surface portions of said trunnion.

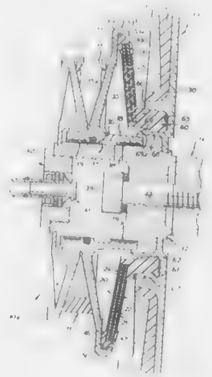
4,854,918

SPEED CHANGER PULLEY

Jean-Jacques Brasse, Montigny-Les-Cormeilles, and Ciriaco Bonfilio, Clichy, both of France, assignors to Valeo, Paris, France

Filed Jul. 22, 1988, Ser. No. 222,778
Claims priority, application France, Jul. 23, 1987, 87 10467
Int. Cl.[4] F16H *55/14*
U.S. Cl. 474—11 4 Claims

1. A speed changer pulley of the kind comprising a hub and two annular flanges disposed opposite each other around said hub, one of said flanges being axially movable relative to the said hub under the control of elastic return means constituted by at least one annular element comprising a diaphragm presenting, on the one hand, a peripheral part forming a Belleville washer which bears axially to rock against the movable flange and, on the other hand, a central part divided by gaps into radial fingers, which bears for rocking movement against a bearing piece, fixed to the hub, by means of a bridging element



made of resilient material interposed axially between the diaphragm and the bearing piece, wherein said bridging element towards its extremity adjacent the bearing piece, is disposed in a housing in said bearing piece, a covering of resilient material encasing the diaphragm, said covering being prolonged axially towards the inner periphery of the diaphragm to form said bridging element, said housing being formed by the interior space delimited on the surface of the bearing piece adjacent to the diaphragm between two rings coaxial with the hub.

4,854,919

INFINITELY VARIABLE TRANSMISSION WITH A CORRECTED PULLEY ALIGNMENT

Johannes H. van Lith, Berlicum, Netherlands, assignor to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Filed May 12, 1988, Ser. No. 192,989
Claims priority, application Netherlands, May 13, 1987, 8701134
Int. Cl.[4] F16H *9/12*
U.S. Cl. 474—25 2 Claims



1. Infinitely variable transmission with a corrected pulley alignment, comprising a primary pulley fitted on a drive-shaft, said pulley consisting of a conical disc fixed to the drive-shaft, and of a conical disc axially movable relatively to the drive-shaft, whereby the two conical discs enclose a V-shaped groove having a centre line; a secondary pulley fitted on a shaft to be driven, said pulley consisting of a conical disc fixed to the shaft to be driven, and of a conical disc axially movable rela-

tively to the shaft to be driven, whereby the two conical discs enclose a V-shaped groove having a centre line and whereby the drive-shaft and the shaft to be driven are positioned axially parallel at a radial distance and the axial positioning of the fixed and the movable disc on the drive-shaft is opposed to that on the shaft to be driven;

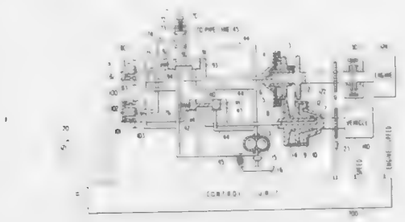
an endless transmission means provided in the grooves of the primary pulley and the secondary pulley, whereby the centre line of the V-shaped groove of the primary pulley, in the position of the endless transmission means where the radial distance of the endless transmission means in the primary pulley to the centre line of the drive-shaft and the radial distance of the endless transmission means in the secondary pulley to the centre line of the shaft to be driven are equal, is axially displaced, relatively to the centre line of the V-shaped groove of the secondary pulley, over a distance (C) in the direction of the movable disc of the secondary pulley, characterized in that the distance (C) of the axial displacement of the centre line of the primary pulley is such that the centre line of the V-shaped groove in the primary pulley and the centre line of the V-shaped groove in the secondary pulley are in alignment with a transmission ratio (ic) whereby the radial distance of the endless transmission means in the primary pulley to the centre line of the drive-shaft is greater than the radial distance of the endless transmission means in the secondary pulley to the centre line of the shaft to be driven.

4,854,920

CONTROL DEVICE OF NON-STAGE TRANSMISSION

Munehiko Mimura, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP87/00631, § 371 Date Jun. 20, 1988, § 102(e) Date Jun. 20, 1988
PCT Filed Aug. 26, 1987, Ser. No. 205,392
Claims priority, application Japan, Aug. 26, 1986, 61-200562
Int. Cl.[4] F16H *11/04*
U.S. Cl. 474—28 **2 Claims**



1. A control device of a stepless transmission, comprising:

a stepless transmission comprising a primary and a secondary pulley having an endless belt circumscribed thereabout, each of said pulleys having two flanges defining a V-shaped groove therebetween and cylinder disposed adjacent one of said flanges, said one flange being axially adjustable by applying hydraulic pressure to said cylinder such that the groove width and attendantly the effective diameter of each of said pulleys is variable;

an electronic control device which receives information and generates duty control information;

a pair of duty valves for independently generating respective reference pressures in response to the duty control information;

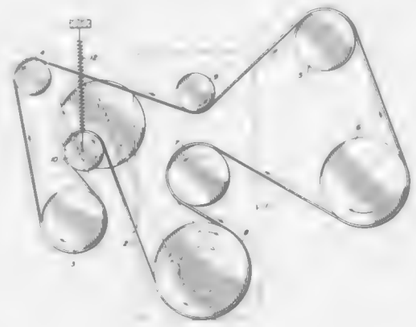
a pair of pressure control valves comprising a cylindrical sleeve and a spool slidably disposed therein so as to define a reference pressure space communicating with an associated duty valve and a feedback pressure space communicating with an associated cylinder, said spaces being disposed on opposite ends of said spool, said spool having a control chamber intermediate of said reference pressure space and said feedback pressure space, said chamber communicating with said feedback pressure space and a high pressure line wherein axial movement of said spool causes said high pressure line to communicate with said feedback pressure space.

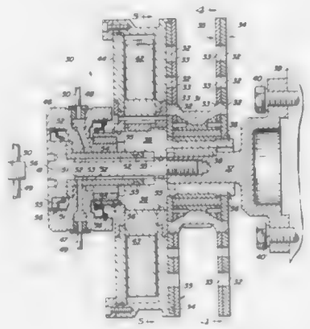
4,854,921

VARIABLE SPEED ENGINE ACCESSORY FLAT BELT DRIVE SYSTEM

Emerson L. Kumm, Tempe, Ariz., assignor to Kumm Industries, Inc., Phoenix, Ariz.

Filed Sep. 23, 1988, Ser. No. 248,174
Int. Cl.[4] F16H *55/52*
U.S. Cl. 474—70 **6 Claims**





1. A drive system for prime-mover-driven accessories comprising:

(A) a prime mover having a rotating output;

(B) a flat belt pulley affixed to a rotating component of each accessory to be driven by said prime mover, said accessories being arranged such that said accessory flat belt pulleys are disposed to be driven in tandem by a flat belt;

(C) a pulley assembly connected to said prime mover rotating output, said pulley assembly including:

1. a shaft;

2. a pair of pulley sheaves;

3. a series of belt engaging elements, each said belt engaging element having:

a. an elongated central shank including a drive surface adapted to be engaged by said drive belt;

b. a first bearing region at a first end of said central shank; and

c. a second bearing region at a second end of said central shank;

4. each said pulley sheave including:

a. a pair of relatively movable guideway disks lying alongside each other in juxtaposition;

i. an inner guideway disk of each said pair including a first series of guideways extending in one direction;

ii. an outer guideway disk of each said pair including a second series of guideways extending in a second direction;

iii. said first and second series of spiral guideways providing intersections for capturing and locating said bearing regions of said belt engaging elements, said intersections providing locations for said bearing regions to establish radial positions of said belt engaging elements with respect to said shaft;

5. means connecting said inner guideway disks of said pulley sheaves together to establish an inner guideway disk set which rotates about the axis of said shaft;

6. means connecting said outer guideway disks of said pulley sheaves together to establish an outer guideway disk set which rotates about the axis of said shaft;

7. means connecting one of said guideway disk sets to said shaft for rotation therewith;

8. means drivingly coupling said prime mover output to said shaft; and

9. control means responsive to prime mover speed for adjusting the angular relationship between said inner guideway disk set and said outer guideway disk set to establish the effective diameter of said pulley assembly;

(D) an idler flat belt pulley disposed to be driven in tandem by a flat belt with said accessory flat belt pulleys, said idler flat belt pulley being adapted to adjust its position with respect to said pulley assembly in order to maintain belt tension within an acceptable range when the effective diameter of said pulley assembly changes; and

(E) a flat drive belt drivingly coupling said pulley assembly and said accessory and idler flat belt pulleys.

4,854,922

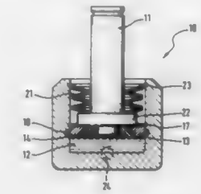
BELT TENSIONING DEVICE

Steffen Hertrich, Herzogenaurach, and Dieter Goppelt, Aurachtal, both of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Feb. 27, 1989, Ser. No. 316,458
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1988, 63-3809362
Int. Cl.[4] F16H *7/10*
U.S. Cl. 474—110 **10 Claims**

1. A tensioning device for belts, chains and similar components especially for the camshaft drive of an internal combustion engine comprising a tension roller mounted on a movable support and a control element by which the support can be moved by an actuating mechanism in the relaxing direction of the belt against the action of a pressure spring when the control element gets heated, characterized in that the control element has a cavity for receiving a pressure liquid whose volume





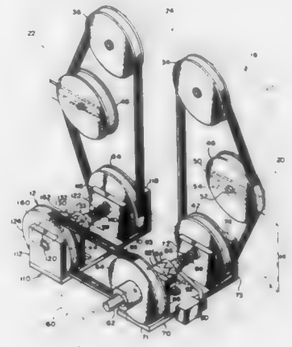
varies as a function of the temperature, the cavity being closed by a membrane connected to the actuating mechanism.

4,854,923

TORQUE TRANSMISSION UNIT FOR PARTIALLY FROZEN BEVERAGE SYSTEM

Rodney N. Sexton, Laguna Hills, and Floyd S. Woolf, Lake Matthews, both of Calif., assignors to ICEE-USA Corporation, Anaheim, Calif.

Filed Sep. 15, 1988, Ser. No. 245,010
Int. Cl.[4] F16H *7/00*
U.S. Cl. 474—84 **20 Claims**



1. A system for delivering torque to a first and a second means for producing partially frozen beverages comprising:

a housing having a floor and a rear housing support for an upper housing section, said first and second means for

producing partially frozen beverages disposed adjacent to said upper housing section;

first and second torque transmission means mounted on said floor;

a geared motor having an output shaft directly connected to said first torque transmission means;

said first torque transmission means including:

a stand having three upright members which rotatably support first and second axially aligned shafts, said stand mounted on said floor;

said first shaft having an axially outboard end directly connected to said output shaft of said geared motor, and having an axially inboard region rotatably supported by a first of said three upright members;

a coupler having axially separable sections, a respective coupler section attached to a corresponding opposing end of said first and second shafts;

said second shaft rotatably supported by a second and a third of said three upright members over a region remote from said coupler;

a drive wheel attached to said first shaft, an output wheel attached to said second shaft at a position intermediate said second and third upright members;

said second torque transmission means including:

a stand having four upright members which rotatably support first and second axially aligned shafts, said stand mounted on said floor;

a coupler having axially separable sections, a respective coupler section attached to a corresponding opposing end of said first and second shafts;

said first shaft rotatably supported by a first and a second of said four upright members over a region remote from said coupler;

said second shaft rotatably supported by a third and a fourth of said four upright members over a region remote from said coupler;

an input wheel attached to said first shaft intermediate said first and second upright members;

a thrust bearing means mounted on said first shaft for preventing axially outboard movement of said input wheel and said first shaft;

an output wheel attached to said second shaft at a position intermediate said third and fourth upright members;

said system including:

means for conveying torque between said drive wheel and said input wheel; and

respective first and second vertical drive mechanisms correspondingly connected between said output wheels of said first and second torque transmission means and respective ones of said first and second means for producing said partially frozen beverages, for conveying torque therebetween.

4,854,924

COVER DEVICE FOR A DRIVING CHAIN FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

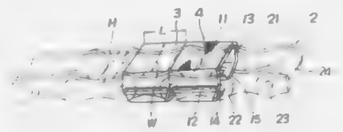
Continuation of Ser. No. 86,395, Aug. 18, 1987, abandoned. This application Oct. 17, 1988, Ser. No. 258,075

Claims priority, application Japan, Aug. 21, 1986, 61-127835[U]

Int. Cl.⁴ F16H *7/18*

U.S. Cl. 474—140 **5 Claims**

1. A cover device for a bicycle driving chain comprising a plurality of pairs of opposite inner link plates and a plurality of alternate pairs of opposite outer link plates, said cover device comprising a plurality of first covers for covering said inner link plates and a plurality of second covers for covering said outer link plates, said first covers and said second covers each including an outside cover portion for covering from the outside a space between opposite link plates and a pair of side cover portions in continuation of both widthwise sides of said outside cover portion, each of said side cover portions being provided at one widthwise free end thereof with an engaging portion bent inwardly in a bending direction adapted to be oriented toward the center of said space between opposite link plates and adapted to be engageable with a widthwise edge of said link plates, wherein a length of each of said first covers and said second covers is equal to a pitch of said link plates forming said chain and each of said side cover portions is provided with at least one cutout at at least one lengthwise end thereof, said cutout comprising means for enabling said chain to move while curving around gears of a bicycle, said outside cover portion and said side cover portions of said first covers and said second covers having a length adapted to be equal to



a distance between adjacent pins connecting the link plates of the chain such that adjacent outside cover portions abut each other and adjacent side cover portions abut each other, wherein said cover device is adapted for use with said driving chain wherein each of said link plates has a lengthwise intermediate portion which includes a contracted portion formed in a circular arc shape and both lengthwise end faces of said chain are formed in a circular arc shape and wherein each of said engaging portions is provided at both lengthwise ends thereof with curved surfaces engageable with said contracted portion and both said lengthwise end faces are formed in a circular arc shape.

4,854,925

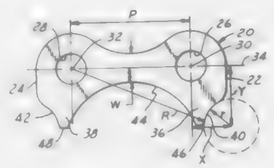
MULTI-RATIO DRIVE SYSTEM FOR SPROCKETS HAVING TRANSLATING PINS

Tirupathi R. Chandrupatla, Flint, Mich., assignor to GMI Engrg., & Mgmt., Institute, Flint, Mich.

Filed Nov. 6, 1987, Ser. No. 118,236

Int. Cl.⁴ F16G *13/04*

U.S. Cl. 474—212 **30 Claims**



1. A chain link for engaging a sprocket having a plurality of parallel cylindrical pins equally spaced radially from one another in a circular array, said link comprising:

a plate having a first and second end having formed therein;

a first and second pivot located in the first and second plate ends respectively, defining a first and second pivot axis perpendicular to the plate and having extending therebetween a link centerline; and

a first and second tooth located adjacent the first and second pivots respectively and projecting transversally from the centerline for engaging the pins of the sprocket, said first tooth having a first drive face oriented toward the first end and said second tooth having a second drive face oriented toward the second end, wherein said drive faces are concave and have a radius substantially equal to that of the sprocket pins to be engaged thereby.

4,854,926

POWER TRANSMITTING V-BELT

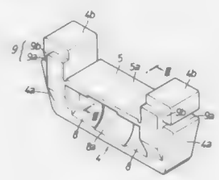
Torao Hattori, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1988, Ser. No. 203,001

Claims priority, application Japan, Jun. 5, 1987, 62-86771[U]

Int. Cl.⁴ F16G *1/22*

U.S. Cl. 474—242 **5 Claims**





1. A power transmitting V-belt comprising an endless metal band mounted on a multiplicity of V-shaped metal blocks lined to one another, with a semi-cylindrical recess extending in a widthwise direction of said metal band being provided on one V-shaped metal block and engaged by semi-cylindrical projection associated with an adjacent metal block to provide a pivotable linkage between said adjacent V-shaped metal blocks, wherein a relief portion having a predetermined axial length is provided at an axially central portion of the said semi-cylindrical recess and projection for eliminating or minimizing the engagement therebetween at said central portion.

4,854,927

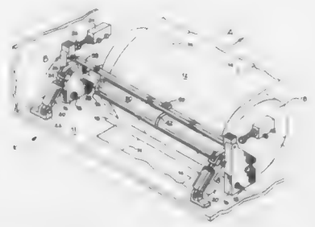
METHOD AND APPARATUS FOR PRESSING PERFORATED WEB FED MATERIALS

Bobby L. Reneau, Plano; George Rhea, Arlington, and Gary Owens, Lewisville, all of Tex., assignors to Advanced Graphic Technologies, Inc., Grapevine, Tex.

Filed Jun. 5, 1987, Ser. No. 58,521

Int. Cl.⁴ B65H *35/00;* **B31F** *7/00*

U.S. Cl. 493—27 **11 Claims**



1. Apparatus for pressing flat perforations formed in a continuous web of paper moving through a web printing press, the web printing press having a frame on both sides of the web, means for perforating the web on the printing press to form perforations, at least one roller downstream of the means for perforating the web, and a sheeter-stacker downstream of the one roller, comprising a cylindrical presser roller extending substantially the full width across the web for engaging the web to flatten the perforations, said presser roller being supported to be rotated by friction with the web moving through the printing press, bracket means for rotatably mounting the two ends of said presser roller to the adjacent printing press frame to form a nip with the one roller, said nip formed by said presser roller and the one roller being positioned to receive the perforated web, and fluid cylinder means for controllably forcing said presser roller uniformly toward the one roller, whereby the perforations can be flattened to permit the web to be subsequently cut into sheets and vertically stacked by the sheeter-stacker without falling.

4,854,928

METHOD AND APPARATUS FOR TRANSFERRING AND BUNDLING PLASTIC BAG SHEET MATERIAL

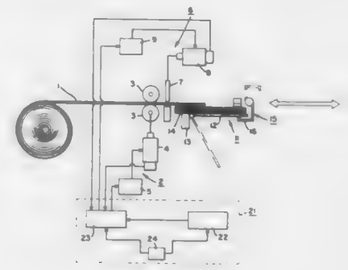
Yoshiaki Fukuyama, Kawagoe, Japan, assignor to Nippon Flute Co., Ltd., Irumagun, Japan

Filed Aug. 5, 1987, Ser. No. 81,678

Claims priority, application Japan, Aug. 5, 1986, 61-184030

Int. Cl.⁴ B31B *1/00*

U.S. Cl. 493—28 **5 Claims**



1. A method for transferring and bundling plastic bag sheet material comprising the steps of:

feeding plastic tubing to be processed into plastic bags from a feed roll;

advancing the plastic tubing through a drive roll mechanism for controllably advancing the tubing to a station for sealing and cutting;

intermittently cutting the tubing into pre-selected lengths and concomitantly sealing the bottom of a next adjacent bag;

temporarily storing a predetermined number of bags in a bundle;

counting the number of bag making cycles up to a predetermined number to complete a bundle;

transferring a bundle of completed bags away from the means for temporarily storing;

during said step of transferring,

controlling said drive roll mechanism for maintaining a desired speed of advancement of the plastic tubing to be processed into plastic bags,

controlling the timing of intermittent cutting and sealing,

reducing the speed of said drive roll mechanism for one bag making cycle to permit removal of said completed bundle of plastic bags, without stopping said drive roll means, and

upon reaching completion of a predetermined period of one bag making cycle during said step of transferring, resuming the speed of said drive roll mechanism.

4,854,929

ADHESIVE-APPLYING MACHINE

Louis Szuba, 3219 Bowmen La., Parma, Ohio 44134

Filed Jul. 16, 1987, Ser. No. 74,157

Int. Cl.⁴ F16H *7/24*

U.S. Cl. 493—150 **13 Claims**

1. A machine for applying adhesive to a cardboard blank having a sheet-like body portion and flaps extending from one

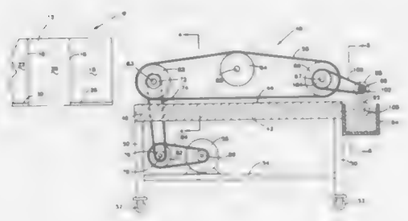
edge of the body portion, selected flaps being foldable to one side of the body portion and other flaps being foldable to another side of the body portion, comprising:

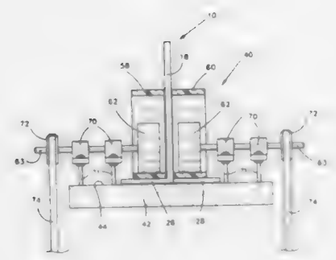
a support table having a flat upper surface and an entrance end and a discharge end;

first conveying means for engaging selected flaps and moving them across the flat upper surface from the entrance and to the discharge end;

second conveying means for engaging other flaps and for moving them across the flat upper surface from the entrance end to the discharge end, the second conveying means being spaced from the first conveying means a distance that will enable the body portion of the blank to be loosely fitted between the first and second conveying means;

adhesive-applying means disposed at the discharge end of the table for applying adhesive to the flaps, the adhesive-applying means including a first roller disposed adjacent





the first conveying means at the discharge end of the table and at approximately the same vertical elevation as the first conveying means, the first roller adapted to be contacted by selected flaps;

a second roller disposed adjacent the second conveying means at the discharge end of the table and at approximately the same vertical elevation as the second conveying means, the second roller adapted to be contacted by other flaps;

a third roller disposed adjacent the discharge end of the table and at a vertical elevation spaced from the first and second rollers, the third roller adapted to contact the flaps, the third roller having a length such that it extends directly below the first and second rollers in order that the workpiece may receive adhesive from the third roller while the first and second rollers contact the selected flaps and other flaps, respectively; and

means for applying adhesive to the third roller.

4,854,930

APPARATUS FOR THE SUPPLY OF BLANKS OF PACKAGING MATERIAL AND IN PARTICULAR FOR THE SUPPLY AND ERECTION OF FLAT FOLDED TUBULAR BLANKS AS PACKAGING CASES IN "BLISTER" PACKAGING MACHINES

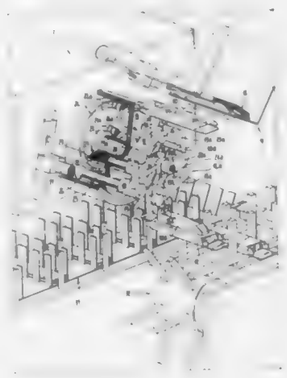
Carlo A. Miselli, Castel San Pietro Terme, and Rino Conti, Ozzano Emilia, both of Italy, assignors to I.M.A. - Industria Macchine Automatiche - SPA, Ozzano Emilia, Italy

Filed Jun. 10, 1988, Ser. No. 205,425

Claims priority, application Italy, Jul. 30, 1987, 3579 A/87

Int. Cl.[4] B31B *3/12, 3/78*

U.S. Cl. 493—315 3 Claims



1. An apparatus for supplying a succession of flat folded tubular blanks from a store of said blanks to a packaging location in a packaging machine, comprising:

a continuously rotatable support wheel;

a plurality of articulated systems on said wheel, each of said systems including:

an elongated arm having an end projecting beyond a periphery of said wheel and formed with an opposite end,

a first link articulated to said opposite end of said arm and swingable on said wheel about a first pivot axis,

a connecting rod pivotally connected to said arm at a location between said ends,

a second link articulated to said rod and pivotally mounted on said wheel at a second axis,

a first cam follower rotatable about said first axis and connected to said first link so as to angularly displace said first link about said first axis, and

a second cam follower rotatable about said second axis and connected to said second link so as to angularly displace said second link about said second axis;

respective stationary cams adjacent said wheel engageable by said first and second cam followers of each of said articulated systems and imparting a reciprocating movement to said arms as said wheel is continuously rotated with a pause as said ends projecting beyond said wheel reach said store for pickup of a respective blank; and

suction means on each of said ends projecting beyond said wheel and activatable to seize a respective one of said blanks during a respective pause.

4,854,931

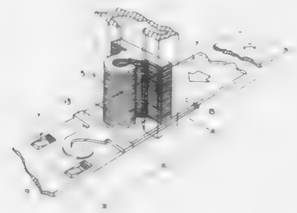
PROCESS AND APPARATUS FOR DISPENSING AND CONVEYING INDIVIDUAL ARTICLES IN SERIATIM ORDER

John T. Roberts, Clover, S.C., and Larry J. Mattson, Matthews, N.C., assignors to Poly-Pro, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 421,859, Sep. 23, 1982, abandoned, and a continuation-in-part of Ser. No. 688,542, Mar. 29, 1985, Pat. No. 4,662,974. This application Jul. 9, 1987, Ser. No. 71,486

Int. Cl.[4] B05B *1//14*

U.S. Cl. 493—348 5 Claims



1. An apparatus for dispensing articles from a cartridge of said articles, comprising:

a magazine for receiving said cartridge;

means for shearing individual articles from said cartridge;

an inserter arm for receiving one of said articles as it is sheared;

said inserter arm having a length which is a plurality of the length of said one article;

means for advancing said article in increments of said length of said one article through said inserter arm;

means for restraining said one article when it has advanced one of said increments; and

means for receiving the next of said articles from said cartridge in said inserter arm and wherein said means for restraining said article is a ratchet-spring stopper located within said inserter arm.

4,854,932

METHOD OF AND APPARATUS FOR GATHERING AND MANIPULATING STACKED ZIG-ZAG FORMATIONS OF PAPER SHEETS

Karl-Heinz Schlottke, Tangstedt, and Jürgen Peter, Hamburg, both of Fed. Rep. of Germany, assignors to E.C.H. Will GmbH, Hamburg, Fed. Rep. of Germany

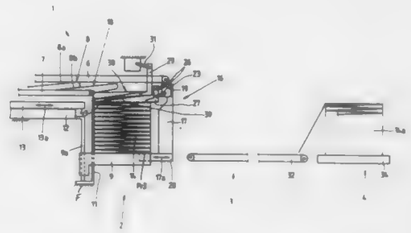
Filed Oct. 19, 1987, Ser. No. 110,289

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1986, 3635895

Int. Cl.[4] B05B *1/14*

U.S. Cl. 493—357 30 Claims

1. A method of separating a fully grown first stack of overlapping panels which are folded over each other in zig-zag formation from a growing second stack which is being formed by zig-zag folding a continuous web of paper or the like and has a foremost panel integral with a rearmost panel of the first stack, comprising the steps of advancing the web longitudinally in a predetermined direction to a stacking station wherein the second stack is located at a level above the first stack so that the foremost panel is the lowermost panel of the second stack and the rearmost panel is the topmost panel of the first stack; breaking the web in the region of one of the foremost and rearmost panels; and removing the first stack from the



stacking station in the course of said breaking step, including unfolding the rearmost panel of the first stack.

4,854,933

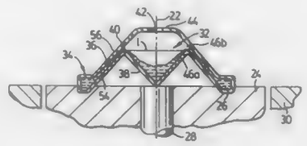
PLASMA SEPARATOR

John D. Mull, 4088 Lakeshore Road East, Burlington, Ontario, Canada L7L 1A1

Filed Oct. 6, 1987, Ser. No. 104,915

Int. Cl.[4] B04B *1/06*

U.S. Cl. 494—38 6 Claims



1. A plasma separator comprising a container having an axis, the container being symmetrical about said axis and being adapted for rotation at high speed about said axis with the container oriented so that the axis is vertical, the container being self supporting during such rotation and defining internally a central chamber for receiving a blood sample, an annular outer chamber, and an annular passageway connecting said chamber and having respective inner and outer ends, the central chamber having a top wall and a lower wall of inverted conical shape extending about said axis, the lower wall having an upper end and a circular edge at said upper end, said circular edge being disposed at said inner end of said passageway, the passageway extending downwardly and outwardly from said edge to said outer chamber, said outer chamber being located at said outer end of said passageway and below said circular edge, the inverted conical shape of the lower wall of the central chamber providing an internal surface of said central chamber which extends upwardly away from said axis to said circular edge at an inclination selected to permit red blood cells in a said blood sample to migrate up said surface, through said annular passageway, and into said outer chamber upon said rotation of the container at an appropriate said high speed, while plasma is retained in said inner chamber, the container having a single opening located in said top wall for permitting insertion of a blood sample into and removal of plasma from said central chamber.

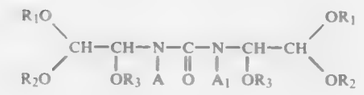
4,854,934

SUBSTITUTED UREAS FOR ENNOBLING CELLULOSE FIBRES

Didier Wilhelm, Hauts de Seine; Antonio Gelabert, Val D'Oise, and Alain Blanc, Paris, all of France, assignors to Societe Francaise Hoechst, Puteaux, France

Filed Mar. 14, 1988, Ser. No. 167,510
Claims priority, application France, Apr. 2, 1987, 87 04629
Int. Cl.[4] D06M *13/40;* C07D *233/32, 233/40*
U.S. Cl. 8—185 12 Claims

1. A urea in its racemic form or a mixture of stereoisomers of the formula



(I)

in which either R_1 and R_2 are identical and represent the $—CH_2R$ group where R represents a hydrogen atom or a C_1 to C_4 alkyl radical, or R_1 and R_2 together form a $—CH_2—(CR_4R_4)n—CH_2$ group in which n is 0 or 1 and R_4 represents a hydrogen atom or methyl group, R_3 represents a hydrogen atom or a $—CH_2R_5$ radical in which R_5 represents a hydrogen atom or a C_1 to C_4 alkyl group and either A and A_1 are identical and represent a hydrogen atom or A and A_1 together form an ethylene, trimethylene or $—CH(OCH_2R_6)—CH(OCH_2R_6)—$ radical wherein R_6 represents hydrogen atom or a C_1 to C_4 alkyl group or, where R3 represents a hydrogen atom, or a 1,2-dihydroxyethylene group.

11. In a method for the treatment of cellulose fibres or fabrics to endow said fibres and fabrics with crease and shrink resisting properties, comprising treating said fibres or fabrics with a cross-linking agent, the improvement wherein said cross-linking agent comprises a product of formula I in accordance with claim 1.

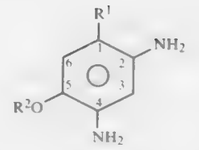
4,854,935

5-ALKOXY-2,4-DIAMINO-ALKYL-BENZENES AND HAIRDYE COMPOSITIONS BASED ON 5-ALKOXY-2,4-DIAMINO-ALKYL-BENZENES

Thomas Clausen, Alsbach, and Eugen Konrad, Darmstadt, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP87/00320, § 371 Date Feb. 26, 1988, § 102(e) Date Feb. 26, 1988, PCT Pub. No. WO88/00042, PCT Pub. Date Jan. 14, 1988
PCT Filed Jun. 20, 1987, Ser. No. 165,278
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1986, 3622784
Int. Cl.[4] A61K *7/13;* C07C *91/40, 87/52*
U.S. Cl. 8—408 10 Claims

1. A compound of the formula (I)



(I)

where R^1 is methyl or ethyl and R^2 is an alkyl radical having 2 to 4 carbon atoms, a monohydroxyalkyl radical having 2 to 4 carbon atoms or a dihydroxyalkyl radical having 3 to 4 carbon atoms, or a physiologically acceptable acid addition salt thereof.

4,854,936

SEMICONDUCTIVE CERAMIC COMPOSITION AND SEMICONDUCTIVE CERAMIC CAPACITOR

Shuichi Ono; Shuichi Itagaki; Masahiro Yahagi; Kiyoshi Furukawa; Shinobu Fujiwara, and Yasunobu Oikawa, all of Akita, Japan, assignors to TDK Corporation, Tokyo, Japan

Division of Ser. No. 79,018, Jul. 29, 1987, Pat. No. 4,799,127. This application Nov. 15, 1988, Ser. No. 272,139
Claims priority, application Japan, Jul. 29, 1986, 61-176632; Jul. 29, 1986, 61-176633
Int. Cl.[4] H01L *21/00, 21/02, 29/00, 29/12*
U.S. Cl. 29—570.1 9 Claims

1. A process for manufacturing a semiconductive ceramic capacitor comprising the steps of:

applying a first conductive paste onto a surface of a semiconductive ceramic body and baking said first conductive paste to form a first conductive layer on said semiconductive ceramic body, said first conductive paste mainly consisting of metal powder selected from the group consisting of zinc powder and aluminum powder; and

applying a second conductive paste onto a surface of said first conductive layer and baking said second conductive paste to form a second conductive layer on said first conductive layer, said second conductive paste mainly consisting of copper powder.

4,854,937

METHOD FOR PREPARATION OF COAL DERIVED FUEL AND ELECTRICITY BY A NOVEL CO-GENERATION SYSTEM

Edmond G. Meyer, Laramie, Wyo., and Lee G. Meyer, Englewood, Colo., assignors to Carbon Fuels Corporation, Englewood, Colo.

Division of Ser. No. 658,879, Oct. 9, 1984, abandoned. This application Mar. 28, 1988, Ser. No. 173,785
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—51 4 Claims

1. A method of generating electrical power in conjunction with production of a fuel product utilizing the pyrolysis of coal comprising the steps of

(a) a hyrolyzing coal to produce a coal char, an organic material and a hydrogen-rich gas

(b) transferring at least a portion of said char, said organic material or said gas or combinations thereof to an electrical generating facility for use as an energy source to power the turbines of facility;

(c) transferring at least a portion of the waste heat from said electric generating facility for use as at least part of the heat to carry out said pyrolysis step and

(d) using at least a portion of said coal char or said organic material or said gas or combinations thereof to produce said fuel product.

4,854,938

REMOVAL OF WATER HAZE FROM DISTILLATE FUEL

Thomas Easton, and Bryan Thomas, both of Barry, Wales, assignors to Dow Corning, Ltd., Barry, Wales

Filed Apr. 28, 1988, Ser. No. 187,186

Claims priority, application United Kingdom, May 8, 1987, 8710888

Int. Cl.[4] C10L *1/28*

U.S. Cl. 44—56 27 Claims

1. A method of de-hazing distillate fuel which comprises adding to the fuel an effective amount for dehazing of a solution of a halide salt dissolved in an alcohol, and an alcohol soluble organosiloxane.

4,854,939

AROMATIZATION AND ETHERIFICATION PROCESS INTEGRATION

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 8, 1987, Ser. No. 130,260

Int. Cl.[4] C10L *1/18*; C07C *12/02, 12/42*

U.S. Cl. 44—77 11 Claims



1. A continuous process for the production of aromatics-rich high octane gasoline and ether-rich high octane gasoline, comprising the steps of:

(a) contacting a C_4+ hydrocarbon feedstream containing iso-olefins and excess methanol based on said iso-olefins with an acid etherification catalyst under etherification conditions in an etherification zone whereby an effluent stream is produced comprising methyl tertiary alkyl ethers, unreacted methanol and hydrocarbons;

(b) distilling said effluent stream whereby a distillate bottom stream is produced comprising high octane ether-rich C_5+ gasoline and a distillate overhead stream comprising unreacted methanol and C_5− hydrocarbons;

(c) passing said distillate overhead stream and an aromatization hydrocarbon feedstream comprising an ethene rich gas feedstream and C_3 hydrocarbons to an olefins and paraffins fixed, fluid or moving bed aromatization zone under aromatization conditions in contact with medium pore size shape selective metallosilicate catalyst having the structure of ZSM-5 whereby a high octane aromatics-rich C_5+ gasoline is produced and hydrogen-rich fuel gas.

4,854,940

METHOD FOR PROVIDING IMPROVED SOLID FUELS FROM AGGLOMERATED SUBBITUMINOUS COAL

Jerzy S. Janiak; Ali A. Turak; Wanda Pawlak, and Boleslaw L. Ignasiak, all of Edmonton, Canada, assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Feb. 16, 1988, Ser. No. 156,541

Int. Cl.[4] C10L *5/00*

U.S. Cl. 44—620 4 Claims

1. A method for separating substantially deashed coal agglomerates generated from finely divided raw subbituminous coal by using low quality bridging liquids to form a solid made of de-oiled agglomerates and a liquid made of distillable hydrocarbons, comprising the step of contacting said agglomerates with steam and/or nitrogen gas at a temperature in the range of 250° to 350° C. at substantially atmospheric pressure, whereby the resultant separated solid contains less than about 7% by weight residual bridging liquid and is characterized by a moisture capacity reduced by at least 5% at a relative humidity of 96% compared to the moisture capacity of said agglomerates.

4,854,941

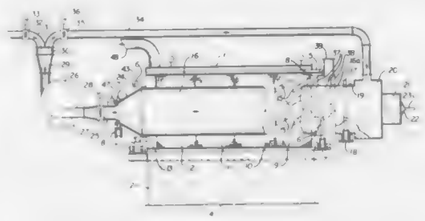
METHOD AND APPARATUS FOR DRYING FINE COAL

David G. Chedgy, Pittsburgh, Pa., assignor to CLI International Enterprises, Inc., Pittsburgh, Pa.

Filed Apr. 12, 1988, Ser. No. 180,303

Int. Cl.[4] C10L *5/00, 9/08*

U.S. Cl. 44—626 10 Claims



1. Coal drying apparatus comprising a rotatable drying chamber, a rotatable heating member positioned within the drying chamber, and forming a coal drying zone therebetween, screen openings in the wall of the drying chamber, and moisture exhaust means from the drying chamber.

3. Coal drying appartus comprising a cylindrical tubular drying chamber mounted for rotation about its axis, screen openings in the wall of the drying chamber, a cylindrical tubular heating member mounted within the drying chamber for rotation about the axis of the heating member, the drying chamber and the heating means forming a coal drying zone therebetween, gas conduit means in flow communication with the interior of the heating chamber for movement of heated gas through the heating chamber, and a coal delivery port positioned above the heating member for discharge of wet coal into the heating chamber.

4,854,942

CONTROL OF PH IN WATER QUENCH OF A PARTIAL OXIDATION PROCESS

Kimberly K. Deaney, Friendswood, and Norman G. Block, Houston, both of Tex., assignors to Quantum Chemical Corporation, New York, N.Y.

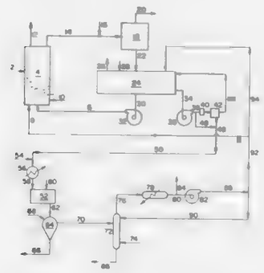
Filed Jul. 29, 1988, Ser. No. 226,256

Int. Cl.[4] L10J *3/46*; C10J *3/84*

U.S. Cl. 48—197 R 11 Claims

1. In a partial oxidation process for producing gaseous mixtures containing H_2, CO, water, particulate carbon, gaseous materials including one or more of CO_2, H_2S, COS, CH_4, NH_3 and N_2 and ash particles comprising materials including vanadium, sulfur, nickel, iron, calcium, sodium, molybdenum, or their reaction products, including sulfides and cyanides, by the partial oxidation of a hydrocarbonaceous feed with an oxygen-containing gas; contacting the gaseous mixture with water in a vessel for conducting a gas quenching or scrubbing step or both; removing from this vessel a water stream containing particulate carbon, dissolved gaseous materials and suspended ash particles; adding a liquid organic extractant to the stream; feeding the stream to a decanter wherein an aqueous ash-bearing phase and an organic carbon-bearing phase separate; removing from the decanter the aqueous phase comprising water, dissolved gaseous material, some particulate carbon, and the suspended ash particles; feeding the aqueous phase to a water flash separator wherein a portion of the dissolved gases are flashed off, and removing from the bottom of the water flash separator the remaining liquid phase comprising metals, sulfides, cyanides, solid materials and ammonia for recycle to the quenching or scrubbing step and purging part of this liquid phase; the improvement comprising:

(a) treating the purge stream to form solid materials from the metals, sulfides and cyanides,



(b) removing the solid materials from the treated purge stream,

(c) subjecting the treated purge stream to stripping to provide a condensible aqueous overhead,

(d) condensing the aqueous overhead to provide an ammonia-containing aqueous stream, and

(e) recycling a first portion of the ammonia-containing aqueous stream for incorporation into the quenching or scrubbing step in an amount effective to maintain the pH at above 4.5 in the quenching or scrubbing step.

4,854,943

PROCESS OF PRODUCING A GAS WHICH IS RICH IN CARBON MONOXIDE BY A CRACKING OF HYDROCARBONS

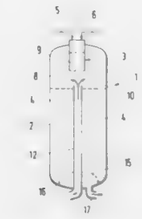
Theodor Voeste, Frankfurt, and Emil Supp, Dietzenbach, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 3, 1989, Ser. No. 292,700

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1988, 3800862

Int. Cl.[4] C01B *3/38*

U.S. Cl. 48—196 A 5 Claims



1. In a process for producing a gas which is rich in carbon monoxide by a catalytic cracking of gaseous or vaporized hydrocarbons, the improvement comprising: completely combusting a part of the hydrocarbons at temperatures of about 800° to 1500° C. in a combustion zone, supplying an oxygen-containing gas to the combustion zone at a rate which corresponds to twice to ten times the stoichiometric oxygen demand, admixing preheated remainder of the hydrocarbons to the oxygen-containing combustion gas to produce a mixture at a temperature between about 700° and about 1300° C., passing the mixture through a fixed bed of a granular cracking catalyst, and withdrawing a high-CO product gas at a temperature between about 800° and about 1150° C. from the fixed bed.

4,854,944

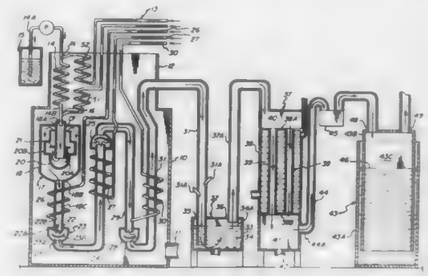
METHOD FOR GASIFYING TOXIC AND HAZARDOUS WASTE OIL

William H. Strong, 394 Graham Rd., S. Windsor, Conn. 06074

Continuation of Ser. No. 14,310, Feb. 13, 1987, abandoned, which is a division of Ser. No. 730,453, May 6, 1985, Pat. No. 4,673,413. This application Jun. 6, 1988, Ser. No. 203,342

Int. Cl.[4] C07C *4/04, 9/04*

U.S. Cl. 48—214 R 2 Claims



1. A method of effecting non-catalytic gasification of an organic waste hydrocarbon oil of a type containing PCB toxic materials to produce a high BTU content gas substitute in a low pressure, pyrolytic manner comprising the steps of

mixing waste oil with a predetermined amount of water to form an oil-water mixture,

preheating said oil-water mixture to a predetermined temperature ranging between 200° to 600° F. by an external heating means,

separately generating steam by said external heating means as said oil-water mixture is being preheated,

introducing said generated steam as a spray into said preheated oil-water mixture to effect an intimate mixing of said steam with said preheated oil-water mixture, heating said preheated oil-water mixture sprayed with said steam by said external heating means to form a partially gasified effluent of said pre-heated mixture having a temperature ranging between 1600° to 1800° F. in a primary dynamic mixing chamber,

directing the partially gasified effluent having a temperature ranging between 1600° to 1800° F. from said primary dynamic mixing chamber to one or more serially connected secondary heating chambers heated by said external heating means to further progressively gasify said partially gasified effluent at a temperature ranging between 1800° to 2200° F. to produce a final gasification effluent, and

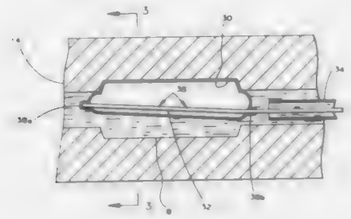
spraying said partially gasified effluent with additional steam at each of said one or more serially connected secondary heating chambers just prior to said gasified effluent entering a respective secondary heating chamber whereby the final gasification effluent is substantially free of said toxic materials.

4,854,945

BLADDER DEVICE AND METHOD FOR DISPLACING AIR IN A BOTTLE BORE SHAFT

Herbert E. Ferree, Hempfield Township, Westmoreland County, Pa., and William S. Beal, Winter Springs, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 69,724, Jun. 7, 1987, abandoned. This application Nov. 17, 1988, Ser. No. 274,640
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—55 22 Claims



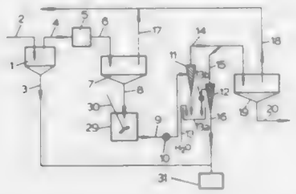
11. A method of removing gas trapped in a liquid filled compartment having a trapped gas space and an exit below the trapped gas, said method comprising the steps of:
(a) inserting a collapsed flexible bladder residing in a tube into the compartment, the flexible bladder including an amount of gas that does not alter the collapsed state during insertion;
(b) removing the bladder from the tube;
(c) applying a vacuum to the compartment, causing the bladder to expand, floating to the top of the compartment and displacing the trapped gas out of the trapped gas space, toward and out the exit.

4,854,946

METHOD FOR TREATING BLAST FURNACE GAS AND APPARATUS FOR CARRYING OUT THAT METHOD

Cornelis P. Heijwegen, Castricum, and Willem Kat, Heiloo, both of Netherlands, assignors to Hoogovens Groep B.V., Ijmuiden, Netherlands

Continuation-in-part of Ser. No. 489,574, Apr. 28, 1983, abandoned. This application Oct. 24, 1984, Ser. No. 664,092
Claims priority, application Netherlands, May 4, 1982, 8201841
Int. Cl.[4] B01D *53/14*
U.S. Cl. 55—85 13 Claims



1. A method of treating blast furnace gas containing dust particles of a range of sizes comprising the steps of:
dry removal of the coarsest dust particles from said blast furnace gas;
wet scrubbing said blast furnace gas to collect dust in said blast furnace gas;
separating said collected blast furnace gas dust in a first separation stage into a coarse grain fraction and a fine grain fraction;
concentrating said fine grain fraction from said first separation stage;
separating said concentrated fine grain fraction in a second separation stage into a coarse grain fraction and a fine grain fraction;
and feeding the coarsest dust particle from said first separation stage and said second separation stage to an agglomeration plant for preparing feed material suitable for feeding into a blast furnace.

4,854,947

PAINT DETACKIFICATION USING OIL-IN-WATER EMULSIONS FROM OILY WASTE TREATMENT PLANTS

Robert R. Patzelt, Wheaton, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Oct. 3, 1988, Ser. No. 252,314
Int. Cl.[4] E01D *47/00*
U.S. Cl. 55—85 5 Claims

1. A method comprising: detackifying oversprayed paints chosen from the group consisting of high solids enamels, two-phase urethane paints, clear coats, and water or solvent borne base coats by the contact of said oversprayed paint with an oil-in-water emulsion having:
(a) 1–50 weight percent of a hydrocarbon oily liquid having a boiling point of at least 150° C.;
(b) 0.1–25 weight percent, based on the oily liquid, of an oil-in-water emulsifier;
(c) the remainder, water; which emulsion has a pH of from 7.5–12.0 and then detackifying through said contact within a paint spray booth to form a detackified oversprayed paint particulate and then, collecting and dispersing said detackified paint particulate within the oil-in-water emulsion sufficient to form a spent oil-in-water emulsion containing at least 5 parts of detackifying paint particulate per 100 parts of hydrocarbon oily liquid contained in said spent oil-in-water emulsion.

4,854,948

SUPPLY CIRCUIT FOR ELECTROSTATIC DUST SEPARATOR

Friedrich Eiserlo, and Kurt Emmrich, both of Tönisvorst, Fed. Rep. of Germany, assignors to Walther & Cie. Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 825,771, Feb. 3, 1986, abandoned. This application Dec. 30, 1987, Ser. No. 140,913
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1982, 3241060
Int. Cl.[4] B03C *3/66*
U.S. Cl. 55—105 9 Claims



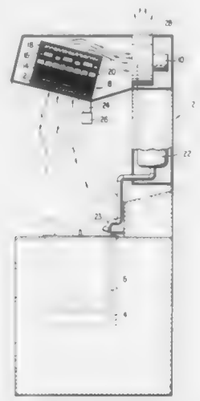
1. In an electrostatic dust separator having an electrically conductive casing and an electrode within and spaced from said casing, and having a power supply circuit for producing high voltage pulses including a transformer with primary and secondary windings, said power supply circuit having a primary circuit that includes the primary winding and contains a pulse-controlled thyristor circuit including a control device for enabling the thyristor circuit to become conductive and having a secondary circuit that includes the secondary winding and contains a series connection including a first capacitor and the dust separator casing and electrode, and means for applying a DC voltage across the dust separator casing and electrode, wherein the dust separator is subject to spark-over between said casing and said electrode, which results in inducing a current pulse into said primary circuit from discharge of said first capacitor and which results in an oscillatory circuit consisting of the secondary winding and first capacitor, the improvement comprising:
a detector coupled to the electrode of the dust separator and to said control device, said detector being responsive only to rapid voltage variations occurring with a spark-over at the dust separator and thereupon enabling said control device to cause the thyristor circuit to become conductive, the response time of the detector being substantially less than the cycle duration of said oscillatory circuit; and
a second capacitor connected across the primary winding of said transformer via said thyristor circuit for absorbing the current pulse induced in the primary circuit following said spark-over.

4,854,949

APPARATUS FOR COOKING FOOD INCLUDING A VENTLESS EXHAUST SYSTEM

William O. Giles, Sr., Montgomery; William T. McNeal, Prattville, and Ted W. Giles, Montgomery, all of Ala., assignors to Giles Enterprises, Inc., Montgomery, Ala.

Filed Apr. 19, 1988, Ser. No. 183,681
Int. Cl.[4] B03C *3/01*
U.S. Cl. 55—126 7 Claims



1. Apparatus for cooking food comprising:
container means for holding oil;
heating means for heating the oil in the container means;
air filter means for treating air drawn therethrough located substantially above the container means and sloping upwardly;
fan means for circulating heated air rising from the heated oil in the container means through the filter means and for recirculating filtered air back into interior room space;
wherein the filter means comprises:
electrostatic precipitator means for removing particulates from the air,
charcoal filter means for deodorizing the air,
aluminum filter means for condensing moisture from the air, and
flame arrester means for preventing passage of fire through the fan means.

4,854,950

MOISTURE SEPARATOR

Frank J. Kierzkowski, Bedford, and John R. Ross, Duncanville, both of Tex., assignors to Peerless Manufacturing Company, Dallas, Tex.

Filed Jul. 6, 1987, Ser. No. 69,710
Int. Cl.[4] B01D *29/02*
U.S. Cl. 55—213 7 Claims



1. An apparatus for filtering air entering a flow passage, comprising:
a frame surrounding an opening into the flow passage;
a panel mounted to said frame for pivotal motion between a closed position and an open position, the panel including means for filtering air passing through the panel, air entering the flow passage passing through the panel when the panel is in the closed position, air being permitted to pass through the frame and around the panel when the panel is in the opened position;
opening means for pivoting the panel from the closed to the opened position;
closing means for pivoting the panel from the open to the closed position; and
means for latching the panel in the closed position, said latching means including a latch mechanism having a plunger movable between a first position latching the panel in the closed position and a second position for permitting the panel to move from the closed position, a spring for urging the plunger into the first position, a cylinder for moving the plunger to the second position upon entry of a pressurized fluid into the cylinder, and a manual override assembly operatively connecting the cylinder and plunger for manually moving the plunger to the second position independent of the cylinder operation.

4,854,951

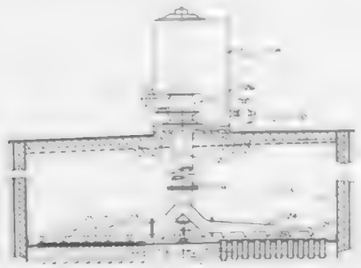
PULSE JET FABRIC FILTER

Robert G. Stephenson, Panania, Australia, assignor to James Howden Australia Pty. Ltd., Australia

PCT No. PCT/AU87/00206, § 371 Date Mar. 11, 1988, § 102(e) Date Mar. 11, 1988, PCT Pub. No. WO88/00496, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 8, 1987, Ser. No. 191,147
Claims priority, application Australia, Jul. 11, 1986, PH06878
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—294 6 Claims

1. A gas filter apparatus having a housing body including a dusty gas section with a main inlet thereto and a clean gas section with a main outlet therefrom; a porting plate mounted in the housing body separating the dusty gas section from the clean gas section and having a plurality of radially spaced, concentric rings of ports in the porting plate, each port in a ring having a filter media sleeve depending therefrom; a generating means
for generating pulses of backflushing gas having an inlet supplied with pressured gas from a single source and having a generator outlet for discharging gas therefrom; and a rotary backflushing gas pulse distributing means within the clean gas section, extending radially across and spaced from the concentric rings of ports in the porting

plate, having a distributor inlet in fluid communication with the generator outlet and a plurality of radially spaced orifices, one respective orifice for each respective ring of ports,each respective orifice subscribing a circular path over the ports of the respective ring of ports and being aligned with the ports of the respective ring so as to provide successive gas communication therewith; the apparatus being characterised in that :



the generating means includes a gas accumulation chamber directly mounted on the housing body, and a gas release valve directly on and within the chamber and fixed to, and axially aligned with, the generator outlet ; and the distributor inlet is directly fluidly coupled to, and axially aligned with, the generator outlet.

4,854,952

CHROMATOGRAPHY APPARATUS

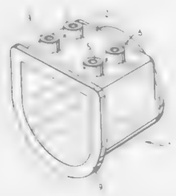
Andrew T. Stepien, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 3, 1988, Ser. No. 228,085

Claims priority, application United Kingdom, Sep. 2, 1987, 8720611

Int. Cl.[4] B01D *15/08*

U.S. Cl. 55—386 **18 Claims**



1. A chromatography oven thermal insulation liner characterised in that the liner is formed by ceramic fibres bound together with an inorganic binder moulded into a one piece component to enclose an oven cavity, the one piece component having an end wall and side walls and being open opposite the end wall.

4,854,953

AIR FILTER AND MODULE TO BE USED FOR BUILDING UP SUCH A FILTER

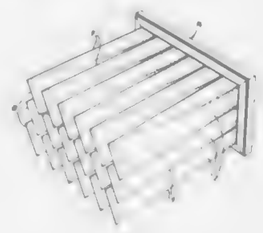
Jan Van Weerden, Zundert; Johannes Valkenburg, Rotterdam, and Ferdinand van der Spek, Breda, all of Netherlands, assignors to Filtrete B.V., Netherlands

Filed Dec. 21, 1987, Ser. No. 136,135

Claims priority, application Netherlands, Dec. 24, 1986, 8603306

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—483 **7 Claims**



1. An air filter comprising:
a plurality of filter elements; and
a plurality of module frames each of which has a projecting edge onto which one of said filter elements is secured, a first pair of side faces provided with a plurality of spaced ribs disposed parallel to a central axis of the frame and each being profiled on at least one of its side boundaries and a plurality of ribs disposed perpendicular to said spaced ribs in the spaces between the spaced ribs and a second pair of side faces having an embossment profiled on its side boundaries in complement to the profile of said profiled side boundaries of said ribs in such a manner that an embossment of a first frame can be slidingly directed in the space between two spaced ribs of a second frame to enable end boundaries of said embossment to contact at least one of said perpendicular ribs of said second frame when the module frames are interconnected.

4,854,954

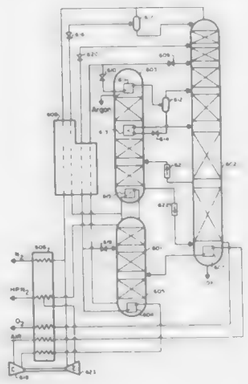
RECTIFIER LIQUID GENERATED INTERMEDIATE REFLUX FOR SUBAMBIENT CASCADES

Donald C. Erickson, 1704 So Harbor Ln., Annapolis, Md. 21401

Filed May 17, 1988, Ser. No. 195,089

Int. Cl.[4] F25J *3/04*

U.S. Cl. 62—22 **40 Claims**



1. In a process for the subambient temperature fractional distillation of a fluid mixture comprising rectifying at least part of the feed at high pressure, distilling the rectified feed at a lower pressure, reboiling said distilling step by exchanging latent heat with vapor from said rectifiying step, and refluxing said distilling step with depressurized liquid from said latent heat exchanging step, the improvement comprising:
(a) essentially totally condensing a minor fraction of the feed, which is preferably at a pressure at least as high as the pressure of said rectifying step, by exchanging latent heat with a liquid from said rectifying step;
(b) splitting the condensed feed into at least two streams; and
(c) intermediate refluxing said high pressure rectifying step with one of said streams and said low pressure distilling step with another.

4,854,955

HYDROCARBON GAS PROCESSING

Roy E. Campbell; John D. Wilkinson, and Hank M. Hudson, all of Midland, Tex., assignors to Elcor Corporation, Dallas, Tex.

Filed May 17, 1988, Ser. No. 194,878

Int. Cl.[4] F25J *3/02*

U.S. Cl. 62—24 **28 Claims**



1. In a process for the separation of a gas containing methane, C_2 components, C_3 components and heavier hydrocarbon components into a volatile residue gas fraction containing a major portion of said methane and C_2 components and a relatively less volatile fraction containing a major portion of said C_3 components and heavier components, in which process
(a) said gas is cooled under pressure to provide a cooled stream;
(b) said cooled stream is expanded to a lower pressure whereby it is further cooled; and
(c) said further cooled stream is fractionated at said lower pressure whereby the major portion of said C_3 components and heavier hydrocarbon components is recovered in said relatively less volatile fraction;
the improvement wherein said gas is cooled sufficiently to partially condense it; and
(1) said partially condensed gas is separated thereby to provide a vapor stream and a condensed stream;
(2) said vapor stream is thereafter divided into gaseous first and second streams;
(3) said gaseous first stream is cooled to condense substantially all of it and is thereafter expanded to said lower pressure;
(4) the expanded cooled first stream is then directed in heat exchange relation with a warmer distillation stream which rises from fractionation stages of a distillation column;
(5) the distillation stream is cooled by said first stream sufficiently to partially condense it and said partially condensed distillation stream is separated thereby to provide said volatile residue gas and a reflux stream, said reflux stream is supplied to said distillation column at a top column feed position;
(6) the warmed first stream is supplied to said column at a first mid-column feed position;
(7) the gaseous second stream is expanded to said lower pressure and is supplied to said distillation column at a second mid-column feed position;
(8) said condensed stream is expanded to said lower pressure and is supplied to said distillation column at a third mid-column feed position; and
(9) the temperatures of said feeds to the column are effective to maintain column overhead temperature at a temperature whereby the major portion of said C_3 components and heavier hydrocarbon components is recovered in said relatively less volatile fraction.

4,854,956

METHOD OF MANUFACTURING OPTICAL FIBRES HAVING A CORE AND A CLADDING OF GLASS APPLYING THE ROD-IN-TUBE TECHNIQUE

René A. M. Pluijms; Emmanuel Papanikolau; Leendert B. Jongeling, and Johannes M. A. Van Esdonk, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 62,920, Jun. 16, 1987, abandoned. This application Oct. 6, 1988, Ser. No. 256,067

Claims priority, application Netherlands, Jul. 14, 1986, 8601830

Int. Cl.[4] C03B *37/012*

U.S. Cl. 65—2 **4 Claims**

1. A method of manufacturing optical fibers having a core and a cladding of glass derived by a rod-in-tube method comprising the steps of:
(a) providing a layer of core glass coated on the inside of a first tube of quarts glass;
(b) contracting the internally coated tube to form a solid rod of the same or substantially the same length as the first tube;
(c) heating the outer surface of a second quartz glass tube at a temperature of at least 2100° C. for a period of time sufficient to dissolve high-melting-point oxides which are present in a surface layer to a depth of about 10 μm to substantially eliminate the adverse effect said oxides exert on the mechanical properties of optical fibers subsequently produced therefrom;
(d) placing the rod resulting from said first tube in the thermally pre-treated second quartz glass tube to form an assembly; and
(e) drawing the assemby to form an optical fiber.

4,854,957

METHOD FOR MODIFYING COLORATION IN TINTED PHOTOCHROMIC GLASSES

Nicholas F. Borrelli, Elmira, and Paul A. Sachenik, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Apr. 13, 1988, Ser. No. 181,180

Int. Cl.[4] C03C *4/06, 21/00*

U.S. Cl. 65—30.11 **9 Claims**



1. A method for making a photochromic glass article exhibiting a surface color pattern which comprises the steps of:
(a) selecting for treatment a silver halide-containing photochromic glass article;

(b) exposing a portion of the surface of the article to a patterned heat source for a time sufficient to raise the temperature of at least a part of the exposed portion above about 450° C.; and

(c) thereafter heating the article under reducing conditions to a temperature not exceeding about 450° C. for a time sufficient to develop reduction coloration in portions of the surface layer other than the exposed portion.

4,854,958

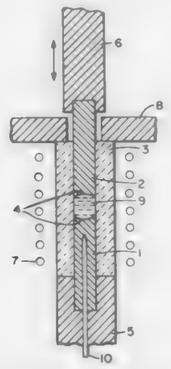
PROCESS TO MOLD PRECISION GLASS ARTICLES

Jean-Pierre Marechal, Grez-sur-Loing, France, and Richard O. Maschmeyer, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 850,180, Apr. 10, 1986, which is a division of Ser. No. 643,412, Aug. 22, 1984, abandoned, which is a continuation of Ser. No. 515,662, Jul. 20, 1983, Pat. No. 4,481,023, which is a continuation of Ser. No. 316,861, Oct. 31, 1981, abandoned. This application Dec. 11, 1987, Ser. No. 131,838

Int. Cl.⁴ C03B *11/00*

U.S. Cl. 65—64 **5 Claims**



1. A method of molding to form a glass lens which method comprises:

forming a glass preform of desired configuration,

providing a mold assembly having a mold cavity therein,

preheating said preform and said mold assembly,

placing the preform within the cavity of said mold assembly

initially pressing said preform within the cavity of the said mold assembly by providing a force on the mold assembly, said initial pressing being carried out at temperatures wherein the glass of said preform is at a viscosity of about $10^8 - 10^{10}$ poises,

maintaining a force on the mold assembly while it is cooled to a temperature where the glass is at a viscosity of about $10^{11} - 10^{12}$ poises,

holding the pressed lens within said mold assembly for a time sufficient to provide an isothermal condition for the mold and the lens

and removing the pressed lens from said mold assembly.

4,854,959

FEEDING APPARATUS FOR GLASS MELTING FURNACES

Erich Waltert, Erlenbach, Fed. Rep. of Germany, assignor to SORG GmbH & Co. KG, Lohr am Main, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 167,071

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709178

Int. Cl.⁴ C03B *3/00*

U.S. Cl. 65—335 **17 Claims**

1. A feeding apparatus for feeding and spreading charge material comprising:

a movable stand;

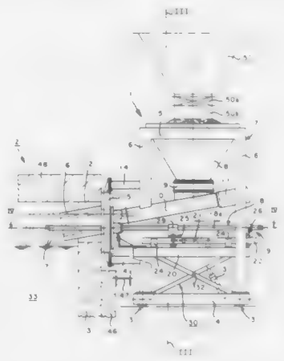
a charge hopper supported by the movable stand;

a charging means;

a horizontal platform, the platform being mounted for movement parallel to itself on the stand by means of a vertical guiding system;

drive means to raise and lower said platform;

a pusher with a pusher holder and pusher driving means



adapted to produce a pushing motion with horizontal and vertical components, the pusher holder being mounted by means of a linear guiding device always horizontally aligned on said movable, horizontal platform and being displaceable with respect to the latter by a horizontal driver; and

a heat shield having at least one slot means provided for the passage of the charging device and of the pusher holder therethrough.

4,854,960

FOREHEARTH

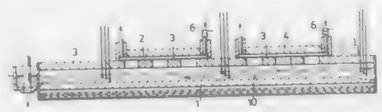
Håkan Lindgren, Västerås; Jan O. Olsson, Hallstahammar, both of Sweden; Martin Knudsen, Moss, and Knut Rönningen, Kambo, both of Norway, assignors to Kanthal AB, Norway, Sweden

Continuation of Ser. No. 77,101, Jun. 8, 1987, abandoned. This application Jul. 5, 1988, Ser. No. 218,492

Claims priority, application Sweden, Jun. 6, 1986, 8602572

Int. Cl.⁴ C03B *5/42*

U.S. Cl. 65—346 **24 Claims**



1. A forehearth for transport of molten glass, comprising:

forehearth channel means including a roof, for conducting molten glass passing beneath said roof between an inlet and an outlet; and

a plurality of cooling surfaces of an iron-chromium-aluminum alloy having fifteen to thirty percent by weight of chromium, three to twelve percent by weight of aluminum, and a balance of essentially iron, disposed in the roof of the forehearth channel means.

4,854,961

SUBSTITUTED 2-PHENYLIMINO-OXAZOLIDINE COMPOUNDS HAVING HERBICIDAL ACTIVITY

Kobus Wellinga, and Jacobus H. H. Eussen, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

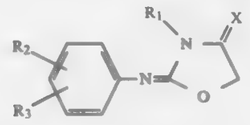
Filed Oct. 30, 1987, Ser. No. 114,863

Claims priority, application Netherlands, Nov. 4, 1986, 8602786

Int. Cl.⁴ A01N *43/00*; C07D *263/40*

U.S. Cl. 71—88 **7 Claims**

1. A substituted 2-phenyliminooxazolidine compound of the formula



wherein

R_1 is an unsubstituted alkyl group having 1–6 carbon atoms or an alkyl group which has 1–6 carbon atoms and which is substituted by halogen or hydroxy, or an alkenyl or alkynyl group having 2–6 carbon atoms;

R_2 is a halogen atom; a nitro group; a cyano group; a benzyl, phenyl, phenoxy, phenylthio, phenylsulphinyl, phenylsulphonyl or phenylsulphonyloxy group, which groups are unsubstituted or substituted with a substituent selected from the group consisting of halogen, lower alkyl, lower alkoxy, lower haloalkyl, lower haloalkoxy, nitro, cyano and lower alkoxycarbonyl; or a halogenated or non-halogenated alkyl, alkoxy, alkylthio, alkylsulphinyl, alkylsulphonyl or alkylsulphonyloxy group having 1–4 carbon atoms;

R_3 is a hudrogen atom, a halogen atom, or an alkyl group having 1–4 carbon atoms; and

X is O or S;

or a herbicidally acceptable salt of this compound with an organic or inorganic acid.

4. A herbicidal and/or algicidal composition which, in addition to a solid or liquid inert carrier material, comprises a substituted 2-phenylimino-oxazolidine compound as the active substance, characterized in that the active substance is a compound of the formula I, wherein R_1, R_2, R_3 and X have the meanings given in claim 1, or a salt of this compound with an organic or inorganic acid, said salt being acceptable for herbicidal application.

4,854,962

HERBICIDAL SULFONAMIDES

David L. Douglass, and Marcus P. Moon, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 39,492, Apr. 16, 1987, Pat. No. 4,746,356, which is a continuation-in-part of Ser. No. 868,239, May 23, 1986, abandoned. This application Feb. 16, 1988, Ser. No. 155,971

Int. Cl.⁴ C07D *403/12, 413/12, 417/12*; A01N *43/54*

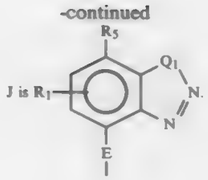
U.S. Cl. 71—90 **48 Claims**

1. A compound of the Formula I:

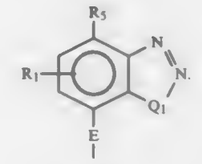


wherein

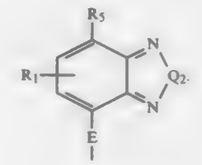
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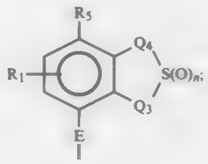
J-1



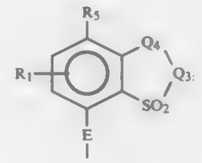
J-2



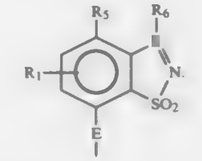
J-3



J-4

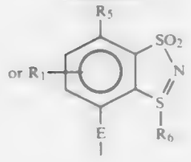


J-5



J-6

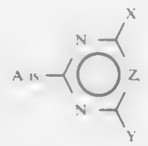
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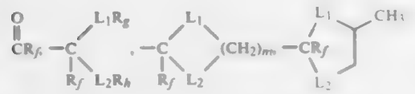
J-7

W is O or S;
R is H or CH_3;
E is a single bond, CH_2 or O;
R_1 is H, C_1–C_3 alkyl, C_1–C_3 haloalkyl, halogen, nitro, C_1–C_3 alkoxy, $SO_2NR_aR_b$, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, CH_2CN, CN, CO_2R_c, C_1–C_3 haloalkoxy, C_1–C_3 haloalkylthio, C_2–C_4 alkoxyalkyl, C_2–C_4 alkylthioalkyl, CH_2N_3 or NR_dR_e;
R_a is H, C_1–C_4 alkyl, C_2–C_3 cyanoalkyl, methoxy or ethoxy;
R_b is H, C_1–C_4 alkyl or C_3–C_4 alkenyl; or
R_a and R_b may be taken together as $—(CH_2)_3—$, $—(CH_2)_4—$, $—(CH_2)_5—$ or $—CH_2CH_2OCH_2CH_2—$;
R_c is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_2–C_4 haloalkyl, C_2–C_3 cyanoalkyl, C_5–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or C_2–C_4 alkoxyalkyl;
R_d and R_e are independently H or C_1–C_2 alkyl;
Q_1 is S, SO_2 or NR_2;
Q_2 is O, S or NR_2;
Q_3 is O, S or NR_3;
Q_4 is O, S or NR_4;
n is 0, 1 or 2;
R_2 is H, C_1–C_3 alkyl, phenyl, benzyl, $CH_2CH=CH_2$, $CH_2C\equiv CH$, CN, C_1–C_3 haloalkyl, OH, OCH_3 or OC_2H_5;
R_3 is H or C_1–C_3 alkyl;
R_4 is H or CH_3;
R_5 is H, halogen, CH_3, CH_2CH_3, OCH_3, OCH_2CH_3, OCF_2H or halomethyl;
R_6 is C_1–C_4 alkyl;

A-1



X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino or C_3–C_5 cycloalkyl;
Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylthioalkyl, C_1–C_4 haloalkyl, C_2–C_4 alkynyl, azido, cyano, C_2–C_5 alkylsulfinylalkyl, C_2–C_5 alkylsulfonylalkyl,



$NR_d(C_2$–C_3 cyanoalkyl) or $N(OCH_3)CH_3$;
m is 2 or 3;
L_1 and L_2 are independently O or S;
R_f is H or C_1–C_3 alkyl;
R_g and R_h are independently C_1–C_3 alkyl; and
Z is CH;
and their agriculturally suitable salts; provided that
(a) when X is Cl, F, Br or I, then Y is OCH_3, OC_2H_5, $N(OCH_3)CH_3$, $NHCH_3$, $N(CH_3)_2$ or OCF_2H;
(b) when W is S, then E is a single bond, R is H and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH=CH_2$, $OCH_2C\equiv CH$, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$ or 1,3-dioxolan-2-yl;
(c) when the total number of carbons of X and Y is greater than four, then the number of carbons of R_1 must be less than or equal to two;
(d) Q_3 and Q_4 are not simultaneously S;
(e) when J is J-5, then Q_3 is NR_3 and Q_4 is NR_4;
(f) when n is 0, then Q_3 is NR_3 and Q_4 is NR_4; and
(g) when R_5 is other than H, then R is H, R_1 is H, W is O, and E is a single bond.

33. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,854,963

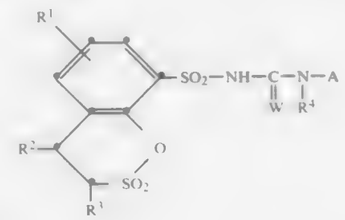
N-HETEROCYCLOSULFONYL-N'-TRIAZINYLUREAS

Werner Föry, and Willy Meyer, both of Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

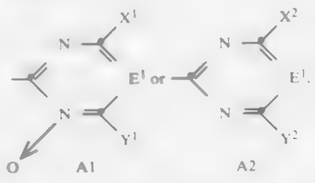
Division of Ser. No. 872,799, Jun. 11, 1986, Pat. No. 4,759,791. This application May 24, 1988, Ser. No. 198,030
Claims priority, application Switzerland, Jun. 18, 1985, 2566/85; Mar. 5, 1986, 894/86
Int. Cl.[4] C07D *411/12;* A01N *43/66*
U.S. Cl. 71—91 **15 Claims**

1. An N-(3,4-dihydro-2,2-dioxo-1,2-benzoxathiin-8-ylsulfonyl)-N'-triazinylurea of formula I

(I)



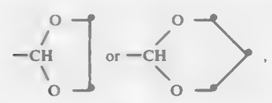
wherein
R^1 is hydrogen, halogen, nitro, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, C_1–C_4alkoxycarbonyl, C_1–C_4alkylthio, C_1–C_4alkylsulfinyl, C_1–C_4alkylsulfonyl or C_2–C_5alkoxyalkoxy,
R^2 and R^3 are each independently of the other hydrogen or C_1–C_4alkyl,
R^4 is hydrogen, methyl or ethyl,
W is oxygen or sulfur, and
A is a radical



A1 A2

in which formulae
X^1, X^2 and Y^1 are each independently halogen, C_1–C_4-haloalkoxy, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4alkyl, dimethylamino, methylamino, ethylamino, amino or C_2–C_4alkoxyalkyl,

E^1 is nitrogen,
Y^2 is cyclopropyl, dimethoxymethyl, diethoxymethyl,



or salt thereof; with the proviso that R^3 is C_1–C_4alkyl if A is A2.

11. A method of controlling undesired plant growth, which method comprises applying to the plants or to the locus thereof an effective amount of a compound of formula I according to claim 1, or of a composition containing such a compound.

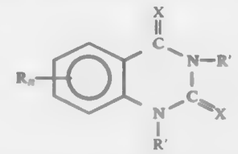
4,854,965

HERBICIDAL COMPOSITIONS

Peretz Bracha, Omer, and Moshe Korat, Beer-Sheva, both of Israel, assignors to Makhteshim Chemical Works, Ltd., Beer-Sheva, Israel

Filed Jun. 22, 1987, Ser. No. 67,418
Claims priority, application Israel, Jun. 26, 1986, 79249
Int. Cl.[4] A01N *43/52*
U.S. Cl. 71—92 **8 Claims**

1. A method of controlling broadleaved weeds in cereal crops, comprising applying to a field of a cereal crop, pre-emergently or post-emergently, a composition comprising an agricultural carrier and an herbicidally effective amount of an active compound of the formula:



wherein
R is hydrogen, lower alkyl, lower alkoxy, amino, substituted amino, cycloalkyl, halogen, or nitro;
R' is selected from the group consisting of a haloalkylthio group containing 1 or 2 carbon atoms and at least two halogen substituents; linear or branched alkyl and alkenyl group having from 2 to 10 carbon atoms, optionally substituted by halogen, hydroxy, lower alkoxy, or haloalkyl; and cycloalkyl of 5 to 10 carbon atoms, optionally substituted by halogen, hydroxy, lower alkoxy, or haloalkyl; provided that at least one of R' is a haloalkylthio group as defined;
n is zero or an integer from 1 to 4; and
X is oxygen or sulfur.

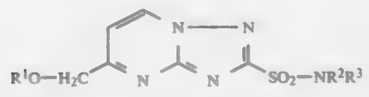
4,854,964

TRIAZOLO-PYRIMIDINE-2-SULPHONAMIDES HAVING HERBICIDAL UTILITY

Klaus Jelich, Wuppertal; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch Gladbach, and Harry Strang, Düsseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 30, 1987, Ser. No. 79,726
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1986, 3627411
Int. Cl.[4] C07D *487/04;* A61K *31/14*
U.S. Cl. 71—92 **6 Claims**

1. A triazolo-pyrimidine-2-sulphonamide of the formula



in which
R^1 represents alkyl having 1 to 6 carbon atoms,
R^2 represents hydrogen, alkyl, alkylcarbonyl, alkoxycarbonyl and alkylsulphonyl in each case having 1 to 6 carbon atoms in the alkyl part, alkenyl and alkinyl in each case having 3 to 8 carbon atoms, or aralkyl, having 6 to 10 carbon atoms in the aryl part and 1 to 4 carbon atoms in the alkyl part, which is optionally monosubstituted or polysubstituted in the aryl part, the substituents being identical or different and being fluorine, chlorine, bromine, iodine, cyano, nitro, hydroxyl, C_1–C_6-alkyl, C_1–C_6-alkoxy, C_1–C_6-alkylthio, halogeno-C_1–C_6-alkyl, halogeno-C_1–C_6-alkoxy or halogeno-C_1–C_6-alkylthio, and
R^3 represents aryl, having 6 to 10 carbon atoms, which is optionally monosubstituted to polysubstituted, the substituents being identical or different and being
fluorine, chlorine, bromine or iodine; nitro; cyano; hydroxyl; C_1–C_6-alkyl; C_1–C_6-alkoxy, C_1–C_6-alkylthio; halogeno-C_1–C_6-alkyl; halogeno-C_1–C_6-alkoxy, halogeno-C_1–C_6-alkylthio; C_1–C_6-alkylcarbonyl; C_1–C_6-alkylsulphinyl; C_1–C_6-alkylsulphonyl; halogeno-C_1–C_6-alkylsulphinyl; halogeno-C_1–C_6-alkylsulphonyl; phenyl; phenoxy; phenylcarbonyl; hydroxycarbonyl, C_1–C_6-alkoxycarbonyl; C_3–C_6-alkenyloxycarbonyl; C_1–C_4-alkoxy-C_1–C_6-alkoxycarbonyl; hydroxyimino or C_1–C_6-alkoxyimino.

5. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a compound according to claim 1.

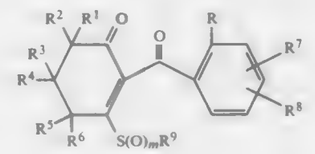
4,854,966

METHOD OF CONTROLLING UNDESIRABLE VEGETATION UTILIZING CERTAIN 3-(SUBSTITUTED THIO)-2-BENZOYL-CYCLOHEX-2-ENONES

Christopher G. Knudsen, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 872,078, Jun. 9, 1986, Pat. No. 4,762,551. This application Mar. 21, 1988, Ser. No. 171,077
Int. Cl.[4] A01N *41/10*
U.S. Cl. 71—103 **10 Claims**

1. The method of controlling undesirable vegetation comprising applying to the area where control is desired, an herbicidally effective amount of a compound having the formula



wherein
R is halogen, C_1–C_2 alkyl, C_1–C_2 alkoxy, nitro; cyano; C_1–C_2 haloalkyl, or R^aSO_n— wherein n is 0 or 2 and R^a is C_1–C_2 alkyl;
R^1 is hydrogen or C_1–C_4 alkyl;
R^2 is hydrogen or C_1–C_4 alkyl; or
R^1 and R^2 together are alkylene having 2 to 5 carbon atoms;
R^3 is hydrogen or C_1–C_4 alkyl;
R^4 is hydrogen or C_1–C_4 alkyl; or
R^3 and R^4 together can be oxo;
R^5 is hydrogen or C_1–C_4 alkyl;
R^6 is hydrogen or C_1–C_4 alkyl; or

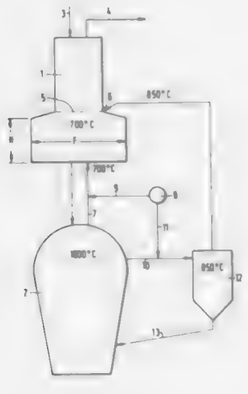
R^5 and R^6 together are alkylene having 2 to 5 carbon atoms;
R^7 and R^8 independenntly are (1) hydrogen; (2) halogen; (3) C_1–C_4 alkyl; (4) C_1–C_4 alkoxy; (5) trifluoromethoxy; (6) cyano; (7) nitro; (8) C_1–C_4 haloalkyl; (9) R^bSO_m— wherein n is the integer 0, 1 or 2; and R^b is (a) C_1–C_4 alkyl; (b) C_1–C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) —NR^cR^d wherein R^c and R^d independently are hydrogen or C_1–C_4 alkyl; (11) $R^cC(O)$— wherein R^c is C_1–C_4 alkyl or C_1–C_4 alkoxy; (12) $SO_2NR^cR^d$ wherein R^c and R^d are as defined; or (13) —$N(R^c)C(O)R^d$ wherein R^c and R^d are as defined; and
m is the integer 0, 1 or 2; and
R^9 is C_1–C_4 alkyl, phenyl, dichlorophenyl; methylphenyl; methoxyphenyl; cyano, or —$(CH_2)_xC(O)O$—(C_1–C_4 alkyl) wherein X is the integer 1, 2 or 3.

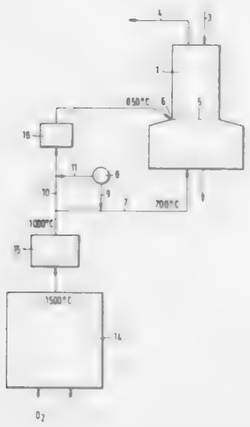
4,854,967

PROCESS FOR PRODUCING CARBURIZED SPONGE IRON

Rolf Hauk, Düsseldorf, Fed. Rep. of Germany, assignor to Korf Engineering GmbH, Duesseldorff, Fed. Rep. of Germany

Filed Oct. 11, 1985, Ser. No. 786,691
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1984, 34379134
Int. Cl.⁴ C21B *11/00, 13/02*
U.S. Cl. 75—34 **8 Claims**





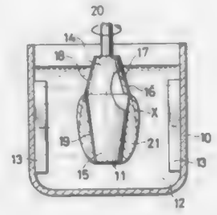
1. A process of producing sponge iron from iron ore in a reduction shaft furnace having a top portion with an inlet for iron ore and an outlet for top gas, a base portion having an outlet for sponge iron, and a bustle plane between said two portions; comprising the steps of: introducing iron ore through said inlet into said top portion, for passage downward through said shaft furnace, introducing a first quantity of reducing gas containing CO from a melt-down gasifier or coal-to-gas plant into said furnace at said bustle plane with a first temperature of from 750° C. to 900° C. to reduce the iron ore, introducing a second quantity of reducing gas containing CO also from the gasifier or coal-to-gas plant into said base portion at a second temperature below that of said first quantity and in a temperature range of from 650° C. to 750° C., at which second temperature CO is separated into carbon and carbon dioxide to thereby carbonize the iron ore in said base portion to form sponge iron, removing the sponge iron through said outlet in said base portion, and removing top gas formed in said furnace through said outlet in said top portion.

4,854,968

METHOD OF PREPARING HIGH-PURITY METAL AND ROTARY COOLING MEMBER FOR USE IN APPARATUS THEREFOR

Ryotatsu Otsuka; Shigemi Tanimoto, and Kazuo Toyoda, all of Sakai, Japan, assignors to Showa Aluminum Corporation, Osaka, Japan

Filed Dec. 22, 1987, Ser. No. 137,213
Claims priority, application Japan, Dec. 25, 1986, 61-313247; Dec. 25, 1986, 61-313248; Dec. 25, 1986, 61-313249
Int. Cl.⁴ C22B *7/00*
U.S. Cl. 75—63 **15 Claims**



1. A method of preparing a high-purity metal by immersing a hollow rotary cooling member in a molten metal containing eutectic impurities and rotating the cooling member while supplying a cooling fluid to the interior of the cooling member, whereby the high-purity metal is caused to crystallize out on a metal deposition area of the peripheral surface portion of the cooling member present under the surface of the molten metal, the metal deposition area being the peripheral surface of at least a part of the entire portion, present under the melt surface, of the member, the method including producing a flow of molten metal having a downward velocity component in the vicinity of an upper part of the entire portion present under the melt surface of the cooling member when the high-purity metal is caused to crystallize out by rotating the cooling member.

4,854,969

LITHOGRAPHIC FOUNTAIN SOLUTIONS

Robert Bassemir, Queens, N.Y.; Ramasamy Krishnan, Sewaren, and Arthur I. Lowell, Edison, both of N.J., assignors to Sun Chemical Corporation, Fort Lee, N.J.

Continuation-in-part of Ser. No. 881,123, Jul. 2, 1986. This application Feb. 26, 1988, Ser. No. 160,889
Int. Cl.⁴ C09K *3/00, 3/18*
U.S. Cl. 106—2 **18 Claims**

1. Lithographic fountain solution comprising:
(a) water;

(b) a nonionic surfactant having an HLB in the range of 1 to 8 selected from the group consisting of block copolymers of propylene oxide and ethylene oxide; block copolymers of propylene oxide, ethylene oxide and ethylenediamine; and C_1–C_{20} ethoxylated alcohols, amides, fatty acid esters, alkanol amides, glycol esters, ethoxylated alkyl phenols, ethoxylated acetylenic glycols, ethoxylated acetylenic carbinols, acetylenic glycols, acetylenic carbinols, silicone glycols, silicone alkylene oxide copolymers and mixtures thereof; and
(c) a hydrotrope selected from the group consisting of sodium toluene sulfonate, sodium xylene sulfonate, sodium cumene sulfonate, sodium terpene sulfonates, ammonium toluene sulfonate, ammonium xylene sulfonate, ammonium cumene sulfonate, tetrabutyl ammonium hydrogen sulfate, tetraphenyl phosphonium bromide, tetrabutyl ammonium bromide, sodium thiocyanate and mixtures thereof, the ratio of hydrotrope to surfactant being in the range of about 1:1 to about 10:1.

4,854,970

ART MEDIUM

Raymond E. Wiech, Jr., San Diego, Calif., assignor to Fine Particle Technology, Inc., San Diego, Calif.

Filed Jun. 4, 1986, Ser. No. 870,744
Int. Cl.⁴ C09D *1/00*
U.S. Cl. 106—286.1 **12 Claims**

1. A method of forming an art medium comprising the steps of:
(a) providing a homogeneous mixture of from about 91% to about 97% by weight of sinterable powdered metal having an average particle size of up to about 5 microns and from about 9% to about 3% by weight of a plasticizer;
(b) mixing said mixture of (a) with water, and
(c) storing the mixture of (b) in an air tight enclosure for from about one week to about one month.

4,854,971

CLAY COMPOSITION

Patrick A. C. Gane, Callington, and Graham P. O'Neill, Bodmin, both of United Kingdom, assignors to E.C.C. International Limited, Great Britain

Filed Dec. 1, 1987, Ser. No. 127,178
Claims priority, application United Kingdom, Dec. 2, 1986, [illegible]
Int. Cl.⁴ C04B *14/10, 33/04*
U.S. Cl. 106—286.5 **21 Claims**

1. A method for improving the rheological properties of a kaolin clay which, when dispersed with water, either releases into solution or retains on its surface multivalent cations, which method includes the step of treating the kaolin clay in aqueous suspension with a zeolite having a cation exchange capacity of at least 50 meq/100 g, said zeolite being employed in an amount of at least 0.1% by weight, based on the weight of dry kaolin clay.

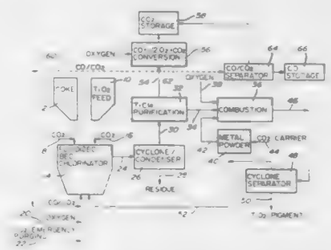
4,854,972

NITROGEN-FREE PROCESS FOR CHLORIDE-ROUTE TiO_2 PIGMENT MANUFACTURE

Guillermo F. Garrido, St-Bruno; Robert G. H. Lee, Montreal, both of Canada, and Olivier Francois, Paris, France, assignors to Canadian Liquid Air Ltd., Montreal, Canada

Filed Jun. 23, 1987, Ser. No. 65,771
Claims priority, application Canada, Mar. 25, 1987, 532986
Int. Cl.⁴ C09C *1/36;* **C01G** *23/02*
U.S. Cl. 106—437 **15 Claims**

1. A substantially nitrogen-free process for chloride-route TiO_2 pigment manufacture in which a TiO_2-containing feedstock is subjected to a fluidized-bed, high temperature carbochlorination in a chlorinator to produce $TiCl_4$ which is thereafter converted to TiO_2 by oxidation, which comprises feeding the TiO_2-containing feedstock and a solid carbonaceous reducing agent to said chlorinator under a CO_2 blanketing atmosphere such that said carbochlorination is carried out in a substantially nitrogen-free atmosphere containing CO_2 and a CO_2-rich flue gas is generated, the CO_2 in said chlorinator assisting in controlling thermal balance of the carbochlorination reaction, the $TiCl_4$ formed in said chlorinator being withdrawn, purified and subjected to a vapor-phase oxidation in a



combustion chamber, and pneumatically conveying to and injecting into said combustion chamber at leat one metal powder to increase exothermicity of the oxidation reaction in said combustion chamber, said metal powder being conveyed to and injected into said combustion chamber by means of a carrier gas consisting of CO_2 or of a CO/CO_2 mixture.

4,854,973

LOW ODOR CARBON AND PAINT REMOVER COMPOSITION

Robert M. Holdar, Irving, Tex., assignor to NCH Corporation, Irving, Tex.

Continuation of Ser. No. 34,686, Apr. 6, 1987, abandoned, Division of Ser. No. 774,922, Sep. 11, 1985, abandoned. This application Dec. 6, 1988, Ser. No. 281,946
Int. Cl.⁴ B08B *3/08;* **C09D** *9/00, 9/04;* **C11D** *3/44*
U.S. Cl. 134—39 **11 Claims**

1. A method for removing carbon deposits from surfaces resulting from combustion of fuels such as carbon deposits which accumulate as a result of the operation of internal combustion engines comprising:
(a) immersing the surface containing carbon deposits in a mixture from about 45% to about 90% by volume of a short chain chlorinated hydrocarbon, 3% to 30% by volume of a short chain dialkylamide, 1% to 5% by volume of surfactant and 2% to 20% by volume of water, said mixture being substantially free of phenolic and aromatic compounds.

4,854,974

ELECTRICAL CONTACTS FOR A THIN-FILM SEMICONDUCTOR DEVICE

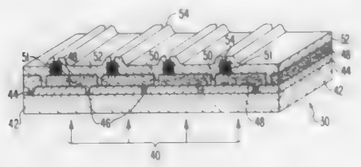
David E. Carlson, Yardley, Pa.; Charles R. Dickson, Pennington, and Robert V. D'Aiello, East Brunswick, both of N.J., assignors to Solarex Corporation, Rockville, Md.

Division of Ser. No. 68,753, Jun. 29, 1987, Pat. No. 4,783,421, which is a continuation of Ser. No. 723,290, Apr. 15, 1985, abandoned. This application May 23, 1988, Ser. No. 197,433
Int. Cl.⁴ H01L *27/14*
U.S. Cl. 136—244 **11 Claims**

6. A multi-cell photovoltaic module, comprising:
a. a flat, transparent superstrate;
b. a plurality of front contacts of a conductive transparent oxide material formed on said superstrate and separated by substantially parallel first grooves;
c. a plurality of photovoltaic elements of a semiconductor material formed on said front contacts and filling said first groove to electrically insulate adjacent front contacts, said photovoltaic elements being separated by second grooves parallel and adjacent to said first grooves; and

d. a plurality of strips of buffer material formed on said photovoltaic elements parallel and adjacent to said second grooves; and

e. a plurality of back contacts of a conductive material



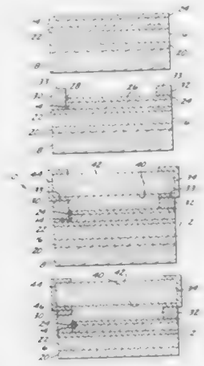
formed on said photovoltaic elements and said buffer strips and being separated by third grooves overlying said buffer strips, said conductive material filling said second grooves to form electrical connections between adjacent front and back contacts.

4,854,975

SOLAR CELL WITH INTEGRATED INTERCONNECT DEVICE AND PROCESS FOR FABRICATION THEREOF

Stanley J. Krause, Northridge, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 3, 1986, Ser. No. 881,752
Int. Cl.[4] H01L *31/00*
U.S. Cl. 136—262 **9 Claims**



1. A solar cell assembly, comprising:

a solar cell having a layer of a p-type semiconductor and a layer of an n-type semiconductor, one of said layers overlying the other, and further having two electrical layer contacts, one to each of said semiconductor layers, said layer contacts each having an external contact surface exposed on a top side of said solar cell; and

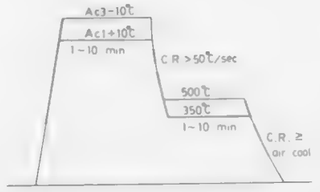
a glass cover overlying said solar cell with a bottom surface of said glass cover in proximity with the top side of said solar cell, said glass cover having a pair of electrical cell contacts extending from the bottom surface of said glass cover to the top surface thereof, the portion of each of said cell contacts at the bottom surface of said glass cover being joined to one of said layer contacts at its external contact surface.

4,854,976

METHOD OF PRODUCING A MULTI-PHASE STRUCTURED COLD ROLLED HIGH-TENSILE STEEL SHEET

Hidenori Era, Izuka; Mineo Shimizu, Munakata, both of Japan, and Huang-Chuan Chen, Hsino-Kang, Taiwan, assignors to China Steel Corporation, Kaohsiung, Taiwan

Filed Jul. 13, 1988, Ser. No. 218,809
Int. Cl.[4] C21D *7/00*
U.S. Cl. 148—2 **1 Claim**



1. A method of producing a retained austenite containing high strength, high ductility, cold rolled steel sheet comprising:

producing a molten steel having a composition of 0.08–0.25% by weight of carbon, 0.3–2.0% by weight of silicon, 0.6–18% by weight of manganese, 0.04–0.20% by weight of phosphorus, less than 0.10% by weight of aluminum, less than 0.01% by weight of boron, unavoidable impurities and balance iron;

forming the molten steel into a slab by a conventional method;

subjecting the slab to a hot rolling under the condition that the coiling temperature is less than 600° C.

subjecting the hot rolled steel to a cold rolling under the condition that the reduction rate is 50–90%;

heating the cold rolled steel for 1–10 minutes to a temperature (Ac1+10)° C. to (Ac3-10)° C., where Ac1 is the temperature at which austenite starts to form, and Ac3 is the temperature at which the transformation of austenite is complete;

cooling the intercritically annealed steel at a rate greater than 50° C./sec down to a temperature 350°–500° C.;

keeping the steel for 1–10 minutes at 350°–500 ° C.; and air cooling the steel;

whereby the resulting cold rolled annealed steel sheet has a microstructure consisting of ferrite and bainite and retained austenite, the volume fraction of said retained austenite being at least 8 percent.

4,854,977

PROCESS FOR TREATING TITANIUM ALLOY PARTS FOR USE AS COMPRESSOR DISKS IN AIRCRAFT PROPULSION SYSTEMS

Edouard Alheritiere, Ugine, and Bernard Prandi, Faverges, both of France, assignors to Compagnie Europeenne du Zirconium Cezus, Courbevoie, France

Filed Apr. 14, 1988, Ser. No. 181,715
Claims priority, application France, Apr. 16, 1987, 87 05786
Int. Cl.[4] C22F *1/18*
U.S. Cl. 148—12.7 B **13 Claims**

1. Process for the production of a titanium alloy part comprising the steps of:

(a) producing an ingot of composition (% by weight): Al 3.8 to 5.4, Sn 1.5 to 2.5, Zr 2.8 to 4.8, Mo 1.5 to 4.5, Cr equal to or below 2.5 and Cr+V=1.5 to 4.5, Fe<2.0, Si<0.3, O<0.15, Ti and impurities constituting the remainder;

(b) hot working the ingot including a rough-shaping working of said ingot giving a hot blank, experimentally determining the real beta transus temperature from a sample of the hot blank, and performing a final hot working of at least a portion of said blank starting at a temperature at lest 10° C. higher than said real beta transus temperature and ending at a temperature below said real beta transus temperature, all said final hot working taking place at ±60° C. of said real beta transus temperature, said final hot working giving a blank of the part;

(c) solid solution heat treating the hot worked part blank, while maintaining said part blank at a temperature between said real beta transus −40° C. and said real beta transus −10° C., followed by cooling said part blank to ambient temperature;

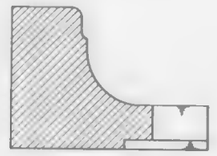
(d) ageing heat treating for 4 to 12 h at between 550° and 650° C. the product of step (c).

4,854,978

MANUFACTURING METHOD FOR HIGH HARDNESS MEMBER

Kaoru Tada, Isehara; Masahiko Hasunuma, and Mitsuo Kawai, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 29, 1988, Ser. No. 174,910
Claims priority, application Japan, Mar. 30, 1987, 62-76630
Int. Cl.[4] C21D *9/00*
U.S. Cl. 148—14 **5 Claims**



1. A method of manufacturing a high hardness product from an easy to work alloy member comprising less than 2 weight % carbon, 10–30 weight % manganese, 10–30 weight % chromium, and the remainder substantially iron, comprising the steps of:

(a) forming said easy to work alloy member; and

(b) subjecting the formed alloy member to a heat treatment to volatilize high vapor pressure elements comprising at least one of carbon and mangagnese in the alloy member and to form a high hardness surface layer by changing the surface composition of the alloy member.

4,854,979

METHOD FOR THE MANUFACTURE OF AN ANISOTROPIC MAGNET MATERIAL ON THE BASIS OF FE, B AND A RARE-EARTH METAL

Joachim Wecker, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

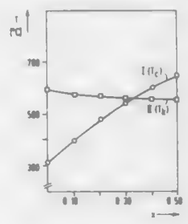
Filed Mar. 18, 1988, Ser. No. 170,297
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709140
Int. Cl.[4] H01F *41/02*
U.S. Cl. 148—103 **19 Claims**

1. A method for manufacturing anisotropic magnetic material of a material system, comprising the steps of:

preparing an alloy melt from at least three material compounds comprising iron (Fe), boron (B) and a rareearth metal (RE), said alloy melt containing a further material component consisting of cobalt (Co);

forming an intermediate product having an amorphous structure by means of rapid solidification of said alloy melt, said cobalt of said amorphous material system being in such an amount that said corresponding amorphous material has a crystallization temperature below the Curie temperature of a crystallizing $RE_2(Fe, Co)_{14}$ of said material system;

developing said $RE_2(Fe, Co)_{14}B$ phase of said material system in the presence of an external d-c magnetic field to form a magnetocrystalline anisotropy by means of heat treating said intermediate product at a heat treatment



temperature above said crystallization temperature and below said Curie temperature, whereby said intermediate product is crystallized, said heat treating temperature being below a predetermined transition temperature at which the uniaxial preference direction of the magnetocrystalline anisotropy changes into a planar reference plane.

4,854,980

REFRACTORY TRANSITION METAL GLASSY ALLOYS CONTAINING MOLYBDENUM

Ramaswamy V. Raman, Framingham, and Shib C. Hsu, Weston, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 17, 1987, Ser. No. 134,132
Int. Cl.[4] C22C *19/05*
U.S. Cl. 148—403 **9 Claims**

1. An alloy at least 50% glassy, and consisting essentially of a composition of the formula

$$Mo_xM_yNi_z$$

wherein M is at least one metal selected from the group consisting of Nb, Ta, and Zr; x is about 2.5–75, y is about 0–70, z is about 27.5–60, and x+y+z=100, all subscripts being expressed in atom percent; and wherein the alloy exhibits a crystallization temperature of at least about 600° C. and a hardness of at least about 400 Kg/mm^2.

4,854,981

IRON OXIDE CATALYST AND METHOD FOR MAKING SAME

Forrest R. Goodson; Mark E. Dudley, both of San Jose, and Thomas P. Rudy, Saratoga, all of Calif., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 30, 1987, Ser. No. 44,096
Int. Cl.[4] C06B *45/00*
U.S. Cl. 149—2 **16 Claims**



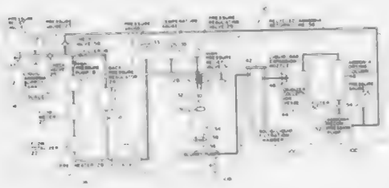
1. A ferric oxide burning rate catalyst comprising ferric oxide particles having an average particle size less than about 100 Å.

4,854,982

METHOD TO DIMILITARIZE EXTRACT, AND RECOVER AMMONIUM PERCHLORATE FROM COMPOSITE PROPELLANTS USING LIQUID AMMONIA

William S. Melvin, Huntsville, and James F. Graham, Decatur, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 31, 1989, Ser. No. 296,557
Int. Cl.[4] D03D *23/00*
U.S. Cl. 149—109.6 2 Claims



1. A method to demilitarize, extract, and recover ammonium perchlorate from a solid composite propellant composition using liquid ammonia under pressure, said method comprising;

(i) providing a demilitarization unit which comprises a supply and high pressure spray system for liquid ammonia; an extraction system including an extraction pressure vessel for containing composite propellant to be demilitarized, said extraction pressure vessel in communication with said supply and high pressure spray system for liquid ammonia; an ammonium perchorate oxidizer recovery system in communication with said extraction pressure vessel for receiving a propellant slurry contained in said liquid ammonia; and an ammonia recovery system in communication with said ammonium perchlorate oxidizer recovery system for recovering, drying, and recycling the ammonia recovered to said supply and high pressure spray system after completing recompression of said recovered ammonia;

(ii) placing a quantity of a solid composite propellant composition in said extraction pressure vessel;

(iii) admitting a continuous supply of liquid ammonia through said high pressure spray system, said liquid ammonia impinging upon said solid composite propellant to erode and complete high particulate comminution of said composite propellant in liquid ammonia to form a slurry of said composite propellant in liquid ammonia;

(iv) pumping said slurry into a solid-liquid filtration chamber of said ammonium perchlorate oxidizer recovery system wherein solid composite solids are separated from liquid ammonia solution of said ammonium perchlorate oxidizer;

(v) passing said liquid ammonia solution containing said ammonium perchlorate through a liquid-gas expansion nozzle contained in an oxidizer separation vessel of said ammonium perchlorate recovery system wherein said liquid ammonia is gasified and said ammonium perchlorate oxidizer is released to predetermined particle sizes based on liquid droplet size and rate of pressure change at a specified temperature;

(vi) recovering said ammonia perchlorate oxidizer; and,

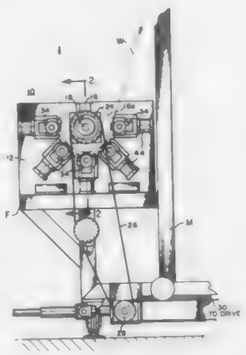
(vii) passing ammonia gas through a drying column of said ammonia recovery system then through a filter and a recompression pump which pressurizes said ammonia gas for recycling said recovered ammonia gas as liquid ammonia to said supply and high pressure spray system of said demilitarization unit.

4,854,983

ROTARY HEAT SEALING METHOD AND APPARATUS

David A. Bryniarski, Rochester, and Robert E. Hollenbeck, Newark, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 22, 1987, Ser. No. 99,807
Int. Cl.[4] B32B *3/00*
U.S. Cl. 56—70 14 Claims



1. A method of heat sealing in the transverse direction a continuously moving multiple layer web of thermoplastic film to preseal the ends of draw tapes in hems in an edge of the web in the manufacture of draw tape bags comprising the steps of:

providing a cylindrical drum mounted for rotation about the axis thereof,

providing a continuously heated area in the cylindrical surface of the drum having a length extending axially of the drum corresponding to the width of the hems,

wrapping the moving web of film with the draw tapes in the hems around the cylindrical surface of the drum,

rotating the cylindrical surface of the drum at the same speed as the moving web of film so that there is no relative motion between the web and the cylindrical surface,

pressing the hem area of the multiple layer web of thermoplastic film against the heated area in the cylindrical surface of the drum, and

maintaining said hem area of the web against the heated area of the cylindrical surface of the drum during the substantial portion of the rotation thereof to preseal the ends of the draw tapes in the hems in the multiple layer web.

4,854,984

DYNAMIC MECHANICAL BONDING METHOD AND APPARATUS

W. Kenneth Ball; David J. K. Goulait, and James E. Zorb, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

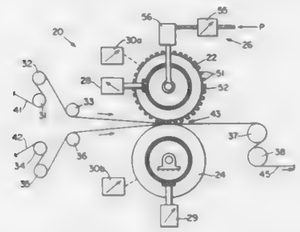
Filed Jun. 19, 1987, Ser. No. 64,896
Int. Cl.[4] B29C *65/06*; B32B *31/20*
U.S. Cl. 156—73.5 16 Claims

1. A method of dynamically bonding plural laminae together, at least one of which laminae comprises thermoplastic material, said method comprising the steps of:

forwarding said laminae, with portions thereof in face to face relation, through a pressure biased nip between a relief patterned nip defining member having pattern element segments, and a nip defining anvil member;

biasing said nip defining members towards each other with a predetermined pattern-element loading of not more than about 90,000 psi; and

driving said nip defining members to provide a predetermined surface velocity differential therebetween, said surface velocity differential having a magnitude of from about 2 to about 40 percent of the surface velocity of said nip defining member having the lower surface velocity.

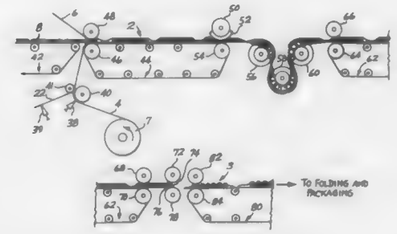


4,854,985

METHOD FOR MANUFACTURE OF AN ELASTIC LEG DIAPER

John D. Soderlund, Bellevue, Wash., and Fumitaka Nishiura, Fujisawa, Japan, assignors to Weyerhaeuser Company

Continuation-in-part of Ser. No. 89,197, Aug. 24, 1987, which is a division of Ser. No. 850,183, Apr. 10, 1986, Pat. No. 4,726,807.
This application Dec. 14, 1987, Ser. No. 132,823
Claims priority, application PCT Int'l Appl., Nov. 24, 1986, PCT/US86/02506; Canada, Mar. 31, 1987, 533498
Int. Cl.[4] B32B *31/08*
U.S. Cl. 156—85 13 Claims



1. A method of making a disposable diaper of the type having a moisture permeable skin contacting cover sheet, a moisture impermeable backing sheet, and a moisture absorbing filler pad disposed therebetween which comprises:

providing the moisture impermeable backing sheet in the form of a continuous strip;

further providing areas of heat shrinkable elastomeric material at regularly spaced intervals on said moisture impermeable backing sheet, said elastomeric material being of the type that is heat unstable and relatively inelastic in its unshrunk form and stable and relatively elastic in its heat shrunk form;

maintaining sufficient tension on the backing sheet to prevent wrinkling thereof;

heating the areas of heat shrinkable elastomeric material desired to be made elastic to a temperature sufficient to enable shrinkage of said elastomeric material;

immediately thereafter relaxing the tension on the heated portions for a time sufficient to permit said heated portions to shrink and cool to a temperature where said elastomeric material is stable, thereby creating elasticized zones on said backing sheet; and

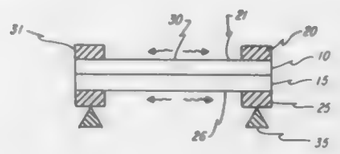
combining said backing sheet having elasticized zones with the filler pad and cover sheet to form diaper units, wherein the elasticized zones provide elasticized leg encircling and/or waist encircling margins on the diaper.

4,854,986

BONDING TECHNIQUE TO JOIN TWO OR MORE SILICON WAFERS

Joseph S. Raby, W. Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed May 13, 1987, Ser. No. 49,637
Int. Cl.[4] B32B *31/14*
U.S. Cl. 156—87 15 Claims



1. A method of bonding wafers comprising the steps of:

(a) providing a first wafer having an exposed first surface;

(b) providing a second wafer having an exposed first surface;

(c) engaging said first and second wafers in a heat producing means, wherein said first surfaces of said first and second wafers are arranged contiguously; and

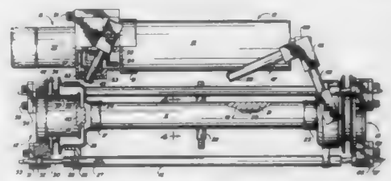
(d) bonding said first and second wafers by inducing a temperature gradient on said first surfaces of said first and second wafers, wherein said gradient originates at a predetermined point on said first surfaces of said wafers and radiates outwardly along a continuous front across the remaining area of said first surfaces of said first and second wafers.

4,854,987

METHOD OF MAKING A GAS LASER

Anthony P. Adsett, Orlando, Fla., assignor to Litton Systems, Inc., Orlando, Fla.

Division of Ser. No. 881,097, Jul. 2, 1986, Pat. No. 4,713,825.
This application Dec. 14, 1987, Ser. No. 132,610
Int. Cl.[4] B32B *31/06*
U.S. Cl. 156—89 3 Claims



1. A process of making a gas laser apparatus comprising the steps of:

selecting an optical mirror blank;

making a metal mirror blank support ring having an opening therethrough for mounting the selected mirror blank thereon and having a heat expansion rate generally matching the heat expansion rate of said optical mirror blank;

applying a glass frit material between the mirror blank and the mirror blank support ring, said glass frit having a heat expansion rate generally matching the heat expansion rate of said optical mirror blank and metal mirror blank support ring;

heating the mirror blank and the metal mirror blank support ring and glass paste material thereon to a temperature in excess of 400 degrees centigrade in a nitrogen atmosphere

to seal said mirror blank to said metal mirror blank support ring with a glass frit seal;

attaching said mirror blank support ring having the mirror blank attached thereto to a temperature expansion sleeve of a gas laser assembly to thereby form a laser with a high temperature glass to metal seal for the mirrors in a gas laser; and

vacuum baking the laser assembly at approximately 300 degrees centrigrade for at least twenty-four hours to remove moisture and impurities therefrom.

4,854,988

PROCESS FOR THE PRODUCTION OF A FIBER-REINFORCED SYNTHETIC RESIN CONTAINER

Peter Voirol, Oberwil, and Urs Moser, Muttenz, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 31, 1987, Ser. No. 79,980

Claims priority, application Switzerland, Aug. 11, 1986, 3215/86

Int. Cl.⁴ B65H *81/00*

U.S. Cl. 156—155 **5 Claims**



1. A process for the production of a fiber-reinforced synthetic resin container, comprising

(a) adding to a core having a first diameter which is mounted on a shaft of a winding machine, by passing on the shaft from a first end thereof a first fitting having a second diameter smaller than said first diameter into contact with one end face of the core, and by passing on the shaft from the other shaft end a second fitting having a third diameter larger than said second diameter but smaller than said first diameter into contact with the other core end face;

(b) passing over the first shaft end a sleeve member into contact with the first fitting and fastening the sleeve member in position on the shaft; and passing over the other shaft end a fixing member, having a flange part of the same diameter as the second fitting and tapering down into a socket part having the same diameter as the first fitting, such that the flange part contacts the second fitting, and fastening the fixing member in position on the shaft, thereby clamping the two fittings and the core between said sleeve member and said fitting member on the shaft;

(c/d) applying first windings of fibers and hardenable synthetic resin onto the assembly resulting from Step (b), at least a portion of said fibers being applied under a smallest winding angle±w with respect to said shaft corresponding to the equation sin (w)-d/D wherein d is the second diameter and D is the first diameter, thereby producing a wound-up body of fibers having a first polar opening about the first fitting and having an opposite opening of substantially the same diameter as the first polar opening about the socket part of the fixing member;

(e) fully hardening the applied windings by exposing them to heat curing and cooling the resulting hardened wound body; and

(f) cutting-off from the structure of said hardened wound body resulting from Step (e) and extending from the region of the core across the second fitting the excess portion extending beyond said second fitting onto the flange part and ending about the socket part of the fixing member.

4,854,989

METHOD OF AFIXING ELASTIC BANDS IN AN INCONTINENCE DIAPER

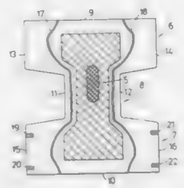
Stig A. R. Singheimer, Halmstad, Sweden, assignor to Duni Bila AB, Sweden

Division of Ser. No. 881,684, Jun. 23, 1986, Pat. No. 4,718,901. This application Jul. 15, 1987, Ser. No. 73,761

Claims priority, application PCT Int'l Appl., Oct. 24, 1984, PCT/SE84/00356

Int. Cl.⁴ B65H *77/00*

U.S. Cl. 156—161 **2 Claims**



1. A method for affixing elastic bands in an incontinence diaper comprising a barrier layer and a nonwoven layer affixed to said barrier layer, said diaper having two wasit portions for together surrounding the lower part of a body and a crotch portion connecting the two waist portions, a tissue covered fluff extending between the barrier layer and the nonwoven layer in the longitudinal direction of the diaper through the entire crotch portion and through parts of said waist portions, the method comprising fastening the bands to the diaper by continuously applying a rapid-drying glue to the bands simultaneously as the bands are stretched with a continuously varying tension and without abrupt changes in tension along the longitudinal direction of the diaper and are pressed under a roll against the barrier layer, wherein the tension of the bands reaches a maximum in the central portion of the crotch area, the tension decreasing toward the edges of the crotch area up to the edges of the waist portions, after which the tension tapers off to about half of said maximum tension, the tension increasing again just before the end edges of the wasit portions to a value close to said maximum tension, the tension subsequently returning at the end edges of the waist portions to a value approximately half of said maximum tension.

4,854,990

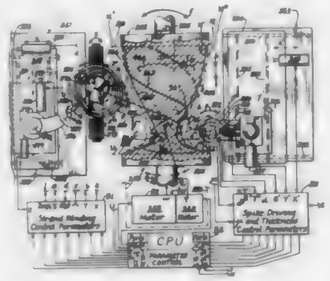
METHOD FOR FABRICATING AND INSERTING REINFORCING SPIKES IN A 3-D REINFORCED STRUCTURE

Constant V. David, 4952 Field St., San Diego, Calif. 92110

Filed Apr. 13, 1987, Ser. No. 37,512

Int. Cl.⁴ B65H *54/00*

U.S. Cl. 156—173 **13 Claims**



1. A method of programmably reinforcing a thick three-

dimensionally reinforced structure in which the third-dimensional substantially radial reinforcement includes short spikes oriented generally normally to said structure external surface, as said structure is being constructed, said method comprising the steps of:

fabricating stiff spikes having two pointed ends and incorporating a plurality of parallel high-strength high-elasticity-modulus material fibers bonded together by a plastic resin;

driving one of the two pointed ends of a spike inwardly into the structure being constructed so as to firmly secure said spike in the structure whilst enabling a portion of the spike length to protrude externally and substantially normally to the external surface of said structure as then existing;

helically winding strands coated with plastic resin in layers in a controlled and programmed manner onto the existing structure along the sides of the spikes protruding therefrom;

varying the helical winding angle so as to cause the strands in one layer to bisect the strands of another adjacent layer;

building up the thickness of the layers of wound strands to the point where additional spikes are then programmed to be driven into the structure;

repeatedly and alternatively winding additional strand layers and inwardly driving more spikes into the structure, until the required thickness of the structure has been obtained; and

concurrently adjusting the rate at which the thickness of the strand wound layers is being built up and the rate at which the spikes are being added to the structure radial reinforcement.

4,854,991

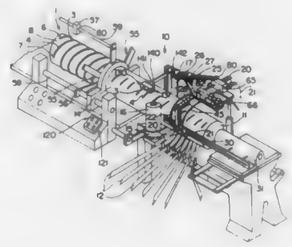
TUBE FORMING APPARATUS AND METHOD

Keith Jackson, Minerva, Ohio, assignor to J. C. Baxter Co., Canton, Ohio

Filed Mar. 4, 1988, Ser. No. 163,987

Int. Cl.⁴ C03B *37/02*

U.S. Cl. 156—195 **36 Claims**



1. Apparatus for making forming tubes with bead means on the outer periphery of such forming tubes comprising winding means for winding plural tube plies around a mandrel and advancing the tube plies along the mandrel toward an outboard end thereof to form the tube plies into tubular material, feed means for feeding bead cord material between selected plies to form such bead means, tube cutter means for cutting forming tubes of a predetermined length from such tube material and removing such forming tubes from the outboard end of the mandrel, and bead cord cutter means for cutting and asiding a predetermined length of the bead cord material at predetermined time intervals while the bead cord material is continuously fed to said bead cord cutter means to redirect such predetermined length of bead cord material away from the tube plies so that the bead means terminates a predetermined distance from the end edges of the forming tubes which are cut from such tube material.

4,854,992

METHOD FOR MOUNTING AN ARMATURE OF PLASTIC MATERIAL TO A JAR OF FRANGIBLE MATERIAL

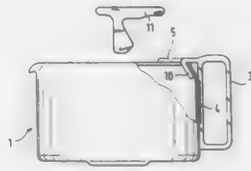
Walter Kramer, Mainz, Fed. Rep. of Germany, assignor to Schott Glaswerke, Fed. Rep. of Germany

Filed Apr. 22, 1988, Ser. No. 184,825

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1987, 3713685

Int. Cl.⁴ B32B *31/20*

U.S. Cl. 156—212 **7 Claims**



1. A method for mounting an armature of plastic material, particularly in the shape of a handle or an adapter designed to be connected to other structural parts, to a jar of frangible material such as glass, ceramic, or glass-ceramic, the armature comprising an extension of thermoplastic material, wherein the method comprises the steps of:

(a) adhesively connecting the armature to an outer surface of the jar;

(b) heating the extension to form a shaped part which will form a positive interlock with a rim portion of the jar and an inner surface thereof;

(c) deforming the interlock portion to secure the jar against dropping out from the armature; and,

(d) hardening the extension by cooling.

4,854,993

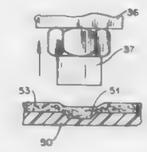
APPARATUS FOR AND A METHOD OF BONDING A LOW DENSITY MATERIAL TO A PLASTIC SUBSTRATE AND PRODUCT THEREOF

Wayne M. Celia, 242 Purdue Ct., Paramus, N.J. 07652

Division of Ser. No. 97,655, Sep. 17, 1987, Pat. No. 4,794,030. This application Jun. 15, 1988, Ser. No. 206,709

Int. Cl.⁴ B32B *31/00*

U.S. Cl. 156—219 **8 Claims**



1. A method of bonding a low density material to a thermoplastic plastic substrate comprising the steps of,

a. contacting the surface of a pre-cut and pre-shaped plastic substrate with at least one heated welding iron for a predetermined period of time to cause the contacted surface to melt only at the points of contact to form a raised quantity of melted plastic about the at least one heated welding iron;

b. removing the at least one heated welding iron from the plastic substrate leaving a depression and a raised bead of melted plastic thereabout;

c. placing a sized and shaped piece of low density material onto the plastic substrate having the depression and raised bead of melted plastic;

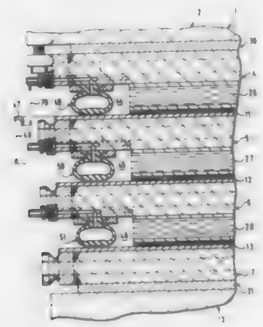
d. embossing the low density material into the melted areas of plastic on the plastic substrate; and
e. permitting the melted areas of plastic on the plastic substrate to cool effectively fusing the low density material to the plastic substrate in such areas.

4,854,994

HOT PRESS FOR PRESSING INDUSTRIAL LAMINATES

Horst Breiter, Dortmund; Helmut Eager, Krefeld, and Uwe Teuwen, Bönen, all of Fed. Rep. of Germany, assignors to Hoesch Maschinenfabrik Deutschland AG, Dortmund, Fed. Rep. of Germany

Filed Oct. 19, 1987, Ser. No. 110,126
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, [illegible]
Int. Cl.[4] B29C *43/02*
U.S. Cl. 156—228 **4 Claims**



1. A method of sealing the area between the platen and loading plate of a hot press for pressing industrial laminates into a single layer pressed board having a heating platen, a loading plate, press opening defined between said platen and said plate and a sealing means between said platen and said plate, wherein said sealing means comprises a resilient expansible and retractable hose having an opening end and a closed end in which the open end is rigidly secured to the platen and the closed end is unrestrained; said hose having internal pressure fluid passages and a plurality of external sealing lips adjacent said closed end and being movable vertically downwardly to cause the closed end to engage said loading plate, a fluid source connected to said fluid passages and means for introducing and withdrawing a fluid medium into and from said pressure fluid passages comprising the steps of:
withdrawing a pressure fluid from said pressure fluid passages to cause said closed end to move vertically upwardly such that said closed end and said sealing lips disengage said loading plate to provide access to said press opening; and
introducing pressure fluid into said pressure fluid passages to cause said hose to expand to move said closed end vertically downwardly to cause said sealing lips to engage said loading plate to thereby seal said press opening.

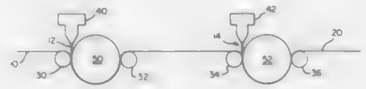
4,854,995

DELIVERY SYSTEM OF STRIPPABLE EXTRUSION COATED FILMS FOR MEDICAL APPLICATIONS

Klaus B. Kasper, Pulaski, and Tom Yip, Central Square, both of N.Y., assignors to Bertek, Inc., Swanton, Vt.

Continuation of Ser. No. 813,791, Dec. 27, 1985, abandoned. This application Sep. 9, 1987, Ser. No. 96,274
Int. Cl.[4] B29C *47/06*
U.S. Cl. 156—243 **11 Claims**

1. A process for producing a wound pressing delivery system comprising the steps of:
extruding first and second thermoplastic resins onto the surface of the carrier sheet to form first and second thermoplastic films, said first thermoplastic film functioning as a temporary support for said second thermoplastic film and being capable of releasing from said second thermoplastic film and said second thermoplastic film being useful as a wound dressing and having a moisture vapor transmission rate of greater than 300 grams/square meter/24 hours (ASTM E-96:37.8° C./90% R.H.); said first thermoplastic resin being extruded onto the surface of said carrier sheet and said second thermoplastic film being extruded directly onto the surface of said first thermoplastic film without the aid of an adhesive such that said first thermoplastic film is interposed between said carrier sheet and said second thermoplastic film.

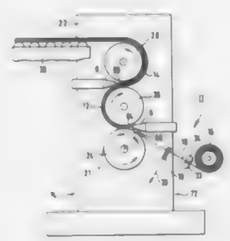


4,854,996

METHOD AND APPARATUS FOR PRODUCING MULTILAYER PANELS

Heinz G. Baus, Wartbodenstrasse 35, CH-3626 Hünibach-Thun, Switzerland

Filed Mar. 8, 1988, Ser. No. 164,794
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708122
Int. Cl.[4] B29C *47/06*
U.S. Cl. 156—244.12 **26 Claims**



1. A method for producing multilayer panels from extrudable plastic wherein two extruded strips of plastic are joined together with a material therebetween, said method comprising:
withdrawing a plurality of laterally spaced, independent, individual, continuous threads from a supply of continuous threads;
feeding said threads through guide means for adjustably regulating the lateral spacing of the threads and thence through first and second successive roller nips;
extruding a first strip of plastic in contact with one side of said threads prior to passage through said first nip, and
extruding a second strip of plastic over the other side of said threads prior to passage through said second nip.

16. An apparatus for producing multilayer panels from extrudable plastic wherein two extruded strips of plastic are joined together with a material therebetween, said apparatus comprising:
a roller arrangement defining first and second roller nips;
means for supplying a plurality of laterally spaced, independent, individual, continuous threads successively to said first and second roller nips;
guide means interposed between said supplying means and said roller arrangement for adjustably regulating the lateral spacing of the threads supplied to said nips;

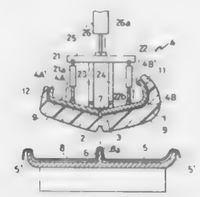
first extrusion means for extruding a first strip of plastic into said first nip in contact with one side of said threads, and
second extrusion means for extruding a second strip of plastic into said second nip in contact with the other side of said threads.

4,854,997

METHOD OF MANUFACTURING AUTOMOTIVE SEAT

Makoto Shimada, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,455
Int. Cl.[4] B32B *3/30, 3/00*
U.S. Cl. 156—245 **7 Claims**



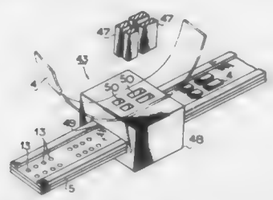
1. A method of manufacturing an automotive seat, comprising the steps of:
forming a foam cushion body with a groove in an upper surface thereof by way of foaming in a mold;
securing a bottom surface of said foam cushion body to an upper die which is provided with a bending means for bending the foam cushion body rearwardly;
opening said groove by bending said foam cushion body rearwardly;
applying an adhesive to said opened groove as well as said upper surface of said cushion body;
turning inside out a covering member and placing it upon a lower die;
thereafter, lowering said upper die towards said lower die;
inserting a part of said covering member into said groove of said cushion body by virtue of inserting means provided on said lower die, said inserting means being so adapted that it is to be inserted into said groove together with said part of said covering member;
then, lowering further said upper die to press and bond said cushion body to said covering member, thereby bonding said covering member to said upper surface of said cushion body while retaining said groove; and
raising the upper die from the lower die.

4,854,998

METHOD FOR MANUFACTURING AN ANALYTICAL ELEMENT

Akira Yamaguchi, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 8, 1987, Ser. No. 106,621
Claims priority, application Japan, Oct. 8, 1986, 61-237999
Int. Cl.[4] B32B *31/00, 23/02;* G01N *27/26*
U.S. Cl. 156—248 **7 Claims**



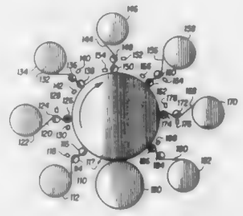
1. A method for manufacturing a portion of an analytical element for the dry analysis of a component in a liquid sample which comprises:
a) dispensing a laminate of a double faced adhesive tape having adhesive surfaces covered with release sheets to sandwich the adhesive tape therebetween;
b) slitting one of said release sheets to produce at least two slit portions in a manner such that upon removal of one of said slit portions, a predetermined width of an adhesive surface of the tape is exposed and punching the slit tape to form holes in the release sheets and the adhesive tape;
c) conveying the tape from step b) to a removal means and removing the slit portion of the release sheet to expose an adhesive surface of the tape;
d) conveying the tape from step c) to a first adhering means and adhering a liquid distributing-element to the exposed adhesive surface so as to leave a remaining exposed adhesive surface surrounding the liquid-distributing element;
e) conveying the tape from step d) to a second adhering means and adhering a lower frame element to the remaining exposed adhesive surface; and
f) conveying the tape from step e) to a separating means and separating from any remaining tape, a unit composed of the liquid-distributing element, the lower frame element, and the tape portion to which the elements are adhered;
wherein the tape is conveyed from each step utilizing the remaining slit portion of the release sheets.

4,854,999

METHOD OF MAKING A LAMINATE VIA CORONA DISCHARGE TREATMENT

Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Continuation of Ser. No. 19,892, Feb. 27, 1987, abandoned, which is a division of Ser. No. 786,898, Oct. 11, 1985, Pat. No. 4,778,557. This application Dec. 9, 1988, Ser. No. 282,879
Int. Cl.[4] B32B *31/22, 31/28*
U.S. Cl. 156—272.6 **1 Claim**



1. A method for making a laminate comprising:
(a) arranging a first, second, and third film feed means circumferentially at intervals around and spaced apart from a central laminating drum;
(b) arranging a first, second and third pressing roll circumferentially at intervals around and in communication with the drum, said feed means, pressing rolls and drum aligned in a common plane;
(c) feeding a first thermoplastic film to a corona discharge means;
(d) corona treating the first film on one surface thereof;
(e) feeding the first treated film between the first pressing roll and onto the drum;
(f) feeding at least one interior thermoplastic film to a pair of corona discharge means;
(g) corona treating the interior film on both surfaces thereof;
(h) feeding the interior treated film between the second pressing roll and onto the first film as the first film is advanced around the drum;
(i) feeding a second thermoplastic film to a corona discharge means;
(j) corona treating the second film on one surface thereof;

(k) feeding the second treated film between the third pressing roll and onto the interior film as the interior film is advanced around the drum; and

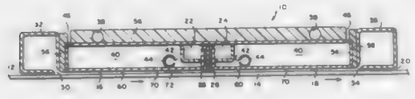
(l) such that the untreated surfaces of the first and second films form the outside surfaces of the resulting laminate.

4,855,000

SEALING OXIDIZING ATMOSPHERE AT HIGH TEMPERATURES

Roy G. Gordon, Samuels, Gauthier, Stevens & Kehoe, 225 Franklin St., Suite 3300, Boston, Mass. 02110

Filed Aug. 4, 1988, Ser. No. 228,053
Int. Cl.[4] B32B *31/12*
U.S. Cl. 156—289 7 Claims



1. In a glass-coating reactor of the type used to coat glass continuously moving through said reactor within a shallow reaction zone having the glass substrate to be coated as its lower boundary, the improvement wherein;

(a) a ceramic-fiber seal is provided along each edge of said shallow reaction zone and parallel the moving glass substrate, said seal forming means to prevent movement of gases from said reaction zone;

(b) and wherein one side of said seal is adhesively bonded to said reactor structure; and

(c) wherein said seal, on the side of said seal which is adjacent to said substrate, bears a boron-nitride powder lubricant.

4,855,001

STRUCTURAL ADHESIVE FORMULATIONS AND BONDING METHOD EMPLOYING SAME

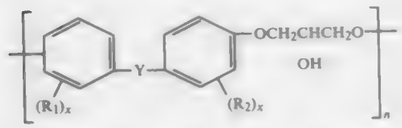
Dennis J. Damico, and Ruth M. Bennett, both of Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Filed Feb. 10, 1987, Ser. No. 13,057
Int. Cl.[4] C09J *5/02*
U.S. Cl. 156—307.3 15 Claims

1. The method of adhering at least two metal surfaces, one to the other, which comprises applying to at least one of the surfaces an adherent quantity of a one component adhesive composition which is activated upon contact with a said metal surface, engaging the said two surfaces with the said adhesive composition therebetween and maintaining the metal surfaces and interposed adhesive composition in engagement until the adhesive composition has cured sufficiently to bond said surfaces, said adhesive composition consisting essentially of:

(A) at least one olefinically unsaturated monomer;

(B) titanium dioxide or at least one phenoxy resin comprised of recurring units represented by the formula



wherein y is selected from the group consisting of alkylene, oxygen, thio, sulfonyl and carboxyl; R_1 and R_2 are selected from the group consisting of hydrogen, halogen, alkyl, aloxy, cycloalkyl, alkylenecycloalkyl, aryl; x is zero or an integer 1–4; n is 10 to 250; or mixtures of titanium dioxide and said phenoxy resin;

(C) a polymeric material selected from the group consisting of

(1) at least one olefinically unsaturated urethane reaction product of at least one isocyanate-functional prepolymer and at least one hydroxy-function monomer having at least one unit of polymerizable olefinic unsaturation, such reaction product being characterized by the presence of at least two units of olefinic unsaturation and the substantial absence of free isocyanate groups;

(2) at least one butadiene-based elastomeric polymeric material selected from the group consisting of

(a) homopolymer of butadiene;

(b) copolymer of butadiene and at least one monomer copolymerizable therewith selected from the group consisting of sytrene, acrylonitrile, methacrylonitrile and mixtures thereof;

(c) modified elastomeric polymeric material selected from the group consisting of butadiene homopolymer and copolymer as previously defined, such homopolymer and copolymer having been modified by copolymerization thereof with trace amounts up to 5 percent by weight, based on weight of modified elastomeric material, of at least one functional monomer; and

(d) mixtures thereof;

(3) at least one polymer-in-monomer syrup consisting essentially of

(a) from 10 to 98 percent by weight of at least one olefinically unsaturated monomeric compound having at least one—C=C—group;

(b) from 2 to 90 percent by weight of at least one polymer derived from such (3)(a) monomers;

(c) from zero to 30 percent by weight of at least one polymer containing the group $(CH_2—CCl=CHCH_2)_n$, wherein n is an integer;

wherein (3)(b) is present as a partial polymerization product of (3)(a) or of (3)(a) in the presence of (3)(c); the mixture of (3)(a) and (3) (b) or of (3)(a), (3)(b) and (3)(c) being a syrup of polymer dissolved or dispersed in unpolymerized monomer;

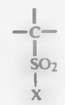
(4) at least one polymeric material selected from the group consisting of polyvinyl alkyl ether, styrene-acrylonitrile resin, unsaturated polyester resin and mixtures thereof, the alkyl moiety of such ether containing from one to 8 carbon atoms;

(5) at least one homopolymer or copolymer of at least one olefinically unsaturated monomer selected from the group consisting of styrene and alkyl or hydroxyalkyl esters of acrylic and methacrylic acid, said ester having one to 18 carbon atoms in the alkyl moiety; and

(6) mixtures of such polymeric materials;

(D) a Bronsted acid compound having at least one organic or inorganic acid group;

(E) at least one compound containing at least one sulfonyl halide group having the structure



wherein X is selected from the group consisting of chlorine bromine or iodine; and

(F) at least one organic or inorganic compound containing at least one reducible transition metal, said metal having its valence electrons in a "d" subshell, said metal being selected from the elements of classes Ib, IIb, IIIb, IVb, Vb, VIb, VIIb, VIII on the periodic chart of the elements,

wherein the amount of said phenoxy based copolymer or homopolymer is in the range of 1 to 30 percent by weight; the amount of said olefinically unsaturated monomer is in the range from 10 to 90 percent by weight; the amount of said olefinically unsaturated urethane reaction product is in the range from 10 to 90 percent by weight; the amount of said butadiene-based elastomeric polymeric material is in the range from 1 to 30 percent by weight; the amount of said Bronsted acid is in the range from 0.05 to 5 percent by weight; the amount of said sulfonyl halide-containing compound is in the range from 0.05 to 5 percent by weight; and the amount of titanium dioxide is in the range from 1 to 50 percent by weight; said weight percents being based on the total weight of ingredients (A)–(F), inclusive.

4,855,002

PROCESS OF BONDING SURFACES EMPLOYING/ANAEROBIC ALUMINUM FILLED COMPOSITIONS

David J. Dunn, Twinsburg; Patrick P. Vano, Parma, both of Ohio; James P. Moran, Jr., Farmington, Conn.; Mark Holmes, Quaker Hill, Conn., and Elliott Frauenglass, Newington, Conn., assignors to Loctite Corporation, Newington, Conn.

Continuation of Ser. No. 63,256, Jun. 17, 1987, abandoned, which is a continuation of Ser. No. 458,999, Jan. 18, 1983, abandoned. This application Jan. 13, 1989, Ser. No. 297,416
Int. Cl.[4] C08K *3/10, 3/08;* C08J *5/02*
U.S. Cl. 156—307.3 24 Claims

1. In a method of bonding to surfaces using an anaerobic adhesive composition wherein said adhesive composition is applied to at least one of said surfaces, and the surfaces are placed in abutting relationship under conditions which promote curing of said adhesive composition, wherein said adhesive comprises at least one polymerizable acrylic monomer system, and an effective amount for initiation of a free radical initiator, the improvement wherein said adhesive composition also comprises high purity powdered aluminum filler material selected from the group consisting of anhydrous alumina, elemental (atomized) aluminum metal powder and mixtures of elemental (atomized) aluminum metal powder and powdered alumina, in an amount in the range from about 30% to about 80% by weight of the total composition, said adhesive composition, in uncured state, exhibiting good shelf stability and, when cured, exhibiting good thermal conductivity and adhesive strength at elevated temperatures, enhanced resistance to thermal cycling, and good dielectric properties.

4,855,003

APPARATUS FOR FIXING PROTECTIVE MOLDINGS TO VEHICLE BODIES

Eiji Matsushima, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 14, 1988, Ser. No. 167,894
Claims priority, application Japan, Mar. 14, 1987, 62/37783[U]
Int. Cl.[4] G05G *15/00*
U.S. Cl. 156—358 19 Claims

1. An apparatus for fixing a protective molding at a vehicle body, the apparatus comprising:

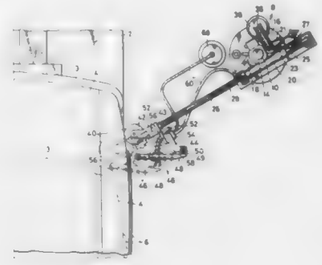
pressure for coming into contact with the protective molding attached temporarily to a side portion of the vehicle body to press the protective molding against the vehicle body when the vehicle body is conveyed along a predetermined path,

backward driving means for causing said pressure means to make a backward movement in relation to the vehicle body,

forward driving means for causing said pressure means to contact and press the protective molding,

body detecting means provided to accompany with said pressure means for coming into contact with the vehicle body before said pressure means contacts the vehicle body,

control means for actuating said backward driving means to move said pressure means backward when said body detecting means comes into contact with the vehicle body and then actuating said forward driving means to cause said pressure means which has been moved backward by said backward driving means to contact the vehicle body and press the protective molding attached temporarily to the side portion of the vehicle body against the vehicle body, and



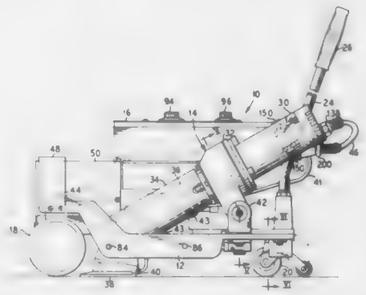
movement adjusting means operative to keep a movement of said pressure means toward the vehicle body at a relatively low moving speed during a period of time in which said control means actuates said forward driving means to cause the pressure means to contact the vehicle body.

4,855,004

SEAM WELDING MACHINE FOR THERMOPLASTIC MATERIAL

John R. Chitjian, Long Grove, Ill., assignor to Clements National Company, Chicago, Ill.

Filed Jun. 26, 1987, Ser. No. 66,522
Int. Cl.[4] B32B *31/08, 31/12, 31/26*
U.S. Cl. 156—359 20 Claims



1. A seam welding apparatus for welding overlapped thermoplastic sheeting with a substantially flat seam, comprising:

a wheel mounted frame having a plurality of wheels including at least one driven wheel linked to a means for driving said wheel and operable to drive said frame, and a dirigible wheel for steering said frame relative to a seam of overlapped thermoplastic sheeting,

a speed control selectively operable to adjust the drive speed of said frame along said seam,

heater means for heating air,

blower means for generating a stream of air,

foot means on said frame for directing a stream of air generated by said blower means and heated by said heating means to between overlapped portions of the sheeting as said frame is driven, and

a heater control including an operator adjustable to temperature control to set outlet temperature to different levels and including a temperature sensor extending directly into the stream of heated air in said foot means to directly sense the air temperature being applied to the thermoplastic sheeting, said heater control connected to vary the supply of thermal energy by said heater means as a function of said temperature independently of a rate of flow of the stream of air and independently of environmental temperature and independently of the speed of said frame relative to the seam,

whereby said apparatus may be driven to continuously weld the seam throughout its length.

4,855,005

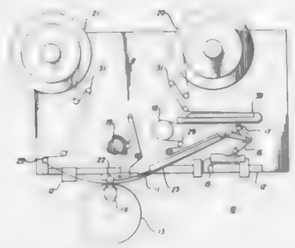
WEB TRANSPORT MOTION COMPENSATION APPARATUS

Robert M. Jodrey, Westboro, Mass., assignor to Deanison Manufacturing Company, Framingham, Mass

Filed Jun. 18, 1987, Ser. No. 64,042

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—361 **7 Claims**



1. Improved apparatus for routing a label carrier web through a label application site in coordination with the surface motion of an article to be decorated, of the type including a web carrying a plurality of labels; means for routing the web over a transport path including the label application site; a shuttle carrying a pair of shuttle rollers for engaging the web at opposite sides of the application site and for regulating the motion of the web through the application site; and means for reciprocating the shuttle and shuttle rolls;

wherein the improvement comprises web compensation means including a profiled cam mounted to said shuttle for modulating the feed of said web between the upstream of one of said shuttle rollers and said application site by varying the motion of a third roller which engages the web, thereby controlling the rate of feed of said web through the application site.

4,855,006

TAPPING UNIT FOR A SEALING MACHINE FOR CARDBOARD BOXES, EQUIPPED WITH A CONTROL SYSTEM FOR SIGNALLING THE ABSENCE OF TAPE SUPPLIED TO THE BOXES TO BE SEALED

Augusto Marchetti, Via Caccialepori, 35 - 20148 Milan, Italy

Filed Apr. 6, 1988, Ser. No. 178,374

Claims priority, application Italy, Apr. 14, 1987, 20109 A/87

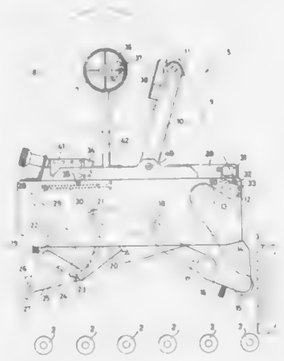
Int. Cl.[4] B65H *63/02*

U.S. Cl. 156—378 **7 Claims**

1. A taping unit for a cardboard box sealing machine, including:

a support roller for a roll of adhesive tape; tape supporting rollers and rollers for applying the tape on the box; means which are sensitive to the passage of the tape from said support roller to said rollers for applying the tape; a control system which can generate a warning signal for a tape stoppage warning device each time that such sensitive means signal a stoppage in the tape feed;

said sensitive means being constituted by a cam sensing means associated with a cam-shaped element rotated by the tape and formed so as to cause the commutation of said cam sensing means at least once for each rotation of said cam-shaped element;



said control system including:

a timer piloted by said cam sensing means so as to generate said warning signal on each occasion a time interval goes by that is longer than a predetermined limit between one commutation and the next of said cam sensing means.

4,855,007

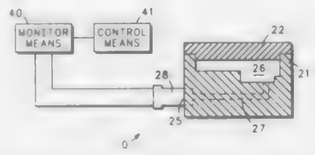
AUTOMATIC DIE ATTACH WORKHOLDER

Marjorie S. Baxter, Mesa, Ariz., and Timothy C. Wilson, Rancho, Calif., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jun. 3, 1988, Ser. No. 201,973

Int. Cl.[4] B23K *1/04*

U.S. Cl. 156—378 **14 Claims**



1. A workholder for use with a semiconductor die bonder comprising

a base plate having a first surface;

a cover coupled to said first surface of said base plate defining a cavity therebetween; and

monitoring means for monitoring the moisture level in the cavity formed between said base plate and said cover, said monitoring means being coupled to a port in one of said base plate and said cover.

4,855,008

EXPANDABLE TIRE BUILDING DRUM

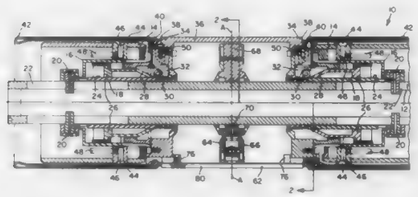
Angel R. Terrado, Mersch, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 9, 1988, Ser. No. 192,156

Int. Cl.[4] B29D *30/24*

U.S. Cl. 156—401 **5 Claims**

1. A radially expandable tire building drum comprising a main shaft rotatably mounted on a supporting structure, a pair of shoulder assemblies positioned on opposite sides and spaced from a centerplane of said main shaft, a plurality of circumferentially spaced drum segments mounted on said shoulder assemblies, a pair of turnup bladders mounted on said shoulder assemblies outboard of said drum segments with nose portions overlapping ends of said drum segments, drum bars positioned between the sides of adjacent drums segments, said shoulder assemblies including shoulder pistons connected to the ends of said drum segments for expanding said drum segments in a radial direction, center pistons mounted on said main shaft at said centerplane of said shaft and positioned at circumferentially spaced positions around said main shaft, said center pistons being connected to said drum bars for urging said bars radially outward, tapered side faces on the sides of said drum bars and sloping side faces on the sides of said drum segments for engagement with said tapered side faces on both sides of said centerplane so that each of said drum bars will be wedged between said sloping side faces of adjacent drum segments for retaining said drum bars in spaces between said drum segments and stabilize the drum bars and drum segments.



4,855,009

ORNAMENT PRODUCTION APPARATUS

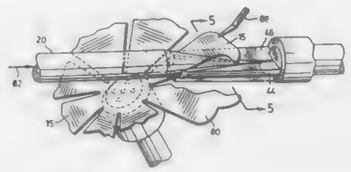
James D. Mancel, Brampton, and Olaf B. Raiskums, Milton, both of Canada, assignors to Rainbow Star Licensing S.A., Fribourg, Switzerland

Division of Ser. No. 318, Dec. 29, 1986, which is a division of Ser. No. 772,576, Sep. 4, 1985, Pat. No. 4,661,197. This application Apr. 29, 1988, Ser. No. 188,891

The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.

Int. Cl.[4] B31F *1/00*

U.S. Cl. 156—443 **6 Claims**



1. Apparatus for producing an ornamental conical element from a planar blank forming at least one leaf, the leaf having a central portion and a pair of lateral portions extending from opposing sides of the central portion, comprising:

a conial form;

a winder assembly having means defining a concave conical bed complementary to the conical form;

said bed being rotatable about a longitudinal axis of the conical form;

positioning means for releasably holding the blank with the leaf positioned over the conical bed;

means for moving the conical form relative to the winder assembly between an active position in which the conical form presses the central portion of the leaf against the bed of the winder assembly and a retracted position in which the conical form is spaced from the bed and the leaf;

means for rotating the bed about the conical form when the conical form is in the active position, the bed rotating means rotating the bed first in one direction to wrap one of the lateral leaf portions over the conical form and then rotating the bed in an opposite direction to wrap the other lateral leaf portion over the conical form thereby forming the conical element;

means for applying an adhesive to at least one of the lateral leaf portions to retain the conical element in the conical configuration;

means for holding the leaf against the conical form as the leaf is wrapped about the conical form and for subsequently releasing the conical element from the conical from when adhesively retained in the conical configuration.

4,855,010

APPARATUS FOR GLUING SHEETS OF MATERIAL TOGETHER

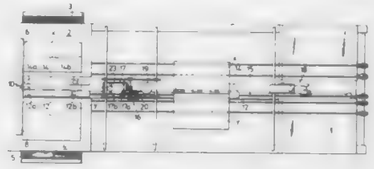
Göran Bolin, Täby, and Jan Sabelström, Huddinge, both of Sweden, assignors to Dynasonic, Johanneshov, Sweden

Continuation of Ser. No. 777,940, Sep. 19, 1985. This application Oct. 27, 1987, Ser. No. 117,341

Claims priority, application Sweden, Sep. 19, 1984, 8404697

Int. Cl.[4] B32B *31/04, 31/10, 31/12*

U.S. Cl. 156—497 **7 Claims**



1. Apparatus for longitudinally conveying and gluing at least a first and second sheet of material cut to finished dimensions and intended to form parts of a folder consisting of a spine and two covers, said apparatus including

a gluing device disposed at a fixed location on said apparatus,

two reception surfaces situated side by side, each defined by fixed aligning members for aligning the first and second sheets in longitudinal alignment relative to each other,

a first conveying means for moving one sheet in a longitudinal direction away from its reception surface and aligning member to said gluing device for coating said first sheet with a longitudinal glue bead,

a second conveying means for moving the second sheet in a longitudinal direction away from its reception surface and aligning member synchronously with the first sheet

at least one of the conveying means being adapted for moving one sheet laterally relative to the other so that both sheets overlap in the area of the glue bead,

press means for pressing together both sheets in said glue bead area, and

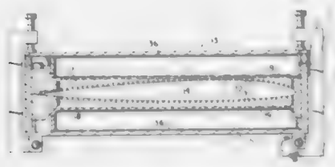
location maintaining means associated with each of the first and second conveying means for positively fixing the sheets in longitudinal alignment and displaceable relative to each other and together with the respective sheets for positively retaining the longitudinal alignment of the sheets during their movement, gluing and pressing together.

4,855,011

ISOSTATIC SELF-CONTAINED BOND OR MOLD TOOL

John R. Legge, Durham, Conn., and Frank C. Rutherford, Toney, Ala., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 12, 1986, Ser. No. 941,904
Int. Cl.[4] B30B *15/34;* B32B *31/20*
U.S. Cl. 156—583.1 9 Claims



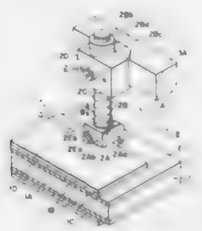
1. An arrangement for manufacturing a composite article structure comprising:
(a) first and second cooperable forming means for establishing a complex form therebetween, said first and second cooperable forming means comprising ceramic;
(b) containment means for containing said first and second cooperable forming means;
(c) said first and second cooperable forming means defining respective first and second inner surfaces for applying pressure upon said complex structure to be made therebetween;
(d) at least one of said cooperable means containing a first controllable heating means for controllably applying heat to one of said inner surfaces including an arrangement of ducts spaced adjacent said inner surface for containing said heating means;
(e) a flexible pressure bag means for applying controllable pressure between said containment means and at least one of said cooperable forming means; and
(f) said arrangement further comprising a flexible pressure heating blanket means disposed adjacent said pressure bag means for applying controllable pressure and heat to at least one of said cooperable forming means;
whereby heat and pressure are transferable from said flexible pressure heating blanket means to said manufactured complex structure in order to accomplish molding or bonding.

4,855,012

PULL-RAISING MEMBER AND PULL-RAISING UNIT FOR PEELING THIN FILM

Sigeo Sumi, Saitama, Japan, assignor to Somar Corporation, Tokyo, Japan

Filed Apr. 6, 1988, Ser. No. 178,152
Claims priority, application Japan, Apr. 6, 1987, 62-85209
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—584 6 Claims



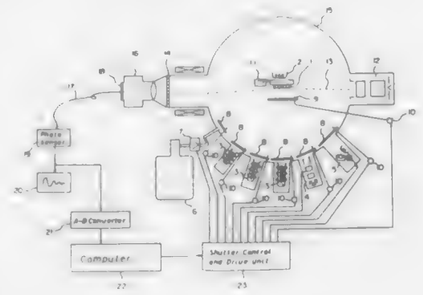
1. In an apparatus including a pull-raising member (2A) for pull-raising an end of a thin film (1D) adhered to a base plate to peel said thin film off of said base plate, the improvements characterized by: a plurality of pull-raising blades (2A*a*, 2A*b*) mounted to said pull-raising member and disposed substantially parallel to said end of said thin film, and an elastic member (2C) disposed to act in a direction to urge said pull-raising blades into contact with said base plate.

4,855,013

METHOD FOR CONTROLLING THE THICKNESS OF A THIN CRYSTAL FILM

Kimihiro Ohta, Kashiwa; Tadashi Nakagawa, Sakura; Takeshi Kojima, Kashiwa; Tsunenori Sakamoto, and Naoyuki Kawai, both of Yatabe, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Continuation of Ser. No. 764,595, Aug. 9, 1985, abandoned. This application Sep. 2, 1987, Ser. No. 92,348
Claims priority, application Japan, Aug. 13, 1984, 59-169125; Aug. 13, 1984, 59-169126
Int. Cl.[4] C30B *25/16*
U.S. Cl. 156—601 9 Claims



1. A method for determining the composition ratio of a mixed crystal including at least two kinds of crystals being grown in a vacuum atmosphere, comprising the steps of:
generating an electron beam in said vacuum atmosphere;
directing said electron beam thus generated to said mixed crystal to obtain a diffraction pattern of each of said crystals constituting said mixed crystal being grown, wherein said crystal is a semiconductor crystal having a (001) plane and said electron beam is incident to said (001) plane in the (100), (120) or (130) azimuth direction;
detecting variations with time of the oscillations of the intensity of said diffraction patterns thus obtained;
obtaining the frequency of the oscillations for each of said crystals constituting said mixed crystal and the frequency of the oscillations of said mixed crystal from said variations thus detected; and
calculating the composition ratio of said mixed crystal from the ratio among said obtained frequencies.

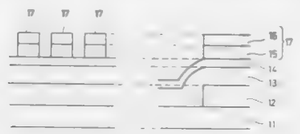
4,855,014

METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICES

Seizo Kakimoto, Tenri; Jun Kudo, and Masayoshi Koba, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 23, 1987, Ser. No. 6,363
Claims priority, application Japan, Jan. 24, 1986, 61-14267
Int. Cl.[4] C30B *1/08, 13/06*
U.S. Cl. 156—620.72 13 Claims

1. A method of manufacturing semiconductor devices, in which a monocrystalline thin film is formed by dissolving and recrystallizing amorphous or polycrystalline thin film by annealing with energy beams, comprising the steps of:
forming a monocrystalline substrate;
forming a first insulation film on said substrate;
forming an amorphous or polycrystalline thin film on said first insulation film, wherein said thin film is formed so as to contact said substrate through a contact opening means in said first insulation film;
forming a second insulation film on said thin film;
forming a compound film having a belt shape with at least a first end and a width narrower than the diameter of said energy beams on said second insulation film, wherein said compound film comprises a high melting point metal film formed o polycrystalline silicon, and wherein said contact opening is formed beneath the center line of said compound film at a position of more than 50 to 200 microns distant from said first end of said compound film along the



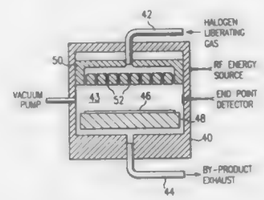
scanning direction of said energy beams, said contact opening being narrower in width than the width of said compound film;
beams scanning in parallel with said compound film by means of radiating energy beams so as to penetrate through said compound film, wherein said beam scanning starts from the vicinity of said first end of said compound film; and
inducing monocrystalline growth of said amorphous or polycrystalline thin film covered by said compound film, wherein said monocrystalline growth starts near said contact opening and said thin film inherits the crystalline configuration of said monocrystalline substrate by epitaxial growth from said substrate.

4,855,015

DRY ETCH PROCESS FOR SELECTIVELY ETCHING NON-HOMOGENEOUS MATERIAL BILAYERS

Monte A. Douglas, Coppell, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 29, 1988, Ser. No. 187,679
Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—626 41 Claims



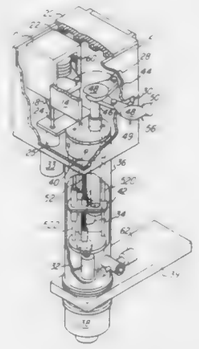
1. A method for etching semiconductor materials employed in fabricating semiconductor circuits, comprising the steps of:
forming a pair of semiconductor material films having a first film of semiconductor material and second film of a different semiconductor material; and
selectively etching said first film with an etch process which etches said first film faster than said second film so that when said first film is removed, the second film is removed at a slower rate.

4,855,016

METHOD FOR ETCHING ALUMINUM FILM DOPED WITH COPPER

Rhett B. Jucha, Celeste; Cecil J. Davis, Greenville, and Lee M. Loewenstein, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 74,452, Jul. 16, 1987, abandoned. This application May 27, 1988, Ser. No. 201,300
Int. Cl.[4] C23F *1/02;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—643 24 Claims



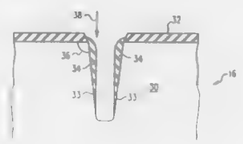
1. A process for etch of Aluminum film doped with Copper comprising the steps of:
(a) disposing said film in a low pressure process chamber;
(b) generating remote plasma from a gas comprised of a mixture of BCl_3, Cl_2, and a hydrocarbon source;
(c) introducing said remote plasma into said chamber and to said film; and
(d) generating an in situ plasma within said chamber from a gas mixture of BCl_3, Cl_2, and a hydrocarbon source.

4,855,017

TRENCH ETCH PROCESS FOR A SINGLE-WAFER RIE DRY ETCH REACTOR

Monte A. Douglas, Coppell, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

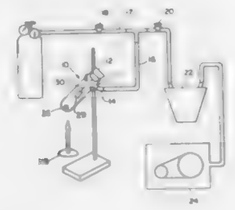
Continuation of Ser. No. 113,942, Oct. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 71,111, Jul. 8, 1987, Ser. No. 26,491, Mar. 16, 1987, Ser. No. 841,391, Mar. 19, 1986, Pat. No. 4,690,729, Ser. No. 841,502, Mar. 19, 1986, abandoned, and Ser. No. 730,701, May 3, 1985, Pat. No. 4,702,795. This application Sep. 8, 1988, Ser. No. 243,186
Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—643 35 Claims



1. A method of etching a trench in a silicon body, said method comprising:
(a) etching a trench in said silicon body by a plasma source of ions and an etchant in an etcher;
(b) introducing, for at least a preselected period during step (a), a silicon passivating agent in said plasma; and
(c) selectively, for at least a predetermined period during

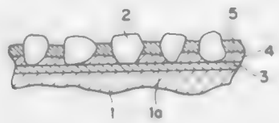
step (a), depositing materials on the sidewalls of the trench.

4,855,018
PROCESS FOR ETCHING POLYTETRAFLUOROETHYLENE
Elizabeth C. Leonard, Cambridge, Mass., and Lewis Erwin, Winnetka, Ill., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Jul. 31, 1987, Ser. No. 80,317
Int. Cl.[4] B44C 1/22; B29C 37/00; C08F 14/26, 114/26
U.S. Cl. 156—646 9 Claims



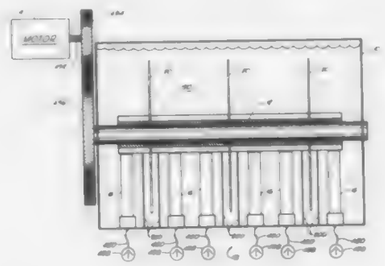
1. A process for etching polyfluorinated polymers which comprises:
(a) exposing said polymers to vapors of an alkali metal or alkaline earth metal to thereby form a layer of a metal fluoride on the surface of the polymer; and
(b) removing the metal fluoride layer from the surface of the polymer.

4,855,019
ELECTRODEPOSITED GRINDSTONE
Hajime Yoshioka; Yukio Kodama, both of Kyoto; Sadato Shigemura; Tohru Funada, both of Hiroshima, and Satoshi Morimoto, Kyoto, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 9, 1988, Ser. No. 165,686
Claims priority, application Japan, Mar. 10, 1987, 62-53117; Mar. 10, 1987, 62-53118; Apr. 28, 1987, 62-103069
Int. Cl.[4] C25D 15/00
U.S. Cl. 204—16 3 Claims



1. An electrodeposited grindstone, comprising:
a grindstone of a base metal;
a nickel plating deposited by electrodeposition upon said base metal;
a nickel bearing layer deposited by electrodeposition above said nickel bearing layer;
a nickel-phosphorus alloy bearing layer deposed upon said nickel bearing layer by chemical plating; and
a plurality of hard abrasive grains embedded within said nickel bearing and nickel-phosphorus alloy bearing layers;
said grindstone and said nickel plating, nickel bearing and nickel-phosphorus alloy bearing layers having been subjected to heating within a temperature range of between about 150° C. and 550° C.

4,855,020
APPARATUS AND METHOD FOR THE ELECTROLYTIC PLATING OF LAYERS ONTO COMPUTER MEMORY HARD DISCS
Michael A. Sirbola, Houston, Tex., assignor to Microsurface Technology Corp., Houston, Tex.
Continuation-in-part of Ser. No. 806,081, Dec. 6, 1985, Pat. No. 4,720,329, and a continuation-in-part of Ser. No. 651,493, Sep. 17, 1984, abandoned. This application Jan. 12, 1988, Ser. No. 144,019
The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.
Int. Cl.[4] C25D 7/00, 17/00
U.S. Cl. 204—23 42 Claims



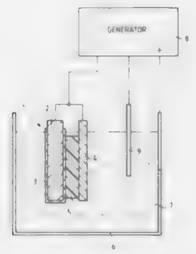
1. An apparatus for the electrolytic plating of computer memory discs comprising:
plating container means for receipt of a liquid plating bath;
spindle means fitted to said plating container means, said spindle means having a receiving area for fixing to the inner diameter of a computer memory disc;
prime mover means connected to said spindle means for causing relative rotational movement between said receiving area of said spindle and said plating container means;
stationary anode means fixed and non-translatable relative to said plating container means, said stationary anode means positioned on opposite sides of said receiving area of said spindle means;
electrical transmission means connected to said spindle means and to said stationary anode means, said electrical transmission means including a contact surface, said contact surface suitable for electrical contact with an edge of a computer memory disc, said electrical transmission means for passing a current between said contact surface and said stationary anode means; and
current distribution control means positioned so as to be adjacent said contact surface within said plating container means, said current distribution control means for reducing the current flow between said stationary anode means and the edge of a computer memory disc affixed to said spindle means.

38. A method of electrolytically plating a computer memory disc comprising the steps of:
fastening a computer memory disc to a rotation-imparting fixture;
submerging said computer memory disc entirely into an electrolytic plating bath;
rotating said computer memory disc in said plating bath at a rate of eight to eighteen revolutions per minute; and
transmitting an electrical current through said rotation-imparting fixture to said computer memory disc, said electrical current passing from said computer memory disc to stationary anodes positioned on opposite sides of said computer memory disc, said computer memory disc being rotated while said current is being transmitted.

4,855,021
METHOD FOR ELECTROPLATING A STEEL STRIP WITH A COATING METAL, IN PARTICULAR ZINC OR A ZINC-CONTAINING ALLOY
Horst Bersch, Neuwied; Karl-Heinz Kilian, Andernach, and Hans U. Weigel, Dernbach, all of Fed. Rep. of Germany, assignors to Rasselstein AG, Neuweld, Fed. Rep. of Germany
Filed Jul. 21, 1988, Ser. No. 222,187
Claims priority, application Fed. Rep. of Germany, Aug. 15, 1987, 3727246
Int. Cl.[4] C25D 7/06
U.S. Cl. 204—28 19 Claims

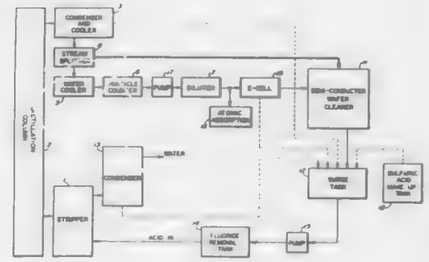
1. In a method for electrodepositing a single-sided metal coating on a steel strip wherein a protective layer of the metal to be coated is first deposited on one side of the steel strip and, after the application of the metal coating to the other side of the steel strip, the steel strip is made anodic and contacted with a stripping electrolyte in order to remove said protective layer from said one side, the improvement comprising the protective layer being deposited in a thickness of 20–100 mg/m^2 and at a current density of from 1–30 A/dm^2 and the stripping of said protective layer being carried out in a stripping electrolyte having an organic sequestering agent and at a current density of 5–30 A/dm^2.

4,855,022
METHOD FOR THE IMPREGNATION OF ELECTROLYTIC CAPACITORS WITH TETRACYANOQUINODIMETHANE SALTS
Dominique Poupard, Dijon, and Jean-Marc Bureau, Villeban sur Yvette, both of France, assignors to Compagnie Europeenne de Composants Electroniques, Courbevoie, France
Filed Feb. 1, 1989, Ser. No. 304,457
Claims priority, application France, Feb. 5, 1988, 88 01345
Int. Cl.[4] C25D 9/02
U.S. Cl. 204—130 7 Claims



1. A method for the impregnation of electrolytic capacitors by a tetracynanoquinodimethane (TCNQ) salt, consisting in the introduction of said salt into each capacitor by electrolytic means, using a solution formed by a solvent, wherein TCNQ has been dissolved, and containing a support electrolyte, the cation of the support electrolyte and the dissolved TCNQ leading, after electrolytic dissociation, to said TCNQ salt.

4,855,023
METHOD AND APPARATUS FOR THE CONTINUOUS ON-SITE CHEMICAL REPROCESSING OF ULTRAPURE LIQUIDS USED IN SEMICONDUCTOR WAFER CLEANING
R. Scot Clark, Fallbrook; Joe G. Hoffman, Oceanside; John B. Davison, Mission Viejo; Alan W. Jones, San Clemente; Allen H. Jones, Jr., Carlsbad; David W. Persichini, Oceanside; Wallace I. Yuan, Irvine, and Bruce A. Lipisko, Carlsbad, all of Calif., assignors to Athens, Inc., Oceanside, Calif.
Division of Ser. No. 915,776, Oct. 6, 1986, Pat. No. 4,828,660.
This application Apr. 19, 1988, Ser. No. 183,089
Int. Cl.[4] C25F 5/00
U.S. Cl. 204—130 21 Claims



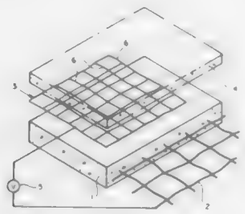
1. In a process for the acid cleaning of semiconductor wafers wherein said wafers are exposed to an oxidant solution for a period of time and at a temperature sufficient to remove contaminants therefrom, the improvement which comprises:
using as the oxidant solution an ultrapure oxidant solution comprising ultrapure sulfuric acid, ultrapure peroxydisulfuric acid, and ultrapure water which is produced according to a continuous process for the reprocessing and repurification of said ultrapure oxidant solution comprising:
withdrawing at least a portion of said oxidant solution used in the semiconductor wafer cleaning process;
distilling said withdrawn oxidant solution to remove particles and dissolved impurities to form ultrapurified sulfuric acid;
dividing said ultrapurified sulfuric acid into a major portion and a minor portion;
returning said major portion of said ultrapurified sulfuric acid to said semiconductor wafer cleaning process;
diluting said remaining minor portion of said ultrapurified sulfuric acid with ultrapure water to produce a continuous stream of diluted ultrapure sulfuric acid;
introducing said diluted ultrapure sulfuric acid into the anode compartment of an electrochemical cell where at least a portion of said diluted ultrapure sulfuric acid is converted into ultrapure peroxydisulfuric acid;
adding at least a portion of said resulting solution of ultrapure sulfuric acid, ultrapure peroxydisulfuric acid, and ultrapure water to said semiconductor wafer cleaning process where it is admixed with said major portion of said ultrapure sulfuric acid to reform said ultrapure oxidant solution.

4,855,024

MESH ELECTRODES AND CLIPS FOR USE IN PREPARING THEM

Kenneth J. Drachnik, Fremont; Joseph Kheder, Newark, and S. Alan Aspey, Saratoga, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 908,459, Sep. 16, 1986, abandoned. This application Nov. 12, 1987, Ser. No. 119,612
Claims priority, application European Pat. Off., Sep. 15, 1987, 87308145.9
Int. Cl.[4] C23F *13/00*
U.S. Cl. 204—147 17 Claims



15. A method of cathodically protecting a corrodible substrate which comprises establishing a potential difference between the substrate as cathode and a mesh anode, said anode comprising

(1) one or more elongate electrodes arranged in the form of a mesh having a plurality of spaced-apart junctions at which portions of the elongate electrode or electrodes are secured together, and

(2) a plurality of clips, each of the clips providing mechanical and electrical connection between the electrode portions at one of said junctions, the electrical connection with each electrode portion being over an electrical contact area of at least 25 mm^2, and the connection being maintained by resilient bias so that if the size of the connected electrode portions is reduced, such mechanical and electrical connection is maintained by elastic recovery of the clip.

4,855,025

POLYFLUORO COMPOUNDS AND METHOD FOR PREPARING THEM

Martine Gautier, Toulouse; Isabelle Rico; Armand Lattes, both of Ramonville, and René Bertocchio, Vourles, all of France, assignors to Societe Atochem, Puteaux, France

Filed Oct. 22, 1987, Ser. No. 111,188
Claims priority, application France, Oct. 24, 1986, 86 14811; Feb. 17, 1987, 87 02009
Int. Cl.[4] C07G *13/00*
U.S. Cl. 204—157.86 19 Claims

1. Polyfluoro compounds comprising:

$$R_F-(CH_2)_m-\underset{\displaystyle CO-X}{\overset{\displaystyle |}{CH}}-R_H \qquad (I)$$

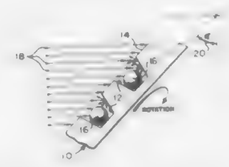
in which R_F denotes a linear or branched perfluoroalkyl radical containing from 1 to 20 carbon atoms, R_H denotes a linear or branched alkyl radical containing from 4 to 18 carbon atoms, m is integer from 0 to 2 and X denotes an OH or NR_1R_2 group in which R_1 and R_2, which are identical or different, each denote a hydrogen atom or a methyl radical.

4,855,026

SPUTTER ENHANCED ION IMPLANTATION PROCESS

Piran Sioshansi, Bedford, Mass., assignor to Spire Corporation, Bedford, Mass.

Filed Jun. 2, 1988, Ser. No. 201,595
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.11 4 Claims



1. Sputter enhanced ion implantation process comprising:

(a) providing a fixture formed of a first material and designed to hold and present a workpiece to an ion beam;

(b) placing said workpiece in operative association t said fixture;

(c) exposing both said workpiece and said fixture to said ion beam;

(d) said ion beam striking said fixture causing a sputtered coating of said first material to be formed by sputtering on said workpiece while simultaneously therewith said ion beam striking said workpiece causing both said workpiece and said sputtered coating thereon to be ion implanted;

(e) said workpiece being formed of a second material, and said ion implantation of said workpiece effecting an ion implanting yield in excess of 20 atomic percent;

(f) said ion beam also effecting an implantation of ions of said first material into said workpiece while effecting ion implantation therein from said ion beam itself;

(g) wherein relative exposure of said workpiece to the direct impact of said ion beam versus the impact of said sputtering from said fixture caused by the indirect impact of said ion beans on said workpiece is variable by the angle of incidence of said ion beam on the surface of said workpiece, and wherein said relative exposure of said workpiece also depends on the composition of said first material; and

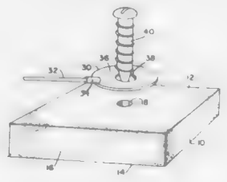
(h) wherein said workpiece is one of a group consisting of ball bearings and cylindrical toolings.

4,855,027

CARBOSIL ANODES

David F . McCready, P.O. Box 1971, Altoona, Pa. 16603

Continuation-in-part of Ser. No. 880,875, Jul. 1, 1986, abandoned, Continuation-in-part of Ser. No. 817,656, Oct. 1, 1985, Pat. No. 4,647,353. This application Feb. 26, 1987, Ser. No. 19,431
The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.
Int. Cl.[4] C23F *13/02*
U.S. Cl. 204—196 27 Claims



1. An anode apparatus for automotive cathodic protection device, comprising:

(a) an insulation layer upon a surface, wherein said layer has about equal parts of polyvinyl acetate-acrylic resin and calcium silicate pigment;

(b) an anode comprising about 90–99% carbon, about 1–9% silica gel, and about 0.1–1% inert binders, mounted on said layer and having a hole extending therethrough receiving a plastic threaded fastener;

(c) an electric lead attached to said anode, wherein said electric lead has a ring connector through which said fastener may be received, whereby said ring may be held fast to a surface of said anode;

(d) the plastic threaded fastener extending through said hole and said ring, a plastic nut receiving said threaded fastener in threaded engagement, and holding the ring on the anode, and wherein said plastic threaded fastener and nut is composed of a polyamide; and

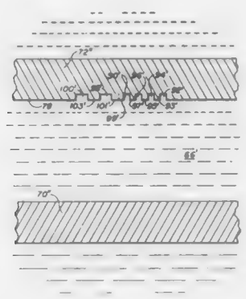
(e) an electrically insulating capsule connected to and covering the anode.

4,855,028

PARTICULATE MAGNETIC RECORDING MEDIA HAVING AN AREALLY CONTROLLED RECORDING CHARACTERISTIC

Ramesh Jagannathan, San Diego, and Matthew R. Bye, San Francisco, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 924,529, Oct. 29, 1986. This application Nov. 14, 1988, Ser. No. 270,940
Int. Cl.[4] C25D *15/00*
U.S. Cl. 204—180.2 1 Claim



1. A method of fabricating a magnetic medium by means of an electrodeposition apparatus utilizing particulate magnetic material and characterized by a critical field intensity, wherein the packing density of said magnetic medium varies in accordance with a predetermined pattern, said method comprising:

a. replicating said pattern by means of grooves and lands in a first electrode of said electrodeposition apparatus,

b. positioning a second electrode in said electrodeposition apparatus in opposition to said first electrode and essentially parallel to said first electrode, wherein the electric field between the grooves of said first electrode and said second electrode has a first magnitude less than said critical electric field of said electrodeposition apparatus, and wherein the electric field between the lands of said first electrode and said second electrode has a second magnitude essentially equal to said critical electric field of said electrodeposition apparatus, and

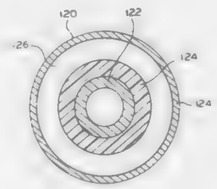
c. electrodepositing said medium on said second electrode under control of said electric field having said first and second magnitudes, whereby said pattern is imaged as a corresponding variation of said packing density of said medium.

4,855,029

INTEGRAL CATHODIC PROTECTION DEVICE

Chester T. Gazda, Chicopee, and Lawrence F. O'Melia, Easthampton, both of Mass., assignors to Titeflex Corporation, Springfield, Mass.

Filed Sep. 11, 1987, Ser. No. 96,515
Int. Cl.[4] C23F *13/00*
U.S. Cl. 204—197 10 Claims



1. A cathodic protection assembly, comprising:

a device having a cross-sectional portion with an outer periphery;

a stand-off comprising a semiconductive material surrounding the cross-sectional portion of the device to be protected and having an inner surface in electrical contact with the periphery of the device cross-sectional portion;

a continuous band of sacrificial anode material supported by said stand-off so as to continuously surround the cross-sectional portion of the device to be protected;

means for establishing electrical continuity throughout the band of sacrificial anode material and said stand-off; and

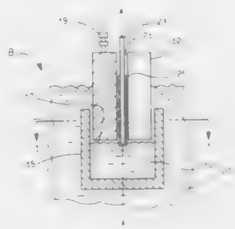
said stand-off maintaining a preselected separation distance between said band of sacrificial anode material and the periphery of the cross-sectional portion of the device to be protected, and said stand-off continuously electrically connecting the band of sacrificial anode material to the periphery of the cross-sectional portion of the device to be protected to provide a controlled galvanic current path throughout the entire cross-sectional periphery of the device to be protected.

4,855,030

DENDRITE INHIBITOR

William E. Miller, Naperville, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 7, 1988, Ser. No. 203,362
Int. Cl.[4] C25C *7/00*; B01D *12/00*; C21B *3/04*
U.S. Cl. 204—212 16 Claims



11. An electrorefining cell comprising;

a lower molten cadmium pool;

an anode basket disposed within the lower molten cadmium pool;

a molten electrolyte pool disposed upon said lower molten cadmium pool;

a molten cadmium cathode, disposed within the electrolyte pool, including an upper surface, wherein said molten cadmium cathode includes a vertically disposed rotatable shaft including a longitudinal surface notch, means for cyclically lowering said shaft to the upper surface of the molten cadmium cathode and raising said shaft from said upper surface, and means for rotating said shaft less than 360 degrees around its longitudinal axis at such time when said shaft is raised to its maximum vertical displacement from the upper surface of the molten cadmium cathode;

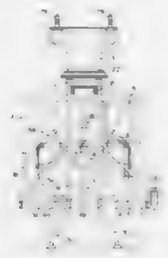
and electrical power means connected to said anode basket and said cathode for providing electrical power to the cell.

4,855,031

EQUIPMENT FOR THE MECHANIZED REPLACEMENT OF THE ANODES IN THE ELECTROLYTIC CELLS FOR ALUMINUM PRODUCTION

Gianfranco Zannini, Limena, Italy, assignor to Techmo Car S.p.A., Limena, Italy

Filed Mar. 30, 1988, Ser. No. 175,186
Claims priority, application Italy, Jul. 9, 1987, 21231 A/87
Int. Cl.⁴ C25C *3/10, 3/14*
U.S. Cl. 204—225 **8 Claims**



1. Equipment for the mechanical replacement in an anodic bus-bar of the anodes of electrolytic cells in a furnace for the production of primary aluminum, said furnace being in a cell room having a bridge crane therein, said equipment comprising:

(a) a first car associated with the bridge crane and adapted to move transverse to the movement of the bridge crane, said car having a crane associated therewith;

(b) a substantially cage-shaped polyfunctional load bearing module, open at the bottom and adapted to be detachably hooked at its top to the crane of said first car;

(c) two horizontal flat beds carried by said cage structure oppositely disposed from the open central region thereof;

(d) a saddle mounted on each of said beds, each of said saddles being adapted for translational movement to and from the open central region of the cage structure, one of said saddles adapted to support a new anode and the other a worn anode;

(e) a control cab for an operator arranged on the outside of said cage structure;

(f) a hopper for a covering material, such as alumina or ground electrolysis bath, to be discharged above the new anode when it is positioned inside the furnace, said hopper being symmetrically oppositely arranged on said cage structure from said control cab;

(g) at least one fork-shaped retractable positioning element protruding laterally from said cage having means for anchoring to the anodic bus-bar with lateral reference to the anode shaft of an adjacent anode so as to position the module with respect to the furnace for removal of the worn anode and replacement with the new anode;

(h) a second car slidingly guided horizontally from the top of said cage structure transversely to the movement of said saddles;

(i) a vertically extending telescoping arm carried by said second car having means for locking and unlocking the shaft of an anode and for clamping and lifting said anode, so that a worn anode can be transferred from the anodic bus-bar to the appropriate saddle disposed in the central region of the cage structure by said second car which is then transferred by the translation of the saddle to the appropriate flat bed and by reverse procedure a new anode is transferred from the opposing flat bed to the vacated anodic bus-bar;

(j) a beating type crust breaker device supported by a retractable telescopic rod and associated with said cage structure;

(k) a telescopically adjustable device associated with said cage structure for cleaning the upper surface of the worn anode; and

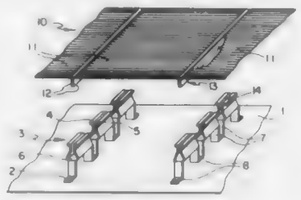
(l) a retractable skimming device associated with said cage structure for cleaning the furnace from whence a worn anode is removed.

4,855,032

ELECTRODE STRUCTURE

Peter Fabian; Helmut Kreba, both of Freigericht, and Heinrich Simon, Langenselbold, all of Fed. Rep. of Germany, assignors to Heraeus Elektroden GmbH, Hanau, Fed. Rep. of Germany

Filed Jul. 22, 1988, Ser. No. 223,168
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1987, 3726674
Int. Cl.⁴ C25B *11/02, 9/04*
U.S. Cl. 204—286 **8 Claims**



1. An electrode structure for an electrochemical membrane cell with a planar eleotrode structure disposed on either side of a membrane, comprising:

a support of sheet metal serving as current distributor,

at least one anodic electrode structure being joined thereto,

metal spacer means through which said electrode structure is joined to said support, said metal spacer means being made in the form of a spring clip mounting which comprises a spring portion and a substantially springless portion, said spring portion being fixedly joined to said support, and said springless portion projecting in the form of a comb-like projection from said electrode structure.

4,855,033

CATHODE AND TARGET DESIGN FOR A SPUTTER COATING APPARATUS

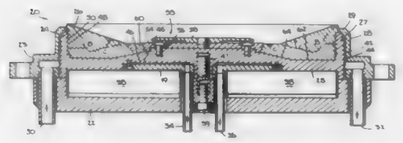
Steven D. Hurwitt, Park Ridge, N.J., assignor to Materials Research Corporation, Orangeburg, N.Y.

Continuation of Ser. No. 848,698, Apr. 4, 1986, abandoned. This application Sep. 10, 1987, Ser. No. 95,100
Int. Cl.⁴ C23C *14/34*
U.S. Cl. 204—298 **20 Claims**

1. A sputtering target assembly for a sputter coating apparatus, comprising:

a target holder, having side walls defining a central cavity the inner periphery of said side walls having first cooling means formed therein for increasing the surface area of said side walls; and

a target composed of coating material and formed to be received with said central cavity, said target having an outer rim having formed therein second cooling means for increasing the surface area of said rim to promote heat flow from said target to said target holder when said target is urged into intimate coupling contact with said target holder during heat induced expansion of said target, said second cooling means intermeshing with said first cooling means.

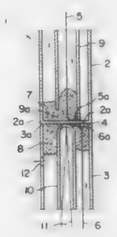


4,855,034

GAS SENSOR FOR SULFUR DIOXIDE

Eisuke Sugimoto, Niihama; Yoshiyasu Tanizawa, Wakayama, and Zensaku Kozuka, Osaka, all of Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Mar. 14, 1983, Ser. No. 474,882
Claims priority, application Japan, Jun. 8, 1982, 57-98374
Int. Cl.⁴ G01N *27/46*
U.S. Cl. 204—427 **7 Claims**



1. A gas sensor for the measurement of the concentration of a sulfur dioxide component of an objective gas, comprising:

a solid electrolyte consisting of beta-alumina, which solid electrode is partially exposed to the objective gas;

a reference material which produces a predetermined Na activity in the electrolyte,

the electrolyte being so arranged as to separate the objective gas from the reference material; and

a catalyst selected from the group consisting of Pt, Pd, Pf-Pd alloys and mixtures thereof provided at least on the portion of the electrolyte exposed to the objective gas, wherein the other side of the solid electrolyte is kept in contact with the reference material, said sensor determining sulfur dioxide concentration based upon the electromotive force generated between said sulfur dioxide component and said reference material.

4,855,035

METHOD OF ABATING CORROSION IN CRUDE OIL DISTILLATION UNITS

Hans U. Schutt, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 14, 1988, Ser. No. 244,239
Int. Cl.⁴ C10G *9/12, 9/16*
U.S. Cl. 208—47 **2 Claims**

1. In a process for abating corrosion in a crude column overhead transfer line operated at a temperature above the nominal aqueous dew point in contact with a crude oil feed stream containing sulfur oxides, ammonia and a hydrochloric acid neutralizing corrosion inhibitor thus forming ammonium chloride and ammonium bisulfate the improvement which comprises maintaining a chloride level in said crude oil feed stream sufficient to provide a mole ratio of ammonium chloride to ammonium bisulfate of greater than about 20 in said crude column overhead system.

4,855,036

CATALYTIC CRACKING PROCESS

Robert L. Chiang, Oakland, N.J.; Raymond G. Perigard, Savannah, Ga., and Jule A. Rabo, Armonk, N.Y., assignors to UOP, Des Plaines, Ill.

Continuation of Ser. No. 848,034, Apr. 4, 1986, abandoned, and Ser. No. 848,033, Apr. 3, 1986, abandoned, which is a division of Ser. No. 659,641, Oct. 4, 1984, Pat. No. 4,591,576, said Ser. No. 848,034, is a division of Ser. No. 657,413, Oct. 4, 1984, Pat. No. 4,588,701. This application Dec. 18, 1987, Ser. No. 134,813
Int. Cl.⁴ C10G *11/05*
U.S. Cl. 208—120 **50 Claims**

2. A process for catalytic cracking of hydrocarbon feedstocks comprising contacting said hydrocarbon feedstock under conditions effective to crack said feedstock with a catalyst prepared by a process comprising the following step:

(i) contacting a fluid mixture of a large pore zeolite having a $SiO_2Al_2O_3$ ratio of about 3.5 to less than about 20 and an inorganic oxide matrix, with a fluoro salt of the formula

$$A_{(n-m)}(MF_n)_z$$

wherein "A" is an organic or inorganic ionic moiety; $(MF_n)_z$ is a fluoroanion moiety comprising the element "M"; "M" is an element selected from the group of elements from Groups VB, VIB, VII, IIIA, IVA and VA of the Periodic Table of Elements; "n" is the coordination number of "M"; "m" is the valence of "M"; and "z" is the valence or charge associated with "A"; at an effective pH value greater than about 3, at effective conditions of temperature and time to produce a catalyst product, whereby the cracking activity of the zeolite is enhanced.

4,855,037

HYDROGENATION CATALYST FOR COAL TAR, A METHOD OF HYDROGENATION OF COAL TAR WITH USE OF SUCH CATALYST, AND A METHOD OF PRODUCING SUPER NEEDLE COKE FROM THE HYDROGENATION PRODUCT OF COAL TAR

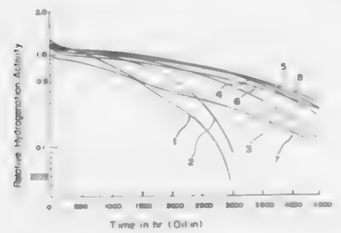
Tadashi Murakami, Yokohama; Mikio Nakaniwa; Yoshio Nakayama, both of Tokyo, and Mitsuaki Masuo, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 867,545, May 28, 1986, abandoned, which is a division of Ser. No. 773,130, Sep. 6, 1985, abandoned. This application Jan. 28, 1988, Ser. No. 149,942
Claims priority, application Japan, Sep. 12, 1984, 59-189493; Oct. 19, 1984, 59-218697
Int. Cl.⁴ C10G *1/08, 1/06*
U.S. Cl. 208—422 **1 Claim**

1. A method of hydrogen treatment of coal tar or coal tar pitch, characterized in that the hydrogen treatment is carried out at a hydrogen pressure of 40–180 kg/m^2G, a temperature of 300°–420° C. and a liquid hourly space velocity of 0.2–2 hr^{-1} using a catalyst comprised of a first catalytic component containing Mo and a second catalytic component containing Ni and/or Co carried on a substrate, the contents of the first and second catalytic components in said catalyst being about 10–30% by weight and about 1–6% by weight, respectively in terms of metal oxide, and said catalyst having the following

physical properties with regard to its pores with a pore diameter of more than 3.5 nm:

(a) an average pore diameter APD being 9.8–15.4 nm;



(b) a total pore volume PV being 0.450–0.632 cc/g;
(c) a surface area SA being 137–215 m^2/g;
(d) a pore size distribution as follows:

pore diameter (nm)	specific volume (cc/g)
3.5–5	less than 0.1
5–8	less than 0.3
8–18	0.2–0.55
18–30	less than 0.2
over 30	less than 0.1; and

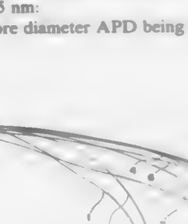
(e) a ratio of the volume of pores with diameters of 8–18 nm to the total pore volume PV being 0.758–0.911.

4,855,038

HIGH CONSISTENCY PRESSURE SCREEN AND METHOD OF SEPARATING ACCEPTS AND REJECTS

Peter E. LeBlanc, Worthington, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed Jun. 20, 1985, Ser. No. 746,734
Int. Cl.[4] B01D *29/38*
U.S. Cl. 209—273 **7 Claims**



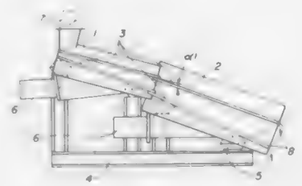
1. Pressure screen apparatus comprising:
a housing including an inlet for receiving a slurry of paper stock, an accepts outlet and a rejects outlet;
a hollow cylindrical screen in said housing including a profiled inner surface and an outer surface;
mounting means mounting said screen to the interior of said housing and defining an accepts chamber between said screen outer surface and said housing which is in communication with said accepts outlet and is sealed from said inlet so that said inlet communicates with said accepts outlet via said screen and said accepts chamber;
drive means including a rotary output;
a rotor connected to said rotary output and mounted within and spaced from said screen between said inlet and said rejects outlet, said rotor comprising outer wall means including an outer surface shaped to define a continuously varying space from said screen inner surface when said rotor is rotated; and
a blunt lead section facing in the direction of rotation, said blunt lead section providing a stock capturing surface for accelerating a volume of stock substantially to rotor velocity.

4,855,039

VIBRATING SCREEN

Ivan V. Genev, Sofia, Bulgaria, assignor to Institute Po Tcherna Metalurgia, Sofia, Bulgaria

Filed Feb. 19, 1988, Ser. No. 158,191
Int. Cl.[4] B07B *1/28*
U.S. Cl. 209—311 **4 Claims**



1. A vibrating screen for the granulometric separation of bulk materials comprising
a first section having a first upper screening surface and a first lower screening surface, said first screening surfaces being arranged at an angle with respect to each other;
a second section having a second upper screening surface and a second lower screening surface, said second screening surfaces being arranged at an angle with respect to each other;
said second screening surfaces being wider than said first screening surfaces;
said second section being arranged downstream of said first section whereby said bulk materials flow from said first section to said second section;
said second upper screening surface being arranged below said first upper screening surface and said second lower screening surface being arranged below said first lower screening surface, whereby said bulk materials flow from said first upper screening surface to said second upper screening surface and materials passing through said first upper screening surface onto said first lower screening surface flow from said first lower screening surface to said second lower screening surface;
said first section and said second section being independently mounted for vibration independent of each other.

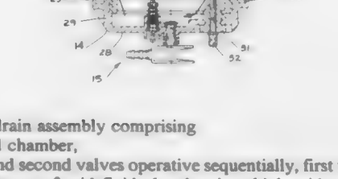
4,855,040

INSTALLATION FOR PURIFYING LIQUIDS USING A THROUGH-FLOW-CONTROLLED AQUATIC PLANT-CONTAINING FILTER BED

Reinhold W. Kickuth, Gilsbergstrasse 9, D-3436 Hess.-Lichtenau, Fed. Rep. of Germany

Filed Mar. 26, 1987, Ser. No. 31,339
Claims priority, application United Kingdom, Mar. 27, 1986, 8607653
Int. Cl.[4] C02F *3/32*
U.S. Cl. 210—109 **25 Claims**

1. An installation for purifying a liquid, comprising:
an aquatic plant-containing filter bed;
infeed means for feeding a liquid to be purified into said aquatic plant-containing filter bed;
outfeed means for receiving purified liquid from said aquatic plant-containing filter bed and producing an outflow from said aquatic plant-containing filter bed;
throughflow control means, operatively associated with said aquatic plant-containing filter bed, for controlling the outflow from said aquatic plant-containing filter bed in a manner such as to set up a predetermined throughflow pattern through said plant-containing filter bed; and
said throughflow control means containing adjusting means for adjusting said outflow and thereby said predetermined throughflow pattern and thereby maintaining a predetermined hydromorphous state of said aquatic plant-containing filter bed.
2. An installation for purifying a liquid, comprising:
an aquatic plant-containing filter bed;



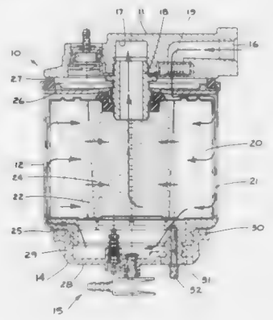
infeed means for infeeding a liquid to be purified into said aquatic plant-containing filter bed;
outfeed means for receiving purified liquid from said aquatic plant-containing filter bed;
throughflow control means, operatively associated with said aquatic plant-containing filter bed, for operating upon said aquatic plant-containing filter bed in a manner such that there is set up a predetermined throughflow pattern which is adapted to the instant operating conditions of said aquatic plant-containing filter bed, wherein said throughflow control means contains at least one intentionally variable by-pass flow path.

4,855,041

FLUID FILTER DRAIN ASSEMBLY

John F. Church, and Steve A. Neff, both of Modesto, Calif., assignors to Parker Hannifin Corporation, Cleveland, Ohio

Filed Apr. 24, 1987, Ser. No. 42,081
Int. Cl.[4] B01D *35/00;* **F16K** *24/02*
U.S. Cl. 210—120 **28 Claims**



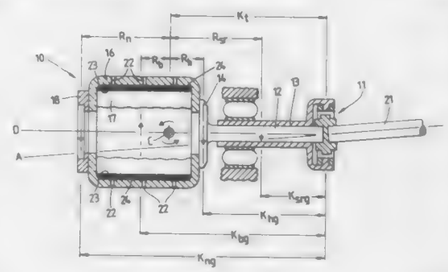
1. A drain assembly comprising
a fluid chamber,
first and second valves operative sequentially, first to initiate drainage of said fluid chamber in which said valves are disposed and then to open a vent to release a partial vacuum in said chamber as fluid is drained therefrom,
said first valve having a valve seat disposed at a first location in said chamber,
said second valve having a valve seat disposed at a second location higher in vertical disposition than said first location,
said first valve having an open position and a closed position and movable therebetween for controlling fluid flow through said first valve seat, and
means coupling said first and second valves for actuating said second valve in response to movement of said first valve as said first valve is between said open and closed positions.

4,855,042

APPARATUS FOR MINIMIZING REACTIVE FORCES ON A GIMBAL-MOUNTED CENTRIFUGE

Lloyd B. Smith, Bristol, Tenn., assignor to The United Company, Bristol, Va.

Continuation-in-part of Ser. No. 941,290, Dec. 12, 1986, abandoned. This application Apr. 18, 1988, Ser. No. 183,430
Int. Cl.[4] B04B *1/06*
U.S. Cl. 210—144 **3 Claims**



1. In a centrifuge for extracting fluids from wet particulate matter wherein said centrifuge includes a rotor system with an overhung composite bowl having an opening at one end thereof and a base at the other end, with a filter media liner proximal the inner surface thereof and a plurality of outlet ports therethrough for the outward discharge of said fluids and a continuous shaft fixed to said base at one end and driven for rotation at a gimbal-like mounting at a second end, with said shaft and said bowl being resiliently supported on bearings located intermediate said gimbal-like mounting and said bowl, the improvement comprising a neutralizer ring affixed about said bowl at the opening thereof and being dynamically balanced, with said ring having a weight, W, and a radius of gyration, K_{ng}, about said gimbal-like mounting such that said neutralizer ring neutralizes the effects of imbalance in a predetermined weight of said particulate matter and causes the geometric axis and the instantaneous dynamic axis of the rotor system to intersect at said gimbal-like mounting thereby reducing reactive forces exerted on said gimbal-like member.

4,855,043

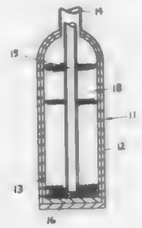
WATER CONDITIONING SYSTEM

Danny L. Dalton, Provo, Utah, assignor to Quantum Conditioning Technology, Inc., Salt Lake City, Utah

Filed May 15, 1987, Ser. No. 49,798
Int. Cl.[4] C02F *1/42*
U.S. Cl. 210—190 **6 Claims**

1. A compact water conditioner for food service applications which includes an enclosed tank containing a stratified resin bed, inlet means and resin regenerating means, said resin bed including a first layer of chloride-anion exchange resin for removing negative ions of water-borne chemicals, gases and acids circulating through the tank, and a second layer of sodium-cation exchange resin for removing water-borne positive metallic ions, said first layer being deposited upon said second layer and said resins being compatible,
said inlet means including means for directing untreated water onto the stratified resin bed and through the layers in sequence, and

said resin regenerating means including means for passing a salt solution through the first layer and then through the



second layer to regenerate both layers with the same solution.

4,855,044

PURIFICATION OF OILS CONTAINING SOLID MATTERS IN SUSPENSION

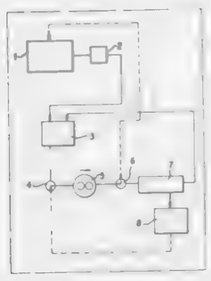
Enzo Calloni, Monza; Maurizio Valente, and Alfonso Raiola, both of Milan, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

Division of Ser. No. 904,355, Sep. 8, 1986, Pat. No. 4,734,207. This application Nov. 25, 1987, Ser. No. 102,375

Claims priority, application Italy, Sep. 13, 1985, 22145 A/85; Apr. 15, 1986, 20080 A/86

Int. Cl.[4] B01D *17/038*

U.S. Cl. 210—195.1 **2 Claims**



1. A filtration device for oils used as the operating fluid in vacuum pumps, and adpated to be directly connected to the vacuum pump for either continuous or discontinuous operation, comprising as its essential components:

a filter of the tangential-flow type, wherein the filtering element has a tubular shape and pores having a diameter less than 0.4 micron including means for enabling the oil to be filtered to flow inside the tubular element; and

means for maintaining an adequate tangential speed of the oil on the filtering surface and of keeping the oil at a pressure higher than the pressure outside the tubular element including a circulation pump.

4,855,045

METHOD AND APPARATUS FOR THE SEPARATION OF ORGANIC SUBSTANCES FROM A SUSPENSION OR SOLUTION

Thomas A. Reed, Otto-Hahn-Platz 7, D-6900 Heidelberg-Emmertsgrund, Fed. Rep. of Germany

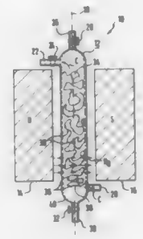
PCT No. PCT/DE83/00003, § 371 Date Sep. 14, 1983, § 102(e) Date Sep. 14, 1983, PCT Pub. No. WO83/02404, PCT Pub. Date Jul. 21, 1983

Continuation of Ser. No. 537,361, Sep. 14, 1983, abandoned. This PCT application Jan. 13, 1983, Ser. No. 890,807

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1982, 3200988

Int. Cl.[4] B03C *1/30*

U.S. Cl. 210—223 **14 Claims**



1. An apparatus for the separation of cells, organelles, or proteins from a suspension or solution thereof, comprising:

(a) a reaction vessel with an inlet and outlet for passing the suspension or solution therethrough;

(b) a plurality of magnetic attachment bodies inside the reaction vessel which bodies are provided with an adsorption layer which is specifically active on test substances or with a cell culture layer; and

(c) a wire ferromagnetic carrier body within a reaction volume and through which a magnetic field passes; and

(d) a magnet arrangement for producing magnetic field gradients which keeps the attachment bodies in the reaction volume inside the reaction vessel.

4,855,046

MULTI-CANISTER, EXTERNALLY-CONNECTED ION REMOVAL SYSTEM

Jeffrey Meehan, Wolcott, Conn., assignor to Napco, Inc., Terryville, Conn.

Filed Oct. 22, 1987, Ser. No. 111,394

Int. Cl.[4] C02F *1/42*

U.S. Cl. 210—232 **9 Claims**

1. Apparatus for removing ions from water comprising:

a plurality of substantially identical, interconnected containers, each container including:

a. a housing having a sidewall;

b. an endwall sealing a first end of said housing;

c. a removable cover for sealing the end of said housing opposite said first end;

d. an inlet in the sidewall near said endwall;

e. an outlet in the sidewall near said cover;

f. a first support flange attached to an inner portion of said sidewall and extending radially inward therefrom, said flange spaced from said endwall a distance greater than is said inlet;

g. a second support flange attached to an inner portion of said sidewall and extending radially inward therefrom, said second flange positioned between said outlet and said first flange;

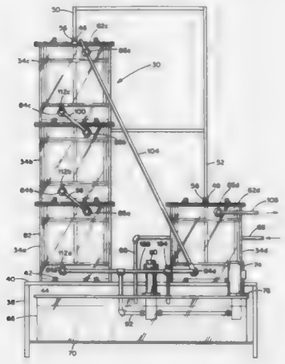
h. a first permeable separator plate adapted to be mounted on said first flange and to define, with said endwall and said sidewall, an inlet plenum;

i. a second permeable separator plate adapted to be

mounted on said second flange and to define, with said cover and said sidewall, an outlet plenum;

said separator plates further defining, with said sidewall, an ion exchange zone for holding ion exchange material;

j. ion exchange material in said ion exchange zone defined by said sidewall and said separator plates on said flanges;



k. means for holding said separator plates on said flanges;

l. means for connecting the outlet of each said container to the inlet of the next container in series; and

m. means for directing water into the inlet of each container, through said ion exchange material in said ion exchange zone, and out its outlet.

4,855,047

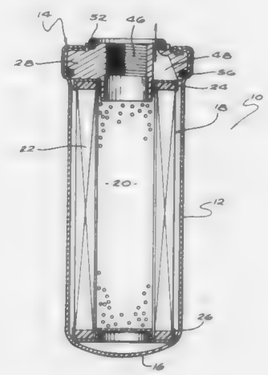
HIGH PRESSURE SPIN-ON FILTER

Robert L. Firth, Edina, Minn., assignor to HR Textron, Inc., Valencia, Calif.

Filed Mar. 23, 1987, Ser. No. 28,853

Int. Cl.[4] B01D *27/08*

U.S. Cl. 210—232 **1 Claim**



1. A spin-on filter comprising:

a generally cylindrical housing having an open end, a closed end and a filter element operatively disposed therein, said open end of said housing including a reentrant portion having a diameter greater than the remainder of said housing and defining a shoulder region displaced from said open end;

a rigid base plate press fitted into the open end of said housing and seated against said shoulder and being secured thereto by said housing being folded inwardly over the periphery of said base plate, said base plate including upper and lower spaced-apart faces interconnected by a sidewall, the lower face of said base plate having a smaller diameter than the upper face thereof, said upper face defining a plurality of spaced-apart depressions therein, the inwardly folded portion of said housing having the overlying sections thereof extending into said depressions to prevent rotation of said housing relative to said base plate; and

cap means fitted over said inwardly folded portion of said housing and including a skirt extending downwardly along said housing for a distance less than the length of said housing but at least co-extensive with said base plate side wall and secured in place by being bent inwardly about its terminus to conform to the smaller diameter of said housing and said lower face to retain said housing on said base plate at pressures in excess of 1000 psi.

4,855,048

AIR DRIED CELLULOSE ACETATE MEMBRANES

Man-Wing Tang, Alhambra; William M. King, Los Alamitos, and C. Glen Wensley, Villa Park, all of Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 99,572, Sep. 22, 1987, abandoned. This application Jan. 29, 1988, Ser. No. 150,265

Int. Cl.[4] B01D *13/00, 13/04*

U.S. Cl. 210—500.3 **34 Claims**

1. The method of preparing a novel dry semipermeable asymmetric cellulosic membrane which comprise:

(a) forming a casting solution comprising cellulose acetates and a solvent for the cellulose acetates,

(b) casting the solution to form a thin uniform layer,

(c) precipitating the membrane in water, and

(d) directly drying the membrane from the aqueous state to recover a membrane having outstanding characteristics for desalination by reverse osmosis, ultrafiltration, non-aqueous liquid separation, pervaporation, and for separation of gaseous mixtures into their constituent parts,

wherein a drying agent is introduced prior to the drying step and is a hydrophobic organic compound having a normal boiling point above 100° C., weak hydrogen bonding characteristics, and a low solubility parameter.

4,855,049

MICROPOROUS MEMBRANE OBTAINED BY THE IRRADIATION OF TWO FACES AND PROCESS FOR OBTAINING THE SAME

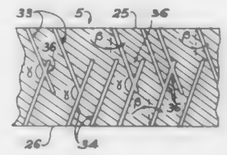
Marcel Toulemonde, and Emmanuel Balanzat, both of Caen, France, assignors to Commissariat A L'Energie Atomique and Centre National de la Recherche Scientifique, both of Paris, France

Filed Nov. 14, 1988, Ser. No. 270,677

Claims priority, application France, Nov. 13, 1987, 87 15687

Int. Cl.[4] B01L *13/00*

U.S. Cl. 210—500.40 **10 Claims**



1. Microporous membrane obtained by the irradiation of particles (P) followed by chemical etching producing pores (**33**, **34**) along the impact lines (**23**, **24**) of the particles, characterized in that it comprises a first network (**33**) of pores issuing

only on one face (25) of the membrane (5), a second network of pores (34) only issuing on the other face (26) of the membrane (5) and in that pores of the first network (33) meet pores of the second network (34) in a median area (20) of membrane (5).

4,855,050

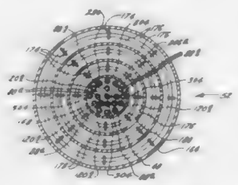
CENTRIFUGAL OIL SEPARATOR FOR REMOVING OIL FROM A WASTE FLOWING STREAM

Corley P. Senyard, Sr., 5319 Didesse, Ste. B, Baton Rouge, La. 70809; Corley P. Senyard, Jr., 624 Main St., League City, Tex. 77573, and Thomas J. Senyard, 5319 Didesse, Ste. B, Baton Rouge, La. 70809

Continuation-in-part of Ser. No. 902,592, Sep. 2, 1986, Pat. No. 4,737,282, which is a continuation-in-part of Ser. No. 648,497, Sep. 10, 1984, Pat. No. 4,626,360. This application Feb. 26, 1988, Ser. No. 160,705

Int. Cl.[4] B01D *21/26;* C02F *1/40*

U.S. Cl. 210—512.1 14 Claims



1. An oil separator for removing oil from a flowing waste stream of waste fluid comprising:

(a) a separator body having a flow bore with a center, an open bottom and an open top each communicating with the flow bore so that fluid can flow in the flow bore between the open bottom and the open top;

(b) a plurality of vanes, each defining a spiral path for fluid flowing in the bore between the open bottom to the open top, the vanes being spaced radially from the center of the bore and each vane having upper and lower end portions;

(c) each vane having a surface to which oil particles can adhere and coalesce as the oil particles travel upwardly thereupon;

(d) the vanes being positioned in the bore with the upper and lower end portions of each vane communicating respectively with the bore open top and the bore open bottom portions:

(i) to swirl waste fluid upwardly, creating laminar flow,

(ii) to centrifugally force the waste fluid outwardly in a direction away from the bore center, and

(iii) to separate oil particles from the wastewater stream beginning with the vane end portions that receive influent wastewater flow; and

(e) means positioned adjacent the bore for separating oil collected and coalesced on the vanes from the wastewater.

4,855,051

MICROBIAL TREATMENT OF WASTEWATER TO REMOVE TERTIARY BUTYL ALCOHOL

James P. Insell, London, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed May 11, 1987, Ser. No. 48,613

Int. Cl.[4] C02F *3/00;* C12R *1/06, 1/07, 1/38*

U.S. Cl. 210—601 4 Claims

1. A process for treating wastewater containing tertiary butyl alcohol so as to reduce the tertiary butyl alcohol content thereof which comprises growing in the presence of said wastewater a population of a biologically pure culture of a bacterium selected from the group consisting of *Bacillus coagulans* ATCC 53595, Arthrobacter *globi formis* ATCC 53596 and *Pseudomonas stutzeri* ATCC 53602.

4,855,052

FOAM-CONTAINING POLYURETHANE (UREA) COMPOSITIONS AND PROCESS FOR THE PREPARATION THEREOF

Arthur Reischl, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Division of Ser. No. 141,735, Jan. 11, 1988, Pat. No. 4,801,621, which is a division of Ser. No. 926,770, Nov. 4, 1986, Pat. No. 4,734,439, which is a continuation of Ser. No. 672,439, Nov. 16, 1984, abandoned. This application Aug. 12, 1988, Ser. No. 231,742

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1984, 3402696

Int. Cl.[4] B01D *29/08*

U.S. Cl. 210—632 2 Claims

1. A process for the treatment of aqueous fluids by filtration or absorption, characterized in that the filtering or absorbing means is a composition comprising a polyurethane(urea) composition in finely divided or particulate form having water-absorbability of from 33 to 97% by weight and containing

(i) from 3 to 95% by weight of a synthetic resin foam in the form of particles,

(ii) from 0 to 90% by weight of lignite and/or peat, and

(iii) from 0 to 90% by weight of other organic and/or inorganic fillers wherein the total amount of components (i), (ii), and (iii) is from 5 to 95% by weight and wherein said percents by weight are based on the total moisture-free weight of said composition.

4,855,053

EXTRACTION OF ORGANIC COMPOUNDS FROM AQUEOUS SOLUTIONS

Charles Benedetti, Marseilles; Claude Gluntz, Cassis; Robert Pascal, Aubagne, and Michel Stefanini, Plan De Cuques, all of France, assignors to Atochem, Puteaux, France

Filed Dec. 18, 1986, Ser. No. 944,271

Claims priority, application France, Dec. 18, 1985, 85 18801

Int. Cl.[4] C02F *1/26*

U.S. Cl. 210—634 25 Claims

1. A process for the extraction of organic compounds comprising an amino acid, a lactam, a phenol compound or mixtures thereof from aqueous solutions and/or suspensions of same, which consists essentially of:

treating said solutions and/or suspensions with a liquid organic carboxylic acid that is immiscible with water at 20° C. in an amount sufficient to form an organic phase, containing the organic compounds, and

isolating the organic phase from the aqueous phase to extract said organic compounds from said solutions or suspensions.

4,855,054

USING LIQUID CHROMATOGRAPHY DUAL ZONE PACKING MATERIALS

Dwight E. Williams, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 63,516, Jun. 17, 1987, Pat. No. 4,778,600. This application Jun. 27, 1988, Ser. No. 212,100

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—635 7 Claims

1. A method for analysis of biological fluids by reverse phase liquid chromatography comprising:

(a) preparing an analyte containing biological fluid to be analyzed,

(b) contacting said analyte with a liquid chromatography column packed with a dual zone reverse phase packing material comprising a porous support having as an internal zone a lipophilic partitioning phase bonded to the internal surface of said porous support and having as an external zone a lipophobic phase comprising fluorocarbon groups bonded to the external surface of said porous support, wherein said fluorocarbon groups have the formula: $Me_{3-m}SiC_2H_4C_nF_{2n+1}$ wherein m is 1-3 and n is 1 or more

(c) whereby proteinaceous substances in said analyte are rejected by said lipophobic phase in said external zone and small molecules of said analyte to be analyzed are absorbed and retained by said liphophilic partitioning phase in said internal zone.

4,855,055

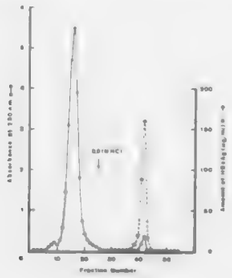
ISOLATION AND PURIFICATION PRE-S2 CONTAINING HEPATITIS B VIRUS SURFACE ANTIGEN BY CHEMICAL AFFINITY CHROMATOGRAPHY

J. Y. Lin; Yih-Shou Hsieh, and Shu-Chen Chu, all of Taipei, Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Sep. 28, 1988, Ser. No. 250,062

Int. Cl.[4] B01D *15/08;* A61K *39/12*

U.S. Cl. 210—635 9 Claims



1. A method for isolating and purifying pre-S2 containing HBsAgs from the plasma of a carrier of HBsAg comprising the sucessive steps of

(1) treating the plasma by heating, and centrifuging to collect clear supernatant;

(2) then effecting ammonium sulfate fractionation, centrifuging to collect precipitates and then dialyzing the precipitates against phosphate buffer;

(3) applying the dialyzate from (2) to a hydroxyapatite column;

(4) subjecting the fractions eluted from said hydroxyapatite column to step (2);

(5) applying the dialyzate from (4) to a pHSA-affinity column; and

(6) neutralizing the fractions eluted from said pHSA-affinity column immediately with NaOH.

4,855,056

PROCESS FOR THE DEMINERALIZATION OF WHEY OR A LIQUID BASED ON WHEY AND FOR PRODUCING AN ACID MIXTURE AND A BASE MIXTURE USEFUL IN FOOD INDUSTRIES

Matti Harju, Nummela, and Matti Heikonen, Espoo, both of Finland, assignors to Valio Meijerien Keskusosuusliike, Helsinki, Finland

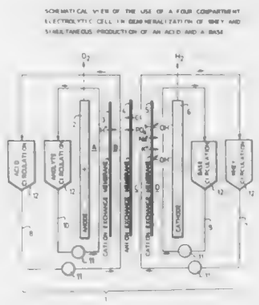
Filed Nov. 3, 1988, Ser. No. 266,677

Claims priority, application Finland, Nov. 6, 1987, 874925

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—638 12 Claims

1. A process for removing at least a portion of salts contained in a liquid selected from wheyand liquids based on whey by means of electrolysis while producing an acid mixture and a base mixture useful in food industries, the process comprising providing a four-compartment electrolytic cell in the electrolysis of the liquid selected from whey and liquids based on whey, the electrolytic cell including in succession (a) an anolyte compartment defined by an anode plate and a first catio exchange membrane, (b) an acid compartment defined by the first cation exchange membrane and an anion exchange membrane, (c) a whey compartment defined by the anion exchange membrane and a second cation exchange membrane and intended for the liquid to be treated which is selected from whey and liquids based on whey, and (d) a base compartment defined by the second cation exchange membrane and a cathode plate, independent liquid recirculations being connected to each one of the four compartments of the electrolytic cell; using a starting solution in the liquid recirculation connected with the whey compartment, selected from cheese whey, acid whey, permeate and a mother liquor from the production of lactose, and from cheese whey, acid whey, permeate and a mother liquor from the production of lactose, each as concentrated to



a dry matter content of no more than 40% by weight; using a starting solution in the acid recirculation connected with the acid compartment, a liquid selected from acid solutions having an anion composition corresponding to that of the liquid to be treated which is selected from whey and liquids based on whey, and lactic acid; using a starting solution in the base recirculation connected with the base compartment selected from base solutions having a cation composition corresponding to that of the liquid to be treated which is selected from whey and liquids based on whey, and sodium hydroxide; and using a starting solution in the anolyte recirculation connected with the anolyte compartment selected from an aqueous solution of an acid.

4,855,057

REGENERATION TYPE BODY FLUID TREATING CIRCUIT AND METHOD FOR TREATING BODY FLUID

Michikazu Ohnishi, Kobe; Hiroshi Ohgoshi, Settsu, and Satoshi Takada, Kobe, all of Japan, assignors to Yokogawa Electric Corporation, Tokyo and Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, both of, Japan

Division of Ser. No. 102,691, Sep. 29, 1987. This application May 6, 1988, Ser. No. 190,985

Claims priority, application Japan, Sep. 30, 1986, 61-234200; Oct. 3, 1986, 61-236783

Int. Cl.[4] B01D *13/00, 15/00*

U.S. Cl. 210—650 4 Claims

1. A method for treating a body fluid in an extracorporeal circuit consisting essentially of a body fluid collecting block, a body fluid treating block and a body fluid return block, said body fluid treating block including a plurality of treating units connected in parallel to each other and comprising at least one first-stage treating unit and at least one second-stage treating unit, which comprises:

(a) a first-stage treating step comprising feeding a body fluid to said first-stage treating unit, subjecting the body fluid to a predetermined treatment therein, and sending the treated body fluid to said body fluid return block;

(b) a feed line switching step which comprises switching the route of feed of the body fluid from said first-stage treating unit to said second-stage treating unit when the amount of

the body fluid treated in said first-stage treating unit has reached a predetermined level;

(c) a body fluid sending step which comprises feeding a washing liquid to said first-stage treating unit to force out the body fluid present therein from said first-stage unit to said body fluid return block;

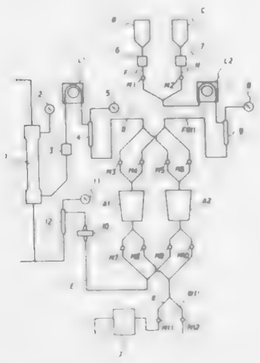
(d) A discharge line connecting step which comprises switching the line on the downstream side of said first-stage unit into communication with a discharge line when the first-stage treating unit has been purged of the body fluid by and filled with the washing liquid;

(e) a regenerating liquid feeding step which comprises feeding a predetermined amount of regenerating liquid to said first-stage treating unit filled with the washing liquid, and discharging the effluent from said first-stage treating unit outside the circuit;

(f) a regenerating liquid discharging step which comprises feeding the washing liquid to said first-stage treating unit to which the regenerating liquid has been fed in the step (e), thereby forcing out the regenerating liquid from said first-stage unit and discharging it outside the circuit;

(g) a washing step which comprises feeding a predetermined additional amount of the washing liquid to said first-stage unit after withdrawal of the regenerating liquid from said first-stage unit conducted in the step (f);

(h) a confirmation step which, after said washing step (g),



comprises feeding the washing liquid further to said first-stage unit and guiding the effluent from said first-stage unit to a salt concentration measuring means for confirming if the salt concentration of said effluent is within a predetermined range;

(i) a washing liquid discharging step which comprises feeding a body fluid to the second-stage treating unit previously filled with the washing liquid, thereby forcing out the washing liquid from the second-stage treating unit and discharging it outside the circuit;

(j) a return line connecting step which comprises switching the line on the downstream side of said second-stage treating line into communication with a body fluid return line when the second-stage unit has been purged of the washing liquid and filled with the body fluid;

(k) a second-stage treating step which comprises feeding the body fluid further to said second-stage treating unit, subjecting it to the predetermined treatment therein, and sending the treated body fluid to the body fluid return block;

(l) a feed line re-switching step which comprises switching the route of feed of the body fluid to be treated from the second-stage treating unit to the first-stage treating unit when the amount of the body fluid treated in the second-stage unit has reached a predetermined level;

(m) a switching preparation step which comprises performing said washing liquid discharging step (i) with respect to the first-stage processing unit and, simultaneously, performing said body fluid discharging step (c) with respect to the second stage treating unit;

(n) a return line re-switching step which comprises switching the line on the downstream side of the first-stage treating unit from the discharge line to the body fluid return line while conducting said confirmation step (h) and, at the same time, switching the line on the downstream side of the second-stage treating unit into communication with the discharge line to interrupt said downstream side from the body fluid return line; and

(o) a repeated first-stage treating step which comprises performing said first-stage treating step (a) again.

4,855,058

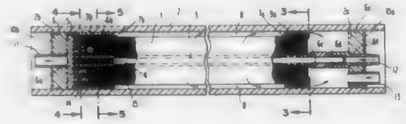
HIGH RECOVERY SPIRAL WOUND MEMBRANE ELEMENT

Eric C. Holland, Goleta; Fredrick K. Lesan, Oxnard, and Peter H. Knappe, Ventura, all of Calif., assignors to Hydranautics, Goleta, Calif.

Continuation of Ser. No. 877,906, Jun. 24, 1986, abandoned. This application May 2, 1988, Ser. No. 188,758

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—652 **24 Claims**



1. In a membrane filtration device of the cylindrical spiral wound type and suitable for filtering a fluid feed mixture under elevated pressure wherein sheet membranes are tightly wound about a central porous core tube providing separate flow channels for a feed-concentrate mixture and a permeate fluid produced therefrom by means of seals to prevent intermixing of the feed-concentrate and permeate fluids, the improvement which comprises means for providing radial flow for the Feed-concentrate mixture to an extent sufficient to achieve a conversion of 30% or greater while maintaining turbulent or chopped laminar flow, said means including, at least one pair of membrane sheets attached at one end to, and wound to spiral outwardly about the central porous core tube and sealed to define at least one radial feed-concentrate flow channel extending between a channel opening at the central porous core tube and another opening at an unsealed terminal end of the spiraling membrane sheets, each feed-concentrate flow channel connected to separate conduit means for delivering feed mixture to and discharging concentrate from the feed-concentrate channel, and the membrane sheets sealed on the permeate side to define at least one permeate channel for permeate discharge from at least one unsealed axial end of each permeate channel, and each permeate channel having spacer material therein being connected to conduit means for collection of said permeate.

4,855,059

PURIFICATION OF BRINES WITH HYDROUS METAL OXIDE ION EXCHANGERS

Teresita C. Frianeza-Kullberg, 2357 Amity Ave., Gastonia, N.C. 28054

Continuation-in-part of Ser. No. 850,464, Apr. 11, 1986, abandoned. This application Jul. 19, 1988, Ser. No. 221,149

Int. Cl.[4] B01D *15/04*

U.S. Cl. 210—670 **10 Claims**

1. A process for separating calcium ions from natural or industrial brines comprising (a) adjusting the pH of the brine to pH 9 to 11; and (b) contacting the alkaline brine with an ion exchanger consisting essentially of a hydrous oxide of zirconium for a period of time sufficient to remove the desired quantity of calcium ions from the brine.

4,855,060

METHOD AND ADDITIVE FOR CLARIFYING AQUEOUS SYSTEMS WITHOUT PRODUCTION OF UNCONTROLLABLE FLOC

Daniel K. Durham, Spring; Urban C. Conkle, Houston, and Hartley H. Downs, Kingwood, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed May 13, 1988, Ser. No. 194,435

Int. Cl.[4] C02F *1/54*

U.S. Cl. 210—708 **8 Claims**

1. A method of clarifying an aqueous system containing an oil-in-water emulsion or a dispersion of a non-aqueous discontinuous phase with production of only a controllable floc in the system, comprising the steps of: (1) contacting the system with an effective water clarifying amount of a composition having present therein a dithiocarbamate of bishexamethylenetriamine, said dithiocarbamate being formed from an approximately stoichiometric ratio of carbon disulfide to primary amine in said bishexamethylenetriamine; (2) maintaining said composition in said system for sufficient time to effectively clarify the system with production of only a controllable floc; and (3) removing said floc from said aqueous system.

4,855,061

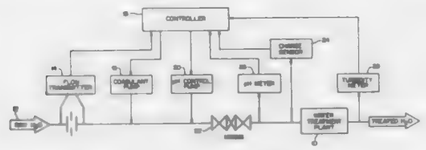
METHOD AND APPARATUS FOR CONTROLLING THE COAGULANT DOSAGE FOR WATER TREATMENT

Arnold D. Martin, Newbrighton, Minn., assignor to CPC Engineering Corporation, Sturbridge, Mass.

Filed Apr. 26, 1988, Ser. No. 186,309

Int. Cl.[4] C02F *1/52*

U.S. Cl. 210—709 **11 Claims**



1. In a water treatment system including a means for feeding coagulant into water to be treated to form coagulated particles, apparatus for controlling the coagulant dosage comprising:

charge sensing means for measuring the net electrical charge of the water after addition of the coagulant;

turbidity sensing means for measuring effluent water turbidity after water treatment to remove said coagulated particles and form said effluent water; and

control means responsive to the charge sensing means and the turbidity sensing means for controlling the dosage rate of the coagulant feeding means, the control means responsive to the charge sensing means for adjusting the dosage rate of the coagulant feeding means to maintain a set point of charge value to be measured by the charge sensing means and responsive to the turbidity sensing means for adjusting the charge value set point to maintain a preselected turbidity to be measured by the turbidity sensing means.

4,855,062

APPARATUS AND PROCESS FOR REGULATING A FILTER PLATE CONTACT PRESSURE IN FILTER PRESSES

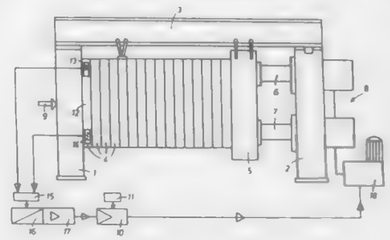
Max Oelbermann, Moltkestrasse 19, 5630 Remscheid, Fed. Rep. of Germany

Filed Oct. 29, 1987, Ser. No. 113,890

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1986, 3636799

Int. Cl.[4] B01D *25/12, 37/04;* **B30B** *15/22*

U.S. Cl. 210—739 **9 Claims**



1. A process for regulating a filter plate contact pressure in a plate filter press including a hydraulic closing cylinder means, the method comprising the steps of determining, as a control variable, at least one of a compression force prevailing in a filter plate pack, the compression of an entire filter plate pack, and a compression of at least one portion of the filter plate pack exposed to a compression force ambient in the filter plate pack, and regulating a hydraulic pressure of the hydraulic closing cylinder means in dependence upon a value of a determined compressive force for maintaining a desired compression value, and wherein the step of determining includes providing at least one strain gauge means for determining a compression of at least one of the filter plate, frame, and separate deformation plate exposed to the compression pressure.

4,855,063

RED BLOOD CELL FILTERING SYSTEM

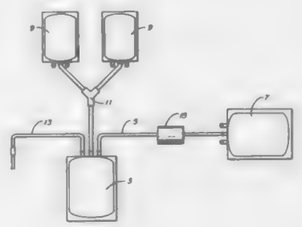
Raleigh A. Carmen, Concord; Chiyong Chong, San Francisco, and Barry S. Leng, Pleasant Hill, all of Calif., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 21, 1986, Ser. No. 854,287

The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.

Int. Cl.[4] B01D *21/26, 29/08, 36/00*

U.S. Cl. 210—749 **6 Claims**



1. A method of filtering at least about 80% of the white blood cells from a mixture of red blood cells and white blood cells from a unit of reconstituted red blood cells in less than about 24 hours and with minimal long term hemolysis of the red blood cells, the method comprising the steps of

(a) providing a closed multiple blood bag system comprising two blood bags in closed communication with each other

via connecting plastic tubing and, including continuous with the plastic tubing a tapered white blood cell filter housing containing a continuous filtering fiber having a generally Y-shaped cross sectional area and a bulk density of less than about 0.6 gram per cc, one of the blood bags being a first bag adapted to include the mixture of red and white blood cells and the other bag being the second bag and including a red blood cell storage solution;

(b) introducing the storage solution into the first bag by passing the solution through the filter to prime the filter and removing air from the filter and then mixing the solution with the red and white blood cells; and

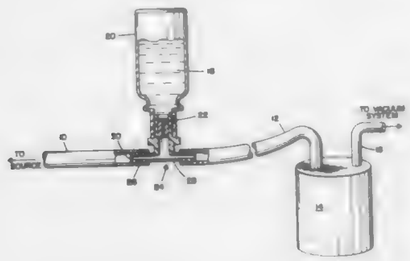
(c) passing the mixture of step (b) through the filter and into the second bag under conditions sufficient to remove at least about 80% of the white blood cells from the mixture in less than about 24 hours, thereby providing a red blood cell preparation substantially free of white blood cells and suitable for long term storage without substantial amounts of white blood cell contaminants and with minimal red blood cell hemolysis.

4,855,064

APPARATUS AND METHOD FOR DECONTAMINATING VIRUS-INFECTED BODY FLUIDS

Allen P. Schlein, Fairfield County, Conn., assignor to Viratec, Inc., Wilmington, Del.

Filed Jan. 13, 1988, Ser. No. 143,819
Int. Cl.[4] B01D *35/00*
U.S. Cl. 210—764 6 Claims



1. A body fluid collection system for decontaminating a virus-infected body fluid as it is being transported from a source of the body fluid to a collection receptacle, said system comprising in combination:

a collection receptacle for receiving and storing a fluid, said receptacle having a first port means for connection to a source of suction and a second port means for admitting a fluid into the receptacle;

a section of tubing connected at one end to the second port of said collection receptacle and the other end comprising a means for connection to a source of body fluid and for transporting body fluid by suction from the source to said collection receptacle; and

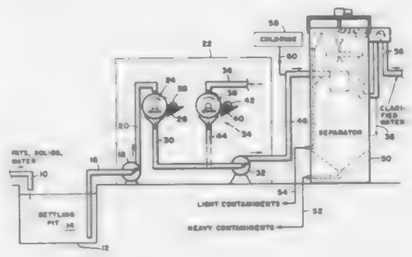
viricidal dispensing means connected in-line with said tubing between the source and the collection receptacle for introducing a viricidal agent into body fluid transported by suction through the tubing toward the collection receptacle, said dispensing means including a container having a constricted closure and containing a liquid viricidal agent with a predetermined concentration, and aspirating means comprising a T-shaped body having a bore extending through in-line arms each connected to one end of a respective segment of said tubing and a branch arm having an inlet to said bore and means for mounting said container with its constricted closure in communication with said bore, said aspirating means communicating suction pressure to said liquid viricidal agent in response to the flow of body fluid through said bore for causing a metered amount of viricidal agent to be sprayed from said container into the body fluid transported through said bore, said metered amount being sufficient to destroy the virus present in the fluid collected in said collection receptacle to a sufficient degree to permit safe disposal of the fluid.

4,855,065

APPARATUS AND PROCESS TO SEPARATE AND REMOVE EXTRANEOUS MATTER FROM A LIQUID STREAM

Kathy L. Keeter, and Thomas L. Keeter, both of 4200 E. Skelly Dr., Ste. 540, Tulsa, Okla. 74135

Continuation-in-part of Ser. No. 133,129, Dec. 14, 1987, Pat. No. 4,780,201, which is a division of Ser. No. 225,871, Jul. 29, 1988.
This application Oct. 24, 1988, Ser. No. 261,710
Claims priority, application European Pat. Off., Aug. 11, 1988, 88307421.3
Int. Cl.[4] B01D *17/038*
U.S. Cl. 210—776 3 Claims



1. Process for removing floatable and non-floatable fats and other solids from water stream comprising the steps of:

supplying said water stream to a mechanical screen means to separate any additional solids therefrom;

supplying a stream of less contaminated water from said mechanical screen means to a first vertical separator, said separator being substantially filled to a normal level with contaminated water;

providing a hydrocyclone in said first vertical separator comprised of a cylinder of substantially less diameter than said separator, a substantially quiescent zone substantially surrounding said hydrocyclone means at the bottom of said separator to remove said non-floatable contaminents, including means for enabling passage of contaminated water through a collection of passageway comprised of an inverted conical funnel having its apex open at its top, the funnel being positioned about and substantially encompassing said hydrocyclone, an upwardly extending conduit communicating with said apex of said funnel, said conduit terminating at its top with an upwardly/outwardly conical baffle, the top of said conical baffle being positioned below a normal level of liquid within said separator, a processed water receiving means positioned around said upwardly extending conduit and a siphon outlet pipe connected to said receiving means for removing said processed water from said separator;

receiving said stream of contaminated water from said second stage and tangentially directing same into said hydrocyclone;

removing said floatable materials through a receiving chamber its top opening being positioned above said normal level by rotating a floatable scraper, located above and below said level, across an upwardly sloped ramp, the bottom end of which extends below said level with its top end terminating at said top opening of receiving chamber; and

supplying said processed water to a second vertical separator, said separator being substantially filled to a normal level with said processed water;

providing a hydrocyclone in said second vertical separator comprised of a cylinder of substantially less diameter than said separator, a substantially quiescent zone substantially surrounding said hydrocyclone means at the bottom of said separator to remove said non-floatable contaminents, including means for enabling passage of contaminated water through a collection passageway comprising of an inverted conical funnel having its apex open at its top, the funnel being positioned about and substantially encompassing said hydrocyclone an upwardly extending conduit communicating with said apex of said funnel, said conduit terminating at its top with an upwardly/outwardly conical baffle, the cop of said conical baffle being positioned below a normal level of liquid within said separator, a substantially clean water receiving means positioned around said upwardly extending conduit and a siphon outlet pipe connected to said receiving means for removing said substantially clean water from said second vertical separator;

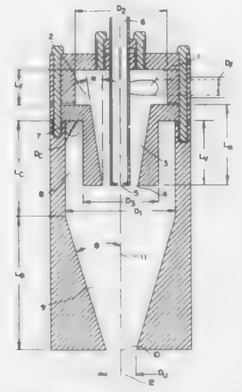
receiving said stream of processed water from said first separator vessel and tengentially directing same into said hydrocyclone thence removing said floatable materials through a receiving chamber its top opening being positioned above said normal level by rotating a floatable scraper, located above and below said level, across and upwardly sloped ramp, the bottom end of which extends below said level with its top end terminating at said top opening of receiving chamber.

4,855,066

HYDROCYCLONE

Charles A. Petty, Haslett, and Hsin-Chih Chen, East Lansing, both of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed May 2, 1988, Ser. No. 189,157
Int. Cl.[4] B01D *21/26*
U.S. Cl. 210—788 16 Claims



1. A hydrocyclonic apparatus which comprises:

(a) a first fluid cyclone having an upper end and a lower end smaller than the upper end along a longitudinal axis of the cyclone and comprising a first fluid inlet oriented to supply liquid tangentially thereto at the upper end thereof, wherein the fluid rotates around the interior surface of the cyclone, wherein the cyclone has a frustoconical shape between the upper end and the lower end for maintaining the angular momentum of the fluid flow, a first fluid outlet which projects inside the first cyclone and terminates in an orifice communicating with the interior of the cyclone along the longitudinal axis at the upper end, a second fluid outlet communicating with the interior of the cyclone at the lower end; and

(b) a second fluid cyclone mounted around the longitudinal axis and around the first fluid outlet and comprising a second fluid inlet to supply fluid tangentially to the second fluid cyclone and around the first fluid outlet to a third annular fluid outlet into the first fluid cyclone wherein the third annular fluid outlet is adjacent to the orifice in the first fluid outlet, wherein in operation of the hydrocyclone clean fluid is supplied to the first inlet and through the first cyclone and out the second outlet, wherein fluid containing dispersed particles is supplied to the second fluid inlet and wherein the particles in concentrated form are removed through the first fluid outlet.

4,855,067

HOUSEHOLD CLEANING COMPOSITION

Gary J. Jakubicki, Robbinsville, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed May 10, 1988, Ser. No. 192,168
Int. Cl.[4] C11D *3/37*
U.S. Cl. 252—174.25 4 Claims

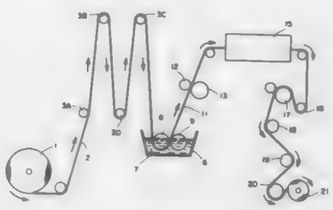
1. A household cleaning composition which comprises: in admixture with a surfactant, finely divided particles of a synthetic thermoplastic resin further comprising terpolymers produced from alpha-methylstyrene, styrene, and acrylonitrile homopolymers, having a density of about 20 pounds per cubic foot, a particle size distribution between about 40–60 mesh, a Rockwell R hardness of about 120–125, wherein said composition is a semi-solid household cleansing cream containing between 5 and 95 percent of said plastic particles dispersed therein and whereby the particles of the synthetic plastic material leave the surfaces cleaned substantially free of abrasion.

4,855,068

MULTI-LAYERED CLEANING PRODUCT

Maung H. Win, and William D. Lloyd, both of Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 4, 1988, Ser. No. 177,551
The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.
Int. Cl.[4] C11D *9/42*
U.S. Cl. 252—90 23 Claims



1. A laundry cleaning product for washing a load of laundry comprising a multi-layered web containing at least 1 gram of active liquid laundry detergent solids per gram of web, said multi-layered web comprising at least two different web materials, wherein the two outer layers comprise a thermoplastic polymer having a melting point of 170° C. or greater.

4,855,069

POLYSACCHARIDE-THICKENED AQUEOUS ACID CLEANING COMPOSITIONS

Jean-Luc Schuppiser, Claye Souilly, and Marie-Madeleine Besnard, Astony, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Continuation of Ser. No. 9,898, Feb. 2, 1987, abandoned. This application Aug. 4, 1988, Ser. No. 228,233
Claims priority, application France, Jan. 31, 1986, 86 01338
Int. Cl.[4] C11D *7/60*
U.S. Cl. 252—87 12 Claims

1. An aqueous acid composition of matter, comprising (i) water, (ii) a carboxylic acid dissolved therein having a negative log of the dissociation constant (pK), at 25° C., of at least 2, (iii) a stabilizing amount of at least one salt of an acid having a pK value of at least 2, and of a strong base, and (iv) a thickening amount of a polysaccharide.

4,855,070

ENERGY TRANSMITTING FLUID

Walter E. F. Lewis, Stamford, Conn., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 947,878, Dec. 30, 1986, abandoned. This application Sep. 16, 1988, Ser. No. 206,201
Int. Cl.[4] C10M *173/02*
U.S. Cl. 252—75 17 Claims

1. An energy transmitting fluid which is substantially free of ethylene glycol consisting essentially of
(a) from about 30 to about 40 percent by weight, based on the total weight of the fluid, of water;
(b) from about 35 to about 50 percent by weight, based on the total weight of the fluid, of diethylene glycol;
(c) from about 0.8 to about 5.0 percent by weight, based on the total weight of the fluid, of an aliphatic carboxylic acid having 9 to 12 carbon atoms inclusive;
(d) a water-soluble polymeric viscosity control agent;
(e) a corrosion inhibiting amount of at least one corrosion inhibitor; and
(f) a metal deactivator, wherein (b) and (d) are present in amounts sufficient to provide the fluid with a viscosity of from about 10 to about 200 centistokes at 40° C.

4,855,071

DEICING COMPOSITIONS COMPRISING ALKALINE EARTH OR ALKALI METAL CARBOXYLATES AND PROCESSES FOR THEIR PRODUCTION

Harold E. Todd, Jr., Pinole, and Daniel L. Walters, San Francisco, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 77,148, Jul. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 3,097, Jan. 14, 1987, abandoned. This application Jan. 14, 1988, Ser. No. 144,359
Int. Cl.[4] C09K *3/18*
U.S. Cl. 252—70 60 Claims

1. A process for preparing a deicing composition which comprises:
(a) preparing a slurry comprising an alkaline earth or alkali metal carboxylate of from 1 to 4 carbon atoms, or mixtures thereof, said slurry containing sufficient water that it is fluid and pumpable and heating said slurry to a temperature in the range of about 100° F. to about 250° F.;
(b) maintaining said slurry at a temperature within said range while distributing said slurry of step (a) in a thin layer on discrete substrate particles; and
(c) drying said layered substrate particles.

17. A process of preparing a deicing composition comprising calcium magnesium acetate having a molar ratio of calcium:magnesium of from about 6:4 to about 2:8 which is substantially free from unreacted magnesium base which comprises:
(a) mixing CM base and water to give a mixture comprising at least about 40 percent by weight water;
(b) adding acetic acid in an amount sufficient to convert said CM base to calcium magnesium acetate to the mixture of step (a) to give a calcium magnesium acetate slurry comprising from about 50 to about 68% water and a pH of about 7 to about 8.5 which is essentially free of acetic acid odor;
(c) heating the slurry of step (b) to a temperature of about 170° F. to about 200° F.;
(d) distributing the heated slurry of step (c) in a thin layer onto a falling curtain of discrete substrate particles in the presence of heated gas to give CMA-layered particles;
(e) repeating step (d) to give CMA-layered particles having a plurality of layers of CMA on said particles.

4,855,072

LIQUID FABRIC SOFTENER

Toan Trinh, Maineville; Errol H. Wahl, Cincinnati; Donald M. Swartley, Cincinnati, and Ronald L. Hemingway, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 717,051, Mar. 28, 1985, Pat. No. 4,661,269. This application Jul. 2, 1987, Ser. No. 28,048
The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.
Int. Cl.[4] D06M *11/00*
U.S. Cl. 252—8.8 23 Claims

1. An aqueous fabric softening composition comprising the following components:
I. from about 3% to about 35% by weight of the composition of a mixture comprising:
(a) from about 10% to about 92% of the reaction product of higher fatty acids with a polyamine selected from the group consisting of hydroxyalkyl alkylene diamines and dialkylene triamines and mixtures thereof;
(b) from about 8% to about 90% of cationic nitrogenous salts having only one long chain acyclic aliphatic C_{15}–C_{22} hydrocarbon group; and
(c) from 0% to about 80% of cationic nitrogenous salts having two or more long chain acyclic aliphatic C_{15}–C_{22} hydrocarbon groups or one said group and one arylalkyl group; all by weight of Component I; and
II. the balance of the composition comprising from about 65% to about 97% of an aqueous carrier selected from the group consisting of water and mixtures of water and up to about 15% of C_1–C_4 monohydric alcohols; and wherein when said (b) is an acyclic quaternary ammonium salt with said one long chain and three C_1–C_4 chains; and wherein said C_1–C_4 chains are saturated alkyl groups.

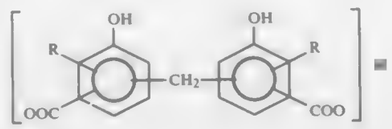
4,855,073

LUBRICANT COMPOSITIONS AND METHODS FOR PREPARATION OF SAME

Mitsuhiro Murakami, 515, Nishi Tanaka, Gotemba-shi, Shizuoka-ken; Takahiro Mikami, Chuoh Green Town, 767-7, Hagiwara, Gotemba-shi, Shizuoka-ken; Hiroyuki Nagamatsu, 1289-578, Niihashi, Gotemba-shi, Shizuoka-ken, and Mitsuji Tokuno, 213-18, Nagatsuka, Gotemba-shi, Shizuoka-ken, all of Japan

Filed May 27, 1988, Ser. No. 199,485
Claims priority, application Japan, Jun. 12, 1987, 62-146434
Int. Cl.[4] C10M *129/10*
U.S. Cl. 252—39 19 Claims

1. A lubricating oil additive compound having the generic formula (I):



(I)

wherein R is a C_{12} to C_{22} alkyl group and M is at least one polyvalent metal selected from the group consisting of magnesium, calcium, strontium and barium; each of said R groups being in the o- or p- position relative to said OH group in the respective benzene ring.

4,855,074

HOMOGENEOUS ADDITIVE CONCENTRATES AND THEIR FORMATION

Andrew G. Papay, Manchester, and Joseph P. O'Brien, Kirkwood, both of Mo., assignors to Ethyl Petroleum Additives, Inc., St. Louis, Mo.

Filed Mar. 14, 1988, Ser. No. 167,875
Int. Cl.[4] C10M *133/56, 155/04*
U.S. Cl. 252—51.5 A 39 Claims

1. A process of forming a homogeneous product from a long chain succinimide in which the chain has a number average molecular weight in the range of 700 to 2,500 and a benzotriazole which at a temperature of 25° C. is normally incompatible therewith, which process comprises (a) heating at a temperature in the range of 50° to about 150° C. and for a time sufficient to achieve homogeneity, a mixture of from about 10 to about 1,000 parts by weight of the succinimide per part by weight of the benzotriazole, optionally with (i) water or (ii) an N,N-bis(hydroxyalkyl)-N-hydrocarbylamine or (iii) a dihydrocarbyl phosphite, or (iv) a dihydrocarbyl phosphonate, or any mixture of any two or any three or all four of (i), (ii), (iii) and (iv); and (b) distilling off excess water, if any.

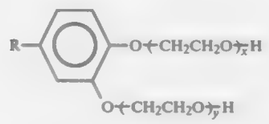
4,855,075

ETHOXYLATES OF ALKYL AND ALKENYL CATECHOLS

Robert V. Casciani, Matthews, N.C., assignor to Sandoz Ltd., Basel, Switzerland

Filed Mar. 14, 1988, Ser. No. 167,828
Int. Cl.[4] C11D *3/20;* C07C *43/11*
U.S. Cl. 252—174.21 19 Claims

1. A compound of formula I:



I

wherein
R is C_8–C_{22} straight or branched chain alkyl or alkenyl; and each of x and y is, independently, an integer 1 to 49, with the proviso that the sum of x and y is 3 to 50.

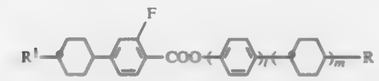
4,855,076

FLUOROPHENYLCYCLOHEXANE DERIVATIVE

Yasuyuki Goto; Tetsuya Ogawa, both of Yokohama, and Shigeru Sugimori, Musashino, all of Japan, assignors to Chisso Corporation, Japan

Filed Sep. 15, 1986, Ser. No. 907,092
Claims priority, application Japan, Sep. 17, 1985, 60-204666
Int. Cl.[4] C09K *19/30;* C07C *69/76*
U.S. Cl. 252—299.63 9 Claims

1. A fluorophenylcyclohexane derivative and expressed by the formula



wherein R represents an alkyl or alkoxy group of 1–10 carbon atoms; R^1 represents an alkyl group of 1–10 carbon atoms; l and m each represent integers of 0 to 2; and a value of (l+m) is 2 or 3.

9. A liquid crystal composition comprising at least two components, at least one of which is a fluorophenylcyclohexane derivative as defined in claim 1.

4,855,077

STICKING AGENT OF IONIC-CONDUCTIVE POLYMER

Yasuo Shikinami; Kunihiro Hata, and Yutaka Ohmura, all of Osaka, Japan, assignors to Takiron Co., Ltd., Osaka, Japan

Filed Apr. 20, 1988, Ser. No. 183,962
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—518 8 Claims

1. An ionic conductive polymeric sticking agent comprising:
(a) a reaction product of:
(i) a polyurethanepolyol prepolymer having an alkylene oxide chain, wherein the molecular weight of the polyurethanepolyol prepolymer is from 1400 to 10.000, a polyol having an alkylene oxide chain, wherein the molecular weight of the polyol is from 150 to 6,000, or mixtures thereof; and
(ii) a polyurethane polyisocyanate prepolymer having an alkylene oxide chain, and
(b) an ionic compound, wherein the ionic compound is an alkali metal salt.

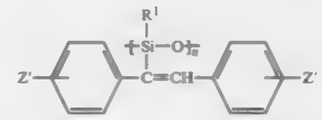
4,855,078

ORGANOPOLYSILOXANES EXHIBITING NONLINEAR RESPONSE

Thomas M. Leslie, Clinton Township, Hunterdon County, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Division of Ser. No. 923,501, Oct. 27, 1986, Pat. No. 4,801,659. This application Feb. 3, 1988, Ser. No. 172,303
Int. Cl.[4] C0BF *283/00;* G02B *5/20*
U.S. Cl. 252—582 11 Claims

1. A nonlinear optical film medium consisting of a noncentrosymmetric configuration of polymer molecules characterized by a recurring structural unit corresponding to the formula:



where R^1 is a hydrocarbyl substituent containing between about 1–12 carbon atoms; n is an integer of at least 5; and Z' is an electron-donating or electron-withdrawing substituent.

4,855,079

SUPER PARAMAGNETIC FLUIDS AND METHODS OF MAKING SUPER PARAMAGNETIC FLUIDS

John E. Wyman, Westford, Mass., assignor to Hitachi Metals, Ltd., Tokyo, Japan and Consolidated Chemical & Consulting Co., Westford, Mass.

Continuation-in-part of Ser. No. 925,248, Oct. 31, 1986, Pat. No. 4,701,276. This application Aug. 27, 1987, Ser. No. 89,853
The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.
Int. Cl.[4] H01F *1/25, 10/10*
U.S. Cl. 252—62.52 28 Claims

1. A magnetic fluid comprising:
(a) a carrier liquid;
(b) a dispersing agent comprising a salt of an aromatic sulfonic acid which disperses coated magnetic particles in said carrier liquid; and
(c) coated magnetic particles coated with a combination of organic acids which renders said magnetic particles hydrophobic, wherein said combination of acids comprises

from about 1% to about 70% of a first acid selected from the group consisting of arachidic acid, behenic acid and a mixture of arachidic and behenic acids and from about 30% to about 99% of a second acid selected from the group consisting of oleic acid, linoleic acid, linolenic acid and isostearic acid, said combination of organic acids being capable of peptizing said magnetic particles into a fugitive solvent for said dispersing agent.

4,855,080

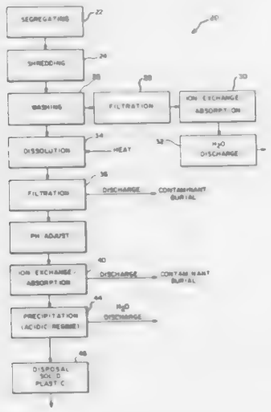
METHOD FOR DECONTAMINATING SPECIALLY SELECTED PLASTIC MATERIALS WHICH HAVE BECOME RADIOACTIVELY CONTAMINATED, AND ARTICLES

William J. McConaghy, San Jose, Calif., and James M. Wallace, Gainesville, Ga., assignors to Nutech, Inc., San Jose, Calif.

Filed Jun. 7, 1988, Ser. No. 203,419

Int. Cl.[4] G21F *9/08, 9/16;* **C02F** *1/42;* **B01D** *11/00*

U.S. Cl. 252—626 **28 Claims**



1. A method for disposing of plastic materials formed into articles for use in an environment having radioactive materials and contaminants, which plastic materials have become radioactively contaminated due to exposure in such environment, comprising the steps of:

selecting as the plastic materials a copolymer of an unsaturated organic acid;

dissolving the plastic materials in an aqueous solvent to produce an effluent stream;

providing for, selectively using one of an ion exchange and an adsorption step whereby the soluble materials, at least some of which are radioactively contaminated, are removed from the effluent stream;

disposing of the soluble materials as radioactively contaminated materials;

discharging the effluent stream selectively by one of reusing the plastic materials and disposing of the plastic materials as non-radioactive contaminated waste.

4,855,081

METHOD FOR DECONTAMINATING CONVENTIONAL PLASTIC MATERIALS WHICH HAVE BECOME RADIOACTIVELY CONTAMINATED, AND ARTICLES

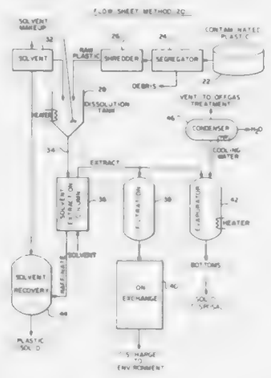
James M. Wallace, Gainesville, Ga., assignor to Nutech, Inc., San Jose, Calif.

Filed Jun. 7, 1988, Ser. No. 203,420

Int. Cl.[4] G21F *9/08, 9/16;* **C02F** *1/42;* **B01D** *11/00*

U.S. Cl. 252—626 **13 Claims**

1. A method of removing low level radioactive contaminants from plastic materials contaminated in a radioactively contaminated environment in order to concentrate the radioactive contaminants for more compact disposal in a low level radioactive waste disposal facility and in order to be able to recycle the plastic materials or dispose of the plastic materials in a conventional manner without restrictions associated with radioactivity contaminated plastic materials, comprising the steps of:



dissolving the plastic materials in an organic solvent to produce a feed stream;

contacting the feed stream in a solvent extraction device with an aqueous solvent to cause the contaminants to transfer from an organic phase to an aqueous phase.

4,855,082

PROCESS FOR RENDERING HARMLESS DANGEROUS CHEMICAL WASTE

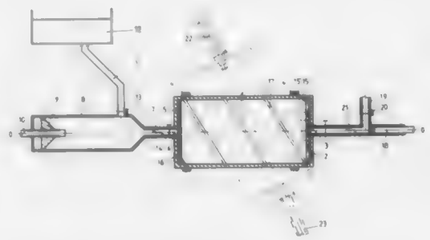
Machiel N. Duivelaar, Maassluis, Netherlands, assignor to Willy De Roode, Maassluis, Netherlands

Filed Sep. 5, 1984, Ser. No. 647,627

Claims priority, application Netherlands, Sep. 9, 1983, 8303132

Int. Cl.[4] G21F *9/16*

U.S. Cl. 252—629 **5 Claims**



1. A process for incorporating chemically dangerous waste material in solid silica glass to render said waste harmless comprising the steps of converting ordinary solid silica glass into a liquid, mixing the waste material with the liquid glass in a closed container under high pressure and high temperature, and thereafter cooling said mixture, removing said mixture from said container and forming said mixture into shaped units for disposal.

4,855,083

SOLIDIFYING AGENT COMPRISING SLAG DUST FROM INDUSTRIAL WASTE, METHOD OF SOLIDIFYING LIQUID ORGANIC HALOGENIDE AND BURNING METHOD FOR DISPOSING OF LIQUID ORGANIC HALOGENIDE

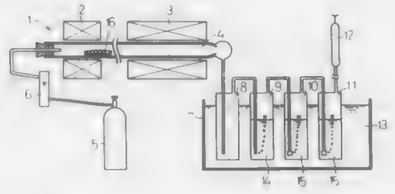
Yoshihiro Kagawa, and Keimitsu Hori, both of Kitakyushyushi, Japan, assignors to Taihosangyo Co., Ltd., Osaka, Japan

Filed Dec. 11, 1987, Ser. No. 131,439

Claims priority, application Japan, Jan. 13, 1987, 62/7117

Int. Cl.[4] G21F *9/08, 9/14;* **F23B** *7/00*

U.S. Cl. 252—632 **14 Claims**



1. A method for disposing of liquid organic halogenides which comprises: adding silicates, water-soluble, high molecular weight compounds, metal salts of an organic acid, calcium carbonate and slag dust from the refining of metals containing at least activated alumina, caustic lime, magnesium oxide and manganese oxide, and water to form a mixture, and stirring and uniformly blending the mixture to form solid composites containing said organic halogenides.

4,855,084

ANTHRAQUINOYLCARBOXYLIC ACID HYDRAZIDES, CURABLE COMPOSITIONS AND USE THEREOF

Rudolf Duthaler, Bettingen, Switzerland; Jürgen Finter, Freiburg, Fed. Rep. of Germany; Walter Fischer, Reinach, and Visvanathan Ramanathan, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

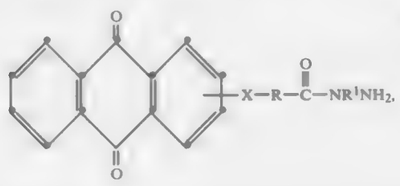
Filed Jun. 20, 1988, Ser. No. 208,522

Claims priority, application Switzerland, Jul. 1, 1987, 2484/87

Int. Cl.[4] C07C *103/75;* **C09B** *1/00*

U.S. Cl. 260—377 **6 Claims**

1. An anthraquinone of formula I



(I)

wherein X is the group $—CR^2R^3—$, where R^2 is H, —CN or C_1–C_5-alkyl and R^3 is H or —CN, R^1 is H or C_1–C_5-alkyl and R is a direct bond or linear or branched C_1–C_{18}-alkylene which, alone or together with the $—CR^2R^3—$ group, can be interrupted by one or more —O— when R^2 and/or R^3 are not —CN.

4,855,085

ASYMMETRIC SYNTHESIS OF NATURAL VITAMIN E

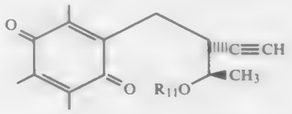
Ka-Kong Chan, Hopatcong, N.J., and Gabriel G. Saucy, Vero Beach, Fla., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 135,128, Dec. 18, 1987. This application Jan. 30, 1989, Ser. No. 303,502

Int. Cl.[4] C07C *50/06*

U.S. Cl. 260—396 R **3 Claims**

1. The optical active antipode of the formula:



wherein R_{11} is mesyl or tosyl, or lower alkanoyl.

4,855,086

NOVEL PESTICIDES, PREPARATION AND USE

Malcolm H. Black, and Robert J. Blade, both of Tring, United Kingdom, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

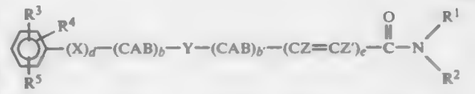
Filed Oct. 11, 1983, Ser. No. 540,801

Claims priority, application United Kingdom, Oct. 15, 1982, 8229550; Dec. 21, 1982, 8236346; Jun. 7, 1983, 8315566

Int. Cl.[4] C07C *103/22*

U.S. Cl. 260—404 **7 Claims**

1. A compound of the Formula (IA):



(IA)

wherein R^1 and R^2 are the same or different and each is hydrogen, alkyl, C_{3-8} cycloalkyl, (C_{3-8} cycloalkyl)-alkyl, aryl, aralkyl or alkenyl any of which groups may be substituted with alkoxy, alkyl, halo, hydroxy; R^3, R^4 and R^5 are independently hydrogen, halo, alkyl, alkenyl, alkoxy, phenyl, naphthyl, furyl, thienyl, aromatic carbocyclic group, aralkyl, SO_2NR_2 where R is alkyl, any of which groups may be substituted with alkoxy, alkyl, halo or hydroxy;

d is 1 or 2;

each X is independently selected from C=C and CZ=CZ';

each Z and Z' is independently selected from hydrogen, halo and alkyl;

Y is CAB, CH_2OCH_2 or $CH_2S(O)dCH_2$ where d is 0, 1 or 2;

each A and B is independently selected from hydrogen, alkyl and halo provided that neither A nor B is halo in a group CAB which is α to an unsaturated atom;

b and b', which may be the same or different, are 0 or an interger from 1 to 5, b and b' together totaling not more than 7;

e is 1 or 2; and

the configuration of the olefinic group conjugated to the CO group is E.

4,855,087

PROCESS FOR THE PREPARATION OF 2-CHLOROETHANEPHOSPHONYL DICHLORIDE

Herbert Siegel, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

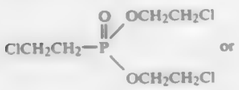
Filed Dec. 1, 1987, Ser. No. 127,175

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1986, 3641100

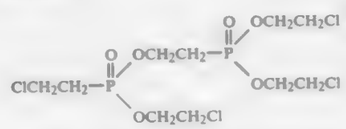
Int. Cl.[4] **C07F** *9/42*

U.S. Cl. 562—817 **6 Claims**

1. A process for the preparation of 2-chloroethanephosphonyl dichloride by reaction of an ester of 2-chloroethanephosphonic acid of the formula



or



or mixture of the two esters with thionyl chloride at a temperature of 60° to 160° C., which comprises carrying out the reaction in the presence of a catalyst which comprises alkali metal halide or alkaline earth metal halide and phosphine oxides of the formula



in which the radicals R^1, R^2 and R^3 can be identical or different and denote straight-chain or branched C_1–C_{10}-alkyl, phenyl, or phenyl which is substituted with halogen radicals, C_1–C_4-alkyl radicals or C_1–C_4-alkoxy radicals.

4,855,088

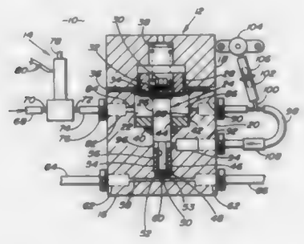
BUBBLE GENERATOR AND METHOD

Chul H. Sohn, Irvine, and David L. Goodale, Anaheim, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 67,034, Jun. 26, 1987, abandoned. This application Oct. 20, 1988, Ser. No. 262,248

Int. Cl.[4] **B01F** *3/04*

U.S. Cl. 261—53 **31 Claims**



1. A device for generating a plurality of gas bubbles in a liquid, comprising:

a conduit having a passageway adapted to carry the liquid;

a first gas chamber proximate the conduit;

an orifice formed between the first gas chamber and the conduit;

a valve member adapted to seat against and close the orifice, the orifice being in a wall to the conduit whereby the valve member is adjacent the passageway;

a gas inlet adapted to connect the first gas chamber to a supply of pressurized gas; and means for actuating the valve member between a closed position wherein the valve members seats against and closes the orifice and an open position wherein the valve member opens the orifice between the first gas chamber and the conduit.

4,855,089

DISTRIBUTOR FOR DISTRIBUTING LIQUID IN AN EXCHANGE COLUMN

Christoph Michels, Wurzburg Lengfeld, Fed. Rep. of Germany, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 2, 1988, Ser. No. 163,371

Claims priority, application Switzerland, Mar. 2, 1987, 00782/87

Int. Cl.[4] **B01F** *3/04*

U.S. Cl. 261—97 **15 Claims**



1. A distributor for distributing liquid in an exchange column comprising

a plurality of distribution channels for receiving a liquid, each said channel having a pair of vertically disposed side walls;

a feeding device for feeding liquid to said distributors;

a plurality of orifices in a lower region of at least one side wall of a distribution channel adapted to expel streams of liquid laterally away from said side wall during normal operation; and

a plurality of impact walls, each said impact wall having a flat uninterrupted portion spaced for impacting of a liquid stream thereon and formation of a downwardly flowing film on said impact wall, each said impact wall being spaced from a respective side wall a distance greater than the thickness of the film of liquid thereon.

4,855,090

METHOD OF PRODUCING HIGH AQUEOUS VOLUME MULTILAMELLAR VESICLES

Donald F. H. Wallach, Brookline, Mass., assignor to Micro-Pak, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 25,525, Mar. 13, 1987, abandoned. This application Jul. 28, 1987, Ser. No. 78,658

Int. Cl.[4] **A61K** *9/66, 37/22;* **B01J** *13/02*

U.S. Cl. 264—4.1 **34 Claims**

1. A method of preparing high aqueous volume multilamellar lipid vesicles consisting essentially of the steps of:

A. Providing a solventless non-aqueous liphphilic phase by blending a polyoxyethylene fatty ether surfactant with a sterol and a charge producing amphiphile while maintaining the temperature of said lipophilic phase above the melting point of said surfactant;

B. Providing an aqueous phase formed of an aqueous solvent and any aqueous soluble materials to be encapsulated; and

C. Combining said non-aqueous lipophilic phase with a substantial excess of said aqueous phase in a single step under shear conditions while maintaining the temperature of the mixture above the melting point of said surfactant;

whereby said high aqueous volume multilamellar lipid vesicles are formed in less than two minutes without forming a separable hydrated lamellar phase.

4,855,091

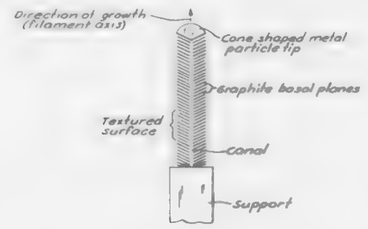
METHOD FOR THE PREPARATION OF CARBON FILAMENTS

John W. Geus, GJ Bilthoven, Netherlands, and John W. Linowski, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 15, 1985, Ser. No. 723,123

Int. Cl.[4] **D01D** *5/00;* **D01F** *9/08*

U.S. Cl. 264—22 **14 Claims**



1. A method for the preparation of carbon filaments, comprising the steps of exposing a thermostable support having substantially completely reduced monocrystalline ferro-magnetic metal particles to a carbon containing gas at a temperature of from about 250° C. up to about 700° C. to 800° C. for a period of time sufficient to promote epitaxial growth of graphite layers at the interface of the metal particle and the support, substantially each of said metal particle having a particle size of at least about 5 nanometers, forming carbon filaments on the support, the upper temperature limit of from 700° C. to 800° C. being contingent upon the stability of a metal carbide which is formed preceding the nucleation of filamentous carbon, said filaments being characterized by a crystalline graphitic structure and a morphology defined by a fishbone-like arrangement of the graphite layers along an axis of the filaments, adjusting loading of the support surface with the metal particles prior to the step of exposing the support and metal particles to the carbon containing gas to control the desired number of the carbon filaments per unit area of support surface, and thereafter separating the carbon filaments from the support.

4,855,092

PROCESS FOR PREPARING A CARBONACEOUS FUEL CELL ELECTRODE SUBSTRATE INCORPORATING THREE-LAYER SEPARATOR

Hiroyuki Fukuda; Masatomo Shigeta; Hisatsugu Kaji, all of Iwaki, and Kuniyuki Saitoh, Abiko, all of Japan, assignors to Kurcha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 719,561, Apr. 3, 1985, Pat. No. 4,579,789. This application Nov. 18, 1985, Ser. No. 798,895

Claims priority, application Japan, Apr. 9, 1984, 59-70410; Jul. 4, 1984, 59-138558; Jul. 5, 1984, 59-140259

Int. Cl.[4] **C01B** *31/02;* **H01M** *4/96*

U.S. Cl. 264—29.5 **24 Claims**

1. In a process for preparing an electrode substrate for fuel cells including a gas impermeable layer which is formed of a carbon plate, first and second flexible graphite sheets provided on respective sides of said carbon plate, and first and second porous carbonaceous layers which are provided on respective sides of said graphite sheets and which each have a number of elongated holes for feeding reactant gases into a fuel cell provided near the center of the thickness of said porous layer, said carbon plate and graphite sheets forming a gas impermeable layer, wherein said porous carbonaceous layer has an average bulk density in the range of from 0.4 to 0.8 g/cm^3, a porosity in the range of from 50 to 80% and a specific gas permeability of 20 ml/cm·hr·mmAq. or more, 60% or more of open pores in the porous layer has a diameter in the range of from 5 to 50 μm, said process comprising, (1) supplying, into a mold having a proper configuration, (i) materials for the porous layer each of which is a mixture comprising 10–50% by weight of a filler (A), 20–40% by weight of a binder (B) and 20–50% by weight of a pore regulator (C), (ii) a material for forming the elongated holes for feeding reactant gases and (iii) the carbon plate, (2) press molding the thus supplied materials (3) postcuring the press molded materials and (4) calcining the postcured materials under an inert atmosphere,

the filler (A) being selected from the group consisting of short carbon fibers and carbon particles, the short carbon fibers having a diameter in the range of from 5 to 30 μm, a fiber length in the range of from 0.02 to 2 mm and linear carbonizing shrinkage in the range of from 0.1 to 3.0% when calcined at 2,000° C.

the binder (B) being selected from the group consisting of phenol resins, epoxy resins, petroleum and/or coal pitches and mixtures thereof which have a carbonizing yield in the range of from 30 to 75% by weight,

the pore regulator (C) comprising organic granules, 70% or more of which have a particle diameter in the range of from 30 to 300 μm, the organic granules being selected from the group consisting of polyvinyl alcohols, polyvinyl chlorides, polyethylenes, polypropylenes, polystyrenes and mixtures thereof,

the material (ii) for forming elongated holes being of polymer which does not evaporate nor melt-flow at 100° C., the polymer being selected from the group consisting of polyethylenes, polypropylenes, polystyrenes, polyvinyl alcohols and polyvinyl chlorides which have a carbonizing yield of 30% by weight or less;

the improvement comprising the steps of:

supplying in this order into a mold having a proper configuration, (a) a material for forming said first porous layer, (b) a material for forming said elongated holes in said first porous layer, (c) a material for further forming said first porous layer, (d) a precombined material for forming said gas impermeable layer which has been prepared by hot pressing and bonding two flexible graphite sheets on both sides of a carbon plate with an adhesive material, (e) a material for forming said second porous layer, (f) a material for forming elongated holes in said second porous layer, and (g) a material for further forming said second porous layer, wherein said flexible graphite sheet has an average bulk density of 1.0 g/cm^3 or more, a specific gas permeability of 0.2 ml/cm·hr·mmAq. or less and a thickness of 1.0 mm or less; and

press molding; postcuring; and calcining said substrate under an inert environment at a temperature of from 800° to 3,000° C. to evaporate and dissipate a major part of the material for forming said elongated holes by thermal decomposition thereof thereby forming said electrode substrate including said first and second porous carbonaceous layers having a number of said elongated holes, and to integrate said postcured materials as a whole body, wherein

said carbon plate has an average bulk density of 1.2 g/cm^3 or more, a specific gas permeability of 0.2 ml/cm hr·mm.Aq. or less and a thickness of 2 mm or less, and

the material (ii) for forming elongated holes being a textile fabric or grating-like shaped article of the polymer,

the textile fabric comprising strands or bundles of a number of strands which have been textured, the strand or the bundle having a diameter in the range of from 0.5 to 3.3 mm, the distance between two strands or bundles parallel to the gas flow direction being in the range of from 1.5 to 5 mm and the distance between strands or bundles perpendicular to the gas flow direction being in the range of from 5 to 50 mm,

the grating-like shaped article being prepared by extrusion molding of a melt of the polymer in a die or by press molding of pellets or powder or polymer in a mold, the gratings having a diameter or equivalent diameter in the range of from 0.5 to 3.3 mm, the distance between two gratings parallel to the gas flow direction being in the range of from 1.5 to 5 mm and the distance between two grating perpendicular to the gas flow direction being in the range of from 5 to 50 mm.

4,855,093

PROCESS OF MAKING A DIAPHRAGM OF CARBONACEOUS MATERIALS FOR A SPEAKER

Mitsuru Yoshida, Fujioka, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1988, Ser. No. 157,980
Int. Cl.[4] C01B *31/02;* **C08K** *5/34*
U.S. Cl. 264—29.6 **9 Claims**

1. A process for producing a diaphragm for a speaker, comprising the steps of:

mixing carbon powder in a binder mainly containing chlorine-containing vinyl resin to form a mixture composition,

applying high shearing force to said mixture composition to sufficiently knead the mixture,

then preliminarily molding the resultant mixture into a sheet shape;

molding the preliminarily molded sheet into a diaphragm,

insolubilizing, infusibilizing the diaphragm and calcining the diaphragm in an inert atmosphere,

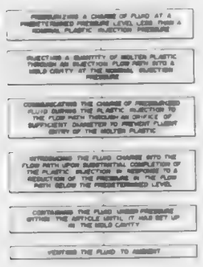
wherein said mixture composition contains at least 0.1 to 5 percent by weight of a material selected from the group consisting of 1,8-diazobicyclo (5, 4, 0) undecene-7 and a chlorine-containing vinyl chloride salt thereof.

4,855,094

METHOD FOR THE INJECTION MOLDING OF PLASTIC ARTICLES USING FLUID PRESSURE

James W. Hendry, Spring Hill, Fla., assignor to Michael Ladney, Sterling Heights, Mich.

Filed Sep. 21, 1987, Ser. No. 98,862
Int. Cl.[4] B29C *45/34, 45/46, 45/77*
U.S. Cl. 264—40.3 **10 Claims**



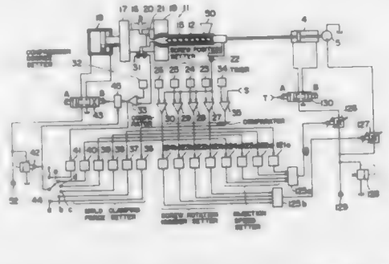
1. A method for injection molding a plastic article in a fluid assisted injection molding system, the method comprising the steps of pressurizing a charge of fluid at a predetermined pressure level no greater than a nominal plastic injection pressure; injecting a quantity of molten plastic through an injection flow path from an injection molding machine of the system into a mold cavity at the nominal plastic injection pressure; communicating the charge of pressurized fluid to the flow path during the step of injecting through an orifice immediately adjacent the flow path, the orifice having a sufficiently small dimension and the predetermined pressure level of the charge of fluid being sufficiently high at the orifice to resist entry of the molten plastic into the orifice, the pressure of the injected plastic in the flow path adjacent the orifice and the small dimension of the orifice preventing the fluid charge from entering the flow path at the orifice prior to completion of the step of injecting molten plastic; the fluid charge traveling through the orifice and into the flow path upon substantial completion of the plastic injection in a self-executing fashion in response to a reduction of the pressure of the plastic in the flow path below the predetermined pressure level of the fluid charge whereby residual plastic in the machine for the next molded article is not contaminated with the fluid; containing the fluid under pressure within the article until it has set in the mold cavity; and venting the fluid to ambient.

4,855,095

METHOD FOR INJECTION COMPRESSION MOLDING

Kazuhito Sato, Gotenba, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1987, Ser. No. 140,145
Int. Cl.[4] B29C *45/80*
U.S. Cl. 264—40.5 **6 Claims**



1. A method of operating an injection compression molding machine comprising a stationary metal mold, a movable metal mold, an oil pressure actuator for advancing said movable metal mold toward said stationary metal mold to form a mold cavity therebetween with a predetermined compression clearance δ left between said movable and stationary metal molds, a heating cylinder adapted to engage with said stationary metal mold, means for supplying a thermoplastic resin into said heating cylinder, a screw contained in said heating cylinder for injecting molten resin into said mold cavity, means for rotating said screw, and means for reciprocating said screw through said heating cylinder, said method comprising the steps of:

advancing said movable metal mold toward said stationary metal mold to form the mold cavity therebetween with the predetermined compression clearance δ left between said movable and stationary metal molds;

filling said molten resin in said mold cavity by advancing said screw in an injection stroke;

detecting positions of said advancing injection screw; and

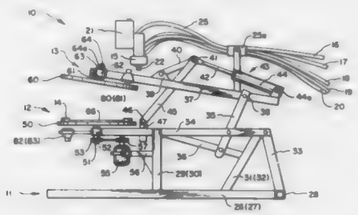
starting advancement of said movable metal mold toward said stationary metal mold for compression molding when said screw reaches a predetermined set position during said injection stroke and before the screw has completed its stroke so as to partially reduce said compression clearance δ and to increase pressure acting upon said molten resin injected into said mold cavity.

4,855,096

METHOD FOR MAKING POLYURETHANE TIRES WITH AN OUTER SKIN

Vincent F. Panaroni, 2330 Susan, Santa Anna, Calif. 92704

Filed May 23, 1986, Ser. No. 866,360
Int. Cl.[4] B29C *67/20, 41/04;* **B29D** *9/00*
U.S. Cl. 264—45.5 **8 Claims**



1. A method of producing non-pneumatic tires and the like comprising

supplying polyurethane materials comprising polyisocyanates, polyol and added water and fluorocarbons through a mixing valve and nozzle to the center of an upper surface of a circular distribution plate;

rotating the distribution plate in a horizontal plane about a central axis at a rotation speed sufficient to move the polyurethane materials as a sheet centrifugually to the edge of the distribution plate and into a mold carried by the plate and having an opening in alignment with the upper surface and into inpingement with the interior wall of the mold; and

continuing the rotation of the distribution plate while filling the mold and during the cure time of the polyurethane materials, whereby the extraneous water serves as a reactive polyol and reacts with the polyisocyanate to create carbon dioxide gas which yields increased expansion pressure which when coupled with the controlled speed of centrifugal spinning during the critical foaming stages of the generated forming polymer mass allows the foam to produce uniform skins around a cellular inner core of a part being produced

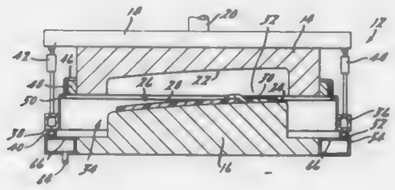
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4,855,097

COMPRESSION MOLDING A CHARGE USING VACUUM

Kenneth A. Iseler, Richmond, and Robert E. Wilkinson, Birmingham, both of Mich., assignors to The Budd Company, Troy, Mich.

Continuation of Ser. No. 640,470, Aug. 13, 1984, Pat. No. 4,612,149. This application Jul. 14, 1986, Ser. No. 885,583
Int. Cl.[4] B29C *43/56*
U.S. Cl. 264—102 **18 Claims**



1. A method of making a part having a large surface area and providing the part with a smooth surface by compression molding a charge containing a curable resin, said method comprising:

(a) opening a mold having an upper die and a lower die with opposing molding surfaces that cooperate to define a mold cavity having a shape corresponding to the desired shape of the part;

(b) placing the charge on the molding surface of one of the dies so that the charge covers 40%–80% of the surface area of the molding surface, the charge being in the form of at least one ply of thermosetting sheet molding compound (SMC) containing a heat curable resin and reinforcing fibers therein;

(c) moving the dies toward each other to a partially closed condition where the mold cavity is essentially defined but the other die remains spaced from the charge;

(d) evacuating the mold cavity;

(e) closing the mold so that the dies compress the charge to cause it to fill the mold cavity;

(f) allowing the resin to cure; and

(g) opening the dies and removing the part.

4,855,098

METHOD OF FORMING CANDLES AND CANDLE COMPOSITION THEREFOR

Ted Taylor, 160 Healdville Rd., Mt. Holly, Vt. 05758

Filed Dec. 16, 1987, Ser. No. 133,541
Int. Cl.[4] B29C *65/00, 65/26;* **C10G** *73/36*
U.S. Cl. 264—103 **14 Claims**

1. A candle composition consisting essentially of about 10 to 90 volume percent of a first paraffin wax with a melting point of 120° to 125° F. and having a maximum of 2.0 percent oil; about 10 to 90 volume percent of a second paraffin wax with a melting point of 125° to 130° F. and having a maximum of 0.5 percent oil; and about 0.1 to 1.0 volume percent of a stretchability enhancer.

4. In a method of forming a candle, the steps comprising:

submerging a plurality of wax pieces consisting essentially of about 10 to 90 volume percent paraffin wax with a melting point of 120° F. and having a maximum of 2.0 percent oil, about 10 to 90 volume percent paraffin wax with a melting point of 125° to 130° F. and having a maximum of 0.2 percent oil and about 0.1 to 1.0 volume percent of a stretchability enhancer in water having a temperature between about 100° and 120° F.;

permitting said pieces to soften in said water;

removing said pieces from said water;

joining said soft pieces together while said pieces are soft; and

inserting wick material in between said joined soft pieces.

4,855,099

SINGLE STAGE PROCESS FOR PRODUCING CONTINUOUS POLYESTER-BASED MULTIFILAMENT YARNS AT HIGH SPEED

Francesco D'Andolfo, Cesano Maderno, and Fulvio Grampa, Busto Arsizio, both of Italy, assignors to Saia Fibre s.p.a., Cesano Maderno, Italy

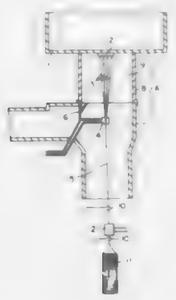
Continuation of Ser. No. 688,150, Dec. 31, 1984, abandoned. This application Dec. 22, 1986, Ser. No. 942,932
Claims priority, application Italy, Dec. 30, 1983, 24454 A/83
Int. Cl.[4] D01D *5/092;* **D01F** *6/62*
U.S. Cl. 264—103 **5 Claims**

1. A method for producing continuous multifilament yarns of polyethylene terephthalate in a single stage and without deflecting spinning rollers, comprising at least the steps of extruding molten polyethylene terephthalate through dies to form filaments, cooling the filaments by blowing, applying a dressing thereto, interlacing and winding the filaments, wherein:

said polyethylene terephthalate having an inherent viscosity in the range of 0.52 to 0.82;

directly below the die and over a distance varying from 30 to 50 cm, the filaments being passed through a medium unperturbed by air streams and maintained at an assigned temperature;

said temperature being in the range of 60° to 80° C.;
said cooling by blowing being performed below said unperturbed medium and above said application of said dressing, interlacing and winding;
the applicatin of said dressing taking place through an arrangement comprising a nozzle and thread guide whereby



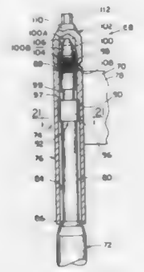
the filaments are gathered into a continuous multifilament yarn;
said arrangement being placed at a distance from the die of from 60 to 70 cm; and
said winding being carried out at a speed in the range of 3500 to 5500 meters/minute.

4,855,100

RECONSTITUTABLE CONTROL ROD SPIDER ASSEMBLY

John M. Shallenberger, Fox Chapel Borough, and Stephen J. Ferlan, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 2, 1988, Ser. No. 162,841
Int. Cl.[4] G21C *7/00*
U.S. Cl. 376—327 **7 Claims**



1. In a reconstitutable control rod spider assembly for use with a nuclear fuel assembly, said control assembly including a spider structure and at least one control rod, an attachment joint for detachably fastening the control rod to the spider structure, said attachment joint comprising:
(a) a hollow connecting finger of said spider structure having a central bore defined therethrough from a bottom end to a top end thereof, an upper end portion of said bore being smaller in diameter and shorter in length than a bottom portion of said bore so as to define a downwardly facing annular shoulder on the interior of said finger between said end portions, and a pair of opposing flat segments formed on the interior of said finger extending from said shoulder and into said bottom end portion of said bore;
(b) an elongated upper end plug of said control rod having a pair of opposing flat sectors formed on the exterior thereof and adapted to interfit with said opposing flat segments on said connecting finger such that a top edge defined by said flat sectors abut said shoulder above said flat segments to thereby positively retain said control rod in one of a pair of predefined angularly-displaced positions relative to said connecting finger when said upper end plug is inserted through said connecting finger from said bottom end thereof, an externally-threaded portion formed on the exterior thereof above said flat sectors and being spaced therefrom by a reduced diameter portion, at least a portion of said externally-threaded portion extending substantially above said top end of said connecting finger when said upper end plug is inserted through said connecting finger from said bottom end thereof, and a non-deformable pilot aligning portion formed thereon outwardly of and being of smaller diameter than said externally-threaded portion; said pilot aligning portion including an outer conical terminal end section and an inner cylindrical section disposed between and interconnected said outer terminal end section and said externally-threaded portion; and
(c) fastening means insertable over said outer conical terminal end section and said inner cylindrical section of said pilot portion and then over said externally-threaded portion of said upper end plug once said upper end plug has been inserted through said connecting finger, said fastening means having an internally-threaded portion being detachably fastened and locked on said externally-threaded portion of said upper end plug once said upper end plug has been inserted through said connecting finger for completing said attachment joint between said connecting finger of said spider structure and said upper end plug of said one control rod, said outer conical terminal end section and inner cylindrical section of said pilot portion being of sufficient length extending outwardly of said externally-threaded portion of said upper end plug to permit alignment of said externally-threaded portion of said upper end plug by said pilot portion thereof with said internally-threaded portion of said fastening means before threading of said threaded portions together can commerce so as to preclude cross-threading of said threaded portions during remote installation and removal of said fastening means onto and from said upper end plug.

4,855,101

PROCESS FOR COATING PROSTHESES OF TITANIUM AND TITANIUM ALLOYS

Rudolf Mohs, and Günter Bensmann, both of Essen, Fed. Rep. of Germany, assignors to Fried. Krupp GmbH, Fed. Rep. of Germany

Filed Jul. 1, 1988, Ser. No. 213,942
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723650
Int. Cl.[4] G22F *7/00*
U.S. Cl. 419—8 **12 Claims**

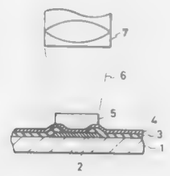
1. Process for sinter-fusing titanium particles or titanium alloy particles onto the surface of a prosthesis shaft made of titanium or a titanium alloy for better bone fusion, comprising providing a coating between the particles and the shaft before the sinter-fusing, the coating being of a material which forms below the α-β-transition temperature a liquid phase with the material of the prosthesis and the particles, which is performed below α-β-transition temperature.

4,855,102

SINTERING METHOD

Ryoji Okada, Niihari; Mitsuaki Haneda, Nishiibaraki; Takeshi Araya, Higashikurume, and Susumu Hioki, Kashiwa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 21, 1988, Ser. No. 171,461
Claims priority, application Japan, Mar. 20, 1987, 62-63848
Int. Cl.[4] B22F *7/00*
U.S. Cl. 419—8 **14 Claims**



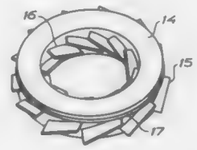
1. A method for sintering ultra-fine metallic powder or a mixture of said ultra-fine metallic powder and ceramic powder by the application of radiant energy which comprises providing a powder comprising black ultra-fine metallic particles or a mixture of black ultra-fine metallic particles and ceramic particles, said black ultra-fine metallic particles exhibiting a reflection factor below 50% of the reflection factor in bulk and exposing said powder to irradiation to sinter said powder and to convert said black ultra-fine metallic particles from the state of an energy absorber to the state of an energy reflector in the sintered product, said black ultra-fine metallic particles having a particle size ranging from 0.01 to 1 μm or below.

4,855,103

METHOD FOR MANUFACTURING METALLIC PRODUCTS FROM POWDER BY HOT ISOSTATIC PRESSING USING CERAMIC CORES

Ragnar Ekbom, Finspång, Sweden, assignor to Asea Stal AB, Finspang, Sweden

PCT No. PCT/SE87/00101, § 371 Date Dec. 21, 1987, § 102(e) Date Dec. 21, 1987, PCT Pub. No. WO87/05241, PCT Pub. Date Sep. 11, 1987
PCT Filed Mar. 4, 1987, Ser. No. 124,102
Claims priority, application Sweden, Mar. 4, 1987, 8600965
Int. Cl.[4] B22F *7/04*
U.S. Cl. 419—26 **1 Claim**



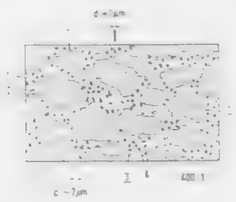
1. Method of manufacturing metal products of a powder comprising the steps of disposing a core including a body of one of the materials in the group comprising graphite and hexagonal boron nitride, in a mold cavity formed by a gas-tight casing, filling the powder into said mold cavity, isostatically hot pressing the powder in the mold cavity to form a monolithic body thereof, and removing said core from the monolithic body by disintegrating the core by blasting.

4,855,104

METHOD FOR THE PRODUCTION OF SINTERED ELECTRICAL CONTACT MATERIAL FOR LOW VOLTAGE POWER SWITCHING

Bernhard Rothkegel, Nuremberg, and Wolfgang Haufe, Hessdorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Division of Ser. No. 930,958, Nov. 12, 1986. This application May 6, 1988, Ser. No. 190,804
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1984, 3421758
Int. Cl.[4] B22F *3/24*
U.S. Cl. 419—28 **7 Claims**



1. A method for producing an $AgSnO_2Bi_2O_3CuO$ sintered contact material comprising the steps of:
forming an internally oxidized $AgSnO_2Bi_2O_3Cu$ composite powder from an AgSnBiCu alloy;
mixing a Bi_2O_3 powder to the composite powder to form a mixture;
compacting the mixture; and
sintering the mixture, wherein the contact material is formed into a dense contact for use in low voltage power switch gear.

4,855,105

WEAR-RESISTANT STEEL

Nikolai A. Svidunovich, Minsk; Leonid I. Parfenov, Moscow; Alexandr I. Garost, Minsk; Gennady A. Sorokin, Vostochno-Kazakhstanskaya; Viktor N. Volkov, Vostochno-Kazakhstanskaya; Viktor A. Obiedkov, Vostochno-Kazakhstanskaya; Valery K. Karbanovich, Minsk; Vladimir V. Vashkevich, Minsk, and Alexandr N. Verbitsky, Minsk, all of U.S.S.R., assignors to Belorussky Tekhnologichesky Institut Imeni S.M. Kirova, U.S.S.R.

Filed Sep. 3, 1987, Ser. No. 92,676
Int. Cl.[4] C22C *38/04, 39/30*
U.S. Cl. 420—75 **3 Claims**

1. A wear-resistant steel consisting essentially of carbon, manganese, silicon, sulphur, phosphorous, nitrogen, titanium, and iron in the following % by weight:

carbon	0.4–1.3

-continued

manganese	3–11.5
silicon	0.1–1.0
sulphur	up to 0.05
phosphorus	up to 0.1
titanium	0.01–0.15
nitrogen	0.02–0.9
iron	the balance.

4,855,106

LOW ALLOY STEELS FOR USE IN PRESSURE VESSEL

Masaaki Katsumata, Kobe; Isamu Takagi; Eiji Takahashi, both of Hyogo; Tadamichi Sakai, Kobe; Yoji Matsumoto; Hideaki Ohtsu, both of Hyogo; Hiroyuki Uchida, Kobe, and Kiyoshi Asami, Hyogo, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation of Ser. No. 883,424, Jul. 14, 1986, abandoned, which is a continuation of Ser. No. 704,853, Feb. 25, 1985, abandoned. This application Sep. 15, 1987, Ser. No. 96,798
Claims priority, application Japan, Feb. 29, 1984, 59-39628
Int. Cl.[4] C22C *38/24*
U.S. Cl. 420—109 8 Claims

1. A low alloy steel for use in a pressure vessel consisting essentially of on a weight % basis:
C: from 0.05% to 0.20%,
Si: less than 0.10%,
Mn: from 0.3% to 1.5%,
Ni: from a trace impurity level to 0.55%,
Cr: from 1.5% to 5.5%,
Mo: from 0.5% to 1.5%,
V: in excess of 0.3% and less than 0.6%,
Nb: from 0.05% to 0.08%,
Ca: from 0.0005% to 0.02%, and
the balance of iron and inevitably incorporated impurities.

4,855,107

ALUMINIUM ALLOY FOR THIN METAL SHEETS WHICH ARE SUITABLE FOR THE PRODUCTION OF CAN LIDS AND BODIES AND A PROCESS FOR MANUFACTURING SAID METAL SHEETS

Didier Teirlinck, Saint Egreve, and Jacques Gagniere, Montreuil-Juigne, both of France, assignors to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

Filed Apr. 7, 1988, Ser. No. 178,539
Claims priority, application France, May 19, 1987, 87 07170
Int. Cl.[4] C22C *21/00*
U.S. Cl. 420—546 6 Claims

1. An aluminium alloy for the production of thin sheets suitable for the production of can lids and bodies, consisting essentially of, in percent by weight:
$0.8 \leqq \text{manganese} \leqq 1.8$
$1 < \text{silicon} \leqq 2$
$0.7 \leqq \text{magnesium} \leqq 3$
$\text{iron} < 0.7$
$\text{copper} < 0.5$
$\text{chromium} < 0.5$
remainder: aluminium.

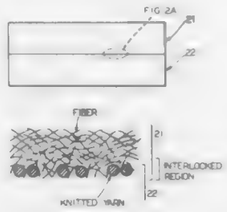
4,855,108

MEMBER OF ANALYTICAL ELEMENT FOR THE ANALYSIS OF LIQUID SAMPLE CONTAINING SOLID

Nobuhito Masuda, and Takeshi Igarashi, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 728,404, Apr. 29, 1985, abandoned.
This application Sep. 16, 1987, Ser. No. 98,735
Claims priority, application Japan, Apr. 27, 1984, 59-87459; Apr. 27, 1984, 59-87460; Apr. 27, 1984, 59-87461
Int. Cl.[4] G01N *31/22*
U.S. Cl. 422—56 6 Claims

1. A filtration element for use in the analysis of a liquid sample containing solid material which comprises a volume filtration layer and a spreading layer having a liquid-retaining capacity larger than that of the volume filtration layer, wherein the volume filtration layer is made of fibrous material having a diameter of 0.1 to 1.0 μm and a wavelength of 10–4,000 μm and has a density of 0.02 to 0.1 g/cm^3, the spreading layer is made of woven or knitted cloth, the volume filtration layer and the spreading layer are united to give an integrated structure to have an interface between both layers, and the fibrous material of the volume filtration layer is interlocked with the spreading layer at the interface.



4,855,109

CHEMICAL ANALYSIS APPARATUS

Katsuaki Muraishi, Kanagawa; Nakatsugu Yaginuma, Saitama; Kikuo Hirai, Saitama; Fuminori Arai, Saitama, and Yuzo Iwata, Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 9, 1987, Ser. No. 12,693
Claims priority, application Japan, Feb. 7, 1986, 61-25582; Feb. 7, 1986, 61-25583; Feb. 7, 1986, 61-25584; Feb. 7, 1986, 61-25585; Sep. 3, 1986, 61-207044; Sep. 3, 1986, 61-207045
Int. Cl.[4] B01N *35/04*
U.S. Cl. 422—63 9 Claims



1. A chemical analysis apparatus comprising:
(i) a slide loading section for holding at least one chemical analysis slide,
(ii) a sample applying section for applying a predetermined amount of a sample material to said at least one chemical analysis slide,
(iii) an incubator provided with a plurality of stationary housing compartments, each of said housing compartments being provided for separately housing a respective one of a plurality of chemical analysis slides, said housing compartments being placed side by side in a transverse direction in the same plane of said incubator,
(iv) a read-out head slideable in said transverse direction and disposed for facing a chemical analysis slide when it is housed in one of said plurality of said housing compartments via a respective read-out opening (**21***a*) formed in each of said housing compartments, thereby emitting light

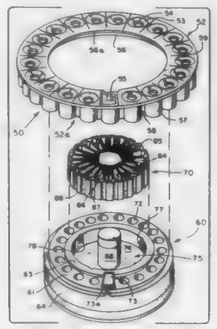
to said chemical analysis slide and measuring reflection optical density of said chemical analysis slide, and
(v) a conveyance and feed-in means for conveying a respective one of said chemical analysis slides from said slide loading section to said sample applying section, conveying the respective one of said chemical analysis slide from said sample applying section to a position facing an inlet opening of a respective one of said housing compartments, and then feeding said respective chemical analysis slide into the respective one of said housing compartments through the inlet opening thereof.

4,855,110

SAMPLE RING FOR CLINICAL ANALYZER NETWORK

Edwin M. Marker, Chicago; Paul F. Thacker, Wauconda, and Peter K. Knopfhart, Libertyville, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed May 6, 1987, Ser. No. 46,964
Int. Cl.[4] G01N *35/02;* B01L *3/00, 9/00*
U.S. Cl. 422—102 20 Claims



1. A sample containment apparatus for use in an automated analyzer network comprising a plurality of analyzers, each of said analyzers being operative to perform a selected test on a plurality of samples, and each of said analyzers including a carousel having a plurality of reaction container holding means, comprising:
ring means having a plurality of openings for receiving a plurality of samples to be tested, said ring means including a plurality of funnel means, each of said funnel means being formed around each of said corresponding openings in said plurality of openings;
a plurality of radially extending rib means located on said ring means between adjacent openings to prevent contamination of one sample by spillage from another;
a plurality of sample container means; and
mounting means attached to said ring means for removably mounting said sample containment apparatus on each carousel of a selected number of analyzers in an automated analyzer network.

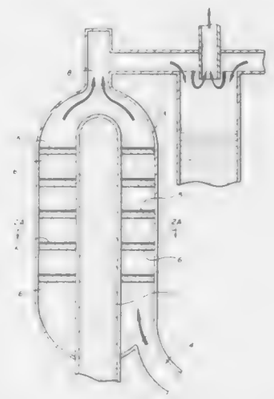
4,855,111

REACTOR FOR METHANE CONVERSION

Robert A. Bader, Overbrook Hills, and Michael G. Axelrod, Media, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 25, 1988, Ser. No. 184,925
Int. Cl.[4] B01J *8/18, 8/04*
U.S. Cl. 422—142 3 Claims

1. A reactor adapted for the conversion of methane to higher molecular weight hydrocarbons comprising a central support column and an outer shell which together define an annular reaction zone, inlet means for introducing a mixture of methane containing gas and fluidized solid catalyst particles into said reaction zone, outlet means for withdrawing a mixture of gas and fluidized solid catalyst particles from said zone, and a plurality of vertically spaced ceramic baffle assemblies comprised of wedged-shaped segments positioned in said reaction zone each perpendicular to said central support column and said outer shell, said baffle assemblies filling the annular cross-section between said support column and said outer shell and being supported at the outer wall of the central support column



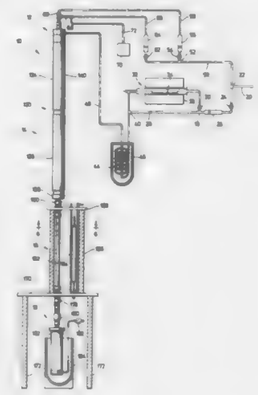
and at the inner wall of the outer shell, adjacent baffle assembly segments also being supported by radial ceramic support beams, said baffle assemblies each having a plurality of openings 0.25 to 3 inches in diameter adapted to permit passage of the mixture of gas and fluidized solid catalyst particles through said baffle assemblies only toward said outlet means, the area of said openings being 10–70% of the baffle area of each baffle assembly.

4,855,112

HIGH EFFICIENCY APPARATUS FOR AEROSOL DIRECT FLUORINATION

James L. Adcock, Knoxville, Tenn., assignor to The University of Tennessee Research Corporation, Knoxville, Tenn.

Filed Aug. 21, 1987, Ser. No. 88,158
Int. Cl.[4] B01J *19/08, 19/26*
U.S. Cl. 422—186.23 10 Claims



1. A direct fluorination apparatus for fluorinating material capable of being vaporized, comprising:

carrier particle means for providing a source of solid carrier particles suspended in a gas;

vapor means for producing a gas containing vapor of the material to be fluorinated;

fluorine means for providing a source of gas containing elemental fluorine;

an aerosol generator comprising an interior space with a flow outlet, first inlet means in flow communication with said carrier particle means and configured to introduce said carrier particles suspended in a gas from said carrier particle means into said interior space in converging flow streams directed substantially toward a convergence zone, and second inlet means in flow communication with said vapor means and configured to introduce a flow of said gas containing vapor of the material from said vapor means into said interior space directed into the approximate center of said convergence zone wherein said vapor condenses onto said carrier particles to produce an aerosol comprising said carrier particles with said vapor of the material to be fluorinated condensed thereon;

a fluorination reactor comprising an elongate tubular reactor defined by an elongate cylindrical wall means defining a confined flow path space through said fluorination reactor and said cylindrical wall means being in flow communication on its exterior with said fluorine means and having inlet and outlet open ends, said inlet open end being in flow communication on with said flow outlet of said aerosol generator so that said aerosol flows into said tubular reactor from said aerosol generator and through said flow path space defined by said cylindrical wall means to said exit open end thereof, and said cylindrical wall means being configured to diffusingly admit said gas containing elemental fluorine therethrough from said fluorine means without large or directed flow streams and substantially continuously over the area of said wall means to provide substantially continuous admittance of said gas containing elemental fluorine into said flow path space along said wall means, whereby flowing said aerosol through said flow path space causes said continuously admitted gas containing elemental fluorine to be swept along said wall means and closely adjacent thereto to provide a continuous insulating layer of said gas containing elemental fluorine between said wall means and said aerosol flowing therethrough, said layer simultaneously providing elemental fluorine for reacting with said flowing aerosol to cause the material to be fluorinated, and confining said flowing aerosol interiorly of said layer and thus substantially preventing contact between said flowing aerosol and said wall means; and

said fluorination reactor being configured and positioned with respect to said aerosol generator so that said convergence zone is closely adjacent to and centrally disposed relative to said layer of said gas containing fluorine such that said aerosol flowing into said flow path space defined by said cylindrical wall means is confined interiorly of said layer of gas containing elemental fluorine substantially immediately upon its formation.

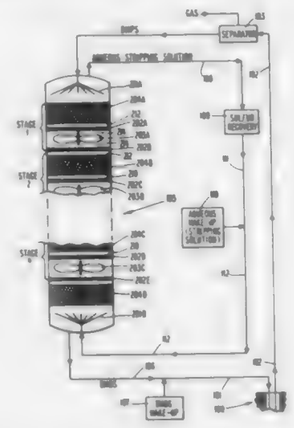
4,855,113

APPARATUS FOR REMOVING SULFUR FROM ORGANIC POLYSULFIDES

Jeffrey H. Yen, Woolwich, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 27, 1986, Ser. No. 923,240
Int. Cl.[4] B01J *8/04*
U.S. Cl. 422—259 9 Claims

1. A multistage continuous countercurrent flow extractor for removing sulfur from an organic polysulfide of high sulfur rank comprising a vertical column having a heavier liquid inlet at a first end and a lighter liquid inlet at a second end, said first end having an outlet for the lighter liquid after it traverses upwardly the length of said column and said second end having an outlet for the heavier liquid after it traverses downwardly the length of said column, the liquids being immiscible; distributor means interiorly adjacent each of said first and second ends and associated with said inlets for uniformly dispersing across a transverse cross-sectional area of the column each of the heavier and lighter liquids respectively; a plurality of successive similar stages disposed longitudinally within said column between each of said distributor means, each of said stages including components spaced from each other and from



adjacent stages, each of said stages sequentially comprising, (a) a horizontally disposed packing section free of fluid-flow baffling means, (b) first redistributor means substantially horizontally coextensive with said packing section, (c) rotary agitating means, and (d) second redistributor means substantially horizontally coextensive with said packing section; and a final packing section below and adjacent to said second redistributor means of the final stage.

4,855,114

DIOXIME KINETIC ENHANCER FOR SOLVENT EXTRACTION OF GALLIUM FROM BASIC AQUEOUS SOLUTIONS THEREOF

David L. Gefvert, Dublin, Ohio, assignor to Sherex Chemical Company, Inc., Dublin, Ohio

Filed Sep. 30, 1988, Ser. No. 252,562
Int. Cl.[4] C01G *15/00*
U.S. Cl. 423—112 7 Claims

1. In a process for recovering gallium values contained in a basic aqueous solution by liquid/liquid extraction thereof comprising contacting the basic aqueous solution with a water-immiscible, organic phase comprising a substituted hydroxyquinoline dissolved in an organic solvent therefor, whereby gallium is extracted into the organic phase; separating the organic phase from the basic aqueous phase; and recovering gallium from said separated organic phase, the improvement which comprises: the organic phase further comprising dissolved therein an organic dioxime compound.

4,855,115

PROCESS FOR REMOVING NITROGEN OXIDES FROM EXHAUST GASES

Makoto Imanari; Takeo Koshikawa, both of Ami; Akihiro Yamauchi, Koganei; Masayuki Hanada, Kitakyushu; Morio Fukuda, Kitakyushu, and Kiyoshi Nagano, Kitakyushu, all of Japan, assignors to Mitsubishi Petrochemical Co. Ltd.; Mitsubishi Jukogyo Kabushiki Kaisha; Catalysts & Chemicals Industries, Co., Ltd. and Mitsubishi Petrochemical Engineering Co., Ltd., all of Tokyo, Japan

Filed Jul. 29, 1987, Ser. No. 79,158
Claims priority, application Japan, Jul. 29, 1986, 61-178347; Jun. 19, 1987, 62-151450
Int. Cl.[4] B01J *8/00;* C01B *17/00*
U.S. Cl. 423—239 5 Claims

1. A process for removing nitrogen oxides from an exhaust gas containing the nitrogen oxides and an arsenic compound, which comprises bringing said exhaust gas into contact with a reducing gas in the presence of a catalyst to reduce the nitrogen oxides in the exhaust gas and render them nontoxic, said catalyst comprising

(A) a catalytic amount of an oxide of titanium,

(B) an oxide of at least one metal selected from tungsten and molybdenum in an amount of 0.001 to 0.3 atom as the metal for each titanium atom in component (A),

(C) an oxide of vanadium in an amount of 0.001 to 0.1 atom as vanadium for each titanium atom in component (A), and

(D) an oxide or a sulfate or a mixture of an oxide and a sulfate of at least one metal selected from the group consisting of yttrium, lanthanum, cerium and neodymium in an amount of 0.001 to 0.5 atom as the metal for each titanium atom in component (A).

4,855,116

ACTIVATED COKE METHOD OF REMOVING NITROGEN OXIDES FROM EXHAUST GASES

Ekkehard Richter; Harald Jüntgen; Hans-Jürgen Schmidt, and Karl Knoblauch, all of Essen, Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

PCT No. PCT/EP86/00205, § 371 Date Jan. 15, 1987, § 102(e) Date Jan. 15, 1987, PCT Pub. No. WO86/05711, PCT Pub. Date Oct. 9, 1986
PCT Filed Apr. 2, 1985, Ser. No. 2,793
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1985, 3512168
Int. Cl.[4] B01J *8/00;* C01B *17/00*
U.S. Cl. 423—239 5 Claims

1. A method of reducing nitrogen oxides in an exhaust gas which comprises the steps of:

(a) preparing an activated coke by

(a_1) blending a hard coal powder with a binder selected from the group which consists of pitch, bitumen, tar and tar oil to form a mixture,

(a_2) shaping said mixture to form individual bodies, and

(a_3) subjecting said bodies to a low-temperature carbonization by heating said bodies at a rate of 20° to 100° C./min to a temperature of 700° to 900° C. in an atmosphere containing 2 to 5% by weight oxygen to produce an activated coke product having 2 to 8% volatile matter and a specific surface of 20 to 150 m^2/g; and

(b) passing an exhaust gas containing nitrogen oxides and ammonia through a bed of said activated coke product at a temperature between substantially 90° and 150° C. to effect a reduction of the nitrogen oxides by the ammonia on the activated coke product.

4,855,117

PROCESS FOR REMOVING SULFUR OXIDES FROM A GAS BY MEANS OF AN ABSORPTION MASS REGENERABLE BY REACTION WITH ELEMENTAL SULFUR

André Deschamps, Noisy Le Roi; Sigismond Franckowiak, Rueil Malmaison, and Serge Leporq, Mantes La Ville, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Continuation-in-part of Ser. No. 906,480, Sep. 12, 1986, Pat. No. 4,781,903. This application Feb. 26, 1988, Ser. No. 160,973
The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.
Int. Cl.[4] C01B *17/00;* B01J *8/00*
U.S. Cl. 423—244 14 Claims

1. A cyclic process for removing sulfur dioxide from a gas containing the same, consisting essentially of repeatedly performing a first step of contacting the gas with a solid absorbent containing magnesium oxide, in the presence of oxygen, at 350°–750° C., and a second step conducted at 500°–750° C. of contacting the absorbent containing at least 1% by weight of magnesium sulfate with a reducing gas consisting essentially of sulfur vapor, so as to regenerate magnesium oxide in the absorbent, each of said first and second steps being discontinued before the subsequent step is conducted.

4,855,118

METHOD OF PRODUCING FLUORAPATITE

Noboru Ichinose, Yokohama, and Hirobumi Tanaka, Anan, both of Japan, assignors to Nichia Kagaku Kogyo K.K., Tokushima, Japan

Filed Apr. 12, 1988, Ser. No. 180,812
Claims priority, application Japan, Apr. 15, 1987, 62-90935; Apr. 15, 1987, 62-90936
Int. Cl.[4] C01B *25/10*
U.S. Cl. 423—301 3 Claims

1. A method of producing fluorapatite comprising the steps of:

(a) providing a mixture containing calcium monohydrogen phosphate, calcium carbonate, and calcium fluoride substantially in a ratio of $CaHPO_4$:$CaCO_3$:CaF_2 of 6:3:1;

(b) subjecting the mixture to a mechanochemical action selected from the group consisting of grinding, friction, sliding, cutting, centrifuging, and impact;

(c) causing the mixture to react in water at a reaction temperature of at most 100° C. thereby depositing fluorapatite; and

(d) collecting the deposited fluorapatite from the mixture.

4,855,119

METHOD OF MANUFACTURING SILICON CARBIDE WHISKER

Hajime Minamikata; Toshiaki Kanno; Masahiro Kanda, and Hitoshi Ushijima, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Continuation of Ser. No. 53,629, May 26, 1987, abandoned. This application Sep. 15, 1988, Ser. No. 244,659
Claims priority, application Japan, May 26, 1986, 61-119112
Int. Cl.[4] C01B *31/36*
U.S. Cl. 423—346 14 Claims

1. A method of manufacturing a silicon carbide whisker, comprising the steps of:

(a) heating a reaction zone to a temperature in the range of 1,100° C. to 1,500° C.:

(b) supplying a carrier gas and reaction materials to said reaction zone, said carrier gas consisting of a reducing or inactive gas, and said reaction materials consisting of a sulfur-containing organic siloxane compound wherein said sulfur promotes the reaction between silicon and carbon;

(c) thermally decomposing, in vapor phase, said reaction

materials to react silicon and carbon contained in said reaction materials by a gaseous phase reaction; and
(d) recovering a silicon carbide whisker.

4,855,120

PRODUCTION OF SILANE AND USEFUL COPRODUCTS

Everett M. Marlett, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 24, 1988, Ser. No. 261,695
Int. Cl.[4] C01B *33/04*
U.S. Cl. 423—347 15 Claims

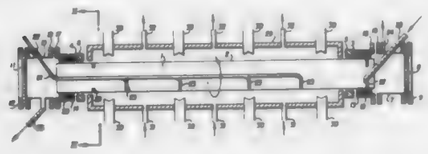
1. A process which comprises reacting tetrahydrocarbyloxysilane and tertiary amine alane such that silane and hydrocarbyloxyaluminum hydride are co-produced.

4,855,121

CONTINUOUS PROCESS FOR THE PREPARATION OF CARBON POLYMONOFLUORIDE AND APPARATUS THEREFOR

Jean Metzger, Pierre Benite, France, assignor to Societe ATOCHEM, Puteaux, France

Filed Dec. 23, 1987, Ser. No. 136,941
Claims priority, application France, Jan. 5, 1987, 87 00015
Int. Cl.[4] C01B *31/00*
U.S. Cl. 423—439 16 Claims



1. A continuous process for preparation of carbon polymonofluoride comprising reacting diluted fluorine with at least one inert gas with carbon particles, carrying out this reaction in a substantially horizontal reaction zone in a rotating reactor in which the particles travel as a thin layer along side walls of the rotating reactor, by continuously simultaneously introducing the diluted fluorine and the particles into the reaction zone, by maintaining the reaction zone at the chosen temperature and by continuously removing the carbon polymonofluoride formed, the reaction gases and the unreacted gases from the reaction zone; the process being characterized in that the diluted fluorine is introduced into the reaction zone in the form of a plurality of gaseous mixtures delivered at a plurality of points close to the layer of particles and distributed in the reaction zone; and in that the volume content of fluorine and the flow rate of each of the gaseous mixtures are controlled independently and such that the volume content of fluorine in the gaseous phase at the gaseous phase/particles interface in the vicinity of each of the points is lower than the minimum content causing inflammation of the particles.

4,855,122

METHOD FOR PRODUCING CHOPPED STRANDS OF CARBON FIBERS

Tadanori Kitamura; Hiroaki Shono, and Atsuki Kodama, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd. and Kawasaki Steel Corporation, both of, Japan

Continuation of Ser. No. 58,377, Jun. 5, 1987, abandoned. This application Jan. 3, 1989, Ser. No. 293,571
Claims priority, application Japan, Jun. 16, 1986, 61-139772
Int. Cl.[4] D01F *9/12*; C10L *3/02*
U.S. Cl. 423—447.1 3 Claims

1. A method for producing chopped strands of carbon fibers having a bulk density of 0.2–0.8 g/cm^3 which comprises spinning a petroleum or coal pitch into continuous pitch fibers, bundling and cutting thus obtained pitch fibers to a length of 1–50 mm and then subjecting the fibers to infusibilization, and then carbonization or graphitization, and then applying an inorganic or organic binder to the resulting chopped strands of carbon fibers or graphite fibers so that 0.1–3% by weight in terms of solid of the binder adheres to the strands.

4,855,123

METHOD OF OXIDIZING SULFIDE-CONTAINING LIQUOR

Masayuki Suzuki; Shinichi Hara; Kuniaki Kimura, all of Hachinobe; Takeo Ono, Kawasaki; Munekazu Nakamura, Yokohama, and Yoshihiro Ohguchi, Ebina, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Japan

Continuation of Ser. No. 927,698, Nov. 6, 1986, abandoned. This application Mar. 10, 1988, Ser. No. 170,667
Claims priority, application Japan, Apr. 18, 1986, 61-89777
Int. Cl.[4] C01B *17/22*; C01D *1/04*
U.S. Cl. 423—562 14 Claims

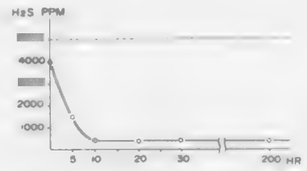
2. A process of treating an aqueous solution containing sodium sulfide and suspended solids, comprising the steps of:
(a) passing said aqueous solution up through a bed of granular solids to filter out the suspended solids, whereby a filtrate containing said sodium sulfide which is substantially free of the suspended solids is obtained; and
(b) contacting said filtrate and an oxygen-containing gas concurrently with a catalyst consisting essentially of activated carbon in a fixed bed to oxidize the sodium sulfide to form polysulfide or sodium hydroxide in solution, said activated carbon catalyst being (1) a particulate catalyst having an average particle diameter of 0.2–4 mm, a pore volume of at least 0.25 cc/g in pores with diameters of not smaller than 100 Å and a pore volume of at least 35% of the total pore volume in pores with diameters of not smaller than 100 Å or (2) a fibrous catalyst having a specific surface area of 300–2500 m^2/g and an outer surface area of 0.1–5 m^2/g.

4,855,124

PROCESS FOR THE DESULFURIZATION OF GAS CONTAINING HYDROGEN SULFIDE

Hiroo Matsuoka, Ebina; Tsutomu Toida; Takao Takinami, both of Handa City; Senji Takenaka, Yokosuka, and Tetsuo Fujita, Kawasaki, all of Japan, assignors to JGC Corporation, Tokyo, Japan

Continuation of Ser. No. 837,353, Mar. 7, 1986, abandoned. This application Nov. 4, 1987, Ser. No. 117,908
Claims priority, application Japan, Mar. 8, 1985, 60-44587; Jul. 4, 1985, 60-145844
Int. Cl.[4] C01B *17/05, 17/54*
U.S. Cl. 423—574 L 9 Claims



1. A process for the desulfurization of gas containing hydrogen sulfide comprising:
(a) introducing the gas containing hydrogen sulfide together with a gas containing sulfur dioxide simultaneously and continuously into a water medium free from any additive and pressurized at a pressure of 10 Kg/cm^2 gauge or higher in a reactor having no mechanical agitating means until the pH of the water medium falls in a range of 0.1 to below 2.0; and
(b) continuing the simultaneous introduction of the gas containing hydrogen sulfide and the gas containing sulfur dioxide into said water medium having a pH in a range of 0.1 to below 2.0, and subjecting the resulting medium to liquid phase Clause reaction to form elemental sulfur in a form of sulfur-in-water dispersion.

4,855,125

IODINATED ESTRADIOLS, INTERMEDIATE PRODUCTS AND METHODS OF PRODUCTION

Richard J. Baranczuk, Overland Park; Jay Spicer, Kansas City; William P. Duncan, Prairie Village, all of Kans., and Gary A. Rotert, Kansas City, Mo., assignors to Bio-Medical Research Laboratories, Overland Park, Kans.

Continuation of Ser. No. 663,571, Oct. 22, 1984, abandoned. This application Sep. 25, 1987, Ser. No. 102,315
Int. Cl.[4] A61K *43/00, 31/56*; C07J *1/00*
U.S. Cl. 424—1.1 8 Claims

1. A compound for use as an imaging agent; said compound being 16-alpha-^{123}I-17-beta-estradiol having a specific activity of greater than 2,000 Ci/mmole.

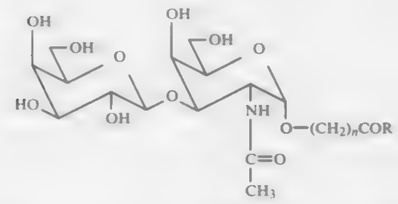
4,855,126

METHOD TO DETECT T-ANTIGEN DELAYED HYPERSENSITIVITY

Raymond U. Lemieux; Robert M. Ratcliffe, both of Edmonton, Canada, and Donald A. Baker, Castro Valley, Calif., assignors to Chembiomed Ltd., Edmonton, Canada

Division of Ser. No. 918,935, Oct. 15, 1986, which is a continuation of Ser. No. 277,680, Jun. 26, 1981, abandoned. This application Aug. 17, 1987, Ser. No. 86,360
Claims priority, application Canada, Jun. 26, 1981, 382306; European Pat. Off., Jul. 7, 1981, 81303087; Japan, Jul. 10, 1981, 56-107178
Int. Cl.[4] A61K *49/00*; G01N *33/48*
U.S. Cl. 424—9 4 Claims

1. A method of detecting a delayed-type hypersensitivity reaction to the T-antigen in the human body, comprising:
injecting intradermally in the human body the artificial T-antigen of the structure



wherein n=3—19, and R is an alkoxy, aryloxy, NHNH$_2$, OH, or N$_3$ group attached to a non-toxic soluble aminated or amine-containing, antigen-forming carrier molecule; and
detecting a delayed-type hypersensitivity reaction by the human body.

4,855,127

LATTICE-ENTRAPPED COMPOSITION

Eric S. Abrutyn, Middletown, N.Y.; Louis Scarfo, New Britain, and Richard Chromecek, Litchfield, both of Conn., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 882,609, Jul. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 683,603, Dec. 12, 1984, Pat. No. 4,724,240, which is a continuation-in-part of Ser. No. 246,663, Mar. 23, 1981, abandoned. This application May 20, 1987, Ser. No. 53,609
Int. Cl.[4] A61K *7/035, 7/40, 7/42, 9/70*
U.S. Cl. 424—411 14 Claims

1. A solid pheromone entrapped composition comprising:
from approximately 5% to approximately 95% by weight of a cross-linked hydrophobic comb-like polymer lattice;
from approximately 95% to about 5% by weight of a solid pheromone;
said monomers of said cross-linked polymer and said pheromone being polymerized in situ;
said pheromone being dispersed uniformly throughout and entrapped within said polymer lattice.

4,855,128

SACCHARIDE INHIBITION OF DENTAL PLAQUE

Donald M. Lynch, Flemington, and Benjamin Appelbaum, Flanders, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 14, 1988, Ser. No. 143,992
Int. Cl.[4] A61K *7/16*
U.S. Cl. 424—49 15 Claims

1. An oral aqueous or aqueous/alcoholic-based anti-plaque mouthwash, mouthspray, or mouthrinse composition for inhibiting plaque comprising an antiplaque agent, said antiplaque agent consisting essentially of an effective amount of from at least about .0025% w/v. to not more than about 4% w/v a polysaccharide selected from the group consisting of xanthan gum, gum tragacanth, guar gum, gum karaya, chondroitin sulfate, polygalacturonic acid, and carrageenans of the kappa/-lambda configuration.

4,855,129

SKIN-PROTECTING OR SKIN-CARE COMPOSITION

Hans-Horst Steinbach, Bergisch Gladbach, and Bernd Wittmann, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 5, 1987, Ser. No. 117,271
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1986, 3640177
Int. Cl.[4] A61K *7/021*
U.S. Cl. 424—63 11 Claims

1. A skin care or skin-protecting composition comprising as an active ingredient a highly viscous polydimethysiloxane having a viscosity of 10^6 to 5×10^7 mPa.s, and a highly volatile, linear or cyclic siloxane, wherein the content of the highly viscous polydimethylsiloxane is 5 to 20% by weight and the content of the highly volatile siloxane is 10 to 50% by weight, based on the weight of the total composition.

4,855,130

HAIR TREATING COMPOSITIONS AND PROCESSES FOR IMPROVING THE CONDITION OF HAIR

Eugen Konrad, Darmstadt; Herbert Mager, Fribourg, and Dietrich Hoch, Pfungstadt, all of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP87/00026, § 371 Date Sep. 30, 1987, § 102(e) Date Sep. 30, 1987, PCT Pub. No. WO87/04616, PCT Pub. Date Aug. 13, 1987
PCT Filed Jan. 20, 1987, Ser. No. 116,721
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1986, 3602746
Int. Cl.[4] A61K *7/06, 7/075, 7/08*
U.S. Cl. 424—70 7 Claims

1. A hair treating composition which is free of cationic surfactants comprising
(a) 0.5 to 25 percent by weight glycine,
(b) 1.0 to 10 percent by weight of a physiologically compatible aliphatic organic acid which is free of amino groups,
(c) 0.5 to 10 percent by weight of a substance selected from the group consisting of wax, an oil component or both; and
(d) balance additional components conventionally used for hair treating compositions selected from the group consisting of water, lower aliphatic alcohols, polyhydric alcohols, anionic, amphoteric, or nonionogenic surfactants, natural, modified natural or synthetic polymers,

thickeners, hair care materials, dyestuffs, pigments, perfume oils, antioxidizing agents, and preservatives.

4,855,131

PHYTOPREPARATION FOR TREATING SKIN AFFECTIONS

Pasini Iris, Crevalcore, Italy, assignor to IRIS S.a.s. di Salvioli Michele e C., Soliera, Italy

Filed Jun. 8, 1988, Ser. No. 203,910
Claims priority, application Italy, Jun. 30, 1987, 21115 A/87
Int. Cl.[4] A61K *7/06, 35/78*
U.S. Cl. 424—74 **11 Claims**

1. A composition for the treatment of skin and scalp affections consisting essentially of an infusion in vinegar of the indicated amounts of the following freshly picked plant components, all amounts being with respect to one litre of vinegar:
Geum—5 to 20 grams;
Lavandula—5 to 15 grams;
Mentha—8 to 40 grams;
Allium—10 to 60 grams; and
Salvia—10 to 30 grams;
all of the above amounts being the weights of the plants as freshly picked.

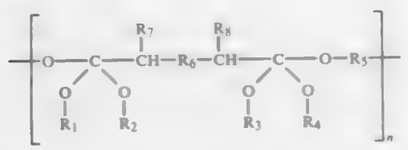
4,855,132

METHOD OF PREPARING BIOERODIBLE POLYMERS HAVING PH SENSITIVITY IN THE ACID RANGE AND RESULTING PRODUCT

Jorge Heller, Woodside; Donald W. H. Penhale, Menlo Park, and Steve Y. Ng, San Francisco, all of Calif., assignors to S R I International, Menlo Park, Calif.

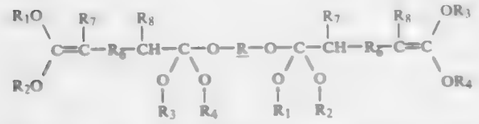
Division of Ser. No. 833,215, Feb. 25, 1986, Pat. No. 4,764,364.
This application Jul. 1, 1988, Ser. No. 214,452
Int. Cl.[4] A61K *9/22, 31/765;* **C08G** *65/28*
U.S. Cl. 424—78 **12 Claims**

1. Polymers having the repeating mer unit



wherein n is an integer substantially greater than 10; wherein R_1, R_2, R_3 and R_4 are the same or different essentially hydrocarbon groups, R_1 and R_2 being separate groups or parts of a cyclic group and R_3 and R_4 being separate groups or parts of a cyclic group; R_5 is an essentially hydrocarbon group which is the residue of a polyol $R_5(OH)_a$ wherein a is an integer equal to two or more, such polyol being a single molecular species or a mixture of molecular species: R_6 is a valence bond or an essentially hydrocarbon group; R_7 and R_8 are hydrogen or essentially hydrocarbon groups which may be separate groups or may form parts of a cyclic group; and wherein such linear chains may be crosslinked to similar chains, at least a substantial portion of the polymers having an amine functionality incorporated in R_6 or in R_5 or in both, whereby the rate of erosion of the polymer in contact with an acidic medium is substantially greater at lower acidic pH's than at higher acidic pH's.

2. Compounds having the structure



wherein R_1, R_2, R_3 and R_4 are the same or different essentially hydrocarbon groups, R_1 and R_2 being separate groups or parts of a cyclic group and R_3 and R_4 being separate groups or parts of a cyclic group; R_6 is a valence bond or an essentially hydrocarbon group; R_7 and R_8 are hydrogen or essentially hydrogen groups which may be separate groups or may form parts of a cyclic group; and R is a linking group.

4,855,133

COMPOSITION FOR ATTRACTING FLIES

Masaharu Kamei, Naka; Tsutomu Negishi, Tokushima; Masaru Nishikawa, Itano, and Kimishiro Kishino, Tokushima, all of Japan, assignors to Earth Chemical Company, Limited, Ako, Japan

PCT No. PCT/JP86/00373, § 371 Date Jul. 16, 1987, § 102(e) Date Jul. 16, 1987, PCT Pub. No. WO87/00401, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 18, 1986, Ser. No. 31,068
Claims priority, application Japan, Jul. 18, 1985, 60-158835; Jul. 26, 1985, 60-166358; Jul. 26, 1985, 60-166359; Aug. 16, 1985, 60-180749
Int. Cl.[4] A01N *25/00, 43/08, 53/00*
U.S. Cl. 424—84 **9 Claims**

1. A fly attracting composition comprising:
(a) as a fly attracting compound, about 0.01 to about 15% by weight, based on the weight of the composition, of at least one sex pheromone selected from the group consisting of 9-tricosene, cis-9-tricosene, 10-methyl-9-tricosene, cis-2-methyl-8-docosene, cis-9-docosene, cis-8-docosene and cis-10-tricosene;
(b) a colorant to impart a yellowish red color in the range of 2.5R to 2.5YR in hue to the composition; and
(c) a carrier; the composition being in granular form having a mean grain size of about 0.5 to about 5 mm.

4,855,134

SUSTAINED-RELEASE PREPARATION

Yoshiya Yamahira, Kobe; Keiji Fujioka, Amagasaki, and Shigeji Sato, Ibaraki, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 660,045, Oct. 12, 1984, abandoned. This application Apr. 24, 1986, Ser. No. 855,387
Claims priority, application Japan, Oct. 14, 1983, 58-193064; Nov. 1, 1983, 58-206226
The portion of the term of this patent subsequent to Sep. 27, 2005, has been disclaimed.
Int. Cl.[4] A61K *45/02*
U.S. Cl. 424—85.7 **14 Claims**

1. A sustained-release preparation, which comprises interferon as an active ingredient and collagen as a carrier, said preparation being in the form of powder particles suspended in a viscous solvent suitable for injection, or being in the form of a shaped preparation suitable for use as an injection in a solid state or for implanting into a body.

4,855,135

METHOD FOR DEBRIDING

Perry A. Ratcliff, 7125 E. Lincoln Dr., Scottsdale, Ariz. 85253

Division of Ser. No. 88,609, Aug. 24, 1987, which is a continuation-in-part of Ser. No. 24,329, Mar. 10, 1987, which is a continuation of Ser. No. 947,079, Dec. 29, 1986, Pat. No. 4,689,215, which is a continuation of Ser. No. 17,247, Dec. 29, 1986, Pat. No. 4,696,811, which is a continuation of Ser. No. 846,342, Mar. 31, 1986, abandoned, which is a continuation of Ser. No. 636,027, Jul. 30, 1984, abandoned. This application Dec. 8, 1988, Ser. No. 281,554
Int. Cl.[4] A61K *33/20*
U.S. Cl. 424—127 **6 Claims**

1. A method for organically debriding wounds, said method comprising the applying to the wound an aqueous solution of stabilized chlorine dioxide having a concentration of at least 0.05%.

4,855,136

THERAPEUTIC COMPOSITION AND METHOD

David F. Horrobin, c/o Efamol Limited, Egamol House, Woodbridge Meadows, Guildford, Surrey, England (GU1 1BA), and Y. Sheng Huang, c/o Efamol Research Inc., Annapolis Valley Industrial Park, P.O. Box 818, Kentville, Nova Scotia, Canada (B4N 4H8)

Filed Sep. 2, 1987, Ser. No. 92,191
Claims priority, application United Kingdom, Sep. 10, 1986, [illegible]
Int. Cl.[4] A61K *33/06, 37/02*
U.S. Cl. 424—602 **3 Claims**

1. A method of treating bone disorders involving calcium loss from the bones in a person in need thereof comprising administering to the person the combination, in dosage unit form, of gamma-linolenic acid in an assimilable form and in an amount of from 1 mg to 100 g per day together with calcium in an assimilable form and in an amount of from 1 mg to 20 g per day.

4,855,137

COSMETIC COMPOSITIONS HAVING SKIN CALMING AND SKIN REGENERATING EFFECT AND PROCESS FOR THE PREPARATION THEREOF

Tibor Kéri, and Jánosné Kristof, both of Debrecen, Hungary, assignors to Innofinance Altalanos Innovacios Penzintezet, Budapest, Hungary

PCT No. PCT/HU86/00034, § 371 Date Jan. 16, 1987, § 102(e) Date Jan. 16, 1987, PCT Pub. No. WO86/06958, PCT Pub. Date Dec. 4, 1986
PCT Filed May 29, 1986, Ser. No. 12,875
Claims priority, application Hungary, May 30, 1985, 2071/85
Int. Cl.[4] A61K *35/78*
U.S. Cl. 424—195.1 **10 Claims**

1. A cosmetic composition having a skin-calming and skin-regenerating effect comprising as active ingredient, an aqueous or alcoholic extract of the aerial shoot, tuber, or aerial shoot and tuber of a Jerusalem artichoke in an amount of 1.0 to 50% together with a pharmaceutically acceptable topical inert carrier or diluent.

4,855,138

SKIN THERAPEUTIC MIXTURE CONTAINING MATICO EXTRACT

Theodore Trenzeluk, Manville, N.J., assignor to Tecma Laboratories, Inc., Manville, N.J.

Filed Jun. 24, 1986, Ser. No. 877,777
Int. Cl.[4] A61K *35/78, 33/30, 31/385, 31/20*
U.S. Cl. 424—195.1 **3 Claims**

1. A mixture for alleviating the skin conditions of acne, psoriasis, burns, pimples, blackheads, and open sores, said mixture comprising:
a. the aqueous extract from the leaves of the Matico plant, said aqueous extract being prepared as follows: said leaves are dried under moderate light, under warm temperature, and with frequent tossing; then said dried leaves are ground to a very small particle size; and then said ground leaves are extracted with water; said aqueous extract being about 2% to about 35% by weight of said mixture;
b. a preservative being sulfathiazole, wherein said preservative is about 2% to about 15% by weight of said mixture;
c. an inert pigment being zinc oxide, said inert pigment being about 5% to about 10% by weight of said mixture; and
d. an oil soluble base being petrolatum, said oil soluble base being about 40% to about 91% by weight of said mixture.

4,855,139

FUNGICIDALLY ACTIVE CELLULOSIC TEXTILE COMPOSITIONS, OR ARTICLES OF MANUFACTURE

Vadake R. Srinivasan, Baton Rouge, La., assignor to Med. Fab (Lafayette), Inc., Lafayette, La.

Filed Jan. 20, 1987, Ser. No. 4,863
Int. Cl.[4] D02G *3/00;* **A61K** *31/695*
U.S. Cl. 424—404 **11 Claims**

1. A composition useful for the treatment and cure by contact with an area of human skin infected by fungi which comprises a cellulosic textile material to which a bisoxirane compound is chemically bonded via attachment of one oxirane group of said bisoxirane compound after reaction with a hydroxyl group of said cellulose textile material, and a second oxirane group of said bisoxirane compound to which there is attached a fungicidally active phenolic compound.

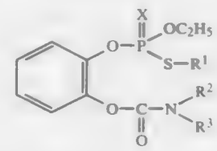
4,855,140

O-(O-ETHYL-S-ALKYLPHOSPHORYL)-O-(CARBAMYL)-PYROCATECHOL DERIVATIVES

Wolfgang Seppelt, Bobenheim-Roxheim; Linhard Sproesser, Bad Doerkheim; Siegfried Kersten, Frankenthal; Peter Hofmeister, Neustadt, and Christoph Kuenast, Otterstadt, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Sep. 26, 1988, Ser. No. 249,320
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1987, 3732527
Int. Cl.[4] A01N *25/00*
U.S. Cl. 424—405 **5 Claims**

1. O-(O-ethyl-S-alkylphosphoryl)-O-(carbamoyl)-pyrocatechol derivatives of the general formula I



(I)

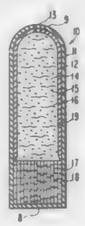
where R^1 is C_1–C_4-alkyl, R^2 is hydrogen, C_1–C_4-alkyl or C_1–C_4-alkoxy, R^3 is hydrogen or C_1–C_4-alkyl, and X is oxygen or sulfur.

4,855,141

DEVICE COMPRISING MEANS FOR PROTECTING AND DISPENSING FLUID SENSITIVE MEDICAMENT

James B. Eckenhoff, Los Altos; Judy A. Magruder, Mt. View; Richard Cortese, Cupertino; John R. Peery, Palo Alto, and Jeremy C. Wright, Los Altos, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Mar. 25, 1988, Ser. No. 173,209
Int. Cl.[4] A61F *2/00*
U.S. Cl. 424—423 **8 Claims**



1. A device for delivering porcine somatotropin to a pig, the device comprising:

(a) a wall that surrounds;
(b) an internal space;
(c) means in the wall for connecting the exterior of the device with the internal space;
(d) a composition in the space comprising porcine somatotropin and a pharmaceutically acceptable polyol and
(e) a composition in the space comprising means for diminishing the volume occupied by the composition comprising the porcine somatotropin, thereby delivering the porcine somatotropin to the pig.

4,855,142

PHARMACEUTICAL PLASTER

Peter Fankhauser, Ettingen; Joel Sinnreich, Basel, and Rolf Dobmeier, Bottmingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 17, 1988, Ser. No. 156,639
Claims priority, application Switzerland, Feb. 27, 1987, 755/87-8
Int. Cl.[4] A61L *15/03, 15/06*
U.S. Cl. 424—434 **20 Claims**

1. Pharmaceutical plaster that adheres to the mucosa, consisting of two discrete layers that adhere well to one another:
(a) a cover film containing as main constituents:
(1) polyvinyl alcohol that is insoluble in cold water, in which a maximum of 8% of the hydroxy groups are in the form of acetate groups; and
(2) optionally one or more plasticisers; and
(b) an adhesive layer containing as main constituents:
(1) an association polymer that is insoluble in water at body temperature, formed (α) from a polymeric carboxylic acid in which at least 10% of the monomer units carry free carboxy groups and (β) from an ethoxylated, non-ionic surfactant that contains at least 2 ethylene oxide units and has a maximum molecular weight of 4000, in a ratio by weight of from approximately 50:1 to approximately 1:20;
(2) optionally one or more pharmaceutical active ingredients; and
(3) optionally one or more substances that assist the absorption of the pharmaceutical active ingredient(s).

4,855,143

METHOD OF PREPARING CONTROLLED LONG-ACTING PHARMACEUTICAL FORMULATIONS IN UNIT DOSAGE FORM HAVING UNIFORM AND COMPARABLE BIOAVAILABILITY CHARACTERISTICS

Hans Lowey, 1045 Nine Acres La., Mamaroneck, N.Y. 10541

Division of Ser. No. 848,702, Apr. 4, 1986, Pat. No. 4,775,535.
This application Jul. 12, 1988, Ser. No. 218,697
Int. Cl.[4] A61K *9/22, 9/26*
U.S. Cl. 424—468 **12 Claims**

1. A multiplicity of uniform batches of unit doses of a controlled, long-acting release pharmaceutical formulation, in oral tablet form, wherein each of said doses contains active therapeutic agent and a carrier base material, and wherein each of said unit doses has uniform bioavailability from batch to batch, said unit doses being prepared by a method comprising the steps of:
(a) adding a quantity of solid, particulate carrier base material consisting essentially of at least one cellulosic ether selected from the group consisting of hydroxypropyl methylcellulose, hydroxypropyl cellulose, carboxymethyl cellulose and ethyl cellulose, to a quantity of a therapeutically active pharmaceutical agent in granular or powder form;
(b) mechanically mixing the carrier base material and the therapeutically active agent to form a uniform mixture;
(c) discontinuing the mixing and permitting the mixture formed in step (a) to stand for a period of time from 2–27 hours to cause the therapeutically active pharmaceutical agent to become bonded to the carrier base material; and
(d) compressing portions of the mixture formed in steps (b) and (c) into solid oral tablet doses, wherein release of said therapeutic agent from a unit dose of a given batch is substantially the same as release of said therapeutic agent from a unit dose of another batch.

4,855,144

SYNTHETIC MELANIN AGGREGATES

Helen Leong, Atherton; Martin Katz, Menlo Park; Ann Delk, Kensington; Sergio Nacht, Los Altos, and David Berliner, Atherton, all of Calif., assignors to Advanced Polymer Systems, Redwood City, Calif.

Continuation-in-part of Ser. No. 112,971, Oct. 23, 1987, Pat. No. 4,806,360. This application Jun. 14, 1988, Ser. No. 206,542
The portion of the term of this patent subsequent to Feb. 21, 2006, has been disclaimed.
Int. Cl.[4] A61K *9/14*
U.S. Cl. 424—487 **34 Claims**

1. A composition comprising polymeric particles having melanin pigment entrapped therein.

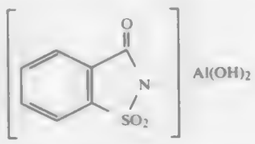
4,855,145

ALUMINUM SALT OF SACCHARIN

Martin M. Rieger, and Robert K. Yang, both of Morris Plains, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 329,644, Dec. 11, 1981, abandoned. This application Jul. 27, 1984, Ser. No. 635,319
Int. Cl.[4] C07F *5/06;* **A23G** *3/30*
U.S. Cl. 426—003 **4 Claims**

1. The aluminum salt of saccharin having the formula



and the following percentage of components:
(a) Aluminum, 9.4 to 11.1;
(b) Saccharin (as the acid) 64.0 to 74.9; and
(c) OH 26.6 to 14, with the following infrared analysis:
(a) large peak at 3450 cm^{-1}; and
(b) strong doublet at 1640–1570 cm^{-1}.

2. A chewing gum composition which comprises the aluminum salt of saccharin of claim 1.

4,855,146

METHOD FOR MANUFACTURE OF CHEWING GUMS WITH SECTIONAL MOTIF PATTERNS

Sanpei Murakami; Tohru Miyaaki; Tokio Imahori; Koichi Ogata, and Hidenari Hagita, all of Osaka, Japan, assignors to Kanebo, Ltd., Tokyo and Hiroshio Nishio, Kobe, both of, Japan

Filed Mar. 22, 1988, Ser. No. 171,703
Int. Cl.[4] H23G *3/30*
U.S. Cl. 426—5 **3 Claims**

1. A method of manufacturing a chewing gum having a sectional motif pattern with a die extruding unit comprising:
concurrently feeding a pattern-forming elastic confectionery material to a pattern-forming cylinder through a passageway having an expanded intermediate portion, and a chewing gum to a discharge section of the die through at least a second passageway having an expanded intermediate portion; said pattern-forming cylinder being disposed within said die so that said discharge section is positioned around said pattern-forming cylinder, and the longitudinal axis of said die is substantially parallel relative to the longitudinal axis of said pattern-forming cylinder;

continuously extruding said elastic confectionery material through said pattern-forming cylinder and continuously extruding said chewing gum around said elastic confectionery material and through said die to produce a chewing gum having a constant motif pattern on all planes of sections perpendicular to the longitudinal axis of said die extrusion unit.

4,855,147

BEVERAGES BY LACTIC ACID FERMENTATION AND METHODS OF PRODUCING SAME

Tetsuya Yokota; Hideki Sakamoto, and Naoto Takahashi, all of Tochigi, Japan, assignors to Kagome Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 18, 1988, Ser. No. 182,412
Claims priority, application Japan, Sep. 17, 1987, 62-233470; Sep. 17, 1987, 62-233471
Int. Cl.[4] A23C *9/127, 9/133;* **A23L** *2/02*
U.S. Cl. 426—43 **15 Claims**

8. A method of producing a beverage by lactic acid fermentation, said method comprising the steps of
sterilizing and cooling a mixture of a processed tomato juice product obtained (by crushing and squeezing tomatoes or a concentrate of said product and a milk product,
adjusting said mixture to pH 4.4–5.3, and
adding precultured *Lactobacillus bulgaricus* to said adjusted mixture for lactic acid fermentation at 35°–45° C. for 4–12 hours.

4,855,148

METHOD FOR PRODUCING QUASI-NATURAL CHEESE FERMENTED FOODS

Yoshihiro Kuribayashi, Usuki, and Kazuomi Sueoka, Nagasaki, both of Japan, assignors to Fundokin Shoyu Kabushiki Kaisha, Oita, Japan

Filed Apr. 28, 1988, Ser. No. 187,250
Claims priority, application Japan, Apr. 30, 1987, 62-104590
Int. Cl.[4] A23L *1/20;* **A23C** *20/02*
U.S. Cl. 426—46 **13 Claims**

1. A method for making a quasi-natural cheese fermented food from curds obtained by the lactic fermentation of soybean milk, comprising the steps of:
shaping said curds to a solid form by compacting and pressing to fix said curds, and
subjecting said fixed curds to fermentative ripening in a brewing material containing at least one type of koji as the substrate and adding at least one microorganism selected from the group consisting of lactic acid bacteria, yeast and combinations thereof, said fermentative ripening occurring under semi-anaerobic conditions wherein contact of the curds with air is cut off.

4,855,149

METHOD FOR PRODUCING NOVEL DRIED COMPOSITIONS CONTAINING POLYSACCHARIDES

Michael J. Pucci, Sarasota, and Blair S. Kunka, Bradenton, both of Fla., assignors to Microlife Technics, Inc., Sarasota, Fla.

Filed Jul. 1, 1987, Ser. No. 68,435
Int. Cl.[4] A23L *1/09, 1/035;* **C12P** *19/04*
U.S. Cl. 426—48 **19 Claims**

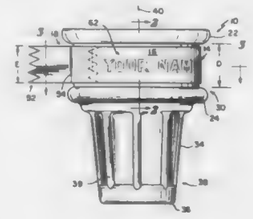
11. A method for forming a dried composition useful as an edible quality improver for foods which comprises:
(a) providing an aqueous growth medium containing sucrose;
(b) fermenting a *Leuconostoc dextranicum* which produces substantially rehydratable polysaccharides in the growth medium to produce the polysaccharides in the growth medium until the sucrose is substantially depleted so as to produce a thickened dextran containing aqueous mixture and so as to allow drying of the fermented growth medium to a powder; and
(c) drying the growth medium with a food grade drying aid to produce the dried composition with the polysaccharides as the powder, wherein the composition is substantially rehydratable to the thickened dextran containing aqueous mixture.

4,855,150

ICE CREAM CONE WITH IMPRINTED BAND

Larry W. Mathes, 341 Lincoln Hills Rd., and William R. Sayder, P.O. Box 338, both of Corydon, Ind. 47112

Filed Apr. 25, 1988, Ser. No. 185,704
Int. Cl.[4] A21D *13/00*
U.S. Cl. 426—87 **4 Claims**



1. In combination, a pastry cone having a lower portion and an upper portion, the lower portion providing a sloping gripping surface with vertically extending ribs to permit the cone to be gripped by a user, the upper portion including a straight cylindrical section bounded by an upper circumferentially extending rib and a lower circumferentially extending rib, and a rectangular-shaped removable band that has a width slightly smaller than the width of the straight cylindrical section between said upper and lower ribs and that extends around but is not adhered to the cone between the upper and lower rib in the straight cylindrical section and with a visual display on the band, wherein the band comprises a first portion and an attached second portion, the first portion extending around the straight cylindrical section of the cone and having an attachment surface adjacent the second portion which overlies and is secured to an end of the first portion, most remote from the attached second portion, to secure the first portion to itself and about the cone between the upper and lower ribs with said ribs configured to retain the secured band from slipping upwardly or downwardly out of the straight cylindrical section, the second portion extending freely away from the cone providing a tab for removing the band from the cone by grasping the cone sloping gripping surface with one hand and by pulling the attachment surface away from the end of the first portion with another hand to release the band from the cone by disengagement of the attachment surface and permit the entire cone to be consumed when desired.

4,855,151

POTATO PRODUCT WITH ASYMMETRIC CORRUGATIONS

Mimi S. Fielding, Gig Harbor, Wash., assignor to Curtice-Burns, Inc., Rochester, N.Y.

Continuation of Ser. No. 900,738, Aug. 27, 1986, abandoned. This application Feb. 12, 1988, Ser. No. 155,314
Int. Cl.[4] A23L *1/217*
U.S. Cl. 426—144 **4 Claims**

1. A food product comprising a slice or sheet of edible material having an upper surface and a lower surface, said upper surface and said lower surface having substantially parallel corrugations thereon, said corrugations being characterized by a sawtooth function having substantially the same frequency and amplitude, each tooth being asymmetric about its peak, each tooth having first and second sides, said first side being longer than said second side, the corrugations on said

upper surface being in phase with the corrugations on said lower surface to yield a relatively thick section adjacent the



first side of said tooth and a relatively thin section adjacent the second side of said tooth.

4,855,152

MIGRATION INHIBITOR FOR FATS AND OILS FOR BAKED CAKES AND PROCESS FOR PRODUCING COMPOSITE BAKED CAKE WITH THE USE OF THE SAME

Akira Nakano, and Masaki Nomura, both of Hazakimachi, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Oct. 29, 1987, Ser. No. 114,677
Claims priority, application Japan, Nov. 17, 1986, 61-273521
Int. Cl.⁴ A21D *13/08*; A23G *3/00*
U.S. Cl. 426—261 **4 Claims**

1. In a process for preparing a baked farinaceous food product which comprises mixing flour, an edible oleaginous component, and other comestible ingredients to form a bakable mixture and then baking said mixture to produce said baked farinaceous food product, the improvement which comprises: said oleaginous component comprises from 0.5 to 100 wt.% of an edible fat migration inhibitor composition and the balance of said oleaginous component is edible oil or fat suitable for making baked farinaceous food products, said edible fat migration inhibitor composition being an edible fat containing 10 wt.% or more, based on said migration inhibitor composition, of a disaturated-monounsaturated mixed acid triglyceride, at least one of the saturated fatty acid moieties of said mixed acid triglyceride being a saturated fatty acid having from 20 to 24 carbon atoms. wherein to inhibit migration of portions of said oleaginous component to the surface of said baked farinaceous food product during cooling thereof from the baking temperature.

4,855,153

PROLONGING THE SHELF LIFE OF FRESH ROOT VEGETABLES

Avigdor Orr, Highland Park; John O. Spingler, Plainsboro, and Seymour G. Gilbert, Piscataway, all of N.J., assignors to DNA Plant Technology Corporation, Cinnaminson, N.J.

Continuation of Ser. No. 792,440, Oct. 29, 1985, which is a continuation-in-part of Ser. No. 650,776, Sep. 13, 1984, Pat. No. 4,670,275. This application Jul. 17, 1987, Ser. No. 75,205
The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.
Int. Cl.⁴ A23B *7/148*
U.S. Cl. 426—270 **14 Claims**

1. A process of maintaining a fresh root vegetable in a viable form which comprises:
(a) peeling the surface of a fresh root vegetable,
(b) providing the vegetable in uniform sized pieces,
(c) subjecting the vegetable to a vacuum of less than about 20 inches Hg absolute for about 2 to about 10 minutes,
(d) breaking the vacuum in the presence of chlorinated water,
(e) removing surface water from the vegetable, and
(f) providing the vegetable in a sealed container effective to prevent microbial recontamination of the vegetable and having a gas permeability and a ratio of the mass of vegetable to the container surface effective to maintain the vegetable in a viable condition.

4,855,154

PROCESS FOR DEODORIZING MARINE OILS

Anthony J. Gioffre, Ridgefield, Conn., and Bonita K. Marcus, Rye, N.Y., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 67,997, Jun. 30, 1987, Pat. No. 4,795,482. This application Jun. 14, 1988, Ser. No. 206,276
Int. Cl.⁴ A23D *5/02*; C09F *5/10*
U.S. Cl. 426—417 **14 Claims**

1. Process for removing an existing odor from a marine oil due to the presence of isovaleric acid or at least one organic amine molecular species which comprises contacting said marine oil and adsorbing said isovaleric acid or organic amine molecular species at a temperature within the range of −20° C. to 200° C. with a crystalline siliceous molecular sieve sorbent which has been at least partially activated, in which at least about 90 percent of the framework tetrahedral oxide units are SiO_2 tetrahedra, which has pore diameters of at least 5.5 Angstroms and has a capacity for adsorbed water of not greater than 10 weight percent when measured at 25° C. and at a water's vapor pressure of 4.6 torr, said contacting and adsorbing of said isovaleric acid or organic molecular species being to such a degree than residual amine concentrations thereof over the adsorbent are below the detection threshold of the human sense of smell.

4,855,155

SWEETS AND PROCESS FOR THEIR MANUFACTURE

Riccardo Cavallin, Stadtallendorf, Fed. Rep. of Germany, assignor to Ferrero oHG m.b.H., Fed. Rep. of Germany

Filed Aug. 18, 1987, Ser. No. 86,547
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1986, 3628011
Int. Cl.⁴ A23G *3/00*; A23C *23/00*
U.S. Cl. 426—564 **13 Claims**

1. A soft, aerated sweetmeat comprising an oil-in-water emulsion of 6.0–7.0% milk products, 25.0–27.0% fat, 17.0–19.9% sugar, starch and 46–48% water produced by:
(a) preheating quarg or yoghurt or a blend of both at temperatures of from 40° to 50° C.;
(b) adding whole or condensed milk with stirring to obtain a blend A;
(c) homogeneously mixing sugar and starch to obtain a dry mix B;
(d) preparing a paste C by stirring the fat at temperatures of from 50° to 75° C.;
(e) mixing blend A with the dry premix B; thereafter
(f) mixing the paste fat C with stirring with the mixture of step (e) at temperatures of from 50° to 60° C.;
(g) subsequently adding aromatic substances and an acid enhancing agent until a pH-value of 4.2 to 5.0 is reached, followed by stirring for 20 to 25 minutes at temperatures of from 50° to 60° C. to obtain a homogeneous mixture;
(h) pasteurizing the mixture at temperatures of from 95° to 110° C. for a period not exceeding 20 seconds; and
(i) cooling the mixture to between 40° and 60° C.;
(j) aerating the mixture by injecting inert gas therein thereby attaining and maintaining a creamy texture;
(k) crystallizing at least part of the fat and the sugar under stirring, and cooling the creamy substance to not more than 20° C.

4,855,156

FROZEN DESSERT

Norman Singer, Highland Park, Ill.; Reed Wilcox, Littleton, Colo., and Joseph S. Podolski, Skokie, Ill., assignors to The NutraSweet Company, Deerfield, Ill.

Filed Jan. 26, 1988, Ser. No. 148,434
Int. Cl.⁴ A23G *9/00, 9/02*
U.S. Cl. 426—565 **13 Claims**

1. In a frozen whipped dessert containing fat and/or oil, the improvement comprising the partial or total replacement of fat and/or oil therein by a macrocolloid comprising substantially non-aggregated particles of denatured protein having in a dry state a mean diameter particle size distribution ranging from about 0.1 microns to about 2.0 microns, with less than about 2 percent of the total number of particles exceeding 3.0 microns in diameter, and wherein the majority of said particles are generally spheroidal as viewed at about 800 power magnification under a standard light microscope, the particles in a hydrated state forming said macrocolloid having substantially smooth, emulsion-like organoleptic character.

4,855,157

PROCESS FOR PRODUCING FAT POWDER

Yoichi Tashiro; Hideki Baba, both of Sennan; Kohei Obatake, Kawachinagano; Hiroshi Sakka, and Ichiro Sohara, both of Hirakata, all of Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Filed Jan. 25, 1988, Ser. No. 148,348
Claims priority, application Japan, Jan. 29, 1987, 62-20159
Int. Cl.⁴ A23D *5/00*
U.S. Cl. 426—609 **6 Claims**

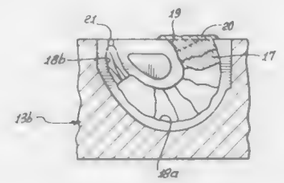
1. A process for producing edible fat powder which consists essentially of contacting an edible fat or oil in the form of liquid drops in an atomized state with air flow at a temperature lower than 10° C., thereby cooling and solidifying the fat or oil, said fat or oil containing an edible non-oil soluble natural solid material uniformly dispersed therein, said non-oil soluble natural solid material being at least one member selected from the group consisting of sugars, starch, dextrin, gums, protein, whole milk powder, whey powder, cacao mass and cacao powder.

4,855,158

CRUSTACEAN FORMING PROCESS AND APPARATUS

Frank S. Kawana, Pasadena, Calif., assignor to JAC Creative Foods, Inc., Los Angeles, Calif.

Division of Ser. No. 818,774, Jan. 14, 1986, Pat. No. 4,720,391. This application Oct. 13, 1987, Ser. No. 106,666
The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.
Int. Cl.⁴ A22C *25/00, 29/02*
U.S. Cl. 426—643 **3 Claims**



1. In a process for forming a simulated crustacean product from fish, the steps that include:
(a') comminuting the fish to form a mass of fish paste, thereby to increase the surface area of the mass, said comminuting carried out by grinding the fish at between about −1.0° C. and 3° C., salt and shrimp flavoring are added to the mix, and said grinding is continued until the fish paste temperature increases to about 8° C.,
(b') spreading a first portion of said mass on a surface and allowing said first portion of the mass to gel, by allowing said first portion to set for about 20 hours, at about 8° C.,
(c') heating the gel in a steam zone, and then shredding the gel into pieces,
(d') treating the gel pieces with a weak citric acid solution for about 15 minutes, and then separating the acid solution from the treated pieces,
(e') combining the acid treated pieces of said first portion of the mass with a second portion of said mass which is in fish paste form, thereby to form a mix,
(f') and thereafter forming the mix to simulated crustacean shape, and heating same to set the mix in the form of said crustacean product, said heating carried out in a mold cavity having a vent from which the mix is allowed to expand outwardly during said heating, thereby producing a displaced bulge displaced from the vent to simulate the uneven neck terminus of a shrimp after pull-off removal of the shrimp head, and recovering the shrimp shaped product from the mold cavity,
(g') and including brushing mold exterior surfaces adjacent the vent prior to said injecting step to free said exterior surfaces of cooked fish paste.

4,855,159

PROCESSED SOYBEAN FOODS AND METHOD FOR PREPARING THE SAME

Shoji Takao; Hiroshi Nakashima; Mako Tokumoto, all of Yamanashi; Makoto Saitoh, Aichi, and Makoto Watanabe, Yamanashi, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 6,788, Jan. 27, 1987. This application Aug. 4, 1988, Ser. No. 228,179
Claims priority, application Japan, Jan. 27, 1986, 13681/86; Australia, Jan. 27, 1987, 68088/87; European Pat. Off., Jan. 27, 1987, 8740078.7; Rep. of Korea, Jan. 27, 1987, 636/1987
Int. Cl.⁴ A23L *1/211*
U.S. Cl. 426—656 **6 Claims**

1. A process for producing a processed soybean food having a phosphorus and potassium content reduced by 30% or more, said process comprising heating 1 part by weight of soybean at 70°–150° C. for 1 to 60 minutes in the presence of water, soaking the heated soybean in 5–100 parts by weight of water at a pH of 3 to 6.5 and a temperature of 10°–80° C. for 5 to 36 hours, separating the soybean from the soaking liquor and washing the separated soybean with 1–100 parts by weight of water at a pH of 5 to 9 and a temperature of 10°–80° C. for 10 minutes to 3 hours.

4,855,160

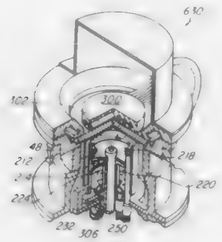
METHOD FOR PASSIVATING WAFER

Joseph D. Luttmer, Richardson; Cecil J. Davis, Greenville; Patricia B. Smith, Euless, and Rudy L. York, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 73,936, Jul. 16, 1987, abandoned. This application May 26, 1988, Ser. No. 203,563
Int. Cl.⁴ D05D *3/06*
U.S. Cl. 427—38 **10 Claims**

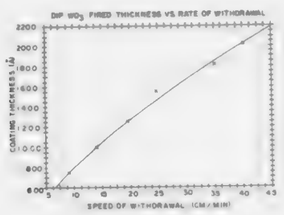
1. A method for depositing a passivating layer on a mercury-cadmium-telluride wafer comprising:

(a) disposing said wafer into a high pressure process chamber under low pressure;
(b) heating said chamber; and



(c) introducing a source of sulfur into said chamber at high pressure and to a face of said wafer.

4,855,161
METHOD FOR DEPOSITION OF ELECTROCHROMIC LAYERS
Frank H. Moser, and Niall R. Lynam, both of Holland, Mich., assignors to Donnelly Corporation, Holland, Mich.
Filed Feb. 19, 1987, Ser. No. 16,663
Int. Cl.[4] G02F *1/17*
U.S. Cl. 427—108 **22 Claims**



1. A method for preparing an electrochromic coating on a substrate having an electrically conductive surface, comprising:
preparing a coating solution by reacting an anhydrous halide of an electrochromically active transition metal with a C_1 to C_5 anhydrous alcohol, wherein the ratio of transition metal halid to alcohol is from about 5 to 20 weight-/volume percent, at 0 to 80 degrees C. while simultaneously passing a stream of gas over said coating solution during said reaction;
coating the conductive surface of said substrate with the resulting solution to give a coating of a desired thickness; and
drying and hydrolyzing and further condensing said coating to an electrochromically active coating.

4,855,162
POLYTETRAFLUOROETHYLENE COATING OF POLYMER SURFACES
Wolfgang J. Wrasidlo, LaJolla; Frieder K. Hofmann, Oceanside, and Karol J. Mysels, LaJolla, all of Calif., assignors to Memtec North America Corp., Buffalo Grove, Ill.
Filed Jul. 17, 1987, Ser. No. 74,635
Int. Cl.[4] B05D *5/00, 3/02*
U.S. Cl. 427—243 **8 Claims**

1. In the coating of polymer surfaces to impart an adherent coating of polytetrafluoroethylene (PTFE) resin to the surface, wherein an aqueous dispersion of PTFE- containing particles having a particle size within the range of 0.05 to 3.0 microns is deposited on the surface, and the surface is thereafter heated to volatize the liquids in said dispersion and cause the particles to adhere to the surface, the improvement which comprises: (i) providing a polymer surface that exhibits a glass transition and softens at temperatures below 250° C. and a dispersion consisting essentially of PTFE particles, dispersing agents sufficient to maintain the particles in suspension and wetting agents to permit the uniform distribution of the particles on the surface, said dispersion having a solids content in the range of 0.1 to 6.0% and being essentially devoid of heavy metal organic complexes, (ii) depositing the dispersion on the surface, and (iii) heating the polymer surface to a temperature at least equal to, but not more than 20° C. above, its softening temperature and maintaining said temperature for a time sufficient to soften said surface and embed said particles therein so to produce an essentially discontinuous, mono particulate coating of said particles.

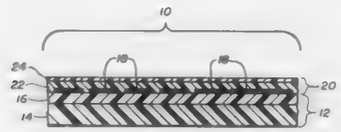
4,855,163
METHOD OF MAKING POLYVINYLIDENE DIFLUORIDE STRUCTURE
Irving B. Joffee; Peter J. Degen, both of Huntington, and Frederick A. Baltusis, Freeport, all of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.
Division of Ser. No. 857,945, May 1, 1986, Pat. No. 4,774,132.
This application May 24, 1988, Ser. No. 197,844
Int. Cl.[4] B05D *3/10, 5/00*
U.S. Cl. 427—244 **13 Claims**

1. A method of making a polyvinylidene difluoride structure with a high critical surface energy comprising the steps of:
(a) contacting a polyvinylidene difluoride structure with an alkali solution to form activated sites on the surface of said structure;
(b) rinsing the activated structure to remove residual alkali;
(c) contacting the rinsed, activated structure with a solution of a polymerization initiator and polymerizable vinylic monomer; and
(d) polymerizing and grafting said monomer to said activated structure to form a polyvinylidene difluoride structure with a critical surface energy of at least about 80 dynes/cm.

4,855,164
STABLE MULTIPHASE COATING COMPOSITIONS
Mary J. Burkholder, Mars; Barbara G. Piccirilli, Gibsonia; Carl C. Anderson, Allison Park, and Rodger G. Temple, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Feb. 12, 1988, Ser. No. 155,458
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—385.5 **42 Claims**

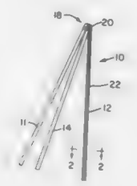
31. A method of preparing a coated article having a piled texture comprising:
(a) applying to a substrate a coating composition comprising:
(i) a waterborne film-forming polymer; and
(ii) a stable, liquid nonaqueous polymer microparticle dispersion characterized in that the nonaqueous dispersion when independently applied is capable of forming discrete particle agglomerates upon volatilization of its nonaqueous medium, the components (i) and (ii) being present in amounts effective to provide that the coating composition is a stable multiphase composition; and
(b) allowing the coating composition to dry.

4,855,165
METHOD FOR MAKING STAIN AND SCRATCH RESISTANT RESILIENT SURFACE COVERINGS
Nicholas C. Bolgiano, Lancaster; Mary B. Grubb, Landisville; Raymond S. Hudson, Lancaster, and William T. Sigman, Quarryville, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.
Division of Ser. No. 22,952, Mar. 6, 1987, Pat. No. 4,781,987.
This application May 18, 1988, Ser. No. 195,654
Int. Cl.[4] B05D *1/36, 3/02, 7/00*
U.S. Cl. 427—393.5 **15 Claims**



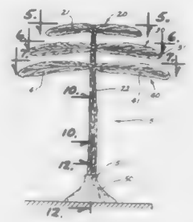
1. A process for providing a resilient floor covering comprising the steps of
providing a resilient vinyl support surface,
providing a crosslinked or crosslinkable second layer material on the support surface, the second layer material being selected from the group consisting of a moisture-cured polyurethane, a moisture-cured and UV-cured polyurethane, a UV-cured polyurethane, and an unsaturated polyester,
coating the second layer material with a composition comprising a polyol component, an aminoplast component and an acid catalyst component,
and
subjecting the composite to thermal curing conditions,
whereby the cured composition has the ability to conform to physical deformations of the crosslinked second layer material when cured, the cured composition having improved scratch and stain resistant properties relative to the properties of the cured crosslinked second layer material.

4,855,166
ARTIFICIAL PINE NEEDLE
John G. Allison, 259 Rosman Hwy., Brevard, N.C. 28712
Filed Dec. 5, 1988, Ser. No. 279,546
Int. Cl.[4] A41G *1/00*
U.S. Cl. 428—15 **16 Claims**



1. An artificial pine needle comprising: a plurality of strands; said strands being at least partially made of a synthetic material; said strands being somewhat parallel and adjacent to one another;
means for attaching said strands together at one end of each strand; said strands not being attached to one another for the major portion of the length of said strands.

4,855,167
SHADED OUTDOOR PARKING AREA
Harold A. Biehl, Rte. 2, Box 191, Lexington, Nebr. 68850
Filed Sep. 22, 1988, Ser. No. 247,475
Int. Cl.[4] A41G *1/00*
U.S. Cl. 428—18 **5 Claims**

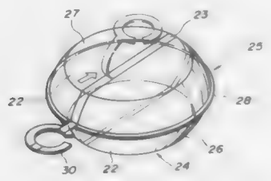


1. A plurality of artificial trees in combination with a plurality of vehicle parking spaces, said vehicle parking spaces each having a front end, a rear end, and lateral sides defining each parking space width, said parking spaces being disposed in an array of adjacently disposed parking spaces forming a parking area, the improvement consisting of:
a plurality of artificial trees, each tree including:
a base having an open cylinder disposed therein, said base being positioned at one lateral side of said parking space such that each base is positioned across the parking space from a next adjacent base;
a cap removably disposed with respect to said cylinder to selectively cover and uncover said cylinder;
an elongated trunk having a top end and a bottom end, said bottom end being matingly received in said open cylinder to hold said trunk in an upright position; wherein said top end of said trunk is provided with three axially spaced distinct tiers of apertures including a top tier, a middle tier, and a lower tier of apertures and the top tier of apertures comprises twelve apertures spaced approximately 30° apart, the middle and lower tiers of apertures comprise six apertures apiece spaced approximately 60° apart on the respective middle and lower tiers and offset from one another by approximately 30°; wherein, the apertures on the top and the middle tiers are offset from one another by approximately 115°, and wherein the bottom end of said trunk is aligned with at least one of the lateral sides defining a parking space; and,
branches releasably attached to the three axially spaced distinct tiers of apertures disposed on said top end of said trunk for providing shade, said branches being disposed from about six feet to about nine feet above ground level and being dimensioned to extend across about one-half of the width of each of the adjacently disposed parking spaces divided by said one lateral side, whereby the entire parking space width is shaded from the sun by the branches.

4,855,168
SYNTHETIC RESIN SHEET HAVING NOTCHING STRIP AND CONTAINER
Yasuyuki Imaizumi, Tokyo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan
Filed Apr. 7, 1987, Ser. No. 35,310
Int. Cl.[4] B65D *77/30, 25/28*
U.S. Cl. 428—35.2 **6 Claims**

1. A synthetic resin sheet integrally coextruded by coextruding sheet main body portions of polyolefin resin and a notching strip interposed between right and left side sheet main body portions, wherein:
the notching strip is formed of a mixture resin material of a first synthetic resin material of polyolefin resin, a second synthetic resin material incapable of bonding with the first

synthetic resin material, a third synthetic resin material capable of bonding with the first and second synthetic resin materials, and a fourth synthetic resin material of a copolymer of olefin and vinyl monomer having carboxylic radicals crosslinked by metallic ions;



the melt index value of the notching strip being no greater than that of the sheet main body portions; and

the softening temperature of the notching strip being no lower than that of the sheet main body portions.

4,855,169

PROPYLACTIC SHEATH WITH AUGMENTED BORDER

Mark W. McGlothlin, and Alice A. DePaul, both of San Diego, Calif., assignors to Apex Medical Technologies, Inc., San Diego, Calif.

Filed Jan. 27, 1988, Ser. No. 148,750
Int. Cl.[4] B27N *5/02*
U.S. Cl. 428—35.2 23 Claims

1. A prophylactic device comprising a sheath of elastomeric sheet material having a 100% tensile modulus of at least about 200 psi and a thickness of less than about 0.0014 inch, said sheath having an open end and with a border containing a resilient material having a 100% tensile modulus substantially lower than that of said elastomeric sheet material, said resilient material being a member selected from the group consisting of polyurethanes, latex rubbers, silicone elastomers, foam silicone elastomers, ethylenepropylene the moplastic elastomers, styrenic block thermoplastic elastomers, olefinic thermoplastic elastomers, polyether-block-amide thermoplastic elastomers, plasticized polyvinylchlorides, and acrylic-based thermoplastic elastomers, and the ratio of the thickness of said border to the thickness of said sheath being from about 10 to about 300.

4,855,170

PRESSURE-SENSITIVE TAPE CONSTRUCTION INCORPORATING RESILIENT POLYMERIC MICROSPHERES

Wayne K. Darvell, North St. Paul; Patricia R. Koosti, Oakdale, both of Minn.; Jurgen Klingen, Schwalmtal, and Karl W. Kreckel, Haan, both of Fed. Rep. of Germany, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 898,941, Aug. 21, 1986, abandoned. This application Aug. 13, 1987, Ser. No. 85,239
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—40 24 Claims

1. Pressure-sensitive adhesive-coated sheet material comprising in combination a sheet backing bearing on at least one surface a layer of normally tacky and pressure-sensitive adhesive on the order of at least 20 micrometers thick, said layer containing from about 1/5 to about 2/3% by volume of resilient non-tacky hollow thermoplastic polymeric spheres having a diameter in the approximate range of 10–125 micrometers, substantially all of said spheres having an actual density on the order of 0.01–0.04 g/cc and a shell thickness on the order of 0.02 micrometers and being substantially completely surrounded by the pressure-sensitive adhesive.

4,855,171

SIGN-MAKING MATERIALS

Peter McKie, Challock, and Kenneth W. A. Elcock, Hythe, both of England, assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Apr. 23, 1987, Ser. No. 41,823
Claims priority, application United Kingdom, Apr. 25, 1986, 8610114
Int. Cl.[4] B44C *1/17*
U.S. Cl. 428—40 7 Claims

1. A sign-making material consisting of a carrier sheet carrying successively:

(1) a layer of adhesive releasably peelable from the carrier sheet,

(2) a film layer adhered to the carrier sheet by the adhesive layer and of sufficient strength that it may be peeled from the carrier sheet,

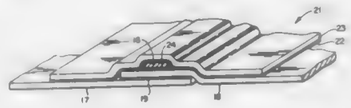
(3) a dye- and/or pigment-containing layer capable of adhering, under the action of heat and pressure, to a transparent or translucent sign sheet.

4,855,172

ADHESIVE COMPOSITION LAMINATE WITH BUTYL RUBBER

Jessie T. Chiu, 1811–164th Ave., NE., Bellevue, Wash. 98008

Continuation of Ser. No. 8,775, Jan. 30, 1987, abandoned, which is a division of Ser. No. 771,250, Aug. 30, 1985, abandoned, which is a continuation of Ser. No. 482,220, Apr. 5, 1983, abandoned. This application Oct. 16, 1987, Ser. No. 110,633
Int. Cl.[4] B32B *3/02*
U.S. Cl. 428—57 11 Claims



1. A monolayer membrane roofing material with joint laminate which comprises two monolayer sheets of non-tacky, non-adhesive, fully cured elastomeric roofing membrane material, overlapped along a relatively small section of their total width, a tapelike adhesive layer adapted to be disposed only between the overlapped sections of the sheets, adhesive layer comprising a permanently tacky cured butyl rubber based composition comprising the reaction product of butyl rubber, a crosslinking system for said butyl rubber, a tackifier compatible with butyl rubber and a filler material, the concentrations of said constituents being chosen such that said composition has a tensile strength of at least 50 psi, an elongation of at least 600%, a modulus at 300% elongation of not more than 12, a modulus at failure of not more than 20, the laminate exhibiting a shear strength of at least 15 psi and a peel strength of at least 2 pounds per linear inch.

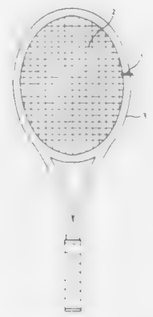
4,855,173

REPAIR PROCESS FOR A FIBRE REINFORCED STRUCTURE

Peter B. Dore, 57 Old Belair Rd., Mitcham, Australia

Filed Aug. 11, 1988, Ser. No. 230,917
Int. Cl.[4] B32B *35/00*
U.S. Cl. 428—63 20 Claims

17. A repaired fibre-reinforced structure, comprising a hollow longitudinal section having an inner surface which at least partially defines a cavity extending axially along the section, wherein said section comprises a plug, situated in the cavity so as to extend axially along the section, and a packing of reinforcing material between the plug and said inner surface, the



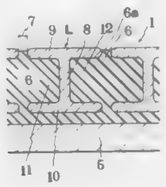
section being further reinforced by an overlay of reinforcing material, which overlies the plug.

4,855,174

LAGGING-REINFORCED STRUCTURE

Masaichi Kawamoto, 2-33 Dairihonmachi 2-chome, Moji-ku, Kitakyushu-shi, Fukuoka, Japan

Filed Mar. 19, 1986, Ser. No. 841,487
Int. Cl.[4] B65G *15/34;* B44C *1/26*
U.S. Cl. 428—67 3 Claims



1. A lagging-reinforced conveyor comprising:

(a) a flexible substrate having a predetermined width,

(b) a lining layer coated on a first surface of said substrate, said lining layer being made of a flexible resilient material, and

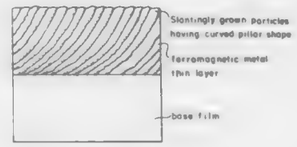
(c) a plurality of laggings embedded in said lining layer, said laggings each having a first flange portion of a width substantially equal to the width of said substrate, a second flange portion of a length substantially equal to the width of said substrate and facing said substrate, said second flange portion being parallel to and spaced from said first flange portion, and a vertical rib portion which has first and second opposite edges integrally connected to central portions of said first and second flange portions, respectively, said laggings being made of a material of high hardness and high wear resistance, each of said laggings defining first and second rectangular grooves on opposite respective sides of said vertical rib portion into which portions of said lining layer extend, said portions of said lining layer having the same shape and size as said rectangular grooves and being firmly engaged therein, the sum of the depths of said grooves being large as compared with the transverse dimensions of said first and second flanges, whereby the removal of said laggings from said lining layer is prevented by the engagement of said portion of said lining layer with said grooves.

4,855,175

MAGNETIC RECORDING MEDIUM AND PRODUCTION THEREOF

Kunio Wakai; Hideaki Niimi, and Noboru Isoe, all of Ibaraki, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 695,055, Jan. 25, 1985, abandoned. This application Jan. 19, 1988, Ser. No. 145,599
Claims priority, application Japan, Jan. 26, 1984, 59-12744; Jan. 26, 1984, 59-12745
Int. Cl.[4] G11B *5/64*
U.S. Cl. 428—148 7 Claims



1. A magnetic recording medium comprising a substrate and, as a recording layer, a thin ferromagnetic metal layer formed on said substrate consisting essentially of slantingly grown particles having a curved pillar shape, in which said thin ferromagnetic metal layer has an oxygen atom concentration in a surface layer of said metal layer and in an interface layer adjacent to said substrate higher than that in an intermediate area between said surface and said interface layer and wherein said oxygen atom concentration in said surface layer being from 1.5 to 6.0 times that of said intermediate area and said oxygen atom concentration in said interface layer being from 1.2 to 3.0 times that of said intermediate area, the ratio of oxygen atom concentration in said surface layer to that in said interface layer being from 0.50 to 5.0, said oxygen atom concentration in said intermediate area being from 5 to 15% of the total number of all component atoms contained in said intermediate area, and the oxygen atom concentration in the whole of said thin ferromagnetic metal layer beding from 10 to 30% of the total number of the component atoms contained in said whole layer, said thin ferromagnetic metal layer having a coercive force of not lower than 800 oersteds, and a magnetic domain of not greater than 0.3 micron.

4,855,176

ANTI-BLURRING OPTICAL MEMBER

Takeshi Ohwaki, and Yasunori Taga, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Dec. 10, 1987, Ser. No. 131,356
Claims priority, application Japan, Dec. 15, 1986, 61-296747
Int. Cl.[4] B32B *3/00, 27/14*
U.S. Cl. 428—195 16 Claims



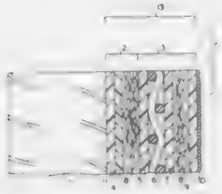
1. An anti-blurring optical member, comprising:

a visible light transmitting substrate, and

at least one hydrophilic region and at least one hydrophobic region formed on said substrate, said hydrophilic and hydrophobic regions being disposed contiguous to each other and said hydrophilic region being of a substantially

continuous pattern so as to allow water from said hydrophobic region to flow along said hydrophilic region.

4,855,177
COMPOSITE PANEL
Rudolf Leis, Haus Nr. 128a, A-5421, Adnet, Austria
Filed Jul. 8, 1987, Ser. No. 70,949
Claims priority, application Austria, Jul. 8, 1986, 1841/86; Aug. 26, 1986, 933/87; Feb. 6, 1987, 243/87
Int. Cl.[4] B32B 7/00
U.S. Cl. 428—247 5 Claims



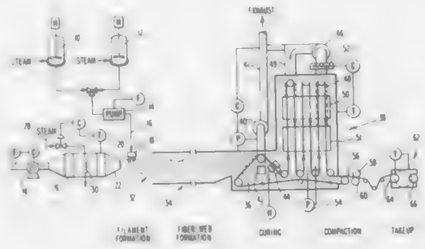
1. A composite panel comprising a natural stone layer which has an exposed finished surface and a back surface, and having a reinforcing coating, which has a fibre layer, bonded to the back of the natural stone layer and which absorbs tensile forces from the concave bending of the exposed finished surface, and at least one compression reinforcing plastic resin layer that absorbs compression forces resulting from convex bending of the exposed finished surface, said plastic resin layer being arranged on the side of the fibre layer that is remote from the natural stone layer.

4,855,178
COMPOSITE CHAMICAL BARRIER FABRIC
John D. Langley, Guntersville, Ala., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 189,202, May 2, 1988. This application Sep. 19, 1988, Ser. No. 246,672
Int. Cl.[4] A62B 17/00; A62D 5/00; B32B 27/12
U.S. Cl. 428—287 4 Claims

1. A composite multilayer fabric consisting essentially of:
a base sheet of relatively bulky, high-strength substrate and a multilayer film sheet laminated to one face of the base sheet; and
said multilayer film sheet comprising a film of ethylene vinyl alcohol, a film layer of nylon laminated to each face thereof, and an outer film of heat-sealable polyethylene.

4,855,179
PRODUCTION OF NONWOVEN FIBROUS ARTICLES
Larry G. Bourland, Downingtown; Robert J. DiLullo, Paoli, both of Pa.; Kimberly E. Ritrievi, Florham Park, N.J., and Jon R. Valbert, Bryn Mawr, Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.
Filed Jul. 29, 1987, Ser. No. 79,312
Int. Cl.[4] D04H 1/04, 3/16
U.S. Cl. 428—296 16 Claims

1. A process for producing a nonwoven fibrous web from an aqueous solution of a polymer composition which is water insoluble and superabsorbent upon curing, which comprises:
(a) forming the polymer solution into water soluble filaments,
(b) contacting the filaments with a primary air stream having a velocity effective to partially attenuate and to partially dry the filaments,
(c) contacting the filaments in a fiber-forming zone with a secondary air stream having a velocity effective to further attenuate and to fragment the filaments into fibers, to further dry the fibers and to transport the fibers to a web-forming zone,
(d) collecting the fibers in reticulated web-form in the web-forming zone, and
(e) curing the web in a curing zone;



wherein the temperature and air stream velocities are controlled with respect to ambient humidity and water content of the fiber during fiber and web formation such that during collection the fibers remain substantially non-sticking and cure in the curing step to a soft, integral web.

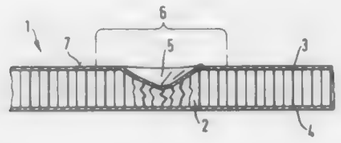
4,855,180
PROCESS FOR PRODUCING OPTICAL ARTICLE HAVING ANTI-REFLECTION FILM
Kazunori Kawamura, Akishima, Japan, assignor to Hoya Corporation, Tokyo, Japan
Filed May 24, 1988, Ser. No. 198,209
Claims priority, application Japan, May 26, 1987, 62-0129208
Int. Cl.[4] B05D 5/06; B32B 5/16
U.S. Cl. 428—328 8 Claims

1. A process for producing an optical article with an anti-reflection film, which comprises the successive steps of:
(1) coating an optical article having a refractive index of less than 1.65, a first liquid composition containing an alcohol-dispersed antimony pentoxide sol having particle diameters of 20–100 mμ, a hydrolyzate of gamma-glycidoxypropyltrialkoxysilane, a curing agent and solvent, wherein the amount of the alcohol-dispersed antimony pentoxide sol is 55 to 85 mole %, calculated as Sb_2O_5, and the amount of the gamma-glycidoxypropyltrialkoxysilane is itself 45–15 mole %, and then heat curing the coated composition to form a first layer film of a high refractive index having an optical thickness of λ/4 (100–200 nm), and thereafter
(2) coating on the first layer film of high refractive index formed in step (1), a second liquid composition
containing a colloidal silica hydrolyzate of a gamma-glycidoxypropyltrialkoxysilane, a hydrolyzate of a gamma-methacryloxypropyltrialkoxysilane, a curing agent and a solvent, provided that the molar ratio of the gamma-glycidoxypropyltrialkoxysilane itself to the gamma-methacryloxypropyltrialkoxysilane itself is from 1:1 to 9:1, that the hydrolyzates of both alkyloxysilanes are produced by simultaneous hydrolysis, and that the amount of the colloidal silica is 60 to 80 mole %, calculated as SiO_2, and the total amount of the gamma-glycidoxypropyltrialkosilane and gamma-methacryloxypropyltrialkoxysilane themselves is 40 to 20 mole %, and then heat curing the coated composition to form a second layer film of low refractive index having an optical film thickness of λ/4 (100–200 nm).

4,855,181
LAMINATE WITH A BLEND LAYER OF POLYESTERAMIDE AND ETHYLENE-VINYL ACETATE COPOLYMER
Hiroyuki Shimo; Isao Kanesige, both of Kurashiki, and Nobuo Tanaka, Nishinomiya, all of Japan, assignors to Kuraray Co., Ltd., Japan
Filed Dec. 3, 1987, Ser. No. 128,092
Claims priority, application Japan, Dec. 12, 1986, 61-297090
Int. Cl.[4] B32B 27/08, 27/28
U.S. Cl. 428—336 6 Claims

1. A laminated structure comprising a base layer of a resin selected from the group consisting of polyvinyl chloride resin, polystyrene resin, polyacrylic resin, polycarbonate resin and polyamide resin; having provided on at least one surface thereof, a layer of a blend of a polyesteramide, exhibiting a Tg (glass transition point) of not higher than 50° C., and a saponified product of ethylene vinyl acetate copolymer in a weight ratio between 5:95 to 35:65.

4,855,182
REPAIR LAMINATE
johann Ondrejas, Vienna, and Friedrich Zitz, Friedberg, both of Austria, assignors to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft, Wiener Neudorf, Austria
Filed Oct. 2, 1987, Ser. No. 103,889
Claims priority, application Austria, Oct. 3, 1986, 2655/86
Int. Cl.[4] C09U 7/02
U.S. Cl. 428—343 6 Claims



1. A repair laminate for the repair of lightweight panels consisting essentially of at least one solid, cured or thermoplastic layer of synthetic material (13) containing a duromer synthetic resin and a fiber reinforcement bonded on one side to the thermally activated adhesive layer (15) and optionally on the other to decorative layer.

4,855,183
MULTIPLE-LAYER, COOK-IN FILM
Timothy T. Oberle, Duncan, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.
Filed Nov. 17, 1986, Ser. No. 932,138
Int. Cl.[4] C09J 7/02
U.S. Cl. 428—345 25 Claims

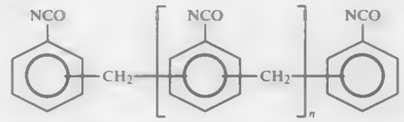
1. A multiple-layer, cook-in film having a first food contact layer (a) having been subjected to an energetic radiation surface treatment provided by a high energy electron treatment to an extent corresponding to a dosage of up to about 12 MR, said first layer (a) functioning as an adhering layer, and wherein said first layer (a) comprises a polyamide composition.

4,855,184
RADIATION-CURABLE PROTECTIVE COATING COMPOSITION
Thomas P. Klun; David D. Lu, and Aida F. Robbins, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 2, 1988, Ser. No. 151,693
Int. Cl.[4] C08B 15/06, 15/10
U.S. Cl. 428—425.1 45 Claims

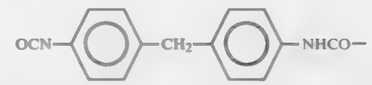
1. Normally solid, organic solvent-soluble, thermoplastic, polyethylenically-unsaturated, cellulosic polyurethane polymers comprising the polymerization product of a reaction mixture of (a) aliphatic or cycloaliphatic diol comprising sufficient ethylenically-unsaturated organic diol to permit cross-linking of the polymerization product to a solvent-insoluble state; (b) organic solvent-soluble cellulosic ether or ester having residual unreacted cellulosic hydroxyl groups; and (c) organic diisocyanate.

4,855,185
POLYURETHANE COATINGS FOR BRIDGE DECKINGS AND THE LIKE
Cung Vu, Gaithersburg; Susan P. Buxbaum, Towson, both of Md.; Norman E. Blank, Heidelberg, Fed. Rep. of Germany, and Richard C. Hartwig, Laurel, Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.
Division of Ser. No. 141,452, Jan. 7, 1988, Pat. No. 4,788,269, which is a continuation-in-part of Ser. No. 128,956, Dec. 4, 1987, abandoned. This application Jun. 15, 1988, Ser. No. 206,775
Int. Cl.[4] C08G 18/10, 18/30
U.S. Cl. 428—423.1 18 Claims

1. Process of coating a substrate comprising applying thereto a polyurethane resin, said resin being the product obtained by reacting together Component A and Component B of a composition consisting essentially of two separate components, A and B;
Component A consisting essentially of, in parts by weight, a low-molecular weight polyol having at least 3 hydroxyl groups and a molecular weight between 92 and about 200, about 3–10 parts; a poly(oxypropylene) triol containing only secondary hydroxyl groups, molecular weight about 500 to 3,000, 80–120 parts; and an elastomer, 0–60 parts;
Component B, about 60–110 parts; being a polyisocyanate of the group consisting of (i) a mixture consisting essentially of (a) and (b), wherein (a) is a mixture of 4,4'-diphenylmethane diisocyanate and 2,4'-diphenylmethane diisocyanate; and
(b) is polymeric MDI, viz.,



having a functionality of 2.3, wherein n is a variable in the range of 1 to 3 ; and (ii) a polyisocyanate material comprising about 45'50 weight % 4,4'-diphenylmethane diisocyanate and balance to make 100% of a polyisocyanate of the structure K-O-$(CH_2CH[CH_3]O)_m$-K, where K is



and m is about 2–5.

4,855,186

COATED PLASTIC FILM AND PLASTIC LAMINATE PREPARED THEREFROM

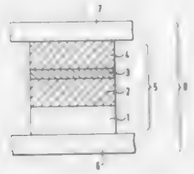
Gerhard Grolig, Pfungstadt, and Guenther Schmidt, Niederhausen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 23, 1988, Ser. No. 159,618

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 3707214

Int. Cl.[4] B32B *7/02, 15/08, 27/36*

U.S. Cl. 428—216 10 Claims



1. A coated plastic film possessing a high transmittance for visible light and high reflectance for infrared radiation comprising a transparent plastic carrier film having a transparent heat reflection layer on at least one surface, said transparent heat reflection layer consisting of:

(a) a first dielectric layer adherent to the surface of said carrier film, said first dielectric layer comprising a nitride;

(b) a heat reflection metallic layer adherent to said first dielectric layer; and

(c) a second dielectric layer adherent to said heat reflection metallic layer, said second dielectric layer comprising a nitride; said first and second dielectric layers are selected from the group consisting of aluminum nitride and silicon nitride.

4. The coated plastic film of claim 1 wherein said heat reflection metallic layer comprises a metal selected from the group consisting of silver, gold, and copper.

5. The coated plastic film of claim 4 wherein said heat reflection metal layer has a thickness in the range of from 5 to 40 nm and the thickness of each of said dielectric layers is in the range of from 20 to 60 nm.

4,855,187

LOW COEFFICIENT OF FRICTION BIAXIALLY ORIENTED FILM

Wayne R. Osgood, Jr., Farmington, and Matthew A. Therrian, Newark, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 6, 1988, Ser. No. 191,107

Int. Cl.[4] B32B *27/08*

U.S. Cl. 428—516 25 Claims

1. An oriented multi-layer film comprising at least a first surface layer of a material consisting essentially of HDPE and a second layer of a material consisting essentially of polypropylene, said film being oriented by stretching at a temperature above the melting point of the material of said first surface layer and below the melting point of the material of said second layer.

14. A method of preparing an oriented multi-layer polypropylene film having low coefficient of friction and good optical properties comprising stretching a multi-layer film comprising at least a first surface layer of a material consisting essentially of HDPE and a second layer of a material consisting essentially of polypropylene at a temperature above the melting point of the material of said first surface layer and below the melting point of the material of said second layer.

4,855,188

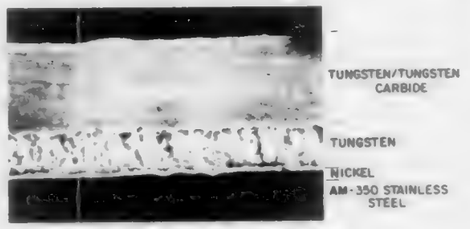
HIGHLY EROSIVE AND ABRASIVE WEAR RESISTANT COMPOSITE COATING SYSTEM

Diwakar Garg, Macungie; Paul N. Dyer, Allentown; Leslie E. Schaffer, Macungie; Ernest L. Wrecsics, Bethlehem, all of Pa.; Duane Dimos, Upper Mount Clair, N.J., and Carl F. Mueller, Easton, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 8, 1988, Ser. No. 153,738

Int. Cl.[4] B32B *15/04*

U.S. Cl. 428—627 16 Claims



14. A highly erosion and abrasion wear resistant composite coating system, comprising a substrate an intermediate layer on a substrate of tungsten having a substantially columnar grain structure and being of sufficient thickness to confer substantial erosion and abrasion wear resistance characteristics on said coating system, and an outer layer of a mixture of tungsten and tungsten carbide wherein said tungsten carbide is selected from the group consisting of W_2C, W_3C, or a mixture of both, said outer layer having a substantially fine-grained, non-columnar and lamellar structure and being of thickness such that the ratio of the thickness of the intermediate layer to the thickness of the outer layer is at least: 0.35 in the case of mixtures of tungsten and W_2C in the outer layer, 0.60 in the case of mixtures of tungsten and W_3C in the outer layer and, 0.35 in the case of mixtures of tungsten and W_2C and W_3C in the outer layer.

4,855,189

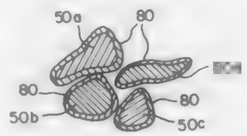
ELECTROLUMINESCENT LAMPS AND PHOSPHORS

Nicholas T. Simopoulos, and George N. Simopoulos, both of Dayton, Ohio, assignors to Lumel, Inc., Dayton, Ohio

Filed Nov. 24, 1987, Ser. No. 124,808

Int. Cl.[4] B05D *5/06*

U.S. Cl. 428—690 6 Claims



1. An improved long-life, flexible electroluminescent lamp which may be die cut or served by cutting or trimming through all of the active layers, including the phosphor layer, and which maintains its brightness up to a cut or severed edge substantially for the life of the lamp, and which exhibits a minimum of color shift during use, comprising:

a base formed of temperature stabilized, flexible film material,

a transparent electrode on said base, a phosphor layer on said transparent electrode, said phosphor layer including phosphor particles in a size range in which about 90% of the particles are between about 14 and 62 microns in size,

each of said particles being coated with an encapsulating layer of silicon dioxide formed thereon as the product of pyrolytic decomposition of silane in the presence of oxygen at the surface of a heated particle,

said containing on each said particle being of substantially uniform thickness in the order of approximately between 0.1 and 3.0 microns,

said coated phosphor particles being dispersed in a resin carrier,

a dielectric layer applied to said phosphor layer, and

a back electrode applied to said dielectric layer.

4,855,190

ELECTROLUMINESCENT LIGHTING ELEMENTS

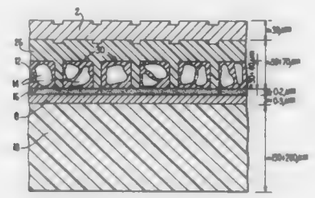
Baruch Bezner, Tel-Aviv, Israel, assignor to Technoset Ltd., Ramat Gan, Israel

Filed Dec. 2, 1987, Ser. No. 127,640

Claims priority, application Israel, Dec. 3, 1986, 80861

Int. Cl.[4] B44D *1/18;* B05D *5/06, 5/12*

U.S. Cl. 428—690 12 Claims



1. A continuous, foil-like electroluminescent lighting element comprising:

a plurality of separate units, each constituted of one or more discrete pieces of a phosphor, each unit being fully encapsulated in a cell consisting of a dielectric, which cell is at least partly embedded in a sealing substance, and

two electrodes of which at least one is at least partly light-transmissive, between which electrodes are disposed said dielectric cells containing said encapsulated phosphor units, and said sealing substance, wherein each of said phosphor-containing cells is substantially isolated from adjacent cells by a separating means whereby moisture is prevented from propagating beyond any damaged cell or cells.

4,855,191

RADIATION IMAGE CONVERTING MATERIAL

Satoshi Arakawa, Minami-ashigara; Akira Kitada, Odawara; Kikuo Yamazaki, Minami-ashigara; Kenji Ohmiya, Odawara, and Jun Kawagoe, Fujinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

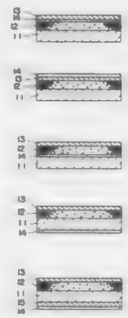
Filed Oct. 20, 1987, Ser. No. 110,367

Claims priority, application Japan, Oct. 20, 1986, 61-248852; Feb. 27, 1987, 62-46475

Int. Cl.[4] G03C *5/17;* G21K *0/4*

U.S. Cl. 428—690 8 Claims

1. A radiation image converting material comprising a support and a phosphor layer provided on the support which comprises a binder and a phosphor dispersed therein, wherein said support has an electrically conductive polymer layer on the side not facing the phosphor layer, said conductive polymer layer comprising an electrically conductive acrylic resin or a polymer containing a siloxane bond.



4,855,192

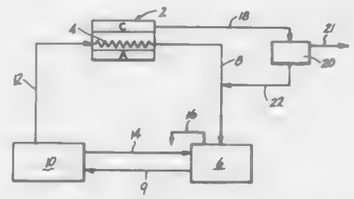
FUEL CELL CLEAN WASTE WATER DISCHARGE SYSTEM

Albert P. Grasso, Vernon, Conn., assignor to International Fuel Cells Corporation, South Windsor, Conn.

Filed Jul. 8, 1988, Ser. No. 216,489

Int. Cl.[4] H01M *8/00, 2/00*

U.S. Cl. 429—13 7 Claims



1. A fuel cell power plant having a power section, and having a water circulating system for cooling the power section, said water circulating system comprising:

(a) a water storage tank for storing water used in said circulating system;

(b) decontaminating means for cleaning water in said circulating system;

(c) first means for carrying water from said storage tank to said decontaminating means;

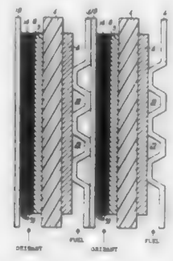
(d) second means for carrying water from said decontaminating means to said power section for cooling the latter;

(e) third means for carrying only clean water from said decontaminating means to said storage tank;

(f) fourth means for carrying contaminated water from said power section to said storage tank; and

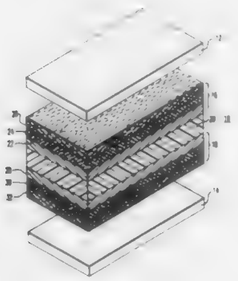
(g) discharge means for releasing water to ambient surroundings from said third means when the amount of water in said storage tank exceeds a predetermined volume whereby only clean water is discharged into the ambient surroundings from the power plant.

4,855,193
BIPOLAR FUEL CELL
James F. McElroy, Suffield, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Continuation of Ser. No. 876,968, Jun. 20, 1986, abandoned.
This application Dec. 14, 1987, Ser. No. 132,697
Int. Cl.[4] H01M *8/10, 4/86*
U.S. Cl. 429—30 3 Claims



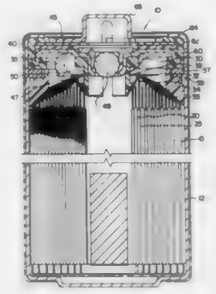
1. A fuel cell stack comprising two or more fuel cells each having a catalytic anode and a catalytic cathode in contact with opposite surfaces of an ion transporting membrane, a wet-proofed carbon paper bonded to the cathode surface opposite the membrane, a bipolar separator in contact with the wet-proofed carbon paper and forming an oxidant flow field, said bipolar separator being in electrical contact with the anode of a second fuel cell; wherein the improvement comprises a plurality of electrically conductive screens between and in electrical contact with the wet-proofed carbon paper and the bipolar separator resulting in improved product water removal and improved fuel cell performance.

4,855,194
FUEL CELL HAVING ELECTROLYTE INVENTORY CONTROL VOLUME
Maynard K. Wright, Bethel Park, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Feb. 5, 1988, Ser. No. 152,775
Int. Cl.[4] H01M *8/04*
U.S. Cl. 429—38 10 Claims



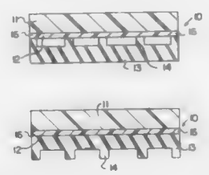
1. A fuel cell having an electrolyte control volume, comprising:
a pair of porous opposed electrodes;
matrix means positioned between said pair of electrodes for containing an electrolyte;
first means for backing positioned adjacent to one of said electrodes, a portion of said means for backing being substantially pervious to the acceptance of electrolyte so as to absorb electrolyte when there is an excess in said matrix means and to desorb electrolyte when there is a shortage in said matrix means; and
second means for backing positioned adjacent to said first means for backing and being substantially impervious to the acceptance of electrolyte.

4,855,195
ELECTROCHEMICAL CELL WITH INTERNAL CIRCUIT INTERRUPTER
Philip Georgopoulos, Lakewood, and John Langkau, Rocky River, both of Ohio, assignors to Eveready Battery Company, Inc., St. Louis, Mo.
Filed Jul. 11, 1988, Ser. No. 217,502
Int. Cl.[4] H01M *10/50*
U.S. Cl. 429—54 29 Claims



1. An electrochemical cell comprising:
(a) an electrode assembly containing a positive and negative electrode;
(b) a housing containing the electrode assembly, and containing a means for providing a terminal for one of the electrodes;
(c) a cover assembly containing a means for providing a terminal opposite the terminal of the housing to thereby establish an electrical circuit in the cell; and
(d) a current collector member disposed in the circuit and in physical contact with one of the electrodes; said collector comprised of a shape-memory alloy, and having a base portion and a plurality of legs extending from the base portion; wherein the collector provides a means for disconnecting the electrical circuit in the cell when the internal temperature of the cell rises.

4,855,196
MULTILAMINATE MATERIAL AND SEFARATOR ASSEMBLY FOR ELECTROCHEMICAL CELLS
Mark L. Eggers, Schaumburg, Ill., assignor to KW Battery Company, Skokie, Ill.
Filed Jun. 23, 1988, Ser. No. 210,430
Int. Cl.[4] H01M *2/16, 2/18*
U.S. Cl. 429—139 31 Claims



1. A multilaminate material for separating electrodes of opposite polarity in cells and battery assemblies, said multilaminate material comprising:
at least one layer of flexible, microporous retaining mat to prevent shedding of active electrode material;
at least one layer of semi-rigid, porous supporting material bonded on one side to said at least one layer of flexible, microporous retaining mat; and
at least one microporous separator to electrically insulate said electrode of opposite polarity bonded to the opposite side of at least one layer of semi-rigid, porous supporting material.

4,855,197
MASK FOR ION, ELECTRON OR X-RAY LITHOGRAPHY AND METHOD OF MAKING IT
Werner Zapka, Gaertringen-Rohrau; Jürgen Kempf, Gechingen; Joachim Keyser, Wildeberg, and Karl Asch, Herrenberg-Gültstein, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 1, 1987, Ser. No. 44,929
Claims priority, application European Pat. Off., May 6, 1986, 86106188.5
Int. Cl.[4] G03F *9/00*
U.S. Cl. 430—5 20 Claims



1. A mask for radiation beam lithography comprising a membrane of semiconductor material having a pair of opposing surfaces and a center and a periphery about said center,
said membrane having a laterally inhomogeneous doping profile across said membrane from said periphery of said membrane to said center of said membrane to said periphery of said membrane on the opposite side of said center,
said doping concentration being maximum at said center of said membrane and said doping concentration being at a minimum at said periphery of said membrane, said doping concentration varying from the periphery of said membrane to the center of said membrane and to the periphery of said membrane on the opposite side of said center as substantially a parabolic function.

16. A method of making a mask wherein a semiconductor wafer having a pair of opposing surfaces is differently doped to form a differently doped layer from one of said surfaces to a depth of 2–3 μm with respect to the remaining portion of said semiconductor wafer,
where, from the opposite surface, said wafer is selectively etched down to said differently doped layer, with a membrane being formed in the process,
etching a pattern of hole defining the mask pattern in said membrane, or into said semiconductor wafer where said membrane is to be formed respectively into a mask, or into a layer deposited on said membrane,
said membrane being treated to have a laterally inhomogeneous doping profile to have minimum stress at the periphery of said membrane and maximum stress in the center of said membrane by means of an additional doping or outdiffusion to eliminate mechanical tensions produced through the first doping, and/or an additional non-uniform doping, said doping profile varying from the periphery of said membrane to the center of said membrane and to the periphery of said membrane on the opposite side of said center as substantially a parabolic function,
whereby said inhomogeneous doping profile generates a tension stress being proportional to the temperature distribution developing thereover in the irradiation with ion, electron or x-rays.

4,855,198
PHOTOENGRAVING ARTICLES OF ZINC-FREE MAGNESIUM-BASED ALLOYS
Geoffrey S. Newhouse, Aurora, Colo., assignor to The Dow Chemical Company, Midland, Mich.
Continuation of Ser. No. 898,478, Aug. 21, 1986, Pat. No. 4,751,162. This application Jun. 10, 1988, Ser. No. 205,714
The portion of the term of this patent subsequent to Jun. 14, 2005, has been disclaimed.
Int. Cl.[4] B41N *3/02;* C22C *23/02*
U.S. Cl. 430—12 18 Claims

1. A photoengraving plate with a pattern etched in a surface, the etched surface being a magnesium-based alloy consisting essentially of less than about 0.01% zinc, from about 0.01% to about 0.04% calcium and the balance being essentially magnesium.

4,855,199
PHOTOPATTERNED PRODUCT OF SILICONE POLYAMIC ACID ON A TRANSPARENT SUBSTRATE
Donald A. Bolon, Scotia; Victoria J. Eddy, Schenectady, and John E. Hallgren, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Division of Ser. No. 33,938, Apr. 3, 1987, Pat. No. 4,782,009.
This application Aug. 8, 1988, Ser. No. 229,667
Int. Cl.[4] G03C *3/00*
U.S. Cl. 430—18 2 Claims

1. A transparent substrate having an adherent silicone-polyimide film photopatterned on at least a portion of its surface, where the silicone-polyimide film is obtained by initially photopatterning a silicone polyamic acid on the surface of the transparent substrate involving the steps of
(1) spin coating the silicone polyamic acid onto the surface of the transparent substrate,
(2) drying the silicone polyamic acid at a temperature of at least 100° C.,
(3) spin coating a photoresist onto the surface of the silicone polyamic acid,
(4) exposing the applied positive photoresist to patterned UV light,
(5) developing the composite of the spin coated photoresist and the silicone polyamic acid,
(6) stripping remaining photoresist from the surface of the silicone polyamic acid with an organic solvent, and
(7) heating the silicone polyamic acid until fully imidized,
where the silicone polyamic acid is the product of reaction of substantially equal molar amounts of aryldiamine and organic dianhydride comprising a mixture of norbornane organosiloxane bisanhydride and aromatic organic bisanhydride.

4,855,200
FLUORESCENT SCREENS OF COLOR PICTURE TUBES AND MANUFACTURING METHOD THEREFOR
Yoshifumi Tomita; Masahiro Nishizawa, both of Mobara, and Saburo Nonogaki, Meguro, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 831,119, Feb. 20, 1986, abandoned, which is a continuation of Ser. No. 361,268, Mar. 24, 1982, abandoned. This application Dec. 28, 1987, Ser. No. 142,360
Claims priority, application Japan, Mar. 27, 1981, 56-43918
The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.
Int. Cl.[4] G03C *5/00;* H01J *9/227*
U.S. Cl. 430—25 6 Claims

1. In a method of manufacturing color picture tubes which tubes include a panel the inner surface of which is coated with a pattern of a black matrix layer and a pattern of a fine dot light absorptive layer of a non-luminous light absorption substance, and a reflective layer on said fine dot light absorptive layer, said black matrix layer, said light absorptive layer, and said reflective layer being overlaid with fluorescent material to

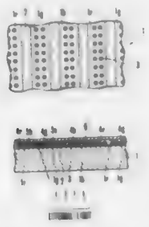
form a fluorescent screen for said color tube, which method comprises the steps of:

forming on the inner surface of said panel a photosensitive resin layer which becomes sticky upon exposure to light;

mounting a photomask on the outside of said panel;

exposing to light said photosensitive resin layer through at least the photomask to form a pattern of sticky portions of said resin layer at which a fine dot pattern of said light absorption layer is to be formed, and whereby the portion of the resin layer not being exposed to light will not be made sticky;

applying said non-luminous light absorbing substance or a substance convertible thereto on said photosensitive resin



layer and developing with air to form a pattern of said light absorbing layer corresponding to the pattern of said sticky portions of said resin layer;

delaying performance of the next step long enough for some of said sticky substance to ooze through the pattern of said light absorbing layer to the surface of said light absorbing substance;

spraying a fine powder of white material on the surfaces of the pattern of said light absorbing layer where said sticky substance has oozed through and developing said surfaces with air to form a fine dot pattern of said light absorbing layer on the surface of which a light reflection layer is deposited.

4,855,201

PHOTOCONDUCTIVE IMAGING MEMBERS WITH ELECTRON TRANSPORTING POLYSILYLENES

Santokh S. Badesha, Pittsford; Steven J. Grammatica, Penfield, and Frank Jansen, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 2, 1988, Ser. No. 189,496

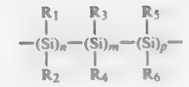
Int. Cl.[4] G03G *5/08, 5/10*

U.S. Cl. 430—58 **28 Claims**



1. A negatively charged photoconductive imaging member comprised of a supporting substrate; an electron polysilylene transporting layer; a metal oxide layer; and thereover a photogenerating layer comprised of hydrogenated amorphous silicon.

2. An imaging member in accordance with claim **1** wherein the polysilylene is of the formula



wherein R_1, R_2, R_3, R_4, R_5, and R_6 are independently selected from the group consisting of alkyl, aryl, substituted alkyl, substituted aryl, and alkoxy; and m, n, and p are numbers that represent the percentage of the monomer unit in the total polymer.

4,855,202

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Toshiyuki Yoshihara, Mitaka, and Tomohiro Kimura, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1988, Ser. No. 165,099

Claims priority, application Japan, Mar. 10, 1987, 62-52882

Int. Cl.[4] G03G *5/06*

U.S. Cl. 430—58 **10 Claims**

1. An electrophotographic photosensitive member having the structure comprising a conductive substrate laminated thereon with (i) a charge generation layer comprising at least a first charge generating material dispersed in a first binder resin and a second charge-generating material dispersed in a second binder resin, each said binder resin in said charge generation layer being incompatible with each other and (ii) a charge transport layer.

4,855,203

IMAGING MEMBERS WITH PHOTOGENERATING COMPOSITIONS OBTAINED BY SOLUTION PROCESSES

Santokh S. Badesha, Pittsford; Geoffrey M. T. Foley; Damodar M. Pai, both of Fairport, all of N.Y.; Richard H. Zallen, Blacksburg, Va.; Michael L. Slade, Rochester, and Martin A. Abkowitz, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 31, 1987, Ser. No. 92,266

Int. Cl.[4] C01B *19/02;* **C22C** *28/00;* **G03G** *5/082, 5/14*

U.S. Cl. 430—59 **36 Claims**

1. A layered photoresponsive imaging member comprised of a supporting substrate; an amorphous photoconductive layer and a hole transport layer dispersed in a resinous binder, which hole transport layer is formulated from a solution mixture; and wherein the photoconductive layer is prepared by a process which comprises dissolving an inorganic photoconductive component selected from the group consisting of amorphous selenium and amorphous selenium alloys in a solvent consisting of one or more amines, removing the suspended particles therefrom, depositing the resulting solution on the supporting substrate, and subsequently heating the aforementioned member, wherein the imaging member is free of residual impurities that adversely affect electrical characteristics.

4,855,204

WHITE TONER CONTAINING A HIGH PURITY TITANIUM DIOXIDE PIGMENT

Masanori Fujii, Sakai; Shuji Komura, Nara, and Shunsuke Oogami, Sakai, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Feb. 23, 1988, Ser. No. 159,238

Claims priority, application Japan, Feb. 26, 1987, 62-45014; Mar. 31, 1987, 62-80576

Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—106 **10 Claims**

1. A white toner comprising a fixing resin medium and dispersed therein a titanium dioxide pigment of high purity containing at least 99% by weight of TiO_2, not more than 0.1% by weight of Al_2O_3 and not more than 0.05% by weight of SiO_2 as a white pigment, said titanium dioxide pigment having an average particle diameter of not less than 0.05 microns.

4,855,205

INTERDISPERSED TWO-PHASE FERRITE COMPOSITE AND CARRIER THEREFROM

Bijay S. Saha, Rochester, and Robert E. Zeman, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1988, Ser. No. 229,366

Int. Cl.[4] G03G *9/10, 9/14*

U.S. Cl. 430—106.6 **12 Claims**



1. A interdipsersed two-phase ferrite composite which comprises about 0.1 mole to about 1.0 moles of a spinel phase having the general formula MFe_2O_4 where M is at least one element that forms a spinel ferrite, to about 2.5 moles of a magnetoplumbite phase having the general formula $R_xP_{1-x}Fe_{12}O_{19}$ where R is a rare earth element selected from the group consisting of lanthanum, neodymium, praseodymium, samarium, europium, and mixtures thereof, P is selected from the group consisting of strontium, barium, calcium, lead, and mixtures thereof, and x has a value of from about 0.1 to about 0.4.

6. A particle formed of a composite according to claim **1**.

8. A carrier for use in electrostatography comprising particles according to claim **6** magnetized and coated with a polymer.

4,855,206

RARE EARTH CONTAINING MAGNETIC CARRIER PARTICLES

Bijay S. Saha, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1988, Ser. No. 229,382

Int. Cl.[4] G03G *9/14*

U.S. Cl. 430—106.6 **19 Claims**

1. Carrier particles for use in the development of electrostatic latent images which comprise magnetically hard ferrite material having a single phase hexagonal crystal structure and containing rare earth selected from the group consisting of neodymium, praseodymium, samarium, europium, mixtures thereof, and mixtures of at least one thereof with lanthanum.

4,855,207

DEVELOPER FOR ELECTROPHOTOGRAPHY

Kazuo Tsubuko, and Kayoko Nagai, both of Numazu, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 166,881

Claims priority, application Japan, Mar. 13, 1987, 62-058203

Int. Cl.[4] G03G *9/10, 9/12*

U.S. Cl. 430—109 **11 Claims**

1. A developer for electrophotography comprising toner particles and a carrier, said toner particles comprising colorant particles coated with an olefin resin having a melt index of 25 to 700 g/10 min, measured under a load of 2160±10 g, at 190°±0.4° C.

3. The developer for electrophotography as claimed in claim **1**, wherein said toner particles have been prepared by a flushing method and consist essentially of pigment particles, said olefin resin and a humic acid component selected from the group consisting of humic acid, a salt of humic acid, and a humic acid derivative.

11. A developer for electrophotography as claimed in claim **3** in which said olefin resin is a terpolymer of (1) from 50 to 60 mole % of an olefin component selected from the group consisting of ethylene or propylene, (2) from 9 to 40 mole % of vinyl acetate and (3) from 10 to 31 mole % of acrylic acid, methacrylic acid or alkyl esters thereof.

4,855,208

TONER FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

Akihiro Tada, Osaka; Takashi Kiriu, Kyoto, and Motoomi Arakawa, Osaka, all of Japan, assignors to Orient Chemical Industries Ltd., Japan

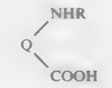
Filed Jun. 13, 1988, Ser. No. 206,472

Claims priority, application Japan, Jul. 9, 1987, 62-172573

Int. Cl.[4] G03G *9/08, 9/14*

U.S. Cl. 430—110 **20 Claims**

1. Toner for developing electrostatic latent images, comprising a resin and a charge control effective amount of an aluminum compound of aromatic o-aminocarboxylic acid, the aromatic o-aminocarboxylic acid being represented by the formula



[1]

wherein Q is a benzene nucleus which is optionally substituted with at least one nuclear substituent or naphthalene nucleus which is optionally substituted with at least one nuclear substituent, R is hydrogen, alkyl (C_1–C_{18}), aryl or nuclear substituted aryl (C_6–C_{18}), aralkyl or nuclear substituted aralkyl (C_7–C_{18}), or —COR′, wherein R′ is alkyl (C–C_8), aryl (C_6–C_8), alkoxy (C_1–C_8) or amino.

4,855,209

LOW MELTING ENCAPSULATED TONERS

Trevor I. Martin, Burlington; Marcel P. Breton, Mississauga; Randolph E. Branston, Sarnia; Karen A. Moffat, Brantford, and Walter Mychajlowskij, Georgetown, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 4, 1987, Ser. No. 128,851

Int. Cl.[4] G03G *13/14*

U.S. Cl. 430—126 **31 Claims**

1. An encapsulated heat fusable toner composition with a melting temperature of from about 65° C. to about 140° C. comprised of a core containing a polymer selected from the group consisting of polyethylene succinate, polyhalogenated olefins, poly(alphaalkylstyrenes), rosin modified maleic resins, aliphatic hydrocarbon resins, poly(ε-caprolactones), and mixtures thereof; and pigment particles, where the core is encapsulated in a shell prepared by interfacial polymerization reactions.

4,855,210

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER, PROCESS AND APPARATUS FOR THE PREPARATION THEREOF

Masaaki Hirooka, Toride; Shunichi Ishihara, Ebina; Junichi Hanna, and Isamu Shimizu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1986, Ser. No. 940,499

Claims priority, application Japan, Dec. 11, 1985, 60-277003

Int. Cl.[4] G03G *5/05*

U.S. Cl. 430—133 **22 Claims**

1. In the process for preparing an improved electrophotot-

graphic photosensitive member having a substrate and a light receiving layer comprising a layer formed from a silicon-containing amorphous material, the improvement which comprises:

(a) introducing via a first gas transportation conduit into an evacuated film-forming space having said substrate therein; a gaseous substance (i) capable of being a constituent for said layer, but essentially incapable of contributing to the formation of said layer in its original energy state and, separately, through a second gas transportation conduit concentric with the first gas transportation conduit, a gaseous oxidizing agent (ii) capable of electronically oxidizing the substance (i); said first and second concentric gas transportation conduits having outlets terminating adjacent said film-forming space to form a mixing region for said substances (i) and (ii);

(b) chemically reacting said two gaseous substances (i) and (ii) in the absence of a plasma in the space surrounding the surface of said substrate in said film-forming space; said substrate being maintained at an elevated temperature to generate a plurality of precursors containing excited precursors and to cause at least one of the precursors to form said layer; and simultaneously rotating said substrate; and

(c) maintaining the length between the outlets of said first and second concentric gas transportation conduits forming said mixing region from about 1 to 5 centimeters.

4,855,211

POLYMERIC PHOSPHONIUM MORDANT AND PHOTOGRAPHIC ELEMENT CONTAINING THE SAME

Wilhelmus Janssens, Aarschot; Daniël M. Timmerman, and Daniël A. Claeys, both of Mortsel, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

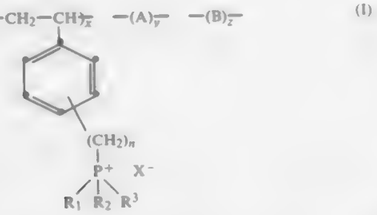
Filed Aug. 4, 1988, Ser. No. 228,173

Claims priority, application European Pat. Off., Sep. 11, 1987, 87201741.3

Int. Cl.⁴ G03C *5/54;* **C08F** *30/02, 19/24, 12/08*

U.S. Cl. 430—213 **12 Claims**

1. Photographic element having on a support at least one layer containing a phosphonium mordanting polymer comprising randomly distributed recurring units corresponding to the general formula (I)



(I)

wherein:

A represents a unit that is derived from a copolymerizable ethylenically unsaturated monomer capable of quenching singlet oxygen;

B represents a unit that is derived from a copolymerizable ethylenically unsaturated monomer having a hydrophobic character;

n represents an integer of from 1 to about 12;

each of R_1, R_2 and R_3 (same or different) represents a C_1–C_8 alkyl group, a cycloalkyl group or an aryl group;

X^- represents an acid anion;

x represents from about 5 mole % to about 80 mole %;

y represents from about 20 mole % to about 95 mole % and

z represents from 0 mole % to about 65 mole %.

4,855,212

PHOTOPOLYMERIZABLE COMPOSITION

Marilyn Tate, Newark, and Daniel F. Varnell, Wilmington, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Jan. 25, 1988, Ser. No. 148,324

Claims priority, application United Kingdom, Feb. 6, 1987, 8702732

Int. Cl.⁴ G03C *1/68, 1/94*

U.S. Cl. 430—281 **13 Claims**

1. In a photopolymerizable composition comprising a carboxyl group-containing, film forming polymeric binder, wherein said binder is prepared from one or more monomers selected from the group consisting of alkyl and hydroxyalkyl acrylates and methacrylates having 3 to 15 carbon atoms, styrene and alkyl-substituted styrenes and one or more alpha, beta ethylenically unsaturated carboxyl group-containing monomers, a free radical photoinitiator, addition photopolymerizable monomers, and a thermal polymerization inhibitor, the improvement wherein the composition further comprises, from about 2 to about 20 weight percent of a cellulosic material wherein said cellulosic material is miscible in said composition.

4,855,213

NOVEL POLYMETHINE DYES AND IMAGING COMPOSITIONS

Margaret E. Logan, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 67,843, Jun. 30, 1987, abandoned. This application Apr. 20, 1988, Ser. No. 183,876

Int. Cl.⁴ G03C *1/10, 1/40;* **C09B** *69/00*

U.S. Cl. 430—281 **13 Claims**

1. A polymethine dye of the formula:



where

D is a cyano, sulfo, or carbonyl group;

E represents the atoms completing an aromatic heterocyclic nucleus comprised of a five or six membered heterocyclic ring containing at least one heteroatom, each of said heteroatoms being chosen from the class consisting of nitrogen, oxygen, and sulfur;

L^1 and L^2 are methine groups and

n is the integer 0, 1, or 2.

4,855,214

RADIATION-SENSITIVE HIGH-POLYMERIC MATERIAL

Yukinori Kuwano, Katano; Yoshikazu Tsujino, Sakai, and Yuji Hamada, Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Aug. 31, 1987, Ser. No. 90,992

Claims priority, application Japan, Sep. 1, 1986, 61-205283; Jun. 9, 1987, 62-144430

Int. Cl.⁴ G03C *1/495, 1/68*

U.S. Cl. 430—281 **4 Claims**

1. A radiation-sensitive high-polymeric material comprising: polymethyl methacrylate having an average molecular weight which is in a range from 600,000 to 1,500,000 and a tetraalkylammonium perchlorate as an orientation inhibitor wherein said polymethyl methacrylate and tetraalkylammonium perchlorate are dissolved in an ethylene glycol monoloweralkyl ether acetate as a solvent.

4,855,215

PHOTOSETTING POLYMER COMPOSITION

Tsunetomo Nakano; Toshikazu Hayashi, and Toshinori Tsukada, all of Ichihara, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Oct. 15, 1987, Ser. No. 108,787

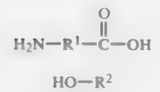
Claims priority, application Japan, Oct. 15, 1986, 61-244944

Int. Cl.⁴ C08F *2/50, 255/10, 267/04, 271/02*

U.S. Cl. 430—283 **14 Claims**

1. A photosetting composition comprising:

a base polymer comprising a base copolymer which is produced by reacting a starting copolymer of maleic anhydride and an unsaturated hydrocarbon compound, with a compound having the formula (I) and a compound having the formula (II):

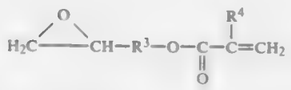


(I)



(II)

wherein R^1 is an alkylene group having 1–12 carbon atoms or an aromatic group and R^2 is a residue of a saturated compound having 1–12 carbon atoms, to open a portion of acid anhydride rings of the maleic anhydride units of the starting copolymer, heating the resulting copolymer to close a portion of units which have been formed by opening the rings with the compound of the formula (I) to form units having an imido structure, and reacting the resulting copolymer with a compound having the formula (III):



(III)

wherein R^3 is an alkylene group having 1–12 carbon atoms or an aromatic group and R^4 is hydrogen or methyl, to introduce the acryloyl or methacryloyl group of the compound of the formula (III) into a portion of carboxyl groups of the copolymer which have been formed by the ring-opening reaction and a portion of the acid anhydride rings of the copolymer, said base copolymer containing residual acid anhydride rings of less than 60 molar % based on the number of the acid anhydride rings of the starting copolymer and having an addition ratio of acryloyl or methacryloyl group originating from the compound of formula (III) in terms of

$$\frac{\text{number of the introduced acryloyl or methacryloyl group}}{\text{number of the maleic anhydride unit of the starting copolymer}} \times 100$$

being not less than 1 molar %;

5–500 weight parts of a photopolymerizable monomer per 100 weight parts of the base copolymer;

1–50 weight parts of a photopolymerization initiator per 100 weight parts of the base polymer.

4,855,216

NO-RINSE PHOTOGRAPHIC PROCESSING METHOD AND THE STABILIZING BATH USED FOR THIS METHOD

Heinz Meckl, Bergisch-Gladbach; Erika Spriewald, Leverkusen, and Günter Renner, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

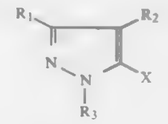
Filed Oct. 5, 1988, Ser. No. 253,664

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1987, 3735274; Jan. 13, 1988, 3800681

Int. Cl.⁴ G03C *5/39*

U.S. Cl. 430—372 **7 Claims**

1. A no-rinse processing method for the production of color photographic images comprising the steps of developing, bleaching, fixing and stabilizing, of which the bleaching and fixing steps may be combined into a bleach-fixing step, characterized in that the stabilizing bath used in the stabilizing step contains an effective quantity of a pyrazole which, in one of the possible tautomeric forms, corresponds to the following general formula:



in which

X represents OH or NH_2,

R_1 represents alkyl, substituted alkyl, aryl, substituted aryl or carboxyl,

R_2 represents hydrogen, alkyl or substituted alkyl,

R_3 represents hydrogen, alkyl, substituted alkyl, aryl or substituted aryl.

4,855,217

PROCESSING OF COLOR PHOTOGRAPHIC MATERIAL UTILIZING A STABILIZING SOLUTION AFTER FIXING

Masayuki Kurematsu, Hino, and Shigeharu Koboshi, Sagamihara, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 21,533, Feb. 26, 1987, abandoned, which is a continuation of Ser. No. 812,591, Dec. 23, 1985, abandoned. This application Mar. 18, 1988, Ser. No. 170,670

Claims priority, application Japan, Dec. 26, 1984, 59-280964

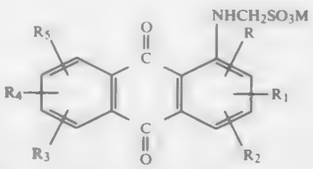
The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.⁴ G03C *7/40, 5/24, 11/00, 7/26*

U.S. Cl. 430—372 **26 Claims**

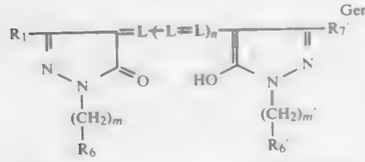
1. A processing method for silver halide color photosensitive material in which said silver halide color photosensitive material is treated with a processing solution that has a fixing ability, and then is not washed, but treated with a washless stabilizer solution, characterized in that said silver halide color photosensitive material is treated with said washless stabilizer in the presence of at least one compound among compounds represented by General Formula [I], [II], [II'], or [II''] shown below; and that said washless stabilizer contains more than 20 mg/l silver ion, and at least one aldehyde compound:

General Formula [I]

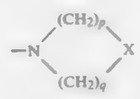


where each of R, R_1, R_2, R_3, R_4, and R_5 is a hydrogen or halogen atom, or a hydroxy, alkyl, alkoxy, sulfo or —NHCH-$_2$SO$_3$M group; M is a cation;

General Formula [II]

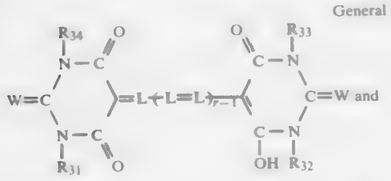


where each of R_6 and R_6' is a hydrogen atom, or an alkyl, aryl or heterocyclic group; each of R_7 and R_7' is a hydroxyl, alkoxy, substituted alkoxy, cyano, trifluoromethyl, —COOR$_8$, —CONHR$_8$, —NHCOR$_8$, amino, or C$_{1-4}$-alkyl-substituted amino group, or a cyclic amino group represented by a formula



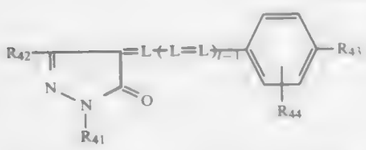
(where each of p and q is the integer 1 or 2; X is an oxygen or sulfur atom, or a —CH$_2$— group); R_8 is a hydrogen atom, or an alkyl or aryl group; L is a methin group; n is the integer 0, 1 or 2; each of m and m' is the integer 0 or 1;

General Formula [II']

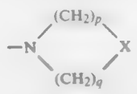


where r is 1, 2 or 3; W is an oxygen or sulfur atom; L is a methine group; each of R_{31} to R_{34} is a hydrogen atom, or an alkyl, aryl, or aralkyl, or heterocyclic group; and at least one group of R_{31} to R_{34} is a substituent group other than a hydrogen atom;

General Formula [II"]



where l is the integer 1 or 2; L is a methine group; R_{41} is an alkyl, aryl, or heterocyclic group; R_{42} is a hydroxy, alkyl, alkoxy substituted alkoxy, cyano, trifluoromethyl, —COOR$_8$, —CONHR$_8$, —NHCOR$_8$, amino, or C$_{1-4}$-alkyl-substituted amino group, or a cyclic amino group represented by a formula



(where each of p and q is an oxygen or sulfur atom, or a —CH$_2$— group); R_8 is a hydrogen atom, or an alkyl or aryl group; further, R_{43} is allowed to be an —OZ, or



group where each of Z_1, Z_2 and Z_3 is a hydrogen atom, or an alkyl group; and Z_2 and Z_3 are allowed to be the same or to form a ring with the combination with each other; and R_{44} is a hydrogen or chlorine atom, or an alkyl or alkoxy group.

4,855,218

METHOD FOR PROCESSING SILVER HALIDE PHOTOGRAPHIC LIGHTSENSITIVE MATERIALS

Yoshihiro Fujita, and Akira Abe, both of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Feb. 10, 1988, Ser. No. 154,200

Claims priority, application Japan, Feb. 13, 1987, 62-31094; Feb. 13, 1987, 62-31095

Int. Cl.[4] G03C *5/24, 7/40, 7/00, 5/44*

U.S. Cl. 430—428 **12 Claims**

1. A method for processing silver halide photographic light-sensitive materials in which there are used replenishers for water washing and/or stabilization processes in such a manner that the concentrations of calcium and magnesium compounds in the replenishers are not more than 5 mg/l on the basis of elemental calcium and magnesium respectively, and a part or whole of overflow from the water washing and/or stabilization processes is introducing into a treating process having fixing ability and which is preceding the water washing and/or stabilization processes.

4,855,219

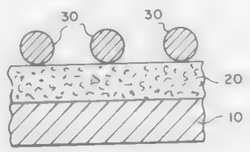
PHOTOGRAPHIC ELEMENT HAVING POLYMER PARTICLES COVALENTLY BONDED TO GELATIN

Pranab Bagchi, Webster; Melvin D. Sterman, Pittsford, and Howard M. Low, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 18, 1987, Ser. No. 98,434

Int. Cl.[4] G03C *1/00, 1/76*

U.S. Cl. 430—496 **8 Claims**



1. A photographic element comprising a support having thereon:

a radiation-sensitive silver halide emulsion layer,

an outermost layer comprising gelatin, which may be the same as or different from the silver halide layer, and

an amount effective as a matting agent of polymer particles on top of the outer surface of the outermost gelatin layer covalently bonded to the gelatin of the outermost layer, either directly or with the aid of a crosslinking agent.

4,855,220

PHOTOGRAPHIC ELEMENT HAVING LAYER FOR INCREASING IMAGE SHARPNESS COMPRISING A NON-DIFFUSION DIR COMPOUND

Richard P. Szajewski, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 14, 1988, Ser. No. 144,889

Int. Cl.[4] G03C *1/46, 7/32, 1/84*

U.S. Cl. 430—505 **6 Claims**

1. A photographic element for exposure to an image, comprising a support having thereon

a layer comprising spectrally-sensitized light-sensitive silver halide and a color dye-forming coupler,

a layer, which may be the same as or different than said silver halide layer, comprising a DIR compound that releases a substantially non-diffusible development inhibitor capable of inhibiting development of said silver halide on reacting with an oxidation product of a development agent during development, and

a layer, between said silver halide layer and the source of the image exposure, comprising a non-diffusible filter dye that absorbs light in the region of the spectrum to which the silver halide is sensitized.

4,855,221

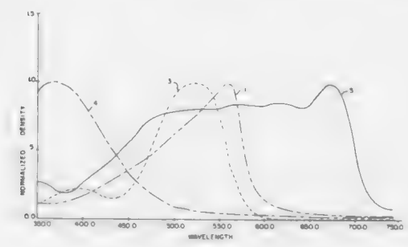
PHOTOGRAPHIC ELEMENTS HAVING OXONOL DYES

Ronda E. Factor, and Donald R. Diehl, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

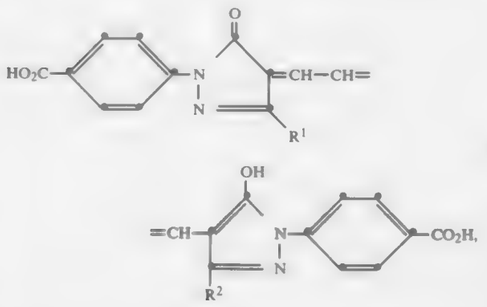
Filed Jul. 13, 1987, Ser. No. 73,257

Int. Cl.[4] G03C *1/84*

U.S. Cl. 430—510 **4 Claims**



1. A photographic element comprising a support having thereon a radiation-sensitive silver halide emulsion layer and a layer, which is the same as or different from the silver halide layer, comprising a hydrophilic colloid and an amount effective as a photographic filter dye of a solid particle dispersion of a compound having the formula:



wherein R^1 and R^2 each independently represent alkyl of from 1 to 5 carbon atoms.

the particles of said dispersion having a mean diameter of between about 0.01 and 10 μm.

4,855,222

COLOR PHOTOGRAPHIC RECORDING MATERIAL

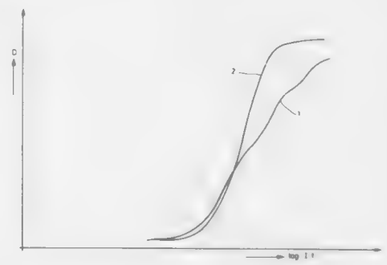
Günter Renner, Bergisch Gladbach; Erich Wolff, Solingen; Heinz Wiesen, Euskirchen, and Werner Liebe, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 18, 1988, Ser. No. 273,955

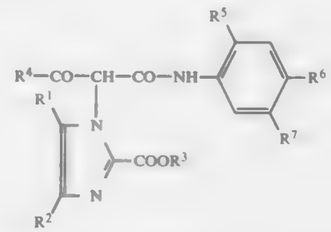
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1987, 3741088

Int. Cl.[4] G03C *7/36*

U.S. Cl. 430—557 **1 Claim**



1. A color photographic recording material comprising at least one photosensitive silver halide emulsion layer and, associated therewith, a 2-equivalent yellow coupler to the coupling position of which an imidazole-2-carboxylic acid ester group is attached by a ring nitrogen atom, characterized in that the 2-equivalent yellow coupler corresponds to the following formula



in which

R^1, R^2 (same or different) represent hydrogen, alkyl or halogen;

R^3 represents alkoxyalkyl or an alkyl radical substituted by a heterocyclic group containing at least one oxygen atom;

R^4 represents alkyl or aryl;

R^5 represents halogen or alkoxy;

R^6 represents hydrogen, alkoxy, amino, acylamino or carbamoyl;

R^7 represents alkoxy, acylamino, carbalkoxy, carbamoyl or sulfamoyl.

4,855,223

ORGANIC COMPOUNDS FOR USE IN A DYE DIFFUSION TRANSFER PROCESS AND PHOTOGRAPHIC ELEMENTS INCORPORATING THEM

Luc J. Vanmaele, Lochristi; Janssens Wilhelmus, Aarschot, and Christian C. Van de Sande, Belsele, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Mar. 9, 1988, Ser. No. 166,028

Claims priority, application European Pat. Off., Mar. 19, 1987, 87200506.1

Int. Cl.[4] G03C *5/54, 7/26*

U.S. Cl. 430—562 9 Claims

1. A photographic silver halide emulsionn material for dye image production comprising a support carrying at least one alkali-permeable silver halide hydrophilic colloid emulsion layer having in operative association therewith a non-diffusing dye releasing compound being capable of releasing a diffusible azo dye from a carrier moiety by a redox-reaction which compound corresponds to the following general formula (I):

$$CAR—L—G—D \quad (I)$$

wherein:

CAR represents a hydroquinone type or quinone type moiety capable of undergoing a redox-reaction,

L represents a chemical group cleavable or releasable from the carrier moiety by a redox-reaction which takes place under alkaline conditions,

G represents a bivalent organic linking group, and

D is an azo dye part directly chemically linked to G,

characterised in that said compound comprises in its structure a group $—Ar^1—SO_2NR—Ar^2—NRSO_2—$ so that:

(1) the group $—Ar^1—SO_2NR—Ar^2—NRSO_2—$ is the bivalent organic linking group G, wherein its Ar^1 group is directly linked to L and wherein between its SO_2 end group and an azo-group of the dye part D only one bivalent aromatic nucleus or bivalent condensed aromatic nucleus, which nuclei may be substituted, is present, and wherein in said group $—Ar^1—SO_2NR—Ar^2—NRSO_2—$ R is hydrogen or an alkyl group, and each of Ar^1 and Ar^2—same or different— represents a bivalent unsubstituted or substituted aromatic nucleus, and/or

(2) said group $—Ar^1—SO_2NR—Ar^2—NRSO_2—$ is linked directly through its first group Ar^1 to an azo-group (—N=N—) of the dye part D, and through its SO_2 end group is linked to a group R^6 which represents hydrogen or an alkyl group, the groups Ar^1, Ar^2 and R having the same definition as given in point (1) above; wherein the group containing Ar^1 and Ar^2 does not form part of the group CAR—L—.

4,855,224

MOLECULARLY CLONED DIAGNOSTIC PRODUCT AND METHOD OF USE

Phillip W. Berman, and Laurence A. Lasky, both of San Francisco, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 587,763, Mar. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 527,916, Aug. 30, 1983, abandoned, and a continuation-in-part of Ser. No. 547,552, Oct. 31, 1983, abandoned. This application Sep. 13, 1985, Ser. No. 776,059

Int. Cl.[4] C12Q *1/70;* C12N *15/00, 5/00*

U.S. Cl. 435—5 34 Claims

1. A diagnostic product comprising membrane-bound polypeptide having antigenic determinants capable of specifically binding complementary antibody to herpes simplex virus, said polypeptide being functionally associated with the membrane of a recombinant, stable, continuous cell line capable of its production.

4,855,225

METHOD OF DETECTING ELECTROPHORETICALLY SEPARATED OLIGONUCLEOTIDES

Steven Fung, Palo Alto; Sam L. Woo, Redwood City, both of Calif.; Richard P. Haugland, Junction City, Oreg.; Steven M. Menchen, Hayward, and Charles R. Connell, Redwood City, both of Calif., assignors to Applied Biosystems, Inc., Foster City, Calif.

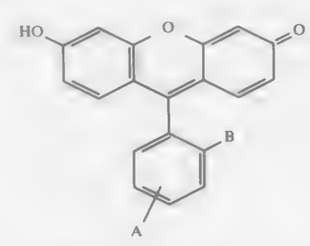
Filed Feb. 7, 1986, Ser. No. 827,348

Int. Cl.[4] C12Q *1/68;* G01N *33/50;* C07H *21/00*

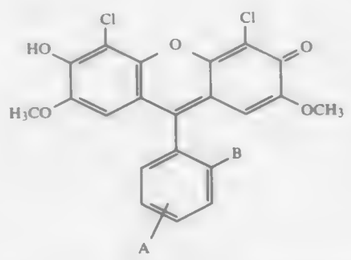
U.S. Cl. 435—6 20 Claims

1. A method for detecting up to four classes of oligonucleotides separated by gel electrophoresis, the method comprising the steps of:

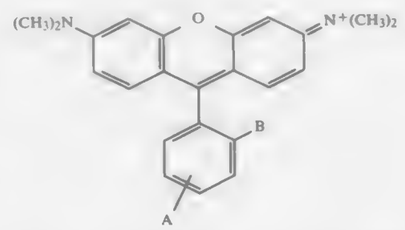
labeling each oligonucleotide within each class with one or more dyes selected from the same one of either a first set of dyes, a second set of dyes, a third set of dyes, or a fourth set of dyes to form dye-oligonucleotide conjugates from each class such that oligonucleotides from the same class are labeled with dyes from the same set and oligonucleotides from different classes are labeled with dyes from different sets, the first set consisting of dyes defined by the formula:



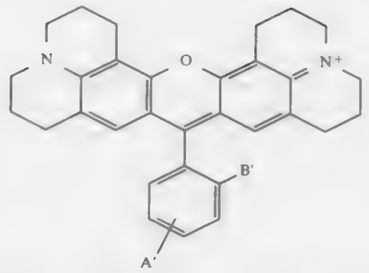
wherein A is a linking functionality and B is an acidic anionic group, the second set consisting of dyes defined by the formula:



wherein A and B are defined as above, the third set consisting of dyes defined by the formula:



wherein A and B are defined as above, and the fourth set consisting of dyes defined by the formula:



wherein A′ is a linking functionality or an acidic anionic group and B′ is a linking functionality whenever A′ is an acidic anionic group, and B′ is an acidic anionic group whenever A′ is a linking functionality;

forming a mixture of the dye-oligonucleotide conjugates from more than one class;

electrophoretically separating the dye-oligonucleotide conjugates on a gel;

illuminating the dyes of similarly separated dye-oligonucleotide conjugates; and

identifying the class of similarly separated dye-oligonucleotide conjugates by the fluorescence or absorption spectrum of the dyes of the dye-oligonucleotide conjugates.

4,855,226

NOVEL COMPETITIVE ASSAY FOR THEOPHYLLINE AND REAGENT FOR USE THEREIN

Alan J. Polito, Danville, and Anthony K. Cheng, Anaheim, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 7, 1985, Ser. No. 742,264

Int. Cl.[4] G01N *33/53*

U.S. Cl. 435—7 14 Claims

1. A competitive immunoassay method for detecting theophylline which may be present in a test sample comprising:

(a) contacting said test sample with antitheophylline antibody and a labelled conjugate having a formula selected from the group consisting of wherein:

(1) Z is a label;

(2) n is an integer of at least 1;

(3) R is a linking group;

(4) X_1 is a methyl group; and

(5) X_2 is a hydrocarbon chain of up to 6 carbon atoms and,

(b) detecting the presence and/or amount of labelled conjugate complexed with said antitheophylline antibody

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4,855,227

RAPID DETECTION OF MYCOPLASMAS

Gerard J. McGarrity, Wenonah, and Hitoshi Kotani, Cherry Hill, both of N.J., assignors to Institute for Medical Research, Camden, N.J.

Filed Jun. 7, 1985, Ser. No. 742,469

Int. Cl.[4] G01N *33/543, 33/569*

U.S. Cl. 435—7 25 Claims

1. A diagnostic method for rapid detection of Mycoplasma pneumoniae in human secretions and specimens comprising:

applying said secretion or a suspension of the specimen comprising 10^5 or less colony forming units of *M. pneumoniae* to a solid support comprising a nitrocellulose paper and allowing it to dry; then

filling unoccupied protein binding sites of the solid support by contacting with a blocking solution comprising horse serum and polyoxyethylene sorbitan monolaurate; then

contacting the solid support with a primary antibody raised in a first vertebrate species against *Mycoplasma pneumoniae;* then

contacting the solid support with a secondary antibody raised against immunoglobulin of the species of the primary antibody, said secondary antibody bearing a means of detection; then

detecting the presence of said secondary antibody bound to said solid support utilizing said means of detection, and relating said bound secondary antibody to the presence of *Mycoplasma pneumoniae.*

4,855,228

MULTIPLE OXIDATIVE INDICATOR SYSTEM FOR VISUAL DETERMINATION OF HYDROGEN PEROXIDE

Steven C. Charlton, and Elva Kurchacova, both of Elkhart, Ind., assignors to Miles Inc., Elkhart, Ind.

Filed Sep. 11, 1987, Ser. No. 95,143

Int. Cl.[4] C21Q *1/28, 1/54, 1/26;* C12N *11/00*

U.S. Cl. 435—28 14 Claims

1. A test composition for the visual determination of hydrogen peroxide in a fluid sample, comprising a composition having a first apparent color prior to contact with a fluid sample and a final apparent color after contact with the fluid sample, wherein the final apparent color is visually distinct from the first apparent color and depends on the concentration of hydrogen peroxide in the fluid sample, said test composition comprising:

(a) a peroxidatively active substance; and

(b) a multiple oxidative indicator system, which multiple oxidative indicator system is composed of at least a first and a second oxidative indicator component, each indicator component of the system being oxidized only by hydrogen peroxide and the peroxidatively active substance; and wherein

the first indicator component is oxidized from a first apparent color to essentially colorless and the second indicator component is oxidized to a final apparent color which is visually distinct from the first apparent color.

4,855,229

MEASUREMENT METHOD OF PEROXIDASE ACTIVITY

Eriko Kogure, Sagamihara; Makoto Nakamura, and Toshiaki Kumazawa, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1986, Ser. No. 936,320

Claims priority, application Japan, Dec. 5, 1985, 60-272426

Int. Cl.[4] C12Q *1/28;* C12N *9/96*

U.S. Cl. 435—28 15 Claims

1. A measurement method of peroxidase activity based on reaction of o-phenylenediamine and hydrogen peroxide in the presence of peroxidase, said method comprising the steps of:

preparing and storing a first reagent containing o-phenylenediamine and having a first pH value higher than 6, which first pH is higher than a second pH value at which said reaction is conducted;

preparing and storing a second reagent having a buffering capacity larger than said first reagent;

mixing said stored first and second reagents together with a sample containing peroxidase and a predetermined amount of hydrogen peroxide to provide a reaction mixture having said second pH value;

conducting said reaction in said reaction mixture, thereby producing 2,2′-diamino-azobenzene; and

measuring absorbance increase at the maximum absorption wavelength of said 2,2′-diamino-azobenzene.

4,855,230
MICROORGANISM INHIBITION OF FROST DAMAGE TO PLANTS
Steven E. Lindow, Berkeley, Calif., assignor to The Regents of the University of California, Alameda, Calif.
Continuation of Ser. No. 867,779, May 27, 1986, abandoned, which is a division of Ser. No. 554,427, Nov. 22, 1983, abandoned, which is a division of Ser. No. 294,604, Aug. 20, 1981, Pat. No. 4,432,160. This application Oct. 19, 1987, Ser. No. 110,557
Int. Cl.[4] C12Q *1/24, 1/02, 1/04;* C12N *1/00, 1/20;* C12R *1/18, 1/38, 1/39;* A01N *63/00;* A01G *13/00*
U.S. Cl. 435—30 5 Claims

1. A method for isolating an antagonistic ice nucleating deficient bacteria wherein said antagonistic bacteria depletes a growing surface of at least one limited nutrient supplied by a host plant, said method comprising:
selecting for ice nucleating deficient first bacteria by isolating bacteria which do not freeze at an ice-forming temperature;
growing said first bacteria on a first nutrient medium surface having a limiting amount of at least one nutrient provided in a limiting amount by a host plant;
growing said second bacteria, wherein said second bacteria are ice-nucleating bacteria, on said first surface whereby antagonistic first bacteria are indicated by a clear zone resulting from no growth of said second bacteria due to the absence of said at least one limited nutrient;
growing said antagonistic first bacteria on a second nutrient-rich medium surface;
growing said second bacteria on said second surface whereby nutrient-depleting antagonistic first bacteria are indicated by absence of a clear zone resulting from growth of said second bacteria on said second surface; and
isolating said nutrient-depleting antagonistic first bacteria.

4,855,231
REGULATORY REGION FOR HETEROLOGOUS GENE EXPRESSION IN YEAST
David W. Stroman, Bartlesville, Okla.; Paul F. Brust, San Diego, Calif.; Steven B. Ellis, La Jolla, Calif.; Thomas R. Gingeras, Encinitas, Calif.; Michael M. Harpold, and Juerg F. Tschopp, both of San Diego, Calif., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Continuation-in-part of Ser. No. 666,391, Oct. 30, 1984. This application Sep. 25, 1985, Ser. No. 780,102
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[4] C12P *21/00, 21/02;* C12N *15/00, 7/00*
U.S. Cl. 435—68 98 Claims

39. An isolated DNA fragment comprising the 3' portion of the p40, p76 or alcohol oxidase genes derived from *Pichia pastoris* which fragment when positioned at the 3' end of a structural gene is capable of controlling the polyadenylation, termination of transcription and termination of translation of messenger corresponding to said structural gene and the 5' portion of the p40, p76 or alcohol oxidase genes derived from *Pichia pastoris* which fragment is responsive to the presence of methanol in the culture medium with which a host organism for said fragment is in contact and wherein said fragment is capable of controlling the transcription of messenger RNA when positioned at the 5' end of said structural gene.

4,855,232
METHOD FOR PRODUCTION OF GLUCOSE BY USE OF TRANSGLUCOSIDASE
Yoshiyuki Takasaki, Matsudo, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan
Filed Mar. 31, 1988, Ser. No. 176,312
Claims priority, application Japan, Feb. 9, 1988, 63-28590
Int. Cl.[4] C12P *19/18*
U.S. Cl. 435—97 10 Claims

1. A method for the production of glucose, comprising:
adding a glucoamylase and a transferase to liquefied starch, thereby saccharifying said liquified starch, wherein said transferase attains a transfer reaction with an α-1,4-glucosidic bond of said liquified starch.

4,855,233
PROCESS FOR CARRYING OUT ENZYMATIC REACTIONS IN AN ORGANIC SOLVENT
Christian Gancet, Billere; Claude Guignard, Habas, and Philippe Fourmentraux, Pau, all of France, assignors to Societe Nationale Elf Aquitaine, France
Filed Mar. 25, 1987, Ser. No. 30,696
Claims priority, application France, Mar. 26, 1986, 86 04352
Int. Cl.[4] C12P *7/62, 7/64*
U.S. Cl. 435—135 15 Claims

1. In a process of carrying out an enzymatic reaction comprising contacting a substrate dissolved in an organic liquid solvent therefor with the enzyme, the improvement which comprises said solvent comprising a fluorinated hydrocarbon and the reaction is conducted in a non-aqueous environment.

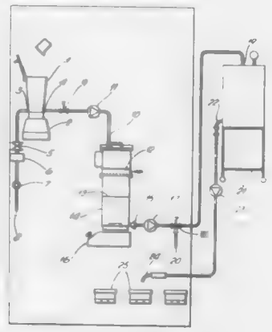
4,855,234
BIOLOGICALLY ACTIVE PROTEIN IMMOBILIZED WITH A POLYMERIC FIBROUS SUPPORT
Carol E. Hendrickson, St. Joseph Township, Ramsey County, Wis.; Rosa Uy, and Arlene J. Mencke, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 796,274, Nov. 8, 1985, Pat. No. 4,757,014. This application Mar. 17, 1988, Ser. No. 169,832
The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.
Int. Cl.[4] C12N *11/06, 11/02, 11/08*
U.S. Cl. 435—181 9 Claims

1. A composite article comprising in sequence:
(a) a polymeric fibrous support having a large surface area, which surface has been subjected to a surface plasma treatment carried out at a frequency of 10 to 125 kiloherz with a power density in the range of 0.05 to 2.25 w/cm^2 generated between two electrodes in a gas at a pressure in the range of 10 mtorr to 10 torr to provide a polar surface having binding sites thereon,
(b) a layer of a protein immobilizer compound comprising a polymer or a silane-functional compound adhering to the resulting treated surface and capable of immobilizing enzymes, and
(c) an enzyme bound to said layer of protein immobilzer compound.

4,855,235
MONOCLONAL ANTIBODIES TO HUMAN LEUKOCYTE ANTIGENS
Toshitada Takahashi, 68, Hakusan, Narumi-cho, Midori-ku, Nagoya-shi, Aichi 458; Ryuzo Ueda, and Kazuo Ohta, both of Nagoya, all of Japan, assignors to Toshitada Takahashi, Aichi, Japan
PCT No. PCT/JP84/00120, § 371 Date Jul. 8, 1985, § 102(e) Date Jul. 8, 1985, PCT Pub. No. WO85/02188, PCT Pub. Date May 23, 1985
PCT Filed Mar. 23, 1984, Ser. No. 758,224
Claims priority, application Japan, Nov. 9, 1983, 58-210381
Int. Cl.[4] G01N *33/53;* C12N *5/00;* C07K *15/14*
U.S. Cl. 435—240.27 3 Claims

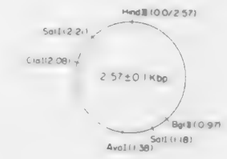
1. Monoclonal antibody, Ta60b, detecting an antigen existing on human leukocytes which is non-reactive with thymocytes, produced by hybridoma cell line FERM BP-2170.
2. Monoclonal antibody, Ts145, detecting an antigen existing on human leukocytes, produced by hybridoma cell line FERM BP-2171.

4,855,236
PROCESS FOR PLANT TISSUE CULTURE PROPAGATION
Robert Levin, Kibbutz Bet Haemek, Israel, assignor to P. B. Ind. Plant Biotech Industries Ltd., Mobile Post Ashrat, Israel
Continuation of Ser. No. 634,112, Jul. 24, 1984, abandoned. This application Jun. 3, 1988, Ser. No. 203,640
Claims priority, application Israel, Jul. 26, 1983, 69333
Int. Cl.[4] C12N *5/00;* C12M *1/00, 1/12*
U.S. Cl. 435—240.45 7 Claims



1. A process of plant tissue culture propagation comprising the steps of:
supplying a mass of sterile meristematic tissue; dividing said mass into clusters; sizing said clusters to provide propagules of a predetermined size;
washing said propagules to remove phytotoxic cell debris; and
distributing the washed propagules on the surface of a culture medium;
wherein prior to the providing of said propagules said clusters are transported in bulk along a first enclosed predetermined flow path, wherein prior to said distributing the washed propagules are transported in bulk along a second enclosed predetermined flow path, and wherein the entire process is performed under aseptic conditions.

4,855,237
DOUBLE-STRANDED DNA HAVING SEQUENCES COMPLEMENTARY TO A SINGLE-STRANDED DNA AND DERIVED FROM A BEAN GOLDEN MOSAIC VIRUS
Tsuto Morinaga, Sagamihara; Kin-ichiro Miura; Kunitada Shimotohno, both of Tokyo; Masato Ikegami, Funabashi, and Yataro Ichikawa, Tokorozawa, all of Japan, assignors to Teijin Limited, Osaka, Japan
Filed Aug. 21, 1984, Ser. No. 643,036
Claims priority, application Japan, Sep. 5, 1983, 58-161946
Int. Cl.[4] C12N *15/00, 7/00;* C07H *15/12;* C12R *1/91*
U.S. Cl. 435—320 10 Claims



1. An isolated double-stranded DNA TMB-1 consisting of a single-stranded DNA which has a molecular size of about 2.57 Kb and is derived from bean golden mosaic virus, and a DNA complementary to said single-stranded DNA,
giving the restriction endonuclease cleavage map shown in FIG. 2(*a*) of the accompanying drawings, and
being incapable of being digested with restriction endonuclease Mbo I.

4,855,238
RECOMBINANT GAMMA INTERFERONS HAVING ENHANCED STABILITY AND METHODS THEREFOR
Patrick W. Gray, San Francisco, and Ernst H. Rinderknecht, San Carlos, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.
Continuation-in-part of Ser. No. 562,009, Dec. 16, 1983, abandoned. This application Feb. 27, 1984, Ser. No. 584,217
Int. Cl.[4] C12N *1/00, 15/00, 5/00, 1/20;* C12P *21/00, 21/02, 19/34;* C07H *21/04;* C07K *13/00*
U.S. Cl. 435—243 13 Claims

1. A replicable expression vehicle capable, in a transformant microorganism or cell culture, of expressing a polypeptide consisting of the amino acid sequence, extending from the N-terminus:

X—Y—ASP—PRO—TYR—VAL—LYS—GLU—ALA—GLU—
1 2 3 4 5 6 7 8 9
—ASN——LEU—LYS—LYS—TYR—PHE—ASN—ALA—
10 11 12 13 14 15 16 17
GLY——HIS—SER—ASP—VAL—ALA—ASP—ASN—GLY—
18 19 20 21 22 23 24 25 26
—THR—LEU—PHE—LEU—GLY—ILE—LEU—LYS—
27 28 29 30 31 32 33 34
—ASN—TRP—LYS—GLU—GLU—SER—ASP—ARG—LYS—
35 36 37 38 39 40 41 42 43
—ILE—MET—GLN—SER—GLN—ILE—VAL—SER—
44 45 46 47 48 49 50 51
—PHE—TYR—PHE—LYS—LEU—PHE—LYS—ASN—
52 53 54 55 56 57 58 59
—PHE—LYS—ASP—ASP—GLN—SER—ILE—GLN—
60 61 62 63 64 65 66 67
—LYS—SER—VAL—GLU—THR—ILE—LYS—GLU—ASP—
68 69 70 71 72 73 74 75 76
—MET—ASN—VAL—LYS—PHE—PHE—ASN—SER—
77 78 79 80 81 82 83 84
—ASN—LYS—LYS—LYS—ARG—ASP—ASP—PHE—GLU—
85 86 87 88 89 90 91 92 93
—LYS—LEU—THR—ASN—TYR—SER—VAL—THR—
94 95 96 97 98 99 100 101

-continued

—ASP—LEU—ASN—VAL—GLN—ARG—LYS—ALA—
102 103 104 105 106 107 108 109
—ILE—HIS—GLU—LEU—ILE—GLN—VAL—MET—ALA—
110 111 112 113 114 115 116 117 118

—GLU—LEU—SER—PRO—ALA—ALA—LYS—THR—Z
119 120 121 122 123 124 125 126

wherein X is a methionine residue or hydrogen and Y is a glutamine residue or, where X is hydrogen, Y is either a glutamine or a pyroglutamate residue, and Z consists of n amino acids wherein n is zero or an integer from 1 to 17 when X is a methionine residue and n is zero or an integer from 1 to 16 when X is hydrogen.

4,855,239

TEST COMPOSITION AND DEVICE FOR THE DETERMINATION OF CYANURIC ACID IN WATER

Chauncey O. Rupe, Elkhard, Ind., assignor to Environmental Test Systems, Inc., Elkhart, Ind.

Filed Dec. 28, 1987, Ser. No. 138,045
Int. Cl.[4] G01N *33/18;* **E04H** *3/16, 3/20*
U.S. Cl. 436—106 **9 Claims**

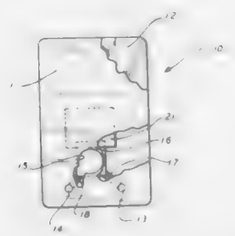
1. A reagent composition for the determination of cyanuric acid in water comprising melamine and an indicator which changes color in response to a change in the pH of the water due to the presence of cyanuric acid, the composition being adjusted to a pH of from about 5 to about 8.

4,855,240

SOLID PHASE ASSAY EMPLOYING CAPILLARY FLOW

Robert W. Rosenstein, Elliott City, and Timothy G. Bloomster, Reisterstown, both of Md., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed May 13, 1987, Ser. No 49,328
Int. Cl.[4] G01N *33/558, 33/549*
U.S. Cl. 436—514 **24 Claims**



1. An assay for determining analyte in a sample, comprising:
employing a absorbent solid support having first, second and third portions, said first portion receiving a sample to be assayed, said second portion receiving a tracer, said third portion including a binder for the analyte, said third portion being in capillary flow communication with both the first and second portions; moving tracer and sample by capillary flow across the binder in the third portion to provide contact between sample and binder prior to substantial contact of the tracer with either the binder or sample; and determining at least one of tracer bound in said third portion or tracer which passes across said third portion to thereby determine analyte.

4,855,241

TUMOR DIAGNOSTIC METHOD

Eugene M. Johnson, Jr., St. Louis, Mo., assignor to Washington University, Mo.

Filed May 26, 1988, Ser. No. 198,948
Int. Cl.[4] G01N *33/53, 33/567, 33/539*
U.S. Cl. 436—548 **7 Claims**

1. An in vitro diagnostic method for determining the presence of a nerve growth factor receptor bearing tumor in a patient afflicted with such tumor comprising determining the presence of a truncated nerve growth factor receptor in a sample of a body fluid from said patient at a level which is elevated relative to the level in a normal patient.

4,855,242

METHOD OF DETECTING ANTIBODIES

J. Stuart Soeldner, Newton, Mass., assignor to Joslin Diabetes Center, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 851,482, Apr. 14, 1986, abandoned. This application Jan. 6, 1987, Ser. No. 680
Int. Cl.[4] G01N *33/539*
U.S. Cl. 436—539 **29 Claims**



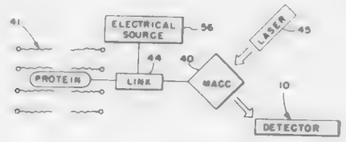
1. A method for determining the quantity of an antibody in a sample, said method comprising the steps of
(1) providing a labelled antigen to said antibody;
(2) contacting said labelled antigen with said sample in solution to form a labelled antigen-antibody complex;
(3) providing an agent for precipitating said complex;
(4) mixing the solution containing said labelled antigen-antibody complex with said precipitating agent to produce a precipitate and a supernatant, said supernatant containing uncomplexed labelled antigen and said precipitate containing said labelled antigen-antibody complex and uncomplexed labelled antigen; and
(5) measuring the quantity of label in said precipitate in a manner substantially independent of the amount of uncomplexed labelled antigen in said precipitate by
(a) measuring the quantity of said label in said precipitate;
(b) determining the quantity of said uncomplexed labelled antigen present in said precipitate by
(i) providing a control sample that is identical to said sample,
(ii) providing an unlabelled antigen to said antibody.
(iii) contacting said control sample in solution with said unlabelled antigen to form an unlabelled antigen-antibody complex,
(iv) contacting the solution containing said unlabelled antigen-antibody complex with said labelled antigen to said antibody, the quantity of said labelled antigen added being the same as the quantity added in step (2),
(v) mixing said solution containing said unlabelled antigen-antibody complex with the same quantity of said precipitating agent used in step (4) to cause a precipitate to form, said precipitate containing said unlabelled antigen-antibody complex, said unlabelled antigen, and said labelled antigen, said labelled antigen being present in the same quantity as in said precipitate formed in step (4), and
(vi) providing a measurement of the quantity of label in said precipitate; and
(c) determining the quantity of said antibody in said sample by subtracting the result of step (b) from the result of step (a) and relating the difference in quantity of said label in said precipitates to the quantity of said antibody in said sample;
wherein said quantity of said unlabelled antigen contacted with said control sample in step (iii) is sufficient to preclude substantially all said labelled antigen contacted in step (iv) from forming a labelled antigen-antibody complex.

4,855,243

NEUROLOGICAL AND BIOLOGICAL MOLECULAR ELECTRO-OPTICAL DEVICES AND METHODS

Branimir Simic-Glavaski, Cleveland Heights, Ohio, assignor to H.S.G. Venture (a Joint Venture Partnership), Cleveland, Ohio

Continuation-in-part of Ser. No. 535,672, Sep. 26, 1983, abandoned. This application Sep. 19, 1984, Ser. No. 652,317
Int. Cl.[4] G01N *21/64, 21/65, 33/48, 33/68*
U.S. Cl. 436—63 **27 Claims**



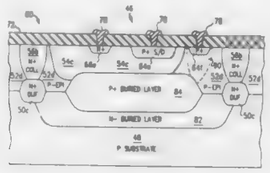
1. A method of affecting the energy state or function of a neurological or biological substance, wherein such substance is at least one of a nerve or muscle, comprising linking an operationally macrocyclic molecule with respect to such substance so as to be non-destructively and non-invasively linked with respect to such neurological or biological substance, and applying at least one of an electrical or optical input to such molecule causing the latter to affect the energy state of such nerve or muscle.

4,855,244

METHOD OF MAKING VERTICAL PNP TRANSISTOR IN MERGED BIPOLAR/CMOS TECHNOLOGY

Louis N. Hutter, Richardson, and Joe R. Trogolo, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 2, 1987, Ser. No. 69,358
Int. Cl.[4] H01L *21/265;* **B01J** *17/00*
U.S. Cl. 437—31 **9 Claims**



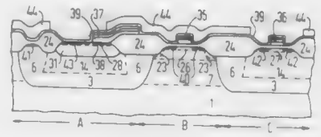
1. A method for fabricating an isolated vertical PNP structure on an integrated circuit in conjunction with PMOS, and NPN structures, comprising the steps of:
providing a P type substrate;
forming an N— isolation region in said substrate at a location for said PNP structure;
forming a first annular N+ isolation region in said substrate surrounding and in contact with said N— region while concurrently forming N+ buried regions for said NPN and PMOS structures;
forming a P— eptaxial layer over said substrate;
forming a P+ type collector region in said epitaxial layer for the PNP structure over said N— isolation region, said collector region being spaced from said first N+ isolation region by a region of said epitaxial layer;
forming a N type base region for the PNP structure and an N well region for the PMOS structure in the same processing step;
forming a second annular N+ isolation region in contact with said first N+ isolation region while concurrently forming a collector contact region for said NPN structure; and
forming a P type emitter region for the PNP structure in said N type base region.

4,855,245

METHOD OF MANUFACTURING INTEGRATED CIRCUIT CONTAINING BIPOLAR AND COMPLEMENTARY MOS TRANSISTORS ON A COMMON SUBSTRATE

Franz Neppl, Munich, and Josef Winnerl, Landshut, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 897,299, Aug. 18, 1986, abandoned. This application Oct. 4, 1988, Ser. No. 253,418
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 3532817
Int. Cl.[4] H01L *21/72*
U.S. Cl. 437—31 **10 Claims**



1. A method for the manufacture of an integrated semiconductor circuit containing a bipolar transistor and complementary n-channel and p-channel MOS transistors which comprises:
(a) providing a p-doped semiconductor substrate,
(b) providing a double insulating layer of silicon oxide and silicon nitride over said substrate,
(c) structuring said silicon nitride layer to define areas in which collector terminals are to be formed,
(d) implanting n-doping ions into said areas,
(e) removing the silicon nitride in those areas of said substrate in which n-wells are to be formed,
(f) implanting n-doping ions into the areas in which n-wells are to be formed,
(g) diffusing said n-doping ions to form said n-wells while simultaneously oxidizing the surface of the n-well areas,
(h) implanting boron ions to form a surface distal region of a channel zone of the said n-channel transistors, using the oxide surfaces produced in step (g) as a mask,
(i) applying a double layer of silicon oxide and silicon nitride after removing the previously grown oxide,
(j) implanting boron ions into the desired field oxide regions of said n-channel transistors,
(k) locally oxidizing the field oxide regions utilizing the previously deposited silicon nitride as an oxidation mask,
(l) oxidizing the surface to generate gate oxides,

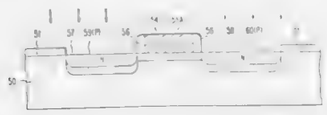
(m) boron-doping the channel regions of the n-channel and p-channel transistors,
(n) boron-doping the base zone of the bipolar transistor,
(o) removing the gate oxide in the region of said base zone,
(p) depositing at least a single layer of a metal silicide over the surface,
(q) depositing a surface-wide oxide layer over said surface,
(r) implanting arsenic ions through said surface,
(s) structuring the metal silicide layer of step (p) for the manufacture of the gate electrodes of the n-channel and p-channel transistors and the emitter terminals of the bipolar transistors,
(t) generating the emitter zone of said bipolar transistors by high temperature treatment,
(u) depositing a surface-wide silicon oxide layer by vapor phase deposition on the surface,
(v) simultaneously forming the source/drain regions of the n-channel transistors and the n^+ collector contact the bipolar transistor by phosphorus ion implantation,
(w) simultaneously forming the source/drain regions of the p-channel transistor and the p^+ base contact of the bipolar transistors by boron ion implantation, and
(x) applying terminal electrodes to the resulting transistor structures.

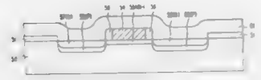
4,855,246

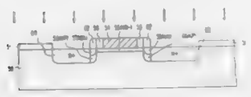
FABRICATION OF A GAAS SHORT CHANNEL LIGHTLY DOPED DRAIN MESFET

Christopher F. Codella, Fishkill, and Seiki Ogura, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 914,033, Oct. 1, 1986, abandoned, which is a division of Ser. No. 644,830, Aug. 27, 1984, Pat. No. 4,636,822. This application Sep. 21, 1988, Ser. No. 247,140
Int. Cl.[4] H01L *29/48, 29/80*
U.S. Cl. 437—41 **11 Claims**







1. A process of forming a metal-semiconductor field effect transistor (MESFET) on a semi-insulating gallium arsenide substrate body, said process comprising:
(a) forming a relatively shallow and lightly doped layer of a first conductivity type on said substrate body;
(b) forming a Schottky gate electrode having substantially vertical surfaces in direct contact with and over a portion of said layer;
(c) forming a first conformal insulator layer over the gate electrode and the lightly doped layer not covered by gate;
(d) etching directionally using reactive ion etching to remove substantially said first insulator layer leaving a narrow dimensioned first sidewalls of said insulator on said vertical surfaces of said gate;
(e) forming source and drain extensions by implanting dopant of the first conductivity type into the portion of the lightly doped layer not covered by said gate and its first insulator sidewalls, said extensions being of a depth and dopant concentrations greater than those of the lightly doped layer;
(f) forming a second conformal insulator layer over the resulting structure;
(g) etching directionally using reactive ion etching to remove said second insulator layer leaving sidewalls of said second insulator abutting said first insulator sidewalls;
(h) forming source and drain regions by implanting dopant of the first conductivity type into the exposed portions of the source and drain extensions, said source and drain regions being of a depth and dopant concentration greater than those of the source and drain extensions; and
annealing the resulting structure at low temperature so as to activate said implanted dopants forming said source and drain regions and said source and drain extensions.

4,855,247

PROCESS FOR FABRICATING SELF-ALIGNED SILICIDE LIGHTLY DOPED DRAIN MOS DEVICES

Di Ma, Syosset, and David H. Hoffman, Hauppauge, both of N.Y., assignors to Standard Microsystems Corporation, Hauppauge, N.Y.

Division of Ser. No. 145,390, Jan. 19, 1988. This application Dec. 29, 1988, Ser. No. 291,541
Int. Cl.[4] H01L *21/265, 21/44, 21/48*
U.S. Cl. 437—44 **12 Claims**





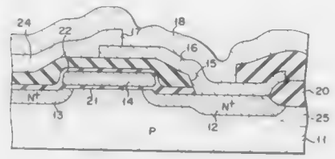
1. A method of fabricating an MOS integrated circuit, said method comprising the steps of:
providing a silicon substrate;
prior to the formation of source and drain regions in the upper surface of said substrate, defining a polysilicon gate on the upper surface of said substrate;
depositing a layer of a first material over said polysilicon gate and over at least a part of the exposed upper surface of said substrate, said first material having a different etch characteristic as compared to that of said silicon substrate;
depositing and forming by etching a side wall spacer about said polysilicon gate of a second material having a different etching characteristic than said first material, said first layer serving as an etching stop;
thereafter removing said first layer in regions of the upper surface of said substrate and said polysilicon gate not covered by said side wall spacer;
depositing a metal and thereafter reacting said metal with the exposed surfaces of said substrate and said polysilicon gate, thereby to form a layer of a silicide of said metal thereat of a thickness such that said silicide layer has substantially less ion implant stopping power than said first layer;
thereafter removing said side wall spacer;
and thereafter performing sequentially a light and a heavy ion implant of the same dopant impurity through said silicide layer and said first layer, thereby to form source and drain regions in the upper surface of said substrate.

4,855,248

METHOD OF MAKING A SEMICONDUCTOR ROM DEVICE

Shoji Ariizumi, Tokyo; Taira Iwase, Kawasaki, and Fujio Masuoka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 919,556, Oct. 16, 1986, Pat. No. 4,737,835, which is a continuation of Ser. No. 603,698, Apr. 25, 1984, abandoned. This application Jan. 12, 1988, Ser. No. 143,068
Claims priority, application Japan, Apr. 28, 1983, 58-75026
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—49 **4 Claims**



1. A method of manufacturing a read only memory semiconductor device comprising the steps of:
forming a field insulation region in a semiconductor substrate of a first conductivity type to form a region of the first conductivity type for an element isolated from another region of the substrate;
forming a first insulation film for gate insulation on the element region;
forming a first conductive layer for a gate electrode on said gate insulation film;
doping an impurity of a second conductivity type opposite to said first conductivity type into said element region, using as a mask said field insulation region and gate electrode, to form a pair of semiconductor regions of said second conductivity type;
forming a second insulation film on the entire major surface of the semiconductor structure;
forming a contact hole, in said second insulation film, leading to one of said pair of semiconductor regions;
forming a second conductive layer of said second conductivity type functioning as an interconnection layer with a predetermined pattern on the entire major surface of the semiconductor structure, the second conductive layer contacting said one of the pair of semiconductor regions and extending onto that part of said second insulation film which is on said gate electrode;
forming a third insulation film on the entire major surface of the semiconductor structure;
forming a contact hole, in said third insulation film, leading to said second conductive layer according to the information to be stored; and
forming a third conductive layer with a predetermined pattern on the entire major surface of semiconductor structure.

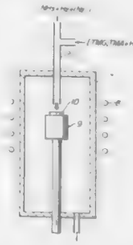
4,855,249

PROCESS FOR GROWING III-V COMPOUND SEMICONDUCTORS ON SAPPHIRE USING A BUFFER LAYER

Isamu Akasaki, and Nobuhiko Sawaki, both of Nagoya, Japan, assignors to Nagoya University, Japan

Continuation of Ser. No. 931,822, Nov. 18, 1986, abandoned. This application Mar. 16, 1988, Ser. No. 272,081
Claims priority, application Japan, Nov. 18, 1985, 60-256806
Int. Cl.[4] H01L *21/205, 21/20*
U.S. Cl. 437—81 **9 Claims**

1. A process for growing a compound semiconductor wherein an organometallic compound and ammonia gas (NH3) are reacted in hydrogen gas (H_2) or hydrogen gas mixed with nitrogen gas (N_2) to grow epitaxially at least one layer of single crystalline $Al_xGa_{1-x}N$ ($0 \leq x < 1$) on a sapphire substrate, said process comprising subjecting the sapphire substrate to a heat treatment of brief duration in a atmosphere comprising at least an Al-containing organometallic compound, NH_3, and H_2 at a temperature lower than the single crystalline AlN growing



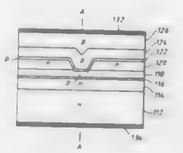
temperature to deposit a non-single crystalline buffer layer of an AlN compound on the surface of the sapphire substrate and thereafter growing epitaxially at a high temperature said single crystalline $Al_xGa_{1-x}N$ directly on said non-single crystalline buffer layer.

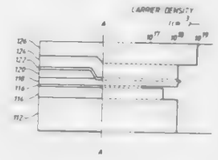
4,855,250

METHOD OF MANUFACTURING A SEMICONDUCTOR LASER WITH AUTODOPING CONTROL

Motoyuki Yamamoto, Kanagawa, and Yasuhiko Tsuburai, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Dec. 28, 1987, Ser. No. 138,660
Claims priority, application Japan, Dec. 26, 1986, 61-315346
Int. Cl.[4] H01L *21/208, 7/00*
U.S. Cl. 437—81 **11 Claims**





1. A method of manufacturing a semiconductor device comprising the steps of:
forming a layered compound semiconductor structure with a p-n junction therein having a first p-type compound semiconductor crystal layer containing aluminum, with the first p-type compound semiconductor crystal layer having an exposed surface portion at the top layer of the structure and unexposed portions;
flowing a p-type dopant into a reactor in which said compound semiconductor structure is placed so that the exposed surface portion of said first p-type compound semiconductor crystal layer has a higher carrier density than the unexposed regions of the first p-type compound semiconductor crystal layer; and
growing a second p-type compound semiconductor crystal layer containing aluminum on said exposed surface por-

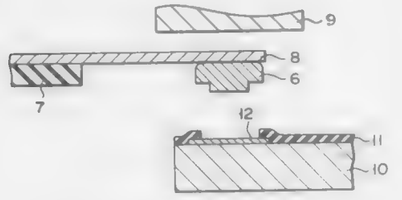
tion of said first p-type compound semiconductor crystal layer in said reactor.

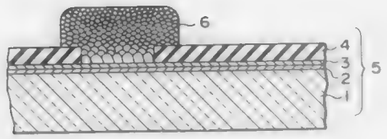
4,855,251

METHOD OF MANUFACTURING ELECTRONIC PARTS INCLUDING TRANSFER OF BUMPS OF LARGER PARTICLE SIZES

Kiyoshi Iyogi; Koji Yamakawa, both of Tokyo, and Nobuo Iwase, Kamakura, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 64,397, Jun. 22, 1987, abandoned. This application Nov. 3, 1988, Ser. No. 267,707
Claims priority, application Japan, Jun. 26, 1986, 61-150445
Int. Cl.[4] H01L *21/92*
U.S. Cl. 437—183 9 Claims





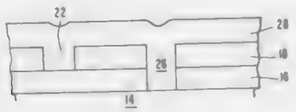
1. A method of manufacturing electronic parts, comprising:
a first step of forming on the surface of a substrate a bump with substantially all the metal crystal particles of that portion of the bump which contacts the surface of the substrate having larger diameters than the metal crystal particles of that portion of the bump which does not contact the surface of the substrate;
a second step of transferring the bump to an electrode lead; and
a third step of connecting an electrode lead to the predetermined electrode section of the semiconductor chip, by means of the transferred bump.

4,855,252

PROCESS FOR MAKING SELF-ALIGNED CONTACTS

Steven Peterman, and David Stanoolovich, both of Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 22, 1988, Ser. No. 234,780
Int. Cl.[4] H01L *21/88*
U.S. Cl. 437—189 9 Claims



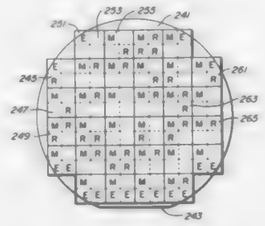
1. In an integrated circuit having a plurality of semiconductor devices fabricated on a substrate, a process for interconnecting the semiconductor devices comprising the following steps in the following order:
A. depositing an insulating layer over said semiconductor devices;
B. depositing a layer of polyimide over said insulating layer;
C. depositing a first layer of photoresist over said polyimide layer;
D. lithographically defining an interconnect wiring pattern in said first layer of photoresist;
E. dry etching said interconnect wiring pattern into said polyimide layer;
F. depositing a second layer of photoresist over said patterned polyimide layer;
G. lithographically defining a pattern of contacts in said second layer of photoresist, said pattern of contacts overlying said patterned polyimide layer;
H. transferring said pattern of contacts to said insulating layer; and
I. depositing a layer of interconnect wiring, said interconnect wiring layer filling said pattern of contacts in said insulating layer and said interconnect wiring pattern in said polyimide layer.

4,855,253

TEST METHOD FOR RANDOM DEFECTS IN ELECTRONIC MICROSTRUCTURES

Charles M. Weber, Santa Clara, Calif., assignor to Hewlett-Packard, Palo Alto, Calif.

Filed Jan. 29, 1988, Ser. No. 149,809
Int. Cl.[4] H01L *21/66*
U.S. Cl. 437—8 18 Claims



1. A method of testing an integrated circuit manufacturing process, which comprises a sequence of unit processes, for defects in a wafer produced by a process, the method comprising the steps of:
providing a first and second reticle plates that are spaced apart and substantially parallel;
providing a first electronic test pattern on the first reticle plate and a second electronic test pattern on the second reticle plate, with each electronic test pattern comprising a sequence of repeating subpatterns, with each sub-pattern comprising an array of die size patterns and with each die size pattern comprising an array of micro-patterns, where each micropattern on the first reticle plate lies closest to and directly opposite at least one corresponding micro-pattern on the second reticle plate, and where, for a micro-pattern on the first reticle plate and the corresponding micro-pattern on the second reticle plate, at least one of these micro-patterns includes an electrically conductive pattern and an electrical contact pad for activating this electrically conductive pattern;
providing an electrically insulating layer of material between the first and second reticle plates;
choosing each micro-pattern on the first reticle plate and the corresponding micro-pattern on the second reticle plate to test for the presence of defects in one of the unit processes that comprise the manufacturing process;
activating the electrically conductive pattern or patterns for each pair of corresponding micro-patterns on the first and second reticle plates; and
identifying the defects in each unit process according to the pairs of corresponding micro-patterns that are found to be inoperative when activated.

4,855,254

METHOD OF GROWING A SINGLE CRYSTALLINE β-SIC LAYER ON A SILICON SUBSTRATE

Takashi Eshita, Inagi; Fumitake Mieno; Yuji Furumura, both of Kawasaki, and Kikuo Itoh, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 13, 1988, Ser. No. 283,642
Claims priority, application Japan, Dec. 19, 1987, 62-320100
Int. Cl.[4] H01L *21/20*; C04B *35/56*
U.S. Cl. 437—100 12 Claims



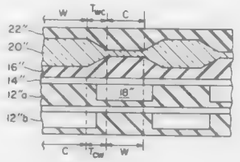
1. A method of growing a single crystalline silicon carbide (β-SiC) layer on a silicon substrate, said method comprising the following steps of:
(a) providing said silicon substrate in a reactor chamber,
(b) reducing a pressure inside said reactor chamber to a subatmospheric level,
(c) flowing a first mixed gas containing acetylene into said reactor chamber,
(d) heating said silicon substrate at a temperature between 800° and 1000° C., whereby a buffer layer of carbonized silicon is grown on said silicon substrate,
(e) stopping said first mixed gas and flowing a second mixed gas containing hydrocarbon and chlorosilane gases into said reactor chamber, and
(f) heating said silicon substrate at a temperature lower than 1000° C., whereby said single crystalline silicon carbide (β-SiC) layer is grown on said buffer layer.

4,855,255

TAPERED LASER OR WAVEGUIDE OPTOELECTRONIC METHOD

William D. Goodhue, Chelmsford, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 23, 1988, Ser. No. 171,952
Int. Cl.[4] H01L *21/18, 7/34, 3/19*
U.S. Cl. 437—129 12 Claims



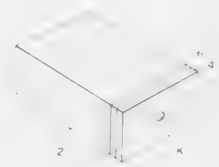
1. A method for forming regions of varying thickness of Group III–V material compound layers and varying ratio of the Group III materials relative to each other in the compound layers to produce compound semiconductor layers with varying bandgap on a substrate comprising the steps of:
(a) providing a substrate in an epitaxial growth chamber;
(b) bringing the substrate to a first warmer growth temperature in one region of the substrate and to a second cooler growth temperature in another region of the substrate;
(c) introducing at least two Group III semiconductor materials and a Group V semiconductor material into the chamber and growing said materials over said substrate, such that a compound III–V material layer is formed over the substrate which layer varies in thickness from one region to another in accordance with the sticking coefficients of the Group III materials some of which sticking coefficients are lower at a higher temperature and because of this the thickness of the compound layer is greater over the region of the lower temperature than in the region of the warmer temperature and the content of the Group III material with the lower sticking coefficient at higher temperature is greater over the region of the lower temperature than in the region of the warmer temperature to produce a change in bandgap of the compound III–V material layer across the layer in accordance with the temperature change in the different regions of the substrate.

4,855,256

METHOD OF MANUFACTURING MASKED SEMICONDUCTOR LASER

Hiroshi Kobayashi, 3-15 Hanakoganei, Kodaira-shi, Tokyo; Haruhiko Machida, 10-7 Nakaochiai 4-chome, Shinjuku-ku, Tokyo; Makoko Harigaya, Yokohama; Yasushi Ide, and Jun Akedo, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd.; Hiroshi Kobayashi and Haruhiko Machida, Tokyo, Japan

Filed Feb. 12, 1988, Ser. No. 155,513
Claims priority, application Japan, Feb. 13, 1987, 62-30770
Int. Cl.[4] H01L *21/20, 21/203*
U.S. Cl. 437—129 9 Claims



1. A method of manufacturing a masked semiconductor laser, comprising the steps of:
forming a masking layer capable of cutting off light emitted from a semiconductor laser body on a light-emitting surface of the semiconductor laser body by means of a vacuum evaporation process; and
simultaneously, while energizing the semiconductor laser body, defining a light-emitting hole in the depositing masking layer by the action of a beam of laser light emitted from the semiconductor, which beam prevents evaporation of masking material onto the body of the laser at the light-emitting hole.

4,855,257

FORMING CONTACTS TO SEMICONDUCTOR DEVICE

Toyomasa Kouda, Takasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

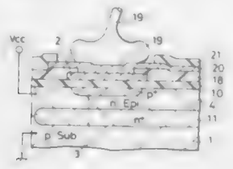
Division of Ser. No. 178,847, Apr. 4, 1988, which is a continuation of Ser. No. 728,201, Apr. 29, 1985, Pat. No. 4,803,541. This application Nov. 18, 1988, Ser. No. 273,011
Claims priority, application Japan, May 23, 1984, 59-102567
Int. Cl.[4] H01L *29/78, 29/90, 29/40*
U.S. Cl. 437—194 1 Claim

1. A process for producing semiconductor devices, comprising the steps of:
(1) preparing a semiconductor substrate having first and second island regions that are spaced from each other, said first and second island regions each extending to one main surface of said semiconductor substrate, said first and second island regions being of a first conductivity type,

said semicnductor substrate farther having an electrically insulating film that is formed on said one main surface of said semiconductor substrate;

(2) selectively removing said insulating film from the surfaces of said first and second island regions, respectively, so as to expose selective portions of the surfaces of said first and second island regions;

(3) introducing impurities of a second type of conductivity, opposite to said first type of conductivity, into said first and second island regions in the portions which are not covered by said insulating film, so as to form a first semiconductor region in said first island region and so as to form a second semiconductor region for providing a semiconductor element in said second island region;



(4) after introducing the impurities of the second type of conductivity to form the first and second semiconductor regions, forming a first insulation film on the surface of said first semiconductor region, and forming a second insulation film on the surface of said second semiconductor region;

(5) selectively removing said second insulation film from said surface of said second semiconductor region, so as to expose the surface of said second semiconductor region; and

(6) after the step (5), forming a bonding pad region on the surface of said first insulation film and on the surface of said insulating film in the vicinity of said first insulation film so as to cover over said first semiconductor region, and forming a conductive layer which connects to said second semiconductor region.

4,855,254

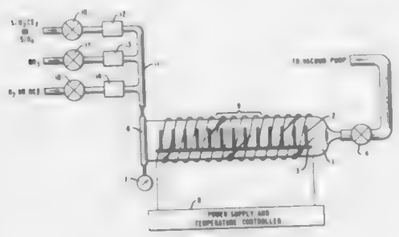
NATIVE OXIDE REDUCTION FOR SEALING NITRIDE DEPOSITION

Derryl D. J. Allman, and Steven S. Lee, both of Colorado Springs, Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 22, 1987, Ser. No. 111,377

Int. Cl.[4] H01L *21/76, 21/318*

U.S. Cl. 437—241 **9 Claims**



1. A semiconductor fabrication process for depositing a sealing layer useable during field oxide growth on a silicon substrate surface, comprising the steps of:

conditioning the substrate in a chamber at reduced pressure and elevated temperature;

removing the native silicon dioxide from the silicon substrate by initiating a flow of silicon dioxide etchant gas through the chamber while maintaining a first subatmospheric pressure and an elevated temperature;

purging the chamber of etching or oxidizing gases by evacuation;

initiating the flow of silicon nitride deposition gases to fill the chamber and raise the pressure to a second subatmospheric level, while maintaining an elevated temperature; and

depositing directly upon the silicon substrate a sealed interface masking layer of silicon nitride nominally ranging from ten to twenty nanometers in thickness.

4,855,259

PROCESS OF MAKING CERAMIC MOLDINGS CONTAINING CORDIERITE

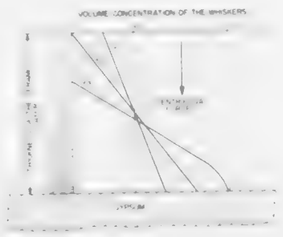
Nils Claussen, Leonberg; Gunter Petzow, Leinfelden-Echterdingen; Katharina Nieszery, Stuttgart; Wolfgang Panhorst, Mainz, and Karl-Ludwig Weiskopf, Stuttgart, all of Fed. Rep. of Germany, assignors to Firma Schott Glaswerke, Hattenbergstrasse, Fed. Rep. of Germany

Filed Sep. 13, 1985, Ser. No. 775,642

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1984, 3445765; Sep. 17, 1984, 3434077

Int. Cl.[4] C03C *10/08*

U.S. Cl. 501—9 **12 Claims**



1. A method for the preparation of a ceramic molding comprising the steps of:

intensively grinding crystallized cordierite powder to form a matrix powder;

mixing said matrix powder with 1–50 wt % of a second additive phase selected from the group consisting of silicon nitride, silicon carbide, zirconium oxide, aluminum oxide, magnesium oxide, mullite, zircon, boron carbide and mixtures thereof;

shaping the mixture to form a greenware compact; and

sintering said greenware compact at a temperature between 900° and 1400° in an atmosphere containing silicon, said atmosphere produced by a siliceous powder bed.

4,855,260

GLASSES EXHIBITING LOW THERMAL COEFFICIENTS OF ELASTICITY

William H. Dumbaugh, Jr., and Henry E. Hagy, both of Painted Post, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jul. 8, 1988, Ser. No. 216,850

Int. Cl.[4] C03C *3/091*

U.S. Cl. 501—66 **1 Claim**

1. A glass consisting essentially, in weight percent on the oxide basis, of about 60–64% SiO_2, 14–18% B_2O_3, 8.5–10% Al_2O_3, 4–7% Na_2O, and 2–12% BaO, said glass exhibiting an average normalized thermal coefficient of elastic modulus over the temperature range −50°–+150° C. which does not exceed about 10 ppm./°C.

4,855,261

SEALING GLASS

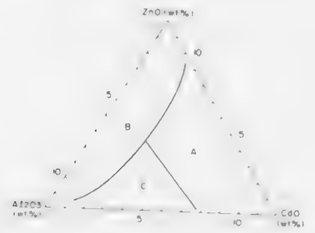
Yasuo Mizuno, Hirakata; Atsushi Nishino, Neyagawa; Masaki Ikeda, Hirakata, and Shinji Kurio, Miyazaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 72,295, Jul. 13, 1987, abandoned. This application Dec. 8, 1988, Ser. No. 281,538

Claims priority, application Japan, Jul. 17, 1986, 61-168340

Int. Cl.[4] C03C *3/074, 8/10, 8/24*

U.S. Cl. 501—76 **8 Claims**



1. A sealing glass for bonding a magnetic head comprising at least as ingredients, in terms of percent by weight, 2 to 7% of SiO_2, 4 to 11% of B_2O_3, 70 to 85% of PbO, 1 to 7% of ZnO, 1 to 5% of Al_2O_3, and 3 to 15% of CdO, said sealing glass being crack-resistant, transparent, bubble-free, haze-free, having no deep color and having sufficient fluidity at a working temperature ≦500° C., and being inert with respect to materials contained within said magnetic head and having excellent chemical durability.

4,855,262

METHOD OF MANUFACTURING SILICON NITRIDE COMPOSITION REINFORCED WITH SILICON CARBIDE WHISKERS HAVING SILICON OXIDE COATING

Dominique Richon, Ville La Grand, France; Olivier De Pous, Rome, Italy, and Pierre Fontaine, Geneva, Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Division of Ser. No. 124,597, Nov. 24, 1987, abandoned. This application Feb. 12, 1988, Ser. No. 180,449

Claims priority, application European Pat. Off., Nov. 25, 1986, 86810540.4

Int. Cl.[4] C04B *35/56*

U.S. Cl. 501—92 **10 Claims**

1. A method for the preparation of a silicon nitride pulverulent composition comprising the steps of: Division Application of RICHON et al -- S.N. 124,597

(i) oxidizing SiC whiskers by heat treatment;

(ii) ball milling α-Si_3N_4 powder with a sintering aid in the presence of a dispersing phase solvent carrier;

(iii) admixing said SiC whiskers by slow rotation on rolls without balls so as not to break the fibers and using a high proportion of the dispersing phase; and

(iv) evaporating the solvent under rotation and granulating the remaining solid.

3. A method according to claim 1 for making a sintered silicon nitride article comprising the further steps of:

(i) isostatically molding said granulated solid into a green body at a pressure of from 2000–4000 bar; and

(ii) sintering said green body at from 1750°–1800° C. under nitrogen for a period of from 5 to 30 minutes.

4,855,263

SILICON CARBIDE SINTERED BODY AND METHOD OF PRODUCING THE SAME

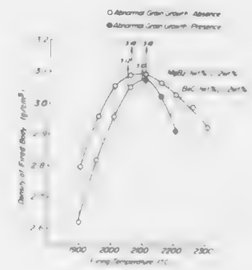
Shinji Kawasaki, Nagoya, and Tomonori Takahashi, Chita, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 27, 1988, Ser. No. 212,317

Claims priority, application Japan, Jul. 6, 1987, 62-167062

Int. Cl.[4] C04B *35/56, 35/58*

U.S. Cl. 501—92 **6 Claims**



1. A silicon carbide sintered body comprising 0.01~2% by weight of magnesium, 0.02~2% by weight of boron 0.1~2% by weight of free carbon and the remainder being silicon carbide, and having a density of not less than 2.80 g/cm^3.

2. A method of producing a silicon carbide sintered body, which comprises adding and mixing powder of silicon carbide having an average grain size of not more than 5 μm with 0.1~5% by weight of magnesium boride and 0.1~5% by weight of carbon or an organic compound producing the same quantity of carbon, shaping the resulting mixture into a form, and firing the resulting shaped body at a temperature of 1,900°~2,300° C. under vacuum or in an inert gas atmosphere.

4,855,264

ALUMINUM OXIDE/ALUMINUM OXYNITRIDE/GROUP IVB METAL NITRIDE ABRASIVE PARTICLES DERIVED FROM A SOL-GEL PROCESS

James P. Mathers, Woodbury; William P. Wood, Minneapolis, and Thomas Forester, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 932,941, Nov. 20, 1986. This application Apr. 15, 1988, Ser. No. 183,478

Int. Cl.[4] C04B *35/58;* **C09C** *1/68;* **C09K** *3/14*

U.S. Cl. 501—98 **7 Claims**

1. A coated ceramic abrasive product for grinding steel comprising a backing and having coated on at least one surface thereof a composition comprising a bonding resin and ceramic abrasive particles consisting essentially of a uniform multiphase composite consisting essentially of alumina and gamma-aluminum oxynitride.

4,855,265

HIGH TEMPERATURE LOW THERMAL EXPANSION CERAMIC

John P. Day, Big Flats, and Robert J. Locker, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

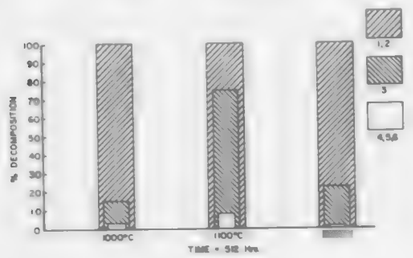
Filed Apr. 4, 1988, Ser. No. 177,050

Int. Cl.[4] C04B *35/10, 35/18, 35/46, 35/50*

U.S. Cl. 501—128 **12 Claims**

1. A sintered ceramic article containing iron-aluminum titanate solid solution and mullite as the predominant crystal phases with a minor amount of a rare earth metal oxide crystal phases, said article exhibiting grain boundary and intracrystal-

line microcracking and consisting essentially, expressed in terms of weight percent on the oxide basis, of 1.5–20% SiO_2,



225–25% Fe_2O_3, 35–75% Al_2O_3, 10–40% TiO_2, and 0.1–5% RE_2O_3.

4,855,266

HIGH K DIELECTRIC COMPOSITION FOR USE IN MULTILAYER CERAMIC CAPACITORS HAVING COPPER INTERNAL ELECTRODES

Ian Burn, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 3,260, Jan. 13, 1987, abandoned. This application Feb. 18, 1988, Ser. No. 161,238

Int. Cl.[4] H01G *4/12;* **C04B** *35/48, 35/49*

U.S. Cl. 501—138 **10 Claims**

1. A High K Dielectric Composition having a dielectric constant above 5,000 consisting essentially of a donor- and acceptor-doped $BaTiO_3$ which is free of fluorides and reducible oxides or their precursors having an intergranular phase of flux containing both glass-forming and glass-modifying ions, characterized stoichiometrically by the following criteria:

(a) the ratio of A site ions to B site ions in the doped $BaTiO_3$,

$$\frac{N_A + N_D^{3+}}{N_B + N_D^{5+} + N_C} = 1.02\text{-}1.10,$$

wherein

N_A=number of divalent A site ions;

N_B=number of tetravalent B site ions;

N_C=number of acceptor ions; and

N_D=number of donor ions of charge 3+ or 5+.

(b) the ratio of donor ions (ND) to total cations (N_T), N_D/N_T=0.5–3.0%;

(c) N_C/N_D is at least 0.20;

(d) the ratio of glass-forming ions (N_G) to total cations, N_G/N_T=0.5–3.5%; and

(e) The ratio of the glass-modifying ions, N_M, to the total number of cations (N_T), N_M/N_T=1.5–5.0%.

4,855,267

REGENERATION OF METHANOL DISSOCIATION CATALYSTS

Wu-Hsun Cheng, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 25, 1988, Ser. No. 186,042

Int. Cl.[4] B01J *23/94, 38/18;* **C01B** *1/13, 31/18*

U.S. Cl. 502—50 **6 Claims**

1. A process for the regeneration of deactivated copper-containing catalysts containing supported or unsupported copper and one or more elements selected from the group consisting of Cr, Mn, Ru, Pd, Zn, Si, Mg, Ca, Sr, and Ba used for methanol or methyl formate dissociation reactions or for the steam reforming of methanol comprising the steps of:

(a) oxidizing the deactivated copper-containing catalyst by contacting the catalyst with an oxygencontaining atmosphere containing at least 1 volume percent of oxygen at a temperature of 275° C. to 400° C. and a pressure of 10 kPa to 5000 kPa for a time sufficient to substantially oxidize the copper component of the deactivated copper-containing catalyst; and

(b) reducing the oxidized copper-containing catalyst of (a) by contactingn the catalyst with a reducing atmosphere at a temperature of 100° C. to 400° C. and a pressure of 10 kPa to 5000 kPa for a time sufficient to substantially reduce the oxidized copper component of the copper-containing catalyst.

4,855,268

MIXED PILLARED CLAYS

Rasik H. Raythatha, Tennille, Ga., assignor to E.C.C. America Inc., Atlanta, Ga.

Continuation of Ser. No. 70,433, Jul. 7, 1987, abandoned. This application Dec. 30, 1988, Ser. No. 292,634

Int. Cl.[4] B01J *29/06, 21/16*

U.S. Cl. 502—63 **4 Claims**

1. A process of preparing a mixed pillared clay which consists essentially of forming an aluminum hydroxy polymer and forming an iron hydroxy polymer, in the liquid phase, and mixing said liquid phase polymers with a swelling clay to form a mixed pillared clay, using a proportion of each individual polymer that will satisfy a selected percentage of the cation exchange capacity of the clay.

4,855,269

PROCESS FOR REGENERATING A MONOFUNCTIONAL LARGE-PORE ZEOLITE CATALYST HAVING HIGH SELECTIVITY FOR PARAFFIN DEHYDROCYCLIZATION

Donald H. Mohr, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 944,403, Dec. 19, 1986, abandoned. This application Jun. 29, 1987, Ser. No. 67,920

Int. Cl.[4] B01J *29/38, 23/96;* **C07C** *2/52;* **C10G** *35/095*

U.S. Cl. 502—37 **5 Claims**

1. A process for redispersing platinum on a catalyst that has been used for reforming hydrocarbons which comprises platinum, L-zeolite having alkali or alkaline earth metals, and an inorganic binder, the process comprising:

(a) contacting the catalyst under oxychlorination conditions with a gas comprising 1% to 21% oxygen, 1% to 4% water, and an effective amount of chlorine atoms to achieve a chlorine to platinum ratio between 4:1 to 1000:1;

(b) contacting the catalyst with a gas consisting essentially of nitrogen for a time between 10 minutes and 1 hour and 30 minutes, at a gas flow rate of between 150 and 1500 GHSV and at a temperature between 850° F. and 950° F.; and

(c) contacting the catalyst with a gas consisting essentially of hydrogen having less than 1000 ppm water, at a temperature between 875° F. and 925° F., and a gas velocity between 150 and 1500 GHSV.

4,855,270

BORONAARONATE MOLECULAR SIEVE

Muin S. Haddad, Naperville, and John J. Schimandle, Coal City, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 824,422, Jan. 31, 1986, Pat. No. 4,721,607. This application Jun. 23, 1987, Ser. No. 65,400

The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.

Int. Cl.[4] B01J *29/04, 29/06;* **C01D** *33/26*

U.S. Cl. 502—64 **30 Claims**

1. A crystalline molecular sieve identified as boronaaronate having a composition in terms of mole ratios of oxides:

$$0.9\pm0.2M_{2/n}O:B_2O_3:ySiO_2:zH_2O$$

wherein M is a cation of valence n, y is above 2 and z is between 0 and about 200 and having an X-ray diffraction pattern substantially as shown in Table I.

4,855,271

CATALYST AND POLYMERIZATION OF OLEFINS

Max P. McDaniel, and Shirley J. Martin, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 22, 1987, Ser. No. 64,373

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—107 **12 Claims**

1. A process for preparing a catalyst comprising:

(a) impregnating a highly porous support comprising at least about 90 weight percent alumina and having an internal porosity of at least 0.5 ml/gm, wherein said support has been calcined at a temperature of more than 100° C. but less than 1000° C., with an aqueous solution of a magnesium compound selected from the group consisting of magnesium dichloride, magnesium dibromide, magnesium diiodide, magnesium nitrate and magnesium acetate to incipient wetness;

(b) drying at a temperature of about 300° C. to 500° C.;

(c) treating the dried support with a chlorinating agent selected from $SiCl_4$ and $SOCl_2$;

(d) then treating said support with about 2 to about 5 moles of an alcohol per mole of magnesium;

(e) then treating said support with an etching agent consisting essentially of a halide or organometallic compound capable of removing residual alcohol; and

(f) then treating said support with a transition metal compound selected from halides and haloalkoxides of Ti.

4,855,272

PROCESS FOR PREPARING SOLID COMPONENTS FOR CATALYSTS, OR PRECURSORS OF SUCH COMPONENTS, IN THE FORM OF MICROSPHEROIDAL PARTICLES, SUITABLE FOR THE PREPARATION OF ETHYLENE POLYMERS

Enrico Albizzati, Novara, Italy, assignor to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 78,087, Jul. 27, 1987, abandoned. This application Jul. 25, 1988, Ser. No. 224,179

Claims priority, application Italy, Jul. 31, 1986, 21333 A/86; Nov. 27, 1986, 22469 A/86

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—119 **10 Claims**

1. Process for the preparation of a solid catalytic component, suitable for use in the polymerization of ethylene or of mixtures thereof with minor amounts of alpha-olefins, or of a precursor of such a catalytic component, in the form of microspheroidal particles, which comprises reacting (a) an emulsion in a perfluoropolyether oil of compounds which are liquid under emulsifying conditions selected from magnesium compounds, transition metal compounds and mixtures thereof, solutions of said compounds or of mixtures of said compounds in solvents not miscible with the perfluoropolyether, with (b) an agent able to precipitate such a compound in the form of a solid containing at least one transition metal-halogen bond or one Mg-halogen bond or at least one transition metal-halogen bond and at least one Mg-halogen bond.

4,855,273

ACID-RESISTANT CATALYSTS FOR THE DIRECT HYDROGENATION OF FATTY ACIDS TO FATTY ALCOHOLS

Joachim Pohl, Duesseldorf; Franz-Josef Carduck, Haan, and Gerd Goebel, Erkrath, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 1, 1988, Ser. No. 162,537

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1987, 3706658

Int. Cl.[4] B01J *23/72*

U.S. Cl. 502—244 **13 Claims**

1. A process for the production of an acid-resistant copper chromite spinel catalyst consisting essentially of copper (II) chromite and silica wherein copper (II) is the only metal ion present therein comprising the steps of:

(a) dissolving a water soluble copper salt in water to form an aqueous solution thereof,

(b) mixing the above aqueous solution with an aqueous colloidal solution of SiO_2,

(c) mixing the solution resulting from step (b) with an aqueous chromic acid/ammonia solution in amount sufficient to form a precipitate of substantially all of the copper present as copper chromate,

(d) washing the precipitated chromate with water to remove soluble anions therefrom,

(e) drying the copper chromate, and

(f) calcining the copper chromate for at least about 12 hours at a temperature of at least about 750° C. to produce silica containing copper (II) chromite;

wherein in step (b) the SiO_2 is present in a quantity of from about 0.1 to about 15% by weight, based on the weight of the catalyst as a whole.

7. An acid-resistant copper (II) chromite spinel catalyst containing intimately admixed therewith from about 0.1 to about 15% by weight of SiO_2, based on the weight of the catalyst as a whole.

4,855,274

PROCESS FOR MAKING A NOBLE METAL ON TIN OXIDE CATALYST

Billy T. Upchurch, Virginia Beach; Patricia A. Davis, and Irvin M. Miller, both of Newport News, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 31, 1987, Ser. No. 90,874

Int. Cl.[4] B01J *23/62*

U.S. Cl. 502—339 **7 Claims**

1. A method of coating a porous, high surface area, ceramic support material with a catalyst comprising tin(IV) oxide overlaid with a noble metal, which process comprises chemically forming in one step a thin tin(Iv) oxide coating form solution directly on the ceramic support material followed by chemically forming in on step a thin noble metal coating from solution directly on the tin(IV) oxide-coated ceramic support material, the tin(IV) oxide coating and the thin noble metal coating each having an amount of matter therein equivalent to about that contained in a monolayer, the ceramic support material being first immersed in deionized water, after which metastannic acid is provided therein, the metastannic acid having been generated by a process which leaves no residue to act as a poison for the catalyst, whence the metastannic acid is absorbed on the ceramic support material, whereupon the metastannic acid becomes tin(IV) oxide upon evaporation and drying.

4,855,275

CATALYST PERFORMANCE IMPROVEMENT VIA SEPARATE BORON ADDITION

Dev D. Suresh, Hudson; Michael J. Seely, Chagrin Falls; James F. Brazdil, Mayfield Village, and Robert K. Grasselli, Aurora, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Feb. 18, 1988, Ser. No. 157,428
Int. Cl.[4] B01J *23/16, 23/18*
U.S. Cl. 502—353 12 Claims

1. A process for improving the performance of a calcined metal-antimonate based ammoxidation catalyst characterized by the formula:

$$Me_aSb_bX_cR_dQ_eO_f$$

wherein
Me is at least one element selected from Fe, Co, Ta, Ni, Mn, U, Ce, Sn and Cu;
X is at least one element selected from V, Mo, W, Nb and Ta;
R is at least one element selected from B, P, Bi and Te;
Q is at least one element selected from Mg, Ca, Sr, Ba, La, Ti, Zr, Cr, Re, Ru, Os, Rh, Ir, Pd, Pt, Ag, Cd, Al, Fa, In. Tl, Si, B, Ge, Pb, As, S, and Se;
a=10;
b=5 to 60;
c=0 to 30;
d=0 to 10;
e=0 to 20;
f=number of oxygen atoms needed to satisfy the valency requirements of the formula comprising contacting said calcined metal-antimonate based catalyst with a heat decomposable boron containing compound at a sufficient elevated temperature and for a time sufficient to decompose the compound and deposit boron on the surface of said calcined catalyst.

4,855,276

SOLID FILTRATION MEDIUM INCORPORATING ALUMINA AND CARBON

Michael W. Osborne, Lilburn; Cynthia A. Afforder, Duluth, and William G. England, Suwanee, all of Ga., assignors to Purafil, Inc., Doraville, Ga.

Filed Sep. 2, 1987, Ser. No. 92,134
Int. Cl.[4] G01B *31/08;* B01J *20/08, 20/20, /20/04*
U.S. Cl. 502—415 15 Claims

1. A process for making an adsorbent composition, consisting essentially of the steps of:
(a) forming a mixture in water of the following components in the following proportions: from about 5% to about 90% finely divided carbon, from about 5% to about 90% alumina, and from about 5% to about 80% sodium bicarbonate;
(b) forming said mixture into at least one cohesive unit; and
(c) curing said unit at a temperature of from about 100 to about 225 degrees F. until said water is from about 5% to about 30% by weight of the composition.

4,855,277

THERMOSENSITIVE RECORDING MATERIAL HAVING RECORDING LAYER CONTAINING FLUORESCENT DYE

Philip G. Walter, Dayton, Ohio, assignor to Hobart Corporation, Troy, Ohio

Continuation of Ser. No. 874,950, Jun. 16, 1986, abandoned. This application Apr. 27, 1988, Ser. No. 188,091
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—204 16 Claims

1. A thermosensitive recording material comprising:
a support and
a thermosensitive recording layer formed on one side of said support, said thermosensitive recording layer including (i) a thermosensitive recording system capable of producing a colored image upon application of heat thereto, and (ii) a colored fluorescent dye composition, said system also comprising a resin, said resin being dissolved in the form of a solid solution with said fluorescent dye, said colored flourescent dye forming a background for said image.

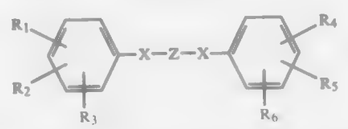
4,855,278

HEAT-SENSITIVE RECORDING MATERIAL

Akira Igarashi; Masato Satomura, and Ken Iwakura, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 11, 1987, Ser. No. 60,556
Claims priority, application Japan, Jun. 11, 1986, 61-135847
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—208 11 Claims

1. A heat-sensitive recording material comprising a neutral paper support having provided on at least one surface thereof a heat-sensitive color forming layer containing a fluoran derivative having an arylamino group at the 2-position and an amine residual group at the 6-position, an electron accepting compound, a hindered phenol derivative and a heat-fusible compound represented by formula (I):



(I)

wherein R_1, R_2, R_3, R_4, R_5 and R_6, which may be the same or different, each represents a hydrogen atom, an alkyl group, an alkoxy group, a phenyl group or a halogen atom, X represents an oxygen atom or a sulfur atom, and Z represents a divalent group, wherein said neutral paper support has a pH of about 6.5 or higher after cold extraction.

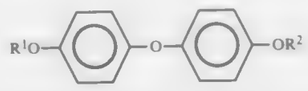
4,855,279

HEAT-SENSITIVE RECORDING MATERIAL

Haruhiko Ikeda; Akinori Okada, and Hirokazu Ohkura, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Limited, Tokyo, Japan

Filed Nov. 8, 1988, Ser. No. 268,941
Claims priority, application Japan, Nov. 9, 1987, 62-283749
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—209 6 Claims

1. A heat-sensitive recording material comprising a support and formed on the support a heat-sensitive recording layer comprising a colorless or light-colored dye precursor, a color developer capable of developing a color of said dye precursor with heating, and a sensitizer, said sensitizer being a compound of the formula:



wherein R^1 is a lower alkyl group, a lower alkenyl group or an acyl group; and R^2 is an aralkyl group or an aroyl group.

4,855,280

DEVELOPER SHEET

Shuzo Ohara, Kawanishi, and Hiroshi Kawahara, Tondabayashi, both of Japan, assignors to Goyo Paper Working Co. Ltd., Osaka, Japan

PCT No. PCT/JP87/00554, § 371 Date Mar. 31, 1988, § 102(e) Date Mar. 31, 1988, PCT Pub. No. WO88/00890, PCT Pub. Date Feb. 11, 1988
PCT Filed Jul. 29, 1987, Ser. No. 184,633
Claims priority, application Japan, Jul. 31, 1986, 61-181646; Jul. 21, 1987, 62-183185
Int. Cl.[4] B41M *5/16, 5/18*
U.S. Cl. 503—214 5 Claims

1. A developer sheet made by integrating a sheet-like molded form of a mixture of an olefin resin, a developer and a dye-adsorbing inorganic substance with a substrate by means of adhesion.

4,855,281

STABILIZER-DONOR ELEMENT USED IN THERMAL DYE TRANSFER

Gary W. Byers, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 23, 1987, Ser. No. 112,907
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 18 Claims

9. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising a dye dispersed in a polymeric binder and transferring a dye image to a dye-receiving element to form said dye transfer image, the improvement wherein said dye-donor element also contains a stabilizer comprising a multialkoxy-substituted aromatic compound or a singlet oxygen quencher metal chelate.

4,855,282

RECORDING MATERIAL AND METHOD FOR PRODUCING THE SAME

Masato Satomura; Ken Iwakura; Masanobu Takashima, and Akira Igarashi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 22, 1987, Ser. No. 99,861
Claims priority, application Japan, Sep. 22, 1986, 61-224611; Oct. 15, 1986, 61-244987; Nov. 5, 1986, 61-263034
Int. Cl.[4] B41M *5/16, 5/18, 5/22*
U.S. Cl. 503—218 10 Claims

1. A recording material comprising a support having thereon a recording layer comprising an at least one electron-donating colorless dye and at least one electron-accepting compound, wherein said electron-donating colorless dye is a copolymer of at least one polymerizable colorless dye monomer and at least one comonomer, wherein said polymerizable colorless dye monomer contains at least one addition polymerizable group, and wherein said addition polymerizable group is selected from an acrylic ester group, a methacrylic ester group, an allyl group, or a vinyl group.

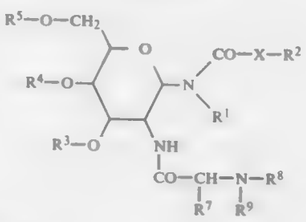
4,855,283

NOVEL PHARMACEUTICALLY ACTIVE N-(2-AMINOACYLAMIDO-2-DEOXY-HEXOSYL)-AMIDES, -CARBAMATES AND -UREAS

Oswald Lockhoff, Cologne; Yutaka Hayauchi, Leverkusen; Peter Stadler, Haan; Klaus G. Stünkel; Gert Streisale, both of Wuppertal; Arnold Paessens, Haan; Volker Klimetzek, Velbert-Toenisheide; Hans-Joachim Zeiler, Velbert; Karl G. Metzger; Hein-Peter Kroll, both of Wuppertal; Helmut Brunner, Langenfeld, and Klaus Schaller, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 16, 1986, Ser. No. 874,983
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1985, 3521994
Int. Cl.[4] A61K *37/00;* C07K *9/00*
U.S. Cl. 514—8 24 Claims

1. A compound of the formula



in which
R^1 denotes hydrogen or a saturated or singly or multiply unsaturated alkyl radical having up to 50 carbon atoms,
X represents —CH_2—, —O— or —NH—,
R^2 denotes a saturated or singly or multiply unsaturated alkyl radical having up to 50 carbon atoms,
R^3, R^4 and R^5, independently of one another, denotes hydrogen or acetyl, benzoyl or P-nitro-benzoyl,
R^7 denotes hydrogen, C_1–C_7-alkyl-, hydroxymethyl, 1-hydroxyethyl, mercaptomethyl, 2-(methylthio)-ethyl, 3-aminopropyl, 3-ureidopropyl, 3-guanidyl-propyl, 4-aminobutyl, carboxymethyl, carbamylmethyl, 2-carboxyethyl, 2-carbamoylethyl, benzyl, 4-hydroxybenzyl, 3-indolylmethyl or 4-imidazolylmethyl, and
R^8 represents hydrogen or methyl, and
R^9 represents hydrogen, acetyl, benzoyl, trichloroacetyl, trifluoroacetyl, methoxycarbonyl, t-butyloxycarbonyl or benzyloxycarbonyl and
R^7 and R^8 together can denote —CH_2—CH_2—CH_2, or a pharmaceutically acceptable salt thereof.

4,855,284

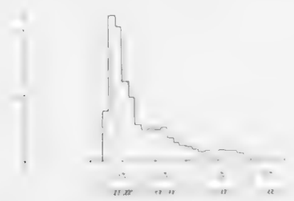
CALCIUM AND MAGNESIUM COMPLEXES OF PHYTOHEMAGGLUTININ-POLYHETEROGLYCANS, THEIR PREPARATION AND PHARMACEUTICAL FORMULATIONS

Gabriel Emoëdi, Basel, Switzerland, assignor to Intex Pharmazeutische Produkte AG, Basel, Switzerland

Filed Aug. 18, 1986, Ser. No. 897,713
Claims priority, application Switzerland, Aug. 23, 1985, 3651/85
Int. Cl.[4] C07K *15/14*
U.S. Cl. 514—8 15 Claims

1. Calcium and magnesium complexes of phytohemagglutinin-polyheteroglycans of plant origin with antiinflammatory, immunostimulating and cytoprotective action, comprising:
a molecular weight of the phytohemagglutinins between 10,000 and 75,000 Dalton (determined by gel electrophoresis),

an infrared spectrum as shown in FIG. 2, with broad band at 3,400 and 1,750 cm^{-1} and a narrow band at 1,600 cm^{-1},
a content of calcium and/or magnesium of 2.0 to 10.0% a phosphorus content of 0.2 to 2% a content of glycans of 40 to 60%, including monosaccharides which are composed of at least 50% galactose and glucose in the ratio of 1:1 and of 10% uronic acids,
an elemental analysis of 35 to 45% carbon, 4 to 7% hydrogen and at least 5% nitrogen,
after combustion, an ash of the following composition: 15 to 25% potassium, 0.1 to 2.0% sodium, 20 to 45% calcium and/or 5 to 15% magnesium, and 3 to 6% phosphorus,
a residue on combustion of at least 15% (600° C., 2 hours),



a peptide content (phytohemagglutinins) of 3 to 25% (determined by amino acid analysis),
a peptide content of 6 to 30% (determined by the biuret reaction),
a peptide content which is composed of at least 75% of the following amino acids: aspartic acid or asparagine, glutamic acid or glutamine, alanine, glycine, lysine, serine, valine and leucine, a ratio for the acid and of the basic amino acids of at least 3:1,
a molecular ratio of the peptide content and of the glycan content of 1:10,
and a cytoprotective action at the oral dose of 400 mg/kg of at least 40% in the rat (determined by the Robert alcohol ulcer test).

4,855,285

ANTIGENIC MODIFICATION OF POLYPEPTIDES

Vernon C. Stevens, Dublin, Ohio, assignor to The Ohio State University Research Foundation, Columbus, Ohio

Continuation-in-part of Ser. No. 804,642, Dec. 4, 1985, Pat. No. 4,713,366. This application Aug. 17, 1987, Ser. No. 86,401
Int. Cl.[4] A61K *37/02, 37/38*
U.S. Cl. 514—12 **20 Claims**

1. A method for controlling a biological activity attributable to chorionic gonadotropin hormone, in primate animals having naturally occurring endogenous chorionic gonadotropin hormone by neutralizing the biological action of the endogenous hormone, comprising the steps of:
administering to said primate animal an immunologically effective amount of a peptide comprising an amino acid sequence substantially immunologically similar to the region of a mammalian chorionic gonadotropin corresponding to the 38–57 region of the beta-subunit of human chorionic gonadotropin; with the two cysteine residues corresponding to the cysteine residues at positions 38 and 57 of the beta-subunit of human chorionic gonadotropin having their sulfur atoms linked in a disulfide bridge,
said peptide being modified by the coupling thereof with a non-endogenous material to effect the formation, following said administration, of antibodies having a specificity to endogenous chorionic gonadotropin hormone, said non-endogenous material having a size sufficient to elicit antibody response following the administration thereof into the body of the primate animal;
thereby inhibiting the biological activity in said primate animal by preventing one or more normal biological functions attributable to the endogenous chorionic gonadotropin hormone.

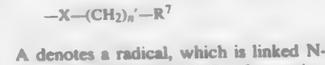
4,855,286

RENIN-INHIBITING DI- AND TRIPEPTIDES, A PROCESS FOR THEIR PREPARATION, AGENTS CONTAINING THEM, AND THEIR USE

Adalbert Wagner, Hofheim am Taunus; Heinz-Werner Kleemann, Kelsterbach; Dieter Ruppert, and Bernward Schölkens, both of Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 28, 1987, Ser. No. 78,843
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1986, 3625687; Aug. 16, 1986, 3627877
Int. Cl.[4] A61K *37/02;* **C07D** *333/22, 307/02, 209/18;* **C07C** *103/19, 103/00, 103/07, 143/78, 143/74, 125/06*
U.S. Cl. 514—19 **8 Claims**

1. A compound of the formula I



(I)

in which
R^1 denotes a radical of the formula II



(II)

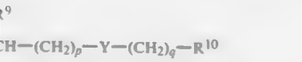
in which W represents —CO—, —O—CO—, —SO_2— ior —NH—CO—, and R^a represents hydrogen, (C_1–C_{10})-alkyl which is saturated or singly or doubly unsaturated and which is unsubstituted or substituted by up to 3 identical or different radicals selected from the group consisting of hydroxyl, (C_1–C_7)-alkoxy, (C_1–C_7)-alkanoyloxy, carboxyl, (C_1–C_7)-alkoxycarbonyl, Cl, Br, amino, (C_1–C_7)-alkylamino, di-(C_1–C_7)-alkylamino, (C_1–C_5)-alkoxycarbonylamino, (C_7–C_{15})-aralkoxycarbonyl-amino and 9-fluorenylmethoxycarbonylamino, or represents (C_3–C_8)-cycloalkyl, (C_3–C_8)-cycloalkyl-(C_1–C_6)-alkyl, (C_6–C_{14})-aryl which is unsubstituted or substituted by one or two identical or different radicals selected from the group consisting of F, Cl, Br, I, hydroxyl, (C_1–C_7)-alkoxy, (C_1–C_7)-alkyl, (C_1–C_7)-alkoxycarbonyl, amino, anilino which is unsubstituted or substituted by up to 2 halogens, and trifluoromethyl, or represents (C_6–C_{14})-aryl-(C_1–C_6)-alkyl in which the aryl moiety is unsubstituted or substituted by one or two identical or different radicals selected from the group consisting of F, Cl, Br, I, hydroxyl, (C_1–C_7)-alkoxy, (C_1–C_7)-alkyl, (C_1–C_7)-alkoxycarbonyl, amino, (C_1–C_7)-alkylamino, di-(C_1–C_7)-alkylamino, carboxyl, carboxymethoxy, amino(C_1–C_7)-alkyl, (C_1–C_7)-alkylamino-(C_1–C_7)-alkyl, di-(C_1–C_7)-alkylamino-(C_1–C_7)-alkyl, (C_1–C_7)-alkoxycarbonylmethoxy, carbamoyl, sulfamoyl, (C_1–C_7)-alkoxysulfonyl, sulfo- and guanidino-methyl, or represents the radical of a 5- or 6-membered monocyclic, or 9- or 10-membered bicyclic, heteroaromatic compound which has at least 1 carbon atom, 1–4 nitrogen atoms and/or 1 sulfur or oxygen atom, as ring members, and is unsubstituted or is mono-, di or trisubstituted independently by a member selected from the group of substitutents as defined for (C_6–C_{14})-aryl above,
R^4 denotes a radical of the formula IV



(IV)

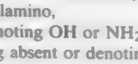
A denotes a radical, which is linked N-terminally with R^1 and C-terminally with B, of an amino acid selected from the group consisting of phenylalanine, histidine, tyrosine, tryptophan, methionine, leucine, isoleucine, asparagine, aspartic acid, β-2-thienylalanine, β-3-thienylalanine, β-2-furylalanine, β-3-furylalanine, lysine, ornithine, valine,

alanine, 2,4-diaminobutyric acid, arginine, 4-chlorophenyl-aalanine, methionine sulfone, methionine sulfoxide, 2-pyridylalanine, 3-pyridylalanine, cyclohexylalanine, cyclohexylglycine, im-methylhistidine, 0-methyltyrosine, 0-benzyltyrosine, O-tert.-butyltyrosine, phenylglycine, 1-naphthylalanine, 2-naphthylalanine, 4-nitrophenylalanine, β-2-benzo(b)thienylalanine, β-3-benzo(b)thienylalanine, 2-fluorophenylalanine, 3-fluorophenylalanmine, 4-fluorophenylalanine, norleucine, cysteine, S-methylcysteine, 1,2,3,4-tetrahydroisoquinoline-3-carboxylic acid, homophenylalanine, DOPA, O-dimethyldopa, 2-amino-4-(2-thienyl)butyric acid, 2-amino-4-(3-thienyl)butyric acid, 3-(2-thienyl)serine, norvaline, (Z)-dehydrophenylalanine and (E)-dehydrophenylalanine,
B denotes a radical of an amino acid as defined under A,
R^2 denotes hydrogen, (C_1–C_{10})-alkyl, (C_4–C_7)cycloalkyl, (C_4–C_7)-cycloalkyl-(C_1–C_4)-alkyl, (C_6–C_{14})-aryl or (C_6–C_{14})-aryl-(C_1–C_4)-alkyl, and
R^3 denotes hydrogen, (C_1–C_{10})-alkyl, (C_6–C_{14})-aryl or (C_6–C_{14})-aryl-(C_1–C_4)-alkyl,
X can be chosen to be absent or denotes O or S,
n′ can be 0, 1, 2, 3 or 4, with the proviso that n′ is not 0 if R^7 is OH or NH,
R^7 denotes hydrogen, OH, NH_2, or heteroaryl which can also be partially or completely hydrogenated or denotes a radical of the formula VI



(VI)

R^9 representing hydrogen, (C_1–C_7)-alkyl, or (C_1–C_7)-alkyl which is monosubstituted by hydroxyl, (C_1–C_3)-alkoxy, (C_1–C_5)-alkylthio, carboxyl, (C_1–C_5)-alkoxycarbonyl, F, Cl, Br, I, (C_1–C_5)-alkylamino, di-(C_1–C_5)-alkylamino, (C_1–C_5)-alkoxycarbonylamino or (C_7–C_{15})-aralkoxycarbonylamino,
R^{10} denoting OH or NH_2,
Y being absent or denoting



p, q, independently of each other denoting 0, 1, 2, 3 or 4, and in the case where Y is



q not being equal to 0, and heteroaryl denoting the radical of a heteroaromatic compound defined under R^1, and its physiologically tolerated salts.

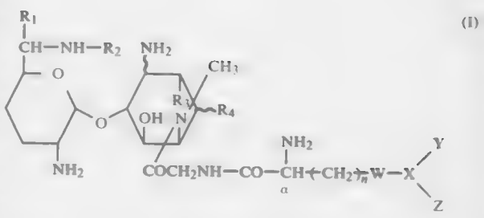
4,855,287

AMINOGLYCOSIDE COMPOUNDS, PROCESSES FOR PRODUCTION THEREOF, AND PHARAMACEUTICAL COMPOSITION CONTAINING THE SAME

Isamu Watanabe; Kazuhiro Kamiya, both of Higashimurayama; Takahiro Torii, Chofu, and Toshihito Mori, Higashimurayama, all of Japan, assignors to Kowa Company Ltd., Nagoya, Japan

Filed Sep. 3, 1986, Ser. No. 903,137
Claims priority, application Japan, Sep. 3, 1985, 60-193166
Int. Cl.[4] C07H *15/22;* **A61K** *31/71*
U.S. Cl. 514—41 **6 Claims**

1. An aminoglycoside compound represented by the following formula (I)



(I)

wherein
one of R_1 and R_2 represents a hydrogen atom, and the other represents a methyl group,
R_3 represents a hydrogen atom or a hydroxyl group,
R_4 represents a hydrogen atom, a hydroxyl group or a methoxy group,
n represents an integer of 1 to 5,
W represents a divalent group of the formula —NHCO→, —CONH→, —COO→, or —S→ in which → represents a bond to X, and
X represents (i) a single bond or (ii) a C_1–C_{20} trivalent acyclic saturated hydrocarbon group, with the proviso that when X represents a single bond (i), the group —Z is absent in the formula, and Y represents a C_6–C_{10} aryl group, a 3,12-dihydroxy-24-nor-cholan-23-yl group, the group —O—Q^1 or the group —CO—Q^1 in which Q^1 represents a C_1–C_9 alkyl group, and that when X represents a C_1–C_{20} trivalent acyclic saturated hydrocarbon group (ii), the groups Z and Y, independently from each other, represent a hydrogen atom, a hydroxyl group, a carboxyl group, the group —COOQ^1 in which Q^1 is as defined, a phenyl group unsubstituted or substituted by lower alkoxy or nitro, a pyridyl group, a phenyl(C_1–C_3)alkyl group, the group —O—Q^1 in which Q^1 is as defined, the group —CH_2)$_l$O—OCQ^2, the group —CO—Q^3 or the group —CH_2)$_l$NHCOQ^4 in which Q^2 represents a 3,12-dihydroxy-24-nor-cholan-23-yl group, a 3,12-diacetoxy-24-nor-cholan-23-yl group, a C_1–C_{20} alkyl group or a naphthyl group, Q^3 represents a C_3–C_8 alkylamino group, Q^4 represents a 3,12-dihydroxy-24-nor-cholan-23-yl group, a 3,12-diacetyloxy-24-nor-chlolan-23-yl group, a 3,12-dipropyloxy-24-nor-cholan-23-yl group or a C_1–C_{25} alkyl group, and
l represents 0 or an integer of 1 to 6; or a pharmaceutically acceptable acid addition salt thereof.

2. A pharmaceutical composition comprising an antibiotically effective amount of the aminoglycoside of formula (I) or a pharmaceutically acceptable acid addition salt thereof as claimed in claim 1 and a pharmaceutically acceptable diluent or carrier.

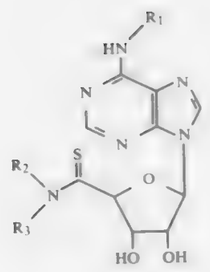
4,855,288

NEW FURANURONIC ACID DERIVATIVES, PROCESS FOR THEIR PRODUCTION AND THEIR USE

Fulvio Gadient, Birsfelden, and Arnold Vogel, Riehen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Dec. 14, 1987, Ser. No. 132,492
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1986, 3642748; Sep. 5, 1987, 3729768
Int. Cl.[4] C07H *19/67, 19/18;* **A61K** *31/70, 31/52*
U.S. Cl. 514—45 **7 Claims**

1. A 1′-desoxy-1′-(6-amino-9-purinyl)-β-D-ribofuranuronic acid thioamide of formula I,



I

wherein

R_1 signifies hydrogen; (C_{1-6})alkyl which may be monosubstituted by a hydroxyl, a —SH or a



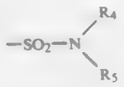
group; (C_{3-7})alkenyl; (C_{3-7})alkinyl; (C_{3-7})cycloalkyl which may be mono- or di-substituted by a hydroxyl, a —SH or a



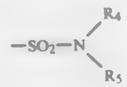
group; (C_{3-7}) cycloalkyl(C_{1-3})alkyl which may be mono- or di-substituted in the cycloalkyl ring by a hydroxyl, a —SH or a



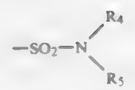
group; phenyl which may be mono-, di- or tri-substituted by halogen with an atomic number of 9–35, (C_{1-4})alkyl, (C_{1-4})alkoxy, a hydroxyl-, a —SH, a —S—(C_{1-4})alkyl, a SO_2—(C_{1-4})alkyl or a



group; phenyl-(C_{1-6}) alkyl which may be mono- or di-substituted in the phenyl ring by halogen with an atomic number of 9–35, (C_{1-4})alkyl, (C_{1-4})alkoxy, a hydroxyl, a —SH, a —S—(C_{1-4})alkyl, a $SO_2(C_{1-4})$alkyl or a



group, and wherein the (C_{1-6})alkylene chain may be substituted by a hydroxyl gorup, phenyl-(C_{3-7})alkenyl which may be substituted in the phenyl ring by halogen with an atomic number of 9–35, (C_{1-4})alkyl, (C_{1-4})-alkoxy, a hydroxyl, a —SH—, a —S—(C_{1-4})alkyl-, a —SO_2—(C_{1-4})alkyl or a



group; a 5 or 6 membered, monocyclic heteroaryl which (i) contains one or two nitrogen atoms or (ii) one oxygen atom or one sulphur atom or (iii) one oxygen atom or one sulphur atom and one nitrogen atom, or a 5 or 6 membered, monocyclic heteroaryl-$(_{1-5})$alkyl containing in the heteroaryl moiety either (i) one or two nitrogen atoms (ii) one oxygen atom or one sulphur atom or (iii) one oxygen atom or one sulphur atom and one nitrogen atom; wherein the alkylene moiety may be substituted by a hydroxyl group, and

R_2 signifies hydrogen, (C_{1-4})alkyl which may be mono-substituted by a hydroxyl, a —SH or a



group, or it signifies (C_{3-6})cycloalkyl, and

R_3 is hydrogen or (C_{1-4})alkyl which may be mono-substituted by a hydroxyl, a —SH or a



group, whereby R_4 and R_5 are independently hydrogen or (C_{1-4})alkyl.

6. A method of treatment of a raised blood pressure which comprises administering to a subject in need of such a treatment a therapeutically effective amount of a compound of formula I according to claim 1.

4,855,289

COMBINATION OF TWO ACTIVE SUBSTANCES

Per O. Wester, Kvarnvägen 1 E, 902 49 Umeå, and Thomas R. Dyckner, Norevägen 7, 133 00 Saltsjöbaden, both of Sweden

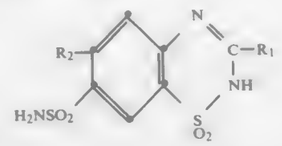
Continuation of Ser. No. 617,050, Jun. 4, 1984, abandoned. This application Jul. 30, 1987, Ser. No. 80,150

Int. Cl.[4] **A61K** *31/19, 31/41, 31/56, 31/415*

U.S. Cl. 514—171 **9 Claims**

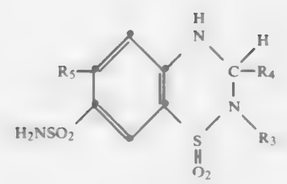
1. A method of treating hypertension or congestive heart failure in a patient in need thereof wherein the mean heart rate of said patient remains substantially unchanged comprising administering to said patient an antihypertensively effective amount of a diuretic compound selected from the group consisting of

(a) a thiazide of formula I



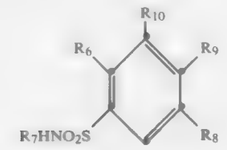
(I)

(b) a hydrothiazide of formula II



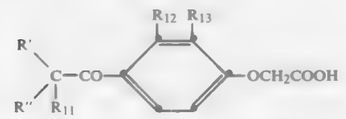
(II)

(c) a benzenesulfonamide of formula III



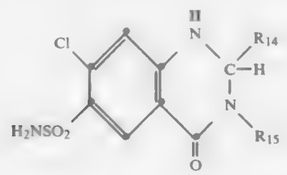
(III)

(d) a phenoxy acetic acid of formula IV



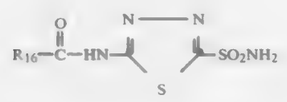
(IV)

(e) a quinazolinesulfonamide of formula V



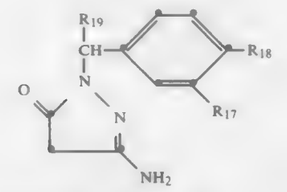
(V)

(f) a thiadiazolesulfonamide of formula VI



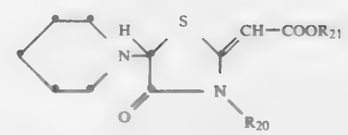
(VI)

(g) a pyrazolinone of formula VII



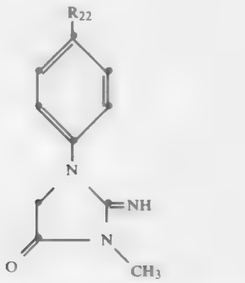
(VII)

(h) a thiazolidone of formula VIII



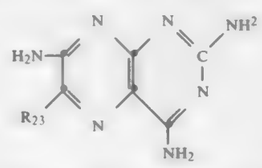
(VIII)

(i) an imidazolidinone of formula IX



(IX)

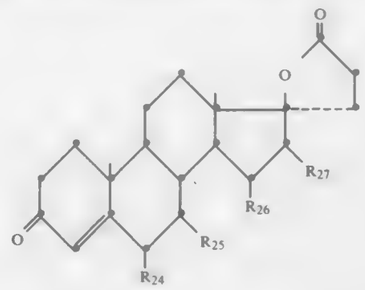
(j) a 6-substituted-2,4,7,-triamino-pteridine of formula X



(X)

(k) N-amidino-3,5-diamino-6-chloro-pyrazine-carbor-amide, and

(l) A spiroxane steroid compound of formula XI



(XI)

wherein

R_1 is hydrogen or phenyl-lower alkylthio-lower alkyl;

R_2 is halogeno or trifluoromehtyl;

R_3 is hydrogen or methyl;

R_4 is hydrogen, C_1–C_4 alkyl, allyl, C_5–C_8 cycloalkyl or cycloalkenyl, C_5–C_6 cycloalkyl-lower alkyl, phenyl-lower alkyl, halophenyl-lower alkyl, halo-lower alkyl, lower alkylthio-lower alkyl, trifluoro-lower alkylthio-lower alkyl, lower alkenyl-thio-lower alkyl, phenyl-lower alkylthio-lower alkyl, or 2,5-dioxopyrrolidin-1-yl-methyl;

R_5 is halogen or trifluoromethyl;

R_6 is chloro;

R_7 is hydrogen;

R_8 is 3-hydroxy-1-oxo-isoindolin-3-yl;

R_9 is hydrogen;
R_{10} is hydrogen;
R' is lower alkyl;
R'' is phenyl;
or R' and R'' together are methylene;
R_{11} is lower alkyl or is methylene which is further bonded to the benzene ring of formula IV to yield an indanone ring;
R_{12} is halogeno or lower alkyl;
R_{13} is hydrogen, halogeno, or lower alkyl;
or R_{12} and R_{13} together represent but-1,3-dienylene-(1,4);
R_{14} is lower alkyl or phenyl;
R_{15} is hydrogen, phenyl, or o-tolyl;
R_{16} is C_1–C_4 alkyl;
R_{17} and R_{18} are hydrogen or chloro;
R_{19} is hydrogen or C_1–C_4 alkyl
R_{20} and R_{21} are independently hydrogen or C_1–C_4 alkyl;
R_{22} is hydrogen or halogeno;
R_{23} is phenyl which is unsubstituted or substituted by methyl, by methoxy, or by furyl;
R_{24}, R_{26} and R_{27} are hydrogen and R_{25} is in the alpha-configuration and is acetylthio or lower alkoxycarbonyl; or R_{24} and R_{25} together form a bond and R_{26} and R_{27} each represent hydrogen; or R_{24} and R_{25} together are methylene and R_{26} and R_{27} are each hydrogen or together also are methylene; or a pharmaceutically acceptable salt thereof and

about 50 to about 800 mg of magnesium per daily dose of said composition in the form of magnesium monoaspartate hydrochloride.

4,855,290

DERIVATIVES OF QUINUCLIDINE

Abraham Fisher, Holon; Ishai Karton, Ness-Ziona; Eliahu Heldman, Rehovot; Aharon Levy, Moshav Beith Hanan, and Yona Grunfeld, Rehovot, all of Israel, assignors to State of Israel, represented by Prime Minister's Office, Israel Institute for Biological Research, Ness-Ziona, Israel

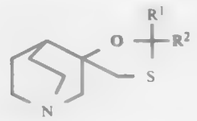
Filed Apr. 18, 1986, Ser. No. 853,404

Claims priority, application Israel, May 10, 1985, 75166; Jan. 10, 1986, 77568

Int. Cl.[4] C07D *497/20;* **A61K** *31/435*

U.S. Cl. 514—278 **67 Claims**

1. A compound of the formula (I)



and geometrical isomers, enantiomers, diastereoisomers, racemates and/or acid addition salts thereof, wherein R^1 is selected from the group consisting of hydrogen, lower alkyl, cyclopentyl, cyclohexyl, phenyl, diphenylmethylol and lower alkyl which is substituted by one or two phenyl groups and R is selected from the group consisting of lower alkyl, cyclopentyl, cyclohexyl, phenyl, diphenylmethylol and lower alkyl which is substituted by one or two phenyl groups.

32. A method for treating diseases of the central nervous system is mammals, comprising transdermal administration to the mammal of a compound of formula (I) according to claim 1 or a pharmaceutically compatible acid addition salt thereof.

4,855,291

1,4-DIHYDROQUINOLINES-3-CARBOXAMIDES

Roy V. Davies, Nottinghamshire, England, assignor to The Boots Company plc, England

Continuation of Ser. No. 838,670, Mar. 12, 1986, abandoned, which is a continuation of Ser. No. 760,823, Jul. 31, 1985, abandoned. This application Jun. 25, 1987, Ser. No. 66,821

Claims priority, application United Kingdom, Aug. 15, 1984, 84/20689; Feb. 13, 1985, 85/03625

Int. Cl.[4] A61K *31/47;* **C07D** *215/56*

U.S. Cl. 514—312 **6 Claims**

3. A pharmaceutical composition useful for reducing blood pressure in humans and animals which comprises a therapeutically effective amount of a compound selected from the group consisting of

(a) 7-fluoro-1-methyl-4-oxo-1,4-dihydroquinoline-3-carboxamide;
(b) 7-chloro-1-methyl-4-oxo-1,4-dihydroquinoline-3-carboxamide;
(c) 1-methyl-4-oxo-7-trifluoromethyl-1,4-dihydroquinoline-3-carboxamide;
and
(d) 7-chloro-1,N-dimethyl-4-oxo-1,4-dihydroquinoline-3-carboxamide, in combination with a pharmaceutically acceptable carrier.

4,855,292

1-CYCLOPROPYL-6-FLUORO-8-ALKYL-1,4-DIHYDRO-4-OXO-QUINOLINE-3-CARBOXYLIC ACID DERIVATIVES

Hiraki Ueda; Hisashi Miyamoto; Shinji Aki, and Tatsuya Otsuka, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Company, Limited, Japan

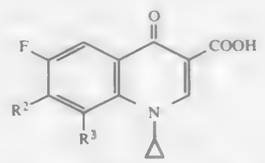
Continuation-in-part of Ser. No. 17,247, Feb. 20, 1987, abandoned. This application Jul. 23, 1987, Ser. No. 76,888

Claims priority, application Japan, Feb. 25, 1986, 61-40921; May 8, 1986, 61-105655; May 22, 1986, 61-118568; Jul. 23, 1986, 61-173370; Aug. 19, 1986, 61-193838; Sep. 30, 1986, 61-233837; Oct. 15, 1986, 61-246050; Dec. 18, 1986, 61-303515; Feb. 19, 1987, 62-37000

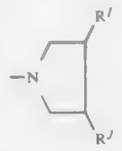
Int. Cl.[4] A61K *31/47;* **C07D** *401/04*

U.S. Cl. 514—312 **30 Claims**

1. A compound of the formula:



wherein R^2 is a 1-pyrrolidinyl group of the formula:



wherein R^J is an amino-(C_1–C_6) alkyl group, said amino group may be substituted by one C_1–C_6 alkyl group, or an amino group which may be substituted by one C_1–C_6 alkyl group; and R^J is hydrogen atom or a C_1–C_6 alkyl group or a 1-piperidinyl group which may have one substituent selected from the group consisting of oxo, hydroxy, and halogen, and R^3 is methyl, or a pharmaceutically acceptable salt thereof.

4,855,293

ANTI-INFLAMMATORY COMPOSITIONS COMPRISING A SYSTEMIC NON-STEROIDAL ANTI-INFLAMMATORY DRUG AND A CYCLOPENTYL ETHER

Eric W. Collington, Knebworth; Harry Finch, Letchworth, and Duncan B. Judd, Ware, all of England, assignors to Glaxo Group Limited, London, England

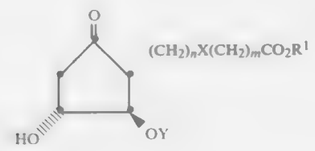
Filed Oct. 21, 1987, Ser. No. 111,026

Claims priority, application United Kingdom, Oct. 22, 1986, 8625325

Int. Cl.[4] C07C *177/00;* **A61K** *31/557, 31/55*

U.S. Cl. 514—212 **25 Claims**

1. A method for the therapy or prophylaxis of inflammatory conditions or for inducing analgesia in the human body, which comprises administering thereto in the presence of each other therapeutically effective amounts of (i) a systemic non-steroidal anti-inflammatory drug and (ii) a compound of formula (1)



wherein

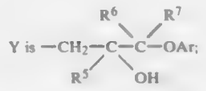
n is 1 or 2;
m is 2-5 and X is cis or trans—CH=CH— or —CH-$_2$—CH_2—; or m is 1-4 and X is —CH=C=CH—;
R^1 is selected from the group consisting of phenyl, phenyl which has been substituted by a substituent selected from the group consisting of C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkanoyl, methylthio, methylsulphinyl, methylsulphonyl, halogen, $—CO_2R^2$ (where R^2 is a hydrogen atom or C_{1-4} alkyl or phenyl), $—NHCOR^2$ (where R^2 is selected from the group consisting of a hydrogen atom or C_{1-4} alkyl or phenyl, or a phenyl group substituted by a substituent selected from the group consisting of hydroxyl, $CH_3CONH—$ or



$—CONR^3R^4$ (where R^3 and R^4 may be the same or different and are each a hydrogen atom or C_{1-4} alkyl group), $—NHCONH_2$, $—CH_2CH(CONH_2)NHCOCH_3$, or



2-naphthyl;



where R^5, R^6 and R^7 is each a hydrogen atom or a methyl group and at least one is a hydrogen atom; and

Ar is selected from the group consisting of a phenyl group, a substituted phenyl group wherein said substituents are selected from the group consisting of one or two C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, C_{1-4} alkylsulphinyl, C_{1-4} alkylsulphonyl, halogen or trifluoromethyl groups, or a physiologically acceptacle salt thereof.

4,855,294

METHOD FOR REDUCING SKIN IRRITATION ASSOCIATED WITH DRUG/PENETRATION ENHANCER COMPOSITIONS

Dinesh C. Patel, Murray, and Charles D. Ebert, Salt Lake City, both of Utah, assignors to TheraTech, Inc., Salt Lake City, Utah

Filed Sep. 6, 1988, Ser. No. 240,688

Int. Cl.[4] A61K *31/55, 31/40, 31/16, 31/10, 31/045*

U.S. Cl. 514—212 **21 Claims**

1. A drug-enhancer composition for transdermally administering a drug having reduced skin irritation properties consisting essentially of (a) a percutaneously absorbable drug, (b) a mild to moderately irritating enhancer composition consisting of a solvent selected from the group consisting of a C_2 or C_3 alcohol, a C_3 or C_4 diol, DMSO, DMF, DMA, 1-n-dodecylcyclazacycloheptan-2-one, N-methyl-pyrrolidone and N-(2-hydroxyethyl)pyrrolidone and mixtures thereof and an effective enhancing amount of a cell envelope disordering compound and (c) an effective amount of glycerin to reduce the irritation of said drug-enhancer composition.

4,855,295

TETRAHYDRO-BETA-CARBOLINES, AND THEIR USE AS DRUGS

Helmut Biere, Berlin, Fed. Rep. of Germany; Mogens Engelstoft, Vaerlose, Denmark; Andreas Huth, Berlin, Fed. Rep. of Germany; Dieter Rahtz, Berlin, Fed. Rep. of Germany; Ralph Schmiechen, Berlin, Fed. Rep. of Germany; Dieter Seidelmann, Berlin, Fed. Rep. of Germany, and David N. Stephens, Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

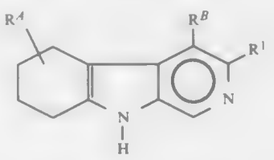
Filed Oct. 6, 1986, Ser. No. 915,357

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535928

Int. Cl.[4] A61K *31/38, 31/435;* **C07D** *471/04*

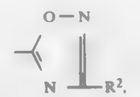
U.S. Cl. 514—232.8 **11 Claims**

1. A 5, 6, 7, 8-Tetrahydro-beta-carboline of the formula



(I)

wherein R^1 is an oxadiazolyl of the formula



$COOR^3$ or CON_4R^5,
R^2 is H, lower alkyl or C_{3-6}-cycloalkyl,
R^3 is H or lower alkyl,
R^4 and R^5 independently are H or lower alkyl, but R^4 and R^5 cannot be hydrogen at the same time, or R^4 and R^5 together with the connecting nitrogen atom form a piperidine, morpholine, pyrrolidine, thiomorpholine or piperazine group,
R^A is hydrogen, =O, C_{3-6}-cycloalkyl, $-COOR^3$, lower alkyl, or lower alkyl substituted by OH, halogen, lower alkoxy, phenyl, phenyloxy, or $-NR^4R^5$, and
R^B is hydrogen, lower alkyl or lower alkoxyalkyl.

9. A method of affecting the binding condition of ben-

zodiazepine receptors comprising administering a compound of claim 1.

4,855,296

BIOCIDAL COMPOSITIONS AND USE THEREOF

Deborah K. Donofrio, The Woodlands, and Wilson K. Whiteketle, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Sep. 12, 1988, Ser. No. 242,837
Int. Cl.[4] A01N *33/18, 43/50, 43/66*
U.S. Cl. 514—241 **11 Claims**

1. A bacterial inhibiting composition comprising a synergistic aqueous mixture of (a) 2-bromo-2-nitropropane-1, 3-diol (BNPD) and (b) bromochlorohydantoin (BCH) wherein the weight ratio of said BNPD to said BCH is from about 16:1 to 1:16.

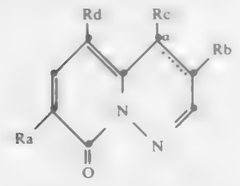
4,855,297

TRICYCLIC PYRIDONE DERIVATIVES

Ulf Fischer, Frenkendorf; Fernand Schneider, Basel, and Widmer Ulrich, Rheinfelden, all of Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed Dec. 4, 1986, Ser. No. 937,934
Claims priority, application Switzerland, Dec. 13, 1985, 5324/85; Oct. 1, 1986, 3922/86
Int. Cl.[4] A61k *31/495;* **C07D** *237/26*
U.S. Cl. 514—248 **50 Claims**

1. A compound of the formula



I

wherein Ra is selected from the group consisting of unsubstituted phenyl, pyridyl or thienyl or said groups substituted by halogen, trifluoromethyl, nitro, lower alkyl or lower alkoxy, Rb and Rc together with the carbon atom denoted by α are a group of the formula $>C_6—CH=CH—CH=CH—$ (c) which is unsubstituted or substituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro, amino or mono- or di(lower alkyl)amino and the dotted line is an additional bond, Rd is the group of the formula $—(A^1)_m—(CO)_n—(Q^1A^2)_q—R^1$, m, n and q each are the integer 0 or 1, A^1 is lower alkylene, A^2 is lower alkylene, a direct bond or the group —CO—, Q^1 is an oxygen atom or the group $—NR^2—$, R^1 is hydrogen, hydroxy, cyano, nitro, halogen, lower alkoxy, lower alkyl, lower alkoxycarbonyl, phenyl group which is unsubstituted or substituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro, amino or mono- or di(lower alkyl)amino, a group of the formula $—NR^3R^4$ or a 5-membered saturated, partially unsaturated or aromatic heterocycle which is attached via a carbon atom and contains as the hetero ring member(s) an oxygen or sulfur atom or an imino or lower alkylimino group and optionally one or two nitrogen atoms, and which is unsubstituted or substituted by one or two lower alkyl groups or substituted by a (C_{3-6})-cycloalkyl, hydroxy, lower alkoxy, lower alkanoyloxy, lower hydroxyalkyl, lower alkoxyalkyl, lower alkanoyloxyalkyl, lower alkoxycarbonyl, lower-alkanoyl, carbamoyl, mono- or di(lower alkyl)carbamoyl, oxo or alkylenedioxy group, R^2 is hydrogen, lower alkyl, or phenyl group which is unsubstituted or substituted by halogen, trifluoromethyl, lower alkyl, lower alkoxy, nitro, amino or mono- or di(lower alkyl)amino, R^3 and R^4 each is hydrogen, lower alkyl, lower alkoxyalkyl, lower dialkoxyalkyl, lower alkylenedioxyalkyl, lower cyanoalkyl, lower haloalkyl, lower hydroxyalkyl, lower dihydroxyalkyl, lower alkanoyl, lower alkoxycarbonyl or a (C_{3-7})-cycloalkyl group which is unsubstituted or substituted by hydroxy, lower alkoxy, lower alkanoyloxy, lower hydroxyalkyl, lower alkoxyalkyl, lower alkanoyloxyalkyl, oxo, carbamoyl, mono- or di(lower alkyl)carbamoyl or by lower alkylenedioxy or R^3 and R^4 together with the nitrogen atom are a saturated N-heterocycle selected from 4,4-$(C_{1-4}$alkylendioxy)-1-piperidinyl, or selected from the group consisting of unsubstituted 1-azetidinyl, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, 4-thiomorpholinyl or 4-R5-1-piperazinyl or substituted by one or two lower alkyl groups or one or two hydroxy, lower alkoxy, lower alkanoyloxy, lower hydroxyalkyl, lower alkoxyalkyl, lower alkanoyloxyalkyl, lower alkoxycarbonyl, lower alkanoyl, carbamoyl, mono- di(lower alkyl)-carbamoyl, oxo or lower groups, and R^5 is hydrogen, lower alkyl, lower hydroxyalkyl, lower alkoxyalkyl, lower alkanoyloxyalkyl, lower alkanoyl, lower alkoxycarbonyl, carbamoyl, or mono- or di(lower alkyl)carbamoyl, with the provision that n is the integer 0 when q is the integer 1 and A^2 is the group —CO—, that R^1 is other than cyano, nitro, halogen or lower alkoxycarbonyl, when q is the integer 0 and n is the integer 1 or when q is the integer 1 and A^2 is the group —CO—, that R^1 is other than hydroxy, cyano, nitro, halogen, lower alkoxycarbonyl, lower alkoxy and $—NR^3R^4$ when q is the integer 1 and A^2 is a direct bond, or a pharmaceutically acceptable acid addition salt of compound of formula I which has one or more basic substituents.

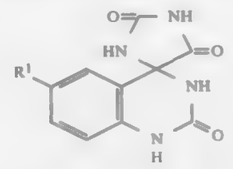
4,855,298

6-HALO-1,2,3,4-TETRAHYDROQUINAZOLINE-4-SPIRO-4-IMIDAZOLIDINE-2,2'5'-TRIONES USEFUL FOR THE TREATMENT AND PROPHYLAXIS OF DIABETIC COMPLICATIONS

Yoshihisa Yamada, Kyoto, and Yuzo Matsuoka, Toyonaka, both of Japan, assignors to Tanabe Seiyaku Co., Ltd., Japan

Filed Oct. 29, 1987, Ser. No. 114,569
Claims priority, application Japan, Nov. 21, 1986, 61-279421
The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.
Int. Cl.[4] A61K *31/505;* **C07D** *487/10*
U.S. Cl. 514—259 **7 Claims**

1. A quinazolinone compound of the formula:



wherein R^1 is a halogen atom, or a non-toxic pharmaceutically acceptable salt thereof.

4,855,299

COCCIDIOCIDAL COMPOSITIONS

Wolfgang Raether, Dreieich, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 9, 1987, Ser. No. 118,322
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1986, 3638446
Int. Cl.[4] A61K *31/35, 31/44, 31/47, 31/505*
U.S. Cl. 514—259 **13 Claims**

1. A coccidiocidal composition comprising monensin or its physiologically acceptable salt in combination with one of the following other ingredients or their respective salts in the ratio of monensin to other ingredients as indicated:

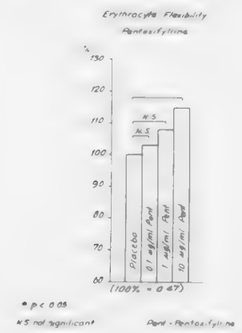
a. with methyl benzoquate in ratio between 10 to 20:1,
b. with halofuginone in a ratio between 33 to 67:1, or
c. with amprolium in a ratio between 1:1 to 2.

4,855,300

PHARMACEUTICAL COMPOSITION FOR THE TREATMENT OF CIRCULATORY DISTURBANCES

Kumaresh Nandi, Laupheim; Helga Fischer, Oberdischingen; Wilfried Herrmann, Laupheim; Hans Köhne, Obersulmetingen; Wolfgang Lahr, Laupheim; Hein U. Schmersahl, Ehingen, and Hatto Walch, Baustetten, all of Fed. Rep. of Germany, assignors to Dr. Rentschler Arzneimittel GmbH & Co., Laupheim, Fed. Rep. of Germany

Filed Feb. 4, 1987, Ser. No. 10,782
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1986, 3604149
Int. Cl.[4] A61K *31/44, 31/52*
U.S. Cl. 514—264 **7 Claims**



1. A pharmaceutical composition comprising:

(a) as active substance (A), Nifedipine having a calcium antagonistic effect; and (b) as active substance (B), Pentoxifylline, the quantity ratios of the active substances (A) and (B) being from about 1.10 to about 1:5.

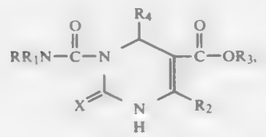
4,855,301

1,2,3,4-TETRAHYDRO-6-SUBSTITUTED-4-ARYL(OR HETEROCYCLO)-3-((SUBSTITUTED AMINO)CARBONYL)-2-THIOXO (OR OXO)-5-PYRIMIDINECARBOXYLIC ACIDS AND ESTERS

Karnail Atwal, Cranbury, and George C. Rovnyak, Hopewell, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 917,349, Oct. 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 839,767, Mar. 14, 1986, abandoned. This application Feb. 9, 1987, Ser. No. 8,037
Int. Cl.[4] A61K *31/505;* **C07D** *239/36, 401/06, 403/06*
U.S. Cl. 514—269 **26 Claims**

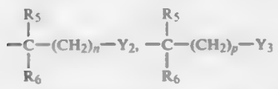
23. A method of treating a disease susceptible to treatment by a calcium entry blocking vasodilator in a mammalian host in need thereof, which comprises administering to said host a compound having the formula



or a pharmaceutically acceptable salt thereof in an amount which is effective for the treatment of a disease susceptible to treatment by a calcium entry blocking vasodilator, wherein

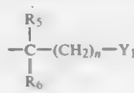
X is oxygen or sulfur;

R is hydrogen, alkyl, cycloalkyl, aryl, or arylalkyl and R_1 is hydrogen, alkyl, cycloalkyl, aryl,



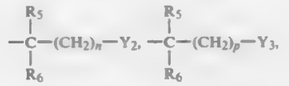
or halo substituted alkyl, or R and R_1 taken together with the nitrogen atom to which they are attached are 1-pyrrolidinyl, 1-piperidinyl, 1-azepinyl, 4-morpholinyl, 4-thiamorpholinyl, 1-piperazinyl, 4-alkyl-1-piperazinyl, 4-arylalkyl-1-piperazinyl, 4-diarylalkyl-1-piperazinyl or 1-pyrrolidinyl, 1-piperidinyl, or 1-azepinyl substituted with alkyl, alkoxy, alkylthio, halo, trifluoromethyl or hydroxy;

R_2 is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl,



or halo substituted alkyl;

R_3 is hydrogen, alkyl, cycloalkyl, aryl,

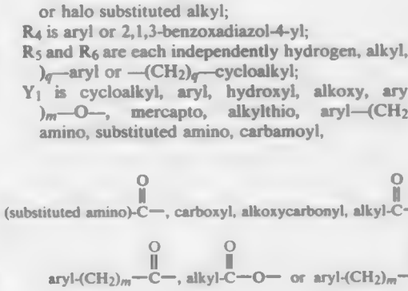


or halo substituted alkyl;

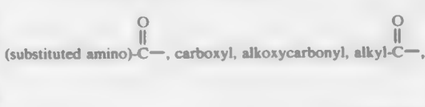
R_4 is aryl or 2,1,3-benzoxadiazol-4-yl;

R_5 and R_6 are each independently hydrogen, alkyl, $—(CH_2)_q—$aryl or $—(CH_2)_q—$cycloalkyl;

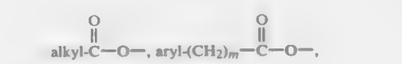
Y_1 is cycloalkyl, aryl, hydroxyl, alkoxy, aryl$—(CH_2)_m—O—$, mercapto, alkylthio, aryl$—(CH_2)_m—S—$, amino, substituted amino, carbamoyl,



Y_2 is cycloalkyl, aryl, carbamoyl,



Y_3 is hydroxyl, alkoxy, aryl$—(CH_2)_m—O—$, mercapto, alkylthio, aryl$—(CH_2)_m—S—$,



amino, or substituted amino;

q is 0, 1, 2 or 3;

m is 0 or an integer of 1 to 6;

n is 0 or an integer of 1 to 5; and

p is an integer of 1 to 5; wherein

the term "cycloalkyl" refers to a cycloalkyl group having 3,4,5,6 or 7 carbon atoms;

the term "aryl" refers to phenyl or phenyl substituted with

one, two or three alkyl, alkoxy, alkylthio, halo, nitro, cyano, hydroxy, amino, alkylamino, dialkylamino, trifluoromethyl, isothiocyanato, isocyanato, or difluoromethoxy groups;

the term "substituted amino" refers to a group of the formula —NZ_1Z_2 wherein Z_1 is hydrogen, alkyl, or aryl—$(CH_2)_m$— and Z_2 is alkyl or aryl—$(CH_2)_m$—.

4,855,302

CERTAIN AZASPIRODECANE COMPOUNDS AND A METHOD OF INDUCING AN ANXIOLYTIC ACTIVITY

Jean-Claude Gasc, Bondy; Lucien Nedelec, Le Raincy; Daniel Humbert, Fontenay-Sous-Bois, and Ana-Maria Boaventura, Courbevoie, all of France, assignors to Roussel Uclaf, Paris, France

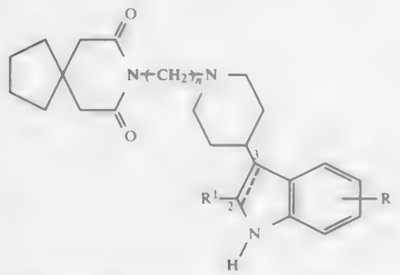
Filed Dec. 10, 1987, Ser. No. 131,186

Claims priority, application France, Dec. 11, 1986, 86 17333

Int. Cl.[4] C07D *221/20*; A61K *31/45, 31/445*

U.S. Cl. 514—278 **12 Claims**

1. A compound selected from the group consisting of azaspirodecane derivatives of the formula



I

wherein R is selected from the group consisting of hydrogen, fluorine, chlorine, bromine, alkoxy of 1 to 3 carbon atoms, $—NO_2$, $—NH_2$ and CH_3S— in the 4,5 or 6 position of the ring, R′ is oxo or hydrogen or —OH or alkyl of 1 to 3 carbon atoms and the dotted line indicates a carbon-carbon bond in the 2,3-position, n is 2,3,4 or 5 and the dotted line in the piperidyl ring is an optional carbon-carbon bond and their non-toxic, pharmaceutically acceptable acid addition salts.

4,855,303

FLUORINE CONTAINING RENIN INHIBITORS

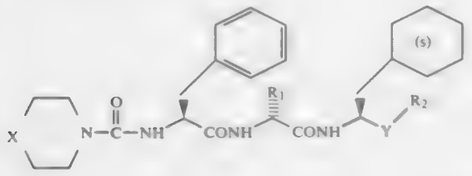
Dennis J. Hoover, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 68,989, Jul. 1, 1987. This application Jun. 10, 1988, Ser. No. 206,079

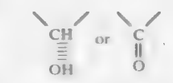
Int. Cl.[4] A61K *37/43*; C07K *5/05*

U.S. Cl. 514—18 **13 Claims**

1. A compound of the formula



and a pharmaceutically acceptable salt thereof wherein X is O or NH; R_1 is alkyl having one to six carbon atoms, imidazol-4-ylmethyl or methylthiomethyl; Y is



and R_2 is $CF_2CONHCH_3$, CF_3 or



4,855,304

DINUCLEOSIDE PYROPHOSPHATES AND PYROPHOSPHATE HOMOLOGS AS PLANT ANTIVIRALS

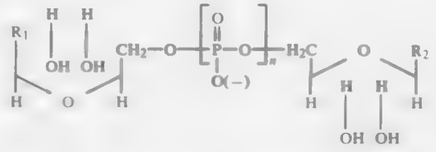
Yair Devash, Winchester, Mass., assignor to Repligen Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 690,929, Jan. 10, 1985, abandoned. This application Oct. 10, 1985, Ser. No. 786,260

Int. Cl.[4] A61K *31/70, 31/665*

U.S. Cl. 514—47 **4 Claims**

1. A method, for inhibiting plant virus replication in a susceptible plant which comprises treating said plant with an effective plant antivirus replication amount of a 5′,5′-dinucleotide of the formula



wherein R_1 and R_2 are purines or pyrimidines, or their analogs, and n is an integer of 2 to 3.

3. A method for inhibiting plant virus replication in a susceptible plant which comprises treating said plant with an effective plant anti-virus replication amount of a 2′,5′-dinucleotide selected from the group consisting of adenosine 2′,5′-diphospho-adenosine (A2′pp5′A), adenosine 2′,5′-diphospho-guanosine (A2′pp5′G), adenosine 2′,5′-diphospho-uridine (A2′pp5′U), adenosine 2′,5′-diphospho-cytidine (A2′pp5′C) and adenosine 2′,5′-diphospho-thymidine (A2′pp5′T).

4,855,305

COMPOSITIONS AND METHODS OF EFFECTING CONTRACEPTION UTILIZING MELATONIN

Michael Cohen, Wassenaar, Netherlands, assignor to Applied Medical Research, Washington, D.C.

Filed Mar. 23, 1987, Ser. No. 29,229

Int. Cl.[4] A61K *31/56, 31/40, 31/405*

U.S. Cl. 514—171 **36 Claims**

1. A method of effecting contraception which comprises the administration, on a cyclic schedule, of melatonin in a series of daily doses to a human female of childbearing years at lode levels sufficient to prevent ovulation.

4,855,306

USES OF DOPAMINE RECEPTOR AGONISTS

Rudolf Markstein, Rheinfelden, Fed. Rep. of Germany, and Jose Palacios, Basel, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Apr. 7, 1988, Ser. No. 178,668

Claims priority, application United Kingdom, Apr. 10, 1987, 8708626; Apr. 14, 1987, 8708898; Apr. 28, 1987, 8710062; Aug. 28, 1987, 8720366

Int. Cl.[4] A61K *31/00*

U.S. Cl. 514—280 **7 Claims**

1. A method of treating primary degenerative dementia which comprises administering to a subject in need of said treatment a selective dopamine D1 receptor agonist in an amount effective for treating primary degenerative dementia.

4,855,307

ACETIC ACID ESTER OF HALOPERIDOL

Jens K. Perregaard, Olstykke, Denmark, assignor to H. Lundbeck A/S, Copenhagen, Denmark

Filed Sep. 4, 1987, Ser. No. 93,404

Claims priority, application United Kingdom, Sep. 11, 1986, 8621892

Int. Cl.[4] A61K *31/435*; C07D *211/52*

U.S. Cl. 514—327 **8 Claims**

1. The acetic acid ester of 4-(4-(4-chlorophenyl)-4-hydroxy-1-piperidinyl)-1-(4-fluorophenyl)-butanone, or a pharmaceutically-acceptable acid addition salt thereof.

4,855,308

METHOD OF TREATING SENILE COGNITIVE DECLINE WITH N′-SUBSTITUTED AMINOPYRIDINE ADRENERGIC AGENTS

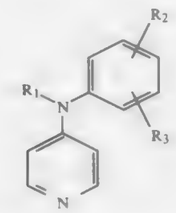
Jeffrey A. Kester; Walter H. Moos, and Anthony J. Thomas, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 4, 1987, Ser. No. 128,831

Int. Cl.[4] C07D *213/61*; A61K *31/44*

U.S. Cl. 514—332 **35 Claims**

1. A method of treating the symptoms of cognitive decline in an elderly patient comprising adminstering to a patient in need of such treatment an effective amount of a compound having the formula



wherein R_1 is selected from hydrogen;

alkyl of from one to six carbon atoms;

alkanoyl of from two to six carbon atoms; benzolyl;

—COOH;

—COO—alkyl wherein alkyl contains from one to six carbon atoms;

2-, 3-, or 4-pyridinyl;

phenyl;

phenyl substituted with fluorine, chorine, hydroxy,

alkyl of from one to four carbon atoms, or

alkoxy of from one to four carbon atoms; or phenylmethyl;

R_2 and R_3 are independently hydrogen;

alkyl of from one to six carbon atoms;

alkanoyl of from two to six carbon atoms;

carboxyl;

carboxyalkyl in which alkyl contains from one to six carbon atoms;

halogen;

hydroxy;

cyano;

trifluoromethyl;

nitro;

$—SO_3H$;

amino;

alkylamino or dialkylamino in which alkyl contains from one to four carbon atoms; or a pharmaceutically acceptable salt thereof.

4,855,309

PYRIDINE DERIVATIVES, AGENTS CONTAINING SAME, AND THE USE THEREOF AS PESTICIDES

Volker Koch, Kelkheim; Andreas Fuss, Karlstein; Werner Bonin, Kelkheim; Werner Knauf, Eppstein/Taunus, and Anna Waltersdorfer, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

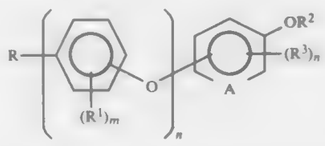
Filed Dec. 19, 1986, Ser. No. 944,323

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545569

Int. Cl.[4] A01N *43/10*; C07D *213/65*

U.S. Cl. 514—346 **7 Claims**

1. A compound of formula I

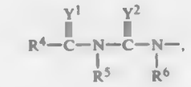


(I)

or an agriculturally acceptable salt thereof in which

A is N or N→O,

R is a radical of formula



R^1, in each case independently of one another, is halogen or is $(C_1–C_6)$-alkyl, $(C_2–C_6)$-alkenyl, $(C_2–C_6)$-alkynyl, $(C_1–C_6)$-alkoxy, $(C_1–C_6)$-alkoxycarbonyl or $(C_1–C_6$-alkyl)-carbonyl which are unsubstituted or mono- or polysubstituted by halogen, or is nitro, cyano or carboxyl,

R^2 is halogenated $(C_1–C_6)$-alkyl, halogenated $(C_2–C_6)$-alkenyl or halogenated $(C_2–C_6)$-alkynyl,

R^3, in each case independently of one another, is halogen,

R^4 is phenyl which is unsubstituted or substituted by halogen, $(C_1–C_3)$-alkyl, $(C_1–C_3)$-alkoxy, halo$(C_1–C_3)$-alkyl or halo$(C_1–C_3)$-alkoxy,

R^5 is hydrogen, $(C_1–C_6)$-alkoxy, $(C_1–C_6)$-alkylthio, benzyl, halogenated $(C_1–C_6)$-alkoxy, halogenated $(C_1–C_6)$-alkylthio or halogenated benzyl,

R^6 is hydrogen or is $(C_1–C_6)$-alkyl, $(C_1–C_6)$-alkylthio or $(C_1–C_6)$-alkylsulfonyl which all are unhalogenated or is phenylthio or phenylsulfonyl which is substituted by $(C_1–C_6)$-alkyl, $(C_1–C_6)$-alkoxy, $(C_1–C_6)$-alkoxycarbonyl, halogenated $(C_1–C_6)$-alkyl, halogenated $(C_1–C_6)$-alkoxy, halogenated $(C_1–C_4)$-alkoxycarbonyl, halogen, nitro or cyano, or is phosphoryl or thiophosphoryl which are both substituted by two radicals selected from the group consisting of $(C_1–C_6)$-alkoxy, $(C_1–C_6)$-alkylthio, amino, $(C_1–C_6)$-alkylamino or di-$(C_1–C_6$-alkyl)-amino,

Y^1 and Y^2, are the same or different and each is O or S,

n, in each case independently of one another, is 0, 1 or 2, and

m is 0, 1, 2 or 3.

7. A process for combating noxious insects, acarides, nematodes and mollusks which comprises applying an effective amount of a compound of formula I as claimed in claim 1 to these pests or to plants infested by same.

4,855,310

THIADIAZOLE COMPOUNDS AS ANTAGONISTS OF SRS-A

Kiyoshi Murase, Saitama; Toshiyasu Mase, Chiba; Hiromu Hara, and Kenichi Tomioka, both of Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

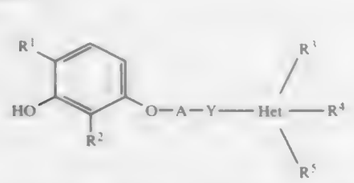
Continuation-in-part of Ser. No. 796,628, Aug. 11, 1985, abandoned. This application Mar. 25, 1988, Ser. No. 173,734

Claims priority, application Japan, Nov. 12, 1984, 59-238991; Oct. 1, 1985, 60-219327

Int. Cl.⁴ C07D *285/12;* **A61K** *31/41*

U.S. Cl. 514—361 **18 Claims**

1. A heterocyclic compound represented by the following formula (I)



(I)

or a salt thereof; wherein R^1 represents a lower alkanoyl group; R^2 represents a lower alkyl group; A represents a lower alkylene group which may be substituted by a hydroxy group; Y represents an oxygen atom, a sulfur atom, a carbonylimino group, or an iminocarbonyl group;

Het represents a 1,3,4-thiadiazole ring, or a a 1,2,4-thiadiazole ring,

R^3, R^4 and R^5, which may be the same or different, each represents a hydrogen atom, a lower alkyl group, a group shown by the formula $—A^1—R^6$ (wherein A^1 represents a lower alkylene group and R^6 represents a hydroxy group, a mercapto group, a carboxy group or a lower alkoxycarbonyl group), a hydroxy group, a mercapto group, a lower alkoxy group, a lower alkylthio group, a group shown by the formula $—Y^1—A^2—R^7$ (wherein Y^1 represents an oxygen atom or a sulfur atom; A^2 represents a lower alkylene group, and R^7 represents a carboxy group, a lower alkoxycarbonyl group, a hydroxyaminocarbonyl group, a mono- or di-lower alkylaminocarbonyl group or an N-lower alkyl-hydroxyaminocarbonyl group), an oxo group, a thioxo group, an amino group, a group shown by the formula $—NH—R^8$ (wherein R^8 represents a carboxy lower alkyl group or a lower alkoxycarbonyl lower alkyl group), a group shown by the formula $—NH—CO—R^9$ (wherein R^9 represents a carboxy-lower alkyl group, a lower alkoxycarbonyl lower alkyl group, a carboxy group or a lower alkoxycarbonyl group), a carboxy group or a group shown by the formula $—CO—R^{10}$ (wherein R^{10} represents a lower alkoxy group).

4,855,311

BENZOISOTHIAZOLE OXIMES WHICH ARE PLANT PROTECTION AGENTS FOR CONTROL OF FUNGI AND BACTERIA

Shinobu Iriuchijima; Hirohiko Kobayashi, both of Yamato; Takahito Masuda, Machida; Shunnosuke Watanabe, Higashikurume, and Hiroshi Tabata, Tokyo, all of Japan, assignors to Agro-Kanesho Co., Ltd. and Denki Kaguku Koygo Kabushiki Kaisha, both of Tokyo, Japan

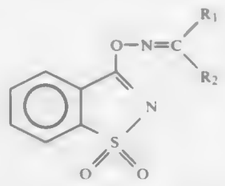
Filed Apr. 19, 1988, Ser. No. 183,617

Claims priority, application Japan, Apr. 24, 1987, 62-101513

Int. Cl.⁴ A01N *43/80;* **C07D** *275/06*

U.S. Cl. 514—373 **31 Claims**

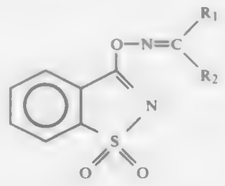
1. A benzoisothiazole oxime represented by the following formula (I):



(I)

wherein R^1 is a C_{1-6} alkyl group, and R_2 is a C_{2-4} alkenyl, methoxymethyl, ethoxymethyl 2-methoxyethyl, methoxycarbonyl or ethoxycarbonyl.

19. A method of prevention of rice blast, comprising applying an effective amount to a rice seeding or to soil in which it grows of at least one benzoisothiazole oxime represented by the following formula (I):



(I)

wherein R_1 is a C_{1-6} alkyl group, and R_2 is a C_{1-6} alkyl, a C_{2-4} alkenyl, methoxymethyl, ethoxymethyl, 2-methoxymethyl, methoxycarbonyl, or ethoxycarbonyl, or R_1 and R_2 together form a cyclopentylidene or cyclohexylidene radical together with the C to which they are attached.

4,855,312

BIOCIDAL DIALKYL (3,5-SUBSTITUTED HYDROXYALKYL OXAZOLIDINES AND HYDROCARBYLENE POLYOXYMETHYLENE OXAZOLIDINES

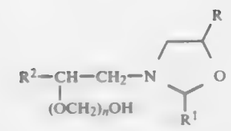
Kamlesh Gaglani, Passaic, and Albert L. Eilender, Montville, both of N.J., assignors to Cosan Chemical Corporation, Carlstadt, N.J.

Continuation of Ser. No. 945,248, Dec. 19, 1986, abandoned, which is a continuation of Ser. No. 744,589, Jun. 14, 1985, abandoned, which is a continuation of Ser. No. 304,809, Sep. 23, 1981, abandoned. This application Mar. 1, 1988, Ser. No. 166,723

Int. Cl.⁴ C07D *263/06;* **A01N** *43/76*

U.S. Cl. 514—374 **14 Claims**

1. A method for inhibiting bacterial growth in aqueous surface coating compositions which comprises treating the composition with a bactericidally effective amount of a polyoxymethyleneoxazolidine having a structural formula:



wherein R is an alkyl group of 1 to 6 carbon atoms, a cycloalkyl group of 3 to 8 carbon atoms or an aryl group of 6 to 10 carbon atoms; R^1 represents a hydrogen, an alkyl group of 1 to 6 carbon atoms, a cycloalkyl group of 3 to 8 carbon atoms, an aryl group of 6 to 10 carbon atoms, a substituted aryl group of 6 to 10 carbon atoms having alkyl, halogen, alkoxy, or nitro substituents; R^2 represents an alkyl group of 1 to 6 carbon atoms, a cycloalkyl group of 3 to 8 carbon atoms, or an aryl group of 6 to 10 carbon atoms; and n represents an integer in the range of 1 to 8.

4,855,313

METHOD OF STIMULATING CASHMERE GROWTH ON CASHMERE-PRODUCING GOATS USING MELATONIN

Robert A. S. Welch, 19 Washington Ave., Wellington, and Keith Betteridge, 72 Pahiatua St., Palmerston, both of New Zealand

Continuation of Ser. No. 36,397, Apr. 9, 1987, abandoned. This application Nov. 15, 1988, Ser. No. 273,185

Claims priority, application New Zealand, Apr. 9, 1986, 215767

Int. Cl.⁴ A61K *31/40;* **A01K** *6/00*

U.S. Cl. 514—415 **19 Claims**

1. A method for stimulating the growth of cashmere fibre on cashmere-producing goats, which method comprises administering melatonin in a sustained release delivery system to the goats.

4,855,314

INDOLE DERIVATIVES

Alexander W. Oxford, Royston; Ian H. Coates, Hertfordshire; David E. Bays, Ware; Colin F. Webb, Royston; Michael D. Dowle, Ware; Keith Mills, Ware, and Colin D. Eldred, Ware, all of England, assignors to Glaxo Group Limited, London, England

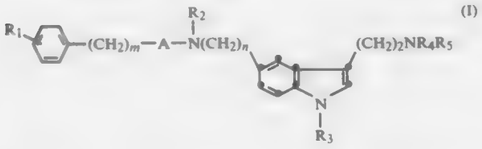
Filed Jan. 8, 1987, Ser. No. 1,469

Claims priority, application United Kingdom, Jan. 8, 1986, 8600397

Int. Cl.⁴ A61K *31/40;* **C07D** *211/26, 211/28*

U.S. Cl. 514—415 **10 Claims**

1. Compounds of the formula (I):



(I)

wherein

R_1 is a $H_2NCOCH_2—$, $CH_3NHCOCH_2—$, $(CH_3)_2NCOCH_2—$, $CH_3CONH—$, $CH_3CONHCH_2—$, $H_2NSO_2—$, $CH_3SO_2NH—$ or $CH_3SO_2NHCH_2$-group;

R_2 represents a hydrogen atom or a C_{1-3}alkyl group;

R_3 represents a hydrogen atom or a C_{1-3}alkyl group;

R_4 and R_5 which may be the same or different each represents a hydrogen atom, a C_{1-3}alkyl group or a 2-propenyl group;

A represents —CO— or $SO_2—$;

n represents an integer from 2 to 5; and m represents zero or an integer from 1 to 4; and physiologically acceptable salts and solvates thereof.

3. A pharmaceutical composition which comprises at least one compound of formula (I) as defined in claim 1 or a physiologically acceptable salt or solvate thereof together with one or more physiologically acceptable carriers or excipients.

4,855,315

USE OF ZOFENOPRIL FOR THE TREATMENT OF RHEUMATOID ARTHRITIS

Richard G. Devlin, Sea Girt, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 2, 1988, Ser. No. 240,015

Int. Cl.⁴ A61K *31/40*

U.S. Cl. 514—422 **2 Claims**

1. A method of treating rheumatoid arthritis in a person in need thereof, which comprises administering to said person an effective amount of zofenopril or a pharmaceutically acceptable salt thereof.

4,855,316

1,2-DIAMINO-4,5-DIMETHOXYCYCLOHEXYL AMIDE ANALGESIC COMPOUNDS

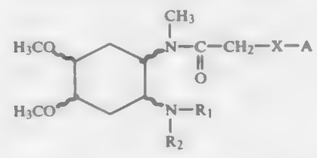
David C. Horwell, Foxton, England, and Stephen J. Johnson, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 18, 1988, Ser. No. 161,563

Int. Cl.⁴ A61K *31/40;* **C07D** *295/08, 295/10*

U.S. Cl. 514—422 **16 Claims**

1. A compound having structural Formula I



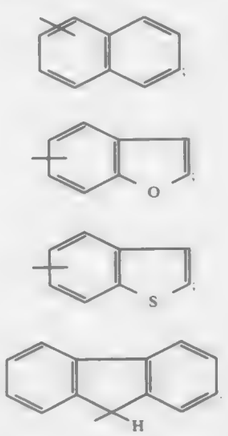
I

wherein the methoxy groups attached to the cyclohexane moiety are cis to one another and the two nitrogen atoms attached to the cyclohexane moiety are trans to one another;

X is a direct bond, or is —O— or —S—;

R_1 and R_2, together with the nitrogen atom to which they are attached form a pyrrolidinyl ring

A is selected from



phenyl;

phenyl substituted with from one to four halogen atoms;

phenyl substituted with one or two alkyl groups of from one to four carbon atoms;

phenyl substituted with one or two alkoxy groups of from one to four carbon atoms; or

phenyl substituted with one or two alkyl groups of from one to four carbon atoms and one or two halogen atoms; or

a pharmaceutically acceptable acid addition salt thereof.

16. A method for treating pain in mammal comprising administering to a mammal in need of such treatment an analgesically effective amount of a compound as defined by claim 1.

4,855,317

INSECTICIDES AND PARASITICIDES

Jean-Claude Gehret, Aesch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

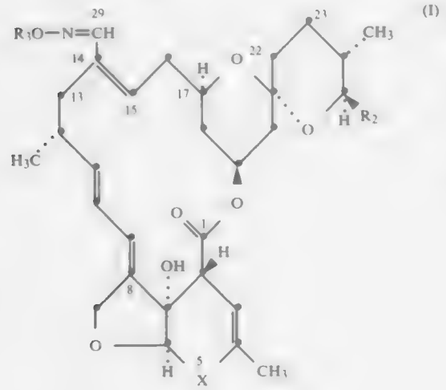
Filed Feb. 25, 1988, Ser. No. 160,237

Claims priority, application Switzerland, Mar. 6, 1987, 847/87

Int. Cl.⁴ A61K *31/365;* **C07D** *493/22*

U.S. Cl. 514—450 **14 Claims**

1. A compound of formula I

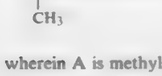


(I)

wherein

X is a group selected from —CH(OR$_1$)—,

R$_2$ is methyl, ethyl, isopropyl, sec-butyl or the

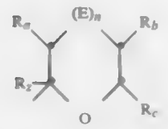


—C≡CH—A group,

CH$_3$

wherein A is methyl, ethyl or isopropyl; and

R$_3$ is hydrogen, C$_1$–C$_6$alkyl, C$_2$–C$_6$alkenyl, a radial selected from the group consisting of phenyl and benzyl which is unsubstituted or substituted by one or more members selected from the group consisting of halogen, C$_1$–C$_3$alkyl, C$_1$–C$_3$alkoxy, C$_1$–C$_3$alkylthio, C$_1$–C$_3$haloalkyl, nitro or cyano, or is the group U



(U)

wherein n is 0, 1, 2, 3, 4 or 5, E is oxygen or —CH(R$_d$)— and R$_z$ is hydrogen, R$_a$ is hydrogen, halogen, C$_1$–C$_3$alkyl, C$_1$–C$_3$alkoxy or 2-tetrahydropyranyl, and R$_b$, R$_c$ and R$_d$ are each independently hydrogen, halogen, C$_1$–C$_3$alkyl or C$_1$–C$_3$alkoxy, which group U may also be in unsaturated form.

4,855,318

IODOPROPARGYL ETHERS USEFUL AS ANTIMICROBIAL AGENTS

Gerold Schade, Cologne; Wilfried Paulus, Krefeld, and Hans-Georg Schmitt, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

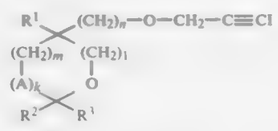
Division of Ser. No. 834,287, Feb. 27, 1986, Pat. No. 4,719,227. This application Jun. 26, 1987, Ser. No. 67,674

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1985, 3510203

Int. Cl.⁴ A01N *43/08;* **C07D** *317/16, 317/34, 307/12*

U.S. Cl. 514—467 **16 Claims**

1. An iodopropargyl ether of the formula



wherein,

A is a methylene group or oxygen,

R^1 denotes hydrogen or lower alkyl,

R^2 and R^3 are identical or different and represent hydrogen, lower alkyl, alkenyl or unsubstituted or halogen-substituted phenyl, or together form a carbocylic ring with 5 to 6 carbon atoms,

k is one, m is one or zero, l is one or zero, and

n is zero to four, with the proviso that the sum of m and l is one.

4,855,319

CONTROL OF PESTS WITH ANNONACEOUS ACETOGENINS

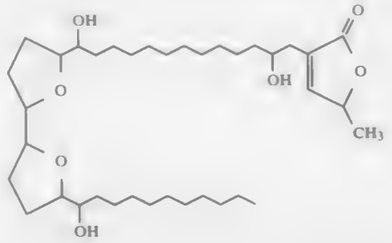
Kenneth L. Mikolajczak, Dunlap, Ill.; Jerry L. McLaughlin, West Lafayette, Ind., and James K. Rupprecht, Midland, Mich., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 860,351, May 6, 1986, Pat. No. 4,721,727. This application Oct. 6, 1987, Ser. No. 104,898

Int. Cl.⁴ A01N *43/08;* **C07D** *307/12*

U.S. Cl. 514—473 **4 Claims**

1. The substantially pure compound, asimicin, characterized by the structural formula:



4,855,320

5-ARYLALKYL-4-ALKOXY-2(5H)-FURANONES, INTERMEDIATES AND PROCESSES FOR THE PREPARATION THEREOF AND MEDICAMENTS CONTAINING THEM

Shyam S. Chatterjee, Karlsruhe, and Klaus Klessing, Ettlingen, both of Fed. Rep. of Germany, assignors to Dr. Willmar Schwabe GmbH & Company, Karlsruhe, Fed. Rep. of Germany

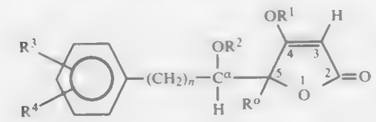
Filed May 4, 1987, Ser. No. 46,586

Claims priority, application Fed. Rep. of Germany, May 5, 1986, 3615157

Int. Cl.⁴ A61K *31/34;* **C07D** *307/32*

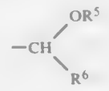
U.S. Cl. 514—473 **17 Claims**

1. 5-Arylalkyl-4-alkoxy-2(5H)-furanones of the formula:



(I)

wherein the oxygen atoms on C-5 and C-α, relative to one another, are in the threo-position and wherein n is 0, 1 or 2, R^0 is a hydrogen atom or an alkyl radical containing up to 3 carbon atoms, R^1 a straight-chained or branched alkyl radical containing up to 5 carbon atoms, R^2 is a hydrogen atom, an alkyl radical containing up to 3 carbon atoms or the radical



wherein R^5 is an alkyl radical containing up to 5 carbon atoms or an ethoxyethyl or methoxyethyl radical and R^6 is a hydrogen atom, an alkyl radical containing up to 5 carbon atoms or a methoxymethyl radical, R^3 and R^4, independently of one another, are hydrogen, fluorine, chlorine or bromine atoms, alkyl radicals containing up to 3 carbon atoms, perfluoroalkyl radicals containing up to 3 carbon atoms, a difluoromethoxy radical or a nitro group, with the exclusion of those compounds of formula (I) wherein R^2 is H or CH$_3$ when n=0 or 2, R^0=H, R^1=CH$_3$, R^3=H and R^4=H.

17. A pharmaceutical composition containing at least one compound of the formula I as claimed in claim 1, with the exclusion of those compounds of said formula I wherein R^2 is H or CH$_3$ when n=0 or 2, R^0=H, R^1=CH$_3$, R^3=H and R^4=H, and a pharmacologically inert excipient.

4,855,321

ANTIHYPERCHOLESTEROLEMIC COMPOUNDS

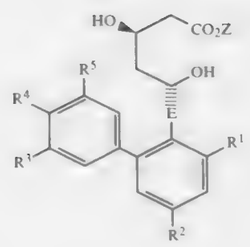
Robert L. Smith, Lansdale, and Gerald E. Stokker, Gwynedd Valley, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 824,900, Jan. 31, 1986, Pat. No. 4,772,626. This application Jul. 18, 1988, Ser. No. 220,854

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 514—532 **15 Claims**

1. A compound represented by the following formula (II):



(II)

wherein

E is —CH$_2$CH$_2$— or —CH=CH—;

R^1 and R^2 independently are methyl or hydroxymethyl;

R^3 and R^5 independently are hydrogen, methyl, hydroxymethyl, or C$_{1-8}$ alkanoyloxymethyl; and R^4 is fluoro or hydrogen; with the proviso that at least one of R^1, R^2, R^3 or R^5 is selected from hydroxymethyl or C$_{1-8}$ alkanoyloxymethyl; Z is hydrogen, methyl or a pharmaceutically acceptable salt.

4,855,322

OXYGENATED ALKYL SUBSTITUTED BICYCLO ALKANES

Walter J. Kasha, Los Angeles, and Chantal S. Burnison, Beverly Hills, both of Calif., assignors to CBD Corporation, Los Angeles, Calif.

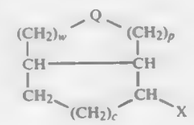
Division of Ser. No. 838,760, Mar. 12, 1986, Pat. No. 4,689,345, which is a continuation-in-part of Ser. No. 795,527, Nov. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 567,172, Dec. 30, 1983, abandoned, which is a continuation-in-part of Ser. No. 550,290, Nov. 8, 1983, abandoned, which is a continuation-in-part of Ser. No. 375,755, May 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 560,310, Oct. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 492,060, May 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 546,299, Oct. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 492,059, May 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 549,306, Oct. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 492,058, May 6, 1983, abandoned. This application Jun. 1, 1987, Ser. No. 56,467

The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.

Int. Cl.⁴ A61K *31/12, 31/22*

U.S. Cl. 514—546 **12 Claims**

1. A compound of the formula



(I)

wherein Q is CO, CH(OR), or CR(OH);

R is H or C$^{1-2}$-alkyl;

X is hydroxy-C$^{2-9}$-alkyl,

methoxy-C$^{2-9}$-alkyl,

ethoxy-C$^{2-9}$-alkyl, oxo-C$^{2-9}$-alkyl,

formyl-C$^{2-9}$-alkyl, carboxy-C$^{2-9}$-alkyl or

(C$^{1-2}$-alkyl)oxycarbonyl-C$^{2-9}$-alkyl;

c is 1 or 2;

p and w are 0, 1 or 2 and the sum of p and w is 1 to 4;

or a pharmaceutically acceptable salt thereof.

4,855,323

LEUKOTRIENE ANTAGONISTS, A PROCESS FOR THE PREPARATION THEREOF, AND THE USE THEREOF FOR THE TREATMENT OF DISEASES

Günther Wess, Erlensee; Wilhelm Bartmann, Bad Soden am Taunus; Gerhard Beck, Frankfurt am Main, and Hiristo Anagnostopulos, Taunusstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

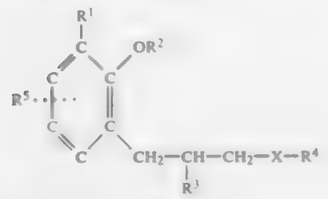
Filed Jul. 22, 1988, Ser. No. 223,129

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724669

Int. Cl.[4] A61K *31/215;* C07C *149/273*

U.S. Cl. 514—550 14 Claims

1. A compound of the formula I:



(I)

wherein the radicals have the following meaning:

X is O, S, SO OR SO_2;

R^1 is H, straight-chain or branched C_1–C_{12}-alkyl, C_2–C_{12}-alkenyl or C_2–C_{12}-alkynyl, or is C_3–C_8-cycloalkyl, C_3–C_8-cycloalkenyl, halogen, phenoxy, CF_3, NO_2, OH, OR^6, COOH, $COOR^6$, CHO or COR^7;

R^2 is H, straight-chain or branched C_1–C_{12}-alkyl, C_2–C_{12}-alkenyl or C_2–C_{12}-alkynyl, or is C_3–C_8-cycloalkyl, C_3–C_8-cycloalkenyl, phenyl-C_1–C_{10}-alkyl, phenoxy-C_1–C_{10}-alkyl, phenyl-C_2–C_{10}-alkenyl or phenyl-C_2–C_{10}-alkynyl, it being possible for the phenyl rings also to be substituted by 1–3 C_1–C_4-alkyl, C_2–C_4-alkenyl, C_1–C_4-alkoxy, C_1–C_4-alkanoyl, C_1–C_4-alkoxycarbonyl, hydroxyl or halogen radicals;

R^3 is OH, OR^6 or $OCOR^7$;

R^4 is a group of the formula $(CH_2)_nCOR^8$;

R^5 is H, halogen, CF_3, OH, C_1–C_4-alkyl or C_1–C_4-alkoxy;

R^6 is C_1–C_4-alkyl, allyl or benzyl;

R^7 is C_1–C_4-alkyl or phenyl;

R^8 is OH, C_1–C_4-alkoxy, OCH_2CO_2H, $OCH_2CO_2R^7$, OCH_2Ph, NHOH, NH_2, NHR^7, $NR^7{}_2$, phenoxy or phenoxy substituted by carboxyl, C_1–C_4-alkoxy-carbonyl, OH or OCH_3; and

n is 0, 1, 2 or 3;

as well as pharmaceutically acceptable salts of a compound of the formula I in which one of the radicals contains a carboxyl group.

4,855,324

FURYL, PHENYLENE, AND THIENYL LEUKOTRIENE B4 ANALOGUES

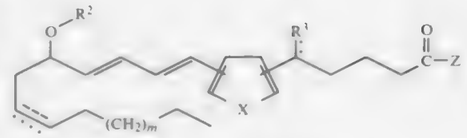
Stevan W. Djuric, Glenview; Richard A. Haack, Chicago, and Stella S. Yu, Morton Grove, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 130,355, Dec. 8, 1987, abandoned. This application Feb. 18, 1988, Ser. No. 158,454

Int. Cl.[4] C07C *59/90, 59/48;* A61K *31/557*

U.S. Cl. 514—570 9 Claims

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof

wherein X is —CH=CH:

wherein Z is OR^1;

wherein R^1 is hydrogen, or a pharmaceutically acceptable cation;

wherein R^2 is H, $—CH_3$ or $—C_2H_5$;

wherein R^3 is OH, H or =O; and

m is an integer from 0–4.

4,855,325

TREATMENT OF MAMMALS SUFFERING FROM DAMAGE TO THE CENTRAL NERVOUS SYSTEM

Nosrat E. Naftchi, 389 Forest Ave., Teaneck, N.J. 07666

Division of Ser. No. 691,830, Jan. 16, 1985, Pat. No. 4,742,054, which is a continuation of Ser. No. 443,915, Nov. 23, 1982, abandoned. This application Feb. 1, 1988, Ser. No. 150,767

The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

Int. Cl.[4] A61K *31/155, 31/55, 31/495, 31/52*

U.S. Cl. 514—634 13 Claims

1. A pharmacologically active composition useful for treating a mammal having an injured spinal cord with a resultant loss of motor and sensory function, to restore at least partially the lost sensory-motor functions, the composition comprising a unit dosage amount of a neural receptor agonist which is a guanidine compound, as a primary therapeutic agent, and an anti-desensitization agent.

4,855,326

RAPIDLY DISSOLUBLE MEDICINAL DOSAGE UNIT AND METHOD OF MANUFACTURE

Richard C. Fuisz, Bethlehem, Pa., assignor to Fuisz Pharmaceutical Ltd., Washington, D.C.

Continuation-in-part of Ser. No. 40,371, Apr. 20, 1987, abandoned. This application Mar. 18, 1988, Ser. No. 169,838

Int. Cl.[4] A61K *9/00, 9/70*

U.S. Cl. 514—777 59 Claims

1. A spun fibrous pharmaceutical composition comprising a mass of spun fibers of a material capable of being spun into fibers that are readily water-soluble and a medicament distributed on or incorporated in said fibrous mass.

4,855,327

PROCESS FOR PRODUCING PRE-EXPANDED PARTICLES OF POLYOLEFIN RESINS

Yoshiharu Fukui, Chiba, Japan, assignor to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Dec. 13, 1988, Ser. No. 284,009

Claims priority, application Japan, Dec. 14, 1987, 62-316455

Int. Cl.[4] C08J *9/22*

U.S. Cl. 521—58 4 Claims

1. A process for producing pre-expanded particles of a thermoplastic resin, wherein said particles are polyolefin resin particles which are obtained by polymerizing an olefin in the presence of a Ziegler-Natta catalyst, said polyolefin resin particles containing no more than 1% by weight of particles having a particle diameter of 105 μm or smaller and having a particle size distribution represented by equation:

$$R(Dp)=100exp[-(Dp/De)^n]$$

wherein Dp represents a polymer particle diameter (μm);

R(Dp) represents a residual cumulative weight percentage; De represents an absolute size constant that is a particle diameter (μm) corresponding to R(Dp)=36.8% by weight; and n represents a distribution constant, in which De is 300 or more, and n is 2.5 or more, and said process comprises dispersing said polyolefin resin particles in a dispersing medium containing a blowing agent and from 0.001 to 5 parts by weight of a phenolic antioxidant per 100 parts by weight of the polyolefin polymer particles, heating the dispersion, and releasing the dispersion in a lower pressure zone.

4,855,328

METHOD FOR REDUCING SILICONE FOAM DENSITY

Kennith A. Smith, Clifton Park, N.Y., assignor to The John Hopkins University, Baltimore, Md.

Filed Oct. 24, 1988, Ser. No. 261,548

Int. Cl.[4] C08J *9/02*

U.S. Cl. 521—88 5 Claims

1. A method for lowering the density of silicone foams resulting from the interaction of ingredients in a foamable mixture comprising an (A) component comprising an effective amount of platinum catalyst, a hydroxylated material and a vinyl-terminated polydiorganosiloxane and a (B) component comprising an organohydrogen polysiloxane, which method comprises,

(1) agitating a mixture of the (A) component and the (B) component at a temperature of —20° C. to 5° C., and

(2) allowing the mixture of (1) to foam while the temperature of the mixture is maintained at −20° C. to 5° C.

4,855,329

POLYSILOXANE-POLYOXYALKYLENE TERPOLYMERS FOR POLYURETHANE FOAM MANUFACTURE

Charles H. Blevins, II, Beacon; William B. Herdle, Greenburgh, and Gerald J. Murphy, Wappingers Falls, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 91,114, Aug. 31, 1987, Continuation-in-part of Ser. No. 947,955, Dec. 31, 1986, abandoned. This application Nov. 17, 1988, Ser. No. 272,429

Int. Cl.[4] C08J *9/12, 9/14*

U.S. Cl. 521—112 9 Claims

1. A process for preparing flexible polyurethane foam, said process comprising reacting and foaming a mixture comprising (a) a polyether containing at least two hydroxyl groups per molecule, (b) an organic polyisocyanate, (c) a catalyst for the reaction of (a) and (b) to produce a polyurethane, (d) a blowing agent and (e) a foam stabilizer of the nominal formula:



wherein:

R is an alkyl group having 1 to 3 carbon atoms;

R′ is a poly-(oxyethylene-oxypropylene) ether group which contains 20% to 60% oxyethylene by weight and which has an average molecular weight of from about 3,000 to about 5,500 and which is attached to the silicon atom through a difunctional link;

R″ is a poly-(oxyethylene-oxypropylene) ether group which contains 20% to 60% oxyethylene by weight and which has an average molecular weight of from about 800 to about 2,900 and which is attached to the silicon atom through a difunctional link; and

R‴ is a polyoxypropylene polyether group which has an average molecular weight from about 130 to about 1200 and which is attached to the silicon atom through a difunctional link;

R* is R′, R″ or R‴;

a and e are individually 0 or 1; either b is not equal to zero and/or c is not equal to zero;

x, b, c and d are positive numbers such that the sum of x+b+c+d ranges from 25 to 400;

and x is greater than the sum b+c+d; wherein the ratio (b+c):d is from 0.8 to 1.9.

4,855,330

HIGH STYRENE CONTENT STABLE POLYMER POLYOLS USING EPOXY RESIN-MODIFIED POLYOLS AS BASE POLYOLS

Robert G. Gastinger, West Chester, Pa., and John E. Hayes, Wilmington, Del., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

Filed May 24, 1988, Ser. No. 197,868

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—137 30 Claims

1. Stable, low viscosity polymer polyols made by a process comprising polymerizing, via a free-radical reaction, a monomer component having a styrene portion and an acrylonitrile portion, in the presence of an epoxy resin-modified polyol as the base polyol, where the wt. ratio of the styrene portion to the acrylonitrile portion ranges from greater than 40/60 to 100/0.

4,855,331

PRODUCTION OF FOAMED POLYMER STRUCTURES

Caroll W. Lanier, Baker; H. Eugene Broemmelsiek, Baton Rouge, both of La., and Raymond Lee, Elk Grove Village, Ill., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 209,018, Jun. 20, 1988, Pat. No. 4,822,537. This application Nov. 28, 1988, Ser. No. 277,541

Int. Cl.[4] B29C *35/00;* C08J *9/02*

U.S. Cl. 521—184 15 Claims

1. A bun of cured polyimide foam produced by (i) exposing to microwave radiation of intensity sufficient to cause the development of a foamed polymer structure, a body of polyimide precursor and the foam structure developing therefrom while (a) maintaining said body and said foam structure as it is developing therefrom under a substantially vapor-impermeable microwave-compatible shroud that does not substantially restrict or impede development of the foam structure, and (b) directing the microwave radiation upon the top, sides and ends of said body of polyimide precursor and of the foam structure as it is development therefrom, but curtailing the extent to which such radiation impinges upwardly into the bottom of said body and said foam structure; and (ii) curing the developed foam structure to a bun of cured polyimide foam; said bun being characterized by having a greater amount and uniformity of cell structure than a bun made from another portion of the said foamable polyimide precursor under the same conditions but without use of (a) and (b).

4,855,332

POLYIMIDE FOAMS THEIR PRODUCTION

David M. Indyke, Arlington Heights, Ill., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 199,991, May 26, 1988. This application Feb. 2, 1989, Ser. No. 306,110

Int. Cl.[4] C08J *9/02*

U.S. Cl. 521—185 10 Claims

1. A polyimide prepared by reaction of at least one aromatic or heterocyclic primary diamine with a mixture of at least two organic tetracarboxylic acids or derivatives thereof, at least one of which is from 1 to 40 mol percent of a 2-(vicinal-dicarboxycyclohexenyl) succinic acid or derivative thereof and a second of which is an aromatic tetracarboxylic acid or derivative thereof.

4,855,333

MULTIPLE WIRE PHOTOSENSITIVE ADHESIVE FOR WIRE EMBEDMENT

William J. Rudik; George P. Schmitt, both of Vestal, and John F. Shipley, Endwell, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 392,997, Jun. 28, 1982, abandoned.
This application Apr. 6, 1987, Ser. No. 35,207
Int. Cl.[4] C08L *63/00*
U.S. Cl. 522—71 25 Claims

1. A photo-curable adhesive composition from:

a Bisphenol A-based epoxy resin having a molecular weight of about 1500 to 5000;

a epoxidized novolak having a molecular weight of about 900 to 1500;

monoethylenically unsaturated carboxylic acid;

a polyethylenically unsaturated compound selected from the group of unsaturated esters of polyols, unsaturated amides, vinyl esters, and unsaturated aldehydes;

a photoinitiator;

phenoxy resin which has a very high molecular weight; and

a thixotropic agent selected from the group of colloidal silica, carbon black, and bentonite clay, and having measured in the dry state at a frequency in the range of 1 to 10 cycles per second

(a) a Loss Angle Ratio at ambient temperature of 0.3–0.7;

(b) a Storage Shear Modulus G' at ambient temperature of greater than about 10^7 to less than about 10^8 dynes/cm^2; and

(c) a Storage Shear Modulus G' at temperatures of below 150° C. of less than about 10^6 dynes/cm^2 to about 10^5 dynes/cm^2.

4,855,334

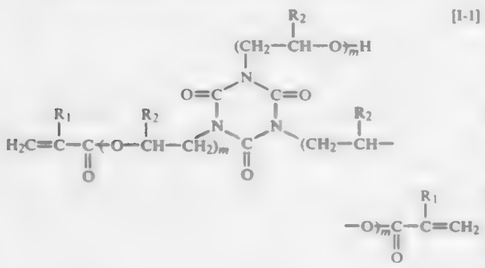
CURABLE RESIN COMPOSITION AND ITS USE

Osamu Maruyama, Chiba; Hidenobu Ishikawa, Ichihara, and Nobuo Takahashi, Chiba, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 517,269, Jul. 26, 1983, abandoned. This application Jun. 3, 1985, Ser. No. 740,824
Int. Cl.[4] C08F *2/50, 226/06, 220/20*
U.S. Cl. 522—96 13 Claims

1. A radiation curable resin composition comprising an isocyanuric ring-containing uretahen modified radical polymerizable compound selected from the group consisting of

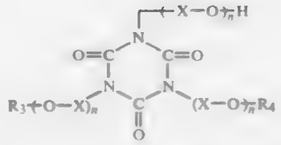
(A) a reaction product of at least one polyisocyanate compound with a di(meth)acrylate of isocyanuric acid represented by the following general formula



[I-1]

wherein R_1 represents a hydrogen atom or a methyl group, R_2 represents an alkyl group having 1 to 5 carbon atoms, and m is an integer of 1 to 20; and

(B) a reaction product of at least one polyisocyanate compound, a di(meth)acrylate of isocyanuric acid represented by the following general formula



[II-1]

wherein X's are identical or different and each represents an alkylene group or a group resulting from substitution of a hydroxyl group for one hydrogen atom in the alkylene group, R_3 and R_4 each represent an acryloyl group and/or a methacryloyl group, and n is an integer of 1 to 20,

and 2-hydroxxyethylacrylate, 2-hydroxypropyl acrylate or a mixture thereof as a hydroxyl group-containing radical-polymerizable compound.

4,855,335

MEDICAL MOISTURE RESISTANT ADHESIVE COMPOSITION FOR USE IN THE PRESENCE OF MOISTURE

Michael A. Neperud, Milwaukee, Wis., assignor to Findley Adhesives Inc., Milwaukee, Wis. and North Coast Adhesives Inc., Akron, Ohio, a part interest

Continuation-in-part of Ser. No. 910,705, Sep. 23, 1986, abandoned. This application Jan. 20, 1988, Ser. No. 146,250
Int. Cl.[4] C08L *15/00;* C08J *23/00*
U.S. Cl. 523—111 7 Claims

1. A moisture resistant adhesive composition for use in the presence of moisture, said adhesive consisting essentially of a substantially homogeneous mixture one a percent weight basis of from about 5% to abut 10% of one or more low molecular weight polyisobutylenes, from about 7% to about 15% of a styrene block copolymer, from about 12% to about 20% of mineral oil, from about 15% to about 30% of a water insoluble, water swellable synthetic hydrocolloid which is a polyacrylic acid metallic sal that forms a gel when it is wet, from about 1% to about 8% of an ethylene vinyl acetate copolymer which increases dimensional stability and from about 30% to about 40% of a tackifying resin.

4,855,336

FRICTION MATERIAL CONTAINING MILL SCALE

Charles E. Newell, Troy, N.Y., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Jul. 25, 1988, Ser. No. 223,494
Int. Cl.[4] C08K *3/22;* C08J *5/14*
U.S. Cl. 523—152 5 Claims

1. In a friction material having from 20–50% by weight of a sponge iron particle combined with friction modifiers and a reinforcing fiber held in a matrix by a phenolic resin, said sponge iron imparting a high cold coefficient of friction and a relatively low coefficient of wear on engagement of the friction material with another member during a brake application, the improvement comprising:

substituting from 14–33% by weight of mill scale for said sponge iron while said friction material retains substantially the same operational characteristics.

4,855,337

HETEROGENEOUS POLYMERS

Claude Dequatre, Bischheim; Peter R. J. Blanpain, Reichstett, both of France, and Michel Longuet, Sarnia, Canada, assignors to Polysar Financial Services S.A., Canton of Fribourg, Switzerland

Filed May 23, 1986, Ser. No. 866,487
Claims priority, application France, Jun. 6, 1985, 85 08542
Int. Cl.[4] C08L *83/00*
U.S. Cl. 523—201 2 Claims

1. A latex comprising from about 30 to 65 weight percent of heterogeneous particles comprising:

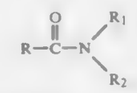
(A) from about 40 to 60 weight percent of a first domain formed by emulsion polymerization of a monomeric mixture consisting of

(i) from about 45 to 65 weight percent of a C_{8-12} vinylaromatic monomer which may be unsubstituted or substituted by a C_{1-4} alkyl or alkanol radical or a bromine or chlorine atom;

(ii) from about 35 to about 50 weight percent of a C_{4-9} aliphatic conjugated diolefin;

(iii) from about 0.5 to about 5 weight percent of at least one C_{3-9} ethylenically unsaturated carboxylic acid; and

(iv) from 0 to about 5 weight percent of an amide of the formula



wherein R is an alkenyl radical of up to about 9 carbon atoms, R_1 may be hydrogen, or a C_{1-4} alkyl or alkanol radical and R_2 may be hydrogen or a C_{1-4} alkyl radical; and

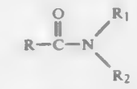
(B) from about 60 to 40 weight percent of a second domain formed by emulsion polymerization of a monomeric mixture consisting of:

(i) from about 40 to about 60 weight percent of a C_{8-12} vinylaromatic monomer which may be unsubstituted or substituted by a C_{1-4} alkyl or alkanol radical or a chlorine or bromine atom;

(ii) from about 30 to about 40 weight percent of a conjugated diolefin;

(iii) from about 0.5 to about 5 weight percent of at least one C_{3-9} ethylenically unsaturated acid;

(iv) from about 0.5 to about 5 weight percent of an amide of the formula



wherein R is an alkenyl radical of up to 7 carbon atoms, R_1 is hydrogen or a C_{1-4} alkyl or alkanol radical, and R_2 is hydrogen or a C_{1-4} alkyl radical; and

(v) from about 3 to about 8 weight percent of an alkenyl nitrile containing up to 6 carbon atoms.

4,855,338

METHOD FOR TREATING GRAFTED PROTEIN LATICES

David E. Erickson, Stow, and Satish C. Sharma, Mogadore, both of Ohio, assignors to GenCorp Inc., Fairlawn, Ohio

Filed Nov. 7, 1986, Ser. No. 928,227
Int. Cl.[4] B01F *5/06;* C08H *5/04*
U.S. Cl. 523—335 6 Claims

1. The method which comprises microfluidizing by interacting two protein-modified alkaline latex fluidized streams in an interaction chamber for a period of time sufficient to reduce the viscosity of and to increase the light transmission of said latex, said fluidized stream being an alkaline latex of a graft or over copolymer of at least one copolymerizable conjugated diene monomer having from 4 to 6 carbon atoms and at least one copolymerizable vinyl aryl monomer having from 8 to 12 carbon atoms and free of an organic carboxylic acid monomer where

(a) said conjugated diene monomer is used in an amount of from about 25 to 50 parts by weight,

(b) said vinyl aryl monomer is used in an amount of from 30 to 60 parts by weight, and

(c) said protein is used in an amount of from 10 to 30 parts by weight, the sum of (a), (b) and (c) being 100 parts by weight.

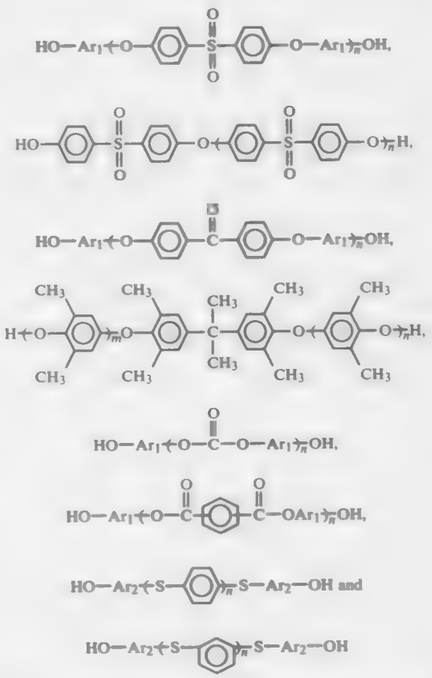
4,855,339

EPOXY RESIN COMPOSITION

Yasuhisa Saito, Higashiosaka; Hisao Takagishi, Kyoto; Hiroshi Nakamura, Ibaraki; Kohichi Okuno, Izumiotsu; Yutaka Shiomi, Minoo, and Kunimasa Kamio, Suita, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 854,313, Apr. 21, 1986, abandoned.
This application Jan. 19, 1989, Ser. No. 298,858
Claims priority, application Japan, Apr. 25, 1985, 60-89779; Mar. 3, 1986, 61-45665
Int. Cl.[4] C08G *59/32, 59/62*
U.S. Cl. 523—400 18 Claims

1. An epoxy resin composition comprising (A) an epoxy resin having three or more epoxy groups per molecule and (B) a reactive oligomer having an average molecular weight of about 400 to 5,000 selected from the oligomers represented by the following formulas,



wherein n denotes a positive number, and Ar_1, and Ar_2 each denotes an aromatic divalent group.

4,855,340

STABILIZED EPOXY RESIN COMPOSITIONS

Kailash C. B. Dangayach, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 19, 1988, Ser. No. 158,019
Int. Cl.[4] C08L *63/00*
U.S. Cl. 523—456 13 Claims

1. A composition comprising
(a) an epoxy resin;
(b) from about 0.5 to about 2 weight percent, based on the weight of the epoxy resin, of 1,2-propylene glycol;
(c) an effective amount of a curing agent for the epoxy resin, and curing agent selected from the group consisting of aliphatic amines, aromatic amines, anhydrides and imidazoles; and
(d) a particulate filler.

4,855,341

HIGH-STRENGTH MAGNESIUM ALUMINOSILICATE GLASS FIBERS HAVING SIZE COATING OF EPOXY RESIN WITH METHACRYLOXYALKYL AND AMINOALKYL SILANES

F. Ronald Paul, Heath; Richard M. Haines, Warsaw, and Homer G. Hill, Mt. Vernon, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 714,605, Mar. 21, 1985, abandoned, which is a continuation of Ser. No. 536,101, Sep. 26, 1983, abandoned. This application Jul. 23, 1987, Ser. No. 77,062
Int. Cl.[4] C08L *63/00;* C08K *3/40;* D02G *3/00*
U.S. Cl. 523—443 14 Claims

1. A bundle of high-strength magnesium aluminosilicate glass fibers wherein the component fibers have a size coating thereon consisting of the dried residue of a dilute aqueous sizing composition consisting essentially of:
(a) an emulsified liquid epoxy resin or an emulsified liquid solution of a major proportion by weight of an epoxy resin and a minor proportion by weight of a solvent therefor;
(b) 3-methacryloxypropyltrimethoxysilane and 3-aminopropyltriethoxysilane or hydrolysates thereof;
(c) at least one glass fiber lubricant;
(d) a thickening agent; and
(e) surfactants.

4,855,342

COATING MATERIAL AND ITS USE AS PRIMER AND EXTENDER

Heinz D. Becker, Bonn; Klaus Bederke, Sprockhovel; Ralf Dahm, Wermelskirchen; Hermann Kerber, Wuppertal; Fritz Sadowski, Brauweiler bei Koln, and Werner Stephan, Wuppertal, all of Fed. Rep. of Germany, assignors to Herberts Gesellschaft, Wuupertal, Fed. Rep. of Germany

Filed Nov. 19, 1987, Ser. No. 122,903
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1986, 3640243
Int. Cl.[4] C09D *3/72, 3/76, 3/81;* B05D *7/26*
U.S. Cl. 524—31 4 Claims

1. A prime coating material for forming primer coatings up to 500 μm thickness without appreciable bubble formation, comprising a vehicle which is a mixture of
(a) from about 60% to about 75% by weight of a hydroxy functional copolymer having a hydroxyl number of from about 60 to about 90 mg KOH/g of the copolymer, said copolymer being made of
(i) from about 36% to about 44% by weight of a styrene or a styrene derivative,
(ii) from about 22% to about 28% by weight of a hydroxyalkyl ester of one or more of an acrylic and methacrylic acid, having 4 to 6 carbonates in the hydroxyalkyl group, and
(iii) from about 26% to about 30% by weight or one more of an acrylate and methacrylate, the homopolymer of which has a glass transition temperature above 40° C.,
(b) from about 1% to about 5% by weight of an ester-soluble nitrocellulose, and
(c) from about 25% to about 35% by weight of a bi-functional or multifunctional polyisocyanate,
wherein the sum of the components (a), (b), and (c); as well as that of (i), (ii), and (iii) is 100% in both cases.

4,855,343

PAPER SIZE BASED ON FINELY DIVIDED AQUEOUS DISPERSIONS

Hans-Juergen Degen, Lorsch; Fritz Reichel, Hirschberg; Ulrich Riebeling, Schifferstadt, and Lothar Hoehr, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 16, 1987, Ser. No. 74,031
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1986, 3627594
The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.
Int. Cl.[4] D21H *3/46*
U.S. Cl. 524—47 6 Claims

1. A paper size based on a finely divided, aqueous dispersion of a copolymer, obtained by copolymerization, by an emulsion polymerization method, of from 10 to 56 parts by weight of a monomer mixture of
(a) from 20 to 65% by weight of acrylonitrile, methacrylonitrile, or a mixture thereof,
(b) from 80 to 35% by weight of an acrylate of a monohydric, saturated C_3–C_8-alcohol and
(c) from 0 to 10% by weight of other ethylenically unsaturated copolymerizable monomers, the sum of the percentages of (a), (b) and (c) always being 100, in 100 parts by weight of an aqueous solution of from 1.5 to 25% by weight of a degraded starch having a viscosity η_i of from 0.12 to 0.50 dl/g, at from 40 to 100° C. in the presence of a peroxide-containing initiator.

4,855,344

INK COMPOSITIONS AND THEIR PREPARATION

David L. Nealy; Louis A. Wilkin, and Fred D. Barlow, Jr., all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 84,773, Aug. 13, 1987, Pat. No. 4,772,491. This application May 16, 1988, Ser. No. 194,242
Int. Cl.[4] C08L *77/12;* C09D *11/10*
U.S. Cl. 524—86 11 Claims

1. A composition useful as a printing ink or useful for the preparation of a printing ink, comprisfng a substantially homogeneous system of the components:
(1) from about 4 to about 90 weight % of polymeric material of at least one linear, water-dispersible polymer having carbonyloxy linking groups in the linear molecular structure wherein up to 80% of the linking groups may be carbonylamido linking groups, the polymer having an inherent viscosity of from about 0.1 to about 1.0 measured in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. and at a concentration of 0.25 gram of polymer in 100 mL of the solvent, the polymer containing substantially equimolar proportions of acid equivalents (100 mole percent) to hydroxy and amino equivalents (100 mole percent), the polymer comprising the reaction products of (a), (b), (c) and (d) from the following reactants or ester forming or esteramide forming derivatives thereof;
(a) at least one difunctional dicarboxylic acid;
(b) from about 4 to about 25 mole percent, based on a total of all acid, hydroxyl and amino equivalents being equal to 200 mole percent, of at least one difunctional sulfomonomer containing at least one cationic sulfonate group attached to an aromatic or cycloaliphatic nucleus wherein the functional groups are hydroxy, carboxyl or amino;

(c) at least one difunctional reactant selected from a glycol or a mixture of a glycol and diamine having two —NRH groups, the glycol containing two —CH_2—OH groups of which
(1) at least 15 mole percent based on the total mole percent of hydroxy or hydroxy and amino equivalents, is a poly(ethylene glycol) having the structural formula

H—OCH_2—CH_2—$_n$OH,

n being an integer of from 2 to about 20, or
(2) of which from about 0.1 to less than about 15 mole percent based on the total mole percent of hydroxy or hydroxy and amino equivalents, is a poly(ethylene glycol) having the structural formula

H—OCH_2—CH_2—$_n$OH,

n being an integer of between 2 and about 500, and with the proviso that the mole percent of said poly(ethylene glycol) within said range is inversely proportional to the quantity of n within said range; and
(d) from none to at least one difunctional reactant selected from a hydroxy-carboxylic acid having one —C(R-)$_2$—OH group, an aminocarboxylic acid having one —NRH group, and an amino-alcohol having one —C(R)$_2$—OH group and one —NRH group, or mixtures of said difunctional reactants;
wherein each R in the (c) or (d) reactants is a H atom or an alkyl group of 1 to 4 carbon atoms;
(2) from none to about 70 weight % of pigment material;
(3) from about 0.01 to about 90 weight % of water; and
(4) one or more acetylacetonates of the formula M[CH—(-$COCH_3)_2]_n$ wherein M is a polyvalent metal and n is the chemical valence of M, the weight ratio of polyester to total acetylacetonates being from about 10,000/1 to about 10/1.

6. The composition according to any one of claims 1–5 wherein the pigment is one or a mixture of the following color index materails: C.I. Pigment Yellow 17; C.I. Pigment Blue 27; C.I. Pigment Red 49:2; C.I. Pigment Red 81:1; C.I. Pigment Red 81:3; C.I. Pigment Red 81:x; C.I. Pigment Yellow 83; C.I. Pigment Red 57:1; C.I. Pigment Red 49:1; C.I. Pigment Violet 23; C.I. Pigment Green 7; C.I. Pigment Blue 61; C.I. Pigment Red 48:1; C.I. Pigment Red 52:1; C.I. Pigment Violet 1; C.I. Pigment White 6; C.I. Pigment Blue 15; C.I. Pigment Yellow 12; C.I. Pigment Blue 56; C.I. Pigment Orange 5; C.I. Pigment Black 7; C.I. Pigment Yellow 14; C.I. Pigment Red 48:2; and C.I. Pigment Blue 15:3.

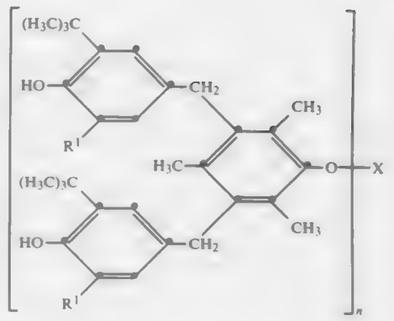
4,855,345

STABILIZERS FOR ORGANIC POLYMERS

Siegfried Rosenberger, Riehen, and Hans-Rudolf Meier, Marly, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

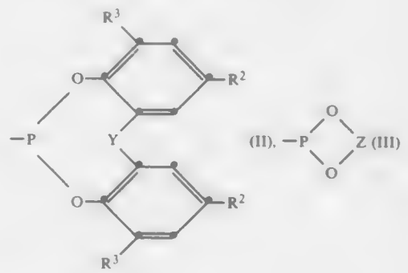
Filed Jun. 10, 1987, Ser. No. 60,287
Claims priority, application Switzerland, Jun. 19, 1986, 2463/86
Int. Cl.[4] C08K *5/49;* C07F *9/15*
U.S. Cl. 524—120 11 Claims

1. a compound of formula I



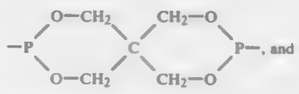
(I)

in which
n is 1, 2 or 3,
R^1 is C_1–C_4-alkyl or cyclohexyl,
when n is 1, X is a group of formula II or III



(II), (III)

in which
R^2 and R^3 independently of one another are C_1–C_4-alkyl, or R^3 is additionally cyclohexyl,
Y is —S—, —CH_2— or —CH(C_1–C_4-alkyl)—, and
Z is a 1,3-alkylene group which has 4 to 8 carbon atoms and is branched in the 2-position,
when n is 2, X is a group of formula IV



(IV)

when n is 3, X is a phosphorus atom.

2. A composition of matter containing a synthetic polymer subject to thermo-oxidative and/or light-induced degradation, stabilized with an effective stabilizing amount of a compound according to claim 1.

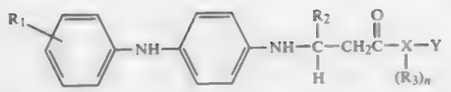
4,855,346

RUBBER STABILIZERS DERIVED FROM N-PHENYL-P-PHENYLENEDIAMINE

Paul K. Battey, Harrogate; Peter Hope, Littleborough, and Ashutosh H. Sharma, Norden, all of Great Britain, assignors to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 560,763, Dec. 12, 1983, abandoned, which is a continuation of Ser. No. 399,581, Jul. 19, 1982, abandoned. This application Sep. 4, 1984, Ser. No. 647,258
Claims priority, application Netherlands, Jul. 21, 1981, 8103441
Int. Cl.[4] C08K *5/18*
U.S. Cl. 524—217 5 Claims

1. A compound of the formula:



wherein n=0 or 1, R_1 is selected from the group consisting of a hydrogen atom, straight chain and branched chain alkyl groups and alkoxy groups, and cycloalkyl groups and cycloalkoxy groups having 5 to 8 carbon atoms, R_2 is selected from the group consisting of lower alkyl groups having 1 to 5 carbon atoms, X is an oxygen atom if n=0 or a nitrogen atom if n=1, Y is selected from the group consisting of straight chain and branched chain alkyl groups having 1 to 18 carbon atoms, cycloalkyl groups having 5 to 8 carbon atoms, alkenyl groups having 3 to 18 carbon atoms, phenyl groups, alkylphenyl groups having 7 to 14 carbon atoms and aralkyl groups having 7 to 15 carbon atoms, and R_3 is selected from a hydrogen atom and the same group as Y, or together with X and Y forms part of a heterocyclic ring composed of 5 to 6 atoms in which X is the hetero-nitrogen atom, wherein in each instance the straight chain and branched chain alkyl groups, the cycloalkyl groups and the aryl groups from which Y may be selected may be substituted with a substituent selected from the group consisting of acyl and chlorine, and wherein in each instance the straight chain and branched chain alkyl groups, the cycloalkyl groups and the aryl groups from which R_3 may be selected may be substituted with a substituent selected from the group consisting of alkoxy, acyl, and chlorine.

4,855,347

LACQUER COATINGS AND COATING PROCESS FOR POLYURETHANE-MOLDED ARTICLES

Brian J. Falline, and Bruce W. Weihrauch, both of Moline, Ill., assignors to Moline Paint Manufacturing Co., Moline, Ill.

Continuation of Ser. No. 912,766, Sep. 26, 1986, abandoned. This application Sep. 12, 1988, Ser. No. 244,553

Int. Cl.[4] C08K *5/54;* **C08L** *75/06*

U.S. Cl. 524—267 **13 Claims**

1. An in-mold lacquer coating for a polyurethane-molded article, which coating is mold-releasable without the aid of an external mold release agent and is re-coatable after de-molding without additional surface preparation, comprising a mixture of a fully-reacted aliphatic polyurethane resin, a polydimethylsiloxane fluid , and a solvent system that is incompatible with said polydimethylsiloxane, having toluene, an acetate solvent, a glycol ether solvent, and alcohol solvents as discrete constituents thereof, which constituents have specific gravities less than said polydimethylsiloxane and have varying rates of evaporation such that the ratio of toluene to the alcohol, glycol ether, and acetate solvent constituents in said solvent system decreases as the constituents of said solvent system evaporate, and that initially has at least 20% toluene, and 15% acetate, glycol ether, and alcohol constituents in combination, as a weight percentage of said coating.

4,855,348

AQUEOUS, SILICONE-CONTAINING COATING COMPOSITION FOR HIGH TEMPERATURE APPLIANCES

Hartzel G. Strader, Miamisburg, Ohio, assignor to DAP Inc., Tipp City, Ohio

Filed Jul. 14, 1988, Ser. No. 219,012

Int. Cl.[4] C08K *5/10*

U.S. Cl. 524—317 **10 Claims**

1. An aqueous coating composition comprising a solid silicone resin; a water soluble ammonium or amine salt of a drying oil-modified copolymer of an alkyl acrylate and an alkyl methacrylate, each of which having from 3 to 5 carbon atoms in the alkyl moiety thereof, said copolymer having an average molecular weight of not more than about 9000; a water soluble organic solvent, and water.

4,855,349

MASTIC AND CAULKING COMPOSITIONS AND COMPOSITE ARTICLES

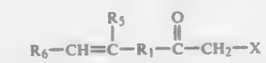
David M. Ingle, Temple City, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Sep. 4, 1986, Ser. No. 903,779

Int. Cl.[4] C08K *3/18*

U.S. Cl. 524—432 **34 Claims**

1. A coating mastic or caulking composition having a total non-volatile solids content of about 60 to about 90 weight percent, which solids content comprises at least about 15 weight percent of a water insoluble polymer and undissolved solids other than said polymer, said undissolved solids other than said polymer constitute about 30 to about 60 weight percent of said composition and are selected from the group consisting of pigments, fillers, extenders and combinations thereof, and said fillers and extenders, other than pigment, constitute about 10 to about 70 weight percent of said total non-volatile solids, wherein said polymer has a T_g of about −50° C. to about −10° C., and comprises at least one functional monomer of the formula:



in which R_1 is a divalent organic radical of at least 3 atoms in length, R_5 and R_6 are independently selected from hydrogen, hydroxy, halo, thio, amino or monovalent organic radicals, and X is —CO—R_4 or —CN wherein R_4 is hydrogen or a monovalent organic radical, and said polymer is selected from the group consisting of

(a) conjugated diolefin polymers comprising at least about 30 weight percent of one or more conjugated diene monomers having 4 to about 8 carbon atoms and 0 to about 70 weight percent of one or more alkenyl substituted monoaromatic monomers;

(b) olefin-ester interpolymers comprising at least about 1 weight percent of a monoolefin monomer having up to about 4 carbon atoms and at least about 40 weight percent of an alkenyl or alkenol ester of a saturated carboxylic acid;

(c) olefinically unsaturated carboxylic acid ester polymers comprising at least about 40 weight percent polymerized olefinically unsaturated carboxylic acid ester monomers;

(d) alkenyl ether polymers comprising at least about 30 weight percent alkenyl ether monomer units; and

(e) combinations thereof.

4,855,350

FABRIC FINISH WITH ALPHA OLEFIN RESINS AND PROCESS

E. Michael Coyle; Fred J. Reichley; Calvin J. Verbrugge, and John G. Villarreal, all of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 28,054, Mar. 19, 1987, abandoned, which is a continuation of Ser. No. 802,631, Nov. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 659,979, Oct. 12, 1984, Pat. No. 4,623,683. This application Apr. 28, 1988, Ser. No. 188,192

The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.

Int. Cl.[4] C08J *0/00*

U.S. Cl. 524—506 **12 Claims**

1. An aqueous fabric finishing composition, comprising:

an aqueous carrier;

an aqueous-carrier solubilized polymer of from about (a) 40 to 51 mole percent of at least one higher 1-alkene, said one higher 1-alkene having at least 10 carbon atoms, said polymer comprising a mixture of (i) a C_{10}–C_{18} 1-alkene monomer and (ii) a C_{20}–C_{30+} mixed 1-alkene monomer and (b) from about 60 to 49 mole percent of maleic anhydride; and

at least one additive in an amount that is effective to reduce friction properties and a foaming tendency of said composition on application to fabrics, wherein said composition is adapted to be applied to said fabrics and fixed thereto using heat and pressure in order to form a wrinkle and water-borne stain resistant fabric thereby.

4,855,351

CYCLIC AMINOALKYLSILANES AND THEIR USE AS ADHESION PROMOTERS IN ROOM TEMPERATURE VULCANIZABLE POLYDIORGANOSILOXANE COMPOSITIONS

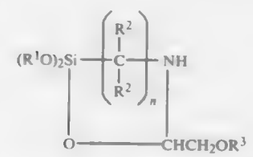
Judith Stein, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 70,009, Jul. 6, 1987, Pat. No. 4,794,192. This application Aug. 22, 1988, Ser. No. 234,730

Int. Cl.[4] C08K *5/35*

U.S. Cl. 524—719 **14 Claims**

1. A method for improving adhesion to a substrate of a room temperature vulcanizable composition comprising a polyalkoxy-terminated polydioganosiloxane and a catalytic amount of a curing catalyst, said method comprising incorporating therein an adhesion improving amount of a cyclic aminoalkysilane having the formula



(I)

wherein R^1 is C_{1-8} alkyl, each R^2 is independently hydrogen or C_{1-4} primary or secondary alkyl, R^3 is methyl or ethyl and n is 2 or 3.

4,855,352

PROCESS FOR THE PRODUCTION OF STABLE DISPERSIONS, THE DISPERSIONS SO PRODUCED, AND THE USE THEREOF IN THE MANUFACTURE OF POLYURETHANES

Michael K. Lowery, Pittsburgh; Richard E. Keegan, McMurray, and Mark A. Koshute, Beaver, all of Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Jul. 28, 1988, Ser. No. 225,403

Int. Cl.[4] C08L *75/04*

U.S. Cl. 524—728 **11 Claims**

1. A process for the production of a stable finely divided dispersion of a polyurea and/or polyhydrazodicarbonamide in a hydroxyl-group-containing material comprising reacting

(i) an organic di- and/or polyisocyanate with

(ii) a composition selected from the group consisting of polyamines, hydrazines, hydrazides and mixtures thereof, in

(iii) the hydroxyl-group-containing material which is selected from the group consisting of polyethers, polyesters, polyester amides, polycarbonates and mixtures thereof,

in the presence of

(iv) a catalyst compound that can catalyze the reaction of isocyanate groups with hydroxyl groups, wherein at least 50 parts by weight of said catalyst compound is used for every million parts by weight of the combined weight of components (i), (ii) and (iii).

4,855,353

HIGH MOLECULAR COMPOUNDS HAVING AMINO GROUPS, AND THEIR UTILIZATION

Miki Kurami; Yoshifumi Shirakami; Keietsu Takahashi, and Nobuo Ueda, all of Chiba, Japan, assignors to Nihon Medi-Physics Co., Ltd., Hyogo, Japan

Filed Feb. 17, 1987, Ser. No. 15,633

Claims priority, application Japan, Feb. 14, 1986, 61-031622; Dec. 31, 1986, 61-315089

Int. Cl.[4] C08L *89/02;* **C08H** *89/02;* **C08F** *283/04;* **C08G** *69/48*

U.S. Cl. 525—54.1 **19 Claims**

1. A reactive high molecular compound having at least one free amino group in a side chain which comprises one unit of (1) a polyamine compound having at least three amino groups in the side chains per molecule and at least two units of (2) a chelate-forming compound having a carboxyl group, each unit of the chelate-forming compound (2) being combined to any of the amino groups in the side chains of the polyamine compound (1) to form carbonamide linkage.

4,855,354

ALDEHYDE STARCH SATURANT LAMINATING ADHESIVES

Paul J. Mohler, Palatine; Thomas A. Romz, Bloomingdale, both of Ill., and Baird E. Lithgow, Redwood City, Calif., assignors to Borden, Inc., Columbus, Ohio

Filed Jan. 7, 1988, Ser. No. 141,392

Int. Cl.[4] C08L *3/02;* **C09J** *3/02;* **B29J** *5/00*

U.S. Cl. 525—54.24 **43 Claims**

1. A curable composition of matter which consist of:

(a) a starch-aldehyde resin mixture, said mixture being formed by mixing said starch and said aldehyde resin;

(b) a curing agent capable of reducing the pH of the composition, wehrein said curing agent is present in an amount sufficient to accelerate the cure of the composition;

(c) a solvent selected from the group consisting of water, methanol, ethanol, isopropyl alcohol and mixtures thereof;

wherein the ratio of aldehyde resin to starch is from 7:5 to 5:1 by weight.

4,855,355

MOLDING RESIN COMPOSITION

Mikio Hirai; Tokuo Tatsuda, and Tomio Yoshida, all of Niihama, Japan, assignors to Sumitomo Naugatuck Co., Ltd., Osaka, Japan

Filed Mar. 28, 1988, Ser. No. 174,166

Claims priority, application Japan, Mar. 27, 1987, 62-75462

Int. Cl.[4] C08L *51/04, 63/00*

U.S. Cl. 525—64 **7 Claims**

1. A molding resin composition comprising (A) a saturated polyester resin, (B) a graft copolymer and (C) a rubber-reinforced resin, wherein the weight ratio of the saturated polyester resin (A) to the total weight of the graft copolymer (B) and the rubber-reinforced resin (C) is from 95:5 to 5:95, the weight ratio of the graft copolymer (B) to the rubber-reinforced resin (C) is from 100:0 to 5:95, and the graft copolymer (B) is one prepared by copolymerizing an unsaturated epoxide monomer and a combination of an aromatic vinyl monomer and a cyanated vinyl monomer in the presence of an ethylene α-olefin base rubber.

4,855,356

TERNARY POLYMER BLENDS CONTAINING A POLYETHERIMIDE, A POLYPHTHALATE CARBONATE, AND RUBBER MODIFIED VINYL AROMATIC POLYMER

Fred F. Holub, Schenectady, N.Y., and John A. Rock, Becket, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 30, 1987, Ser. No. 139,578
Int. Cl.[4] C08L *79/00*
U.S. Cl. 525—66 15 Claims

1. A ternary polymer blend comprising in admixture (a) a polyetherimide, (b) a rubber modified vinyl aromatic polymer, and (c) a polyphthalate carbonate prepared from a dihydric phenol, a carbonate precursor, a terephthalic acid or ester-forming derivative thereof, an isophthalic acid or ester-forming derivative thereof, said polyphthalate carbonate having from about 70 to 95 weight percent ester content and a range of terephthalate groups ranging from about 2 to about 15 percent of the ester content, wherein the rubber modified vinyl aromatic polymer is selected from the group consisting of methyl methacrylate-butadiene-styrene, styrene-ethylene-butylene-styrene, acrylonitrile-butadiene-styrene and high impact polystyrene.

4,855,357

LOW-TEMPERATURE IMPACT BLENDS OF POLYCARBONATE, GRAFT COPOLYMER AND RIGID COPOLYMER

David Whalen, Washington, and Ronald L. Jalbert, Parkersburgh, both of W. Va., assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 12, 1988, Ser. No. 256,856
Int. Cl.[4] C08L *69/00*
U.S. Cl. 525—67 17 Claims

1. A polymer blend composition, comprising
(a) a polycarbonate polymer having a weight average molecular weight, Mw, as measured by gel permeation chromatography techniques, of not less than 35,000;
(b) a graft copolymer formed from at least two ethylenically unsaturated monomers graft polymerized to a rubbery polymer substrate; and
(c) a rigid copolymer formed from at least two ethylenically unsaturated monomers, the rigid copolymer being compatible with the graft copolymer and having a weight average molecular weight, Mw, as measured by gel permeation chromatography techniques, of not less than 130,000.

4,855,358

POWDER COATING CONTAINING AN EPOXY RESIN, ACRYLIC RESIN AND POLYAMIDE

Stephen C. Hart, Warsaw, Ind., assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Dec. 14, 1984, Ser. No. 681,521
Int. Cl.[4] C08L *63/02*
U.S. Cl. 525—113 1 Claim

1. A thermosetting powder coating comprising a blend which comprises about 80 to 130 parts by weight of an epoxy resin or mixture of epoxy resins having an epoxide equivalent weight of at least about 2250, about 0.1 to about 3.0 parts by weight of a cure catalyst for the epoxy resin, about 0.5 to 3.0 parts by weight of an acrylic resin, and about 0.5 to about 10.0 parts by weight of a polyamide resin, wherein said blend is in the form of a powder.

4,855,359

THERMOSETTING CAPROLACTONE-STYRENE ALLYL ALCOHOL POLYESTER URETHANE COATING COMPOSITION

Rose A. Ryntz, Mt. Clemens; Karen A. Surcina, Bloomfield Hills, and Kenneth R. Kurple, Anchorville, all of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 20, 1988, Ser. No. 145,921
Int. Cl.[4] C08L *75/04;* C08F *8/30*
U.S. Cl. 525—130 9 Claims

1. A thermosetting coating composition comprising a binder and a liquid carrier for the binder; wherein the binder consists essentially of
(1) a hydroxyl terminated copolymer of styrene/allyl alcohol polymer chain extended with caprolactone where the styrene/allyl alcohol polymer and caprolactone are reacted in a molar ratio of about 0.5:1 to 6:1 and which polymer has a number average molecular weight of about 750–4000 and a weight average molecular weight of about 1,000–10,000; wherein the molecular weight is determined by gel permeation chromatography using polystyrene as the standard;
(2) a hydroxy functional polyester urethane random polymer which has a number average molecular weight of about 1,000–5,000 and a weight average molecular weight of about 1,000–5,000; wherein the molecular weight is determined by gel permeation chromtography using polystyrene as the standard; and which is the reaction product of:
(A) a hydroxy functional polyester which is the reaction product of:
(i) a polyhydroxy material comprising diols and triols and
(ii) acid component selected from aliphatic, cycloaliphatic or aromatic acids or anhydrides thereof; wherein (i) and (ii) are reacted to provide hydroxyl groups and carboxyl groups in a ratio of about 1.1:1 to 1.7:1; and
(B) an organic polyisocyanate, wherein (A) and (B) are reacted in amounts so as to provide hydroxyl groups and isocyanate groups in a ratio of about 0.3:1 to 1.7; and
(3) an alkylated melamine resin or blocked poly-isocyanate crosslinking agent.

4,855,360

EXTRUDABLE THERMOPLASTIC HYDROCARBON POLYMER COMPOSITION

Denis Duchesne, London, Canada, and Bryce V. Johnson, Orono, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 15, 1988, Ser. No. 182,028
Int. Cl.[4] C08L *23/04, 23/10, 27/12, 71/02*
U.S. Cl. 525—187 16 Claims

1. An extrudable composition comprising
(A) thermoplastic olefin polymer, as the major or predominant component of the composition
(B) poly(oxyalkylene) polymer, and
(C) fluorocarbon polymer where the weight ratio of said fluorocarbon polymer to said poly(oxyalkylene) polymer is in the range of 1/1 to 1/10, the concentration of said fluorocarbon polymer in said composition is 0.005 to 0.2 weight percent, and the concentration of said poly(oxyalkylene) polymer is 0.01 to 0.8 weight percent based on the weight of said extrudable composition.

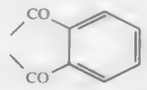
4,855,361

CONDUCTIVE POLYMER-POLYIMIDE BLENDS AND METHOD FOR PRODUCING SAME

Stuart I. Yaniger, Ventura, and Randy E. Cameron, Pacific Palisades, both of Calif., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Feb. 22, 1988, Ser. No. 158,478
Int. Cl.[4] C08L *79/08;* H01B *1/00, 1/06*
U.S. Cl. 525—436 30 Claims

1. A process for producing a conductive polymer blend which comprises:
mixing a polyimide or polyimide precursor with a conductive polymer comprising a base-type polymer containing carbon-nitrogen linkages having a polyimide-like group covalently linked to nitrogen atoms of said base-type polymer, in a suitable solvent, said polyimide-like group having the structural unit



wherein a —CO group of said structural unit is covalently linked to said nitrogen atoms, and employing about 1 to about 99% of said base-type polymer andn about 1 to about 99% of said polyimide or said polyimide precursor, by weight,
removing said solvent, and
forming a conductive continuous phase blend of said polyimide and said conductive polymer.

4,855,362

POLYMER ALLOY

Joel Muse, Jr., Kent, and Howard A. Colvin, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 28, 1987, Ser. No. 138,422
Int. Cl.[4] C08L *9/00, 9/02, 23/16, 23/26*
U.S. Cl. 525—194 19 Claims

1. A polymer alloy which is comprised of (a) at least one highly unsaturated rubbery polymer which is covulcanized with at least one N-chlorothio-sulfonamide modified EPDM rubber and (b) at least one thermoplastic polyolefin.

4,855,363

CROSSLINKABLE POLYMER COMPOSITION

Yoshihiro Moteki, Oita, Japan, assignor to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 734,230, May 15, 1985, abandoned. This application Sep. 15, 1987, Ser. No. 96,431
Claims priority, application Japan, May 15, 1984, 59-95628
Int. Cl.[4] C08L *33/14, 33/04, 33/02, 29/02*
U.S. Cl. 525—207 11 Claims

1. A crosslinked product of a polymer composition comprising:
(I) 5% to 95% by weight of at least one olefin copolymer having a softening temperature or normal crystalline melting point of 100° C. or less selected from the group consisting of:
(A) copolymers composed of (i) α-olefines, (ii) unsaturated dicarboxylic acid anhydrides, and (iii) at least one compound selected from the group consisting of unsaturated carboxylic acid esters, and vinyl esters;
(B) copolymers at least composed of olefins and unsaturated monocarboxylic acids;
(C) copolymers obtained by saponifying and neutralizing olefin copolymers at least composed of olefins and unsaturated carboxylic esters; and
(D) copolymers at least composed of olefins and unsaturated dicarboxylic acids or the half esters thereof; and
(II) 95% to 5% by weight of at least one olefin copolymer having a softening temperature or normal crystalline melting point of 100° C. or less selected from the group consisting of:
(A) copolymers at least composed of olefins and glycidyl alkyl (meth) acrylates; and
(B) copolymers composed of (i) at least one α-olefin, (ii) at least one compound selected from the group consisting of unsaturated carboxylic acid esters and vinyl esters, and (iii) at least one compound having a hydroxyl group or primary or secondary amino group in the side chain;
the gel content of the crosslinked product being 70% or more.

4,855,364

SECONDARY VULCANIZATION ACCELERATOR

Paul H. Sandstrom, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 95,785, Sep. 14, 1987. This application Jan. 27, 1989, Ser. No. 302,521
Int. Cl.[4] C08C *19/22, 19/20;* C08F *8/34*
U.S. Cl. 525—332.7 11 Claims

1. A sulfur vulcanizable unsaturated rubber composition which is comprised of (a) at least one unsaturated rubber, (b) sulfur, (c) at least one primary accelerator, and (d) the secondary accelerator is 4,7-diaza-decane-1,10-diamine.

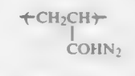
4,855,365

POLY-β-ALANINE COMPOUND, A PROCESS FOR PRODUCING THE SAME AND A POLYACETAL RESIN COMPOSITION CONTAINING A POLY-β-ALANINE COMPOUND

Fumihiko Yamamoto, Kawasaki, and Teruyuki Misumi, Yokohama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 8, 1987, Ser. No. 47,311
Claims priority, application Japan, May 9, 1986, 61-105889; May 9, 1986, 61-105890
Int. Cl.[4] C08G *69/00*
U.S. Cl. 525—401 4 Claims

1. A polyacetal resin composition comprising:
60 to 99.99% by weight, based on the composition, of a polyacetal resin; and
0.01 to 3% by weight, based on the composition, of
a poly-β-alanine comprising:
(X) monomeric units represent by the formula CH_2CH_2CONH; and
(Y) monomeric units represented by the formula



the content of said units (Y) being in the range of 1.4 to 10 mmol per gram of the poly-β-alanine.

4,855,366

MONOCARBOXYLIC ACID DERIVATIVES OF AROMATIC BASED EPOXY RESINS

Michael B. Cavitt, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 22, 1988, Ser. No. 210,050
Int. Cl.[4] C08G *59/16*
U.S. Cl. 525—533 32 Claims

1. An adduct of (A) at least one polyglycidyl ether of a compound containing an average of more than one phenolic hydroxyl group per molecule and (B) at least one aliphatic monocarboxylic acid containing from 7 to 15 carbon atoms per molecule; wherein components (A) and (B) are present in amounts which provide a ratio of carboxylic acid groups per epoxide group of from about 0.01:1 to about 0.2:1.

4,855,367

ORTHOCARBONATES

Peter Flury, Himmetried; Sameer H. Eldin, Fribourg; Martin Roth, Giffers, all of Switzerland, and Claus W. Rabener, Oetlingen, Fed. Rep. of Germany, assignors to Giba-Geigy Corporation, Hawthorne, N.Y.

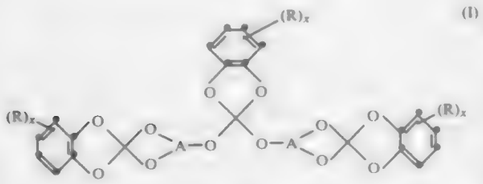
Filed Jun. 7, 1988, Ser. No. 203,792

Claims priority, application Switzerland, Jun. 10, 1987, 2173/87

Int. Cl.[4] C08G *59/40*; C07D *493/10*

U.S. Cl. 525—507 12 Claims

1. An orthocarbonate of the formula I



(I)

in which R is C_1–C_4alkyl, x is zero, 1 or 2, and A is a trivalent radical derived from an aliphatic triol through omission of the hydroxyl groups, the hydroxyl groups of the triol being bonded to different carbon atoms.

10. A curable mixture of substances containing

(a) an orthocarbonate of the formula I according to claim 1,

(b) an epoxy resin and

(c) a curing agent and, if desired, a curing catalyst for the epoxy resin.

4,855,368

THERMOSET RESINOUS MOLDING COMPOSITIONS

Timothy A. Tufts; Dan Borgnaes; Billy M. Culbertson, all of Columbus, and Theodore C. Wilkinson, Dublin, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 75,225, Jul. 17, 1987, abandoned, which is a continuation of Ser. No. 787,550, Oct. 15, 1985, abandoned. This application Jun. 21, 1988, Ser. No. 212,105

Int. Cl.[4] L08L *63/10*

U.S. Cl. 525—454 3 Claims

1. A thermoset resinous composition adapted for use in a reaction injection molding operation prepared by polymerizing a resin-forming reactant mixture consisting essentially of a polyisocyanate, an aromatic primary or secondary polyfunctional amine and a hydroxyl group bearing vinyl ester and wherein the isocyanate index of said reactant mixture is from about 95 to 105.

4,855,369

HIGH SOLIDS ACRYLIC-BASED COATINGS

Albert I. Yezrielev, Kendall Park, N.J.; Michael G. Romanelli, Brooklyn, N.Y., and William E. Wellman, Edison, N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 807,586, Dec. 11, 1985, abandoned. This application Jun. 6, 1988, Ser. No. 202,955

Int. Cl.[4] C08F *18/00*

U.S. Cl. 526—320 10 Claims

1. Improved acrylic resins, which comprise resins formed by polymerization of from about 30 to 95 wt.% of an acrylic monomer mixture in the presence of from about 5 to 70 wt.% of a polymerization solvent, said acrylic monomer mixture comprising:

(i) from about 5 to 45 wt.% of at least one member selected from the group consisting of hydroxy-substituted alkyl (meth)acrylates, acrylic acid and methacrylic acid;

(ii) from about 20 to 80 wt.% of at least one member selected from the group consisting of non-hydroxy substituted C_1–C_4 alkyl methacrylates and vinyl aromatic hydrocarbons;

(iii) from about 0.5 to 6 wt.% of at least one free radical polymerization initiator;

(iv) from about 1 to 55 wt.% of at least one alpha-olefin monomer selected from the group consisting of aliphatic alpha-olefins of from 7 to 20 carbon atoms; and

(v) from about 0 to 64 wt.% of at least one alkyl ester of acrylic acid,

with the proviso that the sum of monomers (i) and (ii) comprise at least about 35 wt.% of said monomer mixture.

4,855,370

METHOD FOR REDUCING SHEETING DURING POLYMERIZATION OF ALPHA-OLEFINS

John R. Chirillo, Victoria; Kellam C. Kimbrough II, Inez, and Peder E. McHattie, Victoria, all of Tex., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 1, 1986, Ser. No. 914,443

Int. Cl.[4] C08F *2/34*, *10/00*

U.S. Cl. 526—74 22 Claims

1. A method for reducing sheeting during polymerization of alpha-olefins in a low pressure fluidized bed reactor utilizing titanium or vanadium based compounds as catalysts together with alkyl aluminum cocatalysts which comprises introducing water into said reactor in an amount sufficient to maintain the electrostatic levels at the site of possible sheet formation at levels which avoid sheeting without substantially altering the effectiveness of said catalysts.

4,855,371

PROCESS FOR POLYMERIZING OLEFINS WITH A CRYSTALLINE MAGNESIUM CATALYST COMPONENT

Robert C. Job, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 875,845, Jun. 18, 1986, Pat. No. 4,710,482. This application Nov. 24, 1987, Ser. No. 124,809

Int. Cl.[4] C08F *4/64*, *10/00*

U.S. Cl. 526—124 28 Claims

1. A polymerization process which comprises contacting at least one olefin with a catalyst composition comprising:

(a) A crystalline magnesium halide/titanium halide catalyst component obtained by the process comprising

(i) contacting a stable crystalline alkoxy magnesium compound selected from the group consisting of compounds with the formula X where X is a counter ion or ions having a total charge of −2 and R and R', which may be the same or different, are selected from alkyl groups of 1 to 4 carbon atoms with a halide of tetravalent titanium, and

(ii) contacting the resulting halogenated product with a tetravalent titanium halide nothing, and

(b) an organoaluminum compound.

4,855,372

METHOD OF PREPARING PULVERULENT OLEFIN-MALEIC ANHYDRIDE COPOLYMERS

Bernhard-Peter Scholz, Oer-Erkenschwick, Fed. Rep. of Germany, assignor to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed May 27, 1987, Ser. No. 54,824

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1986, 3628247

Int. Cl.[4] C08F *2/08*

U.S. Cl. 526—201 16 Claims

1. A method of preparing a pulverulent olefin-maleic anhydride copolymer from a solution of an olefin, maleic anhydride and an organic solvent, said solvent being capable of dissolving said olefin and said maleic anhydride, and said solvent being selected from the group consisting of benzene, C_{1-20}-alkylbenzenes and mixtures thereof, comprising the steps of:

(i) radically polymerizing said olefin and maleic anhydride in said solution at a temperature of about 80°–160° C. in the presence of a dispersant, to produce a solids containing reaction mixture;

(ii) terminating said polymerizing step when the maleic anhydride conversion is greater than about 90%; and

(iii) separating said copolymer from said reaction mixture.

4,855,373

MULTI-SITED HYDRAZONE INITIATORS OF VINYL POLYMERIZATION

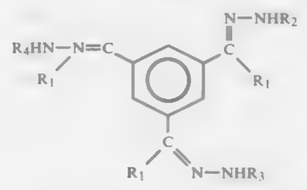
Richard A. Wolf, and John M. Warakomski, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 7, 1988, Ser. No. 268,136

Int. Cl.[4] C08F *4/04*; C07C *109/16*

U.S. Cl. 526—218.1 8 Claims

1. A compound for initiation of vinyl polymerization comprising a hydrazone of Formula I:



I

wherein:

R_1 =H or an alkyl group having up to 22 carbons;

R_2, R_3 and R_4 are independently H or an aromatic or an aliphatic group having up to 22 carbons.

4,855,374

OPTICAL RESIN FROM DIALLYL ESTERS

Yoshishige Murata; Yasumi Koinuma; Naoyuki Amaya, all of Oita; Takayuki Otsu, Nara, and Masafumi Nisimura, Oita, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 30,299, Mar. 23, 1987, abandoned, which is a division of Ser. No. 806,735, Dec. 9, 1985, abandoned. This application Jun. 22, 1988, Ser. No. 211,166

Int. Cl.[4] C08F *226/06*, *218/16*

U.S. Cl. 526—261 1 Claim

1. A transparent optical article constituted of an optical resin obtained by radical polymerization of a diester of dicarboxylic acid and a cross-linkable monomer having at least one allyl group, said diester of dicarboxylic acid being selected from the group consisting of dimethyl fumarate, diethyl fumarate diisopropyl fumarate, di-tert-butyl fumarate, di-sec-butyl fumarate, dicyclopentyl fumarate, dicyclohexyl fumarate, dicycloheptyl fumarate, isopropylmethyl fumarate, methyl-tert-butyl fumarate, isopropylcyclohexyl fumarate, diallyl fumarate, allylisopropyl fumarate, allylcyclohexyl fumarate, methallylisopropyl fumarate, diallyl maleate, diethyl maleate, diisopropyl maleate, dicyclohexyl maleate, allylethyl maleate, allylisopropyl maleate, allylcyclohexyl maleate, diphenyl fumarate, dibenzyl fumarate, diphenethyl fumarate, di(chlorophenyl) fumarate, di(bromophenyl) fumarate, di(chlorobenzyl) fumarate, di(-bromobenzyl) fumarate, isopropylphenyl fumarate, isopropylbenzyl fumarate, cyclohexylphenyl fumarate, cyclohexylbenzyl fumarate, allylphenyl fumarate, allylbenzyl fumarate, diphenyl maleate, dibenzyl maleate, allylphenyl maleate, allylbenzyl maleate, di(phenoxyethyl) fumarate, di(orthochlorophenoxyethyl) fumarate and mixtures thereof, said cross-linkable monomer being selected from the group consisting of diallyl phthalate, diallyl isophthalate, allyl acrylate, allyl methacrylate, diethyleneglycolbisallyl carbonate, triallyl trimellitate, triallyl isocyanurate, triallyl cyanurate, diallyl hexahydrophthalate, diallyl chlorendate, diethyleneglycol diallyl ether and mixtures thereof, said cross-linkable monomer being mixed in a mixing ratio by weight of diester of dicarboxylic acid to cross-linkable monomer of from 99/1 to 10/90.

4,855,375

STYRENE TERMINATED MULTIFUNCTIONAL OLIGOMERIC PHENOLS AS NEW THERMOSETTING RESINS FOR COMPOSITES

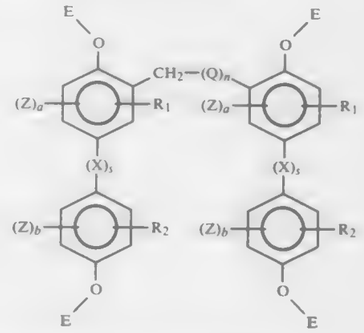
Joseph J. Zupancic, Bensenville; Andrew M. Zweig, Schaumburg, and James A. Wrezel, Buffalo Grove, all of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 87,921, Aug. 21, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 276,598

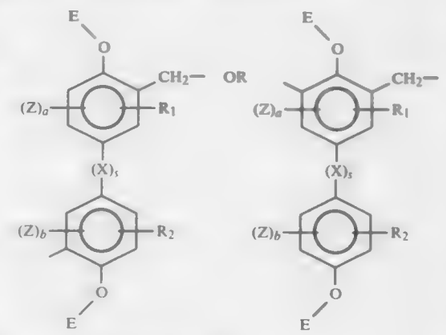
Int. Cl.[4] C08F *16/32*

U.S. Cl. 526—247 13 Claims

1. A thermosetting resin which is a vinylbenzyl ether of the oligomeric condensation product of a dihydric phenoland formaldlehyde and with the formula:



where the recurring unit Q has the structure,



OR

and n is an integer from 1 to 10;

s is 0 or 1;

each X is independently selected from the group consisting of CH_2, $C(CH_3)_2$, $C(CF_3)_2$, $S(O)_2$, and OC_6H_4O;

each R_1 and nR_2 is independently selected from the group consisting of hydrogen, alkyl and alkoxy moieties containing 1 to 10 carbon atoms, phenyl and phenoxy;

a and b are independently 0 or integers from 1 to 4;

Z is Cl or Br;

E is selected from the group consisting of the vinylbenzyl moiety, alkyl moieties containing 1 to 10 carbona toms, or benzyl, subject to the constraint that at least 50% of all E's are the vinylbenzyl moiety.

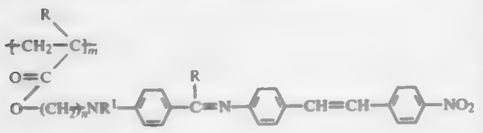
4,855,376

SIDE CHAIN LIQUID CRYSTALLINE POLYMERS EXHIBITING NONLINEAR OPTICAL PROPERTIES

Ronald N. De Martino, Wayne; Hyun-Nam Yoon, New Providence, and James B. Stamatoff, Westfield, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

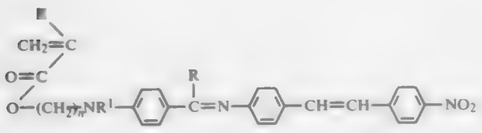
Filed Nov. 21, 1986, Ser. No. 933,425
Int. Cl.[4] C08F *265/04*; F21V *9/00*
U.S. Cl. 526—311 **7 Claims**

1. A side chain liquid crystalline polymer characterized by a recurring monomeric unit corresponding to the formula:



where m is an integer of at least 3; n is an integer between 1–25; R is hydrogen or a C_1–C_4 alkyl substituent; and R^1 is hydrogen or a methyl group.

7. An acrylic ester composition corresponding to the formula:



where n is an integer between 1–25; R is hydrogen or a C_1–C_4 alkyl substituent; and R^1 is hydrogen or a methyl group.

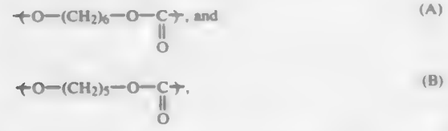
4,855,377

NOVEL COPOLYCARBONATE

Masahisa Yokota, Nobeoka; Atsushi Shimizu, Yokohama; Kyosuke Komiya, Kurashiki; Kazunori Yamataka, Yokohama, and Tadanori Nonura, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 3, 1988, Ser. No. 227,818
Claims priority, application Japan, Aug. 4, 1987, 62-193769; Sep. 21, 1987, 62-236728
Int. Cl.[4] C08G *18/28*
U.S. Cl. 528—25 **9 Claims**

1. A copolycarbonate comprising recurring units respectively of the formulae:



(A)

(B)

and terminal groups, the molar ratio of units (A) to units (B) being in the range of from 9:1 to 1:9, the copolycarbonate having a number average molecular weight of from 300 to 50,000.

4,855,378

ORGANOSILICON COMPOUNDS AND CROSSLINKABLE ORGANOPOLYSILOXANE COMPOSITIONS CONTAINING THE ORGANOSILICON COMPOUNDS

Ferdinand Pradl; Carlos Weise, and Karl-Heinrich Wegehaupt, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 4, 1987, Ser. No. 93,264
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1986, 3631125
Int. Cl.[4] C08G *77/12, 77/40*
U.S. Cl. 528—26 **5 Claims**

1. An organopolysiloxane composition which is crosslinked by the addition of Si-bonded hydrogen to SiC-bonded vinyl groups to form organopolysiloxane elastomers which comprises a diorganopolysiloxane containing SiC-bonded vinyl groups, a compound containing Si-bonded hydrogen, a catalyst which promotes the addition of Si-bonded hydrogen to SiC-bonded vinyl groups and a compound selected from the group consisting of an allyl-3,4-dimethyoxyphenyl acetate, allyl cyanoacetate, allyl acetoacetate, allyl diacetoacetate and an allyl p-methoxyphenylacetate.

4,855,379

SILICONE SURFACTANTS CONTAINING CYCLIC SILOXANE PENDANTS

Richard A. Budnik, Mount Kisco, and Gerald J. Murphy, Wappingers Falls, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 8, 1988, Ser. No. 165,537
Int. Cl.[4] C08G *77/14*
U.S. Cl. 528—29 **8 Claims**

1. A siloxane-polyether surfactant comprising a siloxane backbone to which is attached both polyether groups and cyclic siloxane groups said cyclic siloxane groups being free of reactive groups and which are attached to the siloxane backbone through Si—CH_2—CH_2—Si linkages.

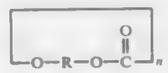
4,855,380

CYCLOPENTADIENE-CONTAINING CYCLIC POLYCARBONATE OLIGOMER

Christopher M. Hawkins, Evansville, and Edgar E. Bostick, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 16, 1987, Ser. No. 133,854
Int. Cl.[4] C08G *63/62*
U.S. Cl. 528—370 **1 Claim**

1. A composition comprising an oligomeric mixture produced by reacting a precursor cyclic oligomer composition having the formula:



wherein n is variously 2 to about 30, wherein R in at least about 60% of the total number of R values of said composition being aromatic and the balance of the R values being aliphatic, alicyclic or aromatic with an alkali metal or magnesium salt of cyclopentadiene or substituted cyclopentadiene and recovering said cyclopentadiene-containing oligomers.

4,855,381

METHOD FOR THE PREPARATION OF AN ORGANOPOLYSILOXANE

Kiyoyuki Mutoh; Kazushi Satoh, and Kouichirou Kobayashi, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1988, Ser. No. 201,156
Claims priority, application Japan, Jun. 3, 1987, 62-139114
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—23 **13 Claims**

1. A method for the preparation of an organopolysiloxane containing tetrafunctional siloxane units and monofunctional siloxane units which comprises:

reacting an alkyl orthosilicate or a partial hydrolysis product thereof with an oligomeric organopolysiloxane having at least one monofunctional siloxane unit represented by the general formula $R_3SiO_{0.5}$, in which R is a hydrogen atom or a monovalent hydrocarbon group, in the presence of a catalytic compound selected from the group consisting of a sulfonic acid group-containing compounds and phosphonitrile compounds.

4,855,382

CROSS-LINKABLE HOT MELT ADHESIVE COMPOSITION

Gerard M. Vanhaeren, Rixensart, Belgium, assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Aug. 3, 1988, Ser. No. 227,971
Claims priority, application United Kingdom, Aug. 4, 1987, 8718480
Int. Cl.[4] C08G *18/80*
U.S. Cl. 528—45 **12 Claims**

1. A hot melt adhesive composition comprising:

(a) a copolymer of at least 50 wt % ethylene containing hydroxyl functionality having a melt viscosity of from 1 to 100 Pa.s at 180° C.

(b) an internally blocked polyisocyanate

(c) a viscosity reducing component.

4,855,383

IN SITU QUATERNARY AMMONIUM CATALYST FORMATION FOR CURING POLYMERIC ISOCYANATES

Laurence G. Dammann; Brent A. Blakley, both of Westerville, and Gary M. Carlson, Dublin, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 23, 1988, Ser. No. 248,805
Int. Cl.[4] C08G *18/02*
U.S. Cl. 528—51 **22 Claims**

1. A method for curing a curable composition which comprises:

(a) formulating a storage-stable, liquid coating composition comprising an isocyanate-functional compound, an epoxy component, and an alkylating agent;

(b) admixing said liquid composition with a tertiary amine; and

(c) applying the mixture of step (b) onto a substrate, said t-amine forming a quaternary ammonium salt in situ by reacting with said epoxy component and with said alkylating agent for achieving cross-linking of said isocyanate-functional compound.

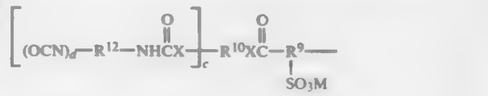
4,855,384

SULFONATE-CONTAINING PHOTOPOLYMER SYSTEMS

Wayne K. Larson, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 9,616, Jan. 22, 1987, Pat. No. 4,746,717, which is a continuation of Ser. No. 739,542, May 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 562,459, Dec. 16, 1983, Pat. No. 4,558,149. This application Feb. 12, 1988, Ser. No. 156,303
Int. Cl.[4] C08G *18/32*
U.S. Cl. 528—60 **16 Claims**

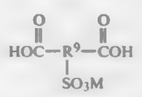
1. A sulfopolyurea or a sulfopolyurethane prepared by the reaction of a compound selected from the group consisting of water, a hydrazino compound, and a polyol or polyamine having the formula $HXR^{10}(XH)_c$, with an isocyanate-termined sulfopolyester or sulfopolyamide having the formula





wherein

R^9 is an arenetriyl (trivalent arene) group having 6 to 12 carbon atoms or an alkanetriyl (trivalent alkane) group having 2 to 12 carbon atoms remaining after the remodel of carboxyl and sulfo groups from sulfoarene- and sulfoalkane dicarboxylic acids having the formula



in which M is a cation, or a primary, secondary, tertiary, or quaternary ammonium cation, and benzyltrimethylammonium cation;

R^{10} is a linear aliphatic group having a valence of (c+1) consisting of a saturated chain of up to about 110 carbon atoms in units of 2 to 12 —CH_2— groups which can be separated by individual oxygen atoms and



groups,

the aliphatic group having a molecular weight of up to about 2000, wherein c is an integer of 1, 2, or 3;

R^{12} is an organic group having a valence of (d+1) selected from linear and branched groups having 2 to 12 carbon atoms, 5- and 6-membered carbocyclic groups having 5 to 14 carbon atoms wherein d is an integer having a value of 1 to 3; and

X is —O— or —NH—.

4,855,385

MONOCARBOXYLIC ACID DERIVATIVES OF ALIPHATIC BASED EPOXY RESINS

Michael B. Cavitt, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 22, 1988, Ser. No. 210,065
Int. Cl.[4] C08G *59/16, 59/06, 59/30*
U.S. Cl. 528—97 **40 Claims**

1. An adduct of (A) at least one polyglycidyl ether of: (1) a compound containing an average of more than one hydroxyl

group per molecule and also at least one cycloalkadiene or oligomer of a cycloalkadiene per molecule or (2) a compound represented by the formula HO—(—A—Y—)$_n$—A—OH wherein each A is independently a divalent hydrocarbyl group having from about 2 to about 6 carbon atoms; each Y independently is —S— or —S—S—; and n has a value from 1 to about 11; and (B) at least one aliphatic monocarboxylic acid containing 6 to 18 carbon atoms per molecule; wherein components (A) and (B) are present in amounts which provide a ratio of carboxylic acid groups per epoxide group of from about 0.01:1 to about 0.2:1.

6. A thermosettable composition comprising (A) one or more adducts of claim 1 and (B) a curing amount of at least one suitable curing agent for component (A).

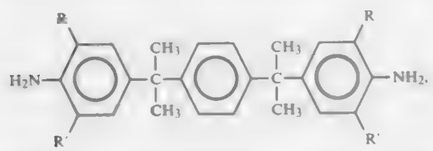
4,855,386

CURING AGENTS FOR EPOXY RESINS COMPRISING DIAMINES WITH THE DI(P-AMINOPHENYL)-DIISOPROPYL BENZENE STRUCTURE

Ronald S. Bauer, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 31, 1987, Ser. No. 140,012
Int. Cl.^{4} C08G *59/50*
U.S. Cl. 528—117 **9 Claims**

1. A composition comprising
(a) an epoxy resin and
(b) a curing amount of an aromatic amine which can be represented by the formula



in which each R is ethyl and each R′ is selected from methyl and ethyl.

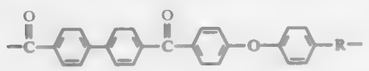
4,855,387

POLY(ARYLENE ETHER KETONES) HAVING BIPHENYLENE-4,4′-DICARBONYL GROUPS

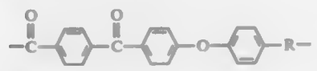
John B. Mazzanti, Belmont, and Stephen Moore, Redwood City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jul. 9, 1987, Ser. No. 72,190
Int. Cl.^{4} C08G *8/02, 14/00*
U.S. Cl. 528—125 **15 Claims**

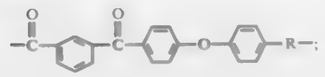
1. A copoly(arylene ether ketone) comprising
(A) a repeat unit



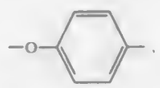
and
(B) a repeat unit selected from the group consisting of



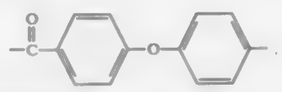
and



where R, which is the same in each of repeat units (A) and (B), is a direct bond,



or



the molar ratio of repeat units (A) to repeat units (B) being between about 10:90 and about 70:30.

4,855,388

CO-REAGENT STABILIZATION OF POLY(ARYL ETHER SULFONES) USING SODIUM, LITHIUM, ALKALINE EARTH OR LANTHANIDE METAL SALTS

Donald R. Kelsey, Houston, Tex., assignor to Amoco Corporation, Chicago, Ill.

Filed Dec. 29, 1987, Ser. No. 138,965
Int. Cl.^{4} C08G *8/02, 14/00*
U.S. Cl. 528—125 **10 Claims**

1. An improved process for preparing poly(aryl ether sulfones) by a nucleophilic displacement reaction conducted in the presence of potassium, rubidium or cesium and fluoride, wherein the improvement comprises adding sodium, lithium, alkaline earth, or lanthanide metal salt to the polycondensation reaction just prior to or at the desired molecular weight in an amount effective to control the molecular weight of the poly(aryl ether sulfones).

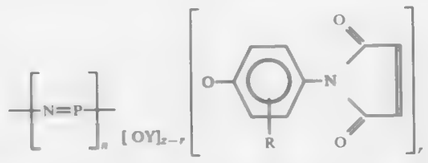
4,855,389

PROCESS FOR PRODUCING PHOSPHONITRILE OLIGOMERS CONTAINING MALEIMIDOPHENOXY GROUP

Shinichiro Ueyama, Tokyo; Masayuki Furukawa, Saitama, and Tadaichi Nishikawa, Kamakura, all of Japan, assignors to Shin Nisso Kako Co., Ltd., Japan

Filed Aug. 28, 1987, Ser. No. 90,368
Claims priority, application Japan, Aug. 29, 1986, 61-201319
Int. Cl.^{4} C08G *79/04*
U.S. Cl. 528—168 **8 Claims**

1. A process for producing a phosphonitrile oligomer having a repeating unit of the formula

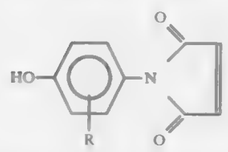


wherein
R represents a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group or a lower alkoxyalkyl group, Y represents an unsubstituted aryl group, an aryl group having a substituent selected from the group consisting of halogen, ower alkyl, lower alkoxy and lower alkoxyalkyl,
an unsubstituted alkyl group, an alkyl group having a substit uent selected from the group consisting of halogen and alkoxy, an alkenyl group, an alkynyl group, an unsubstituted aralkyl group, an aralkyl group having a substituent

selected from the group consisting of halogen, lower alkyl and lower alkoxy, or a cycloalkyl group, n is an integer of not less than 3, and in each repeating unit r is an integer of 0 to 2, wherein in at least one repeating r is not 0 and wherein in at least one repeating unit r is 0 or 1, which process comprises reacting a phosphonitrile chloride oligomer represented by the formula



with a maleimide derivative represented by the formula



and a hydroxy compound represented by the formula HO—Y.

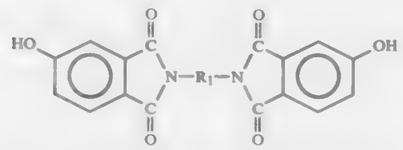
4,855,390

PROCESS FOR PREPARING POLYESTERIMIDE FROM BIS(HYDROXYPHTHALIMIDE)

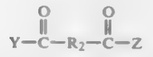
Shigekuni Sasaki, Iruma, and Yoshinori Hasuda, Tokyo, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Division of Ser. No. 839,685, Mar. 14, 1986, Pat. No. 4,769,475. This application Apr. 22, 1988, Ser. No. 185,098
Claims priority, application Japan, Mar. 19, 1985, 60-55151; Oct. 25, 1985, 60-238649
Int. Cl.^{4} C08G *63/14, 73/10*
U.S. Cl. 528—170 **11 Claims**

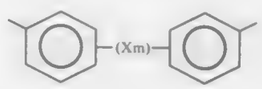
1. A process for the preparation of a polyesterimide which comprises reacting a bis(hydroxyphthalimide) with a dicarboxylic acid dihalide in an organic solvent and in the presence of a tertiary amine, said bis(hydroxyphthalimide) represented by the following formula:



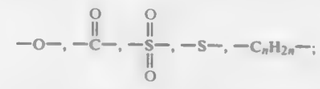
wherein R_1 is a difunctional organic group selected from the groups (a), (b) or (c) wherein:
(a) is an aromatic hydrocarbon group;
(b) is hexylene; and
(c) is diphenylmethane, diphenylsulfide, diphenylsulfone, diphenylether or diphenylketone, and said dicarboxylic acid dihalide represented by the following formula:



wherein R_2 is a difunctional organic group selected from the group (a), (b), or (c) wherein:
(a) is an aromatic hydrocarbon group; having 6 to 20 carbon atooms or a halogenated derivative thereof;
(b) is an alkylene group; and
(c) is a group represented by the following formula:



wherein X is a group selected from the groups consisting of



m is an integer of 1 or zero; and n is an integer of 1 to 5, and wherein Y is a halogen atom selected from the group consisting of fluorine, chlorine, bromine and iodine and Z is a halogen atom selected from the group consisting of fluorine, chlorine, bromine and iodine.

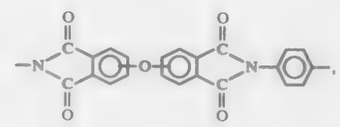
4,855,391

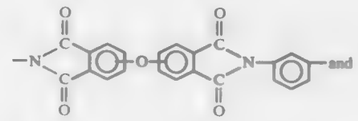
HIGH TEMPERATURE STABLE POLYETHERIMIDES FROM OXYDIPHTHALIC DIANHYDRIDE AND A MIXTURE OF M- AND P-PHENYLENE DIAMINES AND DIAMINODIPHENYL ETHER

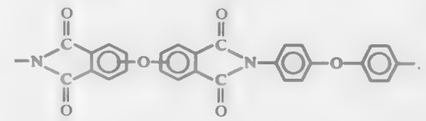
Donald R. Berdahl, Scotia; James A. Cella, and Gary K. Shank, both of Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 95,982, Sep. 14, 1987, abandoned. This application Jun. 3, 1988, Ser. No. 201,817
Int. Cl.^{4} C08G *73/10*
U.S. Cl. 528—188 **3 Claims**

1. A polyetherimide which is free from olefinic groups and which consists essentially of structural units of at least two of the formulas


(II)


(III)


(IV)

each present in the proportions of about 25–75% by number.

4,855,392

PHOTOGRAPHIC ELEMENT COMPRISING POLYCARBONATE HAVING TERTIARY AMINE ACID ADDITION SALT

Tsang J. Chen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 91,249, Aug. 31, 1987. This application Sep. 16, 1988, Ser. No. 245,105
Int. Cl.^{4} C08G *63/62*
U.S. Cl. 528—203 **1 Claim**

1. A photographic element comprising a layer of a polycar-

bonate having from about 0.1 to 30 mole percent of recurring units having a tertiary amine acid addition salt component.

4,855,393

PROCESS FOR THE PREPARATION OF COPOLY(ARYLENE SULFIDE)

Mark Rule; David R. Fagerburg; Joseph J. Watkins, all of Kingsport, and Jerry S. Fauver, Blountville, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 211,180, Jun. 24, 1988, abandoned. This application Feb. 13, 1989, Ser. No. 312,289

Int. Cl.[4] C08G *75/14*

U.S. Cl. 528—212 12 Claims

1. A process for producing elemental iodine and a copoly(arylene sulfide) corresponding to the structure:

$$[(-A-S-)_{1-x}(-A-S-S-)_x]_n$$

wherein A is a divalent substituted or unsubstituted aromatic radical, x is in the range of 0.5 to 0.001 and n is at least 200, comprising

(1) reacting at a temperature above about 175° C. a mixture of a diiodoaromatic compound and elemental sulfur in the absence of a basic material to produce the elemental iodine and the copoly(arylene sulfide), and

(2) recovering the elemental iodine.

4,855,394

REACTION PRODUCTS AND CONDENSATES BASED ON SUBSTITUTED PROPYLENEUREAS AND THEIR PREPARATION

Ulrich Goeckel, Boehl-Iggelheim; Harro Petersen, Frankenthal; Rolf Osterloh, Gruenstadt; Eberhard Schupp, Schwetzingen; Werner Loch, Erpolzheim, and Thomas Schwerzel, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

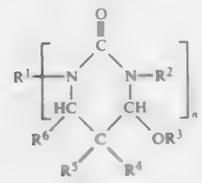
Continuation of Ser. No. 886,403, Jul. 15, 1986, abandoned. This application Jan. 25, 1989, Ser. No. 302,131

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1985, 3525438; Jul. 15, 1985, 3525434; Jul. 15, 1985, 3525435; Jul. 15, 1985, 3525437

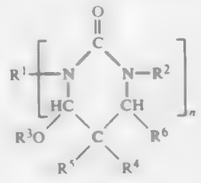
Int. Cl.[4] C08G *71/02, 12/12*

U.S. Cl. 528—263 4 Claims

1. A condensate which essentially contains substituted propyleneureas of the formulae (I) and/or (II)



(I)



(II)

where R^1 is a divalent or polyvalent, straight-chain or branched alkylene, cycloalkylene, oxaalkylene or azaalkylene radical of 4 to 60 carbon atoms which may contain one or more hydroxyl groups and/or urea substituted by hydroxyalkyl, hydroxycycloalkyl, hydroxyoxaalkyl and/or hydroxyazaalkyl, R^2, R^3, R^4, R^5 and R^6 are identical or different and are each hydrogen, alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 15 carbon atoms or oxaalkyl or azaalkyl, each of 2 to 18 carbon atoms, and R2 may furthermore be hydroxyalkyl, with the proviso that where R2 is hydroxyalkyl the latter is of 4 to 18 carbon atoms and n is from 2 to 20, and the individual radicals R^2, R^3, R^4, R^5 and R^6 of the n propyleneurea units of the formulae (I) and/or (II) may be identical or different while conforming to the stated definitions.

4,855,395

HYDROXYETHYLNORBORNENE COMPOUNDS AND A PROCESS FOR THEIR PREPARATION

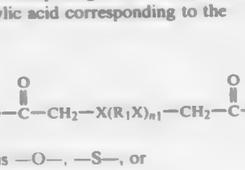
Jerome L. Stavinoha, and Anthony W. McCollum, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 101,472, Sep. 28, 1987, Pat. No. 4,789,602. This application Sep. 16, 1988, Ser. No. 245,110

Int. Cl.[4] C08G *63/02*

U.S. Cl. 528—272 16 Claims

1. A compound of the formula:



wherein R represents an aliphatic or aromatic, branched or unbranched hydrocarbon of 1 to 25 carbon atoms.

4,855,396

POLYESTERS CONTAINING COVALENTLY BOUND QUATERNARY PHOSPHONIUM SALTS

John C. Wilson, and Thomas A. Jadwin, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1988, Ser. No. 229,044

Int. Cl.[4] C08G *63/20*

U.S. Cl. 528—272 9 Claims

1. A polyester containing a quaternary phosphonium salt comprising a cationic portion and an anionic portion, wherein the cationic portion of the salt comprises a phosphorous atom directly covalently bonded to at least one aryl moiety substituted with a group having an ester linkage to the rest of the polyester, and wherein the anionic portion of the salt comprises an arylsulfonate moiety in which the aryl group is unsubstituted or is substituted with one or more alkyl, halide, or group having an ester linkage to the rest of the polyester.

4,855,397

POLYESTERAMIDE FROM AMINO ALCOHOL WITH IMPROVED GAS BARRIER PROPERTIES

Robert B. Barbee, Kingsport, and Larry A. Minnick, Bluff City, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

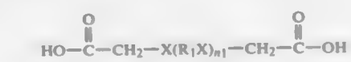
Filed Nov. 17, 1988, Ser. No. 272,379

Int. Cl.[4] C08G *63/16*

U.S. Cl. 528—335 5 Claims

1. A polyesteramide having an inherent viscosity of at least 0.5 measured at 25° C. in a 60/40 by weight mixture of phenol/tetrachloroethane at a concentration of 0.5 g/100 mL, the polyesteramide comprising the reation product of

(A) a dicarboylic acid corresponding to the structure

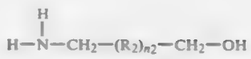


wherein X is —O—, —S—, or



n_1 is 0 or 1 and R_1 is an aromatic structure containing 6 to 15 carbons, and

(B) an aminoalcohol corresponding to the formula



where n_2 is 0 or 1 and R_2 is an aliphatic structure of 1 to 12 carbons.

4,855,398

REACTION OF BICYCLIC AMIDE ACETAL WITH UREA

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 850,655, Apr. 11, 1986, Pat. No. 4,760,178. This application May 12, 1988, Ser. No. 192,987

Int. Cl.[4] C08G *71/02*

U.S. Cl. 528—367 7 Claims

1. The process for producing oligomeric compounds containing a member selected from the group consisting of hydroxy alkyl amide groups and hydroxy alkyl thioamide groups comprising reacting a bicyclic amide acetal with a member selected from the group consisting of urea, biuret, thiourea, thiobiuret, alkyl substituted ureas, aryl substituted ureas, alkyl substituted thioureas, aryl substituted thioureas, alkylene ether ureas, arylene ether ureas, alkylene ether thiureas and arylene ether thioureas at a temperature in excess of about 100° C.

4,855,399

CARBON MONOXIDE/OLEFIN CO-POLYMERIZATION PROCESS WITH PHOSPHINO SUBSTITUTED SULFONIC ACID CATALYST

Johannes A. Van Doorn; Eit Drent; Petrus W. N. M. Van Leeuwen; Nicolaas Meijboom; Aart B. Van Oort, and Richard L. Wife, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 31, 1987, Ser. No. 140,013

Claims priority, application Netherlands, Feb. 26, 1987, 8700476

Int. Cl.[4] C08G *67/02*

U.S. Cl. 528—392 12 Claims

1. The process of producing a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon by contacting under polymerization conditions the carbon monoxide and hydrocarbon in the presence of a catalyst composition formed from a palladium compound and a phosphino-substituted sulfonic acid of up to 30 carbon atoms.

4,855,400

REMOVAL OF CATALYST RESIDUES FROM CARBON MONOXIDE/OLEFIN POLYMERS WITH CATALYST COMPLEXING AGENT

Johannes A. M. van Broekhoven, and Michael J. Doyle, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 935,429, Nov. 26, 1986, Pat. No. 4,786,716. This application Mar. 10, 1988, Ser. No. 166,296

Claims priority, application Netherlands, Nov. 26, 1985, 8503258; Mar. 13, 1987, 8700604

Int. Cl.[4] C08G *67/02*

U.S. Cl. 528—392 15 Claims

1. In the liquid phase process for preparing a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon by contacting the carbon monoxide and hydrocarbon under polymerization conditions of temperature and pressure in the presence of an inert diluent and a catalyst composition formed from a palladium compound, an anion of a nonhydrohalogenic acid having a pKa less than about 6 and an organic ligand and recovering the polymer from the resulting product mixture, the improvement which comprises contacting the polymer subsequent to its production but prior to its recovery with at least about 4×10^{-8} equivalents of a complexing agent for palladium per mole of hydrocarbon polymerized, therein forming a palladium-containing solution comprising said inert diluent and the resulting palladium complex, separating said palladium-containing solution from said polymer and recovering thereafter polymer of enhanced purity.

4,855,401

REMOVAL OF CATALYST REMNANTS FROM CARBON MONOXIDE/OLEFIN POLYMERS AT TEMPERATURES HIGHER THAN POLYMERIZATION TEMPERATURES

Johannes A. M. van Broekhoven, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 14, 1988, Ser. No. 167,926

Claims priority, application Netherlands, Apr. 27, 1987, 8700997

Int. Cl.[4] C08G *67/02*

U.S. Cl. 528—392 11 Claims

1. In the process for the production of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon by contacting the carbon monoxide and hydrocarbon under polymerization conditions of temperature and pressure in the presence of a catalyst composition formed from a palladium compound, an anion of a nonhydrohalogenic acid having a pKa less than about 6 and a bidentate phosphorus ligand selected from 1,3-bis(diphenylphosphino)propane or 1,3-bis[di(2-alkoxyphenyl)phosphino]-propane and recovering the polymer from the resulting product mixture, the improvement which comprises contacting the polymer subsequent to its production but prior to its recovery with an additional quantity of at least about 0.25 mol of bidentate phosphorus ligand per gram atom of palladium present in said polymer at a temperature at least about 10° C. higher than polymerization temperature and recovering thereafter polymer of enhanced purity.

4,855,402

SELF-EMULSIFIABLE RESIN POWDER

Mariano Salazar, Orsay, France, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 52,927, May 22, 1987, Pat. No. 4,777,198, which is a continuation of Ser. No. 801,354, Nov. 25, 1985, abandoned. This application Jun. 16, 1988, Ser. No. 207,418

Int. Cl.[4] C08F *6/00*

U.S. Cl. 528—487 1 Claim

1. A process for dispersing a self-emulsifiable resin powder composition in water comprising:

(a) adjusting the pH of said water to greater than 7;

(b) mixing said self-emulsifiable resin powder composition into the water to form a redispersed latex wherein said self-emulsifiable resin powder composition is comprised of (1) a terpolymer comprised of repeat units derived from about 0.1 to 6 weight percent acrylic acid, (2) about 0.1 to 4 weight percent methacrylic acid, and (3) about 93 to 99 weight percent copolymerizable monomers, with the proviso that the total amount of repeat units derived from acrylic acid, methacrylic acid, and other carboxyl group containing monomers in said terpolymer does not exceed 7 weight percent, said weight percentages being based upon the total weight of said terpolymer; and

(c) from 0.005 to 1 weight percent, based upon the total weight of said powder composition, of at least one member selected from the group consisting of metal salts of alkyl sulfates and metal salts of alkyl sulfonates.

4,855,403

CONNECTED BRANCH COPOLYMERS, METHODS FOR THEIR PRODUCTION, AND COPYING MATERIALS INCLUDING SAME

Debra J. Meschke, Valley Cottage, N.Y., and Kenneth L. Hoy, St. Albans, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 641,640, Aug. 17, 1984, which is a continuation-in-part of Ser. No. 468,670, Feb. 22, 1983, abandoned. This application Aug. 22, 1985, Ser. No. 768,445

Int. Cl.[4] C08G *65/04, 19/00*

U.S. Cl. 528—419 **62 Claims**

1. A capped connected branch copolymer comprising:

(A) a core segment having a valence of v, wherein v is an integer, and having correspondingly v terminal bonds connected to:

(B) v polyvalent, non-crosslinked branched polymer segments each having an average of t terminal bonds, wherein t is greater than about two, one of said terminal bonds being connected to said core segment, and each of said branched polymer segments being connected via its remaining (t—1) terminal bonds to:

(C) a set of linear polymer segments, with an average of t—1 linear polymer segments per set, to provide a group of about v (t—1) linear polymer segments wherein the linear polymer segments have substantially similar chain lengths and composition within said group, the capped connected branch copolymer having a group of terminal linear polymer segments bearing groups capable of effecting hydrogen bonding; and

(D) a set of cap segments connected to terminals of the terminal linear polymer segments which are not connected to the branched polymer segments, each of the cap segments comprising at least one residue of an alkylene oxide containing at least about 4 carbon atoms, there being on average at least about 0.5 of said alkylene oxide residues for each terminal of the terminal linear polymer segments not connected to the branched polymer segments.

4,855,404

PROCESS AND EQUIPMENT FOR PROCESSING THERMOPLASTIC POLYMERS

Stephen R. Betso; Kun S. Hyun, both of Midland, and Patrick M. Russell, Freeland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 822,717, Jan. 27, 1986, abandoned. This application Mar. 14, 1988, Ser. No. 167,762

Int. Cl.[4] C08F *6/00*

U.S. Cl. 528—502 **16 Claims**

1. A method of melt processing a thermoplastic polymer, comprising processing the thermoplastic polymer through processing means having surfaces which contact the thermoplastic polymer, while said thermoplastic polymer is in a heat plastified state, wherein at least 50% of said surfaces which contact the thermoplastic polymer comprises boron carbide.

4,855,405

GLUTAMATE RECEPTOR INHIBITOR

Masanori Yoshioka, Kyoto; Hidemitsu Hou, Osaka, and Nobufumi Kawai, Tokyo, all of Japan, assignors to Tokyo Metropolitan Institute for Neurosciences, Tokyo and Takeda Chemical Industries, Ltd., Osaka, both of, Japan

Continuation of Ser. No. 707,381, Mar. 1, 1985. This application Jun. 8, 1987, Ser. No. 59,517

Claims priority, application Japan, Mar. 2, 1984, 59-38677

Int. Cl.[4] C07K *15/00;* **A61K** *35/56, 37/02*

U.S. Cl. 530—300 **6 Claims**

1. An insecticidally effective composition comprising a glutamate receptor inhibitor, said glutamate receptor inhibitor having insecticidal properties when present in a concentration of at least 10^{-9} M, said glutamate receptor inhibitor possessing only one single spot at the position of Rf value of substantially 0.20 on a Silica gel 60 thin-layer plate developed with phenol-water mixed solvent 3:1 (V/V), said glutamate receptor inhibitor being an organic compound obtained from Joro spider venom glands and which has the following properties:

(a) molecular weight is within the range of 500±200;

(b) it is substantially insoluble in ethyl acetate and soluble in water;

(c) the activity remains unchanged when heated to 80° C. for 20 minutes in water;

(d) the activity remains unchanged when heated to 80° C. for 20 minutes in 0.4 M perchloric acid;

(e) it shows in electrophoresis neutral electric charge with use of 0.01 M phosphate buffer (pH 7) and positive electric charge using 0.2 M formate buffer (pH 2.25);

(f) it develops color with ninhydrin and fluoresces with fluorescamine;

(g) it shows maximum absorption substantially at 270 nm, and minimum absorption substantially at 245 nm in water (pH 6.1).

4,855,406

ONCOGENE-RELATED PEPTIDES

Noboru Yanaihara, Shizuoka, and Kaoru Abe, Yokosuka, both of Japan, assignors to Noboru Yanaihara et al., Shizuoka, Japan

Continuation-in-part of Ser. No. 927,614, Nov. 6, 1986. This application Jul. 10, 1987, Ser. No. 72,191

Claims priority, application Japan, Jul. 11, 1986, 61-164331

Int. Cl.[4] C07K *7/06, 7/08, 7/10*

U.S. Cl. 530—324 **15 Claims**

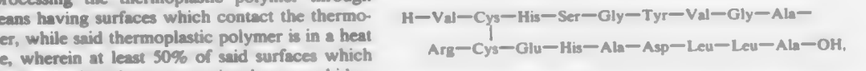
1. An oncogene-related peptide characterized in that the peptide comprises a portion of the amino acid sequence of a gene product coded for by an oncogene wherein the peptide is selected from the group consisting of:

H-Arg-Ser-Ser-Arg-Thr-Arg-Arg-Glu-Thr-Gln-Leu-OH,

H-Tyr,Glu-Ser-Tyr-Lys-Try-Pro-Met-Phe-Ile-Ala-Leu-Ser-Lys-Asn-Gly-Lys-Thr-OH,

H-His-Ala-Asp-Thr-Arg-Asp-Ser-Leu-Leu-Glu-Leu-Ser-Pro-Val-Glu-Arg-Gly-Val-Val-Ser-Ile-Phe-Gly-Val-Ala-Ser-OH,

H-Lys-Gln-Gln-Leu-Leu-Arg-Arg- Glu-Val-Tyr-Asp-Phe-Ala-Phe-Arg-Asp-Leu-OH,



H-Ser-Pro-Glu-Glu-Glu-Glu-Lys-Arg-Arg-Ile-Arg-Arg-Glu-Arg-Asn-Lys-Met-Ala-OH,

H-Ala-Ala-Lys-Cys-Arg-Asn-Arg-Arg-Arg-Glu-Leu-Thr-Asp-OH,

H-Thr-Asp-Gln-Leu-Glu-Asp-Glu-Lys-Ser-Ala-Leu-Gln-OH,

H-Leu-His-Arg-Ala-Ala-His-Thr-Glu-Asp-Ile-Asn-Ala-Cys-Thr-Leu-Thr-Thr-Ser-Pro-Arg-Leu-Pro-Val-Phe-OH,

H-Val-Val-Ser-His-Phe-Asn-Asp-OH,

H-Ser-Gln-His-Arg-Tyr-Ser-Thr-pro-His-Ala-Phe-Thr-Phe-Asn-Thr-Ser-Ser-Pro-Ser-Glu-Gly-OH,

H-His-Gly-Asp-Val-Ala-Val-Lys-Ile-Leu-Lys-Val-Val-Asp-Pro-Thr-Pro-Thr-Pro-Glu-Gln-Phe-Gln-Ala-Phe-Arg-Asn-Glu-Val-Ala-Val-Leu-OH,

H-Gly-Phe-Ala-Glu-His-Ser-Ser-Glu-Pro-Pro-Ser-Trp--Glu-Met-Leu-Leu-Glu-Asn-Glu-Leu-OH, and

H-Ile-Pro-Arg-Leu-Pro-Ser-Phe-Pro-Thr-Gln-Arg-Thr-Ser-Lys-Thr-Leu-Lys-OH.

4,855,407

SOLID PHASE PROCESS FOR SYNTHESIZING PEPTIDES

Su S. Wang, Belmont, Calif., assignor to Alpha-1 Biomedicals, Inc., Washington, D.C.

Continuation-in-part of Ser. No. 722,218, Apr. 11, 1985, abandoned. This application Apr. 9, 1986, Ser. No. 849,835

Int. Cl.[4] C07C *103/52;* **A61K** *37/02*

U.S. Cl. 530—334 **21 Claims**

1. In a solid phase peptide synthesis process for producing a peptide amide having the amino acid sequence represented by the formula

$$Y_p—X—NH_2$$

where

Y_p represents the N-terminal peptide fragment, and

$X—NH_2$ represents the C-terminal amino acid having an amide group ($—CONH_2$) in its molecular structure

by forming the peptide having the above sequence bonded to a resin, said peptide optionally having one or more protected functional groups and cleaving the peptide from the resin and deprotecting protected functional groups;

the improvement comprising forming the peptide bonded to methylbenzhydrylamine resin and cleaving and deprotecting the resin bound peptide with hydrogen bromide.

4,855,408

ANTIGENS FOR DIAGNOSING NEUROCYSTICERCOSIS

Raymond E. Kuhn, Clemmons; John J. Estrada, Winston-Salem, both of N.C., and Max Grogl, Silver Spring, Md., assignors to Wake Forest University, Winston-Salem, N.C.

Continuation-in-part of Ser. No. 102,674, Sep. 30, 1987, Pat. No. 4,801,532, which is a division of Ser. No. 766,017, Aug. 15, 1985, Pat. No. 4,740,456. This application May 27, 1988, Ser. No. 199,917

Int. Cl.[4] C07K *15/02*

U.S. Cl. 530—350 **2 Claims**

1. An antigen useful for diagnosing human neurocysticercosis, which is a substantially purified protein having a molecular weight of 190 K daltons as determined by sodium dodecyl sulfate polyacrylamide gel electrophoresis, which is released by larval *T. solium* into the cerebrospinal fluid of a patient infected by a *T. solium* larva, and which is obtained by subjecting a crude homogenate derived from *T. solium* larvae to SDS-PAGE to isolate said antigen.

4,855,409

NOVEL POLYPEPTIDES AND METHOD OF PRODUCING SAME

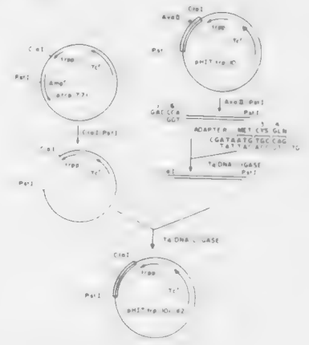
Kikuchi Masakaza, Toyono; Kurokawa Tsutomu, Kawanishi, and Honda Susumu, Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 685,819, Dec. 14, 1984, abandoned. This application Nov. 23, 1987, Ser. No. 129,947

Claims priority, application World Int. Prop. O., Jun. 6, 1984, PCT/JP84/00292; Sep. 11, 1984, PCT/JP84/00434

Int. Cl.[4] A61K *45/02*

U.S. Cl. 530—351 **1 Claim**



1. A polypeptide of the formula

(N) H—X—Y—Asp Pro Tyr Val Lys Glu Ala Glu Asn Leu Lys Lys Tyr Phe Asn Ala Gly His Ser Asp Val Ala Asp Asn Gly Thr Leu Phe Leu Gly Ile Leu Lys Asn Trp Lys Glu Glu Ser Asp Arg Lys Ile Met Gln Ser Gln Ile Val Ser Phe Tyr Phe Lys Leu Phe Lys Asn Phe Lys Asp Asp Gln Ser Ile Gln Lys Ser Val Glu Thr Ile Lys Glu Asp Met Asn Val Lys Phe Phe Asn Ser Asn Lys Lys Lys Arg Asp Asp Asp Phe Glu Lys Leu Thr Asn Tyr Ser Val Thr Asp Leu Asn Val Gln Arg Lys Ala Ile His Glu Leu Ile Gln Val Met Ala Glu Leu Ser Pro Ala Ala Lys Thr Gly—Z—OH (C)

wherein X is Met or a bond, Y is Cys-Gln, Gln, <Gln or a bond and Z is a peptide or amino acid residue having 1 to 16 amino acids counting from the N terminus of the peptide chain of (N) Lys Arg Lys Arg Ser Gln Met Leu Phe Arg Gly Arg Arg Ala Ser Gln (C).

4,855,410

PROCESS FOR THE PREPARATION OF FIBRE-REACTIVE AZO COMPOUNDS CONTAINING A PHENYLENEDIAMINE DIAZO COMPONENT

Rüdiger Oxenius, Rheinfelden, Fed. Rep. of Germany, and Charles Wilhelm, Leymen, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

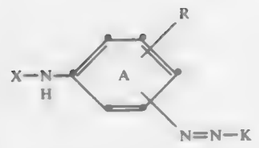
Filed Jul. 9, 1986, Ser. No. 883,891

Claims priority, application Switzerland, Jul. 30, 1985, 3305/85

Int. Cl.[4] C09B *62/026, 62/66, 62/665*

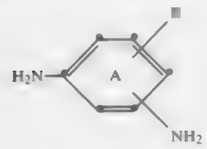
U.S. Cl. 534—591 **16 Claims**

1. A process for the preparation of an azo compound of the formula



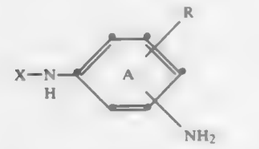
(1)

wherein K is the radical of a coupling component, R is a water-solubilizing group and X is a fibre-reactive radical, and the benzene ring A is unsubstituted or further substituted, which process comprises reacting a compound of the formula



(2)

in an aqueous medium containing 5 to 25% by weight of an alkali metal halide or alkali metal sulfate, based on the weight of the medium, with an acylating agent XA' wherein X is as previously defined and A' is a halide or an anhydride of an organic acid or an easily replaceable atom or group on a heterocyclic compound to give a compound of formula



(3)

diazotising said compound direct without isolation or purification and coupling the diazotisation product with a coupling component of the formula

(4)

in which formulas (2), (3) and (4) A, R, X and K are as defined for formula (1).

4,855,411

WATER-SOLUBLE, MONOAZO DYES CONTAINING A UREIDO GROUP AND TWO SULFONYL FIBER-REACTIVE GROUPS

Glenn A. Thompson, Hopkinton; Anthony J. Corso, Coventry, both of R.I., and Hans H. Steuernagel, Kelkheim, Fed. Rep. of Germany, assignors to Hugh C. Crall and Hoechst Celanese Corp., both of Somerville, N.J.

Filed Mar. 17, 1988, Ser. No. 170,585

Int. Cl.[4] C09B *62/51, 62/515;* **D06P** *1/38, 3/66*

U.S. Cl. 534—629 **21 Claims**

1. A compound of the formula:



wherein:

X and Y are independently selected from

$-CH=CH_2$, $-CH_2CH_2-S-SO_3H$, $-CH_2-CH_2Br$,

$-CH_2CH_2OCOCH_3$, $-CH_2CH_2OH$, $-CH_2CH_2OPO_3H_2$,

$-CH_2CH_2OSO_2CH_3$, $-CH_2CH_2-O-C_6H_5$,

-continued

$-CH_2CH_2OSO_3H$, $-CH_2CH_2CL$, $-CH_2CH_2OSO_2-C_6H_5$ and

$-CH_2CH_2-N-R_1R_2$;

R, R_1 and R_2 are independently selected from hydrogen, lower alkyl having one to four carbon atoms and sulfonated lower alkyl;

A is phenyl or naphthyl unsubstituted or substituted with substituents independently selected from hydroxy, halogen, lower alkyl, lower alkoxy, carboxylic acid and sulfonic acid;

W is phenyl or naphthyl unsubstituted or substituted with substitutents independently selected from sulfonic acid, amido, amino, lower alkyl, lower alkoxy, hydroxy, halogen; and

Z is phenyl unsubstituted or substituted with lower alkyl and lower alkoxy.

4,855,412

DIAMINOPYRIDINE AZO DYES HAVING ACYLOXY RADICALS SUBSTITUTED ON THE DIAMINOPYRIDINE

Johannes Dehnert, Ludwigshafen; Gunther Lamm, Hassloch, and Hermann Loeffler, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

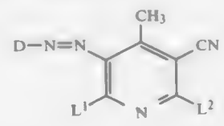
Filed Apr. 24, 1987, Ser. No. 42,243

Claims priority, application Fed. Rep. of Germany, May 3, 1986, 3615093

Int. Cl.[4] C09B *29/033, 29/048, 29/42;* **D06P** *3/54*

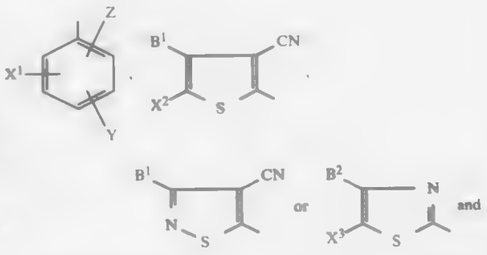
U.S. Cl. 534—766 **2 Claims**

1. A compound of the formula:

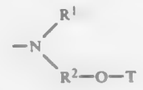


where

D is a radical of the formula



one of the two radicals L^1 and L^2 is unsubstituted amino and the other radical is



where

R^1 is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy-C_2–C_4-alkyl or C_1–C_8-alkanoyloxy-C_2–C_4-alkyl,

R^2 is C_2–C_{10}-alkylene or C_2–C_{10}-alkylene which is interrupted by oxygen,

T is C_1–C_8-alkanoyl which is unsubstituted or is substituted by chlorine or methoxy,

B^1 is C_1–C_4-alkyl or benzyl or phenyl, which are each unsubstituted or are each substituted by methyl, methoxy or chlorine,

B^2 is B^1, hydrogen, halogen, cyano or C_1–C_5-alkoxycarbonyl,

X^1 is hydrogen, nitro, cyano, C_1–C_9-alkoxycarbonyl, C_1–C_9-mono- or -dialkylaminocarbonyl, trifluoromethyl, methylsulfonyl or ethylsulfonyl,

X^2 is nitro or C_1–C_5-alkoxycarbonyl,

X^3 is X^2, cyano or formyl,

Y is hydrogen, chlorine, bromine, methyl, methoxy or ethoxy and

Z is hydrogen, chlorine, bromine, cyano or C_1–C_9-alkoxycarbonyl which is unsubstituted or is substituted by C_1–C_4-alkoxy, and one or more of the substituents X^1, Y and Z is different from hydrogen.

4,855,413

HETEROCYCLIC AZO DYES CONTAINING CYANOTHIOPHENE DERIVATIVES AS DIAZO COMPONENTS AND DIAMINOPYRIDINES AS COUPLING COMPONENTS

Johannes Dehnert, Ludwigshafen; Gunther Lamm, Hassloch, and Hermann Loeffler, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

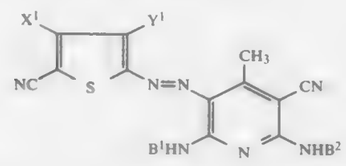
Continuation-in-part of Ser. No. 888,956, Jul. 24, 1986, abandoned. This application Apr. 28, 1988, Ser. No. 188,075

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1985, 3528759

Int. Cl.[4] C09D *11/02;* **C09B** *29/36;* **D06P** *1/02*

U.S. Cl. 534—766 **6 Claims**

1. A compound of the formula I



where

X_1 is hydrogen or methyl, Y_1 is cyano, and

B^1 and B^2 independently of one another are each hydrogen or

(i) C_2–C_8-alkyl which is unsubstituted;

(ii) C_2–C_8-alkyl which is substituted by hydroxyl, C_1–C_8-alkanoyloxy, C_1–C_4-alkoxy, benzyloxy, or phenoxy;

(iii) C_2–C_8-alkyl which is interrupted by oxygen exclusive of (ii);

(iv) C_2–C_8-alkyl which is interrupted by oxygen and substituted by hydroxy, C_1–C_8-alkanoyloxy, C_1–C_4-alkoxy, benzyloxy or phenoxy, exclusive of (ii) and (iii); '(v) phenyl which is unsubstituted; or

(vi) phenyl which is substituted by methyl or methoxy.

4,855,414

PROCESS FOR PRODUCTION OF ANTHRACYCLINE COMPOUND R20X2

Hamao Umezawa; Kazuo Umezawa, both of Tokyo; Atsuo Odagawa, Maebashi; Shiro Kataoka, Maebashi, and Shohachi Nakajima, Maebashi, all of Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

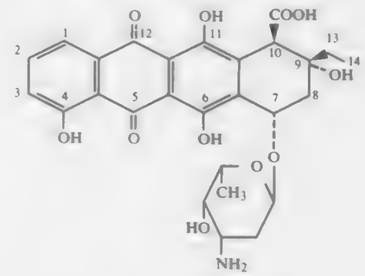
Filed Jun. 30, 1987, Ser. No. 68,627

Claims priority, application Japan, Jul. 4, 1986, 61-157359

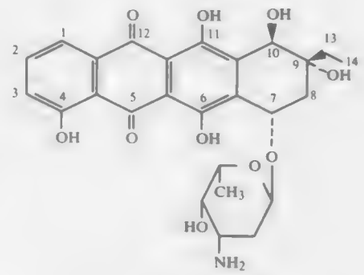
Int. Cl.[4] C07H *15/24*

U.S. Cl. 536—6.4 **1 Claim**

1. A process for producing an anthracycline compound, R20X2, of the following formula (II), which comprises subjecting an anthracycline compound, R20X3, of the following formula (I) or a salt thereof to reaction in the co-presence of (1) acetone and/or dimethylformamide and (2) an aqueous solution containing ammonium ion and/or trialkylamine in a temperature range of about 0° C. to about 30° C.



(I)



(II)

4,855,415

GLUCOSYLMORANOLINE DERIVATIVES

Makoto Sugiyama, Kyoto; Yoji Ezure, Otsu; Yoshiaki Yoshikuni, Uji, and Yukio Fujita, Takatsuki, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

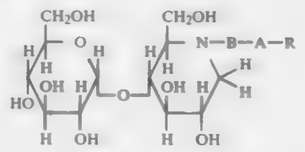
Filed Sep. 1, 1987, Ser. No. 91,822

Claims priority, application Japan, Sep. 2, 1986, 61-207450

Int. Cl.[4] C07H *17/02;* **C07D** *401/12;* **A61K** *31/10, 31/445*

U.S. Cl. 536—17.4 **23 Claims**

1. A compound of formula (I)



[I]

wherein:

B is a divalent cyclic or acyclic, saturated or unsaturated aliphatic hydrocarbon group containing up to about 15 carbon atoms, unsubstituted or substituted by at least one substituent selected from the group consisting of halogen, hydroxyl, mercapto, amino, phenyl, naphthyl or heterocyclyl or substituted phenyl, naphthyl or heterocyclyl, said substituted phenyl, naphthyl and heterocyclyl being substituted by at least one substituent selected from the group consisting of monovalent aliphatic hydrocarbon containing from about 1 to about 15 carbon atoms, halogen, hydroxy, mercapto, amino, carboxyl, alkoxycarbonyl containing from about 1 to about 15 carbon atoms in the alkoxy moiety, phenyl, naphthyl and heterocyclyl, each said heterocyclyl having from 5 to 12 ring members and

containing 1, 2 or 3 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur;

A is a linking group selected from the group consisting of —O—, —S—, —N(H)—, —N(R[1])—, wherein R[1] is alkyl of 1 to 6 carbon atoms, —C(O)O—, —C(O)NH— and —C(O)— or A is a direct bond; and

R is a monovalent cyclic or acyclic, saturated or unsaturated hydrocarbon group containing up to about 15 carbon atoms, unsubstituted or substituted by at least one substituent selected from the group consisting of halogen, hydroxyl, mercapto, amino, phenyl, naphthyl or heterocyclyl, or substituted phenyl, naphthyl or heterocyclyl, or R is phenyl, naphthyl or heterocyclyl or substituted phenyl, naphthyl or heterocyclyl, said substituted phenyl, naphthyl and heterocyclyl being substituted by at least one substituent selected from the group consisting of monovalent aliphatic hydrocarbon containing from about 1 to about 15 carbon atoms, alkoxy of from 1 to 4 carbon atoms in the alkyl moiety, hydroxypropenyl, halogen, hydroxy, mercapto, amino, carboxyl, alkoxycarbonyl containing from about 1 to about 15 carbon atoms in the alkoxy moiety, phenyl, naphthyl and heterocyclyl, each said heterocyclyl having 5 to 12 ring members and containing 1, 2 or 3 heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur; provided that B—A—R may not represent hydrogen, lower alkyl or a monovalent cyclic or acyclic group having at least one hydroxy group.

4,855,416

METHOD FOR THE MANUFACTURE OF DEXTRAN SULFATE AND SALTS THEREOF

Thomas C. Usher, Nassau, The Bahamas, assignor to Polydex Pharmaceuticals, Ltd, Nassau, The Bahamas

Continuation-in-part of Ser. No. 516,640, Jul. 25, 1983, abandoned. This application Jul. 20, 1987, Ser. No. 75,644

Int. Cl.[4] C08B *37/02*

U.S. Cl. 536—112 **5 Claims**

1. The method of manufacturing dextran sulfate which comprises forming a complex between SO_3 and formamide by reacting liquid SO_3 and formamide at a temperature between about 15°–40° C. in an atmosphere of dry nitrogen gas and forming a solution of the complex in formamide, then mixing a selected dextran polymer to be sulfated with said SO_3 formamide complex solution at a temperature between about 25°–55° C. until sulfation is completed.

4,855,417

ANOMERIC DEACETYLATION

Abraham Nudelman, Rehovot; Jaacov Herzig, Raanana, and Ehud Keinan, Holon, all of Israel, assignors to Yeda Research and Development Company Ltd, Rehovot, Israel

Filed Dec. 11, 1986, Ser. No. 942,432

Claims priority, application Israel, Dec. 12, 1985, 73307

Int. Cl.[4] C07H *15/04, 1/00*

U.S. Cl. 536—121 **15 Claims**

1. A process for the selective anomeric deacetylation of a sugar derivative, which comprises reacting such sugar derivatives of formula I:



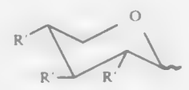
I

where



designates a ring structure selected from the group consisting of formulas (a)–(d) wherein the substituents R′ are selected from the group consisting of acyl and alkoxy and wherein formulas (a)–(d) are as follows:

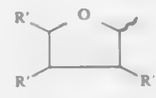
(a)



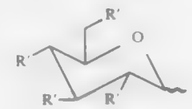
(b)



(c)



(d)



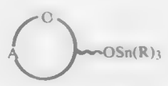
with a tin compound of the formula:

$(R)_3SnOR'$ (II) or the formula $(R)_2SnO$, (V), wherein R and R′ each designates lower alkyl, in an aprotic solvent to yield a 1–10 tin derivative of said ring structure where the anomeric carbon of said ring structure is substituted by the substituent

—O—Sn—$(R)_3$,

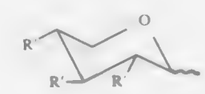
and hydrolyzing said 1–0 tin derivative to yield the corresponding desired deacetylated anomeric 1—OH-sugar; or reacting the starting substituted sugar derivative I in an alcoholic solvent with said tin compound (II) or (V) to yield the corresponding desired anomeric 1—OH-sugar.

12. A sugar compound of the formula

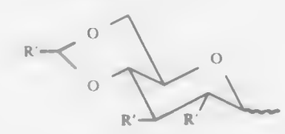


where the ring structure comprising A and O defines a sugar moiety, R is lower alkyl and —$OSn(R)_3$ is attached to the anomeric carbon of said sugar moiety and the ring structure designates a structure selected from the group consisting of formulas (a)–(d), wherein the substituents R′ are selected from the group consisting of acyl and alkoxy and wherein formula (a)–(d) are as follows:

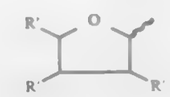
(a)



(b)

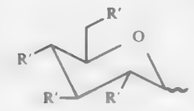


(c)



-continued

(d)



4,855,418

PROCESS FOR PRODUCTION OF CEOPHALOSPORINS

Gwendolyn K. Cook, and John H. McDonald, III, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

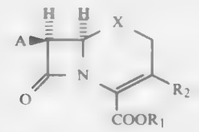
Filed Mar. 23, 1988, Ser. No. 172,091

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

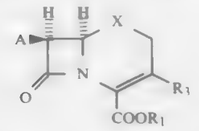
Int. Cl.[4] C07D *501/04, 471/04*

U.S. Cl. 540—205 **16 Claims**

1. A process for preparing a compound of the formula



wherein A is a protected amino group or an acylamino group R(CO)—NH—; R_1 is a carboxy-protecting group or a biologically-labile ester; X is sulfur or —CH_2—; and R_2 is methyl, C_2–C_6 alkenyl; C_2–C_6 alkynyl; C_1–C_6 substituted alkyl, C_2–C_6 substituted alkenyl; C_2–C_6 substituted alkynyl; phenyl; substituted phenyl; C_1–C_6 alkyloxymethyl; phenyl-C_1–C_6 alkyloxymethyl; or tri(C_1–C_6)alkylsilyloxymethyl; which comprises reacting a compound of the formula



wherein A, X and R_1 are as defined above, and R_3 is trifluoromethylsulfonyloxy, methanesulfonyloxy, toluenesulfonyloxy, chloro, bromo or iodo; in an inert solvent in the presence of palladium(O) and, when R_3 is trifluoromethanesulfonyloxy, methanesulfonyloxy or p-toluenesulfonyloxy in the presence of an alkali metal halide, with a tin transfer reagent of the formula trialkyl(C_1–C_6)alkyl—SN—R_2 or $SN(R_2)_4$, wherein R_2 has the same meanings as defined above.

4,855,419

APPLICATION OF 4-[1-OXOALKYL]-2,5-OXAZOLIDINEDIONES IN SELECTIVE STEREOSPECIFIC FORMATION OF BIOLOGICALLY ACTIVE α-LACTAMS

Richard A. Day, Cleves, Ohio, and John Wallace, Covington, Ky., assignors to University of Cincinnati, Cincinnati, Ohio

Filed Jun. 16, 1987, Ser. No. 62,856

Int. Cl.[4] C07D *499/42, 501/14*

U.S. Cl. 540—215 **21 Claims**

1. A stereoselective method of producing beta-lactam-containing compounds comprising the steps of:

(a) reacting a cyclic anhydride selected from the class consisting of cyclic anhydrides having the formula: wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, aryl, aralkyl and saturated and unsaturated alkyl groups in a water-containing solvent for sufficient time and at sufficient temperature and pH to allow the corresponding amino acid of said cyclic anhydride to form, and

(b) reacting the amino acid product of step (a) with a thiol amine compound selected from the class consisting of thiol amine compounds having a formula selected from the class consisting of:

wherein sites A, B, C, D and E are saturated sites and where in the substituents on said sites are independently selected from the group consisting of hydrogen, saturated and unsaturated alkyl groups, and the carboxyl group; for sufficient time and at sufficient temperature to allow reaction to occur, and

(c) reacting the product of said step (b) with cyanogen for sufficient time and at sufficient temperature to allow said beta-lactam-containing compound to form.

4,855,420

CEPHALOSPORIN DERIVATIVES

Frederic H. Jung, Rilly la Montagne, France, assignor to Ici Pharma, Enghein-les-Bains, France

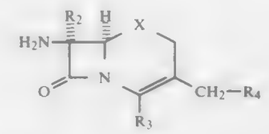
Division of Ser. No. 616,891, Jun. 4, 1984, Pat. No. 4,678,761. This application Apr. 13, 1987, Ser. No. 37,788

Claims priority, application European Pat. Off., Jun. 3, 1983, 83401135.5

Int. Cl.[4] C07D *501/18;* **A61K** *31/545*

U.S. Cl. 540—222 **7 Claims**

1. A cephalosporin derivative of the formula XIX:



XIX

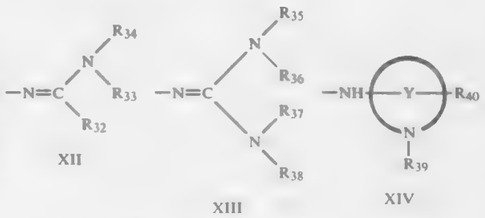
in which

X is sulphur or sulphinyl (R or S configuration);

R2 is hydrogen or methoxy;

R3 is carboxy or a biodegradable ester thereof, or where R4 carries a positive charge, a carboxylate anion;

R4 is of the formula XII, XIII or XIV:



XII XIII XIV

or a tautomeric form thereof, in which the radical of the formula XIV may carry a positive charge, and the acid-addition salts thereof, in which

R32 is hydrogen, (1–6C)alkyl, phenyl, naphthyl or —$(CH_2)_q$—COOR41 in which q is 1 to 6 and R41 is hydrogen or (1–6C)alkyl;

R33 and R34 are selected from hydrogen, (1–6C)alkyl, hydroxy, cyano, phenyl, naphthyl, which q and R41 have the meanings given above,

or R33 and R34 are joined to form, together with the nitrogen to which they are attached, a pyrrolidine, piperidine, morpholine or hexahydroazepine ring, said ring being unfused or fused to a benzene ring,

or R32 and R33 are joined by a carbon chain to form, together with the carbon and nitrogen to which they are attached, a 5- or 6-membered saturated ring which is unfused or which is fused to a benzene ring;

R35 and R37 are selected from hydrogen, (1–6C)alkyl, phenyl(1–6C)alkyl and —$(CH_2)_q$COOR41 in which q is 1 to 6 and R41 is hydrogen or (1–6C) alkyl;
R36 and R38 are selected from hydrogen, (1–6C)alkyl, phenyl, naphthyl and phenyl(1–6C)alkyl;
or R36 and R37 are joined as a carbon chain to form, together with the nitrogen-carbon-nitrogen chain to which they are attached, a saturated or partially unsaturated 5- or 6-membered ring which is unfused or which is fused to a benzene ring;
ring Y is pyridine, pyrimidine, oxazole, thiazole, isoxazole, isothiazole or imidazole each of which is unfused or fused to a benzene, cyclopentane or cyclohexane ring;
R39 is hydrogen, amino, (1–6C)alkyl, (3–6C)cycloalkyl, (3–6C)alkenyl, (2–8C)alkoxyalkyl, —$(CH_2)_1$—COOR41, —$(CH_2)_q$—$CONH_2$, —$(CH_2)_q$— S(O)$_s$—R42 or —$(CH_2)_q$—NHCO—R42 in which q is 1 to 6, R41 is hydrogen or (1–6C)alkyl, s is 0, 1 or 2 and R42 is (1–6C)alkyl or (1–6C) alkoxy,
or R39 is (3–8C)alkanoylmethyl, benzoylmethyl, (1–6C)-primaryhydroxyalkyl, (1–6C)primaryaminoalkyl, (1–4C)alkyamino(1–6C)alkyl, di(1–4C)alkylamino(1–6C)alkyl, (1–6C)alkoxy, (1–6C)alkylamino, phenyl(1–6)alkyl, phenyl(1–6C)alkoxy, (1–4C)alkyoxy)–4C)alkyl, (1–4C)alkoxy(2–4C)alkoxy(1–4C)alkyl, or of the formula $(CH_2)_n$— N=CR43NR44R45 or $(CH_2)_n$C(NR43)NR44R45 (or a tautomer thereof) in which n is 1 to 4 and R43, R44 and R45, same or different, are hydrogen or (1–4C)—alkykl;
R40 is hydroge nor one or two substituents selected from halogen, amino, nitro, (1–6C)alkyl, carboxy, (2–6C)alkyoxycarbonyl, (1–6C)alkoxy, cyano, carbamoyl, (1–6C)haloalkyl, (1–6C)azidoalkyl, (1–6C)aminoalkyl, (2–4C)aminoalkylthio(1–4C)alkyl, (2–6C)alkanoylamino, (2–6C)alkanoylamino(1–4C)alkyl, (2–6C)alkanoyloxy(1–4C)alkyl, benzyl, benzyloxy and heteroarylthio;
wherein when R33, R34, R35, R36, R37, R38, R39 or R40 individually is or contains phenyl or naphthyl, the phenyl or naphthyl is unsubstituted or substituted by one or two radical selected from halogen, nitro, cyano, carboxy, hydroxy, carbamoyl, (1–6C) alkyl, (1–6C) alkoxy and (2–6C) alkoxycarbamoyl, and wherein when R33 or R34 is heteroaryl, or R40 is heteroarylthio, the heteroaryl ring is a 5- or 6-membered ring containing 1, 2 or 3 hetero atoms selected from oxygen, nitrogen and sulphur, provided that not more than one heteroatom shall be selected from the group consisting of oxygen and sulphur.

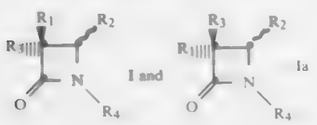
4,855,421

2-OXOAZETIDINES, METHODS FOR THEIR PREPARATION, AND THEIR USE

Hans Fliri, and Ching Pong Mak, both of Vienna, Austria, assignors to Sanraku Incorporation, Tokyo, Japan

Continuation of Ser. No. 852,947, Feb. 25, 1986, abandoned. This application Apr. 20, 1988, Ser. No. 180,200
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425847; Aug. 22, 1984, 3430853
Int. Cl.[4] C07D *205/08, 403/04*
U.S. Cl. 540—357 **5 Claims**

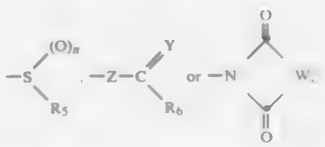
1. New 2-oxoazetidines having the formulas



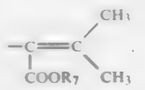
I and

Ia

wherein
R_1 is lower fluoroalkyl, lower hydroxyalkyl or protected lower hydroxyalkyl;
R_2 is chlorine, bromine, iodine, fluorine,

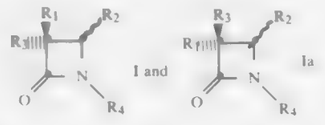


R_3 is bromine, chlorine, iodine, SeC_6H_5 or SC_6H_5;
R_4 is H or



R_5 is lower alkyl, lower alkenyl, benzyl, phenyl or —CH_2COX
R_6 is lower alkyl, lower alkoxy, lower alkylthio, lower dialkylamino, aryl, aryloxy, or arylthio;
R_7 is lower alkyl, benzyl, or benzhydryl;
Z is 0, NH or S;
Y is 0, N or S;
X is lower alkyl, lower alkoxy or amino;
W is —CH_2CH_2, —CH=CH— or C_6H_4; and
n is 1 or 2.

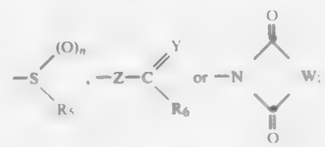
3. New 2-oxoazetidines having the formulas



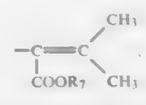
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wherein
R_1 is lower fluoroalkyl;
R_2 is chlorine, bromine, iodine, fluorine,

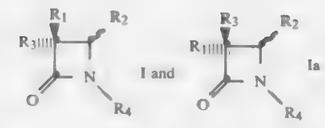


R_3 is bromine, chlorine, iodine, SeC_6H_5 or SC_6H_5;
R_4 is H or



R_5 is lower alkyl, lower alkenyl, benzyl, phenyl or —CH_2COX
R_6 is lower alkyl, lower alkoxy, lower alkylthio, lower dialkylamino, aryl, aryloxy, or arylthio;
R_7 is lower alkyl, benzyl, or benzhydryl;
Z is 0, NH or S;
Y is 0, N or S;
X is lower alkyl, lower alkoxy or amino;
W is —CH_2CH_2, —CH=CH— or C_6H_4; and
n is 0, 1 or 2.

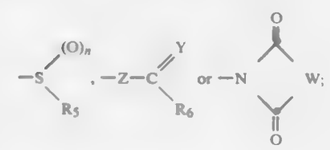
4. 2-oxoazetidines having the formulas



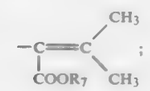
I and

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wherein
R_1 is lower fluoroalkyl, lower hydroxyalkyl or protected lower hydroxyalkyl;
R_2 is chlorine, bromine, iodine, fluorine,

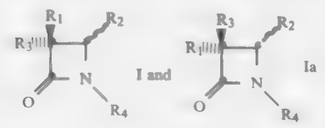


R_3 is SeC_6H_5 or SC_6H_5;
R_4 is H or



R_5 is lower alkyl, lower alkenyl, benzyl, phenyl or —CH_2COX;
R_6 is lower alkyl, lower alkoxy, lower alkylthio, lower dialkylamino, aryl, aryloxy, or arylthio;
R_7 is lower alkyl, benzyl, or benzhydryl;
Z is 0, NH or S;
Y is 0, N or S;
X is lower alkyl, lower alkoxy or amino;
W is —CH_2CH_2, —CH=CH— or C_6H_4; and
n is 0, 1 or 2.

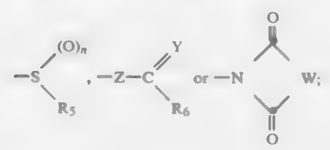
5. New 2-oxoazetidines having the formulas



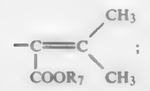
I and

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wherein
R_1 is lower fluoroalkyl, lower hydroxyalkyl or protected lower hydroxyalkyl;
R_2 is chlorine, bromine, iodine, fluorine,



R_3 is bromine, chlorine, iodine, SeC_6H_5 or SC_6H_5;
R_4 is H or



R_5 is benzyl, phenyl or —CH_2COX;
R_6 is lower alkyl, lower alkoxy, lower alkylthio, lower dialkylamino, aryl, aryloxy, or arylthio;
R_7 is lower alkyl, benzyl, or benzhydryl;
Z is 0, NH or S;
Y is 0, N or S;
X is lower alkyl, lower alkoxy or amino;
W is —CH_2CH_2, —CH=CH— or C_6H_4; and
n is 0, 1 or 2.

4,855,422

PROCESS FOR THE PREPARATION OF AZONIASPIRONORTROPANOL ESTERS

Wolf Grimminger; Klaus Görler, both of Gladbach, and Karl P. Odenthal, Grevenbroich, all of Fed. Rep. of Germany, assignors to Madaus GmbH & Co., Köln, Fed. Rep. of Germany

Filed Dec. 23, 1986, Ser. No. 945,488
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1985, 3546218
Int. Cl.[4] C07D *401/00, 237/00, 265/00, 239/00*
U.S. Cl. 540—466 **16 Claims**

1. A process for preparation of an azoniaspironortropanol ester, comprising reacting tropine with a C_1-C_3 chloroalkane containing at least one trichloromethyl group in the presence of an oxidizing agent under conditions favoring formation of nortropine, reacting said nortropine with a dihalide under conditions favoring formation of an azonia compound, said reaction taking place in the presence of an amine, and esterfying said azonia compound with an imidazolide in the presence of a catalyst under conditions favoring formation of an azoniaspironotropanol ester.

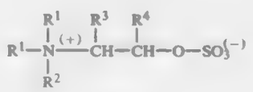
4,855,423

PREPARATION OF SULFATOBETAINES

Gerold Braun, Ludwigshafen; Chung-Ji Tschang, Bad Durkheim; Christos Vamvakaris, Kallstadt, and Klaus Glaser, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

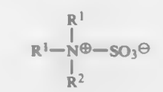
Filed Oct. 13, 1987, Ser. No. 106,802
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3635230
Int. Cl.[4] C07D *291/00, 211/70, 211/20, 217/10*
U.S. Cl. 544—2 **10 Claims**

1. A process for the preparation of a sulfobetaine of the formula (I):



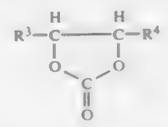
(I)

wherein R^1 and R^2 are the same or different and are each a saturated straight-chainor branched-chain alkyl group of 1 to 22 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, phenyl or naphthyl or aralkyl having 7 to 12 carbon atoms, or R^1 and R^2, together with the N atom, form a 5- or 6-membered heterocyclic ring, which ring either contains no additional heteroatoms or contains one additional heteroatom selected from the group consisting of nitrogen and oxygen or contains a fused benzene ring; R^3 and R^4 are the same or different and R^3 is hydrogen or an alkyl group of 1 to 7 carbon atoms and R^4 is hydrogen, an alkyl group of 1 to 20 carbon atoms, or phenyl, which process comprises:
reacting an addition compound of a base having a tertiary N atom and sulfur trioxide having the formula (II):



(II)

wherein R^1 and R^2 are as defined above with an alkylene carbonate of the formula (III):



(III)

wherein R^3 and R^4 are as defined above, and from 80° to 220° C. in the presence of an excess of the alkylene carbonate, as a solvent, and an excess of the base used to prepare the sulfur trioxide adduct, as a solvent, in an amount sufficient to also accelerate said reaction.

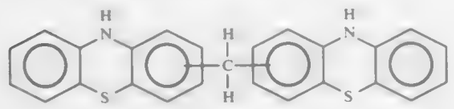
4,855,424

PHENOTHIAZINE DERIVATIVES

Paul O. Hong, Wayne, and Raymond C. De Wald, Douglassville, both of Pa., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jul. 30, 1987, Ser. No. 79,315
Int. Cl.[4] C07D *279/20*
U.S. Cl. 544—35 **7 Claims**

1. A compound having the formula



4,855,425

PROCESS FOR THE SELECTIVE SYNTHESIS OF ETHYLENE DIAMINES

John A. Marsella, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 900,874, Aug. 27, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 187,707
The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.
Int. Cl.[4] C07D *295/02*; C07C *85/06*
U.S. Cl. 544—78 **8 Claims**

1. A process for the selective synthesis of bismorpholino ethane or N,N,N',N'-tetramethyl-1-2-diaminopropane by the reaction of a secondary amine with ethyleneglycol or 1,2-propanediol, said process comprising: carrying out said reaction at a temperature between 125°–200° C. in the presence of a catalyst consisting essentially of $RuCl_3 \times H_2O$ in the absence of an organic phosphine co-catalyst.

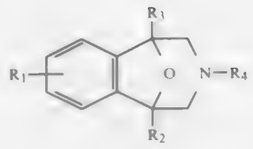
4,855,426

PROCESS OF PREPARING 1,5-EPOXY-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINS

Michael P. Wachter, Bloomsbury, and Donald S. Karanewsky, East Winsor, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 945,273, Dec. 22, 1986, Pat. No. 4,761,413. This application Apr. 14, 1988, Ser. No. 181,619
Int. Cl.[4] C07D *498/06*
U.S. Cl. 544—101 **6 Claims**

1. A process for synthesizing a compound of the formula



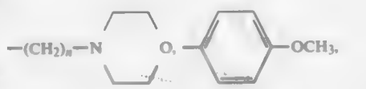
where

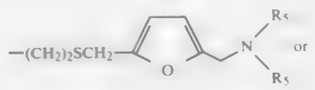
R_1 is H, 7-halogen, 7,8-dihydroxy, 7,8-methylenedioxy, 7,8-di-C_1–C_3 alkoxy or 7,8-dibenzyloxy;

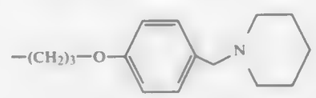
R_2 is H, 1,3-dioxolanyl, phenyl or phenyl substituted by CF_3, C_1–C_6 alkyl or C_1–C_4 alkoxy;

R_3 is H, phenyl or phenyl substituted by CF_3, C_1–C_6 alkyl or C_1–C_4 alkoxy;

R_4 is H, benzyl, C_1–C_6 alkyl, C_3–C_6 alkenyl, $-(CH_2)_3OH$,





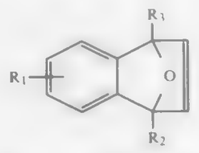


R_5 is C_1–C_3 alkyl; and

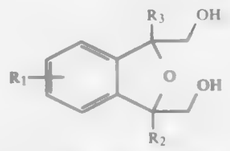
n is 2 or 3, provided that when R_1 is 7-halogen, R_4 is not hydrogen;

which comprises the steps of:

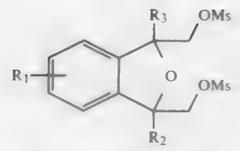
(a) treating a compound of the formula



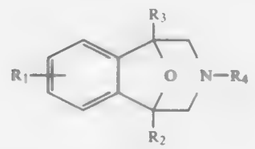
where R_1, R_2, and R_3 are as described above, with ozone and subsequent treatment with $LiAlH_4$ to give an intermediate diol of the formula;



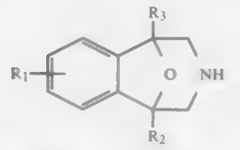
(b) treating the diol with methanesulfonyl chloride to give a dimesylate of the formula;



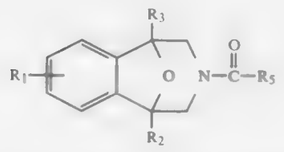
(c) reacting the dimesylate with an amine of the formula R_4NH_2 where R_4 is as described above to give an epoxybenzazepin of the formula;



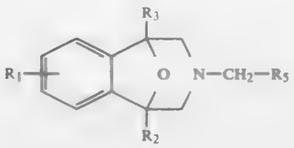
(d) optionally hydrogenating the epoxybenzazepin when R_4 is benzyl to give the debenzylated epoxybenzazepin of the formula;



(e) optionally reacting the deprotected epoxybenzazepin with an anhydride of the formula $(R_5CO)_2O$ where R_5 is as described above to give the acyl epoxybenzazepin of the formula; and



(f) optionally treating the acyl epoxybenzazepin with $LiAlH_4$ to give the tertiary amine of the formula;



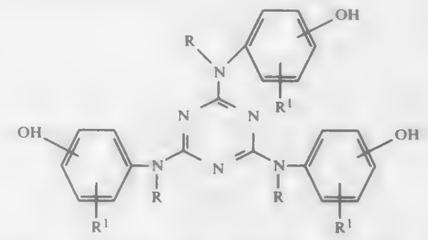
4,855,427

EPOXY RESINS OBTAINED FROM REACTION OF EPOXYALKYL HALIDES AND AROMATIC HYDROXYL-CONTAINING MELAMINES

Roland Peter, Ludwigshafen; Klaus Ebel, Mutterstadt, and Thomas Allspach, Bad Duerkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 13, 1988, Ser. No. 206,127
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1987, 3720851
Int. Cl.[4] C07D *405/12*
U.S. Cl. 544—198 **1 Claim**

1. An epoxy resin obtained by the reaction of A. an epoxyalkyl halide and B. an aromatic hydroxyl-containing melamine derivative of the formula



wherein R is hydrogen, alkyl or aryl and R^1 is hydrogen, alkyl, aryl, aralkyl or a fused aromatic ring.

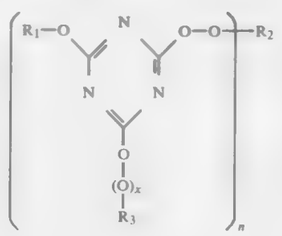
4,855,428

TRIAZINE PEROXIDES

Johannes P. J. Verlaan, Deventer, and Wilhelmus M. Beijleveld, Olst, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed May 20, 1987, Ser. No. 51,753
Claims priority, application Netherlands, Jun. 11, 1986, 8601509
Int. Cl.[4] C07D *251/30, 251/34*
U.S. Cl. 544—219 **3 Claims**

1. A peroxide of the formula



(I)

where

n is 1 or 2

when n = 1,

R_1 is selected from the group consisting of an allyl group, a methallyl group and a crotyl group,

R_2 is selected from the group consisting of an unsubstituted alkyl group, an alkyl group substituted with at least one hydroxyl group, an unsubstituted alkenyl group, an alkenyl group substituted with at least one hydroxyl group, an unsubstituted aralkyl group, and an aralkyl group substituted on the aromatic ring with at least one substitutent selected from the group consisting of alkyl groups, alkenyl groups and mixtures thereof, R_2 having 4–20 carbon atoms

when R_2 is nonaromatic and 7–20 carbon atoms when R_2 is aromatic,

x is selected from the group consisting of 0 and 1,

when x=0, $R_3=R_1$,

when x=1, $R_3=R_2$; and

when n=2,

R_1 is selected from the group consisting of an allyl group, a methallyl group and a crotyl group,

R_2 is selected from the group consisting of an unsubstituted alkylene; an unsubstituted alkynylene; and alkylene substituted with one or more substitutents selected from the group consisting of alkyl groups, alkenyl groups and mixtures thereof; and an alkynylene substituted with one or more substituents selected from the group consisting of alkyl groups, alkenyl groups and mixtures thereof, R_2 having 4–20 carbon atoms,

x=0, and $R_3=R_1$.

4,855,429

CHIRAL ESTERS FORMED FROM α-SUBSTITUTED CARBOXYLIC ACIDS AND MESOGENIC HYDROXYL COMPOUNDS, AND THEIR USE AS DOPANTS IN LIQUID-CRYSTALLINE PHASES

Gerd Heppke; Christian Bahr, both of Berlin; Ingrid Müller, Hofheim am Taunus; Dieter Ohlendorf, Liederbach, and Rainer Wingen, Hattersheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

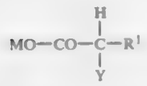
Filed May 28, 1987, Ser. No. 55,246

Claims priority, application Fed. Rep. of Germany, May 30, 1986, 3618213; Sep. 11, 1986, 3630933; Feb. 4, 1987, 3703228

Int. Cl.[4] C07D *239/02*

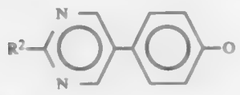
U.S. Cl. 544—335 **7 Claims**

1. A chiral ester of the formula (I)



(I)

wherein MO is a molecular radical of a mesogenic hydroxyl compound MOH after removing an H, the radical MO having trhe formula (II)



(II)

wherein

R^2 is straight-chain or branched (C_1–C_{12})alkyl or alkenyl, where one or two non-adjacent CH_2 groups may be replaced by O or S, or wherein R^2 is F, Cl, Br or CN;

Y is F, Cl, Br, CN or CF_3; and

R^1 is a branched (C_3–C_9)alkyl, benzyl or phenyl.

4,855,430

POLYCYCLICAMINE WITH PSYCHOTROPIC ACTIVITY

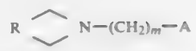
Magid A. Abou-Gharbia, Wilmington, Del., and Usha R. Patel, Audubon, Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Nov. 12, 1987, Ser. No. 119,530

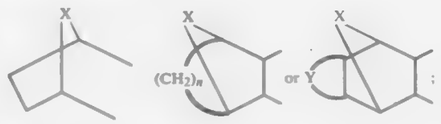
Int. Cl.[4] C07D *403/00, 401/00*

U.S. Cl. 544—373 **4 Claims**

1. A compound having the formula



wherein R represents



where

X is lower alkylene, vinylene or O;

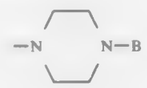
Y is lower alkylene or vinylene;

the dotted line represents an optional double bond;

m is 2 or 3;

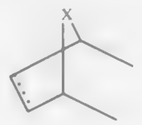
n is 2–4;

A represents the grouping



where

B is phenyl, pyrimidinyl, pyridinyl, or pyrazinyl, or any of the foregoing monosubstituted with lower alkyl, lower alkoxy, halo, cyano, nitro or trifluoromethyl;



and the pharmacologically acceptable salts thereof.

4,855,431

PROCESS FOR MAKING ALKYL PYRAZINES

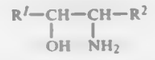
Clarence D. Chang, Princeton, and Patrick D. Perkins, Titusville, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed Jan. 13, 1983, Ser. No. 457,806

Int. Cl.[4] C07D *241/12*

U.S. Cl. 544—410 **9 Claims**

1. A process for making a pyrazine comprising contacting, under conditions which dehydrogenate, dehydrate and cyclize, an aminoalkanol of the formula



wherein R^1 and R^2 are hydrogen or a C_1 to C_{10} alkyl group or mixtures thereof, with a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least 12 and a constraint index of 1 to 12.

4,855,432

OPTICALLY ACTIVE IRIDIUM COMPLEXES AND THEIR USE

Jürgen Kaschig, Freiburg, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

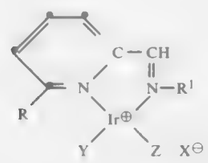
Filed May 8, 1987, Ser. No. 47,098

Claims priority, application Switzerland, May 16, 1986, 1987/86

Int. Cl.[4] C07B *41/02;* **C07F** *15/00;* **B01J** *31/22;* **C07D** *213/53*

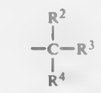
U.S. Cl. 546—12 **8 Claims**

1. An optically active iridium complex of the formula (I)



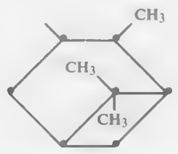
(I)

wherein R is methyl and R^1 is a radical of the formula II

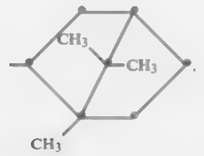


(II)

in which R^2, R^3 and R^4 differ from one another if they do not contain at least 1 chiral C atom, and are a hydrogen atom, C_1–C_4-alkyl, C_1–C_4-alkoxy, cycloalkyl having 5 to 7 ring C atoms which is unsubstituted or substituted by C_1–C_4-alkyl or phenyl, cycloalkylalkyl which has 5 to 7 ring C atoms and 1 or 2 C atoms in the alkylene group and is unsubstituted or substituted by C_1–C_4-alkyl or phenyl, or are phenyl, naphthyl, benzyl or β-phenylethyl, or R^3 and R^4 together are C_1–C_4-alkyl-substituted or phenyl-substituted linear C_4- or C_5-alkylene, C_4- or C_5-oxaalkylene or C_5-dioxaalkylene having one, two, three or four chiral C atoms, or R^2 and R^4 are each H, and R^3 is

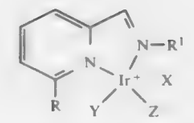


or the group $—CR^2R^3R^4$ corresponds to the formula

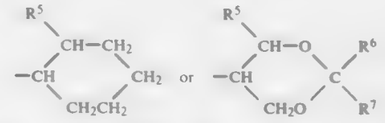


$X^{\ominus}$ is an anion of a monobasic inorganic or organic acid and Y and Z are each ethylene, or Y and Z together represent an open-chain or cyclic diene which has 6 to 10 C atoms and whose double bonds are separated by 1 or 2 carbon atoms.

5. An iridium complex of the formula I



wherein R is H and R^1 is a radical of the formula



in which R^5 is C_1–C_4-alkyl, benzyl or phenyl and R^6 and R^7 independently of one another are H, C_1–C_4-alkyl, or phenyl, X^- is an anion of a monobasic inorganic or organic acid and Y and Z are each ethylene, or Y and Z together represent an open-chain or cyclic diene which has 6 to 10 C atoms and whose double bonds are separated by 1 or 2 carbon atoms.

4,855,433

SILANES

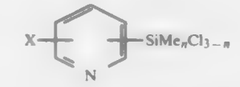
Martel Zeldin, Indianapolis, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

Filed Mar. 29, 1988, Ser. No. 174,249

Int. Cl.[4] B01J *31/02;* **C07F** *7/10*

U.S. Cl. 546—14 **9 Claims**

1. A silylpyridine monomer selected from the group consisting of chloromethylsilylpyridines of the formula:



where n is 1 or 2; X is hydrogen or fluorine; and Me is methyl, and N-oxides thereof.

4,855,434

PIPERIDINE COMPOUNDS

Giuseppe Cantatore, Bitonto, and Valerio Borzatta, Bologna, both of Italy, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

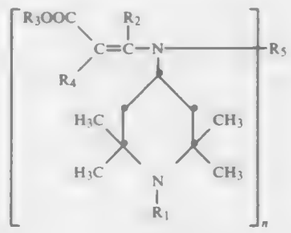
Filed Feb. 16, 1988, Ser. No. 156,112

Claims priority, application Italy, Feb. 26, 1987, 19500 A/87

Int. Cl.[4] C07D *401/12, 401/14;* **C08K** *5/34*

U.S. Cl. 546—190 **8 Claims**

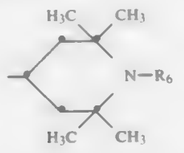
1. A piperidine compound of the formula (I)



(I)

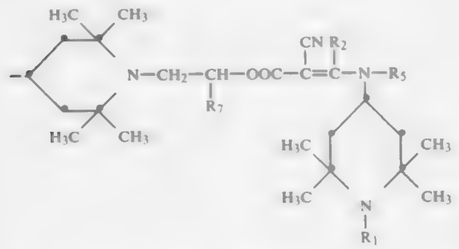
in which n is 1 or 2, R_1 is hydrogen, O·, NO, cyanomethyl, C_1–C_8-alkyl, C_3–C_6alkenyl or C_3–C_6alkynyl subject to the proviso that the carbon atom attached to the nitrogen atom is

a primary carbon atom, benzyl, C_1–C_7acyl or OH-monosubstituted C_2–C_4alkyl, R_2 is hydrogen, C_1–C_4alkyl or phenyl, R_3 is a group of the formula (II)

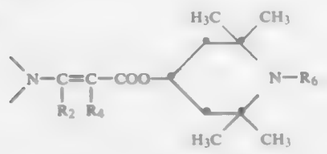


(II)

with R_6 being as defined for R_1, R_4 is —$COOR_3$ or —CN and, if n is 1, R_5 is hydrogen, C_1–C_{18}alkyl, C_2–C_4alkyl substituted by C_1–C_{12}alkoxy or di(C_1–C_6alkyl)amino, or C_5–C_{12}cycloalkyl unsubstituted or substituted by 1, 2 or 3 C_1–C_4alkyl radicals, benzyl, benzyl substituted by 1, 2 or 3 C_1–C_4alkyl radicals, or a group of the formula (II), and, if n is 1 and R_4 is —CN, R_3 is additionally a group of the formula



with R_1, R_2 and R_5 being as defined above and R_7 being as defined for R_2, and, if n is 2, R_5 is C_2–C_{12}alkylene, C_6–C_{15}cycloalkylene, phenylene, xylylene or C_4–C_{12}alkylene which is interrupted in the chain by one or two oxygen atoms or one or two groups



with R_2, R_4 and R_6 being as defined above.

4,855,435

PYRIDYL-SUBSTITUTED BENZOTHIOPHENES

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 433,940, Oct. 12, 1982, abandoned, which is a continuation-in-part of Ser. No. 385,621, Jun. 8, 1982, abandoned. This application Mar. 25, 1985, Ser. No. 715,595

Int. Cl.[4] **C07D** *405/06, 405/12*

U.S. Cl. 546—274 **1 Claim**

1. A compound consisting of 5-(3-Pyridinyloxa)-2-hydroxymethylbenzo(b)thiophene including pharmacologically acceptable acid addition salts thereof.

4,855,436

METHOD OF PREPARATION OF 2,6-BIS(PICRYLAMINO)-3,5-DINITROPYRIDINE

Robert S. Riggs, Grand Prairie, Tex., assignor to Jet Research Center, Inc., Arlington, Tex.

Filed Dec. 11, 1987, Ser. No. 131,971

Int. Cl.[4] **C07D** *31/42*

U.S. Cl. 546—307 **13 Claims**

1. The method of increasing the sensitivity and detonation reliability of 2,6-bis(picrylamino)-3,5-dinitropyridine explosive which comprises:

dissolving crystalline 2,6-bis(picrylamino)-3,5-dinitropyridine in a primary solvent selected from the group consisting of pyridine, dimethylformamide, methylsulfoxide and mixtures thereof to form a primary solution, the weight ratio of the primary solvent to the 2,6-bis(picrylamino)-3,5-dinitropyridine dissolved therein being from about 2:1 to about 20:1:

combining the primary solution with a second solvent in which 2,6-bis(picrylamino)-3,5-dinitropyridine is substantially insoluble, but which combines with the primary solution to form a transparent binary solvent system in which 2,6-bis(pircrylamino)-3,5-dinitropyridine is soluable;

adding to the binary solvent system a third solvent which is miscible with the binary solvent system to form a ternary solvent system from which 2,6-bis(picrylamino)-3,5-dinitropyridine is precipitated; then

separating the precipitate from the ternary solvent system.

4,855,437

PROSTANOIDS AND SYNTHESIS THEREOF

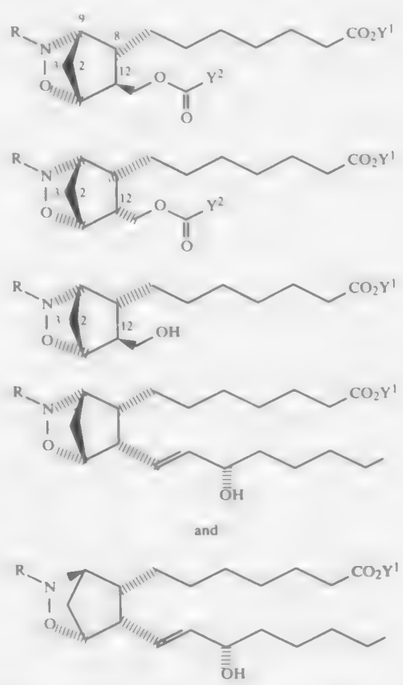
Jih R. Hwu, and Jeffrey A. Robl, both of Baltimore, Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Apr. 30, 1987, Ser. No. 44,322

Int. Cl.[4] **C07D** *261/20*

U.S. Cl. 548—241 **7 Claims**

1. A prostaglandin having a formula selected from the group consisting of



wherein R is phenyl, Y^1 is hydrogen, alkali metal, or lower alkyl; and Y^2 is lower alkyl.

4,855,438

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE 2-HYDROXYETHYLAZOLE DERIVATIVES

Johannes Kaulen, Bergisch Gladbach; Dieter Arlt, Cologne; Graham Holmwood, Wuppertal, and Wolfgang Krämer, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

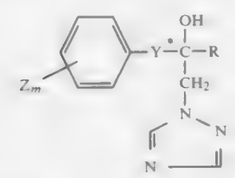
Filed Jul. 30, 1987, Ser. No. 79,844

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1986, 3627673

Int. Cl.[4] **C07D** *249/12*

U.S. Cl. 548—262 **7 Claims**

1. A process for the preparation of an optically active 2-hydroxyethyl-azole derivative of the formula



(I)

in which

R represents optionally substituted alkyl, optionally substituted cycloalkyl or optionally substituted phenyl,

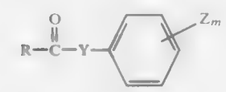
Y represents the —CH_2—CH_2—, —CH=CH— or —C≡C— groups, or represents a direct bond,

Z represents halogen, alkyl, cycloalkyl, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy, halogenoalkylthio, optionally substituted phenyl, optionally substituted phenoxy, optionally substituted phenylalkyl or optionally substituted phenylalkoxy, and

m represents the numbers 0, 1, 2 or 3,

comprising

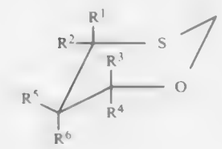
(a) reacting in a first stage, a ketone of the formula



(II)

in which

R, Y, Z and m have the abovementioned meaning, with an enantiomerically pure oxathiane of the formula



(III)

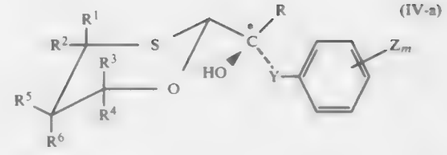
in which

R^1, R^2, R^3, R^4, R^5 and R^6 represent hydrogen or alkyl, but at least one of the radicals represents alkyl, or

R^4 and R^5, together, represent optionally alkyl-substituted alkanediyl, or

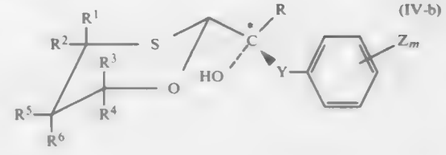
R^4 and R^5, together with the neighbouring carbon atoms, represent an optionally alkyl-substituted, fused bicyclic hydrocarbon radical,

in the presence of a strongly basic organometallic compound, and in the presence of a diluent, at a temperature between −80° C. and +120° C., then, in a second stage, separating the mixture of diastereomeric compounds of the formulae



(IV-a)

and

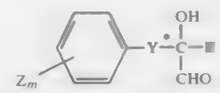


(IV-b)

in which

R, R^1, R^2, R^3, R^4, R^5, R^6, Y, Z and m have the abovementioned meaning,

thus obtained as a result of their different physical properties, then, in a third stage, initially reacting the diastereomer of the formula (IV-a) or (IV-b) desired in each case with a reagent which is suitable for the cleavage of an oxathiane compound, in the presence of a diluent at a temperature between 0° C. and 100° C., and then reacting the optically active α-hydroxyaldehyde of the formula

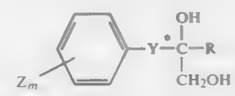


(V)

in which

R, Z, Y and m have the abovementioned meaning,

produced during this, with a reagent which is suitable for the reduction of an aldehyde, in the presence of a diluent at a temperature between −20° C. and +100° C., furthermore, in a fourth stage, reacting the optically active diol of the formula



(VI)

in which

R, Y, Z and m have the abovementioned meaning, thus obtained with a sulphonic acid derivative of the formula

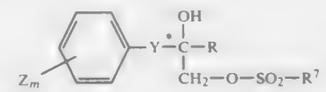
R^7—SO_2—Hal (VII)

in which

R^7 represents alkyl, halogenoalkyl or optionally substituted phenyl, and

Hal represents halogen,

in the presence of a diluent and in the presence of an acid-binding agent at a temperature between 0° C. and 100° C., and finally, in a fifth stage, reacting the resultant optically active compound of the formula

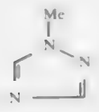


(VIII)

in which

R, R^7, Y, Z and m have the abovementioned meaning,

with a triazole salt of the formula



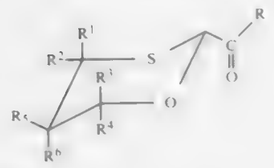
(IX)

in which

Me represents an alkali metal, in the presence of a diluent at a temperature between 20° C. and 150° C.,

or

(b) in a first stage, reacting an enantiomerically pure oxathiane ketone of the formula

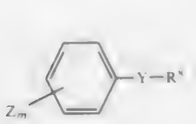


(X)

in which

R, R^1, R^2, R^3, R^4, R^5 and R^6 have the abovementioned meaning,

with an organometallic compound of the formula



(XI)

in which

Y, Z and m have the abovementioned meaning, and

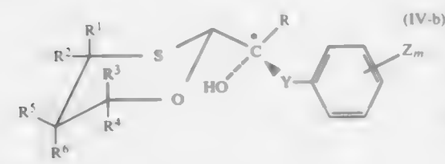
R^8 represents an alkali metal, a transition metal alkylate or a radical of the formula Me^1X, in which

Me^1 represents an alkaline earth metal or zinc, and

X represents chlorine, bromine or iodine,

in the presence of a diluent at a temperature between −78° C. and +100° C.,

then, in a second stage, initially reacting the diastereomer of the formula



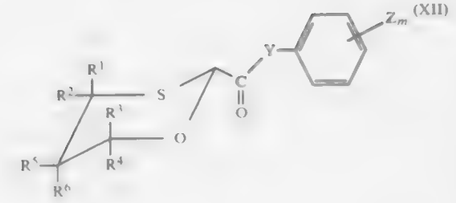
(IV-b)

in which

R, R^1, R^2, R^3, R^4, R^5, R^6, Y, Z and m have the abovementioned meaning,

produced preferentially, with a reagent which is suitable for the cleavage of an oxathiane compound, in the presence of a diluent at a temperature between 0° C. and 100° C., and then carrying out the further procedure in the same fashion as in the case of process version (a), or

(c) in a first stage, reacting an enantiomerically-pure oxathiane ketone of the formula



(XII)

in which

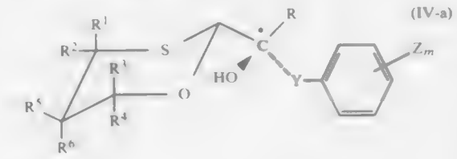
R^1, R^2, R^3, R^4, R^5, R^6, Y, Z and m have the abovementioned meaning,

with an organometallic compound of the formula

(XIII)

in which

R and R^8 have the abovementioned meaning, in the presence of a diluent at a temperature between −78° C. and +100° C., then, in a second stage, initially reacting the diastereomer of the formula



(IV-a)

in which

R, R^1, R^2, R^3, R^4, R^5, R^6, Y, Z and m have the abovementioned meaning,

produced preferentially, with a reagent which is suitable for the cleavage of an oxathiane compound, in the presence of a diluent at a temperature between 0° C. and 100° C., and then carrying out the further procedure in the same fashion as in the case of process version (a).

4,855,439

PROCESS FOR THE PREPARATION OF CIMETIDINE

Teofil Zizek, Ljubljana, Yugoslavia, assignor to LEK, Ljubljana, Yugoslavia

Filed Jan. 25, 1988, Ser. No. 147,423

Claims priority, application Yugoslavia, Jan. 23, 1987, 91/87

Int. Cl.⁴ C07D *233/64*

U.S. Cl. 548—342 **4 Claims**

1. A process for the preparation of crystalline cimetidine (N-cyano-N'-methyl-N''-{2/(5-methyl-1H-imidazole-4-yl)methylthio/ethyl}guanidine) of the formula



characterized in that O-ethyl-S-(4-methyl-imidazolyl-5-methyl)dithiocarbonate hydrobromide is reacted with N-cyano-N'-methyl-N''-(2-chloroethyl)guanidine in an aqueous methylamine solution at a temperature between room temperature and the reflux temperature of the reaction mixture, whereupon this title compound is separated.

4,855,440

METHOD FOR PRODUCING STABLIZED IMIDAZOLINE DERIVATIVES

Dale F. Shumway, and Harry C. Robbins, both of Janesville, Wis., assignors to Sherex Chemical Company, Inc., Dublin, Ohio

Filed Feb. 16, 1988, Ser. No. 155,768

Int. Cl.⁴ C07D *233/04*

U.S. Cl. 548—353 **9 Claims**

1. In a method for making an imidazoline liquid product of improved color stability by reacting a polyamine and a fatty acid or ester thereof under amide-forming reaction conditions comprising a temperature ranging from between about 100° and 300° C. and an inert atmosphere, to make an amide intermediate followed by subjecting said amide intermediate to imidazoline-forming reaction conditions comprising reduced atmospheric conditions with provision for removal of water, the improvement which comprises pre-treating said polyamine at a temperature of less than about 100° C. with an effective amount of a hydride prior to its reaction with said fatty acid or ester thereof.

4,855,441

PROCESS FOR THE PREPARATION OF THIOETHER COMPOUNDS

Günter Renner, Bergisch Gladbach, and Erich Illner, Leichlingen, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 14, 1987, Ser. No. 132,595

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644406

Int. Cl.⁴ C07D *231/00, 263/04, 277/04, 403/00*

U.S. Cl. 548—363 **6 Claims**

1. A process for the preparation of a thioether compound of the formula Py—S—R (I), wherein:

Py represents the residue of a 5-pyrazolone compound to which the group —S—R is attached in the 4-position, and

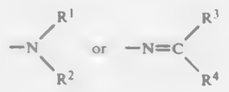
R represents alkyl with up to 20 carbon atoms, cycloalkyl, benzyl, phenethyl

or a heterocyclic group by the reaction of a compound of the formula Py*—H

wherein Py* represents the residue of a 5-pyrazolone compound which is not substituted in the 4-position and from which a hydrogen atom has been removed in the 4-position

with a reactant for the introduction of a thioether group in the 4-position of the 5-pyrazolone compound, wherein the improvement comprises the compound of the formula Py*—H is reacted with a compound of the formula B—S—R (II) wherein

R has the meaning already indicated and B represents



wherein

R^1 represents alkyl, aralkyl or aryl,

R^2 represents alkyl, aralkyl or SO_2—R^5 or R^1 and R^2 together form the residue for completing a 5-membered or 6-membered heterocyclic ring,

R^3 and R^4 represents dialkylamino and

R^5 represents alkyl, aryl or dialkylamino.

4,855,442

SUBSTITUTED 3-HYDROXY PYRAZOLES

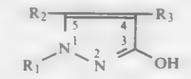
Len F. Lee, St. Charles; Kurt Moedritzer, Webster Groves, and Michael D. Rogers, Maryland Heights, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 13, 1988, Ser. No. 175,461

Int. Cl.⁴ C07D *231/20*

U.S. Cl. 548—365 **15 Claims**

1. A compound represented by the formula:



wherein:

R_1 is methyl or ethyl;

R_2 is halomethyl, haloethyl, methylsulfinyl, ethylsulfinyl or methoxymethyl

R_3 is hydrido or halo.

4,855,443

CHROMOGLYCIC ACID DERIVATIVE

Antonio Buxadé-Vinas, Barcelona, Spain, assignor to Laboratorios Vinas S. A., Barcelona, Spain

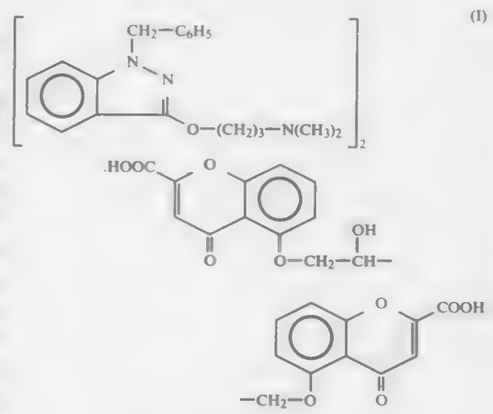
Filed Jul. 26, 1988, Ser. No. 224,573

Claims priority, application Spain, Aug. 5, 1987, 8702294

Int. Cl.⁴ C07D *231/56*

U.S. Cl. 548—372 **1 Claim**

1. A chromoglycic acid derivative having the structural formula I:



(I)

4,855,444

α-PYRROLIDONES AND A METHOD FOR PREPARATION THEREOF

Ludwig Wambach, Heidelberg, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

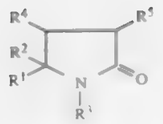
Division of Ser. No. 90,451, Aug. 28, 1987, abandoned. This application Mar. 28, 1988, Ser. No. 177,846

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1986, 3631414

Int. Cl.⁴ C07D *201/08, 207/263, 207/267, 207/273*

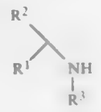
U.S. Cl. 548—408 **7 Claims**

1. A process for the preparation of an α-pyrrolidone of the formula Ia



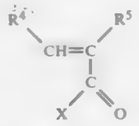
(Ia)

where R^1 and R^2 are each C_1–C_8-alkyl, C_1–C_8-alkoxy, C_3–C_{10}-cycloalkyl or C_3–C_{10}-cycloalkoxy and R^1 and R^2 together may form a ring having, in particular, from 4 to 7 ring carbon atoms, R^3 is hydrogen, C_1–C_6-alkyl, phenyl or naphthyl and R^4 and R^5 are each hydrogen or C_1–C_4-alkyl, wherein an amine of the formula II



(II)

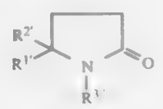
where $R^{3'}$ is hydrogen, tert-butyl, phenyl or naphthyl, is reacted in the presence of a free radical initiator with an α,β-unsaturated carboxylic acid derivative of the formula III



(III)

where X is —OR′, —NR′R″, —NHR′ or —NH_2, in which R′ and R″ are each C_1–C_8-alkyl, C_3–C_8-cycloalkyl or phenyl, and, where $R^{3'}$ is hydrogen and it is intended to prepare a compound in which R^3 is C_1–C_6-alkyl, the product obtainable in this procedure is reacted with an alkylating agent to introduce a C_1–C_6-alkyl group.

6. A α-pyrrolidone of the formula Ia′



(Ia′)

where $R^{1'}$ and $R^{2'}$ are each C_1–C_4-alkyl or, together with the carbon atom to which they are bonded, may form a ring having, in particular, from 4 to 7 ring carbon atoms, and $R^{3''}$ is methyl or tert-butyl.

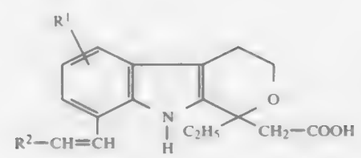
4,855,445

SUBSTITUTED-8-ALKENYL-1,3,4,9-TETRAHYDROPYRANO(3,4-B)INDOLE-1-ACETIC ACIDS

Alan H. Katz, Lawrenceville, and Christopher A. Demerson, Plainsboro, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 201,010, Jan. 1, 1988, Pat. No. 4,822,781.
This application Jan. 9, 1989, Ser. No. 294,705
Claims priority, application Canada, Oct. 8, 1987, 548883
Int. Cl.⁴ C07D *209/12*
U.S. Cl. 548—432 **5 Claims**

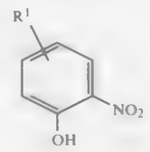
1. The process for producing the compounds having the structure



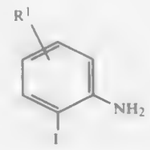
(I)

wherein R^1 is hydrogen, lower alkyl containing 1 to 4 carbon atoms or halogen; R^2 is lower alkyl containing 1 to 4 carbon atoms and the pharmaceutically acceptable salts thereof which comprises

(a) successively triflating, heating with lithium iodide, and reducing the compound of structure

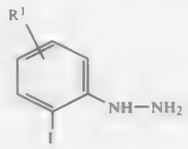


wherein R^1 is as defined above to produce the amine of structure



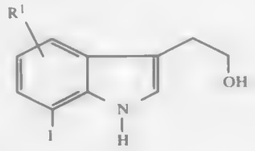
wherein R^1 is as defined above

(b) reacting said amine with HNO_2 and $SnCl_2$ to produce the hydrazine of structure



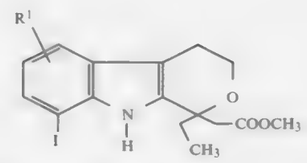
wherein R^1 is as defined above

(c) reacting said hydrazine with dihydrofuran to produce the corresponding hydrazone and in the presence of zinc chloride converting the hydrazone to the corresponding tryptophol of structure



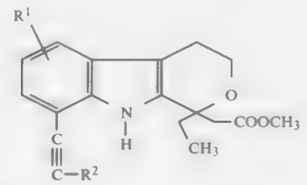
wherein R^1 is as defined above

(d) cyclizing said tryptophol with methyl 3-methoxy-2-pentenoate in the presence of boron trifluoride etherate or with methyl propionyl acetate in the presence of p-toluenesulfuric acid to produce the indole of structure



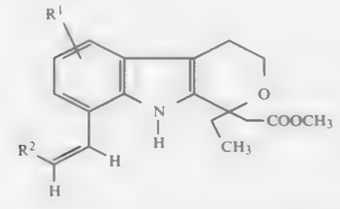
wherein R^1 is as defined above

(e) reacting said indole with copper (I) alkyl acetylide to produce the ester of structure



wherein R^1 and R^2 are as defined above

(f) hydrogenating said propynyl derivative to produce the compound of structure



wherein R^1 and R^2 are as defined above

(g) hydrolyzing said ester to produce the desired compound of structure (1) and optionally converting said compound to a phrmaceutically acceptable salt.

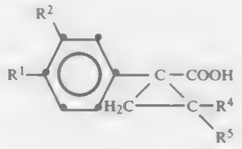
4,855,446

PROCESS FOR THE RESOLUTION OF RACEMATES USING LACTONE ESTERS

Colin C. Duke, Dee Why, and Robert J. Wells, Cromer, both of Australia, assignors to The Sherwin Williams Company, Cleveland, Ohio

Division of Ser. No. 353,755, Mar. 1, 1982, Pat. No. 4,501,908.
This application Dec. 17, 1984, Ser. No. 682,139
Claims priority, application United Kingdom, Mar. 12, 1981, 8107737; Feb. 8, 1982, 8203596
Int. Cl.⁴ C07D *209/82, 307/91, 321/00, 57/00*
U.S. Cl. 548—444 **15 Claims**

1. A process for the resolution of a racemic carboxylic acid selected from the group consisting of a compound of the formula:



I

in which

R^1 represents hydrogen or a C_1–C_9 alkoxy group, a C_1–C_9 alkylthio group, fluoro, chloro, bromo, a C_1–C_9 alkyl group, a nitro or amino group, R^2 represents a hydrogen or a C_1–C_9 alkyl group or R^1 and R^2 together represents a methylenedioxy group and R^4 and R^5 are the same or different and represent fluoro, bromo, chloro, or a C_1–C_9 alkyl group;

cis-3-(2,2-dichlorovinyl)-2,2-dimethyl-cyclopropane carboxylic acid;

cis/trans-3-(2,2-dichlorovinyl)-2,2-dimethyl-cyclopropane carboxylic acid;

cis-3-(2,2-dibromovinyl)-2,2-dimethyl-cyclopropane carboxylic acid;

3-(1,2-dibromo-2,2-dichloroethyl)-2,2-dimethyl-cyclopropane carboxylic acid;

2,2-dimethyl-3-(2,2,2-trichloroethyl)-cyclopropane carboxylic acid;

2,2-dimethyl-4,5-benzospiro[2,4]-hepta-4,6-diene-1-carboxylic acid;

cis-3-(Z-2-chloro-3,3,3-trifluoroprop-1-enyl)-2,2-dimethyl-cyclopropane carboxylic acid;

2-(2-chloro-α,α,α-trifluoro-p-toluidino)-3-methyl lactic acid;

2-(4-chlorophenyl)-3-methyl lactic acid;

2-(4-chlorophenoxy)-3-methylbutanoic acid;

2-(4-difluoromethoxyphenyl)-3-methyl lactic acid;

1-(4-ethoxyphenyl)-2,2,3,3-tetrafluorocyclobutane carboxylic acid;

1-(4-bromophenyl)-2,2,3,3-tetrafluorocyclobutane carboxylic acid;

1-(4-chlorophenyl)-2,2,3,3-tetrafluorocyclobutane carboxylic acid;

1-(3,4-methylenedioxyphenyl)-2,2,3,3-tetrafluorcyclobutane carboxylic acid;

2,3-dimethyl-3-(2,2-dichlorovinyl)-cyclopropane carboxylic acid;

1,4,5,6,7,7-hexachloro-8,9,10-trinoborn-5-ene-2-carboxylic acid;

2-chloropropanoic acid;

2-phenylbutanoic acid;

6-chloro-α-methyl-carbazole-2-acetic acid; and

8-chloro-α-methyl-3-dibenzofuran acetic acid

into its optically active enantiomers, which comprises forming a mixture of diastereomeric esters of the racemic carboxylic acid with a compound selected from the group consisting of an optically active enantiomer of

2,3-isopropylidene-ribonic acid-1,4-lactone;

1,2-isopropylidene-glucofuranurono-3,6-lactone,

2-hydroxy-3,3-dimethyl-1,4-butylrolactone and 3,4-isopropylidene-arabino-1,5-lactone separating the resulting mixture of diastereomeric esters into two optically active diastereomeric esters, and hydrolyzing the separated optically active diastereomeric esters to their corresponding acid.

14. The process of claim 1 wherein the carboxylic acid is 6-chloro-α-methyl-carbazole-2-acetic acid.

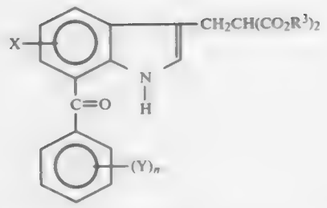
4,855,447

2-AMINO-3-AROYL-UPSILON-OXOBENZENEBUTANOIC ACID AND ESTERS

David A. Walsh, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 900,599, Aug. 26, 1986, Pat. No. 4,782,089.
This application Aug. 8, 1988, Ser. No. 229,932
Int. Cl.⁴ C07D *209/18*
U.S. Cl. 548—494 **8 Claims**

1. A compound selected from the group having the formula:



wherein;
X is selected from hydrogen, halogen, or loweralkyl;
Y is selected from hydrogen, halogen, loweralkyl, nitro, trifluoromethyl, or loweralkoxy;
n is 1 or 2; and
R^3 is hydrogen or loweralkyl.

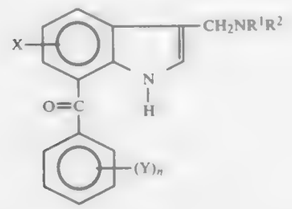
4,855,448

2-AMINO-3-AROYL-γ-OXOBENZENEBUTANOIC ACIDS AND ESTERS

David A. Walsh, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 900,599, Aug. 26, 1986, Pat. No. 4,782,089. This application Aug. 8, 1988, Ser. No. 229,665
Int. Cl.[4] C07D *403/06, 209/16*
U.S. Cl. 548—504 **3 Claims**

1. A compound selected from the group having the formula:



wherein;
X is selected from hydrogen, halogen, or loweralkyl;
Y is selected from hydrogen, halogen, loweralkyl, nitro, trifluoromethyl, or loweralkoxy;
n is 1 or 2; and
R^1 and R^2 are selected from loweralkyl, or when taken together with the adjacent nitrogen atom, may form a heterocyclic amine selected from 1-pyrrolidinyl, 1-piperidinyl, or 4-morpholinyl.

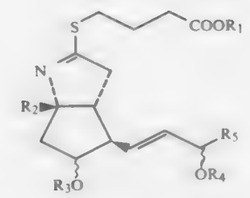
4,855,449

PROSTACYCLIN (PGI_2) ANALOGUES

Sachio Mori; Hikozo Iwakura, and Shozo Takechi, all of Hyogo, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Continuation of Ser. No. 25,807, Mar. 13, 1987, Pat. No. 4,820,836. This application Aug. 1, 1988, Ser. No. 226,844
Claims priority, application Japan, Mar. 31, 1986, 61-74932
The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.
Int. Cl.[4] C07D *209/52*
U.S. Cl. 548—512 **11 Claims**

1. A compound represented by the formula:



wherein R_1 is hydrogen or lower alkyl; R_2 is lower alkenyl; R_3 and R_4 each is hydrogen tetrahydropyranyl, trimethylsilyl, dimethyltert-butylsilyl, or diphenyl-tert-butylsilyl; R_5 is straight or branched C_1–C_8 alkyl which may be substituted with nitrogen-oxygen or sulfur-containing 5-membered heterocycle, straight or branched C_2–C_8 alkynyl or C_3–C_8 cycloalkyl; the wavy line indicates R- or S-configuration, or their mixture; or a salt thereof.

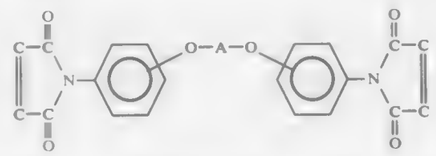
4,855,450

PROCESS FOR THE PREPARATION OF AROMATIC ETHER BISMALEIMIDES

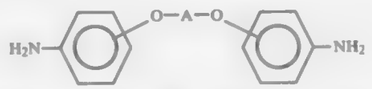
John M. Butler, Centerville; Richard P. Chartoff, Cincinnati, and James A. Harvey, Kettering, all of Ohio, assignors to University of Dayton, Dayton, Ohio

Filed Dec. 22, 1987, Ser. No. 136,900
Int. Cl.[4] C07D *403/10*
U.S. Cl. 548—522 **20 Claims**

1. A process for preparing aromatic ether bismaleimides of the Formula (II)



wherein A is a divalent mononculear or polynuclear aromatic linking group which comprises:
(a) adding maleic anhydride to a solution of an aromatic diamine of the Formula (IV)



wherein A is defined as in Formula (II) in a solvent such that the temperature of said maleic anhydride and said diamine does not exceed about 15° C. to form a maleamic acid, said maleic anhydride being added in an amount of approximately 1.25 to 1.40 mol of said maleic anhydride per mol of said aromatic diamine;
(b) gradually adding a trialkylamine to said reaction mixture at such a rate to maintain a fluid reaction mixture while also maintaining the temperature of said reaction mixture at less than about 0° C., said trialkylamine ionizing said maleamic acid to form an amine salt and being added in an amount sufficient to maintain said maleamic acid in solution;
(c) subsequently adding sufficient maleic anhydride to said reaction mixture such that the total amount of maleic anhydride added is approximately 2 mols of said maleic anhydride per mol of said aromatic diamine;
(d) adding further alkylamine to said reaction mixture in an amount sufficient to convert the maleamic acid essentially completely to said amine salt and thereby maintain said maleamic acid in solution;
(e) adding an imidization catalyst and a dehydration agent to said reaction mixture; and
(f) recovering an aromatic ether bismaleimide of the Formula (II).

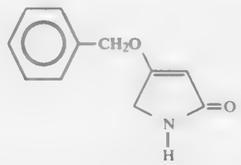
4,855,451

4-BENZYLOXY-3-PYRROLIN-2-ONE, ITS PRODUCTION AND USE FOR SYNTHESIS OF TETRAMIC ACID

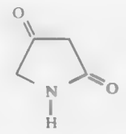
Thomas Meul, Visp, Switzerland, assignor to Lonza Ltd., Gampel, Switzerland

Filed Jun. 10, 1987, Ser. No. 60,338
Claims priority, application Switzerland, Jun. 26, 1986, 02566/86
Int. Cl.[4] C07D *207/32, 207/33*
U.S. Cl. 548—544 **10 Claims**

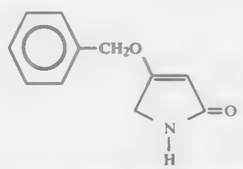
1. 4-Benzyloxy-3-pyrrolin-2-one of the formula:



2. Method for producing tetramic acid of the formula:



comprising (a) reacting 4-alkoxy-3-pyrrolin-2-one in the presence of acid with benzyl alcohol to provide 4-benzyloxy-3-pyrrolin-2-one of the formula:



and (b) catalytically hydrogenolyzing the 4-benzyloxy-3-pyrrolin-2-one to provide the tetramic acid.

4,855,452

N-SUBSTITUTED AZETIDINE CARBOXYLATE DERIVATIVES

Pieter A. Verbrugge; Jannetje de Waal, and David W. Sopher, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 9, 1988, Ser. No. 204,479
Claims priority, application United Kingdom, Apr. 16, 1985, 8509746
Int. Cl.[4] C07D *205/04*
U.S. Cl. 548—953 **6 Claims**

1. N-substituted azetidine carboxylate derivatives of the formula



wherein R_3 represents a hydrogen atom or a phenyl or C_{1-4} alkyl group; and X represents the group CH_2OH or COOY where Y represents a hydrogen or an alkali or alkaline earth metal atom.

4,855,453

TETRACYCLIC THIOPHENE DERIVATIVES

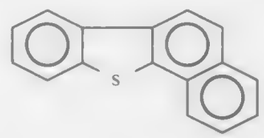
Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 801,087, Nov. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 673,356, Nov. 20, 1984, abandoned. This application May 16, 1988, Ser. No. 196,830
Int. Cl.[4] C07D *333/74*
U.S. Cl. 549—42 **7 Claims**

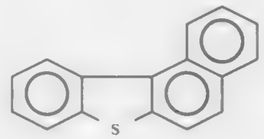
1. A compound of formula (I)

$$ArCH_2R^1 \quad (I)$$

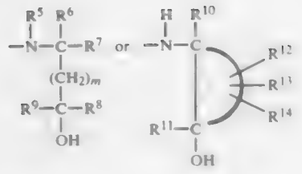
an acid addition salt thereof or a C_{1-6} alkylcarboxcylic acid ester derived therefrom;
the Ar ring system is unsubstituted, mono-substituted or di-substituted, the substituents contain not more than four carbon atoms in total when taken together being the same or different and are selected from halogen; cyano; C_{1-4} alkyl or C_{1-4} alkoxy, each optionally substituted by hydroxy or C_{1-2} alkoxy; halogen substituted C_{1-2} alkyl or C_{1-2} alkoxy; a group $S(O)_nR^2$ wherein n is an integer 0, 1 or 2 and R^2 is C_{1-2} alkyl optionally substituted by hydroxy or C_{1-2} alkoxy; or the Ar ring is optionally substituted by a group NR^3R^4 containing not more than 5 carbon atoms wherein R^3 and R^4 are the same or different and each is a C_{1-3} alkyl group; and
Ar is



or



R^1 contains not more than eight carbon atoms and is a group



wherein
m is 0 or 1;
R^5 is hydrogen;
R^6 and R^7 are the same or different and each is hydrogen or C_{1-5} alkyl optionally substituted by hydroxy;
R^8 and R^9 are the same or different and each is hydrogen or C_{1-3} alkyl;



is a five- or six-membered saturated carboxyclic ring;
R^{10} is hydrogen, methyl or hydroxymethyl;
R^{11}, R^{12} and R^{13} are the same or different and each is hydrogen or methyl;
R^{14} is hydrogen, methyl, hydroxy, or hydroxymethyl.

4,855,454

BRANCHED AMIDES OF L-ASPARTYL-D-AMINO ACID DIPEPTIDES

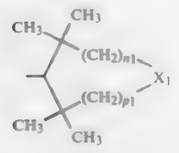
Thomas M. Brennan, Old Lyme, and Michael E. Hendrick, Groton, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 496,428, May 20, 1983, abandoned, which is a division of Ser. No. 201,745, Nov. 5, 1980, Pat. No. 4,411,925, which is a continuation-in-part of Ser. No. 113,800, Jan. 21, 1980, abandoned. This application Jul. 13, 1988, Ser. No. 218,245

Int. Cl.[4] C07D *333/36, 333/48*

U.S. Cl. 549—68 **3 Claims**

1. A compound of formula R^bNH_2 wherein R^b is



wherein n1 is zero and p1 is 1 or n1 and p1 arezero and X1 is S or SO_2.

4,855,455

PREPARATION OF AMINO ACID DERIVATIVES

Robert J. Kupper, Mt. Airy, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Jan. 22, 1988, Ser. No. 146,861

Int. Cl.[4] C07C *102/06, 117/04;* **C07D** *309/14, 335/02*

U.S. Cl. 549—88 **19 Claims**

1. A process of forming an azido-amide comprising:
(A) reacting the hydroxyl group of a hydroxy-carboxylic ester of the formula:

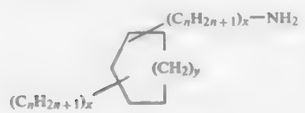
$$R—CH(OH)—(R')_n—COOR'' \quad (I)$$

with an azido-coupler to replace the hydroxyl group or the hydrogen atom of the hydroxyl group with an azide reactable group;

then (B) reacting the product of (A) above with an inorganic azide salt to form an azido-ester of the formula:

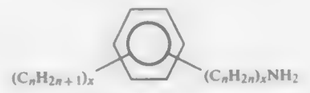
$$R—CH(N_3)—(R')_n—COOR'' \quad (II)$$

and then (C) reacting the azido-ester product of (B) above with a primary or secondary amine selected from:
(a) a linear or branched alkylamine of the formula $H_xN(C_nH_{2n+1})_{3-x}$ wherein n is 1 to 18 and x is 1 or 2; or
(b) a cycloalkyl amine of the formula:



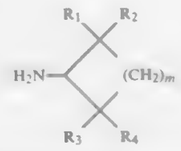
where n is independently 1–8;
y is 0 or 1; and x is independently 0–4

(c) an aromatic amine of the formula:

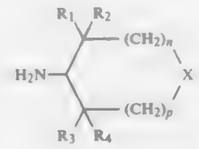


where n = 1–4 and x = independently 0–5

(d) carbo cyclic amines



wherein at least one R_1, R_2, R_3, and R_4 is a C_1–C_4 alkyl and the remainder are hydrogen or a C_1–C_4 alkyl and m is an interger of 1 to 4;
and (e) a heterocyclic amine of the formula



wherein x represents O, SO, SO, SO_2, C=O, or CHOH; n and p each represent o, 1, 2 or 3 and the sum of n+p is not greater than 3; and at least one R_1, R_2, R_3 and R_4 is a C_1–C_4 alkyl and the remainder are hydrogen or C_1–C_4 alkyl and the sum of the carbon atoms of R_1, R_2, R_3 and R_4 is not greater than 6; to form an azido-amide of the formula

$$R—CH(N_3)—(R')_n—CONR''' \quad (III)$$

wherein in said formulas I, II and III above the symbols R represents H or a C_1–C_{18} alkyl, R' represents —CH_2—, n represents an integer of 0 to 8, R'' represents a C_1–C_{18} alkyl, and R''' represents a monovalent organic residual radical of said amine defined above.

4,855,456

INTERMEDIATES FOR 6-ALPHA-HYDROXYMETHYL HMG-COA REDUCTASE INHIBITORS

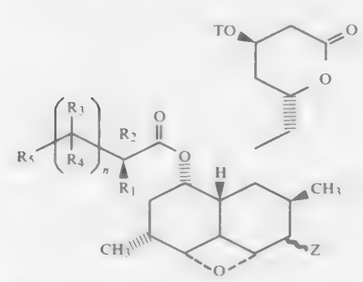
Ta J. Lee, and William F. Hoffman, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 29, 1988, Ser. No. 161,579

Int. Cl.[4] C07F *7/02*

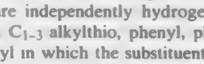
U.S. Cl. 549—214 **8 Claims**

1. A compound of structural formula (5):

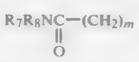


(5)

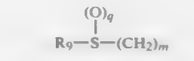
wherein
n is 0 to 3;
R_1 and R_2 independently are hydrogen, C_{1-5} alkyl, or R_1 and R_2 together with the carbon atom to which they are attached form a carbocyclic ring of 3 to 8 carbon atoms;
R_3 and R_4 are independently hydrogen, C_{1-3} alkyl, C_{3-7} cycloalkyl, C_{1-3} alkylthio, phenyl, phenylthio or substituted phenyl in which the substituents are V and W and when n is 2 to 3, each of the R_3s and R_4s are independently hydrogen, C_{1-3} alkyl, C_{3-7} cycloalkyl or only one of the R_3s and R_4s is phenyl or substituted phenyl;
R_5 is hydrogen, tosylate, OT, C_{1-5} alkyl or C_{1-5} alkyl substituted with tosylate or OT, or C_{3-7} cycloalkyl or C_{3-7} cycloalkyl substituted with C_{1-3} alkyl, tosylate or OT, C_{2-5} alkenyl, phenyl or substituted phenyl in which the substituents are V and W, or R_5 is a group selected from:
(a) C_{1-5} alkanoyloxy-C_{1-4} alkyl,
(b)



in which m is 0 to 3 and R_6 is C_{1-5} alkyl;
(c)



in which R_7 and R_8 are independently C_{1-5} alkyl;
(d)



in which g is 0 to 2 and R_9 is C_{1-5} alkyl or phenyl or substituted phenyl in which the substituents are V and W;
V and W independently are hydrogen, halogen, hydroxy, trifluoromethyl, C_{1-3} alkyl, C_{1-3} alkyloxy and TO-C_{1-3} alkyl;
T is tert-butyldimethylsilyl, tert-butyldiphenylsilyl, trimethylsilyl, triethylsilyl, triisopropylsilyl or tetrahydropyranyl;
Z is I, Br, or Cl.

4,855,457

CARBOXYLIC ANHYDRIDE PROCESS

Saleh Y. Ramzi, Neshanic Station, and Israel E. Wachs, Bridgewater, both of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 860,155, Nov. 12, 1985. This application Dec. 21, 1987, Ser. No. 135,823

Int. Cl.[4] C07D *307/89*

U.S. Cl. 549—239 **21 Claims**

1. A process for the preparation of a carboxylic anhydride comprising reacting a hydrocarbon with molecular oxygen in the vapor phase, in the presence of a solid oxidation catalyst, said solid oxidation catalyst being obtained by the steps of:
(a) forming a catalyst precursor by depositing on a titanium dioxide support in the anatase form, at least a monolayer amount of at least one vanadium oxide source which is convertible to vanadium oxide upon calcining;
(b) calcining said catalyst precursor under conditions sufficient to convert at least a portion of said vanadium oxide source into vanadium oxide;
(c) depositing upon the calcined catalyst precursor a catalytically effective amount of at least one vanadium oxide source which is convertible to vanadium oxide upon calcining and at least one reactive metal source selected from the group consisting of compounds of Sb, Ga, Ge, In, Tl, Pb, Bi, P, Te and Se which are convertible to the corresponding metal oxide upon calcining, said canadium oxide source and said reactive metal oxide source being deposited in amounts sufficient to provide a molar ratio of vanadium to the reactive metal of at least about 1:1 up to about 4:1 gram atom or vanadium per gram atom of reactive metal, and wherein the combined weight percent of vanadium and reactive metal thus deposited (based on the oxides thereof) is from about 4 to about 6 wt. %, based on total catalyst weight; and
(d) calcining the catalyst solids formed in step (c) under conditions sufficient to convert at least a portion of said vanadium and metal oxide compounds to vanadium and the reactive metal oxide, the catalyst thereby formed comprising vanadium and the reactive metal in a molar ratio of at least about 1:1 gram atom up to about 6:1 of vanadium per gram atom of reactive metal, and wherein the combined weight percent of vanadium and the reactive metal (based on the oxides thereof) is about 6 to about 8 wt. %, based on total catalyst weight.

4,855,458

MANUFACTURE OF PHTHALIC ANHYDRIDE BY GAS PHASE OXIDATION OF A MIXTURE OF O-XYLOL AND NAPHTHALENE

Werner Fuhrmann, Haltern; Manfred zur Hausen, Marl, and Wilfried Kriz, Bottrop, all of Fed. Rep. of Germany, assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 8, 1988, Ser. No. 203,932

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 37194763

Int. Cl.[4] C07D *307/89*

U.S. Cl. 549—248 **10 Claims**

1. In a process for the manufacture of phthalic anhydride from a gas phase mixture of o-xylol and naphthalene by oxidation in said gas phase on metal oxide catalysts, the improvement consisting essentially of:
producing a solution of 1 to 80 parts by mass naphthalene and 99 to 20 parts by mass o-xylol at a temperature of about 0° to 80° C., storing said solution at said temperature and heating only shortly prior to the reaction to temperatures of about 110° to 180°, atomizing said heated solution into a hot air flow of about 150° to 200° C., passing said heated solution in a gas phase over metal oxide catalysts and collecting said phthalic anhydride.

4,855,459

PROCESS FOR THE PRODUCTION OF MALEIC ANHYDRIDE

Michael J. Mummey, Foley, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 19, 1988, Ser. No. 145,795
Int. Cl.[4] C07D *307/60*
U.S. Cl. 549—260 **34 Claims**

1. In a process for the production of maleic anhydride by the catalytic vapor phase partial oxidation of nonaromatic hydrocarbons having at least four carbon atoms in a straight chain with molecular oxygen or a molecular oxygen-containing gas in the presence of a phosphorus-vanadium mixed oxide oxidation catalyst having a phosphorus/vanadium atom ratio of about 0.5 to about 2.0, said catalyst containing a promoter component comprising each of iron and lithium the oxidation being conducted in a heat transfer medium-cooled fixed bed tube-type reaction zone packed with the catalyst under conditions sufficient to provide a single pass conversion of at least 70% of the hydrocarbon fed to the reaction zone and establish an initial maleic anhydride yield, the improvement comprising diluting the catalyst with an inert solid material in an amount sufficient to form a catalyst-inert solid material composition ffective to stabilize the maleic anhydride yield such that average yield decay is less than 0.30% of the established initial maleic anhydride yield per month over an extended period of sustained operations.

4,855,460

PROCESS FOR PERFLUOROALKYLATION OF ACID ANHYDRIDES

Marc Tordeux, Sceaux; Claude Wakselman, Paris, and Catherine FRancese, L'Hay Les Roses, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jul. 11, 1988, Ser. No. 217,338
Claims priority, application France, Jul. 10, 1987, 87 10176
Int. Cl.[4] C07C *29/00, 45/00;* C07D *307/32, 307/88*
U.S. Cl. 549—308 **16 Claims**

1. A process for the perfluoroalkylation of an acid anhydride, comprising the step of contacting a perfluoroalkyl iodide or a perfluoroalkyl bromide with an acid anhydride, in the presence of a metal chosen from zinc and cadmium.

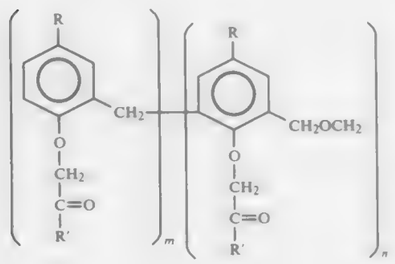
4,855,461

FUNCTIONALIZED OXACALIXARENES, THEIR PREPARATION AND USE IN INSTANT ADHESIVE COMPOSITIONS

Stephen J. Harris, Dublin, Ireland, assignor to Loctite (Ireland) Ltd., Dublin, Ireland

Filed Jan. 20, 1988, Ser. No. 145,993
Claims priority, application Ireland, Jan. 21, 1987, 153/87
Int. Cl.[4] C07D *313/00, 321/00, 323/00*
U.S. Cl. 549—348 **7 Claims**

1. Oxacalixarenes of the general formula :



wherein m=0−7 and n=1−8 with the proviso that m+n<8; R is hydrogen, halogen, or hydrocarbyl which may be substituted by one or more halo or oxo groups or interrupted by one or more oxo groups, and R may be the same or different on each aryl group; and

R′ is hydrocarbyl, which may be substituted by one or more halo or oxo groups or interrupted by one or more oxo groups, or hydrocarbyloxy, which may be substituted by one or more halo or oxo groups or interrupted by one or more oxo groups.

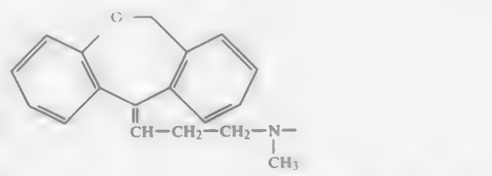
4,855,462

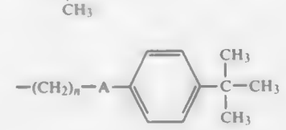
ANTIHISTAMINES

Ronald C. Griffith, Pittsford, and James J. Napier, Rochester, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jun. 17, 1988, Ser. No. 207,839
Int. Cl.[4] C07D *313/12*
U.S. Cl. 549—354 **4 Claims**

1. A compound of the formula:





wherein n is a positive whole integer from 3 to 5 and A is —CH_2—, —CH(OH)— or —C(=O)—, all geometric and enantiomeric forms thereof, and pharmaceutically acceptable acid addition salts thereof.

4,855,463

METHOD OF PRODUCING WATER-SOLUBLE GLUCURONIC ACID DERIVATIVES OF VITAMIN A

Arun B. Barua, and James A. Olson, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Dec. 15, 1986, Ser. No. 941,637
Int. Cl.[4] C09D *309/10*
U.S. Cl. 549—417 **6 Claims**

1. A method of producing water soluble retinoyl β-glucuronide comprising

acylating water-soluble glucuronic acid by treatment with water-insoluble retinoyl fluoride, and

stirring the mixture for an effective amount of time to facilitate the reaction of retinoyl fluoride with glucuronic acid in a mixture of about two parts acetone to about one part water at an alkaline pH of from about 7.2 to about 8,

acidifying the mixture and extracting the retinoyl glucuronide.

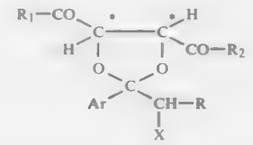
4,855,464

OPTICALLY ACTIVE KETALS, PROCESSES FOR THEIR PREPARATION AND THEIR USE IN THE SYNTHESIS OF ALPHA-ARYLALKANOIC ACIDS

Claudio Giordano, Vicenza; Graziano Castaldi, Briona; Fulvio Uggeri, Codogno, and Silvia Cavicchioli, Costermano, all of Italy, assignors to Zambon S.p.A., Vicenza, Italy

Division of Ser. No. 720,379, Apr. 5, 1985, Pat. No. 4,734,507.
This application Dec. 17, 1987, Ser. No. 134,197
Claims priority, application Italy, Apr. 6, 1984, 7204 A/84; Aug. 6, 1984, 7206 A/84; Aug. 6, 1984, 7207 A/84
The portion of the term of this patent subsequent to Sep. 29, 2004, has been disclaimed.
Int. Cl.[4] C07D *317/00;* C07C *51/16*
U.S. Cl. 549—450 **12 Claims**

1. Process for the preparation of the compounds of formula



(I)

wherein

Ar represents naphthyl or naphthyl substituted by halogen, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, benzyl, hydroxy, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, phenoxy, thienylcarbonyl or benzoyl;

R represents a C_1–C_4 alkyl;

R_1 and R_2, equal to or different from each other, represent a hydroxy, an O^-M^+, or OR_3 or an



group,

R_3 represents a C_1–C_4 alkyl, a C_3–C_6 cycloalkyl, a phenyl or a benzyl;

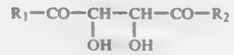
M^+ represents the cation of an alkaline metal;

R_4 and R_5, equal to or different from each other, represent a hydrogen atom, a C_1–C_4 alkyl, a C_5–C_6 cycloalkyl, a $(CH_2)_n$—CH_2OH group with n=1, 2 or 3, or R_4 and R_5 together are a group $(CH_2)_m$ with m=4 or 5, a group —CH_2—CH_2—R_6—CH_2—CH_2— in which R_6 is an oxygen atom, an N—H or N—(C_1–C_4) alkyl group;

X represents a chlorine, bromine or iodine atom, an hydroxy, acyloxy, alkylsulphonyloxy or arysulphonyloxy group;

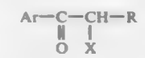
the carbon atoms marked by an asterisk being both contemporaneously in the R or S configuration,

characterized in that L(+) or D(−) tartaric acid or a derivative thereof of formula



wherein R_1 and R_2 have the above reported meanings is reacted with

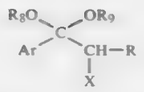
(a) a ketone of formula



(II)

wherein Ar, R and X have the above reported meanings or with

(b) a ketal of formula



(III)

wherein Ar, R and X have the above reported meanings, R_8 and R_9 represent a C_1–C_4 alkyl or R_8 and R_9 together represent a C_2–C_6 alkylene so as to form a 5 or 6-membered ring with the O—C—O group.

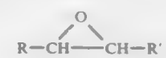
4,855,465

PROCESS FOR THE TREATMENT OF ALIPHATIC EPOXIDES

Andreas Grund, Darmstadt; Guenter Prescher, Hanau; Georg Boehme; Willi Hofen, both of Rodenbach, and Heinrich Petsch, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 890,573, Jul. 30, 1986, abandoned. This application Mar. 2, 1988, Ser. No. 166,784
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1985, 3528005
Int. Cl.[4] C07D *301/12*
U.S. Cl. 549—525 **11 Claims**

1. A process for the preparation of an aliphatic epoxide of the following formula:



comprising reacting an olefin of the formula:

in which R represents an alkyl residue and R′ represents an alkyl residue or hydrogen,

with a solution of perpropionic acid at a concentration of 10–30% by weight in benzene at a molar ratio of 1:1 to 1:1.3 (olefin to perpropionic acid), wherein the aliphatic olefin with a solution of perpropionic acid in benzene at a molar ratio of 1:1 to 1:1.3 is charged to a reaction system consisting of a series of 1 to 4 ideally mixed reactors and a subsequent reactor, the reaction is run at a temperature of 10° to 100° C., whereby the residence time is adjusted so that the conversion, based on the olefin double bond used, is at least 80 mole percent downstream of the ideally mixed reactor(s) and over 98 mole percent downstream of the subsequent reactor,

and separating the liberated propionic acid by a combination of distillation and desorption after the reaction to recover the desired product comprising removing benzene, propionic acid, small amounts of perpropionic acid, and other low boiling substances from the mixture emerging from the subsequent reactor in a combination of distillation and desorption steps, wherein the distillation and desorption steps are carried out at reduced pressure of 50° to 150° C. and with residence times of a maximum of 5 minutes, in the separated steps, wherein initially benzene and propionic acid, as well as small amounts of perpropionic acid, are removed for the most part by distillation, whereupon the amount of propionic acid remaining in the crude epoxide is further removed by desorption with benzene vapor, immediately thereafter driving off benzene and traces of propionic acid by desorption with steam and/or inert gases, and optionally following desorption with benzene vapor the crude epoxide is initially washed with aqueous alkalies, then washed with water, and only then the desorption with steam and/or inert gases is performed,

wherein the perpropionic acid solution is the crude extract from the preparation of perpropionic acid which contains hydrogen peroxide, water and mineral acid and has a

maximum content of 1.5 weight percent of hydrogen peroxide, 1.5 weight percent of water, and about 800 ppm of mineral acid.

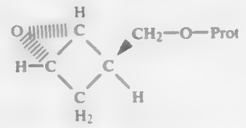
4,855,466

PURINYL CYCLOBUTANES

Robert Zahler, and Glenn A. Jacobs, both of Princeton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 28, 1987, Ser. No. 138,737
Int. Cl.[4] C07D *303/00*
U.S. Cl. 549—546 **1 Claim**

1. A compound having the formula



wherein Prot is a hydroxyl protecting group.

4,855,467

HEAT CURABLE EPOXY COMPOSITIONS, AND AMINE ADDUCTS OF COBALT(II) COMPLEXES

Robert E. Colborn, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 191,639, May 9, 1989, Pat. No. 4,814,391. This application Dec. 14, 1988, Ser. No. 284,020
Int. Cl.[4] C07F *15/06*
U.S. Cl. 556—40 **6 Claims**

1. An adduct of cobalt(II) acetylacetonate and a tertiary organic diamine.

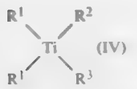
4,855,468

TITANOCENES AND A RADIATION-POLYMERIZABLE COMPOSITION CONTAINING THESE TITANOCENES

Martin Riediker, Riehen; Kurt Meier, Allschwil, and Hans Zweifel, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

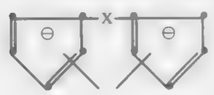
Division of Ser. No. 807,565, Dec. 11, 1985, Pat. No. 4,713,401. This application Sep. 11, 1987, Ser. No. 99,362
Claims priority, application Switzerland, Dec. 20, 1984, 6051/84
Int. Cl.[4] C07F *7/28*
U.S. Cl. 556—53 **8 Claims**

1. A titanocene of the formula I



(I)

in which the two R^1 independently of one another are cyclopentadienyl$^{\ominus}$, indenyl$^{\ominus}$ or 4,5,6,7-tetrahydroindenyl$^{\ominus}$, or both R^1 together are an unsubstituted or substituted radical of the formula II

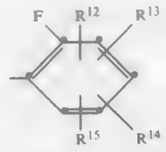


(II)

in which X is $-(CH_2)_n$ with n=1, 2 or 3 alkylidene having 2 to 12 C atoms, cycloalkylidene having 5 to 7 ring carbon atoms, SiR_2^4 or SnR_2^4, and R^4 is C_1–C_{12}-alkyl, C_5–C_{12}-cycloalkyl, C_6–C_{16}-aryl or C_7–C_{16}-aralkyl, or R^1 is said cyclopentadienyl, indenyl, 4,5,6,7-tetrahydroindenyl or radical of formula II which is substituted by alkyl, by alkoxy or by alkenyl of up to 18 carbon atoms, by cycloalkyl or by cycloalkenyl of 5 to 8 ring carbon atoms; by aryl of 6 to 16 carbon atoms; by aralkyl of 7 to 16 carbon atoms; by halogen; by amino or by aminoalkyl of up to 12 carbon atoms wherein the amino groups are unsubstituted or substituted by alkyl of up to 12 carbon atoms or quaternized with an alkyl halide of up to 12 carbon atoms, R^2 is a 6-membered carboxyclic or 5-membered or 6-membered heterocyclic aromatic ring which is substituted in at least one of the two ortho-positions relative to the metal-carbon bond by $-CF_2Z$, in which Z is F or unsubstituted or substituted alkyl, or wherein said aromatic ring of R^2 is further substituted by alkyl or by alkoxy of 1 to 18 carbon atoms; by cycloalkyl of 5 to 6 ring carbon atoms; by aryl of 6 to 16 carbon atoms; by aralkyl of 7 to 16 carbon atoms; by hydroxyl; by carboxyl; by halogen; by cyano; by amino which is unsubstituted or substituted by alkyl or quaternized by an alkyl halide; by pyrrolidino, by piperidino, by piperazino, by morpholino or by N-methylpiperazino; by alkoxycarbonyl of 1 to 18 carbon atoms, in the alkoxy moiety; by aminocarbonyl containing one or two C_1–C_{12}alkyl groups in the amonio moiety; or by aminocarbonyl containing a pyrrolidino, piperidino, piperazino, N-methylpiperazino or morpholino group; or by aminoalkyl of up to 6 carbon atoms wherein the amino group is unsubstituted or substituted by alkyl of up to 12 carbon atoms or quaternized with an alkyl halide of up to 12 carbon atoms and R^3 is as defined for R^2 or is halogen, cyanate, thiocyanate, azide, cyano, —OH, alkoxy, alkylthio, aryloxy, arylthio, acyloxy, a group of the formula $R^{10}R^{11}N$— in which R^{10} and R^{11} are C_1–C_{12}alkyl, unsubstituted or alkyl substituted cyclopentyl, cyclohexyl, phenyl or benzyl, or R^{10} and R^{11} together are tetra-, penta- or hexamethylene which are unsubstituted or alkyl substituted or are interruped by —S—, —O— or



alkynyl, phenylalkynyl, a group of the formula



in which R^{12} to R^{15} are hydrogen, fluorine, chlorine, bromine, C_1–C_4alkyl, dialkylamino having 2 to 12 carbon atoms, trialkylaminomethyl having 3 to 18 carbon atoms or said amino groups being quaternized with C_1–C_6alkyl halides, SiR_3 or S_nR_3 R^4 being as defined above.

4,855,469

PREPARATION OF CYCLOORGANOTRISILAZANES

Gnaneshwar R. Baile; John E. Herman, and Geoffrey M. Wyshak, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 9, 1988, Ser. No. 269,522
Int. Cl.[4] C07F *7/10*
U.S. Cl. 556—409 **15 Claims**

1. A process for the preparation of a cycloorganotrisilazane having the formula,

$$(R_2SiNH)_3,$$

from a cycloorganopolysilazane having the formula,

$$(R_2SiNH)_y,$$

or mixtures thereof,

wherein each R is independently selected from a group consisting of hydrogen, alkyl, alkenyl, aryl, and alkaryl, and y has a value of 4 or greater,

said process comprising heating the cycloorganopolysilazane in the presence of a catalyst to from the cycloorganotrisilazane, said catalyst being selected from a group consisting of quaternary ammonium halides, having the formula,

$$R'_4NX,$$

wherein each R′ is independently selected from a group consisting of alkyl, alkenyl, aryl, and alkaryl, and at least one R′ is a group containing greater than 11 carbon atoms; and X is a halogen atom.

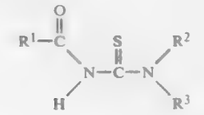
4,855,470

ORGANOSILANES CONTAINING BENZOYL THIOUREA GROUPS AND METHOD OF PREPARATION

Peter Panster, Rodenbach; Horst Grethe, and Peter Kleinschmit, both of Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 10, 1988, Ser. No. 154,408
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1987, 3706521
Int. Cl.[4] C07F *7/10*
U.S. Cl. 556—421 **9 Claims**

1. An organosilane containing benzol thiourea compound of the formula



whereby

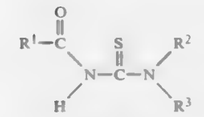
R^1 stands for phenyl or for a phenyl group substituted with an NO_2 group,

R_2 is of the formula

$$R^4—Si(OR)_3$$

in which

R^4 is alkylene with 1 to 10 C atoms or cycloalkylene with 5 to 8 C atoms, or of the formula



in which n is a number from 1 to 6,

and R is linear or branched alkyl with 1 to 3 C atoms,

R^3 has the same meaning as R^2 and can be identical with or different from R^2 or R^3 is H.

4,855,471

PROCESS FOR THE CHLORODEPHENYLATION OF PHENYLDISILANES

William H. Campbell, and Terrence K. Hilty, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 20, 1988, Ser. No. 146,065
Int. Cl.[4] C07F *7/08*
U.S. Cl. 556—430 **11 Claims**

1. A process for the preparation of an alkylhalodisilane having the formula,

$$R_{3-a}X_aSiSiR_{3-b}X_b,$$

wherein each R is an independently selected alkyl group; X is selected from a group consisting of chlorine and bromine atoms; a has a value of 0, 1, 2, or 3; and b has a value of 1, 2, or 3, said process comprising

(A) adding an aluminum halide. AlX_3, to a phenyl-containing disilane, having the formula.

$$R_{3-a}(C_6H_5)_aSiSiR_{3-b}(C_6H_5)_b,$$

wherein R, a, b, and X are defined above, wherein the phenyl-containing disilane has a melting point lower than about 50° C.; and the aluminum halide is added to a concentration of about 1 mole percent or greater relative to the phenyl-containing disilane;

(B) contacting the phenyl-containing disilane and the aluminum halide, in the absence of a solvent, with excess anhydrous hydrogen halide gas at a temperature less than about 50° C.;

(C) facilitating conversion of the phenyl-containing disilane to the alkylhalodisilane; and

(D) isolating and recovering the alkylhalodisilane.

4,855,472

PROCESS FOR CHAIN STABILIZATION OF ORGANOPOLYSILOXANES

Jürgen Burkhardt, Winhöring, Fed. Rep. of Germany, assignor to Wacker- Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 19, 1987, Ser. No. 64,026
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1986, 3625688
Int. Cl.[4] C07F *7/08, 7/18*
U.S. Cl. 556—459 **4 Claims**

1. A process for preparing oligomeric siloxanol mixtures containing siloxanols of the formula

$$HO—SiR_2O—[SiR_2O]—_nH \quad (I)$$

and those of the formula

$$R_3SiO—[SiR_2O]—_mH \quad (II)$$

where R is selected from the group consisting of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals having from 1 to 18 carbon atoms and hydrogen atoms, and n and m are each integers having an average value of from 4 to 30, which comprises reacting a mixture containing at least one compound of the formula R_3SiCl and at least one compound of the formula R_2SiCl_2 with water in the absence of an organic solvent, removing the aqueous phase and distilling off the lower-boiling by-products at a temperature of from 100° to 140° C. under a pressure of from 5 to 15 hPa (absolute), to form a mixture having a viscosity of from 10 to 80 mm^2s^{-1} at 25° C.

4,855,473

PROCESS FOR THE PREPARATION OF ORGANOOXYCHLOROSILANES

Thomas Würminghausen, Leverkusen; Karl Schneider; Franz Saykowski, both of Cologne, and Hans G. Fröhlen, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 8, 1987, Ser. No. 47,963
Claims priority, application Fed. Rep. of Germany, May 27, 1986, 3617729; May 27, 1986, 3617719
Int. Cl.[4] C07F *7/18*
U.S. Cl. 556—471 **2 Claims**

1. In a process for the production of a silane of the formula

$$R^1Si(OR^2)Cl_2$$

wherein

R^1 and R^2 independently of one another represent an alkyl,

haloalkyl or alkenyl radical with 1 to 4 C atoms or represent an aromatic radical with 6 to 8 C atoms; by reaction of an organochlorosilane with a compound of the formula

R^2OH.

the improvement which comprises carrying out the reaction in the presence of a catalyst system consisting of hydrogen chloride resulting from the reaction and a co-catalyst.

4,855,474

PROCESS FOR PRODUCTION OF PHOSPHOROTHIOIC DICHLORIDES

Mohamed H. Fahmy, Wilmington, and James R. Sanborn, Newark, both of Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Mar. 18, 1987, Ser. No. 27,234
Int. Cl.[4] C07F *9/14*
U.S. Cl. 558—95 **9 Claims**

1. A process comprising contacting and reacting a compound of the formula RCHO, wherein R is an alkyl or haloalkyl moiety which is inert under the reaction conditions, with PCl_3 and sulfur monochloride in the presence of a catalytic amount of chloride ion in the liquid phase and under anhydrous conditions and obtaining as a result thereof compound of the formula $RCHClOP(S)Cl_2$, said chloride ion being provided by at least one compound selected from the group consisting of quaternary ammonium, phosphonium, or sulfonium chlorides and polyethyleneoxy ether chloride salt complex.

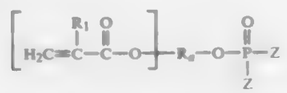
4,855,475

(METH)ACRYLIC ESTERS OF PHOSPHORIC ACID ESTER DIHALIDES

James E. Bunker, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 665,955, Oct. 29, 1984, Pat. No. 4,670,576, which is a continuation of Ser. No. 234,560, Feb. 13, 1981, abandoned. This application Mar. 30, 1987, Ser. No. 31,561
The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.
Int. Cl.[4] C07F *9/14*
U.S. Cl. 558—182 **1 Claim**

1. A polymerizable compound of the formula



where R_1 denotes H or CH_3; R_a denotes a C_{3-37} organic residue having a valence of 2; and Z denotes Cl or Br.

4,855,476

5-FLUORO- AND 8-FLUORO-TRIMETOQUINOL COMPOUNDS AND THE PROCESSES FOR THEIR PREPARATION

Duane D. Miller, Worthington; Dennis R. Feller, Columbus, both of Ohio; Michael T. Clark, West Chester, Pa.; Adeboye Adejare, Kensington, Md.; Karl J. Romstedt, and Gamal Shams, both of Columbus, Ohio, assignors to Ohio State University Research Foundation, Columbus, Ohio

Division of Ser. No. 890,490, Jul. 25, 1986, Pat. No. 4,737,504. This application Mar. 14, 1988, Ser. No. 167,336
Int. Cl.[4] C07C *120/00, 121/66*
U.S. Cl. 558—410 **2 Claims**

1. The compound of the formula namely 3,4-dibenzyloxy5-fluorobenzylcyanide.

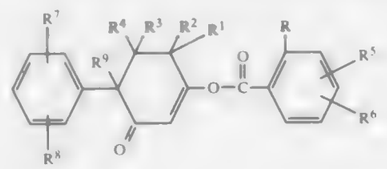
4,855,477

ESTER INTERMEDIATES FOR 2-BENZOYL-4-PHENYL-1,3-CYCLOHEXANEDIONES

David L. Lee, Martinez, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 906,462, Sep. 12, 1986, Pat. No. 4,795,488. This application Aug. 1, 1988, Ser. No. 226,699
Int. Cl.[4] C07C *121/48, 147/107*
U.S. Cl. 558—412 **1 Claim**

1. An intermediate compound of the structural formula



wherein

R is chlorine, bromine, methyl, methoxy nitro; trifluoromethyl or methylsulfonyl;

R^1 is hydrogen or methyl;

R^2 is hydrogen or methyl;

R^3 is hydrogen or methyl;

R^4 is hydrogen or methyl;

R^5, R^6, R^7 and R^8 independently are (1) hydrogen; (2) halogen; (3) C_1–C_4 alkyl; (4) C_1–C_4 alkoxy; (5) trifluoromethoxy; (6) cyano; (7) nitro; (8) C_1–C_4 haloalkyl; (9) R^bSO_n—wherein n is the integer 0, 1 or 2; and R^b is (a) C_1–C_4 alkyl; (b) C_1–C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) —NR^cR^d wherein R^c and R^d independently are hydrogen or C_1–C_4 alkyl; (11) $R^cC(O)$—wherein R^c is C_1–C_4 alkyl or C_1–C_4 alkoxy; or (12) —$SO_2NR^cR^d$ wherein R^c and R^d are as defined; and (13) —$N(R^c)C(O)R^d$ wherein R^c and R^d are as defined; and

R^9 is hydrogen or methyl.

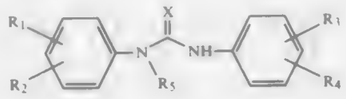
4,855,478

N,N'-DIARYL-N-ALKYLUREAS AND METHOD OF USE

Frank X. Woolard, Berkeley, Calif., assignor to ICI Americas Inc., Wilmington, Del.

Filed Nov. 30, 1987, Ser. No. 128,005
Int. Cl.[4] C07C *127/01, 157/02*
U.S. Cl. 558—417 **18 Claims**

1. An N,N'-diaryl-N-alkylurea having the formula



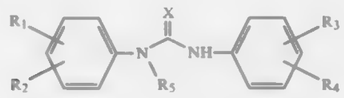
wherein

R_1, R_2, R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, halogen, cyano, trifluoromethyl, trifluoromethylthio, trifluoromethyl thionyl, trifluoromethane sulfonyl, sulfonamido, substituted phenoxy and substituted pyridyloxy groups wherein the substituent is my one of halogen, cyano, trifluoromethyl, trifluoromethylthio, trifluoromethyl thionyl, trifluoromethane sulfonyl, sulfonamido; and

R_5 is selected from the group consisting of alkyl, alkenyl, haloalkyl, haloalkenyl, hydroxyalkyl, hydroxylalkenyl, acetoxyalkyl, acetoxyalkenyl, mercaptoalkyl, and mercaptoalkenyl, wherein the alkyl or alkenyl group in each alkyl- or alkenyl-containing moiety has from 3 to 6 carbon atoms; and

X is oxygen or sulfur.

7. A herbicidal composition which comprises an herbicidally effective amount of an N,N'-diaryl-N-alkylurea having the formula



wherein

R_1, R_2, R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, halogen, cyano, trifluoromethyl, trifluoromethylthio, trifluoromethyl thionyl, trifluoromethane sulfonyl, sulfonamido, substituted phenoxy and substituted pyridyloxy groups wherein the substituent is any one of halogen, cyano, trifluoromethyl, trifluoromethylthio, trifluoromethyl thionyl, trifluoromethane sulfonyl, sulfonamido; and

R_5 is selected from the group consisting of alkyl, alkenyl, haloakyl, haloakenyl, hydroxyalkyl, hydroxylalkenyl, acetoxyalkyl, acetoxyalkenyl, mercaptoalkyl, and mercaptoalkenyl, wherein the alkyl or alkenyl group in each alkyl- or alkenyl-containing moiety has from 3 to 6 carbon atoms; and

X is oxygen or sulfur; and

an inert diluent carrier therefor.

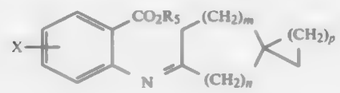
4,855,479

SUBSTITUTED 9-AMINO-SPIRO(CYCLOALKYL(b)QUINOLINE-2,1'CYCLOALKANES

Gregory M. Shutske, 47 Cedarbrook Dr., Somerset, N.J. 08873

Division of Ser. No. 192,037, May 9, 1988, Pat. No. 4,806,646, which is a division of Ser. No. 31,825, Mar. 30, 1987, Pat. No. 4,762,841. This application Nov. 21, 1988, Ser. No. 274,097
Int. Cl.[4] C07C *149/30*
U.S. Cl. 560—18 **1 Claim**

1. A compound having the formula



wherein m is 1 or 2; n is 1 or 2; p is 1-5; X is hydrogen, loweralkyl, cycloalkyl, loweralkoxy, halogen, hydroxy, nitro, tribluoromethyl, formyl, loweralkylcarbonyl, arylcarbonyl, -SH, loweralkylthio, —$NHCOR_2$ or —NR_3R_4 where R_2 is hydrogen or loweralkyl, andn R_3 and R_4 are independently hydrogen, loweralkyl or cycloalklyl; and R_5 is hydrogen or loweralkyl.

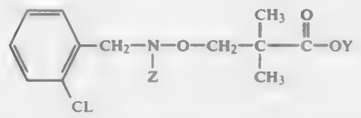
4,855,480

BENZYLAMINOOXYMETHYL METHYLPROPANOIC ACID HERBICIDES

Natesan Murugesan, Lawrenceville, and Mariano Guiducci, Edison, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jun. 29, 1988, Ser. No. 212,856
Int. Cl.[4] C07C *125/06;* A01N *37/44*
U.S. Cl. 560—29 **4 Claims**

1. A compound of the formula



in which Y is hydrogen, lower alkyl or alkali metal or alkaline earth metal and Z is hydrogen, a hydrohalide complex or a tri(lower)alkylmethoxycarbonyl group.

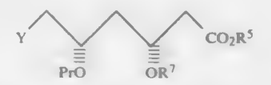
4,855,481

PROCESS FOR THE PREPARATION OF HMG-COA REDUCTASE INHIBITORS AND INTERMEDIATE COMPOUNDS EMPLOYED THEREIN

Yvan Guindon, Closse Ile Bizard; Christiane Yoakim, Montreal, and Howard E. Morton, Dollard des Ormeaux, all of Canada, assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 875,846, Jun. 18, 1986, abandoned, which is a division of Ser. No. 673,231, Nov. 19, 1984, Pat. No. 4,611,068. This application Apr. 4, 1988, Ser. No. 176,828
Int. Cl.[4] C07C *69/76*
U.S. Cl. 560—55 **2 Claims**

1. A compound of the formula



wherein Y is chloro or bromo;

Pr is a protecting group selected from benzoyl, acetyl, triphenylsilyl or t-butyldiphenylsilyl;

R^5 is C_{1-5} alkyl or benzyl; and

R^7 is C_{1-5} alkyl, benzyl, C_{2-5} alkoxyalkyl or C_{3-5} alkoxyalkoxyalkyl.

4,855,482

NEW COMPOUNDS AND THEIR APPLICATION

Ryuzo Ueno, Nishinomiya; Shinichi Katsura, Toyonaka; Yoshirou Uchiyama, Nishinomiya, and Satomi Inoue, Osaka, all of Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Japan

Filed Jun. 26, 1987, Ser. No. 66,476
Claims priority, application Japan, Jul. 2, 1986, 61-154233
Int. Cl.[4] C07C *69/76*
U.S. Cl. 560—56 **1 Claim**

1. A bis(phenoxymethyl)benzene derivative or bis(naphthoxymethyl)benzene derivative having the general formula:



wherein: A represents



and R represents phenyl or benzyl, and X represents a hydrogen atom or a halogen atom.

4,855,483

METHOD FOR PREPARING POLYSALICYLATES

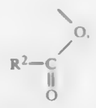
Dwain M. White, Schenectady, and Laura A. Socha, Troy, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 18, 1988, Ser. No. 157,010
Int. Cl.[4] C07C *69/76*
U.S. Cl. 560—66 **13 Claims**

1. A method for preparing linear polysalicylates, comprising the reaction of salicylic acid with a carboxylic acid derivative having the formula



wherein A is a halogen or



and R^1 and R^2 are individually hydrogen or straight or branched alkyl groups containing from about 1 to about 5 carbon atoms, at a temperature ranging from about 140° C. to about 280° C.

4,855,484

PROCESS FOR THE PREPARATION OF 4-HYDROXYPHENYL 4-HYDROXYBENZOATE AND THE USE THEREOF

Hanns P. Müller, Odenthal, and Roland Gipp, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 22, 1987, Ser. No. 64,679

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1986, 3622611

Int. Cl.⁴ C07C *69/88*

U.S. Cl. 560—72 **6 Claims**

1. Process for the preparation of 4-hydroxyphenyl 4-hydroxybenzoate by reacting p-hydroxybenzoic acid and hydroquinone in approximately equivalent molar ratios wherein an esterification catalyst is used and wherein the reaction is carried out in a reaction medium in which the reactants are substantially dispersed.

4,855,485

PROCESS FOR PRODUCTION OF CINNAMATES

Chao-Yang Hsu, Media, Pa., assignor to Sun Refining and Marketing Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 684,822, Dec. 21, 1984, Pat. No. 4,737,591. This application May 4, 1987, Ser. No. 45,507

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—104 **8 Claims**

1. A process for the production of methyl cinnamate and acetophenone which comprises the oxidative carbonylation of styrene with carbon monoxide, oxygen, and methanol in the presence of a catalyst, and in the presence of dehydrating agent in less than a stoichiometric amount.

4,855,486

BLOCKED, MARKED AMINO ACIDS

Suresh M. Kalbag, 922 Blazingwood Ave., Capertino, California 95104

Division of Ser. No. 869,098, May 30, 1986, Pat. No. 4,755,558. This application Feb. 19, 1988, Ser. No. 157,659

Int. Cl.⁴ C07D *209/52*; C07C *103/84*; A61K *31/40, 31/195*

U.S. Cl. 560—158 **11 Claims**

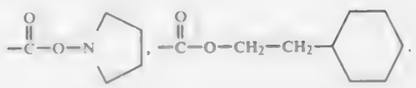
1. A composition of matter having the formula:

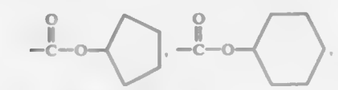


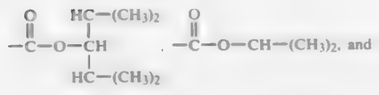
wherein:

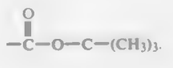
T is H or a blocking group; and

X is selected from the group consisting of $-(CH_2)_a-NH-Z$ and $-(CH_2)_a-Z$, wherein a is O or a positive integer and Z is selected from the group consisting of:









4,855,487

PROCESS FOR PREPARING FLUORINE-CONTAINING CARBOXYLIC ACID ESTER

Takamasa Fuchikami; Hisao Urata; Yoshimitsu Ishii, all of Kanagawa, Japan, and Yoshiko Obata, Rockville, Md., assignors to Sagami Chemical Research Center, Tokyo, Japan

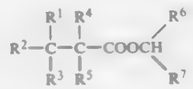
Filed Jul. 10, 1987, Ser. No. 71,832

Claims priority, application Japan, Jul. 11, 1986, 61-161915; Dec. 19, 1986, 61-301332

Int. Cl.⁴ C07C *69/63, 69/635, 51/10*

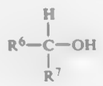
U.S. Cl. 560—227 **6 Claims**

1. In a process for preparing a fluorine-containing carboxylic acid ester represented by the formula (I)



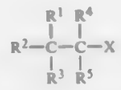
(I)

wherein R^1 represents a fluorine atom or a polyfluoro alkyl group, R^2 and R^3 each represents a hydrogen atom, a fluorine atom, an alkyl group, an aralkyl group, an alkenyl group or an aryl group, R^4, R^5, R^6 and R^7 each represents a hydrogen atom, an alkyl group, an aralkyl group, an alkenyl group or an aryl group, and R^2 and R^3, R^2 and R^4, R^3 and R^5, R^4 and R^5, or R^6 and R^7, when taken together with the carbon atom(s) to which they are attached, can form a ring, in which a fluorine-containing compound is reacted with carbon monoxide and an alcohol of the formula (III)



(III)

wherein R^6 and R^7 are as defined above, in the presence of a transition metal catalyst of the group VIII of the Periodic Table, the improvement which comprises employing as said fluorine-containing compound a fluorine-containing alkyl halide represented by the formula (II)



(II)

wherein R^1, R^2, R^3, R^4 and R^5 are as defined above, and X represents an iodine atom, a bromine atom or a chlorine atom,

in the presence of a base in an amount of from about 0.5 to about 5 molar equivalent to the fluorine-containing alkyl halide of the formula (II), wherein said alcohol is used in an amount of at least an equimolar amount to the halide represented by the formula (II), and the reaction is carried out at a temperature of from about 20° to about 150° C.

4,855,488

PROCESS FOR THE PREPARATION OF DICYCLOPENTENOL ESTERS

Fritz Gude, Herne, and Hans Bellut, Duelmen, both of Fed. Rep. of Germany, assignors to Huels Aktinegesellschaft, Marl, Fed. Rep. of Germany

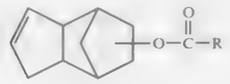
Filed May 25, 1988, Ser. No. 198,749

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1987, 3723891

Int. Cl.⁴ C07C *67/02*

U.S. Cl. 560—249 **8 Claims**

1. A process for the preparation of a dicyclopentenol ester of the formula:



wherein:

R is a C_{1-12} linear, branched or cyclic alkyl group, or R is a C_{6-12} aryl group or a C_{6-12} aryl group substituted by at least one member selected from the group consisting of halogen atoms and C_{1-3} alkyl groups; said process comprising:

(i) reacting together dicyclopentadiene and an organic carboxylic acid in the presence of a catalyst, wherein said organic carboxylic acid has the formula:

R—CO—OH

and wherein said catalyst comprises at least one addition compound of BF_3; and

(ii) obtaining said dicyclopentenol ester.

4,855,489

2-ACYLOXYPROPYLAMINO DERIVATIVES, PROCESSES FOR THE PREPARATION THEREOF, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Uwe Trostmann, Mühlenweg; Christoph Schächtele, Spechtweg; Karl Mannhardt, Graf Toerring; Claus Rudolph, Gewerbestr, and Marmé Dieter, Kaschnitzweg, all of Fed. Rep. of Germany, assignors to Goedecke Aktiengesellschaft, Berlin, Fed. Rep. of Germany

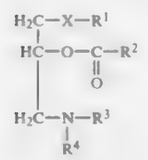
Filed Jul. 15, 1987, Ser. No. 73,926

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1986, 3625738

Int. Cl.⁴ C07C *67/02*

U.S. Cl. 560—250 **21 Claims**

1. A compound of the formula



(I)

wherein R^1 is propyl, octadecyl, octadecenyl, tetradecyl, hexadecyl, eicosanyl, or isobutyl; R^2 is methyl or isopropyl and R^3 and R^4 may be the same or different and are hydrogen, methyl, propyl, or benzyl.

4,855,490

LIQUID POLYISOCYANATE ADDUCT MIXTURES POSSESSING GOOD COMPATIBILITY WITH APOLAR SOLVENTS

Peter Markusch, McMurray, and George A. Hudson, deceased, late of Pittsburgh, both of Pa. (by Richard L. White, administrator), assignors to Mobay Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 389,732, Jun. 18, 1982, abandoned, which is a continuation-in-part of Ser. No. 282,284, Jul. 10, 1987, abandoned. This application Oct. 25, 1988, Ser. No. 262,370

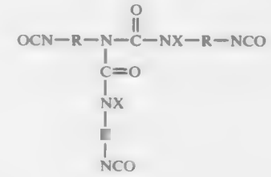
The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.

Int. Cl.⁴ C07C *127/24*; C08G *18/78*

U.S. Cl. 560—355 **16 Claims**

1. A polyisocyanate adduct mixture which at a solids concentration has an isocyanate content of about 4 to 19 weight percent and is liquid at room temperature, and comprises the reaction product of

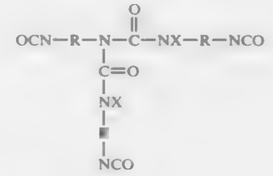
(a) a biuret-containing polyisocyanate of the formula



wherein

R represents an aliphatic residue containing 4 to 12 carbon atoms and

X represents H or



with

(b) about 0.05 to 0.5 moles per equivalent of isocyanate of a saturated, straight or branched monohydroxy alcohol with the exception of 2,6, 8-trimethylnonanol-4 which contains 11 to 36 carbon atoms, or a mixture of said monohydroxy alcohols.

4,855,491

METHOD FOR SELECTIVELY REMOVING PROCESS STREAM IMPURITIES UTILIZING REVERSE OSMOSIS

Calvin T. Chew, Warrenville, and John C. Gee, Aurora, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Apr. 25, 1988, Ser. No. 185,421

Int. Cl.⁴ C07C *51/265*

U.S. Cl. 562—414 **8 Claims**

1. A method for the continuous catalytic production of an aromatic carboxylic acid product by liquid-phase, exothermic oxidation of an aromatic alkyl with an oxygen-containing gas and a solvent medium in an oxidation reactor, wherein a slurry product stream is withdrawn from the reactor and separated to produce a product-containing stream and at least one mother liquor stream which contains oxidation reaction catalyst and impurities, which includes a step for removing impurities from the mother liquor stream by passing at least a portion of the

mother liquor stream through a reverse osmosis separation device and producing a catalyst-bearing stream having a relatively lesser impurities-to-catalyst weight ratio and a purge stream having a relatively greater impurities-to-catalyst weight ratio.

4. A method for the continuous, catalytic production of an aromatic carboxylic acid product by liquid-phase, exothermic oxidation of an aromatic alkyl with an oxygen-containing gas and a solvent medium in an oxidation reactor, wherein a slurry product stream is withdrawn from the reactor means and separated to produce a product-containing stream and at least one mother liquor stream which contains oxidation reaction catalyst and impurities, which includes a step for removing impurities from the mother liquor stream by separating the mother liquor stream into a solvent-rich stream and a solvent-depleted stream which contains the oxidation reaction catalyst and the impurities; and

passing at least a portion of the solvent-depleted stream through a reverse osmosis separation device while producing a catalyst-bearing stream having a relatively lesser impurities-to-catalyst weight ratio and a purge stream having a relatively greater impurities-to-catalyst weight ratio.

4,855,492

PROCESS FOR PRODUCTION OF AROMATIC POLYCARBOXYLIC ACIDS

John G. Hundley, St. Charles, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed May 27, 1988, Ser. No. 199,619

Int. Cl.⁴ C07C *51/265*

U.S. Cl. 562—414 **10 Claims**

1. A continuous process for producing a polycarboxylic acid product, comprising:

combining in a reaction zone polymethyl substituted benzene, an oxidation catalyst, an aqueous solvent and an oxygen-containing gas to produce a reaction mixture;

subjecting the reaction mixture in the reactants and reaction products, including a vapor phase and a product-containing liquid phase;

removing heat from the product-containing liquid phase by withdrawing a portion of the product-containing liquid phase from the reaction zone and passing said reaction zone-removed portion to a separation zone;

generating in the separation zone a product-containing liquid stream and a vapor stream;

cooling the product-containing liquid stream; and

returning the cooled product-containing liquid stream to the reaction zone.

4,855,493

PHARMACOLOGICAL ACTIVE AMINE-CARBOXYBORANES

Bernard F. Spielvogel, Raleigh; Andrew T. McPhail, Durham, and Iris H. Hall, Chapel Hill, all of N.C., assignors to The United States of America, as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 106,416, Dec. 21, 1979, abandoned, Continuation-in-part of Ser. No. 68,356, Aug. 21, 1979, Pat. No. 4,312,989. This application Jul. 7, 1986, Ser. No. 882,562

Int. Cl.⁴ C07C *101/00*

U.S. Cl. 562—575 **5 Claims**

1. A compound of the formula $R_1R_2NHBH_2C(O)OH$ wherein R_1 is hydrogen or methyl and R_2 is selected from the group consisting of hydrogen and alkyl containing 1 to 18 carbon atoms, said compound being sufficiently pure to give results on single-crystal x-ray analysis which unequivocally confirms its structure.

4,855,494

PROCESS FOR PRODUCING CITRIC ACID

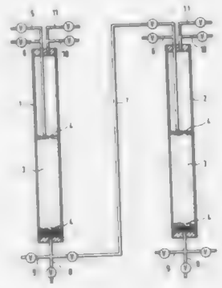
Gabriella Margureanu, Weinheim, and Friedrich Gutmann, Walldorf, both of Fed. Rep. of Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 1, 1985, Ser. No. 697,350

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1984, 3403748

Int. Cl.⁴ C07C *51/42*

U.S. Cl. 562—580 **24 Claims**



1. In a process for preparing highly purified citric acid from a crude citric acid fermentation solution of the type obtained by fermenting a carbohydrate-containing material to produce a fermentation mass containing citric acid in solution and filtering the fermentation mass to produce a crude citric acid fermentation solution, the improvement comprising (a) separating higher molecular weight impurities above about 1,000 mw from the citric acid fermentation solution by membrane ultrafiltration; (b) passing the membrane-filtered citric acid solution over a non-ionic adsorbent resin having a specific surface of 300–1,000 m^2/g to remove non-ionic impurities having a molecular weight below about 1,000 mw from the solution; (c) separating cationic and anionic impurities from the citric acid solution by passing the eluate from the non-ionic adsorbent resin over a cation exchange resin and an anion exchange resin; and (d) concentrating and recovering highly purified citric acid.

4,855,495

ENHANCED 2-HYDROXY-4-METHYLTHIOBUTANOIC ACID COMPOSITION AND METHOD OF PREPARATION

Masaharu Takano, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 750,669, Jul. 2, 1985, which is a continuation-in-part of Ser. No. 529,191, Sep. 6, 1983, abandoned. This application Apr. 10, 1986, Ser. No. 849,971

The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

Int. Cl.⁴ C07C *149/20*

U.S. Cl. 562—581 **6 Claims**

1. A solid composition consisting essentially of calcium and 2-hydroxy-4-(methylthio)butanoic acid equivalent (HMBA), said composition having an HMBA/calcium molar ratio greater than 2.2 and less than 10 and first exhibitinq solid/liquid phase change at a temperature a above 100° C. and comprising $Ca(HMBA)_4$ salt complex.

4. A method for preparing enhanced 2-hydroxy-4-(methylthio)butanoic acid compositions which comprises reacting the conventional calcium salt of 2-hydroxy-4-(methylthio)-butanoic acid with 2-hydroxy-4-(methylthio)butanoic acid so that the overall content of the mixture comprises greater than 2.2 and less than 10 moles of 2-hydroxy-4-(methylthio)butanoic acid equivalent (HMB.A) per mole of calcium to produce a composition comprising $Ca(HMBA)_4$ salt complex.

4,855,496

PROCESS FOR THE PREPARATION OF FORMIC ACID

Jeffrey J. Anderson, Sproatley; David J. Drury, Strawberry Hill; John E. Hamlin, Hull, and Alexander G. Kent, Beverley, all of England, assignors to BP Chemicals Limited, London, England

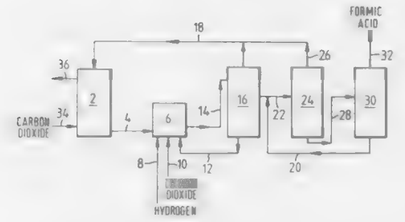
PCT No. PCT/GB85/00443, § 371 Date Apr. 30, 1986, § 102(e) Date Apr. 30, 1986, PCT Pub. No. WO86/02066, PCT Pub. Date Apr. 10, 1986

PCT Filed Sep. 26, 1985, Ser. No. 864,725

Claims priority, application United Kingdom, Sep. 29, 1984, 84/24672

Int. Cl.⁴ C07C *51/097, 53/02*

U.S. Cl. 562—609 **11 Claims**



1. An integrated process for the production of formic acid from carbon dioxide and hydrogen characterised in that

(a) in a first stage a first nitrogenous base, carbon dioxide and hydrogen are reacted together in the presence of a Group VIII transition metal catalyst and in the presence of a high boiling solvent selected from the group consisting of, polyethylene glycol, 1-phenyl-1-propanol, 3-phenyl-1-propanol and sulpholane, to produce a formate salt of the first nitrogenous base;

said first nitrogenous base containing a tertiary nitrogen atom selected from nitrogenous bases of the formulae:



(I)

and



(II)

wherein in the formulae, R^1, R^2 and R^3, may be the same or different, are hydrocarbyl groups or substituted hydrocarbyl groups containing oxygen or nitrogen or any two of R^1, R^2 and R^3 may form part of a ring, R^4 and R^5 form part of a ring;

(b) in a second stage the catalyst is removed from the formate salt of the first nitrogenous base and any low boilers and recycled to the first stage, wherein in the second state the catalyst is removed and recycled as a solution in the high boiling solvent;

(c) in a third stage the formate salt of the first nitrogenous base is recovered from the low boilers;

(d) in a fourth stage the formate salt of the first nitrogenous base is reacted with a second base which is (i) weaker than the first nitrogenous base used in the first stage, (ii) in the form of its formate salt is thermally decomposable at a temperature higher than the boiling point of the first nitrogenous base used in the first stage, and (iii) is less volatile than the first nitrogenous base used in the first stage, to produce the first nitrogenous base and the formate salt of the second base;

(e) in a fifth stage the formate salt of the second base is thermally decomposed to the second base and formic acid.

4,855,497

NOVEL DIAMINE DERIVATIVES

Mitiro Takagi, Saitama; Yasuyuki Katoh, Kanagawa, and Tomatsu Yamazaki, Saitama, all of Japan, assignors to Chugai Seiyaku Kaubshiki Kaisha, Tokyo, Japan

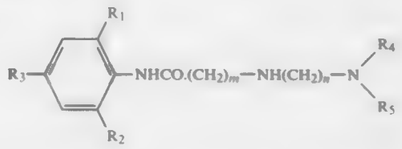
Filed Mar. 18, 1986, Ser. No. 840,681

Claims priority, application Japan, Apr. 2, 1985, 60-69694

Int. Cl.⁴ C07C *103/22*

U.S. Cl. 564—182 **13 Claims**

1. A compound of the following general formula or a salt thereof:



wherein R_1 and R_2 which may be the same or different are each an alkyl group having 1 to 3 carbon atoms; R_3 is a hydrogen atom or an alkyl group having 1 to 3 carbon atom; R_4 and R_5 which may be the same or different are each a hydrogen atom or an alkyl group having 1 to 8 carbon atoms or a cycloalkyl group having 3 to 8 carbon atoms; n is an integer of 1 to 7; and m is an integer of 2 to 5; provided that R_4 and R_5 are not both a hydrogen atom at the same time.

4,855,498

COORDINATION COMPLEXES OF PLATINUM WITH AMIDES

Rosette M. Roat, Chestertown, Md., and Seymour Yolles, Newark, Del., assignors to University of Delaware, Newark, Del.

Division of Ser. No. 899,691, Aug. 25, 1986, Pat. No. 4,772,735. This application Feb. 22, 1988, Ser. No. 158,806

Int. Cl.⁴ C07C *103/127, 103/34, 87/28, 93/08*

U.S. Cl. 564—215 **2 Claims**

1. The method of preparing amides of secondary amines by treating cis-$Pt(CH_2N(CH_3)O)_2$-trans-Cl_2 with reagents selected from the group consisting of aryl and alkyl magnesium bromides in tetrahydrofuran.

4,855,499

NOVEL PROCESS TO PREVENT FORMATION OF CHLORINATED BY-PRODUCTS IN APAP PRODUCTION

Olan S. Fruchey, Corpus Christi, Tex., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Nov. 6, 1987, Ser. No. 118,117

Int. Cl.⁴ C07C *102/10*

U.S. Cl. 564—223 **9 Claims**

1. In the process for the production of N-acetyl-para-aminophenol by the Beckmann rearrangement of 4-hydroxyacetophenone oxime using thionyl chloride in liquid sulfur dioxide as a catalyst the improvement which comprises adding a small but effective amount of an inorganic iodide to the Beckmann rearrangement reactor in order oo minimize the formation of chlorinated by-products.

4,855,500
PROCESS FOR PREPARING A KETIMINE
James C. Spavins, North Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.
Filed May 4, 1988, Ser. No. 190,300
Int. Cl.[4] C07C *119/14*
U.S. Cl. 564—270 12 Claims

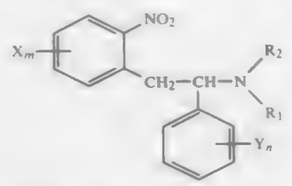
1. A process for preparing N-[4-(3,4-dichlorophenyl)-3,4-dihydro-1(2H)-naphthalenylidene]methanamine, which comprises contacting 4-(3,4-dichlorophenyl)-3,4-dihydro-1(2H)-naphthalenone with methylamine in a reaction-inert aprotic organic solvent in the presence of a hydratable molecular sieve having a pore size that is at least about three Angstrom units in diameter as catalyst, whereby water is removed from the resultant reaction mixture until formation of the desired ketimine final product is substantially complete.

4,855,501
PROCESS FOR PREPARATION OF MONOMETHYLHYDRAZINE
Shiro Hojo, Sakaide; Yoichi Hasegawa, and Takeo Hirai, both of Marugame, all of Japan, assignors to Japan Hydrazine Co., Inc., Tokyo, Japan
Filed Dec. 3, 1981, Ser. No. 327,088
Claims priority, application Japan, Dec. 10, 1980, 55-173116
Int. Cl.[4] C07C *109/04*
U.S. Cl. 564—314 8 Claims

1. A process for the preparation of monomethylhydrazine which comprises reacting hydrazine monohydrochloride with methanol in the presence of a catalytic amount of hydrazine dihydrochloride or methyl chloride and recovering free monomethyl hydrazine from the formed monomethylhydrazine hydrochloride.

4,855,502
α-(2-NITRO-PHENYLMETHYL)-BENZYLAMINES
Lawrence L. Martin, Lebanon, N.J.; Manfred Worm, Wiesbaden-Naurod, Fed. Rep. of Germany, and Charles A. Crishlow, Piscataway, N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.
Continuation of Ser. No. 300,014, Sep. 8, 1981, abandoned, Division of Ser. No. 91,062, Nov. 5, 1979, Pat. No. 4,309,424, Continuation-in-part of Ser. No. 948,896, Oct. 5, 1978, abandoned. This application Aug. 27, 1982, Ser. No. 412,213
Int. Cl.[4] C07C *87/28*
U.S. Cl. 564—373 13 Claims

1. A compound of the formula



in which R_1 is alkyl of from 1 to 5 carbon atoms, cycloalkylalkyl of from 4 to 8 carbon atoms or aralkyl having 1 to 5 carbon atoms in the alkyl moiety; R_2 is hydrogen; X and Y are the same or different and each can be hydrogen, chlorine, bromine, fluorine, methoxy, alkyl of from 1 to 3 carbon atoms, hydroxy or trifluoromethyl; m is the integer 1 or 2; and n is the integer 1, 2 or 3.

4,855,503
PREPARATION OF P,P'-OXYBIS(ANILINE)
Douglas E. Fjare, Naperville, and Gary P. Hagen, Glen Ellyn, both of Ill., assignors to Amoco Corporation, Chicago, Ill.
Filed Apr. 23, 1987, Ser. No. 41,480
Int. Cl.[4] C07C *85/147*
U.S. Cl. 564—394 8 Claims

1. A process for preparation of p,p'-oxybisaniline in high yield and in a highly pure state which comprises the combination of the steps of

a. reacting a solution of a reaction mixture comprising a polyacid consisting essentially of 4,4'-dicarboxydiphenyl ether and a hydroxylamine salt of an inorganic acid, in the presence of polyphosphoric acid at a minimum temperature of about 140° C.;
b. neutralizing said reaction mixture with an aqueous solution of a base to a pH of from 6 to 8 said neutralizing with an aqueous solution of base to a pH of from 6 to 8 being carried out for a period of time that is sufficient to hydrolyze said polyphosphoric acid;
c. reacidifying said reaction mixture with an aqueous mineral acid to a pH of less than 5 and at a temperature within the range of from about 0° C. to about 100° C.;
d. separating acid-insoluble impurities from said mixture to recover the mother liquor;
e. neutralizing said mother liquid with an aqueous solution of a base to a pH within the range of from 5 to 14 to precipitate p,p'-oxybisaniline; and
f. separating said mother liquor and precipitate to recover p,p'-oxybisaniline.

4,855,504
PROCESS FOR PRODUCING HIGHER MOLECULAR WEIGHT AMINO COMPOUNDS HAVING REDUCED MONOMERIC AMINE CONTENT
Werner Rasshofer, Cologne; Ernst Grigat, Leverkusen; Gerhard Grögler, Leverkusen; Heinrich Hess, Leverkusen, and Richard Kopp, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany
Filed Sep. 23, 1985, Ser. No. 778,656
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1984, 3437632
Int. Cl.[4] C07C *85/02*
U.S. Cl. 564—395 11 Claims

1. A process for the production of amino compounds having molecular weight of from 400 to 12,000 which have a reduced content of amino compounds having molecular weights below 400 comprising reacting

(a) a mixture of
(1) an amino compound containing terminal aromatic and/or aliphatic amino groups and having a molecular weight of from 400 to 12,000 and
(2) an amino compound having a molecular weight below 400 with
(b) an isocyanate in quantities such that from 0.5 to 10 equivalents of isocyanate (b) are present for each equivalent of amino compound (a)(2).

4,855,505
PROMOTED NICKEL AND/OR COBALT CATALYST, ITS USE, AND PROCESS PERFORMED IN ITS PRESENCE
Juhan Köll, Stenungsund, Sweden, assignor to Berol Kemi AB, Stenungsund, Sweden
Division of Ser. No. 647,471, Sep. 5, 1984, Pat. No. 4,701,434. This application Dec. 8, 1986, Ser. No. 940,221
Claims priority, application Sweden, Sep. 9, 1983, 8304828
Int. Cl.[4] C07C *85/08*
U.S. Cl. 564—398 22 Claims

1. A process of catalyzing an amination reaction in which one of an alkylene oxide, a hydroxyl-containing compound, an aldehyde, and a ketone is reacted with one of ammonia, a primary amine, and a secondary amine, and which favors the formation of primary or noncyclic amines, comprising conducting the reaction in the presence of a halogen-containing, ruthenium-promoted, nickel and/or cobalt catalyst containing:

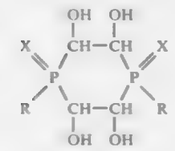
from 4 to 40 % by weight, based on the total weight of said catalyst, of at least one metal selected from nickel and cobalt;
from 0.1 to 5 % by weight, based on the total weight of said catalyst, of ruthenium which ruthenium was introduced as a solution of ruthenium halide; and
a porous metal oxide support comprised of at least 50 % by weight of activated alumina,
wherein said at least one metal selected from nickel and cobalt and said ruthenium are in the metallic state.

4,855,506
PROCESS FOR LITHIUM MONO- AND DIORGANYLBOROHYDRIDES
Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich-Boranes, Inc., Milwaukee, Wis.
Division of Ser. No. 902,176, Aug. 29, 1986, Pat. No. 4,772,751. This application Dec. 17, 1987, Ser. No. 134,469
Int. Cl.[4] C07F *5/02*
U.S. Cl. 568—6 7 Claims

1. In a process for synthesizing a compound of the formula LiR_mBH_n wherein R is an alkyl or aryl group, m is 1 or 2, n is 3 or 2 and m+n=4 comprising the steps of: reacting a lower alkyl borate represented by the formula BOR' where R' alkyl with a compound selected from the group consisting of lithium alkyl and lithium aryl represented by the formula LiR wherein R is alkyl or aryl to form a complex represented by the formula $LiR_mBOR'_n$ wherein R, R', m and n are as defined above; the improvement comprising heating said complex to a temperature of from 110° to 120° C. under vacuum to produce a boronic or borinic ester of the formulae $RB(OR')_2$ and R_2BOR', respectively, wherein R and R' are as defined above, and thereafter reacting said boronic or borinic ester with a compound selected from the group consisting of lithium aluminum hydride and lithium monoalkoxyaluminohydride to produce the desired lithium borohydride.

4,855,507
1,4-DISUBSTITUTED-2,3,5,6-TETRAHYDROXY-1,4-DIPHOSPHORINANES AND THEIR OXIDES OR SULFIDES
Allan J. Robertson, Thorold, Canada, and James B. Gallivan, Norwalk, Conn., assignors to American Cyanamid Company, Stamford, Conn.
Filed Feb. 13, 1989, Ser. No. 309,572
Claims priority, application Canada, Mar. 28, 1988, 562688
Int. Cl.[4] B03D *1/02*; C07F *9/02*
U.S. Cl. 568—12 3 Claims

1. A compound having the formula:



wherein R is a substituted or unsubstituted C_1–C_{12} alkyl, C_5–C_7 cycloalkyl, C_8–C_{12} aralkyl or C_6–C_{12} aryl radical and X is oxygen or sulfur.

4,855,508
ENERGETIC DIETHERS AND PROCESS FOR THEIR PREPARATION
Robert D. Chapman, Lancaster, Calif.; John L. Andreshak, Waukegan, Ill., and Scott A. Shackelford, Colorado Springs, Colo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Sep. 4, 1987, Ser. No. 93,345
Int. Cl.[4] C07C *43/00, 117/00*
U.S. Cl. 568—589 16 Claims

1. An energetic diether having the formula

R41 —O—X—O—R''

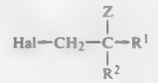
wherein R'' is an energetic alkyl moiety selected from the group consisting of 2-fluoro-2,2-dinitroethyl, 2-nitroethyl, 2,2-dinitroethyl, 2-azido-2,2-dinitroethyl and 2,2,2-trinitroethyl, and X is an alkane moiety selected from the group consisting of butyl, pentyl and hexyl.

4,855,509
REMOVAL OF ALKALI METALS FROM POLYOLS
Shashi B. Dave, Lakewood, and Clifford W. Cain, Jr., Bailey, both of Colo., assignors to Manville Corporation, Denver, Colo.
Filed Jan. 28, 1987, Ser. No. 8,025
Int. Cl.[4] C07C *37/82*
U.S. Cl. 518—621 7 Claims

1. A process for the removal of alkali and alkaline earth metals from polyols containing said metals, said process consisting essentially of the step of contacting the polyol containing said alkali and alkaline earth metal with an alkaline earth mono- or dihydrogen phosphate in an amount sufficient to remove substantially all of said alkali and/or alkaline earth metal from said polyol.

4,855,510
TRIAZOLE AND IMIDAZOLE COMPOUNDS
Robert A. Noon, Maidenhead; Patrick J. Crowley, Crowthorne, and Diana M. Worthington, Maidenhead, all of England, assignors to Imperial Chemical Industries PLC, London, England
Division of Ser. No. 499,399, May 31, 1983, Pat. No. 4,634,466. This application Nov. 14, 1986, Ser. No. 930,497
Claims priority, application United Kingdom, Jun. 18, 1982, 8217693; Jan. 21, 1983, 8301679; Jun. 14, 1983, 8217206
Int. Cl.[4] C07C *43/17, 33/025, 33/042*
U.S. Cl. 568—663 3 Claims

1. A compound of the formula


(III)

wherein R^1 is —CH=CH—X or —CH≡C—X where X is hydrogen, methyl, ethyl or propyl; R^2 is 2,4-dichlorophenyl, Z is OR^3 where R^3 is H, methyl or ethyl; and Hal is a halogen atom.

4,855,511
PROCESS FOR PREPARING $CHF_2OCHFCF_3$ AND $CHF_2OCHCLCF_3$ AND NOVEL INTERMEDIATE COMPOUNDS EMPLOYED THEREIN
Donald F. Halpern, Fanwood, and Mark L. Robin, South Plainfield, both of N.J., assignors to BOC, Inc., New Providence, N.J.
Filed Jul. 18, 1988, Ser. No. 220,129
Int. Cl.[4] C07C *37/62, 41/01*
U.S. Cl. 568—683 9 Claims

1. A process for preparing a compound of the formula

$CHF_2OCHFCF_3$ comprising reacting a compound having the formula $CHCl_2OCHClCOCl$ with SF_4 at an elevated temperature.

4,855,512

PREPARATION OF FLUOROPHENOLS

George Ryback, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 25, 1988, Ser. No. 172,894
Claims priority, application United Kingdom, Apr. 9, 1987, [illegible]
Int. Cl.[4] C07C *39/27*
U.S. Cl. 568—775 9 Claims

1. A process for the preparation of fluorophenols comprising dehydrating 1,2-dihydroxy-3-fluorocyclohexa-3,5-diene in the presence of a base containing HO^- or RO^- ions in which R is an alkyl or aryl group at about 20° C. to about 100° C.

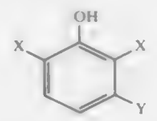
4,855,513

CHLORINATION OF PHENOLIC COMPOUNDS

Bernard Besson, Pont de Claix; Jean-Roger Desmurs, Saint-Symphorien D'Ozon, and Isabelle Jouve, Villeurbanne, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Mar. 7, 1988, Ser. No. 165,007
Claims priority, application France, Mar. 5, 1987, 87 03208
Int. Cl.[4] C07C *37/62, 39/32*
U.S. Cl. 568—779 18 Claims

1. A process for the preparation of a chlorophenol, comprising reacting a phenolic compound having the general formula (I):



(I)

in which the symbols X, which may be identical or different, are each a chlorine atom, a bromine atom, a methyl or ethyl group, a methoxy or ethoxy group, an acetoxy group, an NO_2 group, or an acylamino group having 1 to 4 carbon atoms; and the symbol Y is a hydrogen atom, a methyl or ethyl group, or a methoxy or ethoxy group, with gaseous chlorine in the presence of a catalytically effective amount of a primary, secondary or tertiary amine.

4,855,514

OXIDATIVE IODINATION OF PHENOL

Mark Rule, Kingsport, Tenn., and Regina M. Moncier, Bristol, Va., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 17, 1988, Ser. No. 232,964
Int. Cl.[4] C07C *37/62, 39/27*
U.S. Cl. 568—779 2 Claims

1. A process for producing iodophenols which comprises contacting phenol, a source of iodine selected from the group consisting of elemental iodine, hydriodic acid and iodoalkanes and molecular oxygen in an aqueous medium at a temperature in the range of 100 degrees to 200 degrees C. and a pressure in the range of 10 to 1,000 psia.

4,855,515

PROCESS FOR THE PRODUCTION OF NEOPENTYL GLYCOL

Don L. Morris; Billy W. Palmer, and Thomas W. McAninch, all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 12, 1987, Ser. No. 84,716
Int. Cl.[4] C07C *29/14, 31/20*
U.S. Cl. 568—862 7 Claims

1. In the production of neopentyl glycol wherein isobutyraldehyde is condensed with formaldehyde in the presence of a tertiary amine catalyst to produce a reaction mixture comprising hydroxypivaldehyde and subjecting said reaction mixture to hydrogenation in the presence of a hydrogenation catalyst to provide neopentyl glycol, the improvement comprising employing as said hydrogenation catalyst a manganese oxide-promoted copper oxide/copper chromite catalyst.

4,855,516

METHOD OF MANUFACTURING 2-PROPYN-1-OL

Helmut Westernacher, Haltern; Karl Aertken, Duelmen, and Thomas Stieren, Haltern, all of Fed. Rep. of Germany, assignors to GafF-Huels Chemie GmbH, Marl, Fed. Rep. of Germany

Filed Mar. 10, 1988, Ser. No. 166,475
Claims priority, application Fed. Rep. of Germany, May 23, 1987, 3717471; May 23, 1987, 3717470; May 23, 1987, 3717468
Int. Cl.[4] C07C *33/042, 29/60*
U.S. Cl. 568—873 8 Claims

1. A method of manufacturing 2-propyn-1-ol, comprising the steps of:

(i) introducing a feedstock consisting of 2-butyn-1,4-diol and a solvent into a decomposition reactor,

(ii) decomposing 2-butyn-1,4-diol at an elevated temperature of 130°–180° C. and normal pressure or a slight vacuum up to 300 mbar in the pesence of a copper acetylide catalyst, in said reactor to form a reaction mixture comprising 2-propyn-1-ol and formaldehyde, and

(iii) removing the 2-propyn-1-ol from the reaction mixture.

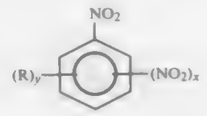
4,855,517

PROCESS FOR PREPARING AROMATIC BROMINE COMPOUNDS

Hans J. Metz, Heppenheim, and Klaus Warning, Eppstein/-Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 770,409, Aug. 28, 1985. This application Sep. 21, 1987, Ser. No. 98,717
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1984, 3431826
Int. Cl.[4] C07C *21/24, 17/12*
U.S. Cl. 570—206 14 Claims

1. A process for preparing an aromatic bromine compound which comprises reacting an aromatic nitro compound of the formula I



(I)

in which R is F, Cl, Br,
trifluoromethyl,
CN,
COBr,
OC_6H_5,
OC_nF_{2n+1}, where n is an integer from 1–3,
or NCO,
x is 0 or 1, and
y is 0 or 1 with elemental bromine in the gas phase at a temperature between about 310° and 550° C. to produce the exclusive replacement of at least one of the nitro groups with a bromine atom.

4,855,518

METHOD FOR PRODUCING P-ALKYLSTYRENE

Isoo Shimizu, and Yuuichi Tokumoto, both of Yokohama, Japan, assignors to Nippon Petrochemicals Company, Limited, Japan

Filed Jul. 19, 1988, Ser. No. 221,119
Claims priority, application Japan, Jul. 22, 1987, 62-183001
Int. Cl.[4] C07C *4/24*
U.S. Cl. 585—319 6 Claims

1. A method for producing p-alkylstyrene which is characterized in that monoalkylbenzene having an alkyl substituent group with 3 or more carbon atoms is reacted with acetaldehyde in the presence of hydrogen fluoride catalyst under the conditions of a temperature of 0° C. or lower, a molar ratio of 2 to 100 in "alkylbenzene/acetaldehyde" to be fed to the reaction system, the other molar ratio of 1.7 to 300 in "hydrogen fluoride/acetaldehyde" to be fed to the reaction system, the proportion of hydrogen fluoride to the sum of hydrogen fluoride and water in the reaction system of 65% by weight or higher, and the concentration of acetaldehyde in the reaction system of 1.0% by weight or lower to obtain 1,1-bis(p-alkylphenyl)ethane, and then subjecting the obtained 1,1-bis(p-alkylphenyl)ethane to catalytic cracking at a temperature in the range of 200° to 650° C. in the presence of an acid catalyst.

4,855,519

METHOD FOR PRODUCING ARYLETHYLENE

Isoo Shimizu, Yokohama; Hitoshi Mitsuyuki, Kawasaki; Kazumichi Uchida, and Yuuichi Tokumoto, both of Yokohama, all of Japan, assignors to Nippon Petrochemicals Company, Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 271,219
Claims priority, application Japan, Nov. 12, 1987, 62-285899; Nov. 12, 1987, 62-285900
Int. Cl.[4] C07C *4/24*
U.S. Cl. 585—319 12 Claims

1. A method for producing arylethylene which method comprises the steps of (I), (II), (III) and (IV):

step (I): bringing 1,1-diarylethane represented by the following general formula (A) into contact with an acid catalyst in the presence of an inert gas to crack said 1,1-diarylethane into arylethylenes represented by the general formulae (B) and/or (C) and alkylbenzenes represented by the general formulae (D) and/or (E);

step (II): separating the reaction mixture obtained in the above cracking step (I) into at least a fraction mainly containing 1,1-diarylethane of the general formula (A);

step (III): bringing said fraction mainly containing 1,1-diarylethane of the general formula (A) into contact with hydrogen gas in the presence of a hydrogenation catalyst to hydrogenate diarylethylene contained therein into 1,1-diarylethane; and

step (IV): re-cracking hydrogenated fraction obtained in the preceding hydrogenation step (III) by bringing it into said cracking step (I),

General formula (A): $Ar_1—CH(CH_3)—Ar_2$
General formula (B): $Ar_1—CH=CH_2$
General formula (C): $Ar_2—CH=CH_2$
General formula (D): $Ar_1—H$
General formula (E): $Ar_2—H$

wherein each of Ar_1 and Ar_2 in the above general formulae (A), (B), (C), (D) and (E) is a phenyl group or an alkylphenyl group having a hydrogen atom or one or a plurality of the same or different alkyl groups having 4 or less carbon atoms and the total number of carbon atoms is 4 or less and Ar_1 and Ar_2 can be the same or different ones.

4,855,520

PROCESS FOR THE PREPARATION OF NAPHTHACENES

Amy P. Essenfeld, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 3, 1987, Ser. No. 80,733
Int. Cl.[4] C07C *1/32*
U.S. Cl. 585—409 19 Claims

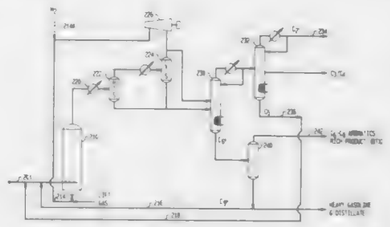
1. A method for the preparation of a naphthacene which comprises (1) reacting a solvent solution of a 1,3-diphenylpropargyl alcohol, in the presence of an acid scavenger, with an alkanesulfonyl halide at a temperature of from about −30° C. to about 30° C. for from about 15 minutes to about 3 hours, (2) heating the resultant reaction product to a temperature of from about 70° C. to about reflux from about 2 to about 8 hours, in an oxygen-free atmosphere, in the absence of light and in the presence of a hindered amine base and (3) recovering the resultant naphthacene.

4,855,521

FLUIDIZED BED PROCESS FOR UPGRADING DIENE-CONTAINING LIGHT OLEFINS

Amos A. Avidan, Yardley; Fritz A. Smith, New Hope, both of Pa., and Samuel A. Tabak, Wenonah, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 6,408, Jan. 23, 1987, Pat. No. 4,778,661. This application Apr. 27, 1988, Ser. No. 186,526
Int. Cl.[4] C07C *12/02*
U.S. Cl. 585—415 23 Claims



1. A fluidized bed catalytic process for upgrading diene-rich liquid olefinic feedstock comprising at least 1 wt. % diene and a total C_4–C_6 olefin content of about 5 to 90 wt. % to produce hydrocarbons rich in C5+ aliphatics and aromatics, comprising the steps of

maintaining a fluidized bed of zeolite catalyst particles in a turbulent reactor bed at a temperature of about 220° to 510° C., said catalyst having an apparent particle density of about 0.9 to 1.6 g/cm^3 and a size range of about 1 to 150 microns, and average catalyst particle size of about 20 to 100 microns;

feeding the olefinic feedstock as a pressurized liquid into a bottom portion of the fluidized bed;

dispersing and vaporizing the liquid feedstock in the fluidized bed;

passing vaporized hot feedstock upwardly through the fluidized catalyst bed under turbulent flow conditions;

maintaining turbulent fluidized bed conditions through the reactor bed between transition velocity and transport velocity at a superficial fluid velocity of about 0.3 to 2 meters per second; and

recovering hydrocarbon product containing a major amount of C_4^+ hydrocarbons and containing C_3–C_5 alkanes and aklenes in the weight ratio of about 0.2:1 to 200:1.

4,855,522

PRODUCTION OF AROMATIC HYDROCARBONS

Henri Diaz, Martigues, France, assignor to The British Petroleum Company p.l.c., London, England

Filed Mar. 16, 1988, Ser. No. 168,701

Claims priority, application United Kingdom, Mar. 19, 1987, [redacted]

Int. Cl.[4] C07C *12/02*

U.S. Cl. 585—417 12 Claims

1. A process for producing aromatic hydrocarbons comprising bringing into contact a hydrocarbon feedstock containing a C_2, C_3 and/or C_4 paraffinic hydrocarbon with a catalyst composition comprising an aluminosilicate in which the molar ratio of silica to alumina is at least 5:1 and loaded with a compound of (a) gallium and (b) at least one rare earth metal.

4,855,523

CATALYST AND PROCESS FOR THE SELECTIVE DIMERIZATION OF PROPYLENE TO 4-METHYL-1-PENTENE

James C. Stevens, and William A. Fordyce, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 27, 1987, Ser. No. 90,268

Int. Cl.[4] C07C *2/10*

U.S. Cl. 585—511 19 Claims

1. A process for the preparation of 4-methyl-1-pentene, the process comprising contacting propylene and a catalyst comprising a uranium(III) di(poly-substituted cyclopentadienyl)-allylic complex under dimerization reaction conditions.

4,855,524

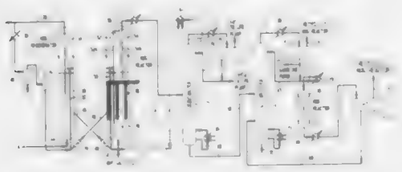
PROCESS FOR COMBINING THE OPERATION OF OLIGOMERIZATION REACTORS CONTAINING A ZEOLITE OLIGOMERIZATION CATALYST

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of, assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 118,926, Nov. 10, 1987, Pat. No. 4,777,316. This application Sep. 29, 1988, Ser. No. 250,660

Int. Cl.[4] C07C *2/02*

U.S. Cl. 585—517 30 Claims



1. In a catalytic process comprising multistage reaction zones for oligomerizing olefin-containing FCC gas, light gas having from 3 to 5 carbon atoms (C_3–C_5) or light naphtha (C_5–C_7) feedstock, into a C_{10}^+ aliphatic hydrocarbon product, including maintaining a primary reaction zone containing zeolite catalyst particles in a low severity reactor bed; passing said feedstock upwardly through said primary reaction zone in a single pass at sufficiently high pressure and temperature to provide reaction severity conditions sufficient to oilgomerize lower alkenes to intermediate range olefins mainly in the C_5–C_9 range; withdrawing from said primary reaction zone a primary effluent containing olefins with a major amount by weight of C_5^+ olefinic hydrocarbons, and, a minor amount of C_4^- olefinic hydrocarbons; and, further oligomerizing said C_5^+ hydrocarbons in a secondary reaction zone by contacting with a bed of medium pore shape selective acid oligomerization catalyst, further to upgrade them to said C_{10}^+ product; the improvement comprising,

(a) separating C_4^- substantially light gas components from said primary effluent so as to provide a predominantly olefinic C_5^+ intermediate stream subtantially free of said C_4^- components and comprising at least 1 part by weight of distillate per 10 parts of gasoline;

(b) contacting said intermediate stream with said oligomerization catalyst in said secondary reaction zone under oligomerization conditions to produce a predominantly C_{10}^+ effluent, and,

(c) recovering said C_{10}^+ aliphatic product.

4,855,525

PROCESS FOR PREPARING LINEAR ALPHA-OLEFINS USING ZIRCONIUM ADDUCTS AS CATALYSTS

David A. Young; Larry O. Jones, and Troy J. Campione, all of Baton Rouge, La., assignors to Exxon Chemical Patents-Inc., Linden, N.J.

Continuation-in-part of Ser. No. 63,662, Jun. 19, 1987, abandoned. This application May 18, 1988, Ser. No. 195,665

Int. Cl.[4] C07C *2/26*

U.S. Cl. 585—523 28 Claims

1. A process for preparing substantially linear alpha-olefins of Mn 70 to about 700 by oligomerizing ethylene in the presence of a homogeneous two component catalyst, the first component being an adduct of $ZrCl_aBr_b$, where a+b=4 and a or b may be 0, 1, 2, 3 or 4, with an organic compound selected from the group consisting of esters, ketones, ethers, amines, nitriles, anhydrides, acid chlorides, amides or aldehydes, said organic compound having up to 30 carbon atoms and the second component being an alkyl metal catalyst selected from the group consisting of $R_2AlX.RAlX_2$, $R_3Al_{12}X_3$, R_3Al and R_2Zn wherein R is C_1–C_{20} alkyl and X is Cl or Br, the oligomerization being conducted in a reactor vessel at 50° C. to 300° C. at a pressure of about 500 to 5000 psig in a solution of C_2–C_{100} alpha-olefin or a liquid inert solvent which is not reactive with said catalyst and in which said two component catalyst is soluble with the presence of water in the reactor vessel being minimized such that the ratio of moles of zirconium to moles of water is at least 50 to 1 and wherein in said process the Mn of said alpha-olefin is controlled through adjustment of the molar ratio of second component catalyst to first component catalyst, said ratio being within the range of about 1 to 1 to about 50 to 1.

4,855,526

PROCESS FOR PREPARING ETHYLENE-HIGHER OLEFIN COPOLYMER OILS WITH ZIEGLER-NATTA CATALYST IN MIXED ALIPHATIC-AROMATIC SOLVENT

John Hen, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 18, 1987, Ser. No. 134,645

Int. Cl.[4] C07C *2/02*

U.S. Cl. 585—524 34 Claims

1. A process for preparing a copolymer oil of ethylene and higher alpha-olefin containing at least 20 mole percent ethylene comprising copolymerizing ethylene and said higher alpha-olefin in the presence of an Al-Ti Ziegler-Natta catalyst in which the Al/Ti molar ratio is 3 or less, and a mixture of an aliphatic solvent and an aromatic solvent in a volume ratio of 1:5 to 5:1, to obtain a copolymer oil having a VI of at least 100 and a point below −17.8° C. without cracking or dewaxing said oil.

4,855,527

OLEFIN OLIGOMERIZATION WITH SURFACE MODIFIED ZEOLITE

Nancy M. Page, Yardley, Pa., and Lewis B. Young, Skillman, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 105,438, Oct. 7, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 298,340

Int. Cl.[4] C07C *2/12*

U.S. Cl. 585—527 7 Claims

1. A process for producing substantially linear hydrocarbons by oligomerizing a lower olefin at elevated temperature and pressure which comprises

contacting the lower olefin under polymerization conditions with siliceous acidic ZSM-23 zeolite having Bronsted acid activity; wherein said zeolite has acidic pore activity and wherein the zeolite surface is rendered substantially inactive for acidic reactions, said zeolite surface being neutralized by contacting HZSM-23 with 2,4,6-collidine.

4,855,528

CATALYSTS AND PROCESS FOR OLIGOMERIZATION OF OLEFINS WITH NICKEL-CONTAINING ZEOLITE CATALYSTS

David A. Young, Baton Rouge, La.; David E. Vaughan, Flemington, N.J.; Roy L. Pruett, Harrisburg, N.C., and Mafer E. Tunison, Baton Rouge, La., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Feb. 5, 1988, Ser. No. 153,707

Int. Cl.[4] C07C *2/10, 2/12*

U.S. Cl. 585—531 13 Claims

1. A process for oligomerizing C_3–C_{12} olefins which comprises contacting a C_3–C_{12} olefin or mixtures thereof in the liquid phase at a temperature of about 50° C. to about 150° C. with a calcined nickel-containing zeolite catalyst, the nickel being added in an amount of from about 0.2% to about 20% by weight either by cation exchange or by impregnation, the zeolite being selected from the group consisting of cesium or barium exchanged CSZ-1, high silica ultra-stable faujasites having a SiO_2:Al_2O_3 ratio of at least about 4.09 and zeolites isostructural with mazzite, the catalyst exhibiting a turnover number of at least 25 moles of olefin per mole of nickel per hour.

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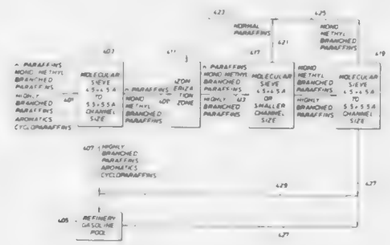
ISOMERIZATION PROCESS WITH PRELIMINARY NORMAL PARAFFIN AND MONO-METHYL PARAFFIN FEED CAPTURE STEP

Stephen C. Stem, and Wayne E. Evans, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 25, 1988, Ser. No. 185,740

Int. Cl.[4] C07C *5/27*

U.S. Cl. 585—737 46 Claims



1. A process for the isomerization of paraffins from a mixed hydrocarbon stream comprising normal paraffins, mono-methyl-branched paraffins, di-methyl-branched paraffins, said process comprising:

(a) passing said mixed hydrocarbon stream to a feed separation zone comprising a shape-selective separatory molecular sieve having an intermediate pore size of 5.5×5.5 to 4.5×4.5A and excluding 4.5×4.5A, said pore size being sufficient to permit entry of said normal paraffins and said mono-methyl-branched paraffins but restrictive to prohibit entry of di-branched paraffins;

(b) separating, in said feed separation zone, at separation conditions, by means of said shape-selective separatory sieve, said di-branched paraffins from said normal paraffins and mono-methyl- branched paraffins;

(c) recovering from said feed separation zone a feed separation zone effluent stream comprising said di-branched paraffins;

(d) recovering from said feed separation zone an isomerization feed stream comprising said normal paraffins and said monomethyl-branched paraffins;

(e) passing at least a portion of said isomerization feed stream to an isomerization zone maintained at isomerization conditions and containing an isomerization catalyst to produce an isomerization zone effluent stream comprising di-branched paraffins, mono-methylbranched paraffins and normal paraffins.

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ISOMERIZATION PROCESS

Rene B. LaPierre, Medford; Randall D. Partridge, Princeton, both of N.J., and Steven S. Wong, Langhorne, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 81,533, Aug. 4, 1987, abandoned, which is a continuation of Ser. No. 379,423, May 18, 1982, abandoned. This application Apr. 13, 1988, Ser. No. 183,399

Int. Cl.[4] C07C *5/13*

U.S. Cl. 585—739 33 Claims

1. An isomerization process in which a hydrocarbon feedstock comprising C_{10}^+ n-paraffins wherein the aromatic content of the feedstock is less than about 20 weight percent of the feedstock, is contacted under isomerization conditions with a catalyst comprising a large pore zeolite selected from the group consisting of ZSM-20 and zeolite Y having a silica/alumina ratio greater than 10:1 and a hydrocarbon absorption capacity of at least 6 percent by weight at 50° C. and a hydrogenation component to convert at least a portion of said n-paraffins to iso-paraffins.

4,855,531

SEPARATION OF M-DIISOPROPYLBENZENE FROM P-DIISOPOROPYLBENZENE BY AZEOTROPIC DISTILLATION WITH ETHERS

Lloyd Berg, 1314 S/ Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed Nov. 29, 1988, Ser. No. 277,647

Int. Cl.[4] C07C *7/00;* B01D *3/34*

U.S. Cl. 585—804 2 Claims

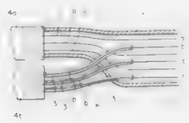
1. A method for recovering m-diisopropylbenzene from a mixture of m-diisopropylbenzene and p-diisopropylbenzene which comprises distilling a mixture of m-diisopropylbenzene and p-diisopropylbenzene in a rectification column in the presence of an azeotrope forming agent, recovering the m-diisopropylbenzene and the azeotrope forming agent as overhead product, obtaining the p-diisopropylbenzene from the stillpot, wherein said azeotrope forming agent is diethylene glycol diethyl ether.

4,855,532

WELDING CABLE

Katuji Tanabe, Tokyo, Japan, assignor to Obara Corporation, Tokyo, Japan

Filed Mar. 7, 1988, Ser. No. 164,572
Claims priority, application Japan, Oct. 16, 1987, 62-157531
Int. Cl.[4] H01B *7/34;* H01R *11/16*
U.S. Cl. 174—15.7 4 Claims





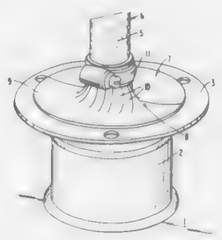
1. A welding cable comprising:
an insulating separator having a plurality of circumferentially-spaced radially-extending walls which define a plurality of spaces disposed circumferentially around the separator;
a group of twisted positive conductors and a group of twisted negative conductors, said positive and negative conductors being circumferentially alternatively arranged in said spaces;
each of the conductors of one said group, in the vicinity near but spaced from the end of said separator, being extracted radially outwardly from said separator and covered by an insulating cover, the conductors of the remaining group being maintained within the respective spaces of the separator;
a first terminal contact fixedly pressed to each of the conductors of said one group; and
a second terminal contact fixedly pressed to each of the conductors of the remaining group and to said separator;
whereby said terminals are adapted for connection with terminals of a transformer and a welding gun.

4,855,533

BUSHING

Klaus B. Meyer Swantée, Mt. Eemnes, Netherlands, assignor to Pidou B.V., Netherlands

Filed May 18, 1988, Ser. No. 195,193
Claims priority, application Netherlands, May 29, 1987, 8701274
Int. Cl.[4] H02G *3/22, 15/068*
U.S. Cl. 174—35 R 8 Claims



1. A bushing for the passage of at least one cable through a hole in a wall or similar structure, affording protection against electromagnetic overload and/or interference, characterized in that the bushing comprises two cable lead-through tubes which are each provided with a flange at its end which are detachably connected together with the aid of these flanges, while at least one earth plate is disposed between these flanges and electrically conductively coupled with said flanges in order to contact an electrically conducting braiding of the at least one cable to be passed through.

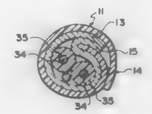
4,855,534

CABLE SHIELDING TAPE AND CABLES INCORPORATING SUCH TAPE

Lawrence J. O'Connor, Winnipeg, Canada, assignor to KT Technologies Inc., Bridgetown, Barbados

Filed Feb. 18, 1988, Ser. No. 157,218
Claims priority, application United Kingdom, Jul. 29, 1987, 8717954
Int. Cl.[4] H01B *7/34, 13/10;* B32B *3/04, 7/00*
U.S. Cl. 174—36 8 Claims





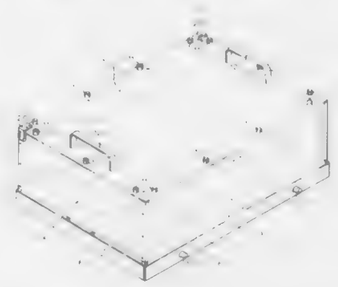
1. A tape consisting of a single conducting layer and a single insulating layer, said conducting layer being laminated to one side of said insulating layer with one longitudinal edge of the conducting layer being spaced inwardly from the respective longitudinal edge of the insulating layer to form an edge portion of the insulating layer which is free from said conducting layer, and the other longitudinal edge of the conducting layer overhanging the respective edge of the insulating layer being folded therearound and bonded to the other side of the insulating layer.

4,855,535

CONTAINER FOR ELECTRICAL APPARATUS

Robert Pereyda, San Jose, Calif., assignor to Autek Systems Corporation, San Jose, Calif.

Filed Jan. 15, 1988, Ser. No. 144,265
Int. Cl.[4] H05K *5/00*
U.S. Cl. 174—52.1 10 Claims



1. A container for housing an electrical apparatus comprising:
a plurality of panels coupled together to form the top, bottom, left and right side panels of the container, said side

panels comprising means for periodic reinforcement of the panels;

a front panel forming the front of the container comprising means to attach the front panel to said side panels and means to carry the container;

hinge means which pivotably couples the front panel to the side panels such that the front panel pivots between an open and closed position, said hinge comprising a linear groove means to allow for the upward movement of said front panel before pivoting said front panel to an open position;

a connection board attached to the rear of the container comprising a plurality of holes to connect the electrical apparatus to be housed in the container whereby external peripheral devices may be connected to the electrical apparatus when housed in the container through the holes; and

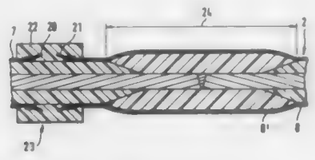
hanger bar means attached to the side panels for mounting the container on a mounting frame.

4,855,536

POWER CABLE HAVING SECTIONALIZED SCREEN AND METHOD OF MAKING SAME

Jan Varreng, Oslo, Norway, assignor to Alcatel STK A/S, Oslo, Norway

Filed Oct. 11, 1988, Ser. No. 256,773
Claims priority, application Norway, Oct. 13, 1987, 874258
Int. Cl.[4] H02G *15/08*
U.S. Cl. 174—73.1 **7 Claims**



1. A power cable comprising:

at least one cable section having a splice-free portion having a substantially constant cross section defining a predetermined outer diameter and comprising a continuous conductor separated from a semiconductive screen by an insulative layer, and

screen interrupting means dividing the semiconductive screen of said splice-free portion into crossbonded, electrically isolated sections, said screen interrupting means comprising a screen interruption area between two adjacent said electrically isolated sections and a double stress cone system above and extending to either side of said screen interruption area, said double stress cone system having a predetermined inner diameter substantially equal to said predetermined outer diameter.

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WIRING SUBSTRATE HAVING MESH-SHAPED EARTH LINE

Toshio Nakai, Tokyo; Takeshi Miyagi, Kawasaki, and Osamu Shimada, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

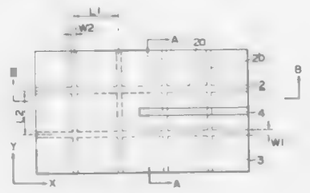
Filed Jun. 2, 1988, Ser. No. 202,310
Claims priority, application Japan, Sep. 25, 1987, 62-241402; Sep. 25, 1987, 62-241403
Int. Cl.[4] H05K *1/00*
U.S. Cl. 174—68.5 **12 Claims**

1. A circuit board comprising:

mesh-shaped earth line means including a first group of earth lines extending in a first direction and a second group of earth lines extending in a second direction which is different from said first direction;

insulative layer means formed on said earth line means; and

signal wiring means formed on said insulative layer means and insulated from said mesh-shaped earth line means by the insulative layer means and extending in a predetermined direction,



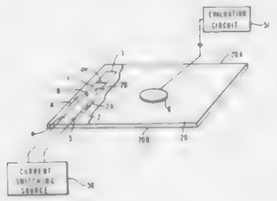
wherein the earth lines in one of said groups extend at a first angle to said signal wiring means and have a first width at least at a portion of said earth lines in said one group, and the earth lines in the other group extend at a second angle greater than the first angle and have a second width smaller than the first width at at least a portion of said earth lines in said other group crossing said signal wiring means.

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MEASURING TABLE FOR CO-ORDINATE MEASURING SYSTEM

Wolfgang Jacob-Grinschgl, Munich, and Udo Müller, Unterschleissheim, both of Fed. Rep. of Germany, assignors to Kontron Holding A.G., Zurich, Switzerland

Continuation of Ser. No. 841,415, Mar. 19, 1986, abandoned. This application Oct. 2, 1987, Ser. No. 104,579
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1985, 3511863
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—18 **5 Claims**



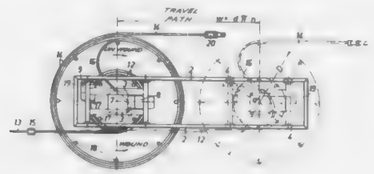
1. In a coordinate measuring system, a measuring table carrying a grid member in the form of a plurality of individually separate grid lines; a moveable coil member inductively coupled to the grid member; and means for applying to one of the members a time variable current that produces a variable magnetic flux that interacts with the other member producing therein a measuring signal in the form of an induced voltage; the improvement wherein each grid line comprises at least two side-by-side, parallel conductors, each having opposite ends that are respectively adjacent opposite sides of the table and separate bridges between respective pairs of conductors so that current flowing in a pair of bridged conductors produces oppositely directed magnetic fields around the conductors of the pair, or a changing magnetic flux produced by the coil and interacting with the conductors of a pair induces voltages of opposite polarity in the conductors of the pair, and said bridged pairs of conductors form a grid coil having more than one turn.

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STOWING DEVICE FOR A CABLE FEED, PARTICULARLY FOR THE CONNECTING CABLE OF A CENTRAL AIRCRAFT POWER SUPPLY SYSTEM AT AIRPORTS

Heinz Schabmüller, Midgardstrasse 20, 8132 Tutzing, Fed. Rep. of Germany

PCT No. PCT/EP86/00034, § 371 Date Sep. 8, 1986, § 102(e) Date Sep. 8, 1996, PCT Pub. No. WO86/04463, PCT Pub. Date Jul. 31, 1986
Continuation of Ser. No. 925,799, Sep. 8, 1986, abandoned. This PCT application Jan. 27, 1986, Ser. No. 125,750
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1985, 3502640
Int. Cl.[4] H02G *11/02*
U.S. Cl. 191—12.2 A **5 Claims**



1. A stowing device for a cable feed, particularly for a connecting cable, comprising:

a double cable drum for receiving, without twisting, corresponding cable lengths for serving as service cable and equalization cable, the cable drum comprising a service drum for the service cable and an equalization drum coaxial with the service drum for the equalization cable, the equalization drum having a smaller diameter than the service drum; the service cable and the equalization cable are wound spirally in the same direction on their respective drums; a drive for rotating the double cable drum in both directions;

a longitudinal guide for guiding longitudinal translation of the cable drum; means for translating the rotatable cable drum for displacing the double cable drum along the longitudinal guide over a distance which is equal to the length of the equalization cable which is freed or wound up, while the service cable is being unwound or wound, respectively.

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SWITCH

Takashi Ohta, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Sep. 14, 1988, Ser. No. 244,372
Claims priority, application Japan, Sep. 17, 1987, 62-141839[U]
Int. Cl.[4] H01H *9/26, 13/72*
U.S. Cl. 200—5 E **10 Claims**

1. A switch comprising:

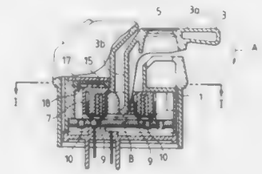
a casing;

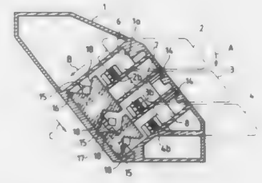
a plurality of fixed contacts fixedly mounted in said casing;

a plurality of juxtaposed contact holders mounted in said casing movable in opposite first directions either to a neutral position or at least one working position, each contact holder having an electrical contact movable therewith disengaged from a respective one of the plurality of fixed contacts at times when said each contact holder is in the neutral position and engaged with a respective one of the plurality of fixed contacts at times when said each contact holder is in the art least one working position; a projection having an engaging surface extending in a second direction substantially perpendicular to the opposite first directions;

an operating member for each contact holder mounted to said casing for moving each respective contact holder either to the neutral or working position; and

a plurality of juxtaposed return members mounted in said casing movable in opposite third directions substantially perpendicular to the opposite first directions and the second direction, each return member having at least one engaging surface opposing said engaging surface of the





projection for engaging the opposing engaging surface of the projection to move a corresponding contact holder of hte plurality of contact holders between the neutral and at least one working positions in one direction in response to movement of another contact holder of the plurality of contact holders between the neutral and working positions in the other direction.

4,855,541

ELECTRONIC COMPONENT HAVING IMPROVED ROTARY SWITCH DETENT SPRING CONSTRUCTION AND IMPROVED TERMINAL SEAL STRUCTURE

Masatsugu Yamashita, Osaka; Norio Iwakiri, Kyoto; Sekisuke Yamanaka, Shizuoka, and Akira Yanase, Osaka, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 8, 1987, Ser. No. 105,791
Claims priority, application Japan, Oct. 8, 1986, 61-154518[U]; Nov. 7, 1986, 61-171134[U]
Int. Cl.[4] H01H *19/00, 1/58*
U.S. Cl. 200—6 R **16 Claims**

1. A rotary switch type electronic component, comprising:

(a) a casing;

(b) a disk shaped rotor member, rotatably disposed under said casing, and formed with first and second wavy cam patterns formed on the upper and lower surfaces, respectively, of said disk shaped rotor member;

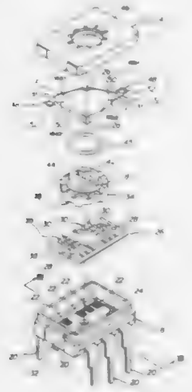
(c) a contact mechanism, which is actuated by said second wavy cam pattern of said disk shaped rotor member as said disk shaped rotor member is rotated; and

(d) a sheet spring disposed between said casing and said disk shaped rotor member, said sheet spring comprising:

(d1) two pressure portions;

(d2) a substantially flat portion, intermediate between said two pressure portions, which is stressed so as to press said two pressure portions against said first wavy cam pattern formed on said disk shaped rotor member as said disk shaped rotor member is rotated, for providing

detent action of said disk shaped rotor member to actuate said contact mechanism; and



(d3) a fixing portion, fixed to said casing, and proximate and connected to said substantially flat portion.

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CANCELLING MECHANISM FOR TURNING SIGNAL

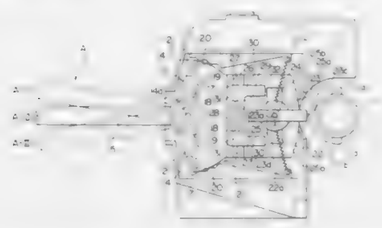
Kenshi Furuhashi; Hiroyasu Ito, and Nobuyuki Enari, all of Aichi, Japan, assignors to Kabushiki Kaisha Tikai-Rika-Denki-Seisakusho, Niwa, Japan

Filed Aug. 2, 1988, Ser. No. 227,140

Claims priority, application Japan, Aug. 12, 1987, 62-123577[U]

Int. Cl.⁴ H01H *3/16*

U.S. Cl. 200—61.27 **17 Claims**



1. A cancelling mechanism for a turning signal, comprising:
a cancelling cam to be pivotally mounted and pivoted by the rotation of a steering shaft;
a base to be mounted adjacent to said cancelling cam;
a bracket which is pivotally mounted to said base, which is pivoted by an operation lever between a neutral position and a right turn position or a left turn position;
a click mechanism for retaining said bracket with respect to said base at said neutral position, said right turn position, and said left turn position;
an engaging member pivotally supported on said bracket by means for displacing said engaging member, so that a first portion of said engaging member is displaced to a position within a rotational locus of said cancelling cam when said bracket is pivoted from said neutral position to said right turn position or to said left turn position and said first portion is maintained out of said rotational locus when said bracket is in said neutral position;
a transfer member movably supported on said bracket between the pivot of said bracket to said base and said means for displacing said engaging member, by slide means allowing said transfer member to move substantially linearly along a direction other than a line defined by the pivot of said bracket to said base and the center of rotation of said cancelling cam, said transfer member having a pair of projecting portions which extend toward said engaging member such that they are located at two sides of a second portion of said engaging member, so that when said cancelling cam is rotated in the same direction as the rotational direction in which said bracket is operated to locate said bracket at said right turn position or said left turn position, said second portion of said engaging member is pivoted between said projecting portions; while, when said cancelling cam is rotated in the opposite direction, said second portion of said engaging member engages with one of said pair of projecting portions to slide said transfer member; and
an elastic member disposed between said transfer member and said bracket acting along said slide means so as to normally retain said transfer member at a neutral position, said elastic member being adapted to transfer a force generated when said second portion of said engaging member engages with either one of said pair of projecting portions of said transfer member, from said transfer member to said bracket to thereby return said bracket to said neutral position.

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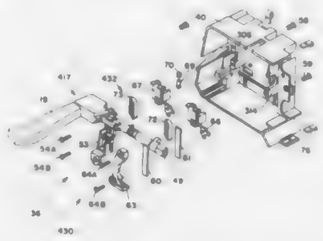
MANUALLY OPERATED ELECTROMECHANICAL SWITCH

Gregg V. Speer, Bloomington, and Donald L. Ray, Oaklandon, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Sep. 23, 1938, Ser. No. 248,160

Int. Cl.⁴ H01H *3/00, 21/24*

U.S. Cl. 200—61.27 **7 Claims**



1. An electromechanical switch comprising:
electrical circuit means;
manually operable means for activating said circuit means, said manually operable means moveable between a neutral position and an activate position; and
return means for returning said manually operable means to said neutral position from said activate position, said return means comprising:
a first cam connected to said manually operable means:
at least one leaf spring; and
housing means for supporting said first cam and said leaf spring with said leaf spring engaged with said first cam and bent by said first cam a first non-zero amount when said manually operable means is in said neutral position and a second amount larger than said first amount when said manually operable means is in said activate position, said first cam shaped so that as said manually operable means moves from said activate position to said neutral position the bending of said leaf spring continuously becomes less, whereby said leaf spring forces said first cam toward the position in which said leaf spring is bent said first amount, thereby returning said manually operable means to said neutral position; and

said switch further comprising detent means for causing a change of feel in said manually operable means as it approaches said activate position without holding it in said activate position.

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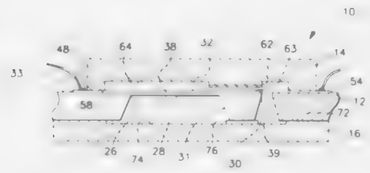
MULTIPLE LEVEL MINIATURE ELECTROMECHANICAL ACCELEROMETER SWITCH

Max C. Glenn, James City, Va., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 1, 1988, Ser. No. 239,482

Int. Cl.⁴ H01H *35/14*

U.S. Cl. 200—61.45 R **4 Claims**



1. An accelerometer switch, comprising:
a contact plate;
a backplate;
an accelerometer die formed from a single piece of semiconductor material, said accelerometer die sandwiched between said contact plate and said backplate, said accelerometer die having a plurality of cantilever beams, each said cantilever beam having a fixed end and a free end, each said free end carrying an integral end mass, each said cantilever beam further having a first contact face;
a first electrical contact located on said first face;
a second contact face located on said contact plate and spaced from said first contact face, said second face having a raised portion located to be complementary to said first electrical contact; and
a second electrical contact located on said raised portion such that a threshold acceleration normal to said first contact face will cause bending of said cantilever beam thereby carrying said first electrical contact into engagement with said second electrical contact; said raised portion allowing said first contact to engage said second contact when said first contact face is tilted due to an offnormal acceleration.

4,855,545

PNEUMATIC TO ELECTRICAL SWITCH ASSEMBLY

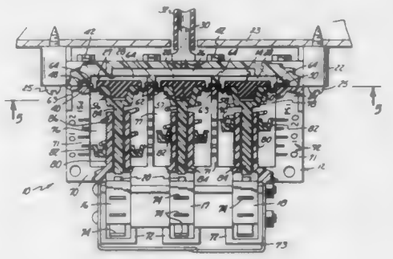
Paul E. Kreuter, Thief River Falls, Minn., assignor to Kreuter Mfg. Co., Inc., New Paris, Ind.

Filed Oct. 24, 1988, Ser. No. 261,230

Int. Cl.⁴ H01H *35/34*

U.S. Cl. 200—81.4 **4 Claims**

1. A multi-stage pressure-to-electric switch assembly having independently adjustable stages, said switch assembly including:
(a) a main frame having:
(1) a top casing provided with a pressure receiving chamber having a diaphragm backup wall and having a pressure inlet port open from the pressure receiving chamber to a variable pressure source, and
(2) a bottom casing having a generally planar diaphragm clamping frame integrally secured to the top casing in closing relation to the pressure receiving chamber;
(b) a diaphragm clamped between the top casing and the bottom diaphragm casing clamping frame to be in sealing, closing relation to the pressure receiving chamber of the top casing, said diaphragm being provided with a plurality of spaced-apart, mutually independent, pressure responsive switch control portions, each such portion including a relatively rigid switch control button surrounded by its own freely flexible diaphragm ring, each button being movable between an inoperative position in contact with the diaphragm backup wall of the top casing and an operative position spaced from said diaphragm backup wall, and the top side of each switch control portion being at all times open to said pressure receiving chamber;
(c) said bottom casing also including a switch positioning station supported in spaced, generally parallel relation to the clamping frame;
(d) a plurality of two-position electrical switches conditioned to nominally lie in a first of said two positions, each



switch being fixedly supported with respect to the switch positioning station in spaced relation with respect to the bottom casing diaphragm clamping frame, and each switch having a switch operating element lying in operable alignment with respect to the switch control button of one of the diaphragm switch control portions;
(e) a plurality of fixed switch control rod means extending upwardly from the switch positioning station, each switch control rod means extending toward said diaphragm to lie in aligned relation between one of the switch control buttons and its operably aligned switch operating elements;
(f) a switch operating pressure control stop adjustably mounted with respect to each switch control rod means;
(g) switch operating means in operative contact with each diaphragm switch control button and extending in parallel relation to one of the switch control rod means to lie in operable relationship with respect to one of the switch control elements;
(h) resilient biasing means having a first end in operational contact with one of the switch operating pressure control operating stops and a second end in operational contact with one of the aligned diaphragm switch control buttons and a second end in operational contact with its aligned switch operating pressure control operating stops, each biasing means being operative to exert a force between its operating stop and its switch control button which force varies as a direct function of the distance between the

second end of the biasing means and the switch operating element; and

(i) the length and positioning of each switch operating means being such that, after the pressure in the pressure receiving chamber overcomes the pressure exerted by the biasing means, the movement of its diaphragm button from its inoperative to its operative position will cause the switch operating means to contact the switch control element to cause the two-position switch to move from its first position to its second position.

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VACUUM OPERATED CIRCUIT BREAKER

Lee J. Leisch, 433 Valencia Rd., Venice, Fla. 33595

Filed Mar. 17, 1987, Ser. No. 26,731
Int. Cl.[4] H01H *33/66*
U.S. Cl. 200—144 B **12 Claims**



1. An electrical vacuum switch assembly comprising, in combination:

a frame;

a vacuum switch operator affixed to said frame, said operator including a moveable plunger such that movement of said plunger makes and breaks an electric circuit;

a pair of parallel plates pivotally mounted to said frame about a first axis and pivotally mounted to said plunger, whereby pivoting of said plates about said first axis moves said plunger;

a pair of parallel first links pivotally mounted to said frame about a second axis;

a pair of parallel second links pivotally connected to said pair of first links and pivotally connected to said pair of parallel plates; and

an operative arm pivotally connected to said pair of first links such that movement of said arm causes said pair of first links to pivot about said second axis, thereby moving said pair of second links and causing said pair of plates to pivot about said first axis, thereby moving said plunger.

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VACUUM INTERRUPTER

Hideaki Toya, and Tatsuya Hayashi, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP86/00576, § 371 Date Jun. 18, 1987, § 102(e) Date Jun. 18, 1987, PCT Pub. No. WO87/03136, PCT Pub. Date May 21, 1987
PCT Filed Nov. 12, 1986, Ser. No. 69,555
Claims priority, application Japan, Nov. 12, 1985, 60-253961; Nov. 12, 1985, 60-253962; Aug. 21, 1986, 61-195966
Int. Cl.[4] H01H *33/66*
U.S. Cl. 200—144 B **19 Claims**

1. A vacuum interrupter for opening and closing a current passage by a pair of electrodes which are incorporated in a vacuum container, connectable and detachable to and from each other and respectively mounted on conductive rods, wherein at least one of said pair of electrodes comprises first high resistance areas formed passing through from a contact surface to a back side thereof at specified distances from a peripheral edge of the electrode and facing to each other, and second high resistance areas extending from ends of the first high resistance areas toward a center of said electrode being not connected to each other, and wherein outside parts of the electrode disposed between the first high resistance areas and said peripheral edges are electrically connected to said conductive rod on said back side of the electrode by way of a bridge conductor arranged over the first high resistance areas,



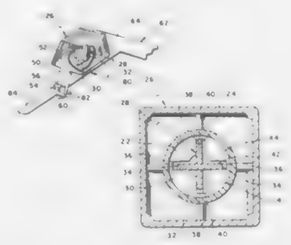
wherein the first and second high resistance areas comprise three circular arc-shaped parts with substantially equal radii arranged around the center of the electrode at substantially equal distances thereamong but which are not connected to one another, and linear parts extending from ends of said circular arc-shaped parts toward the center of the electrode and not being connected to one another, and wherein the bridge conductor has three leg parts electrically connected respectively to the outside parts of the electrode over said circular arc-shaped first high resistance areas to be electrically connected to the conductive rod at a portion joining the leg parts to one another.

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KEYBUTTON GUIDE ASSEMBLY FOR A KEYBOARD

Charles M. Curley, Ithaca, and Scott J. Longrod, Lansing, both of N.Y., assignors to Smith Corona Corporation, Cortland, N.Y.

Filed Jun. 17, 1988, Ser. No. 209,163
Int. Cl.[4] H01H *13/70*
U.S. Cl. 200—345 **8 Claims**



1. A keybutton guide assembly for a keyboard having full travel keybuttons, comprising:

a main frame;

a boss integrally formed from the main frame, the boss having an upper and a lower end;

the boss having a guide slot therein, the guide slot being smallest at the upper end and tapered outward to the lower end of the boss;

a guide stem integrally formed from the keybutton seated in the guide slot of the boss for mounting the keybutton on the boss and for guiding the movement of the keybutton between a rest position and a depressed position;

a spring actuator integrally formed from the keybutton;

a spring finger mounted on the main frame; and

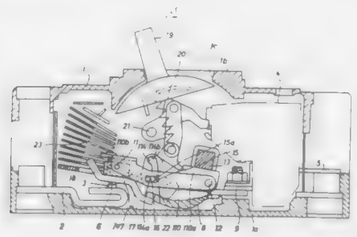
structure integrally projecting from the spring finger for engagement with the spring actuator of the keybutton for causing the guide stem of the keybutton to be guided by the upper end of the boss to minimize resistance of the movement of the keybutton between the rest position and the depressed position.

4,855,549

CIRCUIT BREAKER

Haruhisa Toda, and Shiroo Murata, both of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 76,817, Jul. 23, 1987, abandoned. This application Nov. 15, 1988, Ser. No. 271,486
Claims priority, application Japan, Jul. 24, 1986, 61-114682; Jul. 24, 1986, 61-114683; Jul. 24, 1986, 61-114684; Jul. 24, 1986, 61-114685; Aug. 4, 1986, 61-120174
Int. Cl.[4] H01H *77/06*
U.S. Cl. 200—401 **4 Claims**



1. A circuit breaker utilizing magnetic force for opening a circuit, comprising:

a stationary contact arm having a first contact;

a movable contact arm having a second contact for contacting the first contact;

a first arm mounting pivotally said movable contact arm, being provided with an oblong aperture on a central portion thereof, and mounted pivotally;

a second arm having a flattened U-shaped aperture which is terminated with a substantially indented part on one end portion and mounted pivotally at the other end;

a pin inserted to slidably engage in said oblong aperture and the flattened U-shaped aperture;

a spring for biasing said pin;

operation means for moving said second arm in operation of the circuit breaker, wherein

an indent direction of said indented part is substantially different from a direction in which said pin will seek to move in rebound from an end of said U-shaped aperture.

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WHITE TOUCH PADS FOR CAPACITIVE TOUCH CONTROL PANELS

John Schultz, Jr., Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 4, 1988, Ser. No. 140,392
Int. Cl.[4] H03K *17/975*
U.S. Cl. 200—600 **7 Claims**

1. A capacitive touch pad assembly comprising:

a layer of dielectric material having an outer surface and an inner surface;

an outer electrode comprising a first thin layer of relatively dark-colored conductive material fabricated on said outer surface to be responsive to contact with a human body member;

a pair of spatially separated inner electrodes fabricated on said inner surface substantially within the boundaries of said outer electrode; said inner electrodes being adapted for electrical contact with external electronic control circuitry;

a layer of relatively light-colored non-conductive decorative material applied to said outer surface substantially overlaying said outer electrode, surrounding a small exposed area of said outer electrode, said exposed area defining a symbol to be touched;

whereby said pad provides a pleasing light-colored appearance with a contrasting dark symbol, said symbol providing the means for direct human body member contact with said outer electrode.

5. A capacitive touch pad assembly comprising:

a layer of dielectric material having an outer surface and an inner surface;



a first outer electrode comprising a thin layer of relatively dark-colored conductive material fabricated on said outer surface to be responsive to contact with a human body member;

a pair of spatially separated inner electrodes fabricated on said inner surface underlying said first electrode and adapted for electrical connection with external electronic circuitry;

a thin layer of relatively light-colored non-conductive decorative material deposited on said outer surface overlying said outer electrode defining an uncovered area of said outer electrode; and

a second outer electrode comprising a second thin layer of relatively dark-colored conductive material deposited on said uncovered area and that portion of said thin decorative layer adjacent said uncovered area, said second layer defining a symbol to be touched;

whereby said pad provides a pleasing light-colored appearance with a contrasting dark symbol, said symbol being exposed for direct contact with a human body member and in good electrical contact with said outer electrode.

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METHOD AND APPARATUS FOR HARDENING GEARS

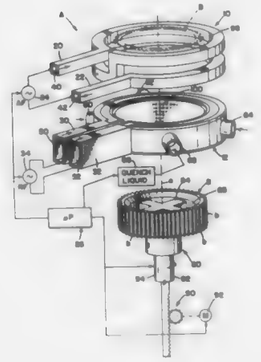
George M. Mucha, Parma Heights, Ohio; George D. Pfaffmann, Farmington, and Donald E. Novorsky, Pleasant Ridge, both of Mich., assignors to Tocco, Inc., Boaz, Ala.

Continuation of Ser. No. 106,537, Oct. 7, 1987, Pat. No. 4,785,147, which is a division of Ser. No. 23,564, Mar. 9, 1987, Pat. No. 4,749,834, which is a division of Ser. No. 878,186, Jun. 25, 1986, Pat. No. 4,675,486. This application Aug. 8, 1988, Ser. No. 229,697

The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.

Int. Cl.[4] H05B *6/14*

U.S. Cl. 219—10.43 10 Claims



1. A method of hardening the surfaces of closely spaced, successive protrusions and the connecting portions between said protrusions on a convoluted workpiece with a central core where the ratio of area to quench mass is substantially lower in said connecting portions than in said surfaces of said protrusions, said method comprising the following sequential steps of:

(a) inductively heating for a first predetermined time period said surfaces of the convoluted workpiece;

(b) interrupting said induction heating for a second predetermined time period such that step a followed by said second predetermined time period defines a preheat cycle;

(c) repeating steps a and b until a predetermined number of preheat cycles have occurred with each preheat cycle having its own predetermined first and second time periods, to produce a heated circular band of an anticipated configuration interconnecting said connecting portions at an unstable temperature, said band at a temperature not less than that of said protrusions, said protrusions being at temperatures greater than the temperature of said core;

(d) immediately inductively heating the surfaces of said convoluted workpieces to a hardening temperature at a radio frequency for a third time period less than that of step a; and

(e) immediately quenching the surface of said convoluted workpieces by quenching liquid sprayed thereagainst.

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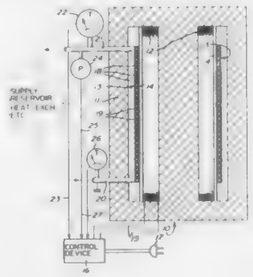
FLUID HEATING DEVICE INCORPORATING TRANSFORMER SECONDARY WINDING HAVING A SINGLE ELECTRICAL TURN AND COOLING MEANS OPTIMIZED FOR HEAT TRANSFER

Richard J. Marceau, Montreal, and Guy Jeanson, Otterburn Park, both of Canada, assignors to Hydro-Quebec, Quebec, Canada

Continuation of Ser. No. 16,137, Feb. 18, 1987, abandoned. This application Jul. 1, 1988, Ser. No. 214,816

Int. Cl.[4] H05B *6/10*

U.S. Cl. 219—10.51 16 Claims



1. A fluid heating device comprising a non-conductive magnetic core having a primary winding of electrically conductive wire, a secondary unitary electrically conductive cylinder concentric with said primary winding in close contact therewith through a thermally conductive and electrically non-conductive medium to provide for said conductive cylinder to absorb heat generated by said primary winding when a voltage is applied thereto, said secondary electrically conductive cylinder being a coil formed from a plurality of windings of a metallic conduit positioned in side-by-side contact, said windings being short-circuited along their entire length with one another across said coil, said primary winding having an input connection connectible to a voltage supply source, a variable power control device connected to said input connection, said secondary electrically conductive cylinder having passage means for the flow of a fluid therein at a predetermined flow rate from an input to an output of said passage, said fluid extracting heat from said secondary conductive cylinder and generated by joule effect whereby to heat said fluid and simultaneously cool said cylinder to maintain said secondary electrically conductive cylinder at a substantially constant temperature.

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METHOD OF HEATING POLYVINYL CHLORIDE USING MICROWAVES

Tomio Minobe, 18-3, Nobidome 4-chome, Niiza-shi, Satiama-pref., Japan

Filed Nov. 29, 1983, Ser. No. 555,981

Claims priority, application Japan, Feb. 24, 1983, 58-29945

The portion of the term of this patent subsequent to Jul. 8, 2003, has been disclaimed.

Int. Cl.[4] H05B *6/64*

U.S. Cl. 219—10.55 M 6 Claims

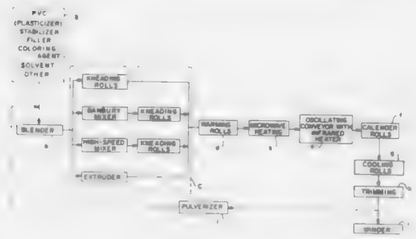
1. A method of heating polyvinyl chloride using microwaves comprising the following steps:

blending polyvinyl chloride raw materials;

mixing and kneading the blended polyvinyl chloride;

raising the temperature of the polyvinyl chloride by heating to the point where its intermolecular bonding force is weakened;

while the polyvinyl chloride is still in this state of weakened intermolecular bonding force, applying microwave energy thereto to cause heat generation by microwave-induced high-speed molecular vibration extending into the interior of the polyvinyl chloride, whereby uniform heating is attained throughout the polyvinyl chloride;



conveying the polyvinyl chloride;

rolling the polyvinyl chloride to form a film;

cooling the film of polyvinyl chloride; and

winding the film of polyvinyl chloride.

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ARRANGEMENT IN A MICROWAVE OVEN

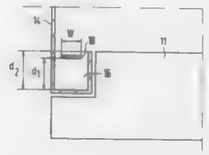
Jan S. Claesson, Linköping, and Per O. G. Risman, Herryda, both of Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 1, 1988, Ser. No. 151,141

Claims priority, application Sweden, Feb. 6, 1987, 8700453

Int. Cl.[4] H05B *6/64*

U.S. Cl. 219—10.55 F 6 Claims



1. An arrangement in a microwave oven comprising an oven cavity bounded by a plurality of conductive walls, a microwave source mounted external of the oven cavity for feeding microwave energy into the interior of the oven cavity, at least one of said conductive cavity walls having a groove-shaped recess that has an open side facing the oven cavity and that disturbs the microwave field pattern in the interior of the oven cavity, the arrangement further comprising reflecting means of conductive material supported with no galvanic contact with said cavity walls at the open side of the recess facing the oven cavity, said reflecting means covering a portion of the open recess side and being dimensioned and positioned so as to substantially reflect all incident radiation from the oven cavity away from said recess and back into the oven cavity at the operational frequency of the microwave oven, and thereby substantially eliminating the effect of said recess on the microwave field.

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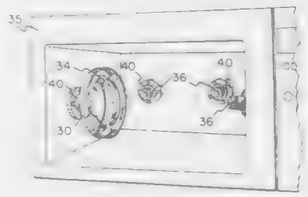
MICROWAVE APPARATUS FOR THAWING FROZEN LIQUID AND A BAG HOLDER ASSEMBLY FOR USE THEREIN

Glenn N. Adams, Westcock, and Gerald Beekenkamp, Paris, both of Canada, assignors to Canadian Patents and Development Limited-Societe Canadienne des Brevets et d' Exploitation Limitee, Ottawa, Canada

Filed Jul. 11, 1988, Ser. No. 217,766

Int. Cl.[4] H05B *6/80*

U.S. Cl. 219—10.55 F 28 Claims



1. Microwave apparatus for thawing frozen liquid in a plastic bag, comprising

(a) a microwave oven including a cavity and a source of microwave energy,

(b) a plurality of separate mounting means each projecting from a wall of said cavity at a different location around said cavity, each said mounting means being adapted for mounting a respective bag holder assembly supporting a plastic bag of frozen liquid,

(c) means for rotating each of said mounting means whereby, when a said bag holder assembly is mounted thereon, to agitate the bag holder assembly in a substantially vertical plane about a substantially horizontal axis,

(d) each said mounting means including means for sensing the temperature of thawing liquid in a bag supported in such a bag holding assembly when mounted in said mounting means, and

(e) means for controlling the energy source as a function of said sensed temperature in each mounting means.

4,855,556

METHOD AND APPARATUS FOR HARDENING GEARS AND SIMILAR WORKPIECES

George M. Mucha, Parma Heights, Ohio; Donald E. Novorsky, Pleasant Ridge, and George D. Pfaffmann, Farmington, both of Mich., assignors to Tocco, Inc., Boaz, Ala.

Continuation of Ser. No. 1,624, Jan. 6, 1987, Pat. No. 4,757,170, and a continuation-in-part of Ser. No. 878,186, Jun. 25, 1986, Pat. No. 4,675,488. This application Jun. 21, 1988, Ser. No. 184,585

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

Int. Cl.[4] H05B *6/14*

U.S. Cl. 219—105.9 3 Claims

1. Apparatus for progressively hardening an elongated workpiece having a generally cylindrical surface concentric with a central axis while axially elongated with respect thereto, said apparatus comprising

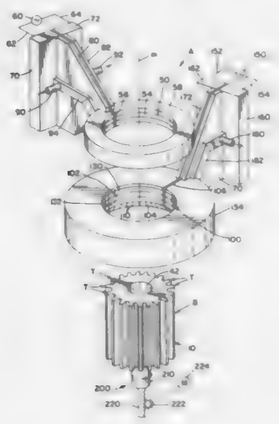
induction coil means for heating said cylindrical surface by induction;

means for energizing said induction coil means with a low frequency;

means for causing relative and progressive motion in an axial direction between said cylindrical surface and said induction coil means energized at said low frequency to initially and progressively preheat said cylindrical surface relative to a first band at a temperature below a quench hardening temperature of the workpiece while relative motion in the axial direction occurs between said cylindrical surface and said induction coil means;

means for energizing said induction coil means at a high frequency;

said means for causing relative and progressive motion operable to cause relative and progressive motion in an axial direction between said induction coil means and said cylindrical surface immediately after said cylindrical surface has been progressively preheated and while said induction coil means is at high frequency to cause final



progressive heating of said cylindrical surface relative to a second band at a temperature greater than or equal to said quench hardening temperatures while relative motion in the axial direction occurs between said cylindrical surface and said induction coil means; and

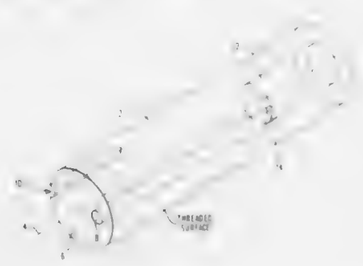
means for progressively quenching said cylindrical surface as it passes from said induction heating coil means after being finally heated.

4,855,557

ELECTRICAL DISCHARGE MACHINING ELECTRODE

Herman C. Denny, Rural Hall, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 11, 1987, Ser. No. 131,705
Int. Cl.[4] B23H *9/14, 1/04*
U.S. Cl. 219—69.15 **3 Claims**



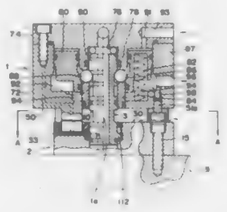
1. An electrode for forming a hole in a metal part by an electrical discharge machining process, said electrode having a free end, a cylindrical cross-section, a longitudinal axis and a longitudinal flushing bore which extends from the free end in the direction of the longitudinal axis and is spaced laterally from the longitudinal axis, at least at said free end, such that electrode material is present on the longitudinal axis at said free end, said electrode further having a groove formed at the periphery thereof and extending from said free end, parallel to the longitudinal axis of said electrode over only a portion of the length of said electrode, wherein said groove is disposed diametrically opposite said flushing bore, with respect to said longitudinal axis, and said groove provides a return path for flushing liquid flowing out of said flushing bore.

4,855,558

CLAMPING DEVICE FOR A TOOL AT A MACHINE TOOL, PARTICULARLY AT A DIE SINKING ELECTRIC DISCHARGE MACHINE

Börje K. Ramsbro, Djursholm, Sweden, assignor to System 3R International ab, Sorterargatan, Sweden

Filed Jul. 14, 1987, Ser. No. 73,574
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1986, 3625608; Nov. 21, 1986, 3639801
Int. Cl.[4] B23H *7/26*
U.S. Cl. 219—69.15 **37 Claims**



1. A clamping device for a tool at a machine tool, the device comprising:

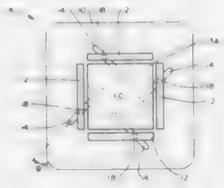
a plurality of posts projecting from the underside of a chuck having two pairs of rails projecting from the underside of the chuck, said posts being provided with reference surfaces at their free front surfaces extending in an x-y-plane defined by said directions, the rails being offset angularly against each other; and a tool holder provided with a plane surface for abutting to the posts, into which two pairs of slots are cut which are in alignment with the rails and provided with elastic lips intended for abutment to the rails, the holder having a center bore with fixing elements for fixing and releasing a draw bar.

4,855,559

ADJUSTABLE HEATER COLLET

Joseph E. Donner, Vista, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 4, 1988, Ser. No. 253,159
Int. Cl.[4] H05K *13/04;* **H05B** *3/24*
U.S. Cl. 219—85.16 **11 Claims**



1. A heater bar assembly for removal or replacement of integrated circuits from a circuit board, comprising:

a base plate;

a plurality of heater bars; and

means for mounting said heater bars to said base plate and guiding said heater bars towards or away from an integrated circuit such that an inward or outward adjustment of said heater bars towards or away from respective sides

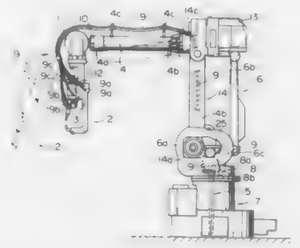
of said integrated circuit is accompanied by a corresponding lateral movement of each heater bar substantially parallel to the said sides of the integrated circuit.

4,855,560

WELDING ROBOT

Akikazu Sonoda, Akahsi; Sinji Fujita; Masanobu Sato, both of Kobe; Syoji Tomono, Kakogawa, and Hisanori Nakamura, Toyotr., all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Jan. 27, 1988, Ser. No. 148,855
Int. Cl.[4] B23K *11/36*
U.S. Cl. 219—86.25 **7 Claims**



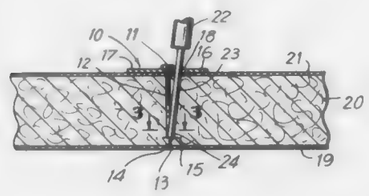
1. A welding robot including a stationary base adapted to be placed on a floor, arm means mounted at one end portion of the base for swivel movement, hand means mounted on the other end portion of the arm means for movement about at least one axis and carrying welding gun means, conduit means for passing fluid therethrough, swivel joint means provided between said one end portion of the arm means and said base and having a stationary part provided with movable passage means which is in communication with said stationary passage means, said conduit means having a first part located in said base and connected with said stationary passage means in said stationary part of the swivel joint means and a second part located along said arm means and connected with movable passage means in said movable part of the swivel joint means.

4,855,561

RESISTANCE WELD PIN AND METHOD OF WELDING

Milton Hinden, Rte. #110, Farmingdale, N.Y. 11735

Filed Sep. 8, 1988, Ser. No. 241,487
Int. Cl.[4] B23K *9/20, 11/14*
U.S. Cl. 219—93 **6 Claims**



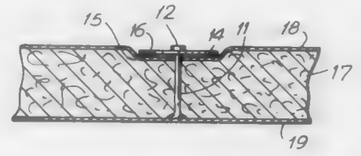
1. A metallic resistance weld pin for the application of insulating batts to ducting or the like, comprising an elongate shank having a sharpened tip portion at one end and an enlarged head at the other, said enlarged head comprising a washer sleeved over said shank and including an aperture formed in said washer at a position offset from the axis of said shank, an abutment portion formed on said shank adjacent said tip portion, said abutment portion being directed toward said head whereby said tip may be biased against a duct by an electrode member inserted through said aperture and biased against said abutment portion.

4,855,562

WELD PIN FOR INSULATION ATTACHMENT

Milton Hinden, Rte. #110, Farmingdale, N.Y. 11735

Filed Oct. 17, 1988, Ser. No. 258,515
Int. Cl.[4] B23K *9/20, 11/14*
U.S. Cl. 219—93 **4 Claims**



1. As a new article of manufacture, a resistance weld pin for attaching batts of insulation to a duct comprising an elongate shank having a point at one end and enlarged head means at the other end disposed generally perpendicular to the axis of said shank, the surface of said head means nearest said point having a het activated adhesive coating.

4,855,563

DEVICE FOR PLASMA-ARC CUTTING OF BIOLOGICAL TISSUES

Alexei S. Beresnev, ulitsa Ostrovskogo, 6, kv. 59; Leonid A. Serykh, ulitsa Oktyabrskoi Revoljutsii, 7, kv. 106, both of Smolensk; Viktor S. Saveliev, ulitsa Donskaya, 27, kv. 29, Moscow; Valery S. Volkoedov, ulitsa Marshala Ustinova, 16, korpus 2, kv. 908, Moscow, and Igor V. Stupin, ulitsa Akademika Bakuleva, 4, kv. 122, Moscow, all of U.S.S.R.

PCT No. PCT/SU86/00077, § 371 Date Apr. 8, 1988, § 102(e) Date Apr. 8, 1988, PCT Pub. No. WO88/01218, PCT Pub. Date Feb. 25, 1988
PCT Filed Aug. 11, 1986, Ser. No. 228,699
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121.39 **1 Claim**



1. A device for plasma-arc cutting of biological tissues, comprising a cathode assembly having passages for supplying a plasma-forming gas and a conical electrode; an anode assembly the nozzle of which comprises an arcing chamber arranged successively with a plasma jet-forming chamber, wherein the electrode has the shape of a truncated cone which has a tapering portion the length of which is equal to between 3.5 and 4.5 its diameter and the end of said electrode is arranged in a tapering chamber of the nozzle at a distance from said arcing

chamber of 0.1 to 0.5 times the length of said tapering chamber, and the passages supplying the plasma-forming gas of the cathode assembly having a length equal to the length of the plasma jet-forming chamber and are spaced from the end of the electrode by the length of the tapering portion of the electrode.

4,855,564

LASER BEAM ALIGNMENT AND TRANSPORT SYSTEM

Phillip J. Hawkins; William H. Kasner, both of Penn Hills Township, Allegheny County; Vincent A. Toth, Penn Township, Westmoreland County, and Mariann C. Stroster, Hempfield Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 23, 1988, Ser. No. 197,176
Int. Cl.[4] B23K *26/02*
U.S. Cl. 219—121.78 31 Claims



1. A laser welding system in which a high power laser produces a laser beam for delivery to a weld site comprising:

a transmitter and a spatially separated receiver, the transmitter being optically coupled to the laser and having an input for receiving the beam and having an output for directing the laser beam to the receiver, the receiver being optically coupled to the transmitter and having an input for receiving the directed laser beam and means for delivering the laser beam to the weld site;

at least two pairs of directable beam deflecting means one pair in the transmitter and one pair in the receiver each pair of beam deflecting means operable in perpendicular planes for aligning the output of the transmitter and the input of the receiver;

a pair of steering deflectors at the input of the transmitter for directing the laser beam toward the directable beam deflecting means of the transmitter;

means for selectively mounting the laser in an orientation relative to the weld site; and

means in the transmitter for selectively adjusting the orientation of the transmitter to an orientation corresponding to the orientation of the laser.

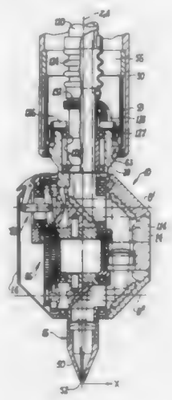
4,855,565

WORK HEAD DEVICE

Bruce A. Thomas, Seaford; Gregory Sapozhnikov, Hampton, and Robert L. Shaw, East Hawthorn, all of Australia, assignors to Laser Lab Limited, Cheltenham, Australia

Continuation of Ser. No. 163,969, Nov. 23, 1987, abandoned. This application Nov. 1, 1988, Ser. No. 265,585
Claims priority, application Australia, Mar. 25, 1986, PH 5190
Int. Cl.[4] B23K *26/02*
U.S. Cl. 219—121.79 21 Claims

1. A work head for an automated machine by which a work medium is able to be applied to a surface of a work piece, the work head having a base member by which it is connectable to carrier means of the machine for lateral movement of the work head parallel to an X-Y plane of a three-axes co-ordinate system, for longitudinal movement of the work head parallel to the Z-axis of that system and for rotating the work head on an A-axis parallel to the Z-axis; link means connected to the base member so as to be pivotable relative to the base member on a B′-axis parallel to the X-Y plane; a work member connected to the link means so as to be pivotable relative to the link means about a B″-axis, spaced from and parallel to the B′-axis, the work member defining a path by which the work medium is able to pass from a source thereof to an outlet defined at a work end of the work member for application to the work piece surface, which outlet is spaced from the B″-axis by substantially the same distance as the spacing between the B′- and B″-axes; and drive means enabling reversable pivoting of the link means on the B′-axis relative to the base member and reversable pivoting of the work member on the B″-axis relative to the link means; the arrangement being such that:



(i) the drive means is operable to reversibly pivot each of the link means and the work member, on the respective one of the B′- and B″-axes, in opposite directions and with pivoting of the work member relative to the link means through substantially twice the angle of pivoting of the link means relative to the base member; and

(ii) the work end at which the outlet of the work member is provided is positioned such that, with the link means and the work member positioned so the Z-, B′-and B″-axes are substantially co-planar, the work end is substantially centered on the Z-axis,

whereby the work end is able to maintain zero, offset with respect to the Z-axis despite rotation of the work head on A-axis and said pivoting on the B′- and B″-axes.

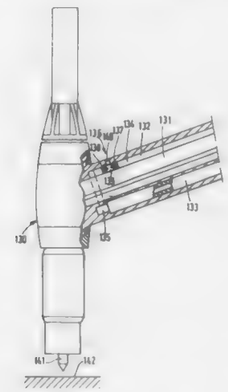
4,855,566

PROCESS FOR STRIKING AN ARC IN ELECTRIC WELDING AND WELDING TORCH EMPLOYING SAID PROCESS

Jean-Francois Hays, Carrieres-Sur-Seine; Pierre Legrand, Pontoise; Eric Verna, Cergy; Michel Delzenne, Francouville; Bernard Reynaud, L'Isle Adam, and Pierre Gaillard, Champigny-Sur-Marne, all of France, assignors to L'Air Liquide, Paris, France

PCT No. PCT/FR86/00363, § 371 Date Apr. 20, 1987, § 102(e) Date Apr. 20, 1987, PCT Pub. No. WO87/02606, PCT Pub. Date May 7, 1987
PCT Filed Oct. 22, 1986, Ser. No. 54,272
Claims priority, application France, Oct. 25, 1985, 85 15363
Int. Cl.[4] B23K *9/06*
U.S. Cl. 219—130.4 7 Claims

1. A process for striking an arc in an electric welding or cutting torch having a torch body with a refractory electrode and conductor means for supplying current to the refractory electrode, the process comprising producing at said refractory electrode an ionizing discharge of high-voltage electric pulses forming at least one spark from a remotely located pulse generator of the electronic ignitor type employing a capacitive electric charge dischargeable into a step-up voltage transformer, connecting the electronic ignitor to the refractory



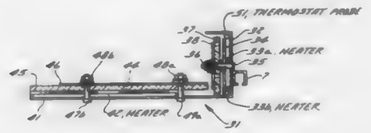
electrode conductor means, and inserting a spark gap in the discharge circuit of said electronic ignitor; the distance between the electronic ignitor and the body of the torch being less than about 8 metres, the distance between said spark gap and said refractory electrode being less than 0.5 meter, the spark gap being located in the torch body.

4,855,567

FROST CONTROL SYSTEM FOR HIGH-SPEED HORIZONTAL FOLDING DOORS

Louis Mueller, Richfield, Wis., assignor to Rytec Corporation, Jackson, Wis.

Filed Jan. 15, 1988, Ser. No. 144,572
Int. Cl.[4] H05B *3/20*
U.S. Cl. 219—218 18 Claims



1. A foldable door comprising:

a header including a front, generally vertical panel and a rear, generally horizontal panel, said header being disposed along a top of an associated doorway;

a downwardly depending foldable curtain disposed below said header;

curtain supporting means connected to said header and movably supporting said curtain for movement between a closed, extended position and an open, folded position in which an upper edge of said curtain is in close proximity to said rear panel, said supporting means including a generally C-shaped bracket for receiving a plurality of carriages associated with said curtain;

a pair of hollow jambs disposed along opposite sides of said doorway, each of said jambs having an inwardly directed, cantilevered hinge mounted thereon in opposing positions at either side of said doorway, said curtain supporting means being pivotally mounted on each of said hinges, each of said jambs including an internal chamber having an interior wall;

means for simultaneously raising both a surface temperature of said foldable curtain and a temperature at the floor level of said doorway above a frost formation temperature;

jamb temperature raising means disposed on said interior wall within said chamber of said jambs for raising a temperature of at least one of said jambs above the frost formation temperature, said jamb temperature raising means comprising:

a serpentine jamb heating element disposed on said interior wall of said jamb;

a first thermal insulating layer disposed over said jamb heating element; and

first retention means for securing said first thermal insulating layer and said jamb heating element to said interior wall;

front panel temperature raising means disposed within said header for raising the temperature of said front panel above the frost formation temperature, said front panel temperature raising means comprising:

front panel heat transferring means disposed on an interior surface of said front panel for transferring heat to said front panel;

a second thermal insulating layer covering said front panel heat transferring means; and

second retention means for securing said second thermal insulating layer and said front panel heat transferring means to said front panel; and

rear panel temperature raising means disposed within said header for raising the temperature of said rear panel above the frost formation temperature, said rear panel temperature raising means comprising:

rear panel heat transferring means disposed on an upper face of said rear panel for transferring heat to said rear panel;

a third thermal insulating layer covering said rear panel heat transferring means; and

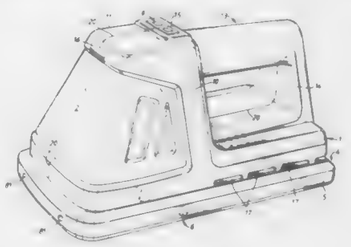
third retention means for securing said thermal insulating layer and said rear panel heat transferring means to said interior face.

4,855,568

WALLPAPER STEAMER

Peter R. Wilkins, Blackwell, England, assignor to Black & Decker Inc., Newark, Del.

Filed Nov. 19, 1987, Ser. No. 123,082
Claims priority, application United Kingdom, Nov. 20, 1986, 8627724
Int. Cl.[4] F22B *1/28*
U.S. Cl. 219—271 38 Claims



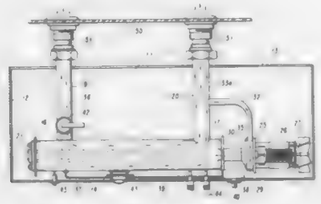
1. A hand-held, wallpaper steamer for use in wallpaper stripping comprising a housing with a base open at one face to form a chamber with a peripheral wall which is placed against wallpaper to be stripped, the housing having, between its ends, a column extending away from the base, and a removable water tank, said column being contoured on one face to receive the water tank and on another face to form a handle that is spaced from the base and extends in a direction generally parallel thereto.

4,855,569

WATER HEATER FOR PREFORMED SPAS AND BAPTISMAL POOLS

Martin F. Wiedemann, c/o Wiedemann Industries, Inc., Progress Industrial Park, P.O. Box 677, Muscatine, Iowa 52761

Filed Feb. 17, 1988, Ser. No. 156,596
Int. Cl.[4] H05B *1/02*; F24H *1/10*; F04B *21/00*; E04H *3/20*
U.S. Cl. 219—306 3 Claims



1. In a heater for water including a hollow heat exchanger defining a water flow path therethrough, said heat exchanger having a pair of opposite first and second end walls and an elongated tubular wall interconnecting said end walls, the heat exchanger being adapted for operating disposition wherein its tubular wall extends in a generally horizontal direction, a water inlet to the heat exchanger disposed adjacent the first end wall and located effective to allow substantially all water in the heat exchanger to drain therefrom through said inlet when the heat exchanger is disposed as aforesaid and the inlet is unsupplied with water, a water outlet from the heat exchanger disposed adjacent the second end wall and located effective to allow substantially all air in the heat exchanger to be expelled therefrom through said outlet when the heat exchanger is disposed as aforesaid and water is supplied to said inlet, electrical means within the housing for heating water, the heating means being mounted adjacent the first end wall and extending longitudinally of the heat exchanger towards the second end wall, and a pump disposed adjacent the exterior of the second end wall, the pump having a water inlet communicating with the interior of the heat exchanger through the second end wall and a first water outlet communicating with the heat exchanger outlet in a direction away from the heat exchanger for circulating water through the heat exchanger, the improvement wherein the pump includes a smaller second water outlet communicating with the interior of the heat exchanger through the second end wall and effective to direct a counterflow of water into the heat exchanger towards the first end wall to reduce the build-up of scale and sediment in the heat exchanger by keeping such scale and sediment in suspension in the water and in circulation.

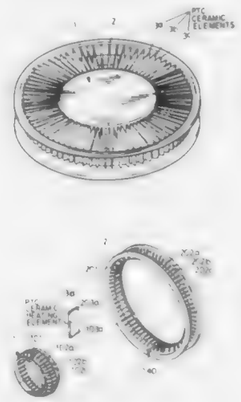
4,855,570

ELECTRIC FLUID HEATING UNIT HAVING RADIAL PTC CERAMIC HEATING ELEMENTS

Tim Wang, No. 80, Yung-Feng Road, Tai-Ping Village, Taiwan

Filed Dec. 9, 1987, Ser. No. 130,998
Int. Cl.[4] F24H *3/04*; H01C *1/014*; H05B *3/14, 3/20*
U.S. Cl. 219—375 6 Claims

1. A heating unit for heating fluid comprising: two electrodes and a plurality of spaced, plate-like PTC ceramic heating elements aligned between the two electrodes; said electrodes being ring-shaped and comprising an inner ring and an outer ring, said inner and outer rings being in nested, concentric, spacedrelationship; said PTC ceramic heating elements being in radial, aligned, spacedrelationship with the opposite ends of each PTC ceramic heating element being mechanically



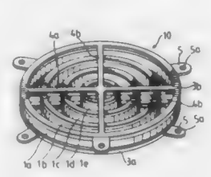
and electrically connected respectively to said inner and outer ring-shaped electrodes.

4,855,571

POSITIVE TEMPERATURE COEFFICIENT CERAMIC HEATING ELEMENT FOR HEATING A FLUID

Ching-Jui Ting, and Cheng-Jien Peng, both of Hsin-Chu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Jan. 29, 1988, Ser. No. 150,785
Int. Cl.[4] H05B *3/10*; F24H *3/04, 1/10*; H01C *7/02*
U.S. Cl. 219—376 9 Claims



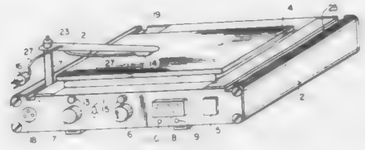
1. A heating element for heating fluids comprising:
a plurality of ring-shaped members made of a ceramic material having a positive temperature coefficient (PTC) and disposed in concentrically spaced, generally coplanar relationship one around the other, said ring-shaped members having encircling walls spaced apart from each other to form through-passages therebetween, each of said ring-shaped members having a first end and a second end opposite to said first end;
an electrode layer formed on and electrically connected to each of said first end and said second end of each of said ring-shaped members; and
means for securing said ring-shaped ceramic members in said concentric spaced relationship, said securing means being connected securely to all of said ring-shaped members and including two conductive securing members which are spaced apart from one another and one of which is in electrical connection with said electrodes formed on all of said first ends and the other of which is in electrical connection with said electrodes formed on all of said second ends of said ring-shaped members, said securing embers incorporating means cooperating with said ring-shaped members for spacing and positioning said ring-shaped ceramic members.

4,855,572

HEATER FOR USE AS EITHER PRIMARY OR AUXILIARY HEAT SOURCE AND IMPROVED CIRCUITRY FOR CONTROLLING THE HEATER

Linus E. Wallgren, Rockville, Md.; Bobby L. Mason, Alexandria, Va.; William J. Siegel, Silver Spring, Md.; Ole V. Olesen, Annapolis, Md., and Louis A. Abbagnaro, Columbia, Md., assignors to PACE Incorporated, Laurel, Md.

Filed Jan. 23, 1987, Ser. No. 6,422
Int. Cl.[4] H05B *3/68*
U.S. Cl. 219—456 27 Claims



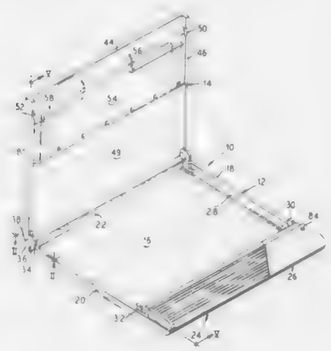
1. A heating system comprising base means, a platen mounted on said base means, heating means for heating said platen, means for fixedly holding said heating means in place, and a heat conducting, compliant member disposed on said platen and supporting a work to be heated; where said work is a substrate having at least one electronic component disposed thereon; and including a further primary heater, said component being mounted on a first side of said substrate and an uneven surface of the substrate being disposed on a side of the substrate opposite said first side, and where said means for heating the platen includes means for raising the temperature at said first surface to a primary temperature greater than a preheat temperature to thus effect said installation or removal of said component.

4,855,573

ELECTRICALLY HEATED BINDER APPARATUS

Alfredo J. Vercillo, Harwood Heights, and Nicholas M. Nanos, Morton Grove, both of Ill., assignors to General Binding Corporation, Northbrook, Ill.

Filed Mar. 22, 1988, Ser. No. 171,686
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—492 10 Claims



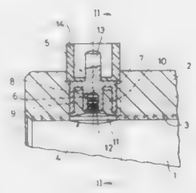
1. An apparatus for binding loose papers in a binder cover having an electrically conductive layer and a heat-activated adhesive means along the spine thereof, spaced electrical contacts along the length of the spine and contacting a conductive layer, said apparatus comprising:
a base member,
an interconnected cover member,
a pair of spaced electrical contact means, which are spaced from each other a distance less than the length of the spine, for electrical connection with the electrical contacts associated with a binder cover, said apparatus contacts associated with one of said base or cover members, and
binder-receiving means associated with the other of said cover member and base member for positioning binder contacts in electrical connection with the spaced electrical contact means of said apparatus within the length of the spine; and
an electronic timing circuit means operatively associated with one of said base member or cover member for delivering electric current to said spaced electrical contacts of said apparatus upon closure of the circuit means.

4,855,574

WELDING SLEEVE WITH CONNECTING MEANS HAVING AN UPPER AND LOWER PART

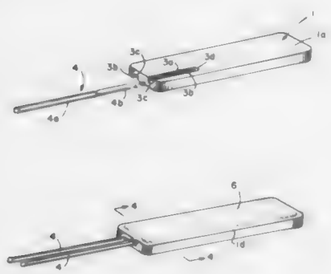
Bernard Lodder; Roelof Koopman, both of Hardenberg, and Jan Visscher, Lutten, all of Netherlands, assignors to Wavin BV, Zwolle, Netherlands

Filed Feb. 8, 1988, Ser. No. 153,583
Claims priority, application Netherlands, Feb. 9, 1987, [redacted]
Int. Cl.[4] H05B *3/58*
U.S. Cl. 219—535 7 Claims



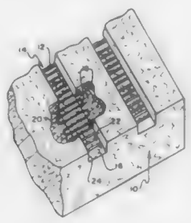
1. A thermoplastic welding sleeve the inside of which is locally provided with electrically conductive material embedded in a wall thereof, at least two connecting means embedded in said wall thereof, at least tow connecting means embedded in said wall for connecting said electrically conductive material to an external voltage source, said connecting means extending maximally to the inner wall of said welding sleeve, at least one of each of said connecting means comprising at least two upper and lower metal parts and interacting with each other and being in contact with the electrically conducting material of said welding sleeve and said electrically conducting material being clamped between said metal parts of said conneting means, said upper metal part being inserted from the outer side of the welding sleeve through a hole through the wall thereof, said lower part of the connecting means being inserted from the inside of said welding sleeve with plastic of the wall of said welding sleeve present between said upper and lower metal parts, said upper and lower parts of said connecting means being brought into physical electrical contact with one another through deoformation of the plastic wall of said slleve present between said parts and said parts being forced into contact with each other the lower part of the conneting means being completely received within the wall of the said welding sleeve, and said connecting means comprising the lower part of the connecting means having a flange provided with one or more projecting parts as well as the upper part of the connecting means having a body provided with one or more spaces in which said projecting parts are received in clamping fashion while deformed plastic of the wall of the welding sleeve is received in at least some of the spaces in the upper part of the connecting means parts.

4,855,575
ELECTROCERAMIC HEATING DEVICES
Lionel J. Melanson, Casco, Me., assignor to GTE Products Corporation, Stamford, Conn.
Filed Oct. 3, 1988, Ser. No. 252,410
Int. Cl.[4] H05B *3/03*
U.S. Cl. 219—541 11 Claims



1. An electroceramic device comprising:
a body of electroceramic material, said body having an outer perimeter edge and two sides, each of the sides forming an exterior face of said body;
at least one groove disposed on one of the exterior faces of said body, said groove extending from said edge and forming an opening on said exterior face;
a lead wire disposed in said groove and extending outwardly from said body through said edge; and
a metallized electrically conductive coating disposed on each of said exterior faces forming electrodes, said coatings being electrically insulated from each other, one of said coatings filling voids left between said lead wire and the interior of said groove, whereby to hold said lead wires in place within said groove and form an electrical connection with said coating; and
means to conduct current to the other of said coatings.

4,855,576
THERMAL INSULATING BLOCKS AND UTILIZING SINGLE BLOCKS FOR ELECTRICAL HEATING UNITS
Duane L. Sterwald, Watertown, Wis., assignor to General Signal Corporation, Stamford, Conn.
Division of Ser. No. 868,651, May 10, 1986, Pat. No. 4,719,336.
This application Oct. 8, 1987, Ser. No. 105,818
Int. Cl.[4] H05B *3/34*
U.S. Cl. 219—544 6 Claims



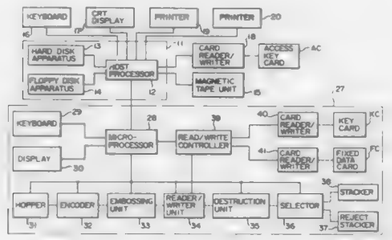
1. A block for producing a thermal insulating block consisting essentially of a mass of elongated inorganic fibers and masses of binder, the mass of inorganic fibers being in a substantially random distribution, each fiber having a plurality of regions disposed closely adjacent to regions of other fibers of the mass, the masses of binder being disposed on and extending between the closely adjacent regions of the fibers of the mass of fibers characterized by the block having a density between 30 pounds per cubic foot and 75 pounds per cubic foot.

4,855,577
NAVIGATIONAL AND YACHT RACING CALCULATOR
Philippe H. McLain, 510 Harden St., Columbia, S.C. 29205
Filed Mar. 3, 1988, Ser. No. 163,617
Int. Cl.[4] G06C *3/00*
U.S. Cl. 235—78 N 15 Claims



1. A navigational calculator comprising:
a plurality of disk members;
means to support said disk members and to permit said disk members to be selectively rotated with respect to each other;
a first of said disk members presenting a true wind indicator;
a second of said disk members presenting a compass rose;
said first and second disk members being relatively rotatable selectively to align said true wind indicator with the direction of said wind, as designated on said compass rose;
a third of said disk members presenting a course indicator and at least two sets of sine/cosine scales, said third disk member being rotatable with respect to said second disk member selectively to align said course indicator with respect to the appropriate course heading, as represented on said compass rose, while maintaining said true wind indicator properly aligned with said compass rose;
the alignment of said course indicator with the heading designated on said compass rose determining the angular disposition of said sine/cosine sets about the means to support said disk members;
a starboard heading indicator having a head portion and a tail portion, said head portion being selectively alignable with the directional representation on said compass rose;
a port heading indicator having a head portion and a tail portion, said head portion being selectively alignable with the directional representation on said compass rose;
a fifth disk member having angular indicia and a starboard tack ratio indicator, alignment of said angular indicia on said fifth disk member with the tail portion of said starboard heading indicator effecting alignment of the starboard tack ratio indicator along the scale of one of said sine/cosine sets;
a sixth disk member having angular indicia and a port tack ratio indicator, alignment of said angular indicia on said sixth disk member with the tail portion of said port heading indicator effecting alignment of the port tack ratio indicator along the scale of the other of said sine/cosine sets;
the readings designated by said tack ratio indicators on said sine/cosine sets reflecting the relative times, and distances, sailed on said starboard and port tacks, respectively, effectively to traverse the course designated by said true course indicator.

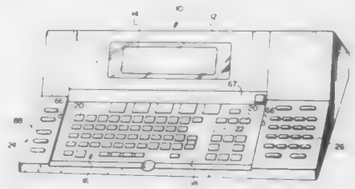
4,855,578
PORTABLE STORAGE MEDIUM PROCESSING SYSTEM
Katsuhisa Hirokawa, Yokosuka, and Hiroshi Ohba, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Aug. 27, 1987, Ser. No. 89,999
Claims priority, application Japan, Aug. 28, 1986, 61-199920
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 21 Claims



1. A portable storage medium processing system which writes data in a first portable storage medium, the data including inherent data which is different from data of other first portable storage media and common data which is common to data of said other first portable storage media, said portable storage medium processing system comprising:
host means including inherent data holding means for holding the inherent data to be written in said first portable storage medium and inherent data reading-out means for reading out the inherent data from said inherent data holding means;
common data holding means for holding the common data to be written in said first portable storage medium, said common data holding means including a second portable storage medium; and
data writing means for writing data in said first portable storage medium, said data writing means including means for receiving the inherent data from said host means, common data reading-out means for reading out the common data from said common data holding means without using said host means, and means for writing the inherent data, received by said receiving means, and the common data, read out by said common data reading-out means, in said first portable storage medium.

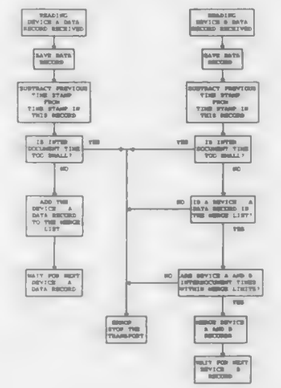
4,855,579
SYSTEM FOR GUIDING A USER IN ORIENTING AN APPLICATION INSERT HAVING A PLURALITY OF DATASTRIPS RELATIVE TO A DATASTRIP READER
David Hancock; Robert Hoyt, and Joseph Formica, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 28, 1987, Ser. No. 138,468
Int. Cl.[4] G06K *7/00*
U.S. Cl. 235—436 3 Claims

1. A digital data system comprising:
an application insert having one or more digitally encoded datastrips located adjacent to and parallel with an edge of said application insert, wherein each of said datastrips includes guidance information at the beginning of the datastrip; and
digital data utilization apparatus including an electronic display, a reader for reading the guidance information contained at the beginning of a datastrip on an application insert which has been oriented relative to said reader for reading said datastrip, and control means for processing the guidance information read by said reader from said datastrip and for displaying, on said electronic display, messages which guide a user of said system to correctly orient said application insert relative to said reader so that



said reader reads said datastrips on said insert in the correct sequence.

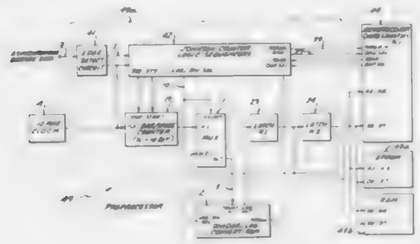
4,855,580
DATA MERGE DOCUMENT PROCESSING METHOD
Paul F. Van Maanen, Jr., Lewisville, Tex., assignor to Recognition Equipment Incorporated, Irving, Tex.
Filed Nov. 20, 1987, Ser. No. 123,381
Int. Cl.[4] G06K *7/00*
U.S. Cl. 235—440 1 Claim



1. A method for merging data from at least two data capture devices including the steps of:
capturing data from a plurality of documents at a first data capture device;
storing the data captured by the first data capture device in a first plurality of records, each one of the first plurality of records corresponding to one of the plurality of documents;
storing in the first plurality of records the time the data was captured for the corresponding one of the plurality of documents;
calculating the time elapsing between successive data captures using the time stored in the first plurality of records and generating an inter-document time for documents captured at the first data capture device;
capturing data from the plurality of documents at a second data capture device;
storing the data captured by the second data capture device in a second plurality of records, each of the second plurality of records corresponding to one of the plurality of documents;
storing in the second plurality of records the time the data was captured for the corresponding one of the plurality of documents;
calculating the time elapsed between successive data captures using the time stored in the second plurality of re-

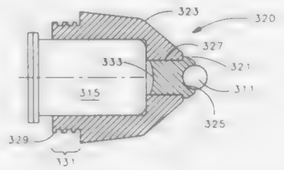
cords and generating an inter-document time for documents captured at the second data capture device;
comparing the inter-document time for successive documents of the first plurality of records with the interdocument time for successive documents of the second plurality of records and generating a time variance signal; and
merging the data stored in the first plurality of records with the data stored in the second plurality of records when the time variance signal is within a predetermined range.

4,855,581
DECODING OF BARCODES BY PREPROCESSING SCAN DATA
Michael E. Mertel, Renton, and James E. Thomas, Seattle, both of Wash., assignors to Microscan Systems Incorporated, Tukwila, Wash.
Filed Jun. 17, 1988, Ser. No. 208,736
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—462 **20 Claims**



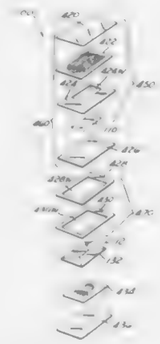
1. In a system for decoding data scanned at a relatively high rate from barcode symbols, the combination comprising:
a preprocessor for receiving and preprocessing a scanned space and bar signal information, and a microprocessor cooperating with said preprocessor for completing decoding of said signal information and having a word length n;
said preprocessor comprising:
edge detect logic means for detecting the occurrence of edges of said space and bar signal information;
primary counter logic means for receiving clock pulses of a predetermined frequency and performing a binary count up to a predetermined maximum count of C where $C=2^{n'}$, and n'=the number of binary bits of said primary counter logic means;
sequencing logic means connected to said edge detect logic means and to said primary counter logic means for causing said primary counter logic means to perform a binary count of said clock pulses to represent the widths of spaces and bars in said space and bar signal information;
log conversion logic means for converting said binary counts of spaces and bars to log counts L represented by integers in a range from 0 to a maximum of 2^n;
ratio logic means for detecting quiet zone margins from consecutive log counts L developed by said log conversion logic means, and producing a margin flag signal in response to log counts L having ratios equal to or greater than a predetermined ratio of space to bar widths; and
latch logic means for latching and transferring log counts L to said microprocessor; and
wherein said microprocessor has RAM means for storing said log counts L of space and bar widths at predetermined address areas, and for storing margin location data in the form of addresses of said log counts L that point to the memory locations of those space and bar counts at or adjacent to said predetermined quiet zone margins.

4,855,582
MOUNTING FOR A SAPPHIRE BALL IN A BAR CODE READER WAND TIP
Brian J. Bayley, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jun. 15, 1988, Ser. No. 207,352
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—472 **16 Claims**



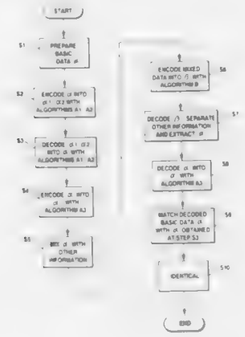
1. In a bar code reader wand having a casing holding an optical assembly for detecting light reflected from a bar code through a sapphire ball at the tip of the wand, a mounting structure for the sapphire ball comprising:
a mounting nest made of a material having a relatively high optical index of refraction, having a front surface with a recess for mounting the sapphire ball, the shape of the recess conforming substantially to the surface of the sapphire ball, said mounting nest occupying the area between the sapphire ball and the optical assembly, so that the optical path of light passing through the sapphire ball to and from the optical assembly passes through the mounting nest;
means for securing the sapphire ball in the recess; and
means for securing the mounting nest to the casing.

4,855,583
STRUCTURE AND METHOD OF MAKING COMBINATION PROXIMITY/INSERTION IDENTIFICATION CARDS
Steven A. Fraser, Saugus; David E. Johnston, Northridge, and Reece D. Metzger, Studio City, all of Calif., assignors to Figgie International, Inc., Willoughby, Ohio
Filed Aug. 17, 1987, Ser. No. 86,061
Int. Cl.[4] G06K *19/06*
U.S. Cl. 235—492 **26 Claims**



1. An identification card, comprising:
electronic circuitry which communicates with a remote sensor by means of electromagnetic signals propagating in space between said sensor and said card; and
a magnetic data storage medium wherein data is stored on said medium in a matrix format and is sensed by a reader which detects said stored data.

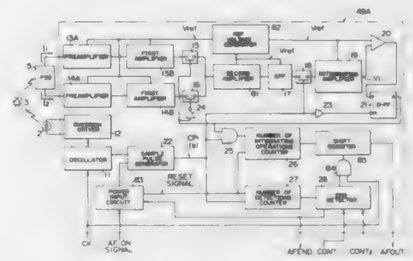
4,855,584
METHOD FOR IDENTIFYING CERTIFICATION IDENTIFYING MEDIA
Hiroshi Tomiyama, and Seishi Naito, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan
Filed Mar. 10, 1987, Ser. No. 24,161
Claims priority, application Japan, Mar. 13, 1986, 61-55893; Mar. 13, 1986, 61-55894; Mar. 13, 1986, 61-55895
Int. Cl.[4] G11B *11/10*
U.S. Cl. 235—493 **8 Claims**



1. An identification data recording method for a certification identifying medium, comprising the steps of:
encoding predetermined basic data into N encoded data using N algorithms, wherein N is a positive integer;
detecting N encoded data from an information identification code strip, said information identification code strip being printed or laminated on said certification identifying medium with magnetic materials;
decoding said detected N encoded data using said N algorithms;
comprising said decoded detected N encoded data with said basic data;
encoding said decoded detected N encoded data using said N algorithms when said compared data is identical; and,
recording said encoded data on a magnetic recording strip, said magnetic recording strip being provided on said certification identifying medium.

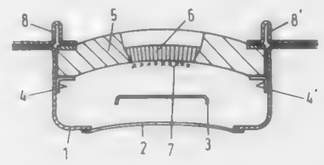
4,855,585
DISTANCE MEASURING APPARATUS
Osamu Nonaka, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Japan
Filed Nov. 19, 1987, Ser. No. 123,104
Claims priority, application Japan, Nov. 21, 1986, 61-279243; Nov. 25, 1986, 61-281530; Nov. 25, 1986, 61-281531
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **54 Claims**

1. A distance measuring apparatus comprising:
radiation projecting means which is driven to emit pulses of radiation continuously;
radiation receiving means for providing a pair of electrical signals having a values which depend on incident position thereon of radiation which is reflected from an object being photographed as it is irradiated by the radiation projecting means;
switch means for switching between the pair of electrical signals to feed a common signal line;
integrated means for integrating the electrical signals fed to the common signal line in synchronism with the emission of pulses from the radiation projecting means, the integrating means integrating one of the electrical signals in a positive direction and the other one of the electrical signals in a negative direction with respect to a reference signal;
comparator means for comparing an output from the integrating means against a reference signal;
control means for operating the switch means in accordance with a decision rendered by the comparator means so that the output from the integrating means shifts toward the reference signal;



first counter means for counting a total number of integrating operations performed by the integrating means;
second counter means for counting a number of integrating operations performed by the integrating means either in the positive or the negative direction;
and means for deriving a value of distance measured based on a count in the second counter means relative to a count in the first counter means.

4,855,586
X-RAY DETECTOR TUBE WITH SIDEWALL-SUPPORTING REAR WALL
Johannes J. Houtkamp, Delft, Netherlands, assignor to B.V. Optische Industrie "De Oude Delft", Delft, Netherlands
Filed Mar. 6, 1986, Ser. No. 837,013
Claims priority, application Netherlands, Mar. 13, 1985, 8500709
Int. Cl.[4] H01J *31/50*
U.S. Cl. 250—213 VT **24 Claims**



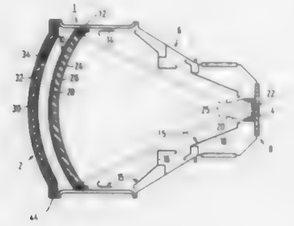
1. An X-ray detector tube, which comprises an essentially rectangular, elongate housing haveing a forward wall, a rear wall and sidewalls, said tube having an elongate proximity focus image intensifier mounted therein, said housing having a vacuum established therein, said rear wall of said tube exhibiting a higher resistance to deformation than said sidewalls, said rear wall supporting said sidewalls against bending.

4,855,587

X-RAY IMAGE INTENSIFIER TUBE WITH CARBON-REINFORCED PLASTIC FOIL ENTRANCE WINDOW

Caspard H. J. Creusen, and Johannes K. E. Colditz, both of Heerlen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1988, Ser. No. 190,199
Claims priority, application Netherlands, May 22, 1987, 8701122
Int. Cl.[4] H01J *31/50, 40/14*
U.S. Cl. 250—213 VT 8 Claims



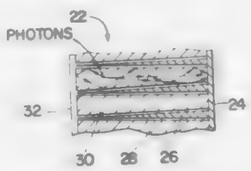
1. An X-ray image intensifier tube (1) comprising an entrance window (2) and an exit window (4) which form part, together with a cylindrical jacket (6), of a vacuumtight envelope (8) which accommodates an entrance screen (10) with a luminescent layer (26) and a photocathode (24), a photo electron imaging electrode system (15) and an exit screen (22), characterized in that the entrance window (2) comprises a carbon fibre reinforced plastics foil covered with a metal layer (32, 34).

4,855,589

PANEL TYPE RADIATION IMAGE INTENSIFIER

Richard S. Eack, San Jose, and F. Dan Meadows, Los Altos, both of Calif., assignors to Picker International, Inc., Cleveland, Ohio

Division of Ser. No. 838,100, Mar. 10, 1986, Pat. No. 4,730,107. This application Nov. 12, 1987, Ser. No. 119,829
Int. Cl.[4] H01J *31/50*
U.S. Cl. 250—213 VT 6 Claims



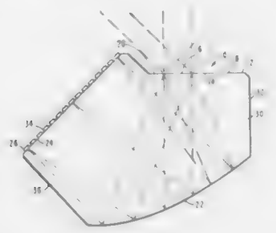
1. A substrate material for use in a panel type radiation sensitive imaging intensifier tube having an evacuated tube envelope, an input window and an output window, said substrate material mountable in the tube envelope for supporting at least a conductive coating, and comprising a pattern etched glass plate defining an array of through holes partitioned by straight walls tapering to a sharp edge on the side of said material oriented toward the input window when mounted in the tube envelope, wherein the thickness of the substrate material is substantially greater than the hole width.

4,855,588

CYLINDRICAL WIDE FIELD RECEIVER ELEMENT

Alan W. Holmes, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Nov. 24, 1987, Ser. No. 124,725
Int. Cl.[4] G01V *1/20*
U.S. Cl. 250—203 R 10 Claims



1. A receiver having a wide field of view in two dimensions and which provides electrical signals indicative of the direction, projected onto a first plane, of a source of electromagnetic radiation within the field of view of the receiver comprising:

a first surface containing an input aperture intersecting said first plane;

a convex cylindrical reflective second surface located generally opposite said aperture and oriented along an axis perpendicular to said first plane, said second surface oriented to reflect radiation within said field of view passing through said aperture to one side of said aperture, said second surface configured and oriented to reflect radiation from sources appearing within the field of view of the receiver to form line images, the location of a line image being dependent upon the direction of the corresponding source; and

a detector means locaated along a flat third surface, said detector means oriented with respect to said reflective second surface to correspond to locations at which line images from sources in said plane and within said field of view are at or near focus, such that line images from sources from different directions projected onto said first plane within said wide field of view vary in location in a direction parallel to said first plane on said detector means, said detector means providing an electrical signal indicative of the direction of a source projected onto said first plane.

4,855,590

INFRARED TOUCH INPUT DEVICE HAVING AMBIENT COMPENSATION

Milan Bures, Tobaccoville; Paul P. Kratochvil, Kernersville, and John R. Rowlette, Clemmons, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 25, 1987, Ser. No. 62,107
Int. Cl.[4] G01V *9/04*
U.S. Cl. 250—221 17 Claims

1. An input detection system for detecting the presence of an opaque element in an irradiated field, comprising:

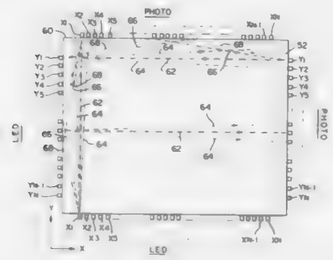
a plurality of light emitting devices located on the periphery of the irradiated field;

a plurality of light detecting devices located on the periphery of the irradiated field, the light emitting devices and the light detecting devices being located on opposite extremities of the irradiated field, individual light detecting devices being aligned with corresponding individual light emitting devices;

means for activating corresponding aligned light emitting devices and light detecting devices during the same time interval;

means for pulsing each activated light emitting device N times during its activated time interval, wherein N is greater than 2;

means for counting the number of pulses received by each corresponding light detecting device during its activated time interval; and



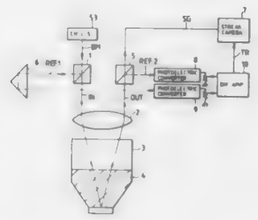
means for reporting the presence of an opaque element in alignment with corresponding aligned and activated light emitting devices and light detecting devices when the number of pulses received by each activated light detecting device during its activated time interval is less than N.

4,855,591

ELECTRO-OPTICAL VOLTAGE DETECTOR

Takuya Nakamura; Shinichiro Aoshima, and Yutaka Tsuchiya, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Jun. 8, 1988, Ser. No. 203,929
Claims priority, application Japan, Jun. 10, 1987, 62-144984
Int. Cl.[4] G01R *19/00*
U.S. Cl. 250—225 8 Claims



1. A voltage detector for detecting a voltage developing in a selected area of an object to be measured, comprising:

a light source for emitting a CW (Continuous-Wave) light beam;

a voltage-sensing part including a reflection means for reflecting an input light beam, and an electro-optic material whose refractive index changes according to said voltage developing in said selected area of said object;

splitting and extracting means for splitting said CW light beam into a first reference light beam with a first predetermined polarized component and said input light beam with a second predetermined polarized component, and splitting an output light beam emerging from said electro-optic material after reflecting from said reflection means into a second reference light beam with a third predetermined polarized component and a signal light beam with a fourth predetermined polarized component;

trigger generation means for receiving said first and second reference light beams and outputting a trigger signal; and

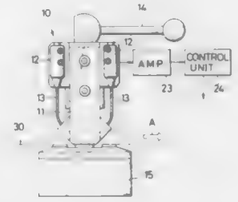
a quick-response detector triggered by said trigger signal, for receiving said signal light beam from said splitting and extracting means, and determining said voltage developing in said selected area of said object.

4,855,592

APPARATUS USING OPTICAL FIBERS FOR INSPECTING SLIDE FASTENER ELEMENTS

Toyosaku Ogura, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 5, 1988, Ser. No. 228,537
Claims priority, application Japan, Aug. 10, 1987, 62-122402[U]
Int. Cl.[4] B21D *53/52*
U.S. Cl. 250—227 4 Claims



1. Apparatus for inspecting the malfunction of coupling elements from slide fastener chains, which comprises:

(a) a holder;

(b) at least one light source carried on said holder and including light emitter means and light receptor means;

(c) at least one optical fiber extending from said light source and having a leading end arranged to face a row of coupling elements along the chamfered corners; and

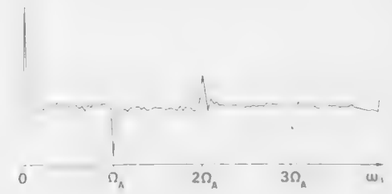
(d) a comparator connected to said light source, whereby said light emitter means emits through said optical fiber light rays onto said row of coupling elements, said light receptor means receives via said optical fiber light rays reflected from the chamfered corners and converts the reflected rays to pulse signals, and said comparator compares the resulting signals with the reference standard thereby detecting irregular coupling elements.

4,855,593

METHOD FOR RECORDING ICR MASS SPECTRA AND ICR MASS SPECTROMETER DESIGNED FOR CARRYING OUT THE SAID METHOD

Geoffrey Bodenhausen, Pully; Peter E. Pfändler, Lausanne; Jacques Rapin, Lausanne; Tino Gaumann, Lausanne, and Raymond Houriet, Lausanne, all of Switzerland, assignors to Spectrospin, AG, Zurich, Switzerland

Filed May 26, 1988, Ser. No. 198,975
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 3719018
Int. Cl.[4] B01D *59/44*
U.S. Cl. 250—282 7 Claims



1. Method for recording ICR mass spectra wherein the ions

of a substance to be examined, which are trapped in the measuring cell of an ICR mass spectrometer, are excited to coherent oscillation by means of an rf pulse applied to the measuring cell, whereafter the rf signals induced by the oscillations of the excited ions are received for a pre-determined measuring period, recorded and transformed into frequency-dependent signals, characterized by the steps of

applying a first rf pulse P_1 for exciting the ions,

irradiating upon the excited ions, after a pre-determined first period t_1, a second rf pulse P_2 containing the same frequency as the first rf pulse P_1,

applying, after a pre-determined mixing period T_m following the second rf pulse P_2, a third rf pulse P_3 which again effects coherent excitation of the ions contained in the measuring cell,

receiving and recording during the pre-determined measuring period t_2 the rf signals induced by the oscillations excited by the third rf pulse P_3,

repeating several times the measuring sequence described before and comprising the steps of exciting the ions by means of three rf pulses P_1, P_2, P_3 following each other in time and recording the induced time-dependent rf signal, while varying the pre-determined period t_1, and

transforming finally the sets of rf signals dependent on the measuring time t_2, which are now dependent on the variation of the period t_1, into two-dimensional frequency-dependent signals, by eliminating the dependence on t_2 and t_1.

4,855,594

APPARATUS AND PROCESS FOR IMPROVED DETECTION LIMITS IN MASS SPECTROMETRY

Fred M. Kimock, Macungie, and John H. Phillips, Fogelsville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 2, 1988, Ser. No. 163,507
Int. Cl.[4] B01D *59/44*
U.S. Cl. 250—282 37 Claims



1. A method for detecting trace levels of sample gas introduced through a nozzle into a mass spectrometer having a vacuum chamber with an ionizing region containing interfering residual background gas, comprising the steps of:

(a) introducing into the vacuum chamber a substantially high density sample gas pulse, the density of the sample gas pulse being sufficient to sweep substantially all the residual background gas from the ionizing region;

(b) ionizing at least a portion of the high density sample gas pulse;

(c) extracting and imaging ions from the ionized gas; and

(d) detecting the extracted ions.

4,855,595

ELECTRIC FIELD CONTROL IN ION MOBILITY SPECTROMETRY

William C. Blanchard, Baltimore, Md., assignor to Allied-Signal Inc., Morristown, N.J.

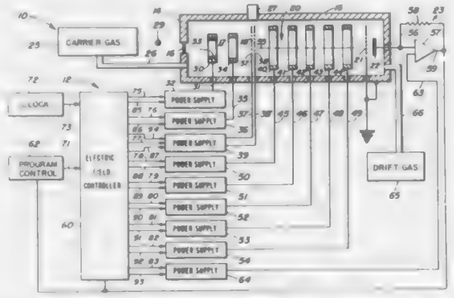
Filed Jul. 3, 1986, Ser. No. 881,871
Int. Cl.[4] H01J *49/40*
U.S. Cl. 250—287 24 Claims

1. Apparatus for detecting ions comprising,

a first inlet means for introducing a carrier gas and a sample gas into a reaction region,

a second inlet means for introducing a drift gas into a drift region and at a pressure wherein the mean free path of the drift gas is a small fraction of the dimensions of the drift region,

first means for generating first ions from said carrier gas and sample gas in said reaction region; second means for generating an electric field in said reaction region to move said first ions toward said drift region having a longitudinal axis, third means for generating an electric field in said



drift region substantially parallel to said longitudinal axis to move said first ions toward a collector at first times, for generating an electric field in said drift region substantially parallel to a longitudinal axis to move said first ions away from said collector at second times, and

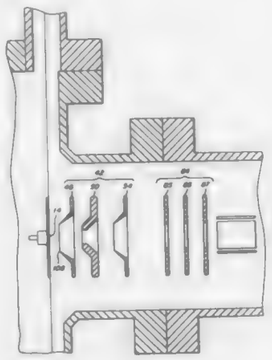
for generating an electric field in said drift region substantially parallel to said longitudinal axis to move said first ions toward said collector at third times.

4,855,596

PHOTO ION SPECTROMETER

Dieter M. Gruen, Downers Grove; Charles E. Young, Westmont, and Michael J. Pellin, Naperville, all of Ill., assignors to ARCH Development Corp., Chicago, Ill.

Division of Ser. No. 870,437, Jun. 4, 1986, abandoned. This application May 5, 1987, Ser. No. 46,117
Int. Cl.[4] H01J *40/00*
U.S. Cl. 250—305 17 Claims



1. A method of efficiently extracting for quantitative spectroscopic analysis a selected atomic component removed from a sample held at a sample electric field potential relative to a spectrometer housing electric field potential, comprising the steps of:

generating near said sample a volume containing said selected atomic component;

applying a predetermined electric field potential near said sample, said predetermined electric field potential comprising regions of slowly diminishing and rapidly diminishing field potential, said slowly diminishing field potential exhibiting an averaged change of potential over a portion of the region between said sample and the electric field generating lens element nearest said sample and said averaged change of potential for said region of slowly diminishing field potential being less than about ten to twenty percent of the difference between said sample electric field potential and said spectrometer housing potential and said predetermined electric field potential further including said region of rapidly diminishing field potential exhibiting an averaged change of potential extending contiguously beyond said slowly diminishing field potential region and said averaged potential change being greater than about ten to twenty percent of the difference between said sample potential and said spectrometer housing potential

ionizing said selected atomic component substantially in said slowly diminishing field potential region; and

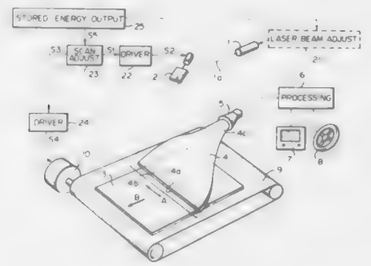
extracting said ionized atomic component responsive to entering said rapidly diminishing field potential region, said extracted atomic component subsequently undergoing said quantitative spectroscopic analysis.

4,855,597

RADIATION IMAGE READ-OUT APPARATUS

Kazuo Shimura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Aug. 11, 1986, Ser. No. 895,478
Claims priority, application Japan, Aug. 15, 1985, 60-179868
Int. Cl.[4] G01N *23/04*
U.S. Cl. 250—327.2 4 Claims



1. A radiation image read-out apparatus including a main scanning means for scanning a stimulable phosphor sheet carrying a radiation image of an object stored thereon with stimulating rays in a main scanning direction to cause the stimuable phosphor sheet to emit light in proportion to the stored radiation energy, a sub-scanning means for moving the stimuable phosphor sheet with respect to the stimulating rays in a sub-scanning direction approximately normal to the main scanning direction, and a light detection means for detecting the light emitted by the stimulable phosphor sheet in proportion to the stored radiation energy,

wherein the improvement comprises the provision of:

(i) a stored energy signal output means for receiving input of information on the level of radiation energy stored on said stimulable phosphor sheet and generating a signal corresponding to said information,

(ii) a stimulation energy adjusting means for receiving said signal generated by said stored energy signal said stimulating rays per unit area of said stimulable phosphor sheet on the basis of said signal;

(iii) a means for inputting information on the radiation dose on the stimulable phosphor sheet at image recording to the stored energy output means; and

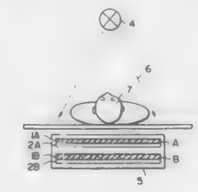
(iv) means for calculating the level of stimulation energy of stimulating rays per unit area of the stimulable phosphor sheet based on the input information from said means for inputting information.

4,855,598

ENERGY SUBTRACTION PROCESSING METHOD FOR RADIATION IMAGES, STIMULABLE PHOSPHOR SHEET, STIMULABLE PHOSPHOR SHEET COMPOSITE MEMBER & STIMULABLE PHOSPHOR SHEET FILTER COMPOSITE MEMBER USED FOR THE METHOD

Makoto Ohgoda, and Nobuyoshi Nakajima, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 883,429, Jul. 14, 1986, which is a continuation of Ser. No. 548,486, Nov. 3, 1983, abandoned. This application Nov. 9, 1987, Ser. No. 119,265
Claims priority, application Japan, Nov. 4, 1982, 57-193765
Int. Cl.[4] G03C *5/16*
U.S. Cl. 250—327.2 23 Claims



1. An energy subtraction processing method for radiation images comprising the steps of:

(i) exposing an object including a specific structure exhibiting radiation energy absorption characteristics different from the radiation energy absorption characteristics of the other structures to a radiation,

(ii) simultaneously exposing substantially the entire area of two stimulable phosphor sheets positioned in the condition overlaid one upon another in a composite member to the radiation passing through said object to have radiation images stored in the respective stimulable phosphor sheets so that image information containing, at the portion corresponding to said specific structure, the low energy component of the radiation in an amount smaller than the amount contained in the image information recorded in a stimulable phosphor sheet positioned closer to said object is recorded in a stimulable phosphor sheet positioned farther from said object, said stimulable phosphor sheets exhibiting different levels of characteristics of absorbing the low energy component of a radiation, said stimulable phosphor sheets being positioned in such a manner that a stimulable phosphor sheet exhibiting a higher level of characteristics of absorbing the low energy component of a radiation is closer to the object that a stimulable phosphor sheet exhibiting a lower level of said characteristics, a material absorbing the low energy component of a radiation being dispersed in the stimulable phosphor layer of the stimulable phosphor sheet positioned closer to the object, whereby the level of characteristics of absorbing the low energy component of a radiation of the stimulable phosphor sheet positioned closer to the object is made higher than a level of the characteristics of the stimulable phosphor sheet positioned farther from the object,

(iii) scanning the respective stimulable phosphor sheets with stimulating rays to sequentially release the radiation energy stored in the stimulable phosphor sheets as light emission,

(iv) photoelectrically detecting the emitted light and converting it to digital image signals of the respective radiation images,

(v) on the basis of said radiation images converted to said digital image signals, obtaining at least two radiation images to be subtraction processed, and

(vi) extracting an image of said specific structure by conducting a subtraction processing of said digital image signals between the corresponding picture elements of

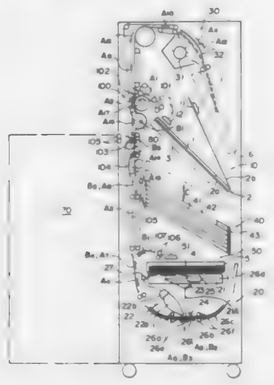
said at least two radiation images to be subtraction processed.

4,855,599

RADIATION IMAGE READ-OUT APPARATUS

Makoto Ohgoda, and Toshitaka Agano, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 24, 1988, Ser. No. 172,540
Claims priority, application Japan, Mar. 24, 1987, 62-69650
Int. Cl.[4] G03B *42/00*
U.S. Cl. 250—327.2 **14 Claims**



1. A radiation image read-out apparatus comprising:

(i) a stimulable phosphor sheet feeding section for housing therein at least one stimulable phosphor sheet carrying a radiation image stored thereon, and feeding out said housed stimulable phosphor sheet,

(ii) an image read-out section for carrying out read-out of said radiation image by conveying said stimulable phosphor sheet in a sub-scanning direction by use of a sub-scanning conveyance means, at the same time scanning said stimulable phosphor sheet in a main scanning direction by a light beam deflected one-dimensionally, thereby to cause said stimulable phosphor sheet to emit light carrying said radiation image, and detecting the emitted light,

(iii) an erasing section for erasing radiation energy remaining on said stimulable phosphor sheet after image read-out from said stimulable phosphor sheet has been finished at said image read-out section, and

(iv) a stimulable phosphor sheet housing section for housing therein said stimulable phosphor sheet on which erasing has been finished at said erasing section,

wherein said stimulable phosphor sheet feeding section, said image read-out section, said erasing section, and said stimulable phosphor sheet housing section are provided one above another so as to vertically overlap one another, and

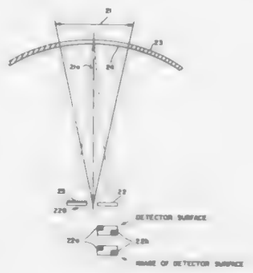
a vertically extending sheet conveyance means disposed on one side of each of said sections for receiving said sheet from said feeding section, respectively conveying said sheet into and out of said read-out section and said erasing section and conveying said sheet into said housing section by reciprocatingly conveying said sheet along said conveyance means.

4,855,600

THERMAL IMAGING DEVICE IN COMBINATION WITH AN IMAGE PRODUCTION SYSTEM

Josef F. Menke, Foerdestrasse 27, D-2392 Gluecksburg, Fed. Rep. of Germany

Filed Apr. 22, 1988, Ser. No. 185,008
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1987, 3714270
Int. Cl.[4] H04N *5/33*; H01L *31/04*
U.S. Cl. 250—332 **3 Claims**



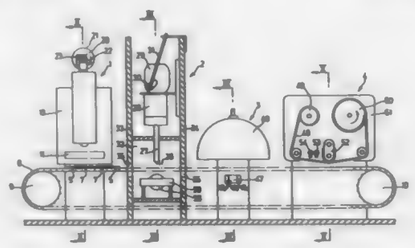
1. A thermal imaging device having an optical recording system and a multi-element detector associated with a first mirror comprising an internally-mirrored autocollimating mirror which possesses, close to the pupil of the optical system, a diaphragm for limiting the recording aperture of the multi-element detector, wherein the multi-element detector is disposed offset from the optical axis, and a second mirror is disposed symmetrically at the other side of the optical axis at which the autocollimating mirror forms the image of the multi-element detector; wherein said second mirror comprises means for projecting the image of the multi-element detector back to the autocollimating mirror, from where it is reflected once more right way up and laterally unreversed onto the multi-element detector in such a way that each individual detector element receives its own image.

4,855,601

METHOD AND DEVICE FOR AUTOMATIC SPECTROMETRIC ANALYSIS OF A LIQUID, PARTICULARLY OF MILK

Jean-Louis Savoyet, La Motte d'Aveillans, France, assignor to Societe Civile de Brevets, J.L.S., La Motte d'Aveillans, France

Filed Oct. 27, 1987, Ser. No. 114,273
Claims priority, application France, Oct. 30, 1986, 86 15160
Int. Cl.[4] G01J *3/36*
U.S. Cl. 250—339 **20 Claims**



1. Method of spectrometric analysis of a liquid, by measurement of the absorption in various frequency bands of an infrared radiation, characterized in that the following operations are carried out in succession:

a small volume of the liquid to be analyzed is accurately dispensed and is deposited on the planar upper surface of a small plaque (7) of a material which is transparent to the radiation employed.

this volume of liquid is spread on the small plaque over a well-defined surface area with the aid of a rotary device,

the liquid spot thus produced is dried, until a dry spot is obtained,

the small plaque (7) carrying its dry spot is subjected to spectrometic analysis in the absence of the solvent of the liquid, and

the upper surface of the small plaque is cleaned by wiping and polishing before the next measurement.

4,855,602

BEAM DEFLECTOR

Devendra N. Sharma, 22, Carroll House, Barrie Estate, Gloucester Terr., London, England W2 3PR

Continuation of Ser. No. 881,092, Jul. 2, 1986, abandoned. This application Mar. 30, 1988, Ser. No. 175,626
Claims priority, application United Kingdom, Jun. 20, 1986, 8615020
Int. Cl.[4] H01J *37/30*
U.S. Cl. 250—396 R **2 Claims**



1. An apparatus for producing a single output particle beam from a plurality of individual particle beams, comprising:

a plurality of individual particle beam sources for each providing an individual particle beam, each of said individual particle beam sources including a vessel wall, a gas inlet inlet in said vessel wall, ionizing coil means for ionizing gas particles from said gas inlet, and accelerating coil means for accelerating ionized gas particles into an individual particle beam;

beam combining means for combining individual particle beams simultaneously output from said plurality of individual particle beam sources into a single combined output particle beam, sid beam combining means including means for generating an electromagnetic field;

beam deflector means for deflecting said single combined output particle beam, said beam deflector means including a means for producing a deflecting electromagnetic field for controllably deflecting said single combined output particle beam; and

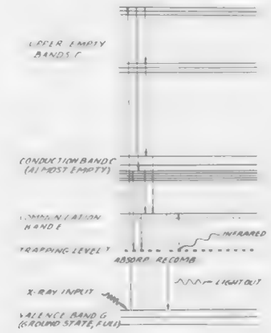
beam scanning means for scanning the deflected single combined output particle beam through a scanning range.

4,855,603

PHOTOLUMINESCENT MATERIALS FOR RADIOGRAPHY

Josephy Lindmayer, Potomac, Md., assignor to Quantex Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 870,809, Jun. 6, 1986, which is a continuation-in-part of Ser. No. 786,095, Oct. 10, 1985, Pat. No. 4,705,952. This application Dec. 1, 1987, Ser. No. 127,118
Int. Cl.[4] H05B *33/00*; C09K *11/08*; G03C *5/16*; B05D *5/06*
U.S. Cl. 250—484.1 **36 Claims**



1. An electron trapping radiation-sensitive photoluminescent material, comprising:

a base material selected from the group of alkaline earth metal sulfides;

a first dopant of samarium;

a second dopant selected from the group of cerium oxide, cerium fluoride, cerium chloride, and cerium sulfide; and

a cesium halide.

24. A radiation detecting device, comprising:

a substrate; and

a cerium doped strontium sulfide phosphor containing a cesium halide, as recited in claim 1 disposed on said substrate.

27. A process for preparing a radiation-sensitive photoluminescent material, comprising the steps of:

mixing,

a base material selected fromthe group of alkaline earth metal sulfides,

a fusible salt, there being up to 10 parts fusible salt per hundred by weight,

a first dopant of samarium, and

a second dopant selected from the group of cerium oxide, cerium fluoride, cerium chloride, and cerium sulfide;

heating the resultant mixture to a first temperature sufficient to fuse the mixture;

grinding the resultant fused mixture into a powder;

adding a cesium halide; and

reheating the resultant powder to a second temperature below said first temperature but sufficiently high to incorporate the cesium halide to yield an electron trapping radiation-sensitive optical material without fusing the powder into a mass.

4,855,604

ION BEAM IMPLANT SYSTEM

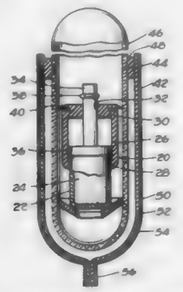
Shantia Riahi, Vista, Calif., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

PCT No. PCT/US85/00929, § 371 Date Mar. 17, 1987, § 102(e) Date Mar. 17, 1987, PCT Pub. No. WO86/06874, PCT Pub. Date Nov. 20, 1986

PCT Filed May 17, 1985, Ser. No. 947,914

Int. Cl.[4] H01J *27/02, 37/18, 49/04*

U.S. Cl. 250—492.2 **23 Claims**



1. An ion source insertion means for loading an ion source into a source vaporizer of an ion implant instrument comprising, in combination:

(a) source forming means for containing, protecting and configuring source material into a configuration which is substantially the size and configuration of the source receptacle in the source vaporizer, the source forming means having a generally cylindrical wall, a bottom and a top, and including a breakseal hermetically sealing the top against contact with the atmosphere;

(b) enclosure means for the source forming means for enclosing at least a substantial portion of the cylindrical wall portions thereof, the enclosure means including means snuggly fitting around the cylindrical wall of the source forming means forming a sliding seal therewith for permitting the source forming means to move under applied force reciprocally in the enclosure means; and

(c) moving means in the enclosure means for applying moving force to the source forming means for moving the source forming means out of the enclosure means and for rupturing the breakseal on the source forming means;

the combination of source forming means, enclosure means and moving means, substantially preventing the source material in the source forming means from coming in contact with the atmosphere.

4,855,605

METHOD FOR PROTECTING OBJECTS FROM DESTRUCTION BY LASER BEAMS USING SOLID OR GASEOUS PROTECTIVE ELEMENTS

Johannes Schroeter, Bad Reichenhall, Fed. Rep. of Germany, assignor to Buck Chemisch-Technische Werke GmbH & Co., Bad Uberkingen, Fed. Rep. of Germany

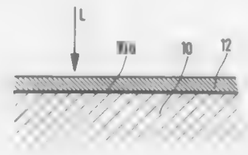
Filed Feb. 23, 1988, Ser. No. 159,353

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1987, 3705694

Int. Cl.[4] G21F *1/00;* **G21G** *1/00*

U.S. Cl. 250—505.1 **21 Claims**

1. A method of forming an object which will resist destruction by a high energy laser beam, said method comprising the steps of (1) providing an object which has a outer surface, (2) providing a solid protective material which, when irradiated with a high energy laser beam, will form a highly ionized plasma which will absorb and/or reflect a high energy laser



beam, and (3) dispersing said solid protective material in said outer surface of said object.

4,855,606

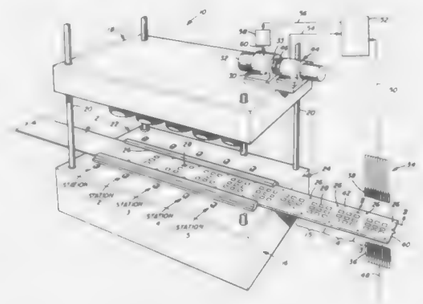
METHOD AND APPARATUS FOR DETECTING A MISFEED IN A STAMPING PRESS

Harry Walters, Pittsburgh, Pa., assignor to Oberg Industries, Inc., Freeport, Pa.

Filed Aug. 12, 1987, Ser. No. 84,453

Int. Cl.[4] G01N *21/86;* **G01V** *9/04*

U.S. Cl. 250—548 **14 Claims**



1. Apparatus for detecting a sheet strip material misfeed condition in a stamping press having an intermittent feed comprising,

stamping means having an intermittent feed of sheet strip material,

said stamping means having an inlet portion and an outlet portion, said stamping means arranged to stamp a sheet strip material passing from said inlet portion to said outlet portion to provide a plurality of individual openings in said sheet strip material,

monitoring means adjacent said stamping means outlet portion,

means for passing said plurality of individual openings in said sheet strip through said monitoring means,

said monitoring means producing a pattern of signals from a plurality of monitoring means signals as each said opening in said sheet strip is passed through said monitoring means,

controller means having an input for receiving said plurality of monitoring means signals produced as each said opening in said sheet strip is passed through said monitoring means and an output connected to said stamping means,

said controller means including means for comparing said pattern of signals from a plurality of monitoring means signals produced as one said opening in said sheet strip is passed through said monitoring means to another pattern of signals from a plurality of monitoring means signals producted as a following opening in said sheet strip is passed through said monitoring means, and

said controller means providing a signal to said stamping means to initiate stoppage of said stamping means as soon as said pattern of signals from a plurality of monitoring means signals produced by an opening in said sheet strip is passed through said monitoring means deviates from said pattern of signals from a plurality of monitoring means signals produced as a prior opening in said sheet strip is passed through said monitoring means.

4,855,607

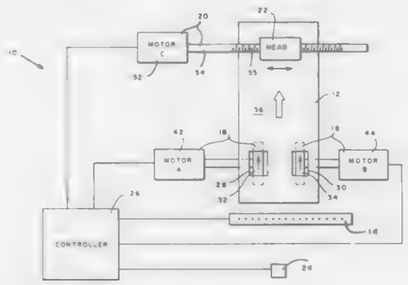
APPARATUS FOR ALIGNING A MOVING SUBSTRATE AND A READ OR WRITE HEAD

John K. Eckl, Norwalk, Conn., assignor to Pitney Bowes, Inc., Stamford, Conn.

Filed Dec. 30, 1987, Ser. No. 139,501

Int. Cl.[4] G06K *15/00*

U.S. Cl. 250—557 **14 Claims**



1. An apparatus for aligning a moving substrate and a read or write head; said apparatus comprising:

sensing means for sensing at least the edges of said moving substrate relative to a reference direction;

deskewing means for deskewing said moving substrate with respect to said reference direction;

translating means for translating said head relative to said reference direction; and

controlling means for controlling said means for translating in response to said means for sensing such that a preselected segment of said moving substrate traverses said head.

4,855,608

LASER CURTAIN HAVING AN ARRAY OF PARABOLIC MIRRORS EACH FOCUSING RADIATION ON A CORRESPONDING DETECTOR POSITIONED IN MIRROR'S FOCAL POINT

William D. Peterson, II, 1444 Murphy's La., Salt Lake City, Utah 84106

Filed Jun. 12, 1987, Ser. No. 61,562

Int. Cl.[4] G01N *21/86;* **G01V** *9/04*

U.S. Cl. 250—560 **19 Claims**



1. A measuring apparatus comprising: a laser curtain assembly, including:

a light source which produces a high intensity collimated beam;

a crystal mounted with respect to said light source and having planar surfaces in the path of said collimated beam to reflect said beam in a planar beam dispersion upon rotation of said crystal and to sweep said beam across an object to be measured,

a collection mirror mounted away from said rotating crystal and with respect to said crystal such that such an object to be measured is in the optical pathway of said beam before reaching said collection mirror, said collection mirror being formed and adapted to reflect said beam to a focal point,

a photodetector mounted with respect to said collection mirror to be at said focal point; and

electronic measuring means linked with said photodetector for determining dimensions of said object by analysis of electronic pulses generated by said photodetector when said beam is received at said photodetector as compared to when said beam is blocked by an object to be measured.

4,855,609

STARTER FOR INTERNAL COMBUSTION ENGINE

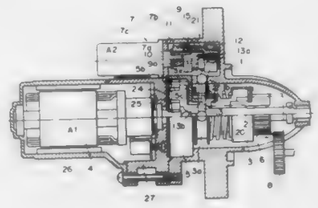
Hitoshi Eguchi; Motoaki Kuribara; Tugio Onodera; Koji Kobayashi, all of Gumma; Ikuo Fujino, Ashikaga; Hiroshi Hagiwara, Isesaki, and Seiichi Ogino, Kiryu, all of Japan, assignors to Mitsuba Electric Mfg. Co., Ltd., Japan

Filed Mar. 17, 1988, Ser. No. 169,330

Claims priority, application Japan, Mar. 18, 1987, 62-63240; Mar. 18, 1987, 62-39554[U]; Mar. 18, 1987, 62-39555[U]; Mar. 18, 1987, 62-39556[U]; Mar. 18, 1987, 62-39557[U]

Int. Cl.[4] F02N *15/06*

U.S. Cl. 290—48 **12 Claims**



1. A starter for starting an internal combustion engine which comprises:

(a) a starter motor having a starter shaft;

(b) a pinion gear splined to the starter shaft so as to be slidable along the starter shaft for connection and disconnection of the starter motor to the engine;

(c) a shifting motor having a shifting shaft;

(d) a stationary support member provided co-axially with the shifting shaft;

(e) a sliding means helically splined to the shifting shaft and slidable along said stationary support member keeping sliding contact therewith; and

(f) a shift arm for transmitting the sliding movement of the sliding means to the pinion gear so as to move the latter for connection and disconnection of the starter motor to the engine.

4,855,610

STARTING ELECTRIC MOTOR

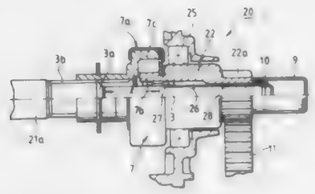
Akira Morishita; Toshinori Tanaka, and Shuzoo Isozumi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1988, Ser. No. 229,527

Claims priority, application Japan, Aug. 7, 1987, 62-198590; Aug. 7, 1987, 62-198591; Aug. 8, 1987, 62-198569

Int. Cl.[4] F02N *15/06*

U.S. Cl. 290—48 **9 Claims**



1. A starting electric motor, comprising:

electric motor means for generating torque to start an engine, said electric motor means being provided with an armature rotary shaft having a shaft extension thereof;

overrunning clutch means axially slidably supported on said haft extension, said overrunning clutch means having a clutch outer being spline-engaged with said shaft extension;

a frame having an opening thereof for covering said electric motor;

first bearing means fixedly fitted in said frame;

movable pinion cylinder means slidably mounted on said shaft extension, said movable pinion cylinder means comprising a clutch inner part at a rear portion thereof, which forms a part of said overrunning clutch means, a pinion part at a front portion thereof, which includes a pinion formed on an outer periphery thereof, said pinion being engaged with a ring gear of said engine, and a middle part formed between said clutch inner part and said pinion part, said middle part including a slidably supporting surface at an outer periphery hereof, and being rotatably supported by said first bearing means and being slidably axially moved with respect to said first bearing means, said pinion part going in and out of said frame through said opening, wherein said movable pinion cylinder means having a first inner periphery which forms a relatively large gap between said movable pinion cylinder means and said shaft extension, said first inner periphery extending from said clutch inner part to at least a part of said middle part, and a second inner periphery extending in said pinion part and providing a minute clearance smaller than said relatively large gap; and

second bearing means arranged in said relatively large gap and being slidably movable together with said movable pinion cylinder means on said shaft extension.

4,855,611

CABLE ADAPTOR WITH SWITCH

Akira Isobe, and Tsutomu Anzai, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 11, 1988, Ser. No. 192,607

Claims priority, application Japan, May 29, 1987, 62-133922

Int. Cl.[4] H01P *1/10;* **H04N** *7/16*

U.S. Cl. 307—125 **1 Claim**

1. A cable adapter having first and second connector sections which are remotely separated from each other, and at least one cable for connecting said first and second connector sections, said adaptor comprising:

(a) a first input terminal adapted to be connected to an antenna terminal;

(b) a second input terminal adapted to be connected to an output terminal of an apparatus for modulating video signals into radio frequency signals;

(c) an output terminal adapted to be connected to an antenna input terminal of a television receiver; and

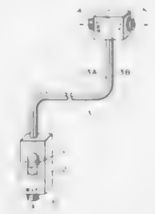
(d) switching means for selecting input signals from one of said first and second input terminals;

wherein:

said first input terminal and said output terminal are closely positioned and integrated in said first connector section,

said second input terminal and said switching means are closely positioned and integrated in said second connector section,

said first input terminal and one input terminal of said switching means are connected by a first cable line,



said output terminal of said first connector section and an output terminal of said switching means are connected by a second cable line,

said second input terminal is connected to another input terminal of said switching means,

said first and second cable lines are arranged in parallel fashion, and said switching means function so as to selectively connect said first input terminal and said output terminal of said first connector section in a first switching position and to connect said second input terminal and said output terminal of said first connector section in a second switching position.

4,855,612

SWITCHING CURRENT AND A RELAY DEVICE EMPLOYED THEREIN

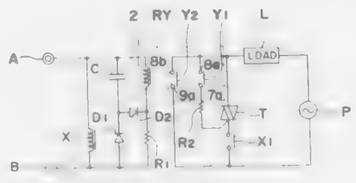
Hirofumi Koga, Kyoto, and Katsumi Koyanagi, Nagaokakyo, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 675,185, Nov. 27, 1984, Pat. No. 4,772,809. This application Mar. 10, 1988, Ser. No. 166,301

Claims priority, application Japan, Nov. 28, 1983, 58-225223

Int. Cl.[4] H01H *33/59*

U.S. Cl. 307—140 **8 Claims**



1. A switching circuit for supplying electric power to a load from a power source, comprising:

a semiconductor switching element connected in series with the power source and load;

first relay switch means for connecting the load and power source, wherein said first relay switch means is connected in parallel with said semiconductor switching element and has an impedance which is substantially less than that of the semiconductor switching element, and a second relay switch means;

gating means for enabling and disabling said semiconductor switching element, wherein said second relay switch means and said gating means are connected in series with each other and

delay circuit means for controlling said first and said second relay switch means and said gating means, said delay circuit having a capacitor, such that:

when supplying current to the laod, said gating means first enables said semiconductor switching element so that current flows from the power source to the load only through said semiconductor switching element, and then said first relay switch means is turned on so that current flows from the power source to the load through said relay switch means; and

when cutting off the current to the load, said second relay switch means is turned off first so that current flows from the power source to the load only through said semiconductor switching element, and then said gating means is operated so as to disable said semiconductor switching element so that no current flows from the power source to the load.

4,855,613

WAFER SCALE INTEGRATION SEMICONDUCTOR DEVICE HAVING IMPROVED CHIP POWER-SUPPLY CONNECTION ARRANGEMENT

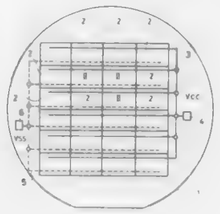
Michihiro Yamada, and Hiroshi Miyamoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

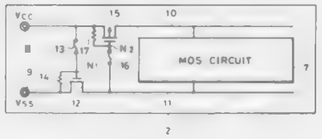
Filed Jan. 15, 1988, Ser. No. 144,383

Claims priority, application Japan, May 8, 1987, 62-112908; Jun. 1, 1987, 62-138532

Int. Cl.[4] H04Q *9/00;* **G11C** *17/00;* **H03K** *17/08, 19/007*

U.S. Cl. 307—202.1 **18 Claims**





1. In a wafer scale integration semiconductor device comprising:

a semiconductor wafer,

a plurality of semiconductor circuit chips formed on said semiconductor wafer,

a first common power supply terminal formed on said semiconductor wafer and coupled to a first power-supply voltage at a high level,

a second common power supply terminal formed on said semiconductor wafer and coupled to a second power-supply voltage at a low level,

a first common power supply interconnection connected between said first common power supply terminal and said plurality of semiconductor circuit chips, and

a second common power supply interconnection connected between said second common power supply terminal and said plurality of semiconductor circuit chips, the improvement comprising:

a switch means having a control terminal connected between at least one of said first and said second common power supply interconnections and one of said semiconductor circuit chips.

a switching control means including a fuse means for rendering said switching means conductive when said fuse means is not disconnected and rendering said switching means nonconductive when said fuse means is disconnected, and

a voltage source means for applying a predetermined voltage to said control terminal for rendering said switching element conductive.

4,855,614

ELECTRONIC SWITCHING APPARATUS HAVING IMPEDANCE MATCHING CIRCUITRY FOR ULTRA-HIGH FREQUENCY SIGNALS

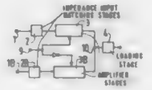
Thierry Maitre, Ruell Malmaison, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1987, Ser. No. 136,244

Claims priority, application France, Dec. 19, 1986, 86 17863

Int. Cl.[4] H03K *17/56, 17/52;* **H03F** *3/68;* **H04N** *5/268*

U.S. Cl. 307—241 **6 Claims**



1. An electronic switching apparatus for switching a plurality of ultra-high frequency signals and providing one of said signals at a circuit output, comprising:

(a) a control means for providing a control signal;

(b) a plurality of signal paths having a common signal output, each of said signal paths comprising a signal input for receiving one of said ultra-high frequency signals, an impedance matching input stage having an input coupled to said signal input and a stage output, amplifier means coupled to said control means and having an input coupled to said stage output and an amplified signal output directly coupled to said common signal output, and

(c) an impedance matching and loading stage having an input coupled to said common signal output and an output coupled to said circuit output;

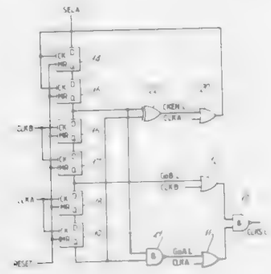
wherein each of said amplifier means alternatively blocks or amplifies and connects its respective ultra-high frequency signal to said common signal output in response to said control signal.

4,855,615

SWITCHING CIRCUIT AVOIDING GLITCHES AT THE INSTANT OF SWITCH-OVER BETWEEN TWO CLOCK SIGNALS

Richard J. Humpleman, Talke, Great Britain, assignor to Active Memory Technology Ltd., England

Filed Jun. 12, 1987, Ser. No. 62,158
Int. Cl.[4] H03K *5/13, 17/687, 1/17;* **G05B** *15/08*
U.S. Cl. 307—269 **3 Claims**



1. A switching circuit for selecting between first and second clock signals, comprising first selection means for selecting the first clock signal, second selection means for selecting the second clock signal, and control means operable to disable the first selection means in synchronism with the first clock signal and then, after a predetermined time delay, to enable the second selection means in synchronism with the second clock signal, wherein the control means is alternatively operable to disable the second selection means in synchronism with the second clock signal and then, after a predetermined time delay, to enable the first selection means in synchronism with the first clock signal, wherein the control means comprises a chain of flip-flops connected in series, the first flip-flop in the series receiving a selection control signal specifying which of the clock signals is to be selected, wherein the chain of flip-flops comprises first, second, and third sections, the first and third sections being clocked by the first clock signal and the second section being clocked by the second clock signal, wherein the outputs of the first and third sections are combined to produce a first control signal which enables the first selection means when both those outputs have a predetermined value, and wherein the output of the second section provides a second control signal which enables the second selection means when that output has a predetermined value.

4,855,616

APPARATUS FOR SYNCHRONOUSLY SWITCHING FREQUENCY SOURCE

Eugene T. Wang, Fremont, and Stephen S. C. Si, Sunnyvale, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Dec. 22, 1987, Ser. No. 136,832
Int. Cl.[4] H03K *5/13, 9/06, 1/17, 17/00*
U.S. Cl. 307—269 **10 Claims**

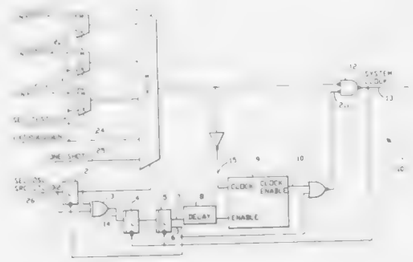
1. A circuit responsive to a switching signal for dynamically switching a system clock from a first one to a second one of a plurality of frequency sources, comprising:

means responsive to said switching signal for disconnecting said first frequency source from the system clock during an inactive clock period; and

means coupled to said disconnecting means for connecting said second frequency source to the system clock, comprising:

gating means receiving said plurality of frequency sources for gating a selected frequency source in response to a given frequency source address;

asynchronous means receiving said selected frequency source for detecting an inactive cycle period therein in response to said switching signal, and for connecting said selected frequency source to the system clock during said inactive cycle period; and



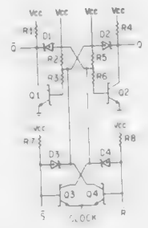
means coupled to said gating means and said asynchronous detecting means for sequencing said gating means and said asynchronous detecting means.

4,855,617

SCHOTTKY TRANSISTOR LOGIC FLOATING LATCH FLIP-FLOP

Kevin M. Ovens, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 944,493, Dec. 19, 1986, abandoned. This application Jun. 30, 1988, Ser. No. 214,921
Int. Cl.[4] H03K *3/286, 3/289*
U.S. Cl. 307—291 **15 Claims**



1. (Amended) An STL flip-flop circuit comprising:

(a) a first latch circuit having first and second input terminals and first and second output terminals;

(b) a second latch circuit comprising:

(i) first and second input terminals,

(ii) first and second output terminals connected respectively to the first and second input terminals of the first latch,

(iii) first and second transistors, each with an emitter, base and collector, the base of each connected to a different second latch input terminal and the collector of each connected to a different second latch output terminal,

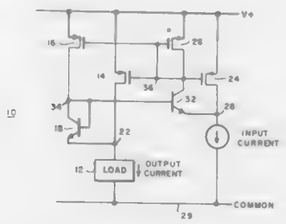
(iv) first and second unidirectional coupling means, each unidirectional coupling means connected from the base of one transistor to the collector of the other transistor to switch the current from the base of one of the transistors to the collector of the other transistor and each of said unidirectional coupling means having a forward voltage drop less than the forward voltage drop of the base-emitter junction of the first and second transistors.

4,855,618

MOS CURRENT MIRROR WITH HIGH OUTPUT IMPEDANCE AND COMPLIANCE

A. Paul Brokaw, Burlington, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Feb. 16, 1988, Ser. No. 156,189
Int. Cl.[4] G05F *1/56*
U.S. Cl. 307—296.6 **11 Claims**



1. A current mirror circuit for receiving a source current at an input node and supplying at an output node, to a load, an output current which is a predetermined multiple of the source current, comprising:

a. first and second MOS transistors, the gates of such transistors being connected together, and the sources of such transistors being connected together and being connectable to a supply voltage;

b. the drain of the first transistor being connected to the input node;

c. the second electrode of the second transistor being connected to the output node; and

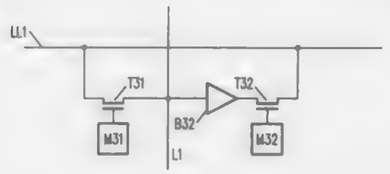
d. means connected at the output node for sensing the voltage at said node, and capable of causing voltage at the input node to be substantially equal to the voltage sensed at the output node.

4,855,619

BUFFERED ROUTING ELEMENT FOR A USER PROGRAMMABLE LOGIC DEVICE

Hung-Cheng Hsieh, Sunnyvale, and William S. Carter, Santa Clara, both of Calif., assignors to Xilinx, Inc., San Jose, Calif.

Filed Nov. 17, 1987, Ser. No. 121,963
Int. Cl.[4] H03K *19/017*
U.S. Cl. 307—443 **29 Claims**



1. A programmable interconnect for programmably connecting a first transmission line to a second transmission line comprising:

a first programmable pass transistor having a first current carrying terminal connected to said first transmission line and a second current carrying terminal connected to the output terminal of a signal buffer, the input terminal of said signal buffer being connected to said second transmission line; and

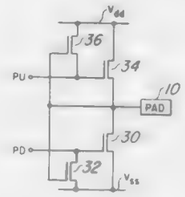
means for controlling the state of said first programmable pass transistor.

4,855,620

OUTPUT BUFFER WITH IMPROVED ESD PROTECTION

Charvaka Duvvury, Missouri City, and Robert N. Rountree, Richmond, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 18, 1987, Ser. No. 122,300
Int. Cl.[4] H03K *5/00;* **H02H** *3/24*
U.S. Cl. 307—448 **14 Claims**



1. An output buffer for an integrated circuit having a power supply voltage, comprising:

a first drive transistor, having its source-to-drain path connected between an output terminal and a reference supply node, and having a gate for receiving an input signal; and

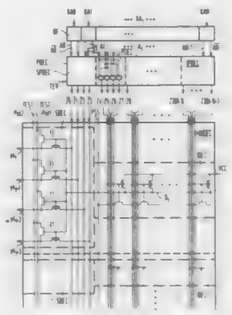
a first high threshold transistor, having a threshold voltage greater than the power supply voltage of said integrated circuit, having its source-to-drain path connected between the gate of said first drive transistor and said reference supply node, and having its gate connected to said output terminal.

4,855,621

MULTI-STAGE, INTEGRATED DECODER DEVICE HAVING REDUNDANCY TEST ENABLE

Kurt Hoffmann, Taufkirchen; Rainer Kraus, Munich, and Oskar Kowarik, Grafing, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 16, 1988, Ser. No. 168,672
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708522; Mar. 16, 1987, 3708532
Int. Cl.[4] H03K *19/003*
U.S. Cl. 371—20 **6 Claims**



1. Multi-stge, integrated decoder device, comprising:

a preliminary decoder device having a selection preliminary decoder and internal preliminary decoder units each being in the form of one-from-n decoders, said selection preliminary decoder including inverters supplying output signals, multiplexers receiving said output signals from said inverters and receiving non-inverted signals, and outputs connected downstream of said multiplexers supplying output signals of said selection preliminary decoder;

means for supplying a test-enable-redundancy signal to said selection preliminary decoder selecting said output signals of said selection preliminary decoder (SPDEC) between said output signals of said inverters and said non-inverted signals;

a main decoder device receiving output signals from said preliminary decoder device and having a plurality of selection decoders and internal decoders, said selection decoders having outputs and transfer transistors with source terminals; and

first and second potential lines each having one of two mutually-complementary levels independently of one another;

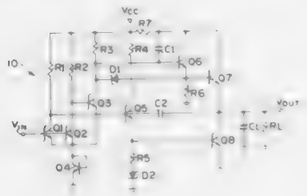
a first half of said outputs of each of said selection decoders each being connected through the source terminals of a respective one of said transfer transistors to said first potential line, and a second half of said outputs of each of said selection decoders each being connected through the source terminals of a respective one of said transfer transistors to said second potential line.

4,855,622

TTL COMPATIBLE SWITCHING CIRCUIT HAVING CONTROLLED RAMP OUTPUT

Derrell Q. Johnson, Orem, Utah, assignor to North American Philips Corporation, Signetics Division, Sunnyvale, Calif.

Filed Dec. 18, 1987, Ser. No. 134,494
Int. Cl.[4] H03K *17/16, 19/088, 00/00*
U.S. Cl. 307—456 **18 Claims**



1. A buffer circuit responsive to an input signal and for providing an output signal at an output thereof, the circuit comprising:

(a) a low voltage driver means coupled to a low voltage source and to said output of said buffer circuit;

(b) a high voltage driver means coupled to a high voltage source and to said output of said buffer circuit;

(c) driver control means for turning said low voltage driver means off before said high voltage driver means turns on when the voltage level of the input signal goes from a first level to a second level, and for turning said high voltage driver means off before said low voltage driver means turns on when the voltage level of the input signal goes from said second level to said first level; and

(d) current limiting means for controllably limiting current flow between said output of said buffer circuit and said low voltage source through said low voltage driver means when said low voltage driver means turns on.

4,855,623

OUTPUT BUFFER HAVING PROGRAMMABLE DRIVE CURRENT

Edward H. Flaherty, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 5, 1987, Ser. No. 117,709
Int. Cl.[4] H03K *19/092, 19/094*
U.S. Cl. 307—475 **11 Claims**

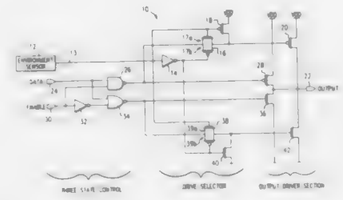
1. Circuitry for varying the output driving characteristics of a logical data signal received at a data input terminal, the variation in response to control signals received at a control signal terminal, and for providing a high impedance output driving characteristic in response to logical enable signals at an enable terminal, comprising:

a series-parallel interconnection of driver elements, each driver element with output connected to an output terminal

and responsive to said logical data signal and an inversion of said logical data signal;

driver selector means with outputs connected to gate inputs of said driver elements;

a control circuit with outputs for providing said control signals, said enable signals, inversions of said enable signals, said data signal, and an inversion of said data signal to the input of said driver selector means;



said control circuit including said control signal terminal, said data input terminal and said enable terminal;

said driver selector means repsonsive to said control signals for enabling and disenabling a second bank of said series-parallel electrical interconnection of driver elements to vary the output driving characteristics of said circuitry; and

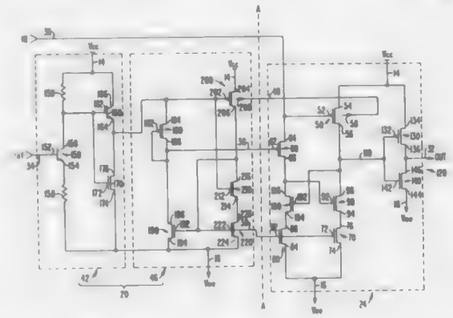
said driver selector means responsive to said enable signals and said inversions of said enable signals for enabling and disenabling said second bank and a first bank of said series-parallel interconnection of driver elements.

4,855,624

LOW-POWER BIPOLAR-CMOS INTERFACE CIRCUIT

Robert A. Kertis; Douglas D. Smith, both of Puyallup, and Terrance L. Bowman, Sumner, all of Wash., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 2, 1988, Ser. No. 151,347
Int. Cl.[4] H03K *17/16*
U.S. Cl. 307—475 **11 Claims**



1. An interface circuit comprising:

at least one translator circuit for translating a first level signal to a second level signal, the translator circuit comprising a first plurality of transistors and having a plurality of nodes, the translator circuit including means for preventing current flow in the translator circuit when the second level signal is at a steady state high and low level;

generator means for generating a desired trip point voltage;

a simulated translator circuit connected between the translator circuit and the generator means to receive the desired trip point voltage and simulate one of the translator circuits, the simulated translator circuit comprising a second plurality of transistors having a plurality of nodes, each of the second plurality of transistors being biased to a particular bias level in response to the trip point voltage;

connecting means for connecting at least one node in said simulated translator circuit to a corresponding node in the translator circuit to provide a control voltage bias signal to establish a desired trip point for the translator circuit.

4,855,625

OPERATIONAL AMPLIFIER HAVING LOW DC CURRENT INPUT CIRCUIT

Robert W. Webb, Indialantic, Fla., assignor to Harris Corp., Melbourne, Fla.

Filed Nov. 9, 1987, Ser. No. 118,251
Int. Cl.[4] H03K *3/26*
U.S. Cl. 307—491 **28 Claims**



1. A transistor circuit comprising

a Darlington-connected pair of first and second bipolar transistors, said first transistor having its base connected to an input terminal for receiving an input signal-, its collector connected with the collector of said second transistor to receive a first bias voltage, the emitter of said first transistor being connected to the base of said second transistor, the emitter of said second transistor being coupled to a second bias source; and

means, coupled to the emitter of said first transistor, for biasing said first transistor so as to minimize DC input current applied to the base of said first transistor without effectively causing the storage of a charge at a node coupled to the emitter of said first transistor, irrespective of the polarity and magnitude of signals applied to the base of said first transistor.

4,855,626

CONTROLLABLE INTEGRATOR

Rolf Böhme, Bad Friedrichshall, Fed. Rep. of Germany, assignor to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

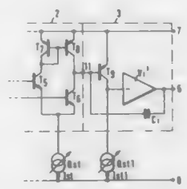
Continuation of Ser. No. 706,294, Feb. 26, 1985. This application Mar. 28, 1988, Ser. No. 192,092
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1984, 3408220
The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.
Int. Cl.[4] G06G *7/12, 7/18*
U.S. Cl. 307—491 **1 Claim**

1. A controllable integrator for a bipolar integrated filter comprising:

a voltage-current-transformer including two transistors, a converting resistor connected between the emitters of said two transistors, and two current sources each connected to a respective one of the emitters of said two transistors;

a source of supply voltage;

a current distribution multiplier including: two logarithmic diodes each having a terminal connected to a respective one of the collectors of said two transistors; a differential stage having differential inputs connected, respectively, to said terminals of said two logarithmic diodes, a current input and an output; a first controllable current source for supplying current to the current input of said differential stage; and a current mirror having an output and comprising two transistors of one conductivity type having emitters connected to said source of supply voltage and collectors connected to the output of said differential stage;



a second controllable current source having the same current as the current flowing in the controllable current source in said current distribution multiplier;

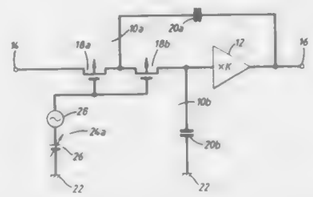
an integrating amplifier including: an inverting amplifier having an input and an output; an integrating capacitor connected between the input and output of said inverting amplifier; and an input circuit including an input transistor of said one conductivity type, said input transistor having a base connected to the output of said current mirror, an emitter connected to said source of supply voltage and a collector connected to the input of said inverting amplifier and to said second controllable current source.

4,855,627

FILTER CIRCUIT

Hisakazu Hitomi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jan. 13, 1988, Ser. No. 143,175
Claims priority, application Japan, Jan. 14, 1987, 62-5105; Jan. 14, 1987, 62-6798
Int. Cl.[4] H03K *5/00, 3/01;* **H03F** *1/30*
U.S. Cl. 307—520 **10 Claims**



1. A filter circuit for filtering an input signal including a DC component signal with a prescribed DC level and an AC component signal comprising:

time constant circuit means for imparting the input signal with prescribed frequency characteristics, the time constant circuit means including a variable impedance device and a capacitor; and

means for supplying a control signal for adjusting the impedance of the variable impedance device, the control signal supply means including DC source means for generating a DC control signal and compensation source means for

generating a compensation signal equivalen to tthe AC component signal of the input signal.

4,855,628

SENSE AMPLIFIER FOR HIGH PERFORMANCE DRAM

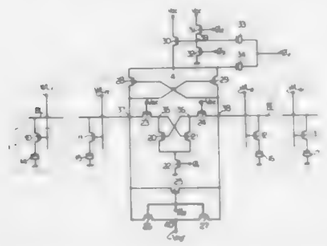
Dong-Soo Jun, Taegu, Rep. of Korea, assignor to Samsung Semiconductors and Telecommunications Co., Ltd., Gumi, Rep. of Korea

Filed Nov. 16, 1987, Ser. No. 120,985

Claims priority, application Rep. of Korea, Nov. 21, 1986, [illegible]

Int. Cl.[4] G01R *19/00*; G11C *7/00*; H03K *3/023, 3/353*

U.S. Cl. 307—530 2 Claims



1. A sense amplifier and high performance DRAM, in combination, comprising:

a DRAM comprising:

at least one row of memory cells (1), whereby the memory cells of the row may be arranged in respective columns with memory cells of other rows;

first and second bit lines (BL and $\overline{BL}$) successively along the row axially;

a fixed voltage source;

each of the memory cells comprising a transistor (10, 11, 12, 13) and a capacitor (14, 15, 16, 17) connected serially between one of the bit lines and the fixed voltage source; and

word lines respectively for the memory cells, each word line being connected to a gate of the transfer of one of the memory cells for activating the memory cell selectively according to row address; and

the sense amplifier comprising:

a cross-coupled bistable flip-flop (20, 21) connecting the bit lines to each other in the row;

a latch transistor (22) connected to the flip-flop for detecting and amplifying a voltage difference between the bit lines;

equalization and precharge means (25, 26, 27, ϕ_5 and V_{REF}) for equalizing and precharging the bit lines with a reference voltage in response to a clock control signal;

transfer means comprising a cross-coupled pair of transistors (28, 29) also connecting the bit lines to each other for transferring a charging voltage to the bit lines;

charging means (31, 32, ϕ_2, ϕ_3 and Vcc) connected to the transfer means for supplying a power-supply level voltage under the control of first and second control clock signals; and

boosting means connected to the charging means for boosting the power-supply level voltage of the charging means to a higher level charging voltage under the control of a third control clock signal, whereby the storage capacitors of the memory cells are charged to the higher voltage.

4,855,629

DC BRUSHLESS MOTOR WITH THREE TEETH AND TWO WINDINGS

Hironobu Sato, Ota, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jan. 4, 1988, Ser. No. 140,665

Claims priority, application Japan, Jan. 14, 1987, 62-6537

Int. Cl.[4] H02K *21/16*; G05B *19/40*

U.S. Cl. 310—49 R 3 Claims



1. A DC brushless motor comprising:

a rotor having a core and having two different magnetic poles disposed around said rotor core;

a stator core having a circular aperture for receiving said rotor therein and having three teeth consisting of a first tooth, a second tooth and a third tooth; wherein said first tooth, said second tooth and said third tooth are positioned on a circumference of said circular aperture at a constant angular intervals; said stator core having a first yoke portion having an end connected to said first tooth, a second yoke portion having an end connected to said second tooth, a third yoke portion having an end connected to said third tooth, and a bridge portion connected to other ends of each of said first, second and third yoke portions;

three magnetic position sensors for detecting a rotational angle of said magnetic poles of said rotor and for providing outputs corresponding thereto, said magnetic position sensors being provided at a position turned a constant angle α with respect to said bridge portions in one direction around said circular aperture;

two stator windings consisting of a first winding and a second winding; said first winding being wound on a part of said bridge portion, and said second winding being wound on another part of said bridge portion;

three terminals consisting of terminal (a), terminal (b) and terminal (c); said terminal (a) being electrically connected to an end of said first winding; said terminal (b) being electrically connected to an end of said second winding; and said terminal (c) being electrically connected to another end of said first winding and to another end of said second winding; and

a control device having six patterns for energizing at least one of said first and second windings via said terminals (a), (b), and (c);

wherein said six patterns include:

a pattern I for magnetizing said first tooth as an N-pole and for magnetizing said third tooth as an S-pole;

a pattern II for magnetizing said second tooth as an N-pole and for magnetizing said third tooth as an S-pole;

a pattern III for magnetizing said second tooth as an N-pole and for magnetizing said first tooth as an S-pole;

a pattern IV for magnetizing said third tooth as an N-pole and for magnetizing said first tooth as an S-pole;

a pattern V for magnetizing said third tooth as an N-pole and for magnetizing said second tooth as an S-pole, and

a pattern VI for magnetizing said first tooth as an N-pole and magnetizing said second tooth as S-pole;

wherein said control device changes from one of said patterns to another of said patterns in accordance with said outputs of said three magnetic position sensors in a predetermined order so as to thereby generate a rotational magnetic field for mechanically rotating said rotor.

4,855,630

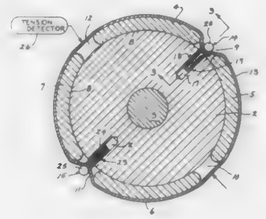
PERMANENT MAGNET ROTOR WITH MAGNET RETENTION BAND

Robert L. Cole, Ludlow Falls, Ohio, assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed May 5, 1988, Ser. No. 190,703

Int. Cl.[4] H02K *1/28, 7/00*

U.S. Cl. 310—156 12 Claims



1. A dynamoelectric machine rotor, comprising a core having an outer cylindrical surface, a plurality of permanent magnets equicircumferentially distributed about said core, said magnets being secured abutting said core and spaced from each other with gaps therebetween, a band member formed of a non-magnetic material encircling said permanent magnets and including a securement portion aligned with one of said gaps, a securement means coupled to said band in alignment with at least one of said gaps and projecting inwardly into holding engagement with said core, said securement means projecting inwardly between said magnets and located totally inwardly of the outer cylindrical circumference defined by the outer surface of said magnets, said securement means forcing said band inwardly between said magnets and establishing a predetermined band holding force in said band to securely affix said permanent magnets in engagement with said core, said force being selected to maintain said permanent magnets in position under predetermined operating rotor speed.

4,855,631

BRUSH HOLDING DEVICE

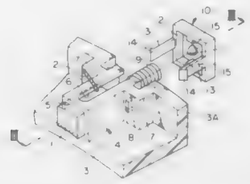
Masaei Sato, Yabuzuka-Honmachi, and Yukiteru Hosoya, Sakai, both of Japan, assignors to Mitsuba Electric Manufacturing Co., Ltd., Gunma, Japan

Filed May 19, 1988, Ser. No. 196,046

Claims priority, application Japan, May 29, 1987, 62-83477[U]

Int. Cl.[4] H02K *13/00*

U.S. Cl. 310—239 4 Claims



1. A brush holding device comprising, a brush box formed into an elongated hollow portion having side walls, a connecting wall connecting said side walls and opposite open ends, a brush being slidably provided in the hollow portion, a pigtail insertion slot provided in the connecting wall of said brush box, said pigtail insertion slot having an open end and a closed end, and a cap capped onto said one end portion of said brush box to block the opening at said one end portion of the brush box and to receive the reaction force of a brush spring that urges the brush into sliding contact with a commutator, and wherein said cap has a projecting portion engagable with a portion of said brush box to prevent the side walls of the brush box from deflecting toward each other.

4,855,632

ASSEMBLED COMMUTATORS

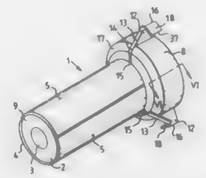
Roger F. Baines, Repulse Bay, Hong Kong, assignor to Johnson Electric Industrial Manufactory, Ltd., Chaiwan, Hong Kong

Filed May 5, 1987, Ser. No. 46,123

Claims priority, application United Kingdom, May 8, 1986, 8611207

Int. Cl.[4] H02K *13/00*

U.S. Cl. 310—233 10 Claims



1. An assembled commutator for an electric motor, comprising a base and a commutator segment mounted on the base, the commutator segment having a brush contacting portion adapted to make an electrical contact with a brush of said electric motor, and a tang for electrical connection to a wire of an armature coil of said electric motor, wherein the tang comprises a first portion extending in a first direction away from the base and a second portion connected to said first portion about a fold line distal of the base, tho fold line extending in a plane containing said base and the first and second portions containing an acute angle,

a collar being provided on said base and defining a slot, an inner end of said first portion being received in said slot,

an edge of said first portion on the side of said brush contacting portion being sloped to guide wire into the old formed between the first and second tang portions, and

a flange being formed at said sloped edge.

4,855,633

PIEZOELECTRIC ACTUATOR

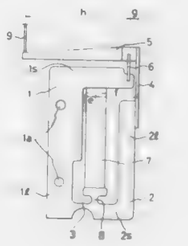
Tsuyoshi Shibuya, Chofu, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

Continuation of Ser. No. 945,665, Dec. 23, 1986, abandoned. This application Jul. 25, 1988, Ser. No. 225,616

Claims priority, application Japan, Dec. 25, 1985, 60-202179[U]

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—328 2 Claims



1. An actuator, comprising:

an L-shaped frame;

a first action lever, shaped substantially as an L, disposed with a first leg thereof substantially in parallel with a first

leg of said L-shaped frame, and a second leg of said first action lever being substantially parallel to a second leg of said L-shaped frame, the second leg of said first action lever being extended from a tip portion of said first leg of said L-shaped frame via a first hinge which is formed by narrowing said tip portion of said first leg in a direction substantially perpendicular to the first leg of the frame and substantially parallel to a second leg of the frame;

a second action lever disposed substantially in parallel with the second leg of said L-shaped frame and on a side of said leg opposite the second leg of said first action lever, said second action lever being connected to the second leg of the frame by a flexible body which is projected from the second leg of the frame;

a piezoelectric element disposed with its direction of expansion substantially parallel to said first leg of said L-shaped frame, one end of said piezoelectric element being fixed to the second leg of the frame and the other end of said piezoelectric element being connected to the second leg of said first action lever via a second hinge located substantially adjacent the narrowed tip portion; and

a second flexible body disposed substantially in parallel with said first leg of said L-shaped frame, said second flexible body connecting said first action lever with said second action lever.

4,855,634

REFLECTOR AND EYELET CONSTRUCTION FOR REFLECTOR-TYPE LAMPS

Peter R. Gagnon, Georgetown, and Timothy A. Benson, Winchester, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Dec. 19, 1985, Ser. No. 810,952
Int. Cl.[4] H01J *5/02, 5/36, 5/46*
U.S. Cl. 313—113 **15 Claims**



1. An electric lamp comprising:

a reflector member having two apertures therein, each of said apertures comprised of a plurality of sections of differing dimensions;

two substantially cylindrical eyelets disposed within and extending through each of said apertures each of said eyelets having a bulged center portion and two end portions, one of said end portions protruding from the rear of said reflector member and the other of said end portions extending into the interior of said reflector member and having a flared end that fastens said eyelets to said reflector member; and

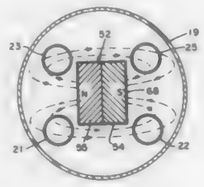
a light source disposed within said reflector member having two lead in conductors connected thereto, one end of said lead in conductors supporting said light source and the other end extending through and connected to one of said eyelets.

4,855,635

FLUORESCENT LAMP UNIT WITH MAGNETIC FIELD GENERATING MEANS

Mark W. Grossman, Belmont, and William A. George, Rockport, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 830,153, Feb. 18, 1986, abandoned.
This application Mar. 22, 1988, Ser. No. 172,940
Int. Cl.[4] H01J *1/88*
U.S. Cl. 313—156 **10 Claims**



1. A fluorescent lamp unit comprising:

a housing having a base means projecting from a first end thereof;

a fluorescent lamp projecting from a second end of said housing comprising a sealed tubular envelope of light-transmitting vitreous material containing an ionizable medium and having at least two leg portions joined together by a generally U-shaped portion, a pair of electrodes respectively sealed at the ends of said envelope, and a pair of electrical contact means respectively connected to said pair of electrodes, said envelope being configured to define a centrally located region extending longitudinally from said second end of said housing; and

magnetic field generating means disposed independently within said centrally located region defined by said envelope and spacedly located therefrom and extending longitudinally from said second end of said housing, said magnetic field generating means forming a single columnar structure disposed within said centrally located region magnetized in a direction transverse to the axial direction of said discharge lamp so as to apply a constant non-time-varying transverse magnetic field over substantially the entire length of positive column induced in said fluorescent lamp to improve the performance of said fluorescent lamp.

4,855,636

MICROMACHINED COLD CATHODE VACUUM TUBE DEVICE AND METHOD OF MAKING

Heinz H. Busta, 223 N. Home Ave., Park Ridge, Ill. 60068, and Raul D. Cuellar, 1262 Briarwood, Libertyville, Ill. 60048

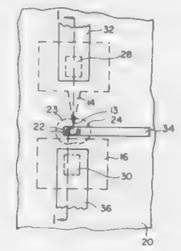
Filed Oct. 8, 1987, Ser. No. 105,895
Int. Cl.[4] H01J *21/10, 21/36*
U.S. Cl. 313—306 **18 Claims**

1. A device comprising:

a vacuum chamber, wherein said vacuum chamber comprises a first insulating layer, a second insulating layer spaced apart from said first layer, and a side insulating layer positioned between and sealed to said first layer and said second layer such that a vacuum space is formed within said first, second and side layers;

a cathode disposed within said vacuum chamber and on said first layer, wherein said cathode comprises a planar field emitter having a small radius of curvature tip; and

an anode disposed within said vacuum chamber and on said first layer, spaced apart from said cathode; and



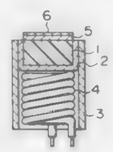
a gate positioned between and spaced apart from said cathode and said anode.

4,855,637

OXIDATION RESISTANT IMPREGNATED CATHODE

Isato Watanabe, Hachioji; Shigehiko Yamamoto, Tokorozawa; Sadanori Taguchi, Tokyo, and Susumu Sasaki, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 155,813
Claims priority, application Japan, Mar. 11, 1987, 62-54160
Int. Cl.[4] H01J *19/14, 1/14*
U.S. Cl. 313—346 R **9 Claims**



1. An impregnated cathode comprising a cathode obtained by impregnating pore portions of a refractory porous substrate with an electron emissive material containing Ba and a thin film formed on said cathode, said thin film comprising a plurality of thin coating layers made of a composition selected from the group consisting of a high melting metal and Sc; a high melting metal and a Sc oxide; a high melting metal, Sc and a Sc oxide; and a high melting metal and a compound of Sc, W and O; said thin coating layers having the same composition but different densities; wherein the density of a topmost layer of said thin film is 1.1 to 3.0 times the density of a lowermost layer of said thin film.

4,855,638

CAMERA TUBE SYSTEM AND ELECTRON GUN THEREFOR

Erich E. Himmelbauer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 6, 1988, Ser. No. 178,161
Claims priority, application Netherlands, Apr. 9, 1987, 8700834
Int. Cl.[4] H01J *29/48, 29/62*
U.S. Cl. 313—389 **9 Claims**

1. A camera tube comprising:

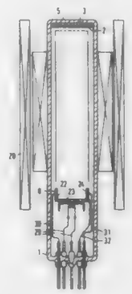
a. an envelope containing a photosensitive target for producing electrical signals corresponding to an optical image formed thereon and a diode electron gun for producing an electron beam;

b. means for focusing the electron beam on the photosensitive target; and

c. means for scanning the electron beam across the target; characterized in that the diode electron gun comprises, arranged along an axis:

(1) a cathode having an electron-emitting surface extending transversely of the axis; and

(2) an anode having a portion thereof extending transversely of the axis at a predetermined distance from the cathode surface and facing said surface, said portion including first and second parts which are electrically insulated from each other, the first part having at least one aperture centered on the axis and the second part having at least



one aperture disposed radially outward from the first aperture;

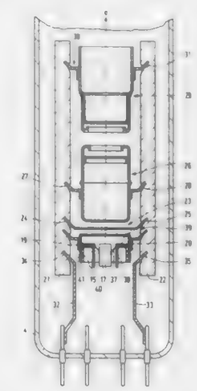
a smaller cross-sectional area of the cathode surface substantially emitting electrons when first and second potential differences exist between the cathode and the first and second parts, respectively, and a larger cross-sectional area of the cathode surface substantially emitting electrons when third and fourth potential differences exist between the cathode and the first and second parts, respectively.

4,855,639

METHOD OF MANUFACTURING AN ELECTRON GUN

Arnoldus H. M. Van Eck, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1988, Ser. No. 190,194
Claims priority, application Netherlands, May 21, 1987, 8701212
Int. Cl.[4] H01J *29/48, 9/18, 29/82*
U.S. Cl. 313—456 **10 Claims**



1. An electron gun comprising at least one electrode centered on a longitudinal axis, at least one support member of

electrically insulating material, and at least one plate-shaped fastening member having a first part affixed to the electrode and a second part embedded in the support member, characterized in that;

a. the second part includes at a distal end thereof an edge defining an inwardly-extending opening and including a portion thereof closest to the electrode;

b. a substantial portion of the edge, including the portion closest to the electrode, lies in a plane which forms an oblique angle with a direction of insertion of said second part into the support member during manufacture; and

c. the portion of the edge closest to the electrode is embedded in the material of the support member, thereby affixing said portion and minimizing the length of the fastening member between the electrode and the support member which is subject to movement parallel to the longitudinal axis during vibration.

4,855,640

CATHODE RAY TUBE WITH METAL REAR HOUSING AND FACEPLATE SUPPORT

Adrian Caple, Purley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 87,720, Aug. 20, 1987, abandoned. This application Aug. 22, 1988, Ser. No. 236,276

Claims priority, application United Kingdom, Aug. 22, 1986, 8620471

Int. Cl.[4] H01J *29/86*

U.S. Cl. 313—477 R **10 Claims**





1. A cathode ray tube having an envelope comprising a metal rear housing having a sidewall portion defining an opening and a substantially flat glass faceplate which extends over the opening and is sealed in a vacuum-tight manner to the surface of a flange on the rear housing extending around the opening, characterized in that the flange comprises a first portion connected to the sidewall portion and extending from the side wall portion in one direction, with the connection between this first portion and the sidewall portion serving as a hinge, and a second portion connected to the first portion and extending in substantially the opposite direction over the first portion, with the connection between the first and second flange portions serving as a further hinge, the second portion providing an outer surface onto which the faceplate is bonded and rotating with respect to the side wall portion by virtue of the flange hinges thereby to conform with deformation of the faceplate upon evacuation of the envelope and further characterized in that the flange is integrally formed as a single element with the sidewall portion.

4,855,641

TRANSPARENT ELECTRODES OF THIN-FILM ELECTROLUMINESCENCE PANEL

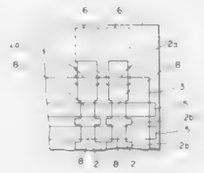
Noriaki Nakamura; Masashi Kawaguchi, and Yasuo Sonoyama, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 11, 1988, Ser. No. 166,893

Claims priority, application Japan, Mar. 13, 1987, 62-59658

Int. Cl.[4] H05B *33/26*

U.S. Cl. 313—505 **5 Claims**



1. In a thin-film EL panel having transparent electrodes formed on a substrate and a first insulative layer, a light-emitting layer, a second insulative layer and back electrodes stacked in this order on said transparent electrodes to define display picture elements on said panel, the improvement wherein the resistance value of parts of said transparent electrodes other than said display picture elements is so controlled as to reduce the occurrence of large breakdown points thereon.

4,855,642

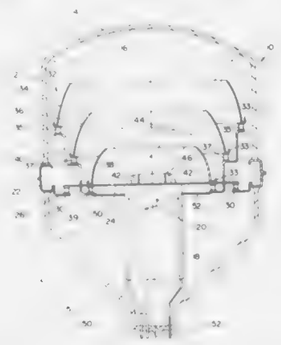
FOCUSING ELECTRODE STRUCTURE FOR PHOTOMULTIPLIER TUBES

Fred A. Helvy, Lancaster, and Gilbert N. Butterwick, Leola, both of Pa., assignors to Burle Technologies, Inc., Lancaster, Pa.

Filed Mar. 18, 1988, Ser. No. 170,016

Int. Cl.[4] H01J *43/06*

U.S. Cl. 313—532 **8 Claims**



1. In a photomultiplier tube of the type including: an evacuated envelope; a faceplate extending across one end of the envelope with a photoemissive cathode located on the interior surface of the faceplate and the cathode providing photoelectrons when it is subjected to radiation; a stem sealing the other end of the envelope; a focusing electrode assembly acting upon the photoelectrons, supported from the envelope and located coaxial to the central axis of the photomultiplier tube; at least one evaporation means supported from the envelope and located for evaporating material onto the faceplate to form the photocathode; and an electron multiplier assembly supported from the envelope; the improvement wherein the focusing electrode assembly comprises:

at least one solid surface conductive electrode structure formed in the shape of a truncated section of an ellipsoid with its single smaller opening nearer the photocathode and its larger opening nearer the electron multiplier assembly and to which a focusing voltage is applied in order to create a focusing electric field.

4,855,643

UNSATURATED VAPOR PRESSURE TYPE HIGH PRESSURE SODIUM LAMP

Philip J. White, Georgetown, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 473,895, Mar. 10, 1983, abandoned. This application Nov. 21, 1988, Ser. No. 274,656

Int. Cl.[4] H01J *61/26*

U.S. Cl. 313—553 **12 Claims**



1. An unsaturated vapor pressure high pressure sodium lamp comprising:

an evacuated glass envelope having a plurality of electrically conductive support members therein and extending therethrough;

an elongated arc tube having a pair of electrodes extending therethrough and affixed to said electrically conductive support members within said glass envelope;

a gas fill including mercury and sodium within said elongated arc tube; and

a getter located within said arc tube in contact with said gas fill and providing a metal oxide having a free energy of formation per mole of oxygen more negative than the free energy of formation per mole of oxygen of sodium oxide.

4,855,644

CROSSED DOUBLE HELIX SLOW-WAVE CIRCUIT FOR USE IN LINEAR-BEAM MICROWAVE TUBE

Ryuzo Orui; Yasuhiro Itagaki, and Toshio Yamaguchi, all of Tokyo, Japan, assignors to NEC Corporation, Japan

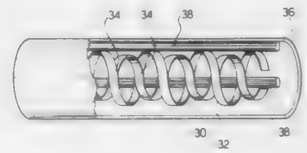
Filed Jan. 14, 1987, Ser. No. 3,197

Claims priority, application Japan, Jan. 14, 1986, 61-6833; Jan. 14, 1986, 61-6834; Mar. 27, 1986, 61-70104; Mar. 27, 1986, 61-70108; Mar. 27, 1986, 61-70109; Jun. 19, 1986, 61-144385

Int. Cl.[4] H01J *25/34*

U.S. Cl. 315—3.6 **26 Claims**

1. A helix slow-wave circuit for use in a linear-beam microwave tube device, comprising a first helix formed by a first wire-like member wound in a first sense at a plurality of turns, said first helix having a circular cross section when viewed along an axis thereof, and a second helix formed by a second wire-like member wound on the first helix at a plurality of turns in a second sense which is opposite to the first sense so as to coaxially superpose on the first helix and to overlie on the first helix at all intersecting portions so that the first and second helixes intersect each other at suitable intervals along an axial direction of the helixes, said second helix having a non-circular cross section when viewed along an axis thereof, whereby the first and second helixes are not in axial symmetry with respect



to each other, the first helix being fixed to the second helix in at least some intersecting points between the first and second helixes, wherein the first helix has a resilient restoring force to have in an unrestrained condition an outer diameter which is larger than an inner diameter of the second helix, whereby the first helix is resiliently fixed to the second helix because of the resilient restroing force of the first helix.

4,855,645

MAGNETRON FOR MICROWAVE OVEN

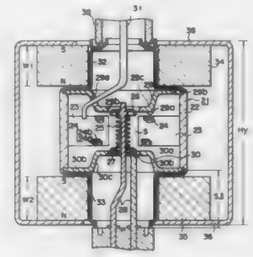
Masanori Kinuno, Yokohama; Hisao Saito, Fujisawa; Akira Kousaka, and Toshio Kawaguchi, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 6, 1987, Ser. No. 105,047

Claims priority, application Japan, Oct. 6, 1986, 61-236221; Oct. 27, 1986, 61-253835

Int. Cl.[4] H01J *25/50*

U.S. Cl. 315—39.71 **4 Claims**



1. A magnet on comprising:

an anode cylinder having a tube axis, two openings, and an inner surface;

a cathode, arranged along said tube axis, for emitting electrons from its surface;

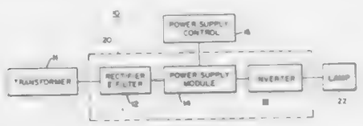
a cathode support member, extending along the tube axis, for supplying a current to said cathode;

a pair of end shields, electrically coupled to said cathode support member, for supporting said cathode arranged therebetween;

a plurality of a anode vanes, radially arranged around said cathode, inner ends of said plurality of anode vanes facing said cathode so that a gape between said inner ends and said cathode defines an interaction space and a resonance cavity exists between said cathode and said anode cylinder, outer ends of said plurality of anode vanes being fixed to said inner surface of said anode cylinder so that said inner ends define an imaginary envelope having a prede-

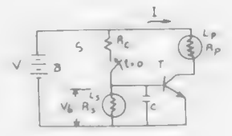
termined diameter, and end portions between said inner and outer ends containing notches;
a pair of pole pieces having a substantially dish shape for supplying magnetic flux to said interaction space that has a magnetic component directed along the tube axis in said imaginary envelope that has magnetic field difference of not more than 15% along said tube axis, each of said pole pieces arranged opposite each other and including:
a flange portion mounted on one of said openings of said anode cylinder,
a flat disk section, arranged adjacent to said anode vanes and having a predetermined outer diameter larger than 160% of the diameter of the imaginary envelope,
a through hole disposed in said flat disk section that has a diameter substantially equal to that of the imaginary envelope, and in which one of said end shields is arranged, and
a coupling section for coupling said flange and disk portions;
a pair of large- and small-diameter strap rings for alternately connecting said anode vanes that are arranged in said notches of said anode vanes and have end portions facing said pole pieces so that a gap exists between said end portions of said anode vanes and said end portions of said strap rings;
a pair of permanent magnets for generating the magnetic flux supplied to said pair of pole pieces;
an antenna lead, electrically coupled to the resonance cavity, for guiding microwaves generated in the resonance cavity; and
a yoke for magnetically coupling said pair of permanent magnets.

4,855,646
FLUORESCENT ILLUMINATOR WITH INVERTER POWER SUPPLY
Guy R. Peckitt, Mar Vista, and Edward E. Kopelman, Beverly Hills, both of Calif., assignors to Techni-Quip Corp., Hollywood, Calif.
Filed May 27, 1987, Ser. No. 54,516
Int. Cl.[4] H05B *41/29*
U.S. Cl. 315—175 **23 Claims**



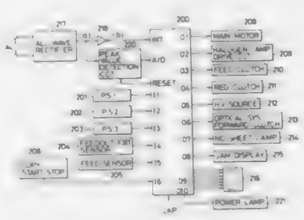
1. A fluorescent illuminator comprising:
a fluorescent lamp;
a lamp housing;
a lamp power supply unit having an AC voltage output with a relatively constant amplitude and a relatively fixed frequency of at least an order of magnitude greater than line frequency and a non-integral multiple thereof for supplying an output current to said lamp;
means for connecting said power supply to said lamp; and
means for adjusting said output current between a first, lowest level and a second, intermediate level to change the light intensity of said lamp.

4,855,647
FLASHLIGHT WITH SOFT TURN ON CONTROL
David R. Schaller, Janeville; El-Sayed Megahed, Madison, both of Wis., and Charles E. Samson, Walpole, Mass., assignors to Rayovac Corporation, Madison, Wis.
Filed Apr. 14, 1987, Ser. No. 38,202
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—209 R **11 Claims**



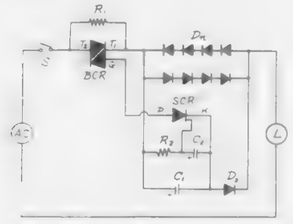
1. A flashlight comprising:
(a) a housing;
(b) a plurality of batteries disposed in said housing;
(c) a primary light bulb;
(d) a manual switch for selectively energizing said primary bulb with said batteries; and
(e) control means responsive to said manual switch for controlling current flow through said primary light bulb, said control means being provided to reduce current inrush to said primary bulb, said control means including a transistor connected in series with said primary light bulb and a biasing network for controlling the operation of said transistor, said biasing network including a thermal resistance element.

4,855,648
CONTROL DEVICE FOR COPIER OR THE LIKE
Toshiaki Yagasaki, Hino, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 746,576, Jun. 19, 1985, abandoned, which is a continuation of Ser. No. 461,166, Jan. 26, 1983, abandoned. This application Jul. 16, 1987, Ser. No. 73,881
Claims priority, application Japan, Feb. 4, 1982, 67-16586; Feb. 4, 1982, 67-16587; Feb. 4, 1982, 67-16588; Jul. 20, 1982, 67-126259
Int. Cl.[4] G03G *15/00*
U.S. Cl. 315—307 **19 Claims**



1. Image processing apparatus comprising:
a plurality of processing means operable for exposing an original document and processing an image of the exposed original document, at least one of said plural processing means including a load member activated by electric power from a power source;
a first control means for controlling the duration of a supply of the electric power to the load member in accordance with an input control signal; and
a second control means storing a program for image processing for controlling the operation of said plurality of processing means in accordance with said program, said second control means including a first timer means operable for time counting in a first time cycle, and a second timer means operable for time counting in a second time cycle shorter than the first time cycle, and said second control means being operable to obtain the time counting cycles of said first and second timer means so as to operate said load member in a predetermined condition, and to produce the control signal to said first control means in accordance with the time counting operations of said first and second timer means.

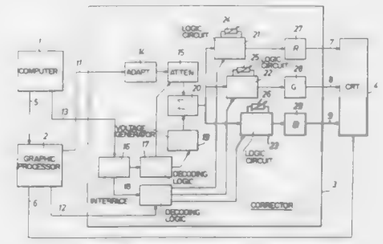
4,855,649
SINGLE-WIRED SWITCHING CIRCUIT DIRECTED TO LIMIT SURGE INTO LAMP
Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan
Filed Jan. 27, 1988, Ser. No. 149,184
Claims priority, application Japan, Feb. 9, 1987, 62-26429; Feb. 9, 1987, 62-26430
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—310 **3 Claims**



1. A single-wired switching circuit directed to use for limiting surge into lamp, comprising:
(a) a diode circuit wherein two sets of diodes are connected in reverse-parallel;
(b) a resistive element connected in series with a lamp to limit the switch-on surge thereinto;
(c) a bidirectionally conductive element having a main current path connected in series with an ac source through said resistive element, diode circuit and lamp; and
(d) a timing circuit having a time constant, said timing circuit comprises a rectifier for rectifying the voltage across said diode circuit, a charging circuit with a time constant comprising a resistor and a capacitor, said charging circuit connected in parallel with said diode circuit through said rectifier, a light-emitting diode connected in parallel with said capacitor in such manner that said capacitor discharges into said light-emitting diode after a lapse of the time constant from switch-on, and a photosensitive resistor connected with the gate of said bidirectionally conductive element in such manner that said photosensitive resistor triggers said bidirectionally conductive element when said light-emitting diode emits light.

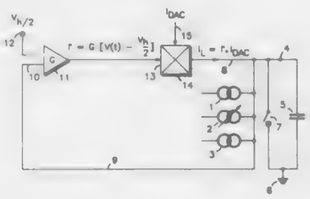
4,855,650
GRAPHIC PROCESSOR OUTPUT DYNAMIC RANGE CORRECTOR SYSTEM FOR ANALYSIS OF BRIGHTNESS CONTRAST
Jean-Michel Seigneur, Petit Quevilly, and Jean-Pierre Menu, Creteil, both of France, assignors to ETAT Francais, France
Filed Dec. 2, 1986, Ser. No. 936,760
Claims priority, application France, Dec. 5, 1985, 85 17992
Int. Cl.[4] H01J *29/52*
U.S. Cl. 315—383 **7 Claims**

1. A graphic processor output dynamic range corrector for use in a brightness contrast analysis instrument to display stimuli at various spatial and time frequencies, including:
a graphic processor for producing a brightness signal and synchronization signals;
attenuator means, connected to said graphic processor for receiving said brightness signal, and having an adjustable attenuation coefficient;
reference voltage generator means having an adjustable voltage level;



summing circuit means for receiving and summing output signals from said attenuator means and said reference voltage generator means to produce a corrected brightness signal; and
means for adjusting the adjustable attenuation coefficient of the attenuator means and for adjusting the adjustable voltage level of the reference voltage generator means.

4,855,651
TIMEBASE CIRCUIT
David T. Jobling, Geneva, and Anthony D. Newton, Le Vaud, both of Switzerland, assignors to Motorola, Inc., Schaumburg, Ill.
Filed May 31, 1985, Ser. No. 739,951
Claims priority, application United Kingdom, Jun. 5, 1984, 8414313
Int. Cl.[4] H01J *29/70*
U.S. Cl. 315—387 **6 Claims**



1. A timebase circuit for a television picture tube comprising current source means for providing a first current for charging a capacitor to produce a ramp voltage; means for continuously monitoring the ramp voltage and for deriving a correction current whose value is continuously dependent upon the monitored instantaneous ramp voltage and means for adding the correction current to the first current during generation of the entire ramp voltage thereby providing dynamic correction to said ramp voltage such that the corrected ramp voltage produces a substantially linear deflection characteristic on the picture tube wherein the correction current is dependent upon the ramp voltage to provide, when integrated on the capacitor, a component of the ramp voltage which is second order in time.

4,855,652

SPEED CONTROL APPARATUS FOR A BRUSHLESS DIRECT CURRENT MOTOR

Koujirou Yamashita, Hitachi; Stunehiro Endo, Hitachioota; Kunio Miyashita, Hitachi; Susumu Kashiwazaki, Utsunomiya, and Kenichi Iizuka, Ashikaga, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 25, 1988, Ser. No. 147,987

Claims priority, application Japan, Jan. 28, 1987, 62-16104; Mar. 14, 1987, 62-59733

Int. Cl.[4] H02P *5/28*

U.S. Cl. 318—268 **3 Claims**



1. A speed control apparatus for a brushless direct current motor comprising:

rectifier circuit means for converting an alternating current of a power supply to a direct current;

step-up chopper circuit means for stepping up an output voltage of said rectifier circuit means and including a reactor, a switching element, and a diode;

smoothing circuit means connected to said step-up chopper circuit means for smoothing the direct current of said rectifier circuit means;

inverter means connected to said smoothing circuit means for conducting an alternating current in response to the direct current obtained at said smoothing circuit means;

a synchronous motor connected to said inverter means;

source voltage detecting means connected to said power supply for producing a voltage signal which is synchronous with a voltage of said power supply; and

control circuit means for driving said inverter means and for switching ON and OFF said switching element of said step-up chopper circuit means, said control circuit means including means for generating a deviation velocity signal by subtracting a detected speed of said synchronous motor from an instruction speed therefor, means for generating a current instruction signal for making the deviation velocity signal become zero, and means for generating a synchronous current instruction signal by multiplying the current instruction signal and a voltage signal output from said source voltage detecting means, said control circuit means intermittently controlling said switching element of said step-up chopper circuit means based on a duty ratio necessary for making the synchronous current instruction signal coincide with said alternating current of said power supply.

4,855,653

OBSTRUCTION DETECTION IN AUTOMATIC PORTAL CONTROL APPARATUS EMPLOYING INDUCTION MOTOR POWER FACTOR

Rodger P. Lemirande, Macomb Township, Mich., assignor to Stanley Automatic Openers, Detroit, Mich.

Filed Mar. 3, 1988, Ser. No. 163,862

Int. Cl.[4] H02P *3/18*

U.S. Cl. 318—282 **11 Claims**

1. An automatic portal operator comprising:

a portal closing member movable between a closed position blocking a portal and an open position not blocking said portal;

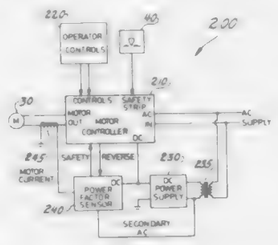
an induction motor mechanically coupled to said portal closing member for controllably moving said portal closing member between said closed position and said open position;

a motor controller electrically coupled to said induction motor for supplying electrical power to said induction motor for controllably moving said portal closing member toward said closing position or toward said open position, said motor controller including a safety operation for supplying electric power to said induction motor to render said portal closing member safe; and

a power factor sensor connected to said induction motor and said motor controller including

a current sensor for generating a current square wave signal having the phase of the current supplied to said induction motor by said motor controller,

a pulse stretching circuits connected to said current sensor for generating a extended current square wave signal



having a trailing edge a predetermined length of time after the trailing edge of said current square wave signal,

a voltage sensor for generating a voltage square wave signal having the phase of the voltage supplied to said induction motor by said motor controller,

a clamping circuit connected to said pulse stretching circuit and said voltage sensor for clamping the reading edge of said extended current square wave signal to the leading edge of said voltage square wave signal, thereby producing a clamped extended current square wave signal,

an inclusive or circuit connected to said voltage sensor and said clamping circuit for generating a phase output signal when said clamped extended current square wave signal differs from said voltage square wave signal, and

an output circuit connected to said motor controller and said exclusive OR circuit for triggering said motor controller to execute said safety operation if the duty cycle of said phase output signal exceeds a predetermined amount.

4,855,654

ROTARY BODY DRIVE DEVICE

Nobuo Fukushima, 1-5, Moegino, Midori-ku, Yokohama-shi, Kanagawa-ken, Japan

Continuation of Ser. No. 839,058, Mar. 13, 1986, abandoned. This application Aug. 21, 1987, Ser. No. 88,979

Claims priority, application Japan, Mar. 16, 1985, 60-53144; Mar. 16, 1985, 60-53145

Int. Cl.[4] H04N *5/93*

U.S. Cl. 369—47 **23 Claims**

1. A rotary body drive device comprising:

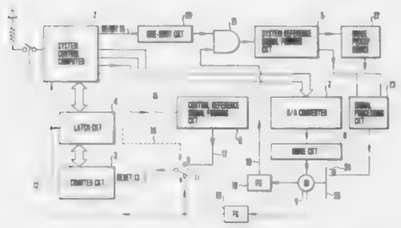
(a) rotation drive means for rotational driving of a rotary body;

(b) detecting means for detecting a phase of rotation of said rotation drive means;

(c) a reference signal source for producing a periodic signal; and

(d) phase difference detection means for detecting a phase difference between the periodic signal produced from said reference signal source and an output of said detecting means;

(e) control means for controlling said rotation drive means in correspondence to the phase difference detected by said phase difference detection means, thereby controlling the phase of rotation of said rotary body; and



(f) correction means for correcting a control state of said control means relative to said rotation drive means, said correction means being arranged to compare a variation amount of said phase difference in a predetermined period with a predetermined value, in which said correction means adds a predetermined constant value to said phase difference as a phase correcting output when said variation amount of said phase difference exceeds said predetermined value and does not add the constant value to said phase difference when said variation amount of said phase difference does not exceed said predetermined value.

4,855,655

ELECTROMAGNETIC SERVO DRIVE FOR POWER STEERING

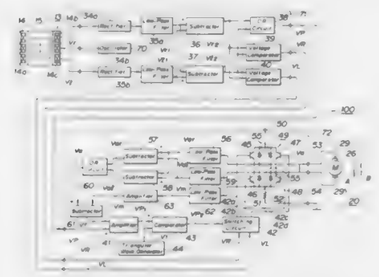
Yasuo Shimizu, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 793,874, Nov. 1, 1985, abandoned. This application Jul. 27, 1987, Ser. No. 77,951

Claims priority, application Japan, Nov. 2, 1984, 59-231758

Int. Cl.[4] B62D *5/04*

U.S. Cl. 388—820 **2 Claims**



1. An electromagnetic servo device comprising:

an input shaft;

an output shaft;

an electric motor for producing assistive torque to be applied to said output shaft;

detecting means for detecting a phase difference between said input and output shafts and for producing a phase difference signal corresponding to the magnitude and direction of said phase difference; and

motor control means for driving said electric motor and for controlling the rotational speed of said electric motor, said motor control means comprising,

a first circuit means, coupled to said detecting means for producing a phase difference magnitude signal and a phase difference direction signal corresponding to the magnitude and direction of said phase difference detected by said detecting means,

feedback circuit means for generating a rotational speed feedback signal corresponding to the rotational speed of said motor, said rotational speed feedback signal being generated by subtracting an armature current signal corresponding to the armature current from a voltage signal corresponding to the armature voltage and for feeding back said rotational speed feedback signal for combination with said phase difference magnitude signal,

a second circuit means, coupled to said first circuit means, said feedback circuit means, and said electric motor, for receiving said phase difference magnitude and direction signals and said rotational speed feedback signal, and for producing a driving pulse for said electric motor, said driving pulse having a voltage polarity which is a function of said phase difference direction signal and a mean voltage level which is a function of the combination of said phase difference magnitude signal and said rotational speed feedback signal.

4,855,656

DRIVERLESS CAR TRAVELLING GUIDE SYSTEM

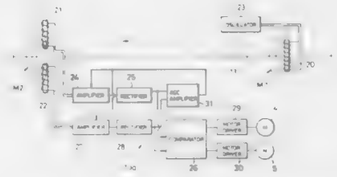
Yoshihiro Saitoh, Aichi; Minoru Kondoh, Kounan, and Yukio Komatsu, Kani, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Aug. 6, 1987, Ser. No. 82,441

Claims priority, application Japan, Aug. 13, 1986, 61-189836

Int. Cl.[4] G05D *1/00*

U.S. Cl. 318—587 **1 Claim**



1. A guide system for a driverless car comprising:

an electroconductive guide line positioned along the intended travel path of the driverless car,

induction means associated with the driverless car for inducing a current flow in the guide line, and

detection means associated with the driverless car for detecting a magnetic field created by the flow of electric current in the guide line,

wherein the electroconductive guide line comprises an electroconductive metallic tape or the like and wherein the detection means further comprises:

a first receiving coil for producing an output representative of the distance between the first receiving coil and the guide line,

a second receiving coil from producing an output representative of the distance between the second receiving coil and the guide line, the first receiving coil and the second receiving coil being positioned on opposite sides of the driverless car,

a comparator for comparing the output of the first receiving coil and the output of the second receiving coil and for generating a signal in response thereto,

whereby a signal corresponding to the deviation of the driverless car from the guide line is generated by the comparator, and further comprising:

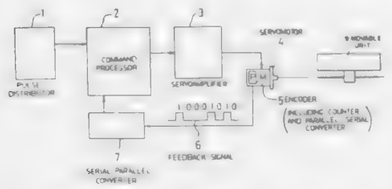
a pair of driving wheels provided on the driverless car,
a corresponding pair of driving motors connected respectively to the driving wheels,
means for supplying the driving motors with the signal generated by the comparator,
whereby the driving wheels are controlled by the driving motors in response to the deviation of the driverless car from the guide line, and further comprising:
an amplifier and a rectifier connected respectively between each of the receiving coils and the comparator, each amplifier having an input and each rectifier having an output,
an auto-gain control amplifier connected between the outputs of the rectifiers and the inputs of the amplifiers to thereby form a feedback loop,
whereby a change in amplitude in the outputs of the receiving coils is automatically compensated for by the auto-gain control amplifier.

4,855,657

POSITIONING SYSTEM

Shinichi Isobe, Hino, and Yoshimasa Kagawa, Hachioji, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP87/00305, § 371 Date Dec. 22, 1987, § 102(e) Date Dec. 22, 1987, PCT Pub. No. WO87/07404, PCT Pub. Date Dec. 3, 1987
PCT Filed May 16, 1987, Ser. No. 145,755
Claims priority, application Japan, May 29, 1986, 61-124235
Int. Cl.[4] G05B *19/29*
U.S. Cl. 318—602 **7 Claims**



1. A positioning system, including a movable unit, comprising:
a servomotor, operatively connected to receive a command value and coupled to the movable unit, rotatable in response to the compound value for moving the movable unit;
a positioning detector mounted on said servomotor and outputting a feedback signal;
command means, coupled to said position detector and the movable unit, for comparing a feedback signal from said position detector and the movable unit with the command value and outputting a servo command value; and
positional information generating means, coupled to said servomotor and the movable unit, for generating a positional information signal indicative of positional information of one of said servomotor and the movable unit, the arrangement being such that the positional information signal from said positional information generating means is fed back to said command means for performing a positioning operation.

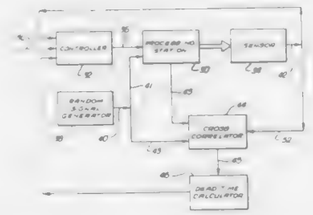
4,855,658

DEAD TIME COMPENSATED CONTROL LOOP

Sang F. Moon, San Jose, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Mar. 23, 1988, Ser. No. 172,071
Int. Cl.[4] G05D *23/19*
U.S. Cl. 318—632 **19 Claims**

1. A system for determining the dead time interval between an adjustment of a process parameter in a process and the time when the effect of the adjustment on the process can be detected by a sensor, comprising:
processing means for processing a material according to a process parameter;
perturbation means for producing a perturbation signal and applying said signal to the processing means to perturb the process parameter in accordance with the perturbation signal;
a sensor, spaced from the processing means, for sensing a physical characteristic of the product made by the process, including the characteristic effected by the perturbation signal and producing a sensor signal in response thereto;



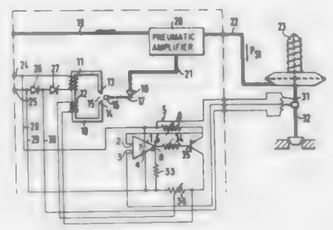
cross-correlation means for cross-correlating the perturbation signal which was applied to the processing means and the signal produced by the sensor, and for producing a cross-correlation function therefrom;
dead time determination means, utilizing the cross-correlation function, for calculating the dead time interval between the time when the perturbation signal is applied to the processing means and the time that the sensor senses the effect of the perturbation on the product.

4,855,659

ELECTROPNEUMATIC POSITION REGULATOR

Heinrich Riensche, Bückeburg, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 8, 1988, Ser. No. 179,498
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712337
Int. Cl.[4] G05D *16/00*
U.S. Cl. 318—645 **5 Claims**



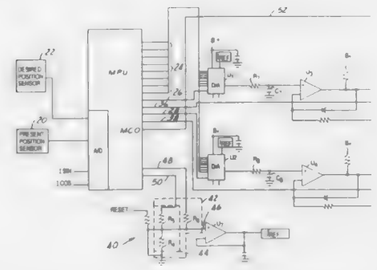
1. An electropneumatic position regulator comprising:
a current/pressure transducer;
a pneumatic system having a nozzle/impact-plate assembly for operating the transducer;
an electric input circuit having at least one coil to be fed with a current setting and a permanent magnet for which the relative position is variable as a function of the current for adjustment of the nozzle/impact-plate assembly;
a pneumatic setting device which is connected with the nozzle/impact-plate system, and has a shaft stroke output, the setting device including a position reporting device between the shaft output and the transducer; and wherein
the reporting device outputs an electric report signal which is fed back to a coil of the electric input circuit; and wherein
the input circuit includes a first coil to be energized with said setting current, and a second coil magnetically coupled thereto, the regulator further comprising
an electronic amplifier arranged between the reporting device and the second coil of the input circuit, the amplifier having setting elements for establishing a linear region of the position regulator to match a stroke of the pneumatic setting device.

4,855,660

MICROSTEPPING OF AN UNIPOLAR STEPPING MOTOR

Danny O. Wright, Newport News, and Kregg S. Wiggins, Tabb, both of Va., assignors to Siemens-Bendix Automotive Electronics L.P., Troy, Mich.

Filed Feb. 18, 1988, Ser. No. 158,015
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **5 Claims**



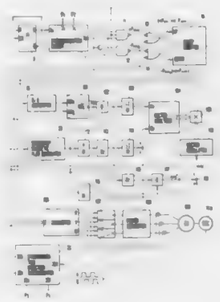
1. A method for controlling a unipolar stepping motor having a two phase winding and an output shaft connected to a driven member operable to be rotated to a desired position comprising the steps of:
coupling a first position sensor means to the driven member for generating a signal indicating the present position of the driven member;
generating a signal representing the desired position of the driven member;
calculating the difference between the desired position and the present position of the driven member;
responding to the magnitude of the difference for generating a stepping rate of the motor;
looking-up in a table in response to a stepping rate of the motor for a signal indicating an angular rotation of the motor; and then
responding to said signal from the table look-up for supplying power to each winding of the motor for rotating the driven member to the desired position; and wherein the step of looking-up, the table is N words of SINE values for indicating the angular rotation of the motor.

4,855,661

MOTION CONTROL APPARATUS FOR INDUCTION MOTOR

Kiyokazu Okamoto; Kiyoshi Hino, and Kosuke Kaito, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Apr. 7, 1987, Ser. No. 35,611
Claims priority, application Japan, Apr. 11, 1986, 61-83849
Int. Cl.[4] H02P *5/40*
U.S. Cl. 318—807 **3 Claims**



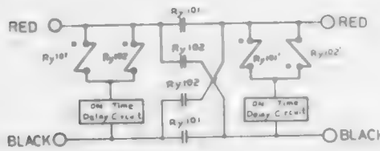
1. A motion control apparatus for an induction motor comprising:
means for generating first serial pulses having a period according to an instructed speed of said induction motor and for outputting commands resulting in a change of a rotation position of said induction motor;
means for deriving the change in the rotation position of the induction motor and generating second serial pulse representing the change in the rotation position;
droop counter means for accumulating sums of the first serial pulses and the second serial pulses to continuously obtain a difference between an actual position and a desired motor position;
means for obtaining an actual speed of the induction motor based on an occurrence density of the second serial pulses;
means responsive to the actual speed for reading out from a table an allowable slip speed $|\omega_s'|$ predetermined in accordance with a characteristic of said induction motor;
means for generating a torque instruction signal on the basis of a difference between an output of said droop counter means and the actual speed;
means for continuously obtaining a slip speed $|\omega_s|$ by using the torque instruction signal, the actual speed and constants based on an equivalent circuit of said induction motor;
means for comparing the slip speed $|\omega_s|$ and the allowable slip speed $|\omega_s'|$
to control the generation of the first serial pulses such that when $|\omega_s'| \geqq |\omega_s|$, the first serial pulses are generated in accordance with an inclination of an acceleration/deceleration curve of the rotation selected in advance, and, when $|\omega_s'| < |\omega_s|$, the first serial pulses are generated so as to decrease the inclination of the acceleration/deceleration curve, thereby to control the motion including increment or decrement of the number of rotations of said induction motor with respect to an unit time interval.

4,855,662

CHARGING CIRCUITRY HAVING POLARITY DETECTING PROTECTION

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Continuation-in-part of Ser. No. 822,222, Jan. 24, 1986, abandoned. This application Oct. 1, 1987, Ser. No. 103,404
Int. Cl.[4] H02J 7/00
U.S. Cl. 320—25 6 Claims



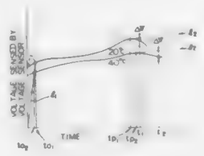
1. A system for comparing the polarity of two sets of pairs of terminals and for electrically connecting the terminals of matching polarity comprising:
a left upper terminal;
a left lower terminal;
a right upper terminal;
a right lower terminal; a first double coil relay, said first relay comprising a first coil, a second coil, a first pair of normally-open contacts, a second pair of normally-open contacts, each of said first and second coils having a first side and a second side, said relay activating when both said first and second coils are magnetized in the same direction, said first side of said first coil connected to said left upper terminal and said second side of said first coil connected to said left lower terminal, said first side of said second coil to said upper right terminal, said second side of said second coil connected to said right lower terminal, each of said first and second coils having the same specific polarity of magnetization on the same side of said coils, said same specific polarity of magnetization of each said first and second coil associated with said first side thereof;
one contact of said first pair of contacts connected to said left upper terminal, the other contact of said first pair connected to said right upper terminal;
one contact of said second pair of contacts connected to said left lower terminal, the other contact of said second pair of contacts connected to said right lower terminal;
and wherein said first pair of contacts and said second pair of contacts become closed during the time when; (1) the polarity applied on said upper left terminal is the same as the polarity applied on the upper right terminal; and (2) the polarity applied on said left lower terminal is the same as the polarity applied on the right lower terminal;
a second double-coil relay, said second relay comprising a third coil, a fourth coil, a third normally-open pair of contacts, a fourth normally-open pair of contacts, each of said third and fourth coils having a first side and a second side;
said second relay activating when both said third and fourth coils are magnetized oppositely;
said first side of said third coil connected to said left upper terminal and said second side of said third coil connected to said left lower terminal;
said first side of fourth coil connected to said right upper terminal and said second side of said fourth coil connected to said lower right terminal, said third and fourth coils having the opposite specific polarity of magnetization of the same side of said third and fourth coils;
one contact of said third pair of contacts connected to said left upper terminal and the other contact of said third pair connected to said right lower terminal;
one contact of said fourth pair of contacts connected to said left lower terminal and the other contact of said fourth pair connected to said right upper terminal,
and wherein said third and fourth pairs of contacts become closed during the time when: (1) the polarity applied on said left upper terminal is the opposite to the polarity of the right upper terminal; and (2) the polarity applied on said left lower terminal is the opposite to the polarity applied on the right lower terminal.

4,855,663

CHARGING CONTROL APPARATUS

Tomoki Matsui; Hidesuke Kimoto, both of Takatsuki, and Setsuo Shimizu, Kamiminochi, all of Japan, assignors to Yuasa Battery Company Limited, Osaka, Japan

Filed Feb. 23, 1988, Ser. No. 159,352
Claims priority, application Japan, Feb. 27, 1986, 61-43502
Int. Cl.[4] H02J 7/04
U.S. Cl. 320—20 3 Claims



1. A battery charging control apparatus comprising:
a charging power supply source;
a switching circuit for controlling the charging current from said charging power source to a storage battery;
ramp generating means for providing a first ramp reference voltage increasing with time corresponding to a value equal to, or more than, the maximum ramp value of the charging characteristic of the storage battery and a second ramp reference voltage increasing with time and corresponding to a value equal to, or less than, the minimum ramp value of the charging characteristic of the storage battery;
a voltage sensor for sensing respective first and second voltages relating to the terminal voltage of said storage battery;
first comparing means for providing a first output when said first voltage coincides with said first ramp reference voltage and a second output when said first voltage coincides with said second ramp reference voltage;
said ramp generating means providing said first ramp reference voltage with said second output and said first ramp reference voltage with said first output; and
second comparing means for controlling said switching circuit to terminate charging when said second voltage coincides with said second ramp reference voltage.

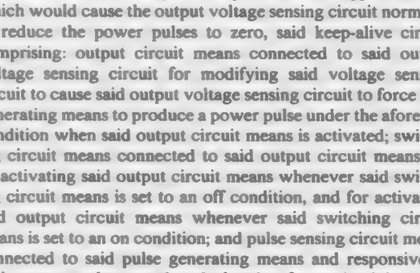
4,855,664

METHOD AND APPARATUS FOR DAMPING OSCILLATIONS OF AN AC GENERATOR

Lawrence J. Lane, Salem, Va., assignor to General Electric Company, Salem, Va.

Filed Jun. 10, 1988, Ser. No. 204,817
Int. Cl.[4] H02H 7/06; H02P 9/00
U.S. Cl. 322—19 19 Claims

1. A system for stabilizing a synchronous generator, providing an output voltage and an output current, through excitation control to dampen generator oscillations comprising:
(a) means to develop a first signal representing the output voltage of said generator;
(b) means to develop second signal representing the output current of said generator;
(c) means responsive to said first and second signals to develop an oscillation signal representing the instantaneous magnitude of said generator oscillations;
(d) means to develop a third signal representing an output voltage of said generator with respect to neutral;



(e) means to multiply said oscillation signal by said third signal to yield a modulation signal; and,
(f) means responsive to said modulation signal to control the excitation of said generator.

4,855,665

STATUS INDICATING CIRCUIT FOR PARALLELED SWITCHING POWER SUPPLIES

Josh Mandelcorn, Los Angeles, Calif., assignor to Pioneer Magnetics, Inc., Santa Monica, Calif.

Filed Sep. 19, 1988, Ser. No. 246,158
Int. Cl.[4] G05F 1/569
U.S. Cl. 323—272 5 Claims

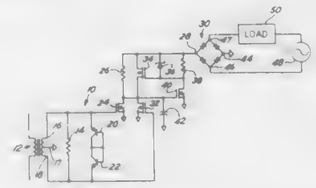
1. In a regulated power supply which includes pulse generating means for producing power pulses for establishing an output voltage, and which further includes an output voltage sensing circuit for regulating the output voltage by modulating the power pulses as a function of the output voltage level, a keep-alive circuit for maintaining said power pulses under a condition where the output voltage assumes an apparent level which would cause the output voltage sensing circuit normally to reduce the power pulses to zero, said keep-alive circuit comprising: output circuit means connected to said output voltage sensing circuit for modifying said voltage sensing circuit to cause said output voltage sensing circuit to force said generating means to produce a power pulse under the aforesaid condition when said output circuit means is activated; switching circuit means connected to said output circuit means for de-activating said output circuit means whenever said switching circuit means is set to an off condition, and for activating said output circuit means whenever said switching circuit means is set to an on condition; and pulse sensing circuit means connected to said pulse generating means and responsive to said power pulses produced thereby for maintaining said switching circuit means in its off condition in the presence of said power pulses from said pulse generating means which recur within a predetermined time interval and for setting said switching circuit means to its on condition whenever said power pulses effectively disappear for more than said predetermined time interval.

4,855,666

AC CURRENT SWITCH

Thad M. Jones, 2048 Trailridge North, Mishawaka, Ind. 46544

Filed Oct. 11, 1988, Ser. No. 255,964
Int. Cl.[4] H03K 17/687
U.S. Cl. 323—351 9 Claims



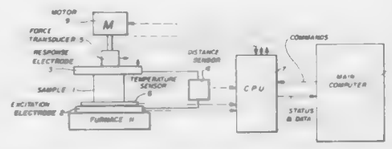
1. A device for switching a first electrical current flowing in a first conductor responsive to a second electrical current flowing in a second conductor, said device comprising,
means for switching said first current, said means having a conductive and nonconductive mode,
means connected to said switching means and operatively associated with said second conductor for sensing said second current, means connected to said switching means for latching said switching means in one of said conductive and non-conductive modes, a voltage source connected to said latching means, said sensing means including a transformer having a center tapped secondary winding and a single turn primary winding operatively associated with said second conductor,
said switching means including a first field effect transistor (FET) having a gate terminal, a drain terminal, and a source terminal, said gate terminal being connected to said transformer secondary winding, said drain terminal connected to said latching means,
said latching means including a second field effect transistor (FET) having a gate terminal, a drain terminal, and a source terminal, said second FET gate terminal being connected to said first FET drain terminal, said latching means further including a capacitive member and a voltage limiting member operatively associated with said second FET,
said latching means being electrically connected to said voltage source.

4,855,667

PARALLEL PLATE DIELECTRIC ANALYZER

Kendall B. Hendrick, Landenberg, Pa., and John R. Reader, Jr., Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 13, 1988, Ser. No. 206,092
Int. Cl.[4] G01R 27/26
U.S. Cl. 324—61 R 7 Claims



1. In an apparatus for measuring the dielectric properties of a sample, the apparatus including an excitation electrode and a response electrode adapted to receive the sample there between, the electrodes being positionable to adjust the distance

there between, a temperature sensor adapted to sense the temperature of the sample, means for applying an input electrical signal to the excitation electrode, and means connected to the response electrode for providing an output signal; wherein the input electrical signal to the excitation electrode passes through the sample into the response electrode and becomes the output electrical signal, such that by measuring the input electrical signal and the output electrical signal the dielectric properties of the sample can be calculated by knowing the distance between the electrodes and the response electrode surface area, the improvement which comprises:

(a) a distance sensor for measuring the distance between the electrodes, and means responsive to the distance sensor for positioning the electrodes relative to each other;

(b) a force transducer for measuring applied force on said sample where said means responsive to said distance sensor are also responsive to said force transducer for varying the spacing between electrodes;

(c) said electrodes are comprised of a ceramic substrate with a conductor applied to the ceramic substrate;

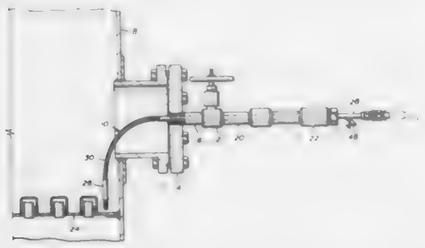
(d) said temperature sensor comprising a metallic strip applied to one of the electrodes and means to measure the resistance across said metallic strip.

4,855,668

FLEXIBLE PROBE AND SAMPLING DEVICE FOR CORROSION MEASURING

Stanley Crow, 121 Easy St., Livingston, Tex. 77351

Filed Sep. 3, 1987, Ser. No. 92,716
Int. Cl.[4] G01R *27/22*; G01N *1/10*
U.S. Cl. 324—65 CR 9 Claims



1. A combination corrosion probe and sampling device comprising:

a. a flexible substantially cylindrical member having proximal and distal ends;

b. a first rigid substantially cylindrical member extending from said distal end of said flexible substantially cylindrical member;

c. an electrical circuit passing through said first rigid substantially cylindrical member and said flexible substantially cylindrical member, a portion of said electrical circuit extending from said first rigid substantially cylindrical member thereby being exposed;

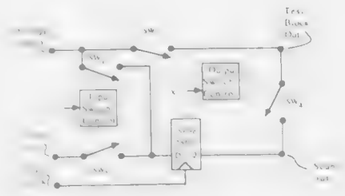
d. sampling means passing through said first rigid substantially cylindrical member and said flexible substantially cylindrical member.

4,855,669

SYSTEM FOR SCAN TESTING OF LOGIC CIRCUIT NETWORKS

John E. Mahoney, San Jose, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Filed Oct. 7, 1987, Ser. No. 106,750
Int. Cl.[4] G01R *31/28*
U.S. Cl. 324—73 R 14 Claims



1. A test block structure for scan testing a network of digital logic blocks, the test block structure comprising:

a first input node for receiving a first digital input signal,

a first output node for outputting a first digital output signal;

first switch means for selectively connecting said first input node to said first output node, the first switch means including first and second signal conducting portions for conducting signals through the first switch means;

a second input node for receiving a second digital input signal;

a second output node for outputting a second digital output signal;

data storage means, having an input terminal and an output terminal, for storing digital data received at the input terminal thereof from either of the first and second input nodes and for outputting the stored digital data through the output terminal thereof, said output terminal being connected to the second output node,

second switch means for selectively connecting the input terminal of the storage means to the second input node;

third switch means for selectively connecting said first input node to the input terminal of said data storage means, the third switch means being integrally formed with the first signal conducting portion such that signals passing through the third switch means must pass through the first signal conducting portion; and

fourth switch means for selectively connecting the output terminal of said data storage means to said first output node, the fourth switch means being integrally formed with the second signal conducting portion such that signals passing through the fourth switch means must pass through the second signal conducting portion.

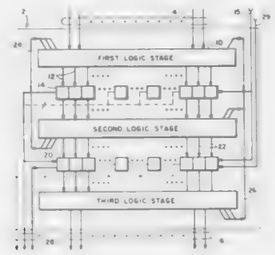
4,855,670

METHOD OF PROVIDING INFORMATION USEFUL IN IDENTIFYING DEFECTS IN ELECTRONIC CIRCUITS

Morris H. Green, Milwaukie, Oreg., assignor to Tektronix, Inc., Beavertoa, Oreg.

Continuation of Ser. No. 712,585, Mar. 15, 1985, abandoned. This application Mar. 7, 1988, Ser. No. 168,523
The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.
Int. Cl.[4] G01R *31/00, 31/28*
U.S. Cl. 324—73 R 10 Claims

1. A method of testing an electronic circuit having an input part for receiving input vectors, an output port for providing output vectors, and a serial scan port for providing at least one serial scan vector reflecting the status of pre-determined elements within the circuit, said method comprising applying a sequence of test vectors to the input port as a plurality of sub-sequences each including at least one test vector, examining the serial scan vector after each sub-sequence and determining whether a part of the serial scan vector indicates the presence of a defect in the circuit, and, in the event that a part of the serial scan vector indicates the presence of a defect in the



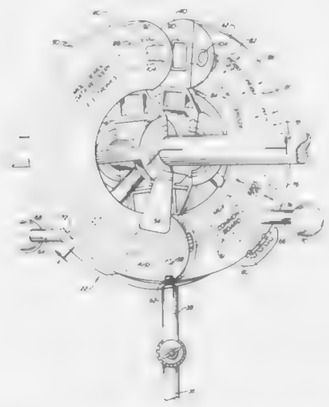
circuit, storing information that indicates the number of serial scan vectors that have previously been examined and information that identifies which part of the serial scan vector indicates the presence of a defect in the circuit.

4,855,671

ELECTRICAL POWER LINE AND SUBSTATION MONITORING APPARATUS

Roosevelt A. Fernandes, 104 Ruby Rd., Liverpool, N.Y. 13088

Division of Ser. No. 859,496, May 5, 1986, Pat. No. 4,758,962, which is a continuation-in-part of Ser. No. 484,681, Apr. 13, 1983, Pat. No. 4,689,752, and a continuation-in-part of Ser. No. 795,226, Nov. 5, 1985, abandoned. This application Mar. 7, 1988, Ser. No. 164,778
The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.
Int. Cl.[4] G01R *21/00, 21/06*
U.S. Cl. 324—127 7 Claims



1. A system for monitoring a plurality of parameters associated with each of a plurality of energized electrical power conductors, on power system circuits operable over a load range between predetermined minimum and maximum conductor currents in either direction, said system comprising:

(a) a plurality of sensor modules for complete installaton and removal while said conductors are energized, one of said modules being mounted upon each of said energized conductors;

(b) means carried by each of said modules for measurement of conductor voltage;

(c) means carried by each of said modules for measurement of the current through said conductor over said entire load range;

(d) means carried by each of said modules for processing and storing said sensed values of conductor voltage and conductor current;

(e) means carried by each of said modules for transmitting signals comprising a sequence of data commensurate with said measured values;

(f) means for providing power to each of said processing means and each of said transmitting means from said conductor current when the latter is above a predetermined value;

(g) a rechargeable energy storage device in each of said modules for providing power to its respective processing and transmitting means when said conductor current is below said predetermined value; and

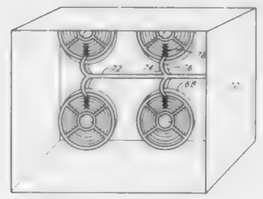
(h) means remote from said modules for receiving said signals from said transmitting means of each of said plurality of sensor modules, decoding said signals and calculating voltage and current of each of said conductors.

4,855,672

METHOD AND PROCESS FOR TESTING THE RELIABILITY OF INTEGRATED CIRCUIT (IC) CHIPS AND NOVEL IC CIRCUITRY FOR ACCOMPLISHING SAME

Robert W. Shreeve, 3650 NW. Elmwood, Corvallis, Oreg. 97330

Filed May 18, 1987, Ser. No. 51,888
Int. Cl.[4] G01R *1/04*
U.S. Cl. 324—158 R 3 Claims



1. A process for burning in an integrated circuit which includes:

a. mounting a plurality of integrated circuit chips on a continuous lead frame,

b. heating said chips to a predetermined elevated temperature, and

c. cycling said chips with test vector signals generated from individual on-chip circuitry by electrically energizing all of said chips simultaneously through said continuous lead frame for a predetermined time and at said elevated temperature to accomplish burn-in thereof without the requirement for individually mounting said chips on burn-in carriers.

4,855,673

ELECTRON BEAM APPARATUS

Hideo Todokoro, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

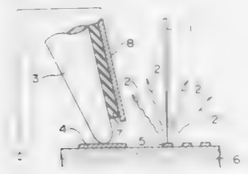
Filed Feb. 16, 1988, Ser. No. 156,458
Claims priority, application Japan, Mar. 20, 1987, 62-63775
Int. Cl.[4] G01R *1/06, 1/067*
U.S. Cl. 324—158 R 7 Claims

1. An electron beam apparatus comprising:

means for irradiating an electron beam on a specimen;

detection means for detecting secondary electrons generated from said specimen under the bombardment of the electron beam;

a probe for applying a voltage to said specimen and picking up a signal voltage from said specimen; and



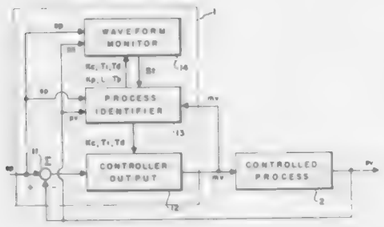
shield means for shielding the secondary electrons from an electric field generated from said probe.

4,855,674

METHOD AND A PROCESS CONTROL SYSTEM USING THE METHOD FOR MINIMIZING HUNTING

Tsuneo Murate, Kamakura, and Shin Suzuki, Yokohama, both of Japan, assignors to Yamatake-Honeywell Company Limited, Tokyo, Japan

Filed Mar. 2, 1987, Ser. No. 20,932
Claims priority, application Japan, Mar. 11, 1986, 61-53172
Int. Cl.[4] G01R *35/00;* **G05B** *13/02, 11/42*
U.S. Cl. 324—158 R **6 Claims**



3. A process control system comprising

a controller having a control means for performing a PID arithmetic operation with respect to a deviation between a setting parameter and a processed variable feed back from a process,

process identification means for identifying process characteristics,

monitoring means for monitoring the waveforms of the setting parameter and the processed variable from the process to obtain an oscillation period of the deviation,

means for obtaining a phase angle of a frequency response of an open-loop transfer function of the process obtained from the oscillation period and process characteristics,

means for detecting a hunting of the process by the magnitude of the phase angle, and

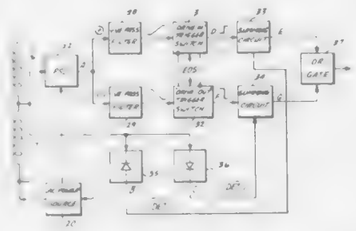
means for subsequently performing a tuning operation of said controller in accordance with the detecting result by said means for detecting.

4,855,675

INDUCTIVE TRANSDUCERS FOR INDICATING ESTABLISHMENT OF A PRESELECTED SPATIAL RELATIONSHIP BETWEEN TWO PARTS

Alexander Russell, Glasgow, Scotland; Leslie A. Cooper, Lymington, and David P. Drudy, Rownhams, both of England, assignors to Sacol Powerline Limited, Southhampton, England

Filed May 16, 1985, Ser. No. 734,891
Claims priority, application United Kingdom, May 21, 1984, 8412937; Mar. 14, 1985, 8506682
Int. Cl.[4] G01B *7/14;* **G01N** *27/72;* **G01R** *33/12;* **H01F** *15/02*
U.S. Cl. 324—208 **15 Claims**



1. An inductive transducer for deriving an output signal from relative movement between two relatively displaceable parts, comprising at least two coils fixedly supported by a first of the two parts substantially coaxially with and spaced from one another in the direction of relative displacement between said two parts, a shorted turn arrangement incorporated in the second part such that it is movable into and out of mutual induction with each of said coils at respective parts of the range of possible relative movement between the two parts, and means which are responsive to change in the inductance of said coils, and which are operable to emit an output signal, said means including a bridge circuit having indicating means connected between the junctions of two pairs of arms of the bridge circuit, a first coil of said at least two coils being connected into one of the arms of one of the pairs and the remainder of said at least two coils being connected into the other arm of said one of the pairs, said transducer indicating establishment of a preselected spatial relationship between the two parts by indicating occurrence of predetermined transient conditions related to a change in the inductance of either said first coil or a change in the inductance of at least one of said remaining coils between constant and varying conditions of the inductance of a coil which occurs as that coil moves into and out of mutual induction with the shorted turn arrangement.

4,855,676

FERROMAGNETIC EDDY CURRENT PROBE HAVING TRANSMIT AND RECEIVE COIL ASSEMBLIES

Valentino S. Cecco, and Jon R. Carter, both of Deep River, Ontario, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed May 6, 1987, Ser. No. 46,549
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[4] G01N *27/90;* **G01R** *33/12*
U.S. Cl. 324—220 **6 Claims**

1. A circumferentially compensating eddy current probe for detecting localized flaws in a tube made of a ferromagnetic material, comprising:

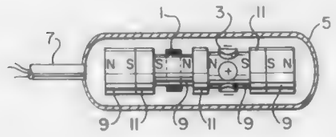
a probe casing made of a non-ferromagnetic material and having an axis,

a transmit coil assembly housed in the said probe casing,

at least one receive coil assembly housed in the said probe casing at a predetermined distance from the said trasnmit coil assembly along the said axis,

each of the said receive coil assembly having an even number of identical pancake coils located circumferentially and symmetrically in the said probe housing,

alternate pancake coils in each receive coil assembly being electromagnetically polarized in opposite directions, and



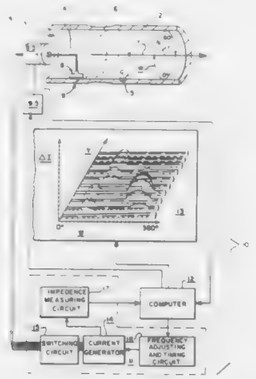
magnet means for magnetically saturating the tube, at least partially, only areas near the said transmit coil assembly and the said receive coil assembly.

4,855,677

MULTIPLE COIL EDDY CURRENT PROBE AND METHOD OF FLAW DETECTION

William G. Clark, Jr., and Michael J. Metala, both of Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 11, 1988, Ser. No. 167,289
Int. Cl.[4] G01N *27/82*
U.S. Cl. 324—238 **28 Claims**



1. An improved eddy current probe system for simultaneously detecting different types of flaws at different depths within a metallic wall, comprising:

a. current means for generating alternating current of substantially different frequencies including a frequency adjuster and timing means;

b. a probe head including first and second coils in separate communication with said alternating currents of substantially different frequencies for detecting different types of flaws at different depths within said metallic wall, wherein the windings of one coil surround the windings of the other coil;

c. shielding means for preventing cross talk between said coils;

d. detector means for providing an electrical output representative of the relative impedance of the respective coils, and

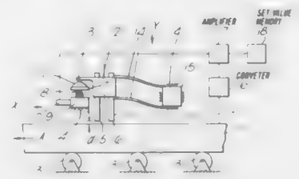
e. a computing means connected to said detector means and said current generating means for receiving and storing the value of the impedance of each coil as the probe head is moved across a portion of said metallic wall, and for transmitting control signals to said frequency adjuster and timing means which cause the current generating means to adjust the frequency of the alternating currents received by the coil so that impedance changes in the coils and hence the flaw-detecting resolution of each is maximized.

4,855,678

APPARATUS FOR GUIDING THE SENSOR HOLDER OF A SURFACE TESTING APPARATUS

Heinz Kreiskorte, Dortmund, Fed. Rep. of Germany, assignor to Thyssen Industrie AG, Essen, Fed. Rep. of Germany

Filed Sep. 10, 1986, Ser. No. 905,473
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 3532654
The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.
Int. Cl.[4] G01R *33/00;* **G01B** *7/14;* **G01N** *27/72*
U.S. Cl. 324—262 **12 Claims**



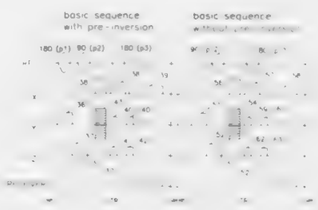
1. In a surface testing apparatus having a sensor for testing a surface having a contour: a sensor holder for holding said testing sensor, means for moving said sensor holder along a preselected path of movement over and at a preselected distance from said surface, said means for moving said sensor holder having a flexible guide rail for establishing said path of movement and for guiding said sensor holder during movement thereof; and means for automatically shaping said guide rail to have a contour matching the contour of said surface, such that said distance is maintained substantially constant during testing of said surface by said testing sensor, said shaping means including a distance sensor means for measuring actual distances between said guide rail and said surface at a plurality of points along the path of movement and means coupled to said distance sensor means for adjusting the distance of said guide rail from said surface at said points to said preselected distance.

4,855,679

MAGNETIC RESONANCE STUDIES OF RESTRICTED VOLUMES

Joseph Granot, Holon, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed Mar. 24, 1988, Ser. No. 172,398
Claims priority, application Israel, Mar. 27, 1987, 82029
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **24 Claims**



1. A method for performing restricted volume magnetic resonance (MR) studies comprising the steps of:

aligning spins in a subject by positioning the subject in a strong static magnetic field,

using a first basic scan sequence comprising the steps of:

irradiating said subject with a first RF pulse in the presence of a first magnetic gradient so as to invert the aligned spins in a first selected volume of said subject,

irradiating said subject with a second RF pulse in the presence of a second magnetic gradient normal to said first magnetic gradient so as to tip the aligned spins into a transverse plane in a selected slice of said selected volume,

irradiating said sample with a third RF pulse in the presence of a third magnetic gradient normal to said first and second magnetic gradients to obtain signals from a selected strip of said selected slice,

using a second basic scan sequence that includes the steps of the first basic scan sequence without the first RF pulse, and

combining the signals of the first and second basic scan sequences to obtain data from a selected VOI.

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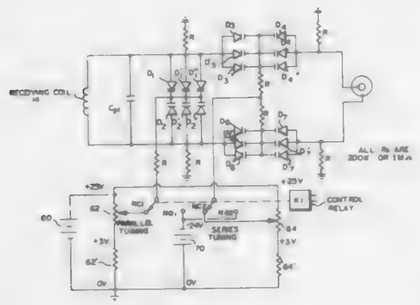
ENHANCED DECOUPLING OF MRI RF COIL PAIRS DURING RF TUNING OF MRI RF TRANSMIT COIL

Mitsuaki Arakawa, Hillsborough, and Brenda G. Nichols, San Francisco, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Nov. 2, 1987, Ser. No. 115,723

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—314 **5 Claims**



1. A method for decoupling an MRI RF receive coil from an MRI RF transmit coil during tuning of the transmit coil, said method comprising the step of:

applying forward bias voltage to at least one varactor diode element connected in circuit with said receive coil.

4,855,681

TIMING GENERATOR FOR GENERATING A MULTIPLICTY OF TIMING SIGNALS HAVING SELECTABLE PULSE POSITIONS

Ernest H. Millham, Catlett, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 8, 1987, Ser. No. 59,647

Int. Cl.[4] G01R *31/28;* **G06F** *11/00*

U.S. Cl. 328—62 **15 Claims**

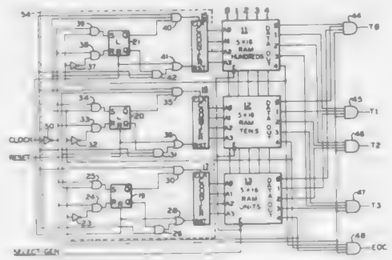
1. An apparatus for generating a multiplicity of timing signals within a program cycle for enabling testing of a circuit component comprising:

a source of periodic clock pulses for identifying an increment of a test cycle;

a multiplicity of random access memories for storing at a plurality of addresses a plurality of multibit binary numbers, said memories producing in response to respective address inputs each bit of said stored binary numbers;

a multiplicity of decoding gates, each gate connected to receive a like numbered bit from each of said memories as well as a clock pulse and producing a timing signal when a predetermined bit pattern is produced by said like-numbered bits;

a multiplicity of counters connected to count said clock pulses, each of said counters connected to supply address signals to one of said memories, the highest order bit of one of said memories being connected to enable a counter of an adjacent memory and to reset a connected counter,



whereby each time the contents of said connected memory are read out between a starting address and an address containing data in said highest order bit, an address input to an adjacent memory is incremented one address unit and a respective counter of said connected memory is reset; and

an END OF CYCLE decoder having a plurality of inputs, each connected to one of said memories, which decode the contents of said memories to identify from said contents the end of a program cycle.

4,855,682

TRIGGER ARRANGEMENT SUITABLE FOR OSCILLSCOPES

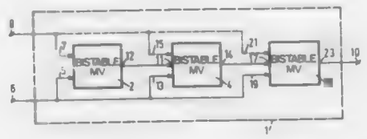
Wilhelmus D. H. Van Groningen, Enschede, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 1, 1988, Ser. No. 151,138

Claims priority, application Netherlands, Feb. 4, 1987, [illegible]

Int. Cl.[4] H03K *1/17, 7/00*

U.S. Cl. 328—63 **15 Claims**



1. A trigger arrangement comprising, a series-combination of a first, a second and a third bistable element where the third bistable element has one input coupled to an output of the second bistable element, an input of each bistable element being coupled to a trigger input for a trigger input signal, a release input for a release signal coupled to at least one of the bistable elements, a trigger output for a trigger output signal coupled to an output of said third bistable element, said trigger output and said first, second and third bistable elements having a first stable state when the release signal is at a first value, and said trigger output assumes a second stable state determined by the trigger input signal and after the release signal has assumed a second value, wherein said second state of said trigger output occurs after an output of the first bistable element assumes a second stable state in response to the trigger signal exceeding a first level, whereupon an output of the second bistable element assumes a second stable state after the trigger input signal

falls below a second level which is lower than the first level, wherein said third element assumes the second state when the trigger signal exceeds the first level after the output of the second bistable element has assumed the second state.

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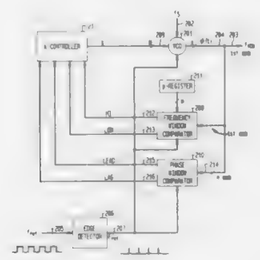
DIGITAL PHASE LOCKED LOOP WITH BOUNDED JITTER

Thierry Troudet, Old Bridge Township, Middlesex County, and Stephen M. Walters, Holmdel Township, Monmouth County, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Nov. 18, 1987, Ser. No. 120,994

Int. Cl.[4] H03L *7/00;* **H03K** *5/00*

U.S. Cl. 328—155 **17 Claims**



8. In a phase locked loop which generates an output clock signal having a frequency equal to an integer multiple to the frequency of an input clock signal, circuitry for maintaining the jitter of the output clock signal within bounded limits comprising:

frequency window comparison means for comparing in response to input clock signal pulses the frequency of the output clock signal with the integer multiple of the input clock signal frequency and for generating an output that indicates whether the output clock signal frequency is higher, lower or equal to the integer multiple of the frequency of the input clock signal;

phase window comparison means for comparing in response to input clock signal pulses the phase angle of the output clock signal relative to a predetermined reference angle and for generating an output that indicates whether the phase angle of the output clock signal relative to the predetermined reference angle is leading, lagging, or within a predetermined window of acceptability, the limits of said window being determined by the bounded limits of the jitter;

means for setting the phase difference between the output clock signal and the input clock signal to zero degrees in response to input clock pulses following each phase comparison; and

means for adjussting the frequency of the output clock signal only when the output of the frequency window comparison means indicates that the output frequency is higher or lower than the integer multiple of the input clock signal frequency, or the output of said phase window comparison means indicates that the phase of the output clock signal is leading or lagging, and for maintaining said control signal when the output of said frequency window comparison means indicates that the output clock signal frequency is equal to the integer multiple of the input clock signal frequency and the output of said phase window comparison means indicates that the phase of the output clock is within said predetermined window of acceptability.

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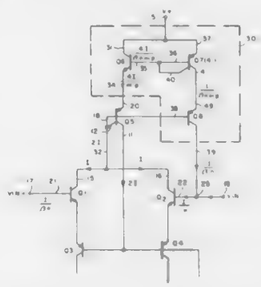
BIAS CURRENT COMPENSATION FOR BIPOLAR INPUT STAGES

Moshe Gerstenhaber, Newton, and Robert J. Libert, Rowley, both of Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Oct. 14, 1988, Ser. No. 257,716

Int. Cl.[4] H03F *3/45*

U.S. Cl. 330—257 **6 Claims**



1. An input stage having an inverting input and a non inverting input, comprising:

a first NPN transistor having (i) a base coupled to the non inverting input, (ii) a collector, and (iii) an emitter;

a second NPN transistor having (i) a base coupled to the inverting input, (ii) a collector coupled to the collector of the the first NPN transistor, and (iii) an emitter;

a first PNP transistor having (i) an emitter coupled to the emitter of the first NPN transistor, (ii) a base, and (iii) a collector:

a second PNP transistor having (i) an emitter coupled to the emitter of the second NPN transistor, (ii) a base coupled to the base of the first PNP transistor; and (iii) a collector

a first dual-collector PNP transistor having first and second collector regions of approximately equal area and having (i) a base and a first collector coupled to the collectors of the first and second NPN transistors, (ii) a second collector coupled to the bases of the first and second PNP transistors, and (iii) an emitter;

a third NPN transistor having (i) an emitter coupled to the emitter of the first dual collector PNP transistor, (ii)

a collector coupled to a positive voltage source, and (iii) a base;

a second dual collector PNP transistor having first and second collector regions, the first collector region being approximately four times the size of the second collector, region the dual-collector PNP transistor having (i) a base and a first collector coupled to the base of the third NPN transistor, (ii) an emitter coupled to the positive voltage source (iii) a second collector; and

a third PNP transistor having (i) a base coupled to the base of the first dual collector PNP transistor, (ii) an emitter coupled to the second collector of the second dual collector PNP transistor, and (iii) a collector coupled to the base of the second NPN transistor.

4,855,685

PRECISION SWITCHABLE GAIN CIRCUIT

James R. Hochschild, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 30, 1987, Ser. No. 102,971

Int. Cl.[4] H03G *3/30*

U.S. Cl. 330—282 **23 Claims**

1. A switchable gain amplifier comprising:

amplifier circuitry for providing amplification of an analog input signal and having an input terminal and an output

terminal, the gain of said amplifier determined by the ratio of a feedback resistance circuit disposed between said input and said output terminals and a series input resistance circuit disposed between said input terminal and the analog input signal;

said series input resistance circuit comprised of a fixed resistor of a first fixed value connected in series with a variable resistor, said variable resistor having a current variable resistance of a first variable value that varies as a function of current; and

said feedback resistance circuit comprising a plurality of feedback legs, each feedback leg separably selectable and having:



a feedback series resistance circuit having a fixed resistance value that is a predetermined multiple of said first fixed value associated with said fixed resistor, and having two ends with one end thereof connected to said output terminal, and

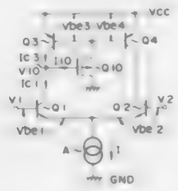
a switch connected between the other end of said resistor and the input of said amplifier circuitry for selection of said associated feedback leg by an external control signal, said switch having a series resistance that is proportional to the variable resistance of said current variable resistance, the proportion being equal to the predetermined multiple of said associated feedback series resistance circuit.

4,855,686

DIFFERENTIAL AMPLIFIER CIRCUIT

Ichiro Ishihara, Tokyo, and Toshio Kanai, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 2, 1988, Ser. No. 201,220
Claims priority, application Japan, Jan. 3, 1987, 62-138165
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—261 11 Claims



1. A differential amplifier circuit comprising:

differential amplifier means, including a pair of transistors of a first conductivity, for amplifying a difference between two input signals of the transistor pair;

a first load transistor of a second conductivity having a collector connected to the collector of one transistor of said transistor pair;

a second load transistor of the second conductivity type having a collector connected to the collector of the other transistor of said transistor pair; and

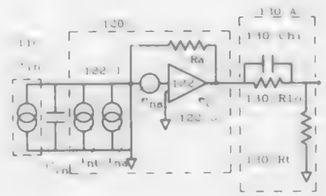
circuit means, a DC input current of which is substantially zero, and having an input terminal connected to the collector of the one transistor, an output terminal connected to the bases of the first and second load transistors, for absorbing a current corresponding to the potential at said input terminal, from the bases of said first and second load transistors.

4,855,687

TRANSIMPEDANCE AMPLIFIER WITH NOISE REDUCTION AND BANDWIDTH COMPENSATION

Hebert Raymond T., Saratoga, Calif., assignor to Micro Video, Inc, Campbell, Calif.

Filed Feb. 29, 1988, Ser. No. 162,130
Int. Cl.[4] H03F *3/191, 3/08*
U.S. Cl. 330—304 31 Claims



1. A transimpedance device having an effective feedback impedance and responsive to an input photon signal for providing an output voltage signal with an enhanced signal-to-noise ratio and a predetermined frequency bandwidth, comprising:

capacitive current source means responsive to the input photon signal for providing an analog current signal;

an operational amplifier means having an input node with a predetermined capacitance to reference potential responsive to the analog current signal, and having an output node;

feedback impedance means connected in negative feedback relationship with the operational amplifier means from the output node to the input node thereof, the feedback impedance means having a predetermined impedance substantially greater than the effective feedback impedance of the transimpedance device for reducing the thermal noise current of the feedback impedance means to increase the signal-to-noise ratio of the operational amplifier means, the predetermined impedance of the feedback impedance means and the predetermined capacitance of the input node determining the upper 3 db pole frequency f_{pa} on the Bode plot of the operational amplifier means at a frequency substantially less than the predetermined bandwidth of the transimpedance device; and

frequency compensation means responsive to the signal at the output node of the operational amplifier means for defining the upper 3 db pole frequency f_{pc} in the Bode plot of the output signal of the transimpedance device which is substantially greater than the pole frequency f_{pa} of the operational amplifier for reestablishing the predetermined bandwidth and reducing the signal-to-noise ratio of the output signal of the transimpedance device;

whereby the output signal of the transimpedance device maintains the predetermined bandwidth with a net increase in signal-to-noise.

4,855,688

MULTIPLE REFERENCE FREQUENCY GENERATOR

Patrick Douziech, and Philippe Berger, both of Villingen, France, assignors to SGS-Thomson Microelectronics S.A., France

Filed Apr. 21, 1988, Ser. No. 184,258
Claims priority, application France, Apr. 24, 1987, 87 05830
Int. Cl.[4] H03L *7/20*
U.S. Cl. 331—8 3 Claims

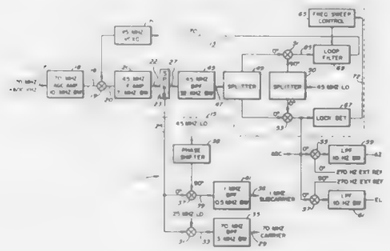
1. An accurate frequency generator using a single reference frequency (F0) comprising a current controlled oscillator (ICO), a phase comparator (PHC) receiving on the one hand the reference frequency and on the other hand the oscillator output, and a loop connecting the phase comparator output with a control input of the oscillator, this loop comprising a filtering capacitor (C), the loop further comprising a switch (K) for opening the loop, this switch being arranged between the output of the phase comparator and the capacitor, and a voltage controlled current generator (GC), capable of generating on its output a variable current as a function of a control voltage and reversely proportional to a resistance value of a resistor, the resistor corresponding to an array of resistors (r, r1, r2, r3) and switches (K1, K2, K3) with means for controlling the switches for adjusting the net value of the resistor to a desired value, the output current of the generator being applied to the control input of the oscillator and the voltage across the capacitor being applied to the input of the current generator.

4,855,689

PHASE LOCK LOOP WITH SWITCHABLE FILTER FOR ACQUISITION AND TRACKING MODES

John F. Kinkel, Irvine, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 13, 1987, Ser. No. 14,580
Int. Cl.[4] H03L *7/10*
U.S. Cl. 331—17 14 Claims



1. In a phase lock loop including a phase detector and voltage controlled oscillator (VCO), the improvement comprising:

a loop filter means connected between said phase detector and voltage controlled oscillator for switching between a constant phase margin filter in a carrier acquisition mode and a second order filter in a carrier tracking mode.

4,855,690

INTEGRATED CIRCUIT RANDOM NUMBER GENERATOR USING SAMPLED OUTPUT OF VARIABLE FREQUENCY OSCILLATOR

Donald R. Dias, Carrollton, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation of Ser. No. 083,583, Aug. 10, 1987, Pat. No. 4,810,975. This application Nov. 1, 1988, Ser. No. 265,732
Int. Cl.[4] H03K *3/84*
U.S. Cl. 331—78 14 Claims

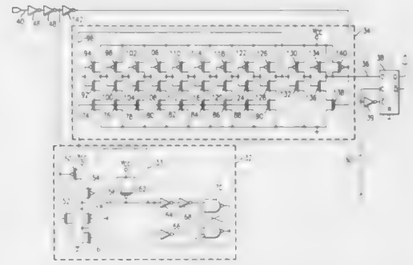
1. An integrated circuit random number generator, comprising:

an analog oscillator;

a digital oscillator,

comprising multiple digital stages connected together,

multiple ones of said stages being connected to be controlled by the output voltage of said analog oscillator; and



a sampling circuit, connected to sample the output of said digital oscillator with a timing which is independent of the operation of said digital oscillator;

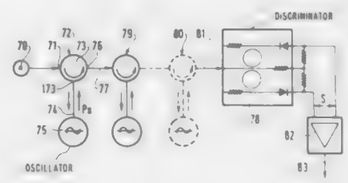
wherein the highest frequency of said analog oscillator is less than the lowest frequency of said digital oscillator.

4,855,691

AMPLITUDE STABILIZER FOR USE IN MICROWAVE DISCRIMINATOR

Lazare Argintaru, Le Pre Saint Gervais, and Denis Hebrard, Levallois Perret, both of France, assignors to Alcatel Thomson Faisceaux, Perret, France

Division of Ser. No. 823,862, Jan. 29, 1986, Pat. No. 4,694,260. This application Aug. 7, 1987, Ser. No. 82,617
Claims priority, application France, Jan. 29, 1985, 85 01207
Int. Cl.[4] H03L *7/00;* H03G *11/06*
U.S. Cl. 331—172 7 Claims



2. A microwave amplitude stabilizer for connecting to a discriminator having a microwave inlet circuit for a microwave signal to be discriminated, said amplitude stabilizer comprising:

a synchronized oscillator; and

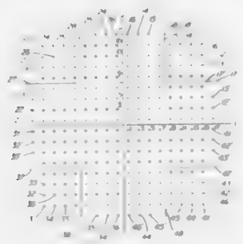
a microwave circulator having at least a first port for receiving microwave signals, a second port in the direction of circulation, said second port being connected to output said received microwave to said synchronized oscillator, and also to receive oscillations output said synchronized oscillator, and a third port in the direction of circulation for outputting amplitude-stabilized microwave signals to said microwave inlet circuit.

4,855,692

METHOD OF QUADRATURE-PHASE AMPLITUDE MODULATION

Paul A. Kennard, Nepean; Joseph L. Middleton, Ottawa; Kuang-Tsan Wu, and John D. McNicol, both of Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 20, 1988, Ser. No. 208,701
Int. Cl.[4] H03C *5/00;* H04L *27/00*
U.S. Cl. 332—17 19 Claims



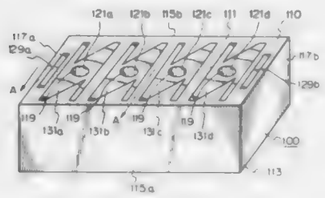
1. A method of quadrature-phase amplitude modulation comprising the step of amplitude modulating two carrier signal components I and Q in phase quadrature in accordance with signal points in a signal point constellation, the signal point constellation comprising 2^{2n} signal points, where n is an integer equal to or greater than 4, arranged in a modified square array with substantially 2^{2n-2} points in each of four quadrants defined by I and Q axes intersecting at an origin of a phase-plane diagram, the signal points in each quadrant of the square array having I and Q component amplitudes of 1, 3, 5, . . . 2^n-1 units, the square array being modified by relocating a plurality of points in each quadrant from positions adjacent to a corner of the square to positions extrapolated from the square array and having reduced distances from the origin, wherein in each quadrant each of a majority of the points so relocated is located in a position, relative to the position which it would have in the square array, rotated through an angle of 180° about one of two predetermined points, said two predetermined points having I and Q amplitude co-ordinates of substantially $(2^n,2^{n-1})$ and $(2^{n-1},2^n)$.

4,855,693

DIELECTRIC FILTER AND A METHOD OF MANUFACTURE THEREOF

Hisao Matsukura; Osamu Yamato, and Hiroyuki Horii, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,874
Claims priority, application Japan, Aug. 8, 1987, 62-198873
Int. Cl.[4] H01P *1/202*
U.S. Cl. 333—202 21 Claims



1. A dielectric filter, comprising:
a dielectric block having a top surface, a bottom surface and a side surface extending from the top surface to the bottom surface, the dielectric block further having an interior surface defining a hole extending from the top surface to the bottom surface;
a side conductive layer covering the side surface;
a bottom conductive layer covering the bottom surface and electrically connected to the side layer, the side layer having an upper edge portion adjacent to the top surface;
a top conductive layer on a portion of the top surface surrounding the hole;
an inner conductive layer covering the interior surface so as to be electrically connected to the bottom layer at the bottom surface and the top conductive layer at the top surface, the top conductive layer being spaced from the side layer and having a side edge portion obliquely opposing and being capacitively coupled with the upper edge portion.

4,855,694

LUMPED ELEMENT CIRCULATOR HAVING A CONDUCTIVE PEDESTAL FRAME STRUCTURE

Hiroshi Ogawa, Tokyo, Japan, assignor to Nec Corporation, Tokyo, Japan

Filed May 31, 1988, Ser. No. 200,102
Claims priority, application Japan, May 29, 1987, 62-134632
Int. Cl.[4] H01P *1/387*
U.S. Cl. 333—1.1 3 Claims

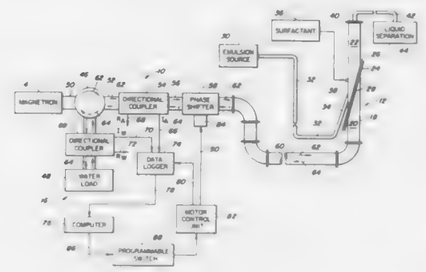
1. A lumped element circulator comprising:
a dielectric substrate having upper and lower conductive layers respectively on opposite surfaces of the substrate;
a conductive pedestal frame structure having a bottom surface thereof being soldered to said upper conductive layer and having a plurality of recesses on an upper surface thereof;
a ferromagnetic substrate disposed within said pedestal frame structure and having a substantially equal thickness to a vertical dimension of said pedestal frame structure;
a plurality of overcrossing parallel conductive strip lines in pairs extending across an upper surface of said ferromagnetic substrate at 120 degrees angles to each other, each pair being short circuited at opposite ends thereof by first and second terminating conductors, said first terminating conductors being respectively adjacent to said recesses;
a plurality of capacitors respectively disposed in said recesses, each of said capacitors comprising a dielectric having a thickness smaller than the thickness of said ferromagnetic substrate and upper and lower electrodes on the opposite sides of said dielectric, said lower electrodes being soldered to the bottom of said recesses and the upper electrodes being substantially flush with the upper surface of said pedestal frame structure;
a plurality of first connecting leads electrically connecting said first terminating conductors to said upper electrodes;
a plurality of second connecting leads electrically connecting said second terminating conductors to the upper surface of said conductive frame structure; and
a plurality of input/output ports on said dielectric substrate and respectively electrically connected to said upper electrodes.

4,855,695

AUTOMATED MICROWAVE TUNING SYSTEM FOR DE-EMULSIFIER SYSTEMS

Nikola Samardzija, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Apr. 29, 1988, Ser. No. 187,678
Int. Cl.[4] H03H *7/40*
U.S. Cl. 333—17.3 5 Claims



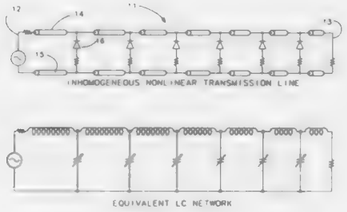
1. Apparatus for automatic tuning control of a microwave irradiation system which consists of a microwave source connected via input wave guide to a fluid applicator containing an impedance matching applicator element, comprising:
a microwave energy source;
a bi-directional circulator receiving output of microwave energy from said source and providing first and second bi-directional microwave connections;
first and second directional couplers connected to said first and second bi-directional microwave connections and providing first and second electrical outputs indicative of energy incident on the applicator element and energy reflected from the applicator element, respectively;
a phase shifter connecting said first directional coupler to said input wave guide;
a dummy load connected to said second directional coupler; and
means comparing said first and second electrical outputs to develop a control signal for controlling said phase shifter so that the voltage standing wave ratio is maintained below a predetermined threshold.

4,855,696

PULSE COMPRESSOR

Michael Tan, Mountain View; Chung-Yi Su, Milpitas, and William J. Anklam, Santa Rosa, all of Calif., assignors to Hewlett-Packard, Palo Alto, Calif.

Filed Dec. 9, 1987, Ser. No. 130,825
Int. Cl.[4] H01P *5/00*
U.S. Cl. 333—20 14 Claims



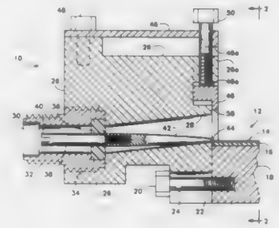
1. A pulse compressor comprising:
an unloaded transmission line of length L_t having an input and an output; and
means for injecting at the compressor input a pulse having a profile tht sufficiently matches the profile of a stable soliton at the input end of the compressor that only a single soliton is generated by the input pulse;
a plurality of varactors that load the transmission line at a plurality of points along the transmission line, thereby defining a plurality of varactor cells, each of which is centered on a varactor and is contiguous with the adjacent cells;
each varactor cell has a nonlinear capacitance [C]C(V) per cell and an inductance L per cell in which V is the voltage drop across that varactor and in which the $[(LC)^{\frac{1}{2}}]$time constant $(LC(0))^{\frac{1}{2}}$ decreases from a first cell at the transmission line input to a last cell at the transmission line output where the change from cell to cell of the $[(LC)_i]$time constant $(LC(0))_i$ is chosen to compress said soliton and to substantially minimize, at the output, the peak amplitude of uncompressed energy, which includes secondary solitons, whereby the formation of secondary solitons is suppressed.

4,855,697

COAXIAL TRANSMISSION LINE TO MICROSTRIP TRANSMISSION LINE LAUNCHER

Keith E. Jones, Aloha, Oreg., and Warren K. Harwood, Vancouver, Wash., assignors to Cascade Microtech, Inc., Beaverton, Oreg.

Filed Jun. 27, 1988, Ser. No. 212,309
Int. Cl.[4] H01P *5/08*
U.S. Cl. 333—33 8 Claims



1. A launcher for connecting a coaxial transmission line having inner and outer conductors to a microstrip transmission line having a planar upper surface and upper and lower conductors, said launcher comprising:
(a) an electrically conductive body having first and second ends and a bore therebetween, said bore having a bore axis, said first end of said conductive body being adapted for coupling with the outer conductor of the coaxial transmission line, and said second end of said conductive body being adapted for coupling with the lower conductor of the microstrip transmission line;
(b) an electrically conductive elongate pin having first and second ends and a longitudinal axis, said first end of said conductive pin being adapted for connecting to the inner conductor of the coaxial transmission line, and said second end being adapted for contacting the upper conductor of the microstrip transmission line;
(c) holding means for holding said pin within said bore of said conductive body such that said longitudinal axis of said pin extends at a predetermined angle relative to said bore axis; and
(d) variable-position stop means for variably positioning the microstrip transmission line relative to said bore along a direction generally transverse to said elongate pin and perpendicular to said upper surface of said microstrip transmission line, said stop means comprising means adjustably movable with respect to said conductive body for abutting said upper surface of said microstrip transmission

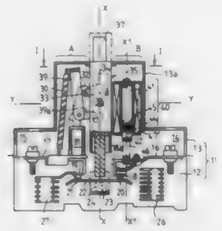
line at variable positions of said upper surface, relative to said conductive body, along said direction.

4,855,698

PROTECTIVE SWITCHING APPARATUS WITH REMOTELY CONTROLLED OPENING AND CLOSING OF THE CONTACTS

Jacques Cohen, Couchey; Pierre Lemarquand, Velars/Ouche, and Christian Pichard, Asnieres-les-Dijon, all of France, assignors to La Telemecanique Electrique, France

Filed Feb. 10, 1988, Ser. No. 154,264
Claims priority, application France, Feb. 13, 1987, 87 01818
Int. Cl.[4] H01H 75/00
U.S. Cl. 335—14 9 Claims



1. A circuit breaker with remote control, said circuit breaker comprising :

i. a housing having a median plane which defines first and second volume portions within said housing ;

ii. a movable contact support bridge extending at right angles to said plane from a first end portion which supports a first movable contact and is housing in said first volume portion to a second end portion which supports a second movable contact and is housed in said second volume portion, said bridge being mounted for translation in a direction parallel to said plane and for pivoting at said first end portion about an axis parallel to said plane and at right angles to said direction;

iii. stop means for angularly limiting the pivoting of said bridge ;

iv. first and second further contacts respectively cooperating with said first and second movable contacts, at least said first further contact being fixed with respect to the housing ;

v. biasing means cooperating with said bridge and normally maintaining said movable contacts in engagement with said further contacts ;

vi. an elongate trip mechanism extending along said median plane and having an operating condition in which it cooperates with said bridge to disengage the movable contacts from the respective further contacts ;

vii. means, including current fault responsive trip means, coupled to said trip mechanism, for switching the trip mechanism into the operating condition, said current fault responsive trip means being housing in said first volume portion ;

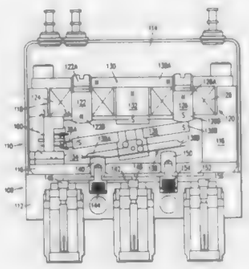
viii. remotely controlled electromagnet means housing in said second volume portion and means having an actuating member which cooperates with at least one of said second further contact and said second movable contact for separating said second further contact and said second movable contact from each other.

4,855,699

SELF-CUTOFF FOR LATCHING COAXIAL SWITCHES

Poul E. Hoegh, San Jose, Calif., assignor to Teledyne Microwave, Mountain View, Calif.

Filed Mar. 11, 1988, Ser. No. 166,861
Int. Cl.[4] H01H 9/00
U.S. Cl. 335—177 11 Claims



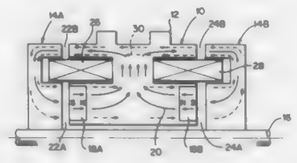
1. In a switching mechanism having a body and first and second electromagnets mounted to the body, to each of which current can be applied and from each of which current can be cut off, and a movable member movably mounted to the body, movable to a first position determining a first switching mechanism state upon application of current to the first electromagnet, and movable to a second position determining a second switching mechanism state upon application of current to the second electromagnet, the improvement comprising means for providing that current is cut off from said first electromagnet upon the movable member being moved from its second position toward its first position sufficiently to determine that the movable member will adopt its first position, and for providing that current is cut off from the second electromagnet upon the movable member being moved from its first toward its second position sufficiently to determine that the movable member will adopt its second position, wherein the means for providing that current is cut off comprise a switch operatively associated with the first and second electromagnets and only a single portion of the movable member.

4,855,700

DUAL CONVERSION FORCE MOTOR

David B. Mohler, Tipp City, Ohio, assignor to Lucas Ledex Inc., Vandalia, Ohio

Continuation of Ser. No. 226,726, Aug. 1, 1988, Pat. No. 4,847,581. This application Feb. 16, 1989, Ser. No. 310,969
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—229 14 Claims



1. A force motor having an axis of operation, said force motor comprising:

a stator having two sides spaced apart along said axis;

an armature having two portions, one portion located on one side of said stator and another portion located on another side of said stator, said stator and armature including means defining radially inner and radially outer working airgaps between each armature portion and said stator;

first means for generating a magnetic flux flow through said one armature portion across said one inner working airgap, through said stator, across said other inner working airgap through said other armature portion, across said other outer working airgap, through said stator, across said one outer working airgap, and back to said one armature portion; and

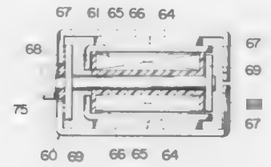
second means for generating a magnetic flux flow in said one armature portion and said stator in coincidence with said first means flux flow therein and for generating a magnetic flux flow in said other ar portion and said stator in opposition to said first means flux flow therein.

4,855,701

POLARIZED ELECTROMAGNET

Kideya Kondo, Hirakata; Youichi Kunimoto, Osaka, and Manabu Yano, Shijyonawate, all of Japan, assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 3, 1988, Ser. No. 267,219
Claims priority, application Japan, Dec. 23, 1987, 62-326321; Jun. 9, 1988, 63-142556
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—230 7 Claims



1. A polarized electromagnet comprising:

an excitation coil;

an elongated core extending through said excitation coil to be magnetically coupled therewith for movement in its axial direction between two positions relative to said excitation coil upon energization and deenergization thereof, said core having at its opposite ends pole plates extending transversely of the axial length;

outer yoke means which is fixed relative to said excitation coil and extends parallel to said core in transversely spaced relation thereto, said outer yoke means having a its opposite ends respective outer pole ends which are located axially outwardly of the adjacent pole plates of said core;

inner yoke means which is fixed relative to said excitation coil and extends parallel to said core inwardly of said outer yoke means in transversely spaced relation to said core, said inner yoke means being connected to said outer yoke means by permanent magnet means so that said inner and outer yoke means are magnetized to the opposite polarities, said inner yoke means having at its opposite ends respective inner pole ends which are cooperative with the adjacent ones of said outer pole ends to form respective magnetic gaps between which the corresponding ones of said pole plates are located;

at least one of said inner pole ends terminating in a pole tip which is positioned transversely outwardly of the adjacent pole plate and extends in the axial direction to a point where it overlies the adjacent pole plate when the latter is magnetically attracted to said pole tip such that the inward face of said pole tip comes into direct facing relation to the lateral edge of the adjacent pole plate when said pole plate is attracted to said pole tip.

4,855,702

LINEAR ELECTROMAGNETIC ACTUATOR

Thomas K. Swanson, and Elwood J. Meyers, both of Rockford, Ill., assignors to Barber-Colman Company, Loves Park, Ill.

Filed Sep. 28, 1988, Ser. No. 250,752
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—261 4 Claims

1. An electromagnetic actuator comprising:

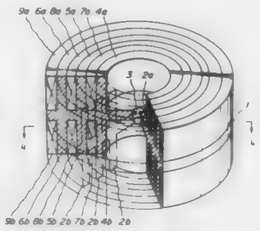
a cup-shaped housing of magnetizable nature having a frusto-conical projection extending inwardly; said projection having a central opening formed therein; a cover of magnetizable material on said housing and having a central opening formed therein; a winding mounted in said housing and encompassing said projection; a shaft extending through said central opening of said projection; an armature having a frusto-conical surface conforming to the frusto-conical projection and secured to a mid-portion of said shaft whereby when said winding is excited said armature will move toward said projection and said shaft will move linearly; an upper housing secured to said cover; bearings mounted in said projection and said upper housing; wherein said shaft is supported for movement on said bearings.

4,855,703

MULTILAYERED-EDDY-CURRENT TYPE STRONG MAGNETIC FIELD GENERATOR

Kazuo Bessho, and Sotoshi Yamada, both of Kanazawa, Japan, assignors to Kanazawa University, Kanazawa, Japan

Filed Feb. 25, 1988, Ser. No. 160,295
Claims priority, application Japan, Mar. 19, 1987, 62-62708
Int. Cl.[4] H01F 3/00
U.S. Cl. 335—296 2 Claims



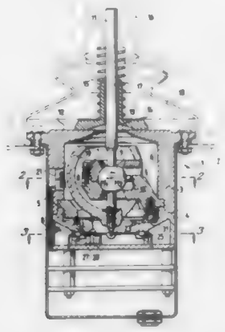
1. A multilayered-eddy-current type strong magnetic field generator, comprising a conductor plate having a central hole and a radial slit extending from the central hole to peripheral edge of the plate so as to open at the edge, a plurality of conductor cylinders joined to said plate in a concentric manner around the central hole, each of said cylinders having a longitudinal slit aligned with the radial slit of the plate in such a manner that wall of each cylinder opens at the longitudinal slit, and a plurality of exciting coils wound along outer surface of corresponding cylinder in such manner that each exciting coil induces an eddy current in the corresponding cylinder in a circumferential direction thereof, whereby path of the eddy current in each cylinder is closed through sidewall portions of both the radial slit and the central hole of the plate, and the eddy currents in all the cylinders are superposed at the sidewall portion of the central hole so as to generate a very strong magnetic field at the central hole.

4,855,704

JOYSTICK FOR GENERATING ELECTRIC CONTROL SIGNALS

Manfred Betz, St. Johann-Gächingen, Fed. Rep. of Germany, assignor to Gustav Mageawirth GmbH & Co., Urach, Fed. Rep. of Germany

Filed Jun. 23, 1988, Ser. No. 210,649
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, 3722046
Int. Cl.[4] H01F *21/06*
U.S. Cl. 336—132 11 Claims



1. Joystick for generating electric control signals comprising a housing, an operating rod, a universal joint which is arranged in said housing and on which said operating rod is movably mounted, sensors arranged in said housing and an element acting upon said sensors in a positionally dependent manner, the distance of said element from said sensors being variable by said operating rod, said sensors being in the form of induction coils through which alternating current circulates, said induction coils each being part of an electric oscillatory circuit, said element acting upon said induction coils being an induction body which is rigidly connected to said operating rod, and the amplitude, frequency and/or phase of the respective oscillatory circuit being changeable by changing the distance of said induction body from said induction coils in order to generate the electric control signals, characterized in that the longitudinal axis of said induction coils (**21**, **22**) intersect in the center (M1) of said universal joint (**6**, **9**, **7**, **8**; **39**) which is designed as a ball-and-socket joint, in that in its zero position, said operating rod (**11**) extends perpendicularly to the plane defined by the longitudinal axes of said induction coils (**21**, **22**), and in that said induction body (**19**) is part of a sphere, the center (M2) of which is spaced from said center (M1) of said universal joint perpendicular to this plane.

4,855,705

FUSE WITH A SOLID ARC-QUENCHING BODY MADE OF NON-POROUS RIGID CERAMIC

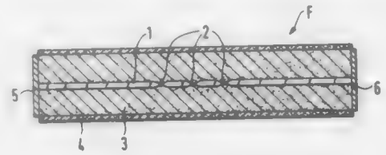
Vojislav Naranicic, Ville d'Anjou, and Gilles Fecteau, Boucherville, both of Canada, assignors to Hydro-Quebec, Montreal, Canada

Continuation of Ser. No. 46,535, May 6, 1987, abandoned. This application Nov. 9, 1988, Ser. No. 270,478
Claims priority, application Canada, Mar. 20, 1987, 532649
Int. Cl.[4] H01H *85/14*
U.S. Cl. 337—246 23 Claims

1. A current-limiting fuse comprising:

a fusible element structured to conduct an electric current and to melt and thereby interrupt said electric current when the same reaches a predetermined value, melting of the fusible element producing an electric arc at a high temperature;

a solid arc-quenching body made of non-porous rigid ceramic closely surrounding the fusible element, said non-porous rigid ceramic having (a) a high dielectric resistivity at the high temperature of the electric arc produced within the solid body upon melting of said fusible element,



as well as (b) a high resistance to shocks of high temperature and of internal pressure caused by the production of said electric arc whereby said arc-quenching body resists and is impervious to said internal pressure; and

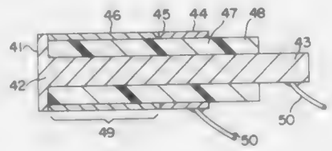
a pair of terminals mounted on said arc-quenching body, interconnected together through the fusible element, and providing for connection of the fusible element in an electric circuit to be protected against an overcurrent.

4,855,706

ORGANIC LIQUID DETECTOR

Paul D. Hauptly, 4583 Mildred Dr., Fremont, Calif. 94536

Filed Sep. 11, 1987, Ser. No. 96,079
Int. Cl.[4] H01L *7/00*
U.S. Cl. 338—34 12 Claims



1. An organic liquid sensor comprising:

a sensor means for sensing the contact thereto by an organic liquid and distinguishing the contact thereto by a vapor or gas of said liquid including;

a non-conductive substrate;

at least two electrodes being disposed proximate said substrate such that said substrate holds said electrodes in electrical separation; said electrodes being formed for electrical connection to a detector circuit;

a sensor material being disposed upon said substrate and contacting said electrodes so as to form an electrical connection between said electrodes;

said sensor material including a uniform mixture of electrically-conductive particles with a non-conductive matrix, said sensor material having a sufficient quantity of said particles such that said sensor material is capable of swelling upon contact with said liquid but not upon contact with the vapor or gas of said liquid; and

wherein the percent by volume of said electrically-conductive particles in said sensor material varies from approximately 78 percent to 97 percent.

4,855,707

ADJUSTABLE FOOT ACTIVATED CONTROL APPARATUS FOR POTENTIOMETER

David C. Clement, 368 Sterling Pl., Brooklyn, N.Y. 11238

Continuation-in-part of Ser. No. 922,960, Oct. 24, 1986. This application Sep. 9, 1988, Ser. No. 242,960
Int. Cl.[4] H01C *10/00*
U.S. Cl. 338—153 13 Claims



1. An adjustable control apparatus for mounting on the potentiometer shaft of an electronic apparatus, said control apparatus comprising:

potentiometer engagement means for selective releasable engagement with the potentiometer shaft of an electronic apparatus;

a response gear rigidly connected to said potentiometer engagement means, said response gear having a rotational axis;

a drive gear having a rotational axis aligned substantially orthogonal to said response gear, said drive gear engaging said response gear, with rotation of said drive gear about its axis causing a corresponding rotation of said response gear about its axis;

a generally planar control platform integral with said drive gear and parallel to the rotational axis of the drive gear such that pivotal movement of said control platform generates rotational movement of said drive gear; and

a foot platform adjustably mounted to said control platform such that the relative positions of said control platform and said foot platform relative to one another is adjustable, whereby pivotal movement of said foot platform causes corresponding pivotal movement of said control platform and associated rotational movement of the drive gear about its axis, and wherein the rotational movement of said drive gear causes corresponding rotational movement of the response gear, the potentiometer engagement means and the potentiometer shaft for affecting rotational adjustments to the potentiometer shaft.

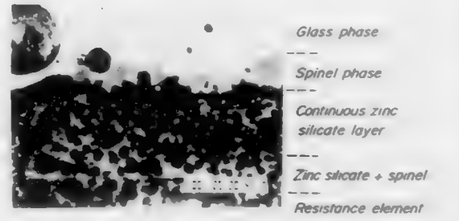
4,855,708

VOLTAGE NON-LINEAR RESISTOR

Masami Nakata, Chita, and Osamu Imai, Kasugai, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Jul. 15, 1988, Ser. No. 219,382
Claims priority, application Japan, Aug. 21, 1987, 62-206579
Int. Cl.[4] H01C *7/10*
U.S. Cl. 338—20 4 Claims

1. A voltage non-linear resistor having a voltage non-linear resistance element consisting mainly of zinc oxides, and a high resistance layer provided on a peripheral side surface of said voltage non-linear resistance element, including a zinc silicate phase consisting mainly of Zn_2SiO_4 and a spinel phase consisting mainly of $Zn_7Sb_2O_{12}$, compring continuous zinc silicate



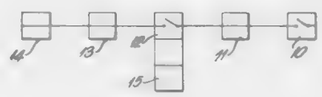
particles in said zinc silicate phase to form a continuous zinc silicate phase.

4,855,709

SYSTEM OF ALARM TO MAKE AWARE ABOUT BAD CONDITION OF CAR

Mohammad T. Naderi, Isabellaland 896, ST The Hague, Netherlands

Filed Jun. 17, 1985, Ser. No. 708,529
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—438 4 Claims



1. An alarm system for indicating malfunctions in a vehicle, said system comprising at least one of the following electrical circuits:

(a) a first electrical circuit indicative of whether the parking brake is engaged or disengaged, said first electrical circuit being connected to the generator of the vehicle, and includes a switch operable by the parking brake, wherein the alarm is activated when current does not flow through the electrical circuit when the parking brake is disengaged,

(b) a second electrical circuit indicative of the state of the brake connected to an alarm and to the doors or seat belt of the vehicle, said second electrical circuit being energized during motion of the vehicle to indicate whether or not said brake is applied, any of said doors is open, or the seat belt is on,

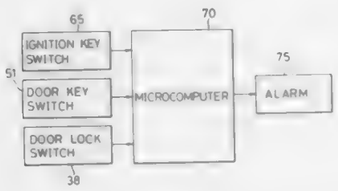
(c) a third electrical circuit indicative of the water level in the radiator and pressure in the tires, said third electrical circuit being connected to an alarm and to said radiator or the tires and being energized when the ignition switch is turned on to indicate whether or not the water level in the radiator is down or the pressure in any of the tires is low, and

(d) each of said electrical circuits including a diode which serves to isolate its respective circuit from the other two circuits.

4,855,710
BURGLARPROOF SYSTEM FOR AUTOMOTIVE VEHICLES

Hideya Kikuchi, and Hiroshi Ikeuchi, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 5, 1988, Ser. No. 214,957
Claims priority, application Japan, Jul. 9, 1987, 62-169660; Aug. 26, 1987, 62-210342
Int. Cl.[4] B60R *25/00*; E05B *9/10*
U.S. Cl. 340—426 8 Claims



1. A burglarproof system for an automotive vehicle, comprising:
(a) latching means for maintaining a door of the automotive vehicle closed with respect to a body of the automotive vehicle;
(b) unlatching operating means for bringing said latching means to an unlatched state;
(c) locking means movable between a locked position where said locking means prohibits transmission of a force from said unlatching operating means to said latching means to maintain the door closed and an unlocked position where said locking means permits the force to be transmitted from said unlatching means to said latching means;
(d) a door key cylinder arranged at the door, said door key cylinder including:
(i) a cylindrical body;
(ii) a rotor accommodated in said cylindrical body, said rotor being operatively connected to said locking means and angularly movable about its own axis between a first angular movement position bringing said locking means to said locked position and a second angular movement position bringing said locking means to said unlocked position;
(iii) tumbler means accommodated in said cylindrical body and movable between a first position where said tumbler means prohibits angular movement of said rotor relative to said cylindrical body and a second position where said tumbler means permits angular movement of said rotor relative to said cylindrical body, said tumbler means being moved from said first position to said second position when the key is inserted into said rotor; and
(iv) an acting section provided at said rotor and extending radially from an axis of said rotor,
(e) a door key switch arranged in the vicinity of said door key cylinder, said door key switch detecting said acting section of said rotor to output a key-operation detection signal when said rotor of said door key cylinder is angularly moved about its own axis toward the second angular movement position by turning operation of said key;
(f) a door lock switch for detecting in which one of said locked position and said unlocked position said locking means is;
(g) stealing detection means for outputting a stealing detection signal when said stealing detection means does not receive the key-operation detection signal from said door key switch, but receives a lock-releasing detection signal from said door lock switch; and
(h) burglarproof means for executing operation for a burglarproof in response to said stealing detection signal from said stealing detection means.

4,855,711
IMPACT DETECTION APPARATUS

David Harrop, Newark; Bradley A. Sharpe-Geisler, and Valli R. Sharpe-Geisler, both of San Jose, all of Calif., assignors to Sensor Science, Newark, Calif.

Filed Jun. 29, 1987, Ser. No. 68,192
Int. Cl.[4] G08B *23/00*; A63C *19/06*
U.S. Cl. 340—323 R 19 Claims



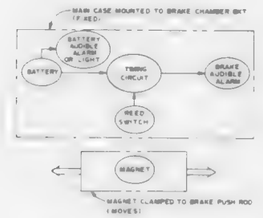
1. An impact detection apparatus comprising:
a first primary multilayered sensor in the nature of a variable magnitude signal generating device situated so as to abut an area enclosed by a boundary of interest;
signal processing means having an input coupled to said multilayered sensor, said signal processing means being responsive to a variable magnitude input signal from said sensor and producing in response thereto an output signal indicative of whether an impact of a given object of interest has occurred to said sensor;
indicator means coupled to said signal processing means output signal for producing in response thereto a sensible signal indicative of impact of said given object of interest;
said multilayered sensor comprising a sandwiched multilayer device including in respective order:
a first outer conductive layer;
a first insulative layer;
an inner conductive layer;
a second insulative layer;
a second outer conductive layer;
said outer conductive layers being electrically interconnected to form an electrically shielded region therebetween within which said insulative layers and said inner conductive layer are disposed; and,
at least one of said insulative layers is formed of a compressible insulative medium.

4,855,712
METHOD AND APPARATUS FOR MONITORING BRAKE CONDITIONS OF A MOTOR VEHICLE

Nathaniel C. Wiley, Jr., Weston, and William L. Jensen, Jr., Beacon Falls, both of Conn., assignors to Rudkin-Wiley Corporation, Bridgeport, Conn.

Filed Feb. 5, 1987, Ser. No. 11,165
Int. Cl.[4] B60Q *9/00*
U.S. Cl. 340—453 34 Claims

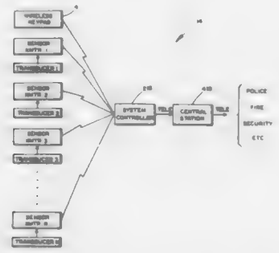
1. In a system for monitoring the condition of brakes of a motor vehicle, said system including switch means electrically coupled to alarm means, and switch actuator means operatively associated with the braking system of the motor vehicle for providing relative movement between said switch means and said switch actuator means in response to movement of a brake pedal of said vehicle for actuating said switch means and said alarm means when said braking system requires adjustment or repair, the improvement comprising;
an independent power supply coupled to said switch means for actuating said alarm means in response to said actuation of said switch means so that said alarm means is not powered by any pre-existing electrical power supply of said motor vehicle, said alarm means including an audible signal generator, and
second alarm means coupled to said independent power supply for monitoring the condition of said independent power supply and providing a signal when said independent power supply is depleted below a predetermined level.



4,855,713
LEARN MODE TRANSMITTER

Robert E. Brunius, St. Paul, Minn., assignor to Interactive Technologies, Inc., St. Paul, Minn.

Filed Oct. 7, 1988, Ser. No. 254,578
Int. Cl.[4] G08B *1/08, 26/00*
U.S. Cl. 340—506 9 Claims

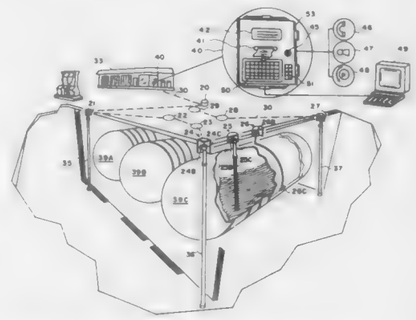


1. A method for programming a local security system controller with the identity of each of a plurality of wireless transmitters to whose transmissions it is to respond, comprising:
(a) programming a unique identity code into each of said wireless transmitters which identity code is transmitted with each transmission;
(b) establishing said system controller in a program mode;
(c) inducing a predetermined transmission from one of said wireless transmitters;
(d) temporarily storing each received identity code as it is received by said system' controller;
(e) upon detecting said program mode and a predetermined alarm condition, comparing each received identity code at said system controller to a code table; and
(f) writing the temporarily stored identity code into said code table, if not located.

4,855,714
FLUID STATUS DETECTOR

Bruce A. Clarkson, Beverly, Mass., and Steven A. MacIntyre, Reston, Va., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Nov. 5, 1987, Ser. No. 116,788
Int. Cl.[4] G08B *19/00*; G01M *3/32*
U.S. Cl. 340—521 5 Claims



1. A fluid status detection system comprising:
a controller, a plurality of probes for sensing the status of fluids at probe locations remote from the controller, and a transmission line connecting said controller and said probes, wherein said controller comprises:
means for sensing the fluid environment of the probe and producing a voltage signal characteristic of the status of said fluid environment;
a voltage controlled oscillator means responsive to said voltage signal for providing an oscillating signal the frequency of which is representative of said status of said fluid environment; and
wherein said controller comprises indicator means responsive to said oscillating status signal for providing an indication of the sensed fluid status.

4,855,715
DOOR MOUNTED ALARM ASSEMBLY

Albert R. Sévigny, 1600, Robert-Charbonneau #501, Montreal, Qc., Canada H4N 2Y1

Filed Nov. 16, 1987, Ser. No. 121,179
Int. Cl.[4] G08B *13/08*; H01H *3/16*
U.S. Cl. 340—545 6 Claims



1. An alarm assembly adapted to be mounted inside a door frame, comprising:
a casing for housing a power supply, a noise producing device and an electrical circuit, said circuit operating from said power supply for actuating said noise producing device,
a switch mounted in said circuit, said switch having a spring operating lever blade for actuating said switch,
a hinged plate mounted in said casing and a spring for biasing said plate in the direction of said blade and adapted to deflect said blade for actuating said switch,

a knob adapted to be retractedly mounted through one of the lateral faces of a door and to project outside said face, and

a flexible link adapted to be mounted inside said door for connecting said knob to said plate, said knob being normally maintained in a retracted position whereby when said knob is projecting outside said face, said plate is biased in the direction of said blade to deflect the latter and actuate said switch and said noise producing device;

the said assembly further comprising:

a first key operating device having a rotatably spindle,

a first cam mounted on said device and adapted to rotate with said spindle, and

a second switch having a second spring operating blade for actuating said second switch, said first cam mounted adjacent said second blade for actuating the latter upon rotation of said first cam, the said second blade being located adjacent said hinged plate and adapted to inhibit its movement when the knob is in a retracted position, whereby when the door is opened, the knob projects outside said face and the hinged plate is pulled by said flexible link away from said second blade, and said second switch actuates the circuit and the noise producing device.

4,855,716

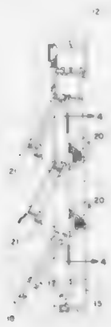
SECURITY AWNING WINDOW

Robert L. Jordal, Rte. 10, Box 351, Winston-Salem, N.C. 27127

Filed Jun. 6, 1988, Ser. No. 203,341

Int. Cl.⁴ G08P *13/02*

U.S. Cl. 340—550 **10 Claims**



1. A window of the awning type having a frame, said frame including a pair of opposingly positioned jambs, a header and a frame sill, said jambs joined to said header and to said frame sill, a pivotal panel positioned within said frame, a horizontal strut, said strut joined to said jambs, a panel drive mechanism, said drive mechanism joined to said frame and to said panel to pivot the panel from an open to a closed position and to raise it within the frame slightly upon closing, the improvement comprising: a panel latch means, said latch means including

(a) a panel lip, and

(b) a panel lip receptacle,

said lip receptacle attaching to said horizontal strut whereby upon closing said panel said panel lip engages said lip receptacle to securely hold said panel within said frame.

4,855,717

SECURITY DEVICE FOR CONVEYING SYSTEMS WITH UNMANNED VEHICLES

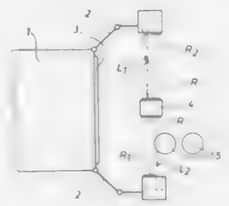
Rudolf Hafner, Nidau, Switzerland, assignor to JD-Technologie AG, Zug, Switzerland

Filed Feb. 17, 1988, Ser. No. 157,458

Claims priority, application Switzerland, Feb. 27, 1987, 757/87

Int. Cl.⁴ G08B *13/00*

U.S. Cl. 340—556 **8 Claims**



5. A driverless vehicle having a security device arranged at least at its front side for monitoring a given area in front of the vehicle and operative for triggering an emergency stop of the vehicle,

said area having an entrance zone laterally defined by left and right monitoring stations, said device comprising:

mutually facing first and second light barriers, one located at each monitoring station,

each barrier comprising a light emitter, a light receiver and a light reflector,

the light emitter of said first barrier being arranged to direct a first light beam across said entrance zone toward the reflector of said second barrier and the reflector of said second barrier being arranged to reflect said first light beam back to the receiver of said first barrier.

the light emitter of said second barrier being arranged to direct a second light beam across said entrance zone in the opposite direction to that of said first beam toward the reflector of said first barrier and the reflector of said first barrier being arranged to reflect said second light beam back to the receiver of said second barrier, whereby both beams will be interrupted by unauthorized objects entering said area through said entrance zone, and

third light reflectors for reflecting said light beams arranged laterally on objects which must not cause an emergency stop of said vehicle when entering said area through said entrance zone between said monitoring stations.

4,855,718

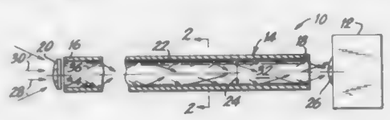
FIRE DETECTION SYSTEM EMPLOYING AT LEAST ONE OPTICAL WAVEGUIDE

John M. Cholin, Oakland, N.J., and Jeffrey G. Cholin, Pound Ridge, N.Y., assignors to Firetek Corporation, Hawthorne, N.J.

Filed Jul. 28, 1987, Ser. No. 78,552

Int. Cl.⁴ G08B *17/12*

U.S. Cl. 340—578 **6 Claims**



1. A fire detection system comprising:

a detector for sensing optical radiation from a spark or flame;

an elongate hollow waveguide tube having an inlet end portion for placement in a hostile, hazardous environment and having an outlet end portion for emitting the optical radiation to the detector and for placement in a benign, non-hazardous environment, said tube having a reflective inner surface forming a passage for transmitting the optical radiation from the tube inlet end portion to the tube outlet end portion by successive internal reflections.

4,855,719

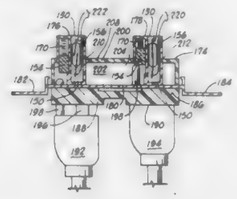
ELECTRICAL RECEPTABLE ALARM SWITCH

William T. Posey, Chickasha, Okla., assignor to Hermetic Switch, Inc., Chickasha, Okla.

Continuation-in-part of Ser. No. 916,296, Oct. 7, 1986, abandoned. This application Feb. 17, 1987, Ser. No. 15,175

Int. Cl.⁴ G08B *13/14*

U.S. Cl. 340—568 **8 Claims**



1. An alternating current receptacle for receiving connection of at least one plural prong plug, comprising:

housing means having at least one plural point array of contact holes for receiving a respective plug therein;

plural contact means disposed in said housing means as secured in prong contacting relationship adjacent respective contact holes;

a magnetic reed switch having alarm output connections secured to said housing means;

a spring-loaded magnetic slug disposed adjacent the reed switch which is movable between the balanced and unbalanced flux condition relative to said reed switch thereby to actuate said switch between open and closed positions; and

means positionable upon complete insertion of a plug to urge said magnetic slug to a position that actuates said magnetic reed switch and initiates an output switch indication from said switch means.

4,855,720

ANTI-THEFT SKI ALARM

Leo P. Donovan, 311 Fisher St., Walpole, Mass. 02081

Filed May 20, 1988, Ser. No. 196,476

Int. Cl.⁴ G08B *13/14*; **H01H** *47/00*

U.S. Cl. 340—571 **7 Claims**

1. An anti-theft alarm, comprising:

hollow housing means;

planar floor plate means on said housing means;

peg means, having an enlarged head portion, for securement to an article to be protected against theft;

aperture means, dimensioned to receive said enlarged head portion of said peg means, formed through said floor plate means;

latch means in said housing means for selective locking engagement with said peg means;

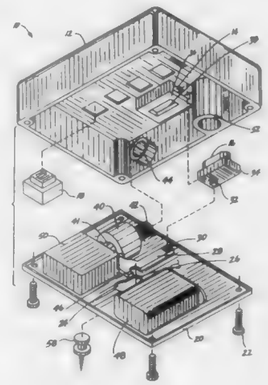
audible alarm means in said housing;

means for selectively activating alarm means;

means for selectively locking and unlocking said latch means;

coded electrical interlock means for preventing said alarm activating means from being deactivated, and said latch locking means from being unlocked, unless a proper code sequence is entered;

said coded electrical interlock means including an electrical solenoid in said housing for abutment with said latch means; and



a plurality of code keys and a plurality of dummy keys connected to said solenoid for energizing said solenoid upon entry of a correct code sequence.

4,855,721

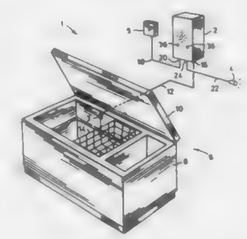
ALARM APPARATUS FOR A FREEZER

Robert Hallett, 477 Laclie Street, Orillia, Ont., Canada L4V 4R2, and Edward Ketelaar, Jr., R.R. #2, Georgetown, Ont., Canada L7G 4S5

Filed Nov. 24, 1987, Ser. No. 124,641

Int. Cl.⁴ G08B *21/00, 25/00*

U.S. Cl. 340—585 **3 Claims**



1. An alarm apparatus, for a freezer having a body and a closure member, the alarm apparatus comprising:

(a) an electrical control unit having a housing and located outside the freezer and including a power supply input;

(b) an alarm device remote from and connected to the control unit by a first flexible lead;

(c) a temperature sensor connected to the control unit, which temperature sensor is adapted for mounting in the freezer, for detecting temperatures exceeding a pre-set temperature; and

(d) a second flexible lead connecting the control unit to the temperature sensor, the second lead having a cross-section enabling the lead to extend between the body and the closure member of the freezer whilst permitting closure thereof; and wherein said control unit includes:

(i) positive and negative lines connected to the power supply input, an operational amplifier connected between the positive and negative lines, which operational amplifier

includes a sensor input connected to the temperature sensor, a reference input connected to a reference voltage source, and an output; and wherein the control unit includes a first resistor and a light emitting diode connected in series between the positive and negative lines, to provide an indication that the control unit is operative;

(ii) a second resistor and a detector input for the temperature sensor, connected in series between the positive and negative lines, with the sensor input of the operational amplifier connected to a junction between the first resistor and the detector input;

(iii) a third resistor, a variable resistor and a fourth resistor connected in series between the positive and negative lines, a zener diode, which is connected between the third resistor and the negative line parallel to the variable resistor and the fourth resistor, with the reference voltage input of the operational amplifier being connected to the variable resistor; and

(iv) fifth and sixth resistors connected in series between an output of the operational amplifier and the negative line, a base of an output transistor being connected to a junction between the fifth and sixth resistors, the emitter of the output transistor being connected to the negative line, and a control unit output being connected between the positive line and the collector of the transistor, for connection to the alarm device; and

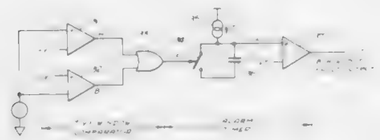
(v) an integrated circuit timer connected to the positive line and the collector of the transistor, and wherein the control unit output includes a common terminal connected to the collector of the transistor, a continuous output terminal connected to the positive line and an intermittent output terminal connected to the integrated circuit timer.

4,855,722

ALTERNATING CURRENT POWER LOSS DETECTOR

Graham Y. Mostyn, Saratoga, and Mohammad Yunus, Fremont, both of Calif., assignors to Intersil, Inc., Santa Clara, Calif.

Filed Aug. 1, 1986, Ser. No. 892,702
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—660 **15 Claims**



1. An apparatus for detecting the loss of alternating current power comprising:

first and second comparator means, each comparator means having a signal input, a reference input, and a signal output; and

means for applying the alternating current power to said signal input of said first nd second comparator means and for applying a first reference voltage to said reference input of said first comparator means and a second reference voltage to said reference input of said second comparator means for generating at the signal output of said first and second comparator means a signal representative of the transition time of the voltage waveform of alternating current power between said first reference voltage and said second reference voltage; and

means coupled to the signal output of said first and second comparator means for receiving the signal and for producing an alarm signal if the transition time is greater than a predetermined time;

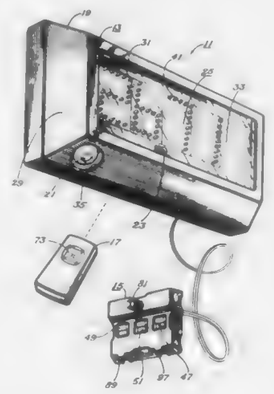
wherein each of the first reference voltage and the second reference voltage are less than fifteen percent of the peak voltage of the voltage waveform.

4,855,723

AUDIO-VISUAL ALARM SYSTEM WITH ADDRESS DISPLAY

Marlene M. Fritz; Betty J. Love; Mary D. Sweeney, all of Dallas, and Chuck Davis, Fort Worth, all of Tex., assignors to Proto Quick, Inc., Dallas, Tex.

Filed Apr. 29, 1988, Ser. No. 187,934
Int. Cl.[4] G08B *5/36, 13/24*
U.S. Cl. 340—691 **22 Claims**



1. An alarm system, comprising:

(a) an alarm unit adapted to be located on a building so as to be visible from the exterior of said building, said alarm unit comprising a siren, stroboscopic light means, and address display means;

(b) said address display means having one or more characters arranged so as to make up the address of said building, with each character being formed by a plurality of light sources;

(c) switching means for activating said siren and said stroboscopic light means, and for switching said light sources of said address display means to a predetermined level of brilliance from a preactivation level of brilliance

(d) reset means for deactivating said siren and said stroboscopic light means, and for returning said light sources of said address display means to the preactivation level of brilliance, so as to be in a state of readiness wherein when said switching means is actuated again said switching means will activate said siren and said stroboscopic light means and switch said light sources of said address display means to said predetermined level of brilliance.

4,855,724

COLOR FILTER GROUPING FOR ADDRESSING MATRIXED DISPLAY DEVICES

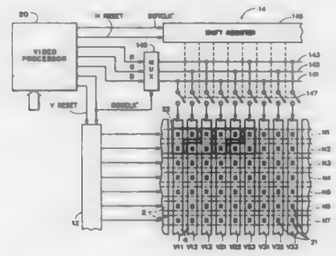
Kei-Wean C. Yang, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 23, 1987, Ser. No. 28,930
Int. Cl.[4] G09G *3/34*
U.S. Cl. 340—703 **10 Claims**

1. Matrixed display apparatus comprising:

a matrixed display device having a plurality of optical structures arranged in a matrix of intersecting rows and columns, each optical structure being actuable to control the propagation of light towards a viewer of the device, the optical structures being in first, second and third distinct arrays associated with first, second and third regions respectively of the optical spectrum, and each optical structure in a given array being selectively actuable to propagate light in the associated region of the optical spectrum towards a viewer of the device and being operative to not propagate light in the other regions of the optical spectrum towards the viewer, the first, second and third arrays being such that each optical structure in each array is one structure in a group of three structures, in the first, second and third arrays respectively, with the optical structures in the first and second arrays being in one row of the matrix and the optical structure in the third array being in a row adjacent said one row and in the same column as the optical structure in one of the first and second arrays,

a video processor for receiving an input video signal composed of a succession of active line intervals and providing an output video signal having two active line intervals



during a period corresponding to one active line interval of the input video signal, and the video processor also being operative to provide at least two output timing signals,

selection means functionally coupled to the optical structures and operative in response to the output timing signals to select each row of optical structures for a period substantially equal to the active line interval of the output video signal, the rows being selected consecutively, and to select the optical structures in a selected row consecutively within the period for which that row is selected, and

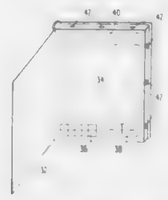
actuation means responsive to the output video signal for actuating a selected optical structure.

4,855,725

MICROPROCESSOR BASED SIMULATED BOOK

Emilio A. Fernandez, 1019 Salt Meadow La., McLean, Va. 22101

Continuation of Ser. No. 124,593, Nov. 24, 1987, abandoned. This application Dec. 28, 1988, Ser. No. 291,433
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—706 **15 Claims**



1. An interactive user interface device for accessing data from mass storage media means which provides a user with the look and feel of a book, said mass storage media means being connected to computer means programmed to access data from said mass storage media means and said computer means being connected to first transceiver means for encoding and transmitting data to and receiving and decoding commands from said user interface device, said user interface device comprising:

a book-shaped housing having mounted thereon display screen means for displaying page data and messages, key means for paging back and forth between displayed pages;

second transceiver means within said housing for receiving and decoding data transmitted by said first transceiver means and for encoding and transmitting commands to said first transceiver means;

memory means within said housing for storing a plurality of page data; and

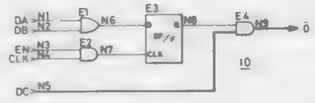
microprocessor means within said housing and connected to said display screen means, said key means and said second transceiver means, said microprocessor means being programmed for storing data received and decoded by said second transceiver means in said memory means and responsive to said key means for causing page data to be displayed by said display screen means and for causing said second transceiver means to transmit a data request command to said first transceiver means.

4,855,726

SIGNAL TRACING APPARATUS FOR LOGIC CIRCUIT DIAGRAMS

Seiichi Nishio, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 29, 1987, Ser. No. 102,494
Claims priority, application Japan, Sep. 30, 1986, 61-232337
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—747 **18 Claims**



1. A signal tracing apparatus for a logic circuit diagram which comprises:

(a) means for designating an original signal or an original signal line in a logic circuit diagram;

(b) means for tracing a plurality of signal lines associated with the designated original signal or original signal line and for changing a display attribute of the plurality of traced signal lines from that of other untraced signal lines; and

(c) means for displaying the traced signal lines in a way visually distinguishable from the other untraced signal ines in a logic circuit diagram in accordance with the display attribute.

4,855,727

ELECTROCHROMIC DISPLAY HAVING A DIELECTRIC LAYER

Soji Tsuchiya, Tsukui; Yoshimasa Ito, Tokyo; Sadashi Higuchi, Kawasaki, and Akio Yamashita, Tsukui, all of Japan, assignors to Matsushita Electric Industrial Company, Ltd., Kadoma, Japan

Continuation of Ser. No. 505,173, Jun. 17, 1983, abandoned. This application Jun. 16, 1986, Ser. No. 874,829
Claims priority, application Japan, Jun. 18, 1982, 57-105904
Int. Cl.[4] G09G *3/34*
U.S. Cl. 340—785 **7 Claims**

1. An electrochromic display device comprising,

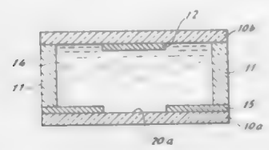
a pair of first and second, opposed insulative substrates,

a layer of an electrochromic substance sandwiched between said substrates,

a transparent display electrode on said first substrate, and

a counter electrode on said second substrate, said counter

electrode including a dielectric region having an area substantially equal to the area of said display electrode in



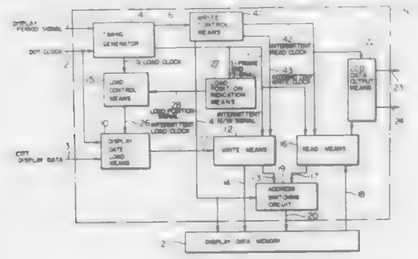
opposed relationship with said display electrode and a conductive region surrounding said dielectric region.

4,855,728

METHOD AND APPARATUS FOR CONVERTING DISPLAY DATA FORM

Hiroyuki Mano, Yokohama; Tsuguji Tachiuchi, Odawara; Kiyoshige Kinugawa, Chiba, and Shinji Tanaka, Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Jun. 1, 1987, Ser. No. 56,128
Claims priority, application Japan, May 30, 1986, 61-123421
Int. Cl.[4] G09G *3/36*
U.S. Cl. 340—805 7 Claims



1. A method of converting input display data organized into frames of data oriented to a cathode ray tube display apparatus into converted display data for display by a panel type display apparatus, comprising the steps of:

forming said input display data for a frame of data into multi-bit segments through serial-to-parallel conversion;

writing one segment of data out of each group of N segments of said frame of input display data (where N is a natural number larger than one) into display data memory means during each frame scanning time by successively selecting during each N successive frame scanning times a different corresponding segment of data in successive groups of N segments of said input display data; and

retrieving each segment of data from said display data memory means to form said converted display data.

4,855,729

COMMUNICATION CONTROL SYSTEM OF FLUID CONTROL VALVE

Kunihiko Takeuchi, Kawasaki; Fujio Babe, and Yasuo Shimomura, both of Tokyo, all of Japan, assignors to Tokyo Keiki Company Ltd., Tokyo, Japan

Filed Feb. 9, 1987, Ser. No. 12,654
Claims priority, application Japan, Feb. 10, 1986, 61-27524
Int. Cl.[4] G08B *21/00;* H04Q *9/12*
U.S. Cl. 340—825.05 4 Claims

1. A communication control system of fluid control valves, comprising:

a central unit;

a plurality of terminal units which are provided integrally with or near fluid control valves; and

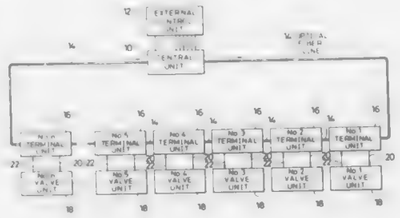
an optical fiber line for connecting said central unit with said plurality of terminal units in a loop form,

wherein said central unit has

(a) data transmitting means for converting control data including control instructions and terminal addresses based on a plurality of valve control signals which are output in parallel from an external control unit into a serial optical signal and for transmitting said serial optical signal to said optical fiber line, and

(b) data receiving means for receiving the optical signal from the final terminal unit disposed at the final position of said loop connection, for interpreting data included in said reception data and indicative of the operating state of a terminal apparatus, and for outputting this data to said external control unit,

and each of said terminal units has



(i) data transmitting/receiving means for receiving the optical signal which is derived through said optical fiber line, for converting this optical signal into the reception optical data, for converting said reception optical data into the serial optical signal synchronously with the detection of the end of reception of said reception data, and for outputting the serial optical signal to the optical fiber line at the post stage,

(ii) address discriminating means for outputting a control signal corresponding to a control instruction bit in said reception optical data to the fluid control valve when the coincidence of the self address is detected from said reception optical data, and

(iii) data changing means for changing the control instruction bit in said reception optical data into the detection data indicative of the operating state of the terminal apparatus due to the fluid control valve when the coincidence of the self address is detected by said address discriminating means, and for allowing said detection data to be transmitted from said data transmitting/receiving means.

4,855,730

COMPONENT AUDIO/VIDEO SYSTEM WITH TIMED CONTROL OF PLURAL PERIPHERAL DEVICES

Howard W. Venners, Indianapolis; Billy W. Beyers Jr., Greenfield, and James E. Hailey, Indianapolis, all of Ind., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed May 8, 1987, Ser. No. 48,107
Int. Cl.[4] H04Q *9/00;* G08C *23/00*
U.S. Cl. 340—825.24 4 Claims

1. A component audio/video system, comprising:

system controller means having an input/output port connected to a plurality of audio/video components, each for processing at least one of an audio and a video signal, via a bidirectional data bus;

system master clock means coupled to said system controller means for supplying present time information thereto;

keyboard means coupled to said system controller means for supplying, in response to activation by a user, a sequence of device commands and time information for selecting ones of said components for control in various operating modes at future times; and

memory means in said system controller means for storing said sequence of device commands and said time information;

said system controller means causing, at said future times to transmit said sequence of device commands stored in said memory means via said bidirectional data bus to said selected ones of said components for controlling said operating modes thereof;

said components each including means for generating a return status message indicating a present operating mode thereof;

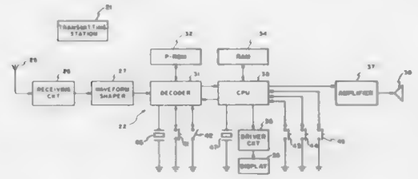
said system controller means being responsive subsequent to transmission of a command of said sequence for monitoring said bus for detecting a received return status message from one of said selected components and in response to said status message for selectively (1) re-transmitting the last command, (2) interrupting the command transmission and (3) transmitting a further command in the command sequence.

4,855,731

PAGER RECEIVER CAPABLE OF AVOIDING AN UNPLEASING INTERRUPTION OF A DISPLAYED MESSAGE

Shigeo Yoshizawa; Takashi Ohyagi; Takashi Oda, and Toshihiro Mori, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Division of Ser. No. 59,207, Jun. 2, 1987, Pat. No. 4,769,641, which is a continuation of Ser. No. 656,087, Sep. 28, 1984, abandoned. This application Mar. 1, 1988, Ser. No. 162,665
Claims priority, application Japan, Sep. 30, 1983, 58-180383; Sep. 30, 1983, 58-180386
Int. Cl.[4] H04B *5/04*
U.S. Cl. 340—825.440 4 Claims



1. A pager receiver successively operable in response to a call number signal followed by a message signal carrying message information to visually display said message information on a display unit, said message signal being successively received in a reception order, said pager receiver comprising:

first memory means having a plurality of sectors each of which is specified by a sector number for successively storing each message information by searching for unused ones of said sectors;

second memory means having a plurality of files each of which is specified by a file number for storing, in each file, the sector numbers of the sectors assigned to each message information;

third memory means having a plurality of sections for storing, in each section, the file number of each message information in said reception order of the message information successively received;

fourth memory means for storing sector status signals which represent whether or not said sectors are used;

fifth memory means for storing file status signals which represent whether of not said files are used; and

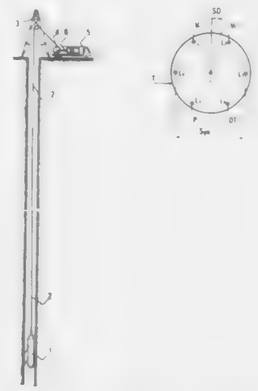
processing means coupled to said first, second, third. fourth, fifth memory means for processing each message information to provide displays on said display unit with reference to said sector numbers, file numbers, sector status signals, and file status signals.

4,855,732

SYSTEM FOR THE TRANSMISSION OF SIGNALS BETWEEN A RECEPTION ASSEMBLY LOWERED INTO A WELL AND A CENTRAL CONTROL AND RECORDING LABORATORY

Jacques Cretin, Parly, and Daniel Saussier, Epone, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Mar. 28, 1988, Ser. No. 174,354
Claims priority, application France, Mar. 27, 1987, 87 04.365
Int. Cl.[4] G01V *1/40;* H01P *3/06*
U.S. Cl. 340—856 7 Claims



1. In a system for connecting a probe lowered in a well to a control and recording unit outside the well through a multiconductor supporting cable for transmission of signals and electric current:

said probe including:

a first sensor means and a second sensor means;

an acquisition device for collecting signals picked up by said first sensor means;

means for digitizing and for translating the collected signals into a coded form; and

a motor means;

said multi-conductor cable including a central conductor, a plurality of external conductors disposed around said central conductor and an outer metal sheath surrounding said external conductors;

said system comprising:

a further means including said external conductors for transmitting signals from said second sensor means to said control and recording unit and for transmitting control signals from said control and recording unit to said probe;

generating means outside the well connected with at least one of said external conductors for supplying operating power to said motor means in said probe;

coding means in said probe for conversion of digitized signals in accordance with a bipolar code; and

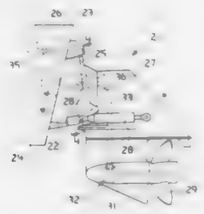
a decoding means in said control and recording unit with output signals from said coding means being connected between said central conductor and said outer metal sheath for transmission of coded signals to said decoding means whereby to provide an increased flow rate of coded signals through said cable.

4,855,733

INCLINATION DETECTOR ADJUSTING DEVICE FOR VESSEL PROPULSION UNIT

Takashi Koike, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 6, 1988, Ser. No. 216,089
Claims priority, application Japan, Jul. 9, 1987, 62-171924
Int. Cl.[4] G08B *1/08*
U.S. Cl. 340—870.19 11 Claims



1. A position sensing device for providing an indication of the position of a member of an outboard drive comprising a position sensing device having a first portion adapted to be adjustably connected to one component of said outboard drive and a second portion adapted to be affixed to another component of said outboard drive, said sensor portions being relatively moveable for providing a variable output signal indicative of the relative positions of said outboard drive components, and a power supply for applying a source of power to said position sensing device, the improvement comprising means for determining if the position sensing device is in a first position within a predetermined range and for amplifying the output of said position sensing device if within said preset range for providing fine adjustment thereof.

4,855,734

RELATIVE POSITION INDICATION SYSTEM

Norbert W. Elsdoerfer, Warwick, R.I., assignor to International Machine & Tool Corporation, Warwick, R.I.

Filed Mar. 29, 1988, Ser. No. 175,488
Int. Cl.[4] G08C *19/16*
U.S. Cl. 340—870.310 16 Claims



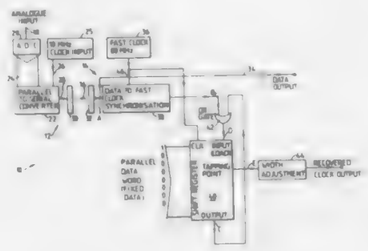
1. In a system for determining the relative positions of a pair of first and second members as said first member is moved in either a positive direction or a negative direction along a predetermined path of movement relative to said second member, said system comprising a cyclical position sensor including a first portion securable in effectively fixed relation to said first member and a second portion securable in effectively fixed relation to said second member, said first portion including cycle means for defining a uniform pattern of sequential cycles thereon and for generating a corresponding pattern of cycle signals therefrom, one of said cycles defining a zero cycle, each of said cycles being divided into a plurality of uniform segments, means defining a zero position station on said second portion, sequential cycles on said first portion sequentially passing adjacent said zero position station when said first and second portions are secured to said first and second members, respectively, and said first member is moved along said predetermined path relative to said second member, said system further comprising cycle position means responsive to said cycle means for determining the relative position between said first and second members within the cycle located adjacent the zero position station at any given time and summing means for determining the sum total of the number of cycles passing adjacent said zero position station in a positive direction minus the number of cycles passing adjacent said zero position station in a negative direction, the improvement comprising pulse means including pulse generating means and pulse sensing means, one of said pulse generating means or said pulse sensing means being effectively fixed with respect to said first portion, the other of said pulse generating means or said pulse sensing means being effectively fixed with respect to said second portion, said pulse generating means and said pulse sensing means cooperating to transmit and receive a pulse signal at at least one predetermined location when they are in a predetermined relative position, said predetermined relative position corresponding to a position wherein said zero cycle is aligned with said zero position station, and means responsive to said pulse sensing means for resetting said summing means to an initialized value without resetting said cycle position means each time said zero cycle is aligned with said zero position station.

4,855,735

RECOVERY OF DATA CLOCK SIGNALS

Peter D. Webb, Derby; Peter Russhard, Nottingham, and Lee Mansfield, Derby, all of England, assignors to Rolls-Royce PLC, London, England

Filed Oct. 30, 1987, Ser. No. 114,733
Claims priority, application United Kingdom, Dec. 6, 1986, 8629219
Int. Cl.[4] G08C *15/12*; H04J *3/06*
U.S. Cl. 340—870.140 10 Claims



1. Apparatus for recovering a data clock signal from a serial data stream, successive like data edges of which may be separated by multiples of the data clock signal period, comprising:
(a) high speed clock means for producing clock pulses at a high frequency which is a whole number multiple n of the frequency of the data clock signal to be recovered;
(b) synchronizing means for synchronizing a preselected data edge of each successive logical one data bit with one of the high frequency clock pulses and outputting a synchronized data pulse each time said synchronizing occurs;
(c) shift register means clocked by said high speed clock means and having input means and output means, the output means being connected to the input means for recirculating data bits through the shift register means, the shift register means having a length of x times n bits, where x is a positive integer;

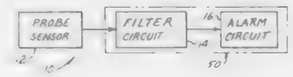
(d) OR gate means, having an output connected to said shift register input means, for receiving the synchronized data pulses and the recirculating bits from the output means of the shift register means and outputting a logical one bit to the shift register means each time said OR gate means receives at least one of said synchronized data pulses and said recirculating bits; and
(e) further output means for outputting bits from said shift register means such that said output bits constitute a series of pulses representing said data clock signal.

4,855,736

ELECTRONIC PARKING SENSOR APPARATUS

Chi-Heng Hsu, 8-2 Alley 48, Lane 278, Yung-Chi Rd., Taipei R.O.C., Taiwan

Filed Jun. 3, 1988, Ser. No. 202,121
Int. Cl.[4] G08G *1/00*; B60Q *1/00*
U.S. Cl. 340—901 27 Claims



1. A vehicle detector apparatus for warning an operator of an impending obstruction, comprising:
(a) a base adapted for attachment to an existing external structure of the vehicle;
(b) a probe having an arm for contacting the obstruction, the arm having a first end proximate the base and a second end, the second end being capable of deflecting relative to the base when contacting the obstruction;
(c) means for producing a contact signal upon the occurrence of a predetermined deflection of the second end of the arm;
(d) filter means for producing a warning signal in response to the contact signal, the filter means being adapted for preventing occurrence of the warning signal in response to spurious occurrences of the contact signal, the filter means being further adapted for terminating the warning signal after a predetermined continuous occurrence of the contact signal; and
(e) transducer means for indicating the warning signal to the operator.

4,855,737

TRACK CIRCUIT SIGNALLING ARRANGEMENT

Damian M. Poole, Timperley, United Kingdom, assignor to General Signal Corporation, Stamford, Conn.

Filed Jul. 27, 1987, Ser. No. 77,831
Claims priority, application United Kingdom, Aug. 4, 1986, 8619013
Int. Cl.[4] G08G *1/01*; B61L *29/00*
U.S. Cl. 340—933 5 Claims

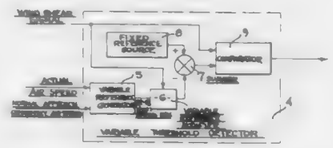
1. A track circuit signalling arrangement wherein a carrier signal transmitted along rails is modulated with a pseudo-random binary sequence, said arrangement comprising: a correlator for correlating a received said binary sequence against a stored sequence, said correlator comprising a multistage shift register to which said received signal is applied serially, an output from each stage of said shift register being connected to one or other of two lines in a predetermined pattern of connections said pattern of connections constituting said stored sequence, and output means connected to said two lines for providing an indication of the correspondence between said received sequence and said stored sequence.

4,855,738

VARIABLE THRESHOLD WIND SHEAR WARNING SYSTEM

Leonard M. Greene, White Plains, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.

Filed Jul. 31, 1987, Ser. No. 79,905
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—968 5 Claims



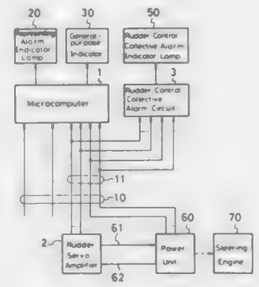
1. An improved aircraft wind shear warning system for warning of hazardous wind shear conditions during an aircraft landing approach of the type having means for generating a signal representing the rate of change of the instantaneous airspeed of the aircraft, means for generating a signal representing the horizontal inertial acceleration of the aircraft, means for subtracting the horizontal inertial acceleration signal from the rate of change of the instantaneous airspeed signal to provide a wind shear signal representing wind shear and warning device means for generating a warning signal wherein the improvement comprises:
means for generating a warning threshold the value of which warning threshold is negative and the magnitude of which warning threshold is the arithmetic combination of a pre-selected negative constant and a variable number which variable number is a function of the excess, if any, of the airspeed of the aircraft over a normal approach reference airspeed and which variable number is adjusted in response to the wind shear signal; and
detector means responsive to the wind shear signal for actuating said warning device means when the wind shear signal is more negative than said warning threshold.

4,855,739

MARINE AUTOPILOT APPARATUS

Toshio Miyayama; Isao Masuzawa, both of Kuroiso, and Nakayasu Hirono, Yokohama, all of Japan, assignors to Tokyo Keike Co., Ltd., Tokyo, Japan

Filed Jul. 17, 1987, Ser. No. 74,884
Claims priority, application Japan, Jul. 28, 1986, 61-177375
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—984 2 Claims



1. A marine autopilot apparatus comprising:
(a) microcomputer means for controlling a rudder control loop formed of at least a rudder servo amplifier and a power unit including means for detecting an abnormality at any one of a plurality of alarm points within said rudder

control loop, and means for detecting various abnormalities at a plurality of alarm points other than said plurality of alarm points within said rudder control loop and for providing signals indicative of the respective abnormality;

(b) representing alarm indicator lamp means responsive to said signals for classifying all of the occurring abnormalities into a single or plurality of groups in accordance with the degree of emergency thereof and for collectively indicating said abnormalities in the form of said single or plurality of groups;

(c) general-purpose indicator means responsive to said signals for sequentially indicating various data at least concerning the steering, set values and an independent content of said abnormality; and

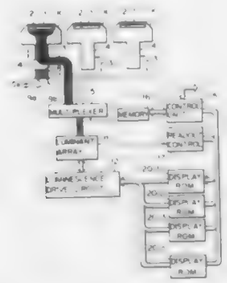
(d) rudder control collective alarm indicator means responsive to the plurality of alarm points only within said rudder control loop and driven when at least one of said plurality of alarm points only within said rudder control loop evidences an abnormal condition so as to provide an alarm indicating the occurrence of an abnormality in said rudder control loop independently of the representing alarm indicator means.

4,855,740

KEYBOARD

Toshihiro Muramatsu; Kenzaburou Iijima, and Yoshinori Hayashi, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

Filed Sep. 25, 1987, Ser. No. 101,141
Claims priority, application Japan, Oct. 1, 1986, 61-233757
Int. Cl.[4] G06F *3/02*
U.S. Cl. 341—23 3 Claims



1. An improved keyboard comprising

a plurality of keys arranged in a matrix array for displaying selected character patterns,

a character pattern indicator mounted atop each of said keys, each of said character pattern indicators including a plurality of dot indicators arranged in a matrix array for forming an image of a selected character pattern,

a plurality of memories each storing a series of character patterns of a key arrangement mode,

selecting means for selecting one of said memories in accordance with operator's instruction, and

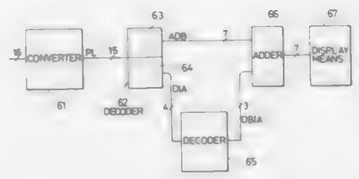
transmitting means for transmitting a series of character patterns from one of said memories to corresponding ones of said character pattern indicators for visual indication of said character patterns by selected ones of said dot indicators, said transmitting means including a single multiplexer for sequentially transmitting said character patterns from one of said memories to each of said character pattern indicators of said keyboard at a sufficient rate whereby a viewer has the visual impression that said character patterns are concurrently received by said character pattern indicators.

4,855,741

LOGARITHMIC DIGITAL LEVEL DISPLAY DEVICE

Hiroshi Iizuka, and Shizuo Kakiuchi, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 19, 1987, Ser. No. 87,112
Claims priority, application Japan, Aug. 19, 1986, 61-195059
Int. Cl.[4] H03M *7/50*
U.S. Cl. 341—75 13 Claims



1. A digital level display device, comprising:

a first decoder for producing a first signal corresponding to a binary-coded decimal (BCD) representation of a logarithm of a value of a digital signal within a range;

a second decoder for producing a second signal representing a level within said range and corresponding to a BCD representation of said logarithm of said level;

an adder for adding said first and second signals to each other and providing an output accordingly; and

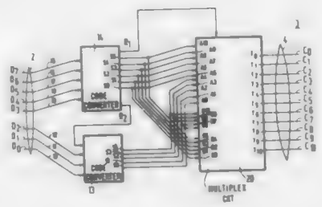
a display circuit for displaying a level of said digital signal corresponding to said output of said adder.

4,855,742

METHOD OF TRANSMITTING N-BIT INFORMATION WORDS, INFORMATION TRANSMISSION SYSTEM FOR CARRYING OUT THE METHOD, AND ENCODING DEVICE AND DECODING DEVICE FOR USE IN THE INFORMATION-TRANSMISSION SYSTEM

Johannes J. Verboom, Colorado Springs, Colo., assignor to Optical Storage International Holland, Eindhoven, Netherlands

Filed Nov. 9, 1987, Ser. No. 119,463
Claims priority, application Netherlands, Dec. 12, 1986, [illegible]
Int. Cl.[4] H03M *7/20*
U.S. Cl. 341—102 7 Claims



1. A method of transmitting n-bit information words, such method comprising encoding each information word to be transmitted by converting it into an m-bit code word, m being greater than n; transmission of the m-bit code word, and decoding the received m-bit code word by reconverting it into an n-bit information word; characterized in that for a first group of the information words to be transmitted, a predetermined first portion comprising p-bits of each such information word is converted into a predetermined first group of q bits of an m-bit code word, and a predetermined second portion comprising r-bits of such information word is converted into a predetermined second group of s-bits of such code word; and for a second group of the information words to be transmitted,

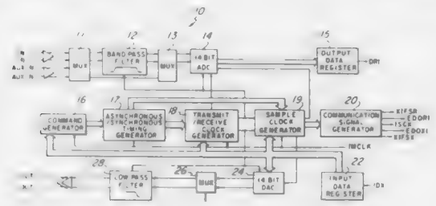
a predetermined first portion comprising p-bits of each such information word is converted into a predetermined second group of q-bits of an m-bit code word, and a predetermined second portion comprising r-bits of such information word is converted into a predetermined first group of s-bits of such code word; whereby the groups of q-bits and s-bits in each code word are combined in accordance with whether the information word represented by such code word is in said first or said second group of information words.

4,855,743

ANALOG INTERFACE SYSTEM

Richard K. Hester, Whitewright, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 9, 1987, Ser. No. 130,840
Int. Cl.[4] H03M *1/00, 1/02*
U.S. Cl. 341—110 10 Claims



1. An analog interface system for interfacing with digital signal processing means having control input means and data bus means, comprising:

(a) an input interface circuit coupled to the data bus means, the input interface circuit including:

a data input, first translating means having an input connected to the data input and having an output, the first translating means performing a selectable translation of the form of data from the data input to produce translated data at the output, first memory means connected to receive the translated data from the output of the first translating means, the first memory means having an output to the data bus means;

(b) an output interface circuit coupled to the data bus means, the output interface circuit including:

second memory means having an input connected to the data bus means and an output, second translating means connected to receive the output of the second memory means, adapted to perform a selectable translation of the form of data from the output of the second memory means to produce translated data at an output, a data output coupled to the output of the second translating means; and

(c) control means connected to the control input means for sending commands to the digital processing means, the commands including commands to transmit and receive data.

4,855,744

ANGLE DIGITIZER

Anthony D. Sayers, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

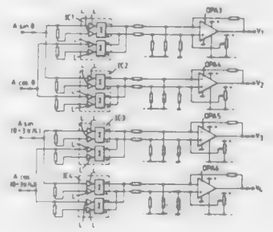
Continuation of Ser. No. 122,825, Nov. 19, 1987, abandoned.
This application Nov. 1, 1988, Ser. No. 266,345
Claims priority, application United Kingdom, Dec. 23, 1986, 8630815
Int. Cl.[4] H03M *1/64*
U.S. Cl. 341—116 20 Claims

1. A system for producing a digital representation of the value of an angle θ from two first analogue quantities respectively representative of A sin θ and A cos θ, where A is an amplitude factor, comprising

first means for deriving from the two first analogue quantities a plurality of n second analogue quantities which are functions of θ such that in each of n contiguous portions of a total angular range for θ of 2π radians, each portion extending over $2\pi/n$ radians, the value of a respective third analogue quantity which is derivable from two of the second quantities and which is independent of A lies within a predetermined range of values,

second means, comprising comparison means, for deriving from the second analogue quantities a first digital quantity representative of which one of the n portions the value of θ lies in,

third means for deriving a second digital quantity representative of the value of the respective third analogue quantity whose value lies within said predetermined range of values and thereby being representative of the value of θ within said one portion, said third means comprising selection means controlled by said first digital quantity and analogue-to-digital conversion means, and



fourth means for deriving from the first and second digital quantities a digital representation of θ,

wherein the improvement comprises:

said third means comprising amplifier means operable to produce a plurality of n fourth analogue quantities respectively substantially representative of the logarithms of the second analogue quantities over at least a range of values thereof, and addition and/or subtraction means for deriving from the fourth analogue quantities each of the third analogue quantities the value of each of which lies within said predetermined range of values in at least one respective portion of the angular range for θ of 2π radians, the third analogue quantities being representative of the logarithms, over at least a range of values thereof, of quotients of respective pairs of the second analogue quantities.

4,855,745

HIGH RESOLUTION ANALOG-TO-DIGITAL CONVERTER

Miles A. Smither, 6955 Santa Fe Dr., Houston, Tex. 77061

Filed Oct. 14, 1987, Ser. No. 108,727
Int. Cl.[4] H03M *1/12*
U.S. Cl. 341—156 18 Claims

1. An apparatus for converting an analog input signal into a digital signal, comprising:

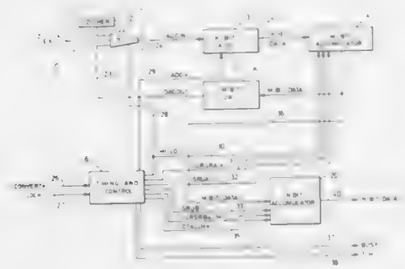
(a) a K-bit analog-to-digital converter (ADC) for converting analog signals into a K-bit digital signal, where K is an integer;

(b) an M-bit accumulator, operatively coupled to said K-bit ADC, where M is an integer, for accumulating said K-bit digital signals in at least one set of bit locations, each set having K-bits, said accumulator also providing an M-bit digital output;

(c) an M-bit digital-to-analog converter (DAC) operatively coupled to said M-bit accumulator, said M-bit DAC adapted to receive and convert said M-bit digital output into an analog feedback signal;

(d) circuit means for passing said input signal through said K-bit ADC for accumulation of the resulting K-bit digital signal in a set of bit locations in said M-bit accumulator;

(e) a difference amplifier operatively coupled to said K-bit ADC for amplifying the difference between said input signal and said feedback signal and passing the amplified difference through said K-bit ADC for accumulation of the resulting K-bit digital signal in a set of bit locations in said M-bit accumulator; and



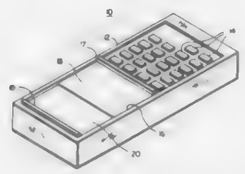
(f) an N-bit accumulator, where N is an integer greater than M, operatively coupled to said M-bit accumulator, said N-bit accumulator adapted to receive and successively add said M-bit digital output to provide a digital signal output having higher resolution than the resolution of said M-bit digital output.

4,855,746

MULTIPLE DEVICE REMOTE CONTROL TRANSMITTER

Carl W. Stacy, Elmwood Park, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 30, 1984, Ser. No. 635,857
Int. Cl.[4] G08C *19/00*
U.S. Cl. 341—176 **5 Claims**



1. A remote control transmitter for selectively transmitting signals for controlling at least two different devices comprising:

a housing;

a first plurality of keys on said housing for activating functions common to said devices, some of said first plurality of keys being capable of activating two different control functions;

a second and third plurality of keys on said housing for activating functions individual to said devices;

cover means on said housing for prohibiting simultaneous access to said second and to said third plurality of keys;

an integrated circuit for generating coded control signals; and

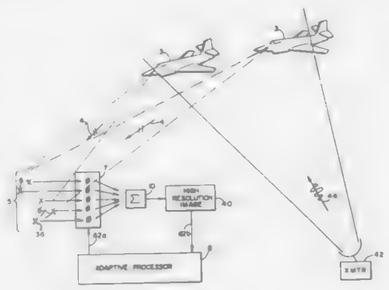
means, including switch means operable by movement of said cover means, for enabling transmission of different coded control signals for activating said different devices and said different control functions by changing connections between said integrated circuit and certain of said keys.

4,855,747

METHOD OF TARGET IMAGING AND IDENTIFICATION

Bernard D. Steinberg, Wyndmoor, Pa., assignor to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Aug. 17, 1987, Ser. No. 86,695
Int. Cl.[4] G01S *13/90*
U.S. Cl. 342—179 **4 Claims**



1. A method of imaging and identifying moving targets comprising the steps of:

(A) Illuminating said moving targets with an Inverse Synthetic Aperture RADAR (ISAR) system, the steps of illuminating said moving target with said ISAR comprising:

(i) Energizig a RADAR transmitter;

(ii) Irradiating said moving target travelling with a velocity V for a time T with a plurality of pulses from said RADAR transmitter such that a synthetic aperture is obtained;

(B) Receiving backscattered echoes containing phase information from the target and phase distortion due to target perturbation from said illumination of the target with a phased array receiver means;

(C) Performing Adaptive Beam Forming (ABF) on said echoes to obtain self-coherence after said echoes have been received by said phased array, the steps of ABF comprising:

(i) Measuring and storing complex waveform envelopes of said echoes;

(ii) Searching said complex wave-form envelopes for an envelope of constant phase and amplitude;

(iii) Phase rotating said envelope of constant phase and amplitude in relation to a predetermined reference element of said phased array;

(iv) Focusing said phased array by phase rotating each remaining complex waveform envelope in relation to said envelope of constant phase and amplitude;

(v) Imparting a linear phase rotation to all phase rotated complex wave-form envelopes;

(vi) Summing said linear phase rotated complex wave-form envelopes;

(vii) Allowing said phased array to scan said target for additional backscattered echoes;

(viii) Employing a feedback loop with an adaptive processor to focus all of the complex wave-form envelopes;

(ix) distinguishing the target's phase information from the target's phase distortion due to target perturbation with the feedback loop having an adaptive processor such that the sum of the linear phase rotated complex wave-form envelopes and the additional backscattered echoes form a highly resolved signal; and

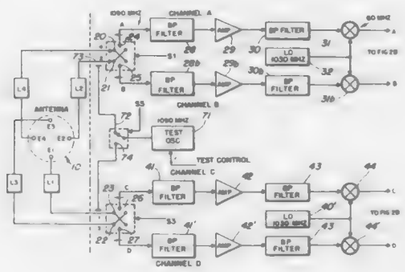
(D) Optically displaying said highly resolved signal.

4,855,748

TCAS BEARING ESTIMATION RECEIVER USING A 4 ELEMENT ANTENNA

Ruy L. Brandao, Ft. Lauderdale; Constantinos S. Kyriakos, Boca Raton; Randall C. Spires, Ft. Lauderdale, and Andrejs Jugs, Boca Raton, all of Fla., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Mar. 18, 1988, Ser. No. 170,227
Int. Cl.[4] G01S *3/02*
U.S. Cl. 342—455 **16 Claims**



1. A direction finding antenna system for determining the relative bearing of an intruder aircraft from a protected aircraft in conjunction with a Traffic Alert Collision Avoidance System (TCAS), the intruder aircraft being equipped to transmit signals received by said antenna system, comprising

first and third spaced apart antennas mounted aboard the protected aircraft;

first and third receivers aboard the protected aircraft for amplifying, converting and limiting the signals received by said first and third antennas;

first switching means at the inputs to said first and third receivers for interchangeably applying the signals received by said first and third antennas to the inputs of said first and third receivers;

second switching means at the outputs of said first and third receivers;

a first phase detector having a reference phase input and a variable phase input,

said inputs to said first phase detector being connected to said second switching means,

said second switching means operating in synchronism with said first switching means so that in a first position of said first switching means signals from said first and third antennas are applied to said first and third receivers, respectively, and in a first position of said second switching means the outputs of said first and third receivers are applied respectively to said reference phase and said variable phase inputs to said first phase detector and in a second position said first switching means signals from said first and third antennas are applied to the inputs of said third and first receivers, respectively, in a second position of second switching means the outputs of said third receiver and said first receiver are applied respectively to said reference phase and variable phase inputs to said first phase detector; and

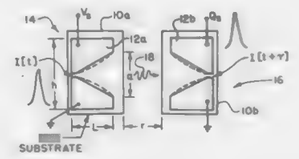
first means for processing the outputs of said first phase detector obtained in alternate operations of said first and second switching means to eliminate the errors therein caused by a difference between the phase delays of signals passing through said first and third receivers, the result of said processing means being a first quantity related to the relative bearing to the intruder aircraft from the protected aircraft.

4,855,749

OPTO-ELECTRONIC VIVALDI TRANSCEIVER

Alfred P. DeFonzo, Amherst, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 26, 1988, Ser. No. 160,736
Int. Cl.[4] H01Q *1/38*
U.S. Cl. 343—767 **10 Claims**



1. A planar integrated opto-electronic transceiver apparatus comprising in combination:

a first silicon on sapphire substrate with a first tapered slot line antenna deposited on the surface of the silicon epilayer, said first slot line antenna having a narrow slot at one end and a large aperture at its other end, said first slot line antenna having a predetermined overall length, said first slot li-ne antenna receiving a DC bias, said first slot line antenna receiving an optical pulse signal at said narrow slot which causes an electromagnetic transient to propagate down said first slot line antenna towards its aperture, said electromagnetic transient is radiated from said aperture of said first slot line antenna, and,

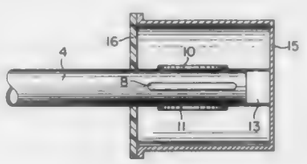
a second silicon on sapphire substrate with a second tapered slot line antenna deposited on the surface of the silicon epilayer, said second slot line antenna having a narrow slot at one end and a large aperture at its other end, said second slot line antenna having a predetermined overall length, said second slot line antenna receiving a DC bias, said second slot line antenna receiving said electromagnetic transient at said aperture of said second slot antenna, said electromagnetic transient is propagated down said second slot line antenna towards said narrow slot, said electromagnetic transient is detected and time resolved at said narrow slot by a photoconductive signal which is applied to said narrow slot.

4,855,750

DIPOLE EXCITER FOR AN ANTENNA

Reimer Nagel, and Ralf Wendel, both of Hanover, Fed. Rep. of Germany, assignors to kabelmetal electro Gesellschaft mit beschränkter Haftung, Hanover, Fed. Rep. of Germany

Filed Aug. 22, 1988, Ser. No. 234,814
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1987, 3735226
Int. Cl.[4] H01Q *13/10*
U.S. Cl. 343—770 **6 Claims**



1. A dipole exciter for an antenna with parabolic reflector for transmitting electromagnetic waves, comprising:

a rigid coaxial line fastened at one end to the reflector and having an inner conductor, an outer conductor concentri-

cally surrounding said inner conductor, and a dielectric contained between the two conductors;

a dipole connected in electrically conductive manner with the outer conductor, said dipole being disposed on a free end of the outer conductor and being situate approximately at the focal point of the reflector; and wherein

two axially extending slots are formed on the outer conductor, the slots lying diametrically opposite each other and being arranged within the region of the dipole, the inner and the outer conductors being short-circuited at a narrowly limited place in circumferential direction in the region of the slots, the improvement wherein

the dipole comprises two flat metal pieces which lie in spaced-apart planes diametrically opposite each other on the outer conductor and extend parallel to each other, the wall thickness of each metal piece being small as compared with its other dimensions; and wherein

the two metal pieces are arranged on the outer conductor each with its main dimension extending tangentially to the outer conductor and parallel to an axis of the coaxial line.

4,855,751

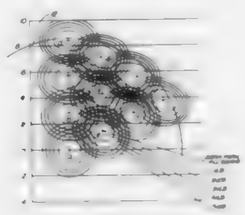
HIGH-EFFICIENCY MULTIBEAM ANTENNA

Paul G. Ingerson, Torrance, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 47,568, Apr. 22, 1987, which is a continuation of Ser. No. 491,004, May 3, 1983. This application Jun. 14, 1988, Ser. No. 210,140

Int. Cl.[4] H01Q *3/24*

U.S. Cl. 343—779 **10 Claims**



1. A multibeam antenna system, comprising:

a single antenna aperture element for producing a plurality of secondary beams of radiation from an equal plurality of primary beams of radiation impinging on said aperture element; and

a plurality of antenna feed horns positioned in an array to produce the plurality of primary radiation beams;

wherein said aperture element and said antenna feed horns are configured to be non-focused, the degree of non-focusing and the aperture size of said feed horns being selected to maximize the gain of the antenna system and to produce the secondary radiation beams as diverging beams with a desired beamwidth at a specified power level;

and wherein the diameter of said antenna aperture element is adjusted to provide an overlap of the secondary radiation beams that produces contiguous coverage of an area by the secondary radiation beams at the specified power level, while maintaining the degree of non-focusing and the aperture size of said feed horns to preserve the maximized gain of the antenna system and the beamwidth of the secondary radiation beams.

4,855,752

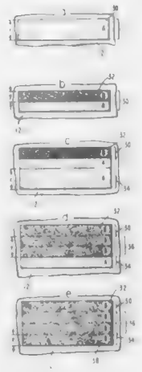
METHOD OF IMPROVING DOT-ON-DOT GRAPHICS AREA-FILL USING AN INK-JET DEVICE

Donald B. Bergstedt, Escondido, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 57,130, Jun. 1, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 256,174

Int. Cl.[4] G01D *15/16;* **B41J** *3/04*

U.S. Cl. 346—1.1 **16 Claims**



1. An improved method or generating dot-on-dot graphics area fill on a print medium using an ink-jet device, said device including at least one printhead having a set of primitives, each primitive comprising a plurality of adjacent nozzles one dot apart fluidically connected to a reservoir of a given color, said method comprising:

(a) printing a first swath of a first color by ejecting ink through said plurality of nozzles;

(b) partially overprinting said first swath with a narrower swath of a second color such that part of said first swath is exposed as a partial swath of said first color, said overprinting being accomplished by ejecting ink through a second plurality of nozzles;

(c) printing a second swath of said first color abutting said partial swath;

(d) printing another swath of said second color over said partial swath and an adjacent portion of said second swath of said first color;

(e) repeating steps (c) and (d) until said graphic area is completely colored; and

(f) finally overprinting any remaining narrow swath of said first color with a partial swath of said second color.

4,855,753

METHOD OF INK JET RECORDING AND INK JET RECORDING APPARATUS

Kyoko Ichikawa, Tokyo; Makoto Aoki, and Hideo Takiguchi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1988, Ser. No. 209,330

Claims priority, application Japan, Jun. 19, 1987, 151337; Sep. 12, 1987, 227574; Sep. 25, 1987, 240279; Jun. 17, 1988, 149476

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—1.1 **7 Claims**

1. A method of ink jet recording for forming a color image including a color-mixed portion by using a plurality of colored inks for at least one of which a plurality of inks having different dyestuff densities are used, said method comprising:

compensating OD value data concerning discharge of ink in accordance with a rate of change in the OD value of an

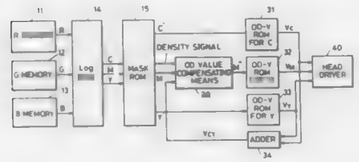


image due to a change in the amount of ink supplied and a total amount of ink supplied per picture element.

4,855,754

CONTROL DEVICE FOR AN IMAGE RECORDER

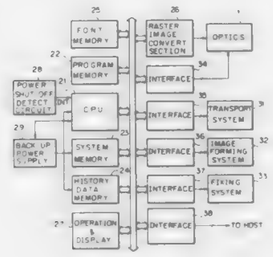
Hidetake Tanaka, and Yasushi Nakazato, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1987, Ser. No. 74,280

Claims priority, application Japan, Jul. 21, 1986, 61-110631[U]

Int. Cl.[4] G01D *9/00*

U.S. Cl. 346—17 **2 Claims**



1. A control system for an image recorder having components including a replaceable photoconductive element and means for feeding sheets to the photoconductive member to thereby print images on said sheets comprising:

first detecting means for detecting selected kinds of failures in the operation of selected ones of said components and for providing failure signals related to the detected failures;

second detecting means for detecting the replacement of said photoconductive member in said image recorder and for providing replacement signals indicative of the replacement of said photoconductive member;

a counter counting the number of sheets fed to said photoconductive member and for providing a corresponding count signals;

a history data memory coupled to said first and second detecting means and to said counter to receive said failure signals, said replacement signals and said count signals and to store history data related to (i) the frequency of the replacement of photoconductive members; (ii) the respective number of sheets fed to each of a plurality of photoconductive members used in said image recorder, including the current photoconductive member and at least one previously used and now replaced photoconductive member; (iii) the number of failures of components which have occurred for each different photoconductive member comprised within said plurality of photoconductive members used in said image recorder; and (iv) the frequency of occurrence of each different kind of a selected plurality of kinds of failures; and

display means coupled to said history data storing means for selectively displaying at any one time selected subsets of the history data stored therein.

4,855,755

THERMAL HEAD SUPPORTING MEANS IN THERMAL RECORDING APPARATUS

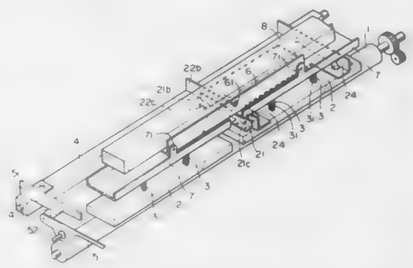
Isamu Aizawa, Tokyo, Japan, assignor to Graphtec Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,685

Claims priority, application Japan, Oct. 22, 1987, 62-266969; Oct. 22, 1987, 62-266970; Jun. 14, 1988, 63-146090

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH **4 Claims**



1. In a thermal recording apparatus in which a plurality of thermal heads provided with thermal element arrays aligned at lower surfaces of said thermal heads are made to be slidably in contact with a recording medium transported on a platen to thereby perform recording on said recording medium, means for supporting said plurality of thermal heads, said means comprising:

(A) a thermal head supporting mechanism including a plurality of single supporting units provided for correspondingly respectively supporting said thermal heads and aligned in a direction perpendicular to a direction of movement of said recording medium, each of said single supporting unit including:

(i) a pair of hook-shaped members fixed to each of said thermal heads at two places on a rear surface of said thermal head, and

(ii) a thermal head supporting member having a pair of side end portions corresponding to said pair of hook-shaped members and a plane portion between said pair of side end portions, said thermal head supporting member being engaged with said side end portions at predetermined positions thereof so as to be movable in at least two directions including a vertical direction and a rotational direction relative to the respective hook-shaped members, said plane portion having a cutaway portion formed at a predetermined position thereof and a backward edge fixedly attached to a rotatable member having a rotary shaft; and

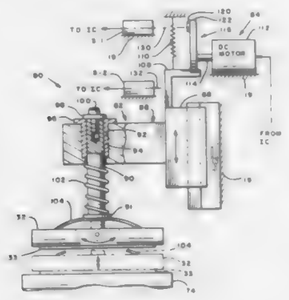
(B) a thermal head pressing mechanism including a pair of movable members each for keeping at least one head-urging compression spring at a symmetrical position on corresponding one of said thermal heads of said head supporting mechanism so as to press the rear surface of said corresponding thermal head, and further including a common movable member for keeping said pair of movable members arranged on one straight line and at symmetrical positions, said common movable member being engaged with a fixation beam member at a symmetric position.

4,855,756

THERMAL TRANSFER PRINTING APPARATUS INCLUDING MEANS FOR CONTROLLING PRINTING ON IRREGULARLY-SHAPED LETTERS

Julius Gluck, Norwalk; Patrick Murphy, Stamford, and Duc H. Tran, Bridgeport, all of Conn., assignors to Pitney Bowes, Inc., Stamford, Conn.

Filed Dec. 28, 1987, Ser. No. 138,426
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—76 PH 16 Claims



1. In apparatus for thermally transferring ink from a ribbon having backing and ink donor layers to a letter, wherein the apparatus includes a frame, a thermal printhead, a roller and controlling means connected to the frame for controlling the printhead, the printhead being disposable in a non-printing position permitting a ribbon to be located between the printhead and roller and in a printing position in which the printhead is in engagement with the backing layer of a ribbon, and wherein the roller is adapted for rotation when in engagement with a letter fed between the roller and a ribbon, an improvement for urging a ribbon and letter of non-uniform thickness into engagement with one another, the improvement wherein said controlling means comprises a first member carried by said frame and movable axially toward and away from said roller, said first member having a lower part, said printhead being pivotally mounted to said lower part,

means engaging and resiliently biasing said first member and printhead axially toward said roller, said printhead thereby resiliently urging said ribbon toward said roller,

said printhead being pivotable such that letters of non-uniform thickness can be fed between and be in continuous contact with said roller and ribbon while thermal transfer of ink occurs.

4,855,757

THERMAL PRINTHEAD WITH STATIC ELECTRICITY DISCHARGE CAPABILITY

Christopher A. Wiklof, Everett, and Gerald R. Apperson, Seattle, both of Wash., assignors to Intermec Corporation, Lynnwood, Wash.

Filed Jun. 17, 1987, Ser. No. 63,167
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH 13 Claims

1. A thermal printhead for dissipating static electric charge accumulated on the surface of the printhead, comprising:

one or more first leads;

one or more second leads;

a resistive heating element connected to at least one of the first leads and at least one of the second leads;

a thermally conductive, first electrically insulative layer formed over the resistive heating element and over the at-least-one first lead and the at-least-one second lead connected to the resistive heating element in the vicinity of their connection to the resistive heating element; and

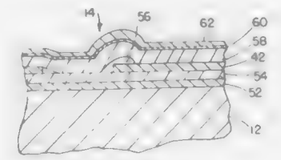
a first electrically conductive layer formed over the surface of the first electrically insulative layer, and over the resistive heating element, and connected to an electrical ground.

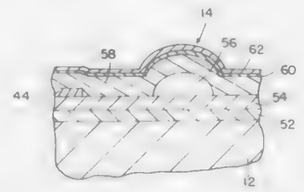
9. A thermal printhead for dissipating static electric charge accumulated on the surface of the printhead, comprising:

one or more first leads;

one or more second leads;

a resistive heating element connected to at least one of the first leads and at least one of the second leads;





a thermally conductive, first electrically insulative layer formed over the resistive heating element and over the at-least-one first lead and the at-least-one second lead connected to the resistive heating element in the vicinity of their connection to the resistive heating element;

an activating layer formed over the surface of the electrically insulative layer; and

a first electrically conductive layer formed over the surface of the activating layer, and over the resistive heating element, and connected to an electrical ground.

4,855,758

THERMAL TRANSFER RECORDING APPARATUS WITH ELECTROCONDUCTIVE INK

Nobuyuki Kuwabara, Tokyo; Kou Hasegawa, Yokohama; Hideo Sugimura, Yokohama; Kazuhiro Nakajima, Yokohama, and Haruhiko Moriguchi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1988, Ser. No. 141,765
Claims priority, application Japan, Apr. 17, 1987, 62-93274; Oct. 22, 1987, 62-265424
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—76 PH 40 Claims

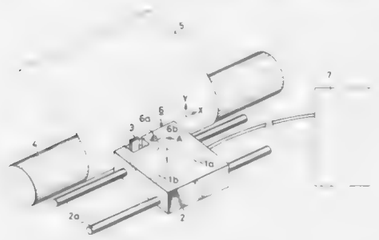
16. A thermal transfer recording apparatus for recording an image onto a medium to be recorded, comprising:

a mounting portion capable of mounting a transfer medium which has electroconductive ink on insulative base sheet;

conveying means for conveying said transfer medium mounted on said mounting portion in response to an image signal;

recording head means for heating said transfer medium in accordance with an image signal; and

an electroconductive member provided to be in physical contact with an ink surface of said transfer medium upstream of the conveying direction of said transfer medium



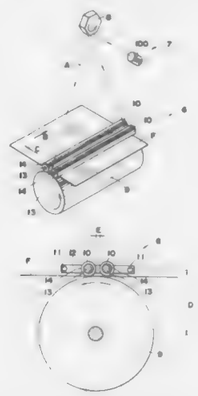
in respect of a contact position of said transfer medium and said recording means.

4,855,759

LASER SCANNING WITH AN ELASTIC NIP ROLLER

Yutaka Maeda, Isehara, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 81,136, Aug. 3, 1987, abandoned. This application Aug. 26, 1988, Ser. No. 237,625
Claims priority, application Japan, Aug. 2, 1986, 61-119124[U]
Int. Cl.[4] G01D *9/42, 15/24*
U.S. Cl. 346—108 6 Claims



1. A laser scanning apparatus comprising:

a drum rotatably mounted in the apparatus about an axis of rotation fixed in the apparatus;

at least one idle roller rotatably mounted in the apparatus about an axis of rotation fixed in the apparatus relative to the axis of rotation of said drum, each said at least one idle roller contacting said drum so as to be driven by said drum when said drum rotates for transporting a sheet when nipped between said drum and said roller in a sheet transporting direction,

the fixed axis of rotation of said drum and the fixed axis of rotation of said idle roller extending parallel to one another so that a predetermined distance is maintained therebetween;

laser beam generating means for generating a laser beam; and

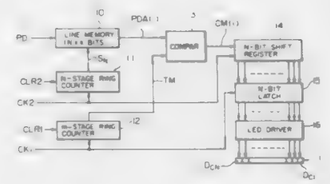
scanning means for causing the generated laser beam to scan the transported sheets in a direction perpendicular to said sheet transporting direction.

4,855,760

LED ARRAY WITH GRADUATED QUANTITY CONTROL

Toshikiyo Kanayama, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1988, Ser. No. 167,283
Claims priority, application Japan, Mar. 12, 1987, 62-55245; Mar. 13, 1987, 62-56889; Mar. 20, 1987, 62-64293
Int. Cl.[4] G01D *9/42*
U.S. Cl. 346—108 3 Claims



1. In a method for forming an image on a light-sensitive material by controlling a quantity of light received on a light-sensitive material by gradation-controlling a light-emitting diode array, the improvement comprising: establishing light-emitting intensities of diodes constituting said light-emitting diode array at a constant level, and controlling a quantity of light received on said light-sensitive material in a predetermined period by changing light-emitting periods of time of the respective light-emitting diodes correspondingly to recording gradation data, in which the light-emitting diode array is composed of a plurality of light-emitting diodes which are N in number, and in which an image having 2^k gradations is recorded on said light-sensitive material by provision of: an m-stage ring counter for counting pulses of a first clock signal of a predetermined frequency to divide a period T for deriving each of the N light-emitting diodes by 2^k; an N-stage ring counter for counting pulses of a second clock signal of a predetermined frequency; a line memory of N×k bits receiving an output of the N-stage ring counter as an address signal; a comparator for comparing image data produced by said line memory with an output of said m-stage ring counter to thereby produce binary-coded data; a shift register of N bits receiving the binary-coded data in synchronism with said second clock signal; and a driving circuit for transferring in parallel an output of said N-bit shift register to said light-emitting diodes to drive the latter.

4,855,761

LIGHT BEAM RECORDER WITH AN AFOCAL ANAMORPHIC OPTICAL AMPLIFIER

Hiroyuki Hiiro, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 29, 1988, Ser. No. 174,558
Claims priority, application Japan, Mar. 30, 1987, 62-77091
Int. Cl.[4] G01D *9/42;* G02B *26/08*
U.S. Cl. 346—108 18 Claims

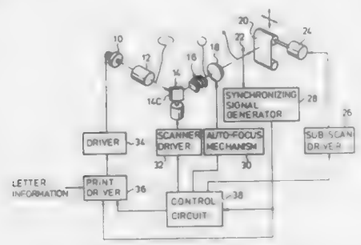
1. A recording apparatus for recording information with a light beam, comprising:

a beam source for emitting said light beam;

light deflecting means for deflecting said light beam from said beam source in the direction of main scan by sine wave oscillation;

an afocal anamorphic optical system for amplifying, in the

direction of the main scan, the deflection angle of said light beam deflected by said deflecting means; and



a scanning lens through which said light beam from said afocal anamorphic optical system is focused on a recording material.

4,855,762

INK STORING DEVICE

Tetsuo Suzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

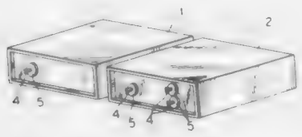
Continuation of Ser. No. 485,289, Apr. 15, 1983, abandoned. This application May 19, 1987, Ser. No. 52,202

Claims priority, application Japan, May 10, 1982, 57-76615

The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **3 Claims**



1. An ink storage device for supplying a plurality of types of ink to a recording system, the ink storage device comprising first and second ink storing means that are individually removable from said ink storage device wherein:

said first storage means includes a first case having interiorly thereof a storage space having therein a first flexible ink tank holding one color of ink;

said second ink storing means includes a second case separate from said first case and having substantially the same size and shape as said first case, the interior of said second case being divided by at least one partition into a plurality of storage spaces having therein a plurality of additional flexible ink tanks holding a plurality of colors of ink different from the color of the ink in the first flexible ink tank;

said first case includes detachable-connection means for enabling an ink outlet tube to be detachably connected to said first case in fluid communication with the first flexible ink tank; and

said second case includes a plurality of detachable-connection means for enabling a plurality of ink outlet tubes to be detachably connected to said second case in fluid communication with respective flexible ink tanks in said second case, wherein said plural detachable-connection means included in said second case are disposed at spaced apart positions so that adjacent ones of said plural detachable connection means are not proximate to each other.

4,855,763

IMAGE RECORDING APPARATUS

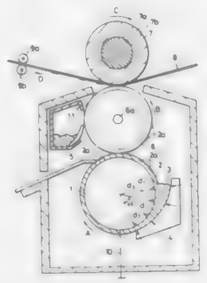
Fumitaka Kan, deceased, late of Tokyo, Japan (by Akiko Kan, successor); Norihiko Koizumi, Yokohama, Japan; Hiroshi Fukumoto, Kawasaki, Japan; Toshiya Yuasa, Mitaka, Japan; Noboru Tohyama, Kawasaki, Japan; Shinya Mishina, Atsugi, Japan, and Hiroshi Tanioka, Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1988, Ser. No. 198,297

Claims priority, application Japan, May 25, 1987, 62-125969; May 25, 1987, 62-125970; May 25, 1987, 62-125971; May 25, 1987, 62-125972; May 25, 1987, 62-125973; Jul. 20, 1987, 62-179074

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—160.1 **14 Claims**



1. An image recording apparatus for recording an image on a recording medium, comprising:

ink transporting means for transporting a fluid ink;

energy applying means for selectively applying energy to the ink transported by said ink transporting means;

transfer means for transferring to the recording medium ink whose transfer characteristics are changed upon selectively application of the energy; and

coating means, disposed upstream of said energy applying means with respect to a transporting direction of said ink transporting means so as to oppose said ink transporting means, for supplying ink having a predetermined thickness to said ink transporting means,

wherein the distance between said ink transporting means and said coating means gradually decreases from the upstream to the downstream direction.

4,855,764

APPARATUS FOR SEALING AND CLEANING THE INK DISCHARGE OPENINGS AT AN INK PRINTING HEAD

Rolf Humbs, Munich, and Ingolf Depta, Petershausen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

PCT No. PCT/DE87/00057, § 371 Date Oct. 13, 1987, § 102(e) Date Oct. 13, 1987, PCT Pub. No. WO87/04979, PCT Pub. Date Aug. 27, 1987

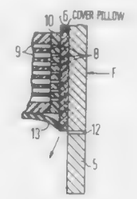
PCT Filed Feb. 20, 1987, Ser. No. 138,090

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1986, 3606031

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **4 Claims**

1. Apparatus for sealing and cleaning ink discharge openings of an ink printing head (**1**) of an ink printing means comprising a cover and stripper element (**6, 5**) mounted adjacent the ink printing head (**8**) and displaceably seated relative to each other such that in a first operating condition, only the cover element (**5**) covers the discharge openings (**8**) at a distance which forms a gap (**11**), said gap (**11**) is filled with writing fluid (**19**) by way of the ink discharge openings (**8**); and said ink discharge openings (**8**) can be wiped by said stripper element (**6**) during a second operating condition so as to remove the writing fluid (**19**) located in the gap (**11**), wherein said stripper element (**6**) and said cover element (**5**) are arranged adjacent each other and the cover element (**5**) extends over the discharge openings **8** which are to be sealed and to be stripped after a gap formation (**11**), wherein in said cover and stripper elements (**5, 6**) comprise a cover pillow of porous material that can be moved in front of the discharge openings (**8**) for sealing and which



preferably absorbs writing fluid (**19**) through the discharge openings (**8**) due to capillary action and seals the discharge openings (**8**) with a fluid film, wherein said elements (**5, 6**) are connected to each other and can be actuated with a shared, electromotive actuation means (**7**), including a stripper and sealing lip (**13**) of elastic material which projects over the ink discharge surface and is mounted on the ink printing head (**1**), and wherein said cover element (**5**) comprises an aeration channel (**12**).

4,855,765

COLOR IMAGE PROCESSING METHOD AND APPARATUS

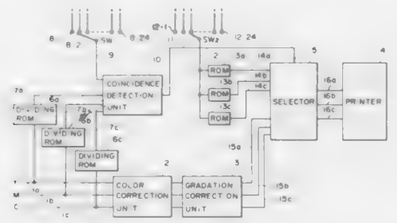
Akio Suzuki, Tokyo; Masaharu Ohkubo, and Yoshihiro Takada, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 84,012, Aug. 11, 1987, abandoned. This application Nov. 29, 1988, Ser. No. 277,515

Claims priority, application Japan, Aug. 13, 1986, 61-190034; Aug. 13, 1986, 61-188772

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—154 **15 Claims**



1. A method for processing a color image including a plurality of colors to replace one particular color of the color image with a second color, comprising the steps of:

designating one particular color of a color image and a second color, said one particular color having a plurality of color components;

inputting a color image signal;

extracting said one particular color from the input color image signal;

converting said one particular color to said second color; and

forming a color image on the basis of the converted color image signal.

4,855,766

IMAGE RECORDING APPARATUS DETECTING AND CONTROLLING IMAGE CONTRAST

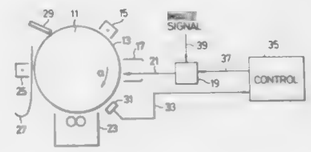
Akio Suzuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 464,879, Feb. 8, 1983, abandoned. This application Jan. 19, 1989, Ser. No. 298,853

Claims priority, application Japan, Feb. 19, 1982, 57-24435

Int. Cl.[4] G01D *15/14, 9/42*

U.S. Cl. 346—160 **12 Claims**



1. An image recording apparatus comprising:

an image recording member having a variable sensitivity characteristic;

image recording means for recording an image on said recording member;

detecting means for detecting a surface condition of said recording member; and

control means for controlling an image recording condition of said image recording means in accordance with an output of said detecting means, said control means controlling the image recording condition such that (i) the contrast of the image formed on the recording member by said image recording means is determined in accordance with the output of said detecting means, and the determined contrast exceeds a predetermined value; and then (ii) the slope of the sensitivity characteristic of said recording member at a point, at which the contrast of the image exceeding said predetermined value is determined, is determined in accordance with the output of said detecting means, and the determined slope satisfies a predetermined relationship.

4,855,767

IMAGE RECORDING APPARATUS HAVING PLURAL LIGHT SOURCES, AND HAVING ARBITRARITY COMBINABLE FUNCTIONS

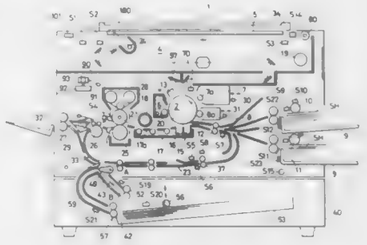
Isamu Sato; Masato Ishida; Eiichi Abe, all of Yokohama, and Hiroaki Takeda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1988, Ser. No. 177,362

Claims priority, application Japan, Apr. 2, 1987, 62-079572; Apr. 2, 1987, 62-079576; Apr. 2, 1987, 62-079577

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—160 **14 Claims**



1. An image recording apparatus comprising:

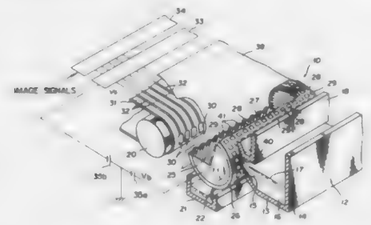
first image forming means for forming a first image on a recording medium;
second image forming means for forming a second image on the recording medium
area designating means for designating a desired area; and
control means for controlling said first and second image forming means to combine the first image and the second image,
wherein said second image forming means has a mode for forming a predetermined screen dot image, and said control means controls said second image forming means to form a screen dot image correspondingly to an area designated by said area designating means.

4,855,768

DIGITAL PRINTING APPARATUS

Shuji Iino, and Akihito Ikegawa, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Continuation of Ser. No. 175,244, Mar. 30, 1988, abandoned. This application Sep. 26, 1988, Ser. No. 251,031
Claims priority, application Japan, Mar. 31, 1987, 62-80802
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—160.1 **21 Claims**



1. A digital printing apparatus, comprising:
ink retaining means provided with a multiplicity of minute surfaces possessing ink-wettability and corresponding to dots to be recorded on a recording medium, said ink-wettable minute surfaces each being enclosed with a ink-repellent part and adapted to retain ink thereon in a raised state;
means for supplying ink to said ink retaining means;
conveying means for conveying said recording medium contactless to said ink retaining means so as to oppose to each other; and
means for causing the ink retained on said ink-wettable minute surfaces of said ink retaining means to be selectively deposited on said recording medium.

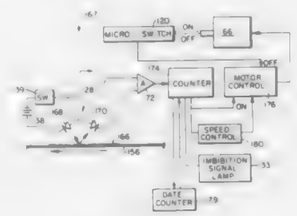
4,855,769

PHOTOGRAPHIC APPARATUS FOR MOTORIZED PROCESSING OF INSTANT FILM

Frederick Slavitter, Needham, and James J. Marchese, Saugus, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 29, 1988, Ser. No. 237,531
Int. Cl.[4] G03B *17/52*
U.S. Cl. 354—21 **16 Claims**

12. In a camera back for processing an instant film unit having a leader, processing fluid carried by said film unit for processing of said film unit upon advancement of said film unit through pressure applying processing rollers, and a pull tab releasably attached to said leader and extending to the exterior of the camera back, the camera back including a pair of processing rollers defining a nip through which said leader and said unit are advanced from the camera back in a direction of feed to apply processing fluid across said film unit, said leader being advanced in the direction of feed to the nip of said rollers upon pulling of said tab, said leader first exiting the camera back as a leading end portion of said unit in the context of said direction of feed, the improvement wherein:
said processing rollers being mounted for rotation with at least one of said rollers being also mounted for translation toward the other roller, and said rollers are adjustable for movement between an initial position in which the rolling surfaces thereof are spaced from each other at said nip and an operating position in which the rolling surfaces thereof are biased toward one another at said nip, and further comprising:



drive means for adjusting said processing rollers between said initial and operating positions and for driveably rotating said rollers in said operating position to process said film unit in a direction of feed to discharge said film unit from the camera back; and
control means for operating said drive means in response to sensing the location of a film leader within the nip of said rollers whereby upon pulling of said tab, the leaders are advanced to within the nip of the rollers and said control means thereby operates said motor to adjust said rollers to their operating position and rotate said rollers to advance said film unit.

4,855,770

VEHICLE IDENTIFICATION CAMERA

Donald E. Mauchan, Marlboro, and Frederick Slavitter, Needham, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 9, 1988, Ser. No. 242,178
Int. Cl.[4] G03B *11/00, 15/03*
U.S. Cl. 354—75 **21 Claims**



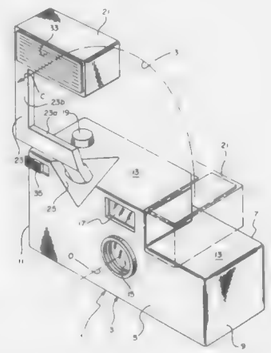
1. Photographic apparatus for close-up photography of an object through a transparent medium, said apparatus comprising:
a housing having a first section defining an exposure chamber including a lens located in a wall of said first section for directing image forming rays into said chamber from a photographic scene located forwardly along the optical axis of said lens, and a second section extending forwardly of said lens a given predetermined distance along said optical axis and terminating at its distal end in an object window defining an apparatus mounting plane configured for locating said lens at said predetermined distance from said transparent medium when said distal end of said second section is placed in engagement with said transparent medium;
flash illuminating and directing means carried by said housing for producing a flash of illumination directed at the distal end of said second section to illuminate the scene behind the medium; and
said distal end of said second section defining said camera mounting plane at an oblique angle to said optical axis to permit exposure of the scene area located on said optical axis behind the medium while minimizing reflection of said flash from the medium along said optical axis.

4,855,771

COMPACT CAMERA WITH FLASH UNIT MOVABLE TO REDUCE RED-EYE

John H. Alligood, Penfield, and Joel S. Lawther, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 10, 1989, Ser. No. 309,455
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—149.11 **5 Claims**



1. An improved photographic camera wherein a flash unit is movable with respect to the camera body between a storage position in which said flash unit is located relatively close to the camera objective lens and an erect position in which the distance between the flash unit and said objective lens is increased to reduce the possibility of red-eye when using said flash unit to take a picture, and wherein the improvement comprises:
means supporting said flash unit for movement from its storage position to its erect position generally along an arc extending diagonally of an upper surface of said camera body longitudinally disposed between opposite ends of the camera body, whereby the distance between said flash unit and said objective lens can be made greater when the flash unit is in its erect position.

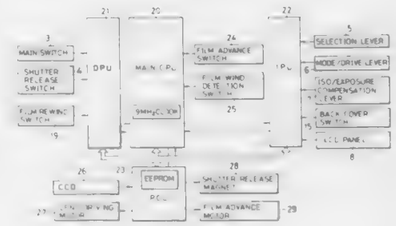
4,855,772

ELECTRONICALLY CONTROLLED CAMERA

Isamu Hashimoto, and Takao Nishida, both of Tokyo, Japan, assignors to Asahi Optical Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,560
Claims priority, application Japan, Mar. 26, 1987, 62-45012[U]; Mar. 26, 1987, 62-45013[U]; Mar. 26, 1987, 62-45014[U]; Mar. 26, 1987, 62-45015[U]
Int. Cl.[4] G03B *1/12*
U.S. Cl. 354—173.1 **22 Claims**

1. An electronically controlled camera comprising
a back cover switch adapted to be turned ON/OFF in accordance with the opening/closing position of a back cover;
back cover switch data detecting means for detecting switch data relating to said back cover switch, at a predetermined cycle and for outputting said switch data;
an erasable programmable memory for memorizing the switch data output from said back cover switch data detecting means; and



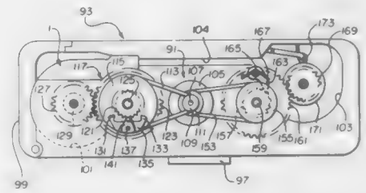
control means for comparing the most recent switch data output from said back cover switch data detecting means with the switch data from a preceding cycle read from said memory, and for controlling a film advance motor, a display system and said memory.

4,855,773

MOTOR-DRIVEN FILM TRANSPORT APPARATUS

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 20, 1988, Ser. No. 221,955
Int. Cl.[4] G03B *1/12*
U.S. Cl. 354—173.1 **8 Claims**



8. An improved motor-driven film transport apparatus for a photographic camera to be used with a film cassette having a film spool rotatable to unwind a filmstrip off the spool to propel the filmstrip from the cassette and alternatively to rewind the filmstrip onto the spool to draw the filmstrip back into the cassette, wherein a bi-directional drive motor is rotatable in opposite directions to effect film transport, and wherein the improvement comprises:
a bi-directional drive member having respective positions for effecting alternate one-way driving relations with the film spool to rotate the spool to unwind and rewind the filmstrip; and
change-over means for moving said drive member from one of its positions to the other position automatically in accordance with the rotational direction of said drive motor.

4,855,774

LENS-FITTED PHOTOGRAPHIC FILM PACKAGE

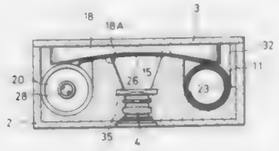
Hiroshi Ohmura; Seimei Ushiro; Hiroshi Hara, all of Tokyo; Seiji Asano, Saitama, and Toshio Yoshida, Ibaragi, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 1, 1987, Ser. No. 127,286

Claims priority, application Japan, Dec. 1, 1986, 61-185230[U]; Feb. 10, 1987, 62-19279[U]

Int. Cl.[4] G03B *17/00, 17/02*

U.S. Cl. 354—203 17 Claims



15. A lens-fitted photographic film package comprising a light-tight film case with a taking lens fitted thereto and a rolled film, said case having a rolled film chamber, a film take-up chamber, and a back wall portion that closes said two chambers, said rolled film chamber having a rearwardly opening concave curved wall against which the outermost turn of the rolled film lies, said back wall portion having a forwardly opening concave curved portion that overlies said rolled film chamber and that contacts and supports the rear of the film emerging from said roll at regions of said film spaced from the longitudinal edges of the film and that in cooperation with said rearwardly opening concave wall of said rolled film chamber contacts the outermost turn of said rolled film and maintains said rolled film is a substantially cylindrical roll.

4,855,775

DEVELOPING APPARATUS

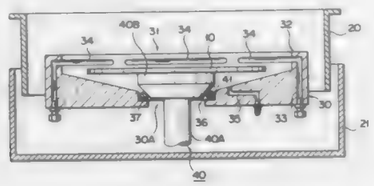
Fuminori Matsuoka, Kofu, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Apr. 22, 1988, Ser. No. 184,806

Claims priority, application Japan, Apr. 28, 1987, 62-106126

Int. Cl.[4] G03D *3/02*

U.S. Cl. 354—325 8 Claims



1. A developing apparatus, comprising:

a cup member forming a dip tank for a developing solution and within which an object to be developed is positioned;

means for supplying the developing solution to said cup member so that said object can be dipped in the developing solution for performance of dip development, wherein said means for supplying developing solution comprises a supply path for supplying said developing solution into said cup member and which includes a developing solution supply pipe positioned in said cup member and at least one arcuate slit-like spraying port formed in an inner circumferential wall of said cup member and connected to said supply pipe such that said developing solution is uniformly dispersed from a periphery of said object.

4,855,776

CAMERA WITH AUTOMATIC FOCUSING DEVICE

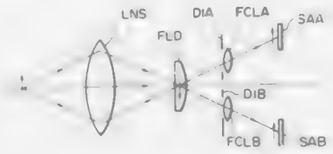
Akira Akashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 12, 1988, Ser. No. 143,033

Claims priority, application Japan, Jan. 12, 1987, 62-004561; Jan. 12, 1987, 62-004574

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—402 17 Claims



1. An auto-focus camera provided with an optical system, comprising:

focus detecting means for repeatedly detecting the focusing state of the optical system, and for generating a focus signal representing the focusing state;

drive means for driving the optical system in response to the focus signal from said focus detecting means; and

control means for permitting, within a predetermined period of time after the focusing state is indicated by the focus signal from said focus detecting means, said drive means to drive the optical system in response to the focus signal detected by said focus detecting means if an amount of drive of the optical system, represented by said focus signal, is smaller than a predetermined value, and for prohibiting said drive means from driving the optical system in response to said focus signal during said predetermined period of time if said amount of drive is larger than said predetermined value.

4,855,777

APPARATUS FOR DETECTING THE FOCUS ADJUSTED STATE OF AN OBJECTIVE LENS

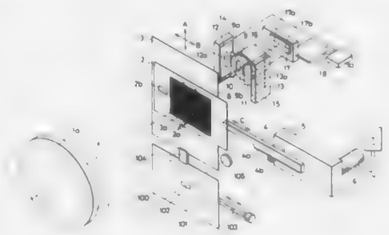
Yasuo Suda; Masaki Higashihara, and Terutake Kadohara, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1988, Ser. No. 162,575

Claims priority, application Japan, Mar. 2, 1987, 62-047245; Mar. 2, 1987, 62-047246; Mar. 2, 1987, 62-047247; Mar. 2, 1987, 62-047248

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—402 14 Claims



1. An apparatus for detecting the focus adjusted state of an objective lens, comprising:

scanning means having optical slits and disposed on or near a predetermined imaging plane of said objective lens for scanning the image of an object in a predetermined scanning direction;

aperture setting means disposed on or near said predetermined imaging plane for (1) providing an aperture which determines a range for detection, (2) moving the aperture to a desired position in the field of view, and (3) masking a light beam from entering portions other than the aperture;

a plurality of light-receiving device for receiving light fluxes passed through said optical slits and said aperture, and for outputting a signal regarding the focus adjusted state of said objective lens; and

means for relating the light fluxes entering said light-receiving devices with each other so that they pass through different areas of the exit pupil of said objective lens.

4,855,779

CAMERA SYSTEM

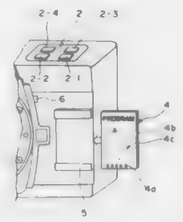
Norio Ishikawa, Osaka; Masaaki Nakai, Kawachinagano; Masayasu Hirano, Nishinomiya; Akihiko Fujino; Hiroshi Ootsuka, both of Sakai; Takeshi Egawa, Osaka, and Kunio Kawamura, Sakai, all of Japan, assignors to Minolta Camera Kubushiki Kaisha, Osaka, Japan

Filed Nov. 18, 1987, Ser. No. 122,243

Claims priority, application Japan, Nov. 19, 1986, 61-275546; Nov. 19, 1986, 61-275547; Nov. 19, 1986, 61-275548; Nov. 19, 1986, 61-275549; Nov. 19, 1986, 61-275550; Nov. 19, 1986, 61-275551; Nov. 19, 1986, 61-275552

Int. Cl.[4] G03B *7/00*

U.S. Cl. 354—412 15 Claims



1. A camera system, comprising a camera selectively operable in a plurality of operation modes and an external device to be mounted thereon wherein the external device includes:

first electrical terminals adapted for connecting to the external device to the camera electrically; and

data output means for outputting data, capable of altering a camera operation mode, to the camera through the first electrical terminals;

and the camera includes:

second electrical terminals adapted to be connected to the first electrical terminals of the external device;

data input means for inputting the data fed from the external device through the first and second electrical terminals;

storage means for storing the data having been input from the data output means through the data input means;

a manually operable member;

selection means, responsive to a manual operation of the manually operable member, for selecting one of the operation modes;

determination means for determining a control operation mode to be carried out by the camera in response to the input data, the determination means determining one of the operation modes selected by the selection means as the control operation mode when the storage means has stored the data capable of altering the camera operation mode and determining a predetermined operation mode as the control operation mode when the storage means has not stored the data; and

a control means for controlling the operation of the camera according to the control operation mode determined by the determination means.

4,855,778

MOTOR CONTROL DEVICE FOR USE IN A CAMERA SYSTEM

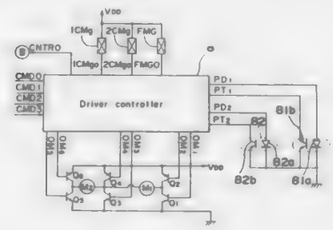
Toshihiko Ishimura, Habikino; Norio Ishikawa; Yasuaki Akada, both of Osaka; Reiji Seki, Sakai, and Nobuyuki Taniguchi, Nishinomiya, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 24,072, Mar. 10, 1987, abandoned. This application Jun. 22, 1988, Ser. No. 210,187

Claims priority, application Japan, Mar. 11, 1986, 54137; Mar. 11, 1986, 54138

Int. Cl.[4] G03B *1/00, 3/10, 7/00*

U.S. Cl. 354—412 6 Claims



1. A motor control device for use in a camera system, comprising:

a plurality of motors for driving first mechanisms of the camera system,

a plurality of electromagnets for driving second mechanisms of the camera system,

a decoder driver IC to which the motors and the electromagnets are connected through m number of output signal lines, and a sequence control circuit for generating n bits of control data where n is less than m, which are fed to the decoder driver IC in order to control the motors and the electromagnets,

said decoder driver IC including a decoder for decoding the n data bits into m bit signals, each sent to the output signal lines for controlling the corresponding one of the motors and the electromagnets, and a driver for driving the motors and the electromagnets in accordance with the m bit signals from said decoder.

4,855,780

PHOTOMETRIC DEVICE FOR PSEUDO FORMAT CAMERA

Shingo Hayakawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1988, Ser. No. 195,820

Int. Cl.[4] G03B *7/08*

U.S. Cl. 354—432 22 Claims

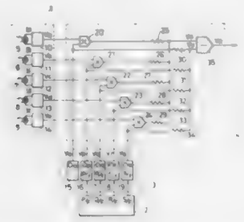
1. A photometric device for a pseudo format camera capable of performing trimming photography, comprising:

(a) trimming data setting means for setting trimming data;

(b) light-receiving means consisting of a plurality of light-receiving portions for splitting an objective field into a

plurality of regions and obtaining luminance data of said plurality of regions; and

(c) computing means for calculating a photometric value using said plurality of luminance data, said computing



means including a correction circuit for substantially correcting luminance data of only a specific region in accordance with said trimming data from said trimming data setting means.

4,855,781

CAMERA WITH BATTERY CHECK CIRCUIT

Yasushi Hoshino, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Feb. 4, 1988, Ser. No. 152,398

Claims priority, application Japan, Feb. 5, 1987, 62-25968; Feb. 5, 1987, 62-25969

Int. Cl.[4] G03B *17/18*

U.S. Cl. 354—468 4 Claims



1. A camera battery check circuit, comprising:

first detection means for detecting the presence or absence of a main power supply battery at first predetermined intervals and generating first and second signals in response to the detection of the presence or absence, respectively, of the main power supply battery;

second detection means for detecting the voltage level of said main power supply battery in response to said first signal and thereafter detecting said voltage state at second predetermined intervals, said second predetermined intervals being longer than said first predetermined intervals;

display means for displaying the voltage level of said main power supply battery and for indicating the presence or absence of said main power supply battery in response to said first and second signals, respectively; and

a sub power supply battery for supplying power to said display means and said first detection means.

4,855,782

DISPLAY DEVICE FOR INDICATING THE SETTING OF A ZOOM LENS

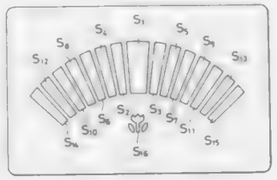
Takeo Kobayashi, and Norio Numako, both of Tokyo, Japan, assignors to Asahi Optical Co. Ltd., Tokyo, Japan

Filed Apr. 12, 1988, Ser. No. 180,813

Claims priority, application Japan, Apr. 13, 1987, 62-55830[U]

Int. Cl.[4] G03B *17/20, 13/12*

U.S. Cl. 354—475 16 Claims



1. A zoom setting display device in a camera provided with a zoom lens, comprising:

zoom-setting detecting means for detecting the zoom setting of said zoom lens which is variable by zooming operation;

display means having a plurality of display segments disposed in an arcuate pattern;

driving means for driving each of said display segments individually; and

control means for controlling, on the basis of the zoom setting as detected by said detecting means, said driving means so that the state of each of said segments can be changed by the driving action of said driving means in response to a change in the angle of view of said zoom lens.

4,855,783

AGITATING ROLLER AND RESTRICTING MEMBER FOR A DEVELOPING DEVICE

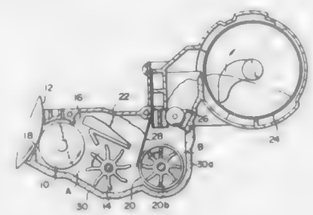
Masayuki Takashima, Yokohama, and Noboru Sawayama, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

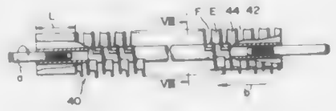
Filed Nov. 18, 1987, Ser. No. 122,685

Claims priority, application Japan, Nov. 18, 1986, 61-176098

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—298 8 Claims





1. In a developer agitating unit installed in a developing device of an image-forming apparatus and composed of a spiral blade extending spirally around an axis of rotation of said developer agitating unit, a plurality of radial blades each extending radially from the axis of rotation, and a plurality of chambers defined by said spiral blade and said plurality of radial blades one after another in a circumferential direction of said developer agitating unit, the improvements wherein:

(a) said spiral blade is provided with a greater outside diameter than the outside diameter of said plurality of radial blades;

(b) those parts of said spiral blade where said plurality of chambers are located are notched at one side of said spiral blade and intermittently with respect to an order in the circumferential direction; and

(c) those parts of said plurality of radial blades where said plurality of chambers into which the developer from the notched parts of said spiral blade flows are notched.

4. A developing apparatus for supplying a developer to a photoconductive element to develop an electrostatic latent image which is provided on said element, said developing apparatus comprising:

(a) a developing roller for transporting the developer deposited thereon to develop the latent image in contact with or in close proximity to the photoconductive element;

(b) a paddle wheel located adjacent to said developing roller for supplying the developer to said developing roller;

(c) a developer agitating roller unit rotatable in a direction for moving the upper peripheral portion of said developer agitating roller unit away from said paddle wheel;

(d) a doctor blade for scraping the developer off said developing roller to regulate said developer to a predetermined thickness;

(e) a separator for returning the developer scraped by said doctor blade toward said paddle wheel and said developer agitating roller unit; and

(f) a restricting member extending from a developer outlet side of said separator to a position between said paddle wheel and said developer agitating roller unit for blocking a part of the developer collected from said separator and the developer being moved away from said paddle wheel in response to rotation of said developer agitating roller unit.

4,855,784

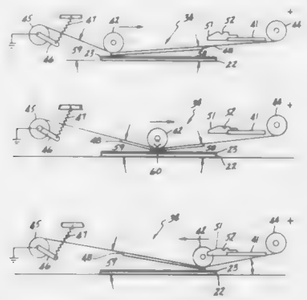
WEB BACKING PLATE

David P. Bujese, Butler, N.J., assignor to Olin Hunt Specialty Products Inc., Palisades Park, N.J.

Filed Dec. 21, 1987, Ser. No. 135,838

Int. Cl.[4] G03G *15/14, 15/16*

U.S. Cl. 355—272 32 Claims



1. Apparatus for the electrostatic transfer of a developed image from an electrostatically developable surface to a receiving surface and having charging means, developing means and cleaning means, the improvement comprising in combination:

(a) flexible carrier means movably connected to the apparatus and held in tension thereon having a first generally planar surface, and an opposing second generally planar surface, the flexible carrier means supporting the electrostatically developable surface on the first generally planar surface;

(b) transfer means reversibly movably connected to the apparatus and contactable with the second generally planar surface of the flexible carrier means to move the electrostatically developable surface adjacent to, but not in contact with the receiving surface to effect the electrostatic transfer of a developed image; and

(c) backing means reversibly movably connected to the apparatus for backing and supporting at least a portion of the flexible carrier means, the backing means being positioned above the flexible carrier means and contactable with the second generally planar surface thereof and further being cooperative with the transfer means to ensure uniform spacing of the flexible carrier means from the charging means and developing means.

4,855,785

TRIMMING COPYING MACHINE

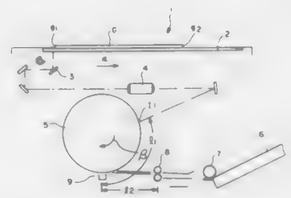
Yuji Okamoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 21,801, Mar. 4, 1987, abandoned. This application Jul. 20, 1988, Ser. No. 222,354

Claims priority, application Japan, Mar. 5, 1986, 61-47949

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—218 3 Claims



1. In a trimming copying machine for producing a copy from a document by scanning said document and feeding a copy paper sheet in correspondence therewith, said machine being capable of copying only a specified area of said document, the improvement wherein said trimming copying machine comprises

input means for setting a first distance indicative of a first position on a document along a predetermined scan direction where a scan of a specified area of said document along said scan direction is to be started, a second distance indicative of a second position on said document along said scan direction where said scan is to end, a length L indicative of the size of a copy paper sheet along said scan direction and a magnification M,

calculating means for determining a value L' indicative of the length of said specified area of said document along said scan direction and calculating a difference L'M−L' and

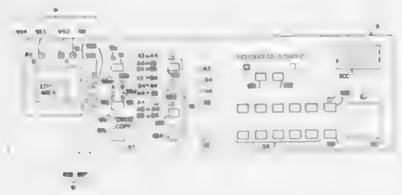
adjusting means for adjusting the starting time for feeding said copy paper if said difference is positive such that an image of said specified area of said document is formed entirely within the area of said copy sheet.

4,855,786

ELECTROPHOTOGRAPHIC COPYING MACHINE CAPABLE OF EDITING FUNCTION

Tadashi Ohira, Toyokawa; Masazumi Ito, Toyohashi, and Syuzi Maruta, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 21, 1987, Ser. No. 5,743
Claims priority, application Japan, Jan. 24, 1986, 61-14176
Int. Cl.[4] G03G *15/00*; G03B *27/52*
U.S. Cl. 355—218 **17 Claims**





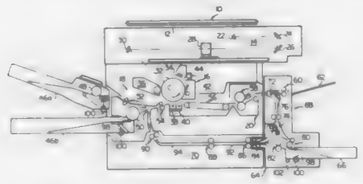
1. An electrophotographic copying machine comprising:
a table for setting a document;
scan means for scanning the document on said table;
means for inputting an arbitrary numerical value;
means for setting a first input mode in which the numerical value input by said input means is handled as first data to specify a first position in a first direction on said table;
means for setting a second input mode in which the numerical value input by said input means is handled as second data to specify a second position in the first direction on said table;
means for setting a third input mode in which the numerical value input by said input means is handled as third data to specify a first position in a second direction on said table, wherein said second direction is perpendicular to said first direction;
means for setting a fourth input mode in which the numerical value input by said input means is handled as fourth data to specify a second position in the second direction on said table;
memory means for storing data, said memory means having a first memory area for storing the first data, a second memory area for storing the second data, a third memory area for storing the third data, and a fourth memory area for storing the fourth data;
means for exchanging the first data and the second data in said memory means when the first data is greater than the second data;
means for exchanging the third data and the fourth data in said memory means when the third data is greater than the fourth data;
means for specifying an area on said table on the basis of the data stored in said memory means; and
copying means for reproducing an image of the document corresponding to said specified area on said table.

4,855,787

IMAGE DUPLICATING APPARATUS HAVING PLURAL COPYING MODES AND PLURAL SHEET FEEDING ARRANGEMENTS

Kaoru Hashimoto, and Hirohisa Miyamoto, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 27, 1988, Ser. No. 149,164
Claims priority, application Japan, Jan. 28, 1987, 62-18052
Int. Cl.[4] B65H *7/02*; G03G *15/00*
U.S. Cl. 355—311 **23 Claims**



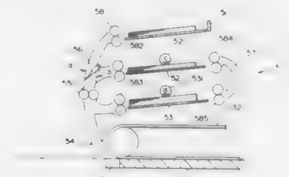
1. An image duplicating apparatus including
(a) means for reproducing images on a sheet medium,
(b) a plurality of sheet feeding means each for feeding a sheet medium to the image reproducing means, the sheet feeding means being respectively operative to store sheet media of different predetermined sizes,
(c) first control means for controlling said image reproducing means so that the image reproducing means reproduces images on one of the opposite faces of a sheet medium fed from one of said plurality of sheet feeding means,
(d) sheet recovery and supply means for temporarily storing the sheet medium having images reproduced on one of its faces under the control of said first control means and thereafter supplying the sheet medium for a second time to said image reproducing means, and
(e) second control means for controlling said image reproducing means so that the image reproducing means reproduces images on the other face of the sheet medium supplied from said sheet recovery and supply means,
wherein the improvement comprises
(f) first size indicating means for indicating the size of the sheet media stored in each of said plurality of sheet feeding means,
(g) second size indicating means for indicating the size of the sheet media which can be stored in said sheet recovery and supply means, and
(h) sheet-feed selecting means for comparing the size of sheet media indicated by said first size indicating means and the size of sheet media indicated by said second size indicating means and automatically selecting the particular one of said plurality of sheet feeding means that stores sheet media of the size identical with the size of sheet media indicated by said second size indicating means.

4,855,788

COPIER WITH IMPROVED PAPER TRANSPORTING MEANS

Yoshihalu Fujii, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 38,781, Apr. 15, 1987, abandoned. This application Sep. 1, 1988, Ser. No. 240,417
Claims priority, application Japan, Apr. 15, 1986, 61-87452; Jun. 17, 1986, 61-142133; Jun. 27, 1986, 61-151975
Int. Cl.[4] G03G *15/00*; B65H *3/44*
U.S. Cl. 355—313 **3 Claims**





1. A document transporting device comprising
document discharging means for discharging documents sequentially,
a discharge tray,
intermediate tray means including a first intermediate tray and a second intermediate tray,
selective document transporting means for transporting documents selectively from said document discharge means to said discharge tray or to said intermediate tray means and from said intermediate tray means to said discharge tray, said selective document transporting means being adapted to selectively transport a document through said document discharging means to said first intermediate tray or to said discharge tray, from said first intermediate tray to said second intermediate tray, from said second intermediate tray to said first intermediate tray or to said discharge tray,
discharge sequence memory means for storing data indicative of a sequence in which documents are to be discharged onto said discharge tray, and
control means for controlling the operation of said selective document transporting means according to a sequence stored in discharge sequence memory means.

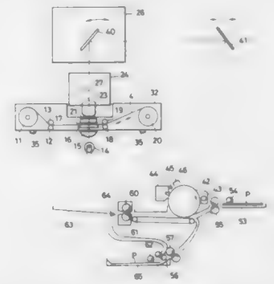
4,855,789

IMAGE FORMING METHOD AND APPARATUS

Masami Ogawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 19,664, Feb. 27, 1987, abandoned. This application Jan. 18, 1989, Ser. No. 298,306
Claims priority, application Japan, Mar. 13, 1986, 61-53663
Int. Cl.[4] G03B *27/32*, *27/52*
U.S. Cl. 355—26 **13 Claims**

1. An image recording apparatus for recording images from an elongated recording medium on which a plurality of images are arranged in both the lateral and longitudinal directions thereof, wherein the apparatus comprises:
a first moving means for moving the elongated recording medium in its longitudinal direction;
a second moving means for moving the recording medium in its lateral direction;
recording means for recording on sheets the images moved to a predetermined position; and
a first control means for controlling said first and second moving means to move the recording medium in its longitudinal direction to place a first image at the predetermined position, and then to move the recording medium in its lateral direction to place a second image at the predetermined position, the second image being arranged in the lateral direction of the recording medium in relation to the first image, and then to move the recording medium in its longitudinal direction and its lateral direction to place a third image at the predetermined position, the third image being arranged in the longitudinal direction of the recording medium in relation to the first image; and
a second control means for controlling the recording means to record on a first surface of the sheet the first image placed at the predetermined position, and then to record on a second surface of the sheet the second image placed at the predetermined position, and then to record on a first surface of a second sheet the third image placed at the predetermined position.

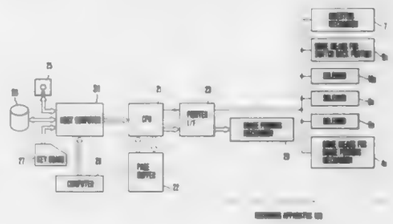


4,855,790

RECORDING APPARATUS

Yasuhito Suzuki, Kanagawa, Japan, assignor to Cannon Kabushiki Kaisha, Tokyo, Japan and Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1988, Ser. No. 190,473
Claims priority, application Japan, May 12, 1987, 62-116560
Int. Cl.[4] G03B *27/32*, *27/52*
U.S. Cl. 355—24 **11 Claims**



1. A recording apparatus comprising:
image forming means for forming an image on a sheet-shaped recording medium;

discriminating means for discriminating an image related to predetermined information among images to be formed on sheet-shaped recording mediums by said image forming means to produce a discrimination signal; and

inverting means for selectively inverting front and back sides of each of sheet-shaped recording mediums on which images are formed by said image forming means on the basis of the discrimination signal produced by said discriminating means.

4,855,791

SHEET ROLL CARTRIDGE AND METHOD FOR LOADING THE SAME TO IMAGE RECORDING APPARATUS

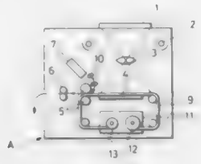
Yukichi Sawaki, Gifu, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 24, 1988, Ser. No. 198,183

Claims priority, application Japan, May 29, 1987, 62-135377; May 29, 1987, 62-135378

Int. Cl.[4] G03B *27/32, 27/52*

U.S. Cl. 355—27 **5 Claims**



1. A sheet roll cartridge for accommodating therein a recording medium for use in an image recording apparatus which comprises an exposure station and a pressure/developing station, said sheet roll cartridge comprising:

a light-shieldable casing for accommodating said recording medium, said casing being formed with first and second openings for allowing said recording medium to path therethrough; and,

recording medium loading means arranged in said light-shieldable casing for supplying said recording medium through said first opening to said image recording apparatus and withdrawing said recording medium through said second opening after exposure and development operations in said exposure and pressure/developing stations, said recording medium having a tail end portion provided with at least two separable connection portions to be separable from remaining part of said recording medium, a distance between said connection portions being at least equal to or larger than a length of a sheet path starting from said first opening and ending at said second opening through said exposure and pressure/developing stations.

4,855,792

OPTICAL ALIGNMENT SYSTEM FOR USE IN PHOTOLITHOGRAPHY AND HAVING REDUCED REFLECTANCE ERRORS

David S. Holbrook, Woburn, and Craig R. Simpson, Arlington, both of Mass., assignors to MRS Technology, Inc., Chelmsford, Mass.

Filed May 13, 1988, Ser. No. 193,887

Int. Cl.[4] G03B *27/52*

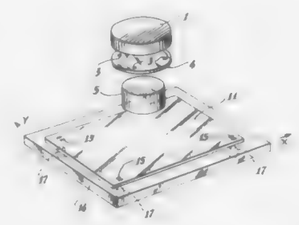
U.S. Cl. 355—53 **19 Claims**

1. A direct reference reticle alignment system for use in photolithography and in which the substrates have optical transmissivity, said system including

an illumination system for projecting an image, said illumination system including a light source, a projection lens, and a reticle carrier therebetween,

a stage for supporting a substrate, said stage including stage moving means capable of moving said stage in at least X- and Y-directions,

at least one sensor mounted in said stage, said sensor being



positioned to be beneath and proximate to a substrate supported by said stage,

whereby an optical image can be projected to said sensor from a reticle carried by said reticle carrier.

4,855,793

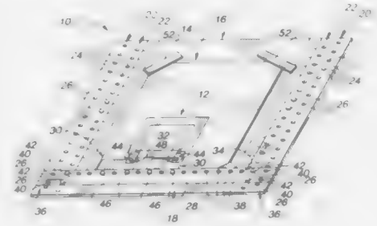
STEP AND REPEAT SYSTEM

Chesley F. Carlson, Edina, Minn., assignor to Chesley F. Carlson Company, Plymouth, Minn.

Filed Oct. 9, 1987, Ser. No. 107,222

Int. Cl.[4] G03B *27/42, 27/04, 27/62*

U.S. Cl. 355—53 **12 Claims**



1. A step repeat system for accurately stepping an image secured to a single substrate for repeated exposures at spatially distinct horizontal and vertical positions on a step and repeat board comprising:

a horizontal stepping strip having a first vertical interface means and a plurality of first horizontal interface means spaced apart from each other along said strip at generally uniform intervals;

a step and repeat board having a second vertical interface means to accurately interface with the first interface means associated with the horizontal stepping strip including means for selectively positioning said horizontal stepping strip at a plurality of fixed vertical positions along said step and repeat board; and

a selection of fraction spacer means for coupling said substrate to said horizontal stepping strip, each fraction spacer means including second horizontal interface means for detachably coupling said fraction spacer means to a selected one of said first horizontal interface means and third horizontal interface means for detachably coupling said substrate to said fraction spacer means, said third horizontal interface means of said different fraction spacer means being horizontally offset from said second horizontal interface means by different selected distances whereby said substrate can be horizontally positioned at different offset distances from said first horizontal interface means by employing different ones of said selection of fraction spacers.

4,855,794

COPYING MACHINE WITH AN AUTOMATIC DOCUMENT FEEDER

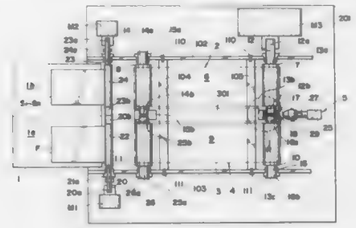
Norihiko Suzuki, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 16, 1988, Ser. No. 194,228

Claims priority, application Japan, May 19, 1987, 62-122035

Int. Cl.[4] G03B *27/44*

U.S. Cl. 355—54 **10 Claims**



1. A document feeding apparatus wherein a document is fed to a platen of a copying machine and discharged from the platen after exposure, said apparatus comprising:

document stack means including a first stack portion and a second stack portion;

first supply means for feeding a document placed on the first stack portion to the platen;

first transport means for setting the document fed by the first supply means on a first area of the platen and then discharging the same therefrom after exposure;

second supply means for feeding a document placed on the second stack portion to the platen, said second supply means being independently operable of the first supply means; and

second transport means for setting the document fed by the second supply means on a second area of the platen and then discharging the same therefrom after exposure, said second transport means being independently operable of the first transport means.

4,855,795

PHOTOSENSOR

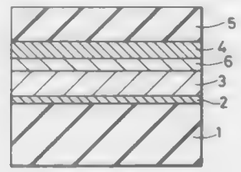
Hideaki Yamamoto, Tokorozawa; Akira Sasano, Tokyo; Haruo Matsumaru, Tokyo; Yasuo Tanaka, Tokyo, and Toshihisa Tsukada, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 21, 1986, Ser. No. 898,540

Claims priority, application Japan, Sep. 24, 1985, 60-208646

Int. Cl.[4] H01L *45/00*

U.S. Cl. 357—2 **8 Claims**



1. A photosensor comprising:

an electrode consisting essentially of a conductor;

a photoconductor layer consisting essentially of a hydrogenated amorphous silicon semiconductor which is obtained by the glow discharge decomposition of monosilane gas;

a juncture stabilizing layer consisting essentially of a hydrogenated amorphous silicon semiconductor which contains boron which is obtained by the glow discharge decomposition of a mixed gas of monosilane and diborane;

a transparent electrode; and

a transparent protective layer; all of these elements being laminated in that order on an insulating substrate,

wherein the content of said diborane gas in said mixed gas is 0.02 to 0.1 vol% on the basis of said monosilane gas content, and the thickness of said junction stabilizing layer satisfies the condition $xy<15$, wherein x represents the diborane gas content in vol% and y represents the thickness of said junction stabilizing layer an Å, and said thickness is at least 150Å.

4,855,796

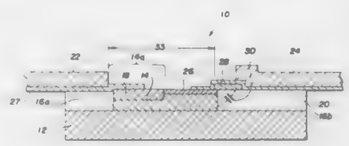
BEAM LEAD MIXER DIODE

Wah S. Wong, Montebello; Cheng P. Wen, Mission Viejo, and Jen K. Kung, Rolling Hills, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 6, 1986, Ser. No. 871,236

Int. Cl.[4] H01L *29/48, 23/48, 27/02*

U.S. Cl. 357—15 **12 Claims**



1. A beam lead diode which comprises:

a semi-insulating substrate;

an N^+ layer heavily doped with N impurities to achieve a conductive layer on said substrate layer;

an N layer formed on said N^+ layer;

first and second semi-insulating conversion regions formed in said N^+ and N layers by proton bombardment of said layers, defining a diode region of said N^+ and N layers having at least two side edges between said conversion regions;

an ohmic contact formed on a first portion of said diode region adjacent said first conversion region;

a first metallization layer formed over a portion of said ohmic contact and said first conversion region;

a first beam lead supported by said first semi-insulating conversion region and formed on said first metallization layer and spaced from one side edge of said diode region to provide a first diode lead;

a second metallization layer formed over a portion of said N layer adjacent said second semi-insulating conversion region, forming a Schottky contact;

a dielectric separator piece located on a portion of said second semi-insulating conversion region under a portion of said second metallization layer adjacent said active diode region for increasing the separation between said Schottky contact and said N^+ layer in the region adjacent said second semi-insulating conversion region; and

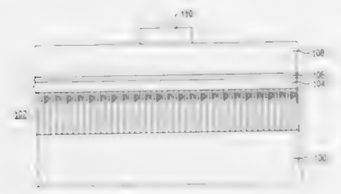
a second beam lead supported by said second semi-insulating conversion region and formed on said second metallization layer and spaced from the other side edge of said diode region to provide a second diode lead.

4,855,797

MODULATION DOPED HIGH ELECTRON MOBILITY TRANSISTOR WITH N-I-P-I STRUCTURE

Erhard Kohn, Titusville, and Karl R. Hofmann, Kingston, both of N.J., assignors to Siemens Corporate Research and Support, Inc., Iselin, N.J.

Filed Jul. 6, 1987, Ser. No. 69,685
Int. Cl.[4] H01L 29/80
U.S. Cl. 357—22 19 Claims



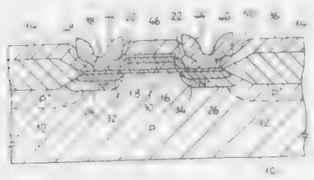
1. A modulation-doped field effect transistor including a first semiconductor layer being substantially undoped, a second semiconductor layer of a first conductivity type, formed over said first semiconductor layer, and gate electrode means formed over said second semiconductor layer for controlling conduction through a conduction channel formed in said first semiconductor layer, comprising:
- a third semiconductor layer of said first conductivity type;
- a fourth semiconductor layer of a second conductivity type formed next to said third semiconductor layer, said third and fourth semiconductor layers having respective ends on one side thereof abutting said first semiconductor layer for locally modulating conductivity in said first semiconductor layer in a pattern corresponding to said respective ends.

4,855,798

SEMICONDUCTOR AND PROCESS OF FABRICATION THEREOF

Youichiro Imamura; Toshiyuki Kaeriyama, and Hironori Ishimoto, all of Miho, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 944,387, Dec. 19, 1986, abandoned. This application Dec. 13, 1988, Ser. No. 284,860
Int. Cl.[4] H01L 23/48, 29/44, 29/54, 29/62
U.S. Cl. 357—71 15 Claims



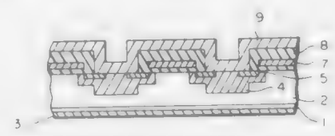
1. A semiconductor device comprising
(a) a layer of a metal silicide having a surface portion, and
(b) a nitride layer forming said surface portion and consisting of a nitride of said metal silicide.

4,855,799

POWER MOSFET WITH CARRIER LIFETIME KILLER

Hirohito Tanabe, Fujisawa; Yu Ohata, Tokyo; Kazuaki Suzuki, Kawasaki; Yukiharu Miwa, Yokohama, and Yoshihito Nakayama, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 22, 1987, Ser. No. 136,767
Int. Cl.[4] H01L 29/78
U.S. Cl. 357—23.4 1 Claim



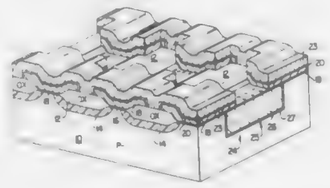
1. An MOS type field effect transistor comprising:
- a drain region made of a semiconductor substrate of a first conduction type;
- a base region of a second conduction type formed within said semiconductor substrate, said base region having a deep portion and a shallow portion;
- a source region of the first conduction type formed within said base region;
- a gate insulator layer formed above said base region between said drain region and said source region;
- a gate electrode formed on said gate insulator layer;
- a covering insulator layer formed over the surface of said substrate including said gate electrode, an opening being formed in a portion of said covering insulator layer and above a PN diode junction formed by said drain and said deep portion of the base region, said opening being located at a position laterally displaced from said gate electrode;
- a source electrode connected to a portion of said source region and a portion of said base region through said opening; and
- a drain electrode connected to said drain region;
- wherein platinum is diffused as a lifetime killer into the vicinity of said diode junction so that the concentration of platinum in the surface of said base region and said source region below said opening is highest.

4,855,800

EPROM WITH INCREASED FLOATING GATE/CONTROL GATE COUPLING

Agerico L. Esquivel, Dallas, Tex.; Robert Groover, III, Arlington, Va., and Howard L. Tigelaar, Allen, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 844,915, Mar. 27, 1986, Pat. No. 4,698,009. This application Sep. 11, 1987, Ser. No. 96,176
Int. Cl.[4] H01L 29/78, 29/52, 29/06
U.S. Cl. 357—23.5 14 Claims



1. A non-volatile memory cell array, comprising: a semiconductor body;
a plurality of bit line diffusions extending along a surface of said semiconductor body;

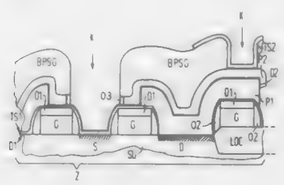
a plurality of word lines crossing said bit line diffusions;
a plurality of floating gates, each floating gate underlying one of said word lines at a location between a pair of said bit line diffusions, each said floating gate defining a transistor channel location substantially thereunder; and
a plurality of trenches in said semiconductor body, each of said trenches for isolating adjacent ones of said channel locations in the direction said bit line diffusions extend;
wherein said word lines and said floating gates each include a first extension overlying an adjacent trench, each first floating gate extension underlying a first extension of its overlying word line.

4,855,801

TRANSISTOR VARACTOR FOR DYNAMICS SEMICONDUCTOR STORAGE MEANS

Karl-Heinz Kuesters, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 16, 1987, Ser. No. 74,334
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1986, 3628500
Int. Cl.[4] H01L 29/78
U.S. Cl. 357—23.6 2 Claims



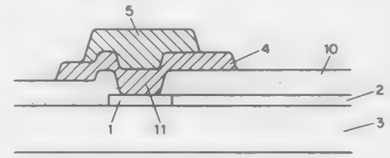
1. A transistor varactor arrangement for dynamic semiconductor memories on a doped silicon substrate (SU), comprising: at least one field effect transistor having a source (S) region and drain (D) region lying in said doped silicon substrate and having a gate electrode (G) covered on all sides with insulating layers (01,02), said source (S) region being directly contactable from the outside by a terminal (K), and at least one varactor overlapping the gate electrode (G) of the field effect transistor, said at least one varactor being formed as a stacked capacitor and composed of two doped polysilicon layers (P1, P2) with a separating dielectric layer (D2), whereby the upper polysilicon layer (P2) is contactable from the outside and overlaps the lower polysilicon layer (P1) and the sidewalls of the lower polysilicon layer (P1) and overlaps the majority part of the gate electrode (G), an oxide layer (03) produced by oxidation of the sidewalls of the upper polysilicon layer (P2) is provided for insulation of the sidewalls of the upper polysilicon layer (P2) from the terminal (K) to said source region (S), an insulation layer (BPSG) formed on the upper polysilicon layer (P2) except for the contact region (K) and on the oxide layer (03) located on the sidewalls of the upper polysilicon layer (P2), the lower polysilicon layer (P1) partially overlaps the gate electrode (G) and is connected to the drain (D) region of the field effect transistor, and a layer (TS1) containing nitride and/or tetraethylorthosilicate covering said gate electrode (G) which is covered on all sides by said insulating layers (01, 02)

4,855,802

CONTACT TYPE IMAGE SENSOR

Toshiaki Kato, Matsumoto, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 20, 1987, Ser. No. 111,520
Claims priority, application Japan, Oct. 20, 1986, 61-249109; Oct. 29, 1986, 61-257519
Int. Cl.[4] H01L 27/14, 31/00, 29/04, 29/12
U.S. Cl. 357—30 10 Claims



1. An image sensor, comprising: a substrate and a plurality of individual picture elements disposed in a linear array thereon, each picture element comprising;
- an individual electrode;
- an insulating film disposed on a first surface of the individual electrode and extending beyond an edge of the individual electrode, said insulating film having an opening therein such that a central portion of the individual electrode remains uncovered by the insulating film;
- a semiconductor film with a first side and a second side, disposed on the insulating film and extending through the opening therein, so as to contact the individual electrode through the opening on its first side; and
- a portion of a common electrode disposed on the second side of the semiconductor film, so as to contact the semiconductor film in an area coincident with the area of contact between the semiconductor film and the individual electrode, wherein the picture elements are disposed on the substrate such that a portion of the insulating film that extends beyond the individual electrode is in contact with the substrate, the openings through the insulating film in each picture elements are of substantially equal area, and the portions of the common electrode are joined to form a single common electrode.

4,855,803

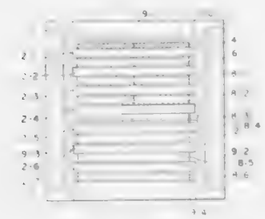
SELECTIVELY DEFINABLE SEMICONDUCTOR DEVICE

Hideo Azumai, Takarazuka; Koichi Fujii, Toyonaka; Takashi Seigenji, Minoo, and Keiichi Yoshioka, Nishinomiya, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 884,391, Jul. 11, 1986, abandoned. This application Jul. 26, 1988, Ser. No. 224,268
Claims priority, application Japan, Sep. 2, 1985, 60-194563; Sep. 6, 1985, 60-198103
Int. Cl.[4] H01L 27/10, 27/15, 27/02
U.S. Cl. 357—45 7 Claims

1. A composite gate-array semiconductor device, comprising:
- a plurality of logic dedicated general purpose cell regions, each capable of providing a desired logic function and also capable of providing an interconnection function selectively;
- a plurality of function dedicated cell regions, each capable of providing a desired function and also capable of providing an interconnection function selectively, each of said plurality of function dedicated cell regions being disposed between two corresponding ones of said plurality of logic dedicated general purpose cell regions;
- a pair of adjacent bit lines;
- wherein said plurality of function dedicated cell regions include a plurality of RAM/ROM cells which can be selectively defined either as RAM cells or as ROM cells

by metallization and which are connected to said adjacent bit lines; and





a one-bit decoder which is connected between said pair of adjacent bit lines when said plurality of RAM/ROM cells are defined as ROM cells.

4,855,804

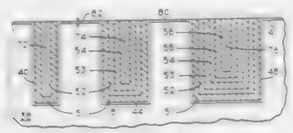
MULTILAYER TRENCH ISOLATION PROCESS AND STRUCTURE

Bridgette A. Bergami, Gilbert, and Phillip H. Williams, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 122,091, Nov. 17, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 271,145

Int. Cl.[4] H01L *27/12, 29/06, 29/34*

U.S. Cl. 357—49 **22 Claims**



1. An electronic device having dielectric filled trenches, comprising

a substrate having a semiconductor surface;

multiple trenches in the substrate comprising, a first trench having a first width and, at least a second trench having a second width larger than first width, wherein trenches have sidewalls extending from the surface into the substrate and bottoms separated from the surface; and

multiple dielectric layer pairs of alternating composition and etch rate on the sidewalls and bottom, of at least the second trench, including odd-numbered layers of oxygen rich oxy-nitride and even-numbered layers of nitrogen rich oxy-nitride each oxy-nitride layer being thicker than a natural oxy-nitride interfacial layer formed between superposed silicon oxide and silicon nitride.

4,855,805

NONLINEAR SEMICONDUCTOR ELEMENT, LIQUID CRYSTAL DISPLAY PANEL USING THE SAME AND THEIR MANUFACTURING METHODS

Shunpei Yamazaki; Akira Mase; Toshimitsu Konuma; Minoru Miyazaki; Mitsunori Sakama, and Takashi Inushima, all of Tokyo, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 782,628, Oct. 1, 1985, abandoned. This application Jun. 3, 1988, Ser. No. 203,641

Claims priority, application Japan, Oct. 1, 1984, 59-206080; Oct. 1, 1984, 59-206081; Jan. 7, 1985, 60-00547

Int. Cl.[4] H01L *29/12*

U.S. Cl. 357—58 **12 Claims**



1. A nonlinear semiconductor element comprising:

a first conductive layer serving as a first electrode;

a non-single-crystal semiconductor layer laminate member formed on the first electrode; and

a second conductive layer formed on the non-single-crystal semiconductor layer laminate member and serving as a second electrode;

wherein the non-single-crystal semiconductor layer laminate member consists of an n-type first non-single-crystal semiconductor layer formed on the first conductive layer, a boron doped i-type second non-single-crystal semiconductor layer, formed on the first non-single-crystal semiconductor layer, and an n-type third non-single-crystal semiconductor layer formed on the i-type second semiconductor layer to thus effect an nin junction, and

wherein the i-type second non-single-crystal semiconductor layer is doped with said boron without influencing the conductivity type of the i-type semiconductor layer to thus symmetrically form said nin junction.

4,855,806

THIN FILM TRANSISTOR WITH ALUMINUM CONTACTS AND NONALUMINUM METALLIZATION

Harold G. Parks; William W. Piper, both of Scotia; George E. Possin, Schenectady, and Donald E. Castleberry, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 127,024, Nov. 30, 1987, abandoned, which is a continuation of Ser. No. 761,939, Aug. 2, 1985, abandoned. This application Sep. 7, 1988, Ser. No. 241,271

Int. Cl.[4] H01L *29/04*

U.S. Cl. 357—59 **6 Claims**

1. An inverted, thin film field effect transistor structure, particularly useful in active matrix liquid crystal displays, said structure comprising:

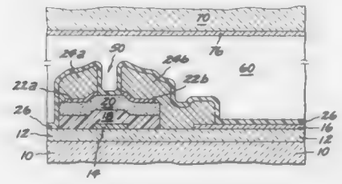
a substrate having an insulative coating thereon;

a gate electrode comprising titanium disposed on said insulative substrate coating;

a gate insulation layer disposed over said gate electrode;

an amorphous silicon layer disposed over said gate insulation layer, said amorphous silicon and said gate insulation layer having an island configuration;

a layer of aluminum disposed over said island said aluminum layer having an insulative gap therein, said gap being located over said gate electrode so as to define a field effect transistor;



source line metallization disposed so as to be in contact with said aluminum layer on one side of said insulative gap and drain line metallization disposed so as to be in contact with said aluminum layer on the other side of said insulative gap said source line metallization and said drain line metallization comprising conductive material different than the conductive material in said aluminum layer; and

a layer of indium tin oxide disposed on said insulative coating so as to form a pixel electrode, said pixel electrode being in electrical contact with said source or said drain line metallization.

4,855,807

SEMICONDUCTOR DEVICE

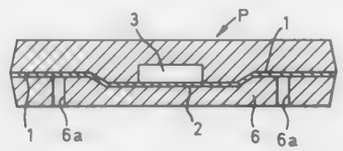
Yasuhiro Yamaji, Kawasaki; Kenji Takahashi, Yokohama; Seiichi Hirata, Yokosuka, and Toshiharu Sakurai, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 18, 1987, Ser. No. 134,708

Claims priority, application Japan, Dec. 26, 1986, 61-313754

Int. Cl.[4] H01L *23/48, 23/28*

U.S. Cl. 357—72 **7 Claims**



1. A semiconductor device comprising:

a die-pad supported by a plurality of tie-bars;

a semiconductor element mounted on the die-pad with the die-pad, tie-bars and semiconductor element being encapsulated in moulding compound; and

means for defining at least one aperture which each extends from a surface of said moulding compound into said moulding compound so as to expose a portion of a respective one of said tie-bars.

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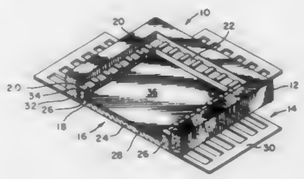
HERMETIC GLASS CHIP CARRIER

Steven A. Tower, 13 Onyx Dr., North Dartmouth, Mass. 02747, and Jay S. Greenspan, 7 Hillside St., South Dartmouth, Mass. 02748

Filed Mar. 25, 1987, Ser. No. 30,553

Int. Cl.[4] H01L *23/08, 23/50, 23/30*

U.S. Cl. 357—74 **19 Claims**



1. A hermetically sealed glass chip carrier, comprising:

a glass base member having bounding sidewalls;

a glass sidewall member having interior sidewalls, a segment of each said interior sidewall being disposed adjacent corresponding said bounding sidewalls; and

a plurality of conductive leads, each conductive lead further comprising

a contact pad disposed on said glass base member,

a body segment integral with said contact pad disposed intermediate said segment of said interior sidewall and said bounding sidewalls, and

an extensible segment integral with said body segment extending exteriorly of said hermetically sealed glass chip carrier;

wherein said bounding sidewalls, said segment of said interior sidewalls and each said body segment of said plurality of conductive leads are hermetically sealed together by subjecting said carrier to a softening temperature to cause bonding at interfaces thereof.

4,855,809

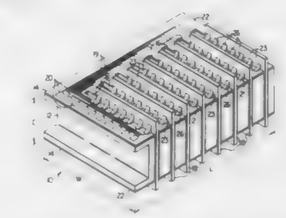
ORTHOGONAL CHIP MOUNT SYSTEM MODULE AND METHOD

Satwinder Malhi, Garland; Kenneth E. Bean, Celina; Charles C. Driscoll, Richardson, and Pallab K. Chatterjee, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 24, 1987, Ser. No. 125,033

Int. Cl.[4] H01L *23/16*

U.S. Cl. 357—75 **20 Claims**



1. [The apparatus of Claim 1, wherein said base module comprises:]

Apparatus for mounting semiconductor chips to form a system module, comprising a base module and means for interconnecting circuits on the semiconductor chips to said base module so that the chips and said base module form an integrated system module, said base module including orthogonal slots for receiving the semiconductor chips and further including a base portion and

at least one interconnect chip fixed to said base portion[; and],

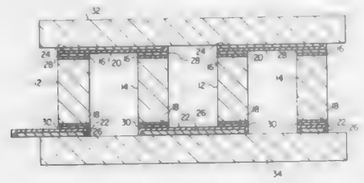
said interconnect chip having cutouts corresponding to said slots on said base module.

4,855,810

THERMOELECTRIC HEAT PUMP

Allan S. Gelb, 2606 Hollow Bend, Mesquite, Tex. 75150; Peter B. Townsend, 4204 High Mesa Ct., Arlington, Tex. 76015, and Erika Purdy, 301 Rita, Garland, Tex. 75042

Filed Jun. 2, 1987, Ser. No. 56,651
Int. Cl.[4] H01L *23/48, 25/54, 25/04, 23/38*
U.S. Cl. 357—87 4 Claims



1. An improved thermoelectric heat pump comprising:
an array of alternatively positioned n-type and p-type thermoelectric elements having substantially stable operating characteristics at up to about 251 degrees Celsius, said thermoelectric elements having first and second ends;
metallic diffusion barrier plates formed on the first and second ends of the thermoelectric elements for providing soldering surfaces having nondiffusion characteristics;
first and second electrical contact forming metallizations; and
lead-antimony binary alloy solder joints connecting the first ends of adjacent n-type and p-type thermoelectric elements in series, and the second ends of adjacent p-type and n-type thermoelectric elements in series for connecting the array of n- and p-type thermoelectric elements in a serpentine manner, said first and second metalizations having end leads for connection to a source of power, said lead antimony binary solder comprising essentially 90 molecular percent lead and 10 molecular percent antimony for forming a solder having a eutectic temperature of about 251 degrees Celsius, whereby said thermoelectric elements, diffusion barrier plates, and solder joints are inactive both chemically and physically with respect to one to another.

4,855,811

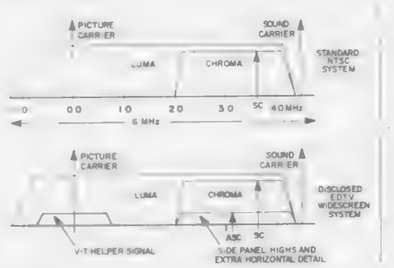
APPARATUS FOR PROCESSING AUXILIARY INFORMATION IN AN EXTENDED DEFINITION WIDESCREEN TELEVISION SYSTEM

Michael A. Isnardi, Plainsboro, N.J., assignor to General Electric Company, Princeton, N.J.

Division of Ser. No. 139,340, Dec. 29, 1987. This application Feb. 10, 1988, Ser. No. 154,570
Claims priority, application United Kingdom, Sep. 14, 1987, 8721565
Int. Cl.[4] H04N *7/00, 11/00, 11/14*
U.S. Cl. 358—12 7 Claims

1. A system for processing a television-type signal, comprising:
means for providing a television-type signal representative of a widescreen image containing side panel information and main panel information, and having an image aspect ratio greater than that of a standard television image;
means for providing a first signal component representative of said side panel information;
means for providing a second signal component representative of high frequency image information; and
means for modulating a baseband auxiliary subcarrier other than a chrominance subcarrier with said first and second signal components.

4. A system for receiving a television-type signal comprising a first component containing image information of a first type and a second component containing image information of a second type, said first and second components modulating a base band auxiliary subcarrier other than a chrominance subcarrier; said system including:
means for demodulating said modulated alternate subcarrier to recover said first and second components;
first video signal processing means responsive to said recovered first component for producing a processed first image signal;
second video signal processing means responsive to said recovered second component for producing a processed second image signal; and



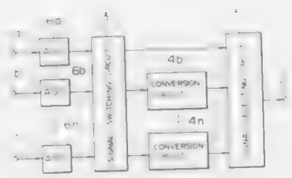
means for combining said processed first and second image signals to produce a combined image signal; wherein
said television-type signal is representative of a widescreen image having side panel image information and main panel image information, and an aspect ratio greater than that of a standard television image;
said first component is representative of said side panel image information; and
said second component is representative of high frequency image information.

4,855,812

PICTURE SYNTHESIZING APPARATUS WITH GAIN CONTROL SYSTEM

Morito Rokuda; Hiroyasu Ohtsubo; Michio Masuda; Hideo Nishijima, and Kaneyuki Okamoto, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 15, 1987, Ser. No. 133,360
Claims priority, application Japan, Dec. 18, 1986, 61-299998; Jan. 20, 1987, 62-8926
Int. Cl.[4] H04N *5/272, 9/68*
U.S. Cl. 358—22 12 Claims



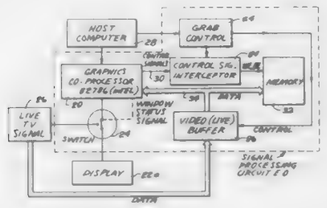
12. A picture synthesizing apparatus for inlaying a first composite video signal with a second composite video signal to provide an inlaid composite video signal for display on a single display screen in the form of two pictures, said apparatus comprising:
detecting means for detecting the signal level of the chrominance signal of a first composite video signal;
gain regulating means for regulating the gain of the chrominance signal of a second composite video signal in accordance with the detected level of the chrominance signal of the first composite video signal; and
signal combining means for inlaying the second composite video signal having a chrominance signal regulated by said gain regulating means into the first composite video signal to provide an inlaid composite video signal.

4,855,813

TELEVISION IMAGE PROCESSING SYSTEM HAVING CAPTURE, MERGE AND DISPLAY CAPABILITY

David P. Russell, 10 Swan Pl., Nissequogue, N.Y. 11780, and Raymond C. Papworth, 82 Wimpole Road, Barton, Cambridge CB37AD, England

Filed Dec. 11, 1987, Ser. No. 131,992
Int. Cl.[4] H04N *9/74, 5/45*
U.S. Cl. 358—22 46 Claims



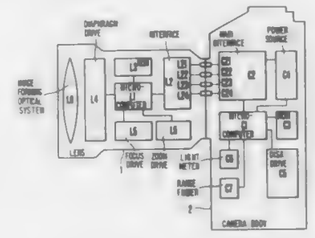
1. An image processing system capable of selectively merging graphics, text, digitized video frames and/or full motion video into a user selectable composite television display, said system comprising a composite or component RGB video input source means, said composite or component RGB video input source means comprising means for providing a full motion video input; a graphics coprocessor means capable of controllably retrievably storing digitized video frames for providing a user controllable variable window in an output composite television display picture; memory means operatively connected to said graphics coprocessor means for receiving memory control signals therefrom, said memory means having a data input/output means for inputting and outputting data therefrom and a control signal input means for enabling control of reading and writing from and to said memory means; control signal interception means operatively connected between said graphics coprocessor means and said control signal input means for controllably intercepting read memory control signals generated from said graphics coprocessor means and substituting write memory control signals therefor for providing said write memory control signals to said memory means control signal input means; grab control means operatively connected to said control interceptor means for controllably causing said interception of said read memory control signals during grabbing of a user selected full motion video signal input from said composite video input source means, said grab control means selectively substantially instantaneously grabbing said full motion video signal input in response to said user selection of a full motion video frame to be grabbed; video buffer means operatively connected to said data input/output means for controllably providing said grabbed user selected full motion video frame signal input to said memory means for retrievable storage of said grabbed user selected full motion video frame signal input, said grab control means further being operatively connected to said video buffer means for controlling said instantaneous grabbing of said user selected video frame signal input, said memory means retrievably storing said grabbed user selected video frame as a digitized video frame, said graphics coprocessor means enabling user manipulation of said stored grabbed user selected video frame for providing a still video image in said user controllable variable window in said output composite television display; and video switch and merging means for selectively merging said stored grabbed digitized video frames with said full motion video and/or graphics and/or text in said user selectable composite television display picture; whereby a flexible user controllable multimedia television image processing system is provided.

4,855,814

VIDEO CAMERA BODY AND DETACHABLE LENS EACH CONTAINING A MEMORY FOR STORING SIGNALS INDICATIVE OF SPECTRAL CHARACTERISTICS

Akihiko Shiraishi, Kawasaki; Masatake Kato, Kunitachi, and Kenichi Kawamoto, Komae, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 916,212, Oct. 7, 1986, abandoned. This application Jun. 24, 1988, Ser. No. 212,050
Claims priority, application Japan, Oct. 9, 1985, 60-226569; Oct. 11, 1985, 60-227513
Int. Cl.[4] H04N *9/73, 5/225, 5/232, 9/04*
U.S. Cl. 358—29 34 Claims



1. An image pickup system comprising a camera body and an optical image forming unit for detachable joinder to said camera body, said camera body including therein image conversion means and processing circuit means for communication with said optical image forming unit, said optical image forming unit comprising:
(a) lens means for forming an optical image;
(b) memory means for storage of information and containing stored signals indicative of spectral characteristics of both said image conversion means and said lens means; and
(c) circuit means operably responsive to said camera body processing circuit means for generating output signals corresponding to said stored signals.

6. In combination:
(a) a camera body having means for supporting releasable joinder thereto of an image forming unit including lens means for forming an optical image;
(b) memory means in said camera body for the storage of separate signals indicative of spectral characteristics of plural diverse such image forming units; and
(c) processor circuit means in said camera body selectively operable upon joinder to said camera body of any one of said diverse image forming units for selecting from said memory means those stored signals indicative of the spectral characteristics of such one image forming unit.

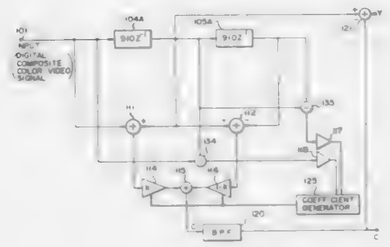
18. In combination:
(a) a camera body having means for supporting releasable joinder thereto of any one of a preselected group of diverse image forming units, each including lens means for forming an optical image and having respective different spectral characteristics;
(b) memory means in said camera body for the storage of signals typically representative of said respective different spectral characteristics of said image forming units; and
(c) processor circuit means in said camera body selectively operable upon joinder to said camera body of any one of said diverse image forming units for retrieving from said memory means such stored signals.

4,855,815

DIGITAL COMPOSITE COLOR VIDEO SIGNAL SEPARATING CIRCUIT WITH VERTICAL CORRELATION WEIGHTING FUNCTION

Seijiro Yasuki, and Kiyoshi Hoshino, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 13, 1988, Ser. No. 243,842
Claims priority, application Japan, Sep. 18, 1987, 62-233935
Int. Cl.[4] H04N *9/78*
U.S. Cl. 358—31 11 Claims



1. A digital composite color video signal separating circuit comprising:

first delay means connected to receive a digital composite color video signal for delaying the digital composite color video signal by a one-scanning-line time;

second delay means connected to receive an output signal from said first delay means for delaying the output signal by the one-scanning-line time;

first correlation detecting means connected to receive the digital composite color video signal and the output signal from said first delay means for detecting a correlation therebetween;

second correlation detecting means connected to receive output signals from said first and second delay means for detecting a correlation therebetween;

coefficient generating means connected to receive correlation-detect outputs from said first and second correlation means for generating first and second coefficients corresponding to magnitudes of the correlation-detect outputs;

first difference-signal detecting means connected to receive the digital composite color video signal and the output signal from said first delay means for detecting a difference signal thereof;

second difference signal detecting means connected to receive the output signals from said first and second delay means for detecting a difference signal thereof;

first weighting means for weighting the difference signal from said first difference-signal detecting means with the first coefficient provided from said coefficient generating means;

second weighting means for weighting the difference signal from said second difference-signal detecting means with the second coefficient provided from said coefficient generating means; and

chrominance signal component outputting means for adding together output signals of said first and second weighting means to separate and output a chrominance signal component contained in the digital composite color video signal.

4,855,816

COLOR IMAGING APPARATUS INCLUDING PHASE CONTROL SYSTEM FOR MAINTAINING START POSITIONS OF SCANNING LINES EQUAL TO START POSITIONS OF REFERENCE VALUES THEREOF

Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Fujisawa; Hiroshi Ichimura, Tokyo; Ichiro Negishi, and Masaru Osada, both of Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 108,988, Oct. 14, 1987, which is a continuation of Ser. No. 790,455, Oct. 23, 1985, Pat. No. 4,736,243. This application Dec. 28, 1987, Ser. No. 137,926
Claims priority, application Japan, Dec. 26, 1986, 61-311670
Int. Cl.[4] H04N *9/083, 9/07*
U.S. Cl. 358—47 4 Claims

1. A color imaging apparatus comprising:

(a) a color filter having a plurality of successively arranged recurrent groups of different color stripes;

(b) an index signal generation pattern;

(c) an image pickup tube having a photoelectrical conversion target exposed to light passing through the color filter and the index pattern, the image pickup tube outputting a video signal including a plurality of periodic frames each including a plurality of scanning lines, said video signal containing a color signal component in the form of a carrier modulated in frequency and phase in accordance with the individual color stripes of each said recurrent group of the color filter, the video signal also containing an index signal component which depends on the index pattern, the index signal component having a phase which represents a present start position of each scanning line;

(d) means for holding a portion of the video signal which occurs under a condition where the photoelectrical conversion target is exposed via the color filter to light having a color equal to the color of one of the color stripes, said held signal portion corresponding to scanning lines included in at least one initial frame period occurring during said condition, said held signal portion containing an index signal component having a phase representative of a start position of each scanning line which occurs in said initial frame period under said condition;

(e) means for repeatedly reading out the held signal portion from the holding means and outputting a first reference signal corresponding to the signal portion read out from the holding means;

(f) means for generating a second reference signal on the basis of the first reference signal, said second reference signal having a phase in a fixed relationship with the phase of the carrier of the video signal;

(g) means for detecting a color component signal from the video signal in response to the second reference signal;

(h) a closed-loop phase control system comprising means for deriving a difference in phase between the index signal component of the video signal and the index signal component of the first reference signal and thereby deriving a difference between the present start position of each scanning line and the start position of a corresponding scanning line in said initial frame period, means for deflecting an electron beam within the image pickup tube, and means for controlling the deflecting means in accordance with said positional difference and thereby allowing the present start position of each scanning line to remain essentially equal to the start position of the scanning line corresponding thereto in said initial frame period; and

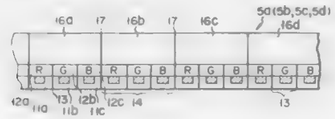
(i) a signal shifting means interposed in a loop of the closed-loop phase control system.

4,855,817

COLOR IMAGE SENSOR WITH OPTICAL DIFFUSION MEMBERS COVERING SETS OF COLOR FILTERS AND SEPARATED BY LIGHT SHIELDS TO OBTAIN ACCURATE COLOR REPRODUCTION

Yoshio Watanabe, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 14, 1987, Ser. No. 74,998
Claims priority, application Japan, Jul. 15, 1986, 61-166011
Int. Cl.[4] H04N *1/028*
U.S. Cl. 358—75 7 Claims



1. A color image sensor comprising:

a plurality of photoelectric conversion elements arranged in a straight line;

a plurality of sets of filters of different colors, one color filter located on each photoelectric conversion element, so that each set of color filters form a pixel;

an optical diffusion member provided on each set of color filters to diffuse light incident on each color filter in each set; and

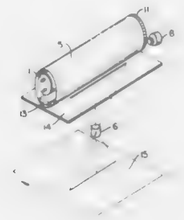
a plurality of light shields, one light shield disposed between adjacent pixels and adjacent optical diffusion members for shielding adjacent sets of color filters.

4,855,818

DOCUMENT READING APPARATUS WITH COLOR FILTER

Kenichi Morimoto, Nara, and Takao Tagawa, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 120,699, Nov. 10, 1987, abandoned, which is a continuation of Ser. No. 943,815, Dec. 29, 1986, abandoned, which is a continuation of Ser. No. 748,487, Jun. 25, 1985, abandoned. This application Jul. 27, 1988, Ser. No. 225,628
Claims priority, application Japan, Jul. 4, 1984, 59-130650; Jul. 4, 1984, 59-130651
Int. Cl.[4] H04N *1/46*
U.S. Cl. 358—75 1 Claim



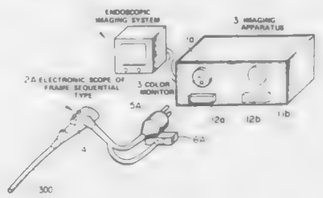
1. In a document reading apparatus for reading color information of a document by using a color filter to color-decompose scanning light, a color filter formed in a cylindrical shape with a plurality of filter elements having different colors, a light source disposed inside said cylindrical color filter and a cylindrical lens disposed inside said cylindrical color filter.

4,855,819

ENDOSCOPE IMAGING SYSTEM FOR USE WITH MULTIPLE COLOR IMAGING SYSTEMS

Hiroki Hibino, Hachioji; Kenji Kimura, Tachikawa; Masahide Kanno, Hachioji; Toshiaki Nishikori, Sagamihara; Jun Yoshinaga, Hino; Atsushi Kidawara, Tachikawa; Hisao Yabe, Hachioji; Shinichi Katou, Oume; Koji Takamura, Hachioji, and Takeaki Nakamura, Hino, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 150,255
Claims priority, application Japan, Jan. 31, 1987, 62-21459; Jan. 31, 1987, 62-21461; Mar. 10, 1987, 62-54599; Mar. 17, 1987, 62-61608
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—98 63 Claims



1. A endoscope imaging system comprising:

a color imaging means provided with a color filter using a solid state imaging device fitted with a color separating color filter in front of an imaging part having a photoelectric converting function;

a frame sequential type color imaging means using a solid state imaging device not fitted with said color separating color filter in front of an imaging part having a photoelectric converting function;

a light output means and signal processing means either of which is provided with functions corresponding to said color imaging means provided with said color filter and said frame sequential type color imaging means; and

a color monitoring means color-displaying predetermined color video signals output from said signal processing means.

4,855,820

DOWN HOLE VIDEO TOOL APPARATUS AND METHOD FOR VISUAL WELL BORE RECORDING

Joel Barbour, 3960 Germain St., Camarillo, Calif. 93010

Filed Oct. 5, 1987, Ser. No. 104,881
Int. Cl.[4] H04N *7/18, 7/10*
U.S. Cl. 358—100 28 Claims

1. A method for visually examining and video recording the sidewall of a bore hole comprising the steps of:

attaching a video camera at one end to a first housing forming a lower section of a tool;

installing a gyroscope in a second housing which is connected at one end to said other end of said first housing forming the upper section of said tool;

said video camera, said first housing, said second housing and said gyroscope being interconnected in a predetermined set radial alignment relative to each other along the tool's longitudinal axis;

connecting the other end of said second housing to a cable head having a power supply cord and a coaxial transmission cable for connecting said tool to a video monitor and providing power to said tool;

aligning said gyroscope in its free state in said second housing so that its spin axis is pointed to a given direction;

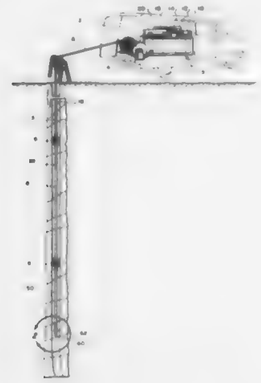
attaching a light source adjacent to said video camera for illuminating a portion of the bore hole viewed by said video camera;

energizing said video camera and said light source;

lowering said cable, cable head, and first and second housing

which form the down hole video tool into said bore hole by means of said cable while suspending said tool in said bore hole;

projecting onto a video monitor the image of the illuminated sidewall along with a floating reference point, said reference point indicating the preset aligned direction of said gyroscope's spin axis thereby providing for the directional



radial or circumferential reference to any portion of the sidewall shown on said video monitor and also projecting onto said monitor the depth at which said video camera is located in the bore hole;

connecting a video recorder to said video monitor for recording in real time the images and data through a given passage of said tool as it is lowered or raised in the bore hole.

4,855,821

VIDEO TIMING DEVICE FOR PHARMACEUTICAL TABLET TESTING

James E. Swon, 12 Brookside, Brookside, N.J. 07926, and Henry Hofer, 8 Telemark Rd., Rockaway, N.J. 07866

Filed Feb. 16, 1988, Ser. No. 156,032

Int. Cl.[4] H04N *7/18;* **G01N** *19/00*

U.S. Cl. 358—101 **19 Claims**



1. A video device for pharmaceutical surveillance and recording timing of rates of disintegration or dissolving of pharmaceutical tablets, comprising in combination: (a) an electronic video camera means for powering movement of and for surveillance of tablets undergoing disintegration or dissolution of tablets in liquid media; (b) camera support means for supporting and positioning said electronic video camera means for observing tablets being disintegrated or dissolved in a liquid media; (c) timing means for indicating running or intermittent times during surveillance of said camera means; and (d) video recording means for recording observations made by said electronic video camera means and for recording said times associated with observations during powering and surveillance of said electronic video camera means.

4,855,822

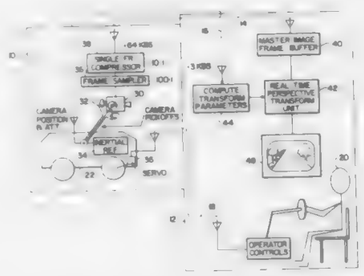
HUMAN ENGINEERED REMOTE DRIVING SYSTEM

Patrenahalli M. Narendra, Edina; Karl M. Fant, Minneapolis, and Carl P. Graf, Forest Lake, all of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Jan. 26, 1988, Ser. No. 148,531

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—103 **11 Claims**



1. A system for driving from a remote control station a vehicle comprising:

a sensor on the vehicle for providing snapshot images from the vehicle of an environment in which the vehicle is operating;

motion detecting means on the vehicle for providing information describing the motion of the vehicle;

transmitting means on the vehicle for transmitting the snapshot images and the information describing the motion of the vehicle to the remote control station; and

image generation means at the remote control station for combining the snapshot images and the information describing the motion of the vehicle into a display that can be utilized for driving the vehicle from the remote control station.

4,855,823

IMAGING ASSEMBLY AND MOUNTING FOR SURVEILLANCE VIEWING UNDER REMOTE CONTROL

Kenneth E. Struhs; Mark J. Struhs, and Patrick L. Struhs, all of Salt Lake City, Utah, assignors to Applied Engineering Products Co., Salt Lake City, Utah

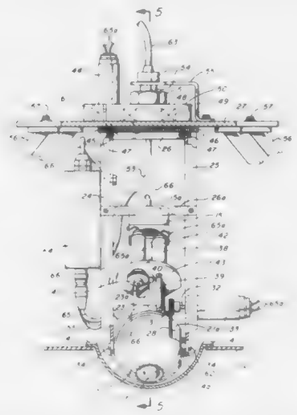
Filed May 5, 1988, Ser. No. 190,365

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—108 **38 Claims**

1. An integrated imaging assembly and mounting therefor particularly for surveillance viewing under remote control from a closed circuit television system, said imaging assembly comprising an optical lens arrangment including, among other lenses, an objective lens, a mount for said objective lens, and an electronic, charge-coupled, image-acquisition device optically aligned with said lens arrangement for receiving images therefrom; mounting means for said imaging assembly; means pivotally mounting said objective lens mount in said mounting means rearwardly of but adjacent to said objective lens, so the objective lens and the forward portion of said objective lens mount can be placed within a concave viewing dome of unusually small and shallow size, with the remainder of said imaging assembly and mounting therefor substantially wholly outside of and behind the concavity of the viewing dome, and can be tilted and panned to sweep over a broad viewing area with minimum protrusion thereinto; remotely controlled means for tilting said objective lens mount; remotely controlled means for panning said objective lens mount; remotely controlled

means for adjusting the positions of lenses in said lens arrangement; and electronic video camera means with which said



charge-coupled, image-acquisition device is electrically connected.

4,855,824

COMPATIBLE TELEVISION SYSTEM WITH COMPANDING OF AUXILIARY SIGNAL ENCODING INFORMATION

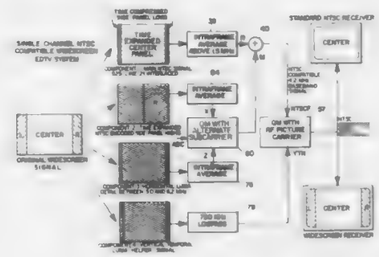
Jack S. Fuhrer, Princeton Junction, N.J., assignor to General Electric Company, Princeton, N.J.

Filed Dec. 29, 1987, Ser. No. 139,339

Claims priority, application United Kingdom, Sep. 14, 1987, 8721565

Int. Cl.[4] H04N *11/06, 7/12, 7/04*

U.S. Cl. 358—133 **33 Claims**



1. A system for processing a television-type signal, comprising:

means for providing a television-type signal containing image information of a first type;

means for providing an auxiliary signal containing auxiliary image information of a second type having low and high frequency image information portions;

means for nonlinearly compressing large amplitude excursions of said high frequency image information portion of said auxiliary signal, substantially exclusive of said low frequency image information; and

means for combining said image information of said first type and said compressed high frequency information to produce a combined signal.

4,855,825

METHOD AND APPARATUS FOR DETECTING THE MOST POWERFULLY CHANGED PICTURE AREAS IN A LIVE VIDEO SIGNAL

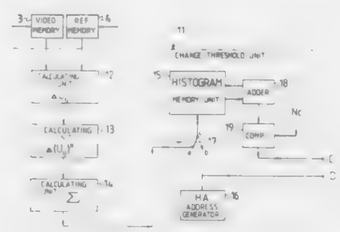
Harry J. Santamaki; Ilkka O. Korhonen, and Pentti O. Haikonen, all of Espoo, Finland, assignors to Valtion teknillinen tutkimuskeskus, Espoo, Finland

PCT No. PCT/FI85/00096, § 371 Date Sep. 28, 1987, § 102(e) Date Sep. 28, 1987, PCT Pub. No. WO87/03768, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 5, 1985, Ser. No. 138,846

Int. Cl.[4] H04N *7/04, 7/12*

U.S. Cl. 358—135 **5 Claims**



1. A method for detecting the most powerfully changed and for the human eye the most important picture areas in a video image in order to compress a live image into a transmission channel which functions at the rates of narrow bandwidth data connections, comprising:

digitizing a video signal so that a digital video image is formed of pels and a picture area is composed of a group of pels of image;

forming a picture information of the address of the picture area and of the data concerning the pels of image as well as the whole picture;

setting a change threshold (T) in a thresholding unit;

reading a digitized picture information into a video memory;

storing the digitized picture information which is already transmitted into a transmission channel in a reference memory;

comparing the digitized picture information read into the video memory (3) to the already transmitted picture information stored into the reference memory (4) such that the result is a change value (M);

comparing the change value (M) to the present change threshold (T), and when the change value surpasses the change threshold (T), coding and transmitting the picture information of the respective picture area, and storing the corresponding picture information into reference memory (4) in preparation for a new comparison, wherein the comparison between the new picture information and the transmitted picture information is carried out so that the change values in each predetermined picture area are calculated by summing up, pel by pel, the difference (U_{ij}) between the picture data of the new picture (U_{ijn}) and the reference picture (U_{ijn}) and the reference picture (U_{ijr});

combining the change values (M) obtained for each separate picture area into a change histogram of the whole frame, which change histogram contains the change values (M) of the picture areas in order of magnitude;

choosing from this change histogram a number defined by a reference number (N_c) of picture areas with the largest change values, which reference number (N_c) is predetermined; and

setting the change value of the chosen picture area with the smallest change value as the change threshold ($T=M_{opt}$).

4,855,826

ZONE PLATE SIGNAL GENERATOR

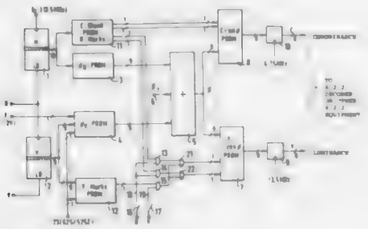
Gerhard Wischermann, Weiterstadt, and Hans-Peter Richter, Griesheim, both of Fed. Rep. of Germany, assignors to BTS Broadcast Television Systems GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jun. 6, 1988, Ser. No. 203,477

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719485

Int. Cl.[4] H04N *17/00, 17/02*

U.S. Cl. 358—139 **8 Claims**



1. Generator for producing circular zone plate pattern signals for testing digital television signals conforming with CCIR-Rec. 601, including first and second counters for counting at horizontal and vertical scan frequencies respectively to produce an orthogonal raster, first and second ROMs connected to said respective counters for producing horizontal and vertical frequency phase values, means for additively combining said horizontal and vertical frequency phase values, a third ROM connected to said combining means for converting said phase values into amplitude values, and further comprising:

means in and for said third ROM (7) for producing therefrom a digital luminance signal (Y) according to the equation $Y=-\cos\phi$;

a fourth ROM (8) connected to said combining means (5) for producing a chrominance signal (C) according to the equation $C=\sin\phi$;

means (9, 10) connected respectively to said third and fourths ROMs (7,8) for clocking out said luminance and chrominance signals in bit-parallel form, at respective rates conforming to a television signal standard, to an output suitable for connection to a 4:2:2 decoder or other equipment, and

means connected to outputs of said first and second counters for generating frequency marker signals of horizontal and vertical scan frequency and for modifying the operation of said third ROM so as to superpose frequency marker signals on said luminance signal (Y) as delivered at the output of said third ROM.

4,855,827

METHOD OF PROVIDING IDENTIFICATION, OTHER DIGITAL DATA AND MULTIPLE AUDIO TRACKS IN VIDEO SYSTEMS

Robert J. Best, San Jose, Calif., assignor to Worlds of Wonder, Inc., Fremon, Calif.

Filed Jul. 21, 1987, Ser. No. 76,036

Int. Cl.[4] H01N *7/04*

U.S. Cl. 358—143 **43 Claims**

1. A method of providing multiple analog signals in a composite signal of a video system comprising the steps of:

(a) for each of a plurality of analog signals, sampling such analog signal a predetermined number of times for each video scan line to provide a plurality of sampled analog signals for each video field;

(b) for each sampled analog signal, and for each video field, providing as a video signal for at least one predetermined video scan line associated with such analog signal, the sampled analog signal associated with such analog signal and such field at a rate wherein the sampled analog signal will be within the respective said at least one predetermined video scan line associated with said analog signal;



whereby said plurality of analog signals may be recorded, transmitted and otherwise manipulated as video signals on a plurality of scan lines of each field of the composite signal of the video system.

4,855,828

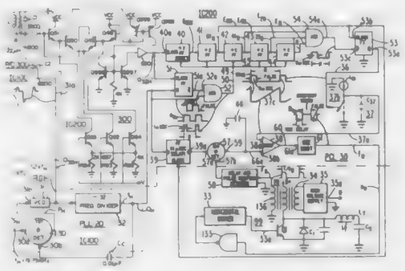
TELEVISION SYNCHRONIZING ARRANGEMENT

Jeffery B. Lendaro, Noblesville, Ind., assignor to RCA Licensing Corp., Princeton, N.J.

Filed Mar. 29, 1988, Ser. No. 174,928

Int. Cl.[4] H04N *5/04*

U.S. Cl. 358—148 **15 Claims**



1. A television deflection apparatus, comprising:

a source of a synchronizing input signal at a frequency that is related to a deflection frequency;

a resonant circuit;

a phase-lock-loop circuit including a first oscillator responsive to said input signal for generating a first signal at a frequency that is related to said deflection frequency that is coupled to said resonant circuit, said resonant circuit tuned to generate a second signal that is synchronized to said first signal such that undesirable high order harmonics are filtered out from said second signal;

an amplifier stage having regenerative feedback and having an input terminal that is coupled to said second signal for generating a third signal at a corresponding frequency;

a ramp generator responsive to said third signal for generating a ramp signal having a sawtooth waveform at a phase that is determined by a phase of said third signal;

a deflection circuit output stage responsive to a control signal for generating a deflection current in a deflection winding at a phase that is determined by a phase of said control signal and for generating a phase indicative signal that is indicative of said phase of said deflection current;

a phase detector responsive to said synchronizing signal and to said phase indicative signal for generating a phase difference indicative signal in accordance with a phase difference between said phase indicative signal and said synchronizing signal; and

phase shifting means responsive to said phase difference signal and to said ramp signal for generating said control signal having said phase that varies in accordance with said phase difference signal.

4,855,829

APERTURE CORRECTION CIRCUIT

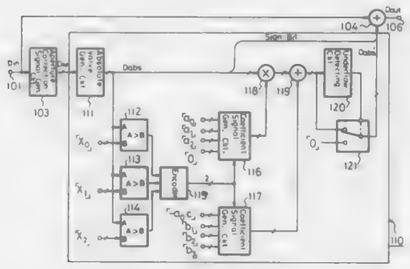
Taku Kihara, Kanagawa, Japan, assignor to Sony Corp., Tokyo, Japan

Filed Mar. 22, 1988, Ser. No. 171,764

Claims priority, application Japan, Mar. 31, 1987, 62-080310; Jun. 13, 1987, 62-147717

Int. Cl.[4] H04N *5/14*

U.S. Cl. 358—162 **4 Claims**



1. An aperture correction circuit comprising:

a video signal source for generating a video signal;

aperture correction signal generating means supplied with said video signal from said video signal source for generating an aperture correction signal;

absolute value generating means supplied with said aperture correction signal for generating an absolute value and a sign signal thereof;

level detecting means supplied with said absolute value for detecting a level of said absolute value and and generating a detected output corresponding thereto;

coefficient signal generating means for generating first and second coefficient signals;

multiplying means for multiplying said absolute value by said first coefficient signal;

first adding means for adding an output of said multiplying means to said second coefficient signal;

said coefficient signal generating means being controlled by said detected output so that said first and second coefficient signals are changed in response to changes in said detected output such that a gain of an output from said adding means relative to said absolute value input to said multiplying means decreases as said absolute value increases;

combining means for combining said output of said adding means and said sign signal; and

second adding means for adding the output of said combining means and said video signal to provide aperture-corrected video data therefrom.

4,855,830

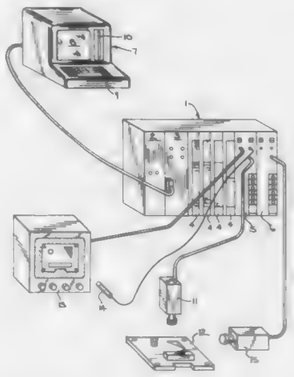
MACHINE VISION SYSTEM WITH ILLUMINATION VARIATION COMPENSATION

Wesley Davis, Franklin, and Michael L. Gasperi, Caledonia, both of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Mar. 30, 1987, Ser. No. 31,414

Int. Cl.[4] H04N *5/57, 17/04*

U.S. Cl. 358—168 **13 Claims**



1. A programmable controller for operating a machine, said controller including a vision input system comprising:

means for receiving a video signal representing a video image of an object to be processed by the machine;

means for measuring the luminance of the video signal for a portion of said video image;

means, responsive to said means for measuring, for establishing a luminance threshold;

means for digitizing the video image by employing the luminance threshold; and

means for analyzing characteristics of the digitized image to generate data for use in operating the machine.

4,855,831

VIDEO SIGNAL PROCESSING APPARATUS

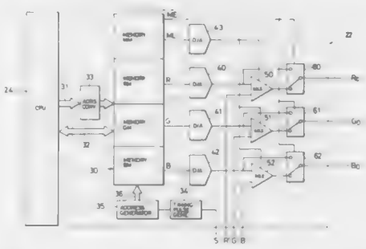
Fumitaka Miyamoto, Ibaraki, and Daisaku Kato, Iwai, both of Japan, assignors to Victor Co. of Japan, Japan

Filed Oct. 29, 1987, Ser. No. 115,604

Claims priority, application Japan, Oct. 31, 1986, 61-259879

Int. Cl.[4] H04N *5/272, 9/74*

U.S. Cl. 358—183 **6 Claims**



1. A video signal processing apparatus comprising:

(a) means for generating a superimposing video signal representing a superimposing image;

(b) means for mixing the superimposing video signal and a background video signal at a variable mixing rate; and

(c) means for varying the mixing rate during an interval where the superimposing video signal corresponds to an edge of the superimposing image,

further comprising means for selecting either of the superimposing video signal and an output signal from the mixing means which represents a mixture of the superimposing video signal and the background video signal.

4,855,832

GATED VIDEO MIXER

Ronald E. Carmean, Madison, Wis., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed Mar. 31, 1988, Ser. No. 175,512
Int. Cl.[4] H04N *5/265*
U.S. Cl. 358—183 **12 Claims**



1. A video mixer circuit for adding to a first video signal input portions of a second video signal input, the mixer comprising:

sync stripper means for separating the synchronization pulse from the first video signal input and providing a synchronization pulse output to the source of the second video signal input;

voltage comparator means responsive to one of the first and second video signal inputs for blocking passage of the second video signal except during defined voltage levels of the video signal; and

summing means to sum the first video signal to those portions of the second video signal which are not blocked by the voltage comparator means.

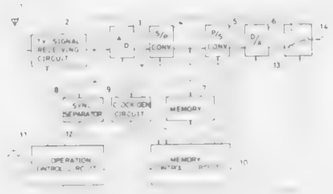
4,855,833

TELEVISION CHANNEL SELECTION APPARATUS EMPLOYING MULTI-PICTURE DISPLAY

Yoshikazu Kageyama, and Mineo Mino, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 4, 1987, Ser. No. 116,735
Claims priority, application Japan, Nov. 4, 1986, 61-262230
Int. Cl.[4] H04N *5/268, 5/272, 5/44*
U.S. Cl. 358—183 **3 Claims**

1. In a channel selection apparatus manually operable for selecting one of a plurality of television channel signals to derive a video signal to be supplied to television picture display means having a display screen, the apparatus including television signal receiving circuit means coupled to receive said plurality of television channel signals for selecting and demodulating one of said channel signals to produce a first video signal, memory means capable of storing data representing at least one field of said first video signal, and control circuit means for controlling receiving circuit means and said memory means, operable to selectively establish a normal operating mode of said apparatus in which one of said channel signals is fixedly selected by said television signal receiving circuit means and said first video signal is directly transferred to said display means and a multi-picture display operating mode in which data stored in said memory means are continuously read out and converted to a second video signal which is transferred to said display means, the improvement whereby said control circuit means controls said receiving circuit means during said multi-picture display mode operation to sequentially select said plurality of television channel signals during respective time intervals of fixed duration, and controls said memory means during each of said time intervals such that data derived from said first video signal representing a television picture in compressed form are repetitively written into said memory means during a plurality of successive fields of said first video signal, said data being written concurrently with said continuous read-out operation, whereby a miniature display picture corresponding to a currently selected one of said channels is displayed by said display means in the form of a moving picture, while miniature display pictures corresponding to the remainder of said channels are displayed in the form of respective static pictures, and whereby said control circuit means executes control upon a transition from said multi-picture display mode to said normal operating mode such that one of said channel signals that is currently selected at the time of said transition is thereafter held continuously selected by said receiver circuit means.

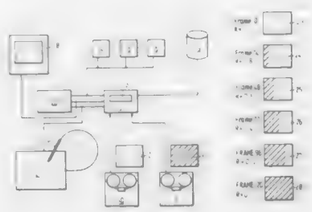


4,855,834

VIDEO WIPE PROCESSING APPARATUS

Robin A. Cawley, and Paul R. N. Keller, both of Newbury, United Kingdom, assignors to Quantel Limited, Newbury, Berkshire, England

Filed Nov. 17, 1988, Ser. No. 272,515
Claims priority, application United Kingdom, Nov. 21, 1987, 8727339
Int. Cl.[4] H04N *5/22*
U.S. Cl. 358—183 **6 Claims**



1. Video processing apparatus for creating a wipe wherein a decreasing proportion of successive output frames is derived from a first video input signal (A) and an increasing proportion of said frame is derived from a second video input signal (B), characterised by frame storage means for storing a frame of multi-bit wipe-shape signals, addressing means for addressing said frame storage means in synchronism with the input video

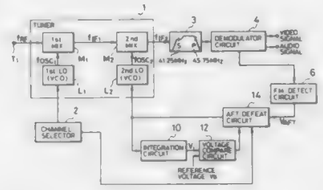
signals during frame periods, processing means for processing values read from said frame storage with a reference signal to determine whether the output is to be derived from said first input, said second input or a combination of said inputs, and means for adjusting said reference signal between said frame periods.

4,855,835

AFT CIRCUIT FOR CATV RECEIVER SYSTEM

Katsumi Tobita, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1988, Ser. No. 187,223
Claims priority, application Japan, Aug. 14, 1987, 62-124504
Int. Cl.[4] H04N *5/50;* **H04B** *1/26*
U.S. Cl. 358—195.1 **3 Claims**



1. An AFT circuit of a CATV receiver system of a double conversion method having a first local oscillator and a second local oscillator and a first mixer and a second mixer respectively supplied with oscillation outputs from said first and second local oscillators such that a reception signal is sequentially subjected to a frequency conversion by use of said first and second mixers so as to attain a second intermediate frequency signal of a predetermined frequency comprising:

control voltage generate means for outputting a control voltage depending on a frequency fluctuation of said second intermediate frequency signal;

select means for selecting either said control voltage or a constant voltage and for supplying the selected voltage as an oscillation frequency control voltage controlling an oscillation frequency of said second local oscillator to said second local oscillator;

integrate means for integrating said oscillation frequency control voltage so as to produce as an output therefrom an integrated voltage attained through the integration; and

voltage compare means for comparing said integrated voltage with a reference voltage so as to supply a result of the comparison to said select means wherein

said select means operative based on said compare result from said voltage compare means supplies said control voltage to said second local oscillator when said integrated voltage is higher than said reference voltage and supplies said constant voltage to said second local oscillator when said integrated voltage is lower than said reference voltage.

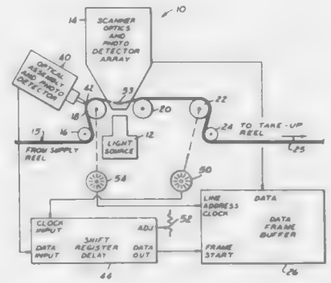
4,855,836

METHOD AND APPARATUS FOR CONVERTING FILM TO LINE SNYCHRONIZED VIDEO SIGNAL DATA

Thomas E. Shearer, Royal Oak, Mich., assignor to Producers Color Service, Inc., Southfield, Mich.

Filed Oct. 15, 1987, Ser. No. 108,559
Int. Cl.[4] H04N *3/38, 5/253*
U.S. Cl. 358—214 **16 Claims**

10. In a method of converting image data stored in frames on film to video signals which includes the steps of (a) propelling the film lengthwise adjacent to image scanner means, (b) scanning each film frame in a plurality of scan lines from frame top to bottom to develop a series of scan line data, and (c) storing said scan line data in memory by line and frame, the improvement for automatically compensating storage of scan line data for variation in film speed comprising the step of (d) clocking storage of said scan line data as a function of film motion by



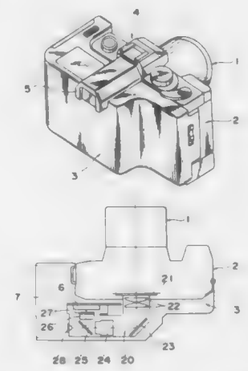
(d1) sensing increments of lengthwise film motion and (d2) clocking said data as a function of said increments.

4,855,837

A VIDEO COVER & VIEWFINDER ACCESSORY FOR A STILL CAMERA

Tetsuyuki Tanimoto, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 18, 1988, Ser. No. 157,635
Claims priority, application Japan, Feb. 18, 1987, 62-36130
Int. Cl.[4] G03B *13/00;* **H04N** *5/225*
U.S. Cl. 358—229 **17 Claims**



12. In a camera of the type capable of taking pictures with film and having a viewfinder, the improvement of:

a still video back cover attached to the camera and replacing the normal camera back cover;

means for converting an image of an object into a corresponding video signal;

means for recording the video signal, and

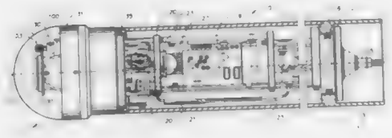
means for modifying the image from the viewfinder while providing operating information with the modified image to the user.

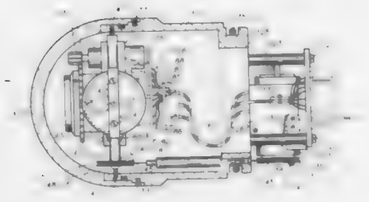
4,855,838

REMOTELY CONTROLLED PAN AND TILT TELEVISION CAMERA

David P. Jones, North Falmouth, and William D. McElroy, Falmouth, both of Mass., assignors to Cues, Inc., Orlando, Fla.

Filed May 27, 1988, Ser. No. 199,425
Int. Cl.[4] H04N *7/18, 5/30*
U.S. Cl. 358—229 27 Claims





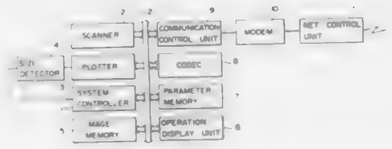
1. A television camera comprising:
an elongated housing having a longitudinal axis and a front end covered by a transparent member;
a first gimbal pivotably mounted in said front end for controllable rotation relative to said housing about a first axis oriented transversely of said longitudinal axis;
a second gimbal pivotably mounted on said first gimbal for controllable rotation relative to said first gimbal about a second axis oriented transversely of said longitudinal axis and orthogonally of said first axis, said second gimbal being movable with said first gimbal about said first axis;
a lens having an adjustable focus capability mounted on said second gimbal and having an optical axis oriented perpendicular to said first and second axes;
a focus control motor mounted on and movable with said second gimbal for controllably changing the focus of said lens;
a first motor positionally fixed in said housing for controllably rotating said first gimbal about said first axis relative to said housing;
a second motor mounted on and movable with said second gimbal for controllably rotating said second gimbal about said second axis relative to said first gimbal;
image transducer means, mounted in positionally fixed relation to said lens so as to be movable with said lens, for receiving optical images from said lens and converting the optical images to electrical signals; and
electronic circuit means for converting said electrical signals to video signals suitable for display on a television monitor, said circuit means being disposed positionally fixed within said housing.

4,855,839

FACSIMILE MACHINE WITH A PAPER SIZE ADJUSTABLE PROXY RECEPTION FUNCTION

Yuichi Saito, Hadano, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 10, 1987, Ser. No. 131,359
Claims priority, application Japan, Dec. 10, 1986, 61-292407
Int. Cl.[4] H04N *1/21, 1/32, 1/40, 1/04*
U.S. Cl. 358—296 5 Claims



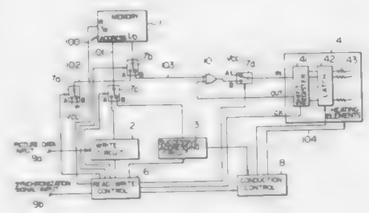
1. A facsimile machine comprising:
communication control means for controlling communication with another facsimile machine;
first storing means for temporarily storing image information;
recording means for recording the image information stored in said first storing means on recording paper, wherein recording paper having a predetermined size may be set in said recording means;
detecting means for detecting the size of said recording paper set in said recording means;
second storing means for storing the size detected by said detecting means; and
a system controller for controlling the overall operation of said facsimile machine, said system controller sending the size stored in said second storing means to a transmitter as a paper size usable for image reception prior to transmission of image information from said transmitter when an abnormal condition regarding said recording paper is present in said recording means upon reception of a call from said transmitter.

4,855,840

CONTROL CIRCUIT FOR VIDEO PRINTER

Hiroyuki Kimura, Kanagawa; Yasunori Kobori, Yokohama; Kentaro Hamma, Yokohama; Takashi Omata, Yokohama, and Katsunori Oki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 13, 1988, Ser. No. 193,787
Claims priority, application Japan, May 15, 1987, 62-116814
Int. Cl.[4] G01D *15/10;* H04N *1/21*
U.S. Cl. 358—296 5 Claims



1. In a video printer including a picture data input terminal successively supplied with digital picture data corresponding to one line, a memory for storing therein picture data corresponding to one line, a shift register successively supplied with data read out from said memory, and a thermal head having a plurality of heating resistors coupled respectively to respective bits of said shift register,

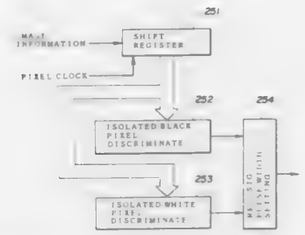
a video printer control circuit comprising:
first address generation means for generating a first address of said memory on the basis of picture data supplied to said picture data input terminal and for supplying said first address to said memory, said memory being addressed by said first address and a second address;
second address generation means for generating an address signal depending upon a printing dot of said thermal head and for supplying the address signal to said memory as said second address;
a memory write circuit comprising said first address generation means and said second address generation means; and
a memory readout circuit for generating said second address for each of said first address and for supplying said second address to said memory.

4,855,841

RECORDING SIGNAL GENERATING CIRCUIT FOR PRINTING

Kazuyuki Shimada, Chofu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 196,314, May 20, 1988, abandoned. This application Feb. 22, 1989, Ser. No. 314,287
Claims priority, application Japan, May 25, 1987, 62-126034
Int. Cl.[4] H04N *1/23, 1/40*
U.S. Cl. 358—296 17 Claims



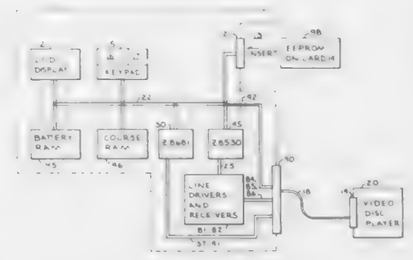
1. A recording signal generating circuit for printing in which a recording signal corresponding to image information is generated, comprising:
storing means for sequentially storing image information on a predetermined number of consecutive pixels in synchronism with a pixel clock, one pixel positioned at the center of the consecutive pixels being a pixel of interest;
isolated black pixel discriminating means for discriminating an isolated black pixel pattern in which the pixel of interest is a black pixel and the other pixels in the storing means preceding and following the pixel of interest are all white pixels;
isolated white pixel discriminating means for discriminating an isolated white pixel pattern in which the pixel of interest is a white pixel and the other pixels in the storing means preceding and following the pixel of interest are all black pixels; and
recording signal pulse width setting means for setting a pulse width of a recording signal for each of the pixels to a standard pulse width when the isolated black pixel discriminating means and the isolated white pixel discriminating means detect no isolated black and white pixel patterns and for setting a pulse width of the recording signal for the pixel of interest to a wider pulse width when the isolated black pixel pattern is detected and for setting a pulse width of the recording signal for one of the pixels just preceding and following the pixel of interest to a narrower pulse width when the isolated white pixel pattern is detected.

4,855,842

DEDICATED PROGRAMMABLE CONTROLLER FOR INTERACTIVE VIDEO DISC SYSTEM

John B. Hayes, and Douglas L. Armstrong, both of Atlanta, Ga., assignors to Professional Training Systems, Inc., Atlanta, Ga.

Filed Aug. 6, 1987, Ser. No. 82,770
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—342 5 Claims



1. A dedicated controller for controlling interactive video disc systems comprising in combination:
a housing;
a selectively operable input means disposed on said housing for providing user response signals;
connection means, including a plurality of electrical signal paths, for connecting said controller to a control port on at least one of said video disc systems;
at least one microprocessor,
means for providing a video disc control selection signal, corresponding to a particular one of a predetermined plurality of said video disc systems, in response to one of said user response signals;
first storage means for storing said video disc control selection signal;
second storage means for storing a plurality of sets video disc control characterization signals:
third storage means for providing control program signals to said microprocessor;
means for connecting said microprocessor to said first, second, and third storage means; and
wherein said microprocessor is responsive to each of said user response signals to access one of said video disc control characterization signals from a particular one of said sets of video disc control characterization signals determined by said video disc control selection signal and to provide a predetermined signal state to said plurality of electrical signal paths of said connection means in response thereto.

4,855,843

DIGITAL VIDEO RECORDING

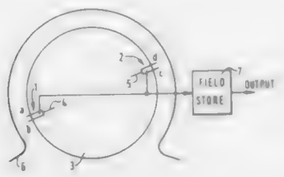
John G. S. Ive, Basingstoke, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 6, 1987, Ser. No. 83,903
Claims priority, application United Kingdom, Oct. 5, 1984, 8425179
Int. Cl.[4] H04N *5/78*
U.S. Cl. 360—10.2 15 Claims

1. A method of recording and reproducing a digital video signal, the method comprising:
recording said video signal in oblique tracks on a magnetic tape using four recording heads arranged in two head pairs disposed on diametrically opposite sides of a rotary head drum, the video data relating to each field being distributed evenly between the four heads for recording;
each said oblique track comprising two half-tracks separated by a central gap, and each field occupying a plurality of

successively recorded pairs of half-tracks with each field boundary located at a said central gap; and

reproducing said video signal at a speed different from the normal reproduction speed using four reproducing heads provided with dynamic tracking and arranged in two head pairs disposed on diametrically opposite sides of a rotary head drum, by successively reproducing two said half-



tracks from the first part of a first pair of adjacent oblique tracks, then jumping to reproduce two said half-tracks from the second part of a second pair of adjacent oblique tracks adjacent to said first pair and so on until all the data of one field has been reproduced, and then jumping to another field, each said reproducing head pair making said field jump when it is out of contact with said magnetic tape.

4,855,844

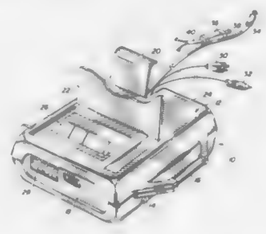
METHOD OF PRERECORDING TAPE AND APPARATUS FOR USE THEREWITH

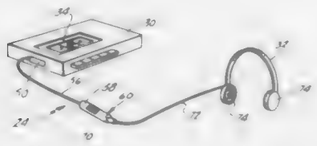
Michael Snodgrass, 550 Slayton, Grand Haven, Mich. 49417

Filed Nov. 2, 1984, Ser. No. 667,642

Int. Cl.[4] G11B *5/02, 15/12*

U.S. Cl. 360—22 **5 Claims**





1. An adaptor device for use with a conventional stereo tape playing assembly that complementarily, simultaneously produces both channels of a stereophonic signal in order to permit use of the stereo tape playing assembly to reproduce noncomplementary monaural signals carried on both said channels, said adaptor device being selectively separable from said tape playing assembly and said tape playing assembly having a signal outlet that includes a first outlet lead for one of said stereo channels and a second outlet leads for the other of said stereo channels, said outlet adapted for connection to a speaker assembly signal input, said speaker assembly signal input having a first speaker lead adapted for mating with said first outlet lead and a second speaker lead adapted for mating with said second outlet lead to simultaneously broadcast both said stereo channels, comprising:

a tape player connector adapted for connection to said tape playing assembly signal outlet, said tape player connector including a first adaptor lead located to mate with said first outlet lead and a second adaptor lead located to mate with said second outlet lead when said tape player connector is connected to said outlet;

a speaker connector adapted for connection to said speaker assembly signal input, said speaker connector including a third adaptor lead located to mate with said first speaker lead and a fourth adaptor lead located to mate with said second speaker lead when said speaker connector is connected with said input;

means for selectively switching said first adaptor lead into operative electrical communication with at least one of said third and fourth adaptor leads and for selectively switching said second adaptor lead into operative electrical communication with at least one of said third and fourth adaptor leads, whereby when said tape player connector is operatively connected to said tape playing assembly signal outlet and said speaker connector is operatively connected to said speaker assembly signal input, an operator is provided with the ability to selectively broadcast one of said stereo channels individually by operating said switching means.

4,855,845

VIDEO CASSETTE APPARATUS CASE AND METHOD THEREFORE

Ted K. Thrush, 7035 North 23rd Way, Phoenix, Ariz. 85020

Division of Ser. No. 552,159, Nov. 15, 1983, Pat. No. 4,669,001.

This application May 22, 1987, Ser. No. 53,821

The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.

Int. Cl.[4] B65D *85/30, 85/00;* **H04N** *5/782*

U.S. Cl. 360—33.1 **17 Claims**

1. A protective carrying case for an enclosed video cassette apparatus, comprising:

upper and lower carrying case halves, said video cassette apparatus positioned within said carrying case halves;

means for securing said upper carrying case half to said lower carrying case half at a plurality of peripheral points thereof;

first access means located on an exterior portion of one of said upper and lower carrying case halves for affording quick access to a cassette door of said video cassette apparatus and to permit rapid loading and unloading of a video cassette therethrough and into and out of said enclosed video cassette apparatus;

second access means for additionally affording access to electrical connections of said video cassette apparatus;

control panel access means for allowing access to at least a portion of the video cassette apparatus' controls, said control panel access means is substantially integral to a front portion of said carrying case;

at least one of first feet support means coupled to a first side portion of said upper carrying case half and at least one of second feet support means coupled to a first side portion of said lower carrying case half for providing support and stability to said carrying case when said carrying case is rested on said first and second feet support means, said first feet support means are substantially proximate to said second feet support means when said upper and lower carrying case halves are connected together;

at least one set of ventilation port means located in at least one of said upper and lower carrying case halves for permitting circulation of cooling air for said video cassette apparatus located therein; and

handle means for allowing hand gripping of said carrying case.

4,855,846

DEVICE FOR LOADING A TAPE-LIKE SUBSTANCE

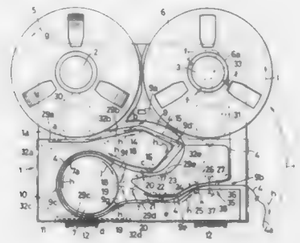
Shinji Hanatani; Yoshiaki Sugiyama, and Hisayoshi Chino, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 6, 1988, Ser. No. 141,299

Claims priority, application Japan, Jan. 30, 1987, 62-020278; Feb. 4, 1987, 62-024045

Int. Cl.[4] G11B *5/027*

U.S. Cl. 360—84 **7 Claims**



1. A device for loading a tape-like substance comprising:

a supply reel;

a take-up reel;

a guide drum;

path-defining means defining a tape path extending from an inlet for receiving said tape-like substance from the supply reel to an outlet for supplying said tape-like substance to the take-up reel, said tape path including a peripheral path extending along the periphery of the guide drum;

means defining a plurality of air outlets along the tape path; and

at least one blower for blowing air from the plurality of air outlets into the tape path,

wherein the tape-like substance is paid out of the supply reel and conveyed with assistance by the air blown from the plurality of air outlets, from said inlet to said outlet through said peripheral path;

the device further comprising:

a guide plate for leading said tape-like substance together with the air to the beginning of said peripheral path; and

a drive mechanism for moving said guide plate in either direction between an active position and an inactive position, said guide plate in said active position leading said tape-like substance together with the air to the beginning of said peripheral path in order to facilitate loading of said tape-like substance and in said inactive position avoiding interference with movement of said tape-like substance in order to facilitate movement of said tape-like substance between said supply reel and said take-up reel.

4,855,847

VIDEO DISK REPRODUCING DEVICE HAVING IMPROVED MOTOR SPEED CONTROL

Hitoshi Kanamaru, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 5,345, Jan. 12, 1987, abandoned, which is a continuation of Ser. No. 687,326, Dec. 28, 1984, abandoned.

This application Jul. 6, 1988, Ser. No. 218,525

Claims priority, application Japan, Dec. 29, 1983, 58-202883[U]

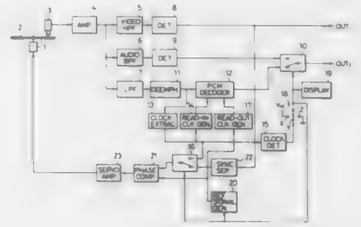
Int. Cl.[4] H04N *5/91;* **G11B** *17/00*

U.S. Cl. 360—19.1 **4 Claims**

1. A data reproducing device for reading via pickup means data from a recording medium, said data comprising a first signal obtained by frequency modulating a video signal including a synchronizing signal and optionally a second signal obtained by digitally modulating an audio signal including a clock signal, said first and second signals being recorded together on said recording medium, and for reproducing the data thus read, comprising:

means for extracting said clock signal from said data thus read when said second signal is present;

changeover instruction generating means for detecting the presence of said clock signal and producing a changeover instruction signal when the presence of said clock signal is detected;



means for extracting said synchronizing signal form said data thus read; and

signal selecting means for selectively outputting, in response to said changeover instruction signal, said clock signal as a signal for controlling a speed of movement of a data detecting point of said pickup means relative to said recording medium and, in response to a lack of said changeover instruction signal, using said synchronizing signal as said signal for controlling said speed.

4,855,848

DOUBLE INSERTION AND INNER LID FLOAT PREVENTING MECHANISM

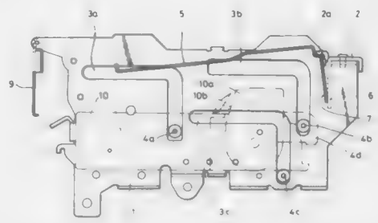
Kimichika Yamada; Yukio Ito, and Hiroyuki Ohkawa, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 100,281

Claims priority, application Japan, Sep. 30, 1986, 61-232211

Int. Cl.[4] G11B *15/675*

U.S. Cl. 360—96.5 **4 Claims**



1. A magnetic recording and reproducing apparatus comprising:

a pair of spaced side plates;

a connection plate connecting said side plates;

a cassette holder configured to move along said side plates to an inner position in said apparatus while holding an inserted cassette, to the drop to a predetermined mode position to position said cassette there, and to eject said cassette by moving along an opposite course away from said mode position;

a misplate supported at one end for pivotal movement and having a portion overhanging a space defined by said side plates and said connection plate, and means for effecting downward and upward pivotal movement of said misplate respectively in response to downward and upward move-

ment of said cassette holder between said inner and mode positions thereof;

first regulating means for limiting downward pivotal movement of said misplate to a position to prevent insertion of a cassette into said apparatus; and

second regulating means for limiting downward pivotal movement of said misplate to a position to prevent insertion of a cassette into said apparatus; and

second regulating means for limiting upward pivotal movement of said misplate to a position to allow insertion of a cassette into said cassette holder;

wherein said misplate has said one end insertingly engaging said connection plate to effect said pivotal support of said misplate thereon.

4,855,849

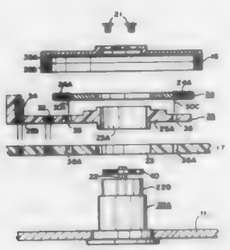
DISK DRIVE MOTOR MOUNT

David E. Jones, Layton, and David S. McMurtrey, West Point, both of Utah, assignors to Iomega Corporation, Roy, Utah

Continuation of Ser. No. 854,342, Apr. 21, 1986, abandoned. This application Apr. 25, 1988, Ser. No. 186,780

Int. Cl.[4] G11B *25/04*

U.S. Cl. 360—97.01 **8 Claims**



1. A magnetic disk drive comprising:

(a) a chassis;

(b) a drive spindle rotatably supported by said chassis for driving the magnetic disk;

(c) a drive shaft rotatably engaging said spindle;

(d) a stator having a plurality of stator windings and a central aperture disposed about said drive shaft;

(e) a printed circuit board supporting said stator disposed between said chassis and said stator, said printed circuit board having a printed circuit thereon and an aperture through which said drive shaft passes;

(f) a bell rotor mounted to the drive shaft and inductively disposed about said stator;

(g) a first sensing device for sensing the rotation of said bell rotor;

(h) a stator spacer supported by said printed circuit board for aligning said first sensor with said bell rotor and said stator with said drive shaft, said stator spacer including a cylindrical member about which said stator is alignedly disposed, said cylindrical member having a bore through which said drive shaft rotatably passes, and a fan shaped portion integral with and extending radially out from said cylindrical member, said fan shaped portion having a first receptacle therein for retaining said first sensing device; and

(i) a retaining pin for fixedly holding and electrically connecting said motor stator to said printed circuit board.

4,855,850

DISK APPARATUS WITH DISK ROTATING MEANS

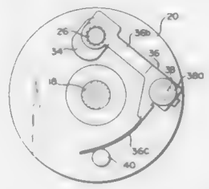
Tomoo Nagaoka, and Takashi Kimura, both of Tokyo, Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 137,186

Claims priority, application Japan, Dec. 27, 1986, 61-198959[U]; Mar. 30, 1987, 62-47522[U]; Mar. 31, 1987, 62-46963[U]

Int. Cl.[4] G11B *17/022*

U.S. Cl. 360—99.12 **7 Claims**



1. A disk rotating apparatus for rotating a magnetic disk supported by a disk hub on its central portion, said disk hub having a central hole coaxial with a central axis thereof and a drive hole eccentric with respect to the central axis, said disk rotating apparatus comprising:

a driving motor;

a spindle shaft rotated by said driving motor and inserted through the central hole of the magnetic disk;

a rotating member fixed to said spindle shaft in coaxial relation therewith and rotated together with said spindle shaft;

a drive pin arranged on said rotating member eccentric with respect to the central axis thereof and capable of being inserted through the drive hole of the magnetic disk;

a leaf spring member attached to the underside of said rotating member, said leaf spring member including a first leaf spring portion having said drive pin implanted in one end thereof, and a second leaf spring portion bent at a right angle from the other end of said first leaf spring portion;

journal means for rotatably supporting said leaf spring member, at said other end of said first leaf spring portion, on said rotating member about an axis perpendicular to the underside of said rotating member; and

a spring contact member fixed to the underside of said rotating member eccentric with respect to the central axis thereof;

said second leaf spring portion contacting said spring contact member to apply an urging force for biasing said drive pin into resilient contact with a side edge of the drive..hole, and said first leaf spring portion applying an urging force for biasing said drive pin resiliently to insert the same into the drive hole.

4,855,851

HEAD SUSPENSION FOR MAGNETIC RECORDING

Hatem R. Radwan, Eden Prairie, and Lloyd C. Goss, Bloomington, both of Minn., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Mar. 2, 1988, Ser. No. 162,950

Int. Cl.[4] G11B *5/48*

U.S. Cl. 360—104 **17 Claims**

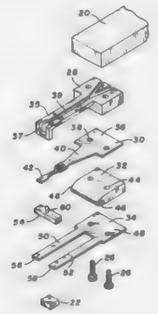
1. A suspension apparatus for supporting a magnetic transducing head with respect to a rigid carriage member for movement relative to a substantially planar magnetic recording surface of a magnetic recording medium and with an air bearing supporting the head in parallel, spaced apart relation to the recording surface, including:

elongate and spaced apart first and second normally planar flexure members, each flexure member mounted to and extended lengthwise away from a rigid carriage and normally disposed parallel to a substantially planar recording surface of a magnetic recording medium;

a substantially rigid cross-member fixed to said first and second flexure members at respective first and second end portions of the flexure members remote from said carriage;

a magnetic transducing head integrally mounted to said cross-member and centrally disposed between said first and second end portions; and

a biasing means for urging said cross-member and said transducing head toward said recording surface, while said head is supported in parallel, spaced apart relation to the recording surface by an air bearing formed by movement of said surface relative to said head;



wherein each of said first and second flexure members is disposed with its width dimension parallel to said recording surface and its thickness dimension substantially normal to the recording surface, the width of each flexure member being substantially greater than its thickness whereby each flexure member is subject to lengthwise torsional bending and highly compliant for elastic deformation about axes parallel to its width whereby the orientation of the transducing head and cross-member are determined primarily by said biasing means and said air bearing, with said flexure members being so deformed in accordance with said orientation; and wherein each said flexure member is substantially resistant to elastic bending about axes normal to said recording surface.

4,855,852

MAGNETIC HEAD

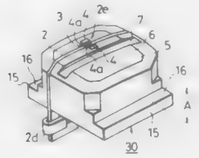
Masao Okita, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Continuation of Ser. No. 875,553, Jun. 18, 1986, abandoned. This application May 26, 1988, Ser. No. 201,317

Claims priority, application Japan, Jun. 26, 1985, 60-95728

Int. Cl.[4] G11B *5/48, 21/16*

U.S. Cl. 360—104 **4 Claims**



1. In a structure for mounting a magnetic head to a mounting member of a magnetic recording/reproducing device, in which the magnetic head has a planar front slide surface integrally formed with a head core facing in contact with a magnetic recording medium oriented in a lateral direction, and a rear mounting part of the magnetic head is mounted to the mounting member,

the improvement comprising:

said mounting member having a mounting hole formed therethrough and a laterally extending surface around the mounting hole on a front side facing toward the recording medium;

said rear mounting part including a pair of flanges extending laterally on opposite sides of the magnetic head from each other, said flanges each having a mounting surface extending parallel to the lateral direction on their sides facing toward the recording medium, each mounting surface being formed a given distance from the front slide surface of the magnetic head in a reference mounting plane;

a pair of mounting plates mounted on the laterally extending surface of the mounting member extending laterally partially across the hole on each side of the hole opposite from each other; and

said magnetic head being mounted in the hole and adhered from a rear side of the mounting member such that the mounting surfaces of the flanges are held as the reference mounting plane in contact with the respective mounting plates extending laterally partially across the hole, whereby the slide surface of the mounted magnetic head is accurately located by the given distance above the lateral surface of the mounting member.

4,855,853

ACTUATOR FOR POSITIONING HEADS IN MAGNETIC DISC APPARATUS

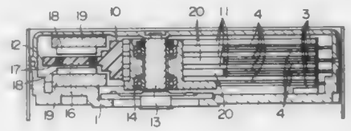
Toshio Matsushita; Hideaki Amano; Satoru Yamaura; Shigeo Nakamura, all of Odawara, and Yasusuke Nakada, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 6, 1987, Ser. No. 105,018

Claims priority, application Japan, Oct. 15, 1986, 61-243151

Int. Cl.[4] G11B *21/08*

U.S. Cl. 360—106 **18 Claims**



1. An actuator mechanism for positioning a head in a disc apparatus, comprising:

(a) at least one head for recording and reproducing information on a disc;

(b) an arm having one end supporting said head and the other end supported rotatably about a shaft;

(c) a coil constituting a voice coil motor for causing said arm to rotate about said shaft to position said at least one head to a desired position on the disc; and

(d) a coil support member made of a molded resin for covering said coil, said support member being attached to the other end of said arm, wherein said resin includes a mixture of a first resin powder mixed with a predetermined amount of a second powder having a specific gravity larger than said resin powder, the predetermined amount of said second powder being selected so as to balance a portion including said arm and said at least one head with a portion including said coil and said coil support member in relation to said shaft.

4,855,854

THIN-FILM MAGNETIC HEAD

Toshiaki Wada, and Akio Murata, both of Osaka, Japan, assignors to Sumitomo Special Metal Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 37,682, Apr. 13, 1987, abandoned. This application Sep. 22, 1988, Ser. No. 248,289
Claims priority, application Japan, Feb. 9, 1987, 62-28694
Int. Cl.[4] G11B *5/147*; H01F *7/06*
U.S. Cl. 360—126 **20 Claims**



1. A thin-film, perpendicular magnetic recording and reproducing head comprising:

a magnetic substrate which comprises (a) a base element that is composed of a magnetic material and defines a primary surface having grooves therein and an end surface that is perpendicular to said primary surface, and (b) a nonmagnetic material in said grooves, said primary surface and the nonmagnetic material in said grooves of said magnetic substrate forming a smooth principal surface of said magnetic substrate as a result of mechanochemical polishing, said end surface of said magnetic substrate being adapted to face a magnetic recording medium;

a thin-film conductor coil located on said polished principal surface of said magnetic substrate;

an insulating layer of an inorganic oxide covering said magnetic substrate and said conductor coil, said insulating layer having surface opposite said magnetic substrate which has been flattened by polishing with a diamond powder, said insulating material also including a via hole formed therein which extends to said principal surface of said magnetic substrate to expose a surface portion of said principal surface of said magnetic substrate, the surface of said insulating layer and the exposed surface portion of said magnetic substrate having been also mechanochemically polished;

a first main pole located on said polished surface of said insulating layer and said polished surface portion of said magnetic substrate; and

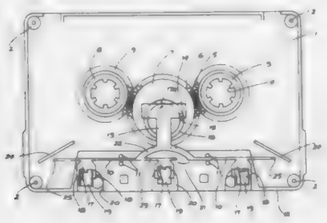
a protective overcoat covering said first main pole.

4,855,855

TAPE RECORDER HEAD CLEANER

Peter R. Stanton, 48 Prince Alfred Parade, Newport, New South Wales, Australia 2106

Continuation of Ser. No. 569,212, Jan. 9, 1984, abandoned. This application May 22, 1987, Ser. No. 58,661
Claims priority, application Australia, Jan. 17, 1983, PF7635
Int. Cl.[4] G11B *5/41*
U.S. Cl. 360—128 **7 Claims**



1. Apparatus for cleaning a plurality of components in a cassette type tape recorder and wherein the components, including a plurality of heads, are contacted by a magnetic tape in use of the recorder, said apparatus comprising:

a cassette shaped base element adapted to be inserted into a recorder;

a hub member rotatably mounted on the base element and adapted to engage with and be rotated by a recorder drive spindle;

a cam rotated by the hub member;

an elongate mounting bar slidably mounted in guides associated with the base element for reciprocal motion substantially parallel to the path of a magnetic tape across the heads of a recorder;

an arm formed in one unitary rigid piece with the mounting bar and cantilevered transversely thereto, said arm incorporating a cam follower engaged with the cam such that rotation of the cam causes the mounting bar and arm to reciprocate in unison and said bar to move solely axially in said guides; and

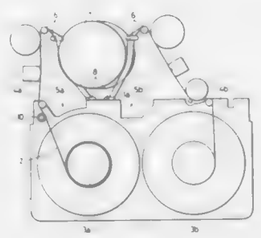
a plurality of cleaning pads mounted on said mounting bar so that, when said mounting bar is axially reciprocated by said arm, each said pad reciprocates for cleaning a surface of at least one component of a recorder.

4,855,856

CLEANING DEVICE FOR VHS VIDEO CASETTE PLAYERS

Kenzo Matsuoka, Hyogoken, Japan, assignor to Nippon Seiki Koseki Kogyo, Japan

Filed May 11, 1987, Ser. No. 48,748
Claims priority, application Japan, Jun. 20, 1986, 61-145085
Int. Cl.[4] G11B *5/41*
U.S. Cl. 360—128 **5 Claims**



1. A cleaning device for a VHS video cassette player, the cleaning device comprising a case including:

first and second reels for supplying and receiving a cleaning tape;

an outlet for supplying the cleaning tape therethrough, and an inlet for receiving it therethrough; and

a regulator means adapted to reduce the area of contact of the cleaning tape with a surface of a head of the player, wherein the regulator means comprises a pair of tape guide semi-ring members detachably connected to the case at locations spaced from one another.

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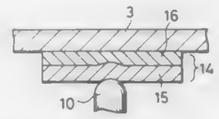
MAGNETIC DISC CARTRIDGE WITH SPINDLE ABUTMENT PLATE

Tsuyoshi Ono, and Kunihira Seto, both of Kanagawa, Japan, assignors to Fuji Photo Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 920,498, Oct. 2, 1986, abandoned. This application Dec. 2, 1988, Ser. No. 279,275
Claims priority, application Japan, Oct. 19, 1985, 60-159264[U]
Int. Cl.[4] G11B *23/02*
U.S. Cl. 360—133 **2 Claims**

1. A magnetic disc cartridge including an abutment plate (14) adapted to contact the end of a spindle (10) of magnetic disc sheet rotating means, said plate being disposed at the center of a wall (3) of a protective envelope in which a magnetic disc sheet (4) is rotatably accommodated, characterized in that:

said abutment plate comprises a surface layer (15) for engaging the spindle end and a base layer (16) made of a material harder than said surface layer and interposed between said



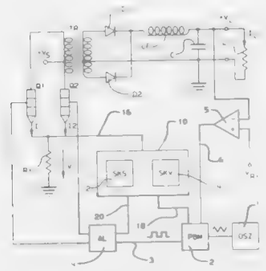
wall and said surface layer, said surface layer being bonded to said wall of said envelope by adhesive applied to both surfaces of said base layer, wherein said base layer has a sufficiently high compressive strength to resist indentation thereof by said spindle end.

4,855,858

POWER REGULATOR WITH OVERCURRENT PROTECTION

Martin Boertzel, Tuebingen; Reinhold Ludwig, Herrenberg; Wilhelm Schmits, Holzgerlingen, and Ulrich Weiss, Aidlingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 651,487, Sep. 17, 1984, abandoned. This application Dec. 29, 1987, Ser. No. 142,304
Claims priority, application European Pat. Off., Sep. 15, 1983, 83109122.8
Int. Cl.[4] H02H *7/10*
U.S. Cl. 361—18 **9 Claims**



1. A push-pull power regulator, with the output voltage being kept constant through pulse-width control of the drive pulses for two push-pull operated regulator switching transistors and with a protective system to protect the switching transistors against current overload,

characterized in that said protective system includes a first protective circuit with immediate but short duration effect with instant switching-off of a switching transistor driver pulse in the event of an overload occurring due to a critical current value being reached by the switching transistor currently being activated, said short duration being within a switching cycle and

a second protective circuit with immediate but long duration delay effect with instant switching-off of the switching transistor drive pulse and with a recovery only after several switching cycles to prevent for a longer but measured the time generation of further drive pulses after the appearance of an increased overload,

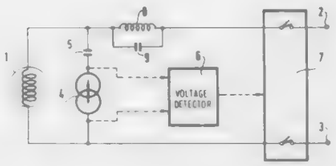
and in that the input of said protective system is directly connected to the respectively conductive switching transistor so as to be directly controlled by the emitter current flowing through the respectively conductive switching transistor.

4,855,859

DETECTION DEVICE FOR DETECTING TRANSITIONS TO THE NORMAL STATE IN A SUPERCONDUCTING WINDING, IN PARTICULAR FOR GENERATING ELECTRICITY, AND A PROTECTION DEVICE FOR PROTECTING SUCH A WINDING

Pascal Tixador, Grenoble, and Yves Brunet, Gieres, both of France, assignors to Societe Anonyme dite Alsthom, Paris Cedex, France

Filed Mar. 30, 1988, Ser. No. 175,441
Claims priority, application France, Mar. 30, 1987, 87 04404
Int. Cl.[4] H02H *7/08*
U.S. Cl. 361—19 **5 Claims**



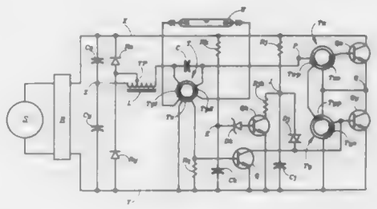
1. A detection device for detecting transitions in conductors from the superconducting state to the normal state in a superconducting winding at industrial frequency connected across load terminals, in particular for the stator of an electricity generator (1), the device being characterized in that it comprises an auxiliary generator (4) for generating a low current at a frequency which is considerably higher than industrial frequency, said current being single-phase or multi-phase depending on whether the main current through the winding is single-phase or multi-phase, said auxiliary generator being connected in parallel with the superconductor winding, the detection device further including means (5, 6) for detecting the change in phase difference between the auxiliary current and the auxiliary voltage which occurs when the conductors of said winding switch to the normal state.

4,855,860

GROUND-FAULT PROTECTED BALLAST

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Continuation-in-part of Ser. No. 640,240, Aug. 13, 1984, Pat. No. 4,563,719, which is a continuation of Ser. No. 412,771, Aug. 30, 1982, abandoned. This application May 6, 1985, Ser. No. 730,596
The portion of the term of this patent subsequent to Jan. 7, 2003, has been disclaimed.
Int. Cl.[4] H02H *3/33*
U.S. Cl. 361—45 **16 Claims**



1. A ballasting means comprising:

a voltage source operative to supply a current-limited AC voltage suitable for proper starting and operation of said lamp, said AC voltage being provided between a first and a second output terminal;

connection means having a first and a second input terminal,

said connection means being operative to permit connection with a gas discharge lamp;

differential current transformer means connected between said output terminals and said input terminals, and operative to provide an output signal whenever the current flowing out of said first output terminal and into said first input terminal is substantively different from the current flowing into said second output terminal and out of said second input terminal; and

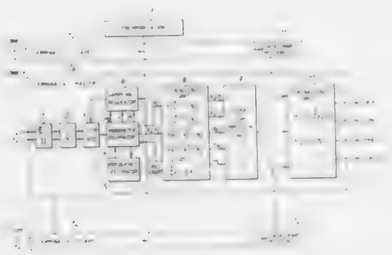
safety means responsive to said output signal and operative, whenever said output signal has been provided for more than a relatively brief period of time, to cause substantial reduction in the magnitude of said AC voltage.

4,855,861

LONGITUDINAL DIFFERENTIAL PROTECTION

Sten Bergman, and Stefan Ljung, both of Västerås, Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

Filed Oct. 26, 1988, Ser. No. 262,742
Claims priority, application Sweden, Nov. 12, 1987, 8704424
Int. Cl.[4] H02H *7/26*
U.S. Cl. 361—65 **3 Claims**



1. Longitudinal differential protective relays for protection of line zones included in power distribution systems, which protective relays, arranged at terminals at all the ends of each line zone, are provided with a measuring device for measuring the current and voltage of the phase quantities, a filter for high-frequency filtering of the measured signals and an A/D converter for conversion from analog to digital representation of the measured and filtered signals, said digital signals being adapted to be supplied to a Fourier parameter estimator which is adapted to cooperate with a frequency estimator and a sampling regulator, said Fourier parameter estimator being adapted to generate the Fourier components for a truncated model ($\hat{M}=a_1 \sin \omega_0 t + a_2 \cos \omega_0 t$) of the measured phase quantities and the respective residuals, wherein said Fourier parameters and residuals, generated by the parameter estimator, are adapted to be supplied to a local logic unit which is adapted to determine whether an abrupt event has occurred in the power distribution system by comparison of the loss functions $V_{Lx}^{Ck}(t)$ and $V_{Lx}^{Ek}(t)$ with the respective threshold values η_{LC} and η_{LE} according to

$$V_{Lx}^{Ck}(t) = \sum_{j=1}^{l} \lambda^{l-j}(\epsilon_{xk}^{C}(j))^2 = \lambda V_{Lx}^{Ck}(t-1) + (\epsilon_{xk}^{C}(t))^2 > \eta_{LC} \quad (23,24)$$

$$V_{Lx}^{Ek}(t) = \sum_{j=1}^{l} \lambda^{l-j}(\epsilon_{xk}^{E}(j))^2 = \lambda V_{Lx}^{Ek}(t-1) + (\epsilon_{xk}^{E}(t))^2 > \eta_{LE} \quad (23,24)$$

where L indicates local logic processing, $x \epsilon (\hat{R}, S, T)$ indicates that both V-functions and corresponding residual functions ϵ are based on current values, E indicates that the same functions are based on voltage values, k indicates that the equations are valid for each terminal, λ is a forgetting factor within the region 0,5–1.0, and, if the threshold values have been exceeded, the local logic unit is adapted to initiate a restart of the parameter estimator and determine whether the abrupt event derives from a conventional fault in the power distribution system by comparing a function $f=\sqrt{a_1^2+a_2^2}$ with two threshold values η_0 and η_I according to $\eta_0 > \sqrt{a_1^2+a_2^2} > \eta_I$, and, if the function is within the threshold region, the local unit is further adapted to determine the current direction and the signs of the current residuals, whereby the fourier components, the residuals and the information that the abrupt event derives from a conventional fault and information about the current direction are code-compressed in a signal compression unit to be transmitted to a central logic unit located at one of the terminals and adapted to compare loss functions with a threshold value according to

$$V_{GX}(t) = \sum_{j=1}^{l} \lambda^{l-j}/\sigma_x^2(j) = \lambda V_{GX}(t-1) + \sigma_x^2(t) > \eta_G \quad (19,21,22)$$

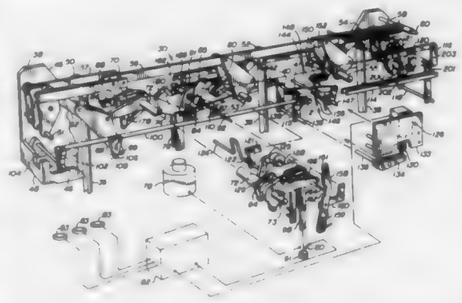
where G indicates that the loss function belongs to the central logic unit and where $\sigma_x(t)$ is the sum of the current residuals of all the terminals and that, if the threshold value is exceeded, the longitudinal differential protective system is adapted to deliver a TRIP signal and to indicate a faulty line zone and a faulty phase.

4,855,862

RECLOSER UNDERVOLTAGE LOCKOUT MECHANISM

Ronald A. Wainio, South Milwaukee, and Daniel J. Schreiber, New Berlin, both of Wis., assignors to Cooper Industries, Inc., Houston, Tex.

Filed May 21, 1987, Ser. No. 52,803
Int. Cl.[4] H02H *3/24*
U.S. Cl. 361—72 **8 Claims**



1. A circuit interrupter for interrupting the flow of electric current through a circuit or power line, comprising:

detection means for detecting voltage transients in the circuit or power line;

signal means for transmitting a control signal upon said detection means detecting a voltage transient;

circuit contact means having circuit contacts for moving said circuit contacts from a circuit closed position to a circuit open position upon receiving a signal from said signal means for selectively interrupting the flow of current through the interrupter;

mechanical linkage for moving said circuit contacts between said closed position and said open position;

a control solenoid for actuating said mechanical linkage in response to said signal from said signal means to cause said mechanical linkage to move said circuit contacts from said closed to said open position;

a switch closed by said mechanical linkage;

linear actuator means for actuating said mechanical linkage in response to said closing of said switch to reclose said circuit contact means by causing said mechanical linkage to move said circuit contacts from said open to said closed position; and

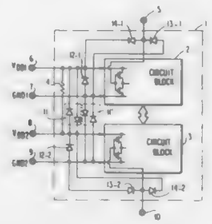
lockout means for opening said switch and locking said switch in an open position after said switch had been actuated in the closed position for a predetermined period of time and said mechanical linkage had not moved said circuit contact to said closed position.

4,855,863

INTEGRATED CIRCUIT HAVING TWO CIRCUIT BLOCKS THEREIN INDEPENDENTLY ENERGIZED THROUGH DIFFERENT POWER SUPPLY TERMINALS

Kazuki Yoshitake, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 30, 1987, Ser. No. 79,386
Claims priority, application Japan, Jul. 30, 1986, 61-180354
Int. Cl.[4] H02H *3/20*
U.S. Cl. 361—91 **5 Claims**



1. A MOS integrated circuit comprising:

a semiconductor body;

first and second circuit blocks formed on said semiconductor boy to operate separately with different power supply, said first and second circuit blocks including independent electrical circuits which are formed of P-channel type and N-channel type MOS field effect transistors having a gate electrode;

first and second power supply terminals connected to said first circuit block to supply a first power voltage;

third and fourth power supply terminals connected to said second circuit block to supply a second power voltage, said second and fourth power supply terminals being coupled through said semiconductor body;

a first power protection diode connected between said first and second power supply terminals;

a second power protection diode connected between said third and fourth power supply terminals;

at least one first input terminal connected with said gate electrode of said MOS field effect transistor in said first circuit block;

a first gate protection diode connected between said first input terminal and said first power supply terminal;

a second gate protection diode connected between said first input terminal and said second power supply terminal;

at least one second input terminal connected said gate electrode of said MOS field effect transistor in said second circuit block;

a third gate protection diode connected between said second input terminal and said third power supply terminal;

a fourth gate protection diode connected between said second input terminal and said fourth power supply terminal; and

a parallel connection of first and second diodes connected between said second and fourth power supply terminals, an anode of said firs diode being connected with a cathode of said second diode, and a cathode of said first diode being connected with an anode of said second diode;

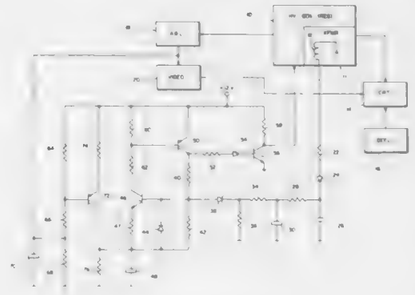
a parallel connection of third an fourth diodes connected between said first and third power supply terminals, an anode of said third diode being connected with a cathode of said fourth diode, and a cathode of said third diode being connected with an anode of said fourth diode.

4,855,864

HIGH VOLTAGE SHUTDOWN CIRCUIT WITH BRIGHTNESS TRACKING

Donald E. Griffey, Skokie, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 22, 1988, Ser. No. 223,034
Int. Cl.[4] H04N *5/48*
U.S. Cl. 361—91 **6 Claims**



1. A high voltage system comprising:

a cathode ray tube;

a regulated high voltage generating means including a high voltage transformer for supplying energy to said cathode ray tube;

sensing means for monitoring the voltage across said transformer;

trigger means coupled to said sensing me. ns for developing a shutdown signal; and

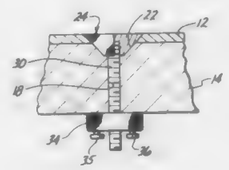
tracking means for adjusting the operation of said trigger means as a function of energy supplied to said cathode ray tube by said regulated high voltage generating means.

4,855,865

GROUNDING SYSTEM FOR STATIC DISSIPATIVE SURFACES

Jack Rooklyn, Northridge, Calif., assignor to Industrial Management Co., North Hollywood, Calif.

Filed Mar. 14, 1988, Ser. No. 167,960
Int. Cl.[4] H05F *3/02*
U.S. Cl. 361—212 **3 Claims**



1. A grouding attachment device for attachment of a grounding connection to a static dissipative product comprising, in combination, a threaded stem adapted to extend through a hole in the product to be grounded, a grounding connection part at one end of the threaded stem, the said part having a conical shape, the surface of which is knurled and shaped to fit into a conical counterbore in said product, the said part having a flat outer end surface and a flat inner end surface having a diameter slightly larger than the diameter of the threaded stem, a holding member threaded onto the threaded stem, the said holding member being in the form of a cylindrical knob having an outer knurled surface whereby the knob is adapted to be turned to finger-tight condition against said product, the flat

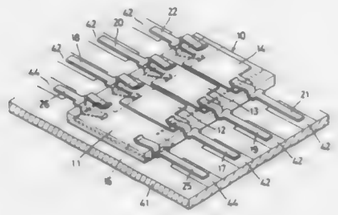
lower surface of the said knob having threaded bores in it and threaded members fitting in said bores providing for a plurality of electrical grounding connections to the knob.

4,855,866

CAPACITOR NETWORK

Eiji Imamura, and Katsumi Nishiyama, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Jun. 6, 1988, Ser. No. 203,152
Claims priority, application Japan, Jun. 6, 1987, 62-87764; Sep. 29, 1987, 62-150015
Int. Cl.[4] H01G *1/00*; H05K *1/06*
U.S. Cl. 361—306 10 Claims



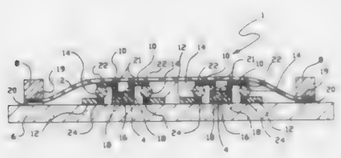
1. A capacitor network for eliminating noise contained in a plurality of data signals, comprising:
- a dielectric substrate;
- a plurality of data signal transmission means for transmitting data signals across said dielectric substrate;
- each said data signal transmission means including a data electrode disposed on one side of said dielectric substrate, a data input terminal member connected to one end of said data electrode, and a data output terminal member connected to an opposite end of said data electrode;
- a common electrode disposed on the other side of said dielectric substrate opposite said plurality of data electrodes, said common electrode having at least one terminal member connecting said common electrode to ground;
- each said data input terminal member, each said data output terminal member, and said at least one terminal member connecting said common electrode to ground including an elongated conducting member having one end connected to its respective electrode and an opposite end adapted to be connected to a connecting point on a circuit substrate.

4,855,867

FULL PANEL ELECTRONIC PACKAGING STRUCTURE

Charles E. Gazdik, Endicott; Donald G. McBride, Binghamton; Donald P. Seraphim, Vestal, all of N.Y., and Patrick A. Toole, Westport, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 9,981, Feb. 2, 1987, Pat. No. 4,766,670. This application Feb. 2, 1988, Ser. No. 151,382
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—306 8 Claims



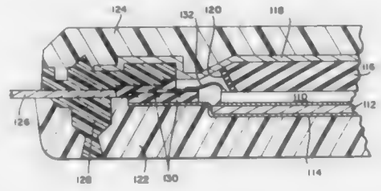
1. An electronic packaging structure comprising:
- a circuitized substrate having a plurality of bonding sites arranged in a selected pattern on said circuitized substrate;
- a heat sink which is part of the circuitized substrate;
- a thermally conductive frame in thermal contact with the heat sink;
- a flexible sheet of polyimide attached to the thermally conductive frame and mounted on the circuitized substrate, said flexible sheet of polyimide having a thickness of less than approximately 25.0 microns (about 0.001 inch);
- circuitry on at least one side of the flexible sheet of polyimide, said circuitry including electronic device mounting pads, and lands connecting said circuitry to the bonding sites on the circuitized substrate; and
- a plurality of electronic devices mounted on the pads of the circuitry on the flexible sheet of polyimide using controlled collapse chip connections.

4,855,868

PREFORMED PACKAGING ARRANGEMENT FOR ENERGY DISSIPATING DEVICES

Ade'yemi S. K. Harding, 12513 Hunters Chase Dr., Austin, Tex. 78729

Continuation-in-part of Ser. No. 4,710, Jan. 20, 1987. This application Jul. 20, 1987, Ser. No. 75,642
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 9 Claims



5. In combination with an energy dissipating device, a packaging arrangement comprising:
- a preformed thermoplastic base having means formed therein for receiving the energy dissipating device;
- a leadframe having a plurality of leads electrically connected to said device;
- at least one thermal element mounted inside the packaging arrangement adjacent the device and adjacent at least a portion of the leads of the leadframe so as to be in thermal communication with the device and leadframe;
- an elastomeric seal formed around the leads of the leadframe; and
- a cap molded to said base to form a sealed thermoplastic enclosure around the device.

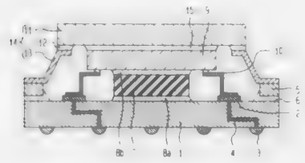
4,855,869

CHIP CARRIER

Mutsuo Tsuji, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 18, 1987, Ser. No. 98,218
Claims priority, application Japan, Sep. 19, 1986, 61-219414
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 20 Claims

1. A chip carrier comprising:
- a substrate having a plurality of pads formed on the upper and lower surfaces thereof and wirings to connect said pads;
- an integrated circuit chip having a plurality of leads connected to corresponding ones of said pads on said upper surface of said substrate;
- a first metal frame soldered to the upper surface of said substrate so as to surround said integrated circuit chip;
- a second metal frame having an upper end and a lower end, said lower end of said second metal frame seam-welded to the upper end of said first metal frame so as to surround said integrated circuit chip; and



- a plate having a bottom surface, said plate soldered only at a portion of said bottom surface to the upper end of said second metal frame so as to cover said integrated circuit chip.

4,855,870

ASSEMBLIES FOR SUPPORTING ELECTRICAL CIRCUIT BOARDS WITHIN TUBES

Michael K. Russell, Prestbury, England; Donald L. Wesenberg, Santa Barbara, Calif., and Peter A. Leaney, Charlton Kings, England, assignors to NL Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 854,367, Apr. 21, 1986, Pat. No. 4,694,555. This application Sep. 18, 1987, Ser. No. 98,286
Claims priority, application United Kingdom, Feb. 7, 1986, [illegible]
Int. Cl.[4] H05K *1/14*
U.S. Cl. 361—395 9 Claims

1. An assembly for supporting an electrical circuit baord within a tube having an inside surface, the assembly comprising the circuit board, an elongated support spine for extending longitudinally along the tube and supporting the circuit board, and shock-absorbing means for holding the assembly within the tube, the spine having a holding surface arranged adjacent the inside surface of the tube and a support surface spaced from the inside surface of the tube, the circuit board having a base surface parallel to the support surface of the spine with a gap therebetween, and a layer of vibration-absorbing material being interposed in the gap between the circuit board and the spine.

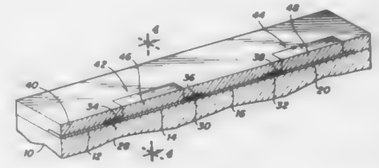
4,855,871

THIN FILM SEMICONDUCTOR INTERCONNECT MODULE

Peter L. Young, Mercer Island, Wash., assignor to Optical Materials, Inc., Mercer Island, Wash.

Continuation of Ser. No. 22,011, Mar. 5, 1987, abandoned. This application Jan. 11, 1989, Ser. No. 296,923
Int. Cl.[4] H05K *1/02*
U.S. Cl. 361—411 14 Claims

1. A device for interconnecting semiconductor devices, said device having at least one signal layer, said signal layer being substantially planar and having a plurality of electroplated conductors thereon, said electroplated conductors being linked by a material that is a conductor while the electroplated conductors are being formed and an insulator thereafter wherein



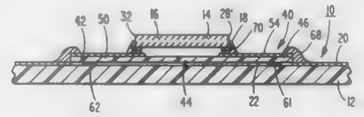
the material linking said conductors is a composite film comprising a metal layer and a metal halide layer.

4,855,872

LEADLESS CERAMIC CHIP CARRIER PRINTED WIRING BOARD ADAPTER

Jeffrey S. Wojnar, and Joseph H. McCusker, both of Mercer County, N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 13, 1987, Ser. No. 84,788
Int. Cl.[4] H05K *1/14*
U.S. Cl. 361—414 4 Claims



1. A leadless ceramic chip carrier (LCCC) and a planar printed wiring board (PWB) assembly comprising:
- an LCCC having a plurality of terminals positioned in a first array;
- a PWB having a plurality of first conductors on a surface thereof each conductor corresponding to a terminal, said conductors terminating in a second array on said PWB surface;
- a pliable electrically non-conductive membrane having first and second surface and including a plurality of second conductors on said first surface, said second conductors terminating in said first array in one region of the membrane and in said second array in a second region of the membrane, said second region being adjacent to a peripheral edge of the membrane, the first conductors having corresponding second conductors, said membrane second surface and said PWB surface facing one another in juxtaposed relation;
- a plurality of first solder connections over said membrane peripheral edge connecting said first conductors to said second conductors at said terminating second array; and
- a plurality of second solder connections connecting said terminals to said second conductors at said terminating first array.

4,855,873

STANDOFF AND GROUNDING CLIP ASSEMBLY

Vikram Bhargava, Alpharetta, and James R. Heberling, Lawrenceville, both of Ga., assignors to Hayes Microcomputer Products, Inc., Norcross, Ga.

Filed Jun. 3, 1988, Ser. No. 202,111
Int. Cl.[4] H05K *9/00, 7/14*; F16B *19/00*; H01R *4/26*
U.S. Cl. 361—424 12 Claims

1. A standoff for use in constructing electronic equipment, comprising:
- an elongated shank characterized by a longitudinal axis;

means defining a bore completely through said shank, said bore being centered on said longitudinal axis;

at least three elongated reenforcing fin members disposed on the periphery of said shank and extending parallel to said longitudinal axis, each of said fin members terminating at first and second ends of said shank in first and second planes perpendicular to said longitudinal axis; and

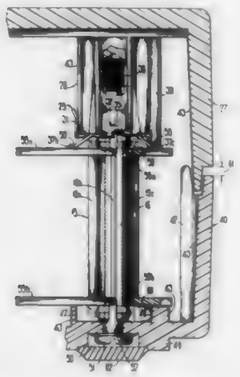
a plurality of flexible snap clips located at said first end of said shank and extending above said first plane perpendicular to said longitudinal axis for holding a circuit board seated on the ends of said fin members parallel to said first plane perpendicular to said longitudinal axis.

8. A grounding and spring clip for use in constructing an electronic device of the type having at least one circuit board within an equipment enclosure having RFI suppressing shielding therein, comprising:

a substantially planar surface;

means defining a hole through said substantially planar surface for allowing a bolt to pass therethrough;

a plurality of extending legs for fitting over and maintaining contact with an electrically conductive portion of a mounting post, said mounting post being connected to said RFI suppressing shielding, and at least one of said extending legs including means for scoring and gripping said electrically conductive portion of said mounting post; and



at least one extending electrically conductive leaf spring, at least one said leaf spring being electrically connected to at least one of said extending legs and extending in a direction opposite of said extending legs.

12. Apparatus for use in constructing an electronic device of the type having at least one circuit board with at least one mounting hole provided therethrough within an equipment enclosure having RFI suppressing shielding therein, comprising:

a mounting post secured to at least one portion of said equipment enclosure, said mounting post having at least one electrically conductive portion thereof electrically connected to said RFI suppressing shielding, said mounting post having a characteristic post longitudinal axis;

a standoff having an elongated shank characterized by a standoff longitudinal axis;

means defining first and second land areas in planes perpendicular to said standoff longitudinal axis at first and second ends of said shank;

a plurality of flexible snap clips located at said first end of said shank and extending above said first plane perpendicular to said standoff longitudinal axis, said plurality of snap clips being radially inward of at least a portion of the periphery of said first land area with respect to said standoff longitudinal axis;

a grounding clip including a substantially planar surface;

means defining a hole through said substantially planar surface for allowing said plurality of flexible snap clips to pass therethrough;

a plurality of extending legs for fitting over and maintaining contact with said electrically conductive ortion of said mounting post; and

at least one extending, electrically conductive, leaf spring for contacting a grounded foil area on said circuit board proximate said mounting hole, at least one said leaf spring being electrically connected to at least one of said extending legs and extending in a direction opposite of said extending legs.

4,855,874

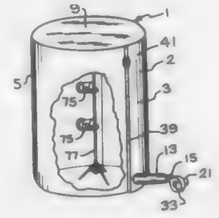
LIGHT MODIFIER AND METHOD FOR MODIFYING LIGHT

Thomas A. Waltz, Sylvania, Ohio, assignor to The F. J. Westcott Company, Toledo, Ohio

Filed Jun. 10, 1987, Ser. No. 60,221

Int. Cl.⁴ B60Q *1/06*

U.S. Cl. 362—16 **49 Claims**



1. A light modifier for use with a light source to direct light onto an object spaced apart from said modifier that is to be illuminated, said light modifier comprising:

an inflatable structure having a translucent panel and a reflective panel, said reflective panel being disposed with its reflective surface facing the interior of said inflatable structure, said reflective surface acting to reflect light from said light source through said translucent panel onto said object;

a passageway connected to said inflatable structure, said passageway being in communication with the interior of said inflatable structure, said passageway being disposed for supplying a fluid under pressure to the interior of said inflatable structure; and

at least one closeable opening positioned in said inflatable structure to provide access to the interior of said light modifier and to allow said light source to be positioned in said interior of said light modifier, whereby said light source is positioned within said light modifier such that light from said light source is directed at said translucent panel to produce one level of diffused light and the light from said light source is directed at said reflective panel whereby said light is reflected off said reflective panel prior to passing through said translucent panel to produce diffused light of a lower intensity.

4,855,875

LIGHT SOURCE DEVICE FOR MEDICAL APPARATUS

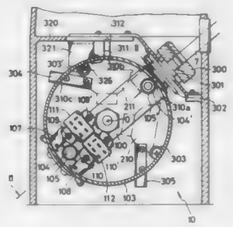
Jun Onose; Kazutoshi Takagi, both of Tokyo, and Fukuichi Adachi, Osaka, all of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed May 9, 1988, Ser. No. 192,063

Claims priority, application Japan, May 11, 1987, 62-114033; May 11, 1987, 62-114034; May 11, 1987, 62-114035; May 11, 1987, 62-114036

Int. Cl.⁴ F21V *8/00, 19/04*

U.S. Cl. 362—32 **8 Claims**



1. A light source device for use in a medical apparatus, comprising:

a movable flange movably mounted on a housing;

an actuator for supporting at least two light sources thereon;

coupling means for removably coupling said movable flange with said actuator and for transmitting to said movable flange the action applied to said actuator, said actuator being able to be manually coupled through said coupling means to said movable flange;

light conductor means for guiding light from one of said light sources to an object to be illuminated;

said actuator being provided with at least two connector plugs each of which is electrically connected to a corresponding one of said light sources;

said movable flange being provided with connector sockets electrically connected to a power source with which each of said connector plugs is engaged when said actuator is coupled through said coupling means; and

switch means for controlling the supply of power from said power source to each of said connector sockets to supply power to only a selected one of said light sources when said selected one of said light sources is positioned opposite to the inlet of said light conductor means by moving said actuator.

4,855,876

AUTOMOBILE LAMP ASSEMBLY

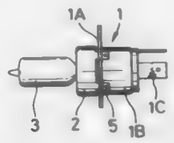
Tetsuya Kudo, Kawasaki, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 221,314

Claims priority, application Japan, Jul. 29, 1987, 62-116502[U]

Int. Cl.⁴ B60Q *1/04*

U.S. Cl. 362—61 **12 Claims**



1. An automobile lamp assembly of a fixed focus type, comprising:

a socket having a main body portion with an outer surface;

a flange coupled to said socket;

a socket cap adapted to be mounted to said socket;

a lamp fixedly mounted on said socket cap;

at least three thin, substantially flat tongues provided on and projecting from said socket cap, said tongues being sufficiently thin to be spot welded;

at least three tongue-receiving holes in said flange, said tongue-receiving holes having a size to allow respective ones of said thin tongues to pass therethrough when said socket cap is mounted to said socket and said tongue-receiving holes being arranged such that said thin tongues are adjacent said main body portion of said socket and are slidably guided along said main body portion in face-to-face confronting relationship with said outer surface of said main body portion after passing through said tongue-receiving holes; and

said tongues being spot welded to said main body portion of said socket after said socket cap is moved relative to said socket for adjusting a focus of said lamp with said tongues inserted through said tongue-receiving holes, thereby forming a single unitary structure wherein said socket cap, flange and socket are all integrally and fixedly connected together.

4,855,877

COMBINATION LAMP ASSEMBLY OF MONOCHROMATIC APPEARANCE CAPABLE OF GLOWING IN DIFFERENT COLORS

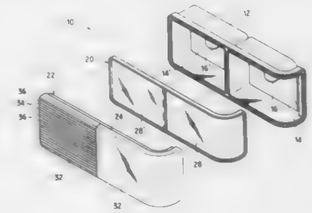
Nobuo Otaka, Shizuoka, Japan, assignor to Koito Seisakusho Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 278,204

Claims priority, application Japan, Dec. 1, 1987, 62-304116

Int. Cl.⁴ B60Q *1/26*

U.S. Cl. 362—61 **9 Claims**



1. A combination lamp assembly of monochromatic appearance with a capability of glowing in different colors, for use on motor vehicles or the like, comprising:

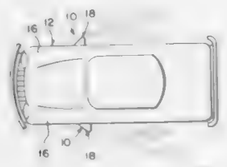
(a) a lamp housing defining at least two lighting compartments, each lighting compartment having an open front end;

(b) a plurality of light sources mounted one in each lighting compartment;

(c) a first lens section closing the open front end of one of the lighting compartments, the first lens section being transparent and having a prescribed color; and

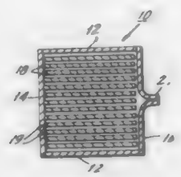
(d) a second lens section closing the open front of the other lighting compartment, the second lens section having alternating transparent stripes and opaque stripes, the transparent stripes being colorless, the opaque stripes having substantially the same color as the first lens section.

4,855,878
BACK UP SIDE FENDER LIGHT
Thanh D. Vu, 323 18 St., Brooklyn, N.Y. 11215, and George Spector, 233 Broadway, Rm. 3815, New York, N.Y. 10007
Filed Nov. 4, 1988, Ser. No. 267,240
Int. Cl.[4] B60Q *1/08, 1/22*
U.S. Cl. 362—66 3 Claims



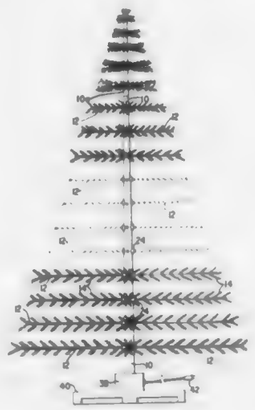
1. An auxiliary backup side fender light for a motor vehicle comprising in combination with the motor vehicle;
(a) a stationary housing mounted within side of a front fender of the motor vehicle;
(b) a movable housing spring biased to forward end of said stationary housing so as to extend into said stationary housing said movable housing having a reflective chamber;
(c) an auxiliary lamp mounted into said reflective chamber of said movable housing; and
(d) means for pivoting said movable housing out from said stationary housing so that said auxiliary lamp can be activated to project light beams rearward from said reflective chamber of said movable housing relative to the motor vehicle to help driver see at night when parking, wherein said pivoting means includes:
(e) a solenoid mounted transversely into said stationary housing; and
(f) a recessed portion disposed in said movable housing so that when said solenoid is activated movable arm of said solenoid will push against said recessed portion causing said movable housing to pivot out from said stationary housing further including a switch electrically connected between said solenoid and said auxiliary lamp and is mechanically connected to a gear shift lever in the morot vehicle so that when the gear shift lever is placed into reverse said switch will close activating said solenoid and said auxiliary lamp from a battery in the motor vehicle.

4,855,879
HIGH-LUMINANCE RADIOLUMINESCENT LAMP
Peter K. Soltani, Olney; Charles Y. Wrigley, Ijamsville, both of Md., and George M. Storti, Washington, D.C., assignors to Quantex Corporation, Rockville, Md.
Filed Aug. 5, 1988, Ser. No. 229,567
Int. Cl.[4] F21V *9/16*
U.S. Cl. 362—84 15 Claims



1. A radioluminescent lamp, comprising:
(a) a containment envelope filled with radioactive gas and having a face plate; and
(b) a plurality of light guides disposed within said containment envelope, each said light guide being optically coupled to said face plate; wherein each of said light guides comprises:
(a) a substrate;
(b) a thin vapor-deposited layer of phosphor material disposed on said substrate; and
(c) a reflective overlayer disposed so as to guide light produced by said phosphor material through said substrate to said face plate.

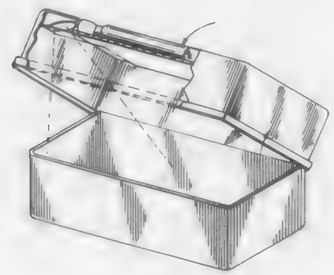
4,855,880
ELECTRICALLY ENHANCED ARTIFICIAL TREE
Joseph J. Mancusi Jr., 25 Port Tack, Hilton Head Island, S.C. 29928
Filed Nov. 10, 1987, Ser. No. 126,034
Int. Cl.[4] A47G *33/06*
U.S. Cl. 362—123 5 Claims



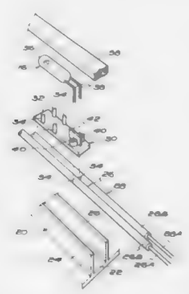
1. An electrified artificial Christmas tree having branches, lamps on the various branches, and sets of two wires, groups of said lamps being electrically connected across the two wires of respective sets, and each of the wires of each interior set being electrically connected in series with a wire of different other sets.

4,855,881
OPTIONALLY ILLUMINATING HANDLE
James F. Pence, 7826 170th St. West, Lakeville, Minn. 55044
Filed Sep. 26, 1988, Ser. No. 248,648
Int. Cl.[4] A45C *15/06*
U.S. Cl. 362—156 1 Claim

1. A flashlight in combination with a container for illuminating the area surrounding the container and the interior thereof, comprising:
(a) a handle attached to a surface of said container of sufficient size to accommodate a human hand,
(b) said flashlight inserted into said handle,
(c) said handle is attached to the surface of said container to provide a position suitable for carrying said container with the hand while simultaneously aiming the flashlight to direct a beam of light,
(d) said surface of the container is formed with a recess therein, and
(e) said handle fitting into said recess when not used for carrying the container and directing the beam of the flashlight through a window aperture in said surface to a light conductive or reflective surface so as to illuminate an interior of said container and its contents.

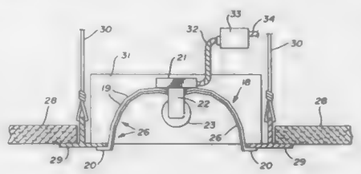


4,855,882
LIGHTING APPARATUS
Ian Boss, London, England, assignor to Lightgraphix Limited, Dartford, England
Filed Apr. 12, 1988, Ser. No. 180,943
Claims priority, application United Kingdom, Mar. 29, 1988, 8807387
Int. Cl.[4] F21V *1/00*
U.S. Cl. 362—238 9 Claims



1. Lighting apparatus comprising a unit inserted in a channel for coupling to electrical conductors arranged in the channel side by side and covered by insulating sheath means, said unit comprising an elongate support plate adapted to be fitted to the channel with sides of the plate parallel to sides of the channel;
an illumination source supported by said support plate on one side thereof;
first and second electrical terminals connected to said illumination source; and
first and second electrical connectors extending from the other side of said plate and having spike portions for penetrating the sheath means of the electrical conductors in order to make electrical contact with said conductors when the plate is inserted in the channel, said first and second terminals being electrically connected to said electrical connectors.

4,855,883
FLUORESCENT LIGHTING APPARATUS
Russell W. Spitz, 2999 Hartley Rd., Ste. 301, Bldg. C, Jacksonville, Fla. 33217
Continuation-in-part of Ser. No. 865,411, May 21, 1986, Pat. No. 4,719,546. This application Nov. 23, 1987, Ser. No. 123,705
Int. Cl.[4] F21V *7/12*
U.S. Cl. 362—260 15 Claims

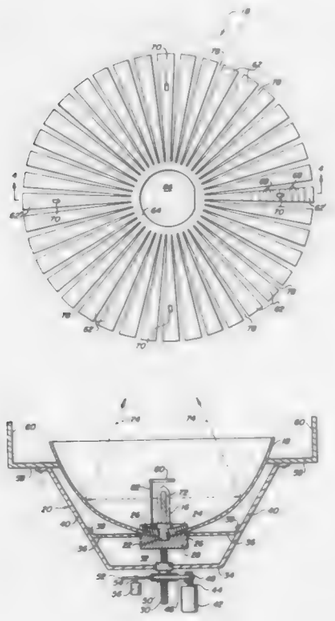


1. In fluorescent lighting apparatus of the type having one fluorescent tube and elongated structures supporting the same, an improved fluorescent lighting apparatus, the improvement comprising: an elongated structure formed in a modified arcuate configuration positioned radially of and partially surrounding said fluorescent tube and defining an elongated downward facing opening of a known width, an elongated hollow raceway positioned on the upper surface of said elongated structure for reinforcing said elongated structure and for providing an enclosure for current conductors, light hangers on said raceway supporting said fluorescent tube and an elongated reflector means on the inside of said elongated structure, said elongated reflector means formed of a plurality of elongated planar mirrors arranged in a modified arcuate configuration so that said fluorescent tube is centrally positioned with respect to said reflector means and said elongated structure, said elongated planar mirrors being angularly disposed and having adjoining edges such that the planes defined by each of said adjacent planar mirrors intersect at a line defined by the adjoining edges to define included angles disposed to reflect light from said fluorescent tube in a direction away from said fluorescent tube and outwardly and downwardly through said downward facing opening whereby said reflected light is distributed in substantially equal amounts across the width of said opening and whereby said fluorescent lighting apparatus appears to have a light source of a width equal to the known width of said downward facing opening.

4,855,884
VARIABLE BEAMWIDTH STAGE LIGHT
Brian E. Richardson, San Jose, Calif., assignor to Morpheus Lights, Inc., San Jose, Calif.
Filed Dec. 2, 1987, Ser. No. 127,932
Int. Cl.[4] F21V *7/00*
U.S. Cl. 362—278 21 Claims

1. A variable beamwidth light comprising,
a bowl-shaped reflector including a plurality of elongated leaves made of an elastically deformable material and having inward portions disposed adjacently to form a base which defines a central aperture and from which said leaves radiate outwardly and forwardly along the center axis of said aperture to respective outward ends collectively defining a peripheral edge of said reflector, said leaves being bent at multiple predetermined incremental positions and forming substantially the entirety of the reflector,
a light source fixed relative to said base and axially aligned with said central aperture,
a fixed flange defining a shaping aperture having a diameter less than twice the length of said leaves through which said reflector is movably disposed said leaves extending through said shaping aperture and being constrained to assume an elliptical shape by engagement with said flange, and

means for displacing, relative to said fixed flange, said reflector and said light source along said axis to cause said reflector to be elastically deformed at said incremental positions to curve through shapes belonging to a selected



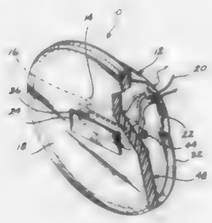
common family of ellipses as said reflector is moved axially relative to said flange means, to selectively vary the ellipticity of said reflector and thus vary the width of a light beam reflected from the reflector.

4,855,885

LIGHT BEAM INTENSIFIER

Donald C. MacEachern, Montreal, and Gaston Levesque, Quebec, both of Canada, assignors to DSL Dynamic Sciences Limited, St. Laurent, Canada

Filed Apr. 11, 1988, Ser. No. 179,954
Int. Cl.[4] F21V *7/02*
U.S. Cl. 362—298 **16 Claims**



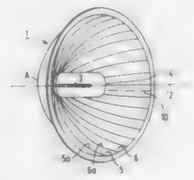
1. A light beam intensifier comprising:
a first reflector having a parabolic-shaped reflecting surface and a focal point located forward of said reflecting surface; and
a highly reflective second reflector positioned forward of said focal point, said second reflector having a reflecting surface oriented to face toward the reflecting surface of said first reflector such that light radiating from a light source positioned coincident with said focal point and adjacent the reflecting surface of said second reflector is reflected from said first reflector to form a first light beam and completely reflected from said second reflector onto said first reflector to form a second light beam that combines with said first light beam to thereby form a composite light beam having a predetermined pattern.

4,855,886

LUMINAIRE HAVING A FACETED REFLECTING SURFACE

Leonard C. H. Eijkelenboom; Egbertus J. P. Maassen, and Franciscus A. M. M. Van Meel, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1987, Ser. No. 128,757
Claims priority, application Netherlands, Dec. 4, 1986, [redacted]
Int. Cl.[4] F21V *7/00*
U.S. Cl. 362—350 **7 Claims**



1. A luminaire, comprising:
a light source having an elongated light emitting portion defining a principal axis; and
a bowl shaped reflector having an opening for receiving said light source and a reflecting surface defining a focal axis aligned with said principal axis of said light source,
said reflecting surface comprising a plurality of contiguous facets each extending from said opening to a peripheral edge of said reflector along a portion of a substantially parabolically curved plane, and
for points along substantially the entire axial length of said reflecting surface, the cross-section in planes normal to said principal axis of the reflecting surface of each facet is a straight line, and the straight line cross-sections of said plurality of facets defining an equilateral and equiangular polygon.

4,855,887

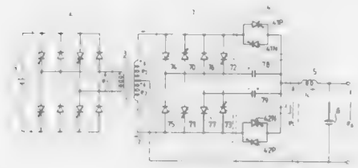
CURRENT AND FREQUENCY CONVERTER HAVING MEANS TO REDUCE SWITCHING LOSSES

Ikuo Yamato; Norikazu Tokunaga; Yasuo Matsuda, and Hisao Amano, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,508
Claims priority, application Japan, Sep. 30, 1987, 62-243811
Int. Cl.[4] H02M *5/22*
U.S. Cl. 363—8 **9 Claims**

1. A power conversion apparatus having:
a DC power source;
an inverter, fed by said DC power source, for producing AC power having a certain frequency;
a transformer having a primary winding supplied with the AC power output from said inverter and a secondary winding for outputting AC power, the voltage of which is adjusted at a desired value; and
a frequency converter for converting the frequency of the AC power output from the secondary winding into a desired frequency, which is lower than the certain frequency of the AC power

characterized in that
said frequency converter is formed by switching elements with the self turn-off function and further provided with an energy regenerating device comprising first means, coupled across both ends of the secondary winding, for absorbing the energy of a spike voltage occurring due to



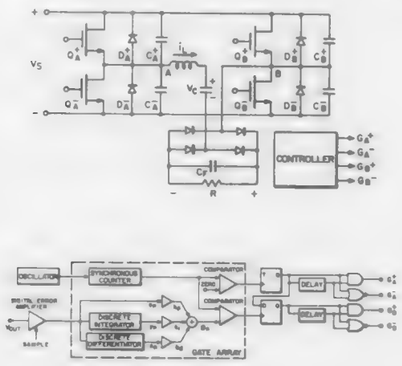
a circuit inductance upon interruption of a current flowing through each element of said frequency converter and second means for switching over the direction of coupling the first means with the secondary winding in accordance with the polarity of a voltage appearing across the secondary winding so that the energy stored in the first means is regenerated to said transformer.

4,855,888

CONSTANT FREQUENCY RESONANT POWER CONVERTER WITH ZERO VOLTAGE SWITCHING

Christopher P. Henze, Eagan; Ned Mohan, Minneapolis, both of Minn., and John G. Hayes, Camarillo, Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 19, 1988, Ser. No. 259,673
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—17 **12 Claims**



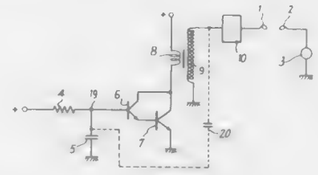
1. A resonant DC-DC switching power converter comprising rectifier means, switching means having a current path coupled to an input DC source and to said rectifier means, series inductance means, series capacitance means, wherein said series inductance means and said series capacitance means are coupled in series with each other and to said rectifier means in order to form a series circuit that is resonant at a predetermined frequency, and control means for operating said switching means when a voltage that is approximately zero exists across said current path so as to provide a series bidirectional current through said inductance means of a frequency that is greater than said predetermined resonant frequency.

4,855,889

HIGH-TENSION GENERATOR CIRCUIT WITH VERY LOW CURRENT CONSUMPTION

Michele Blanchot, Courbevoie; Daniel Dutertre-Laduree, Bonnieres-Sur-Seine, and Rein Roos, Noce, all of France, assignors to Professional General Electronic Products, France

Filed Jan. 12, 1988, Ser. No. 143,497
Claims priority, application France, Jan. 15, 1987, 87 00377
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—19 **14 Claims**



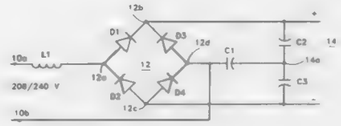
1. High-tension generator circuit with very low current consumption, of the type comprising a step-up voltage transformer and, on the secondary side, a voltage step-up circuit, characterized in that the primary of the transformer is fed by means of a power transistor whose drive transistor is controlled by means of a resistance-capacitance circuit, and in that in each conduction period of the primary the secondary brings about a reversal of the polarity of said capacitance.

4,855,890

POWER FACTOR CORRECTION CIRCUIT

Neil Kammiller, Lakewood, Ohio, assignor to Reliance Comm/-Tec Corporation, Chicago, Ill.

Continuation of Ser. No. 66,121, Jun. 24, 1987, abandoned. This application Oct. 27, 1988, Ser. No. 265,327
Int. Cl.[4] H02M *1/12*
U.S. Cl. 363—44 **31 Claims**



1. A power factor correction circuit for connection to an off line switch mode type power supply, said supply having an input for connection to an AC line voltage, rectifying means and energy storage capacitor means, said rectifying means having an input connected to said power supply input and an output connected to said energy storage capacitor means, said power factor correction circuit comprising:
(a) at least one capacitor for connection between said rectifying means input and said energy storage capacitor means;
(b) at least one inductor for connection between said power supply input and said rectifying means.

4,855,891

POWER SUPPLY DESIGN

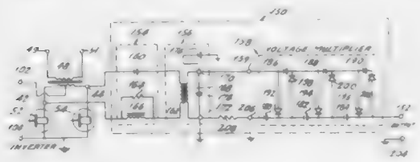
Jon D. Paul, San Francisco, Calif., assignor to Eventide Inc., Little Ferry, N.J.

Filed Sep. 23, 1987, Ser. No. 100,253
Int. Cl.[4] H02H *7/122*
U.S. Cl. 363—56 **10 Claims**

1. A power processor comprising:
a switch mode inverter;

power input voltage terminals for applying therethrough a DC input voltage for said switch mode inverter; and

a high voltage generating circuit for generating a high voltage DC output, said high voltage generating circuit including a high voltage transformer having a primary



winding and a coupling circuit for coupling said primary winding of said high voltage transformer to said inverter, said coupling circuit including a parallel connected inductor/resistor circuit connected between one terminal of said primary winding of said high voltage transformer and said inverter.

4,855,892

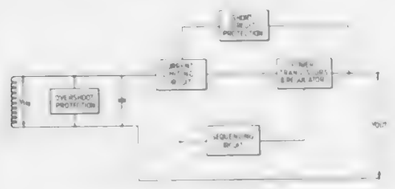
POWER SUPPLY FOR PLASMA DISPLAY

Edwin M. Lower, Richmond, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 13,689, Feb. 12, 1987. This application Jan. 24, 1989, Ser. No. 302,070

Int. Cl.[4] H02M *7/515*

U.S. Cl. 363—86 **4 Claims**



2. A regulated gas-plasma high-voltage power supply employing a fly-back topology for the first stage and an improved second stage the improvement comprising a linear post-regulated power supply comprising:

(a) a transformer for providing an electrical input for the power supply;

(b) a power switch for receiving the electrical input and transmitting it to power supply output;

(c) a high voltage regulator for controlling the electrical potential of the power supply output independent of the load impedence;

(d) a triggering circuit responsive to receipt of a first electrical signal and operating to close the power switch upon receipt of said signal;

(e) an overload protection circuit adapted to detect an electrical potential difference of a preselected magnitude between the power supply input and the power supply output and responsive to that potential difference to open the power switch; and

(f) a sequencing circuit for selectively activating the power transistor when a signal is received by the sequencing circuit wherein the sequencing circuit coordinates activation and deactivation of the display voltage with other operational voltages within the computer.

4,855,893

APPARATUS FOR THE LOW-LOSS WIRING OF THE SEMICONDUCTOR SWITCHING ELEMENTS OF A THREE-LEVEL INVERTER

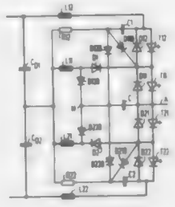
Gerhard Kratz, Heroldsbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 8, 1988, Ser. No. 216,814

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723740

Int. Cl.[4] H02M *7/515*

U.S. Cl. 363—136 **10 Claims**



1. An apparatus for relieving semiconductor switching elements of one stage of a neutral-point-clamped PWM inverter of large voltage changes during a switching-off process, said inverter stage including a series arrangement of first, second, third and fourth antiparallel circuits each containing a semiconductor switching element and a bypass diode, a junction point between the second and the third antiparallel circuits serving as a stage output, the inverter stage receiving input from a d-c voltage source having positive and negative potentials via a first and second switching-on relief choke coil coupling the ends of the series arrangement to said d-c voltage source, two voltage divider capacitors coupled in series across the d-c voltage source, and first and second coupling diodes coupling the junction point of said voltage divider capacitors to junotion points between the first and second, and third and fourth antiparallel circuits, the relieving apparatus comprising:

(a) third and fourth switching-on relief choke coils for limiting the current rate of rise, coupled in series respectively with the first and second coupling diodes coupling said first and second coupling diodes to said junction point of the two voltage divider capacitors,

(b) a switching-off relief capacitor having one terminal connected to the stage output,

(c) first and second wiring capacitors with one terminal of said first wiring capacitor being coupled to the end of the series arrangement which is coupled to the positive potential, and one terminal of said second wiring capacitor being coupled to the end of the series arrangement that is coupled to the negative potential of the d-c voltage source,

(d) first and second d-c consumers which couple the other terminals of said first and second wiring capacitors to the junction point of the two voltage divider capacitors, and

(e) a diode network having: first and second wiring diodes which couple a fictitious center at the other terminal of the switching-off relief capacitor respectively to a junction point between the first coupling diode and the third switching-off relief choke coil, and a junction point between the second coupling diode and the fourth switching-on relief choke coil; third and fourth wiring diodes coupling the fictitious center respectively to a junction point between the first wiring capacitor and the first d-c consumer, and to a junction point between the second wiring capacitor and the second d-c consumer; and fifth and sixth wiring diodes which respectively couple the junction point between the first wiring capacitor and the first d-c consumer to the junction point between the first and second antiparallel circuit; and the junction point between the second wiring capacitor and the second d-c consumer to the junction point between the third and fourth antiparallel circuit.

4,855,894

FREQUENCY CONVERTING APPARATUS

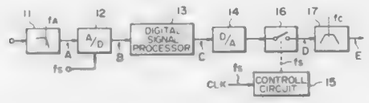
Nobumitsu Asahi, Sagamihara; Tetsuo Ikeda, Hiroshima, and Seiji Kawase, Yokohama, all of Japan, assignors to Kabushiki Kaisha Kenwood, Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,576

Claims priority, application Japan, May 25, 1987, 62-77372; Jul. 30, 1987, 62-115868

Int. Cl.[4] H02M *5/00*

U.S. Cl. 363—157 **4 Claims**



1. Apparatus for frequency-converting a signal from a lower frequency band into a higher frequency band, comprising:

means for receiving the signal to be subjected to frequency conversion;

means for sample-holding the received signal by using a sample-hold signal, a sample period and hold interval of the sample-hold signal being determined so that the top of a selected lobe in the spectrum of the sample-hold signal corresponds to the higher frequency band; and

a bandpass filter for extracting frequency components at the higher frequency band from the sample-held received signal to produce the signal at the higher frequency band.

4,855,895

FREQUENCY DIVIDING APPARATUS FOR HIGH FREQUENCY

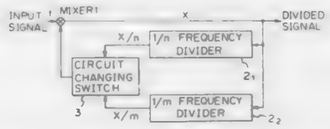
Masafumi Shigaki, Kawasaki; Hiroshi Kurihara, Tokyo, and Hidetoshi Nishi, Yamato, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 19, 1988, Ser. No. 196,620

Claims priority, application Japan, May 22, 1987, 62-125578

Int. Cl.[4] H02M *5/00*

U.S. Cl. 363—157 **11 Claims**



1. A frequency dividing apparatus having an input signal terminal and a divided signal terminal, said apparatus comprising:

a mixer, having a first input terminal connected to the input signal terminal, having a second input terminal, and having an output terminal connected to the divided signal terminal, for mixing two signals input to said first and second input terminals and outputting a mixed signal to said output terminal;

a circuit changing switch having a plurality of input terminals and one output terminal connected to said second input terminal of said mixer, for selecting a circuit to be connected to said input terminals thereof; and

one or more frequency dividers having a different fixed frequency dividing ratio, each of said frequency dividers having an input terminal connected to the divided signal terminal and an output terminal connected to one of said input terminals of said circuit changing switch.

4,855,896

COLLECTIVE WIRING SYSTEM AND METHOD OF CONTROL THEREOF

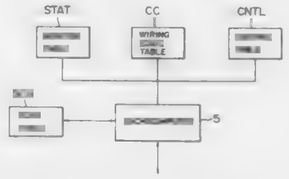
Shigeru Obo, Hitachi; Takeshi Hirayama, Mito; Masahiro Matsumoto, Yokohama; Akira Hasegawa; Fumio Hamano, both of Katsuta, and Takanori Shibata, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 777,441, Sep. 18, 1985, abandoned. This application Mar. 21, 1988, Ser. No. 171,419

Claims priority, application Japan, Feb. 23, 1985, 60-33658; Mar. 25, 1985, 60-58438

Int. Cl.[4] G06F *15/46;* **G05B** *19/02*

U.S. Cl. 364—138 **15 Claims**



1. A method of control of a collective wiring system in which data is transmitted between a plurality of input and output terminals by a common data transmission system under control of a central control unit equipped with a computer operating under control of a stored control program and having a memory for storing data, comprising the steps of:

periodically checking the operation status of each of said input terminals;

storing in memory the result of said checking of the operation status of said input terminals in the form of a status table;

storing in memory a desired control condition of each of said output terminals in the form of a control table;

storing in memory connection information independent of said stored control program and including the identity of the output terminals to be controlled by identified input terminals in the form of a connection table; and

sending control command signals from said central control unit via said common data transmission system to said output terminals in accordance with said stored control program to control the operation condition thereof on the basis of the operation status information stored in said status table and the connection information stored in said connection table.

4,855,897

METHOD AND APPARATUS FOR STATISTICAL SET POINT BIAS CONTROL

Francis G. Shinskey, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Jul. 13, 1987, Ser. No. 73,798

Int. Cl.[4] G06F *15/46;* **G05B** *13/02*

U.S. Cl. 364—148 **18 Claims**

10. Process control apparatus for set point bias control of a process having at least one specification limit, comprising:

(a) means for determining a measured process value,

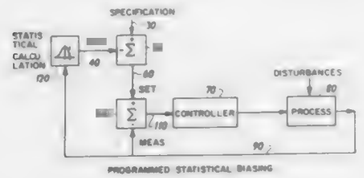
(b) a process controller responsive to a set point condition and to the measured process value to produce a control signal for controlling the process,

(c) means for generating a set point bias, and

(d) means for offsetting a specification limit by the set point bias in a preferred direction to produce the set point condition,

wherein the set point bias generating means includes means for

determining a statistical measure of the measured process value to produce the set point bias in a form related to the statistical



measure, and wherein the statistical measure includes an nth degree moment surface.

4,855,898

NC DATA CREATION METHOD

Hideaki Kawamura; Teruyuki Matsumura, and Takahiko Mineshige, all of Tokyo, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

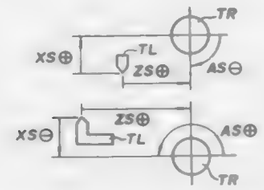
PCT No. PCT/JP86/00625, § 371 Date Aug. 5, 1987, § 102(e) Date Aug. 5, 1987, PCT Pub. No. WO87/03525, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 10, 1986, Ser. No. 93,020

Claims priority, application Japan, Dec. 10, 1985, 60-277747

Int. Cl.⁴ G05B *19/18*

U.S. Cl. 364—191 **4 Claims**



1. A numerical control data creation method through which numerical data are created by previously registering, for each and every tool, a tool data file including names of machining processes using the tool and tool shape data indicative of the tools, then deciding machining processes necessary for obtaining a finished shape and selecting a predetermined tool from among tools registered as tools used in the machining processes, said method comprising the steps of:

(a) including in the tool data file of each and every tool a tool data rotation direction for that tool;

(b) outputting a tool selection command for selecting a predetermined tool, and a command for rotating the spindle in a spindle rotating direction conforming to the tool data rotation direction included in the tool data file of the predetermined tool; and

(c) setting, prior to performing step (b), a parameter indicating whether the spindle rotating direction is determined in dependence upon the machining processes or in dependence upon the tools used.

4,855,899

MULTIPLE I/O BUS VIRTUAL BROADCAST OF PROGRAMMED I/O INSTRUCTIONS

Stephen D. Presant, Medway, Mass., assignor to Prime Computer, Inc., Natick, Mass.

Filed Apr. 13, 1987, Ser. No. 37,707

Int. Cl.⁴ G06F *3/00, 9/00, 13/20*

U.S. Cl. 364—200 **6 Claims**

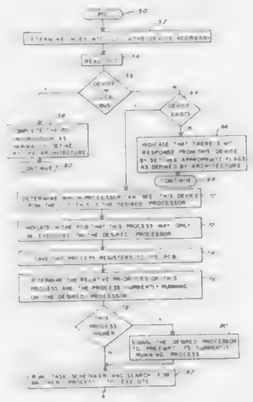
1. A method for performing an input/output process containing a programmed input/output instruction in a multiprocessor system including at least two processors, each of said processors being coupled to an I/O bus with one or more I/O devices connected thereto, said multiprocessor system including an operating system having process scheduling means for executing processes on said processors according to assigned priority, said process scheduling means including a process control block containing scheduling information for each of said processes said method comprising the steps of:

establishing a global device location table accessible by each of said processors in which a unique I/O device address and a corresponding I/O bus location are stored for each I/O device in said multiprocessor system;

when starting a programmed input/output instruction, determining the unique address of a referenced I/O device;

reading the corresponding I/O bus location of the referenced I/O device from the global device location table;

determining whether the referenced I/O device is connected to the local I/O bus, and



when the referenced I/O device is connected to the local I/O bus, executing the input/output process on the local processor,

when the referenced I/O device is connected to a prescribed remote I/O bus, placing a locked descriptor in the process control block for the input/output process indicating that the input/output process can be performed only on the remote processor coupled with the prescribed remote I/O bus,

saving the registers of the input/output process in its process control block,

scheduling the input/output process on the remote processor coupled with the prescribed remote I/O bus in accordance with the priority assigned to the I/O process by the operating system, and

executing the input/output process on the remote processor coupled with the prescribed remote I/O bus.

4,855,900

SYSTEM FOR TRANSFERRING DATA TO A MAINFRAME COMPUTER

Willis D. Simpson, Dallas, and Gene S. Gurley, Hurst, both of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.

Filed Oct. 28, 1987, Ser. No. 114,635

Int. Cl.⁴ G06F *3/00*

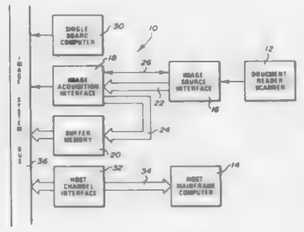
U.S. Cl. 364—200 **2 Claims**

1. A system for transferring data from an image acquisition device to a mainframe computer comprising:

memory means for temporarily storing data received from the image acquisition device prior to transfer to the mainframe computer;

means connected to the image acquisition device for generating blocks of data;

a direct memory access controller interconnected between the image acquisition device and said memory for controlling the transfer of said blocks of data from the image acquisition device to said memory;



means for controlling said direct memory access controller for partitioning said blocks of data into smaller sized blocks prior to transfer and storage in said memory means; and

means for transferring said stored blocks of data to the mainframe computer.

4,855,901

APPARATUS FOR TRANSFERRING DATA BETWEEN A MICROPROCESSOR AND A MEMORY

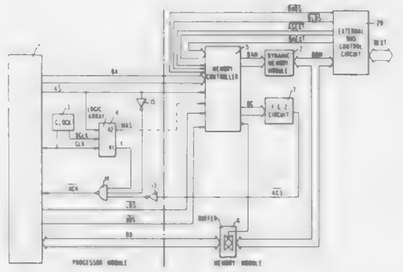
Pierre Planteline, Eybens, France, assignor to Bull, S.A., Paris, France

Filed Aug. 6, 1986, Ser. No. 893,931

Claims priority, application France, Aug. 6, 1985, 85 12000

Int. Cl.⁴ G06F *13/14*

U.S. Cl. 364—200 **14 Claims**



1. Apparatus for asynchronously transferring data between a microprocessor module and a memory module, the microprocessor module comprising:

a microprocessor,

a clock source,

a logic array and a gate, the logic array being responsive to the clock signal source and a transfer command signal for deriving a mask window signal, F, having a duration equal to a transfer time between the memory and microprocessor modules, said transfer time being equal to one waiting cycle of said memory for commands form said microprocessor, the mask window signal, F, being derived by the logic array in accordance with

$$F=(MAS)\,(CLK)+F(AS)(CLK)$$

where

$MAS=(AS)(CLK)+(MAS)(AS)(CLK)$

CLK=the state of the clock signal derived by the clock source and applied to the microprocessor, and

AS=the state of the transfer command signal;

the microprocessor including an output terminal on which is derived a signal commanding transfer of data between the memory and microprocessor modules and an input terminal for enabling data and address terminals of the microprocessors to be selectively coupled to address and data buses coupled to the memory module while an acknowledge signal is applied thereto;

the memory module comprising a memory,

a memory controller,

an internal acknowledge signal generator responsive to signals from the memory controller and the transfer command signal for deriving an advance acknowledge signal in synchronism with derivation of the transfer command signal in response to signals form the memory controller indicating unused space in the memory is allocated to said microprocessor, the internal acknowledge signal generator also being responsive to first and second signals from the memory controller, the first signal being derived by the memory controller in response to the microprocessor to indicate whether the memory is and is not available at the time the transfer control signal is derived, the second signal indicating whether or not the memory is reading or writing a data signal of said microprocessor, the internal acknowledge signal generator selectively deriving an internal acknowledge signal (1) while the second signal is derived and while the first signal is derived, and (2) while the advance acknowledge signal is generated;

the gate being responsive to the transfer command signal, the internal acknowledge signal and the mask window signal for supplying the acknowledge signal to the microprocessor input terminal to control coupling of the address and data buses to the address and data terminals of the microprocessor.

4,855,902

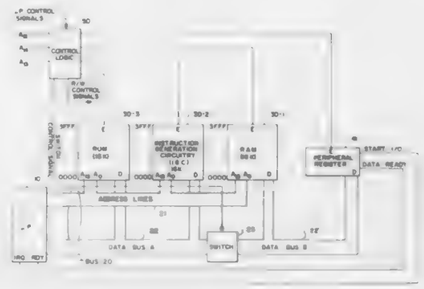
MICROPROCESSOR ASSISTED DATA BLOCK TRANSFER APPARATUS

Tony J. Kozlik, Phoenix, and Ronald J. Freimark, Scottsdale, both of Ariz., assignors to Honeywell, Inc., Minneapolis, Minn.

Continuation of Ser. No. 750,433, Jul. 1, 1985, abandoned. This application May 24, 1988, Ser. No. 198,814

Int. Cl.⁴ G06F *13/10, 13/40*

U.S. Cl. 364—200 **5 Claims**



1. In a data processing system, an apparatus for controlling the movement of a data block between a peripheral and the data processing system, said apparatus, comprising:

(a) a bus wherein said bus includes:

(i) an address bus;

(ii) a first data bus; and

(iii) a second data bus, wherein said peripheral is operatively connected to said second data bus;

(b) first memory means, having a plurality of locations and a corresponding address for each location whereby each location is separately addressable, and operatively connected to said address bus and to said second data bus, for storing data;

(c) second memory means, having a plurality of locations and a corresponding address for each location whereby each location is separately addressable, and operatively connected to said address bus and to said first data bus, for storing a sequence of dummy instructions in predetermined areas of said second memory means having corresponding buffer areas in said first memory means, and further wherein each addressable location within the predetermined area of said second memory means has a corresponding addressable location within the corresponding buffer area of said first memory means;

(d) processor means, operatively connected to said address bus and to said first data bus, and further operatively connected to said peripheral, for fetching a preselected one of said dummy instructions from said second memory means in response to a control signal from said peripheral, such that address signals corresponding to the address of said dummy instruction are coupled to the address bus thereby indicating the corresponding location of the buffer area in said first memory means;

(e) switch means, interposed between said first data bus and said second data bus to provide a connection therebetween, for disconnecting the first data bus from the second data bus in response to an enable signal, thereby inhibiting the transfer of data between said first data bus and the second data bus, thereby permitting said processor means to operate as a controller in the transfer of data between the peripheral and the first memory means of the data processing system; and

(f) logic means, operatively connected to said address bus, said first memory means, said second memory means, said processor means, said switch means, and said peripheral, for generating at least one control signal to enable at least one of said first memory means, said second memory means, said switch means, and said peripheral in response to the memory area addressed by said processor means, such that the fetching of said dummy instruction by said processor means via said first data bus does not interfere with the essentially simultaneous transfer of data between the peripheral and the first memory means via said second data bus, the address of the dummy instruction being fetched also defining the location of the first memory means nvolved in the data transfer and the direction of the data transfer between said peripheral and said first memory means.

4,855,903

TOPOLOGICALLY-DISTRIBUTED-MEMORY MULTIPROCESSOR COMPUTER

Herbert R. Carleton, Setauket, and Jeremy Q. Broughton, Stony Brook, both of N.Y., assignors to State University of New York, Albany, N.Y.

Continuation of Ser. No. 684,250, Dec. 20, 1984, abandoned. This application Jan. 22, 1988, Ser. No. 147,595

Int. Cl.[4] G06F *15/16*

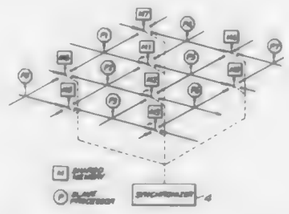
U.S. Cl. 364—200 **45 Claims**

1. A multiprocessor computer, comprising:

a grid-like network of processors and memory cells, said processors and memory cells defining the nodes of said grid and being logically configured in an alternating sequence within said grid, such that individual processors are logically interposed between surrounding memory cells and individual memory cells are logically interposed between surrounding processors;

communication means for providing direct, parallel communications between the individual processors and their logically surrounding memory cells and between the individual memory cells and their logically surrounding processors, such that nearest adjacent processors articulate at least two common memory cells and nearest adjacent memory cells are articulated by at lest two common processors;

switching means provided logically between the individual processors and each of their surrounding memory cells and between the individual memory cells and each of their surrounding processors, and cooperating with said communications means, for enabling/disabling communication between each individual processor and a particular one of it surrounding memory cells and between each individual memory cell and a particular one of its surrounding processors; and



synchronizing means, cooperating with said switching means, for synchronizing the switching of communications between the individual processors and particular ones of their surrounding memory cells, and between the individual memory cells and particular ones of their surrounding processors.

4,855,904

CACHE STORAGE QUEUE

Kevin L. Daberkow, San Jose; Christopher D. Finan, Santa Clara; Joseph A. Petolino, Palo Alto, all of Calif.; Daniel C. Sobottka, Chicago, Ill., and Jeffrey A. Thomas, Cupertino, Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Division of Ser. No. 233,953, Aug. 18, 1988, which is a continuation of Ser. No. 900,640, Aug. 27, 1986, abandoned. This application Sep. 22, 1988, Ser. No. 225,875

Int. Cl.[4] G06F *12/00, 13/00*

U.S. Cl. 364—200 **4 Claims**

1. A data processing apparatus comprising:

instruction processing means for processing a sequence of instructions including

means, connected to receive the sequence of instructions, for decoding an instruction in the sequence to generate control signals including a request for storage of resulting data to a data location and an address identifying the data location, and other requests for access to a data location and corresponding addresses,

means, connected to receive a subset of the control signals, for executing decoded instructions to generate the resulting data; and

storage means for storing data at data locations identifiable by addresses;

storage port means, connected to receive resulting data from the executing means and having at least one register for holding the address and resulting data from the execution of an instruction when allocated to the instruction, for generating a request for access to a data location identified by the address in the at least one register to store the resulting data, the at least one register being free if it is not allocated; and

access control means, connected to receive a plurality of request for access to a data location including the requests for storage of resulting data and corresponding addresses from the storage port means and the decoding means, for processing a sequence of requests for access to the storage means including

means for allocating the at least one register in the storage port means if it is free in response to a request from the decoding means to store resulting data to the requesting instruction,

means for accessing data locations in response to other requests for access to a data location, and

means for selecting from the plurality of received requests one request for processing next in the sequence by the access control means in response to a priority signal.

4,855,905

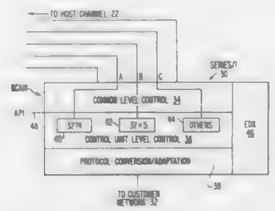
MULTIPROTOCOL I/O COMMUNICATIONS CONTROLLER UNIT INCLUDING EMULATED I/O CONTROLLERS AND TABLES TRANSLATION OF COMMON COMMANDS AND DEVICE ADDRESSES

Suzanne L. Estrada, Gaithersburg, and Robert R. Ploger, III, Potomac, both of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1987, Ser. No. 43,798

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—200 **1 Claim**



1. In a data processing system including a host processor having a channel for communicating commands through a first type I/O control unit to a first terminal or a second terminal having first and second device addresses, respectively, and for communicating commands through a second type I/O control unit to a communications link having a third device address, a multiprotocol I/O communication controller unit coupled between said channel and said terminals and said communications link, said communication controller unit comprising:

a common level control logic means coupled to said channel, for receiving from said channel a device address value and an associated common command value representing a command;

a control unit level control logic means coupled to said common level control logic means and also coupled to said first terminal, to said second terminal and to said communications link, including a first emulated I/O controller for controlling said first and said second terminals and including a second emulated I/O controller for controlling said communications link;

said common level control logic means including a device address translation table for directing said associated common command value to said first emulated I/O controller in response to said device address value being either said first or said second device address and for directing said associated common command value to said second emulated I/O controller in response to said device address value being said third device address;

said first emulated I/O controller including a first command translation table for converting said associated common command value to a first type terminal control command, said control unit level control logic means outputting said first type terminal control command to either said first or said second terminal in response to said device address value being either said first or said second device address, respectively;

said second emulated I/O controller including a second command translation table for converting said associated common command value to a second type communications link control command, said control unit level control logic means outputting said second type communications link control command to said communications link in response to said device address value being said third device address.

4,855,906

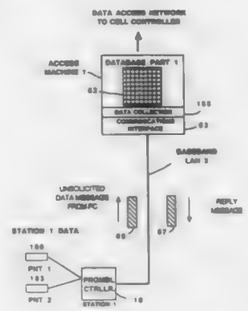
SYSTEM FOR HANDLING UNSOLICITED MESSAGES FROM LOWER-TIER CONTROLLERS

Thomas J. Burke, Chagrin Falls, Ohio, assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Oct. 23, 1987, Ser. No. 113,216

Int. Cl.[4] G06F *15/46, 13/00*

U.S. Cl. 364—200 **5 Claims**



1. A database cache computer for receiving at least a portion of data base downloaded over a first-tier communication link from a higher-level computer and for connection to a plurality of station-level computers located at a corresponding plurality of stations, the plurality of station-level computers including at least one station-level computer controlling an industrial machine in real time, the database cache computer comprising:

means for receiving from the higher-level computer and storing at least a portion of a database including data items which are accessed by the higher-level computer on a basis that is independent of addresses which are assigned to data items at the stations for reference by respective station-level computers;

means for communicating the data item through a second-tier communication link to and form the station-level

computers via messages in which the data items are related to addresses which are assigned to the data items at the stations for reference by respective station-level computers;

means interfacing the means for storing to the second-tier communication link for re-organizing the data items from the addresses assigned at the stations to enable access by the higher-level computer on a basis that is independent of the addresses assigned at the stations; and

wherein an improvement comprises

means received from the higher-level computer for selecting data items for unsolicited update;

wherein the means for re-organizing the data items is configuration, in response to the means for selecting data items for unsolicited update, to include means for recognizing an unsolicited update message initiated from a respective station-level computer without sending a polling message to the station-level computer; and

wherein the means for re-organizing the data items is configured, in response to means for selecting data items for unsolicited updated, to include means for extracting updated values from an unsolicited update message and loading such updated values into their respective locations in the database for access by the higher-level computer on a basis that is independent of the addresses assigned at the stations.

4,855,907

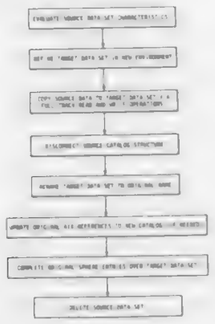
METHOD FOR MOVING VSAM BASE CLUSTERS WHILE MAINTAINING ALTERNATE INDICES INTO THE CLUSTER

John T. Ferro, Jr.; Patrick C. Jacobs, both of San Jose; Robert M. Laye, Hayward, and Brian D. Starr, Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 761,739, Aug. 1, 1985. This application Apr. 22, 1988, Ser. No. 184,655

Int. Cl.[4] G06F *7/00*

U.S. Cl. 364—300 **3 Claims**



1. In a system having a DASD storage subsystem and a CPU coupling said DASD subsystem, said system utilizing selectively invocable nested storage access methods, said methods including a storage device level access method (ISAM) nested within a virtual storage access method (VSAM),

said VSAM creating, modifying, or deleting data sets including records, catalogs, and indices, said data sets being accessed by VSAM only at a partial DASD tract-at-a-time-per-access basis,

the recreation of any data set of related records, catalog entries, or indices from within VSAM including the steps of copying the records from a first to a second DASD location, and rebuilding the catalog entries and indices,

a computer-implemented method for moving a data set of related records, catalogs, and indices from a first to a second DASD location from without VSAM,

comprising the steps of:

(a) creating a newly-defined catalog record and allocating space for a data set on the second DASD location;

(b) invoking the device level access method by the CPU independently of VSAM; and

(c) causing the invoked device level access method to execute the steps of:

(1) moving the data set resident at the first DASD location onto the second DASD location a full track at a time, preserving thereby all relative byte addressing of data set constituitive elements;

(2) defining the indices, if any, on the second DASD location and connecting them to the moved catalog;

(3) deleting the data set including catalogs and indices resident at the first DASD location; and

(4) renaming the newly-defined catalog record to the original name.

4,855,908

POS SYSTEM

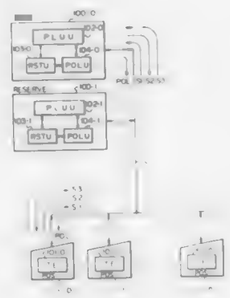
Makoto Shimoda; Tatsuyuki Ishino, and Makoto Matsuo, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 27, 1985, Ser. No. 814,039

Claims priority, application Japan, Dec. 27, 1984, 59-280631; Dec. 28, 1984, 59-275303; Dec. 28, 1984, 59-275304

Int. Cl.[4] G06F *13/06*

U.S. Cl. 364—405 **12 Claims**



1. A point-of-sales system including at least one controller provided at a management center in a store and a plurality of point-of-sales terminals, each sales counter in said store provided with one of said point-of-sales terminals, said controller and each of said point-of-sales terminals being connected by a closed circuit in said store,

said controller comprising:

a price look-up file including a price look-up table and a sum table for storing article data, and a master file for storing fixed article data for a first time interval and a temporary file for temporarily storing article data for a second time interval shorter than the first time interval, all of the article data having an article code assigned thereto; and

each of said point of sales terminals including means for generating a price look-up inquiry signal having a particular article code designated by any of said point-of sales terminals, said price look-up table and said sum table being searched simultaneously by said price look-up inquiry signal for all data having the particular article code assigned thereto.

4,855,909

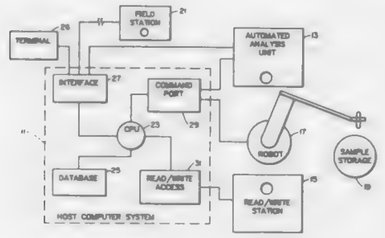
FORENSIC SAMPLE TRACKING SYSTEM AND PRINT STATION THEREFOR

Kent D. Vincent, and Carl A. Myerholtz, both of Cupertino, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 20, 1987, Ser. No. 123,489

Int. Cl.[4] G06F *15/42;* **G01D** *9/00*

U.S. Cl. 364—413.01 **15 Claims**



1. A system comprising:

a write station; and

computer means for receiving, processing, storing and transmitting data and commands, said computer means including:

data base means for storing descriptive sample data in association with a sample identifier referable to a sample in a sample container,

access means for sending data to be encoded and written by said write station, and

processor means, coupled to said data base means and said access means for causing data referable to said sample identifier to be sent via said access means to said write station so that said write station writes a sample identificatiion code referable to said sample identifier on said sample container.

4,855,910

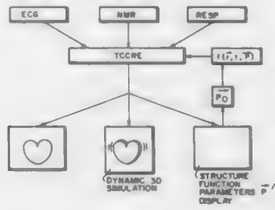
TIME-CLUSTERED CARDIO-RESPIRATORY ENCODER AND METHOD FOR CLUSTERING CARDIO-RESPIRATORY SIGNALS

Daryl E. Bohning, Birmingham, Ala., assignor to North American Philips Corporation, New York, N.Y.

Filed Oct. 22, 1986, Ser. No. 921,980

Int. Cl.[4] G01R *33/20*

U.S. Cl. 364—413.13 **4 Claims**



1. A system for obtaining imaging data of in vivo biological tissue subject to substantially periodic cardiac and respiratory cycles, which image data is sorted by phase intervals of the cycles comprising:

a free-running NMR scanner means for collecting NMR data samples of said biological tissue without synchronization to the cycles, said NMR data samples requiring transformation of a plurality of said samples in order to produce image data therefrom;

a transducer means for coupling to said biological tissue to detect cardiac and respiratory data simultaneously with the collection of NMR data samples by said NMR scanner; and

data processing means receiving said NMR data samples and said cardiac and respiratory data, comprising:

(a) means, utilizing said cardiac and respiratory data, for dividing each successive cycle into normalized time bins indicative of phase intervals of the cycle;

(b) means for sorting the NMR data samples obtained during successive cycles into a two-dimensional array defined by the normalized time bins indicative of the phase intervals of the cycles during which said data samples were collected, and

(c) means for transforming the sorted NMR data samples in the normalized time bins into image data corresponding to said time bins.

4,855,911

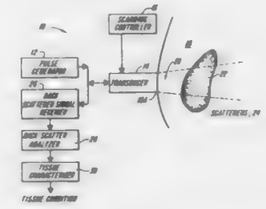
ULTRASONIC TISSUE CHARACTERIZATION

Padmakar P. Lele, Winchester, Mass., and Gerard E. Sleefe, Cedar Crest, N. Mex., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 16, 1987, Ser. No. 121,240

Int. Cl.[4] A61B *10/00*

U.S. Cl. 364—413.25 **29 Claims**



1. A method for non-invasive characterization of tissue, the method comprising:

transmitting an acoustic signal to a tissue;

receiving a backscattered waveform from said tissue;

analyzing said backscattered waveform as a sum of individual scatterer components to assign a scatterer number density to said tissue; and

characterizing said tissue by comparing said assigned scatterer number density with predetermined parameters to obtain an identification of the tissue character.

4,855,912

METHOD AND APPARATUS FOR MEASUREMENT OF THE THERMAL BEHAVIOR OF POROUS MEDIA

Jayanth R. Banavar, Ridgefield; David L. Johnson, Danbury, both of Conn.; Sidney R. Nagel, Chicago, Ill., and Kambiz A. Safinya, Ridgefield, Conn., assignors to Schlumberger Technology Corp., New York, N.Y.

Filed Feb. 8, 1988, Ser. No. 153,130

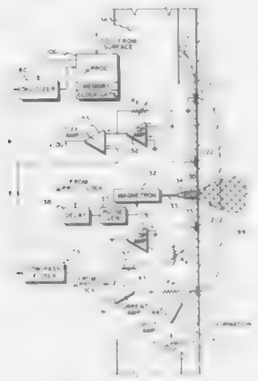
Int. Cl.[4] G01V *3/20, 3/30, 9/00*

U.S. Cl. 364—422 **39 Claims**

1. A method for investigating earth formations surrounding a borehole, comprising the steps of:

heating a region of the formations by transmitting a pulse of microwave electromagnetic energy into the formations;

measuring the change in the conductivity of the heated region in response to said pulse; and



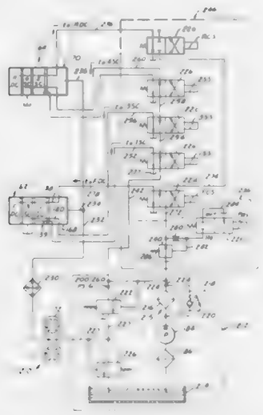
determining a property of the region from the measured conductivity change.

4,855,913

ELECTRONIC CONTROL SYSTEM FOR POWERSHIFT TRANSMISSION

Kevin L. Brekkestran, and John C. Thomas, both of Fargo, N. Dak., assignors to J. I. Case Company, Racine, Wis.

Filed May 29, 1987, Ser. No. 55,820
Int. Cl.[4] B60K *41/08, 41/18*
U.S. Cl. 364—424.1 **4 Claims**



1. An electronic control system for a powershift transmission having a plurality of hydraulically-actuated clutches and a plurality of electrically-operated hydraulic valves for selecting the clutch for engagement, each such valve being provided with electrical coil means for operating the valve, the control system comprising:

first electrical switching means for providing a first electrical signal to a first electrical coil means associated with a first hydraulic valve for selecting a first clutch of the transmission for engagement;

second electrical switching means for providing a second electrical signal which is proportional signal to a second electrical coil means associated with a second hydraulic valve for adjusting the hydraulic pressure applied to the first clutch during engagement thereof;

microprocessor means for operating the powershift transmission in accordance with operating parameters stored within the microprocessor means, the operating parameters including a first parameter corresponding to a reduced hydraulic pressure to be applied to the first clutch during initial engagement thereof,

the microprocessor means including first output means for controlling the first electrical switching means, second output means for controlling the second electrical switching means, and means for causing the second electrical signal to command the second hydraulic valve to adjust the hydraulic pressure applied to the first clutch during the initial engagement thereof in accordance with a stored value of the first parameter;

wherein the second electrical signal is a pulse width modulated (PWM) signal;

wherein the first signal electrical coil means are solenoid coils, and wherein the first and second electrical switching means are substantially identical in construction;

means for providing a predetermined time delay between the application of the first electrical signal to the first electrical coil means and the application of the second electrical signal to the second electrical coil means; and

wherein the operating parameters stored within the microprocessor means includes a second parameter corresponding to the rate at which hydraulic pressure applied to the first clutch during engagement thereof is to be increased from the reduced pressure applied during the initial engagement of the first clutch, and a third parameter corresponding to the maximum length of time reduced hydraulic pressure is to be applied to the first clutch during engagement thereof, and

the microprocessor means includes means for causing the second electrical signal to command the second hydraulic valve to increase the hydraulic pressure applied to the first clutch during engagement thereof from the reduced pressure applied during the initial engagement thereof in accordance with a stored value of the second parameter, and means for causing the second electrical signal to command the second hydraulic valve to apply reduced hydraulic pressure to the first clutch during engagement thereof in accordance with a stored value of the third paramenter.

4,855,914

COMPUTER CONTROLLABLE SYNCHRONOUS SHIFTING OF AN AUTOMATIC TRANSMISSION

Roy I. Davis, 9214 Abbey La., Ypsilanti, Mich. 48198, and Prabhakar B. Patil, 10294 W. Outer Dr., Detroit, Mich. 48223

Filed Nov. 27, 1987, Ser. No. 126,064
Int. Cl.[4] B60K *41/18;* **G05D** *17/02*
U.S. Cl. 364—424.1 **22 Claims**

1. In a powertrain that includes a multiple gear ratio automatic transmission drivably connecting a power source and the drive wheels of a motor vehicle and having a gearset and multiple friction elements whose selective engagement and disengagement determine the operating gear ratio, a method for controlling a synchronous gear ratio change comprising the steps of:

producing a commanded power source speed Wmc;

producing a commanded transmission output torque Twc;

producing signals representing the instantaneous output torque of the transmission and the instantaneous power source speed;

generating a first error Twe defined as the difference between the output torque of the transmission and the commanded transmission output torque;

applying the first error signal to a first controller and obtaining as output of said first controller an inertia phase first friction element control pressure command;

applying the first error as input to a second controller and obtaining as the output of said second controller a torque phase power source torque command;

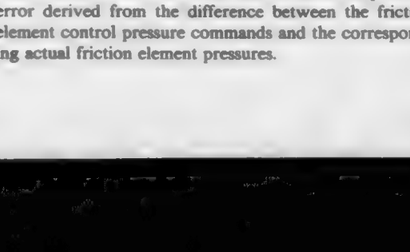
generating a second error Wme defined as the difference between the actual speed of the power source and the commanded speed of the power source;

applying the second error as input to a third controller and obtaining as the output of said third controller a torque phase first friction element control pressure command;

applying the second error as input to a fourth controller and obtaining as the output of said fourth controller a torque phase second friction element control pressure command;

applying the second error as input to a fifth controller and obtaining as the output of said fifth controller an inertia phase power source torque command;

producing a first friction element control pressure command from the output of said first controller provided the gear ratio change is in the inertia phase, or from the output of said third controller provided the gear ratio change is in the torque phase;



producing a second friction element control pressure command from the output of said fourth controller provided the gear ratio change is in the torque phase;

producing a power source torque command from the output of said second controller provided the gear ratio change is in the torque phase, or from the output of said fifth controller provided the gear ratio change is in the inertia phase;

controlling the torque produced by the power source by supplying to a power source control unit the power source torque command corresponding to the inertia phase or torque phase of the gear ratio change; and

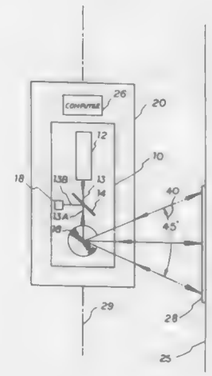
controlling the torque transmitted by the friction elements, hence the gear ratio, by supplying pressure to the friction elements in accordance with the friction element pressure error derived from the difference between the friction element control pressure commands and the corresponding actual friction element pressures.

4,855,915

AUTOGUIDED VEHICLE USING REFLECTIVE MATERIALS

Rodney J. Dallaire, 37497 Bristol Ct., Livonia, Mich. 48154

Filed Mar. 13, 1987, Ser. No. 25,722
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—424.02 **5 Claims**



1. A guidance means for a vehicle traveling along a path comprising:

a target mounted along and to the side of a vehicle path, said target having at least a mirror reflective element and one or more horizontally arranged retro-reflective elements;

first means mounted on the vehicle for emitting a beam of light toward the target and for sensing a reflection of the light beam from the mirror-reflective element and the retroreflective element at such times as the vehicle is at a pre-set distance from the target; and

computer means on the vehicle for computing the position and heading of the vehicle according to a signal received from the first means in response to sensing the reflected light beam at such times as the beam of light is along a line perpendicular to the reflective surface of the mirror reflective element, and the beam of light is within a predetermined angle of incidence of the reflective surface of the retro-reflective element.

4,855,916

ANTI-SKID BRAKING SYSTEM CONTROL METHOD

Douglas E. Bernard, Hawthorne, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 28, 1987, Ser. No. 138,540
Int. Cl.[4] B60T *8/32*
U.S. Cl. 364—426.02 **18 Claims**

8. In an anti-skid braking system for controlling brake torque on a vehicular wheel, an adaptive control method for determining a desired one of at least three available brake control actions, the method comprising:

partitioning each one of a plurality of phase planes into at least three sectors, each meeting at a common point, each phase plane having coordinates defined by wheel slip and wheel acceleration, with the shape of the sectors being related to a vehicular speed range associated with each phase plane, each sector representing one of the at least three brake control actions;

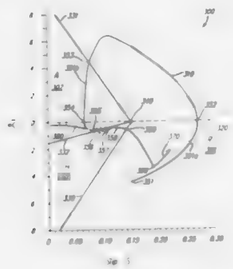
estimating a vehicular speed;

selecting one of the plurality of phase planes in accordance with the estimated vehicular speed;

estimating wheel acceleration and slip;

examining the selected phase plane at a coordinate point

defined by the estimated wheel slip and acceleration and determining the sector containing the point; and



issuing a command designating one of the at least three brake control actions in accordance with the determined sector.

4,855,917

ANTISKID CONTROL DEVICE

Susumu Sawano, Tokyo; Masaru Sakuma, Kawasaki; Hideaki Nagai, Yokohama, and Tatsuya Funabashi, Tokyo, all of Japan, assignors to Tokico, Ltd., Japan

Filed May 27, 1987, Ser. No. 54,659

Claims priority, application Japan, May 30, 1986, 61-125498; May 30, 1986, 61-125499

Int. Cl.[4] B60T 8/32

U.S. Cl. 364—426.02 8 Claims



1. An antiskid control device comprising:

detectors for measuring circumferential velocities of a plurality of respective wheels,

actuator means for providing a braking oil pressure to each of said wheels, and

electric circuit means for calculating frictional coefficients of road surfaces in contact with said wheels respectively based on the measured values from said detectors, for calculating aimed wheel circumferential velocities of the respective wheels based on the calculated frictional coefficients of the road surfaces, and for operating said actuator means such that respective ones of said aimed wheel circumferential velocities coincide with respective ones of the measured wheel circumferential velocities,

said electric circuit means being adapted to operate said actuator means by setting individual aimed wheel circumferential velocities for each of said plurality of wheels based on a vehicle deceleration calculated from an average value for the frictional coefficients of road surfaces with which said plurality of wheels are in contact, respectively, and based on a slip ratio for each of the plurality of wheels.

4,855,918

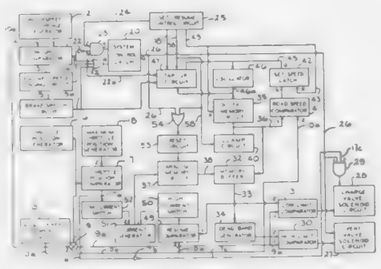
ELECTRONIC VEHICLE SPEED CONTROL SYSTEM HAVING ANALOG AND DIGITAL MEMORY CIRCUITS

Larry O. Gray, Laurinburg, N.C., assignor to Dana Corporation, Toledo, Ohio

Filed Aug. 28, 1986, Ser. No. 901,135

Int. Cl.[4] B60K 31/00

U.S. Cl. 364—426.04 18 Claims



1. In an electronic vehicle speed control system including means for generating a signal representing the actual speed of the vehicle and comparison means for comparing the actual speed signal with a signal representing the desired speed of the vehicle so as to control the actual speed of the vehicle in accordance with the desired speed, a means for generating the desired speed signal comprising:

first and second memory circuits for storing and generating first and second memory signals, respectively; and

memory buffer means including firs. and second operational amplifiers, a first input of said first operational amplifier being connected to receive said first memory signal, a first input of said second operational amplifier being connected to receive said second memory signal, and second inputs of both said first and second operational amplifiers being connected to outputs of both of said first and second operational amplifiers and to an output line, whereby a signal is generated on the output line which is equal in value to one of said first and second memory signals as said desired speed signal.

4,855,919

METHOD AND CIRCUITRY FOR THE DRIVING OF DRIVER STAGES FOR FUNCTIONS OF INTERNAL COMBUSTION ENGINES FOR AUTOMOTIVE VEHICLES ESPECIALLY FOR FUEL INJECTION OR IGNITION

Ralf Bergholz, Julicher Strasse 21, D-8500 Nürnberg 90, Fed. Rep. of Germany

Filed Nov. 5, 1986, Ser. No. 927,822

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1985, 3541884

Int. Cl.[4] F02D 41/34, 41/26

U.S. Cl. 364—431.03 9 Claims

1. A method for the driving of driver stages for operation of internal combustion engines of automotive vehicles, especially for fuel injection or ignition, including the use of first and second timer-controlled output signals of a microcontroller for the cylinder-selective driving and for the presetting of operational start and operational end modes of the driving, further including the use of a signal of a pickup to identify a cylinder for the coordination of the cylinder-selective driving, comprising the steps of

driving a first address counter for operational start addresses by means of one edge of the first output signal;

addressing output memory by the first address counter;

changing the output memory to an operational start mode by means of the other edge of the first output signal;

driving a second address counter for operational transmitting addresses by means of one edge of the second output signal;

addressing the output memory by the second address counter;



changing the output memory to an operational end mode by means of the other edge of the second output signal.

4,855,920

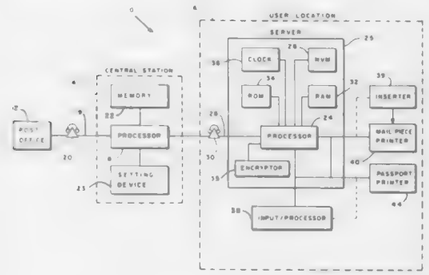
POSTAGE ACCOUNTING DEVICE

Ronald P. Sansone, Weston, and Wojciech M. Chrosny, Milford, both of Conn., assignors to Pitney Bowes, Inc., Stamford, Conn.

Filed Dec. 26, 1985, Ser. No. 813,443

Int. Cl.[4] G06F 15/20

U.S. Cl. 364—464.02 14 Claims



10. A postage accounting device comprising:

(a) a processor;

(b) means for inputting postage information to said processor including information identifying a class of mail;

(c) a memory in communication with said processor, said memory including rate chart means;

(d) security means for providing security for said processor and said memory;

(e) means for inputting postage value into said memory;

(f) means, in communication with said processor and responsive to said mail class information and said rate chart means for determining the amount of postage required to process mail pieces in a batch of mail pieces; and,

(g) means, in communication with said processor, for subtracting a series of such amounts from said postage value stored in said memory to account for said batch of mail pieces.

4,855,921

COMPLEX CURVED SURFACE CREATION METHOD

Masaki Seki, and Norihisa Amano, both of Tokyo, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

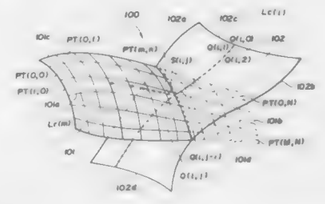
PCT No. PCT/JP86/00470, § 371 Date May 18, 1987, § 102(e) Date May 18, 1987, PCT Pub. No. WO87/01831, PCT Pub. Date Mar. 26, 1987

PCT Filed Sep. 12, 1986, Ser. No. 57,939

Claims priority, application Japan, Sep. 17, 1985, 60-204628

Int. Cl.[4] G06F 15/46

U.S. Cl. 364—474.29 7 Claims



1. A method of creating a complex curved machining surface by combining at least first and second three-dimensional curved machining surfaces, comprising:

inputting data for specifying first and second three-dimensional curved machining surfaces;

obtaining position data indicative of a j-th point Q(i,j) along an i-th path, the i-th path passing through the first three-dimensional curved machining surface and having a first side on one side of the first three-dimensional curved machining surface and a first side on the other side of the second three-dimensional curved machining surface, where the second three-dimensional curved machining surface is defined by a set of plural paths generated in dependence upon said data;

determining, with regard to the first three-dimensional curved machining surface, whether the point Q(i,j) is on a same side of the first three dimensional curved machining surface as a (j—1) th point Q(i, j—1) along said i-th path;

storing the point Q(i,j) if it is on the same side and, if it is not on the same side, obtaining and storing the coordinates of a point S(i,j) on the first three-dimensional curved machining surface corresponding to a projected point obtained by projecting the point Q(i,j) on a predetermined plane;

performing the operation j=j+1, obtaining position data indicative of the next point Q(i,j) on the i-th path, performing said steps of determining and storing, and obtaining a point on the complex curved machining surface corresponding to the i-th path; and

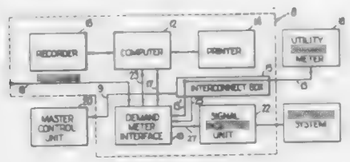
machining the complex curved machining surface.

4,855,922

APPARATUS AND METHOD FOR MONITORING AN ENERGY MANAGEMENT SYSTEM

Paul M. Huddleston, Stone Mountain; G. Burns Porter, Jr., Doraville, and David T. Rooney, Marietta, all of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Mar. 20, 1987, Ser. No. 28,618
Int. Cl.[4] G06F *15/20*; H02J *1/00*
U.S. Cl. 364—464.04 23 Claims



1. An apparatus for determining a parameter of operation of an energy management system of the type which controllably drops load from an electrical power network in response to preselected conditions, comprising:

means for periodically interrupting the operation of said energy management system and restoring said load to said network;

means for generating a first energy usage signal representative of energy usage on said network at a time when said energy management is not interrupted by said interrupting means;

means for generating a second energy usage signal representative of energy usage on said network at a time when said interrupting means interrupts said energy management system; and

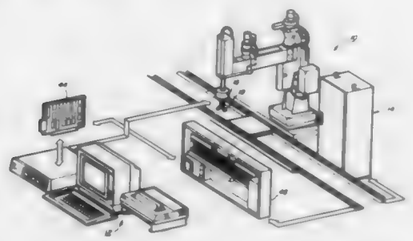
means responsive to said first energy usage signal and said second energy usage signal for computing said parameter of operation of said energy management system.

4,855,923

PARTS ASSEMBLY USING SIGNATURE ANALYSIS

David M. Fullmer, Ann Arbor, Mich., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1988, Ser. No. 141,235
Int. Cl.[4] G06F *15/46, 15/36*
U.S. Cl. 364—468 5 Claims



1. A method of assembling parts, including the steps of:

sensing, at discrete time intervals before actual assembly of the parts, forces exerted on the parts corresponding to a good assembly and a faulty assembly;

processing statistically the sensed forces to determine waveforms corresponding to the forces associated with a good assembly and the forces associated with a faulty assembly;

detecting, at discrete time intervals, forces exerted on the parts during the actual assembly of the parts;

processing statistically the detected forces to determine waveforms of the forces used during actual assembly of the parts;

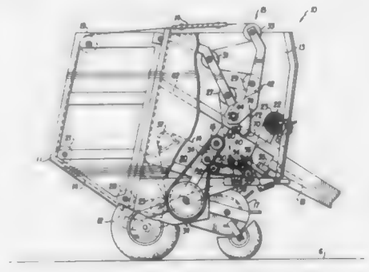
comparing the waveforms of the forces used during actual assembly of the parts to the waveforms corresponding to the forces associated with a good assembly and a faulty assembly to classify the waveforms of the forces used during actual assembly of the parts as those associated with a good assembly or those associated with a faulty assembly.

4,855,924

ROUND BALER WITH CONTINUOUS BALE SIZE MONITORING

Richard P. Strosser, Akron; Edward J. Wynn; Mark K. Chow, both of Leola, and Stephen C. Schlotterbeck, New Holland, all of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed May 14, 1987, Ser. No. 49,874
Int. Cl.[4] B65B *13/18*
U.S. Cl. 364—468 16 Claims



1. In a round baler wherein crop material is fed to a bale forming chamber and crop material in said bale forming chamber is rotated to form a round bale, the improvement comprising:

operator-controller means for producing a digital value representing a desired bale size;

bale sensor means for continuously sensing bale size and continuously producing an analog output signal which varies as the size of the bale being sensed varies;

analog to digital converter means responsive to said analog signal for producing a digital value representative of actual bale size;

indicator means; and,

microprocessor control means including means responsive to said digital value representative of actual bale size and the digital value representing desired bale size for energizing said indicator means when the actual bale size is at least as large as said desired bale size.

4,855,925

MONITORING APPARATUS

Chander P. Bhateja, 23 Wildwood Rd., Keene, N.H. 03431

Filed Apr. 14, 1987, Ser. No. 38,229
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—474.06 7 Claims

1. Apparatus for monitoring a grinding machine wherein a plurality of transducers are coupled to the machine for sensing the relative displacement between a machine member and a workpiece and for sensing the power consumed in producing the relative displacement, said apparatus comprising:

signal conditioning circuit means for receiving an electrical signal produced by an associated transducer of the plurality of transducers in response to the relative movement between the machine member and the workpiece;

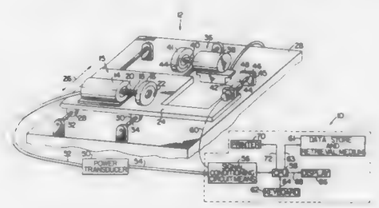
means for coupling the output of said associated transducer to said signal conditioning circuit;

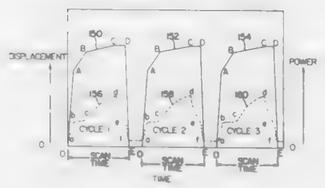
means for containing an instruction set, said instruction set including a plurality of operating modes to direct the operation of said apparatus in response to an input command;

signal processing means responsive to said instruction set and coupled to said signal conditioning circuit for sampling in real-time, signals produced by said associated transducers, said signal processing means further acting upon said sampled signals to produce data representative of and corresponding to each of said sampled signals;

means for storing said data, said storage means being addressable and responsive to said signal processing means for retrieving data stored at a location identified by an associated address;

visual display means coupled to said signal processing means, and





means coupled to said signal processing means for receiving said retrieved data and for transforming said data for viewing in real time on said visual displays as a simultaneous plot of relative displacement between said machine member and said workpiece and the power consumption during the relative displacement substantially immediately as said data is produced;

said signal processing means comprising a central processing unit (CPU) wherein said CPU includes a computational module for determining grinding parameters from said data corresponding to said sampled signals, said computational module being selectable from a group of computational modules, and each of said computational modules including formulas for computing grinding parameters associated with a specific type of grinding process.

4,855,926

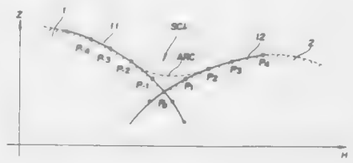
COMPLEX CURVED SURFACE CREATION METHOD

Masaki Seki, and Norihisa Amano, both of Tokyo, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP86/00310, § 371 Date Feb. 12, 1987, § 102(e) Date Feb. 12, 1987, PCT Pub. No. WO86/07645, PCT Pub. Date Dec. 31, 1986
PCT Filed Jun. 19, 1986, Ser. No. 32,516
Claims priority, application Japan, Jun. 20, 1985, 60-135055
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—474.29 7 Claims

1. A complex curved machining surface creation method for generating a curved machining surface with a rounded section curve having a radius R provided at an intersection where a first curve approximated by straight lines on a first three-dimensional curved machining surface intersects a second curve approximated by straight lines on a second three-dimensional curved machining surface, wherein a point of intersection of the first an second curves being denoted by P_0, straight line approximation points located one after another from the point of intersection P_0 to a starting point of the first curve being denoted by P_j (j=0, 1, 2, . . .), and staight line approximation points located one after another from the point of intersection P_0 to an end point of the second curve being denoted by P_j (j=0, 1, 2, . . .), said method comprising the steps of:

performing operations of setting $P_{-S}=P_{-E}=P_{i-1}$, $P_S=P_j$ and $P_E=P_{j+1}$ (where i, j each have an initial value of 0), and obtaining points of tangency P_{-T}, P_T at which two straight lines $P_{-S}P_{-E}$ and P_SP_E are tangent to a circle of radius R, where P_{-S}, P_{-E}, P_S and P_E are end points of the straight lines;



determining whether the points of tangency P_{-T}, P_T lie between $P_{-E}\sim P_0$ an $P_0\sim P_E$, respectively;

designating a circular arc $P_{-T}P_T$ the rounded section curve of the curved surface creating the complex curved machining surface joining the first and second three-dimensional curved machining surface a and inserted at the intersection if the points of tangency P_{-T}, P_T lie between $P_{-E}\sim P_0$ and $P_0\sim P_E$, respectively;

executing said steps of performing, determining an designating, with the operation of setting i=i—1 being performed if P_{-T}, does not lie between $P_{-E}\sim P_0$ and the operation of setting j=j+1 being performed if P_T does not lie between $P_0\sim P_E$; and

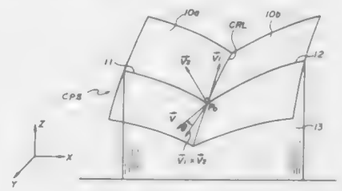
machining the complex curved machining surface.

4,855,927

COMPLEX CURVED SURFACE CREATION METHOD

Masaki Seki, and Norihisa Amano, both of Tokyo, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP86/00374, § 371 Date Mar. 16, 1987, § 102(e) Date Mar. 16, 1987, PCT Pub. No. WO87/00651, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 18, 1986, Ser. No. 36,680
Claims priority, application Japan, Jul. 18, 1985, 60-158583
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—474.29 4 Claims



1. A method of creating a complex curved machining surface in which a rounded section curve is provided where first and second curved machining surfaces intersect, comprising the steps of:

obtaining normal vectors V_1, V_2 of the first and second curved machining surfaces at a point of intersection P_0 of first and second section curves obtained when said first and second curved machining surfaces are cut by a section

perpendicular to the XY plane, when the normal vectors originate at the point of intersection P_0 of the first section curve, the second section curve and the perpendicular section;

calculating an angle θ defined by $V_1 \times V_2$ and a normal vector V of said perpendicular section;

calculating R′ in accordance with the equation

$$R' = (1 + 1/|\cos\theta|)\, R/2$$

when a rounded section curve of radius R is desired;

inserting a circular arc of radius R′ where the first and second curved machining surfaces intersect; and

machining the complex curved machining surface.

4,855,928

WIRE BONDING DEVICE

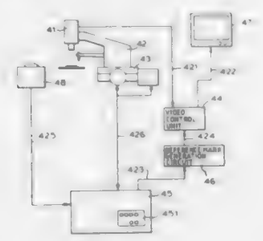
Kazuyuki Yamanaka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 2, 1987, Ser. No. 92,369

Claims priority, application Japan, Sep. 2, 1986, 61-206555

Int. Cl.[4] G06F *15/60*; G06K *9/64*

U.S. Cl. 364—489 **5 Claims**



1. A wire bonding device comprising:

camera means for producing image signals corresponding to a field of view including an object having plural target patterns on which wire bonding is to be performed;

displacement means coupled to said camera means for altering the field of view by varying the relative positioning between the camera means and the object;

monitor means for displaying an image of the object to be wire bonded based on the image signals produced by said camera means;

reference mark display generation means coupled to said monitor means for combining reference mark signals with said image signals so that an image of a reference mark is superimposed on the image of each target pattern displayed by said monitor means;

reference mark generation means for storing data corresponding to a plurality of reference marks and for producing reference mark signals defining a selected reference mark and applying said reference mark signals to said reference mark display generation means; and

input selection and control means coupled to said reference mark generation means for selecting a respective reference mark shape and size tailored to each target pattern and for producing corresponding selection signals applied to said reference mark generation means, said reference mark generation means producing said reference mark signals in correspondence with said selection signals

4,855,929

ROUTING METHOD FOR USE IN WIRING DESIGN

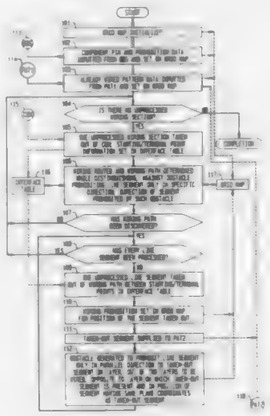
Yasuhiro Nakajima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 7, 1987, Ser. No. 105,247

Claims priority, application Japan, Oct. 9, 1986, 61-241641

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—490 **6 Claims**



1. A routing method for wiring design, comprising:

a determining step of identifying, in one of the wiring sections where no wiring path is determined, the direction of the line segment which is prohibited by an obstacle and accordingly determining a wiring path of at least one line segment; and

a generating step for generating, on an opposing layer to the layer on which one unprocessed line segment is present and in a position having the same plane coordinates as said unprocessed line segment, said obstacle which prohibits on said opposing layer the routing of line segments as are parallel in direction to and in opposing relation to said unprocessed line segment.

4,855,930

METHOD AND APPARTATUS FOR IMPROVED TIME-RESOLVED FLUORESCENCE SPECTROSCOPY

Yong-Sheng Chao, Glaston; Salvador M. Fernandez, Hartford, and Ernest F. Guignon, Canton, all of Conn., assignors to Chimerix Corporation, Glastonbury, Conn.

Filed Mar. 27, 1987, Ser. No. 31,288

Int. Cl.[4] G01J *1/58*; G06F *15/20*

U.S. Cl. 364—497 **23 Claims**

1. A method for fluorescent spectroscopy of material, comprising the steps of:

(a) exciting the material with a single pulse of light energy to induce fluorescence;

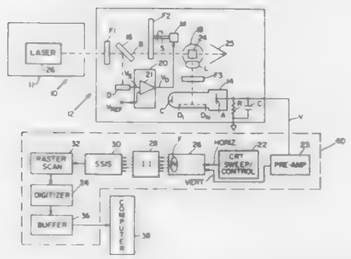
(b) detecting in a detector a signal corresponding to the fluorescence transient waveform induced by said single pulse, as distorted by said detector and said pulse, and generating an electrical signal F(t) corresponding to said distorted signal;

(c) detecting in said detector a signal, which corresponds to said single pulse, as distorted by the impulse response of said detector, and generating an electrical signal E(t);

(d) separately displaying an image of said waveforms F(t) and E(t);

(e) digitizing a predetermined number of data points on each such image, as digital numbers representing points on said waveforms;

(f) storing said numbers in memory as data points of E(t) and F(t); and



(g) calculating the true fluorescence impulse response waveform f(t) from the stored data point numbers.

4,855,931

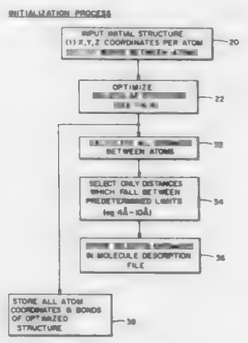
STOCHASTIC METHOD FOR FINDING MOLECULAR CONFORMATIONS

Martin Saunders, Guilford, Conn., assignor to Yale University, New Haven, Conn.

Filed Mar. 25, 1988, Ser. No. 173,397

Int. Cl.[4] G06F *15/46*; G01N *33/00*

U.S. Cl. 364—499 **9 Claims**



1. A method for determining a likely structure of a molecule, the method comprising:

(a) selecting an initial molecular structure, each of whose atoms is specified by a set of spatial coordinates and wherein bonds between said atoms are specified;

(b) generating a plurality of random numbers;

(c) combining a random number with each spatial coordinate of each said atom to create a new set of spatial coordinates for each said atom and thus a new molecular structure;

(d) calculating steric energy of said new molecular structure; and

(e) repeating steps (a)–(d) until a molecular structure is found which exhibits a steric energy minima.

4,855,932

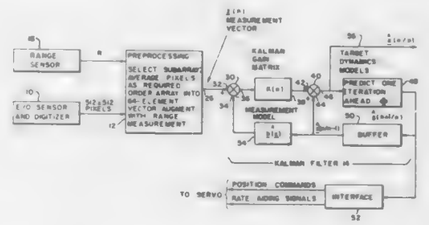
THREE-DIMENSIONAL ELECTRO-OPTICAL TRACKER

Gene L. Cangiani, Parsippany, N.J., and Appasaheb N. Madiwale, Andover, Mass., assignors to Lockheed Electronics Company, Plainfield, N.J.

Filed Jul. 8, 1987, Ser. No. 71,085

Int. Cl.[4] G01S *13/00*

U.S. Cl. 364—516 **11 Claims**



1. An electro-optical tracker for tracking a target moving in three-dimensional space, comprising:

a servo-controlled electro-optical sensor having an image data output;

a range sensor for detecting the distance between the sensor and the target, the range sensor having an output;

preprocessing means responsive to the output of the electro-optical sensor and the range sensor, the preprocessing means having an output; and

Kalman filter means for generating a predicted position, velocity, and acceleration of the target, the Kalman filter means being connected to the output of the preprocessing means and including an interface for controlling the servos of the electro-optical sensor; the Kalman filter means including

prediction means for generating a predicted position, velocity, and acceleration of the target; and

modeling means for generating a predicted two-dimensional image from a projection of the target in space, where the target is represented in the filter by a three-dimensional object.

4,855,933

LINE FIGURE CONNECTING APPARATUS

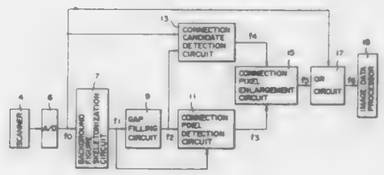
Takashi Kondo, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 24, 1987, Ser. No. 100,618

Claims priority, application Japan, Dec. 15, 1986, 61-298392; May 30, 1987, 62-136255

Int. Cl.[4] G06K *9/44*, *9/36*

U.S. Cl. 364—518 **14 Claims**



14. A line figure connecting apparatus comprising:

means for digitizing line figure image data into a first value indicating pixel data on line figure and a second value indicating background pixel data;

means for skeletonizing a set of pixels having the second value by an arbitrary number of steps so as to produce a width segment;

means for comparing a length of the width segment with a predetermined value; and

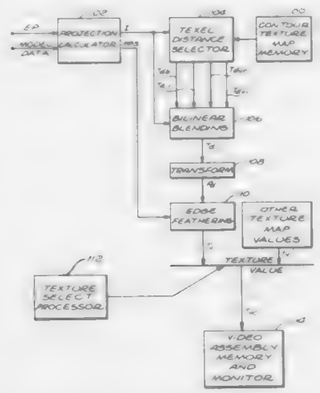
means for converting the background pixel data into the pixel data on line figure when the length of the width segment is smaller than the predetermined value.

4,855,934

SYSTEM FOR TEXTURING COMPUTER GRAPHICS IMAGES

John Robinson, Sandy, Utah, assignor to Evans & Sutherland Computer Corporation, Salt Lake City, Utah

Filed Oct. 3, 1986, Ser. No. 914,971
Int. Cl.[4] G09B *9/08*
U.S. Cl. 364—521 **10 Claims**



8. An apparatus for texturing computer graphics images defined by polygon data in a predefined model space coordinate system by modifying said polygon data in accordance with texel data, the texture polygons to be displayed and viewed from an eye point in an eye space coordinate system on a display screen and defined by a plurality of pixels in a predefined pixel space coordinate system, the eye space being related to the screen space by a plurality of predefined direction vectors EP, each extending from the eye point through the center of a selected one pixel, the apparatus comprising:

means for supplying signal-represented texel data specifying a contour texture map by a plurality of discrete symmetrically spaced texels, a first area region of said map being defined by a first texture value and a second area region of said map defined by a second texture value, the first and second area regions separated by a boundary, the texel data defining the contour texture map by a plurality of spatial distance measures, one distance measure associated with each texel, each distance measure defining a spatial distance from the texel to the boundary;

projection calculator means for receiving a predefined direction vector, identifying the intersection point I of that direction vector EP with the contour texture map and computing the projected size (PPS) of a pixel on the contour texture map;

means coupled to the projection calculator and to receive said signal-represented texel data for computing a texel distance value Td between the intersection point I and the boundary in the texture coordinate system, the texel distance value having a first identifier associated therewith when the intersection I is in the first area and a second identifier associated therewith when the intersection point I is in the second area; and

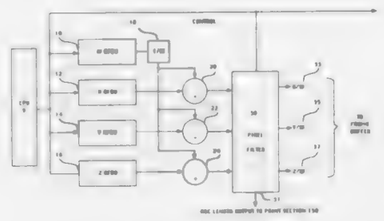
texture value computer means for selecting a texture value for each pixel for display, under the control of said first and second identifiers.

4,855,935

METHOD AND APPARATUS FOR RENDERING VECTORS USING BRESENHAM PARAMETERS

Sheue-Ling Lien, Mountain View; Michael J. Shantz, Sunnyvale; Jerald R. Evans, Mountain View; Serdar Ergene, San Jose, and Susan E. Carrie, Sunnyvale, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed May 8, 1987, Ser. No. 47,693
Int. Cl.[4] G06F *15/72*
U.S. Cl. 364—521 **2 Claims**



1. An apparatus for rendering curves, curved surfaces and vectors defined by major and minor coordinates on a display device having a plurality of display elements, said apparatus comprising:

means for rendering curves and curved surfaces using adaptive forward differencing;

means for rendering vectors comprising:

means for receiving Bresenham parameters defining an ideal vector between beginning and ending display element coordinates x_0, y_0 and x_1,y_1;

means for initializing a Bresenham error to be the change in the major coordinate of the ideal vector multiplied by one-half, plus the change in the minor coordinate of the ideal vector;

means for displaying instantaneous coordinates of said vector being rendered;

means for continuously updating the Bresenham error between each coordinate of said ideal vector and corresponding coordinate of said vector being rendered comprising:

means for determining whether or not said Bresenham error is greater than or equal to zero at each one of said instantaneous coordinates;

if said Bresenham error is greater than or equal to zero, means for updating said Bresenham error by adding a first predetermined increment to said error;

if said Bresenham error is less than zero, means for updating said Bresenham error by adding a second predetermined increment to said Bresenham error;

if said Bresenham error is greater than or equal to zero, means for adjusting the incrementation of said vector being rendered by incrementing said major and minor coordinates of the instantaneous coordinates by a predetermined value;

if said Bresenham error is less than zero, means for incrementing said major coordinate of the instantaneous coordinates by the predetermined value.

4,855,936

FULL-SCREEN INPUT/OUTPUT APPLICATION PROGRAM INTERFACE

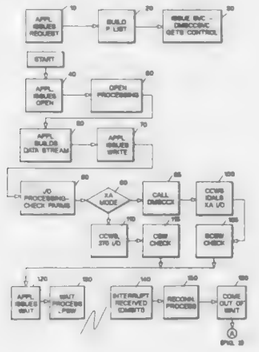
Christine T. Casey, Newark Valley, N.Y., and Stephen E. Record, Ridgefield, Conn., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 25, 1987, Ser. No. 101,537
Int. Cl.[4] G06F *3/14*
U.S. Cl. 364—521 **6 Claims**

1. A method of providing full-screen input/output operations in an information handling system having a central processing unit controlled by an operating system and having one or more application programs that perform input/output operations to a display device, said method being performed by a console facility communicating between said operating system and said one or more application programs, comprising the steps of:

determining characteristics of the display device in response to an inquiry for said characteristics from an application program and providing these characteristics to the application program

for use in providing a buffer and, if an output operation is to be performed,



construction a data stream for the device;

in response to a request from an application program to perform

a full screen input/output operation using the buffer and any data stream provided by the application program, building a parameter list; generating instructions to process the request

; passing the generated instructions to the

operating system to perform the desired full screen input-/output operation; and

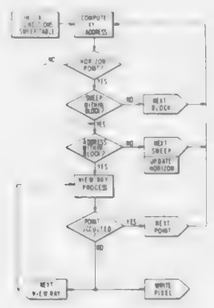
passing status information resulting from the input/output operation to the application program.

4,855,937

DATA BLOCK PROCESSING FOR FAST IMAGE GENERATION

Robert A. Heartz, DeLand, Fla., assignor to General Electric Company, Syracuse, N.Y.

Filed Aug. 8, 1984, Ser. No. 638,708
Int. Cl.[4] G09B *9/00*
U.S. Cl. 364—521 **6 Claims**



4. In a real-time computer image generating system comprising data base means for storing a grid data base of elevation posts at predetermined intervals for the visual scene to be generated and a view ray processor including sweep generation means for defining a horizontal field of view as a predetermined number of sweeps perpendicular to a boresight at a view point, range incrementing means for changing the range from the view point and for each sweep, defining the changes in ΔX and ΔY in said grid data base, address means for accumulating ΔX and ΔY to generate an X,Y data base address for extracting the elevation for that sweep element, said sweep generation means being responsive to said range incrementing means for stepping a view ray down by an increment of $\Delta R \tan\phi_m$ for each range increment ΔR where m refers to the mth view ray and increasing the distance between sweeps by the increment $\Delta R \Delta \tan\phi$, comparing means for comparing the accumulated elevation value of the view ray at each range increment ϕR with the elevation extracted from said means for storing with said X,Y data base address, and means responsive to said comparing means for reading data for that post to a display means if the view ray strikes the post or reading the elevation data for the next elevation post from said storage means if the view ray does not strike the post, the improvement wherein said grid data base is divided into an array of data blocks within said storage meaas and said computer image generator means further comprises:

an on-line memory;

means for sequentially transferring said data blocks to said on-line memory in an order to allow processing such that the sweep data remains continuous;

block edge detection means responsive to said address generation means for detecting the edge of a data block currently being processed; and

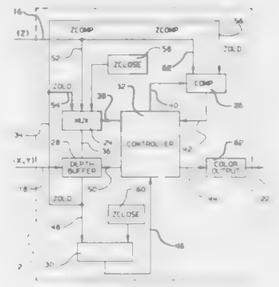
sweep memory means responsive to said block edge detection means for storing the exit processing parameters as sweep parameters, said sweep parameters being read out of said sweep memory means as initial conditions for the processing of the next data block said view ray processor.

4,855,938

HIDDEN LINE REMOVAL METHOD WITH MODIFIED DEPTH BUFFER

Jorge Gonzalez-Lopez, Red Hook, and Bob C. Liang, Hurley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

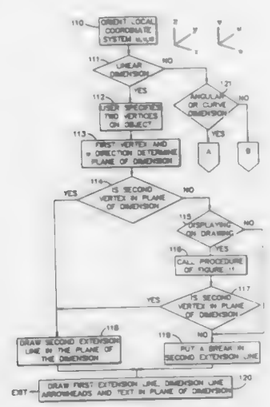
Filed Oct. 30, 1987, Ser. No. 115,455
Int. Cl.[4] G06F *15/68*
U.S. Cl. 364—522 **4 Claims**



4. A method for producing a wire-frame graphics display in two dimensions with hidden lines removed in a grapics display system having a depth buffer and a frame buffer, each containing a storage location for each displayable point on said display system, said display to be as it would appear from a chosen viewpoint and said display to be produced from data representing the vertices of a set of polygons defining a three dimensional object projected onto a viewplane, said method comprising the steps of:

masking the edges of each polygon from being overwritten during hidden line removal processing;
tessellating said polygon into triangles;
processing all points in each triangle to remove any hidden lines; and
unmasking and processing the edges of each polygon to write a foreground color on said display system and to store the computed depth value.

4,855,939
3D DIMENSIONING IN COMPUTER AIDED DRAFTING
William J. Fitzgerald, Jr., Ridgefield, Conn., and Raymond G. Glemser, II, Center Valley, Pa., assignors to International Business Machines Corp., Armonk, N.Y.
Filed Sep. 11, 1987, Ser. No. 96,171
Int. Cl.[4] G06F *3/14*
U.S. Cl. 364—522 7 Claims



1. A computer aided drafting procedure for presenting, for a three dimensional object to be modeled in a general purpose computer, dimensional and tolerance parameters appropriate to changes of view or parameters comprising the steps of:
for linear dimensions, obtaining by said computer two user specified vertices on the object;
using by said computer a first of one said user specified vertices together with a locally specified coordinate system to compute a plane of a dimension between said two vertices;
testing by said computer a second one of said user specified vertices to determine if it is in the computed plane of the dimension;
if the second of said two user specified vertices is in the plane of the said dimension, drawing by said computer an extension line from said second vertex in said plane and then drawing by said computer an extension line from said first vertex, a dimension line with arrowheads at first and second ends of said dimension line and dimension text in said plane between said extension lines; but
if said second vertex is not in said plane, determining by said computer if the dimension is displayed on a computer generated three dimensional model of said object and, if so, drawing by said computer an extension line from said second vertex with a dogleg break and then drawing by said computer said extension line from said first vertex, said dimension line with arrowheads and dimension text in said plane between said extension lines.

4,855,940
METHOD OF AND SYSTEM FOR COMPUTER GRAPHIC PHOTOGRAPHY
Thomas L. Richardson, Winchester; Vernon Grabel, Cotuit, and Joseph T. Kowalik, Charlestown, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Jan. 16, 1987, Ser. No. 3,869
Int. Cl.[4] G03B *15/00, 27/80, 33/06*
U.S. Cl. 364—526 55 Claims

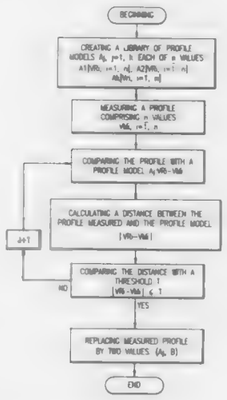


1. An improvement in a system for computer graphic photography, the improvement comprising means including an exposure mapping table at each address containing on or off display information data for a plurality of adjacent multiple display pixels, and a display memory containing indices into said exposure mapping table, said exposure mapping table being coupled to said display memory and responsive to said indices for outputting said on or off display information.

4. A method of colored computer graphic photography which allows tradeoff between color resolution and horizontal resolution, comprising the steps of (a) extracting a color component of an input image into at least one field, (b) transforming the field into a format and storing the formatted field in a memory, (c) setting each level of an exposure mapping table respectively to off or on in accordance with vertical resolution and color resolution of the image, (d) updating the exposure mapping table respectively to display or turn off pixels of current color level, and (e) repeating steps (a)–(d) for each other primary color.

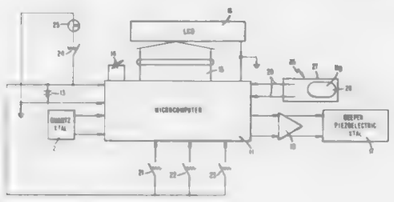
48. A system for computer graphic photography comprising a film printer, an address bus and means for providing pixel data of an image, random access memory means coupled to said means for providing to receive the pixel data of an image therefrom for providing data output, address multiplexing means coupled to said random access memory means to receive the data output therefrom and coupled to said address bus to receive address signals, and a memory device coupled to said address multiplexing means for providing an exposure mapping table containing at each memory location display information for multiple display pixels, said multiplexing means selecting address lines from the address bus whenever the memory device is being read or written and from the random access memory means whenever an image is to be printed.

4,855,941
PROCESS FOR COMPRESSION OF A DATA SET
Yves Berruyer, 94, Boulevard Gabriel Peri, 92240 Malakoff, France
Filed Apr. 10, 1987, Ser. No. 37,022
Claims priority, application France, Apr. 10, 1986, 86 05139
Int. Cl.[4] G06F *15/48;* H04R *1/00*
U.S. Cl. 364—550 12 Claims



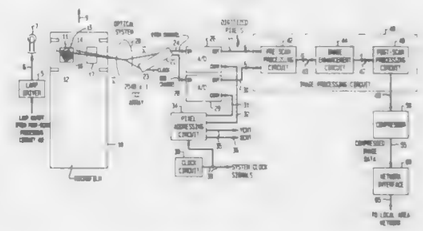
1. Process of compression of a data set formed from successive measurements of a signal representative of a traffic load at a determined place in a telecommunication network over a first predetermined period, the set of said measurements being called a measured profile, comprising the steps of creating a library of profile models, each profile model comprising n values called reference values comparing said measured profile with each profile model to determine a distance between said measured profile and each profile model, comparing said distance to a first threshold, and replacing said measured profile with a pair of values, the first value containing a reference to a profile model for which the distance between this profile model and the measured profile is less than said threshold and the second value being representative of the ratio of the amplitudes of the measured profile to the amplitudes of said profile model.

4,855,942
PEDOMETER AND/OR CALORIE MEASURING DEVICE AND METHOD
Frank J. Bianco, Pembroke Pines, Fla., assignor to Elexis Corporation, Miami, Fla.
Filed Oct. 28, 1987, Ser. No. 113,745
Int. Cl.[4] G06F *15/42;* G01C *21/00*
U.S. Cl. 364—561 42 Claims



1. A method of measuring an approximate number of calories consumed by a subject performing an exercise routine, the method being performed with a computer having a predetermined cycle time, comprising the steps of determining distance travelled by the subject during the computer cycle time, entering an indication of weight of the subject into a memory of the computer, activating the computer to store an indication of the number of calories the subject burns in traversing a predetermined distance during the computer cycle time in response to the stored weight indication, calculating the calories consumed by the subject during the cycle time from the stored indication and the distance travelled during the cycle time, and accumulating the calculated consumed calories over several consecutive cycle times.

4,855,943
METHOD AND APPARATUS FOR DEAVERAGING A STREAM OF AVERAGED DATA
Scott Lewis, Ann Arbor, Mich., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jul. 24, 1987, Ser. No. 77,704
Int. Cl.[4] G06K *9/36;* H04N *5/14*
U.S. Cl. 364—575 15 Claims

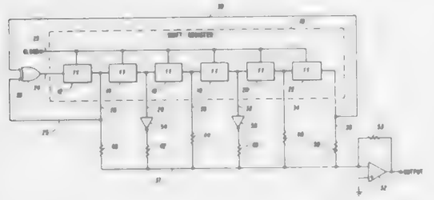


1. Apparatus for deaveraging a stream of incoming averaged digital data values in order to reconstruct a stream of original non-averaged data values therefrom, wherein each of said averaged values represents an average of "n" separate successive ones of said original data values, said apparatus comprising:
means for multiplying an incoming averaged digital data value by a pre-determined amount to yield a multiplied average value;
means for subtracting "m" successive prior data values in a reconstructed stream of original non-averaged data values from said multiplied average value in order to yield a current value, wherein the value of "m" equals "N−1";
means for delaying said current value by "m" successive delay intervals in order to provide said "m" successive prior data values; and
means for routing said current value to an output point as a current non-averaged value in said reconstructed data stream.

4,855,944
NOISE GENERATOR WITH SHAPED SPECTRUM
Billy D. Hart, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Sep. 4, 1987, Ser. No. 94,250
Int. Cl.[4] G06V *1/00*
U.S. Cl. 364—602 8 Claims

1. A pseudorandom noise generator, comprising:
a feedback shift register sequence generator, having a multiplicity of stages, each presenting an interstage signal;

means for multiplying at least one of said interstage signals by a predetermined factor; and



means for summing signals produced by said multiplying means to produce pseudorandom noise having a desired frequency spectrum.

4,855,945

PORTABLE FOOD-CONSTITUENT-AMOUNT DISPLAY AND CALCULATING SYSTEM, AND DEVICE TO OPERATE THE SYSTEM

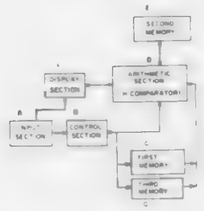
Ritsuko Sakai, 21-10-506, Mitsuzawa-Shimomachi, Kanagawa-ku, Yokohama-shi, Kanagawa 221, Japan

Continuation of Ser. No. 232, May 27, 1984, abandoned. This application Nov. 27, 1985, Ser. No. 802,359

Claims priority, application Japan, Mar. 27, 1984, 59-60332; Mar. 27, 1984, 59-60333

Int. Cl.[4] **G06F** *15/42*

U.S. Cl. 364—709.02 **16 Claims**



1. A portable food constituent amount display calculator which, when commanded, compares the total amount of at least one constituent of foods taken in per day with the necessary amount of each said constituent a day and displays the amount of each excess or deficiency for health control, comprising

an input section provided with a character-input keyboard for inputing names of food taken in by a user during the day, and for selectively indicating a plural number of a standard amount of said at least one constituent thereof;

A food-data memory in which said food names and each said standard amount of each said constituent thereof are prestored;

means by which to read out from said food-data memory said standard amount of each said constituent of a food name which is input from the keyboard;

a display which shows an input food name and each said standard amount of each said constituent read out from the food-data memory and results of comparison and arithmetic operations;

an arithmetic and control section which performs said arithmetic operations, including adding the respective amounts of each said constituent of said foods taken in the day to form at least one respective total for the day for each said constituent;

an all-input food data memory which stores said food names and amounts of said constituents which are displayed and each said total from said arithmetic operations;

a necessary-constituent-amount memory which stores the necessary amount of each said constituent of each said stored food name; and

comparison means for comparing the respective necessary amount of each said constituent and the respective total from said arithmetic operations stored in said all-input data memory.

4,855,946

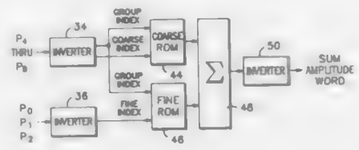
REDUCED SIZE PHASE-TO-AMPLITUDE CONVERTER IN A NUMERICALLY CONTROLLED OSCILLATOR

Paul W. Ruben; Eugene F. Heimbecher, II, and David L. Dilley, all of Chandler, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 22, 1987, Ser. No. 111,224

Int. Cl.[4] **G06F** *1/02*

U.S. Cl. 364—721 **6 Claims**



2. A numerically controlled oscillator having a phase-to-amplitude converter comprising:

a phase accumulator having an input and an output;

a phase-to-amplitude converter with an input and an output, said phase-to-amplitude converter input being coupled to said output of said phase accumulator and said phase-to-amplitude converter including:

a memory having an address input and an output, said memory having stored therein a plurality of fine and coarse amplitude words defining a first quadrant of a sinusoidal wave, said fine and coarse amplitude words approximating the equation:

$$AW=\beta\sin\left[(PW+\tfrac{1}{2})\pi/2^{(n-1)}\right]-\tfrac{1}{2}$$

where

AW is sum amplitude word

PW is the phase word, and

n is the number of bits used to describe PW

β is a scaling factor

given by

$$\beta=(2^{m}-1)/2$$

where

m is the number of bits used by a digital to analog convertor (DAC)

logic means coupled to said memory, said logic means for determining a quadrant number from particular bits of said phase word;

said logic means further operating to ones complement said sum amplitude word;

said memory further operating in response to said quadrant number and to said complemented sum of amplitude word to produce sum amplitude words which represent second, third and fourth quadrants of a sinusoidal wave;

said digital-to-analog converter with an input coupled to said output of said phase-to-amplitude converter and an output; and

a low pass filter coupled to said output of said digital-to-analog converter.

4,855,947

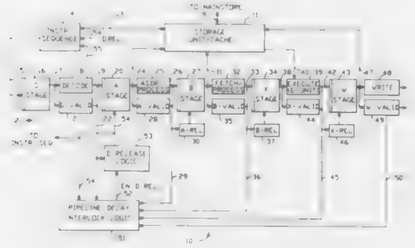
MICROPROGRAMMABLE PIPELINE INTERLOCKS BASED ON THE VALIDITY OF PIPELINE STATES

Allan J. Zmyslowski, Sunnyvale, and Robert M. Maier, San Jose, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed May 27, 1987, Ser. No. 54,947

Int. Cl.[4] **G06F** *9/28, 9/38, 13/14*

U.S. Cl. 364—200 **18 Claims**



1. In a data processing machine having an instruction processing unit including of stages in a pipeline configuration, having a pipeline offset of P, where P is a number of stages greater than or equal to 1, for executing a stream of instructions in which stage N is responsive to a stage release signal to release a current instruction and proceed with processing of a following instruction; in which the instruction processing unit includes validity logic generating stage valid control signals indicating current processing of a valid instruction in corresponding stages; and in which processing in the Nth stage of a dependent instruction is dependent is dependent on processing in the Mth stage of a previous instruction in the stream of instructions, where M−N is greater than P; an improvement comprising:

release enabling means, in communication with the Nth stage and the validity logic and receiving a delay interlock signal, for enabling an Nth stage release signal in response to a characteristic of the stage valid control signals identified by the delay interlock signal; and

interlock control means, responsive to prespecified instructions in the stream of instructions for generating the delay interlock signal.

4,855,948

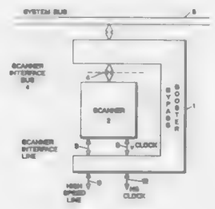
BYPASS BOOSTER MECHANISMS FOR THE LINE SCANNERS OF A COMMUNICATION CONTROLLER

Michel Bouillot, Nice; Jean-Louis J. Calvignac, LaGaude, and Jean-Marie L. Munier, Cagnes sur Mer, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 8, 1987, Ser. No. 107,432

Int. Cl.[4] **G06F** *3/00*

U.S. Cl. 364—900 **10 Claims**



1. An improved receive mechanism to be used to a communication controller comprising a central control unit connected to at least one line scanner (2) having a speed of operation v through a bus (5), wherein the line scanner may not be attached through its interface line (3), to communication lines working at a speed higher than v, said mechanism allowing the scanner to be connected to one communication line (6) onto which information is transported in frames at a high speed HS which is higher than v, and being characterized in that it comprises:

line interface receive means comprising:

receiving means (22,34,36,40) for receiving the frames of a frame bit stream at the line speed HS,

receive storing means (44), into which the frame bytes received from the receiving means are stored at addresses delimited by first and second write pointers, saved in first and second write register means (46,48);

means responsive to the received frames on the high speed line for constructing short frames therefrom, said short frames comprising a fixed number of frame bytes and the first and second write pointer values indicating where the frame bytes are stored in the receive storing means;

means (102,50,52) for sending to the scanner at the scanner speed v on the scanner interface line, the so constructed frames;

bus interface receive means comprising:

means (205,214,207,201) which are responsive to a receive command from the central control unit for outputting the short constructed frames from the scanner and sending the fixed number of the frame bytes to the central control unit through the bus,

means (210,211,213) which prevent the write pointer values comprised in the short frames and which are outputted from the scanner from being sent to the central control unit;

means (218,220,226,228) for providing said write pointer values to first and second read register means (230,232);

means (204,238,242,246) for sequentially reading the receive storing means content at the addresses defined by the first and second read pointer register means content and sending the frame bytes exceeding the fixed number of bytes from the receive storing means to the central control unit.

4,855,949

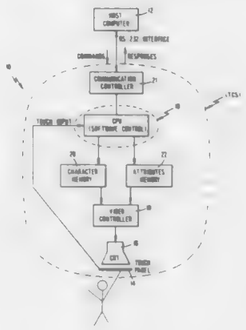
NOCHANGE ATTRIBUTE MODE

Anthony C. Garland, 603 N. Sunset Dr., Camano Island, Wash. 98292, and Randal L. Jones, 22307 65th Ave. W., Mountlake Terrace, Wash. 98043

Filed May 5, 1986, Ser. No. 859,820

Int. Cl.[4] **G06F** *3/14;* **G09G** *1/00*

U.S. Cl. 364—900 **19 Claims**



1. In a display control device having control means for effecting changes in elements of a display controlled thereby, the control means responsive to a set of direct commands for changing attributes of the displayed elements by causing a

display means to generate a display having the changed attributes, the control means further responsive to a set of indirect commands for changing individual elements of the display by causing the display means to generate a display including the changed elements with attributes different from attributes of the elements previously displayed, the improvement comprising:

first means for determining whether a command effected by the control means to change display elements includes a direct or indirect command to change attributes of the display elements,

second means for determining whether a NOCHANGE mode has been set or reset, and

inhibiting means for inhibiting changes of display attributes of regions of the display including the affected elements when said first means determines that the command effected by the control means includes only an indirect command to change attributes and said second means determines that the NOCHANGE mode has been set.

9. In a display control device having control means for effecting changes in elements of a display controlled thereby, the control means responsive to a set of direct commands for changing attributes of the displayed elements by causing a display means to generate a display having the changed attributes, the control means further responsive to a set of indirect commands for changing individual elements of the display by causing the display means to generate a display including the changed elements with attributes different from attributes of the elements previously displayed, the improvement comprising:

a method for eliminating indirect modifications of attributes of the display thus reducing the number of instructions to be given to the control means for effecting changes in display elements of the display, comprising the steps of:

determining whether a command effected by the control means to change display elements includes a direct or indirect command to change attributes of the display elements,

determining whether a NOCHANGE mode has been set or reset, and

inhibiting changes of display attributes of regions of the display including the affected elements when the result of the first mentioned determining step indicates that the command effected by the control means includes only an indirect command to change attributes and the results of the second mentioned determining step indicate that the NOCHANGE mode has been set.

4,855,950

OPTICAL STORAGE APPARATUS INCLUDING A REVERSIBLE, DOPING MODULATED, MULTILAYER, AMORPHOUS ELEMENT

Jun Takada, Kobe, Japan, assignor to Kanegafuchi Chemical Industry Company, Limited, Japan

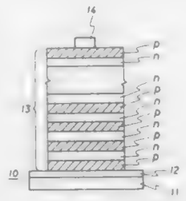
Filed Apr. 17, 1987, Ser. No. 40,190
Int. Cl.[4] G11C *13/00, 7/00*
U.S. Cl. 365—113 **20 Claims**

1. An optical memory device for storage of information comprising:

storage means comprising a reversible doping modulated multilayer amorphous semiconductor element for changing for an extended period from a first value of an electrical characteristic to a second value of said electrical characteristic in response to exposure to activating light of a selected frequency and for returning to the first value in response to application of a restore bias voltage across the storage means;

at least a pair of electrodes, at least one of which is transparent to the light, coupled to the storage means and configured such that the storage means is sandwiched between the transparent electrode and at lease one other of the electrodes.

20. A method of storing and erasing data in an optical memory comprising a reversible doping modulated multilayer amorphous semiconductor element having a characteristic optical energy band gap and having at least a pair of electrodes coupled to the semiconductor element, the method comprising the steps of:



changing an electrical characteristic of the semiconductor element for an extended period by exposing the semiconductor element to light having photon energy approximately greater than the optical energy band gap of the semiconductor element; and,

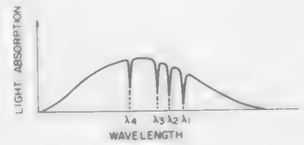
restoring the electrical characteristic of the semiconductor element by exposing the semiconductor element to light having photon energy less than approximately one half of the optical energy band gap of the semiconductor element.

4,855,951

METHOD FOR ERASING RECORDING IN A PHB MEMORY

Yasushi Tomioka, Kokubunji; Shuji Imazeki, Kodaira; Motoyasu Terao; Masahiro Ojima, both of Tokyo, and Yoshio Taniguchi, Hino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 23, 1987, Ser. No. 111,611
Claims priority, application Japan, Oct. 24, 1986, 61-251902; Dec. 1, 1986, 61-284248; Jun. 11, 1987, 62-144078
Int. Cl.[4] G11C *13/04*
U.S. Cl. 365—119 **17 Claims**



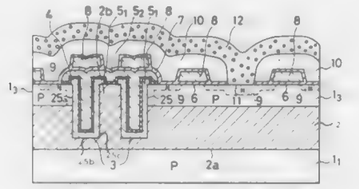
1. A method for erasing recording in a PHB memory, wherein a desired portion of a recording medium, in which a plurality of holes are formed by hole burning, is irradiated with light so that among said plurality of holes only the holes, which are irradiated with said light, are selectively erased for the purpose of erasing a desired portion of information stored in the form of said plurality of holes in said recording medium.

4,855,952

DRAM HAVING PIP CAPACITOR INSIDE A TRENCH

Fumio Kiyosumi, Tokyo, Japan, assignor to Oki Electric Industry Co. Ltd., Tokyo, Japan

Filed Dec. 18, 1987, Ser. No. 134,867
Claims priority, application Japan, Dec. 23, 1986, 61-305265
Int. Cl.[4] G11C *11/24, 11/34;* **H01L** *29/06, 29/78*
U.S. Cl. 365—149 **11 Claims**



1. A semiconductor memory device comprising:

a silicon substrate;

an insulating layer formed over said substrate and comprised of a first portion and a second portion;

at least one monocrystalline silicon island formed within said insulating layer on the first portion thereof, separated from said silicon substrate by the first portion of said insulating layer and laterally spaced from one another by the second portion of said insulating layer, with at least one trench having one wall defined by a side of the at least one monocrystalline silicon island and extending into the first portion of said insulating layer, and having an opposite wall defined by the second portion of said insulating layer, the second portion of said insulating layer being disposed between monocrystalline silicon islands when there are two or more monocrystalline silicon islands;

a lower electrode formed on the inner surface of each said at least one trench and making contact with said at least one monocrystalline silicon island;

a dielectric film formed over said lower electrode; and

an upper electrode formed over said dielectric film;

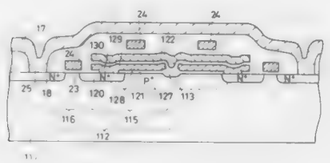
wherein information is stored as charge in a capacitor comprising said lower electrode, said dielectric layer, and said upper electrode.

4,855,953

SEMICONDUCTOR MEMORY DEVICE HAVING STACKED MEMORY CAPACITORS AND METHOD FOR MANUFACTURING THE SAME

Katsuhiro Tsukamoto; Masahiro Shimizu; Kazuyasu Fujishima, and Yoshio Matsuda, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1988, Ser. No. 158,323
Claims priority, application Japan, Feb. 25, 1987, 62-43422; Feb. 25, 1987, 62-43423; Feb. 25, 1987, 62-43424; Feb. 25, 1987, 62-43425; Feb. 26, 1987, 62-44275; May 19, 1987, 62-122024
Int. Cl.[4] G11C *13/00, 11/40*
U.S. Cl. 365—149 **30 Claims**



1. A semiconductor memory device, comprising:

a semiconductor substrate of a first conductivity type,

a plurality of word lines and a plurality of bit lines formed on said semiconductor substrate to intersect with each other, and

memory cells formed at intersections of said word lines and said bit lines, each of said memory cells comprising charge storage means, a single read/write transistor and means for connecting said charge storage means and said transistor,

said charge storage means comprising

a common electrode layer formed on said semiconductor substrate,

first and second memory capacitors stacked on said semiconductor substrate to be opposed to each other with said common electrode layer interposed therebetween,

said transistor comprising

a first electrode region of a second conductivity type formed on the surface of said semiconductor substrate and connected to one of said bit lines,

a second electrode region of the second conductivity type formed, spaced apart from said first electrode region, on the surface of said semiconductor substrate, and

a control electrode formed on a region between said first electrode region and said second electrode region and corresponding to one of said plurality of word lines,

said connecting means comprising a contact portion of said common electrode layer connecting said common electrode layer to the second electrode region of said transistor

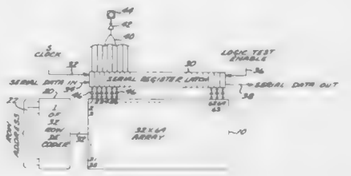
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4,855,954

IN-SYSTEM PROGRAMMABLE LOGIC DEVICE WITH FOUR DEDICATED TERMINALS

John E. Turner; David L. Rutledge, both of Beaverton, and Roy D. Darling, Forest Grove, all of Oreg., assignors to Lattice Semiconductor Corporation, Hillsboro, Oreg.

Division of Ser. No. 862,815, May 13, 1986, which is a continuation-in-part of Ser. No. 707,662, Mar. 4, 1985, Pat. No. 4,761,768. This application Oct. 25, 1988, Ser. No. 262,493
Int. Cl.[4] G11C *11/34, 7/00*
U.S. Cl. 365—185 **4 Claims**



1. An integrated in-system programmable logic device, operable during a normal device operating state to receive logical input data and provide output data in dependence on predetermined logic functions implemented by selective connection of input lines to product term lines, comprising:

a set of device terminals dedicated to the functions of receiving input logical data signals or providing output logical data signals;

a programmable array including at least one input line and at least one output line,

means for coupling an input line to one of said device terminals;

said programmable array comprising an array of one or more nonvolatile memory cells arranged in at least one row and column, each cell associated with a predetermined one of said input and output lines and arranged to selectively connect the input line to the output line in dependence on the cell state, each cell comprising a cell selection element and an electrically erasable and reprogrammable nonvolatile memory element which retains a selected cell state upon interruption of device power;

a first device utility terminal dedicated for device utility functions, including inputting serial data;

a second device utility terminal dedicated for receiving control signals to select between the normal device operating state and one or more device utility states;

a serial data receiving and transitting means coupled to the first device utility terminal for receiving serial data during a device utility state;

means for programming the cells of said array to predetermined conditions in dependence on cell selection and programming data input to the serial data receiving and transmitting means during a predetermined one of said utility states;

a third device utility terminal dedicated for device utility functions, including outputting serial data; and

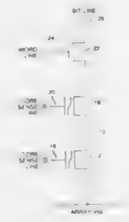
a fourth device utility terminal dedicated for inputting a clock signal to clock said device utility functions including clocking serial data into and out of the serial data receiving and transmitting means via the first and third device utility terminals.

4,855,955

THREE TRANSISTOR HIGH ENDURANCE EEPROM CELL

Dumitru G. Cioaca, Capertino, Calif., assignor to Seeq Technology, Inc., San Jose, Calif.

Filed Apr. 8, 1988, Ser. No. 179,527
Int. Cl.[4] G11C *11/34, 7/00;* **H01L** *29/78, 27/02*
U.S. Cl. 365—185 **2 Claims**



1. An electrically-erasable programmable read only memory cell, including,

a first floating gate MOS transistor having a floating gate and having its source connected to a first potential, and its control gate connected to a first sense line,

a second floating gate MOS transistor having a floating gate, the floating gate of said first floating gate MOS transistor being electrically isolated from the floating gate of said second floating gate MOS transistor and the source of said second floating gate MOS transistor connected to the drain of said first floating gate MOS transistor, and the control gate of said second floating gate MOS transistor connected to a second sense line,

an MOS select transistor, having its source connected to the drain of said second floating gate MOS transistor, its gate connected to a word line, and its drain connected to a bit line,

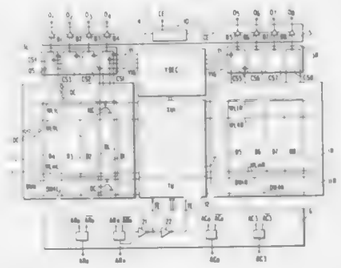
whereby if one of said floating gate MOS transistors fails, said memory cell will continue to function.

4,855,956

SEMICONDUCTOR MEMORY DEVICE WITH IMPROVED CELL ARRANGEMENT

Takahiko Urai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 1, 1987, Ser. No. 103,312
Claims priority, application Japan, Oct. 1, 1986, 61-234929
Int. Cl.[4] G11C *7/02*
U.S. Cl. 365—210 **6 Claims**



1. A semiconductor memory device comprising means receiving address information consisting of N bits (N being a positive integer), an array of memory cells arranged in a matrix form of rows and columns, each of said memory cells having the same structure, the number of said memory cells in said array being larger than 2^N, said memory cells in said array being divided into a peripheral group and an internal group, the memory cells of said internal group being completely surrounded by the memory cells of said peripheral group, so that all peripheries of each memory cell of said internal group are completely surrounded by other memory cells, the number of said internal groups of memory cells being said 2^N or less and a selection circuit coupled to said receiving means and said internal group of memory cells without being connected to said peripheral group of memory cells for selectively accessing only said internal group of memory cells in accordance with said address information.

4,855,957

RANDOM ACCESS MEMORY INCLUDING SWITCHING ELEMENTS TO LIMIT THE NUMBER OF ENERGIZED DATA IN PAIRS

Kazutaka Nogami, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 20, 1987, Ser. No. 28,549
Claims priority, application Japan, Mar. 31, 1986, 61-72821
Int. Cl.[4] G11C *7/00, 8/00*
U.S. Cl. 365—230.03 **12 Claims**

1. A random access memory comprising:

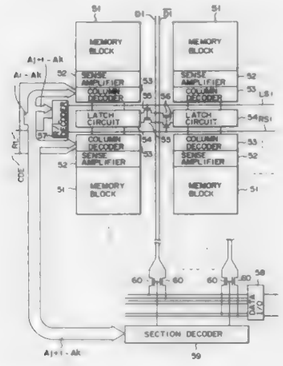
a plurality of memory blocks, arranged two-dimensionally, each of said memory blocks comprising a plurality of memory cells;

a plurality of pairs of data lines for transferring write-data to and read-data from said memory blocks;

first switching means, responsive to an address signal, for connecting selected ones of said memory blocks to selected ones of said pairs of data lines;

data input/output means, having fewer input terminals than the number of said pairs of data lines, for receiving write-data for said memory cells and for outputting read-data from said memory cells; and

second switching means, coupled to said first switching means by said pairs of data lines and to said input/output



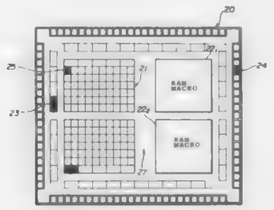
means, for connecting said selected ones of said pairs of data lines to said data input/output means.

4,855,958

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING LOGIC MACRO AND RANDOM ACCESS MEMORY MACRO

Motohisa Ikeda, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 17, 1988, Ser. No. 233,093
Claims priority, application Japan, Aug. 19, 1987, 62-205937
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—230.08 **9 Claims**



1. A semiconductor integrated circuit device comprising:

a semiconductor chip;

a logic macro provided on said semiconductor chip, said logic macro having a plurality of internal cells; and

a plurality of random access memory macros provided on said semiconductor chip,

each of said random access memory macros having a latch circuit group including a plurality of latch circuits with inputs coupled to outputs of predetermined ones of the internal cells of said logic macro by fixed interconnections, an operation circuit and a memory cell array coupled to the operation circuit,

at least a first random access memory macro out of said random access memory macros having outputs of all of the latch circuits thereof coupled to the operation circuit thereof by a first interconnection,

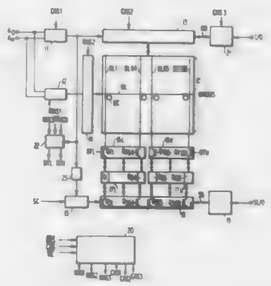
at least a second random access memory macro out of said random access memory macros having an output of at least one of the latch circuits coupled to certain internal cells of said logic macro by a second interconnection.

4,855,959

DUAL PORT MEMORY CIRCUIT

Satoru Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 6, 1987, Ser. No. 69,744
Claims priority, application Japan, Jul. 4, 1986, 61-158250
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—239 **4 Claims**



1. A memory circuit comprising a plurality of row lines, a plurality of column lines crossing said row lines to form a matrix array of rows and columns, said column lines being classified into a first group having first to K-th column lines and a second group having (K+1)-th to N-th column lines (K and N being positive integers of 2 or more and N being larger than K), a plurality of memory cells coupled to said row lines and said column lines, row selection means for operatively selecting one of said row lines thereby to provide said column lines with read signals from the memory cells coupled to the selected row line simultaneously, a first data register having first to K-th storage bits, a second data register having (K+1)-th to N-th storage bits, a first transfer circuit having first to K-th transfer gates coupled between the first to K-th column lines and the first to K-th storage bits, respectively, a second transfer circuit having (K+1)-th to N-th transfer gates coupled between the (K+1)-th to N-th column lines and the (K+1)-th to N-th storage bits, respectively, a serial selection circuit for consecutively selecting said first and second storage registers in an order from the first storage bit to the N-th storage bit one by one thereby to extract data stored in the selected storage bits consecutively, control means coupled to said row selection means for operatively enabling said row selection means at a first time duration and at a second time duration after said first time duration, said row selection means selecting one of said row lines at said first time duration and a different one of said row lines at said second time duration, and a control circuit coupled to said first and second transfer circuits, said transfer circuit enabling the (K+1)-th to N-th transfer gates to transfer circuit derived from the memory cells coupled to said one of the row lines to the (K+1)-th to N-th storage bits in a first time frame when said serial selection circuit selects the first to K-th storage bits consecutively, said control circuit enabling the first to K-th transfer gates to transfer signals derived from the memory cells coupled to said different one of the row lines to the first to K-th storage bits in a second time frame when said serial selection circuit selects the (K+1)-th to N-th storage bits storing signals transferred thereto in said first time frame, whereby data stored in said memory cells coupled to said row lines are sequentially derived one by one.

4,855,960

PROCESS AND APPARATUS FOR THE PREPARATION OF MORTARS

Wilhelmus G. E. Janssen, and Herve J. W. Janssen, both of Ubroekweg 39-41, Venlo-Blerick, Netherlands

Continuation of Ser. No. 725,327, Apr. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 489,242, Apr. 27, 1983, abandoned. This application Nov. 20, 1987, Ser. No. 124,402

Claims priority, application Belgium, Apr. 30, 1982, 1/10502

Int. Cl.⁴ B01F *7/08*

U.S. Cl. 366—8 **16 Claims**



1. A process for the preparation of brick-laying or jointing mortar from an aggregate and a binder using a device which includes a silo, a frame on which the silo is mounted and mixing accessories connected to the frame or silo, so that the mortar is ready for use on a building site, by jointing a desired amount of mortar of a desired proportion of aggregate to binder, to yield small quantities of mortar such as in batches of ½ cubic feet or less, which comprises the steps of:

filling the silo located on a storage yard or in a storage space in such a way, that the aggregate and the binder are contained in separate compartments within the silo, said compartments having outlets for the dispensation of the aggregate and the binder;

loading the filled silo, frame and mixing accessories onto a vehicle;

transporting the silo, frame and mixing accessories with the aggregate and the binder by means of a vehicle to a building site with the silo in a substantially horizontal position and so that the frame, mixing accessories, the silo and the aggregate and binder in the silo are fully supported by the vehicle;

unloading said silo, mixing accessories and frame from the vehicle at the building site by tilting the frame and silo to a substantially vertical operational position, so that said silo, mixing accessories and frame may be left at the site for preparation and dispensation of desired amounts of mortar from time to time when desired, wherein the silo, mixing accessories and frame are completely free from the vehicle;

adjusting relative volumetric flows of aggregate and binder to obtain the desired proportion and stopping said flows when batches of desired amounts of aggregate and binder have been dispensed so that the remaining aggregate and binder are stored in said separate compartments of the silo for later use; and

mixing the aggregate and the binder while adding the required proportion of water.

4,855,961

IMAGING APPARATUS

Jules S. Jaffe, Waquoit; Philippe Cassereau, Mashpee, both of Mass., and Tomomasa Sato, Sakura, Japan, assignors to Woods Hole Oceanographic Institute, Woods Hole, Mass.

Filed Jul. 31, 1986, Ser. No. 892,332

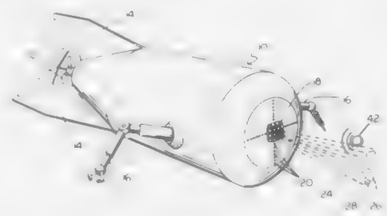
Int. Cl.⁴ G03B *42/06*

U.S. Cl. 367—7 **26 Claims**

1. Imaging apparatus comprising

an array of transmitters for simultaneously transmitting more than two unique coded signal beams in different directions to cover different, mutually exclusive regions of a field of view so as to uniquely identify a said region by the beam passing through it, said beams being modified by objects within said field of view,

signal means for providing individual coded signals to respective said transmitters,



a plurality of receivers in an array for simultaneously receiving plural coded modified signals derived from said coded signal beams,

a processor for separating the plural coded modified signals of different codes and processing them into an image signal.

4,855,962

METHOD AND SYSTEM FOR LOCATING AND CORRECTING THE ORIENTATION OF AN AUTONOMOUS MOBILE OBJECT AND A NON-AUTONOMOUS MOBILE OBJECT

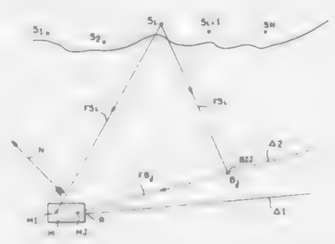
Jacques Regnaudin, Paris, and Francois Boucquaert, Catus, both of France, assignors to Compagnie Generale De Geophysique, Massy Cedex, France

Filed Jun. 29, 1987, Ser. No. 68,540

Claims priority, application France, Jul. 1, 1986, 86 09529

Int. Cl.⁴ G01V *1/38;* **G01S** *5/12*

U.S. Cl. 367—19 **18 Claims**



1. Method of locating or orienting a first direction linked to the position and to the oreintation of an autonomous first mobile object (M) and a second direction defined by a non-autonomous second mobile object (Bj) and at least one reference point on the first mobile object relative to a fixed reference radionavigation system comprising at least two reference beacons (Si, Si+1), the first mobile object (M) and the second mobile object (Bj) being respectively provided, on the one hand, with first communication means (MI) providing communications between the first mobile object (M) and the reference beacons (Si, Si+1) and second communication means (MJ) providing communications between the first mobile object (M) and the second mobile object (Bj), and, on the other hand, communication means (BIJ) providing communications between each refrence beacon (Si, Si+1) and the second mobile object (Bj), which method consists in:

(a) determining the position of the first mobile object (M) relative to the reference radionavigation system and the orientation of the first direction relative to the first mobile object (M),

(b) determining the position of the second mobile object (Bj) relative to the reference radionavigation system,

(c) determining the angular offset between the first and second directions, with a view to correcting the orientation of the first direction relative to the second direction.

4,855,963

SHEAR WAVE LOGGING USING ACOUSTIC MULTIPOLE DEVICES

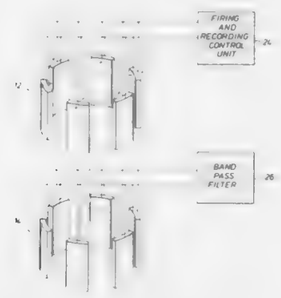
Graham A. Winbow, Houston; Sen-Tsuen Chen, Sugarland, and James A. Rice, Houston, all of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Continuation of Ser. No. 440,140, Nov. 8, 1972, abandoned. This application Jan. 6, 1988, Ser. No. 140,871

The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.

Int. Cl.⁴ G01V *1/00*

U.S. Cl. 367—31 **18 Claims**



1. A method of acoustic shear well wave logging of the earth surrounding a well which comprises operating a source of substantially only 2^n-pole acoustic waves in the well to transmit from the well a 2^n-pole shear wave through the earth along the well wherein n is an integer greater than two, and detecting the 2^n-pole shear wave arrival at at least one point longitudinal spaced along the well from the point of transmission.

4,855,964

VENTED-PIPE PROJECTOR

Bryce L. Fanning, and Garfield W. McMahon, both of Dartmouth, Canada, assignors to Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ontario, Canada

Filed Jul. 8, 1988, Ser. No. 216,504

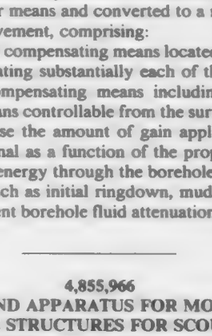
Int. Cl.⁴ H04R *17/00*

U.S. Cl. 367—159 **9 Claims**

1. A resonant-pipe projector, comprising:

a hollow, open-ended, substantially cylindrical central section having electroacoustical means for driving said projector; and

a pair of hollow, open-ended substantially cylindrical tubular sections, one end of each of said tubular sections being attached to an end of said central section;



each of said tubular sections having a single row of circumferentially-distributed vents formed in the cylindrical walls thereof.

4,855,965

TIME RAMPED GAIN FOR BOREHOLE TELEVIEWER

Frederick H. K. Rambow, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 26, 1986, Ser. No. 935,422

Int. Cl.⁴ G01V *1/00*

U.S. Cl. 367—69 **11 Claims**



1. A borehole imaging apparatus wherein a rotating acoustic transducer means is periodically pulsed to emit a sequence of acoustic pulses into the borehole fluid toward the borehole wall and the reflected response of the acoustic pulse is received by said transducer means and converted to a related electrical signal, the improvement, comprising:

electrical signal compensating means located in the borehole for compensating substantially each of the electrical signals, said compensating means including variable gain amplifier means controllable from the surface for continuing to increase the amount of gain applied to each said electrical signal as a function of the propagation time of the acoustic energy through the borehole fluid, to reduce the effects such as initial ringdown, mud reflections, and time-dependent borehole fluid attenuation of said acoustic energy.

4,855,966

METHOD AND APPARATUS FOR MONITORING BRIDGE STRUCTURES FOR SCOURING

John Cinquino, 2302 Cayuga Rd., Schenectady, N.Y. 12309

Filed Oct. 16, 1987, Ser. No. 109,494

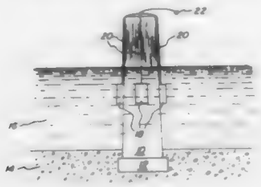
Int. Cl.⁴ G01S *15/08*

U.S. Cl. 367—99 **34 Claims**

1. A method for monitoring scouring around a structural

member which extends upwardly from a bed of soil material located beneath a body of water, said structural member being at least partially submerged in said soil bed material, said method comprising:

determining the separation distance between at least one



predetermined fixed point on said structural member and the uppermost portion of said soil bed material in which said structure is at least partially submerged; and

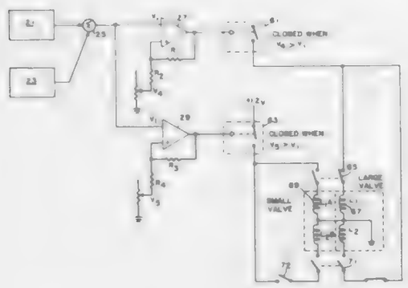
indicating a change in said separation distance for said at least one fixed point from a predetermined value which is associated with said at least one fixed point.

4,855,967

SEISMIC VIBRATOR HOLD-DOWN WEIGHT MONITOR/CONTROLLER

John J. Sallas, Plano; Richard M. Weber, Prosper, and David S. Lamance, Princeton, all of Tex., assignors to Halliburton Geophysical Services, Inc., Houston, Tex.

Continuation of Ser. No. 65,458, Jun. 23, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 289,506
Int. Cl.[4] G01V *1/04*
U.S. Cl. 367—190 17 Claims



1. A system for controlling the application and removal of hold-down weight of a vehicle means carried seismic vibrator, to minimize the generation of unwanted seismic energy wherein said vibrator is mounted on a base plate secured to a foot piece positioned thereabove with pressurized air bag means disposed between said base plate and said foot piece, comprising:

support means for applying at least a portion of the weight of said vehicle means to said base plate through said foot piece and air bag means;

means for moving said support means into and out of contact with the ground below said vehicle means; and

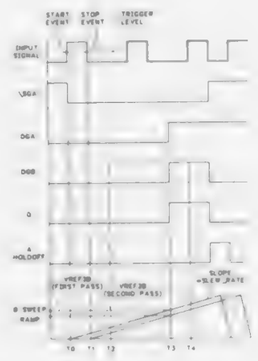
means for continuously controlling the rate of movement of said support means; and means for continously monitoring the level of pressure in said air bag means; and means for continuously comparing said monitored pressure to a predetermined threshold level.

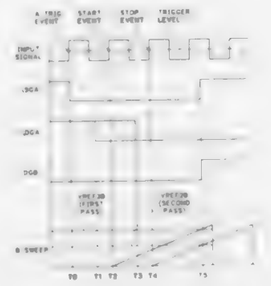
4,855,968

TIME INTERVAL MEASUREMENT SYSTEM FOR ANALOG OSCILLOSCOPE

Gordon W. Shank, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 30, 1988, Ser. No. 213,645
Int. Cl.[4] G04F *8/00*
U.S. Cl. 368—115 7 Claims





1. Apparatus responsive to an input signal for measuring a time interval between two level crossing events in the input signal comprising:

means for generating a first sweep ramp signal, said first sweep ramp signal being initiated when an input signal crosses a predetermined first trigger level;

means for generating a first including signal when said first sweep ramp signal reaches a first reference magnitude;

means for generating a second sweep ramp signal, said second sweep ramp signal being initiated when said input signal crosses a predetermined second trigger level;

means for generating a second indicating signal when said second sweep ramp signal reaches a second reference magnitude; and

means for monitoring said first and second indicating signals, and for adjusting one of said first and second reference magnitudes until said first and second indicating signals are generated at substantially the same time; and

wherein said means for monitoring and adjusting comprises:

means responsive to said first and second indicating signals for producing a third signal indicating whether said first indicating signal is generated before said second indicating signal; and

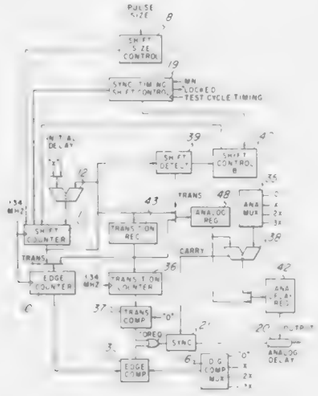
means for monitoring said third indicating signal and for selectively incrementing or decrementing said second reference magnitude in response to said third indicating signal.

4,855,969

DYNAMIC TIMING REFERENCE ALIGNMENT SYSTEM

Marc R. Mydill, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 14, 1987, Ser. No. 96,871
Int. Cl.[4] G04F *10/00*
U.S. Cl. 368—120 17 Claims



1. In a tester for testing very large scale integrated circuits wherein a device under test requires a tester generated timing input that has to be dynamically shifted to maintain a fixed timing relationship between the tester and the timing reference output of the device under test, a multi-edge delay generator comprising:

(a) a timing generator for providing a master timing reference signal,

(b) first, second and third counters preset at the beginning of each test cycle to each provide a count responsive to said timing reference signal,

(c) first and second multiplexers, each associated with one of said first and second counters, and

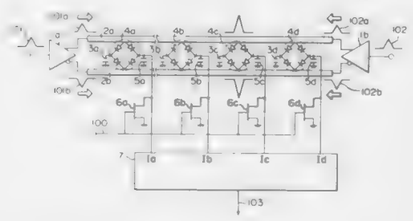
(d) first and second comparators for comparing the contents of each of said first and second multiplexers with the count of an associated said counter and producing a timing edge when a count match occurs.

4,855,970

TIME INTERVAL MEASUREMENT APPARATUS

Yoshihiko Hayashi, Yokohama, and Ritsuro Orihashi, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 136,937
Claims priority, application Japan, Dec. 26, 1986, 61-308419
Int. Cl.[4] G04F *87/00*
U.S. Cl. 368—120 27 Claims



1. A time interval measurement circuit comprising:

two parallel transmission lines;

first and second differential output drives, each having an input terminal for receiving an input signal and a pair of output terminals for providing output signals and wherein the pair of output terminals of said first and second differential output drivers are respectively coupled to first and second ends of said transmission lines;

a plurality of potential difference sensing means each being respectively coupled between said transmission lines and distributed thereat at predetermined intervals so as to generate an output signal indicative of a potential difference between said two transmission lines which is above a predetermined level in response to transmission line signals from the outputs of said first and second output drivers; and

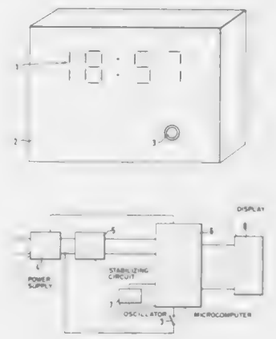
output signal detection means coupled to said plurality of potential difference sensing means for detecting output signals generated by said potential difference sensing means whereby the time interval between respective input signals applied at the input terminals of said differential output drivers is measured.

4,855,971

TIME ADJUSTMENT ARRANGEMENT FOR DIGITAL DISPLAYS

Alfred Meisner, and Karlheinz Hammelsbacher, both of Nuremberg, Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jul. 2, 1987, Ser. No. 69,509
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1986, 3622681
Int. Cl.[4] G04C *9/00*
U.S. Cl. 368—188 5 Claims



1. In an electronic timepiece with a digital display and an arrangement for the adjustment or setting of the minute and/or hour display through a short or lengthier depression of a push button; the improvement comprising a single timing push button on the timepiece for the selective forward and backward resetting of the display, said single timing push button providing for a rapid setting of the display, such that said arrangement distinguishes between a short depression of the timing push button ($t<t_1$) and a lengthier depression of the push button ($t>t_1$) to cause a backward or forward resetting, respectively, wherein the arrangement assumes a backward setting of the display only when the push button is initially depressed for a short period ($t<t_1$), and depressed for a subsequent pulse interval similarly for a short period ($t<t_1$), and wherein the arrangement assumes a forward setting of the display when the timing push button is depressed for a lengthier period ($t>t_1$), and upon a continual actuation of the timing push button, assumes after a predetermined time period ($t>n.t_1$) a rapid setting of the display in a plurality of speed increments.

4,855,972

WATCH CASE FOR TENNIS BRACELET

Martin Eiss, Freeport, N.Y., assignor to Ajco Jewelry Co. Inc., New York, N.Y.

Filed Jul. 18, 1988, Ser. No. 220,562
Int. Cl.[4] G04B *37/00*; A44C *5/00*
U.S. Cl. 368—282 6 Claims



1. A watch case assembly for connection to a bracelet having first and second latch means on opposite ends of the bracelet for engagement with each other to close the bracelet, the bracelet having an effective length, said assembly comprising:

a watch case having a periphery;

first and second additional latch means corresponding respectively to the first and second latch means of the bracelet, at diametrically opposed positions on the watch case periphery whereby said first and second additional latch means are respectively engageable with the second and first latch means of the bracelet for connecting the watch case to the bracelet; and

a pair of brackets connected at diametrically opposed positions on said watch case periphery for engaging the bracelet adjacent its ends, each bracket being spaced away from said first and second additional latch means whereby part of the length of the bracelet extends along said watch case periphery with the bracelet engaged with said brackets so that the effective length of the watch case plus bracelet is substantially the same as the effective length of the bracelet alone.

4,855,973

WRISTBAND, COMPRISING TWO STRAPS IN WHICH ONE STRAP PASSES THROUGH AN OPENING OF THE OTHER STRAP

Carlo Crocco, Lugano, Switzerland, assignor to C & KN Hobby Design S.A., Switzerland

PCT No. PCT/CH87/00019, § 371 Date Oct. 5, 1987, § 102(e) Date Oct. 5, 1987, PCT Pub. No. WO87/04907, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 12, 1987, Ser. No. 112,831
Claims priority, application Switzerland, Feb. 18, 1986, 645/86
Int. Cl.[4] G04B *37/00*
U.S. Cl. 368—282 11 Claims

1. A wristband for use with a wristwatch case, comprising: a first strap having a first end for connection to a wristwatch case and a second end opposite the first strap first end, said first strap having a plurality of openings, one opening succeeding another opening along the length of the first strap; a second strap having a first end for connection to the wristwatch case and a second, elongate prolonged free end opposite said second strap first end, said second strap elongate prolonged free end being adapted to pass through one of the openings of said first strap such that the first strap and the second strap form a closed loop; fastening means for fastening the elongate prolonged free end of said second strap to a portion of said second strap intermediate said elongate prolonged free end and said second strap first end said second strap elongate prolonged free end being adapted to be reversely bent during passage through the one opening to overlie the said portion of said second strap



progressively to tighten the loop and to enable operation of the fastening means.

4,855,974

MULTIPLE CONFIGURATION ADJUSTABLE WATCH AND BAND

Hardy Steinmann, New York, N.Y., assignor to Watchout Fashions, Inc., New York, N.Y.

Filed Feb. 12, 1988, Ser. No. 155,237
Int. Cl.[4] G04B *37/00*
U.S. Cl. 368—282 8 Claims



1. An improved watch, comprising;

(a) a watch;

(b) a first strap, having first and second ends, secured to said watch at said first end of said first strap;

(c) a strap end retaining means, securing said second end of said first strap to a user selectable point positioned between said first and said second ends of said first strap to vary the effective length of said first strap and form a loop at the end of said first strap;

(d) a second strap having first and second ends, said second strap being secured to said watch at said second end of said second strap;

(e) first buckle means secured to said second strap at said first end of said second strap and adapted to couple to said loop and to allow said second end of said first strap to pass through said first buckle means; and

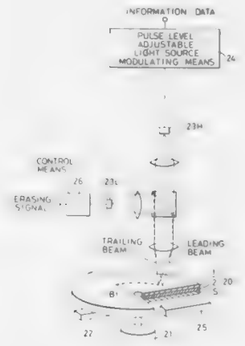
(f) second buckle means secured to said second strap between said first and second ends of said second strap and adapted to couple to said loop.

4,855,975

OVER WRITE CAPABLE MAGNETOOPTICAL RECORDING METHOD USING TWO BEAMS, AND MAGNETOOPTICAL RECORDING APPARATUS THEREFOR

Hideki Akasaka, Yokohama, and Masatoshi Sato, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Oct. 5, 1987, Ser. No. 104,421
Claims priority, application Japan, Oct. 8, 1986, 61-239852
Int. Cl.[4] G11B *13/04, 11/12*
U.S. Cl. 369—13 11 Claims



1. An over write capable magnetooptical recording apparatus using a multilayered magnetic recording medium that includes a first layer having a perpendicular magnetic anisotropy acting as a recording layer and a second layer having a perpendicular magnetic anisotropy acting as a reference layer, said first and second layers being coupled to each other so that an exchange coupling force influences said first and second layers, and comprising:

(a) initial field applying means for applying initial field to at least a part of said medium without influencing the direction of magnetization of said first layer and so that the direction of magnetization of said second layer is aligned either upward or downward;

(b) an optical system;

(c) erasing means for applying an erasing laser beam through said optical system to said part of said medium after the applying of said initial field to said medium, said erasing means applying said erasing laser beam so that one of a bit having upward magnetization and a bit having downward magnetization is formed in a portion of said first layer corresponding to said part of said medium, the intensity of said erasing laser beam being a predetermined level;

(d) writing means for applying a writing laser beam through said optical system to said part of said medium;

(e) displacement means for providing relative displacement between said medium and said two laser beams of said erasing means and said writing means, said erasing means and said writing means being disposed so that said erasing means applies said erasing laser beam to said part of said medium prior to the applying of said writing laser beam to said part of said medium;

(f) pulse modulating means for causing said writing means to pulse-modulate the intensity of said writing laser beam between a first level and a second level depending upon binary data to be recorded, said first level being higher than said predetermined level and causing said first layer to reach a predetermined temperature suitable for forming the other of said bits, said second level being equal to or lower than said predetermined level; and

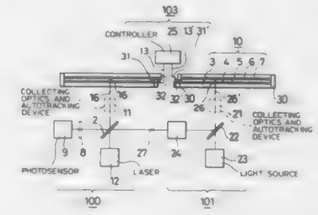
(g) bias field applying means for applying bias field to said part of said medium in order to form said other bit in the portion of said first layer corresponding to said part of said medium when said writing means applies said writing laser beam to said part.

4,855,976

INFORMATION WRITING METHOD FOR AN OPTICAL DISC MEMORY SYSTEM UTILIZING A SMECTIC CHIRAL LIQUID CRYSTAL

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 874,100, Jun. 13, 1986, abandoned.
This application Mar. 3, 1988, Ser. No. 166,798
Claims priority, application Japan, Jun. 14, 1985, 60-130187; Jun. 14, 1985, 60-130190; Jun. 14, 1985, 60-130189; Jun. 14, 1985, 60-130188; Aug. 7, 1985, 60-173935; Aug. 7, 1985, 60-173936
Int. Cl.[4] G11B *11/14*; G11C *13/04*
U.S. Cl. 369—13 4 Claims



1. An information writing and reading method comprising the steps of:

providing an optical disc memory including (a) a pair of substrates provided in parallel with an interval in between, at least one of which is transparent and (b) a chiral smectic liquid crystal layer disposed between said substrates in which liquid crystal molecules are arranged in parallel to the substrates with their dipole moments perpendicular to said substrates, wherein a number of domains are defined in said liquid crystal layer of the optical disc memory;

applying to said liquid crystal layer a strong electric field, the strength of the strong electric field being such as to direct the dipole moments of the liquid crystal molecules uniformly in one direction perpendicular to said substrates, said one direction of the dipole moments remaining after removal of the strong electric field;

subjecting, subsequent to the removal of the strong electric field, at least said particular domains to a weak electric field opposite in direction to said strong electric field, the strength of said weak electric field being such as not to change the directions of the electric dipole moments established by the strong electric field;

irradiating particular domains defined in said optical disc memory with light, the directions of the dipole moments at the particular domains being changed in response to the particular domains being irradiated and the weak electric field being applied thereto to thus write and store information in the optical disc memory; and

reading information stored in said optical disc memory by applying light to a polarizing element spaced from the optical disc memory and out of the path of the light utilized in the irradiating step to thus apply polarized light to the optical disc memory and then sensing light which

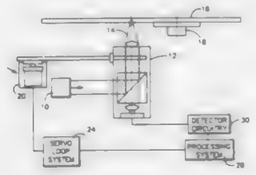
passes through predetermind domains in the liquid crystal layer corresponding to the polarized light to thus read the information stored inthe optical disk.

4,855,977

TRACK SEEKING APPARATUS AND METHOD USING SAMPLED INFORMATION

Kurt W. Getreuer, and David L. Schell, both of Colorado Springs, Colo., assignors to Laser Magnetic Storage International Company, Colorado Springs, Colo.

Filed Jul. 27, 1987, Ser. No. 78,264
Int. Cl.[4] G11B *17/22, 15/18*
U.S. Cl. 369—32 **44 Claims**



1. A method for use in track seeking using discontinuous information found along disk tracks, comprising:

providing a disk having at least first and second sets of discontinuous servo patterns used in track counting;

providing actuator means used in moving read/write means relative to said disk;

determining a magnitude relating to actual velocity of said actuator means using a first method and said first set of servo patterns found on the disk when said actual velocity of said actuator means is less than a first predetermined value;

determining a magnitude relating to actual velocity of said actuator means using a second method and said second set of servo patterns found on the disk when said velocity of said actuator means is greater than a second predetermined value, said second predetermined value being different from said first predetermined value; and

controlling said actual velocity of said actuator means using a third method when said actual velocity is greater than said first predetermined value and less than said second predetermined value.

27. An apparatus for use in a controlled track seek operation comprising:

disk means having at least first and second sets of discontinuous servo patterns used in track counting:

read/write means operatively associated with said disk means for use in reading from and writing on said disk means;

actuator means operatively associated with said read/write means for use in moving at least portions of said read/-write means; and

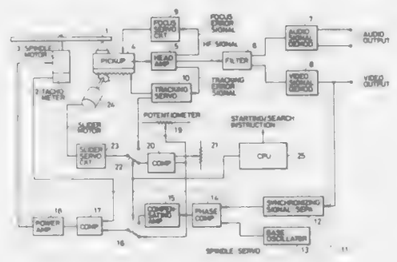
processing means communicating with said read/write means for processing information received from said servo patterns and controlling said actuator means, said processing means including first means for determining a magnitude relating to actual velocity of said actuator means when the velocity of said actuator means is greater than a first predetermined velocity value using said first set of servo patterns, second means for determining a magnitude relating to actual velocity of said actuator means when the velocity of said actuator means is less than a second predetermined velocity value using said second set of servo patterns, and third means for determining a magnitude relating to actual velocity of said actuator means when said velocity is greater than said first predetermined velocity value and less than said second predetermined velocity value.

4,855,978

VIDEO/COMPACT DISK PLAYER HAVING REDUCED TRACK SEARCH TIME

Hitoshi Kanamaru, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 802,398, Nov. 7, 1985, abandoned. This application Nov. 24, 1987, Ser. No. 129,391
Claims priority, application Japan, Nov. 28, 1984, 59-251383
Int. Cl.[4] G11B *21/08, 19/24*
U.S. Cl. 369—32 **10 Claims**



1. A disk player system comprising:

pickup means for reading information recorded on a disk being played;

means for moving said pickup means radially of said disk;

first controlling means for controlling a radial position of said pickup means during a normal playing operation;

first instructing means for instructing said pickup moving means to move said pickup means to a program-start position of a designated program recorded on said disk so as to commence a playback operation at said program-start position;

motor means for rotating said disk;

second controlling means for controlling said motor means to rotate at an appropriate speed during said normal playing operation;

second instructing means for instructing said motor means to start rotating said disk when said pickup means is being moved to said program-start position so that, when said pickup means arrives at said program-start position, said disk will be rotating at a speed proper for reading information from said disk by said pickup means at said program-start position;

first switch means for selectively connecting said pickup moving means to said first controlling means or said first instructing means;

second switch means for selectively connecting said motor means to said second controlling means or said second instructing means;

and start instructing means for simultaneously controlling both said first and second switches to simultaneously connect said pickup moving means to said first instructing means and said motor means to said second instructing means to start a play operation, then simultaneously connecting said pickup moving means to said first controlling means and said motor means to said second controlling means to allow said normal playing operation.

4,855,979

DISK PLAYING METHOD FOR DISK PLAYER

Toshiyuki Kimura; Yoshio Aoyagi, and Fumio Endo, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 4, 1988, Ser. No. 164,353
Claims priority, application Japan, Mar. 4, 1987, 62-47790; Mar. 4, 1987, 62-47791; Mar. 4, 1987, 62-47792; Mar. 4, 1987, 62-47793; Mar. 4, 1987, 62-47794
Int. Cl.[4] G11B *17/00, 17/22*
U.S. Cl. 369—33 **4 Claims**



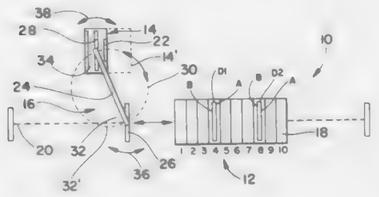
1. A disk playing method for a disk player comprising the steps of: reading at least total number of pieces of music from an accumulated total time code recorded in a lead-in region of said disk; and when random music selection is effected preventing reproduction of the same piece of music in a protective range.

4,855,980

METHOD OF AND APPARATUS FOR STORING AND RETRIEVING INFORMATION CONTAINING DISC UTILIZING A MOVABLE MAGAZINE

Paul Hug, Saratoga; Bill Umeda, San Jose; Paul A. Yesnosky, Sunnyvale; Bart Raudebaugh, Sunnyvale; Gary Ricco, Sunnyvale, and Gary E. McCabe, San Jose, all of Calif., assignors to Cygnet Systems, Sunnyvale, Calif.

Filed Dec. 15, 1987, Ser. No. 133,008
Int. Cl.[4] G11B *19/00, 5/48*
U.S. Cl. 369—36 **30 Claims**



1. An apparatus for storing and retrieving information containing discs, comprising:

(a) a disc storage magazine for storing a plurality of said information containing discs in individual compartments, said magazine being movable along a predetermined path including a specific disc storage station such that each of said individual compartments is positionable within said disc storage station;

(b) means for moving said magazine along said predetermined path;

(c) means including a disc drive for storing information on and retrieving information from said discs, said disc drive being located at a disc drive station spaced from said disc storage station;

(d) means for transferring an information containing disc between said drive at said disc drive station and one of said magazine compartments when the latter is at said disc storage station, said transferring means including

(i) a transfer arm mounted for rotation about an axis perpendicular to the transfer arm and through its center such that the ends of said arm move along a common circular transfer path through both said storage station and said drive station,

(ii) carriage means located at each end of said transfer arm for retrieving an information containing disc at either one of said storage or drive stations and for delivering it to the other station by rotating said transfer arm in a controlled way, and

(iii) means for rotating said transfer arm in said controlled way so as to cause said carriage means at each end of the arm to move along said circular transfer path between said storage and transfer stations; and

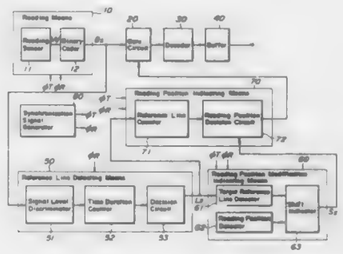
(e) means for controlling the movement of said magazine along its predetermined path and for controlling said transferring means for transferring specific information containing discs between said magazine and drive.

4,855,981

METHOD AND DEVICE FOR READING OUT OPTICALLY RECORDED DATA AND COMPENSATING FOR A DRASTIC CHANGE IN THE POSITION OF A LINE TO BE READ

Fumio Kimura; Shunzo Takahashi, and Yukio Hamasaki, all of Tokyo, Japan, assignors to Computer Services Corporation, Tokyo, Japan

Filed Apr. 17, 1986, Ser. No. 853,339
Claims priority, application Japan, Apr. 18, 1985, 60-083482; Apr. 22, 1985, 60-085697; May 18, 1985, 60-106640
Int. Cl.[4] G11B *7/08;* G06K *7/10*
U.S. Cl. 369—44 **10 Claims**



1. A method for reading out optically recorded data from an optical recording medium having data recording regions defined by reference lines in stripe form respectively and plural data tracks arranged perpendicular to said reference lines and in parallel to each other on said data recording regions, which is characterized in that:

data are sequentially read from a starting end of a sensing field of a reading sensor, said field covering plural data tracks including the data tracks to be read,

signals optically corresponding to said reference lines are extracted from the output signals of said reading sensor to sequentially detect the reference lines, and

when a reference line at a predetermined order in said field is detected, the data from the track in the data recording region defined by th detected reference line at said predetermined order is read in as the proper data, wherein

the position of the first reference line in said sensing field is detected for temporary store and the position of a first reference line which will appear in said sensing field will be detected in a succeeding reading for comparison with the so temporarily stored position of the first reference line to monitor whether there is any drastic change between the two,

if there is no drastic change and when the reference line at the predetermined order in the field is detected, the data

from the track in the data recording region defined by said reference line at said predetermined order is read in as the proper data, and

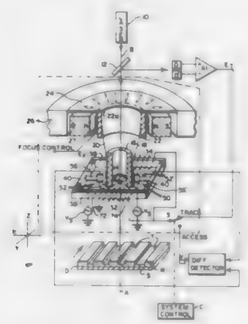
if there is a drastic change, and when a reference line which has been at the predetermined order in the field in the previous reading and now at an order adjacent said predetermined order in th field is detected, the data from the track in the data recording region defined by said reference line which is now at the order adjacent said predetermined order is read in as the proper data.

4,855,982

LENS POSITION-SENSING APPARATUS FOR OPTICAL RECORDING SYSTEM

David M. Orlicki, Rochester, and William T. Fearnside, Fishers, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 18, 1987, Ser. No. 50,810
Int. Cl.[4] G11B 7/095
U.S. Cl. 369—44 **5 Claims**



1. An optical recording apparatus of the type comprising:

(a) means for producing a beam of radiation;

(b) a lens for focusing such beam to a spot on a moving recording medium, such medium having a plurality of spaced tracks along which data is recorded;

(c) movably mounted support means for supporting said lens for movement in a direction perpendicular to the lens axis;

(d) detector means for detecting the displacement of the focused spot relative to a desired data track and for producing a tracking error signal proportional to such displacement;

(e) tracking actuator means responsive to the error signal for adjusting the position of the lens support to continuously maintain the focused spot on a desired data track during movement of the recording medium;

(f) means for sensing the instantaneous position of the lens relative to a nominal optical axis and for providing the tracking actuator means with a lens position-sensitive signal representative of such instantaneous position, said sensing means comprising variable inductance transducer means having an instantaneous inductance determined by the instantaneous position of said movably mounted lens support means relative to a nominal position, and circuit means responsive to the instantaneous inductance of said transducer for producing said position-sensitive signal; and

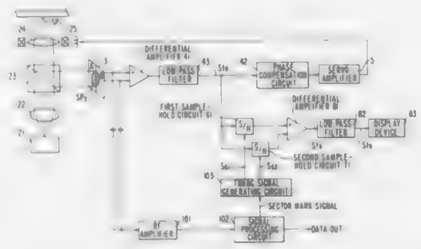
(g) switching means for selectively applying either said tracking error signal or said lens position-sensitive signal to said tracking actuator means.

4,855,983

APPARATUS FOR RECORDING AND READING AN OPTICAL DISK, HAVING REDUCED OFFSET IN ITS TRACKING ERROR SIGNAL

Shigeru Arai, Zushi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 3, 1987, Ser. No. 128,279
Claims priority, application Japan, Dec. 3, 1986, 61-289549
Int. Cl.[4] G11B 7/00
U.S. Cl. 369—46 **9 Claims**



1. An apparatus for optically reading and writing digital information on an optical recording disk having a light reflecting track divided into a plurality of sectors and having a center, an ID area and a data area along a guide groove, said apparatus comprising:

light means for focusing a light spot on the track;

light detection means for detecting light reflected from said ID and data areas of said track and having an output from which first and second light spot location signals are generated;

error means for generating a tracking error signal from the light spot location signals;

a servo control system aiming said light means, the tracking error signal being supplied to said servo control system to aim the light spot at the center of the track;

first means for determining a difference between the first and second light spot location signals generated by said light detection means from light reflected from said ID area of said track and outputting said detected difference as a first sampled tracking error signal;

second means for determining a difference between the first and second light spot location signals generated by said light detection means from light reflected from said data area of said track and outputting said difference as a second sampled tracking error signal; and

third means for determining and outputting a difference between said first and second sampled tracking error signals as an offset signal indicating an amount of deviation of the light spot from the track.

4,855,984

METHOD OF MAKING AND PRETESTING A DIGITAL RECORDING MEDIUM

Arthur M. Gerber, 202 Ocean, Solana Beach, Calif. 92075

Division of Ser. No. 700,735, Feb. 11, 1985, abandoned. This application Aug. 20, 1987, Ser. No. 87,530
Int. Cl.[4] G11B 7/26, 20/18
U.S. Cl. 369—54 **7 Claims**

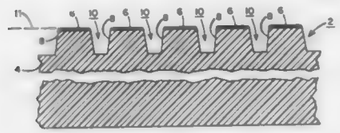
1. The method of making and pretesting a digital recording medium comprising the steps of

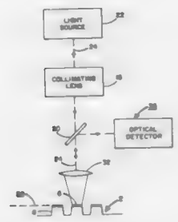
forming a substrate of thermoplastic material,

coating said substrate with a reflective coating,

embossing said substrate to form an array of rows of separate equally spaced predefined storage areas, each of said storage areas being capable of storing at least one bit of digital information by a reduction in reflectivity by exposure to a beam of focused energy,

successively scanning and individually identifying each of said storage areas with a beam of focused energy having an intensity less than that which will significantly reduce the reflectivity of said storage areas, and





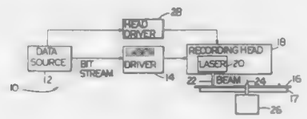
prior to any exposure to focused energy of sufficient intensity to significantly reduce the reflectivity of said storage areas measuring the reflectivity from each of said storage areas and comparing it with a predetermined level of reflectivity thereby to detect defects in the reflectivity of said storage areas.

4,855,985

DIGITAL STORAGE

Enid K. Sichel, Lincoln, Mass., assignor to Masschusetts Institute Of Technology, Cambridge, Mass.

Filed Jul. 14, 1987, Ser. No. 73,148
Int. Cl.[4] G11B 7/00; G02B 7/02
U.S. Cl. 369—100 **23 Claims**



1. A recording system for representing digital information in the form of marks or the absence of marks at a plurality of locations, comprising

a source for delivering an energy-carrying beam, and

a material configured in a form to receive said beam at selected locations for forming said marks, said material being characterized by undergoing pyrolysis to form said marks at said selected locations in response to energy of appropriate levels being received at said locations,

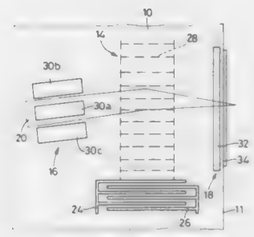
said source being controlled to cause said beam to carry said appropriate levels of energy to said selected locations.

4,855,986

DATA STORAGE AND READOUT OPTICAL HEAD USING A SINGLE SUBSTRATE HAVING AN ELECTROOPTIC CONVERGING PORTION FOR ADJUSTMENT OF THE LIGHT BEAM FOCAL POINT

Kazunari Taki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 13, 1986, Ser. No. 829,065
Claims priority, application Japan, Feb. 16, 1985, 60-28972
Int. Cl.[4] G11B 7/135; G02B 6/12
U.S. Cl. 369—112 **7 Claims**



6. An optical head for optical storage and readout of information on or from an optical recording medium using an emitted light beam, comprising:

a single substrate having a waveguide on one of its opposite surfaces;

a deflector portion, disposed on a first part of said waveguide and comprising a plurality of deflector electrodes, to deflect the light beam passing through said waveguide at an adjustable angle in response to an adjustable voltage applied across said plurality of deflector electrodes; and

first and second converging portions which are respectively disposed on a second and a third part of said waveguide, said first part of said waveguide being disposed intermediate said second and third parts of said waveguide, said first and second converging portions including a plurality of first and second convergence electrodes, respectively, which are respectively spaced apart from each other in a direction perpendicular to a direction of propagation of said light beam through said second and third parts of the waveguide, such that said first converging portion possesses, as a consequence of an electro-optic effect, a distribution of refractive index which permits the light beam passing through said second part of the waveguide to be converged in a first direction parallel to said one surface of the substrate in response to an adjustable voltage applied across said plurality of first convergence electrodes, said second converging portion possessing, as a consequence of an electro-optic effect, a distribution of refractive index which permits the light beam passing through said third part of the waveguide to be converged in a second direction parallel to a direction of thickness of the substrate, in response to an adjustable voltage applied across said plurality of second convergence electrodes, whereby the light beam emitted from said third part of the waveguide is converged at an adjustable focal point with respect to said optical recording medium in said first and second directions.

4,855,987

OPTICAL DEVICE COMPRISING A HOLDER ACCOMMODATING AN OPTICAL SYSTEM WHICH COMPENSATES FOR THERMAL EXPANSION/CONTRACTION

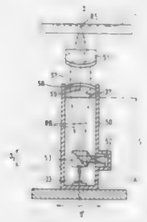
Johannes W. Versluis, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 72,835, Jul. 13, 1987, abandoned. This application Jan. 31, 1989, Ser. No. 304,934

Claims priority, application Netherlands, Feb. 23, 1987, 8700440

Int. Cl.[4] G11B 7/00; G01J 1/20; G02B 7/02

U.S. Cl. 369—112 12 Claims



1. An optical device comprising a holder and means for fixing a system of optical elements thereto, characterized in that the parameters:

the coefficients of expansion of the materials of the optical elements,

the refractive indices of these materials and their variations with temperature, and

the dimensions of the optical elements which control the change in the optical behaviour of the system of optical elements, are adapted to the coefficients of expansion of the holder material which is located between the fixing means of the holder thereby ensuring that the optical device is substantially independent of temperature variations.

4,855,988

OPTICAL INFORMATION RECORDING AND REPRODUCING APPARATUS WITH AMPLITUDE LIMITATION OF A DETECTED SIGNAL IN A WRITE OPERATION MODE

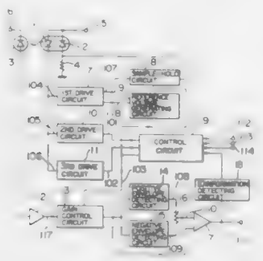
Toshiya Shinbayashi, Yokohama, and Takashi Takeuchi, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 19, 1986, Ser. No. 943,781

Claims priority, application Japan, Dec. 24, 1985, 60-289283

Int. Cl.[4] G11B 7/00; H04B 9/00; G01J 1/32

U.S. Cl. 369—116 5 Claims



1. An optical information recording and reproducing apparatus having a single semiconductor laser for recording information bits on an optical recording film with laser light responsive to a drive current modulated by an information signal during a write operation mode and for radiating constant readout laser light onto said recording film to reproduce signals recorded on the recording film during a read operation mode, comprising:

means for detecting light reflected from said optical recording film and for converting the detected reflected light to an electric signal;

a binary coding circuit including means for detecting a positive envelope signal and a negative envelope signal with respect to said electric signal, means for producing a threshold signal in accordance with said positive and negative envelope signals, and means for comparing said electric signal with said threshold signal so as to convert said electric signal to a binary signal; and

amplitude limiting means for limiting the amplitude of said electric signal during the write operation mode, said amplitude limiting means being disposed at a stage preceding said binary coding circuit.

4,855,989

STYLUS

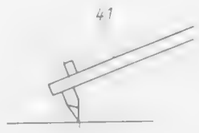
Fritz Gyger, Jr., Reckholderweg 4c, CH-3645 Gwatt, Switzerland

Filed Jul. 7, 1987, Ser. No. 70,425

Claims priority, application Switzerland, Jul. 9, 1986, 2765/86-3

Int. Cl.[4] G11B 3/44

U.S. Cl. 369—173 5 Claims



1. A stylus for tracking stereophonic and quadrophonic sound grooves of gramophone records, comprising:

a stylus body having a tip, the tip of the stylus having at least one substantially flat surface which forms a front side of the stylus facing forward along said sound grooves during tracking, the stylus being prismatic with a square cross-section and having a surface forming the tip defining a shaped section with tracking edges, the shaped section having facets disposed diagonally to a longitudinal axis of the stylus, the flat surface forming the front side of the stylus leading in the direction of tracking along the grooves.

4,855,990

DISC PLAYER

Hiroo Akiyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 3, 1987, Ser. No. 21,323

Claims priority, application Japan, Mar. 10, 1986, 61-52051; Mar. 10, 1986, 61-52052; Mar. 10, 1986, 61-52054

Int. Cl.[4] G11B 25/04, 17/02

U.S. Cl. 369—265 15 Claims

1. A disc player for playing various information carrier discs, each having a central aperture, and an annular information area where information signals are recorded, the information area surrounding the central aperture, the disc player comprising:

a single turntable for supporting an information carrier disc;

a single drive motor for rotating the turntable, the drive motor having a motor body and a rotation shaft, and being attached at the rotation shaft directly to the turntable with the motor body spaced apart from the turntable, a first clearance being formed between the motor body and the turntable; and

reproducing means for reading signals recorded on the disc, the reproducing means being radially transferrable relative to the turntable, and being positioned in said first clearance without butting against either the motor body or the turntable when the reproducing means is transferred to its innermost position where it reads the signals recorded on an inner periphery of the information area of the disc.



4,855,991

OPTICAL DISK HAVING TRACK OFFSET DETECTION AREAS

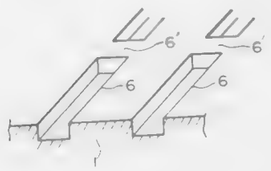
Toshimitsu Kaku, Hachioji; Yoshito Tsunoda, Mitaka; Takeshi Maeda, Kokubunji, and Shigeru Nakamura, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 515,520, Jul. 20, 1983, Pat. No. 4,663,751. This application Feb. 3, 1987, Ser. No. 10,428

Claims priority, application Japan, Jul. 21, 1982, 57-125702

Int. Cl.[4] G11B 7/24

U.S. Cl. 369—275 14 Claims



1. An optical disk comprising:

a disk-like substrate;

a recording layer provided on the substrate;

first and second regions alternately arranged along rotational direction of the optical disk, the first region having a preformed, optically detectable header portion containing at least a mark for indicating a start of the first region and an address area, the second region having a guide groove serving as an optical guide for a light spot; and

a track offset detection area for detecting track offset due to inclination of the optical disk being disposed between the first region and the second region, the track offset detection area being a mirror portion without pits or a guide groove therein and which substantially reflects the light spot such that the light spot is not affected by the header portion and the guide groove.

4,855,992

REVERSIBLE OPTICAL RECORDING MEDIUM WITH AN OPTOTHERMALLY DEFORMABLE RECORDING LAYER

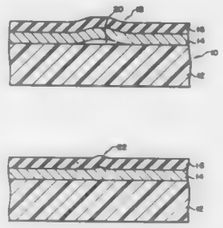
Sumio Ikegawa, Tokyo; Akio Hori, Kawasaki; Shuichi Komatsu, Yokohama; Shinji Arai, Chigasaki, and Nobuaki Yasuda, Zushi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1987, Ser. No. 136,972

Claims priority, application Japan, Feb. 13, 1987, 62-30744

Int. Cl.[4] G11B 7/24, 7/26

U.S. Cl. 369—275 18 Claims



1. A data rewritable optical recording medium comprising:

(a) a substrate at least partially formed of an organic material, and releasing a gas component when said substrate is heated at a radiation region of a first light beam; and

(b) an amorphous recording layer which is formed on said substrate, contains silicon and fine metal particles, and is deformed to be locally peeled from said substrate upon releasing of the gas component so as to form a protuberance, said recording layer being deformed to cause said protuberance to disappear to have a substantially flat surface when a second light beam having an intensity different from that of the first light beam is radiated thereonto, and wherein said recording layer contains oxygen, which serves to increase an upper-limit temperature at which said recording layer can stably perform data recording.

4,855,993

METHOD AND APPARATUS FOR DETECTING A FAULT IN A RING NETWORK DATA TRANSMISSION SYSTEM

Takuji Hamada, Hitachiota; Masahiro Takahashi, Hitachi; Katsuhiko Yoneda, Hitachi; Ken Onuki, Hitachi, and Toshihiko Uchiyama, Hitachi, all of Japan, assignors to 501 Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1988, Ser. No. 158,696

Claims priority, application Japan, Feb. 23, 1987, 62-37952

Int. Cl.[4] H04L 1/12

U.S. Cl. 370—16 9 Claims

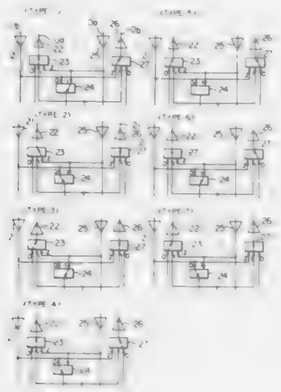
1. A method of detecting a faulty location in a ring network system including a plurality of transmission apparatuses, terminals connected to each of said transmission apparatuses and double ring transmission paths for interconnecting said transmission apparatuses in a ring-like configuration so that any given ones of said terminals can communicate with each other by way of the respective associated transmission apparatuses, comprising the steps of:

searching address of adjacent one of said transmission apparatuses;

determining arithmetically the stage numbers of bypassed transmission apparatuses on the basis of said address of said adjacent transmission apparatus and predetermined addresses indicating an order in which the transmission apparatuses are connected; and

comparing said arithmetically determined number of by-

passed transmission apparatuses with a predetermined maximum number of the transmission apparatuses allow-



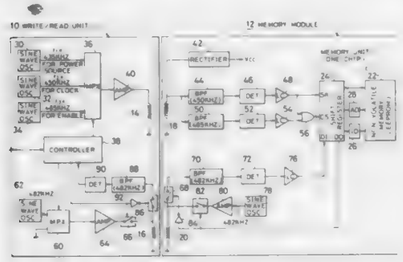
able to be bypassed to thereby detect the faulty location in said ring network system.

4,855,994

MEMORY PACKAGE SYSTEM FOR PERFORMING DATA TRANSMISSION BETWEEN MEMORY MODULE AND WRITE/READ UNIT BY ELECTROMAGNETIC INDUCTION COUPLING

Kunihiko Takeuchi, Kawasaki; Masao Oba, Yokohama, and Shinichi Horinouchi, Tokyo, all of Japan, assignors to Tokyo Keiki Company Ltd., Tokyo, Japan

Filed Jan. 6, 1988, Ser. No. 141,222
Claims priority, application Japan, Jan. 26, 1987, 62-15784
Int. Cl.[4] H04J *1/00*
U.S. Cl. 370—69.1 **6 Claims**



1. A memory package system comprising a write/read unit and a memory module, said memory module having a non-volatile memory therein;

(A) said write/read unit and said memory module respectively comprising first and second induction coils for up-signal transmission from said write/read unit to said memory module, and said write/read unit and said memory module respectively comprising third and fourth induction coils for bidirectional transmission therebetween;

(B) said write/read unit further comprising:

(i) an up-signal transmitting means for modulating a power source signal at a first frequency, a sync clock signal at a second frequency which is different from said first frequency, and an enable clock signal at a third frequency which is different from said first and second frequencies, and for frequency multiplexing the thus modulated power source signal, sync clock and enable clock signal, and for transmitting the thus frequency multiplexed power source signal, sync clock signal and enable clock signal to said memory module using said first and second induction coils,

(ii) an access information transmitting means for modulating write access information and read access information into different frequencies, and for transmitting the thus modulated write access information and read access information to said memory module using said third and fourth induction coils, and

(iii) a read data demodulating means for demodulating read data from a frequency modulated signal received from said memory module and transmitted using said third and fourth induction coils;

(C) said memory module further comprising:

(i) a first demodulating means for producing an operating power, a sync clock and enable signal in accordance with said frequency multiplexed power source signal, sync clock signal and enable clock signal received from said write/read unit and transmitted using said first and second induction coils;

(ii) a second demodulating means for reproducing said write access information and said read access information in accordance with said modulated write access information and read access information received form said write/read unit and transmitted using said third and fourth induction coils;

(iii) a memory control means for executing writing and reading operations of said non-volatile memory in accordance with said write access information and said read access information reproduced by said second demodulating means,

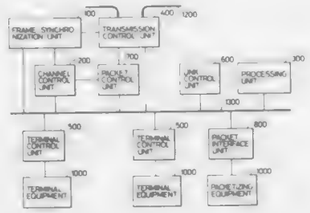
(iv) a read data transmitting means for frequency modulating read data obtained as a result of reading operations executed by said memory control means and for transmitting the thus frequency modulated read data to said write/read unit using said third and fourth induction coils.

4,855,995

METHOD AND SYSTEM FOR DATA TRANSMISSION

Kunio Hiyama, Fujisawa; Kenji Kawakita, Kawasaki, and Osamu Takada, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 402,418, Jul. 28, 1982, abandoned. This application Jan. 27, 1987, Ser. No. 7,339
Claims priority, application Japan, Jul. 31, 1981, 56-119064; May 24, 1982, 57-86636
Int. Cl.[4] H04J *3/00, 3/16*
U.S. Cl. 370—86 **12 Claims**



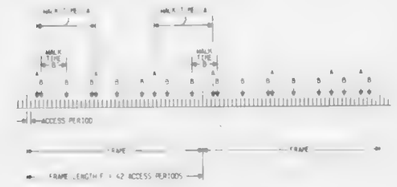
1. A data communication system comprising a plurality of node equipments and at least one transmission loop line coupling said node equipments, at least one of said node equipments including means for generating a frame having a multiplicity of channels, at least one channel in each frame containing a region for data information and a region for indicating the validity of said data information such that a predetermined value is set in said region for indicating the validity of data information to be transmitted and data information to be transmitted is set in said region for data information if said data information is to be transmitted through a channel already occupied as a communication path from one node equipment to a designated node equipment and means for transmitting a generated frame to said transmission loop line.

4,855,996

TIME DIVISION MULTIPLEX ARRANGEMENT

William Douskalis, Lincroft, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Aug. 3, 1988, Ser. No. 227,839
Int. Cl.[4] H04J *3/22*
U.S. Cl. 370—84 **43 Claims**



1. A time division multiplex arrangement comprising

a communication medium,

a plurality of devices for generating respective streams of data at respective synchronous bit rates, there being at least one pair of said rates for which neither rate of the pair is a whole number multiple of the other,

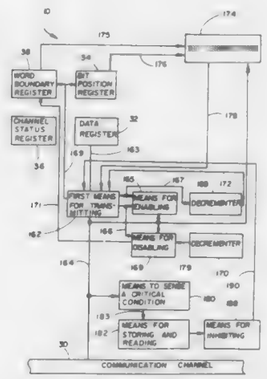
means for causing each said device to apply to said medium, during each of a succession of access periods allocated to that device, a constant number of bits of the respective bit stream, the access periods allocated to each said device occurring at equally spaced time intervals, said time intervals being of equal duration.

4,855,997

PRIORITY QUEUING TECHNIQUE FOR CONTENT INDUCED TRANSACTION OVERLAP (CITO) COMMUNICATION SYSTEM

Colleen R. Wilson, Cary, N.C.; Richard A. Burne, Columbia, and Semyon Berkovich, Rockville, both of Md., assignors to Allied-Signal, Inc., Morristown, N.J.

Filed Dec. 21, 1987, Ser. No. 135,902
Int. Cl.[4] H04J *3/00*
U.S. Cl. 370—85 **16 Claims**



7. A data communication system having a single data communication channel interconnecting a plurality of Senders to at least one receiver, wherein each Sender comprises:

data register means for storing a multi-bit data word; each bit of said multi-bit data word having one of two possible states;

word boundary register means for storing a number corresponding to the number of bits in said multi-bit data word;

bit position register means for storing a number corresponding to the number of bits in said multi-bit data word;

first means for transmitting the data bits from said data register to the communication channel one bit at a time in serial fashion;

means responsive at times the communication channel assumes the same state as the transmitted data bit for enabling said first means for transmitting to transmit the next data bit, said first means further including means for decrementing said word boundary register and said bit position register at said times to signify that the state of the transmitted data bit was the same as the state of the communication channel;

means for disabling said first means for transmitting in response to detecting a difference between the state of the transmitted bit and the state of the communication channel, said means for disabling further including means for only decrementing said work boundary register for each bit transmitted on the communication channel;

bit competition means responsive to the word boundary register being decremented to zero for comparing the contents of its Sender's bit position registers in said other plurality of Sender's at times the contents are transmitted over the communication channel by CITO protocol to enable said first means for transmitting at times the content of its bit position register is indicative of the lexicographically smallest data word remaining to be transmitted;

means to sense a critical condition indicated by one of the Senders;

means responsive to the sensed critical condition for storing a data word indicative of the existence of the sensed condition;

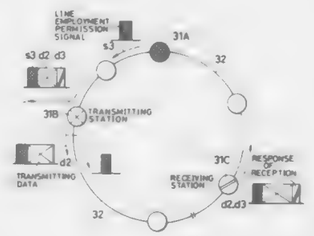
means for reading the data word indicative of the sensed critical condition, said means for reading further including means for inhibiting sais first means for transmitting until a Sender associated with the critical condition has transmitted its data bits.

4,855,998

STAND-ALONE TRANSMISSION CONTROLLER

Kazuo Kishimoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1986, Ser. No. 933,155
Claims priority, application Japan, Jan. 20, 1986, 61-9324
Int. Cl.[4] H04L *5/22*
U.S. Cl. 370—86 **10 Claims**



1. A stand-alone transmisson controller comprising a plurality of transmission-reception stations linked in the form of a loop through a transmission line, and intended to have data

transmission between voluntary ones of said stations, each of said transmission-reception stations comprising:

signal detecting means for detecting the presence or absence of a line employment permission signal on said transmission line;

transmission control means which sends out said line employment permission signal from one of said stations into said looped data transmission system on condition that said signal detecting means of said one station has detected the absence of said line employment permission signal from another station on said transmission line and that said one station has loop control priority;

transmitting control means which sends transmission data through said loop to a receiving station on condition that said signal detecting means of the sending station has detected said line employment permission signal produced by said transmission control means of said station having the loop control priority;

reception control means which takes said transmission data addressed to said receiving station, as detected by said signal detecting means, into said receiving station and sends out a reception acknowledge signal into said loop;

transmission clock pulse synchronizing means which sends out a signal from a sending station to a receiving station, said signal being received by said receiving station through a data insertion switching means for connection to said transmission line, in synchronism with the clock pulse of said one station when said one station sends a signal to said looped data transmission system;

said transmission control means issuing a line employment permission signal, a line insertion signal and a reception acknowledgement signal to said data insertion switching means following reception of transmission data when the station is a receiving station; and

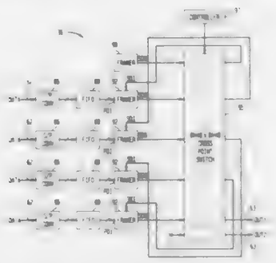
by-pass means which forms a by-pass by removing a station from said looped transmission system when that station has failed.

4,855,999

DTDM MULTIPLEXER WITH CROSS-POINT SWITCH

Hung-Hsiang J. Chao, Madison, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Nov. 10, 1987, Ser. No. 118,979
Int. Cl.[4] H04J *3/04, 3/22*
U.S. Cl. 370—112 **7 Claims**



1. A multiplexer for combining a plurality of relatively sparsely occupied incoming bit streams comprising input frames into a smaller number of more densely occupied outgoing bit streams comprising output frames, said multiplexer comprising:

a cross-point switch having a plurality of input lines corresponding to the number of incoming streams,

a plurality of input means connected to said switch through said input lines for receiving said incoming bit streams, said input means being divided into groups defined by settings of said cross-point switch, and

a plurality of output lines connected to said switch for transmitting said outgoing bit streams, said incoming bit streams arriving on each one of said groups of input means being combined into one outgoing bit stream transmitted on each corresponding one of said output lines associated with said each one of said groups,

said cross-point switch being adapted to generate a chain of empty output frames for said each one of said groups and to transmit each said chain by sequencing through each said input means to each of said input lines associated with said each one of said groups so that data from said incoming streams can be inserted therein to form said outgoing streams.

4,856,000

DUPLICATED CIRCUIT ARRANGEMENT FOR FAST TRANSMISSION AND REPAIRABILITY

Michel Bauge, Lesigny; Gerard Boudon, Mennecy; Pierre Mollier, Boissise le Roi; Jean-Luc Peter, Champcueil, all of France, and Yiannis J. Yamour, New York, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 8, 1987, Ser. No. 96,569
Claims priority, application France, Dec. 30, 1986, 86430056
Int. Cl.[4] G06F *15/16*
U.S. Cl. 371—9 **13 Claims**



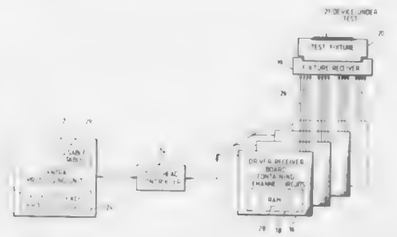
1. An improved circuit arrangement of redundant devices, including a main processor provided with a P bit main data bus, N redundant devices, and means for providing identical portions of data input sequences to at least two of said redundant devices, said N redundant devices each provided with a device data bus, a processing element for processing a P bit word or frame in accordance with a function redundant to at least one other of said redundant devices, and receiving means connected between the inputs of the processing element and the lines of the device data bus, said device data bus being connected to said P bit main data bus, said circuit characterized in that: at least two said redundant devices are provided with driving means connected between the outputs of the processing element and the lines of the device data bus and are connected to share the driving function on the P bit main data bus between them, so that each device transmits only a part of the P bit word to said P bit main data bus, which part comprises a set of bits corresponding to the content of a predetermined section of its processing element, and bus connection means for assembling from said device data busses the sets of bits supplied by said at least two redundant devices so that the whole P bit word is available integrality on the P bit main data bus.

4,856,001

DIGITAL IN-CIRCUIT TESTER HAVING CHANNEL-MEMORY EARSE-PREVENTER

Barbara K. McElfresh, Walnut Creek, and Eugene H. Breniman, Antioch, both of Calif., assignors to Zehntel, Inc., Walnut Creek, Calif.

Filed May 29, 1987, Ser. No. 55,736
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—15 **4 Claims**



4. In a digital in-circuit tester having a test-head controller which controls bursts of test vectors generated by a group of driver-receiver channels for driving contact elements of a device under test, the group of driver-receiver channels responsive to an erase instruction from the test-head controller, a method for selectively nullifying an erase instruction to a given driver-receiver channel from the test-head controller comprising the steps of:

(a) determining the presence or absence of an erase-inhibit signal in the given driver-receiver channel;

(b) sending an erase instruction to erase a memory in each driver-receiver channel of the group of driver-receiver channels;

(c) erasing said memory in the given driver-receiver channel when said erase instruction is sent in the absence of said erase-inhibit signal; and

(d) prohibiting erasing said memory in the given driver-receiver channel when said erase instruction is sent in the presence of said erase-inhibit signal.

4,856,002

SEMICONDUCTOR INTEGRATED CIRCUIT APPARATUS

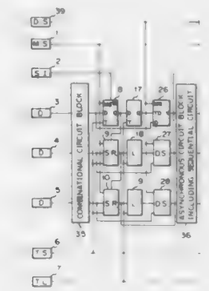
Kazuhiro Sakashita; Satoru Kishida; Toshiaki Hanibuchi; Ichiro Tomioka, and Takahiko Arakawa, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

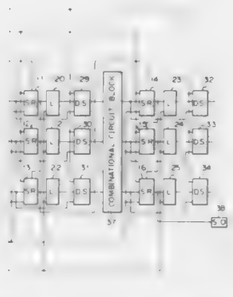
Filed Jun. 12, 1987, Ser. No. 62,439
Claims priority, application Japan, Aug. 4, 1986, 61-183684
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—21 **15 Claims**

1. In a semiconductor integrated circuit having computational circuitry which can be divided into a plurality of circuit blocks, each of said circuit blocks having an input and an output, said integrated circuit having self-test apparatus comprising a plurality of scan registers serially connected to form a shift register path, one of said scan registers having an output and a parallel-load input connected to the output of a first of said circuit blocks, and first means for selectively connecting said first circuit block output and said one scan register output to the input of a second of said circuit blocks, the improvement comprising:

means responsive to an output signal at said one scan register output for temporarily storing said output signal, and

second means for connecting said first circuit block output and said temporary storage means output to said first connecting means so that said first circuit block output





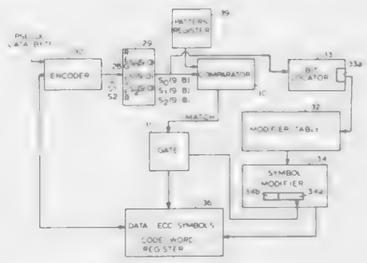
and said temporary storage means output can selectively be connected to said second circuit block input.

4,856,003

ERROR CORRECTION CODE ENCODER

Lih-Jyh Weng, Lexington, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed May 7, 1987, Ser. No. 47,627
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37 **16 Claims**



7. An apparatus for encoding data symbols into code words using a modified Reed-Solomon error correction code ("ECC" over Galois Field (p^q) and a generator polynomial g(x) which has q-bit coefficients which are elements of the Galois Field, such that a maximum of d errors can be corrected, said apparatus comprising:

A. means for encoding K data symbols plus L predetermined pseudo data symbols to produce d q-bit ECC symbols;

B. means for ascertaining whether n selected bits in each of said q-bit ECC symbols match a truncation pattern, and if any of said selected bits do not match the corresponding bits in said truncation pattern, ascertaining the location of the non-matching bits; and

C. (1) in response to a determination that said selected n bits in each of said q-bit ECC symbols match said pattern, means for forming a code word containing said K data symbols, said L psuedo data symbols and d EEC symbols, each of which is formed from the q–n bits of a q-bit ECC symbol which are not said selected bits,

(2) in response to a determination that said selected n bits in at least one of said q-bit ECC symbols do not match said pattern,

1. modifying means for modifying said predetermined pseudo data symbols to provide L modified pseudo data symbols such that encoding a string consisting of the data symbols and the modified pseudo data symbols will produce q-bit replacement ECC symbols in which said selected n bits of each of said replacement ECC symbols match said pattern, and

2. means for forming a code word containing said K data symbols, said L modified psuedo data symbols and d ECC symbols, each of which is formed from the q–n bits of a q-bit replacement ECC symbol which are not the selected bits.

4,856,004

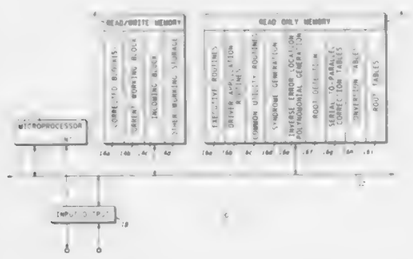
MICROPROCESSOR BASED BCH DECODER

Robert I. Foster, Mesa, and Beth A. Longbrake, Cave Creek, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 5, 1987, Ser. No. 104,186

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—37 **14 Claims**



1. An apparatus for decoding a stream of BCH encoded data, said apparatus comprising:

a microprocessor for performing said decoding of said stream of said BCH encoded data;

means for coupling the stream of BCH encoded data to said microprocessor; and

means, coupled to said microprocessor, for converting M successive bits of the input data stream into N-bit finite field elements so that a syndrome representative of the serial stream of data may be calculated by said microprocessor utilizing the N-bit values, where M and N each represent positive integer numbers greater than 1.

4,856,005

WAVELENGTH CONVERSION ELEMENT FOR A SEMICONDUCTOR LASER

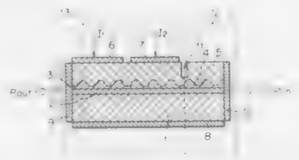
Kunishige Oe, Isehara; Hitoshi Kawaguchi, Hiratsuka, and Yuzo Yoshikuni, Kawasaki, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Mar. 29, 1988, Ser. No. 174,713

Claims priority, application Japan, Mar. 31, 1987, 62-77670

Int. Cl.[4] H01S *3/10, 3/08, 3/19*

U.S. Cl. 372—20 **10 Claims**



1. In a wavelength conversion element for a semiconductor laser, comprising a substrate having thereon an active layer, a waveguide layer, a refractive grating, a clad layer and an electrode,

the improvement wherein said wavelength conversion element comprises:

(a) a wavelength-tunable semiconductor laser portion which oscillates in a single mode and whose oscillation wavelength is settable at a desired value within a given wavelength range by changing operational conditions, said wavelength-tunable semiconductor laser portion comprising a part of said active layer, a part of said waveguide layer, a part of said refractive grating, a part of said clad layer and at least two injection electrodes having the same polarity which are arranged on said part of said clad layer spaced apart from each other along a light axis and which are controllable with respect to the amount of current to be injected thereby so that a ratio of the amount of current therebetween is changeable to a predetermined value, one end surface of said laser portion servicing as an output light emitting end; and

(b) a saturable absorption region optically connected to said wavelength-tunable semiconductor laser portion, said saturable absorption region comprising the remaining parts of each of said active layer, said waveguide layer, said refractive grating, and said clad layer, respectively, one end surface of said saturable absorption region serving as an input light receiving end;

whereby an input light received by said saturable absorption region is optically transferred to said wavelength-tunable semiconductor laser portion, which produces an output light whose wavelength is converted to a predetermined value as a function of the proportion of the amounts of electrical currents fed to said injection electrodes.

4,856,006

HIGHER HARMONIC GENERATING DEVICE

Seiki Yano, Kashihara, and Toshiki Hijikata, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 11, 1987, Ser. No. 83,352

Claims priority, application Japan, Aug. 11, 1986, 61-188201

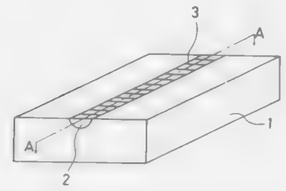
Int. Cl.[4] H01S *3/10*

U.S. Cl. 372—22 **8 Claims**

1. A higher harmonic generating device for developing a higher harmonic laser light corresponding to a first refractive index friom an incident fundamental wave laser light corresponding to a second refractive index comprising:

nonlinear medium means for receiving the incident fundamental wave laser light;

waveguide means disposed within said nonlinear medium means for developing the higher harmonic laser light in response to the incident fundamental wave laser light; and diffraction grating means formed directly in said waveguide means for counterbalancing a difference between the first



refractive index and the second refractive index and wavelength dispersion resulting from said difference, thereby generating matching phases of the higher harmonic laser light and the incident fundamental wave laser light.

4,856,007

AXIAL GAS LASER AND PROCESS FOR STABILIZING ITS OPERATION

Hardy P. Weiss, IM Seeblick 8821, Hutten, Switzerland

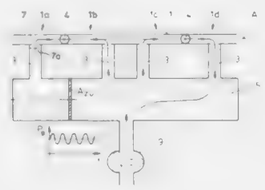
PCT No. PCT/CH87/00031, § 371 Date Dec. 15, 1987, § 102(e) Date Dec. 15, 1987, PCT Pub. No. WO87/05750, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 11, 1987, Ser. No. 138,849

Claims priority, application Switzerland, Mar. 12, 1986, 1014/86

Int. Cl.[4] H01S *3/13*

U.S. Cl. 372—29 **25 Claims**



1. A process of operating a continuous axial gas laser including at least one gas flow tube system through which a gas flows, said gas flow tube system comprising at least one excitation tube along which the flowing gas is electrically excited, and gas flow circulation means connected to said gas flow tube system to generate a gas flow therethrough, said gas flow circulation means generating a gas flow pulsating in time and providing for an output pressure signal which has a predetermined frequency spectrum, said flow tube system having a pressure-versus-frequency damping transmission characteristic between an input from said gas flow circulation means and said excitation tube, the damping of which varies with a frequency of pressure pulsations applied to said input, the process comprising stabilizing the operation of the continuous axial gas laser flow including shifting said predetermined frequency spectrum of said pulsating gas flow generated by said gas flow circulation means with respect to frequency and relative to frequency of said damping transmission characteristic to minimize pressure pulsations transmitted to said excitation tube from said gas flow circulation means.

4,856,008

SEMICONDUCTOR LASER CONTROL APPARATUS

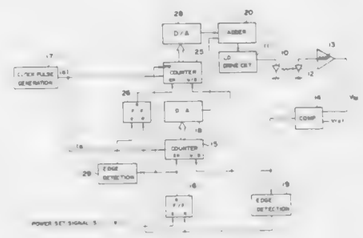
Toshitaka Senma, Yokohama; Tomoatsu Imamura, Isehara, and Kazuyuki Shimada, Chofu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 290,441

Claims priority, application Japan, Dec. 29, 1987, 62-336547; Jan. 22, 1988, 63-10879

Int. Cl.[4] H01S *3/13*

U.S. Cl. 372—31 **12 Claims**



1. A semiconductor laser control apparatus for controlling an intensity of light emitted from a semiconductor laser by controlling a drive current to be supplied to said semiconductor laser, comprising

monitor means for monitoring the intensity of light emitted from said semiconductor laser;

first means for roughly determining a first value of the drive current by using the intensity of light monitored by said monitor means so as to obtain a intensity of light near a desired intensity of light emitted from said laser diode;

second means for precisely determining a second value of the drive current by using the intensity of light monitored by said monitor means so as to obtain the desired intensity of light, after determining the first value of the drive current by said first means; and

adder means for adding said first value of the drive current determined by said first means and said second value of the drive current determined by said second means, the drive current having an added value being supplied to said semiconductor laser.

4,856,009

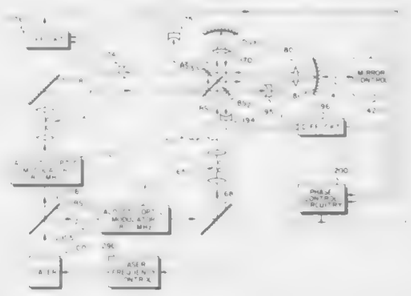
METHOD AND APPARTUS FOR LASER CONTROL

John L. Hall, and Miao Zhu, both of Boulder, Colo., assignors to University Patents, Inc., Westport, Conn.

Filed Jun. 8, 1987, Ser. No. 59,076

Int. Cl.[4] H01S *3/13*

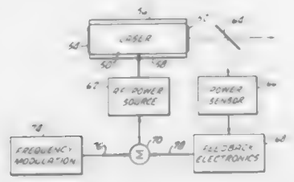
U.S. Cl. 372—32 **23 Claims**



18. Apparatus for controlling the frequency of a laser, comprising:

a laser for generating a laser beam;
means for processing the laser beam to obtain first and second processed beams having periodic time-varying intensities at the same frequency as each other and below the laser frequency, said second beam intensity having a phase difference from the first beam intensity that is a function of the laser frequency;
means for generating a first electrical signal as a function of said first beam intensity and a second electrical signal as a function of said second beam intensity;
means for detecting the phase difference between the first and second electrical signals, and for producing a control signal as a function of the detected phase difference; and
means for controlling the laser frequency with the control signal.

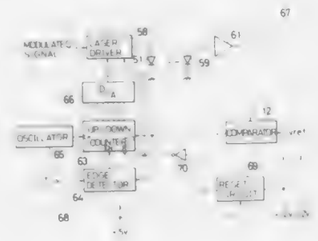
4,856,010
LASER FREQUENCY CONTROL
Charles H. Wissman, and Michael T. Braski, both of Carlsbad, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Jul. 18, 1988, Ser. No. 220,632
Int. Cl.[4] H01S *3/13*
U.S. Cl. 372—32 **15 Claims**



1. A laser comprising:
means for defining a lasing cavity,
a lasing medium in said cavity,
exciting means for applying excitation energy to said lasing medium to produce energy oscillations within said cavity,
output means for transmitting an output energy beam from the cavity at a selected frequency,
power sensing means for sensing variation of the power of said output energy beam and providing a feedback signal indicative of sensed power,
power supply means for supplying an excitation signal to said exciting means, and
frequency control means for varying frequency of said energy oscillations, said frequency control means comprising excitation power control means responsive to said power sensing means for varying magnitude of said excitation signal to thereby vary said selected frequency.

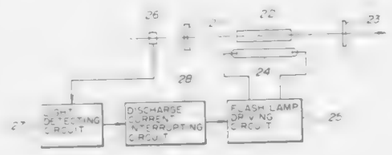
4,856,011
SEMICONDUCTOR LASER CONTROL CIRCUIT
Kazuyuki Shimada, Tokyo, and Isamu Shibata, Fuchu, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Continuation of Ser. No. 102,247, Sep. 28, 1987, abandoned, which is a continuation of Ser. No. 820,947, Jan. 21, 1986. This application Nov. 8, 1988, Ser. No. 270,474
Claims priority, application Japan, Jan. 30, 1985, 60-16013; Jan. 30, 1985, 60-11696[U]
Int. Cl.[4] H01S *3/00, 3/13;* G01J *1/32*
U.S. Cl. 372—38 **6 Claims**

1. A system for controlling the operation of a semiconductor laser, comprising:
a semiconductor laser emitting a laser beam when driven with a driving current;
detecting means for detecting the intensity level of said laser beam emitted from said semiconductor laser;
comparing means for comparing said detected intensity level with a predetermined reference level and supplying an output signal which has either a first or a second state depending on a result of the comparison between the detected and reference levels;
a clock signal generating source supplying clock pulses;
counting means for counting clock signals supplied from said clock signal generating source, said counting means changing a count incrementally or decrementally depending on the state of said output signal from said comparing means;
driving means for driving said semiconductor laser with a driving current whose magnitude is varied depending on said count of said counting means;



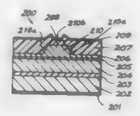
resetting means for resetting said counting means when at least said driving means is powered up;
a power supply which powers said driving means with a first power supply voltage and powers said counting means with a second power supply voltage, wherein said first and second power supply voltages are different; and
disconnecting means for disconnecting the supply of said driving current to said semiconductor laser for a predetermined period of time after power up of the driving means with said first power supply voltage in response to a reset signal supplied from said resetting means.

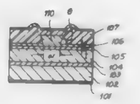
4,856,012
APPARATUS FOR CONTROLLING LIGHT OUTPUT OF A PULSE-EXCITED LASER OSCILLATOR
Hiroo Takenaka, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Aug. 4, 1987, Ser. No. 81,662
Claims priority, application Japan, Aug. 6, 1986, 61-184781
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—38 **4 Claims**



1. An apparatus for controlling light output of a pulse-excited laser oscillator comprising,
means for driving a flash lamp to provide a discharge current therein by applying a driving voltge thereto,
means for detecting an energy level of laser light output and means for comparing said energy level with a predetermined value,
means for producing an interrupting signal when said energy level is equal to said predetermined value, and
means for controlling said means for driving to interrupt the application of said driving voltage to said flash lamp when said interrupting signal is produced , the interruption of said driving voltage interrupting the flow of discharge current in said flash lamp, resulting in the interruption of a laser oscillation.

4,856,013
SEMICONDUCTOR LASER HAVING AN ACTIVE LAYER AND CLADDING LAYER
Hideaki Iwano, and Yoshifumi Tsunekawa, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Oct. 28, 1987, Ser. No. 113,788
Claims priority, application Japan, Oct. 29, 1986, 61-257539; Oct. 29, 1986, 61-257540; Nov. 14, 1986, 61-271404; Dec. 5, 1986, 61-290263; Dec. 5, 1986, 61-290264; Dec. 11, 1986, 61-295197; Feb. 12, 1987, 62-30134; Jul. 7, 1987, 62-169458; Aug. 19, 1987, 62-205602
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **26 Claims**

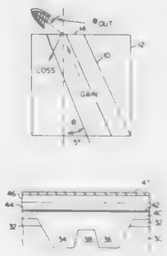




1. A semiconductor laser, comprising:
an active layer;
a cladding layer on the active layer;
a contact layer on the cladding layer;
a second electrode formed below the active layer;
a first electrode formed above the contact layer;
the active layer, cladding layer and contact layer each formed of semiconductors of elements from Groups III–V;
the contact layer and cladding layer formed into an elongated projecting rib, with the cladding layer including a remaining planar portion disposed on the active layer, the rib containing a cavity formed along the widthof the rib along a portion of its length; and
a high resistance film of a semiconductor of elements from Groups II–VI disposed on each side of the rib supported on the remaining cladding layer planar portion.

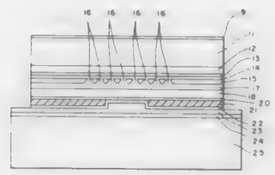
4,856,014
ANGLED STRIPE SUPERLUMINESCENT DIODE
Luis Figueroa, Gainesville, Fla.; Charles B. Morrison, San Pedro, Calif.; Lawrence M. Zinkiewicz, Rancho Palos Verdes, Calif., and Joseph W. Niesen, Los Alamitos, Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed Dec. 31, 1986, Ser. No. 948,177
Int. Cl.[4] H01S *3/19;* H01L *33/00*
U.S. Cl. 372—46 **9 Claims**

1. A superluminescent light-emitting diode device having high power output and high spectral bandwidth, the device comprising:
a semiconductor structure including at least one channel region formed in a semiconductor substrate and filled with a first semiconductor cladding layer of a material having a higher index of refraction than substrate material outside the channel region, to provide lateral index-guiding of light within the channel region, the semiconductor structure also including a second semiconductor cladding layer of opposite conductivity type to the first, an active semiconductor layer at a junction between the first and second semiconductor cladding layers, and at least one emitting facet formed at a channel end; and
means for applying an electrical forward-bias voltage across the junction to produce emission of light;



and wherein the channel is slightly inclined to a direction normal to the facet, to suppress lasing within the device, which can then operated at high powers and a broad spectral width.

4,856,015
SEMICONDUCTOR LASER ARRAY DEVICE
Sadayoshi Matsui, Nara; Mototaka Taneya, Ibaragi; Mitsuhiro Matsumoto, and Hiroyuki Hosoba, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jun. 7, 1988, Ser. No. 203,469
Claims priority, application Japan, Jun. 19, 1987, 62-153843
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—50 **9 Claims**

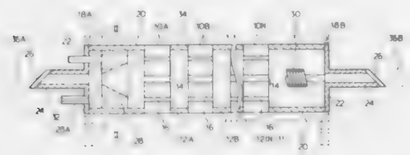


1. In a semiconductor laser array device having a light-emitting area having thereon a plurality of semiconductor laser channels, the improvement wherein said semiconductor laser array device further comprises temperature compensating means having non-uniform thermal conductivity and disposed near said light-emitting area for making the temperature distribution uniform over said plurality of semiconductor laser channels on said light-emitting area.

4,856,016
GAS LASER TUBE HAVING A SLOTTED ANODE
Takashi Kanamoto, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Jul. 31, 1987, Ser. No. 80,326
Claims priority, application Japan, Jul. 31, 1986, 61-117776
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—87 **6 Claims**

2. A gas laser tube comprising an elongated insulative envelope for containing a laser active medium therein, and an anode electrode and a cathode electrode provided in the elongated envelope for an electric discharge therebetween within the envelope, the anode electrode being formed of a metallic disc having a center through hole for allowing passage of a laser beam and for receiving the electric discharge from the cathode, wherein the improvement is that said metal disc anode electrode has an outer side surface in endless contact with an

inner surface of said envelope, said metallic disc anode electrode having a plurality of slots formed in said outer side surface thereof at equal angular intervals to extend from one of opposite end surfaces of said metallic disc anode electrode to the other end surface, each of said slots being inclined with respect to a radius of said metallic disc anode electrode, each of said slots having a depth which does not extend far enough



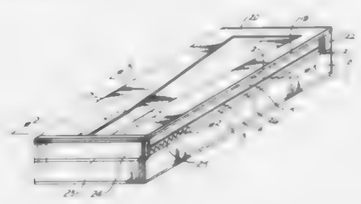
radially to reach said center through hole, and said slots having said depth and a width sufficient to allow said metallic disc anode electrode to thermally expand in a circumferential direction of said metallic disc anode electrode without a substantial increase in the diameter of said metallic disc anode electrode, said increase of diameter narrowing said slots themselves so that said envelope is protected from being destroyed by the radial thermal expansion of said metallic disc anode electrode.

4,856,017

SINGLE FREQUENCY HIGH POWER SEMICONDUCTOR LASER

Jeffrey E. Ungar, Los Angeles, Calif., assignor to Ortel Corporation, Alhambra, Calif.

Filed Dec. 22, 1987, Ser. No. 138,556
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—96 **26 Claims**



1. A semiconductor laser comprising:
an elongated active gain medium layer;
a relatively narrower rear facet at one end of the gain layer;
a relatively wider output facet at the other end of the gain layer;
means adjacent to only the rear facet for pumping a parallel edged portion of the gain layer for stimulated emission of radiation in a mode selecting waveguide portion of the gain layer;
means for pumping a portion of the gain layer between the parallel edged portion and the output facet for stimulated emission of radiation; and
a radiation diffraction grating extending normal to the length of the pumped portion of the gain layer for selecting a single longitudinal mode of laser oscillation.

4,856,018

LIGHT SOURCE FOR REDUCED PROJECTION

Yasuhiro Nozue, Yokohama; Koichi Kajiyama, Hiratsuka; Kaoru Saito, Hiratsuka; Osamu Wakabayashi, Hiratsuka; Masahiko Kowaka, Hiratsuka, and Yasuo Itakura, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 5,226
Claims priority, application Japan, Jan. 22, 1986, 61-11765; Feb. 25, 1986, 61-39455
Int. Cl.[4] H01S *3/03*
U.S. Cl. 372—98 **4 Claims**

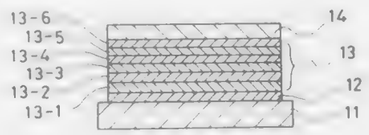
1. A narrow line width excimer laser adapted to be used as a light source for reduced projection, comprising:
a front mirror for outputting an oscillation laser beam, said front mirror having a reflective index of from 1 to 49%;
a rear mirror for reflecting said oscillation laser beam;
a laser chamber provided between said front mirror and said rear mirror, said laser chamber containing KrF gas and means for exciting said KrF gas; and
at least one etalon provided between said laser chamber and said rear mirror, said etalon having an effective diameter sufficiently large for multi-transverse mode oscillation.

4,856,019

REFLECTOR FOR EXCIMER LASER AND EXCIMER LASER APPARATUS USING THE REFLECTOR

Takeo Miyata, Zama, and Takashi Iwabuchi, Sagamihara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 25, 1988, Ser. No. 160,460
Claims priority, application Japan, Feb. 26, 1987, 62-43328
Int. Cl.[4] H01S *3/08*
U.S. Cl. 372—99 **12 Claims**



1. A reflector for an excimer laser comprising:
a substrate made of a material having a high thermal conductivity and a low coefficient of linear expansion,
an aluminium layer formed on one surface of said substrate, and
dielectric multilayers formed on said aluminium layer,
said dielectric multilayers being essentially composed of at least two pairs of a layer of high refractive index material and a layer of low refractive index material, and an optical thickness of each layer except for an outer pair of layers is $\lambda/4$, and an optical thickness of each layer of said outer pair of layers is deviated from $\lambda/4$, and total optical thickness of said outer pair of layers is $\lambda/2$.

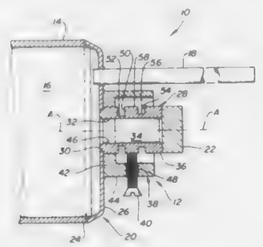
4,856,020

LASER MIRROR ALIGNMENT MECHANISM

Mark V. Ortiz, Mountain View, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Jun. 15, 1988, Ser. No. 206,845
Int. Cl.[4] H01S *3/086*
U.S. Cl. 372—107 **10 Claims**

1. A laser mirror alignment mechanism for a laser having a central axis and a hollow, mirror-supporting member mounted at an end of said laser and generally coaxially along the axis, said alignment mechanism comprising:
an annular member adapted to be mounted on said end of said laser in surrounding and outward radially spaced relation to the mirror-supporting member;
a plurality of adjustment elements mounted to said annular member at circumferentially spaced locations about the mirror-supporting member, said adjustment elements being independently movably adjustable in a radial direction relative to the laser axis toward and away from the mirror-supporting member for selectively applying deformation-inducing contact forces on the mirror-supporting member directed transversely to the laser axis for causing angular deformation of the mirror-supporting member relative to the laser axis to align the mirror mounted on



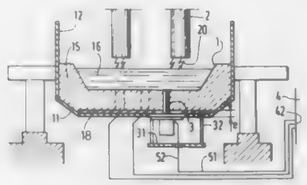
the mirror-supporting member in a desired predetermined relation to the axis;
means defining a first weakened region in said mirror-supporting member for permitting deformation thereof upon selective application of said deformation-inducing contact forces thereto by said adjustment elements; and
means defining a second weakened region in said mirror-supporting member spaced axially outward from said first weakened region for limiting transmission of said deformation-inducing contact forces being applied on said mirror-supporting member to a mirror mounted on said end of said mirror-supporting member opposite from the laser end.

4,856,021

ELECTRIC DIRECT-CURRENT SCRAP-MELTING FURNACE

Robert A. Janiak, Saint-Genest-Malifaux, and Jean G. Davené, Marly le Roi, both of France, assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 30, 1987, Ser. No. 79,361
Claims priority, application France, Aug. 1, 1986, 86 11216
Int. Cl.[4] H05B *7/00*; F27D *1/00*
U.S. Cl. 373—108 **10 Claims**



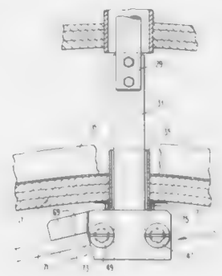
1. An electric direct-current metal-melting furnace comprising
(a) a vessel (1) delimited by a bottom (11), covered with a refractory heath (15), and a sidewall (12), and closed by a removable cover in the form of a vault (13), said vessel containing a batch of raw material;
(b) means for melting said raw material to form a molten-metal bath (26), said means for melting comprising:
(i) at least one consumable vault-electrode (2) mounted for vertical sliding movement through said vault (13) and placed above at least one fixed hearth-electrode (3), which is in contact with said raw material;
(ii) a direct-current source (4) having a negative pole (41) connected to said at least one consumable vault-electrode (2) by means of at least one feed conductor (22), and a positive pole (42) connected to said at least one hearth-electrode (3) by means of at least one return conductor (51);
(iii) said at least one hearth electrode (3) passing through said refractory hearth (15) and said bottom (11) by a passage hole (30) and having a connection with a corresponding return conductor (51);
(iv) said at least one return conductor (51) comprising a horizontal part passing relatively near the bottom (11) of said vessel (1); and
(v) a magnetic screen arranged along the bottom (11) of said vessel (1) and being made of a metal of high relative permeability and covering at least a part of the latter surrounding each connection of said at least one return conductor (51) with said at least one fixed hearth electrode (3) and extending above the horizontal part of said at least one return conductor (51) over a sufficient length to prevent the magnetic field resulting from the passage of current through said horizontal part of said conductor (51) from spreading inside said vessel (1).

4,856,022

GRAPHITE HOT ZONE ASSEMBLY

William R. Jones, P.O. Box 205, Telford, Pa. 18969

Filed Oct. 5, 1988, Ser. No. 253,497
Int. Cl.[4] H05B *3/08*
U.S. Cl. 373—112 **11 Claims**



1. A power terminal assembly for use with a graphite hot zone assembly comprising in combination: graphite block means having length, width, and depth dimensions and formed to have a channel cut at least partially along said depth dimension, said block further formed to have first and second engagable means, having an axial characteristic and respectively disposed on opposite sides of said channel; graphite keeper means formed and disposed to bridge said channel and further formed to have first and second apertures therein, with said first and second apertures respectively disposed to have substantial axially alignment with said first and second engagable means; spacer means formed of molybdenum and having third and fourth apertures formed therein with said third and fourth apertures respectively disposed to be in substantial axial alignment with said first and second apertures; first and second locking means respectively formed to be engagable with said first and second engagable means, said first locking means disposed through said third aperture, and through said first aperture, to be in engagement with said first engagable means, said second locking means disposed through said fourth aperture, and through said second aperture, to be in engagement with said second engagable means, whereby when an electrical energizable rod is located in said channel, electrical current is

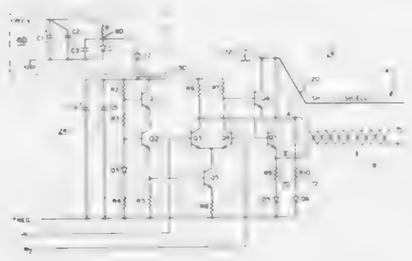
conducted by said block means and whereby said block means can be secured to said electrical energizable rod located in said channel by engaging said first and second locking means with said first and second engagable means.

4,856,023

SYSTEM FOR MAINTAINING LOW BIT ERROR RATE IN A STARCOUPLED NETWORK OF DIRECT COUPLED STATIONS

Amar J. Singh, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Jul. 23, 1986, Ser. No. 888,607
Int. Cl.[4] H04B 3/36; H04L 25/20
U.S. Cl. 375—3 11 Claims



1. In a star-configured communications network having a plurality of terminals, a star coupler, and a plurality of bidirectional communication channels coupled between said star coupler and respective ones of said terminals for transferring data to and from said terminals, each of said channels comprising a shielded cable having a first transmission line for carrying signals from one of said terminals to said star coupler, and a second transmission line for carrying signals from said star coupler to said one terminal, each of said transmission lines comprising a pair of signal wires connected for differential signal transmission between said star coupler and said one terminal, said transmission lines being surrounded by a shield connected to a system ground, each of said terminals comprising differential amplifier means connected to said wires of said first transmission line for transmitting signals on said first transmission line, an improved means for providing noise isolation in said network comprising a first bias voltage source for biasing said differential amplifier means, and means for defining a virtual ground that is at the same potential level as said system ground but is electrically isolated from said system ground, said differential amplifier means connected between said first bias voltage means and said means for defining a virtual ground whereby noise rejection of said star coupler is maintained in the absence of signal transmission from said terminals by isolating said differential amplifier means from said system ground.

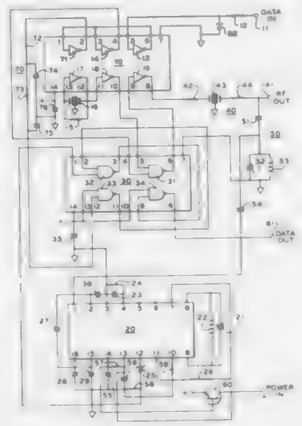
4,856,024

DATA TRANSCEIVING MODEM

George A. Bowman, Lake, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 313,441, Oct. 21, 1981, abandoned, which is a continuation of Ser. No. 53,872, Jul. 2, 1979, abandoned. This application Apr. 16, 1987, Ser. No. 39,830
Int. Cl.[4] H04B 1/54
U.S. Cl. 375—8 18 Claims

1. A modem for transmitting and receiving digital information comprising:
- data input terminal means for receiving digital data to be transitted;
- channel terminal means for supplying modulated digital data signals to a transmission channel;
- an oscillator providing an oscillator output signal;
- switch means connected to said data input terminal means, said oscillator and said channel terminal means for modulating said oscillator output signal and for connecting said modulated digital data signals to said channel terminal means;
- data output terminal means; and,
- receiver means connected to said channel terminal means and to said data output terminal means for demodulating received modulated digital data signals into received digital data and supplying said received digital data to said data output terminal means,



said switch means including blocking means connected to said data input terminal means and to said receiver means, said blocking means including a delay network for delaying, within said modem, input data which has been transmitted by said modem, said delay of said delay network matching the delay of said transmission channel, and said blocking means being responsive to said delayed input data for blocking from said data output terminal means received data which has been transmitted by said modem.

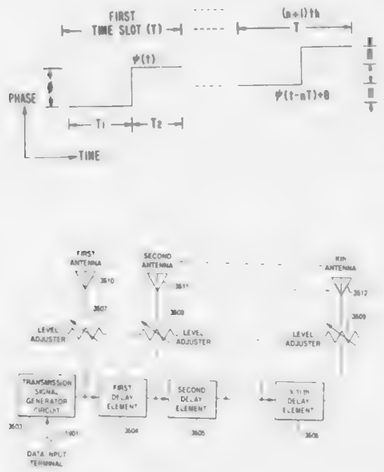
4,856,025

METHOD OF DIGITAL SIGNAL TRANSMISSION

Hitoshi Takai, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 29, 1986, Ser. No. 948,137
Claims priority, application Japan, Dec. 26, 1985, 60-293748; Feb. 20, 1986, 61-35943; Mar. 11, 1986, 61-57221
Int. Cl.[4] H04B 7/02; H04L 27/18
U.S. Cl. 375—40 22 Claims

1. A method of transmitting a digital signal, employing, in a transmission apparatus for transmitting digital data, a transmission signal having phase transition waveforms in respective continuous time slots of data, each phase transition waveform in each of the time slots having a varying rate of change of phase or at least one phase jump, wherein phase transition waveforms in any two time slots which are spaced apart from each other on a time axis by a prescribed number of time slots are identical to each other in shape irrespective of an information to be transmitted, the information to be transmitted being present in a phase difference between the phase transition



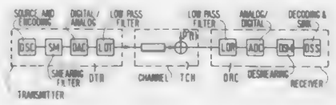
waveforms in any two time slots spaced apart from each other on a time axis by the prescribed number of time slots.

4,856,026

DATA TRANSMISSION SYSTEM COMPRISING SMEARING FILTERS

Johannes W. M. Bergmans; Theodoor A. C. M. Claasen, and Petrus J. Van Gerwen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 13, 1988, Ser. No. 143,914
Claims priority, application Netherlands, Jan. 14, 1987, [redacted]
Int. Cl.[4] H04B 15/00, 27/10
U.S. Cl. 375—58 20 Claims



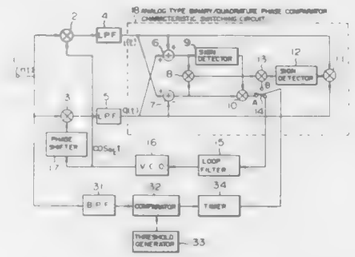
1. A transmission system for transmitting data signals at a given symbol rate 1/T through a channel in which additive pulse-like disturbances occur, which system comprises:
- a. a data transmitter having:
  - a transmit discrete-time smearing filter with a finite impulse response s(i), with $i=0, 1, 2, \ldots, N_s-1$, where N_s represents the length of the impulse response s(i), the impulse response s(i) having non-zero values occurring only at values of i which recur with a period of L, where L is an integer greater than one and is greater than or approximately equal to a ratio L_0 of the symbol rate 1/T to twice a frequency f_m, which frequency f_m is a highest significant frequency of the pulse-like disturbances; and
- b. a data receiver having:
  - a receive discrete-time smearing filter with a finite impulse response d(j) with $j=0, 1, 2, \ldots, N_d-1$, where N_d represents the length of the impulse response d(j), the receive smearing filter being substantially complementary to the transmit smearing filter, the impulse response d(j) assuming only coarsely quantized values, the impulse response d(j) having non-zero values occurring only at values of j which recur with a period of L.

4,856,027

CARRIER RECOVERY PHASE-LOCKED LOOP

Shigeki Nakamura, Kawasaki, and Yasufumi Takahashi, Yokohama, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 24, 1988, Ser. No. 173,652
Claims priority, application Japan, Mar. 24, 1987, 62-68060
Int. Cl.[4] H04L 27/22
U.S. Cl. 375—81 8 Claims



1. A carrier recovery phase-locked loop comprising:
- a voltage controlled oscillator;
- a plurality of mixer means for receiving a digitized quadrature phase shift keying modulated burst wave added with a binary phase shift keying modulated preamble as a heading of said digitized quadrature phase shift keying modulated burst wave and arriving on time division basis and mixing the digitized quadrature phase shift keying modulated burst wave with an output signal of said voltage controlled oscillator;
- first means, responsive to output signals of said plurality of mixer means, for preparing a phase comparison characteristic signal adapted for a binary phase shift keying modulated wave;
- second means, responsive to the output signals of said plurality of mixer means, for preparing a phase comparison characteristic signal adapted for the quadrature phase shift keying modulated burst wave;
- a loop filter that feeds back an output signal of either said first means or said second means to said voltage controlled oscillator; and
- means for selectively supplying the output signals of said first means to said loop filter to establish a phase locked condition with respect to said preamble and upon establishment, supplying the output of said second means to said loop filter.

4,856,028

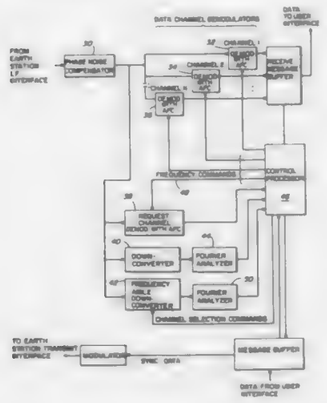
LOW DATA RATE COMMUNICATIONS LINK

Walter C. Scales, Honolulu, Hi., assignor to The MITRE Corporation, Bedford, Mass.

Filed Apr. 25, 1986, Ser. No. 855,678
Int. Cl.[4] H04L 27/06; H04B 1/10
U.S. Cl. 375—97 3 Claims

1. Low data rate communications system comprising:
- a receiver responsive to an electromagnetic radiation signal including a data portion and a pilot signal portion;
- a phase noise compensator connected to receive the electromagnetic radiation signal from the receiver;
- at least one non-scanning Fourier analyzer connected in series to the output of said phase noise compensator to determine the frequency of the signal; and
- at least one demodulator including an automatic frequency

control circuit connected to receive signals from the phase noise compensator and the Fourier analyzer, the signal



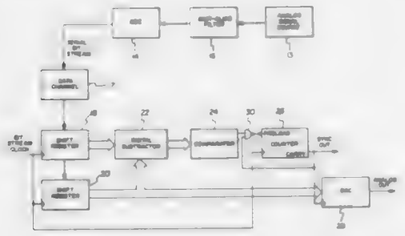
from the analyzer adapted to initialize the automatic frequency control circuit of the demodulator.

4,856,029

TECHNIQUE FOR PROCESSING A DIGITAL SIGNAL HAVING ZERO OVERHEAD SYNC

Daniel J. Geyer, Leucadia, and Ward M. Calaway, Sierra Madre, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 11, 1988, Ser. No. 255,689
Int. Cl.[4] H04L *7/02*
U.S. Cl. 375—110 **4 Claims**



1. Digital signal processing apparatus comprising:

means for providing a serial bit stream digital signal constituted by a succession of words which are each comprised of the same number of bits per word, wherein said digital signal is characterized such that there is no synchronizing bits between successive words to delineate the start and end of each of said words, and such that the change in the value between successive words is not greater than a maximum slew rate limit S;

memory means for storing first and second successive words of said digital signal;

means for subtracting said first and second words to produce a difference signal;

means for comparing said difference signal with said maximum slew rate signal S and for producing a sync signal when said difference signal is not greater than S; and

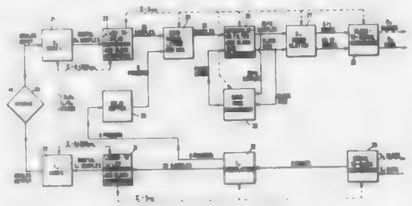
means for shifting the successive words stored in said memory means by one bit when said difference signal is greater than S and for causing said subtracting means and said comparing means to subtract and compare said bit shifted successive words, until, when the difference signal no longer exceeds S, sync is assumed.

4,856,030

APPARATUS AND METHODS OF LOCKING A RECEIVING MODEM TO A TRANSMITTING MODEM EMPLOYING A BURST SIGNAL

John L. Batzer, New Providence, N.J., and Kristine N. Kneib, La Jolla, Calif., assignors to ITT Defense Communications, Nutley, N.J.

Filed Jul. 20, 1988, Ser. No. 221,833
Int. Cl.[4] H04B *7/00*
U.S. Cl. 375—106 **24 Claims**



1. Apparatus for locking a receiving modem to a remote transmitting modem, said receiving modem communicating with said transmitting modem over a communications channel of a given bandwidth for accommodating a given data rate with said transmitting modem providing an analog signal for transmission, which signal is generated by said transmitting modem using a clock for sampling digital data from a data set and converting said data according to said clock into an analog signal, comprising:

receiving means for receiving said analog signal and for converting said signal to a digital signal,

an interpolation filter means responsive to said digital signal for providing a retimed digital output signal, said interpolation filter means having coefficient input means to enable said retimed signal to vary according to selected coefficients,

means coupled to the output of said interpolation filter means and responsive to said retimed signal to provide an error signal at an output indicative of differences in positions of said transmitted analog signal and said retimed signal,

means for applying said error signal to said coefficient input means for varying said retimed signal according to said error signal to lock said retimed signal to said transmitted analog signal.

4,856,031

ADAPTIVE MULTIHARMONIC PHASE JITTER COMPENSATION

Yuri Goldstein, Southbury, Conn., assignor to General Data-Comm, Inc., Middlebury, Conn.

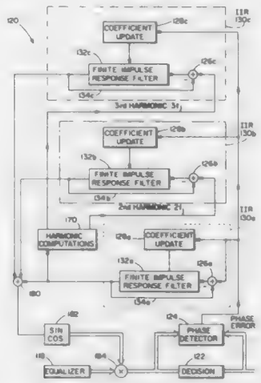
Filed Apr. 28, 1988, Ser. No. 187,285
Int. Cl.[4] H04L *7/00, 25/36*
U.S. Cl. 375—118 **9 Claims**

1. A multiharmonic adaptive phase jitter compensator, comprising:

(a) a primary filter means having an input, a coefficient update means, and an output, wherein said primary filter means is arranged to receive at its input and at its coefficient update means an error signal from a phase detector which compares an equalized phase corrected signal entering a decision means with a signal exiting the decision means, and wherein said primary filter means is arranged to adaptively provide at its output a first jitter signal indicative at least of the fundamental phase jitter frequency of the signal entering the decision means;

(b) harmonic derivation means coupled to the output of said primary filter means for obtaining said jitter signal indicative of said fundamental phase jitter frequency and for providing therefrom at least one adapted signal indicative of at least one higher harmonic of said fundamental phase jitter frequency;

(c) at least one secondary filter means, each secondary filter means having an input, a coefficient update means, and an output, wherein a particular adapted higher harmonic



signal corresponding to a particular secondary filter means is provided to said input thereof, and wherein said error signal is provided to said coefficient update of each secondary filter means; and

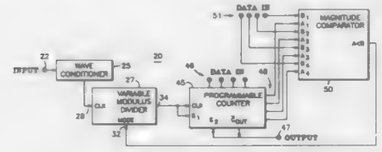
(d) summation means coupled to the outputs of said primary and secondary filter means for summing said outputs thereof and for applying said sum to a multiplier which multiplies functions of said sum with equalized signals to provide phase correction of an equalized signal which is sent to said decision means.

4,856,032

HIGH SPEED PROGRAMMABLE FREQUENCY DIVIDER AND PLL

James E. Klekotka, and David L. Dilley, both of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 12, 1987, Ser. No. 2,474
Int. Cl.[4] H03K *21/00*
U.S. Cl. 377—47 **5 Claims**



1. A high speed programmable frequency divider comprising:

a variable modulus divider having a high frequency signal input, a mode control input, and an output, said variable modulus divider being constructed to switch to a selected one of a plurality of modes in response to a mode control signal on the mode control input and to divide a high frequency signal supplied to the high frequency signal input by a different predetermined number in each of the plurality of modes;

a programmable counter having a signal input connected to the output of said variable modulus divider, a data input for receiving a programming signal to preprogram said programmable counter to a predetermined count, a count output having a signal thereon indicative of an instant count in said programmable counter, and a final count output;

a signal comparator having a first input connected to the count output of said programmable counter, a second input for receiving a signal indicative of a desired instant count, and a mode control signal output connected to the mode control input of said variable modulus divider; and

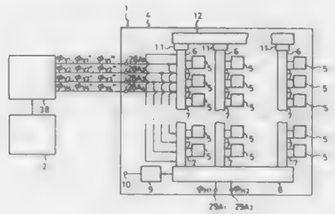
wave conditioning mean having a high frequency signal input and an output connected to the high frequency signal input of the variable modulus divider for converting sinusoidal input signals to emitter coupled logic level signal square waves.

4,856,033

SOLID STATE IMAGER DEVICE WITH EXPOSURE CONTROL WITH NOISE REDUCTION

Isao Hirota, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 3, 1988, Ser. No. 163,865
Claims priority, application Japan, Mar. 6, 1987, 62-51337; Apr. 14, 1987, 62-91418
Int. Cl.[4] G11C *19/28;* **H01L** *29/78;* **H04N** *3/14;* **H03K** *3/42*
U.S. Cl. 377—58 **3 Claims**



3. For use with a solid state imager device having light receiving areas for accumulating charges, during an exposure, means for discharging certain of said charges to a drain region as unnecessary charges, and means for reading out others of said charges to a vertical register section as signal charges, the method comprising the steps of;

after said unnecessary charges have been discharged to said drain region, setting said vertical register section into a high-speed normal-transfer operation by supplying said vertical register section with driving pulses for a high speed normal-transfer operation; and

subsequently reading out said signal charges to said vertical register section.

4,856,034

SEMICONDUCTOR INTEGRATED CIRCUIT

Yoshiaki Takeuchi, and Kaoru Nakagawa, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 27, 1988, Ser. No. 199,914
Claims priority, application Japan, Jun. 3, 1987, 62-139405
Int. Cl.[4] G11C *11/40;* **H03K** *21/02*
U.S. Cl. 377—74 **7 Claims**

1. A semiconductor integrated circuit comprising:

a logic circuit having a first and a second input connected to receive a control clock signal and an input signal, respectively;

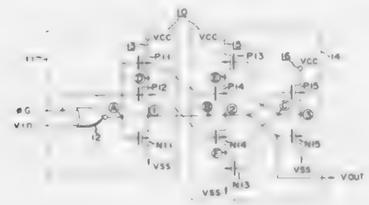
first and second transistors of a first conductivity type connected in series between a first power supply terminal and a first node, said first transistor having a gate connected to receive an output signal of said logic circuit, and said

second transistor having a gate connected to receive the control clock signal;

a third transistor of a second conductivity type connected between said first node and a second power supply terminal and having a gate connected to receive the output signal of said logic circuit;

fourth and fifth transistors of the first conductivity type connected in series between said first power supply terminal and a second node connected to said first node, said fourth transistor having a gate connected to receive the output signal of said logic circuit, and said fifth transistor having a gate connected to a third node;

sixth and seventh transistors of the second conductivity type connected in series between said second power supply



terminal and said second node, said sixth transistor having a gate connected to receive the clock signal, and said seventh transistor having a gate connected to said third node;

an eighth transistor of the first conductivity type connected between said third node and said first power supply terminal and having a gate connected to said second node; and

a ninth transistor of the second conductivity type connected between said third node and said second power supply terminal, and having a gate connected to said second node;

an output signal of said semiconductor integrated circuit being taken from at least one of said second node and said third node.

4,856,035

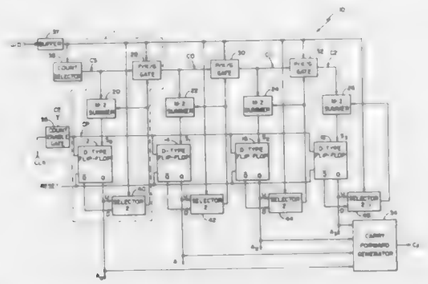
CMOS BINARY UP/DOWN COUNTER

Edward T. Lewis, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 26, 1988, Ser. No. 199,831

Int. Cl.[4] H03K *23/44, 23/52, 23/56*

U.S. Cl. 377—116 **24 Claims**



1. A binary up/down counter having a plurality of sequentially coupled stages, each of said stages comprising:

means for storing a bit of a binary count, said storing means having a data input, a clock input, a first output providing said bit of the binary count and a second output providing a complement signal of said first output;

means having an output coupled to said data input of said storing means for performing a modulo-two sum of a lower order carry signal and said first output or said second output of said storing means in accordance with an up/down mode selection signal;

means coupled to said up/down mode selection signal and said lower order carry signal for determining whether to propagate/kill or propagate/generate a higher order carry signal in accordance with the state of said up/down mode selection signal and said first output or said second output of said storing means in accordance with the state of said up/down mode selection signal; and

means coupled to said first output and said second output of said storing means for selecting whether said first output or said second output of said storing means is coupled to said modulo-two summing means and said higher order carry determining means in accordance with the state of said up/down mode selection signal.

4,856,036

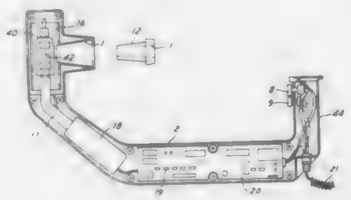
METHOD FOR PRODUCTION OF FLUOROSCOPIC AND RADIOGRAPHIC X-RAY IMAGES AND HAND HELD DIAGNOSTIC APPARATUS INCORPORATING THE SAME

David H. Malcolm, Randolph, N.J., and George P. T. Wilenius, Dunrobin, Canada, assignors to Xi Tech Inc., Randolph, N.J.

Continuation of Ser. No. 863,318, May 15, 1986. This application Jun. 20, 1988, Ser. No. 224,121

Int. Cl.[4] H05G *1/58*

U.S. Cl. 378—116 **8 Claims**



1. Hand portable and readily moveable, light weight and diminutive diagnostic apparatus for the selective provision of either transitory or permanent record visable image of portions of a human body in response to transmission of x-radiation through said body portions comprising

manually manipulable means for supporting a source of x-radiation and either one of two selectable and independently positionable radiation responsive image producing means in a predetermined spaced apart relation not exceeding 50 centimeters, therebetween,

said source of x-radiation consisting of an x-ray tube having a focal spot not exceeding 1 millimeter square in area for emitting a beam of x-rays centered about a predetermined axis,

means for selectively and independently positioning in mutually exclusive relation only one of said two radiation responsive image producing means in said predetermined spatial relation with said source of x-radiation to permit interposition of a selected portion of a human body to be examined therebetween,

said first one of said two independent image producing means including means for converting x-radiation passing through said interposed selected body portion into a transitory fluoroscopic visable image thereof,

said second of said two independent image producing means including an x-radiation responsive cassette containing an unexposed photographic film for converting x-radiation which passes through said interposed body portion and then uninterruptedly impinges onto said cassette for forming a permanent visable and radiation responsive photographic image thereof,

each of said first and second image producing means including independent x-radiation to visable light conversion screen means for producing a viewable transitory fluoroscopic or a permanent photographic image at a resolution level of at least 3.5 line pairs per millimeter,

means responsive to the selected positioning of said first fluoroscopic image producing means in predetermined spatial relation with said radiation source for limiting the x-ray tube electron beam current to a value intermediate 50 microamperes and 300 microamperes, and

means responsive to the selected positioning of said second photographic image producing means in predetermined spatial relation with said radiation source for limiting the x-ray tube electron beam current to a value intermediate 500 microamperes and 3 milliamperes.

4,856,037

ARRANGEMENT FOR EXPOSING SEMICONDUCTOR WAFERS BY MEANS OF A SYNCHROTRON RADIATION IN LITHOGRAPHIC EQUIPMENT

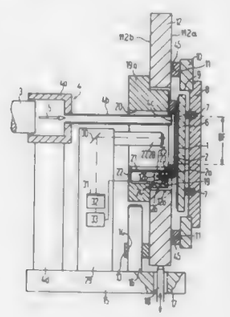
Karl-Heinz Mueller; Hans Betz, both of Berlin; Wilhelm Vach, Hallbergmoos, and Johann Krenner, Berglern, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft; Karl Suess KG GmbH & Co. and Frauenhofer Gesellschaft, all of Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 15, 1987, Ser. No. 73,435

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1986, 3623875

Int. Cl.[4] G21K *5/10*

U.S. Cl. 378—34 **20 Claims**



1. In an apparatus for exposing semiconductor wafers by means of a synchrotron radiation in lithographic equipment, wherein parallel X-rays are guided in a beam feed tube to emerge from a radiation window and impinge on a structured mask and then from the structured mask to a semiconductor wafer to be structured, said apparatus having means for mounting the mask and semiconductor wafer for movement together in a plane perpendicular to the radiation direction in order to sweep an exposure field which is larger than the area of the radiation window and means for adjusting the mask relative to the semiconductor wafer including optical devices for observing alignment adjustment marks on both the mask and wafer to create control signals, for controlling the movement of actuators to create relative movement between the mask and semicondcutor wafer, the improvements comprising the radiation window having a rectangular slot-like configuration, said beam feed tube extending up to adjacent the mask to stationarily arrange the window immediately in front of said mask and said optical devices being stationarily provided next to the beam feed tube and being aligned to a part of the mask lying outside of an X-ray impingement area during a step of adjustment.

4,856,038

DENTAL X-RAY DIAGNOSTICS INSTALLATION FOR PRODUCING PANORAMIC EXPOSURES OF SLICES IN THE SKULL

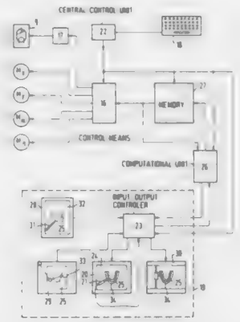
Werner Guenther; Erich Heubeck, and Manfred Muether, all of Bensheim, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 28, 1987, Ser. No. 101,722

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1986, 3632817

Int. Cl.[4] A61B *6/14*

U.S. Cl. 378—39 **10 Claims**



1. In a dental x-ray diagnostics installation for the production of panoramic exposures of slices taken in a skull of a patient particularly those in the region of the jaw, said installation comprising an exposure unit with an x-ray tube being pivotable around an axis and displaceable in a plane extending perpendicular to the axis, a film holder unit lying opposite the exposure unit and movable relative thereto, support means including a head holder arranged between the two units for holding the head in a fixed position, control means for first controlling the pivoting and displacement motion of the exposure unit relative to the head holder of the support means, and for secondly controlling the movement of the film holder relative to the x-ray tube, the control means including input means for selecting a curvature of a slice to be exposed so that the control means can control the various movements in view of the selected curvature the improvements comprising said input means having a graphical input means with means for a human operator to graphically draw the selected curvature of a slice for the shape of the teeth and jaw of a patient as a continuous curved stroke and said graphical input means having means to directly input said graphically drawn selected curvature of a slice to the control means to control the relative movement of the exposure unit to the head holder and the relative movement of the film holder to the x-ray tube.

4,856,039

X-RAY TUBE HAVING A ROTARY ANODE WITH RHENIUM-CONTAINING BEARING SURFACES FOR A GALLIUM-ALLOY LUBRICANT

Cornelius D. Roelandse, and Pieter Hokkeling, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 2, 1987, Ser. No. 57,580

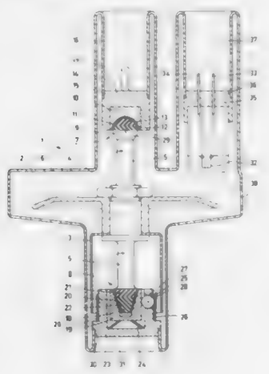
Claims priority, application Netherlands, Jun. 2, 1986, 8601414

Int. Cl.[4] H01J *35/10*

U.S. Cl. 378—133 **4 Claims**

1. In an X-ray tube having a vacuum-tight housing, a rotary anode, a bearing having a first bearing surface on said rotary anode and a second bearing surface in said housing cooperating with said first bearing surface for rotatably supporting said rotary anode in said housing, and a lubricant disposed between

said bearing surfaces comprising Ga for effectively wetting said bearing surfaces and lubricating said bearing, wherein the improvement comprises:



said first and second bearing surfaces consisting of an W-alloy having at least 99% by weight of W and Re, and in which the quantity of Re is between 2% and 27% by weight.

4,856,040

APPARATUS AND METHOD FOR SLIT RADIOGRAPHY WITH DIFFERENT X-RAY ENERGIES

Ronald J. Geluk, Nootdorp, Netherlands, assignor to B.V. Optische Industrie "De Oude Delft", Delft, Netherlands

Continuation of Ser. No. 875,409, Jun. 17, 1986, abandoned.
This application Jun. 28, 1988, Ser. No. 212,530
Claims priority, application Netherlands, Jun. 21, 1985, 8501793
Int. Cl.[4] G21K *5/10*
U.S. Cl. 378—146 **16 Claims**



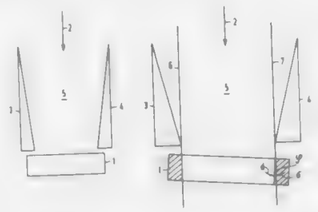
2. An apparatus for slit radiography, which comprises:
an X-ray source;
an X-ray detector means for collecting radiation passing through a body to be radiographed;
a slit diaphragm means positioned between said X-ray source and said body for forming a substantially planar X-ray beam;
a plurality of attenuating elements positioned along said slit diaphragm means forming a plurality of attenuating section;
means for successively scanning said body with planar X-ray beams of increasing hardness;
memory means connected to said X-ray detector means for storing an electric signal responsive to radiation collected on said X-ray detector means respresentative of intensity of said thus collected radiation corresponding to respective attenuating sections during a first scanning of said body by said planar X-ray beam; and
means responsive to said memory means for controlling each of said attenuating elements during a subsequent scanning of said body by said planar X-ray beam of increased hardness if a respective electric signal exceeds a predetermined value at a corresponding instant during a first scanning of said body.

4,856,041

X-RAY DETECTOR SYSTEM

Sigismund Klein, Nuremberg, and Reiner Schulz, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Muncih, Fed. Rep. of Germany

Filed Jun. 25, 1987, Ser. No. 66,213
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1986, 8621546
Int. Cl.[4] G21K *1/02*
U.S. Cl. 378—147 **5 Claims**



1. An x-ray detector system for use with a source of x-radiation, said detector system comprising:
two spaced collimator plates defining a collimator shaft having a width therebetween in which said x-radiation propagates from a distal end toward a proximate end of said shaft;
a detector element disposed adjacent said proximate end of said shaft with respect to said collimator plates, said detector element having two spaced edges respectively disposed behind said collimator plates such that at least a portion of a surface of said detector element facing said collimator plates is shielded from radiation by said plates with a remainder of said detector element exposed to radiation; and
each of said plates having a thickness projection on said surface of said detector element at said edges which varies along a length of each plate in the direction of propagation of said radiation from a smallest projection at said distal end to a largest projection at said proximate end so that said shaft has a largest width at said distal end and a smallest width at said proximate end.

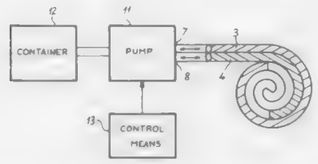
4,856,042

DIAPHRAGM FOR ELECTROMAGNET RADIATION BEAM AND ITS USE IN A COLLIMATION DEVICE FOR THIS BEAM

Alain Staron, Paris; Christian Claudepierre, Athis-Mons; Francois Micheron, Gif sur Yvette, and Edmond Chambron, Gonesse, all of France, assignors to Thomson-CGR, Paris, France

Filed Jul. 8, 1987, Ser. No. 70,938
Claims priority, application France, Jul. 8, 1986, 86 09895
Int. Cl.[4] G21K *1/04*
U.S. Cl. 378—147 **10 Claims**

1. A diaphragm for electromagnetic radiation beams, comprising:
at least one chamber in which flows a radiation-beam-attenuating deformable material;
said at least one chamber being shaped so that said deformable material can be introduced from outside said at least one chamber and so that inside said at least one chamber said deformable material can surround a zone of passage of a radiation beam in such a way that the area of the zone of passage varies continuously with the volume of said deformable material in said at least one chamber; and



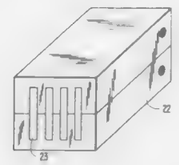
wherein said at least one chamber comprises a first duct wound on itself in the shape of a spiral.

4,856,043

TWO PIECE CERAMIC SOLLER SLIT COLLIMATOR FOR X-RAY COLLIMATION

John J. Zola, Ramsey, N.J., assignor to North American Philips Corporation, New York, N.Y.

Filed Jul. 18, 1988, Ser. No. 220,775
Int. Cl.[4] G21K *1/02*
U.S. Cl. 378—149 **12 Claims**



1. A method of producing a Soller slit collimator for use in X-ray analysis, said method comprising
(a) forming a plurality of narrow grooves perpendicular to two parallel surfaces of two rectangular ceramic blocks of essentially identical configuration and composition and capable of absorbing X-radiation each of said grooves being separated from each other by a blade, each of said ceramic blocks being provided with upper and lower wall portions parallel to said grooves,
(b) positioning said resultant grooved ceramic blocks in a facing relationship with each other so that corresponding surfaces of the upper and lower wall portions and corresponding blades of said ceramic blocks are in mutual contact and in an essentially parallel relationship with each other and
(c) adhesively binding together said ceramic block along the corresponding surfaces of top and bottom wall portions of said ceramic blocks.

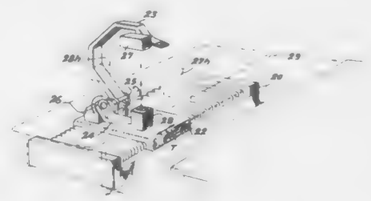
4,856,044

APPARATUS FOR THE DETERMINATION OF THE OSSEOUS MINERAL CONTENT

Jean-Claude Tanguy, Athis Mons; Domonique Chambellan, Versailles, and Raymond Pommet, Les Essarts Le Roi, all of France, assignors to Commissaruat A L'Energie Atomique, Paris, France

Filed Jul. 17, 1987, Ser. No. 75,048
Claims priority, application France, Jul. 18, 1986, 86 10492
Int. Cl.[4] H05G *1/02*
U.S. Cl. 378—198 **11 Claims**

1. Apparatus for the determination of the osseous mineral content of a patient by partial absorption of ionizing rays, comprising a block constituted by a source of ionizing rays and another block constituted by a radiation detector, the source and the detector facing one another during observations of a patient and the patient being then between the source and the detector, wherein one of the blocks is articulated on a first arm about an axis directed in a first direction, the first arm being articulated on a support about an axis directed in the first direction, the other block being secured to a second arm articulated on the support about another axis perpendicular to the first direction.

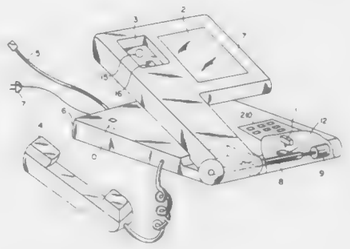


4,856,045

DISPLAY TERMINAL FOR A VIDEOPHONE

Yuichiro Hoshina, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 8, 1988, Ser. No. 241,894
Claims priority, application Japan, Sep. 8, 1987, 62-223066
Int. Cl.[4] H04M *11/00*; H04N *7/14*
U.S. Cl. 379—53 **19 Claims**



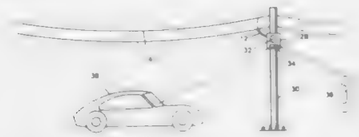
7. A videophone comprising:
a base section including a telephone unit connected to detect a ringing signal;
a movable section having an image display section and being movably mounted on the base section, the movable section being movable between a resting position and a raised position;
a hand set wired to the telephone unit and having an on-hook state and an off-hook state; and
means for moving the movable section to the raised position when the hand set enters the off-hook state or when a ringing signal is detected and for moving the movable section to the resting position when the hand set enters the on-hook state and no ringing signal is detected.

4,856,046

REMOTE PUBLIC TELEPHONE LINK

Donald A. Streck, 832 Country Dr., Ojai, Calif. 93023, and Jerry R. Iggulden, 21600 Cleardale St., Newhall, Calif. 91321, assignors to Jerry R. Iggulden, Santa Clarita and Donald A. Streck, Ojai, both of, Calif., a part interest

Filed Apr. 8, 1988, Ser. No. 179,661
Int. Cl.[4] H04Q 7/04
U.S. Cl. 379—56 28 Claims



1. Apparatus for permitting remote access by telephone devices to a public telephone line comprising:

(a) public telephone access module means for receiving remote telephone transmissions and for connecting them to the public telephone line, said public telephone access module means including visible indicia of its presence and location and first interface module means for wirelessly transmitting and receiving telephone communications by means of a beam of infrared energy;

(b) remote telephone interface means operably connected to a telephone device for interfacing between said telephone device and said public telephone access module means including second interface module means for transmitting and receiving telephone communications by means of said beam of infrared energy; and,

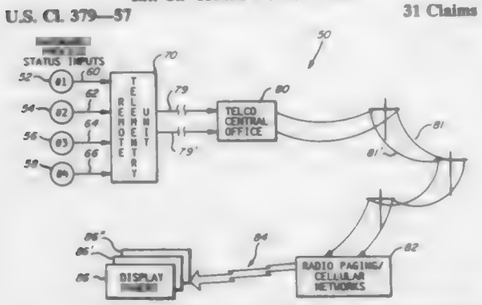
(c) interference prevention means disposed in a communication path for said beam of infrared energy between said first interface module means and said second interface module means for preventing more than one said second interface module means from making a connection to the public telephone line through said first interface module means at a time.

4,856,047

AUTOMATED REMOTE TELEMETRY PAGING SYSTEM

James R. Saunders, Humble, Tex., assignor to BD Systems, Inc., Humble, Tex.

Filed Apr. 29, 1987, Ser. No. 44,511
Int. Cl.[4] H04M 11/00, 11/04
U.S. Cl. 379—57 31 Claims



1. In an automated telemetry paging system for providing remote pager notification of deviations in selected operating parameters measured at a specific site location wherein indication of each of the selected parameters and the unacceptable deviation therefrom is provided in the form of a plurality of electrical status signals each representative of one of the selected parameters, telephone company line connections to telephone central switching equipment for dialing selected telephone numbers is provided at the site location, and pager network communications equipment is provided that is in communication with the telephone central switching equipment and in communication with a plurality of paging devices, a remote telemetry unit located at the site location comprising

a programmed microprocessor including

data input/output means,

memory means,

a central processing unit (CPU), and

a real time clock,

status signal receiving means for receiving and isolating the received electrical status signals, said receiving means isolating said received signals for eliminating short duty-cycle over-voltage signals and shaping said received signals into digital signals representative of said received status signals, said digital signals applied as inputs to said input/output means,

interrogation means controlled by said CPU and cooperating with said real time clock for continuously scanning said digital status signals applied to said input/output means at a predetermined rate,

discrimination means controlled by said CPU for reading and comparing said digital status signals applied to said input/output means against a current status signal reference stored in said memory means and in response to detecting a deviation therefrom initiating a time delay prior to again reading and comparing said digital status signals against said current status signal reference, and if said second comparison after said time delay detects a deviation from said reference signalling said CPU of the presence of a valid status signal indicating an unacceptable parameter deviation,

formatting means controlled by said CPU for reading said digital status signals, correlating said digital signals with a message table preprogrammed into said memory means and converting said digital status signals appearing at said input/output means into a digital status message of a preselected format that is representative of the identification of the specific site location and successive codes indicating the parameters that have reached an unacceptable deviation,

digital to multiple frequency (DTMF) conversion means for converting said digital status message generated by said formatting means to audio frequency signals for transmission over the telephone lines to said paging network equipment,

and

telephone interface means for interfacing between said DTMF conversion means and the telephone company line interconnected to the telephone central switching equipment for applying audio frequency telephone signals to the telephone lines for application to said telephone central switching equipment and the pager network equipment,

wherein said CPU in response to said formatted digital status message reads digital signals stored in said memory means representative of a preselected number of pager telephone numbers and applies said digital signals in serial order to said DTMF conversion means for converting said signals representative of said pager telephone numbers to audio frequency signals for application through said telephone interface means and the telephone central switching equipment directly to the paging network equipment for automatically and sequentially dialing said preselected pager telephone numbers, and

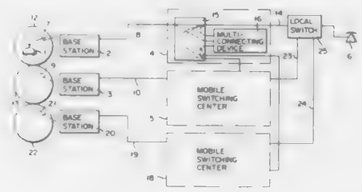
wherein said CPU further applies said digital status message in serial order to said DTMF conversion means for converting said digital signals to audio frequency signals for transmission over the telephone lines to the pager network equipment for broadcast to the paging devices for alphanumeric display and said digital status message therein in said preselected message format.

4,856,048

MOBILE COMMUNICATION SYSTEM

Koji Yamamoto; Akihisa Nakajima, both of Tokyo; Hiroshi Sawada, Iruma; Noriteru Shinagawa, Tokorozawa, and Jiro Itano, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 162,062
Claims priority, application Japan, Mar. 2, 1987, 62-46963
Int. Cl.[4] H04Q 7/04
U.S. Cl. 379—60 9 Claims



1. A method of switching a radio speech channel during communication in a mobile communication system comprising a plurality of mobile switching centers for accommodating through respective networks a plurality of base stations each having an independent radio zone area, said mobile switching centers being connected to each other through a wire speech path and to a telephone through a wire speech path; a mobile station connectable to each of said base stations through a radio speech channel; and multi-connecting means included in said mobile switching center for multi-connecting, during communication of the mobile station, a wire speech between the mobile switching center and an old or first base station left by the mobile station during communication, a wire speech path over which the said mobile switching center is to be coupled to a new or destination base station through a destination mobile switching center, and a wire speech path between the mobile switching center and the telephone; the method comprising:

detecting by said mobile switching centers when said mobile station moves across adjacent radio zone areas of two base stations during communication, a radio speech channel in the destination radio zone area through the destination base station as a channel change;

multi-connecting by said multi-connecting means in the first mobile switching center a wire speech path between said first mobile switching center and the old base station and a wire speech path over which the said first mobile switching center is to be coupled to the new base station through a second mobile switching center and the new base station and wire speech path between the mobile switching center and the telephone after the detection of the radio speech channel as handover; and

switching the radio speech channel to be used by said mobile station from the radio speech channel in the old zone area to the radio speech channel in the new zone area while keeping the communication condition of said mobile station.

4,856,049

SINGLE LINE COMPATIBLE FAX SYSTEM

Donald A. Streck, Ojai, Calif., assignor to Jerry R. Iggulden, Newhall, Calif., a part interest

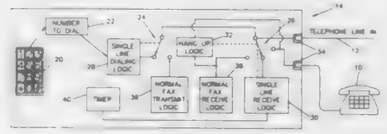
Filed Mar. 18, 1988, Ser. No. 170,380
Int. Cl.[4] H04M 1/65, 11/00
U.S. Cl. 379—67 24 Claims

22. Switching apparatus for answering an incoming call from a single telephone line which includes a first and a second pair of conductors with an active telephone tip and ring connected to said first pair of conductors and for automatically switching the call between a telephone and a carrier signal-based device as appropriate comprising:

(a) switch means for switching telephone line connected thereto between first and second output positions thereof, said switch means having a pair of first conductors connected to said first output position thereof and a pair of second conductors connected to said second output position thereof, the carrier signal-based device being connected to said second output position thereof through said pair of second conductors;

(b) branching means for operably connecting tip and ring wires of the telephone to said first output position through said pair of first conductors; and,

(c) first logic means having an output operably connected to switch said switch means between said first and second output positions for answering an incoming call on said telephone line, for determining whether said incoming call is from a carrier signal-based device, for switching said switch means to connect said first output position when an incoming call from a non-carrier signal-based device is detected, and for switching said switch means to connect said second output position when an incoming call from a carrier signal-based device is detected.

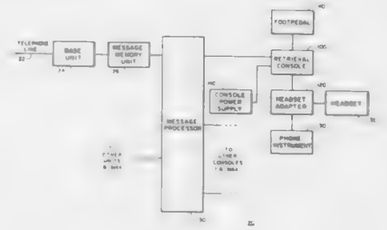


4,856,050

TELEPHONE MESSAGE RETRIEVAL SYSTEM WITH IMPROVED MESSAGE PROCESSOR AND RETRIEVAL CONSOLE INCLUDING AUTO-DISABLING PLAYBACK SWITCH

Peter F. Theis, 3203 Bay View La., McHenry, Ill. 60050, and Gregory Buchberger, 500 Huntington Commons Rd., Mt. Prospect, Ill. 60056

Division of Ser. No. 574,880, Jan. 30, 1984, Pat. No. 4,719,647.
This application Sep. 17, 1987, Ser. No. 98,017
Int. Cl.[4] H04M 1/64
U.S. Cl. 379—68 3 Claims



1. In a message retrieval system of the type comprising a plurality of telephone answering machines and a plurality of message memory units coupled to the answering machines, each of the message memory units including means for storing a plurality of messages, the improvement comprising:

at least one retrieval console coupled to the message memory units to permit an operator at the retrieval console to audit messages stored on the message memory units, said retrieval console comprising at least one forward switch operative to generate a playback command to cause a selected one of the message memory units to playback a stored message in a forward direction;

means for preventing a single activation of the forward switch from causing the selected one of the message memory units from playing back a stored message for more than a first preselected time interval; and

means, responsive to a subsequent activation of the forward switch, for causing the selected one of the message memory units to resume playback of any remaining portion of said stored message.

4,856,051

AUTOMATIC TELEPHONE ANSWERING APPARATUS

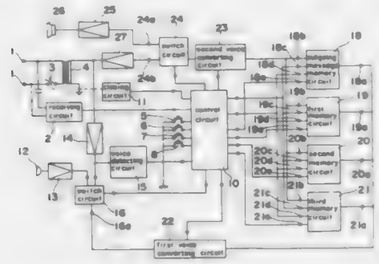
Isao Ohtawara, Ohra, and Satoshi Ohgochi, Ohta, both of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Jun. 9, 1987, Ser. No. 60,108

Claims priority, application Japan, Jun. 10, 1986, 61-134211; Jun. 10, 1986, 61-134212; Jun. 10, 1986, 61-134213; Jun. 11, 1986, 61-135430; Jun. 12, 1986, 61-136829

Int. Cl.[4] H04M *1/64*

U.S. Cl. 379—88 9 Claims



1. An automatic telephone answering apparatus for use in the absence of a receiver, comprising, in combination,

a first voice converting circuit for converting an analog voice input signal into a digital signal,

an outgoing message memory circuit for receiving and storing a digital signal of an outgoing message converted by the first voice converting circuit,

an incoming message circuit for receiving and storing a digital signal of an incoming message converted by said first voice converting circuit when receiving an incoming message,

a second voice converting circuit for receiving and converting the digital signals stored in the outgoing message memory circuit and the incoming message memory circuit into analog voice signals,

a ringing receiving means for detecting a ringing signal coming from a telephone line, said ringing receiving means producing a detection signal,

switch means including a plurality of switches for selecting respective operation modes such as recording, reproducing and erasing, and

a control circuit for controlling operations of the first voice converting circuit, the second voice converting circuit, the outgoing message memory circuit and the incoming message memory circuit upon receiving the detection signal of the ringing receiving means in accordance with the operation modes selected with the switch means,

said switch means including a call recording switch operating so that as a call operation is going on through the telephone line, a plurality of incoming message memory circuits are brought into a state of being ready for use in succession so as to enable a call recording for a long time.

4,856,052

APPARATUS HAVING A DIAL CALLING FUNCTION AND OPERABLE TO IDENTIFY PICTURE IMAGE SIGNALS NOT YET TRANSMITTED TO A CALLED SELECTED DESTINATION PARTY

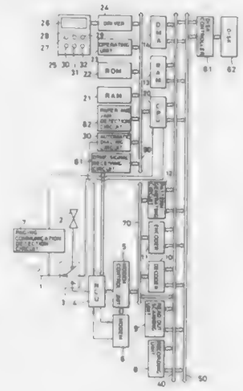
Yoshihiro Hirata, Koganei, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 128,440, Dec. 3, 1987, abandoned, which is a division of Ser. No. 812,465, Dec. 23, 1985, abandoned. This application Sep. 2, 1988, Ser. No. 240,440

Claims priority, application Japan, Dec. 21, 1984, 59-268400; Dec. 21, 1984, 59-270463; Dec. 21, 1984, 59-270468

Int. Cl.[4] H04N *1/32*

U.S. Cl. 379—100 2 Claims



1. An apparatus having a dial calling function comprising:

dial means for performing a calling operation from a calling party to a destination party selected to be called;

accumulation means for accumulating and storing picture image signals to be transmitted to a selected destination party;

means for transmitting to a selected destination party called, in accordance with the calling operation performed by said dial means, the picture signals stored in said accumulation means;

administration data forming means for forming administration data concerning transmission of the picture image signals stored in said accumulation means to a selected destination party;

printing means; and

means, responsive to the condition that all of the picture image signals stored in the accumulation means are not transmitted to a selected destination party called by a calling party in accordance with the calling operation, for causing the printing means to print the administrative data and at least part of the picture image signals which have not been transmitted during the calling operation, to identify picture image signals which have not yet been transmitted to a called selected destination party.

4,856,053

TELEPHONE TERMINAL EQUIPMENT HAVING MEANS FOR PREVENTING MALICIOUS AND NUISANCE TRANSMISSION

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Apr. 29, 1988, Ser. No. 187,940

Claims priority, application Japan, May 6, 1987, 62-109987

Int. Cl.[4] H04N *1/00, 1/32*

U.S. Cl. 379—96 7 Claims

1. Telephone terminal equipment having means for preventing malicious and nuisance transmission to a data reception apparatus, comprising:

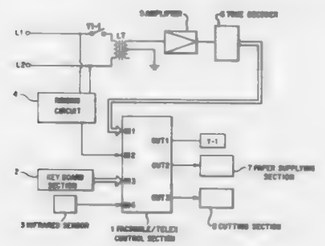
a paper roll containing papers on which incoming data to the equipment are recorded;

sensor means for detecting whether or not any person is present around said telephone terminal equipment during reception of an incoming call at said equipment;

means responsive to said sensor means for receiving information sent by a calling party during the incoming call without any limit on the number of papers onto which said data are recorded when any person is present around said telephone terminal equipment;

limit means responsive to said sensing means for limiting the number of papers onto which said data are recorded during the incoming call when no person is present around said telephone terminal equipment; and

means for adjusting variably said limit means in response to a control signal sent to the equipment by telephone from a remote location.



4,856,054

METER READER

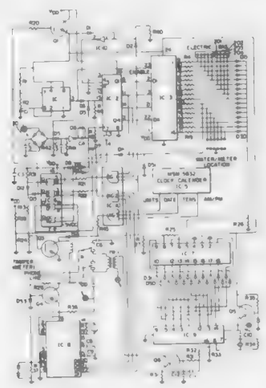
William V. Smith, Memphis, Tenn., assignor to Lectrolarm Custom Systems, Inc., Memphis, Tenn.

Continuation of Ser. No. 758,693, Jul. 25, 1985, Pat. No. 4,720,851. This application Jan. 11, 1988, Ser. No. 141,943

The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.

Int. Cl.[4] H04M *11/00*

U.S. Cl. 379—107 34 Claims



1. A method of remotely reading at least one utility meter of a subscriber using telephone communication lines, comprising the steps of:

dialing the telephone number of said subscriber;

detecting the occurrence of a predetermined number of ring signals at the subscriber location;

transmitting one of a plurality of coded tones to circuitry connected in parallel across the subscriber's telephone communication line;

detecting if said one of a plurality of transmitted tones matches a predetermined tone after detecting the occurrence of a predetermined number of ring signals;

sequentially reading voltages corresponding to the consumption recorded by said at least one utility meter upon detecting that said one of a plurality of transmitted tones matches the predetermined tone;

converting each of said sequentially read voltages to one of a plurality of standard DTMF tones each representing a number from 0 to 9; and

transmitting said sequentially read voltages over said subscriber's telephone communication line.

4,856,055

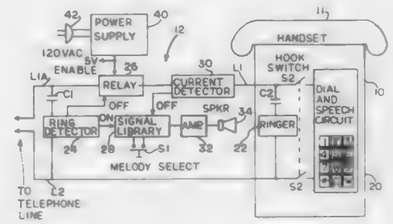
CONTROLLABLE TELEPHONE ANNUNCIATOR

Nira Schwartz, 1225-376 Vienna Dr., Sunnyvale, Calif. 94089

Filed Jul. 25, 1988, Ser. No. 224,070

Int. Cl.[4] H04M *11/02*

U.S. Cl. 379—374 17 Claims



1. A controllable telephone call annunciator, comprising:

signal library means for storing a plurality of different call-announcing signals and supplying, upon activation, a selected one of said signals,

output means for receiving the signals supplied by said signal library means and providing a humanly-sensible output in response to each signal,

connecting means for connecting said library means and said output means to a telephone containing a ringer,

disabling means for disabling said ringer of said telephone and activating said library means in response to a ring signal being received by said telephone, and

incoming signal detector means for receiving an incoming signal on a line to said telephone and selecting a particular one of the signals stored in said signal library means in response to said incoming signal.

4,856,056

APPARATUS FOR TIMELY CONTROLLING THE SOUND CHARACTERISTIC OF A SIGNALING MEANS OF A VOICE COMMUNICATION DEVICE

Kou-I Yeh, Taipei, Taiwan, assignor to Inventa Electronics Co., Ltd., Taipei, Taiwan

Continuation-in-part of Ser. No. 690,720, Jan. 10, 1985, Pat. No. 4,644,106. This application Jun. 18, 1987, Ser. No. 65,204

The portion of the term of this patent subsequent to Feb. 17, 2004, has been disclaimed.

Int. Cl.[4] H04M *1/21*

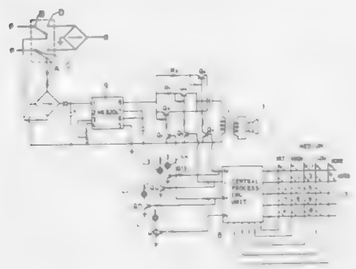
U.S. Cl. 379—375 4 Claims

1. An apparatus for timely controlling a sound characteristic of a signaling means of a voice communication device having an input section for controlling the ringing volume condition of a telephone comprising:

a circuitry of controller coupled to the input section and the signaling means;

a setting means capable of generating at least two sets of time setting signals and sound characteristic setting signals;

a controlling means coupled to said setting means and said circuitry of controller for receiving and storing said sets of time setting signals and sound characteristic setting signals from said setting means, so that when a calling signal is transmitted to said circuitry of controller through said input section, said controlling means actuates said signalling means to produce a signaling sound having a desired sound characteristic, the desired sound characteristic of the signaling sound being predetermined by said sets of time setting signals and sound characteristic setting signals



and sound characteristic setting signals stored in said controlling means;

wherein said circuitry of controller comprises at least one set of transistors coupled to said input section, said controlling means, and said signalling means, said controlling means respectively controlling said transistors and turning one of said transistors on in accordance with said stored sets of time and sound characteristic setting signals, each of said transistors being connected with a respectively different resistance for attenuating said calling signal from said input section in different degrees, so that said signaling means will be actuated by an attenuated signal from said turned-on transistor to produce a signaling sound having the desired sound characteristic.

4,856,057

APPARATUS IN A LOUDSPEAKING TELEPHONE SET FOR SUPPLYING POWER TO AN AMPLIFIER CONNECTED TO THE LOUDSPEAKER

Lars A. Smith, Kista, and Bengt O. Berg, Solna, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE87/00582, § 371 Date Jun. 21, 1988, § 102(e) Date Jun. 21, 1988, PCT Pub. No. WO88/04502, PCT Pub. Date Jun. 16, 1988

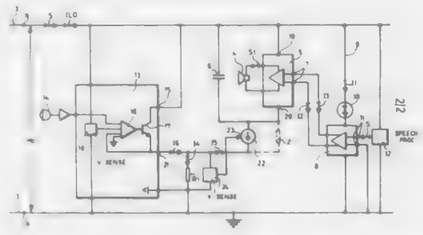
PCT Filed Dec. 8, 1987, Ser. No. 209,623

Claims priority, application Sweden, Dec. 9, 1986, 8605276

Int. Cl.⁴ H04M *1/60*

U.S. Cl. 379—388 **5 Claims**

1. Apparatus in a loudspeaker telephone set for supplying power to an amplifier connected to the loudspeaker, said telephone set being DC fed by a line current via its subscriber line and provided with a speech circuit having electronic semiconductor circuits, the receiver and microphone of the telephone set being connected to the speech circuit, which also has a voltage sensing circuit connected to the subscriber line for sensing a line voltage across it, as well as an amplifier means connected via a first impedance to the subscriber line said amplifier means maintaining a current through the first impedance at a constant value responsive to the line voltage, characterized in that the loudspeaker amplifier (5) is connected to a reservoir capacitor (6) which can supply the amplifier (5) with power, and in that the reservoir capacitor (6) is connected to the first impedance (R1) in the amplifier means (16, 17) of the speech circuit (13), the constant current (I4) through said



first impedance (R1) being the sum of a current (I6) through the amplifier means (16, 17) of the speech circuit (13) and a current (I5) through the reservoir capacitor (6) and the loudspeaker amplifier (5).

4,856,058

OFFICE LINE INTERFACE CIRCUITS

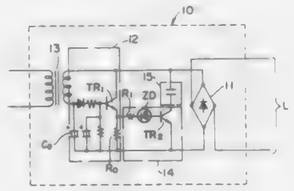
Yasuji Sato, Hachioji, and Fumio Hino, Tama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

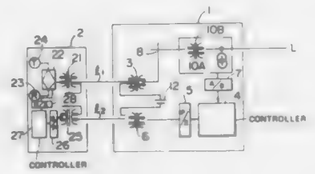
Continuation of Ser. No. 780,817, Sep. 27, 1985, abandoned. This application Apr. 27, 1988, Ser. No. 188,101

Claims priority, application Japan, Sep. 28, 1984, 59-204686

Int. Cl.⁴ H04M *7/00*

U.S. Cl. 379—394 **5 Claims**





1. An office line interface circuit for interfacing an office line with a telephone set having a receiver, a transmitter, and a sidetone preventing circuit connected between said receiver and said transmitter, the office line interface circuit comprising:

direct current circuit means, coupled to said office line, for extracting a direct current signal component flowing through said office line;

alternating current circuit means, coupled to said office line, for extracting an alternating current signal component from said office line current and for providing the extracted alternating current signal component to said receiver of said telephone set;

an impedance circuit switchably connected to said office line and coupled to said direct current circuit means;

switching circuit means, coupled to said direct current circuit means, for performing switching operations to connect said impedance circuit to said office line when said direct current signal component extracted by said direct current circuit means exceeds a predetermined level to maintain at a substantially constant value an impedance, as viewed from said telephone set, of said office line;

amplifier means, coupled to said alternating current circuit means, for amplifying said alternating current signal component extracted by said alternating current circuit means and for providing said amplified alternating current signal to said receiver of the telephone set;

detecting means, coupled to said direct current circuit means, for detecting the level of the direct current signal component extracted by said direct current circuit means; and

control means, coupled to said detecting means and to said amplifier means, for controlling the gain of said amplifier means in accordance with the output of said detecting means.

4,856,059

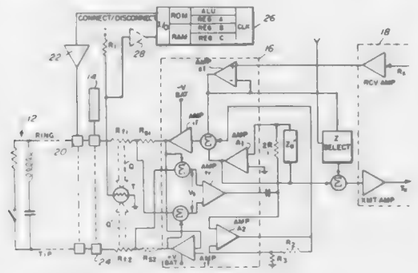
SEMICONDUCTOR SUBSCRIBER LINE INTERFACE CIRCUIT WITH ENHANCED SURVIVABILITY

Walter A. Halbig, Huntsville, Ala., assignor to ITEC, Inc., Huntsville, Ala.

Filed Nov. 13, 1987, Ser. No. 120,067

Int. Cl.⁴ H04M *1/74*

U.S. Cl. 379—412 **32 Claims**



1. An improved telephone subscriber line interface circuit, comprising:

means for effecting a connection interface with a subscriber loop of the type having a subscriber station in circuit with ring and tip lines and including an amplifier for driving the ring line, an amplifier for driving the tip line, and an amplifier for accepting a signal representative of the current in the subscriber loop; and

resistive network means in circuit in the ring and tip lines to provide a signal to the third-mentioned amplifier and including first and second series connected resistors in the ring line and first and second series connected resistors in the tip line, the resistance of the second resistors greater than that of the first resistors by a factor K, where K is greater than 1.5.

4,856,060

SOLID STATE TELEPHONE PROTECTOR MODULE

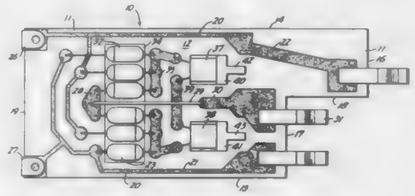
Carl Meyerhoefer, Dix Hills, and Helmuth Neuwirth, Garden City, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Aug. 1, 1988, Ser. No. 227,079

Int. Cl.⁴ H02H *3/22*

U.S. Cl. 379—412 **3 Claims**

1. An improved solid state protector module for use with laminar type connector blocks for protecting an individual subscriber circuit, said module comprising: a generally planar insulated base having a pair of through openings extending between first and second oppositely disposed surfaces thereof, a printed circuit on one of said first and second surfaces; tip, ring and ground contacts extending outwardly of said base at one end thereof and communicating with said printed circuit; a pair of solid state integrated protector elements positioned within said through openings and electrically communicating with said printed circuit, said units being heat responsive to current overloads; a shorting spring interconnected at a medial point to said base to conduct to said ground contact having end portions overlying contacts communicating with said tip and



ring contacts; a pair of fusable solder preforms each having an angularly positioned camming surface thereon positioned beneath each end portion of said shorting spring and within a through opening wherein said camming surface contacts an edge of a respective opening and is urged against a surface of a protector circuit for the transmission of heat thereto; whereby upon the occurrence of an overload current within said protector circuits, heat generated by said protective circuit causes said solder preforms to fuse and allow said shorting spring to contact said contacts communicating with said tip and ring contacts to ground the protected subscriber circuit.

4,856,061

METHOD FOR CRYPTOGRAPHIC TRANSMISSION OF SPEECH SIGNALS AND A COMMUNICATION STATION FOR PERFORMING THE METHOD

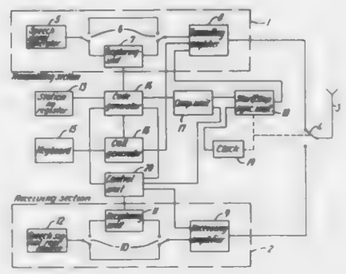
Lars Thrane, Soborg, Denmark, assignor to S.P. Radio A/S, Alborg, Denmark

Filed Dec. 28, 1984, Ser. No. 687,153

Claims priority, application Denmark, Dec. 30, 1983, 6084-83

Int. Cl.⁴ H04L *7/00, 25/38*

U.S. Cl. 380—48 **4 Claims**



1. A method for cryptographic transmission of speech signals by selective calls or group calls between at least two communication stations in an open communication system through a single public telecommunication channel comprising the steps of:

enciphering speech signals in a transmitting station utilizing a secret binary transformation code associated with a particular cryptographic transmission;

initiating and finalizing said cryptographic transmission by transmission of respective start and stop commands;
generating and transmitting synchronizing signals based upon duration of said cryptographic communication;
producing a transmitting station generated communication identification signal which is an unambiguous irreversible function of said transformation code;
adding said start and stop commands and said synchronizing signals to said communication identification signal;
deciphering said speech signals in a receiving station utilizing said secret binary transformation code;
producing a receiving station generated identification signal from said transformation code;
initiating and finalizing said deciphering of speech signals in accordance with said start and stop commands only upon correspondence between said transmitting station generated communication identification signal and said receiving station generated identification signal.

4,856,062

COMPUTING AND INDICATING DEVICE

Kenneth Weiss, c/o Security Dynamics Tech., Inc., 2067 Mass. Ave., Cambridge, Mass. 02140

Continuation of Ser. No. 676,626, Nov. 30, 1984, Pat. No. 4,720,860. This application Nov. 24, 1987, Ser. No. 124,666
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—23 **11 Claims**



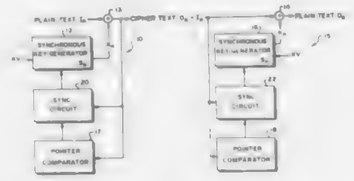
1. In a verification system wherein a first mechanism generates a first non-predictable code in accordance with a predetermined algorithm in response to both a unique static variable and a dynamic variable, a second mechanism generates a second non-predictable code in accordance with the predetermined variable and a second dynamic variable corresponding to the first dynamic variable, and means are provided for comparing the two non-predictable codes, a portable, handheld computing and indicating device forming the first mechanism comprising:
a processor having said algorithm preprogrammed therein; means for causing the program stored in said processor to be erased if an effort is made to gain access to the program;
means for storing a unique static variable in said device;
means for generating a time varying dynamic variable, said means being adapted to generate the same dynamic variable as that generated at said second mechanism at substantially the same instant of time;
means for applying the stored unique static variable and the currently generated dynamic variable to said processor, said processor being adapted to generate said first non-predictable code in response to the two variable applied thereto; and
means for affording person sensing of the non-predictable code currently being generated by said processor.

4,856,063

NO-OVERHEAD SYNCHRONIZATION FOR CRYPTOGRAPHIC SYSTEMS

Arnold M. McCalmont, Acton, Mass., assignor to Technical Communication Corporation, Concord, Mass.

Filed Jan. 27, 1988, Ser. No. 148,930
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—48 **2 Claims**



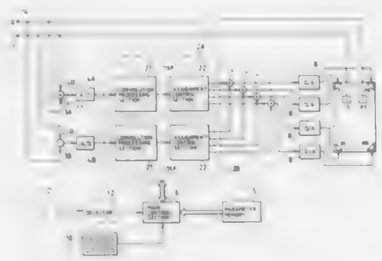
1. An encryption system comprising:
A. a cipher-signal generator for assuming in succession
a plurality of generator states, for receiving plain-text input signals, and for generating cipher signals determined by both the plain text input and the generator state, the cipher-signal generator normally assuming a generator state independent of the cipher signal but being operable by application of synchronization signals thereto to assume a generator state dictated by the synchronization signals;
B. a pointer detector for monitoring the cipher signal for a predetermined pointer sequence and generating a trigger signal only in response to the occurrence of the pointer sequence; and
C. a synchronization circuit, responsive to the trigger signal to read the contents of the cipher signal that occur at a time determined by the time of occurrence of the pointer sequence, for applying to the keystream generator synchronization signals determined by those contents and thereby placing the cipher-signal generator in the generator state dictated thereby.

4,856,064

SOUND FIELD CONTROL APPARATUS

Masayuki Iwamatsu, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Oct. 25, 1988, Ser. No. 262,318
Claims priority, application Japan, Oct. 29, 1987, 62-273672
Int. Cl.[4] H04S *1/00*
U.S. Cl. 381—1 **4 Claims**



1. A sound field control apparatus comprising:
a memory storing first and second sound field data corresponding to desired imaginary sound source distribution;
first signal processing means convoluting the first sound field data read out of said memory to a sum signal of two channel stereophonic input signals to produce a first initial reflection sound signal group; and

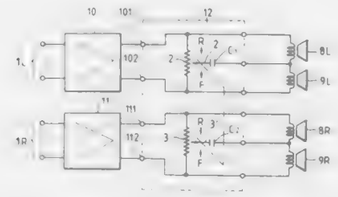
second signal processing means convoluting the second sound field data read out of said memory to a difference signal of said two channel stereophonic input signals to produce a second initial reflection sound signal group,
said first and second initial reflection sound signal groups being outputted to a plurality of loudspeakers for sound field reproduction.

4,856,065

POWER FADER FOR A LOUDSPEAKER SYSTEM

Kazunori Takagi, and Masahiko Ito, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,981
Claims priority, application Japan, Feb. 27, 1987, 62-27465[U]
Int. Cl.[4] H04R *5/02*
U.S. Cl. 381—28 **10 Claims**



1. A power fader for a loudspeaker system, including at least a power amplifier having output terminals and at least two loudspeakers connected in a series circuit between said output terminals, which receive the output of the power amplifier, comprising:
a variable resistor connected between said output terminals in parallel with said series circuit, and having a moveable contact; and
a capacitor connected between said moveable contact and a middle point between two of said loudspeakers in the series circuit;
wherein movement of said moveable contact changes the level of audio signals applied to the loudspeakers on each side of said middle point.

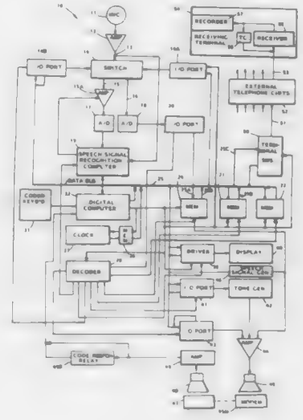
4,856,066

SPEECH COMMUNICATION SYSTEM AND METHOD

Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540

Filed Nov. 6, 1986, Ser. No. 927,380
Int. Cl.[4] H04M *3/38, 3/50;* **G10L** *5/00*
U.S. Cl. 381—36 **23 Claims**

1. An automatic electronic communication system comprising in combination:
(a) a message composing and sending station including a first transducing means, such as a microphone, for transducing sounds of speech to electrical signals,
(b) first electronic circuit means including electronic computing means for receiving, processing and analyzing signals output by said first transducing means in a manner to recognize signals generated when select words of speech are spoken into said microphone, said first circuit means being operable to generate control signals in accordance with the words spoken into said microphone,
(c) second electronic circuit means connected to receive signals output by said first electronic circuit means for generating code signals which vary in accordance with the speech signals recognized by said first electronic circuit means,
(d) third electronic circuit means including a memory connected to receive signals output by said second electronic circuit means and to record said signals therein,
(e) control means for causing said memory to generate selected of the signals recorded therein on an output,
(f) means controlled by a person speaking into said microphone for activating said control means upon completing a message to cause said memory to generate the complete message in the form of digital speech signals on said output,
(g) electrically operable driving means connected to receive signals defining information generated by said second electronic circuit means,
(h) intelligible indicating means connected to said driving means for intelligibly indicating information representative of the words of speech spoken into said microphone so as to permit a person composing messages to monitor the contents of messages generated by speaking into said microphone,
(i) a communication network connected to the output of said memory for receiving signals reproduced from said memory,



(j) a plurality of terminal circuits of said communication network, each containing a respective recording means for message signals received thereby,
(k) switching means in said communication network,
(l) code responsive means in said network connected to control the operation of said switching means,
(m) said second electronic circuit means being operable, in response to the speaking of select words of speech spoken into said microphone, to generate code signals to which said control means for said switching means at said network is responsive to properly operate said switching means of said network and to cause messages transmitted to said network to be gated through said switching means to selected of said receiving circuits of said network.

4,856,067

SPEECH RECOGNITION SYSTEM WHEREIN THE CONSONANTAL CHARACTERISTICS OF INPUT UTTERANCES ARE EXTRACTED

Youichi Yamada, and Keiko Takahashi, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1987, Ser. No. 82,211
Claims priority, application Japan, Aug. 21, 1986, 61-196271; Aug. 21, 1986, 61-196273
Int. Cl.[4] G10L *7/08*
U.S. Cl. 381—45 **5 Claims**

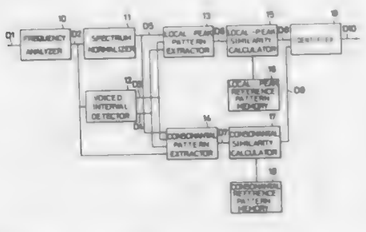
1. A speech-recognition system in which time-series patterns of characteristic quantities are extracted periodically at each frame defined as a predetermined time interval from an input utterance within a voiced interval, i.e. within a time interval from the start point of the utterance until its end point, the similarities are calculated between these time-series patterns

and reference patterns prepared in advance, and the similarity is calculated for each category to be recognized, and the category having the largest similarity among all the categories to be recognized is used as the result of the recognition, the speech-recognition system comprising:

(a) a spectrum normalizer which performs frequency analysis in a plurality of channels (numbered by their central frequencies) and logarithmic conversion and extracts the frequency spectra, and then calculates normalized spectrum patterns by normalizing the frequency spectra with least square fit lines;

(b) a consonantal pattern extractor which makes judgement as to whether each frame has consonantal properties and creates consonantal paterns by processing in sequence the frames within a voiced interval, extracting the consonantal patterns in those frames which are judged to have consonantal properties, and not extracting consonantal patterns in those frames which are judged to lack consonantal properties (i.e., in which the value is set at 0 in all channel components);

(c) a local-peak pattern extractor, which creates local peak



patterns by processing all the frames within a voiced interval, assigning number 1 to those channel components in which the value of the normalized spectrum pattern is positive and reaches a maximum, and assigning number 0 to all the other channel components;

(d) a consonantal similarity degree calculator which calculates the similarity between the consonantal patterns calculated by the extractor in (b) and consonantal reference patterns prepared in advance, and calculates the consonantal similarity for each category to be recognized;

(e) a memory unit for the consonantal reference patterns;

(f) a local-peak similarity calculator which calculates the similarity between the local-peak patterns calculated by the extractor in (c) and local-peak reference patterns prepared in advance, and calculates the local-peak similarity for each category to be recognized; and

(g) an identifier which references both the consonantal similarity and the local-peak similarity and calculates the comprehensive similarity for each category to be recognized, and selecting, among all the categories to be recognized, the category which has the largest comprehensive similarity as the result of recognition.

4,856,068

AUDIO PRE-PROCESSING METHODS AND APPARATUS

Thomas F. Quatieri, Jr., Arlington, and Robert J. McAulay, Lexington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 712,866, Mar. 18, 1985. This application Apr. 2, 1987, Ser. No. 34,204

Int. Cl.⁴ G10L *5/00*

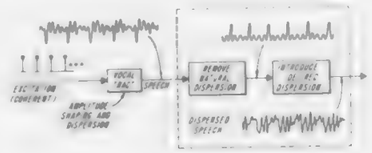
U.S. Cl. 381—47 **20 Claims**

1. A method of pre-processing an acoustic waveform prior to transmission to reduce the peak-to-RMS ratio of the waveform, the method comprising:

a. sampling the waveform to obtain a series of discrete samples and constructing therefrom a series of frames, each frame spanning a plurality of samples;

b. analyzing each frame of samples to extract a set of variable frequency components having individual amplitudes and phases;

c. removing the natural phase dispersion from said variable frequency components and substituting therefor a desired phase dispersion;



d. tracking said components from one frame to a next frame; and

e. interpolating the values of the components from the one frame to the next frame to obtain a parametric representation of the waveform whereby a synthetic waveform having a flattened time-domain envelope can be constructed by generating a set of sine waves corresponding to the interpolated values of the parametric representation.

4,856,069

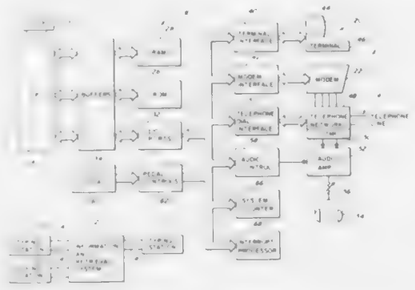
REMOTE TYPING SYSTEM

Gerald M. Kolodny, West Newton, and Howard I. Cohen, Waltham, both of Mass., assignors to Sudbury Systems, Inc., Sudbury, Mass.

Continuation of Ser. No. 39,786, Apr. 16, 1987, abandoned, which is a continuation of Ser. No. 473,668, Mar. 9, 1983, abandoned. This application Dec. 21, 1987, Ser. No. 135,467

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—52 **10 Claims**



1. A remote typing station, for connection to an information storage and retrieval system having means for storing and transmitting analog information defining audio messages and receiving digital data defining a transcription for the audio messages, comprising:

(a) computer means for mutually exclusively initiating and terminating audio and data modes, said data mode being terminated when said audio mode is initiated and said data mode being initiated when said audio mode is terminated;

(b) interface means connected to said computer means, said interface means configured to receive audio information signals representing an audio message and transmit digital data signals;

(c) terminal means having a keyboard and display, said terminal means connected to said computer means and said interface means, said terminal means generating digital data signals representing the audio information signals of the audio message received by said interface means whereby the digital data signals constitute transcribed audio information; and

(d) switch means connected to said computer means, said switch means having energized and deenergized states, said computer means initiating said audio mode for transmitting a control signal to said information storage and retrieval system when said switch means is in one of said energized and denergized states, said computer means terminating said audio mode and initiating said data mode for transmitting a further control signal to said information storage and retreival system when said switch means is in the other of said energized and deenergized states.

4,856,070

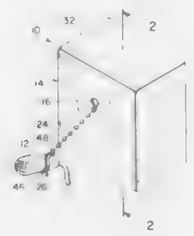
RETRACTABLE 2 WAY MICROPHONE

Joe L. Britton, Sr., P.O. Box 30033, Houston, Tex. 77230, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Jul. 20, 1987, Ser. No. 75,639

Int. Cl.⁴ H04R *1/02*

U.S. Cl. 381—169 **5 Claims**



1. A retraction device for a microphone which comprises:

(a) a housing having an aperture therethrough;

(b) means for securing said housing to a supporting surface;

(c) a spindle fixedly secured within said housing;

(d) a spool disposed rotatably on said spindle;

(e) an elongated chain extending through the aperture in said housing having an inner end secured to said spool and wound around said spool;

(f) means rotatably biasing said spool in a preferred direction of rotation to automatically retract said chain when uncoiled;

(g) a microphone holder affixed to an outer end of said chain outward of said aperture whereby, an operator can manually pull the holder outwardly from the housing and then release the holder whereby said spool will automatically retract said chain back into said housing and retain the holder against said housing.

4,856,071

PLANAR LOUDSPEAKER SYSTEM

Stanley L. Marquiss, Plymouth, Calif., assignor to Electromagnetic Research and Development, Rancho Cordova, Calif.

Division of Ser. No. 90,738, Aug. 28, 1987, Pat. No. 4,792,978. This application Aug. 5, 1988, Ser. No. 228,487

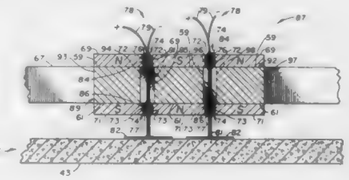
Int. Cl.⁴ H04R *7/18*

U.S. Cl. 381—203 **10 Claims**

1. Cooperating coil and magnet means for driving a diaphragm in a loudspeaker, comprising:

a. a pair of substantially identical, elongated bar magnets, having upper and lower longitudinal faces adjacent and remote longitudinal sides, and opposing transverse ends, each of said magnets having opposing magnetic poles upon respective said upper and lower faces;

b. means for adjacently mounting said magnets upon the frame of the loudspeaker with the longitudinal axes of said magnets being parallel, said upper and lower longitudinal pole faces of said magnets being both co-planar and of opposite polarity with respect to the adjacent magnet, and the adjacent longitudinal sides of said magnets being spaced apart a pre-determined distance to define an elongated flux aperture having upper transverse flux lines and lower transverse flux lines passing between said adjacent opposite magnetic poles;



c. a coil of conductive wire, arranged in an elongated planar configuration and positioned within said elongated flux aperture, said coil having upper turns of wire located in a plane substantially intersected by said upper flux lines, and having lower turns of wire located in a plane substantially intersected by said lower flux lines;

d. substantially rigid support means for maintaining said coil in a planar configuration, said support means being connected to the speaker diaphragm for driving the loudspeaker when an electrical signal is impressed upon said coil.

4,856,072

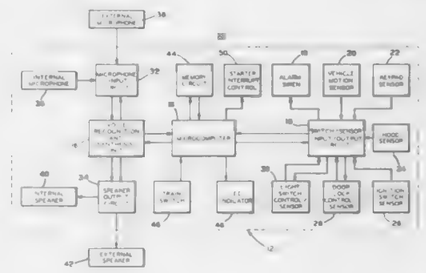
VOICE ACTUATED VEHICLE SECURITY SYSTEM

Jack H. Schneider, and Larry O. Gray, both of Laurinburg, N.C., assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 31, 1986, Ser. No. 947,984

Int. Cl.⁴ H04B *1/00*

U.S. Cl. 381—86 **21 Claims**



1. A voice actuated vehicle security system comprising:

a first microphone adapted to be mounted inside a vehicle and responsive to a vocal instruction for generating an input signal;

a second microphone adapted to be mounted outside a vehicle and responsive to said vocal instruction for generating said input signal;

voice control means connected to said first and second microphones and responsive to said input signal for generating a vocal instruction signal;

storage means connected to said voice control means for generating a control signal in response to a correspondence between said vocal instruction signal and one of a plurality of stored voice recognition templates; and

speaker means connected to said voice control means and responsive to an output signal for generating a vocal

message, said voice control means being responsive to said control signal for generating said output signal.

4,856,073

AUTOMATED MICROBIOLOGICAL TESTING APPARATUS AND METHOD

Glenn L. Farber, Port Jefferson, and Maria C. Navarro, North Massapequa, both of N.Y., assignors to Sherwood Medical Company, St. Louis, Mo.

Division of Ser. No. 706,068, Feb. 27, 1985, Pat. No. 4,724,215.
This application Nov. 10, 1987, Ser. No. 118,917
The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—6 **22 Claims**



1. The method of automatically reading results of reaction tests between agents and samples in wells of microbiological test trays and strips such as susceptibility trays and identifiction trays, comprising the steps of:

making an image with a video camera of a tray having samples and agents together in the wells of the tray for at least a predetermined time;

then electronically analyzing only predetermined areas of interest in the image made by the camera, which areas of interest are substantially within the peripheries of the tray wells in the image;

for each well of interest, electronically determining whether an area of interest therein has an associated value that exceeds a predetermined threshold for that area of interest; and

electronically assigning a binary partial result to each well based upon whether the predetermined threshold for each corresponding area of interest is exceeded.

4,856,074

REGION RECOGNIZING DEVICE

Daiji Nagaoka, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1988, Ser. No. 165,602
Claims priority, application Japan, Mar. 20, 1987, 62-63972
Int. Cl.[4] G06K *9/46, 9/12*
U.S. Cl. 382—22 **12 Claims**

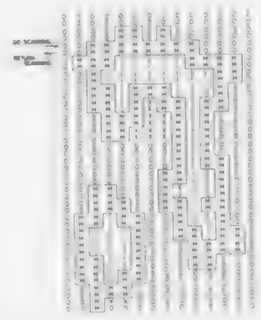
1. A region recognizing device for detecting a closed loop line inscribed on a document, said region recognizing device comprising:

reading means operative to scan individual lines of said document for generating successive blocks of image data of said document for each scan line in succession, each block having a corresponding block in a preceding line;

line storing means for storing successive blocks of image data for at least two of said scan lines;

mark identifying means for identifying each of said successive blocks of said scan line as being on said closed loop line of said document;

single status latch means for storing a status of each of said blocks of a scanned line in succession, said status indicative of the position of said block being alternately outside, inside, or on said closed loop line of said document or having an "unknown" status;



multiple status storing means for storing said statuses of each said successive blocks of said scanned line; and

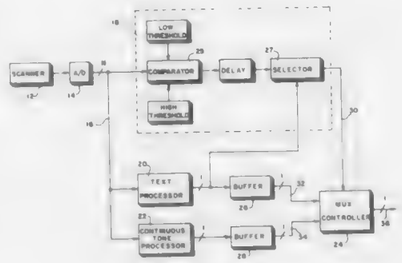
status determining means responsive to said mark identifying means, to said status of a previous block stored in said single status latch means, and to said status of a corresponding block in a line where said status has been determined previously for each of said successive blocks of said line and where such status is stored in said multiple status storing means, for determining said status of each of said successive blocks of said scanned line.

4,856,075

IMAGE DISCRIMINATION

Craig M. Smith, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 5, 1987, Ser. No. 104,694
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—50 **4 Claims**



1. A method for discriminating between regions of text and continuous tone regions of mixed format documents and for selecting print/no-print decisions to be made by an image processing algorithm optimized for text or an image processing algorithm optimized for continuous tone, said method comprising the steps of:

generating a video signal of values indicative of pixels representing the image content of the document;

passing said video signal through a two-level discrimination having a low and a high threshold value;

applying said video signal to first and second image processors having, respectively, the text image processing algorithm and the continuous tone image processing algorithm for making print/no-print decisions;

selecting the second image processor when the video signal is above the lower threshold value and the decision of the first image processor is to print;

selecting the second image processor when the video signal value is below the upper threshold value and the decision of the first image processor is to not print; and

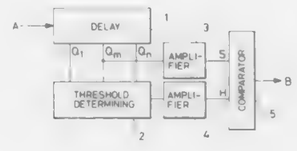
selecting the first image processor under any other condition.

4,856,076

BINARY CODING CIRCUIT FOR OCR

Naoki Maeda, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 7, 1987, Ser. No. 70,733
Claims priority, application Japan, Jul. 8, 1986, 61-160446
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—53 **5 Claims**



1. A binary coding circuit for an optical character reader which identifies characters or symbols using a photoelectric conversion cell, comprising:

a delay circuit having one input terminal for receiving an output of said photoelectric conversion cell as an input signal, and at least three separate and distinct output terminals providing respective time-shifted output representations of said input signal, said time-shifted output representations having delays that are different from each other;

a threshold determining circuit arranged so that when one of said time-shifted output representations of said input signal is selected to be a binary-coding target signal, said threshold determining circuit receives as its inputs a plurality of said time-shifted output representations including one time-shifted output representation having a larger delay time than that of said binary-coding target signal and one time-shifted output representation having a smaller delay time than that of said binary-coding target signal as threshold determining signals for determining a threshold signal, said threshold signal being determined to be the threshold determining signal of said threshold determining signals, having a maximum absolute value for each point in time; and

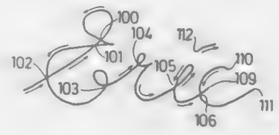
a comparator circuit, having a first input receiving said binary-coding target signal and a second input receiving said threshold signal, for comparing said binary-coding target signal with said threshold signal to thereby produce a binary signal having a first level if said binary-coding target signal is greater than said threshold signal and a second level if said binary-coding target signal is less than said threshold signal.

4,856,077

METHOD OF SIGNATURE VERIFICATION AND DEVICE FOR CARRYING OUT THE METHOD

Eric Rothfjell, Lotsvägen 4, S-952 00 Kalix, Sweden

PCT No. PCT/SE87/00217, § 371 Date Jan. 14, 1988, § 102(e) Date Jan. 14, 1988, PCT Pub. No. WO87/06744, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 27, 1987, Ser. No. 138,031
Int. Cl.[4] G06K *9/00, 9/22*
U.S. Cl. 382—3 **11 Claims**



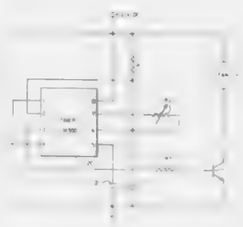
1. A method of signature verification, at which an electric pulse train individual for every person in question is generated in that said person is allowed to move a pen, which includes at its nib a light-emitting member and a light-sensitive member, over a background, whereby an electric pulse train is caused to be emitted from the light-sensitive member in response to patterns on said background, and said pulse train generated at a certain occasion is caused by means of a computer, processor or corresponding device to be compared with pulse trains generated earlier, comprising said pen **(1)** including at its nib a writing pen **(14)** or a ballpoint pen arranged to leave behind a line that forms said background when the pen is moved against a support capable to write on, such as a paper document, and that said pulse train is generated as a binary pulse train, derived solely from crossover points in said signature when the person at the writing of his/her signature with the pen nib **(14)** crosses over lines written earlier at the writing with the pen of said signature, such that the signature being written constitutes said background.

4,856,078

DC FAN SPEED CONTROL

John G. Konopka, Barrington, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Mar. 23, 1988, Ser. No. 172,734
Int. Cl.[4] H02P *7/29*
U.S. Cl. 388—831 **3 Claims**



1. A speed control for a DC fan motor comprising:

a source of DC voltage;

a switch transistor connected in series with said motor and said voltage source;

a type 555 timer including an RC circuit coupled to said voltage source for developing a constant amplitude pulsed voltage output;

means for operating said switch transistor which said pulsed voltage output; and

means for varying the on/off cycle of said timer, said RC circuit including a thermistor for changing the speed of

said motor as a function of temperature, said speed control consisting of two capacitors and two resistors in addition to said switch transistor said 555 timer, and said thermistor.

3. A speed control for a brushless DC fan motor comprising:

a source of DC voltage;

a switch transistor having a base and an emitter-collector path connected in series with said voltage source and said motor;

a type 555 timer coupled to said DC voltage source and to said base of said switch transistor, said timer supplying constant amplitude voltage pulses to said transistor at approximately a 10 Hz rate;

an RC circuit coupled to said timer for varying the duty cycle thereof; and

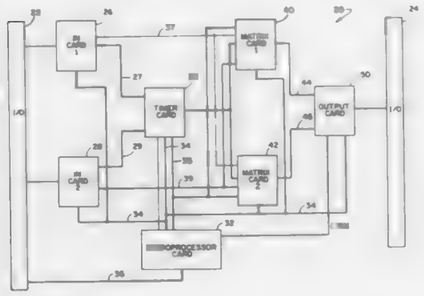
a thermistor in said RC circuit for controlling the speed of said motor as a function of temperature.

4,856,079

ADAPTIVE AND PROGRAMMABLE BLANKER

Janet E. Wedgwood, Roslyn Heights; Dennis W. Berde, Melville; Steven J. Bocskor, Roakonkoma, and George E. Cotter, Commack, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Sep. 4, 1987, Ser. No. 93,399
Int. Cl.[4] H04B 1/10
U.S. Cl. 455—50 **35 Claims**



1. An electronic blanking system having a plurality of inputs, said inputs including a plurality of voltage or current pulses of varying duration, said blanking system also having a plurality of outputs for supplying blanking pulses, said system comprising

input processing means for processing input pulses from said inputs to produce processed input signals;

timing means for altering the timing of said processed input signals to produce blanking pulses;

matrix means for routing said processed input signals to said outputs and for routing any of said processed input signals to any of said outputs;

microprocessor means coupled to said matrix means for controlling said matrix means to determine said routing; and

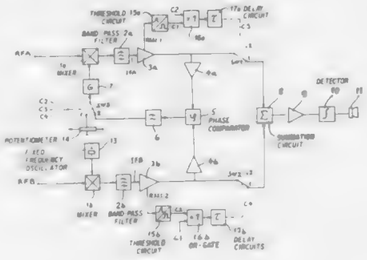
output means for supplying said blanking pulses, at a predetermined voltage level, to said outputs.

4,856,080

CIRCUITRY FOR THE DIVERSITY UNIT IN AN FM RECEIVER FOR A TELEPHONE SYSTEM

Jaakko Hulkko, Oulu, Finland, assignor to Nokia-Mobira Oy, Salo, Finland

Filed Nov. 10, 1987, Ser. No. 119,469
Claims priority, application Finland, Nov. 18, 1986, 864704
Int. Cl.[4] H04B 1/16
U.S. Cl. 455—139 **3 Claims**



1. A circuitry in a diversity unit of an FM receiver for a telephone system, comprising:

at least two channels for receiving signals at least one of differing from and similar to one another in amplitude and frequency, wherein each channel comprises a mixer and a band-pass filter for forming an intermediate-frequency signal; and

at least one phase-lock loop having phase-lock branches operably connected between each mixer of said channels which comprises a frequency-phase comparator wherein phase-lock loop equalizes the channel signals in phase and amplitude, and at least one summation means for adding the channel signals which have been equalized,

wherein said frequency-phase comparator has a single phase-lock branch exiting therefrom along with a voltage-controlled oscillator connected to one of said mixers of one of said channels,

wherein said voltage-controlled oscillator has switch means on an input side thereof, said switch means are for disconnecting the input side of said voltage-controlled oscillator from said frequency-phase comparator of said single phase-lock branch and for switching said voltage controlled oscillator to a fixed and preset reference frequency,

wherein coupled to another of said mixers of another set channels is a fixed-frequency oscillator and a signal-level sensing circuit which, in an event of slow fading in said another channel, inputs a separate signal to said switch means of said voltage-controlled oscillator in order to switch the voltage-controlled oscillator to said fixed reference frequency.

4,856,081

RECONFIGURABLE REMOTE CONTROL APPARATUS AND METHOD OF USING THE SAME

Bobby J. Smith, Knoxville, Tenn., assignor to North American Philips Consumer Electronics Corp., Knoxville, Tenn.

Filed Dec. 9, 1987, Ser. No. 130,817
Int. Cl.[4] G08C 19/00
U.S. Cl. 455—151 **22 Claims**

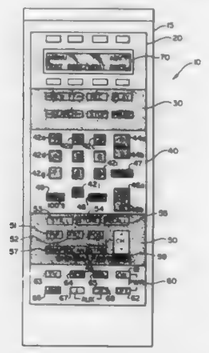
1. A reconfigurable remote control apparatus for use with a plurality of remotely controllable products at least one of which is responsive to signals of a different transmission protocol than another, said reconfigurable remote control apparatus comprising:

(a) receiver means for receiving during a capture mode signals transmitted from a remote control transmitters to be emulated, said signals comprising first protocol signals having pulses separated by pauses, and second protocol signals having bursts of pulses at a carrier frequency separated by pauses;

(b) distinguishing means connected to said receiver means for distinguishing between said first protocol signals and said second protocol signals and for providing an indication of the protocol used by each transmitter to be emulated;

(c) memory means;

(d) processing means connected to said receiver means for substantially determining at least the duration of said pauses and providing to said memory means first date representative thereof when said first protocol signals are received, and for substantially determining the carrier



frequency and the duration of said pulse burst and pauses between pulse bursts and providing second data representative thereof when said second protocol signals are received;

(e) transmitter means for transmitting control signals corresponding to transmitter input signals applied thereto;

(f) user operable selector means for controlling said reconfigurable remote control apparatus; and

(g) transmitter control means connected to said memory means and said user operable selector means, for addressing said memory means in response to user activation of said selector means and causing data stored in said memory means to be sent to said transmitter means to constitute said transmitter input signals.

4,856,082

RECEPTION SENSITIVITY CONTROL SYSTEM IN A SWEEPING RECEIVER

Koichi Kasa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Japan

Filed Aug. 19, 1987, Ser. No. 87,116
Claims priority, application Japan, Aug. 19, 1986, 61-194448
Int. Cl.[4] H04B 11/16
U.S. Cl. 455—161 **6 Claims**

1. A reception sensitivity control system in a sweeping receiver, comprising:

level adjusting means for receiving a reception signal and for adjusting a level thereof;

a mixer for receiving an output of said level adjusting means;

a voltage controlled oscillator for providing an oscillation output as a local oscillation signal for said mixer;

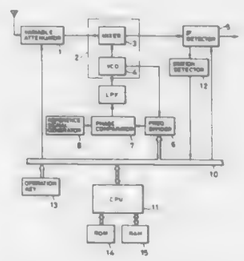
a frequency divider for frequency dividing an oscillation output of said voltage controlled oscillator according to a frequency dividing ratio;

a reference signal source;

a phase comparator for comparing outputs of said frequency divider and said reference signal source, and for providing the comparison as an input to said voltage controlled oscillator;

first control means for changing said frequency dividing ratio from a first value to a second value, said first and second value corresponding to minimum and maximum frequencies of a predetermined reception frequency band, respectively;

means for detecting when a level of an output signal from said mixer exceeds a predetermined level;



means for counting, within a predetermined period, a number of times said detecting means detects said level to exceed said predetermined level; and

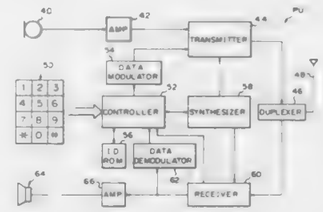
means for increasing said level of said level adjusting means when said counted number is less than a predetermined number.

4,856,083

METHOD OF CONNECTING A CORDLESS TELEPHONE BY RADIO

Masayuki Makino, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 18, 1988, Ser. No. 220,147
Claims priority, application Japan, Jul. 16, 1987, 62-178286
Int. Cl.[4] H04Q 7/00
U.S. Cl. 455—166 **9 Claims**



1. A method of connecting by radio a cordless telephone having a base unit and a mobile unit, having a particular identification number, and sharing a plurality of radio channels with other cordless telephones without using control channels, said method comprising the steps of:

(a) selecting priority radio channels from the radio channels and assigning each of said priority radio channels to a respective one of the cordless telephones;

(b) causing the base unit to monitor the priority radio channel assigned to the cordless telephone associated with said base unit when a calling signal is received;

(c) if said priority radio channel is idle, causing said base unit to send the calling signal to the mobile unit over said priority radio channel;

(d) causing said mobile unit to monitor the priority radio channel assigned to said cordless telephone when a call origination signal is to be sent;

(e) causing said mobile unit to send an answer signal to said base unit when a calling signal meant for said cordless telephone is received over said priority radio channel; and

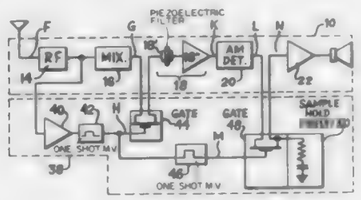
(f) causing said mobile unit to send a call origination signal to said base unit over the priority radio channel only if a calling signal meant for said cordless telephone is not received over said priority radio channel and said priority radio channel is idle.

4,856,084

NOISE BLANKING SYSTEM FOR AN AM RADIO RECEIVER

Oliver L. Richards, Jr., Windham, Conn., assignor to Sprague Electric Company, North Adams, Mass.

Filed Feb. 16, 1988, Ser. No. 156,049
Int. Cl.[4] H04B *7/00*
U.S. Cl. 455—223 8 Claims



1. A noise blanking system for suppressing impulse noise in an AM radio receiver comprising:

a preliminary blanking means adapted for connection to a point in the AM-modulated-signal path of an AM radio receiver for sensing each occurrence of an ambient electromagnetic impulse of noise and for momentarily blanking the AM-modulated-signal path in said receiver; and

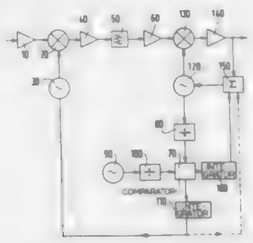
an audio blanking means for sensing each occurrence of ambient electromagnetic impulse of noise, and adapated for connection to a point in one audio-signal path of the receiver for at said each occurrence interrupting said one audio-signal path for a period of from 2 to 5 times the duration of said momentarily blanking.

4,856,085

FM RECEIVER WITH IMPROVED ADJACENT-CHANNEL REJECTION

Philippe Horvat, Vieux Thann, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 23, 1987, Ser. No. 28,936
Claims priority, application France, Mar. 21, 1986, 86 04077
Int. Cl.[4] H04B *15/00*
U.S. Cl. 455—315 2 Claims



1. An FM receiver comprising a channel selection and intermediate frequency circuit having a signal output, a phase-locked loop frequency demodulator connected to said signal output and including a demodulator oscillator, and a return path from the demodulator to the channel selection circuit, said return path forming part of a frequency-locked loop for a tuning oscillator of the selection and intermediate frequency circuit,

characterized by comprising a voltage correction stage having two outputs,

said stage comprising a reference oscillator, at least one integrator, a comparator for comparing signals supplied from said demodulator oscillator with a signal supplied from said reference oscillator, and an adder,

said comparator having an output supplied to said at least one integrator,

said at least one integrator having an output connected to an input of said tuning oscillator and forming part of said frequency-locked loop for the tuning oscillator, and said at least one integrator having an output connected to said adder, and

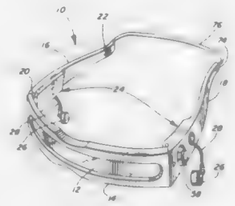
said adder being connected in said phase-locked loop for adding the output of the demodulator and the output of said at least one integrator, and having an output connected to a control input of said demodulator oscillator.

4,856,086

RADIO GLASSES

Gene McCullough, 2334 W. Van Buren, Apt. 703, Chicago, Ill. 60612

Filed Nov. 20, 1987, Ser. No. 123,302
Int. Cl.[4] H04B *1/08;* H05K *11/00*
U.S. Cl. 455—344 4 Claims



1. A device worn about ones head for receiving electrically transmitted signals, comprising:

a lens for aiding in vision;

a frame for holding said lens;

first and second temples hinged to said frame on opposite ends for supporting said frame;

a radio integrally mounted in one of said temples;

first and second loud speakers electrically connected to said radio; and

recesses within opposite temples for removably mounting said loud speakers within opposite temples;

wherein each recess stores the electrical connections for said loud speakers when mounted, and said loud speakers securely fit in a wearer's ear for listening when removed from said recesses.

4,856,087

RADIO EQUIPPED INFLATABLE DEVICE

Mark S. Nesbit, 1248-17th St., West Des Moines, Iowa 50265

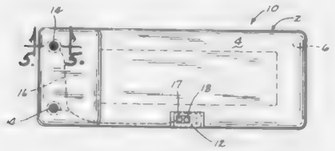
Filed Aug. 26, 1988, Ser. No. 240,055
Int. Cl.[4] H04B *1/06*
U.S. Cl. 455—344 15 Claims

1. An enlarged air inflatable member for use with water related activities, said air inflatable member being dimensioned to support both the head and the torso of a user and having a top side and a bottom side sealed together to form an air space, the improvement comprising:

a waterproof container attached to the top side of said inflatable member, said container including a conducting wire opening and a waterproof seal disposed in said opening;

an audio signal source disposed within said waterproof container;

a waterproof speaker assembly attached to the top said of said inflatable member at a point remote from the point of attachment of said waterproof container; wherein, said waterproof speaker assembly includes a plurality of speak-



ers disposed at spaced locations on opposite sides of a head supporting portion of said enlarged inflatable member; and,

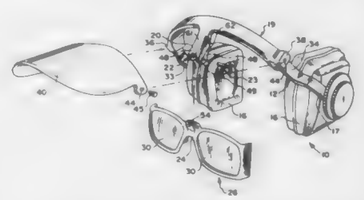
a conducting wire disposed to electronically interconnect said audio signal source and said waterproof speaker assembly, wherein said conducting wire extends through said waterproof seal disposed in said opening.

4,856,088

COMBINED EYE COVERING AND EAR COVERING ASSEMBLY

Lee A. Horton, 272 N. Prospect, Mundelein, Ill. 60060

Continuation of Ser. No. 889,747, Jul. 28, 1986, abandoned. This application Nov. 30, 1988, Ser. No. 279,288
Int. Cl.[4] H04B *1/08;* A61F *9/00*
U.S. Cl. 455—351 23 Claims



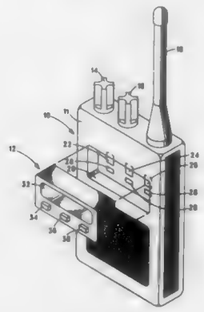
1. An ear covering and eye covering assembly comprising a resilient, hard, stiff, non-elastic, arcuate, non-encircling elongated head band structure which is adapted to be positioned at an angle above the eyes and across a forehead of a wearer and which is constructed to extend only part way around the head of a wearer from one ear forwardly across the forehead to the other ear and not behind the head or over the top of the head of the wearer, said band structure having a hard, inelastic center portion which is adapted to be positioned over the middle of the forehead of the wearer and above the nose of the wearer and first and second hard, inelastic, but flexible end portions each having a free end which is arranged to extend to a position adjacent one ear, each end portion including a band made of rigid but flexible spring material and coupled at an inner end thereof, opposite said free end, to said center portion of said band structure, first and second ear coverings mounted, respectively, to one of said band structure end portions adjacent said free end thereof, adjusting means for adjusting the position of said ear coverings on said band end portions, said center portion of said band structure including rigid mounting means centrally located over the wearer's forehead for mounting an eye covering, and an eye covering mounted to said mounting means.

4,856,058

RADIO WITH REMOVABLE DISPLAY

Gary A. Oliwa, Boynton Beach, and Marilyn S. Burger, Pompano Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 14, 1988, Ser. No. 143,783
Int. Cl.[4] H04B *1/08;* H04Q *1/02*
U.S. Cl. 455—349 10 Claims



1. An electronic device including a paging receiver for receiving messages and a display module electrically coupled to said electronic device, said electronic device comprising:

memory means disposed in the display module for storing therein said received messages when the display module is electrically coupled to the electronic device;

means for electrically decoupling the display module from the electronic device; and

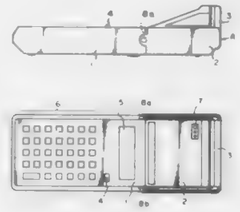
means disposed in the display module for operating the display module to display the stored messages of the memory means when electrically decoupled from the electronic device, such that the display module may be utilized to display received messages when electrically disconnected from the electronic device.

4,856,090

LIGHT COMMUNICATION EQUIPMENT

Shigehisa Kitani, Chigasaki; Atsuyoshi Sasai, and Hirokimi Shimizu, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1985, Ser. No. 734,077
Claims priority, application Japan, May 22, 1984, 59-101749; May 22, 1984, 59-101740; May 22, 1984, 59-101751; May 22, 1984, 59-101752; May 22, 1984, 59-101753; May 22, 1984, 59-101754
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—607 19 Claims



5. A handy terminal comprising:

input means for inputting data;

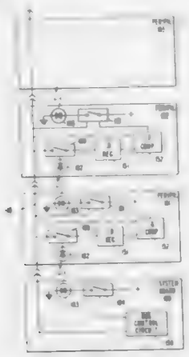
processing means for processing the data from said input means and additional data;
a handy terminal housing having said input means and said processing means therein;
a printer detachably mountable on said handy terminal housing, wherein said printer is capable of printing data supplied from said processing means when said printer is mounted on said handy terminal housing;
light emitting/receiving means detachably and movably mountable on said handy terminal housing, wherein said light emitting/receiving means is capable of transmitting and receiving data to and from said processing means when said light emitting/receiving means is mounted on said handy terminal housing; and
a connector for connecting either one of said printer or said light emitting/receiving means to said handy terminal housing.

4,856,091

RADIATION-COUPLED DAISY CHAIN

John L. Tuska, Naperville, Ill., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Apr. 27, 1987, Ser. No. 43,073
Int. Cl.[4] H04B *9/00*; H04J *3/24*
U.S. Cl. 455—607 **18 Claims**



1. An apparatus comprising:
a plurality of units;
a communication medium interconnecting the plurality of units; and
a link interconnecting the plurality of units in series and including
a plurality of first means coupled to the medium, each when enabled for latching a first signal received over the medium,
a plurality of emitters each mounted on a different unit,
a plurality of second means connected to the medium and each connected to a different emitter and a different first means, each for selectively turning on the connected emitter when a second signal received over the medium matches the first signal latched by the connected first means, and
a plurality of detectors, a different one connected to each first means, for enabling the connected first means when irradiated, each mounted on a different unit and positioned for irradiation through free space by the emitter mounted on the preceding unit in the series.

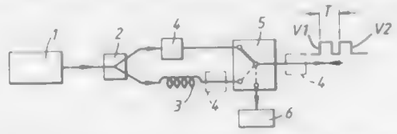
4,856,092

OPTICAL PULSE GENERATING ARRANGEMENTS

Christopher A. Wade, Southampton, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Nov. 22, 1985, Ser. No. 800,879
Claims priority, application United Kingdom, Nov. 24, 1984, 8429155
Int. Cl.[4] G02F *1/21, 2/02*
U.S. Cl. 455—609 **5 Claims**

1. A differential delay optical coherent pulse generating arrangement, a which continuous wave light derived from a coherent light source is divided by beam splitting means into two optical paths, in which the light beam in one of said paths is delayed relative to the light beam in the other of said paths by differential delay means prior to the sequential selection of the light from the respective paths by optical switching means to produce two coherent pulses in predetermined time displaced relationship at an output of the optical switching means when the optical switching means is in two different respective switching positions and in which the optical switching means



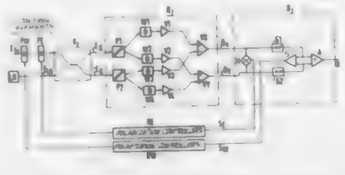
has a further switching position is which light reflected to the output of the optical switching means will be directed on light detector means.

4,856,093

OPTICAL HETERODYNE RECEIVER

Friedemann Mohr, Renningen, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Jun. 29, 1987, Ser. No. 67,960
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1986, 3621734
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—619 **8 Claims**



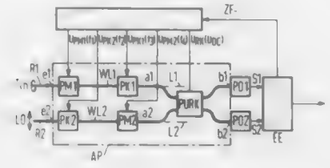
1. An optical heterodyne receiver for receiving an input signal in the form of polarized light modulated with a useful signal, said receiver comprising:
a source of circularly polarized light,
an optical coupler having at least two input ports and at least two output ports, a first one of said input ports being coupled to the said polarized light modulated with a useful signal and a second one of said input ports being coupled to said source of circularly polarized light;
an optical to electrical converter responsive to the output of said coupler, said converter comprising:
first polarization selective means coupled to the first of said two output ports for producing first and second light beams which differ in polarization angle by 90°
second polarization selective means coupled to the second of said two output ports for producing third and fourth light beams which also differ in polarization angle by 90°
first and second optical-to-electric transducers respectively responsive to said first and second light beams; for providing first and second electrical signals
third and fourth optical-to-electric transducers respectively responsive to said third and fourth light beams, for providing third and fourth electrical signals and
means for deriving first and second radio-frequency output signals differing in phase by approximately 90° by subtraction of said third and fourth electrical signals from said first and second electrical signals, respectively,
a demodulator responsive to said first and second radio-frequency output signals for delivering a demodulated output signal and
polarization control means for controlling the polarization angle and the ellipticity of the polarized light modulated with a useful signal such that completely linearly polarized light with a constant polarization angle of 45° or 135° is obtained at the point where said modulated polarized light is input to said coupler, said polarization control means comprising:
a first polarization control element responsive to the amplitude difference between said first and second radio-frequency output signals for controlling the polarization angle of the modulated polarized light before it enters said coupler, and
a second polarization control element responsive to the phase angle between said first and second radio-frequency output signals for controlling the polarization ellipticity of the modulated polarized light before it enters said coupler.

4,856,094

ARRANGEMENT FOR POLARIZATION CONTROL, SUCH AS FOR AN OPTICAL HETERODYNE OR HOMODYNE RECEIVER

Helmut Heidrich; Detlef Hoffmann, and Hans-Peter Nolting, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 11, 1987, Ser. No. 95,270
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1986, 3631767
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—619 **7 Claims**



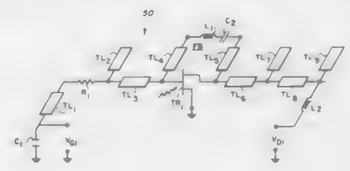
1. An arrangement for controlling polarization, particularly for an optical heterodyne or homodyne receiver, comprising: a first optical waveguide (WL1) which receives at an input (e_1) a polarized optical wave transmitted by a subscribed (Tln) which travels in a first direction, having a first phase modulator (PM1) mounted on said first waveguide (WL1) which provides a continuously controllable birefringence which has a fixed elliptical refractive index axis (A_1) which is aligned in the first waveguide (WL1) and, the phase of the input optical wave received from the subscriber (Tln) coupled into the first waveguide (WL1) is tunable with a first polarization converter (PK1) which receives the output of said first phase modulator (PM1) of the input optical wave received from the subscriber (Tln) which is coupled into the first waveguide (WL1), and a continuously controllable birefringence in said first waveguide (WL1) which is controlled by said first polarization converter (PK1) and said controllable birefringence having an elliptical refractive index axis (A_2) which is aligned at an angle of about 45° relative to the elliptical refractive index axis (A_1) of the first phase modulator (PM1), and as a result thereof, the state of polarization of said optical wave guided in said first waveguide (WL1) transformed into any arbitrary state of polarization of the output of said first polarization converter (PK1); a second optical waveguide (WL2) mounted parallel to and closely adjacent said first optical waveguide and receiving at an input (e_2) from a local oscillator (LO) a polarized optical wave which has an individual state of polarization, a second polarization converter (PK2) mounted onto said waveguide (WL2) that provides a continuously variable birefringence which has an elliptical refractive index axis (A_4) aligned at angle of about 45° relative to the fixed elliptical refractive index axis (A_1) of said first phase modulator (PM1) which is formed in said second waveguide (WL2) and with which a state of polarization which is orthogonal to the state of polarization of said optical wave generated by said local oscillator (LO) coupled into said second waveguide (WL2) is generated; and a second phase modulator (PM2) receiving the output of said second polarization converter (PK2) of the optical wave guided in said second waveguide (WL2), and said second phase modulator (PM2) provides a continuously variable birefringence which has an elliptical refractive index axis (A3) which is aligned in parallel relative to the fixed elliptical refractive index axis (A_1) of said first phase modulator (PM1) which is formed in said second waveguide (WL2) and, as a result thereof, the state of polarization of said optical wave guided in said second waveguide (WL2) is transformed into any arbitrary state of polarization at the output of said second phase modulator (PM2), and wherein a polarization-independent, optical coupling means (PURK) receives the output of said first polarization converter (PK1) of the polarized optical wave received from the subscriber (Tln) coupled into said first waveguide (WL1) and the output of said second phase modulator (PM2) of the optical wave generated by said local oscillator (LO) coupled into said second waveguide (WL2) and both of said optical waves supplied to said optical coupling means for superposition, a pair of photo detectors which receive a pair of optical outputs from said optical coupling means (PURK), an electrical unit which receives inputs from said pair of photo detectors, and a polarization control which receives an output of said electronic unit and supplies outputs to said first and second phase modulators, said optical coupling means and said first and second polarization converters.

4,856,095

OPFET DEMODULATOR-DONWCONVERTER FOR DETECTING MICROWAVE MODULATED OPTICAL SIGNALS

Christen Rauscher, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 28, 1987, Ser. No. 54,976
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—619 **4 Claims**



1. A Demodulator-Downconverter for demodulating a microwave-modualted optical carrier signal to separate a microwave signal of frequency f_1 from the optical carrier signal and to convert the signal frequency f_1 to a lower signal frequency f_O, comprising:
an OPFET responsive to a microwave-modulated optical signal carrying a microwave signal of frequency f_1 to demodulate said microwave-modulated optical signal;
the OPFET having a source, a drain, and a gate;
biasing means connected to the source, the drain, and the gate to bias the source, the drain, and the gate thereby causing the OPFET to simultaneously exhibit both nonlinear transconductance and nonlinear drain-source conductance;
feadback means carrying a microwave signal of frequency f_{loc} around the OPFET from the output port of the OPFET back to the input port of the OPFET while harmonics of this signal are generated in the OPFET because of the OPFET's nonlinear transconductance resulting from the bias applied to the source, the drain, and the gate;
said OPFET, through its nonlinear output conductance characteristics causes mixing of a microwave signal of frequency n f_{loc}, where n is a positive integer, with the microwave signal of frequency fl after the latter has been

separated from the optical carrier signal in the OPFET to produce a microwave signal of beat frequency f_O according to the relation $f_1 = n f_{loc}$ plus or minus f_O at the output of the Demodulator-Downconverter;

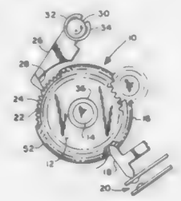
whereby the output port of the OPFET can be connected to a filter means for selecting the microwave signal of beat frequency f_O from all beat frequency signals of frequency $f_O = n f_{loc}$ plus or minus f_1 where n=1, 2, 3, . . .

4,856,096

PROVIDING A PROGRAMMER/TIMER WITH DUAL RATE DRIVE

Joseph J. Mahon, Libertyville, and Robert K. Aigner, Chicago, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 9, 1988, Ser. No. 242,397
Int. Cl.[4] H01H 7/08
U.S. Cl. 200—38 C 16 Claims



14. A method of providing a programmer/timer with a dual rate of advance comprising the steps of

(a) providing a rotatable cam for actuating at least one switch and frictionally clutching an advance ratchet to said cam;

(b) providing a motorized advance pawl engaging said ratchet and advancing said cam at a first rate through said clutching;

(c) frictionally engaging said ratchet with a continuous motor drive and allowing said ratchet to slip on said motor drive when said pawl engages said ratchet for advancing said cam at said first rate; and,

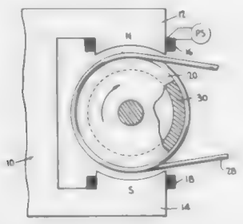
(d) selectively lifting said pawl from engaging said ratchet and advancing said cam continuously at a second rate without slipping said ratchet with said motor drive.

4,856,097

APPARATUS FOR INDUCTION HEATING OF ELECTRICALLY CONDUCTIVE METAL WIRE AND STRIP

Glenn Mohr, P.O. Box 52, Linthicum, Md. 21090

Filed Mar. 29, 1988, Ser. No. 174,868
Int. Cl.[4] H05B 6/10
U.S. Cl. 219—10.61 R 4 Claims



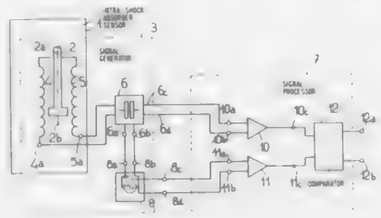
1. Apparatus for induction heating of electrically conductive metal wire and strip, said apparatus comprising a metal drum having a spiral groove external surface to provide a multiple turn continuous path for wire and strip from one end portion of said drum around said drum to an opposite end portion of said drum, means mounting said drum for rotation, drive means connected to said drum for rotating said drum at a selected rate, coil means fixedly positioned in cooperating relation to said drum to provide a magnetic field in which said drum rotates, said coil means being coupled to a constant D.C. power supply providing a constant D.C. field strength, and heating is controlled by the speed of rotation of said drum.

4,856,098

INDUCTANCE SENSOR AND CIRCUIT ARRANGEMENT FOR THE DETECTION OF VEHICLE ATTITUDE

Luigi Morra, Asti, Italy, assignor to Industrie Riunite SPA, Turin, Italy

Filed Jan. 15, 1988, Ser. No. 144,220
Claims priority, application Italy, Jan. 16, 1987, 20524/87[U]
Int. Cl.[4] G01B 7/14; G08C 19/06
U.S. Cl. 324—207 3 Claims



1. A circuit for the detection of vehicle attitude, comprising a signal generating means including a signal sensor inside the cylinder of a shock absorber which is coaxial with the piston thereof, said sensor including a first inductance coil electrically connected at one end thereof to one end of a second inductance coil, said generating means further including capacitive circuit means and an AC power supply electrically connected to said capacitive circuit means and having the free ends of said coils electrically connected to said capacitive circuit means so as to form a resonant circuit fed by said power supply and producing a variable frequency output signal, said circuit further comprising a signal processing means cooperating with said generating means, said variable frequency output signal of said resonant circuit being electrically coupled to a first input of said processing means, said AC power supply producing a fixed frequency output signal and being electrically connected to a second input of said processing means, said processing means comprising a circuit for frequency-to-voltage conversion of the variable frequency output signal produced by the generating means and of the fixed frequency signal provided by the power supply, respectively, said variable and fixed signals being applied after said conversion to a comparator circuit at the output terminals of which a voltage change corresponds to a relative position change of said piston with respect to said cylinder.

4,856,099

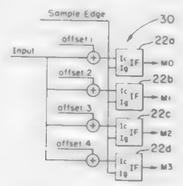
ULTRA FAST ANALOG TO DIGITAL CONVERTERS

Edwin E. Stebbins, New York, N.Y., assignor to Hypres, Incorporated, Elmsford, N.Y.

Filed Aug. 24, 1988, Ser. No. 236,641
Int. Cl.[4] H03M 1/12; H01L 39/22
U.S. Cl. 341—133 10 Claims

1. An analog to digital converter, comprising a plurality of interferometers having respective outputs of a bit that forms part of a digital representation of a sampled analog signal; each

said interferometer having an offset which is different from any of the offsets of the other interferometers of said plurality of



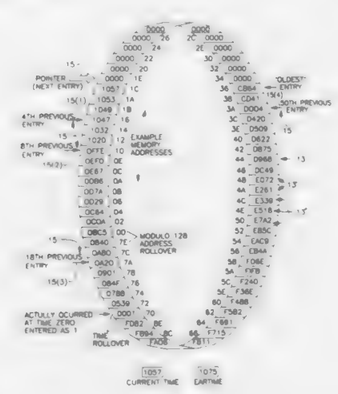
interferometers, whereby said outputs are weighted by said offsetting.

4,856,100

REPLY RATE LIMITING

Robert G. Lehman, Peoria, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 30, 1988, Ser. No. 213,646
Int. Cl.[4] G01S 13/80
U.S. Cl. 342—51 11 Claims



1. An arrangement for determining whether to respond with replies to signal inquiries from an external source which repetitively transmits inquiry signals, said arrangement comprising means for storing a predetermined number of reply times at which replies were made to inquiry signals; means for entering the times of said replies in said means for storing; means for determining eartimes from said predetermined number of reply times; means for determining current time; and means for enabling a response when the current time exceeds said eartime.

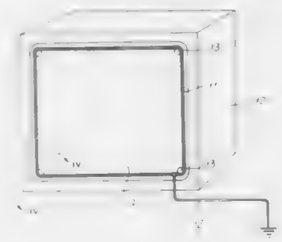
4,856,101

APPARATUS FOR DIVERTING ELECTROSTATIC FIELDS, FOR INSTANCE FROM TELEVISION VIEWING SCREENS

Sven Jonsson, Vimmerby, and Anders Hagman, Vastervik, both of Sweden, assignors to Jonson Teknik KB, Vimmerby, Sweden

Filed Dec. 17, 1987, Ser. No. 134,338
Claims priority, application Sweden, Dec. 17, 1986, 8605423; Jan. 30, 1987, 8700374
Int. Cl.[4] H04N 5/72, 5/65
U.S. Cl. 358—245 15 Claims

1. Method of reducing and diverting radiation from any kind of radiation emitting surfaces like viewing screens, TV screens, chassis and apparatus box etc, applying in that a layer of fluid (8) or a mass of a salt of electrolytic type in direct contact with the radiation emitting surface (1; 9), providing an electrically conducting current diverting means (11) in contact with said



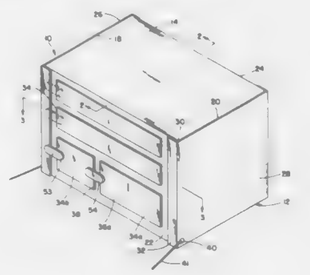
surface (1; 9) and in intimate contact with said layer of fluid (8) or mass, before or after the said layer or mass is applied to the radiation emitting surface.

4,856,102

ADJUSTABLE MULITLAYERED CAPACITOR

Victor Insetta, Jacksonville, Fla., and Donald J. Davis, Jr., Rocky Point, N.Y., assignors to American Technical Ceramics Corporation, Huntington Station, N.Y.

Filed Dec. 19, 1988, Ser. No. 286,348
Int. Cl.[4] H01G 4/34
U.S. Cl. 361—330 10 Claims



1. A capacitor having an adjustable capacitance comprising:

a monolithic dielectric block having a plurality of external walls;

spaced conductive terminal layers on said walls;

laterally spaced electrodes embedded in said block and in direct electric circuit with different ones of said terminal layers;

a plurality of conductive stripes spaced apart from each other and from said terminal layers on at least one of said walls, said stripes being disposed adjacent to and spaced from said electrodes in said block; and

jumper elements for selectively and directly connecting said stripes to at least one of said terminal layers, for adjusting said capacitance.

4,856,103

LUMINAIRE WITH DIFFERENT ASYMMETRY ALONG TWO HORIZONTAL AXES

Wayne W. Compton, Chino Hills, Calif., assignor to Kidde Consumer Durables Corporation, City of Industry, Calif.

Filed Jun. 24, 1988, Ser. No. 220,046
Int. Cl.[4] F21V 5/02
U.S. Cl. 362—340 10 Claims

1. A luminaire having an upper end and a bottom end, a central vertical axis, a horizontal driving lane axis and a hori-

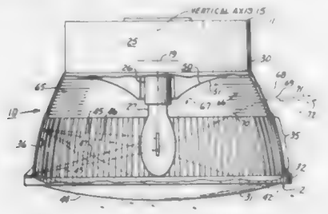
zontal parking stall axis, the driving lane axis and the parking stall axis being normal to the vertical axis, and non-parallel to one another, said axes all intersecting one another, said luminaire comprising:

a base at said upper end including means for making electrical connections and means for supporting a lamp on said vertical axis;

a peripheral enclosure encircling said vertical axis, extending to an opening at said bottom end;

a transparent closure closing said opening;

a reflecting band formed on said enclosure extending from said bottom end to an elevation nearer to said base, and extending along said vertical axis, encircling the major portion of the axial length of said lamp in said socket, said



reflecting band having a reflecting surface facing the vertical axis which curves in planes that include the vertical axis, the curvative being generally concave as it faces the vertical axis;

a transparent band above said reflecting band formed as part of said enclosure, said transparent band including transmitting regions on both sides of said enclosure which intersect said driving lane axis, said transmitting regions being smooth and continuous surfaces, said transparent band also including refracting regions on both sides of said enclosure which intersect said parking stall axis incorporating refracting elements which tend to deflect light downwardly which emitted upwardly from said lamp to impinge thereon, said transmitting and refracting regions alternating around the enclosure.

4,856,104

DEVICE FOR THE DISPLAY AND EDITING OF KNITTING PATTERNS PRODUCED ON A FLAT-BED KNITTING MACHINE

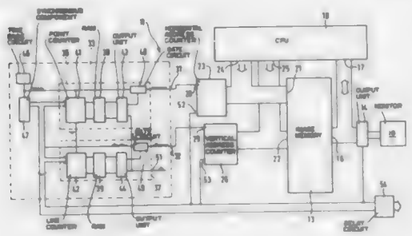
Thomas Stoll; Martin Killus, and Gerd Mak, all of Reutlingen, Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Reutlingen, Fed. Rep. of Germany

Filed Sep. 3, 1987, Ser. No. 92,544

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1986, 3630828

Int. Cl.[4] **D04B** *15/66*

U.S. Cl. 364—470 **10 Claims**



1. A device for the display and editing of knitting patterns produced, preferably on a flat-bed knitting machine, comprising:

an image memory containing a knitting pattern, by loop, in a linear and columnar arrangement, an image memory locations being associated with a corresponding loop of the knitting pattern;

a horizontal address counter and a vertical address counter connected as inputs to the image memory, said image memory being connected on its output with a monitor;

a central processor unit connected to the image memory, the horizontal address counter and the vertical address counter for the programmed control of the image memory and the monitor; and

a bit board device connected to the horizontal address counter and to the vertical address counter, said bit board device serving for the pre-determined change, by line or point, of at least part of the data content read from the image memory, such that both the changed part and the unchanged part of the data content is displayed on the monitor.

4,856,105

METHOD AND APPARATUS FOR MAKING PISTON RINGS

Manfred Brocksieper, Hückeswagen; Rolf Lückger; Hans-Gerd Kröschel, both of Cologne, and Jochen Stechow, Leichlingen, all of Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Sep. 23, 1987, Ser. No. 99,951

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632346

Int. Cl.[4] **G06F** *15/46;* **B23B** *5/26*

U.S. Cl. 364—474.02 **5 Claims**

1. In a method of making self-tensioning rings, including the steps of circumferentially machining an out-of-round ring blank on inner and outer surfaces thereof and subsequently cutting a ring segment out of the ring for obtaining a ring gap therein, the improvement comprising the steps of measuring a circumferential contour of the ring subsequent to the machining step; and calculating the circumferential length of the ring segment and a cutting angle for removing the ring segment from the ring as a function of data obtained in said measuring step.

4,856,106

SYNCHRONOUS STATIC RANDOM ACCESS MEMORY HAVING PRECHARGE SYSTEM AND OPERATING METHOD THEREOF

Eiichi Teraoka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1988, Ser. No. 230,343

Claims priority, application Japan, Aug. 19, 1987, 62-206865

Int. Cl.[4] **G11C** *11/40*

U.S. Cl. 365—203 **12 Claims**

1. A synchronous static random access memory, comprising:

a plurality of word lines;

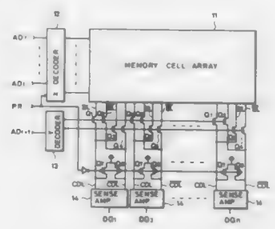
a plurality of bit line pairs arranged so as to intersect said plurality of word lines;

a plurality of memory cells at intersections of said word lines and said bit lines for storing information;

a common data line pair;

a source of precharge voltage at said common data line pair;

first selection means for selecting any of said plurality of bit lines; and



switch means for connecting said common data line pair to only said selected bit line pair and establishing a unidirectional precharge current flow path between said common data line pair and said selected bit line pair, said unidirectional precharge current flow path carrying precharge current only from said source at said common data line pair to said selected bit line pair.

4,856,107

ACOUSTIC FILTER FOR SUPPRESSING OR ATTENUATING THE NEGATIVE HALF-WAVES OF AN ELASTIC WAVE AND AN ELASTIC WAVE GENERATOR COMPRISING SUCH A FILTER

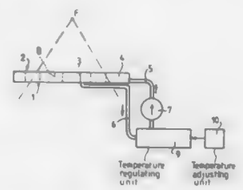
Jacques Dory, Coupvray, France, assignor to EDAP International, France

Continuation-in-part of Ser. No. 187,177, Apr. 28, 1988. This application Apr. 28, 1988, Ser. No. 187,178

Claims priority, application France, Apr. 28, 1987, 87 05981

Int. Cl.[4] **H04R** *1/02;* **A61B** *17/00*

U.S. Cl. 367—150 **10 Claims**



1. An acoustic filter for attenuating the negative pressure half-waves of an elastic wave, comprising an enclosure wherein a predetermined temperature and a mean static pressure prevail when the elastic wave is transmitted therethrough, said enclosure containing a liquid whose saturating vapor tension, at said temperature, is selected at a predetermined value for causing vapor filled cavities to be formed within said liquid.

4,856,108

OPTICAL ARRANGEMENT AND A READING APPARATUS INCLUDING DETECTION OF DATA ELEMENTS DIFFRACTIVE ALONG ENTIRE EXTENT

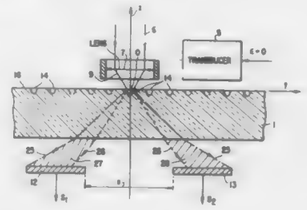
Claude Tinet, Paris, France, assignor to Thomson-CSF, Paris, France

Division of Ser. No. 96,317, Sep. 9, 1987, which is a continuation of Ser. No. 925,491, Oct. 29, 1986, abandoned, which is a continuation of Ser. No. 667,100, Nov. 1, 1984, abandoned, which is a division of Ser. No. 545,110, Oct. 25, 1983, Pat. No. 4,491,940, which is a continuation of Ser. No. 108,499, Dec. 31, 1979, abandoned, which is a continuation of Ser. No. 793,270, May 3, 1977, abandoned, which is a continuation of Ser. No. 390,715, Aug. 23, 1973, abandoned. This application Jun. 29, 1988, Ser. No. 213,097

Claims priority, application France, Aug. 25, 1972, 72 30346

Int. Cl.[4] **G11B** *7/09, 7/24, 7/013*

U.S. Cl. 369—46 **27 Claims**



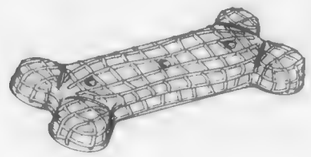
1. An arrangement for reading an optically readable light reflective carrier on which data is stored in the form of diffractive data elements which are deviations from a smooth reference surface but not holes through the carrier, said data elements each having a width of at most 2 microns, said data elements forming tracks with clearance bands in the reference surface therebetween, comprising:

illumination means for projecting a concentrated light spot onto said carrier and said data elements, said light spot substantially occupying the width of a track being read in order to obtain diffraction of light along the entire length of each of said data elements;

an optical arrangement for collecting light reflected from said carrier in such a manner that the maximum light energy is received when the projected light spot impinges on the reference surface and the minimum light energy is received when the projected light spot impinges on a data element, the optical arrangement being configured and positioned such that a part of the light diffracted by said data elements is not collected by said optical arrangement; and

detection means receiving the collected light for providing a data readout signal.

302,622
CANINE BISCUIT
Henry C. Spanier, West Milford, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.
Filed Jan. 5, 1987, Ser. No. 959
Term of patent 14 years
U.S. Cl. D1—106



302,623
MEN AND BOYS UNDERGARMENT
T. Jack Robinson, Pine Hill Dr., Dayton, Tenn. 37321
Filed Dec. 16, 1983, Ser. No. 562,292
Term of patent 14 years
U.S. Cl. D2—10

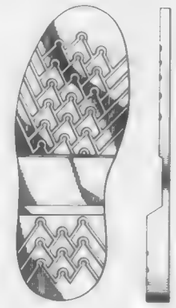




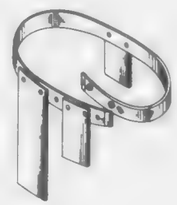
302,624
INSOLE
Donald B. Thompson, Memphis, and Gary Wildman, Germantown, both of Tenn., assignors to Scholl, Inc., Memphis, Tenn.
Filed Oct. 22, 1986, Ser. No. 922,094
Term of patent 14 years
U.S. Cl. D2—318



302,625
SHOE SOLE
Arnold S. Austin, East Brookfield, Mass., assignor to Quabaug Corporation, North Brookfield, Mass.
Filed May 6, 1987, Ser. No. 47,041
Term of patent 14 years
U.S. Cl. D2—320



302,626
TOWEL AND BELT COMBINATION
Albert M. Robinson, Jr., 6104 Springhouse Pl., Apt 23D, Bridgeville, Pa. 15017
Filed May 13, 1986, Ser. No. 862,888
Term of patent 14 years
U.S. Cl. D2—629



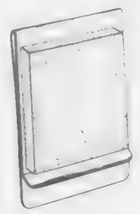
302,627
SEAT BELT RETAINING CLIP
David J. Jordan, 2505 W. Iola, Broken Arrow, Okla. 74012
Filed Nov. 12, 1986, Ser. No. 929,801
Term of patent 14 years
U.S. Cl. D2—639



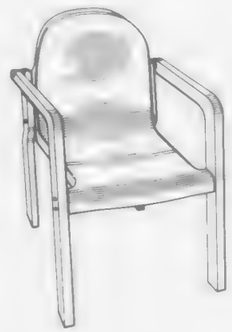
302,628
GUN RACK
Raymond L. Smith, 2645 Roubinwood Way, West Linn, Oreg. 97068
Filed Feb. 10, 1986, Ser. No. 828,492
Term of patent 14 years
U.S. Cl. D3—38



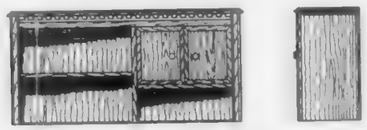
302,629
FISH HOOK HOLDER
Dennis Lackritz, 3839 Divisidaro, San Francisco, Calif. 94123
Filed Mar. 21, 1986, Ser. No. 845,435
Term of patent 14 years
U.S. Cl. D3—104



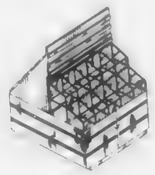
302,630
CHAIR
Just B. Meyer, Rhenen, Netherlands, assignor to Kembo B.V., Veenendaal, Netherlands
Filed Oct. 17, 1986, Ser. No. 920,356
The portion of the term of this patent subsequent to Feb. 17, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—379



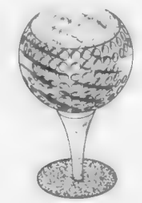
302,631
HUTCH
Paul Bush, Lakewood, N.Y., and Bruce O. Anderson, Talbott, Tenn., assignors to Bush Industries, Inc., Jamestown, N.Y.
Division of Ser. No. 189,693, May 2, 1988. This application Jan. 30, 1989, Ser. No. 303,408
Term of patent 14 years
U.S. Cl. D6—436



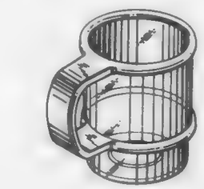
302,632
DISPLAY STAND
Deborah Rees, 2 Longwood Pl., Apt. 21, Elgin, Ill. 60120
Filed Dec. 20, 1985, Ser. No. 811,357
Term of patent 14 years
U.S. Cl. D6—474

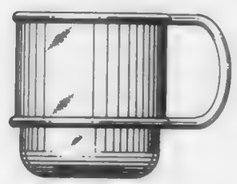


302,633
BEVERAGE CUP
Patrick D. Burns, Uniontown, Ohio, assignor to Golf Decor Creations, Uniontown, Ohio
Filed Oct. 28, 1986, Ser. No. 924,590
Term of patent 14 years
U.S. Cl. D7—5



302,634
MUG
Paul Segal, 15 Colonial Rd., White Plains, N.Y. 10605
Filed Nov. 24, 1986, Ser. No. 934,316
Term of patent 14 years
U.S. Cl. D7—9

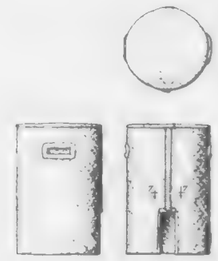




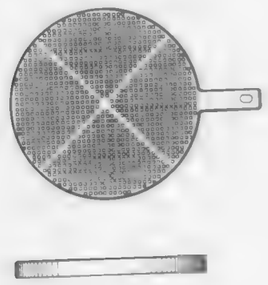
302,635
STRAINER
Bernard Friedman, Allentown, Pa., assignor to Oil Process Systems, Inc., Allentown, Pa.
Filed May 19, 1986, Ser. No. 865,241
Term of patent 14 years
U.S. Cl. D7—47



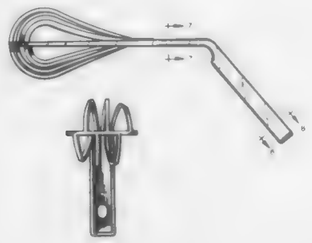
302,636
COFFEE WARMER OR SIMILAR ARTICLE
Marian L. Singer, 1208 E. 9th St., Brooklyn, N.Y. 11230
Filed Sep. 8, 1986, Ser. No. 905,117
Term of patent 14 years
U.S. Cl. D7—70



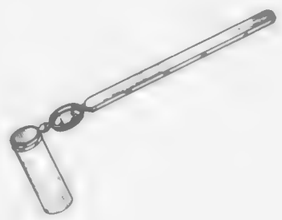
302,637
SPLATTER SCREEN
William D. Hiscott, Chicago, Ill.; Ina Witlin, North Miami Beach, Fla.; Theodore J. Hasler, and Andrew T. Jastrzebski, both of Chicago, Ill., assignors to Ekco Housewares, Inc., Franklin Park, Ill.
Filed May 4, 1987, Ser. No. 45,134
Term of patent 14 years
U.S. Cl. D7—99



302,638
WHISK
William D. Hiscott, Chicago, Ill.; Ina Witlin, North Miami Beach, Fla.; Theodore J. Hasler, and Andrew T. Jastrzebski, both of Chicago, Ill., assignors to Ekco Housewares, Inc., Franklin Park, Ill.
Filed May 4, 1987, Ser. No. 45,135
Term of patent 14 years
U.S. Cl. D7—103



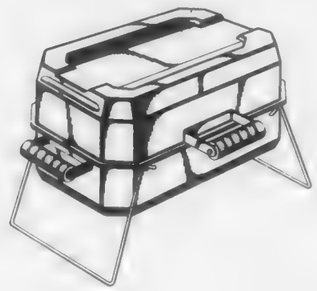
302,639
MILK SAMPLING APPARATUS
Stanley E. Charm, 21 Concolor Ave., Newton, Mass. 02158
Filed Jun. 12, 1987, Ser. No. 62,221
Term of patent 14 years
U.S. Cl. D7—104



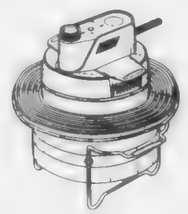
302,640
FORK OR SIMILAR ARTICLE
Siro R. Toffolon, Old-Lyme, Conn., assignor to Avery International, Pasadena, Calif.
Filed Jun. 5, 1986, Ser. No. 871,666
Term of patent 14 years
U.S. Cl. D7—150



302,641
BARBECUE GRILL
John R. Elmburg, Miami, Okla., assignor to U.S. Metal Container Company, Miami, Okla.
Filed Jun. 8, 1987, Ser. No. 59,273
Term of patent 14 years
U.S. Cl. D7—332



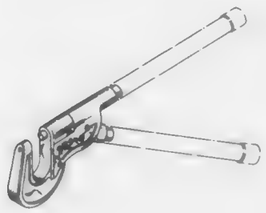
302,642
HOT AIR ELECTRIC OVEN
Hideo Nishikawa, Osaka, Japan, assignor to Imanishi Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Aug. 28, 1986, Ser. No. 901,462
The portion of the term of this patent subsequent to Jul. 11, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—350



302,643
DEVICE FOR REMOVING CAPS OR TOPS FROM SEALED CONTAINERS
David J. Barnett, 3 Fulmar Crescent, Hemel Hempstead, Hertfordshire, and Alan W. E. Knight, 319 Camp Road, St. Albans, Hertfordshire, both of England
Filed Nov. 6, 1986, Ser. No. 928,138
Term of patent 14 years
U.S. Cl. D8—40



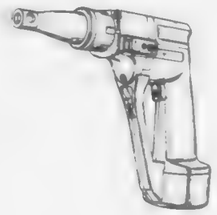
302,644
HEAD FOR A HAND-HELD RIVETING TOOL
Donald G. Townend, 15322 Kornblum Ave., Lawndale, Calif. 90260
Filed Jul. 2, 1985, Ser. No. 751,065
Term of patent 14 years
U.S. Cl. D8—52



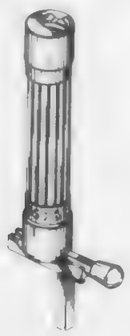
302,645
HAIR CUTTING SHEARS
Leo Passage, 34 Salem La., Evanston, Ill. 60203
Filed Sep. 26, 1986, Ser. No. 912,624
Term of patent 14 years
U.S. Cl. D8—57



302,646
CORDLESS SCREW DRIVER
Yuichiro Sasaki, and Toshiaki Uchida, both of Katsuta, Japan, assignors to Hitachi Koki Company, Ltd., Japan
Filed Dec. 21, 1987, Ser. No. 136,484
Term of patent 14 years
U.S. Cl. D8—68



302,647
LOCKSMITH'S PIN DISPENSER
Benjamin L. Powell, III, 4224 Robin Ave., Naples, Fla. 33942
Filed Mar. 25, 1986, Ser. No. 845,820
Term of patent 14 years
U.S. Cl. D8—71



302,648
SCREWDRIVER
Donald V. Mahaney, 1095 Acacia, Sierra Vista, Ariz. 85635
Filed Nov. 30, 1987, Ser. No. 126,686
Term of patent 14 years
U.S. Cl. D8—82



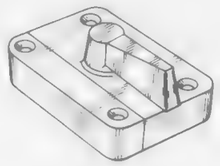
302,649
FOLDING KNIFE
Ferdinand A. Porsche, Robert-Bosch-Strasse 9, 7000 Stuttgart 1, Fed. Rep. of Germany, and Michael Rabe, Zeller Moosstrasse 27/4, 5700 Zell am See, Austria
Filed May 20, 1986, Ser. No. 867,255
Claims priority, application World Int. Prop. O., Dec. 27, 1985, DMA/000456
Term of patent 14 years
U.S. Cl. D8—99



302,650
FOLDING KNIFE
John M. Giordano, 820 E. Sparrow Rd., Virginia Beach, Va. 23464
Filed Jul. 10, 1986, Ser. No. 884,274
Term of patent 14 years
U.S. Cl. D8—99



302,651
COMBINED CHECK RAIL LOCK AND KEEPER
Duane L. Mosch, Owatonna, Minn., assignor to Truth Incorporated, Owatonna, Minn.
Filed Apr. 13, 1987, Ser. No. 37,456
Term of patent 14 years
U.S. Cl. D8—337



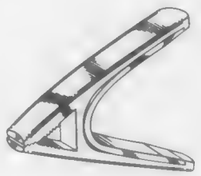
302,652
PRECISION SCALE SUPPORT
William P. Spaeth, Jr., 3728 Northhaven, Dallas, Tex. 75229
Filed Apr. 4, 1986, Ser. No. 847,860
Term of patent 14 years
U.S. Cl. D8—373



302,653
WALL CLIP
Stephen H. Wolff, 222 E. 35th St., New York, N.Y. 10016
Filed Feb. 24, 1987, Ser. No. 18,073
Term of patent 14 years
U.S. Cl. D8—395



302,654
SPRING CLAMP
Vincent B. Cetrone, Warren, Ohio, assignor to Warren Tool Corporation, Hiram, Ohio
Filed Sep. 4, 1987, Ser. No. 93,515
Term of patent 14 years
U.S. Cl. D8—395



302,655
CABLE CLIP
Isaac Sachs, 1240 Ridgewood Drive, Chomedey, Laval, Quebec, Canada H7W 1L3
Filed Jan. 18, 1983, Ser. No. 458,879
Term of patent 14 years
U.S. Cl. D8—396



302,656
DUAL COMPARTMENT BOTTLE
Richard D. Green, 1150 18th St., Ste. 101, Santa Monica, Calif. 90403
Filed Mar. 21, 1986, Ser. No. 845,411
The portion of the term of this patent subsequent to Sep. 17, 1899, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—341



302,657
BOTTLE
Richard L. Platte, Ann Arbor, and Alan W. Vanover, Adrian, both of Mich., assignors to Hoover Universal, Inc., Ann Arbor, Mich.
Filed Jun. 2, 1986, Ser. No. 869,963
Term of patent 14 years
U.S. Cl. D9—375



302,658
DUAL COMPARTMENT CONTAINER FOR MEASURING AND STORING FLUIDS
James E. Grinde, 2401 - 147th La. NE., Anoka, Minn. 55303
Filed Dec. 12, 1986, Ser. No. 941,272
Term of patent 14 years
U.S. Cl. D9—375



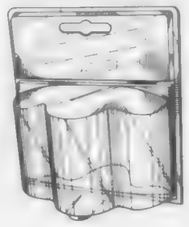
302,659
BOTTLE OR SIMILAR ARTICLE
Ronald A. Peterson, Greenwich, Conn., and Heidi Mohrmann-Tidwell, New York, N.Y., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Dec. 20, 1985, Ser. No. 811,266
Term of patent 14 years
U.S. Cl. D9—377



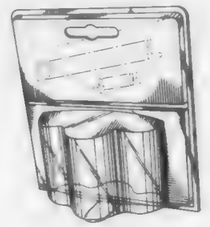
302,660
PERFUME BOTTLE
Jean-Jacques Durand, LaBute, 62510 Arques, France
Filed Jun. 17, 1986, Ser. No. 875,741
Term of patent 14 years
U.S. Cl. D9—403



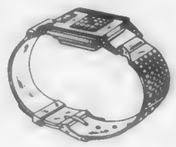
302,661
CONTAINER FOR BATTERIES
Victor Calcerano, R.D. #10 Whangtown, Carmel, N.Y. 10512, and David O'Brien, Star Rte., North Woodstock, Conn. 06244
Filed Sep. 2, 1988, Ser. No. 240,902
The portion of the term of this patent subsequent to Aug. 8, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—415



302,662
CONTAINER FOR BATTERIES
Victor Calcerano, R.D. #10 Whantown Rd., New York, N.Y. 10512, and David O'Brien, Star Rte., North Woodstock, Conn. 06244
Filed Sep. 2, 1988, Ser. No. 240,897
The portion of the term of this patent subsequent to Aug. 8, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—415



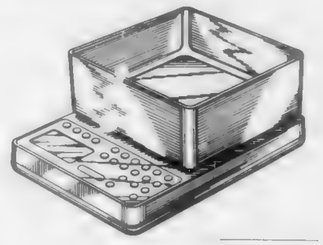
302,663
WRISTWATCH
Jonathan S. Basckin, 3B, Palm Court, 55 Robinson Road, Hong Kong, Hong Kong
Filed Jun. 19, 1986, Ser. No. 876,259
Term of patent 14 years
U.S. Cl. D10—32



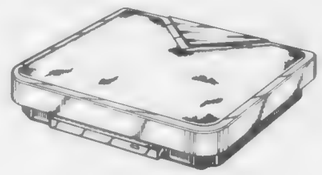
302,664
ELECTRONIC WATCH
Melvyn H. Dawson, Jr., 1130 Rollingwood Trail, Maitland, Fla. 32751
Filed Sep. 8, 1986, Ser. No. 905,116
Term of patent 14 years
U.S. Cl. D10—38



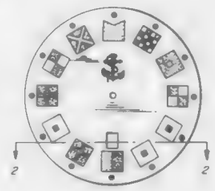
302,665
DIET AND HOUSEHOLD SCALE WITH BOWL
Rido Busse, Elchingen, Fed. Rep. of Germany, assignor to Soehnle-Waagen GmbH & Company, Murrhardt, Fed. Rep. of Germany
Filed May 21, 1986, Ser. No. 866,025
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1986, 2GRII 204/86
Term of patent 14 years
U.S. Cl. D10—91



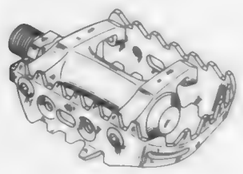
302,666
HOUSEHOLD SCALE
Rido Busse, Elchingen, Fed. Rep. of Germany, assignor to Soehnle-Waagen GmbH & Co., Murrhardt, Fed. Rep. of Germany
Division of Ser. No. 847,023, Mar. 27, 1986. This application Dec. 16, 1988, Ser. No. 285,851
Claims priority, application World Int. Prop. O., Oct. 2, 1985, DM/005922
Term of patent 14 years
U.S. Cl. D10—92



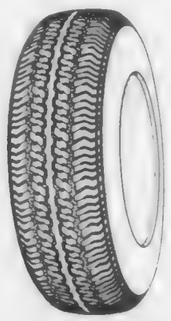
302,667
TIMEPIECE FACE
Charles S. Tobias, Tortola, British Virgin Isls., assignor to Pusser's Inc., Tortola, British Virgin Isls.
Filed May 5, 1986, Ser. No. 859,739
Term of patent 14 years
U.S. Cl. D10—126



302,668
BICYCLE PEDAL
Yoshiya Chounan, Souka, Japan, assignor to Sakae Ringyo Co., Ltd., Japan
Filed Apr. 3, 1987, Ser. No. 33,632
Term of patent 14 years
U.S. Cl. D12—125



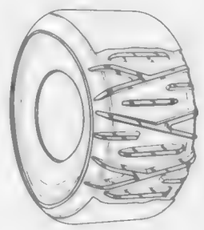
302,669
TIRE
Maurice Graas, Luxembourg, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jun. 16, 1986, Ser. No. 875,779
Claims priority, application Benelux, Jan. 31, 1986, 60795-00
The portion of the term of this patent subsequent to Dec. 16, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—143



302,670
TIRE FOR TWO-WHEELED VEHICLES
Guido Giancola, Milan, and Giancarlo Armellin, Messina, both of Italy, assignors to Pirelli Coordinamento Pneumatici S.p.A., Italy
Filed Sep. 16, 1986, Ser. No. 908,148
Claims priority, application Italy, Mar. 21, 1986, 21299/86[U]
Term of patent 14 years
U.S. Cl. D12—145



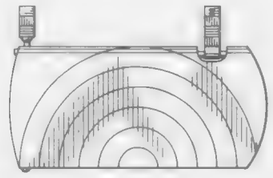
302,671
VEHICLE TIRE
Glynne D. Miller, Pickerington, Ohio, assignor to Kenda Rubber Industrial Co., Ltd., Yuanlin, Taiwan
Filed Jun. 6, 1986, Ser. No. 871,585
Term of patent 14 years
U.S. Cl. D12—149



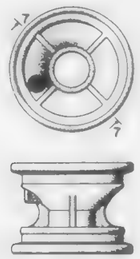
302,672
SHOCK ABSORBER FOR MOTORCYCLE
Yutaka Ueno, Shizuoka, Japan, assignor to Kabushiki Kaisha Showa Seisakusho, Tokyo, Japan
Filed Dec. 5, 1986, Ser. No. 938,746
Term of patent 14 years
U.S. Cl. D12—159



302,673
SUN VISOR
Jay A. Butler, 405 Christopher Ave., El Paso, Tex. 79912
Filed Nov. 9, 1987, Ser. No. 118,643
Term of patent 14 years
U.S. Cl. D12—191



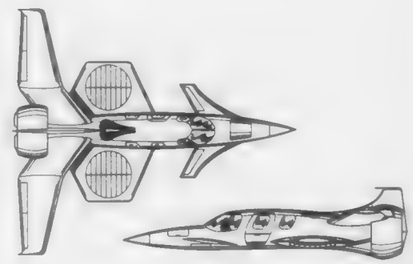
302,674
WHEEL
Joseph W. Sheeler, Carlisle, Pa., assignor to Carlisle Tire & Rubber Company, Cincinnati, Ohio
Filed Sep. 28, 1987, Ser. No. 101,676
Term of patent 14 years
U.S. Cl. D12—204



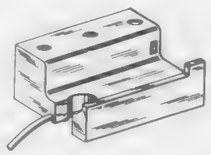
302,675
BOAT
James E. Tucker, 253 Front Street East, Hastings, Ontario K0L 1Y0, Canada
Filed Oct. 5, 1987, Ser. No. 104,487
Term of patent 14 years
U.S. Cl. D12—314



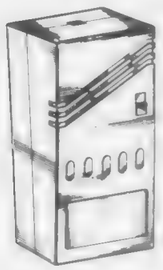
302,676
VERTICAL TAKEOFF AND LANDING AIRCRAFT
Robert T. Clifton, Houston, Tex., assignor to Vulcan Aircraft Corporation, Houston, Tex.
Filed Nov. 18, 1985, Ser. No. 805,386
Term of patent 14 years
U.S. Cl. D12—326



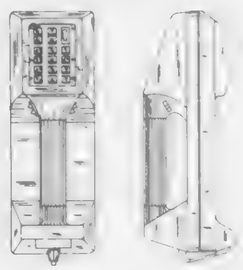
302,677
CHARGER FOR A HAND-HELD MIXER
Hans-Jürgen Precht, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany
Filed Apr. 20, 1987, Ser. No. 40,326
Term of patent 14 years
U.S. Cl. D13—6



302,678
LIGHT DIMMER SWITCH
Steven E. Hilko, Buffalo, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jul. 16, 1986, Ser. No. 886,523
Term of patent 14 years
U.S. Cl. D13—32



302,679
TELEPHONE CRAFTSMAN TEST SET
John R. Mason, 743 Shadow Lade Dr., Thousand Oaks, Calif. 91360
Filed Oct. 5, 1987, Ser. No. 104,312
Term of patent 14 years
U.S. Cl. D14—138



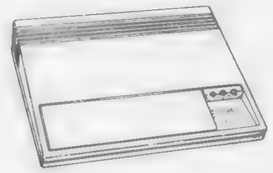
302,680
HANDSET TELEPHONE
Shinichi Fujita; Tsuyoshi Nakamachi, both of Kamakura, and Shigeyuki Yoshida, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 15, 1987, Ser. No. 61,994
Claims priority, application Japan, Dec. 16, 1986, 61-49974
The portion of the term of this patent subsequent to May 9, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—138



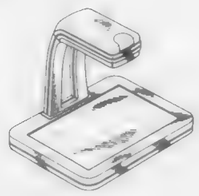
302,681
AMPLIFIED FREQUENCY MODULATION ANTENNA
Piergiorgio Redaelli, Vimercate, Italy, assignor to Cobra S.r.l., Vimercate, Italy
Filed Jun. 24, 1986, Ser. No. 878,562
Term of patent 14 years
U.S. Cl. D14—230



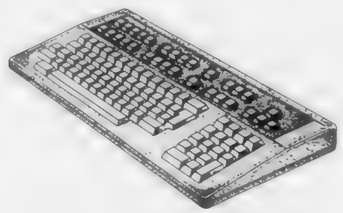
302,682
PRINTER CONTROLLER
David H. Bloom, Vernon Hills; Ralph Camporese, Arlington Heights; William C. Kastilahn, Evanston, all of Ill., and Robert J. Welch, Dallas, Pa., assignors to American Telephone and Telegraph Company, AT&T Teletype, Skokie, Ill.
Filed Sep. 4, 1986, Ser. No. 904,307
Term of patent 14 years
U.S. Cl. D14—107



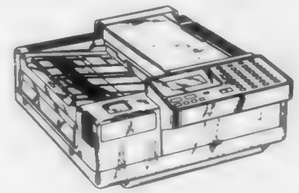
302,683
IMAGE INFORMATION READING MACHINE FOR ELECTRONIC COMPUTER
Hiroyoshi Iwasaki, Chino, and Yasuhiko Nakayama, Suwa, both of Japan, assignors to Chinon Kabushiki Kaisha, Nagano, Japan
Filed Jun. 18, 1987, Ser. No. 63,521
Claims priority, application Japan, Dec. 22, 1986, 61-50682
Term of patent 14 years
U.S. Cl. D14—107



302,684
KEYBOARD
Kenichi Akagi, Littleton, and Marcus C. Koepke, Clinton, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Jul. 14, 1986, Ser. No. 884,921
Term of patent 14 years
U.S. Cl. D14—115



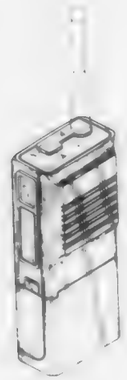
302,685
FACSIMILE TRANSCEIVER
Shigeru Kawai, Higashimurayama; Yoshihiro Kawakatsu, Sayama; Yoshiaki Tsuchihashi, Koganei; Hiroshi Endou, Yokohama, and Katsufumi Ohuchi, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 20, 1986, Ser. No. 834,451
Claims priority, application Japan, Nov. 6, 1985, 60-46304
Term of patent 14 years
U.S. Cl. D14—118



302,686
PORTABLE TWO-WAY RADIO OR SIMILAR ARTICLE
Bruce A. Claxton, Coral Springs, Fla.; Richard K. Althaus, Long Grove, Ill.; William J. Scheid, Coral Springs, and Scott H. Richards, Sunrise, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 29, 1986, Ser. No. 902,335
Term of patent 14 years
U.S. Cl. D14—137



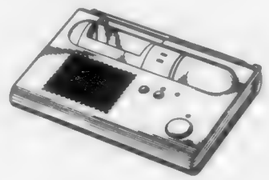
302,687
PORTABLE TWO-WAY RADIO OR SIMILAR ARTICLE
Bruce A. Claxton, Coral Springs, Fla., and Khoo B. Lay, Singapore, Singapore, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 29, 1986, Ser. No. 902,336
Term of patent 14 years
U.S. Cl. D14—137



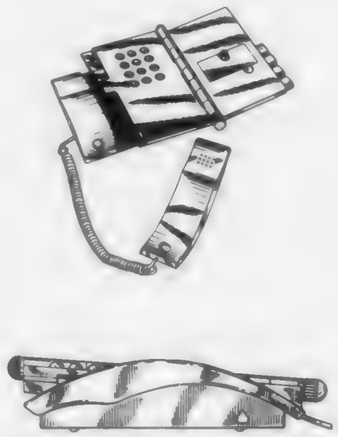
302,688
PORTABLE TWO-WAY RADIO OR SIMILAR ARTICLE
Richard J. Toth, Boca Raton, Fla.; James W. Brinkerhoff, Mount Clemens, Mich.; Craig F. Siddoway, Ft. Lauderdale, and Bruce A. Claxton, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 29, 1986, Ser. No. 902,260
Term of patent 14 years
U.S. Cl. D14—137



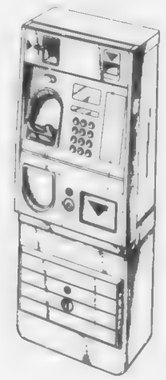
302,689
CORDLESS TELEPHONE SET
Shinzo Murakami, and Yoshitaka Ueda, both of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 25, 1988, Ser. No. 147,827
Claims priority, application Japan, Jul. 28, 1987, 62-30614; Jul. 28, 1987, 62-30615
Term of patent 14 years
U.S. Cl. D14—138



302,690
COMBINATION TELEPHONE ANSWERING MACHINE AND TELEPHONE SET OR SIMILAR ARTICLE
Lisa Krohn, 45 Gramercy Park N., New York, N.Y. 10010, and Tucker Viemeister, 74 Fifth Ave., New York, N.Y. 10011
Filed Dec. 22, 1987, Ser. No. 136,837
Term of patent 14 years
U.S. Cl. D14—141

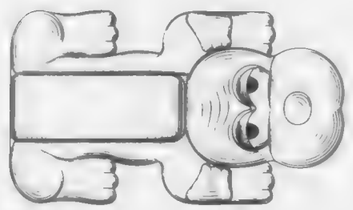


302,691
CASH CALL PUBLIC PAY TELEPHONE STAND
Martin S. Rose, Sudbury, England, assignor to GEC Plessey Telecommunications Ltd., Coventry, England
Filed Jun. 14, 1988, Ser. No. 206,629
Claims priority, application United Kingdom, Dec. 16, 1987, 1407132
Term of patent 14 years
U.S. Cl. D14—142

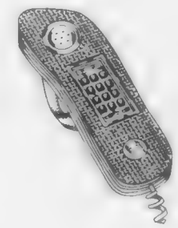


302,692
HOUSING FOR A TELEPHONE
Kash Gobindram, Farmingdale, N.Y., assignor to Kash N'Gold Ltd., Ronkonkoma, N.Y.
Filed Apr. 9, 1987, Ser. No. 36,248
Term of patent 14 years
U.S. Cl. D14—143





302,693
INTEGRAL HANDSET TELEPHONE AND FLIP-TOP TYPE SHOE
David Le bleu, 14 Concord Rd., Westford, Mass. 01886
Filed Oct. 21, 1988, Ser. No. 260,670
Term of patent 14 years
U.S. Cl. D14—143



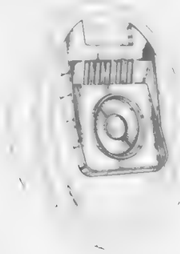


302,694
COMBINED I.C. PORTABLE AM-FM RADIO, SPOTLIGHT AND BLINKING LIGHT
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Apr. 10, 1986, Ser. No. 851,399
Claims priority, application United Kingdom, Oct. 14, 1985, 1027821
Term of patent 14 years
U.S. Cl. D14—168

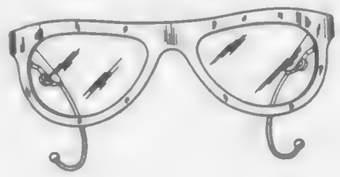


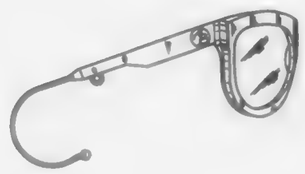


302,695
COMPONENT FOR A VEHICULAR LOUDSPEAKER
Gary S. Weissberg, Long Beach; David Kwang, Pasadena, and Masahiko Yamada, Irvine, all of Calif., assignors to Concept Enterprises, Inc., Vernon, Calif.
Filed Dec. 19, 1986, Ser. No. 943,577
Term of patent 14 years
U.S. Cl. D14—222

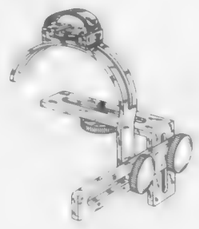


302,696
SPECTACLES
Bernard Bleschet, Chateau Thierry, and Jean-Marie Assenat, Conde En Brie, both of France, assignors to Assenat-Bleschet, Conde En Brie, France
Filed Jan. 8, 1987, Ser. No. 1,437
Claims priority, application France, Jul. 8, 1986, 863654
Term of patent 14 years
U.S. Cl. D16—102

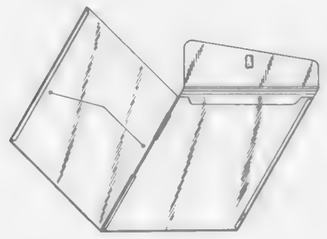




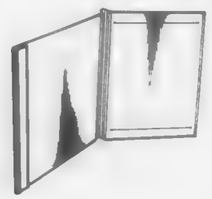
302,697
CAMERA AND FLASH ATTACHMENT BRACKET
Lewis E. Parrish, 3329 Elk Dr., Burlington, N.C. 27215
Filed Apr. 24, 1986, Ser. No. 857,617
Term of patent 14 years
U.S. Cl. D16—242



302,698
PORTFOLIO
Mark D. Rexroat, Kettering, and Meredith Spence, Jr., Dayton, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio
Filed Apr. 21, 1986, Ser. No. 857,559
Term of patent 14 years
U.S. Cl. D19—26



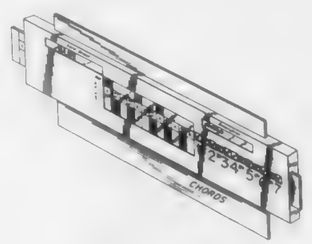
302,699
TWO-SIDED MAGNETIC FOLIO
Ghanshyam H. Popat, Alta Loma; Tien-Tsung Chen, Clarmont; Christopher H. Binkley, Rancho Palos Verdes, and K. Fou Tsai, Rowland Hts., all of Calif., assignors to Avery International, Pasadena, Calif.
Filed May 28, 1986, Ser. No. 868,309
Term of patent 14 years
U.S. Cl. D19—26



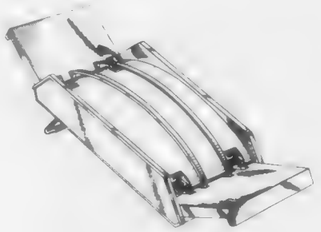
302,700
CLIP FOR WRITING INSTRUMENT
Claude Grossiord, Annecy, France, assignor to S.T. DuPont, Paris, France
Filed Jun. 4, 1986, Ser. No. 870,690
Term of patent 14 years
U.S. Cl. D19—56



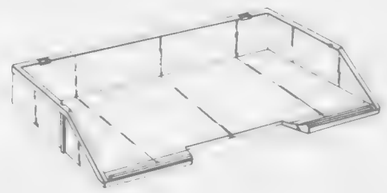
302,701
MUSIC TEACHING DEVICE
Steven Conaway, Plano, Tex., assignor to Trinity Music Computer, Inc., Dallas, Tex.
Filed Apr. 11, 1986, Ser. No. 851,655
Term of patent 14 years
U.S. Cl. D19—62



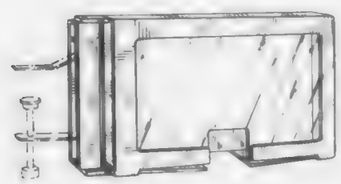
302,702
ADJUSTABLE FILE CARD HOLDER
Albrecht Goertz, New York, N.Y., assignor to Insilco Corporation, Meriden, Conn.
Filed Apr. 3, 1986, Ser. No. 847,850
Term of patent 14 years
U.S. Cl. D19—76



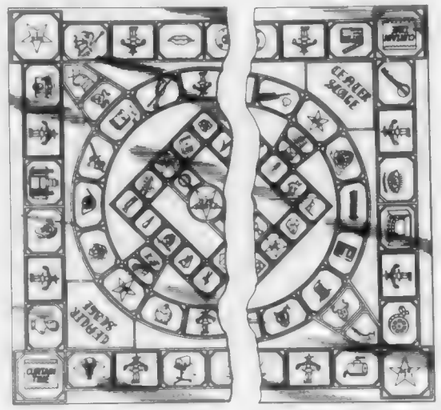
302,703
LETTER TRAY
Kenneth C. Foran, 2209 E. Smithville-Western Rd., Wooster, Ohio 44691, and Thomas J. David, 140 E. North St., Worthington, Ohio 43085
Filed Aug. 7, 1986, Ser. No. 894,159
Term of patent 14 years
U.S. Cl. D19—92



302,704
PIVOTABLE DISPLAY HOLDER FOR SHEETS
Richard G. Krautsack, Arlington Heights, Ill., assignor to Comark Merchandising, Inc., Elk Grove Village, Ill.
Filed Aug. 28, 1986, Ser. No. 901,933
Term of patent 14 years
U.S. Cl. D20—43



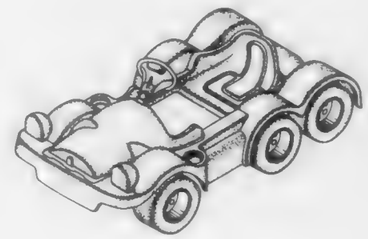
302,705
GAME BOARD
Joseph S. Agee, Jr., 51 Wexford Club Dr., Hilton Head Island, S.C. 29928
Filed Oct. 24, 1985, Ser. No. 791,090
Term of patent 14 years
U.S. Cl. D21—25



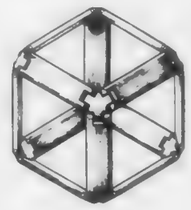
302,706
GAME BOARD
Louis J. Giacona, Scotch Plains; James J. Masterson, Cranford, and Cynthia L. Monsky, Fords, all of N.J., assignors to Union Hospital Foundation, Inc., Union, N.J.
Filed Jun. 3, 1986, Ser. No. 870,338
Term of patent 14 years
U.S. Cl. D21—31

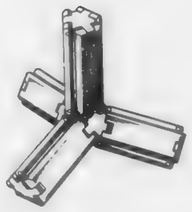


302,708
TOY RIDING VEHICLE
Jerry L. King, Snyder, N.Y., assignor to Kingsbury Toy Products, Ltd., Buffalo, N.Y.
Filed Feb. 25, 1987, Ser. No. 18,957
Term of patent 14 years
U.S. Cl. D21—78

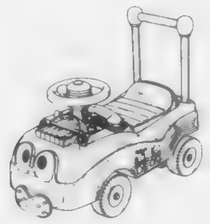


302,709
PUZZLE TOY
Harrison R. Thompson, 306 Southwood Dr., Columbia, S.C. 29205
Filed Jun. 13, 1986, Ser. No. 874,360
Term of patent 14 years
U.S. Cl. D21—104





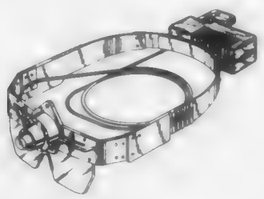
302,707
TOY VEHICLE
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Susumu Matsumoto, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Nov. 19, 1986, Ser. No. 932,533
Claims priority, application Japan, May 19, 1986, 61-18786
Term of patent 14 years
U.S. Cl. D21—74



302,710
CARRIAGE HOUSE PLAYHOUSE
Joseph C. Roy, 16 Berry Hill Rd., Columbia, S.C. 29210
Filed Aug. 3, 1987, Ser. No. 80,686
Term of patent 14 years
U.S. Cl. D21—114



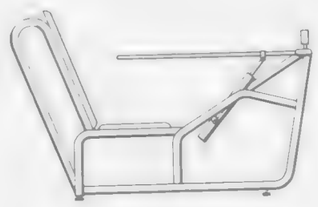
302,711
WATER SQUIRTING TOY
Barry Burlison, Santa Monica, Calif., assignor to C & S Distributing Co., Culver City, Calif.
Filed Mar. 2, 1987, Ser. No. 20,495
Term of patent 14 years
U.S. Cl. D21—145



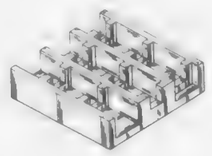
302,712
ANIMATED STUFFED BEAR
Kathy Henn, 9388 Oakhurst Rd., Seminole, Fla. 33542, and Babs Ray, 1424 Rowewood Dr., Chattanooga, Tenn. 37421
Filed Dec. 13, 1985, Ser. No. 808,819
Term of patent 14 years
U.S. Cl. D21—159



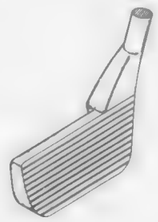
302,713
UNILATERAL INCLINE SHOULDER EXERCISER
Jerry D. Brentham, P.O. Box 599, Belton, Tex. 76513
Filed Nov. 4, 1986, Ser. No. 926,790
Term of patent 14 years
U.S. Cl. D21—195



302,714
GOLF TEE SETTING GAUGE
Johnnie P. Chatham, Rte. 2, Box 331, Valley Ridge, Covington, Va.
Filed Jan. 30, 1986, Ser. No. 824,231
Term of patent 14 years
U.S. Cl. D21—208



302,715
GOLF CLUB HEAD
Alan D. Petersen, 3660 Boulder Hwy., #21, Las Vegas, Nev. 89104
Filed Jun. 17, 1986, Ser. No. 875,664
Term of patent 14 years
U.S. Cl. D21—220



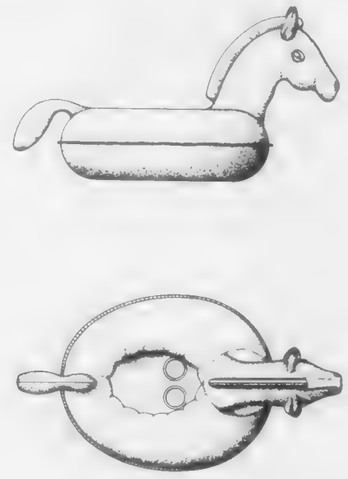
302,716
MINI-SOLE GOLF CLUB
James D. Giambazi, 12 Abbott St., Cumberland, R.I. 02864
Filed Dec. 2, 1985, Ser. No. 803,494
Term of patent 14 years
U.S. Cl. D21—220



302,717
SURFBOARD PROTECTIVE TIP
David Skedeleski, 806 Hoomalu St., and Eric Arakawa, 2073 Komo Mai Dr., both of Pearl City, Hi. 96782
Filed Sep. 15, 1986, Ser. No. 907,614
Term of patent 14 years
U.S. Cl. D21—230



302,718
FLOAT
Henry S. Wolfe, 14810 Rue De Bayonne, Apt. 3H, Clearwater, Fla. 33520
Filed Oct. 24, 1986, Ser. No. 923,656
Term of patent 14 years
U.S. Cl. D21—237



302,719
CUSHION FLOAT
Sheila D. Hance, Erlanger, and Anna M. Brockman, Covington, both of Ky., assignors to Kenneth Mahler DBA GoodLife Designs, Cincinnati, Ohio
Filed Jul. 16, 1987, Ser. No. 74,467
Term of patent 14 years
U.S. Cl. D21—237



302,720
INFLATABLE TENT
Cerby E. Merrill, Rte. 1, Pine Rock Rd., Oregon, Ill. 61061
Filed Sep. 30, 1987, Ser. No. 102,900
Term of patent 14 years
U.S. Cl. D21—253



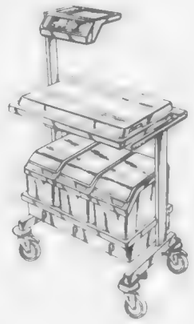
302,721
CARTRIDGE CASE SPINNER
Richard J. Machholz, 714 E. Eastwood, Marshall, Mo. 65340
Filed Jul. 1, 1987, Ser. No. 68,318
Term of patent 14 years
U.S. Cl. 22—116



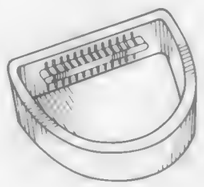
302,722
SAMPLE VIAL
James A. Baxter, London, England, assignor to Chromacol Limited, London, England
Filed Dec. 26, 1985, Ser. No. 813,549
Claims priority, application United Kingdom, Sep. 25, 1985, 10294/87
Term of patent 14 years
U.S. Cl. D24—8



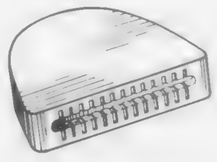
302,723
DISINFECTOR UNIT FOR CLEANING AND DISINFECTING A MEDICAL FIBERSCOPE
Allan P. Arnold, Corringham; Russell Manoy, Welwyn; Ian Wood, Welwyn Garden City; Henry Greaves; Nigel Goode, both of London, and Stephen Hughes, Southend, all of United Kingdom, assignors to Keymed (Industrial & Medical Equipment) Ltd., Southend-On-Sea, United Kingdom
Filed Jul. 21, 1986, Ser. No. 888,191
Term of patent 14 years
U.S. Cl. D24—9



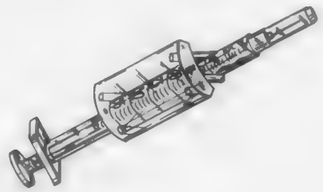
302,724
STRIATED MOLD FOR A FULL BASE DENTAL CAST
Ronald E. Huffman, Tucson, Ariz., assignor to KV33 Corporation, Tucson, Ariz.
Filed Jan. 28, 1987, Ser. No. 7,824
Term of patent 14 years
U.S. Cl. D24—16



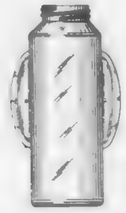
302,725
STRIATED MOLDED FULL BASE DENTAL CAST
Ronald E. Huffman, Tucson, Ariz., assignor to KV33 Corporation, Tucson, Ariz.
Filed Jan. 28, 1987, Ser. No. 7,823
Term of patent 14 years
U.S. Cl. D24—16



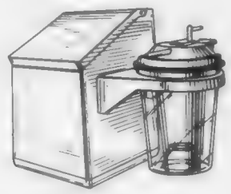
302,726
INJECTION SYRINGE
Eckhard Schwöbel, Emmenbrücke, Fed. Rep. of Germany, assignor to Intermedicat GmbH, Emmenbruke, Switzerland
Filed Nov. 3, 1986, Ser. No. 926,792
Claims priority, application Hague, May 13, 1986, DM/000921
Term of patent 14 years
U.S. Cl. D24—24



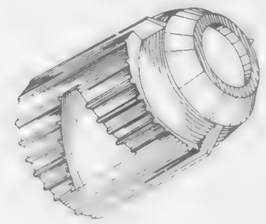
302,727
BABY BOTTLE
Kathryn A. Ryan, and Gregory F. Ryan, both of 77 Erie St., Dumont, N.J. 07628
Filed Jan. 13, 1986, Ser. No. 818,288
Term of patent 14 years
U.S. Cl. D24—47



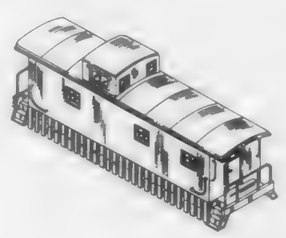
302,728
ASPIRATOR
Walter B. Herbst, Chicago, Ill., and Roy J. Rozek, Plymouth, Wis., assignors to Thomas Industries, Inc., Sheboygan, Wis.
Filed Jan. 23, 1987, Ser. No. 6,105
Term of patent 14 years
U.S. Cl. D24—51



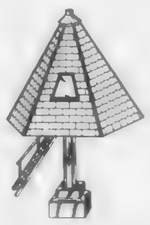
302,729
LUER NUT FOR CONNECTING MEDICAL DEVICES
Thomas P. Stephens, Boxford; William R. Brown, Stoneham, and David A. Bristol, Lyanfield, all of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 3, 1986, Ser. No. 916,084
Term of patent 14 years
U.S. Cl. D24—53



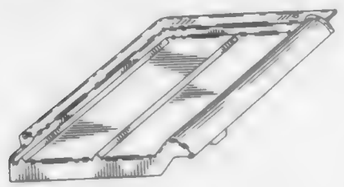
302,730
BUILDING
Danny R. Slagle, 212 Whitson Ave., Swannanoa, N.C. 28778
Filed Jul. 2, 1986, Ser. No. 881,289
Term of patent 14 years
U.S. Cl. D25—11



302,731
BOOTH
Koki Isaka, 11-16 Sasamemachi, Kamakura-shi, Kanagawa pref., Japan
Filed Sep. 18, 1986, Ser. No. 908,638
Term of patent 14 years
U.S. Cl. D25—16



302,732
ROOFING TILE
Edouard Ferland, Magog, Canada, assignor to Les Tuiles de Geneve L.T.G. (1987) Inc., Deauville, Canada
Filed Sep. 22, 1986, Ser. No. 910,421
Claims priority, application Canada, Sep. 16, 1986, 16-09-86-2
Term of patent 14 years
U.S. Cl. D25—140



302,733
COMPACT SELF-BALLASTED FLUORESCENT LAMP
Masashi Sangen, Hyogo; Naoyuki Nakamura, Okayama, and Takeshi Matsumura, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 28, 1987, Ser. No. 78,723
Term of patent 14 years
U.S. Cl. D26—3



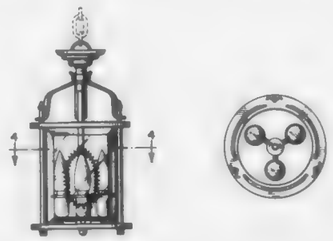
302,734
ADJUSTABLE TABLE LAMP
Michele De Lucchi, Milan, Italy, assignor to Artemide S.P.A., Milan, Italy
Filed Jan. 28, 1987, Ser. No. 5,525
Claims priority, application Italy, Jul. 23, 1986, 22611 B/86
The portion of the term of this patent subsequent to Aug. 8, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—65



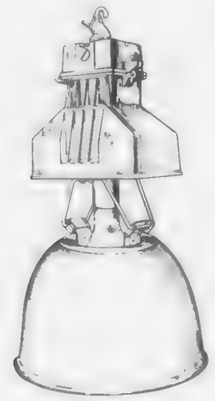
302,735
ADJUSTABLE TABLE LAMP
Michele De Lucchi, Milan, Italy, assignor to Artemide S.p.A., Milan, Italy
Filed Jun. 11, 1987, Ser. No. 60,584
Claims priority, application Italy, Dec. 19, 1986, 24153 B/86
The portion of the term of this patent subsequent to Aug. 8, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—65



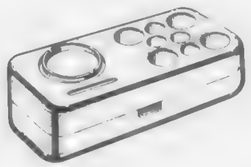
302,736
LIGHT FIXTURE
Robert E. Bohler, Aurora, Ill., assignor to St. Joe Lighting, Inc., Batavia, Ill.
Filed Oct. 31, 1986, Ser. No. 925,401
The portion of the term of this patent subsequent to Jul. 25, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—81

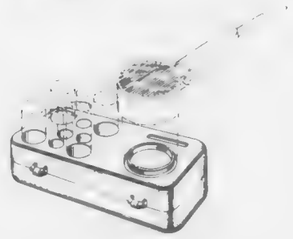


302,737
LUMINAIRE
Merle C. Hoke; John W. Harvey, and Linda M. Bauer, all of Newark, Ohio, assignors to Manville Corporation, Denver, Colo.
Filed Jan. 28, 1987, Ser. No. 7,886
Term of patent 14 years
U.S. Cl. D26—88

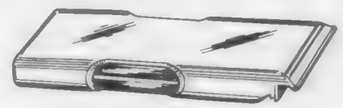


302,738
COMBINED CARRYING CASE AND HEATING UNIT FOR HAIR CURLERS
Edward J. Doyle, Hatboro, Pa., assignor to Conair Corporation, Edison, N.J.
Filed Jun. 16, 1986, Ser. No. 875,371
Term of patent 14 years
U.S. Cl. D28—38

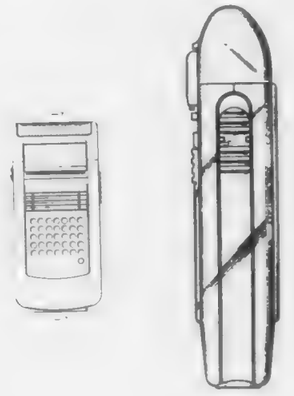




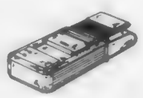
302,739
SAFETY RAZOR HANDLE
Roland Beuchat, Cologny, Switzerland, assignor to Synertrade and Finance S.A., Carouge, Switzerland
Filed Oct. 10, 1986, Ser. No. 917,513
Claims priority, application Int'l Pat. Institute, Apr. 10, 1986, DMA/000488
Term of patent 14 years
U.S. Cl. D28—48



302,740
ELECTRIC SHAVER
Yonosuke Iwai, and Kazuyoshi Yonesawa, both of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Sep. 29, 1986, Ser. No. 912,820
Claims priority, application Japan, Apr. 1, 1986, 61-11966
Term of patent 14 years
U.S. Cl. D28—49



302,741
DRY SHAVER
Gotthard C. Mahlich, Kronberg, and Florian Seiffert, Wiesbaden, both of Fed. Rep. of Germany, assignors to Robert Krups Stiftung & Co. K.G., Solingen, Fed. Rep. of Germany
Filed Oct. 9, 1986, Ser. No. 917,376
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1986, 8MR353
Term of patent 14 years
U.S. Cl. D28—49

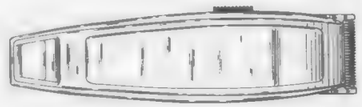


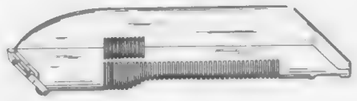


302,742
ELECTRIC DRY SHAVER
Kazuo Segawa, Funabashi; Toshiro Higa, Hino, and Yoshio Mouri, Tokyo, all of Japan, assignors to Kyusyu Hitachi Maxwell, Ltd., Fukuoka, Japan
Filed Sep. 5, 1986, Ser. No. 904,256
Term of patent 14 years
U.S. Cl. D28—51

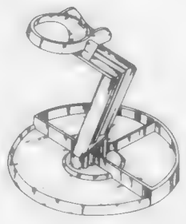


302,743
HAIR CLIPPER
John F. Wahl, Sterling, and Kenneth M. Hattori, Bensenville, both of Ill., assignors to Wahl Clipper Corporation, Sterling, Ill.
Filed Nov. 5, 1986, Ser. No. 927,427
Term of patent 14 years
U.S. Cl. D28—53

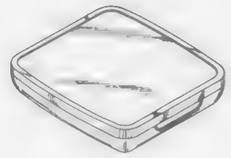


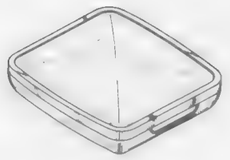


302,744
NAIL DRYER STAND
Jerome R. Flynn, 3857 Birch St., Newport Bch., Calif. 92660
Filed Sep. 22, 1986, Ser. No. 910,426
Term of patent 14 years
U.S. Cl. D28—61



302,745
COSMETIC CASE
Karena Bakic, Varese, Italy, assignor to Cosmede Anstalt, Vaduz, Liechtenstein
Filed Apr. 13, 1987, Ser. No. 37,441
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1986, URA1461/86
Term of patent 14 years
U.S. Cl. D28—83

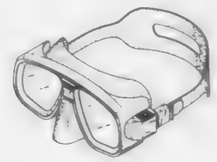




302,746
INHALATION MASK
Terry L. Shirley, 31471 Paseo Durian, San Juan Capistrano, Calif. 92675
Filed Jul. 23, 1987, Ser. No. 77,312
Term of patent 14 years
U.S. Cl. D29—7



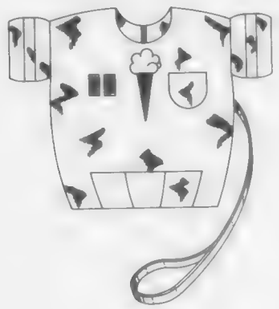
302,747
DIVING MASK
Seiji Hattori, Kanagawa, Japan, assignor to Dacor Corporation, Northfield, Ill.
Filed Apr. 28, 1985, Ser. No. 858,221
Term of patent 14 years
U.S. Cl. D29—9

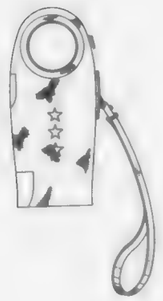


302,748
PROTECTIVE PAD FOR A SEAT BELT
John A. Dubeck, and Charlotte Dubeck, both of P.O. Box 3753, Port Charlotte, Fla. 33949
Filed Jun. 23, 1986, Ser. No. 877,675
Term of patent 14 years
U.S. Cl. D29—10

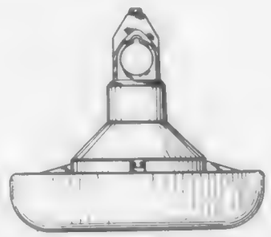


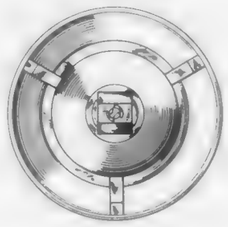
302,749
COMBINED CHILD'S VEST AND HARNESS
Stephan A. Marquez, and Juanita Marquez, both of 220 Withington Ave., Rollinda, Calif. 95673
Filed Jul. 24, 1986, Ser. No. 888,842
Term of patent 14 years
U.S. Cl. D29—11



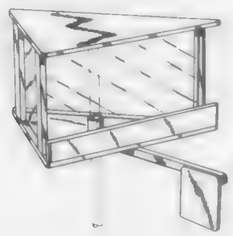


302,750
POULTRY FEEDER
Howard S. Brembeck, Goshen, and Ray E. Swartzendruber, Syracuse, both of Ind., assignors to CTB, Inc., North Milford, Ind.
Filed Jun. 9, 1988, Ser. No. 204,406
Term of patent 14 years
U.S. Cl. D30—122

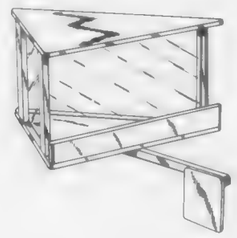




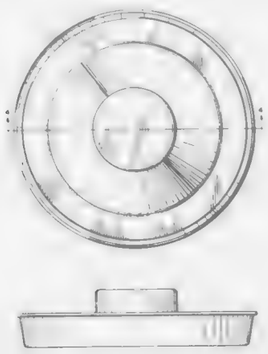
302,751
SHELTERED BIRD FEEDER
Timothy Baldwin, 151 Woodbury Dr., Dayton, Ohio 45415
Filed Jan. 7, 1988, Ser. No. 142,880
The portion of the term of this patent subsequent to Aug. 8, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D30—124



302,752
SHELTERED BIRD FEEDER
Timothy Baldwin, 151 Woodbury Dr., Dayton, Ohio 45415
Filed Mar. 4, 1988, Ser. No. 165,668
The portion of the term of this patent subsequent to Aug. 8, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D30—124



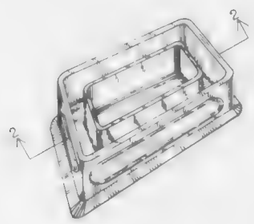
302,753
ANIMAL FEEDING DISH
Alan Zelinger, Monsey, N.Y., assignor to Ethical Products, Inc., Newark, N.J.
Filed Sep. 18, 1987, Ser. No. 98,134
Term of patent 14 years
U.S. Cl. D30—129



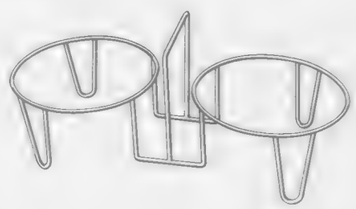
302,754
ANIMAL FEEDER
John M. Fuller, Winchester, Va., assignor to Rubbermaid Commerical Products Inc., Winchester, Va.
Filed Jan. 12, 1987, Ser. No. 2,520
Term of patent 14 years
U.S. Cl. D30—129



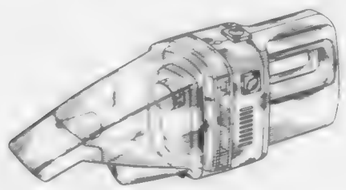
302,755
PET FEEDING DISH
Majid Zaliti, P.O. Box 27912, Escondido, Calif. 92027
Filed Mar. 14, 1988, Ser. No. 167,448
Term of patent 14 years
U.S. Cl. D30—130

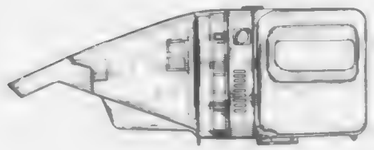


302,756
ANIMAL FEEDING DISH RACK
Cecil W. Trine, 16795 Perrett Rd., Marshall, Mich. 49068
Filed Jan. 29, 1988, Ser. No. 150,095
Term of patent 14 years
U.S. Cl. D30—133



302,757
PORTABLE VACUUM CLEANER
Shigehiro Uemura, Kyoto, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan
Filed Dec. 10, 1986, Ser. No. 940,074
Claims priority, application Japan, Jun. 30, 1986, 61-25420
Term of patent 14 years
U.S. Cl. D32—18





302,758
HANDHELD VACUUM CLEANER
Brunhilde Lauer, Koppelgasse 5, 3573 Gemuenden, Fed. Rep. of Germany
Filed Dec. 28, 1987, Ser. No. 138,029
Term of patent 14 years
U.S. Cl. D32—18



302,759
WRINGER SPONGE MOP
Douglas R. Batchelor, Chicago, Ill., assignor to Libman Broom Company, Arcola, Ill.
Filed Aug. 8, 1989, Ser. No. 947,484
Term of patent 14 years
U.S. Cl. D32—44



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF AUGUST, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Gullichsen, Johan, 4,854,819, Cl. 415-143.000.
A. H. Robins Company, Incorporated: *See*—
Walsh, David A., 4,855,447, Cl. 548-494.000.
Walsh, David A., 4,855,448, Cl. 548-504.000.
A. O. Smith Corporation: *See*—
Cole, Robert L., 4,855,630, Cl. 310-156.000.
A V L Gesellschaft fur Verbrennungskraftmaschinen Und Messtechnik M.B.H., Prof. Dr.Dr.h.c. Hans List: *See*—
Melde-Tuczai, Helmut; Wagner, Johann; and Fraidl, Gunter, 4,854,270, Cl. 123-52.00M.
AB Biodisk: *See*—
Ericsson, Magnus, 4,854,627, Cl. 294-64.100.
AB Sandvik Coromant: *See*—
Faber, Kurt H. A. E.; Faber, Ute M. I.; Faber, Knut; Faber, Inken A. H.; and Faber, Andrea J., 4,854,764, Cl. 403-13.000.
AB Volvo: *See*—
Persson, Jan; and Rangstähl, Jan, 4,854,567, Cl. 269-71.000.
ABB Stal AB: *See*—
Jonsson, Arne, 4,854,854, Cl. 431-170.000.
Abbagnaro, Louis A.: *See*—
Wallgren, Linus E.; Mason, Bobby L.; Siegel, William J.; Olesen, Ole V.; and Abbagnaro, Louis A., 4,855,572, Cl. 219-456.000.
Abbott Laboratories: *See*—
Marker, Edwin M.; Thacker, Paul F.; and Knopfhart, Peter K., 4,855,110, Cl. 422-102.000.
ABC Orthoproducts, Inc.: *See*—
Broudy, Arnold S.; and Shank, Cheryl A., 4,854,566, Cl. 269-44.000.
Abe, Akira: *See*—
Fujita, Yoshihiro; and Abe, Akira, 4,855,218, Cl. 430-428.000.
Abe, Eiichi: *See*—
Sato, Isamu; Ishida, Masato; Abe, Eiichi; and Takeda, Hiroaki, 4,855,767, Cl. 346-160.000.
Abe, Kaoru: *See*—
Yanaihara, Noboru; and Abe, Kaoru, 4,855,406, Cl. 530-324.000.
Abe, Tomoaki: *See*—
Kiyono, Masashi; Takeuchi, Kanji; Abe, Tomoaki; and Takao, Mitsunori, 4,854,283, Cl. 123-361.000.
Abkowitz, Martin A.: *See*—
Badesha, Santokh S.; Foley, Geoffrey M. T.; Pai, Damodar M.; Zallen, Richard H.; Slade, Michael L.; and Abkowitz, Martin A., 4,855,203, Cl. 430-59.000.
Abou-Gharbia, Magid A.; and Patel, Usha R., to American Home Products Corporation. Polycyclicamine with psychotropic activity. 4,855,430, Cl. 544-373.000.
Abrutyn, Eric S.; Scarfo, Louis; and Chromecek, Richard, to Dow Corning Corporation. Lattice-entrapped composition. 4,855,127, Cl. 424-411.000.
Ackermann, Helmut: *See*—
Ring, Manfred; Weber, Jurgen; and Ackermann, Helmut, 4,854,707, Cl. 356-356.000.
Acro Med Corporation: *See*—
Steffee, Arthur D., 4,854,311, Cl. 128-92.0YM.
Active Memory Technology Ltd.: *See*—
Humpleman, Richard J., 4,855,615, Cl. 307-269.000.
Adachi, Fukuichi: *See*—
Onose, Jun; Takagi, Kazutoshi; and Adachi, Fukuichi, 4,855,875, Cl. 362-32.000.
Adams, Glenn N.; and Beekenkamp, Gerald, to Canadian Patents and Development Limited-Societe Canadienne des Brevets et d' Exploitation Limitee. Microwave apparatus for thawing frozen liquid and a bag holder assembly for use therein. 4,855,555, Cl. 219-10.55F.
Adams, Mark J.; and Crisman, Elton M., Jr., to Lockheed Corporation. Method of and apparatus for thermographic evaluation of spot welds. 4,854,724, Cl. 374-5.000.
Adams, Steven L.: *See*—
Archibald, James B.; and Adams, Steven L., 4,854,034, Cl. 29-596.000.
Adcock, James L., to University of Tennessee Research Corporation, The. High efficiency apparatus for aerosol direct fluorination. 4,855,112, Cl. 422-186.230.
Adejare, Adeboye: *See*—
Miller, Duane D.; Feller, Dennis R.; Clark, Michael T.; Adejare, Adeboye; Romstedt, Karl J.; and Shams, Gamal, 4,855,476, Cl. 558-410.000.
Adsett, Anthony P., to Litton Systems, Inc. Method of making a gas laser. 4,854,987, Cl. 156-89.000.
Advanced Graphic Technologies, Inc.: *See*—
Reneau, Bobby L.; Rhea, George; and Owens, Gary, 4,854,927, Cl. 493-27.000.
Advanced Polymer Systems: *See*—
Leong, Helen; Katz, Martin; Delk, Ann; Nacht, Sergio; and Berliner, David, 4,855,144, Cl. 424-487.000.
AEG Olympia Aktiengesellschaft: *See*—
Lange, Heinz; Heins, Hans-Peter; and Jendricke, Hermann, 4,854,755, Cl. 400-208.100.
Aerometrics, Inc.: *See*—
Bachalo, William D., 4,854,705, Cl. 356-336.000.
Aerovironment, Inc.: *See*—
Mathai, C. V.; Rathbun, Lyle A.; and Kinsey, John S., 4,854,500, Cl. 239-3.000.
Aertken, Karl: *See*—
Westernacher, Helmut; Aertken, Karl; and Stieren, Thomas, 4,855,516, Cl. 568-873.000.
Aesculap-Werke AG Vormals Jetter & Scheerer: *See*—
Braun, Karl, 4,854,317, Cl. 128-334.00R.
Aetna Bearing Company: *See*—
Harrington, Richard F.; and Selgrad, James, 4,854,437, Cl. 192-98.000.
Afforder, Cynthia A.: *See*—
Osborne, Michael W.; Afforder, Cynthia A.; and England, William G., 4,855,276, Cl. 502-415.000.
Ag-Chem Equipment Co., Inc.: *See*—
LaVine, M. Joseph, Jr., 4,854,505, Cl. 239-304.000.
AG Processing Technologies, Inc.: *See*—
Pecot, Michel; and Nulman, Jaim, 4,854,727, Cl. 374-57.000.
Agano, Toshitaka: *See*—
Ohgoda, Makoto; and Agano, Toshitaka, 4,855,599, Cl. 250-327.200.
Agency of Industrial Science and Technology: *See*—
Ohta, Kimihiro; Nakagawa, Tadashi; Kojima, Takeshi; Sakamoto, Tsunenori; and Kawai, Naoyuki, 4,855,013, Cl. 156-601.000.
Takasaki, Yoshiyuki, 4,855,232, Cl. 435-97.000.
Agfa-Gevaert Aktiengesellschaft: *See*—
Meckl, Heinz; Spriewald, Erika; and Renner, Gunter, 4,855,216, Cl. 430-372.000.
Renner, Gunter; Wolff, Erich; Wiesen, Heinz; and Liebe, Werner, 4,855,222, Cl. 430-557.000.
Renner, Gunter; and Illner, Erich, 4,855,441, Cl. 548-363.000.
Agfa-Gevaert, N.V.: *See*—
Janssens, Wilhelmus; Timmerman, Daniel M.; and Claeys, Daniel A., 4,855,211, Cl. 430-213.000.
Vanmaele, Luc J.; Wilhelmus, Janssens; and Van de Sande, Christian C., 4,855,223, Cl. 430-562.000.
AGIP Petroli S.P.A.: *See*—
Lovato, Vittorio, 4,854,729, Cl. 374-141.000.
Agro-Kanesho Co., Ltd.: *See*—
Iriuchijima, Shinobu; Kobayashi, Hirohiko; Masuda, Takahito; Watanabe, Shunnosuke; and Tabata, Hiroshi, 4,855,311, Cl. 514-373.000.
Ahmann, John E. Dual voting booth package. 4,854,652, Cl. 312-140.200.
Aigner, Robert K.: *See*—
Mahon, Joseph J.; and Aigner, Robert K., 4,856,096, Cl. 200-38.00C.
Air Products and Chemicals, Inc.: *See*—
Garg, Diwakar; Dyer, Paul N.; Schaffer, Leslie E.; Wrecsics, Ernest L.; Dimos, Duane; and Mueller, Carl F., 4,855,188, Cl. 428-627.000.
Kimock, Fred M.; and Phillips, John H., 4,855,594, Cl. 250-282.000.
Marsella, John A., 4,855,425, Cl. 544-78.000.
Riahi, Shantia, 4,855,604, Cl. 250-492.200.
Tang, Man-Wing; King, William M.; and Wensley, C. Glen, 4,855,048, Cl. 210-500.300.
Aisan Kogyo Kabushiki Kaisha: *See*—
Kozawa, Tadashi; Natsume, Naohiro; Komatsubara, Hirofumi; Takaku, Yasunori; Kato, Kiyoshi; and Harada, Seiichi, 4,854,830, Cl. 417-365.000.
Aisin Seiki Kabushiki Kaisha: *See*—
Hayakawa, Shigeru; Shiraishi, Daiichi; and Murakami, Hisakazu, 4,854,617, Cl. 292-216.000.
Aisin-Warner Limited: *See*—
Moroto, Shuzo; Sumiya, Koji; Sakaguchi, Yoshikazu; Kubo, Seitoku; and Taga, Yutaka, 4,854,195, Cl. 74-867.000.
Aizawa, Isamu, to Graphtec Kabushiki Kaisha. Thermal head supporting means in thermal recording apparatus. 4,855,755, Cl. 346-76.0PH.
Ajco Jewelry Co. Inc.: *See*—
Eiss, Martin, 4,855,972, Cl. 368-282.000.
Akada, Yasuaki: *See*—
Ishimura, Toshihiko; Ishikawa, Norio; Akada, Yasuaki; Seki, Reiji; and Taniguchi, Nobuyuki, 4,855,778, Cl. 354-412.000.

Akasaka, Hideki; and Sato, Masatoshi, to Nikon Corporation. Over write capable magnetooptical recording method using two beams, and magnetooptical recording apparatus therefor. 4,855,975, Cl. 369-13.000.

Akasaki, Isamu; and Sawaki, Nobuhiko, to Nagoya University. Process for growing III-V compound semiconductors on sapphire using a buffer layer. 4,855,249, Cl. 437-81.000.

Akashi, Akira, to Canon Kabushiki Kaisha. Camera with automatic focusing device. 4,855,776, Cl. 354-402.000.

Akechi Ceramics Co., Ltd.: *See*—
Ando, Mitsuru; and Takasu, Toshikazu, 4,854,487, Cl. 222-606.000.

Akedo, Jun: *See*—
Kobayashi, Hiroshi; Machida, Haruhiko; Harigaya, Makoko; Ide, Yasushi; and Akedo, Jun, 4,855,256, Cl. 437-129.000.

Aki, Shinji: *See*—
Ueda, Hiraki; Miyamoto, Hisashi; Aki, Shinji; and Otsuka, Tatsuya, 4,855,292, Cl. 514-312.000.

Akiyama, Hiroo, to Nippon Gakki Seizo Kabushiki Kaisha. Disc player. 4,855,990, Cl. 369-265.000.

Akron City Hospital: *See*—
Elsey, Denise M., 4,854,309, Cl. 128-87.00R.

Akutsu, Takashi: *See*—
Matsubara, Akinori; Tsutsumi, Kenichi; Kaneko, Youji; Akutsu, Takashi; and Tateishi, Naofumi, 4,854,209, Cl. 84-1.010.

Akzo N.V.: *See*—
Verlaan, Johannes P. J.; and Beijleveld, Wilhelmus M., 4,855,428, Cl. 544-219.000.

Akzona Incorporated: *See*—
Battey, Paul K.; Hope, Peter; and Sharma, Ashutosh H., 4,855,346, Cl. 524-217.000.

Albizzati, Enrico, to Montedison S.p.A. Process for preparing solid components for catalysts, or precursors of such components, in the form of microspheroidal particles, suitable for the preparation of ethylene polymers. 4,855,272, Cl. 502-119.000.

Alcan International Ltd.: *See*—
Dobner, Alfred, 4,854,275, Cl. 123-193.00H.

Alcatel N.V.: *See*—
Mohr, Friedemann, 4,856,093, Cl. 455-619.000.

Alcatel STK A/S: *See*—
Varreag, Jan, 4,855,536, Cl. 174-73.100.

Alcatel Thomson Faisceaux: *See*—
Argintaru, Lazare; and Hebrard, Denis, 4,855,691, Cl. 331-172.000.

Aldrich-Boranes, Inc.: *See*—
Brown, Herbert C., 4,855,506, Cl. 568-6.000.

Alexander, Robert H.; Osmer, Thomas M.; and Neely, James W., to Allen-Bradley Company, Inc. Computer controlled automatic shift drill. 4,854,786, Cl. 408-1.00R.

Alexander, Steven W.: *See*—
Czarnocki, Walter S.; Harper, Peter W.; Moran, Kevin S.; and Alexander, Steven W., 4,854,167, Cl. 73-204.190.

Alfatechnic AG: *See*—
Dubach, Werner F., 4,854,473, Cl. 220-335.000.
Gyimothy, Gabor, 4,854,478, Cl. 221-190.000.

Alheritiere, Edouard; and Prandi, Bernard, to Compagnie Europeenne du Zirconium Cezus. Process for treating titanium alloy parts for use as compressor disks in aircraft propulsion systems. 4,854,977, Cl. 148-12.70B.

Allen-Bradley Company, Inc.: *See*—
Alexander, Robert H.; Osmer, Thomas M.; and Neely, James W., 4,854,786, Cl. 408-1.00R.
Burke, Thomas J., 4,855,906, Cl. 364-200.000.
Davis, Wesley; and Gasperi, Michael L., 4,855,830, Cl. 358-168.000.

Allen, D. Mason, to Awareness Marketing Corporation, The. Water level control. 4,853,986, Cl. 4-508.000.

Allen-Morrison, Inc.: *See*—
Callahan, David T.; and Moorefield, Barry A., 4,854,479, Cl. 221-304.000.

Allied-Signal Inc.: *See*—
Blanchard, William C., 4,855,595, Cl. 250-287.000.
Brandao, Ruy L.; Kyriakos, Constantinos S.; Spires, Randall C.; and Juga, Andrejs, 4,855,748, Cl. 342-455.000.
Newell, Charles E., 4,855,336, Cl. 523-152.000.
Vick, Ralph L., 4,854,222, Cl. 91-447.000.
Wilson, Colleen R.; Burne, Richard A.; and Berkovich, Semyon, 4,855,997, Cl. 370-85.000.
Zupancic, Joseph J.; Zweig, Andrew M.; and Wrezel, James A., 4,855,375, Cl. 526-247.000.

Alligood, John H.; and Lawther, Joel S., to Eastman Kodak Company. Compact camera with flash unit movable to reduce red-eye. 4,855,771, Cl. 354-149.110.

Allison, John G. Artificial pine needle. 4,855,166, Cl. 428-15.000.

Allman, Derryl D. J.; and Lee, Steven S., to NCR Corporation. Native oxide reduction for sealing nitride deposition. 4,855,258, Cl. 437-241.000.

Allo Pro AG: *See*—
Ziemann, Edeltraud; and Ziemann, Andreas, 4,854,716, Cl. 366-139.000.

Allred, Jimmie B., III, to Welch Allyn, Inc. Video equipped endoscope with needle probe. 4,854,302, Cl. 128-6.000.

Allspach, Thomas: *See*—
Peter, Roland; Ebel, Klaus; and Allspach, Thomas, 4,855,427, Cl. 544-198.000.

Almeras, Roland: *See*—
Ollivier, Jean; and Almeras, Roland, 4,854,793, Cl. 411-49.000.

Alpha-1 Biomedicals, Inc.: *See*—
Wang, Su S., 4,855,407, Cl. 530-334.000.

Alps Electric Co., Ltd.: *See*—
Okita, Masao, 4,855,852, Cl. 360-104.000.
Tobita, Katsumi, 4,855,835, Cl. 358-195.100.

Alsthom: *See*—
Lemoine, Francois; and Rathouit, Rene , 4,854,777, Cl. 405-202.000.

Althoff, Karl-Heinz; Kunick, Werner; Munstermann, Manfred; Voss, Uwe; and Glanz, Werner, to O & K Orenstein & Koppel AG. Apparatus for transporting loads. 4,854,805, Cl. 414-495.000.

ALZA Corporation: *See*—
Eckenhoff, James B.; Magruder, Judy A.; Cortese, Richard; Peery, John R.; and Wright, Jeremy C., 4,855,141, Cl. 424-423.000.

AM International Incorporated: *See*—
Faltin, Hans G., 4,854,204, Cl. 83-500.000.

Amada Company, Limited: *See*—
Aoyagi, Minoru, 4,854,208, Cl. 83-862.000.

Amano, Hideaki: *See*—
Matsushita, Toshio; Amano, Hideaki; Yamaura, Satoru; Nakamura, Shigeo; and Nakada, Yasusuke, 4,855,853, Cl. 360-106.000.

Amano, Hisao: *See*—
Yamato, Ikuo; Tokunaga, Norikazu; Matsuda, Yasuo; and Amano, Hisao, 4,855,887, Cl. 363-8.000.

Amano, Norihisa: *See*—
Seki, Masaki; and Amano, Norihisa, 4,855,921, Cl. 364-474.290.
Seki, Masaki; and Amano, Norihisa, 4,855,926, Cl. 364-474.290.
Seki, Masaki; and Amano, Norihisa, 4,855,927, Cl. 364-474.290.

Amaya, Naoyuki: *See*—
Murata, Yoshishige; Koinuma, Yasumi; Amaya, Naoyuki; Otsu, Takayuki; and Nisimura, Masafumi, 4,855,374, Cl. 526-261.000.

Amdahl Corporation: *See*—
Daberkow, Kevin L.; Finan, Christopher D.; Petolino, Joseph A.; Sobottka, Daniel C.; and Thomas, Jeffrey A., 4,855,904, Cl. 364-200.000.
Wang, Eugene T.; and Si, Stephen S. C., 4,855,616, Cl. 307-269.000.
Zmyslowski, Allan J.; and Maier, Robert M., 4,855,947, Cl. 364-200.000.

Amerace Corporation: *See*—
Flanagan, Robert M.; and Heenan, Sidney A., 4,854,768, Cl. 404-11.000.

American Cyanamid Company: *See*—
Essenfeld, Amy P., 4,855,520, Cl. 585-409.000.
Robertson, Allan J.; and Gallivan, James B., 4,855,507, Cl. 568-12.000.

American Home Products Corporation: *See*—
Abou-Gharbia, Magid A.; and Patel, Usha R., 4,855,430, Cl. 544-373.000.
Katz, Alan H.; and Demerson, Christopher A., 4,855,445, Cl. 548-432.000.

American National Carbide Company: *See*—
Stroud, Donald S., 4,854,405, Cl. 175-374.000.

American Safety Products: *See*—
Wyatt, Donald H., 4,854,388, Cl. 169-26.000.

American Technical Ceramics Corporation: *See*—
Insetta, Victor; and Davis, Donald J., Jr., 4,856,102, Cl. 361-330.000.

American Telephone and Telegraph Company: *See*—
Douskalis, William, 4,855,996, Cl. 370-84.000.
Taska, John L., 4,856,091, Cl. 455-607.000.

American Tourister, Inc.: *See*—
Carpenter, Lester E.; and Waddell, Charles E., Jr., 4,854,432, Cl. 190-110.000.
Pulichino, John V., Jr.; and Tong, Joy, 4,854,431, Cl. 190-108.000.

Amioka, Shigenori: *See*—
Shiraishi, Noriaki; Kamiyama, Sigeru; Amioka, Shigenori; and Okada, Akiyoshi, 4,854,634, Cl. 296-108.000.

Ammann, Hans-Rudolf. Laser beam levelling instruments. 4,854,703, Cl. 356-248.000.

Ammco Tools, Inc.: *See*—
Norman, John S., 4,854,199, Cl. 82-112.000.

Amoco Corporation: *See*—
Chew, Calvin T.; and Gee, John C., 4,855,491, Cl. 562-414.000.
Fjare, Douglas E.; and Hagen, Gary P., 4,855,503, Cl. 564-394.000.
Haddad, Muin S.; and Schimandle, John J., 4,855,270, Cl. 502-64.000.
Hundley, John G., 4,855,492, Cl. 562-414.000.
Kelsey, Donald R., 4,855,388, Cl. 528-125.000.
Mount, Houston B., II; and Snoddy, Michael L., 4,854,163, Cl. 73-153.000.
Warren, Tommy M.; and Winters, Warren J., 4,854,397, Cl. 175-26.000.

AMP Incorporated: *See*—
Bures, Milan; Kratochvil, Paul P.; and Rowlette, John R., 4,855,590, Cl. 250-221.000.
Gutterman, Pamela R.; Harms, Sherry J.; and Hoffer, John C., 4,854,660, Cl. 350-96.180.
Nishimura, Ryoji, 4,854,890, Cl. 439-607.000.
Vignoli, Guido, 4,854,892, Cl. 439-417.000.

Amphenol Corporation: *See*—
Muhlhoff, Carl H., 4,854,900, Cl. 439-751.000.

Anagnostopulos, Hiristo: *See*—
Wess, Gunther; Bartmann, Wilhelm; Beck, Gerhard; and Anagnostopulos, Hiristo, 4,855,323, Cl. 514-550.000.

Analog Devices, Inc.: *See*—
Brokaw, A. Paul, 4,855,618, Cl. 307-296.600.
Gerstenhaber, Moshe; and Libert, Robert J., 4,855,684, Cl. 330-257.000.

Anazawa, Osamu: *See*—
Kurosawa, Akihito; Suzuki, Kazuyuki; Anazawa, Osamu; and Yoshihara, Masayuki, 4,854,477, Cl. 221-1.000.

Anderka, Gerold, to Rotring-werke Riepe KG. Sign cutting device. 4,854,205, Cl. 83-529.000.

Anderson, Carl C.: *See*—
Burkholder, Mary J.; Piccirilli, Barbara G.; Anderson, Carl C.; and Temple, Rodger G., 4,855,164, Cl. 427-385.500.

Anderson, Edward M. Deep fat food cooker having a fat pre-warmer. 4,854,299, Cl. 126-380.000.

Anderson, Ian M., to Courtaulds Packaging Australia Limited. Flexible containers. 4,854,734, Cl. 383-66.000.

Anderson, Jeffrey J.; Drury, David J.; Hamlin, John E.; and Kent, Alexander G., to BP Chemicals Limited. Process for the preparation of formic acid. 4,855,496, Cl. 562-609.000.

Ando, Mitsuru; and Takasu, Toshikazu, to Akechi Ceramics Co., Ltd. Molten steel pouring nozzle. 4,854,487, Cl. 222-606.000.

Andre, Jean-luc, to Lohr Industrie. Vehicle wheel support and fastening device. 4,854,790, Cl. 410-30.000.

Andreshak, John L.: *See*—
Chapman, Robert D.; Andreshak, John L.; and Shackelford, Scott A., 4,855,508, Cl. 568-589.000.

Andrew, James C.: *See*—
Geiste, Douglas W.; and Andrew, James C., 4,854,651, Cl. 312-9.000.

Anklam, William J.: *See*—
Tan, Michael; Su, Chung-Yi; and Anklam, William J., 4,855,696, Cl. 333-20.000.

Anzai, Tsutomu: *See*—
Isobe, Akira; and Anzai, Tsutomu, 4,855,611, Cl. 307-125.000.

Aoki, Makoto: *See*—
Ichikawa, Kyoko; Aoki, Makoto; and Takiguchi, Hideo, 4,855,753, Cl. 346-1.100.

Aoshima, Shinichiro: *See*—
Nakamura, Takuya; Aoshima, Shinichiro; and Tsuchiya, Yutaka, 4,855,591, Cl. 250-225.000.

Aoyagi, Minoru, to Amada Company, Limited. Two-way band saw machine. 4,854,208, Cl. 83-862.000.

Aoyagi, Yoshio: *See*—
Kimura, Toshiyuki; Aoyagi, Yoshio; and Endo, Fumio, 4,855,979, Cl. 369-33.000.

Apex Medical Technologies, Inc.: *See*—
McGlothlin, Mark W.; and DePaul, Alice A., 4,855,169, Cl. 428-35.200.

Apollo Sprayers International, Inc.: *See*—
Darroch, John B., 4,854,822, Cl. 417-62.000.

Appelbaum, Benjamin: *See*—
Lynch, Donald M.; and Appelbaum, Benjamin, 4,855,128, Cl. 424-49.000.

Apperson, Gerald R.: *See*—
Wiklof, Christopher A.; and Apperson, Gerald R., 4,855,757, Cl. 346-76.0PH.

Appleton, Gregory H.; and Mikelk, Paul D., to Breakthru Industries, Inc. Weighing system. 4,854,406, Cl. 177-139.000.

Applied Biosystems, Inc.: *See*—
Fung, Steven; Woo, Sam L.; Haugland, Richard P.; Menchen, Steven M.; and Connell, Charles R., 4,855,225, Cl. 435-6.000.

Applied Engineering Products Co.: *See*—
Struhs, Kenneth E.; Struhs, Mark J.; and Struhs, Patrick L., 4,855,823, Cl. 358-108.000.

Applied Materials, Inc.: *See*—
Chang, Mei; Wang, David N. K.; White, John M.; and Maydan, Dan, 4,854,263, Cl. 118-715.000.

Applied Medical Research: *See*—
Cohen, Michael, 4,855,305, Cl. 514-171.000.

Arai, Fuminori: *See*—
Muraishi, Katsuaki; Yaginuma, Nakatsugu; Hirai, Kikuo; Arai, Fuminori; and Iwata, Yuzo, 4,855,109, Cl. 422-63.000.

Arai, Hisao; Sonehara, Keisuke; Yasumura, Satoshi; and Kobayashi, Junji, to Kabushiki Kaisha Kenwood. Lock device for equipment loaded to vehicle. 4,854,145, Cl. 70-258.000.

Arai, Shigeru, to Fujitsu Limited. Apparatus for recording and reading an optical disk, having reduced offset in its tracking error signal. 4,855,983, Cl. 369-46.000.

Arai, Shinji: *See*—
Ikegawa, Sumio; Hori, Akio; Komatsu, Shuichi; Arai, Shinji; and Yasuda, Nobuaki, 4,855,992, Cl. 369-275.000.

Arakawa, Mitsuaki; and Nichols, Brenda G., to University of California, The Regents of the. Enhanced decoupling of MRI RF coil pairs during RF tuning of MRI RF transmit coil. 4,855,680, Cl. 324-314.000.

Arakawa, Motoomi: *See*—
Tada, Akihiro; Kiriu, Takashi; and Arakawa, Motoomi, 4,855,208, Cl. 430-110.000.

Arakawa, Satoshi; Kitada, Akira; Yamazaki, Kikuo; Ohmiya, Kenji; and Kawagoe, Jun, to Fuji Photo Film Co., Ltd. Radiation image converting material. 4,855,191, Cl. 428-690.000.

Arakawa, Takahiko: *See*—
Sakashita, Kazuhiro; Kishida, Satoru; Hanibuchi, Toshiaki; Tomioka, Ichiro; and Arakawa, Takahiko, 4,856,002, Cl. 371-21.000.

Araya, Takeshi: *See*—
Okada, Ryoji; Haneda, Mitsuaki; Araya, Takeshi; and Hioki, Susumu, 4,855,102, Cl. 419-8.000.

ARCH Development Corp.: *See*—
Gruen, Dieter M.; Young, Charles E.; and Pellin, Michael J., 4,855,596, Cl. 250-305.000.

Archibald, James B.; and Adams, Steven L., to General Electric Company. Method for producing a stack of laminations with skewed conductor slots. 4,854,034, Cl. 29-596.000.

Arco Chemical Technology, Inc.: *See*—
Bourland, Larry G.; DiLullo, Robert J.; Ritrievi, Kimberly E.; and Valbert, Jon R., 4,855,179, Cl. 428-296.000.
Gastinger, Robert G.; and Hayes, John E., 4,855,330, Cl. 521-137.000.

Argintaru, Lazare; and Hebrard, Denis, to Alcatel Thomson Faisceaux. Amplitude stabilizer for use in microwave discriminator. 4,855,691, Cl. 331-172.000.

Arii, Michio; Kamataki, Yoshihisa; Hino, Shirou; and Matsui, Shoji, to Kabushiki Kaisha Toshiba. Combined cycle power plant capable of controlling water level in boiler drum of power plant. 4,854,121, Cl. 60-39.182.

Ariizumi, Shoji; Iwase, Taira; and Masuoka, Fujio, to Kabushiki Kaisha Toshiba. Method of making a semiconductor ROM device. 4,855,248, Cl. 437-49.000.

Arikawa, Tetsuro, to Nippon A B S, Ltd. Anti-skid control apparatus for a vehicle braking system. 4,854,649, Cl. 303-113.000.

Arlt, Dieter: *See*—
Kaulen, Johannes; Arlt, Dieter; Holmwood, Graham; and Kramer, Wolfgang, 4,855,438, Cl. 548-262.000.

Armbruster, Guenter: *See*—
Greenhalgh, Geoffrey; Morris, Peter; Bearon, John N.; and Armbruster, Guenter, 4,854,636, Cl. 296-201.000.

Armstrong, Douglas L.: *See*—
Hayes, John B.; and Armstrong, Douglas L., 4,855,842, Cl. 358-342.000.

Armstrong World Industries, Inc.: *See*—
Bolgiano, Nicholas C.; Grubb, Mary B.; Hudson, Raymond S.; and Sigman, William T., 4,855,165, Cl. 427-393.500.

Arnold, Ronald D.; Atol, Gerald R.; and Baker, Samuel F., to Texas Iron Works, Inc. Manifold arrangement for use with a top drive power unit. 4,854,383, Cl. 166-70.000.

Arntzen, Sven. Means for exercising dogs from a bicycle. 4,854,269, Cl. 119-29.000.

Aro Corporation, The: *See*—
Gardner, Richard K.; and Kozumplik, Nicholas, Jr., 4,854,832, Cl. 417-393.000.

Asahi Denka Kogyo K. K.: *See*—
Takeda, Satoru; Hayashi, Toshihiro; and Kohno, Hiroshige, 4,854,843, Cl. 425-437.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Yamamoto, Fumihiko; and Misumi, Teruyuki, 4,855,365, Cl. 525-401.000.
Yokota, Masahisa; Shimizu, Atsushi; Komiya, Kyosuke; Yamataka, Kazunori; and Nonura, Tadanori, 4,855,377, Cl. 528-25.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Tanaka, Hitoshi, 4,854,673, Cl. 350-255.000.

Asahi, Nobumitsu; Ikeda, Tetsuo; and Kawase, Seiji, to Kabushiki Kaisha Kenwood. Frequency converting apparatus. 4,855,894, Cl. 363-157.000.

Asahi Optical Co., Ltd.: *See*—
Hashimoto, Isamu; and Nishida, Takao, 4,855,772, Cl. 354-173.100.
Kobayashi, Takeo; and Numako, Norio, 4,855,782, Cl. 354-475.000.

Asai, Kazumitsu: *See*—
Fukukawa, Mitsuo; Yazawa, Masayuki; Asai, Kazumitsu; Okamoto, Yoshiharu; and Mio, Kouhei, 4,854,769, Cl. 404-72.000.

Asakawa, Toshiyuki: *See*—
Kitajima, Tadayuki; Asakawa, Toshiyuki; Naito, Masataka; Matsuo, Kazuhiro; and Murayama, Toshiaki, 4,854,571, Cl. 271-293.000.

Asami, Kiyoshi: *See*—
Katsumata, Masaaki; Takagi, Isamu; Takahashi, Eiji; Sakai, Tadamichi; Matsumoto, Yoji; Ohtsu, Hideaki; Uchida, Hiroyuki; and Asami, Kiyoshi, 4,855,106, Cl. 420-109.000.

Asano, Osamu: *See*—
Ooki, Yasumasa; Asano, Osamu; and Mikiya, Toshio, 4,854,787, Cl. 408-17.000.

Asano, Seiji: *See*—
Ohmura, Hiroshi; Ushiro, Seimei; Hara, Hiroshi; Asano, Seiji; and Yoshida, Toshio, 4,855,774, Cl. 354-203.000.

Asao, Hideo; Yamazi, Satoru; and Saibe, Seiichi, to Juki Corporation; and Takatori Machinery Manufacturing Co., Ltd. Method for button sewing. 4,854,252, Cl. 112-265.100.

Asch, Karl: *See*—
Zapka, Werner; Kempf, Jurgen; Keyser, Joachim; and Asch, Karl, 4,855,197, Cl. 430-5.000.

Asea Brown Boveri AB: *See*—
Bergman, Sten; and Ljung, Stefan, 4,855,861, Cl. 361-65.000.

Asea Stal AB: *See*—
Ekbom, Ragnar, 4,855,103, Cl. 419-26.000.

Ash Medical Systems, Inc.: *See*—
Ash, Stephen R.; and Janle-Swain, Elsa M., 4,854,322, Cl. 128-635.000.

Ash, Stephen R.; and Janle-Swain, Elsa M., to Ash Medical Systems, Inc. Capillary filtration and collection device for long-term monitoring of blood constituents. 4,854,322, Cl. 128-635.000.

Ashland Oil, Inc.: *See*—
Dammann, Laurence G.; Blakley, Brent A.; and Carlson, Gary M., 4,855,383, Cl. 528-51.000.
Goel, Anil B., 4,855,398, Cl. 528-367.000.
Snook, Robert L., 4,854,367, Cl. 164-34.000.

Tufts, Timothy A.; Borgnaes, Dan; Culbertson, Billy M.; and Wilkinson, Theodore C., 4,855,368, Cl. 525-454.000.
Asics Corporation: *See*—
Sugiyama, Yasunori; and Nakata, Satoru, 4,854,055, Cl. 36-127.000.
Aspey, S. Alan: *See*—
Drachnik, Kenneth J.; Kheder, Joseph; and Aspey, S. Alan, 4,855,024, Cl. 204-147.000.
Assinder, Andrew J.: *See*—
Burleigh, David W.; and Assinder, Andrew J., 4,854,639, Cl. 297-250.000.
AT&T Information Systems Inc.: *See*—
Douskalis, William, 4,855,996, Cl. 370-84.000.
Taska, John L., 4,856,091, Cl. 455-607.000.
Athens, Inc.: *See*—
Clark, R. Scot; Hoffman, Joe G.; Davison, John B.; Jones, Alan W.; Jones, Allen H., Jr.; Persichini, David W.; Yuan, Wallace I.; and Lipisko, Bruce A., 4,855,023, Cl. 204-130.000.
Atlantic Richfield Company: *See*—
Bader, Robert A.; and Axelrod, Michael G., 4,855,111, Cl. 422-142.000.
Atlas Copco Aktiebolag: *See*—
Schoeps, Knut C.; and Westerberg, Sven P. J., 4,854,916, Cl. 464-25.000.
Atochem: *See*—
Benedetti, Charles; Gluntz, Claude; Pascal, Robert; and Stefanini, Michel, 4,855,053, Cl. 210-634.000.
Atol, Gerald R.: *See*—
Arnold, Ronald D.; Atol, Gerald R.; and Baker, Samuel F., 4,854,383, Cl. 166-70.000.
Atomic Energy of Canada Limited: *See*—
Cecco, Valentino S.; and Carter, Jon R., 4,855,676, Cl. 324-220.000.
Attaar, Mustan: *See*—
Mott, Gerry; Attaar, Mustan; and Rishel, Rick D., 4,854,173, Cl. 73-600.000.
Atwal, Karnail; and Rovnyak, George C., to E. R. Squibb & Sons, Inc. 1,2,3,4-Tetrahydro-6-substituted-4-aryl(or heterocyclo)-3-((substituted amino)carbonyl)-2-thioxo (or oxo)-5-pyrimidinecarboxylic acids and esters. 4,855,301, Cl. 514-269.000.
Audi AG: *See*—
Chemnitzer, Eberhard, 4,854,286, Cl. 123-425.000.
Augat Inc.: *See*—
Corridori, Anthony J., 4,854,882, Cl. 439-83.000.
Augst, Herbert, to Benz & Hilgers GmbH. Apparatus for feeding a packaging machine with cardboard cut pieces stored in stacks. 4,854,815, Cl. 414-788.400.
Ausimont S.p.A.: *See*—
Calloni, Enzo; Valente, Maurizio; and Raiola, Alfonso, 4,855,044, Cl. 210-195.100.
Ausonia S.p.A.: *See*—
Coslovi, Giuliano; and Casalegno, Italo, 4,854,136, Cl. 66-191.000.
Austin Rover Group Limited: *See*—
Wallbank, James, 4,854,366, Cl. 164-16.000.
Autek Systems Corporation: *See*—
Pereyda, Robert, 4,855,535, Cl. 174-52.100.
Autopart Sweden AB: *See*—
Hagstrom, Robert, 4,854,629, Cl. 296-97.130.
Avelis, Julian P.: *See*—
McBrady, William J.; and Avelis, Julian P., 4,854,441, Cl. 198-384.000.
Averdick, Gunter; and Sandten, Herbert, to G. Siempelkamp GmbH & Co. Method of producing a press platen. 4,854,026, Cl. 29-157.30R.
Avibank Mfg., Inc.: *See*—
Duran, John A., 4,854,795, Cl. 411-352.000.
Avidan, Amos A.; Smith, Fritz A.; and Tabak, Samuel A., to Mobil Oil Corporation. Fluidized bed process for upgrading diene-containing light olefins. 4,855,521, Cl. 585-415.000.
Awareness Marketing Corporation, The: *See*—
Allen, D. Mason, 4,853,986, Cl. 4-508.000.
Axelrod, Michael G.: *See*—
Bader, Robert A.; and Axelrod, Michael G., 4,855,111, Cl. 422-142.000.
AXIS USA Inc.: *See*—
Luciani, Sabatino; and Santandrea, Luciano, 4,854,033, Cl. 29-596.000.
Ayabe, Hideo: *See*—
Yamazaki, Tsuneo; Saito, Tomoki; and Ayabe, Hideo, 4,854,518, Cl. 242-56.900.
Azumai, Hideo; Fujii, Koichi; Seigenji, Takashi; and Yoshioka, Keiichi, to Ricoh Company, Ltd. Selectively definable semiconductor device. 4,855,803, Cl. 357-45.000.
Baba, Fujio: *See*—
Takeuchi, Kunihiko; Baba, Fujio; and Shimomura, Yasuo, 4,855,729, Cl. 340-825.050.
Baba, Hideki: *See*—
Tashiro, Yoichi; Baba, Hideki; Obatake, Kohei; Sakka, Hiroshi; and Sohara, Ichiro, 4,855,157, Cl. 426-609.000.
Babcock Industries Inc.: *See*—
Lichtenberg, Norman B.; Sponseller, Harold P.; and Totten, Jeffrey E., 4,854,185, Cl. 74-501.50R.
Newman, Gordon A.; and Gilmore, William J., 4,854,193, Cl. 74-850.000.
Babcock & Wilcox Company, The: *See*—
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Babendererde, Siegmund: *See*—
Hentschel, Volker; Versteegen, Clemens; Mahmens, Olaf; and Babendererde, Siegmund, 4,854,776, Cl. 405-147.000.
Bach, Erik, to Interlego A. G. Wheel bearing, in particular for toy vehicles. 4,854,742, Cl. 384-129.000.
Bachalo, William D., to Aerometrics, Inc. Method and apparatus to determine the size and velocity of particles using light scatter detection from confocal beams. 4,854,705, Cl. 356-336.000.
Bader, Robert A.; and Axelrod, Michael G., to Atlantic Richfield Company. Reactor for methane conversion. 4,855,111, Cl. 422-142.000.
Badesha, Santokh S.; Grammatica, Steven J.; and Jansen, Frank, to Xerox Corporation. Photoconductive imaging members with electron transporting polysilylenes. 4,855,201, Cl. 430-58.000.
Badesha, Santokh S.; Foley, Geoffrey M. T.; Pai, Damodar M.; Zallen, Richard H.; Slade, Michael L.; and Abkowitz, Martin A., to Xerox Corporation. Imaging members with photogenerating compositions obtained by solution processes. 4,855,203, Cl. 430-59.000.
Badoureaux, Jean-Pierre, to Parker Hannifin RAK. Valve coupler with decompression. 4,854,345, Cl. 137-614.050.
Baeza, Sam; and Pulido, Hector. Universal angle V-block work holding fixture. 4,854,568, Cl. 269-268.000.
Bagchi, Pranab; Sterman, Melvin D.; and Low, Howard M., to Eastman Kodak Company. Photographic element having polymer particles covalently bonded to gelatin. 4,855,219, Cl. 430-496.000.
Baglio, Thomas P. Hanger system for flexible plastic bags. 4,854,530, Cl. 248-95.000.
Bahr, Christian: *See*—
Heppke, Gerd; Bahr, Christian; Muller, Ingrid; Ohlendorf, Dieter; and Wingen, Rainer, 4,855,429, Cl. 544-335.000.
Baile, Gnaneshwar R.; Herman, John E.; and Wyshak, Geoffrey M., to Dow Corning Corporation. Preparation of cycloorganotrisilazanes. 4,855,469, Cl. 556-409.000.
Bailey, Francis V., to Outboard Marine Corporation. Apparatus for surrounding a foam pattern cluster with sand. 4,854,369, Cl. 164-159.000.
Baines, Roger F., to Johnson Electric Industrial Manufactory, Ltd. Assembled commutators. 4,855,632, Cl. 310-233.000.
Bair, Kenneth W., to Burroughs Wellcome Co. Tetracyclic thiophene derivatives. 4,855,453, Cl. 549-42.000.
Baker, Charles D.: *See*—
Brimhall, Owen D.; Peterson, Stephen C.; Baker, Charles D.; and Riddle, Merwyn D., 4,854,170, Cl. 73-570.000.
Baker, Donald A.: *See*—
Lemieux, Raymond U.; Ratcliffe, Robert M.; and Baker, Donald A., 4,855,126, Cl. 424-9.000.
Baker Hughes Incorporated: *See*—
Durham, Daniel K.; Conkle, Urban C.; and Downs, Hartley H., 4,855,060, Cl. 210-708.000.
Baker, Robert L.: *See*—
Davis, Gail F.; Baker, Robert L.; Bragg, Dale E.; and Stegemoeller, Calvin L., 4,854,714, Cl. 366-132.000.
Baker, Samuel F.; and Braddick, Britt O., to Texas Iron Works, Inc. Method and apparatus for stage cementing a liner in a well bore having a casing. 4,854,386, Cl. 166-289.000.
Baker, Samuel F.: *See*—
Arnold, Ronald D.; Atol, Gerald R.; and Baker, Samuel F., 4,854,383, Cl. 166-70.000.
Balanzat, Emmanuel: *See*—
Toulemonde, Marcel; and Balanzat, Emmanuel, 4,855,049, Cl 210-500.400.
Baldwin, Robert L. Reinforced door security assembly. 4,854,621, Cl. 292-340.000.
Balek, Lynn A., to LIL Industries Ltd. Vehicle battery mounting apparatus. 4,854,540, Cl. 248-503.000.
Ball, Ralph A. Mouse exterminating device and method. 4,854,073, Cl. 43-75.000.
Ball, W. Kenneth; Goulait, David J. K.; and Zorb, James E., to Procter & Gamble Company, The. Dynamic mechanical bonding method and apparatus. 4,854,984, Cl. 156-73.500.
Baltusis, Frederick A.: *See*—
Joffee, Irving B.; Degen, Peter J.; and Baltusis, Frederick A., 4,855,163, Cl. 427-244.000.
Banavar, Jayanth R.; Johnson, David L.; Nagel, Sidney R.; and Safinya, Kambiz A., to Schlumberger Technology Corp. Method and apparatus for measurement of the thermal behavior of porous media. 4,855,912, Cl. 364-422.000.
Banba, Nobuyuki: *See*—
Uchida, Kenji; Banba, Nobuyuki; Kuroiwa, Minoru; Saito, Makoto; and Kamino, Yukishige, 4,854,783, Cl. 406-13.000.
Banerjee, Chandra K.; Farrier, Ernest G.; Harris, James L.; Norman, Alan B.; Resce, James L.; Reynolds, John H., IV; Ridings, Henry T.; Sensabaugh, Andrew J., Jr.; Shannon, Michael D.; and Shelar, Gary R., to R. J. Reynolds Tobacco Company. Smoking article. 4,854,331, Cl. 131-194.000.
Baranczuk, Richard J.; Spicer, Jay; Duncan, William P.; and Rotert, Gary A., to Bio-Medical Research Laboratories. Iodinated estradiols, intermediate products and methods of production. 4,855,125, Cl. 424-1.100.
Barbee, Robert B.; and Minnick, Larry A., to Eastman Kodak Company. Polyesteramide from amino alcohol with improved gas barrier properties. 4,855,397, Cl. 528-335.000.
Barber-Colman Company: *See*—
Swanson, Thomas K.; and Meyers, Elwood J., 4,855,702, Cl. 335-261.000.
Barbour, Joel. Down hole video tool apparatus and method for visual well bore recording. 4,855,820, Cl. 358-100.000.

Baril, James D.: *See*—
Raftopoulos, Demetrios D.; and Baril, James D., 4,854,312, Cl. 128-92.0YY.
Barlow, Fred D., Jr.: *See*—
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Barlow, Robert W.: *See*—
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Baron, George; Vreeland, William H.; and Brown, Neil L., to Sippican Ocean Systems, Inc. Seawater probe. 4,854,728, Cl. 374-136.000.
Baroni, Robert J., to Rockwell International Corporation. Vehicle axle and brake support assembly. 4,854,427, Cl. 188-205.00R.
Barral, Jacques, to Carl F. Schroth GmbH. Safety belt. 4,854,608, Cl. 280-805.000.
Barratt, Peter J.; Clough, Douglas O.; Dickinson, Peter J.; and Farnhill, William M., to Hollingsworth (U.K.), Ltd. Friction spinning apparatus with slub clearing means. 4,854,117, Cl. 57-301.000.
Barrett, Robert A.: *See*—
Halling, Horace P.; Barrett, Robert A.; and Woozley, Mark E., 4,854,600, Cl. 277-236.000.
Barrier, Ronald B.: *See*—
Phipps, Jackie M.; and Barrier, Ronald B., 4,854,177, Cl. 73-861.240.
Barteck, Werner W., to Libbey-Owens-Ford Co. Seal construction for a mold structure for encapsulating glass with a gasket. 4,854,599, Cl. 277-227.000.
Bartmann, Wilhelm: *See*—
Wess, Gunther; Bartmann, Wilhelm; Beck, Gerhard; and Anagnostopulos, Hiristo, 4,855,323, Cl. 514-550.000.
Barua, Arun B.; and Olson, James A., to Iowa State University Research Foundation, Inc. Method of producing water-soluble glucuronic acid derivatives of vitamin A. 4,855,463, Cl. 549-417.000.
BASF Aktiengesellschaft: *See*—
Braun, Gerold; Tschang, Chung-Ji; Vamvakaris, Christos; and Glaser, Klaus, 4,855,423, Cl. 544-2.000.
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Dehnert, Johannes; Lamm, Gunther; and Loeffler, Hermann, 4,855,413, Cl. 534-766.000.
Goeckel, Ulrich; Petersen, Harro; Osterloh, Rolf; Schupp, Eberhard; Loch, Werner; and Schwerzel, Thomas, 4,855,394, Cl. 528-263.000.
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Bassemir, Robert; Krishnan, Ramasamy; and Lowell, Arthur I., to Sun Chemical Corporation. Lithographic fountain solutions. 4,854,969, Cl. 106-2.000.
Bata, George T.: *See*—
Grieb, John H.; Joseph, J. M.; Weaver, Richard D.; and Bata, George T., 4,854,024, Cl. 29-156.70R.
Bates, Terence W., to Shell Oil Company. Journal bearing simulator. 4,854,159, Cl. 73-64.000.
Battelle Memorial Institute: *See*—
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Batten, Ronald W. Hand wrenching tool. 4,854,198, Cl. 81-98.000.
Battey, Paul K.; Hope, Peter; and Sharma, Ashutosh H., to Akzona Incorporated. Rubber stabilizers derived from N-phenyl-p-phenylenediamine. 4,855,346, Cl. 524-217.000.
Batzer, John L.; and Kneib, Kristine N., to ITT Defense Communications. Apparatus and methods of locking a receiving modem to a transmitting modem employing a burst signal. 4,856,030, Cl. 375-106.000.
Baudon nee Chardon, Sylvie: *See*—
Haldric, Bernard; Benedi, Gregorio; and Baudon nee Chardon, Sylvie, 4,854,141, Cl. 70-182.000.
Bauer, Friedrich, to ENFO Grundlagenforschungs AG. Plate valve. 4,854,341, Cl. 137-514.000.
Bauer, Ronald S., to Shell Oil Company. Curing agents for epoxy resins comprising diamines with the di(p-aminophenyl)-diisopropyl benzene structure. 4,855,386, Cl. 528-117.000.
Bauge, Michel; Boudon, Gerard; Mollier, Pierre; Peter, Jean-Luc; and Yamour, Yiannis J., to International Business Machines Corporation. Duplicated circuit arrangement for fast transmission and repairability. 4,856,000, Cl. 371-9.000.
Baugh, James D.; and Hager, Francis M., to Cummins Engine Company, Inc. Crankshaft bearing cap location scheme. 4,854,746, Cl. 384-432.000.
Baus, Heinz G. Method and apparatus for producing multilayer panels. 4,854,996, Cl. 156-244.120.
Baxter, G. Matthew. Wind indicator for golfers. 4,854,579, Cl. 273-32.00H.
Baxter International Inc.: *See*—
Borsanyi, Alexander S., 4,854,836, Cl. 417-474.000.
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Bayer Aktiengesellschaft: *See*—
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Kaulen, Johannes; Arlt, Dieter; Holmwood, Graham; and Kramer, Wolfgang, 4,855,438, Cl. 548-262.000.
Lockhoff, Oswald; Hayauchi, Yutaka; Stadler, Peter; Stunkel, Klaus G.; Streissle, Gert; Paessens, Arnold; Klimetzek, Volker; Zeiler, Hans-Joachim; Metzger, Karl G.; Kroll, Hein-Peter; Brunner, Helmut; and Schaller, Klaus, 4,855,283, Cl. 514-8.000.
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Rasshofer, Werner; Grigat, Ernst; Grogler, Gerhard; Hess, Heinrich; and Kopp, Richard, 4,855,504, Cl. 564-395.000.
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Wagner, Wolfram; Paulini, Dieter; and Widder, Peter, 4,854,020, Cl. 28-255.000.
Wurminghausen, Thomas; Schneider, Karl; Saykowski, Franz; and Frohlen, Hans G., 4,855,473, Cl. 556-471.000.
Bayley, Brian J., to Hewlett-Packard Company. Mounting for a sapphire ball in a bar code reader wand tip. 4,855,582, Cl. 235-472.000.
Baymiller, Sharon R. Device for picking up animal feces. 4,854,624, Cl. 294-1.300.
Bayo, Luis E. Illuminated house number device. 4,854,062, Cl. 40-551.000.
Bays, David E.: *See*—
Oxford, Alexander W.; Coates, Ian H.; Bays, David E.; Webb, Colin F.; Dowle, Michael D.; Mills, Keith; and Eldred, Colin D., 4,855,314, Cl. 514-415.000.
BD Systems, Inc.: *See*—
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Bean, Kenneth E.: *See*—
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Beard, David R.; Gibson, Peter J.; and Hinchey, Christopher B., to Secretary of State for Defence in her Majesty's Government of the United Kingdom of Great Britian and Northern Ireland, The. Obstacle surmounting aid for tracked vehicle. 4,854,408, Cl. 180-9.320.
Beard, Richard B.; Hasan, Saleem; Scoles, Kevin J.; and Onaral, Banu, to Drexel University. Biocompatible electrode and use in orthodontic electroosteogenesis. 4,854,865, Cl. 433-18.000.
Bearon, John N.: *See*—
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Beccaris, Carlo: *See*—
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Becker, Heinz D.; Bederke, Klaus; Dahm, Ralf; Kerber, Hermann; Sadowski, Fritz; and Stephan, Werner, to Herberts Gesellschaft. Coating material and its use as primer and extender. 4,855,342, Cl. 524-31.000.
Beckman Instruments, Inc.: *See*—
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Becton Dickinson and Company: *See*—
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Becker, Heinz D.; Bederke, Klaus; Dahm, Ralf; Kerber, Hermann; Sadowski, Fritz; and Stephan, Werner, 4,855,342, Cl. 524-31.000.
Beekenkamp, Gerald: *See*—
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Beijleveld, Wilhelmus M.: *See*—
Verlaan, Johannes P. J.; and Beijleveld, Wilhelmus M., 4,855,428, Cl. 544-219.000.
Belgarde, Richard J. Apparatus for realigning vehicle body and frame members. 4,854,151, Cl. 72-447.000.
Bell Communications Research, Inc.: *See*—
Chao, Hung-Hsiang J., 4,855,999, Cl. 370-112.000.
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Belling, Paul R., to United States of America, Air Force. Augmentor curtain liner assembly for sharing tensile loading. 4,854,122, Cl. 60-261.000.
Bellut, Hans: *See*—
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Beloit Corporation: *See*—
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Belokin, Martin P.; and Belokin, Normal P. Display device and method of assembly. 4,854,246, Cl. 108-111.000.
Belokin, Normal P.: *See*—
Belokin, Martin P.; and Belokin, Normal P., 4,854,246, Cl. 108-111.000.
Belorussky Tekhnologichesky Institut Imeni S.M. Kirova: *See*—
Svidunovich, Nikolai A.; Parfenov, Leonid I.; Garost, Alexandr I.; Sorokin, Gennady A.; Volkov, Viktor N.; Obiedkov, Viktor A.; Karbanovich, Valery K.; Vashkevich, Vladimir V.; and Verbitsky, Alexandr N., 4,855,105, Cl. 420-75.000.

Benedetti, Charles; Gluntz, Claude; Pascal, Robert; and Stefanini, Michel, to Atochem. Extraction of organic compounds from aqueous solutions. 4,855,053, Cl. 210-634.000.

Benedi, Gregorio: *See*—
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Bennes Marrel: *See*—
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Bennett, Ruth M.: *See*—
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Benningfield, George W.: *See*—
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Bensmann, Gunter: *See*—
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Benson, Timothy A.: *See*—
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Benz & Hilgers GmbH: *See*—
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Berdahl, Donald R.; Cella, James A.; and Shank, Gary K., to General Electric Company. High temperature stable polyetherimides from oxydiphthalic dianhydride and a mixture of m- and p-phenylene diamines and diaminodiphenyl ether. 4,855,391, Cl. 528-188.000.

Berde, Dennis W.: *See*—
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Beresnev, Alexei S.; Serykh, Leonid A.; Saveliev, Viktor S.; Volkoedov, Valery S.; and Stupin, Igor V. Device for plasma-arc cutting of biological tissues. 4,855,563, Cl. 219-121.390.

Berg, Bengt O.: *See*—
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Berg, Lloyd, to Berg, Lloyd. Separation of M-diisopropylbenzene from p-diisoporopylbenzene by azeotropic distillation with ethers. 4,855,531, Cl. 585-804.000.

Bergami, Bridgette A.; and Williams, Phillip H., to Motorola, Inc. Multilayer trench isolation process and structure. 4,855,804, Cl. 357-49.000.

Berger, Philippe: *See*—
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Bergholz, Ralf. Method and circuitry for the driving of driver stages for functions of internal combustion engines for automotive vehicles especially for fuel injection or ignition. 4,855,919, Cl. 364-431.030.

Bergman, Sten; and Ljung, Stefan, to Asea Brown Boveri AB. Longitudinal differential protection. 4,855,861, Cl. 361-65.000.

Bergmans, Johannes W. M.; Claasen, Theodoor A. C. M.; and Van Gerwen, Petrus J., to U.S. Philips Corporation. Data transmission system comprising smearing filters. 4,856,026, Cl. 375-58.000.

Bergner, Arndt, to Hilti Aktiengesellschaft. Dispensing device for flowable masses. 4,854,482, Cl. 222-94.000.

Bergstedt, Donald B., to Hewlett-Packard Company. Method of improving dot-on-dot graphics area-fill using an ink-jet device. 4,855,752, Cl. 346-1.100.

Bergwerksverband GmbH: *See*—
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Berkovich, Semyon: *See*—
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Berliner, David: *See*—
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Berliner, William; and Koda, Walter, to Coleco Industries, Inc. Doll with waterproof joints. 4,854,911, Cl. 446-376.000.

Berman, Phillip W.; and Lasky, Laurence A., to Genentech, Inc. Molecularly cloned diagnostic product and method of use. 4,855,224, Cl. 435-5.000.

Bernadic, Thomas: *See*—
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Bernard, Douglas E., to Hughes Aircraft Company. Anti-skid braking system control method. 4,855,916, Cl. 364-426.020.

Bernard, Jean; and Brunet, Roger, to Constructions Industrielles de la Mediterranee (C.N.I.M.). System for spreading and depositing a spanning beam from a vehicle such as an armored vehicle of the engineer corps for clearing an obstacle. 4,853,998, Cl. 14-2.400.

Berol Kemi AB: *See*—
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Berruyer, Yves. Process for compression of a data set. 4,855,941, Cl. 364-550.000.

Berach, Horst; Kilian, Karl-Heinz; and Weigel, Hans U., to Rasselstein AG. Method for electroplating a steel strip with a coating metal, in particular zinc or a zinc-containing alloy. 4,855,021, Cl. 204-28.000.

Bertek, Inc.: *See*—
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Bertin & CIE: *See*—
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Bertocchio, Rene : *See*—
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Besnard, Marie-Madeleine: *See*—
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Bessey & John GmbH & Co.: *See*—
Ritsch, Ingomar, 4,854,565, Cl. 269-41.000.

Bessho, Kazuo; and Yamada, Sotoshi, to Kanazawa University. Multilayered-eddy-current type strong magnetic field generator. 4,855,703, Cl. 335-296.000.

Besson, Bernard; Desmurs, Jean-Roger; and Jouve, Isabelle, to Rhone-Poulenc Chimie. Chlorination of phenolic compounds. 4,855,513, Cl. 568-779.000.

Best, Lance E.: *See*—
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Best, Robert J., to Worlds of Wonder, Inc. Method of providing identification, other digital data and multiple audio tracks in video systems. 4,855,827, Cl. 358-143.000.

Bethell, George L.; Burch, Donald F.; and Hinkhouse, Lysle R., to Sears Manufacturing Company. Molded cushion article. 4,853,995, Cl. 5-481.000.

Bethlehem Steel Corporation: *See*—
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Betso, Stephen R.; Hyun, Kun S.; and Russell, Patrick M., to Dow Chemical Company, The. Process and equipment for processing thermoplastic polymers. 4,855,404, Cl. 528-502.000.

Bettcher Industries, Inc.: *See*—
Decker, Richard B.; and Bozzi, Richard P., 4,854,046, Cl. 30-276.000

Betteridge, Keith: *See*—
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Betz, Hans: *See*—
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Betz Laboratories, Inc.: *See*—
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Betz, Manfred, to Gustav Magenwirth GmbH & Co. Joystick for generating electric control signals. 4,855,704, Cl. 336-132.000.

Beyers Jr., Billy W.: *See*—
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Bez, Eckhard; and Farrant, John L., to Commonwealth Scientific and Industrial Research Organization. Multi-stage vacuum pump. 4,854,825, Cl. 417-265.000.

Bezner, Baruch, to Technoset Ltd. Electroluminescent lighting elements. 4,855,190, Cl. 428-690.000.

Bhargava, Vikram; and Heberling, James R., to Hayes Microcomputer Products, Inc. Standoff and grounding clip assembly. 4,855,873, Cl. 361-424.000.

Bhateja, Chander P. Monitoring apparatus. 4,855,925, Cl. 364-474.060.

Biancale, Vito. Bow connector device for tarpaulin cover. 4,854,630, Cl. 296-100.000.

Bianco, Frank J., to Elexis Corporation. Pedometer and/or calorie measuring device and method. 4,855,942, Cl. 364-561.000.

Bieber, William J. Ammunition carrier. 4,854,490, Cl. 224-202.000.

Biehl, Harold A. Shaded outdoor parking area. 4,855,167, Cl. 428-18.000.

Biere, Helmut; Engelstoft, Mogens; Huth, Andreas; Rahtz, Dieter; Schmiechen, Ralph; Seidelmann, Dieter; and Stephens, David N., to Schering Aktiengesellschaft. Tetrahydro-beta-carbolines, and their use as drugs. 4,855,295, Cl. 514-232.800.

Bio-Medical Research Laboratories: *See*—
Baranczuk, Richard J.; Spicer, Jay; Duncan, William P.; and Rotert, Gary A., 4,855,125, Cl. 424-1.100.

Birnbach, Curtis; and Hsu, Fu Kuo, to Quantum Diagnostics Ltd. Optical image processor with highly selectable modulation transfer function. 4,854,669, Cl. 350-162.120.

Bishop, Frank W., to George Blair Public Limited Company. Freight container lifting means. 4,854,807, Cl. 414-498.000.

Bissell, Inc.: *See*—
Blase, Michael R.; Rosendall, Henry J.; and Goodrich, Gordon W., 4,854,544, Cl. 251-245.000.

Black & Decker Inc.: *See*—
Wilkins, Peter R., 4,855,568, Cl. 219-271.000.

Black, Malcolm H.; and Blade, Robert J., to Burroughs Wellcome Co. Novel pesticides, preparation and use. 4,855,086, Cl. 260-404.000.

Blade, Robert J.: *See*—
Black, Malcolm H.; and Blade, Robert J., 4,855,086, Cl. 260-404.000.

Blakewood Business Forms, Inc.: *See*—
Blakewood, James C., 4,854,609, Cl. 281-2.000.

Blakewood, James C., to Blakewood Business Forms, Inc. Business form feeding leader system. 4,854,609, Cl. 281-2.000.

Blakley, Brent A.: *See*—
Dammann, Laurence G.; Blakley, Brent A.; and Carlson, Gary M., 4,855,383, Cl. 528-51.000.

Blanc, Alain: *See*—
Wilhelm, Didier; Gelabert, Antonio; and Blanc, Alain, 4,854,934, Cl. 8-185.000.

Blanchard, William C., to Allied-Signal Inc. Electric field control in ion mobility spectrometry. 4,855,595, Cl. 250-287.000.

Blanchot, Michele; Dutertre-Laduree, Daniel; and Roos, Rein, to Professional General Electronic Products. High-tension generator circuit with very low current consumption. 4,855,889, Cl. 363-19.000.

Blandin, Jean-Claude, to S.A. Raccords et Plastiques Nicoll. Pipe system for central suction cleaning installation. 4,854,887, Cl. 439-194.000.

Blank, Norman E.: *See*—
Vu, Cung; Buxbaum, Susan P.; Blank, Norman E.; and Hartwig, Richard C., 4,855,185, Cl. 428-423.100.

Blanpain, Peter R. J.: *See*—
Dequatre, Claude; Blanpain, Peter R. J.; and Longuet, Michel, 4,855,337, Cl. 523-201.000.

Blase, Michael R.; Rosendall, Henry J.; and Goodrich, Gordon W., to Bissell, Inc. Fluid flow control valve. 4,854,544, Cl. 251-245.000.

Blazek, Vladimir: *See*—
Noll, Joachim J.; Blazek, Vladimir; and Schmitt, Hans-Jurgen, 4,854,701, Cl. 356-73.100.

Blevins, Charles H., II; Herdle, William B.; and Murphy, Gerald J., to Union Carbide Corporation. Polysiloxane-polyoxyalkylene terpolymers for polyurethane foam manufacture. 4,855,329, Cl. 521-112.000.

BLH Electronics, Inc.: *See*—
Haggstrom, Rolf P., 4,854,179, Cl. 73-862.660.

Block, Norman G.: *See*—
Denney, Kimberly K.; and Block, Norman G., 4,854,942, Cl. 48-197.00R.

Bloomster, Timothy G.: *See*—
Rosenstein, Robert W.; and Bloomster, Timothy G., 4,855,240, Cl. 436-514.000.

Blumkin, Irene S.; and Spector, George. Earring for the 2 hole ear. 4,854,132, Cl. 63-12.000.

Board of Trustees operating Michigan State University: *See*—
Petty, Charles A.; and Chen, Hsin-Chih, 4,855,066, Cl. 210-788.000.

Boaventura, Ana-Maria: *See*—
Gasc, Jean-Claude; Nedelec, Lucien; Humbert, Daniel; and Boaventura, Ana-Maria, 4,855,302, Cl. 514-278.000.

BOC, Inc.: *See*—
Halpern, Donald F.; and Robin, Mark L., 4,855,511, Cl. 568-683.000.

Bocskor, Steven J.: *See*—
Wedgwood, Janet E.; Berde, Dennis W.; Bocskor, Steven J.; and Cotter, George E., 4,856,079, Cl. 455-50.000.

Bodenhausen, Geoffrey; Pfandler, Peter E.; Rapin, Jacques; Gaumann, Tino; and Houriet, Raymond, to Spectrospin, AG. Method for recording ICR mass spectra and ICR mass spectrometer designed for carrying out the said method. 4,855,593, Cl. 250-282.000.

Boehme, Georg: *See*—
Grund, Andreas; Prescher, Guenter; Boehme, Georg; Hofen, Willi; and Petsch, Heinrich, 4,855,465, Cl. 549-525.000.

Boeing Company, The: *See*—
Buckwitz, Richard J.; and Walter, Alfred E., Jr., 4,854,147, Cl. 72-7.000.
Chee, Wan T., 4,854,525, Cl. 244-54.000.
Giles, Daniel N., 4,854,765, Cl. 403-30.000.
Maraghe, Alex; and Puncoch, Miloslav, 4,854,010, Cl. 16-360.000.
Shaull, Lawrence M., 4,854,015, Cl. 24-16.00R.

Boertzel, Martin; Ludwig, Reinhold; Schmits, Wilhelm; and Weiss, Ulrich, to International Business Machines Corporation. Power regulator with overcurrent protection. 4,855,858, Cl. 361-18.000.

Bogar, Bela. Clip and spacer for reinforcing rods. 4,854,106, Cl. 52-719.000.

Bohl, Aleck; and Valdez, Leandro, to Gates Rubber Company, The. Collapsible fluid storage receptacle. 4,854,481, Cl. 222-94.000.

Bohman, Carl E.: *See*—
Strosser, Richard P.; and Bohman, Carl E., 4,854,113, Cl. 56-10.200.

Bohme, Rolf, to Telefunken electronic GmbH. Controllable integrator. 4,855,626, Cl. 307-491.000.

Bohning, Daryl E., to North American Philips Corporation. Time-clustered cardio-respiratory encoder and method for clustering cardio-respiratory signals. 4,855,910, Cl. 364-413.130.

Boiarski, Anthony A., to Medex, Inc. Integrated optic system for monitoring blood gases. 4,854,321, Cl. 128-634.000.

Boilley, Michel: *See*—
Periou, Pierre; and Boilley, Michel, 4,854,183, Cl. 74-113.000.

Bolgiano, Nicholas C.; Grubb, Mary B.; Hudson, Raymond S.; and Sigman, William T., to Armstrong World Industries, Inc. Method for making stain and scratch resistant resilient surface coverings. 4,855,165, Cl. 427-393.500.

Bolin, Goran; and Sabelstrom, Jan, to Dynasonic. Apparatus for gluing sheets of material together. 4,855,010, Cl. 156-497.000.

Boller, Giorgio; Ferro, Francesco; and Colli, Luigi, to Savio, S.p.A. Method and device for intermittently storing and returning yarn during the winding of conical bobbins fed with yarn at constant speed. 4,854,509, Cl. 242-18.00R.

Boller, Giorgio; Montali, Sergio; and Colli, Luigi, to Savio, S.p.A. Device and method for intermittently storing and returning yarn during the winding of conical bobbins fed with yarn at constant speed. 4,854,513, Cl. 242-18.00R.

Boller, Giorgio: *See*—
Montali, Sergio; Boller, Giorgio; and Colli, Luigi, 4,854,511, Cl. 242-18.0DD.
Montali, Sergio; Boller, Giorgio; and Colli, Luigi, 4,854,512, Cl. 242-18.0DD.

Bolon, Donald A.; Eddy, Victoria J.; and Hallgren, John E., to General Electric Company. Photopatterned product of silicone polyamic acid on a transparent substrate. 4,855,199, Cl. 430-18.000.

Bonerb, Timothy C., to Flexair, Inc. Bulk storage bin with pneumatically assisted discharge. 4,854,801, Cl. 414-291.000.

Bonfanti, Lorenzo: *See*—
Farina, Daniele; Colombo, Guglielmo; and Bonfanti, Lorenzo, 4,854,375, Cl. 165-53.000.

Bonfilio, Ciriaco: *See*—
Brasse, Jean-Jacques; and Bonfilio, Ciriaco, 4,854,918, Cl. 474-11.000.

Bonin, Werner: *See*—
Koch, Volker; Fuss, Andreas; Bonin, Werner; Knauf, Werner; and Waltersdorfer, Anna, 4,855,309, Cl. 514-346.000.

Boochard, E. L., to Jackson Products, Inc. Welding helmet. 4,853,973, Cl. 2-8.000.

Boots Company plc, The: *See*—
Davies, Roy V., 4,855,291, Cl. 514-312.000.

Borden, Inc.: *See*—
Mohler, Paul J.; Romz, Thomas A.; and Lithgow, Baird E., 4,855,354, Cl. 525-54.240.

Borg-Warner Automotive, Inc.: *See*—
Churchill, Bruce A.; and Raugh, Jeffery D., 4,854,192, Cl. 74-752.00E.

Borgnaes, Dan: *See*—
Tufts, Timothy A.; Borgnaes, Dan; Culbertson, Billy M.; and Wilkinson, Theodore C., 4,855,368, Cl. 525-454.000.

Borrelli, Nicholas F.; and Sachenik, Paul A., to Corning Incorporated. Method for modifying coloration in tinted photochromic glasses. 4,854,957, Cl. 65-30.110.

Borsanyi, Alexander S., to Baxter International Inc. Collapsible conduit for linear peristaltic pump and method of making the same. 4,854,836, Cl. 417-474.000.

Borsuk, Leslie M.; and Coutts, Bruce, to ITT Corporation. Lensed optic fiber terminus and method. 4,854,663, Cl. 350-96.200.

Borzatta, Valerio: *See*—
Cantatore, Giuseppe; and Borzatta, Valerio, 4,855,434, Cl. 546-190.000.

Boss, Ian, to Lightgraphix Limited. Lighting apparatus. 4,855,882, Cl. 362-238.000.

Bostick, Edgar E.: *See*—
Hawkins, Christopher M.; and Bostick, Edgar E., 4,855,380, Cl. 528-370.000.

Boucherie, Leonel, to G. B. Boucherie, naamloze vennootschap, Firma. Brush manufacturing machine. 4,854,645, Cl. 300-10.000.

Boucquaert, Francois: *See*—
Regnaudin, Jacques; and Boucquaert, Francois, 4,855,962, Cl. 367-19.000.

Boudon, Gerard: *See*—
Bauge, Michel; Boudon, Gerard; Mollier, Pierre; Peter, Jean-Luc; and Yamour, Yiannis J., 4,856,000, Cl. 371-9.000.

Bouillot, Michel; Calvignac, Jean-Louis J.; and Munier, Jean-Marie L., to International Business Machines Corporation. Bypass booster mechanisms for the line scanners of a communication controller. 4,855,948, Cl. 364-900.000.

Bourland, Larry G.; DiLullo, Robert J.; Ritrievi, Kimberly E.; and Valbert, Jon R., to Arco Chemical Technology, Inc. Production of nonwoven fibrous articles. 4,855,179, Cl. 428-296.000.

Bowden, Jr., Wade R.; and Herzfeld, David, to Slater Electric Inc. Electrical outlet receptacle with non-metallic mounting strap and automatic grounding. 4,854,885, Cl. 439-107.000.

Bowman, George A., to Honeywell Inc. Data transceiving modem. 4,856,024, Cl. 375-8.000.

Bowman, Terrance L.: *See*—
Kertis, Robert A.; Smith, Douglas D.; and Bowman, Terrance L., 4,855,624, Cl. 307-475.000.

Bozzi, Richard P.: *See*—
Decker, Richard B.; and Bozzi, Richard P., 4,854,046, Cl. 30-276.000.

BP Chemicals Limited: *See*—
Anderson, Jeffrey J.; Drury, David J.; Hamlin, John E.; and Kent, Alexander G., 4,855,496, Cl. 562-609.000.

Bracha, Peretz; and Korat, Moshe, to Makhteshim Chemical Works, Ltd. Herbicidal compositions. 4,854,965, Cl. 71-92.000.

Braddick, Britt O.: *See*—
Baker, Samuel F.; and Braddick, Britt O., 4,854,386, Cl. 166-289.000.

Bragg, Dale E.: *See*—
Davis, Gail F.; Baker, Robert L.; Bragg, Dale E.; and Stegemoeller, Calvin L., 4,854,714, Cl. 366-132.000.

Brandao, Ruy L.; Kyriakos, Constantinos S.; Spires, Randall C.; and Jugs, Andrejs, to Allied-Signal Inc. TCAS bearing estimation receiver using a 4 element antenna. 4,855,748, Cl. 342-455.000.

Branston, Randolph E.: *See*—
Martin, Trevor I.; Breton, Marcel P.; Branston, Randolph E.; Moffat, Karen A.; and Mychajlowskij, Walter, 4,855,209, Cl. 430-126.000.

Braski, Michael T.: *See*—
Wissman, Charles H.; and Braski, Michael T., 4,856,010, Cl. 372-32.000.

Brasse, Jean-Jacques; and Bonfilio, Ciriaco, to Valeo. Speed changer pulley. 4,854,918, Cl. 474-11.000.

Braun, Gerold; Tschang, Chung-Ji; Vamvakaris, Christos; and Glaser, Klaus, to BASF Aktiengesellschaft. Preparation of sulfatobetaines. 4,855,423, Cl. 544-2.000.

Braun, Karl, to Aesculap-Werke AG Vormals Jetter & Scheerer. Applicator for C-shaped scalp clips. 4,854,317, Cl. 128-334.00R.

Brazdil, James F.: *See*—
Suresh, Dev D.; Seely, Michael J.; Brazdil, James F.; and Grasselli, Robert K., 4,855,275, Cl. 502-353.000.

Breakthru Industries, Inc.: *See*—
Appleton, Gregory H.; and Mikelk, Paul D., 4,854,406, Cl. 177-139.000.

Breiter, Horst; Enger, Helmut; and Teuwen, Uwe, to Hoesch Maschinenfabrik Deutschland AG. Hot press for pressing industrial laminates. 4,854,994, Cl. 156-228.000.

Brekkestran, Kevin L.; and Thomas, John C., to J. I. Case Company. Electronic control system for powershift transmission. 4,855,913, Cl. 364-424.100.

Bremer Brace of Florida, Inc.: *See*—
Bremer, Ross L., 4,854,305, Cl. 128-75.000.

Bremer, Ross L., to Bremer Brace of Florida, Inc. Radiolucent transport and diagnostic procedure board. 4,854,305, Cl. 128-75.000.

Breniman, Eugene H.: *See*—
McElfresh, Barbara K.; and Breniman, Eugene H., 4,856,001, Cl 371-15.000.

Brennan, Thomas J.: *See*—
Rhodes, Thomas R.; and Brennan, Thomas J., 4,854,244, Cl. 104-279.000.

Brennan, Thomas M.; and Hendrick, Michael E., to Pfizer Inc. Branched amides of L-aspartyl-D-amino acid dipeptides. 4,855,454, Cl. 549-68.000.

Breton, Marcel P.: *See*—
Martin, Trevor I.; Breton, Marcel P.; Branston, Randolph E.; Moffat, Karen A.; and Mychajlowskij, Walter, 4,855,209, Cl. 430-126.000.

Breuer, Jakob: *See*—
Reinehr, Ulrich; Pieper, Christian; Hirsch, Rolf-Burkhard; Jungverdorben, Hermann-Josef; and Breuer, Jakob, 4,854,021, Cl 28-263.000

Bridgestone Corporation: *See*—
Goshima, Norio; and Watanabe, Isao, 4,854,557, Cl. 267-64.270
Ohkawa, Fujio; Higashidani, Akira; and Maeda, Hiroyuki, 4,854,555, Cl. 267-64.240.

Brimhall, Owen D.; Peterson, Stephen C.; Baker, Charles D.; and Riddle, Merwyn D., to Separation Technology, Inc. Apparatus and method for using ultrasound to determine hematocrit. 4,854,170, Cl. 73-570.000.

Brin, Constantin: *See*—
Durm, Juergen; and Brin, Constantin, 4,854,635, Cl. 296-180.500.

Briner, Emil; Keller, Urs; and Stalder, Herbert, to Rieter Machine Works, Ltd. Methof of, and apparatus for, producing a friction spun yarn. 4,854,118, Cl. 57-401.000.

Britax-Excelsior Limited: *See*—
Burleigh, David W.; and Assinder, Andrew J., 4,854,639, Cl. 297-250.000.

Britax-Kole GmbH & Co.: *See*—
Ernst, Hans-Hellmut, 4,854,644, Cl. 297-476.000.

Britax Wingard Limited: *See*—
Glue, William J., 4,854,539, Cl. 248-479.000.

British Aerospace Public Limited Company: *See*—
Frick, Heinz E.; and Mottram, Dennis J., 4,854,800, Cl 414-138.200.

British Hydromechanics Research Association, The: *See*—
Heron, Roger A.; Saunders, David H.; and Fairhurst, Robert M., 4,854,090, Cl. 51-410.000.

British Petroleum Company p.l.c., The: *See*—
Diaz, Henri, 4,855,522, Cl. 585-417.000.

British Telecommunications public limited Company: *See*—
Stanley, Ian W., 4,854,658, Cl. 350-96.150.

Britton, Joe L., Sr.; and Spector, George. Retractable 2 way microphone. 4,856,070, Cl. 381-169.000.

Brockhaus, Ernst, to Ed. Scharwachter GmbH & Co. KG. Unhingeable door hinge for motor vehicle doors having a hinge pin divided into two bolt-like halves non rotatably fastened to a hinge portion. 4,854,009, Cl. 16-263.000.

Brocksieper, Manfred; Luckger, Rolf; Kroschel, Hans-Gerd; and Stechow, Jochen, to Goetze AG. Method and apparatus for making piston rings. 4,856,105, Cl. 364-474.020.

Broemmelsiek, H. Eugene: *See*—
Lanier, Caroll W.; Broemmelsiek, H. Eugene; and Lee, Raymond, 4,855,331, Cl. 521-184.000.

Brokaw, A. Paul, to Analog Devices, Inc. MOS current mirror with high output impedance and compliance. 4,855,618, Cl. 307-296.600.

Brookshire, Phillip L.: *See*—
Marcus, Kenneth N.; and Brookshire, Phillip L., 4,854,638, Cl. 297-250.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Sawaki, Yukichi, 4,855,791, Cl. 355-27.000.
Taki, Kazunari, 4,855,986, Cl. 369-112.000

Broudy, Arnold S.; and Shank, Cheryl A., to ABC Orthoproducts, Inc. Orthopedic device. 4,854,566, Cl. 269-44.000

Broughton, Jeremy Q.: *See*—
Carleton, Herbert R.; and Broughton, Jeremy Q., 4,855,903, Cl. 364-200.000.

Brown, Herbert C., to Aldrich-Boranes, Inc. Process for lithium mono- and diorganylborohydrides. 4,855,506, Cl. 568-6.000

Brown, James T., to Bethlehem Steel Corporation. Container door barricade. 4,854,791, Cl. 410-52.000.

Brown, Louis R.; and Higbee, Wallace C., to TRW Vehicle Safety Systems Inc. Safety apparatus. 4,854,522, Cl. 242-107.700

Brown, Neil L.: *See*—
Baron, George; Vreeland, William H.; and Brown, Neil L., 4,854,728, Cl. 374-136.000.

Brown, Peter A.; Jenkins, Kenneth N.; and Pouget, Paul A., to Rockwell International Suspension Systems Company. Method of bending and forming heated tubular workpieces. 4,854,150, Cl. 72-369.000.

Browne, Ronnie: *See*—
Simson, Morris; Fabricius, John H.; Browne, Ronnie; Waugh, Arthur; Sarkozy, Robert F.; and Lai, Chiu K. S., 4,854,266, Cl. 118-728.000.

Bruckner Trockentechnik GmbH & Co. KG: *See*—
Gresens, Harry, 4,854,862, Cl. 432-59.000.

Bruderer Ag: *See*—
Portmann, August T., 4,854,152, Cl. 72-456.000.

Brunell, Alejandro. Street identification sign assembly. 4,854,063, Cl. 40-607.000.

Brunet, Roger: *See*—
Bernard, Jean; and Brunet, Roger, 4,853,998, Cl. 14-2.400.

Brunet, Yves: *See*—
Tixador, Pascal; and Brunet, Yves, 4,855,859, Cl. 361-19.000.

Brunius, Robert E., to Interactive Technologies, Inc. Learn mode transmitter. 4,855,713, Cl. 340-506.000.

Brunner, Helmut: *See*—
Lockhoff, Oswald; Hayauchi, Yutaka; Stadler, Peter; Stunkel, Klaus G.; Streissle, Gert; Paessens, Arnold; Klimetzek, Volker; Zeiler, Hans-Joachim; Metzger, Karl G.; Kroll, Hein-Peter; Brunner, Helmut; and Schaller, Klaus, 4,855,283, Cl. 514-8.000.

Bruno, Bisiach. Multi-articulated industrial robot with several degrees of freedom of movement. 4,854,808, Cl. 414-680.000.

Brust, Paul F.: *See*—
Stroman, David W.; Brust, Paul F.; Ellis, Steven B.; Gingeras, Thomas R.; Harpold, Michael M.; and Tschopp, Juerg P., 4,855,231, Cl. 435-68.000.

Bryan, Thomas T.: *See*—
Dziki, Michael M.; and Bryan, Thomas T., 4,854,875, Cl. 433-213.000.

Bryniarski, David A.; and Hollenbeck, Robert E., to Mobil Oil Corporation. Rotary heat sealing method and apparatus. 4,854,983, Cl. 56-70.000

BT&D Technologies, Ltd.: *See*—
Hamerslag, James D.; and Musk, Robert W., 4,854,659, Cl. 350-96.150

BTS Broadcast Television Systems GmbH: *See*—
Wischermann, Gerhard; and Richter, Hans-Peter, 4,855,826, Cl 358-139.000

BTU Engineering Corporation: *See*—
Simson, Morris; Fabricius, John H.; Browne, Ronnie; Waugh, Arthur; Sarkozy, Robert F.; and Lai, Chiu K. S., 4,854,266, Cl. 118-728.000.

Buchberger, Gregory: *See*—
Theis, Peter F.; and Buchberger, Gregory, 4,856,050, Cl. 379-68.000.

Buchko, Matthew T.: *See*—
Shaubach, Robert M.; Dussinger, Peter; and Buchko, Matthew T., 4,854,379, Cl. 165-104.260.

Buchler, Wilhelm; Lippert, Walter; and Maier, Lorenz, to Dyckerhoff & Widmann Aktiengesellschaft. Method of locating operational surfaces of a track for electromagnetically levitated vehicles. 4,854,028, Cl. 29-452.000.

Buck Chemisch-Technische Werke GmbH & Co.: *See*—
Schroeter, Johannes, 4,855,605, Cl. 250-505.100.

Buckwitz, Richard J.; and Walter, Alfred E., Jr., to Boeing Company, The. Wire pinch mark applicator. 4,854,147, Cl. 72-7.000.

Bud Antle, Inc.: *See*—
deGroot, Peter F., 4,854,802, Cl. 414-404.000.

Budd Company, The: *See*—
Iseler, Kenneth A.; and Wilkinson, Robert E., 4,855,097, Cl. 264-102.000.

Budde, Peter. Pipe-end protector. 4,854,350, Cl. 138-96.00R.

Budenbender, Bernd. Container of sheet metal. 4,854,467, Cl. 220-67.000.

Budhu, Muniram, to Research Foundation of State University of New York, The. Simple shear device for testing earthen materials and powders. 4,854,175, Cl. 73-841.000.

Budnik, Richard A.; and Murphy, Gerald J., to Union Carbide Corporation. Silicone surfactants containing cyclic siloxane pendants. 4,855,379, Cl. 528-29.000.

Bugle, Clifford M., to Dynamet, Inc. Porous metal coated implant and method for producing same. 4,854,496, Cl. 228-193.000.

Bujese, David P., to Olin Hunt Specialty Products Inc. Web backing plate. 4,855,784, Cl. 355-272.000.

Bull, S.A.: *See*—
Planteline, Pierre, 4,855,901, Cl. 364-200.000.

Bullock, Norman E.: *See*—
Ryan, Will G.; and Bullock, Norman E., 4,854,182, Cl. 73-864.640.

Bunkenburg, Joachim; and Hammond, Peter M., to Eastman Kodak Company. Apparatus for treating wafers utilizing megasonic energy. 4,854,337, Cl. 134-184.000

Bunker, James E., to Minnesota Mining and Manufacturing Company. (Meth)acrylic esters of phosphoric acid ester dihalides. 4,855,475, Cl. 558-182.000

Burch, Donald F.: *See*—
Bethell, George L.; Burch, Donald F.; and Hinkhouse, Lysle R., 4,853,995, Cl. 5-481.000.

Burch, William E., to United States of America, Army. Pivoting cutter for ice coring auger. 4,854,396, Cl. 175-18.000.

Bureau, Jean-Marc: *See*—
Poupard, Dominique; and Bureau, Jean-Marc, 4,855,022, Cl. 204-130.000.

Bures, Milan; Kratochvil, Paul P.; and Rowlette, John R., to AMP Incorporated. Infrared touch input device having ambient compensation. 4,855,590, Cl. 250-221.000.

Burger, Marilyn S.: *See*—
Oliwa, Gary A.; and Burger, Marilyn S., 4,856,088, Cl. 455-349.000.

Burke, Thomas J., to Allen-Bradley Company, Inc. System for handling unsolicited messages from lower-tier controllers. 4,855,906, Cl. 364-200.000.

Burkhardt, Jurgen, to Wacker- Chemie GmbH. Process for chain stabilization of organopolysiloxanes. 4,855,472, Cl. 556-459.000.

Burkholder, Mary J.; Piccirilli, Barbara G.; Anderson, Carl C.; and Temple, Rodger G., to PPG Industries, Inc. Stable multiphase coating compositions. 4,855,164, Cl. 427-385.500.

Burle Technologies, Inc.: *See*—
Helvy, Fred A.; and Butterwick, Gilbert N., 4,855,642, Cl. 313-532.000.

Burleigh, David W.; and Assinder, Andrew J., to Britax-Excelsior Limited. Child's safety seat. 4,854,639, Cl. 297-250.000.

Burlington Industries, Inc.: *See*—
Petracek, Vaclav; and Schnegg, Julius, 4,854,135, Cl. 66-190.000.

Burn, Ian, to Du Pont de Nemours, E. I., and Company. High K dielectric composition for use in multilayer ceramic capacitors having copper internal electrodes. 4,855,266, Cl. 501-138.000.

Burne, Richard A.: *See*—
Wilson, Colleen R.; Burne, Richard A.; and Berkovich, Semyon, 4,855,997, Cl. 370-85.000.

Burnison, Chantal S.: *See*—
Kasha, Walter J.; and Burnison, Chantal S., 4,855,322, Cl. 514-546.000.

Burns, Raymond W.: *See*—
Rassieur, Charles L.; and Burns, Raymond W., 4,854,395, Cl. 173-163.000.

Burroughs Wellcome Co.: *See*—
Bair, Kenneth W., 4,855,453, Cl. 549-42.000.
Black, Malcolm H.; and Blade, Robert J., 4,855,086, Cl. 260-404.000.

Busta, Heinz H.; and Cuellar, Raul D. Micromachined cold cathode vacuum tube device and method of making. 4,855,636, Cl. 313-306.000.

Butler, John M.; Chartoff, Richard P.; and Harvey, James A., to University of Dayton. Process for the preparation of aromatic ether bismaleimides. 4,855,450, Cl. 548-522.000.

Butler, Peter D.: *See*—
Corbin, Maxwell H., Jr.; and Butler, Peter D., 4,854,771, Cl. 404-79.000.

Butterwick, Gilbert N.: *See*—
Helvy, Fred A.; and Butterwick, Gilbert N., 4,855,642, Cl. 313-532.000.

Buxade-Vinas, Antonio, to Laboratorios Vinas S. A. Chromoglycic acid derivative. 4,855,443, Cl. 548-372.000.

Buxbaum, Susan P.: *See*—
Vu, Cung; Buxbaum, Susan P.; Blank, Norman E.; and Hartwig, Richard C., 4,855,185, Cl. 428-423.100.

B.V. Optische Industrie "De Oude Delft": *See*—
Geluk, Ronald J., 4,856,040, Cl. 378-146.000.
Houtkamp, Johannes J., 4,855,586, Cl. 250-213.0VT.

Bye, Matthew R.: *See*—
Jagannathan, Ramesh; and Bye, Matthew R., 4,855,028, Cl. 204-180.200.

Byers, Gary W., to Eastman Kodak Company. Stabilizer-donor element used in thermal dye transfer. 4,855,281, Cl. 503-227.000.

Byrne, John J. Diagonal blade cartridge. 4,854,042, Cl. 30-34.100.

Byzitter, Martin. Teat cup disinfectant system. 4,854,336, Cl. 134-104.100.

C & KN Hobby Design S.A.: *See*—
Crocco, Carlo, 4,855,973, Cl. 368-282.000.

Cain, Clifford W., Jr.: *See*—
Dave, Shashi B.; and Cain, Clifford W., Jr., 4,855,509, Cl. 518-621.000.

Calaway, Ward M.: *See*—
Geyer, Daniel J.; and Calaway, Ward M., 4,856,029, Cl. 375-110.000.

Caldari, Gianfranco: *See*—
Sparacca, Romano; and Caldari, Gianfranco, 4,854,084, Cl. 51-139.000.

Caldwell Manufacturing Company: *See*—
Newton, William P., 4,854,558, Cl. 267-74.000.

Callahan, David T.; and Moorefield, Barry A., to Allen-Morrison, Inc. Adjustable cup dispensing assembly. 4,854,479, Cl. 221-304.000.

Calloni, Enzo; Valente, Maurizio; and Raiola, Alfonso, to Ausimont S.p.A. Purification of oils containing solid matters in suspension. 4,855,044, Cl. 210-195.100.

Calvignac, Jean-Louis J.: *See*—
Bouillot, Michel; Calvignac, Jean-Louis J.; and Munier, Jean-Marie L., 4,855,948, Cl. 364-900.000.

Camco, Incorporated: *See*—
Pringle, Ronald E., 4,854,387, Cl. 166-321.000.

Cameron Iron Works USA, Inc.: *See*—
Valenzuela, Ernesto D., 4,854,778, Cl. 405-204.000.

Cameron, Randy E.: *See*—
Yaniger, Stuart I.; and Cameron, Randy E., 4,855,361, Cl. 525-436.000.

Campbell, Douglas C., to Dawasue Industries Limited. Pipeline packer. 4,854,384, Cl. 166-122.000.

Campbell, Roy E.; Wilkinson, John D.; and Hudson, Hank M., to Elcor Corporation. Hydrocarbon gas processing. 4,854,955, Cl. 62-24.000.

Campbell, William H.; and Hilty, Terrence K., to Dow Corning Corporation. Process for the chlorodephenylation of phenyldisilanes. 4,855,471, Cl. 556-430.000.

Campione, Troy J.: *See*—
Young, David A.; Jones, Larry O.; and Campione, Troy J., 4,855,525, Cl. 585-523.000.

Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See*—
Fanning, Bryce L.; and McMahon, Garfield W., 4,855,964, Cl. 367-159.000.

Canadian Liquid Air Ltd.: *See*—
Garrido, Guillermo F.; Lee, Robert G. H.; and Francois, Olivier, 4,854,972, Cl. 106-437.000.

Canadian Patents and Development Limited-Societe Canadienne des Brevets et d' Exploitation Limitee: *See*—
Adams, Glenn N.; and Beekenkamp, Gerald, 4,855,555, Cl. 219-10.55F.

Cangiani, Gene L.; and Madiwale, Appasaheb N., to Lockheed Electronics Company. Three-dimensional electro-optical tracker. 4,855,932, Cl. 364-516.000.

Cannon, Donald M., to GTE Products Corporation. Lamp base. 4,854,888, Cl. 439-236.000.

Cannon Kabushiki Kaisha: *See*—
Suzuki, Yasuhito, 4,855,790, Cl. 355-24.000.

Canon Kabushiki Kaisha: *See*—
Akashi, Akira, 4,855,776, Cl. 354-402.000.
Hayakawa, Shingo, 4,855,780, Cl. 354-432.000.
Hirooka, Masaaki; Ishihara, Shunichi; Hanna, Junichi; and Shimizu, Isamu, 4,855,210, Cl. 430-133.000.
Horiuchi, Akihisa, 4,854,684, Cl. 350-427.000.
Ichikawa, Kyoko; Aoki, Makoto; and Takiguchi, Hideo, 4,855,753, Cl. 346-1.100.
Iwamoto, Kazunori, 4,854,444, Cl. 198-750.000.
Kan, Fumitaka, deceased; Koizumi, Norihiko; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; Mishina, Shinya; and Tanioka, Hiroshi, 4,855,763, Cl. 346-160.100.
Kato, Masatake; Tsuji, Sadahiko; Sugiura, Muneharu; and Tanaka, Kazuo, 4,854,681, Cl. 350-427.000.
Kitajima, Tadayuki; Asakawa, Toshiyuki; Naito, Masataka; Matsuo, Kazuhiro; and Murayama, Toshiaki, 4,854,571, Cl. 271-293.000.
Kitani, Shigehisa; Sasai, Atsuyoshi; and Shimizu, Hirokimi, 4,856,090, Cl. 455-607.000.
Kobata, Yoshihiro, 4,854,753, Cl. 400-144.200.
Kuwabara, Nobuyuki; Hasegawa, Kou; Sugimura, Hideo; Nakajima, Kazuhiro; and Moriguchi, Haruhiko, 4,855,758, Cl. 346-76.0PH.
Ogawa, Masami, 4,855,789, Cl. 355-26.000.
Sato, Isamu; Ishida, Masato; Abe, Eiichi; and Takeda, Hiroaki, 4,855,767, Cl. 346-160.000.
Shiraishi, Akihiko; Kato, Masatake; and Kawamoto, Kenichi, 4,855,814, Cl. 358-29.000.
Suda, Yasuo; Higashihara, Masaki; and Kadohara, Terutake, 4,855,777, Cl. 354-402.000.
Suzuki, Akio; Ohkubo, Masaharu; and Takada, Yoshihiro, 4,855,765, Cl. 346-154.000.
Suzuki, Akio, 4,855,766, Cl. 346-160.000.
Suzuki, Tetsuo, 4,855,762, Cl. 346-140.00R.
Suzuki, Yasuhito, 4,855,790, Cl. 355-24.000.
Tsuji, Sadahiko, 4,854,679, Cl. 350-422.000.
Yagasaki, Toshiaki, 4,855,648, Cl. 315-307.000.
Yoshihara, Toshiyuki; and Kimura, Tomohiro, 4,855,202, Cl. 430-58.000.

Cantatore, Giuseppe; and Borzatta, Valerio, to Ciba-Geigy Corporation. Piperidine compounds. 4,855,434, Cl. 546-190.000.

Canterbury, Randall L., Sr. Adjustable rifle rest. 4,854,066, Cl. 42-94.000.

Caple, Adrian, to U.S. Philips Corporation. Cathode ray tube with metal rear housing and faceplate support. 4,855,640, Cl. 313-477.00R.

Carbon Fuels Corporation: *See*—
Meyer, Edmond G.; and Meyer, Lee G., 4,854,937, Cl. 44-51.000.

Carbonetti, Italo. Tennis racket with angularly adjustable handle and fixed anatomic grip. 4,854,596, Cl. 273-73.00J.

Carduck, Franz-Josef: *See*—
Pohl, Joachim; Carduck, Franz-Josef; and Goebel, Gerd, 4,855,273, Cl. 502-244.000.

Carl F. Schroth GmbH: *See*—
Barral, Jacques, 4,854,608, Cl. 280-805.000.

Carl Freudenberg, Firma: *See*—
Grassmuck, Volker; Jorg, Benno; and Sommer, Eberhard, 4,854,751, Cl. 384-537.000.

Carleton, Herbert R.; and Broughton, Jeremy Q., to State University of New York. Topologically-distributed-memory multiprocessor computer. 4,855,903, Cl. 364-200.000.

Carlsen, Richard A., to John Brown, Inc. Die-lip adjusting mechanism. 4,854,844, Cl. 425-141.000.

Carlson, Chesley F., to Chesley F. Carlson Company. Step and repeat system. 4,855,793, Cl. 355-53.000.

Carlson, David E.; Dickson, Charles R.; and D'Aiello, Robert V., to Solarex Corporation. Electrical contacts for a thin-film semiconductor device. 4,854,974, Cl. 136-244.000.

Carlson, Gary M.: *See*—
Dammann, Laurence G.; Blakley, Brent A.; and Carlson, Gary M., 4,855,383, Cl. 528-51.000.

Carmean, Ronald E., to Nicolet Instrument Corporation. Gated video mixer. 4,855,832, Cl. 358-183.000.

Carmen, Raleigh A.; Chong, Chiyong; and Leng, Barry S., to Miles Laboratories, Inc. Red blood cell filtering system. 4,855,063, Cl. 210-749.000.

Carolla, Russell A.; and Gammon, Nathan A., to Goodyear Tire & Rubber Company, The. Pneumatic tire. 4,854,362, Cl. 152-554.000.

Carpenter, Keith J.: *See*—
Murray, Gerald D.; Gibson, Shelby R.; Carpenter, Keith J.; Carpenter, Kenneth E.; and Carpenter, Michael R., 4,854,784, Cl. 407-114.000

Carpenter, Kenneth E.: *See*—
Murray, Gerald D.; Gibson, Shelby R.; Carpenter, Keith J.; Carpenter, Kenneth E.; and Carpenter, Michael R., 4,854,784, Cl. 407-114.000.

Carpenter, Lester E.; and Waddell, Charles E., Jr., to American Tourister, Inc. Suitcase having removable divider with clothing pockets. 4,854,432, Cl. 190-110.000.

Carpenter, Michael R.: *See*—
Murray, Gerald D.; Gibson, Shelby R.; Carpenter, Keith J.; Carpenter, Kenneth E.; and Carpenter, Michael R., 4,854,784, Cl 407-114.000.

Carrie, Susan E.: *See*—
Lien, Sheue-Ling; Shantz, Michael J.; Evans, Jerald R.; Ergene, Serdar; and Carrie, Susan E., 4,855,935, Cl. 364-521.000.

Carrier Corporation: *See*—
Etemad, Shahrokh; Yannascoli, Donald; and Hatzikazakis, Michael, 4,854,831, Cl. 417-366.000.

Carter, Jon R.. *See*—
Cecco, Valentino S.; and Carter, Jon R., 4,855,676, Cl. 324-220.000.

Carter, William S.: *See*—
Hsieh, Hung-Cheng; and Carter, William S., 4,855,619, Cl 307-443.000.

Carver, George P.: *See*—
Reineman, Richard G.; and Carver, George P. 4,854,641, Cl. 297-345.000.

Casalegno, Italo: *See*—
Coslovi, Giuliano; and Casalegno, Italo, 4,854,136, Cl. 66-191.000.

Cascade Microtech, Inc.: *See*—
Jones, Keith E.; and Harwood, Warren K., 4,855,697, Cl. 333-33.000.

Cascade Wood Products Incorporated: *See*—
Roberts, William F.; and Collins, Truman D., 4,854,549, Cl 256-69.000.

Casciani, Robert V., to Sandoz Ltd. Ethoxylates of alkyl and alkenyl catechols. 4,855,075, Cl. 252-174.210.

Casey, Christine T.; and Record, Stephen E., to International Business Machines Corp. Full-screen input/output application program interface. 4,855,936, Cl. 364-521.000.

Casey, Gary L. Variable rate shock absorber and system therefor. 4,854,429, Cl. 188-299.000.

Casio Computer Co., Ltd.: *See*—
Matsubara, Akinori; Tsutsumi, Kenichi; Kaneko, Youji; Akutsu, Takashi; and Tateishi, Naofumi, 4,854,209, Cl. 84-1.010.

Cassereau, Philippe: *See*—
Jaffe, Jules S.; Cassereau, Philippe; and Sato, Tomomasa, 4,855,961, Cl. 367-7.000.

Cassoli Macchine Automatiche Confezionatrici S.r.l.: *See*—
Cassoli, Paolo, 4,854,108, Cl. 53-209.000.

Cassoli, Paolo, to Cassoli Macchine Automatiche Confezionatrici S.r.l. Automatic wrapping machine. 4,854,108, Cl. 53-209.000.

Castaldi, Graziano: *See*—
Giordano, Claudio; Castaldi, Graziano; Uggeri, Fulvio; and Cavicchioli, Silvia, 4,855,464, Cl. 549-450.000.

Castleberry, Donald E.: *See*—
Parks, Harold G.; Piper, William W.; Possin, George E.; and Castleberry, Donald E., 4,855,806, Cl. 357-59.000.

Catalysts & Chemicals Industries, Co., Ltd.: *See*—
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,855,115, Cl. 423-239.000.

Catania, Victor M.: *See*—
Steiger Jr., H. M.; and Catania, Victor M., 4,854,856, Cl 431-253.000.

Caterpillar Inc.: *See*—
Degeeter, Robert L.; and Knell, Harvey A., 4,854,813, Cl. 414-723.000.
Getz, Marvin G.; McFeeters, Brian D.; and Purcell, Robert J., 4,854,650, Cl. 305-10.000.

Cauquil, Gerard: *See*—
Chazot, Henri; Cauquil, Gerard; and Muller, Jean-Paul, 4,854,355, Cl. 141-130.000.

Cavallin, Riccardo, to Ferrero oHG m.b.H. Sweets and process for their manufacture. 4,855,155, Cl. 426-564.000.

Cavicchioli, Silvia: *See*—
Giordano, Claudio; Castaldi, Graziano; Uggeri, Fulvio; and Cavicchioli, Silvia, 4,855,464, Cl. 549-450.000.

Cavitt, Michael B., to Dow Chemical Company, The. Monocarboxylic acid derivatives of aromatic based epoxy resins. 4,855,366, Cl. 525-533.000.

Cavitt, Michael B., to Dow Chemical Company, The. Monocarboxylic acid derivatives of aliphatic based epoxy resins. 4,855,385, Cl. 528-97.000.

Cawley, Robin A.; and Keller, Paul R. N., to Quantel Limited. Video wipe processing apparatus. 4,855,834, Cl. 358-183.000.

CBD Corporation: *See*—
Kasha, Walter J.; and Burnison, Chantal S., 4,855,322, Cl. 514-546.000

Cecco, Valentino S.; and Carter, Jon R., to Atomic Energy of Canada Limited. Ferromagnetic eddy current probe having transmit and receive coil assemblies. 4,855,676, Cl. 324-220.000.

CEF Industries, Inc.: *See*—
Nelson, Neil M.; Sponzilli, William A.; and Lott, Quitman W., 4,854,120, Cl. 60-39.020.

Cegedur Societe de Transformation de l'Aluminium Pechiney: *See*—
Teirlinck, Didier; and Gagniere, Jacques, 4,855,107, Cl. 420-546.000

Celia, Wayne M. Apparatus for and a method of bonding a low density material to a plastic substrate and product thereof. 4,854,993, Cl. 156-219.000

Celiano, Eugene. System and method for maintaining a swimming pool cover drained of accumulated precipitation. 4,853,984, Cl. 4-496.000.

Cella, James A.: *See*—
Berdahl, Donald R.; Cella, James A.; and Shank, Gary K., 4,855,391, Cl. 528-188.000.

Central Mine Equipment Company: *See*—
Rassieur, Charles L.; and Burns, Raymond W., 4,854,395, Cl. 173-163.000.

Central Sprinkler Corporation: *See*—
Polan, George S., 4,854,342, Cl. 137-516.290.

Centre National de la Recherche Scientifique: *See*—
Toulemonde, Marcel; and Balanzat, Emmanuel, 4,855,049, Cl. 210-500.400.

Century Products Company: *See*—
Wise, Robert D., 4,854,796, Cl. 411-366.000.

Chambellan, Domonique: *See*—
Tanguy, Jean-Claude; Chambellan, Domonique; and Pommet, Raymond, 4,856,044, Cl. 378-198.000.

Chambron, Edmond: *See*—
Staron, Alain; Claudepierre, Christian; Micheron, Francois; and Chambron, Edmond, 4,856,042, Cl. 378-147.000.

Champagne, Wendel J. Mounting clip for installing siding. 4,854,101, Cl. 52-520.000.

Chan, Ka-Kong; and Saucy, Gabriel G., to Hoffmann-La Roche Inc. Asymmetric synthesis of natural vitamin E. 4,855,085, Cl. 260-396.00R.

Chandrupatla, Tirupathi R., to GMI Engrg., & Mgmt., Institute. Multi-ratio drive system for sprockets having translating pins. 4,854,925, Cl. 474-212.000

Chang, Clarence D.; and Perkins, Patrick D., to Mobil Oil Corp. Process for making alkyl pyrazines. 4,855,431, Cl. 544-410.000.

Chang, Dale. Self-teaching book for children with an electronic device. 4,854,879, Cl. 434-339.000.

Chang, Dao-Pin. Hair circle for conjugal affection. 4,854,303, Cl. 128-62.00R.

Chang, Mei; Wang, David N. K.; White, John M.; and Maydan, Dan, to Applied Materials, Inc. Inlet manifold and methods for increasing gas dissociation and for PECVD of dielectric films. 4,854,263, Cl. 118-715.000.

Chao, Hung-Hsiang J., to Bell Communications Research, Inc. DTDM multiplexer with cross-point switch. 4,855,999, Cl. 370-112.000.

Chao, Yong-Sheng; Fernandez, Salvador M.; and Guignon, Ernest F., to Chimerix Corporation. Method and appartatus for improved time-resolved fluorescence spectroscopy. 4,855,930, Cl. 364-497.000.

Chapman, Robert D.; Andreshak, John L.; and Shackelford, Scott A., to United States of America, Air Force. Energetic diethers and process for their preparation. 4,855,508, Cl. 568-589.000.

Charette, Joseph G.: *See*—
Hedger, James E., Jr.; and Charette, Joseph G., 4,854,504, Cl. 239-294.000.

Charland, Robert S. Restraining device. 4,854,138, Cl. 70-16.000.

Charlton, Steven C.; and Kurchacova, Elva, to Miles Inc. Multiple oxidative indicator system for visual determination of hydrogen peroxide. 4,855,228, Cl. 435-28.000.

Chartoff, Richard P.: *See*—
Butler, John M.; Chartoff, Richard P.; and Harvey, James A., 4,855,450, Cl. 548-522.000.

Chatenay epouse, Catherine M. Mobile structure for meeting halls or auditoriums. 4,854,092, Cl. 52-10.000.

Chatterjee, Pallab K.: *See*—
Malhi, Satwinder; Bean, Kenneth E.; Driscoll, Charles C.; and Chatterjee, Pallab K., 4,855,809, Cl. 357-75.000.

Chatterjee, Shyam S.; and Klessing, Klaus, to Dr. Willmar Schwabe GmbH & Company. 5-arylalkyl-4-alkoxy-2(5H)-furanones, intermediates and processes for the preparation thereof and medicaments containing them. 4,855,320, Cl. 514-473.000.

Chazot, Henri; Cauquil, Gerard; and Muller, Jean-Paul, to Cogema-Compagnie Generale Des Matieres Nucleaires. Stepwise advancing rotary conveyor and installation for taking liquid samples incorporating such a conveyor. 4,854,355, Cl. 141-130.000.

Chedgy, David G., to CLI International Enterprises, Inc. Method and apparatus for drying fine coal. 4,854,941, Cl. 44-626.000

Chee, Wan T., to Boeing Company, The. Engine mounting assembly. 4,854,525, Cl. 244-54.000.

Cheers, Christopher F.: *See*—
Porucznik, Paul; and Cheers, Christopher F., 4,854,149, Cl. 72-352.000

Chembiomed Ltd.: *See*—
Lemieux, Raymond U.; Ratcliffe, Robert M.; and Baker, Donald A., 4,855,126, Cl. 424-9.000.

Chemnitzer, Eberhard, to Audi AG. Device for adapting the air/fuel metering system and the ignition system of an internal combustion engine to enable the engine to run with all normally available grades of petrol (gasoline) fuel. 4,854,286, Cl. 123-425.000.

Chen, Evan N., to Warner-Lambert Company. Flexible razor head. 4,854,043, Cl. 30-50.000.

Chen, Hsin-Chih: *See*—
Petty, Charles A.; and Chen, Hsin-Chih, 4,855,066, Cl. 210-788.000.

Chen, Huang-Chuan: *See*—
Era, Hidenori; Shimizu, Mineo; and Chen, Huang-Chuan, 4,854,976, Cl. 148-2.000.

Chen, Sen-Tsuen: *See*—
Winbow, Graham A.; Chen, Sen-Tsuen; and Rice, James A., 4,855,963, Cl. 367-31.000.

Chen, Tasi A. Continuous processing machines for baking buns. 4,854,226, Cl. 99-353.000.

Chen, Tsang J., to Eastman Kodak Company. Photographic element comprising polycarbonate having tertiary amine acid addition salt. 4,855,392, Cl. 528-203.000.

Cheng, Anthony K.: *See*—
Polito, Alan J.; and Cheng, Anthony K., 4,855,226, Cl. 435-7.000.

Cheng, Chih-Jen. Dust-proof caster with a brake mechanism. 4,854,007, Cl. 16-18.00A.

Cheng, Wu-Hsun, to Du Pont de Nemours, E. I., and Company. Regeneration of methanol dissociation catalysts. 4,855,267, Cl. 502-50.000.

Chesebrough-Pond's Inc.: *See*—
Gentile, James L.; LaRosa, Joseph P.; and Rainey, Dean R., 4,854,484, Cl. 222-256.000.

Chesley F. Carlson Company: *See*—
Carlson, Chesley F., 4,855,793, Cl. 355-53.000.

Chevis, Robert W.; and Keetley, Reginald G., to Teledyne Industries, Inc. Centrifugal compressor diffuser system and method of making same. 4,854,126, Cl. 60-726.000.

Chevron Research Company: *See*—
Mohr, Harold H., 4,855,269, Cl. 502-37.000.
Todd, Harold E., Jr.; and Walters, Daniel L., 4,855,071, Cl. 252-70.000.

Chew, Calvin T.; and Gee, John C., to Amoco Corporation. Method for selectively removing process stream impurities utilizing reverse osmosis. 4,855,491, Cl. 562-414.000.

Chiang, Robert L.; Perigard, Raymond G.; and Rabo, Jule A., to UOP. Catalytic cracking process. 4,855,036, Cl. 208-120.000.

Chikuma Kouki Co., Ltd.: *See*—
Mori, Yasumasa, 4,854,712, Cl. 366-129.000.

Child Safety Products: *See*—
Hair, John, II, 4,854,448, Cl. 206-1.500.

Chilly Bones, Inc.: *See*—
Tobin, Cullin S., 4,854,319, Cl. 128-380.000.

Chimerix Corporation: *See*—
Chao, Yong-Sheng; Fernandez, Salvador M.; and Guignon, Ernest F., 4,855,930, Cl. 364-497.000.

China Steel Corporation: *See*—
Era, Hidenori; Shimizu, Mineo; and Chen, Huang-Chuan, 4,854,976, Cl. 148-2.000.

Chino, Hisayoshi: *See*—
Hanatani, Shinji; Sugiyama, Yoshiaki; and Chino, Hisayoshi, 4,855,846, Cl. 360-84.000.

Chino, Naoyoshi; Hiraki, Yasuhito; and Sato, Tsunehiko, to Fuji Photo Film Co., Ltd. Coating apparatus. 4,854,262, Cl. 118-411.000.

Chirillo, John R.; Kimbrough II, Kellam C.; and McHattie, Peder E., to Union Carbide Corporation. Method for reducing sheeting during polymerization of alpha-olefins. 4,855,370, Cl. 526-74.000.

Chisso Corporation: *See*—
Goto, Yasuyuki; Ogawa, Tetsuya; and Sugimori, Shigeru, 4,855,076, Cl. 252-299.630.

Chitjian, John R., to Clements National Company. Seam welding machine for thermoplastic material. 4,855,004, Cl. 156-359.000.

Chiu, Jessie T. Adhesive composition laminate with butyl rubber. 4,855,172, Cl. 428-57.000.

Chivas Products Limited: *See*—
Lorence, Brian S.; and Grabowski, David N., 4,854,536, Cl. 248-311.200.

Cholin, Jeffrey G.: *See*—
Cholin, John M.; and Cholin, Jeffrey G., 4,855,718, Cl. 340-578.000.

Cholin, John M.; and Cholin, Jeffrey G., to Firetek Corporation. Fire detection system employing at least one optical waveguide. 4,855,718, Cl. 340-578.000.

Chong, Chiyong: *See*—
Carmen, Raleigh A.; Chong, Chiyong; and Leng, Barry S., 4,855,063, Cl. 210-749.000.

Chow, Mark K.: *See*—
Strosser, Richard P.; Wynn, Edward J.; Chow, Mark K.; and Schlotterbeck, Stephen C., 4,855,924, Cl. 364-468.000.

Chromecek, Richard: *See*—
Abrutyn, Eric S.; Scarfo, Louis; and Chromecek, Richard, 4,855,127, Cl. 424-411.000.

Chrosny, Wojciech M.: *See*—
Sansone, Ronald P.; and Chrosny, Wojciech M., 4,855,920, Cl. 364-464.020.

Chu, Matthew M.: *See*—
McCrimmon, Kenneth A., Jr.; and Chu, Matthew M., 4,854,756, Cl. 400-322.000.

Chu, Shu-Chen: *See*—
Lin, J. Y.; Hsieh, Yih-Shou; and Chu, Shu-Chen, 4,855,055, Cl. 210-635.000.

Chugai Seiyaku Kaubshiki Kaisha: *See*—
Takagi, Mitiro; Katoh, Yasuyuki; and Yamazaki, Tomatsu, 4,855,497, Cl. 564-182.000.

Church, John F.; and Neff, Steve A., to Parker Hannifin Corporation. Fluid filter drain assembly. 4,855,041, Cl. 210-120.000.

Churchill, Bruce A.; and Raugh, Jeffery D., to Borg-Warner Automotive, Inc. Centrifugally controlled two-speed accessory drive. 4,854,192, Cl. 74-752.00E.

Ciba Corning Diagnostics Corp.: *See*—
Daley, Richard J.; and Potts, Robert S., 4,854,486, Cl. 222-484.000.

Ciba-Geigy Corporation: *See*—
Cantatore, Giuseppe; and Borzatta, Valerio, 4,855,434, Cl. 546-190.000.
Duthaler, Rudolf; Finter, Jurgen; Fischer, Walter; and Ramanathan, Visvanathan, 4,855,084, Cl. 260-377.000.
Fankhauser, Peter; Sinnreich, Joel; and Dobmeier, Rolf, 4,855,142, Cl. 424-434.000.
Fory, Werner; and Meyer, Willy, 4,854,963, Cl. 71-91.000.
Gehret, Jean-Claude, 4,855,317, Cl. 514-450.000.
Kaschig, Jurgen, 4,855,432, Cl. 546-12.000.
Oxenius, Rudiger; and Wilhelm, Charles, 4,855,410, Cl. 534-591.000.
Riediker, Martin; Meier, Kurt; and Zweifel, Hans, 4,855,468, Cl. 556-53.000.
Rosenberger, Siegfried; and Meier, Hans-Rudolf, 4,855,345, Cl. 524-120.000.
Voirol, Peter; and Moser, Urs, 4,854,988, Cl. 156-155.000.

Cinquino, John. Method and apparatus for monitoring bridge structures for scouring. 4,855,966, Cl. 367-99.000.

Cioaca, Dumitru G., to Seeq Technology, Inc. Three transistor high endurance eeprom cell. 4,855,955, Cl. 365-185.000.

Cisek, Richard J., Jr.: *See*—
Corbo, Thomas E.; Cisek, Richard J., Jr.; Matthews, Kathryn M.; and Sehringer, George K., 4,854,060, Cl. 40-152.100.

Claasen, Theodoor A. C. M.: *See*—
Bergmans, Johannes W. M.; Claasen, Theodoor A. C. M.; and Van Gerwen, Petrus J., 4,856,026, Cl. 375-58.000.

Claassen, Cornelius J.: *See*—
Hickley, Pieter; and Claassen, Cornelius J., 4,854,129, Cl. 62-304.000.

Claesson, Jan S.; and Risman, Per O. G., to U.S. Philips Corporation. Arrangement in a microwave oven. 4,855,554, Cl. 219-10.55F.

Claeys, Daniel A.: *See*—
Janssens, Wilhelmus; Timmerman, Daniel M.; and Claeys, Daniel A., 4,855,211, Cl. 430-213.000.

Clanton, Thomas L.: *See*—
Larson, Douglas A.; and Clanton, Thomas L., 4,854,574, Cl. 272-99.000.

Clarion Co., Ltd.: *See*—
Yamada, Kimichika; Ito, Yukio; and Ohkawa, Hiroyuki, 4,855,848, Cl. 360-96.500.

Clark, John G.: *See*—
Hirschman, Alan D.; Reilly, David M.; Potter, Ross H.; Stulen, John; Toft, Eric M.; and Clark, John G., 4,854,324, Cl. 128-655.000.

Clark, Michael T.: *See*—
Miller, Duane D.; Feller, Dennis R.; Clark, Michael T.; Adejare, Adeboye; Romstedt, Karl J.; and Shams, Gamal, 4,855,476, Cl. 558-410.000.

Clark, Phillip C. Method for converting one or more steel shipping containers into a habitable building at a building site and the product thereof. 4,854,094, Cl. 52-79.100.

Clark, R. Scot; Hoffman, Joe G.; Davison, John B.; Jones, Alan W.; Jones, Allen H., Jr.; Persichini, David W.; Yuan, Wallace I.; and Lipisko, Bruce A., to Athens, Inc. Method and apparatus for the continuous on-site chemical reprocessing of ultrapure liquids used in semiconductor wafer cleaning. 4,855,023, Cl. 204-130.000.

Clark, William G., Jr.; and Metala, Michael J., to Westinghouse Electric Corp. Multiple coil eddy current probe and method of flaw detection. 4,855,677, Cl. 324-238.000.

Clarkson, Bruce A.; and MacIntyre, Steven A., to Emhart Industries, Inc. Fluid status detector. 4,855,714, Cl. 340-521.000.

Claudepierre, Christian: *See*—
Staron, Alain; Claudepierre, Christian; Micheron, Francois; and Chambron, Edmond, 4,856,042, Cl. 378-147.000.

Claus, Richard O.; and Bennett, K. D., to Virginia Tech Intellectual Properties, Inc. Modal domain optical fiber sensors. 4,854,706, Cl. 356-345.000.

Clausen, Thomas; and Konrad, Eugen, to Wella Aktiengesellschaft. 5-alkoxy-2,4-diamino-alkyl-benzenes and hairdye compositions based on 5-alkoxy-2,4-diamino-alkyl-benzenes. 4,854,935, Cl. 8-408.000.

Claussen, Nils; Petzow, Gunter; Nieszery, Katharina; Panhorst, Wolfgang; and Weisskopf, Karl-Ludwig, to Schott Glaswerke, Firma. Process of making ceramic moldings containing cordierite. 4,855,259, Cl. 501-9.000.

Cleary, James D., to Unitek Corporation. Orthodontic bracket and palatal bar system. 4,854,864, Cl. 433-7.000.

Clem, George K., to Holland Company. In-track rail base grinding method. 4,854,088, Cl. 51-281.00R.

Clement, David C. Adjustable foot activated control apparatus for potentiometer. 4,855,707, Cl. 338-153.000.

Clements National Company: *See*—
Chitjian, John R., 4,855,004, Cl. 156-359.000.

Cleveland Machine Controls, Inc.: *See*—
Griebeler, Elmer L., 4,854,551, Cl. 266-76.000.

Clevenhagen, Robert L., to Figgie International Inc. Catcher's mitt. 4,853,975, Cl. 2-19.000.
CLI International Enterprises, Inc.: *See*—
Chedgy, David G., 4,854,941, Cl. 44-626.000.
Clough, Douglas O.: *See*—
Barratt, Peter J.; Clough, Douglas O.; Dickinson, Peter J.; and Farnhill, William M., 4,854,117, Cl. 57-301.000
Cluett, George, to Sta-Rite Industries, Inc. Improved trim-tab control system for power boats. 4,854,259, Cl. 114-285.000.
Coates, Ian H.: *See*—
Oxford, Alexander W.; Coates, Ian H.; Bays, David E.; Webb, Colin F.; Dowle, Michael D.; Mills, Keith; and Eldred, Colin D., 4,855,314, Cl. 514-415.000.
Coca-Cola Company, The: *See*—
Saunders, William J.; and Crosby, Samuel C., 4,854,655, Cl. 312-257.100.
Coccaro, Albert V. Apparatus and method for jacking and dollying an affixed vehicle wheel assembly. 4,854,803, Cl. 414-429.000.
Codella, Christopher F.; and Ogura, Seiki, to International Business Machines Corporation. Fabrication of a gaas short channel lightly doped drain mesfet. 4,855,246, Cl. 437-41.000.
Cogema-Compagnie Generale Des Matieres Nucleaires: *See*—
Chazot, Henri; Cauquil, Gerard; and Muller, Jean-Paul, 4,854,355, Cl. 141-130.000.
Cohen, Howard I.: *See*—
Kolodny, Gerald M.; and Cohen, Howard I., 4,856,069, Cl. 381-52.000.
Cohen, Jacques; Lemarquand, Pierre; and Pichard, Christian, to La Telemecanique Electrique. Protective switching apparatus with remotely controlled opening and closing of the contacts. 4,855,698, Cl. 335-14.000.
Cohen, Michael, to Applied Medical Research. Compositions and methods of effecting contraception utilizing melatonin. 4,855,305, Cl. 514-171.000.
Cojocari, Brian S.; and Shivers, Joseph R., to Wickes Manufacturing Company. Seat construction. 4,854,643, Cl. 297-452.000.
Colborn, Robert E., to General Electric Company. Heat curable epoxy compositions, and amine adducts of cobalt(II) complexes. 4,855,467, Cl. 556-40.000.
Colditz, Johannes K. E.: *See*—
Creusen, Caspard H. J.; and Colditz, Johannes K. E., 4,855,587, Cl. 250-213.0VT.
Cole, John C.: *See*—
Heath, William W.; and Cole, John C., 4,854,876, Cl. 434-29.000.
Cole, Robert L., to A. O. Smith Corporation. Permanent magnet rotor with magnet retention band. 4,855,630, Cl. 310-156.000.
Coleco Industries, Inc.: *See*—
Berliner, William; and Koda, Walter, 4,854,911, Cl. 446-376.000
Colgate-Palmolive Company: *See*—
Jakubicki, Gary J., 4,855,067, Cl. 252-174.250.
Colli, Luigi: *See*—
Boller, Giorgio; Ferro, Francesco; and Colli, Luigi, 4,854,509, Cl. 242-18.00R.
Boller, Giorgio; Montali, Sergio; and Colli, Luigi, 4,854,513, Cl. 242-18.00R.
Montali, Sergio; Boller, Giorgio; and Colli, Luigi, 4,854,511, Cl. 242-18.0DD.
Montali, Sergio; Boller, Giorgio; and Colli, Luigi, 4,854,512, Cl. 242-18.0DD.
Romanin, Bruno; Ferro, Francesco; and Colli, Luigi, 4,854,510, Cl. 242-18.0DD.
Romanin, Bruno; Ferro, Francesco; and Colli, Luigi, 4,854,514, Cl. 242-18.00R.
Collington, Eric W.; Finch, Harry; and Judd, Duncan B., to Glaxo Group Limited. Anti-inflammatory compositions comprising a systemic non-steroidal anti-inflammatory drug and a cyclopentyl ether. 4,855,293, Cl. 514-212.000.
Collins, Malcolm G., to Metal Box p.l.c. Pistons for pressure-dispensing containers. 4,854,485, Cl. 222-386.000.
Collins, Truman D.: *See*—
Roberts, William F.; and Collins, Truman D., 4,854,549, Cl. 256-69.000.
Collins, Walter W., to Wenoka Seastyle-Div. of Schur, Inc. Knife and sheath. 4,854,044, Cl. 30-151.000.
Colombo, Guglielmo: *See*—
Farina, Daniele; Colombo, Guglielmo; and Bonfanti, Lorenzo, 4,854,375, Cl. 165-53.000.
Columbus McKinnon Corporation: *See*—
Dicky, John, 4,854,508, Cl. 241-236.000.
Colvin, Howard A.: *See*—
Muse, Joel, Jr.; and Colvin, Howard A., 4,855,362, Cl. 525-194.000.
Combier, Charles M., to J. B. Martin Company. Textile fabrics having a plurality of warp and filling layers and attendant method of making. 4,854,352, Cl. 139-408.000
Commissariat A L'Energie Atomique: *See*—
Toulemonde, Marcel; and Balanzat, Emmanuel, 4,855,049, Cl. 210-500.400.
Commissaruat A L'Energie Atomique: *See*—
Tanguy, Jean-Claude; Chambellan, Domonique; and Pommet, Raymond, 4,856,044, Cl. 378-198.000.
Commonwealth Scientific and Industrial Research Organization: *See*—
Bez, Eckhard; and Farrant, John L., 4,854,825, Cl. 417-265.000.
Compagnie De Raffinage et de Distribution Total France: *See*—
Mauleon, Jean-Louis; Ville, Francois; and Mengus, Charles, 4,854,180, Cl. 73-863.860.
Compagnie Europeenne de Composants Electroniques: *See*—
Poupard, Dominique; and Bureau, Jean-Marc, 4,855,022, Cl. 204-130.000
Compagnie Europeenne du Zirconium Cezus: *See*—
Alheritiere, Edouard; and Prandi, Bernard, 4,854,977, Cl. 148-12.70B
Compagnie Generale De Geophysique: *See*—
Regnaudin, Jacques; and Boucquaert, Francois, 4,855,962, Cl. 367-19.000
Compaq Computer Corporation: *See*—
Lower, Edwin M., 4,855,892, Cl. 363-86.000
Compton, Wayne W., to Kidde Consumer Durables Corporation. Luminaire with different asymmetry along two horizontal axes. 4,856,103, Cl. 362-340.000.
Computer Services Corporation: *See*—
Kimura, Fumio; Takahashi, Shunzo; and Hamasaki, Yukio, 4,855,981, Cl. 369-44.000.
Con/Span Culvert Systems, Inc.: *See*—
Lockwood, William D., 4,854,775, Cl. 405-126.000.
Conanan, Virgilio D. Inclinometer of liquid in thin graduated cylinder. 4,854,047, Cl. 33-377.000.
Conkle, Urban C.: *See*—
Durham, Daniel K.; Conkle, Urban C.; and Downs, Hartley H., 4,855,060, Cl. 210-708.000.
Connell, Charles R.: *See*—
Fung, Steven; Woo, Sam L.; Haugland, Richard P.; Menchen, Steven M.; and Connell, Charles R., 4,855,225, Cl. 435-6.000.
Consolidated Chemical & Consulting Co.: *See*—
Wyman, John E., 4,855,079, Cl. 252-62.520.
Constructions Industrielles de la Mediterranee (C.N.I.M.): *See*—
Bernard, Jean; and Brunet, Roger, 4,853,998, Cl. 14-2.400.
Container Corporation of America: *See*—
Murray, Lowell C.; and Wyss, Frederick, 4,854,474, Cl. 220-462.000.
Russell, Raymond L., 4,854,353, Cl. 141-74.000.
Conti, Rino: *See*—
Miselli, Carlo A.; and Conti, Rino, 4,854,930, Cl. 493-315.000.
Continental Brokers and Consultants, Inc.: *See*—
Jolliff, Daniel; Hahn, Michael W.; and Oldham, Dean C., 4,854,590, Cl. 273-138.00A.
Cook, Gwendolyn K.; and McDonald, John H., III, to Eli Lilly and Company. Process for production of ceophalosporins. 4,855,418, Cl. 540-205.000.
Cooper, David A.; and Barlow, Robert W., to GTE Service Corporation. Splice cradle. 4,854,661, Cl. 350-96.200.
Cooper Industries, Inc.: *See*—
Harrell, Timothy J., 4,854,894, Cl. 439-606.000.
Wainio, Ronald A.; and Schreiber, Daniel J., 4,855,862, Cl. 361-72.000
Cooper, Leslie A.: *See*—
Russell, Alexander; Cooper, Leslie A.; and Drudy, David P., 4,855,675, Cl. 324-208.000.
Copal Company Limited: *See*—
Nagaoka, Tomoo; and Kimura, Takashi, 4,855,850, Cl. 360-99.120.
Copeland Corporation: *See*—
DiFlora, Michael A., 4,854,839, Cl. 417-571.000.
Copeland-Sirois Enterprises, Inc.: *See*—
Sirois, William L., 4,854,903, Cl. 440-83.000.
Corbasson, Gerard, to Etablissements Pierre Angenieux. Variable-focus objective-lens device and a method for the control of said device. 4,854,685, Cl. 350-427.000.
Corbel, Henri: *See*—
Couderc, Pierre; and Corbel, Henri, 4,854,845, Cl. 425-363.000.
Corbin, Maxwell H., Jr.; and Butler, Peter D. Method of installing preformed pavement materials into asphalt surfaces. 4,854,771, Cl. 404-79.000.
Corbo, Antonino. Discardable adjustable vaginal speculum. 4,854,300, Cl. 128-3.000.
Corbo, Thomas E.; Cisek, Richard J., Jr.; Matthews, Kathryn M.; and Sehringer, George K., to Manco Inc. Self-erecting photo display. 4,854,060, Cl. 40-152.100.
Corder, Thomas E.; and Stewart, John F., to Intelock Corporation. Bolt assembly and method. 4,854,143, Cl. 70-218.000.
Cordray International Corporation: *See*—
Cordray, Robert K., 4,854,837, Cl. 417-492.000.
Cordray, Robert K., to Cordray International Corporation. Rotary actuated pump or motor. 4,854,837, Cl. 417-492.000.
Corning Glass Works: *See*—
Marechal, Jean-Pierre; and Maschmeyer, Richard O., 4,854,958, Cl. 65-64.000.
Corning Incorporated: *See*—
Borrelli, Nicholas F.; and Sachenik, Paul A., 4,854,957, Cl. 65-30.110.
Day, John P.; and Locker, Robert J., 4,855,265, Cl. 501-128.000.
Dumbaugh, William H., Jr.; and Hagy, Henry E., 4,855,260, Cl. 501-66.000.
Corrao, Anthony J.: *See*—
Misevich, Kenneth W.; McGregor, Rob R.; and Corrao, Anthony J., 4,854,057, Cl. 36-114.000.
Corridori, Anthony J., to Augat Inc. Floatable surface mount terminal. 4,854,882, Cl. 439-83.000.
Corrugated Products Limited: *See*—
Haggart, John A., 4,854,483, Cl. 222-95.000.
Corso, Anthony J.: *See*—
Thompson, Glenn A.; Corso, Anthony J.; and Steuernagel, Hans H., 4,855,411, Cl. 534-629.000.

Cortese, Richard: *See*—
Eckenhoff, James B.; Magruder, Judy A.; Cortese, Richard; Peery, John R.; and Wright, Jeremy C., 4,855,141, Cl. 424-423.000.
Cosan Chemical Corporation: *See*—
Gaglani, Kamlesh; and Eilender, Albert L., 4,855,312, Cl. 514-374.000
Coslovi, Giuliano; and Casalegno, Italo, to Ausonia S.p.A. Textile manufactured article for contact fastener. 4,854,136, Cl. 66-191.000.
Cotter, George E.: *See*—
Wedgwood, Janet E.; Berde, Dennis W.; Bocskor, Steven J.; and Cotter, George E., 4,856,079, Cl. 455-50.000.
Cottone, Mark A., to Cougar Package Designers, Inc. Bracing and cushioning system and method for transporting massive loads. 4,854,792, Cl. 410-118.000.
Couderc, Pierre; and Corbel, Henri, to Elf Isolation Apparatus for embossing sections of a cladding element for outer facades. 4,854,845, Cl. 425-363.000.
Cougar Package Designers, Inc.: *See*—
Cottone, Mark A., 4,854,792, Cl. 410-118.000.
Courtaulds Packaging Australia Limited: *See*—
Anderson, Ian M., 4,854,734, Cl. 383-66.000.
Coutts, Bruce: *See*—
Borsuk, Leslie M.; and Coutts, Bruce, 4,854,663, Cl. 350-96.200.
Cowan, Kevin P.: *See*—
Evans, Russell M., III; Machek, James E.; and Cowan, Kevin P., 4,854,330, Cl. 128-772.000.
Cox, Roger D. Recycling spray apparatus for lounge. 4,854,502, Cl. 239-124.000.
Coyle, E. Michael; Reichley, Fred J.; Verbrugge, Calvin J.; and Villarreal, John G., to S. C. Johnson & Son, Inc. Fabric finish with alpha olefin resins and process. 4,855,350, Cl. 524-506.000.
CPC Engineering Corporation: *See*—
Martin, Arnold D., 4,855,061, Cl. 210-709.000.
Crall, Hugh C.: *See*—
Thompson, Glenn A.; Corso, Anthony J.; and Steuernagel, Hans H., 4,855,411, Cl. 534-629.000.
Crane, Herbert R.; and Liddell, Margaret G., to Hobart Corporation. Food mixer/folder. 4,854,717, Cl. 366-197.000.
Craver, Richard D., to Orrville Products, Inc. Secondary combustion device for woodburning stove. 4,854,298, Cl. 126-77.000.
Creative Products Merchandising, Inc.: *See*—
Sainato, Anthony V., 4,854,533, Cl. 248-221.100.
Cretin, Jacques; and Saussier, Daniel, to Institut Francais du Petrole. System for the transmission of signals between a reception assembly lowered into a well and a central control and recording laboratory. 4,855,732, Cl. 340-856.000.
Creusen, Caspard H. J.; and Colditz, Johannes K. E., to U.S. Philips Corporation. X-ray image intensifier tube with carbon-reinforced plastic foil entrance window. 4,855,587, Cl. 250-213.0VT.
Crishlow, Charles A.: *See*—
Martin, Lawrence L.; Worm, Manfred; and Crishlow, Charles A., 4,855,502, Cl. 564-373.000.
Crisman, Elton M., Jr.: *See*—
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Crisp, Martin: *See*—
Smith, Michael J.; Sully, George R. W.; and Crisp, Martin, 4,854,027, Cl. 29-434.000.
Crocco, Carlo, to C & KN Hobby Design S.A. Wristband, comprising two straps in which one strap passes through an opening of the other strap. 4,855,973, Cl. 368-282.000.
Crosby, Samuel C.: *See*—
Saunders, William J.; and Crosby, Samuel C., 4,854,655, Cl. 312-257.100.
Crow, Stanley. Flexible probe and sampling device for corrosion measuring. 4,855,668, Cl. 324-65.0CR.
Crowley, Patrick J.: *See*—
Noon, Robert A.; Crowley, Patrick J.; and Worthington, Diana M., 4,855,510, Cl. 568-663.000.
Cubric, Robert; and Roedseth, John K., to Goodyear Tire & Rubber Company, The. Tire building drum shaft connection. 4,854,612, Cl. 285-18.000.
Cuellar, Raul D.: *See*—
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Cues, Inc.: *See*—
Jones, David P.; and McElroy, William D., 4,855,838, Cl. 358-229.000.
Culbertson, Billy M.: *See*—
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Cummins Engine Company, Inc.: *See*—
Baugh, James D.; and Hager, Francis M., 4,854,746, Cl. 384-432.000.
Curley, Charles M.; and Longrod, Scott J., to Smith Corona Corporation. Keybutton guide assembly for a keyboard. 4,855,548, Cl. 200-345.000.
Curtice-Burns, Inc.: *See*—
Fielding, Mimi S., 4,855,151, Cl. 426-144.000.
Custom Products of Litchfield, Inc.: *See*—
Halberg, Laurie L., 4,854,628, Cl. 296-3.000.
Cutie, Sergio S.; Langhorst, Martin A.; and Wood, Stewart P., to Dow Chemical Company, The. Column holder for on-column photometric detection. 4,854,700, Cl. 356-72.000.
Cygnet Systems: *See*—
Hug, Paul; Umeda, Bill; Yesnosky, Paul A.; Raudebaugh, Bart; Ricco, Gary; and McCabe, Gary E., 4,855,980, Cl. 369-36.000.
Cyr, Michel L. Potatoe drawer. 4,854,463, Cl. 220-18.000.
Czarnocki, Walter S.; Harper, Peter W.; Moran, Kevin S.; and Alexander, Steven W., to Motorola Inc. Mass fluid flow sensor. 4,854,167, Cl. 73-204.190.
Daberkow, Kevin L.; Finan, Christopher D.; Petolino, Joseph A.; Sobottka, Daniel C.; and Thomas, Jeffrey A., to Amdahl Corporation. Cache storage queue. 4,855,904, Cl. 364-200.000.
Daenicke, Heinrich: *See*—
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Dahlby, Larry C., to S. C. Johnson & Son, Inc. Apparatus and method for segregating parts. 4,854,454, Cl. 209-616.000.
Dahlquist, Charles W., II; and North, Vaughn N. Cupholder adaptive device. 4,854,468, Cl. 220-85.00H.
Dahm, Ralf: *See*—
Becker, Heinz D.; Bederke, Klaus; Dahm, Ralf; Kerber, Hermann; Sadowski, Fritz; and Stephan, Werner, 4,855,342, Cl. 524-31.000.
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Carlson, David E.; Dickson, Charles R.; and D'Aiello, Robert V., 4,854,974, Cl. 136-244.000.
Daigle, Clement; and Gonthier, Emile, to Les Industries Fortier Ltee. Apparatus for forming an opening with a gasket in a masonry manhole. 4,854,543, Cl. 249-95.000.
Daiichi Denshi Kogyo Kabushiki Kaisha: *See*—
Ohtsuka, Hiroo; Hara, Osamu; Hori, Akira; and Nodoa, Minoru, 4,854,889, Cl. 439-395.000.
Daikin Industries, Ltd.: *See*—
Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi, 4,854,131, Cl. 62-51.200.
Daikoku, Akihiro, to Sharp Kabushiki Kaisha. Optical system for copier. 4,854,672, Cl. 350-255.000.
Daimler-Benz Aktiengesellschaft: *See*—
Peitsmeier, Karl; and Steinkamper, Reinhard, 4,854,142, Cl. 70-186.000.
Dainippon Ink and Chemicals, Inc.: *See*—
Maruyama, Osamu; Ishikawa, Hidenobu; and Takahashi, Nobuo, 4,855,334, Cl. 522-96.000.
Dainippon Screen Mfg. Co. Ltd.: *See*—
Oda, Osamu, 4,854,232, Cl. 101-211.000.
Daley, Richard J.; and Potts, Robert S., to Ciba Corning Diagnostics Corp. Resealable container for dispensing liquid. 4,854,486, Cl. 222-484.000.
Dallaire, Rodney J. Autoguided vehicle using reflective materials. 4,855,915, Cl. 364-424.020.
Dallas Semiconductor Corporation: *See*—
Dias, Donald R., 4,855,690, Cl. 331-78.000.
Dalton, Danny L., to Quantum Conditioning Technology, Inc. Water conditioning system. 4,855,043, Cl. 210-190.000.
Dambre, Paul, to N.V. Bekaert S.A. Method of manufacturing a steel wire with high tensile strength. 4,854,032, Cl. 29-527.400.
Damico, Dennis J.; and Bennett, Ruth M., to Lord Corporation. Structural adhesive formulations and bonding method employing same. 4,855,001, Cl. 156-307.300.
D'Amico, Richard: *See*—
Riihimaki, Roy; and D'Amico, Richard, 4,854,475, Cl. 220-337.000.
Dammann, Laurence G.; Blakley, Brent A.; and Carlson, Gary M., to Ashland Oil, Inc. In situ quaternary ammonium catalyst formation for curing polymeric isocyanates. 4,855,383, Cl. 528-51.000.
Dana Corporation: *See*—
Gray, Larry O., 4,855,918, Cl. 364-426.040.
Schneider, Jack H.; and Gray, Larry O., 4,856,072, Cl. 381-86.000.
D'Andolfo, Francesco; and Grampa, Fulvio, to Snia Fibre s.p.a. Single stage process for producing continuous polyester-based multifilament yarns at high speed. 4,855,099, Cl. 264-103.000.
Dangayach, Kailash C. B., to Shell Oil Company. Stabilized epoxy resin compositions. 4,855,340, Cl. 523-456.000.
Daniel, Aaron E.; and Rule, Daniel P., to Rule Steel Tanks, Inc. Storage box. 4,854,461, Cl. 220-4.00R.
DAP Inc.: *See*—
Strader, Hartzel G., 4,855,348, Cl. 524-317.000.
Darling, Roy D.: *See*—
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Darroch, John B., to Apollo Sprayers International, Inc. Series impeller air pump for liquid sprayer. 4,854,822, Cl. 417-62.000.
Darvell, Wayne K.; Konsti, Patricia R.; Klingen, Jurgen; and Kreckel, Karl W., to Minnesota Mining and Manufacturing Company. Pressure-sensitive tape construction incorporating resilient polymeric microspheres. 4,855,170, Cl. 428-40.000.
Data Recording Instrument Company Limited: *See*—
Smith, Michael J.; Sully, George R. W.; and Crisp, Martin, 4,854,027, Cl. 29-434.000.
Daussan, Andre : *See*—
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Daussan et Compagnie: *See*—
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Daussan, Gerard: *See*—
Daussan, Jean C.; Daussan, Gerard; and Daussan, Andre , 4,854,550, Cl. 266-45.000.
Daussan, Jean C.; Daussan, Gerard; and Daussan, Andre , to Daussan et Compagnie. Stopper for retaining slag and process for implementation and manufacture thereof. 4,854,550, Cl. 266-45.000.

Dave, Shashi B.; and Cain, Clifford W., Jr., to Manville Corporation. Removal of alkali metals from polyols. 4,855,509, Cl. 518-621.000.

Davene, Jean G.: *See—*
Janiak, Robert A.; and Davene, Jean G., 4,856,021, Cl. 373-108.000.

David, Constant V. Method for fabricating and inserting reinforcing spikes in a 3-D reinforced structure. 4,854,990, Cl. 156-173.000

Davies, Roy V., to Boots Company plc, The. 1,4-dihydroquinolines-3-carboxamides. 4,855,291, Cl. 514-312.000.

Davis, Cecil J.: *See—*
Jucha, Rhett B.; Davis, Cecil J.; and Loewenstein, Lee M., 4,855,016, Cl. 156-643.000
Luttmer, Joseph D.; Davis, Cecil J.; Smith, Patricia B.; and York, Rudy L., 4,855,160, Cl. 427-38.000.

Davis, Chuck: *See—*
Fritz, Marlene M.; Love, Betty J.; Sweeney, Mary D.; and Davis, Chuck, 4,855,723, Cl. 340-691.000.

Davis, Donald J., Jr.: *See—*
Insetta, Victor; and Davis, Donald J., Jr., 4,856,102, Cl. 361-330.000.

Davis, Emsley A. Apparatus and method for repairing and preventing para-stomal hernias. 4,854,316, Cl. 128-334.00R.

Davis, Emsley A. Game. 4,854,589, Cl. 273-123.00R.

Davis, Gail F.; Baker, Robert L.; Bragg, Dale E.; and Stegemoeller, Calvin L., to Halliburton Company. Blender vehicle apparatus. 4,854,714, Cl. 366-132.000.

Davis, Patricia A.: *See—*
Upchurch, Billy T.; Davis, Patricia A.; and Miller, Irvin M., 4,855,274, Cl. 502-339.000.

Davis, Phillip, to Double Helix Enterprises. Vehicle immobilization device. 4,854,144, Cl. 70-226.000.

Davis, Roy I.; and Patil, Prabhakar B. Computer controllable synchronous shifting of an automatic transmission. 4,855,914, Cl. 364-424.100.

Davis, Wesley; and Gasperi, Michael L., to Allen-Bradley Company, Inc. Machine vision system with illumination variation compensation. 4,855,830, Cl. 358-168.000.

Davison, John B.: *See—*
Clark, R. Scot; Hoffman, Joe G.; Davison, John B.; Jones, Alan W.; Jones, Allen H., Jr.; Persichini, David W.; Yuan, Wallace I.; and Lipisko, Bruce A., 4,855,023, Cl. 204-130.000.

Dawasue Industries Limited: *See—*
Campbell, Douglas C., 4,854,384, Cl. 166-122.000

Day, John P.; and Locker, Robert J., to Corning Incorporated. High temperature low thermal expansion ceramic. 4,855,265, Cl. 501-128.000.

Day, Richard A.; and Wallace, John, to University of Cincinnati. Application of 4-[1-oxoalkyl]-2,5-oxazolidinediones in selective stereospecific formation of biologically active α-lactams. 4,855,419, Cl 540-215.000.

Dayco Products, Inc.: *See—*
Grantham, Rodger P., 4,854,338, Cl. 137-68.100.
Oglesby, Donald L., 4,854,846, Cl. 425-391.000.

de Fontenay: Etienne; and Parisot, Patrick, to S.A. dite: Caoutchouc Manufacture et Plastiques. Elastic mounting with rigidity blocked in one direction by the tension of a cable embedded in elastomer. 4,854,562, Cl. 267-292.000.

De La Rue Systems, Ltd.: *See—*
Martin, Harvey G.; Pilling, Roger; and Hosking, Steven M., 4,854,570, Cl. 271-162.000.

Decker, Richard B.; and Bozzi, Richard P., to Bettcher Industries, Inc. Rotary hand trimming knife. 4,854,046, Cl. 30-276.000.

DeFonzo, Alfred P., to United States of America, Air Force. Opto-electronic vivaldi transceiver. 4,855,749, Cl. 343-767.000

Degeeter, Robert L.; and Knell, Harvey A., to Caterpillar Inc. Coupling apparatus. 4,854,813, Cl. 414-723.000.

Degen, Hans-Juergen; Reichel, Fritz; Riebeling, Ulrich; and Hoehr, Lothar, to BASF Aktiengesellschaft. Paper size based on finely divided aqueous dispersions. 4,855,343, Cl. 524-47.000.

Degen, Peter J.: *See—*
Joffee, Irving B.; Degen, Peter J.; and Baltusis, Frederick A., 4,855,163, Cl. 427-244.000.

de Goncourt, Louis; and Sayers, Kenneth H., to Bertin & CIE. Vehicle suspension assembly. 4,854,606, Cl. 280-699.000.

deGroot, Peter F., to Bud Antle, Inc. Plant transfer mechanism. 4,854,802, Cl. 414-404.000.

Degussa Aktiengesellschaft: *See—*
Grund, Andreas; Prescher, Guenter; Boehme, Georg; Hofen, Willi; and Petsch, Heinrich, 4,855,465, Cl. 549-525.000
Panster, Peter; Grethe, Horst; and Kleinschmit, Peter, 4,855,470, Cl. 556-421.000.

Dehnert, Johannes; Lamm, Gunther; and Loeffler, Hermann, to BASF Aktiengesellschaft. Diaminopyridine azo dyes having acyloxy radicals substituted on the diaminopyridine. 4,855,412, Cl. 534-766.000.

Dehnert, Johannes; Lamm, Gunther; and Loeffler, Hermann, to BASF Aktiengesellschaft. Heterocyclic azo dyes containing cyanothiophene derivatives as diazo components and diaminopyridines as coupling components. 4,855,413, Cl. 534-766.000.

DeJonge, Antonia R., to Primary Delivery Systems, Inc. Convertible childproof/non-childproof cap and container. 4,854,459, Cl. 215-220.000.

Delaware Capital Formation, Inc.: *See—*
McPherson, Alexander W.; and Witt, Larry M., 4,854,564, Cl. 269-32.000.

Delchi/Carrier S.p.A.: *See—*
Farina, Daniele; Colombo, Guglielmo; and Bonfanti, Lorenzo, 4,854,375, Cl. 165-53.000.

Delfos & Atlas Copco Limited: *See—*
Mazzalupi, Giovanni; and Onofri, Bruno, 4,854,402, Cl. 175-171.000.

Delisle, Roger L. Roofing membrane anchor. 4,854,105, Cl. 52-698.000.

Delk, Ann: *See—*
Leong, Helen; Katz, Martin; Delk, Ann; Nacht, Sergio; and Berliner, David, 4,855,144, Cl. 424-487.000.

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Hays, Jean-Francois; Legrand, Pierre; Verna, Eric; Delzenne, Michel; Reynaud, Bernard; and Gaillard, Pierre, 4,855,566, Cl. 219-130.400.

De Martino, Ronald N.; Yoon, Hyun-Nam; and Stamatoff, James B., to Hoechst Celanese Corp. Side chain liquid crystalline polymers exhibiting nonlinear optical properties. 4,855,376, Cl. 526-311.000.

Demerson, Christopher A.: *See—*
Katz, Alan H.; and Demerson, Christopher A., 4,855,445, Cl. 548-432.000.

Demuth, Robert: *See—*
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Denki Kaguku Koygo Kabushiki Kaisha: *See—*
Iriuchijima, Shinobu; Kobayashi, Hirohiko; Masuda, Takahito; Watanabe, Shunnosuke; and Tabata, Hiroshi, 4,855,311, Cl 514-373.000.

Denney, Kimberly K.; and Block, Norman G., to Quantum Chemical Corporation. Control of pH in water quench of a partial oxidation process. 4,854,942, Cl. 48-197.00R.

Dennison Manufacturing Company: *See—*
Jodrey, Robert M., 4,855,005, Cl. 156-361.000.

Denny, Herman C., to Westinghouse Electric Corp. Electrical discharge machining electrode. 4,855,557, Cl. 219-69.150.

DePaul, Alice A.: *See—*
McGlothlin, Mark W.; and DePaul, Alice A., 4,855,169, Cl. 428-35.200.

De Pous, Olivier: *See—*
Richon, Dominique; De Pous, Olivier; and Fontaine, Pierre, 4,855,262, Cl. 501-92.000

DePrima, George R., to Morton Manufacturing Co. Curved sliding door assembly and method of repair. 4,854,078, Cl. 49-409.000.

Depta, Ingolf: *See—*
Humbs, Rolf; and Depta, Ingolf, 4,855,764, Cl. 346-140.00R.

Dequatre, Claude; Blanpain, Peter R. J.; and Longuet, Michel, to Polysar Financial Services S.A. Heterogeneous polymers. 4,855,337, Cl. 523-201.000.

De Ridder, A. Lody: *See—*
Mannheimer, Lee R.; and De Ridder, A. Lody, 4,854,001, Cl. 15-97.00R.

De Roode, Willy: *See—*
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DeSanto, Joseph J. Hook and loop holding strength maximizing apparatus. 4,854,037, Cl. 29-755.000.

Deschamps, Andre ; Franckowiak, Sigismond; and Leporq, Serge, to Institut Francais du Petrole. Process for removing sulfur oxides from a gas by means of an absorption mass regenerable by reaction with elemental sulfur. 4,855,117, Cl. 423-244.000.

Desmurs, Jean-Roger: *See—*
Besson, Bernard; Desmurs, Jean-Roger; and Jouve, Isabelle, 4,855,513, Cl. 568-779.000.

Despot, Janko; and Krober, Ulrich, to M.A.N. Roland. Protective device on rotary printing presses. 4,854,233, Cl. 101-216.000.

Detsch, Steven G. Prosthetic implant attachment system and method. 4,854,872, Cl. 433-173.000.

Deuring, Hans, to Goetze AG. Slide ring seal with carrier body. 4,854,598, Cl. 277-87.000.

Deutsche Filterbau GmbH: *See—*
Hartweck, Winfried G.; and Hahn, Ulrich, 4,854,861, Cl. 432-14.000.

Devash, Yair, to Repligen Corporation. Dinucleoside pyrophosphates and pyrophosphate homologs as plant antivirals. 4,855,304, Cl. 514-47.000.

Devlin, Richard G., to E. R. Squibb & Sons, Inc. Use of zofenopril for the treatment of rheumatoid arthritis. 4,855,315, Cl. 514-422.000.

Dew, Douglas K.; Hsu, Long S.; and Halpern, Steven J., to Laser Surgery Software, Inc. Laser healing method and apparatus. 4,854,320, Cl. 128-397.000.

de Waal, Jannetje: *See—*
Verbrugge, Pieter A.; de Waal, Jannetje; and Sopher, David W., 4,855,452, Cl. 548-953.000.

De Wald, Raymond C.: *See—*
Hong, Paul O.; and De Wald, Raymond C., 4,855,424, Cl. 544-35.000.

Dias, Donald R., to Dallas Semiconductor Corporation. Integrated circuit random number generator using sampled output of variable frequency oscillator. 4,855,690, Cl. 331-78.000.

Diaz, Henri, to British Petroleum Company p.l.c., The. Production of aromatic hydrocarbons. 4,855,522, Cl. 585-417.000.

Dickinson, Peter J.: *See—*
Barratt, Peter J.; Clough, Douglas O.; Dickinson, Peter J.; and Farnhill, William M., 4,854,117, Cl. 57-301.000.

Dickson, Charles R.: *See—*
Carlson, David E.; Dickson, Charles R.; and D'Aiello, Robert V., 4,854,974, Cl. 136-244.000.

Dicky, John, to Columbus McKinnon Corporation. Tire shredding machine. 4,854,508, Cl. 241-236.000.

Diehl, Donald R.: *See—*
Factor, Ronda E.; and Diehl, Donald R., 4,855,221, Cl. 430-510.000.

Diehl GmbH & Co.: *See—*
Meisner, Alfred; and Hammelsbacher, Karlheinz, 4,855,971, Cl. 368-188.000.

Diesel Kiki Co., Ltd.: *See—*
Kikuchi, Hideya; and Ikeuchi, Hiroshi, 4,855,710, Cl. 340-426.000.

Differ, Dennis J. Reclosable tamper-proof specimen bottle. 4,854,458, Cl. 215-253.000.

DiFlora, Michael A., to Copeland Corporation. Compressor valve assembly. 4,854,839, Cl. 417-571.000.

Digital Equipment Corporation: *See—*
Weng, Lih-Jyh, 4,856,003, Cl. 371-37.000.

DiGregorio, Germano, to Storage Technology Corporation. Apparatus for assembling magnetic tape drive read/write read modules. 4,854,036, Cl. 29-744.000.

Dilley, David L.: *See—*
Klekotka, James E.; and Dilley, David L., 4,856,032, Cl. 377-47.000.
Ruben, Paul W.; Heimbecher, Eugene F., II; and Dilley, David L., 4,855,946, Cl. 364-721.000.

DiLullo, Robert J.: *See—*
Bourland, Larry G.; DiLullo, Robert J.; Ritrievi, Kimberly E.; and Valbert, Jon R., 4,855,179, Cl. 428-296.000.

Dimos, Duane: *See—*
Garg, Diwakar; Dyer, Paul N.; Schaffer, Leslie E.; Wrecsics, Ernest L.; Dimos, Duane; and Mueller, Carl F., 4,855,188, Cl. 428-627.000.

Dingess, Billy E. Power booster internal combustion engine flywheel. 4,854,274, Cl. 123-192.00R.

Dinsmore, William R.: *See—*
Johnson, Robert E.; and Dinsmore, William R., 4,854,074, Cl. 47-57.500.

Ditzig, Albert, to Telephone Products, Inc. Rotary electrical connector assembly. 4,854,881, Cl. 439-26.000.

Djuric, Stevan W.; Haack, Richard A.; and Yu, Stella S., to G. D. Searle & Co. Furyl, phenylene, and thienyl leukotriene B4 analogues. 4,855,324, Cl. 514-570.000.

DNA Plant Technology Corporation: *See—*
Orr, Avigdor; Spingler, John O.; and Gilbert, Seymour G., 4,855,153, Cl. 426-270.000.

Dobmeier, Rolf: *See—*
Fankhauser, Peter; Sinnreich, Joel; and Dobmeier, Rolf, 4,855,142, Cl. 424-434.000.

Dobner, Alfred, to Alcan International Ltd. Cylinder head for a combustion engine. 4,854,275, Cl. 123-193.00H.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Durm, Juergen; and Brin, Constantin, 4,854,635, Cl. 296-180.500.
Schempp, Ulrich; and Ruehr, Volker, 4,854,646, Cl. 301-65.000.

Dr. Rentschler Arzneimittel GmbH & Co.: *See—*
Nandi, Kumaresh; Fischer, Helga; Herrmann, Wilfried; Kohne, Hans; Lahr, Wolfgang; Schmersahl, Hein U.; and Walch, Hatto, 4,855,300, Cl. 514-264.000.

Dr. Thomastik und Mitarbeiter Offene Handelsgesellschaft: *See—*
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Dr. Willmar Schwabe GmbH & Company: *See—*
Chatterjee, Shyam S.; and Klessing, Klaus, 4,855,320, Cl. 514-473.000.

Dolfsma, Hendrik: *See—*
Gabelli, Antonio; and Dolfsma, Hendrik, 4,854,748, Cl. 384-466.000.

Dollfus, Jacques, to Societe Anonyme: Societe Generale Pour les Techniques Nouvelles - SGN. Flowmeter for dangerous fluids. 4,854,178, Cl. 73-861.580.

Dolly, Inc.: *See—*
Marcus, Kenneth N.; and Brookshire, Phillip L., 4,854,638, Cl. 297-250.000.

Donnelly Corporation: *See—*
Moser, Frank H.; and Lynam, Niall R., 4,855,161, Cl. 427-108.000.

Donner, Joseph E., to Hughes Aircraft Company. Adjustable heater collet. 4,855,559, Cl. 219-85.160.

Donofrio, Deborah K.; and Whitekettle, Wilson K., to Betz Laboratories, Inc. Biocidal compositions and use thereof. 4,855,296, Cl. 514-241.000.

Donovan, Leo P. Anti-theft ski alarm. 4,855,720, Cl. 340-571.000.

Dore, Peter B. Repair process for a fibre reinforced structure. 4,855,173, Cl. 428-63 000.

Dorner Mfg. Corp.: *See—*
Dorner, Wolfgang C., 4,854,817, Cl. 414-798.900.

Dorner, Wolfgang C., to Dorner Mfg. Corp. Apparatus for unstacking articles. 4,854,817, Cl. 414-798.900.

Dornfeld, David A.: *See—*
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Dory, Jacques, to EDAP International. Acoustic filter for suppressing or attenuating the negative half-waves of an elastic wave and an elastic wave generator comprising such a filter. 4,856,107, Cl. 367-150.000.

Double Helix Enterprises: *See—*
Davis, Phillip, 4,854,144, Cl. 70-226.000.

Douglas, Monte A., to Texas Instruments Incorporated. Dry etch process for selectively etching non-homogeneous material bilayers. 4,855,015, Cl. 156-626.000.

Douglas, Monte A., to Texas Instruments Incorporated. Trench etch process for a single-wafer RIE dry etch reactor. 4,855,017, Cl. 156-643.000.

Douglass, David L.; and Moon, Marcus P., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,854,962, Cl. 71-90.000.

Douskalis, William, to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Time division multiplex arrangement. 4,855,996, Cl. 370-84.000.

Douziech, Patrick; and Berger, Philippe, to SGS-Thomson Microelectronics S.A. Multiple reference frequency generator. 4,855,688, Cl. 331-8.000.

Dow Chemical Company, The: *See—*
Betso, Stephen R.; Hyun, Kun S.; and Russell, Patrick M., 4,855,404, Cl. 528-502.000.
Cavitt, Michael B., 4,855,366, Cl. 525-533.000.
Cavitt, Michael B., 4,855,385, Cl. 528-97.000.
Cutie, Sergio S.; Langhorst, Martin A.; and Wood, Stewart P., 4,854,700, Cl. 356-72.000.
Geus, John W.; and Linowski, John W., 4,855,091, Cl. 264-22.000.
Newhouse, Geoffrey S., 4,855,198, Cl. 430-12.000.
Stevens, James C.; and Fordyce, William A., 4,855,523, Cl. 585-511.000.
Wolf, Richard A.; and Warakomski, John M., 4,855,373, Cl. 526-218.100.

Dow Corning Corporation: *See—*
Abrutyn, Eric S.; Scarfo, Louis; and Chromecek, Richard, 4,855,127, Cl. 424-411.000.
Baile, Gnaneshwar R.; Herman, John E.; and Wyshak, Geoffrey M., 4,855,469, Cl. 556-409.000.
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Williams, Dwight E., 4,855,054, Cl. 210-635.000.

Dow Corning, Ltd.: *See—*
Easton, Thomas; and Thomas, Bryan, 4,854,938, Cl. 44-56.000.

Dowle, Michael D.: *See—*
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Dowling, Donald J.: *See—*
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Downs, Hartley H.: *See—*
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Doyle, Michael J.: *See—*
van Broekhoven, Johannes A. M.; and Doyle, Michael J., 4,855,400, Cl. 528-392.000.

Drachnik, Kenneth J.; Kheder, Joseph; and Aspey, S. Alan, to Raychem Corporation. Mesh electrodes and clips for use in preparing them. 4,855,024, Cl. 204-147.000.

Draim, John E. Tetrahedral multi-satellite continuous-coverage constellation. 4,854,527, Cl. 244-158.00R.

Drent, Eit: *See—*
Van Doorn, Johannes A.; Drent, Eit; Van Leeuwen, Petrus W. N. M.; Meijboom, Nicolaas; Van Oort, Aart B.; and Wife, Richard L., 4,855,399, Cl. 528-392.000.

Drexel University: *See—*
Beard, Richard B.; Hasan, Saleem; Scoles, Kevin J.; and Onaral, Banu, 4,854,865, Cl. 433-18.000.

DRG (UK) Limited: *See—*
Simpson, Brian K., 4,854,400, Cl. 175-85.000.

Drillio, Robert C. Knee orthosis having offset within hinges and anti-rotation straps. 4,854,308, Cl. 128-80.00C.

Driscoll, Charles C.: *See—*
Malhi, Satwinder; Bean, Kenneth E.; Driscoll, Charles C.; and Chatterjee, Pallab K., 4,855,809, Cl. 357-75.000.

Drits, Vladimir, to Innovex Inc. Method for diagnosing cutting tool dullness. 4,854,161, Cl. 73-104.000.

Drudy, David P.: *See—*
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Drury, David J.: *See—*
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DSL Dynamic Sciences Limited: *See—*
MacEachern, Donald C.; and Levesque, Gaston, 4,855,885, Cl. 362-298.000.

Dubach, Werner F., to Alfatechnic AG. Single-piece snap hinge closure. 4,854,473, Cl. 220-335.000.

Duchesne, Denis; and Johnson, Bryce V., to Minnesota Mining and Manufacturing Company. Extrudable thermoplastic hydrocarbon polymer composition. 4,855,360, Cl. 525-187.000.

Dudley, Mark E.: *See—*
Goodson, Forrest R.; Dudley, Mark E.; and Rudy, Thomas P., 4,854,981, Cl. 149-2.000.

Dufour, Maurice; and Obrecht, Gerard, to Essilor International Compagnie Generale d'Optique. Progressive ophthalmic lens. 4,854,689, Cl. 351-169.000.

Duivelaar, Machiel N., to De Roode, Willy. Process for rendering harmless dangerous chemical waste. 4,855,082, Cl. 252-629.000.

Duke, Colin C.; and Wells, Robert J., to Sherwin Williams Company, The. Process for the resolution of racemates using lactone esters. 4,855,446, Cl. 548-444.000.

Duke, Roger S. Fish retrieving tool. 4,854,626, Cl. 294-19.100.

Dumbaugh, William H., Jr.; and Hagy, Henry E., to Corning Incorporated. Glasses exhibiting low thermal coefficients of elasticity. 4,855,260, Cl. 501-66.000.
Duncan, William P.: *See—*
Baranczuk, Richard J.; Spicer, Jay; Duncan, William P.; and Rotert, Gary A., 4,855,125, Cl. 424-1.100
Duni Bila AB: *See—*
Singheimer, Stig A. R., 4,854,989, Cl. 156-161.000.
Dunn, David J.; Vano, Patrick P.; Moran, James P., Jr.; Holmes, Mark; and Frauenglass, Elliott, to Loctite Corporation. Process of bonding surfaces employing/anaerobic aluminum filled compositions. 4,855,002, Cl. 156-307.300.
Dunphy, Gerald F.; and Best, Lance E., to Ogden Industries Pty., Ltd. Door set mounting. 4,854,620, Cl. 292-337.000.
Duphar International Research B.V.: *See—*
Wellinga, Kobus; and Eussen, Jacobus H. H., 4,854,961, Cl. 71-88.000.
Du Pont de Nemours, E. I., and Company: *See—*
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Fahmy, Mohamed H.; and Sanborn, James R., 4,855,474, Cl. 558-95.000.
Hendrick, Kendall B.; and Reader, John R., Jr., 4,855,667, Cl. 324-61.00R
Langley, John D., 4,855,178, Cl. 428-287.000
Ryntz, Rose A.; Surcina, Karen A.; and Kurple, Kenneth R., 4,855,359, Cl. 525-130.000.
Samardzija, Nikola, 4,855,695, Cl. 333-17.300.
Vassiliou, Eustathios, 4,854,229, Cl. 101-123.000.
Williams, James E., 4,854,552, Cl. 266-170.000.
Duran, John A., to Avibank Mfg., Inc. Spring form captive panel fastener assembly. 4,854,795, Cl. 411-352.000.
Durham, Daniel K.; Conkle, Urban C.; and Downs, Hartley H., to Baker Hughes Incorporated. Method and additive for clarifying aqueous systems without production of uncontrollable floc. 4,855,060, Cl. 210-708.000.
Durm, Juergen; and Brin, Constantin, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Drive mechanism for an air guide arrangement. 4,854,635, Cl. 296-180.500.
Dussinger, Peter: *See—*
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Duthaler, Rudolf; Finter, Jurgen; Fischer, Walter; and Ramanathan, Visvanathan, to Ciba-Geigy Corporation. Anthraquinoylcarboxylic acid hydrazides, curable compositions and use thereof. 4,855,084, Cl. 260-377.000.
Duvvury, Charvaka; and Rountree, Robert N., to Texas Instruments Incorporated. Output buffer with improved ESD protection. 4,855,620, Cl. 307-448.000.
DVSG Patentverwaltungs GmbH: *See—*
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Dyckerhoff & Widmann Aktiengesellschaft: *See—*
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Dynabrade, Inc.: *See—*
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Dynamet, Inc.: *See—*
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Dynasonic: *See—*
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Dziki, Michael M.; and Bryan, Thomas T., to Minnesota Mining and Manufacturing Company. Extra-oral dental restoration. 4,854,875, Cl. 433-213.000.
E.C.C. America Inc.: *See—*
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E.C.C. International Limited: *See—*
Gane, Patrick A. C.; and O'Neill, Graham P., 4,854,971, Cl. 106-286.500.
E.C.H. Will GmbH: *See—*
Schlottke, Karl-Heinz; and Peter, Jurgen, 4,854,932, Cl. 493-357.000.
E.M.M. S.R.L.: *See—*
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E. R. Squibb & Sons, Inc.: *See—*
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Steer, Peter L.; and Steer, Graham E., 4,854,737, Cl. 383-127.000.
Zahler, Robert; and Jacobs, Glenn A., 4,855,466, Cl. 549-546.000.
Earth Chemical Company, Limited: *See—*
Kamei, Masaharu; Negishi, Tsutomu; Nishikawa, Masaru; and Kishino, Kimishiro, 4,855,133, Cl. 424-84.000.
Eastman Christensen Company: *See—*
Kruger, Volker; and Daenicke, Heinrich, 4,854,401, Cl. 175-107.000.
Ostertag, Alfred; and Schillinger, Hans, 4,854,403, Cl. 175-325.000.
Eastman Kodak Company: *See—*
Alligood, John H.; and Lawther, Joel S., 4,855,771, Cl. 354-149.110.
Bagchi, Pranab; Sterman, Melvin D.; and Low, Howard M., 4,855,219, Cl. 430-496.000.
Barbee, Robert B.; and Minnick, Larry A., 4,855,397, Cl. 528-335.000.
Bunkenburg, Joachim; and Hammond, Peter M., 4,854,337, Cl. 134-184.000.
Byers, Gary W., 4,855,281, Cl. 503-227.000.
Chen, Tsang J., 4,855,392, Cl. 528-203.000.
Estes, Marvin F.; and Lungershausen, Arnold W., 4,854,662, Cl. 350-96.200
Factor, Ronda E.; and Diehl, Donald R., 4,855,221, Cl. 430-510.000.
Geyer, Daniel J.; and Calaway, Ward M., 4,856,029, Cl. 375-110.000.
Hancock, David; Hoyt, Robert; and Formica, Joseph, 4,855,579, Cl. 235-436.000.
Harvey, Donald M., 4,855,773, Cl. 354-173.100.
Jagannathan, Ramesh; and Bye, Matthew R., 4,855,028, Cl. 204-180.200.
Lewis, Scott, 4,855,943, Cl. 364-575.000.
Logan, Margaret E., 4,855,213, Cl. 430-281.000.
Morris, Don L.; Palmer, Billy W.; and McAninch, Thomas W., 4,855,515, Cl. 568-862.000.
Nealy, David L.; Wilkin, Louis A.; and Barlow, Fred D., Jr., 4,855,344, Cl. 524-86.000
Orlicki, David M.; and Fearnside, William T., 4,855,982, Cl. 369-44.000
Rule, Mark; Fagerburg, David R.; Watkins, Joseph J.; and Fauver, Jerry S., 4,855,393, Cl. 528-212.000.
Rule, Mark; and Moncier, Regina M., 4,855,514, Cl. 568-779.000.
Saha, Bijay S.; and Zeman, Robert E., 4,855,205, Cl. 430-106.600.
Saha, Bijay S., 4,855,206, Cl. 430-106.600.
Smith, Craig M., 4,856,075, Cl. 382-50.000.
Stavinoha, Jerome L.; and McCollum, Anthony W., 4,855,395, Cl. 528-272.000.
Szajewski, Richard P., 4,855,220, Cl. 430-505.000.
Trovato, Joseph R., 4,854,532, Cl. 248-178.000.
Wever, Albrecht, 4,854,203, Cl. 83-321.000.
Wilson, John C.; and Jadwin, Thomas A., 4,855,396, Cl. 528-272.000.
Easton, Thomas; and Thomas, Bryan, to Dow Corning, Ltd. Removal of water haze from distillate fuel. 4,854,938, Cl. 44-56.000.
Eaton Corporation: *See—*
Mahon, Joseph J.; and Aigner, Robert K., 4,856,096, Cl. 200-38.00C.
Eaton, Daniel T.; and Benningfield, George W., to Figgie International Inc. Wide range accumulator conveyor. 4,854,445, Cl. 198-781.000.
Eaton, Ronald E. Method of playing a board game. 4,854,594, Cl. 273-249.000.
Ebata, Genji; Tanabe, Koji; and Saito, Takahiro, to Japan Aviation Electronics Industry Limited. Optical fiber alignment and fixing method and apparatus therefor. 4,854,667, Cl. 350-96.200.
Ebel, Klaus: *See—*
Peter, Roland; Ebel, Klaus; and Allspach, Thomas, 4,855,427, Cl. 544-198.000.
Eberle, Karl: *See—*
Gukkenberger, Horst; and Eberle, Karl, 4,854,035, Cl. 29-603.000.
Ebert, Charles D.: *See—*
Patel, Dinesh C.; and Ebert, Charles D., 4,855,294, Cl. 514-212.000.
Ebihara, Hideyuki: *See—*
Uchida, Shinya; Hirata, Akira; Ebihara, Hideyuki; Yoshikawa, Eiichi; Sano, Eisaku; and Uehara, Kazuhiro, 4,854,452, Cl. 209-534.000.
Eckenhoff, James B.; Magruder, Judy A.; Cortese, Richard; Peery, John R.; and Wright, Jeremy C., to ALZA Corporation. Device comprising means for protecting and dispensing fluid sensitive medicament. 4,855,141, Cl. 424-423.000.
Eckl, John K., to Pitney Bowes, Inc. Apparatus for aligning a moving substrate and a read or write head. 4,855,607, Cl. 250-557.000.
Ed. Scharwachter GmbH & Co. KG.: *See—*
Brockhaus, Ernst, 4,854,009, Cl. 16-263.000.
EDAP International: *See—*
Dory, Jacques, 4,856,107, Cl. 367-150.000.
Eddy, Victoria J.: *See—*
Bolon, Donald A.; Eddy, Victoria J.; and Hallgren, John E., 4,855,199, Cl. 430-18.000.
Edgar, Reuben W., Jr., to Nippon Colin Co., Ltd. Backscatter oximeter. 4,854,699, Cl. 356-41.000.
Edmondson, Peter C. Door latch assembly with see-through capabilities. 4,854,616, Cl. 272-173.000.
EG&G Pressure Science, Inc.: *See—*
Halling, Horace P.; Barrett, Robert A.; and Woozley, Mark E., 4,854,600, Cl. 277-236.000.
Egawa, Takeshi: *See—*
Ishikawa, Norio; Nakai, Masaaki; Hirano, Masayasu; Fujino, Akihiko; Ootsuka, Hiroshi; Egawa, Takeshi; and Kawamura, Kunio, 4,855,779, Cl. 354-412.000.
Eggers, Mark L., to KW Battery Company. Multilaminate material and separator assembly for electrochemical cells. 4,855,196, Cl. 429-139.000.
Eguchi, Hitoshi; Kuribara, Motoaki; Onodera, Tugio; Kobayashi, Koji; Fujino, Ikuo; Hagiwara, Hiroshi; and Ogino, Seiichi, to Mitsuba

Electric Mfg. Co., Ltd. Starter for internal combustion engine. 4,855,609, Cl. 290-48.000.
Eheim, Franz, deceased (by Eheim, Helga, heir); and Hofer, Gerald, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,854,289, Cl. 123-503.000.
Eheim, Helga, heir: *See—*
Eheim, Franz, deceased; and Hofer, Gerald, 4,854,289, Cl. 123-503.000.
Eichweber, Kurt, to Precitronic Gesellschaft fur Feinmechanic und Electronic mbH. Firearm aiming simulator device. 4,854,595, Cl. 273-312.000.
Eijkelenboom, Leonard C. H.; Maassen, Egbertus J. P.; and Van Meel, Franciscus A. M. M., to U.S. Philips Corporation. Luminaire having a faceted reflecting surface. 4,855,886, Cl. 362-350.000.
Eilender, Albert L.: *See—*
Gaglani, Kamlesh; and Eilender, Albert L., 4,855,312, Cl. 514-374.000.
Eirich, Hubert: *See—*
Eirich, Paul; Eirich, Hubert; and Eirich, Walter, 4,854,715, Cl. 366-139.000.
Eirich, Paul; Eirich, Hubert; and Eirich, Walter. Pressure-resistant mixer. 4,854,715, Cl. 366-139.000.
Eirich, Walter: *See—*
Eirich, Paul; Eirich, Hubert; and Eirich, Walter, 4,854,715, Cl. 366-139.000.
Eisenzimmer, George W., to Goodyear Tire & Rubber Company, The. Hose crimper and method of using same. 4,854,031, Cl. 29-508.000.
Eiserlo, Friedrich; and Emmrich, Kurt, to Walther & Cie. Aktiengesellschaft. Supply circuit for electrostatic dust separator. 4,854,948, Cl. 55-105.000.
Eiss, Martin, to Ajco Jewelry Co. Inc. Watch case for tennis bracelet. 4,855,972, Cl. 368-282.000.
Ekbom, Ragnar, to Asea Stal AB. Method for manufacturing metallic products from powder by hot isostatic pressing using ceramic cores. 4,855,103, Cl. 419-26.000.
Ekstein, Penny S., to P.S.E. Marketing, Inc. Pillow book. 4,853,994, Cl. 5-437.000.
Elcock, Kenneth W. A.: *See—*
McKie, Peter; and Elcock, Kenneth W. A., 4,855,171, Cl. 428-40.000.
Elcon Products International Company: *See—*
Matthews, Russell H., 4,854,899, Cl. 439-724.000.
Elcor Corporation: *See—*
Campbell, Roy E.; Wilkinson, John D.; and Hudson, Hank M., 4,854,955, Cl. 62-24.000.
Elder, William H.; Hansen, Ries B.; and Olivier, Andre W., to Mechanical Backrest, Inc. Mechanical backlift. 4,853,990, Cl. 5-71.000.
Eldin, Sameer H.: *See—*
Flury, Peter; Eldin, Sameer H.; Roth, Martin; and Rabener, Claus W., 4,855,367, Cl. 525-507.000.
Eldred, Colin D.: *See—*
Oxford, Alexander W.; Coates, Ian H.; Bays, David E.; Webb, Colin F.; Dowle, Michael D.; Mills, Keith; and Eldred, Colin D., 4,855,314, Cl. 514-415.000.
Electric Power Research Institute, Inc.: *See—*
Janiak, Jerzy S.; Turak, Ali A.; Pawlak, Wanda; and Ignasiak, Boleslaw L., 4,854,940, Cl. 44-620.000.
Kondo, Kideya; Kunimoto, Youichi; and Yano, Manabu, 4,855,701, Cl. 335-230.000.
Electromagnetic Research and Development: *See—*
Marquiss, Stanley L., 4,856,071, Cl. 381-203.000.
Elexis Corporation: *See—*
Bianco, Frank J., 4,855,942, Cl. 364-561.000.
Elf Isolation: *See—*
Couderc, Pierre; and Corbel, Henri, 4,854,845, Cl. 425-363.000.
Elfenbein, Bettye. Applying liquid adhesive to upper eyelid to counteract drooping. 4,854,307, Cl. 128-76.500.
Eli Lilly and Company: *See—*
Cook, Gwendolyn K.; and McDonald, John H., III, 4,855,418, Cl. 540-205.000.
Elliott, Richard E.: *See—*
Hoeffel, James D.; Elliott, Richard E.; Hoppe, Wally C.; and Nevitt, James S., 4,854,156, Cl. 73-37.500.
Ellis, Steven B.: *See—*
Stroman, David W.; Brust, Paul F.; Ellis, Steven B.; Gingeras, Thomas R.; Harpold, Michael M.; and Tschopp, Juerg F., 4,855,231, Cl. 435-68.000.
Elsbett, Gunter: *See—*
Elsbett, Ludwig; Elsbett, Gunter; and Elsbett, Klaus, 4,854,276, Cl. 123-196.0AB.
Elsbett, Ludwig; Elsbett, Gunter; and Elsbett, Klaus, 4,854,291, Cl. 123-569.000.
Elsbett, Klaus: *See—*
Elsbett, Ludwig; Elsbett, Gunter; and Elsbett, Klaus, 4,854,276, Cl. 123-196.0AB.
Elsbett, Ludwig; Elsbett, Gunter; and Elsbett, Klaus, 4,854,291, Cl. 123-569.000.
Elsbett, Ludwig; Elsbett, Gunter; and Elsbett, Klaus. Internal combustion engine with combined cooling and lubricating system. 4,854,276, Cl. 123-196.0AB.
Elsbett, Ludwig; Elsbett, Gunter; and Elsbett, Klaus. Cylinder head for use in diesel engines. 4,854,291, Cl. 123-569.000.
Elscint Ltd.: *See—*
Granot, Joseph, 4,855,679, Cl. 324-309.000.
Elsdoerfer, Norbert W., to International Machine & Tool Corporation. Relative position indication system. 4,855,734, Cl. 340-870.310.
Elsey, Denise M., to Akron City Hospital. Flexible wrist splint. 4,854,309, Cl. 128-87.00R.
Eltreva AG: *See—*
Emmer, Hans, 4,854,098, Cl. 52-398.000.
Emerson, Kenneth D. Ski binding for mountain skiing. 4,854,605, Cl. 280-615.000.
Emery, David C.; Field, David G.; and Leck, Derek C., to Harris Graphics Corporation. Ink fountain closure system. 4,854,234, Cl. 101-364.000.
Emhart Industries, Inc.: *See—*
Clarkson, Bruce A.; and MacIntyre, Steven A., 4,855,714, Cl. 340-521.000.
Speer, Gregg V.; and Ray, Donald L., 4,855,543, Cl. 200-61.270.
Emmer, Hans, to Eltreva AG. Facade structure. 4,854,098, Cl. 52-398.000.
Emmrich, Kurt: *See—*
Eiserlo, Friedrich; and Emmrich, Kurt, 4,854,948, Cl. 55-105.000.
Emoedi, Gabriel, to Intex Pharmazeutische Produkte AG. Calcium and magnesium complexes of phytohemagglutinin-polyheteroglycans, their preparation and pharmaceutical formulations. 4,855,284, Cl. 514-8.000.
Enari, Nobuyuki: *See—*
Furuhashi, Kenshi; Ito, Hiroyasu; and Enari, Nobuyuki, 4,855,542, Cl. 200-61.270.
Enck, Richard S.; and Meadows, F. Dan, to Picker International, Inc. Panel type radiation image intensifier. 4,855,589, Cl. 250-213.0VT.
Endo, Fumio: *See—*
Kimura, Toshiyuki; Aoyagi, Yoshio; and Endo, Fumio, 4,855,979, Cl. 369-33.000.
Endo Manufacturing Co., Ltd.: *See—*
Kobayashi, Kenji, 4,854,580, Cl. 273-77.00A.
Endo, Stunehiro: *See—*
Yamashita, Koujirou; Endo, Stunehiro; Miyashita, Kunio; Kashiwazaki, Susumu; and Iizuka, Kenichi, 4,855,652, Cl. 318-268.000.
Endot Industries, Inc.: *See—*
Gagnon, Bernard, 4,854,665, Cl. 350-96.230.
ENFO Grundlagenforschungs AG: *See—*
Bauer, Friedrich, 4,854,341, Cl. 137-514.000.
Engelstoft, Mogens: *See—*
Biere, Helmut; Engelstoft, Mogens; Huth, Andreas; Rahtz, Dieter; Schmiechen, Ralph; Seidelmann, Dieter; and Stephens, David N., 4,855,295, Cl. 514-232.800.
Enger, Helmut: *See—*
Breiter, Horst; Enger, Helmut; and Teuwen, Uwe, 4,854,994, Cl. 156-228.000.
Engineered Security Products Corporation: *See—*
Lakso, Matthew L., 4,854,653, Cl. 312-222.000.
England, William G.: *See—*
Osborne, Michael W.; Afforder, Cynthia A.; and England, William G., 4,855,276, Cl. 502-415.000.
Environmental Test Systems, Inc.: *See—*
Rupe, Chauncey O., 4,855,239, Cl. 436-106.000.
Equip-Mark, Inc.: *See—*
Hume, Ronald W., 4,854,721, Cl. 366-340.000.
Era, Hidenori; Shimizu, Mineo; and Chen, Huang-Chuan, to China Steel Corporation. Method of producing a multi-phase structured cold rolled high-tensile steel sheet. 4,854,976, Cl. 148-2.000.
Erca Holding: *See—*
Hautemont, Jean-Claude, 4,854,850, Cl. 425-503.000.
Ergene, Serdar: *See—*
Lien, Sheue-Ling; Shantz, Michael J.; Evans, Jerald R.; Ergene, Serdar; and Carrie, Susan E., 4,855,935, Cl. 364-521.000.
Erickson, David E.; and Sharma, Satish C., to GenCorp Inc. Method for treating grafted protein latices. 4,855,338, Cl. 523-335.000.
Erickson, Donald C. Rectifier liquid generated intermediate reflux for subambient cascades. 4,854,954, Cl. 62-22.000.
Ericsson, Magnus, to AB Biodisk. Method and a device for applying objects onto a surface. 4,854,627, Cl. 294-64.100.
Ernst, Hans-Hellmut, to Britax-Kole GmbH & Co. Deflection clamping device. 4,854,644, Cl. 297-476.000.
Erwin, Lewis: *See—*
Leonard, Elizabeth C.; and Erwin, Lewis, 4,855,018, Cl. 156-646.000.
Eshita, Takashi; Mieno, Fumitake; Furumura, Yuji; and Itoh, Kikuo, to Fujitsu Limited. Method of growing a single crystalline β-SiC layer on a silicon substrate. 4,855,254, Cl. 437-100.000.
Esposito, Joseph R. Three legged workbench. 4,854,531, Cl. 248-165.000.
Esquivel, Agerico L.; Groover, Robert, III; and Tigelaar, Howard L., to Texas Instruments Incorporated. EPROM with increased floating gate/control gate coupling. 4,855,800, Cl. 357-23.500.
Esselte Pendaflex Corporation: *See—*
McKie, Peter; and Elcock, Kenneth W. A., 4,855,171, Cl. 428-40.000.
Essenfeld, Amy P., to American Cyanamid Company. Process for the preparation of naphthacenes. 4,855,520, Cl. 585-409.000.
Essilor International Compagnie Generale d'Optique: *See—*
Dufour, Maurice; and Obrecht, Gerard, 4,854,689, Cl. 351-169.000.
Estes, Marvin F.; and Lungershausen, Arnold W., to Eastman Kodak Company. Optical data signal apparatus for optically coupling a plurality of data channels between stationary and rotating systems. 4,854,662, Cl. 350-96.200.
Estrada, John J.: *See—*
Kuhn, Raymond E.; Estrada, John J.; and Grogl, Max, 4,855,408, Cl. 530-350.000.

Estrada, Suzanne L.; and Ploger, Robert R., III, to International Business Machines Corporation. Multiprotocol I/O communications controller unit including emulated I/O controllers and tables translation of common commands and device addresses. 4,855,905, Cl. 364-200.000.

Etablissements Pierre Angenieux: *See—*
Corbasson, Gerard, 4,854,685, Cl. 350-427.000.

ETAT Francais: *See—*
Seigneur, Jean-Michel; and Menu, Jean-Pierre, 4,855,650, Cl. 315-383.000.

Etemad, Shahrokh; Yannascoli, Donald; and Hatzikazakis, Michael, to Carrier Corporation. Scroll compressor with plural discharge flow paths. 4,854,831, Cl. 417-366.000

Ethyl Corporation: *See—*
Indyke, David M., 4,855,332, Cl. 521-185.000
Lanier, Caroll W.; Broemmelsiek, H. Eugene; and Lee, Raymond, 4,855,331, Cl. 521-184.000.
Marlett, Everett M., 4,855,120, Cl. 423-347.000.

Ethyl Petroleum Additives, Inc.: *See—*
Papay, Andrew G.; and O'Brien, Joseph P., 4,855,074, Cl. 252-51.50A.

Eubanks, Furney; and Eubanks, Randy. Multi-purpose tool holder for extension handle. 4,854,625, Cl. 294-19.100.

Eubanks, Randy: *See—*
Eubanks, Furney; and Eubanks, Randy, 4,854,625, Cl. 294-19.100

Eussen, Jacobus H. H.: *See—*
Wellinga, Kobus; and Eussen, Jacobus H. H., 4,854,961, Cl. 71-88.000.

Evans, Anthony C.; and Last, Larry L., to Kelsey Hayes Company. Hydraulic disc brake drum-in-hat parking brake assembly. 4,854,423, Cl. 188-70.00R.

Evans, Jerald R.: *See—*
Lien, Sheue-Ling; Shantz, Michael J.; Evans, Jerald R.; Ergene, Serdar; and Carrie, Susan E., 4,855,935, Cl. 364-521.000.

Evans, Russell M., III; Machek, James E.; and Cowan, Kevin P., to Medrad, Inc. Formed core catheter guide wire assembly. 4,854,330, Cl. 128-772.000.

Evans & Sutherland Computer Corporation: *See—*
Robinson, John, 4,855,934, Cl. 364-521.000.

Evans, Wayne E.: *See—*
Stem, Stephen C.; and Evans, Wayne E., 4,855,529, Cl. 585-737.000.

Eventide Inc.: *See—*
Paul, Jon D., 4,855,891, Cl. 363-56.000.

Eveready Battery Company, Inc.: *See—*
Georgopoulos, Philip; and Langkau, John, 4,855,195, Cl. 429-54.000.

Evseanko, Nicholas, Jr., to NYTD Industries Inc. Cutting tool assembly. 4,854,789, Cl. 408-125.000.

Expertek, Inc.: *See—*
Gates, Donald C., 4,854,158, Cl. 73-45.500.

Exxon Chemical Patents Inc.: *See—*
Vanhaeren, Gerard M., 4,855,382, Cl. 528-45.000.
Yezrielev, Albert I.; Romanelli, Michael G.; and Wellman, William E., 4,855,369, Cl. 526-320.000
Young, David A.; Jones, Larry O.; and Campione, Troy J., 4,855,525, Cl. 585-523.000.
Young, David A.; Vaughan, David E.; Pruett, Roy L.; and Tunison, Mafer E., 4,855,528, Cl. 585-531.000.

Exxon Production Research Company: *See—*
Winbow, Graham A.; Chen, Sen-Tsuen; and Rice, James A., 4,855,963, Cl. 367-31.000.

Exxon Research & Engineering Company: *See—*
Ramzi, Saleh Y.; and Wachs, Israel E., 4,855,457, Cl. 549-239.000.

Ezure, Yoji: *See—*
Sugiyama, Makoto; Ezure, Yoji; Yoshikuni, Yoshiaki; and Fujita, Yukio, 4,855,415, Cl. 536-17.400.

F. J. Westcott Company, The: *See—*
Waltz, Thomas A., 4,855,874, Cl. 362-16.000.

Faber, Andrea J.: *See—*
Faber, Kurt H. A. E.; Faber, Ute M. I.; Faber, Knut; Faber, Inken A. H.; and Faber, Andrea J., 4,854,764, Cl. 403-13.000.

Faber, Inken A. H.: *See—*
Faber, Kurt H. A. E.; Faber, Ute M. I.; Faber, Knut; Faber, Inken A. H.; and Faber, Andrea J., 4,854,764, Cl. 403-13.000.

Faber, Knut: *See—*
Faber, Kurt H. A. E.; Faber, Ute M. I.; Faber, Knut; Faber, Inken A. H.; and Faber, Andrea J., 4,854,764, Cl. 403-13.000.

Faber, Kurt H. A. E.; Faber, Ute M. I.; Faber, Knut; Faber, Inken A. H.; and Faber, Andrea J., to AB Sandvik Coromant. Coupling device between two elements. 4,854,764, Cl. 403-13.000.

Faber, Ute M. I.: *See—*
Faber, Kurt H. A. E.; Faber, Ute M. I.; Faber, Knut; Faber, Inken A. H.; and Faber, Andrea J., 4,854,764, Cl. 403-13.000.

Fabian, Peter; Krebs, Helmut; and Simon, Heinrich, to Heraeus Elektroden GmbH. Electrode structure. 4,855,032, Cl. 204-286.000.

Fabricius, John H.: *See—*
Simson, Morris; Fabricius, John H.; Browne, Ronnie; Waugh, Arthur; Sarkozy, Robert F.; and Lai, Chiu K. S., 4,854,266, Cl. 118-728.000.

Factor, Ronda E.; and Diehl, Donald R., to Eastman Kodak Company. Photographic elements having oxonol dyes. 4,855,221, Cl. 430-510 000.

Fagerburg, David R.: *See—*
Rule, Mark; Fagerburg, David R.; Watkins, Joseph J.; and Fauver, Jerry S., 4,855,393, Cl. 528-212.000.

Fahmy, Mohamed H.; and Sanborn, James R., to Du Pont de Nemours, E. I., and Company. Process for production of phosphorothioic dichlorides. 4,855,474, Cl. 558-95.000

Fairhurst, Robert M.: *See—*
Heron, Roger A.; Saunders, David H.; and Fairhurst, Robert M., 4,854,090, Cl. 51-410.000.

Faivre, Claude, to Societe a Responsabilite Limitee: Establissements Faivre. Machine for grading and sorting fish, in particular fish from the salmonidae family. 4,854,455, Cl. 209-678.000.

Falline, Brian J.; and Weihrauch, Bruce W., to Moline Paint Manufacturing Co. Lacquer coatings and coating process for polyurethane-molded articles. 4,855,347, Cl. 524-267.000.

Faltin, Hans G., to AM International Incorporated. Rotary knife paper trimmer with long life shearing surfaces for trimming thick and shingled paper products. 4,854,204, Cl. 83-500.000.

Fankhauser, Peter; Simnreich, Joel; and Dobmeier, Rolf, to Ciba-Geigy Corporation. Pharmaceutical plaster. 4,855,142, Cl. 424-434.000.

Fanning, Bryce L.; and McMahon, Garfield W., to Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Vented-pipe projector. 4,855,964, Cl. 367-159.000.

Fant, Karl M.: *See—*
Narendra, Patrenahalli M.; Fant, Karl M.; and Graf, Carl P., 4,855,822, Cl. 358-103.000.

Fanuc Ltd.: *See—*
Isobe, Shinichi; and Kagawa, Yoshimasa, 4,855,657, Cl. 313-602.000
Seki, Masaki; and Amano, Norihisa, 4,855,921, Cl. 364-474.290.

Fanuc Ltd: *See—*
Kawamura, Hideaki; Matsumura, Teruyuki; and Mineshige, Takahiko, 4,855,898, Cl. 364-191.000.
Seki, Masaki; and Amano, Norihisa, 4,855,926, Cl. 364-474.290.
Seki, Masaki; and Amano, Norihisa, 4,855,927, Cl. 364-474.290.

Farber, Glenn L.; and Navarro, Maria C., to Sherwood Medical Company. Automated microbiological testing apparatus and method. 4,856,073, Cl. 382-6.000

Farina, Daniele; Colombo, Guglielmo; and Bonfanti, Lorenzo, to Delchi/Carrier S.p.A. Overhanging blow-convector for indoor space air-conditioning. 4,854,375, Cl. 165-53.000.

Farnhill, William M.: *See—*
Barratt, Peter J.; Clough, Douglas O.; Dickinson, Peter J.; and Farnhill, William M., 4,854,117, Cl. 57-301.000.

Farnsworth, Fred L. Fencing wire unwinder and tensioner. 4,854,521, Cl. 242-86.50R.

Farrant, John L.: *See—*
Bez, Eckhard; and Farrant, John L., 4,854,825, Cl. 417-265.000.

Farrier, Ernest G.: *See—*
Banerjee, Chandra K.; Farrier, Ernest G.; Harris, James L.; Norman, Alan B.; Resce, James L.; Reynolds, John H., IV; Ridings, Henry T.; Sensabaugh, Andrew J., Jr.; Shannon, Michael D.; and Shelar, Gary R., 4,854,331, Cl. 131-194.000.

Fauver, Jerry S.: *See—*
Rule, Mark; Fagerburg, David R.; Watkins, Joseph J.; and Fauver, Jerry S., 4,855,393, Cl. 528-212.000.

Fearnside, William T.: *See—*
Orlicki, David M.; and Fearnside, William T., 4,855,982, Cl. 369-44.000.

Fecteau, Gilles: *See—*
Narancic, Vojislav; and Fecteau, Gilles, 4,855,705, Cl. 337-246.000.

Federal-Mogul Corporation: *See—*
Sakarcan, Metin, 4,854,295, Cl. 125-15.000.

Feil, Eugen; Neumann, Gerd; Graser, Wolfgang; and Friedrich, Horst. Sub-roof for a roof covered with roofing boards. 4,854,102, Cl. 52-535.000

Feller, Dennis R.: *See—*
Miller, Duane D.; Feller, Dennis R.; Clark, Michael T.; Adejare, Adeboye; Romstedt, Karl J.; and Shams, Gamal, 4,855,476, Cl. 558-410.000.

Ferlan, Stephen J.: *See—*
Shallenberger, John M.; and Ferlan, Stephen J., 4,855,100, Cl. 376-327.000.

Fernandes, Roosevelt A. Electrical power line and substation monitoring apparatus. 4,855,671, Cl. 324-127.000.

Fernandez, Emilio A. Microprocessor based simulated book. 4,855,725, Cl. 340-706.000.

Fernandez, Salvador M.: *See—*
Chao, Yong-Sheng; Fernandez, Salvador M.; and Guignon, Ernest F., 4,855,930, Cl. 364-497.000.

Ferree, Herbert E.; and Beal, William S., to Westinghouse Electric Corp. Bladder device and method for displacing air in a bottle bore shaft. 4,854,945, Cl. 55-55.000.

Ferrero oHG m.b.H.: *See—*
Cavallin, Riccardo, 4,855,155, Cl. 426-564.000.

Ferrero, Pietro, to Ferrero S.p.A. Device for the manufacture of food products, particularly confectionery wafer products. 4,854,228, Cl. 99-450.600.

Ferrero S.p.A.: *See—*
Ferrero, Pietro, 4,854,228, Cl. 99-450.600.

Ferro, Francesco: *See—*
Boller, Giorgio; Ferro, Francesco; and Colli, Luigi, 4,854,509, Cl. 242-18.00R.
Romanin, Bruno; Ferro, Francesco; and Colli, Luigi, 4,854,510, Cl. 242-18.0DD.
Romanin, Bruno; Ferro, Francesco; and Colli, Luigi, 4,854,514, Cl. 242-18.00R.

Ferro, John T., Jr.; Jacobs, Patrick C.; Laye, Robert M.; and Starr, Brian D., to International Business Machines Corporation. Method for moving VSAM base clusters while maintaining alternate indices into the cluster. 4,855,907, Cl. 364-300.000.

Feuchter, Wolfgang: *See—*
Stahlecker, Fritz; Stahlecker, Hans; and Feuchter, Wolfgang, 4,854,119, Cl. 57-417.000.

Fialon, Bernard, to U.S. Philips Corp. Suspension arm for the tub of a laundry washing machine. 4,854,559, Cl. 267-74.000.

Fichtel & Sachs AG: *See—*
Weissenberger, Helmuth; and Huditz, Peter, 4,854,438, Cl. 192-107.00R.

Field, David G.: *See—*
Emery, David C.; Field, David G.; and Leck, Derek C., 4,854,234, Cl. 101-364.000.

Fielding, Mimi S., to Curtice-Burns, Inc. Potato product with asymmetric corrugations. 4,855,151, Cl. 426-144.000.

Figgie International Inc.: *See—*
Clevenhagen, Robert L., 4,853,975, Cl. 2-19.000.
Eaton, Daniel T.; and Benningfield, George W., 4,854,445, Cl. 198-781.000.
Fraser, Steven A.; Johnston, David E.; and Metzger, Reece D., 4,855,583, Cl. 235-492.000.

Figueroa, Luis; Morrison, Charles B.; Zinkiewicz, Lawrence M.; and Niesen, Joseph W., to TRW Inc. Angled stripe superluminescent diode. 4,856,014, Cl. 372-46.000.

Filtrete B.V.: *See—*
Van Weerden, Jan; Valkenburg, Johannes; and van der Spek, Ferdinand, 4,854,953, Cl. 55-483.000.

Finan, Christopher D.: *See—*
Daberkow, Kevin L.; Finan, Christopher D.; Petolino, Joseph A.; Sobottka, Daniel C.; and Thomas, Jeffrey A., 4,855,904, Cl. 364-200.000.

Finch, Harry: *See—*
Collington, Eric W.; Finch, Harry; and Judd, Duncan B., 4,855,293, Cl. 514-212.000.

Findley Adhesives Inc.: *See—*
Neperud, Michael A., 4,855,335, Cl. 523-111.000.

Fine Particle Technology, Inc.: *See—*
Wiech, Raymond E., Jr., 4,854,970, Cl. 106-286.100.

Fink, Martin, to IFE Industrie-Einrichtungen Fertigungs-Aktiengesellschaft. Pneumatic or hydraulic drive for opening and closing of doors. 4,854,223, Cl. 92-17.000.

Finter, Jurgen: *See—*
Duthaler, Rudolf; Finter, Jurgen; Fischer, Walter; and Ramanathan, Visvanathan, 4,855,084, Cl. 260-377.000.

Firestone Tire & Rubber Company, The: *See—*
Hunter, Stephen B., 4,854,840, Cl. 425-32.000.

Firetek Corporation: *See—*
Cholin, John M.; and Cholin, Jeffrey G., 4,855,718, Cl. 340-578.000.

First Brands Corporation: *See—*
Kamp, Ewald A., 4,854,017, Cl. 24-587.000.

Firth, Robert L., to HR Textron, Inc. High pressure spin-on filter. 4,855,047, Cl. 210-232.000.

Fischer, Helga: *See—*
Nandi, Kumaresh; Fischer, Helga; Herrmann, Wilfried; Kohne, Hans; Lahr, Wolfgang; Schmersahl, Hein U.; and Walch, Hatto, 4,855,300, Cl. 514-264.000.

Fischer, Ulf; Schneider, Fernand; and Widmer Ulrich, to Hoffman-La Roche Inc. Tricyclic pyridone derivatives. 4,855,297, Cl. 514-248.000.

Fischer, Walter: *See—*
Duthaler, Rudolf; Finter, Jurgen; Fischer, Walter; and Ramanathan, Visvanathan, 4,855,084, Cl. 260-377.000.

Fisher, Abraham; Karton, Ishai; Heldman, Eliahu; Levy, Aharon; and Grunfeld, Yona, to State of Israel, represented by Prime Minister's Office, Israel Institute for Biological Research. Derivatives of quinuclidine. 4,855,290, Cl. 514-278.000.

Fisher, Brian A., to Tridon Limited. Blister package. 4,854,450, Cl. 206-469.000.

Fitzgerald, William J., Jr.; and Glemser, Raymond G., II, to International Business Machines Corp. 3D Dimensioning in computer aided drafting. 4,855,939, Cl. 364-522.000.

Fitzhugh, Michael A. Container in which to carry a reusable lens cleaning material. 4,854,449, Cl. 206-37.000.

Fjare, Douglas E.; and Hagen, Gary P., to Amoco Corporation. Preparation of P,P'-oxybis(aniline). 4,855,503, Cl. 564-394.000.

Flaherty, Edward H., to Texas Instruments Incorporated. Output buffer having programmable drive current. 4,855,623, Cl. 307-475.000.

Flanagan, Robert M.; and Heenan, Sidney A., to Amerace Corporation. Depressible roadway marker. 4,854,768, Cl. 404-11.000.

Fletcher, Keith, to United Technologies Corporation. Beam steering mirror construction. 4,854,687, Cl. 350-486.000.

Flexair, Inc.: *See—*
Bonerb, Timothy C., 4,854,801, Cl. 414-291.000.

Fliri, Hans; and Mak, Ching Pong, to Sanraku Incorporation. 2-Oxoazetidines, methods for their preparation, and their use. 4,855,421, Cl. 540-357.000.

Flow Industries, Inc.: *See—*
Hashish, Mohamed; and Marvin, Mark, 4,854,091, Cl. 51-439.000.

Flow Technology, Inc.: *See—*
Halpin, Michael W., 4,854,154, Cl. 73-3.000.

Flury, Peter; Eldin, Sameer H.; Roth, Martin; and Rabener, Claus W., to Giba-Geigy Corporation. Orthocarbonates. 4,855,367, Cl. 525-507.000.

Flux-Gerate GmbH: *See—*
Gschwender, Alois; Szeteli, Andreas; and Kruger, Horst, 4,854,834, Cl. 417-423.300.

FMC Corporation: *See—*
Murugesan, Natesan; and Guiducci, Mariano, 4,855,480, Cl. 560-29.000.

Foley, Geoffrey M. T.: *See—*
Badesha, Santokh S.; Foley, Geoffrey M. T.; Pai, Damodar M.; Zallen, Richard H.; Slade, Michael L.; and Abkowitz, Martin A., 4,855,203, Cl. 430-59.000.

Fontaine, Pierre: *See—*
Richon, Dominique; De Pous, Olivier; and Fontaine, Pierre, 4,855,262, Cl. 501-92.000.

Forbeton-Betonbohr S.A.: *See—*
Pittet, Guy, 4,854,296, Cl. 125-21.000.

Ford Motor Company: *See—*
Gourd, James T., 4,854,797, Cl. 411-383.000.
Yerace, Daniel; and Zinkosky, Alexander J., 4,854,162, Cl. 73-119.00R.

Ford New Holland, Inc.: *See—*
Strosser, Richard P.; and Bohman, Carl E., 4,854,113, Cl. 56-10.200.
Strosser, Richard P.; Wynn, Edward J.; Chow, Mark K.; and Schlotterbeck, Stephen C., 4,855,924, Cl. 364-468.000.

Ford, Thomas L.: *See—*
Gasowski, Chester J.; Kolowski, Michael A.; Smithkey, John C.; and Ford, Thomas L., 4,854,361, Cl. 152-552.000.

Fordyce, William A.: *See—*
Stevens, James C.; and Fordyce, William A., 4,855,523, Cl. 585-511.000.

Foreman, Dennis. Sewage draining device for recreational vehicles or the like. 4,854,349, Cl. 138-89.000.

Foreman, Vivian S. Patient garment. 4,853,977, Cl. 2-114.000.

Forester, Thomas: *See—*
Mathers, James P.; Wood, William P.; and Forester, Thomas, 4,855,264, Cl. 501-98.000.

Forintek Canada Corp.: *See—*
Kirbach, Eberhard; and Sykes, David A., 4,854,207, Cl. 83-823.000.

Formica, Joseph: *See—*
Hancock, David; Hoyt, Robert; and Formica, Joseph, 4,855,579, Cl. 235-436.000.

Forster, Gervase L., to Hepco Slide Systems, Ltd. Bearings for slide systems. 4,854,739, Cl. 384-13.000.

Fory, Werner; and Meyer, Willy, to Ciba-Geigy Corporation. N-heterocyclosulfonyl-N'-triazinylureas. 4,854,963, Cl. 71-91.000.

Foster, Robert I.; and Longbrake, Beth A., to Motorola, Inc. Microprocessor based BCH decoder. 4,856,004, Cl. 371-37.000.

Fouquet, Jean M. Device for supporting movable cover elements. 4,854,363, Cl. 160-98.000.

Fourmentraux, Philippe: *See—*
Gancet, Christian; Guignard, Claude; and Fourmentraux, Philippe, 4,855,233, Cl. 435-135.000.

Foxboro Company, The: *See—*
Shinskey, Francis G., 4,855,897, Cl. 364-148.000.

Fraden, Jacob. Radiation thermometer and method for measuring temperature. 4,854,730, Cl. 374-164.000.

Fraidl, Gunter: *See—*
Melde-Tuczai, Helmut; Wagner, Johann; and Fraidl, Gunter, 4,854,270, Cl. 123-52.00M.

FRancese, Catherine: *See—*
Tordeux, Marc; Wakselman, Claude; and FRancese, Catherine, 4,855,460, Cl. 549-308.000.

Franckowiak, Sigismond: *See—*
Deschamps, Andre ; Franckowiak, Sigismond; and Leporq, Serge, 4,855,117, Cl. 423-244.000.

Francois, Olivier: *See—*
Garrido, Guillermo F.; Lee, Robert G. H.; and Francois, Olivier, 4,854,972, Cl. 106-437.000.

Frank, Christian; and Knosp, Helmut, to Hafner, C. Apparatus for grinding tooth replacement primary crown castings. 4,854,082, Cl. 51-109.00R.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,854,243, Cl. 104-7.300.

Fraser, Steven A.; Johnston, David E.; and Metzger, Reece D., to Figgie International, Inc. Structure and method of making combination proximity/insertion identification cards. 4,855,583, Cl. 235-492.000.

Frauenglass, Elliott: *See—*
Dunn, David J.; Vano, Patrick P.; Moran, James F., Jr.; Holmes, Mark; and Frauenglass, Elliott, 4,855,002, Cl. 156-307.300.

Frauenhofer Gesellschaft: *See—*
Mueller, Karl-Heinz; Betz, Hans; Vach, Wilhelm; and Krenner, Johann, 4,856,037, Cl. 378-34.000.

Freimark, Ronald J.: *See—*
Kozlik, Tony J.; and Freimark, Ronald J., 4,855,902, Cl. 364-200.000.

French, Kendrick L.; and Laney, Mark C., to K.W. Thompson Tool Company, Inc. Hammer block device. 4,854,065, Cl. 42-65.000.

Frenzen, Gustav: *See—*
Lorenz, Rainer; Frenzen, Gustav; and Lossa, Ulrich, 4,854,116, Cl. 57-58.840.

Frianeza-Kullberg, Teresita C. Purification of brines with hydrous metal oxide ion exchangers. 4,855,059, Cl. 210-670.000.

Frick, Heinz E.; and Mottram, Dennis J., to British Aerospace Public Limited Company. Open sea transfer of articles. 4,854,800, Cl. 414-138.200.

Fried. Krupp GmbH: *See—*
Mohs, Rudolf; and Bensmann, Gunter, 4,855,101, Cl. 419-8.000.

Friedrich, Horst: *See—*
Feil, Eugen; Neumann, Gerd; Graser, Wolfgang; and Friedrich, Horst, 4,854,102, Cl. 52-535.000.

Frisbee, Claude M., to J. I. Case Company. Hose positioning assembly 4,854,392, Cl. 172-813.000.

Fritz, Marlene M.; Love, Betty J.; Sweeney, Mary D.; and Davis, Chuck, to Proto Quick, Inc. Audio-visual alarm system with address display. 4,855,723, Cl. 340-691.000.

Fritzsche, Peter: *See—*
Staheli, Paul; Demuth, Robert; and Fritzsche, Peter, 4,854,011, Cl. 19-105.000.

Frohlen, Hans G.: *See—*
Wurminghausen, Thomas; Schneider, Karl; Saykowski, Franz; and Frohlen, Hans G., 4,855,473, Cl. 556-471.000.

Fruchey, Olan S., to Hoechst Celanese Corporation. Novel process to prevent formation of chlorinated by-products in APAP production. 4,855,499, Cl. 564-223.000.

Fuchikami, Takamasa; Urata, Hisao; Ishii, Yoshimitsu; and Obata, Yoshiko, to Sagami Chemical Research Center. Process for preparing fluorine-containing carboxylic acid ester. 4,855,487, Cl. 560-227.000.

Fuhrer, Jack S., to General Electric Company. Compatible television system with companding of auxiliary signal encoding information. 4,855,824, Cl. 358-133.000.

Fuhrmann, Werner; zur Hausen, Manfred; and Krix, Wilfried, to Huls Aktiengesellschaft. Manufacture of phthalic anhydride by gas phase oxidation of a mixture of o-xylol and naphthalene. 4,855,458, Cl. 549-248.000.

Fuisz Pharmaceutical Ltd.: *See—*
Fuisz, Richard C., 4,855,326, Cl. 514-777.000

Fuisz, Richard C., to Fuisz Pharmaceutical Ltd. Rapidly dissoluble medicinal dosage unit and method of manufacture. 4,855,326, Cl. 514-777.000

Fuji Electric Co., Ltd.: *See—*
Kato, Toshiaki, 4,855,802, Cl. 357-30.000.

Fuji Oil Company, Limited: *See—*
Tashiro, Yoichi; Baba, Hideki; Obatake, Kohei; Sakka, Hiroshi; and Sohara, Ichiro, 4,855,157, Cl. 426-609.000.

Fuji Photo Co., Ltd.: *See—*
Ono, Tsuyoshi; and Seto, Kunihira, 4,855,857, Cl. 360-133.000

Fuji Photo Film Co., Ltd.: *See—*
Arakawa, Satoshi; Kitada, Akira; Yamazaki, Kikuo; Ohmiya, Kenji; and Kawagoe, Jun, 4,855,191, Cl. 428-690.000
Chino, Naoyoshi; Hiraki, Yasuhito; and Sato, Tsunehiko, 4,854,262, Cl. 118-411.000.
Fujita, Yoshihiro; and Abe, Akira, 4,855,218, Cl. 430-428.000.
Hiiro, Hiroyuki, 4,855,761, Cl. 346-108.000
Igarashi, Akira; Satomura, Masato; and Iwakura, Ken, 4,855,278, Cl. 503-208.000
Kanayama, Toshikiyo, 4,855,760, Cl. 346-108.000
Masuda, Nobuhito; and Igarashi, Takeshi, 4,855,108, Cl. 422-56.000.
Mizuta, Akira, 4,854,569, Cl. 271-98.000.
Muraishi, Katsuaki; Yaginuma, Nakatsugu; Hirai, Kikuo; Arai, Fuminori; and Iwata, Yuzo, 4,855,109, Cl. 422-63.000
Ohgoda, Makoto; and Nakajima, Nobuyoshi, 4,855,598, Cl. 250-327.200
Ohgoda, Makoto; and Agano, Toshitaka, 4,855,599, Cl. 250-327.200.
Ohmura, Hiroshi; Ushiro, Seimei; Hara, Hiroshi; Asano, Seiji; and Yoshida, Toshio, 4,855,774, Cl. 354-203.000.
Satomura, Masato; Iwakura, Ken; Takashima, Masanobu; and Igarashi, Akira, 4,855,282, Cl. 503-218.000
Shimura, Kazuo, 4,855,597, Cl. 250-327.200.
Yamaguchi, Akira, 4,854,998, Cl. 156-248.000
Yamazaki, Tsuneo; Saito, Tomoki; and Ayabe, Hideo, 4,854,518, Cl. 242-56.900

Fuji Seiki Inc.: *See—*
Noma, Hiroshi; and Fujiyasu, Hiroshi, 4,854,264, Cl. 118-719.000.

Fuji Xerox Co., Ltd.: *See—*
Nagaoka, Daiji, 4,856,074, Cl. 382-22.000.

Fujii, Koichi: *See—*
Azumai, Hideo; Fujii, Koichi; Seigenji, Takashi; and Yoshioka, Keiichi, 4,855,803, Cl. 357-45.000.

Fujii, Mamoru; Noda, Kazuo; Nagasaka, Shoji; Tajika, Hiroshi; and Ono, Koji, to Kawasaki Steel Corporation. Method and apparatus for cutting welding steel strips. 4,854,493, Cl. 228-5.700

Fujii, Masanori; Komura, Shuji; and Oogami, Shunsuke, to Mita Industrial Co., Ltd. White toner containing a high purity titanium dioxide pigment. 4,855,204, Cl. 430-106.000

Fujii, Yoshiharu, to Sharp Kabushiki Kaisha. Copier with improved paper transporting means. 4,855,788, Cl. 355-313.000.

Fujikura Ltd.: *See—*
Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, 4,854,372, Cl. 165-46.000.

Fujino, Akihiko: *See—*
Ishikawa, Norio; Nakai, Masaaki; Hirano, Masayasu; Fujino, Akihiko; Ootsuka, Hiroshi; Egawa, Takeshi; and Kawamura, Kunio, 4,855,779, Cl. 354-412.000

Fujino, Ikuo: *See—*
Eguchi, Hitoshi; Kuribara, Motoaki; Onodera, Tugio; Kobayashi, Koji; Fujino, Ikuo; Hagiwara, Hiroshi; and Ogino, Seiichi, 4,855,609, Cl. 290-48.000.

Fujino, Yasunori: *See—*
Urushiwara, Noriyoshi; Sugiura, Noboru; Fujino, Yasunori; and Kobayashi, Ryoichi, 4,854,292, Cl. 123-630.000.

Fujioka, Keiji: *See—*
Yamahira, Yoshiya; Fujioka, Keiji; and Sato, Shigeji, 4,855,134, Cl. 424-85.700.

Fujishima, Kazuyasu: *See—*
Tsukamoto, Katsuhiro; Shimizu, Masahiro; Fujishima, Kazuyasu; and Matsuda, Yoshio, 4,855,953, Cl. 365-149.000.

Fujita, Sinji: *See—*
Sonoda, Akikazu; Fujita, Sinji; Sato, Masanobu; Tomono, Syoji; and Nakamura, Hisanori, 4,855,560, Cl. 219-86.250.

Fujita, Tetsuo: *See—*
Matsuoka, Hiroo; Toida, Tsutomu; Takinami, Takao; Takenaka, Senji; and Fujita, Tetsuo, 4,855,124, Cl. 423-574.00L.

Fujita, Yoshihiro; and Abe, Akira, to Fuji Photo Film Co., Ltd. Method for processing silver halide photographic lightsensitive materials. 4,855,218, Cl. 430-428.000.

Fujita, Yukio: *See—*
Sugiyama, Makoto; Ezure, Yoji; Yoshikuni, Yoshiaki; and Fujita, Yukio, 4,855,415, Cl. 536-17.400.

Fujitsu Limited: *See—*
Arai, Shigeru, 4,855,983, Cl. 369-46.000.
Eshita, Takashi; Mieno, Fumitake; Furumura, Yuji; and Itoh, Kikuo, 4,855,254, Cl. 437-100.000.
Ikeda, Motohisa, 4,855,958, Cl. 365-230.080.
Shigaki, Masafumi; Kurihara, Hiroshi; and Nishi, Hidetoshi, 4,855,895, Cl. 363-157.000.
Shimoda, Makoto; Ishino, Tatsuyuki; and Matsuo, Makoto, 4,855,908, Cl. 364-405.000.

Fujiwara, Shinobu: *See—*
Ono, Shuichi; Itagaki, Shuichi; Yahagi, Masahiro; Furukawa, Kiyoshi; Fujiwara, Shinobu; and Oikawa, Yasunobu, 4,854,936, Cl. 29-570.100

Fujiwara, Shiro: *See—*
Watanabe, Toshihiro; and Fujiwara, Shiro, 4,854,517, Cl. 242-56.00R

Fujiyasu, Hiroshi: *See—*
Noma, Hiroshi; and Fujiyasu, Hiroshi, 4,854,264, Cl. 118-719.000.

Fukuda, Hiroyuki; Shigeta, Masatomo; Kaji, Hisatsugu; and Saitoh, Kuniyuki, to Kurcha Kagaku Kogyo Kabushiki Kaisha. Process for preparing a carbonaceous fuel cell electrode substrate incorporating three-layer separator. 4,855,092, Cl. 264-29.500.

Fukuda, Morio: *See—*
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,855,115, Cl. 423-239.000

Fukui, Yoshiharu, to Sumitomo Chemical Co., Ltd. Process for producing pre-expanded particles of polyolefin resins. 4,855,327, Cl. 521-58.000.

Fukukawa, Mitsuo; Yazawa, Masayuki; Asai, Kazumitsu; Okamoto, Yoshiharu; and Mio, Kouhei, to Kajima Corporation; and Kasima Road Company. System for paving inclined and/or curved surfaces. 4,854,769, Cl. 404-72.000.

Fukumoto, Hiroshi: *See—*
Kan, Fumitaka, deceased; Koizumi, Norihiko; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; Mishina, Shinya; and Taniока, Hiroshi, 4,855,763, Cl. 346-160.100.

Fukushima, Nobuo. Rotary body drive device. 4,855,654, Cl. 369-47.000

Fukuyama, Yoshiaki, to Nippon Flute Co., Ltd. Method and apparatus for transferring and bundling plastic bag sheet material. 4,854,928, Cl. 493-28.000.

Fulks, Kent B. Multi-purpose exercise machine. 4,854,578, Cl. 272-134.000

Fullmer, David M., to Xerox Corporation. Parts assembly using signature analysis. 4,855,923, Cl. 364-468.000.

Funabashi, Tatsuya: *See—*
Sawano, Susumu; Sakuma, Masaru; Nagai, Hideaki; and Funabashi, Tatsuya, 4,855,917, Cl. 364-426.020.

Funada, Tohru: *See—*
Yoshioka, Hajime; Kodama, Yukio; Shigemura, Sadato; Funada, Tohru; and Morimoto, Satoshi, 4,855,019, Cl. 204-16.000.

Funazaki, Ichizi; and Tani, Haruo, to Sokkisha Co., Ltd. Optical automatic levelling apparatus. 4,854,704, Cl. 356-250.000.

Fundokin Shoyu Kabushiki Kaisha: *See—*
Kuribayashi, Yoshihiro; and Sucoka, Kazuomi, 4,855,148, Cl. 426-46.000

Fung, Steven; Woo, Sam L.; Haugland, Richard P.; Menchen, Steven M.; and Connell, Charles R., to Applied Biosystems, Inc. Method of detecting electrophoretically separated oligonucleotides. 4,855,225, Cl. 435-6.000.

Funke, Karl-Heinz, to Funke Warmeaustauscher Apparatebau GmbH. Plate heat exchanger. 4,854,382, Cl. 165-167.000.

Funke Warmeaustauscher Apparatebau GmbH: *See—*
Funke, Karl-Heinz, 4,854,382, Cl. 165-167.000

Furlong, Patrick J.: *See—*
Pike, Brian R.; Furlong, Patrick J.; and Moers, John W., 4,854,760, Cl. 401-134.000.

Furuhashi, Kenshi; Ito, Hiroyasu; and Enari, Nobuyuki, to Kabushiki Kaisha Tikai-Rika-Denki-Seisakusho. Cancelling mechanism for turning signal. 4,855,542, Cl. 200-61.270.

Furukawa, Kiyoshi: *See—*
Ono, Shuichi; Itagaki, Shuichi; Yahagi, Masahiro; Furukawa, Kiyoshi; Fujiwara, Shinobu; and Oikawa, Yasunobu, 4,854,936, Cl. 29-570.100

Furukawa, Masayuki: *See—*
Ueyama, Shinichiro; Furukawa, Masayuki; and Nishikawa, Tadaichi, 4,855,389, Cl. 528-168.000.

Furumura, Yuji: *See—*
Eshita, Takashi; Mieno, Fumitake; Furumura, Yuji; and Itoh, Kikuo, 4,855,254, Cl. 437-100.000.

Fuss, Andreas: *See—*
Koch, Volker; Fuss, Andreas; Bonin, Werner; Knauf, Werner; and Waltersdorfer, Anna, 4,855,309, Cl. 514-346.000.

Futrell, James C., II, to United States of America, Interior. Lightweight wading rod for stream flow measurements. 4,854,166, Cl. 73-170.00A.

G. B. Boucherie, naamloze vennootschap, Firma: *See—*
Boucherie, Leonel, 4,854,645, Cl. 300-10.000.

G. D. Searle & Co.: *See—*
Djuric, Stevan W.; Haack, Richard A.; and Yu, Stella S., 4,855,324, Cl. 514-570.000.

G. Siempelkamp GmbH & Co.: *See—*
Averdick, Gunter; and Sandten, Herbert, 4,854,026, Cl. 29-157.30R.

Gabelli, Antonio; and Dolfsma, Hendrik, to SKF Industrial Trading and Development Co. B.V. Shaft bearing assembly. 4,854,748, Cl. 384-466.000

Gadient, Fulvio; and Vogel, Arnold, to Sandoz Ltd. New furanuronic acid derivatives, process for their production and their use. 4,855,288, Cl. 514-45.000

GafF-Huels Chemie GmbH: *See—*
Westernacher, Helmut; Aertken, Karl; and Stieren, Thomas, 4,855,516, Cl. 568-873.000.

Gaglani, Kamlesh; and Eilender, Albert L., to Cosan Chemical Corporation. Biocidal dialkyl (3,5-substituted hydroxyalkyl oxazolidines and hydrocarbylene polyoxymethylene oxazolidines. 4,855,312, Cl. 514-374.000

Gagniere, Jacques: *See—*
Teirlinck, Didier; and Gagniere, Jacques, 4,855,107, Cl. 420-546.000.

Gagnon, Bernard, to Endot Industries, Inc. Coupling for joining axial sections of duct for fiber optic cables. 4,854,665, Cl. 350-96.230.

Gagnon, Peter R.; and Benson, Timothy A., to GTE Products Corporation. Reflector and eyelet construction for reflector-type lamps. 4,855,634, Cl. 313-113.000.

Gaillard, Pierre: *See—*
Hays, Jean-Francois; Legrand, Pierre; Verna, Eric; Delzenne, Michel; Reynaud, Bernard; and Gaillard, Pierre, 4,855,566, Cl. 219-130.400.

Gallivan, James B.: *See—*
Robertson, Allan J.; and Gallivan, James B., 4,855,507, Cl. 568-12.000.

Gammon, Nathan A.: *See—*
Carolla, Russell A.; and Gammon, Nathan A., 4,854,362, Cl. 152-554.000.

Gancet, Christian; Guignard, Claude; and Fourmentraux, Philippe, to Societe Nationale Elf Aquitaine. Process for carrying out enzymatic reactions in an organic solvent. 4,855,233, Cl. 435-135.000.

Gane, Patrick A. C.; and O'Neill, Graham P., to E.C.C. International Limited. Clay composition. 4,854,971, Cl. 106-286.500.

Garcia, Michel. Device for folding or retracting a bed, or its analogue into a false ceiling. 4,853,989, Cl. 5-10.00B.

Gardner, Richard K.; and Kozumplik, Nicholas, Jr., to Aro Corporation, The. Mechanical shift, pneumatic assist pilot valve for diaphragm pump. 4,854,832, Cl. 417-393.000.

Garg, Diwakar; Dyer, Paul N.; Schaffer, Leslie E.; Wrecsics, Ernest L.; Dimos, Duane; and Mueller, Carl F., to Air Products and Chemicals, Inc. Highly erosive and abrasive wear resistant composite coating system. 4,855,188, Cl. 428-627.000.

Garito, Anthony F.: *See—*
Kalyanaraman, Palaiyur S.; and Garito, Anthony F., 4,854,676, Cl. 350-354.000.

Garland, Anthony C.; and Jones, Randal L. NOCHANGE attribute mode. 4,855,949, Cl. 364-900.000.

Garost, Alexandr I.: *See—*
Svidunovich, Nikolai A.; Parfenov, Leonid I.; Garost, Alexandr I.; Sorokin, Gennady A.; Volkov, Viktor N.; Obiedkov, Viktor A.; Karbanovich, Valery K.; Vashkevich, Vladimir V.; and Verbitsky, Alexandr N., 4,855,105, Cl. 420-75.000.

Garrido, Guillermo F.; Lee, Robert G. H.; and Francois, Olivier, to Canadian Liquid Air Ltd. Nitrogen-free process for chloride-route TiO_2 pigment manufacture. 4,854,972, Cl. 106-437.000.

Gas Research Institute: *See—*
Hemsath, Klaus H., 4,854,860, Cl. 432-5.000.
Hemsath, Klaus H., 4,854,863, Cl. 432-176.000.
Houtman, William H., 4,854,857, Cl. 431-154.000.

Gasc, Jean-Claude; Nedelec, Lucien; Humbert, Daniel; and Boaventura, Ana-Maria, to Roussel Uclaf. Certain azaspirodecane compounds and a method of inducing an anxiolytic activity. 4,855,302, Cl. 514-278.000.

Gasowski, Chester J.; Kolowski, Michael A.; Smithkey, John C.; and Ford, Thomas L., to Goodyear Tire & Rubber Company, The. Pneumatic tires. 4,854,361, Cl. 152-552.000.

Gasperi, Michael L.: *See—*
Davis, Wesley; and Gasperi, Michael L., 4,855,830, Cl. 358-168.000.

Gastinger, Robert G.; and Hayes, John E., to Arco Chemical Technology, Inc. High styrene content stable polymer polyols using epoxy resin-modified polyols as base polyols. 4,855,330, Cl. 521-137.000.

Gatchel, Gary; Newgarden, Joseph E.; and Lynn, Gordon E., to Newgarden, Joseph E. Table tennis ball serving device. 4,854,588, Cl. 273-30.000.

Gates, Donald C., to Expertek, Inc. Method and apparatus for leak testing a fluid containing chamber. 4,854,158, Cl. 73-45.500.

Gates Rubber Company, The: *See—*
Bohl, Aleck; and Valdez, Leandro, 4,854,481, Cl. 222-94.000.

Gaumann, Tino: *See—*
Bodenhausen, Geoffrey; Pfandler, Peter E.; Rapin, Jacques; Gaumann, Tino; and Houriet, Raymond, 4,855,593, Cl. 250-282.000.

Gautier, Martine; Rico, Isabelle; Lattes, Armand; and Bertocchio, Rene , to Societe Atochem. Polyfluoro compounds and method for preparing them. 4,855,025, Cl. 204-157.860.

Gavin, James R.; and Roeland, James F., to Mobil Oil Corporation. Apparatus for forming center-unwindable rolls of perforated plastic film. 4,854,520, Cl. 242-72.00B.

Gavronsky, German: *See—*
Pinarer, Talat I.; and Gavronsky, German, 4,854,109, Cl. 53-397.000.

Gazda, Chester T.; and O'Melia, Lawrence F., to Titeflex Corporation. Integral cathodic protection device. 4,855,029, Cl. 204-197.000.

Gazdik, Charles E.; McBride, Donald G.; Seraphim, Donald P.; and Toole, Patrick A., to International Business Machines Corporation. Full panel electronic packaging structure. 4,855,867, Cl. 361-306.000.

Gee, John C.: *See—*
Chew, Calvin T.; and Gee, John C., 4,855,491, Cl. 562-414.000.

Gefvert, David L., to Sherex Chemical Company, Inc. Dioxime kinetic enhancer for solvent extraction of gallium from basic aqueous solutions thereof. 4,855,114, Cl. 423-112.000.

Gehret, Jean-Claude, to Ciba-Geigy Corporation. Insecticides and parasiticides. 4,855,317, Cl. 514-450.000.

Geis, Mark: *See—*
McKiernan, Edward F.; Sigler, James; Sprang, Richard; Lewellen, Richard; and Geis, Mark, 4,854,827, Cl. 417-313.000.

Geiste, Douglas W.; and Andrew, James C. Video cassette recorder protector and organizer. 4,854,651, Cl. 312-9.000.

Geka, Toshiaki: *See—*
Mottate, Tatsuo; and Geka, Toshiaki, 4,854,741, Cl. 384-45.000.

Gelabert, Antonio: *See—*
Wilhelm, Didier; Gelabert, Antonio; and Blanc, Alain, 4,854,934, Cl. 8-185.000.

Gelb, Allan S.; Townsend, Peter B.; and Purdy, Erika. Thermoelectric heat pump. 4,855,810, Cl. 357-87.000.

Gellert, Jobst U. Injection molding system with insertable insulating ring. 4,854,851, Cl. 425-549.000.

Geluk, Ronald J., to B.V. Optische Industrie "De Oude Delft". Apparatus and method for slit radiography with different x-ray energies. 4,856,040, Cl. 378-146.000.

GenCorp Inc.: *See—*
Erickson, David E.; and Sharma, Satish C., 4,855,338, Cl. 523-335.000.
Hein, Richard D., 4,854,766, Cl. 403-224.000.

Genentech, Inc.: *See—*
Berman, Phillip W.; and Lasky, Laurence A., 4,855,224, Cl. 435-5.000.
Gray, Patrick W.; and Rinderknecht, Ernst H., 4,855,238, Cl. 435-243.000.

General Binding Corporation: *See—*
Vercillo, Alfredo J.; and Nanos, Nicholas M., 4,855,573, Cl. 219-492.000.

General Components, Inc.: *See—*
Leigh, Charles, 4,854,597, Cl. 277-1.000.

General DataComm, Inc.: *See—*
Goldstein, Yuri, 4,856,031, Cl. 375-118.000.

General Electric Company: *See—*
Archibald, James B.; and Adams, Steven L., 4,854,034, Cl. 29-596.000.
Berdahl, Donald R.; Cella, James A.; and Shank, Gary K., 4,855,391, Cl. 528-188.000.
Bolon, Donald A.; Eddy, Victoria J.; and Hallgren, John E., 4,855,199, Cl. 430-18.000.
Colborn, Robert E., 4,855,467, Cl. 556-40.000.
Fuhrer, Jack S., 4,855,824, Cl. 358-133.000.
Hawkins, Christopher M.; and Bostick, Edgar E., 4,855,380, Cl. 528-370.000.
Heartz, Robert A., 4,855,937, Cl. 364-521.000.
Holub, Fred F.; and Rock, John A., 4,855,356, Cl. 525-66.000.
Isnardi, Michael A., 4,855,811, Cl. 358-12.000.
Lane, Lawrence J., 4,855,664, Cl. 322-19.000.
Mehan, Richard L., 4,854,196, Cl. 76-101.00R.
Parks, Harold G.; Piper, William W.; Possin, George E.; and Castleberry, Donald E., 4,855,806, Cl. 357-59.000.
Raymond, Eugene B.; and Proulx, Edward A., 4,854,216, Cl. 89-33.160.
Schultz, John, Jr., 4,855,550, Cl. 200-600.000.
Stein, Judith, 4,855,351, Cl. 524-719.000.
Vinson, John W.; Howell, Stephen J.; and Lampes, Elias H., 4,854,127, Cl. 60-742.000.
Whalen, David; and Jalbert, Ronald L., 4,855,357, Cl. 525-67.000.
White, Dwain M.; and Socha, Laura A., 4,855,483, Cl. 560-66.000.
Wojnar, Jeffrey S.; and McCusker, Joseph H., 4,855,872, Cl. 361-414.000.

General Foods Inc.: *See—*
Jackson, Miles, 4,854,722, Cl. 366-341.000.

General Motors Corporation: *See—*
Lun, Saiman, 4,854,560, Cl. 267-140.100.

General Signal Corporation: *See—*
Poole, Damian M., 4,855,737, Cl. 340-933.000.
Rhodes, Thomas R.; and Brennan, Thomas J., 4,854,244, Cl. 104-279.000.
Sterwald, Duane L., 4,855,576, Cl. 219-544.000.

Genev, Ivan V., to Institute Po Tcherna Metalurgia. Vibrating screen. 4,855,039, Cl. 209-311.000.

Gentile, James L.; LaRosa, Joseph P.; and Rainey, Dean R., to Chesebrough-Pond's Inc. Viscous product dispenser. 4,854,484, Cl 222-256.000.

Georg Fischer Aktiengesellschaft: *See—*
Ring, Manfred; Weber, Jurgen; and Ackermann, Helmut, 4,854,707, Cl. 356-356.000.

George Blair Public Limited Company: *See—*
Bishop, Frank W., 4,854,807, Cl. 414-498.000

George Koch Sons, Inc.: *See—*
Kraft, Kenneth N.; and Powers, Daniel, 4,854,633, Cl. 296-104.000.

George, William A.: *See—*
Grossman, Mark W.; and George, William A., 4,855,635, Cl 313-156.000.

Georgopoulos, Philip; and Langkau, John, to Eveready Battery Company, Inc. Electrochemical cell with internal circuit interrupter. 4,855,195, Cl. 429-54.000.

Gerber, Arthur M. Method of making and pretesting a digital recording medium. 4,855,984, Cl. 369-54.000

Gerhard, Helmut, to Westerwaelder Eisenwerk Gerhard GmbH. Tank container. 4,854,462, Cl. 220-5.00A.

Gerstel, Eberhard. Sample injection or extraction head for gaseous or liquid fluids. 4,854,181, Cl. 73-863.860

Gerstenhaber, Moshe; and Libert, Robert J., to Analog Devices, Inc. Bias current compensation for bipolar input stages. 4,855,684, Cl. 330-257.000.

Gertsch, Peter; and Kohler, Arnold, to Maschinenfabrik Wifag. Device for loading or unloading paper rolls onto or from a roll stand of a web-fed rotary printing press. 4,854,806, Cl. 414-495.000.

Getreuer, Kurt W.; and Schell, David L., to Laser Magnetic Storage International Company. Track seeking apparatus and method using sampled information. 4,855,977, Cl. 369-32.000

Getz, Marvin G.; McFeeters, Brian D.; and Purcell, Robert J., to Caterpillar Inc. Track recoil and tensioning mechanism. 4,854,650, Cl. 305-10.000.

Geus, John W.; and Linowski, John W., to Dow Chemical Company, The. Method for the preparation of carbon filaments. 4,855,091, Cl. 264-22.000.

Geyer, Daniel J.; and Calaway, Ward M., to Eastman Kodak Company. Technique for processing a digital signal having zero overhead sync 4,856,029, Cl. 375-110.000.

Gialanella, Donald G.: *See—*
Wilson, Robert D.; Grigg, Douglas W.; and Gialanella, Donald G., 4,854,575, Cl. 272-122.000

Giba-Geigy Corporation: *See—*
Flury, Peter; Eldin, Sameer H.; Roth, Martin; and Rabener, Claus W., 4,855,367, Cl. 525-507.000.

Gibson, Peter J.: *See—*
Beard, David R.; Gibson, Peter J.; and Hinchey, Christopher B., 4,854,408, Cl. 180-9.320.

Gibson, Shelby R.: *See—*
Murray, Gerald D.; Gibson, Shelby R.; Carpenter, Keith J.; Carpenter, Kenneth E.; and Carpenter, Michael R., 4,854,784, Cl 407-114.000.

Giebel, Gerhard, to DVSG Patentverwaltungs GmbH. Machine for lasting side portions of shoe uppers. 4,853,997, Cl. 12-8.300.

Gilbert, Seymour G.: *See—*
Orr, Avigdor; Spingler, John O.; and Gilbert, Seymour G., 4,855,153, Cl. 426-270.000.

Giles, Daniel N., to Boeing Company, The. Reversible thermal compensation joint. 4,854,765, Cl. 403-30.000.

Giles Enterprises, Inc.: *See—*
Giles, William O., Sr.; McNeal, William T.; and Giles, Ted W., 4,854,949, Cl. 55-126.000.

Giles, Ted W.: *See—*
Giles, William O., Sr.; McNeal, William T.; and Giles, Ted W., 4,854,949, Cl. 55-126.000

Giles, William O., Sr.; McNeal, William T.; and Giles, Ted W., to Giles Enterprises, Inc. Apparatus for cooking food including a ventless exhaust system. 4,854,949, Cl. 55-126.000.

Gilmore, William J.: *See—*
Newman, Gordon A.; and Gilmore, William J., 4,854,193, Cl. 74-850.000.

Gingeras, Thomas R.: *See—*
Stroman, David W.; Brust, Paul F.; Ellis, Steven B.; Gingeras, Thomas R.; Harpold, Michael M.; and Tschopp, Juerg F., 4,855,231, Cl. 435-68.000

Gioffre, Anthony J.; and Marcus, Bonita K., to UOP. Process for deodorizing marine oils. 4,855,154, Cl. 426-417.000

Giordano, Claudio; Castaldi, Graziano; Uggeri, Fulvio; and Cavicchioli, Silvia, to Zambon S.p.A. Optically active ketals, processes for their preparation and their use in the synthesis of alpha-arylalkanoic acids. 4,855,464, Cl. 549-450.000.

Gipp, Roland: *See—*
Muller, Hanns P.; and Gipp, Roland, 4,855,484, Cl. 560-72.000.

Gladwin Corporation: *See—*
Trenkle, Charles; and Sears, James B., Jr., 4,854,488, Cl. 222-607.000

Glanz, Werner: *See—*
Althoff, Karl-Heinz; Kunick, Werner; Munstermann, Manfred; Voss, Uwe; and Glanz, Werner, 4,854,805, Cl. 414-495.000

Glaser, Klaus: *See—*
Braun, Gerold; Tschang, Chung-Ji; Vamvakaris, Christos; and Glaser, Klaus, 4,855,423, Cl. 544-2.000.

Glatt, Otto G. Equilibrium and ambient relative humidity indicator. 4,854,160, Cl. 73-73.000.

Glaxo Group Limited: *See—*
Collington, Eric W.; Finch, Harry; and Judd, Duncan B., 4,855,293, Cl. 514-212.000.
Oxford, Alexander W.; Coates, Ian H.; Bays, David E.; Webb, Colin F.; Dowle, Michael D.; Mills, Keith; and Eldred, Colin D., 4,855,314, Cl. 514-415.000

Glemser, Raymond G., II: *See—*
Fitzgerald, William J., Jr.; and Glemser, Raymond G., II, 4,855,939, Cl. 364-522.000.

Glenn, Max C., to Honeywell Inc. Multiple level miniature electromechanical accelerometer switch. 4,855,544, Cl. 200-61.45R.

Glenview Security Systems, Inc.: *See—*
Sciortino, Michael J.; and Schmidt, Wendel, 4,854,247, Cl. 109-1.00R

Glory Kogyo Kabushiki Kaisha: *See—*
Tomiyama, Hiroshi; and Naito, Seishi, 4,855,584, Cl. 235-493.000.

Glosecki, David M.: *See—*
Snyder, David A.; and Glosecki, David M., 4,854,798, Cl. 411-434.000.

Gluck, Julius; Murphy, Patrick; and Tran, Duc H., to Pitney Bowes, Inc. Thermal transfer printing apparatus including means for controlling printing on irregularly-shaped letters. 4,855,756, Cl. 346-76.0PH.

Glue, William J., to Britax Wingard Limited. Exterior rear view mirror. 4,854,539, Cl. 248-479.000.

Gluntz, Claude: *See—*
Benedetti, Charles; Gluntz, Claude; Pascal, Robert; and Stefanini, Michel, 4,855,053, Cl. 210-634.000.

GMI Engrg., & Mgmt., Institute: *See—*
Chandrupatla, Tirupathi R., 4,854,925, Cl. 474-212.000.

Godo, Kiyoshi: *See—*
Osada, Shuichi; Hayashi, Satoru; Goto, Masaru; and Godo, Kiyoshi, 4,854,529, Cl. 246-187.00B.

Goebel, Gerd: *See—*
Pohl, Joachim; Carduck, Franz-Josef; and Goebel, Gerd, 4,855,273, Cl. 502-244.000.

Goeckel, Ulrich; Petersen, Harro; Osterloh, Rolf; Schupp, Eberhard; Loch, Werner; and Schwerzel, Thomas, to BASF Aktiengesellschaft Reaction products and condensates based on substituted propyleneureas and their preparation. 4,855,394, Cl. 528-263.000

Goedecke Aktiengesellschaft: *See—*
Trostmann, Uwe; Schachtele, Christoph; Mannhardt, Karl; Rudolph, Claus; and Marme Dieter, 4,855,489, Cl. 560-250.000.

Goel, Anil B., to Ashland Oil, Inc. Reaction of bicyclic amide acetal with urea. 4,855,398, Cl. 528-367.000.

Goetze AG: *See—*
Brocksieper, Manfred; Luckger, Rolf; Kroschel, Hans-Gerd; and Stechow, Jochen, 4,856,105, Cl. 364-474.020.
Deuring, Hans, 4,854,598, Cl. 277-87.000.

Goldsmith, Howard G., to Todd Enterprises, Inc. Combination seat for boats. 4,854,261, Cl. 114-343.000

Goldstein, Yuri, to General DataComm, Inc. Adaptive multiharmonic phase jitter compensation. 4,856,031, Cl. 375-118.000.

Gonthier, Emile: *See—*
Daigle, Clement; and Gonthier, Emile, 4,854,543, Cl. 249-95.000

Gonzalez-Lopez, Jorge; and Liang, Bob C., to International Business Machines Corporation. Hidden line removal method with modified depth buffer. 4,855,938, Cl. 364-522.000.

Goodale, David L.: *See—*
Sohn, Chul H.; and Goodale, David L., 4,855,088, Cl. 261-53.000

Goodhue, William D., to Massachusetts Institute of Technology. Tapered laser or waveguide optoelectronic method. 4,855,255, Cl. 437-129.000.

Goodman, Steve F., to Herman Miller, Inc. Plunger lock mechanism. 4,854,140, Cl. 70-100.000.

Goodrich, Gordon W.: *See—*
Blase, Michael R.; Rosendall, Henry J.; and Goodrich, Gordon W., 4,854,544, Cl. 251-245.000.

Goodrich, Rollie M.: *See—*
Herdzina, Frank J.; and Goodrich, Rollie M., 4,854,799, Cl. 413-66.000.

Goodson, Forrest R.; Dudley, Mark E.; and Rudy, Thomas P., to United Technologies Corporation. Iron oxide catalyst and method for making same. 4,854,981, Cl. 149-2.000.

Goodyear Tire & Rubber Company, The: *See—*
Carolla, Russell A.; and Gammon, Nathan A., 4,854,362, Cl. 152-554.000.
Cubric, Robert; and Roedseth, John K., 4,854,612, Cl. 285-18.000.
Eisenzimmer, George W., 4,854,031, Cl. 29-508.000.
Gasowski, Chester J.; Kolowski, Michael A.; Smithkey, John C.; and Ford, Thomas L., 4,854,361, Cl. 152-552.000
Hausmann, George J.; and Patton, Donald E., Jr., 4,854,258, Cl 114-219.000.
Muse, Joel, Jr.; and Colvin, Howard A., 4,855,362, Cl. 525-194.000.
Salazar, Mariano, 4,855,402, Cl. 528-487.000.
Sandstrom, Paul H., 4,855,364, Cl. 525-332.700.
Strader, Don S., 4,854,446, Cl. 198-810.000
Terrado, Angel R., 4,855,008, Cl. 156-401.000.

Goppelt, Dieter: *See—*
Hertrich, Steffen; and Goppelt, Dieter, 4,854,922, Cl. 474-110.000.

Gordon Belt Scrapers, Inc.: *See—*
Gordon, James R., 4,854,443, Cl. 198-497.000.

Gordon, James R., to Gordon Belt Scrapers, Inc. Conveyor belt cleaner. 4,854,443, Cl. 198-497.000.

Gordon, Roy G. Sealing oxidizing atmosphere at high temperatures. 4,855,000, Cl. 156-289.000.

Goren, Eliezer: *See—*
Hirsch, Eitan; Gutmann, Alexander; Schwartz, Ana; Goren, Eliezer; Perlmuter, Nikolai; and Tal, Reuven, 4,854,240, Cl. 102-476.000.

Gorler, Klaus: *See—*
Grimminger, Wolf; Gorler, Klaus; and Odenthal, Karl P., 4,855,422, Cl. 540-466.000

Goschke, Bernd, to Siemens Aktiengesellschaft. Hearing aid whose components are mounted in a hearing aid housing. 4,854,415, Cl. 181-130.000

Goshima, Norio; and Watanabe, Isao, to Bridgestone Corporation. Air springs. 4,854,557, Cl. 267-64.270.

Goss, Lloyd C.: *See—*
Radwan, Hatem R.; and Goss, Lloyd C., 4,855,851, Cl. 360-104.000.

Goto, Masaru: *See—*
Osada, Shuichi; Hayashi, Satoru; Goto, Masaru; and Godo, Kiyoshi, 4,854,529, Cl. 246-187.00B.

Goto, Yasuyuki; Ogawa, Tetsuya; and Sugimori, Shigeru, to Chisso Corporation. Fluorophenylcyclohexane derivative. 4,855,076, Cl. 252-299.630.

Gotz, Johann: *See—*
Stuvecke, Claus-Peter; and Gotz, Johann, 4,854,250, Cl. 112-80.160.

Goulait, David J. K.: *See—*
Ball, W. Kenneth; Goulait, David J. K.; and Zorb, James E., 4,854,984, Cl. 156-73.500

Goulet, Benoit. Template for driver's dailey log book. 4,854,048, Cl. 33-443.000

Gourd, James T., to Ford Motor Company. Threaded fastener with resilient linking means. 4,854,797, Cl. 411-383.000.

Goyo Paper Working Co. Ltd.: *See—*
Ohara, Shuzo; and Kawahara, Hiroshi, 4,855,280, Cl. 503-214.000.

Grabel, Vernon: *See—*
Richardson, Thomas L.; Grabel, Vernon; and Kowalik, Joseph T., 4,855,940, Cl. 364-526.000.

Grabowski, David N.: *See—*
Lorence, Brian S.; and Grabowski, David N., 4,854,536, Cl. 248-311.200.

Graf, Carl P.: *See—*
Narendra, Patrenahalli M.; Fant, Karl M.; and Graf, Carl P., 4,855,822, Cl. 358-103.000.

Graf & Cie Ag: *See—*
Graf, Ralph A., 4,854,012, Cl. 19-114.000.

Graf, Hans-Joachim; and Koliwer, Wolfgang, to Klockner Ferromatik Desma GmbH. Apparatus for manufacture of an article of footwear having an outer sole, an inner sole and a lateral sole. 4,854,841, Cl. 425-119.000.

Graf, Ralph A., to Graf & Cie Ag. Saw tooth wire of a saw tooth-card clothing for a textile machine producing randomly oriented fibre fleeces. 4,854,012, Cl. 19-114.000.

Graham, James F.: *See—*
Melvin, William S.; and Graham, James F., 4,854,982, Cl. 149-109.600.

Grammatica, Steven J.: *See—*
Badesha, Santokh S.; Grammatica, Steven J.; and Jansen, Frank, 4,855,201, Cl. 430-58.000

Grampa, Fulvio: *See—*
D'Andolfo, Francesco; and Grampa, Fulvio, 4,855,099, Cl. 264-103.000

Granot, Joseph, to Elscint Ltd. Magnetic resonance studies of restricted volumes. 4,855,679, Cl. 324-309.000.

Grant, Denis A. Mechanized toilet seat. 4,853,983, Cl. 4-251.000.

Grantham, Rodger P., to Dayco Products, Inc. Breakaway coupling, conduit system utilizing the coupling and methods of making the same. 4,854,338, Cl. 137-68.100.

Graphic Controls Corporation: *See—*
Hubbard, James R., 4,854,762, Cl. 401-199.000.

Graphtec Kabushiki Kaisha: *See—*
Aizawa, Isamu, 4,855,755, Cl. 346-76.0PH.

Graser, Wolfgang: *See—*
Feil, Eugen; Neumann, Gerd; Graser, Wolfgang; and Friedrich, Horst, 4,854,102, Cl. 52-535.000.

Grasselli, Robert K.: *See—*
Suresh, Dev D.; Seely, Michael J.; Brazdil, James F.; and Grasselli, Robert K., 4,855,275, Cl. 502-353.000.

Grassmuck, Volker; Jorg, Benno; and Sommer, Eberhard, to Carl Freudenberg, Firma. Antifriction bearing. 4,854,751, Cl. 384-537.000.

Grasso, Albert P., to International Fuel Cells Corporation. Fuel cell clean waste water discharge system. 4,855,192, Cl. 429-13.000.

Graves Spray Supply Co., Inc.: *See—*
Hedger, James E., Jr.; and Charette, Joseph G., 4,854,504, Cl. 239-294.000.

Gray, Larry O., to Dana Corporation. Electronic vehicle speed control system having analog and digital memory circuits. 4,855,918, Cl. 364-426.040.

Gray, Larry O.: *See—*
Schneider, Jack H.; and Gray, Larry O., 4,856,072, Cl. 381-86.000.

Gray, Patrick W.; and Rinderknecht, Ernst H., to Genentech, Inc. Recombinant gamma interferons having enhanced stability and methods therefor. 4,855,238, Cl. 435-243.000.

Grayson, James L. Yacht tender/boarding vessel. 4,854,257, Cl. 114-61.000.

Green, Morris H., to Tektronix, Inc. Method of providing information useful in identifying defects in electronic circuits. 4,855,670, Cl. 324-73.00R.

Greene, Leonard M., to Safe Flight Instrument Corporation. Variable threshold wind shear warning system. 4,855,738, Cl. 340-968.000.

Greenhalgh, Geoffrey; Morris, Peter; Bearon, John N.; and Armbruster, Guenter, to Pilkington plc. Edge-encapsulated glazing module. 4,854,636, Cl. 296-201.000.

Greenspan, Jay S.: *See—*
Tower, Steven A.; and Greenspan, Jay S., 4,855,808, Cl. 357-74.000.

Greiling Farms Inc.: *See—*
Greiling, Gene E., 4,854,075, Cl. 47-73.000.

Greiling, Gene E., to Greiling Farms Inc. Plant tray. 4,854,075, Cl. 47-73.000.

Gresens, Harry, to Bruckner Trockentechnik GmbH & Co. KG. Apparatus for the heat treatment of a length of continuously moving material. 4,854,862, Cl. 432-59.000.

Grethe, Horst: *See—*
Panster, Peter; Grethe, Horst; and Kleinschmit, Peter, 4,855,470, Cl. 556-421.000.

Grieb, John H.; Joseph, J. M.; Weaver, Richard D.; and Bata, George T., to Siemens-Bendix Automotive Electronics L.P. Method of making multi-stream thin edge orifice disks for valves. 4,854,024, Cl. 29-156.70R.

Griebeler, Elmer L., to Cleveland Machine Controls, Inc. Device for controlling operating gap of cutting head and method of using same. 4,854,551, Cl. 266-76.000.

Griffey, Donald E., to Zenith Electronics Corporation. High voltage shutdown circuit with brightness tracking. 4,855,864, Cl. 361-91.000.

Griffith, Ronald C.; and Napier, James J., to Pennwalt Corporation Antihistamines. 4,855,462, Cl. 549-354.000.

Griffiths, Edward E. Remotely engagable power actuator. 4,854,188, Cl. 74-625.000.

Grigat, Ernst: *See—*
Rasshofer, Werner; Grigat, Ernst; Grogler, Gerhard; Hess, Heinrich; and Kopp, Richard, 4,855,504, Cl. 564-395.000.

Grigg, Douglas W.: *See—*
Wilson, Robert D.; Grigg, Douglas W.; and Gialanella, Donald G., 4,854,575, Cl. 272-122.000.

Grimminger, Rolf D.: *See—*
Hanke, Peter; and Grimminger, Rolf D., 4,854,671, Cl. 350-252.000.

Grimminger, Wolf; Gorler, Klaus; and Odenthal, Karl P., to Madaus GmbH & Co. Process for the preparation of azoniaspironortropanol esters. 4,855,422, Cl. 540-466.000.

Grob & Co. Akt.: *See—*
Steiner, Ernst, 4,854,351, Cl. 139-353.000.

Grobbel, Ronald M., to Syndevco, Inc. Electrical power distribution terminal block assembly. 4,854,897, Cl. 439-716.000.

Grogl, Max: *See—*
Kuhn, Raymond E.; Estrada, John J.; and Grogl, Max, 4,855,408, Cl. 530-350.000.

Grogler, Gerhard: *See—*
Rasshofer, Werner; Grigat, Ernst; Grogler, Gerhard; Hess, Heinrich; and Kopp, Richard, 4,855,504, Cl. 564-395.000.

Grolig, Gerhard; and Schmidt, Guenther, to Hoechst Aktiengesellschaft. Coated plastic film and plastic laminate prepared therefrom. 4,855,186, Cl. 428-216.000.

Groover, Robert, III: *See—*
Esquivel, Agerico L.; Groover, Robert, III; and Tigelaar, Howard L., 4,855,800, Cl. 357-23.500.

Grossman, Mark W.; and George, William A., to GTE Products Corporation. Fluorescent lamp unit with magnetic field generating means. 4,855,635, Cl. 313-156.000.

Groves, Keith N. Pop-up practice batting tee. 4,854,587, Cl. 273-26.00R

Grubb, Mary B.: *See—*
Bolgiano, Nicholas C.; Grubb, Mary B.; Hudson, Raymond S.; and Sigman, William T., 4,855,165, Cl. 427-393.500.

Gruen, Dieter M.; Young, Charles E.; and Pellin, Michael J., to ARCH Development Corp. Photo ion spectrometer. 4,855,596, Cl. 250-305.000

Grumman Aerospace Corporation: *See—*
Wedgwood, Janet E.; Berde, Dennis W.; Bocskor, Steven J.; and Cotter, George E., 4,856,079, Cl. 455-50.000.

Grund, Andreas; Prescher, Guenter; Boehme, Georg; Hofen, Willi; and Petsch, Heinrich, to Degussa Aktiengesellschaft. Process for the treatment of aliphatic epoxides. 4,855,465, Cl. 549-525.000.

Grunfeld, Yona: *See—*
Fisher, Abraham; Karton, Ishai; Heldman, Eliahu; Levy, Aharon; and Grunfeld, Yona, 4,855,290, Cl. 514-278.000.

Gschwender, Alois; Szeteli, Andreas; and Kruger, Horst, to Flux-Geräte GmbH. Pump with improved seal. 4,854,834, Cl. 417-423.300.

GTE Laboratories Incorporated: *See—*
Raman, Ramaswamy V.; and Hsu, Shih C., 4,854,980, Cl. 148-403.000.

GTE Products Corporation: *See—*
Cannon, Donald M., 4,854,888, Cl. 439-236.000.
Gagnon, Peter R.; and Benson, Timothy A., 4,855,634, Cl. 313-113.000.
Grossman, Mark W.; and George, William A., 4,855,635, Cl. 313-156.000.
Melanson, Lionel J., 4,855,575, Cl. 219-541.000.
Mellor, Charles E., 4,854,670, Cl. 350-166.000.
White, Philip J., 4,855,643, Cl. 313-553.000.

GTE Service Corporation: *See—*
Cooper, David A.; and Barlow, Robert W., 4,854,661, Cl. 350-96.200.

GTE Valenite Corporation: *See—*
Lowe, Tony; and Bernadic, Thomas, 4,854,785, Cl. 407-115.000.

Gude, Fritz; and Bellut, Hans, to Huels Aktinegesellschaft. Process for the preparation of dicyclopentenol esters. 4,855,488, Cl. 560-249.000.
Guenther, Werner; Heubeck, Erich; and Muether, Manfred, to Siemens Aktiengesellschaft. Dental x-ray diagnostics installation for producing panoramic exposures of slices in the skull. 4,856,038, Cl. 378-39.000.
Guez, Moshe. Method and apparatus for placing indicia on cinematic film. 4,854,696, Cl. 352-90.000.
Guiducci, Mariano: *See*—
Murugesan, Natesan; and Guiducci, Mariano, 4,855,480, Cl. 560-29.000
Guignard, Claude: *See*—
Gancet, Christian; Guignard, Claude; and Fourmentraux, Philippe, 4,855,233, Cl. 435-135.000.
Guignon, Ernest F.: *See*—
Chao, Yong-Sheng; Fernandez, Salvador M.; and Guignon, Ernest F., 4,855,930, Cl. 364-497.000.
Guindon, Yvan; Yoakim, Christiane; and Morton, Howard E., to Merck & Co., Inc. Process for the preparation of HMG-CoA reductase inhibitors and intermediate compounds employed therein. 4,855,481, Cl. 560-55.000
Gukkenberger, Horst; and Eberle, Karl, to U.S. Philips Corporation. Method of manufacturing a magnetic head. 4,854,035, Cl. 29-603.000.
Gullichsen, Johan, to A. Ahlstrom Corporation. Method and apparatus for pumping fibre suspensions. 4,854,819, Cl. 415-143.000
Gurley, Gene S.: *See*—
Simpson, Willis D.; and Gurley, Gene S., 4,855,900, Cl. 364-200.000.
Gustav Magenwirth GmbH & Co.: *See*—
Betz, Manfred, 4,855,704, Cl. 336-132.000.
Gutmann, Alexander: *See*—
Hirsch, Eitan; Gutmann, Alexander; Schwartz, Ana; Goren, Eliezer; Perlmuter, Nikolai; and Tal, Reuven, 4,854,240, Cl. 102-476.000
Gutmann, Friedrich: *See*—
Margureana, Gabriella; and Gutmann, Friedrich, 4,855,494, Cl. 562-580.000.
Gutterman, Pamela R.; Harms, Sherry J.; and Hoffer, John C., to AMP Incorporated. Linear translation switch with optical fibers. 4,854,660, Cl. 350-96.180.
Gyger, Fritz, Jr. Stylus. 4,855,989, Cl. 369-173.000
Gyimothy, Gabor, to Alfatechnic AG. Tablet dispenser. 4,854,478, Cl. 221-190.000.
H. Lundbeck A/S: *See*—
Perregaard, Jens K., 4,855,307, Cl. 514-327.000
H.S.G. Venture (a Joint Venture Partnership): *See*—
Simic-Glavaski, Branimir, 4,855,243, Cl. 436-63.000.
H. Stoll GmbH & Co.: *See*—
Stoll, Thomas; Killus, Martin; and Mak, Gerd, 4,856,104, Cl. 364-470.000.
Haack, Richard A.: *See*—
Djuric, Stevan W.; Haack, Richard A.; and Yu, Stella S., 4,855,324, Cl. 514-570.000.
Haddad, Muin S.; and Schimandle, John J., to Amoco Corporation. Boronaaronate molecular sieve. 4,855,270, Cl. 502-64.000.
Haener, Juan. Insulated interlocking building blocks. 4,854,097, Cl. 52-309.110.
Haentjens, Walter D. Remotely removable and replaceable motor for hazardous service pump installation. 4,854,828, Cl. 417-360.000.
Hafner, C.: *See*—
Frank, Christian; and Knosp, Helmut, 4,854,082, Cl. 51-109.00R.
Hafner, Rudolf, to JD-Technologie AG. Security device for conveying systems with unmanned vehicles. 4,855,717, Cl. 340-556.000.
Haga, Shoji: *See*—
Koide, Toshikazu; Ida, Shuichiro; Yoshinaka, Toshio; Nagano, Shuji; and Haga, Shoji, 4,854,414, Cl. 180-249.000.
Hagan, Vincent de P., to Vince Hagan Company, The. Apparatus and method for mixing concrete. 4,854,711, Cl. 366-46.000.
Hagen, Gary P.: *See*—
Fjare, Douglas E.; and Hagen, Gary P., 4,855,503, Cl. 564-394.000.
Hager, Francis M.: *See*—
Baugh, James D.; and Hager, Francis M., 4,854,746, Cl. 384-432.000.
Haggart, John A., to Corrugated Products Limited. Packages for carbonated beverages. 4,854,483, Cl. 222-95.000.
Haggstrom, Rolf P., to BLH Electronics, Inc. Coaxial load cell. 4,854,179, Cl. 73-862.660.
Hagita, Hidenari: *See*—
Murakami, Sanpei; Miyaaki, Tohru; Imahori, Tokio; Ogata, Koichi; and Hagita, Hidenari, 4,855,146, Cl. 426-5.000.
Hagiwara, Hiroshi: *See*—
Eguchi, Hitoshi; Kuribara, Motoaki; Onodera, Tugio; Kobayashi, Koji; Fujino, Ikuo; Hagiwara, Hiroshi; and Ogino, Seiichi, 4,855,609, Cl. 290-48.000.
Hagman, Anders: *See*—
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Hagon, John W.: *See*—
Little, Henry M. T.; and Hagon, John W., 4,854,503, Cl. 239-167.000.
Hagstrom, Robert, to Autopart Sweden AB. Sun visor for motor vehicles and process for its manufacture. 4,854,629, Cl. 296-97.130.
Hagy, Henry E.: *See*—
Dumbaugh, William H., Jr.; and Hagy, Henry E., 4,855,260, Cl. 501-66.000.
Hahn, Michael W.: *See*—
Jolliff, Daniel; Hahn, Michael W.; and Oldham, Dean C., 4,854,590, Cl. 273-138.00A.
Hahn, Ulrich: *See*—
Hartweck, Winfried G.; and Hahn, Ulrich, 4,854,861, Cl. 432-14.000
Haikonen, Pentti O.: *See*—
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Hailey, James E.: *See*—
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Haines, Richard M.: *See*—
Paul, F. Ronald; Haines, Richard M.; and Hill, Homer G., 4,855,341, Cl. 523-443.000.
Hair, John, II, to Child Safety Products. Child proof container. 4,854,448, Cl. 206-1.500.
Halberg, Laurie L., to Custom Products of Litchfield, Inc. Carrying rack for a vehicle. 4,854,628, Cl. 296-3.000.
Halbig, Walter A., to ITEC, Inc. Semiconductor subscriber line interface circuit with enhanced survivability. 4,856,059, Cl. 379-412.000.
Haldric, Bernard; Benedi, Gregorio; and Baudon nee Chardon, Sylvie, to NACAM. Anti-rotation locking device including a torque limitation for a motor vehicle steering column. 4,854,141, Cl. 70-182.000.
Hall, Iris H.: *See*—
Spielvogel, Bernard F.; McPhail, Andrew T.; and Hall, Iris H., 4,855,493, Cl. 562-575.000.
Hall, John L.; and Zhu, Miao, to University Patents, Inc. Method and appartus for laser control. 4,856,009, Cl. 372-32.000.
Hall Surgical Division of Zimmer, Inc.: *See*—
Linden, Harry A., 4,854,873, Cl. 433-173.000.
Hallett, Robert; and Ketelaar, Edward, Jr. Alarm apparatus for a freezer. 4,855,721, Cl. 340-585.000.
Hallgren, John E.: *See*—
Bolon, Donald A.; Eddy, Victoria J.; and Hallgren, John E., 4,855,199, Cl. 430-18.000.
Halliburton Company: *See*—
Davis, Gail F.; Baker, Robert L.; Bragg, Dale E.; and Stegemoeller, Calvin L., 4,854,714, Cl. 366-132.000
Halliburton Geophysical Services, Inc.: *See*—
Sallas, John J.; Weber, Richard M.; and Lamance, David S., 4,855,967, Cl. 367-190.000.
Halling, Horace P.; Barrett, Robert A.; and Woozley, Mark E., to EG&G Pressure Science, Inc. Pressure balanced metallic S-seal. 4,854,600, Cl. 277-236.000.
Halpern, Donald F.; and Robin, Mark L., to BOC, Inc. Process for preparing $CHF_2OCHFCF_3$ and $CHF_2OCHClCF_3$ and novel intermediate compounds employed therein. 4,855,511, Cl. 568-683.000.
Halpern, Steven J.: *See*—
Dew, Douglas K.; Hsu, Long S.; and Halpern, Steven J., 4,854,320, Cl. 128-397.000
Halpin, Michael W., to Flow Technology, Inc. Apparatus and method for determining the flow characteristics of a volumetric flowmeter. 4,854,154, Cl. 73-3.000.
Hamada, Takuji; Takahashi, Masahiro; Yoneda, Katsuhiko; Onuki, Ken; and Uchiyama, Toshihiko, to 501 Hitachi, Ltd. Method and apparatus for detecting a fault in a ring network data transmission system. 4,855,993, Cl. 370-16.000.
Hamada, Yuji: *See*—
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Nakamura, Takuya; Aoshima, Shinichiro; and Tsuchiya, Yutaka, 4,855,591, Cl. 250-225.000.
Hamano, Fumio: *See*—
Oho, Shigeru; Hirayama, Takeshi; Matsumoto, Masahiro; Hasegawa, Akira; Hamano, Fumio; and Shibata, Takanori, 4,855,896, Cl. 364-138.000.
Hamasaki, Yukio: *See*—
Kimura, Fumio; Takahashi, Shunzo; and Hamasaki, Yukio, 4,855,981, Cl. 369-44.000.
Hamerslag, James D.; and Musk, Robert W., to BT&D Technologies, Ltd. Optical devices. 4,854,659, Cl. 350-96.150.
Hamlin, John E.: *See*—
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Hamma, Kentaro: *See*—
Kimura, Hiroyuki; Kobori, Yasunori; Hamma, Kentaro; Omata, Takashi; and Oki, Katsunori, 4,855,840, Cl. 358-296.000.
Hammelsbacher, Karlheinz: *See*—
Meisner, Alfred; and Hammelsbacher, Karlheinz, 4,855,971, Cl. 368-188.000.
Hammond, Peter M.: *See*—
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Hanada, Masayuki: *See*—
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,855,115, Cl. 423-239.000.
Hanakura, Niichi, to Sakura Color Products Corp. Cigarette having thermochromogenic portions thereon. 4,854,332, Cl. 131-365.000.
Hanatani, Shinji; Sugiyama, Yoshiaki; and Chino, Hisayoshi, to Sony Corporation. Device for loading a tape-like substance. 4,855,846, Cl. 360-84.000.
Hancock, David; Hoyt, Robert; and Formica, Joseph, to Eastman Kodak Company. System for guiding a user in orienting an application insert having a plurality of datastrips relative to a datastrip reader. 4,855,579, Cl. 235-436.000.
Haneda, Mitsuaki: *See*—
Okada, Ryoji; Haneda, Mitsuaki; Araya, Takeshi; and Hioki, Susumu, 4,855,102, Cl. 419-8.000.
Hanibuchi, Toshiaki: *See*—
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Hanke, Peter; and Grimminger, Rolf D., to Optische Werke G. Rodenstock. Mount for optical elements. 4,854,671, Cl. 350-252.000.
Hanna, Junichi: *See*—
Hirooka, Masaaki; Ishihara, Shunichi; Hanna, Junichi; and Shimizu, Isamu, 4,855,210, Cl. 430-133.000.
Hansen, Ries B.: *See*—
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Hanson, Charles B.: *See*—
Smith, Wayne G.; Martinez, David V.; Mozingo, Robert E.; and Hanson, Charles B., 4,854,812, Cl. 414-723.000.
Smith, Wayne G.; Martinez, David V.; Mozingo, Robert E.; and Hanson, Charles B., 4,854,814, Cl. 414-723.000.
Hara, Hiromu: *See*—
Murase, Kiyoshi; Mase, Toshiyasu; Hara, Hiromu; and Tomioka, Kenichi, 4,855,310, Cl. 514-361.000.
Hara, Hiroshi: *See*—
Ohmura, Hiroshi; Ushiro, Seimei; Hara, Hiroshi; Asano, Seiji; and Yoshida, Toshio, 4,855,774, Cl. 354-203.000.
Hara, Osamu: *See*—
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Hara, Seiichiro; and Hoshi, Yoshikazu, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Rotation angle measuring apparatus. 4,854,284, Cl. 123-414.000.
Hara, Shinichi: *See*—
Suzuki, Masayuki; Hara, Shinichi; Kimura, Kuniaki; Ono, Takeo; Nakamura, Munekazu; and Ohguchi, Yoshihiro, 4,855,123, Cl. 423-562.000.
Hara, Yoshitaka: *See*—
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Harada, Seiichi: *See*—
Kozawa, Tadashi; Natsume, Naohiro; Komatsubara, Hirofumi; Takaku, Yasunori; Kato, Kiyoshi; and Harada, Seiichi, 4,854,830, Cl. 417-365.000.
Harandi, Mohsen N.; and Owen, Hartley, to Mobil Oil Corporation. Aromatization and etherification process integration. 4,854,939, Cl. 44-77.000
Harandi, Mohsen N.; and Owen, Hartley, to Mobil Oil Corporation. Process for combining the operation of oligomerization reactors containing a zeolite oligomerization catalyst. 4,855,524, Cl. 585-517.000
Harding, Ade'yemi S. K. Preformed packaging arrangement for energy dissipating devices. 4,855,868, Cl. 361-386.000.
Hareyama, Kisichiro; and Hareyama, Shokichi, to Kabushiki Kaisha Hareyama Giken. Internal combustion engine. 4,854,281, Cl. 123-292.000.
Hareyama, Shokichi: *See*—
Hareyama, Kisichiro; and Hareyama, Shokichi, 4,854,281, Cl. 123-292.000.
Hargest, Thomas S. Pollution control apparatus for marine fuel tanks. 4,854,469, Cl. 220-86.00R.
Harigaya, Makoko: *See*—
Kobayashi, Hiroshi; Machida, Haruhiko; Harigaya, Makoko; Ide, Yasushi; and Axedo, Jun, 4,855,256, Cl. 437-129.000.
Harju, Matti; and Heikonen, Matti, to Valio Meijerien Keskusosuusliike. Process for the demineralization of whey or a liquid based on whey and for producing an acid mixture and a base mixture useful in food industries. 4,855,056, Cl. 210-638.000.
Harms, Sherry J.: *See*—
Gutterman, Pamela R.; Harms, Sherry J.; and Hoffer, John C., 4,854,660, Cl. 350-96.180.
Harnischfeger Corporation: *See*—
Oliphant, Larry J., 4,854,547, Cl. 254-271.000.
Harper, Peter W.: *See*—
Czarnocki, Walter S.; Harper, Peter W.; Moran, Kevin S.; and Alexander, Steven W., 4,854,167, Cl. 73-204.190.
Harpold, Michael M.: *See*—
Stroman, David W.; Brust, Paul F.; Ellis, Steven B.; Gingeras, Thomas R.; Harpold, Michael M.; and Tschopp, Juerg F., 4,855,231, Cl. 435-68.000.
Harrell, Timothy J., to Cooper Industries, Inc. Intermediate component for an electrical connector and method of manufacture. 4,854,894, Cl. 439-606.000.
Harrigan, Linda M.; and Jaworski, Marlene H. Patient bed restraint. 4,853,996, Cl. 5-494.000.
Harrington, Richard F.; and Selgrad, James, to Aetna Bearing Company. Radially adjustable clutch release bearing assembly. 4,854,437, Cl. 192-98.000.
Harris Corporation: *See*—
Raby, Joseph S., 4,854,986, Cl. 156-87.000.
Webb, Robert W., 4,855,625, Cl. 307-491.000.
Harris Graphics Corporation: *See*—
Emery, David C.; Field, David G.; and Leck, Derek C., 4,854,234, Cl. 101-364.000.
Harris, James L.: *See*—
Banerjee, Chandra K.; Farrier, Ernest G.; Harris, James L.; Norman, Alan B.; Resce, James L.; Reynolds, John H., IV; Ridings, Henry T.; Sensabaugh, Andrew J., Jr.; Shannon, Michael D.; and Shelar, Gary R., 4,854,331, Cl. 131-194.000.
Harris, Stephen J., to Loctite (Ireland) Ltd. Functionalized oxacalixarenes, their preparation and use in instant adhesive compositions. 4,855,461, Cl. 549-348.000.
Harrison, Frank. Temperature controlling apparatus. 4,854,374, Cl. 165-47.000.
Harrop, David; Sharpe-Geisler, Bradley A.; and Sharpe-Geisler, Valli R., to Sensor Science. Impact detection apparatus. 4,855,711, Cl. 340-323.00R.
Hart, Billy D., to Rockwell International Corporation. Noise generator with shaped spectrum. 4,855,944, Cl. 364-602.000.
Hart, Stephen C., to Morton Thiokol, Inc. Powder coating containing an epoxy resin, acrylic resin and polyamide. 4,855,358, Cl. 525-113.000.
Hartmann, Erwin: *See*—
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Hartweck, Winfried G.; and Hahn, Ulrich, to Deutsche Filterbau GmbH. Process for calcining limestone. 4,854,861, Cl. 432-14.000.
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Harvey, Donald M., to Eastman Kodak Company. Motor-driven film transport apparatus. 4,855,773, Cl. 354-173.100.
Harvey, James A.: *See*—
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Hasan, Saleem: *See*—
Beard, Richard B.; Hasan, Saleem; Scoles, Kevin J.; and Onaral, Banu, 4,854,865, Cl. 433-18.000.
Hasegawa, Akira: *See*—
Oho, Shigeru; Hirayama, Takeshi; Matsumoto, Masahiro; Hasegawa, Akira; Hamano, Fumio; and Shibata, Takanori, 4,855,896, Cl. 364-138.000.
Hasegawa, Kou: *See*—
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Hasegawa, Yoichi: *See*—
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Hashimoto Corporation: *See*—
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Hashimoto, Isamu; and Nishida, Takao, to Asahi Optical Co., Ltd. Electronically controlled camera. 4,855,772, Cl. 354-173.100.
Hashimoto, Kaoru; and Miyamoto, Hirohisa, to Minolta Camera Kabushiki Kaisha. Image duplicating apparatus having plural copying modes and plural sheet feeding arrangements. 4,855,787, Cl. 355-311.000.
Hashimoto, Kazuo, to Hashimoto Corporation. Telephone terminal equipment having means for preventing malicious and nuisance transmission. 4,856,053, Cl. 379-96.000.
Hashish, Mohamed; and Marvin, Mark, to Flow Industries, Inc. Abrasive swivel assembly and method. 4,854,091, Cl. 51-439.000.
Hasuda, Yoshinori: *See*—
Sasaki, Shigekuni; and Hasuda, Yoshinori, 4,855,390, Cl. 528-170.000.
Hasunuma, Masahiko: *See*—
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Hata, Kunihiro: *See*—
Shikinami, Yasuo; Hata, Kunihiro; and Ohmura, Yutaka, 4,855,077, Cl. 252-518.000.
Hatting, Paul; and Wienen, Kurt. Leak indicating device for centrifugal pump. 4,854,823, Cl. 417-63.000.
Hattori, Torao, to Honda Giken Kogyo Kabushiki Kaisha. Power Transmitting V-belt. 4,854,926, Cl. 474-242.000.
Hatzikazakis, Michael: *See*—
Etemad, Shahrokh; Yannascoli, Donald; and Hatzikazakis, Michael, 4,854,831, Cl. 417-366.000.
Haufe, Wolfgang: *See*—
Rothkegel, Bernhard; and Haufe, Wolfgang, 4,855,104, Cl. 419-28.000.
Haugland, Richard P.: *See*—
Fung, Steven; Woo, Sam L.; Haugland, Richard P.; Menchen, Steven M.; and Connell, Charles R., 4,855,225, Cl. 435-6.000.
Hauk, Rolf, to Korf Engineering GmbH. Process for producing carburized sponge iron. 4,854,967, Cl. 75-34.000.
Hauptly, Paul D. Organic liquid detector. 4,855,706, Cl. 338-34.000.
Hausmann, George J.; and Patton, Donald E., Jr., to Goodyear Tire & Rubber Company, The. Bumper rub strip assembly. 4,854,258, Cl. 114-219.000.
Hautemont, Jean-Claude, to Erca Holding. Device for producing and positioning a label on a thermoformed container. 4,854,850, Cl. 425-503.000.
Havins, Felton H. Boat speed and direction control system. 4,854,902, Cl. 440-7.000.

Hawkins, Christopher M.; and Bostick, Edgar E., to General Electric Company. Cyclopentadiene-containing cyclic polycarbonate oligomer. 4,855,380, Cl. 528-370.000.

Hawkins, Phillip J.; Kasner, William H.; Toth, Vincent A.; and Stroster, Mariann C., to Westinghouse Electric Corp. Laser beam alignment and transport system. 4,855,564, Cl. 219-121.780.

Hayakawa, Shigeru; Shiraishi, Daiichi; and Murakami, Hisakazu, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Door lock for automotive vehicles. 4,854,617, Cl. 292-216.000.

Hayakawa, Shingo, to Canon Kabushiki Kaisha. Photometric device for pseudo format camera. 4,855,780, Cl. 354-432.000.

Hayashi, Satoru: *See*—
Osada, Shuichi; Hayashi, Satoru; Goto, Masaru; and Godo, Kiyoshi, 4,854,529, Cl. 246-187.00B.

Hayashi, Takeshi. Aquatic show boat. 4,854,256, Cl. 114-61.000.

Hayashi, Tatsuya: *See*—
Toya, Hideaki; and Hayashi, Tatsuya, 4,855,547, Cl. 200-144.00B.

Hayashi, Toshihiro: *See*—
Takeda, Satoru; Hayashi, Toshihiro; and Kohno, Hiroshige, 4,854,843, Cl. 425-437.000.

Hayashi, Toshikazu: *See*—
Nakano, Tsunetomo; Hayashi, Toshikazu; and Tsukada, Toshinori, 4,855,215, Cl. 430-283.000.

Hayashi, Yoshihiko; and Orihashi, Ritsuro, to Hitachi, Ltd. Time interval measurement apparatus. 4,855,970, Cl. 368-120.000.

Hayashi, Yoshinori: *See*—
Muramatsu, Toshihiro; Iijima, Kenzaburou; and Hayashi, Yoshinori, 4,855,740, Cl. 341-23.000.

Hayashibara, Ken: *See*—
Masaki, Kazumi, 4,855,649, Cl. 315-310.000.

Hayauchi, Yutaka: *See*—
Lockhoff, Oswald; Hayauchi, Yutaka; Stadler, Peter; Stunkel, Klaus G.; Streissle, Gert; Paessens, Arnold; Klimetzek, Volker; Zeiler, Hans-Joachim; Metzger, Karl G.; Kroll, Hein-Peter; Brunner, Helmut; and Schaller, Klaus, 4,855,283, Cl. 514-8.000.

Hayes, John B.; and Armstrong, Douglas L., to Professional Training Systems, Inc. Dedicated programmable controller for interactive video disc system. 4,855,842, Cl. 358-342.000.

Hayes, John E.: *See*—
Gastinger, Robert G.; and Hayes, John E., 4,855,330, Cl. 521-137.000.

Hayes, John G.: *See*—
Henze, Christopher P.; Mohan, Ned; and Hayes, John G., 4,855,888, Cl. 363-17.000.

Hayes Microcomputer Products, Inc.: *See*—
Bhargava, Vikram; and Heberling, James R., 4,855,873, Cl. 361-424.000.

Hayford, Michael J.; and Koch, Donald G., to Honeywell Inc. Optical arrangement. 4,854,688, Cl. 350-571.000.

Hays, Jean-Francois; Legrand, Pierre; Verna, Eric; Delzenne, Michel; Reynaud, Bernard; and Gaillard, Pierre, to L'Air Liquide. Process for striking an arc in electric welding and welding torch employing said process. 4,855,566, Cl. 219-130.400.

Heartz, Robert A., to General Electric Company. Data block processing for fast image generation. 4,855,937, Cl. 364-521.000

Heath, William W.; and Cole, John C. Aircraft carrier simulator and method. 4,854,876, Cl. 434-29.000.

Heberling, James R.: *See*—
Bhargava, Vikram; and Heberling, James R., 4,855,873, Cl. 361-424.000.

Hebert Raymond T., to Micro Video, Inc. Transimpedance amplifier with noise reduction and bandwidth compensation. 4,855,687, Cl. 330-304.000.

Hebrard, Denis: *See*—
Argintaru, Lazare; and Hebrard, Denis, 4,855,691, Cl. 331-172.000.

Hedger, James E., Jr.; and Charette, Joseph G., to Graves Spray Supply Co., Inc. Fiberglass spray nozzle. 4,854,504, Cl. 239-294.000.

Hedley Purvis Limited: *See*—
Walton, John N., 4,854,197, Cl. 81-57.390.

Heenan, Sidney A.: *See*—
Flanagan, Robert M.; and Heenan, Sidney A., 4,854,768, Cl. 404-11.000.

Heidelberger Druckmaschinen AG: *See*—
Thunker, Norbert; Spiegel, Nikolaus; Lorenz, Roland; and Joss, Werner, 4,854,236, Cl. 101-411.000.

Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Jahn, Hans-Georg, 4,854,231, Cl. 101-177.000

Heidrich, Helmut; Hoffmann, Detlef; and Nolting, Hans-Peter, to Siemens Aktiengesellschaft. Arrangement for polarization control, such as for an optical heterodyne or homodyne receiver. 4,856,094, Cl. 455-619.000.

Heijwegen, Cornelis P.; and Kat, Willem, to Hoogovens Groep B.V. Method for treating blast furnace gas and apparatus for carrying out that method. 4,854,946, Cl. 55-85.000.

Heikonen, Matti: *See*—
Harju, Matti; and Heikonen, Matti, 4,855,056, Cl. 210-638.000

Heimbecher, Eugene F., II: *See*—
Ruben, Paul W.; Heimbecher, Eugene F., II; and Dilley, David L., 4,855,946, Cl. 364-721.000.

Hein, Richard D., to GenCorp Inc. Slip bearing for a sway bar clamp. 4,854,766, Cl. 403-224.000.

Heinonen, Jarmo, to Oy Tampella AB. Arrangement for supporting of a shank of a drilling machine. 4,854,394, Cl. 173-105.000.

Heins, Hans-Peter: *See*—
Lange, Heinz; Heins, Hans-Peter; and Jendricke, Hermann, 4,854,755, Cl. 400-208.100.

Heldman, Eliahu: *See*—
Fisher, Abraham; Karton, Ishai; Heldman, Eliahu; Levy, Aharon; and Grunfeld, Yona, 4,855,290, Cl. 514-278.000.

Heller, Jorge; Penhale, Donald W. H.; and Ng, Steve Y., to S R I International. Method of preparing bioerodible polymers having pH sensitivity in the acid range and resulting product. 4,855,132, Cl. 424-78.000.

Hellwig, Rolf: *See*—
Synofzik, Reinhard; Hellwig, Rolf; and Karius, Klaus D., 4,854,241, Cl. 102-489.000.

Helvy, Fred A.; and Butterwick, Gilbert N., to Burle Technologies, Inc. Focusing electrode structure for photomultiplier tubes. 4,855,642, Cl. 313-532.000.

Hemingway, Ronald L.: *See*—
Trinh, Toan; Wahl, Errol H.; Swartley, Donald M.; and Hemingway, Ronald L., 4,855,072, Cl. 252-8.800.

Hemsath, Klaus H., to Gas Research Institute. Convective heat transfer within an industrial heat treating furnace. 4,854,860, Cl. 432-5.000.

Hemsath, Klaus H., to Gas Research Institute. Convective heat transfer within an industrial heat treating furnace. 4,854,863, Cl. 432-176.000.

Hen, John, to Mobil Oil Corporation. Process for preparing ethylene-higher olefin copolymer oils with Ziegler-Natta catalyst in mixed aliphatic-aromatic solvent. 4,855,526, Cl. 585-524.000.

Hendrick, Kendall B.; and Reader, John R., Jr., to Du Pont de Nemours, E. I., and Company. Parallel plate dielectric analyzer. 4,855,667, Cl. 324-61.00R.

Hendrick, Michael E.: *See*—
Brennan, Thomas M.; and Hendrick, Michael E., 4,855,454, Cl. 549-68.000.

Hendrickson, Carol E.; Uy, Rosa; and Mencke, Arlene J., to Minnesota Mining and Manufacturing Company. Biologically active protein immobilized with a polymeric fibrous support. 4,855,234, Cl. 435-181.000.

Hendry, James W., to Ladney, Michael. Method for the injection molding of plastic articles using fluid pressure. 4,855,094, Cl. 264-40.300

Hengstenberger, Gary M.; and Montavon, John I. Safety harness. 4,854,418, Cl. 182-3.000

Henkel Kommanditgesellschaft auf Aktien: *See*—
Pohl, Joachim; Carduck, Franz-Josef; and Goebel, Gerd, 4,855,273, Cl. 502-244.000

Hentschel, Volker; Versteegen, Clemens; Mahmens, Olaf; and Babendererde, Siegmund, to Hochtief Aktiengesellschaft Vorm. Gebr. Helfmann. Process and apparatus for lining a tunnel with concrete. 4,854,776, Cl. 405-147.000.

Henze, Christopher P.; Mohan, Ned; and Hayes, John G., to Unisys Corporation. Constant frequency resonant power converter with zero voltage switching. 4,855,888, Cl. 363-17.000.

Hepco Slide Systems, Ltd.: *See*—
Forster, Gervase L., 4,854,739, Cl. 384-13.000.

Heppke, Gerd; Bahr, Christian; Muller, Ingrid; Ohlendorf, Dieter; and Wingen, Rainer, to Hoechst Aktiengesellschaft. Chiral esters formed from α-substituted carboxylic acids and mesogenic hydroxyl compounds, and their use as dopants in liquid-crystalline phases. 4,855,429, Cl. 544-335.000.

Her, Fwu-Long. Full-range temperature indicator device and circuitry. 4,854,723, Cl. 374-179.000.

Heraeus Elektroden GmbH: *See*—
Fabian, Peter; Krebs, Helmut; and Simon, Heinrich, 4,855,032, Cl. 204-286.000.

Herberts Gesellschaft: *See*—
Becker, Heinz D.; Bederke, Klaus; Dahm, Ralf; Kerber, Hermann; Sadowski, Fritz; and Stephan, Werner, 4,855,342, Cl. 524-31.000.

Hercules Incorporated: *See*—
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Herdle, William B.: *See*—
Blevins, Charles H., II; Herdle, William B.; and Murphy, Gerald J., 4,855,329, Cl. 521-112.000.

Herdzina, Frank J.; and Goodrich, Rollie M., to Service Tool Die & Mfg. Co. Dual lane conversion system. 4,854,799, Cl. 413-66.000.

Hergeth Hollingsworth GmbH: *See*—
Pinto, Akiva; and Lucassen, Guenter, 4,854,013, Cl. 19-200.000.

Hergeth, Hubert. Apparatus for detecting extraneous components in a textile fiber preparation installation. 4,854,171, Cl. 73-572.000.

Herman, John E.: *See*—
Baile, Gnaneshwar R.; Herman, John E.; and Wyshak, Geoffrey M., 4,855,469, Cl. 556-409.000.

Herman Miller, Inc.: *See*—
Goodman, Steve F., 4,854,140, Cl. 70-100.000.

Hermes Precisa Internatinal S.A.: *See*—
Rossopoulos, Stephane, 4,854,752, Cl. 400-124.000.

Hermetic Switch, Inc.: *See*—
Posey, William T., 4,855,719, Cl. 340-568.000

Herndon, George W. Swivel wheel wheelbarrow. 4,854,601, Cl. 280-47.310.

Heron, Roger A.; Saunders, David H.; and Fairhurst, Robert M., to British Hydromechanics Research Association, The. Feeding abrasive material. 4,854,090, Cl. 51-410.000

Herrmann, Wilfried: *See*—
Nandi, Kumaresh; Fischer, Helga; Herrmann, Wilfried; Kohne, Hans; Lahr, Wolfgang; Schmersahl, Hein U.; and Walch, Hatto, 4,855,300, Cl. 514-264.000.

Herschel Corporation: *See*—
Speck, Cleo T., 4,854,114, Cl. 56-296.000.

Hertrich, Steffen; and Goppelt, Dieter, to INA Walzlager Schaeffler KG. Belt tensioning device. 4,854,922, Cl. 474-110.000.

Herzfeld, David: *See*—
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Herzig, Jaacov: *See*—
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Hess, Heinrich: *See*—
Rasshofer, Werner; Grigat, Ernst; Grogler, Gerhard; Hess, Heinrich; and Kopp, Richard, 4,855,504, Cl. 564-395.000.

Hessenthaler, George D. Jig for aligning cutter blades. 4,854,051, Cl. 33-628.000.

Hester, Richard K., to Texas Instruments Incorporated. Analog interface system. 4,855,743, Cl. 341-110.000.

Heubeck, Erich: *See*—
Guenther, Werner; Heubeck, Erich; and Muether, Manfred, 4,856,038, Cl. 378-39.000.

Hewitt, Nevil E.: *See*—
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Hewlett-Packard: *See*—
Tan, Michael; Su, Chung-Yi; and Anklam, William J., 4,855,696, Cl. 333-20.000.
Weber, Charles M., 4,855,253, Cl. 437-8.000.

Hewlett-Packard Company: *See*—
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Bergstedt, Donald B., 4,855,752, Cl. 346-1.100.
Merrick, Edwin B., 4,854,326, Cl. 128-675.000.
Vincent, Kent D.; and Myerholtz, Carl A., 4,855,909, Cl. 364-413.010.

Hewlings, Winston G. System and method of damping waves on a body of water using towable field of ice pieces of random sizes. 4,854,780, Cl. 405-211.000.

Hibino, Hiroki; Kimura, Kenji; Kanno, Masahide; Nishikori, Toshiaki; Yoshinaga, Jun; Kidawara, Atsushi; Yabe, Hisao; Katou, Shinichi; Takamura, Koji; and Nakamura, Takeaki, to Olympus Optical Co., Ltd. Endoscope imaging system for use with multiple color imaging systems. 4,855,819, Cl. 358-98.000.

Hickley, Pieter; and Claassen, Cornelius J. Cooling process and apparatus. 4,854,129, Cl. 62-304.000.

Hideshima, Masayuki: *See*—
Sekine, Akihiko; Wada, Shinji; Yokokura, Takashi; Nunokawa, Kazuo; and Hideshima, Masayuki, 4,854,691, Cl. 351-221.000.

Higashidani, Akira: *See*—
Ohkawa, Fujio; Higashidani, Akira; and Maeda, Hiroyuki, 4,854,555, Cl. 267-64.240.

Higashihara, Masaki: *See*—
Suda, Yasuo; Higashihara, Masaki; and Kadohara, Terutake, 4,855,777, Cl. 354-402.000.

Higbee, Wallace C.: *See*—
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Higuchi, Sadashi: *See*—
Tsuchiya, Soji; Ito, Yoshimasa; Higuchi, Sadashi; and Yamashita, Akio, 4,855,727, Cl. 340-785.000.

Hiiro, Hiroyuki, to Fuji Photo Film Co., Ltd. Light beam recorder with an afocal anamorphic optical amplifier. 4,855,761, Cl. 346-108.000.

Hijikata, Toshiki: *See*—
Yano, Seiki; and Hijikata, Toshiki, 4,856,006, Cl. 372-22.000.

Hill, Homer G.: *See*—
Paul, F. Ronald; Haines, Richard M.; and Hill, Homer G., 4,855,341, Cl. 523-443.000.

Hillebrand, Robert D.; and Wilson, Charles W., to Lear Siegler, Inc. Lift axle control system. 4,854,409, Cl. 180-24.020.

Hilti Aktiengesellschaft: *See*—
Bergner, Arndt, 4,854,482, Cl. 222-94.000.

Hilty, Terrence K.: *See*—
Campbell, William H.; and Hilty, Terrence K., 4,855,471, Cl. 556-430.000.

Himmelbauer, Erich E., to U.S. Philips Corporation. Camera tube system and electron gun therefor. 4,855,638, Cl. 313-389.000.

Himmler, Gunther, to Hofmann Werkstatt-Technik GmbH. Method for balancing a rotor, in particular a motor vehicle wheel, in two planes. 4,854,168, Cl. 73-459.000.

Hinchey, Christopher B.: *See*—
Beard, David R.; Gibson, Peter J.; and Hinchey, Christopher B., 4,854,408, Cl. 180-9.320.

Hinden, Milton. Resistance weld pin and method of welding. 4,855,561, Cl. 219-93.000.

Hinden, Milton. Weld pin for insulation attachment. 4,855,562, Cl. 219-93.000.

Hinkhouse, Lysle R.: *See*—
Bethell, George L.; Burch, Donald F.; and Hinkhouse, Lysle R., 4,853,995, Cl. 5-481.000.

Hino, Fumio: *See*—
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Hino, Kiyoshi: *See*—
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Hino, Shirou: *See*—
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Hioki, Susumu: *See*—
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Hirai, Kikuo: *See*—
Muraishi, Katsuaki; Yaginuma, Nakatsugu; Hirai, Kikuo; Arai, Fuminori; and Iwata, Yuzo, 4,855,109, Cl. 422-63.000.

Hirai, Mikio; Tatsuda, Tokuo; and Yoshida, Tomio, to Sumitomo Naugatuck Co., Ltd. Molding resin composition. 4,855,355, Cl. 525-64.000.

Hirai, Takeo: *See*—
Hojo, Shiro; Hasegawa, Yoichi; and Hirai, Takeo, 4,855,501, Cl. 564-314.000.

Hiraki, Yasuhito: *See*—
Chino, Naoyoshi; Hiraki, Yasuhito; and Sato, Tsunehiko, 4,854,262, Cl. 118-411.000.

Hiramatsu, Tohru; Tami, Kazuya; and Ohchi, Torao, to Okyo Juki Industrial Co., Ltd. Automatic sewing machine exclusively used for sewing zipper on workpiece. 4,854,251, Cl. 112-121.120.

Hirano, Masayasu: *See*—
Ishikawa, Norio; Nakai, Masaaki; Hirano, Masayasu; Fujino, Akihiko; Ootsuka, Hiroshi; Egawa, Takeshi; and Kawamura, Kunio, 4,855,779, Cl. 354-412.000.

Hirano, Takashi; and Kojima, Atsushi, to Kowa Company Limited. Eye fixation monitor. 4,854,694, Cl. 351-224.000.

Hirata, Akira: *See*—
Uchida, Shinya; Hirata, Akira; Ebihara, Hideyuki; Yoshikawa, Eiichi; Sano, Eisaku; and Uehara, Kazuhiro, 4,854,452, Cl. 209-534.000.

Hirata, Seiichi: *See*—
Yamaji, Yasuhiro; Takahashi, Kenji; Hirata, Seiichi; and Sakurai, Toshiharu, 4,855,807, Cl. 357-72.000.

Hirata, Yoshihiro, to Kabushiki Kaisha Toshiba. Apparatus having a dial calling function and operable to identify picture image signals not yet transmitted to a called selected destination party. 4,856,052, Cl. 379-100.000.

Hirayama, Shoji. Air cleaning apparatus and construction of clean room with the same. 4,854,224, Cl. 98-31.500.

Hirayama, Takeshi: *See*—
Oho, Shigeru; Hirayama, Takeshi; Matsumoto, Masahiro; Hasegawa, Akira; Hamano, Fumio; and Shibata, Takanori, 4,855,896, Cl. 364-138.000.

Hirayama, Yasutaka: *See*—
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Hirokawa, Katsuhisa; and Ohba, Hiroshi, to Kabushiki Kaisha Toshiba. Portable storage medium processing system. 4,855,578, Cl. 235-380.000.

Hirono, Nakayasu: *See*—
Miyayama, Toshio; Masuzawa, Isao; and Hirono, Nakayasu, 4,855,739, Cl. 340-984.000.

Hirooka, Masaaki; Ishihara, Shunichi; Hanna, Junichi; and Shimizu, Isamu, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member, process and apparatus for the preparation thereof. 4,855,210, Cl. 430-133.000.

Hiroshio Nishio: *See*—
Murakami, Sanpei; Miyaaki, Tohru; Imahori, Tokio; Ogata, Koichi; and Hagita, Hidenari, 4,855,146, Cl. 426-5.000.

Hirota, Isao, to Sony Corporation. Solid state imager device with exposure control with noise reduction. 4,856,033, Cl. 377-58.000.

Hirsch, Eitan; Gutmann, Alexander; Schwartz, Ana; Goren, Eliezer; Perlmuter, Nikolai; and Tal, Reuven, to State of Israel, Ministry of Defence, Israel Military Industries, The. Two-stage shaped charge projectile. 4,854,240, Cl. 102-476.000.

Hirsch, Rolf-Burkhard: *See*—
Reinehr, Ulrich; Pieper, Christian; Hirsch, Rolf-Burkhard; Jungverdorben, Hermann-Josef; and Breuer, Jakob, 4,854,021, Cl. 28-263.000.

Hirschman, Alan D.; Reilly, David M.; Potter, Ross H.; Stulen, John; Toft, Eric M.; and Clark, John G., to Medrad, Inc. Processor-controlled angiographic injector device. 4,854,324, Cl. 128-655.000.

Hitachi Automotive Engineering Co., Ltd.: *See*—
Hara, Seiichiro; and Hoshi, Yoshikazu, 4,854,284, Cl. 123-414.000.

Hitachi, Ltd.: *See*—
Hara, Seiichiro; and Hoshi, Yoshikazu, 4,854,284, Cl. 123-414.000.
Hayashi, Yoshihiko; and Orihashi, Ritsuro, 4,855,970, Cl. 368-120.000.
Hiyama, Kunio; Kawakita, Kenji; and Takada, Osamu, 4,855,995, Cl. 370-86.000.
Kaku, Toshimitsu; Tsunoda, Yoshito; Maeda, Takeshi; and Nakamura, Shigeru, 4,855,991, Cl. 369-275.000.
Kimura, Hiroyuki; Kobori, Yasunori; Hamma, Kentaro; Omata, Takashi; and Oki, Katsunori, 4,855,840, Cl. 358-296.000.
Kouda, Toyomasa, 4,855,257, Cl. 437-194.000.
Mano, Hiroyuki; Tachiuchi, Tsuguji; Kinugawa, Kiyoshige; and Tanaka, Shinji, 4,855,728, Cl. 340-805.000.
Matsushita, Toshio; Amano, Hideaki; Yamaura, Satoru; Nakamura, Shigeo; and Nakada, Yasusuke, 4,855,853, Cl. 360-106.000.
Nakamura, Shigeki; and Takahashi, Yasufumi, 4,856,027, Cl. 375-81.000.
Oho, Shigeru; Hirayama, Takeshi; Matsumoto, Masahiro; Hasegawa, Akira; Hamano, Fumio; and Shibata, Takanori, 4,855,896, Cl. 364-138.000.
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Rokuda, Morito; Ohtsubo, Hiroyasu; Masuda, Michio; Nishijima, Hideo; and Okamoto, Kaneyuki, 4,855,812, Cl. 358-22.000.
Shinbayashi, Toshiya; and Takeuchi, Takashi, 4,855,988, Cl. 369-116.000.
Todokoro, Hideo. 4,855,673, Cl. 324-158.00R.

Tomioka, Yasushi; Imazeki, Shuji; Terao, Motoyasu; Ojima, Masahiro; and Taniguchi, Yoshio, 4,855,951, Cl. 365-119.000.
Tomita, Yoshifumi; Nishizawa, Masahiro; and Nonogaki, Saburo, 4,855,200, Cl. 430-25.000
Uchida, Kenji; Banba, Nobuyuki; Kuroiwa, Minoru; Saito, Makoto; and Kamino, Yukishige, 4,854,783, Cl. 406-13.000.
Urushiwara, Noriyoshi; Sugiura, Noboru; Fujino, Yasunori; and Kobayashi, Ryoichi, 4,854,292, Cl. 123-630.000
Watanabe, Isato; Yamamoto, Shigehiko; Taguchi, Sadanori; and Sasaki, Susumu, 4,855,637, Cl. 313-346.00R
Yamamoto, Akihiko; Kohno, Akiomi; Yamada, Toshihiri; Satou, Motohiro; Taguchi, Keiji; and Yokoi, Kazuaki, 4,854,495, Cl. 228-124.000.
Yamamoto, Hideaki; Sasano, Akira; Matsumaru, Haruo; Tanaka, Yasuo; and Tsukada, Toshihisa, 4,855,795, Cl. 357-2.000.
Yamashita, Koujirou; Endo, Stunehiro; Miyashita, Kunio; Kashiwazaki, Susumu; and Iizuka, Kenichi, 4,855,652, Cl. 318-268.000.
Yamato, Ikuo; Tokunaga, Norikazu; Matsuda, Yasuo; and Amano, Hisao, 4,855,887, Cl. 363-8.000.

Hitachi Maxell, Ltd.: *See—*
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Hitachi Metals, Ltd.: *See—*
Wyman, John E., 4,855,079, Cl. 252-62.520.

Hitachi Microcomputer Engineering Ltd.: *See—*
Mano, Hiroyuki; Tachiuchi, Tsuguji; Kinugawa, Kiyoshige; and Tanaka, Shinji, 4,855,728, Cl. 340-805.000

Hitomi, Hisakazu, to Kabushiki Kaisha Toshiba. Filter circuit. 4,855,627, Cl. 307-520.000.

Hiyama, Kunio; Kawakita, Kenji; and Takada, Osamu, to Hitachi, Ltd. Method and system for data transmission. 4,855,995, Cl. 370-86.000.

Hobart Corporation: *See—*
Crane, Herbert R.; and Liddell, Margaret G., 4,854,717, Cl. 366-197.000
Walter, Philip G., 4,855,277, Cl. 503-204.000.

Hoch, Dietrich: *See—*
Konrad, Eugen; Mager, Herbert; and Hoch, Dietrich, 4,855,130, Cl. 424-70.000.

Hochschild, James R., to Texas Instruments Incorporated. Precision switchable gain circuit. 4,855,685, Cl. 330-282.000.

Hochtief Aktiengesellschaft Vorm. Gebr. Helfmann: *See—*
Hentschel, Volker; Versteegen, Clemens; Mahmens, Olaf; and Babendererde, Siegmund, 4,854,776, Cl. 405-147.000.

Hockaday, Bruce D.; and Taylor, Kenneth D., to United Technologies Corporation. Optical control system. 4,854,219, Cl. 91-367.000.

Hoechst Aktiengesellschaft: *See—*
Grolig, Gerhard; and Schmidt, Guenther, 4,855,186, Cl. 428-216.000.
Heppke, Gerd; Bahr, Christian; Muller, Ingrid; Ohlendorf, Dieter; and Wingen, Rainer, 4,855,429, Cl. 544-335.000.
Koch, Volker; Fuss, Andreas; Bonin, Werner; Knauf, Werner; and Waltersdorfer, Anna, 4,855,309, Cl. 514-346.000.
Metz, Hans J.; and Warning, Klaus, 4,855,517, Cl. 570-206.000.
Raether, Wolfgang, 4,855,299, Cl. 514-259.000
Reinehr, Ulrich; Pieper, Christian; Hirsch, Rolf-Burkhard; Jungverdorben, Hermann-Josef; and Breuer, Jakob, 4,854,021, Cl. 28-263.000.
Siegel, Herbert, 4,855,087, Cl. 562-817.000.
Wagner, Adalbert; Kleemann, Heinz-Werner; Ruppert, Dieter; and Scholkens, Bernward, 4,855,286, Cl. 514-19.000.
Wess, Gunther; Bartmann, Wilhelm; Beck, Gerhard; and Anagnostopulos, Hiristo, 4,855,323, Cl. 514-550.000.

Hoechst Celanese Corp.: *See—*
De Martino, Ronald N.; Yoon, Hyun-Nam; and Stamatoff, James B., 4,855,376, Cl. 526-311.000.
Fruchey, Olan S., 4,855,499, Cl. 564-223.000.
Kalyanaraman, Palaiyur S.; and Garito, Anthony F., 4,854,676, Cl. 350-354.000.
Leslie, Thomas M., 4,855,078, Cl. 252-582.000.
Thompson, Glenn A.; Corso, Anthony J.; and Steuernagel, Hans H., 4,855,411, Cl. 534-629.000.

Hoechst-Roussel Pharmaceuticals, Inc.: *See—*
Martin, Lawrence L.; Worm, Manfred; and Crishlow, Charles A., 4,855,502, Cl. 564-373.000.

Hoeffel, James D.; Elliott, Richard E.; Hoppe, Wally C.; and Nevitt, James S., to Systems Research Laboratories, Inc. Pneumatic surface-following control system. 4,854,156, Cl. 73-37.500.

Hoegh, Poul E., to Teledyne Microwave. Self-cutoff for latching coaxial switches. 4,855,699, Cl. 335-177.000.

Hoehr, Lothar: *See—*
Degen, Hans-Juergen; Reichel, Fritz; Riebeling, Ulrich; and Hoehr, Lothar, 4,855,343, Cl. 524-47.000.

Hoeptner, Herbert W., III. Freeze valve apparatus. 4,854,339, Cl. 137-282.000.

Hoesch Maschinenfabrik Deutschland AG: *See—*
Breiter, Horst; Enger, Helmut; and Teuwen, Uwe, 4,854,994, Cl. 156-228.000.

Hofen, Willi: *See—*
Grund, Andreas; Prescher, Guenter; Boehme, Georg; Hofen, Willi; and Petsch, Heinrich, 4,855,465, Cl. 549-525.000

Hofer, Gerald: *See—*
Eheim, Franz, deceased; and Hofer, Gerald, 4,854,289, Cl. 123-503.000.

Hofer, Henry: *See—*
Swon, James E.; and Hofer, Henry, 4,855,821, Cl. 358-101.000.

Hoffer, John C.: *See—*
Gutterman, Pamela R.; Harms, Sherry J.; and Hoffer, John C., 4,854,660, Cl. 350-96.180.

Hoffman, David H.: *See—*
Ma, Di; and Hoffman, David H., 4,855,247, Cl. 437-44.000.

Hoffman, Joe G.: *See—*
Clark, R. Scot; Hoffman, Joe G.; Davison, John B.; Jones, Alan W.; Jones, Allen H., Jr.; Persichini, David W.; Yuan, Wallace I.; and Lipisko, Bruce A., 4,855,023, Cl. 204-130.000.

Hoffman-La Roche Inc.: *See—*
Fischer, Ulf; Schneider, Fernand; and Widmer Ulrich, 4,855,297, Cl. 514-248.000.

Hoffman, William F.: *See—*
Lee, Ta J.; and Hoffman, William F., 4,855,456, Cl. 549-214.000.

Hoffmann, Detlef: *See—*
Heidrich, Helmut; Hoffmann, Detlef; and Nolting, Hans-Peter, 4,856,094, Cl. 455-619.000.

Hoffmann, Kurt; Kraus, Rainer; and Kowarik, Oskar, to Siemens Aktiengesellschaft. Multi-stage, integrated decoder device having redundancy test enable. 4,855,621, Cl. 371-20.000.

Hoffmann-La Roche Inc.: *See—*
Chan, Ka-Kong; and Saucy, Gabriel G., 4,855,085, Cl. 260-396.00R.

Hofmann, Frieder K.: *See—*
Wrasidlo, Wolfgang J.; Hofmann, Frieder K.; and Mysels, Karol J., 4,855,162, Cl. 427-243.000.

Hofmann, Karl R.: *See—*
Kohn, Erhard; and Hofmann, Karl R., 4,855,797, Cl. 357-22.000.

Hofmann Werkstatt-Technik GmbH: *See—*
Himmler, Gunther, 4,854,168, Cl. 73-459.000.

Hofmeister, Peter: *See—*
Seppelt, Wolfgang; Sproesser, Linhard; Kersten, Siegfried; Hofmeister, Peter; and Kuenast, Christoph, 4,855,140, Cl. 424-405.000.

Hofrichter, Hanns-Gerhard, to Messerschmitt-Boelkow-Blohm GmbH. Cover for flap guide rails in aircraft wings. 4,854,528, Cl. 244-215.000.

Hojo, Shiro; Hasegawa, Yoichi; and Hirai, Takeo, to Japan Hydrazine Co., Inc. Process for preparation of monomethylhydrazine. 4,855,501, Cl. 564-314.000.

Hokkeling, Pieter: *See—*
Roelandse, Cornelius D.; and Hokkeling, Pieter, 4,856,039, Cl. 378-133.000.

Holbrook, David S.; and Simpson, Craig R., to MRS Technology, Inc. Optical alignment system for use in photolithography and having reduced reflectance errors. 4,855,792, Cl. 355-53.000.

Holdar, Robert M., to NCH Corporation. Low odor carbon and paint remover composition. 4,854,973, Cl. 134-39.000.

Holland Company: *See—*
Clem, George K., 4,854,088, Cl. 51-281.00R.

Holland, Eric C.; Lesan, Fredrick K.; and Knappe, Peter H., to Hydranautics. High recovery spiral wound membrane element. 4,855,058, Cl. 210-652.000.

Hollenbeck, Robert E.: *See—*
Bryniarski, David A.; and Hollenbeck, Robert E., 4,854,983, Cl. 56-70.000.

Holley, Charles C.; Petersen, Walter J.; and Zenner, Michael N., to Toro Company, The. Turf maintenance apparatus. 4,854,112, Cl. 56-6.000.

Hollingsworth (U.K.), Ltd.: *See—*
Barratt, Peter J.; Clough, Douglas O.; Dickinson, Peter J.; and Farnhill, William M., 4,854,117, Cl. 57-301.000.

Holloway, David E. Locating devices for soil displacement hammers. 4,854,398, Cl. 175-45.000.

Holmes, Alan W., to Santa Barbara Research Center. Cylindrical wide field receiver element. 4,855,588, Cl. 250-203.00R.

Holmes, Mark: *See—*
Dunn, David J.; Vano, Patrick P.; Moran, James P., Jr.; Holmes, Mark; and Frauenglass, Elliott, 4,855,002, Cl. 156-307.300.

Holmes, Stephen E. "ESU" flying ring. 4,854,907, Cl. 446-48.000.

Holmwood, Graham: *See—*
Kaulen, Johannes; Arlt, Dieter; Holmwood, Graham; and Kramer, Wolfgang, 4,855,438, Cl. 548-262.000.

Holub, Fred F.; and Rock, John A., to General Electric Company. Ternary polymer blends containing a polyetherimide, a polyphthalate carbonate, and rubber modified vinyl aromatic polymer. 4,855,356, Cl. 525-66.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Hattori, Torao, 4,854,926, Cl. 474-242.000.
Inoue, Kazuo, 4,854,125, Cl. 60-489.000.
Konno, Tsuneo, 4,854,272, Cl. 123-90.170.
Miyano, Hideyo; and Kitami, Yasuo, 4,854,271, Cl. 123-52.0MV.
Shimizu, Yasuo, 4,855,655, Cl. 388-820.000.
Uesugi, Naomoto; Takahashi, Hideo; and Ikeno, Tetsuro, 4,854,417, Cl. 181-272.000.
Yamatoh, Kouhei; Ogura, Masami; Kanbe, Katunori; and Isogai, Yuji, 4,854,424, Cl. 188-72.100.

Honecker, Gunter, to Linde Aktiengesellschaft. Vehicle with a noise-damped drive assembly. 4,854,278, Cl. 123-198.00E.

Honeywell Inc.: *See—*
Bowman, George A., 4,856,024, Cl. 375-8.000.
Glenn, Max C., 4,855,544, Cl. 200-61.45R
Hayford, Michael J.; and Koch, Donald G., 4,854,688, Cl. 350-571.000.
Kozlik, Tony J.; and Freimark, Ronald J., 4,855,902, Cl. 364-200.000.
Lehman, Robert G., 4,856,100, Cl. 342-51.000.

Narendra, Patrenahalli M.; Fant, Karl M.; and Graf, Carl P., 4,855,822, Cl. 358-103.000.
Patton, Paul B.; and Landis, William R., 4,854,852, Cl. 431-78.000.
Van Sloun, Peter H., 4,854,239, Cl. 102-426.000.

Hong, Paul O.; and De Wald, Raymond C., to Occidental Chemical Corporation. Phenothiazine derivatives. 4,855,424, Cl. 544-35.000.

Hoogovens Groep B.V.: *See—*
Heijwegen, Cornelis P.; and Kat, Willem, 4,854,946, Cl. 55-85.000.

Hoover, Dennis J., to Pfizer Inc. Fluorine containing renin inhibitors. 4,855,303, Cl. 514-18.000.

Hoover Universal, Inc.: *See—*
Vidwans, Mohan P.; and Ino, Kenji, 4,854,642, Cl. 297-410.000.

Hope, Peter: *See—*
Battey, Paul K.; Hope, Peter; and Sharma, Ashutosh H., 4,855,346, Cl. 524-217.000.

Hoppe, Wally C.: *See—*
Hoeffel, James D.; Elliott, Richard E.; Hoppe, Wally C.; and Nevitt, James S., 4,854,156, Cl. 73-37.500.

Hori, Akio: *See—*
Ikegawa, Sumio; Hori, Akio; Komatsu, Shuichi; Arai, Shinji; and Yasuda, Nobuaki, 4,855,992, Cl. 369-275.000.

Hori, Akira: *See—*
Ohtsuka, Hiroo; Hara, Osamu; Hori, Akira; and Nodoa, Minoru, 4,854,889, Cl. 439-395.000.

Hori, Keimitsu: *See—*
Kagawa, Yoshihiro; and Hori, Keimitsu, 4,855,083, Cl. 252-632.000.

Horii, Hiroyuki: *See—*
Matsukura, Hisao; Yamato, Osamu; and Horii, Hiroyuki, 4,855,693, Cl. 333-202.000.

Horinouchi, Shinichi: *See—*
Takeuchi, Kunihiko; Oba, Masao; and Horinouchi, Shinichi, 4,855,994, Cl. 370-69.100.

Horiuchi, Akihisa, to Canon Kabushiki Kaisha. Compact zoom lens. 4,854,684, Cl. 350-427.000.

Horrobin, David F.; and Huang, Y. Sheng. Therapeutic composition and method. 4,855,136, Cl. 424-602.000.

Horton, Lee A. Combined eye covering and ear covering assembly. 4,856,089, Cl. 455-351.000.

Horvat, Philippe, to U.S. Philips Corporation. FM receiver with improved adjacent-channel rejection. 4,856,085, Cl. 455-315.000.

Horvath, Eduard, to Otto Bock Orthopadische Industrie Besitz- und Verwaltungs-KG. Double-acting hydraulic piston-and-cylinder device. 4,854,428, Cl. 188-298.000.

Horwell, David C.; and Johnson, Stephen J., to Warner-Lambert Company. 1,2-diamino-4,5-dimethoxycyclohexyl amide analgesic compounds. 4,855,316, Cl. 514-422.000.

Hoshi, Yoshikazu: *See—*
Hara, Seiichiro; and Hoshi, Yoshikazu, 4,854,284, Cl. 123-414.000.

Hoshina, Yuichiro, to NEC Corporation. Display terminal for a videophone. 4,856,045, Cl. 379-53.000.

Hoshino, Kiyoshi: *See—*
Yasuki, Seijiro; and Hoshino, Kiyoshi, 4,855,815, Cl. 358-31.000.

Hoshino, Yasushi, to Konica Corporation. Camera with battery check circuit. 4,855,781, Cl. 354-468.000.

Hoshizaki Electric Co., Ltd.: *See—*
Naruse, Nobutaka; and Minari, Katsunobu, 4,854,130, Cl. 62-352.000.

Hosiden Electronics Co., Ltd.: *See—*
Komatsu, Yasuhiro, 4,854,895, Cl. 439-610.000.

Hosking, Steven M.: *See—*
Martin, Harvey G.; Pilling, Roger; and Hosking, Steven M., 4,854,570, Cl. 271-162.000.

Hosoba, Hiroyuki: *See—*
Matsui, Sadayoshi; Taneya, Mototaka; Matsumoto, Mitsuhiro; and Hosoba, Hiroyuki, 4,856,015, Cl. 372-50.000.

Hosoya, Yukiteru: *See—*
Sato, Masaei; and Hosoya, Yukiteru, 4,855,631, Cl. 310-239.000.

Hou, Hidemitsu: *See—*
Yoshioka, Masanori; Hou, Hidemitsu; and Kawai, Nobufumi, 4,855,405, Cl. 530-300.000.

Houck, Robert B.; and McGuffey, Arnold L., to Sencorp. Flywheel for an electromechanical fastener driving tool. 4,854,492, Cl. 227-131.000.

Houriet, Raymond: *See—*
Bodenhausen, Geoffrey; Pfandler, Peter E.; Rapin, Jacques; Gaumann, Tino; and Houriet, Raymond, 4,855,593, Cl. 250-282.000.

Houtkamp, Johannes J., to B.V. Optische Industrie "De Oude Delft". X-ray detector tube with sidewall-supporting rear wall. 4,855,586, Cl. 250-213.0VT.

Houtman, William H., to Gas Research Institute. Torch ignitor. 4,854,857, Cl. 431-154.000.

Hovis, Keith: *See—*
Levin, Zaida; and Hovis, Keith, 4,854,212, Cl. 84-283.000.

Howell, Stephen J.: *See—*
Vinson, John W.; Howell, Stephen J.; and Lampes, Elias H., 4,854,127, Cl. 60-742.000.

Hoy, Kenneth L.: *See—*
Meschke, Debra J.; and Hoy, Kenneth L., 4,855,403, Cl. 528-419.000.

Hoya Corporation: *See—*
Kawamura, Kazunori, 4,855,180, Cl. 428-328.000.

Hoyt, Robert: *See—*
Hancock, David; Hoyt, Robert; and Formica, Joseph, 4,855,579, Cl. 235-436.000.

HR Textron, Inc.: *See—*
Firth, Robert L., 4,855,047, Cl. 210-232.000.

Hsieh, Hung-Cheng; and Carter, William S., to Xilinx, Inc. Buffered routing element for a user programmable logic device. 4,855,619, Cl. 307-443.000.

Hsieh, Yih-Shou: *See—*
Lin, J. Y.; Hsieh, Yih-Shou; and Chu, Shu-Chen, 4,855,055, Cl. 210-635.000.

Hsing, Hsiau C. Pull roller mount for sewing machines. 4,854,254, Cl. 112-305.000.

Hsu, Chao-Yang, to Sun Refining and Marketing Company. Process for production of cinnamates. 4,855,485, Cl. 560-104.000.

Hsu, Chi-Heng. Electronic parking sensor apparatus. 4,855,736, Cl. 340-901.000.

Hsu, Fu Kuo: *See—*
Birnbach, Curtis; and Hsu, Fu Kuo, 4,854,669, Cl. 350-162.120.

Hsu, Long S.: *See—*
Dew, Douglas K.; Hsu, Long S.; and Halpern, Steven J., 4,854,320, Cl. 128-397.000.

Hsu, Shih C.: *See—*
Raman, Ramaswamy V.; and Hsu, Shih C., 4,854,980, Cl. 148-403.000.

Hu-Friedy Manufacturing Co., Inc.: *See—*
Riihimaki, Roy; and D'Amico, Richard, 4,854,475, Cl. 220-337.000.

Huang, Y. Sheng: *See—*
Horrobin, David F.; and Huang, Y. Sheng, 4,855,136, Cl. 424-602.000.

Hubbard, James R., to Graphic Controls Corporation. Disposable marker and adapter for pen-driven integrator. 4,854,762, Cl. 401-199.000.

Hubbell Incorporated: *See—*
Neuroth, David H., 4,854,886, Cl. 439-192.000.

Huber, Paul W., to Dynabrade, Inc. Random orbital sander. 4,854,085, Cl. 51-170.0MT.

Huddleston, Paul M.; Porter, G. Burns, Jr.; and Rooney, David T., to Scientific-Atlanta, Inc. Apparatus and method for monitoring an energy management system. 4,855,922, Cl. 364-464.040.

Huditz, Peter: *See—*
Weissenberger, Helmuth; and Huditz, Peter, 4,854,438, Cl. 192-107.00R.

Hudson, George A., deceased: *See—*
Markusch, Peter; and Hudson, George A., deceased, 4,855,490, Cl. 560-355.000.

Hudson, Hank M.: *See—*
Campbell, Roy E.; Wilkinson, John D.; and Hudson, Hank M., 4,854,955, Cl. 62-24.000.

Hudson, Raymond S.: *See—*
Bolgiano, Nicholas C.; Grubb, Mary B.; Hudson, Raymond S.; and Sigman, William T., 4,855,165, Cl. 427-393.500.

Huels Aktinegesellschaft: *See—*
Gude, Fritz; and Bellut, Hans, 4,855,488, Cl. 560-249.000.

Hug, Paul; Umeda, Bill; Yesnosky, Paul A.; Raudebaugh, Bart; Ricco, Gary; and McCabe, Gary E., to Cygnet Systems. Method of and apparatus for storing and retrieving information containing disc utilizing a movable magazine. 4,855,980, Cl. 369-36.000.

Hughes Aircraft Company: *See—*
Bernard, Douglas E., 4,855,916, Cl. 364-426.020.
Donner, Joseph E., 4,855,559, Cl. 219-85.160.
Kinkel, John F., 4,855,689, Cl. 331-17.000.
Krause, Stanley J., 4,854,975, Cl. 136-262.000.
Lesley, Arthur M.; and Jaron, William, 4,854,726, Cl. 374-45.000.
O'Meara, Thomas R., 4,854,677, Cl. 350-355.000.
Rochefort, Mark G., 4,854,526, Cl. 244-158.00R.
Wissman, Charles H.; and Braski, Michael T., 4,856,010, Cl. 372-32.000.
Wong, Wah S.; Wen, Cheng P.; and Kung, Jen K., 4,855,796, Cl. 357-15.000.
Wreede, John E., 4,854,674, Cl. 350-320.000.

Hujii, Masao: *See—*
Yoshida, Takayuki; Sakuma, Kiyoshi; Seshimo, Yu; and Hujii, Masao, 4,854,380, Cl. 165-152.000.

Hulkko, Jaakko, to Nokia-Mobira Oy. Circuitry for the diversity unit in an FM receiver for a telephone system. 4,856,080, Cl. 455-139.000.

Huls Aktiengesellschaft: *See—*
Fuhrmann, Werner; zur Hausen, Manfred; and Krix, Wilfried, 4,855,458, Cl. 549-248.000.
Scholz, Bernhard-Peter, 4,855,372, Cl. 526-201.000.

Humbert, Daniel: *See—*
Gasc, Jean-Claude; Nedelec, Lucien; Humbert, Daniel; and Boaventura, Ana-Maria, 4,855,302, Cl. 514-278.000.

Humbs, Rolf; and Depta, Ingolf, to Siemens Aktiengesellschaft. Apparatus for sealing and cleaning the ink discharge openings at an ink printing head. 4,855,764, Cl. 346-140.00R.

Hume, Ronald W., to Equip-Mark, Inc. Blending and dispensing beverages. 4,854,721, Cl. 366-340.000.

Humpleman, Richard J., to Active Memory Technology Ltd. Switching circuit avoiding glitches at the instant of switch-over between two clock signals. 4,855,615, Cl. 307-269.000.

Hundley, John G., to Amoco Corporation. Process for production of aromatic polycarboxylic acids. 4,855,492, Cl. 562-414.000.

Hunnicutt, Clyde J., Jr. Ventilated water closet. 4,853,981, Cl. 4-213.000.

Hunter Engineering Company: *See—*
Stieff, Michael T., 4,854,702, Cl. 356-155.000.

Hunter, Stephen B., to Firestone Tire & Rubber Company, The. Mold gate having multiple valve stem receiving apertures. 4,854,840, Cl. 425-32.000.

Hurd, B. George; Jones, Lloyd G.; and Strange, Lloyd K., to Mobil Oil Corporation. Oil recovery process utilizing gravitational forces. 4,854,385, Cl. 166-273.000.
Hurtienne, Daniel G.: *See—*
Kelley, William J.; and Hurtienne, Daniel G., 4,854,913, Cl. 446-397.000.
Hurwitt, Steven D., to Materials Research Corporation. Cathode and target design for a sputter coating apparatus. 4,855,033, Cl. 204-298.000.
Huth, Andreas: *See—*
Biere, Helmut; Engelstoft, Mogens; Huth, Andreas; Rahtz, Dieter; Schmiechen, Ralph; Seidelmann, Dieter; and Stephens, David N., 4,855,295, Cl. 514-232.800.
Hutter, Louis N.; and Trogolo, Joe R., to Texas Instruments Incorporated. Method of making vertical PNP transistor in merged bipolar/-CMOS technology. 4,855,244, Cl. 437-31.000.
Hwu, Jih R.; and Robl, Jeffrey A., to Johns Hopkins University, The. Prostanoids and synthesis thereof. 4,855,437, Cl. 548-241.000.
Hydranautics: *See—*
Holland, Eric C.; Lesan, Fredrick K.; and Knappe, Peter H., 4,855,058, Cl. 210-652.000.
Hydro-Quebec: *See—*
Marceau, Richard J.; and Jeanson, Guy, 4,855,552, Cl. 219-10.510.
Narancic, Vojislav; and Fecteau, Gilles, 4,855,705, Cl. 337-246.000.
Hypres, Incorporated: *See—*
Stebbins, Edwin E., 4,856,099, Cl. 341-133.000
Hyun, Kun S.: *See—*
Betso, Stephen R.; Hyun, Kun S.; and Russell, Patrick M., 4,855,404, Cl. 528-502.000.
I.M.A. - Industria Macchine Automatiche - SPA: *See—*
Miselli, Carlo A.; and Conti, Rino, 4,854,930, Cl. 493-315.000.
ICEE USA Corporation: *See—*
Sexton, Rodney N.; Woolf, Floyd S.; and Ruud, Timothy W., 4,854,743, Cl. 384-130.000.
Sexton, Rodney N.; and Woolf, Floyd S., 4,854,923, Cl. 474-84.000.
Ichihashi, Tadashi; Kakizawa, Koichiro; and Kawamura, Masunori, to Kowa Company Ltd. Ophthalmic disease detection apparatus. 4,854,693, Cl. 351-221.000.
Ichikawa, Kyoko; Aoki, Makoto; and Takiguchi, Hideo, to Canon Kabushiki Kaisha. Method of ink jet recording and ink jet recording apparatus. 4,855,753, Cl. 346-1.100.
Ichikawa, Yataro: *See—*
Morinaga, Tsuto; Miura, Kin-ichiro; Shimotohno, Kunitada; Ikegami, Masato; and Ichikawa, Yataro, 4,855,237, Cl. 435-320.000
Ichimura, Hiroshi: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; Negishi, Ichiro; and Osada, Masaru, 4,855,816, Cl. 358-47.000.
Ichinose, Noboru; and Tanaka, Hirohumi, to Nichia Kagaku Kogyo K.K. Method of producing fluorapatite. 4,855,118, Cl. 423-301.000.
ICI Americas Inc.: *See—*
Woolard, Frank X., 4,855,478, Cl. 558-417.000.
Ici Pharma: *See—*
Jung, Frederic H., 4,855,420, Cl. 540-222.000.
Ida, Shuichiro: *See—*
Koide, Toshikazu; Ida, Shuichiro; Yoshinaka, Toshio; Nagano, Shuji; and Haga, Shoji, 4,854,414, Cl. 180-249.000.
Ide, Masayuki: *See—*
Kasugai, Joji; Toki, Satoshi; and Ide, Masayuki, 4,854,471, Cl. 220-288.000.
Ide, Yasushi: *See—*
Kobayashi, Hiroshi; Machida, Haruhiko; Harigaya, Makoko; Ide, Yasushi; and Akedo, Jun, 4,855,256, Cl. 437-129.000.
IFE Industrie-Emrichtungen Fertigungs-Aktiengesellschaft: *See—*
Fink, Martin, 4,854,223, Cl. 92-17.000.
Igarashi, Akira; Satomura, Masato; and Iwakura, Ken, to Fuji Photo Film Co., Ltd. Heat-sensitive recording material. 4,855,278, Cl. 503-208.000.
Igarashi, Akira: *See—*
Satomura, Masato; Iwakura, Ken; Takashima, Masanobu; and Igarashi, Akira, 4,855,282, Cl. 503-218.000.
Igarashi, Takeshi: *See—*
Masuda, Nobuhito; and Igarashi, Takeshi, 4,855,108, Cl. 422-56.000.
Iggulden, Jerry R.: *See—*
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Streck, Donald A., 4,856,049, Cl. 379-67.000.
Ignasiak, Boleslaw L.: *See—*
Janiak, Jerzy S.; Turak, Ali A.; Pawlak, Wanda; and Ignasiak, Boleslaw L., 4,854,940, Cl. 44-620.000.
Iijima, Kenzaburou: *See—*
Muramatsu, Toshihiro; Iijima, Kenzaburou; and Hayashi, Yoshinori, 4,855,740, Cl. 341-23.000.
Iino, Shuji; and Ikegawa, Akihito, to Minolta Camera Kabushiki Kaisha. Digital printing apparatus. 4,855,768, Cl. 346-160.100.
Iizuka, Hiroshi; and Kakiuchi, Shizuo, to Pioneer Electronic Corporation. Logarithmic digital level display device. 4,855,741, Cl. 341-75.000
Iizuka, Kenichi: *See—*
Yamashita, Koujirou; Endo, Stunehiro; Miyashita, Kunio; Kashiwazaki, Susumu; and Iizuka, Kenichi, 4,855,652, Cl. 318-268.000.
Ikeda, Haruhiko; Okada, Akinori; and Ohkura, Hirokazu, to Mitsubishi Paper Mills, Limited. Heat-sensitive recording material. 4,855,279, Cl. 503-209.000.
Ikeda, Masaki: *See—*
Mizuno, Yasuo; Nishino, Atsushi; Ikeda, Masaki; and Kurio, Shinji, 4,855,261, Cl. 501-76.000.
Ikeda, Motohisa, to Fujitsu Limited. Semiconductor integrated circuit device having logic macro and random access memory macro. 4,855,958, Cl. 365-230.080.
Ikeda, Tetsuo: *See—*
Asahi, Nobumitsu; Ikeda, Tetsuo; and Kawase, Seiji, 4,855,894, Cl. 363-157.000.
Ikegami, Masato: *See—*
Morinaga, Tsuto; Miura, Kin-ichiro; Shimotohno, Kunitada; Ikegami, Masato; and Ichikawa, Yataro, 4,855,237, Cl. 435-320.000.
Ikegawa, Akihito: *See—*
Iino, Shuji; and Ikegawa, Akihito, 4,855,768, Cl. 346-160.100.
Ikegawa, Sumio; Hori, Akio; Komatsu, Shuichi; Arai, Shinji; and Yasuda, Nobuaki, to Kabushiki Kaisha Toshiba. Reversible optical recording medium with an optothermally deformable recording layer. 4,855,992, Cl. 369-275.000.
Ikeno, Tetsuro: *See—*
Uesugi, Naomoto; Takahashi, Hideo; and Ikeno, Tetsuro, 4,854,417, Cl. 181-272.000.
Ikeuchi, Hiroshi: *See—*
Kikuchi, Hideya; and Ikeuchi, Hiroshi, 4,855,710, Cl. 340-426.000.
Illner, Erich: *See—*
Renner, Gunter; and Illner, Erich, 4,855,441, Cl. 548-363.000.
Imahori, Tokio: *See—*
Murakami, Sanpei; Miyaaki, Tohru; Imahori, Tokio; Ogata, Koichi; and Hagita, Hidenari, 4,855,146, Cl. 426-5.000.
Imai, Osamu: *See—*
Nakata, Masami; and Imai, Osamu, 4,855,708, Cl. 338-20.000.
Imaizumi, Yasuyuki, to Yoshino Kogyosho Co., Ltd. Synthetic resin sheet having notching strip and container. 4,855,168, Cl. 428-35.200.
Imamura, Eiji; and Nishiyama, Katsumi, to Murata Manufacturing Co., Ltd. Capacitor network. 4,855,866, Cl. 361-306.000.
Imamura, Tomoatsu: *See—*
Senma, Toshitaka; Imamura, Tomoatsu; and Shimada, Kazuyuki, 4,856,008, Cl. 372-31.000.
Imamura, Youichiro; Kaeriyama, Toshiyuki; and Ishimoto, Hironori, to Texas Instruments Incorporated. Semiconductor and process of fabrication thereof. 4,855,798, Cl. 357-71.000.
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, to Mitsubishi Petrochemical Co. Ltd.; Mitsubishi Jukogyo Kabushiki Kaisha; Catalysts & Chemicals Industries, Co., Ltd.; and Mitsubishi Petrochemical Engineering Co., Ltd. Process for removing nitrogen oxides from exhaust gases. 4,855,115, Cl. 423-239.000.
Imayoshi, Mamoru, to Nippon Air Brake Co., Ltd. Pull-type booster. 4,854,220, Cl. 91-376.00R.
Imazeki, Shuji: *See—*
Tomioka, Yasushi; Imazeki, Shuji; Terao, Motoyasu; Ojima, Masahiro; and Taniguchi, Yoshio, 4,855,951, Cl. 365-119.000.
Imperial Chemical Industries plc: *See—*
Noakes, Timothy J.; and Hewitt, Nevil E., 4,854,506, Cl. 239-691.000.
Noon, Robert A.; Crowley, Patrick J.; and Worthington, Diana M., 4,855,510, Cl. 568-663.000.
INA Walzlager Schaeffler KG: *See—*
Hertrich, Steffen; and Goppelt, Dieter, 4,854,922, Cl. 474-110.000.
Indescor Hydrodynamics Inc.: *See—*
Puchala, Ryszard J.; and Miko, Stephen J., 4,854,770, Cl. 404-75.000.
Indiana University Foundation: *See—*
Zeldin, Martel, 4,855,433, Cl. 546-14.000.
Industrial Management Co.: *See—*
Rooklyn, Jack, 4,855,865, Cl. 361-212.000.
Industrial Technology Research Institute: *See—*
Ting, Ching-Jui; and Peng, Cheng-Jien, 4,855,571, Cl. 219-376.000.
Industrie Riunite SPA: *See—*
Morra, Luigi, 4,856,098, Cl. 324-207.000.
Indyke, David M., to Ethyl Corporation. Polyimide foams their production. 4,855,332, Cl. 521-185.000.
Infeld, Peter, to Dr. Thomastik und Mitarbeiter Offene Handelsgesellschaft. Music string. 4,854,213, Cl. 84-297.00S.
Ingerson, Paul G., to TRW Inc. High-efficiency multibeam antenna. 4,855,751, Cl. 343-779.000.
Ingle, David M., to Union Oil Company of California. Mastic and caulking compositions and composite articles. 4,855,349, Cl. 524-432.000.
Inman, Everett; Roberts, Nancy J.; and Juneja, Prem S., to Procter & Gamble Company, The. Stable antidandruff shampoo compositions. 4,854,333, Cl. 132-209.000.
Innofinance Altalanos Innovacios Penzintezet: *See—*
Keri, Tibor; and Kristof, Janosne , 4,855,137, Cl. 424-195.100.
Innovex Inc.: *See—*
Drits, Vladimir, 4,854,161, Cl. 73-104.000.
Ino, Kenji: *See—*
Vidwans, Mohan P.; and Ino, Kenji, 4,854,642, Cl. 297-410.000.
Inoue, Akira, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Method for removal of nitrogen oxides from exhaust gas of diesel engine. 4,854,123, Cl. 60-274.000.
Inoue, Kazuo, to Honda Giken Kogyo Kabushiki Kaisha. Hydrostatically operated continuously variable transmission. 4,854,125, Cl. 60-489.000.

Inoue, Satomi: *See—*
Ueno, Ryuzo; Katsura, Shinichi; Uchiyama, Yoshirou; and Inoue, Satomi, 4,855,482, Cl. 560-56.000.
Insell, James P., to Polysar Limited. Microbial treatment of wastewater to remove tertiary butyl alcohol. 4,855,051, Cl. 210-601.000.
Insetta, Victor; and Davis, Donald J., Jr., to American Technical Ceramics Corporation. Adjustable mulitlayered capacitor. 4,856,102, Cl. 361-330.000.
Institut Francais du Petrole: *See—*
Cretin, Jacques; and Saussier, Daniel, 4,855,732, Cl. 340-856.000.
Deschamps, Andre ; Franckowiak, Sigismond; and Leporq, Serge, 4,855,117, Cl. 423-244.000.
Sparks, Charles; and Odru, Pierre, 4,854,781, Cl. 405-224.000.
Institute for Medical Research: *See—*
McGarrity, Gerard J.; and Kotani, Hitoshi, 4,855,227, Cl. 435-7.000.
Institute of Gas Technology: *See—*
Khinkis, Mark J.; Patel, Jitendra G.; and Sandstrom, William A., 4,854,249, Cl. 110-342.000.
Institute Po Tcherna Metalurgia: *See—*
Genev, Ivan V., 4,855,039, Cl. 209-311.000.
Intelock Corporation: *See—*
Corder, Thomas E.; and Stewart, John F., 4,854,143, Cl. 70-218.000
Inter-Ikea A/S: *See—*
Jonsson, Magnus, 4,854,763, Cl. 402-32.000.
Interactive Technologies, Inc.: *See—*
Brunius, Robert E., 4,855,713, Cl. 340-506.000.
Interlego A. G.: *See—*
Bach, Erik, 4,854,742, Cl. 384-129.000.
Intermec Corporation: *See—*
Wiklof, Christopher A.; and Apperson, Gerald R., 4,855,757, Cl. 346-76.0PH.
International Business Machines Corporation: *See—*
Bauge, Michel; Boudon, Gerard; Mollier, Pierre; Peter, Jean-Luc; and Yamour, Yiannis J., 4,856,000, Cl. 371-9.000.
Boertzel, Martin; Ludwig, Reinhold; Schmits, Wilhelm; and Weiss, Ulrich, 4,855,858, Cl. 361-18.000.
Bouillot, Michel; Calvignac, Jean-Louis J.; and Munier, Jean-Marie L., 4,855,948, Cl. 364-900.000.
Casey, Christine T.; and Record, Stephen E., 4,855,936, Cl. 364-521.000.
Codella, Christopher F.; and Ogura, Seiki, 4,855,246, Cl. 437-41 000.
Estrada, Suzanne L.; and Ploger, Robert R., III, 4,855,905, Cl. 364-200.000
Ferro, John T., Jr.; Jacobs, Patrick C.; Laye, Robert M.; and Starr, Brian D., 4,855,907, Cl. 364-300.000.
Fitzgerald, William J., Jr.; and Glemser, Raymond G., II, 4,855,939, Cl. 364-522.000.
Gazdik, Charles E.; McBride, Donald G.; Seraphim, Donald P.; and Toole, Patrick A., 4,855,867, Cl. 361-306.000.
Gonzalez-Lopez, Jorge; and Liang, Bob C., 4,855,938, Cl. 364-522.000.
Millham, Ernest H., 4,855,681, Cl. 328-62.000.
Peterman, Steven; and Stanasolovich, David, 4,855,252, Cl. 437-189.000.
Rudik, William J.; Schmitt, George P.; and Shipley, John F., 4,855,333, Cl. 522-71.000.
Wiley, John P., 4,854,038, Cl. 29-830.000.
Zapka, Werner; Kempf, Jurgen; Keyser, Joachim; and Asch, Karl, 4,855,197, Cl. 430-5.000.
International Fuel Cells Corporation: *See—*
Grasso, Albert P., 4,855,192, Cl. 429-13.000.
International Machine & Tool Corporation: *See—*
Elsdoerfer, Norbert W., 4,855,734, Cl. 340-870.310.
International Power Blocks Holdings Ltd.: *See—*
Johannson, Gerald G.; and Trca, Gordon R., 4,854,573, Cl. 272-93.000.
Intersil, Inc.: *See—*
Mostyn, Graham Y.; and Yunus, Mohammad, 4,855,722, Cl. 340-660.000.
Intex Pharmazeutische Produkte AG: *See—*
Emoedi, Gabriel, 4,855,284, Cl. 514-8.000.
Inushima, Takashi: *See—*
Yamazaki, Shunpei; Mase, Akira; Konuma, Toshimitsu; Miyazaki, Minoru; Sakama, Mitsunori; and Inushima, Takashi, 4,855,805, Cl. 357-58.000.
Inventa Electronics Co., Ltd.: *See—*
Yeh, Kou-I, 4,856,056, Cl. 379-375.000.
Iomega Corporation: *See—*
Jones, David E.; and McMurtrey, David S., 4,855,849, Cl. 360-97.010.
Iowa State University Research Foundation, Inc.: *See—*
Barua, Arun B.; and Olson, James A., 4,855,463, Cl. 549-417.000.
McConnell, Kenneth G., 4,854,541, Cl. 248-565.000.
IPCO Corporation: *See—*
Weissman, Bernard, 4,854,871, Cl. 433-166.000.
Ippen, Heiko; and Preusker, Werner. Antiskid device, particularly for pneumatically tired vehicle wheels on snow and ice surfaces. 4,854,359, Cl. 152-216.000.
Ireland, Russ L. Paint brush holder. 4,854,470, Cl. 220-90.000.
Iris, Pasini, to IRIS S.a.s. di Salvioli Michele e C. Phytopreparation for treating skin affections. 4,855,131, Cl. 424-74.000.
IRIS S.a.s. di Salvioli Michele e C.: *See—*
Iris, Pasini, 4,855,131, Cl. 424-74.000.
Iriuchijima, Shinobu; Kobayashi, Hirohiko; Masuda, Takahito; Watanabe, Shunnosuke; and Tabata, Hiroshi, to Agro-Kanesho Co., Ltd.; and Denki Kaguku Koygo Kabushiki Kaisha. Benzoisothiazole oximes which are plant protection agents for control of fungi and bacteria. 4,855,311, Cl. 514-373.000.
Ironclad, Corporation: *See—*
Rutledge, Gary L., 4,854,735, Cl. 383-72.000.
Irwin, Eric. Coin supports. 4,854,133, Cl. 63-15.000.
Ise, Kiyotaka; Matsumoto, Sinichi; and Miyazaki, Hiroharu, to Toyota Jidosha Kabushiki Kaisha. Device for determining whether a motor vehicle is on an uphill road upon starting of the vehicle. 4,854,411, Cl. 180-197.000.
Iseler, Kenneth A.; and Wilkinson, Robert E., to Budd Company, The. Compression molding a charge using vacuum. 4,855,097, Cl. 264-102.000.
Ishida, Masato: *See—*
Sato, Isamu; Ishida, Masato; Abe, Eiichi; and Takeda, Hiroaki, 4,855,767, Cl. 346-160.000.
Ishihara, Ichiro; and Kanai, Toshio, to Kabushiki Kaisha Toshiba. Differential amplifier circuit. 4,855,686, Cl. 330-261.000.
Ishihara, Shunichi: *See—*
Hirooka, Masaaki; Ishihara, Shunichi; Hanna, Junichi; and Shimizu, Isamu, 4,855,210, Cl. 430-133.000.
Ishii, Yoshimitsu: *See—*
Fuchikami, Takamasa; Urata, Hisao; Ishii, Yoshimitsu; and Obata, Yoshiko, 4,855,487, Cl. 560-227.000.
Ishikawa, Hidenobu: *See—*
Maruyama, Osamu; Ishikawa, Hidenobu; and Takahashi, Nobuo, 4,855,334, Cl. 522-96.000.
Ishikawa, Norio; Nakai, Masaaki; Hirano, Masayasu; Fujino, Akihiko; Ootsuka, Hiroshi; Egawa, Takeshi; and Kawamura, Kunio, to Minolta Camera Kubushiki Kaisha. Camera system. 4,855,779, Cl. 354-412.000.
Ishikawa, Norio: *See—*
Ishimura, Toshihiko; Ishikawa, Norio; Akada, Yasuaki; Seki, Reiji; and Taniguchi, Nobuyuki, 4,855,778, Cl. 354-412.000.
Ishimoto, Hironori: *See—*
Imamura, Youichiro; Kaeriyama, Toshiyuki; and Ishimoto, Hironori, 4,855,798, Cl. 357-71.000.
Ishimoto, Zenichi, to Nikko Co., Ltd. Apparatus for transferring a running track of a racing toy. 4,854,909, Cl. 446-129.000.
Ishimura, Toshihiko; Ishikawa, Norio; Akada, Yasuaki; Seki, Reiji; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Motor control device for use in a camera system. 4,855,778, Cl. 354-412.000.
Ishino, Tatsuyuki: *See—*
Shimoda, Makoto; Ishino, Tatsuyuki; and Matsuo, Makoto, 4,855,908, Cl. 364-405.000.
Ishizuka, Hiroshi; and Togano, Toshio, to Ishizuka Research Institute, The. Polishing machine using super abrasive grains. 4,854,083, Cl. 51-131.400.
Ishizuka Research Institute, The: *See—*
Ishizuka, Hiroshi; and Togano, Toshio, 4,854,083, Cl. 51-131.400.
Isnardi, Michael A., to General Electric Company. Apparatus for processing auxiliary information in an extended definition widescreen television system. 4,855,811, Cl. 358-12.000.
Isobe, Akira; and Anzai, Tsutomu, to Sony Corporation. Cable adaptor with switch. 4,855,611, Cl. 307-125.000.
Isobe, Shinichi; and Kagawa, Yoshimasa, to Fanuc Ltd. Positioning system. 4,855,657, Cl. 318-602.000.
Isoe, Noboru: *See—*
Wakai, Kunio; Niimi, Hideaki; and Isoe, Noboru, 4,855,175, Cl. 428-148.000.
Isogai, Yuji: *See—*
Yamatoh, Kouhei; Ogura, Masami; Kanbe, Katunori; and Isogai, Yuji, 4,854,424, Cl. 188-72.100.
Isono, Toru: *See—*
Nishikawa, Masayuki; Miyazaki, Takeshi; Shigeki, Terumitsu; Mizutani, Satoshi; and Isono, Toru, 4,854,030, Cl. 29-510.000.
Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft: *See—*
Ondrejas, johann; and Zitz, Friedrich, 4,855,182, Cl. 428-343.000.
Isozumi, Shuzoo: *See—*
Morishita, Akira; Tanaka, Toshinori; and Isozumi, Shuzoo, 4,855,610, Cl. 290-48.000.
Itagaki, Shuichi: *See—*
Ono, Shuichi; Itagaki, Shuichi; Yahagi, Masahiro; Furukawa, Kiyoshi; Fujiwara, Shinobu; and Oikawa, Yasunobu, 4,854,936, Cl. 29-570.100.
Itagaki, Yasuhiro: *See—*
Orui, Ryuzo; Itagaki, Yasuhiro; and Yamaguchi, Toshio, 4,855,644, Cl. 315-3.600.
Itakura, Yasuo: *See—*
Nozue, Yasuhiro; Kajiyama, Koichi; Saito, Kaoru; Wakabayashi, Osamu; Kowaka, Masahiko; and Itakura, Yasuo, 4,856,018, Cl. 372-98.000.
Italici, Rino, to Lucas International S.R.L. Unsinkable bag provided with flotation elements in the handles and bag compartments. 4,854,732, Cl. 383-6.000.
Itano, Jiro: *See—*
Yamamoto, Koji; Nakajima, Akihisa; Sawada, Hiroshi; Shinagawa, Noriteru; and Itano, Jiro, 4,856,048, Cl. 379-60.000.
ITEC, Inc.: *See—*
Halbig, Walter A., 4,856,059, Cl. 379-412.000.
Ito, Hiroyasu: *See—*
Furuhashi, Kenshi; Ito, Hiroyasu; and Enari, Nobuyuki, 4,855,542, Cl. 200-61.270.

Ito, Masahiko: *See*—
Takagi, Kazunori; and Ito, Masahiko, 4,856,065, Cl. 381-28.000.
Ito, Masazumi: *See*—
Ohira, Tadashi; Ito, Masazumi; and Maruta, Syuzi, 4,855,786, Cl. 355-218.000.
Ito, Michio: *See*—
Saito, Akira; Nukada, Teisuke; and Ito, Michio, 4,854,041, Cl. 29-884.000.
Ito, Yoshimasa: *See*—
Tsuchiya, Soji; Ito, Yoshimasa; Higuchi, Sadashi; and Yamashita, Akio, 4,855,727, Cl. 340-785.000.
Ito, Yukio: *See*—
Yamada, Kimichika; Ito, Yukio; and Ohkawa, Hiroyuki, 4,855,848, Cl. 360-96.500.
Itoh, Hirohito: *See*—
Sakuma, Kazuhiro; Itoh, Hirohito; Kazou, Mitsuaki; and Kuramoto, Kenji, 4,854,169, Cl. 73-517.00B.
Itoh, Kikuo: *See*—
Eshita, Takashi; Mieno, Fumitake; Furumura, Yuji; and Itoh, Kikuo, 4,855,254, Cl. 437-100.000.
ITT Corporation: *See*—
Borsuk, Leslie M.; and Coutts, Bruce, 4,854,663, Cl. 350-96.200.
ITT Defense Communications: *See*—
Batzer, John L.; and Kneib, Kristine N., 4,856,030, Cl. 375-106.000.
Ive, John G. S., to Sony Corporation. Digital video recording. 4,855,843, Cl. 360-10.200.
Iwabuchi, Takashi: *See*—
Miyata, Takeo; and Iwabuchi, Takashi, 4,856,019, Cl. 372-99.000.
Iwakiri, Norio: *See*—
Yamashita, Masatsugu; Iwakiri, Norio; Yamanaka, Sekisuke; and Yanase, Akira, 4,855,541, Cl. 200-6.00R.
Iwakura, Hikozo: *See*—
Mori, Sachio; Iwakura, Hikozo; and Takechi, Shozo, 4,855,449, Cl. 548-512.000.
Iwakura, Ken: *See*—
Igarashi, Akira; Satomura, Masato; and Iwakura, Ken, 4,855,278, Cl. 503-208.000.
Satomura, Masato; Iwakura, Ken; Takashima, Masanobu; and Igarashi, Akira, 4,855,282, Cl. 503-218.000.
Iwakura, Masaru: *See*—
Kamimura, Hiroto; Kubota, Shuichi; and Iwakura, Masaru, 4,854,745, Cl. 384-420.000.
Iwamatsu, Masayuki, to Yamaha Corporation. Sound field control apparatus. 4,856,064, Cl. 381-1.000.
Iwamoto, Kazunori, to Canon Kabushiki Kaisha. Precise feeding mechanism. 4,854,444, Cl. 198-750.000.
Iwamoto, Keiichi: *See*—
Torichigai, Masaaki; and Iwamoto, Keiichi, 4,854,614, Cl. 285-93.000.
Iwano, Hideaki; and Tsunekawa, Yoshifumi, to Seiko Epson Corporation. Semiconductor laser having an active layer and cladding layer. 4,856,013, Cl. 372-45.000.
Iwase, Nobuo: *See*—
Iyogi, Kiyoshi; Yamakawa, Koji; and Iwase, Nobuo, 4,855,251, Cl. 437-183.000.
Iwase, Taira: *See*—
Ariizumi, Shoji; Iwase, Taira; and Masuoka, Fujio, 4,855,248, Cl. 437-49.000.
Iwata, Yuzo: *See*—
Muraishi, Katsuaki; Yaginuma, Nakatsugu; Hirai, Kikuo; Arai, Fuminori; and Iwata, Yuzo, 4,855,109, Cl. 422-63.000.
Iwatsu Electric Co., Ltd.: *See*—
Ohtsuka, Hiroo; Hara, Osamu; Hori, Akira; and Nodoa, Minoru, 4,854,889, Cl. 439-395.000.
Iyogi, Kiyoshi; Yamakawa, Koji; and Iwase, Nobuo, to Kabushiki Kaisha Toshiba. Method of manufacturing electronic parts including transfer of bumps of larger particle sizes. 4,855,251, Cl. 437-183.000.
J. B. Martin Company: *See*—
Combier, Charles M., 4,854,352, Cl. 139-408.000.
J. C. Baxter Co.: *See*—
Jackson, Keith, 4,854,991, Cl. 156-195.000.
J. I. Case Company: *See*—
Brekkestran, Kevin L.; and Thomas, John C., 4,855,913, Cl. 364-424.100.
Frisbee, Claude M., 4,854,392, Cl. 172-813.000.
Smith, Wayne G.; Martinez, David V.; Mozingo, Robert E.; and Hanson, Charles B., 4,854,812, Cl. 414-723.000.
Smith, Wayne G.; Martinez, David V.; Mozingo, Robert E.; and Hanson, Charles B., 4,854,814, Cl. 414-723.000.
JAC Creative Foods, Inc.: *See*—
Kawana, Frank S., 4,855,158, Cl. 426-643.000.
Jackson, Keith, to J. C. Baxter Co. Tube forming apparatus and method. 4,854,991, Cl. 156-195.000.
Jackson, Miles, to General Foods Inc. Apparatus for dispensing particulate material. 4,854,722, Cl. 366-341.000.
Jackson Products, Inc.: *See*—
Boochard, E. L., 4,853,973, Cl. 2-8.000.
Jacob-Grinschgl, Wolfgang; and Muller, Udo, to Kontron Holding A.G. Measuring table for co-ordinate measuring system. 4,855,538, Cl. 178-18.000.
Jacobs, Glenn A.: *See*—
Zahler, Robert; and Jacobs, Glenn A., 4,855,466, Cl. 549-546.000.
Jacobs, Patrick C.: *See*—
Ferro, John T., Jr.; Jacobs, Patrick C.; Laye, Robert M.; and Starr, Brian D., 4,855,907, Cl. 364-300.000.
Jadwin, Thomas A.: *See*—
Wilson, John C.; and Jadwin, Thomas A., 4,855,396, Cl. 528-272.000.
Jaffe, Jules S.; Cassereau, Philippe; and Sato, Tomomasa, to Woods Hole Oceanographic Institute. Imaging apparatus. 4,855,961, Cl. 367-7.000
Jagannathan, Ramesh; and Bye, Matthew R., to Eastman Kodak Company. Particulate magnetic recording media having an areally controlled recording characteristic. 4,855,028, Cl. 204-180.200.
Jahn, Hans-Georg, to Heidelberger Druckmaschinen Aktiengesellschaft. Sheet-fed rotary printing presses for multi-color printing. 4,854,231, Cl. 101-177.000.
Jakob, Willi; and Marscholl, Klaus, to Kuster & Co. GmbH. Apparatus for adjusting the length of a bowden cable. 4,854,186, Cl. 74-501.50R.
Jakubicki, Gary J., to Colgate-Palmolive Company. Household cleaning composition. 4,855,067, Cl. 252-174.250.
Jalbert, Ronald L.: *See*—
Whalen, David; and Jalbert, Ronald L., 4,855,357, Cl. 525-67.000.
James Howden Australia Pty. Ltd.: *See*—
Stephenson, Robert G., 4,854,951, Cl. 55-294.000.
Janiak, Jerzy S.; Turak, Ali A.; Pawlak, Wanda; and Ignasiak, Boleslaw L., to Electric Power Research Institute, Inc. Method for providing improved solid fuels from agglomerated subbituminous coal. 4,854,940, Cl. 44-620.000.
Janiak, Robert A.; and Davene, Jean G., to Zenith Electronics Corporation. Electric direct-current scrap-melting furnace. 4,856,021, Cl. 373-108.000.
Janle-Swain, Elsa M.: *See*—
Ash, Stephen R.; and Janle-Swain, Elsa M., 4,854,322, Cl. 128-635.000.
Jansen, Frank: *See*—
Badesha, Santokh S.; Grammatica, Steven J.; and Jansen, Frank, 4,855,201, Cl. 430-58.000.
Janssen, Herve J. W.: *See*—
Janssen, Wilhelmus G. E.; and Janssen, Herve J. W., 4,855,960, Cl. 366-8.000.
Janssen, Wilhelmus G. E.; and Janssen, Herve J. W. Process and apparatus for the preparation of mortars. 4,855,960, Cl. 366-8.000.
Janssens, Wilhelmus; Timmerman, Daniel M.; and Claeys, Daniel A., to Agfa-Gevaert, N.V. Polymeric phosphonium mordant and photographic element containing the same. 4,855,211, Cl. 430-213.000.
Japan Aviation Electronics Industry Limited: *See*—
Ebata, Genji; Tanabe, Koji; and Saito, Takahiro, 4,854,667, Cl. 350-96.200.
Sakuma, Kazuhiro; Itoh, Hirohito; Kazou, Mitsuaki; and Kuramoto, Kenji, 4,854,169, Cl. 73-517.00B.
Japan Electronic Control Systems Co.: *See*—
Uchikawa, Akira, 4,854,288, Cl. 123-489.000.
Japan Electronic Control Systems Co., Ltd.: *See*—
Tomisawa, Naoki, 4,854,287, Cl. 123-489.000.
Japan Hydrazine Co., Inc.: *See*—
Hojo, Shiro; Hasegawa, Yoichi; and Hirai, Takeo, 4,855,501, Cl. 564-314.000.
Jaron, William: *See*—
Lesley, Arthur M.; and Jaron, William, 4,854,726, Cl. 374-45.000.
Jasper, Louis J., Jr., to United States of America, Army. Electromagnetic injector/railgun. 4,854,215, Cl. 89-8.000.
Jaworski, Marlene H.: *See*—
Harrigan, Linda M.; and Jaworski, Marlene H., 4,853,996, Cl. 5-494.000.
Jaworski, William R. Unitized hydrotherapy jet and pump assembly. 4,853,987, Cl. 4-542.000.
Jay, Danford A.: *See*—
Jay, Steven P., 4,854,165, Cl. 73-168.000.
Jay, Steven P., to Jay, Danford A. Apparatus for testing electrical components. 4,854,165, Cl. 73-168.000.
JD-Technologie AG: *See*—
Hafner, Rudolf, 4,855,717, Cl. 340-556.000.
Jeanson, Guy: *See*—
Marceau, Richard J.; and Jeanson, Guy, 4,855,552, Cl. 219-10.510.
Jefferies, Roy S.: *See*—
O'Connell, John; Jefferies, Roy S.; and Trevor-Jones, Hugh, 4,854,146, Cl. 70-277.000.
Jelich, Klaus; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, to Bayer Aktiengesellschaft. Triazolo-pyrimidine-2-sulphonamides having herbicidal utility. 4,854,964, Cl. 71-92.000.
Jendricke, Hermann: *See*—
Lange, Heinz; Heins, Hans-Peter; and Jendricke, Hermann, 4,854,755, Cl. 400-208.100.
Jenkins, James O. M., to Siliconix Limited. Temperature sensing apparatus. 4,854,731, Cl. 374-178.000.
Jenkins, Kenneth N.: *See*—
Brown, Peter A.; Jenkins, Kenneth N.; and Pouget, Paul A., 4,854,150, Cl. 72-369.000.
Jensen, Harold A. Apparatus for the manufacture of block-sealed side-gussetted bags. 4,854,451, Cl. 206-554.000.
Jensen, William L., Jr.: *See*—
Wiley, Nathaniel C., Jr.; and Jensen, William L., Jr., 4,855,712, Cl. 340-453.000.
Jessup, Thurman W. Support system for shaft. 4,854,184, Cl. 74-411.000.
Jet Research Center, Inc.: *See*—
Riggs, Robert S., 4,855,436, Cl. 546-307.000.
JGC Corporation: *See*—
Matsuoka, Hiroo; Toida, Tsutomu; Takinami, Takao; Takenaka, Senji; and Fujita, Tetsuo, 4,855,124, Cl. 423-574.00L.

Job, Robert C., to Shell Oil Company. Process for polymerizing olefins with a crystalline magnesium catalyst component. 4,855,371, Cl. 526-124.000.
Jobling, David T.; and Newton, Anthony D., to Motorola, Inc. Timebase circuit. 4,855,651, Cl. 315-387.000.
Jodrey, Robert M., to Dennison Manufacturing Company. Web transport motion compensation apparatus. 4,855,005, Cl. 156-361.000.
Joffee, Irving B.; Degen, Peter J.; and Baltusis, Frederick A., to Pall Corporation. Method of making polyvinylidene difluoride structure. 4,855,163, Cl. 427-244.000.
Joh. A. Benckiser GmbH: *See*—
Margureanu, Gabriella; and Gutmann, Friedrich, 4,855,494, Cl. 562-580.000.
Johannson, Gerald G.; and Trca, Gordon R., to International Power Blocks Holdings Ltd. Exercising device. 4,854,573, Cl. 272-93.000.
Johansson, Rolf. Belt conveyor system. 4,854,447, Cl. 198-817.000.
John Brown, Inc.: *See*—
Carlsen, Richard A., 4,854,844, Cl. 425-141.000.
John Hopkins University, The: *See*—
Smith, Kennith A., 4,855,328, Cl. 521-88.000.
Johns Hopkins University, The: *See*—
Hwu, Jih R.; and Robl, Jeffrey A., 4,855,437, Cl. 548-241.000.
Johnson, Alan L. Hand propelled soil cultivation tool. 4,854,391, Cl. 172-354.000.
Johnson, Bryce V.: *See*—
Duchesne, Denis; and Johnson, Bryce V., 4,855,360, Cl. 525-187.000.
Johnson, David L.: *See*—
Banavar, Jayanth R.; Johnson, David L.; Nagel, Sidney R.; and Safinya, Kambiz A., 4,855,912, Cl. 364-422.000.
Johnson, Derrell Q., to North American Philips Corporation, Signetics Division. TTL compatible switching circuit having controlled ramp output. 4,855,622, Cl. 307-456.000.
Johnson Electric Industrial Manufactory, Ltd.: *See*—
Baines, Roger F., 4,855,632, Cl. 310-233.000.
Johnson, Eugene M., Jr., to Washington University. Tumor diagnostic method. 4,855,241, Cl. 436-548.000.
Johnson, Robert E.; and Dinsmore, William R., to Powertech Labs Inc. Injection capsule for treating trees. 4,854,074, Cl. 47-57.500.
Johnson, Stephen J.: *See*—
Horwell, David C.; and Johnson, Stephen J., 4,855,316, Cl. 514-422.000.
Johnson, Thomas M., to Maytag Corporation. Fabric dryer airflow system. 4,854,054, Cl. 34-133.000.
Johnston, David E.: *See*—
Fraser, Steven A.; Johnston, David E.; and Metzger, Reece D., 4,855,583, Cl. 235-492.000.
Jolliff, Daniel; Hahn, Michael W.; and Oldham, Dean C., to Continental Brokers and Consultants, Inc. Cash register gaming device. 4,854,590, Cl. 273-138.00A.
Jones, Alan W.: *See*—
Clark, R. Scot; Hoffman, Joe G.; Davison, John B.; Jones, Alan W.; Jones, Allen H., Jr.; Persichini, David W.; Yuan, Wallace I.; and Lipisko, Bruce A., 4,855,023, Cl. 204-130.000.
Jones, Allen H., Jr.: *See*—
Clark, R. Scot; Hoffman, Joe G.; Davison, John B.; Jones, Alan W.; Jones, Allen H., Jr.; Persichini, David W.; Yuan, Wallace I.; and Lipisko, Bruce A., 4,855,023, Cl. 204-130.000.
Jones, Dallas W.; and Young, Lauren, to Trim-A-Lawn Corporation. Apparatus for cutting grass and the like. 4,854,115, Cl. 56-320.100.
Jones, David E.; and McMurtrey, David S., to Iomega Corporation. Disk drive motor mount. 4,855,849, Cl. 360-97.010.
Jones, David P.; and McElroy, William D., to Cues, Inc. Remotely controlled pan and tilt television camera. 4,855,838, Cl. 358-229.000.
Jones, Keith E.; and Harwood, Warren K., to Cascade Microtech, Inc. Coaxial transmission line to microstrip transmission line launcher. 4,855,697, Cl. 333-33.000.
Jones, Larry O.: *See*—
Young, David A.; Jones, Larry O.; and Campione, Troy J., 4,855,525, Cl. 585-523.000.
Jones, Lloyd G.: *See*—
Hurd, B. George; Jones, Lloyd G.; and Strange, Lloyd K., 4,854,385, Cl. 166-273.000.
Jones, Randal L.: *See*—
Garland, Anthony C.; and Jones, Randal L., 4,855,949, Cl. 364-900.000.
Jones, Thad M. AC current switch. 4,855,666, Cl. 323-351.000.
Jones, William R. Graphite hot zone assembly. 4,856,022, Cl. 373-112.000.
Jongeling, Leendert B.: *See*—
Pluijms, Rene A. M.; Papanikolau, Emmanuel; Jongeling, Leendert B.; and Van Esdonk, Johannes M. A., 4,854,956, Cl. 65-2.000.
Jonson Teknik KB: *See*—
Jonsson, Sven; and Hagman, Anders, 4,856,101, Cl. 358-245.000.
Jonsson, Arne, to ABB Stal AB. Fluidized bed fuel-fired power plant. 4,854,854, Cl. 431-170.000.
Jonsson, Magnus, to Inter-Ikea A/S. Device for the impaling of loose leaves. 4,854,763, Cl. 402-32.000.
Jonsson, Sven; and Hagman, Anders, to Jonson Teknik KB. Apparatus for diverting electrostatic fields, for instance from television viewing screens. 4,856,101, Cl. 358-245.000.
Jordal, Robert L. Security awning window. 4,855,716, Cl. 340-550.000.
Jorg, Benno: *See*—
Grassmuck, Volker; Jorg, Benno; and Sommer, Eberhard, 4,854,751, Cl. 384-537.000.
Joseph, J. M.: *See*—
Grieb, John H.; Joseph, J. M.; Weaver, Richard D.; and Bata, George T., 4,854,024, Cl. 29-156.70R.
Josephs, Charles R., to Rent-A-Vault, Inc. Portable storage container with integral ramp. 4,854,460, Cl. 220-1.500.
Joslin Diabetes Center, Inc.: *See*—
Soeldner, J. Stuart, 4,855,242, Cl. 436-539.000.
Joss, Werner: *See*—
Thunker, Norbert; Spiegel, Nikolaus; Lorenz, Roland; and Joss, Werner, 4,854,236, Cl. 101-411.000.
Joulia, Gerard: *See*—
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Jouve, Isabelle: *See*—
Besson, Bernard; Desmurs, Jean-Roger; and Jouve, Isabelle, 4,855,513, Cl. 568-779.000.
Juang, Yuan C. Securing means for a double step ladder. 4,854,420, Cl. 182-166.000.
Jucha, Rhett B.; Davis, Cecil J.; and Loewenstein, Lee M., to Texas Instruments Incorporated. Method for etching aluminum film doped with copper. 4,855,016, Cl. 156-643.000.
Judd, Duncan B.: *See*—
Collington, Eric W.; Finch, Harry; and Judd, Duncan B., 4,855,293, Cl. 514-212.000.
Jugs, Andrejs: *See*—
Brandao, Ruy L.; Kyriakos, Constantinos S.; Spires, Randall C.; and Jugs, Andrejs, 4,855,748, Cl. 342-455.000.
Juki Corporation: *See*—
Asao, Hideo; Yamazi, Satoru; and Saibe, Seiichi, 4,854,252, Cl. 112-265.100.
Jun, Dong-Soo, to Samsung Semiconductors and Telecommunications Co., Ltd. Sense amplifier for high performance dram. 4,855,628, Cl. 307-530.000.
Junckers Industrier A/S: *See*—
Kristoffersen, Kaj, 4,854,099, Cl. 52-403.000.
Juneau, Pierre. Sectional-type door. 4,854,365, Cl. 160-232.000.
Juneja, Prem S.: *See*—
Inman, Everett; Roberts, Nancy J.; and Juneja, Prem S., 4,854,333, Cl. 132-209.000.
Jung, Frederic H., to Ici Pharma. Cephalosporin derivatives. 4,855,420, Cl. 540-222.000.
Jungverdorben, Hermann-Josef: *See*—
Reinehr, Ulrich; Pieper, Christian; Hirsch, Rolf-Burkhard; Jungverdorben, Hermann-Josef; and Breuer, Jakob, 4,854,021, Cl. 28-263.000.
Junker, Belva J. Pet barrier for car window installation. 4,854,364, Cl. 160-105.000.
Juntgen, Harald: *See*—
Richter, Ekkehard; Juntgen, Harald; Schmidt, Hans-Jurgen; and Knoblauch, Karl, 4,855,116, Cl. 423-239.000.
Just Japan Co., Ltd.: *See*—
Sasaki, Mitsuo, 4,854,767, Cl. 404-6.000.
K.W. Thompson Tool Company, Inc.: *See*—
French, Kendrick L.; and Laney, Mark C., 4,854,065, Cl. 42-65.000.
kabelmetal electro Gesellschaft mit beschrankter Haftung: *See*—
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Kabushiki Kaisha Hareyama Giken: *See*—
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Kabushiki Kaisha Kenwood: *See*—
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Asahi, Nobumitsu; Ikeda, Tetsuo; and Kawase, Seiji, 4,855,894, Cl. 363-157.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Katsumata, Masaaki; Takagi, Isamu; Takahashi, Eiji; Sakai, Tadamichi; Matsumoto, Yoji; Ohtsu, Hideaki; Uchida, Hiroyuki; and Asami, Kiyoshi, 4,855,106, Cl. 420-109.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
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Nozue, Yasuhiro; Kajiyama, Koichi; Saito, Kaoru; Wakabayashi, Osamu; Kowaka, Masahiko; and Itakura, Yasuo, 4,856,018, Cl. 372-98.000.
Kabushiki Kaisha Sebun Shiizu: *See*—
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Kabushiki Kaisha Tikai-Rika-Denki-Seisakusho: *See*—
Furuhashi, Kenshi; Ito, Hiroyasu; and Enari, Nobuyuki, 4,855,542, Cl. 200-61.270.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Ohta, Takashi, 4,855,540, Cl. 200-5.00E.
Kabushiki Kaisha Toshiba: *See*—
Arii, Michio; Kamataki, Yoshihisa; Hino, Shirou; and Matsui, Shoji, 4,854,121, Cl. 60-39.182.
Ariizumi, Shoji; Iwase, Taira; and Masuoka, Fujio, 4,855,248, Cl. 437-49.000.
Hirata, Yoshihiro, 4,856,052, Cl. 379-100.000.
Hirokawa, Katsuhisa; and Ohba, Hiroshi, 4,855,578, Cl. 235-380.000.
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Ikegawa, Sumio; Hori, Akio; Komatsu, Shuichi; Arai, Shinji; and Yasuda, Nobuaki, 4,855,992, Cl. 369-275.000.
Ishihara, Ichiro; and Kanai, Toshio, 4,855,686, Cl. 330-261.000.
Iyogi, Kiyoshi; Yamakawa, Koji; and Iwase, Nobuo, 4,855,251, Cl. 437-183.000.
Kikuchi, Kiyoji, 4,854,757, Cl. 400-605.000.
Kinuno, Masanori; Saito, Hisao; Kousaka, Akira; and Kawaguchi, Toshio, 4,855,645, Cl. 315-39.710.

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Miura, Kunihiko; and Nosaki, Takefumi, 4,854,754, Cl. 400-802.200.
Nakai, Toshio; Miyagi, Takeshi; and Shimada, Osamu, 4,855,537, Cl. 174-68.500.
Nishio, Seiichi, 4,855,726, Cl. 340-747.000.
Nogami, Kazutaka, 4,855,957, Cl. 365-230.030.
Sato, Yasuji; and Hino, Fumio, 4,856,058, Cl. 379-394.000.
Tada, Kaoru; Hasunuma, Masahiko; and Kawai, Mitsuo, 4,854,978, Cl. 148-14.000.
Takeuchi, Yoshiaki; and Nakagawa, Kaoru, 4,856,034, Cl. 377-74.000.
Tanabe, Hirohito; Ohata, Yu; Suzuki, Kazuaki; Miwa, Yukiharu; and Nakayama, Yoshihito, 4,855,799, Cl. 357-23.400.
Watanabe, Yoshio, 4,855,817, Cl. 358-75.000.
Yamaji, Yasuhiro; Takahashi, Kenji; Hirata, Seiichi; and Sakurai, Toshiharu, 4,855,807, Cl. 357-72.000.
Yamamoto, Motoyuki; and Tsuburai, Yasuhiko, 4,855,250, Cl. 437-81.000.
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Yasuki, Seijiro; and Hoshino, Kiyoshi, 4,855,815, Cl. 358-31.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Ohwaki, Takeshi; and Taga, Yasunori, 4,855,176, Cl. 428-195.000.

Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo: *See*—
Ueno, Ryuzo; Katsura, Shinichi; Uchiyama, Yoshirou; and Inoue, Satomi, 4,855,482, Cl. 560-56.000.

Kabushiki Raisha Kotobuki: *See*—
Yokoyama, Toshio, 4,854,640, Cl. 297-333.000.

Kadohara, Terutake: *See*—
Suda, Yasuo; Higashihara, Masaki; and Kadohara, Terutake, 4,855,777, Cl. 354-402.000.

Kaeriyama, Toshiyuki: *See*—
Imamura, Youichiro; Kaeriyama, Toshiyuki; and Ishimoto, Hironori, 4,855,798, Cl. 357-71.000.

Kafri, Oded; and Kreske, Kathi M., to Rotlex Optics Ltd. Optical examination apparatus particularly useful as a Fizeau interferometer and schlieren device. 4,854,708, Cl. 356-359.000.

Kagawa, Yoshihiro; and Hori, Keimitsu, to Taihosangyo Co., Ltd. Solidifying agent comprising slag dust from industrial waste, method of solidifying liquid organic halogenide and burning method for disposing of liquid organic halogenide. 4,855,083, Cl. 252-632.000.

Kagawa, Yoshimasa: *See*—
Isobe, Shinichi; and Kagawa, Yoshimasa, 4,855,657, Cl. 318-602.000.

Kageyama, Yoshikazu; and Mino, Mineo, to Matsushita Electric Industrial Co., Ltd. Television channel selection apparatus employing multi-picture display. 4,855,833, Cl. 358-183.000.

Kagome Kabushiki Kaisha: *See*—
Yokota, Tetsuya; Sakamoto, Hideki; and Takahashi, Naoto, 4,855,147, Cl. 426-43.000.

Kain, Richard S.: *See*—
Winter, Russell K.; Harvey, Thomas D.; Savas, Nedim; and Kain, Richard S., 4,854,535, Cl. 248-225.200.

Kaito, Kosuke: *See*—
Okamoto, Kiyokazu; Hino, Kiyoshi; and Kaito, Kosuke, 4,855,661, Cl. 318-807.000.

Kaji, Hisatsugu: *See*—
Fukuda, Hiroyuki; Shigeta, Masatomo; Kaji, Hisatsugu; and Saitoh, Kuniyuki, 4,855,092, Cl. 264-29.500.

Kajima Corporation: *See*—
Fukukawa, Mitsuo; Yazawa, Masayuki; Asai, Kazumitsu; Okamoto, Yoshiharu; and Mio, Kouhei, 4,854,769, Cl. 404-72.000.

Kajiyama, Koichi: *See*—
Nozue, Yasuhiro; Kajiyama, Koichi; Saito, Kaoru; Wakabayashi, Osamu; Kowaka, Masahiko; and Itakura, Yasuo, 4,856,018, Cl. 372-98.000.

Kakimoto, Seizo; Kudo, Jun; and Koba, Masayoshi, to Sharp Kabushiki Kaisha. Method for manufacturing semiconductor devices. 4,855,014, Cl. 156-620.720.

Kakiuchi, Shizuo: *See*—
Iizuka, Hiroshi; and Kakiuchi, Shizuo, 4,855,741, Cl. 341-75.000.

Kakizawa, Koichiro: *See*—
Ichihashi, Tadashi; Kakizawa, Koichiro; and Kawamura, Masunori, 4,854,693, Cl. 351-221.000.

Kaku, Toshimitsu; Tsunoda, Yoshito; Maeda, Takeshi; and Nakamura, Shigeru, to Hitachi, Ltd. Optical disk having track offset detection areas. 4,855,991, Cl. 369-275.000.

Kalbag, Suresh M. Blocked, marked amino acids. 4,855,486, Cl. 560-158.000.

Kalyanaraman, Palaiyur S.; and Garito, Anthony F., to Hoechst Celanese Corp. Bistable optical devices. 4,854,676, Cl. 350-354.000.

Kamataki, Yoshihisa: *See*—
Arii, Michio; Kamataki, Yoshihisa; Hino, Shirou; and Matsui, Shoji, 4,854,121, Cl. 60-39.182.

Kamax-Werke Rudolf Kellermann GmbH & Co. KG: *See*—
Oertel, Klaus, 4,854,794, Cl. 411-307.000.

Kameda, Osamu; and Tabata, Shigeo, to Mazda Motor Corporation. Transfer case shifting apparatus for part-time four-wheel drive vehicle. 4,854,413, Cl. 180-247.000.

Kamei, Masaharu; Negishi, Tsutomu; Nishikawa, Masaru; and Kishino, Kimishiro, to Earth Chemical Company, Limited. Composition for attracting flies. 4,855,133, Cl. 424-84.000.

Kamei, Takeo; and Sekine, Katsuyuki, to Yokogawa Aviation Company, Ltd. Connector backshell structure. 4,854,891, Cl. 439-462.000.

Kamenov, Mitko V.: *See*—
Tersiev, Kostadin G.; and Kamenov, Mitko V., 4,854,067, Cl. 43-6.000.

Kamimura, Hiroto; Kubota, Shuichi; and Iwakura, Masaru, to Oiles Industry Co., Ltd. Thrust bearing made of synthetic resin. 4,854,745, Cl. 384-420.000.

Kamino, Yukishige: *See*—
Uchida, Kenji; Banba, Nobuyuki; Kuroiwa, Minoru; Saito, Makoto; and Kamino, Yukishige, 4,854,783, Cl. 406-13.000.

Kamio, Kunimasa: *See*—
Saito, Yasuhisa; Takagishi, Hisao; Nakamura, Hiroshi; Okuno, Kohichi; Shiomi, Yutaka; and Kamio, Kunimasa, 4,855,339, Cl. 523-400.000.

Kamiya, Kazuhiro: *See*—
Watanabe, Isamu; Kamiya, Kazuhiro; Torii, Takahiro; and Mori, Toshihito, 4,855,287, Cl. 514-41.000.

Kamiyama, Sigeru: *See*—
Shiraishi, Noriaki; Kamiyama, Sigeru; Amioka, Shigenori; and Okada, Akiyoshi, 4,854,634, Cl. 296-108.000

Kammiller, Neil, to Reliance Comm/Tec Corporation. Power factor correction circuit. 4,855,890, Cl. 363-44.000.

Kamp, Ewald A., to First Brands Corporation. Multiposition interlocking closure fastening device. 4,854,017, Cl. 24-587.000.

Kan, Akiko, successor: *See*—
Kan, Fumitaka, deceased; Koizumi, Norihiko; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; Mishina, Shinya; and Tanioka, Hiroshi, 4,855,763, Cl. 346-160.100.

Kan, Fumitaka, deceased (by Kan, Akiko, successor); Koizumi, Norihiko; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; Mishina, Shinya; and Tanioka, Hiroshi, to Canon Kabushiki Kaisha. Image recording apparatus. 4,855,763, Cl. 346-160.100.

Kanai, Noriyuki: *See*—
Katahira, Keiichi; Shio, Kiyomi; and Kanai, Noriyuki, 4,854,371, Cl. 164-431.000.

Kanai, Toshio: *See*—
Ishihara, Ichiro; and Kanai, Toshio, 4,855,686, Cl. 330-261.000.

Kanamaru, Hitoshi, to Pioneer Electronic Corporation. Video disk reproducing device having improved motor speed control. 4,855,847, Cl. 360-19.100.

Kanamaru, Hitoshi, to Pioneer Electronic Corporation. Video/compact disk player having reduced track search time. 4,855,978, Cl. 369-32.000.

Kanamoto, Takashi, to NEC Corporation. Gas laser tube having a slotted anode. 4,856,016, Cl. 372-87.000.

Kanayama, Toshikiyo, to Fuji Photo Film Co., Ltd. LED array with graduated quantity control. 4,855,760, Cl. 346-108.000.

Kanazawa, Hirotaka; Note, Koushun; Nakashima, Yasuhiro; Mukai, Yoshiaki; Sakamoto, Shunji; and Okamizu, Shigeo, to Mazda Motor Corporation. Method of incorporating four-wheel steering system in vehicle and four-wheel steering system. 4,854,410, Cl. 180-140.000.

Kanazawa University: *See*—
Bessho, Kazuo; and Yamada, Sotoshi, 4,855,703, Cl. 335-296.000.

Kanbe, Katunori: *See*—
Yamatoh, Kouhei; Ogura, Masami; Kanbe, Katunori; and Isogai, Yuji, 4,854,424, Cl. 188-72.100.

Kanda, Masahiro: *See*—
Minamikata, Hajime; Kanno, Toshiaki; Kanda, Masahiro; and Ushijima, Hitoshi, 4,855,119, Cl. 423-346.000.

Kanda, Ryouji, to Tokai Rubber Industries, Ltd.; and Nissan Motor Company, Limited. Elastic bushing filled with viscous fluid. 4,854,561, Cl. 267-140.100.

Kanebo, Ltd.: *See*—
Murakami, Sanpei; Miyaaki, Tohru; Imahori, Tokio; Ogata, Koichi; and Hagita, Hidenari, 4,855,146, Cl. 426-5.000.

Kanegafuchi Chemical Industry Company, Limited: *See*—
Takada, Jun, 4,855,950, Cl. 365-113.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Ohnishi, Michikazu; Ohgoshi, Hiroshi; and Takada, Satoshi, 4,855,057, Cl. 210-650.000.

Kaneko, Kiyoshi; and Kato, Yoshiaki, to Kabushiki Kaisha Komatsu Seisakusho. Starting speed stage selector in automatic transmission control system. 4,854,194, Cl. 74-866.000.

Kaneko, Youji: *See*—
Matsubara, Akinori; Tsutsumi, Kenichi; Kaneko, Youji; Akutsu, Takashi; and Tateishi, Naofumi, 4,854,209, Cl. 84-1.010.

Kanesige, Isao: *See*—
Shimo, Hiroyuki; Kanesige, Isao; and Tanaka, Nobuo, 4,855,181, Cl. 428-336.000.

Kang, Yoon M.: *See*—
Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi, 4,854,131, Cl. 62-51.200.

Kanno, Masahide: *See*—
Hibino, Hiroki; Kimura, Kenji; Kanno, Masahide; Nishikori, Toshiaki; Yoshinaga, Jun; Kidawara, Atsushi; Yabe, Hisao; Katou, Shinichi; Takamura, Koji; and Nakamura, Takeaki, 4,855,819, Cl. 358-98.000.

Kanno, Toshiaki: *See*—
Minamikata, Hajime; Kanno, Toshiaki; Kanda, Masahiro; and Ushijima, Hitoshi, 4,855,119, Cl. 423-346.000.

Kanno, Yoshiaki; and Nishiyama, Ryoji, to Mitsubishi Denki Kabushiki Kaisha. Electronic control circuit for internal-combustion engines. 4,854,285, Cl. 123-418.000.

Kanthal AB: *See*—
Lindgren, Håkan; Olsson, Jan O.; Knudsen, Martin; and Ronningen, Knut, 4,854,960, Cl. 65-346.000.

Kao Corporation: *See*—
Nakano, Akira; and Nomura, Masaki, 4,855,152, Cl. 426-261.000.

Karachaban, Nikolai G.: *See*—
Zolotar, Arkady I.; Samoilovich, David S.; Karakhanian, Vladimir K.; Kuznetsov, Vyacheslav I.; Kopelyansky, Vladimir B.; Kuznetsov, Oleg V.; Nesterenko, Vladimir E.; Karachaban, Nikolai G.; Shmuratov, Georgy E.; Kljuzhin, Evgeny A.; and Livshits, Semen V., 4,854,820, Cl. 415-171.100.

Karakhanian, Vladimir K.: *See*—
Zolotar, Arkady I.; Samoilovich, David S.; Karakhanian, Vladimir K.; Kuznetsov, Vyacheslav I.; Kopelyansky, Vladimir B.; Kuznetsov, Oleg V.; Nesterenko, Vladimir E.; Karachaban, Nikolai G.; Shmuratov, Georgy E.; Kljuzhin, Evgeny A.; and Livshits, Semen V., 4,854,820, Cl. 415-171.100.

Karanewsky, Donald S.: *See*—
Wachter, Michael P.; and Karanewsky, Donald S., 4,855,426, Cl. 544-101.000.

Karbanovich, Valery K.: *See*—
Svidunovich, Nikolai A.; Parfenov, Leonid I.; Garost, Alexandr I.; Sorokin, Gennady A.; Volkov, Viktor N.; Obiedkov, Viktor A.; Karbanovich, Valery K.; Vashkevich, Vladimir V.; and Verbitsky, Alexandr N., 4,855,105, Cl. 420-75.000.

Karibe, Tamiharu; and Kunii, Noboru, to Nissan Motor Co., Ltd. Weather strip. 4,854,079, Cl. 49-479.000.

Karius, Klaus D.: *See*—
Synofzik, Reinhard; Hellwig, Rolf; and Karius, Klaus D., 4,854,241, Cl. 102-489.000.

Karl Suess KG GmbH & Co.: *See*—
Mueller, Karl-Heinz; Betz, Hans; Vach, Wilhelm; and Krenner, Johann, 4,856,037, Cl. 378-34.000.

Karton, Ishai: *See*—
Fisher, Abraham; Karton, Ishai; Heldman, Eliahu; Levy, Aharon; and Grunfeld, Yona, 4,855,290, Cl. 514-278.000.

Kasa, Koichi, to Pioneer Electronic Corporation. Reception sensitivity control system in a sweeping receiver. 4,856,082, Cl. 455-161.000.

Kasai, Tomoaki: *See*—
Sugimoto, Isao; and Kasai, Tomoaki, 4,854,137, Cl. 68-15.000.

Kaschig, Jurgen, to Ciba-Geigy Corporation. Optically active iridium complexes and their use. 4,855,432, Cl. 546-12.000.

Kasha, Walter J.; and Burnison, Chantal S., to CBD Corporation. Oxygenated alkyl substituted bicyclo alkanes. 4,855,322, Cl. 514-546.000.

Kashiwazaki, Susumu: *See*—
Yamashita, Koujirou; Endo, Stunehiro; Miyashita, Kunio; Kashiwazaki, Susumu; and Iizuka, Kenichi, 4,855,652, Cl. 318-268.000.

Kasima Road Company: *See*—
Fukukawa, Mitsuo; Yazawa, Masayuki; Asai, Kazumitsu; Okamoto, Yoshiharu; and Mio, Kouhei, 4,854,769, Cl. 404-72.000.

Kasner, William H.: *See*—
Hawkins, Phillip J.; Kasner, William H.; Toth, Vincent A.; and Stroster, Mariann C., 4,855,564, Cl. 219-121.780.

Kasper, Klaus B.; and Yip, Tom, to Bertek, Inc. Delivery system of strippable extrusion coated films for medical applications. 4,854,995, Cl. 156-243.000.

Kasugai, Joji; Toki, Satoshi; and Ide, Masayuki, to Toyoda Gosei Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Fuel cap. 4,854,471, Cl. 220-288.000.

Kat, Willem: *See*—
Heijwegen, Cornelis P.; and Kat, Willem, 4,854,946, Cl. 55-85.000.

Katahira, Keiichi; Shio, Kiyomi; and Kanai, Noriyuki, to Nippon Steel Corporation. Twin belt type continuous casting machine. 4,854,371, Cl. 164-431.000.

Kataoka, Shiro: *See*—
Umezawa, Hamao; Umezawa, Kazuo; Odagawa, Atsuo; Kataoka, Shiro; and Nakajima, Shohachi, 4,855,414, Cl. 536-6.400.

Kato, Daisaku: *See*—
Miyamoto, Fumitaka; and Kato, Daisaku, 4,855,831, Cl. 358-183.000.

Kato, Kiyoshi: *See*—
Kozawa, Tadashi; Natsume, Naohiro; Komatsubara, Hirofumi; Takaku, Yasunori; Kato, Kiyoshi; and Harada, Seiichi, 4,854,830, Cl. 417-365.000.

Kato, Masatake; Tsuji, Sadahiko; Sugiura, Muneharu; and Tanaka, Kazuo, to Canon Kabushiki Kaisha. Compact zoom lens. 4,854,681, Cl. 350-427.000.

Kato, Masatake: *See*—
Shiraishi, Akihiko; Kato, Masatake; and Kawamoto, Kenichi, 4,855,814, Cl. 358-29.000.

Kato, Toshiaki, to Fuji Electric Co., Ltd. Contact type image sensor. 4,855,802, Cl. 357-30.000.

Kato, Yoshiaki: *See*—
Kaneko, Kiyoshi; and Kato, Yoshiaki, 4,854,194, Cl. 74-866.000.

Katoh, Yasuyuki: *See*—
Takagi, Mitiro; Katoh, Yasuyuki; and Yamazaki, Tomatsu, 4,855,497, Cl. 564-182.000.

Katou, Shinichi: *See*—
Hibino, Hiroki; Kimura, Kenji; Kanno, Masahide; Nishikori, Toshiaki; Yoshinaga, Jun; Kidawara, Atsushi; Yabe, Hisao; Katou, Shinichi; Takamura, Koji; and Nakamura, Takeaki, 4,855,819, Cl. 358-98.000.

Katsumata, Masaaki; Takagi, Isamu; Takahashi, Eiji; Sakai, Tadamichi; Matsumoto, Yoji; Ohtsu, Hideaki; Uchida, Hiroyuki; and Asami, Kiyoshi, to Kabushiki Kaisha Kobe Seiko Sho. Low alloy steels for use in pressure vessel. 4,855,106, Cl. 420-109.000.

Katsura, Shinichi: *See*—
Ueno, Ryuzo; Katsura, Shinichi; Uchiyama, Yoshirou; and Inoue, Satomi, 4,855,482, Cl. 560-56.000.

Katuragawa, Tadao: *See*—
Ohta, Wasaburo; Katuragawa, Tadao; and Kinoshita, Mikio, 4,854,265, Cl. 118-723.000.

Katz, Alan H.; and Demerson, Christopher A., to American Home Products Corporation. Substituted-8-alkenyl-1,3,4,9-tetrahydropyrano(3,4-b)indole-1-acetic acids. 4,855,445, Cl. 548-432.000.

Katz, Martin: *See*—
Leong, Helen; Katz, Martin; Delk, Ann; Nacht, Sergio; and Berliner, David, 4,855,144, Cl. 424-487.000.

Katzmann, Harald, to Wekzeugmaschinenfabrik Oerlikon-Buhrle AG. Sabot projectile containing a projectile core and a sabot jacket. 4,854,242, Cl. 102-522.000.

Kaulen, Johannes; Arlt, Dieter; Holmwood, Graham; and Kramer, Wolfgang, to Bayer Aktiengesellschaft. Process for the preparation of optically active 2-hydroxyethylazole derivatives. 4,855,438, Cl. 548-262.000.

Kautman, Frank W.: *See*—
Smith, Louise; and Kautman, Frank W., 4,854,761, Cl. 401-196.000.

Kawada, Hiroyuki, to Sugiyasu Industries Co., Ltd. System for lifting a vehicle for repair thereof. 4,854,421, Cl. 187-8.710.

Kawada, Hiroyuki; and Niwa, Kiminori, to Sugiyasu Iron Works Inc. Hand-operated lift truck. 4,854,422, Cl. 187-9.00R.

Kawagoe, Jun: *See*—
Arakawa, Satoshi; Kitada, Akira; Yamazaki, Kikuo; Ohmiya, Kenji; and Kawagoe, Jun, 4,855,191, Cl. 428-690.000.

Kawaguchi, Hitoshi: *See*—
Oe, Kunishige; Kawaguchi, Hitoshi; and Yoshikuni, Yuzo, 4,856,005, Cl. 372-20.000.

Kawaguchi, Masashi: *See*—
Nakamura, Noriaki; Kawaguchi, Masashi; and Sonoyama, Yasuo, 4,855,641, Cl. 313-505.000.

Kawaguchi, Toshio: *See*—
Kinuno, Masanori; Saito, Hisao; Kousaka, Akira; and Kawaguchi, Toshio, 4,855,645, Cl. 315-39.710.

Kawahara, Hiroshi: *See*—
Ohara, Shuzo; and Kawahara, Hiroshi, 4,855,280, Cl. 503-214.000.

Kawai, Mitsuo: *See*—
Tada, Kaoru; Hasunuma, Masahiko; and Kawai, Mitsuo, 4,854,978, Cl. 148-14.000.

Kawai, Naoyuki: *See*—
Ohta, Kimihiro; Nakagawa, Tadashi; Kojima, Takeshi; Sakamoto, Tsunenori; and Kawai, Naoyuki, 4,855,013, Cl. 156-601.000.

Kawai, Nobufumi: *See*—
Yoshioka, Masanori; Hou, Hidemitsu; and Kawai, Nobufumi, 4,855,405, Cl. 530-300.000.

Kawakita, Kenji: *See*—
Hiyama, Kunio; Kawakita, Kenji; and Takada, Osamu, 4,855,995, Cl. 370-86.000.

Kawamoto, Kenichi: *See*—
Shiraishi, Akihiko; Kato, Masatake; and Kawamoto, Kenichi, 4,855,814, Cl. 358-29.000.

Kawamoto, Masaichi. Lagging-reinforced structure. 4,855,174, Cl. 428-67.000.

Kawamura, Hideaki; Matsumura, Teruyuki; and Mineshige, Takahiko, to Fanuc Ltd. NC data creation method. 4,855,898, Cl. 364-191.000.

Kawamura, Kazunori, to Hoya Corporation. Process for producing optical article having anti-reflection film. 4,855,180, Cl. 428-328.000.

Kawamura, Kunio: *See*—
Ishikawa, Norio; Nakai, Masaaki; Hirano, Masayasu; Fujino, Akihiko; Ootsuka, Hiroshi; Egawa, Takeshi; and Kawamura, Kunio, 4,855,779, Cl. 354-412.000.

Kawamura, Masunori: *See*—
Ichihashi, Tadashi; Kakizawa, Koichiro; and Kawamura, Masunori, 4,854,693, Cl. 351-221.000.

Kawana, Frank S., to JAC Creative Foods, Inc. Crustacean forming process and apparatus. 4,855,158, Cl. 426-643.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Sonoda, Akikazu; Fujita, Sinji; Sato, Masanobu; Tomono, Syoji; and Nakamura, Hisanori, 4,855,560, Cl. 219-86.250.

Kawasaki, Shinji; and Takahashi, Tomonori, to NGK Insulators, Ltd. Silicon carbide sintered body and method of producing the same. 4,855,263, Cl. 501-92.000.

Kawasaki Steel Corporation: *See*—
Fujii, Mamoru; Noda, Kazuo; Nagasaka, Shoji; Tajika, Hiroshi; and Ono, Koji, 4,854,493, Cl. 228-5.700.
Kitamura, Tadanori; Shono, Hiroaki; and Kodama, Atsuki, 4,855,122, Cl. 423-447.100.

Kawase, Seiji: *See*—
Asahi, Nobumitsu; Ikeda, Tetsuo; and Kawase, Seiji, 4,855,894, Cl. 363-157.000.

Kazou, Mitsuaki: *See*—
Sakuma, Kazuhiro; Itoh, Hirohito; Kazou, Mitsuaki; and Kuramoto, Kenji, 4,854,169, Cl. 73-517.00B.

Keegan, Richard E.: *See*—
Lowery, Michael K.; Keegan, Richard E.; and Koshute, Mark A., 4,855,352, Cl. 524-728.000.

Keeter, Kathy L.; and Keeter, Thomas L. Apparatus and process to separate and remove extraneous matter from a liquid stream. 4,855,065, Cl. 210-776.000.

Keeter, Thomas L.: *See*—
Keeter, Kathy L.; and Keeter, Thomas L., 4,855,065, Cl 210-776.000.

Keetley, Reginald G.: *See—*
Chevis, Robert W.; and Keetley, Reginald G., 4,854,126, Cl. 60-726.000.

Keinan, Ehud: *See—*
Nudelman, Abraham; Herzig, Jaacov; and Keinan, Ehud, 4,855,417, Cl. 536-121.000.

Keith, William L., to United States of America, Navy. Colinear fluctuating wall shear stress and fluctuating pressure transducer. 4,854,174, Cl. 73-714.000.

Keller, Paul R. N.: *See—*
Cawley, Robin A.; and Keller, Paul R. N., 4,855,834, Cl. 358-183.000.

Keller, Urs: *See—*
Briner, Emil; Keller, Urs; and Stalder, Herbert, 4,854,118, Cl. 57-401.000.

Kelley, William J.; and Hurtienne, Daniel G., to Mattel, Inc. Toy crib apparatus. 4,854,913, Cl. 446-397.000.

Kellom, Gary J. Fixture mount. 4,854,093, Cl. 52-28.000.

Kelsey, Donald R., to Amoco Corporation. Co-reagent stabilization of poly(aryl ether sulfones) using sodium, lithium, alkaline earth or lanthanide metal salts. 4,855,388, Cl. 528-125.000.

Kelsey Hayes Company: *See—*
Evans, Anthony C.; and Last, Larry L., 4,854,423, Cl. 188-70.00R.

Kempf, Jurgen: *See—*
Zapka, Werner; Kempf, Jurgen; Keyser, Joachim; and Asch, Karl, 4,855,197, Cl. 430-5.000.

Kendall Company, The: *See—*
Wilson, Earl, 4,854,157, Cl. 73-38.000.

Kendall, Jay. Plastic fishing spoon type lure. 4,854,071, Cl. 43-42.330.

Kennametal Inc.: *See—*
Murray, Gerald D.; Gibson, Shelby R.; Carpenter, Keith J.; Carpenter, Kenneth E.; and Carpenter, Michael R., 4,854,784, Cl. 407-114.000.

Kennard, Paul A.; Middleton, Joseph L.; Wu, Kuang-Tsan; and McNicol, John D., to Northern Telecom Limited. Method of quadrature-phase amplitude modulation. 4,855,692, Cl. 332-17.000.

Kenney, Robert D. Apparatus and method for flushing the crankcase of an internal combustion engine. 4,854,277, Cl. 123-196.00A.

Kent, Alexander G.: *See—*
Anderson, Jeffrey J.; Drury, David J.; Hamlin, John E.; and Kent, Alexander G., 4,855,496, Cl. 562-609.000.

Kerber, Hermann: *See—*
Becker, Heinz D.; Bederke, Klaus; Dahm, Ralf; Kerber, Hermann; Sadowski, Fritz; and Stephan, Werner, 4,855,342, Cl. 524-31.000.

Keri, Tibor; and Kristof, Janosne , to Innofinance Altalanos Innovacios Penzintezet. Cosmetic compositions having skin calming and skin regenerating effect and process for the preparation thereof. 4,855,137, Cl. 424-195.100.

Kernon, John D.; Langley, Kenneth R.; and Thatcher, Mark R., to Rolls-Royce plc. Rotor assembly. 4,854,821, Cl. 416-95.000.

Kersten, Siegfried: *See—*
Seppelt, Wolfgang; Sproesser, Linhard; Kersten, Siegfried; Hofmeister, Peter; and Kuenast, Christoph, 4,855,140, Cl. 424-405.000.

Kertis, Robert A.; Smith, Douglas D.; and Bowman, Terrance L., to National Semiconductor Corporation. Low-power bipolar-CMOS interface circuit. 4,855,624, Cl. 307-475.000.

Kester, Jeffrey A.; Moos, Walter H.; and Thomas, Anthony J., to Warner-Lambert Company. Method of treating senile cognitive decline with N'-substituted aminopyridine adrenergic agents. 4,855,308, Cl. 514-332.000.

Ketelaar, Edward, Jr.: *See—*
Hallett, Robert; and Ketelaar, Edward, Jr., 4,855,721, Cl. 340-585.000.

Keyser, Joachim: *See—*
Zapka, Werner; Kempf, Jurgen; Keyser, Joachim; and Asch, Karl, 4,855,197, Cl. 430-5.000.

Kheder, Joseph: *See—*
Drachnik, Kenneth J.; Kheder, Joseph; and Aspey, S. Alan, 4,855,024, Cl. 204-147.000.

Khinkis, Mark J.; Patel, Jitendra G.; and Sandstrom, William A., to Institute of Gas Technology. Two stage combustion. 4,854,249, Cl. 110-342.000.

Khoshkish, Kamran. Door sign device. 4,854,061, Cl. 40-495.000.

Kickuth, Reinhold W. Installation for purifying liquids using a through-flow-controlled aquatic plant-containing filter bed. 4,855,040, Cl. 210-109.000.

Kidawara, Atsushi: *See—*
Hibino, Hiroki; Kimura, Kenji; Kanno, Masahide; Nishikori, Toshiaki; Yoshinaga, Jun; Kidawara, Atsushi; Yabe, Hisao; Katou, Shinichi; Takamura, Koji; and Nakamura, Takeaki, 4,855,819, Cl. 358-98.000.

Kidde Consumer Durables Corporation: *See—*
Comptos, Wayne W., 4,856,103, Cl. 362-340.000.

Kief, Horst. Sailing provisions including release to prevent capsizing. 4,854,255, Cl. 114-39.100.

Kierzkowski, Frank J.; and Ross, John R., to Peerless Manufacturing Company. Moisture separator. 4,854,950, Cl. 55-213.000.

Kihara, Taku, to Sony Corp. Aperture correction circuit. 4,855,829, Cl. 358-162.000.

Kikuchi, Hideya; and Ikeuchi, Hiroshi, to Diesel Kiki Co., Ltd. Burglar-proof system for automotive vehicles. 4,855,710, Cl. 340-426.000.

Kikuchi, Juro, to Olympus Optical Co., Ltd. Zoom view finder. 4,854,680, Cl. 350-423.000.

Kikuchi, Katsuji; Nakao, Haruki; and Mori, Tamotsu, to Nitto Kohki Co., Ltd. Electromagnetically reciprocating apparatus with adjustable bounce chamber. 4,854,833, Cl. 417-417.000.

Kikuchi, Kiyoji, to Kabushiki Kaisha Toshiba. Automatic sheet feeder movable between active and inactive positions. 4,854,757, Cl. 400-605.000.

Kilian, Karl-Heinz: *See—*
Bersch, Horst; Kilian, Karl-Heinz; and Weigel, Hans U., 4,855,021, Cl. 204-28.000.

Killus, Martin: *See—*
Stoll, Thomas; Killus, Martin; and Mak, Gerd, 4,856,104, Cl. 364-470.000.

Kim, Hae J., to KMB Industries, Corp. Photograph keeping box. 4,854,464, Cl. 220-22.000.

Kimberly-Clark Corporation: *See—*
Win, Maung H.; and Lloyd, William D., 4,855,068, Cl. 252-90.000.

Kimbrough II, Kellam C.: *See—*
Chirillo, John R.; Kimbrough II, Kellam C.; and McHattie, Peder E., 4,855,370, Cl. 526-74.000.

Kimock, Fred M.; and Phillips, John H., to Air Products and Chemicals, Inc. Apparatus and process for improved detection limits in mass spectrometry. 4,855,594, Cl. 250-282.000.

Kimoto, Hidesuke: *See—*
Matsui, Tomoki; Kimoto, Hidesuke; and Shimizu, Setsuo, 4,855,663, Cl. 320-20.000.

Kimura, Fumio; Takahashi, Shunzo; and Hamasaki, Yukio, to Computer Services Corporation. Method and device for reading out optically recorded data and compensating for a drastic change in the position of a line to be read. 4,855,981, Cl. 369-44.000.

Kimura, Hiroyuki; Kobori, Yasunori; Hamma, Kentaro; Omata, Takashi; and Oki, Katsunori, to Hitachi, Ltd. Control circuit for video printer. 4,855,840, Cl. 358-296.000.

Kimura, Kenji: *See—*
Hibino, Hiroki; Kimura, Kenji; Kanno, Masahide; Nishikori, Toshiaki; Yoshinaga, Jun; Kidawara, Atsushi; Yabe, Hisao; Katou, Shinichi; Takamura, Koji; and Nakamura, Takeaki, 4,855,819, Cl. 358-98.000.

Kimura, Kuniaki: *See—*
Suzuki, Masayuki; Hara, Shinichi; Kimura, Kuniaki; Ono, Takeo; Nakamura, Munekazu; and Ohguchi, Yoshihiro, 4,855,123, Cl. 423-562.000.

Kimura, Takashi: *See—*
Nagaoka, Tomoo; and Kimura, Takashi, 4,855,850, Cl. 360-99.120.

Kimura, Tomohiro: *See—*
Yoshihara, Toshiyuki; and Kimura, Tomohiro, 4,855,202, Cl. 430-58.000.

Kimura, Toshiyuki; Aoyagi, Yoshio; and Endo, Fumio, to Pioneer Electronic Corporation. Disk playing method for disk player. 4,855,979, Cl. 369-33.000.

King, William M.: *See—*
Tang, Man-Wing; King, William M.; and Wensley, C. Glen, 4,855,048, Cl. 210-500.300.

Kinkel, John F., to Hughes Aircraft Company. Phase lock loop with switchable filter for acquisition and tracking modes. 4,855,689, Cl. 331-17.000.

Kinoshita, Mikio: *See—*
Ohta, Wasaburo; Katuragawa, Tadao; and Kinoshita, Mikio, 4,854,265, Cl. 118-723.000.

Kinsey, John S.: *See—*
Mathai, C. V.; Rathbun, Lyle A.; and Kinsey, John S., 4,854,500, Cl. 239-3.000.

Kinugawa, Kiyoshige: *See—*
Mano, Hiroyuki; Tachiuchi, Tsuguji; Kinugawa, Kiyoshige; and Tanaka, Shinji, 4,855,728, Cl. 340-805.000.

Kinuno, Masanori; Saito, Hisao; Kousaka, Akira; and Kawaguchi, Toshio, to Kabushiki Kaisha Toshiba. Magnetron for microwave oven. 4,855,645, Cl. 315-39.710.

Kipe, H. Kenneth. Milking plant and sorting system. 4,854,268, Cl. 119-14.030.

Kirbach, Eberhard; and Sykes, David A., to Forintek Canada Corp. Circular saw blade guide and vibration damper. 4,854,207, Cl. 83-823.000.

Kiriake, Masaharu: *See—*
Ueda, Yutaka; and Kiriake, Masaharu, 4,854,453, Cl. 209-583.000.

Kirin Beer Kabushiki Kaisha: *See—*
Umezawa, Hamao; Umezawa, Kazuo; Odagawa, Atsuo; Kataoka, Shiro; and Nakajima, Shohachi, 4,855,414, Cl. 536-6.400.

Kiriu, Takashi: *See—*
Tada, Akihiro; Kiriu, Takashi; and Arakawa, Motoomi, 4,855,208, Cl. 430-110.000.

Kirox, Inc.: *See—*
McElroy, James G., 4,854,853, Cl. 431-115.000.

Kishida, Satoru: *See—*
Sakashita, Kazuhiro; Kishida, Satoru; Hanibuchi, Toshiaki; Tomioka, Ichiro; and Arakawa, Takahiko, 4,856,002, Cl. 371-21.000.

Kishimoto, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Stand-alone transmission controller. 4,855,998, Cl. 370-86.000.

Kishino, Kimishiro: *See—*
Kamei, Masaharu; Negishi, Tsutomu; Nishikawa, Masaru; and Kishino, Kimishiro, 4,855,133, Cl. 424-84.000.

Kitada, Akira: *See—*
Arakawa, Satoshi; Kitada, Akira; Yamazaki, Kikuo; Ohmiya, Kenji; and Kawagoe, Jun, 4,855,191, Cl. 428-690.000.

Kitajima, Tadayuki; Asakawa, Toshiyuki; Naito, Masataka; Matsuo, Kazuhiro; and Murayama, Toshiaki, to Canon Kabushiki Kaisha. Sheet sorting device. 4,854,571, Cl. 271-293.000.

Kitami, Yasuo: *See—*
Miyano, Hideyo; and Kitami, Yasuo, 4,854,271, Cl. 123-52.0MV.

Kitamura, Noboru; and Komatsubara, Norio, to NSK-Warner Kabishiki Kaisha. Double-notched sprag outer retainer. 4,854,435, Cl. 192-41.00A.

Kitamura, Tadanori; Shono, Hiroaki; and Kodama, Atsuki, to Nitto Boseki Co., Ltd.; and Kawasaki Steel Corporation. Method for producing chopped strands of carbon fibers. 4,855,122, Cl. 423-447.100.

Kitani, Shigehisa; Sasai, Atsuyoshi; and Shimizu, Hirokimi, to Canon Kabushiki Kaisha. Light communication equipment. 4,856,090, Cl. 455-607.000.

Kitano, Hirohisa; Saito, Itaru; Shingaki, Kouichi; Matsubara, Ken; and Masuda, Tomohiko, to Minolta Camera Kabushiki Kaisha. Electro-optical light shutter device. 4,854,678, Cl. 350-356.000.

Kiyono, Masashi; Takeuchi, Kanji; Abe, Tomoaki; and Takao, Mitsunori, to Nippondenso Co., Ltd. Throttle valve control apparatus. 4,854,283, Cl. 123-361.000.

Kiyosumi, Fumio, to Oki Electric Industry Co. Ltd. Dram having pip capacitor inside a trench. 4,855,952, Cl. 365-149.000.

Kleemann, Heinz-Werner: *See—*
Wagner, Adalbert; Kleemann, Heinz-Werner; Ruppert, Dieter; and Scholkens, Bernward, 4,855,286, Cl. 514-19.000.

Klein, Sigismund; and Schulz, Reiner, to Siemens Aktiengesellschaft. X-ray detector system. 4,856,041, Cl. 378-147.000.

Kleineisel, Gustav, to Linde Aktiengesellschaft. Assembly of a primary power source and several axial piston pumps flanged on it. 4,854,826, Cl. 417-269.000.

Kleinschmit, Peter: *See—*
Panster, Peter; Grethe, Horst; and Kleinschmit, Peter, 4,855,470, Cl. 556-421.000.

Klekotka, James E.; and Dilley, David L., to Motorola, Inc. High speed programmable frequency divider and PLL. 4,856,032, Cl. 377-47.000.

Klessing, Klaus: *See—*
Chatterjee, Shyam S.; and Klessing, Klaus, 4,855,320, Cl. 514-473.000.

Klimetzek, Volker: *See—*
Lockhoff, Oswald; Hayauchi, Yutaka; Stadler, Peter; Stunkel, Klaus G.; Streissle, Gert; Paessens, Arnold; Klimetzek, Volker; Zeiler, Hans-Joachim; Metzger, Karl G.; Kroll, Hein-Peter; Brunner, Helmut; and Schaller, Klaus, 4,855,283, Cl. 514-8.000.

Klingen, Jurgen: *See—*
Darvell, Wayne K.; Konsti, Patricia R.; Klingen, Jurgen; and Kreckel, Karl W., 4,855,170, Cl. 428-40.000.

Kljuzhin, Evgeny A.: *See—*
Zolotar, Arkady I.; Samoilovich, David S.; Karakhanian, Vladimir K.; Kuznetsov, Vyacheslav I.; Kopelyansky, Vladimir B.; Kuznetsov, Oleg V.; Nesterenko, Vladimir E.; Karachaban, Nikolai G.; Shmuratov, Georgy E.; Kljuzhin, Evgeny A.; and Livshits, Semen V., 4,854,820, Cl. 415-171.100.

Klockner Ferromatik Desma GmbH: *See—*
Graf, Hans-Joachim; and Koliwer, Wolfgang, 4,854,841, Cl. 425-119.000.

Kloeckner-Humboldt-Deutz AG: *See—*
Richardt, Karl-Heinz, 4,854,290, Cl. 123-556.000.

Kloepper, Paul A. Surgical leg stressing device. 4,854,313, Cl. 128-882.000.

Klun, Thomas P.; Lu, David D.; and Robbins, Aida F., to Minnesota Mining and Manufacturing Company. Radiation-curable protective coating composition. 4,855,184, Cl. 428-425.100.

Klym, Kyle. Building system with interlocking blocks. 4,854,103, Cl. 52-593.000.

KMB Industries, Corp.: *See—*
Kim, Hae J., 4,854,464, Cl. 220-22.000.

Knapp, Alfons, to Masco Corporation. Faucet valve with noise reducing slots and blades in preclosing apertures. 4,854,347, Cl. 137-625.400.

Knappe, Peter H.: *See—*
Holland, Eric C.; Lesan, Fredrick K.; and Knappe, Peter H., 4,855,058, Cl. 210-652.000.

Knauf, Werner: *See—*
Koch, Volker; Fuss, Andreas; Bonin, Werner; Knauf, Werner; and Waltersdorfer, Anna, 4,855,309, Cl. 514-346.000.

Kneib, Kristine N.: *See—*
Batzer, John L.; and Kneib, Kristine N., 4,856,030, Cl. 375-106.000.

Knell, Harvey A.: *See—*
Degeeter, Robert L.; and Knell, Harvey A., 4,854,813, Cl. 414-723.000.

Knight, Eric A. Physical training accessory. 4,854,572, Cl. 272-70.000.

Knoblauch, Karl: *See—*
Richter, Ekkehard; Juntgen, Harald; Schmidt, Hans-Jurgen; and Knoblauch, Karl, 4,855,116, Cl. 423-239.000.

Knopfhart, Peter K.: *See—*
Marker, Edwin M.; Thacker, Paul F.; and Knopfhart, Peter K., 4,855,110, Cl. 422-102.000.

Knorreck, Peter, to Robert Bosch GmbH. Device for securing control magnets on injection pumps for diesel fuel. 4,854,282, Cl. 123-357.000.

Knosp, Helmut: *See—*
Frank, Christian; and Knosp, Helmut, 4,854,082, Cl. 51-109.00R.

Knudsen, Christopher G., to Stauffer Chemical Company. Method of controlling undesirable vegetation utilizing certain 3-(substituted thio)-2-benzoyl-cyclohex-2-enones. 4,854,966, Cl. 71-103.000.

Knudsen, Martin: *See—*
Lindgren, Håkan; Olsson, Jan O.; Knudsen, Martin; and Ronningen, Knut, 4,854,960, Cl. 65-346.000.

Koba, Masayoshi: *See—*
Kakimoto, Seizo; Kudo, Jun; and Koba, Masayoshi, 4,855,014, Cl. 156-620.720.

Kobata, Yoshihiro, to Canon Kabushiki Kaisha. Printer. 4,854,753, Cl. 400-144.200.

Kobayashi, Hirohiko: *See—*
Iriuchijima, Shinobu; Kobayashi, Hirohiko; Masuda, Takahito; Watanabe, Shunnosuke; and Tabata, Hiroshi, 4,855,311, Cl. 514-373.000.

Kobayashi, Hiroshi; Machida, Haruhiko; Harigaya, Makoko; Ide, Yasushi; and Akedo, Jun, to Ricoh Company, Ltd.; Kobayashi, Hiroshi; and Machida, Haruhiko. Method of manufacturing masked semiconductor laser. 4,855,256, Cl. 437-129.000.

Kobayashi, Junji: *See—*
Arai, Hisao; Sonehara, Keisuke; Yasumura, Satoshi; and Kobayashi, Junji, 4,854,145, Cl. 70-258.000.

Kobayashi, Kenji, to Endo Manufacturing Co., Ltd. Golf club. 4,854,580, Cl. 273-77.00A.

Kobayashi, Koji: *See—*
Eguchi, Hitoshi; Kuribara, Motoaki; Onodera, Tugio; Kobayashi, Koji; Fujino, Ikuo; Hagiwara, Hiroshi; and Ogino, Seiichi, 4,855,609, Cl. 290-48.000.

Kobayashi, Kouichirou: *See—*
Mutoh, Kiyoyuki; Satoh, Kazushi; and Kobayashi, Kouichirou, 4,855,381, Cl. 528-23.000.

Kobayashi, Kouji, to Kowa Company Ltd. Ophthalmic examination apparatus. 4,854,692, Cl. 351-221.000.

Kobayashi, Masao. Production apparatus to form the solid state food material completely wrapped and sealed with the clayish state food material into globular shape. 4,854,842, Cl. 425-133.100.

Kobayashi, Masashi, to Maruman Golf Co., Ltd. Construction of portion connecting golf club-head and golf club shaft. 4,854,583, Cl. 273-80.800.

Kobayashi, Ryoichi: *See—*
Urushiwara, Noriyoshi; Sugiura, Noboru; Fujino, Yasunori; and Kobayashi, Ryoichi, 4,854,292, Cl. 123-630.000.

Kobayashi, Satoru, to NEC Corporation. Dual port memory circuit. 4,855,959, Cl. 365-239.000.

Kobayashi, Takeo; and Numako, Norio, to Asahi Optical Co. Ltd. Display device for indicating the setting of a zoom lens. 4,855,782, Cl. 354-475.000.

Kobori, Yasunori: *See—*
Kimura, Hiroyuki; Kobori, Yasunori; Hamma, Kentaro; Omata, Takashi; and Oki, Katsunori, 4,855,840, Cl. 358-296.000.

Koboshi, Shigeharu: *See—*
Kurematsu, Masayuki; and Koboshi, Shigeharu, 4,855,217, Cl. 430-372.000.

Koch, Alfred E.; and Koch, Robert C. Golf swing training device. 4,854,585, Cl. 273-193.00B.

Koch, Donald G.: *See—*
Hayford, Michael J.; and Koch, Donald G., 4,854,688, Cl. 350-571.000.

Koch, Robert C.: *See—*
Koch, Alfred E.; and Koch, Robert C., 4,854,585, Cl. 273-193.00B.

Koch, Volker; Fuss, Andreas; Bonin, Werner; Knauf, Werner; and Waltersdorfer, Anna, to Hoechst Aktiengesellschaft. Pyridine derivatives, agents containing same, and the use thereof as pesticides. 4,855,309, Cl. 514-346.000.

Koda, Walter: *See—*
Berliner, William; and Koda, Walter, 4,854,911, Cl. 446-376.000.

Kodama, Atsuki: *See—*
Kitamura, Tadanori; Shono, Hiroaki; and Kodama, Atsuki, 4,855,122, Cl. 423-447.100.

Kodama, Yukio: *See—*
Yoshioka, Hajime; Kodama, Yukio; Shigemura, Sadato; Funada, Tohru; and Morimoto, Satoshi, 4,855,019, Cl. 204-16.000.

Kofod, Finn. Cleaning tool, especially for dental use. 4,854,870, Cl. 433-166.000.

Koga, Hirofumi; and Koyanagi, Katsumi, to Omron Tateisi Electronics Co. Switching current and a relay device employed therein. 4,855,612, Cl. 307-140.000.

Kogo, Katsuyuki: *See—*
Miyagawa, Yuichi; Yoneda, Kiwamu; Kuwa, Kazuhiro; and Kogo, Katsuyuki, 4,854,153, Cl. 73-1.00G.

Kogure, Eriko; Nakamura, Makoto; and Kumazawa, Toshiaki, to Olympus Optical Co., Ltd. Measurement method of peroxidase activity. 4,855,229, Cl. 435-28.000.

Koh, Chang-Am. Doll of rush stalks. 4,854,912, Cl. 446-373.000.

Kohara, Yoshiaki; and Shinkoda, Kazuya, to Mitsui Toatsu Chemicals, Incorporated. Photosetting resin composition. 4,854,666, Cl. 350-96.340.

Kohigashi, Minoru; Shiraki, Toshihiko; and Tsujimoto, Akito, to Koyo Seiko Co., Ltd. Bearing sealing device. 4,854,749, Cl. 384-482.000.

Kohler, Arnold: *See—*
Gertsch, Peter; and Kohler, Arnold, 4,854,806, Cl. 414-495.000.

Kohn, Erhard; and Hofmann, Karl R., to Siemens Corporate Research and Support, Inc. Modulation doped high electron mobility transistor with n-i-p-i structure. 4,855,797, Cl. 357-22.000.

Kohne, Hans: *See—*
Nandi, Kumaresh; Fischer, Helga; Herrmann, Wilfried; Kohne, Hans; Lahr, Wolfgang; Schmersahl, Hein U.; and Walch, Hatto, 4,855,300, Cl. 514-264.000.

Kohno, Akiomi: *See—*
Yamamoto, Akihiko; Kohno, Akiomi; Yamada, Toshihiri; Satou, Motohiro; Taguchi, Keiji; and Yokoi, Kazuaki, 4,854,495, Cl. 228-124.000.

Kohno, Hiroshige: *See—*
Takeda, Satoru; Hayashi, Toshihiro; and Kohno, Hiroshige, 4,854,843, Cl. 425-437.000.

Koide, Toshikazu; Ida, Shuichiro; Yoshinaka, Toshio; Nagano, Shuji; and Haga, Shoji, to Toyota Jidosha Kabushiki Kaisha. Electric control apparatus for transfer device in part-time four-wheel drive vehicle. 4,854,414, Cl. 180-249.000.

Koike, Takashi, to Sanshin Kogyo Kabushiki Kaisha. Inclination detector adjusting device for vessel propulsion unit. 4,855,733, Cl. 340-870.190.

Koinuma, Yasumi: *See—*
Murata, Yoshihige; Koinuma, Yasumi; Amaya, Naoyuki; Otsu, Takayuki; and Nisimura, Masafumi, 4,855,374, Cl. 526-261.000

Koito Seisakusho Co., Ltd.: *See—*
Otaka, Nobuo, 4,855,877, Cl. 362-61.000.

Koizumi, Norihiko: *See—*
Kan, Fumitaka, deceased; Koizumi, Norihiko; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; Mishina, Shinya; and Taniока, Hiroshi, 4,855,763, Cl. 346-160.100.

Kojima, Atsushi: *See—*
Hirano, Takashi; and Kojima, Atsushi, 4,854,694, Cl. 351-224.000.

Kojima, Takeshi: *See—*
Ohta, Kimihiro; Nakagawa, Tadashi; Kojima, Takeshi; Sakamoto, Tsunenori; and Kawai, Naoyuki, 4,855,013, Cl. 156-601.000.

Koliwer, Wolfgang: *See—*
Graf, Hans-Joachim; and Koliwer, Wolfgang, 4,854,841, Cl 425-119.000.

Koll, Juhan, to Berol Kemi AB. Promoted nickel and/or cobalt catalyst, its use, and process performed in its presence. 4,855,505, Cl. 564-398.000.

Kolodny, Gerald M.; and Cohen, Howard I., to Sudbury Systems, Inc. Remote typing system. 4,856,069, Cl. 381-52.000.

Kolowski, Michael A.: *See—*
Gasowski, Chester J.; Kolowski, Michael A.; Smithkey, John C.; and Ford, Thomas L., 4,854,361, Cl. 152-552.000

Komatsu, Shuichi: *See—*
Ikegawa, Sumio; Hori, Akio; Komatsu, Shuichi; Arai, Shinji; and Yasuda, Nobuaki, 4,855,992, Cl. 369-275.000.

Komatsu, Yasuhiro, to Hosiden Electronics Co., Ltd. Shielded connector socket for connection with a multipin connector plug. 4,854,895, Cl. 439-610.000.

Komatsu, Yukio: *See—*
Saitoh, Yoshihiro; Kondoh, Minoru; and Komatsu, Yukio, 4,855,656, Cl. 318-587.000.

Komatsubara, Hirofumi: *See—*
Kozawa, Tadashi; Natsume, Naohiro; Komatsubara, Hirofumi; Takaku, Yasunori; Kato, Kiyoshi; and Harada, Seiichi, 4,854,830, Cl. 417-365.000.

Komatsubara, Norio: *See—*
Kitamura, Noboru; and Komatsubara, Norio, 4,854,435, Cl. 192-41.00A.

Komiya, Kyosuke: *See—*
Yokota, Masahisa; Shimizu, Atsushi; Komiya, Kyosuke; Yamataka, Kazunori; and Nonura, Tadanori, 4,855,377, Cl. 528-25.000.

Komoto, Mitsuo; Matsuo, Youichi; and Sano, Toshifumi, to NEC Corporation. Liquid cooling system for integrated circuit chips. 4,854,377, Cl. 165-80.400.

Komura, Shuji: *See—*
Fujii, Masanori; Komura, Shuji; and Oogami, Shunsuke, 4,855,204, Cl. 430-106.000.

Kondo, Kideya; Kunimoto, Youichi; and Yano, Manabu, to Electric Power Research Institute, Inc. Polarized electromagnet. 4,855,701, Cl. 335-230.000.

Kondo, Takashi, to Kabushiki Kaisha Toshiba. Line figure connecting apparatus. 4,855,933, Cl. 364-518.000.

Kondoh, Minoru: *See—*
Saitoh, Yoshihiro; Kondoh, Minoru; and Komatsu, Yukio, 4,855,656, Cl. 318-587.000.

Konica Corporation: *See—*
Hoshino, Yasushi, 4,855,781, Cl. 354-468.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Kurematsu, Masayuki; and Koboshi, Shigeharu, 4,855,217, Cl. 430-372.000.

Konno, Tsuneo, to Honda Giken Kogyo Kabushiki Kaisha. Valve operating device for internal combustion engine. 4,854,272, Cl. 123-90.170.

Konopka, John G., to Zenith Electronics Corporation. DC fan speed control. 4,856,078, Cl. 388-831.000.

Konrad, Eugen; Mager, Herbert; and Hoch, Dietrich, to Wella Aktiengesellschaft. Hair treating compositions and processes for improving the condition of hair. 4,855,130, Cl. 424-70.000.

Konrad, Eugen: *See—*
Clausen, Thomas; and Konrad, Eugen, 4,854,935, Cl. 8-408.000.

Konsti, Patricia R.: *See—*
Darvell, Wayne K.; Konsti, Patricia R.; Klingen, Jurgen; and Kreckel, Karl W., 4,855,170, Cl. 428-40.000.

Kontron Holding A.G.: *See—*
Jacob-Grinschgl, Wolfgang; and Muller, Udo, 4,855,538, Cl. 178-18.000.

Konuma, Toshimitsu: *See—*
Yamazaki, Shunpei; Mase, Akira; Konuma, Toshimitsu; Miyazaki, Minoru; Sakama, Mitsunori; and Inushima, Takashi, 4,855,805, Cl. 357-58.000.

Koopman, R. Nelson, to Restaurant Technology, Inc. Apparatus for frying food products. 4,854,227, Cl. 99-416.000.

Koopman, Roelof: *See—*
Lodder, Bernard; Koopman, Roelof; and Visscher, Jan, 4,855,574, Cl. 219-535.000.

Kopelman, Edward E.: *See—*
Peckitt, Guy R.; and Kopelman, Edward E., 4,855,646, Cl. 315-175.000

Kopelyansky, Vladimir B.: *See—*
Zolotar, Arkady I.; Samoilovich, David S.; Karakhanian, Vladimir K.; Kuznetsov, Vyacheslav I.; Kopelyansky, Vladimir B.; Kuznetsov, Oleg V.; Nesterenko, Vladimir E.; Karachaban, Nikolai G.; Shmuratov, Georgy E.; Kljuzhin, Evgeny A.; and Livshits, Semen V., 4,854,820, Cl. 415-171.100.

Kopp, Richard: *See—*
Rasshofer, Werner; Grigat, Ernst; Grogler, Gerhard; Hess, Heinrich; and Kopp, Richard, 4,855,504, Cl. 564-395.000.

Korat, Moshe: *See—*
Bracha, Peretz; and Korat, Moshe, 4,854,965, Cl. 71-92.000.

Korcz, William H., to Shell Oil Company. Auto sealing pressure container. 4,854,110, Cl. 53-452.000.

Korf Engineering GmbH: *See—*
Hauk, Rolf, 4,854,967, Cl. 75-34.000.

Korhonen, Ilkka O.: *See—*
Santamaki, Harry J.; Korhonen, Ilkka O.; and Haikonen, Pentti O., 4,855,825, Cl. 358-135.000.

Korpela, Jaakko, to Proxy Oy. Collapsible cabinet. 4,854,654, Cl. 312-265.100.

Korpela, Matti, to Valmet Oy. Floater radiation dryer. 4,854,052, Cl. 34-68.000

Koshikawa, Takeo: *See—*
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,855,115, Cl. 423-239.000.

Koshute, Mark A.: *See—*
Lowery, Michael K.; Keegan, Richard E.; and Koshute, Mark A., 4,855,352, Cl. 524-728.000.

Kotani, Hitoshi: *See—*
McGarrity, Gerard J.; and Kotani, Hitoshi, 4,855,227, Cl. 435-7.000.

Kouda, Toyomasa, to Hitachi, Ltd. Forming contacts to semiconductor device. 4,855,257, Cl. 437-194.000.

Kousaka, Akira: *See—*
Kinuno, Masanori; Saito, Hisao; Kousaka, Akira; and Kawaguchi, Toshio, 4,855,645, Cl. 315-39.710

Koutsoupidis, Theodore. Safety apparatus for tire. 4,854,356, Cl. 152-158.000

Kowa Company Limited: *See—*
Hirano, Takashi; and Kojima, Atsushi, 4,854,694, Cl. 351-224.000.
Ichihashi, Tadashi; Kakizawa, Koichiro; and Kawamura, Masunori, 4,854,693, Cl. 351-221.000.
Kobayashi, Kouji, 4,854,692, Cl. 351-221.000.
Watanabe, Isamu; Kamiya, Kazuhiro; Torii, Takahiro; and Mori, Toshihito, 4,855,287, Cl. 514-41.000.

Kowaka, Masahiko: *See—*
Nozue, Yasuhiro; Kajiyama, Koichi; Saito, Kaoru; Wakabayashi, Osamu; Kowaka, Masahiko; and Itakura, Yasuo, 4,856,018, Cl. 372-98.000.

Kowalik, Joseph T.: *See—*
Richardson, Thomas L.; Grabel, Vernon; and Kowalik, Joseph T., 4,855,940, Cl. 364-526.000.

Kowarik, Oskar: *See—*
Hoffmann, Kurt; Kraus, Rainer; and Kowarik, Oskar, 4,855,621, Cl. 371-20.000.

Koyanagi, Katsumi: *See—*
Koga, Hirofumi; and Koyanagi, Katsumi, 4,855,612, Cl. 307-140.000.

Koyo Seiko Co., Ltd.: *See—*
Kohigashi, Minoru; Shiraki, Toshihiko; and Tsujimoto, Akito, 4,854,749, Cl. 384-482.000.

Kozawa, Tadashi; Natsume, Naohiro; Komatsubara, Hirofumi; Takaku, Yasunori; Kato, Kiyoshi; and Harada, Seiichi, to Aisan Kogyo Kabushiki Kaisha. Motor-driven fuel pump. 4,854,830, Cl. 417-365.000.

Kozlik, Tony J.; and Freimark, Ronald J., to Honeywell, Inc. Microprocessor assisted data block transfer apparatus. 4,855,902, Cl. 364-200.000.

Kozu, Naoshi: *See—*
Omata, Tadao; and Kozu, Naoshi, 4,854,004, Cl. 15-304.000.

Kozuka, Zensaku: *See—*
Sugimoto, Eisuke; Tanizawa, Yoshiyasu; and Kozuka, Zensaku, 4,855,034, Cl. 204-427.000

Kozumplik, Nicholas, Jr.: *See—*
Gardner, Richard K.; and Kozumplik, Nicholas, Jr., 4,854,832, Cl. 417-393.000.

Kraft, Kenneth N.; and Powers, Daniel, to George Koch Sons, Inc. Roof bow locking system. 4,854,633, Cl. 296-104.000.

Krall, Thomas J.; and Myers, Robert A., to Owens-Illinois Plastic Products Inc. Apparatus for applying labels to blow molded articles. 4,854,848, Cl. 425-503.000.

Kramer, Walter, to Schott Glaswerke. Method for mounting an armature of plastic material to a jar of frangible material. 4,854,992, Cl. 156-212.000

Kramer, Wolfgang: *See—*
Kaulen, Johannes; Arit, Dieter; Holmwood, Graham; and Kramer, Wolfgang, 4,855,438, Cl. 548-262.000.

Kratochvil, Paul P.: *See—*
Bures, Milan; Kratochvil, Paul P.; and Rowlette, John R., 4,855,590, Cl. 250-221.000.

Kratz, Gerhard, to Siemens Aktiengesellschaft. Apparatus for the low-loss wiring of the semiconductor switching elements of a three-level inverter. 4,855,893, Cl. 363-136.000.

Kraus, Rainer: *See—*
Hoffmann, Kurt; Kraus, Rainer; and Kowarik, Oskar, 4,855,621, Cl. 371-20.000.

Krause, Stanley J., to Hughes Aircraft Company. Solar cell with integrated interconnect device and process for fabrication thereof. 4,854,975, Cl. 136-262.000.

Krauss-Maffei A.G.: *See—*
Soechtig, Wolfgang, 4,854,713, Cl. 366-132.000.

Krebs, Helmut: *See—*
Fabian, Peter; Krebs, Helmut; and Simon, Heinrich, 4,855,032, Cl. 204-286.000.

Kreckel, Karl W.: *See—*
Darvell, Wayne K.; Konsti, Patricia R.; Klingen, Jurgen; and Kreckel, Karl W., 4,855,170, Cl. 428-40.000.

Kreiskorte, Heinz, to Thyssen Industrie AG. Apparatus for guiding the sensor holder of a surface testing apparatus. 4,855,678, Cl. 324-262.000.

Krenner, Johann: *See—*
Mueller, Karl-Heinz; Betz, Hans; Vach, Wilhelm; and Krenner, Johann, 4,856,037, Cl. 378-34.000.

Kreske, Kathi M.: *See—*
Kafri, Oded; and Kreske, Kathi M., 4,854,708, Cl. 356-359.000.

Kreuter Mfg. Co., Inc.: *See—*
Kreuter, Paul E., 4,855,545, Cl. 200-81.400.

Kreuter, Paul E., to Kreuter Mfg. Co., Inc. Pneumatic to electrical switch assembly. 4,855,545, Cl. 200-81.400.

Kreuze, Kenneth D.; and Rennie, Eric D., to Prince Corporation. Storage compartment. 4,854,632, Cl. 296-37.120.

Krishnan, Ramasamy: *See—*
Bassemir, Robert; Krishnan, Ramasamy; and Lowell, Arthur I., 4,854,969, Cl. 106-2.000.

Kristof, Janosne : *See—*
Keri, Tibor; and Kristof, Janosne , 4,855,137, Cl. 424-195.100.

Kristoffersen, Kaj, to Junckers Industrier A/S. Floor structure. 4,854,099, Cl. 52-403.000.

Krix, Wilfried: *See—*
Fuhrmann, Werner; zur Hausen, Manfred; and Krix, Wilfried, 4,855,458, Cl. 549-248.000.

Krober, Ulrich: *See—*
Despot, Janko; and Krober, Ulrich, 4,854,233, Cl. 101-216.000.

Kroll, Hein-Peter: *See—*
Lockhoff, Oswald; Hayauchi, Yutaka; Stadler, Peter; Stunkel, Klaus G.; Streissle, Gert; Paessens, Arnold; Klimetzek, Volker; Zeiler, Hans-Joachim; Metzger, Karl G.; Kroll, Hein-Peter; Brunner, Helmut; and Schaller, Klaus, 4,855,283, Cl. 514-8.000.

Kronbauer, Hermann; Kupper, Hermann; and Rehm, Christian, to Reflecta GmbH Foto-Flim Projection. Slides projector. 4,854,697, Cl. 353-89.000.

Krooss, Robert J. Bottle stand up apparatus. 4,854,442, Cl. 198-400.000.

Kroschel, Hans-Gerd: *See—*
Brocksieper, Manfred; Luckger, Rolf; Kroschel, Hans-Gerd; and Stechow, Jochen, 4,856,105, Cl. 364-474.020.

Kruger, Horst: *See—*
Gschwender, Alois; Szeteli, Andreas; and Kruger, Horst, 4,854,834, Cl. 417-423.300.

Kruger, Volker; and Daenicke, Heinrich, to Eastman Christensen Company. Drill bit direct drive for deep well drilling tools. 4,854,401, Cl. 175-107.000.

Krupp MaK Maschinenbau GmbH: *See—*
Woidich, Richard; and Toobe, Werner, 4,854,260, Cl. 114-316.000.

KT Technologies Inc.: *See—*
O'Connor, Lawrence J., 4,855,534, Cl. 174-36.000.

Kubo, Seitoku: *See—*
Moroto, Shuzo; Sumiya, Koji; Sakaguchi, Yoshikazu; Kubo, Seitoku; and Taga, Yutaka, 4,854,195, Cl. 74-867.000.

Kubota, Shuichi: *See—*
Kamimura, Hiroto; Kubota, Shuichi; and Iwakura, Masaru, 4,854,745, Cl. 384-420.000.

Kubsh, Leroy M.; and Schlie, Donald R., to Litton Industrial Automation Systems, Inc. Abrasive disc. 4,854,086, Cl. 51-209.00R.

Kudo, Jun: *See—*
Kakimoto, Seizo; Kudo, Jun; and Koba, Masayoshi, 4,855,014, Cl. 156-620.720.

Kudo, Tetsuya, to Stanley Electric Co., Ltd. Automobile lamp assembly. 4,855,876, Cl. 362-61.000.

Kuenast, Christoph: *See—*
Seppelt, Wolfgang; Sproesser, Linhard; Kersten, Siegfried; Hofmeister, Peter; and Kuenast, Christoph, 4,855,140, Cl. 424-405.000.

Kuesters, Karl-Heinz, to Siemens Aktiengesellschaft. Transistor varactor for dynamics semiconductor storage means. 4,855,801, Cl. 357-23.600.

Kuhn, Raymond E.; Estrada, John J.; and Grogl, Max, to Wake Forest University. Antigens for diagnosing neurocysticercosis. 4,855,408, Cl. 530-350.000.

Kuhtik, John N. Magnetic cropper. 4,854,049, Cl. 33-464.000.

Kumazawa, Toshiaki: *See—*
Kogure, Eriko; Nakamura, Makoto; and Kumazawa, Toshiaki, 4,855,229, Cl. 435-28.000.

Kumm, Emerson L., to Kumm Industries, Inc. Variable speed engine accessory flat belt drive system. 4,854,921, Cl. 474-70.000.

Kumm Industries, Inc.: *See—*
Kumm, Emerson L., 4,854,921, Cl. 474-70.000.

Kung, Jen K.: *See—*
Wong, Wah S.; Wen, Cheng P.; and Kung, Jen K., 4,855,796, Cl. 357-15.000.

Kunick, Werner: *See—*
Althoff, Karl-Heinz; Kunick, Werner; Munstermann, Manfred; Voss, Uwe; and Glanz, Werner, 4,854,805, Cl. 414-495.000.

Kunig, Horst E. Non-invasive and continuous cardiac performance monitoring device. 4,854,327, Cl. 128-713.000.

Kunii, Noboru: *See—*
Karibe, Tamiharu; and Kunii, Noboru, 4,854,079, Cl. 49-479.000.

Kunimoto, Youichi: *See—*
Kondo, Kideya; Kunimoto, Youichi; and Yano, Manabu, 4,855,701, Cl. 335-230.000.

Kunka, Blair S.: *See—*
Pucci, Michael J.; and Kunka, Blair S., 4,855,149, Cl. 426-48.000.

Kuo, Jason. Detachable castor support for a baby carriage. 4,854,008, Cl. 16-30.000.

Kupper, Hermann: *See—*
Kronbauer, Hermann; Kupper, Hermann; and Rehm, Christian, 4,854,697, Cl. 353-89.000.

Kupper, Robert J., to W. R. Grace & Co.-Conn. Preparation of amino acid derivatives. 4,855,455, Cl. 549-88.000.

Kurami, Miki; Shirakami, Yoshifumi; Takahashi, Keietsu; and Ueda, Nobuo, to Nihon Medi-Physics Co., Ltd. High molecular compounds having amino groups, and their utilization. 4,855,353, Cl. 525-54.100.

Kuramoto, Kenji: *See—*
Sakuma, Kazuhiro; Itoh, Hirohito; Kazou, Mitsuaki; and Kuramoto, Kenji, 4,854,169, Cl. 73-517.00B.

Kuraray Co., Ltd.: *See—*
Shimo, Hiroyuki; Kanesige, Isao; and Tanaka, Nobuo, 4,855,181, Cl. 428-336.000.

Kurcha Kagaku Kogyo Kabushiki Kaisha: *See—*
Fukuda, Hiroyuki; Shigeta, Masatomo; Kaji, Hisatsugu; and Saitoh, Kuniyuki, 4,855,092, Cl. 264-29.500.

Kurchacova, Elva: *See—*
Charlton, Steven C.; and Kurchacova, Elva, 4,855,228, Cl. 435-28.000.

Kurematsu, Masayuki; and Koboshi, Shigeharu, to Konishiroku Photo Industry Co., Ltd. Processing of color photographic material utilizing a stabilizing solution after fixing. 4,855,217, Cl. 430-372.000.

Kuribara, Motoaki: *See—*
Eguchi, Hitoshi; Kuribara, Motoaki; Onodera, Tugio; Kobayashi, Koji; Fujino, Ikuo; Hagiwara, Hiroshi; and Ogino, Seiichi, 4,855,609, Cl. 290-48.000.

Kuribayashi, Yoshihiro; and Sueoka, Kazuomi, to Fundokin Shoyu Kabushiki Kaisha. Method for producing quasi-natural cheese fermented foods. 4,855,148, Cl. 426-46.000.

Kurihara, Hiroshi: *See—*
Shigaki, Masafumi; Kurihara, Hiroshi; and Nishi, Hidetoshi, 4,855,895, Cl. 363-157.000.

Kurihara, Sakuo, to Tochigi-Fuji Sangyo Kabushiki Kaisha. Hub clutch. 4,854,434, Cl. 192-35.000.

Kurio, Shinji: *See—*
Mizuno, Yasuo; Nishino, Atsushi; Ikeda, Masaki; and Kurio, Shinji, 4,855,261, Cl. 501-76.000.

Kuroda Seiko Co. Ltd.: *See—*
Nakanishi, Koji; Yoshino, Mituo; and Saito, Yoshitane, 4,854,346, Cl. 137-624.110.

Kuroiwa, Minoru: *See—*
Uchida, Kenji; Banba, Nobuyuki; Kuroiwa, Minoru; Saito, Makoto; and Kamino, Yukishige, 4,854,783, Cl. 406-13.000.

Kurosawa, Akihito; Suzuki, Kazuyuki; Anazawa, Osamu; and Yoshihara, Masayuki, to Sanden Corporation. Control device for a vending machine dispensing mechanism. 4,854,477, Cl. 221-1.000.

Kurple, Kenneth R.: *See—*
Ryntz, Rose A.; Surcina, Karen A.; and Kurple, Kenneth R., 4,855,359, Cl. 525-130.000.

Kuster & Co. GmbH: *See—*
Jakob, Willi; and Marscholl, Klaus, 4,854,186, Cl. 74-501.50R.

Kuwa, Kazuhiro: *See—*
Miyagawa, Yuichi; Yoneda, Kiwamu; Kuwa, Kazuhiro; and Kogo, Katsuyuki, 4,854,153, Cl. 73-1.00G.

Kuwabara, Nobuyuki; Hasegawa, Kou; Sugimura, Hideo; Nakajima, Kazuhiro; and Moriguchi, Haruhiko, to Canon Kabushiki Kaisha. Thermal transfer recording apparatus with electroconductive ink. 4,855,758, Cl. 346-76.0PH.

Kuwano, Yukinori; Tsujino, Yoshikazu; and Hamada, Yuji, to Sanyo Electric Co., Ltd. Radiation-sensitive high-polymeric material. 4,855,214, Cl. 430-281.000.

Kuznetsov, Oleg V.: *See—*
Zolotar, Arkady I.; Samoilovich, David S.; Karakhanian, Vladimir K.; Kuznetsov, Vyacheslav I.; Kopelyansky, Vladimir B.; Kuznetsov, Oleg V.; Nesterenko, Vladimir E.; Karachaban, Nikolai G.; Shmuratov, Georgy E.; Kljuzhin, Evgeny A.; and Livshits, Semen V., 4,854,820, Cl. 415-171.100.

Kuznetsov, Vyacheslav I.: *See—*
Zolotar, Arkady I.; Samoilovich, David S.; Karakhanian, Vladimir K.; Kuznetsov, Vyacheslav I.; Kopelyansky, Vladimir B.; Kuznetsov, Oleg V.; Nesterenko, Vladimir E.; Karachaban, Nikolai G.; Shmuratov, Georgy E.; Kljuzhin, Evgeny A.; and Livshits, Semen V., 4,854,820, Cl. 415-171.100.

KW Battery Company: *See—*
Eggers, Mark L., 4,855,196, Cl. 429-139.000.

Kwiatek, Alfred, to Bertek, Inc. Method of making laminated articles and articles made therefrom. 4,854,610, Cl. 282-11.50A.

Kyriakos, Constantinos S.: *See—*
Brandao, Ruy L.; Kyriakos, Constantinos S.; Spires, Randall C.; and Jugo, Andreja, 4,855,748, Cl. 342-455.000.

La Telemecanique Electrique: *See—*
Cohen, Jacques; Lemarquand, Pierre; and Pichard, Christian, 4,855,698, Cl. 335-14.000.

Labate, Micheal D. Self shielding lance. 4,854,553, Cl. 266-266.000.

Laboratorios Vinas S. A.: *See—*
Buxade-Vinas, Antonio, 4,855,443, Cl. 548-372.000.

LaChappell, Philip S.: *See—*
Roberts, John T.; Reid, Philip L.; LaChappell, Philip S.; and Williams, Danny R., 4,854,111, Cl. 53-500.000.

Ladney, Michael: *See—*
Hendry, James W., 4,855,094, Cl. 264-40.300.

Lahr, Wolfgang: *See—*
Nandi, Kumaresh; Fischer, Helga; Herrmann, Wilfried; Kohne, Hans; Lahr, Wolfgang; Schmersahl, Hein U.; and Walch, Hatto, 4,855,300, Cl. 514-264.000.

Lai, Chiu K. S.: *See—*
Simson, Morris; Fabricius, John H.; Browne, Ronnie; Waugh, Arthur; Sarkozy, Robert F.; and Lai, Chiu K. S., 4,854,266, Cl. 118-728.000.

L'Air Liquide: *See—*
Hays, Jean-Francois; Legrand, Pierre; Verna, Eric; Delzenne, Michel; Reynaud, Bernard; and Gaillard, Pierre, 4,855,566, Cl. 219-130.400.

Lakso, Matthew L., to Engineered Security Products Corporation. Multiple interlocking system for file cabinets, e.g. 4,854,653, Cl. 312-222.000.

Lala, Anthony S. Pressure-assisted blow gun. 4,854,294, Cl. 124-62.000.

Lalikos, James M.; and Waite, Harold K., to Titeflex Corporation. Tuned self-damping convoluted conduit. 4,854,416, Cl. 181-207.000.

Lamance, David S.: *See—*
Sallas, John J.; Weber, Richard M.; and Lamance, David S., 4,855,967, Cl. 367-190.000.

Lamm, Gunther: *See—*
Dehnert, Johannes; Lamm, Gunther; and Loeffler, Hermann, 4,855,412, Cl. 534-766.000.
Dehnert, Johannes; Lamm, Gunther; and Loeffler, Hermann, 4,855,413, Cl. 534-766.000.

Lampes, Elias H.: *See—*
Vinson, John W.; Howell, Stephen J.; and Lampes, Elias H., 4,854,127, Cl. 60-742.000.

Landis, William R.: *See—*
Patton, Paul B.; and Landis, William R., 4,854,852, Cl. 431-78.000.

Lane, Lawrence J., to General Electric Company. Method and apparatus for damping oscillations of an ac generator. 4,855,664, Cl. 322-19.000.

Lane, William A., Jr. Hanging packaging cup. 4,854,466, Cl. 220-23.830.

Laney, Mark C.: *See—*
French, Kendrick L.; and Laney, Mark C., 4,854,065, Cl. 42-65.000.

Lange, Heinz; Heins, Hans-Peter; and Jendricke, Hermann, to AEG Olympia Aktiengesellschaft. Reloadable ribbon cassette system. 4,854,755, Cl. 400-208.100.

Langhorst, Martin A.: *See—*
Cutie, Sergio S.; Langhorst, Martin A.; and Wood, Stewart P., 4,854,700, Cl. 356-72.000.

Langkau, John: *See—*
Georgopoulos, Philip; and Langkau, John, 4,855,195, Cl. 429-54.000.

Langley, John D., to Du Pont de Nemours, E. I., and Company. Composite chamical barrier fabric. 4,855,178, Cl. 428-287.000.

Langley, Kenneth R.: *See—*
Kernon, John D.; Langley, Kenneth R.; and Thatcher, Mark R., 4,854,821, Cl. 416-95.000.

Lanier, Caroll W.; Broemmelsiek, H. Eugene; and Lee, Raymond, to Ethyl Corporation. Production of foamed polymer structures. 4,855,331, Cl. 521-184.000.

LaPierre, Rene B.; Partridge, Randall D.; and Wong, Steven S., to Mobil Oil Corporation. Isomerization process. 4,855,530, Cl. 585-739.000.

LaRosa, Joseph P.: *See—*
Gentile, James L.; LaRosa, Joseph P.; and Rainey, Dean R., 4,854,484, Cl. 222-256.000.

Larson, Douglas A.; and Clanton, Thomas L., to 501 Healthscan, Inc. Inspirator muscle trainer. 4,854,574, Cl. 272-99.000.

Larson, Wayne K., to Minnesota Mining and Manufacturing Company. Sulfonate-containing photopolymer systems. 4,855,384, Cl. 528-60.000.

La See, Jack C. Concealed snap-in grill clip. 4,854,100, Cl. 52-456.000.

Laser Lab Limited: *See—*
Thomas, Bruce A.; Sapozhnikov, Gregory; and Shaw, Robert L., 4,855,565, Cl. 219-121.790.

Laser Magnetic Storage International Company: *See—*
Getreuer, Kurt W.; and Schell, David L., 4,855,977, Cl. 369-32.000.

Laser Surgery Software, Inc.: *See—*
Dew, Douglas K.; Hsu, Long S.; and Halpern, Steven J., 4,854,320, Cl. 128-397.000.

Lasky, Laurence A.: *See—*
Berman, Phillip W.; and Lasky, Laurence A., 4,855,224, Cl. 435-5.000.

Lassiaz, Philippe; Villata, Gino; and Beccaris, Carlo, to Valeo. Clutch release bearing. 4,854,436, Cl. 192-98.000.

Last, Larry L.: *See—*
Evans, Anthony C.; and Last, Larry L., 4,854,423, Cl. 188-70.00R.

Lattes, Armand: *See—*
Gautier, Martine; Rico, Isabelle; Lattes, Armand; and Bertocchio, Rene , 4,855,025, Cl. 204-157.860.

Lattice Semiconductor Corporation: *See—*
Turner, John E.; Rutledge, David L.; and Darling, Roy D., 4,855,954, Cl. 365-185.000.

Laube, Ludwig; Leypold, Helmut; and Pioch, Erhard, to Robert Bosch GmbH. Apparatus for transferring articles to a packaging machine conveyor apparatus. 4,854,440, Cl. 198-357.000.

Laurel Bank Machines Co., Ltd.: *See—*
Uchida, Shinya; Hirata, Akira; Ebihara, Hideyuki; Yoshikawa, Eiichi; Sano, Eisaku; and Uehara, Kazuhiro, 4,854,452, Cl. 209-534.000.

Laursen, Darlene. Combination recreational transport and camper vehicle. 4,854,631, Cl. 296-158.000.

Lavin, Aaron M. Zero clearance bearing system. 4,854,750, Cl. 384-500.000.

LaVine, M. Joseph, Jr., to Ag-Chem Equipment Co., Inc. Injection valve for lawn treatment system. 4,854,505, Cl. 239-304.000.

Lawhorn, Timothy M. Unilateral direction control for dental syringe. 4,854,869, Cl. 433-80.000.

Lawther, Joel S.: *See—*
Alligood, John H.; and Lawther, Joel S., 4,855,771, Cl. 354-149.110.

Laye, Robert M.: *See—*
Ferro, John T., Jr.; Jacobs, Patrick C.; Laye, Robert M.; and Starr, Brian D., 4,855,907, Cl. 364-300.000.

Leaney, Peter A.: *See—*
Russell, Michael K.; Wesenberg, Donald L.; and Leaney, Peter A., 4,855,870, Cl. 361-395.000.

Lear Siegler, Inc.: *See—*
Hillebrand, Robert D.; and Wilson, Charles W., 4,854,409, Cl. 180-24.020.

LeBlanc, Peter E., to Beloit Corporation. High consistency pressure screen and method of separating accepts and rejects. 4,855,038, Cl. 209-273.000.

Leck, Derek C.: *See—*
Emery, David C.; Field, David G.; and Leck, Derek C., 4,854,234, Cl. 101-364.000.

Lectrolarm Custom Systems, Inc.: *See—*
Smith, William V., 4,856,054, Cl. 379-107.000.

Lee, David L., to Stauffer Chemical Company. Ester intermediates for 2-benzoyl-4-phenyl-1,3-cyclohexanediones. 4,855,477, Cl. 558-412.000.

Lee, Juang J. Rack structure for balls and related equipment. 4,854,456, Cl. 211-14.000.

Lee, Lawrence L. Perforated splint. 4,854,310, Cl. 128-87.00A.

Lee, Len F.; Moedritzer, Kurt; and Rogers, Michael D., to Monsanto Company. Substituted 3-hydroxy pyrazoles. 4,855,442, Cl. 548-365.000.

Lee, Raymond: *See—*
Lanier, Caroll W.; Broemmelsiek, H. Eugene; and Lee, Raymond, 4,855,331, Cl. 521-184.000.

Lee, Robert G. H.: *See—*
Garrido, Guillermo F.; Lee, Robert G. H.; and Francois, Olivier, 4,854,972, Cl. 106-437.000.

Lee, Steven S.: *See—*
Allman, Derryl D. J.; and Lee, Steven S., 4,855,258, Cl. 437-241.000.

Lee, Ta J.; and Hoffman, William F., to Merck & Co., Inc. Intermediates for 6-alpha-hydroxymethyl HMG-CoA reductase inhibitors. 4,855,456, Cl. 549-214.000.

Legge, John R.; and Rutherford, Frank C., to United Technologies Corporation. Isostatic self-contained bond or mold tool. 4,855,011, Cl. 156-583.100.

Leggett & Platt, Incorporated: *See—*
Yates, Chester R., 4,853,991, Cl. 5-247.000.

Legrand, Pierre: *See—*
Hays, Jean-Francois; Legrand, Pierre; Verna, Eric; Delzenne, Michel; Reynaud, Bernard; and Gaillard, Pierre, 4,855,566, Cl. 219-130.400.

Lehman, Dexter K.: *See—*
Wiese, Martin E.; and Lehman, Dexter K., 4,854,005, Cl. 15-320.000.

Lehman, Robert G., to Honeywell Inc. Reply rate limiting. 4,856,100, Cl. 342-51.000.

Leigh, Charles, to General Components, Inc. Metal gasket having conical and radial sealing surfaces and method of using the gasket with a tubular element. 4,854,597, Cl. 277-1.000.

Leis, Rudolf. Composite panel. 4,855,177, Cl. 428-247.000.

Leisch, Lee J. Vacuum operated circuit breaker. 4,855,546, Cl. 200-144.00B.

LEK.: *See—*
Zizek, Teofil, 4,855,439, Cl. 548-342.000.

Lele, Padmakar P.; and Sleefe, Gerard E., to Massachusetts Institute of Technology. Ultrasonic tissue characterization. 4,855,911, Cl. 364-413.250.

Lemarquand, Pierre: *See—*
Cohen, Jacques; Lemarquand, Pierre; and Pichard, Christian, 4,855,698, Cl. 335-14.000.

Lemaster, Richard L.; and Dornfeld, David A., to University of California, Regents of the. Method and apparatus for measurement of density profiles in wood composites, using acoustic emission. 4,854,172, Cl. 73-587.000.

Lemelson, Jerome H. Speech communication system and method. 4,856,066, Cl. 381-36.000.

Lemieux, Raymond U.; Ratcliffe, Robert M.; and Baker, Donald A., to Chembiomed Ltd. Method to detect T-antigen delayed hypersensitivity. 4,855,126, Cl. 424-9.000.

Lemirande, Rodger P., to Stanley Automatic Openers. Obstruction detection in automatic portal control apparatus employing induction motor power factor. 4,855,653, Cl. 318-282.000.

Lemoine, Francois; and Rathouit, Rene , to Alsthom. Mechanical connector. 4,854,777, Cl. 405-202.000.

Lendaro, Jeffery B., to RCA Licensing Corp. Television synchronizing arrangement. 4,855,828, Cl. 358-148.000.

Leng, Barry S.: *See—*
Carmen, Raleigh A.; Chong, Chiyong; and Leng, Barry S., 4,855,063, Cl. 210-749.000.

Leonard, Elizabeth C.; and Erwin, Lewis, to Massachusetts Institute of Technology. Process for etching polytetrafluoroethylene. 4,855,018, Cl. 156-646.000.

Leong, Helen; Katz, Martin; Delk, Ann; Nacht, Sergio; and Berliner, David, to Advanced Polymer Systems. Synthetic melanin aggregates. 4,855,144, Cl. 424-487.000.

Leporq, Serge: *See—*
Deschamps, Andre ; Franckowiak, Sigismond; and Leporq, Serge, 4,855,117, Cl. 423-244.000.

Les Industries Fortier Ltee: *See—*
Daigle, Clement; and Gonthier, Emile, 4,854,543, Cl. 249-95.000.

Lesan, Fredrick K.: *See—*
Holland, Eric C.; Lesan, Fredrick K.; and Knappe, Peter H., 4,855,058, Cl. 210-652.000.

Lesley, Arthur M.; and Jaron, William, to Hughes Aircraft Company. Thermal stress screening system. 4,854,726, Cl. 374-45.000.

Leslie, Thomas M., to Hoechst Celanese Corp. Organopolysiloxanes exhibiting nonlinear response. 4,855,078, Cl. 252-582.000.

Levesque, Gaston: *See—*
MacEachern, Donald C.; and Levesque, Gaston, 4,855,885, Cl. 362-298.000.

Levin, Eleanor B. Universal shoe sling. 4,854,056, Cl. 36-58.500.

Levin, Robert, to P. B. Ind. Plant Biotech Industries Ltd. Process for plant tissue culture propagation. 4,855,236, Cl. 435-240.450.

Levin, Zaida; and Hovis, Keith. Bowing guide for stringed instrument. 4,854,212, Cl. 84-283.000.

Levy, Aharon: *See—*
Fisher, Abraham; Karton, Ishai; Heldman, Eliahu; Levy, Aharon; and Grunfeld, Yona, 4,855,290, Cl. 514-278.000.

Lewellen, Richard: *See—*
McKiernan, Edward F.; Sigler, James; Sprang, Richard; Lewellen, Richard; and Geis, Mark, 4,854,827, Cl. 417-313.000.

Lewis, Edward T., to Raytheon Company. CMOS binary up/down counter. 4,856,035, Cl. 377-116.000.

Lewis, John M., to Stereo Optical Company, Inc. Visual acuity testing. 4,854,695, Cl. 351-246.000.

Lewis, Scott, to Eastman Kodak Company. Method and apparatus for deaveraging a stream of averaged data. 4,855,943, Cl. 364-575.000.

Lewis, Walter E. F., to Union Carbide Corporation. Energy transmitting fluid. 4,855,070, Cl. 252-75.000.

Leypold, Helmut: *See—*
Laube, Ludwig; Leypold, Helmut; and Pioch, Erhard, 4,854,440, Cl. 198-357.000.

Liang, Bob C.: *See—*
Gonzalez-Lopez, Jorge; and Liang, Bob C., 4,855,938, Cl. 364-522.000.

Libbey-Owens-Ford Co.: *See—*
Barteck, Werner W., 4,854,599, Cl. 277-227.000.

Libert, Robert J.: *See—*
Gerstenhaber, Moshe; and Libert, Robert J., 4,855,684, Cl. 330-257.000.

Lichtenberg, Norman B.; Sponseller, Harold P.; and Totten, Jeffrey E., to Babcock Industries Inc. Manually operated and locked conduit length adjuster system. 4,854,185, Cl. 74-501.50R.

Liddell, Margaret G.: *See—*
Crane, Herbert R.; and Liddell, Margaret G., 4,854,717, Cl. 366-197.000.

Liebe, Werner: *See—*
Renner, Gunter; Wolff, Erich; Wiesen, Heinz; and Liebe, Werner, 4,855,222, Cl. 430-557.000.

Liebel, Richard J. Venting control device. 4,854,225, Cl. 98-116.000.

Lien, Sheue-Ling; Shantz, Michael J.; Evans, Jerald R.; Ergene, Serdar; and Carrie, Susan E., to Sun Microsystems, Inc. Method and apparatus for rendering vectors using bresenham parameters. 4,855,935, Cl. 364-521.000.

Lightgraphix Limited: *See—*
Boss, Ian, 4,855,882, Cl. 362-238.000.

LIL Industries Ltd.: *See—*
Balek, Lynn A., 4,854,540, Cl. 248-503.000.

Lin, Anderson. Adjustment and positioning structure of the elongated rod-like lighter. 4,854,859, Cl. 431-344.000.

Lin, J. Y.; Hsieh, Yih-Shou; and Chu, Shu-Chen, to National Science Council. Isolation and purification pre-S2 containing hepatitis B virus surface antigen by chemical affinity chromatography. 4,855,055, Cl. 210-635.000.

Linde Aktiengesellschaft: *See—*
Honecker, Gunter, 4,854,278, Cl. 123-198.00E.
Kleineisel, Gustav, 4,854,826, Cl. 417-269.000.

Linden, Harry A., to Hall Surgical Division of Zimmer, Inc. Oral implant. 4,854,873, Cl. 433-173.000.

Lindgren, Håkan; Olsson, Jan O.; Knudsen, Martin; and Ronningen, Knut, to Kanthal AB. Forehearth. 4,854,960, Cl. 65-346.000.

Lindmayer, Josephy, to Quantex Corporation. Photoluminescent materials for radiography. 4,855,603, Cl. 250-484.100.

Lindow, Steven E., to University of California, The Regents of the. Microorganism inhibition of frost damage to plants. 4,855,230, Cl. 435-30.000.

Linnemeier, Elmer H., to Torrington Company, The. Tempered needle bearing with dimple. 4,854,738, Cl. 384-127.000.

Linowski, John W.: *See—*
Geus, John W.; and Linowski, John W., 4,855,091, Cl. 264-22.000.

Lipisko, Bruce A.: *See—*
Clark, R. Scot; Hoffman, Joe G.; Davison, John B.; Jones, Alan W.; Jones, Allen H., Jr.; Persichini, David W.; Yuan, Wallace I.; and Lipisko, Bruce A., 4,855,023, Cl. 204-130.000.

Lippert, Walter: *See—*
Buchler, Wilhelm; Lippert, Walter; and Maier, Lorenz, 4,854,028, Cl. 29-452.000.

Lisec, Peter. Device for the formation of a corner of flexible spacers for glass plates. 4,854,022, Cl. 29-33.00K.

Lithgow, Baird E.: *See—*
Mohler, Paul J.; Romz, Thomas A.; and Lithgow, Baird E., 4,855,354, Cl. 525-54.240.

Little, Henry M. T.; and Hagon, John W. Boom spraying apparatus. 4,854,503, Cl. 239-167.000.

Litton Industrial Automation Systems, Inc.: *See—*
Kubsh, Leroy M.; and Schlie, Donald R., 4,854,086, Cl. 51-209.00R.

Litton Systems, Inc.: *See—*
Adsett, Anthony P., 4,854,987, Cl. 156-89.000.

Livshits, Semen V.: *See—*
Zolotar, Arkady I.; Samoilovich, David S.; Karakhanian, Vladimir K.; Kuznetsov, Vyacheslav I.; Kopelyansky, Vladimir B.; Kuznetsov, Oleg V.; Nesterenko, Vladimir E.; Karachaban, Nikolai G.; Shmuratov, Georgy E.; Kljuzhin, Evgeny A.; and Livshits, Semen V., 4,854,820, Cl. 415-171.100.

Livshultz, Michael; and Tong, Hua Sou, to Zenith Electronics Corporation. Material, and assemblies for tensioned foil shadow masks. 4,854,906, Cl. 445-37.000.

Ljung, Stefan: *See—*
Bergman, Sten; and Ljung, Stefan, 4,855,861, Cl. 361-65.000.

Lloyd, William D.: *See—*
Win, Maung H.; and Lloyd, William D., 4,855,068, Cl. 252-90.000.

Loch, Werner: *See—*
Goeckel, Ulrich; Petersen, Harro; Osterloh, Rolf; Schupp, Eberhard; Loch, Werner; and Schwerzel, Thomas, 4,855,394, Cl. 528-263.000.

Locker, Robert J.: *See—*
Day, John P.; and Locker, Robert J., 4,855,265, Cl. 501-128.000.

Lockheed Corporation: *See—*
Adams, Mark J.; and Crisman, Elton M., Jr., 4,854,724, Cl. 374-5.000.
Yaniger, Stuart I.; and Cameron, Randy E., 4,855,361, Cl. 525-436.000.

Lockheed Electronics Company: *See—*
Cangiani, Gene L.; and Madiwale, Appasaheb N., 4,855,932, Cl. 364-516.000.

Lockhoff, Oswald; Hayauchi, Yutaka; Stadler, Peter; Stunkel, Klaus G.; Streissle, Gert; Paessens, Arnold; Klimetzek, Volker; Zeiler, Hans-Joachim; Metzger, Karl G.; Kroll, Hein-Peter; Brunner, Helmut; and Schaller, Klaus, to Bayer Aktiengesellschaft. Novel pharmaceutically active N-(2-aminoacylamido-2-deoxy-hexosyl)-amides, -carbamates and -ureas. 4,855,283, Cl. 514-8.000.

Lockwood, William D., to Con/Span Culvert Systems, Inc. Precast concrete culvert system. 4,854,775, Cl. 405-126.000.

Loctite Corporation: *See—*
Dunn, David J.; Vano, Patrick P.; Moran, James P., Jr.; Holmes, Mark; and Frauenglass, Elliott, 4,855,002, Cl. 156-307.300.

Loctite (Ireland) Ltd.: *See—*
Harris, Stephen J., 4,855,461, Cl. 549-348.000.

Lodder, Bernard; Koopman, Roelof; and Visscher, Jan, to Wavin BV. Welding sleeve with connecting means having an upper and lower part. 4,855,574, Cl. 219-535.000.

Loeffler, Hermann: *See—*
Dehnert, Johannes; Lamm, Gunther; and Loeffler, Hermann, 4,855,412, Cl. 534-766.000.
Dehnert, Johannes; Lamm, Gunther; and Loeffler, Hermann, 4,855,413, Cl. 534-766.000.

Loewenstein, Lee M.: *See—*
Jucha, Rhett B.; Davis, Cecil J.; and Loewenstein, Lee M., 4,855,016, Cl. 156-643.000.

Logan, Margaret E., to Eastman Kodak Company. Novel polymethine dyes and imaging compositions. 4,855,213, Cl. 430-281.000.

Lohr Industrie: *See—*
Andre, Jean-luc, 4,854,790, Cl. 410-30.000.

Long, D. Clayton, to MacGregor Golf Company. Golf irons. 4,854,581, Cl. 273-77.00A.

Longbrake, Beth A.: *See—*
Foster, Robert I.; and Longbrake, Beth A., 4,856,004, Cl. 371-37.000.

Longrod, Scott J.: *See—*
Curley, Charles M.; and Longrod, Scott J., 4,855,548, Cl. 200-345.000.

Longuet, Michel: *See—*
Dequatre, Claude; Blanpain, Peter R. J.; and Longuet, Michel, 4,855,337, Cl. 523-201.000.

Lonza Ltd.: *See—*
Meul, Thomas, 4,855,451, Cl. 548-544.000.

Lord Corporation: *See—*
Damico, Dennis J.; and Bennett, Ruth M., 4,855,001, Cl. 156-307.300.

L'Oreal: *See—*
Morane, Bruno; and Joulia, Gerard, 4,854,759, Cl. 401-119.000.

Lorence, Brian S.; and Grabowski, David N., to Chivas Products Limited. Container holder. 4,854,536, Cl. 248-311.200.

Lorenz, Rainer; Frenzen, Gustav; and Lossa, Ulrich, to Palitex Project Company GmbH. A spindle rotor adapted for use in a spindle of a textile thread processing machine. 4,854,116, Cl. 57-58.840.

Lorenz, Roland: *See—*
Thunker, Norbert; Spiegel, Nikolaus; Lorenz, Roland; and Joss, Werner, 4,854,236, Cl. 101-411.000.

Lossa, Ulrich: *See—*
Lorenz, Rainer; Frenzen, Gustav; and Lossa, Ulrich, 4,854,116, Cl. 57-58.840.

Lott, Quitman W.: *See—*
Nelson, Neil M.; Sponzilli, William A.; and Lott, Quitman W., 4,854,120, Cl. 60-39.020.

Lovato, Vittorio, to AGIP Petroli S.P.A. Temperature detecting apparatus for pipes in refinery furnaces and the like. 4,854,729, Cl. 374-141.000.

Love, Betty J.: *See—*
Fritz, Marlene M.; Love, Betty J.; Sweeney, Mary D.; and Davis, Chuck, 4,855,723, Cl. 340-691.000.

Low, Howard M.: *See—*
Bagchi, Pranab; Sterman, Melvin D.; and Low, Howard M., 4,855,219, Cl. 430-496.000.

Lowe, Donald J. Illuminated wind chime. 4,854,214, Cl. 84-404.000.

Lowe and Fletcher Limited: *See—*
O'Connell, John; Jefferies, Roy S.; and Trevor-Jones, Hugh, 4,854,146, Cl. 70-277.000.

Lowe, Tony; and Bernadic, Thomas, to GTE Valenite Corporation. Scalloped threader cutting insert. 4,854,785, Cl. 407-115.000.

Lowell, Arthur I.: *See—*
Bassemir, Robert; Krishnan, Ramasamy; and Lowell, Arthur I., 4,854,969, Cl. 106-2.000.

Lower, Edwin M., to Compaq Computer Corporation. Power supply for plasma display. 4,855,892, Cl. 363-86.000.

Lowery, Michael K.; Keegan, Richard E.; and Koshute, Mark A., to Mobay Corporation. Process for the production of stable dispersions, the dispersions so produced, and the use thereof in the manufacture of polyurethanes. 4,855,352, Cl. 524-728.000.

Lowey, Hans. Method of preparing controlled long-acting pharmaceutical formulations in unit dosage form having uniform and comparable bioavailability characteristics. 4,855,143, Cl. 424-468.000.

Lozano, Anthony R. Door assembly incorporating means to increase resistance to forced entry. 4,854,622, Cl. 292-340.000.

Lu, David D.: *See—*
Klun, Thomas P.; Lu, David D.; and Robbins, Aida F., 4,855,184, Cl. 428-425.100.

Lucas International S.R.L.: *See—*
Italici, Rino, 4,854,732, Cl. 383-6.000.

Lucas Ledex Inc.: *See—*
Mohler, David B., 4,855,700, Cl. 335-229.000.

Lucassen, Guenter: *See—*
Pinto, Akiva; and Lucassen, Guenter, 4,854,013, Cl. 19-200.000

Luciani, Sabatino; and Santandrea, Luciano, to AXIS USA Inc. Inserting insulating material into electric motor stators. 4,854,033, Cl. 29-596.000.

Luckger, Rolf: *See—*
Brocksieper, Manfred; Luckger, Rolf; Kroschel, Hans-Gerd; and Stechow, Jochen, 4,856,105, Cl. 364-474.020

Ludwig, George C., to Maremont Corporation. Pneumatic spring structure with dial output force and pressure decay compensation and method of operation. 4,854,554, Cl. 267-64.110.

Ludwig, Reinhold: *See—*
Boertzel, Martin; Ludwig, Reinhold; Schmits, Wilhelm; and Weiss, Ulrich, 4,855,858, Cl. 361-18.000.

Luedy, Joyce A. Post-mastectomy garment. 4,854,915, Cl. 450-31.000.

Lumel, Inc.: *See—*
Simopoulos, Nicholas T.; and Simopoulos, George N., 4,855,189, Cl. 428-690.000.

Lun, Saiman, to General Motors Corporation. Hydraulic mount with reciprocal partition. 4,854,560, Cl. 267-140.100.

Lungershausen, Arnold W.: *See—*
Estes, Marvin F.; and Lungershausen, Arnold W., 4,854,662, Cl. 350-96.200.

Luttmer, Joseph D.; Davis, Cecil J.; Smith, Patricia B.; and York, Rudy L., to Texas Instruments Incorporated. Method for passivating wafer. 4,855,160, Cl. 427-38.000.

Luyties, William H., to Shell Offshore Inc. Installation of multipiece jackets using mating pins. 4,854,779, Cl. 405-205.000.

Lycett, Norma. Hair curler system. 4,854,335, Cl. 132-247.000.

Lynam, Niall R.: *See—*
Moser, Frank H.; and Lynam, Niall R., 4,855,161, Cl. 427-108.000.

Lynch, Donald M.; and Appelbaum, Benjamin, to Warner-Lambert Company. Saccharide inhibition of dental plaque. 4,855,128, Cl. 424-49.000.

Lynn, Gordon E.: *See—*
Gatchel, Gary; Newgarden, Joseph E.; and Lynn, Gordon E., 4,854,588, Cl. 273-30.000.

Lyon, Donald A. Portable hand-operated stamps. 4,854,235, Cl. 101-389.100.

Lyras, Gus G.: *See—*
Lyras, Louis G.; and Lyras, Gus G., 4,854,419, Cl. 182-129.000.

Lyras, Louis G.; and Lyras, Gus G. Particulate containment control method and platform device. 4,854,419, Cl. 182-129.000.

M.A.N. Roland: *See—*
Despot, Janko; and Krober, Ulrich, 4,854,233, Cl. 101-216.000.

M u. W Verpackungen: *See—*
Schwinn, Georg, 4,854,733, Cl. 383-29.000.

Ma, Di; and Hoffman, David H., to Standard Microsystems Corporation. Process for fabricating self-aligned silicide lightly doped drain MOS devices. 4,855,247, Cl. 437-44.000.

Maassen, Egbertus J. P.: *See—*
Eijkelenboom, Leonard C. H.; Maassen, Egbertus J. P.; and Van Meel, Franciscus A. M. M., 4,855,886, Cl. 362-350.000.

MacEachern, Donald C.; and Levesque, Gaston, to DSL Dynamic Sciences Limited. Light beam intensifier. 4,855,885, Cl. 362-298.000.

MacGregor Golf Company: *See—*
Long, D. Clayton, 4,854,581, Cl. 273-77.00A.

Machek, James E.: *See—*
Evans, Russell M., III; Machek, James E.; and Cowan, Kevin P., 4,854,330, Cl. 128-772.000.

Machida, Haruhiko: *See—*
Kobayashi, Hiroshi; Machida, Haruhiko; Harigaya, Makoko; Ide, Yasushi; and Akedo, Jun, 4,855,256, Cl. 437-129.000.

MacIntyre, Steven A.: *See—*
Clarkson, Bruce A.; and MacIntyre, Steven A., 4,855,714, Cl. 340-521.000.

Madaus GmbH & Co.: *See—*
Grimminger, Wolf; Gorler, Klaus; and Odenthal, Karl P., 4,855,422, Cl. 540-466.000.

Madiwale, Appasaheb N.: *See—*
Cangiani, Gene L.; and Madiwale, Appasaheb N., 4,855,932, Cl. 364-516.000

Maeda, Hiroyuki: *See—*
Ohkawa, Fujio; Higashidani, Akira; and Maeda, Hiroyuki, 4,854,555, Cl. 267-64.240.

Maeda, Naoki, to Sumitomo ELectric Industries, Ltd. Binary coding circuit for OCR. 4,856,076, Cl. 382-53.000.

Maeda, Takeshi: *See—*
Kaku, Toshimitsu; Tsunoda, Yoshito; Maeda, Takeshi; and Nakamura, Shigeru, 4,855,991, Cl. 369-275.000.

Maeda, Yoshimi, to Shimano Industrial Company Limited. Fishing rod and a manufacturing method therefor. 4,854,068, Cl. 43-18.500.

Maeda, Yutaka; and Makiyama, Hiroyuki, to Minolta Camera Kabushiki Kaisha. Magazine for containing strip of recording medium. 4,854,519, Cl. 242-71.100.

Maeda, Yutaka, to Minolta Camera Kabushiki Kaisha. Laser scanning with an elastic nip roller. 4,855,759, Cl. 346-108.000.

Mager, Herbert: *See—*
Konrad, Eugen; Mager, Herbert; and Hoch, Dietrich, 4,855,130, Cl. 424-70.000.

Magnetic Peripherals Inc.: *See—*
Radwan, Hatem R.; and Goss, Lloyd C., 4,855,851, Cl. 360-104.000.

Magruder, Judy A.: *See—*
Eckenhoff, James B.; Magruder, Judy A.; Cortese, Richard; Peery, John R.; and Wright, Jeremy C., 4,855,141, Cl. 424-423.000.

Mahmens, Olaf: *See—*
Hentschel, Volker; Versteegen, Clemens; Mahmens, Olaf; and Babendererde, Siegmund, 4,854,776, Cl. 405-147.000.

Mahon, Joseph J.; and Aigner, Robert K., to Eaton Corporation. Providing a programmer/timer with dual rate drive. 4,856,096, Cl. 200-38.00C.

Mahoney, John E., to Xilinx, Inc. System for scan testing of logic circuit networks. 4,855,669, Cl. 324-73.00R.

Maier, Lorenz: *See—*
Buchler, Wilhelm; Lippert, Walter; and Maier, Lorenz, 4,854,028, Cl. 29-452.000.

Maier, Robert M.: *See—*
Zmyslowski, Allan J.; and Maier, Robert M., 4,855,947, Cl. 364-200.000.

Maitre, Thierry, to U.S. Philips Corporation. Electronic switching apparatus having impedance matching circuitry for ultra-high frequency signals. 4,855,614, Cl. 307-241.000.

Mak, Ching Pong: *See—*
Fliri, Hans; and Mak, Ching Pong, 4,855,421, Cl. 540-357.000.

Mak, Gerd: *See—*
Stoll, Thomas; Killus, Martin; and Mak, Gerd, 4,856,104, Cl. 364-470.000.

Makhteshim Chemical Works, Ltd.: *See—*
Bracha, Peretz; and Korat, Moshe, 4,854,965, Cl. 71-92.000

Makino, Masayuki, to NEC Corporation. Method of connecting a cordless telephone by radio. 4,856,083, Cl. 455-166.000.

Makita, Tetsuro: *See—*
Niki, Kenichi; Makita, Tetsuro; and Takasago, Hayato, 4,854,230, Cl. 101-123.000

Makiyama, Hiroyuki: *See—*
Maeda, Yutaka; and Makiyama, Hiroyuki, 4,854,519, Cl. 242-71.100.

Malcolm, David H.; and Wilenius, George P. T., to Xi Tech Inc. Method for production of fluoroscopic and radiographic x-ray images and hand held diagnostic apparatus incorporating the same. 4,856,036, Cl. 378-116.000.

Malhi, Satwinder; Bean, Kenneth E.; Driscoll, Charles C.; and Chatterjee, Pallab K., to Texas Instruments Incorporated. Orthogonal chip mount system module and method. 4,855,809, Cl. 357-75.000.

Malvino, Albert P.; and Malvino, Joanna M., to Malvino, Inc. Textbook with animated illustrations. 4,854,878, Cl. 434-335.000.

Malvino, Inc.: *See—*
Malvino, Albert P.; and Malvino, Joanna M., 4,854,878, Cl. 434-335.000.

Malvino, Joanna M.: *See—*
Malvino, Albert P.; and Malvino, Joanna M., 4,854,878, Cl. 434-335.000.

MAN - Roland Druckmaschinen AG: *See—*
Theilacker, Klaus, 4,854,237, Cl. 101-415.100.

Mancel, James D.; and Raiskums, Olaf B., to Rainbow Star Licensing S.A. Ornament production apparatus. 4,855,009, Cl. 156-443.000.

Manco Inc.: *See—*
Corbo, Thomas E.; Cisek, Richard J., Jr.; Matthews, Kathryn M.; and Schringer, George K., 4,854,060, Cl. 40-152.100.

Mancusi Jr., Joseph J. Electrically enhanced artificial tree. 4,855,880, Cl. 362-123.000.

Mandelcorn, Josh, to Pioneer Magnetics, Inc. Status indicating circuit for paralleled switching power supplies. 4,855,665, Cl. 323-272.000.

Mandracchia, Charles D.; and Mandracchia, Janet A. Harness for small children. 4,854,607, Cl. 280-801.000.

Mandracchia, Janet A.: *See—*
Mandracchia, Charles D.; and Mandracchia, Janet A., 4,854,607, Cl. 280-801.000.

Mannhardt, Karl: *See—*
Trostmann, Uwe; Schachtele, Christoph; Mannhardt, Karl; Rudolph, Claus; and Marme Dieter, 4,855,489, Cl. 560-250.000.

Mannheimer, Lee R.; and De Ridder, A. Lody. Diskette cleaner. 4,854,001, Cl. 15-97.00R.

Mano, Hiroyuki; Tachiuchi, Tsuguji; Kinugawa, Kiyoshige; and Tanaka, Shinji, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Method and apparatus for converting display data form. 4,855,728, Cl. 340-805.000.

Mansfield, Lee: *See—*
Webb, Peter D.; Russhard, Peter; and Mansfield, Lee, 4,855,735, Cl. 340-870.140.

Manville Corporation: *See—*
Dave, Shashi B.; and Cain, Clifford W., Jr., 4,855,509, Cl. 518-621.000.

Maraghe, Alex; and Puncoch, Miloslav, to Boeing Company, The. Hinge mechanism for aircraft door. 4,854,010, Cl. 16-360.000.

Marceau, Richard J.; and Jeanson, Guy, to Hydro-Quebec. Fluid heating device incorporating transformer secondary winding having a single electrical turn and cooling means optimized for heat transfer. 4,855,552, Cl. 219-10.510.

Marchese, James J.: *See—*
Slavitter, Frederick; and Marchese, James J., 4,855,769, Cl. 354-21.000.

Marchetti, Augusto. Tapping unit for a sealing machine for cardboard boxes, equipped with a control system for signalling the absence of tape supplied to the boxes to be sealed. 4,855,006, Cl. 156-378.000.

Marcus, Bonita K.: *See—*
Gioffre, Anthony J.; and Marcus, Bonita K., 4,855,154, Cl. 426-417.000.

Marcus, Kenneth N.; and Brookshire, Phillip L., to Dolly, Inc. Portable adjustable child's chair. 4,854,638, Cl. 297-250.000.

Marechal, Jean-Pierre; and Maschmeyer, Richard O., to Corning Glass Works. Process to mold precision glass articles. 4,854,958, Cl. 65-64.000.

Maremont Corporation: *See—*
Ludwig, George C., 4,854,554, Cl. 267-64.110.

Margureanu, Gabriella; and Gutmann, Friedrich, to Joh. A. Benckiser GmbH. Process for producing citric acid. 4,855,494, Cl. 562-580.000.

Marker, Edwin M.; Thacker, Paul F.; and Knopfhart, Peter K., to Abbott Laboratories. Sample ring for clinical analyzer network. 4,855,110, Cl. 422-102.000.

Markstein, Rudolf; and Palacios, Jose, to Sandoz Ltd. Uses of dopamine receptor agonists. 4,855,306, Cl. 514-280.000.

Markusch, Peter; and Hudson, George A., deceased (by White, Richard L., administrator), to Mobay Corporation. Liquid polyisocyanate adduct mixtures possessing good compatibility with apolar solvents. 4,855,490, Cl. 560-355.000.

Marlett, Everett M., to Ethyl Corporation. Production of silane and useful coproducts. 4,855,120, Cl. 423-347.000.

Marme Dieter: *See—*
Trostmann, Uwe; Schachtele, Christoph; Mannhardt, Karl; Rudolph, Claus; and Marme Dieter, 4,855,489, Cl. 560-250.000.

Marquiss, Stanley L., to Electromagnetic Research and Development. Planar loudspeaker system. 4,856,071, Cl. 381-203.000.

Marscholl, Klaus: *See—*
Jakob, Willi; and Marscholl, Klaus, 4,854,186, Cl. 74-501.50R.

Marsella, John A., to Air Products and Chemicals, Inc. Process for the selective synthesis of ethylene diamines. 4,855,425, Cl. 544-78.000.

Martin, Arnold D., to CPC Engineering Corporation. Method and apparatus for controlling the coagulant dosage for water treatment. 4,855,061, Cl. 210-709.000.

Martin, Harvey G.; Pilling, Roger; and Hosking, Steven M., to De La Rue Systems, Ltd. Sheet feeding system. 4,854,570, Cl. 271-162.000.

Martin, Lawrence L.; Worm, Manfred; and Crishlow, Charles A., to Hoechst-Roussel Pharmaceuticals, Inc. α-(2-nitro-phenylmethyl)-benzylamines. 4,855,502, Cl. 564-373.000.

Martin, Roy E.; Parr, John H.; and McCullah, C. Gray. Safety pillow for preventing smoke inhalation. 4,854,314, Cl. 128-205.270.

Martin, Shirley J.: *See—*
McDaniel, Max P.; and Martin, Shirley J., 4,855,271, Cl. 502-107.000.

Martin, Trevor I.; Breton, Marcel P.; Branston, Randolph E.; Moffat, Karen A.; and Mychajlowskij, Walter, to Xerox Corporation. Low melting encapsulated toners. 4,855,209, Cl. 430-126.000.

Martinez, David V.: *See—*
Smith, Wayne G.; Martinez, David V.; Mozingo, Robert E.; and Hanson, Charles B., 4,854,812, Cl. 414-723.000.
Smith, Wayne G.; Martinez, David V.; Mozingo, Robert E.; and Hanson, Charles B., 4,854,814, Cl. 414-723.000.

Martinval, Andre. Toilet apparatus with device for washing, disinfecting and drying toilet seats. 4,853,982, Cl. 4-233.000.

Maruman Golf Co., Ltd.: *See—*
Kobayashi, Masashi, 4,854,583, Cl. 273-80.800.

Maruta, Syuzi: *See—*
Ohira, Tadashi; Ito, Masazumi; and Maruta, Syuzi, 4,855,786, Cl. 355-218.000.

Maruyama, Osamu; Ishikawa, Hidenobu; and Takahashi, Nobuo, to Dainippon Ink and Chemicals, Inc. Curable resin composition and its use. 4,855,334, Cl. 522-96.000.

Marvin, Mark: *See—*
Hashish, Mohamed; and Marvin, Mark, 4,854,091, Cl. 51-439.000.

Masakazu, Kikuchi; Tsutomu, Kurokawa; and Susumu, Honda, to Takeda Chemical Industries, Ltd. Novel polypeptides and method of producing same. 4,855,409, Cl. 530-351.000.

Masaki, Kazumi, to Hayashibara, Ken. Single-wired switching circuit directed to limit surge into lamp. 4,855,649, Cl. 315-310.000.

Maschinenfabrik Wifag: *See—*
Gertsch, Peter; and Kohler, Arnold, 4,854,806, Cl. 414-495.000.

Maschmeyer, Richard O.: *See—*
Marechal, Jean-Pierre; and Maschmeyer, Richard O., 4,854,958, Cl. 65-64.000.

Masco Corporation: *See—*
Knapp, Alfons, 4,854,347, Cl. 137-625.400.

Mase, Akira: *See—*
Yamazaki, Shunpei; Mase, Akira; and Sakayori, Hiroyuki, 4,854,675, Cl. 350-336.000.
Yamazaki, Shunpei; Mase, Akira; Konuma, Toshimitsu; Miyazaki, Minoru; Sakama, Mitsunori; and Inushima, Takashi, 4,855,805, Cl. 357-58.000.

Mase, Toshiyasu: *See—*
Murase, Kiyoshi; Mase, Toshiyasu; Hara, Hiromu; and Tomioka, Kenichi, 4,855,310, Cl. 514-361.000.

Mashiko, Kouichi: *See—*
Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, 4,854,372, Cl. 165-46.000.

Mason, Bobby L.: *See—*
Wallgren, Linus E.; Mason, Bobby L.; Siegel, William J.; Olesen, Ole V.; and Abbagnaro, Louis A., 4,855,572, Cl. 219-456.000.

Massa, Giacinto: *See—*
Pola, Carlo; and Massa, Giacinto, 4,854,081, Cl. 51-76.00R.

Massachusetts Institute of Technology: *See—*
Goodhue, William D., 4,855,255, Cl. 437-129.000.
Lele, Padmakar P.; and Sleefe, Gerard E., 4,855,911, Cl. 364-413.250.
Leonard, Elizabeth C.; and Erwin, Lewis, 4,855,018, Cl. 156-646.000.
Quatieri, Thomas F., Jr.; and McAulay, Robert J., 4,856,068, Cl. 381-47.000.

Masschusetts Institute Of Technology: *See—*
Sichel, Enid K., 4,855,985, Cl. 369-100.000.

Masuda, Michio: *See—*
Rokuda, Morito; Ohtsubo, Hiroyasu; Masuda, Michio; Nishijima, Hideo; and Okamoto, Kaneyuki, 4,855,812, Cl. 358-22.000.

Masuda, Nobuhito; and Igarashi, Takeshi, to Fuji Photo Film Co., Ltd. Member of analytical element for the analysis of liquid sample containing solid. 4,855,108, Cl. 422-56.000.

Masuda, Takahito: *See—*
Iriuchijima, Shinobu; Kobayashi, Hirohiko; Masuda, Takahito; Watanabe, Shunnosuke; and Tabata, Hiroshi, 4,855,311, Cl. 514-373.000.

Masuda, Tomohiko: *See—*
Kitano, Hirohisa; Saito, Itaru; Shingaki, Kouichi; Matsubara, Ken; and Masuda, Tomohiko, 4,854,678, Cl. 350-356.000.

Masuo, Mitsuaki: *See—*
Murakami, Tadashi; Nakaniwa, Mikio; Nakayama, Yoshio; and Masuo, Mitsuaki, 4,855,037, Cl. 208-422.000.

Masuoka, Fujio: *See—*
Ariizumi, Shoji; Iwase, Taira; and Masuoka, Fujio, 4,855,248, Cl. 437-49.000.

Masuzawa, Isao: *See—*
Miyayama, Toshio; Masuzawa, Isao; and Hirono, Nakayasu, 4,855,739, Cl. 340-984.000.

Materials Research Corporation: *See—*
Hurwitt, Steven D., 4,855,033, Cl. 204-298.000.

Mathai, C. V.; Rathbun, Lyle A.; and Kinsey, John S., to Aerovironment, Inc. Apparatus and method to produce charged fog. 4,854,500, Cl. 239-3.000.

Mathers, James P.; Wood, William P.; and Forester, Thomas, to Minnesota Mining and Manufacturing Company. Aluminum oxide/aluminum oxynitride/group IVB metal nitride abrasive particles derived from a sol-gel process. 4,855,264, Cl. 501-98.000.

Mathes, Larry W.; and Snyder, William R. Ice cream cone with imprinted band. 4,855,150, Cl. 426-87.000.

Matsubara, Akinori; Tsutsumi, Kenichi; Kaneko, Youji; Akutsu, Takashi; and Tateishi, Naofumi, to Casio Computer Co., Ltd. Electronic musical instrument with key scaling using multiple set points. 4,854,209, Cl. 84-1.010.

Matsubara, Ken: *See*—
Kitano, Hirohisa; Saito, Itaru; Shingaki, Kouichi; Matsubara, Ken; and Masuda, Tomohiko, 4,854,678, Cl. 350-356.000.

Matsuda, Yasuo: *See*—
Yamato, Ikuo; Tokunaga, Norikazu; Matsuda, Yasuo; and Amano, Hisao, 4,855,887, Cl. 363-8.000.

Matsuda, Yoshio: *See*—
Tsukamoto, Katsuhiro; Shimizu, Masahiro; Fujishima, Kazuyasu; and Matsuda, Yoshio, 4,855,953, Cl. 365-149.000.

Matsui, Sadayoshi; Taneya, Mototaka; Matsumoto, Mitsuhiro; and Hosoba, Hiroyuki, to Sharp Kabushiki Kaisha. Semiconductor laser array device. 4,856,015, Cl. 372-50.000.

Matsui, Shoji: *See*—
Arii, Michio; Kamataki, Yoshihisa; Hino, Shirou; and Matsui, Shoji, 4,854,121, Cl. 60-39.182.

Matsui, Tomoki; Kimoto, Hidesuke; and Shimizu, Setsuo, to Yuasa Battery Company Limited. Charging control apparatus. 4,855,663, Cl. 320-20.000.

Matsukura, Hisao; Yamato, Osamu; and Horii, Hiroyuki, to Oki Electric Industry Co., Ltd. Dielectric filter and a method of manufacture thereof. 4,855,693, Cl. 333-202.000.

Matsumaru, Haruo: *See*—
Yamamoto, Hideaki; Sasano, Akira; Matsumaru, Haruo; Tanaka, Yasuo; and Tsukada, Toshihisa, 4,855,795, Cl. 357-2.000.

Matsumoto, Masahiro: *See*—
Oho, Shigeru; Hirayama, Takeshi; Matsumoto, Masahiro; Hasegawa, Akira; Hamano, Fumio; and Shibata, Takanori, 4,855,896, Cl. 364-138.000.

Matsumoto, Mitsuhiro: *See*—
Matsui, Sadayoshi; Taneya, Mototaka; Matsumoto, Mitsuhiro; and Hosoba, Hiroyuki, 4,856,015, Cl. 372-50.000.

Matsumoto, Sinichi: *See*—
Ise, Kiyotaka; Matsumoto, Sinichi; and Miyazaki, Hiroharu, 4,854,411, Cl. 180-197.000.

Matsumoto, Yoji: *See*—
Katsumata, Masaaki; Takagi, Isamu; Takahashi, Eiji; Sakai, Tadamichi; Matsumoto, Yoji; Ohtsu, Hideaki; Uchida, Hiroyuki; and Asami, Kiyoshi, 4,855,106, Cl. 420-109.000.

Matsumura, Teruyuki: *See*—
Kawamura, Hideaki; Matsumura, Teruyuki; and Mineshige, Takahiko, 4,855,898, Cl. 364-191.000.

Matsuo, Kazuhiro: *See*—
Kitajima, Tadayuki; Asakawa, Toshiyuki; Naito, Masataka; Matsuo, Kazuhiro; and Murayama, Toshiaki, 4,854,571, Cl. 271-293.000.

Matsuo, Makoto: *See*—
Shimoda, Makoto; Ishino, Tatsuyuki; and Matsuo, Makoto, 4,855,908, Cl. 364-405.000.

Matsuo, Youichi: *See*—
Komoto, Mitsuo; Matsuo, Youichi; and Sano, Toshifumi, 4,854,377, Cl. 165-80.400.

Matsuoka, Fuminori, to Tokyo Electron Limited. Developing apparatus. 4,855,775, Cl. 354-325.000.

Matsuoka, Hiroo; Toida, Tsutomu; Takinami, Takao; Takenaka, Senji; and Fujita, Tetsuo, to JGC Corporation. Process for the desulfurization of gas containing hydrogen sulfide. 4,855,124, Cl. 423-574.00L.

Matsuoka, Kenzo, to Nippon Seiki Hoseki Kogyo. Cleaning device for vhs video casette players. 4,855,856, Cl. 360-128.000.

Matsuoka, Yuzo: *See*—
Yamada, Yoshihisa; and Matsuoka, Yuzo, 4,855,298, Cl. 514-259.000.

Matsushima, Eiji, to Mazda Motor Corporation. Apparatus for fixing protective moldings to vehicle bodies. 4,855,003, Cl. 156-358.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Kageyama, Yoshikazu; and Mino, Mineo, 4,855,833, Cl. 358-183.000.
Miyata, Takeo; and Iwabuchi, Takashi, 4,856,019, Cl. 372-99.000.
Mizuno, Yasuo; Nishino, Atsushi; Ikeda, Masaki; and Kurio, Shinji, 4,855,261, Cl. 501-76.000.
Nishimura, Hiroshi; and Hirayama, Yasutaka, 4,854,006, Cl. 15-375.000.
Takai, Hitoshi, 4,856,025, Cl. 375-40.000.
Tsuchiya, Soji; Ito, Yoshimasa; Higuchi, Sadashi; and Yamashita, Akio, 4,855,727, Cl. 340-785.000.

Matsushita, Toshio; Amano, Hideaki; Yamaura, Satoru; Nakamura, Shigeo; and Nakada, Yasusuke, to Hitachi, Ltd. Actuator for positioning heads in magnetic disc apparatus. 4,855,853, Cl. 360-106.000.

Matsuzaki Seisan Kabusiki Kaisha: *See*—
Takeuchi, Tadao, 4,854,602, Cl. 280-79.110.

Mattel, Inc.: *See*—
Kelley, William J.; and Hurtienne, Daniel G., 4,854,913, Cl. 446-397.000.

Matthews, Kathryn M.: *See*—
Corbo, Thomas E.; Cisek, Richard J., Jr.; Matthews, Kathryn M.; and Schringer, George K., 4,854,060, Cl. 40-152.100.

Matthews, Russell H., to Elcon Products International Company. Terminal bus junction with multiple, displaced contact points. 4,854,899, Cl. 439-724.000.

Mattson, Larry J.: *See*—
Roberts, John T.; and Mattson, Larry J., 4,854,931, Cl. 493-348.000.

Mauchan, Donald E.; and Slavitter, Frederick, to Polaroid Corporation. Vehicle identification camera. 4,855,770, Cl. 354-75.000.

Mauleon, Jean-Louis; Ville, Francois; and Mengus, Charles, to Compagnie De Raffinage et de Distribution Total France. System for the sampling in an enclosure of solid particles in a fluidized bed. 4,854,180, Cl. 73-863.860.

May, Donald R., to Sandra L. May. Apparatus for lifting structures. 4,854,782, Cl. 405-230.000.

Maydan, Dan: *See*—
Chang, Mei; Wang, David N. K.; White, John M.; and Maydan, Dan, 4,854,263, Cl. 118-715.000.

Mayer, Dean L., to Babcock & Wilcox Company, The. Cold drawing technique and apparatus for forming internally grooved tubes. 4,854,148, Cl. 72-68.000

Mayle, Steven R. Lifting and carrying heavy loads. 4,854,804, Cl. 414-469.000

Mayr, Ernst; Oestreich, Ulrich; and Weil, Erich, to Siemens Aktiengesellschaft. Light waveguide having three protective layers of plastic material and a method of manufacture. 4,854,668, Cl. 350-96.300.

Maytag Corporation: *See*—
Johnson, Thomas M., 4,854,054, Cl. 34-133.000.

Mazda Motor Corporation: *See*—
Kameda, Osamu; and Tabata, Shigeo, 4,854,413, Cl. 180-247.000
Kanazawa, Hirotaka; Note, Koushun; Nakashima, Yasuhiro; Mukai, Yoshiaki; Sakamoto, Shunji; and Okamizu, Shigeo, 4,854,410, Cl. 180-140.000.
Matsushima, Eiji, 4,855,003, Cl. 156-358.000.
Shiraishi, Noriaki; Kamiyama, Sigeru; Amioka, Shigenori, and Okada, Akiyoshi, 4,854,634, Cl. 296-108.000.
Sudo, Yoshinori, 4,854,849, Cl. 425-556.000.
Uesugi, Tatsuya; and Nakai, Eiji, 4,854,273, Cl. 123-90.170.

Mazzalupi, Giovanni; and Onofri, Bruno, to Delfos & Atlas Copco Limited. Shaft sinking rig. 4,854,402, Cl. 175-171.000.

Mazzanti, John B.; and Moore, Stephen, to Raychem Corporation. Poly(arylene ether ketones) having biphenylene-4,4'-dicarbonyl groups. 4,855,387, Cl. 528-125.000.

McAninch, Thomas W.: *See*—
Morris, Don L.; Palmer, Billy W.; and McAninch, Thomas W., 4,855,515, Cl. 568-862.000.

McAulay, Robert J.: *See*—
Quatieri, Thomas F., Jr.; and McAulay, Robert J., 4,856,068, Cl. 381-47.000.

McBrady, William J.; and Avelis, Julian P., to McBrady, William J. Bottle duster. 4,854,441, Cl. 198-384.000.

McBride, Donald G.: *See*—
Gazdik, Charles E.; McBride, Donald G.; Seraphim, Donald P.; and Toole, Patrick A., 4,855,867, Cl. 361-306.000.

McCabe, Gary E.: *See*—
Hug, Paul; Umeda, Bill; Yesnosky, Paul A.; Raudebaugh, Bart; Ricco, Gary; and McCabe, Gary E., 4,855,980, Cl. 369-36.000.

McCalmont, Arnold M., to Technical Communication Corporation. No-overhead synchronization for cryptographic systems. 4,856,063, Cl. 380-48.000.

McCartney, Ronald L., to Rockwell International Corporation. Multifiber optic cable connector and cable apparatus. 4,854,664, Cl. 350-96.220.

McCollum, Anthony W.: *See*—
Stavinoha, Jerome L.; and McCollum, Anthony W., 4,855,395, Cl. 528-272.000.

McConaghy, William J.; and Wallace, James M., to Nutech, Inc. Method for decontaminating specially selected plastic materials which have become radioactively contaminated, and articles. 4,855,080, Cl. 252-626.000.

McConnell, Kenneth G., to Iowa State University Research Foundation, Inc. Power line support. 4,854,541, Cl. 248-565.000.

McCready, David F. Carbosil anodes. 4,855,027, Cl. 204-196.000.

McCree, LaVan. Seat cushion back pack. 4,854,637, Cl. 297-188.000.

McCrimmon, Kenneth A., Jr.; and Chu, Matthew M., to Printronix, Inc. Adaptive print hammer timing system. 4,854,756, Cl. 400-322.000.

McCullah, C. Gray: *See*—
Martin, Roy E.; Parr, John H.; and McCullah, C. Gray, 4,854,314, Cl. 128-205.270.

McCullough, Gene. Radio glasses. 4,856,086, Cl. 455-344.000.

McCusker, Joseph H.: *See*—
Wojnar, Jeffrey S.; and McCusker, Joseph H., 4,855,872, Cl. 361-414.000.

McDaniel, Max P.; and Martin, Shirley J., to Phillips Petroleum Company. Catalyst and polymerization of olefins. 4,855,271, Cl. 502-107.000.

McDonald, John H., III: *See*—
Cook, Gwendolyn K.; and McDonald, John H., III, 4,855,418, Cl. 540-205.000.

McElfresh, Barbara K.; and Breniman, Eugene H., to Zehntel, Inc. Digital in-circuit tester having channel-memory earse-preventer. 4,856,001, Cl. 371-15.000.

McElroy, James F., to United Technologies Corporation. Bipolar fuel cell. 4,855,193, Cl. 429-30.000.

McElroy, James G., to Kirox, Inc. Waste combustion system. 4,854,853, Cl. 431-115.000.

McElroy, William D.: *See*—
Jones, David P.; and McElroy, William D., 4,855,838, Cl. 358-229.000.

McFeeters, Brian D.: *See*—
Getz, Marvin G.; McFeeters, Brian D.; and Purcell, Robert J., 4,854,650, Cl. 305-10.000.

McGarrity, Gerard J.; and Kotani, Hitoshi, to Institute for Medical Research. Rapid detection of mycoplasmas. 4,855,227, Cl. 435-7.000.

McGlothlin, Mark W.; and DePaul, Alice A., to Apex Medical Technologies, Inc. Propylactic sheath with augmented border. 4,855,169, Cl. 428-35.200.

McGregor, Rob R.: *See*—
Misevich, Kenneth W.; McGregor, Rob R.; and Corrao, Anthony J., 4,854,057, Cl. 36-114.000.

McGuffey, Arnold L.: *See*—
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McHattie, Peder E.: *See*—
Chirillo, John R.; Kimbrough II, Kellam C.; and McHattie, Peder E., 4,855,370, Cl. 526-74.000.

McKie, Peter; and Elcock, Kenneth W. A., to Esselte Pendaflex Corporation. Sign-making materials. 4,855,171, Cl. 428-40.000.

McKiernan, Edward F.; Sigler, James; Sprang, Richard; Lewellen, Richard; and Geis, Mark, to Sealand Technology, Inc. Sanitary pump station. 4,854,827, Cl. 417-313.000.

McLain, Philippe H. Navigational and yacht racing calculator. 4,855,577, Cl. 235-78.00N.

McLaughlin, Jerry L.: *See*—
Mikolajczak, Kenneth L.; McLaughlin, Jerry L.; and Rupprecht, James K., 4,855,319, Cl. 514-473.000.

McMahon, Garfield W.: *See*—
Fanning, Bryce L.; and McMahon, Garfield W., 4,855,964, Cl. 367-159.000.

McMurtrey, David S.: *See*—
Jones, David E.; and McMurtrey, David S., 4,855,849, Cl. 360-97.010.

McMurtry, David R., to Renishaw plc. Contact-sensing probe. 4,854,050, Cl. 33-558.000.

McNab, Donald R.; and Smith, Floyd D., to McNab, Donald R. Apparatus for providing beveled edge pads. 4,854,202, Cl. 83-153.000.

McNeal, William T.: *See*—
Giles, William O., Sr.; McNeal, William T.; and Giles, Ted W., 4,854,949, Cl. 55-126.000.

McNicol, John D.: *See*—
Kennard, Paul A.; Middleton, Joseph L.; Wu, Kuang-Tsan; and McNicol, John D., 4,855,692, Cl. 332-17.000.

McPhail, Andrew T.: *See*—
Spielvogel, Bernard F.; McPhail, Andrew T.; and Hall, Iris H., 4,855,493, Cl. 562-575.000.

McPherson, Alexander W.; and Witt, Larry M., to Delaware Capital Formation, Inc. Power clamp with track wiper. 4,854,564, Cl. 269-32.000.

McVeigh, Martin L. Insulated carry bag. 4,854,736, Cl. 383-76.000.

McWain, Richard J. Collapsible weight system. 4,854,576, Cl. 272-123.000.

Meadows, F. Dan: *See*—
Enck, Richard S.; and Meadows, F. Dan, 4,855,589, Cl. 250-213.0VT.

Measurex Corporation: *See*—
Moon, Sang F., 4,855,658, Cl. 318-632.000.

Mechanical Backrest, Inc.: *See*—
Elder, William H.; Hansen, Ries B.; and Olivier, Andre W., 4,853,990, Cl. 5-71.000.

Meckl, Heinz; Spriewald, Erika; and Renner, Gunter, to Agfa-Gevaert Aktiengesellschaft. No-rinse photographic processing method and the stabilizing bath used for this method. 4,855,216, Cl. 430-372.000.

Med. Fab (Lafayette), Inc.: *See*—
Srinivasan, Vadake R., 4,855,139, Cl. 424-404.000.

Medex, Inc.: *See*—
Boiarski, Anthony A., 4,854,321, Cl. 128-634.000.

Medrad, Inc.: *See*—
Evans, Russell M., III; Machek, James E.; and Cowan, Kevin P., 4,854,330, Cl. 128-772.000.
Hirschman, Alan D.; Reilly, David M.; Potter, Ross H.; Stulen, John; Toft, Eric M.; and Clark, John G., 4,854,324, Cl. 128-655.000.

Meehan, Jeffrey, to Napco, Inc. Multi-canister, externally-connected ion removal system. 4,855,046, Cl. 210-232.000.

Megahed, El-Sayed: *See*—
Schaller, David R.; Megahed, El-Sayed; and Samson, Charles E., 4,855,647, Cl. 315-209.00R.

Mehan, Richard L., to General Electric Company. Method of forming turbine blades with abradable tips. 4,854,196, Cl. 76-101.00R.

Mehnert, Walter; and Theil, Thomas, to MITEC Moderne Industrietechnik GmbH. Arrangement for measuring the distance of a marking element on a displaceable body from a reference marking element. 4,854,709, Cl. 356-375.000.

Mehr, Fred E. Eye sight restorer device and method. 4,854,690, Cl. 351-203.000.

Meier, Hans-Rudolf: *See*—
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Meier, Kurt: *See*—
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Meijboom, Nicolaas: *See*—
Van Doorn, Johannes A.; Drent, Eit; Van Leeuwen, Petrus W. N. M.; Meijboom, Nicolaas; Van Oort, Aart B.; and Wife, Richard L., 4,855,399, Cl. 528-392.000.

Meinershagen, Charles I., to NewTech Products, Inc. Dental tool for facilitating gingival retraction. 4,854,867, Cl. 433-40.000.

Meisner, Alfred; and Hammelsbacher, Karlheinz, to Diehl GmbH & Co. Time adjustment arrangement for digital displays. 4,855,971, Cl. 368-188.000.

Melanson, Lionel J., to GTE Products Corporation. Electroceramic heating devices. 4,855,575, Cl. 219-541.000.

Melchior, Jean F. Two-stroke internal combustion engine and cylinder head for the latter. 4,854,280, Cl. 123-257.000.

Melde-Tuczai, Helmut; Wagner, Johann; and Fraidl, Gunter, to A V L Gesellschaft fur Verbrennungskraftmaschinen Und Messtechnik M.B.H., Prof. Dr.Dr.h.c. Hans List. Intake system for internal combustion engines. 4,854,270, Cl. 123-52.00M.

Mellor, Charles E., to GTE Products Corporation. Wide angle optical filters. 4,854,670, Cl. 350-166.000.

Melvin, William S.; and Graham, James F., to United States of America, Army. Method to dimilitarize extract, and recover ammonium perchlorate from composite propellants using liquid ammonia. 4,854,982, Cl. 149-109.600.

Memtec North America Corp.: *See*—
Wrasidlo, Wolfgang J.; Hofmann, Frieder K.; and Mysels, Karol J., 4,855,162, Cl. 427-243.000.

Menchen, Steven M.: *See*—
Fung, Steven; Woo, Sam L.; Haugland, Richard P.; Menchen, Steven M.; and Connell, Charles R., 4,855,225, Cl. 435-6.000.

Mencke, Arlene J.: *See*—
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Mendoza, Fausto C. Tortilla dough forming machine. 4,854,847, Cl. 425-205.000.

Meng, Sen Y., to Rockwell International Corporation. Shrouded inducer pump. 4,854,818, Cl. 415-58.400.

Mengus, Charles: *See*—
Mauleon, Jean-Louis; Ville, Francois; and Mengus, Charles, 4,854,180, Cl. 73-863.860.

Menke, Josef F. Thermal imaging device in combination with an image production system. 4,855,600, Cl. 250-332.000.

Menu, Jean-Pierre: *See*—
Seigneur, Jean-Michel; and Menu, Jean-Pierre, 4,855,650, Cl. 315-383.000.

Merck & Co., Inc.: *See*—
Guindon, Yvan; Yoakim, Christiane; and Morton, Howard E., 4,855,481, Cl. 560-55.000.
Lee, Ta J.; and Hoffman, William F., 4,855,456, Cl. 549-214.000.
Smith, Robert L.; and Stokker, Gerald E., 4,855,321, Cl. 514-532.000.

Merrick, Edwin B., to Hewlett-Packard Company. Establishing a zero reference for invasive pressure sensors. 4,854,326, Cl. 128-675.000.

Mertel, Michael E.; and Thomas, James E., to Microscan Systems Incorporated. Decoding of barcodes by preprocessing scan data. 4,855,581, Cl. 235-462.000.

Mertz, Gail. Insulative swimming suits for children. 4,853,976, Cl. 2-67.000.

Meschke, Debra J.; and Hoy, Kenneth L., to Union Carbide Corporation. Connected branch copolymers, methods for their production, and copying materials including same. 4,855,403, Cl. 528-419.000.

Messerschmitt-Boelkow-Blohm GmbH: *See*—
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Messerschmitt-Boelkow-Blohm GmbH: *See*—
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Metal Box p.l.c.: *See*—
Collins, Malcolm G., 4,854,485, Cl. 222-386.000.

Metal Box plc: *See*—
Porucznik, Paul; and Cheers, Christopher F., 4,854,149, Cl. 72-352.000.

Metala, Michael J.: *See*—
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Metallgesellschaft Aktiengesellschaft: *See*—
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Metallifacture, Ltd.: *See*—
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Metallized Carbon Corporation: *See*—
Siebert, Craig; and Scott, Martin, 4,854,747, Cl. 384-447.000.

Metz, Hans J.; and Warning, Klaus, to Hoechst Aktiengesellschaft. Process for preparing aromatic bromine compounds. 4,855,517, Cl. 570-206.000.

Metzger, Jean, to Societe ATOCHEM. Continuous process for the preparation of carbon polymonofluoride and apparatus therefor. 4,855,121, Cl. 423-439.000.

Metzger, Karl G.: *See*—
Lockhoff, Oswald; Hayauchi, Yutaka; Stadler, Peter; Stunkel, Klaus G.; Streissle, Gert; Paessens, Arnold; Klimetzek, Volker; Zeiler, Hans-Joachim; Metzger, Karl G.; Kroll, Hein-Peter; Brunner, Helmut; and Schaller, Klaus, 4,855,283, Cl. 514-8.000.

Metzger, Reece D.: *See*—
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Meul, Thomas, to Lonza Ltd. 4-benzyloxy-3-pyrrolin-2-one, its production and use for synthesis of tetramic acid. 4,855,451, Cl. 548-544.000.

Meyer, Edmond G.; and Meyer, Lee G., to Carbon Fuels Corporation. Method for preparation of coal derived fuel and electricity by a novel co-generation system. 4,854,937, Cl. 44-51.000.

Meyer, Lee G.: *See*—
Meyer, Edmond G.; and Meyer, Lee G., 4,854,937, Cl. 44-51.000.

Meyer Swantee, Klaus B., to Pidou B.V. Bushing. 4,855,533, Cl. 174-35.00R.

Meyer, Willy: *See*—
Fory, Werner; and Meyer, Willy, 4,854,963, Cl. 71-91.000.

Meyerhoefer, Carl; and Neuwirth, Helmuth, to Porta Systems Corp. Solid state telephone protector module. 4,856,060, Cl. 379-412.000.

Meyers, Elwood J.: *See—*
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Michels, Christoph, to Sulzer Brothers Limited. Distributor for distributing liquid in an exchange column. 4,855,089, Cl. 261-97.000.

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Michlovic, John J., to Standard Products Company, The. Color cap system for locking strip gaskets. 4,854,095, Cl. 52-235.000.

Micro-Pak, Inc.: *See—*
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Micro Video, Inc: *See—*
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Microlife Technics, Inc.: *See—*
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Microscan Systems Incorporated: *See—*
Mertel, Michael E.; and Thomas, James E., 4,855,581, Cl. 235-462.000.

Microsurface Technology Corp.: *See—*
Sirbola, Michael A., 4,855,020, Cl. 204-23.000.

Middleton, Joseph L.: *See—*
Kennard, Paul A.; Middleton, Joseph L.; Wu, Kuang-Tsan; and McNicol, John D., 4,855,692, Cl. 332-17.000.

Mieno, Fumitake: *See—*
Eshita, Takashi; Mieno, Fumitake; Furumura, Yuji; and Itoh, Kikuo, 4,855,254, Cl. 437-100.000.

Mikami, Takahiro: *See—*
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Mikiya, Toshio: *See—*
Ooki, Yasumasa; Asano, Osamu; and Mikiya, Toshio, 4,854,787, Cl. 408-17.000.

Miko, Stephen J.: *See—*
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Mikolajczak, Kenneth L.; McLaughlin, Jerry L.; and Rupprecht, James K., to United States of America, Agriculture. Control of pests with annonaceous acetogenins. 4,855,319, Cl. 514-473.000.

Mikrona, AG: *See—*
Romhild, Ludwig; Hartmann, Erwin; and Reinhard, Peter, 4,854,080, Cl. 51-55.000.

Mikula, Paul. Heat exchanger device. 4,854,381, Cl. 165-158.000.

Miles Inc.: *See—*
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Miles Laboratories, Inc.: *See—*
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Miller, Duane D.; Feller, Dennis R.; Clark, Michael T.; Adejare, Adeboye; Romstedt, Karl J.; and Shama, Gamal, to Ohio State University Research Foundation. 5-fluoro- and 8-fluoro-trimetoquinol compounds and the processes for their preparation. 4,855,476, Cl. 558-410.000.

Miller, Irvin M.: *See—*
Upchurch, Billy T.; Davis, Patricia A.; and Miller, Irvin M., 4,855,274, Cl. 502-339.000.

Miller, William E., to United States of America, Energy. Dendrite inhibitor. 4,855,030, Cl. 204-212.000.

Millham, Ernest H., to International Business Machines Corporation. Timing generator for generating a multiplicty of timing signals having selectable pulse positions. 4,855,681, Cl. 328-62.000.

Mills, Keith: *See—*
Oxford, Alexander W.; Coates, Ian H.; Bays, David E.; Webb, Colin F.; Dowle, Michael D.; Mills, Keith; and Eldred, Colin D., 4,855,314, Cl. 514-415.000

Milovic, Alex J. Golf club with interaal sand rake. 4,854,592, Cl. 273-162.00F.

Mimura, Munehiko, to Mitsubishi Denki Kabushiki Kaisha. Control device of non-stage transmission. 4,854,920, Cl. 474-28.000.

Minamikata, Hajime; Kanno, Toshiaki; Kanda, Masahiro; and Ushijima, Hitoshi, to Yazaki Corporation. Method of manufacturing silicon carbide whisker. 4,855,119, Cl. 423-346.000.

Minari, Katsunobu: *See—*
Naruse, Nobutaka; and Minari, Katsunobu, 4,854,130, Cl. 62-352.000.

Mine Safety Appliances Company: *See—*
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Mineshige, Takahiko: *See—*
Kawamura, Hideaki; Matsumura, Teruyuki; and Mineshige, Takahiko, 4,855,898, Cl. 364-191.000.

Ministry of International Trade & Industry: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
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Darvell, Wayne K.; Konsti, Patricia R.; Klingen, Jurgen; and Kreckel, Karl W., 4,855,170, Cl. 428-40.000.
Duchesne, Denis; and Johnson, Bryce V., 4,855,360, Cl. 525-187.000.
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Hendrickson, Carol E.; Uy, Rosa; and Mencke, Arlene J., 4,855,234, Cl. 435-181.000.
Klun, Thomas P.; Lu, David D.; and Robbins, Aida F., 4,855,184, Cl. 428-425.100.
Larson, Wayne K., 4,855,384, Cl. 528-60.000.
Mathers, James P.; Wood, William P.; and Forester, Thomas, 4,855,264, Cl. 501-98.000.
Turk, Frederick J., 4,854,898, Cl. 439-723.000.

Minnick, Larry A.: *See—*
Barbee, Robert B.; and Minnick, Larry A., 4,855,397, Cl. 528-335.000.

Mino, Mineo: *See—*
Kageyama, Yoshikazu; and Mino, Mineo, 4,855,833, Cl. 358-183.000.

Minobe, Tomio. Method of heating polyvinyl chloride using microwaves. 4,855,553, Cl. 219-10.55M.

Minolta Camera Kabushiki Kaisha: *See—*
Hashimoto, Kaoru; and Miyamoto, Hirohisa, 4,855,787, Cl. 355-311.000.
Iino, Shuji; and Ikegawa, Akihito, 4,855,768, Cl. 346-160.100.
Ishimura, Toshihiko; Ishikawa, Norio; Akada, Yasuaki; Seki, Reiji; and Taniguchi, Nobuyuki, 4,855,778, Cl. 354-412.000.
Kitano, Hirohisa; Saito, Itaru; Shingaki, Kouichi; Matsubara, Ken; and Masuda, Tomohiko, 4,854,678, Cl. 350-356.000.
Maeda, Yutaka; and Makiyama, Hiroyuki, 4,854,519, Cl. 242-71.100
Maeda, Yutaka, 4,855,759, Cl. 346-108.000.
Ohira, Tadashi; Ito, Masazumi; and Maruta, Syuzi, 4,855,786, Cl. 355-218.000.
Suzuki, Norihiko, 4,855,794, Cl. 355-54.000.
Tanimoto, Tetsuyuki, 4,855,837, Cl. 358-229.000.

Minolta Camera Kubushiki Kaisha: *See—*
Ishikawa, Norio; Nakai, Masaaki; Hirano, Masayasu; Fujino, Akihiko; Ootsuka, Hiroshi; Egawa, Takeshi; and Kawamura, Kunio, 4,855,779, Cl. 354-412.000.

Mio, Kouhei: *See—*
Fukukawa, Mitsuo; Yazawa, Masayuki; Asai, Kazumitsu; Okamoto, Yoshiharu; and Mio, Kouhei, 4,854,769, Cl. 404-72.000.

Miselli, Carlo A.; and Conti, Rino, to I.M.A. - Industria Macchine Automatiche - SPA. Apparatus for the supply of blanks of packaging material and in particular for the supply and erection of flat folded tubular blanks as packaging cases in "blister" packaging machines. 4,854,930, Cl. 493-315.000.

Misevich, Kenneth W.; McGregor, Rob R.; and Corrao, Anthony J., to Tretorn AB. Dynamic support for an athletic shoe. 4,854,057, Cl. 36-114.000.

Mishina, Shinya: *See—*
Kan, Fumitaka, deceased; Koizumi, Norihiko; Fukumoto, Hiroshu; Yuasa, Toshiya; Tohyama, Noboru; Mishina, Shinya; and Tanioka, Hiroshi, 4,855,763, Cl. 346-160.100.

Misumi, Teruyuki: *See—*
Yamamoto, Fumihiko; and Misumi, Teruyuki, 4,855,365, Cl. 525-401.000.

Mita Industrial Co., Ltd.: *See—*
Fujii, Masanori; Komura, Shuji; and Oogami, Shunsuke, 4,855,204, Cl. 430-106.000.

MITEC Moderne Industrietechnik GmbH: *See—*
Mehnert, Walter; and Theil, Thomas, 4,854,709, Cl. 356-375.000.

MITRE Corporation, The: *See—*
Scales, Walter C., 4,856,028, Cl. 375-97.000.

Mitsuba Electric Mfg. Co., Ltd.: *See—*
Eguchi, Hitoshi; Kuribara, Motoaki; Onodera, Tugio; Kobayashi, Koji; Fujino, Ikuo; Hagiwara, Hiroshi; and Ogino, Seiichi, 4,855,609, Cl. 290-48.000.
Sato, Masaei; and Hosoya, Yukiteru, 4,855,631, Cl. 310-239.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Kanno, Yoshiaki; and Nishiyama, Ryoji, 4,854,285, Cl. 123-418.000.
Kishimoto, Kazuo, 4,855,998, Cl. 370-86.000.
Mimura, Munehiko, 4,854,920, Cl. 474-28.000.
Morishita, Akira; Tanaka, Toshinori; and Isozumi, Shuzoo, 4,855,610, Cl. 290-48.000.
Niki, Kenichi; Makita, Tetsuro; and Takasago, Hayato, 4,854,230, Cl. 101-123.000.
Oda, Minoru, 4,854,686, Cl. 350-456.000.
Sakashita, Kazuhiro; Kishida, Satoru; Hanibuchi, Toshiaki; Tomioka, Ichiro; and Arakawa, Takahiko, 4,856,002, Cl. 371-21.000.
Terasoka, Eiichi, 4,856,106, Cl. 365-203.000.
Toda, Haruhisa; and Murata, Shiroo, 4,855,549, Cl. 200-401.000.
Toya, Hideaki; and Hayashi, Tatsuya, 4,855,547, Cl. 200-144.00B.
Tsukamoto, Katsuhiro; Shimizu, Masahiro; Fujishima, Kazuyasu; and Matsuda, Yoshio, 4,855,953, Cl. 365-149.000.
Yamada, Michihiro; and Miyamoto, Hiroshi, 4,855,613, Cl. 307-202.100.
Yoshida, Takayuki; Sakuma, Kiyoshi; Seshimo, Yu; and Hujii, Masao, 4,854,380, Cl. 165-152.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,855,115, Cl. 423-239.000.
Torichigai, Masaaki; and Iwamoto, Keiichi, 4,854,614, Cl. 285-93.000.
Yoshioka, Hajime; Kodama, Yukio; Shigemura, Sadato; Funada, Tohru; and Morimoto, Satoshi, 4,855,019, Cl. 204-16.000.

Mitsubishi Paper Mills, Limited: *See—*
Ikeda, Haruhiko; Okada, Akinori; and Ohkura, Hirokazu, 4,855,279, Cl. 503-209.000.

Suzuki, Masayuki; Hara, Shinichi; Kimura, Kuniaki; Ono, Takeo; Nakamura, Munekazu; and Ohguchi, Yoshihiro, 4,855,123, Cl. 423-562.000.

Mitsubishi Pencil Co., Ltd.: *See—*
Yoshida, Mitsuru, 4,855,093, Cl. 264-29.600.

Mitsubishi Petrochemical Co. Ltd.: *See—*
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,855,115, Cl. 423-239.000.

Mitsubishi Petrochemical Engineering Co., Ltd.: *See—*
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,855,115, Cl. 423-239.000.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Kohara, Yoshiaki; and Shinkoda, Kazuya, 4,854,666, Cl. 350-96.340.

Mitsuyuki, Hitoshi: *See—*
Shimizu, Isoo; Mitsuyuki, Hitoshi; Uchida, Kazumichi; and Tokumoto, Yuuichi, 4,855,519, Cl. 585-319.000.

Miura, Kazuo: *See—*
Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi, 4,854,131, Cl. 62-51.200.

Miura, Kin-ichiro: *See—*
Morinaga, Tsuto; Miura, Kin-ichiro; Shimotohno, Kunitada; Ikegami, Masato; and Ichikawa, Yataro, 4,855,237, Cl. 435-320.000.

Miura, Kunihiko; and Nosaki, Takefumi, to Kabushiki Kaisha Toshiba. Recording apparatus. 4,854,754, Cl. 400-802.200.

Miwa, Yukiharu: *See—*
Tanabe, Hirohito; Ohata, Yu; Suzuki, Kazuaki; Miwa, Yukiharu; and Nakayama, Yoshihito, 4,855,799, Cl. 357-23.400.

Miyaaki, Tohru: *See—*
Murakami, Sanpei; Miyaaki, Tohru; Imahori, Tokio; Ogata, Koichi; and Hagita, Hidenari, 4,855,146, Cl. 426-5.000.

Miyagawa, Yuichi; Yoneda, Kiwamu; Kuwa, Kazuhiro; and Kogo, Katsuyuki, to Sumitomo Electric Industries, Ltd. Automatic calibration apparatus for a partial gas pressure measuring sensor. 4,854,153, Cl. 73-1.00G.

Miyagi, Takeshi: *See—*
Nakai, Toshio; Miyagi, Takeshi; and Shimada, Osamu, 4,855,537, Cl. 174-68.500.

Miyamoto, Fumitaka; and Kato, Daisaku, to Victor Co. of Japan. Video signal processing apparatus. 4,855,831, Cl. 358-183.000.

Miyamoto, Hirohisa: *See—*
Hashimoto, Kaoru; and Miyamoto, Hirohisa, 4,855,787, Cl. 355-311.000.

Miyamoto, Hiroshi: *See—*
Yamada, Michihiro; and Miyamoto, Hiroshi, 4,855,613, Cl. 307-202.100.

Miyamoto, Hisashi: *See—*
Ueda, Hiraki; Miyamoto, Hisashi; Aki, Shinji; and Otsuka, Tatsuya, 4,855,292, Cl. 514-312.000.

Miyano, Hideyo; and Kitami, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Intake manifold assembly for engines. 4,854,271, Cl. 123-52.0MV.

Miyashita, Kunio: *See—*
Yamashita, Koujirou; Endo, Stunehiro; Miyashita, Kunio; Kashiwazaki, Susumu; and Iizuka, Kenichi, 4,855,652, Cl. 318-268.000.

Miyata, Takeo; and Iwabuchi, Takashi, to Matsushita Electric Industrial Co., Ltd. Reflector for excimer laser and excimer laser apparatus using the reflector. 4,856,019, Cl. 372-99.000.

Miyayama, Toshio; Masuzawa, Isao; and Hirono, Nakayasu, to Tokyo Keike Co., Ltd. Marine autopilot apparatus. 4,855,739, Cl. 340-984.000.

Miyazaki, Hiroharu: *See—*
Ise, Kiyotaka; Matsumoto, Sinichi; and Miyazaki, Hiroharu, 4,854,411, Cl. 180-197.000.

Miyazaki, Minoru: *See—*
Yamazaki, Shunpei; Mase, Akira; Konuma, Toshimitsu; Miyazaki, Minoru; Sakama, Mitsunori; and Inushima, Takashi, 4,855,805, Cl. 357-58.000.

Miyazaki, Takeshi: *See—*
Nishikawa, Masayuki; Miyazaki, Takeshi; Shigeki, Terumitsu; Mizutani, Satoshi; and Isono, Toru, 4,854,030, Cl. 29-510.000.

Mizukoshi, Yasumasa, to Nippon Seiko Kabushiki Kaisha. Tripot type constant velocity universal joint. 4,854,917, Cl. 464-111.000.

Mizuno, Yasuo; Nishino, Atsushi; Ikeda, Masaki; and Kurio, Shinji, to Matsushita Electric Industrial Co., Ltd. Sealing glass. 4,855,261, Cl. 501-76.000.

Mizuta, Akira, to Fuji Photo Film Co., Ltd. Apparatus for taking out flexible work. 4,854,569, Cl. 271-98.000.

Mizutani, Satoshi: *See—*
Nishikawa, Masayuki; Miyazaki, Takeshi; Shigeki, Terumitsu; Mizutani, Satoshi; and Isono, Toru, 4,854,030, Cl. 29-510.000.

Mobay Corporation: *See—*
Lowery, Michael K.; Keegan, Richard E.; and Koshute, Mark A., 4,855,352, Cl. 524-728.000.
Markusch, Peter; and Hudson, George A., deceased, 4,855,490, Cl. 560-355.000.

Mobil Oil Corporation: *See—*
Avidan, Amos A.; Smith, Fritz A.; and Tabak, Samuel A., 4,855,521, Cl. 585-415.000.
Bryniarski, David A.; and Hollenbeck, Robert E., 4,854,983, Cl. 56-70.000.
Chang, Clarence D.; and Perkins, Patrick D., 4,855,431, Cl. 544-410.000.
Gavin, James R.; and Roeland, James F., 4,854,520, Cl. 242-72.00B.
Harandi, Mohsen N.; and Owen, Hartley, 4,854,939, Cl. 44-77.000.
Harandi, Mohsen N.; and Owen, Hartley, 4,855,524, Cl. 585-517.000.
Hen, John, 4,855,526, Cl. 585-524.000.
Hurd, B. George; Jones, Lloyd G.; and Strange, Lloyd K., 4,854,385, Cl. 166-273.000.
LaPierre, Rene B.; Partridge, Randall D.; and Wong, Steven S., 4,855,530, Cl. 585-739.000.
Osgood, Wayne R., Jr.; and Therrian, Matthew A., 4,855,187, Cl. 428-516.000.
Page, Nancy M.; and Young, Lewis B., 4,855,527, Cl. 585-527.000.

Mochizuki, Masataka: *See—*
Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, 4,854,372, Cl. 165-46.000.

Moedritzer, Kurt: *See—*
Lee, Len F.; Moedritzer, Kurt; and Rogers, Michael D., 4,855,442, Cl. 548-365.000.

Moeller, Dieter, to Benz & Hilgers GmbH. Dosing arrangement including a return sucking device. 4,854,354, Cl. 141-116.000.

Moers, John W.: *See—*
Pike, Brian R.; Furlong, Patrick J.; and Moers, John W., 4,854,760, Cl. 401-134.000.

Moffat, Karen A.: *See—*
Martin, Trevor I.; Breton, Marcel P.; Branston, Randolph E.; Moffat, Karen A.; and Mychajlowskij, Walter, 4,855,209, Cl. 430-126.000.

Mohan, Ned: *See—*
Henze, Christopher P.; Mohan, Ned; and Hayes, John G., 4,855,888, Cl. 363-17.000.

Mohler, David B., to Lucas Ledex Inc. Dual conversion force motor. 4,855,700, Cl. 335-229.000

Mohler, Paul J.; Romz, Thomas A.; and Lithgow, Baird E., to Borden, Inc. Aldehyde starch saturant laminating adhesives. 4,855,354, Cl. 525-54.240.

Mohr, Donald H., to Chevron Research Company. Process for regenerating a monofunctional large-pore zeolite catalyst having high selectivity for paraffin dehydrocyclization. 4,855,269, Cl. 502-37.000.

Mohr, Friedemann, to Alcatel N.V. Optical heterodyne receiver. 4,856,093, Cl. 455-619.000.

Mohr, Glenn. Apparatus for induction heating of electrically conductive metal wire and strip. 4,856,097, Cl. 219-10.61R.

Mohs, Rudolf; and Bensmann, Gunter, to Fried. Krupp GmbH. Process for coating prostheses of titanium and titanium alloys. 4,855,101, Cl. 419-8.000.

Molinaro, James S., to UOP. End effector. 4,854,623, Cl. 294-1.100.

Moline Paint Manufacturing Co.: *See—*
Falline, Brian J.; and Weihrauch, Bruce W., 4,855,347, Cl. 524-267.000.

Mollier, Pierre: *See—*
Bauge, Michel; Boudon, Gerard; Mollier, Pierre; Peter, Jean-Luc; and Yamour, Yiannis J., 4,856,000, Cl. 371-9.000.

Moncier, Regina M.: *See—*
Rule, Mark; and Moncier, Regina M., 4,855,514, Cl. 568-779.000.

Monsanto Company: *See—*
Lee, Len F.; Moedritzer, Kurt; and Rogers, Michael D., 4,855,442, Cl. 548-365.000.
Mummey, Michael J., 4,855,459, Cl. 549-260.000.
Takano, Masaharu, 4,855,495, Cl. 562-581.000.

Montali, Sergio; Boller, Giorgio; and Colli, Luigi, to Savio SpA. Device and method for intermittently storing and returning yarn during the winding of conical bobbins fed with yarn at constant speed. 4,854,511, Cl. 242-18.0DD.

Montali, Sergio; Boller, Giorgio; and Colli, Luigi, to Savio, S.p.A. Method and device for intermittently storing and returning yarn during the winding of conical bobbins fed with yarn at constant speed. 4,854,512, Cl. 242-18.0DD.

Montali, Sergio: *See—*
Boller, Giorgio; Montali, Sergio; and Colli, Luigi, 4,854,513, Cl. 242-18.00R.

Montavon, John I.: *See—*
Hengstenberger, Gary M.; and Montavon, John I., 4,854,418, Cl. 182-3.000.

Montedison S.p.A.: *See—*
Albizzati, Enrico, 4,855,272, Cl. 502-119.000.

Moon, Marcus P.: *See—*
Douglass, David L.; and Moon, Marcus P., 4,854,962, Cl. 71-90.000.

Moon, Sang F., to Measurex Corporation. Dead time compensated control loop. 4,855,658, Cl. 318-632.000.

Moore, Stephen: *See—*
Mazzanti, John B.; and Moore, Stephen, 4,855,387, Cl. 528-125.000.

Moorefield, Barry A.: *See—*
Callahan, David T.; and Moorefield, Barry A., 4,854,479, Cl. 221-304.000.

Moos, Walter H.: *See—*
Kester, Jeffrey A.; Moos, Walter H.; and Thomas, Anthony J., 4,855,308, Cl. 514-332.000.

Morales, Heriberto, to Sola U.S.A. Inc. Method of making a rigid gas permeable bifocal contact lens. 4,854,089, Cl. 51-284.00R.

Moran, James P., Jr.: *See—*
Dunn, David J.; Vano, Patrick P.; Moran, James P., Jr.; Holmes, Mark; and Frauenglass, Elliott, 4,855,002, Cl. 156-307.300.

Moran, John: *See—*
Rogers, Tracy G.; Nier, Michael R.; and Moran, John, 4,854,077, Cl. 49-322.000.
Moran, Kevin S.: *See—*
Czarnocki, Walter S.; Harper, Peter W.; Moran, Kevin S.; and Alexander, Steven W., 4,854,167, Cl. 73-204.190.
Morane, Bruno; and Joulia, Gerard, to L'Oreal. Device for applying a liquid, product, in particular for applying nail polish. 4,854,759, Cl. 401-119.000.
Morel, Simone, to Societe de Conseils et D'Etudes des Emballages SCEE. Retractable applicator device for nail varnishes with flow control. 4,854,758, Cl. 401-116.000.
Mori, Sachio; Iwakura, Hikozo; and Takechi, Shozo, to Shionogi & Co., Ltd. Prostacyclin (PGI_2) analogues. 4,855,449, Cl. 548-512.000.
Mori, Tamotsu: *See—*
Kikuchi, Katsuji; Nakao, Haruki; and Mori, Tamotsu, 4,854,833, Cl. 417-417.000.
Mori, Toshihiro: *See—*
Yoshizawa, Shigeo; Ohyagi, Takashi; Oda, Takashi; and Mori, Toshihiro, 4,855,731, Cl. 340-825.440.
Mori, Toshihito: *See—*
Watanabe, Isamu; Kamiya, Kazuhiro; Torii, Takahiro; and Mori, Toshihito, 4,855,287, Cl. 514-41.000.
Mori, Yasumasa, to Chikuma Kouki Co., Ltd. Multi-color luminous stirrer. 4,854,712, Cl. 366-129.000.
Moriguchi, Haruhiko: *See—*
Kuwabara, Nobuyuki; Hasegawa, Kou; Sugimura, Hideo; Nakajima, Kazuhiro; and Moriguchi, Haruhiko, 4,855,758, Cl. 346-76.0PH.
Morimoto, Kenichi; and Tagawa, Takao, to Sharp Kabushiki Kaisha. Document reading apparatus with color filter. 4,855,818, Cl. 358-75.000.
Morimoto, Satoshi: *See—*
Yoshioka, Hajime; Kodama, Yukio; Shigemura, Sadato; Funada, Tohru; and Morimoto, Satoshi, 4,855,019, Cl. 204-16.000
Morimoto, Shinichi, to Shimano Industrial Company Limited. Drag mechanism for a double-bearing fishing reel. 4,854,524, Cl. 242-268.000.
Morinaga, Tsuto; Miura, Kin-ichiro; Shimotohno, Kunitada; Ikegami, Masato; and Ichikawa, Yataro, to Teijin Limited. Double-stranded DNA having sequences complementary to a single-stranded DNA and derived from a bean golden mosaic virus. 4,855,237, Cl. 435-320.000.
Morishita, Akira; Tanaka, Toshinori; and Isozumi, Shuzoo, to Mitsubishi Denki Kabushiki Kaisha. Starting electric motor. 4,855,610, Cl. 290-48.000.
Moroto, Shuzo; Sumiya, Koji; Sakaguchi, Yoshikazu; Kubo, Seitoku; and Taga, Yutaka, to Aisin-Warner Limited. Hydraulic control system for vehicular automatic transmission with two accumulator control values to vary back pressure to accumulator to follow the change in engine torque. 4,854,195, Cl. 74-867.000.
Morpheus Lights, Inc.: *See—*
Richardson, Brian E., 4,855,884, Cl. 362-278.000.
Morra, Luigi, to Industrie Riunite SPA. Inductance sensor and circuit arrangement for the detection of vehicle attitude. 4,856,098, Cl. 324-207.000.
Morris, Don L.; Palmer, Billy W.; and McAninch, Thomas W., to Eastman Kodak Company. Process for the production of neopentyl glycol. 4,855,515, Cl. 568-862.000.
Morris, Peter: *See—*
Greenhalgh, Geoffrey; Morris, Peter; Bearon, John N.; and Armbruster, Guenter, 4,854,636, Cl. 296-201.000.
Morris, William E., to Pyramid Industries, Inc. Coaxial cable connector and method of terminating a cable using same. 4,854,893, Cl. 439-578.000.
Morrison, Charles B.: *See—*
Figueroa, Luis; Morrison, Charles B.; Zinkiewicz, Lawrence M.; and Niesen, Joseph W., 4,856,014, Cl. 372-46.000.
Morrow, Dan. Mechanical cat litter box. 4,854,267, Cl. 119-1.000.
Morse, Vicki M. Modified cribbage game utilizing cards and dice. 4,854,586, Cl. 273-249.000.
Morton, Howard E.: *See—*
Guindon, Yvan; Yoakim, Christiane; and Morton, Howard E., 4,855,481, Cl. 560-55.000.
Morton Manufacturing Co.: *See—*
DePrima, George R., 4,854,078, Cl. 49-409.000.
Morton Thiokol, Inc.: *See—*
Hart, Stephen C., 4,855,358, Cl. 525-113.000.
Moser, Frank H.; and Lynam, Niall R., to Donnelly Corporation. Method for deposition of electrochromic layers. 4,855,161, Cl. 427-108.000.
Moser, Urs: *See—*
Voirol, Peter; and Moser, Urs, 4,854,988, Cl. 156-155.000.
Mostafa Taha, Maher A. H. Wheel accessory for additional traction. 4,854,357, Cl. 152-181.000.
Mostya, Graham Y.; and Yunus, Mohammad, to Intersil, Inc. Alternating current power loss detector. 4,855,722, Cl. 340-660.000.
Motai, Tsuneaki: *See—*
Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, 4,854,372, Cl. 165-46.000.
Moteki, Yoshihiro, to Showa Denko Kabushiki Kaisha. Crosslinkable polymer composition. 4,855,363, Cl. 525-207.000.
Motorola Inc.: *See—*
Baxter, Marjorie S.; and Wilson, Timothy C., 4,855,007, Cl. 156-378.000.
Bergami, Bridgette A.; and Williams, Phillip H., 4,855,804, Cl. 357-49.000
Czarnocki, Walter S.; Harper, Peter W.; Moran, Kevin S.; and Alexander, Steven W., 4,854,167, Cl. 73-204.190.
Foster, Robert I.; and Longbrake, Beth A., 4,856,004, Cl. 371-37.000
Jobling, David T.; and Newton, Anthony D., 4,855,651, Cl. 315-387.000.
Klekotka, James E.; and Dilley, David L., 4,856,032, Cl. 377-47.000.
Oliwa, Gary A.; and Burger, Marilyn S., 4,856,088, Cl. 455-349.000.
Ruben, Paul W.; Heimbecher, Eugene F., II; and Dilley, David L., 4,855,946, Cl. 364-721.000.
Mott, Gerry; Attaar, Mustan; and Rishel, Rick D., to United States of America, Energy. Measurement of intergranular attack in stainless steel using ultrasonic energy. 4,854,173, Cl. 73-600.000.
Mottate, Tatsuo; and Geka, Toshiaki, to Nippon Thompson Co., Ltd. Holding device of rectilinear motion rolling guide unit. 4,854,741, Cl. 384-45.000.
Mottram, Dennis J.: *See—*
Frick, Heinz E.; and Mottram, Dennis J., 4,854,800, Cl. 414-138.200.
Mount, Houston B., II; and Snoddy, Michael L., to Amoco Corporation. Beltless core conveyor system for wellsite analysis. 4,854,163, Cl. 73-153.000
Mozingo, Robert E.: *See—*
Smith, Wayne G.; Martinez, David V.; Mozingo, Robert E.; and Hanson, Charles B., 4,854,812, Cl. 414-723.000.
Smith, Wayne G.; Martinez, David V.; Mozingo, Robert E.; and Hanson, Charles B., 4,854,814, Cl. 414-723.000.
MRS Technology, Inc.: *See—*
Holbrook, David S.; and Simpson, Craig R., 4,855,792, Cl. 355-53.000.
Mucha, George M.; Pfaffmann, George D.; and Novorsky, Donald E., to Tocco, Inc. Method and apparatus for hardening gears. 4,855,551, Cl. 219-10.430.
Mucha, George M.; Novorsky, Donald E.; and Pfaffmann, George D., to Tocco, Inc. Method and apparatus for hardening gears and similar workpieces. 4,855,556, Cl. 219-105.900.
Mueller, Carl F.: *See—*
Garg, Diwakar; Dyer, Paul N.; Schaffer, Leslie E.; Wrecsics, Ernest L.; Dimos, Duane; and Mueller, Carl F., 4,855,188, Cl. 428-627.000.
Mueller, Karl-Heinz; Betz, Hans; Vach, Wilhelm; and Krenner, Johann, to Siemens Aktiengesellschaft; Karl Suess KG GmbH & Co.; and Frauenhofer Gesellschaft. Arrangement for exposing semiconductor wafers by means of a synchrotron radiation in lithographic equipment. 4,856,037, Cl. 378-34.000.
Mueller, Louis, to Rytec Corporation. Frost control system for high-speed horizontal folding doors. 4,855,567, Cl. 219-218.000.
Muether, Manfred: *See—*
Guenther, Werner; Heubeck, Erich; and Muether, Manfred, 4,856,038, Cl. 378-39.000.
Muhlhoff, Carl H., to Amphenol Corporation. Press fit pin. 4,854,900, Cl. 439-751.000.
Mukai, Yoshiaki: *See—*
Kanazawa, Hirotaka; Note, Koushun; Nakashima, Yasuhiro; Mukai, Yoshiaki; Sakamoto, Shunji; and Okamizu, Shigeo, 4,854,410, Cl. 180-140.000.
Mull, John D. Plasma separator. 4,854,933, Cl. 494-38.000.
Muller, Hanns P.; and Gipp, Roland, to Bayer Aktiengesellschaft. Process for the preparation of 4-hydroxyphenyl 4-hydroxybenzoate and the use thereof. 4,855,484, Cl. 560-72.000.
Muller, Ingrid: *See—*
Heppke, Gerd; Bahr, Christian; Muller, Ingrid; Ohlendorf, Dieter; and Wingen, Rainer, 4,855,429, Cl. 544-335.000.
Muller, Jean-Paul: *See—*
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Muller, Udo: *See—*
Jacob-Grinschgl, Wolfgang; and Muller, Udo, 4,855,538, Cl. 178-18.000.
Mummey, Michael J., to Monsanto Company. Process for the production of maleic anhydride. 4,855,459, Cl. 549-260.000.
Munier, Jean-Marie L.: *See—*
Bouillot, Michel; Calvignac, Jean-Louis J.; and Munier, Jean-Marie L., 4,855,948, Cl. 364-900.000.
Munstermann, Manfred: *See—*
Althoff, Karl-Heinz; Kunick, Werner; Munstermann, Manfred; Voss, Uwe; and Glanz, Werner, 4,854,805, Cl. 414-495.000.
Muraishi, Katsuaki; Yaginuma, Nakatsugu; Hirai, Kikuo; Arai, Fuminori; and Iwata, Yuzo, to Fuji Photo Film Co., Ltd. Chemical analysis apparatus. 4,855,109, Cl. 422-63.000.
Murakami, Hisakazu: *See—*
Hayakawa, Shigeru; Shiraishi, Daiichi; and Murakami, Hisakazu, 4,854,617, Cl. 292-216.000.
Murakami, Mitsuhiro; Mikami, Takahiro; Nagamatsu, Hiroyuki; and Tokuno, Mitsuji. Lubricant compositions and methods for preparation of same. 4,855,073, Cl. 252-39.000.
Murakami, Sanpei; Miyaaki, Tohru; Imahori, Tokio; Ogata, Koichi; and Hagita, Hidenari, to Kanebo, Ltd.; and Hiroshio Nishio. Method for manufacture of chewing gums with sectional motif patterns. 4,855,146, Cl. 426-5.000.
Murakami, Tadashi; Nakaniwa, Mikio; Nakayama, Yoshio; and Masuo, Mitsuaki, to Nippon Kokan Kabushiki Kaisha. Hydrogenation catalyst for coal tar, a method of hydrogenation of coal tar with use of

such catalyst, and a method of producing super needle coke from the hydrogenation product of coal tar. 4,855,037, Cl. 208-422.000.
Muramatsu, Toshihiro; Iijima, Kenzaburou; and Hayashi, Yoshinori, to Yamaha Corporation. Keyboard. 4,855,740, Cl. 341-23.000.
Murase, Kiyoshi; Mase, Toshiyasu; Hara, Hiromu; and Tomioka, Kenichi, to Yamanouchi Pharmaceutical Co., Ltd. Thiadiazole compounds as antagonists of SRS-A. 4,855,310, Cl. 514-361.000.
Murata, Akio: *See—*
Wada, Toshiaki; and Murata, Akio, 4,855,854, Cl. 360-126.000.
Murata Kikai Kabushiki Kaisha: *See—*
Saitoh, Yoshihiro; Kondoh, Minoru; and Komatsu, Yukio, 4,855,656, Cl. 318-587.000.
Tone, Shoichi, 4,854,515, Cl. 242-36.000.
Ueda, Yutaka, 4,854,439, Cl. 198-350.000.
Ueda, Yutaka; and Kiriake, Masaharu, 4,854,453, Cl. 209-583.000.
Yamada, Shoji, 4,854,516, Cl. 242-43.200.
Murata Manufacturing Co., Ltd.: *See—*
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Murata, Shiroo: *See—*
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Murata, Yoshishige; Koinuma, Yasumi; Amaya, Naoyuki; Otsu, Takayuki; and Nisimura, Masafumi, to Nippon Oil and Fats Co., Ltd. Optical resin from diallyl esters. 4,855,374, Cl. 526-261.000.
Murate, Tsuneo; and Suzuki, Shin, to Yamatake-Honeywell Company Limited. Method and a process control system using the method for minimizing hunting. 4,855,674, Cl. 324-158.00R.
Murayama, Toshiaki: *See—*
Kitajima, Tadayuki; Asakawa, Toshiyuki; Naito, Masataka; Matsuo, Kazuhiro; and Murayama, Toshiaki, 4,854,571, Cl. 271-293.000.
Murphy, Gerald J.: *See—*
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Budnik, Richard A.; and Murphy, Gerald J., 4,855,379, Cl. 528-29.000.
Murphy, Patrick: *See—*
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Murray, Gerald D.; Gibson, Shelby R.; Carpenter, Keith J.; Carpenter, Kenneth E.; and Carpenter, Michael R., to Kennametal Inc. Diamond tipped chip control insert. 4,854,784, Cl. 407-114.000.
Murray, Lowell C.; and Wyss, Frederick, to Container Corporation of America. Composite drinking cup. 4,854,474, Cl. 220-462.000.
Murugesan, Natesan; and Guiducci, Mariano, to FMC Corporation. Benzylaminooxymethyl methylpropanoic acid herbicides. 4,855,480, Cl. 560-29.000.
Muse, Joel, Jr.; and Colvin, Howard A., to Goodyear Tire & Rubber Company, The. Polymer alloy. 4,855,362, Cl. 525-194.000.
Musk, Robert W.: *See—*
Hamerslag, James D.; and Musk, Robert W., 4,854,659, Cl. 350-96.150.
Mutoh, Kiyoyuki; Satoh, Kazushi; and Kobayashi, Kouichirou, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of an organopolysiloxane. 4,855,381, Cl. 528-23.000.
Mutzell, Theodor. Overwater pressure jet massage apparatus. 4,853,988, Cl. 4-615.000.
Mychajlowskij, Walter: *See—*
Martin, Trevor I.; Breton, Marcel P.; Branston, Randolph E.; Moffat, Karen A.; and Mychajlowskij, Walter, 4,855,209, Cl. 430-126.000.
Mydill, Marc R., to Texas Instruments Incorporated. Dynamic timing reference alignment system. 4,855,969, Cl. 368-120.000.
Myerholtz, Carl A.: *See—*
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Myers, Robert A.: *See—*
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Mynhier, Charles R. Portable facing and threading machine having an interchangeable taper means. 4,854,200, Cl. 82-110.000.
Mysels, Karol J.: *See—*
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N/COR Inc.: *See—*
Rhoads, Benjamin J., 4,854,164, Cl. 73-155.000.
Nabulon, Werner, to Rieter Machine Works Ltd. Texturizing nozzle for endless filament threads. 4,854,019, Cl. 28-255.000.
NACAM: *See—*
Haldric, Bernard; Benedi, Gregorio; and Baudon nee Chardon, Sylvie, 4,854,141, Cl. 70-182.000.
Nacht, Sergio: *See—*
Leong, Helen; Katz, Martin; Delk, Ann; Nacht, Sergio; and Berliner, David, 4,855,144, Cl. 424-487.000.
Naderi, Mohammad T. System of alarm to make aware about bad condition of car. 4,855,709, Cl. 340-438.000.
Naftchi, Nosrat E. Treatment of mammals suffering from damage to the central nervous system. 4,855,325, Cl. 514-634.000.
Nagai, Hideaki: *See—*
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Nagai, Kayoko: *See—*
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Nagamatsu, Hiroyuki: *See—*
Murakami, Mitsuhiro; Mikami, Takahiro; Nagamatsu, Hiroyuki; and Tokuno, Mitsuji, 4,855,073, Cl. 252-39.000.
Nagano, Kiyoshi: *See—*
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,855,115, Cl. 423-239.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Speed change device for a bicycle. 4,854,191, Cl. 74-750.00B.
Nagano, Masashi, to Shimano Industrial Company Limited. Cover device for a driving chain for a bicycle. 4,854,924, Cl. 474-140.000.
Nagano, Shuji: *See—*
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Nagaoka, Daiji, to Fuji Xerox Co., Ltd. Region recognizing device. 4,856,074, Cl. 382-22.000.
Nagaoka, Tomoo; and Kimura, Takashi, to Copal Company Limited. Disk apparatus with disk rotating means. 4,855,850, Cl. 360-99.120.
Nagasaka, Shoji: *See—*
Fujii, Mamoru; Noda, Kazuo; Nagasaka, Shoji; Tajika, Hiroshi; and Ono, Koji, 4,854,493, Cl. 228-5.700.
Nagel, Reimer; and Wendel, Ralf, to kabelmetal electro Gesellschaft mit beschrankter Haftung. Dipole exciter for an antenna. 4,855,750, Cl. 343-770.000.
Nagel, Sidney R.: *See—*
Banavar, Jayanth R.; Johnson, David L.; Nagel, Sidney R.; and Safinya, Kambiz A., 4,855,912, Cl. 364-422.000.
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Nagumo, Tadanobu; Takei, Sadakazu; and Tozawa, Yukio, to Yokohama Rubber Co., Ltd., The. Pneumatic radial tire arrangement for vehicle. 4,854,360, Cl. 152-529.000.
Naito, Masataka: *See—*
Kitajima, Tadayuki; Asakawa, Toshiyuki; Naito, Masataka; Matsuo, Kazuhiro; and Murayama, Toshiaki, 4,854,571, Cl. 271-293.000.
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Nakagaki, Shintaro: *See—*
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Nakagawa, Kaoru: *See—*
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Nakagawa, Tadashi: *See—*
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Nakai, Eiji: *See—*
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Ishikawa, Norio; Nakai, Masaaki; Hirano, Masayasu; Fujino, Akihiko; Ootsuka, Hiroshi; Egawa, Takeshi; and Kawamura, Kunio, 4,855,779, Cl. 354-412.000.
Nakai, Toshio; Miyagi, Takeshi; and Shimada, Osamu, to Kabushiki Kaisha Toshiba. Wiring substrate having mesh-shaped earth line. 4,855,537, Cl. 174-68.500.
Nakajima, Akihisa: *See—*
Yamamoto, Koji; Nakajima, Akihisa; Sawada, Hiroshi; Shinagawa, Noriteru; and Itano, Jiro, 4,856,048, Cl. 379-60.000.
Nakajima, Kazuhiro: *See—*
Kuwabara, Nobuyuki; Hasegawa, Kou; Sugimura, Hideo; Nakajima, Kazuhiro; and Moriguchi, Haruhiko, 4,855,758, Cl. 346-76.0PH.
Nakajima, Nobuyoshi: *See—*
Ohgoda, Makoto; and Nakajima, Nobuyoshi, 4,855,598, Cl. 250-327.200.
Nakajima, Shigeru, to Olympus Optical Co., Ltd. Endoscope apparatus having a chair with a switch. 4,854,301, Cl. 128-4.000.
Nakajima, Shohachi: *See—*
Umezawa, Hamao; Umezawa, Kazuo; Odagawa, Atsuo; Kataoka, Shiro; and Nakajima, Shohachi, 4,855,414, Cl. 536-6.400.
Nakajima, Yasuhiro, to NEC Corporation. Routing method for use in wiring design. 4,855,929, Cl. 364-490.000.
Nakamura, Hiromi, to Toshiba Kikai Kabushiki Kaisha. Die casting apparatus. 4,854,370, Cl. 164-259.000.
Nakamura, Hiroshi: *See—*
Saito, Yasuhisa; Takagishi, Hisao; Nakamura, Hiroshi; Okuno, Kohichi; Shiomi, Yutaka; and Kamio, Kunimasa, 4,855,339, Cl. 523-400.000.
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Nakamura Kiki Engineering Co.: *See—*
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Nakamura, Makoto: *See—*
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Nakamura, Munekazu: *See—*
Suzuki, Masayuki; Hara, Shinichi; Kimura, Kuniaki; Ono, Takeo; Nakamura, Munekazu; and Ohguchi, Yoshihiro, 4,855,123, Cl. 423-562.000.
Nakamura, Noriaki; Kawaguchi, Masashi; and Sonoyama, Yasuo, to Sharp Kabushiki Kaisha. Transparent electrodes of thin-film electroluminescence panel. 4,855,641, Cl. 313-505.000.

Nakamura, Shigeki; and Takahashi, Yasufumi, to Hitachi, Ltd. Carrier recovery phase-locked loop. 4,856,027, Cl. 375-81.000.

Nakamura, Shigeo: *See*—
Matsushita, Toshio; Amano, Hideaki; Yamaura, Satoru; Nakamura, Shigeo; and Nakada, Yasusuke, 4,855,853, Cl. 360-106.000.

Nakamura, Shigeru: *See*—
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Nakamura, Takeaki: *See*—
Hibino, Hiroki; Kimura, Kenji; Kanno, Masahide; Nishikori, Toshiaki; Yoshinaga, Jun; Kidawara, Atsushi; Yabe, Hisao; Katou, Shinichi; Takamura, Koji; and Nakamura, Takeaki, 4,855,819, Cl. 358-98.000.

Nakamura, Takuya; Aoshima, Shinichiro; and Tsuchiya, Yutaka, to Hamamatsu Photonics Kabushiki Kaisha. Electro-optical voltage detector. 4,855,591, Cl. 250-225.000.

Nakanishi, Koji; Yoshino, Mituo; and Saito, Yoshitane, to Kuroda Seiko Co. Ltd.; and Nakamura Kiki Engineering Co. Control apparatus for manifold type electromagnetic valve device. 4,854,346, Cl. 137-624.110.

Nakanishi, Yutaka; and Yamada, Toshihiko, to Toyotomi Kogyo Co., Ltd. Oil reservoir for oil burner. 4,854,858, Cl. 431-320.000.

Nakaniwa, Mikio: *See*—
Murakami, Tadashi; Nakaniwa, Mikio; Nakayama, Yoshio; and Masuo, Mitsuaki, 4,855,037, Cl. 208-422.000.

Nakano, Akira; and Nomura, Masaki, to Kao Corporation. Migration inhibitor for fats and oils for baked cakes and process for producing composite baked cake with the use of the same. 4,855,152, Cl. 426-261.000.

Nakano, Tsunetomo; Hayashi, Toshikazu; and Tsukada, Toshinori, to Ube Industries, Ltd. Photosetting polymer composition. 4,855,215, Cl. 430-283.000.

Nakao, Haruki: *See*—
Kikuchi, Katsuji; Nakao, Haruki; and Mori, Tamotsu, 4,854,833, Cl. 417-417.000.

Nakao, Yasuo, to Nippon Air Brake Co., Ltd. Automatic air brake systems with accelerated exhaustion of the brake line. 4,854,647, Cl. 303-69.000.

Nakao, Yasuo, to Nippon Air Brake Co., Ltd. Automatic air braking system. 4,854,648, Cl. 303-69.000.

Nakashima, Hiroshi: *See*—
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Nakashima, Yasuhiro: *See*—
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Nakata, Masami; and Imai, Osamu, to NGK Insulators, Ltd. Voltage non-linear resistor. 4,855,708, Cl. 338-20.000.

Nakata, Satoru: *See*—
Sugiyama, Yasunori; and Nakata, Satoru, 4,854,055, Cl. 36-127.000.

Nakauchi, Shunsaku, to RYOBI Ltd. Electric key. 4,854,619, Cl. 292-335.000.

Nakayama, Yoshihito: *See*—
Tanabe, Hirohito; Ohata, Yu; Suzuki, Kazuaki; Miwa, Yukiharu; and Nakayama, Yoshihito, 4,855,799, Cl. 357-23.400.

Nakayama, Yoshio: *See*—
Murakami, Tadashi; Nakaniwa, Mikio; Nakayama, Yoshio; and Masuo, Mitsuaki, 4,855,037, Cl. 208-422.000.

Nakazato, Yasushi: *See*—
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Nalco Chemical Company: *See*—
Patzelt, Robert R., 4,854,947, Cl. 55-85.000

Nandi, Kumaresh; Fischer, Helga; Herrmann, Wilfried; Kohne, Hans; Lahr, Wolfgang; Schmersahl, Hein U.; and Walch, Hatto, to Dr. Rentschler Arzneimittel GmbH & Co. Pharmaceutical composition for the treatment of circulatory disturbances. 4,855,300, Cl 514-264.000.

Nanos, Nicholas M.: *See*—
Vercillo, Alfredo J.; and Nanos, Nicholas M., 4,855,573, Cl. 219-492.000.

Napco, Inc.: *See*—
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Napier, James J.: *See*—
Griffith, Ronald C.; and Napier, James J., 4,855,462, Cl. 549-354.000.

Narancic, Vojislav; and Fecteau, Gilles, to Hydro-Quebec. Fuse with a solid arc-quenching body made of non-porous rigid ceramic. 4,855,705, Cl. 337-246.000.

Narendra, Patrenahalli M.; Fant, Karl M.; and Graf, Carl P., to Honeywell, Inc. Human engineered remote driving system. 4,855,822, Cl. 358-103.000.

Naruse, Nobutaka; and Minari, Katsunobu, to Hoshizaki Electric Co., Ltd. Refrigerating apparatus. 4,854,130, Cl. 62-352.000.

Nasby, James A. Wardrobe color coordination kit. 4,854,880, Cl. 434-395.000.

National Coupling Company, Inc.: *See*—
Smith, Robert E., III, 4,854,615, Cl. 285-331.000.

National Science Council: *See*—
Lin, J. Y.; Hsieh, Yih-Shou; and Chu, Shu-Chen, 4,855,055, Cl 210-635.000.

National Semiconductor Corporation: *See*—
Kertis, Robert A.; Smith, Douglas D.; and Bowman, Terrance L., 4,855,624, Cl. 307-475.000.

National Steel Corporation: *See*—
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Natsume, Naohiro: *See*—
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Naudin, Jacky, to Valeo. Method of fixing a part for transmitting torque to a plate of a clutch. 4,854,029, Cl. 29-458.000.

Navarro, Maria C.: *See*—
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NCH Corporation: *See*—
Holdar, Robert M., 4,854,973, Cl. 134-39.000.

NCR Corporation: *See*—
Allman, Derryl D. J.; and Lee, Steven S., 4,855,258, Cl. 437-241.000.
Singh, Amar J., 4,856,023, Cl. 375-3.000.

Nealy, David L.; Wilkin, Louis A.; and Barlow, Fred D., Jr., to Eastman Kodak Company. Ink compositions and their preparation. 4,855,344, Cl. 524-86.000.

NEC Corporation: *See*—
Hoshina, Yuichiro, 4,856,045, Cl. 379-53.000.
Kanamoto, Takashi, 4,856,016, Cl. 372-87.000.
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Komoto, Mitsuo; Matsuo, Youichi; and Sano, Toshifumi, 4,854,377, Cl. 165-80.400.
Makino, Masayuki, 4,856,083, Cl. 455-166.000.
Nakajima, Yasuhiro, 4,855,929, Cl. 364-490.000.
Ogawa, Hiroshi, 4,855,694, Cl. 333-1.100.
Okamoto, Kiyokazu; Hino, Kiyoshi; and Kaito, Kosuke, 4,855,661, Cl. 318-807.000
Orui, Ryuzo; Itagaki, Yasuhiro; and Yamaguchi, Toshio, 4,855,644, Cl. 315-3.600.
Takenaka, Hiroo, 4,856,012, Cl. 372-38.000.
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Urai, Takahiko, 4,855,956, Cl. 365-210.000.
Yoshitake, Kazuki, 4,855,863, Cl. 361-91.000.
Yoshizawa, Shigeo; Ohyagi, Takashi; Oda, Takashi; and Mori, Toshihiro, 4,855,731, Cl. 340-825.440.

Nedbal, Thomas F. Method of psychologically reinforcing a dieting regimen. 4,854,877, Cl. 434-236.000.

Nedelec, Lucien: *See*—
Gasc, Jean-Claude; Nedelec, Lucien; Humbert, Daniel; and Boaventura, Ana-Maria, 4,855,302, Cl. 514-278.000.

Neely, James W.: *See*—
Alexander, Robert H.; Osmer, Thomas M.; and Neely, James W., 4,854,786, Cl. 408-1.00R.

Neff, Steve A.: *See*—
Church, John F.; and Neff, Steve A., 4,855,041, Cl. 210-120.000.

Negishi, Ichiro: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; Negishi, Ichiro; and Osada, Masaru, 4,855,816, Cl. 358-47.000

Negishi, Tsutomu: *See*—
Kamei, Masaharu; Negishi, Tsutomu; Nishikawa, Masaru; and Kishino, Kimishiro, 4,855,133, Cl. 424-84.000.

Nelson, Neil M.; Sponzilli, William A.; and Lott, Quitman W., to CEF Industries, Inc. Performance envelope extension method for a gas turbine engine. 4,854,120, Cl. 60-39.020

Neperud, Michael A., to Findley Adhesives Inc.; and North Coast Adhesives Inc., a part interest. Medical moisture resistant adhesive composition for use in the presence of moisture. 4,855,335, Cl. 523-111.000.

Neppl, Franz; and Winnerl, Josef, to Siemens Aktiengesellschaft. Method of manufacturing integrated circuit containing bipolar and complementary MOS transistors on a common substrate. 4,855,245, Cl. 437-31.000.

Nesbit, Mark S. Radio equipped inflatable device. 4,856,087, Cl. 455-344.000

Nesterenko, Vladimir E.: *See*—
Zolotar, Arkady I.; Samoilovich, David S.; Karakhanian, Vladimir K.; Kuznetsov, Vyacheslav I.; Kopelyansky, Vladimir B.; Kuznetsov, Oleg V.; Nesterenko, Vladimir E.; Karachaban, Nikolai G.; Shmuratov, Georgy E.; Kljuzhin, Evgeny A.; and Livshits, Semen V., 4,854,820, Cl. 415-171.100.

Neuman, Eli. Temperature sensitive shower diverter valve and method for diverting shower water. 4,854,499, Cl. 236-93.00B.

Neumann, Gerd: *See*—
Feil, Eugen; Neumann, Gerd; Graser, Wolfgang; and Friedrich, Horst, 4,854,102, Cl. 52-535.000.

Neuroth, David H., to Hubbell Incorporated. Electrical penetrator for hot, high pressure service. 4,854,886, Cl. 439-192.000

Neuwirth, Helmuth: *See*—
Meyerhoefer, Carl; and Neuwirth, Helmuth, 4,856,060, Cl. 379-412.000.

Neuwirth, Peyton S. Oral implant. 4,854,874, Cl. 433-176.000.

Nevitt, James S.: *See*—
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Newell, Charles E., to Allied-Signal Inc. Friction material containing mill scale. 4,855,336, Cl. 523-152.000.

Newgarden, Joseph E.: *See*—
Gatchel, Gary; Newgarden, Joseph E.; and Lynn, Gordon E., 4,854,588, Cl. 273-30.000

Newhouse, Geoffrey S., to Dow Chemical Company, The. Photoengraving articles of zinc-free magnesium-based alloys. 4,855,198, Cl. 430-12.000

Newman, Gordon A.; and Gilmore, William J., to Babcock Industries Inc. Key interlock system for automatic floor mounted transmission shifter. 4,854,193, Cl. 74-850.000.

NewTech Products, Inc.: *See*—
Meinershagen, Charles I., 4,854,867, Cl. 433-40.000.

Newton, Anthony D.: *See*—
Jobling, David T.; and Newton, Anthony D., 4,855,651, Cl. 315-387.000.

Newton, William P., to Caldwell Manufacturing Company. Sound deadener for window counterbalance spring. 4,854,558, Cl. 267-74.000.

Ng, Steve Y.: *See*—
Heller, Jorge; Penhale, Donald W. H.; and Ng, Steve Y., 4,855,132, Cl. 424-78.000.

NGK Insulators, Ltd.: *See*—
Kawasaki, Shinji; and Takahashi, Tomonori, 4,855,263, Cl. 501-92.000.
Nakata, Masami; and Imai, Osamu, 4,855,708, Cl. 338-20.000.
Oda, Isao; and Tsuno, Nobuo, 4,854,025, Cl. 29-156.80R.

NGK Spark Plug Co., Ltd.: *See*—
Sugimoto, Eisuke; Tanizawa, Yoshiyasu; and Kozuka, Zensaku, 4,855,034, Cl. 204-427.000.

Nichia Kagaku Kogyo K.K.: *See*—
Ichinose, Noboru; and Tanaka, Hirohumi, 4,855,118, Cl. 423-301.000.

Nichols, Brenda G.: *See*—
Arakawa, Mitsuaki; and Nichols, Brenda G., 4,855,680, Cl. 324-314.000.

Nicolet Instrument Corporation: *See*—
Carmean, Ronald E., 4,855,832, Cl. 358-183.000.

Nicoll, James D. Beach carpet. 4,854,773, Cl. 405-19.000.

Nier, Michael R.: *See*—
Rogers, Tracy G.; Nier, Michael R.; and Moran, John, 4,854,077, Cl. 49-322.000.

Niesen, Joseph W.: *See*—
Figueroa, Luis; Morrison, Charles B.; Zinkiewicz, Lawrence M.; and Niesen, Joseph W., 4,856,014, Cl. 372-46.000.

Nieszery, Katharina: *See*—
Claussen, Nils; Petzow, Gunter; Nieszery, Katharina; Panhorst, Wolfgang; and Weisskopf, Karl-Ludwig, 4,855,259, Cl. 501-9.000.

Nihon Kaiheiki Industrial Co., Ltd.: *See*—
Saito, Akira; Nukada, Teisuke; and Ito, Michio, 4,854,041, Cl. 29-884.000.

Nihon Medi-Physics Co., Ltd.: *See*—
Kurami, Miki; Shirakami, Yoshifumi; Takahashi, Keietsu; and Ueda, Nobuo, 4,855,353, Cl. 525-54.100.

Niimi, Hideaki: *See*—
Wakai, Kunio; Niimi, Hideaki; and Isoe, Noboru, 4,855,175, Cl. 428-148.000.

Niki, Kenichi; Makita, Tetsuro; and Takasago, Hayato, to Mitsubishi Denki Kabushiki Kaisha. Screen printing apparatus. 4,854,230, Cl. 101-123.000.

Nikken Tool Co., Ltd.: *See*—
Okinaga, Hiroaki, 4,854,788, Cl. 408-59.000.

Nikko Co., Ltd.: *See*—
Ishimoto, Zenichi, 4,854,909, Cl. 446-129.000.

Nikon Corporation: *See*—
Akasaka, Hideki; and Sato, Masatoshi, 4,855,975, Cl. 369-13.000.

Nilssen, Ole K. Ground-fault protected ballast. 4,855,860, Cl. 361-45.000.

Nippon A B S, Ltd.: *See*—
Arikawa, Tetsuro, 4,854,649, Cl. 303-113.000.

Nippon Air Brake Co., Ltd.: *See*—
Imayoshi, Mamoru, 4,854,220, Cl. 91-376.00R.
Nakao, Yasuo, 4,854,647, Cl. 303-69.000.
Nakao, Yasuo, 4,854,648, Cl. 303-69.000.

Nippon Colin Co., Ltd.: *See*—
Edgar, Reuben W., Jr., 4,854,699, Cl. 356-41.000.

Nippon Flute Co., Ltd.: *See*—
Fukuyama, Yoshiaki, 4,854,928, Cl. 493-28.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Akiyama, Hiroo, 4,855,990, Cl. 369-265.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Murakami, Tadashi; Nakaniwa, Mikio; Nakayama, Yoshio; and Masuo, Mitsuaki, 4,855,037, Cl. 208-422.000.

Nippon Oil and Fats Co., Ltd.: *See*—
Murata, Yoshishige; Koinuma, Yasumi; Amaya, Naoyuki; Otsu, Takayuki; and Nisimura, Masafumi, 4,855,374, Cl. 526-261.000.

Nippon Petrochemicals Company: *See*—
Shimizu, Isoo; Mitsuyuki, Hitoshi; Uchida, Kazumichi; and Tokumoto, Yuuichi, 4,855,519, Cl. 585-319.000.

Nippon Petrochemicals Company, Limited: *See*—
Shimizu, Isoo; and Tokumoto, Yuuichi, 4,855,518, Cl. 585-319.000.

Nippon Seiki Hoseki Kogyo: *See*—
Matsuoka, Kenzo, 4,855,856, Cl. 360-128.000.

Nippon Seiko Kabushiki Kaisha: *See*—
Mizukoshi, Yasumasa, 4,854,917, Cl. 464-111.000.

Nippon Shinyaku Co., Ltd.: *See*—
Sugiyama, Makoto; Ezure, Yoji; Yoshikuni, Yoshiaki; and Fujita, Yukio, 4,855,415, Cl. 536-17.400.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Inoue, Akira, 4,854,123, Cl. 60-274.000.

Nippon Steel Corporation: *See*—
Katahira, Keiichi; Shio, Kiyomi; and Kanai, Noriyuki, 4,854,371, Cl. 164-431.000.

Nippon Telegraph and Telephone Corporation: *See*—
Oe, Kunishige; Kawaguchi, Hitoshi; and Yoshikuni, Yuzo, 4,856,005, Cl. 372-20.000.
Sasaki, Shigekuni; and Hasuda, Yoshinori, 4,855,390, Cl. 528-170.000.
Yamamoto, Koji; Nakajima, Akihisa; Sawada, Hiroshi; Shinagawa, Noriteru; and Itano, Jiro, 4,856,048, Cl. 379-60.000.

Nippon Thompson Co., Ltd.: *See*—
Mottate, Tatsuo; and Geka, Toshiaki, 4,854,741, Cl. 384-45.000.

Nippondenso Co., Ltd.: *See*—
Kiyono, Masashi; Takeuchi, Kanji; Abe, Tomoaki; and Takao, Mitsunori, 4,854,283, Cl. 123-361.000.

Nishi, Hidetoshi: *See*—
Shigaki, Masafumi; Kurihara, Hiroshi; and Nishi, Hidetoshi, 4,855,895, Cl. 363-157.000.

Nishida, Takao: *See*—
Hashimoto, Isamu; and Nishida, Takao, 4,855,772, Cl. 354-173.100.

Nishijima, Hideo: *See*—
Rokuda, Morito; Ohtsubo, Hiroyasu; Masuda, Michio; Nishijima, Hideo; and Okamoto, Kaneyuki, 4,855,812, Cl. 358-22.000.

Nishikawa, Masaru: *See*—
Kamei, Masaharu; Negishi, Tsutomu; Nishikawa, Masaru; and Kishino, Kimishiro, 4,855,133, Cl. 424-84.000

Nishikawa, Masayuki; Miyazaki, Takeshi; Shigeki, Terumitsu; Mizutani, Satoshi; and Isono, Toru, to Toyoda Gosei Co., Ltd. Process of manufacturing a hose fitting. 4,854,030, Cl. 29-510.000.

Nishikawa, Tadaichi: *See*—
Ueyama, Shinichiro; Furukawa, Masayuki; and Nishikawa, Tadaichi, 4,855,389, Cl. 528-168.000.

Nishikori, Toshiaki: *See*—
Hibino, Hiroki; Kimura, Kenji; Kanno, Masahide; Nishikori, Toshiaki; Yoshinaga, Jun; Kidawara, Atsushi; Yabe, Hisao; Katou, Shinichi; Takamura, Koji; and Nakamura, Takeaki, 4,855,819, Cl. 358-98.000.

Nishimura, Hiroshi; and Hirayama, Yasutaka, to Matsushita Electric Industrial Co., Ltd. Floor nozzle for vacuum cleaner. 4,854,006, Cl. 15-375.000.

Nishimura, Ryoji, to AMP Incorporated. Shielded electrical connector. 4,854,890, Cl. 439-607.000.

Nishino, Atsushi: *See*—
Mizuno, Yasuo; Nishino, Atsushi; Ikeda, Masaki; and Kurio, Shinji, 4,855,261, Cl. 501-76.000.

Nishio, Seiichi, to Kabushiki Kaisha Toshiba. Signal tracing apparatus for logic circuit diagrams. 4,855,726, Cl. 340-747.000.

Nishiura, Fumitaka: *See*—
Soderlund, John D.; and Nishiura, Fumitaka, 4,854,985, Cl. 156-85.000.

Nishiyama, Katsumi: *See*—
Imamura, Eiji; and Nishiyama, Katsumi, 4,855,866, Cl. 361-306.000.

Nishiyama, Ryoji: *See*—
Kanno, Yoshiaki; and Nishiyama, Ryoji, 4,854,285, Cl. 123-418.000.

Nishizawa, Masahiro: *See*—
Tomita, Yoshifumi; Nishizawa, Masahiro; and Nonogaki, Saburo, 4,855,200, Cl. 430-25.000.

Nisimura, Masafumi: *See*—
Murata, Yoshishige; Koinuma, Yasumi; Amaya, Naoyuki; Otsu, Takayuki; and Nisimura, Masafumi, 4,855,374, Cl. 526-261.000.

Nissan Motor Company, Limited: *See*—
Kanda, Ryouji, 4,854,561, Cl. 267-140.100.
Karibe, Tamiharu; and Kunii, Noboru, 4,854,079, Cl. 49-479.000.

Nissen Corporation: *See*—
Sugimoto, Isao; and Kasai, Tomoaki, 4,854,137, Cl. 68-15.000.

Nitto Boseki Co., Ltd.: *See*—
Kitamura, Tadanori; Shono, Hiroaki; and Kodama, Atsuki, 4,855,122, Cl. 423-447.100.

Nitto Kohki Co., Ltd.: *See*—
Kikuchi, Katsuji; Nakao, Haruki; and Mori, Tamotsu, 4,854,833, Cl. 417-417.000.
Ooki, Yasumasa; Asano, Osamu; and Mikiya, Toshio, 4,854,787, Cl. 408-17.000.

Niwa, Kiminori: *See*—
Kawada, Hiroyuki; and Niwa, Kiminori, 4,854,422, Cl. 187-9.00R.

NL Industries, Inc.: *See*—
Russell, Michael K.; Wesenberg, Donald L.; and Leaney, Peter A., 4,855,870, Cl. 361-395.000.

Noakes, Timothy J.; and Hewitt, Nevil E., to Imperial Chemical Industries plc. Electrostatic spraying. 4,854,506, Cl. 239-691.000.

Noboru Yanaihara et al.: *See*—
Yanaihara, Noboru; and Abe, Kaoru, 4,855,406, Cl. 530-324.000.

Noda, Kazuo: *See*—
Fujii, Mamoru; Noda, Kazuo; Nagasaka, Shoji; Tajika, Hiroshi; and Ono, Koji, 4,854,493, Cl. 228-5.700.

Nodoa, Minoru: *See*—
Ohtsuka, Hiroo; Hara, Osamu; Hori, Akira; and Nodoa, Minoru, 4,854,889, Cl. 439-395.000.

Nogami, Kazutaka, to Kabushiki Kaisha Toshiba. Random access memory including switching elements to limit the number of energized data in pairs. 4,855,957, Cl. 365-230.030.

Noguchi, Satoshi: *See*—
Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi, 4,854,131, Cl. 62-51.200.

Nokia-Mobira Oy: *See*—
Hulkko, Jaakko, 4,856,080, Cl. 455-139.000.

Noll, Joachim J.; Blazek, Vladimir; and Schmitt, Hans-Jurgen, to U.S Philips Corp. Arrangement for inspecting light waveguide end faces. 4,854,701, Cl. 356-73.100.

Nolting, Hans-Peter: *See*—
Heidrich, Helmut; Hoffmann, Detlef; and Nolting, Hans-Peter, 4,856,094, Cl. 455-619.000

Noma, Hiroshi; and Fujiyasu, Hiroshi, to Fuji Seiki Inc. Vacuum evaporating apparatus. 4,854,264, Cl. 118-719.000

Nomura, Masaki: *See*—
Nakano, Akira; and Nomura, Masaki, 4,855,152, Cl. 426-261.000

Nonaka, Osamu, to Olympus Optical Co., Ltd. Distance measuring apparatus. 4,855,585, Cl. 250-201.000.

Nonogaki, Saburo: *See*—
Tomita, Yoshifumi; Nishizawa, Masahiro; and Nonogaki, Saburo, 4,855,200, Cl. 430-25.000.

Nonura, Tadanori: *See*—
Yokota, Masahisa; Shimizu, Atsushi; Komiya, Kyosuke; Yamataka, Kazunori; and Nonura, Tadanori, 4,855,377, Cl. 528-25.000.

Noon, Robert A.; Crowley, Patrick J.; and Worthington, Diana M., to Imperial Chemical Industries PLC. Triazole and imidazole compounds. 4,855,510, Cl. 568-663.000.

Norman, Alan B.: *See*—
Banerjee, Chandra K.; Farrier, Ernest G.; Harris, James L.; Norman, Alan B.; Resce, James L.; Reynolds, John H., IV; Ridings, Henry T.; Sensabaugh, Andrew J., Jr.; Shannon, Michael D.; and Shelar, Gary R., 4,854,331, Cl. 131-194.000.

Norman, John S., to Ammco Tools, Inc. Portable brake disc resurfacing tool. 4,854,199, Cl. 82-112.000.

North American Philips Consumer Electronics Corp.: *See*—
Smith, Bobby J., 4,856,081, Cl. 455-151.000.

North American Philips Corporation: *See*—
Bohning, Daryl E., 4,855,910, Cl. 364-413.130.
Zola, John J., 4,856,043, Cl. 378-149.000.

North American Philips Corporation, Signetics Division: *See*—
Johnson, Derrell Q., 4,855,622, Cl. 307-456.000.

North Coast Adhesives Inc.: *See*—
Neperud, Michael A., 4,855,335, Cl. 523-111.000.

North, Vaughn N.: *See*—
Dahlquist, Charles W., II; and North, Vaughn N., 4,854,468, Cl. 220-85.00H.

Northern Telecom Limited: *See*—
Kennard, Paul A.; Middleton, Joseph L.; Wu, Kuang-Tsan; and McNicol, John D., 4,855,692, Cl. 332-17.000.

Nosaki, Takefumi: *See*—
Miura, Kunihiko; and Nosaki, Takefumi, 4,854,754, Cl. 400-802.200.

Note, Koushun: *See*—
Kanazawa, Hirotaka; Note, Koushun; Nakashima, Yasuhiro; Mukai, Yoshiaki; Sakamoto, Shunji; and Okamizu, Shigeo, 4,854,410, Cl. 180-140.000.

Novorsky, Donald E.: *See*—
Mucha, George M.; Pfaffmann, George D.; and Novorsky, Donald E., 4,855,551, Cl. 219-10.430.
Mucha, George M.; Novorsky, Donald E.; and Pfaffmann, George D., 4,855,556, Cl. 219-105.900.

Nozue, Yasuhiro; Kajiyama, Koichi; Saito, Kaoru; Wakabayashi, Osamu; Kowaka, Masahiko; and Itakura, Yasuo, to Kabushiki Kaisha Komatsu Seisakusho. Light source for reduced projection. 4,856,018, Cl. 372-98.000.

NSK-Warner Kabishiki Kaisha: *See*—
Kitamura, Noboru; and Komatsubara, Norio, 4,854,435, Cl. 192-41.00A.

Nudelman, Abraham; Herzig, Jaacov; and Keinan, Ehud, to Yeda Research and Development Company Ltd. Anomeric deacetylation. 4,855,417, Cl. 536-121.000.

Nukada, Teisuke: *See*—
Saito, Akira; Nukada, Teisuke; and Ito, Michio, 4,854,041, Cl 29-884.000.

Nulman, Jaim: *See*—
Pecot, Michel; and Nulman, Jaim, 4,854,727, Cl. 374-57.000.

Numako, Norio: *See*—
Kobayashi, Takeo; and Numako, Norio, 4,855,782, Cl. 354-475.000.

Nunokawa, Kazuo: *See*—
Sekine, Akihiko; Wada, Shinji; Yokokura, Takashi; Nunokawa, Kazuo; and Hideshima, Masayuki, 4,854,691, Cl. 351-221.000.

Nussbaum, Theodore W.: *See*—
Sims, Jackie C.; Dowling, Donald J.; and Nussbaum, Theodore W., 4,854,725, Cl. 374-42.000.

Nutech, Inc.: *See*—
McConaghy, William J.; and Wallace, James M., 4,855,080, Cl. 252-626.000.
Wallace, James M., 4,855,081, Cl. 252-626.000.

NutraSweet Company, The: *See*—
Singer, Norman; Wilcox, Reed; and Podolski, Joseph S., 4,855,156, Cl. 426-565.000.

N.V. Bekaert S.A.: *See*—
Dambre, Paul, 4,854,032, Cl. 29-527.400.

NYTD Industries Inc.: *See*—
Evseanko, Nicholas, Jr., 4,854,789, Cl. 408-125.000.

O & K Orenstein & Koppel AG: *See*—
Althoff, Karl-Heinz; Kunick, Werner; Munstermann, Manfred; Voss, Uwe; and Glanz, Werner, 4,854,805, Cl. 414-495.000.

Oba, Masao: *See*—
Takeuchi, Kunihiko; Oba, Masao; and Horinouchi, Shinichi, 4,855,994, Cl. 370-69.100.

Obara Corporation: *See*—
Tanabe, Katuji, 4,855,532, Cl. 174-15.700.

Obata, Yoshiko: *See*—
Fuchikami, Takamasa; Urata, Hisao; Ishii, Yoshimitsu; and Obata, Yoshiko, 4,855,487, Cl. 560-227.000.

Obatake, Kohei: *See*—
Tashiro, Yoichi; Baba, Hideki; Obatake, Kohei; Sakka, Hiroshi; and Sohara, Ichiro, 4,855,157, Cl. 426-609.000

Oberg Industries, Inc.: *See*—
Walters, Harry, 4,855,606, Cl. 250-548.000

Oberle, Timothy T., to W. R. Grace & Co.-Conn. Multiple-layer, cook-in film. 4,855,183, Cl. 428-345.000.

Obiedkov, Viktor A.: *See*—
Svidunovich, Nikolai A.; Parfenov, Leonid I.; Garost, Alexandr I.; Sorokin, Gennady A.; Volkov, Viktor N.; Obiedkov, Viktor A.; Karbanovich, Valery K.; Vashkevich, Vladimir V.; and Verbitsky, Alexandr N., 4,855,105, Cl. 420-75.000.

Obrecht, Gerard: *See*—
Dufour, Maurice; and Obrecht, Gerard, 4,854,689, Cl. 351-169.000.

O'Brien, Joseph P.: *See*—
Papay, Andrew G.; and O'Brien, Joseph P., 4,855,074, Cl. 252-51.50A.

Occidental Chemical Corporation: *See*—
Hong, Paul O.; and De Wald, Raymond C., 4,855,424, Cl. 544-35.000

O'Connell, John; Jefferies, Roy S.; and Trevor-Jones, Hugh, to Lowe and Fletcher Limited. Security device and method. 4,854,146, Cl. 70-277.000

O'Connor, Lawrence J., to KT Technologies Inc. Cable shielding tape and cables incorporating such tape. 4,855,534, Cl. 174-36.000.

Oda, Isao; and Tsuno, Nobuo, to NGK Insulators, Ltd. Method of producing a turbine rotor. 4,854,025, Cl. 29-156.80R.

Oda, Minoru, to Mitsubishi Denki Kabushiki Kaisha. Apochromat type objective lenses. 4,854,686, Cl. 350-456.000.

Oda, Osamu, to Dainippon Screen Mfg. Co. Ltd. Method and apparatus for multi-color printing. 4,854,232, Cl. 101-211.000.

Oda, Takashi: *See*—
Yoshizawa, Shigeo; Ohyagi, Takashi; Oda, Takashi; and Mori, Toshihiro, 4,855,731, Cl. 340-825.440.

Odagawa, Atsuo: *See*—
Umezawa, Hamao; Umezawa, Kazuo; Odagawa, Atsuo; Kataoka, Shiro; and Nakajima, Shohachi, 4,855,414, Cl. 536-6.400.

Odenthal, Karl P.: *See*—
Grimminger, Wolf; Gorler, Klaus; and Odenthal, Karl P., 4,855,422, Cl. 540-466.000.

Odru, Pierre: *See*—
Sparks, Charles; and Odru, Pierre, 4,854,781, Cl. 405-224.000.

Oe, Kunishige; Kawaguchi, Hitoshi; and Yoshikuni, Yuzo, to Nippon Telegraph and Telephone Corporation. Wavelength conversion element for a semiconductor laser. 4,856,005, Cl. 372-20.000.

Oelbermann, Max. Apparatus and process for regulating a filter plate contact pressure in filter presses. 4,855,062, Cl. 210-739.000.

Oertel, Klaus, to Kamax-Werke Rudolf Kellermann GmbH & Co. KG. Connector of the nut-and-bolt type. 4,854,794, Cl. 411-307.000.

Oestreich, Ulrich: *See*—
Mayr, Ernst; Oestreich, Ulrich; and Weil, Erich, 4,854,668, Cl. 350-96.300.

Ogata, Koichi: *See*—
Murakami, Sanpei; Miyaaki, Tohru; Imahori, Tokio; Ogata, Koichi; and Hagita, Hidenari, 4,855,146, Cl. 426-5.000.

Ogawa, Hiroshi, to Nec Corporation. Lumped element circulator having a conductive pedestal frame structure. 4,855,694, Cl. 333-1.100.

Ogawa, Masami, to Canon Kabushiki Kaisha. Image forming method and apparatus. 4,855,789, Cl. 355-26.000.

Ogawa, Tetsuya: *See*—
Goto, Yasuyuki; Ogawa, Tetsuya; and Sugimori, Shigeru, 4,855,076, Cl. 252-299.630.

Ogden Industries Pty., Ltd.: *See*—
Dunphy, Gerald F.; and Best, Lance E., 4,854,620, Cl. 292-337.000.

Ogino, Seiichi: *See*—
Eguchi, Hitoshi; Kuribara, Motoaki; Onodera, Tugio; Kobayashi, Koji; Fujino, Ikuo; Hagiwara, Hiroshi; and Ogino, Seiichi, 4,855,609, Cl. 290-48.000.

Oglesby, Donald L., to Dayco Products, Inc. Method and apparatus for making a plurality of flexible hoses each having a preformed bend therein. 4,854,846, Cl. 425-391.000.

Ogura, Masami: *See*—
Yamatoh, Kouhei; Ogura, Masami; Kanbe, Katunori; and Isogai, Yuji, 4,854,424, Cl. 188-72.100.

Ogura, Seiki: *See*—
Codella, Christopher F.; and Ogura, Seiki, 4,855,246, Cl. 437-41.000.

Ogura, Tadashi: *See*—
Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi, 4,854,131, Cl. 62-51.200.

Ogura, Toyosaku, to Yoshida Kogyo K. K. Apparatus using optical fibers for inspecting slide fastener elements. 4,855,592, Cl. 250-227.000.

Ohara, Shuzo; and Kawahara, Hiroshi, to Goyo Paper Working Co. Ltd. Developer sheet. 4,855,280, Cl. 503-214.000.

Ohata, Yu: *See*—
Tanabe, Hirohito; Ohata, Yu; Suzuki, Kazuaki; Miwa, Yukiharu; and Nakayama, Yoshihito, 4,855,799, Cl. 357-23.400.

Ohba, Hiroshi: *See*—
Hirokawa, Katsuhisa; and Ohba, Hiroshi, 4,855,578, Cl. 235-380.000.

Ohchi, Torao: *See*—
Hiramatsu, Tohru; Tami, Kazuya; and Ohchi, Torao, 4,854,251, Cl. 112-121.120.

Ohgochi, Satoshi: *See*—
Ohtawara, Isao; and Ohgochi, Satoshi, 4,856,051, Cl. 379-88.000.

Ohgoda, Makoto; and Nakajima, Nobuyoshi, to Fuji Photo Film Co., Ltd. Energy subtraction processing method for radiation images, stimulable phosphor sheet, stimulable phosphor sheet composite member & stimulable phosphor sheet filter composite member used for the method. 4,855,598, Cl. 250-327.200.

Ohgoda, Makoto; and Agano, Toshitaka, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 4,855,599, Cl. 250-327.200.

Ohgoshi, Hiroshi: *See*—
Ohnishi, Michikazu; Ohgoshi, Hiroshi; and Takada, Satoshi, 4,855,057, Cl. 210-650.000.

Ohguchi, Yoshihiro: *See*—
Suzuki, Masayuki; Hara, Shinichi; Kimura, Kuniaki; Ono, Takeo; Nakamura, Munekazu; and Ohguchi, Yoshihiro, 4,855,123, Cl. 423-562.000.

Ohio State University Research Foundation: *See*—
Miller, Duane D.; Feller, Dennis R.; Clark, Michael T.; Adejare, Adeboye; Romstedt, Karl J.; and Shams, Gamal, 4,855,476, Cl. 558-410.000.
Stevens, Vernon C., 4,855,285, Cl. 514-12.000.

Ohira, Tadashi; Ito, Masazumi; and Maruta, Syuzi, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying machine capable of editing function. 4,855,786, Cl. 355-218.000.

Ohkawa, Fujio; Higashidani, Akira; and Maeda, Hiroyuki, to Bridgestone Corporation. Diaphragm type air springs. 4,854,555, Cl. 267-64.240.

Ohkawa, Hiroyuki: *See*—
Yamada, Kimichika; Ito, Yukio; and Ohkawa, Hiroyuki, 4,855,848, Cl. 360-96.500.

Ohkubo, Masaharu: *See*—
Suzuki, Akio; Ohkubo, Masaharu; and Takada, Yoshihiro, 4,855,765, Cl. 346-154.000.

Ohkura, Hirokazu: *See*—
Ikeda, Haruhiko; Okada, Akinori; and Ohkura, Hirokazu, 4,855,279, Cl. 503-209.000.

Ohlendorf, Dieter: *See*—
Heppke, Gerd; Bahr, Christian; Muller, Ingrid; Ohlendorf, Dieter; and Wingen, Rainer, 4,855,429, Cl. 544-335.000.

Ohmiya, Kenji: *See*—
Arakawa, Satoshi; Kitada, Akira; Yamazaki, Kikuo; Ohmiya, Kenji; and Kawagoe, Jun, 4,855,191, Cl. 428-690.000.

Ohmura, Hiroshi; Ushiro, Seimei; Hara, Hiroshi; Asano, Seiji; and Yoshida, Toshio, to Fuji Photo Film Co., Ltd. Lens-fitted photographic film package. 4,855,774, Cl. 354-203.000.

Ohmura, Yutaka: *See*—
Shikinami, Yasuo; Hata, Kunihiro; and Ohmura, Yutaka, 4,855,077, Cl. 252-518.000.

Ohnishi, Michikazu; Ohgoshi, Hiroshi; and Takada, Satoshi, to Yokogawa Electric Corporation; and Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Regeneration type body fluid treating circuit and method for treating body fluid. 4,855,057, Cl. 210-650.000.

Oho, Shigeru; Hirayama, Takeshi; Matsumoto, Masahiro; Hasegawa, Akira; Hamano, Fumio; and Shibata, Takanori, to Hitachi, Ltd. Collective wiring system and method of control thereof. 4,855,896, Cl. 364-138.000.

Ohta, Kazuo: *See*—
Takahashi, Toshitada; Ueda, Ryuzo; and Ohta, Kazuo, 4,855,235, Cl. 435-240.270.

Ohta, Kimihiro; Nakagawa, Tadashi; Kojima, Takeshi; Sakamoto, Tsunenori; and Kawai, Naoyuki, to Agency of Industrial Science and Technology. Method for controlling the thickness of a thin crystal film. 4,855,013, Cl. 156-601.000.

Ohta, Takashi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Switch. 4,855,540, Cl. 200-5.00E.

Ohta, Wasaburo; Katuragawa, Tadao; and Kinoshita, Mikio, to Ricoh Company, Ltd. Thin film forming apparatus. 4,854,265, Cl. 118-723.000.

Ohtawara, Isao; and Ohgochi, Satoshi, to Sanyo Electric Co., Ltd. Automatic telephone answering apparatus. 4,856,051, Cl. 379-88.000.

Ohtsu, Hideaki: *See*—
Katsumata, Masaaki; Takagi, Isamu; Takahashi, Eiji; Sakai, Tadamichi; Matsumoto, Yoji; Ohtsu, Hideaki; Uchida, Hiroyuki; and Asami, Kiyoshi, 4,855,106, Cl. 420-109.000.

Ohtsubo, Hiroyasu: *See*—
Rokuda, Morito; Ohtsubo, Hiroyasu; Masuda, Michio; Nishijima, Hideo; and Okamoto, Kaneyuki, 4,855,812, Cl. 358-22.000.

Ohtsuka, Hiroo; Hara, Osamu; Hori, Akira; and Nodoa, Minoru, to Daiichi Denshi Kogyo Kabushiki Kaisha; Iwatsu Electric Co., Ltd.; and Tomei Tsushin Kogyo Co., Ltd. Miniature electrical connector. 4,854,889, Cl. 439-395.000.

Ohwaki, Takeshi; and Taga, Yasunori, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Anti-blurring optical member. 4,855,176, Cl. 428-195.000.

Ohyagi, Takashi: *See*—
Yoshizawa, Shigeo; Ohyagi, Takashi; Oda, Takashi; and Mori, Toshihiro, 4,855,731, Cl. 340-825.440.

Oikawa, Yasunobu: *See*—
Ono, Shuichi; Itagaki, Shuichi; Yahagi, Masahiro; Furukawa, Kiyoshi; Fujiwara, Shinobu; and Oikawa, Yasunobu, 4,854,936, Cl. 29-570.100.

Oiles Industry Co., Ltd.: *See*—
Kamimura, Hiroto; Kubota, Shuichi; and Iwakura, Masaru, 4,854,745, Cl. 384-420.000.

Ojima, Masahiro: *See*—
Tomioka, Yasushi; Imazeki, Shuji; Terao, Motoyasu; Ojima, Masahiro; and Taniguchi, Yoshio, 4,855,951, Cl. 365-119.000

Okabayashi, Makoto, to Osaka Gas Co., Ltd. Fluidic flowmeter. 4,854,176, Cl. 73-861.190.

Okada, Akinori: *See*—
Ikeda, Haruhiko; Okada, Akinori; and Ohkura, Hirokazu, 4,855,279, Cl. 503-209.000.

Okada, Akiyoshi: *See*—
Shiraishi, Noriaki; Kamiyama, Sigeru; Amioka, Shigenori; and Okada, Akiyoshi, 4,854,634, Cl. 296-108.000.

Okada, Ryoji; Haneda, Mitsuaki; Araya, Takeshi; and Hioki, Susumu, to Hitachi, Ltd. Sintering method. 4,855,102, Cl. 419-8.000.

Okamizu, Shigeo: *See*—
Kanazawa, Hirotaka; Note, Koushun; Nakashima, Yasuhiro; Mukai, Yoshiaki; Sakamoto, Shunji; and Okamizu, Shigeo, 4,854,410, Cl. 180-140.000.

Okamoto, Kaneyuki: *See*—
Rokuda, Morito; Ohtsubo, Hiroyasu; Masuda, Michio; Nishijima, Hideo; and Okamoto, Kaneyuki, 4,855,812, Cl. 358-22.000.

Okamoto, Kiyokazu; Hino, Kiyoshi; and Kaito, Kosuke, to NEC Corporation. Motion control apparatus for induction motor. 4,855,661, Cl. 318-807.000.

Okamoto, Yoshiharu: *See*—
Fukukawa, Mitsuo; Yazawa, Masayuki; Asai, Kazumitsu; Okamoto, Yoshiharu; and Mio, Kouhei, 4,854,769, Cl. 404-72.000.

Okamoto, Yuji, to Sharp Kabushiki Kaisha. Trimming copying machine. 4,855,785, Cl. 355-218.000.

O'Keefe, Ellen. Jewelry storage apparatus. 4,854,656, Cl. 312-345.000.

Oki Electric Industry Co. Ltd.: *See*—
Kiyosumi, Fumio, 4,855,952, Cl. 365-149.000.
Matsukura, Hisao; Yamato, Osamu; and Horii, Hiroyuki, 4,855,693, Cl. 333-202.000.
Yamada, Youichi; and Takahashi, Keiko, 4,856,067, Cl. 381-45.000.

Oki, Katsunori: *See*—
Kimura, Hiroyuki; Kobori, Yasunori; Hamma, Kentaro; Omata, Takashi; and Oki, Katsunori, 4,855,840, Cl. 358-296.000.

Okinaga, Hiroaki, to Nikken Tool Co., Ltd.; and Yoshino Seiki Inc. Drill. 4,854,788, Cl. 408-59.000.

Okita, Masao, to Alps Electric Co., Ltd. Magnetic head. 4,855,852, Cl. 360-104.000.

Okuno, Kohichi: *See*—
Saito, Yasuhisa; Takagishi, Hisao; Nakamura, Hiroshi; Okuno, Kohichi; Shiomi, Yutaka; and Kamio, Kunimasa, 4,855,339, Cl. 523-400.000.

Okyo Juki Industrial Co., Ltd.: *See*—
Hiramatsu, Tohru; Tami, Kazuya; and Ohchi, Torao, 4,854,251, Cl. 112-121.120.

Oldham, Dean C.: *See*—
Jolliff, Daniel; Hahn, Michael W.; and Oldham, Dean C., 4,854,590, Cl. 273-138.00A.

Olesen, Ole V.: *See*—
Wallgren, Linus E.; Mason, Bobby L.; Siegel, William J.; Olesen, Ole V.; and Abbagnaro, Louis A., 4,855,572, Cl. 219-456.000.

Olim, Marvin J. Frameless face protector. 4,853,974, Cl. 2-9.000.

Olin, Christian: *See*—
Solem, Jan O.; Olin, Christian; and Scanlan, Timothy M., 4,854,318, Cl. 128-346.000.

Olin Hunt Specialty Products Inc.: *See*—
Bujese, David P., 4,855,784, Cl. 355-272.000.

Oliphant, Larry J., to Harnischfeger Corporation. Vehicle-mounted retrieval winch and control means therefor. 4,854,547, Cl. 254-271.000.

Olivier, Andre W.: *See*—
Elder, William H.; Hansen, Ries B.; and Olivier, Andre W., 4,853,990, Cl. 5-71.000.

Oliwa, Gary A.; and Burger, Marilyn S., to Motorola, Inc. Radio with removable display. 4,856,088, Cl. 455-349.000.

Ollivier, Jean; and Almeras, Roland, to Societe de Prospection et d'Inventions Techniques. Cone expansion wall plug. 4,854,793, Cl. 411-49.000.

Olson, James A.: *See*—
Barua, Arun B.; and Olson, James A., 4,855,463, Cl. 549-417.000.

Olsson, Jan O.: *See*—
Lindgren, Håkan; Olsson, Jan O.; Knudsen, Martin; and Ronningen, Knut, 4,854,960, Cl. 65-346.000.

Olympus Optical Co., Ltd.: *See*—
Hibino, Hiroki; Kimura, Kenji; Kanno, Masahide; Nishikori, Toshiaki; Yoshinaga, Jun; Kidawara, Atsushi; Yabe, Hisao; Katou, Shinichi; Takamura, Koji; and Nakamura, Takeaki, 4,855,819, Cl. 358-98.000.
Kikuchi, Juro, 4,854,680, Cl. 350-423.000.
Kogure, Eriko; Nakamura, Makoto; and Kumazawa, Toshiaki, 4,855,229, Cl. 435-28.000.
Nakajima, Shigeru, 4,854,301, Cl. 128-4.000.
Nonaka, Osamu, 4,855,585, Cl. 250-201.000.
Yamanashi, Takanori, 4,854,682, Cl. 350-427.000.

Omata, Tadao; and Kozu, Naoshi, to ORC Manufacturing Co., Ltd. Device for clearing the hole blockage of a liquid resist substrate. 4,854,004, Cl. 15-304.000.

Omata, Takashi: *See—*
Kimura, Hiroyuki; Kobori, Yasunori; Hamma, Kentaro; Omata, Takashi; and Oki, Katsunori, 4,855,840, Cl. 358-296.000.

O'Meara, Thomas R., to Hughes Aircraft Company. Interferometric/-feedback spatial light modulation system and method. 4,854,677, Cl. 350-355.000

O'Melia, Lawrence F.: *See—*
Gazda, Chester T.; and O'Melia, Lawrence F., 4,855,029, Cl. 204-197.000

Omron Tateisi Electronics Co.: *See—*
Koga, Hirofumi; and Koyanagi, Katsumi, 4,855,612, Cl. 307-140.000.
Yamashita, Masatsugu; Iwakiri, Norio; Yamanaka, Sekisuke; and Yanase, Akira, 4,855,541, Cl. 200-6.00R.

Onaral, Banu: *See—*
Beard, Richard B.; Hasan, Saleem; Scoles, Kevin J.; and Onaral, Banu, 4,854,865, Cl. 433-18.000.

Ondrejas, johann; and Zitz, Friedrich, to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft. Repair laminate. 4,855,182, Cl. 428-343.000.

O'Neill, Graham P.: *See—*
Gane, Patrick A. C.; and O'Neill, Graham P., 4,854,971, Cl. 106-286.500.

Onishi, Keiichi, to Sumimoto Electric Industries, Ltd. Plunger pump. 4,854,835, Cl. 417-435.000.

Ono, Koji: *See—*
Fujii, Mamoru; Noda, Kazuo; Nagasaka, Shoji; Tajika, Hiroshi; and Ono, Koji, 4,854,493, Cl. 228-5.700.

Ono, Shuichi; Itagaki, Shuichi; Yahagi, Masahiro; Furukawa, Kiyoshi; Fujiwara, Shinobu; and Oikawa, Yasunobu, to TDK Corporation. Semiconductive ceramic composition and semiconductive ceramic capacitor. 4,854,936, Cl. 29-570.100.

Ono, Takeo: *See—*
Suzuki, Masayuki; Hara, Shinichi; Kimura, Kuniaki; Ono, Takeo; Nakamura, Munekazu; and Ohguchi, Yoshihiro, 4,855,123, Cl. 423-562.000.

Ono, Tsuyoshi; and Seto, Kunihira, to Fuji Photo Co., Ltd. Magnetic disc cartridge with spindle abutment plate. 4,855,857, Cl. 360-133.000.

Onodera, Tugio: *See—*
Eguchi, Hitoshi; Kuribara, Motoaki; Onodera, Tugio; Kobayashi, Koji; Fujino, Ikuo; Hagiwara, Hiroshi; and Ogino, Seiichi, 4,855,609, Cl. 290-48.000.

Onofri, Bruno: *See—*
Mazzalupi, Giovanni; and Onofri, Bruno, 4,854,402, Cl. 175-171.000.

Onose, Jun; Takagi, Kazutoshi; and Adachi, Fukuichi, to Tokyo Kogaku Kikai Kabushiki Kaisha. Light source device for medical apparatus. 4,855,875, Cl. 362-32.000.

Onuki, Ken: *See—*
Hamada, Takuji; Takahashi, Masahiro; Yoneda, Katsuhiko; Onuki, Ken; and Uchiyama, Toshihiko, 4,855,993, Cl. 370-16.000.

Oogami, Shunsuke: *See—*
Fujii, Masanori; Komura, Shuji; and Oogami, Shunsuke, 4,855,204, Cl. 430-106.000.

Ooki, Yasumasa; Asano, Osamu; and Mikiya, Toshio, to Nitto Kohki Co., Ltd. Boring device. 4,854,787, Cl. 408-17.000.

Ootsuka, Hiroshi: *See—*
Ishikawa, Norio; Nakai, Masaaki; Hirano, Masayasu; Fujino, Akihiko; Ootsuka, Hiroshi; Egawa, Takeshi; and Kawamura, Kunio, 4,855,779, Cl. 354-412.000.

Opeal, Jon; Rosencwaig, Allan; and Smith, Walter L., to Therma-Wave, Inc. Method and apparatus for evaluating surface and subsurface features in a semiconductor. 4,854,710, Cl. 356-432.000.

Optical Materials, Inc.: *See—*
Young, Peter L., 4,855,871, Cl. 361-411.000.

Optical Storage International Holland: *See—*
Verboom, Johannes J., 4,855,742, Cl. 341-102.000.

Optische Werke G. Rodenstock: *See—*
Hanke, Peter; and Grimminger, Rolf D., 4,854,671, Cl. 350-252.000.

ORC Manufacturing Co., Ltd.: *See—*
Omata, Tadao; and Kozu, Naoshi, 4,854,004, Cl. 15-304.000.

Orient Chemical Industries Ltd.: *See—*
Tada, Akihiro; Kiriu, Takashi; and Arakawa, Motoomi, 4,855,208, Cl. 430-110.000.

Orihashi, Ritsuro: *See—*
Hayashi, Yoshihiko; and Orihashi, Ritsuro, 4,855,970, Cl. 368-120.000.

Orlicki, David M.; and Fearnside, William T., to Eastman Kodak Company. Lens position-sensing apparatus for optical recording system. 4,855,982, Cl. 369-44.000.

Orr, Avigdor; Spingler, John O.; and Gilbert, Seymour G., to DNA Plant Technology Corporation. Prolonging the shelf life of fresh root vegetables. 4,855,153, Cl. 426-270.000.

Orrville Products, Inc.: *See—*
Craver, Richard D., 4,854,298, Cl. 126-77.000.

Ortel Corporation: *See—*
Ungar, Jeffrey E., 4,856,017, Cl. 372-96.000.

Ortho Pharmaceutical Corporation: *See—*
Wachter, Michael P.; and Karanewsky, Donald S., 4,855,426, Cl. 544-101.000.

Ortiz, Mark V., to Spectra-Physics, Inc. Laser mirror alignment mechanism. 4,856,020, Cl. 372-107.000.

Orui, Ryuzo; Itagaki, Yasuhiro; and Yamaguchi, Toshio, to NEC Corporation. Crossed double helix slow-wave circuit for use in linear-beam microwave tube. 4,855,644, Cl. 315-3.600.

Osada, Masaru: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; Negishi, Ichiro; and Osada, Masaru, 4,855,816, Cl. 358-47.000.

Osada, Shuichi; Hayashi, Satoru; Goto, Masaru; and Godo, Kiyoshi, to Tsubakimoto Chain Co. Vehicle control system having two trackside signal lines. 4,854,529, Cl. 246-187.00B.

Osaka Gas Co., Ltd.: *See—*
Okabayashi, Makoto, 4,854,176, Cl. 73-861.190.

Osborne, Michael W.; Afforder, Cynthia A.; and England, William G., to Purafil, Inc. Solid filtration medium incorporating alumina and carbon. 4,855,276, Cl. 502-415.000.

Oscobal AG: *See—*
Zielke, Klaus, 4,854,304, Cl. 128-69.000.

Osgood, Wayne R., Jr.; and Therrian, Matthew A., to Mobil Oil Corporation. Low coefficient of friction biaxially oriented film. 4,855,187, Cl. 428-516.000.

Osmer, Thomas M.: *See—*
Alexander, Robert H.; Osmer, Thomas M.; and Neely, James W., 4,854,786, Cl. 408-1.00R.

Osterloh, Rolf: *See—*
Goeckel, Ulrich; Petersen, Harro; Osterloh, Rolf; Schupp, Eberhard; Loch, Werner; and Schwerzel, Thomas, 4,855,394, Cl. 528-263.000.

Ostertag, Alfred; and Schillinger, Hans, to Eastman Christensen Company. Stabilizer for deep well drilling tools. 4,854,403, Cl. 175-325.000

Otaka, Nobuo, to Koito Seisakusho Co., Ltd. Combination lamp assembly of monochromatic appearance capable of glowing in different colors. 4,855,877, Cl. 362-61.000.

Otsu, Takayuki: *See—*
Murata, Yoshishige; Koinuma, Yasumi; Amaya, Naoyuki; Otsu, Takayuki; and Nisimura, Masafumi, 4,855,374, Cl. 526-261.000.

Otsuka Pharmaceutical Company, Limited: *See—*
Ueda, Hiraki; Miyamoto, Hisashi; Aki, Shinji; and Otsuka, Tatsuya, 4,855,292, Cl. 514-312.000.

Otsuka, Ryotatsu; Tanimoto, Shigemi; and Toyoda, Kazuo, to Showa Aluminum Corporation. Method of preparing high-purity metal and rotary cooling member for use in apparatus therefor. 4,854,968, Cl. 75-63.000.

Otsuka, Tatsuya: *See—*
Ueda, Hiraki; Miyamoto, Hisashi; Aki, Shinji; and Otsuka, Tatsuya, 4,855,292, Cl. 514-312.000.

Otto Bock Orthopadische Industrie Besitz- und Verwaltungs-KG: *See—*
Horvath, Eduard, 4,854,428, Cl. 188-298.000.

Outboard Marine Corporation: *See—*
Bailey, Francis V., 4,854,369, Cl. 164-159.000.

Ovens, Kevin M., to Texas Instruments Incorporated. Schottky transistor logic floating latch flip-flop. 4,855,617, Cl. 307-291.000.

Owen, Hartley: *See—*
Harandi, Mohsen N.; and Owen, Hartley, 4,854,939, Cl. 44-77.000.
Harandi, Mohsen N.; and Owen, Hartley, 4,855,524, Cl. 585-517.000.

Owens-Corning Fiberglas Corporation: *See—*
Paul, F. Ronald; Haines, Richard M.; and Hill, Homer G., 4,855,341, Cl. 523-443.000

Owens, Gary: *See—*
Reneau, Bobby L.; Rhea, George; and Owens, Gary, 4,854,927, Cl. 493-27.000.

Owens-Illinois Plastic Products Inc.: *See—*
Krall, Thomas J.; and Myers, Robert A., 4,854,848, Cl. 425-503.000.

Oxenius, Rudiger; and Wilhelm, Charles, to Ciba-Geigy Corporation. Process for the preparation of fibre-reactive azo compounds containing a phenylenediamine diazo component. 4,855,410, Cl. 534-591.000.

Oxford, Alexander W.; Coates, Ian H.; Bays, David E.; Webb, Colin F.; Dowle, Michael D.; Mills, Keith; and Eldred, Colin D., to Glaxo Group Limited. Indole derivatives. 4,855,314, Cl. 514-415.000.

Oy Tampella AB: *See—*
Heinonen, Jarmo, 4,854,394, Cl. 173-105.000.

Ozawa, Toshiro, to Ricoh Company, Ltd. Zoom lens. 4,854,683, Cl. 350-427.000.

P. B. Ind. Plant Biotech Industries Ltd.: *See—*
Levin, Robert, 4,855,236, Cl. 435-240.450.

P.S.E. Marketing, Inc.: *See—*
Ekstein, Penny S., 4,853,994, Cl. 5-437.000.

PACE Incorporated: *See—*
Wallgren, Linus E.; Mason, Bobby L.; Siegel, William J.; Olesen, Ole V.; and Abbagnaro, Louis A., 4,855,572, Cl. 219-456.000.

Paessens, Arnold: *See—*
Lockhoff, Oswald; Hayauchi, Yutaka; Stadler, Peter; Stunkel, Klaus G.; Streisle, Gert; Paessens, Arnold; Klimetzek, Volker; Zeiler, Hans-Joachim; Metzger, Karl G.; Kroll, Hein-Peter; Brunner, Helmut; and Schaller, Klaus, 4,855,283, Cl. 514-8.000.

Page, Nancy M.; and Young, Lewis B., to Mobil Oil Corporation. Olefin oligomerization with surface modified zeolite. 4,855,527, Cl. 585-527.000.

Pai, Damodar M.: *See—*
Badesha, Santokh S.; Foley, Geoffrey M. T.; Pai, Damodar M.; Zallen, Richard H.; Slade, Michael L.; and Abkowitz, Martin A., 4,855,203, Cl. 430-59.000.

Palacios, Jose: *See—*
Markstein, Rudolf; and Palacios, Jose, 4,855,306, Cl. 514-280.000.

Palazzolo, Nicholas P. Detachable electric guitar pick-up system. 4,854,210, Cl. 84-1.150.

Palet, Timothy J. Combination air hammer, water stream blaster and liquid mist dust suppressor. 4,854,393, Cl. 173-62.000.

Palitex Project Company GmbH: *See—*
Lorenz, Rainer; Frenzen, Gustav; and Lossa, Ulrich, 4,854,116, Cl. 57-58.840.

Pall Corporation: *See—*
Joffee, Irving B.; Degen, Peter J.; and Baltusis, Frederick A., 4,855,163, Cl. 427-244.000.

Palmer, Billy W.: *See—*
Morris, Don L.; Palmer, Billy W.; and McAninch, Thomas W., 4,855,515, Cl. 568-862.000.

Panaroni, Vincent F. Method for making polyurethane tires with an outer skin. 4,855,096, Cl. 264-45.500.

Panhorst, Wolfgang: *See—*
Claussen, Nils; Petzow, Gunter; Nieszery, Katharina; Panhorst, Wolfgang; and Weisskopf, Karl-Ludwig, 4,855,259, Cl. 501-9.000.

Panster, Peter; Grethe, Horst; and Kleinschmit, Peter, to Degussa Aktiengesellschaft. Organosilanes containing benzoyl thiourea groups and method of preparation. 4,855,470, Cl. 556-421.000.

Papanikolau, Emmanuel: *See—*
Pluijms, Rene A. M.; Papanikolau, Emmanuel; Jongeling, Leendert B.; and Van Esdonk, Johannes M. A., 4,854,956, Cl. 65-2.000.

Papay, Andrew G.; and O'Brien, Joseph P., to Ethyl Petroleum Additives, Inc. Homogeneous additive concentrates and their formation. 4,855,074, Cl. 252-51.50A.

Papworth, Raymond C.: *See—*
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Parfenov, Leonid I.: *See—*
Svidunovich, Nikolai A.; Parfenov, Leonid I.; Garost, Alexandr I.; Sorokin, Gennady A.; Volkov, Viktor N.; Obiedkov, Viktor A.; Karbanovich, Valery K.; Vashkevich, Vladimir V.; and Verbitsky, Alexandr N., 4,855,105, Cl. 420-75.000.

Parisot, Patrick: *See—*
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Parker Hannifin Corporation: *See—*
Church, John F.; and Neff, Steve A., 4,855,041, Cl. 210-120.000.
Scholz, Daniel E., 4,854,824, Cl. 417-69.000.

Parker Hannifin RAK: *See—*
Badoureaux, Jean-Pierre, 4,854,345, Cl. 137-614.050.

Parks, Harold G.; Piper, William W.; Possin, George E.; and Castleberry, Donald E., to General Electric Company. Thin film transistor with aluminum contacts and nonaluminum metallization. 4,855,806, Cl. 357-59.000.

Parr, John H.: *See—*
Martin, Roy E.; Parr, John H.; and McCullah, C. Gray, 4,854,314, Cl. 128-205.270.

Partridge, Randall D.: *See—*
LaPierre, Rene B.; Partridge, Randall D.; and Wong, Steven S., 4,855,530, Cl. 585-739.000.

Pascal, Robert: *See—*
Benedetti, Charles; Gluntz, Claude; Pascal, Robert; and Stefanini, Michel, 4,855,053, Cl. 210-634.000.

Patel, Dinesh C.; and Ebert, Charles D., to TheraTech, Inc. Method for reducing skin irritation associated with drug/penetration enhancer compositions. 4,855,294, Cl. 514-212.000.

Patel, Jitendra G.: *See—*
Khinkis, Mark J.; Patel, Jitendra G.; and Sandstrom, William A., 4,854,249, Cl. 110-342.000.

Patel, Usha R.: *See—*
Abou-Gharbia, Magid A.; and Patel, Usha R., 4,855,430, Cl. 544-373.000.

Patil, Prabhakar B.: *See—*
Davis, Roy I.; and Patil, Prabhakar B., 4,855,914, Cl. 364-424.100.

Patton, Donald E., Jr.: *See—*
Hausmann, George J.; and Patton, Donald E., Jr., 4,854,258, Cl. 114-219.000.

Patton, Paul B.; and Landis, William R., to Honeywell Inc. System for redundantly processing a flame amplifier output signal. 4,854,852, Cl. 431-78.000.

Patzelt, Robert R., to Nalco Chemical Company. Paint detackification using oil-in-water emulsions from oily waste treatment plants. 4,854,947, Cl. 55-85.000.

Paul, F. Ronald; Haines, Richard M.; and Hill, Homer G., to Owens-Corning Fiberglas Corporation. High-strength magnesium aluminosilicate glass fibers having size coating of epoxy resin with methacryloxyalkyl and aminoalkyl silanes. 4,855,341, Cl. 523-443.000.

Paul, Jon D., to Eventide Inc. Power supply design. 4,855,891, Cl. 363-56.000.

Paulini, Dieter: *See—*
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Paulus, Wilfried: *See—*
Schade, Gerold; Paulus, Wilfried; and Schmitt, Hans-Georg, 4,855,318, Cl. 514-467.000.

Pavlik, John P. Toilet-tank float-booster. 4,854,340, Cl. 137-425.000.

Pawlak, Wanda: *See—*
Janiak, Jerzy S.; Turak, Ali A.; Pawlak, Wanda; and Ignasiak, Boleslaw L., 4,854,940, Cl. 44-620.000.

Peckitt, Guy R.; and Kopelman, Edward E., to Techni-Quip Corp. Fluorescent illuminator with inverter power supply. 4,855,646, Cl. 315-175.000.

Pecor, Gerald D. Fishing blade assembly. 4,854,072, Cl. 43-43.120.

Pecot, Michel; and Nulman, Jaim, to AG Processing Technologies, Inc. Emissivity calibration apparatus and method. 4,854,727, Cl. 374-57.000.

Peerless Manufacturing Company: *See—*
Kierzkowski, Frank J.; and Ross, John R., 4,854,950, Cl. 55-213.000.

Peery, John R.: *See—*
Eckenhoff, James B.; Magruder, Judy A.; Cortese, Richard; Peery, John R.; and Wright, Jeremy C., 4,855,141, Cl. 424-423.000.

Peitsmeier, Karl; and Steinkamper, Reinhard, to Daimler-Benz Aktiengesellschaft. Antiremoval device for a locking mechanism. 4,854,142, Cl. 70-186.000.

Pellin, Michael J.: *See—*
Gruen, Dieter M.; Young, Charles E.; and Pellin, Michael J., 4,855,596, Cl. 250-305.000.

Pence, James F. Optionally illuminating handle. 4,855,881, Cl. 362-156.000.

Pendy Plastic Products Limited: *See—*
Radcliffe, Anthony E., 4,854,489, Cl. 223-95.000.

Peng, Cheng-Jien: *See—*
Ting, Ching-Jui; and Peng, Cheng-Jien, 4,855,571, Cl. 219-376.000.

Penhale, Donald W. H.: *See—*
Heller, Jorge; Penhale, Donald W. H.; and Ng, Steve Y., 4,855,132, Cl. 424-78.000.

Pennwalt Corporation: *See—*
Griffith, Ronald C.; and Napier, James J., 4,855,462, Cl. 549-354.000.
Yen, Jeffrey H., 4,855,113, Cl. 422-259.000.

Pereyda, Robert, to Autek Systems Corporation. Container for electrical apparatus. 4,855,535, Cl. 174-52.100.

Perigard, Raymond G.: *See—*
Chiang, Robert L.; Perigard, Raymond G.; and Rabo, Jule A., 4,855,036, Cl. 208-120.000.

Periou, Pierre; and Boilley, Michel, to Rockwell-CIM. Cyclic electromechanical program control for controlling elements, such as for example openable roofs of vehicles. 4,854,183, Cl. 74-113.000.

Perkins, Patrick D.: *See—*
Chang, Clarence D.; and Perkins, Patrick D., 4,855,431, Cl. 544-410.000.

Perler, Robert. Hygienic toothbrush holder. 4,854,457, Cl. 211-65.000.

Perlmuter, Nikolai: *See—*
Hirsch, Eitan; Gutmann, Alexander; Schwartz, Ana; Goren, Eliezer; Perlmuter, Nikolai; and Tal, Reuven, 4,854,240, Cl. 102-476.000.

Perregaard, Jens K., to H. Lundbeck A/S. Acetic acid ester of haloperidol. 4,855,307, Cl. 514-327.000.

Perry, Cliff R. Cover for a hot tub or the like. 4,853,985, Cl. 4-498.000.

Persichini, David W.: *See—*
Clark, R. Scot; Hoffman, Joe G.; Davison, John B.; Jones, Alan W.; Jones, Allen H., Jr.; Persichini, David W.; Yuan, Wallace I.; and Lipisko, Bruce A., 4,855,023, Cl. 204-130.000.

Persson, Jan; and Rangstähl, Jan, to AB Volvo. Device for localizing and/or holding an object. 4,854,567, Cl. 269-71.000.

Peter, Jean-Luc: *See—*
Bauge, Michel; Boudon, Gerard; Mollier, Pierre; Peter, Jean-Luc; and Yamour, Yiannis J., 4,856,000, Cl. 371-9.000.

Peter, Jurgen: *See—*
Schlottke, Karl-Heinz; and Peter, Jurgen, 4,854,932, Cl. 493-357.000.

Peter, Roland; Ebel, Klaus; and Allspach, Thomas, to BASF Aktiengesellschaft. Epoxy resins obtained from reaction of epoxyalkyl halides and aromatic hydroxyl-containing melamines. 4,855,427, Cl. 544-198.000.

Peterman, Steven; and Stanasolovich, David, to International Business Machines Corporation. Process for making self-aligned contacts. 4,855,252, Cl. 437-189.000.

Petersen, Harro: *See—*
Goeckel, Ulrich; Petersen, Harro; Osterloh, Rolf; Schupp, Eberhard; Loch, Werner; and Schwerzel, Thomas, 4,855,394, Cl. 528-263.000.

Petersen, Walter J.: *See—*
Holley, Charles C.; Petersen, Walter J.; and Zenner, Michael N., 4,854,112, Cl. 56-6.000.

Peterson, Laverne. Expandable carrying case with external expansion control means. 4,854,430, Cl. 190-105.000.

Peterson, Stephen C.: *See—*
Brimhall, Owen D.; Peterson, Stephen C.; Baker, Charles D.; and Riddle, Merwyn D., 4,854,170, Cl. 73-570.000.

Peterson, William D., II. Laser curtain having an array of parabolic mirrors each focusing radiation on a corresponding detector positioned in mirror's focal point. 4,855,608, Cl. 250-560.000.

Petolino, Joseph A.: *See—*
Daberkow, Kevin L.; Finan, Christopher D.; Petolino, Joseph A.; Sobottka, Daniel C.; and Thomas, Jeffrey A., 4,855,904, Cl. 364-200.000.

Petracek, Vaclav; and Schnegg, Julius, to Burlington Industries, Inc. Antique satin weft inserted warp knit drapery fabric. 4,854,135, Cl. 66-190.000.

Petsch, Heinrich: *See—*
Grund, Andreas; Prescher, Guenter; Boehme, Georg; Hofen, Willi; and Petsch, Heinrich, 4,855,465, Cl. 549-525.000.

Petty, Charles A.; and Chen, Hsin-Chih, to Board of Trustees operating Michigan State University. Hydrocyclone. 4,855,066, Cl. 210-788.000.

Petzow, Gunter: *See—*
Claussen, Nils; Petzow, Gunter; Nieszery, Katharina; Panhorst, Wolfgang; and Weisskopf, Karl-Ludwig, 4,855,259, Cl. 501-9.000.

Pezzarossi, John J. Faucet valve with diagonal sealing ring. 4,854,545, Cl. 251-310.000

Pfaffmann, George D.: *See—*
Mucha, George M.; Pfaffmann, George D.; and Novorsky, Donald E., 4,855,551, Cl. 219-10.430.
Mucha, George M.; Novorsky, Donald E.; and Pfaffmann, George D., 4,855,556, Cl. 219-105.900.

Pfandler, Peter E.: *See—*
Bodenhausen, Geoffrey; Pfandler, Peter E.; Rapin, Jacques; Gaumann, Tino; and Houriet, Raymond, 4,855,593, Cl. 250-282.000.

Pfizer Inc.: *See—*
Brennan, Thomas M.; and Hendrick, Michael E., 4,855,454, Cl. 549-68.000.
Hoover, Dennis J., 4,855,303, Cl. 514-18.000.
Spavins, James C., 4,855,500, Cl. 564-270.000.

Phillips, John H.: *See—*
Kimock, Fred M.; and Phillips, John H., 4,855,594, Cl. 250-282.000.

Phillips Petroleum Company: *See—*
McDaniel, Max P.; and Martin, Shirley J., 4,855,271, Cl 502-107.000.
Stroman, David W.; Brust, Paul F.; Ellis, Steven B.; Gingeras, Thomas R.; Harpold, Michael M.; and Tschopp, Juerg F., 4,855,231, Cl. 435-68.000

Phipps, Jackie M.; and Barrier, Ronald B. Piezoelectric vortex flow meter. 4,854,177, Cl. 73-861.240.

Piccirilli, Barbara G.: *See—*
Burkholder, Mary J.; Piccirilli, Barbara G.; Anderson, Carl C.; and Temple, Rodger G., 4,855,164, Cl. 427-385.500.

Pichard, Christian: *See—*
Cohen, Jacques; Lemarquand, Pierre; and Pichard, Christian, 4,855,698, Cl. 335-14.000.

Picker International, Inc.: *See—*
Enck, Richard S.; and Meadows, F. Dan, 4,855,589, Cl. 250-213.0VT.

Pidou B.V.: *See—*
Meyer Swantee, Klaus B., 4,855,533, Cl. 174-35.00R.

Pieper, Christian: *See—*
Reinehr, Ulrich; Pieper, Christian; Hirsch, Rolf-Burkhard; Jungverdorben, Hermann-Josef; and Breuer, Jakob, 4,854,021, Cl. 28-263.000

Pietrzak, Patrick, to Societe Anonyme dite: Intertechnique. Device for damping shocks and vibrations. 4,854,556, Cl. 267-33.000.

Pike, Brian R.; Furlong, Patrick J.; and Moers, John W., to Unidec. Disposable container with applicator. 4,854,760, Cl. 401-134.000.

Pilkington plc: *See—*
Greenhalgh, Geoffrey; Morris, Peter; Bearon, John N.; and Armbruster, Guenter, 4,854,636, Cl. 296-201.000.

Pilling, Roger: *See—*
Martin, Harvey G.; Pilling, Roger; and Hosking, Steven M., 4,854,570, Cl. 271-162.000.

Pinarer, Talat I.; and Gavronsky, German, to Sealed Air. Apparatus and method for forming foam cushions for packaging purposes. 4,854,109, Cl. 53-397.000.

Pinto, Akiva; and Lucassen, Guenter, to Hergeth Hollingsworth GmbH. Device for fine-opening and cleaning fiber material, etc. 4,854,013, Cl. 19-200.000.

Pioch, Erhard: *See—*
Laube, Ludwig; Leypold, Helmut; and Pioch, Erhard, 4,854,440, Cl. 198-357.000.

Pioneer Electronic Corporation: *See—*
Iizuka, Hiroshi; and Kakiuchi, Shizuo, 4,855,741, Cl. 341-75.000.
Kanamaru, Hitoshi, 4,855,847, Cl. 360-19.100.
Kanamaru, Hitoshi, 4,855,978, Cl. 369-32.000.
Kasa, Koichi, 4,856,082, Cl. 455-161.000.
Kimura, Toshiyuki; Aoyagi, Yoshio; and Endo, Fumio, 4,855,979, Cl. 369-33.000.
Takagi, Kazunori; and Ito, Masahiko, 4,856,065, Cl. 381-28.000.

Pioneer Magnetics, Inc.: *See—*
Mandelcorn, Josh, 4,855,665, Cl. 323-272.000

Piper, William W.: *See—*
Parks, Harold G.; Piper, William W.; Possin, George E.; and Castleberry, Donald E., 4,855,806, Cl. 357-59.000.

Pitney Bowes, Inc.: *See—*
Eckl, John K., 4,855,607, Cl. 250-557.000.
Gluck, Julius; Murphy, Patrick; and Tran, Duc H., 4,855,756, Cl. 346-76.0PH.
Sansone, Ronald P.; and Chrosny, Wojciech M., 4,855,920, Cl. 364-464.020.

Pitre, Evard M. Dental articulator. 4,854,868, Cl. 433-60.000.

Pittet, Guy, to Forbeton-Betonbohr S.A. Machine for cutting building materials by means of an abrasive cable or wire. 4,854,296, Cl. 125-21.000.

Planteline, Pierre, to Bull, S.A. Apparatus for transferring data between a microprocessor and a memory. 4,855,901, Cl. 364-200.000.

Plastic Technologies, Inc.: *See—*
Semersky, Frank E., 4,854,472, Cl. 220-306.000

Platzer, Wolfgang P. Arrangement for increased passengers utilization in mobile units. 4,854,245, Cl. 105-317.000.

Plessey Overseas Limited: *See—*
Wade, Christopher A., 4,856,092, Cl. 455-609.000.

Ploger, Robert R., III: *See—*
Estrada, Suzanne L.; and Ploger, Robert R., III, 4,855,905, Cl. 364-200.000.

Pluijms, Rene A. M.; Papanikolau, Emmanuel; Jongeling, Leendert B.; and Van Esdonk, Johannes M. A., to U.S. Philips Corp. Method of manufacturing optical fibres having a core and a cladding of glass applying the rod-in-tube technique. 4,854,956, Cl. 65-2.000.

Podolski, Joseph S.: *See—*
Singer, Norman; Wilcox, Reed; and Podolski, Joseph S., 4,855,156, Cl. 426-565.000.

Pohl, Joachim; Carduck, Franz-Josef; and Goebel, Gerd, to Henkel Kommanditgesellschaft auf Aktien. Acid-resistant catalysts for the direct hydrogenation of fatty acids to fatty alcohols. 4,855,273, Cl. 502-244.000.

Pola, Carlo; and Massa, Giacinto, to Pola E Massa S.N.C. Di Pola C. E M. & Massa G. Device for treating printed circuit boards, in particular for pumicing and trimming. 4,854,081, Cl. 51-76.00R.

Pola E Massa S.N.C. Di Pola C. E M. & Massa G.: *See—*
Pola, Carlo; and Massa, Giacinto, 4,854,081, Cl. 51-76.00R.

Polan, George S., to Central Sprinkler Corporation. Clapper seal for dry pipe valve. 4,854,342, Cl. 137-516.290.

Polaroid Corporation: *See—*
Mauchan, Donald E.; and Slavitter, Frederick, 4,855,770, Cl. 354-75.000
Richardson, Thomas L.; Grabel, Vernon; and Kowalik, Joseph T., 4,855,940, Cl. 364-526.000.
Slavitter, Frederick; and Marchese, James J., 4,855,769, Cl. 354-21.000.

Poli, Albert A., to Mine Safety Appliances Company. Combustible gas detector having catalytic sensor stabilizing network. 4,854,155, Cl. 73-27.00R

Polito, Alan J.; and Cheng, Anthony K., to Beckman Instruments, Inc. Novel competitive assay for theophylline and reagent for use therein. 4,855,226, Cl. 435-7.000.

Pollack, Philip. Animal monitoring telltale and information system. 4,854,328, Cl. 128-736.000.

Poly Circuits, Inc.: *See—*
Turek, Joseph A., 4,854,040, Cl. 29-847.000.

Poly-Pro, Inc.: *See—*
Roberts, John T.; and Mattson, Larry J., 4,854,931, Cl. 493-348.000.

Polydex Pharmaceuticals, Ltd: *See—*
Usher, Thomas C., 4,855,416, Cl. 536-112.000.

Polysar Financial Services S.A.: *See—*
Dequatre, Claude; Blanpain, Peter R. J.; and Longuet, Michel, 4,855,337, Cl. 523-201.000.

Polysar Limited: *See—*
Insell, James P., 4,855,051, Cl. 210-601.000.

Polytron Corporation: *See—*
Vea, Cary A. C., 4,854,546, Cl. 254-134.30R.

Pomento, Patrick G. Roof truss assembly. 4,854,104, Cl. 52-639.000.

Pommet, Raymond: *See—*
Tanguy, Jean-Claude; Chambellan, Domonique; and Pommet, Raymond, 4,856,044, Cl. 378-198.000

Poole, Damian M., to General Signal Corporation. Track circuit signalling arrangement. 4,855,737, Cl. 340-933.000.

Porta Systems Corp.: *See—*
Meyerhoefer, Carl; and Neuwirth, Helmuth, 4,856,060, Cl. 379-412.000.

Porter, G. Burns, Jr.: *See—*
Huddleston, Paul M.; Porter, G. Burns, Jr.; and Rooney, David T., 4,855,922, Cl. 364-464.040.

Porter, Stuart J. Top release platform bracket. 4,854,534, Cl. 248-222.100.

Portmann, August T., to Bruderer Ag. Ram guiding apparatus for a punch press. 4,854,152, Cl. 72-456.000.

Porucznik, Paul; and Cheers, Christopher F., to Metal Box plc. Reducing the diameter of tubular bodies. 4,854,149, Cl. 72-352.000.

Posey, William T., to Hermetic Switch, Inc. Electrical receptable alarm switch. 4,855,719, Cl. 340-568.000

Possin, George E.: *See—*
Parks, Harold G.; Piper, William W.; Possin, George E.; and Castleberry, Donald E., 4,855,806, Cl. 357-59.000

Potter, Ross H.: *See—*
Hirschman, Alan D.; Reilly, David M.; Potter, Ross H.; Stulen, John; Toft, Eric M.; and Clark, John G., 4,854,324, Cl. 128-655.000.

Potts, Robert S.: *See—*
Daley, Richard J.; and Potts, Robert S., 4,854,486, Cl. 222-484.000.

Pouget, Paul A.: *See—*
Brown, Peter A.; Jenkins, Kenneth N.; and Pouget, Paul A., 4,854,150, Cl. 72-369.000.

Poupard, Dominique; and Bureau, Jean-Marc, to Compagnie Europeenne de Composants Electroniques. Method for the impregnation of electrolytic capacitors with tetracyanoquinodimethane salts. 4,855,022, Cl. 204-130.000.

Powers, Daniel: *See—*
Kraft, Kenneth N.; and Powers, Daniel, 4,854,633, Cl. 296-104.000.

Powertech Labs Inc.: *See—*
Johnson, Robert E.; and Dinsmore, William R., 4,854,074, Cl. 47-57.500.

PPG Industries, Inc.: *See—*
Burkholder, Mary J.; Piccirilli, Barbara G.; Anderson, Carl C.; and Temple, Rodger G., 4,855,164, Cl. 427-385.500.

Pradl, Ferdinand; Weise, Carlos; and Wegehaupt, Karl-Heinrich, to Wacker-Chemie GmbH. Organosilicon compounds and crosslinkable organopolysiloxane compositions containing the organosilicon compounds. 4,855,378, Cl. 528-26.000.

Prandi, Bernard: *See—*
Alheritiere, Edouard; and Prandi, Bernard, 4,854,977, Cl. 148-12.70B.

Precitronic Gesellschaft fur Feinmechanic und Electronic mbH: *See—*
Eichweber, Kurt, 4,854,595, Cl. 273-312.000.

Premier Brands U.K. Limited: *See—*
Rimmer, James R.; and Sweeney, Ronald M., 4,854,816, Cl. 414-790.300.

Premier Industrial Corporation: *See—*
Schnipke, Dennis E., 4,854,344, Cl. 137-606.000.

Presant, Stephen D., to Prime Computer, Inc. Multiple I/O bus virtual broadcast of programmed I/O instructions. 4,855,899, Cl. 364-200.000.

Prescher, Guenter: *See—*
Grund, Andreas; Prescher, Guenter; Boehme, Georg; Hofen, Willi; and Petsch, Heinrich, 4,855,465, Cl. 549-525.000.

Press, Irving D., to Unidynamics Corporation. Fail-safe bellows assembly. 4,854,611, Cl. 285-3.000.

Pressac Limited: *See—*
Tuckwood, Denis W., 4,854,883, Cl. 439-84.000.

Presto Lock, Inc.: *See—*
Scelba, Stephen S., 4,854,139, Cl. 70-68.000.

Preusker, Werner: *See—*
Ippen, Heiko; and Preusker, Werner, 4,854,359, Cl. 152-216.000.

Primary Delivery Systems, Inc.: *See—*
DeJonge, Antonia R., 4,854,459, Cl. 215-220.000.

Prime Computer, Inc.: *See—*
Presant, Stephen D., 4,855,899, Cl. 364-200.000.

Prince Corporation: *See—*
Kreuze, Kenneth D.; and Rennie, Eric D., 4,854,632, Cl. 296-37.120.

Pringle, Ronald E., to Camco, Incorporated. Large bore retrievable well safety valve. 4,854,387, Cl. 166-321.000.

Printronix, Inc.: *See—*
McCrimmon, Kenneth A., Jr.; and Chu, Matthew M., 4,854,756, Cl. 400-322.000.

Procter & Gamble Company, The: *See—*
Ball, W. Kenneth; Goulait, David J. K.; and Zorb, James E., 4,854,984, Cl. 156-73.500.
Inman, Everett; Roberts, Nancy J.; and Juneja, Prem S., 4,854,333, Cl. 132-209.000.
Trinh, Toan; Wahl, Errol H.; Swartley, Donald M.; and Hemingway, Ronald L., 4,855,072, Cl. 252-8.800.

Producers Color Service, Inc.: *See—*
Shearer, Thomas E., 4,855,836, Cl. 358-214.000.

Professional General Electronic Products: *See—*
Blanchot, Michele; Dutertre-Laduree, Daniel; and Roos, Rein, 4,855,889, Cl. 363-19.000.

Professional Training Systems, Inc.: *See—*
Hayes, John B.; and Armstrong, Douglas L., 4,855,842, Cl. 358-342.000.

Proto Quick, Inc.: *See—*
Fritz, Marlene M.; Love, Betty J.; Sweeney, Mary D.; and Davis, Chuck, 4,855,723, Cl. 340-691.000.

Proulx, Edward A.: *See—*
Raymond, Eugene B.; and Proulx, Edward A., 4,854,216, Cl. 89-33.160.

Proxy Oy: *See—*
Korpela, Jaakko, 4,854,654, Cl. 312-265.100.

Pruett, M. B. Concrete column form. 4,854,542, Cl. 249-48.000.

Pruett, Roy L.: *See—*
Young, David A.; Vaughan, David E.; Pruett, Roy L.; and Tunison, Mafer E., 4,855,528, Cl. 585-531.000.

Pucci, Michael J.; and Kunka, Blair S., to Microlife Technics, Inc. Method for producing novel dried compositions containing polysaccharides. 4,855,149, Cl. 426-48.000.

Puchala, Ryszard J.; and Miko, Stephen J., to Indescor Hydrodynamics Inc. Method and apparatus for removal of surface material. 4,854,770, Cl. 404-75.000.

Pujals, Charles, Jr. Cervical/occipital support. 4,854,306, Cl. 128-75.000.

Pujol Y Tarrago S.A.: *See—*
Solano, Victorino; and Trilla, Antonio, 4,854,426, Cl. 188-196.00M.

Pulichino, John V., Jr.; and Tong, Joy, to American Tourister, Inc. Suitcase with compartment for a foldable garment bag. 4,854,431, Cl. 190-108.000.

Pulido, Hector: *See—*
Baeza, Sam; and Pulido, Hector, 4,854,568, Cl. 269-268.000.

Puncoch, Miloslav: *See—*
Maraghe, Alex; and Puncoch, Miloslav, 4,854,010, Cl. 16-360.000.

Purafil, Inc.: *See—*
Osborne, Michael W.; Afforder, Cynthia A.; and England, William G., 4,855,276, Cl. 502-415.000.

Purcell, Robert J.: *See—*
Getz, Marvin G.; McFeeters, Brian D.; and Purcell, Robert J., 4,854,650, Cl. 305-10.000.

Purdy, Erika: *See—*
Gelb, Allan S.; Townsend, Peter B.; and Purdy, Erika, 4,855,810, Cl. 357-87.000.

Pyramid Industries, Inc.: *See—*
Morris, William E., 4,854,893, Cl. 439-578.000.

Quantel Limited: *See—*
Cawley, Robin A.; and Keller, Paul R. N., 4,855,834, Cl. 358-183.000.

Quantex Corporation: *See—*
Lindmayer, Josephy, 4,855,603, Cl. 250-484.100.
Soltani, Peter K.; Wrigley, Charles Y.; and Storti, George M., 4,855,879, Cl. 362-84.000.

Quantum Chemical Corporation: *See—*
Denney, Kimberly K.; and Block, Norman G., 4,854,942, Cl. 48-197.00R.

Quantum Conditioning Technology, Inc.: *See—*
Dalton, Danny L., 4,855,043, Cl. 210-190.000.

Quantum Diagnostics Ltd.: *See—*
Birnbach, Curtis; and Hsu, Fu Kuo, 4,854,669, Cl. 350-162.120.

Quatieri, Thomas F., Jr.; and McAulay, Robert J., to Massachusetts Institute of Technology. Audio pre-processing methods and apparatus. 4,856,068, Cl. 381-47.000.

R. J. Reynolds Tobacco Company: *See—*
Banerjee, Chandra K.; Farrier, Ernest G.; Harris, James L.; Norman, Alan B.; Reace, James L.; Reynolds, John H., IV; Ridings, Henry T.; Sensabaugh, Andrew J., Jr.; Shannon, Michael D.; and Shelar, Gary R., 4,854,331, Cl. 131-194.000.

Rabener, Claus W.: *See—*
Flury, Peter; Eldin, Sameer H.; Roth, Martin; and Rabener, Claus W., 4,855,367, Cl. 525-507.000.

Rabo, Jule A.: *See—*
Chiang, Robert L.; Perigard, Raymond G.; and Rabo, Jule A., 4,855,036, Cl. 208-120.000.

Raby, Joseph S., to Harris Corporation. Bonding technique to join two or more silicon wafers. 4,854,986, Cl. 156-87.000.

Radcliffe, Anthony E., to Pendy Plastic Products Limited. Garment hanger. 4,854,489, Cl. 223-95.000.

Radwan, Hatem R.; and Goss, Lloyd C., to Magnetic Peripherals Inc. Head suspension for magnetic recording. 4,855,851, Cl. 360-104.000.

Raether, Wolfgang, to Hoechst Aktiengesellschaft. Coccidiocidal compositions. 4,855,299, Cl. 514-259.000.

Raftopoulos, Demetrios D.; and Baril, James D., to University of Toledo, The. Expanding intramedullary nail. 4,854,312, Cl. 128-92.0YY.

Rahtz, Dieter: *See—*
Biere, Helmut; Engelstoft, Mogens; Huth, Andreas; Rahtz, Dieter; Schmiechen, Ralph; Seidelmann, Dieter; and Stephens, David N., 4,855,295, Cl. 514-232.800.

Rainbow Star Licensing S.A.: *See—*
Mancel, James D.; and Raiskums, Olaf B., 4,855,009, Cl. 156-443.000.

Rainey, Dean R.: *See—*
Gentile, James L.; LaRosa, Joseph P.; and Rainey, Dean R., 4,854,484, Cl. 222-256.000.

Raiola, Alfonso: *See—*
Calloni, Enzo; Valente, Maurizio; and Raiola, Alfonso, 4,855,044, Cl. 210-195.100.

Raiskums, Olaf B.: *See—*
Mancel, James D.; and Raiskums, Olaf B., 4,855,009, Cl. 156-443.000.

Rajewski, Robert C. Flare igniter assembly. 4,854,855, Cl. 431-202.000.

Raman, Ramaswamy V.; and Hsu, Shih C., to GTE Laboratories Incorporated. Refractory transition metal glassy alloys containing molybdenum. 4,854,980, Cl. 148-403.000.

Ramanathan, Visvanathan: *See—*
Duthaler, Rudolf; Finter, Jurgen; Fischer, Walter; and Ramanathan, Visvanathan, 4,855,084, Cl. 260-377.000.

Rambow, Frederick H. K., to Shell Oil Company. Time ramped gain for borehole televiewer. 4,855,965, Cl. 367-69.000.

Ramsbro, Borje K., to System 3R International ab. Clamping device for a tool at a machine tool, particularly at a die sinking electric discharge machine. 4,855,558, Cl. 219-69.150.

Ramsey, Keith E., to Sellick Equipment Limited. Parallel translation mechanism. 4,854,810, Cl. 414-710.000.

Ramzi, Saleh Y.; and Wachs, Israel E., to Exxon Research & Engineering Company. Carboxylic anhydride process. 4,855,457, Cl. 549-239.000.

Rangstâhl, Jan: *See—*
Persson, Jan; and Rangstâhl, Jan, 4,854,567, Cl. 269-71.000.

Ransom, Charles R. Breech lock for firearms. 4,854,217, Cl. 89-163.000.

Rapin, Jacques: *See—*
Bodenhausen, Geoffrey; Pfandler, Peter E.; Rapin, Jacques; Gaumann, Tino; and Houriet, Raymond, 4,855,593, Cl. 250-282.000.

Rasselstein AG: *See—*
Bersch, Horst; Kilian, Karl-Heinz; and Weigel, Hans U., 4,855,021, Cl. 204-28.000.

Rasshofer, Werner; Grigat, Ernst; Grogler, Gerhard; Hess, Heinrich; and Kopp, Richard, to Bayer Aktiengesellschaft. Process for producing higher molecular weight amino compounds having reduced monomeric amine content. 4,855,504, Cl. 564-395.000.

Rassieur, Charles L.; and Burns, Raymond W., to Central Mine Equipment Company. Hydraulic kelly bar chuck. 4,854,395, Cl. 173-163.000.

Ratcliff, Perry A. Method for debriding. 4,855,135, Cl. 424-127.000.

Ratcliffe, Robert M.: *See—*
Lemieux, Raymond U.; Ratcliffe, Robert M.; and Baker, Donald A., 4,855,126, Cl. 424-9.000.

Rathbun, Lyle A.: *See—*
Mathai, C. V.; Rathbun, Lyle A.; and Kinsey, John S., 4,854,500, Cl. 239-3.000.

Rathouit, Rene : *See—*
Lemoine, Francois; and Rathouit, Rene , 4,854,777, Cl. 405-202.000.

Raudebaugh, Bart: *See—*
Hug, Paul; Umeda, Bill; Yesnosky, Paul A.; Raudebaugh, Bart; Ricco, Gary; and McCabe, Gary E., 4,855,980, Cl. 369-36.000.

Raugh, Jeffery D.: *See—*
Churchill, Bruce A.; and Raugh, Jeffery D., 4,854,192, Cl. 74-752.00E.

Rauscher, Christen, to United States of America, Navy. OPFET demodulator-donwconverter for detecting microwave modulated optical signals. 4,856,095, Cl. 455-619.000.

Ray, Donald L.: *See—*
Speer, Gregg V.; and Ray, Donald L., 4,855,543, Cl. 200-61.270.

Raychem Corporation: *See—*
Drachnik, Kenneth J.; Kheder, Joseph; and Aspey, S. Alan, 4,855,024, Cl. 204-147.000.
Mazzanti, John B.; and Moore, Stephen, 4,855,387, Cl. 528-125.000.

Raymond, Eugene B.; and Proulx, Edward A., to General Electric Company. Ammunition handling apparatus. 4,854,216, Cl. 89-33.160.

Rayovac Corporation: *See—*
Schaller, David R.; Megahed, El-Sayed; and Samson, Charles E., 4,855,647, Cl. 315-209.00R.

Raythatha, Rasik H., to E.C.C. America Inc. Mixed pillared clays. 4,855,268, Cl. 502-63.000.

Raytheon Company: *See—*
Lewis, Edward T., 4,856,035, Cl. 377-116.000.

RCA Licensing Corp.: *See—*
Lendaro, Jeffery B., 4,855,828, Cl. 358-148.000
Venners, Howard W.; Beyers Jr., Billy W.; and Hailey, James E., 4,855,730, Cl. 340-825.240.

Reader, John R., Jr.: *See—*
Hendrick, Kendall B.; and Reader, John R., Jr., 4,855,667, Cl. 324-61.00R.

Recognition Equipment Incorporated: *See—*
Simpson, Willis D.; and Gurley, Gene S., 4,855,900, Cl. 364-200.000.
Van Maanen, Paul F., Jr., 4,855,580, Cl. 235-440.000.

Record, Stephen E.: *See—*
Casey, Christine T.; and Record, Stephen E., 4,855,936, Cl. 364-521.000.

Reece, Marvin P.; Schepergerdes, Wilhelm F.; and Renfrow, Frampton, to Rexnord Holdings Inc. Composite connecting member for hydraulic fluid lines. 4,854,613, Cl. 285-39.000.

Reed, Thomas A. Method and apparatus for the separation of organic substances from a suspension or solution. 4,855,045, Cl. 210-223.000.

Reflecta GmbH Foto-Flim Projection: *See—*
Kronbauer, Hermann; Kupper, Hermann; and Rehm, Christian, 4,854,697, Cl. 353-89.000.

Regnaudin, Jacques; and Boucquaert, Francois, to Compagnie Generale De Geophysique. Method and system for locating and correcting the orientation of an autonomous mobile object and a non-autonomous mobile object. 4,855,962, Cl. 367-19.000.

Rehm, Christian: *See—*
Kronbauer, Hermann; Kupper, Hermann; and Rehm, Christian, 4,854,697, Cl. 353-89.000.

Reichel, Fritz: *See—*
Degen, Hans-Juergen; Reichel, Fritz; Riebeling, Ulrich; and Hochr, Lothar, 4,855,343, Cl. 524-47.000.

Reichley, Fred J.: *See—*
Coyle, E. Michael; Reichley, Fred J.; Verbrugge, Calvin J.; and Villarreal, John G., 4,855,350, Cl. 524-506.000.

Reid, Philip L.: *See—*
Roberts, John T.; Reid, Philip L.; LaChappell, Philip S.; and Williams, Danny R., 4,854,111, Cl. 53-500.000.

Reilly, Dann M.; and Wiedo, Robert H. Container having depression for confining smaller containers. 4,854,465, Cl. 220-23.400.

Reilly, David M.: *See—*
Hirschman, Alan D.; Reilly, David M.; Potter, Ross H.; Stulen, John; Toft, Eric M.; and Clark, John G., 4,854,324, Cl. 128-655.000.

Reinehr, Ulrich; Pieper, Christian; Hirsch, Rolf-Burkhard; Jungverdorben, Hermann-Josef; and Breuer, Jakob, to Hoechst Aktiengesellschaft. Stufferbox crimper and process for preparing crimped synthetic fibers. 4,854,021, Cl. 28-263.000.

Reineman, Richard G.; and Carver, George P. Adjustable chair. 4,854,641, Cl. 297-345.000.

Reinhard, Peter: *See—*
Romhild, Ludwig; Hartmann, Erwin; and Reinhard, Peter, 4,854,080, Cl. 51-55.000.

Reischl, Arthur, to Bayer Aktiengesellschaft. Foam-containing polyurethane (urea) compositions and process for the preparation thereof. 4,855,052, Cl. 210-632.000.

Reliance Comm/Tec Corporation: *See—*
Kammiller, Neil, 4,855,890, Cl. 363-44.000.
Unger, John J., 4,854,884, Cl. 439-92.000.

Reneau, Bobby L.; Rhea, George; and Owens, Gary, to Advanced Graphic Technologies, Inc. Method and apparatus for pressing perforated web fed materials. 4,854,927, Cl. 493-27.000.

Renfrow, Frampton: *See—*
Reece, Marvin P.; Schepergerdes, Wilhelm F.; and Renfrow, Frampton, 4,854,613, Cl. 285-39.000.

Renishaw plc: *See—*
McMurtry, David R., 4,854,050, Cl. 33-558.000

Renner, Gunter; Wolff, Erich; Wiesen, Heinz; and Liebe, Werner, to Agfa-Gevaert Aktiengesellschaft. Color photographic recording material. 4,855,222, Cl. 430-557.000.

Renner, Gunter; and Illner, Erich, to Agfa-Gevaert Aktiengesellschaft. Process for the preparation of thioether compounds. 4,855,441, Cl. 548-363.000.

Renner, Gunter: *See—*
Meckl, Heinz; Spriewald, Erika; and Renner, Gunter, 4,855,216, Cl. 430-372.000.

Rennie, Eric D.: *See—*
Kreuze, Kenneth D.; and Rennie, Eric D., 4,854,632, Cl. 296-37.120.

Rent-A-Vault, Inc.: *See—*
Josephs, Charles R., 4,854,460, Cl. 220-1.500.

Repligen Corporation: *See—*
Devash, Yair, 4,855,304, Cl. 514-47.000.

Resce, James L.: *See—*
Banerjee, Chandra K.; Farrier, Ernest G.; Harris, James L.; Norman, Alan B.; Resce, James L.; Reynolds, John H., IV; Ridings, Henry T.; Sensabaugh, Andrew J., Jr.; Shannon, Michael D.; and Shelar, Gary R., 4,854,331, Cl. 131-194.000.

Research Foundation of State University of New York, The: *See—*
Budhu, Muniram, 4,854,175, Cl. 73-841.000.

Restaurant Technology, Inc.: *See—*
Koopman, R. Nelson, 4,854,227, Cl. 99-416.000.

Rexnord Holdings Inc.: *See—*
Reece, Marvin P.; Schepergerdes, Wilhelm F.; and Renfrow, Frampton, 4,854,613, Cl. 285-39.000.

Reynaud, Bernard: *See—*
Hays, Jean-Francois; Legrand, Pierre; Verna, Eric; Delzenne, Michel; Reynaud, Bernard; and Gaillard, Pierre, 4,855,566, Cl. 219-130.400.

Reynolds, John H., IV: *See—*
Banerjee, Chandra K.; Farrier, Ernest G.; Harris, James L.; Norman, Alan B.; Resce, James L.; Reynolds, John H., IV; Ridings, Henry T.; Sensabaugh, Andrew J., Jr.; Shannon, Michael D.; and Shelar, Gary R., 4,854,331, Cl. 131-194.000.

Rhea, George: *See—*
Reneau, Bobby L.; Rhea, George; and Owens, Gary, 4,854,927, Cl 493-27.000

Rheinmetall GmbH: *See—*
Synofzik, Reinhard; Hellwig, Rolf; and Karius, Klaus D., 4,854,241, Cl. 102-489.000.

Rhoads, Benjamin J., to N/COR Inc. Rod pump optimization system. 4,854,164, Cl. 73-155.000.

Rhodes, Jim L. Hay bale elevator apparatus. 4,854,809, Cl. 414-685.000.

Rhodes, Thomas R.; and Brennan, Thomas J., to General Signal Corporation. Transit rail deicing system. 4,854,244, Cl. 104-279.000.

Rhone-Poulenc Chimie: *See—*
Besson, Bernard; Desmurs, Jean-Roger; and Jouve, Isabelle, 4,855,513, Cl. 568-779.000.
Schuppiser, Jean-Luc; and Besnard, Marie-Madeleine, 4,855,069, Cl. 252-87.000.
Tordeux, Marc; Wakselman, Claude; and FRancese, Catherine, 4,855,460, Cl. 549-308.000

Riahi, Shantia, to Air Products and Chemicals, Inc. Ion Beam implant system. 4,855,604, Cl. 250-492.200.

Ricci, Fannie. Fragrance sack. 4,854,501, Cl. 239-54.000.

Ricco, Gary: *See—*
Hug, Paul; Umeda, Bill; Yesnosky, Paul A.; Raudebaugh, Bart; Ricco, Gary; and McCabe, Gary E., 4,855,980, Cl. 369-36.000.

Rice, James A.: *See—*
Winbow, Graham A.; Chen, Sen-Tsuen; and Rice, James A., 4,855,963, Cl. 367-31.000.

Rice, Paul. Device for clamping the edge of a table top. 4,854,016, Cl. 24-495.000.

Richards, Oliver L., Jr., to Sprague Electric Company. Noise blanking system for an AM radio receiver. 4,856,084, Cl. 455-223.000.

Richardson, Brian E., to Morpheus Lights, Inc. Variable beamwidth stage light. 4,855,884, Cl. 362-278.000.

Richardson, Thomas L.; Grabel, Vernon; and Kowalik, Joseph T., to Polaroid Corporation. Method of and system for computer graphic photography. 4,855,940, Cl. 364-526.000.

Richardt, Karl-Heinz, to Kloeckner-Humboldt-Deutz AG. Air preheating device for an internal combustion engine. 4,854,290, Cl. 123-556.000.

Richon, Dominique; De Pous, Olivier; and Fontaine, Pierre, to Battelle Memorial Institute. Method of manufacturing silicon nitride composition reinforced with silicon carbide whiskers having silicon oxide coating. 4,855,262, Cl. 501-92.000.

Richter, Ekkehard; Juntgen, Harald; Schmidt, Hans-Jurgen; and Knoblauch, Karl, to Bergwerksverband GmbH. Activated coke method of removing nitrogen oxides from exhaust gases. 4,855,116, Cl. 423-239.000.

Richter, Hans-Peter: *See—*
Wischermann, Gerhard; and Richter, Hans-Peter, 4,855,826, Cl. 358-139.000.

Rico, Isabelle: *See—*
Gautier, Martine; Rico, Isabelle; Lattes, Armand; and Bertocchio, Rene , 4,855,025, Cl. 204-157.860.

Ricoh Company, Ltd.: *See—*
Azumai, Hideo; Fujii, Koichi; Seigenji, Takashi; and Yoshioka, Keiichi, 4,855,803, Cl. 357-45.000.
Kobayashi, Hiroshi; Machida, Haruhiko; Harigaya, Makoko; Ide, Yasushi; and Akedo, Jun, 4,855,256, Cl. 437-129.000
Ohta, Wasaburo; Katuragawa, Tadao; and Kinoshita, Mikio, 4,854,265, Cl. 118-723.000.
Ozawa, Toshiro, 4,854,683, Cl. 350-427.000.
Saito, Yuichi, 4,855,839, Cl. 358-296.000.
Senma, Toshitaka; Imamura, Tomoatsu; and Shimada, Kazuyuki, 4,856,008, Cl. 372-31.000.
Shimada, Kazuyuki, 4,855,841, Cl. 358-296.000.
Shimada, Kazuyuki; and Shibata, Isamu, 4,856,011, Cl. 372-38.000.
Takashima, Masayuki; and Sawayama, Noboru, 4,855,783, Cl. 355-298.000.

Tanaka, Hidetake; and Nakazato, Yasushi, 4,855,754, Cl. 346-17.000.
Tsubuko, Kazuo; and Nagai, Kayoko, 4,855,207, Cl. 430-109.000.

Riddle, Merwyn D.: *See—*
Brimhall, Owen D.; Peterson, Stephen C.; Baker, Charles D.; and Riddle, Merwyn D., 4,854,170, Cl. 73-570.000.

Ridings, Henry T.: *See—*
Banerjee, Chandra K.; Farrier, Ernest G.; Harris, James L.; Norman, Alan B.; Resce, James L.; Reynolds, John H., IV; Ridings, Henry T.; Sensabaugh, Andrew J., Jr.; Shannon, Michael D.; and Shelar, Gary R., 4,854,331, Cl. 131-194.000.

Riebeling, Ulrich: *See—*
Degen, Hans-Juergen; Reichel, Fritz; Riebeling, Ulrich; and Hochr, Lothar, 4,855,343, Cl. 524-47.000.

Riediker, Martin; Meier, Kurt; and Zweifel, Hans, to Ciba-Geigy Corporation. Titanocenes and a radiation-polymerizable composition containing these titanocenes. 4,855,468, Cl. 556-53.000.

Rieger, Martin M.; and Yang, Robert K., to Warner-Lambert Company. Aluminum salt of saccharin. 4,855,145, Cl. 426-003.000.

Riensche, Heinrich, to VDO Adolf Schindling AG. Electropneumatic position regulator. 4,855,659, Cl. 318-645.000.

Rieter Machine Works, Ltd.: *See—*
Briner, Emil; Keller, Urs; and Stalder, Herbert, 4,854,118, Cl. 57-401.000.
Nabulon, Werner, 4,854,019, Cl. 28-255.000.
Staheli, Paul; Demuth, Robert; and Fritzsche, Peter, 4,854,011, Cl. 19-105.000.

Riggs, Robert S., to Jet Research Center, Inc. Method of preparation of 2,6-bis(picrylamino)-3,5-dinitropyridine. 4,855,436, Cl. 546-307.000.

Riha, Werner, to Zahnradfabrik Friedrichshafen AG. Grinding disc. 4,854,087, Cl. 51-209.00R.

Riihimaki, Roy; and D'Amico, Richard, to Hu-Friedy Manufacturing Co., Inc. Instrument cassette. 4,854,475, Cl. 220-337.000.

Rilett, John W. Fluid containers. 4,854,343, Cl. 137-543.190.

Riley, Dennis S.; and Riley, Jo F. Four player backgammon. 4,854,593, Cl. 273-248.000.

Riley, Jo F.: *See—*
Riley, Dennis S.; and Riley, Jo F., 4,854,593, Cl. 273-248.000.

Rimmer, James R.; and Sweeney, Ronald M., to Premier Brands U.K. Limited. Production of tea and the like bags. 4,854,816, Cl. 414-790.300.

Rinderknecht, Ernst H.: *See—*
Gray, Patrick W.; and Rinderknecht, Ernst H., 4,855,238, Cl. 435-243.000.

Ring, Manfred; Weber, Jurgen; and Ackermann, Helmut, to Georg Fischer Aktiengesellschaft. Method and apparatus for the optical electronic measurement of a workpiece. 4,854,707, Cl. 356-356.000.

Rishel, Rick D.: *See—*
Mott, Gerry; Attaar, Mustan; and Rishel, Rick D., 4,854,173, Cl. 73-600.000.

Risman, Per O. G.: *See—*
Claesson, Jan S.; and Risman, Per O. G., 4,855,554, Cl. 219-10.55F.

Ritrievi, Kimberly E.: *See—*
Bourland, Larry G.; DiLullo, Robert J.; Ritrievi, Kimberly E.; and Valbert, Jon R., 4,855,179, Cl. 428-296.000.

Ritsch, Ingomar, to Bessey & John GmbH & Co. Clamping device. 4,854,565, Cl. 269-41.000.

Roat, Rosette M.; and Yolles, Seymour, to University of Delaware. Coordination complexes of platinum with amides. 4,855,498, Cl. 564-215.000.

Robbins, Aida F.: *See—*
Klun, Thomas P.; Lu, David D.; and Robbins, Aida F., 4,855,184, Cl. 428-425.100.

Robbins, Harry C.: *See—*
Shumway, Dale F.; and Robbins, Harry C., 4,855,440, Cl. 548-353.000.

Robert Bosch GmbH: *See—*
Eheim, Franz, deceased; and Hofer, Gerald, 4,854,289, Cl. 123-503.000.
Knorreck, Peter, 4,854,282, Cl. 123-357.000.
Laube, Ludwig; Leypold, Helmut; and Pioch, Erhard, 4,854,440, Cl. 198-357.000.

Roberts, Gary L. Beam framing system and process. 4,854,107, Cl. 52-725.000.

Roberts, John T.; Reid, Philip L.; LaChappell, Philip S.; and Williams, Danny R., to Roberts Systems, Inc. Apparatus for conveying and packaging groups of articles. 4,854,111, Cl. 53-500.000.

Roberts, John T.; and Mattson, Larry J., to Poly-Pro, Inc. Process and apparatus for dispensing and conveying individual articles in seriatim order. 4,854,931, Cl. 493-348.000.

Roberts, John W. Flexible receptacle for collecting and transporting loose debris. 4,854,003, Cl. 15-257.500.

Roberts, Kent S., to Roberts Mfg., Inc. Archery bowstring drawback and release device. 4,854,293, Cl. 124-35.00A.

Roberts Mfg., Inc.: *See—*
Roberts, Kent S., 4,854,293, Cl. 124-35.00A.

Roberts, Nancy J.: *See—*
Inman, Everett; Roberts, Nancy J.; and Juneja, Prem S., 4,854,333, Cl. 132-209.000.

Roberts Systems, Inc.: *See—*
Roberts, John T.; Reid, Philip L.; LaChappell, Philip S.; and Williams, Danny R., 4,854,111, Cl. 53-500.000.

Roberts, William F.; and Collins, Truman D., to Cascade Wood Products Incorporated. Newel post fastener and rail attachment. 4,854,549, Cl. 256-69.000.

Robertson, Allan J.; and Gallivan, James B., to American Cyanamid Company. 1,4-Disubstituted-2,3,5,6-tetrahydroxy-1,4-diphosphorinanes and their oxides or sulfides. 4,855,507, Cl. 568-12.000.

Robin, Mark L.: *See—*
Halpern, Donald F.; and Robin, Mark L., 4,855,511, Cl. 568-683.000.

Robinson, John, to Evans & Sutherland Computer Corporation. System for texturing computer graphics images. 4,855,934, Cl. 364-521.000.

Robl, Jeffrey A.: *See—*
Hwu, Jih R.; and Robl, Jeffrey A., 4,855,437, Cl. 548-241.000.

Robotic Vision Systems, Inc.: *See—*
Schmidt, Richard Q., 4,854,698, Cl. 356-5.000.

Rochefort, Mark G., to Hughes Aircraft Company. Spacecraft design enabling the compact nesting of multiple spacecraft in the launch vehicle. 4,854,526, Cl. 244-158.00R.

Rock, John A.: *See—*
Holub, Fred F.; and Rock, John A., 4,855,356, Cl. 525-66.000.

Rockwell-CIM: *See—*
Periou, Pierre; and Boilley, Michel, 4,854,183, Cl. 74-113.000.

Rockwell International Corporation: *See—*
Baroni, Robert J., 4,854,427, Cl. 188-205.00R.
Hart, Billy D., 4,855,944, Cl. 364-602.000.
McCartney, Ronald L., 4,854,664, Cl. 350-96.220.
Meng, Sen Y., 4,854,818, Cl. 415-58.400.

Rockwell International Suspension Systems Company: *See—*
Brown, Peter A.; Jenkins, Kenneth N.; and Pouget, Paul A., 4,854,150, Cl. 72-369.000.

Roedseth, John K.: *See—*
Cubric, Robert; and Roedseth, John K., 4,854,612, Cl. 285-18.000.

Roeland, James F.: *See—*
Gavin, James R.; and Roeland, James F., 4,854,520, Cl. 242-72.00B.

Roelandse, Cornelius D.; and Hokkeling, Pieter, to U.S. Philips Corporation. X-ray tube having a rotary anode with rhenium-containing bearing surfaces for a gallium-alloy lubricant. 4,856,039, Cl. 378-133.000.

Rogers, Michael D.: *See—*
Lee, Len F.; Moedritzer, Kurt; and Rogers, Michael D., 4,855,442, Cl. 548-365.000.

Rogers, Tracy G.; Nier, Michael R.; and Moran, John, to Schlegel Corporation. Fail-safe tip-lock shoe. 4,854,077, Cl. 49-322.000.

Rohs, Gordon L.: *See—*
Sieben, Murray K.; and Rohs, Gordon L., 4,854,076, Cl. 49-280.000.

Rokuda, Morito; Ohtsubo, Hiroyasu; Masuda, Michio; Nishijima, Hideo; and Okamoto, Kaneyuki, to Hitachi, Ltd. Picture synthesizing apparatus with gain control system. 4,855,812, Cl. 358-22.000.

Rolls-Royce plc: *See—*
Kernon, John D.; Langley, Kenneth R.; and Thatcher, Mark R., 4,854,821, Cl. 416-95.000.
Webb, Peter D.; Russhard, Peter; and Mansfield, Lee, 4,855,735, Cl. 340-870.140.

Roloke Company: *See—*
Walpin, Arline; and Walpin, Lionel A., 4,853,993, Cl. 5-431.000.

Romanelli, Michael G.: *See—*
Yezrielev, Albert I.; Romanelli, Michael G.; and Wellman, William E., 4,855,369, Cl. 526-320.000.

Romanin, Bruno; Ferro, Francesco; and Colli, Luigi, to Savio, S.p.A. Device and method for storing and returning yarn during the winding of conical bobbins fed with yarn at constant speed. 4,854,510, Cl. 242-18.0DD.

Romanin, Bruno; Ferro, Francesco; and Colli, Luigi, to Savio, S.p.A. Device and method for storing and returning yarn during the winding of conical bobbins fed with yarn at constant speed. 4,854,514, Cl. 242-18.00R.

Romhild, Ludwig; Hartmann, Erwin; and Reinhard, Peter, to Mikrona, AG; and Romhild, Ludwig. Apparatus for sharpening periodontal instruments. 4,854,080, Cl. 51-55.000.

Romstedt, Karl J.: *See—*
Miller, Duane D.; Feller, Dennis R.; Clark, Michael T.; Adejare, Adeboye; Romstedt, Karl J.; and Shams, Gamal, 4,855,476, Cl. 558-410.000.

Romz, Thomas A.: *See—*
Mohler, Paul J.; Romz, Thomas A.; and Lithgow, Baird E., 4,855,354, Cl. 525-54.240.

Ronchi, Costantino. Steam iron sole plate with plug insert. 4,854,059, Cl. 38-93.000.

Ronningen, Knut: *See—*
Lindgren, Håkan; Olsson, Jan O.; Knudsen, Martin; and Ronningen, Knut, 4,854,960, Cl. 65-346.000.

Rooklyn, Jack, to Industrial Management Co. Grounding system for static dissipative surfaces. 4,855,865, Cl. 361-212.000.

Rooney, David T.: *See—*
Huddleston, Paul M.; Porter, G. Burns, Jr.; and Rooney, David T., 4,855,922, Cl. 364-464.040.

Roos, Rein: *See—*
Blanchot, Michele; Dutertre-Laduree, Daniel; and Roos, Rein, 4,855,889, Cl. 363-19.000.

Rosenberger, Siegfried; and Meier, Hans-Rudolf, to Ciba-Geigy Corporation. Stabilizers for organic polymers. 4,855,345, Cl. 524-120.000.

Rosencwaig, Allan: *See—*
Opsal, Jon; Rosencwaig, Allan; and Smith, Walter L., 4,854,710, Cl. 356-432.000.

Rosendall, Henry J.: *See—*
Blase, Michael R.; Rosendall, Henry J.; and Goodrich, Gordon W., 4,854,544, Cl. 251-245.000.

Rosenstein, Robert W.; and Bloomster, Timothy G., to Becton Dickinson and Company. Solid phase assay employing capillary flow. 4,855,240, Cl. 436-514.000.

Ross, John R.: *See—*
Kierzkowski, Frank J.; and Ross, John R., 4,854,950, Cl 55-213.000.

Rossopoulos, Stephane, to Hermes Precisa Internatinal S.A. Convertible print head. 4,854,752, Cl. 400-124.000.

Rotert, Gary A.: *See—*
Baranczuk, Richard J.; Spicer, Jay; Duncan, William P.; and Rotert, Gary A., 4,855,125, Cl. 424-1.100.

Roth, Martin: *See—*
Flury, Peter; Eldin, Sameer H.; Roth, Martin; and Rabener, Claus W., 4,855,367, Cl. 525-507.000.

Rothfjell, Eric. Method of signature verification and device for carrying out the method. 4,856,077, Cl. 382-3.000.

Rothkegel, Bernhard; and Haufe, Wolfgang, to Siemens Aktiengesellschaft. Method for the production of sintered electrical contact material for low voltage power switching. 4,855,104, Cl. 419-28.000.

Rotlex Optics Ltd.: *See—*
Kafri, Oded; and Kreske, Kathi M., 4,854,708, Cl. 356-359.000.

Rotring-werke Riepe KG: *See—*
Anderka, Gerold, 4,854,205, Cl. 83-529.000.

Rountree, Robert N.: *See—*
Duvvury, Charvaka; and Rountree, Robert N., 4,855,620, Cl. 307-448.000.

Roussel Uclaf: *See—*
Gasc, Jean-Claude; Nedelec, Lucien; Humbert, Daniel; and Boaventura, Ana-Maria, 4,855,302, Cl. 514-278.000.

Rovnyak, George C.: *See—*
Atwal, Karnail; and Rovnyak, George C., 4,855,301, Cl. 514-269.000.

Rowlette, John R.: *See—*
Bures, Milan; Kratochvil, Paul P.; and Rowlette, John R., 4,855,590, Cl. 250-221.000.

Ruben, Paul W.; Heimbecher, Eugene F., II; and Dilley, David L., to Motorola, Inc. Reduced size phase-to-amplitude converter in a numerically controlled oscillator. 4,855,946, Cl. 364-721.000.

Rubin, Lawrence A. Electrocardiograph harness. 4,854,323, Cl. 128-644.000.

Rudik, William J.; Schmitt, George P.; and Shipley, John F., to International Business Machines Corp. Multiple wire photosensitive adhesive for wire embedment. 4,855,333, Cl. 522-71.000.

Rudkin-Wiley Corporation: *See—*
Wiley, Nathaniel C., Jr.; and Jensen, William L., Jr., 4,855,712, Cl 340-453.000.

Rudolph, Claus: *See—*
Trostmann, Uwe; Schachtele, Christoph; Mannhardt, Karl; Rudolph, Claus; and Marme Dieter, 4,855,489, Cl. 560-250.000.

Rudy, Thomas P.: *See—*
Goodson, Forrest R.; Dudley, Mark E.; and Rudy, Thomas P., 4,854,981, Cl. 149-2.000.

Ruehr, Volker: *See—*
Schempp, Ulrich; and Ruehr, Volker, 4,854,646, Cl. 301-65.000.

Rule, Daniel P.: *See—*
Daniel, Aaron E.; and Rule, Daniel P., 4,854,461, Cl. 220-4.00R.

Rule, Mark; Fagerburg, David R.; Watkins, Joseph J.; and Fauver, Jerry S., to Eastman Kodak Company. Process for the preparation of copoly(arylene sulfide). 4,855,393, Cl. 528-212.000.

Rule, Mark; and Moncier, Regina M., to Eastman Kodak Company. Oxidative iodination of phenol. 4,855,514, Cl. 568-779.000.

Rule Steel Tanks, Inc.: *See—*
Daniel, Aaron E.; and Rule, Daniel P., 4,854,461, Cl. 220-4.00R.

Rupe, Chauncey O., to Environmental Test Systems, Inc. Test composition and device for the determination of cyanuric acid in water. 4,855,239, Cl. 436-106.000.

Ruppert, Dieter: *See—*
Wagner, Adalbert; Kleemann, Heinz-Werner; Ruppert, Dieter; and Scholkens, Bernward, 4,855,286, Cl. 514-19.000.

Rupprecht, James K.: *See—*
Mikolajczak, Kenneth L.; McLaughlin, Jerry L.; and Rupprecht, James K., 4,855,319, Cl. 514-473.000.

Russell, Alexander; Cooper, Leslie A.; and Drudy, David P., to Sacol Powerline Limited. Inductive transducers for indicating establishment of a preselected spatial relationship between two parts. 4,855,675, Cl. 324-208.000.

Russell, David P.; and Papworth, Raymond C. Television image processing system having capture, merge and display capability. 4,855,813, Cl. 358-22.000.

Russell, Michael K.; Wesenberg, Donald L.; and Leaney, Peter A., to NL Industries, Inc. Assemblies for supporting electrical circuit boards within tubes. 4,855,870, Cl. 361-395.000.

Russell, Patrick M.: *See—*
Betso, Stephen R.; Hyun, Kun S.; and Russell, Patrick M., 4,855,404, Cl. 528-502.000.

Russell, Raymond L., to Container Corporation of America. Bulk container filling apparatus. 4,854,353, Cl. 141-74.000.

Russell William, Ltd.: *See—*
Winter, Russell K.; Harvey, Thomas D.; Savas, Nedim; and Kain, Richard S., 4,854,535, Cl. 248-225.200.

Russhard, Peter: *See—*
Webb, Peter D.; Russhard, Peter; and Mansfield, Lee, 4,855,735, Cl. 340-870.140.

Rutherford, Frank C.: *See—*
Legge, John R.; and Rutherford, Frank C., 4,855,011, Cl. 156-583.100.

Rutledge, David L.: *See—*
Turner, John E.; Rutledge, David L.; and Darling, Roy D., 4,855,954, Cl. 365-185.000.

Rutledge, Gary L., to Ironclad, Corporation. Plastic film bag with integral plastic film tie element, and associated fabrication methods. 4,854,735, Cl. 383-72.000.

Ruud, Timothy W.: *See—*
Sexton, Rodney N.; Woolf, Floyd S.; and Ruud, Timothy W., 4,854,743, Cl. 384-130.000.

Ryan, Will G.; and Bullock, Norman E. Aliquoting of serial liquid samples. 4,854,182, Cl. 73-864.640

Ryback, George, to Shell Oil Company. Preparation of fluorophenols. 4,855,512, Cl. 568-775.000.

Ryder, Judith A. Releasable securing means for an infant's shirt. 4,853,979, Cl. 2-326.000.

Ryntz, Rose A.; Surcina, Karen A.; and Kurple, Kenneth R., to Du Pont de Nemours, E. I., and Company. Thermosetting caprolactone-styrene allyl alcohol polyester urethane coating composition. 4,855,359, Cl. 525-130.000.

RYOBI Ltd.: *See—*
Nakauchi, Shunsaku, 4,854,619, Cl. 292-335.000.

Rytec Corporation: *See—*
Mueller, Louis, 4,855,567, Cl. 219-218.000.

S. C. Johnson & Son, Inc.: *See—*
Coyle, E. Michael; Reichley, Fred J.; Verbrugge, Calvin J.; and Villarreal, John G., 4,855,350, Cl. 524-506.000.
Dahlby, Larry C., 4,854,454, Cl. 209-616.000.

S.P. Radio A/S: *See—*
Thrane, Lars, 4,856,061, Cl. 380-48.000.

S R I International: *See—*
Heller, Jorge; Penhale, Donald W. H.; and Ng, Steve Y., 4,855,132, Cl. 424-78.000.

Sabelstrom, Jan: *See—*
Bolin, Goran; and Sabelstrom, Jan, 4,855,010, Cl. 156-497.000.

Sachenik, Paul A.: *See—*
Borrelli, Nicholas F.; and Sachenik, Paul A., 4,854,957, Cl. 65-30.110.

Sachs-Systemtechnik GmbH: *See—*
Tellert, Rudy, 4,854,433, Cl. 192-0.033.

Sacol Powerline Limited: *See—*
Russell, Alexander; Cooper, Leslie A.; and Drudy, David P., 4,855,675, Cl. 324-208.000.

Sadowski, Fritz: *See—*
Becker, Heinz D.; Bederke, Klaus; Dahm, Ralf; Kerber, Hermann; Sadowski, Fritz; and Stephan, Werner, 4,855,342, Cl. 524-31.000.

Safe Flight Instrument Corporation: *See—*
Greene, Leonard M., 4,855,738, Cl. 340-968.000.

Safinya, Kambiz A.: *See—*
Banavar, Jayanth R.; Johnson, David L.; Nagel, Sidney R.; and Safinya, Kambiz A., 4,855,912, Cl. 364-422.000.

Sagami Chemical Research Center: *See—*
Fuchikami, Takamasa; Urata, Hisao; Ishii, Yoshimitsu; and Obata, Yoshiko, 4,855,487, Cl. 560-227.000.

Saha, Bijay S.; and Zeman, Robert E., to Eastman Kodak Company. Interdispersed two-phase ferrite composite and carrier therefrom. 4,855,205, Cl. 430-106.600.

Saha, Bijay S., to Eastman Kodak Company. Rare earth containing magnetic carrier particles. 4,855,206, Cl. 430-106.600.

Saibe, Seiichi: *See—*
Asao, Hideo; Yamazi, Satoru; and Saibe, Seiichi, 4,854,252, Cl. 112-265.100.

Sainato, Anthony V., to Creative Products Merchandising, Inc. Assembly for mounting a display sign. 4,854,533, Cl. 248-221.100.

Saito, Akira; Nukada, Teisuke; and Ito, Michio, to Nihon Kaiheiki Industrial Co., Ltd. Method of manufacturing a switch base. 4,854,041, Cl. 29-884.000.

Saito, Hisao: *See—*
Kinuno, Masanori; Saito, Hisao; Kousaka, Akira; and Kawaguchi, Toshio, 4,855,645, Cl. 315-39.710.

Saito, Itaru: *See—*
Kitano, Hirohisa; Saito, Itaru; Shingaki, Kouichi; Matsubara, Ken; and Masuda, Tomohiko, 4,854,678, Cl. 350-356.000.

Saito, Kaoru: *See—*
Nozue, Yasuhiro; Kajiyama, Koichi; Saito, Kaoru; Wakabayashi, Osamu; Kowaka, Masahiko; and Itakura, Yasuo, 4,856,018, Cl. 372-98.000.

Saito, Makoto: *See—*
Uchida, Kenji; Banba, Nobuyuki; Kuroiwa, Minoru; Saito, Makoto; and Kamino, Yukishige, 4,854,785, Cl. 406-13.000.

Saito, Shiro: *See—*
Tanaka, Hajime; and Saito, Shiro, 4,854,211, Cl. 84-240.000.

Saito, Takahiro: *See—*
Ebata, Genji; Tanabe, Koji; and Saito, Takahiro, 4,854,667, Cl. 350-96.200.

Saito, Tomoki: *See—*
Yamazaki, Tsuneo; Saito, Tomoki; and Ayabe, Hideo, 4,854,518, Cl. 242-56.900.

Saito, Yasuhisa; Takagishi, Hisao; Nakamura, Hiroshi; Okuno, Kohichi; Shiomi, Yutaka; and Kamio, Kunimasa, to Sumitomo Chemical Company, Limited. Epoxy resin composition. 4,855,339, Cl. 523-400.000.

Saito, Yoshitane: *See—*
Nakanishi, Koji; Yoshino, Mituo; and Saito, Yoshitane, 4,854,346, Cl. 137-624.110.

Saito, Yuichi, to Ricoh Company, Ltd. Facsimile machine with a paper size adjustable proxy reception function. 4,855,839, Cl. 358-296.000.

Saitoh, Kuniyuki: *See—*
Fukuda, Hiroyuki; Shigeta, Masatomo; Kaji, Hisatsugu; and Saitoh, Kuniyuki, 4,855,092, Cl. 264-29.500.

Saitoh, Makoto: *See—*
Takao, Shoji; Nakashima, Hiroshi; Tokumoto, Mako; Saitoh, Makoto; and Watanabe, Makoto, 4,855,159, Cl. 426-656.000.

Saitoh, Yoshihiro; Kondoh, Minoru; and Komatsu, Yukio, to Murata Kikai Kabushiki Kaisha. Driverless car travelling guide system. 4,855,656, Cl. 318-587.000.

Sakaguchi, Yoshikazu: *See—*
Moroto, Shuzo; Sumiya, Koji; Sakaguchi, Yoshikazu; Kubo, Seitoku; and Taga, Yutaka, 4,854,195, Cl. 74-867.000.

Sakai, Ritsuko. Portable food-constituent-amount display and calculating system, and device to operate the system. 4,855,945, Cl. 364-709.020.

Sakai, Tadamichi: *See—*
Katsumata, Masaaki; Takagi, Isamu; Takahashi, Eiji; Sakai, Tadamichi; Matsumoto, Yoji; Ohtsu, Hideaki; Uchida, Hiroyuki; and Asami, Kiyoshi, 4,855,106, Cl. 420-109.000.

Sakama, Mitsunori: *See—*
Yamazaki, Shunpei; Mase, Akira; Konuma, Toshimitsu; Miyazaki, Minoru; Sakama, Mitsunori; and Inushima, Takashi, 4,855,805, Cl. 357-58.000.

Sakamoto, Hideki: *See—*
Yokota, Tetsuya; Sakamoto, Hideki; and Takahashi, Naoto, 4,855,147, Cl. 426-43.000.

Sakamoto, Shunji: *See—*
Kanazawa, Hirotaka; Note, Koushun; Nakashima, Yasuhiro; Mukai, Yoshiaki; Sakamoto, Shunji; and Okamizu, Shigeo, 4,854,410, Cl. 180-140.000.

Sakamoto, Tsunenori: *See—*
Ohta, Kimihiro; Nakagawa, Tadashi; Kojima, Takeshi; Sakamoto, Tsunenori; and Kawai, Naoyuki, 4,855,013, Cl. 156-601.000.

Sakarcan, Metin, to Federal-Mogul Corporation. Wear resistant abrasive cutting wheel. 4,854,295, Cl. 125-15.000.

Sakashita, Kazuhiro; Kishida, Satoru; Hanibuchi, Toshiaki; Tomioka, Ichiro; and Arakawa, Takahiko, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit apparatus. 4,856,002, Cl. 371-21.000.

Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, to Fujikura Ltd. Corrugated heat pipe. 4,854,372, Cl. 165-46.000.

Sakayori, Hiroyuki: *See—*
Yamazaki, Shunpei; Mase, Akira; and Sakayori, Hiroyuki, 4,854,675, Cl. 350-336.000.

Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi, to Daikin Industries, Ltd. Very low temperature refrigerator. 4,854,131, Cl. 62-51.200.

Sakka, Hiroshi: *See—*
Tashiro, Yoichi; Baba, Hideki; Obatake, Kohei; Sakka, Hiroshi; and Sohara, Ichiro, 4,855,157, Cl. 426-609.000.

Sakuma, Kazuhiro; Itoh, Hirohito; Kazou, Mitsuaki; and Kuramoto, Kenji, to Japan Aviation Electronics Industry Ltd. Accelerometer. 4,854,169, Cl. 73-517.00B.

Sakuma, Kiyoshi: *See—*
Yoshida, Takayuki; Sakuma, Kiyoshi; Seshimo, Yu; and Hujii, Masao, 4,854,380, Cl. 165-152.000.

Sakuma, Masaru: *See—*
Sawano, Susumu; Sakuma, Masaru; Nagai, Hideaki; and Funabashi, Tatsuya, 4,855,917, Cl. 364-426.020.

Sakura Color Products Corp.: *See—*
Hanakura, Niichi, 4,854,332, Cl. 131-365.000.

Sakurai, Toshiharu: *See—*
Yamaji, Yasuhiro; Takahashi, Kenji; Hirata, Seiichi; and Sakurai, Toshiharu, 4,855,807, Cl. 357-72.000.

Salazar, Mariano, to Goodyear Tire & Rubber Company, The. Self-emulsifiable resin powder. 4,855,402, Cl. 528-487.000.

Sallas, John J.; Weber, Richard M.; and Lamance, David S., to Halliburton Geophysical Services, Inc. Seismic vibrator hold-down weight monitor/controller. 4,855,967, Cl. 367-190.000.

Salzer, Heinrich. Blast resistant composite framing section. 4,854,248, Cl. 109-79.000.

Sam Stevens, Inc.: *See—*
Stevens, Sammy L., 4,854,390, Cl. 172-1.000.

Samardzija, Nikola, to Du Pont de Nemours, E. I., and Company. Automated microwave tuning system for de-emulsifier systems. 4,855,695, Cl. 333-17.300.

Samoilovich, David S.: *See—*
Zolotar, Arkady I.; Samoilovich, David S.; Karakhanian, Vladimir K.; Kuznetsov, Vyacheslav I.; Kopelyansky, Vladimir B.; Kuznetsov, Oleg V.; Nesterenko, Vladimir E.; Karachaban, Nikolai G.; Shmuratov, Georgy E.; Kljuzhin, Evgeny A.; and Livshits, Semen V., 4,854,820, Cl. 415-171.100.

Samson, Charles E.: *See—*
Schaller, David R.; Megahed, El-Sayed; and Samson, Charles E., 4,855,647, Cl. 315-209.00R.

Samsung Semiconductors and Telecommunications Co., Ltd.: *See—*
Jun, Dong-Soo, 4,855,628, Cl. 307-530.000.

Sanborn, James R.: *See—*
Fahmy, Mohamed H.; and Sanborn, James R., 4,855,474, Cl. 558-95.000.

Sanden Corporation: *See—*
Kurosawa, Akihito; Suzuki, Kazuyuki; Anazawa, Osamu; and Yoshihara, Masayuki, 4,854,477, Cl. 221-1.000.

Sandoz Ltd.: *See—*
Casciani, Robert V., 4,855,075, Cl. 252-174.210.
Gadient, Fulvio; and Vogel, Arnold, 4,855,288, Cl. 514-45.000.
Markstein, Rudolf; and Palacios, Jose, 4,855,306, Cl. 514-280.000.

Sandra L. May: *See—*
May, Donald R., 4,854,782, Cl. 405-230.000.

Sandstrom, Paul H., to Goodyear Tire & Rubber Company, The. Secondary vulcanization accelerator. 4,855,364, Cl. 525-332.700.

Sandstrom, William A.: *See—*
Khinkis, Mark J.; Patel, Jitendra G.; and Sandstrom, William A., 4,854,249, Cl. 110-342.000.

Sandten, Herbert: *See—*
Averdick, Gunter; and Sandten, Herbert, 4,854,026, Cl. 29-157.30R.

Sano, Eisaku: *See—*
Uchida, Shinya; Hirata, Akira; Ebihara, Hideyuki; Yoshikawa, Eiichi; Sano, Eisaku; and Uehara, Kazuhiro, 4,854,452, Cl. 209-534.000.

Sano, Toshifumi: *See—*
Komoto, Mitsuo; Matsuo, Youichi; and Sano, Toshifumi, 4,854,377, Cl. 165-80.400.

Sanraku Incorporation: *See—*
Fliri, Hans; and Mak, Ching Pong, 4,855,421, Cl. 540-357.000.

Sanshin Kogyo Kabushiki Kaisha: *See—*
Koike, Takashi, 4,855,733, Cl. 340-870.190.

Sansone, Ronald P.; and Chrosny, Wojciech M., to Pitney Bowes, Inc. Postage accounting device. 4,855,920, Cl. 364-464.020.

Santa Barbara Research Center: *See—*
Holmes, Alan W., 4,855,588, Cl. 250-203.00R.

Santamaki, Harry J.; Korhonen, Ilkka O.; and Haikonen, Pentti O., to Valtion teknillinen tutkimuskeskus. Method and apparatus for detecting the most powerfully changed picture areas in a live video signal. 4,855,825, Cl. 358-135.000.

Santandrea, Luciano: *See—*
Luciani, Sabatino; and Santandrea, Luciano, 4,854,033, Cl. 29-596.000.

Santel, Hans-Joachim: *See—*
Jelich, Klaus; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,854,964, Cl. 71-92.000.

Sanyo Electric Co., Ltd.: *See—*
Kuwano, Yukinori; Tsujino, Yoshikazu; and Hamada, Yuji, 4,855,214, Cl. 430-281.000.
Ohtawara, Isao; and Ohgochi, Satoshi, 4,856,051, Cl. 379-88.000.
Sato, Hironobu, 4,855,629, Cl. 310-49.00R.
Tunekawa, Shouji; Yamada, Wazoh; Hara, Yoshitaka; and Suzuki, Fujio, 4,854,376, Cl. 165-54.000.

Sapozhnikov, Gregory: *See—*
Thomas, Bruce A.; Sapozhnikov, Gregory; and Shaw, Robert L., 4,855,565, Cl. 219-121.790.

Sarkozy, Robert F.: *See—*
Simson, Morris; Fabricius, John H.; Browne, Ronnie; Waugh, Arthur; Sarkozy, Robert F.; and Lai, Chiu K. S., 4,854,266, Cl. 118-728.000.

Sasai, Atsuyoshi: *See—*
Kitani, Shigehisa; Sasai, Atsuyoshi; and Shimizu, Hirokimi, 4,856,090, Cl. 455-607.000.

Sasaki, Mitsuo, to Just Japan Co., Ltd. Assembly-type barricade. 4,854,767, Cl. 404-6.000.

Sasaki, Shigekuni; and Hasuda, Yoshinori, to Nippon Telegraph and Telephone Corporation. Process for preparing polyesterimide from bis(hydroxyphthalimide). 4,855,390, Cl. 528-170.000.

Sasaki, Susumu: *See—*
Watanabe, Isato; Yamamoto, Shigehiko; Taguchi, Sadanori; and Sasaki, Susumu, 4,855,637, Cl. 313-346.00R.

Sasano, Akira: *See—*
Yamamoto, Hideaki; Sasano, Akira; Matsumaru, Haruo; Tanaka, Yasuo; and Tsukada, Toshihisa, 4,855,795, Cl. 357-2.000.

Sato, Hironobu, to Sanyo Electric Co., Ltd. DC brushless motor with three teeth and two windings. 4,855,629, Cl. 310-49.00R.

Sato, Isamu; Ishida, Masato; Abe, Eiichi; and Takeda, Hiroaki, to Canon Kabushiki Kaisha. Image recording apparatus having plural light sources, and having arbitrarity combinable functions. 4,855,767, Cl. 346-160.000.

Sato, Kazuhito, to Toshiba Kikai Kabushiki Kaisha. Method for injection compression molding. 4,855,095, Cl. 264-40.500.

Sato, Masaei; and Hosoya, Yukiteru, to Mitsuba Electric Manufacturing Co., Ltd. Brush holding device. 4,855,631, Cl. 310-239.000.

Sato, Masanobu: *See—*
Sonoda, Akikazu; Fujita, Sinji; Sato, Masanobu; Tomono, Syoji; and Nakamura, Hisanori, 4,855,560, Cl. 219-86.250.

Sato, Masatoshi: *See—*
Akasaka, Hideki; and Sato, Masatoshi, 4,855,975, Cl. 369-13.000.

Sato, Shigeji: *See—*
Yamahira, Yoshiya; Fujioka, Keiji; and Sato, Shigeji, 4,855,134, Cl. 424-85.700.

Sato, Tomomasa: *See—*
Jaffe, Jules S.; Cassereau, Philippe; and Sato, Tomomasa, 4,855,961, Cl. 367-7.000.

Sato, Tsunehiko: *See—*
Chino, Naoyoshi; Hiraki, Yasuhito; and Sato, Tsunehiko, 4,854,262, Cl. 118-411.000.

Sato, Yasuji; and Hino, Fumio, to Kabushiki Kaisha Toshiba. Office line interface circuits. 4,856,058, Cl. 379-394.000.

Satoh, Kazushi: *See—*
Mutoh, Kiyoyuki; Satoh, Kazushi; and Kobayashi, Kouichirou, 4,855,381, Cl. 528-23.000.

Satomura, Masato; Iwakura, Ken; Takashima, Masanobu; and Igarashi, Akira, to Fuji Photo Film Co., Ltd. Recording material and method for producing the same. 4,855,282, Cl. 503-218.000.

Satomura, Masato: *See—*
Igarashi, Akira; Satomura, Masato; and Iwakura, Ken, 4,855,278, Cl. 503-208.000.

Satou, Motohiro: *See—*
Yamamoto, Akihiko; Kohno, Akiomi; Yamada, Toshihiri; Satou, Motohiro; Taguchi, Keiji; and Yokoi, Kazuaki, 4,854,495, Cl. 228-124.000.

Saucy, Gabriel G.: *See—*
Chan, Ka-Kong; and Saucy, Gabriel G., 4,855,085, Cl. 260-396.00R.

Saunders, David H.: *See—*
Heron, Roger A.; Saunders, David H.; and Fairhurst, Robert M., 4,854,090, Cl. 51-410.000.

Saunders, James R., to BD Systems, Inc. Automated remote telemetry paging system. 4,856,047, Cl. 379-57.000.

Saunders, Martin, to Yale University. Stochastic method for finding molecular conformations. 4,855,931, Cl. 364-499.000.

Saunders, William J.; and Crosby, Samuel C., to Coca-Cola Company, The. Cabinet and method of assembly of a beverage dispenser. 4,854,655, Cl. 312-257.100.

Saussier, Daniel: *See—*
Cretin, Jacques; and Saussier, Daniel, 4,855,732, Cl. 340-856.000.

Savas, Nedim: *See—*
Winter, Russell K.; Harvey, Thomas D.; Savas, Nedim; and Kain, Richard S., 4,854,535, Cl. 248-225.200.

Saveliev, Viktor S.: *See—*
Beresnev, Alexei S.; Serykh, Leonid A.; Saveliev, Viktor S.; Volkoedov, Valery S.; and Stupin, Igor V., 4,855,563, Cl. 219-121.390.

Savio, S.p.A.: *See—*
Boller, Giorgio; Ferro, Francesco; and Colli, Luigi, 4,854,509, Cl. 242-18.00R.
Boller, Giorgio; Montali, Sergio; and Colli, Luigi, 4,854,513, Cl. 242-18.00R.
Montali, Sergio; Boller, Giorgio; and Colli, Luigi, 4,854,512, Cl. 242-18.0DD.
Romanin, Bruno; Ferro, Francesco; and Colli, Luigi, 4,854,510, Cl. 242-18.0DD.
Romanin, Bruno; Ferro, Francesco; and Colli, Luigi, 4,854,514, Cl. 242-18.00R.

Savio SpA: *See—*
Montali, Sergio; Boller, Giorgio; and Colli, Luigi, 4,854,511, Cl. 242-18.0DD.

Savoyet, Jean-Louis, to Societe Civile de Brevets, J.L.S. Method and device for automatic spectrometric analysis of a liquid, particularly of milk. 4,855,601, Cl. 250-339.000.

Sawada, Hiroshi: *See—*
Yamamoto, Koji; Nakajima, Akihisa; Sawada, Hiroshi; Shinagawa, Noriteru; and Itano, Jiro, 4,856,048, Cl. 379-60.000.

Sawaki, Nobuhiko: *See—*
Akasaki, Isamu; and Sawaki, Nobuhiko, 4,855,249, Cl. 437-81.000.

Sawaki, Yukichi, to Brother Kogyo Kabushiki Kaisha. Sheet roll cartridge and method for loading the same to image recording apparatus. 4,855,791, Cl. 355-27.000.

Sawano, Susumu; Sakuma, Masaru; Nagai, Hideaki; and Funabashi, Tatsuya, to Tokico, Ltd. Antiskid control device. 4,855,917, Cl. 364-426.020.

Sawayama, Noboru: *See—*
Takashima, Masayuki; and Sawayama, Noboru, 4,855,783, Cl. 355-298.000.

Sayers, Anthony D., to U.S. Philips Corporation. Angle digitizer. 4,855,744, Cl. 341-116.000.

Sayers, Kenneth H.: *See—*
de Goncourt, Louis; and Sayers, Kenneth H., 4,854,606, Cl. 280-699.000.

Saykowski, Franz: *See—*
Wurminghausen, Thomas; Schneider, Karl; Saykowski, Franz; and Frohlen, Hans G., 4,855,473, Cl. 556-471.000.

Scaduto, Onofrio. Constant camber suspension system. 4,854,603, Cl. 280-112.100.

Scales, Walter C., to MITRE Corporation, The. Low data rate communications link. 4,856,028, Cl. 375-97.000.

Scanlan International: *See—*
Solem, Jan O.; Olin, Christian; and Scanlan, Timothy M., 4,854,318, Cl. 128-346.000.

Scanlan, Timothy M.: *See—*
Solem, Jan O.; Olin, Christian; and Scanlan, Timothy M., 4,854,318, Cl. 128-346.000.

Scarfo, Louis: *See—*
Abrutyn, Eric S.; Scarfo, Louis; and Chromecek, Richard, 4,855,127, Cl. 424-411.000.

Scelba, Stephen S., to Presto Lock, Inc. Zipper locking apparatus for luggage cases. 4,854,139, Cl. 70-68.000.

Schabmuller, Heinz. Stowing device for a cable feed, particularly for the connecting cable of a central aircraft power supply system at airports. 4,855,539, Cl. 191-12.20A.

Schachtele, Christoph: *See—*
Trostmann, Uwe; Schachtele, Christoph; Mannhardt, Karl; Rudolph, Claus; and Marme Dieter, 4,855,489, Cl. 560-250.000.

Schade, Gerold; Paulus, Wilfried; and Schmitt, Hans-Georg, to Bayer Aktiengesellschaft. Iodopropargyl ethers useful as antimicrobial agents. 4,855,318, Cl. 514-467.000.

Schaffer, Leslie E.: *See—*
Garg, Diwakar; Dyer, Paul N.; Schaffer, Leslie E.; Wrecsics, Ernest L.; Dimos, Duane; and Mueller, Carl F., 4,855,188, Cl. 428-627.000.

Schaller, David R.; Megahed, El-Sayed; and Samson, Charles E., to Rayovac Corporation. Flashlight with soft turn on control. 4,855,647, Cl. 315-209.00R.

Schaller, Klaus: *See—*
Lockhoff, Oswald; Hayauchi, Yutaka; Stadler, Peter; Stunkel, Klaus G.; Streissle, Gert; Paessens, Arnold; Klimetzek, Volker; Zeiler, Hans-Joachim; Metzger, Karl G.; Kroll, Hein-Peter; Brunner, Helmut; and Schaller, Klaus, 4,855,283, Cl. 514-8.000.

Schaub, Michael, to Wenger SA. Modular pocketknife. 4,854,045, Cl. 30-155.000.

Schell, David L.: *See—*
Getreuer, Kurt W.; and Schell, David L., 4,855,977, Cl. 369-32.000.

Schempp, Ulrich; and Ruehr, Volker, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Rim for a motor vehicle wheel. 4,854,646, Cl. 301-65.000.

Schepergerdes, Wilhelm F.: *See—*
Reece, Marvin P.; Schepergerdes, Wilhelm F.; and Renfrow, Frampton, 4,854,613, Cl. 285-39.000.

Schering Aktiengesellschaft: *See—*
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Schillinger, Hans: *See—*
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Schimandle, John J.: *See—*
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Schirmer, Henry G., to W. R. Grace & Co. Method of making a laminate via corona discharge treatment. 4,854,999, Cl. 156-272.600.

Schlegel Corporation: *See—*
Rogers, Tracy G.; Nier, Michael R.; and Moran, John, 4,854,077, Cl. 49-322.000.

Schlein, Allen P., to Viratec, Inc. Apparatus and method for decontaminating virus-infected body fluids. 4,855,064, Cl. 210-764.000.

Schlie, Donald R.: *See—*
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Schlotterbeck, Stephen C.: *See—*
Strosser, Richard P.; Wynn, Edward J.; Chow, Mark K.; and Schlotterbeck, Stephen C., 4,855,924, Cl. 364-468.000.

Schlottke, Karl-Heinz; and Peter, Jurgen, to E.C.H. Will GmbH. Method of and apparatus for gathering and manipulating stacked zig-zag formations of paper sheets. 4,854,932, Cl. 493-357.000.

Schlumberger Technology Corp.: *See—*
Banavar, Jayanth R.; Johnson, David L.; Nagel, Sidney R.; and Safinya, Kambiz A., 4,855,912, Cl. 364-422.000.

Schmersahl, Hein U.: *See—*
Nandi, Kumaresh; Fischer, Helga; Herrmann, Wilfried; Kohne, Hans; Lahr, Wolfgang; Schmersahl, Hein U.; and Walch, Hatto, 4,855,300, Cl. 514-264.000.

Schmidt, Guenther: *See—*
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Schmidt, Hans-Jurgen: *See—*
Richter, Ekkehard; Juntgen, Harald; Schmidt, Hans-Jurgen; and Knoblauch, Karl, 4,855,116, Cl. 423-239.000.

Schmidt, Richard Q., to Robotic Vision Systems, Inc. 3-D measurement via multiple gating. 4,854,698, Cl. 356-5.000.

Schmidt, Robert R.: *See—*
Jelich, Klaus; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,854,964, Cl. 71-92.000.

Schmidt, Wendel: *See—*
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Schmiechen, Ralph: *See—*
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Schmits, Wilhelm: *See—*
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Schmitt, George P.: *See—*
Rudik, William J.; Schmitt, George P.; and Shipley, John F., 4,855,333, Cl. 522-71.000.

Schmitt, Hans-Georg: *See—*
Schade, Gerold; Paulus, Wilfried; and Schmitt, Hans-Georg, 4,855,318, Cl. 514-467.000.

Schmitt, Hans-Jurgen: *See—*
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Schnegg, Julius: *See—*
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Schneider, Fernand: *See—*
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Schneider, Jack H.; and Gray, Larry O., to Dana Corporation. Voice actuated vehicle security system. 4,856,072, Cl. 381-86.000.

Schneider, Karl: *See—*
Wurminghausen, Thomas; Schneider, Karl; Saykowski, Franz; and Frohlen, Hans G., 4,855,473, Cl. 556-471.000.

Schnipke, Dennis E., to Premier Industrial Corporation. Slow-close apparatus for minimizing water hammer and/or shock waves resulting from closure of valve means. 4,854,344, Cl. 137-606.000.

Schoeps, Knut C.; and Westerberg, Sven P. J., to Atlas Copco Aktiebolag. Hydraulic torque impulse generator with bypass mechanism. 4,854,916, Cl. 464-25.000.

Schold, George R. Disperser apparatus with two coaxial drive shafts. 4,854,720, Cl. 366-294.000.

Scholkens, Bernward: *See—*
Wagner, Adalbert; Kleemann, Heinz-Werner; Ruppert, Dieter; and Scholkens, Bernward, 4,855,286, Cl. 514-19.000.

Scholz, Bernhard-Peter, to Huls Aktiengesellschaft. Method of preparing pulverulent olefin-maleic anhydride copolymers. 4,855,372, Cl. 526-201.000.

Scholz, Daniel E., to Parker-Hannifin Corporation. Vapor separating and metering pump. 4,854,824, Cl. 417-69.000.

Schott Glaswerke, Firma: *See—*
Claussen, Nils; Petzow, Gunter; Nieszery, Katharina; Panhorst, Wolfgang; and Weisskopf, Karl-Ludwig, 4,855,259, Cl. 501-9.000.
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Schreiber, Daniel J.: *See—*
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Schroeter, Johannes, to Buck Chemisch-Technische Werke GmbH & Co. Method for protecting objects from destruction by laser beams using solid or gaseous protective elements. 4,855,605, Cl. 250-505.100.

Schultz, John, Jr., to General Electric Company. White touch pads for capacitive touch control panels. 4,855,550, Cl. 200-600.000.

Schulz, Reiner: *See—*
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Schupp, Eberhard: *See—*
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Schuppiser, Jean-Luc; and Besnard, Marie-Madeleine, to Rhone-Poulenc Chimie. Polysaccharide-thickened aqueous acid cleaning compositions. 4,855,069, Cl. 252-87.000.

Schutt, Hans U., to Shell Oil Company. Method of abating corrosion in crude oil distillation units. 4,855,035, Cl. 208-47.000.

Schwartz, Ana: *See—*
Hirsch, Eitan; Gutmann, Alexander; Schwartz, Ana; Goren, Eliezer; Perlmuter, Nikolai; and Tal, Reuven, 4,854,240, Cl. 102-476.000.

Schwartz, Nira. Controllable telephone annunciator. 4,856,055, Cl. 379-374.000.

Schwerzel, Thomas: *See—*
Goeckel, Ulrich; Petersen, Harro; Osterloh, Rolf; Schupp, Eberhard; Loch, Werner; and Schwerzel, Thomas, 4,855,394, Cl. 528-263.000.

Schwinn, Georg, to M u. W Verpackungen. Portable packing bag having a two section loop handle. 4,854,733, Cl. 383-29.000.

Scientific-Atlanta, Inc.: *See—*
Huddleston, Paul M.; Porter, G. Burns, Jr.; and Rooney, David T., 4,855,922, Cl. 364-464.040.

Sciortino, Michael J.; and Schmidt, Wendel, to Glenview Security Systems, Inc. Lock type sealed paper currency collector and security device. 4,854,247, Cl. 109-1.00R.

Scoles, Kevin J.: *See—*
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Scott, Brent. Kaleidoscope with restrictive aperture for visual enhancement. 4,854,657, Cl. 350-4.200.

Scott, Martin: *See—*
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Sealand Technology, Inc.: *See—*
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Sealed Air: *See—*
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Sears, James B., Jr.: *See—*
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Sears Manufacturing Company: *See—*
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Secretary of State for Defence in her Majesty's Government of the United Kingdom of Great Britian and Northern Ireland, The: *See—*
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Seely, Michael J.: *See—*
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Seeq Technology, Inc.: *See—*
Cioaca, Dumitru G., 4,855,955, Cl. 365-185.000.

Sehringer, George K.: *See—*
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Seidelmann, Dieter: *See—*
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Seigenji, Takashi: *See—*
Azumai, Hideo; Fujii, Koichi; Seigenji, Takashi; and Yoshioka, Keiichi, 4,855,803, Cl. 357-45.000.

Seigneur, Jean-Michel; and Menu, Jean-Pierre, to ETAT Francais. Graphic processor output dynamic range corrector system for analysis of brightness contrast. 4,855,650, Cl. 315-383.000.

Seiko Epson Corporation: *See—*
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Seki, Masaki; and Amano, Norihisa, to Fanuc Ltd. Complex curved surface creation method. 4,855,921, Cl. 364-474.290.

Seki, Masaki; and Amano, Norihisa, to Fanuc Ltd. Complex curved surface creation method. 4,855,926, Cl. 364-474.290.

Seki, Masaki; and Amano, Norihisa, to Fanuc Ltd. Complex curved surface creation method. 4,855,927, Cl. 364-474.290.

Seki, Reiji: *See—*
Ishimura, Toshihiko; Ishikawa, Norio; Akada, Yasuaki; Seki, Reiji; and Taniguchi, Nobuyuki, 4,855,778, Cl. 354-412.000.

Sekine, Akihiko; Wada, Shinji; Yokokura, Takashi; Nunokawa, Kazuo; and Hideshima, Masayuki, to Tokyo Kogaku Kikai Kabushiki Kaisha. Laser beam scanning type eye fundus camera. 4,854,691, Cl. 351-221.000.

Sekine, Katsuyuki: *See—*
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Selgrad, James: *See—*
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Semersky, Frank E., to Plastic Technologies, Inc. Tamper resistant wide mouth package with dynamic seal. 4,854,472, Cl. 220-306.000.

Semiconductor Energy Laboratory Co., Ltd.: *See—*
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Yamazaki, Shunpei; Mase, Akira; Konuma, Toshimitsu; Miyazaki, Minoru; Sakama, Mitsunori; and Inushima, Takashi, 4,855,805, Cl. 357-58.000.
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Sencorp: *See—*
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Senma, Toshitaka; Imamura, Tomoatsu; and Shimada, Kazuyuki, to Ricoh Company, Ltd. Semiconductor laser control apparatus. 4,856,008, Cl. 372-31.000.

Seno, Cornelio L. Three chamber continuous combustion engine. 4,854,279, Cl. 123-204.000.

Sensabaugh, Andrew J., Jr.: *See—*
Banerjee, Chandra K.; Farrier, Ernest G.; Harris, James L.; Norman, Alan B.; Resce, James L.; Reynolds, John H., IV; Ridings, Henry T.; Sensabaugh, Andrew J., Jr.; Shannon, Michael D.; and Shelar, Gary R., 4,854,331, Cl. 131-194.000.

Sensor Science: *See—*
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Senyard, Corley P., Jr.: *See—*
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Senyard, Corley P., Sr.; Senyard, Corley P., Jr.; and Senyard, Thomas J. Centrifugal oil separator for removing oil from a waste flowing stream. 4,855,050, Cl. 210-512.100.

Senyard, Thomas J.: *See—*
Senyard, Corley P., Sr.; Senyard, Corley P., Jr.; and Senyard, Thomas J., 4,855,050, Cl. 210-512.100.

Separation Technology, Inc.: *See—*
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Seppelt, Wolfgang; Sproesser, Linhard; Kersten, Siegfried; Hofmeister, Peter; and Kuenast, Christoph, to Basf Aktiengesellschaft. O-(O-ethyl-S-alkylphosphoryl)-O-(carbamyl)-pyrocatechol derivatives. 4,855,140, Cl. 424-405.000.

Seraphim, Donald P.: *See—*
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Serco Mold, Inc.: *See—*
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Serio, Donald L., Jr., to Serco Mold, Inc. Container and perimeter seal therefor. 4,854,476, Cl. 220-357.000.

Service Tool Die & Mfg. Co.: *See—*
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Serykh, Leonid A.: *See—*
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Seshimo, Yu: *See—*
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Seto, Kunihira: *See—*
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Setteducati, Mark. Three dimensional puzzle employing a reflective surface. 4,854,591, Cl. 273-157.00R.

Sevadio, Robert. Self-energizing disc brake shoe. 4,854,425, Cl. 188-72.200.

Sevigny, Albert R. Door mounted alarm assembly. 4,855,715, Cl. 340-545.000.

Sexton, Rodney N.; Woolf, Floyd S.; and Ruud, Timothy W., to ICEE USA Corporation. Rear seal assembly for a chamber holding a partially frozen beverage. 4,854,743, Cl. 384-130.000.

Sexton, Rodney N.; and Woolf, Floyd S., to ICEE-USA Corporation. Torque transmission unit for partially frozen beverage system. 4,854,923, Cl. 474-84.000.

SGS-Thomson Microelectronics S.A.: *See—*
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Shackelford, Scott A.: *See—*
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Shallenberger, John M.; and Ferlan, Stephen J., to Westinghouse Electric Corp. Reconstitutable control rod spider assembly. 4,855,100, Cl. 376-327.000.

Shams, Gamal: *See—*
Miller, Duane D.; Feller, Dennis R.; Clark, Michael T.; Adejare, Adeboye; Romstedt, Karl J.; and Shams, Gamal, 4,855,476, Cl. 558-410.000.

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Shank, Gary K.: *See—*
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Shank, Gordon W., to Tektronix, Inc. Time interval measurement system for analog oscilloscope. 4,855,968, Cl. 368-115.000.

Shannon, Michael D.: *See—*
Banerjee, Chandra K.; Farrier, Ernest G.; Harris, James L.; Norman, Alan B.; Resce, James L.; Reynolds, John H., IV; Ridings, Henry T.; Sensabaugh, Andrew J., Jr.; Shannon, Michael D.; and Shelar, Gary R., 4,854,331, Cl. 131-194.000.

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Sharma, Ashutosh H.: *See—*
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Sharma, Devendra N. Beam deflector. 4,855,602, Cl. 250-396.00R.

Sharma, Satish C.: *See—*
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Sharp Kabushiki Kaisha: *See—*
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Matsui, Sadayoshi; Taneya, Mototaka; Matsumoto, Mitsuhiro; and Hosoba, Hiroyuki, 4,856,015, Cl. 372-50.000.
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Sharpe-Geisler, Bradley A.: *See—*
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Sharpe-Geisler, Valli R.: *See—*
Harrop, David; Sharpe-Geisler, Bradley A.; and Sharpe-Geisler, Valli R., 4,855,711, Cl. 340-323.00R

Shaubach, Robert M.; Dussinger, Peter; and Buchko, Matthew T., to Thermacore, Inc. Vapor resistant arteries. 4,854,379, Cl. 165-104.260.

Shaull, Lawrence M., to Boeing Company, The. Adjustable loop clamp 4,854,015, Cl. 24-16.00R.

Shaw, Robert L.: *See—*
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Shearer, Thomas E., to Producers Color Service, Inc. Method and apparatus for converting film to line snychronized video signal data. 4,855,836, Cl. 358-214.000.

Shelar, Gary R.: *See—*
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Shell Offshore Inc.: *See—*
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Shell Oil Company: *See—*
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Korcz, William H., 4,854,110, Cl. 53-452.000
Rambow, Frederick H. K., 4,855,965, Cl. 367-69.000
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Stem, Stephen C.; and Evans, Wayne E., 4,855,529, Cl. 585-737.000.
van Broekhoven, Johannes A. M.; and Doyle, Michael J., 4,855,400, Cl. 528-392.000.
van Broekhoven, Johannes A. M., 4,855,401, Cl. 528-392.000.
Van Doorn, Johannes A.; Drent, Eit; Van Leeuwen, Petrus W. N. M.; Meijboom, Nicolaas; Van Oort, Aart B.; and Wife, Richard L., 4,855,399, Cl. 528-392.000.
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Sherwin Williams Company, The: *See—*
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Sherwood Medical Company: *See—*
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Shibata, Isamu: *See—*
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Shibata, Takanori: *See—*
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Shibuya, Kiminobu; and Takayanagi, Kenichiro, to Sony Corporation. Method of fixing a color screening structure for a color picture tube. 4,854,905, Cl. 445-30.000.

Shibuya, Tsuyoshi, to Tokyo Juki Industrial Co., Ltd. Piezoelectric actuator. 4,855,633, Cl. 310-328.000.

Shigaki, Masafumi; Kurihara, Hiroshi; and Nishi, Hidetoshi, to Fujitsu Limited. Frequency dividing apparatus for high frequency. 4,855,895, Cl. 363-157.000.

Shigeki, Terumitsu: *See—*
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Shikinami, Yasuo; Hata, Kunihiro; and Ohmura, Yutaka, to Takiron Co., Ltd. Sticking agent of ionic-conductive polymer. 4,855,077, Cl. 252-518.000.

Shimada, Kazuyuki, to Ricoh Company, Ltd. Recording signal generating circuit for printing. 4,855,841, Cl. 358-296.000.

Shimada, Kazuyuki; and Shibata, Isamu, to Ricoh Company, Ltd. Semiconductor laser control circuit. 4,856,011, Cl. 372-38.000.

Shimada, Kazuyuki: *See—*
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Shimada, Makoto, to Tachi-S Co., Ltd. Method of manufacturing automotive seat. 4,854,997, Cl. 156-245.000.

Shimada, Osamu: *See—*
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Shimano Industrial Company Limited: *See—*
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Nagano, Masashi, 4,854,924, Cl. 474-140.000.

Shimizu, Atsushi: *See—*
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Shimizu, Hirokimi: *See—*
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Shimizu, Isamu: *See—*
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Shimizu, Isoo; and Tokumoto, Yuuichi, to Nippon Petrochemicals Company, Limited. Method for producing p-alkylstyrene. 4,855,518, Cl. 585-319.000.

Shimizu, Isoo; Mitsuyuki, Hitoshi; Uchida, Kazumichi; and Tokumoto, Yuuichi, to Nippon Petrochemicals Company. Method for producing arylethylene. 4,855,519, Cl. 585-319.000.

Shimizu, Masahiro: *See—*
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Shimizu, Mineo: *See—*
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Shimizu, Setsuo: *See—*
Matsui, Tomoki; Kimoto, Hidesuke; and Shimizu, Setsuo, 4,855,663, Cl. 320-20.000.

Shimizu, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Electromagnetic servo drive for power steering. 4,855,655, Cl. 388-820.000.

Shimo, Hiroyuki; Kanesige, Isao; and Tanaka, Nobuo, to Kuraray Co., Ltd. Laminate with a blend layer of polyesteramide and ethylene-vinyl acetate copolymer. 4,855,181, Cl. 428-336.000.

Shimoda, Makoto; Ishino, Tatsuyuki; and Matsuo, Makoto, to Fujitsu Limited. POS system. 4,855,908, Cl. 364-405.000.

Shimomura, Yasuo: *See—*
Takeuchi, Kunihiko; Baba, Fujio; and Shimomura, Yasuo, 4,855,729, Cl. 340-825.050.

Shimotohno, Kunitada: *See—*
Morinaga, Tsuto; Miura, Kin-ichiro; Shimotohno, Kunitada; Ikegami, Masato; and Ichikawa, Yataro, 4,855,237, Cl. 435-320.000.

Shimura, Kazuo, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 4,855,597, Cl. 250-327.200.

Shin-Etsu Chemical Co., Ltd.: *See—*
Mutoh, Kiyoyuki; Satoh, Kazushi; and Kobayashi, Kouichirou, 4,855,381, Cl. 528-23.000.

Shin Nisso Kako Co., Ltd.: *See—*
Ueyama, Shinichiro; Furukawa, Masayuki; and Nishikawa, Tadaichi, 4,855,389, Cl. 528-168.000.

Shinagawa, Noriteru: *See—*
Yamamoto, Koji; Nakajima, Akihisa; Sawada, Hiroshi; Shinagawa, Noriteru; and Itano, Jiro, 4,856,048, Cl. 379-60.000.

Shinbayashi, Toshiya; and Takeuchi, Takashi, to Hitachi, Ltd. Optical information recording and reproducing apparatus with amplitude limitation of a detected signal in a write operation mode. 4,855,988, Cl. 369-116.000.

Shindo, Robert S. Long range trigger-actuated squirt gun. 4,854,480, Cl. 222-79.000.

Shingaki, Kouichi: *See—*
Kitano, Hirohisa; Saito, Itaru; Shingaki, Kouichi; Matsubara, Ken; and Masuda, Tomohiko, 4,854,678, Cl. 350-356.000.

Shinkoda, Kazuya: *See—*
Kohara, Yoshiaki; and Shinkoda, Kazuya, 4,854,666, Cl. 350-96.140.

Shinozaki, Shinichiro: *See—*
Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi, 4,854,131, Cl. 62-51.200.

Shinozawa, Yusaku; and Sugiura, Shin, to Topy Kogyo Kabushiki Kaisha. Valve hole punching apparatus for a wheel. 4,854,201, Cl. 83-140.000.

Shinskey, Francis G., to Foxboro Company, The. Method and apparatus for statistical set point bias control. 4,855,897, Cl. 364-148.000.

Shio, Kiyomi: *See—*
Katahira, Keiichi; Shio, Kiyomi; and Kanai, Noriyuki, 4,854,371, Cl. 164-431.000.

Shiomi, Yutaka: *See—*
Saito, Yasuhisa; Takagishi, Hisao; Nakamura, Hiroshi; Okuno, Kohichi; Shiomi, Yutaka; and Kamio, Kunimasa, 4,855,339, Cl. 523-400.000.

Shionogi & Co., Ltd.: *See—*
Mori, Sachio; Iwakura, Hikozo; and Takechi, Shozo, 4,855,449, Cl. 548-512.000.

Shipley, John F.: *See—*
Rudik, William J.; Schmitt, George P.; and Shipley, John F., 4,855,333, Cl. 522-71.000.

Shiraishi, Akihiko; Kato, Masatake; and Kawamoto, Kenichi, to Canon Kabushiki Kaisha. Video camera body and detachable lens each containing a memory for storing signals indicative of spectral characteristics. 4,855,814, Cl. 358-29.000.

Shiraishi, Daiichi: *See—*
Hayakawa, Shigeru; Shiraishi, Daiichi; and Murakami, Hisakazu, 4,854,617, Cl. 292-216.000.

Shiraishi, Noriaki; Kamiyama, Sigeru; Amioka, Shigenori; and Okada, Akiyoshi, to Mazda Motor Corporation. Upper body structure for a convertible vehicle. 4,854,634, Cl. 296-108.000.

Shirakami, Yoshifumi: *See—*
Kurami, Miki; Shirakami, Yoshifumi; Takahashi, Keietsu; and Ueda, Nobuo, 4,855,353, Cl. 525-54.100.

Shiraki, Toshihiko: *See—*
Kohigashi, Minoru; Shiraki, Toshihiko; and Tsujimoto, Akito, 4,854,749, Cl. 384-482.000.

Shively, Nina. Stuffed horse convertible to unicorn. 4,854,908, Cl. 446-100.000.

Shivers, Joseph R.: *See—*
Cojocari, Brian S.; and Shivers, Joseph R., 4,854,643, Cl. 297-452.000.

Shmuratov, Georgy E.: *See—*
Zolotar, Arkady I.; Samoilovich, David S.; Karakhanian, Vladimir K.; Kuznetsov, Vyacheslav I.; Kopelyansky, Vladimir B.; Kuznetsov, Oleg V.; Nesterenko, Vladimir E.; Karachaban, Nikolai G.; Shmuratov, Georgy E.; Kljuzhin, Evgeny A.; and Livshits, Semen V., 4,854,820, Cl. 415-171.100.

Shono, Hiroaki: *See—*
Kitamura, Tadanori; Shono, Hiroaki; and Kodama, Atsuki, 4,855,122, Cl. 423-447.100.

Showa Aluminum Corporation: *See—*
Otsuka, Ryotatsu; Tanimoto, Shigemi; and Toyoda, Kazuo, 4,854,968, Cl. 75-63.000.

Showa Denko Kabushiki Kaisha: *See—*
Moteki, Yoshihiro, 4,855,363, Cl. 525-207.000.

Shreeve, Robert W. Method and process for testing the reliability of integrated circuit (IC) chips and novel IC circuitry for accomplishing same. 4,855,672, Cl. 324-158.00R.

Shuman, Joseph L. Portable grill assembly. 4,854,297, Cl. 126-30.000.

Shumway, Dale F.; and Robbins, Harry C., to Sherex Chemical Company, Inc. Method for producing stablized imidazoline derivatives. 4,855,440, Cl. 548-353.000.

Shutske, Gregory M. Substituted 9-amino-spiro(cycloalkyl(B)quinoline-2,1'cycloalkanes. 4,855,479, Cl. 560-18.000.

Si, Stephen S. C.: *See—*
Wang, Eugene T.; and Si, Stephen S. C., 4,855,616, Cl. 307-269.000.

Sichel, Enid K., to Masschusetts Institute Of Technology. Digital storage. 4,855,985, Cl. 369-100.000.

Sieben, Murray K.; and Rohs, Gordon L. Remotely operated hatch covers for tank trucks and the like. 4,854,076, Cl. 49-280.000.

Siebert, Craig; and Scott, Martin, to Metallized Carbon Corporation. Eccentric bearing and hanger. 4,854,747, Cl. 384-447.000.

Siegel, Herbert, to Hoechst Aktiengesellschaft. Process for the preparation of 2-chloroethanephosphonyl dichloride. 4,855,087, Cl. 562-817.000.

Siegel, William J.: *See—*
Wallgren, Linus E.; Mason, Bobby L.; Siegel, William J.; Olesen, Ole V.; and Abbagnaro, Louis A., 4,855,572, Cl. 219-456.000.

Siemens Aktiengesellschaft: *See—*
Goschke, Bernd, 4,854,415, Cl. 181-130.000.
Guenther, Werner; Heubeck, Erich; and Muether, Manfred, 4,856,038, Cl. 378-39.000.
Heidrich, Helmut; Hoffmann, Detlef; and Nolting, Hans-Peter, 4,856,094, Cl. 455-619.000.
Hoffmann, Kurt; Kraus, Rainer; and Kowarik, Oskar, 4,855,621, Cl. 371-20.000.
Humbs, Rolf; and Depta, Ingolf, 4,855,764, Cl. 346-140.00R.
Klein, Sigismund; and Schulz, Reiner, 4,856,041, Cl. 378-147.000.
Kratz, Gerhard, 4,855,893, Cl. 363-136.000.
Kuesters, Karl-Heinz, 4,855,801, Cl. 357-23.600.
Mayr, Ernst; Oestreich, Ulrich; and Weil, Erich, 4,854,668, Cl. 350-96.300.
Mueller, Karl-Heinz; Betz, Hans; Vach, Wilhelm; and Krenner, Johann, 4,856,037, Cl. 378-34.000.
Neppl, Franz; and Winnerl, Josef, 4,855,245, Cl. 437-31.000.
Rothkegel, Bernhard; and Haufe, Wolfgang, 4,855,104, Cl. 419-28.000.
von Raben, Klaus-Ulrich, 4,854,494, Cl. 228-102.000.
Wecker, Joachim, 4,854,979, Cl. 148-103.000.

Siemens-Bendix Automotive Electronics L.P.: *See—*
Grieb, John H.; Joseph, J. M.; Weaver, Richard D.; and Bata, George T., 4,854,024, Cl. 29-156.70R.
Wright, Danny O.; and Wiggins, Kregg S., 4,855,660, Cl. 318-696.000.

Siemens Corporate Research and Support, Inc.: *See—*
Kohn, Erhard; and Hofmann, Karl R., 4,855,797, Cl. 357-22.000.

Sigler, James: *See—*
McKiernan, Edward F.; Sigler, James; Sprang, Richard; Lewellen, Richard; and Geis, Mark, 4,854,827, Cl. 417-313.000.

Sigman, William T.: *See—*
Bolgiano, Nicholas C.; Grubb, Mary B.; Hudson, Raymond S.; and Sigman, William T., 4,855,165, Cl. 427-393.500.

Sih, John C., to Upjohn Company, The. Pyridyl-substituted benzothiophenes. 4,855,435, Cl. 546-274.000.

Siliconix Limited: *See—*
Jenkins, James O. M., 4,854,731, Cl. 374-178.000.

Simic-Glavaski, Branimir, to H.S.G. Venture (a Joint Venture Partnership). Neurological and biological molecular electro-optical devices and methods. 4,855,243, Cl. 436-63.000.

Simmons U.S.A. Corporation: *See—*
Stumpf, Walter, 4,854,023, Cl. 29-91.000.

Simon, Heinrich: *See—*
Fabian, Peter; Krebs, Helmut; and Simon, Heinrich, 4,855,032, Cl. 204-286.000.

Simopoulos, George N.: *See—*
Simopoulos, Nicholas T.; and Simopoulos, George N., 4,855,189, Cl. 428-690.000.

Simopoulos, Nicholas T.; and Simopoulos, George N., to Lumel, Inc. Electroluminescent lamps and phosphors. 4,855,189, Cl. 428-690.000.

Simpson, Brian K., to DRG (UK) Limited. Well drilling. 4,854,400, Cl. 175-85.000.

Simpson, Craig R.: *See—*
Holbrook, David S.; and Simpson, Craig R., 4,855,792, Cl. 355-53.000.

Simpson, Willis D.; and Gurley, Gene S., to Recognition Equipment Incorporated. System for transferring data to a mainframe computer. 4,855,900, Cl. 364-200.000.

Sims, Anthony M., to Titan Fitness Products Pty., Ltd. Exercise means. 4,854,577, Cl. 272-130.000.

Sims, Jackie C.; Dowling, Donald J.; and Nussbaum, Theodore W., to Texaco Inc. Multi-sensor steam quality monitoring means and method. 4,854,725, Cl. 374-42.000.

Simson, Morris; Fabricius, John H.; Browne, Ronnie; Waugh, Arthur; Sarkozy, Robert F.; and Lai, Chiu K. S., to BTU Engineering Corporation. Cross-flow diffusion furnace. 4,854,266, Cl. 118-728.000.

Singer, Norman; Wilcox, Reed; and Podolski, Joseph S., to NutraSweet Company, The. Frozen dessert. 4,855,156, Cl. 426-565.000.

Singh, Amar J., to NCR Corporation. System for maintaining low bit error rate in a starcoupled network of direct coupled stations. 4,856,023, Cl. 375-3.000.

Singheimer, Stig A. R., to Duni Bila AB. Method of afixing elastic bands in an incontinence diaper. 4,854,989, Cl. 156-161.000.

Sinkkonen, Matti, to Tana Jyra Ky. Method to manufacture compactor and compactor manufactured by the method, and compactor series. 4,854,772, Cl. 404-121.000.

Sinnreich, Joel: *See—*
Fankhauser, Peter; Sinnreich, Joel; and Dobmeier, Rolf, 4,855,142, Cl. 424-434.000.

Sioshansi, Piran, to Spire Corporation. Sputter enhanced ion implantation process. 4,855,026, Cl. 204-192.110.

Sippican Ocean Systems, Inc.: *See—*
Baron, George; Vreeland, William H.; and Brown, Neil L., 4,854,728, Cl. 374-136.000.

Sirbola, Michael A., to Microsurface Technology Corp. Apparatus and method for the electrolytic plating of layers onto computer memory hard discs. 4,855,020, Cl. 204-23.000.

Sirois, William L., to Copeland-Sirois Enterprises, Inc. Parallel thrust propulsion system. 4,854,903, Cl. 440-83.000.

Skaugen, Borgeir, to Beloit Corporation. Transfer apparatus. 4,854,053, Cl. 34-117.000.

SKF Industrial Trading and Development Co. B.V.: *See—*
Gabelli, Antonio; and Dolfsma, Hendrik, 4,854,748, Cl. 384-466.000.

Slade, Michael L.: *See—*
Badesha, Santokh S.; Foley, Geoffrey M. T.; Pai, Damodar M.; Zallen, Richard H.; Slade, Michael L.; and Abkowitz, Martin A., 4,855,203, Cl. 430-59.000.

Slater Electric Inc.: *See—*
Bowden, Jr., Wade R.; and Herzfeld, David, 4,854,885, Cl. 439-107.000.

Slavitter, Frederick; and Marchese, James J., to Polaroid Corporation. Photographic apparatus for motorized processing of instant film. 4,855,769, Cl. 354-21.000.
Slavitter, Frederick: *See*—
Mauchan, Donald E.; and Slavitter, Frederick, 4,855,770, Cl. 354-75.000.
Sleefe, Gerard E.: *See*—
Lele, Padmakar P.; and Sleefe, Gerard E., 4,855,911, Cl. 364-413.250.
Sloan, Albert H.: *See*—
Sloan, Owen K.; and Sloan, Albert H., 4,854,058, Cl. 37-63.000.
Sloan, Owen K.; and Sloan, Albert H., to Sloan Pump Company, Inc. Dredging apparatus having a diver-operated hand-held dredge head for quasi-closed loop system. 4,854,058, Cl. 37-63.000.
Sloan Pump Company, Inc.: *See*—
Sloan, Owen K.; and Sloan, Albert H., 4,854,058, Cl. 37-63.000.
Smith, Billy J. Trash collection unit. 4,854,497, Cl. 232-43.400
Smith, Bobby J., to North American Philips Consumer Electronics Corp. Reconfigurable remote control apparatus and method of using the same. 4,856,081, Cl. 455-151.000.
Smith Corona Corporation: *See*—
Curley, Charles M.; and Longrod, Scott J., 4,855,548, Cl. 200-345.000.
Smith, Craig M., to Eastman Kodak Company. Image discrimination. 4,856,075, Cl. 382-50.000.
Smith, Douglas D.: *See*—
Kertis, Robert A.; Smith, Douglas D.; and Bowman, Terrance L., 4,855,624, Cl. 307-475.000.
Smith, Edward. Tail bridge. 4,853,999, Cl. 14-69.500.
Smith, Ellis D.; and Smith, Tyrone, Jr. Fishing pole support apparatus. 4,854,069, Cl. 43-21.200.
Smith, Floyd D.: *See*—
McNab, Donald R.; and Smith, Floyd D., 4,854,202, Cl. 83-153.000.
Smith, Fritz A.: *See*—
Avidan, Amos A.; Smith, Fritz A.; and Tabak, Samuel A., 4,855,521, Cl. 585-415.000.
Smith, Gordon. Method and apparatus for conditioning the litter on the floor of a poultry rearing facility. 4,854,507, Cl. 241-27.000
Smith, Keith E. Gutter broom with locking mechanism. 4,854,002, Cl 15-176.600.
Smith, Kennith A., to John Hopkins University, The. Method for reducing silicone foam density. 4,855,328, Cl. 521-88.000.
Smith, Lloyd B., to United Company, The. Apparatus for minimizing reactive forces on a gimbal-mounted centrifuge. 4,855,042, Cl. 210-144.000.
Smith, Louise; and Kautman, Frank W. Nail polish remover wand containing disposable pads. 4,854,761, Cl. 401-196.000.
Smith, Michael J.; Sully, George R. W.; and Crisp, Martin, to Data Recording Instrument Company Limited. Manufacture of impact printing ribbon cartridge. 4,854,027, Cl. 29-434.000.
Smith, Patricia B.: *See*—
Luttmer, Joseph D.; Davis, Cecil J.; Smith, Patricia B.; and York, Rudy L., 4,855,160, Cl. 427-38.000.
Smith, Robert E., III, to National Coupling Company, Inc. Metal sealed joint for large diameter rocket motor casings. 4,854,615, Cl. 285-331.000.
Smith, Robert L.; and Stokker, Gerald E., to Merck & Co., Inc. Antihypercholesterolemic compounds. 4,855,321, Cl. 514-532.000.
Smith, Tyrone, Jr.: *See*—
Smith, Ellis D.; and Smith, Tyrone, Jr., 4,854,069, Cl. 43-21.200.
Smith, Walter L.: *See*—
Opsal, Jon; Rosencwaig, Allan; and Smith, Walter L., 4,854,710, Cl. 356-432.000.
Smith, Wayne G.; Martinez, David V.; Mozingo, Robert E.; and Hanson, Charles B., to J. I. Case Company. Quick coupler assembly. 4,854,812, Cl. 414-723.000.
Smith, Wayne G.; Martinez, David V.; Mozingo, Robert E.; and Hanson, Charles B., to J.I. Case Company. Quick coupler assembly. 4,854,814, Cl. 414-723.000.
Smith, William V., to Lectrolarm Custom Systems, Inc. Meter reader. 4,856,054, Cl. 379-107.000.
Smither, Miles A. High resolution analog-to-digital converter. 4,855,745, Cl. 341-156.000.
Smithkey, John C.: *See*—
Gasowski, Chester J.; Kolowski, Michael A.; Smithkey, John C.; and Ford, Thomas L., 4,854,361, Cl. 152-552.000.
Smolik, Robert A. Wall assembly. 4,854,096, Cl. 52-241.000.
Snia Fibre s.p.a.: *See*—
D'Andolfo, Francesco; and Grampa, Fulvio, 4,855,099, Cl. 264-103.000.
Snith, Lars A.; and Berg, Bengt O., to Telefonaktiebolaget L M Ericsson. Apparatus in a loudspeaking telephone set for supplying power to an amplifier connected to the loudspeaker. 4,856,057, Cl. 379-388.000.
Snoddy, Michael L.: *See*—
Mount, Houston B., II; and Snoddy, Michael L., 4,854,163, Cl. 73-153.000.
Snodgrass, Michael. Method of prerecording tape and apparatus for use therewith. 4,855,844, Cl. 360-22.000.
Snook, Robert L., to Ashland Oil, Inc. Refractory compositions and evaporative pattern casting process using same. 4,854,367, Cl. 164-34.000.
Snyder, David A.; and Glosecki, David M., to Westinghouse Electric Corp. In-place tensioning washer. 4,854,798, Cl. 411-434.000.
Snyder, William R.: *See*—
Mathes, Larry W.; and Snyder, William R., 4,855,150, Cl. 426-87.000.
Sobottka, Daniel C.: *See*—
Daberkow, Kevin L.; Finan, Christopher D.; Petolino, Joseph A.; Sobottka, Daniel C.; and Thomas, Jeffrey A., 4,855,904, Cl. 364-200.000.
Socha, Laura A.: *See*—
White, Dwain M.; and Socha, Laura A., 4,855,483, Cl. 560-66.000.
Societe a Responsabilite Limitee: Establissements Faivre: *See*—
Faivre, Claude, 4,854,455, Cl. 209-678.000.
Societe Anonyme dite Alsthom: *See*—
Tixador, Pascal; and Brunet, Yves, 4,855,859, Cl. 361-19.000.
S.A. dite: Caoutchouc Manufacture et Plastiques: *See*—
de Fontenay: Etienne; and Parisot, Patrick, 4,854,562, Cl. 267-292.000.
Societe Anonyme dite: Intertechnique: *See*—
Pietrzak, Patrick, 4,854,556, Cl. 267-33.000.
S.A. Raccords et Plastiques Nicoll: *See*—
Blandin, Jean-Claude, 4,854,887, Cl. 439-194.000.
Societe Anonyme: Societe Generale Pour les Techniques Nouvelles - SGN: *See*—
Dollfus, Jacques, 4,854,178, Cl. 73-861.580.
Societe Atochem: *See*—
Gautier, Martine; Rico, Isabelle; Lattes, Armand; and Bertocchio, Rene , 4,855,025, Cl. 204-157.860.
Metzger, Jean, 4,855,121, Cl. 423-439.000.
Societe Civile de Brevets, J.L.S.: *See*—
Savoyet, Jean-Louis, 4,855,601, Cl. 250-339.000.
Societe de Conseils et D'Etudes des Emballages SCEE: *See*—
Morel, Simone, 4,854,758, Cl. 401-116.000.
Societe de Prospection et d'Inventions Techniques: *See*—
Ollivier, Jean; and Almeras, Roland, 4,854,793, Cl. 411-49.000.
Societe Francaise Hoechst: *See*—
Wilhelm, Didier; Gelabert, Antonio; and Blanc, Alain, 4,854,934, Cl. 8-185.000.
Societe Nationale Elf Aquitaine: *See*—
Gancet, Christian; Guignard, Claude; and Fourmentraux, Philippe, 4,855,233, Cl. 435-135.000.
Soderlund, John D.; and Nishiura, Fumitaka, to Weyerhaeuser Company. Method for manufacture of an elastic leg diaper. 4,854,985, Cl. 156-85.000
Soechtig, Wolfgang, to Krauss-Maffei A.G. Impingement mixing device with pressure controlled nozzle adjustment. 4,854,713, Cl. 366-132.000
Soeldner, J. Stuart, to Joslin Diabetes Center, Inc. Method of detecting antibodies. 4,855,242, Cl. 436-539.000.
Sohara, Ichiro: *See*—
Tashiro, Yoichi; Baba, Hideki; Obatake, Kohei; Sakka, Hiroshi; and Sohara, Ichiro, 4,855,157, Cl. 426-609.000.
Sohn, Chul H.; and Goodale, David L., to Beckman Instruments, Inc. Bubble generator and method. 4,855,088, Cl. 261-53.000.
Sokkisha Co., Ltd.: *See*—
Funazaki, Ichizi; and Tani, Haruo, 4,854,704, Cl. 356-250.000.
Sola U.S.A. Inc.: *See*—
Morales, Heriberto, 4,854,089, Cl. 51-284.00R.
Solano, Victorino; and Trilla, Antonio, to Pujol Y Tarrago S.A. Handbrake compensator for motor vehicles. 4,854,426, Cl. 188-196.00M.
Solarex Corporation: *See*—
Carlson, David E.; Dickson, Charles R.; and D'Aiello, Robert V., 4,854,974, Cl. 136-244.000.
Solem, Jan O.; Olin, Christian; and Scanlan, Timothy M., to Scanlan International. Blood vessel holder and method of using in anastomosis. 4,854,318, Cl. 128-346.000
Soltani, Peter K.; Wrigley, Charles Y.; and Storti, George M., to Quantex Corporation. High-luminance radioluminescent lamp. 4,855,879, Cl. 362-84.000
Somar Corporation: *See*—
Sumi, Sigeo, 4,855,012, Cl. 156-584.000.
Sommer, Eberhard: *See*—
Grassmuck, Volker; Jorg, Benno; and Sommer, Eberhard, 4,854,751, Cl. 384-537.000.
Sonda S.r.l.: *See*—
Zarotti, Claudio, 4,853,980, Cl. 2-413.000.
Sonehara, Keisuke: *See*—
Arai, Hisao; Sonehara, Keisuke; Yasumura, Satoshi; and Kobayashi, Junji, 4,854,145, Cl. 70-258.000.
Sonoda, Akikazu; Fujita, Sinji; Sato, Masanobu; Tomono, Syoji; and Nakamura, Hisanori, to Kawasaki Jukogyo Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Welding robot. 4,855,560, Cl. 219-86.250.
Sonoyama, Yasuo: *See*—
Nakamura, Noriaki; Kawaguchi, Masashi; and Sonoyama, Yasuo, 4,855,641, Cl. 313-505.000.
Sony Corporation: *See*—
Hanatani, Shinji; Sugiyama, Yoshiaki; and Chino, Hisayoshi, 4,855,846, Cl. 360-84.000.
Hirota, Isao, 4,856,033, Cl. 377-58.000.
Isobe, Akira; and Anzai, Tsutomu, 4,855,611, Cl. 307-125.000.
Ive, John G. S., 4,855,843, Cl. 360-10.200.
Kihara, Taku, 4,855,829, Cl. 358-162.000.
Shibuya, Kiminobu; and Takayanagi, Kenichiro, 4,854,905, Cl. 445-30.000.
Watanabe, Toshihiro; and Fujiwara, Shiro, 4,854,517, Cl. 242-56.00R.

Sopher, David W.: *See*—
Verbrugge, Pieter A.; de Waal, Jannetje; and Sopher, David W., 4,855,452, Cl. 548-953.000.
SORG GmbH & Co. KG: *See*—
Waltert, Erich, 4,854,959, Cl. 65-335.000.
Sorokin, Gennady A.: *See*—
Svidunovich, Nikolai A.; Parfenov, Leonid I.; Garost, Alexandr I.; Sorokin, Gennady A.; Volkov, Viktor N.; Obiedkov, Viktor A.; Karbanovich, Valery K.; Vashkevich, Vladimir V.; and Verbitsky, Alexandr N., 4,855,105, Cl. 420-75.000.
Soucy, Etienne R. Golf reminder device. 4,854,584, Cl. 273-183.00B.
Sparacca, Romano; and Caldari, Gianfranco, to Technolegno S.R.L. Equipment for sanding the rounded corners of boards automaticaliy. 4,854,084, Cl. 51-139.000.
Sparks, Charles; and Odru, Pierre, to Institut Francais du Petrole. Variable rigidity element for transfer column foot. 4,854,781, Cl. 403-224.000.
Spavins, James C., to Pfizer Inc. Process for preparing a ketimine. 4,855,500, Cl. 564-270.000.
Speck, Cleo T., to Herschel Corporation. Sectional sickle bar. 4,854,114, Cl. 56-296.000.
Spector, George: *See*—
Blumkin, Irene S.; and Spector, George, 4,854,132, Cl. 63-12.000.
Britton, Joe L., Sr.; and Spector, George, 4,856,070, Cl. 381-169.000.
Vu, Thaun D.; and Spector, George, 4,855,878, Cl. 362-66.000.
Spectra-Physics, Inc.: *See*—
Ortiz, Mark V., 4,856,020, Cl. 372-107.000.
Spectrospin, AG: *See*—
Bodenhausen, Geoffrey; Pfandler, Peter E.; Rapin, Jacques; Gaumann, Tino; and Houriet, Raymond, 4,855,593, Cl. 250-282.000.
Speer, Gregg V.; and Ray, Donald L., to Emhart Industries, Inc. Manually operated electromechanical switch. 4,855,543, Cl. 200-61.270.
Spicer, Jay: *See*—
Baranczuk, Richard J.; Spicer, Jay; Duncan, William P.; and Rotert, Gary A., 4,855,125, Cl. 424-1.100.
Spiegel, Nikolaus: *See*—
Thunker, Norbert; Spiegel, Nikolaus; Lorenz, Roland; and Joss, Werner, 4,854,236, Cl. 101-411.000.
Spielvogel, Bernard F.; McPhail, Andrew T.; and Hall, Iris H., to United States of America, Army. Pharmacological active amine-carboxyboranes. 4,855,493, Cl. 562-575.000.
Spingler, John O.: *See*—
Orr, Avigdor; Spingler, John O.; and Gilbert, Seymour G., 4,855,153, Cl. 426-270.000.
Spire Corporation: *See*—
Sioshansi, Piran, 4,855,026, Cl. 204-192.110.
Spires, Randall C.: *See*—
Brandao, Ruy L.; Kyriakos, Constantinos S.; Spires, Randall C.; and Jugs, Andrejs, 4,855,748, Cl. 342-455.000.
Spitz, Russell W. Fluorescent lighting apparatus. 4,855,883, Cl. 362-260.000.
Sponseller, Harold P.: *See*—
Lichtenberg, Norman B.; Sponseller, Harold P.; and Totten, Jeffrey E., 4,854,185, Cl. 74-501.50R.
Sponzilli, William A.: *See*—
Nelson, Neil M.; Sponzilli, William A.; and Lott, Quitman W., 4,854,120, Cl. 60-39.020.
Sprague Electric Company: *See*—
Richards, Oliver L., Jr., 4,856,084, Cl. 455-223.000.
Sprang, Richard: *See*—
McKiernan, Edward F.; Sigler, James; Sprang, Richard; Lewellen, Richard; and Geis, Mark, 4,854,827, Cl. 417-313.000.
Spriewald, Erika: *See*—
Meckl, Heinz; Spriewald, Erika; and Renner, Gunter, 4,855,216, Cl. 430-372.000.
Sproesser, Linhard: *See*—
Seppelt, Wolfgang; Sproesser, Linhard; Kersten, Siegfried; Hofmeister, Peter; and Kuenast, Christoph, 4,855,140, Cl. 424-405.000.
Srinivasan, Vadake R., to Med. Fab (Lafayette), Inc. Fungicidally active cellulosic textile compositions, or articles of manufacture. 4,855,139, Cl. 424-404.000.
Sta-Rite Industries, Inc.: *See*—
Cluett, George, 4,854,259, Cl. 114-285.000.
Stack, Richard S.; and Wolbarsht, Myron. Laser catheter. 4,854,315, Cl. 128-303.100.
Stacy, Carl W., to Zenith Electronics Corporation. Multiple device remote control transmitter. 4,855,746, Cl. 341-176.000.
Stadler, Peter: *See*—
Lockhoff, Oswald; Hayauchi, Yutaka; Stadler, Peter; Stunkel, Klaus G.; Streissle, Gert; Paessens, Arnold; Klimetzek, Volker; Zeiler, Hans-Joachim; Metzger, Karl G.; Kroll, Hein-Peter; Brunner, Helmut; and Schaller, Klaus, 4,855,283, Cl. 514-8.000.
Staheli, Paul; Demuth, Robert; and Fritzsche, Peter, to Rieter Machine Works, Ltd. Method for automatically compensating density or thickness variations of fiber material at textile machines, such as cards, draw frames and the like. 4,854,011, Cl. 19-105.000.
Stahlecker, Fritz; Stahlecker, Hans; and Feuchter, Wolfgang, to Stahlecker, Fritz; and Stahlecker, Hans. Arrangement for open-end rotor spinning. 4,854,119, Cl. 57-417.000.
Stahlecker, Fritz; and Stahlecker, Hans. Twisted yarn feed spool and process for producing same. 4,854,523, Cl. 242-166.000.
Stahlecker, Hans: *See*—
Stahlecker, Fritz; Stahlecker, Hans; and Feuchter, Wolfgang, 4,854,119, Cl. 57-417.000.
Stahlecker, Fritz; and Stahlecker, Hans, 4,854,523, Cl. 242-166.000.
Stalder, Herbert: *See*—
Briner, Emil; Keller, Urs; and Stalder, Herbert, 4,854,118, Cl. 57-401.000.
Stallsworth, Bradley E. Self-centering hitch. 4,854,604, Cl. 280-477.000.
Stamatoff, James B.: *See*—
De Martino, Ronald N.; Yoon, Hyun-Nam; and Stamatoff, James B., 4,855,376, Cl. 526-311.000.
Stanasolovich, David: *See*—
Peterman, Steven; and Stanasolovich, David, 4,855,252, Cl. 437-189.000.
Standard Microsystems Corporation: *See*—
Ma, Di; and Hoffman, David H., 4,855,247, Cl. 437-44.000.
Standard Oil Company, The: *See*—
Suresh, Dev D.; Seely, Michael J.; Brazdil, James F.; and Grasselli, Robert K., 4,855,275, Cl. 502-353.000.
Standard Products Company, The: *See*—
Michlovic, John J., 4,854,095, Cl. 52-235.000.
Stanley Automatic Openers: *See*—
Lemirande, Rodger P., 4,855,653, Cl. 318-282.000.
Stanley Electric Co., Ltd.: *See*—
Kudo, Tetsuya, 4,855,876, Cl. 362-61.000.
Stanley, Ian W., to British Telecommunications public limited Company. Radiation deflector assembly. 4,854,658, Cl. 350-96.150.
Stanton, Peter R. Tape recorder head cleaner. 4,855,855, Cl. 360-128.000.
Stanzani, Franco; and Stanzani, Sandro. Structure for motor-compressor units used with refrigerant fluids. 4,854,829, Cl. 417-360.000.
Stanzani, Sandro: *See*—
Stanzani, Franco; and Stanzani, Sandro, 4,854,829, Cl. 417-360.000.
Staron, Alain; Claudepierre, Christian; Micheron, Francois; and Chambron, Edmond, to Thomson-CGR. Diaphragm for electromagnet radiation beam and its use in a collimation device for this beam. 4,856,042, Cl. 378-147.000.
Starr, Brian D.: *See*—
Ferro, John T., Jr.; Jacobs, Patrick C.; Laye, Robert M.; and Starr, Brian D., 4,855,907, Cl. 364-300.000.
State of Israel, Ministry of Defence, Israel Military Industries, The: *See*—
Hirsch, Eitan; Gutmann, Alexander; Schwartz, Ana; Goren, Eliezer; Perlmuter, Nikolai; and Tal, Reuven, 4,854,240, Cl. 102-476.000.
State of Israel, represented by Prime Minister's Office, Israel Institute for Biological Research: *See*—
Fisher, Abraham; Karton, Ishai; Heldman, Eliahu; Levy, Aharon; and Grunfeld, Yona, 4,855,290, Cl. 514-278.000.
State University of New York: *See*—
Carleton, Herbert R.; and Broughton, Jeremy Q., 4,855,903, Cl. 364-200.000.
Stauffer Chemical Company: *See*—
Knudsen, Christopher G., 4,854,966, Cl. 71-103.000.
Lee, David L., 4,855,477, Cl. 558-412.000.
Stavinoha, Jerome L.; and McCollum, Anthony W., to Eastman Kodak Company. Hydroxyethylnorbornene compounds and a process for their preparation. 4,855,395, Cl. 528-272.000.
Stayton, L. Dean. Shower temperature control system. 4,854,498, Cl. 236-12.120.
Stebbins, Edwin E., to Hypres, Incorporated. Ultra fast analog to digital converters. 4,856,099, Cl. 341-133.000.
Stechow, Jochen: *See*—
Brocksieper, Manfred; Luckger, Rolf; Kroschel, Hans-Gerd; and Stechow, Jochen, 4,856,105, Cl. 364-474.020.
Steer, Graham E.: *See*—
Steer, Peter L.; and Steer, Graham E., 4,854,737, Cl. 383-127.000.
Steer, Peter L.; and Steer, Graham E., to E. R. Squibb and Sons, Inc. Bags for containing liquids. 4,854,737, Cl. 383-127.000.
Stefanini, Michel: *See*—
Benedetti, Charles; Gluntz, Claude; Pascal, Robert; and Stefanini, Michel, 4,855,053, Cl. 210-634.000.
Steffee, Arthur D., to Acro Med Corporation. Bone screw. 4,854,311, Cl. 128-92.0YM.
Stegemoeller, Calvin L.: *See*—
Davis, Gail F.; Baker, Robert L.; Bragg, Dale E.; and Stegemoeller, Calvin L., 4,854,714, Cl. 366-132.000.
Steiger Jr., H. M.; and Catania, Victor M., to V and H Enterprises, Ltd. Container opener and lighter combination. 4,854,856, Cl. 431-253.000.
Stein, Judith, to General Electric Company. Cyclic aminoalkylsilanes and their use as adhesion promoters in room temperature vulcanizable polydiorganosiloxane compositions. 4,855,351, Cl. 524-719.000.
Steinbach, Hans-Horst; and Wittmann, Bernd, to Bayer Aktiengesellschaft. Skin-protecting or skin-care composition. 4,855,129, Cl. 424-63.000.
Steinberg, Bernard D., to University of Pennsylvania, Trustees of the. Method of target imaging and identification. 4,855,747, Cl. 342-179.000.
Steiner, Ernst, to Grob & Co. Akt. Contact bar for the warp stop motion. 4,854,351, Cl. 139-353.000.
Steinkamper, Reinhard: *See*—
Peitsmeier, Karl; and Steinkamper, Reinhard, 4,854,142, Cl. 70-186.000.
Steinmann, Hardy, to Watchout Fashions, Inc. Multiple configuration adjustable watch and band. 4,855,974, Cl. 368-282.000.

Stem, Stephen C.; and Evans, Wayne E., to Shell Oil Company. Isomerization process with preliminary normal paraffin and mono-methyl paraffin feed capture step. 4,855,529, Cl. 585-737.000.

Stephan, Werner: *See*—
Becker, Heinz D.; Bederke, Klaus; Dahm, Ralf; Kerber, Hermann; Sadowski, Fritz; and Stephan, Werner, 4,855,342, Cl. 524-31.000.

Stephens, David N.: *See*—
Biere, Helmut; Engelstoft, Mogens; Huth, Andreas; Rahtz, Dieter; Schmiechen, Ralph; Seidelmann, Dieter; and Stephens, David N., 4,855,295, Cl. 514-232.800.

Stephenson, Robert G., to James Howden Australia Pty. Ltd. Pulse jet fabric filter. 4,854,951, Cl. 55-294.000.

Stepien, Andrew T., to U.S. Philips Corporation. Chromatography apparatus. 4,854,952, Cl. 55-386.000.

Stereo Optical Company, Inc.: *See*—
Lewis, John M., 4,854,695, Cl. 351-246.000.

Sterman, Melvin D.: *See*—
Bagchi, Pranab; Sterman, Melvin D.; and Low, Howard M., 4,855,219, Cl. 430-496.000.

Sterwald, Duane L., to General Signal Corporation. Thermal insulating blocks and utilizing single blocks for electrical heating units. 4,855,576, Cl. 219-544.000.

Steuernagel, Hans H.: *See*—
Thompson, Glenn A.; Corso, Anthony J.; and Steuernagel, Hans H., 4,855,411, Cl. 534-629.000.

Stevens, James C.; and Fordyce, William A., to Dow Chemical Company, The. Catalyst and process for the selective dimerization of propylene to 4-methyl-1-pentene. 4,855,523, Cl. 585-511.000.

Stevens, Robert C. Reciprocating guidewire method. 4,854,325, Cl. 128-657.000.

Stevens, Sammy L., to Sam Stevens, Inc. Sand fighter for bed planting. 4,854,390, Cl. 172-1.000.

Stevens, Vernon C., to Ohio State University Research Foundation, The. Antigenic modification of polypeptides. 4,855,285, Cl. 514-12.000.

Stewart, John F.: *See*—
Corder, Thomas E.; and Stewart, John F., 4,854,143, Cl. 70-218.000.

Stieff, Michael T., to Hunter Engineering Company. Vehicle wheel alignment apparatus and method of use. 4,854,702, Cl. 356-155.000.

Stiemge: *See*—
Tersiev, Kostadin G.; and Kamenov, Mitko V., 4,854,067, Cl. 43-6.000.

Stieren, Thomas: *See*—
Westernacher, Helmut; Aertken, Karl; and Stieren, Thomas, 4,855,516, Cl. 568-873.000.

Stockum, Glenn F., to Surgikos, Inc. Antimicrobial medical glove. 4,853,978, Cl. 2-167.000.

Stoewer, Udo-Heaning, to Messerschmitt-Boelkow-Blohm GmbH. Riveting. 4,854,491, Cl. 227-58.000.

Stokker, Gerald E.: *See*—
Smith, Robert L.; and Stokker, Gerald E., 4,855,321, Cl. 514-532.000.

Stoll, Kurt. Piston and cylinder unit. 4,854,218, Cl. 91-1.000.

Stoll, Thomas; Killus, Martin; and Mak, Gerd, to H. Stoll GmbH & Co. Device for the display and editing of knitting patterns produced on a flat-bed knitting machine. 4,856,104, Cl. 364-470.000.

Stoppazzini, Benito, to E.M.M. S.R.L. Device for effecting and maintaining the vertical tension of the fabric in automatic flat knitting machines. 4,854,134, Cl. 66-152.000.

Storage Technology Corporation: *See*—
DiGregorio, Germano, 4,854,036, Cl. 29-744.000.

Storti, George M.: *See*—
Soltani, Peter K.; Wrigley, Charles Y.; and Storti, George M., 4,855,879, Cl. 362-84.000.

Strader, Don S., to Goodyear Tire & Rubber Company, The. Electrical conductor. 4,854,446, Cl. 198-810.000.

Strader, Hartzel G., to DAP Inc. Aqueous, silicone-containing coating composition for high temperature appliances. 4,855,348, Cl. 524-317.000.

Strang, Harry: *See*—
Jelich, Klaus; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,854,964, Cl. 71-92.000.

Strange, Lloyd K.: *See*—
Hurd, B. George; Jones, Lloyd G.; and Strange, Lloyd K., 4,854,385, Cl. 166-273.000.

Streck, Donald A.; and Iggulden, Jerry R., to Iggulden, Jerry R.; and Streck, Donald A., a part interest. Remote public telephone link. 4,856,046, Cl. 379-56.000.

Streck, Donald A., to Iggulden, Jerry R., a part interest. Single line compatible fax system. 4,856,049, Cl. 379-67.000.

Streichenberger, Antonius. Process for implantation of aquatic artificial substrates, structures for the implantation, and device for operating the process. 4,854,774, Cl. 405-25.000.

Streissle, Gert: *See*—
Lockhoff, Oswald; Hayauchi, Yutaka; Stadler, Peter; Stunkel, Klaus G.; Streissle, Gert; Paessens, Arnold; Klimetzek, Volker; Zeiler, Hans-Joachim; Metzger, Karl G.; Kroll, Hein-Peter; Brunner, Helmut; and Schaller, Klaus, 4,855,283, Cl. 514-8.000.

Stroman, David W.; Brust, Paul F.; Ellis, Steven B.; Gingeras, Thomas R.; Harpold, Michael M.; and Tschopp, Juerg F., to Phillips Petroleum Company. Regulatory region for heterologous gene expression in yeast. 4,855,231, Cl. 435-68.000.

Strong, William H. Method for gasifying toxic and hazardous waste oil. 4,854,944, Cl. 48-214.00R.

Strosser, Richard P.; and Bohman, Carl E., to Ford New Holland, Inc. Digital noise cancellation in a metal detector. 4,854,113, Cl. 56-10.200.

Strosser, Richard P.; Wynn, Edward J.; Chow, Mark K.; and Schlotterbeck, Stephen C., to Ford New Holland, Inc. Round baler with continuous bale size monitoring. 4,855,924, Cl. 364-468.000.

Stroster, Mariann C.: *See*—
Hawkins, Phillip J.; Kasner, William H.; Toth, Vincent A.; and Stroster, Mariann C., 4,855,564, Cl. 219-121.780.

Stroud, Donald S., to American National Carbide Company. Cutting tools. 4,854,405, Cl. 175-374.000.

Struhs, Kenneth E.; Struhs, Mark J.; and Struhs, Patrick L., to Applied Engineering Products Co. Imaging assembly and mounting for surveillance viewing under remote control. 4,855,823, Cl. 358-108.000.

Struhs, Mark J.: *See*—
Struhs, Kenneth E.; Struhs, Mark J.; and Struhs, Patrick L., 4,855,823, Cl. 358-108.000.

Struhs, Patrick L.: *See*—
Struhs, Kenneth E.; Struhs, Mark J.; and Struhs, Patrick L., 4,855,823, Cl. 358-108.000.

Stulen, John: *See*—
Hirschman, Alan D.; Reilly, David M.; Potter, Ross H.; Stulen, John; Toft, Eric M.; and Clark, John G., 4,854,324, Cl. 128-655.000.

Stumpf, Walter, to Simmons U.S.A. Corporation. Method for providing pocketed coil strings having a flat overlap side seam. 4,854,023, Cl. 29-91.000.

Stunkel, Klaus G.: *See*—
Lockhoff, Oswald; Hayauchi, Yutaka; Stadler, Peter; Stunkel, Klaus G.; Streissle, Gert; Paessens, Arnold; Klimetzek, Volker; Zeiler, Hans-Joachim; Metzger, Karl G.; Kroll, Hein-Peter; Brunner, Helmut; and Schaller, Klaus, 4,855,283, Cl. 514-8.000.

Stupin, Igor V.: *See*—
Beresnev, Alexei S.; Serykh, Leonid A.; Saveliev, Viktor S.; Volkoedov, Valery S.; and Stupin, Igor V., 4,855,563, Cl. 219-121.390.

Stuvecke, Claus-Peter; and Gotz, Johann. Process for the drawing of optical fibers through textiles, and a device for the carrying out of the process. 4,854,250, Cl. 112-80.160.

Su, Chung-Yi: *See*—
Tan, Michael; Su, Chung-Yi; and Anklam, William J., 4,855,696, Cl. 333-20.000.

Su, Hsiu-Kuei. Nail trimmer. 4,854,334, Cl. 132-73.600.

Suda, Yasuo; Higashihara, Masaki; and Kadohara, Terutake, to Canon Kabushiki Kaisha. Apparatus for detecting the focus adjusted state of an objective lens. 4,855,777, Cl. 354-402.000.

Sudbury Systems, Inc.: *See*—
Kolodny, Gerald M.; and Cohen, Howard I., 4,856,069, Cl. 381-52.000.

Sudo, Yoshinori, to Mazda Motor Corporation. Injection mold. 4,854,849, Cl. 425-556.000.

Sueoka, Kazuomi: *See*—
Kuribayashi, Yoshihiro; and Sueoka, Kazuomi, 4,855,148, Cl. 426-46.000.

Sugimori, Shigeru: *See*—
Goto, Yasuyuki; Ogawa, Tetsuya; and Sugimori, Shigeru, 4,855,076, Cl. 252-299.630.

Sugimoto, Eisuke; Tanizawa, Yoshiyasu; and Kozuka, Zensaku, to NGK Spark Plug Co., Ltd. Gas sensor for sulfur dioxide. 4,855,034, Cl. 204-427.000.

Sugimoto, Isao; and Kasai, Tomoaki, to Yoshida Kogyo K. K.; and Nissen Corporation. Perforated beam apparatus. 4,854,137, Cl. 68-15.000.

Sugimura, Hideo: *See*—
Kuwabara, Nobuyuki; Hasegawa, Kou; Sugimura, Hideo; Nakajima, Kazuhiro; and Moriguchi, Haruhiko, 4,855,758, Cl. 346-76.0PH.

Sugiura, Muneharu: *See*—
Kato, Masatake; Tsuji, Sadahiko; Sugiura, Muneharu; and Tanaka, Kazuo, 4,854,681, Cl. 350-427.000.

Sugiura, Noboru: *See*—
Urushiwara, Noriyoshi; Sugiura, Noboru; Fujino, Yasunori; and Kobayashi, Ryoichi, 4,854,292, Cl. 123-630.000.

Sugiura, Shin: *See*—
Shinozawa, Yusaku; and Sugiura, Shin, 4,854,201, Cl. 83-140.000.

Sugiyama, Makoto; Ezure, Yoji; Yoshikuni, Yoshiaki; and Fujita, Yukio, to Nippon Shinyaku Co., Ltd. Glucosylmoranoline derivatives. 4,855,415, Cl. 536-17.400.

Sugiyama, Yasunori; and Nakata, Satoru, to Asics Corporation. Sports shoe. 4,854,055, Cl. 36-127.000.

Sugiyama, Yoshiaki: *See*—
Hanatani, Shinji; Sugiyama, Yoshiaki; and Chino, Hisayoshi, 4,855,846, Cl. 360-84.000.

Sugiyasu Industries Co., Ltd.: *See*—
Kawada, Hiroyuki, 4,854,421, Cl. 187-8.710.

Sugiyasu Iron Works Inc.: *See*—
Kawada, Hiroyuki; and Niwa, Kiminori, 4,854,422, Cl. 187-9.00R.

Sukup, Eugene G. Grain stirring apparatus. 4,854,719, Cl. 366-261.000.

Sully, George R. W.: *See*—
Smith, Michael J.; Sully, George R. W.; and Crisp, Martin, 4,854,027, Cl. 29-434.000.

Sulzer Brothers Limited: *See*—
Michels, Christoph, 4,855,089, Cl. 261-97.000.
Ziemann, Edeltraud; and Ziemann, Andreas, 4,854,716, Cl. 366-139.000.

Sumi, Sigeo, to Somar Corporation. Pull-raising member and pull-raising unit for peeling thin film. 4,855,012, Cl. 156-584.000.

Sumimoto Electric Industries, Ltd.: *See*—
Onishi, Keiichi, 4,854,835, Cl. 417-435.000.

Sumitomo Chemical Co., Ltd.: *See*—
Fukui, Yoshiharu, 4,855,327, Cl. 521-58.000.
Saito, Yasuhisa; Takagishi, Hisao; Nakamura, Hiroshi; Okuno, Kohichi; Shiomi, Yutaka; and Kamio, Kunimasa, 4,855,339, Cl. 523-400.000.

Sumitomo ELectric Industries, Ltd.: *See*—
Maeda, Naoki, 4,856,076, Cl. 382-53.000.
Miyagawa, Yuichi; Yoneda, Kiwamu; Kuwa, Kazuhiro; and Kogo, Katsuyuki, 4,854,153, Cl. 73-1.00G.

Sumitomo Naugatuck Co., Ltd.: *See*—
Hirai, Mikio; Tatsuda, Tokuo; and Yoshida, Tomio, 4,855,355, Cl. 525-64.000.

Sumitomo Pharmaceuticals Company, Limited: *See*—
Yamahira, Yoshiya; Fujioka, Keiji; and Sato, Shigeji, 4,855,134, Cl. 424-85.700.

Sumitomo Rubber Industries, Ltd.: *See*—
Takeuchi, Akihiro, 4,854,358, Cl. 152-209.00R.

Sumitomo Special Metal Co., Ltd.: *See*—
Wada, Toshiaki; and Murata, Akio, 4,855,854, Cl. 360-126.000.

Sumiya, Koji: *See*—
Moroto, Shuzo; Sumiya, Koji; Sakaguchi, Yoshikazu; Kubo, Seitoku; and Taga, Yutaka, 4,854,195, Cl. 74-867.000.

Sun Chemical Corporation: *See*—
Bassemir, Robert; Krishnan, Ramasamy; and Lowell, Arthur I., 4,854,969, Cl. 106-2.000.

Sun Microsystems, Inc.: *See*—
Lien, Sheue-Ling; Shantz, Michael J.; Evans, Jerald R.; Ergene, Serdar; and Carrie, Susan E., 4,855,935, Cl. 364-521.000.

Sun Refining and Marketing Company: *See*—
Hsu, Chao-Yang, 4,855,485, Cl. 560-104.000.

Supp, Emil: *See*—
Voeste, Theodor; and Supp, Emil, 4,854,943, Cl. 48-196.00A.

Surcina, Karen A.: *See*—
Ryntz, Rose A.; Surcina, Karen A.; and Kurple, Kenneth R., 4,855,359, Cl. 525-130.000.

Suresh, Dev D.; Seely, Michael J.; Brazdil, James F.; and Grasselli, Robert K., to Standard Oil Company, The. Catalyst performance improvement via separate boron addition. 4,855,275, Cl. 502-353.000.

Surgikos, Inc.: *See*—
Stockum, Glenn F., 4,853,978, Cl. 2-167.000.

Susumu, Honda: *See*—
Masakazu, Kikuchi; Tsutomu, Kurokawa; and Susumu, Honda, 4,855,409, Cl. 530-351.000.

Suzuki, Akio; Ohkubo, Masaharu; and Takada, Yoshihiro, to Canon Kabushiki Kaisha. Color image processing method and apparatus. 4,855,765, Cl. 346-154.000.

Suzuki, Akio, to Canon Kabushiki Kaisha. Image recording apparatus detecting and controlling image contrast. 4,855,766, Cl. 346-160.000.

Suzuki, Fujio: *See*—
Tunekawa, Shouji; Yamada, Wazoh; Hara, Yoshitaka; and Suzuki, Fujio, 4,854,376, Cl. 165-54.000.

Suzuki, Kazuaki: *See*—
Tanabe, Hirohito; Ohata, Yu; Suzuki, Kazuaki; Miwa, Yukiharu; and Nakayama, Yoshihito, 4,855,799, Cl. 357-23.400.

Suzuki, Kazuyuki: *See*—
Kurosawa, Akihito; Suzuki, Kazuyuki; Anazawa, Osamu; and Yoshihara, Masayuki, 4,854,477, Cl. 221-1.000.

Suzuki, Masayuki; Hara, Shinichi; Kimura, Kuniaki; Ono, Takeo; Nakamura, Munekazu; and Ohguchi, Yoshihiro, to Mitsubishi Paper Mills, Ltd. Method of oxidizing sulfide-containing liquor. 4,855,123, Cl. 423-562.000.

Suzuki, Norihiko, to Minolta Camera Kabushiki Kaisha. Copying machine with an automatic document feeder. 4,855,794, Cl. 355-54.000.

Suzuki, Shin: *See*—
Murate, Tsuneo; and Suzuki, Shin, 4,855,674, Cl. 324-158.00R.

Suzuki, Tetsuo, to Canon Kabushiki Kaisha. Ink storing device. 4,855,762, Cl. 346-140.00R.

Suzuki, Yasuhito, to Cannon Kabushiki Kaisha; and Canon Kabushiki Kaisha. Recording apparatus. 4,855,790, Cl. 355-24.000.

Svidunovich, Nikolai A.; Parfenov, Leonid I.; Garost, Alexandr I.; Sorokin, Gennady A.; Volkov, Viktor N.; Obiedkov, Viktor A.; Karbanovich, Valery K.; Vashkevich, Vladimir V.; and Verbitsky, Alexandr N., to Belorussky Tekhnologichesky Institut Imeni S.M. Kirova. Wear-resistant steel. 4,855,105, Cl. 420-75.000.

Swain, David O. Hydraulic pump gate apparatus. 4,854,838, Cl. 417-517.000.

Swanson, Thomas K.; and Meyers, Elwood J., to Barber-Colman Company. Linear electromagnetic actuator. 4,855,702, Cl. 335-261.000.

Swartley, Donald M.: *See*—
Trinh, Toan; Wahl, Errol H.; Swartley, Donald M.; and Hemingway, Ronald L., 4,855,072, Cl. 252-8.800.

Sweeney, Mary D.: *See*—
Fritz, Marlene M.; Love, Betty J.; Sweeney, Mary D.; and Davis, Chuck, 4,855,723, Cl. 340-691.000.

Sweeney, Ronald M.: *See*—
Rimmer, James R.; and Sweeney, Ronald M., 4,854,816, Cl. 414-790.300.

Swon, James E.; and Hofer, Henry. Video timing device for pharmaceutical tablet testing. 4,855,821, Cl. 358-101.000.

Sykes, David A.: *See*—
Kirbach, Eberhard; and Sykes, David A., 4,854,207, Cl. 83-823.000.

Syndevco, Inc.: *See*—
Grobbel, Ronald M., 4,854,897, Cl. 439-716.000.

Synofzik, Reinhard; Hellwig, Rolf; and Karius, Klaus D., to Rheinmetall GmbH. Spin stabilized carrier projectile. 4,854,241, Cl. 102-489.000.

System 3R International ab: *See*—
Ramsbro, Borje K., 4,855,558, Cl. 219-69.150.

Systems Research Laboratories, Inc.: *See*—
Hoeffel, James D.; Elliott, Richard E.; Hoppe, Wally C.; and Nevitt, James S., 4,854,156, Cl. 73-37.500.

Systron Donner Corp.: *See*—
Warren, Donald E.; and Tyler, Maurice E., 4,854,389, Cl. 169-28.000.

Szajewski, Richard P., to Eastman Kodak Company. Photographic element having layer for increasing image sharpness comprising a non-diffusion DIR compound. 4,855,220, Cl. 430-505.000.

Szeteli, Andreas: *See*—
Gschwender, Alois; Szeteli, Andreas; and Kruger, Horst, 4,854,834, Cl. 417-423.300.

Szuba, Louis. Adhesive-applying machine. 4,854,929, Cl. 493-150.000.

Tabak, Samuel A.: *See*—
Avidan, Amos A.; Smith, Fritz A.; and Tabak, Samuel A., 4,855,521, Cl. 585-415.000.

Tabata, Hiroshi: *See*—
Iriuchijima, Shinobu; Kobayashi, Hirohiko; Masuda, Takahito; Watanabe, Shunnosuke; and Tabata, Hiroshi, 4,855,311, Cl. 514-373.000.

Tabata, Shigeo: *See*—
Kameda, Osamu; and Tabata, Shigeo, 4,854,413, Cl. 180-247.000.

Tachi-S Co., Ltd.: *See*—
Shimada, Makoto, 4,854,997, Cl. 156-245.000.

Tachiuchi, Tsuguji: *See*—
Mano, Hiroyuki; Tachiuchi, Tsuguji; Kinugawa, Kiyoshige; and Tanaka, Shinji, 4,855,728, Cl. 340-805.000.

Tada, Akihiro; Kiriu, Takashi; and Arakawa, Motoomi, to Orient Chemical Industries Ltd. Toner for developing electrostatic latent images. 4,855,208, Cl. 430-110.000.

Tada, Kaoru; Hasunuma, Masahiko; and Kawai, Mitsuo, to Kabushiki Kaisha Toshiba. Manufacturing method for high hardness member. 4,854,978, Cl. 148-14.000.

Taga, Yasunori: *See*—
Ohwaki, Takeshi; and Taga, Yasunori, 4,855,176, Cl. 428-195.000.

Taga, Yutaka: *See*—
Moroto, Shuzo; Sumiya, Koji; Sakaguchi, Yoshikazu; Kubo, Seitoku; and Taga, Yutaka, 4,854,195, Cl. 74-867.000.

Tagawa, Takao: *See*—
Morimoto, Kenichi; and Tagawa, Takao, 4,855,818, Cl. 358-75.000.

Taguchi, Keiji: *See*—
Yamamoto, Akihiko; Kohno, Akiomi; Yamada, Toshihiri; Satou, Motohiro; Taguchi, Keiji; and Yokoi, Kazuaki, 4,854,495, Cl. 228-124.000.

Taguchi, Sadanori: *See*—
Watanabe, Isato; Yamamoto, Shigehiko; Taguchi, Sadanori; and Sasaki, Susumu, 4,855,637, Cl. 313-346.00R.

Taihosangyo Co., Ltd.: *See*—
Kagawa, Yoshihiro; and Hori, Keimitsu, 4,855,083, Cl. 252-632.000.

Tajika, Hiroshi: *See*—
Fujii, Mamoru; Noda, Kazuo; Nagasaka, Shoji; Tajika, Hiroshi; and Ono, Koji, 4,854,493, Cl. 228-5.700.

Takada, Jun, to Kanegafuchi Chemical Industry Company, Limited. Optical storage apparatus including a reversible, doping modulated, multilayer, amorphous element. 4,855,950, Cl. 365-113.000.

Takada, Osamu: *See*—
Hiyama, Kunio; Kawakita, Kenji; and Takada, Osamu, 4,855,995, Cl. 370-86.000.

Takada, Satoshi: *See*—
Ohnishi, Michikazu; Ohgoshi, Hiroshi; and Takada, Satoshi, 4,855,057, Cl. 210-650.000.

Takada, Yoshihiro: *See*—
Suzuki, Akio; Ohkubo, Masaharu; and Takada, Yoshihiro, 4,855,765, Cl. 346-154.000.

Takagi, Isamu: *See*—
Katsumata, Masaaki; Takagi, Isamu; Takahashi, Eiji; Sakai, Tadamichi; Matsumoto, Yoji; Ohtsu, Hideaki; Uchida, Hiroyuki; and Asami, Kiyoshi, 4,855,106, Cl. 420-109.000.

Takagi, Kazunori; and Ito, Masahiko, to Pioneer Electronic Corporation. Power fader for a loudspeaker system. 4,856,065, Cl. 381-28.000.

Takagi, Kazutoshi: *See*—
Onose, Jun; Takagi, Kazutoshi; and Adachi, Fukuichi, 4,855,875, Cl. 362-32.000.

Takagi, Mitiro; Katoh, Yasuyuki; and Yamazaki, Tomatsu, to Chugai Seiyaku Kaubshiki Kaisha. Novel diamine derivatives. 4,855,497, Cl. 564-182.000.

Takagishi, Hisao: *See*—
Saito, Yasuhisa; Takagishi, Hisao; Nakamura, Hiroshi; Okuno, Kohichi; Shiomi, Yutaka; and Kamio, Kunimasa, 4,855,339, Cl. 523-400.000.

Takahashi, Eiji: *See*—
Katsumata, Masaaki; Takagi, Isamu; Takahashi, Eiji; Sakai, Tadamichi; Matsumoto, Yoji; Ohtsu, Hideaki; Uchida, Hiroyuki; and Asami, Kiyoshi, 4,855,106, Cl. 420-109.000.

Takahashi, Hideo: *See*—
Uesugi, Naomoto; Takahashi, Hideo; and Ikeno, Tetsuro, 4,854,417, Cl. 181-272.000.

Takahashi, Keietsu: *See—*
Kurami, Miki; Shirakami, Yoshifumi; Takahashi, Keietsu; and Ueda, Nobuo, 4,855,353, Cl. 525-54.100.

Takahashi, Keiko: *See—*
Yamada, Youichi; and Takahashi, Keiko, 4,856,067, Cl. 381-45.000.

Takahashi, Kenji: *See—*
Yamaji, Yasuhiro; Takahashi, Kenji; Hirata, Seiichi; and Sakurai, Toshiharu, 4,855,807, Cl. 357-72.000.

Takahashi, Masahiro: *See—*
Hamada, Takuji; Takahashi, Masahiro; Yoneda, Katsuhiko; Onuki, Ken; and Uchiyama, Toshihiko, 4,855,993, Cl. 370-16.000.

Takahashi, Naoto: *See—*
Yokota, Tetsuya; Sakamoto, Hideki; and Takahashi, Naoto, 4,855,147, Cl. 426-43.000.

Takahashi, Nobuo: *See—*
Maruyama, Osamu; Ishikawa, Hidenobu; and Takahashi, Nobuo, 4,855,334, Cl. 522-96.000.

Takahashi, Shunzo: *See—*
Kimura, Fumio; Takahashi, Shunzo; and Hamasaki, Yukio, 4,855,981, Cl. 369-44.000.

Takahashi, Tomonori: *See—*
Kawasaki, Shinji; and Takahashi, Tomonori, 4,855,263, Cl. 501-92.000.

Takahashi, Toshitada; Ueda, Ryuzo; and Ohta, Kazuo, to Takahashi, Toshitada. Monoclonal antibodies to human leukocyte antigens. 4,855,235, Cl. 435-240.270.

Takahashi, Yasufumi: *See—*
Nakamura, Shigeki; and Takahashi, Yasufumi, 4,856,027, Cl. 375-81.000.

Takai, Hitoshi, to Matsushita Electric Industrial Co., Ltd. Method of digital signal transmission. 4,856,025, Cl. 375-40.000.

Takaku, Yasunori: *See—*
Kozawa, Tadashi; Natsume, Naohiro; Komatsubara, Hirofumi; Takaku, Yasunori; Kato, Kiyoshi; and Harada, Seiichi, 4,854,830, Cl. 417-365.000.

Takamura, Koji: *See—*
Hibino, Hiroki; Kimura, Kenji; Kanno, Masahide; Nishikori, Toshiaki; Yoshinaga, Jun; Kidawara, Atsushi; Yabe, Hisao; Katou, Shinichi; Takamura, Koji; and Nakamura, Takeaki, 4,855,819, Cl. 358-98.000.

Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; Negishi, Ichiro; and Osada, Masaru, to Victor Company of Japan, Ltd. Color imaging apparatus including phase control system for maintaining start positions of scanning lines equal to start positions of reference values thereof. 4,855,816, Cl. 358-47.000.

Takano, Masaharu, to Monsanto Company. Enhanced 2-hydroxy-4-methylthiobutanoic acid composition and method of preparation. 4,855,495, Cl. 562-581.000.

Takao, Mitsunori: *See—*
Kiyono, Masashi; Takeuchi, Kanji; Abe, Tomoaki; and Takao, Mitsunori, 4,854,283, Cl. 123-361.000.

Takao, Shoji; Nakashima, Hiroshi; Tokumoto, Mako; Saitoh, Makoto; and Watanabe, Makoto, to Terumo Kabushiki Kaisha. Processed soybean foods and method for preparing the same. 4,855,159, Cl. 426-656.000.

Takasago, Hayato: *See—*
Niki, Kenichi; Makita, Tetsuro; and Takasago, Hayato, 4,854,230, Cl. 101-123.000.

Takasaki, Yoshiyuki, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for production of glucose by use of transglucosidase. 4,855,232, Cl. 435-97.000.

Takashima, Masanobu: *See—*
Satomura, Masato; Iwakura, Ken; Takashima, Masanobu; and Igarashi, Akira, 4,855,282, Cl. 503-218.000.

Takashima, Masayuki; and Sawayama, Noboru, to Ricoh Company, Ltd. Agitating roller and restricting member for a developing device. 4,855,783, Cl. 355-298.000.

Takasu, Toshikazu: *See—*
Ando, Mitsuru; and Takasu, Toshikazu, 4,854,487, Cl. 222-606.000.

Takatori Machinery Manufacturing Co., Ltd.: *See—*
Asao, Hideo; Yamazi, Satoru; and Saibe, Seiichi, 4,854,252, Cl. 112-265.100.

Takayanagi, Kenichiro: *See—*
Shibuya, Kiminobu; and Takayanagi, Kenichiro, 4,854,905, Cl. 445-30.000.

Takechi, Shozo: *See—*
Mori, Sachio; Iwakura, Hikozo; and Takechi, Shozo, 4,855,449, Cl. 548-512.000.

Takeda Chemical Industries, Ltd.: *See—*
Masakazu, Kikuchi; Tsutomu, Kurokawa; and Susumu, Honda, 4,855,409, Cl. 530-351.000.
Yoshioka, Masanori; Hou, Hidemitsu; and Kawai, Nobufumi, 4,855,405, Cl. 530-300.000.

Takeda, Hiroaki: *See—*
Sato, Isamu; Ishida, Masato; Abe, Eiichi; and Takeda, Hiroaki, 4,855,767, Cl. 346-160.000.

Takeda, Satoru; Hayashi, Toshihiro; and Kohno, Hiroshige, to Asahi Denka Kogyo K. K. Apparatus for producing cast products. 4,854,843, Cl. 425-437.000.

Takei, Sadakazu: *See—*
Nagumo, Tadanobu; Takei, Sadakazu; and Tozawa, Yukio, 4,854,360, Cl. 152-529.000.

Takenaka, Hiroo, to NEC Corporation. Apparatus for controlling light output of a pulse-excited laser oscillator. 4,856,012, Cl. 372-38.000.

Takenaka, Senji: *See—*
Matsuoka, Hiroo; Toida, Tsutomu; Takinami, Takao; Takenaka, Senji; and Fujita, Tetsuo, 4,855,124, Cl. 423-574.00L.

Takeuchi, Akihiro, to Sumitomo Rubber Industries, Ltd. Tread pattern for a heavy load pneumatic tire which changes from a block pattern to a rib pattern with wear. 4,854,358, Cl. 152-209.00R.

Takeuchi, Kanji: *See—*
Kiyono, Masashi; Takeuchi, Kanji; Abe, Tomoaki; and Takao, Mitsunori, 4,854,283, Cl. 123-361.000.

Takeuchi, Kunihiko; Baba, Fujio; and Shimomura, Yasuo, to Tokyo Keiki Company Ltd. Communication control system of fluid control valve. 4,855,729, Cl. 340-825.050.

Takeuchi, Kunihiko; Oba, Masao; and Horinouchi, Shinichi, to Tokyo Keiki Company Ltd. Memory package system for performing data transmission between memory module and write/read unit by electromagnetic induction coupling. 4,855,994, Cl. 370-69.100.

Takeuchi, Tadao, to Matsuzaki Seisan Kabusiki Kaisha. Case such as suitcase and its improvement. 4,854,602, Cl. 280-79.110.

Takeuchi, Takashi: *See—*
Shinbayashi, Toshiya; and Takeuchi, Takashi, 4,855,988, Cl. 369-116.000.

Takeuchi, Yoshiaki; and Nakagawa, Kaoru, to Kabushiki Kaisha Toshiba. Semiconductor integrated circuit. 4,856,034, Cl. 377-74.000.

Taki, Kazunari, to Brother Kogyo Kabushiki Kaisha. Data storage and readout optical head using a single substrate having an electrooptic converging portion for adjustment of the light beam focal point. 4,855,986, Cl. 369-112.000.

Takiguchi, Hideo: *See—*
Ichikawa, Kyoko; Aoki, Makoto; and Takiguchi, Hideo, 4,855,753, Cl. 346-1.100.

Takimoto, Nobuko. Cleaner of remote-control type. 4,854,000, Cl. 15-3.000.

Takinami, Takao: *See—*
Matsuoka, Hiroo; Toida, Tsutomu; Takinami, Takao; Takenaka, Senji; and Fujita, Tetsuo, 4,855,124, Cl. 423-574.00L.

Takiron Co., Ltd.: *See—*
Shikinami, Yasuo; Hata, Kunihiro; and Ohmura, Yutaka, 4,855,077, Cl. 252-518.000.

Tal, Reuven: *See—*
Hirsch, Eitan; Gutmann, Alexander; Schwartz, Ana; Goren, Eliezer; Perlmuter, Nikolai; and Tal, Reuven, 4,854,240, Cl. 102-476.000.

Tami, Kazuya: *See—*
Hiramatsu, Tohru; Tami, Kazuya; and Ohchi, Torao, 4,854,251, Cl. 112-121.120.

Tamura, Masanobu, to Toyota Jidosha Kabushiki Kaisha. Double air-fuel ratio sensor system having divided-skip function. 4,854,124, Cl. 60-274.000

Tan, Michael; Su, Chung-Yi; and Anklam, William J., to Hewlett-Packard. Pulse compressor. 4,855,696, Cl. 333-20.000.

Tana Jyra Ky: *See—*
Sinkkonen, Matti, 4,854,772, Cl. 404-121.000.

Tanabe, Hirohito; Ohata, Yu; Suzuki, Kazuaki; Miwa, Yukiharu; and Nakayama, Yoshihito, to Kabushiki Kaisha Toshiba. Power MOSFET with carrier lifetime killer. 4,855,799, Cl. 357-23.400.

Tanabe, Katuji, to Obara Corporation. Welding cable. 4,855,532, Cl. 174-15.700.

Tanabe, Koji: *See—*
Ebata, Genji; Tanabe, Koji; and Saito, Takahiro, 4,854,667, Cl. 350-96.200.

Tanabe Seiyaku Co., Ltd.: *See—*
Yamada, Yoshihisa; and Matsuoka, Yuzo, 4,855,298, Cl. 514-259.000.

Tanaka, Hajime; and Saito, Shiro, to Tanaka International Co., Ltd. Action mechanism of an upright piano. 4,854,211, Cl. 84-240.000.

Tanaka, Hidetake; and Nakazato, Yasushi, to Ricoh Co., Ltd. Control device for an image recorder. 4,855,754, Cl. 346-17.000.

Tanaka, Hirohumi: *See—*
Ichinose, Noboru; and Tanaka, Hirohumi, 4,855,118, Cl. 423-301.000.

Tanaka, Hitoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Lens photographing distance range limiting device. 4,854,673, Cl. 350-255.000.

Tanaka International Co., Ltd.: *See—*
Tanaka, Hajime; and Saito, Shiro, 4,854,211, Cl. 84-240.000.

Tanaka, Kazuo: *See—*
Kato, Masatake; Tsuji, Sadahiko; Sugiura, Muneharu; and Tanaka, Kazuo, 4,854,681, Cl. 350-427.000.

Tanaka, Nobuo: *See—*
Shimo, Hiroyuki; Kanesige, Isao; and Tanaka, Nobuo, 4,855,181, Cl. 428-336.000.

Tanaka, Shinji: *See—*
Mano, Hiroyuki; Tachiuchi, Tsuguji; Kinugawa, Kiyoshige; and Tanaka, Shinji, 4,855,728, Cl. 340-805.000.

Tanaka, Toshinori: *See—*
Morishita, Akira; Tanaka, Toshinori; and Isozumi, Shuzoo, 4,855,610, Cl. 290-48.000.

Tanaka, Yasuo: *See—*
Yamamoto, Hideaki; Sasano, Akira; Matsumaru, Haruo; Tanaka, Yasuo; and Tsukada, Toshihisa, 4,855,795, Cl. 357-2.000.

Taneya, Mototaka: *See—*
Matsui, Sadayoshi; Taneya, Mototaka; Matsumoto, Mitsuhiro; and Hosoba, Hiroyuki, 4,856,015, Cl. 372-50.000.

Taneya, Shoichi: *See—*
Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi, 4,854,131, Cl. 62-51.200.

Tang, Man-Wing; King, William M.; and Wensley, C. Glen, to Air Products and Chemicals, Inc. Air dried cellulose acetate membranes. 4,855,048, Cl. 210-500.300.

Tanguy, Jean-Claude; Chambellan, Domonique; and Pommet, Raymond, to Commissaruat A L'Energie Atomique. Apparatus for the determination of the osseous mineral content. 4,856,044. Cl. 378-198.000.

Tani, Haruo: *See—*
Funazaki, Ichizi; and Tani, Haruo, 4.854,704, Cl. 356-250.000.

Taniguchi, Nobuyuki: *See—*
Ishimura, Toshihiko; Ishikawa, Norio; Akada, Yasuaki; Seki, Reiji; and Taniguchi, Nobuyuki, 4,855,778, Cl. 354-412.000.

Taniguchi, Yoshio: *See—*
Tomioka, Yasushi; Imazeki, Shuji; Terao, Motoyasu; Ojima, Masahiro; and Taniguchi, Yoshio, 4,855,951, Cl. 365-119.000.

Tanimoto, Shigemi: *See—*
Otsuka, Ryotatsu; Tanimoto, Shigemi; and Toyoda, Kazuo, 4,854,968, Cl. 75-63.000.

Tanimoto, Tetsuyuki, to Minolta Camera Kabushiki Kaisha. A video cover & viewfinder accessory for a still camera. 4,855,837, Cl. 358-229.000.

Tanioka, Hiroshi: *See—*
Kan, Fumitaka, deceased; Koizumi, Norihiko; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; Mishina, Shinya; and Tanioka, Hiroshi, 4,855,763, Cl. 346-160.100.

Tanizawa, Yoshiyasu: *See—*
Sugimoto, Eisuke; Tanizawa, Yoshiyasu; and Kozuka, Zensaku, 4,855,034, Cl. 204-427.000.

Tardy, Maurice, to Bennes Marrel. Pilot-controlled valve for braking or speed limitation in a hydraulic circuit. 4,854,221, Cl. 91-420.000.

Tashiro, Yoichi; Baba, Hideki; Obatake, Kohei; Sakka, Hiroshi; and Sohara, Ichiro, to Fuji Oil Company, Limited. Process for producing fat powder. 4,855,157, Cl. 426-609.000.

Taska, John L., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Radiation-coupled daisy chain. 4,856,091, Cl. 455-607.000.

Tate, Marilyn; and Varnell, Daniel F., to Hercules Incorporated. Photopolymerizable composition. 4,855,212, Cl. 430-281.000.

Tateishi, Naofumi: *See—*
Matsubara, Akinori; Tsutsumi, Kenichi; Kaneko, Youji; Akutsu, Takashi; and Tateishi, Naofumi, 4,854,209, Cl. 84-1.010.

Tatsuda, Tokuo: *See—*
Hirai, Mikio; Tatsuda, Tokuo; and Yoshida, Tomio, 4,855,355, Cl. 525-64.000.

Taylor, Kenneth D.: *See—*
Hockaday, Bruce D.; and Taylor, Kenneth D., 4,854,219, Cl. 91-367.000.

Taylor, Ted. Method of forming candles and candle composition therefor. 4,855,098, Cl. 264-103.000.

TDK Corporation: *See—*
Ono, Shuichi; Itagaki, Shuichi; Yahagi, Masahiro; Furukawa, Kiyoshi; Fujiwara, Shinobu; and Oikawa, Yasunobu, 4,854,936, Cl. 29-570.100.

Techmo Car S.p.A.: *See—*
Zannini, Gianfranco, 4,855,031, Cl. 204-225.000.

Techni-Quip Corp.: *See—*
Peckitt, Guy R.; and Kopelman, Edward E., 4,855,646, Cl. 315-175.000.

Technical Communication Corporation: *See—*
McCalmont, Arnold M., 4,856,063, Cl. 380-48.000.

Technolegno S.R.L.: *See—*
Sparacca, Romano; and Caldari, Gianfranco, 4,854,084, Cl. 51-139.000.

Technology Congress, Ltd., The: *See—*
Wendt, Barry M., 4,854,039, Cl. 29-832.000.

Technoset Ltd.: *See—*
Bezner, Baruch, 4,855,190, Cl. 428-690.000.

Tecma Laboratories, Inc.: *See—*
Trenzeluk, Theodore, 4,855,138, Cl. 424-195.100.

Teijin Limited: *See—*
Morinaga, Tsuto; Miura, Kin-ichiro; Shimotohno, Kunitada; Ikegami, Masato; and Ichikawa, Yataro, 4,855,237, Cl. 435-320.000.

Teirlinck, Didier; and Gagniere, Jacques, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Aluminium alloy for thin metal sheets which are suitable for the production of can lids and bodies and a process for manufacturing said metal sheets. 4,855,107, Cl. 420-546.000.

Tektronix, Inc.: *See—*
Green, Morris H., 4,855,670, Cl. 324-73.00R.
Shank, Gordon W., 4,855,968, Cl. 368-115.000.
Yang, Kei-Wean C., 4,855,724, Cl. 340-703.000.

Teledyne Industries, Inc.: *See—*
Chevis, Robert W.; and Keetley, Reginald G., 4,854,126, Cl. 60-726.000.

Teledyne Microwave: *See—*
Hoegh, Poul E., 4,855,699, Cl. 335-177.000.

Telefonaktiebolaget L M Ericsson: *See—*
Snith, Lars A.; and Berg, Bengt O., 4,856,057, Cl. 379-388.000.

Telefunken electronic GmbH: *See—*
Bohme, Rolf, 4,855,626, Cl. 307-491.000.

Telephone Products, Inc.: *See—*
Ditzig, Albert, 4,854,881, Cl. 439-26.000.

Tellert, Rudy, to Sachs-Systemtechnik GmbH. Automatic clutch actuation system with program control using plural function generators. 4,854,433, Cl. 192-0.033.

Temple, Rodger G.: *See—*
Burkholder, Mary J.; Piccirilli, Barbara G.; Anderson, Carl C.; and Temple, Rodger G., 4,855,164, Cl. 427-385.500.

Terao, Motoyasu: *See—*
Tomioka, Yasushi; Imazeki, Shuji; Terao, Motoyasu; Ojima, Masahiro; and Taniguchi, Yoshio, 4,855,951, Cl. 365-119.000.

Teraoka, Eiichi, to Mitsubishi Denki Kabushiki Kaisha. Synchronous static random access memory having precharge system and operating method thereof. 4,856,106, Cl. 365-203.000.

Terrado, Angel R., to Goodyear Tire & Rubber Company, The. Expandable tire building drum. 4,855,008, Cl. 156-401.000.

Tersiev, Kostadin G.; and Kamenov, Mitko V., to Stiemge. Hydropneumatic harpoon. 4,854,067, Cl. 43-6.000.

Terumo Kabushiki Kaisha: *See—*
Takao, Shoji; Nakashima, Hiroshi; Tokumoto, Mako; Saitoh, Makoto; and Watanabe, Makoto, 4,855,159, Cl. 426-656.000.

Teuwen, Uwe: *See—*
Breiter, Horst; Enger, Helmut; and Teuwen, Uwe, 4,854,994, Cl. 156-228.000.

Texaco Inc.: *See—*
Sims, Jackie C.; Dowling, Donald J.; and Nussbaum, Theodore W., 4,854,725, Cl. 374-42.000.

Texas Instruments Incorporated: *See—*
Douglas, Monte A., 4,855,015, Cl. 156-626.000.
Douglas, Monte A., 4,855,017, Cl. 156-643.000.
Duvvury, Charvaka; and Rountree, Robert N., 4,855,620, Cl. 307-448.000.
Esquivel, Agerico L.; Groover, Robert, III; and Tigelaar, Howard L., 4,855,800, Cl. 357-23.500.
Flaherty, Edward H., 4,855,623, Cl. 307-475.000.
Hester, Richard K., 4,855,743, Cl. 341-110.000.
Hochschild, James R., 4,855,685, Cl. 330-282.000.
Hutter, Louis N.; and Trogolo, Joe R., 4,855,244, Cl. 437-31.000.
Imamura, Youichiro; Kaeriyama, Toshiyuki; and Ishimoto, Hironori, 4,855,798, Cl. 357-71.000.
Jucha, Rhett B.; Davis, Cecil J.; and Loewenstein, Lee M., 4,855,016, Cl. 156-643.000.
Luttmer, Joseph D.; Davis, Cecil J.; Smith, Patricia B.; and York, Rudy L., 4,855,160, Cl. 427-38.000.
Malhi, Satwinder; Bean, Kenneth E.; Driscoll, Charles C.; and Chatterjee, Pallab K., 4,855,809, Cl. 357-75.000.
Mydill, Marc R., 4,855,969, Cl. 368-120.000.
Ovens, Kevin M., 4,855,617, Cl. 307-291.000.

Texas Iron Works, Inc.: *See—*
Arnold, Ronald D.; Atol, Gerald R.; and Baker, Samuel F., 4,854,383, Cl. 166-70.000.
Baker, Samuel F.; and Braddick, Britt O., 4,854,386, Cl. 166-289.000.

Thacker, Paul F.: *See—*
Marker, Edwin M.; Thacker, Paul F.; and Knopfhart, Peter K., 4,855,110, Cl. 422-102.000.

Thatcher, Mark R.: *See—*
Kernon, John D.; Langley, Kenneth R.; and Thatcher, Mark R., 4,854,821, Cl. 416-95.000.

Theil, Thomas: *See—*
Mehnert, Walter; and Theil, Thomas, 4,854,709, Cl. 356-375.000.

Theilacker, Klaus, to MAN - Roland Druckmaschinen AG. Printing machine cylinder underlay holding arrangement. 4,854,237, Cl. 101-415.100.

Theis, Peter F.; and Buchberger, Gregory. Telephone message retrieval system with improved message processor and retrieval console including auto-disabling playback switch. 4,856,050, Cl. 379-68.000.

TheraTech, Inc.: *See—*
Patel, Dinesh C.; and Ebert, Charles D., 4,855,294, Cl. 514-212.000.

Therma-Wave, Inc.: *See—*
Opsal, Jon; Rosencwaig, Allan; and Smith, Walter L., 4,854,710, Cl. 356-432.000.

Thermacore, Inc.: *See—*
Shaubach, Robert M.; Dussinger, Peter; and Buchko, Matthew T., 4,854,379, Cl. 165-104.260.

Therrian, Matthew A.: *See—*
Osgood, Wayne R., Jr.; and Therrian, Matthew A., 4,855,187, Cl. 428-516.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile track renewal machine. 4,854,243, Cl. 104-7.300.

Thibodeau, Andre . Bearing assembly for rocking chair. 4,854,744, Cl. 384-295.000.

Thomas, Anthony J.: *See—*
Kester, Jeffrey A.; Moos, Walter H.; and Thomas, Anthony J., 4,855,308, Cl. 514-332.000.

Thomas, Bruce A.; Sapozhnikov, Gregory; and Shaw, Robert L., to Laser Lab Limited. Work head device. 4,855,565, Cl. 219-121.790.

Thomas, Bryan: *See—*
Easton, Thomas; and Thomas, Bryan, 4,854,938, Cl. 44-56.000.

Thomas, James E.: *See—*
Mertel, Michael E.; and Thomas, James E., 4,855,581, Cl. 235-462.000.

Thomas, Jeffrey A.: *See—*
Daberkow, Kevin L.; Finan, Christopher D.; Petolino, Joseph A.; Sobottka, Daniel C.; and Thomas, Jeffrey A., 4,855,904, Cl. 364-200.000.

Thomas, John C.: *See—*
Brekkestran, Kevin L.; and Thomas, John C., 4,855,913, Cl. 364-424.100.

Thompson, Glenn A.; Corso, Anthony J.; and Steuernagel, Hans H., to Crall, Hugh C.; and Hoechst Celanese Corp. Water-soluble, monoazo dyes containing a ureido group and two sulfonyl fiber-reactive groups. 4,855,411, Cl. 534-629.000.

Thomson-CGR: *See—*
Staron, Alain; Claudepierre, Christian; Micheron, Francois; and Chambron, Edmond, 4,856,042, Cl. 378-147.000.

Thomson-CSF: *See—*
Tinet, Claude, 4,856,108, Cl. 369-46.000.

Thrane, Lars, to S.P. Radio A/S. Method for cryptographic transmission of speech signals and a communication station for performing the method. 4,856,061, Cl. 380-48.000.

Thrush, Ted K. Video cassette apparatus case and method therefore. 4,855,845, Cl. 360-33.100.

Thunker, Norbert; Spiegel, Nikolaus; Lorenz, Roland; and Joss, Werner, to Heidelberger Druckmaschinen AG. Transmission system for forming cyclical motion from rotational motion printing press with counterbalance for torque fluctuation of gripper feed drum. 4,854,236, Cl. 101-411.000.

Thyssen Industrie AG: *See—*
Kreiskorte, Heinz, 4,855,678, Cl. 324-262.000.

Tidwell, Kelly. Fork stabilizer for motorcycle. 4,854,412, Cl. 180-219.000.

Tigelaar, Howard L.: *See—*
Esquivel, Agerico L.; Groover, Robert, III; and Tigelaar, Howard L., 4,855,800, Cl. 357-23.500.

Timmerman, Daniel M.: *See—*
Janssens, Wilhelmus; Timmerman, Daniel M.; and Claeys, Daniel A., 4,855,211, Cl. 430-213.000.

Tinet, Claude, to Thomson-CSF. Optical arrangement and a reading apparatus including detection of data elements diffractive along entire extent. 4,856,108, Cl. 369-46.000.

Ting, Ching-Jui; and Peng, Cheng-Jien, to Industrial Technology Research Institute. Positive temperature coefficient ceramic heating element for heating a fluid. 4,855,571, Cl. 219-376.000.

Titan Fitness Products Pty., Ltd.: *See—*
Sims, Anthony M., 4,854,577, Cl. 272-130.000.

Titeflex Corporation: *See—*
Gazda, Chester T.; and O'Melia, Lawrence F., 4,855,029, Cl. 204-197.000.
Lalikos, James M.; and Waite, Harold K., 4,854,416, Cl. 181-207.000.

Tixador, Pascal; and Brunet, Yves, to Societe Anonyme dite Alsthom. Detection device for detecting transitions to the normal state in a superconducting winding, in particular for generating electricity, and a protection device for protecting such a winding. 4,855,859, Cl. 361-19.000.

Tobin, Cullin S., to Chilly Bones, Inc. Cooling apparel. 4,854,319, Cl. 128-380.000.

Tobita, Katsumi, to Alps Electric Co., Ltd. AFT circuit for CATV receiver system. 4,855,835, Cl. 358-195.100.

Tocco, Inc.: *See—*
Mucha, George M.; Pfaffmann, George D.; and Novorsky, Donald E., 4,855,551, Cl. 219-10.430.
Mucha, George M.; Novorsky, Donald E.; and Pfaffmann, George D., 4,855,556, Cl. 219-105.900.

Tochigi-Fuji Sangyo Kabushiki Kaisha: *See—*
Kurihara, Sakuo, 4,854,434, Cl. 192-35.000.

Tochikubo, Shigeo. Single cylinder type switching valve for mixing hot and cold waters. 4,854,348, Cl. 137-625.170.

Toda, Haruhisa; and Murata, Shiroo, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker. 4,855,549, Cl. 200-401.000.

Todd Enterprises, Inc.: *See—*
Goldsmith, Howard G., 4,854,261, Cl. 114-343.000.

Todd, Harold E., Jr.; and Walters, Daniel L., to Chevron Research Company. Deicing compositions comprising alkaline earth or alkali metal carboxylates and processes for their production. 4,855,071, Cl. 252-70.000.

Todokoro, Hideo, to Hitachi, Ltd. Electron beam apparatus. 4,855,673, Cl. 324-158.00R.

Toft, Eric M.: *See—*
Hirschman, Alan D.; Reilly, David M.; Potter, Ross H.; Stulen, John; Toft, Eric M.; and Clark, John G., 4,854,324, Cl. 128-655.000.

Togano, Toshio: *See—*
Ishizuka, Hiroshi; and Togano, Toshio, 4,854,083, Cl. 51-131.400.

Tohyama, Noboru: *See—*
Kan, Fumitaka, deceased; Koizumi, Norihiko; Fukumoto, Hiroshi; Yusa, Toshiya; Tohyama, Noboru; Mishina, Shinya; and Tanioka, Hiroshi, 4,855,763, Cl. 346-160.100.

Toida, Tsutomu: *See—*
Matsuoka, Hiroo; Toida, Tsutomu; Takinami, Takao; Takenaka, Senji; and Fujita, Tetsuo, 4,855,124, Cl. 423-574.00L.

Tokai Rubber Industries, Ltd.: *See—*
Kanda, Ryouji, 4,854,561, Cl. 267-140.100.

Toki, Satoshi: *See—*
Kasugai, Joji; Toki, Satoshi; and Ide, Masayuki, 4,854,471, Cl. 220-288.000.

Tokico, Ltd.: *See—*
Sawano, Susumu; Sakuma, Masaru; Nagai, Hideaki; and Funabashi, Tatsuya, 4,855,917, Cl. 364-426.020.

Tokumoto, Mako: *See—*
Takao, Shoji; Nakashima, Hiroshi; Tokumoto, Mako; Saitoh, Makoto; and Watanabe, Makoto, 4,855,159, Cl. 426-656.000.

Tokumoto, Yuuichi: *See—*
Shimizu, Isoo; and Tokumoto, Yuuichi, 4,855,518, Cl. 585-319.000.
Shimizu, Isoo; Mitsuyuki, Hitoshi; Uchida, Kazumichi; and Tokumoto, Yuuichi, 4,855,519, Cl. 585-319.000.

Tokunaga, Norikazu: *See—*
Yamato, Ikuo; Tokunaga, Norikazu; Matsuda, Yasuo; and Amano, Hisao, 4,855,887, Cl. 363-8.000.

Tokuno, Mitsuji: *See—*
Murakami, Mitsuhiro; Mikami, Takahiro; Nagamatsu, Hiroyuki; and Tokuno, Mitsuji, 4,855,073, Cl. 252-39.000.

Tokyo Electron Limited: *See—*
Matsuoka, Fuminori, 4,855,775, Cl. 354-325.000.

Tokyo Juki Industrial Co., Ltd.: *See—*
Shibuya, Tsuyoshi, 4,855,633, Cl. 310-328.000.

Tokyo Keike Co., Ltd.: *See—*
Miyayama, Toshio; Masuzawa, Isao; and Hirono, Nakayasu, 4,855,739, Cl. 340-984.000.

Tokyo Keiki Company Ltd.: *See—*
Takeuchi, Kunihiko; Baba, Fujio; and Shimomura, Yasuo, 4,855,729, Cl. 340-825.050.
Takeuchi, Kunihiko; Oba, Masao; and Horinouchi, Shinichi, 4,855,994, Cl. 370-69.100.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See—*
Onose, Jun; Takagi, Kazutoshi; and Adachi, Fukuichi, 4,855,875, Cl. 362-32.000.
Sekine, Akihiko; Wada, Shinji; Yokokura, Takashi; Nunokawa, Kazuo; and Hideshima, Masayuki, 4,854,691, Cl. 351-221.000.

Tokyo Metropolitan Institute for Neurosciences: *See—*
Yoshioka, Masanori; Hou, Hidemitsu; and Kawai, Nobufumi, 4,855,405, Cl. 530-300.000.

Tomei Tsushin Kogyo Co., Ltd.: *See—*
Ohtsuka, Hiroo; Hara, Osamu; Hori, Akira; and Nodoa, Minoru, 4,854,889, Cl. 439-395.000.

Tomioka, Ichiro: *See—*
Sakashita, Kazuhiro; Kishida, Satoru; Hanibuchi, Toshiaki; Tomioka, Ichiro; and Arakawa, Takahiko, 4,856,002, Cl. 371-21.000.

Tomioka, Kenichi: *See—*
Murase, Kiyoshi; Mase, Toshiyasu; Hara, Hiromu; and Tomioka, Kenichi, 4,855,310, Cl. 514-361.000.

Tomioka, Yasushi; Imazeki, Shuji; Terao, Motoyasu; Ojima, Masahiro; and Taniguchi, Yoshio, to Hitachi, Ltd. Method for erasing recording in a PHB memory. 4,855,951, Cl. 365-119.000.

Tomisawa, Naoki, to Japan Electronic Control Systems Co., Ltd. Apparatus for learning and controlling air/fuel ratio in internal combustion engine. 4,854,287, Cl. 123-489.000.

Tomita, Yoshifumi; Nishizawa, Masahiro; and Nonogaki, Saburo, to Hitachi, Ltd. Fluorescent screens of color picture tubes and manufacturing method therefor. 4,855,200, Cl. 430-25.000.

Tomiyama, Hiroshi; and Naito, Seiahi, to Glory Kogyo Kabushiki Kaisha. Method for identifying certification identifying media. 4,855,584, Cl. 235-493.000.

Tomono, Syoji: *See—*
Sonoda, Akikazu; Fujita, Sinji; Sato, Masanobu; Tomono, Syoji; and Nakamura, Hisanori, 4,855,560, Cl. 219-86.250.

Tone, Shoichi, to Murata Kikai Kabushiki Kaisha. Winding controlling method for an automatic winder. 4,854,515, Cl. 242-36.000.

Tong, Hua Sou: *See—*
Livshultz, Michael; and Tong, Hua Sou, 4,854,906, Cl. 445-37.000.

Tong, Joy: *See—*
Pulichino, John V., Jr.; and Tong, Joy, 4,854,431, Cl. 190-108.000.

Toobe, Werner: *See—*
Woidich, Richard; and Toobe, Werner, 4,854,260, Cl. 114-316.000.

Toole, Patrick A.: *See—*
Gazdik, Charles E.; McBride, Donald G.; Seraphim, Donald P.; and Toole, Patrick A., 4,855,867, Cl. 361-306.000.

Topy Kogyo Kabushiki Kaisha: *See—*
Shinozawa, Yusaku; and Sugiura, Shin, 4,854,201, Cl. 83-140.000.

Tordeux, Marc; Wakselman, Claude; and FRancese, Catherine, to Rhone-Poulenc Chimie. Process for perfluoroalkylation of acid anhydrides. 4,855,460, Cl. 549-308.000.

Torichigai, Masaaki; and Iwamoto, Keiichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Cable insert nozzle. 4,854,614, Cl. 285-93.000.

Torii, Takahiro: *See—*
Watanabe, Isamu; Kamiya, Kazuhiro; Torii, Takahiro; and Mori, Toshihito, 4,855,287, Cl. 514-41.000.

Toro Company, The: *See—*
Holley, Charles C.; Petersen, Walter J.; and Zenner, Michael N., 4,854,112, Cl. 56-6.000.

Torrington Company, The: *See—*
Linnemeier, Elmer H., 4,854,738, Cl. 384-127.000.

Toshiba Kikai Kabushiki Kaisha: *See—*
Nakamura, Hiromi, 4,854,370, Cl. 164-259.000.
Sato, Kazuhito, 4,855,095, Cl. 264-40.500.

Toska Co., Ltd.: *See—*
Ueno, Hideyuki, 4,854,014, Cl. 24-16.0PB.

Toss, Franco. Support unit. 4,854,563, Cl. 269-25.000.

Toth, Vincent A.: *See—*
Hawkins, Phillip J.; Kasner, William H.; Toth, Vincent A.; and Stroster, Mariann C., 4,855,564, Cl. 219-121.780.

Totten, Jeffrey E.: *See—*
Lichtenberg, Norman B.; Sponseller, Harold P.; and Totten, Jeffrey E., 4,854,185, Cl. 74-501.50R.

Toulemonde, Marcel; and Balanzat, Emmanuel, to Commissariat A L'Energie Atomique; and Centre National de la Recherche Scientifique. Microporous membrane obtained by the irradiation of two faces and process for obtaining the same. 4,855,049, Cl. 210-500.400.

Tower, Steven A.; and Greenspan, Jay S. Hermetic glass chip carrier. 4,855,808, Cl. 357-74.000.

Townsend, Peter B.: *See—*
Gelb, Allan S.; Townsend, Peter B.; and Purdy, Erika, 4,855,810, Cl. 357-87.000.

Toya, Hideaki; and Hayashi, Tatsuya, to Mitsubishi Denki Kabushiki Kaisha. Vacuum interrupter. 4,855,547, Cl. 200-144.00B.

Toyoda Gosei Co., Ltd.: *See—*
Kasugai, Joji; Toki, Satoshi; and Ide, Masayuki, 4,854,471, Cl. 220-288.000.
Nishikawa, Masayuki; Miyazaki, Takeshi; Shigeki, Terumitsu; Mizutani, Satoshi; and Isono, Toru, 4,854,030, Cl. 29-510.000.

Toyoda, Kazuo: *See—*
Otsuka, Ryotatsu; Tanimoto, Shigemi; and Toyoda, Kazuo, 4,854,968, Cl. 75-63.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Hayakawa, Shigeru; Shiraishi, Daiichi; and Murakami, Hisakazu, 4,854,617, Cl. 292-216.000.
Ise, Kiyotaka; Matsumoto, Sinichi; and Miyazaki, Hiroharu, 4,854,411, Cl. 180-197.000.
Kasugai, Joji; Toki, Satoshi; and Ide, Masayuki, 4,854,471, Cl. 220-288.000.
Koide, Toshikazu; Ida, Shuichiro; Yoshinaka, Toshio; Nagano, Shuji; and Haga, Shoji, 4,854,414, Cl. 180-249.000.
Sonoda, Akikazu; Fujita, Sinji; Sato, Masanobu; Tomono, Syoji; and Nakamura, Hisanori, 4,855,560, Cl. 219-86.250.
Tamura, Masanobu, 4,854,124, Cl. 60-274.000.

Toyotomi Kogyo Co., Ltd.: *See—*
Nakanishi, Yutaka; and Yamada, Toshihiko, 4,854,858, Cl. 431-320.000.

Tozawa, Yukio: *See—*
Nagumo, Tadanobu; Takei, Sadakazu; and Tozawa, Yukio, 4,854,360, Cl. 152-529.000.

Tran, Duc H.: *See—*
Gluck, Julius; Murphy, Patrick; and Tran, Duc H., 4,855,756, Cl. 346-76.0PH.

Trca, Gordon R.: *See—*
Johannson, Gerald G.; and Trca, Gordon R., 4,854,573, Cl. 272-93.000.

Trenkle, Charles; and Sears, James B., Jr., to National Steel Corporation; and Gladwin Corporation. Shroud tube support and changing device. 4,854,488, Cl. 222-607.000.

Trenzeluk, Theodore, to Tecma Laboratories, Inc. Skin therapeutic mixture containing matico extract. 4,855,138, Cl. 424-195.100.

Tretorn AB: *See—*
Misevich, Kenneth W.; McGregor, Rob R.; and Corrao, Anthony J., 4,854,057, Cl. 36-114.000.

Trevor-Jones, Hugh: *See—*
O'Connell, John; Jefferies, Roy S.; and Trevor-Jones, Hugh, 4,854,146, Cl. 70-277.000.

Tridon Limited: *See—*
Fisher, Brian A., 4,854,450, Cl. 206-469.000.

Trilla, Antonio: *See—*
Solano, Victorino; and Trilla, Antonio, 4,854,426, Cl. 188-196.00M.

Trim-A-Lawn Corporation: *See—*
Jones, Dallas W.; and Young, Lauren, 4,854,115, Cl. 56-320.100.

Trinh, Toan; Wahl, Errol H.; Swartley, Donald M.; and Hemingway, Ronald L., to Procter & Gamble Company, The. Liquid fabric softener. 4,855,072, Cl. 252-8.800.

Trogolo, Joe R.: *See—*
Hutter, Louis N.; and Trogolo, Joe R., 4,855,244, Cl. 437-31.000.

Trostmann, Uwe; Schachtele, Christoph; Mannhardt, Karl; Rudolph, Claus; and Marme Dieter, to Goedecke Aktiengesellschaft. 2-Acyloxypropylamino derivatives, processes for the preparation thereof, and pharmaceutical compositions containing them. 4,855,489, Cl. 560-250.000.

Troudet, Thierry; and Walters, Stephen M., to Bell Communications Research, Inc. Digital phase locked loop with bounded jitter. 4,855,683, Cl. 328-155.000.

Trovato, Joseph R., to Eastman Kodak Company. Devices for mounting a load and orienting the load in two orthogonal directions. 4,854,532, Cl. 248-178.000.

TRW Inc.: *See—*
Figueroa, Luis; Morrison, Charles B.; Zinkiewicz, Lawrence M.; and Niesen, Joseph W., 4,856,014, Cl. 372-46.000.
Ingerson, Paul G., 4,855,751, Cl. 343-779.000.

TRW Vehicle Safety Systems Inc.: *See—*
Brown, Louis R.; and Higbee, Wallace C., 4,854,522, Cl. 242-107.700.

Tschang, Chung-Ji: *See—*
Braun, Gerold; Tschang, Chung-Ji; Vamvakaris, Christos; and Glaser, Klaus, 4,855,423, Cl. 544-2.000.

Tschopp, Juerg F.: *See—*
Stroman, David W.; Brust, Paul F.; Ellis, Steven B.; Gingeras, Thomas R.; Harpold, Michael M.; and Tschopp, Juerg F., 4,855,231, Cl. 435-68.000.

Tsubakimoto Chain Co.: *See—*
Osada, Shuichi; Hayashi, Satoru; Goto, Masaru; and Godo, Kiyoshi, 4,854,529, Cl. 246-187.00B.

Tsubuko, Kazuo; and Nagai, Kayoko, to Ricoh Company, Ltd. Developer for electrophotography. 4,855,207, Cl. 430-109.000.

Tsuburai, Yasuhiko: *See—*
Yamamoto, Motoyuki; and Tsuburai, Yasuhiko, 4,855,250, Cl. 437-81.000.

Tsuchiya, Soji; Ito, Yoshimasa; Higuchi, Sadashi; and Yamashita, Akio, to Matsushita Electric Industrial Company, Ltd. Electrochromic display having a dielectric layer. 4,855,727, Cl. 340-785.000.

Tsuchiya, Yutaka: *See—*
Nakamura, Takuya; Aoshima, Shinichiro; and Tsuchiya, Yutaka, 4,855,591, Cl. 250-225.000.

Tsuji, Mutsuo, to NEC Corporation. Chip carrier. 4,855,869, Cl. 361-386.000.

Tsuji, Sadahiko, to Canon Kabushiki Kaisha. Photographic system having front conversion lens. 4,854,679, Cl. 350-422.000.

Tsuji, Sadahiko: *See—*
Kato, Masatake; Tsuji, Sadahiko; Sugiura, Muneharu; and Tanaka, Kazuo, 4,854,681, Cl. 350-427.000.

Tsujimoto, Akito: *See—*
Kohigashi, Minoru; Shiraki, Toshihiko; and Tsujimoto, Akito, 4,854,749, Cl. 384-482.000.

Tsujino, Yoshikazu: *See—*
Kuwano, Yukinori; Tsujino, Yoshikazu; and Hamada, Yuji, 4,855,214, Cl. 430-281.000.

Tsukada, Toshihisa: *See—*
Yamamoto, Hideaki; Sasano, Akira; Matsumaru, Haruo; Tanaka, Yasuo; and Tsukada, Toshihisa, 4,855,795, Cl. 357-2.000.

Tsukada, Toshinori: *See—*
Nakano, Tsunetomo; Hayashi, Toshikazu; and Tsukada, Toshinori, 4,855,215, Cl. 430-283.000.

Tsukamoto, Katsuhiro; Shimizu, Masahiro; Fujishima, Kazuyasu; and Matsuda, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device having stacked memory capacitors and method for manufacturing the same. 4,855,953, Cl. 365-149.000.

Tsunekawa, Yoshifumi: *See—*
Iwano, Hideaki; and Tsunekawa, Yoshifumi, 4,856,013, Cl. 372-45.000.

Tsuno, Nobuo: *See—*
Oda, Isao; and Tsuno, Nobuo, 4,854,025, Cl. 29-156.80R.

Tsunoda, Yoshito: *See—*
Kaku, Toshimitsu; Tsunoda, Yoshito; Maeda, Takeshi; and Nakamura, Shigeru, 4,855,991, Cl. 369-275.000.

Tsutomu, Kurokawa: *See—*
Masakazu, Kikuchi; Tsutomu, Kurokawa; and Susumu, Honda, 4,855,409, Cl. 530-351.000.

Tsutsumi, Kenichi: *See—*
Matsubara, Akinori; Tsutsumi, Kenichi; Kaneko, Youji; Akutsu, Takashi; and Tateishi, Naofumi, 4,854,209, Cl. 84-1.010

Tuckwood, Denis W., to Pressac Limited. Electrical connector for a printed circuit. 4,854,883, Cl. 439-84.000.

Tufts, Timothy A.; Borgnaes, Dan; Culbertson, Billy M.; and Wilkinson, Theodore C., to Ashland Oil, Inc. Thermoset resinous molding compositions. 4,855,368, Cl. 525-454.000.

Tunekawa, Shouji; Yamada, Wazoh; Hara, Yoshitaka; and Suzuki, Fujio, to Sanyo Electric Co., Ltd. Wall mounted air conditioner with dischargers in separate rooms. 4,854,376, Cl. 165-54.000.

Tunison, Mafer E.: *See—*
Young, David A.; Vaughan, David E.; Pruett, Roy L.; and Tunison, Mafer E., 4,855,528, Cl. 585-531.000.

Turak, Ali A.: *See—*
Janiak, Jerzy S.; Turak, Ali A.; Pawlak, Wanda; and Ignasiak, Boleslaw L., 4,854,940, Cl. 44-620.000.

Turek, Joseph A., to Poly Circuits, Inc. Method of making multilayer pc board using polymer thick films. 4,854,040, Cl. 29-847.000.

Turk, Frederick J., to Minnesota Mining and Manufacturing Company. Electrical connector. 4,854,898, Cl. 439-723.000.

Turner, John E.; Rutledge, David L.; and Darling, Roy D., to Lattice Semiconductor Corporation. In-system programmable logic device with four dedicated terminals. 4,855,954, Cl. 365-185.000.

Tyler, Maurice E.: *See—*
Warren, Donald E.; and Tyler, Maurice E., 4,854,389, Cl. 169-28.000.

Ube Industries, Ltd.: *See—*
Nakano, Tsunetomo; Hayashi, Toshikazu; and Tsukada, Toshinori, 4,855,215, Cl. 430-283.000.

Uchida, Hiroyuki: *See—*
Katsumata, Masaaki; Takagi, Isamu; Takahashi, Eiji; Sakai, Tadamichi; Matsumoto, Yoji; Ohtsu, Hideaki; Uchida, Hiroyuki; and Asami, Kiyoshi, 4,855,106, Cl. 420-109.000.

Uchida, Kazumichi: *See—*
Shimizu, Isoo; Mitsuyuki, Hitoshi; Uchida, Kazumichi; and Tokumoto, Yuuichi, 4,855,519, Cl. 585-319.000.

Uchida, Kenji; Banba, Nobuyuki; Kuroiwa, Minoru; Saito, Makoto; and Kamino, Yukishige, to Hitachi, Ltd. Vertical hydro-hoist with adjustable floats and method of operating the same. 4,854,783, Cl. 406-13.000.

Uchida, Shinya; Hirata, Akira; Ebihara, Hideyuki; Yoshikawa, Eiichi; Sano, Eisaku; and Uehara, Kazuhiro, to Laurel Bank Machines Co., Ltd. Bill receiving, discriminating, and dispensing machine. 4,854,452, Cl. 209-534.000.

Uchikawa, Akira, to Japan Electronic Control Systems Co. Air-fuel ratio control apparatus in internal combustion engine. 4,854,288, Cl. 123-489.000.

Uchiyama, Toshihiko: *See—*
Hamada, Takuji; Takahashi, Masahiro; Yoneda, Katsuhiko; Onuki, Ken; and Uchiyama, Toshihiko, 4,855,993, Cl. 370-16.000.

Uchiyama, Yoshirou: *See*—
Ueno, Ryuzo; Katsura, Shinichi; Uchiyama, Yoshirou; and Inoue, Satomi, 4,855,482, Cl. 560-56.000.
Ueda, Hiraki; Miyamoto, Hisashi; Aki, Shinji; and Otsuka, Tatsuya, to Otsuka Pharmaceutical Company, Limited. 1-cyclopropyl-6-fluoro-8-alkyl-1,4-dihydro-4-oxo-quinoline-3-carboxylic acid derivatives. 4,855,292, Cl. 514-312.000
Ueda, Nobuo: *See*—
Kurami, Miki; Shirakami, Yoshifumi; Takahashi, Kenetsu; and Ueda, Nobuo, 4,855,353, Cl. 525-54.100.
Ueda, Ryuzo: *See*—
Takahashi, Toshitada; Ueda, Ryuzo; and Ohta, Kazuo, 4,855,235, Cl. 435-240.270.
Ueda, Yutaka, to Murata Kikai Kabushiki Kaisha. Doffed package transporting system. 4,854,439, Cl. 198-350.000
Ueda, Yutaka; and Kiriake, Masaharu, to Murata Kikai Kabushiki Kaisha. Article selecting and conveying system. 4,854,453, Cl. 209-583.000.
Uehara, Kazuhiro: *See*—
Uchida, Shinya; Hirata, Akira; Ebihara, Hideyuki; Yoshikawa, Eiichi; Sano, Eisaku; and Uehara, Kazuhiro, 4,854,452, Cl. 209-534.000.
Ueno, Hideyuki, to Toska Co., Ltd. Fastener. 4,854,014, Cl. 24-16.0PB.
Ueno, Ryuzo; Katsura, Shinichi; Uchiyama, Yoshirou; and Inoue, Satomi, to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo. New compounds and their application. 4,855,482, Cl. 560-56.000.
Uesugi, Naomoto; Takahashi, Hideo; and Ikeno, Tetsuro, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust muffler for an internal combustion engine. 4,854,417, Cl. 181-272.000
Uesugi, Tatsuya; and Nakai, Eiji, to Mazda Motor Corporation. Oil pressure control apparatus for an internal combustion engine. 4,854,273, Cl. 123-90.170.
Ueyama, Shinichiro; Furukawa, Masayuki; and Nishikawa, Tadaichi, to Shin Nisso Kako Co., Ltd. Process for producing phosphonitrile oligomers containing maleimidophenoxy group. 4,855,389, Cl. 528-168.000.
Uggeri, Fulvio: *See*—
Giordano, Claudio; Castaldi, Graziano; Uggeri, Fulvio; and Cavicchioli, Silvia, 4,855,464, Cl. 549-450.000
Ulbing, Otmar M., to Windwinder Corporation. Rotary/linear actuator. 4,854,189, Cl. 74-640.000.
Umeda, Bill: *See*—
Hug, Paul; Umeda, Bill; Yesnosky, Paul A.; Raudebaugh, Bart; Ricco, Gary; and McCabe, Gary E., 4,855,980, Cl. 369-36.000
Umezawa, Hamao; Umezawa, Kazuo; Odagawa, Atsuo; Kataoka, Shiro; and Nakajima, Shohachi, to Kirin Beer Kabushiki Kaisha. Process for production of anthracycline compound R20X2. 4,855,414, Cl. 536-6.400.
Umezawa, Kazuo: *See*—
Umezawa, Hamao; Umezawa, Kazuo; Odagawa, Atsuo; Kataoka, Shiro; and Nakajima, Shohachi, 4,855,414, Cl. 536-6.400.
Ungar, Jeffrey E., to Ortel Corporation. Single frequency high power semiconductor laser. 4,856,017, Cl. 372-96.000
Unger, John J., to Reliance Comm/Tec Corporation. Telephone distribution frame connector assembly for use with central office protector module having alarm indicator. 4,854,884, Cl. 439-92.000.
Unidec: *See*—
Pike, Brian R.; Furlong, Patrick J.; and Moers, John W., 4,854,760, Cl. 401-134.000.
Unidynamics Corporation: *See*—
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Union Carbide Corporation: *See*—
Blevins, Charles H., II; Herdle, William B.; and Murphy, Gerald J., 4,855,329, Cl. 521-112.000.
Budnik, Richard A.; and Murphy, Gerald J., 4,855,379, Cl. 528-29.000
Chirillo, John R.; Kimbrough II, Kellam C.; and McHattie, Peder E., 4,855,370, Cl. 526-74.000.
Lewis, Walter E. F., 4,855,070, Cl. 252-75.000.
Meschke, Debra J.; and Hoy, Kenneth L., 4,855,403, Cl. 528-419.000.
Union Oil Company of California: *See*—
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Unisys Corporation: *See*—
Henze, Christopher P.; Mohan, Ned; and Hayes, John G., 4,855,888, Cl. 363-17.000.
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Agriculture: *See*—
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Won, Vann Yuen, 4,854,190, Cl. 74-695.000.
Army: *See*—
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Jasper, Louis J., Jr., 4,854,215, Cl. 89-8.000.
Melvin, William S.; and Graham, James F., 4,854,982, Cl. 149-109.600.
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Wright, Maynard K., 4,855,194, Cl. 429-38.000.
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National Aeronautics and Space Administration: *See*—
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U.S. Philips Corporation: *See*—
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Creusen, Caspard H. J.; and Colditz, Johannes K. E., 4,855,587, Cl. 250-213.0VT.
Eijkelenboom, Leonard C. H.; Maassen, Egbertus J. P.; and Van Meel, Franciscus A. M. M., 4,855,886, Cl. 362-350.000.
Fialon, Bernard, 4,854,559, Cl. 267-74.000
Gukkenberger, Horst; and Eberle, Karl, 4,854,035, Cl. 29-603.000.
Himmelbauer, Erich E., 4,855,638, Cl. 313-389.000.
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McElroy, James F., 4,855,193, Cl. 429-30.000.
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University of California, The Regents of the: *See*—
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University of Dayton: *See*—
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University of Delaware: *See*—
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University of Pennsylvania, Trustees of the: *See*—
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University of Tennessee Research Corporation, The: *See*—
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Raftopoulos, Demetrios D.; and Baril, James D., 4,854,312, Cl. 128-92.0YY.
University Patents, Inc.: *See*—
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UOP: *See*—
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Gioffre, Anthony J.; and Marcus, Bonita K., 4,855,154, Cl. 426-417.000.
Molinaro, James S., 4,854,623, Cl. 294-1.100.
Upchurch, Billy T.; Davis, Patricia A.; and Miller, Irvin M., to United States of America, National Aeronautics and Space Administration. Process for making a noble metal on tin oxide catalyst. 4,855,274, Cl. 502-339.000.
Upjohn Company, The: *See*—
Sih, John C., 4,855,435, Cl. 546-274.000.
Urai, Takahiko, to NEC Corporation. Semiconductor memory device with improved cell arrangement. 4,855,956, Cl. 365-210.000.
Urata, Hisao: *See*—
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Urushiwara, Noriyoshi; Sugiura, Noboru; Fujino, Yasunori; and Kobayashi, Ryoichi, to Hitachi, Ltd. Ignition system for internal combustion engine. 4,854,292, Cl. 123-630.000.
Usher, Thomas C., to Polydex Pharmaceuticals, Ltd. Method for the manufacture of dextran sulfate and salts thereof. 4,855,416, Cl. 536-112.000.
Ushijima, Hitoshi: *See*—
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Van Doorne's Transmissie B.V.: *See*—
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van Broekhoven, Johannes A. M.; and Doyle, Michael J., to Shell Oil Company. Removal of catalyst residues from carbon monoxide/olefin polymers with catalyst complexing agent. 4,855,400, Cl. 528-392.000.
van Broekhoven, Johannes A. M., to Shell Oil Company. Removal of catalyst remnants from carbon monoxide/olefin polymers at temperatures higher than polymerization temperatures. 4,855,401, Cl. 528-392.000.
van der Spek, Ferdinand: *See*—
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Van de Sande, Christian C.: *See*—
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Van Doorn, Johannes A.; Drent, Eit; Van Leeuwen, Petrus W. N. M.; Meijboom, Nicolaas; Van Oort, Aart B.; and Wife, Richard L., to Shell Oil Company. Carbon monoxide/olefin co-polymerization process with phosphino substituted sulfonic acid catalyst. 4,855,399, Cl. 528-392.000.
Van Eck, Arnoldus H. M., to U.S. Philips Corporation. Method of manufacturing an electron gun. 4,855,639, Cl. 313-456.000.
Van Esdonk, Johannes M. A.: *See*—
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Van Gerwen, Petrus J.: *See*—
Bergmans, Johannes W. M.; Claasen, Theodoor A. C. M.; and Van Gerwen, Petrus J., 4,856,026, Cl. 375-58.000.
Van Groningen, Wilhelmus D. H., to U.S. Philips Corporation. Trigger arrangement suitable for oscilloscopes. 4,855,682, Cl. 328-63.000.
Vanhaeren, Gerard M., to Exxon Chemical Patents Inc. Cross-linkable hot melt adhesive composition. 4,855,382, Cl. 528-45.000.
Van Leeuwen, Petrus W. N. M.: *See*—
Van Doorn, Johannes A.; Drent, Eit; Van Leeuwen, Petrus W. N. M.; Meijboom, Nicolaas; Van Oort, Aart B.; and Wife, Richard L., 4,855,399, Cl. 528-392.000.
van Lith, Johannes H., to Van Doorne's Transmissie B.V. Infinitely variable transmission with a corrected pulley alignment. 4,854,919, Cl. 474-25.000.
Van Maanen, Paul F., Jr., to Recognition Equipment Incorporated. Data merge document processing method. 4,855,580, Cl. 235-440.000.
Vanmaele, Luc J.; Wilhelmus, Janssens; and Van de Sande, Christian C., to Agfa-Gevaert, N.V. Organic compounds for use in a dye diffusion transfer process and photographic elements incorporating them. 4,855,223, Cl. 430-562.000.
Van Meel, Franciscus A. M. M.: *See*—
Eijkelenboom, Leonard C. H.; Maassen, Egbertus J. P.; and Van Meel, Franciscus A. M. M., 4,855,886, Cl. 362-350.000.
Vano, Patrick P.: *See*—
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Van Doorn, Johannes A.; Drent, Eit; Van Leeuwen, Petrus W. N. M.; Meijboom, Nicolaas; Van Oort, Aart B.; and Wife, Richard L., 4,855,399, Cl. 528-392.000.
Van Sloun, Peter H., to Honeywell Inc. Self-sterilizing safe-arm device with arm/fire feature. 4,854,239, Cl. 102-426.000.
Van Weerden, Jan; Valkenburg, Johannes; and van der Spek, Ferdinand, to Filtrete B.V. Air filter and module to be used for building up such a filter. 4,854,953, Cl. 55-483.000.
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Vassiliou, Eustathios, to Du Pont de Nemours, E. I., and Company. Screen printer apparatus. 4,854,229, Cl. 101-123.000.
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Vea, Cary A. C., to Polytron Corporation. Cable installation and placement implement. 4,854,546, Cl. 254-134.30R.
Venners, Howard W.; Beyers Jr., Billy W.; and Hailey, James E., to RCA Licensing Corporation. Component audio/video system with timed control of plural peripheral devices. 4,855,730, Cl. 340-825.240.
Verbitsky, Alexandr N.: *See*—
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Verboom, Johannes J., to Optical Storage International Holland. Method of transmitting n-bit information words, information transmission system for carrying out the method, and encoding device and decoding device for use in the information-transmission system. 4,855,742, Cl. 341-102.000.
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Verbrugge, Pieter A.; de Waal, Jannetje; and Sopher, David W., to Shell Oil Company. N-substituted azetidine carboxylate derivatives. 4,855,452, Cl. 548-953.000.
Vercillo, Alfredo J.; and Nanos, Nicholas M., to General Binding Corporation. Electrically heated binder apparatus. 4,855,573, Cl. 219-492.000.
Verlaan, Johannes P. J.; and Beijleveld, Wilhelmus M., to Akzo N.V. Triazine peroxides. 4,855,428, Cl. 544-219.000.
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Vernachio, Mark D. Side terminal battery charging apparatus. 4,854,901, Cl. 439-755.000.
Versluis, Johannes W., to U.S. Philips Corp. Optical device comprising a holder accommodating an optical system which compensates for thermal expansion/contraction. 4,855,987, Cl. 369-112.000.
Versteegen, Clemens: *See*—
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Vezirian, Edward. Lost foam casting method. 4,854,368, Cl. 164-34.000.
Vick, Ralph L., to Allied-Signal Inc. Load compensated servo system to control flow rate as a function of command. 4,854,222, Cl. 91-447.000.
Victor Co. of Japan: *See*—
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Vidwans, Mohan P.; and Ino, Kenji, to Hoover Universal, Inc. Head restraint guide assembly. 4,854,642, Cl. 297-410.000.
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Vincent, Kent D.; and Myerholtz, Carl A., to Hewlett-Packard Company. Forensic sample tracking system and print station therefor. 4,855,909, Cl. 364-413.010.
Vinson, John W.; Howell, Stephen J.; and Lampes, Elias H., to General Electric Company. Bimodal swirler injector for a gas turbine combustor. 4,854,127, Cl. 60-742.000.

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Voeste, Theodor; and Supp, Emil, to Metallgesellschaft Aktiengesellschaft. Process of producing a gas which is rich in carbon monoxide by a cracking of hydrocarbons. 4,854,943, Cl. 48-196.00A.
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Voirol, Peter; and Moser, Urs, to Ciba-Geigy Corporation. Process for the production of a fiber-reinforced synthetic resin container. 4,854,988, Cl. 156-155.000.
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Von Bratt, Marmaduke G. Casket liners. 4,854,018, Cl. 27-19.000.
von Raben, Klaus-Ulrich, to Siemens Aktiengesellschaft. Monitoring bond parameters during the bonding process. 4,854,494, Cl. 228-102.000.
Von Schalscha, Craig. Appliance mounting device. 4,854,538, Cl. 248-346.000.
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Vu, Cung; Buxbaum, Susan P.; Blank, Norman E.; and Hartwig, Richard C., to W. R. Grace & Co.-Conn. Polyurethane coatings for bridge deckings and the like. 4,855,185, Cl. 428-423.100
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Wada, Toshiaki; and Murata, Akio, to Sumitomo Special Metal Co., Ltd. Thin-film magnetic head. 4,855,854, Cl. 360-126.000.
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Wade, Christopher A., to Plessey Overseas Limited. Optical pulse generating arrangements. 4,856,092, Cl. 455-609.000.
Wagner, Adalbert; Kleemann, Heinz-Werner; Ruppert, Dieter; and Scholkens, Bernward, to Hoechst Aktiengesellschaft. Renin-inhibiting di- and tripeptides, a process for their preparation, agents containing them, and their use. 4,855,286, Cl. 514-19.000.
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Wagner, William C. System for measuring air pressure on drive axles of road tractor trailers and load distribution. 4,854,407, Cl. 177-141.000.
Wagner, Wolfram; Paulini, Dieter; and Widder, Peter, to Bayer Aktiengesellschaft. Process for treatment of filament cable. 4,854,020, Cl. 28-255.000.
Wahl, Eric R. Sailboard with adjustable keel mechanism. 4,854,904, Cl. 441-79.000.
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Wakai, Kunio; Niimi, Hideaki; and Isoe, Noboru, to Hitachi Maxell, Ltd. Magnetic recording medium and production thereof. 4,855,175, Cl. 428-148.000.
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Wallach, Donald F. H., to Micro-Pak, Inc. Method of producing high aqueous volume multilamellar vesicles 4,855,090, Cl. 264-4.10.
Wallbank, James, to Austin Rover Group Limited. Method of making a moulded article. 4,854,366, Cl. 164-16.000.
Wallgren, Linus E.; Mason, Bobby L.; Siegel, William J.; Olesen, Ole V.; and Abbagnaro, Louis A., to PACE Incorporated. Heater for use as either primary or auxiliary heat source and improved circuitry for controlling the heater. 4,855,572, Cl. 219-456.000.
Walpin, Arline; and Walpin, Lionel A., to Roloke Company. Adjustable body positioner. 4,853,993, Cl. 5-431.000.
Walpin, Lionel A.: *See—*
Walpin, Arline; and Walpin, Lionel A., 4,853,993, Cl. 5-431.000.
Walruff, James C. Apparatus and method for noninvasive testing of voluntary and involuntary motor response patterns. 4,854,329, Cl. 128-745.000.
Walsh, David A., to A. H. Robins Company, Incorporated. 2-amino-3-aroyl-upsilon-oxobenzenebutanoic acid and esters. 4,855,447, Cl. 548-494.000.
Walsh, David A., to A. H. Robins Company, Incorporated. 2-Amino-3-aroyl-γ-oxobenzenebutanoic acids and esters. 4,855,448, Cl. 548-504.000
Walter, Alfred E., Jr.: *See—*
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Walters, John E., to Metallifacture, Ltd. Hand brake assembly for a vehicle. 4,854,187, Cl. 74-535.000.
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Waltz, Thomas A., to F. J. Westcott Company, The. Light modifier and method for modifying light. 4,855,874, Cl. 362-16.000
Wambach, Ludwig, to BASF Aktiengesellschaft. α-pyrrolidones and a method for preparation thereof. 4,855,444, Cl. 548-408.000.
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Wang, Eugene T.; and Si, Stephen S. C., to Amdahl Corporation. Apparatus for synchronously switching frequency source. 4,855,616, Cl. 307-269.000.
Wang, Su S., to Alpha-1 Biomedicals, Inc. Solid phase process for synthesizing peptides. 4,855,407, Cl. 530-334.000.
Wang, Tim. Electric fluid heating unit having radial PTC ceramic heating elements. 4,855,570, Cl. 219-375.000.
Wang, Yen-Flui. Manual blenders. 4,854,718, Cl. 366-252.000.
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Weber, Charles M., to Hewlett-Packard. Test method for random defects in electronic microstructures. 4,855,253, Cl. 437-8.000.
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Wecker, Joachim, to Siemens Aktiengesellschaft. Method for the manufacture of an anisotropic magnet material on the basis of Fe, B and a rare-earth metal. 4,854,979, Cl. 148-103.000.
Wedgwood, Janet E.; Berde, Dennis W.; Bocskor, Steven J.; and Cotter, George E., to Grumman Aerospace Corporation. Adaptive and programmable blanker. 4,856,079, Cl. 455-50.000.
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Wellinga, Kobus; and Eussen, Jacobus H. H., to Duphar International Research B.V. Substituted 2-phenylimino-oxazolidine compounds having herbicidal activity. 4,854,961, Cl. 71-88.000.
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Wendt, Barry M., to Technology Congress, Ltd., The. Prototype circuit board and method of testing. 4,854,039, Cl. 29-832.000.
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Wiese, Martin E.; and Lehman, Dexter K. Automatic floor scrubbing machine with squeegee assembly and adjustable wheels. 4,854,005, Cl. 15-320.000.
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Wilson, Earl, to Kendall Company, The. Device for measuring effective porosity. 4,854,157, Cl. 73-38.000.
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Wilson, Robert D.; Grigg, Douglas W.; and Gialanella, Donald G., to Wilson Water Weights, Inc. Fluid fillable, collapsible dumbbells. 4,854,575, Cl. 272-122.000.
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Woidich, Richard; and Toobe, Werner, to Krupp MaK Maschinenbau GmbH. Configuration of discharge tubes, ejection tubes or receptacles in submarines. 4,854,260, Cl. 114-316.000.
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Renner, Gunter; Wolff, Erich; Wiesen, Heinz; and Liebe, Werner, 4,855,222, Cl. 430-557.000.
Won, Vann Yuen, to United States of America, Air Force. Continuously variable gear drive transmission. 4,854,190, Cl. 74-695.000.
Wong, Steven S.: *See*—
LaPierre, Rene B.; Partridge, Randall D.; and Wong, Steven S., 4,855,530, Cl. 585-739.000.
Wong, Wah S.; Wen, Cheng P.; and Kung, Jen K., to Hughes Aircraft Company. Beam lead mixer diode. 4,855,796, Cl. 357-15.000.
Woo, Sam L.: *See*—
Fung, Steven; Woo, Sam L.; Haugland, Richard P.; Menchen, Steven M.; and Connell, Charles R., 4,855,225, Cl. 435-6.000
Wood, Stewart P.: *See*—
Cutie, Sergio S.; Langhorst, Martin A.; and Wood, Stewart P., 4,854,700, Cl. 356-72.000.
Wood, William P.: *See*—
Mathers, James P.; Wood, William P.; and Forester, Thomas, 4,855,264, Cl. 501-98.000.
Woods Hole Oceanographic Institute: *See*—
Jaffe, Jules S.; Cassereau, Philippe; and Sato, Tomomasa, 4,855,961, Cl. 367-7.000.
Woolard, Frank X., to ICI Americas Inc. N,N'-diaryl-N-alkylureas and method of use. 4,855,478, Cl. 558-417.000.
Woolf, Floyd S.: *See*—
Sexton, Rodney N.; Woolf, Floyd S.; and Ruud, Timothy W., 4,854,743, Cl. 384-130.000.
Sexton, Rodney N.; and Woolf, Floyd S., 4,854,923, Cl. 474-84.000.
Woozley, Mark E.: *See*—
Halling, Horace P.; Barrett, Robert A.; and Woozley, Mark E., 4,854,600, Cl. 277-236.000.
Worlds of Wonder, Inc.: *See*—
Best, Robert J., 4,855,827, Cl. 358-143.000.
Worm, Manfred: *See*—
Martin, Lawrence L.; Worm, Manfred; and Crishlow, Charles A., 4,855,502, Cl. 564-373.000.
Worthington, Diana M.: *See*—
Noon, Robert A.; Crowley, Patrick J.; and Worthington, Diana M., 4,855,510, Cl. 568-663.000.
Wrasidlo, Wolfgang J.; Hofmann, Frieder K.; and Mysels, Karol J., to Memtec North America Corp. Polytetrafluoroethylene coating of polymer surfaces. 4,855,162, Cl. 427-243.000.

Wrecsics, Ernest L.: *See*—
Garg, Diwakar; Dyer, Paul N.; Schaffer, Leslie E.; Wrecsics, Ernest L.; Dimos, Duane; and Mueller, Carl F., 4,855,188, Cl. 428-627.000.
Wreede, John E., to Hughes Aircraft Company. Process for improving holographic efficiency. 4,854,674, Cl. 350-320.000.
Wrezel, James A.: *See*—
Zupancic, Joseph J.; Zweig, Andrew M.; and Wrezel, James A., 4,855,375, Cl. 526-247.000.
Wright, Danny O.; and Wiggins, Kregg S., to Siemens-Bendix Automotive Electronics L.P. Microstepping of an unipolar stepping motor. 4,855,660, Cl. 318-696.000.
Wright, Jeremy C.: *See*—
Eckenhoff, James B.; Magruder, Judy A.; Cortese, Richard; Peery, John R.; and Wright, Jeremy C., 4,855,141, Cl. 424-423.000.
Wright, Maynard K., to United States of America, Energy. Fuel cell having electrolyte inventory control volume. 4,855,194, Cl. 429-38.000.
Wrigley, Charles Y.: *See*—
Soltani, Peter K.; Wrigley, Charles Y.; and Storti, George M., 4,855,879, Cl. 362-84.000.
Wu, Kuang-Tsan: *See*—
Kennard, Paul A.; Middleton, Joseph L.; Wu, Kuang-Tsan; and McNicol, John D., 4,855,692, Cl. 332-17.000.
Wurminghausen, Thomas; Schneider, Karl; Saykowski, Franz; and Frohlen, Hans G., to Bayer Aktiengesellschaft. Process for the preparation of organooxychlorosilanes. 4,855,473, Cl. 556-471.000.
Wyatt, Donald H., to American Safety Products. Fire extinguishing apparatus. 4,854,388, Cl. 169-26.000.
Wylie, Glenn J. Decorative posts for crowd control. 4,854,548, Cl. 256-65.000.
Wyman, John E., to Hitachi Metals, Ltd.; and Consolidated Chemical & Consulting Co. Super paramagnetic fluids and methods of making super paramagnetic fluids. 4,855,079, Cl. 252-62.520.
Wynn, Edward J.: *See*—
Strosser, Richard P.; Wynn, Edward J.; Chow, Mark K.; and Schlotterbeck, Stephen C., 4,855,924, Cl. 364-468.000.
Wyshak, Geoffrey M.: *See*—
Baile, Gnaneshwar R.; Herman, John E.; and Wyshak, Geoffrey M., 4,855,469, Cl. 556-409.000.
Wyss, Frederick: *See*—
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Xerox Corporation: *See*—
Badesha, Santokh S.; Grammatica, Steven J.; and Jansen, Frank, 4,855,201, Cl. 430-58.000.
Badesha, Santokh S.; Foley, Geoffrey M. T.; Pai, Damodar M.; Zallen, Richard H.; Slade, Michael L.; and Abkowitz, Martin A., 4,855,203, Cl. 430-59.000.
Fullmer, David M., 4,855,923, Cl. 364-468.000.
Martin, Trevor I.; Breton, Marcel P.; Branston, Randolph E.; Moffat, Karen A.; and Mychajlowskij, Walter, 4,855,209, Cl. 430-126.000.
Xi Tech Inc.: *See*—
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Xilinx, Inc.: *See*—
Hsieh, Hung-Cheng; and Carter, William S., 4,855,619, Cl. 307-443.000.
Mahoney, John E., 4,855,669, Cl. 324-73.00R.
Yabe, Hisao: *See*—
Hibino, Hiroki; Kimura, Kenji; Kanno, Masahide; Nishikori, Toshiaki; Yoshinaga, Jun; Kidawara, Atsushi; Yabe, Hisao; Katou, Shinichi; Takamura, Koji; and Nakamura, Takeaki, 4,855,819, Cl. 358-98.000.
Yagasaki, Toshiaki, to Canon Kabushiki Kaisha. Control device for copier or the like. 4,855,648, Cl. 315-307.000.
Yaginuma, Nakatsugu: *See*—
Muraishi, Katsuaki; Yaginuma, Nakatsugu; Hirai, Kikuo; Arai, Fuminori; and Iwata, Yuzo, 4,855,109, Cl. 422-63.000.
Yahagi, Masahiro: *See*—
Ono, Shuichi; Itagaki, Shuichi; Yahagi, Masahiro; Furukawa, Kiyoshi; Fujiwara, Shinobu; and Oikawa, Yasunobu, 4,854,936, Cl. 29-570.100.
Yale University: *See*—
Saunders, Martin, 4,855,931, Cl. 364-499.000.
Yamada, Kimichika; Ito, Yukio; and Ohkawa, Hiroyuki, to Clarion Co., Ltd. Double insertion and inner lid float preventing mechanism. 4,855,848, Cl. 360-96.500.
Yamada, Kunio. Head connecting device in golf clubs. 4,854,582, Cl. 273-80.200.
Yamada, Michihiro; and Miyamoto, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Wafer scale integration semiconductor device having improved chip power-supply connection arrangement. 4,855,613, Cl. 307-202.100.
Yamada, Shoji, to Murata Kikai Kabushiki Kaisha. Traverse drum. 4,854,516, Cl. 242-43.200.
Yamada, Sotoshi: *See*—
Bessho, Kazuo; and Yamada, Sotoshi, 4,855,703, Cl. 335-296.000.
Yamada, Toshihiko: *See*—
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Yamada, Toshihiri: *See*—
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Yamada, Wazoh: *See*—
Tunekawa, Shouji; Yamada, Wazoh; Hara, Yoshitaka; and Suzuki, Fujio, 4,854,376, Cl. 165-54.000.
Yamada, Yoshihisa; and Matsuoka, Yuzo, to Tanabe Seiyaku Co., Ltd. 6-Halo-1,2,3,4-tetrahydroquinazoline-4-spiro-4-imidazolidine-2,2'5'-triones useful for the treatment and prophylaxis of diabetic complications. 4,855,298, Cl. 514-259.000.
Yamada, Youichi; and Takahashi, Keiko, to Oki Electric Industry Co., Ltd. Speech recognition system wherein the consonantal characteristics of input utterances are extracted. 4,856,067, Cl. 381-45.000.
Yamaguchi, Akira, to Fuji Photo Film Co., Ltd. Method for manufacturing an analytical element. 4,854,998, Cl. 156-248.000.
Yamaguchi, Takashi, to Kabushiki Kaisha Sebun Shiizu. Integrated article bearing indicia and manufacturing processes therefor. 4,854,064, Cl. 40-630.000.
Yamaguchi, Toshio: *See*—
Orui, Ryuzo; Itagaki, Yasuhiro; and Yamaguchi, Toshio, 4,855,644, Cl. 315-3.600.
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Iwamatsu, Masayuki, 4,856,064, Cl. 381-1.000.
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Yamahira, Yoshiya; Fujioka, Keiji; and Sato, Shigeji, to Sumitomo Pharmaceuticals Company, Limited. Sustained-release preparation. 4,855,134, Cl. 424-85.700.
Yamaji, Yasuhiro; Takahashi, Kenji; Hirata, Seiichi; and Sakurai, Toshiharu, to Kabushiki Kaisha Toshiba. Semiconductor device. 4,855,807, Cl. 357-72.000.
Yamakawa, Koji: *See*—
Iyogi, Kiyoshi; Yamakawa, Koji; and Iwase, Nobuo, 4,855,251, Cl. 437-183.000.
Yamamoto, Akihiko; Kohno, Akiomi; Yamada, Toshihiri; Satou, Motohiro; Taguchi, Keiji; and Yokoi, Kazuaki, to Hitachi, Ltd. Sealing structure, method of soldering and process for preparing sealing structure. 4,854,495, Cl. 228-124.000.
Yamamoto, Fumihiko; and Misumi, Teruyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Poly-β-alanine compound, a process for producing the same and a polyacetal resin composition containing a poly-β-alanine compound. 4,855,365, Cl. 525-401.000.
Yamamoto, Hideaki; Sasano, Akira; Matsumaru, Haruo; Tanaka, Yasuo; and Tsukada, Toshihisa, to Hitachi, Ltd. Photosensor. 4,855,795, Cl. 357-2.000.
Yamamoto, Koji; Nakajima, Akihisa; Sawada, Hiroshi; Shinagawa, Noriteru; and Itano, Jiro, to Nippon Telegraph and Telephone Corporation. Mobile communication system. 4,856,048, Cl. 379-60.000.
Yamamoto, Motoyuki; and Tsuburai, Yasuhiko, to Kabushiki Kaisha Toshiba. Method of manufacturing a semiconductor laser with autodoping control. 4,855,250, Cl. 437-81.000.
Yamamoto, Shigehiko: *See*—
Watanabe, Isato; Yamamoto, Shigehiko; Taguchi, Sadanori; and Sasaki, Susumu, 4,855,637, Cl. 313-346.00R.
Yamanaka, Kazuyuki, to Kabushiki Kaisha Toshiba. Wire bonding device. 4,855,928, Cl. 364-489.000.
Yamanaka, Sekisuke: *See*—
Yamashita, Masatsugu; Iwakiri, Norio; Yamanaka, Sekisuke; and Yanase, Akira, 4,855,541, Cl. 200-6.00R.
Yamanashi, Takanori, to Olympus Optical Co., Ltd. Compact high vari-focal ratio zoom lens system. 4,854,682, Cl. 350-427.000.
Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Murase, Kiyoshi; Mase, Toshiyasu; Hara, Hiromu; and Tomioka, Kenichi, 4,855,310, Cl. 514-361.000.
Yamashita, Akio: *See*—
Tsuchiya, Soji; Ito, Yoshimasa; Higuchi, Sadashi; and Yamashita, Akio, 4,855,727, Cl. 340-785.000.
Yamashita, Koujirou; Endo, Stunehiro; Miyashita, Kunio; Kashiwazaki, Susumu; and Iizuka, Kenichi, to Hitachi, Ltd. Speed control apparatus for a brushless direct current motor. 4,855,652, Cl. 318-268.000.
Yamashita, Masatsugu; Iwakiri, Norio; Yamanaka, Sekisuke; and Yanase, Akira, to Omron Tateisi Electronics Co. Electronic component having improved rotary switch detent spring construction and improved terminal seal structure. 4,855,541, Cl. 200-6.00R.
Yamataka, Kazunori: *See*—
Yokota, Masahisa; Shimizu, Atsushi; Komiya, Kyosuke; Yamataka, Kazunori; and Nonura, Tadanori, 4,855,377, Cl. 528-25.000.
Yamatake-Honeywell Company Limited: *See*—
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Yamato, Ikuo; Tokunaga, Norikazu; Matsuda, Yasuo; and Amano, Hisao, to Hitachi, Ltd. Current and frequency converter having means to reduce switching losses. 4,855,887, Cl. 363-8.000.
Yamato, Osamu: *See*—
Matsukura, Hisao; Yamato, Osamu; and Horii, Hiroyuki, 4,855,693, Cl. 333-202.000.
Yamatoh, Kouhei; Ogura, Masami; Kanbe, Katunori; and Isogai, Yuji, to Honda Giken Kogyo Kabushiki Kaisha. Piezoelectric brake device. 4,854,424, Cl. 188-72.100.
Yamauchi, Akihiro: *See*—
Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, 4,855,115, Cl. 423-239.000.
Yamaura, Satoru: *See*—
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Yamazaki, Kikuo: *See*—
Arakawa, Satoshi; Kitada, Akira; Yamazaki, Kikuo; Ohmiya, Kenji; and Kawagoe, Jun, 4,855,191, Cl. 428-690.000.

Yamazaki, Shunpei; Mase, Akira; and Sakayori, Hiroyuki, to Semiconductor Energy Laboratory Co., Ltd. Liquid crystal device having electrode strips in the seal without applied voltage. 4,854,675, Cl. 350-336.000.

Yamazaki, Shunpei; Mase, Akira; Konuma, Toshimitsu; Miyazaki, Minoru; Sakama, Mitsunori; and Inushima, Takashi, to Semiconductor Energy Laboratory Co., Ltd. Nonlinear semiconductor element, liquid crystal display panel using the same and their manufacturing methods. 4,855,805, Cl. 357-58.000.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Information writing method for an optical disc memory system utilizing a smectic chiral liquid crystal. 4,855,976, Cl. 369-13.000.

Yamazaki, Tomatsu: *See*—
Takagi, Mitiro; Katoh, Yasuyuki; and Yamazaki, Tomatsu, 4,855,497, Cl. 564-182.000.

Yamazaki, Tsuneo; Saito, Tomoki; and Ayabe, Hideo, to Fuji Photo Film Co., Ltd. Hub setting device. 4,854,518, Cl. 242-56.900.

Yamazi, Satoru: *See*—
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Yamour, Yiannis J.: *See*—
Bauge, Michel; Boudon, Gerard; Mollier, Pierre; Peter, Jean-Luc; and Yamour, Yiannis J., 4,856,000, Cl. 371-9.000.

Yanaihara, Noboru; and Abe, Kaoru, to Noboru Yanaihara et al. Oncogene-related peptides. 4,855,406, Cl. 530-324.000.

Yanase, Akira: *See*—
Yamashita, Masatsugu; Iwakiri, Norio; Yamanaka, Sekisuke; and Yanase, Akira, 4,855,541, Cl. 200-6.00R.

Yang, Kei-Wean C., to Tektronix, Inc. Color filter grouping for addressing matrixed display devices. 4,855,724, Cl. 340-703.000

Yang, Ping. Wear reduction member for engine. 4,854,740, Cl. 384-42.000.

Yang, Robert K.: *See*—
Rieger, Martin M.; and Yang, Robert K., 4,855,145, Cl. 426-003.000.

Yang, Tai-Her. Charging circuitry having polarity detecting protection. 4,855,662, Cl. 320-25.000.

Yang, Yug L. Shooting toy. 4,854,910, Cl. 446-177.000.

Yaniger, Stuart I.; and Cameron, Randy E., to Lockheed Corporation. Conductive polymer-polyimide blends and method for producing same. 4,855,361, Cl. 525-436.000.

Yannascoli, Donald: *See*—
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Yano, Manabu: *See*—
Kondo, Kideya; Kunimoto, Youichi; and Yano, Manabu, 4,855,701, Cl. 335-230.000.

Yano, Seiki; and Hijikata, Toshiki, to Sharp Kabushiki Kaisha. Higher harmonic generating device. 4,856,006, Cl. 372-22.000.

Yasuda, Nobuaki: *See*—
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Yasuki, Seijiro; and Hoshino, Kiyoshi, to Kabushiki Kaisha Toshiba. Digital composite color video signal separating circuit with vertical correlation weighting function. 4,855,815, Cl. 358-31.000.

Yasumura, Satoshi: *See*—
Arai, Hisao; Sonehara, Keisuke; Yasumura, Satoshi; and Kobayashi, Junji, 4,854,145, Cl. 70-258.000.

Yates, Chester R., to Leggett & Platt, Incorporated. Bedding foundation having multiple-span sinuous wire springs. 4,853,991, Cl. 5-247.000.

Yazaki Corporation: *See*—
Minamikata, Hajime; Kanno, Toshiaki; Kanda, Masahiro; and Ushijima, Hitoshi, 4,855,119, Cl. 423-346.000.

Yazawa, Masayuki: *See*—
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Yeda Research and Development Company Ltd: *See*—
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Yeh, Kou-I, to Inventa Electronics Co., Ltd. Apparatus for timely controlling the sound characteristic of a signaling means of a voice communication device. 4,856,056, Cl. 379-375.000.

Yen, Jeffrey H., to Pennwalt Corporation. Apparatus for removing sulfur from organic polysulfides. 4,855,113, Cl. 422-259.000.

Yerace, Daniel; and Zinkosky, Alexander J., to Ford Motor Company. Method of locating friction generating defects in a multiple bearing assembly. 4,854,162, Cl. 73-119.00R.

Yesnosky, Paul A.: *See*—
Hug, Paul; Umeda, Bill; Yesnosky, Paul A.; Raudebaugh, Bart; Ricco, Gary; and McCabe, Gary E., 4,855,980, Cl. 369-36.000.

Yezrielev, Albert I.; Romanelli, Michael G.; and Wellman, William E., to Exxon Chemical Patents Inc. High solids acrylic-based coatings. 4,855,369, Cl. 526-320.000.

Yip, Tom: *See*—
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Yoakim, Christiane: *See*—
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Yokogawa Aviation Company, Ltd.: *See*—
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Yokogawa Electric Corporation: *See*—
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Yokokura, Takashi: *See*—
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Yokota, Masahisa; Shimizu, Atsushi; Komiya, Kyosuke; Yamataka, Kazunori; and Nonura, Tadanori, to Asahi Kasei Kogyo Kabushiki Kaisha. Novel copolycarbonate. 4,855,377, Cl. 528-25.000.

Yokota, Tetsuya; Sakamoto, Hideki; and Takahashi, Naoto, to Kagome Kabushiki Kaisha. Beverages by lactic acid fermentation and methods of producing same. 4,855,147, Cl. 426-43.000.

Yokoyama, Toshio, to Kabushiki Raisha Kotobuki. Apparatus for raising seat of chair. 4,854,640, Cl. 297-333.000.

Yolles, Seymour: *See*—
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Yoneda, Katsuhiko: *See*—
Hamada, Takuji; Takahashi, Masahiro; Yoneda, Katsuhiko; Onuki, Ken; and Uchiyama, Toshihiko, 4,855,993, Cl. 370-16.000.

Yoneda, Kiwamu: *See*—
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Yoon, Hyun-Nam: *See*—
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York, Rudy L.: *See*—
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Yoshida Kogyo K. K.: *See*—
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Yoshida, Mitsuru, to Mitsubishi Pencil Co., Ltd. Process of making a diaphragm of carbonaceous materials for a speaker. 4,855,093, Cl. 264-29.600.

Yoshida, Takayuki; Sakuma, Kiyoshi; Seshimo, Yu; and Hujii, Masao, to Mitsubishi Denki Kabushiki Kaisha. Heat exchanger. 4,854,380, Cl. 165-152.000.

Yoshida, Tomio: *See*—
Hirai, Mikio; Tatsuda, Tokuo; and Yoshida, Tomio, 4,855,355, Cl. 525-64.000.

Yoshida, Toshio: *See*—
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Yoshihara, Toshiyuki; and Kimura, Tomohiro, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member. 4,855,202, Cl. 430-58.000.

Yoshikawa, Eiichi: *See*—
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Yoshikuni, Yuzo: *See*—
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Yoshinaka, Toshio: *See*—
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Yoshino Kogyosho Co., Ltd.: *See*—
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Yoshino, Mituo: *See*—
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Yoshino Seiki Inc.: *See*—
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Yoshioka, Hajime; Kodama, Yukio; Shigemura, Sadato; Funada, Tohru; and Morimoto, Satoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Electrodeposited grindstone. 4,855,019, Cl. 204-16.000.

Yoshioka, Keiichi: *See*—
Azumai, Hideo; Fujii, Koichi; Seigenji, Takashi; and Yoshioka, Keiichi, 4,855,803, Cl. 357-45.000.

Yoshioka, Masanori; Hou, Hidemitsu; and Kawai, Nobufumi, to Tokyo Metropolitan Institute for Neurosciences; and Takeda Chemical Industries, Ltd. Glutamate receptor inhibitor. 4,855,405, Cl. 530-300.000

Yoshitake, Kazuki, to NEC Corporation. Integrated circuit having two circuit blocks therein independently energized through different power supply terminals. 4,855,863, Cl. 361-91.000.

Yoshizawa, Shigeo; Ohyagi, Takashi; Oda, Takashi; and Mori, Toshihiro, to NEC Corporation. Pager receiver capable of avoiding an unpleasing interruption of a displayed message. 4,855,731, Cl. 340-825.440.

Young, Charles E.: *See*—
Gruen, Dieter M.; Young, Charles E.; and Pellin, Michael J., 4,855,596, Cl. 250-305.000.

Young, David A.; Jones, Larry O.; and Campione, Troy J., to Exxon Chemical Patents-Inc. Process for preparing linear alpha-olefins using zirconium adducts as catalysts. 4,855,525, Cl. 585-523.000.

Young, David A.; Vaughan, David E.; Pruett, Roy L.; and Tunison, Mafer E., to Exxon Chemical Patents Inc. Catalysts and process for oligomerization of olefins with nickel-containing zeolite catalysts. 4,855,528, Cl. 585-531.000.

Young, Gary M. Sure set hook. 4,854,070, Cl. 43-34.000.

Young, Lauren: *See*—
Jones, Dallas W.; and Young, Lauren, 4,854,115, Cl. 56-320.100.

Young, Lewis B.: *See*—
Page, Nancy M.; and Young, Lewis B., 4,855,527, Cl. 585-527.000.

Young, Peter L., to Optical Materials, Inc. Thin film semiconductor interconnect module. 4,855,871, Cl. 361-411.000.

Yu, Kaung H. Air cooled/heated seat cushion. 4,853,992, Cl. 5-423.000.

Yu, Stella S.: *See*—
Djuric, Stevan W.; Haack, Richard A.; and Yu, Stella S., 4,855,324, Cl. 514-570.000.

Yuan, Wallace I.: *See*—
Clark, R. Scot; Hoffman, Joe G.; Davison, John B.; Jones, Alan W.; Jones, Allen H., Jr.; Persichini, David W.; Yuan, Wallace I.; and Lipisko, Bruce A., 4,855,023, Cl. 204-130.000.

Yuasa Battery Company Limited: *See*—
Matsui, Tomoki; Kimoto, Hidesuke; and Shimizu, Setsuo, 4,855,663, Cl. 320-20.000.

Yuasa, Toshiya: *See*—
Kan, Fumitaka, deceased; Koizumi, Norihiko; Fukumoto, Hiroshi; Yuasa, Toshiya; Tohyama, Noboru; Mishina, Shinya; and Tanioka, Hiroshi, 4,855,763, Cl. 346-160.100.

Yunoki, Akio, to Yoshida Kogyo K. K. Method and apparatus for applying protective strip to end of slide fastener. 4,854,253, Cl. 112-265.200.

Yunus, Mohammad: *See*—
Mostyn, Graham Y.; and Yunus, Mohammad, 4,855,722, Cl. 340-660.000

Zahler, Robert; and Jacobs, Glenn A., to E. R. Squibb & Sons, Inc. Purinyl cyclobutanes. 4,855,466, Cl. 549-546.000.

Zahnradfabrik Friedrichshafen AG: *See*—
Riha, Werner, 4,854,087, Cl. 51-209.00R.

Zallen, Richard H.: *See*—
Badesha, Santokh S.; Foley, Geoffrey M. T.; Pai, Damodar M.; Zallen, Richard H.; Slade, Michael L.; and Abkowitz, Martin A., 4,855,203, Cl. 430-59.000.

Zambon S.p.A.: *See*—
Giordano, Claudio; Castaldi, Graziano; Uggeri, Fulvio; and Cavicchioli, Silvia, 4,855,464, Cl. 549-450.000.

Zannini, Gianfranco, to Techmo Car S.p.A. Equipment for the mechanized replacement of the anodes in the electrolytic cells for aluminum production. 4,855,031, Cl. 204-225.000.

Zapka, Werner; Kempf, Jurgen; Keyser, Joachim; and Asch, Karl, to International Business Machines Corporation. Mask for ion, electron or X-ray lithography and method of making it. 4,855,197, Cl. 430-5.000.

Zappia, Joseph M. Heat transfer and fluid heating device. 4,854,378, Cl. 165-104.190.

Zarotti, Claudio, to Sonda S.r.l. Protective buffer padding element. 4,853,980, Cl. 2-413.000.

Zeamer Corporation: *See*—
Zeamer, Geoffrey H., 4,854,128, Cl. 62-50.100.

Zeamer, Geoffrey H., to Zeamer Corporation. Cryogen supply system. 4,854,128, Cl. 62-50.100.

Zehntel, Inc.: *See*—
McElfresh, Barbara K.; and Breniman, Eugene H., 4,856,001, Cl. 371-15.000.

Zeiler, Hans-Joachim: *See*—
Lockhoff, Oswald, Hayauchi, Yutaka; Stadler, Peter; Stunkel, Klaus G.; Streissle, Gert; Paessens, Arnold; Klimetzek, Volker; Zeiler, Hans-Joachim; Metzger, Karl G.; Kroll, Hein-Peter; Brunner, Helmut; and Schaller, Klaus, 4,855,283, Cl. 514-8.000.

Zeldin, Martel, to Indiana University Foundation. Silanes. 4,855,433, Cl. 546-14.000.

Zeman, Robert E.: *See*—
Saha, Bijay S.; and Zeman, Robert E., 4,855,205, Cl. 430-106.600.

Zenith Electronics Corporation: *See*—
Griffey, Donald E., 4,855,864, Cl. 361-91.000.
Janiak, Robert A.; and Davene, Jean G., 4,856,021, Cl. 373-108.000.
Konopka, John G., 4,856,078, Cl. 388-831.000.
Livshultz, Michael; and Tong, Hua Sou, 4,854,906, Cl. 445-37.000.
Stacy, Carl W., 4,855,746, Cl. 341-176.000.

Zenner, Michael N.: *See*—
Holley, Charles C.; Petersen, Walter J.; and Zenner, Michael N., 4,854,112, Cl. 56-6.000.

Zhu, Miao: *See*—
Hall, John L.; and Zhu, Miao, 4,856,009, Cl. 372-32.000.

Zielke, Klaus, to Oscobal AG. Implant for the operative correction of spinal deformity. 4,854,304, Cl. 128-69.000.

Ziemann, Andreas: *See*—
Ziemann, Edeltraud; and Ziemann, Andreas, 4,854,716, Cl. 366-139.000.

Ziemann, Edeltraud; and Ziemann, Andreas, to Sulzer Brothers Ltd.; and Allo Pro AG. Device for processing bone cement. 4,854,716, Cl. 366-139.000.

Zijsling, Djurre H., to Shell Oil Company. Tubular element for use in a rotary drilling assembly. 4,854,399, Cl. 175-61.000.

Zinkiewicz, Lawrence M.: *See*—
Figueroa, Luis; Morrison, Charles B.; Zinkiewicz, Lawrence M.; and Niesen, Joseph W., 4,856,014, Cl. 372-46.000.

Zinkosky, Alexander J.: *See*—
Yerace, Daniel; and Zinkosky, Alexander J., 4,854,162, Cl. 73-119.00R.

Zitz, Friedrich: *See*—
Ondrejas, johann; and Zitz, Friedrich, 4,855,182, Cl. 428-343.000.

Zizek, Teofil, to LEK. Process for the preparation of cimetidine. 4,855,439, Cl. 548-342.000.

Zmysłowski, Allan J.; and Maier, Robert M., to Amdahl Corporation. Microprogrammable pipeline interlocks based on the validity of pipeline states. 4,855,947, Cl. 364-200.000.

Zola, John J., to North American Philips Corporation. Two piece ceramic Soller slit collimator for X-ray collimation. 4,856,043, Cl. 378-149.000.

Zolotar, Arkady I.; Samoilovich, David S.; Karakhanian, Vladimir K.; Kuznetsov, Vyacheslav I.; Kopelyansky, Vladimir B.; Kuznetsov, Oleg V.; Nesterenko, Vladimir E.; Karachaban, Nikolai G.; Shmuratov, Georgy E.; Kljuzhin, Evgeny A.; and Livshits, Semen V. Centrifugal pump for handling liquids carrying solid abrasive paraticles. 4,854,820, Cl. 415-171.100.

Zorb, James E.: *See*—
Ball, W. Kenneth; Goulait, David J. K.; and Zorb, James E., 4,854,984, Cl. 156-73.500.

Zupancic, Joseph J.; Zweig, Andrew M.; and Wrezel, James A., to Allied-Signal Inc. Styrene terminated multifunctional oligomeric phenols as new thermosetting resins for composites. 4,855,375, Cl. 526-247.000.

zur Hausen, Manfred: *See*—
Fuhrmann, Werner; zur Hausen, Manfred; and Krix, Wilfried, 4,855,458, Cl. 549-248.000.

Zweifel, Hans: *See*—
Riediker, Martin; Meier, Kurt; and Zweifel, Hans, 4,855,468, Cl. 556-53.000.

Zweig, Andrew M.: *See*—
Zupancic, Joseph J.; Zweig, Andrew M.; and Wrezel, James A., 4,855,375, Cl. 526-247.000.

501 Healthscan, Inc.: *See*—
Larson, Douglas A.; and Clanton, Thomas L., 4,854,574, Cl. 272-99.000.

501 Hitachi, Ltd.: *See*—
Hamada, Takuji; Takahashi, Masahiro; Yoneda, Katsuhiko; Onuki, Ken; and Uchiyama, Toshihiko, 4,855,993, Cl. 370-16.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF AUGUST, 1989

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bellafiore, Gaspare. Hearing aid. Re. 33,017, Cl. 381-68.600.
Fernandez, David. Tennis racket frame made of metal oxide fibers and ceramic particles. Re. 33,011, Cl. 273-73.00C.
Froom, Thomas W., to Somerville Packaging Corporation. Folding ice-cream carton, carton blank, and method. Re. 33,010, Cl. 229-151.000.
Fujita, Tadasha: *See*—
Takeuchi, Yukihisa; and Fujita, Tadasha, Re. 33,013, Cl. 438-116.000.
Howard, Durrell U. Trailer coupling means. Re. 33,012, Cl. 280-432.000.
Ishikawa, Norio; and Miki, Yukio, to Minolta Camera Kabushiki Kaisha. Protective device for automatic focusing camera. Re. 33,016, Cl. 354-400.000.
Miki, Yukio: *See*—
Ishikawa, Norio; and Miki, Yukio, Re. 33,016, Cl. 354-400.000.
Minolta Camera Kabushiki Kaisha: *See*—
Ishikawa, Norio; and Miki, Yukio, Re. 33,016, Cl. 354-400.000
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, Re. 33,015, Cl. 354-286.000.
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Camera system operable in accordance with stored memory. Re. 33,015, Cl. 354-286.000.
NGK Insulators, Ltd.: *See*—
Takeuchi, Yukihisa; and Fujita, Tadasha, Re. 33,013, Cl. 438-116.000.
Sahara, Masayoshi: *See*—
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, Re. 33,015, Cl. 354-286.000.
Somerville Packaging Corporation: *See*—
Froom, Thomas W., Re. 33,010, Cl. 229-151.000.
Sparton of Canada, Ltd.: *See*—
Tadros, Atef R., Re. 33,014, Cl. 367-4.000.
Tadros, Atef R., to Sparton of Canada, Ltd. Cable deployment unit. Re. 33,014, Cl. 367-4.000.
Takeuchi, Yukihisa; and Fujita, Tadasha, to NGK Insulators, Ltd. Multi-channel body. Re. 33,013, Cl. 438-116.000.
Taniguchi, Nobuyuki: *See*—
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, Re. 33,015, Cl. 354-286.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Balazs, Endre A., to Biotrics, Inc. Ultrapure hyaluronic acid and the use thereof. B1 4,141,973, 8-8-89, Cl. 514-54.000.
Biotrics, Inc.: *See*—
Balazs, Endre A., B1 4,141,973, Cl. 514-54.000.

LIST OF DESIGN PATENTEES

Agee, Joseph S., Jr. Game board. 302,705, 8-8-89, Cl. D21-25.000.
Akagi, Kenichi; and Koepke, Marcus C., to Digital Equipment Corporation. Keyboard. 302,684, 8-8-89, Cl. D14-115.000
Althans, Richard K.: *See*—
Claxton, Bruce A.; Althans, Richard K.; Scheid, William J.; and Richards, Scott H., 302,686, Cl. D14-137.000.
American Telephone and Telegraph Company, AT&T Teletype: *See*—
Bloom, David H.; Camporese, Ralph; Kastilahn, William C.; and Welch, Robert J., 302,682, Cl. D14-107.000.
Anderson, Bruce O.: *See*—
Bush, Paul; and Anderson, Bruce O., 302,631, Cl. D6-436.000.
Arakawa, Eric: *See*—
Skedeleski, David; and Arakawa, Eric, 302,717, Cl. D21-230.000.
Armellin, Giancarlo: *See*—
Giancola, Guido; and Armellin, Giancarlo, 302,670, Cl. D12-145.000.
Arnold, Allan P.; Manoy, Russell; Wood, Ian; Greaves, Henry; Goode, Nigel; and Hughes, Stephen, to Keymed (Industrial & Medical Equipment) Ltd. Disinfector unit for cleaning and disinfecting a medical fiberscope. 302,723, 8-8-89, Cl. D24-9.000.
Artemide S.P.A.: *See*—
De Lucchi, Michele, 302,734, Cl. D26-65.000.
De Lucchi, Michele, 302,735, Cl. D26-65.000.
Assenat-Bleschet: *See*—
Bleschet, Bernard; and Assenat, Jean-Marie, 302,696, Cl. D16-102.000
Assenat, Jean-Marie: *See*—
Bleschet, Bernard; and Assenat, Jean-Marie, 302,696, Cl. D16-102.000
Austin, Arnold S., to Quabaug Corporation. Shoe sole. 302,625, 8-8-89, Cl. D2-320.000.
Avery International: *See*—
Popat, Ghanshyam H.; Chen, Tien-Tsung; Binkley, Christopher H.; and Tsai, K. Fou, 302,699, Cl. D19-26.000.
Toffolon, Siro R., 302,640, Cl. D7-150.000.
Bakic, Karena, to Cosmede Anstalt. Cosmetic case. 302,745, 8-8-89, Cl. D28-83.000
Baldwin, Timothy. Sheltered bird feeder. 302,751, 8-8-89, Cl. D30-124.000.
Baldwin, Timothy. Sheltered bird feeder. 302,752, 8-8-89, Cl. D30-124.000.
Barnett, David J.; and Knight, Alan W. E. Device for removing caps or tops from sealed containers. 302,643, 8-8-89, Cl. D8-40.000.
Basckin, Jonathan S. Wristwatch. 302,663, 8-8-89, Cl. D10-32.000
Batchelor, Douglas R., to Libman Broom Company. Wringer sponge mop. 302,759, 8-8-89, Cl. D32-44.000.
Bauer, Linda M.: *See*—
Hoke, Merle C.; Harvey, John W.; and Bauer, Linda M., 302,737, Cl. D26-88.000.
Baxter, James A., to Chromacol Limited. Sample vial. 302,722, 8-8-89, Cl. D24-8.000.
Beuchat, Roland, to Synertrade and Finance S.A. Safety razor handle. 302,739, 8-8-89, Cl. D28-48.000.
Binkley, Christopher H.: *See*—
Popat, Ghanshyam H.; Chen, Tien-Tsung; Binkley, Christopher H.; and Tsai, K. Fou, 302,699, Cl. D19-26.000.
Bleschet, Bernard; and Assenat, Jean-Marie, to Assenat-Bleschet. Spectacles. 302,696, 8-8-89, Cl. D16-102.000.
Bloom, David H.; Camporese, Ralph; Kastilahn, William C.; and Welch, Robert J., to American Telephone and Telegraph Company, AT&T Teletype. Printer controller. 302,682, 8-8-89, Cl. D14-107.000.
Bohler, Robert E., to St. Joe Lighting, Inc. Light fixture. 302,736, 8-8-89, Cl. D26-81.000.
Brembeck, Howard S.; and Swartzendruber, Ray E., to CTB, Inc. Poultry feeder. 302,750, 8-8-89, Cl. D30-122.000.
Brentham, Jerry D. Unilateral incline shoulder exerciser. 302,713, 8-8-89, Cl. D21-195.000.
Brinkerhoff, James W.: *See*—
Toth, Richard J.; Brinkerhoff, James W.; Siddoway, Craig F.; and Claxton, Bruce A., 302,688, Cl. D14-137.000.

Bristol, David A.: *See*—
Stephens, Thomas P.; Brown, William R.; and Bristol, David A., 302,729, Cl. D24-53.000.
Brockman, Anna M.: *See*—
Hance, Sheila D.; and Brockman, Anna M., 302,719, Cl. D21-237.000.
Brown, William R.: *See*—
Stephens, Thomas P.; Brown, William R.; and Bristol, David A., 302,729, Cl. D24-53.000.
Burlison, Barry, to C & S Distributing Co. Water squirting toy. 302,711, 8-8-89, Cl. D21-145.000.
Burns, Patrick D., to Golf Decor Creations. Beverage cup. 302,633, 8-8-89, Cl. D7-5.000.
Bush Industries, Inc.: *See*—
Bush, Paul; and Anderson, Bruce O., 302,631, Cl. D6-436.000.
Bush, Paul; and Anderson, Bruce O., to Bush Industries, Inc. Hutch. 302,631, 8-8-89, Cl. D6-436.000.
Busse, Rido, to Soehnle-Waagen GmbH & Company. Diet and household scale with bowl. 302,665, 8-8-89, Cl. D10-91.000.
Busse, Rido, to Soehnle-Waagen GmbH & Co. Household scale. 302,666, 8-8-89, Cl. D10-92.000.
Butler, Jay A. Sun visor. 302,673, 8-8-89, Cl. D12-191.000.
C & S Distributing Co.: *See*—
Burlison, Barry, 302,711, Cl. D21-145.000.
Calcerano, Victor; and O'Brien, David. Container for batteries. 302,661, 8-8-89, Cl. D9-415.000.
Calcerano, Victor; and O'Brien, David. Container for batteries. 302,662, 8-8-89, Cl. D9-415.000.
Camporese, Ralph: *See*—
Bloom, David H.; Camporese, Ralph; Kastilahn, William C.; and Welch, Robert J., 302,682, Cl. D14-107.000.
Carlisle Tire & Rubber Company: *See*—
Sheeler, Joseph W., 302,674, Cl. D12-204.000.
Cetrone, Vincent B., to Warren Tool Corporation. Spring clamp. 302,654, 8-8-89, Cl. D8-395.000.
Charm, Stanley E. Milk sampling apparatus. 302,639, 8-8-89, Cl. D7-104.000.
Chatham, Johnnie P. Golf tee setting gauge. 302,714, 8-8-89, Cl. D21-208.000.
Chen, Tien-Tsung: *See*—
Popat, Ghanshyam H.; Chen, Tien-Tsung; Binkley, Christopher H.; and Tsai, K. Fou, 302,699, Cl. D19-26.000.
Chinon Kabushiki Kaisha: *See*—
Iwasaki, Hiroyoshi; and Nakayama, Yasuhiko, 302,683, Cl. D14-107.000.
Chounan, Yoshiya, to Sakae Ringyo Co., Ltd. Bicycle pedal. 302,668, 8-8-89, Cl. D12-125.000.
Chromacol Limited: *See*—
Baxter, James A., 302,722, Cl. D24-8.000.
Claxton, Bruce A.; Althans, Richard K.; Scheid, William J.; and Richards, Scott H., to Motorola, Inc. Portable two-way radio or similar article. 302,686, 8-8-89, Cl. D14-137.000.
Claxton, Bruce A.; and Lay, Khoo B., to Motorola, Inc. Portable two-way radio or similar article. 302,687, 8-8-89, Cl. D14-137.000.
Claxton, Bruce A.: *See*—
Toth, Richard J.; Brinkerhoff, James W.; Siddoway, Craig F.; and Claxton, Bruce A., 302,688, Cl. D14-137.000.
Clifton, Robert T., to Vulcan Aircraft Corporation. Vertical takeoff and landing aircraft. 302,676, 8-8-89, Cl. D12-326.000.
Cobra S.r.l.: *See*—
Redaelli, Piergiorgio, 302,681, Cl. D14-230.000.
Comark Merchandising, Inc.: *See*—
Krautsack, Richard G., 302,704, Cl. D20-43.000.
Combi Co., Ltd.: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsumoto, Susumu, 302,707, Cl. D21-74.000.
Conair Corporation: *See*—
Doyle, Edward J., 302,738, Cl. D28-38.000.
Conaway, Steven, to Trinity Music Computer, Inc. Music teaching device. 302,701, 8-8-89, Cl. D19-62.000.
Concept Enterprises, Inc.: *See*—
Weissberg, Gary S.; Kwang, David; and Yamada, Masahiko, 302,695, Cl. D14-222.000.
Cosmede Anstalt: *See*—
Bakic, Karena, 302,745, Cl. D28-83.000.
CTB, Inc.: *See*—
Brembeck, Howard S.; and Swartzendruber, Ray E., 302,750, Cl. D30-122.000.
Dacor Corporation: *See*—
Hattori, Seiji, 302,747, Cl. D29-9.000.
David, Thomas J.: *See*—
Foran, Kenneth C.; and David, Thomas J., 302,703, Cl. D19-92.000.
Dawson, Melvyn H., Jr. Electronic watch. 302,664, 8-8-89, Cl. D10-38.000.
De Lucchi, Michele, to Artemide S.P.A. Adjustable table lamp. 302,734, 8-8-89, Cl. D26-65.000.
De Lucchi, Michele, to Artemide S.p.A. Adjustable table lamp. 302,735, 8-8-89, Cl. D26-65.000.
Digital Equipment Corporation: *See*—
Akagi, Kenichi; and Koepke, Marcus C., 302,684, Cl. D14-115.000.
Doyle, Edward J., to Conair Corporation. Combined carrying case and heating unit for hair curlers. 302,738, 8-8-89, Cl. D28-38.000.
Dubeck, Charlotte: *See*—
Dubeck, John A.; and Dubeck, Charlotte, 302,748, Cl. D29-10.000.
Dubeck, John A.; and Dubeck, Charlotte. Protective pad for a seat belt. 302,748, 8-8-89, Cl. D29-10.000.
Durand, Jean-Jacques. Perfume bottle. 302,660, 8-8-89, Cl. D9-403.000.
Ekco Housewares, Inc.: *See*—
Hiscott, William D.; Witlin, Ina; Hasler, Theodore J.; and Jastrzebski, Andrew T., 302,637, Cl. D7-99.000.
Hiscott, William D.; Witlin, Ina; Hasler, Theodore J.; and Jastrzebski, Andrew T., 302,638, Cl. D7-103.000.
Elmburg, John R., to U.S. Metal Container Company. Barbecue grill. 302,641, 8-8-89, Cl. D7-332.000.
Endou, Hiroshi: *See*—
Kawai, Shigeru; Kawakatsu, Yoshihiro; Tsuchihashi, Yoshiaki; Endou, Hiroshi; and Ohuchi, Katsufumi, 302,685, Cl. D14-118.000.
Ethical Products, Inc.: *See*—
Zelinger, Alan, 302,753, Cl. D30-129.000.
Ferland, Edouard, to Les Tuiles de Geneve L.T.G. (1987) Inc. Roofing tile. 302,732, 8-8-89, Cl. D25-140.000.
Flynn, Jerome R. Nail dryer stand. 302,744, 8-8-89, Cl. D28-61.000.
Foran, Kenneth C.; and David, Thomas J. Letter tray. 302,703, 8-8-89, Cl. D19-92.000.
Friedman, Bernard, to Oil Process Systems, Inc. Strainer. 302,635, 8-8-89, Cl. D7-47.000.
Fujita, Shinichi; Nakamachi, Tsuyoshi; and Yoshida, Shigeyuki, to Mitsubishi Denki Kabushiki Kaisha. Handset telephone. 302,680, 8-8-89, Cl. D14-138.000.
Fuller, John M., to Rubbermaid Commerical Products Inc. Animal feeder. 302,754, 8-8-89, Cl. D30-129.000.
GEC Plessey Telecommunications Ltd.: *See*—
Rose, Martin S., 302,691, Cl. D14-142.000.
Giacona, Louis J.; Masterson, James J.; and Monsky, Cynthia L., to Union Hospital Foundation, Inc. Game board. 302,706, 8-8-89, Cl. D21-31.000.
Giambazi, James D. Mini-sole golf club. 302,716, 8-8-89, Cl. D21-220.000.
Giancola, Guido; and Armellin, Giancarlo, to Pirelli Coordinamento Pneumatici S.p.A. Tire for two-wheeled vehicles. 302,670, 8-8-89, Cl. D12-145.000.
Giordano, John M. Folding knife. 302,650, 8-8-89, Cl. D8-99.000.
Gobindram, Kash, to Kash N'Gold Ltd. Housing for a telephone. 302,692, 8-8-89, Cl. D14-143.000.
Goertz, Albrecht, to Insilco Corporation. Adjustable file card holder. 302,702, 8-8-89, Cl. D19-76.000.
Golf Decor Creations: *See*—
Burns, Patrick D., 302,633, Cl. D7-5.000.
Goode, Nigel: *See*—
Arnold, Allan P.; Manoy, Russell; Wood, Ian; Greaves, Henry; Goode, Nigel; and Hughes, Stephen, 302,723, Cl. D24-9.000.
Goodyear Tire & Rubber Company, The: *See*—
Graas, Maurice, 302,669, Cl. D12-143.000.
Graas, Maurice, to Goodyear Tire & Rubber Company, The. Tire. 302,669, 8-8-89, Cl. D12-143.000.
Greaves, Henry: *See*—
Arnold, Allan P.; Manoy, Russell; Wood, Ian; Greaves, Henry; Goode, Nigel; and Hughes, Stephen, 302,723, Cl. D24-9.000.
Green, Richard D. Dual compartment bottle. 302,656, 8-8-89, Cl. D9-341.000.
Grinde, James E. Dual compartment container for measuring and storing fluids. 302,658, 8-8-89, Cl. D9-375.000.
Grossiord, Claude, to S.T. DuPont. Clip for writing instrument. 302,700, 8-8-89, Cl. D19-56.000.
Hance, Sheila D.; and Brockman, Anna M., to Kenneth Mahler DBA GoodLife Designs. Cushion float. 302,719, 8-8-89, Cl. D21-237.000.
Harvey, John W.: *See*—
Hoke, Merle C.; Harvey, John W.; and Bauer, Linda M., 302,737, Cl. D26-88.000.
Hasler, Theodore J.: *See*—
Hiscott, William D.; Witlin, Ina; Hasler, Theodore J.; and Jastrzebski, Andrew T., 302,637, Cl. D7-99.000.
Hiscott, William D.; Witlin, Ina; Hasler, Theodore J.; and Jastrzebski, Andrew T., 302,638, Cl. D7-103.000.
Hattori, Kenneth M.: *See*—
Wahl, John F.; and Hattori, Kenneth M., 302,743, Cl. D28-53.000.
Hattori, Seiji, to Dacor Corporation. Diving mask. 302,747, 8-8-89, Cl. D29-9.000.
Henn, Kathy; and Ray, Babs. Animated stuffed bear. 302,712, 8-8-89, Cl. D21-159.000.
Herbst, Walter B.; and Rozek, Roy J., to Thomas Industries, Inc. Aspirator. 302,728, 8-8-89, Cl. D24-51.000.
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Sawaya, Milhem; and Howe, Michael J., 6,980, Cl. 86.000
Fiala, John L., to Chas. Klehm & Son. Crabapple tree named Red Swan. 6,974, 8-8-89, Cl. 34.000.
Hansche, Paul E., to University of California, The Regents of The. Valley Gem. 6,976, 8-8-89, Cl. 43.000.
Howe, Michael J.: *See*—
Sawaya, Milhem; and Howe, Michael J., 6,980, Cl. 86.000
Jackson & Perkins Company: *See*—
Warriner, William A., 6,971, Cl. 20.000.
Warriner, William A., 6,972, Cl. 24.000.
Landsburg, Roger B., to Bailey Nurseries, Inc. Red Maple — Landsburg cultivar. 6,977, 8-8-89, Cl. 51.000.
Langmaid, Martin C., to Weyerhaeuser Company. Ilex × ataclerensis 'Wight Selection' variety. 6,978, 8-8-89, Cl. 65.000.
Madison, Dennis N. Walnut tree named Vester. 6,973, 8-8-89, Cl. 32.000.
Sawaya, Milhem; and Howe, Michael J., to Fernlea Flowers, Ltd. Distinct variety of Poinsettia named Red Sails. 6,980, 8-8-89, Cl. 86.000.
University of California, The Regents of The: *See*—
Hansche, Paul E., 6,976, Cl. 43.000
Warriner, William A., to Jackson & Perkins Company. Rose plant Jacstop. 6,971, 8-8-89, Cl. 20.000.
Warriner, William A., to Jackson & Perkins Company. Rose plant Jacloy. 6,972, 8-8-89, Cl. 24.000.
Weyerhaeuser Company: *See*—
Langmaid, Martin C., 6,978, Cl. 65.000.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 8, 1989

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

8 4,853,973
9 4,853,974
19 4,853,975
67 4,853,976
114 4,853,977
167 4,853,978
326 4,853,979
413 4,853,980

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213 4,853,981
233 4,853,982
251 4,853,983
496 4,853,984
498 4,853,985
508 4,853,986
542 4,853,987
615 4,853,988

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10 B 4,853,989
71 4,853,990
247 4,853,991
423 4,853,992
431 4,853,993
437 4,853,994
481 4,853,995
494 4,853,996

CLASS 8

185 4,854,934
408 4,854,935

CLASS 12

8.3 4,853,997

CLASS 14

2.4 4,853,998
69.5 4,853,999

CLASS 15

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176.6 4,854,002
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304 4,854,004
320 4,854,005
375 4,854,006

CLASS 16

18 A 4,854,007
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263 4,854,009
360 4,854,010

CLASS 19

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114 4,854,012
200 4,854,013

CLASS 24

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16 R 4,854,015
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587 4,854,017

CLASS 27

19 4,854,018

CLASS 28

255 4,854,019
4,854,020
263 4,854,021

CLASS 29

33 K 4,854,022
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570.1 4,854,936
596 4,854,033
4,854,034
603 4,854,035
744 4,854,036
755 4,854,037
830 4,854,038
832 4,854,039
847 4,854,040
884 4,854,041

CLASS 30

34.1 4,854,042
50 4,854,043
151 4,854,044
155 4,854,045
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443 4,854,048
464 4,854,049
558 4,854,050
628 4,854,051

CLASS 34

68 4,854,052
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CLASS 36

58.5 4,854,056
114 4,854,057
127 4,854,055

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63 4,854,058

CLASS 38

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CLASS 40

152.1 4,854,060
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607 4,854,063
630 4,854,064

CLASS 42

65 4,854,065
94 4,854,066

CLASS 43

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43.12 4,854,072
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CLASS 44

51 4,854,937
56 4,854,938
77 4,854,939
620 4,854,940
626 4,854,941

CLASS 47

57.5 4,854,074
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CLASS 48

196 A 4,854,943
197 R 4,854,942
214 R 4,854,944

CLASS 49

280 4,854,076
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409 4,854,078
479 4,854,079

CLASS 51

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76 R 4,854,081
109 R 4,854,082
131.4 4,854,083
139 4,854,084
170 MT 4,854,085
209 R 4,854,086
4,854,087
281 R 4,854,088
284 R 4,854,089
410 4,854,090
439 4,854,091

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10 4,854,092
28 4,854,093
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241 4,854,096
309.11 4,854,097
398 4,854,098
403 4,854,099
456 4,854,100
520 4,854,101
535 4,854,102
593 4,854,103
639 4,854,104
698 4,854,105
719 4,854,106
725 4,854,107

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397 4,854,109
452 4,854,110
500 4,854,111

CLASS 55

55 4,854,945
85 4,854,946
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105 4,854,948
126 4,854,949
213 4,854,950
294 4,854,951
386 4,854,952
483 4,854,953

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6 4,854,112
10.2 4,854,113
70 4,854,983
296 4,854,114
320.1 4,854,115

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274 4,854,123
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489 4,854,125
726 4,854,126
742 4,854,127

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51.2 4,854,131
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15 4,854,133

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2 4,854,956
30.11 4,854,957
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152 4,854,134
190 4,854,135
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570 4,854,170
572 4,854,171
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600 4,854,173
714 4,854,174
841 4,854,175
861.19 4,854,176
861.24 4,854,177
861.58 4,854,178
862.66 4,854,179
863.86 4,854,180
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864.64 4,854,182

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750 B 4,854,191
752 E 4,854,192
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CLASS 75

34 4,854,967
63 4,854,968

CLASS 76

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CLASS 81

57.39 4,854,197
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112 4,854,199

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321 4,854,203
500 4,854,204
529 4,854,205
745 4,854,206
823 4,854,207
862 4,854,208

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1.01 4,854,209
1.15 4,854,210
240 4,854,211
283 4,854,212
297 S 4,854,213
404 4,854,214

CLASS 89

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33.16 4,854,216
163 4,854,217

CLASS 91

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376 R 4,854,220
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CLASS 92

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CLASS 98

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CLASS 99

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450.6 4,854,228

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4,854,230
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211 4,854,232
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364 4,854,234
389.1 4,854,235
411 4,854,236
415.1 4,854,237

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476 4,854,240
489 4,854,241
522 4,854,242

CLASS 104

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279 4,854,244

CLASS 105

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CLASS 106

2 4,854,969
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CLASS 108

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CLASS 109

1 R 4,854,247
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CLASS 110

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CLASS 112

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121.12 4,854,251
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265.2 4,854,253
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CLASS 114

39.1 4,854,255
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285 4,854,259
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CLASS 118

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257 4,854,280
292 4,854,281
357 4,854,282
361 4,854,283
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418 4,854,285
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CLASS 125

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21 4,854,296

CLASS 126

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CLASS 128

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62 R 4,854,303
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76.5 4,854,307
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87 R 4,854,309
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92 YY 4,854,312
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303.1 4,854,315
334 R 4,854,316
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397 4,854,320
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675 4,854,326
713 4,854,327
736 4,854,328
745 4,854,329
772 4,854,330
882 4,854,313

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CLASS 132

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CLASS 134

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CLASS 136

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262 4,854,975

CLASS 137

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282 4,854,339
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516.29 4,854,342
543.19 4,854,343
606 4,854,344
614.05 4,854,345

624.11 4,854,346
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625.4 4,854,347

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CLASS 139

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CLASS 141

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12.7 B 4,854,977
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103 4,854,979
403 4,854,980

CLASS 149

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109.6 4,854,982

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161 4,854,989
173 4,854,990
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212 4,854,992
219 4,854,993
228 4,854,994
243 4,854,995
244.12 4,854,996
245 4,854,997
248 4,854,998
272.6 4,854,999
289 4,855,000
307.3 4,855,001
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358 4,855,003
359 4,855,004
361 4,855,005
378 4,855,006
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583.1 4,855,011
584 4,855,012
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158 4,854,381
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CLASS 166

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CLASS 169

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CLASS 172

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813 4,854,392

CLASS 173

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105 4,854,394
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CLASS 174

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52.1 4,855,535
68.5 4,855,537
73.1 4,855,536

CLASS 175

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26 4,854,397
45 4,854,398
61 4,854,399
85 4,854,400
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325 4,854,403
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CLASS 177

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141 4,854,407

CLASS 178

18 4,855,538

CLASS 180

9.32 4,854,408
24.02 4,854,409
140 4,854,410
197 4,854,411
219 4,854,412
247 4,854,413
249 4,854,414

CLASS 181

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207 4,854,416
272 4,854,417

CLASS 182

3 4,854,418
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166 4,854,420

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9 R 4,854,422

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196 M 4,854,426
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298 4,854,428
299 4,854,429

CLASS 190

105 4,854,430
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110 4,854,432

CLASS 191

12.2 A 4,855,539

CLASS 192

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5 F 4,855,540
6 R 4,855,541
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61.45 R 4,855,544
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144 B 4,855,546
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147 4,855,024
157.86 4,855,025
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192.11 4,855,026
196 4,855,027
197 4,855,029
212 4,855,030
225 4,855,031
286 4,855,032
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427 4,855,034

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554 4,854,451

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634 4,855,053
635 4,855,054
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670 4,855,059
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709 4,855,061
739 4,855,062
749 4,855,063
764 4,855,064
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456 4,855,572
492 4,855,573
535 4,855,574
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4 R 4,854,461
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23.4 4,854,465
23.83 4,854,466
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306 4,854,472
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337 4,854,475
357 4,854,476
462 4,854,474

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CLASS 222

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607 4,854,488

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CLASS 224

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CLASS 236

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304 4,854,505
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CLASS 248

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222.1 4,854,534
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311.2 4,854,536
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327.2 4,855,597
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332 4,855,600
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396 R 4,855,602
484.1 4,855,603
492.2 4,855,604
505.1 4,855,605
548 4,855,606
557 4,855,607
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CLASS 251

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310 4,854,545

CLASS 252

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CLASS 254

134.3 R 4,854,546
271 4,854,547

CLASS 256

65 4,854,548
69 4,854,549

CLASS 260

377 4,855,084
396 R 4,855,085
404 4,855,086

CLASS 261

53 4,855,088
97 4,855,089

CLASS 264

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64.11 4,854,554
64.24 4,854,555
64.27 4,854,557
74 4,854,558
4,854,559
140.1 4,854,560
4,854,561
292 4,854,562

CLASS 269

25 4,854,563
32 4,854,564
41 4,854,565
44 4,854,566
71 4,854,567
268 4,854,568

CLASS 271

98 4,854,569
162 4,854,570
293 4,854,571

CLASS 272

70 4,854,572
93 4,854,573
99 4,854,574
122 4,854,575
123 4,854,576
130 4,854,577
134 4,854,578
173 4,854,616

CLASS 273

26 R 4,854,587
30 4,854,588
32 H 4,854,579
73 C Re.33,011
73 J 4,854,596
77 A 4,854,580
4,854,581
80.2 4,854,582
80.8 4,854,583
123 R 4,854,589
138 A 4,854,590
157 R 4,854,591
162 F 4,854,592
183 B 4,854,584
193 B 4,854,585
248 4,854,593
249 4,854,586
4,854,594
312 4,854,595

CLASS 277

1 4,854,597
87 4,854,598
227 4,854,599
236 4,854,600

CLASS 280

47.31 4,854,601
79.11 4,854,602
112.1 4,854,603
432 Re.33,012
477 4,854,604
615 4,854,605
699 4,854,606
801 4,854,607
805 4,854,608

CLASS 281

2 4,854,609

CLASS 282

11.5 A 4,854,610

CLASS 285

3 4,854,611
18 4,854,612
39 4,854,613
93 4,854,614
331 4,854,615

CLASS 290

48 4,855,609
4,855,610

CLASS 292

216 4,854,617
244 4,854,618
335 4,854,619
337 4,854,620
340 4,854,621
4,854,622

CLASS 294

1.1 4,854,623
1.3 4,854,624
19.1 4,854,625
4,854,626
64.1 4,854,627

CLASS 296

3 4,854,628
37.12 4,854,632
97.13 4,854,629
100 4,854,630
104 4,854,633

108 4,854,634
158 4,854,631
180.5 4,854,635
201 4,854,636

CLASS 297

188 4,854,637
250 4,854,638
4,854,639
333 4,854,640
345 4,854,641
410 4,854,642
452 4,854,643
476 4,854,644

CLASS 300

10 4,854,645

CLASS 301

65 4,854,646

CLASS 303

69 4,854,647
4,854,648
113 4,854,649

CLASS 305

10 4,854,650

CLASS 307

125 4,855,611
140 4,855,612
202.1 4,855,613
241 4,855,614
269 4,855,615
4,855,616
291 4,855,617
296.6 4,855,618
443 4,855,619
448 4,855,620
456 4,855,622
475 4,855,623
4,855,624
491 4,855,625
4,855,626
520 4,855,627
530 4,855,628

CLASS 310

49 R 4,855,629
156 4,855,630
233 4,855,632
239 4,855,631
328 4,855,633

CLASS 312

9 4,854,651
140.2 4,854,652
222 4,854,653
257.1 4,854,655
265.1 4,854,654
345 4,854,656

CLASS 313

113 4,855,634
156 4,855,635
306 4,855,636
346 R 4,855,637
389 4,855,638
456 4,855,639
477 R 4,855,640
505 4,855,641
532 4,855,642
553 4,855,643

CLASS 315

3.6 4,855,644
39.71 4,855,645
175 4,855,646
209 R 4,855,647
307 4,855,648
310 4,855,649
383 4,855,650
387 4,855,651

CLASS 318

268 4,855,652
282 4,855,653
587 4,855,656
602 4,855,657
632 4,855,658
645 4,855,659
696 4,855,660
807 4,855,661

CLASS 320

20 4,855,663
25 4,855,662

CLASS 322

19 4,855,664

CLASS 323

272 4,855,665
351 4,855,666

CLASS 324

61 R 4,855,667
65 CR 4,855,668
73 R 4,855,669
4,855,670
127 4,855,671
158 R 4,855,672
4,855,673
4,855,674
207 4,856,098
208 4,855,675
220 4,855,676
238 4,855,677
262 4,855,678
309 4,855,679
314 4,855,680

CLASS 328

62 4,855,681
63 4,855,682
155 4,855,683

CLASS 330

257 4,855,684
261 4,855,686
282 4,855,685
304 4,855,687

CLASS 331

8 4,855,688
17 4,855,689
78 4,855,690
172 4,855,691

CLASS 332

17 4,855,692

CLASS 333

1.1 4,855,694
17.3 4,855,695
20 4,855,696
33 4,855,697
202 4,855,693

CLASS 335

14 4,855,698
177 4,855,699
229 4,855,700
230 4,855,701
261 4,855,702
296 4,855,703

CLASS 336

132 4,855,704

CLASS 337

246 4,855,705

CLASS 338

20 4,855,708
34 4,855,706
153 4,855,707

CLASS 340

323 R 4,855,711
426 4,855,710
438 4,855,709
453 4,855,712
506 4,855,713
521 4,855,714
545 4,855,715
550 4,855,716
556 4,855,717
568 4,855,719
571 4,855,720
578 4,855,718
585 4,855,721
660 4,855,722
691 4,855,723
703 4,855,724
706 4,855,725
747 4,855,726
785 4,855,727
805 4,855,728
825.05 4,855,729
825.24 4,855,730
825.440 4,855,731
856 4,855,732
870.140 4,855,735
870.19 4,855,733
870.310 4,855,734
901 4,855,736
933 4,855,737
968 4,855,738
984 4,855,739

CLASS 341

23 4,855,740
75 4,855,741
102 4,855,742
110 4,855,743
116 4,855,744
133 4,856,099
156 4,855,745
176 4,855,746

CLASS 342

51 4,856,100
179 4,855,747
455 4,855,748

CLASS 343

767 4,855,749
770 4,855,750
779 4,855,751

CLASS 346

1.1 4,855,752
4,855,753
17 4,855,754
76 PH 4,855,755
4,855,756
4,855,757
4,855,758
108 4,855,759
4,855,760
4,855,761
140 R 4,855,762
4,855,764
154 4,855,765
160 4,855,766
4,855,767
160.1 4,855,763
4,855,768

CLASS 350

4.2 4,854,657
96.15 4,854,658
4,854,659
96.18 4,854,660
96.20 4,854,661
4,854,662
96.22 4,854,664
96.23 4,854,665
96.30 4,854,668
96.34 4,854,666
162.12 4,854,669
166 4,854,670
252 4,854,671
255 4,854,672
4,854,673
320 4,854,674
336 4,854,675
354 4,854,676
355 4,854,677
356 4,854,678
422 4,854,679
423 4,854,680
427 4,854,681
4,854,682
4,854,683
4,854,684
4,854,685
456 4,854,686
486 4,854,687
571 4,854,688

CLASS 351

169 4,854,689
203 4,854,690
221 4,854,691
4,854,692
4,854,693
224 4,854,694
246 4,854,695

CLASS 352

90 4,854,696

CLASS 353

89 4,854,697

CLASS 354

21 4,855,769
75 4,855,770
149.11 4,855,771
173.1 4,855,772
4,855,773
203 4,855,774
286 Re.33,015
325 4,855,775
400 Re.33,016
402 4,855,776
4,855,777
412 4,855,778
4,855,779
432 4,855,780
468 4,855,781
475 4,855,782

CLASS 355

24 4,855,790
26 4,855,789
27 4,855,791
53 4,855,792
4,855,793
54 4,855,794
218 4,855,785
4,855,786
272 4,855,784
298 4,855,783
311 4,855,787
313 4,855,788

CLASS 356

5 4,854,698
41 4,854,699
72 4,854,700
73.1 4,854,701
155 4,854,702
248 4,854,703
250 4,854,704
336 4,854,705
345 4,854,706
356 4,854,707
359 4,854,708
375 4,854,709
432 4,854,710

CLASS 357

2 4,855,795
15 4,855,796
22 4,855,797
23.4 4,855,799
23.5 4,855,800
23.6 4,855,801
30 4,855,802
45 4,855,803
4,855,804
58 4,855,805
4,855,806
71 4,855,798
72 4,855,807
74 4,855,808
75 4,855,809
87 4,855,810

CLASS 358

12 4,855,811
22 4,855,812
4,855,813
29 4,855,814
31 4,855,815
47 4,855,816
75 4,855,817
4,855,818
98 4,855,819
100 4,855,820
101 4,855,821
103 4,855,822
4,855,823
133 4,855,824
135 4,855,825
139 4,855,826
143 4,855,827
4,855,828
162 4,855,829
168 4,855,830
183 4,855,831
4,855,832
4,855,833
4,855,834
195.1 4,855,835
214 4,855,836
229 4,855,837
4,855,838
245 4,856,101
296 4,855,839
4,855,840
4,855,841
342 4,855,842

CLASS 360

10.2 4,855,843
19.1 4,855,847
22 4,855,844
33.1 4,855,845
4,855,846
96.5 4,855,848
97.01 4,855,849
99.12 4,855,850
4,855,851
4,855,852
106 4,855,853
126 4,855,854
128 4,855,855
4,855,856
133 4,855,857

CLASS 361

18 4,855,858
19 4,855,859
45 4,855,860
65 4,855,861
72 4,855,862
91 4,855,863
4,855,864
212 4,855,865
4,855,866
4,855,867
330 4,856,102
4,855,868
4,855,869
395 4,855,870
411 4,855,871
414 4,855,872
424 4,855,873

CLASS 362

16 4,855,874
32 4,855,875
61 4,855,876
4,855,877
66 4,855,878
84 4,855,879
123 4,855,880
156 4,855,881
238 4,855,882
260 4,855,883
4,855,884
4,855,885
340 4,856,103
350 4,855,886

CLASS 363

8 4,855,887
17 4,855,888
19 4,855,889
44 4,855,890
56 4,855,891
86 4,855,892
136 4,855,893
157 4,855,894
4,855,895

CLASS 364

138 4,855,896
4,855,897
191 4,855,898
4,855,899
4,855,900
4,855,901
4,855,902
4,855,903
4,855,904
4,855,905
4,855,906
4,855,947
4,855,907
405 4,855,908
413.01 4,855,909
413.13 4,855,910
413.25 4,855,911
422 4,855,912
424.02 4,855,915
424.1 4,855,913
4,855,914
426.02 4,855,916
4,855,917
426.04 4,855,918
431.03 4,855,919
4,855,920
464.04 4,855,922
4,855,923
4,855,924
470 4,856,104
474.02 4,856,105
474.06 4,855,925
474.29 4,855,921
4,855,926
4,855,927
4,855,928
4,855,929
497 4,855,930
4,855,931
516 4,855,932
518 4,855,933
521 4,855,934
4,855,935
4,855,936
4,855,937
522 4,855,938
4,855,939
526 4,855,940
550 4,855,941
561 4,855,942
575 4,855,943
4,855,944
709.02 4,855,945
721 4,855,946
4,855,948
4,855,949

CLASS 365

113 4,855,950
119 4,855,951
149 4,855,952
4,855,953
185 4,855,954
4,855,955
203 4,856,106
210 4,855,956
230.03 4,855,957
4,855,958
239 4,855,959

CLASS 366

8 4,855,960
4,854,711
129 4,854,712
132 4,854,713
4,854,714
139 4,854,715
4,854,716
197 4,854,717
252 4,854,718
261 4,854,719
294 4,854,720
340 4,854,721
341 4,854,722

CLASS 367

Re.33,014
7 4,855,961
19 4,855,962
31 4,855,963
4,855,965
4,855,966
150 4,856,107
159 4,855,964
4,855,967

CLASS 368

115 4,855,968
120 4,855,969
4,855,970
4,855,971
282 4,855,972
4,855,973
4,855,974

CLASS 369

13 4,855,975
4,855,976
32 4,855,977
4,855,978
33 4,855,979
36 4,855,980
44 4,855,981
4,855,982
4,855,983
4,856,108
47 4,855,654
4,855,984
100 4,855,985
112 4,855,986
4,855,987
4,855,988
4,855,989
4,855,990
275 4,855,991
4,855,992

CLASS 370

4,855,993
69.1 4,855,994
4,855,996
4,855,997
4,855,995
4,855,998
112 4,855,999

CLASS 371

4,856,000
15 4,856,001
20 4,855,621
4,856,002
37 4,856,003
4,856,004

CLASS 372

4,856,005
22 4,856,006
29 4,856,007
31 4,856,008
32 4,856,009
4,856,010
38 4,856,011
4,856,012
45 4,856,013
4,856,014
4,856,015
4,856,016
4,856,017
98 4,856,018
4,856,019
107 4,856,020

CLASS 373

4,856,021
112 4,856,022

CLASS 374

4,854,724
42 4,854,725
45 4,854,726
57 4,854,727
136 4,854,728
141 4,854,729
4,854,730
178 4,854,731
179 4,854,723

CLASS 375

3 4,856,023
4,856,024
4,856,025
58 4,856,026
4,856,027
97 4,856,028
106 4,856,030
110 4,856,029
118 4,856,031

CLASS 376

327 4,855,100

CLASS 377
47 4,856,032
58 4,856,033
74 4,856,034
116 4,856,035

CLASS 378
34 4,856,037
39 4,856,038
116 4,856,036
133 4,856,039
146 4,856,040
147 4,856,041
4,856,042
149 4,856,043
198 4,856,044

CLASS 379
53 4,856,045
56 4,856,046
57 4,856,047
60 4,856,048
67 4,856,049
[illegible] 4,856,050
88 4,856,051
[illegible] 4,856,053
100 4,856,052
107 4,856,054
374 4,856,055
375 4,856,056
388 4,856,057
394 4,856,058
412 4,856,059
4,856,060

CLASS 380
23 4,856,062
48 4,856,061
4,856,063

CLASS 381
1 4,856,064
28 4,856,065
36 4,856,066
45 4,856,067
47 4,856,068
52 4,856,069
68.6 Re.33,017
86 4,856,072
169 4,856,070
203 4,856,071

CLASS 382
3 4,856,077
6 4,856,073
22 4,856,074
50 4,856,075
53 4,856,076

CLASS 383
6 4,854,732
29 4,854,733
66 4,854,734
72 4,854,735
76 4,854,736
127 4,854,737

CLASS 384
13 4,854,739
42 4,854,740
45 4,854,741
127 4,854,738
129 4,854,742
130 4,854,743
295 4,854,744
420 4,854,745
432 4,854,746
447 4,854,747
[illegible] 4,854,748
482 4,854,749
500 4,854,750
537 4,854,751

CLASS 388
820 4,855,655
831 4,856,078

CLASS 400
124 4,854,752
144.2 4,854,753
208.1 4,854,755
322 4,854,756
605 4,854,757
802.2 4,854,754

CLASS 401
116 4,854,758
119 4,854,759
134 4,854,760
196 4,854,761
199 4,854,762

CLASS 402
32 4,854,763

CLASS 403
13 4,854,764
30 4,854,765
224 4,854,766

CLASS 404
6 4,854,767
11 4,854,768
72 4,854,769
75 4,854,770
79 4,854,771
121 4,854,772

CLASS 405
19 4,854,773
25 4,854,774
126 4,854,775
147 4,854,776
202 4,854,777
204 4,854,778
205 4,854,779
211 4,854,780
224 4,854,781
230 4,854,782

CLASS 406
13 4,854,783

CLASS 407
114 4,854,784
115 4,854,785

CLASS 408
1 R 4,854,786
17 4,854,787
59 4,854,788
125 4,854,789

CLASS 410
30 4,854,790
52 4,854,791
118 4,854,792

CLASS 411
49 4,854,793
307 4,854,794
352 4,854,795
366 4,854,796
383 4,854,797
434 4,854,798

CLASS 413
66 4,854,799

CLASS 414
138.2 4,854,800
291 4,854,801
404 4,854,802
429 4,854,803
469 4,854,804
495 4,854,805
4,854,806
498 4,854,807
[illegible] 4,854,808
685 4,854,809
710 4,854,810
718 4,854,811
723 4,854,812
4,854,813
4,854,814
788.4 4,854,815
790.3 4,854,816
798.9 4,854,817

CLASS 415
58.4 4,854,818
143 4,854,819
171.1 4,854,820

CLASS 416
95 4,854,821

CLASS 417
62 4,854,822
63 4,854,823
69 4,854,824
265 4,854,825
269 4,854,826
313 4,854,827
360 4,854,828
4,854,829
365 4,854,830
366 4,854,831
393 4,854,832
417 4,854,833
423.3 4,854,834
435 4,854,835
474 4,854,836
492 4,854,837
517 4,854,838
571 4,854,839

CLASS 419
8 4,855,101
4,855,102
26 4,855,103
28 4,855,104

CLASS 420
75 4,855,105
109 4,855,106
546 4,855,107

CLASS 422
56 4,855,108
63 4,855,109
102 4,855,110
142 4,855,111
186.23 4,855,112
259 4,855,113

CLASS 423
112 4,855,114
239 4,855,115
4,855,116
244 4,855,117
301 4,855,118
346 4,855,119
347 4,855,120
439 4,855,121
447.1 4,855,122
562 4,855,123
574 L 4,855,124

CLASS 424
1.1 4,855,125
9 4,855,126
49 4,855,128
63 4,855,129
70 4,855,130
74 4,855,131
78 4,855,132
84 4,855,133
85.7 4,855,134
127 4,855,135
195.1 4,855,137
4,855,138
404 4,855,139
405 4,855,140
411 4,855,127
423 4,855,141
434 4,855,142
468 4,855,143
487 4,855,144
602 4,855,136

CLASS 425
32 4,854,840
119 4,854,841
133.1 4,854,842
141 4,854,844
205 4,854,847
363 4,854,845
391 4,854,846
437 4,854,843
503 4,854,848
4,854,850
549 4,854,851
556 4,854,849

CLASS 426
5 4,855,146
43 4,855,147
46 4,855,148
48 4,855,149
87 4,855,150
003 4,855,145
144 4,855,151
261 4,855,152
270 4,855,153
417 4,855,154
564 4,855,155
565 4,855,156
609 4,855,157
643 4,855,158
656 4,855,159

CLASS 427
38 4,855,160
108 4,855,161
243 4,855,162
244 4,855,163
385.5 4,855,164
393.5 4,855,165

CLASS 428
15 4,855,166
18 4,855,167
35.2 4,855,168
4,855,169
40 4,855,170
4,855,171
57 4,855,172
63 4,855,173
67 4,855,174
148 4,855,175
195 4,855,176
216 4,855,186
247 4,855,177
287 4,855,178
296 4,855,179
328 4,855,180
336 4,855,181
343 4,855,182
345 4,855,183
423.1 4,855,185
425.1 4,855,184
516 4,855,187
627 4,855,188
690 4,855,189
4,855,190
4,855,191

CLASS 429
13 4,855,192
30 4,855,193
38 4,855,194
54 4,855,195
139 4,855,196

CLASS 430
II 4,855,197
12 4,855,198
18 4,855,199
25 4,855,200
58 4,855,201
4,855,202
59 4,855,203
106 4,855,204
106.6 4,855,205
4,855,206
109 4,855,207
110 4,855,208
126 4,855,209
133 4,855,210
213 4,855,211
281 4,855,212
4,855,213
4,855,214
283 4,855,215
372 4,855,216
4,855,217
428 4,855,218
496 4,855,219
505 4,855,220
510 4,855,221
557 4,855,222
562 4,855,223

CLASS 431
78 4,854,852
115 4,854,853
154 4,854,857
170 4,854,854
202 4,854,855
253 4,854,856
320 4,854,858
344 4,854,859

CLASS 432
5 4,854,860
14 4,854,861
59 4,854,862
176 4,854,863

CLASS 433
7 4,854,864
18 4,854,865
24 4,854,866
40 4,854,867
60 4,854,868
80 4,854,869
166 4,854,870
4,854,871
173 4,854,872
4,854,873
176 4,854,874
213 4,854,875

CLASS 434
29 4,854,876
236 4,854,877
335 4,854,878
339 4,854,879
395 4,854,880

CLASS 435
5 4,855,224
6 4,855,225
7 4,855,226
4,855,227
28 4,855,228
4,855,229
30 4,855,230
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	4,855,324		4,854,653		4,855,170		4,854,077		4,854,625		4,854,324
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	4,855,347		4,854,696		4,855,264		4,854,104		4,854,915		4,854,330
	4,855,354		4,854,728		4,855,384		4,854,115		4,855,059		4,854,342
	4,855,375		4,854,866		4,855,475		4,854,132		4,855,075		4,854,379
	4,855,491		4,854,882		4,855,545		4,854,135		4,855,166		4,854,425
	4,855,492		4,854,980		4,855,713		4,854,138		4,855,408		4,854,496
	4,855,503		4,855,000		4,855,793		4,854,144		4,855,453		4,854,553
	4,855,573		4,855,005		4,855,822		4,854,175		4,855,493		4,854,566
	4,855,596		4,855,018		4,855,851		4,854,189		4,855,557		4,854,623
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	4,855,702		4,855,029		4,855,888		4,854,196		4,855,716		4,854,660
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	4,855,506		4,854,070		4,854,160		4,855,143		4,854,796		4,855,594
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19 :	4,854,054		4,854,193		4,854,597		4,855,203		4,854,839		4,855,747
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20 :	4,854,498		4,854,642		4,855,128		4,855,333		4,855,277		4,854,469
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	4,854,393		4,855,035		4,855,800		4,854,610		4,854,525		4,855,440
	4,854,404		4,855,060		4,855,809		4,854,780		4,854,618		4,855,567
	4,854,405		4,855,160		4,855,810		4,855,098		4,854,656		4,855,576
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	4,854,578		4,855,366		4,855,963		4,854,107		4,855,151		4,855,862
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	302,725		302,687		302,743		302,706	39	302,633	45	302,705
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	302,699	15 :	302,717		302,639		302,653		302,737	48	302,652
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	302,744		302,632		302,693		302,662		302,752		302,676
	302,746		302,637		302,729		302,678	40	302,627		302,701
	302,749		302,638	26	302,657		302,690		302,641		302,713
	302,755		302,645		302,756		302,692	41 :	302,628	51	302,650
09	302,640		302,682	27	302,651		302,702	42 :	302,626		302,714
	302,659		302,704		302,658		302,708		302,635		302,754
12 :	302,647		302,720	29	302,721		302,753		302,674		

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Robert A. Mosbacher, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner*

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1101 O.G. 56 on Apr. 25, 1989.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	550.00
—Corresponding prior U.S. national application filed:	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority.	400.00
—Additional examination fee, per additional invention	130.00
—Searching Authority not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee:	436.00
Basic Supplemental fee (for each page over 30):	9.00
Designation fee per country or region for the first 10 national or regional offices:	106.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	134.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	165.00	330.00
USPTO was ISA but no IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

May 3, 1989. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Patent Cooperation Treaty (PCT) Update

Change in International Search Fee Charged by the European Patent Office Effective Sept. 1, 1989

The International Bureau of the World Intellectual Property Organization has informed the U. S. Patent and Trademark Office that, due to changes in the exchange rate of the U. S. dollar in relation to the German Mark, the dollar amount of the international search fee charged by the European Patent Office for international applications filed in the United States Receiving Office will be $1,040.00, effective September 1, 1989.

July 7, 1989 DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

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Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on August 12, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,604,758 through 4,606,076
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on August 10, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,343,044 through 4,344,188
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MAY 28, 1989
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,519,097	06/482,866	05/28/85
4,519,105	06/601,016	05/28/85
4,519,106	06/255,269	05/28/85
4,519,118	06/642,727	05/28/85
4,519,122	06/485,868	05/28/85
4,519,124	06/531,430	05/28/85
4,519,134	06/604,244	05/28/85
4,519,139	06/616,015	05/28/85
4,519,141	06/419,031	05/28/85
4,519,147	06/383,670	05/28/85
4,519,148	06/514,873	05/28/85
4,519,149	06/408,318	05/28/85
4,519,150	06/460,026	05/28/85
4,519,160	06/618,755	05/28/85
4,519,163	06/530,854	05/28/85
4,519,167	06/459,116	05/28/85
4,519,179	06/433,032	05/28/85
4,519,195	06/524,502	05/28/85
4,519,202	06/480,868	05/28/85
4,519,210	06/485,890	05/28/85
4,519,212	06/370,451	05/28/85
4,519,218	06/602,008	05/28/85
4,519,222	06/502,408	05/28/85
4,519,224	06/449,932	05/28/85
4,519,229	06/468,111	05/28/85
4,519,230	06/552,175	05/28/85
4,519,235	06/541,465	05/28/85
4,519,244	06/506,243	05/28/85
4,519,249	06/508,188	05/28/85
4,519,250	06/516,254	05/28/85
4,519,251	06/529,812	05/28/85
4,519,257	06/517,456	05/28/85
4,519,262	06/489,728	05/28/85
4,519,263	06/417,244	05/28/85
4,519,271	06/367,029	05/28/85
4,519,278	06/495,103	05/28/85
4,519,280	06/518,649	05/28/85
4,519,282	06/384,382	05/28/85
4,519,287	06/573,518	05/28/85
4,519,290	06/552,565	05/28/85
4,519,295	06/500,517	05/28/85
4,519,306	06/559,233	05/28/85
4,519,307	06/559,373	05/28/85
4,519,308	06/557,040	05/28/85
4,519,315	06/450,874	05/28/85
4,519,318	06/458,028	05/28/85
4,519,320	06/424,953	05/28/85
4,519,327	06/588,249	05/28/85
4,519,332	06/560,393	05/28/85
4,519,334	06/477,774	05/28/85
4,519,336	06/526,020	05/28/85
4,519,341	06/405,598	05/28/85
4,519,345	06/586,231	05/28/85
4,519,347	06/521,716	05/28/85
4,519,348	06/487,071	05/28/85
4,519,349	06/439,744	05/28/85
4,519,357	06/428,471	05/28/85
4,519,359	06/585,172	05/28/85
4,519,377	06/616,094	05/28/85
4,519,378	06/292,539	05/28/85
4,519,379	06/507,337	05/28/85
4,519,381	06/577,787	05/28/85
4,519,384	06/609,701	05/28/85
4,519,407	06/503,932	05/28/85
4,519,416	06/515,430	05/28/85

Patent Number	Serial Number	Issue Date
4,519,426	06/560,609	05/28/85
4,519,428	06/393,706	05/28/85
4,519,433	06/648,054	05/28/85
4,519,439	06/468,976	05/28/85
4,519,441	06/428,652	05/28/85
4,519,445	06/555,507	05/28/85
4,519,447	06/584,309	05/28/85
4,519,448	06/494,937	05/28/85
4,519,464	06/535,450	05/28/85
4,519,465	06/362,544	05/28/85
4,519,466	06/363,615	05/28/85
4,519,470	06/480,135	05/28/85
4,519,474	06/529,492	05/28/85
4,519,475	06/453,824	05/28/85
4,519,477	06/551,802	05/28/85
4,519,480	06/481,295	05/28/85
4,519,500	06/570,226	05/28/85
4,519,502	06/581,113	05/28/85
4,519,506	06,407,541	05/28/85
4,519,523	06/411,960	05/28/85
4,519,530	06/469,945	05/28/85
4,519,533	06/487,684	05/28/85
4,519,536	06/585,203	05/28/85
4,519,538	06/620,600	05/28/85
4,519,542	06/594,404	05/28/85
4,519,544	06/489,726	05/28/85
4,519,556	06/632,430	05/28/85
4,519,557	06/444,618	05/28/85
4,519,566	06/538,534	05/28/85
4,519,570	06/534,682	05/28/85
4,519,578	06/474,504	05/28/85
4,519,582	06/428,669	05/28/85
4,519,584	06/485,314	05/28/85
4,519,586	06/594,370	05/28/85
4,519,605	06/435,329	05/28/85
4,519,606	06/401,619	05/28/85
4,519,608	06/414,914	05/28/85
4,519,609	06/570,640	05/28/85
4,519,614	06/598,229	05/28/85
4,519,615	06/599,094	05/28/85
4,519,618	06/619,725	05/28/85
4,519,621	06/447,641	05/28/85
4,519,632	06/359,961	05/28/85
4,519,634	06/452,315	05/28/85
4,519,637	06/425,709	05/28/85
4,519,638	06/428,720	05/28/85
4,519,643	06/587,908	05/28/85
4,519,644	06/506,640	05/28/85
4,519,648	06/400,256	05/28/85
4,519,655	06/487,746	05/28/85
4,519,658	06/460,434	05/28/85
4,519,661	06/560,036	05/28/85
4,519,663	06/387,935	05/28/85
4,519,673	06/482,971	05/28/85
4,519,704	06/476,465	05/28/85
4,519,714	06/617,114	05/28/85
4,519,716	06/598,456	05/28/85
4,519,724	06/506,251	05/28/85
4,519,727	06/531,884	05/28/85
4,519,736	06/376,226	05/28/85
4,519,738	06/479,553	05/28/85
4,519,742	06/451,148	05/28/85
4,519,744	06/614,422	05/28/85
4,519,752	06/625,571	05/28/85
4,519,757	06/571,596	05/28/85
4,519,765	06/545,921	05/28/85
4,519,767	06/619,986	05/28/85
4,519,771	06/481,002	05/28/85
4,519,774	06/594,811	05/28/85
4,519,779	06/595,096	05/28/85
4,519,787	06/418,025	05/28/85
4,519,794	06/540,879	05/28/85
4,519,800	06/425,272	05/28/85
4,519,808	06/433,210	05/28/85
4,519,810	06/505,529	05/28/85
4,519,827	06/584,026	05/28/85
4,519,832	06/605,003	05/28/85
4,519,834	06/512,273	05/28/85
4,519,847	06/560,418	05/28/85
4,519,866	06/534,243	05/28/85
4,519,871	06/555,276	05/28/85
4,519,877	06/665,535	05/28/85
4,519,880	06/540,520	05/28/85
4,519/892	06/609,138	05/28/85
4,519,893	06/511,408	05/28/85
4,519,894	06/641,875	05/28/85
4,519,899	06/554,453	05/28/85
4,519,904	06/578,840	05/28/85
4,519,907	06/562,649	05/28/85
4,519,916	06/592,164	05/28/85
4,519,935	06/643,752	05/28/85
4,519,936	06/400,170	05/28/85
4,519,939	06/362,100	05/28/85
4,519,943	06/535,794	05/28/85
4,519,945	06/562,102	05/28/85
4,519,949	06/423,276	05/28/85
4,519,954	06/454,506	05/28/85
4,519,960	06/474,534	05/28/85
4,519,962	06/533,643	05/28/85
4,519,964	06/572,044	05/28/85
4,519,967	06/544,942	05/28/85
4,519,982	06/357,922	05/28/85
4,519,995	06/519,775	05/28/85
4,519,997	06/473,850	05/28/85
4,520,003	06/418,085	05/28/85
4,520,012	06/345,446	05/28/85
4,520,018	06/369,543	05/28/85
4,520,032	06/589,662	05/28/85
4,520,035	06/528,864	05/28/85
4,520,054	06/535,874	05/28/85
4,520,063	06/400,006	05/28/85
4,520,083	06/471,429	05/28/85
4,520,084	06/618,244	05/28/85
4,520,094	06/435,272	05/28/85
4,520,136	06/422,766	05/28/85
4,520,139	06/635,212	05/28/85
4,520,191	06/549,939	05/28/85
4,520,193	06/322,961	05/28/85
4,520,197	06/575,740	05/28/85
4,520,199	06/407,685	05/28/85
4,520,207	06/423,789	05/28/85
4,520,225	06/551,187	05/28/85
4,520,266	06/418,425	05/28/85
4,520,274	06/516,388	05/28/85
4,520,284	06/612,980	05/28/85
4,520,293	06/465,639	05/28/85
4,520,310	06/389,723	05/28/85
4,520,313	06/363,641	05/28/85
4,520,323	06/524,174	05/28/85
4,520,327	06/388,630	05/28/85
4,520,334	06/546,704	05/28/85
4,520,336	06/557,130	05/28/85
4,520,344	06/406,953	05/28/85
4,520,347	06/443,352	05/28/85
4,520,349	06/367,547	05/28/85
4,520,350	06/419,961	05/28/85
4,520,354	06/393,872	05/28/85
4,520,363	06/475,921	05/28/85
4,520,364	06/486,603	05/28/85
4,520,389	06/473,277	05/28/85
4,520,408	06/463,645	05/28/85
4,520,412	06/413,059	05/28/85
4,520,420	06/556,779	05/28/85
4,520,427	06/379,768	05/28/85
4,520,444	06/396,443	05/28/85
4,520,473	06/322,382	05/28/85
4,520,474	06/558,685	05/28/85
4,520,475	06/558,739	05/28/85
4,520,481	06/417,370	05/28/85
4,520,482	06/416,620	05/28/85
4,520,484	06/379,048	05/28/85
4,520,494	06/502,117	05/28/85
4,520,498	06/507,563	05/28/85
4,520,499	06/392,309	05/28/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,453,554, Re. S.N. 374,934, Filed June 29, 1989, Cl. 132/39, HAIR CURLER, Richard Caruso, Owner of Record:*Inventor*, Attorney or Agent: Steven J. Rocci, Ex. Gp.:333

4,619,676, Re. S.N. 372,055, Filed June 27, 1989, Cl. 55/500, FILTER CARTRIDGE FOR FILTERING APPARATUSES, Ernst Turck, Owner of Record:*Inventor*, Attorney or Agent: Philip E. Kurz, Ex. Gp.:135

4,676,088, Re. S.N. 375,256, Filed June 30, 1989, Cl. 34/237, CAGE-TYPE WAFER CARRIER AND METHOD, Richard J. Armstrong, Owner of Record: *Microglass, Inc., Syracuse, N.Y.*, Attorney or Agent: Charles R. Hoffman, Ex. Gp.:344

4,677,655, Re. S.N. 375,561, Filed June 29, 1989, Cl. 379/61, CORDLESS TELEPHONE WITH AUTOMATIC TELEPHONE ANSWERING/RECORDING FUNCTION, Kazuo Hashimoto, Owner of Record: *Hashimoto Corp., Tokyo, Japan*, Attorney or Agent: Robert L. Price, Ex. Gp.:261

4,678,949, Re. S.N. 370,322, Filed June 22, 1989, Cl. 307/527, SYNCHRONISM DETECTOR CIRCUIT, Keiichi Oshkiri, et al., Owner of Record: *Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Frank L. Neuhauser, Ex. Gp.:254

4,722,285, Re. S.N. 371,600, Filed June 26, 1989, Cl. 109/50, TAMPERPROOF CABINET, Steve F. Goodman, Owner of Record: *Herman Miller, Inc.*, Attorney or Agent: John E. McGarry, Ex. Gp.:358

4,735,359, Re. S.N. 375,189, Filed July 3, 1989, Cl. 239/001, LIQUID MIXING EMPLOYING EXPANDING, THINNING LIQUID SHEETS, Robert J. Demyanovich, Owner of Record: *Inventor*, Attorney or Agent: None, Ex. Gp.:314

4,742,861, Re. S.N. 375,031, Filed July 3, 1989, Cl. 164/80, METHOD AND MATERIAL FOR DENTAL STRUCTURES, Itzhak Shoher, Owner of Record: *Inventor*, Attorney or Agent: Eugene Lieberstein, Ex. Gp.:323

4,776,121, Re. S.N. 375,310, Filed July 6, 1989, Cl. 40/610, INFLATABLE SIGN, Robert K. Vicino, Owner of Record: *Inventor*, Attorney or Agent: Henri J. A. Charmasson, Ex. Gp.:357

4,789,575, Re. S.N. 373,964, Filed June 27, 1989, Cl. 428/34.2, IMPROVED NON-FOIL COMPOSITE FOR PACKAGING JUICE, Charles E. Gibbons, et al., Owner of Record: *International Paper Co., New York, N.Y.*, Attorney or Agent: Stewart L. Gitler, Ex. Gp.:158

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be, constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,396,619, Reexam. No. 90/001,802, Requested: June 27, 1989, Cl. 83/639, FLUID AMPLIFIER EMPLOYING BOUNDARY LAYER EFFECT, Ronald E. Bowles, et al., Owner of Record: *Inventor(s)*, Attorney or Agent: Unknown, Ex. Gp.: 320, Requester: Jim Zegeer, Alexandria, Va.

3,956,593, Reexam. No. 90/001,797, Requested: June 21, 1989, Cl. 370/63, TIME SPACE TIME (TST) WITH COMBINED AND DISTRIBUTED STATE STORE AND CONTROL STORE, Arthur A. Collins, Owner of Record: *Sevin, Rosen, Bayless & Borovoy, Dallas, Tex.*, Attorney or Agent: R. S. Borovoy, Ex. Gp.: 260, Requester: Owner

4,411,128, Reexam. No. 90/001,801, Requested: June 26, 1989, Cl. 57/22, METHOD AND APPARATUS FOR SPLICING SPUN YARN, Hiroshi Mima, Owner of Record: *Murata Machinery Kikai Kabushiki Kaisha, Kyoto, Japan*, Attorney or Agent: Spensley, Horn, Jubas & Lubitz, Ex. Gp.: 240, Requester: Owner

4,632,980, Reexam. No. 90/001,799, Requested: June 23, 1989, Cl. 530/380, OZONE DECONTAMINATION OF BLOOD AND BLOOD PRODUCTS, Yuan C. Zee, Owner of Record: *Medizone International, Inc., New York, N. Y.*, Attorney or Agent: Unknown, Ex. Gp.: 150, Requester: Owner

4,815,620, Reexam. No. 90/001,800, Requested: June 23, 1989, Cl. 215/256, TAMPER-EVIDENT CAP HAVING PLURAL DIAMETERS, Joseph J. Bullock, Owner of Record: *Cap Snap, Inc., San Jose, Calif.*, Attorney or Agent: Julian Caplan, Ex. Gp.: 240, Requester: W. B. Harpman, Youngstown, Ohio

Erratum

"All reference to Reexamination Certificate No. B1-4,404,040 (1021st) appearing in the Official Gazette of March 7, 1989 should be deleted since the certificate has been vacated and deemed null and void."

Erratum

"All reference to Reexamination Certificate No. B1-4,426,860 (1037th) appearing in the Official Gazette of April 18, 1989 should be deleted since the certificate has been vacated and deemed null and void."

Listing of Commercial Bonded Draftsmen

The following listing of bonded draftsmen supersedes the listing published on October 18, 1988, 1095 O.G. 30.

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Publication of this list does not constitute a recommendation or endorsement of any individual or firm by the Patent and Trademark Office. All arrangements for drafting related services are the sole responsibility of patent and trademark practitioners.

THERESA A. BRELSFORD
Assistant Commissioner
for Administration

PATENT NOTICES

Certificates of Correction For Week of August 15, 1989

B14,643,971	4,771,466	4,794,000	4,804,898
Re. 32,760	4,772,620	4,794,256	4,805,397
D. 298,832	4,773,135	4,794,284	4,805,426
D. 299,093	4,774,240	4,794,770	4,805,906
D. 299,619	4,774,479	4,794,979	4,805,919
4,524,722	4,778,321	4,795,036	4,806,016
4,598,331	4,781,790	4,795,363	4,806,190
4,628,254	4,782,963	4,795,670	4,806,413
4,659,125	4,783,160	4,795,703	4,806,442
4,685,095	4,784,331	4,795,748	4,806,606
4,685,330	4,784,486	4,795,749	4,806,607
4,689,183	4,785,070	4,795,762	4,806,635
4,698,453	4,785,086	4,796,080	4,806,663
4,705,770	4,785,171	4,796,476	4,807,031
4,719,478	4,785,518	4,797,526	4,807,054
4,721,533	4,786,884	4,797,665	4,807,184
4,735,034	4,787,224	4,797,707	4,807,389
4,737,510	4,787,318	4,797,854	4,807,495
4,738,282	4,787,909	4,798,110	4,807,710
4,741,411	4,788,030	4,798,175	4,807,763
4,749,167	4,788,613	4,798,473	4,807,836
4,749,168	4,788,619	4,799,152	4,808,329
4,749,656	4,788,860	4,799,176	4,808,608
4,752,822	4,788,970	4,800,646	4,808,913
4,754,075	4,789,963	4,800,660	4,809,244
4,754,651	4,790,254	4,800,958	4,809,338
4,755,361	4,790,849	4,801,604	4,809,553
4,755,715	4,791,085	4,801,609	4,810,228
4,757,921	4,791,091	4,801,911	4,810,563
4,758,073	4,791,240	4,802,461	4,810,612
4,759,726	4,791,281	4,803,236	4,810,815
4,760,732	4,791,301	4,803,317	4,810,866
4,760,995	4,791,436	4,803,777	4,811,352
4,761,657	4,792,048	4,803,878	4,812,432
4,762,701	4,792,596	4,804,127	4,813,014
4,762,952	4,792,746	4,804,268	4,814,042
4,764,592	4,793,318	4,804,521	4,827,017
4,767,684	4,793,717	4,804,721	4,828,623
4,769,026	4,793,723	4,804,723	4,831,691
4,771,268	4,793,971	4,804,724	4,842,245

SPECIAL BOXES FOR MAIL

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Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.
Box Assignments	All assignment documents except those filed in new patent applications.

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The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to libary, ranging from patents of only recent years to all or most of the patents issued since 1790.

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	Sunnyvale: Patent Information Clearinghouse	(408) 730-7290
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New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 473-4636
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	Cleveland Public Library	(216) 623-2870
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	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State University	(503) 378-4239
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	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
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Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF July 15, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director.	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	7-15-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	12-23-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. SHAW, Acting Director	5-12-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-27-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-17-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-2-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—D. G. KELLY, Director	1-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	4-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-24-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-1-88

Expiration of patents: The patents within the range of numbers indicated below expire during July 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

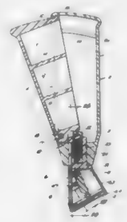
Patents	Numbers 3,673,609 to 3,680,148 inclusive
Plant Patents	3,224 to 3,244 inclusive

REEXAMINATIONS

AUGUST 15, 1989

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,109,844 (1114th)
SURGICAL STAPLING INSTRUMENT
Carl T. Becht, Cincinnati, Ohio, assignor to Ethicon, Inc.
Reexamination Request No. 90/001,599, Sep. 9, 1988.
Reexamination Certificate for Patent No. 4,109,844, issued Aug. 29, 1978, Ser. No. 742,843, Nov. 18, 1976.
Int. Cl.[4] A61B *17/00*
U.S. Cl. 227—120



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–14 is confirmed.

1. A surgical stapling instrument for forming and implanting a staple in the skin or fascia of a patient, said instrument comprising a handle portion incorporating a nose portion, said nose portion having an anvil plate at the bottom end thereof, said anvil plate terminating at its forward end in a coextensive anvil surface, said anvil plate being adapted to slidably mount a row of staples, means to constantly urge and advance said row of staples along said anvil plate to place a forwardmost staple of said row on said anvil surface, a staple driver mounted in said nose portion and shiftable vertically between a normal upper position closely adjacent said forwardmost staple on said anvil surface and a lower position wherein it forms and implants said forwardmost staple about said anvil surface, and means to shift said staple driver between said upper and lower positions thereof.

B1 4,253,615 (1115th)
PALLET AUGER
Larry E. Koenig, 1208 Medow Lane Dr., Bettendorf, Iowa 52722
Reexamination Request No. 90/001,615, Oct. 6, 1988.
Reexamination Certificate for Patent No. 4,253,615, issued Mar. 3, 1981, Ser. No. 72,715, Sep. 4, 1979.
Int. Cl.[4] B02C *18/38*
U.S. Cl. 241—36

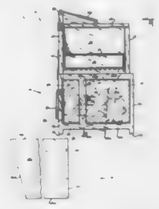
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 2 and 3 are cancelled.

Claims 1 and 4 are determined to be patentable as amended.

New claim 5 is added and determined to be patentable.

1. A machine for handling and reducing waste and like material, having a material-receiving hopper discharge downwardly into an elongated trough in which an auger rotates to move received material axially lengthwise of the trough, and including means cooperative between the auger and the trough to reduce material as it is moved, characterized in that the trough has an elongated imperforate bottom of substantially semicircular section and opposite sides adjoining the bottom and flaring upwardly and outwardly to lead material directly downwardly from the hopper into the auger and trough substantially throughout the length of the trough, the trough has axially spaced apart generally upright front and rear walls and the front wall has a circular opening therein through which reduced waste is forced by the auger, the trough is larger at its rear end than at its front end so that the bottom inclines upwardly and forwardly from rear to front, the auger is generally coextensive in length with the trough and rotates on an axis coaxial with the center of the front wall opening, said axis inclining downwardly from front to rear and said auger having



flighting tapering from a larger end adjacent to the rear wall to a smaller end adjacent to the front wall so that a line extended from rear to front along the bottom of the flighting is substantially parallel to the bottom of the trough whereby material is moved uphill to the opening and is simultaneously compressed and tapered as it exits from the trough through the front wall opening, *and*

the means cooperative between the auger and trough for reducing material comprises a plurality of teeth on and projecting radially from the auger flighting and a plurality of breaker bars fixed to and projecting upwardly from the trough bottom and spaced apart both lengthwise and semi-circumferentially of the trough bottom in such manner that the auger teeth pass between the bars with the cutting and breaking action of the material.

B1 4,590,265 (1116th)
CARBOXYLATED CELLULOSE ESTER AND MANUFACTURE THEREOF
Richard T. Bogan, and Chung-Ming Kuo, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
Reexamination Request No. 90/001,623, Oct. 18, 1988.
Reexamination Certificate for Patent No. 4,590,265, issued May 20, 1986, Ser. No. 724,747, Apr. 18, 1985.
Continuation-in-part of Ser. No. 581,014, Feb. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 542,233, Oct. 14, 1983, abandoned.
Int. Cl.[4] C08B *15/04*; C09D *3/18, 11/14*
U.S. Cl. 536—63

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

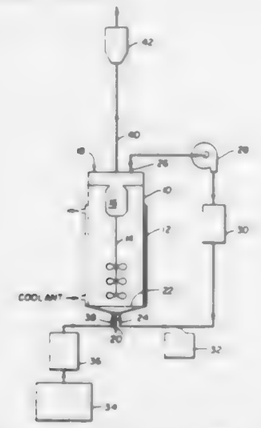
The patentability of claims 23–28 and 35–68 is confirmed.

Claims **8**, **14**, **17** and **33** are cancelled.

Claims **1**, **9**, **16**, **18** and **29** are determined to be patentable as amended.

Claims **2–7**, **10–13**, **15**, **19–22**, **30–32** and **34**, dependent on an amended claim, are determined to be patentable.

1. A process for the preparation of carboxylated cellulose esters comprising the steps of



(a) providing a cellulose ester to a reaction zone;
(b) intimately contacting said cellulose ester in said reaction zone with a gaseous stream comprising ozone; and
(c) reacting said cellulose ester with said ozone at a temperature of about 25° to 80° C. for a period of time sufficient to yield a carboxylated cellulose ester product having an acid number of at least about 5, *wherein said cellulose ester is cellulose propionate, cellulose butyrate, cellulose acetate butyrate, cellulose acetate propionate, or a mixture thereof.*

B1 4,605,721 (1117th)

NOVEL GRAFT COPOLYMERS AND PROCESS FOR THE PREPARATION THEREOF

Waylon L. Jenkins; James M. Hawkins, both of Kingsport, and Daniel Sand, Jonesborough, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Reexamination Request No. 90/001,624, Oct. 18, 1988.
Reexamination Certificate for Patent No. 4,605,721, issued Aug. 12, 1986, Ser. No. 725,186, Apr. 19, 1985.
Continuation-in-part of Ser. No. 605,341, Apr. 30, 1984, abandoned, which is a continuation of Ser. No. 542,233, Oct. 14, 1983, abandoned.
Int. Cl.⁴ C08G *81/00, 83/00*
U.S. Cl. 527—312

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **9**, **10**, **32** and **33** are cancelled.

Claims **1**, **11**, **16**, **24**, **34** and **44** are determined to be patentable as amended.

Claims **2–8**, **12–15**, **17–23**, **25–31**, **35–43** and **45–52**, dependent on an amended claim, are determined to be patentable.

1. A novel polymeric composition of matter comprising the reaction product of an ethylenically unsaturated monomer and a carboxylated cellulose ester having an acid number of at least about 5, an inherent viscosity of from about 0.01 to about 1.00 and wherein the anhydroglucose units thereof have ring substituents comprising by weight based on total polymer weight, of from about 0.05 to about 20% hydroxyl groups, from about 0.5 to about 44% acetyl groups, from 0 to about 54% butyryl groups, from 0 to about 47% propionyl groups, from about 0.4 to about 4.0% total carboxyl groups wherein from about 20% to about 100% of these carboxyl groups are non-saponifiable backbone, and wherein the material has a lactone level of from about 4.52×10^{-5} to about 6.13×10^{-4}, *wherein said carboxylated cellulose ester is carboxylated cellulose acetate butyrate, carboxylated cellulose acetate propionate, or a mixture thereof.*

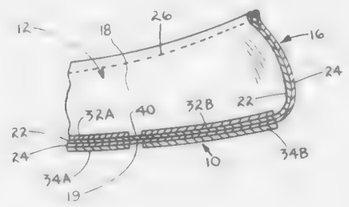
Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

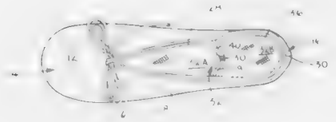
Re. 33,018

SLIPPER

Charles Ostrander, Middletown, N.J., assignor to Consolidated Foods, Winston-Salem, N.C.

Original No. 4,554,749, dated Nov. 26, 1985, Ser. No. 653,484, Sep. 21, 1984. Continuation of Ser. No. 424,153, Sep. 27, 1982, abandoned. Application for reissue Jun. 26, 1987, Ser. No. 66,705
Int. Cl.⁴ A43B *01/10*
U.S. Cl. 36—102 **13 Claims**





1. A flexible slipper comprising an upper defining a cover for encompassing the foot of a wearer, said cover including a unitary layer of elastic fabric defining a toe portion, a heel portion, a shank portion and a base portion, said shank portion interconnecting said toe and heel portions, said base portion interconnecting said toe, heel and shank portions and extending throughout the length of the slipper from the toe portion to the heel portion and beneath the foot of a wearer, and a sole comprising discrete fore and aft sections positioned in predetermined, spaced relation overlying sections of said base portion and means securing said fore and aft sections to said base portion, *said sole comprising an inner sole and an outer sole, each of said inner and outer soles including fore and aft discrete sections secured in spaced relation to said base portion.*

Re. 33,019

ENVIRONMENTALLY CONTROLLED BUILDING

James A. Rhodes; Michael Wren; Paul W. Lantz, and George W. Acock, Jr., all c/o James A. Rhodes & Asso., Ste. 1300, 42 E. Gay St., Columbus, Ohio 43215

Original No. 4,608,785, dated Sep. 2, 1986, Ser. No. 700,254, Feb. 11, 1985. Application for reissue Oct. 7, 1987, Ser. No. 105,365
Int. Cl.⁴ E04B *1/345*
U.S. Cl. 52—2 **15 Claims**

1. An environmentally controlled building suitable for use as a residential [apartment] building, a commercial building or a professional or business office building, or a combination thereof, said building comprising:

an outer circumferential wall forming an outer building perimeter and defining the building exterior;

an inner circumferential wall within said outer circumferential wall and defining an atrium within the building;

at least one of said outer circumferential wall and said inner circumferential wall having fenestrations therethrough;

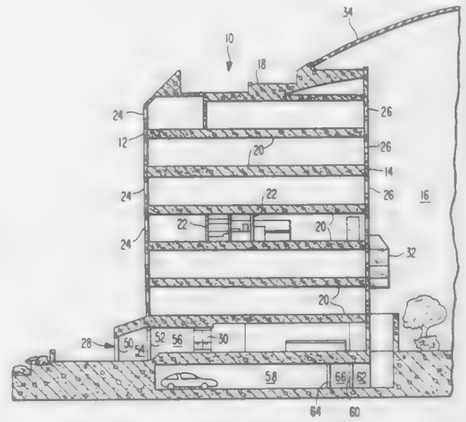
a substantially rigid roof bridging said outer circumferential wall to said inner circumferential wall, [and a plurality of] *an* interior [floors] *floor, and a plurality of interior walls, all* cooperating with said outer circumferential wall and said inner circumferential wall to define a [multistorey, multi-unit] building interior;

a second roof covering the atrium;

pressure sensing means for sensing the ambient atmospheric pressure outside the building;

pressurizing means for pressurizing the building interior and the atrium above the ambient atmospheric pressure outside the building;

first control means responsive to the ambient atmospheric pressure sensed by said pressure sensing means for controlling said pressurizing means to adjust the air pressure within the building interior and the atrium in response to



variations in the ambient atmospheric pressure outside the building so that when there is a first difference between the ambient atmospheric pressure and the air pressure within the building and the atrium and the ambient atmospheric pressure changes in a given direction by a first amount, the air pressure within the building and the atrium initially changes in the given direction by a second amount less than the first amount, thereby changing the difference between the ambient atmospheric pressure and the pressure within the building and the atrium, following which the air pressure within the building and the atrium changes further in the given direction to return the difference between the ambient atmospheric pressure and the pressure within the building and the atrium to the first difference; and

air lock means cooperating with at least some of the fenestrations for permitting personnel to enter and exit the building interior and atrium without substantial loss of pressure from the building interior and the atrium.

Re. 33,020

AUTOMATIC SEAT BELT DRIVING DEVICE

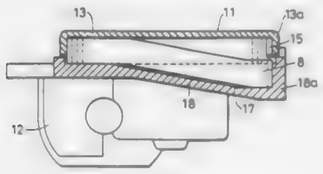
Yoshihiro Yokote, Yokohama, and Kazuo Yamamoto, Sagamihara, both of Japan, assignors to NSK-Warner K.K., Japan

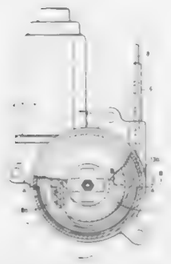
Original No. 4,564,218, dated Jan. 14, 1986, Ser. No. 601,003, Apr. 16, 1984. Application for reissue Dec. 24, 1987, Ser. No. 136,536

Claims priority, application Japan, Apr. 28, 1983, 58-63168; Apr. 28, 1983, 58-63169

Int. Cl.[4] B60R *21/10*

U.S. Cl. 280—804 28 Claims





1. A driving device for moving a seat belt in an automatic seat belt system between a seat occupant liberating position and a seat occupant restraining position, said device comprising:

an elongate flexible drive member, one end of said drive member being operatively connected to the seat belt,

a rotatable member formed with a portion for containing the drive member, the other end of the drive member being attached to said rotatable member and the drive member being taken up into and pushed out from said containing portion by the rotation of said rotatable member,

driving means for rotating the rotatable member,

a fixed side member formed with a port through which the drive member is taken up into and pushed out from said containing portion, said port lying at a position deviated from said containing portion in the direction of the rotational axis of the rotatable member.

Re. 33,021

DUAL SOURCE PARENTERAL INFUSION APPARATUS

Hal C. Danby, Chilton, United Kingdom, assignor to Critikon, Inc., Tampa, Fla.

Original No. 4,576,592, dated Mar. 18, 1986, Ser. No. 480,527, Mar. 30, 1983. Application for reissue Mar. 8, 1988, Ser. No. 165,682

Int. Cl.[4] A61M *5/16*

U.S. Cl. 604—80 18 Claims

9. A parenteral infusion apparatus for delivering parenteral solutions from two sources comprising:

a primary solution source;

a first conduit means for conducting solution supplied by said primary solution source;

a check valve located in said first conduit means;

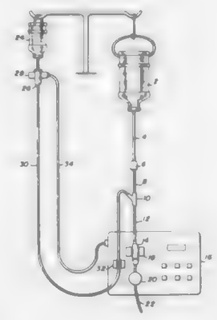
a supplementary solution source;

a second conduit means for conducting solution supplied by said supplementary solution source;

an outlet conduit leading to a patient site;

a junction means for connecting said first conduit means and said second conduit means to said outlet conduit;

wherein the flow path of said primary solution includes said first conduit means, said check valve, said junction means, and said outlet conduit, and the flow path of said supplementary solution includes said second conduit means, said junction means, and said outlet conduit;



controller means, engaging said second conduit means, and including means for selectively occluding said second conduit means to terminate solution flow from said supplementary solution source, and further including a flow control valve means engaging said outlet conduit for controlling the flow therethrough; and

primary flow sensor means located in said primary solution flow path for detecting the liquid flow rate of solution therethrough, and supplementary flow sensor means located in said supplementary solution flow path between said supplementary solution source and said engagement of said second conduit means with said controller means for detecting the liquid flow rate of solution therethrough,

wherein said controller means is responsive to said flow sensor means for controlling said selectively occluding means and said flow control valve means.

Re. 33,022

FERROMAGNETIC AMORPHOUS ALLOY

Shinji Takayama, Tokyo; Yasuo Tsukuda, Ome; Kazuo Shiiki, Kanagawa; Shigekazu Otomo, Hachioji; Mitsuhiro Kudo, Hamuramachi; Yasunobu Ogata, Kumagaya, and Yoshizo Sawada, Saitama, all of Japan, assignors to Hitachi, Ltd.; Hitachi Metals, Ltd. and Research Development Corp. of Japan, all of Tokyo, Japan

Original No. 4,306,908, dated Dec. 22, 1981, Ser. No. 188,746, Sep. 19, 1980. Application for reissue Nov. 5, 1987, Ser. No. 116,883

Claims priority, application Japan, Sep. 21, 1979, 54-121655

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—304 9 Claims

1. A ferromagnetic amorphous alloy having a composition expressed by $(Co_xNi_yFe_z)_aM_bG_c$, wherein M is at least one transition metal element selected from the group consisting of Cr, Mo and W, G is [at least one element selected from the group consisting of Zr] Hf [and Ti] and wherein x, y, z and a, b, c are selected to meet the conditions of: $x=1-y-z$, $0 \leqq y \leqq 0.2$, $0 \leqq z \leqq 0.7$, $a=1-c$, $0 \leqq b \leqq 0.05$ and $0.05 \leqq c \leqq 0.2$.

Re. 33,023

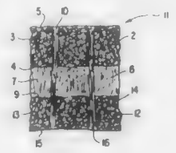
INTEGRAL TEXTILE COMPOSITE FABRIC

John J. Hiers, Elkin, N.C., assignor to Lydall, Inc., Manchester, Conn.

Original No. 4,522,876, dated Jun. 11, 1985, Ser. No. 627,688, Jul. 5, 1984. Application for reissue Jun. 10, 1987, Ser. No. 60,400

Int. Cl.[4] B32B *15/00*

U.S. Cl. 428—285 26 Claims



1. An integral textile composite fabric of non-woven, needled textile fibers comprising:

(a) at least one organic textile fiber layer of laid and needled textile organic fibers, said layer having an inner and an outer surface;

(b) at least one glass fiber layer of laid and needled glass fibers, said layer having an inner and outer surface;

(c) a plurality of first needled *binding* stitches composed essentially of said organic fibers from said one organic fiber layer needled in and disposed substantially through said one glass fiber layer while the fibers of the said glass fiber layer are substantially undisturbed, whereby the said stitches bind the said layers together at their inner surfaces[, the said layers are substantially non-detachable from each other] and form an integral textile composite fabric having substantially uniform [and high] physical properties, and wherein there are [at least 700] *sufficient numbers of* stitches per square inch of said binding stitches passing through said one glass fiber layer *so that the said layers are substantially non-detachable from each other,* and wherein said one organic fiber layer is essentially free, at least on the outer surface thereof, of glass fibers displaced from said one glass fiber layer.

Re. 33,024

BRONCHODILATING 8-HYDROXY-5-(1R)-1-HYDROXY-2-(N-((1R)-2-(P-METHOXYPHENYL)-1-METHYLETHYL)-AMINO)ETHYL) CARBOSTYRIL AND INTERMEDIATES THEREOV

Takeo Iwakuma, Ageo; Akira Tsunashima, Toda; Katsuo Ikezawa, Urawa, and Osasi Takaiti, Shiki, all of Japan, assignors to Tanabe Seiyaku Co. Ltd., Japan

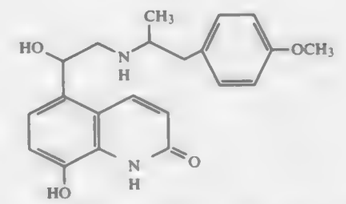
Original No. 4,579,854, dated Apr. 1, 1986, Ser. No. 684,505, Dec. 21, 1984. Application for reissue Jul. 9, 1987, Ser. No. 71,741

Claims priority, application United Kingdom, Dec. 24, 1983, [illegible]

Int. Cl.[4] A61K *31/47;* C07D *215/22*

U.S. Cl. 514—312 7 Claims

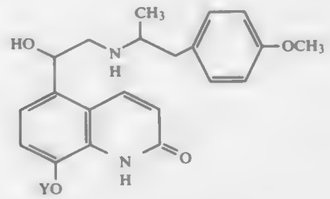
4. A pharmaceutical composition which comprises a therapeutically effective amount of a bronchodilating compound of the formula:



(I)

or a pharmaceutically acceptable acid addition salt thereof, and a pharmaceutically acceptable carrier therefor.

6. A carbostyril compound of the formula



wherein Y is benzyl, p-methoxybenzyl, or 3-4-dimethoxybenzyl.

Re. 33,025

METHOD AND APPARATUS FOR DISPLAY OF DISTANCE AND DIRECTION TO DESTINATION

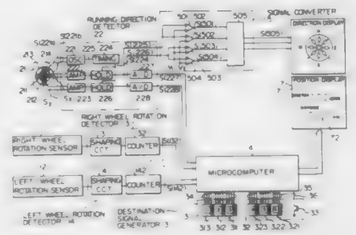
Maneaki Matsumoto, Okazaki; Akira Kuno, Oobu, and Koji Numata, Toyokawa, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Original No. 4,633,519, dated May 5, 1987, Ser. No. 488,707, Apr. 26, 1983. Application for reissue Nov. 5, 1987, Ser. No. 117,053

Claims priority, application Japan, Apr. 28, 1982, 57-70201

Int. Cl.[4] G06F *15/50;* G09B *29/10*

U.S. Cl. 364—444 9 Claims



9. A device for obtaining a present running position from a starting position of an automobile comprising:

means for generating, during running, wheel rotation signals by detecting rotation of left and right wheels of the automobile;

means for calculating and storing an automobile running distance by using said wheel rotation signals;

means for calculating and storing an automobile turning angle by a subtraction between said left and right wheel rotation signals;

means for generating a signal, at the starting position, to represent a running direction of the automobile by detecting terrestrial magnetism; and

means for calculating and storing values of a vector from the starting position to the present running position using said calculated automobile running distance, said calculated automobile turning angle and said running direction of the automobile detected by terrestrial magnetism at the starting position.

PLANT PATENTS

GRANTED AUGUST 15, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,981

NECTARINE TREE (SPARKLING JUNE)

Norman G. Bradford, 11875 Savana Rd., Le Grand, Calif. 95333

Filed Feb. 19, 1985, Ser. No. 702,911

The portion of the term of this patent subsequent to Nov. 15, 2003, has been disclaimed.

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of freestone nectarine tree, substantially as illustrated and described, which is somewhat similar to the Early Sun Grand Nectarine Tree (U.S. Plant Pat. No. 1,420), and the Red Diamond Nectarine Tree (U.S. Plant Pat. No. 3,165) from which it was derived as a progeny, but is distinguished therefrom by producing fruit which is ripe for commercial harvesting fourteen days earlier than Early Sun Grand Nectarine Tree, and 18 days earlier than the Sun Diamond Nectarine Tree, the variety having a good flavor, a fuller red color, and a more desirable, less deeply sutured shape, and is further characterized by its excellent firmness, shipping quality, and shelf life.

6,982

DWARF NECTARINE TREE (RED SUNSET)

Norman G. Bradford, 11875 Savana Rd., Le Grand, Calif. 95333

Filed Feb. 19, 1985, Ser. No. 702,917

The portion of the term of this patent subsequent to Nov. 15, 2003, has been disclaimed.

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of genetic dwarf freestone nectarine tree, substantially as illustrated and described, which most closely resembles the genetically tall May Grand Nectarine Tree variety (U.S. Plant Pat. No. 2,794), but is distinguishable therefrom in that it ripens eight days later, yields a good flavored freestone nectarine fruit and is a genetic dwarf tree.

6,983

CHINESE ELM CULTIVAR NAMED "AROSS/CENTRAL PARK"

David F. Karnosky, Chassell, Mich., assignor to Central Park Conservatory and Arthur Ross Foundation, Inc., both of New York, N.Y.

Filed Feb. 1, 1988, Ser. No. 151,001

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—51 1 Claim

1. A new and distinct variety of Chinese Elm tree, substantially as illustrated and described, and which is somewhat remotely similar to the "Dynasty", "Supervirens", and "Drake" varieties of Chinese Elm tree with which it is remotely related, but which is distinguished therefrom and characterized principally as to novelty by being increasingly cold hardy and growing taller than other Chinese Elm Cultivars. While retaining the urban hardiness characteristics of and by producing larger leaves than that typically displayed by other Chinese Elm trees with which it is most closely similar, the new and novel variety of Chinese Elm having noteworthy height characteristics under typical Zone 6 conditions.

6,984

ORCHID YAMADARA MIDNIGHT MAGENTA 'FINE WINE' AM/AOS

Ernest Hetherington, Arcadia, Calif., assignor to Stewart Orchids, Carpenteria, Calif.

Filed Mar. 3, 1988, Ser. No. 163,940

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of hybrid orchid substantially as described and illustrated herein and distinguised from its parents and siblings of the grex, Midnight Magenta and other orchids by its combination of rich flower coloring, superior flower substance, strength of stem structure, vigor of plant and reliable blooming.

6,985

AFRICAN VIOLET PLANT NAMED JENNIE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 251,249

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African Violet named Jennie, as described and illustrated, and particularly characterized by its relatively small, single, violet-shaped white flowers with some flowers having irregular light violet patches; strong, upright flower stems that curve slightly toward the center to form a compact bouquet above the leaves; bright green round to heart-shaped leaves, profuse flowering, vigorous growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

6,986

AFRICAN VIOLET PLANT NAMED LITTLE APATITE

Holtkamp, Sr. Reinhold, Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 251,250

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Little Apatite, as described and illustrated, and particularly characterized by its miniature growth habit; single, lilac flowers with darker touch in the center; violet-shaped flowers having elongated petals; strong stems which curve toward the center to form a compact bouquet above the leaves; profuse and continuous flowering; medium green spear to heart-shaped, slightly serrated leaves; flowering 10–11 weeks after planting of unrooted shoot, and by its long lasting and non-dropping flowers.

6,987

CHRYSANTHEMUM PLANT NAMED BORDEAUX

Janet S. Fucas, 9011 Red Hill Rd., New Hartford, N.Y. 13413

Filed Jan. 6, 1988, Ser. No. 141,252

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—76 1 Claim

1. A new and distinct cultivar of chrysanthemum plant named Bordeaux, as illustrated and described, and parts thereof.

6,988

CHRYSANTHEMUM PLANT NAMED TOLIMA

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Sep. 22, 1988, Ser. No. 247,524

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—77 1 Claim

1. A new and distinct chrysanthemum plant named Tolima, as described and illustrated.

6,989

CHRYSANTHEMUM PLANT NAMED DARK RED SIMONA

Camilo Herrera, Bogota, Colombia, assignor to Whitefield Corporation, Panama

Filed Sep. 29, 1988, Ser. No. 250,541
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—82 1 Claim

1. A new and distinct Chrysanthemum plant named Dark Red Simona, as described and illustrated.

6,990

DISTINCT VARIETY OF POINSETTIA NAMED WONDER STAR II

Alexander Hrebeniuk, R.D. #1, Box 118, Sugar Run, Pa. 18846

Filed Apr. 6, 1988, Ser. No. 178,331
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—86 1 Claim

1. A new and distinct variety of poinsettia plant as herein shown and described, particularly characterized by its dark red and fade resistant bracts, dark green foliage, double compact form, long lasting keeping qualities and adaptability for basket presentation, and parts therefor.

PATENTS

GRANTED AUG. 15, 1989

ERRATA

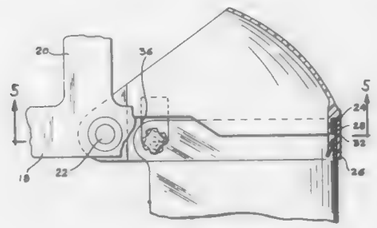
For CLASS	See PATENT NO.
562-820	4,857,238
562-896	4,857,239

PATENTS

GRANTED AUGUST 15, 1989

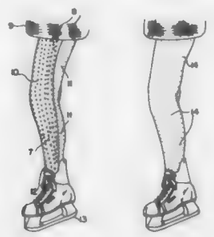
GENERAL AND MECHANICAL

4,856,109
FACE PROTECTIVE DEVICE
Raoul O. Desy, Fiskdale, and James J. Krusas, Sturbridge, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.
Filed Apr. 27, 1988, Ser. No. 187,055
Int. Cl.[4] A61F *9/06*
U.S. Cl. 2—9 14 Claims



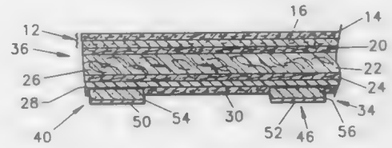
1. A face protective device comprising:
a crown having an arcuate shape for covering the forehead, said crown having a lower peripheral edge;
detent means integrally molded in said peripheral edge;
a faceshield for covering the face, said faceshield having an upper edge;
openings through said faceshield near said upper edge, the number of said openings corresponding to the number of said detent means, said openings being sized to receive said detent means and to effect detachable engagement to said detent means so as to detachably mate said faceshield to said crown.

4,856,110
ATHLETIC PROTECTIVE SAFETY SOCK
Gary Glesick, 18502 Mateney Rd., Germantown, Md. 20874
Filed Jun. 24, 1988, Ser. No. 211,293
Int. Cl.[4] A41D *13/06;* A41B *11/00*
U.S. Cl. 2—22 3 Claims



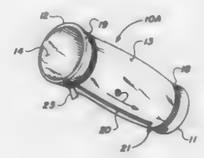
1. Oversock means made from a woven flexible fabric comprising: aramid and metallic yarns, resistant to cutting by skate blades or other sharp edges, for protecting athletes' legs; and wherein said sock includes means to secure the same over the arch of a foot of an athlete and has sufficient length to extend upwardly above the athlete's knee and thigh to provide a soft and very flexible protective covering to inhibit cutting of at least the rear portion of the athlete's leg between the ankle and buttocks area while allowing for complete flexibility of leg motion.

4,856,111
PERSPIRATION SHIELD
Bessie M. Sholes, 1439 76th Ave., Oakland, Calif. 94621
Filed Jul. 6, 1988, Ser. No. 215,816
Int. Cl.[4] A41D *27/13*
U.S. Cl. 2—56 5 Claims



1. A disposable perspiration shield for use with an upper torso garment comprising:
a. a first layer of absorbent tissue;
b. a second layer of absorbent tissue; lying adjacent said first layer;
c. a third layer of absorbent swab material, said third layer possessing a thickness grater than said first layer, and lying adjacent said second layer;
d. a fourth layer of absorbent material; lying adjacent said third layer;
e. a fifth layer of water repellent material, said fifth layer lying adjacent said fourth layer;
f. a sixth layer of sound suppressing material lying adjacent said fifth layer, said first, second, third, fourth, fifth and sixth layers of material being in sandwiched relationship to form a moisture absorbing and sound suppressing unit; and
g. means for adhering said moisture absorbing and sound suppressing unit to the torso garment, said adhering means including an adhesive strip being fastened to the fifth layer of water repellent material, extending through said sixth layer and being capable of being removably fastened to the torso garment.

4,856,112
POWDER CUFF
Michael D. Effle, 2140 W. Thunderbird, Apt. #3126, Phoenix, Ariz. 85023
Filed Jun. 4, 1987, Ser. No. 50,420
Int. Cl.[4] A41D *13/08*
U.S. Cl. 2—59 6 Claims



1. A snow sleeve for preventing snow from penetrating between the glove and garment sleeve being worn by an individual, said snow sleeve comprising
(a) a snow impervious pliable tubular portion of extended length having outer and inner surfaces and upper and lower ends and adapted to cover the glove and coat sleeve of an individual from the wrist of one of
(i) a positioned below the elbow of the arm; and
(ii) a position above the elbow of the arm;

(b) wrist engaging elastic means on said lower end of said tubular portion for drawing said lower end of said tubular portion around said glove;
(c) arm engaging elastic means on said upper end of said tubular portion for drawing said upper end of said tubular portion around said garment sleeve about the individual's arm at one of
(i) a position below the elbow, and
(ii) a position above the elbow, to hold said upper end of said tubular portion in position around said arm;
(d) a longitudinal split spaced apart from said wrist engaging elastic means and intermediate said wrist engaging elastic means and said upper end and opening at and extending from said upper end partially toward said lower end; and,
(e) zipper means including a pull tab for closing said split by moving said tab in a direction of travel away from said wrist toward said elbow, said sleeve being readily manually installed on one arm using only the gloved hand of the outer arm and, when pulled over said glove and arm with said zipper means open, being sized to be fit around said garment sleeve without forcing said sleeve up the arm.

4,856,113
PROTECTIVE GARMENT FOR OPERATION IN CONTAMINATED AREAS

Romano Moscatelli, Rome, Italy, assignor to Sekur S.p.A., Milan, Italy

Filed Apr. 25, 1988, Ser. No. 186,019
Claims priority, application Italy, Apr. 30, 1987, 20317 A/87; Feb. 25, 1988, 19533 A/88
Int. Cl.[4] A41D *10/00*
U.S. Cl. 2—84 **9 Claims**



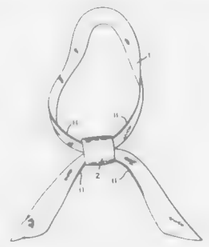
1. A protective garment for operation in contaminated areas, of the type comprising an impermeable suit provided with boots, gloves, hood and facial mask, as well as with at least one slit which can be opened, along the opposite edges of which operate tight closing means, characterized in that it comprises at least one pair of protective skirts secured inside the garment along opposite sides of the slit, the skirts being provided with gripping means to be brought from a rest position, in which they are enclosed within the garment and extend in opposite directions, to a working position in which each skirt is reversed astride the corresponding edge of the slit.

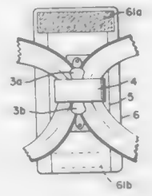
4,856,114
SEAMAN STYLE PRESET NECKTIE

Jiann-Jong Chen, and Ching-Hwa Chen, both of 21, Alley 21, Lane 244, Sec. 5, Yen-Ping North Road, Taipei, Taiwan

Filed Jul. 27, 1988, Ser. No. 224,608
Int. Cl.[4] A41D *25/04, 25/14*
U.S. Cl. 2—149 **2 Claims**

1. A seaman style preset necktie comprising:
a tie body made of a strip of cloth, both ends thereof being provided with zippers of same color along the edges on the same side;
a tie collector, a normally oriented zipper slider being fixed on the upper portion of said collector and another inverted zipper slider being fixed on the lower portion thereof;
a leather fitting plate securely sewn on the outer cover of the tie knot, said fitting plate being securely connected to said collector and said zipper sliders by means of rivets;
an outer cover for the tie knot, the front side of the upper end of said outer cover and the back side of the lower end thereof being each provided with fastening strip means which will be fastened one to the other when said outer





cover is folded; wherein the zippers on said tie body are firstly inserted through said slider provided on the upper portion of said collector to gather the portions of said tie body, then through said inverted slider provided on the lower portion of said collector causing the ends of said tie body to be separated, and then by bending the lower end of said outer cover of the tie knot upwardly and outwardly and folding the upper end of said outer cover of the tie knot downwardly so that said fastening means can be fastened.

4,856,115
NECKTIE WITH ADJUSTABLE CLOSURE

Eddy L. Knapp, 6131 Thorpe Springs Rd., Weatherford, Tex. 76086

Filed Jul. 20, 1988, Ser. No. 222,073
Int. Cl.[4] A41D *25/04*
U.S. Cl. 2—155 **4 Claims**

1. An improved necktie, comprising:
an elongate body having a large width portion adjacent one end and having a small width portion adjacent an opposite end thereof;
a knot located intermediate the ends of the elongate body;
a neck loop extending from the knot, the neck loop being divided to form first and second adjacent ends;
a clasp attached to the first adjacent neck loop end the clasp having an opening therein; and
a flexible strip formed entirely of fabric portions attached to the second adjacent neck loop end, the flexible strip having a fixed end joined to the second neck loop end and a free end adapted to loop through the clasp opening, the free end having a fastening means thereon engageable with mating fastening means provided on the fixed end

when the flexible strip is looped through the clasp opening to secure the neck about the neck of the wearer, the flexi-

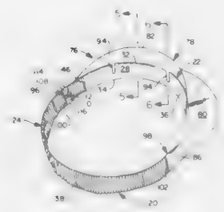


ble strip having an elastic region located between the fixed end and the free end.

4,856,116
SWEATBANDS

Lloyd S. Sullivan, c/o Osoli, Inc., 1516 Second Ave., #300, Seattle, Wash. 98101

Filed Jul. 7, 1988, Ser. No. 216,078
Int. Cl.[4] A42C *5/02;* A42B *1/18*
U.S. Cl. 2—181 **17 Claims**

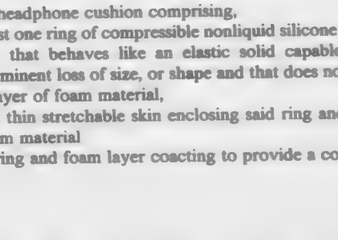


1. A sweatband which has: a first component for absorbing perspiration from the skin of a user and a second, separate component for holding said first component against that part of the user's skin from which perspiration is to be absorbed, said first component being essentially inextensible and having an elongated core fabricated from a porous, predominantly open cell, moisture absorbent, synthetic polymer; a permeable covering overlying the inner side of said core and adapted to be in contact with the user's skin, said covering being fabricated from a chamois material which is soft and pliable and capable of promoting the transfer of moistur from the user's skin to the core of said first component; and a second, permeable covering overlying the outer side of said core, said second covering being made from a porous fabric which is capable of promoting the evaporation of moisture from said core into the ambient surroundings; the second component for holding the first component against the user's skin comprising an elongated, elastically extensible member; one end of said second, elastically extensible member being fixed to one end of said first component; and the other end of said elastically extensible member being fixed to the other end of said first component.

4,856,117
COLLAPSIBLE CAP

Stephen Goldman, and John Richardson, both of Little Rock, Ark., assignors to Bancroft Cap Company, Framingham, Mass.

Continuation-in-part of Ser. No. 96,006, Sep. 14, 1987, Pat. No. 4,790,033. This application Jul. 26, 1988, Ser. No. 224,461
The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.
Int. Cl.[4] A42B *1/00, 1/20*
U.S. Cl. 2—195 **8 Claims**

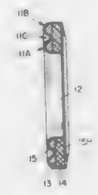


1. A collapsible cap having a peak, frame, grommet, visor and cap cover, said cap comprising:
a means for opening and closing said cap;
a plastic material having a top and bottom portion, the top and bottom portion of said material encapsulates a portion of said means, the bottom portion of said material being connected to said frame and the top portion of said material being connected to a fabric that holds a portion of said grommet so that said cap may be opened when the top portion of said material is pushed up and said cap may be closed when the top portion of said material is pushed down.

4,856,118
HEADPHONE CUSHIONING

Roman Sapiejewski, Boston, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Feb. 11, 1987, Ser. No. 13,339
Int. Cl.[4] A42B *1/06*
U.S. Cl. 2—209 **11 Claims**



1. A headphone cushion comprising,
at least one ring of compressible nonliquid silicone gel material that behaves like an elastic solid capable without perminent loss of size, or shape and that does not flow on a layer of foam material,
and a thin stretchable skin enclosing said ring and layer of foam material
said ring and foam layer coacting to provide a comfortable

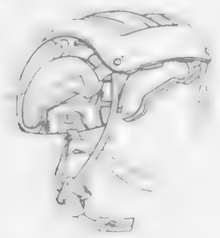
fit for the wearer of said cushion while providing a good acoustic seal.

4,856,119

HELMET WITH THREE-POINT CHIN STRAP

Hermann Häberle, Ulm-Unterweiler, Fed. Rep. of Germany, assignor to Romer GmbH, Neu-Ulm, Fed. Rep. of Germany

Filed Aug. 1, 1988, Ser. No. 226,620
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1987, 8710581[U]
Int. Cl.[4] A42B *1/22, 7/00*
U.S. Cl. 2—417 7 Claims



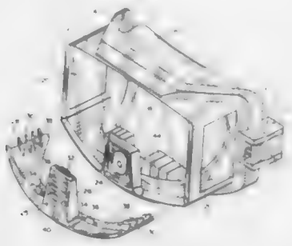
1. A helmet for protecting a head, the helmet comprising:
a hard shell generally symmetrical to a longitudinal plane and having a rear edge normally juxtaposed with the nape of the neck of the wearer and a pair of front temple regions flanking the plane and normally juxtaposed with the temples of the wearer;
a rear center strap having two ends and lying generally on the plane;
means on the helmet at the rear edge thereof and generally on the plane for adjustably securing one end of the center strap to the helmet;
a pair of similar side straps generally symmetrically flanking the plane and each having a rear end fixed to the other end of the center strap and a front end secured to the helmet at the respective temple region;
respective fittings slidable on the side straps between the ends thereof; and
a chin strap extending between the fittings and normally passing under the chin of the wearer.

4,856,120

DIVE MASK

Dennis Hart, Newport Beach, Calif., assignor to Undersea Industries, Inc., Rancho Dominguez, Calif.

Filed Jan. 25, 1988, Ser. No. 147,394
Int. Cl.[4] A61F *9/02*
U.S. Cl. 2—428 6 Claims



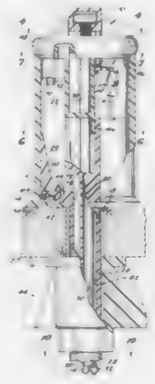
1. An improved dive mask of the type having a frame circumscribing a diver's nose and eyes to define an interior space, a front transparent viewing member and a purge valve for expelling water from within the mask by exhalation of air through the diver's nose; the improvement comprising:
a deflector affixed to said frame in overlapping engagement with said purge valve, said deflector being substantially T-shaped in contour, said T-shaped deflector defining a central leg member forming a purge valve overlapping member having an interior wall adjacent said purge valve for intercepting and downwardly deflecting said expelled water and air, and a transverse elongated member integrally formed with said purge valve overlapping member in one piece formation for providing at least one channel defined by a space formed between an interior surface of said transverse elongated member and an exterior surface of said frame for routing expelled water and air transversely to the side of the mask for precluding interference with the diver's vision through said viewing member.

4,856,121

AIR GAP FAUCET

Paul L. Traylor, 16591 Milliken Ave., Irvine, Calif. 92714

Continuation-in-part of Ser. No. 866,402, May 23, 1986, Pat. No. 4,771,485. This application Jul. 22, 1988, Ser. No. 222,951
Int. Cl.[4] E03C *1/00*
U.S. Cl. 4—191 16 Claims



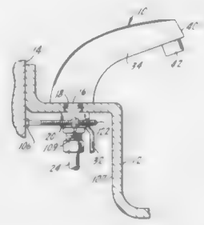
1. In a faucet installation associated with a mounting structure having a faucet opening, and in which the installation includes a faucet connected to a potable water conduit for dispensing potable water on demand, and further connected to waste water inlet and outlet conduits, an improved faucet having an integral air gap between the waste water inlet and outlet conduits and comprising;
a faucet housing which includes an upper seat and a base engaged upon the upper side of the mounting structure, the base having an opening for alignment with the faucet opening;
a valve mechanism coupled to the potable water conduit and operative to dispense potable water;
an upper mount located within the faucet housing and carried by the upper seat, the upper mount mounting fastening means and receiving the valve mechanism, and further receiving the upper extremity of the waste water inlet conduit to define with the waste water conduit the upper portion of the air gap;
a lower mount located within the faucet housing below the upper mount, the lower mount including a waste water collection cup defining the lower portion of the air gap, the cup including a drain outlet, the lower mount further including an elongated, hollow and externally threaded fastener mount extending from the interior of the faucet housing through the central opening, the fastener mount including internal passage means defining a cup drain space and a conduit space, the cup drain space constituting a waste water outlet conduit having an upper terminus in communication with the cup and a lower terminus for coupling to a drain line, the conduit space slidably receiving the potable water and waste water inlet conduits;
threaded means threaded upon the lower extremity of the fastener mount and fixing the faucet housing base in position against the mounting structure.

4,856,122

ANTI-ROTATION DEVICE

Joseph J. Pilolla, Elmhurst, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Mar. 28, 1988, Ser. No. 173,884
Int. Cl.[4] F03C *1/04*
U.S. Cl. 4—192 9 Claims



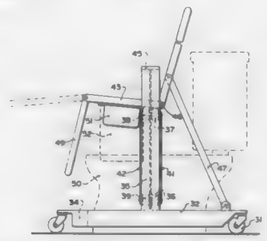
1. In a sink having a faucet mounted on a basin with a faucet shank extending through a port in the basin, the shank including a keyway, the improvement comprising an anti-rotation spacer including:
a generally cylindrical body having a central bore therethrough for mounting the body on the faucet shank on the underside of the basin;
a key on the interior of the body and engageable with the shank's keyway;
a pair of webs attached to opposite sides of the body; and
a pair of arms connected to the webs and adapted to extend to a rigid surface for engagement therewith, the arms being disposed in a plane perpendicular to the shank axis.

4,856,123

TOILET APPARATUS FOR USE BY BED RIDDEN PATIENTS

D. Grant Henderson; Grenville K. Yuill, and David Kroeker, all of Winnipeg, Canada, assignors to Henderson Medical Appliance Company Ltd., Winnipeg, Canada

Filed Sep. 24, 1987, Ser. No. 100,660
Int. Cl.[4] A61G *7/02*
U.S. Cl. 4—480 3 Claims



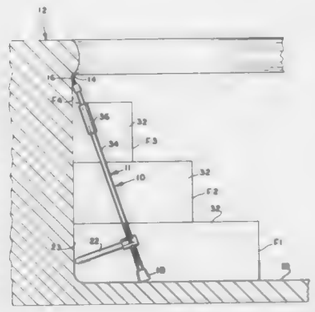
1. A toileting apparatus for use by bed ridden patients comprising a patient support including a seat portion, and a back rest portion, one edge of the back rest portion being pivotally connected to the seat portion at an adjacent edge thereof, frame means mounting said portions such that they can be moved from a first position in which they lie in a substantially flat co-planar relationship for supporting the patient in a lying condition to a second position in which the back rest portion inclined upwardly from the seat portion for supporting the patient in an at least the seat portion for supporting the patient in an at least partially seated condition, said frame means comprising a substantially rectangular base frame having ground wheels thereon for movement across the ground, upstanding support means arranged solely on one side portion of said base frame and means for supporting said patient support in cantilever manner outwardly from said upstanding support means over said base frame so that the patient support can be pushed underneath the patient on top of a bed surface by an operative standing on the side of the base frame remote from the bed, the base frame being of U-shape in plan defining a front portion, two side portions and an open rear face underlying the back rest portion so that the base frame can be moved to a position surrounding a conventional toilet bowl with the seat portion directly overlying the conventional toilet bowl, rolling bearing means mounting said patient support on said upstanding support means for free sliding movement thereon in a vertical direction, a rigid link pivotally connected at one end to a point on the back rest portion spaced outwardly from the seat portion and pivotally connected at the other end to the base frame such that movement of the back portion from said second position to said first position will cause movement of said seat portion upwardly along said upstanding support which causes movement of the patient to occur substantially about the center of gravity of the patient whereby the center of gravity of the patient remains at a substantially constant height as said patient support moves from said first position to said second position and vice versa, means for causing said movement from said first position to said second position consisting solely of manually graspable portions of said seat portion and said back rest portion whereby the patient is raised and lowered by manual lifting force, the seat portion being apertured for use as a toilet seat, and means for supporting a toilet bucket positioned beneath the seat portion for use in the second position of the patient support.

4,856,124

SWIMMING POOL STEP GUARD

Claude L. McJunkin, 12184 111th La. North, Largo, Fla. 34648

Filed Feb. 8, 1988, Ser. No. 153,415
Int. Cl.[4] E04H *3/18*
U.S. Cl. 4—496 1 Claim



1. A swimming pool step guard for use in a pool having a stairwell with a horizontal surface of the pool being adjacent the stairwell and the pool having an abutting downwardly facing inner edge formed thereon overlying a portion of the horizontal surface, said step guard comprising an upper and a lower tubular portion with one of said portions being telescopically received in the other end of said portions, an abutting shoulder means formed on the other of said portions, an abutting pin means adjustably carried by one of said portions, a

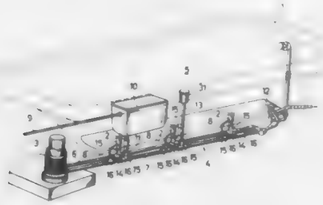
coiled compression spring disposed between said shoulder means and said pin means for biasing said tubular portions axially of each other thereby urging the assembly of said tubular portions to become longer, an abutting member pivotally secured to the upper end of said upper tubular portion and projecting inwardly therefrom for engagement with the downwardly facing inner edge of the pool, an elastomeric cap secured over the lower end of said lower tubular portion for engagement with the horizontal surface of the pool, and a transverse member secured transversely to said lower portion, said transverse member having a tapered outer end for abutting the adjacent side wall of the pool.

4,856,125

CLEANING DEVICE FOR THE PIPING SYSTEM OF A WHIRLPOOL TUB OUTLET VALVE THEREFOR

Okko K. Dijkhuizen, Roden, Netherlands, assignor to Ucosan B.V., Roden, Netherlands

Filed Oct. 19, 1987, Ser. No. 109,617
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—543 **16 Claims**



1. A cleaning system for a piping system of a whirlpool tub, said piping system having a delivery pipe means for delivering a flow of water to at least one outlet disposed in said whirlpool tub, the cleaning system comprising:

a circulation means for circulating a flow of cleaning fluid through said piping system of said whirlpool tub, said circulation means including a pump means for pumping said cleaning fluid through said piping system; and

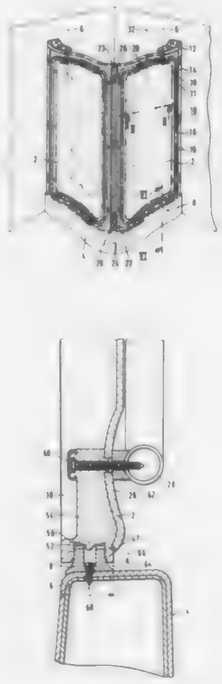
each said outlet having an outlet valve means for closing said outlet upon circulation of said cleaning fluid through said piping system to prevent issuance of said cleaning fluid into said whirlpool tub, said outlet valve means having a valve body and a valve member movably mounted in said valve body between a closed position closing said outlet and an open position opening said outlet, said valve member having an end face at least flush with an end face of said valve body when said valve member is in said closed position to thereby prevent the formation of a recess in said whirlpool tub at said outlet valve means when said outlet is closed by said outlet valve means.

4,856,126

SHOWER PARTITION

Heinz G. Baus, Wartbodenstrasse 35, CH-3626 Huenibach-Thun, Switzerland

Filed Feb. 18, 1988, Ser. No. 156,994
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, URA 209/87; Mar. 11, 1987, 3707795; World Int. Prop. O., Mar. 11, 1987, DM/008309; European Pat. Off., Jan. 26, 1988, 88101049.0
Int. Cl.[4] A47K *3/22*
U.S. Cl. 4—607 **22 Claims**



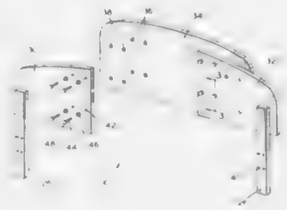
1. A shower partition with a door constructed as a pivotable wing pivotably mounted on a wall by means of hinges with a substantially vertical pivot axis and which serves to open or close an entry opening to a shower compartment, wherein said door has a circumferential recess in its front surface adjacent its outer margins, and a frame is associated with said recess and is spaced from the front surface of the door.

4,856,127

EXPANDABLE HEADBOARD FOR BEDS

Sidney A. Lenger, Kernersville, N.C., assignor to The Pilliod Cabinet Company, Swanton, Ohio

Filed Jun. 27, 1988, Ser. No. 214,197
Int. Cl.[4] A47C *19/04*
U.S. Cl. 5—53 R **3 Claims**



1. An expandable headboard for attachment to a mattress supporting frame including:

a central planar panel having spaced apart side portions;

a first array of fastener receiving means formed in the side portions of said central panel;

a pair of side panels;

a second array of fastener receiving means formed in said side panels for selective alignment with selected ones of said first array of fastener receiving means;

fasteners associated with said first array and said second array of fastener receiving means for attaching said side panels to respective side portions of said central panel; and

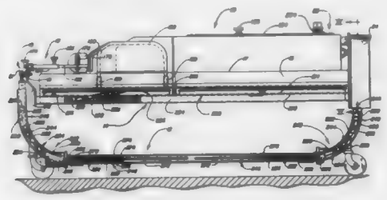
means for respectively attaching said side panels to the mattress supporting frame.

4,856,128

THERAPEUTIC TABLE

Allen W. Alsip; Clayton E. Boesert, both of Aurora, and Richard E. LaVelle, Olympia Fields, all of Ill., assignors to Thomas J. Ring, Harvey, Ill.

Continuation of Ser. No. 724,408, Apr. 17, 1985, abandoned. This application Jan. 27, 1988, Ser. No. 149,124
Int. Cl.[4] H01H *3/42*
U.S. Cl. 5—61 **10 Claims**



1. In a kinetic therapeutic table having a frame, a patient support mounted to the frame for rotary movement relative thereto between selected angular positions and an electric motor for providing power to rotate the patient support, an improved drive control assembly, comprising:

means engagable with the motor through a unidirectional driving gear and connected with the patient support for transmitting the power from the motor to rotate the patient support;

means for moving the motor and the power transmitting means into and out of engagement with one another;

a switch for terminating electrical power to and stopping the rotation of the motor at any position of the patient support, said unidirectional driving gear when engaged to hold the patient support in any position it is in when the motor stops, disengagement of the engageable means and unidirectional driving gear causing release of the hold on the patient support to enable movement thereof to a substantially horizontal position;

actuable means for locking the patient support against movement relative to the frame when it reaches a preselected position, and

means associated with the moving means for actuating the actuable locking means when the power transmitting means and motor are disengaged.

4,856,129

TILTABLE BED FRAME ASSEMBLY

Wilbur T. Butler, 4039 Spyglass Rd., Oklahoma City, Okla. 73120

Continuation-in-part of Ser. No. 899,488, Aug. 22, 1986, Pat. No. 4,715,037. This application Dec. 28, 1987, Ser. No. 139,299
Int. Cl.[4] A61G *7/00*
U.S. Cl. 5—62 **13 Claims**

1. An improved tiltable bed frame assembly comprising:

a main frame comprising:

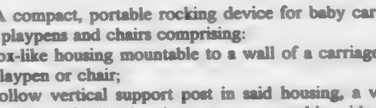
a plurality of elongated members rigidly interconnected to provide a substantially rectangular shaped main frame having opposed, spatially disposed sides; and

a plurality of post members substantially normally disposed relative to the elongated axis of the opposed sides of the main frame, one of the post members being a foot post member positioned near one end of each of the sides of the main frame, one of the post members being a head post member positioned near an opposed end of each of the sides of the main frame, and one post member being a center post member positioned intermediate the foot post and the head post members, the foot post members having a length less than the length of the center post members;

a mattress frame pivotally supported by the center post members such that the mattress frame can be selectively pivoted to an angular position relative to the main frame, the mattress frame comprising:

a plurality of elongated members rigidly interconnected to provide a substantially rectangular shaped mattress frame having opposed, spatially disposed sides; and

a plurality of leg members substantially normally disposed



relative to the elongated axis of the opposed sides of the mattress frame, one of the leg members being positioned near one end of each side of the mattress frame so as to be aligned with one of the foot post members of the main frame, one of the leg members being positioned near an opposed end of each side of the mattress frame so as to be aligned with one of the head post members of the main frame; and

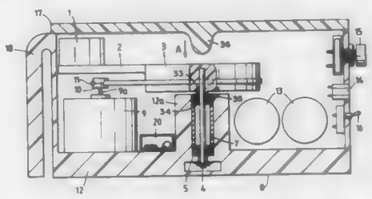
linkage means for connecting the leg members supported by sides of the mattress frame to the foot post members and the head post members supported by the sides of the main frame such that leg members of the mattress frame can be telescopically moved relative to the foot and head post members of the main frame during pivotal movements of the mattress frame relative to the main frame.

4,856,130

DEVICE FOR ROCKING A BABY CARRIAGE

Shlomo Berkovich, Tor Hazahav St. 10/22, Herzlia, Israel

Continuation of Ser. No. 63,829, Jun. 19, 1987, abandoned. This application Dec. 23, 1988, Ser. No. 288,941
Claims priority, application Israel, Jun. 20, 1986, 75591
Int. Cl.[4] A47D *9/02*; B62B *9/22*
U.S. Cl. 5—109 **7 Claims**



1. A compact, portable rocking device for baby carriages, cribs, playpens and chairs comprising:

a box-like housing mountable to a wall of a carriage, crib, playpen or chair;

a hollow vertical support post in said housing, a vertical shaft, low friction bearing means mounted in said support post and rotatably receiving said shaft, said bearing means comprising a fixed outer bearing race and a rotatable inner race with low friction bearings therebetween, a circular, horizontally disposed plate overlying, affixed to and axially receiving said shaft, an axial sleeve integral with said plate and depending therefrom in encircling relation about said shaft, said sleeve seating solely on said inner race and

maintaining said plate in vertically spaced relation above said bearing means and said support post;
a weight disposed on said plate and eccentric relative to said shaft;
a miniature 6 volt DC motor drawing up to 200 milliamp of current mounted in said housing, and low friction belt transmission means coupling said motor to said plate for rotation thereof;
a switch for actuating and stopping the motor; and
electronic means for automatically activating said switch.

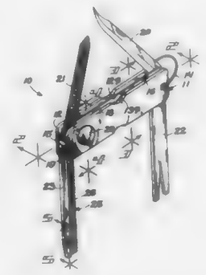
4,856,131
CONVERTIBLE DOLL AND SLEEPING BAG
Carol B. Mills, 6830 Trexler Rd., Lanham, Md. 20706
Division of Ser. No. 65,111, Jun. 23, 1987, Pat. No. 4,739,529, which is a continuation of Ser. No. 601,395, Apr. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 493,191, May 10, 1983, Pat. No. 4,458,372. This application Apr. 22, 1988, Ser. No. 184,686
The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.
Int. Cl.[4] A47C *23/00*; A63H *3/02*
U.S. Cl. 5—413 **4 Claims**



1. A three-dimensional doll which is convertible to a bedding apparatus comprising a head portion and a body portion, first and second arm and leg means attached to said body portion, a first pocket means defined within said head portion, said head portion having a facial panel having a first image bearing surface disposed outwardly of the doll, a second image bearing surface oriented into said first pocket means, said body portion of said doll having a fixed panel member and at least one movable panel member, fastening means for selectively securing said movable panel member in a generally closed opposing relationship with said fixed panel member to form a second pocket means therebetween, a cover means, a first portion of said cover means being retained within said first pocket means and a second portion of said cover means being retained within said second pocket means, said first and second portions of said cover means being selectively removed from said body portion of the doll when said movable panel member is opened with respect to said fixed panel member, said second portion of said cover means may be unfolded with respect to said body portion of the doll and said head portion may be turned inside out thereby removing said first portion of said cover means therefrom.

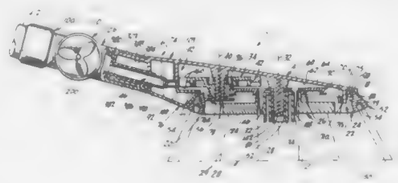
4,856,132
UTILITY GOLF TOOL
Walter T. Burns, and Nancy H. Burns, both of 1142 E. Main St., Meriden, Conn. 06450
Filed Jul. 5, 1988, Ser. No. 215,274
Int. Cl.[4] B25F *1/04*
U.S. Cl. 7—118 **1 Claim**

1. A golf utility tool comprising,
a case including a first plate in a spaced parallel aligned orientation to a second plate,
a rib means integrally formed to interior facing surfaces of said first and second plates to define an upper compartment and a lower compartment, and
said upper compartment including a first blade means and said lower compartment including a second blade means, and
said second blade means including a bifurcated turf repair tool and a further blade defining a brush, said brush provided with a matrix of bristles of varying lengths for cleaning golf equipment, and
wherein said bristles of varying lengths are of alternating lengths defining long bristles and short bristles, and
wherein said bristles are formed with spherical tips to minimize abrasion of golf equipment during a cleaning procedure, and



wherein said second plate is formed with a recess to receive a magnetic ball marker wherein said magnetic ball marker is positioned within said recess in a first position and removable from said recess in a second position for use in marking a golf ball on a golf course, and
wherein said first and second blade means are provided with biasing means to bias said blades in a closed or open orientation relative to said case, and
wherein said first and second plates are formed with aligned recesses medially of the edges of said first and second plates for enhanced securement by a user.

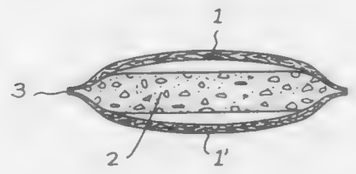
4,856,133
LOW PROFILE GEAR DRIVEN ROTARY SCRUB BRUSH
George Sanchez, Chatsworth, Calif., assignor to Clyde Industries Limited, New South Wales, Australia
Filed Aug. 21, 1986, Ser. No. 899,336
Int. Cl.[4] A46B *13/06*
U.S. Cl. 15—29 **22 Claims**



1. A fluid driven assembly for a rotary brush, the assembly comprising:
a housing comprising a top side elongated between an end and an opposite end of the housing, the end of the housing comprising a fluid receiving inlet, a bottom side facing substantially opposite from the top side, a cavity in the housing and an opening through the bottom side to the cavity, the housing converging in cross section between the top side and bottom side, moving towards the opposite end relative to the inlet end, the housing comprises an upper housing portion comprising a mounting portion extending at least partially around the opening;

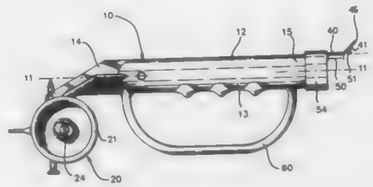
a fixed brush mounted on the mounting portion and having an opening therein and extending substantially around the opening in the housing;
the housing containing, substantially in the cavity
a rotary brush mounting adaptor for removably mounting a rotary brush facing out of the opening in the fixed brush base and adaptor gear teeth affixed to the adaptor, both the rotary brush mounting adaptor and the adaptor gear teeth being mounted for rotation about a common first axis extending out of the opening;
a waterwheel and waterwheel gear teeth affixed to the waterwheel, both mounted for rotation about a second common axis, displaced towards the inlet end from the first axis, the waterwheel gear teeth being in driving engagement with the adaptor gear teeth and the waterwheel comprising water vanes axially displaced towards the top side from the waterwheel gear teeth and the adaptor gear teeth;
a nozzle for dispensing against the water vanes, at a position displaced toward the inlet end from the second axis, fluid received from the inlet end;
the upper housing portion comprising a substantially circular portion adjacent the opposite end and wherein the housing comprises a lower housing portion attached to the upper housing portion on the opposite side from the top side, the upper housing portion and the lower housing portion comprising a throat portion extending from the substantially circular portion and containing therein the nozzle and the fluid inlet; and
a shroud defining, with the top wall, a waterwheel cavity which opens into the cavity, the waterwheel being at least partially positioned in the waterwheel cavity such that the vanes receive fluid from the nozzle in the water wheel cavity.

4,856,134
ABRASIVE PAD, WHICH CAN SUBSTITUTE FOR A STEEL WOOL PAD, AND/OR SCOURING PAD AND PROCESS FOR PRODUCING SAME
Jean-Luc Wertz, Beauvais, and Jacques Bandousel, Oue-en-Bray, both of France, assignors to Societe Anonyme: SPONTEX, Paris Cedex, France
Filed Feb. 24, 1988, Ser. No. 159,707
Claims priority, application France, Jan. 27, 1988, 88 00947
Int. Cl.[4] A47L *17/08*
U.S. Cl. 15—104.93 **15 Claims**



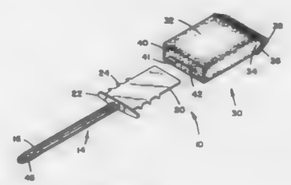
1. A pad adapted for abrasive, scouring or both uses comprising a block of foam material, and two nonwoven webs sandwiching said block therebetween, said foam material being a polyurethane foam, said nonwoven webs each comprising a mixture of polyamide and polyester fibers, said polyamide fibers having physical properties similar to those of said polyurethane foam; and a thermally welded joint bonding said nonwoven webs and said foam block together at the periphery thereof.

4,856,135
MASONRY TOOL
Jon K. Stewart, Reno, Nev., assignor to AusTek, Inc., Reno, Nev.
Filed Mar. 7, 1988, Ser. No. 164,978
Int. Cl.[4] E04F *21/165*
U.S. Cl. 15—105.5 **11 Claims**



1. A masonry tool for taking unhardened mortar at a predetermined depth between courses of brick, said tool comprising:
an elongated handle having a longitudinal axis, an upper side, an opposing lower side, a forward end and a terminal end;
a rake and carriage assembly attached to the forward end of the tool and projecting downward in orientation with respect to the lower side of the handle, said assembly including (i) a pair of wheels oriented for movement along a line substantially parallel with the longitudinal axis and (ii) means for supporting a first raking device at a predetermined depth beyond a base rim of the wheels such that a terminal portion of the raking device may project into a joint separating adjacent bricks as the wheels roll across an exposed face thereof to enable the terminal portion to drag loose mortar from the joint at the predetermined depth;
a cap member rotatably attached to the terminal end of said handle such that the cap can be rotated about the longitudinal axis; and
a second raking device attached to the rotatable cap on the handle to thereby enable a user to rake joints at narrow corners and other confined spaces which are too small for the carriage assembly to access.

4,856,136
FLOCKED FOAM BRUSH
Robert I. Janssen, St. Paul, Minn., assignor to Padco, Inc., Minneapolis, Minn.
Filed May 6, 1988, Ser. No. 190,717
Int. Cl.[4] A46B *15/00*, *5/02*; B05C *17/10*
U.S. Cl. 15—244.3 **16 Claims**



1. A paint brush comprising:
(a) a handle member with a gripping section and a head mounting section, and,
(b) a head member formed of a removable and replaceable foam material, said head member being substantially rectangular in shape with a wedge-shaped forward tip portion, and said head member having fibers attached perpendicularly thereto; and,
(c) said fibers surround at least a portion of said head member and extend up at least a portion of opposite sides

thereof with a portion of material of said head member disposed between said opposing sides defining a chamber of said head member disposed between opposing fiber bristles.

4,856,137

WINDSCREEN WIPER ARM OF IMPROVED TYPE

Attilio D. Palù, Rivoli, Italy, assignor to Fister S.p.A, Turin, Italy

Filed Mar. 20, 1987, Ser. No. 28,255
Claims priority, application Italy, Apr. 2, 1986, 53218/86[U]
Int. Cl.[4] B60S *1/34*; E05D *7/10*
U.S. Cl. 15—250.31 5 Claims



1. An improved windscreen wiper arm adapted to carry a wiper blade thereon and adapted for attachment to a drive shaft (3) of a wiper motor, comprising:

a U-shaped, plastic material arm element (4) adapted to support said wiper blade and comprising two side walls (32);

a block (2) fixable for rotation with said drive shaft (3), said block (2) including a first portion (13) having a notch (16) formed therein; and

articulated means for attaching and supporting said element (4) on said block (2) including a fixed pin (36) located close to one end of said element (4), said pin (36) being integrally formed with and connecting said side walls (32);

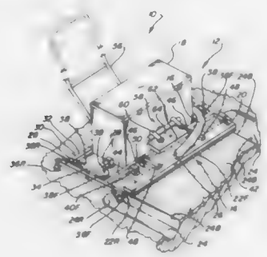
wherein said fixed pin (36) has at least one flat side (41) extending longitudinally of the pin and is dimensioned to permit removeable engagement of said pin (36) in said notch (16) upon rotation of said element (4) about a longitudinal axis of said pin (36), thereby allowing removeable securement of said element (4) and said wiper blade to said block (2).

4,856,138

BOWLING LANE VACUUM WITH FLOATING HEAD

Donald E. Ingermann; Stephen F. Caffrey; Alan R. DeVoe, all of Arvada; Ronald L. Smith, Boulder, and Ronald G. Sullivan, Arvada, all of Colo., assignors to Century International Corporation, Golden, Colo.

Filed Nov. 21, 1988, Ser. No. 274,448
Int. Cl.[4] A47L *5/28*
U.S. Cl. 15—320 3 Claims



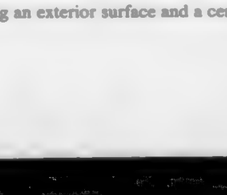
1. In an apparatus for applying a solvent to a bowling lane and wet-vacuuming the solvent-laden residues therefrom that includes a carriage having front and rear transversely-spaced pairs of carriage-support wheels located fore and aft thereof which are positioned and adapted to roll down the ramps leading into the gutters alongside the lane a pair at a time sequentially, a power unit mounted atop the carriage containing both solvent-dispensing means for placing solvent onto the lane to be cleaned as well as vacuuming means for sucking up and storing the wet residues left on the lane surface, and a pickup head operatively connected to the vacuuming means and movable with the carriage for squeegeeing the lane surface free of all liquid and solid residues, the improvement which comprises: pivotally attaching the pickup head to the carriage for hinged movement about a transverse axis spaced behind the latter a distance selected to permit said head to yield and raise up without damaging the lane surface while remaining in continuous side-to-side wiping contact therewith as the carriage-support wheels enter the gutters causing the carriage and power unit supported thereon to tip forwardly.

4,856,139

VACUUM CLEANER UPPER HOSE ASSEMBLY

James A. Matthews, and Louis A. Rotola, Jr., both of Anderson, S.C., assignors to Ryobi Motor Products Corp., Pickens, S.C.

Filed Feb. 1, 1989, Ser. No. 304,466
Int. Cl.[4] A47L *9/14*
U.S. Cl. 15—350 8 Claims



1. In a vacuum cleaner having a cleaner head portion with a rigid fan discharge tube stub and a dirt collecting portion with an internally threaded intake duct, an assembly for providing fluid communication between said discharge tube stub and said intake duct comprising:

an elongated flexible hose having a first end and a second end, said hose being formed with an external spiral rib extending from said first end a sufficient distance and of appropriate pitch to act as an external thread for matingly engaging said first end of said hose with said intake duct, said hose being further formed as an undulating bellows from the end of said spiral rib to said hose second end;

a connector mounted on said hose second end, said connector being formed of a plastic material and having a hollow cylindrical stub portion sized to fit within said hose second end and an external circumferential rib on said stub portion for engaging a bellows undulation so as to secure said stub portion within said hose; and

latching means for removably securing said connector to said cleaner head portion so that said fan discharge tube stub is in fluid communication with said connector stub portion.

4,856,140

SANITARY HANDLE COVER

Frank Visco, and Alfiero Balzano, both of 11782 Western Ave., #4, Stanton, Calif. 90680

Filed Jun. 9, 1988, Ser. No. 204,369
Int. Cl.[4] E05B *1/04*
U.S. Cl. 16—114 R 1 Claim

1. A sanitary cover in combination with a knob or handle comprising:

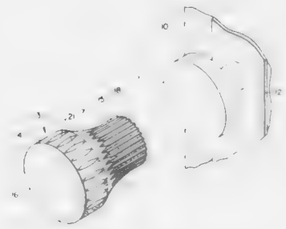
a knob having an exterior surface and a central longitudinal axis;

a cylindrical sheet of material having a closed end and an open end defining an internal pocket for insertably receiving said knob via said open end;

a neck portion immediately adjacent to said open end having a diameter adapted to be circumferentially reduced to gather behind said knob so as to be retained in position;

slot means extending coaxially in parallel with said central axis of said knob provided on said sheet of material for permitting limited engagement of a user's fingers with the knob for manipulation thereof;

said sheet of material impregnated with a disinfectant substance in contact with said knob or handle;



said sheet of material is configured to be substantially up-like in shape, having a circular disc bottom with an integral and carried about the periphery thereof and said neck portion outwardly extending therefrom to define said open end;

constriction means disposed on said neck portion for reducing said diameter thereof comprising a plurality of parallel convolutions integrally formed in said sheet of material collapsible to effect diameter reduction; and

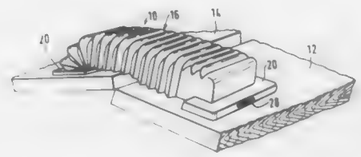
said slotted engagement means having a plurality of parallel elongated slots carried in said integral band exposing a limited portion of said knob exterior surface.

4,856,141

CABINET HINGE WITH COVER IN THE FORM OF AN ELONGATED BELLOWS

Gero Sassenberg, High Point, N.C., assignor to Karl Lautenschläger GmbH & Co. KG, Fed. Rep. of Germany

Filed May 10, 1988, Ser. No. 192,304
Claims priority, application Fed. Rep. of Germany, May 15, 1987, 8707024[U]
Int. Cl.[4] E05D *11/00*
U.S. Cl. 16—250 13 Claims



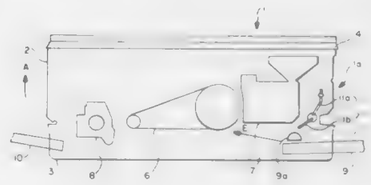
1. In combination: a cabinet hinge comprising a carcase-related hinge part having a flange adjustably fastened on an inside surface of a carcase wall of a cabinet, a door-related hinge part having a flange fastened to an inside surface of a door, a linkage coupling said two parts so as to pivot about a pivot axis, and a cover comprising: an elongated bellows of elastic material, open on one side and overreaching portions of the hinge projecting above the inside surfaces, the bellows having at each of two opposite ends thereof a fastening flange projecting laterally and terminally from the bellows, the bellows having a substantially U-shaped cross section, marginal edges of the bellows formed by free ends of limbs of the U-shaped cross section being shaped such that they lie substantially on the inside surfaces in an open position of the hinge, and means for respectively joining the fastening flange to the flange on the carcase-related hinge part, and to the flange on the door-related hinge part, said joining means including holding elements respectively overreaching the associated fastening flanges of the bellows and of the carcase-related part, and of the door-related hinge part, and snapped to associated holding means provided on opposite boundary sides of the associated fastening flanges, the bellows being stretchable as said hinge parts move apart from each other upon opening of the hinge and, at least in the area of the linkage, being bendable about the pivot axis.

4,856,142

HINGE STRUCTURE WITH TORSION BARS

Takahiro Fukunaga, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 193,154, May 5, 1988, abandoned, which is a continuation of Ser. No. 927,854, Nov. 6, 1986, abandoned. This application Feb. 7, 1989, Ser. No. 309,902
Claims priority, application Japan, Nov. 13, 1985, 60-176552[U]; Nov. 13, 1985, 60-176553[U]; Nov. 13, 1985, 60-176554[U]; Nov. 13, 1985, 60-176555[U]
Int. Cl.[4] E05F *1/12*
U.S. Cl. 16—298 2 Claims





1. In a hinged structure for a housing, said housing having an upper unit and a lower unit which are connected to each other such that said upper unit can be rotationally opened and closed with respect to said lower unit around an axis at an edge of said upper unit, a torsion bar means applying a biasing force to said upper unit in the direction of opening said upper unit, the improvement wherein said torsion bar means comprises two elongated elastic members each twisting by an angle, said hinge structure including attachment pieces adapted to be attached individually to said upper and lower units and stopping pieces for attaching said elongated elastic members individually to said attachment pieces, one of said units having contact pieces which are so formed that, if said hinge structure is attached to the other of said units and said units are thereafter assembled together, said contact pieces come onto contact individually with and push end parts of said elongated elastic

members to thereby increase said angles and increase the elastic force of said torsion bar means.

4,856,143

APPARATUS FOR SKINNING POULTRY CARCASSES

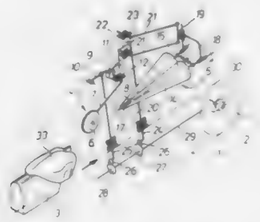
Hans Callsen, Bad Schwartau, and Peter Munss, Lübeck, both of Fed. Rep. of Germany, assignors to Nordischer Maschinenbau Rud. Baader GmbH + CO KG, Labeck, Fed. Rep. of Germany

Filed Oct. 21, 1988, Ser. No. 260,790

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1987, 3736401

Int. Cl.[4] A22C *21/00*; A22B *5/16*

U.S. Cl. 17—11 **18 Claims**



1. An apparatus for processing poultry having lower and upper extremities, a breast including a breastbone and a back, both covered by skin, as well as a backbone, by skinning one of poultry carcasses (bodies), parts thereof and particularly breast portions obtained by a cross- cut extending transversally through the poultry backbone between the lower and upper extremities, in which breast portions the upper extremities have also been removed, the apparatus comprising a skinning tool including a pair of toothed rollers with meshing toothed webs and driven to rotate in opposite directions about a roller axis, wherein said toothed rollers have a conical shape.

4,856,144

METHOD AND AN APPARATUS FOR TRANSPORTING SLAUGHTER ANIMALS DURING SLAUGHTERING, PACKAGING OR OTHERWISE PROCESSING SAID ANIMALS, IN PARTICULAR POULTRY

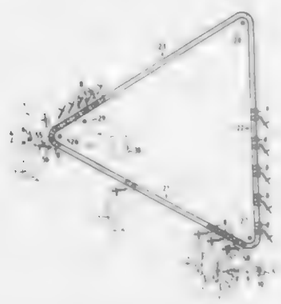
Willem M. de Greuf, Lunteren, Netherlands, assignor to Terpa Poultry B.V., Amstelveen, Netherlands

Filed Nov. 16, 1987, Ser. No. 121,313

Claims priority, application Netherlands, Nov. 17, 1986, 8602913

Int. Cl.[4] A22B *5/00*

U.S. Cl. 17—24 **20 Claims**



1. A conveyor for slaughter animals comprising a rail guide, suspension carriages for the slaughter animals movable along the rail guide, drive means for displacing the carriages along the rail guide and wherein the carriages are out of engagement with the drive means along at least one rail guide portion where the conveyor serves as a buffer conveyor and wherein the buffer conveyor is a closed, triangular conveyor.

4,856,145

APPARATUS FOR MECHANICALLY PROCESSING FISH OF THE TRACHURUS SPECIES

Günter Behnk, Reinfeld, and Dieter Nüske, Stockelsdorf, both of Fed. Rep. of Germany, assignors to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG, Labeck, Fed. Rep. of Germany

Division of Ser. No. 175,750, Mar. 31, 1988, Pat. No. 4,811,461. This application Jan. 4, 1989, Ser. No. 293,335

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710851

Int. Cl.[4] A22C *25/16*

U.S. Cl. 17—57 **8 Claims**



1. An apparatus for mechanically processing decapitated fish, which fish have a head end and a tail end defining a swimming direction of said fish, an abdominal cavity extending from said head and towards said tail end ending in an anal region, said fish having been decapitated, abdominally opened and gutted, the apparatus comprising:

a. a guideway;

b. conveyor means for conveying said decapitated fish in said swimming direction along said guideway;

c. a tool for opening said abdominal cavity, including two circular knives arranged symmetrically with respect to said guideway, defining cutting edges with an active part with regard to said fish and forming a gap between them;

d. a guide member fixedly arranged between said two circular knives in an area downstream of said active part of said cutting edges;

e. said guide member substantially filling a lateral dimension of said gap;

f. said guide member including an upper edge forming at least a part of said guideway;

g. said guide member including a leading edge directed counter to said fish conveying direction in the region of the culmination point of said cutting edges;

h. said leading edge being sharp.

4,856,146

COMOSITES OF STRETCH BROKEN ALIGNED FIBERS OF CARBON AND GLASS REINFORCED RESIN

Thomas E. Armiger, Newark; David H. Edison, Hockessin; Herbert G. Lauterbach, Wilmington, all of Del.; James R. Layton, Kinston, N.C., and Richard K. Okine, Wilmington, Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 942,441, Dec. 16, 1986, Pat. No. 4,759,985. This application Jun. 10, 1988, Ser. No. 205,183

Int. Cl.[4] D01G *1/08*; D02G *3/00*

U.S. Cl. 19—0.35 **1 Claim**

1. In a process for preparing a sliver of stretch broken fibers that includes the steps of feeding a yarn or tow of continuous filaments into a tensioning zone, and tensioning said filaments to their breaking tension causing them to break, the improvement comprising: feeding a yarn or tow of carbon fibers into said tensioning zone and applying a finish comprising polyethylene glycol monolaurate and lauric amide prior to breaking the tensioned filaments.



4,856,147

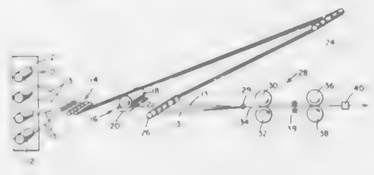
COMPOSITES OF STRETCH BROKEN ALIGNED FIBERS OF CARBON AND GLASS REINFORCED RESIN

Thomas E. Armiger, Newark; David H. Edison, Hockessin; Herbert G. Lauterbach, Wilmington, all of Del.; James R. Layton, Kinston, N.C., and Richard K. Okine, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 942,441, Dec. 16, 1986, Pat. No. 4,759,985. This application Jun. 10, 1988, Ser. No. 205,181

Int. Cl.[4] D01G *1/08*; D02G *3/00*

U.S. Cl. 19—0.35 **1 Claim**



1. In a process for preparing a sliver of stretch broken fibers that includes the steps of feeding a yarn or tow of continuous filaments into a tensioning zone, tensioning said filaments to their breaking tension causing them to randomly break, the improvement comprising: feeding a yarn or tow of glass fibers into said tensioning zone and applying a finish comprising a mixture of one part of the diethanol amine salt of C8-C12 phosphate ester and two parts of polyethylene glycol monolaurate and a lauric amide prior to breaking the tensioned filaments.

4,856,148

DIFFERENTIAL GINNING PROCESS AND APPARATUS

Eugene P. Columbus, Leland, Miss., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 140,470, Jan. 4, 1988, Pat. No. 4,835,818. This application Mar. 8, 1989, Ser. No. 320,638

Int. Cl.[4] D01B *1/08*

U.S. Cl. 19—55 R **10 Claims**

1. A process of ginning comprising,

providing a saw gang including at least two saw sections, each said saw section including at least one saw blade,

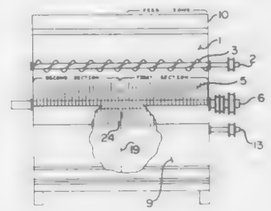
providing means defining a lint chamber adjacent said saw gang,

conveying material to be ginned successively to each said section,

ginning said material successively in each said section to separate lint from said material,

removing lint from each said section and transporting said lint through said lint chamber, and

keeping substantially separate lint removed from each said section by providing separating means partitioning said



lint chamber and extending between said at least two saw sections.

4,856,149

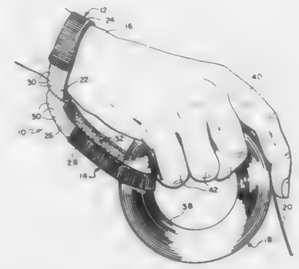
TAPE LEASH

William D. Brame, P.O. Box 107, Bellflower, Calif. 90706

Filed Mar. 15, 1988, Ser. No. 168,159

Int. Cl.[4] A44B *21/00*

U.S. Cl. 24—3 A **10 Claims**



1. A device for use in manually applying tape from a roll of tape comprising a leash formed of a first pair of strap sections both having free ends which bear contact sensitive mating releasable fastening means, and said free ends are releasably securable to each other to form a first loop with said free ends of said first pair of strap sections disposed to extend in directions opposite to each other and in juxtaposed overlapping relationship for encircling the wrist of a user and a second pair of strap sections both having free ends which bear contact sensitive mating releasable fastening means, and said free ends of said second pair of strap sections are releasably securable to each other to form a second loop with said free ends of said second pair of strap sections disposed to extend in directions opposite to each other and in juxtaposed overlapping relationship for capturing said roll of tape, and said first and second pairs of strap sections are permanently secured to each other.

4,856,150

CONTAINER COUPLER

John A. Johnson, 9 Sheridan Dr., Short Hills, N.J. 07078

Filed May 24, 1988, Ser. No. 198,177

Int. Cl.[4] F16B *7/00*

U.S. Cl. 24—287 **13 Claims**

1. A portable coupler device adaptable for detachable engagement with a pair of opposed standard corner fittings of two adjacent freight container or shelter units so that the two said units are joined end-to-end into one integral unit when each of a plurality of such couplers individually join a respective corner fitting of a first said unit to an opposed adjacent

corear fitting of a second said unit, the coupler device comprising:

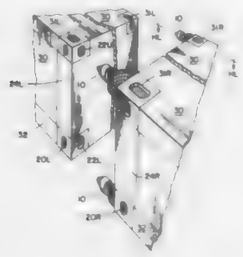
(a) a unitary tension spindle member formed with a nose section at each of its ends, each said nose section of a size and shape to fit through an opening and into the interior of said standard container corner fitting, and arranged to latch onto a wall of said standard continer corner fitting such that each of said pair of container corner fittings is engaged and latched together by said spindle member;

(b) a pair of bearing rings each fitted about said spindle member, with each bearing ring formed with a bearing face arranged to bear against a respective external face of one of said pair of opposed container corner fittings to hich said spindle member is engaged;

(c) torque means mounted about said spindle member, said torque means adaptable to apply a compression force between said bearng rings and therethrough to said engaged corner fittings of said units and simultaneously produce a tension force in said spindle member that is latched into said opposed corner fittings, said compression and tension frces serving to structurally unite said joined corner fittings;

(d) a pair of latch members slidably mounted with relation to said spindle member along the longitudinal axis of said spindle member, wherein each said bearing ring is fixed to one of said pair of latch members; and

(e) means for preventing rotational movement of each said latch member about said spindle member, said means for



preventing serving to prevent rotational movement of each of said bearing rings with respect to said spindle and each other such that upon the application of torque to said torque means to furnish compression force between said bearing rings, said bearing rings do not rotate with repect to each other and do not rotate with respect to surfaces of said adjacent container corner fittings to which said bearing rings are engaged in compression, wherein

at least one said nose section has a cross-sectional size and shape adaptable for freely fitting within said opening of said container corner fittings, with said nose section joined to a mid-section of said spindle member by a neck section of reduced cross-sectional size relative to said nose section and relative to said mid-section of said pindle member, said neck section being of greater length along a longitudinal axis of said spindle than the thickness of a container corner fitting wall that borders said opening of said container corner fitting, sid neck section together with said nose section and said midsection of said spindle bounding an open slot section of said spindle located such that the periphery of said slot section encloses a section of the wall of a container corner fitting opening so as to engage a section of said container corner fitting opening wall when said spindle is engaged in said corner fitting opening and a latch member has been slid along the longitudinal axis into the same corner fitting opening and has forced the neck section of said spindle member to move along a lateral direction perpendicular to said spindle logitudinal axis such that said neck section and said latch member cooperate to maintain a latched engagement of said spindle member to a respective container corner fitting in which it is engaged.

4,856,151

BOARD SPACER

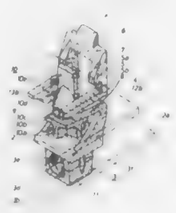
Nobuaki Fujimoto, Okazaki, Japan, assignor to Kitagawa Industries Company, Ltd., Nagoya, Japan

Filed Nov. 7, 1988, Ser. No. 268,277

Claims priority, application Japan, Nov. 24, 1987, 62-178458[U]

Int. Cl.⁴ F16B *21/08, 5/06;* H05K *7/12*

U.S. Cl. 24—453 **5 Claims**



1. A board spacer for spacing a lower board and an upper board a fixed distance apart, comprising:

a base;

an anchor under the base for securing the lower board;

at least one strut on the upper surface of the base;

a spring bar on the upper end of the strut;

a latch on the spring bar for engaging with and securing the upper board;

a handle on the latch for manipulating the latch;

a sloped face on the latch;

a tip on the spring bar opposite the latch for facilitating removal of the upper board;

a peg at one side of the base; and

a notch at the side of the base opposite the peg for coupling with the peg of another such board spacer so such spacers can be used to stack several spaced boards.

4,856,152

APPARATUS FOR NEEDLING A NONWOVEN WEB

Ludwig Kis, Goldwörth, Fed. Rep. of Germany, assignor to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft, Linz, Austria

Filed Jul. 8, 1988, Ser. No. 216,313

Claims priority, application Austria, Jul. 23, 1987, 1861/87

Int. Cl.⁴ D04H *18/00*

U.S. Cl. 28—114 **6 Claims**

1. In an apparatus for needling a nonwoven web, comprising

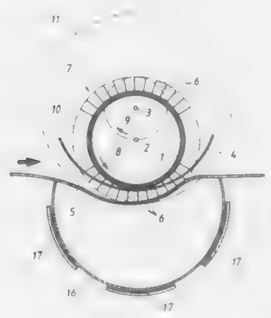
web-guiding means comprising a bedplate and a stripper, which defines with said bedplate a gap in which said web is adapted to travel, said bedplate and said stripper being provided with a multiplicity of holes, and

a needle carrier, which carries needles and is adapted to be driven to move said needles through said holes into and out of said gap,

the improvement comprising that

said needle carrier consists of a needle roller and is adapted to be driven to rotate about the axis of said roller in a first sense and to revolve in an opposite, second sense about an axis of revolution, which is parallel to the axis of said roller so that a rolling circle rolling in a stationary circle

is generated and each of said needles describes a hypocycloidal path, and



said stripper consists of at least a segment of a cylinder which is centered on said axis of revolution.

4,856,153

SPINDLE MECHANISM

Nagle V. Gusching, Sidney, Ohio, assignor to The Monarch Machine Tool Company, Sidney, Ohio

Filed Oct. 26, 1988, Ser. No. 263,041

Int. Cl.⁴ B23C *5/26*

U.S. Cl. 29—26 A **11 Claims**



1. A combined rotative tool and nonrotative tool spindle mechanism, comprising, in combination:

a support;

a first spindle in said support;

a combined thrust and radial bearing in said support at least partially journaling said spindle;

said spindle adapted to receive either a rotative or nonrotative tool;

motor means connectable to drive said spindle in rotation;

a first dog clutch acting on said support;

a second complementary dog clutch cooperable with said first dog clutch and acting on said rotatable spindle;

first means to relatively move together said first and second dog clutches and to unload said bearing for locking said spindle against rotation, whereby a rotating workpiece may be machined with a nonrotative tool in said spindle; and

second means to relatively move apart said first and second dog clutches and to engage said bearing for rotation of said spindle by said motor means, whereby a workpiece may be machined with a rotative tool in said spindle.

4,856,154

METHOD AND DEVICE IN AN ADJUSTABLE CROWN ROLL

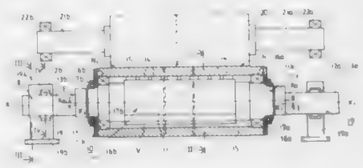
Osmo Nikulainen, Muurame, and Vesa Kainu, Jyväskyl-/e,uml/a/ , both of Finland, assignors to Valmet Oy, Finland

Filed Nov. 23, 1987, Ser. No. 124,256

Claims priority, application Finland, Nov. 21, 1986, 864759

Int. Cl.⁴ B21B *31/24*

U.S. Cl. 29—113.1 **24 Claims**



1. Method of opening a nip formed between a variable crown roll and a counter roll, the variable crown roll having a central axle supported by axle journals thereof and a substantially cylindrical mantle rotatably mounted with respect to said axle, comprising the steps of

pivotally mounting said axle so that an axis of pivoting thereof is offset from an axis of rotation of said mantle and substantially parallel thereto when the nip is closed, and

pivoting said axle about the pivoting axis thereof from a position in which the nip is closed and can be loaded,

whereby the mantle is shifted away from the counter roll by the pivoting of the axle, to open the nip.

4,856,155

METHOD AND DEVICE IN AN ADJUSTABLE-CROWN ROLL

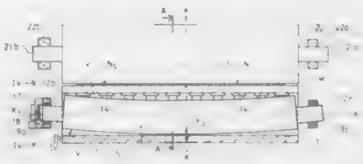
Juhani Niskanen, Oulunsalo, and Martti Pullinen, Jyväskylä, both of Finland, assignors to Valmet Oy, Finland

Filed Nov. 23, 1987, Ser. No. 124,241

Claims priority, application Finland, Nov. 21, 1986, 864758

Int. Cl.⁴ B21B *31/24*

U.S. Cl. 29—113.2 **27 Claims**



1. Method for opening a nip formed between a counter roll and a variable crown roll having a series of loading elements situated in a plane of the nip to act between a central axle and a cylindrical mantle of said variable crown roll, the mantle being fitted about the axle for rotation thereabout and the axle being supported at axle journals thereof and being formed to have a cross-section providing sufficiently high rigidity in the plane of the nip, comprising the steps of

rotating said axle about a longitudinally-extending axis around the journals thereof over an angle relative to a position in which the axle is positioned when the nip is closed and in which the nip can be loaded,

whereby a space between the axle and an inner surface of the mantle adjacent to the nip is formed or enlarged, and

shifting the roll mantle relative to the axle, whereby size of the thus-formed space decreases, the mantle moves away from the counter roll, and the nip is opened.

4,856,156

ROLL ARRANGEMENT CONTAINING A CONTROLLED DEFLECTION ROLL

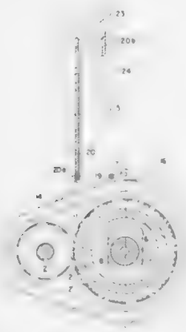
Christoph Link, Weingarten, and Herbert Brandiser, Mochenwangen, both of Fed. Rep. of Germany, assignors to Sulzer-Escher Wyss AG, Zürich, Switzerland

Filed Mar. 31, 1988, Ser. No. 176,263

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1987, 3711856

Int. Cl.[4] B60B *15/16*

U.S. Cl. 29—115 **11 Claims**



1. A roll arrangement comprising:
a roll stand;
a controlled deflection roll supported by the roll stand;
said controlled deflection roll comprising:
a stationary carrier arranged in the roll stand;
at least one support element;
a rotatable roll shell supported on said stationary carrier by means of said at least one support element;
said roll shell having a lengthwise axis;
said roll shell being displaceable by means of said at least one support element in at least one radial direction relative to said lengthwise axis of said roll shell;
a load arranged at one end of said roll shell and defining a center of gravity;
said load having a predeterminate inherent weight;
said load participating in displacement movements of said roll shell; and
support means associated with said one end of said roll shell and supporting at the roll stand at least part of the predeterminate inherent weight of said load at least approximately at the region of said center of gravity of said load.

4,856,157

ROLL WITH CONTROLLABLE LINE PRESSURE

Karl-Heinz Küsters, Krefeld-Forstwald, Fed. Rep. of Germany, assignor to Eduard Küsters Maschinenfabrik GmbH & Co. KG, Krefeld, Fed. Rep. of Germany

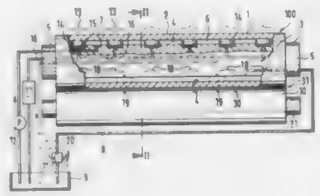
Filed Nov. 30, 1987, Ser. No. 126,773

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 3640902; Nov. 29, 1986, 3640903

Int. Cl.[4] B21B *13/02*

U.S. Cl. 29—116.2 **20 Claims**

1. A roll with controllable line pressure comprising a hollow roll forming a working roll circumference, a stationary crosshead extending through the hollow roll and forming therewith a clearance gap surrounding the hollow roll, transverse seals provided at both ends of the hollow roll sealing the clearance gap, means for establishing discrete isolated pressure zones within said clearance gap, means for supplying pressurized fluid at a predetermined pressure to the entire clearance gap except for said isolated pressure zones, said pressure zone establishing means including means for adjusting the pressure



within the zones to a value less than the predetermined pressure in the clearance gap.

4,856,158

SPREADER ROLL OR EQUIVALENT FOR A FABRIC IN A PAPER MACHINE, AND METHOD FOR MANUFACTURING THE SAME

Kaj Lindroos, and Mauno Töhönen, both of Jyväskylä , Finland, assignors to Valmet Oy, Finland

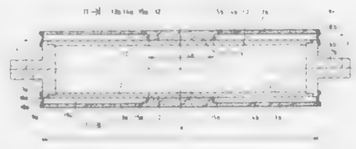
Filed Feb. 12, 1987, Ser. No. 13,775

Claims priority, application Finland, Feb. 13, 1986, 860670

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.

Int. Cl.[4] B21B *13/02*

U.S. Cl. 29—116.1 **15 Claims**



1. A spreader roll or equivalent for a fabric such as a wire or felt, in a paper machine, comprising
an inner hollow tube,
an outer hollow tube situated over said inner hollow tube, said outer hollow tube comprising an inwardly extending centrally located intermediate part integral with said outer hollow tube and attached onto said inner hollow tube, said intermediate part being substantially symmetrical relative to a transverse center plane through said roll, said inner and outer hollow tubes being substantially coaxially with one another when said roll is in an unbent state, and forming annular intermediate spaces between said inner and outer hollow tubes at both sides of said intermediate part, said intermediate spaces being dimensioned to permit deflection of said inner and outer hollow tubes in different directions relative to one another by the effect of tensioning force of fabric arranged to run over said roll,
said inner hollow tube adapted to be coupled to axle journals at outer ends thereof, whereby said roll can be rotatably journaled,
wherein said inner tube is formed of metallic material, and said outer tube and inwardly extending intermediate part thereof are made of a single joint-free integral piece of reinforced plastic being formed onto a middle portion of said inner tube.

9. Method for manufacturing a spreader roll or equivalent, comprising the steps of
dispensing intermediate core pieces onto a metallic inner tube, the core pieces corresponding to dimensions and forms of intermediate spaces between the inner tube and an outer tube to be formed thereon,
producing an intermediate part of the outer tube between inner ends of the intermediate core pieces, with the intermediate part directly adhering to an outer surface of the inner tube, and
forming the outer tube upon said intermediate part and the core pieces,
whereby a roll having a double mantle with the outer tube attached to the inner tube through the intermediate part,

situated between axial inner ends of the intermediate core pieces, and
forming the outer hollow tube part upon the intermediate part and the core pieces and integral with said intermediate part,
whereby a roll having a double mantle with the outer hollow tube part integrally attached to the inner hollow tube part through the intermediate part is produced.

4,856,159

SPREADER ROLL OR EQUIVALENT FOR FABRIC IN PAPER MACHINE AND METHOD FOR THE MANUFACTURE THEREOF

Osmo Skyttä , Jyväskylä , Finland, assignor to Valmet Oy, Finland

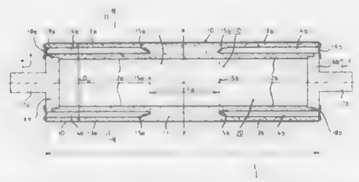
Filed Feb. 12, 1987, Ser. No. 13,774

Claims priority, application Finland, Feb. 13, 1986, 860671

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.

Int. Cl.[4] B21B *13/02*

U.S. Cl. 29—116.1 **20 Claims**



1. A spreader roll or equivalent for a fabric such as a wire or felt in a paper machine, comprising
an inner hollow tube part,
an outer hollow tube part situated over said inner hollow tube part forming a pair of annular intermediate spaces between them, said annular intermediate spaces extending from respective axial ends of said roll substantially axially inwardly,
an intermediate part situated between said pair of annular intermediate spaces and connecting said outer tube part to said inner tube part, said intermediate part being substantially symmetric relative to a transverse center plane of the roll, said inner and outer hollow tube parts being substantially coaxial with one another when said roll is in an unbent state,
said annular intermediate spaces between said inner and outer hollow tube parts being dimensioned to permit deflection of said inner and outer hollow tube parts relative to one another when the fabric passing over said roll is being tensioned,
said inner hollow tube part adapted to be coupled at axial ends thereof to axle journals, whereby said roll can be rotatably journaled, and
wherein said inner and outer hollow tube parts form a double mantle of said roll together with said intermediate part thereof, said inner and ouer hollow tubes and intermediate parts being formed of reinforced plastic and comprising a single, integral member in which said inner and outer hollow tube parts are integrally connected to each other through said intermediate part without joints.

9. Method for manufacturing a spreader roll or equivalent, comprising the steps of
applying fluid plastic material and reinforcement fiber onto a core shaped as a body of revolution, to form a blank of a diameter corresponding to an outer diameter of an inner hollow tube part of the roll,
then placing cylindrical intermediate core pieces onto the blank, the core pieces having dimensions and shape of intermediate spaces between the inner hollow tube part and an outer hollow tube part to be formed thereon,
producing an intermediate part of the outer hollow tube part to be formed integral with said inner hollow tube part and

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4,856,160

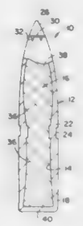
BULLET WITH REVERSE TAPER INTERLOCK JACKET AND METHOD OF MANUFACTURING THE BULLET

Randall G. Habbe, Pocahantas, and Herman N. Bockstruck, Alton, both of Ill., assignors to Olin Corporation, Stamford, Conn.

Filed Feb. 16, 1988, Ser. No. 156,157

Int. Cl.[4] B21K *21/06*

U.S. Cl. 29—1.23 **13 Claims**



1. A method of manufacturing a bullet, which comprises the steps of:
(a) performing a final draw of a predrawn elongated cup to form a bullet jacket having opposite heel and mouth portions and an intermediate portion therebetween so as to produce a thicker wall at the intermediate portion than at the opposite heel and mouth portions with the thicker intermediate wall portion bulging outwardly at the exterior of the jacket; and
(b) producing a generally uniform outside diameter on at least the intermediate and heel portions of the jacket so as to cause the thicker intermediate wall portion to bulge inwardly at the interior of the jacket.

4,856,161

PRESS ROLL

Veijo Miihkinen, Jyväskylä , Finland, assignor to Valmet Oy, Finland

Division of Ser. No. 894,925, Aug. 8, 1986, Pat. No. 4,748,736, which is a continuation-in-part of Ser. No. 816,628, Jan. 6, 1986. This application Apr. 1, 1988, Ser. No. 176,460

Claims priority, application Finland, Jan. 9, 1985, 850107; Sep. 16, 1985, 853544

Int. Cl.[4] B21B *27/00*

U.S. Cl. 29—129.5 **10 Claims**



1. A press roll for paper machines, comprising:
a cylindrical mantle formed of a metallic material and having

an outer surface, said mantle providing said press roll with mechanical strength; and

a coating formed on said outer surface of said mantle, said coating being at least partially constituted of a metallic component, said metallic component being chosen so that said coating comprises means for obtaining a controlled detachment of a paper web from said roll, and said roll coating further comprising means for providing resistance to strains at an outer surface of said roll.

4,856,162

FABRICATION OF BONDED STRUCTURES

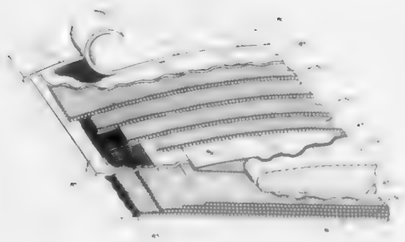
John M. Graff, West Suffield, Conn.; Harry A. Nutter, Jr., Longmeadow, Mass., and Leon Stoltze, East Hartland, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 814,421, Dec. 30, 1985, abandoned. This application Aug. 8, 1988, Ser. No. 231,651

Int. Cl.[4] B21K *3/04;* **B21D** *53/78*

U.S. Cl. 29—156.8 B **12 Claims**





1. In a method for manufacturing an article by the compression molding under conditions of elevated pressure, of a lay-up of constituents within a mold having an interior shape corresponding to the desired shape of said article, wherein said constituents are first inserted within said mold, the improvement characterized by:

inserting within said mold, between said mold and said constituents, a flexible perforated sheet material which is softer than said mold; and

bonding said constituents into said article by said compression molding of said lay-up while compressively deforming said sheet material in a manner in which select, solid portions of said sheet material locally expand into perforations thereof;

uniformity of pressure distribution between said mold and constituents being enhanced by said localized expansion to reduce the size of perforations therein, thereby establishing continuous paths therethrough for the application of adequate bonding pressure to said lay-up, whereby weaknesses in the bonding of said constituents due to variations in molding pressure resulting from dimensional inconsistencies of said constituents, are minimized.

12. A method for determining the conformance of mold tooling to an article of select surface geometry, said method being characterized by:

inserting a sheet of flexible, compressible, perforated material between said mold tooling and said article;

compressing said material between said article and said mold tooling while compressively deforming said sheet material in a manner in which select, solid portions of said sheet material locally expand into perforations thereof; and

noting any areas of said perforated material which exhibit variations in thickness and porosity thereof subsequently to said compression;

areas of reduced material thickness and porosity corresponding to, and being indicative of nonconformance between said article and said mold tooling.

4,856,163

COMBUSTOR OF HIGH PRESSURE BURNER FOR ROCKET ENGINE AND METHOD OF FABRICATION THEREOF

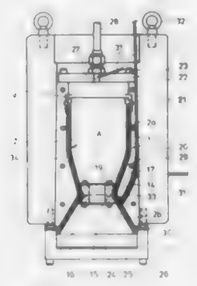
Ryo Horiuchi, Urayasu; Satoshi Saito, Yokohama; Koichi Suzuki, Tokorozawa, and Kazuyuki Higashino, Sayama, all of Japan, assignors to Astronautical Science and Ishikawajima-Harima Jukogyo Kabushiki Kaisha, both of, Japan

Filed Mar. 22, 1988, Ser. No. 171,856

Claims priority, application Japan, Mar. 26, 1987, 62-70230

Int. Cl.[4] F02K *9/64*

U.S. Cl. 29—157 C **2 Claims**



1. A method for fabrication of a combustor of a high pressure burner for a rocket engine, which comprises providing an inner tube having a throat, machined at its outer periphery to define regenerative coolant grooves and split into uppef and lower portions at said throat, press-fitting said upper and lower portions into an outer tube fabricated as a unitary structure for intimate contact with each other, tightening the upper and lower portions by jig means, securely attaching further jig means to an outer periphery of said outer tube, and rigidly joining together abutment surfaces between said upper and lower inner tube portions as well as abutment surfaces between said inner and outer tubes simultaneously by a diffused junction process.

4,856,164

METHOD OF MAKING A VALVE CONSTRUCTION

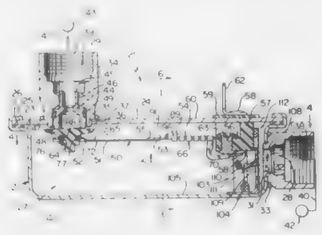
Harvey J. Shopsky, Latrobe, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 47,205, May 6, 1987, Pat. No. 4,769,887, which is a division of Ser. No. 870,363, Jun. 4, 1986, Pat. No. 4,685,652, which is a division of Ser. No. 794,742, Nov. 4, 1985, Pat. No. 4,651,968. This application May 11, 1988, Ser. No. 192,838

The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.

Int. Cl.[4] B21D *53/00*

U.S. Cl. 29—157.1 R **4 Claims**



1. In a method of making a valve construction comprising the steps of providing a housing means that has a chamber therein and an inlet leading to said chamber and an outlet leading from said chamber, forming a valve seat that is carried by said housing means and that leads to said outlet, forming a movable bimetallic lever means that is carried by said housing means and that has an operating bimetallic part, disposing a heater wire means so as to be in coiled relation on said operating part to heat the same when an electrical current flows through said heater wire means, forming a valve member that is carried by said bimetallic lever means for opening and closing said valve seat under the control of said operating part of said bimetallic lever means, forming a tab on said operating part of said bimetallic lever means, and operatively interconnecting said heater wire means to said tab whereby said tab tends to hold said heater wire means in said coiled relation on said operating part of said bimetallic lever means, the improvement comprising the step of forming said heater wire means to comprise a length of said wire means doubled upon itself to define a looped end and a pair of free ends adjacent each other with said looped end being hooked over said tab.

4,856,165

METHOD FOR PRODUCING BY WELDING A FINNED HEAT EXCHANGER PIPE

Günter Reuchlein, and Gerhard Schiessl, both of Augsburg, Fed. Rep. of Germany, assignors to Man Technologie GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 26, 1988, Ser. No. 249,387

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1987, 3733155

Int. Cl.[4] B21D *53/06*

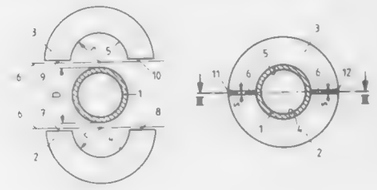
U.S. Cl. 29—157.3 A **14 Claims**

1. A method of producing a heat exchanger pipe starting with a metallic pipe (1) of circular cross section and metallic fins (2, 3), comprising the steps of

producing said fin in two halves (2,3) formed with semicircular recesses (4,5) which have a radius (r) adapted to the external diameter (D) of the metallic pipe, said fin recess being flanked by two side surfaces (7,8,9,10),

placing the fin halves on said pipe (1) so as to straddle same and leaving a narrow gap(s) at a parting line between said fins, wherein the gap has a size range of 0.05 mm to 1 mm positively correlated with the diameter of the metallic pipe,

producing weld spots (11,12) to connect the two halves of such fin at radially outer end parts of the gap, and



cooling the weld spots so that the gap is reduced in size and the fin halves are pressed by shrinkage due to cooling of said fin halves onto the metallic pipe at the boundaries of their recesses.

4,856,166

METHOD FOR MANUFACTURING A GEAR FIT ARTICLE AND GEAR FIT ARTICLE PRODUCED THEREBY

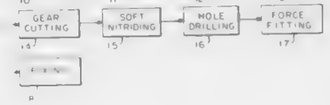
Yoshihisa Miwa, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 13, 1987, Ser. No. 107,415

Claims priority, application Japan, Oct. 24, 1986, 61-253292

Int. Cl.[4] B21D *53/28;* **F16H** *55/00*

U.S. Cl. 29—159.2 **13 Claims**



7. A method for manufacturing a gear fit article comprising the steps of:

forming a plating layer on a steel work to prevent nitriding,

gear cutting the plated steel work to form a gear having teeth of exposed steel,

nitriding said gear at a temperature within a predetermined range to harden the teeth of the gear and to soften the plating layer,

drilling overlying portions of the gear and the support member to form axially aligned holes for a fastener, and thereafter,

interference fitting a fit portion of the gear having a plating layer thereon to fit a portion of a support member, and thereafter

inserting a fastener into the aligned holes of the gear and supporting member.

4,856,167

METHOD FOR PRODUCING NEAR NET RING GEAR FORGINGS

Alvin M. Sabroff, and James R. Douglas, both of Mentor, Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 12, 1987, Ser. No. 14,426

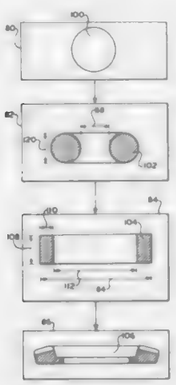
Int. Cl.[4] B23P *15/14*

U.S. Cl. 29—159.2 **19 Claims**

1. A method for producing near net ring gear forgings (106) having a known outside diameter (126), toe diameter (124) and volume, said process comprising the steps of:

(a) providing properly sized and shaped billets (100) of a known low to medium carbon level carbon or alloy steel;

(b) heating the billets (130) to an appropriate forging temperature;
(c) forging the heated billets (130) in a preform (138) die having a generally toroidal shaped cavity (150) into untrimmed substantially toroidal shaped ring rolling preforms (132);
(d) without reheating, trimming the untrimmed substantially toroidal shaped ring rolling preforms into trimmed substantially toroidal shaped ring rolling preforms (102);



(e) without reheating, ring rolling the preforms into rings (104) having substantially rectangular cross-sectional walls of a given height (108) and thickness (110) such that the inner diameter (112) of said ring is substantially equal to the toe diameter, the outer diameter (114) of said ring is less than said outside diameter and the height of said rings is in the range of one (1) to four (4) times the wall thickness thereof; and,
(f) without reheating, precision forging said rings into near net ring gear forgings.

4,856,169

APPARATUS FOR POSITIONING THE END OF A FIRST ELONGATED SYNTHETIC PIECE WITH AT LEAST THE END OF A SECOND ELONGATED SYNTHETIC PIECE, FOR THE COUPLING THEREOF

Marc Bazinet, Emerainville, and Jean Sauron, Draveil, both of France, assignors to Gaz de France and Societe Joseph Sauron Material Industriel, both of, France

Filed Mar. 23, 1988, Ser. No. 172,694
Claims priority, application France, Mar. 30, 1987, 87 04414
Int. Cl.[4] B23K *37/04*
U.S. Cl. 29—272 **15 Claims**

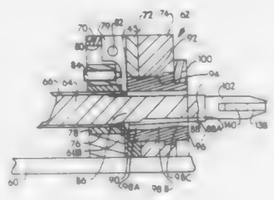
1. An apparatus for straightening and aligning the end of a first tubular member made of a synthetic material with at least the end of a second tubular member of synthetic material, for the coupling thereof, said apparatus comprising a frame on which are mounted devices for holding said tubular member ends located at a predetermined distance from each other in the axial direction of the tubular members and at least a device for positioning one tubular member end, adapted to move said end perpendicularly with respect to its axis into a position axially aligned with the other end and located between the holding devices, the positioning device comprising a support structure having the shape of a bow supported on said frame, coaxially therewith and through which extends said tubular member, and a pusher means mounted on said bow movably thereon in the peripheral direction about the axis of said bow between different angular positions and radially movable between a withdrawn position and a position in contact with the lateral peripheral surface of the tubular member, so as to be in a condition to exert a predetermined lateral pressure for laterally moving said tubular member in its position axially aligned with said other tubular member.

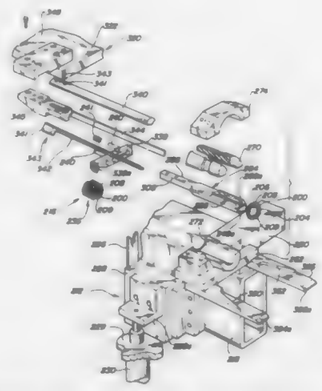
4,856,169

APPARATUS FOR COMPRESSING A RETAINER RING TO ASSEMBLY SIZE

Deryll Liechty, Berne, Ind., assignor to Micro-Precision Operations Inc., Berne, Ind.

Continuation-in-part of Ser. No. 600,237, Apr. 16, 1984, abandoned, which is a division of Ser. No. 362,203, Mar. 26, 1982, Pat. No. 4,454,642. This application Jul. 14, 1988, Ser. No. 219,054
The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.
Int. Cl.[4] B23Q *1/00, 3/00, 7/04*
U.S. Cl. 29—283 **11 Claims**





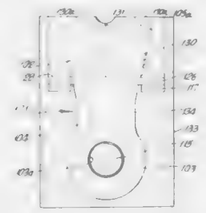
1. In combination, an assembling mandrel having an outer surface and an elongate, lug-retaining groove means with opposing spaced apart sides and at least one open end, and a resilient retainer ring comprising a C-shaped, arcuate portion having an outer periphery and inner periphery disposed around the mandrel and terminating in a pair of lugs extending inwardly of the ring when viewed in plan, said retainer ring being held compressed in size on the mandrel with said inner periphery substantially conforming to said outer surface and said outer periphery compressed to desired assembly size by virtue of said lugs having oppositely facing, outer retaining sides engaged between the spaced apart side walls of said groove means, whereby the ring is retained at compressed assembly size without the need for external ring containment for receipt in another component and assembly in said another component by removal of said lugs from said open end of said groove means.

4,856,170

REBUILDING WORN HAMMER MILL HAMMERS

Robert H. Kachik, Lakehurst, N.J., assignor to Orgo-Thermit Inc., Lakehurst, N.J.

Filed Apr. 21, 1988, Ser. No. 183,825
Int. Cl.[4] B23P *15/02*
U.S. Cl. 29—402.18 **7 Claims**



1. Method of rebuilding worn hammers used in hammer mills where the hammer is elongated with a pair of opposite ends in the elongated direction with a head at one end, with the one end forming a wearing surface, extending transversely of the elongated direction and an eye at the opposite end, and the wearing surface on the head becomes worn away during use, whereby the dimension between the wearing surface and the opposite end decreases from a starting dimension, the method comprising the steps of supporting the worn hammer with the elongated dimension thereof being substantially vertical and with the wearing surface located upwardly above the eye, at least laterally enclosing the worn head within a mold forming a mold chamber extending upwardly from the worn surface, providing a seal between the head and the mold below the worn surface, igniting an exothermic material in a space separate from the mold chamber, when the ignited exothermic material forms a molten metal, flowing the molten metal into the mold chamber over the worn surface of the head and filling the mold chamber with the molten metal until the surface of the molten metal reaches the desired dimension between the wearing surface and the opposite end of the hammer.

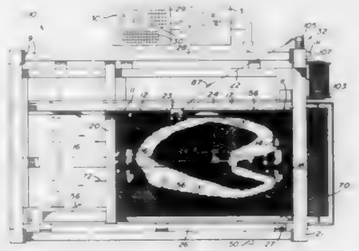
4,856,171

METHOD FOR APPLYING A FABRIC MATERIAL TO A FRAME

René Croteau, Contrecoeur, Canada, assignor to Les Produits Duvernay Ltee, St-Leonard, Canada

Continuation of Ser. No. 942,294, Dec. 16, 1986, Pat. No. 4,766,661. This application Mar. 14, 1988, Ser. No. 167,898
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—417 **10 Claims**

1. A method of applying a fabric material in a retention groove disposed circumferentially about a rectangular frame by applying a spline cord in said groove with a fabric portion disposed therein, said method comprising the steps of:
(i) storing data in an electronic control means, said data pertaining to the dimensions of a rectangular frame;
(ii) automatically displacing a frame support structure having four frame engaging members to a frame receiving position;
(iii) placing a frame on said frame support structure;
(iv) moving at least two frame engaging members of said frame support structure to position side members of said frame in a desired configuration;
(v) gripping said side members by gripping means to maintain said side members along respective straight transverse axes;
(vi) positioning a predetermined length of fabric material over said frame to overlie said retention groove in said side members by:
(a) displacing engaging means to engage a leading edge portion of said fabric adjacent dispensing pincer rolls;
(b) applying a retracting force to said engaging means, and
(c) dispensing a predetermined length of fabric by controlling the revolutions of said pincer rolls;
(vii) displacing a spline cord positioner to a predetermined position on one of said side members of said frame;



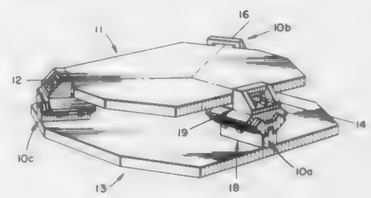
(viii) disposing a spline cord in said groove by displacing said positioner along the entire length of said grooves in said side members while forcing said spline cord in said groove over a portion of fabric;
(ix) simultaneously with step (viii) trimming said fabric adjacent said spline cord in said groove;
(x) severing said spline cord;
(xi) cutting said fabric to disconnect same from a supply of fabric simultaneously displacing a support bridge bar to position same and a cutting device to an out-of-way position; and
(xii) disconnecting said frame from said frame support structure.

4,856,172

METHOD FOR THE STRAIN-FREE MOUNTING OF OPTICAL COMPONENTS

Nazeer Ahmed, Palos Verdes Estates, and Roger R. Tomlinson, La Palma, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 18, 1988, Ser. No. 169,916
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—434 **5 Claims**



1. A method of mounting a first mechanical assembly having a characteristic coefficient of expansion to a second mechanical assembly having a different characteristic coefficient of expansion in order to substantially eliminate the creation within the assemblies of mechanical stresses generated by a

variation in ambient temperature causing an unequal expansion or contraction of one of the mechanical assemblies relative to the other, comprising the steps of:

determining a radius of a first mounting circle upon which the first mechanical assembly is to be mounted upon the second mechanical assembly;

providing a plurality of linear bearings upon the circumference of the mounting circle, each of the linear bearings having an axis of translation colinear with an extension of a radius of the mounting circle;

mounting a first connective member of each of the linear bearings to the first mechanical assembly; and

mounting a second connective member of each of the linear bearings to said second mechanical assembly, wherein said first connective member is movable along said second connective member so that

the first mechanical assembly is movably coupled for relative motion to the second mechanical assembly such that unequal expansion and contraction of each of the assemblies results in a linear motion along each of the linear bearings thereby substantially eliminating mechanical stresses between the two assemblies.

4,856,173

METHOD OF THE FORMATION OF SLIDE SURFACES ON A TRACK FOR ELECTROMAGNETICALLY LEVITATED VEHICLES

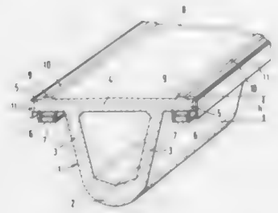
Lorenz Maier, Otterfing; Wilhelm Büchler, Haar; Harald Neumann, Hamburg, and Karl H. Löanecke, Bremen, all of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 24, 1988, Ser. No. 159,961

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1987, 3705773

Int. Cl.[4] B23P *15/20*

U.S. Cl. 29—445 **10 Claims**



1. Method of accurately positioning slide surfaces on slide rails on a track for electromagnetically levitated vehicles where the track is formed as a beam from at least one of steel, reinforced concrete and prestressed concrete, the track including the beam elongated in the direction of the track and including an upper part having an upper surface and a base extending downwardly from the upper part with the upper part cantilevered laterally outwardly from the base and forming cantilevered parts with slide rails located on and extending upwardly from the upper surface of the cantilevered parts, support stators located on the underside of the cantilevered parts below the slide rails and the support stators having a lower surface, the support stators arranged to be engaged by the levitated vehicles, wherein the method comprises the steps of providing the slide rails oversized in height upwardly from the upper surface of said cantilevered parts, attaching and adjusting the support stators on the undersides of the cantilevered parts, forming the slide surfaces on the upper surface of said slide rails by removing the height oversize and guiding the formation of the slide surfaces using the lower surface of the support stators as a reference plane.

4,856,174

METHOD OF MAKING A STAINLESS STEEL VACUUM BOTTLE WITH A SILVER MIRRORED SURFACE

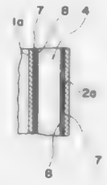
Hidetsurumaro Ishizaki, Hirakata, and Riyozo Taguchi, Higashi, all of Japan, assignors to Zojirushi Vacuum Bottle Co., Ltd., Osaka, Japan

Continuation of Ser. No. 524,592, Aug. 19, 1983, abandoned. This application May 17, 1985, Ser. No. 735,307

Claims priority, application Japan, Aug. 25, 1982, 57-148162; Dec. 6, 1982, 57-214113; Jul. 25, 1983, 58-136436

Int. Cl.[4] B05S *3/04;* **B23P** *25/00;* **C23C** *8/06*

U.S. Cl. 29—455.1 **6 Claims**



4. A method of making a stainless steel vacuum bottle, which comprises preparing inner and outer bottle members, oxidizing at least the outer surface of the stainless steel inner bottle member to form an oxide layer thereon, forming a silver mirror layer on the oxide layer, and evacuating the space between the bottle members.

4,856,175

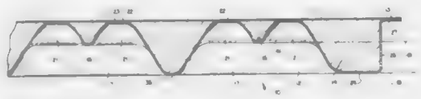
METHOD OF MANUFACTURING ELEVATED FLOOR PANELS

Eugene L. Swensen, Laurel, and George F. Ray, III, Rockville, both of Md., assignors to USG Interiors, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 905,951, Sep. 11, 1986, Pat. No. 4,753,058. This application May 18, 1988, Ser. No. 195,219

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—460 **24 Claims**



1. A method of producing sheet metal elevated floor panels having an upper sheet and a lower sheet wherein the lower sheet provides an array of projections extending to the upper sheet, comprising in a first operation drawing in said lower sheet preliminary projections to an intermediate depth by stretching a first portion of the sheet metal while leaving a flat second portion adjacent to said first portion unworked, subsequently drawing said second portion in a second operation to form secondary projections having a depth greater than one-half of said intermediate depth to increase the depth of said projections, said first and second operations being performed so that the thickness of the metal forming said projections is substantially uniform, and thereafter connecting said upper sheet to said secondary projections.

4,856,176

PROCESS AND APPARATUS FOR ASSEMBLING A TUBULAR CONTAINER

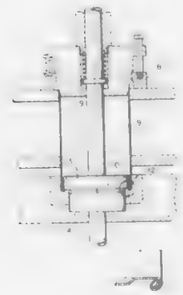
Ruggiero La Rovere, Rio de Janeiro, Brazil, assignor to Rheem Empreendimentos Industriais E. Comerciais S/A, Rio de Janeiro, Brazil

Filed Jul. 13, 1987, Ser. No. 72,513

Claims priority, application Brazil, Nov. 21, 1986, PI 8605741[U]

Int. Cl.[4] B21D *39/00;* **B23P** *11/00*

U.S. Cl. 29—511 **12 Claims**



1. A process for lock seaming one circular can end to a tubular member to form a cylindrical container, said tubular member being preliminarily formed from a flat sheet into a tubular shape with a welded vertical seam and said circular can end having a substantially planar configuration with turned down peripheral edge portions, the inside corner of the turned down edge portions containing an elastic material, said process comprising the steps of:

(a) placing the circular can end having its peripheral edge turned in the downward direction, in a device having in its lower portion a suitably profiled forming tool,

(b) placing the tubular shaped member in said device in such a manner that it stands concentrically over the can end,

(c) vertically lowering the tubular shaped member until it contacts the can end so that the inside surface of the lower edge of said tubular member touches the outside peripheral surface of the can end,

(d) applying a downward vertical force to said tubular shaped member until said member's lower edge end is forced by contact with the forming tool (12), to curl inward, around the can end's cylindrical edge, until it contacts the elastic material previously applied to the inner surface of said cylindrical edge, thus completing a "first seaming operation", and

(e) transferring the tubular shaped member with its partially seamed end to a second suitably shaped device and pressing the partially seamed end with the inwardly curled edge portion against said shaped device to form the adjoining parts of said tubular member and said can end into a final shape, thus concluding a second seaming operation.

4,856,177

AUTOMATIC TOOL CHANGER WITH ELECTROMAGNETICALLY READABLE TOOL HOLDER HAVING AN ELECTROMAGNETICALLY COUPLING STOPPER FOR NUMERICAL CONTROL

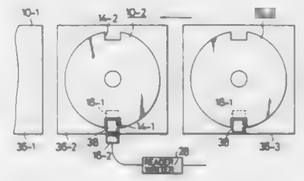
Kunihiko Takeuchi, Kawasaki; Masao Oba, Yokohama, and Shinichi Horinouchi, Tokyo, all of Japan, assignors to Tokyo Keiki Company Ltd., Tokyo, Japan

Filed Feb. 4, 1988, Ser. No. 152,419

Claims priority, application Japan, Feb. 10, 1987, 62-29389

Int. Cl.[4] B23Q *3/00*

U.S. Cl. 29—568 **4 Claims**



1. An automatic tool changer comprising:

a rack means for releasably holding at least one tool holder;

at least one tool holder releasably held in said rack means, said at least one tool holder including an outer flange having a positioning groove therein, a first magnetic induction coupling apparatus imbedded in said tool holder and adjacent a bottom surface of said positioning groove, a memory means in said tool holder and adjacent said first magnetic induction coupling apparatus, and said memory means executable by an electromagnetic induction coupling between said first magnetic induction coupling apparatus and a second magnetic induction apparatus;

a second magnetic induction apparatus disposed externally of said at least one tool holder, and said second magnetic induction apparatus connectable to a data reading/writing device; and

a stopper member, said stopper member insertable into said positioning groove of said tool holder for stopping said tool holder, magnetic coupling means on said stopper member for insertion between said first and second magnetic induction coupling apparatuses for electromagnetically induction coupling said first and second magnetic induction coupling apparatuses and for electromagnetically coupling said memory means to a data reading/writing device through said first magnetic induction coupling apparatuses, through said magnetic coupling means of said stopper member, and through said second magnetic induction device when said stopper member is inserted in said positioning groove and between said first and second magnetic induction coupling apparatuses.

4,856,178

MACHINE TOOL FOR TURNING, MILLING, BORING, DRILLING, AND WASHING WITH INDEPENDENT MEANS FOR CLAMPING THE PART TO BE MACHINED

Guido Salvagnini, Sarego, Italy, assignor to SZ s.r.l., Sarego, Italy

Filed Jun. 2, 1988, Ser. No. 201,401

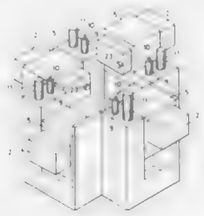
Claims priority, application Italy, Jun. 9, 1987, 20825 A/87

Int. Cl.[4] B23Q *3/157;* **B23P** *23/02*

U.S. Cl. 29—568 **6 Claims**

1. A machine tool comprising two pairs of identical operating heads with chucks rotating on horizontal axes, the chucks of the first pair having their axes in a first vertical plane and the chucks of the second pair having their axes in a second vertical plane perpendicular to the first, each head being movable along the horizontal axis of its chuck and in a vertical direc-

tion, each chuck having at its end a housing for alternately receiving an operating tool or a tool for clamping the part to be



machined, said housings facing towards a central cavity surrounded by said operating heads.

4,856,179

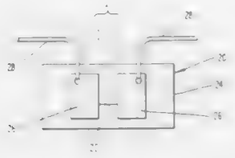
METHOD OF MAKING AN ELECTRICAL DEVICE MADE OF PARTIALLY PYROLYZED POLYMER

Harris A. Goldberg, Colonia; Ilmar L. Kalnin, Millington; Clyde C. Williams, Roselle, all of N.J., and Spain, Ian L., Fort Collins, Colo., assignors to Hoechst Celanese Corp., Somerville, N.J.

Continuation of Ser. No. 859,709, May 5, 1986, abandoned, which is a division of Ser. No. 487,401, Apr. 21, 1983, Pat. No. 4,642,644. This application Jan. 5, 1988, Ser. No. 141,077

Int. Cl.[4] D01F *9/14;* **H01H** *61/02*

U.S. Cl. 29—592.1 **9 Claims**



8. A method of making an electrical switch, comprising the steps of:

stabilizing a polymer filament in an atmosphere containing oxygen;

partially pyrolyzing the filament by heating the filament to between 500° C. and 800° C.; and

applying to the filament at two different locations along the length of the filament a voltage gradient greater than 800 volts per centimeter thereby causing the filament to exhibit negative resistance.

4,856,180

METHOD OF TERMINATING WINDING LEADS

Eugene R. Barrett, Columbia City, and Richard L. Arnett, Ft. Wayne, both of Ind., assignors to General Electric Company, Fort Wayne, Ind.

Filed Dec. 6, 1988, Ser. No. 280,349

Int. Cl.[4] H02K *15/00*

U.S. Cl. 29—596 **16 Claims**

13. A method of terminating a set of leads integral with a winding on a stator assembly for use in a dynamoelectric machine, the winding and the leads being formed of magnet wire having a conductor with a dielectric material coating thereon and with each lead extending from a part of the winding and having a free end, and a set of dielectric material tubes respectively extending about the leads, the tubes including a pair of generally opposite end portions, the method comprising the steps of:

arranging at least one of the opposite end portions of the tubes in preselected positions with respect to each other with the free ends of the leads extending beyond the one opposite end portions, respectively;

melting through each tube and severing a distal section from each tube adjacent its one opposite end portion in response to the melting step;



maintaining the insulating integrity of the dielectric material coating on the leads during the melting step; and

removing the severed distal sections of the tubes from the leads, respectively.

4,856,181

METHOD FOR MANUFACTURING TERMINAL CONTACTS FOR THIN-FILM MAGNETIC HEADS

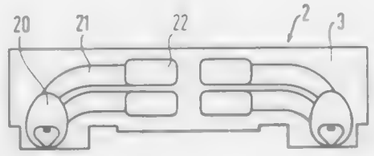
Alfred Pichler, Maisach; Joachim Hertrampf, Munich, and Horst Pachonik, Taufkirchen, all of Fed. Rep. of Germany, assignors to Simens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 26, 1988, Ser. No. 240,065

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1987, 3732193

Int. Cl.[4] G11B *5/42*

U.S. Cl. 29—603 **4 Claims**



1. A method for manufacturing terminal contacts for thin-film magnetic heads on a substrate that is subdivided into individual substrate elements each having two write/read heads, whereby a surface of the substrate is covered surface-wide with an electrically conductive permalloy layer that at least has a plurality of contact locations with respective contact lugs directed toward respective magnetic heads and being structured by ion beam etching using a metallic mask, and whereby the resulting structured permalloy layer is covered surface-wide with a protective aluminum oxide layer except for the contact locations that are provided for the attachment of a bonding wire to an electrodeposited gold film, the method comprising the steps-of: applying a photoresistive layer onto the masked, electrically conductive permalloy layer and letting into the photoresistive layer at the contact locations by an exposure envelope process to form contact windows that lay the electrically conductive permalloy layer bare; electrodepositing a copper layer fashioned as a half-tower onto the exposed permalloy layer, the layer thickness of the copper layer being smaller than that of the photoresistive layer; electrodepositing the gold film onto said copper layer fashioned as a half-tower and the gold film being provided with a masking for protection from the ion beam etching; removing residues of the photoresistive layer on the electrically conductive permalloy layer and the permalloy layer being subsequently structured; initially applying surface-wide the protective aluminum oxide layer onto the structured permalloy layer including the masking and subsequently eroding said aluminum oxide layer to such an extent by mechanical working that until the masking is laid free and can be removed and a bonding wire can be attached to the gold film.

4,856,182

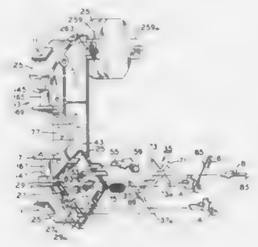
METHOD OF ASSEMBLING A SWITCH DEVICE WITH A SUPPORTING MEANS THEREOF

Lynn E. Fisher, Ft. Wayne, Ind.; Richard A. Wandler, Clinton, Iowa, and James P. Frank, Rock Falls, Ill., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 33,975, Apr. 3, 1987, Pat. No. 4,781,726. This application Jun. 8, 1988, Ser. No. 203,904

Int. Cl.[4] H01H *11/06;* **H02K** *15/14*

U.S. Cl. 29—622 **24 Claims**



1. A method of assembling a switch device with a terminal board adapted for use in a dynamoelectric machine, the terminal board including a pair of generally opposite faces with a peripheral edge interposed therebetween, at least a pair of spaced apart bosses extending from one of the opposite faces, and each boss having a free end and also having an open sided recess therein defining a ledge in off-set spaced relation between the free end and the one opposite face, the switch device including a generally elongate actuating lever having a pair of generally opposite ends, and a pair of generally opposite trunnions extending from the actuating lever at least generally adjacent one of the opposite ends thereof, respectively, and at least a pair of terminals and each including an electrical connector section and a deformed end section opposite thereto, the method comprising the steps of:

disposing the actuating lever at least adjacent the one opposite face of the terminal board and arranging the one end of the actuating lever generally between the bosses extending from the one opposite face of the terminal board;

seating the opposite trunnions on the actuating lever on the ledges of the bosses, respectively, and extending the other of the opposite end of the actuating lever beyond the peripheral edge of the terminal board during the disposing and arranging step;

associating the terminals in preselected positions therefor with respect to the terminal board and positioning thereby the terminals at least adjacent the ledges on the bosses, respectively;

extending the terminal connector sections of the terminals beyond the other of the opposite faces of the terminal board and placing the deformed end sections of the terminals at least in part in spaced apart overlaying relation with the ledges of the bosses and in overlaying relation with the free ends of the bosses during the associating and positioning step, respectively; and

securing the terminals in their preselected positions to the terminal board and capturing thereby the opposite trunnions between the open sided recesses in the bosses and the terminals, respectively.

4,856,183

DEVICE FOR FITTING AND CRIMPING END PIECES ON ELECTRIC CONDUCTORS

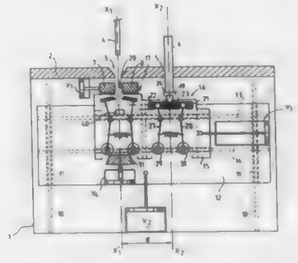
Ali Belaidouni, Dijon; André Benani, Seurre, and Jean-Marie Millet, Bellefond, all of France, assignors to La Telemecanique Electrique, France

Filed May 6, 1988, Ser. No. 190,989

Claims priority, application France, May 6, 1987, 87 06366

Int. Cl.[4] H01R *43/04*

U.S. Cl. 29—753 **9 Claims**



1. A device for fitting and crimpng end-pieces on a stripped electric conductor, said device comprising:

i—an end-piece supply device;

ii—a holding device for guiding and holding in position said conductor,

iii—a transfer device receiving in a reception means having a cavity the end-pieces delivered by said end-piece supply device and then transporting them to said holding device, said transfer device, at the end of a predetermined travel, positioning an end-piece on the end of the stripped conductor; and

iv—a device for crimping the end-piece once positioned on said end,

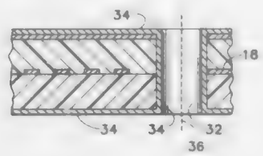
v—access of the transfer device to the supply device and to the holding device taking place following translational movements during which the reception means is held coaxial to the device to which it accedes, wherein the transfer device further includes a closure device having at least two jaws movable above the reception means, so as to occupy a closed position in which the jaws define a through passage therebetween whose minimum section is at least equal to the section of the stripped conductor, but is however less than the maximum section of the end-piece, and an open position in which the minimum section of the passage defined by the jaws is at least equal to the maximum section of the cavity of the reception means, and the supply device and the reception means respectively include first and second stop devices cooperating with at least one cam surface provided on the closure device for causing the jaws to pass from the open position to the closed position when the transfer device accedes to the supply device and to the reception means, respectively.

4,856,184

METHOD OF FABRICATING A CIRCUIT BOARD

Wallace D. Doeling, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 6, 1988, Ser. No. 202,621
Int. Cl.[4] H01K *3/10*
U.S. Cl. 29—852 **4 Claims**



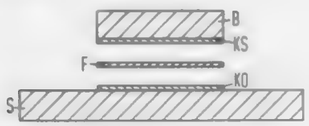
1. An improved method of fabricating a circuit board, comprising the steps of:
(a) providing a first substrate of dielectric material having at least one run of conductive material adhered to one surface thereof,
(b) bonding a second substrate of dielectric material to said one surface of the first substrate, so as to cover the run of conductive material.
(c) forming a hole through the first and second substrates of dielectric material, which hole intercepts the run of conductive material, and
(d) depositing conductive material into the hole, the deposited conductive material being in electrically conductive contact with the run of conductive material,
wherein the improvement resides in that the diameter of the hole is at least as great as the width of the run of conductive material where it is intercepted by the hole.

4,856,185

METHOD FOR FASTENING ELECTRONIC COMPONENTS TO A SUBSTRATE USING A FILM

Werner Baumgartner, Munich, and Johannes Fellinger, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 11, 1987, Ser. No. 132,009
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, [illegible]
Int. Cl.[4] H05K *13/04*
U.S. Cl. 29—840 **27 Claims**



20. A method for fastening an electronic component to a substrate, comprising:
manufacturing a connecting layer by providing a metal powder with solvent to form a paste;
applying the paste to a foundation to create a layer;
driving out the solvent with heat;
at least partially sintering the metal powder particles so as to create a pre-sintered film as said connecting layer;
cutting the pre-sintered film to a shape of a mounting area of said electronic component;
introducing the pre-sintered film connecting layer between the electronic component and substrate; and
pressing the electronic component, connecting layer, and substrate together in a sintering process.

4,856,186

APPARATUS AND METHOD FOR DETERMINATION OF CRIMP HEIGHT

Michael A. Yeomans, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 4, 1988, Ser. No. 266,977
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—863 **9 Claims**



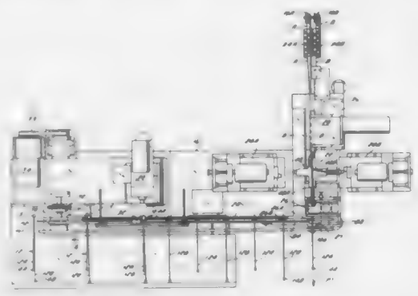
1. In a method of determining the crimp height of a terminal crimped onto an element utilizing crimping apparatus which includes a press having a base and a ram arranged for opposing relative reciprocating motion, said base and ram each carrying a mating half of a crimping die set, the steps comprising;
(a) placing a terminal and element in crimping position within said crimping apparatus;
(b) causing at least one of said base and said ram to undergo relative motion so, that said die set engages and crimps said terminal onto said element; and
(c) during step (b) determining that the crimping process has actually begun and then monitoring the force imposed on said terminal as said force recedes from a predetermined value to zero, whereupon said force reaching substantially zero, simultaneously therewith determining the distance between the terminal engaging portions of said die set, said distance being said crimp height.

4,856,187

APPARATUS AND METHODS FOR MAKING TERMINATED WIRE SEGMENTS

Gerald Blaha, Waukesha, Wis., assignor to Artos Engineering Company, New Berlin, Wis.

Filed Mar. 31, 1988, Ser. No. 175,862
Int. Cl.[4] H01R *43/04*; **B23P** *23/00*
U.S. Cl. 29—867 **16 Claims**



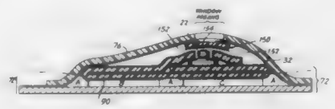
1. A method of processing wire comprising the steps of:
providing a plurality of wire strands, each strand having a free end;
feeding one wire strand to which a terminal has been attached in one direction along a path to provide a wire segment of predetermined length;
severing said wire segment to which a terminal has been attached from said one wire strand at a location along said path after a predetermined length has been fed;
and attaching a terminal to the free end of another wire strand while said one wire strand is being fed and severed.
6. Wire processing apparatus comprising means for alternately feeding a pair of wire strands in one direction along a common path;
means to sever at a location along said path a wire segment of predetermined length from said other wire strand fed prior to feeding said one wire strand;
and means for attaching a terminal to a free end of one wire strand, while the other wire strand is being fed in said one direction along said path.

4,856,188

METHOD FOR MAKING DISPOSABLE AND/OR REPLENISHABLE TRANSDERMAL DRUG APPLICATORS

Dan Sibalis, Stony Brook, N.Y., assignor to Drug Delivery Systems Inc.

Division of Ser. No. 807,234, Dec. 10, 1985, Pat. No. 4,731,926, and a continuation-in-part of Ser. No. 702,486, Feb. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 660,192, Oct. 12, 1984, Pat. No. 4,622,031, which is a continuation-in-part of Ser. No. 524,252, Aug. 18, 1983, Pat. No. 4,557,723. This application Oct. 7, 1987, Ser. No. 105,889
The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—877 **16 Claims**



1. A method for making a replaceable disposable drug reservoir for an electrically powered transdermal drug applicator, comprising the steps of:
a. providing a release coated substrate;
b. depositing on said substrate occlusive adhesive dam material to define drug reservoir compartments;
c. laminating an open cell foam material to said substrate over said occlusive adhesive dam material so as to cause said dam material to penetrate and fill the full thickness of said open cell foam; and
d. filling said plurality of drug reservoir compartments with drug electrolyte mixtures.

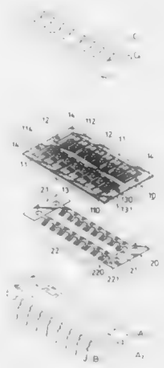
4,856,189

METHOD FOR MANUFACTURING MULTIPLE PUSH-BUTTON AND CONDUCTIVE MEMBERS FOR DIP SWITCHES

Pen-Lin Liao, No. 1-11, Li-Ming Rd., Nan Tung Dist., Taichung City, Taiwan

Filed Jun. 16, 1988, Ser. No. 207,495
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—882 **1 Claim**

1. A method for manufacturing multiple push-button and conductive members for dual-in-line package (DIP) switches comprising the steps of:
a. integrally forming a multiple push-button member from plastic material in a push-button mold and a multiple conductive member from metal material in a conductive mold;
b. superimposingly combining one of said multiple push-button member with one of said multiple conductive member by aligning each corresponding part of both members for being pressed as a single solid unit; and



c. simultaneously cutting said single solid unit into a plurality of push-button units with a cutting mechanism; thereby, said push-button units can be quickly produced for mass production through an integrated operation without encurring any burs on said push-button units.

4,856,190

SINGLE CUT CLIPPER FOR ARTIFICIAL NAILS

Gary J. Reiswig, 17190 SW. 131st, Tigard, Oreg. 97224

Filed Jun. 2, 1988, Ser. No. 201,773
Int. Cl.[4] A45D *29/00*
U.S. Cl. 30—29 **11 Claims**



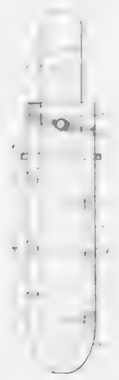
1. A clipper for trimming a finger nail comprising:
a clipper body including a first handle;
a second handle opposing the first handle and pivotally coupled to said clipper body;
a planar nail holder having a first side, a second side, a proximal end attached to the clipper body and a distal end, the holder having a crescent shaped aperture with a bight portion thereof extending toward the distal end for receiving the finger nail when inserted from the first side;
a planar blade having a blade edge;
means for retaining the blade in slidable face-to-face relation with the second side of said nail holder; and
means responsive to movement of said second handle for sliding the blade from an initial position toward the distal end of said blade holder such the blade edge passes over the aperture in the nail holder and retracts to its initial position.

4,856,191
CUTTER AND GUIDE FOR WALL COVERINGS AND FLOOR COVERINGS
Andreas Weber, Ludwigstr. 8,, D 6078 Neu-Isenburg, Fed. Rep. of Germany
Filed Nov. 18, 1986, Ser. No. 932,035
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608147
Int. Cl.[4] B26B *27/00*
U.S. Cl. 30—123 4 Claims



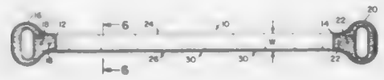
4. A cutting device for wall and floor coverings, comprising
a cutting rail for aligning said cutting device, said cutting rail including at least one cutting groove, and
an electric scissors associated with said cutting rail, said electric scissors comprising a housing, a drive motor, a movable cutting blade, and a fixed cutting blade, said fixed cutting blade including a cutting edge oriented towards said housing, said movable cutting blade being driven by said motor and cooperating with said fixed cutting blade for cutting said wall and floor coverings in a direction oriented towards said housing, said fixed cutting blade being sized to be received within said cutting groove,
wherein the depth of said cutting groove is about 0.5 to 2 mm less than the height of said fixed cutting blade.

4,856,192
ADAPTER FOR KNIFE AND SHEATH ASSEMBLY
Walter W. Collins, North, S.C., assignor to Wenoka Seastyle, West Palm Beach, Fla.
Filed Jan. 28, 1988, Ser. No. 149,529
Int. Cl.[4] B26B *29/02*
U.S. Cl. 30—151 7 Claims



1. A means for interlocking a tool and a sheath comprising:
locking means disposed on said tool having a pair of members adapted to be alternately moved into an interfering fit with a portion of said sheath, wherein said pair of members comprises a pair of buttons, and a shaft rigidly interconnecting said buttons,
means disposed on said sheath for actuating said locking means on insertion of said tool into said sheath including means for engaging either one of said pair of buttons depending upon the orientation of said tool on insertion into said sheath for actuating said locking means whereby the other if said pair of buttons engages a portion of said sheath in an interfering fit,
and said tool has means formed therein for supporting said shaft for limited reciprocal axial movement between positions in which a different one of said buttons projects beyond the surface of said tool with said projecting button comprising the button which engages a portion of said sheath in an interfering fit.

4,856,193
SAW
Ronald A. Grachan, 1400 Valley Wind La., Missoula, Mont. [illegible]
Continuation of Ser. No. 77,179, Jul. 24, 1987, abandoned. This application Jan. 31, 1989, Ser. No. 304,875
Int. Cl.[4] B23D *57/00*
U.S. Cl. 30—166.1 8 Claims



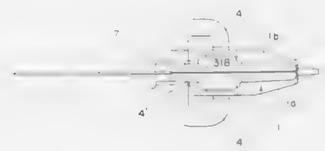
1. A saw adapted for a plurality of uses including sawing wood and bone, comprising:
a planar blade having a cutting edge;
a handle secured to said blade;
a plurality of saw teeth disposed on said cutting edge in a predetermined pattern with each of said teeth extending from a base to a tip, said tips of said teeth set from side walls of said blade by a predetermined amount, said teeth having a depth measured from a base to tip of about ¼ to about ⅜ inch and a spacing of tip-to-tip between contiguous teeth of about ¼ to ⅜ inch;
said saw including teeth alternately set away from opposite sides of said blade with teeth curving from said blade to said tips and with blade tips provided with a slope
said teeth are provided with said slope set at a bevel of 3° to 15°.

4,856,194
CUTTING ATTACHMENT FOR TRIMMERS
Anthony L. Lee, P.O. Box 617, Walnut Grove, Calif. 95690
Filed Sep. 15, 1987, Ser. No. 96,669
Int. Cl.[4] B26B *7/00*
U.S. Cl. 30—276 11 Claims



1. In a cutting attachment for a cutting device, first and second mating body sections forming a rigid body, said first body sectio having a generally vertical side wall portion, a downwardly and inwardly inclined bottom wall portion, an upwardly and inwardly extending wall portion adjoining said bottom wall portion, said second body section having a generally vertical side walls portion, an inwardly extending and generally horizontal portion adjoining said generally vertical portion, an upwardly and inwardly inclined portion adjoining said horizontal portion, means interconnecting said first and second body sections to form a rigid body and to cause said upwardly and inwardly extending portion of said first body section and said upwardly and inwardly inclined portion of said second body section to adjoin each other to provide a relatively smooth inner surface in the form of a truncated cone the generally vertical side wall portions of the first and second body sections defining the outer confines of the body, coupling means carried by the upwardly and inwardly inclined portion of said second body section adapted to be coupled to the cutting device and a plurality of cutting elements carried by the body and being movable between cutting positions extending outside of the outer confines of the body and out-of-the-way positions within the outer confines of the body.

4,856,195
HANDLE ARRANGEMENT FOR PORTABLE POWER TOOL
Horst Grossmann, Hunfelden, and Michael Stirm, Oberursel, both of Fed. Rep. of Germany, assignors to Black & Decker Inc., Newark, Del.
Continuation-in-part of Ser. No. 116,823, Oct. 30, 1987. This application Sep. 26, 1988, Ser. No. 249,644
Claims priority, application European Pat. Off., Nov. 11, 1986, 86115652.9
Int. Cl.[4] B27B *19/00*
U.S. Cl. 30—369 28 Claims



1. A hand-held power tool, comprising:
a housing containing a motor;
means for cutting extending forwardly from said housing in a lengthwise direction of said tool;
transmission means for driving said cutting means from said motor;
a rear handle extending rearwardly from said housing in said lengthwise direction;
a front handle spaced from said rear handle and extending forwardly from an upper portion of said housing;
a pair of looped side handles attachable to and detachable from opposite sides of said tool at a location between said rear handle and said cutting means;
each side handle having upper and lower legs;
upper securing means for securing end portions of the upper legs to said front handle; and
lower securing means for securing end portions of the lower legs to said housing.

4,856,196
METHOD AND DEVICE FOR CONSTRUCTING SLEEVES
Camille A. Ajus, and Marguerite H. Ajus, both of 831 St. Aubin, Ville St. Laurent, P.Q., Canada H4M 1J9
Filed Oct. 19, 1987, Ser. No. 109,539
Claims priority, application Canada, Oct. 29, 1986, 521766
Int. Cl.[4] A41H *3/00*
U.S. Cl. 33—17 R 15 Claims

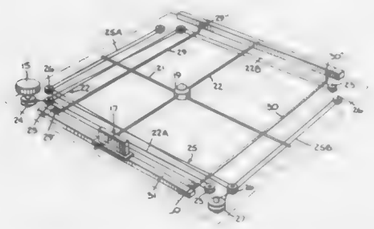


1. In a method of constructing a sleeve, in which an elbow dart is formed inwardly spaced from a side longitudinal line of a length of elongated material having an inclined lower sleeve width at one end thereof, the improvement characterized by:
(i) forming a dart at said apex wherein the arms of said dart form a substantially right angle with
(a) a line intersecting said apex on said side longitudinal line at the rear sleeve cap and
(b) said inclined lower sleeve width,
(ii) determining the mounting point of a sleeve underarm seam to a front armhole of a garment,
(iii) forming the underarm sleeve width so as to have a width of said material projecting beyond said line intersecting said apex of (ia) approximately equal to the width of said sleeve width less a distance approximately equal to said mounting point of the sleeve underarm seam with a garment and the side seam of a garment,
(iv) forming an arcuate rear sleeve head between said (ii) and a seam of the sleeve,
(v) increasing the length of said width of the sleeve at the side opposed to (iv) a distance approximately equal to the length of the mounting point of the sleeve underarm seam to a front armhole of a garment and the side seam of a garment, and
(vi) forming an arcuate front sleeve head adapted to meet the rear sleeve head of said sleeve material when the material is joined together.

4,856,197
DRAWING DEVICE HAVING RETRACTABLE STYLUS
Robert T. Auer, East Stroudsburg, Pa., and Richard J. Mayer, Parsippany, N.J., assignors to Buddy L Corporation, New York, N.Y.
Filed May 13, 1988, Ser. No. 193,879
Int. Cl.[4] B43L *13/00*
U.S. Cl. 33—18.1 8 Claims

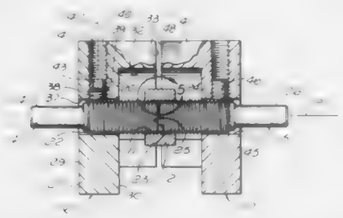
1. A drawing device for producing line drawings or sketches, said device comprising:
(A) a box-like case provided at its top with a transparent screen, said case being partly filled with a slightly adhesive powder that adheres to the undersurface of the screen to render it opaque, which powder can readily be dislodged by shaking the case or respread on the undersurface;
(B) transverse and longitudinal rods disposed within the case;
(C) a stylus mounted for sliding movement at the intersection of the rods;
(D) a first string loop looped about one set of four pulleys anchored on the vase of the case adjacent the corners thereof to define a first pair of parallel string branches, said transverse rod being fastened at its extremities to these first branches;

(E) a first knob on top of said case operatively coupled to said first loop which when turned causes said transverse bar and the stylus borne thereby to shift toward either end of the case, depending on the direction of turning;
(F) a second string loop looped about another set of four pulleys anchored on the base of the case adjacent the corners thereof to define a second pair of parallel string branches at right angles to the first pair of parallel string branches, said longitudinal rod being fastened at its extremities to these second branches;
(G) a second knob on top of said case operatively coupled to said second loop which when turned causes said longitudinal rod and the stylus borne thereby to shift toward either



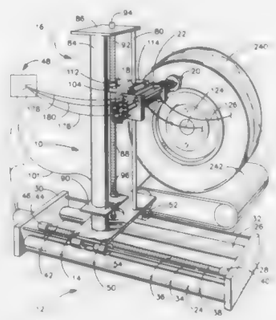
side of the case, depending on the direction of turning, said first and second loops being tensioned to urge said stylus against the undersurface of the screen to draw a line of powder therefrom in a path determined by operation of the knobs; and
(H) an interrupter mechanism within the case manually operated by a single depressible actuator that projects from said case to effect retraction of the stylus to break the traced line as the stylus is being shifted without, however, inhibiting such shifting, said mechanism including means engaging the opposite ends of said rods which when the actuator is manually depressed by an operator acts to depress both ends of said one rod and the stylus borne thereby.

4,856,198
GAUGE FOR INTERNAL THREADS
Mark Hattan, Orange, and Robert G. Dodge, Glendale, both of Calif., assignors to William P. Green, Pasadena, Calif.
Filed May 9, 1988, Ser. No. 191,611
Int. Cl.[4] G01B *3/48, 5/12*
U.S. Cl. 33—199 R **37 Claims**



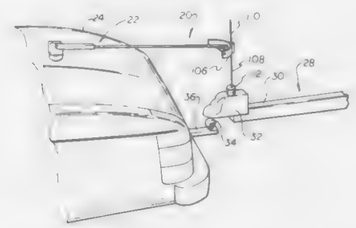
1. A gauge for measuring an internal thread, which thread is formed within a passage in a member and extends along an axis, comprising:
first and second gauge elements having similar external threads adapted to project into said passage along said axis from opposite first and second ends of the passage in threaded engagement with opposite ends respectively of said internal thread;
said gauge elements being free for rotation about said axis relative to one another to threadedly adjust their relative axial positions, and being retained against axial movement relative to one another beyond a predetermined relative axial position;
a first indicator disposed about said first gauge element at a location axially outwardly beyond said first end of said passage and detachably connected to said first gauge element at said location for rotation therewith; and
a second indicator disposed about said second gauge element at a location axially outwardly beyond said second end of said passage and detachably connected to said second gauge element at said location beyond said second end of the passage for rotation therewith;
said indicators extending externally of said passage to positions at which the rotary setting of one can be read against the rotary setting of the other, as a measurement of the functional size of the internal thread.

4,856,199
SINGLE CONTACT POINT DISTANCE MEASURING FOR PLANE DETERMINATION
Marcellus S. Merrill, Denver, and Thomas B. Chapin, Lakewood, both of Colo., assignors to Merrill Engineering Laboratories, Inc., Englewood, Colo.
Filed Feb. 18, 1987, Ser. No. 15,923
Int. Cl.[4] G01B *21/26, 5/24*
U.S. Cl. 33—203.17 **42 Claims**



1. A method useful in measuring alignment parameters of a single wheel rotatable about an axis comprising:
positioning a probe adjacent to a wheel point while the wheel is in a first rotational position, said wheel point being spaced from the axis;
measuring first, second and third quantities using said probe;
determining a first position in space of said wheel point relative to a reference plane using said first, second and third quantities;
rotating the wheel about the axis to a second rotational position while moving said probe to maintain said probe adjacent to said wheel point;
measuring fourth, fifth and sixth quantities using said probe;
determining a second position in space of said wheel point relative to said reference plane using said fourth, fifth and sixth quantities;
rotating the wheel about the axis to a third rotational position while moving said probe to maintain said probe adjacent to said wheel point;
measuring seventh, eighth and ninth quantities using said probe;
determining a third position in space of said wheel point relative to said reference plane using said seventh, eighth and ninth quantities; and
determining quantities related to defining the plane of rotation of the single wheel relative to a reference plane using said first, second and third positions in space.

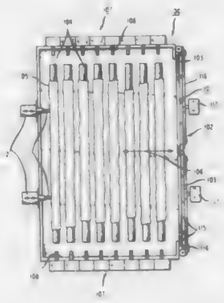
4,856,200
TRAILER HITCH ALIGNMENT DEVICE
Eugene W. Riggs, 12940 Wilson Rd., Coopersville, Mich. 49404
Filed Jun. 24, 1988, Ser. No. 210,861
Int. Cl.[4] G01C *5/00*
U.S. Cl. 33—264 **18 Claims**



1. A trailer hitch alignment device comprising:
a pointing assembly having an elongated pointer, mounting means for mounting said pointer to a rear portion of a vehicle and adjustable coupling means for adjustably coupling said pointer to said mounting means;
said mounting means including a base and attaching means for attaching said base to a surface of a vehicle, said base including first and second opposite side portions, a third side portion between said opposite side portions, a first engagement surface adjacent said first side portion and a second engagement surface on one of said first and second side portions, said attaching means positioned on said third side portion;
said pointer including a neck and an elongated pointing member attached to said neck and extending outwardly along an axis of said neck, said neck including a third engagement surface laterally of said axis;
an elongated extension member having a fourth engagement surface and means opposite said fourth engagement surface for mounting said extension member to said second engagement surface whereby said pointer is capable of being selectively coupled to said mounting means in a first manner in which said third engagement surface engages said first engagement surface and in a second manner in which said neck is fastened with fastening means to said fourth engagement surface; and
a target assembly having a target device configured to be aligned with said pointing member and trailer mounting means for mounting said target device to a trailer.

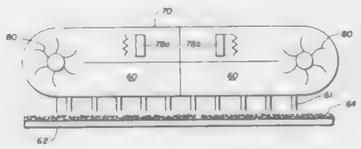
4,856,201
SYSTEM FOR CONDITIONING OF LEATHER HIDES, FURS AND THE LIKE
Jiri Dokoupil, Hochstrasse 9, D-6254 Gückingen, and Thaddaeus Kuzzora, Schoenbornerstrasse 8, D-6251 Flacht, both of Fed. Rep. of Germany
Filed Feb. 12, 1987, Ser. No. 13,737
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1985, 3521061
Int. Cl.[4] F26B *3/34*
U.S. Cl. 34—1 **47 Claims**

1. A method for thermal treatment for animal skin products comprising subjecting an animal skin product to a pressure below atmospheric pressure;
applying an electromagnetic alternating wave field of a frequency from about 0.3 GHz to 30 GHz to the animal skin product in order to dry the animal skin product; moving the animal skin product through the electromagnetic alternating field in a lateral direction; contacting the animal skin product with a moisture sensor for determining the moisture content; and



wherein the measurement sensor touches the leather during the sensing of the moisture.

4,856,202
METHOD AND APPARATUS FOR TREATING ASPHALTIC CONCRETE PAVING MATERIALS
John Radomsky, Cedar Park, Tex., assignor to Cyclean, Inc., Georgetown, Tex.
Filed Mar. 20, 1987, Ser. No. 28,581
Int. Cl.[4] F26B *3/06*
U.S. Cl. 34—10 **8 Claims**

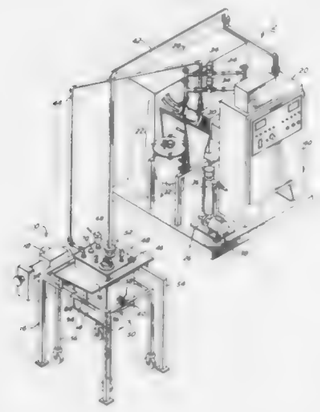


1. Apparatus for removing moisture from reclaimed asphaltic paving (RAP) comprising:
a belt conveyor for carrying a layer of RAP while moisture therein is removed, an air dryer having a plurality of air injection tubes in staggered relationship along the direction of travel of the belt, the tubes being positioned above the belt to blow heated air downwardly onto the layer of RAP, means to heat air being used in the air dryer, means to blow heated air through the tubes at a velocity sufficient to clear the RAP from the belt immediately beneath the tubes and to push the RAP back and forth sideways across the conveyor belt as the belt carries the layer of RAP below the tubes.

4,856,203
MICROWAVE VACUUM DRYER
Scott Wennerstrum, Chicago, Ill., assignor to The Fitzpatrick Company, Elmhurst, Ill.
Filed Jan. 15, 1988, Ser. No. 144,406
Int. Cl.[4] F26B *19/00*
U.S. Cl. 34—68 **22 Claims**

1. A microwave vacuum drying apparatus for drying a product, comprising, in combination:
a source of microwave radiation;
a vertically oriented product drying chamber connected to the source of microwave radiation, with the inlet for the microwaves positioned at the top of the drying chamber, the drying chamber further comprising a lid at the chamber's top and a separable drum attached beneath the lid;
a structure for maintaining a vacuum into the chamber;

a mechanism for mixing the product in the chamber;
a control system for the mixing mechanism, microwave radiation source and vacuum structure; and
a support for the chamber, the support comprising a stand supporting the lid and a rolling cart supporting the drum and the drum is pivotally mounted on the rolling cart,



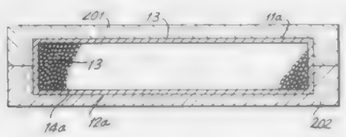
whereby the drum may be loaded or unloaded by rolling the cart away from the stand and pivoting the drum on the cart to dump the product with the support being adapted to move the chamber from a drying position to a discharge position and adapted further to allow the chamber to dump product when in the discharge position.

4,856,204

MICROPOROUS PLATE AND METHOD FOR MANUFACTURING THE SAME AND SUCTION DRIER APPARATUS

Rolf Hindström, Turku, Finland, assignor to Valmet Oy, Finland

Filed Dec. 3, 1986, Ser. No. 937,395
Int. Cl.[4] F26B *19/00*
U.S. Cl. 34—95 19 Claims



1. A microporous filter plate comprising:
a pair of opposed suction walls formed of microporous material defining an interior space between them;
granular material situated in said interior space between said opposed suction walls; and
means for placing said interior space in communication with a negative pressure;
whereby said filter plate is adapted to be brought into association with material to be dewatered, liquid from the material flowing from the material through said microporous suction walls into said interior space and then out from said interior space.

4,856,205

AIR GUIDE BOX FOR THE DRYING SECTION OF A HIGH-SPEED PAPER MACHINE

Richard Meyer, Frickingen; Wolfgang Müller, Giegen, and Helmut Heinzmann, Böhmenkirch, all of Fed. Rep. of Germany, assignors to J. M. GmbH Voith, Heidenheim, Fed. Rep. of Germany

Filed Feb. 29, 1988, Ser. No. 162,114
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1987, 3706542
Int. Cl.[4] F26B *13/04*
U.S. Cl. 34—117 17 Claims



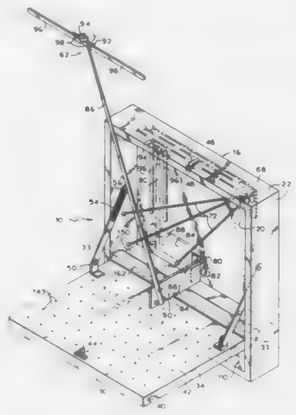
1. An air guide box for the drying section of a high-speed paper machine in which a paper web to be dried meanders in a running direction together with a backing belt configured as a continuous backing belt loop alternately across drying cylinders located outside and inside the backing belt loop, characterized by:
said air guide box extending along a side of said backing belt not covered by the paper web from proximate a departure point where the paper web and backing belt depart from an outside drying cylinder toward an inlet gore located proximate an approach point where the backing belt and paper web run onto a following inside drying cylinder;
said air guide box having a first foil wall which viewed in cross-section extends from an edge on an approach side along the backing belt toward said inlet gore, leaving between the foil wall and the backing belt a first gap which diverges in the running direction of the backing belt;
said air guide box having a second wall located proximate the cylinder surface of said following inside drying cylinder and together there with defines a second gap, said second wall meeting said foil wall in said inlet gore;
said second wall being provided with an air blowing slot proximate the inlet gore having a blowing direction opposite to the running direction of the cylinder surface of said following inside drying cylinder;
a device for stripping the air boundary layer carried by the backing belt provided on said edge of the foil wall on said approach side; and
said foil wall being shaped so as to correspond with the trajectory of the backing belt which, in operation, curves toward the foil wall between said outside drying cylinder and said following inside drying cylinder.

4,856,206

DRYING CENTER

Robert Klein, 1112 Park Ave., Apartment 5C, New York, N.Y. 10028

Filed Nov. 18, 1987, Ser. No. 121,934
Int. Cl.[4] F26B *13/00*
U.S. Cl. 34—151 41 Claims



1. A drying center comprising:
(A) a housing;
(B) means defining a plenum and having a surface defining a plurality of spaced apertures in gaseous communication with said plenum;
(C) means mounting said plenum means on said housing for movement relative to said housing between an operative position wherein at least some of said plurality of spaced apertures are substantially spaced from said housing and a storage position wherein said plenum means acts as a closure for said housing;
(D) an air source for blowing air; and
(E) means for operatively connecting said air source and said plenum means; said connecting means operatively connecting said air source and said plenum means by putting the same in fluid communication when said plenum means is in said operative position and disconnecting the same by interrupting the fluid communication when said plenum means is in said storage position.

4,856,207

SHOE AND GAITER

Ian A. Datson, 68 Caulfield Ave., Cumberland Park, Australia 5041

Filed Mar. 4, 1988, Ser. No. 164,211
Claims priority, application Australia, Mar. 4, 1987, PI0668
Int. Cl.[4] A41D *17/00;* A43B *3/00, 1/14*
U.S. Cl. 36—2 R 9 Claims

1. A shoe and gaiter,
said shoe having a sole, an outer surface, an instep portion, a pair of lacing flaps extending up the instep portion, and lace retention means on the lacing flaps,
said gaiter being of flexible foldable material and having a lower end, an upper end, a vertically extending gusset, and fastener means which, when fastened, closes the gusset to a tubular shape,
a continuous waterproof join between the gaiter lower end and the outer surface of the shoe at the locality of said instep portion and circumscribing the shoe above its sole, said gaiter being sufficiently imperforate between its upper and lower ends that the shoe and gaiter comprise a waterproof combination,



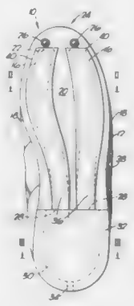
and closure means at the upper end of the gaiter movable to constrict or release the periphery of the gaiter upper end.

4,856,208

SHOE WITH SOLE THAT INCLUDES INFLATABLE PASSAGES TO PROVIDE CUSHIONING AND STABILITY

Carlo Zaccaro, Rome, Italy, assignor to Treshlen Limited, Douglas, United Kingdom

Filed Feb. 9, 1988, Ser. No. 153,937
Claims priority, application United Kingdom, Feb. 16, 1987, 8703555
Int. Cl.[4] A43B *13/20, 21/28*
U.S. Cl. 36—29 14 Claims



1. A shoe which defines a toe end and a heel end and which includes a sole that comprises a body portion which extends from said toe end of said shoe to said heel end and which

defines opposite sides and a bottom surface; elongated first and second inflatable passage means respectively extending along said body portion adjacent said opposite sides thereof, each of said first and second inflatable passage means extending from forward ends which are not interconnected to rearward ends near said heel end of said shoe, thereby providing an elongated recess therebetween which exposes said bottom surface of said body portion; meansn at said heel end interconnecting said rearward ends of said first and second inflatable passage means to enable fluid to flow therebetween when, during use of the shoe, more load is applied on one of said first and second inflatable passage means than the other; and means for supplying fluid to said first and second inflatable passage means.

4,856,209

WALKING SHOE WITH PADDED COLLAR

Arthur Kenyon, Red Wing, Minn., assignor to Red Wing Shoe Company, Inc., Red Wing, Minn.

Filed Sep. 8, 1987, Ser. No. 93,880
Int. Cl.[4] A43B *5/00, 7/14*
U.S. Cl. 36—114 4 Claims



1. Footwear in the form of a shoe comprising a sole assembly and an upper, said upper having a support collar comprising a strip of padding material which is teardrop shaped in the vertical cross section with a wide upper portion and a tapered lower portion, said padding material being adhesively attached to an outer collar mounting strip which is attached to said upper by stitching, said support collar also including an inner rubberized support band overlaying said padding material, and a cloth liner over said rubberized support band, said cloth liner forming an inner shoe lining immediately adjacent to the wearer's foot, said support collar further having opposing forward collar tips with a pair of opposing eyelets placed in said tips, said forward collar tips being located approximately over the region above the intersection of the inferior extensor retinaculum and the deep peroneal nerve, or more generally the upper instep, said eyelets being adapted to receive a lace for securing said support collar in use, and said forward collar tips being extensions of said support collar beyond that portion of the support collar comprising the outer collar mounting strip which is stitched to the shoe upper, wherein said support collar and eyelets provide support and protection for the heel and the ankle, and the forward collar tips conform more closely to various upper instep shapes in cooperation with but substantially separate from the support and protection provided by said upper in said shoe.

4,856,210

CLOSING DEVICE FOR SKI BOOTS AND THE LIKE

Marc Delery, Caluire, France, assignor to Skis Rossignol, France

Filed Jan. 13, 1988, Ser. No. 143,590
Claims priority, application France, Jan. 20, 1987, 87 00743
Int. Cl.[4] A43B *5/04*; A43C *11/00*
U.S. Cl. 36—117 6 Claims

1. A closing device for ski boots and the like, including a strapping (7) comprising a flexible cord (8) in the form of a closed loop, having a first end (10) adjustably secured to a first edge (5) of a collar portion (4) of the boot allowing it to be opened and a second end (14) which is operatively connected to a pivoting lever (9) pivotable about a pivot pin (11) provided on a second edge (6) of said collar portion of said boot allowing it to be opened and to exert a pull to ensure closing of the boot, said pivoting lever (9) being mounted permanently on the boot and having, over its length, a continuous slot (15), in which the



end (10) of the loop (8) on which the pull is exerted slides freely, such that the two ends (10,14) of the flexible cord (8) in the form of a closed loop are kept permanently on either side of the two edges (5,6) of the boot allowing it to be opened and closed.

4,856,211

BICYCLE PEDAL FOOT HOLDER

Steven J. Phillips, 421 Laurel St., Des Moines, Iowa 50314

Filed Oct. 8, 1986, Ser. No. 916,651
Int. Cl.[4] A43B *5/16*
U.S. Cl. 36—131 8 Claims



1. Bicycle pedal foot holder comprising,
a pedal fastener including an adjustable strap adapted to extend completely around a pedal for securing the fastener to a pedal,
a foot fastener including means for securing the foot fastener to a foot, and
coacting flexible (Velcro type) hook and eye gripping elements on said pedal fastener and said foot fastener, said gripping elements being positioned to provide an interface of engagement in a plane between the top of the pedal and the bottom of a foot for releasably connecting a foot to a pedal.

4,856,212

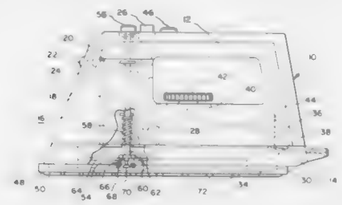
CORDLESS IRON WITH HIGH-TEMPERATURE, NON-SCORCHING SOLE PLATE SURFACE

Joseph Dikoff, 1510 Andalusia Ave., Venice, Calif. 90291

Filed Aug. 8, 1988, Ser. No. 229,712
Int. Cl.[4] D06F *75/18, 75/26, 75/38, 75/40*
U.S. Cl. 38—93 8 Claims

1. A cordless iron, including:
a handle portion;
a body portion connected to said handle portion;
a foot portion connected to said body portion and,
a sole plate connected to said foot portion;
said sole plate carrying, on the exposed surface thereof, a layer of polyimide film;
said body portion of said cordless iron including a main reservoir portion and said foot portion including a secondary reservoir portion selectively hydraulically couplable to said main reservoir portion;
said sole plate having a recess in its non-exposed surface for receiving a heating element;

an axially movable valve-operating shaft carried in said handle portion and in said body portion;
said secondary reservoir portion having an upper wall and a lower wall, said upper wall having an opening therein through which said valve-operating shaft passes centrally;
said valve-operating shaft terminating, at its end proximate to said handle, in an opeating button and, at its other end, in the poppet portion of a poppet valve;
said shaft carrying in a fixed position thereon on the side of said upper wall facing said main reservoir, a gasket-like valve member having a diameter exceeding that of said



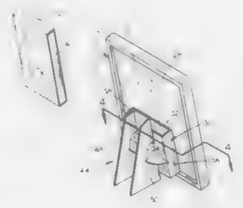
opening, said gasket-like valve member being movable with said shaft into a position to close off said opening;
a seat member for said poppet valve, said seat member being carried by said lower wall in coaxial alignment with said opening in said upper wall, said poppet being spaced from said gasket-like member a distance such that said poppet member moves away from said seat when said gasket-like valve member closes said opening in said upper wall of said secondary reservoir, whereby the contents of said secondary reservoir, only, are discharged into said recess in said non-exposed surface of said sole plate.

4,856,213

COMBINATION PICTURE FRAME AND VIDEO CASSETTE HOLDER

H. S. Hord, Omaha, Nebr., assignor to Micott Corp., Omaha, Nebr.

Filed Feb. 29, 1988, Ser. No. 161,794
Int. Cl.[4] G09F *1/12*
U.S. Cl. 40—152 6 Claims



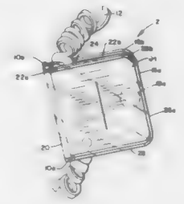
1. In combination,
a picture frame means having rearward and forward sides, an upper end, a lower end, and opposite side edges,
and a video cassette holder on the rearward side of said picture frame.

4,856,214

INFORMATION CLIP-IT

James A. Machen, Plymouth, Minn., assignor to Jamco International, Inc., Eden Prairie, Minn.

Filed Oct. 20, 1987, Ser. No. 51,522
Int. Cl.[4] G09F *3/08*
U.S. Cl. 40—316 19 Claims



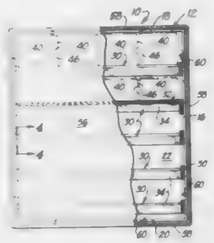
15. An attachable informational device for attachment to an elongated member, said information booklet comprising a plastic holder including pocket means for receiving and displaying printed information inserts, hinge means for foldably connecting portions of said holder such that said holder can be folded along said hinge means and around the elongated member, and attachment means for detachably attaching the portions of said holder which can be folded around the elongated member such that said holder can be attached around said elongated member.

4,856,215

SLIDE SORTERS

Brian L. Tiep, 632 Norumbega Dr., Monrovia, Calif. 91016

Continuation of Ser. No. 44,241, Apr. 30, 1987, abandoned. This application Mar. 28, 1989, Ser. No. 331,067
Int. Cl.[4] G02B *27/02*
U.S. Cl. 40—361 2 Claims



1. A device for use in sorting photographic slides, said device including:
a tray formed of self-supporting, white, opaque light reflective polymer composition, said tray having a bottom plate which has an upper surface and a peripheral wall extending around and upwardly from said bottom plate, said peripheral wall including parallel side walls and aligned holes in said side walls;
holding means for use in holding a series of slides in such a manner that the sequence of said slides can be changed in sorting said slides;
said holding means including a generally U-shaped channel adapted to receive said slides so as to hold said slides, said channel being shaped so that the frames of said slides will fit within said channel so as to be held thereby;
said holding means also including aligned shafts at the extremities of said channel and fitting within said holes,

said shafts serving as a mounting means pivotally mounting said holding means relative to said bottom plate in a position in which it extends transverse to said side walls so that said mounting means can be rotated about an axis extending parallel to said support surface and including

coacting detent means located on said tray and on said holding means for securing said holding means in either a position in which any slides held by said holding means are at an angle of from about 30 degrees to about 60 degrees to said upper surface or a position in which any slides held by said holding means are parallel to said upper surface located on said holding means and on said tray; and

lever means attached to said holding means for use in rotating said holding means,

said upper surface serving to reflect diffused ambient light towards the backs of any slides held by said holding means at an angle to said upper surface so that said slides may be conveniently viewed and sorted.

4,856,216

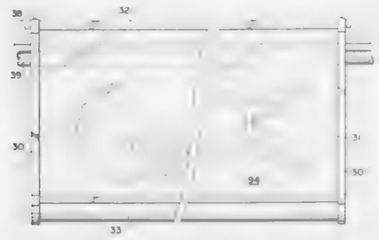
ADVERTISING COVER FOR FLUORESCENT LIGHTING

Jan S. Gross, P.O. Box 5117, St. Augustine, Fla. 32085

Continuation-in-part of Ser. No. 864,548, May 19, 1986, Pat. No. 4,716,671. This application Nov. 27, 1987, Ser. No. 125,946

Int. Cl.[4] G09F *13/02*

U.S. Cl. 40—559 **21 Claims**



1. An advertising cover for use on fluorescent lighting fixtures comprising a pair of triangular end caps, two upper corner spacer members, a lower corner spacer member, and a pair of flexible transparent sheets of plastic; each said end cap having an inside surface, an outside surface, a top edge, two side edges, two upper angular corners, and a smoothly rounded lower corner forming the general shape of a triangle, a generally rectangular cutout portion extending from the central portion of the top edge toward said lower rounded corner, said two side edges having a right angle flange portion extending inwardly from said inside surface, two parallel channel recesses extending substantially the entire length of each said side edge to form an inside channel recess and an outside channel recess, and said outside recess extending around said rounded corner; a pair of horizontally slidable supporting members mounted on each side of said cutout portion adjacent said top edge, each said member having a finger extending laterally along said top edge; said upper corner spacer members being elongated straight rods having two parallel longitudinal channel recesses to connect the respective channel recesses on the side edge of said end caps; said lower corner spacer member being an elongated trough shaped structure having the general cross-sectional shape of said rounded corner of said end cap with each edge of said structure including two parallel channel recesses to connect the respective channel recesses on the side edge of said end cap; said flexible transparent plastic sheets having an inside surface and an outside surface and being of a size to slide in the outside one of said channel recesses of said end caps, said upper corner spacer members, and said lower corner spacer member; said end cap having an elongated slotted passageway through said end cap coextensive with one inside channel recess and adapted to receive a sheet with advertising material printed thereon to slide therethrough and be retained by said inside channel recess of said end caps, said upper corner spacers, and said lower corner spacer.

4,856,217

CARTRIDGE FEEDING ASSEMBLY FOR SMOOTH-BORE GUNS WITH SEMIAUTOMATIC OR PUMP OPERATION

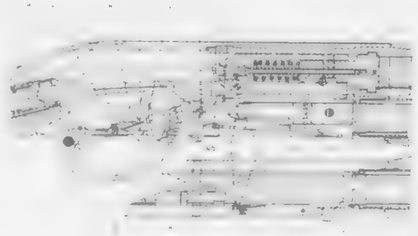
Paolo Benelli, Pesaro, Italy, assignor to Benelli Armi S.p.A., Urbino, Italy

Filed Feb. 19, 1988, Ser. No. 157,844

Claims priority, application Italy, Mar. 12, 1987, 44099 A/87

Int. Cl.[4] F41C *13/00*

U.S. Cl. 42—17 **7 Claims**



1. A cartridge feeding assembly for delivering cartridges from a tubular magazine into the barrel of a smoothbore firearm having a casing, a bolt slidable with respect to said casing, a cocking rod acting on said bolt, a lifter cup for the cartridge, a hammer and a trigger, and feeding assembly further comprising:

a cartridge descent lever pivoted on said casing, and having a first leg directed toward said cartridge magazine and having a nose, and an integral second leg directed away from said magazine;

a spring mounted on said casing and normally biasing said descent lever to a rest position;

a cartridge stop lever pivoted on said casing and having a nose interacting with said nose of said descent lever so that said stop lever retains a cartridge in said magazine while said descent lever is in said rest position and allows the cartridge to slide out of said magazine when said descent lever swings away from said rest position;

a first control member and a second control member provided on said descent lever;

first means operatively connecting said trigger to said first control member of said descent lever;

second means operatively connecting said bolt to said second control member;

said first means acting on said first control member to swing away said descent lever from said rest position upon acting on said trigger;

said second means acting on said second control member to swing away said descent lever from said rest position upon acting on said cocking rod.

4,856,218

LIGHT BEAM ASSISTED AIMING OF FIREARMS

Edward C. Reynolds, Jr., Anaheim, Calif., assignor to Laser Products Corporation, Fountain Valley, Calif.

Division of Ser. No. 941,307, Dec. 19, 1986, Pat. No. 4,777,754. This application Aug. 17, 1988, Ser. No. 233,712

Int. Cl.[4] F41G *1/34*

U.S. Cl. 42—103 **20 Claims**

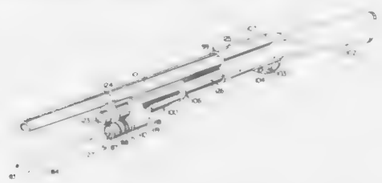
1. In apparatus including a flashlight for throwing a light beam assisting the aiming of a firearm having a barrel and a fore-end assembly

different from said barrel, the improvement comprising in combination:

a lamp and reflector assembly for throwing said light beam upon electric energization of a lamp in the lamp and reflector assembly;

a hand grip having an elongate aperture for receiving part of said fore-end assembly;

a battery housing for mounting said lamp and reflector assembly below said barrel, said battery housing being integral with said hand grip at a front portion thereof, as seen from a muzzle of said firearm, but offset non-coaxially from said elongate aperture and from said fore-end assembly when said part of the fore-end assembly is received in said elongate aperture of said hand grip;



means for attaching said hand grip to said fore-end assembly;

an electric circuit for electrically energizing said lamp from an electric battery, including an electric on-off switch; and

means in said battery housing for receiving said electric battery and for providing said electric energization of the lamp upon closure of said switch.

4,856,219

FISHING FLOAT

Marcus W. Severance, 1911 Martha Berry Dr., Knoxville, Tenn. 37918, and Aaron A. Kirby, 5531 Pinecrest Rd., Knoxville, Tenn. 37912

Filed Dec. 16, 1988, Ser. No. 285,115

Int. Cl.[4] A01K *93/00*

U.S. Cl. 43—17.5 **11 Claims**



1. A fishing float for releasably engaging a fishing line and for floating on the surface of water so as to maintain said line at a preselected depth and/or signal a pull on said fishing line, said fishing float comprising:

a first buoyant member for floating on said surface of said water, said first buoyant member having a first end portion;

a second buoyant member for floating on said surface of said water, said second buoyant member having a first end portion; and

a locking stem for releasably joining said first end portions of said first and second buoyant members, whereby said line is received about said locking stem, and releasably secured between said first end portion of said first buoyant member and said first end portion of said second buoyant member wherein each said buoyant member included a bulb defining a cavity therein and an opening accessing said cavity, and also includes a boot member having a rearward end portion for being releasably received in said opening in said bulb, said boot member defining an aperture for force fit reception of said locking stem.

4,856,220

RETAINER CAP FOR SPINNING ROD HOLDER

Reginald O. Oak, 290 Somerset Ave., Fairfield, Conn. 06430, and William J. Preinsberger, P.O. Box 1731, Darien, Conn. 06820

Filed Jan. 3, 1989, Ser. No. 292,907

Int. Cl.[4] A01K *97/00*

U.S. Cl. 43—21.2 **16 Claims**



1. A spinning rod retainer cap for use in combination with a tubular rod holder for receiving and holding a spinning rod having a reel supported on the handle thereof by the reel's integral base and mounting strut, the retainer cap comprising:

(A) a cylindrical skirt sized to fit over and frictionally engage with the tubular rod holder with the upper end of the skirt adjacent the mouth of the tubular rod holder;

(B) a plurality of resilient fingers extending inwardly from the upper end of the skirt, the tips of the resilient fingers defining an entry opening into the tubular rod holder; and

(C) two retainer posts respectively integrally formed extending upwardly from adjacent resilient fingers, the two retainer posts being spaced apart to define a notch for accommodating the mounting strut of the reel;

whereby when the retainer cap is mounted on the rod holder and the handle of the rod is inserted through the entry opening, the resilient fingers deflect downwardly to accept and grip the rod handle and the retainer posts incline toward the rod handle, thereby forming the notch into a triangular configuration which accepts and holds the reel strut.

4,856,221

FISHING ROD HOLDER

David M. Thompson, 834 Mantoloking Rd., Brick Town, N.J. 08723

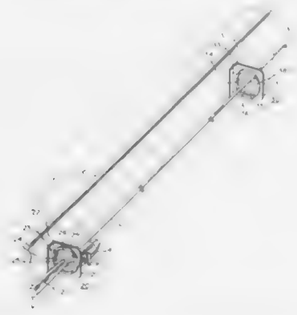
Filed Jan. 12, 1989, Ser. No. 296,030

Int. Cl.[4] A01K *97/10*

U.S. Cl. 43—21.2 **4 Claims**

1. A fishing pole holder comprising a pair of units mounted on a relatively flat surface; the spacing of said units being less than the length of said fishing pole; each of said units comprising a flange having a means for mounting on said surface; each of said flanges supporting a bracket at substantially right angles to said surface; each of said brackets having a central opening; each of said central openings supporting a resillient diaphragm with a centrally-located hole, and radial cuts from said centrally-located hole to the edges of said central openings; and means

for securing said resilient diaphragms to said brackets; said radial cuts permitting said flexible diaphragm to expand to



accomodate and secure each end of said fishing rod in a cushioned manner.

4,856,222

REMOTELY CONTROLLED FISHING APPARATUS

Michael E. Hannam, 7 Creighton Street, Orillia, Ontario, Canada L3V 1A9

Filed Oct. 31, 1988, Ser. No. 264,974
Int. Cl.[4] A01K *93/00*
U.S. Cl. 43—26.1 2 Claims



1. A fishing apparatus which comprises:

a bouyant hull in turn comprising:

integrally formed wall members defining a compartment and a deck member removably secured to said wall members to provide a closed water-tight compartment and in which said deck member is defined exclusively by outer surfaces facing upwardly and outwardly thereby to permit free movement across said deck member of a fishing line;

propulsion means on said hull for propelling said hull through a body of water;

drive means associated with said propulsion means for causing operation thereof;

drive control means associated with said drive means for controlling operation thereof;

drive signal-receiving means associated with said drive control means and operative to receive a radio drive signal from a transmitter means disposed at a position distanced from said hull and, in response to such a drive signal to control operation of said drive control means;

steering means for controlling the direction of movement of said hull through a body of water;

steering control means associated with said steering means for controlling operation thereof;

steering signal-receiving means associated with said steering control means and operative to receive a steering radio signal from a transmitter means disposed at a position distanced from said hull and, in response to such a steering signal, to control operation of said steering control means, and in which said drive means, said drive control means, said drive signal-receiving means, said steering control means, and said steering signal-receiving means are disposed within said compartment;

a mast mounted on said deck member and extending upwardly therefrom;

a fishing line attachment means rotatably mounted on said mast at an upper end thereof for unrestricted rotation relative thereto and for releasably engaging a fishing line between ends thereof, adapted to release said fishing line when a predetermined force is applied through said fishing line to said attachment means and in turn comprising:

a generally cylindrical member pivotally mounted for movement downwardly from an engaged position in which it extends upwardly and outwardly with respect to said mast to a released position in which it extends generally downwardly, said cylindrical member being adapted to have a fishing line wound therearound when such fishing line is releasably engaged thereby; and

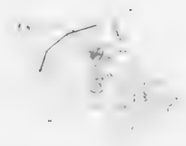
retention force adjusting means whereby the attachment means can be adjusted to vary the predetermined force necessary to be applied thereto through a fishing line to cause release of such a fishing line from said attachment means.

4,856,223

FISHING LURE

Steven C. Evans, 10297 NW. 17th St., Coral Springs, Fla. 33065

Continuation-in-part of Ser. No. 586,882, Mar. 19, 1984, abandoned, which is a continuation of Ser. No. 213,329, Dec. 5, 1980. This application Nov. 13, 1985, Ser. No. 797,782
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42 3 Claims





1. A method of mating a first quantity of plastisol and a first material with a first and a second side having a plurality of pores or fibers so as to prevent additional plastisol from saturating said first material during a mold filling stage wherein the mated plastisol and first material are further mated to an additional quantity of plastisol, said additional quantity of plastisol being connected exclusively to said first quantity of plastisol, there being left over a remaining portion of said first material being in a natural state and forming a natural side away from said additional quantity or plastisol, comprising the steps of:

providing said first material;

providing plastisol material and a transfer means for placing said plastisol material on the first side of said first material;

relatively moving said first material and said transfer means;

controlling the quantity of said plastisol material placed on the first side of said first material;

setting said plastisol material after it penetrates said first material to prevent total penetration to keep the second side of said first material in its pre-penetration state and to make the first side a common plastisol bonding surface and prevent further penetration of the first material by additional plastisol material during the mold filling stage;

adding additional plastisol material to said common plastisol bonding surface;

drying and cooling a combination of said first material, and said additional plastisol material;

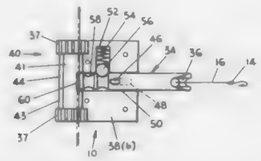
the mold filling stage is comprised of placing said first quantity of plastisol and said first material into a mold of a fishing lure of the type used for fishing, the natural side of said first material being positioned in facial contact with the inner surface of the mold, and thereafter introducing an additional quantity of plastisol into said mold, wherein the placement of said first material in facial contact with said mold together with a pre-set layer of plastisol connected to the first side of said first material precludes further interaction of the plastisol with said first material.

4,856,224

FISHING RIG RETAINER

Harold L. Fincher, Sr., 204 E. 24th St., Holland, Mich. 49423

Filed Dec. 18, 1987, Ser. No. 134,961
Int. Cl.[4] A01K *91/04*
U.S. Cl. 43—43.12 5 Claims



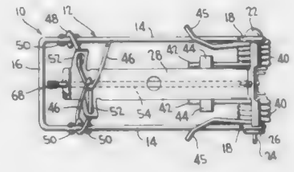
1. A fishing rig retainer means for installing a secondary fishing rig and hook to a primary fishing line, the fishing rig retainer means comprising a retention means slidably mounted for movement along the primary fishing line and a connection means for attaching the secondary fishing rig to the retention means, the connection means being movably mounted in the retention means between a retained position, where the connection means cause hc retention means to be held on the primary fishing line at a given longitudinal position on the primary fishing line, and a released position, where the retention means can slide freely along the primary fishing line, the connection means moving from its retained position to its released position by the exertion of a pull on the secondary fishing rig with a predetermined force representative of a fish on the secondary fishing rig, the retention means comprising a body with an internal opening therethrough, the primary fishing line extending through the internal opening, and the connection means comprising a plunger slidably mounted within the body and longitudinally movable in a transverse direction relative to the direction of the fishing line as it extends through the internal opening, the plunger being movable between a retained position, wherein an inner end of the plunger extends into the slot so as to engage the primary fishing line and hold it in a fixed position with respect to the fishing rig retainer means, and a released position, wherein the plunger is withdrawn from the primary fishing line holding position, the plunger being resiliently held in place when in its retained position, the secondary fishing line being attached to the connection means such that a pull on the secondary fishing rig representative of a fish taking the hook on the secondary fishing rig causes the plunger to move from its retained position to its released position, releasing the primary fishing line such that the fishing rig retainer means can slide along the primary fishing line, the slidable plunger having an exterior end opposite the inner end, the exterior end protruding out of the body and having attachment means thereon for fastening the secondary fishing rig to the plunger, the plunger having a pair of axially spaced detents therein and the body including an outwardly biased projection mounted transversely to the detents for engaging either detent, depending on the axial position of the plunger, the projection resiliently holding the plunger in its retained position when engaging one detent and holding the plunger in tis released position when engaging the other detent.

4,856,225

GOPHER TRAP

Joseph A. Radesky; Carl B. Brandt, both of Lititz, Pa.; Gerald A. Thomas, Elkins, W. Va., and William E. Aksins, Lititz, Pa., assignors to Woodstream Corporation, Lititz, Pa.

Filed Aug. 19, 1988, Ser. No. 234,079
Int. Cl.[4] A01K *23/26*
U.S. Cl. 43—81 9 Claims



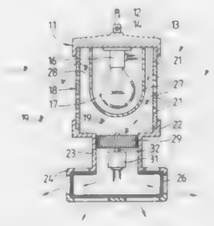
1. A rodent trap comprising an elongate base frame having a proximal end and a distal end with a cross member at the distal end, jaw means mounted on the base frame for movement from an open position when the trap is set to a closed position when the trap is sprung, jaw actuator means mounted on the base frame for moving the jaw means between said positions, spring means connected between the base frame and the actuator means forcibly urging the actuator means to retain the jaw means in the closed position, settable trigger means associated with the actuator means for engaging a part of the base frame when set and holding the actuator means in a condition retaining the jaw means in the open position in opposition to the spring means, and trigger release means for disengaging the trigger from said part of the base frame thereby springing the trap, the release means comprising a trigger pan pivotly mounted about a transverse axis at the proximal end of the base frame, the trigger means comprising a trigger rod attached to the pan and extending lengthwise of the trap, the trigger rod having distal end portion for engaging under said cross member to set the trap by forward tilting of the pan and for being disengaged from under said cross member to spring the trap when the pan is tilted rearwardly by a rodent.

4,856,226

VACUUM INSECT ERADICATION DEVICE

Adoyal Taylor, Fulton, Miss., assignor to A. Q. Oldacre, Somerville, Ala.

Filed Jul. 11, 1988, Ser. No. 217,623
Int. Cl.[4] A01M *1/04, 1/06, 1/08*
U.S. Cl. 43—113 15 Claims

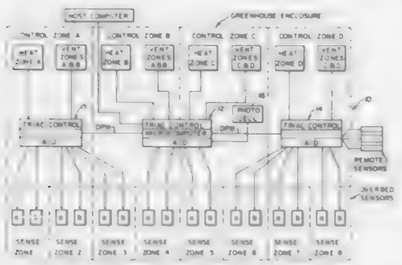


1. Apparatus for insect eradication comprising:

(a) an upper chamber with walls of transparent material, said

walls having multiple orifices of sufficient diameter to permit passage of insects therethrough;
(b) luminescent means within said upper chamber for attraction of insects into a predetermined zone proximal said orifices;
(c) vacuum means for creation of sub-atmospheric pressure within said upper chamber such that insects located within said predetermined zone are entrained in an airflow through said upper chamber and vacuum means;
(d) a lower pervious collection chamber positioned distal said upper chamber for receipt of exhausted airflow and the contents thereof from said vacuum means.

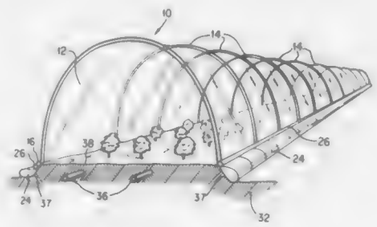
4,856,227
PLANT ORIENTED CONTROL SYSTEM BASED UPON VAPOR PRESSURE DEFICIT DATA
James R. Ogievee, and Kirk A. Ogievee, both of Connellsville, Pa., assignors to OCS, Inc., Connellsville, Pa.
Continuation-in-part of Ser. No. 919,702, Oct. 16, 1986. This application Feb. 16, 1988, Ser. No. 156,418
Int. Cl.[4] B01F *3/02*; A01G *9/00*
U.S. Cl. 47—17 **15 Claims**



1. A method for automatically applying water to a crop bed in a greenhouse comprising the steps for:
(a) continuously at spaced intervals gathering temperature data directly above the bed for estimating the vapor pressure of crop leaf water;
(b) continuously at spaced intervals gathering data for estimating the vapor pressure of the atmosphere directly above the bed;
(c) continuously calculating vapor pressure deficit from the data gathered in steps (a) and (b) and accumulating said data;
(d) establishing a factor indicative of leaf area;
(e) establishing a vapor pressure deficit accumulation threshold for initiating supply of water based upon the factor established in step (d); and
(f) when the accumulation determined in step (c) reaches the threshold, supplying water to said crop bed.

4,856,228
TUNNEL SYSTEM FOR CARE OR SEEDS, PLANTS AND THE LIKE
Clell Robinson, Sr., 2262 SE. 150th St., Summerfield, Fla. 32691
Continuation of Ser. No. 796,294, Nov. 8, 1985, abandoned. This application Dec. 4, 1987, Ser. No. 129,871
Int. Cl.[4] A01G *13/04*
U.S. Cl. 47—29 **5 Claims**

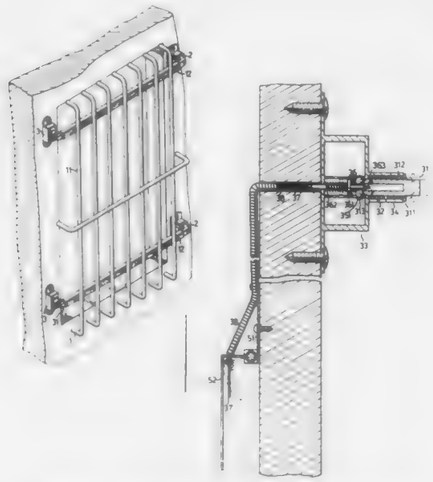
1. An air supported tunnel system for protecting soil rows of planted items by providing a cover thereover, said tunnel system comprising a one piece tunnel cover adapted to extend over a longitudinally extending soil row, said cover being formed from a single sheet of plastic material and defining a tunnel of generally semi-circular cross section, a pluality of longitudinally spaced air ribs formed in and constituting a part of said cover and extending from end to end of th cross section of the cover to act as tunnel supports when inflated, an air channel connected to the tunnel cover along one side thereof, said air channel being in fluid communication with each air rib whereby pressurized air may be supplied through said air channel to inflate the air ribs to maintain the tunnel system in erected condition; a water ballast assembly connected to each longitudinal side of the tunnel cover independent from the air



channel, said water ballast assembly comprising a water channel connected to the longitudinal side of the cover, a plurality of ballast chambers in fluid communication with each water channel whereby water may be fed through the water channel into each ballast chamber so as to maintain the tunnel cover in place over the row of planted items.

4,856,229
WINDOW GRILLE LATCH DEVICE
Ray L. Tseng, Changhua Hsien, Taiwan, assignor to Chuan Erh Industrial Co., Ltd., Chang Hua Hsien, Taiwan
Filed May 20, 1988, Ser. No. 197,093
Int. Cl.[4] E06B *3/68*
U.S. Cl. 49—56 **3 Claims**

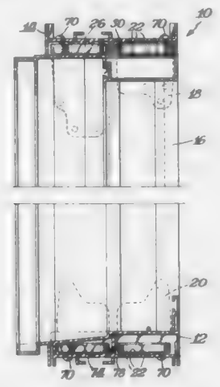
1. A window grille latch device for a grille affixed on a wall adjacent to a window, comprising:
an arm engaged with the grille, said arm including a hollow tube member extending substantially perpendicular to the plane of the grille, said hollow tube member having a pair of holes adjacent to an end of said hollow tube member furthest from the plane of the grille; a pair of balls received in said holes of said hollow tube member; and a first spring encompassing said hollow tube member; and
a latch housing assembly affixed on the wall, said housing assembly including a housing having a rear wall; an inner hollow tube extending substantially perpendicularly away from the rear wall; an outer hollow tube co-axial with said inner hollow tube and extending away from the rear wall further than said inner hollow tube, said inner hollow tube being provided with a recess; and a slide bar in said housing, said slide bar including a front portion with a tapered end, an intermediate portion including an exterior flange, and a rear portion inserted through said rear wall of said housing and connected with a cable which has a protective cover; and a second spring encompassing said rear portion of said slide bar;
said hollow tube member being insertable into said outer hollow tube and said inner hollow tube, and when thusly inserted, said hollow tube member receiving said front portion of said slide bar, said exterior flange of said hollow tube contacting an outer end of said outer hollow tube, said ribs further providing a snug seating of said corner keys into said frame pieces.



and said balls being forced by said slide bar to move into said recess of said inner hollow tube.

4,856,230
ULTRA SOUND WELDED WINDOW FRAMES
Leon Slocomb, Wilmington, Del., assignor to Slocomb Industries, Wilmington, Del.
Filed May 31, 1988, Ser. No. 200,352
Int. Cl.[4] E06B *1/04*
U.S. Cl. 49—504 **15 Claims**

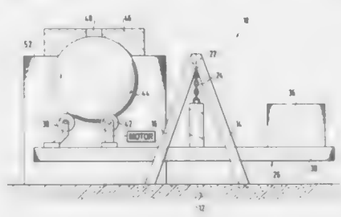
1. A window frame comprising four perpendicularly disposed hollow extruded plastic frame pieces, a corner key located at the corner of each pair of adjacent frame pieces, each of said corner keys comprising a support member having at least one set of extensions arranged perpendicularly to each other, each of said extensions being inserted into a respective frame piece, raised ribs are provided on the inner surface of each frame piece in contact with said extensions and said frame pieces and said extensions being secured together by an ultra-



sound weld, said ribs comprising material to assure a proper weld by spreading under the influence of the ultra-sound, and

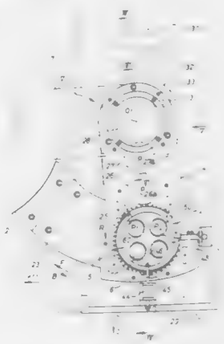
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4,856,231
MACHINE FOR GRINDING LARGE BALLS
Josef Kusser, Renbolding 29, 8359 Aicha v. W. Ndb., Fed. Rep. of Germany
Filed Jun. 27, 1988, Ser. No. 212,382
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1987, 3721592
Int. Cl.[4] B24B *5/00*
U.S. Cl. 51—129 **14 Claims**



1. A machine for grinding large balls, particularly natural and artifical stone, comprising:
a frame,
a support carried freely movable on the frame via flexible connecting elements,
a disk-shaped grinding tool arranged vertically above a ball blank to be ground,
rolling bodies arranged on the support, the ball blank being rollingly mountable on the rolling bodies, said rolling bodies comprising three rollers each having an axis of rotation, one of said three rollers being constructed as a guiding roller and being mounted on said support to be pivotable about a second axis askew with respect to its axis of rotation,
means for driving at least one of said rollers, and
means engaging said support for producing grinding pressure between the ball blank and the grinding tool.

4,856,232
WORKPIECE CARRIER MEANS FOR SURFACE GRINDING MACHINE
Hikaru Shirai, Itami, Japan, assignor to Daisyo Seiki Kabushiki Kaisha, Osaka, Japan
Filed Aug. 11, 1987, Ser. No. 83,999
Claims priority, application Japan, May 7, 1987, 62-111590
Int. Cl.[4] B24B *47/02*
U.S. Cl. 51—215 AR **4 Claims**



1. A workpiece carrier for a surface grinding machine having spaced, opposed grinding wheels, comprising a revolving

workpiece holder revolvably installed adjacent a tip end of a carrier arm for rotation on said carrier arm around the axis of said workpiece holder; a plurality of workpiece pockets passing through said workpiece holder, said pockets being equally spaced from the axis of rotation of said workpiece holder on said carrier arm and equally spaced from each other around said axis of rotation; said carrier arm being movable in a rockable manner within a range from a grinding position between said grinding wheels to a setting position spaced from said grinding wheels; an automatic limited revolution mechanism for stopping the revolution of said workpiece holder at a specified angular spot in said setting position of said carrier arm; a rockable loading arm and a rockable unloading arm each having plural workpiece holding members in an arrangement corresponding to a workpiece pocket arrangement at said specified angular spot; and plural workpieces simultaneously loaded on and unloaded from said workpiece holder in said setting position by means of said loading arm and said unloading arm, respectively.

4,856,233

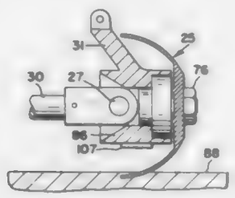
METHOD FOR SAMPLING A WORKPIECE

David W. Mercaldi, Sudbury, Mass., assignor to Failure Analysis Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 17,632, Feb. 24, 1987. This application Oct. 17, 1988, Ser. No. 258,471

Int. Cl.[4] B24B *19/00;* **G01N** *1/04*

U.S. Cl. 51—281 R **17 Claims**



1. A method of cutting from a workpiece to be sampled relatively small, preselected portion of the surface or surface and substrate of said workpiece and for retrieving said preselected portion for analysis apart from said workpiece without creating any substantial increase in stress in said workpiece whereby insufficient damage is caused to said workpiece to be detrimental to its continued use, the steps comprising:

locating a cutting means adjacent said preselected portion of the surface or surface and substrate of said workpiece to be sampled,

driving said cutting means so as to enable it to cut said workpiece when brought into contact therewith,

articulating said cutting means into contact with said workpiece,

cutting said relatively small, preselected portion of the surface or surface and substrate from said workpiece by driving said cutting means while articulating said cutting means through a single arcuate path, thereby creating a relatively shallow, smooth depression in said workpiece, and

retrieving said preselected portion for analysis after said cutting means separates said preselected portion from said workpiece.

4,856,234

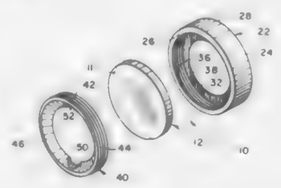
OPTICAL LENS MANUFACTURING APPARATUS AND METHOD

Gary D. Goins, St. Petersburg, Fla., assignor to Research Machine Center, Inc., Grand Rapids, Mich.

Filed Feb. 26, 1988, Ser. No. 160,678

Int. Cl.[4] B24B *13/00, 13/005, 31/00*

U.S. Cl. 51—284 R **31 Claims**



1. A carrier for holding an optical lens blank having a central area and a periphery while optical surfaces are formed on the blank, said carrier comprising:

a rigid body having an outer peripheral surface, first and second spaced end surfaces, and an inside surface defining an aperture extending through said body on an axis, said outer peripheral surface and said spaced end surfaces being adapted to accurately locate said carrier on a tool for machining the lens blank surfaces;

lens blank holding means mounted on said rigid body for holding at least portions of the periphery of a lens blank within said body, said lens blank holding means extending axially toward the exterior of said rigid body no further than flush with one of said end surfaces when mounted on said rigid body;

said carrier being reversible to allow use of each of said spaced end surfaces for locating said carrier on a tool for machining the lens blank surfaces and to allow access to the central lens blank area from adjacent each end surface without removing said lens blank holding means from said rigid body such that opposite surfaces of the central area of the lens blank are exposed and accessible when said carrier is reversed for performing operations to form optical surfaces on the lens blank.

4,856,235

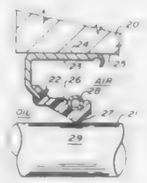
METHOD OF MAKING A BI-DIRECTIONAL WEAR SLEEVE

Robert N. Haynie, Northville, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Continuation of Ser. No. 939,246, Dec. 8, 1986, abandoned, which is a continuation of Ser. No. 556,629, Nov. 30, 1983, abandoned. This application May 3, 1988, Ser. No. 191,753

Int. Cl.[4] B24B *5/00*

U.S. Cl. 51—289 R **16 Claims**



1. A method for making a cylindrical surface which is substantially directionally evenly balanced hydrodynamically when rotated in either direction and can be used as a hydrodynamically neutral contacting surface in engagement with a radial lip oil seal, comprising:

balancing a clockwise set of microabrasions produced during preparation of said surface with counterclockwise set of microabrasions, said sets of microabrasions having approximately equal magnitudes and approximately equally opposed inclined directions so as to neutralize hydrodynamic pumping created by relative rotation between said seal and said surface, wherein said balancing comprises grinding said surface by moving a grinding apparatus relative to said surface, first in one direction to form one of said sets of microabrasions and then in an opposite direction to form the other set of microabrasions while keeping speeds and grinding conditions substantially the same.

4,856,236

ROOF STRUCTURE

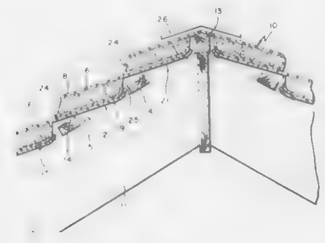
Geoffrey C. Parker, Warwick, Bermuda, assignor to Parker Limited, Warwick, Bermuda

Continuation of Ser. No. 934,645, Nov. 25, 1986, Pat. No. 4,741,131. This application Jan. 12, 1988, Ser. No. 143,004

The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

Int. Cl.[4] E04D *1/28, 13/00*

U.S. Cl. 52—11 **5 Claims**



1. Roof structure for use on a building having rafters sloping downwardly from a ridge and having purlins connecting the upper surfaces of the rafters, comprising:

a series of elongated plank elements extending across several of the rafters and parallel to the purlins, each plank element having a main body of generally rectangular cross-section formed with a water-impermeable skin enclosing a light-weight interior mass, each plank having a thin tail member extending from one edge and constituting an extension of an upper flat surface, the main body of each upper adjacent plank element resting on the tail member of its next lower adjacent plank, wherein the plank elements adjacent the ridge are bridged by a ridge element of tent-like configuration.

4,856,237

MULTIFUNCTION ROOF EDGER

Frank T. Wigle, Ste. 502, Bartlett Bldg. 76 University W., Windsor, Ontario, Canada N9A 5N7

Filed Jul. 13, 1988, Ser. No. 218,811

Int. Cl.[4] E04D *13/06*

U.S. Cl. 52—12 **12 Claims**

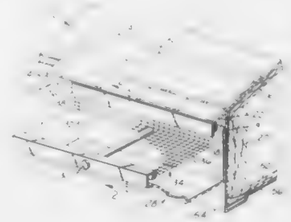
1. A multifunction roof edger comprising:

an inclined mounting portion for mounting fixedly atop roof sheathing and being longitudinally coextensive with a roof edge, said inclined mounting portion extending laterally and inwardly with respect thereto, said inclined mounting portion thereby also functioning both as flashing and as a shingle starter;

a vertical mounting portion for mounting fixedly to a roof fascia board, said vertical mounting portion depending from said inclined mounting portion along a line closely paralleling the roof edge and being disposed obtusely with respect to said inclined mounting portion, said vertical mounting portion thereby also functioning as flashing;

an overhang portion connected to said inclined mounting portion and to said vertical mounting portion along the line of intersection therebetween and extending laterally and outwardly with respect to the roof edge to form an overhanging drip edge to keep water draining from the roof away from the roof fascia board, the outermost edge of said overhang portion functioning also as a shingle aligning guide;

an attachment flange connected to and depending substantially vertically from the outer edge of said overhang



portion, said attachment flange having at least one latching member for attaching accessories thereto; and

an elongated screening member for mounting atop an associated eavestrough said screening member having a reticular or perforated portion for allowing the passage of water therethrough while prohibiting the passage of objects that might clog the eavestrough, said screening member having, along the edge thereof nearest to the fascia board, at least one inner connector removably connectable to said latching member of said attachment flange, and said screening member having, along the edge thereof farthest from the fascia board, at least one outer connector removably connectable to the outer lip of the eavestrough.

4,856,238

PREFABRICATED PART FOR CONSTRUCTING A BUILDING AIR-CONDITIONED VIA ITS WALLS

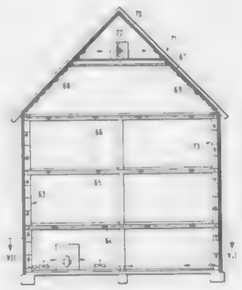
Lorenz Kesting, Holzheck 21, 4600 Dortmund-Eving, Fed. Rep. of Germany

Division of Ser. No. 737,740, May 28, 1985, Pat. No. 4,715,163. This application Dec. 7, 1987, Ser. No. 129,045

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1985, 3505841

Int. Cl.[4] E04C *1/40;* **E04B** *2/42;* **E04F** *17/04*

U.S. Cl. 52—90 **12 Claims**



1. A prefabricated element for constructing a wall of a build-

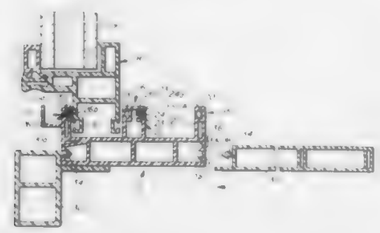
ing, the wall having a fluid medium flowing therethrough for altering or maintaining the temperature within the building, said element comprising a brick-like element having dimensions in excess of those of a standard brick; said element having at least two spaced passages therewithin, said passages forming sections of vertical conduits for the medium when said element is incorporated in a wall, said passages being of a truncated conical configuration so that the small opening is at the upper end of the section and the larger opening is at the lower end of the section when the element is incorporated in a wall, each of said passages being spaced from the adjacent side of said element running parallel thereto by a distance approximately equal to one half its distance from the other passage and the spacing between said passages is the sum of the distances from said sides plus the width of a joint between the sides of adjacent elements when incorporated in a wall; said element having generally semicircular depressions in the surfaces of the element extending normal to said passages, said depressions intersecting the openings of said passages in said surfaces and forming sections of horizontal conduits for the medium when said element is incorporated in a wall; said element having a substantially homogeneous thermal insulating plate attached to one side thereof and covering the entire area of said side.

4,856,239

WINDOW FRAME MEMBER OR RIGID PLASTICS MATERIAL

Glenn R. Elsasser, Winnipeg, Canada, assignor to Western Profiles Limited, Winnipeg, Canada

Filed Mar. 9, 1988, Ser. No. 166,126
Claims priority, application Canada, Mar. 17, 1987, 532218
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—98 **6 Claims**



1. A window frame member formed as an extrusion of a rigid plastic material, said frame member having a hollow space partly defined by a wall portion including two opposed, undercut lips having inwardly facing surfaces and a web interconnecting said lips and meeting each of said lips at a junction line; and wherein an internal groove is provided along each said junction line of the web with said lips so that said grooves provide lines of severance allowing already removal of the web to provide a slot between the edges of the lips, whereby said inwardly facing surfaces of said undercut lips may be used to retain an additional window frame part, and wherein said web and adjacent parts of said lips have a smooth, uninterrupted exterior surface.

4,856,240

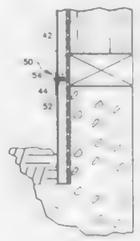
METHOD FOR FORMING A SOIL MOISTURE BARRIER IN A STUCCO WALL AND STUCCO WALL INCORPORATING SAME

James J. McHale, 1207 Branding Iron Clr., Vista, Calif. 92083

Filed Apr. 11, 1988, Ser. No. 179,975
Int. Cl.[4] E02D *27/48*
U.S. Cl. 52—169.14 **23 Claims**

14. In a building having a stucco wall formed of a layer of stucco formed upon a lath layer wherein said stucco layer contacts soil, a moisture shield for preventing the upward migration of water-borne minerals and salts from said soil in said stucco layer, said moisture shield comprising:

a strip of non-porous material material disposed within and along a continuous slot formed in said stucco layer along an exterior surface of said wall in a region adjacent said soil, said slot extending into said stucco layer of a predetermined depth proximate said lath layer;



a water-resistant coating material disposed within said slot about said non-porous material strip;

a strip of mesh-like material affixed to said exterior surface of said wall overlying said slot; and

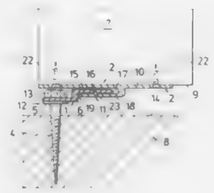
a patch layer formed from a stucco-based material disposed upon said strip of mesh-like material and a region immediate thereto upon said exterior surface of said wall.

4,856,241

DEVICE FOR FASTENING DOORS AND WINDOWS TO A WALL OPENING

Lars Eriksson, Emmaboda, Sweden, assignor to Lars Lagergren, Sweden, a part interest

Continuation of Ser. No. 52,042, May 6, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 273,645
Claims priority, application Sweden, Sep. 9, 1985, 8504172
Int. Cl.[4] E06B *1/52, 1/60*
U.S. Cl. 52—217 **5 Claims**



1. Fastening means for attaching a frame to the edge of a wall opening, said fastening means comprising:

an adjusting screw attachable to the edge of said wall opening, and a snap means supported by said adjusting screw;

a locking plate for cooperating with said snap means, said locking plate comprising:

a fastening plate attachable against the border of said frame;

a branch extending in parallel to and at a predetermined spacing from said fastening plate, the spacing between said branch and said fastening plate forming a locking gap; and

a hook which protrudes from said branch into said locking gap, said hook extending longitudinally across said branch;

said snap means comprising a tongue protruding from a shoulder rotatably fixed to said adjusting screw, said tongue being provided with a longitudinal locking slot which nonreleasably locks together with said hook of said locking plate so as to engage said locking plate while still allowing relative longitudinal movement between said snap means and said locking plate;

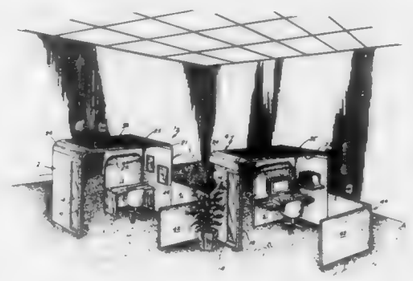
said adjusting screw being rotatable for adjusting the position of said snap means with respect to said locking plate.

4,856,242

SPACE PARTITION ARRANGEMENT

Mark A. Baloga, Grand Rapids, Mich.; Edmond Trimborn, Wasselonne, France, and Philippe Fussler, Strasbourg, France, assignors to Steelcase Inc., Grand Rapids, Mich.

Continuation-in-part of Ser. No. 680,282, Dec. 10, 1984, Pat. No. 4,715,154. This application Dec. 18, 1987, Ser. No. 134,701
The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—239 **17 Claims**



1. A space partition arrangement for subdividing an open office space in a building envelope, which is defined by a building ceiling, a building floor having a predetermined area and perimeter, and fixed building walls having a predetermined height; said space partition arrangement comprising:

first and second sidewall panels positioned in a generally vertical, oppositely facing orientation; said first and second sidewall panels having upper edges, lower edges, and said edges, with said lower edges extending along the building floor;

means for supporting said first and second sidewall panels in a generally parallel, spaced apart condition;

a ceiling having opposite end edges operably connected with the upper edges of said first and second sidewall panels, and spanning said first and second sidewall panels without any intermediate support; said ceiling being supported by said first and second sidewall panels at a height above the building floor that is less than the height of the building walls, and said first and second sidewall panels being spaced apart and arranged in a manner that defines an interior area and a perimeter which are substantially less than the area and the perimeter of the open office space in the building envelope, whereby said space partition arrangement can be freely positioned on the building floor at any desired location; and wherein

said ceiling includes a pair of cove panels having opposite edges thereof connected with the upper edges of said first and second sidewalls panels, and being inclined upwardly and inwardly toward each other; and

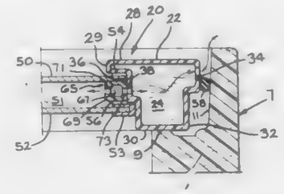
said ceiling forms a canopy with sufficient headroom to accommodate average standing users, which canopy, in conjunction with said first and second sidewall panels, defines an unobstructed, three-dimensional area within and independent of the open office space.

4,856,243

ASSEMBLIES FOR WINDOWS AND DOORS

Russell L. Ault, Newark; Wesley E. Legg, Bexley, and Richard A. Mott, Alexandria, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 25, 1988, Ser. No. 224,030
Int. Cl.[4] E06B *3/66, 7/12*
U.S. Cl. 52—304 **16 Claims**



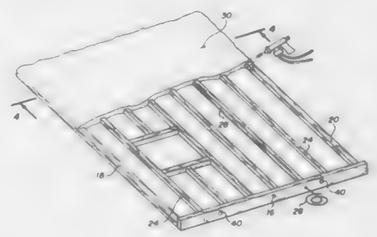
1. In an assembly for a window or door of the type having at least two spaced apart panes positioned in a sash fabricated from lineals having a fibrous glass wool core and a hardened resinous outer surface, the panes defining a cavity therebetween, the improvement comprising: a plurality of orifices in the resinous outer surface of the sash, where the orifices do not extend through the wool core, and where the wool core is exposed via the orifices to (a) the cavity between the panes and (b) the exterior of the sash to permit movement of air and moisture between the cavity and the exterior of the sash, where the movement of air and moisture is through the wool core, with the wool core acting as a filter.

4,856,244

TILT-WALL CONCRETE PANEL AND METHOD OF FABRICATING BUILDINGS THEREWITH

Guy C. Clapp, 5412 Hidden Oaks La., Arlington, Tex. 76017

Filed Jun. 1, 1987, Ser. No. 56,389
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—309.7 **14 Claims**



1. A building panel having utililty in a technique for fabricating tilt-wall structures, said panel having an interior and an exterior face and an upper and lower edge, comprising:

(a) an exterior face of cementitious material having sufficient thickness to function as a load-bearing member;

(b) a plurality of wood-like members arranged at spaced locations along the interior face of the panel, said wood-like members having a side-to-side spacing which is similar to that which is appropriate for wall studs in traditional wood-frame buildings; and

(c) an insulating core of closed-cell plastic foam which is foamed in place over the wood-like members to hold them rigidly in place, said plastic foam being generated while the wood-like members are oriented horizontally, and said exterior face of cementitious material being cast in direct contact with the plastic form core so as to be integrally formed therewith.

4,856,245

SUPPORT PLATE FOR TILES

Yoshinori Osawa, 178, Oaza Sagami, Koka-cho, Koka-gun, Shiga, Japan

Filed Dec. 11, 1984, Ser. No. 680,643
Claims priority, application Japan, Dec. 19, 1983, 58-196976
Int. Cl.[4] E04F *13/12, 13/08*
U.S. Cl. 52—386 2 Claims



1. An arrangement for tiling a surface of a building, comprising:

a plurality of rectangular metal plates mounted on the surface of the building;

a plurality of tile support pieces being aligned in rows and projecting out of an external surface of each of the plurality of rectangular metal plates;

each of said plurality of tile support pieces having a web portion perpendicular to the external surface of each of the plurality of rectangular metal pieces and also having a flange portion parallel to but spaced from the external surface of each of the plurality of rectangular metal plates;

wherein flange portions of said plurality of tile support pieces extend from said web portions of said plurality of tile support pieces in an identical vertically upward direction;

a plurality of tiles being mounted on the plurality of rectangular metal plates and each having a stepped lower edges;

an L-shaped groove means, provided in a middle back side of each of said plurality of tiles, for allowing the flange portions of one row of said plurality of tile support pieces to fit therein without being seen from a front side of each of said plurality of tiles; and

a second groove means, provided in the stepped lower edge of each of said plurality of tiles, for allowing the flange portions of alternate rows of said plurality of tile support pieces to fit therein so that each of the plurality of tiles is vertically supported along its stepped lower edge by the web portions of said plurality of tile support pieces without being seen from a front side of each of the plurality of tiles.

4,856,246

TILE ASSEMBLY

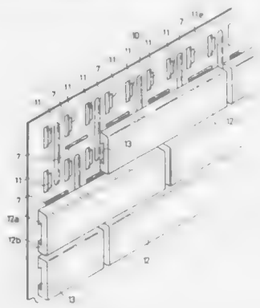
Shigetaka Shimasaki, Tokyo, Japan, assignor to Nihon Kenkou K.K., Tokyo, Japan

Filed Dec. 31, 1987, Ser. No. 140,204
Claims priority, application Japan, Apr. 17, 1987, 62-58247[U]
Int. Cl.[4] E04F *13/08*
U.S. Cl. 52—386 2 Claims

1. A tile assembly comprising:

a tile support plate having a plurality of vertical brackets each erected at right angles to said tile support plate and extending in the vertical direction so as to form a parallelogram with an upper inclined side and an outer vertical side forming a hook portion and inner vertical side integral with said tile support plate; and

a plurality of tiles each having on its backside a dovetailed groove extending in the horizontal direction and provided with an upper engaging edge for engaging at least a pair of



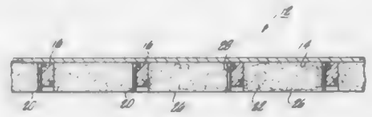
said hook portions, thereby securing said tile to said support plate, whereby the tile can be engaged on the inclined surface of the hook portion in either direction.

4,856,247

ARTICLE AND METHOD FOR INSTALLING INSULATION

John M. Georgino, 1821 S. Charlotte, San Gabriel, Calif. 91776

Filed Apr. 6, 1987, Ser. No. 34,729
Int. Cl.[4] E04B *2/00*
U.S. Cl. 52—404 12 Claims



1. An article for securing insulation within a structure, the structure having a surface with a substantial horizontal component and a plurality of framing members proximate the surface, the framing members being substantially parallel to each other and regularly spaced apart from each other by a first distance, the article comprising a strip of material for securely holding the insulation in place between the strip and the surface having the substantial horizontal component and between adjacent framing members, the strip of material being sufficiently flexible to be coiled without tools, the article further having a plurality of appendages for attaching to the framing members, the appendages projecting outwardly from the strip and being regularly spaced apart from each other by a second distance, the first and second distances being substantially equal, each appendage having a length sufficiently long so that adjacent appendages are capable of being securely attached by attachment means to the adjacent framing members.

4,856,248

STRUCTURAL BUILDING ELEMENT

Nils, F. Larson, deceased, Lewisville, Fed. Rep. of Germany; heir & representative Larson, Catherine J., 51000 Riversest Rd., Lewisville, both of N.C. 27023, and Knut von Loh, Luebecker Str. 43A, D-2060 Bad Oldesloe, Fed. Rep. of Germany

Filed Jul. 15, 1986, Ser. No. 885,685
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1985, 3525768
Int. Cl.[4] E04B *2/00*
U.S. Cl. 52—405 28 Claims

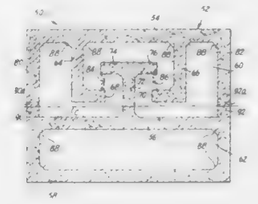
1. A building element comprising:

(a) a continuous phase of cementitious material including:

1. a matrix having a first density, and

2. at least one zone dispersed within the matrix having a second density lower than the first density, wherein said continuous phase of cementitious material extends throughout said matrix and said lower density zone, wherein said matrix includes a porous structure throughout, said porous structure being produced by the incorporation of a chemical agent within said matrix, and wherein said lower density zone includes a synthetic resin binder for adhesion of said lower density zone to said matrix; and wherein

(b) the matrix includes a first wall section and a generally parallel and opposing second wall section, said first wall



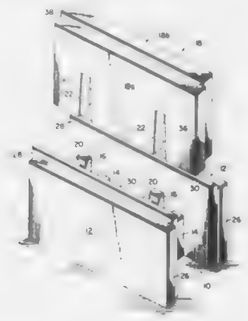
section having at least one first lateral section extending away therefrom at least half the distance between said first and second wall sections but terminating short of said opposing second wall section at a lower density zone disposed between the terminal end of the lateral section and the second wall section, and said second wall section having at least one second lateral section, spaced longitudinally from said first lateral section, extending away therefrom at least half the distance between said first and second wall sections but terminating short of said opposing first wall section at a lower density zone disposed between the terminal end of the lateral section and the first wall section.

4,856,249

INSULATED BUILDING BLOCK

David L. Nickerson, 27 Leemond St., Wilbraham, Mass. 01095

Continuation of Ser. No. 136,474, Dec. 23, 1987, abandoned, which is a continuation of Ser. No. 31,141, Mar. 24, 1987, abandoned, which is a continuation of Ser. No. 881,513, Jun. 30, 1986, abandoned, which is a continuation of Ser. No. 758,577, Jul. 24, 1985, abandoned, which is a continuation of Ser. No. 536,327, Sep. 29, 1983, abandoned. This application Dec. 15, 1988, Ser. No. 285,282
Int. Cl.[4] E04B *1/88*
U.S. Cl. 52—405 8 Claims



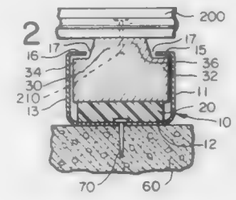
1. The combination of a preformed masonry building block and at least one preformed insulating insert therefor; said building block being adapted for use with similar blocks and inserts in vertically stacked horizontal rows in the contruction of structural walls and the like, and said block comprising a pair of laterally spaced longitudinally extending vertically disposed side walls each of a generally rectangular configuration viewed laterally and each of generally rectangular cross-sectional configuration, said walls cooperatively defining a vertically open generally rectanguar space therebetween, a pair of vertically disposed generally rectangular and laterally extending connecting arms disposed between and connected with said side walls at respective inner surfaces thereof whereby to secure the walls in relatively fixed position, said arms being spaced longitudinally from each other and from the ends of the walls and each arm including a vertically open notch adjacent a wall for receiving an insulating insert, said insulating insert being of a light weight thermal insulating and fire retarding material and having an external configuration which is generally rectangular, said insert having a pair of notches respectively for receiving portions of said arms of a block when the insert is disposed internally of and adjacent a wall thereof and entered vertically in the notches in the arms of the block, the insert being generally coextensive with the walls of the block and having no portion thereof projecting substantially beyond the walls of the block when so disposed in the block, and both block walls and said insulating insert having overlap and interlock means at least along each marginal end portion thereof so as to provide for overlapping and interlocking relationship between each block wall and insert and horizontally adjacent block walls and inserts in a structural wall or the like formed of similar blocks and inserts.

4,856,250

SLEEPER FOR THE ATTACHMENT OF COVERING MATERIAL TO A SURFACE

Arthur W. Gronau, and Gregory S. Gronau, both of 875 N. Lively Blvd., Wood Dale, Ill. 60191

Filed Apr. 17, 1987, Ser. No. 40,172
Int. Cl.[4] E06B *3/54*
U.S. Cl. 52—480 20 Claims



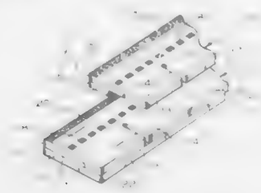
1. A sleeper of the type used in attaching covering material to a surface, the sleeper comprising:

an attachment member adapted for attachment to the covering material;

means for biasing the attachment member away from the surface; and

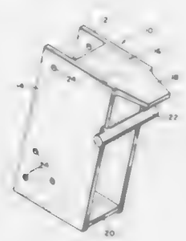
means for mounting the attachment member to the surface such that the attachment member is slidable along at least one guided direction relative to the surface and the means for biasing is not tightly engaged by the means for mounting.

4,856,251
SELF-GAUGING, ANTI-ICE DAMMING, DOUBLE SEALED SHINGLE SYSTEM
Donald A. Buck, 137 W. Arthur, Roselle, Ill. 60172
Continuation-in-part of Ser. No. 17,772, Feb. 20, 1987, abandoned. This application Jun. 25, 1987, Ser. No. 67,422
Int. Cl.[4] E04D *1/00*
U.S. Cl. 52—553 6 Claims



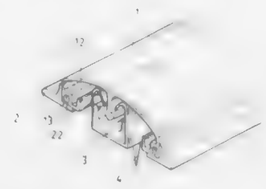
1. An improvement roofing shingle assembly comprising a shingle having a front edge, a rear edge and cut away portions to permit drainage, a gauge piece being of the same thickness as said shingle and bonded to said shingle adjacent to and aligned with said rear edge of said shingle and extending partially across a width of said shingle, said gauge piece being of uniform thickness and including a leading edge adapted to form an abutment surface, and adhesive seal tab means disposed on and across a length of said shingle on a side opposite said gauge piece, said assembly including a starter strip attached to said shingle on the side of said shingle to which said gauge piece is bonded, said starter strip extending from said abutment surface to the front edge of said shingle.

4,856,252
JOIST HANGER
James C. Cornell, 9501 S. Nogales Ave., Jenks, Okla. 74037
Filed Dec. 22, 1988, Ser. No. 288,436
Int. Cl.[4] E04B *1/38*
U.S. Cl. 52—702 20 Claims



1. A joist hanger capable of suspending a joist from an adjacent support surface, said joist hanger comprising
a pair of parallel side members spaced apart sufficiently to receive a joist, each said side member having a front edge which inclines rearwardly from top to bottom and having a top edge such that the angle between said top edge and said front edge is acute,
a top joist support member interconnecting said side members so as to overlay a joist received in said hanger, said top joist support member having dimensions such as to allow said hanger to be pivoted downwardly even when a joist is located therein,
an extension member projecting outwardly from the front of said hanger a sufficient distance to enable said extension member to be rested upon said support surface,
a bottom joist support member extending from one of said side members to the other of said side members so as to be capable of supporting a joist between said side members, and
a pivot means extending across said front edges of said side members at a point below said extension member, said pivot means having a protruding front portion which extends at least to an imaginary plane that passes through said extension member and is perpendicular thereto.

4,856,253
CHANNELLED STRUCTURAL ELEMENT
Lin W. Jou, No. 46, Lane 179, Sec. 1, Hai Pien Rd., Tainan, Taiwan
Filed Jul. 1, 1988, Ser. No. 214,586
Int. Cl.[4] E04F *19/02*
U.S. Cl. 52—717.1 1 Claim



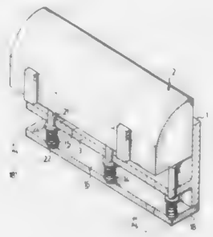
1. A structural element comprising:
a main element, elongated in shape, having an engaging portion along a central line of an inner side thereof, and a groove with an open bottom at both sides thereof;
an auxiliary element provided with a vertically extending portion beside which there is a tenon having a right angle surface and a slot, the tenon being able to be just received into the groove with an open bottom of the main element; and
a fixed element formed with a hole at a center thereof and a lip at both sides thereof so that the engaging portion of the main element can be press-fitted therein, each lip being provided with a notch for facilitating disposition of a screw into the hole so as to rigidly mount the fixed element on a wall.

4,856,254
METHOD OF PLACING STEEL TENDONS THROUGH DUCTS IN A CONCRETE STRUCTURAL MEMBER
Dieter Jungwirth, Munich, Fed. Rep. of Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Mar. 14, 1988, Ser. No. 167,570
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1987, 3708358
Int. Cl.[4] E04C *3/10*
U.S. Cl. 52—741 7 Claims



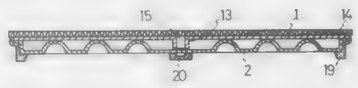
1. Method of inserting axially elongated steel tendons, such as tendons in the form of strands or bundles of strands of steel wire into tendon ducts located in a concrete structural member wherein the tendon ducts include encasing elongated sheathing ducts within the concrete of the structural member, wherein the improvement comprises forming recesses in an exterior surface of the structural member and traversing the ducts for affording access within the structural member to the tendon ducts, displacing tendons through the tendon ducts at the recesses and limiting friction on the tendons during displacement by applying directly to the tendons in the recesses at least one of forces in the axial direction of the tendon by using pushing devices for applying forces in the axial direction and locating the pushing devices in the recesses in the structural member and vibration forces acting transversely of the axial direction of the tendons by using vibrators for applying the vibration forces to the tendons and locating the vibrators within the recesses in the structural member.

4,856,255
RETRACTABLE TOOL-FREE WINDOW FRAME
Hsun-Wei Chao, 11 Fl., No. 703, Chung-Cheng Rd., Shih-Lin District, Taipei, Taiwan
Filed Dec. 28, 1988, Ser. No. 291,281
Int. Cl.[4] E04B *1/60*
U.S. Cl. 52—769 1 Claim



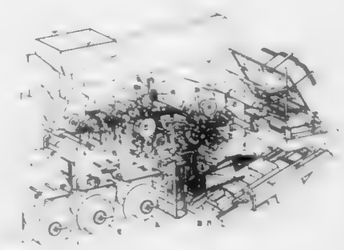
1. A retractable tool-free window frame comprising:
(A) a substantially H-shaped main frame (1); said main frame (1) including a partition plate (13) set laterally between two side walls and a lower partition plate (18) fixed at a lower end of said H-shaped main frame (1); said partition plate (13) having a plurality of holes (17) thereon which are evenly spaced along a lengthwise central axis thereof; said partition plate (13) dividing said main frame (1) into an upper compartment (15) and a lower compartment (16); said lower partition plate (18) having a plurality of circular recesses (14) on an upper surface thereof; said recesses (14) being respectively vertically in-line with said holes (17); a plurality of rectangular alignment channels (12) vertically extending from a top surface of said side walls to an upper surface of the partition plate (13);
(B) a spring-loaded glass retention blade (2); said blade (2) having a lower surface, a top surface and a front side surface and a rear side surface, said rear surface being perpendicular to said lower surface; said blade (2) being slidably received by said upper compartment (15); said top surface of said blade (2) having a positive slope which continuously decreases from the front side surface to the rear side surface; and a plurality of extension posts (21) protruding straight downwards from a bottom surface of said blade (2), said extension posts (21) being respectively slidably received by said holes (17); said extension posts (21) each having a respective retention ring (24) fixed on a lower portion thereof to prevent said blade (2) from projecting too far out of the upper compartment (15); a plurality of rectangular alignment rails (23) extending vertically along and projecting out from said front side surface; said alignment rails (23) respectively being slidably received by said rectangular alignment channels (12).

4,856,256
FREE ACCESS FLOOR PANEL
Kobayashi Tokuzo, Okayama, Japan, assignor to O M Kiki Co., Ltd., Okayama, Japan
Filed Sep. 10, 1987, Ser. No. 95,316
Claims priority, application Japan, Sep. 10, 1986, 61-214555; Jan. 24, 1987, 62-9196[U]; Mar. 25, 1987, 62-72400
Int. Cl.[4] E04C *2/34*
U.S. Cl. 52—805 8 Claims



1. A free access floor panel comprising a top plate and a bottom plate which is provided with an upright wall along its peripheral edge, said bottom plate and top plate being made of flat steel plates and connected to each other at the peripheral edges thereof to form a quadrate floor panel, and said floor panel is characterized in that either said top plate or bottom plate is divided along a diagonal line into two triangular pieces, and a remaining plate in a quadrate shape functions as a hinge so that the entire quadrate floor panel conforms with any regularities of a base on which said floor on which said floor panel is installed.

4,856,257
APPARATUS WITH ROTARY WHEEL HAVING PICKUP MEANS FOR APPLYING LABELS AND THREAD TO A FLATTENED TUBE CARRYING SERIALLY ARRANGED DUAL-USE FILTER SACHETS IN MACHINES FOR CONTINUOUSLY PRODUCING SAID FILTER SACHETS
Andrea Romagnoli, San Lazzaro di Savena, Italy, assignor to Cestind - Centro Studi Industriali - S.R.L., San Pietro Terra, Italy
Filed Feb. 10, 1988, Ser. No. 154,649
Claims priority, application Italy, Mar. 9, 1987, 3379 A/87
Int. Cl.[4] B65B *29/04*
U.S. Cl. 53—134 4 Claims



1. An apparatus for applying tabs, labels and a longitudinal thread to filter bags, said apparatus comprising:
means for feeding a continuously moving flattened tubular strip of thermally weldable filter paper having a top and a bottom side along a horizontal transport path, said tubular strip being formed with transverse welds separating individual portions of filterable substance in respective pouches from one another;
means for supplying a continuous longitudinal thread, labels transversely contacting said thread and thermally weldable tabs to said path at a location downstream of said means for feeding;
a roller at said location rotatable about a horizontal axis, said roller being formed with a periphery and having a bottom tangential to said top of the strip, said periphery being

provided with pressing means thereon for periodically contacting said strip at said bottom of said roller;

a conveying member rotatable about another horizontal axis in a sense opposite the sense of rotation of said roller, said conveying member being a wheel juxtaposed with said bottom side of said strip and being formed with a conveying periphery and being provided with:

seizing means for holding said string, tabs and labels on the conveying periphery, said seizing means being provided with a plurality of radially equidistantly spaced apart heating elements, and

folding means equidistantly interposed on said conveying periphery between successive heating elements for folding said longitudinal string into loops, so that said tabs, said string and said labels run successively into contact with said conveying periphery of said conveying member feeding said string, respective tabs and labels to said continuously moving flattened strip for thermally welding said tabs, said labels and said string to said strip at said transverse welds whereby each of said pressing means of said roller periodically urges against said strip in a juxtaposition with the respective heating element of said conveying member.

4,856,258

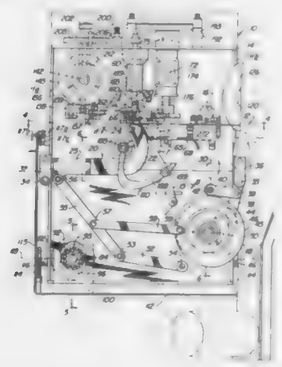
WIRE TYING DEVICE

Charles E. Burford, Dallas, Tex., and Jimmy R. Frazier, Norman, Okla., assignors to Burford Corp., Maysville, Okla.

Continuation of Ser. No. 934,560, Nov. 21, 1986, abandoned. This application Dec. 2, 1988, Ser. No. 282,994

Int. Cl.[4] B65B *7/06, 51/08*

U.S. Cl. 53—138 A **4 Claims**



1. Apparatus to position a bag along a path comprising: a frame; a plunger; plunger guide means; first cam actuated means secured to said plunger to reciprocate said plunger linearly on said plunger guide means; means pivotally securing said plunger guide means to said frame; and second cam actuated means secured to said guide means to pivot said guide means to position said plunger adjacent said path such that said plunger engages the neck of a bag moving along said path and moves along said path as it moves in a first linear direction on said guide means, wherein said plunger moves away from said path to disengage the neck of the bag as said plunger begins to move in the opposite linear direction along said guide means; bag clamp means positioned adjacent said path; and means for actuating said clamp means perpendicularly to said path to restrict movement of the neck of a bag longitudinally of said path as said plunger moves adjacent to said clamp means to adjust tension in the bag.

4,856,259

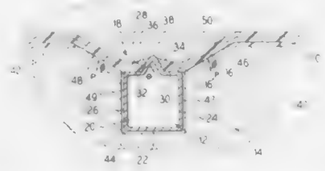
APPRATUS FOR SEALING AND SEVERING A WEB OF FILM

Lecon Woo, Libertyville, and Michael T. K. Ling, Vernon Hills, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed Oct. 17, 1988, Ser. No. 258,945

Int. Cl.[4] B65B *51/30, 51/14*

U.S. Cl. 53—373 **46 Claims**



1. An apparatus for sealing and severing a web of film comprising:

a sealing bar having a body portion including first and second sidewalls and a top portion for melting and severing a portion of a web of film;

a backup member, located on an opposite side of the film from the sealing bar and diametric thereto, for urging the film against a portion of the sealing bar; and

a holder for holding the sealing bar, the holder including a first side and a second side that define a center region for receiving at least a portion of the body of the sealing bar, the first and second sides each including shoulders, the shoulders and top portion of the sealing bar being so constructed and arranged to define means for deflecting a bead generated at a molten area of the film when the film is sealed and severed and for substantially limiting the creation of a resultant bead in a final cooled product.

4,856,260

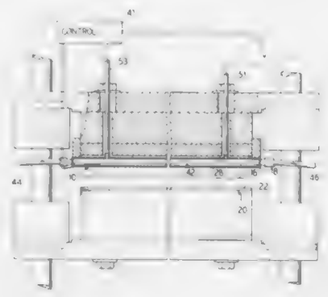
APPARATUS FOR SEALING A WEB OF FILM IN A PACKAGING

Lecon Woo, Libertyville, and Michael T. K. Ling, Vernon Hills, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed Oct. 17, 1988, Ser. No. 258,943

Int. Cl.[4] B65B *51/30, 51/14*

U.S. Cl. 53—373 **24 Claims**



1. An apparatus for sealing a web of film in a packaging machine comprising:

a sealing bar fc heating a web of film to a temperature sufficient to melt at least a portion of the web of film, the sealing bar including a surface that directly contacts the web of film and does not include a release layer;

means for heating the sealing bar; means for cooling the sealing bar; the means for heating and the means for cooling functioning to heat and cool the sealing bar during a cycle of the packaging machine;

and means for measuring the temperature of a portion of the web of film located on the surface of the sealing bar.

4,856,261

FORMING SMALL FLEXIBLE CONTAINERS

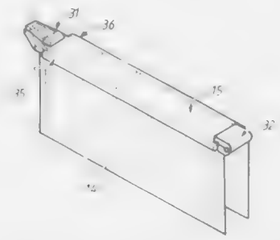
Malcolm J. Hackett, Lower Templestowe, and Charalambos G. Kalkipsakis, Monbulk, both of Australia, assignors to Courtaulds Packaging Australia Limited, Hawthorn East, Australia

Filed Nov. 9, 1987, Ser. No. 118,541

Claims priority, application Australia, Nov. 27, 1986, PH09200; Mar. 3, 1987, PI0636

Int. Cl.[4] B65B *3/10, 3/16, 7/02*

U.S. Cl. 53—469 **2 Claims**



1. A method of forming filled flexible containers comprising:

filling a large flexible container having heat sealable walls with a fluid product inserted into the container through a container inlet,

supporting the container along its length intermediate its side edges so that opposite side portions of the container depend downwardly on either side of the support,

applying to the depending side portions of the container a template means to divide the depending side portions of the container into separate communicating compartments by bringing opposed walls of the container into contact,

distributing the content of the fluid product between said compartments in each depending side portion by varying the pressure applied to the depending side portions of the container to obtain a desired distribution, and

heat sealing the opposed walls of the depending side portions of the container together to form sealed filled compartments which are capable of separation into individual filled containers.

4,856,262

APPARATUS FOR DISPOSING PACKING IN PREDETERMINED RELATIVE POSITIONS

Pieter G. Uithoven, Gorssel, Netherlands, assignor to Thomassen & Drijver-Verblifa N.V., Netherlands

Filed Feb. 24, 1984, Ser. No. 583,342

Claims priority, application Netherlands, Mar. 8, 1983, 8300839

Int. Cl.[4] B65G *43/10, 47/53;* **B65B** *35/38*

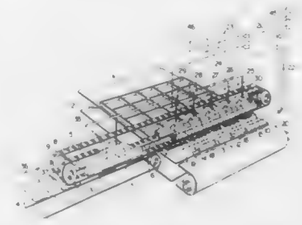
U.S. Cl. 53—499 **8 Claims**

1. In a conveying system for transporting a sequence of articles to a suspending point in captured relation and then transporting them by vacuum suspension to a plurality of separate discharge stations, comprising the combination of:

at least a pair of conveyor belts disposed in vertically spaced, overlapping relation to define an elongate nip therebetween extending from a capturing point to a suspending point, the upper of said belts extending beyond said suspending point and being provided with a series of openings extending longitudinally thereof;

feed means for feeding articles to said capturing point in sequentially spaced relation so as to be captured between said belts and transported therebetween to said suspending point;

suction means overlying said upper belt beyond said suspending point and defining a first chamber for subjecting



the articles to vacuum through said openings to suspend them after they pass beyond said suspending point, said suction means defining a plurality of further and separate chambers in spaced sequence beyond said suspending point; and

control means for independently controlling vacuum to said further suction chambers to release said articles sequentially at their respective stations beginning at that station located most remotely from said suspending point.

4,856,263

SYSTEM FOR LOADING PATTERNS OF ARTICLES INTO CONTAINERS

Thomas C. Schneider, Oak Forest, and James J. Diver, South Holland, both of Ill., assignors to Advanced Pulver Systems, Inc., Chicago Ridge, Ill.

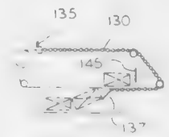
Filed Jun. 15, 1987, Ser. No. 61,732

Int. Cl.[4] B65B *5/08*

U.S. Cl. 53—543 **19 Claims**

MICROFICHE APPENDIX INCLUDED

(74 Microfiche, 1 Pages)



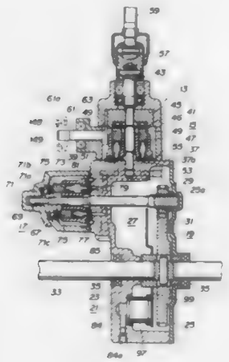
1. Apparatus for loading product into a container comprising: support means for holding a container in a loading position, endless loading means movable along an endless path having a substantially horizontal lower reach disposed immediately above said loading position, said loading means including a conveyor section for supporting product and a window section for allowing product to drop therethrough, transfer means for moving product onto said conveyor section when said conveyor section is disposed along said lower reach of said endless path, shifting means for shifting the product from said conveyor section through said window section and into a container supported in said loading position when the loading means moves in a predetermined direction along said endless path, and discharge means carried by said loading means and effective, upon continued movement thereof along said path, for moving the loaded container from said loading position.

4,856,264

HYDRAULIC TRANSMISSION APPARATUS

Sadanori Nishimura; Hiroshige Makita, and Tomoaki Ishikawa, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1988, Ser. No. 146,964
Claims priority, application Japan, Jan. 26, 1987, 62-15450; May 29, 1987, 62-134192; May 29, 1987, 62-82652[U]
Int. Cl.[4] A01D *34/76, 34/80*
U.S. Cl. 56—10.9 7 Claims



1. A hydraulic transmission apparatus for a vehicle having driving wheels, said apparatus comprising at least one oil pump to which power from a power source having a drive shaft is applied in a first direction, at least one oil motor hydraulically coupled to the oil pump for extracting power from said oil pump in a second direction which is different from said first direction, an output shaft for outputting the power extracted in said second direction, and a case supporting said oil pump and said oil motor, said case being in the form of a box, wherein

(A) said drive shaft is directly connected to an input shaft of said oil pump,

(B) said case is filled with working oil for operating said oil pump and said oil motor,

(C) said oil pump is mounted on a first outer surface of said case,

(D) said oil motor is mounted on a second outer surface of said case, said second surface being perpendicular to said first surface,

(E) said oil motor has a driven shaft which extends into the interior of said case,

(F) a speed reducer mechanism for transmitting power from said driven shaft to said output shaft is disposed within said case,

(G) said output shaft penetrates said case in said second direction through an inner chamber of said case which is filled with said working oil, said output shaft being operatively connected at its ends with corresponding ones of said drive wheels, and

(H) said case has a wall defining therein an inlet oil passages for communicating said working oil within said inner chamber of said case with said oil pump, an outlet oil passage for communicating said oil pump with said oil motor, and a return passage for communicating said oil motor with said working oil within said inner chamber of said case.

4,856,265

CUTTING HEAD WITH SYNCHRONIZED COUNTER-ROTARY BLADES

Pierre Wolf, Wissembourg, France, assignor to Etesia, Wissembourg, France

Filed Jul. 27, 1987, Ser. No. 78,164
Claims priority, application France, Jul. 25, 1986, 86 11159
Int. Cl.[4] A01D *34/66, 34/70*
U.S. Cl. 56—320.2 4 Claims



1. A cutting head with synchronized counter-rotating blades, comprising to rotatable vertical shafts (1) each carrying a cutting blade (2) and turning in opposite directions, the blades (2) describing trajectories that intersect at a point (7) forward of said shafts, the blades having an anular displacement relative to each other that is constant, the rotation of said shafts (1) being synchronized, a housing for the cutting head that directs the airflow caused by rotation of each blade (2) to said intersection point (7) of the trajectories of the blades (2), an ejection channel (4) extending upwardly and rearwardly between said shafts (1), the housing having radially inner (6') and outer (6) arcuate walls about each shaft (1) covering and laterally bounding arcuate spaces (5) above each blade, said spaces (5) merging into a space common to both

blades (2) that progressively widens in horizontal section rearwardly from said point of intersection (7) of the trajectors of the blades, said radially outer walls (6) of the housing comprising a pair of intersecting circular skirts that terminate downwardly in free circular edges that are the lowermost edges of the housing, each said skirt enclosing the trajectory described by the end of one said blade (2), said radially inner walls (6') of the housing having portions that border and confine a portion of said space common to both blades (2) and that are oval with a major axis intersecting the axis of rotation of the associated blade (2) and extending forwardly and rearwardly and a minor axis also intersecting the axis of rotation of the associated blade (2) but extending perpendicular to said major axis, said major axes being parallel to each other and said minor axes being coincident, said oval portions extending forwardly of said minor axes at least a distance such that when said blades occupy said point of intersection said blades directly underlie said oval portions.

4,856,266

METHOD OF PRODUCING OPTICAL FIBER CABLE

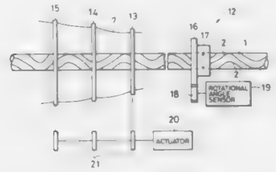
Kanagawa Ogawa, and Yasushi Ito, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 3, 1988, Ser. No. 151,992
Claims priority, application Japan, Feb. 10, 1987, 62-29444
Int. Cl.[4] G02B *6/44;* D01H *13/04;* D07B *5/00*
U.S. Cl. 57—9 2 Claims

1. A method of producing an optical fiber cable comprising the steps of:

continuously advancing an elongated cylindrical spacer in a longitudinal direction of the spacer and forming a plurality of continuous grooves in an outer surface of the spacer, said grooves being formed by a die which surrounds and rotates about a circumference of said spacer in a reciprocating motion so that said grooves extend in the form of parallel periodically reversing helices along the longitudinal direction of said spacer;

guiding optical fibers fed out of an optical fiber storing means by a plurality of guide plates into said respective grooves, said guide plates being positioned so as to rotate in reciprocating motion about said spacer;



detecting a rotational displacement position of said grooves of said spacer at a reference point along the longitudinal direction of said spacer and generating an electric position signal indicative thereof; and

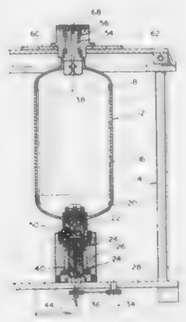
controlling the operation of an actuator for driving said die and said plurality of guide plates, said actuator driving said guide plates and said die on the basis of said position signal so that said die and said guide plates rotate in synchronism with displacement of said grooves.

4,856,267

METHOD AND APPARATUS FOR TWISTING TOGETHER LENGTHS OF FILAMENTARY MATERIAL

John N. Garner, Kingston, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 25, 1988, Ser. No. 275,984
Int. Cl.[4] D01H *7/86, 13/10;* D07B *3/12*
U.S. Cl. 57—58.52 17 Claims



1. A method of twisting together at least two lengths of filamentary material with a double twist comprising:

causing the lengths of material to follow paths from reels of material located in axial alignment within a surrounding concentric cylindrical means, the paths extending in one axial direction from the reel surfaces and between the surrounding cylindrical means and ends of the reels to a first twist position axially beyond the reels, radially outwards from the cylindrical means to extend in the other axial direction through flyer means radially outside the cylindrical means and then axially away from the cylindrical means substantially on the axis thereof to a second twist position;

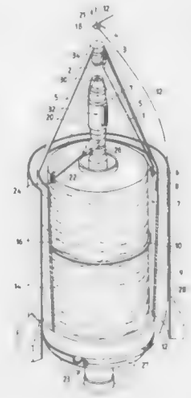
and drawing the lengths of material along their paths while rotating the flyer means around said axis, the lengths of material being unwound from the reels and forced, by speed of rotation, against the inner surface of the cylindrical means and sliding against said inner surface as they pass towards the first twist position.

4,856,268

UNWINDER ARM ROTATING ABOUT A PIVOT SUSPENDED ABOVE A TWO-FOR-ONE TWISTING SPINDLE FOR UNWINDING SUPERPOSED BOBBINS

Luigi Colli, Pordenone, Italy, assignor to Savio, S.p.A., Pordenone, Italy

Filed Jul. 13, 1988, Ser. No. 218,541
Claims priority, application Italy, Jul. 24, 1987, 21427 A/87
Int. Cl.[4] D01H *7/86, 13/04, 13/12*
U.S. Cl. 57—58.52 4 Claims



1. A two-for one spindle assembly for producing twisted yarn from at least two separate yarn sources, comprising;

(a) a rotatable spindle having an opening in its top for receiving the separate yarns and a bottom end for emitting the twisted yarn;

(b) a pair of superposed upper and lower feed bobbins having an orifice through which said spindle passes, wherein each of said bobbins is adapted to supply yarn to said opening in said spindle;

(c) a pivot positioned above said spindle opening;

(d) a first unwinder arm rotatable about said spindle and rotatably connected at one end to said pivot, and having at its other end an eyelet through which yarn from said lower bobbin passes as it is fed to said spindle opening and while said eyelet rotates about said spindle; and

(e) a second unwinder arm rotatably connected at one end to said spindle and having at its other end an eyelet positioned within the rotatable trajectory of said first arm eyelet and through which yarn from said upper bobbin passes as it is fed to said spindle opening and while said second arm eyelet rotates about said spindle.

4,856,269

DEVICE FOR STARTING OR RECOMMENCING SPINNING OF A YARN IN A FRICTION SPINNING APPARATUS

Emil Briner, Winterthur, and Samuel Wehrli, Pfäffikon, both of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Apr. 25, 1988, Ser. No. 186,114
Claims priority, application Switzerland, Apr. 29, 1987, 1695/87
Int. Cl.[4] D01H *15/02*
U.S. Cl. 57—263 18 Claims

1. A device for performing a start spinning operation entail-

ing starting or recommencing spinning of a yarn in a friction spinning apparatus, wherein:

said friction spinning apparatus comprises:

friction spinning means provided with a friction spinning surface;

said friction spinning means defining a yarn formation position at which there is formed a twisted fiber structure;

means for delivering fibers to the friction spinning surface of the friction spinning means;

the fibers being formed into the twisted fiber structure at the yarn formation position during the start spinning operation;

yarn withdrawal means for withdrawing the twisted fiber structure in the form of a yarn in a yarn withdrawal direction;

said device for performing the start spinning operation comprising:

a pressure air infeed channel having an outflow opening directed towards the yarn formation position and through which flows an airstream;

said pressure air infeed channel possessing a flow direction for the airstream flowing therethrough which is directed such that dynamic pressure arising from the flow of the airstream is divisible into two force components of different magnitudes defining a larger force component and a smaller force component;

the larger force component acting in the yarn withdrawal direction of the yarn;

a yarn guide element provided between the friction spinning means and the yarn withdrawal means for guiding the twisted fiber structure and a portion of the airstream of the pressure air infeed channel;

said yarn guide element containing a portion directed towards said yarn withdrawal means;

air venting means provided in said yarn guide element in said portion directed towards said yarn withdrawal means; and

said air venting means preventing the main quantity of the portion of the airstream flowing through said yarn guide element, from diverting the twisted fiber structure from said yarn withdrawal means.

18. A device for performing a start spinning operation entailing starting or recommencing spinning of a yarn in a friction spinning apparatus, wherein:

said friction spinning apparatus comprises:

friction spinning drums provided with a friction spinning surface;

said friction spinning drums defining substantially between and along the friction spinning drums a yarn formation position at which there is formed a twisted fiber structure;

means for delivering fibers to the friction spinning surface of the friction spinning means;

the fibers being formed into the twisted fiber structure at the yarn formation position during the start spinning operation;

a yarn withdrawal roller pair for withdrawing the twisted fiber structure in the form of a yarn in a yarn withdrawal direction;

said device for performing the start spinning operation comprising:

a pressure air infeed channel having an outflow opening directed towards the yarn formation position and through which flows an airstream;

said pressure air infeed channel possessing a flow direction for the airstream flowing therethrough which is directed such that dynamic pressure arising from the flow of the airstream is divisible into two force components of different magnitudes defining a larger force component and a smaller force component;

the larger force component acting in the yarn withdrawal direction of the yarn;

a yarn guide tube provided between the friction spinning drums and the yarn withdrawal roller pair for guiding the twisted fiber structure and a portion of the airstream of the pressure air infeed channel;

said yarn guide tube includes a yarn guide tube portion directed towards said yarn withdrawal roller pair; and

said yarn guide tube being provided with venting openings at said yarn guide tube portion which is directed towards said yarn withdrawal roller pair.

4,856,270

AUTOMATED TEXTILE THREAD PROCESSING SYSTEM

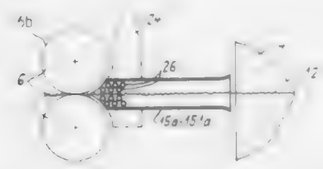
Manfred Langen, Monchen-Gladbach, and Heinz Fink, Krefeld, both of Fed. Rep. of Germany, assignors to Palitex Project Company GmbH, Krefeld, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 142,657

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1987, 8700472[U]

Int. Cl.[4] D01H *9/18;* **B61B** *3/00;* **B65H** *67/06;* **E01B** *25/22*

U.S. Cl. 57—281 **18 Claims**





1. An automated textile thread processing system characterized by reducing thread package handling and labor requirements and comprising:

a textile thread processing machine station, such as a twisting, spinning machine, having a plurality of spindle assemblies for processing thread and forming wound packages of processed thread, said spindle assemblies being arranged on said machine in two longitudinally-extending rows on opposite sides of said machine and in spaced side-by-side relationship;

at least one additional station, such as a thread processing machine, packaging mechanism, fabric producing machine, thread package receptacle; and

a thread package transporting mechanism comprising elongate stationary continuous rail means passing through said thread processing machine station between said rows of spindle assemblies and to and through said additional station and back to said thread processing machine station, thread package carrying means movably mounted on said rail means and positioned for receiving the wound packages of thread doffed from said spindle assemblies of said thread processing machine station and then carrying the thread packages from said thread processing machine station to said additional station and releasing the thread packages at said additional station and then returning to said thread processing machine station, and drive means for driving said thread package carrying means along said rail means; and

each said thread package carrying means comprises a three dimensional framework having a generally triangular transverse cross-section, a generally rectangular bottom, a width less than the diameter of the wound thread package, a height greater than the wound thread package, a length greater than the wound thread package, and open sides to receive the doffed wound thread package therethrough.

4,856,271

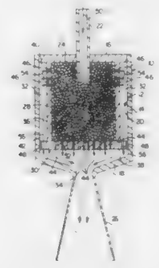
GAS GENERATOR AND GENERATING METHOD EMPLOYING DUAL CATALYTIC AND THERMAL LIQUID PROPELLANT DECOMPOSITION PATHS

W. K. Burke, Bellevue, Wash., assignor to Olin Corporation, Stamford, Conn.

Filed Oct. 1, 1987, Ser. No. 104,303

Int. Cl.[4] F02C *3/20*

U.S. Cl. 60—39.02 **6 Claims**



1. In a power-producing system having a vessel which includes a pressure chamber, an inlet for propellant liquid defined in an upstream end of said vessel chamber and an outlet for propellant gas defined in a downstream end of said vessel chamber and being spaced in an axial direction through said vessel chamber from said inlet, a dual gas generator, comprising:

(a) a single catalyst bed only, said catalyst bed having an upstream end portion being disposed in said vessel chamber in contact and communication with said propellant liquid inlet of said vessel chamber for receiving directly therefrom in the axial direction of said vessel chamber an injection of liquid propellant;

(b) a tubular sleeve disposed within and extending in the axial direction through said vessel chamber so as to surround the periphery of said catalyst bed between said upstream end portion and a downstream end portion thereof and defining an annulus at the exterior of said sleeve and within said vessel chamber, said sleeve having a plurality of orifices therethrough which interface with and lead from the periphery of said catalyst bed to said annulus; and

(c) a bedplate transversely disposed across said vessel chamber at a downstream end of said sleeve and at said downstream end portion of said catalyst bed so as to define a catalyst-free mixing passage at the exterior of said bedplate which extends between said bedplate and said downstream end of said vessel chamber, said bedplate having a plurality of holes therethrough which interface with and lead from said downsteam end portion of said catalyst bed and a downstream end of said annulus to said passage for defining a first flow path which leads in the axial direction of said vessel chamber directly through said catalyst bed to said gas outlet via some of said bedplate holes and said mixing passage and a second flow path which leads in a radial direction relative to the axial direction of said vessel chamber through said catalyst bed and said orifices in said sleeve and then in the axial direction along said annulus to said gas outlet via others of said bedplate holes and said mixing passage, such that when a propellant liquid is injected under pressure through said vessel chamber inlet in the axial direction directly into said catalyst bed (i) a first fraction of the liquid flows along said first path and concurrently is catalytically decomposed into a first fraction of propellant gas which then flows into said passage and (ii) a second fraction of the liquid overflows along said second path and concurrently is thermally decomposed therein into a second fraction of propellant gas by contact with heat from the catalytic decomposition of the first liquid fraction in said bed, the second gas fraction then flowing into said passage wherein it mixes with the first gas fraction before exiting through said vessel outlet.

6. In a power-producing system having a vessel being formed by a side wall and opposite end walls being spaced in an axial direction through said vessel from one another and defining a pressure chamber, an inlet for propellant liquid defined in an upstream one of said vessel opposite end walls and an outlet for propellant gas defined in a downstream one of said vessel opposite end walls, a dual gas generating method comprising the steps of:

(a) injecting a propellant liquid under pressure through the vessel inlet in the axial direction directly into a catalyst bed housed in the vessel pressure chamber;

(b) flowing a first fraction of the liquid along a first path in the axial direction through and in contact with the catalyst bed;

(c) catalytically decomposing the first liquid fraction, as it flows in the axial direction through and in contact with the bed along the first path, into a first fraction of propellant gas;

(d) flowing the first gas fraction from the bed through the openings therethrough into a mixing passage defined and extending between downstream of the bed and upstream of the vessel outlet;

(e) overflowing a second fraction of the liquid along a second path in a radial direction through the catalyst bed and the orifices of the sleeve and then in the axial direction along an annulus defined about the bed and between the vessel side wall and the bed;

(f) thermally decomposing the second liquid fraction into a second fraction of propellant gas, as it flows through the annulus, by contacting the second liquid fraction with heat from the catalytic decomposition of the first liquid fraction in the catalyst bed; and

(g) flowing the second gas fraction from the annulus into the mixing passage where it mixes with the first gas fraction before exiting through the vessel outlet without passing through another catalyst bed.

4,856,272

METHOD FOR MAINTAINING BLADE TIP CLEARANCE

Robert L. Putman, Palm City, Fla., and Edward J. Hovan, Manchester, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 2, 1988, Ser. No. 189,270

Int. Cl.[4] F02C *7/12*

U.S. Cl. 60—39.02 **5 Claims**

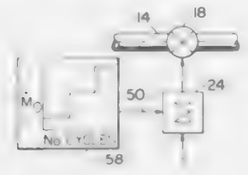
1. A method for maintaining long term performance efficiency between consecutive periodic seal replacement in a particular one of a plurality of substantially similar gas turbine engines each having an active clearance control system for selectably reducing the clearance between a plurality of rotating blade tips and a surrounding annular seal, including

means, disposed adjacent a portion of the engine structure, for delivering a modulated flow of gas, said gas flow having a temperature substantially different from the engine portion,

means, responsive to current engine operating conditions, for modulating the flow rate of the delivered gas relative to a baseline flow rate, the baseline flow rate being established at each seal replacement,

wherein the method comprises the steps of:

establishing, for the plurality of engines, an average clearance deterioration rate between the blade tips and the annular seal, the deterioration rate being determined as a function of accumulated engine usage since the most recent overhaul,



selecting at least one level of accumulated engine operation intermediate two consecutive periodic seal replacements and determining, for the selected level, an average incremental change to the gas baseline flow rate required to restore the deteriorated clearance between the blade tips and the annular seal, the restored clearance being no less than the undeteriorated clearance immediately following seal replacement, and

altering, by an amount equal to the average incremental change, the baseline gas flow rate of the particular one engine when the particular one engine achieves the selected level of accumulated engine usage.

4,856,273

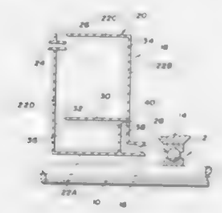
SECONDARY OIL SYSTEM FOR GAS TURBINE ENGINE

Stephen G. Murray, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 21, 1988, Ser. No. 222,470

Int. Cl.⁴ F02C *7/06*

U.S. Cl. 60—39.08 **3 Claims**



1. In a flight propulsion gas turbine engine having a horizontal flight mode and a vertical flight mode, a rotor shaft supported on a case of said engine by a bearing for rotation about a rotor axis of said engine oriented horizontally in said horizontal flight mode and vertically in said vertical flight mode, and a primary oil system for lubricating said bearing,

a secondary oil system for said bearing comprising:

a secondary oil tank on said engine moveable therewith between a first position corresponding to said vertical flight mode and a second position corresponding to said horizontal flight mode,

inlet means connecting said secondary oil tank to said primary oil system whereby said secondary oil tank is supplied with a fraction of the oil flow in said primary oil system,

a discharge orifice in said secondary oil tank located at the bottom thereof in each of said first and said second positions of said secondary oil tank so that oil in said secondary oil tank is induced by gravity to flow out through said discharge orifice in each of said vertical and said horizontal flight modes of said gas turbine engine,

said discharge orifice limiting said gravity induced oil outflow from said secondary oil tank to a secondary oil flow constituting a small fraction of the oil flow in said primary oil system in each of said first and said second positions of said secondary oil tank,

first partition means in said secondary oil tank defining a descent reservoir chamber connected to said discharge orifice in each of said first and said second positions of said secondary oil tank, and

second partition means in said secondary oil tank operative to maintain a predetermined minimum volume of oil in said descent reservoir tank in said second position of said secondary oil tank so that said predetermined minimum is available to sustain said secondary oil flow when said engine transitions from said horizontal to said vertical flight mode.

4,856,274

METHOD AND APPARATUS FOR EVALUATING THE WORKING LINE CHARACTERISTICS OF A COMPRESSOR OF A GAS TURBINE ENGINE

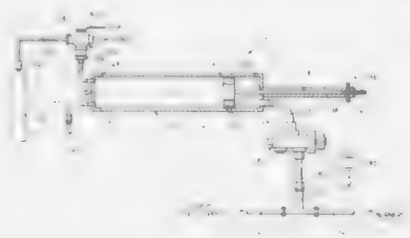
Michael J. Cox, Derby, England, assignor to Rolls-Royce plc, London, England

Filed Jan. 29, 1988, Ser. No. 150,238

Claims priority, application United Kingdom, Mar. 23, 1987, 8706878

Int. Cl.⁴ F02C *7/00*

U.S. Cl. 60—39.33 **11 Claims**



1. An apparatus for evaluating the working line characteristics of a compressor of a gas turbine engine comprising a movable trolley, a fuel accumulator, a first valve means, a second valve means, a high pressure fluid source, a first fluid conduit and a second fluid conduit,

the fuel accumulator being mounted on the trolley, the fuel accumulator comprising a piston and a cylinder, the piston being arranged to move axially in the cylinder, the piston defining with the cylinder a first chamber and a second chamber, the first chamber of the fuel accumulator having means for being removably interconnected with a fuel supply of the gas turbine engine via the first fluid conduit and the first valve means in order for the first chamber to be supplied with fuel from the gas turbine engine fuel supply, the second chamber of the fuel accumulator being interconnected with the high pressure fluid source via the second fluid conduit and the second valve means in order to pressurize the fuel in the first chamber of the fuel accumulator to one of a plurality of predetermined pressures, said second chamber having a pressure indicating means connected thereto for indication to an observer the pressure in said second chamber, the first chamber of the fuel accumulator having means for establishing a removable interconnection with a combustion chamber of the gas turbine engine via the first fluid conduit and the first valve means in order to supply the pressurized fuel at one of a plurality of fuel flow rates to the gas turbine engine combustion chamber to increase the pressure in the combustion chamber, the pressure increase in the combustion chamber and hence the one of the plurality of predetermined flow rates of fuel being indicative of the working line characteristics of the compression.

4,856,275

Patent Not Issued For This Number

4,856,276

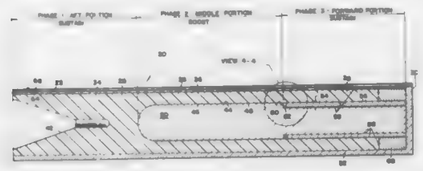
VARIABLE MASS FLOW RATE SOLID PROPELLANT GRAIN

Mark A. Solberg, Edgewood, Md., assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Jun. 12, 1987, Ser. No. 62,531

Int. Cl.⁴ F02K *9/08, 9/12*

U.S. Cl. 60—250 **20 Claims**



1. A solid propellant grain comprises an elongate mass of solid propellant material having an aft end portion and a forward end portion, said solid propellant mass has a surface which is within said solid propellant mass and which extends longitudinally thereof to define a cavity which extends longitudinally partially through said solid propellant mass and which terminates at and does not extend into said aft end portion of said solid propellant mass, said aft end portion has an end burner configuration over at least a portion of its length wherein said aft end portion is free of perforations extending into said cavity, means for closing the forward end of said cavity, and plug means disposed in said cavity for supporting the solid propellant mass during burning of said aft end portion, said plug means is sized to provide a gap between said plug means and said surface over at least part of the length thereof for flame propagation radially of the grain from the surface over said at least part of the length thereof.

4,856,277

TWO-STAGE FLOW DIVIDER WITH CONSTANT ORIFICE FIRST STAGE IN HYDRAULIC SYSTEM FOR WORKING VEHICLES

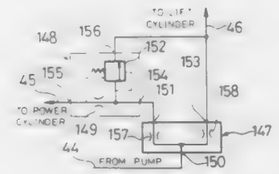
Ryota Ohashi, Sakai; Masahisa Kawamura, and Jiro Shibata, both of Amagasaki, all of Japan, assignors to Kanzaki Kokyukoki Mfg. Co. Ltd., Inadera, Japan

Division of Ser. No. 818,285, Jan. 13, 1986, Pat. No. 4,773,216. This application Jul. 1, 1988, Ser. No. 214,311

Claims priority, application Japan, Jan. 22, 1985, 60-7591[U]; Mar. 29, 1985, 60-46487[U]

Int. Cl.⁴ B62D *5/08;* **F15B** *13/06*

U.S. Cl. 60—422 **2 Claims**



1. In a working vehicle comprising a hydraulic power steering mechanism, including a power cylinder, and a hydraulic lift mechanism including a lift cylinder, said power cylinder and said lift cylinder being powered by a single pump driven by engine, a hydraulic system comprising:

a first flow control valve means **(147)** which includes an inlet port **(150)** connected to said pump **(43)** and is operable to divide its inflow into first and second proportional control flows of a predetermined ratio, said first flow control valve means further including first and second control flow outlet ports for flowing out said first and second control flows respectively, and said second control flow outlet port **(153)** being connected to a first fluid supply path **(46)** which is connected to said lift cylinder **(31)** via a lift control valve **(33)**; and

a second flow control valve means **(148)** which includes an inlet port **(154)** connected to said first control flow outlet port **(151)** and is operable to divide its inflow into a predetermined constant flow and a surplus flow in excess of said constant flow, said second flow control valve means further including a constant flow outlet port **(155)** for flowing out said constant flow and a surplus flow outlet port **(156)** for flowing out said surplus flow, said constant flow outlet port **(155)** being connected to a second fluid supply path **(45)** which is connected to said power cylinder **(25)** via a steering control valve **(26)**, and said surplus flow outlet port **(156)** being connected to said first fluid supply path **(46)**.

4,856,278

CONTROL ARRANGEMENT FOR AT LEAST TWO HYDRAULIC CONSUMERS FED BY AT LEAST ONE PUMP

Karlheinz Widmann; Norbert Kreth, both of Lohr; Martin Schmitt, Goldbach, and Armin Stellwagen, Lohr, all of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 944,432, Dec. 19, 1986, Pat. No. 4,759,183. This application Dec. 29, 1987, Ser. No. 138,934

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1985, 3546336; Dec. 30, 1986, 3644736

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—423 22 Claims



1. Control arrangement for at least two hydraulic consumers, at least one pump, circuit means connecting the output of said pump with each of said consumers via a respective directional control valve for controlling the direction and velocity of the respective consumer, each directional control valve being actuated by means of a control pickup associated with the respective consumer, and a pressure balance in said circuit means between the respective directional control valves and said pump for providing a load-independent flow to the respective directional control valve derived from a pressure difference between the input and the output of the associated directional control valve, and means for reducing the total flow through the driven directional control valves when the pump delivery is not adequate by generating a control signal to reduce the stroke of the driven directional control valves, said means including a summation stage in which the signals corresponding to the respective flow rates through the directional control valves are summed and a comparison stage in which the sum voltage is compared with a limit value corresponding to the maximum pump delivery, said control signal being generated when the limit value is exceeded, characterized in that the directional control valves are hydraulically actuated and electrical signals corresponding to the respective flow rates through the directional control valves are derived in each from the position of the directional control valves.

4,856,279

HYDRAULICALLY OPERATED CONTINUOUSLY VARIABLE TRANSMISSION

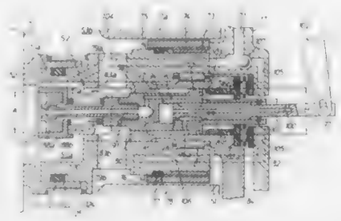
Eiichiro Kawahara, and Kenichi Ikejiri, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1987, Ser. No. 132,471

Claims priority, application Japan, Dec. 12, 1986, 61-191426[U]

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—489 12 Claims



1. A hydraulically operated continuously variable transmission comprising:

a transmission case;

a fixed shaft mounted in said transmission case;

an output shaft rotatably supported in said transmission case;

a hydraulic motor coupled to said output shaft and having a motor cylinder and an annular array of slidable motor plungers disposed around an axis of rotation thereof and slidably disposed in respective cylinder holes defined in said motor cylinder, said hydraulic motor also having a distribution ring supported on said fixed shaft and rotatable relatively to and slidable against an end face of said motor cylinder for introducing high-pressure oil successively into said cylinder holes and discharging oil successively from said cylinder holes in response to rotation of said motor cylinder;

an input shaft rotatably supported in said transmission case;

a hydraulic pump coupled to said input shaft, at least one of said hydraulic pump and said hydraulic motor being of the variable-displacement type;

a closed hydraulic circuit interconnecting said hydraulic pump and said hydraulic motor; and

spring means disposed around said fixed shaft for normally urging said distribution ring resiliently against said end face of the motor cylinder.

4,856,280

APPARATUS AND METHOD FOR THE SPEED OR POWER CONTROL OF STIRLING TYPE MACHINES

Bruce J. Chagnot, Athens, Ohio, assignor to Stirling Technology, Inc., Athens, Ohio

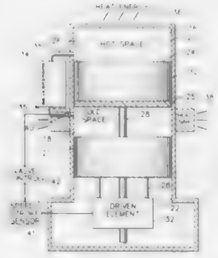
Filed Dec. 19, 1988, Ser. No. 286,607

Int. Cl.[4] F02G *1/04*

U.S. Cl. 60—522 10 Claims

1. Apparatus for controlling power of a Stirling type machine having separate expansion and compression spaces connected by a flow passage through which the working gas passes, wherein the improvement comprises,

a variable valving arrangement positioned in the working gas flow passage for continuously regulating the flow resistance of the working gas flow passage during machine operation; and



sensing means for controlling the valving arrangement to increase the flow resistance in response to increases of operating speed beyond selected operating limits.

4,856,281

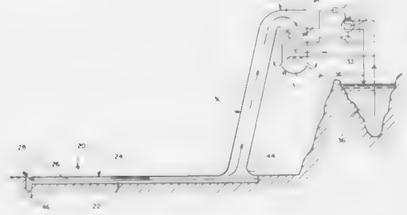
SOLAR POWER PLANT AND STILL

William P. Taylor, 22291 Caminito Tiburon, Laguna Hills, Calif. 92653

Filed Dec. 28, 1988, Ser. No. 291,139

Int. Cl.[4] F03G *7/02*

U.S. Cl. 60—641.9 6 Claims



1. A solar energy system comprising:

a water pond which is heated by solar energy;

a cover above the pond which transmits solar energy;

an air space between the pond and the cover through which warm air and vaporized water move;

a chimney which induces the rapid flow of warm humid air into its lower end and delivers such air at its upper end;

a fresh water heat sink which receives condensed vapor from the chimney-induced flow;

a heat energy driven engine, the power output of which is a function of the temperature difference between higher and lower temperature levels;

a first heat exchanger in the engine connected to the top of the chimney, and arranged to convert the vapor condensation energy into the higher temperature level of the engine;

a second heat exchanger in the engine arranged to provide the lower temperature of the engine by connection to the heat sink; and

power transfer means driven by the temperature differential energy of the engine.

4,856,282

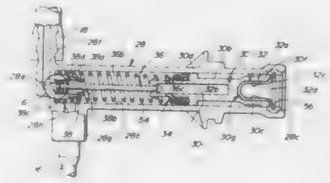
CENTER-FEED MASTER CYLINDER WITH RETAINER FOR VALVE STEM

Keith V. Leigh-Monstevens, and Leslie P. Branum, both of Troy, Mich., assignors to Automotive Products plc, Warwickshire, England

Filed May 12, 1987, Ser. No. 49,133

Int. Cl.[4] B60T *11/28*

U.S. Cl. 60—589 16 Claims



7. A cylinder assembly comprising:

(A) a cylinder defining an axially extending pressure chamber and including a reservoir port proximate the front end of the cylinder for communication with a fluid reservoir;

(B) a piston slidably positioned within said cylinder and adapted for coaction with a piston rod extending into the rear end of the cylinder;

(C) a valve assembly in said pressure chamber including a valving member proximate said reservoir port and a valve stem secured to said valving member and extending axially rearwardly into said chamber and having a head portion at its rearward end; and

(D) a plurality of circumferentially spaced resilient fingers extending axially forwardly from the front end of said piston and coacting in their relaxed condition to define an opening of lesser diameter than the diameter of said valve stem head portion but yieldable radially outwardly in response to rearward axial movement of said valve stem head portion therebetween to allow passage of said valve stem head portion therebetween, said valve stem head portion defining a shoulder at its front face and said fingers each defining a radially inwardly extending shoulder surface adjacent to its free forward end, said shoulder and said shoulder surfaces coacting following rearward passage of said valve stem head portion between said fingers to preclude separation of said valve stem from said fingers while allowing rearward movement of said valve stem relative to said fingers;

(E) said assembly further including a retainer member secured to the front end of said piston and defining said fingers;

(F) said retainer member including a central bore sized to pass said valve stem head portion;

(G) said fingers being circumferentially arranged about said central bore;

(H) said piston including a blind bore opening in the front face thereof, sized to pass said valve stem head portion, and axially aligned with said central bore in said retainer member;

(I) said valve stem head portion shoulder being annular;

(J) each of said fingers including a head portion at its front end defining said radially inwardly extending shoulder surface;

(K) said head portion of each finger further including a radially outwardly extending shoulder surface; and

(L) said assembly further including a resilient O-ring encircling said fingers rearwardly of said radially outwardly extending shoulder surface to delimit radial outward expansion of said fingers.

4,856,283

REFRIGERATOR

Yoshio Kazumoto; Yoshiro Furuishi, and Kazuo Kashiwamura, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1988, Ser. No. 168,078
Claims priority, application Japan, Mar. 13, 1987, 62-58153
Int. Cl.[4] F25B *9/00*
U.S. Cl. 62—6 **1 Claim**



1. A refrigerator apparatus, comprising: a compressor (1), a cold finger portion (2) defining a cylinder (6) connected through a supply pipe (5) to said compressor, a movable member (7) reciprocable within said cold finger portion cylinder, a regenerative heat exchanger (10) disposed within said movable member and in free communication with opposite outer ends thereof, a gas working space including a space (8) at one end of the cylinder, a closed end gas spring space (12) defined axially outwardly of said one end of the cylinder and separated from said gas working space by seal means (13) surrounding an axial extension (11) of said movable member projecting into said spring space, said movable member being adapted to be driven by a difference in pressure between said gas working space and said gas spring space with a phase relation between an operation pressure and movement of said movable member, and a spring member (16) disposed between and continuously coupling one end of said movable member and said cold finger portion and constituting, together with said movable member, a vibration system wherein said spring member is a coil spring having one end fixed to an upper end of said movable member.

4,856,284

AUTOMATED CYLINDER TRANSFILL SYSTEM AND METHOD

Paul A. Mattiola, Coopersburg, and James V. Ommeren, Werley's Corner, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 20, 1987, Ser. No. 111,532
Int. Cl.[4] F17C *7/02*
U.S. Cl. 62—55 **15 Claims**



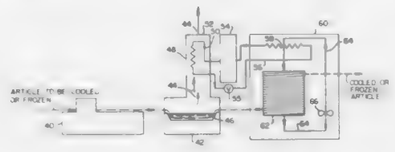
1. A method of filling at least one high pressure gas storage device in a filling station having a pump and a pump motor and having a storage tank containing liquefied gas, comprising the steps of:
(a) evacuating a gas storage device to improve final product purity of said device when filled;
(b) supplying liquefied gas to the pump simultaneously with the evacuation of the gas storage device;
(c) cooling the pump during the evacuation with the liquefied gas;
(d) determining when the evacuation is complete; and then
(e) starting the pump motor in response to the determination in step (d).

4,856,285

CRYO-MECHANICAL COMBINATION FREEZER

Arun Acharya, East Amherst; Michael A. Marchese, Elmsford, and Jeffert J. Nowobilski, Orchard Park, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 20, 1988, Ser. No. 246,862
Int. Cl.[4] F25D *13/06*
U.S. Cl. 62—63 **25 Claims**



1. A method of cooling and freezing an organic-comprised article, comprising the steps of contacting said article which is to be reduced in temperature with a liquid cryogen and subsequently contacting said article with cold gases in a mechanical refrigeration system to further cool said article, wherein the improvement comprises:
using at least a portion of the cryogen vapor generated by the direct contact of said article with said liquid cryogen for indirect heat exchange with a heat transfer fluid used within said mechanical refrigeration system.

4,856,286

REFRIGERATION COMPRESSOR DRIVEN BY A DC MOTOR

Louis E. Sulfstede; Robert W. Helt, and Thomas E. Jensen, all of Tyler, Tex., assignors to American Standard Inc., New York, N.Y.

Continuation of Ser. No. 127,994, Dec. 2, 1987, abandoned. This application Sep. 1, 1988, Ser. No. 240,418
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—89 **50 Claims**



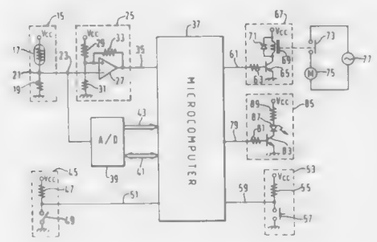
1. A refrigeration system comprising:
(a) a compressor disposed in a hermetic shell, an outdoor heat exchanger, an expansion device, and an indoor heat exchanger all of which are connected in series to comprise a hermetically sealed refrigeraton circuit for conditioning the temperature of a comfort zone;
(b) a refrigeration system controller than generates a pulse-width modulated speed command signal in response to a zone temperature setpoint and the temperature of said comfort zone;
(c) a variable speed brushless DC motor coupled to said compressor and controlled in response to said pulse-width modulated speed command signal such that;
i. said motor de-energizes in response to a pulse width of said speed command signal being within a predetermined lower pulse width range,
ii. said motor de-energizes in response to said pulse width of said speed command signal being within a predetermined upper pulse width range, and
iii. the speed of said motor varies as a function of said pulse width when said pulse width of said speed command signal is within a predetermined intermediate range that lies between said upper and said lower range.

4,856,287

TEMPERATURE CONTROLLER AND METHOD OF TEMPERATURE CONTROL FOR USE IN A REFRIGERATING DEVICE

Hiroshi Oike, Osaka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 8, 1988, Ser. No. 165,606
Claims priority, application Japan, Mar. 13, 1987, 62-59700
Int. Cl.[4] F25B *49/00*
U.S. Cl. 62—126 **17 Claims**



1. A temperature controller including a temperature sensor for use in a refrigerating device, said temperature controller comprising:
conversion means for converting a temperature detected by the temperature sensor into a voltage value;
refrigerating cycle driving means, connected to receive the voltage value, for operating a refrigerating cycle to cool a compartment in accordance with the voltage value;
comparison means for comparing the voltage value with a predetermined voltage range wider than a voltage range corresponding to an ordinary operating temperature range in the compartment; and
memory means for storing a predetermined value when said comparison means determines that the voltage value is maintained outside the predetermined voltage range for a certain period of time, and for resetting said predetermined value when said voltage value is maintained inside the predetermined voltage range for a time shorter than said certain period of time.

4,856,288

REFRIGERANT ALERT AND AUTOMATIC RECHARGING DEVICE

Robert C. Weber, 57 Dunbar Rd., Palm Beach Gardens, Fla. 33418

Continuation-in-part of Ser. No. 514,642, Jul. 18, 1983, abandoned. This application Sep. 13, 1984, Ser. No. 650,178
Int. Cl.[4] G01K *13/00;* **F16K** *31/18*
U.S. Cl. 62—129 **15 Claims**



1. In a refrigeration system having a condenser connected by a liquid refrigerant line to a throttling device, an alarm and control sensor comprising:
a closed chamber having a vertical orientation, said chamber having a refrigerant inlet connection at a lower portion thereof, said connection in fluid communication with said liquid refrigerant line adjacent to said throttling device such that liquid refrigerant in said line enters said chamber;
an electrically conductive float enclosed in said chamber;
a first pair of electrical contacts disposed within said lower portion of said chamber and having external connections thereto, said contacts positioned to be closed by said conductive float when the level of liquid refrigerant in said chamber is at or below a preselected low level and to be open when the level of liquid refrigerant in said chamber is above said low level; and
a second pair of electrical contacts disposed within an upper portion of said chamber and having external connections thereto, said contacts positioned to be closed by said conductive float when the level of said liquid refrigerant in said chamber is at or above a preselected high level and to be open when the level of refrigeration said chamber is below said high level.

4,856,289

APPARATUS FOR RECLAIMING AND PURIFYING CHLORINATED FLUOROCARBONS

Spencer G. Lofland, 1014 Papaloa, Bastrop, Tex. 78602

Filed Jul. 8, 1988, Ser. No. 216,894
Int. Cl.[4] F25B *45/00*
U.S. Cl. 62—149 **17 Claims**

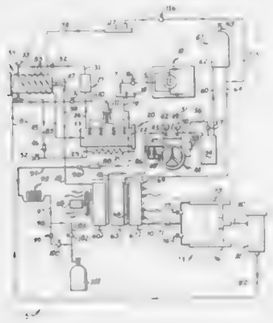
1. Apparatus for recovering and purifying contaminated CFC from a device containing it, comprising,
inlet means for connection to said device to receive contaminated CFC therefrom,
a heated still for vaporizing contaminated CFC which is received in liquid form,
a vapor dryer for receiving vapor from the still and drying it to remove non-CFC impurities therein and produce a dry vapor,
a superheater for receiving the dry vapor and further heating it, to a temperature above its saturation point,
a compressor for receiving superheated vapor from the

superheater and compressing the same, thereby further heating the superheated vapor,

a chamber for receiving the compressed heated vapor, said chamber adapted to permit noncondensable gases to separate physically from CFC in said vapor to be withdrawn therefrom,

a condenser for receiving CFC vapor from said chamber and cooling the same to convert such CFC vapor to liquid,

a sub cooler for receiving liquid CFC from the condenser and further cooling the same without revaporization,



a drier coil in heat exchanging relation to said vapor drier and a line carrying liquid CFC from said condenser to said coil to heat the vapor drier,

a still coil in heat exchanging relation to said still for heating incoming material therein, and a line for carrying liquid CFC from said drier coil to said still coil to heat the still,

flow control means for reducing the rate of flow of liquid CFC from said still coil, and

outlet means for connection to a receiver for CFC so purified.

4,856,290

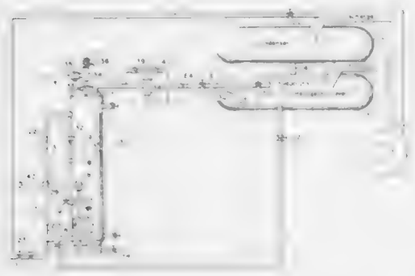
REFRIGERANT RECLAMATION SYSTEM

Richard K. Rodda, 2906 Tarragon La., Bowie, Md. 20715

Filed Jul. 26, 1988, Ser. No. 224,361

Int. Cl.[4] F25B *45/00*

U.S. Cl. 62—149 **15 Claims**



11. A refrigerant reclamation system for on-site reclamation of contaminated refrigerant comprising an upright pressure vessel for holding a predetermined portion of the contaminated refrigerant, liquid pump means for pumping said contaminated refrigerant into said vessel, a liquid level control means externally mounted on said vessel for controlling said pump means to maintain a predetermined high and low liquid level in said vessel, an electric resistance heater mounted in a lower portion of said vessel in pressure tight relationship therewith; and thermostatic switch means for controlling said resistance heater.

4,856,291

AIR CONDITIONING SYSTEM FOR AUTOMOTIVE VEHICLES

Tadahiro Takahashi, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 289,839

Claims priority, application Japan, Dec. 28, 1987, 62-336370

Int. Cl.[4] F25B *41/04*

U.S. Cl. 62—217 **6 Claims**



1. In an air conditioning system for an automotive vehicle having an engine installed therein, said air conditioning system having a variable capacity type compressor, thermal-load detecting means for detecting a thermal load on the system, suction-pressure arithmetic means for calculating a desired value of suction pressure of the compressor on the basis of an output from said thermal-load detecting means in accordance with a predetermined suction-pressure vs. thermal-load characteristic, suction-pressure changing means for changing the suction pressure of the compressor, and suction-pressure control means for controlling said suction-pressure changing means on the basis of an output from said suction-pressure arithmetic means,

the improvement comprising:

required-driving-torque arithmetic means for calculating a value of torque required for driving the compressor, on the basis of the output from said suction-pressure arithmetic means and said detected thermal load in accordance with a predetermined required-driving-torque vs. suction-pressure characteristic; and

idle-up control means for setting the rotational speed of said engine at idling on the basis of an output from said required-driving-torque arithmetic means.

4,856,292

PRESSURE CONTROL VALVE ASSEMBLY

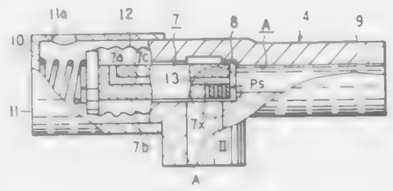
Katsunori Kawai; Shinichi Suzuki; Mitsuhiro Hattori, and Hiroyuki Deguchi, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Dec. 21, 1987, Ser. No. 136,107

Claims priority, application Japan, Dec. 27, 1986, 61-201054[U]

Int. Cl.[4] F25B *1/00*

U.S. Cl. 62—217 **6 Claims**



1. A pressure control valve assembly incorporated in an air conditioning system having an evaporator connected at its inlet to a receiver by way of an expansion valve, and a refrigerant compressor having the suction side connected to the outlet of said evaporator and the discharge side connected to a condenser which is in turn connected to said receiver, said pressure control valve being mounted to respond automatically to changes in differences between atmospheric pressure and pressure of refrigerant gas for regulating flow of such gas and comprising:

a casing having formed therein a fluid passage communicating between said outlet of the evaporator and said suction side of the compressor for allowing refrigerant gas from said evaporator to pass therethrough;

slidably movable plunger means supported for simple translational motion in said casing and having one end thereof received in said fluid passage;

seat means formed in said casing and cooperating with said plunger means to form variable-area throttling passage means in said fluid passage for regulating the flow of the refrigerant gas passing therethrough, said plunger means being movable between its wide-open position where maximum flow of the refrigerant gas is allowed through said fluid passage and its full-throttling position where minimum flow of the refrigerant gas is allowed;

a plurality of narrow passages forming part of said variable-area throttling passage means and arranged in such a way that at least part of said narrow passages may be closed successively with the movement of said plunger means toward said full-throttling position relative to said seat means.

4,856,293

AIR-CONDITIONING CONTROL SYSTEM FOR AUTOMOTIVE VEHICLES

Tadahiro Takahashi, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Saitama, Japan

Filed Jun. 14, 1988, Ser. No. 206,577

Claims priority, application Japan, Dec. 10, 1987, 62-314588

Int. Cl.[4] F25B *1/00*

U.S. Cl. 62—228.3 **6 Claims**

1. An air-conditioning control system for automotive vehicles, comprising:

a variable capacity compressor variable in capacity in accordance with a change in suction pressure thereof;

an evaporator having an outlet side;

control means arranged outside of said compressor for supplying said compressor with an electric signal for setting the suction pressure;

first sensor means for detecting outdoor-air temperature;

second sensor means for detecting whether or not the air-conditioning control system is in an indoor-air recirculating mode;

third sensor means for detecting temperature on the outlet side of said evaporator;

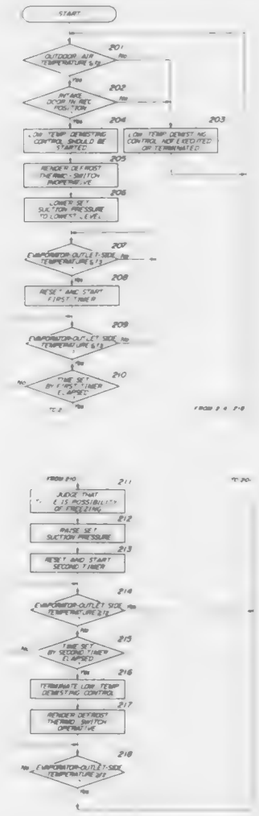
fourth sensor means for detecting the suction pressure of said compressor; and

said first through fourth sensor means being connected to said control means;

said control means carrying out the below-mentioned demisting control, on the basis of output signals from the respective first through fourth sensor means:

(i) when the outdoor-air temperature is equal to or lower than a predetermined value and at the same time the air-conditioning control system is in the indoor-air recirculating mode, the suction pressure set by said control means is lowered to a value at which the temperature on the outlet side of said evaporator is brought to a value equal to or lower than a predetermined freezing temperature; and

(ii) when a state in which freezing of said evaporator may occur has continued for a predetermined period of time, the suction pressure set by said control means is raised until the temperature on the outlet side of said evaporator



is brought to a value equal to or higher than a predetermined non-freezing temperature.

4,856,294

MICRO-CLIMATE CONTROL VEST

Robert P. Scaringe, Rockledge; Jay A. Buckman, Melbourne, and Lawrence R. Grzyll, Merritt Island, all of Fla., assignors to Mainstream Engineering Corporation, Melbourne, Fla.

Filed Feb. 4, 1988, Ser. No. 152,648

Int. Cl.[4] F25D *23/12*; A41D *1/04*; A61F *7/00*; F28F *7/00*

U.S. Cl. 62—259.3 **23 Claims**

1. A device for controlling the transfer of heat with respect to a body comprising heat exchange material that changes between solid and liquid phases at its melting/freezing temperature, and means for supporting said heat exchange material in thermal communication with the skin of the body in both its solid and liquid phases and thereby causing the temperature of said heat exchange material in each of its phases to be applied to the skin of the body, and wherein the melting/freezing temperature of said heat exchange material lies in a temperature range on the order of 60°–90° F., so as to be comfortable during prolonged thermal communication with the skin.

18. A method for controlling the transfer of heat with respect to a body comprising the steps of:

(a) providing heat exchange material that changes between solid and liquid phases at its melting/freezing temperature; and

(b) placing said heat exchange material, in its solid phase, in thermal communication with the skin of the body and thereby causing the temperature of the solid phase of said heat exchange material to be applied to the skin of the body; and wherein



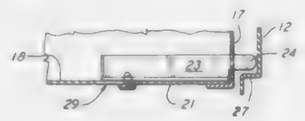
the melting/freezing temperature of said heat exchange material lies in a range on the order of 60°-90° F., so as to be comfortable during prolonged thermal communication with the skin.

4,856,295

SECURITY LOCK FOR A ROOM AIR CONDITIONER

Theodore S. Bolton, Liverpool, and Richard D. Lang, Chittenango, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 8, 1988, Ser. No. 153,690
Int. Cl.[4] F25D *23/12*
U.S. Cl. 62—263 14 Claims



1. In a room air condtioning system of the type having a chassis with a compressor and evaporator and condenser coils mounted thereon, and having front and side wall structures and being slideably disposed within a rectangular cabinet which is adapted for installation into a wall opening an improved security lock apparatus comprising:

a side opening formed in the chassis side wall structure;

a front elongate opening formed in the chassis front wall structure adjacent said side opening; and

a lock member slideably mounted between said side and front openings and being accessible from said front elongate opening to be selectively positionable by sliding between a retracted position and an extended position wherein, when the chassis is positioned within the cabinet to such a position that said lock member is aligned with a selected po:...n of the cabinet, a portion of said lock member extends through said said opening to engage said selected portion of the cabinet to thereby lock the chassis into the cabinet.

4,856,296

CLOSED VARIABLE-VOLUME CONTAINER COOLABLE TO RAPIDLY SOLIDIFY WATER THEREIN

Chi-Yao Shu, Tainan, Taiwan, assignor to Matthias Tai, Hsin-Chu; Shing-Bun Hu, Taipei; Gwo-Guer Yeh, Kaohsiung and Mow-Ho Guo, Hsinchu, all of, Taiwan

Filed Jul. 12, 1988, Ser. No. 217,827
Int. Cl.[4] F25D *11/00*
U.S. Cl. 62—430 12 Claims



1. A container comprising:

a container body having a longitudinal axis, said container body being filled with water;

a central stem secured in said container body, said central stem extending generally along the axis of said container body and serving as a core on which ice deposits when the water in the container body is cooled whereby a temperature at which said water begins to solidify is raised; and

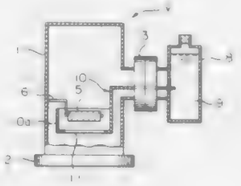
a plurality of branches extending generally radially outwardly from said central stem in a brush-like manner whereby the water in said container can initially solidify on said branches when said container body is cooled.

4,856,297

TRANSFER VESSEL DEVICE AND METHOD OF TRANSFER USING THE DEVICE

Takao Yasue, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 29, 1987, Ser. No. 138,953
Claims priority, application Japan, Sep. 30, 1987, 62-243680
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—51.1 9 Claims



1. A transfer vessel device comprising:

a hermetic container for accommodating a specimen removed from a vacuum apparatus and for supporting said specimen;

a heat-insulated container adapted to accommodate a cooling medium and operatively associated with said hermetic container; and

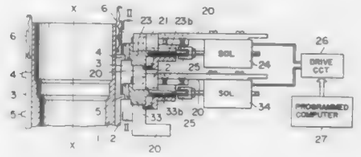
a heat-transfer member adapted to surround said specimen in said hermetic container and one end of which leads into said heat-insulated container so as to be cooled by said cooling medium.

4,856,298

NEEDLE ACTUATING DEVICE FOR A CIRCULAR KNITTING MACHINE

Kakuji Maruyama; Takeshi Kondo, both of Bunsui, and Yoshimitsu Okubo, Teradomari, all of Japan, assignors to Nagata Seiki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1988, Ser. No. 234,953
Claims priority, application Japan, Aug. 25, 1987, 62-128854[U]
Int. Cl.[4] D04B *15/78*
U.S. Cl. 66—40 3 Claims





1. A needle actuating device for a circular knitting machine, comprising:

(a) a knitting cylinder rotatable in a prescribed direction about its own axis;

(b) a multiplicity of needles mounted to the knitting cylinder for independent longitudinal displacement in a direction parallel to the axis of the knitting cylinder, each needle having a shank with a first and a second butt formed thereon with a spacing in its longitudinal direction, so that there are first and second rows of such butts arranged circumferentially of the knitting cylinder, at least the first row of butts including a group of butts longer than the others;

(c) stationary guide means disposed adjacent the knitting cylinder;

(d) a first cam mounted to the guide means for movement in a radial direction of the knitting cylinder toward and away from a first working position in which the first cam makes relative sliding engagement with the longer butts included in the first row of butts, the first cam having a cam surface such that the needles having the longer first butts are displaced in a predetermined direction parallel to the axis of the knitting cylinder as the longer first butts slide, with the rotation of the knitting cylinder, over the cam surface of the first cam being held in the first working position;

(e) a second cam spaced from the first cam in a direction parallel to the axis of the knitting cylinder and also mounted to the guide means for movement in a radial direction of the knitting cylinder toward and away from a second working position in which the second cam makes relative sliding engagement with the second row of butts, the second cam having a cam surface such that the needles are displaced in the predetermined direction parallel to the axis of the knitting cylinder as the second butts thereof slide, with the rotation of the knitting cylinder, over the cam surface of the second cam;

(f) a first linear actuator for reciprocably moving the first cam toward and away from the first working position; and

(g) a second linear actuator for reciprocably moving the second cam toward and away from the second working position;

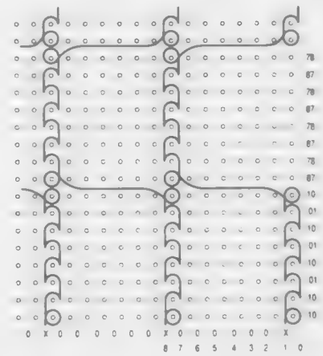
(h) the distance between the cam surfaces of the first and second cams in the direction parallel to the axis of the knitting cylinder being so determined in relation to the distance between the first and second butts of each needle that when the longer first butts ride onto the cam surface of the first cam being held in the first working position, a spacing is created between the second cam being held in the sevcond working position and those of the second butts which are on the same needles as the longer first butts, so that the second cam can be moved to the second working position without being loaded by the second butts after the longer first butts have ridden onto the cam surface of the first cam being held in the first working position.

4,856,299

KNITTED FABRIC HAVING IMPROVED ELECTRICAL CHARGE DISSIPATION AND ABSORPTION PROPERTIES

Kenneth G. Bryant, Charlotte, N.C., assignor to Conductex, Inc.

Continuation-in-part of Ser. No. 940,864, Dec. 12, 1986. This application Dec. 14, 1987, Ser. No. 132,122
Int. Cl.[4] D04B *7/16*
U.S. Cl. 66—202 11 Claims



1. A knitted fabric having improved electrical charge dissipation, absorption, stain resistance, anti-pilling and linting, and tensile strength properties comprised of stitches of nonconductive fibers knitted together with conductive fibers that form underlaps and overlaps in combination with the nonconductive fibers in both the course and wale directions, the conductive fibers being substantially parallel and perpendicular to the wale of the fabric, so as to form an electrically conductive matrix capable of dissipating charge in substantially any direction along the course and wale of the technical face and back of the fabric.

4,856,300

DEVICE FOR SELECTING NEEDLES IN CIRCULAR KNITTING MACHINES FOR HOSIERY AND THE LIKE

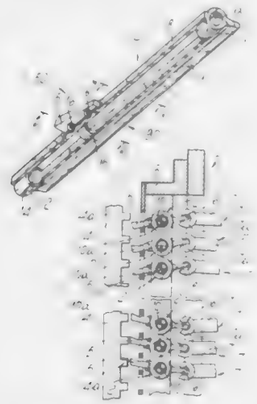
Francesco Lonati, Brescia, Italy, assignor to Lonati S.p.A., Brescia BS, Italy

Filed Feb. 8, 1988, Ser. No. 153,759
Claims priority, application Italy, Feb. 16, 1987, 19395 A/87
Int. Cl.[4] D04B *15/78*
U.S. Cl. 66—221 20 Claims

1. A device for the selecting needles in circular knitting machines having a needle cylinder and a support structure, comprising a plurality of selectors, each selector having at least one selector butt, a plurality of superimposed selection levers each having an intermediate portion, each intermediate portion of each selection lever being pivotally connected to said support structure by a pin, each said pin having a pin axis, said selection levers each having at least one end located adjacent

to said needle cylinder proximate to said selectors and at least one other end located remote from said selectors, said selection levers each being oscillatable in a plane substantially parallel to said selectors, said selectors being arranged to pass in front of said selection levers during operation of a knitting machine, from an inoperative position, whereat said one end is located between said selector butts to avoid interference therewith, to an operative position whereat said one end is located on a level with said selector butts to interfere therewith, said device further comprising actuation means adapted to act on said other end of each of said selection levers for moving the relative selection lever from said inoperative position to said operative position and vice versa, wherein each of said selection levers comprises:

at least one first portion having a longitudinal extension and defining first portion ends and a first portion intermediate zone;



at least one second portion spaced from said first portion and extending substantially parallel to said pin axis, said second portion defining second portion ends and a second portion intermediate zone;

a space defined between said first portion and said second portion;

a plurality of cross-members extending across said space and interconnecting said first portion and said second portion at least proximate to said first portion ends and said second portion ends;

at least one seat defined by said plurality of cross-members, said seat accommodating said pin, and;

at least one plate rigidly associated with said intermediate zone of said first portion, said plate extending towards said selector butts and defining said at least one end of each of said selection levers located adjacent to said needle cylinder proximate to said selectors.

4,856,301

WASHING AND EXTRACTING MACHINE

John Broadbent, Bloomingdale, Ill., assignor to Ellis Corporation, Itasca, Ill.

Filed Dec. 8, 1987, Ser. No. 130,311
Int. Cl.[4] D06F *33/02*
U.S. Cl. 68—12 R **9 Claims**

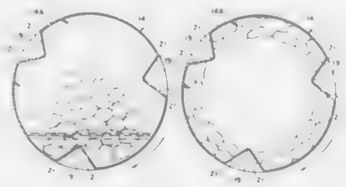
1. A washing and extracting machine for use with a plurality of different types of laundry materials, comprising:

a laundering cylinder mounted for rotation about a central axis for centrifugally moving the laundry materials;

drive means for rotating said laundering cylinder at a variable speed;

programmable controller means for controlling said drive means to vary the rotation speed of said cylinder in accordance with a predefined acceleration/deceleration profile, said predefined acceleration/deceleration profile being selectively provided corresponding to a particular one of said laundry materials; and

said predefined acceleration profile including a plurality of predetermined time intervals for varying said rotation



speed of said cylinder between predetermined first and second speeds for each of said time intervals, thereby to accelerate said laundering cylinder at a predetermined rate within each of said time intervals.

4,856,302

BATCH WASHING MACHINE

Werner Eck, Herzogenaurach, Fed. Rep. of Germany, assignor to Kleindienst GmbH Firma, Augsburg, Fed. Rep. of Germany

PCT No. PCT/EP87/00114, § 371 Date Oct. 28, 1987, § 102(e) Date Oct. 28, 1987, PCT Pub. No. WO87/05345, PCT Pub. Date Sep. 11, 1987
PCT Filed Feb. 26, 1987, Ser. No. 130,113
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1986, 3607119
Int. Cl.[4] D06E *21/04*
U.S. Cl. 68—27 **9 Claims**



1. A batch washing machine, comprising:

a base;

an outer elongated cylinder fixedly mounted on said base, said outer cylinder having a longitudinal axis and being formed with side walls at each end of said outer cylinder;

two flanges, each of said flanges being fastened to the respective side wall;

an inner elongated cylinder coaxial with and rotatable about said axis in said outer cylinder, said inner cylinder being formed with two projections defining respective ens of said inner cylinder, said projections axially extending over the respective side walls of the outer cylinder, said inner cylinder having a peripheral wall between the ends of said projections;

two annular flanges, each of said annular flanges being rigidly connected with the respective end of said inner cylinder and being formed with a sprocket at an end spaced from the respective flange fastened to the side walls of the outer cylinder;

guiding means for guiding said inner cylinder adjacent to the respective sprocket on the respective annular flange;

supporting means on said base for supporting said inner cylinder and cooperating with said guiding means;

sealing means for sealing free space between said inner and outer cylinders at each of said projections, said sealing means comprising:

a radial resilient lip seal urging against the peripheral wall and bearing upon the respective flange fastened to said side walls, and

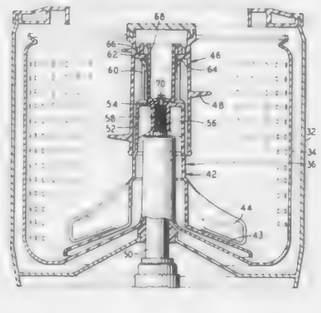
a sheet gasket flanged to the respective side wall of said outer cylinder and axially spaced from the respective radial resilient seal, said gasket being juxtaposed with said peripheral wall, so that said gasket and said resilient seal form an annular flooding chamber in a vicinity of respective projectionad, said annular flooding chamber being formed with means forming a water passage providing the chamber with a continuous water pressure preventing a water solution influxing said chamber.

4,856,303

AGITATOR THRUST SPACER FOR AUTOMATIC WASHER

Richard D. Hood, Jr.; Dale E. Mueller, both of Benton Township, Berrien County, and Douglas J. Walker, Lake Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 21, 1988, Ser. No. 222,029
Int. Cl.[4] D06F *37/40*
U.S. Cl. 68—133 **10 Claims**



1. In an automatic washer, a two-piece vertical agitator comprising:

a lower agitator portion having an upper bearing surface;

an upper agitator portion partially surrounding said lower agitator portion and having an inwardly extending support ring carried on said bearing surface of said lower agitator portion;

a one-way clutch mechanism connecting said upper and lower portions to permit relative rotation between said two portions;

said clutch mechanism having a cam member secured to said lower agitator portion to rotate therewith, a portion of said cam member overlying and spaced from said bearing surface of said lower agitator portion to form a vertical space therebetween partially filled by said support ring of said upper agitator portion; and

a thrust spacer interposed between said lower agitator portion bearing surface and said upper agitator portion support ring;

said thrust spacer having a plurality of resilient tabs angularly upstanding therefrom to substantially fill said vertical space not already filled by said support ring.

4,856,304

SECURITY DEVICE FOR CASSETTE TAPE DECKS OR THE LIKE

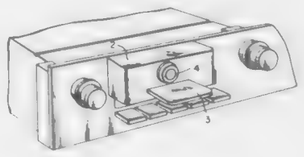
Jay S. Derman, 4141 Dixie Canyon Ave., Sherman Oaks, Calif. 91423

Filed Mar. 23, 1989, Ser. No. 328,042
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—14 **9 Claims**

1. A security device for cassette tape decks, CD players or the like, for insertion into the cassette chamber opening and for blocking access to said cassette chamber opening, the device comprising:

(a) a transverse block assembly, and

(b) a tongue piece; said transverse block assembly further comprising a main transverse block member, a rearward bearing member and a locking means; said main transverse block member being made of a rigid plastic material and sized 2.5 to 5.5 inches wide, depending on device application, and approximately 1.3 inches high by 0.75 inches deep, the rear longitudinal surface of said transverse block being for the purpose of bearing against and blocking access to said cassette chamber opening; said rearward bearing member being attached to, or formed as part of the rear longitudinal surface of said main transverse block member, so that said rearward member projects horizontally outwards, providing a surface against which said tongue piece bears when assembled; said tongue piece being a "T" shaped member made of 0.100 inch thick stainless steel or equivalent strength material, and having a multiplicity of locking slots cut in the long portion of the



"T" for the purpose of engagement with a locking element; said tongue piece including a projecting ridge, welded or otherwise attached to the surface of said tongue piece top "T" so that it is perpendicular to the long axis of said tongue piece; said tongue piece thickness and the thickness of said rearward bearing member, together being equal to the thickness of a standard cassette for the purpose of filling the cassette chamber opening; said main transverse block member incorporating a horizontal slot for the purpose of inserting said tongue piece; said tongue piece when inserted in said main transverse block member, and then inserted in a tape deck cassette chamber opening, able to have its projecting ridge bear against the inside surface of said cassette chamber opening, and said main transverse block member bear against the outside surface of said tape deck or similar equipment; said locking means, when motivated, engaging one of said transverse locking slots in said tongue piece, thereby holding the device in place, blocking access to said tape deck cassette chamber, preventing the device removal and unauthorized use of said tape deck or similar equipment.

4,856,305

OFFICE MACHINE SECURITY SYSTEM

Michael W. Adams, 1903 Hemmingway St., Canoga Park, Calif. 91306

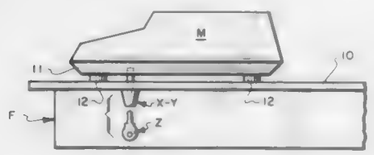
Continuation of Ser. No. 889,832, Jul. 28, 1986, abandoned. This application Dec. 7, 1987, Ser. No. 129,240
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—58 **13 Claims**

1. A security system that discourages the theft of office machines mounted on the top of furniture having a flat lower surface comprising in combination:

an elongated fastener comprising a rod having a first end including attachment means to attach the first end to the base of the machine, said rod having a length sufficient to extend through a hole in said top of the furniture and including a second end;

a cap having a wider diameter than the rod and the hole in the top attached to the second end of the rod for securing the machine to the top;

a hollow housing surrounding said cap having a chamber, said housing including a flat upper wall, a downwardly extending side wall connected to the upper wall and having an open lower end, said flat upper wall engaging the flat lower surface of the top and having an aperture for receiving the second end of said rod and being rotatably mounted on said rod between the cap and the lower surface of the furniture top;



a lock closure means including a lock barrel having a retractable latch, said lock barrel being releasably and rotatably secured in the lower open end of said housing with the lock barrel spaced from said cap and being independent of the cap fastener; and

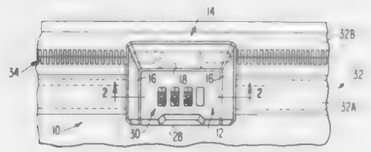
the inner surface of the side wall of the housing containing a continuous, horizontal rim disposed in a position to slidingly engage the bottom surface of the latch whereby said lock barrel is rotatable throughout 360 degrees in said housing.

4,856,306

ZIPPER LOCKING APPARATUS FOR LUGGAGE CASES

Stephen S. Scelba, Clifton, N.J., and Martin R. Feinberg, Denver, Colo., assignors to Presto Lock, Inc., Garfield, N.J. and Samsonite Corporation, Denver, Colo.

Filed Feb. 27, 1987, Ser. No. 19,514
Int. Cl.[4] F05B *67/38*
U.S. Cl. 70—68 **7 Claims**



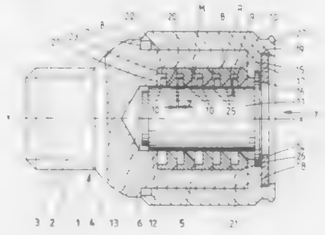
1. In combination with a zipper device on a luggage case, said zipper device having a pair of zipper sliders that are at predetermined locations adjacent to one another when the zipper device is closed, each zipper slider including a body that operates zipper teeth and a pull tab connected to the body, zipper locking apparatus comprising a base with means for attaching the base to the luggage case adjacent to said predetermined locations and having means for defining a pair of chambers for enclosing said zipper sliders at said predetermined locations substantially entirely with the pull tabs of the sliders extending away from one another and for trapping said zipper sliders merely by said enclosing, said chambers being defined in part by a member supported on said base for pivotal movement about an axis substantially parallel to said zipper device at one side thereof, said pivotal movement being between a first position in which the chambers are open and a second position in which the chambers are closed, and means for releasably latching said member in said position.

4,856,307

DEVICE FOR PROTECTING MOTOR-VEHICLE WHEELS AGAINST THEFT

Herbert P. Haüser, Elsdorf-Heppendorf, Fed. Rep. of Germany, assignor to Dom-Sicherheitstechnik GmbH & Co KG, Fed. Rep. of Germany

Filed Jun. 22, 1988, Ser. No. 209,654
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 3722870
Int. Cl.[4] F16B *41/00*
U.S. Cl. 70—165 **8 Claims**



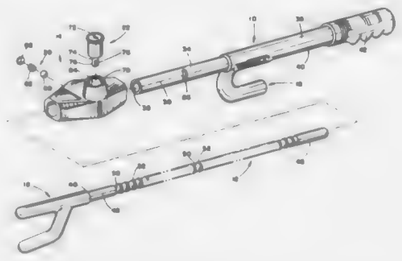
1. A device for protecting motor-vehicle wheels against theft, comprising a freely rotatable sleeve covering the polygonal head of a wheel bolt, into which sleeve a cylinder lock engages rotatably, which lock is provided with at least one tumbler entering the inner wall of the cylinder lock location cavity of said polygonal head which projects beyond the circumference of said cylinder lock and in a locking position engages behind a cooperating locking shoulder wherein said locking shoulder is located on an annular body inserted into an axial chamber of said polygonal head and locked in position thereto.

4,856,308

AUTOMOBILE STEERING LOCK

Charles R. Johnson, Hudson, Ohio, assignor to James Winner, Sharon, Pa.

Continuation of Ser. No. 15,596, Feb. 18, 1987, Pat. No. 4,738,127, which is a continuation of Ser. No. 801,821, Nov. 26, 1985, abandoned. This application Oct. 26, 1987, Ser. No. 112,375
The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.
Int. Cl.[4] B60R *25/02*
U.S. Cl. 70—209 **6 Claims**



1. An anti-theft device for attachment to a steering wheel of an automotive vehicle comprising:

an elongated tubular member having an inner end, an outer end and an elongated passageway extending along its axis therethrough, said tubular member having a generally U-shaped hook portion extending therefrom with the closed end of the U-shaped portion generally adjacent to but slightly spaced from the inner end of said tubular member and the open end of said U-shaped portion facing said outer end of said tubular member but substantially removed therefrom, said U-shaped hook portion of said tubular member further defined by a bottom leg portion generally extending in the direction of said tubular member's axis and terminating at a distance substantially removed from said outer end of said tubular member, said U-shaped hook portion of said tubular member adapted to engage said wheel from the inside thereof with said outer end of said tubular member extending a substantial distance beyond the periphery of said wheel;

an elongated rod member having an inner and an outer end, said inner end adapted to extend in a telescopic manner within said passageway of said tubular member, said outer end of said member being formed in to a generally U-shaped portion with the opening of said U-shaped portion at said outer end of said rod member, said U-shaped portion of said rod member adapted to engage said wheel from the inside thereof, said rod member further including a plurality of spaced annular grooves disposed about a portion thereof;

a lock, and

means for securing said lock to said inner end of said tubular member including (i) locating means permitting telescopic movement of said rod member in a yieldably resisting manner and (ii) locking means rotatable from an unlocking position permitting telescopic movement of said rod member within said tubular member to a locking position preventing relative movement between said rod member and said tubular member;

said locking means including said tubular member having a circular opening formed in said inner end thereof, said lock having a blind passageway aligned with and opening to said circular opening when said lock is assembled to said tubular member, a spherical bearing contained within said passageway, said bearing having a diameter slightly greater than said cirucular opening and biased into said circular opening to partially intersect said passageway and said annular grooves in said rod member to connect said lock to said tubular member and said locking means further including said tubular member having a slot formed therein diametrically opposite said circular opening, a generally cylindrical locking member rotatably mounted within said lock and aligned with said slot in said tubular member, said locking member having a flat portion on one side thereof and an arcuate portion opposite thereto and rotatable from said unlocking position whereat said flat portion is approximately flush with said slot to a locking position whereat said arcuate portion extends through said slot to contact one of said annular grooves of said rod member to connect said lock to said tubular member in both said locking and unlocking positions.

4,856,309

PIN TUMBLER LOCK

Noach Eizen, Rishon Lezion, Israel, assignor to Mul-T-Lock, Ltd., Yavneh, Israel

Filed Sep. 16, 1987, Ser. No. 98,596
Claims priority, application Israel, Jul. 3, 1987, 83071
Int. Cl.[4] E05B *27/04*
U.S. Cl. 70—359 **8 Claims**

1. A pin tumbler lock comprising a shell with a cylindrical hole, a cylindrical plug fitting within said hole of said shell, said plug being rotatable by key means, said plug having first bore means for receiving first pin tumblers, said first bore means being substantially normal to the axis of said plug, said shell having second bore means for receiving second pin tumblers therein, said second bore means being aligned with said first bore means, first pin tumblers in said first bore means, second pin tumblers in said second bore means, and means in said shell for forcing said second pin tumblers into said aligned first bores to thereby prevent rotation of said plug, said first and second pin tumblers having at the respective ends contacting each other substantially mating surfaces to provide contact substantially along entire surface of the contacting ends, said plug comprising two substantially parallel grooves each extending in a plane normal to the axis of said plug and along the periphery of said plug, one of said grooves being provided on each opposite side of said first bore means, along the longitudinal axis of said plug and adjacent said first bore means, and said first and second tumbler pins being rotatable independently of one another and mating at least partially within said grooves in said plug, thereby providing a non-linear shear line between said plug and said shell irrespective of the circumferential position of said pins, said bore means and said plug.

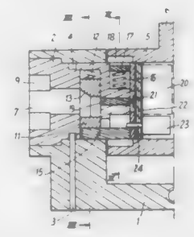


4,856,310

ELECTRONIC LOCK

Raoul Parienti, 5, rue de Belgique, 06000 Nice, France

Filed Apr. 27, 1988, Ser. No. 186,804
Claims priority, application France, Apr. 29, 1987, 87 06276
Int. Cl.[4] E05B *17/04*
U.S. Cl. 70—379 R **4 Claims**



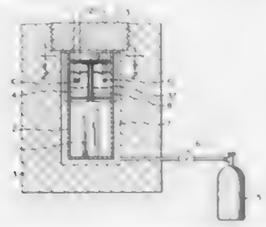
1. An electronic lock that is programmed to be operated by a key having a number of programmable memories, said lock comprising an activation element (5), a dormant memory which contains a code, and comparison means to successively compare said code contained in the dormant memory with the codes contained in the programmable memories of the key, characterized by the fact that said lock comprises means of engagement (2, 15, 17) between the key and the activation element, an electromagnet (23) controlling said means of engagement by a single impulse as soon as the comparison means have recognized that the code of the key and the code of the lock are identical, and locking means (27) maintaining the means of engagement in the engaged position until the key is withdrawn from the lock, said lock being operable as a conventional lock as long as said key is not withdrawn.

4,856,311

APPARATUS AND METHOD FOR THE RAPID ATTAINMENT OF HIGH HYDROSTATIC PRESSURES AND CONCURRENT DELIVERY TO A WORKPIECE

Robert M. Conaway, Columbus, Ohio, assignor to Vital Force, Inc., Columbus, Ohio

Filed Jun. 11, 1987, Ser. No. 60,518
Int. Cl.[4] B21D *26/10*
U.S. Cl. 72—56 17 Claims



1. An apparatus for the production and delivery to a workpiece of high levels of static pressure comprising:
(a) a first chamber, thermally insulated from its surroundings, wherein said workpiece is placed;
(b) a second chamber directly adjacent to said first chamber thermally insulated therefrom, and thermally insulated from other surroundings of said second chamber, said second chamber connected to said first chamber by means of a hollow connecting tube, said connecting tube blocked to the passage of gas and fluid by means of a pressure-opening inlet device;
(c) a means for the introduction of an expansible fluid into said second chamber;
(d) a means for rapidly heating and expanding said fluid, attaining thereby pressure in excess of that required to open said inlet device, transmitting thereby said pressure to said first chamber and to said workpiece contained therein;
(e) a means for confining said pressure produced by said expansion to said first and second chambers;
(f) a means for controlling the pressure of said first and second chambers;
(g) a means for controlling the temperature of said workpiece.

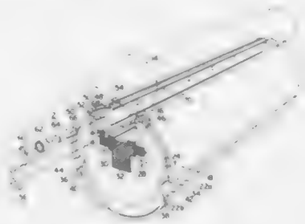
17. A method for the processing of a workpiece with high temperatures and high pressures comprising the steps:
(a) placing said workpiece into a first thermally insulated chamber, wherein said first chamber has a means therein for heating said workpiece in a controlled manner;
(b) heating said workpiece in said first chamber to the desired temperature;
(c) concurrently with step b, inserting into a second thermally insulated chamber, a heating means in thermal contact with a sufficient quantity of expansible fluid to cause a pressure raise upon expansion in said first chamber and said second chamber to the desired processing pressure for said workpiece;
(d) joining said first and said second chambers by means of a hollow connecting tube, said tube having an impermeable pressure-opening inlet device isolating said first and said second chambers;
(e) inserting said first and said second chambers, as joined in step d, into a pressure-containment vessel;
(f) introducing sufficient heat into said heating means to open said inlet device and raise the pressure in both chambers to the desired value;
(g) holding the combination of said first and said second chambers, as connected, at the required temperature and pressure for the required length of time;
(h) reducing said pressure;
(i) removing said combination of said first and said second chambers from said pressure-containment vessel;
(j) reducing the temperature of said workpiece and removing said workpiece from said first chamber.

4,856,312

ROUNDING APPARATUS FOR A CAN WELDING MACHINE

Kurt Alznauer, Lauchringen, Fed. Rep. of Germany, assignor to Elpatronic AG, Zug, Switzerland

Filed Mar. 24, 1988, Ser. No. 172,649
Claims priority, application Switzerland, May 5, 1987, 01714/87
Int. Cl.[4] B21D *5/14*
U.S. Cl. 72—133 6 Claims



1. A rounding apparatus for a can welding machine, the apparatus including a device for supplying sheet-metal blanks, a pair of rounding rolls for rounding the supplied sheet-metal blanks, a shell-type rounding tool which defines a slit formed between an inner shell and an outer shell to guide the rounded sheet-metal blanks from the rounding rolls, wherein the improvement comprises a stop provided at the end of the slit for engaging and stopping the sheet-metal blanks in the slit, the stop having a catch hook for engaging the edge of a sheet-metal blank and being rotatable about an axis extending parallel to the longitudinal axis of the shell-type rounding tool and offset radially from the slit to permit at least a component of hook movement with the engaged edge of a blank in a direction tangential to the slit.

4,856,313

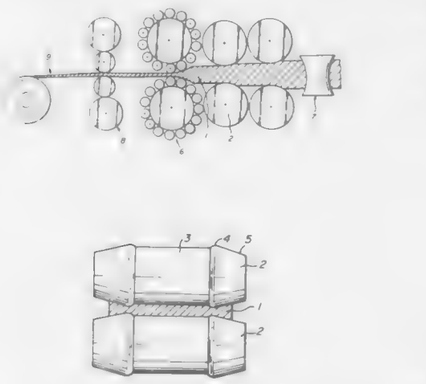
METHOD OF CONTROLLING STRIP CROWN IN PLANETARY ROLLING

Ryozo Mirura; Yoshio Okamoto; Hiroki Takahashi, all of Yokohama, and Souichi Inada, Yokosuka, all of Japan, assignors to Nippon Yakin Kogyo Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1987, Ser. No. 97,199
Int. Cl.[4] B21B *1/02, 1/22, 1/42*
U.S. Cl. 72—234 5 Claims

1. A method of controlling strip crown in a planetary mill line including feeding rolls and planetary rolls, comprising the steps of
rolling a slab with feeding rolls to shape a slab profile in the direction of the width of the slab having a flat or curved central portion, opposite side ends being thicker than the central portion and side portions being thinner than the central portion between the cemntral portion and the opposite side ends, at least one of a pair of the feeding rolls including a flat or curved central region, at least one reduced side end having a diameter smaller than that of the central region, at least one enlarged side portion being spaced from the reduced side end by a distance determined by a roll gap between the central regions of the pair of feeding rolls and having a diameter 0.1–1% larger than that of the central region and a tapered side region between the enlarged side portion and the reduced end, and

substantially rolling the slab having the shaped slab profile by means of planetary rolls, thereby providing a planetary



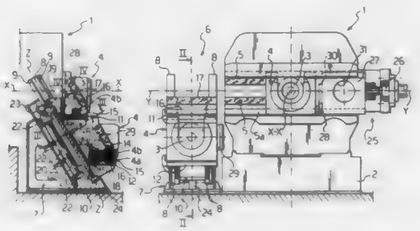
rolled strip having a substantially flat strip crown having a uniform thickness over the width of the strip.

4,856,314

DIE EXCHANGE DEVICE FOR HORIZONTAL AXIS EXTRUDING PRESSES

Sergio Zarru, San Donato Milanese, and Romano Alberti, Turate, both of Italy, assignors to Innse Innocenti Santeustacchio S.p.A., Brescia, Italy

Filed Jan. 7, 1988, Ser. No. 141,522
Claims priority, application Italy, Jan. 8, 1987, 19021 A/87
Int. Cl.[4] B21C *27/00*
U.S. Cl. 72—263 2 Claims



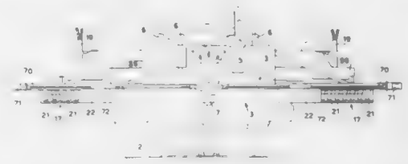
1. A die exchange device for horizontal axis extruding presses having a working position whereat an extrusion die is held during the extrusion process, characterized in that it comprises a supporting column provided with guide extending therealong in an inclined direction from the vertical, a carriage movable along said guides
and provided with at least two superimposed rest shelves in a mutually spaced-apart relationship and in a stepped arrangement and each arranged to carry a respective die holding slide, drive means operative on said carriage to take each of said shelves
and respective slides to a die exchange position close to said working position, and pusher means effective to shift a die holding slide from said die exchange position to said working position, and vice versa.

4,856,315

BENDING MACHINE FOR THE PRODUCTION OF RECTANGULAR SHEET METAL PANELS STARTING FROM FLAT METAL SHEETS

Guido Salvagnini, Sarego, Italy, assignor to Salvagnini Transferica S.p.A., Sarego, Italy

Filed Dec. 28, 1987, Ser. No. 138,054
Claims priority, application Italy, Jan. 9, 1987, 19046 A/87
Int. Cl.[4] B21D *5/04*
U.S. Cl. 72—306 20 Claims



1. A bending machine for manufacturing sheet metal panels, comprising:
a fixed counterblade;
a blank holder vertically movable to and from said counterblade;
a pair of bending blades carried by a C-like support vertically movable with respect to said counterblade;
said blank holder comprising a vertically movable support and a succession of adjacent blank-holding elements slidingly carried by said vertically movable support;
said blank-holding elements comprising thinner central elements, removable thicker end elements and removable spacers arranged at respective ends of said succession of blank-holding elements and provided with means for forming free spaces near said end elements;
width-adjusting means for the blank holder, including at least one magazine for removable end elements which have a same shape but different width with respect to said end elements of the blank holder;
at least one running carriage programmer movable along the blank holder and between said magazine and said blank holder and provided with means for taking said end elements and said spacers from said blank holder and said magazine and selectively moving said end elements and said spacers from the magazine to the blank holder and vice versa or to different positions in the blank holder and with means for selectively defining between said blank holding elements free spaces for taking and introducing said end elements and said spacers; and
means for grouping said blank-holding elements at the conclusion of each taking and introducing operation.

4,856,316

APPARATUS FOR FORMING JOINTS

Arthur L. Slasinski, Anita, Mich., assignor to Weldex, Inc., Warren, Mich.

Filed Jul. 8, 1987, Ser. No. 71,451
Int. Cl.[4] B21J *9/18*
U.S. Cl. 72—451 7 Claims

1. Apparatus for forming a clinch joint between two sheets of deformable material comprising:
drive lever means;
support means;
means for pivotally mounting said drive lever means on said support means;
motor means connected with said drive lever means for shifting said lever means relative to said support means to form said clinch joint;
a punch;
an anvil mounted opposite said punch, said anvil being operatively interconnected to said drive lever means and re-

sponsive to pivotal movement of said drive lever means to reciprocate relative to said punch;
a die mounted opposite said punch; and,



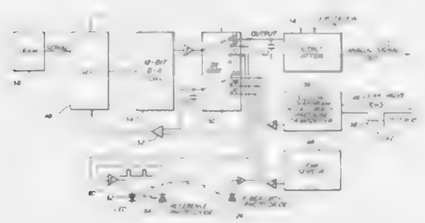
first connecting links interconnecting said die with said drive lever means such that said die is responsive to pivotal movement of said drive lever means to reciprocate relative to said punch independently of said anvil.

4,856,317

VACUUM CALIBRATION SYSTEM AND METHOD FOR FIBEROPTIC PRESSURE TRANSDUCER

John Pidorenko, Ypsilanti, Mich.; Alan R. Hoffman, Chagrin Falls; Robert F. Hodge, Kent, both of Ohio, and Wei-Min Wang, Ypsilanti, Mich., assignors to Fiberoptic Sensor Technologies, Inc., Ann Arbor, Mich.

Filed May 2, 1988, Ser. No. 189,333
Int. Cl.[4] G01L *27/00*
U.S. Cl. 73—4 R **20 Claims**



1. In a fiber optic pressure measurement system having one or more optical fibers extending from a proximal end to a distal end within an enclosed sensor tip, means for directing light of known intensity through the fiber(s) from the proximal to and through the distal end, reflecting means within the sensor tip for directing at least a portion of the light back through the fiber(s) to the proximal end, and means for attenuating the intensity of the reflected light as a function of the pressure differential across the outside and inside of the sensor tip, means for calibrating the measurement system to establish a known relationship between the intensity of reflected light and pressure differential the calibrating means comprising:
(a) means for applying a pressure differential across the outside and inside of said sensor tip;
(b) means for varying said pressure differential continuously from a first to a second value over a time period;
(c) means for measuring the value of said pressure differential at a plurality of discrete times during said time period;
(d) means for measuring the value of the intensity of reflected light at said plurality of discrete times; and
(e) means for storing said measured values of pressure differential and intensity of reflected light, whereby a known pressure value may be determined after calibration of the pressure measurement system by matching a measured value of reflected light intensity with the corresponding stored value of pressure differential.

4,856,318

SURFACE RESILIENCY TESTER

Paul J. Hogan, Phoenixville, Pa.; Evan Sanders, Tewksbury, Mass., and Robert DiGirolamo, Springfield, Pa., assignors to Playground Clearing House, Inc., Phoenixville, Pa.

Filed Jul. 20, 1987, Ser. No. 75,519
Int. Cl.[4] G01N *3/30*
U.S. Cl. 73—12 **18 Claims**



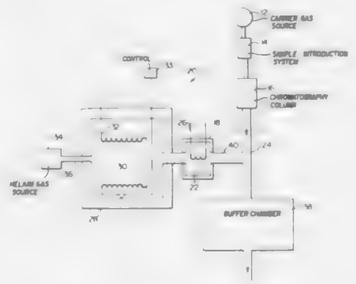
1. A hand-portable, self contained surface resiliency tester having a transducer module and an electronic module adapted to obtain multiple drop test measurements of the in-site resiliency, compactness and hardness characteristics of natural and synthetic surfaces, said transducer module comprising an impact head and a transducer means suitable for producing an electrical signal proportional to impact forces or g's and said electronic module including means for converting said electrical signals from the transducer means to indicia means of said electrical signals relatable to the characteristics of the surface under test and a shock isolation/absorbing system at the interface between the transducer and electronic modules.

4,856,319

THERMALLY SWITCHABLE KATHAROMETER

Marcel E. Golay, La Conversion, Switzerland, assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 31, 1988, Ser. No. 200,335
Int. Cl.[4] G01N *31/08*
U.S. Cl. 73—23.1 **12 Claims**



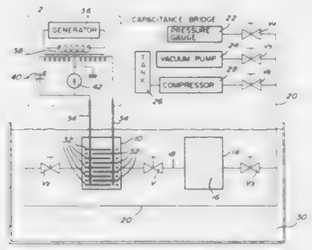
1. A gas chromatography system comprising
a gas chromatography column having an inlet and outlet,
detector means for analyzing sample components, said detector means having a detection chamber connected to the column outlet, and
means for selectively alternately filling said detection chamber with carrier gas for a baseline measurement and with effluent from said column outlet for a sample measurement,
said means for selectively alternately filling said detection chamber comprising
a gas chamber connected to said detection chamber,
means for supplying carrier gas to said gas chamber, and
means for selectively heating gas in said gas chamber to cause carrier gas from said gas chamber to fill said detection chamber and thereafter cooling gas in said gas chamber to withdraw gas in said detector chamber into said gas chamber so as to draw effluent from said column outlet to fill said detection chamber for a sample measurement.

4,856,320

METHOD AND APPARATUS FOR MEASURING PHYSICAL ADSORPTION OF GASES BASED ON DIELECTRIC MEASUREMENTS

Tapan K. Bose; Richard Chahine; Louis Marchildon, and Jean-Marie St-Arnaud, all of Trois-Rivières, Canada, assignors to Universite du Quebec a Trois-Rivieres, Societe Quebecoise d'Initiatives Petrolieres and Gaz Metropolitain Inc., Quebec, Canada

Filed Sep. 8, 1988, Ser. No. 241,844
Int. Cl.[4] G01N *9/00*
U.S. Cl. 73—30 **19 Claims**



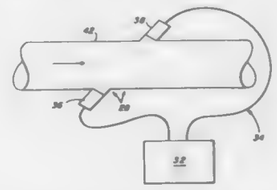
1. A method of measuring physical adsorption of a gas by a solid adsorbent, wherein use is made of a capacitance cell in controlled gas flow communication with a sample cell initially under vacuum and containing the solid adsorbent, said method comprising the steps of:
(a) filling said capacitance cell with an adsorptive gas at a predetermined pressure and measuring the dielectric constant of said gas at said predetermined pressure to determine a first density value;
(b) allowing said gas from said capacitance cell to expand into said sample cell for adsorption by said solid adsorbent, whereby as adsorption takes place pressure falls until equilibrium is established;
(c) measuring the dielectric constant of said gas at equilibrium pressure to determine a second density value; and
(d) determining the amount of gas adsorbed by said solid adsorbent at said equilibrium pressure from said first and second density values.

4,856,321

APPARATUS AND METHODS FOR MEASURING FLUID FLOW PARAMETERS

Jack W. Smalling; Leonard D. Braswell, both of Baytown, Tex., and Lawrence C. Lynnworth, Waltham, Mass., assignors to Panametrics, Inc., Waltham, Mass.

Division of Ser. No. 846,635, Apr. 1, 1986, Pat. No. 4,754,650, which is a division of Ser. No. 518,444, Jul. 29, 1983, Pat. No. 4,596,133. This application Apr. 27, 1988, Ser. No. 186,571
Int. Cl.[4] G01M *3/24*
U.S. Cl. 73—40.5 A **9 Claims**



1. Apparatus for detecting a leak in a flare stack system, said flare stack comprising
a plurality of processing stations,
each processing station having associated therewith a safety discharge conduit and a safety discharge valve connected for controlling discharge from said processing station to said conduit,
said apparatus comprising
a header conduit connected to a plurality of different discharge conduits, and
means for monitoring said header conduit for detecting said leaks, said monitoring means determining fluid flow velocity proximate said discharge conduits as a function of time, said monitoring means comprising
first transducers at first locations in said header conduit proximate said discharge conduits,
second transducers at second locations in said header conduit proximate said discharge conduits, corresponding ones of said first and second transducers defining between them an interrogation path proximate said discharge conduits,
means for exciting said first and second transducers to emit acoustic energy,
means for measuring an upstream transit time and a downstream transit time for the propagation of said energy between said transducers in an upstream and downstream direction respectively,
means for controlling said excitation and measuring means for generating said transmit time measurements at a rate greater than at least ten times per second, and
means for determining from said transmit times the speed of sound in said fluid proximate said discharge conduits as a function of time and the fluid flow velocity proximate said discharge conduits as a function of time,
whereby a gas leak through said safety valves can be detected.

4,856,322

METHOD AND DEVICE FOR MEASURING THE VISCOSITY OF AN INK

David J. Langrick, Lubbenham, and Mark Smith, Peterborough, both of England, assignors to Willett International Limited, Slough, United Kingdom

Filed Jul. 27, 1988, Ser. No. 224,735
Claims priority, application United Kingdom, Feb. 17, 1988, 8803641
Int. Cl.[4] G01N *11/06*
U.S. Cl. 73—56 **9 Claims**

1. A method for monitoring the viscosity of ink in a continuous jet ink jet printer, which method comprises causing at least

part of the ink to flow through a restricted orifice into a vessel and measuring the time taken to fill the vessel between a lower level limit and an upper level limit and allowing ink to escape



from the vessel to reduce the level to below the lower level limit, characterised in that ink is automatically removed from the vessel by means of a syphon when the ink has reached at least the said upper level limit.

4,856,323

STEERING TORQUE DETECTING DEVICE

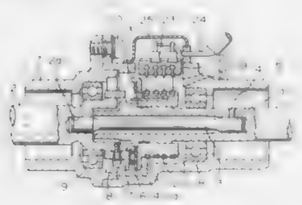
Mitsuharu Morishita; Shinichi Kohge; Tadayuki Hara; Yasuaki Hata, and Hisato Umemaru, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 177,085, Apr. 4, 1988. This application Oct. 20, 1988, Ser. No. 260,276

Claims priority, application Japan, Apr. 6, 1987, 62-52839; Apr. 6, 1987, 62-52840; Apr. 22, 1987, 62-61811; Apr. 22, 1987, 62-61812

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—118.1 **1 Claim**



1. A steering torque detecting device, comprising:
- a steering shaft consisting of an input shaft and an output shaft,
- a torsion bar provided between said input shaft and said output shaft,
- a torque detecting unit for converting a quantity of torsion produced in said torsion bar into an electric output,
- an electricity collecting unit comprising a slip ring holder connected to said input shaft and having a flange, a plurality of slip rings mounted on said slip ring holders and including a connecting line extending to a side portion of said flange, a potentiometer mounted on said side-portion of said flange of said slip ring holder,
- a plurality of brushes which receive said electric output and supplies electric power from a power source;
- a plurality of bearings for supporting said input and output shafts on the same axial line; and
- a housing supporting said bearings, wherein each of said brushes comprises a pair of elongated bodies made of nickel or a nickel series alloy, a first end of each of which are electrically and mechanically connected to a terminal block of a brush holder and a second end of each including free ends respectively in contact with one of said slip rings.

4,856,324

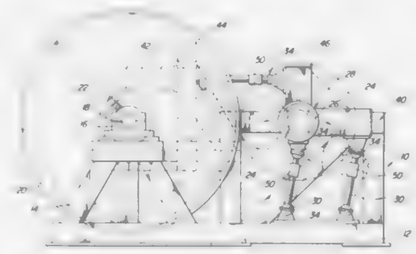
HIGH SPEED TIRE TESTING DEVICE WITH COMPENSATED LINKAGES

Gerald R. Potts, G-6235 Corunna Rd., Flint, Mich. 48532

Filed Mar. 21, 1988, Ser. No. 171,086

Int. Cl.[4] G01M *17/02*

U.S. Cl. 73—146 **6 Claims**



1. An apparatus for testing tires at high speed comprising:
- a rotatable wheel having an outer surface, means for supporting said wheel on a frame, and means for driving said wheel;
- a tire mounting means connected to a housing for rotatably mounting a test tire having an outer surface, and means for moving said housing and test tire toward and away from said wheel; and
- means for supporting said housing such that during movement of said test tire toward said wheel an acute angle is formed between the outer surface of said test tire and the outer surface of said wheel when the test tire initially engages the wheel, and said means for supporting said housing providing for a variable acute angle being formed between the outer surfaces of said wheel and test tire depending upon the diameter of the test tire;
- wherein said means for supporting said housing includes members which are connected between the frame and the housing and wherein said members are arranged in a nonparallel relationship with respect to each other;
- wherein said members, housing, and frame form a trapezoid; and
- wherein said members are connected to the housing and the frame by means of universal joints.

4,856,325

APPARATUS FOR MEASURING ADHESION

Osamu Tomita, Osaka; Kazuhiko Saiwai, and Akira Kimura, both of Suita, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1988, Ser. No. 237,865

Claims priority, application Japan, Aug. 31, 1987, 62-218168; Sep. 28, 1987, 62-244896

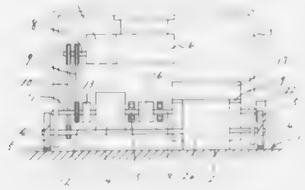
Int. Cl.[4] G01N *19/04*

U.S. Cl. 73—150 A **6 Claims**

6. Apparatus for use in the adhesion measurement of an adhesive sheet comprising a standard surface to be sticked with a certain longitudinal portion of the adhesive sheet as a sample to be measured, a take-up roller having an anchor means in the peripheral surface thereof to fixedly hold the free end of the unsticked portion of the sheet, a source of driving force for rotating the take-up roller to tension the unsticked or peeled portion of the sheet from the peeling side of the sticked sheet portion on the standard surface and to take up the former portion thereon, and a torque meter interposed between the surface of driving force and the take-up roller for generating electrical signals to indicate a roller driving torque corresponding to the tensile strength of the tensioned sheet portion which in turn corresponds to the adhesion of the adhesive sheet, said apparatus further comprising:

(a) a position detector for detecting a rotating angular position of said takeup roller;

(b) a memory for storing no-load torque data represented by detected signals of said torque meter in correspondence with detected position signals of said position detector in no-load test in which said take-up roller does not take the unsticked free end portion of the sheet;



(c) a data processing unit for reading out the no-load torque data from said memory, subtracting it from load torque data represented by currently detected signals of said torque meter in angularly synchronous relation to each other and outputting the difference therebetween in load tests in which said take-up roller takes up the sheet; and

(d) an output unit for recording and indicating the subtracted torque data as the adhesion of said adhesive sheet.

4,856,326

APPARATUS FOR MEASURING AN ADHESION FORCE OF A THIN FILM

Yuji Tsukamoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 26, 1988, Ser. No. 224,306

Claims priority, application Japan, Jul. 27, 1987, 62-188193

Int. Cl.[4] G01N *3/34*

U.S. Cl. 73—150 A **12 Claims**



1. An apparatus for measuring an adhesion force of a thin film, comprising:
- an inclining mechanism for mounting a sample dish with a specimen including a substrate and a thin film deposited on said substrate, said specimen being inclined by a predetermined angle with respect to said sample dish;
- an indenter disposed above said specimen for deforming said specimen by indentation;
- a driver for driving said indenter perpendicularly to said sample dish;
- a load transducer for measuring a load applied to said specimen by said indenter;
- a sensor for sensing propagation of a crack produced in said specimen by said load;
- a displacement gauge interlocked with said driver for measuring a penetration depth of said indenter; and
- measuring means for measuring said adhesion force of said thin film to said substrate on the basis of said load and said penetration depth at a time when said sensor produces a sense signal and said predetermined angle.

4,856,327

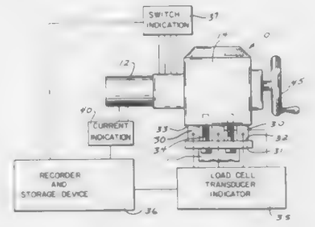
METHOD AND APPARATUS FOR MONITORING AND MEASURING DYNAMIC LOADS IN THRUST INDUCING SYSTEMS

Timothy R. Branam, Manitowoc; Jeffrey J. Roberts, Michicot, and Jack O. Schoenberger, Two Rivers, all of Wis., assignors to General Physics Corporation, Columbia, Md.

Filed Jan. 19, 1988, Ser. No. 144,949

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—168 **12 Claims**



1. In a valve and valve operator assembly including a valve body, a valve plug within the body movable to and between a valve open position and a valve closed position, a valve stem attached to he valve plug, the valve operator assembly including a source of motive power, an operator housing attached to the valve body to provide an attachment interface therebetween, and power transmission means operatively connecting the power source and the valve stem and disposed to transmit an operating load from the power source to the stem for effecting movement of the valve plug, an apparatus for monitoring and measuring the actual valve stem operating load comprising:

(a) load sensing means operatively connected to the attachment interface between the valve body and the operator housing for sensing a force that is directly proportional to the dynamic valve stem operating load at any position of the valve plug and for generating a signal representative of the load sensed; and

(b) means for converting the load signal into an actual dynamic valve stem operating load signal and for generating an output indication of the valve stem operating load.

4,856,328

SAMPLING PROBE FLOW SENSOR

Stewart D. Johnson, Stockton, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

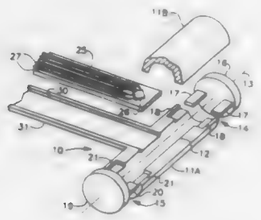
Filed Jun. 30, 1988, Ser. No. 213,376

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—202 **16 Claims**

1. A flow sensor comprising:
- a member with a hole therethrough for providing a fluid flow passageway, the hole having a first cross sectional area at a first location along the fluid flow path and a second cross sectional area smaller than the first cross sectional area at a second location downstream from the first location;
- a tubular element having a signal flow channel therethrough of which the principal portion extends along an axis, the signal flow channel connecting an inlet port to an exit port, the inlet port oriented at substantially a right angle to the axis;
- means for mounting said tubular element within the hole in said member so that the axis of said tubular element is

substantially aligned with the direction of fluid flow through the hole and so that the inlet and exit ports are at the first and second locations respectively within the hole; and



a flow detector mounted in the signal flow channel in said tubular element.

4,856,329

HEAT TRANSFER MEASUREMENT DEVICE, IN PARTICULAR FLOW MONITOR

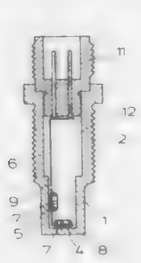
Robert Buck, 7992 Tettnang, Vogelherdbogen 67, and Gerd Marhofer, 4300 Essen 1, Beckmannsbusch 67, both of Fed. Rep. of Germany

Filed Mar. 24, 1988, Ser. No. 172,457

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1987, 3713981

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204.22 **28 Claims**



1. A flow measuring device for the electrical measurement of heat losses in a flowing medium, comprising:

a housing formed as a cylindrical jacket with a front side at one end;

a first temperature measurement element;

at least one heating element;

a second temperature measurement element; and

a carrier foil having said first temperature measurement element, said at least one heating element and said second temperature measurement element disposed on one side thereof, said carrier foil being electrical insulating and thermal conducting,

wherein said carrier foil being brought into thermally conductive contact with said housing with its side facing away from said temperature measurement elements and said at least one heating element, at least in those areas where said temperature measuring elements and said at least one heating element are disposed; and

wherein said first temperature measurement element and said at least one heating element are disposed at the front side of said housing and said second temperature measurement element is disposed at a distance from said front side of said housing on the cylindrical jacket of said housing.

4,856,330

FLUID SPEED OR DIRECTION MEASURING APPARATUS

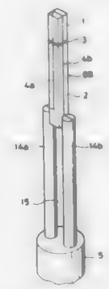
Hideyuki Honda, Kyoto; Koichi Kawasaki, Tokyo, and Hiroshi Sato, Machida, all of Japan, assignors to Honda Engineering Co., Ltd., Osaka and Tokyo Denshi Yakin Co., Ltd., Kanagawa, both of, Japan

Filed Apr. 16, 1987, Ser. No. 39,198

Claims priority, application Japan, Apr. 17, 1986, 61-57682[U]; Apr. 17, 1986, 61-57683[U]; Sep. 12, 1986, 61-140965[U]; Sep. 12, 1986, 61-140964[U]; Sep. 24, 1986, 61-22562

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204.25 **38 Claims**



1. A fluid speed or direction measuring apparatus, comprising:

a sensor composed of a small piece of single crystal germanium and having a rod-like shape;

a rod-like support fixed to said sensor, end to end;

a pair of metal wires, each conductively fixed to opposing ends of said sensor; and

power means, electrically connected to said wires, for supplying electric power to said sensor, such that said sensor remains at a constant temperature, and for determining the speed or direction of the fluid based on the variation of voltage, current or power level flowing through said sensor, caused by a variation in resistance of said sensor when a temperature change in said sensor occurs through contact with the fluid.

4,856,331

BELLOWS-TYPE GAS METER

Horst Roese; Heinrich Bertke; Reinhard Brüggemann, all of Wallenhorst, and Peter Hampel, Belm, all of Fed. Rep. of Germany, assignors to G. Kromschroder Aktiengesellschaft, Osnabruck, Fed. Rep. of Germany

Filed Jul. 9, 1987, Ser. No. 71,332

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1986, 3623667

Int. Cl.[4] G01F *3/20*

U.S. Cl. 73—268 **6 Claims**

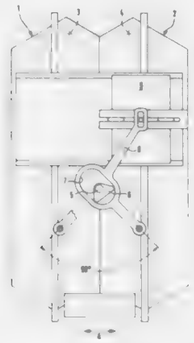
1. A bellows-type gas meter comprising:

two compartments, each compartment having a diaphragm positioned to divide the compartment into distinct chambers, each diaphragm having an associated crank assembly,

two valves, each valve having an associated crank assembly, said two valves enabling the chambers into which said two compartments are divided by said diaphragms to be filled and emptied cyclicly,

a shaft common to said two compartments, said shaft having two eccentric cam assemblies, one of said eccentric cam assemblies being connected with the crank assemblies associated with said diaphragms and the other one of said eccentric cam assemblies being connected with the crank assemblies associated with said two valves,

said two eccentric cam assemblies being displaced relative to each other by an angle so that each of the two valves, during its respective valve closing cycle, closes before the diaphragm operating in conjunction therewith moves into its final position,



the eccentric cam assembly associated with said valves being provided with a disk-shaped cam assembly for each of the two valves, said disk-shaped cam assemblies being accommodated on said common shaft, each of said disk-shaped cam assemblies having a noncircular disk-shaped cam engaging with a substantially longitudinal opening in the crank assembly associated with the valve.

4,856,332

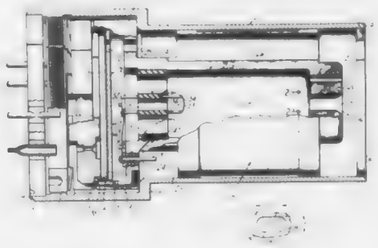
ANGULAR RATE SENSOR NOZZLE

Mario T. Lopicolo, Southington, and Richard E. Swarts, Simbsury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 3, 1988, Ser. No. 151,762

Int. Cl.[4] G01P *3/28*

U.S. Cl. 73—505 **1 Claim**



1. In a fluidic rate sensor having a nozzle, a pumping means for pressurizing a stream of gas which passes through said nozzle, said gas stream forming a laminar velocity profile as it passes from said nozzle, and temperature sensitive elements disposed in the path of said gas stream, said elements being differentially cooled by said gas stream impinging upon said elements as a function of an angular rotation of said rate sensor in a plane of sensitivity, the improvement comprising:

said nozzle having an opening means for directing said stream of gas such that a portion of said velocity profile of said stream of gas impinging upon said temperature sensitive elements is substantially linear for angular rotation rates of up to 10,000 degrees per second in said plane of sensitivity, said opening means having a pair of parallel portions, and a pair of side portions connecting said parallel portions, each said side portions having a semi-circular shape, said parallel portions being arranged perpendicularly to said temperature sensitive elements.

4,856,333

SERVO TYPE ACCELEROMETER

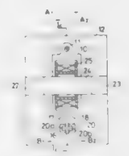
Akio Ito, Konosu, Japan, assignor to Jeco Company Limited, Gyoda, Japan

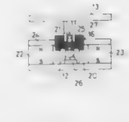
Filed Dec. 18, 1987, Ser. No. 135,112

Claims priority, application Japan, Dec. 27, 1986, 61-313583

Int. Cl.[4] G01A *15/13*

U.S. Cl. 73—517 B **14 Claims**





1. A servo type accelerometer comprising:

a photoelectric element which is a single element and has two separated photoelectric parts;

a light-emitting element opposite to said photoelectric element;

frame means comprising a pair of plate-shaped frame members which are spaced and opposed to each other;

a pendulum pivotally supported by said frame means so that said pendulum is swung between said pair of plateshaped frame members, said pendulum having an optical path limiting member for limiting an optical path of light emitted by said light-emitting element, said photoelectric element, said light-emitting element and said pendulum being positioned so that said optical path limiting member is located between said photoelectric element and said light-emitting element;

detection means for detecting a rotational displacement of said pendulum corresponding to acceleration by use of output signals of the photoelectric parts to produce a detection signal corresponding to the rotational displacement; and

torque generating means for generating a torque corresponding to said detection signal to drive said pendulum towards its original position,

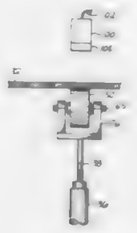
said torque generating means comprising a coil mounted on said pendulum, magnet means provided between said pair of plate-shaped frame members so that one pole of said magnet means is close to one plate-shaped frame member of said pair of plate-shaped frame members and the other pole of said magnet means is at a distance from said one plate-shaped frame member, and a plate-shaped yoke inserted into said coil so as to be separate from said coil, said plate-shaped yoke being coupled to said other pole of said magnet means so that lines of magnetic force are formed between said plate-shaped yoke and said one plate-shaped frame member.

4,856,334

BOND STRENGTH MEASUREMENT OF COMPOSITE PANEL PRODUCTS

Dwayne M. Shearer, Seattle; Richard C. Beetham, Enumclaw; Frank C. Beall, Puyallup, all of Wash., and John M. Rodgers, Sacramento, Calif., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 53,929, May 26, 1987, Pat. No. 4,750,368. This application Apr. 6, 1988, Ser. No. 172,719
The portion of the term of this patent subsequent to Jun. 14, 2005, has been disclaimed.
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—588 18 Claims



1. A method for the on-line, nondestructive determination of the internal bond strength of composite panel products which comprises:

designating a thickness class for the panels being measured;

determining the temperature of the panel;

impinging an ultrasound pulse against the panel through a first transducer;

receiving the transmitted pulse at a second transducer spaced apart from the first transducer;

expressing the received signal as an output voltage;

entering temperature and output signal voltage into a linear equation of the form

$$IB = a + b(\text{output voltage}) + c(\text{temperature})$$

where the coefficients are determined for the given thickness class; and

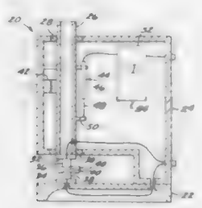
solving the equation to determine the internal bond strength.

4,856,335

METHOD OF ESTABLISHING STANDARD COMPOSITE MATERIAL PROPERTIES

Neal E. Tornberg, San Diego, Calif., assignor to The Expert System Technologies, Inc., San Diego, Calif.

Filed Oct. 21, 1987, Ser. No. 111,694
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—597 18 Claims



1. A process for measuring a standard reference deformation for a composite material, comprising the steps of:

furnishing a specimen of a multiphase material wherein at least one phase is flowable, and which initially contains compressible inclusions within the specimen;

compressing the specimen; and

determining the deformation at which the dominant compressive displacement behavior of the composite material changes from that characteristic of collapse of the compressible inclusions to that characteristic of flow of the flowable phase, this deformation being the standard reference deformation.

4,856,336

ULTRASONIC FLAW DETECTOR

Sergei A. Falkevich, 5 Parkovaya ulitsa, 52,kv.31; Mikhail V. Naumov, Sirenevy bulvar. 52,kv.143, both of Moscow; Jury M. Shkarlet, Lefortovsky val, 12,kv.40; Dmitry V. Sukhorukov, 2 Vladimirskaya ulitsa,50,korpus 2,kv.51, both of Moscow; Viktor N. Fedotov, ulitsa Lenina, 6a,kv.8., Moskovskaya oblast, Klimovsk, and Jury I. Sazonov, Likhachevskoe shosse,10,kv.189., Moskovskaya oblast Dolgoprudny, all of U.S.S.R.

PCT No. PCT/SU86/00044, § 371 Date Dec. 17, 1987, § 102(e) Date Dec. 17, 1987, PCT Pub. No. WO87/06704, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 30, 1986, Ser. No. 170,998
Int. Cl.[4] G01N *29/00, 29/04*
U.S. Cl. 73—598 2 Claims



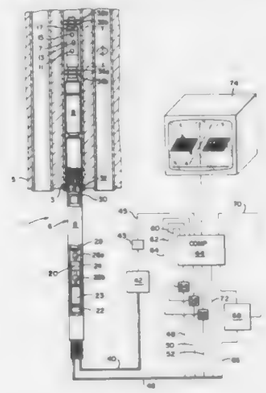
1. An ultrasonic flaw detector wherein an electric signal transmitting channel comprises a sync generator (1) connected to a sonic pulse generator (2) connected to at least one transmitting piezoelectric element (3), while an electric signal receiving channel comprises at least two receiving piezoelectric elements (4) spaced apart to a distance less than or equal to the ultrasonic wavelength, and, connected in series, to a radio-frequency pulse amplifier (6), a video detector (7), a video amplifier (8), and a recording device (9), which are coupled to a control voltage generator (15) and to the receiving piezoelectric elements (4), as well as a horizontal-sweep generator (16) connected to the sync generator (1) and the latter connected to a frequency divider (13) whose output is connected to a vertical-sweep generator (14), characterized in that the electric signal receiving channel comprises a multivibrator (10) whose input is connected to an output of the video amplifier (8), a first electronic switch (11) having its control input connected to a first output of the multivibrator (10), its input to the frequency divider (13), and its output to the control voltage generator (15); a second electronic switch (12) having its control input connected to the first output of the multivibrator (10), its input connected to the input of the transmitting piezoelectric element (3), and its output connected to the input of the radio-frequency pulse amplifier (6); and a third electronic switch (5) having its control input connected to a second output of the multivibrator (10), its input connected to the output of the receiving piezoelectric element (4), and its output connected to the radio-frequency pulse amplifier (6).

4,856,337

APPARATUS AND METHOD FOR PROVIDING A COMBINED ULTRASONIC AND EDDY CURRENT INSPECTION OF A TUBE

Michael J. Metala; William G. Clark, Jr., both of Murrysville; Warren R. Junker, Monroeville; Lee W. Burtner, Elizabeth Twp., Allegheny County; Thomas E. Arzenti, Greensburg; Harold P. Johnson, Verona; Robert P. Vestovich, Monroeville, and Bruce W. Bevilacqua, Irwin, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 30, 1987, Ser. No. 79,860
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—601 31 Claims



1. An apparatus for inspecting the walls of an elongated conduit having a circular cross section with both ultrasound and eddy currents, comprising:

(a) a housing assembly insertable within a elected conduit,

(b) a probe carrier rotatably connected to and helically movable with respect to said housing, including at least three ultrasonic probes for transmitting ultrasonic beams that are directly oriented radially, chordally and axially with respect to the circular cross section of the conduit, and an eddy current probe (for simultaneously generating eddy currents in the walls of the conduit when the probe carrier is rotated, and

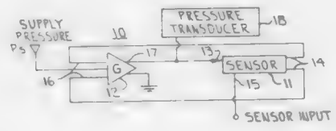
(c) a helical drive train for helically moving the probe carrier with respect to the housing assembly whereby said conduit walls are helically scanned both ultrasonically and electromagnetically.

4,856,338

TECHNIQUE FOR NULL BALANCING FLUIDIC CIRCUITS

R. Michael Phillippi, Highland, and Francis M. Manion, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1988, Ser. No. 252,944
Int. Cl.[4] F15C *4/00;* G01L *7/00*
U.S. Cl. 73—701 7 Claims



1. A fluidic system for sensing an input stimulus comprising: a fluid sensor, said sensor having a supply input and first and second outputs for indicating a differential fluidic signal as a function of the input stimulus;

a fluidic amplifier, said amplifier having means for receiving a pressurized supply of fluid; means for receiving said differential signal from said sensor; a system output connected to said supply input of said sensor for passing an amplified system output signal to said supply input of said sensor; and

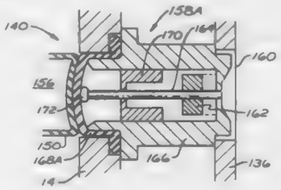
means for measuring the system output signal, whereby said system output signal is a function of said input stimulus and is less susceptible to pressure variations in said pressurized supply of fluid.

4,856,339

MEDICAL INFUSION PUMP WITH SENSORS

David R. Williams, San Diego, Calif., assignor to Centaur Sciences, Inc., Stamford, Conn.

Division of Ser. No. 931,506, Nov. 17, 1986, Pat. No. 4,758,228. This application Apr. 6, 1988, Ser. No. 178,277
Int. Cl.[4] G01L *7/08, 9/14*
U.S. Cl. 73—714 10 Claims



1. In a medical infusion pump apparatus, a system for measuring the pressure of the pumped fluid comprising:

a cassette including at least a first fluid inlet port adapted to be connected to the pump and at least a first fluid outlet port, a chamber interposed between and in fluid communication with said inlet and outlet ports, said chamber being defined in part by a first flexible diaphragm having a flexure response compatible with the range of pressure to be measured in said chamber; and

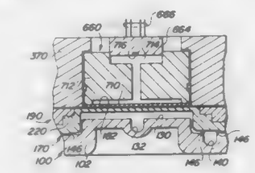
a fluid transducer assembly including a Hall effect device supported in spaced relationship with respect to said cassette, a magnet supported adjacent to said device for movement relative thereto, and reciprocally moveable support means for coupling said magnet to said first diaphragm, whereby flexure of the first diaphragm produces a commensurate displacement of the magnet, thereby causing said device to generate a signal indicative of the pressure of the fluid in said chamber.

4,856,340

PRESSURE DIAPHRAGM FOR A MEDICATION INFUSION SYSTEM

Michi E. Garrison, Granada Hills, Calif., assignor to Minimed Technologies, Sylmar, Calif.

Filed Dec. 1, 1987, Ser. No. 128,122
Int. Cl.[4] G01L *7/08*
U.S. Cl. 73—715 17 Claims



1. A pressure diaphragm for facilitating the measurement of fluid pressure, comprising:

a housing member having an upper surface portion;

a pressure plateau located on and extending above said upper

surface portion of said housing member, said pressure plateau being essentially circular and having an essentially flat top and essentially cylindrical sides;

a channel recessed in said flat top of said pressure plateau, said channel extending diametrically across said pressure plateau;

thin, flexible diaphragm means located above and spaced away from said flat top and said cylindrical sides of said pressure plateau, said diaphragm means including a cylindrical portion located around said pressure plateau, the inner diameter of said cylindrical portion of said diaphragm means being larger than the outer diameter of said pressure plateau, said diaphragm means being maintained in a sealing relationship with said upper surface portion of said housing member;

fluid inlet means located in said housing, said fluid inlet means for supplying fluid to said pressure plateau at one end of said channel in said pressure plateau, fluid pressure being transmitted to said diaphragm means; and

fluid outlet means located in said housing, said fluid outlet means for removing fluid from said pressure plateau at the other end of said channel in said pressure plateau.

4,856,341

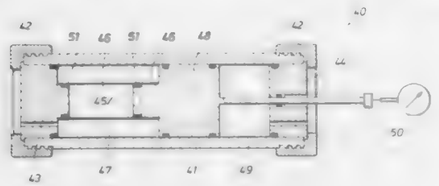
APPARATUS FOR ANALYSIS OF FAILURE OF MATERIAL

Harold J. Vinegar; Scott L. Wellington, both of Houston, Tex., and Jannetje A. de Waal, AB Rijswijk, Z.H., Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 25, 1987, Ser. No. 66,179

Int. Cl.[4] G01N *3/10*

U.S. Cl. 73—798 **1 Claim**



1. Apparatus for containing a sample, comprising:

outer tubular member having engaging means at each extreme end and an interior opening therethrough,

first end member disposed partially in said tubular member and sealingly contacting said interior opening,

second end member disposed partially in said tubular member and sealingly contacting said interior opening and having a projection thereon,

first and second ring members for releasably engaging said engaging means of said tubular member and fixedly restraining said end members in said tubular member,

piston means disposed in said tubular member operating in conjunction with said second end member for providing uniaxial forces on such a sample and having a projection thereon,

pressure transmitting member sealingly disposed around such a sample, said projection of said second end member, and said projection of said piston means,

means for applying pressure to said pressure transmitting member, and

means for moving said piston means.

4,856,342

PROCESS AND DEVICE FOR MEASURING THE ADHESION OF FIBRES IN FIBRE-REINFORCED SYNTHETIC MATERIALS

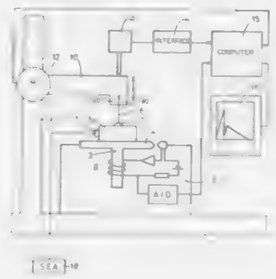
Ludwig Bottenbruch; Hans-Joachim Traenckner, both of Krefeld; Andreas Hampe, and Klaus Schumacher, both of Berlin, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 170,492

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 3712073

Int. Cl.[4] G01N *3/08*

U.S. Cl. 73—827 **6 Claims**



1. In a process for determining the adhesion of an individual fibre embedded in a polymer matrix, including carrying out a drawing experiment wherein the fibre is drawn out of the polymer matrix and an associated force-distance diagram is simultaneously registered, the improvement wherein: a test sample of the individual fibre embedded in the polymer matrix is produced by melting a quantity of polymer mass in granular or powder form on an object holder, lowering the individual fibre in an axial direction perpendicular to the object holder dipping an end of the fibre into the molten polymer mass, and subsequently cooling the molten polymer mass below melting point; and the drawing experiment is carried out by introducing the object holder together with the test sample adhering to it into a force-distance measuring device, and fixing the free end of the fibre to a fibre chucking device moveable in the direction of the fibre, and converting a distance travelled by the fibre chucking device into an electrical signal with a displacement transducer.

4,856,343

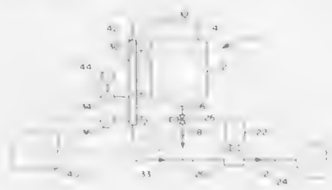
MONITORING LIQUID LEVEL INFED TANK AND FLOW RATE OF LIQUID THEREFROM TO POINT OF USE

Clarence C. Hon, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 24, 1987, Ser. No. 124,638

Int. Cl.[4] G01F *1/00*

U.S. Cl. 73—861 **14 Claims**



1. In a liquid feed system wherein liquid is withdrawn through an outlet at the bottom of a feed tank with a pump having an inlet which delivers the liquid to a use point and a constant cross-section liquid gauge member communicates with the interior of the tank such that a column of liquid is present in said gauge member to the same level as that in the tank, the gauge member further being in communication with the inlet of said pump, a method for checking the rate at which the pump is delivering liquid to the point of use, said method comprising

blocking the tank outlet at time T_0 so that the pump withdraws liquid only from the gauge member thereby reducing the level in the gauge member,

detecting the level of liquid in the gauge member at first and second reduced levels thereof and converting these detections to electrical signals indicative of times T_1, and T_2,

processing the time T_1 and T_2 electrical signals in a computer to provide the flow rate in said gauge member as a processed signal output indicative of the pump delivery flow rate to the point of use, and

further processing the flow rate, the T_1 electrical signal and data representative of time T_0 to compute the height of the level of the liquid column in the gauge member at time T_0.

4,856,344

MEASURING FLOW IN A PIPE

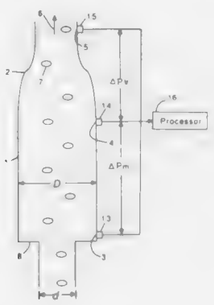
Andrew Hunt, Orwell, England, assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Feb. 20, 1987, Ser. No. 17,469

Claims priority, application United Kingdom, Feb. 21, 1986, [illegible]

Int. Cl.[4] G01F *1/74*

U.S. Cl. 73—861.04 **5 Claims**



1. A full bore, multi-phase fluid flowmeter having no internal obstructions comprising;

a first section of pipe with a first diameter;

a second section of pipe with a second diameter less than said first diameter;

a third section of pipe intermediate and connecting said first and second pipe sections and having a smoothly and gradually changing diameter from said first diameter to said second diameter;

a first pressure sensor positioned in the neighborhood of the start of the change of diameter of said third section of pipe from said first diameter to said second diameter;

a second pressure sensor in said first section of pipe spaced in one direction from said first pressure sensor;

a third pressure sensor spaced in the other direction from said first pressure sensor;

whereby, the density of the fluid flowing through the pipe obtained from a first differential pressure measurement made between said first and second pressure sensors is combined with the flow rate of the fluid flowing through the pipe sections obtained from said density value and a second differential pressure measurement made between said first and third pressure sensors to obtain a multi-phase fluid flow determination compensated for phase slippage and friction pressure losses.

4,856,345

METHOD AND APPARATUS FOR MAKING COMPENSATION FOR DC OFFSET VOLTAGE GENERATED IN APLIFYING CIRCUIT IN ELECTROMAGNETIC FLOWMETER

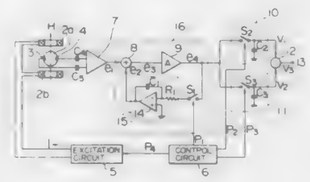
Tutomu Mochizuki, Okazaki, Japan, assignor to Aichi Tokei Denki Co., Ltd, Nagoya, Japan

Filed Apr. 12, 1988, Ser. No. 180,736

Claims priority, application Japan, Apr. 13, 1987, 62-91654

Int. Cl.[4] G01F *1/60*

U.S. Cl. 73—861.17 **4 Claims**



1. In magnetic induction flow measurement in which a flow rate of a fluid is measured by means of a DC magnetic field having a periodically reversed polarity, a method of making compensation for a DC offset voltage generated in an amplifying circuit in an electromagnetic flowmeter comprising the steps of: sampling and storing a signal voltage produced across electrodes in each of a pair of sampling periods where the magnetic field takes a positive polarity and a negative polarity respectively and forming a difference between the sampling values as n output signal voltage; sampling and storing the signal voltage in a compensation period following said pair of sampling periods to thereby produce a compensation voltage to be superimposed onto said signal voltage; making compensation on said signal voltage by using said compensation voltage and holding said compensation voltage until a succeeding compensation period; in which a time constant of a compensation circuit is made large so as to make the compensation in said compensation period be 60%～10% of the value before compensation to thereby make the compensation for the DC offset voltage generated in said amplifying circuit in said electromagnetic flowmeter without being affected by AC noises generated across said electrodes.

4,856,346

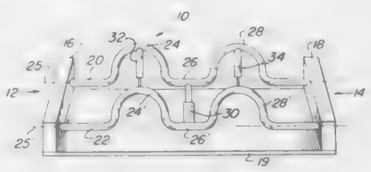
DUAL FLEXURES FOR CORIOLIS TYPE MASS FLOW METER

Martin Kane, Atlantic City, N.J., assignor to K-Flow Division of Kane Steel Company, Inc., Millville, N.J.

Filed Nov. 13, 1986, Ser. No. 792,987

Int. Cl.[4] G01F *1/84*

U.S. Cl. 73—861.38 **15 Claims**



1. A continuous conduit within a Coriolis type mass flow meter of the type which is oscillated transverse to the direction of flow and having sensors for measuring motion of the con-

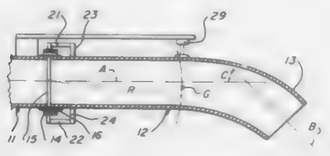
duit, the sensors generating signals which are processed to determine the mass flow through the meter, the conduit comprising: an inlet and outlet, the inlet and the outlet positioned along a substantially straight line; a first and second flexure portion extending in the same direction away from the substantially straight line, the first flexure in communication with the inlet and the second flexure in communication with the outlet, the first and second flexure portion directing the flow, first, away from the straight line and then returning the flow toward the straight line; and a central section extending between the first and second flexure portion, the flexure portions positioned on opposite sides of the central section in the direction of flow from the inlet to the outlet, and the central section communicating with the first and second flexure portion substantially adjacent the straight line.

4,856,347

METHOD AND APPARATUS FOR MEASURING THE FLOW RATE AND VELOCITY OF A LIQUID IN A PIPELINE

Hans K. Johnson, P.O. Box 254, 7501 Stjordal, Norway

Filed Jul. 24, 1987, Ser. No. 77,386
Int. Cl.[4] G01F *1/28*
U.S. Cl. 73—861.72 **7 Claims**



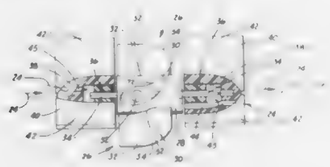
1. A flow meter for determining the flow rate and the specific gravity of a flowing liquid having a gaseous and a solid constituent, said flow meter comprising a J-bend member suspended between at least a pair of load cells and including a connecting member joining the J-bend with an inlet tube, said load cells being provided with means to suspend the J-bend in a substantially vertical and a substantially horizontal plane respectively, and said pair of load cells are mounted on a rigid surface and arranged generally in a common plane transversal to the axis of the J-bend to measure the weight and the momentum respectively, substantially at the center of gravity of the J-bend.

4,856,348

FLOW METER TURBINE

Robert E. Hall, Wichita, Kans., assignor to Great Plains, Industries, Inc., Wichita, Kans.

Continuation of Ser. No. 836,297, Feb. 5, 1986, Pat. No. 4,700,579, which is a continuation of Ser. No. 553,793, Nov. 21, 1983, abandoned. This application Sep. 21, 1987, Ser. No. 99,132
Int. Cl.[4] G01F *1/115*
U.S. Cl. 73—861.78 **5 Claims**



1. An improved turbine rotatingly supported in a fluid opening of a meter housing of a flow meter, the flow meter mounted in a fluid delivery line for dispensing fluids, the turbine comprising:

a turbine rotor;

a plurality of turbine blades supported by the turbine rotor, each such turbine blade comprising:

a first end and a second end, the first end attached to the turbine rotor with the blade extending outwardly therefrom, the second end having a flattened surface with an aperture therein for receiving a ferrous slug, the ferrous slug disposed within the aperture so as to be flush with the flattened surface of the second end;

a rounded leading edge;

a feathered trailing edge;

a first blade surface concave in shape along the length of the blade, the concave first blade surface disposed to receive fluid flow thereagainst to rotate the turbine; and

an opposed second blade surface convex in shape along the length of the blade, the blade tapered from the rounded leading edge into the feathered trailing edge so that the blade has a hydrofoil shape.

4,856,349

PROCESS AND DEVICE FOR MEASURING THE DRAW-IN FORCE AT THE INTERFACE BETWEEN A TOOL AND THE SPINDLE END OF A MACHINE TOOL

Josef P. Huser, Lindenhohe, CH-6045 Meggen, Switzerland

Filed Aug. 10, 1988, Ser. No. 230,849
Claims priority, application Switzerland, Aug. 10, 1987, 3045/87
Int. Cl.[4] G01L *5/00, 1/02*
U.S. Cl. 73—862.54 **10 Claims**



4. A device for measuring the draw-in force on the interface between a tool and the spindle end of a machine tool with automatic tool changing, in which the holding cone of a tool is drawn into a conical spindle boring by an automatic gripping device positioned in the spindle, said measuring device comprising: a bolt (**4**) having on one end a draw-in element (**21**) and on the other end an external threading (**41**), a catch centering casing (**5**) which can be moved in a sliding manner on said bolt (**4**), a ring-shaped pressure measuring means (**6**) which can be placed in a sliding manner onto said bolt (**4**), and an axial adjustable stop nut (**7**) which can be screwed onto said threading (**41**), said measuring means (**6**) being between said casing (**5**) and said stop nut (**7**).

4,856,350

FORCE SENSING DEVICE AND METHOD

Richard A. Hanson, 21220 N.E. 156th St., Woodinville, Wash. 98072

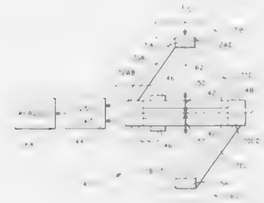
Filed Oct. 22, 1987, Ser. No. 112,409
Int. Cl.[4] G01L *1/10*
U.S. Cl. 73—862.59 **25 Claims**

22. A force sensing device, comprising:

(a) elongated vibratable tine means;

(b) means for vibrating said tine means back and forth in a direction normal to the elongation axis of the tine;

(c) an arrangement including a number of structure links and means interconnecting the links to one another to formed a closed loop structure and to opposite ends of said tine means such that the elongation axis of said tine means extends between a first pair of opposing corners of the structure, said arrangement including mounting means located along said structure for connecting the arrangement to an external member capsule of applying a variable external force to the arrangement along an axis which is neither parallel with nor normal to any of the links of said



structure such that the arrangement applies to said tine means its own internal force in response to and varying with said external force and causes the tine means to vibrate at a frequency that varies with the magnitude of said internal force and therefore said external force; and

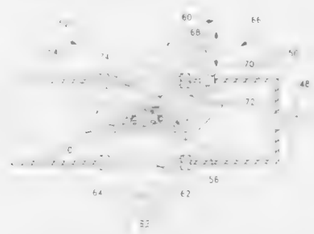
(d) means for sensing the frequency of said tine means and for determining therefrom the magnitude of said external force.

4,856,351

SAMPLE CHAMBER AND SYSTEM FOR ANALYZING FLUID INCLUSIONS

Michael P. Smith, and Frank C. Haines, Jr., both of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 27, 1987, Ser. No. 114,349
Int. Cl.[4] G01N *1/10, 1/28, 33/24*
U.S. Cl. 73—863.21 **24 Claims**



1. A sample taker for analysis of individual fluid microinclusions having diameters under 10 microns of a rock specimen comprising:

an enclosed chamber for receiving the rock specimen and for collecting fluid microinclusion samples upon microinclusion rupture;

the enclosed chamber comprising means for transmitting light through the rock specimen within the enclosed chamber; and

the enclosed chamber further comprising means for viewing the rock specimen using a microscope for selecting fluid microinclusions for rupturing; and

within the chamber, microrupturing means for individually mechanically rupturing single selected fluid microinclusions of the rock specimen having diameters under 10 microns;

the microrupturing means comprising a stylus having a point sufficient to puncture individual fluid microinclusions less than 10 microns in diameter;

also within the chamber, positioning means for positioning single selected fluid microinclusions of the rock specimen for rupturing by the microrupturing means; and

also within the chamber, drive means for causing the microrupturing means to mechanically rupture single selected fluid microinclusions.

4,856,352

GAS SAMPLING SYSTEM FOR REACTIVE GAS-SOLID MIXTURES

Edward D. Daum; William Downs, both of Alliance; Bryan J. Jankura, Mogadore, and John M. McCoury, Jr., Mineral City, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Aug. 23, 1988, Ser. No. 235,358
Int. Cl.[4] G01N *1/22*
U.S. Cl. 73—863.25 **3 Claims**



1. An apparatus for sampling a gas containing a reactive particulate solid phase flowing through a duct and for communicating a representative sample to a gas analyzer, comprising:

a vertically orientated sample probe sheath extending into the sample gas duct, said sample probe sheath having an angular opening at one end with the opening in the opposite direction of the gas flow;

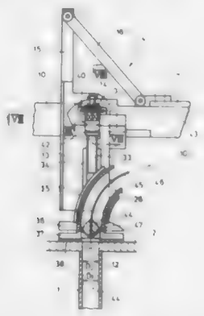
a gas sampling probe partially extending into said sample probe sheath;

a calibration probe connected to a calibration gas line extending into said sample probe sheath parallel to said gas sampling probe, said calibration probe extending further in said sample probe sheath than said gas sampling probe to allow for purging the sample probe sheath with a calibration gas, said calibration and gas sampling probes further being sealed at the point of entrance into said sample probe sheath to prevent infiltration of ambient air;

at least two filters outside of the sample gas duct connected in parallel with respect to each other between said gas sampling probe and the gas analyzer, each of said filters having a valve to allow for diverting sample gas flow for replacement of said filter; and

means for maintaining a temperature range surrounding a part of the apparatus, said surrounded part being said sample probe sheath, said calibration probe, and said gas sampling probe outside of the gas duct, and said at least two filters.

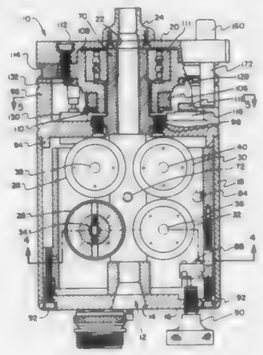
4,856,353
NONDESTRUCTIVE INSPECTION APPARATUS FOR HEAT-TRANSFER TUBES IN BOILERS
Yoshimi Okabe, and Katsumi Kikuchi, both of Tokyo, Japan, assignors to The Tokyo Electric Power Co. and Ishikwajima-Harima Jukogyo Kabushiki Kaisha, both of, Japan
Continuation-in-part of Ser. No. 141,421, Jan. 7, 1988, abandoned. This application Mar. 13, 1989, Ser. No. 323,192
Claims priority, application Japan, Jan. 30, 1987, 62-20146
Int. Cl.[4] G02B *6/00*
U.S. Cl. 73—865.8 3 Claims



1. In a non-destructive inspection apparatus for heat-transfer tubes having open ended holes in a header in a boiler, wherein a flexible tube is inserted through an inspection hole into said header and jointed at its leading end to an open ended hole of one of said heat transfer tubes, and a measuring instrument is inserted through said flexible tube into said one heat-transfer tube by a compressed fluid, the improvement comprising means for aligning the leading end of said flexible tube with said open ended hole of said one heat-transfer tube comprising an optical fiber, a supporting cable for inserting said optical fiber into said flexible tube, and a spherical body attached to a leading end of said supporting cable and having an inner diameter slightly smaller than that of said open ended hole of said one heat-transfer tube, a leading end of said optical fiber being disposed at a frontal peripheral surface of said spherical body which faces said open ended hole when the leading end of said flexible tube is in alignment with said open ended hole of said one heat-transfer tube.

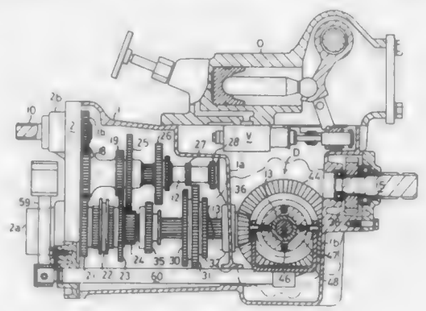
4,856,354
INSPECTION PROBE MANIPULATOR
Mark A. Overbay, East Ridge, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Mar. 7, 1988, Ser. No. 164,595
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—866.5 8 Claims

1. An improved manipulator for providing measured amounts of rotatonal movement and translative advancing and retracting movement to an inspection probe located within an opening, said manipulator comprising:
- means for providing frictionally driven measured translative advancing and retracting movement to said probe;
- means for providing measured rotational movement both to said probe and to said means for providing frictionally driven measured translative advancing and retracting movement to said probe; and
- a base including means for fixing said base relative to said opening within which said inspection probe is located, said base supporting for relative rotation thereto both said means for providing frictionally driven measured translative advancing and retracting movement to said probe and said means for providing measured rotational movement to said probe and to said means for providing frictionally



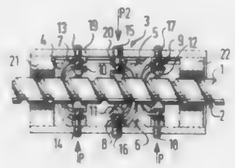
driven measured translative advancing and retracting movement to said probe.

4,856,355
TRANSMISSION FOR A TRACTOR
Yoshitaka Ishimaru, Toyonaka, Japan, assignor to Kanzaki Kokyukoki Mfg., Co. Ltd., Japan
Filed Apr. 8, 1988, Ser. No. 179,232
Claims priority, application Japan, Apr. 17, 1987, 62-59044; Apr. 24, 1987, 62-63041
Int. Cl.[4] B60K *17/08*
U.S. Cl. 74—11 6 Claims



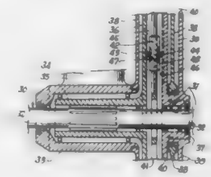
1. A transmission for a tractor, comprising:
- a transmission case having a front portion, a central portion and a rear wall, said front portion being open;
- a bearing plate closing said open front portion;
- a bearing wall provided within said transmission case at said central portion;
- an input shaft supported in cantilever fashion by said bearing plate;
- a driving gear supported on a rear portion of said input shaft;
- a countershaft supported by said bearing plate and said bearing wall;
- a double-toothed gear freely fitted on said countershaft at said bearing plate and driven by said driving gear;
- a pinion shaft supported by said bearing plate and by said bearing wall;
- a tubular shaft freely fitted on said pinion shaft adjacent said bearing plate;
- a plurality of speed-change gears disposed on said tubular shaft;
- wherein said double-toothed gear is selectively engageable with one of said speed-change gears to constitute a high-low transmission unit;
- an output gear disposed on said tubular shaft;
- a fixed gear disposed on said countershaft, whereby said output gear engages with said fixed gear to constitute a multistage transmission unit including a rearward running speed between said countershaft and said pinion shaft;
- a differential gear unit disposed within said transmission case and having a bevel gear;
- said pinion shaft projecting at one end thereof from said bearing wall;
- a pinion gear disposed on said one end of said pinion shaft for engagement with said bevel gear;
- a power takeoff speed-change shaft journaled to said bearing plate and extending through said bearing wall;
- a power takeoff transmission shaft supported by said rear wall and disposed parallel to said countershaft, said power takeoff transmission shaft coupled to said power takeoff speed-change shaft, wherein said power takeoff transmission shaft has at least one gear affixed thereon for driving said power takeoff shaft supported by said rear wall; and
- a double-toothed speed-change gear disposed on said power takeoff speed-change shaft whereby said double-toothed speed-change gear interfaces with said double-toothed gear of said countershaft to constitute a two-stage power takeoff transmission unit.

4,856,356
SCREW JACK
Robert Gärtner, Freiherr-vom-Stein-Str. 8, 6308 Butzbach, Fed. Rep. of Germany
Filed May 18, 1987, Ser. No. 50,882
Claims priority, application Fed. Rep. of Germany, May 20, 1986, 3616905
Int. Cl.[4] F16H *25/22*
U.S. Cl. 74—25 10 Claims



1. A screw jack, comprising a threaded screw shaft and a nut structure, said nut structure comprising at least three ball bearing units which surround the screw shaft eccentrically, each ball bearing unit having an inner track ring which engages unilaterally into the threads of the screw shaft and rolls in the threads, and an outer ring, the outer rings of the ball bearing units being connected together;
- wherein the screw shaft has a longitudinal axis and each ball bearing unit engages the threads of the screw shaft at a point of engagement, the points of engagement of the ball bearing units being within a common plane of action which is parallel to the longitudinal axis;
- wherein the point of engagement of at least one ball bearing unit is disposed 180° opposite to the points of engagement of at least two other ball bearing units, said nut structure being supported against the screw shaft solely by the points of engagement of the ball bearing units;
- wherein the outer rings of the ball bearing units are connected together by at least one longitudinal member made of hardened spring steel which presses the ball bearing units, at their points of engagement, into the threads of the screw shaft; and
- wherein the outer rings of two outer ball bearing units of said nut structure are fixed immovably relative to each other.

4,856,357
INFINITELY VARIABLE (IV) MECHANICAL NON-CYLINDRICAL DRIVE
Constant V. David, 4952 Field St., San Diego, Calif. 92110
Filed Jun. 21, 1988, Ser. No. 209,488
Int. Cl.[4] F16H *11/04*
U.S. Cl. 74—63 27 Claims



1. An infinitely-variable (IV) mechanical drive for positively transmitting power and converting torque, and comprising:
- a centrally located first power shaft for rotation around a drive axis;
- a centrally located second power shaft substantially in line with said first power shaft for rotation around the drive axis;
- first body of revolution means mounted on the second power shaft for rotation around the drive axis;
- ball means located between corresponding facing surfaces of said first and second body of revolution means for transmitting torque and angular motion between said first and second power shafts, the ball means including a plurality of non-rotatable segments enabled to slide linearly and synchronously, the direction of motion of said sliding intersecting the drive axis, each one of such segment containing and retaining balls arranged to form a substantially continuous ball chain within said segment and urged to create a plurality of sets (one of each segment) of balls in alternate engagement with two opposite segment faces and the corresponding facing surfaces of said first and second body of revolution means, thereby creating circumferentially distributed ball-chain mechanical links between said first and second body of revolution means; following means attached to the segments for adjusting their linear sliding position; cams means partially rotatable about the drive axis for actuating the following means of the segments; an external structure for holding the first power shaft and the second power shaft in line, and for mounting the mechanical drive;
- non-rotatable and linearly guiding means located both on two opposite sides of each segment and between continuous segments for restraining the segments and associated ball chains against segment lateral displacements in the directions of rotation of the first and second body of revolution means, and between two substantially parallel facing surfaces of revolution means, and between two substantially parallel facing surfaces of revolution formed by the corresponding facing surfaces of said first and second body of revolution means;
- fixed structural means attached to the external structure for mounting the non-rotatable and linearly guiding means located between two contiguous segments;
- helically oriented groove means located on the facing surface of the first body of revolution means;
- helically oriented groove means located on the facing surface of the second body of revolution means;
- a set of straight groove means for linearly guiding balls engaged therein, one straight groove being located on each one of the two opposite faces of each segment and oriented parallel to the parallel facing surfaces of revolu-

tion and to the direction of the sliding motion of the segment so as to intersect the helical groove means of said first and second body of revolution means, each straight groove having a length shorter than one ball diameter and being enabled to guide a ball engaged within said length and to prevent the rotation of said engaged ball along the directions of rotation of said first and second body of revolution means, and each straight groove being thus enabled to prevent more than one ball from being engaged in each straight groove at any time;

means for urging a plurality of the balls to ride in and remain constrained between corresponding sets of helical groove means and cooperating associated straight groove means; and

ball engagement-facilitating means located at each one of the two ends of each straight groove for enabling a ball ready to become engaged to wait until a helically oriented groove becomes positioned to accept said waiting ball;

whereby a rotation of one of said first power shaft or said second power shaft causes said first body helically oriented groove means or said second body helically oriented groove means, respectively, to cooperate with said straight groove means for forcibly urging said continuous chains of balls to move around said segments, the cooperating engagement of said balls with said straight groove means and an other of said first body helically oriented groove means or said second body helically oriented groove means causes rotation of an other of said first power shaft or said second power shaft, respectively.

4,856,358

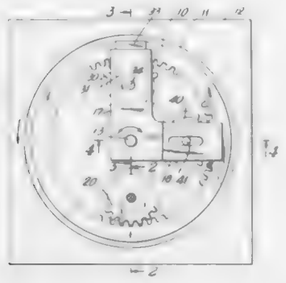
CONVERSION OF ROTATIONAL OUTPUT TO LINEAR FORCE

Paul J. Montalbano, 121 Sheraden Ave., Staten Island, N.Y. 10314

Continuation-in-part of Ser. No. 519,005, Aug. 1, 1983, abandoned, and a continuation-in-part of Ser. No. 833,135, Jan. 13, 1986, abandoned. This application Dec. 16, 1987, Ser. No. 133,879

Int. Cl.[4] F16H *33/20*

U.S. Cl. 74—84 R 6 Claims



1. Machine for converting rotational torque into linear force comprising an internally toothed annular gear, driven by a variable speed motor which has capability of reversing its direction of rotation, in operative interconnection with three smaller externally toothed circular gears mounted within its annulus, one in interconnection with a source of rotary motion for driving the annular gear, the remaining two being driven by the annular gear, a rocker member pivotably supported along the axis of the annular gear and rockable on that axis, said rocker member having two spaced arms each in interconnection with one of the respective gears driven by the annular gear, said gears causing the rocker member to move an impeller rotatable with one of the said gears, said impeller generating a centrifugal force, the other gear driven by the annular gear causing the rocker member to rock by means of a cam shaft, the path traced by the said impeller shall be the widest obtainable such that said impeller shall always be on the outside part of the cycle, so that for part of the cycle, the rocker will pull opposite to the centrifugal force generated, during the course of rocking the rotatable impeller will be caused to regularly increase its speed with rocking motion in one direction, and decrease its speed with rocking motion in the opposite direction, this rocking will cause the impeller to vary the center about which it rotates and will have the effect of producing linear force from the original rotational movement, the other said gear having means for limiting the motion of the rocker member in both clockwise and counter-clockwise directions, said gears and rocker member being housed within a supportive and protective casing.

4,856,359

MECHANICAL SERVO UNIT

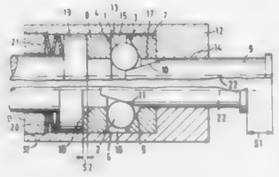
Ludwig Krause, 2, Buchen am Wald, D 8966 Altusried, Fed. Rep. of Germany

Filed Mar. 14, 1988, Ser. No. 167,696

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3708021

Int. Cl.[4] F16H *21/44*

U.S. Cl. 74—110 11 Claims



1. A mechanical servo unit comprising:

a housing member;

a hollow chamber in said housing member having central and outer portions;

a first replaceable disc member in said chamber;

a second replaceable disc member movable in said chamber spaced from said first replaceable disc member;

a secondary element abutting said second replaceable disc member and movable therewith;

a first pair of inclined planar faces on said first replaceable disc member;

a second pair of inclined planar faces on said second replaceable disc member;

said first and second pairs of inclined planar faces substantially facing and being inclined toward each other in the direction of the outer portion of the chamber and defining a narrowing aperture therebetween;

a primary rod shaped element movable within said housing and having a wedge portion thereon comprising a third pair of oppositely facing inclined planar faces facing substantially towards said aperture; and

two cylindrical pressure rollers in said aperture between and in engagement with said inclined planar faces so that movement of said primary element by a force in the direction of said second replaceable disc member transmits and amplifies the force via said wedge portion, rollers and first and second pairs of inclined faces to said secondary element.

4,856,360

TRANSMISSION CONTROL APPARATUS

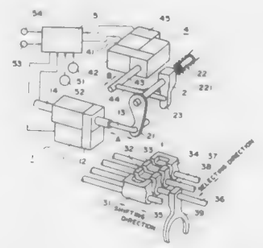
Hiroshi Yoshimura, Hiroshima; Akihiro Shirata, Yokohama, and Junzo Kuroyanagi, Kamakura, all of Japan, assignors to Isuzu Motor Limited, Tokyo, Japan

Filed Sep. 29, 1988, Ser. No. 250,700

Claims priority, application Japan, Sep. 29, 1987, 62-245660

Int. Cl.[4] B60K *20/10*

U.S. Cl. 74—335 6 Claims



1. An apparatus for controlling a transmission having a synchromesh, comprising:

a shifting actuator having an electric motor for shifting gears of the transmission;

means for detecting a shifting stroke of said shifting actuator when said shifting actuator shifts the gears;

means for measuring a load on the synchromesh when said shifting actuator shifts the gears;

means for learning a shifting stroke value of said shifting actuator when synchromesh operation of the synchromesh is finished, based on the measured load on the synchromesh;

means for storing the learned shifting stroke value; and

means for controlling the electric motor of said shifting actuator when shifting the gears, based on the stored shifting stroke value.

4,856,361

REVERSE SYNCHRONIZER WITH A SMALLER SYNCHRONIZATION CAPACITY THEN THE FORWARD GEAR SYNCHRONIZERS

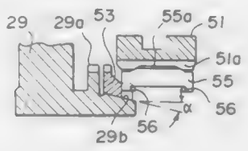
Toshiharu Shinmoto, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 1, 1987, Ser. No. 91,782

Claims priority, application Japan, Sep. 9, 1986, 61-212485

Int. Cl.[4] F16H *3/38*

U.S. Cl. 74—339 3 Claims



1. A manual transmission having at least one forward speed gear train each including a pair of gears respectively mounted on input and output shafts one gear being rigidly connected to one of the input and output shafts and the other gear being mounted on the other shaft to be rotatable relative to the other shaft, and a reverse gear train including a pair of gears respectively mounted on the input and output shafts one gear being rigidly connected to one of the input and output shafts and the other gear being mounted on the other shaft to be rotatable relative to the other shaft, the pair of gears in each gear train being permanently interlocked, each other gear having a tapered surface, and each gear train being provided with a synchronizer which comprises:

a clutch hub fixedly mounted on the other shaft and drivingly connecting both other gears to the other shaft,

gear splines integrally formed on both other gears,

a clutch sleeve engagable with the clutch hub to be rotated together therewith and movable in an axial direction of the clutch hub to engage the gear splines,

a pair of clutch cones each having a tapered inner surface opposed to the tapered surface formed on a respective other gear and rotatable together with the clutch sleeve when the clutch sleeve is moved to engage the gear splines, and

a synchronizer key movable in response to sliding motion of the clutch sleeve to move one of the clutch cones in the axial direction of the clutch hub to bring the tapered inner surface of the moved clutch cone into frictional engagement with the tapered surface on its respective other gear,

wherein the improvement comprises that the synchronization capacity of the synchronizer for the reverse speed is smaller than that of the synchronizer for the forward speed for a given operating force, and the angle of taper of the tapered surface on the other gear is larger in the synchronizer for the reverse speed than in the synchronizer for the forward speed.

4,856,362

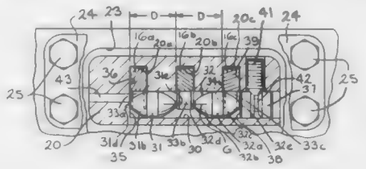
TRANSMISSION SHIFT RAIL INTERLOCK

Terry L. Jester, Stony Ridge, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Mar. 4, 1988, Ser. No. 164,150

Int. Cl.[4] G05G *5/10*

U.S. Cl. 74—477 13 Claims



1. A shift rail interlock mechanism for a transmission having a plurality of shift rails shiftable along spaced apart and parallel axes, said interlock mechanism comprising:

housing means for supporting said shift rails for axially shiftable movement along their respective axes, said housing means including an interlock pin aperture intersecting said shift rails and having an axis extending generally transverse to the axes of said shift rails;

a plurality of interlock pins slidably mounted within said aperture, with a separate interlock pin located between adjacent ones of said shift rails, each of said pins provided with tapered end portions defining end surfaces engageable with end surfaces of adjacent ones of said pins;

each shift rail provided with a separate notch means for receiving said tapered end portion of at least one of said pins, said notch means located along said shift rails such that (a) when each of said notch means are in axial alignment with one another along said transverse axis of said aperture, said transmission is in a neutral position and (b) when any one of said shift rails is axially shifted from said neutral position, said notch means of said one shifted shift rail engages a tapered end portion of said pin extending into said notch means and causes said pin to be moved within said aperture out of said notch means, said one shifted shift rail being engageable with said end surface of said moved pin to temporarily secure said pins in a predetermined fixed axial position within said notch means of the other ones of said shift rails to prevent axially shiftable

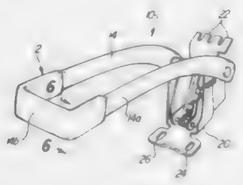
movement of any of said shift rails except said one shifted shift rail.

4,856,363

PARKING BRAKE ASSEMBLY

William J. LaRocca, Sterling Heights, and David M. Trash, Warren, both of Mich., assignors to Wickes Manufacturing Company, Southfield, Mich.

Filed Feb. 10, 1988, Ser. No. 154,266
Int. Cl.[4] G05G *1/04*
U.S. Cl. 74—535 12 Claims



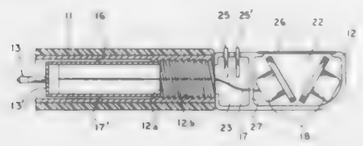
1. A parking brake assembly comprising a mounting bracket, an axle rotatably mounted on the mounting bracket, a handle secured to the axle for rotation therewith in opposing brake-release and brake-apply directions, means connecting the handle to a parking brake and biasing the handle in brake-release direction, a ratchet affixed to the mounting bracket, a pawl, means mounting the pawl on the axle for movement adjacent the ratchet with the handle at a position for selectively engaging the ratchet, a sleeve extending along and mounted on the axle for rotation relative thereto in opposing pawl-engaging and pawl-release directions, an actuator member interconnecting the pawl and sleeve for moving the pawl in response to sleeve movement, means biasing the sleeve in pawl-engage direction to prevent movement of the axle and handle in brake-release direction, and a release member mounted on the handle and operable to move the sleeve in pawl-release direction to disengage the pawl from the ratchet and enable movement of the axle and handle in brake-release direction.

4,856,364

HANDLEBAR DEVICE FOR CONTAINING A PORTABLE RADIO APPARATUS

John Dixon, Pioneer Realty, P.O. Box 33, Flippin, Ark. 72634

Filed Nov. 20, 1987, Ser. No. 123,528
Int. Cl.[4] B62K *21/12, 21/26*
U.S. Cl. 74—551.8 7 Claims



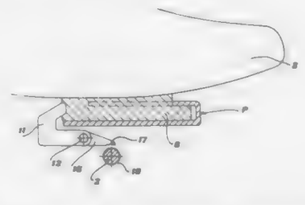
1. A portable radio apparatus incorporated with a hollow handlebar assembly having a pair of tubular end sections, comprising;
- a pair of tubular extensions each having a shank for securing to said handlebar end sections respectively,
- each said shank being integral with a bulbous distal portion of said extensions,
- mating threaded fastening means on each said shank and within said end sections engageable to secure said bulbous distal portions to said end sections,
- each said extension defining an interior compartment,
- means within at least one said extension compartment for processing of radio signals,
- on-off switching and tuning means on at least one said distal portion accessible externally of said bulbous distal portion,
- said means for processing of radio signals including speaker means within said compartment of each said extension,
- a grille element overlying said compartments containing said speaker means, and
- wiring within said hollow handlebar assembly communicating with said speaker means in said distal portion compartments, whereby a user grasping the handlebar assembly has immediate access to said switching and tuning means to regulate the output from said speaker means.

4,856,365

DEVICE TO ANCHOR A CYCLIST'S SHOE TO THE PEDAL OF A SPORTS OR COMPETITION BICYCLE

Antonio Romano, Padova, Italy, assignor to Campagnolo S.P.A., Vicenza, Italy

Filed Jul. 6, 1987, Ser. No. 70,114
Claims priority, application Italy, Jul. 8, 1986, 21065 A/86
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—594.6 5 Claims



1. A device to anchor a cyclist's shoe to the pedal of a bicycle, comprising
- a plate fixed to the bottom of a cyclist's shoe, said plate having front and rear portions;
- a bicycle pedal rotatable about a spindle;
- means for removably engaging said plate with a foot rest surface of said pedal, said means for removable engagement comprising clip means to cooperatively engage said front portion of said plate and locking means to cooperatively engage said rear portion of said plate;
- said clip means being laterally pivotable about an axis perpendicular to said foot rest surface;
- said locking means comprising a pivotable hook lever, one end of said hook lever adapted to engage said rear portion of said plate, and another end of said hook lever adapted to cooperatively engage said spindle in a manner which prevents said pedal from rotating when said hook lever is not in engagement with said plate, each said hook lever and said spindle including knurled surfaces which upon engagement prevent said pedal from rotating when said hook lever is not in engagement with said plate.

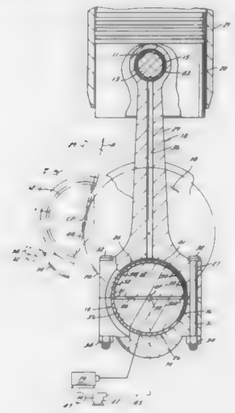
4,856,366

CONNECTING ROD BEARING ASSEMBLY

John G. Nikolaus, New Berlin, Wis., assignor to Vilter Manufacturing Company, Milwaukee, Wis.

Continuation of Ser. No. 867,075, May 27, 1986, abandoned.
This application Mar. 9, 1988, Ser. No. 169,104
Int. Cl.[4] F16C *3/14, 33/10;* G05G *1/00*
U.S. Cl. 74—605 3 Claims

1. In combination:
- a connecting rod (18), a crankshaft (14) and bearing means (10);
- said connecting rod (18) comprising a wrist pin hole (11), a crank pin hole (16) having opposite side walls (35, 39) and having a circumferentially extending oil groove (41) formed in one side wall (35) of said crank pin hole (16) closest to said wrist pin hole (11), and an oil passage (36) communicating between said oil groove (41) and said wrist pin hole (11);
- said crankshaft (14) comprising a crank pin (12) disposed in said crank pin hole (16) and having at least one oil supply port (51, 51A) located on the outer surface of said crank pin (12);
- said bearing means (10) disposed in said crank pin hole (16) around said crank pin (12) and comprising two discrete separable bearing sections (24, 26), each bearing section (24, 26) having an inner surface, an outer surface and opposite ends;
- said oil supply port (51, 51A) being adapted to constantly supply oil directly to the inner surfaces of the bearing sections (24, 26);
- at least one of said bearing sections (24, 26) having a projection (65, 66) at one end thereof which is engaged with a notch (68, 69) formed in a side wall of said crank pin hole (16) to prevent rotation of said bearing sections (24, 26) relative to said crank pin hole (16);
- one bearing section (26) disposed between said crank pin (12) and the side wall (39) of said crank pin hole (16) which is opposite said one side wall (35),
- said one bearing section (26) having an uninterrupted smooth outer surface (55) confronting said opposite side wall (39) of said crank pin hole (16) and having an uninterrupted smooth inner surface (56) confronting said crank pin (12);
- the other bearing section (24) disposed between said crank pin (12) and said one side wall (35) of said crank pin hole (16), said other bearing section (24) having an uninterrupted smooth outer surface (53) confronting said oil groove (41) in said one side wall (35) of said crank pin hole (16), said other bearing section (24) having a smooth inner surface (50) confronting said crank pin (12);
- said other bearing section (24) being provided near each end with an oil feed hole (52) spaced inwardly from a respective end and extending from said inner surface (50) to said outer surface (53) into direct communication with said oil groove (41) for enabling periodic oil flow from said oil supply port (51, 51A) through the oil feed holes (52), through said oil groove (41) and through said oil passage (36) to said wrist pin hole (11);
- said other bearing section (24) being provided near each end with an oil well recess (54) spaced inwardly and spaced from a respective oil feed hole (52) for periodically receiving oil directly from said oil supply port (51, 51A) and operable in cooperation with said crank pin (12) and said inner surface (50) of said other bearing section (24) to provide hydrodynamic lubrication of said bearing means (10) and said crank pin (12);
- said oil well recess (54) having spaced apart side walls (57) and a curved rear wall (59) cooperating with said outer surface of said crank pin (12) to define an oil well recess (54) having a curved longitudinal cross-sectional configuration having a wedge-shaped cross-sectional configuration at each end thereof adjacent a zone between said inner surface (50) of said other bearing section (24) and said outer surface of said crank pin (12),
- said crank pin (12) being movable during rotational movement of said crankshaft (14) and reciprocating movement of said connecting rod (18) to cause said oil supply port (51, 51A) to periodically move past and directly supply oil to each of said oil feed holes (52) and to each of said oil well recesses (54) and to cause oil present in said oil well recesses (54) to be drawn from an end thereof by hydrodynamic lubrication and to be forced between said inner surface (50) of said other bearing section (24) and said outer surface of said crank pin (12).

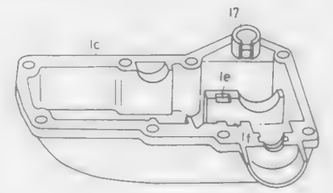


4,856,367

DRIVING POWER TRANSMISSION

Shusuke Nemoto, Yao, Japan, assignor to Kanzaki Kokyukoki Mfg., Co. Ltd., Japan

Filed Apr. 8, 1988, Ser. No. 179,650
Claims priority, application Japan, Apr. 18, 1987, 62-57684[U]; May 19, 1987, 62-75660[U]
Int. Cl.[4] F16H *57/02*
U.S. Cl. 74—606 R 3 Claims



1. A driving power transmission adapted for use with a tractor having a variety of tire diameters, comprising:
- a transmission case, having an inside surface;
- a plurality of shafts within said case;
- each shaft being provided with at least one speed reduction gear;
- one of said shafts comprising a counter-shaft;
- said counter-shaft having a longitudinal axis;
- at least one axial end of said counter shaft being provided with a retaining portion for retaining said counter shaft within said case;
- said retaining portion having a central axis, wherein said axis of said counter-shaft is eccentric to said central axis of said retaining portion;
- said case being provided, at the inside surface thereof, with at least one retaining groove for receiving the retaining portion of said counter-shaft.

4,856,368

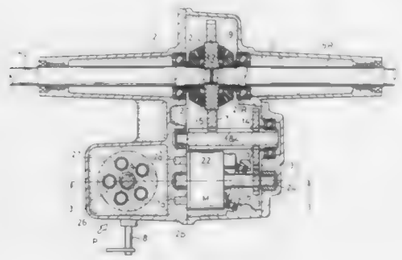
HST (HYDROSTATIC TRANSMISSION) CONTAINING AXLE DRIVE APPARATUS

Koichiro Fujisaki; Ryota Ohashi, both of Kobe, and Shusuke Nemoto, Yao, all of Japan, assignors to Kanzaki Kokyukoki Mfg. Co. Ltd., Japan

Filed Jun. 27, 1988, Ser. No. 212,173
Claims priority, application Japan, Jun. 26, 1987, 62-160652; Jun. 27, 1987, 62-160690
Int. Cl.[4] F16H *57/02, 47/04*
U.S. Cl. 74—606 R 5 Claims

1. An axle driving apparatus housing a hydrostatic transmission, comprising:
- an axle housing;

said axle housing having therein a first axle, a second axle and a differential gear unit;
said axle housing being divided into a first axle casing and a second axle casing portion;
a hydraulic pump, having a pump shaft disposed perpendicular to said first axle and said second axle, disposed within one of said first and second axle casings;



a hydraulic motor, having a motor shaft disposed parallel to said first axle and said second axle;
a speed reduction transmission for associating said motor shaft with a ring gear of said differential gear unit; and
said hydraulic motor, said speed reduction transmission, and said differential gear unit disposed within the other of said first and second axle casings.

4,856,369

CONTINUALLY VARIABLE TRANSMISSION HAVING TORQUE REGENERATION OPERATING MODE

Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1987, Ser. No. 138,466
Int. Cl.[4] F16H *37/00*
U.S. Cl. 74—665 GE **16 Claims**



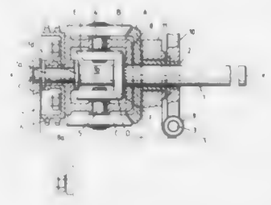
1. A transmission for producing a stepless, continually variable range of ratios of the speed of its output to its input comprising:
means having an impeller adapted for connection to a power source and a turbine hydrodynamically connected to the impeller for hydrodynamically connecting the turbine and impeller;
a planetary gearset having a ring gear, a sun gear, a first set of planet pinions meshing with the sun gear, a second set of planet pinions meshing with the first set of pinions and with the ring gear, and a pinion carrier on which the first and second sets of pinions are rotatably supported;
first drive means drivably connecting the turbine and the sun gear for producing a variable speed ratio therebetween, said ratio being in a range between underdrive and overdrive;
second drive means drivably connecting the turbine and the ring gear for producing a fixed speed ratio in one direction therebetween, said fixed speed ratio being substantially equal to an underdrive speed ratio of the first drive means;
a first clutch means for drivably connecting and disconnecting the ring gear and the second drive means; and
a second clutch means for drivably connecting and disconnecting the first drive means and the pinion carrier.

4,856,370

VARIABLE PHASE COUPLINGS

Frederick M. Stidworthy, 2 Butlers Close, Long Compton Nr. Shipston-on-Stour, CV36 5JY, Warwickshire, England

PCT No. PCT/GB86/00736, § 371 Date Jul. 30, 1987, § 102(e) Date Jul. 30, 1987, PCT Pub. No. WO87/03715, PCT Pub. Date Jun. 18, 1987
PCT Filed Dec. 3, 1986, Ser. No. 91,511
Int. Cl.[4] F16H *37/06, 37/08*
U.S. Cl. 74—675 **11 Claims**



1. A drive assembly comprising a driving member supported for rotation about a first axis; a driven member supported for rotation about the first axis; a drive element fixed to the driven member; transmission means coupling the driving member to the drive element for rotating the driven member in response to rotation of the driving member; and phase adjusting means for adjustably setting the relative angular positions of the driven member and the driving member about the first axis in order to select the phase of rotation of the driven member relative to the rotation of the driving member; said transmission means comprising a transmission shaft rotatable about a second axis and rotatable with the driving member about the first axis and a transmission element fixed to the transmission shaft for rotation therewith about the second axis and drivingly engaged with the drive element to rotate the driven member upon rotation of the driving member; said phase adjusting means comprising an adjusting element fixed to the transmission shaft for rotation therewith, a setting member supported for rotation about the first axis and drivingly engaged with the adjusting element, and unidirectional actuating means for adjusting the angular position of the setting member about the first axis and thereby rotating the transmission shaft in order to select and then maintain a desired phase of rotation of the driven member relative to the rotation of the driving member.

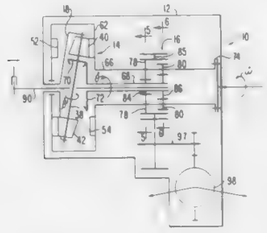
4,856,371

TRACTION DRIVE TRANSMISSION SYSTEM

Yves J. Kemper, Bloomfield Hills, Mich., assignor to Tractiontec Corporation, Bloomfield Hills, Mich.

Continuation-in-part of Ser. No. 25,113, Mar. 12, 1987, abandoned. This application May 19, 1987, Ser. No. 51,353
Int. Cl.[4] F16H *37/06*
U.S. Cl. 74—690 **17 Claims**

1. A continuously variable power transmission system comprising:
a continuously variable traction drive unit having a unit input, a unit output and variable radius ratio defining means for varying the unit output/input speed ratios continuously between minimum and maximum values;
a system input;
a system output;
gear means for combining at said system output, power at said system input with power at said unit output at system-output/system-input speed ratios of 1:1, less than 1:1 and greater than 1:1, said gear means having alternately operative ratio factors whereby operation with one of said ratio factors results in a system-output/system-input speed ratio of 1:1 or less and operation with the other of said ratio factors results in a system-output/system-input speed ratio of 1:1 or higher;



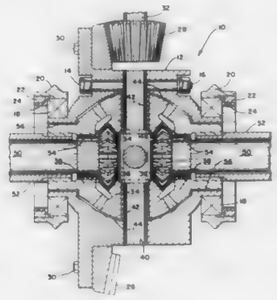
means for alternating said ratio factors to establish two ranges of system-output/system-input speed ratios in which respectively, the output/input speed ratio of said continuously variable traction drive unit may be varied between said minimum and maximum values;
wherein said gear means comprises planetary gearing having a pair of planet gears and a common carrier for rotatably supporting said planet gears; and
wherein said common carrier is driven by said system input.

4,856,372

FOUR WHEEL AXLE DIFFERENTIAL

Archie O. Williamson, Edina, Minn., assignor to Williamson Patent Holding Company, Edina, Minn.

Filed Dec. 1, 1988, Ser. No. 278,657
Int. Cl.[4] F16H *1/38*
U.S. Cl. 74—710 **7 Claims**



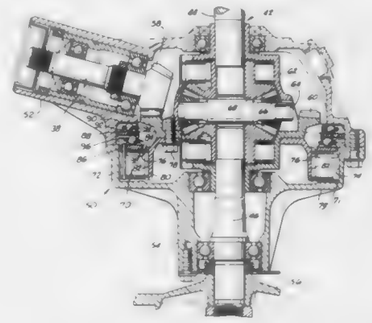
1. In a differential of the type including a rotatable case supporting pinions engaged between opposite first bevels coupled to respective first output shafts rotatable about a common transverse axis, the improvement comprising:
second bevels independently rotatable about the transverse axis;
said first and second bevels both being drivingly engaged with said pinions, but at different predetermined drive ratios; and
second output shafts coupled to said second bevels and rotatable about the transverse axis, in order to compensate for relative rotation between the first output shaft and second output shafts on each side of the differential as well as for relative rotation between the first and second output shafts on opposite sides of the differential.

4,856,373

AXLE ASSEMBLY

Yoshikazu Washizawa, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 572,153, Jan. 17, 1984, abandoned. This application Feb. 11, 1987, Ser. No. 14,157
Claims priority, application Japan, Jan. 17, 1983, 58-5706; Mar. 24, 1983, 58-42696[U]
Int. Cl.[4] F16H *1/44, 57/10*
U.S. Cl. 74—710.5 **10 Claims**



1. A rear axle assembly for a vehicle having two driven rear wheels and a vehicle frame, comprising:
a gear case having a friction surface formed on the interior surface thereof;
a rear axle housing joined to a first side of said gear case and supported by the vehicle frame midway between the rear wheels;
a first rotatable axle shaft for driving a first of the rear wheels, said first axle shaft extending within said rear axle housing to said first side of said gear case;
a drive shaft extending to said gear case; a second rotatable axle shaft for driving a second of the rear wheels, said second axle shaft extending to a second side of said gear case, said first side and said second side being oppisite sides on said gear case, said gear case being disposed offset from the centerline of the vehicle such that said gear case is adjacent to a second wheel;
gearing in said gear case, said drive shaft and said axle shafts being coupled with said gearing, said gearing including a first gear wheel, the axis of said drive shaft being other than perpendicular to the axis of said gear wheel;
a friction disk brake within said gear case between said first gear wheel and said friction surface; and
actuation means for selectively securing said friction disk brake between said first gear wheel and said gear case.

4,856,374

ADJUSTABLE TRANSMISSION

Hubert Kreuzer, Munderkingen, Fed. Rep. of Germany, assignor to planetroll Antriebe GmbH, Munderkingen, Fed. Rep. of Germany

Filed Feb. 26, 1988, Ser. No. 160,763
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1987, 3706716
Int. Cl.[4] F16H *37/02*
U.S. Cl. 74—740 **8 Claims**

1. A transmission comprising:
an input shaft;
an ouput shaft;
a continuously variable friction drive trnasmission (12) including an input component (7), an output component (2) and spherical rolling members (19), with said input shaft (1) being operatively connected for transmitting torque to

both said planet carrier (3) and said input component (7), and said output component (2) being oepatively con-



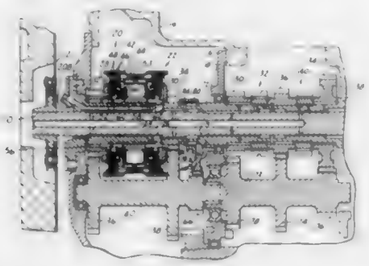
nected to said sun gear (4) and said outer gear (5) being operatively connected to said output shaft (6).

4,856,375

MECHANISM FOR SYNCHRONIZED SHIFTING OF A TRANSMISSION USING COUPLERS

Rudolf Beim, Southfield, Mich., assignor to Ford New Holland, New Holland, Pa.

Filed Dec. 7, 1987, Ser. No. 129,564
Int. Cl.[4] F16H *3/02;* F16D *67/02*
U.S. Cl. 74—745 16 Claims



1. A gear shift mechanism for synchronized shifting of a transmission having an input adapted for connection to a power source and an output, comprising:

first means for drivably connecting and disconnecting the power source and the transmission input;

gearing means defining pairs of pinions and gears for producing multiple gear ratios of said transmission input and output;

coupler means for drivably connecting and disconnecting the transmission output and the gearing means;

clutch means for selectively connecting and disconnecting the transmission input and the gearing means; and

input brake means for holding the gearing means against rotation.

4,856,376

GEARING FOR MULTIPLE-USE BICYCLES

Francisco X. Billini, Inversiones Don Eduardo S.A., Av. Francisco de Miranda, Edf. Galipan, Piso 1, Entrada C-1-C, Caracas, Venezuela

Filed Oct. 16, 1987, Ser. No. 109,203
Int. Cl.[4] F16H *3/44*
U.S. Cl. 74—750 B 13 Claims

1. Gearing for a bicycle having connection to pedals or such motive power and to a chain for connection to a rear wheel sprocket on a rear wheel comprising

a main tie rod shaft connected to the pedals;

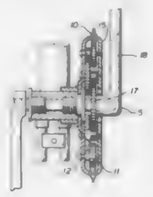
a central shaft mounted on said main tie rod shaft and including

central shaft external teeth on the periphery of said central shaft;

a plurality of primary prockets having teeth spaced around the periphery of each of said primary sprockets and said primary sprockets being spaced around said central shaft and each including

a primary sprocket gear mounted integrally to said primary sprocket and having primary gear teeth engaging with said central shaft external teeth as both said central shaft and said primary sprocket and said gear mounted thereon are rotated;

a plurality of secondary sprockets having teeth spaced around the periphery of each of said secondary sprockets,



at least one of said secondary sprockets for each of said primary sprockets, with said at least one said secondary sprocket positioned adjacent a said primary sprocket and each of said secondary sprockets including

a secondary sprocket gear mounted integrally to said secondary sprocket and having secondary gear teeth engaging with a said adjacently positioned primary sprocket;

a sprocket crown having internal and external sprocket crown teeth with said internal sprocket crown teeth engaged by said secondary sprocket teeth of each of said secondary sprockets;

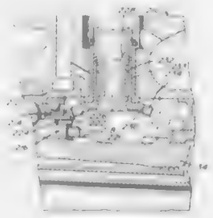
said external sprocket crown teeth positioned to engage the chain for connection to the rear wheel sprocket of the bicycle.

4,856,377

PLANETARY GEAR SYSTEM FOR A GAS TURBINE ENGINE

Roger Goudreau, and Jean-Jacques Jobin, both of Montreal, Canada, assignors to Pratt & Whitney Canada Inc., Longueuil, Canada

Filed Jan. 7, 1987, Ser. No. 1,182
Int. Cl.[4] F16H *57/10*
U.S. Cl. 74—768 5 Claims



1. A planetary gear transmission for use in gas turbine engines, including a gear case housing fixed to the engine housing, ring gear means including first and second ring gear members fixed to the housing, a first stage planetary gear assembly including a first sun gear coupled to the engine output shaft, a first planetary carrier rotatably mounted in said housing and first planetary pinion supported by the first carrier meshing

with the first sun gear and with the first ring gear member, a second stage planetary gear assembly comprising a second sun gear coupled to the first planetary carrier, a second planetary carrier coupled to a propeller shaft, second planetary pinion gears supported on the second carrier meshing with the second ring gear member and the second sun gear characterized in that one of the first and second planetary carriers is exchangeable for a similar carrier with planetary pinion gears and supplementary pinion gear arrangement effective to provide reverse rotation of the propeller shaft, said similar planetary carrier with planetary pinion gears and supplementary pinion gears being of the same radial dimension and mass as the planetary carrier and planetary pinion gears it is replacing such that the overall mass of the planetary gear transmission is the same as the planetary gear transmission arrangement for standard rotation, and the effective gear ration of the resulting planetary gear transmission for reverse rotation is the same as the planetary gear transmission arrangement for standard rotation.

4,856,378

VARIABLE SPEED TRANSMISSION

Dusan J. Hvolka, Salt Lake City, Utah, assignor to DJH Engineering Center, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 742,997, Jun. 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 667,983, Nov. 5, 1984, abandoned. This application Jan. 21, 1988, Ser. No. 146,429
Int. Cl.[4] F16H *1/28, 53/00*
U.S. Cl. 74—804 13 Claims



1. A variable speed transmission for adjusting torque output comprising:

a variably extenable offset cam adjustably attached to a rotatable drive shaft providing torque inputs to the transmission;

means variably associated with the cam to extend said cam a distance from the drive shaft selected by a user;

a stationary housing journal mounted to the drive shaft defining a chamber surrounding the cam to accommodate its variable rotation; said housing having a plurality of radially displaced equidistant apertures in communication with the interior and exterior of the housing;

a plurality of retractably mounted push rods having first ends and second ends slideably mounted within the housing apertures; the first ends each extending into the interior of the housing to selectively contact the cam, and the second ends each extending beyond the housing a predetermined distance when the first ends are contacted by the cam to provide minimum torque and maximum speed output when fully extended, and maximum torque and minimum speed output when minimally extended;

a rotatable casing journal mounted to the drive shaft and encasing the stationary housing, said casing having a periodic undulating cyclical track surrounding and in passing registration with the second ends of the push rods with the track having peaks and valleys shaped to be engaged by the second ends of the push rods when activated, with

i. said peaks inclined to maintain an effective slope along the segments contacted by the second ends of the push rods to provide uniform torque output against the track to rotate the casing; and of a height to maintain the desired maximum torque when contacted by the second ends of the push rods when minimally extended by the cam at minimum displacement, and

ii. said valleys of a depth to accommodate the second ends of the push rods when fully extended by the variable cam at maximum displacement, and

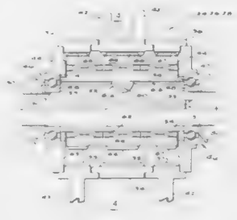
means associated with the casing to translate the output rotation to a drive train.

4,856,379

NON-JAMMING ROTARY MECHANICAL ACTUATOR

Nozar Jafarey, Long Beach, Calif., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Sep. 22, 1987, Ser. No. 100,146
Int. Cl.[4] F16H *1/28;* F16D *9/00*
U.S. Cl. 74—805 22 Claims



1. An actuator comprising:

at least one moving ring gear having an internal gear surface;

a fixed ring gear on each side of said at least one moving ring gear, each fixed ring gear having an internal gear surface defining a ring gear bore;

a shaft extending through said ring gears including a first cam member rotatable with and secured thereon, the axis of said first cam member being offset from the axis of said shaft by a first amount of offset;

means for retaining said ring gears in a desired relationship which means are rotatable with said shaft;

bearing means, mounted within said means for retaining, for rotatably supporting said shaft;

a generally cylindrical second cam member having a bore therethrough, the axis of said bore is offset from the axis of said second cam member by a second amount of offset, said first cam member disposed within said bore of said second cam member and having said first amount of offset thereof being approximately equal to said second amount of offset;

shear means for transmitting torque from said first cam member to said second cam member below a desired torque level;

a needle bearing located around said second cam member; and

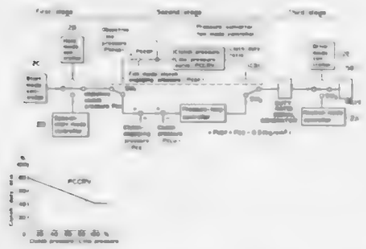
a compound gear secured over said needle bearing, said compound gear having a number of gear tooth surfaces thereon, said number of gear tooth surfaces being equal to the total number of fixed and moving gear rings and in driving relationship therewith below said desired torque level of said shear means.

4,856,380

METHOD OF CONTROLLING CLUTCH PRESSURE OF CONTINUOUSLY VARIABLE TRANSMISSION SYSTEM

Katsuaki Murano; Sadayuki Hirano, both of Hamamatsu; Yoshinori Yamashita, Hamana; Takumi Tatsumi, and Hiroaki Yamamoto, both of Himeji, all of Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Aug. 8, 1988, Ser. No. 229,893
Claims priority, application Japan, Aug. 10, 1987, 62-199416
Int. Cl.[4] B60K *41/16*
U.S. Cl. 74—866 2 Claims



1. A method of controlling clutch pressure in a continuously variable transmission system which can expand and contract a width of a channel between a stationary pulley member and a movable pulley movable relative to said stationary pulley member in order to respectively contract and expand a radius of travel about said pulleys of a belt engaging said pulleys before eventually varying a belt ratio, clutch-pressure control means of said continuously variable transmission system including a controller unit which effects control by feeding an actually-detected clutch pressure back in determining an objective clutch pressure and including an oil-pressure circuit which controls oil pressure in response to signals from said controller unit; said method comprising a step of: causing said controller unit to calculate a clutch duty ratio in reference to the objective clutch pressure and an objective line pressure when a pressure sensor detecting said actually-detected clutch pressure outputs an abnormal signal before eventually causing said controller unit to control the clutch pressure in accordance with said calculated clutch duty ratio.

4,856,381

FLUID PRESSURE CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Makoto Funahashi; Seitoku Kubo, both of Toyota, and Shinya Nakamura, Owariasahi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Apr. 12, 1988, Ser. No. 180,762
Claims priority, application Japan, Apr. 17, 1987, 62-94647
Int. Cl.[4] F16H *41/16*
U.S. Cl. 74—867 6 Claims

1. In an automatic transmission including selector means for selecting a plurality of speed stages including reverse, neutral and forward stages; at least one shift valve made operative in response to a first signal pressure coming from said selector means and a second signal pressure according to a vehicular running speed and a throttle opening; friction engaging means adapted to come into engagement in response to a fluid pressure coming from said shift valve in case the reverse stage is selected by said selector means and in case the running speed and the throttle opening come into a state for shifting a predetermined forward speed stage to another; and an accumulator disposed midway of a fluid passage leading from said shift valve to said friction engaging means for establishing a back pressure against the fluid pressure prevailing in said fluid passage,

a fluid pressure control system comprising back pressure regulating means having a port for receiving the first signal pressure, when the reverse stage is selected by said selector means, for dropping the back pressure of said



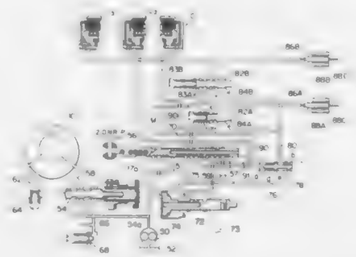
accumulator when the first signal pressure is exerted upon said port.

4,856,382

AUTOMATIC SHIFT TRANSMISSION FOR VEHICLES

Masao Nishikawa, Tokyo; Takashi Aoki, Saitama; Yoichi Sato, Saitama, and Yukihiro Fukuda, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 513,248, Jul. 13, 1983. This application Sep. 18, 1985, Ser. No. 777,566
Claims priority, application Japan, Jul. 13, 1982, 57-106582
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—867 6 Claims



1. In an automatic shift hydraulic transmission for vehicles including a hydraulic fluid line, at least one hydraulically actuated changeover valve in said fluid line for automatically effecting a speed shift, an orifice in said hydraulic fluid line upstream of said changeover valve and a pilot type solenoid valve in said fluid line downstream of said changeover valve, said solenoid valve having open-close action, said changeover valve being operable with the open-close action of said solenoid valve, an improvement comprising: a pressure reducing valve means in said fluid line immediately upstream of said orifice for outputting to said orifice actuating hydraulic fluid at a preset pressure lower than the fluid pressure supply to said pressure reducing valve.

4,856,383

COAST CLUTCH CONTROL FOR MULTIPLE SPEED AUTOMATIC TRANSMISSION

Stanley D. Rosen, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 6, 1988, Ser. No. 202,746
Int. Cl.[4] B60K *41/18, 41/16*
U.S. Cl. 74—869 12 Claims



1. A system for controlling the operation of a first friction element, comprising:

a source of regulated line fluid pressure;

manual valve means moveable among positions selected by an operator for connecting said line pressure source to a first port of the manual valve means and for producing a third control pressure, in accordance with the position of the manual valve means;

a first control valve means operated by a solenoid for producing a first control pressure;

first shift valve means connected to the first control pressure for connecting the first port of the manual valve means to a first output port of the first shift valve means according to the control of the first control pressure;

second control valve means operated by a solenoid for producing a second control pressure;

second shift valve means connected to the second control pressure for connecting the first output port of the first shift valve means to the first friction element in accordance with the control of the second control pressure

means for directing alternately the third control pressure or the second control pressure to the second shift valve; and

the second shift valve means is connected to the output of the directing means for connecting the output port of the first shift valve means to the first friction element in accordance with the control of the direction means output.

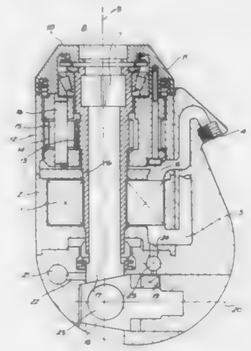
4,856,384

ROOF BOLT DRILL POT DRIVE

Edward Wechner, Minnamura, Australia, assignor to Joy Technologies Inc., Pittsburgh, Pa.

Filed Sep. 2, 1988, Ser. No. 240,879
Claims priority, application Australia, Sep. 4, 1987, PI4165
Int. Cl.[4] B25B *21/00*
U.S. Cl. 81—57.11 9 Claims

1. A roof bolt drill pot drive comprising a drive motor having a drive shaft, a drill chuck coupled to and driven by the drive shaft, and a bolt socket driven by the drive shaft via a reduction gear box, the drill chuck being coaxially mounted with the bolt socket and both the drill chuck and bolt socket



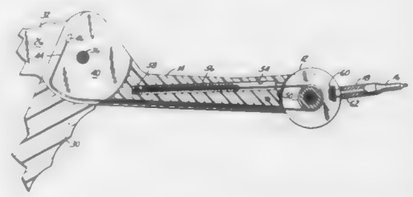
being permanently coupled to and simultaneously driven by the drive motor.

4,856,385

SQUEEZE MOTION TO ROTARY MOTION TILT HEAD DRIVER

James W. Ogilvie, Edina, Minn., and Frank R. Ogilvie, Leavenworth, Wash., assignors to Reagents of the University of Minnesota, Minneapolis, Minn.

Filed Mar. 18, 1988, Ser. No. 170,288
Int. Cl.[4] B25B *13/46*
U.S. Cl. 81—57.39 1 Claim



1. Squeeze motion to rotary motion driver apparatus for driving an output member comprising:

drum means rotatable about a first axis;

driver means for driving the output member in a first direction about a second axis perpendicular to the first axis;

clutch means connected between the driver means and the drum means to provide rotation of the driver means in the first direction upon rotation of the drum means in a predetermined direction;

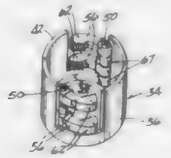
first and second lever members squeezable from a first to a second position;

positioning means having an at least partly circular surface connected to the first lever member so as to be rotatable about a third axis parallel to the first axis, squeezing of the first and second lever members causing motion of the circular surface around the third axis; and

cable means connected to the positioning means so as to extend along a first path from a position tangential to the circular surface to the drum means and wound around the drum means so that upon squeezing the first and second lever members from the first to the second position, the motion of the circular surface around the third axis pulls the cable means along the circular surface and the cable means, staying tangential to the circular surface and moving in the first path, operates to pull the cable around the

drum means and thereby cause rotation of the drum means in the predetermined direction.

4,856,386
SOCKET ASSEMBLY FOR MULTIPLE SIZE WRENCHING SURFACES
Hector L. Rodriguez, 40 Porter St., New Haven, Conn. 06511
Filed Sep. 26, 1988, Ser. No. 248,596
Int. Cl.[4] B25B *13/32*
U.S. Cl. 81—90.2 **3 Claims**

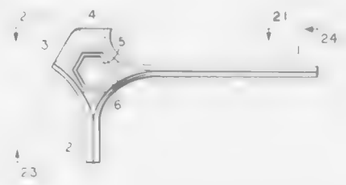


1. A socket assembly for imparting wrenching torque to wrenching surfaces having dimensions within a predetermined size range, said assembly comprising an outer annular member adapted for releasable engagement by a wrench and an internal annular wall having a pair of like cylindrical portions defining an assembly axis and a pair of diametrically opposite inwardly extending lobed cam surfaces joining said cylindrical portions, an inner annular member within said wall and having first and second diametrically opposite slots open at one end of said inner member, first and second identical pawls associated with said first and second slots, respectively, each said pawl having an inner face with a jaw portion and an outwardly bulged lobed portion opposite said inner face, said pawls mounted with said inner faces confronting each other and with said bulged lobed portion of each said pawl extending outwardly through its said associated slot, and means resiliently urging said bulged lobed portion of said first and second pawls outwardly against said cam surfaces, so that with said wrenching surfaces within said inner member, relative rotation of said members in one direction will cause said cam surfaces to push said jaw portions against the wrenching surfaces and said members will then rotate together to apply wrenching torque to said wrenching surfaces, wherein each said pawl has a mounting hole therethrough and said assembly further comprises first and second diametrically opposite cylindrical members parallel to and equidistant from said assembly axis, said first cylindrical member passing through said mounting hole of said first pawl and said second cylindrical member passing through said mounting hole of said second pawl.

4,856,387
HERMAPHRODITE WRENCH
Peter O. Gibson, 58 Forest Ave., Riverside, Ill. 60546
Continuation of Ser. No. 36,386, Apr. 9, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,204
Int. Cl.[4] B25B *13/02*
U.S. Cl. 81—124.4 **5 Claims**

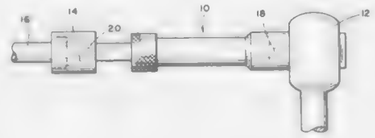
1. A wrench comprising:

a body having two parallel faces; said body having a plurality of socket openings, each of said sockets having a central axis and a hexagonal cross-section; one of said sockets having a central axis which extends perpendicularly to the other central axes; said one of said sockets having a hexagonal cross-section which opens on both parallel faces of said body; and two handles; each handle having an end attached to said body; each of said handles having a longitudinal axis and a free end having a hexagonal cross-section, both of said handle axes lying in a plane parallel to



said body faces, said handle axes disposed perpendicularly to each other.

4,856,388
ADJUSTABLE LENGTH EXTENSION
David L. Freeman, Rt. 1, Box 373-5, Sperry, Okla. 74073
Filed Apr. 14, 1988, Ser. No. 181,708
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—177.2 **2 Claims**



1. An adjustable length extension tool for interconnection between a driving tool and an object to be driven, comprising:

an extension housing body having a noncircular axial bore extending at least partially therethrough from a first end thereof and opening through a second end thereof;

the first end of the extension housing body including means for interconnection with the driving tool;

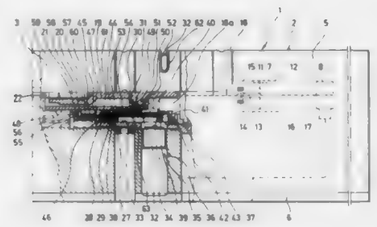
a shaft having a first portion receivable for axial reciprocal movement within the bore, and a second end of the shaft including means for interconnection with the object to be driven;

compression means receivable around the shaft and connecting with the extension housing body adjacent the second end thereof for limiting the movement of the shaft within the bore, the compression means comprising a compressible O-ring expandably disposed around the shaft, a washer disposed around the shaft exterior of the O-ring, a compression sleeve having a stepped bore therethrough, with a portion being of smaller interior diameter than the outside diameter of the washer for receiving the shaft therethrough, and an exterior surface of the extension housing body adjacent the first end thereof and a portion of the bore within the compressive sleeve includes threads cooperable with the extension housing body,

whereby as the compression sleeve is threaded onto the extension housing body the washer abutting against the extension housing body compresses the O-ring which is forced into the stepped bore and then inwardly against the shaft thereby providing adjustability of resistance to axial movement of the shaft depending solely upon the threaded position of the compression sleeve onto the extension housing body; and

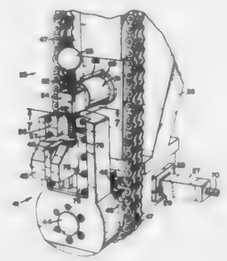
the washer includes an internally projecting finger cooperable with a longitudinal groove within the shaft to prevent the shaft from being removed from the bore.

4,856,389
DEVICE FOR SETTING FASTENER ELEMENTS AND PINS
Karl-Heinz Weber, Wolfratshausen, Fed. Rep. of Germany, assignor to Weber-Schraubautomaten GmbH & Co., K.G., Wolfratshausen, Fed. Rep. of Germany
Filed Jul. 22, 1987, Ser. No. 76,516
Int. Cl.[4] B25B *7/02*
U.S. Cl. 81—429 **28 Claims**



1. A setting device for setting fastener elements and pins comprising a housing, a retainer shaft for a setting tool mounted in said housing and axially displaceable within said housing, at least one advance drive mechanism within said housing adapted to be connected to said retainer shaft, a switching sleeve mounted in said housing displaceable in an advancing direction in unison with said retainer shaft and having at least one actuating edge defining a switch-off point within the range of said advance movement of said retainer shaft, means for switching said drive mechanism off comprising a sensor device connected to said drive mechanism responsive to said actuating edge, and externally accessible means for adjusting the axial position of said switch-off point relative to said retainer shaft comprising an adjustment mechanism between said retainer shaft and said switching sleeve wherein said switching sleeve acts as an externally accessible adjusting member of said adjustment mechanism.

4,856,390
VALVE RESEATER APPARATUS AND METHOD
Donato L. Ricci, 834 Spring Creek Rd., Red Wing, Minn. 55066
Filed Feb. 19, 1988, Ser. No. 158,224
Int. Cl.[4] B23B *3/26*
U.S. Cl. 82—172 **2 Claims**



1. A valve reseater apparatus for forming or finishing a valve seat in a valve body, said valve seat having a perimeter which forms a transverse plane of said valve seat, said valve reseater apparatus comprising:

(a) a stationary valve reseater frame, said frame including a plurality of adjustable stabilizer means to support and position said frame within a valve body and proximate the valve seat;

(b) tool holder means for supporting a cutting tool, said tool holder means being operatively interconnected to a rotation shaft for rotating said tool holder means about said rotation shaft and said cutting tool around the perimeter of said valve seat;

(c) translation means for translating said tool holder means in a direction substantially perpendicular to the transverse plane of the valve seat, said translation means being operative as said cutting tool rotates around the perimeter of said valve seat, wherein said translation means comprises:

(i) a translation screw operatively interconnected to said tool holder means, wherein rotation of said translation screw causes translation of said tool holder means; and

(ii) a rotatable handknob operatively interconnected to said translation screw;

(d) radial movement means for moving said tool holder means in a radial direction so as to vary the diameter of rotation of said tool holder means, said radial movement means being operative as said cutting tool rotates around the perimeter of said valve seat, wherein said radial movement means comprises:

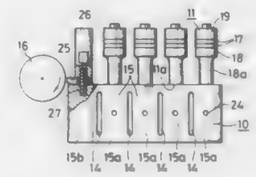
(i) an indexing screw having a first end and an opposite second end, said first end being interconnected with said tool holder means, wherein rotation of said indexing screw causes movement of said tool head in a radial direction;

(ii) a star wheel mounted upon said second end of said indexing screw, said star wheel having a plurality of notches, wherein rotation of said star wheel causes rotation of said indexing screw;

(iii) trip means for engagement with said star wheel to cause incremental rotation of said star wheel each time said tool holder means completes a full rotation; and

(e) disengagement means for disengaging said trip means from said star wheel so as to discontinue radial movement.

4,856,391
ULTRASONIC OSCILLATION MACHINING APPARATUS
Shoji Mishiro, Kawasaki, Japan, assignor to Taga Electric Co., Ltd., Tokyo, Japan
Filed Apr. 22, 1988, Ser. No. 185,051
Claims priority, application Japan, May 13, 1987, 62-116186
Int. Cl.[4] B23B *21/00*
U.S. Cl. 82—137 **11 Claims**



1. An ultrasonic oscillation machining apparatus, comprising:

a wide oscillating body divided into a plurality of units by one or more slits formed perpendicularly to the longer side of said body when viewed in cross-section such that end portions are left in said wide oscillating body;

a plurality of vertical ultrasonic oscillating elements wherein at least one of which is secured to each one of the portions of said wide oscillating body which forms the said individual units, of said wide oscillating body, for producing vertical oscillations of a frequency such that said opposite end portions of said wide oscillating body are positioned at loop portions of the oscillations so produced in said wide oscillating body; and

a bite provided at one of said end portions of said wide

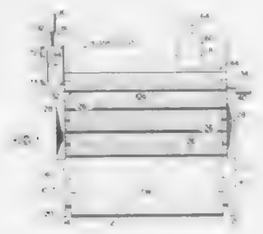
oscillating body which is positioned at a loop portion of the oscillations of said wide oscillating body.

4,856,392

APPARATUS AND METHOD FOR CUTTING MULTIPLE LAMP OUTLINES FROM ELECTROLUMINESCENT STRIP

Gustaf T. Appelberg, Fairfield, Conn., assignor to E-Lite Technologies, Inc., Watertown, Conn.

Filed Nov. 9, 1987, Ser. No. 118,758
Int. Cl.[4] B26D *5/20, 9/00*
U.S. Cl. 83—40 7 Claims



1. A method for cutting multiple lamp outlines each having opposite first and second major sides of selected length with said first side being a straight edge having a tab projecting therefrom and said second side being a straight edge and having opposite first and second straight minor sides of selected width from an electroluminescent strip having a strip length that is a multiple of said selected length and a strip width that is a multiple of said selected width, comprising:

(a) moving the strip along the strip length toward strip cutting means in increments substantially equal to said selected length,

(b) cutting the strip after an increment of movement to cut the strip into a rectangular blank having a first dimension equal to the selected length of the lamp outline and a second dimension equal to multiples of the selected width of the lamp outline;

(c) moving the blank toward the blank cutting means in the direction of the second dimension in increments substantially equal to said selected width of the lamp outline and forming a groove along one surface of the blank in a direction substantially parallel to said minor sides and extending substantially the entire width of the blank and substantially midway between said minor sides as said blank is advanced toward the blank cutting means,

(d) cutting the blank with the blank cutting means after each increment of movement to cut the second major side of a lamp outline advanced ahead of the blank cutting means as a straight edge and the first major side of an adjacent lamp outline behind the blank cutting means as a straight edge having a tab projecting therefrom, whereby the blank is cut into lamp outlines having said selected length and width as the blank is incrementally advanced past the blank cutting means.

4,856,393

METHOD FOR DIE CUTTING PLASTIC FOAM

George B. Braddon, 26 Maple Ave., Holcomb, N.Y. 14469

Division of Ser. No. 800,732, Nov. 22, 1985, abandoned. This application Jun. 10, 1987, Ser. No. 60,981
Int. Cl.[4] B26F *1/40*
U.S. Cl. 83—50 3 Claims

1. A method for cutting a product from a sheet of plastic foam material, comprising in combination:

(a) providing a rule die blade with an inner perimeter that defines an outline of the product;

(b) mounting the die blade to a die holder which has an opening with a perimeter bounded by the die blade;

(c) mounting a platen in front of and to a support base by at least one support member to define a clearance between the platen and the support base, providing the platen with a central portion bounded by a groove with an inner perimeter having substantially the same dimensions as the inner perimeter of the die blade and which extends completely through the platen in communication with the clearance, and freeing the clearance between the support base and the groove of any obstructions;

(d) mounting a resilient stripper plate on the die holder adjacent to the die blade;

(e) placing a single sheet of plastic foam material between the die blade and the platen;



(f) moving one of the die holder and the platen toward the other until the die blade passes through the sheet and into the groove to cut a completed product from the sheet, causing the completed product to move into the opening bounded by the die blade and causing chaff resulting from cutting of the sheet to pass through the groove and fall freely into the clearance between the platen and support base; then

(g) separating the die holder and the platen from each other and stripping with the stripper plate a skeleton scrap of the sheet from the die blade; then

(h) removing the skeleton scrap from between the die holder and platen, and repeating steps (e) through (g) continuously to cause the completed products to advance through the opening in the die holder.

4,856,394

PORTABLE CIRCULAR SAW

Earl R. Clowers, Jackson, Tenn., assignor to Porter-Cable Corporation, Jackson, Tenn.

Filed Apr. 14, 1988, Ser. No. 181,502
Int. Cl.[4] B27B *9/02*
U.S. Cl. 83—56 14 Claims

1. A method of cutting a substrate with a power operated circular type hand saw having a motor supporting housing, a motor disposed within said housing, a rotating circular sawblade driven by said motor, and a work supporting shoe pivotally attached and movable relative to said housing; said motor supporting housing having a depth limiting stop plate with a depth limiting ear and a clasp, said clasp adapted to lock said stop plate in a depth limiting position; said work supporting shoe including a longitudinal slot, a generally arctuate vertically extending slotted support member having a plurality of prepositioned tabs adapted to engage said ear of said depth limiting stop plate, and locking means;

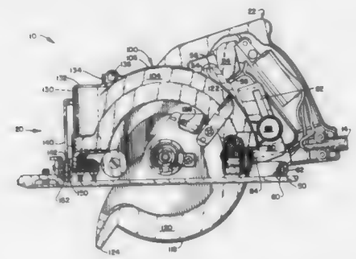
said method comprising the steps of:

(1) fixing said depth limiting stop plate in a desired depth limitating position,

(2) moving said housing to a fully inclined position with the blade fixed above the plane of said longitudinal slot,

(3) positioning said shoe against the work,

(4) turning on said saw to rotate said blade,



(5) plunging said blade into the work until said ear abuts a selected tab on said support member, and

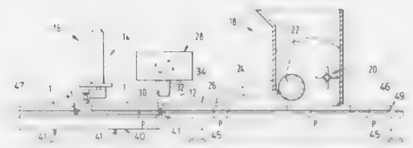
(6) making the desired length of cut in the work.

4,856,395

CUTTING MECHANISMS

Frank A. F. Smith, Godstone, and Trevor A. Ludlow, East Grinstead, both of England, assignors to Redland Roof Tiles Limited, England

Filed Nov. 19, 1987, Ser. No. 123,047
Claims priority, application United Kingdom, Nov. 28, 1986, [illegible]
Int. Cl.[4] B26D *7/06, 1/56;* B28B *11/12, 11/14*
U.S. Cl. 83—158 19 Claims



1. A cutting mechanism adapted for use in the removal of a portion of a roofing tile while in a green state comprising:

(a) blanking means to blank out said portion from the remainder of a roofing tile while in the green state; and

(b) removal means for removing said blanked out portion of the roofing tile.

4,856,396

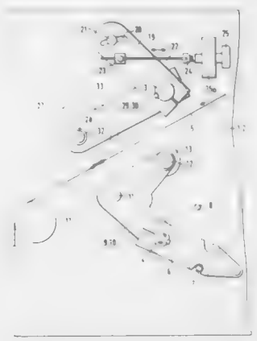
APPARATUS FOR SELECTIVELY FORMING APERTURES OR HOLES OR VENTING PINHOLES IN A CONTINUOUSLY MOVING WEB

Friedhelm Brinkmeier, Lengerich i.W., and Ulrich Eckelt, Tecklenburg-Leeden, both of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Mar. 17, 1988, Ser. No. 169,463
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710872
Int. Cl.[4] B26F *1/10, 1/24;* B31B *19/14*
U.S. Cl. 83—300 6 Claims

1. In apparatus for selectively forming a continuously moving web with apertures or holes by means of a punching mechanism including a rotating die and a cooperating rotating punch and with venting pinholes by means of a rotating needle bar and a cooperating rotating abutment,

the improvement comprising one of the die or punch and the needle bar secured to a common shaft on one side of the web, said other of the punch or die for cooperating with the said one of the die or punch on the common shaft secured to a first shaft on the opposite side of the web, the



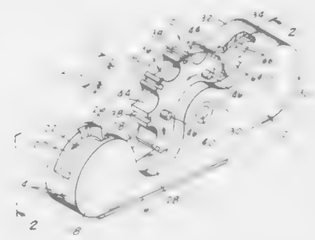
abutment for cooperating with the needle bar secured to a second shaft disposed on the opposite side of the web, and said first and second shafts being movably mounted in pivoted mounting arms, which are adapted to be fixed in position, and in such a manner that said first and second shafts can be positioned to place selectively the other of the punch or die into engagement with the said one of the die or punch or the needle bar into engagement with the abutment.

4,856,397

ADHESIVE TAPE CUTTER

Arshaloos N. Rebekale, 3740 La Crescenta Ave., Glendale, Calif. 91206

Continuation of Ser. No. 871,522, Jun. 6, 1986, abandoned. This application Mar. 11, 1988, Ser. No. 169,170
Int. Cl.[4] B26D *1/62*
U.S. Cl. 83—322 1 Claim



1. An adhesive tape cutter device comprising a housing having spaced apart side walls, means for rotatably supporting a roll of tape between said side/walls adjacent one end of the housing, means unrolling tape from the roll of tape, said means for unrolling tape comprising a slotted wheel rotatably supported between said side walls and adjacent roll of tape, said slotted wheel having a plurality of projections uniformly spaced on the periphery, each projections include a pair of tape contacting faces spaced apart by a slot on the periphery which are progressively contact the tape to unroll the tape from the roll, cutting means including a bladed wheel located rotatably

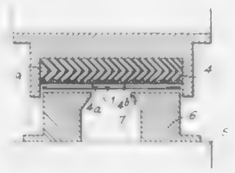
between said side walls adjacent the slotted wheel and adjacent the other end of the housing, said bladed wheel having a plurality of cutter blades on it periphery which project into said slots ink said projections on said slotted wheel in use to cut the unrolled tape on said projections, a first gear secured to said slotted wheel, a second gear secured to said bladed wheel, said gears rotate with said wheels, said gears being smaller said wheels, and two intermeshed idler gears rotatably supported between said side walls and between said first and second gears, one idler gear intermeshed with the slotted and the other idler gear intermeshed with the bladed wheel, whereby the four gears are intermeshed and rotation of the slotted wheel rotates the bladed wheel and the cutter blades move into the slots of said projection and cut the tape thereon.

4,856,399

APPARATUS FOR BLANKING THIN SHEETS USING A PUNCH HAVING LOCALIZED REGIONS OF HAND AND SOFT ELASTIC MATERIAL

Gabriel Deshet, Nogent-sur-Oise, France, assignor to Isoform, Courbevoie, France

Filed May 17, 1988, Ser. No. 195,087
Claims priority, application France, May 22, 1987, 87 07239
Int. Cl.[4] B26F *1/14*
U.S. Cl. 83—685 **11 Claims**



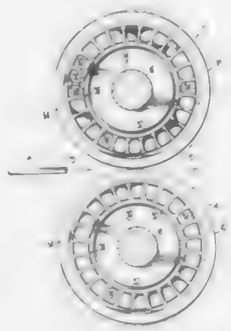
1. An apparatus for blanking out a sheet of material between a punch and die, said die having a sharp edge, said punch comprising a heterogeneous composite elastic material having localized regions having a relatively higher hardness and complementary regions having a relatively lower hardness for inducing differentiated stresses on the surface of the sheet to be blanked.

4,856,400

SCORING CUTTER

Robert A. Kelzer, 2111 E. Pinetree Blvd., Thomasville, Ga. 31792

Filed Feb. 17, 1988, Ser. No. 156,841
Int. Cl.[4] B26D *3/08*
U.S. Cl. 83—885 **13 Claims**



1. A scoring cutter for scoring a board to a uniform thickness comprising first and second cutting means aligned and spaced apart a predetermined distance to define a gap wherein:

(a) the first cutting means comprises:

(i) a first circular cutting blade having a first blade diameter and fixed to a first shaft for rotation therewith; and

(ii) a first pair of resilient wheels having a common first wheel diameter and a common first resilience, each mounted one on either side of the first cutting blade for rotation relative to the first cutting blade, wherein the first wheel diameter is equal to or greater than the first blade diameter,

(b) the second cutting means comprises:

(i) a second circular cutting blade having a second blade diameter and fixed to a second shaft for rotation therewith; and

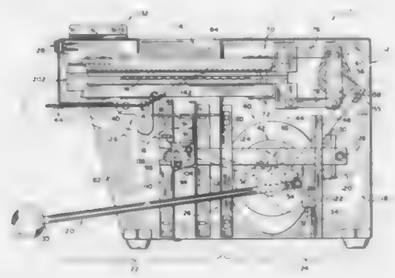
(ii) a second pair of resilient wheels having a common second wheel diameter and a common second resilience, each mounted on either side of the second cutting blade for rotation relative to the second cutting blade, wherein the second wheel diameter is equal to or greater than the second blade diameter.

4,856,401

COUNTERTOP BREAD SLICER WITH MANUALLY ACTUATED CRADLE

Gary L. Kruse, Spring Lake, and Bernard L. Petersen, Grand Rapids, both of Mich., assignors to Oliver Products Company, Grand Rapids, Mich.

Filed Jan. 22, 1988, Ser. No. 147,230
Int. Cl.[4] B26D *1/11, 7/06*
U.S. Cl. 83—425.2 **8 Claims**



1. An improved bread slicer including a generally horizontal blade assembly, a bread cradle vertically movable between a lower position below said blade assembly and an upper position generally proximate said blade assembly, and a transport mechanism for transporting said bread cradle between said lower and upper positions, wherein the improvement comprises said transport mechanism comprising:

a first spur gear rotatable about a horizontal axis;

a cradle support arm extending radially from said first spur gear, said cradle support arm operably connected to said first spur gear so that said first spur gear and said cradle support arm rotate together, said cradle support arm operably connected to said bread cradle so that rotation of said cradle support arm causes vertical movement of said bread cradle;

a second spur gear rotatable about a horizontal axis and meshingly engaging said first spur gear, said second spur gear having a larger diameter than said first spur gear, whereby rotation of said second spur gear causes greater rotation of said first spur gear; and

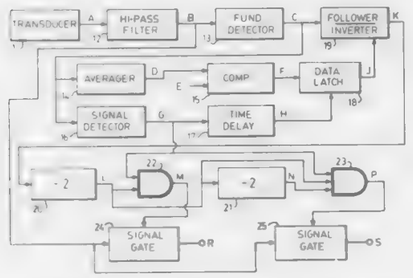
a handle arm extending radially from said second spur gear and operably connected thereto so that said second spur gear and said handle arm rotate together, whereby an angular deflection of said handle arm causes greater angular deflection of said cradle support arm.

4,856,401

SUB-HARMONIC TONE GENERATOR FOR BOWED MUSICAL INSTRUMENTS

Richard E. D. McClish, 2200 Chapdelaine Apt. 1203, Ste-Foy, Quebec, Canada G1V-4G8

Filed Sep. 2, 1987, Ser. No. 92,085
Int. Cl.[4] G10H *3/12, 1/06*
U.S. Cl. 84—1.11 **10 Claims**



1. A sub-harmonic tone generator for a bowed musical instrument having at least one vibrating element which is bowed in more than one direction of bowing, said sub-harmonic tone generator comprising:

transducer means responsive to vibrations of a bowed vibrating element in a plane determined by a direction of bowing and producing a transducer signal,

fundamental frequency detection means responsive to a fundamental frequency of said transducer signal and producing a signal indicative of said fundamental frequency,

means to produce a signal indicative of the direction of said bowing.

frequency divider means producing a sub-harmonic control signal at a sub-multiple of said fundamental frequency of said transducer signal,

means responsive to said signal indicative of the direction of said bowing for maintaining a constant phase relationship between said transducer signal and said sub-harmonic control signal, irrespective of the direction of said bowing, and

transducer signal gating means responsive to said sub-harmonic control signal and producing a sub-harmonic transducer signal at said sub-multiple of said fundamental frequency of said transducer signal, whereby said sub-harmonic transducer siganl has a tone color which is effectively independent of the direction of said bowing.

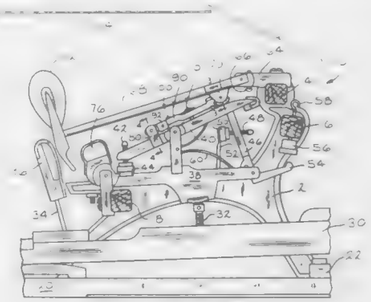
4,856,402

GRAND PIANO ACTIONS

James R. Alexander, 772 Burroughs, Plymouth, Mich. 48170

Filed Jan. 6, 1989, Ser. No. 293,989
Int. Cl.[4] G10C *3/18*
U.S. Cl. 84—239 **20 Claims**

1. In a piano action having a repetition lever and a hammer shank, the improvement comprising a lever pivotally secured at one end to said repetition lever, platform means pivotally secured to the other end of said lever for engaging said hammer shank, said platform means including brake means for engaging said repetition lever.

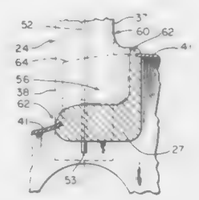


4,856,403

STRINGED MUSICAL INSTRUMENT

James S. Davies, 702 Blanchard, Seattle, Wash. 98121

Continuation-in-part of Ser. No. 699,405, Feb. 7, 1985. This application Jul. 22, 1986, Ser. No. 889,314
Int. Cl.[4] G10D *3/00*
U.S. Cl. 84—291 **9 Claims**



1. In an acoustic guitar having a hollow body consistingn of a soundboard, a back, and a side connecting said soundboard and back to enclose said hollow body; a neck including a head at one end, a heel portion at the other end, and a fingerboard secured to the upper surface of said neck betwteen said head and said heel portion; strings extending over said fingerboard and att least a portion of said body; and a heel connecting said neck with said hollow body, the improvement comprising:

said neck having a longitudinal axis dividing said neck into bass and treble halves, corresponding to the tuning of the strings extending thereover, said neck halves having corresponding bass and treble edges;

said heel being L-shaped when viewed in a cross-sectional plane parallel with said soundboard, said heel extending between and being connected to said soundboard and to said back, a first leg of said L extending transversely of said neck, and a second leg extending away from said first leg parallel to said neck axis, said second leg being spaced away from teh bass edge of said neck;

said neck having an integral heel portion extending outwardly parallel to said soundboard from said neck and joined at least to said second leg; and

said side of said hollow body having opposite ends, both joining with either said neck or said heel in the vicinity of the free ends of said first and second legs.

4,856,404

GUITAR WITH TUNING CHANGING, KEY CHANGING, CHORD CHANGING AND MODULATING CAPABILITIES

Samuel G. Hughes, Sr., c/o Mrs. Jobie Kessler, P.O. Box 136, Mallory, W. Va. 25634

Filed Dec. 23, 1987, Ser. No. 136,966
Int. Cl.[4] G10D *3/00*
U.S. Cl. 84—297 R **23 Claims**



1. An apparatus for use with stringed instruments having a body portion and a neck portion extending from said body portion in a longitudinal direction of the strings, comprising in combination:

an adjustable first key modulating means comprising a bridge slidably mounted on said neck portion of said instrument having a plurality of rollers rotatably mounted in said bridge each of said rollers being in rolling contact with a respective one of said strings for adjusting the effective length of the strings to modulate the key; and

a second key modulating means mounted on said body portion of said instrument for selectively changing the tension of the strings;

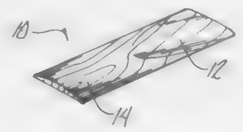
whereby one or both of said key modulating means may be selectively operated to achieve a desired key.

4,856,405

MEANS AND METHOD FOR FLAVORED WOOD REEDS FOR WOODWIND INSTRUMENTS

Sean P. Humphrey, 1023 Winegardner Rd., Des Moines, Iowa [redacted]

Filed Aug. 13, 1987, Ser. No. 84,831
Int. Cl.[4] B05D *1/18;* **G10D** *9/02*
U.S. Cl. 84—383 A **9 Claims**



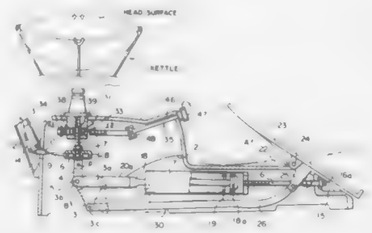
1. A normally porous, natural cane woodwind reed having a non-toxic absorbable edible flavoring disposed within the pores of said reed, whereby a pleasant taste is imparted to said reed when used.

4,856,406

TIMPANI

Hiroaki Ohmuro, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Apr. 27, 1987, Ser. No. 42,717
Claims priority, application Japan, May 12, 1986, 61-70002
Int. Cl.[4] G10D *13/04*
U.S. Cl. 84—419 **9 Claims**



1. A timpani comprising a kettle having

a head surface,

head surface tensioning means adjustably interacting with said head surface for tensioning said head surface,

tonal pitch adjustment means for adjusting the tension provided by said head surface tensioning means, said tonal pitch adjustment means including foot pedal means and interconnection means for interconnecting said foot pedal means with said head surface tensioning means, whereby a predetermined degree of tension is provided in said head surface from a predetermined position of said foot pedal means.

said interconnection means including balancing means for retaining said predetermined degree of tension in said head surface during periods of non-use of said timpani, said balancing means including a first end connected to said head surface tensioning means, and

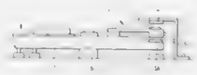
braking means interposed between said balancing means and said head surface tensioning means and connected solely to said first end of said balancing means for maintaining said predetermined degree of tension in said head surface during periods of use of said timpani.

4,856,407

ACTION MECHANISM FOR A KEYBOARD OF AN ELECTRONIC PIANO

Masanori Katsuta, and Tsutomu Yamaguchi, both of Shizuoka, Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Shizuoka, Japan

Filed Sep. 12, 1988, Ser. No. 242,575
Claims priority, application Japan, Sep. 18, 1987, 62-143570[U]
Int. Cl.[4] G10C *3/12*
U.S. Cl. 84—439 **4 Claims**



1. An action mechanism for a keyboard of an electronic piano, comprising:

a plurality of key members (1) each supported at an approximately center position thereof by a balance rail (6) in such a manner that said key members (1) are allowed to move seesaw with respect to said balance rail (6);

a member (5) disposed behind said key members laterally, which is commonly used as a stopper to all of said key members (1);

a plurality of action springs (2) each including a holder portion (2A), an action spring portion (2B) and a friction spring portion (2C); and

a counter weight (3) provided to said holder portion 2A of each of said action springs (2),

an end of said action spring portion (2B) being mounted to an upper surface of said key members (1) at a rear position of said supporting position of said balance rail (6), and a free end portion of said friction spring portion (2C) contacting with said stopper (5) slidably with being biased to said stopper (5).

4,856,408

SHOT AND POWDER LOADING SYSTEM

Walter R. Hendrickson, 2215 E. Orange Grove, Pasadena, Calif. 91104

Filed Aug. 4, 1988, Ser. No. 228,354
Int. Cl.[4] F42B *33/02;* **B67D** *5/06*
U.S. Cl. 86—29 **4 Claims**



1. An improvement for a shot and powder loading system having a wad jammer tube with an upper barrel portion, a swaged tapering shoulder, and a lower barrel portion and a loading funnel having a cylindrical body portion telescopically received within the upper barrel portion of the wad jammer tube, the improvement comprising a liner tube closely received within the body portion of the loading funnel and interfacing with the lower barrel portion of the wad jammer tube, the interface adapted to avoid shot and powder contact with the swaged tapering shoulder of the wad jammer tube, the liner tube further having a scarfed upper end with the apex of the scarf at least one shot pellet diameter higher than the base of the scarf and the tube wall in the scarf tapered on the internal wall to a knife edge at the scarf lip.

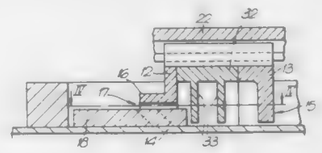
4,856,409

MISSILES AND LAUNCHER APPARATUS THEREFOR

Raymond F. Bowden, Hatfield, England, assignor to British Aerospace Public Limited Company, London, England

Filed Aug. 26, 1988, Ser. No. 236,937
Claims priority, application United Kingdom, Nov. 18, 1986, 8627530; European Pat. Off., Nov. 18, 1987, 873101935
Int. Cl.[4] F41F *3/04, 3/052, 3/06*
U.S. Cl. 89—1.819 **10 Claims**

1. A missile having at least one hook attached to the missile body and operable for engaging a slide rail forming part of a launch station for the missile, cutter knife means positioned in front of the hook and movable relative to the missile towards said hook and abutment means for engaging said cutter knife means as the missile is launched and for causing the cutter knife



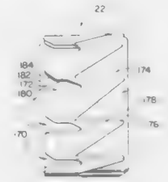
means to forcibly engage and sever the hook from the missile at a position adjacent the missile body.

4,856,410

FIREARM

John A. Anderson, P.O. Box 5620, Hamden, Conn.

Continuation of Ser. No. 947,845, Dec. 30, 1986, abandoned, which is a division of Ser. No. 622,793, Jun. 21, 1984, Pat. No. 4,709,611. This application Jul. 1, 1988, Ser. No. 214,875
Int. Cl.[4] F41D *7/04*
U.S. Cl. 89—161 **14 Claims**



1. A magazine comprising a cylindrical magazine drum having a cylindrical drum surface and front and rear walls and defining a circumaxial series of firing chambers and a circumaxial series of sets of cam recesses equal in number to said firing chambers, each of said sets of cam recesses including a front cam recess opening radially outward through said cylindrical drum surface and through said front wall and defining a front cam track, each of said sets of cam recesses including a rear cam recess independent of said front cam recess and opening radially outward through said cylindrical drum surface and through said rear wall, each said front cam recess increasing in width from its rear end toward its front end, each portion of said front cam recess having a width at least equal to the width of the immediately preceding portion of said front cam recess in progressing from the rear end of said front cam recess to the front end thereof, each said rear cam recess increasing in width from its front end toward its rear end, each portion of said rear cam recess having a width at least equal to the immediately preceding portion of said rear cam recess in progressing from the front end of said rear cam recess to the rear end thereof.

4,856,411

OVERLOAD RELEASE SYSTEM FOR AN AXIALLY MOVABLE BOLT

Ruprecht Maurer, and Karlheinz Tintner, both of Bad Homburg, Fed. Rep. of Germany, assignors to Ringspann Albrecht Maurer KG, Bad Homburg, Fed. Rep. of Germany

Filed Mar. 17, 1987, Ser. No. 26,867
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1986, 3611617
Int. Cl.[4] F01B *25/26;* **F15B** *15/26*
U.S. Cl. 91—1 **18 Claims**

1. System for axially releasably retaining a bolt (3,19, 24) while permitting the bolt to move freely under overload condi-

tions in a bore of a housing element (1) in either axial direction, comprising,

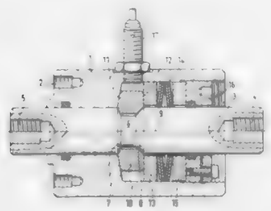
a circumferential groove (6) formed in the bolt, said groove having a wedge-shaped cross-section tapering in a direction towards a central axis (9) of the bolt;

at least one radially movable locking element (10,25; 410, 510, 610) located in said groove and having a cross-section which tapers from a wider dimension to a narrower dimension towards said central axis;

an axially movable support element (13, 27) having a support surface (12, 29) which extends radially and is located adjacent the groove of the bolt;

means (14, 26, 713, 714), supported on said housing element, for applying a biassing force to said support element and thereby defining an overload release limit;

a radially extending counter surface (11) terminating the housing element axially adjacent the groove,



said at least one locking element being retained in said groove and being supported against said biassing force by said counter surface, and

wherein at least one of said surfaces (11, 12, 29) is a conical surface having a theoretical cone apex located at least with the wider portion of the conical surface towards the other of said surfaces to define a hollow cone surface which is in engagement with said at least one locking element,

said locking element being radially movable along one of said surfaces, against said biassing force, and out of said circumferential groove (6) in response to axial loading of said bolt, as transmitted at a surface of said wedge-shaped groove (6), thereby releasing said bolt (3) and rendering it axially movable and free of axial restoring forces.

4,856,412

VACUUM OPERATED BOOSTER

Satoshi Kawasumi, Takahama; Yuzuru Sugiura; Hiroyuki Kondo, both of Anjo; Akihiko Miwa, Toyota, and Kazuhiko Suzuki, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 27, 1987, Ser. No. 89,835

Claims priority, application Japan, Aug. 29, 1986, 61-131115[U]

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—369.2 **3 Claims**

1. A vacuum operated booster comprising:

a housing defining an interior and having an opening at one end;

a power piston extending through the opening and hermetically slidable therein;

a diagram dividing the interior of the housing into a constant pressure chamber and a variable pressure chamber, an outer edge of the diaphragm being hermetically connected to the housing, an inner edge of the diaphragm hermetically fitting over an outer peripheral portion of the power piston;

a first opening provided in the power piston;

a valve plunger connected to a pushrod interlocking with a brake pedal of an automobile and received in the opening so as to be slidable therein;

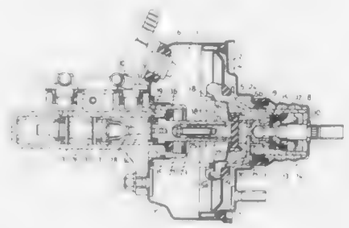
a control valve mounted in the power piston and which, when the booster is not in operation, engages with a rear end portion of the plunger;

a control valve mechanism placing the variable pressure chamber into communication with one of the content pressure chamber and the atmosphere dependent on depression of the brake pedal of the automobile;

an opening relatively larger than said first opening provided in the power piston and communicating with the first opening;

an output rod having a rear end portion received in the relatively larger opening so as to be slidable therein;

a reaction disk mounted between the rear end portion of the output rod and the power piston within the relatively larger opening; and a retainer having one end connected to the power piston, an opposite end pressed against the



rear end portion of the output rod so that the output rod pushes the reaction disk toward the power piston to provide a spring force acting against the output rod even when the booster is in an unactuated state, and an intermediate portion extending from said one end to said opposite end, the retainer being positioned on the power piston on the constant pressure chamber side, said intermediate portion and said opposite end of the retainer being spaced from said power piston and said opposite end of the retainer extending toward and pressing against the rear end portion of the output rod at an angle, said one end of the retainer being anchored to the power piston by a spring which is mounted in the constant pressure chamber, said spring biasing the power piston toward the variable pressure chamber, whereby at least a portion of said retainer is biased.

4,856,413

EXAMINATION APPARATUS WITH MASS BALANCING FOR A PART THEREOF WHICH IS PIVOTABLE ABOUT AN AXIS

Norbert Koropp, Reinbek, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 499,622, May 31, 1983, abandoned. This application Nov. 17, 1988, Ser. No. 274,714

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1982, 3221043

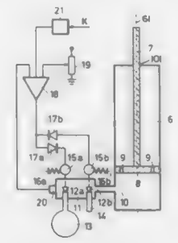
Int. Cl.[4] F15B *11/08*

U.S. Cl. 91—454 **9 Claims**

2. In an examination apparatus having two parts which are displaceable toward or away from each other along a displacement axis substantially perpendicular to a plane containing a pivot axis about which said two parts pivot as a unit, thereby varying the angular position of said displacement axis about said pivot axis, the mass balancing device for maintaining relative support between said parts comprising:

an air cylinder acting between said two parts, said air cylinder having two opposed working chambers and an opening communicating between the chambers to give spring characteristics to said cylinder;

means responsive to the angular position of said displacement axis about said pivot axis for generating a first signal representing the required air pressure in said cylinder to produce a force balancing the component of the gravitational force acting on one of said parts along said displacement axis; and



control means for selectively supplying pressured air to or venting pressurized air from the cylinder, said control means comprising:

means for generating a second signal representing the actual air pressure in said cylinder;

means for comparing the said first and second signals; and

means for varying the air pressure in the cylinder in response to the difference between said first and second signals.

4,856,414

VISCOELASTOPLASTIC-SEALANT PACKED FLEXIBLE POWER TRANSMISSION CABLE FOR HYDRAULIC ACTUATOR

Vladimir G. Churkin; Sergei B. Negrutsky; Sergei B. Klimov, and Boris F. Negrutsky, all of Karaganda, U.S.S.R., assignors to Upravlenie po Montazhu, Demontazhu i Remontu Gornoshakhtnogo Oborudovania "Spetsshakhtomontazh" Karagandinskogo Proizvodstvennogo Obiedinenie po Dobyche Uglya "Karagandaugol" , Karaganda, U.S.S.R.

PCT No. PCT/SU84/00059, § 371 Date Dec. 19, 1985, § 102(e) Date Dec. 19, 1985, PCT Pub. No. WO85/04913, PCT Pub. Date Nov. 7, 1985

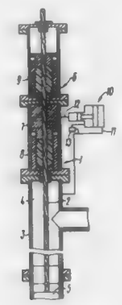
PCT Filed Nov. 2, 1985, Ser. No. 829,125

Claims priority, application U.S.S.R., Apr. 24, 1984, 3730996; Apr. 24, 1984, 3732435

The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.

Int. Cl.[4] D07B *7/12;* **F15B** *15/14;* **F16J** *15/48, 15/56*

U.S. Cl. 92—83 **10 Claims**



3. A hydraulic cylinder with a flexible piston rod comprising a housing (3) with a work space (4) filled with a pressurized working fluid, said space accommodating therein a piston (5) coupled to a flexible rod (2) in the form of a rope and provided with at least one space packing assembly (6) having a chamber (7) filled with a viscous material, through which chamber is passed the flexible rod, characterized in that the viscous material is a viscoelastoplastic material and the chamber (7) of the packing assembly (6) is formed between two packing members (8, 9) positioned in the space of the housing (3), the chamber being coupled to means (10) for maintaining in said chamber a pressure exceeding the pressure of the working fluid in the work space (4) of the housing (3) irrespective of fluctuations in the pressure of the working fluid.

4,856,415

RODLESS CYLINDER ASSEMBLY

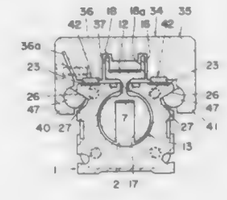
Mitsuo Noda, Ichinomiya, Japan, assignor to Howa Machinery, Ltd., Nagoya, Japan

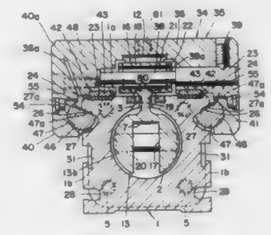
Filed Jan. 20, 1988, Ser. No. 146,047

Claims priority, application Japan, Jan. 30, 1987, 62-21102

Int. Cl.[4] F01B *29/00*

U.S. Cl. 92—88 **28 Claims**





1. A rodless cylinder assembly, comprising: a cylinder barrel provided with an axial bore and an outer wall in which a slit is formed so as to extend in an axial direction of the cylinder barrel, the cylinder barrel being arranged substantially horizontally with said slit being directed upwardly;

a piston member slidably fitted in said axial bore of the cylinder barrel;

connecting means formed integrally with said piston member so as to project outwardly through said slit;

sealing means for sealing said slit;

a slide mount operatively connected to said connecting means to be slidable along the outer wall surface of said cylinder barrel in accordance with the movement of said piston member in the axial bore of said cylinder barrel, said slide mount comprising a central base portion and a pair of depending wall portions extending downwardly from both longitudinal sides of said base portion so as to be located outwardly of, and close to opposite side walls of said cylinder barrel, said depending wall portions rotatably supporting guide rods having planar guide surfaces, said base portion of the slide mount being provided in one longitudinal side portion with a cut-in slot so that one of said depending wall portions is elastically deformable

inwardly and the amount of deformation is adjustable by screw means screwed in said slide mount form one side thereof;

first guide means for said slide mount, said guide means having guide surfaces and disposed on an upper wall surface of said cylinder barrel on both sides of said slit with the guide surfaces lying substantially in a horizontal plane;

second guide means for said slide amount, disposed on the opposite side walls of said cylinder barrel, said second guide means being inclined guide surfaces disposed on the opposite side walls of said cylinder barrel and inclined downwardly towards a cross-sectionally central portion of the cylinder barrel, said inclined guide surfaces engaging said planar guide surfaces of the guide rods, respectively; and

guide members provided for said slide mount so as to be guided along said first guide means.

4,856,416

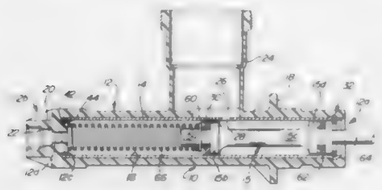
HYDRAULIC CYLINDER STRUCTURE

Richard A. Nix, Auburn Hills, and Paul M. Regula, Sterling Heights, both of Mich., assignors to Automotive Products plc, Warwickshire, England

Continuation-in-part of Ser. No. 885,671, Jul. 15, 1986, abandoned. This application Feb. 18, 1988, Ser. No. 157,375

Int. Cl.[4] F16J *10/02*

U.S. Cl. 92—169.1 **15 Claims**



1. A composite cylinder construction comprising:

(A) a metallic sleeve of generally cylindrical configuration defining an elongated axial bore;

(B) a non-metallic housing molded intimately around said sleeve and defining a closed housing end proximate the forward end of said sleeve defined by a housing end wall and an open housing end proximate the rearward end of said sleeve; and

(C) a piston reciprocally mounted in said sleeve bore;

(D) said metallic sleeve including annular anchoring means proximate the rearward end thereof lockingly and moldingly engaging the adjacent material of said housing to anchor said sleeve within said housing and presenting an annular radially inwardly opening internal groove proximate the rearward end thereof for receipt of retainer means.

4,856,417

TRUNK PISTON FOR USE IN AN INTERNAL COMBUSTION ENGINE

Yoshikazu Ishikawa, Chofu, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 492,372, May 6, 1983, abandoned. This application Feb. 21, 1985, Ser. No. 703,657

Claims priority, application Japan, May 27, 1982, 57-78166[U]

Int. Cl.[4] F16J *1/04*

U.S. Cl. 92—233 **8 Claims**

1. A trunk piston for use in an internal combustion engine comprising:

a piston crown section;

a piston skirt section comprising a cylindrical part attached to the crown section and a pair of flat parts which are opposite to and inclined with respect to each other;

a pair of piston pin boss sections each having an outer edge part and an outer periphery, said boss sections being attached to the flat parts of the skirt section such that each



flat part is positioned at a location inset from the outer edge of an associated pin boss section, said inset extent increasing from an upper position of the associated pin boss section to a lower position of the associated pin boss section.

4,856,418

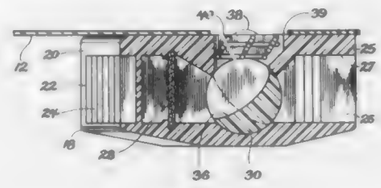
AUTOMOBILE VENTILATION DEVICE

Delton D. Hooser, 704 Orchard Manor Dr., Boonsboro, Md. 21713

Filed May 20, 1988, Ser. No. 196,505

Int. Cl.[4] B60H *1/30*

U.S. Cl. 98—2.13 **6 Claims**



4. An automobile ventilation device adapted for mounting in a window of an automobile, comprising:

a rectangular transparent mounting plate provided with dual flanged top and bottom edge portions for allowing inversion of said mounting plate for alternative engagement in both driver and passenger side windows of an automobile;

an air scoop mounted on said mounting plate, a leading side of said air scoop having an elongated air inlet opening communicating with a hollow interior, a lateral opening directed transversely to said air inlet opening communicating from said hollow interior through said mounting plate to an automobile interior, and an air outlet opening on a trailing side of said air scoop;

an elongated solid cylindrical air control valve mounted for limited reciprocal rotation about a central axis in said air scoop interior, said air control valve extending generally parallel to said air inlet opening and having an arcuate axial section removed to provide an arcuate air control surface;

a control lever connected to said air control valve and extending into the automobile interior though a slot in said mounting plate for allowing manual rotation of said air control valve by automobile occupants; and

said air control valve being rotatable to a first position in which said arcuate air control surface faces said air inlet opening to direct air through said lateral opening into an automobile interior, and to a second position in which said arcuate air control surface faces rearwardly for inducting air from an automobile interior out said lateral opening to said air outlet opening.

4,856,419

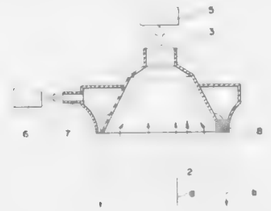
PROCESS FOR COLLECTING A CONTAMINATED SUBSTANCE AND APPARATUS THEREOF

Takeo Imai, C504, 18-23 Ohmori-Nishi, 2-Chome, Ohta-ku, Tokyo, Japan

Filed May 19, 1987, Ser. No. 51,963

Int. Cl.[4] F24F *9/00*

U.S. Cl. 98—115.1 **8 Claims**



1. Apparatus for collecting a contaminated substance issuing from a contamination source, comprising:

means for forming a first annular air current which is directed downwardly toward said contamination source so as to annularly surround said contamination source;

means for forming a second suction air current interiorly within said first annular air current and directed upwardly away from said contamination source so as to remove contaminated substances from said contamination source;

a hood;

means defining separate compartments within said hood;

annular slot means defined within a peripheral portion of said hood for defining an outlet path for said first annular air current;

an upstanding conical duct defined radially inwardly of said annular slot means for defining an outlet path for said second suction air current; and

means defining separate air exit slots within said annular slot means and respectively connected to said separate hood compartments for providing exiting air currents comprising said first annular air current having different flow velocities at different locations relative to said contamination source.

4,856,420

FUME HOOD

Rudolph G. Poblete, Statesville; Kurt Rindoks, Cornelius, and James R. Frederick, Statesville, all of N.C., assignors to Kewaunee Scientific Corporation, Statesville, N.C.

Filed Jun. 20, 1988, Ser. No. 208,582

Int. Cl.[4] B08B *15/02*

U.S. Cl. 98—115.3 **9 Claims**



1. In a fume hood having an open front cabinet opened and closed by a transparent upright lift sash which also controls air flow patterns through the cabinet and a top panel mounted across the front of the cabinet above the opening closed by the lift sash, and said cabinet having an air intake passage behind said panel, the improvements of said top panel being transparent and the lift sash being inwardly inclined from the vertical in a bottom to top direction to increase viewing of the cabinet interior and to open said air intake passage in its closed position and close said air intake passage in its opened position.

4,856,421

COMPUTER-CONTROLLED FERMENTATION MEANS FOR WINES

Darryl R. Whitford, Rosedale, Australia, assignor to S. Smith & Son Pty. Ltd., Angaston, Australia

Filed Dec. 29, 1987, Ser. No. 178,916

Claims priority, application Australia, May 2, 1986, PH5719; World Int. Prop. O., May 1, 1987, PCT/AU87/00126

Int. Cl.[4] C12M *1/36*

U.S. Cl. 99—276 **13 Claims**



1. Fermentation control means for controlling fermentation of sugar solution in the production of an alcoholic beverage, comprising:

(a) a yeast propagating tank;

(b) a continuous fermenting tank;

(c) a first pump having an input conduit connected to a source of sugar solution and an output conduit connected to the continuous fermenting tank;

(d) a second pump having an input conduit connected to an outlet of said continuous fermenting tank;

(e) at least one of Baume sensing means and yeast concentration sensing means in communication with the contents of the continuous fermenting tank and both indirectly sensitive to yeast activity therein; and

(f) a computer interconnecting said sensing means with both said pumps and arranged to control the pumps so that the feed rate of sugar solution and product discharge are controlled to vary in accordance with yeast activity in said continuous fermenting tank so as to retain both the Baume and yeast cell count substantially constant in said tank during most of the time of fermentation.

4,856,422

HEAT TREATMENT OF FOOD WITH FLOW-DEPENDENT CONTROL

Siegfried Meister, Siemensstrasse 2,, 8910 Landsberg, Fed. Rep. of Germany

Filed May 20, 1986, Ser. No. 865,181

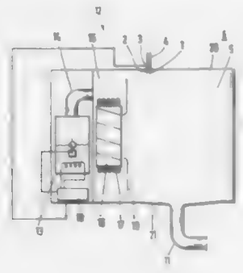
Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518498

Int. Cl.[4] A47J *27/00*

U.S. Cl. 99—330 **12 Claims**

1. An apparatus for regulating the heat treatment of food comprising a cooking area, a steam supply regulatable subject to a sensor, a permanently open connection between the cooking area and the ambient having a cooking area opening, and means for creating a circulating flow of cooking medium in the cooking area passing across the cooking area opening, charac-

terized in that adjacent the cooking area opening there is provided a venturi-type flow obstacle creating a local subatmospheric pressure and that the sensor is arranged in the cooking area opening.

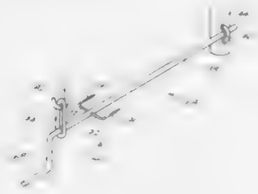


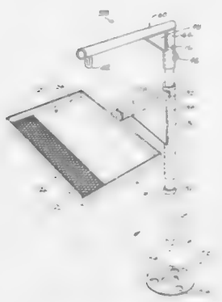
4,856,423

PORTABLE BARBECUE APPARATUS

Peter Burns, 39 Hobbs Avenue, Dalkeith, Western Australia, Australia 6009

Filed Apr. 7, 1987, Ser. No. 35,481
Claims priority, application Australia, Apr. 8, 1986, PH5373
Int. Cl.[4] A47J *37/10*
U.S. Cl. 99—421 H 1 Claim





1. Cooking apparatus comprising:
a stake having a first end and a second end, said first end being arranged to be driven into the ground in an upright manner with said second end uppermost;
stop means provided on said stake at a position remote from said second end;
a first tubular sleeve comprising an upper end and a lower end arranged to slide over said second end of said stake so that said lower end of said first tubular sleeve abuts said stop means positioning said first tubular sleeve at fixed distances from said first and second ends respectively, of said stake;
a projecting member extending substantially at a right angle from said first tubular sleeve;
support means for supporting food to be cooked or a food container to be heated, said support means being provided with a support projecting member arranged to connect with said projecting member of said first tubular sleeve so that said support means is connected to said first tubular sleeve, said first tubular sleeve being freely rotatable about said stake in either direction form a stationary position, said lower end of said first tubular sleeve being constantly in abutment with said stop means and said stop means being the sole means of retaining said first tubular sleeve at said fixed distances from said first and second ends of said stake;
a second tubular sleeve having an upper end and a lower end;
an elongated member having a first end and second end extending from said second tubular sleeve substantially at right angles thereto and connected at said first end of said elongated member over said upper end of said second tubular sleeve to thereby close off said upper end; guide means provided on said second tubular sleeve and attachment means provided at said second end of said elongated member;
a spit connected to said guide means and said attachment means so that said spit is rotatably held in said guide means and said attachment means; and
said second tubular sleeve being constructed to slide over said second end of said stake until said second end of said stake abuts with said elongated member that is connected over said upper end of said second tubular sleeve, said second tubular sleeve being freely rotatable about said stake in either a clockwise or counter-clockwise direction from a stationary position, said second end of said stake positioned in abutment with said elongated member regardless of movement, said elongated member being the sole means of preventing said second tubular sleeve from sliding further downwardly along said stake.

4,856,424

APPARATUS FOR FILLER TAPING SCREEN FRAME AND APPARATUS FOR APPLYING FILLING LIQUID TO SCREEN FRAME

Kameharu Seki, and Isamu Kubo, both of Saitama, Japan, assignors to Nippon CMK Corporation, Japan

Filed Dec. 12, 1988, Ser. No. 283,257
Claims priority, application Japan, Feb. 10, 1988, 63-30644; Feb. 10, 1988, 63-30646
Int. Cl.[4] B41C *1/14*
U.S. Cl. 101—128.4 5 Claims



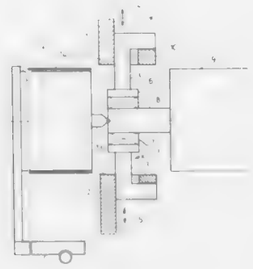
1. An apparatus for filler taping a screen frame, comprising:
a frame clamping device including a frame supporting member which is slidable between a frame receiving position and an operating position and is indexable 90 degrees; and
a pair of tape attaching devices which are supported in such a manner as to be capable of effecting linear motion along opposing two sides of said screen frame and are adapted to attach a tape on said opposing two sides.

4,856,425

ADJUSTABLE BEARING ARRANGEMENT FOR A PRINTING MACHINE CYLINDER

Ingo Köbler, Anhausen, Fed. Rep. of Germany, assignor to M.A.N. Roland Druckmaschinen AG, Offenbach-am-Main, Fed. Rep. of Germany

Filed Apr. 27, 1988, Ser. No. 186,797
Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3715536
Int. Cl.[4] B41F *13/20*
U.S. Cl. 101—212 14 Claims



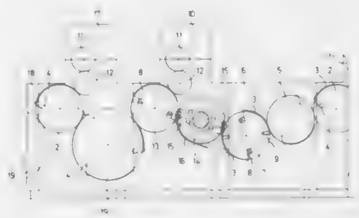
1. A rotary printing machine having a side wall (1);
a printing cylinder (9) adapted to receive a sleeve thereon and a cylinder shaft (8) extending from the printing cylinder;
a bearing (7) rotatably retaining said cylinder shaft;
a bearing bushing (6; 15') surrounding the bearing;
a jaw chuck (3) having jaws (3'; 16–18) retained on the side wall (1) for radial sliding movement thereon relative to the cylinder shaft, and positioned for selectively gripping and releasing the bearing bushing (6; 15');
the side wall of the printing machine being formed with an opening (2) of sufficient size to permit a sleeve (14) to pass through the side wall (1) and be fitted over the printing cylinder (9);
means for withdrawing said jaws of said jaw chuck to permit placement of a sleeve on said cylinder;
means for supporting and reliably maintaining the position of the free end of the cylinder shaft while said jaws are withdrawn;
and means for permitting said jaws to be held in a holding position and to maintain said bearing bushing and hence said shaft in a desired position, and to enable said jaws to be quickly and reliably returned to said holding position after having been withdrawn from said bearing bushing;
said means for permitting said jaws to maintain and be quickly and reliably returned to said holding position comprising adjustable stop means (10; 22–24) operatively associated with the jaws of said jaw chuck and said bearing bushing, and abutment means formed on the jaws, wherein said adjustable stop means are set and said jaws and hence said abutment means can be slid in and out of engagement with said stop means such that when the jaws grip the bearing bushing, the stop and adjustment means are engaged, and when the jaws are withdrawn, the stop and abutment means are released.

4,856,426

SHEET-FED ROTARY PRINTING MACHINE WITH PRINTING UNITS ARRANGED IN TANDEM

Arno Wirz, Bammental, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed May 28, 1985, Ser. No. 738,587
Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419762
Int. Cl.[4] B41F *7/06*
U.S. Cl. 101—217 9 Claims



1. Sheet-fed rotary offset printing machine having printing units arranged in tandem for processing both paper as well as cardboard with single-side multicolor or first form and perfector printing and having at least one sheet-turning device, each of the printing units having four cylinders consisting, in addition to a plate and a blanket cylinder of given diameter, of an impression cylinder and a transfer cylinder each having double the diameter of the respective plate and blanket cylinders, comprising a base frame located between two of the printing units and carrying only two cylinders consisting of a transfer cylinder and a storage cylinder, each having a diameter double that of the respective plate and blanket cylinders, the one of said two printing units located downstream of said base frame in travel direction of a sheet through the printing machine having a transfer cylinder in the form of a sheet-turning cylinder with respective rows of tongs-grippers disposed 180° from one another around the circumference thereof, said base frame and said one of said two printing units together constituting a sheet-turning device, the impression cylinder of said one of said two printing units being in cooperative engagement with said turning cylinder and having hook grippers thereon for taking over a sheet from said tongs grippers of said turning cylinder, and means disposed on the impression and turning cylinder as well as the transfer and storage cylinders for transporting the sheet smudge-free with the printed surface thereof facing radially inwardly on the cylinders.

4,856,427

INK METERING ASSEMBLY

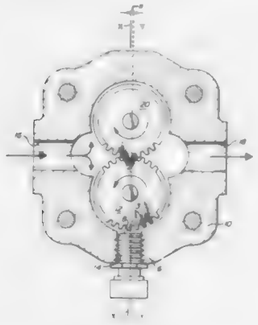
Charles R. Gasparrini, Rye, N.Y., assignor to Baldwin Technology Corp., Stamford, Conn.

Continuation of Ser. No. 850,728, Apr. 11, 1986, abandoned.
This application Apr. 15, 1988, Ser. No. 183,463
Int. Cl.[4] B41F *31/00*
U.S. Cl. 101—366 12 Claims

1. A method of metering ink being fed under pressure to a printing press, said method comprising the steps of:
interposing a positive displacement gear meter in the feedline in which said ink is being delivered under pressure to said press, said meter having an inlet port, an exit port, and a chamber communicating with said inlet and exit ports and having intermeshing gears rotatably mounted therein;
feeding said ink via said inlet port into said chamber and around the periphery of said intermeshing gears and discharging said ink through said exit port of said meter;
said positive displacement gear meter being further characterized in that the axes of said intermeshing gears are

offset, towards said exit port, from the axis of symmetry of said chamber;

providing sensing means adjacent the teeth of said intermeshing gears and adapted to generate pulses indicative of



rotation of said gear teeth past said sensing means as said flow of ink causes said gears to rotate; and

processing said pulses in counter means to provide an indication of the amount of said ink passing through said meter.

4,856,429

FLEXOGRAPHIC PRINTING MACHINE, ESPECIALLY FOR FLEXOGRAPHIC BLANK PRINTING

Peter Lauber, Stetten, Switzerland, assignor to Conprinta Ltd., Zurich, Switzerland

Filed Aug. 29, 1988, Ser. No. 237,851

Claims priority, application Switzerland, Sep. 10, 1987, 3502/87

Int. Cl.[4] B41L *3/02*

U.S. Cl. 101—486 **10 Claims**



1. A process for lifting off a printing belt in a flexographic printing machine comprising at least one printing unit; each printing unit having an endless printing belt drawn on round a back-up cylinder mounted on bearings and a tension roller mounted on bearings, an impression cylinder mounted on bearings, an engraved roller transferring the ink to the printing belt, and an ink drier; and a paper web running through all the printing units and guided via an idler roller or idler rollers and a draw roller or draw rollers between the printing belt and the impression cylinder and through the ink drier; means for displacing the back-up cylinder and the tension roller, wherein, in each printing unit, the bearings of the impression cylinder are fastened rigidly to the machine frame, whereas the bearings of the back-up cylinder are arranged so as to be displaceable by said means for displacing in at least two directions and the bearings of the tension roller are arranged so as to be displaceable by said means for displacing in at least one direction, comprising the steps of lifting the back-up cylinder guiding the printing belt off from the engraved roller and then from the impression cylinder guiding the paper web such that the period of time required for a point on the printing belt to move forwards from the engraved roller to the impression cylinder corresponds to that period of time which elapses between the lifting off of the printing belt from the engraved roller and its lifting off from the impression cylinder.

4,856,428

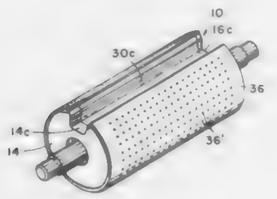
EXTRUDED PRINT CYLINDER

Melvin E. Green, Evanston, and Efim Motev, Lincolnwood, both of Ill., assignors to American Screen Printing Equipment Company, Chicago, Ill.

Filed Nov. 7, 1986, Ser. No. 928,290

Int. Cl.[4] B41F *1/28*

U.S. Cl. 101—475 **13 Claims**



1. A printing cylinder comprising:

a plurality of arcuate cylindric extruded sections, each section having a pair of opposite axial edges in engagement with adjacent sections;

one of said sections having a gripper channel therein for receiving sheet stock gripper mechanism;

said sections each having channels in the outermost periphery thereof, extending axially from one end of the section to the opposite end, open through both ends of the section;

said edges of said sections being bonded together to form an integral cylinder;

a perforated jacket around the entire periphery of said integral cylinder except for the peripheral extent of the gripper channel, over the periphery of said channels allowing vacuum communication to the outer surface of said jacket; and

a pair of axial end members attached to said cylinder, covering the ends of said cylinder and said channels, and providing axial bearing journals for the printing cylinder.

4,856,430

WALL-BREACHING APPARATUS

Allan W. M. Gibb, Medicine Hat; Hans R. Gartner, Limoges; A. William Bauer, Kingston, and Dennis P. Chadwick, Napanee, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

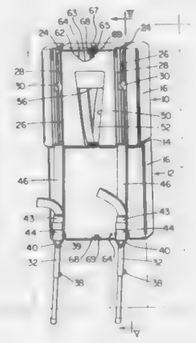
Filed May 19, 1988, Ser. No. 195,833

Int. Cl.[4] F42B *1/02*

U.S. Cl. 102—307 **24 Claims**

14. A wall-breaching apparatus comprising:

two panels, each with an outer face, an inner face and a peripheral edge, each panel comprising a matrix, and a linear shaped charge embedded in the matrix with its ends adjacent the peripheral edge of the panel;



hinge means connecting the panels to pivot between a closed position with the inner faces confronting one another and an open position with the inner faces substantially coplanar and the linear shaped charges arranged end to end.

4,856,431

DEVICE FOR ARMING AND DISARMING A DIRECTIONAL MINE

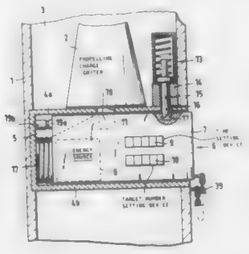
Jens Seidensticker, Kaarst, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 1, 1988, Ser. No. 176,867

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1987, 3711166

Int. Cl.[4] F42B *23/26;* **F42C** *15/14*

U.S. Cl. 102—427 **10 Claims**



1. In a directional mine for combatting armored vehicles, including a projectile having a propelling means and a warhead; a support structure positioning the projectile prior to launching the projectile therefrom; electric circuit means for serving the projectile; the improvement comprising

(a) an arming unit including a battery, igniting means for firing the propelling means and a housing accommodating said battery and said igniting means, said housing being insertable into and removable from said support structure;

(b) ejecting means in engagement with said support structure and said housing for pushing said housing at least partially out of said support structure from an inserted position into an ejected position;

(c) locking means for retaining said housing in the inserted position and for preventing said ejecting means from becoming effective;

(d) timing means for placing said locking means in a releasing state after a predetermined period for allowing said ejecting means to push said housing outwardly of said support structure from said inserted position into said ejected position; and

(e) first electrical contact means mounted in said support structure and forming part of said electric circuit means and second electrical contact means mounted on said housing and being electrically connected to said battery; said first and second electric contact means being in electric contact with one another in the inserted position of said housing.

4,856,432

SPIN STABILIZED CARRIER PROJECTILE INCLUDING AT LEAST TWO SUBMUNITION PROJECTILES

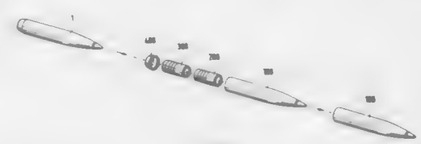
Reinhard Synofzik, Jüchen, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 16, 1987, Ser. No. 135,508

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, 3643293

Int. Cl.[4] F42B *13/50, 13/32*

U.S. Cl. 102—489 **5 Claims**



1. A spin stabilized carrier projectile having a longitudinal axis comprising:

a projectile body; and

at least two submunition bodies disposed in, and ejectable from, said projectile body, said submunition bodies being spaced along said axis, each said submunition body having a folded, expandable disk-shaped deceleration means for reducing the velocity and spin of said submunition body upon ejection from said projectile body, said deceleration disk-shaped means including a sheet of material for producing air resistance, and said disk-shaped deceleration means having different dimensions for respectively different submunition bodies so that each respective submunition body is decelerated less than said submunition body disposed behind the respective submunition body.

4,856,433

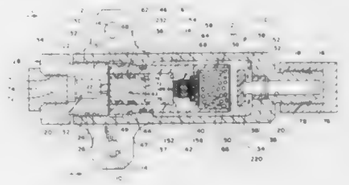
INITIATOR DEVICE WITH ADIABATIC COMPRESSION IGNITION

Griffith S. Evans, Westmont, Ill., assignor to Scot, Incorporated, Downers Grove, Ill.

Filed Jul. 13, 1987, Ser. No. 72,561

Int. Cl.[4] F42B *5/20*

U.S. Cl. 102—530 **15 Claims**



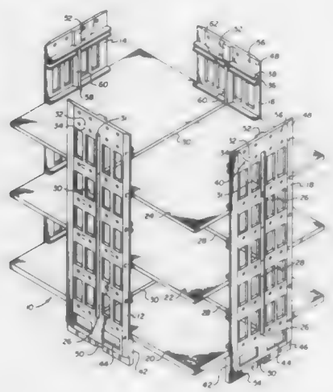
1. A pyrotechnic material actuated initiator device for activating emergency equipment,

said initiator device comprising:

a housing defining a central chamber of cylindric configuration having a discharge bore at one end of same and being open at the other end of same,

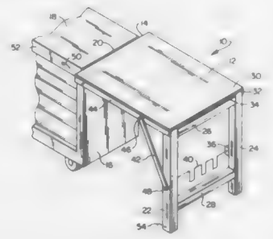
said housing defining an annular shoulder about said chamber adjacent said other end of said housing,
a pyrotechnic cartridge mounted in said chamber,
said cartridge including:
a body having a head portion adjacent one end of same for seating against said annular shoulder and being chambered adjacent the other end of same for mounting pyrotechnic material means in a pyrotechnic column having a head facing said body one end,
said body adjacent said one end of same defining a cylinder aligned with the pyrotechnic column head and having a piston mounted in said cylinder in close fitting relation thereto adjacent said one end of said body,
said cylinder being proportioned lengthwise thereof to define a piston stroke toward and against the pyrotechnic column head end,
means for spacing the pyrotechnic column head end from said piston at the end of the piston stroke when effected,
and a head secured in said other end of said body and against said head portion of said cartridge body for biasing said cartridge body against said housing shoulder for centering said cartridge body in said housing and directing said cartridge other end toward said housing discharge bore,
said head having a bore therethrough directed at said piston,
and means for acting through said head bore for effecting thrust of said piston toward said pyrotechnic material head end to effect adiabatic compression ignition of same for initiating discharge from said housing discharge bore.

4,856,434
SMITTY TABLE
Gene A. Smith, 5725 N.W. Blvd., Davenport, Iowa 52806
Filed Dec. 27, 1988, Ser. No. 289,685
Int. Cl.[4] B65D *19/12*
U.S. Cl. 108—53.1 **5 Claims**



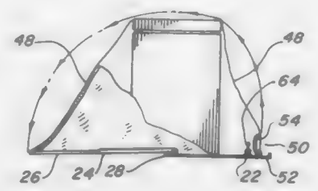
1. A collapsible shipping, storing and displaying table comprising:
a raised pallet base of rectangular configuration having four way forklift entries thereunder,
support posts attached to the mid-sections of said pallet base on each of the sides thereof, said support posts having leg portions above which said pallet base is attached to permit forklift entry below said pallet base, said support posts having vertically spaced shelf attachments above said leg portions, and
a plurality of shelves adapted to be connected to said attachments.

4,856,435
STOWABLE WORK BENCH
Kevin D. Larson, 3032 Sawdust La., Dublin, Ohio 43017
Filed May 26, 1988, Ser. No. 199,167
Int. Cl.[4] A47C *5/04*
U.S. Cl. 108—134 **1 Claim**



1. A stowable work bench adapted to be pivotally mounted to one side of a tool box comprising:
a generally flat work surface having a top side and a bottom side;
first pivot means attached to one end of said work surface for pivotally mounting said work bench to one side of a tool box;
wherein said flat work surface is moveable between a working position in which said work surface lies in a generally horizontal plane such that it extends outwardly from said first pivot means and said top side faces upwardly and a stowed position in which said work surface lies in a generally vertical plane such that it extends downwardly from said first pivot means and said top side faces outwardly;
a movable support means for said work surface;
second pivot means attached to said movable support means and the other end of said work surface to provide a pivotal connection therebetween; and
wherein said support means is movable between a first position in which it extends downwardly from said bottom side perpendicular to said work surface to engage the ground when said surface is in said working position and a second position in which it extends parallel to said work surface and overlies said top side when said work surface is in said stowed position.

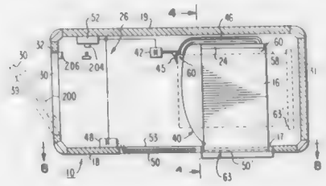
4,856,436
AUTOMATICALLY EXPANDING PROTECTIVE COVER
Jonathan Campbell, 5721 Zelzah Ave., Encino, Calif. 91316
Filed Jan. 25, 1988, Ser. No. 148,347
Int. Cl.[4] E06B *9/00*
U.S. Cl. 109—1 R **8 Claims**



1. An automatically expandable protective cover for electronic equipment comprising:
(a) a pair of floor bases disposed in close proximity to the electronic equipment parallel with two of the equipment sides distending from the center thereof to at least beyond the equipments front surface;

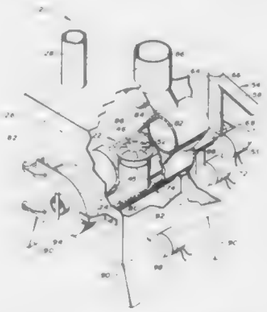
(b) a pair of pivotal spring loaded extending arms with a connecting strut in between forming a "U" shape, having the pivoted end mounted on said bases at the center of the equipment for rotation from one side of the equipment to the other under the influence of the pivoted spring, said arms further having compression springs integrally affixed therein, with the extension providing the increase in length to clear the electronic equipment when rotating thereover;
(c) a cover of resilient material having sides, a front, a rear, and a top, with said rear attached to said connecting strut and said front disposed between said floor bases on the ends opposite the center defining a protective enclosure for the electronic equipment, said cover of a size to completely envelope the equipment when said connecting strut is extended on the rear and the front of the cover opposed between the bases, having the ability to fold into a series of pleats when the arms are rotated in the spring loaded position with the strut contiguous with the base distended ends;
(d) electrically actuated containment and escapement means interfacing with said arms such that the arms are mechanically locked into place when rotated in the retracted and spring loaded position, and are released when electrically actuated by an electrical circuit thus allowing the cover to be folded and stored in a retracted position and completely extended, thereby enclosing the electronic equipment upon energization of the electric circuit of the containment and escapement means; and,
(e) manual containment and escapement means integral with the electrically actuated means having a pair of levers one mechanically linked onto each extending arm such that either lever may be manually moved releasing the arm from its contained position allowing the arm to pivotally rotate under spring influence enclosing the electronic equipment with said cover.

4,856,437
SECURITY ENCLOSURE FOR TRANSACTION MACHINE
A. William Trucksess, 451 Creek Rd., R.D. #2, Moorestown, N.J. 08057
Continuation-in-part of Ser. No. 724,461, Apr. 18, 1985, Pat. No. 4,696,239. This application Jun. 2, 1987, Ser. No. 57,251
The portion of the term of this patent subsequent to Sep. 29, 2004, has been disclaimed.
Int. Cl.[4] G07G *5/00*
U.S. Cl. 109—24.1 **14 Claims**



1. Security apparatus for a transaction-processing machine that has an operating interface on one surface and a service-access interface on another surface, comprising:
(i) a walled enclosure having a window in one of its walls,
(ii) means for mounting said transaction-processing machine within said enclosure in a normal-operating position where said operating interface is located adjacent said window and said service-access interface is located adjacent a second wall of said enclosure, said means for mounting comprising:
(a) means for turning said machine about a vertical axis to a position where said service-access interface is transversely disposed relative to said second wall and is accessible for entry from inside said enclosure,
(b) means for causing said vertical axis to move with respect to said enclosure when said machine is turned about said vertical axis, and
(c) a movable carrier for said machine, a base, and means for supporting said carrier on said base for turning movement thereon,
(d) said means for turning comprising a rotatable jackscrew mounted on said base, a traveling nut on said jackscrew that moves along the length of said jackscrew when the jackscrew is rotated, and coupling means between said traveling nut and said carrier for transmitting carrier-turning force from said traveling nut to said carrier, said coupling means comprising a pivot joint that is constructed to allow said carrier to turn about said vertical axis and a pin and slot connection that is constructed to allow said vertical axis to move with respect to said enclosure as said traveling nut is moved along the jackscrew.

4,856,438
FURNACE
Dean Peugh, 5156 Harlan Dr., Klamath Falls, Oreg. 97603
Filed Mar. 14, 1988, Ser. No. 167,554
Int. Cl.[4] F23B *7/00*
U.S. Cl. 110—233 **15 Claims**



1. A furnace for burning combustible pelletized or particulate fuel, comprising:
(a) an upright, elongated burner defining a receptacle wherein said fuel is burnt, said burner having a lower bottom end and an open upper end, said burner having a fuel receiving opening near said lower bottom end, said burner having at least one tuyere formed therein, said tuyere being positioned substantially below said upper end, said burner having a perforated baffle positioned upon and partially closing said upper end for substantially retaining said fuel within said burner, said perforated baffle having means allowing ash, heat, exhaust, and combustible gases to escape from within said burner while reflecting heat back into said burner thereby increasing the combustion temperature in said burner, and causing expelled ash to fall away from said burner;
(b) fuel conveying means for delivering metered quantities of said fuel from a fuel supply storage bin into said burner through said fuel receiving opening, said burner having a fuel baffle located near said bottom end forcing said fuel being delivered to said burner upwardly into a combustion zone;
(c) air supplying means having an air supply manifold extending at least partially about the periphery of said burner to partially enclose said tuyere, said air supplying means producing a combustion air plenum within said air supply manifold such that air is forced through said tuyere

into said burner to induce combustion within said burner; and

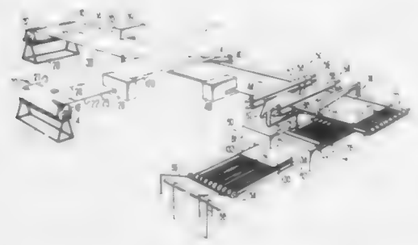
(d) a primary combustion chamber, said burner being enclosed within said primary combustion chamber.

4,856,439

APPARATUS FOR MANUFACTURING PILLOWCASES

Darrell D. O'Neal, 2081 Merle Dr., Conyers, Ga. 30207, and Parks C. Stewart, 1005 Winding Creek Trail, Atlanta, Ga. 30329

Filed Aug. 18, 1988, Ser. No. 233,466
Int. Cl.[4] D05B *13/00*
U.S. Cl. 112—10 8 Claims



1. An apparatus for constructing a pillowcase or the like, comprising:

means for conveying an upper layer of fabric having obverse and reverse surfaces and being of indeterminate length along a first predetermined path with its obverse surface facing upwardly, and for conveying a lower layer of fabric having obverse and reverse surfaces and being of indeterminate length along a second predetermined path with its obverse surface facing upwardly;

means for forming a first cuff along a first lateral edge of said upper layer of fabric;

means disposed along said first predetermined path for stitching said first cuff to said first lateral edge of said upper layer of fabric;

means for forming a second cuff along a first lateral edge of said lower layer of fabric;

means disposed along said second predetermined path for stitching said second cuff to said first lateral edge of said lower layer of fabric;

means for reversing said upper layer of fabric so that its obverse surface faces downwardly and for bringing said upper and lower layers of fabric together with their obverse sides mutually facing and their first cuffed lateral edges mutually corresponding;

means for conveying said mutually facing upper and lower layers of fabric together along a third predetermined path;

means disposed along said third predetermined path for stitching said upper and lower layers of fabric together along the second lateral edges of said layers of fabric opposite said first cuffed lateral edges;

means for measuring said indeterminate length upper and lower layers of fabric to a predetermined length substantially equal to the desired width of a finished pillowcase;

means for cutting said upper and lower layers of fabric perpendicular to said first and second lateral edges at said predetermined length to form a rectangular unitary workpiece comprising upper and lower panels of fabric having obverse surfaces in mutually facing superposition, said panels being stitched together along one transverse edge and cuffed at their opposite transverse edge, and the remaining two edges of said rectangular unitary workpiece comprising longitudinal edges;

means for conveying said rectangular unitary workpiece along a fourth predetermined path parallel to said longitudinal edges of said rectangular unitary workpiece; and

means disposed along said fourth predetermined path for stitching said upper and lower panels of said rectangular unitary workpiece together along said longitudinal edges of said rectangular unitary workpiece, whereby said rectangular unitary workpiece is stitched together along both longitudinal edges and one transverse edge and is open at the opposite cuffed transverse edge.

4,856,440

LINKING MACHINE

Denis Matthews, Sutton-in-Ashfield, England, assignor to Mathbirk Limited, Sutton-in-Ashfield, England

Filed Aug. 10, 1988, Ser. No. 230,599
Int. Cl.[4] D05B *7/00*
U.S. Cl. 112—27 14 Claims



1. A fabric feed-on apparatus for a linking machine having a rotatable dial of points, the device including a fabric push-on device mounted on the linking machine adjacent to said points for meshing with said points and operable to push fabric onto and down the shanks of the points during rotation of the dial of points, and a fabric uncurling device movably mounted on the linking machine for movement between an operative position and an inoperative position, the uncurling device in said operative position being located adjacent to and upstream with relation to the movement of the rotatable dial of the push-on device so as to be able to guide and uncurl fabric edges to the push-on device during rotation of the dial of points to thereby cause the fabric edges to be impaled on the points, the uncurling device in said inoperative position being located at a remote stowed location so as to provide clear access to the dial of points.

4,856,441

PILE YARN FEEDING DEVICE IN TUFTING MACHINE

Yoshiharu Kurata, Anou, Japan, assignor to Nakagawa Seisakusho Co., Ltd., Mie, Japan

Filed Feb. 8, 1988, Ser. No. 153,153
Claims priority, application Japan, Feb. 16, 1987, 62-32881
Int. Cl.[4] D05C *15/18*
U.S. Cl. 112—80.73 2 Claims

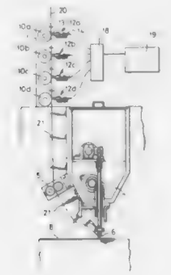
1. A pile yarn feeding device in a tufting machine comprising:

(a) a plurality of driving rollers in a vertical bank each driven at a different speed,

(b) pulling rollers for moving a plurality of horizontally spaced strands of pile yarn tangentially past said driving rollers,

(c) a vertical bank of a plurality of horizontally spaced individual pressure rollers independent of the pulling rollers positioned adjacent each strand of pile and each driving roller, the center of each pressure roller being slightly offset vertically from the center of each pressure roller to which it is adjacent, and

(d) projectable means mounting each pressure roller to move each pressure roller toward a driving roller to engage a pile strand between a pressure roller and a driving roller at an area slightly above the point of tangency of said strand and said driving roller to move the strand at a speed commensurate with the surface speed of a driving roller,



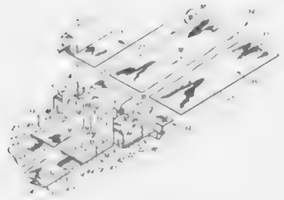
(e) said pressure rollers being advanced and retracted upon reception of a signal from a pattern control device.

4,856,442

FITTED SHEET HEMMER

Charles E. Brocklehurst, Fountain Inn, S.C., assignor to Sew Simple Systems, Inc., Fountain Inn, S.C.

Continuation-in-part of Ser. No. 248,790, Sep. 28, 1988, which is a division of Ser. No. 111,915, Oct. 21, 1987, Pat. No. 4,773,341.
This application Oct. 20, 1988, Ser. No. 260,381
Int. Cl.[4] D05B *35/02*
U.S. Cl. 112—147 2 Claims



1. In a hemming apparatus in which flexible segments of sheet material are advanced along their lengths in series along a processing path, folded and sewn, the improvement therein of a folder for folding the segments of the sheet material as the segments are moved in series along the processing path, said folder comprising:

U-turn guide means for moving the central body portion of the segment through a U-turn;

first beveled turning means adjacent opposite sides of said U-turn guide means for turning each of the opposite end edges of the segment through a right angle turn inwardly onto the adjacent portion of the central body portion of the segment as the central body portion approaches the U-turn,

second beveled turning means adjacent opposite sides of said U-turn guide means for turning each of the opposite end edges of the segment through a second right-- angle- turn into overlying relationship with respect to the adjacent portion of the central body portion as the central body portion approaches the U-turn, and

side folder belts movable through each of said first and second beveled turning means at opposite sides of the U-turn guide to carry the opposite end edges of the segments about the first and second beveled turning means.

4,856,443

NEEDLE THREAD TENSIONING DEVICE FOR A SWING MACHINE

Masao Ogawa, Nagoya; Noboru Ito, Oogaki, and Yukio Yamamura, Nagoya, all of Japan, assignors to Okamura & Co., Osaka, Japan

Filed May 13, 1988, Ser. No. 193,553
Claims priority, application Japan, May 15, 1987, 62-119897; May 15, 1987, 62-119898
Int. Cl.[4] D05B *49/00, 57/00, 47/00*
U.S. Cl. 112—241 8 Claims



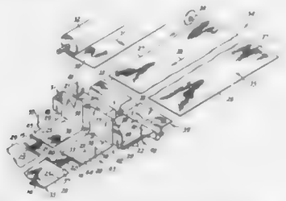


1. A thread checking device in combination with a sewing machine having an endwise reciprocatory needle with an eye; a bobbin with a bobbin thread; a rotating looptaker comprising a bobbin case which contains said bobbin and is restrained not to rotate by a rotation stopping member, a looptaker which is rotated to seize and enlarge a needle thread loop formed at the eye of the needle; and a thread take-up member movable between a minimum thread slack position and a maximum thread take-up position and being provided with a thread guide for holding a needle thread;

said thread checking device comprising:

thread suspending means which is provided with a thread suspending part disposed near a specified position where said thread guide of said thread take-up member is located when said needle thread loop passes between said rotation stopping member and said bobbin case, and means for maintaining said thread suspending part to be out of engagement with said needle thread when said thread take-up member is in said maximum thread take-up position and for permitting said thread suspension part to engage said needle thread during movement of the thread take-up member from said maximum thread slack position, whereby proper tension is extended on the thread loop formed at the eye of the needle during sewing machine operation.

4,856,444
FITTED SHEET HOLDER
Charles E. Brocklehurst, Fountain Inn, S.C., assignor to Sew Simple Systems, Inc., Fountain Inn, S.C.
Division of Ser. No. 111,915, Oct. 21, 1987, Pat. No. 4,773,341.
This application Sep. 23, 1988, Ser. No. 248,790
Int. Cl.[4] D05B 97/00
U.S. Cl. 112—262.3 12 Claims



1. A method of continuously forming fitted bedsheets and the like comprising:
advancing sheet material along its length from a supply,
cutting across the length of the sheet material at a cutting station to form the sheet material in segments with cut edge portions at opposite ends,
advancing the segments of sheet material in spaced series in a direction parallel to the cut edge portions, and as the segments are advanced parallel to their cut edge portions,
continuously attaching an elastic band to the cut edge portions of the segments,
progressively folding the cut edge portions into overlying relationship with adjacent intermediate portions of the segment to form head and foot skirts at the ends of the segment, and
attaching the head and foot skirts to the intermediate side portions of the segments with a line of connection extending at an angle across each corner of the skirts.

8. A method of continuously forming fitted bedsheets and the like with a main body portion that covers the top surface of a bed mattress and head, foot and side skirts that extend generally at right angles to the main body portion and fit about the perimeter of the mattress comprising:
advancing sheet material along its length from a supply,
cutting across the length of the sheet material at a cutting station to form the sheet material in segments with cut edge portions at opposite ends,
advancing the segments of sheet material in spaced series in a direction parallel to the cut edge portions, and as the segments are advanced parallel to their cut edge portions,
attaching elastic band material along the cut edge portions of the segments with the band material spanning the spaces between the segments,
folding the cut edge portions and the elastic band material at each corner of the segments in overlying relationship with adjacent side portions of the segments, and
attaching the cut edge portions of the segments to the adjacent side portions of the segments at the corners of the segments with lines of connection that form the perimeters of the segments into head, foot and side skirts for extending about the perimeter of a bed mattress.

10. A method of continuously forming fitted bedsheets and the like with a main body portion that covers the top surface of a bed mattress and head, foot and side skirts that fit about the perimeter of the mattress comprising:
advancing substantially rectangular segments of sheet material in spaced series in a direction parallel to their opposite side edge portions, and as the segments are advanced parallel to their side edge portions,
attaching an elastic band to the side edge portions of the segments with the bands spanning the spaces between the segments,
folding the side edge portions into overlying relationship with adjacent intermediate portions of the segment to form head and foot skirts at the ends of the segment, and
attaching the head and foot skirts to the intermediate side portions of the segments with lines of connection that form the perimeters of the segments into head, foot and side skirts that extend generally at right angles to the main body portion of the segment.

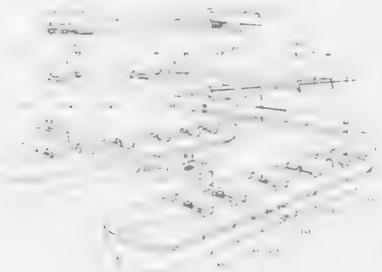
12. A method of continuously forming fitted bedsheets and the like each with a main body portion that covers the upper surface of a bed mattress and head, foot and side skirts that fit about the perimeter of a mattress comprising:
advancing sheet material along its length parallel to its side edges from a supply,
cutting across the length of the sheet material at a cutting station to form the sheet material in segments with cut edge portions at opposite ends,
advancing the segments of sheet material in spaced series in a direction parallel to the cut edge portions, and as the segments are advanced parallel to their cut edge portions,
attaching elastic band material to the cut edge portions of the segments,
folding the cut edge portions into overlying relationship with adjacent portions of the segments to form head and foot skirts at the ends of the segments, and
attaching the head and foot skirts to adjacent portions of the segments at the corners of the segments with lines of connection that form the perimeters of the segments into skirts for extending about the perimeter of a bed mattress.

4,856,445
SAILBOAT CONSTRUCTION
James B. Kiper, 17A Boston St., Coventry, R.I. 02816
Filed Feb. 18, 1988, Ser. No. 158,281
Int. Cl.[4] B63B 1/00, 9/00
U.S. Cl. 114—39.1 8 Claims



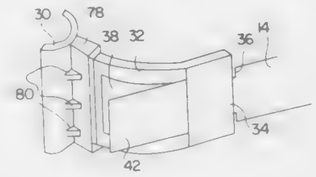
1. A sailboat construction comprising a hull having a longitudinal center line, spar means on said hull, and sail means supported by said spar means, said sail means including at least one sail and being operative in response to wind movement for propelling said hull in a forward direction, said hull including first, second and third lateral resistance means, each of said lateral resistance means normally extending into the water and each being operative for substantially preventing lateral movement of said hull in both port and starboard direction, said first and third lateral resistance means being substantially parallel to said hull centerline and being spaced outwardly on opposite sides thereof, the theoretical center of lateral resistance of each of said first and third resistance means being disposed forward of the theoretical center of the sail area of said sail means when said sail means is substantially perpendicular to the longitudinal centerline of said hull, said second resistance means being substantially aligned with the longitudinal centerline of said hull, the theoretical center of resistance of said second resistance means being disposed aft of the theoretical center of the sail area of said sail means when said sail means is substantially aligned with the longitudinal centerline of said hull.

4,856,446
COLLAPSIBLE FISHING AND/OR LEISURE BOAT
Yves Herard, 2, place de la mairie, F-81380 Lescure, France
Filed Feb. 17, 1988, Ser. No. 156,625
Claims priority, application France, Feb. 18, 1987, 87 02354
Int. Cl.[4] B63B 7/00
U.S. Cl. 114—61 4 Claims



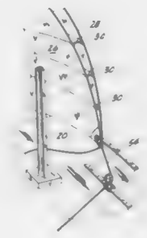
1. A knockdown catamaran comprising
(a) two identical floats, each having a horizontal float length extending parallel to a direction of forward travel of the catamaran; a horizontal float width extending perpendicularly to the float length; an upper horizontal float surface; a plurality of rectangular float recesses provided in the float surface along said float width; said float recesses being spaced form one another parallel to said float length; each said float recess having a length parallel to said float width and a width parallel to said float length;
(b) a threaded bolt being affixed to each float in each said float recess and extending substantially perpendicularly to said float surface;
(c) a plurality of identical planks each having a plank length, a plank thickness, two opposite ends, a top surface, a bottom surface and two rectangular plank recesses provided in said bottom surface at each said end and each having a depth less than the plank thickness; said two plank recesses at each end being spaced in a direction perpendicular to said plank length to define therebetween a narrowed plank portion having a thickness equalling said depth; and a throughgoing hole provided in each said narrowed plank portion; the narrow plank portion at one end of each said plank readily removably fitting into a separate one of said float recesses of one of said floats and the narrow plank portion at the other end of each said plank readily removably fitting into a separate one of said float recesses of the other of said floats; said planks, when received by respective said float recesses, forming a continuous deck and rigidly connecting said two floats with one another by the fit between respective said float recesses and respective narrowed plank portions; and
(d) a manually turnable nut threadable on each said threaded bolt projecting into a respective said hole of said plank when fitted into respective said float recesses, whereby said planks are tightenable to and readily removable from said floats.

4,856,447
FLEX WING APPARATUS
Jeffrey J. Magnan, San Clemente, Calif., assignor to Gaastra Sails International Limited, Hong Kong
Continuation-in-part of Ser. No. 594,476, Mar. 28, 1984, Pat. No. 4,686,921, and Ser. No. 647,549, Sep. 5, 1984, Pat. No. 4,708,079. This application May 8, 1987, Ser. No. 47,089
Int. Cl.[4] B63H 9/06
U.S. Cl. 114—103 29 Claims



1. A flex wing comprising a mast, a sail of flexible material having a leading edge and a trailing edge and a luff sleeve at its leading edge, the sail being mounted on the mast by means of the luff sleeve enclosing the mast; a plurality of resilient battens, and means on the sail for carrying the battens with the battens extending towards the leading edge of the sail; coupling means for coupling the battens to the mast for pivotal movement of the battens about the mast, the coupling means including a plurality of couplings of which each coupling comprises a collar for engaging and at least partially surrounding the mast, and a leg extending therefrom for connection to a respective batten end; each coupling allowing pivotal movement between the collar and the end of a batten connected to said leg thereof such that said batten end can move laterally with respect to the mast to align itself with the leeward side of the luff sleeve on either tack.

4,856,448
HARMONICA SAIL
R. Allan Peyman, P.O. Box 36, East Alton, Ill.
Filed Apr. 11, 1988, Ser. No. 179,742
Int. Cl.[4] B63H 9/06
U.S. Cl. 114—103 17 Claims



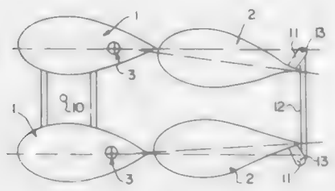
1. A sail for a boat comprising:
a first panel having a predetermined draft therein;
a second panel having a predetermined draft therein; and
a plurality of baffles extending between the first and second panels, the baffles comprising a plurality of elevationally spaced, generally horizontal webs extending substantially from the luff edges to the leech edges of the panels, the first and second panels being open at the luff and leech edges to allow wind to pass therebetween so that the first and second panels can assume their respective predetermined draft shapes.

4,856,449

WINGSAIL STALLING

John G. Walker, Tipwell House, St. Mellion, Cornwall, United Kingdom (PL12 8RS)

Continuation-in-part of Ser. No. 5,167, Jan. 2, 1987, Pat. No. 4,770,113. This application Jul. 22, 1988, Ser. No. 222,824
Claims priority, application United Kingdom, May 2, 1985, 8511232; May 2, 1985, 8511233; May 2, 1985, 8511234; May 2, 1985, 8511235; Feb. 12, 1988, 8803265
Int. Cl.[4] B63H 9/04
U.S. Cl. 114—103 12 Claims



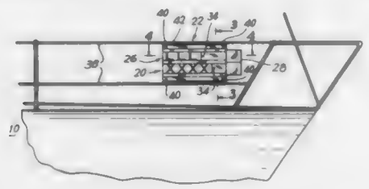
1. A wingsail arrangement comprising a plurality of thrust wings each of which comprises an upright leading airfoil having a leading edge and a trailing edge and an upright trailing airfoil having a leading edge and a trailing edge the leading edge of the trailing airfoil being positioned closely behind the trailing edge of the leading airfoil and means for mounting the trailing airfoil for pivoting movement about an upright axis relative to the first airfoil from an aligned position in which the trailing airfoil is aligned coplanar with the leading airfoil to positions to each side of an angularly displaced from the aligned position, and means for maintaining a lesser distance between the trailing edges of at least a pair of trailing airfoils of said plurality of thrust wings than between the leading edges of said pair.

4,856,450

ANCHORING METHOD AND DISPLAY APPARATUS FOR USE THEREIN

Douglas H. Lubahn, 317 W. 77th St., Apartment 2-F, New York, N.Y. 10024

Filed May 13, 1988, Ser. No. 193,856
Int. Cl.[4] B63B 21/00
U.S. Cl. 114—293 15 Claims



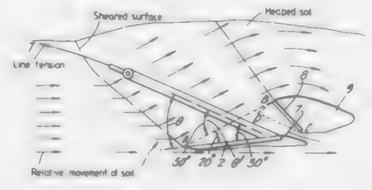
1. A method for insuring safe anchorage, comprising:
anchoring a boat;
measuring the length of the anchor rode for the anchored boat; and
displaying on an exterior portion of said anchored boat, in a location visible to incoming vessels at a distance from and abeam of the anchored boat, indicia relating to the scope ratio for said anchored boat and displayed so as to be readable from said incoming vessels for use in safe anchoring of said incoming vessels.

4,856,451

FLUKED BURIAL DEVICES

Peter Bruce, Onchan, United Kingdom, assignor to Brupat Limited, Onchan, United Kingdom

Continuation-in-part of Ser. No. 822,308, Dec. 31, 1985, abandoned. This application Nov. 20, 1987, Ser. No. 123,911
Claims priority, application United Kingdom, May 5, 1984, 8411595; Feb. 20, 1985, 8504402
Int. Cl.[4] B63B 21/26, 21/32, 21/40
U.S. Cl. 114—301 22 Claims



1. A fluke burial device, particularly an anchor having a burial fluke member orientated to provide a positive burial angle for digging into a bed of soil when the burial device is in the vertical working burial attitude, a cable attachment member attached to said fluke member, soil barrier means located substantially above the burial fluke member when the burial device is in said vertical working burial attitude such that a straight line from a foremost extremity of the fluke member to an upper edge of the soil barrier means lies in the range 8° to 24° to the upper surface of the fluke member, the major portion of the soil barrier means lying within the lateral extent of the fluke member, and the major portion of the soil barrier means also being located aft of the rear edge of the burial fluke member such that the rear of the soil barrier means has a horizontal separation from the rear of the burial fluke member not more than half the overall longitudinal length of the fluke member, said soil barrier surface having an area less than the upper surface area of the fluke member, and passage means associated with said soil barrier means to permit escape of non-cohesive soil passing over the fluke member.

4,856,452

EXTENDIBLE STERN LIGHT ASSEMBLY

Robert L. Pingel, P.O. Box 45, Oakland, Ark. 72611, and Matthias A. Pingel, 9837 Teason Ferry Rd., St. Louis, Mo. 63123

Filed Jan. 19, 1988, Ser. No. 145,555
Int. Cl.[4] B63B 45/06
U.S. Cl. 114—364 15 Claims



10. A stern light assembly adaptable for being positioned within a stern light mounting fixture on a boat, said mounting fixture including electrical connections for connecting to the stern light assembly positioned therewithin, said stern light assembly comprising a collapsible support structure, said collapsible support structure including a plurality of elongated

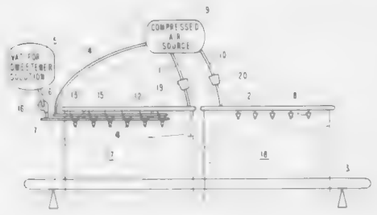
tubular members telescopically fitted one within another, said support structure adapted to be moved between a first collapsed condition wherein all of said tubular members are telescoped one within the other and a second extended condition wherein each member extends from said adjacent members, a lamp unit mounted to one end of one of said tubular members, said lamp unit having electrical connections thereto, means at the opposite end of another of said tubular members for mounting said assembly within the stern light mounting fixture associated with said boat, said mounting means including a tubular power fitting member having electrical connections thereto, and means for connecting the electrical connections of said lamp unit to the electrical connections of said power fitting member, said power fitting member being cooperatively engageable with said mounting fixture such that the electrical connections of said power fitting member make electrical contact with the electrical connections of said mounting fixture.

4,856,453

METHOD AND APPARATUS FOR SPRAYING SNOW-LIKE FROSTING ONTO FOOD STUFF PARTICLES

Marsha K. Verrico, Fair Lawn, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Continuation of Ser. No. 885,689, Jul. 15, 1986, abandoned, which is a division of Ser. No. 710,400, Mar. 11, 1985, Pat. No. 4,702,925. This application Nov. 6, 1987, Ser. No. 119,257
Int. Cl.[4] B05C 5/00
U.S. Cl. 118—24 8 Claims



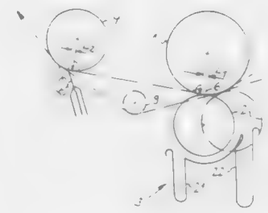
1. An apparatus for applying a crystalline frosting on foodstuffs, including a first section and a second section and further comprising:
means for conveying a plurality of foodstuff units through said apparatus; a plurality of spray guns mounted in said first section and adapted to atomize and spray a sweetener solution to form crystalline particles;
a plurality of air flow amplifiers mounted in said second section;
a liquid feed systems adapted to continuously supply a sweetener solution to said plurality of spray guns; and
a compressed air supply system for supplying food grade clean compressed air to said plurality of spray guns and said air flow amplifiers via manifolds and step down lines, at pressures such that compressed air is provided to said spray guns such that said spray guns atomize and spray said sweetener solution onto said foodstuff units to form crystalline sweetener particles thereon, and compressed air is provided to said air flow amplifiers at pressures such that said air flow amplifiers direct a mixture of compressed air and atmospheric air onto the sprayed foodstuff units to dry the sprayed crystalline sweetener particles, wherein said manifolds and step down lines are adapted to provide compressed air to said spray guns at pressures between about 30 and about 75 psig and to said air flow amplifiers at pressures between about 20 and about 40 psig.

4,856,454

APPLICATOR MECHANISM FOR COATING RUNNING WEBS

Ralf Sieberth, Appleton, Wis., and Hans-Peter Sollinger, Heidenheim, Fed. Rep. of Germany, assignors to J.M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Apr. 28, 1988, Ser. No. 187,265
Claims priority, application Fed. Rep. of Germany, May 8, 1987, 3715307
Int. Cl.[4] B05C 11/02
U.S. Cl. 118—126 4 Claims



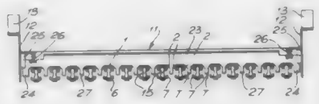
1. Applicator mechanism for the coating of running webs comprising:
a rough dosing device having a first opposed roll from which the web departs at a departure point, and having an application point;
a finish dosing device having a second opposed roll onto which the web runs at a run-on point, and having a blade element cooperating with the second opposed roll to define a finish dosing point;
said rough dosing device having a distance L_1, defined from the application point to the departure point;
said finish dosing device having a distance L_2 defined from the run-on point to the finish dosing point;
wherein the condition applies that $L_{1,2} \leqq 0.12\ D_{1,2}$, where $L_{1,2}$ are measured each in the direction of web run and $D_{1,2}$ are the diameters of the first and second opposed rolls, respectively; and
a reversing roll engaging said web to form a sharp reversal point, at which the course of said web curves heavily
while otherwise curving unnoticeably, said reversing roll having a maximum diameter of 300 mm, the course of said web curving at said reversing roll at an arcuate angle of reversal between 25° and 60°.

4,856,455

APPARATUS FOR HOLDING ELECTRICAL OR ELECTRONIC COMPONENTS DURING THE APPLICATION OF SOLDER

Sim A. Tee, Singapore, Singapore, assignor to Sun Industrial Coatings Private Ltd., Jalan Senang, Singapore

Continuation of Ser. No. 760,585, Jul. 30, 1985, Pat. No. 4,677,937. This application Apr. 28, 1987, Ser. No. 43,310
Claims priority, application United Kingdom, Jul. 30, 1984, 8419420
The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.
Int. Cl.[4] B05D 5/12
U.S. Cl. 118—500 39 Claims



1. A portable carrier for a plurality of electrical or electronic

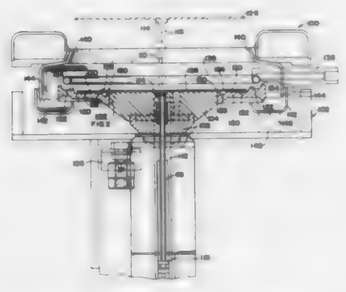
components, comprising a frame in which is provided a plurality of parallel tracks for receiving the components, the tracks being formed by a plurality of parallel, laterally spaced, axially extending upper support members each of which defines a pair of parallel, axially extending upper rails having downwardly facing portions, and by a plurality of parallel, laterally spaced, axially extending lower support members aligned with the upper support members, each of the lower support members being an elongate channel member of generally U-shaped cross section so as to define a pair of parallel, axially extending lower rails having upwardly facing portions whereby each track is defined by four rails and is situated between two adjacent upper support members and their aligned lower support members.

4,856,456

APPARATUS AND METHOD FOR THE FLUID TREATMENT OF A WORKPIECE

Gary Hillman, Livingston; Richard H. Rubin, Fairfield, and Bernard H. Paulfus, West Milford, all of N.J., assignors to Machine Technology, Inc., Parsippany, N.J.

Filed Oct. 3, 1988, Ser. No. 252,762
Int. Cl.[4] B05C *11/14*
U.S. Cl. 118—500 **30 Claims**



1. An apparatus for the fluid treatment of a workpiece, said apparatus comprising

mounting means for mounting a workpiece thereto, fluid supplying means for supplying a fluid for treating the surface of said workpiece, and

forming means for forming a gas pocket between a portion of said mounting means and a portion of said workpiece upon supplying said fluid to said workpiece from said fluid supplying means, whereby said gas pocket prevents contact of said fluid with said portion of said mounting means and said portion of said workpiece.

4,856,457

CLUSTER SOURCE FOR NONVOLATILE SPECIES, HAVING INDEPENDENT TEMPERATURE CONTROL

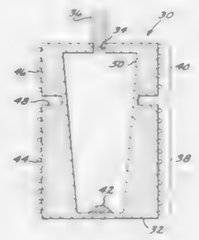
Wolfgang Knauer, Malibu, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 20, 1987, Ser. No. 17,389
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—666 **16 Claims**

1. A cluster source for nonvolatile species, comprising:

crucible means for evaporating atoms of the species;

cluster formation means for heterogeneously nucleating and growing clusters of the evaporated species, wherein at least a portion of said cluster formation means is constructed of a material which is not wet by the selected species, said cluster formation means being located adjacent to said crucible means so that atoms evaporated from said crucible means enter said cluster formation means;



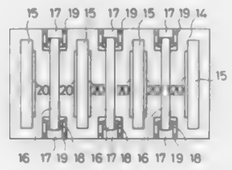
temperature controls means for maintaining the temperature of said cluster formation means at a lower temperature than said crucible means.

4,856,458

PHOTO CVD APPARATUS HAVING NO ULTRAVIOLET LIGHT WINDOW

Shunpei Yamazaki, Tokyo, and Toshiji Hamatani, Atsugi, both of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed May 26, 1987, Ser. No. 53,726
Claims priority, application Japan, May 27, 1986, 61-122859; May 27, 1986, 61-122860
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—722 **9 Claims**



1. A photo-CVD apparatus comprising:

a reaction chamber in which an optical reaction space is defined;

a gas feeding system for introducing a reactive gas into said reaction chamber;

a lamp provided with a central light emitting portion and an electrode at each end for emitting light rays to said reaction space; and

a cooling system surrounding the ends of said lamp so that the central light-emitting portion of said lamp is exposed to said reaction chamber to directly illuminate the reaction chamber while the ends of said lamp are cooled by said cooling system.

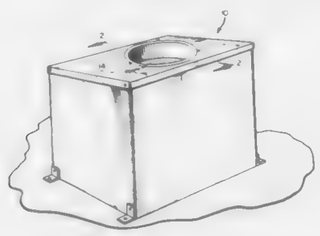
4,856,459

HEATER AND THERMOSTAT ARRANGEMENT FOR ANIMAL WATERERS

Leland G. Wiseman, Conrad, and Daryl J. Hertema, Beaman, both of Iowa, assignors to Ritchie Industries, Inc., Conrad, Iowa

Filed Aug. 3, 1987, Ser. No. 81,285
Int. Cl.[4] A01K *7/00*
U.S. Cl. 119—73 **7 Claims**

1. A livestock waterer, comprising, in combination, a trough for holding water, the trough being at least partly defined by a heat-conductive wall, the wall having an inner side for containing the water and an opposite outer side, an electric heater adjacent to the wall outer side for providing heat through the wall to the water, a thermostat having electric contacts electrically connected to the heater for controlling the electric power supplied to the heater and consequently controlling the amount of heat supplied by the heater to the water, the thermostat further including a bimetallic strip element in thermal contact with and adjacent the trough wall so as to change its shape in response to the wall temperature, and plug means



interposed between the bimetallic strip element and an electric contact so as to cause the contacts to move into and out of electrically conductive contact with each other in response to the temperature of the wall and bimetallic strip, the waterer further including a bracket mounted to the wall outer side and engaging the thermostat so as to locate the thermostat bimetallic strip element adjacent to the wall outer side at any one of a range of positions varying in distance from the heater.

4,856,460

FLUIDIZED BED COMBUSTION

Edwin Wied, Alsting, France, and Josef Glezerman, Frankfurt, Fed. Rep. of Germany, assignors to Inter Power Technologie, Fed. Rep. of Germany

Continuation of Ser. No. 108,535, Oct. 15, 1987, abandoned. This application Nov. 2, 1988, Ser. No. 268,622
Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3715516
Int. Cl.[4] F22B *1/00*
U.S. Cl. 122—4 D **4 Claims**



1. A fluidized bed combustion with a tuyère bottom for the admission of combustion and carrier ari, as well as a fuel feed entering a combustion chamber from below, with devices for the separation of solid particles borne by fluid gases and for their feedback into the fluidized bed, comprising:

a deflection device with a separation chamber placed above the fluidized bed, within a flue gas current, the total deflection of the gases being approximately 360° C., wherein the fluid device has been configured with a first flow cross-section and with a second cross-section, wherein further the first flow cross-section has been placed at an angle of greater than 45 in relation to an incoming flue gas current and the second cross-section is essentially orthogonal to the first flow cross-section, wherein an output of the first flow cross-section and an input of the second flow cross-section are connected via the separation chamber wherein the first and second flow cross-sections are both subdivided into subchannels arranged parallel to a flow direction and wherein the subchannel of the first flow cross-section and the subchannel of the second flow cross-section are configured next to one another in an alternating manner, wherein the deflection of the flue gas flow within the sepration chamber is approximately 270°;

a fuel feed configured as a fluidized bed channel and placed upstream from the combustion chamber, with its own tuyère bottom;

a feed line providing a mixture of fuel and cooled bed material; and

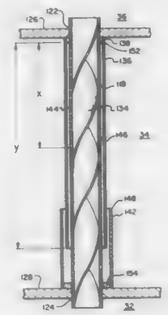
a feedback of the solid particles taking place from the separation chamber into the feed line.

4,856,461

MULTIPLE TUBE STEAM DRYER FOR MOISTURE SEPARATOR REHEATER

James K. Hayes, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 1, 1988, Ser. No. 151,012
Int. Cl.[4] F16T *1/00*; F22B *37/26*
U.S. Cl. 122—488 **15 Claims**



1. A moisture separator comprising:

a wet steam region for containing moisture laden water vapor;

a dry steam region for containing dry water vapor;

an entrance tube fluidly connected to the wet steam region and having an open upper end;

a single helical ribbon extending substantially the full length of the entrance tube, for separating steam flowing through the entrance tube into a substantially liquid stream and a substantially dry vapor stream;

perforations in the upper portion of the entrance tube for extracting the liquid stream from the entrance tube; and

at least one additional tube concentrically disposed outside the entrance tube, for capturing the extracted liquid stream and channeling the extracted stream downward along the exterior of the entrance tube.

4,856,462

CYLINDER BLOCK MADE OF FIBER-REINFORCED LIGHT ALLOY FOR INTERNAL COMBUSTION ENGINE

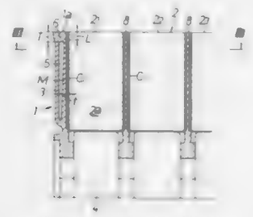
Hideaki Ushio; Tadayoshi Hayashi; Kazuo Shibata; Tsunehisa Hata, and Yoshikazu Fujisawa, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1987, Ser. No. 119,873

Claims priority, application Japan, Nov. 13, 1986, 61-174660[U]; Nov. 13, 1986, 61-174661[U]; Nov. 13, 1986, 61-174662[U]

Int. Cl.[4] F02F *1/10*

U.S. Cl. 123—41.84 9 Claims



1. A cylinder block made of fiber-reinforced light alloy for an internal combustion engine, comprising a cylinder barrel having a fiber-reinforced part formed around a cylinder bore, and a cylinder block outer wall surrounding said cylinder barrel and defining a water jacket between the cylinder barrel and the outer wall, wherein a reinforcing deck part is provided to connect between said cylinder block outer wall and an end portion of said cylinder barrel adjacent a cylinder head joining surface, said reinforcing deck part having a thickness in an axial direction of the cylinder barrel set to be not less than 7% of a piston stroke.

4,856,463

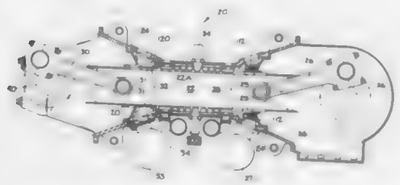
VARIABLE-CYCLE RECIPROCATING INTERNAL COMBUSTION ENGINE

Richard P. Johnston, 3044 Middleboro Rd., Morrow, Ohio 45152

Continuation-in-part of Ser. No. 7,951, Jan. 28, 1987, abandoned. This application Jan. 29, 1988, Ser. No. 148,286

Int. Cl.[4] F02B *25/08*

U.S. Cl. 123—51 BA 24 Claims



1. A variable cycle internal combustion engine comprising:
(a) a block, said block having at least one cylinder chamber disposed therein;
(b) a pair of opposed pistons mounted in said cylinder chamber;
(c) a first rotating crankshaft and a second rotating crankshaft, each crankshaft connected to a different one of said pistons;
(d) means for synchronizing the speed and relative phase relationship of said crankshafts, said synchronizing means connected to at least one of said crankshafts;
(e) a harmonic gear drive assembly for selectively adjusting the rotation phase relationship between said crankshaft during operation of the engine, said harmonic gear drive assembly being connected to said synchronizing means.

4,856,464

AIR DISTRIBUTION APPARATUS FOR USE WITH AN INTERNAL COMBUSTION ENGINE

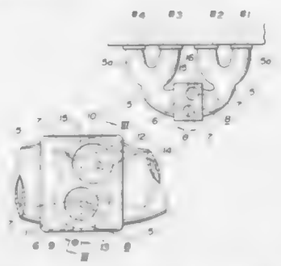
Keiji Hosoi, Hamamatsu, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Oct. 12, 1988, Ser. No. 256,728

Claims priority, application Japan, Oct. 20, 1987, 62-159291

Int. Cl.[4] F02M *35/00*

U.S. Cl. 123—52 M 7 Claims



1. An air-distribution apparatus for use with an internal combustion engine wherein end portions of a plurality of branched air-intake tubes are adapted to be respectively connected to air-intake holes of respective cylinders of a multiple-cylinder engine whose carburetor is connected to a plurality of air-intake ports above an assembly unit installed substantially at the center of said plurality of branched air-intake tubes, and wherein a primary barrel of said carburetor is disposed in alignment with a transverse centerline of said assembly unit and a secondary barrel of said carburetor is disposed in a position wherein it is displaced sidewardly from the centerline in the direction of the fuel nozzles which connect to both barrels.

4,856,465

MULTIDEPENDENT VALVE TIMING OVERLAP CONTROL FOR THE CYLINDERS OF AN INTERNAL COMBUSTION ENGINE

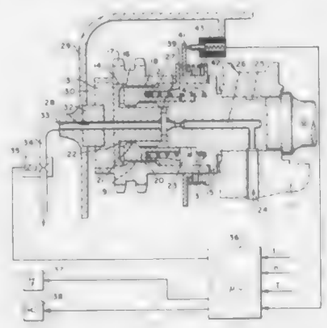
Helmut Denz, Stuttgart, and Martin Person, Oberriexingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 29, 1983, Ser. No. 555,949

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247916

Int. Cl.[4] F01L *1/34*

U.S. Cl. 123—90.17 4 Claims



2. Apparatus for controlling valves of an internal combus-

tion engine, having an engine block through a camshaft having a drive gear which is hydraulically rotable on said camshaft over a predetermined angle, the rotation of said camshaft drive gear relative to said camshaft being controllable in a manner dependent upon engine speed by a hydraulic device within said engine block, which device is in turn controlled by a valve affecting flow of a hydraulic fluid, said engine having at least one of its functions of engine ignition and fuel injection controlled by a computer associated with said engine, said apparatus having the improvement which comprises:

an electromagnetic valve serving as said valve and located outside said engine block in a hydraulic line for control of said hydraulic medium;

rotary feed-through bearing means (31, 32) for connecting said line to said hydraulic device;

means for indicating the position of said hydraulic device and thereby the actual relative angular position of said camshaft and said drive gear, and for producing an electrical signal representative thereof;

means for pulsing said electromagnetic valve at a controllable variable duty cycle for rotating said camshaft relative to said drive gear under control through electrical circuits by said computer, in response to a computation by said computer of a desired position of said hydraulic device in accordance with a predetermined function of engine speed (n) and engine load (t_1) made available to said computer for its control of at least one of said engine functions, comparison of said desired position with a signal produced by said position indicating means, and provision by said computer of a succession of outputs for variation of said duty cycle of pulsing sense appropriate for causing said actual position to approach said desired position, said predetermined function being stored in said computer as a field of function values addressable by corresponding combinations of values of engine speed and engine load.

4,856,466

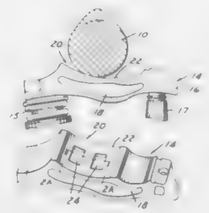
LUBRICANT RETAINING FINGER-FOLLOWER ROCKER ARM

Loi-Lou Ting, Ann Arbor; Granger K. Chui, Dearborn Heights, and Edward T. King, Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 28, 1988, Ser. No. 250,476

Int. Cl.[4] F01L *1/18;* F01M *9/10*

U.S. Cl. 123—90.33 10 Claims



1. A longitudinally extending finger-follower type rocker arm for an automotive type internal combustion engine, the rocker arm consisting of a longitudinally extending body having a solid essentially continuous upper surface from end to end and having means at opposite ends for engagement with a movable valve stem at one end and a stationary lash adjuster type fulcrum at the other end, a central portion of the surface adapted to be contacted by an overhead cam being concave for retaining oil or lubricant directed thereonto and having a plurality of oil containing pockets, and a rotatable overhead cam slidably engaging the central surface portion for pivoting the arm about the end fulcrum upon rotation of the cam.

4,856,467

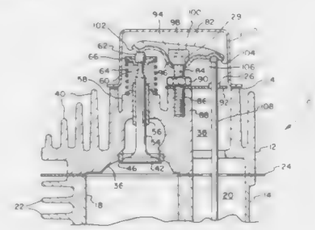
ADJUSTABLE LASH VALVE TRAIN FOR OVERHEAD VALVE ENGINE

Peter G. Kronich, Sheboygan, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed May 20, 1988, Ser. No. 196,722

Int. Cl.[4] F01L *1/22, 1/14*

U.S. Cl. 123—90.43 12 Claims



1. In combination with an overhead valve internal combustion engine having a cylinder head, a valve reciprocally mounted in said cylinder head, and a push rod, an adjustable lash valve train comprising:

a rocker arm disposed for transmitting motion of said push rod to said valve, said rocker arm including a bearing surface;

a rocker arm stud having a threaded shank and an integral head having a top surface, the head having tool-engaging means recessed in the top surface thereof for engaging a tool suitable for rotating said rocker arm stud, the head having an integral bearing surface in engagement with the bearing surface of said rocker arm;

threaded means in said cylinder head for threadedly receiving the threaded shank of said rocker arm stud;

a push rod guide plate disposed on said cylinder head adjacent said rocker arm stud; and

locking means for selectively locking said push rod guide plate against movement with respect to said cylinder head and for locking the threaded shank against rotation with respect to said threaded means in said cylinder head.

4,856,468

BALL-AND-SOCKET JOINT

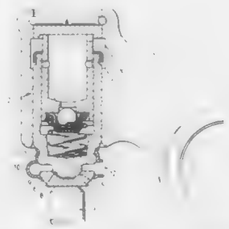
Walter Speil, Ingolstadt; Dieter Schmidt, Nuremberg, and Michael Zipprath, Herzogenaurach, all of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed May 24, 1988, Ser. No. 198,062

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725245

Int. Cl.[4] F01L *1/18, 1/24*

U.S. Cl. 123—90.47 8 Claims



1. A ball-and-socket joint interposed between a rocker arm and a valve shaft of an internal combustion engine including a journal cooperating with the rocker arm and having a crowned

end face which cooperates with a spherical cavity of a joint socket provided at its side opposing the spherical cavity with a plane surface by which it bears against the valve shaft wherein a restraining element is linked to the journal or to a structural element connected to the journal for grasping from behind the circumferential surface of the joint socket thereby securely holding the latter at the journal, characterized in that the restraining element is a spring element (10,19) which bears by elastic prestress against the joint socket (7) thereby holding the crowned end face (5) of the journal (4) in play free contact with the spherical cavity (6).

4,856,469

MECHANICAL PARTS OF VALVE DRIVING MECHANISM FOR INTERNAL COMBUSTION ENGINE

Ken Okazaki; Kazuo Satou, Higashi-Hiroshima, and Junichi Yamamoto, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 22, 1988, Ser. No. 247,639
Claims priority, application Japan, Sep. 25, 1987, 62-240260
Int. Cl.[4] F01L *1/04*
U.S. Cl. 123—90.51 **4 Claims**



1. In a valve driving mechanism of which a rocker arm is provided at one end portion with a roller brought into a rotative contact with a cam surface of a cam for driving engine valves, the improvement comprising the cam consisting of 2.0–4.0 wt % of C, 1.5–3.5 wt % of Si, 0.1–1.0 wt % of Mn, 0.005–0.08 wt % of Mg, less than 0.15 wt % of P, less than 0.15 wt % of S, 0.3–1.0 wt % of Cu, 0.03–0.09 wt % of Mo with the balance of Fe, a matrix of the cam being a granular graphite cast iron having a mixed structure of 30–50 vol % of residual austenite structure and a bainite structure.

4,856,470

ENGINE WORKING MACHINE ASSEMBLY WITH SOUNDPROOF COVER

Akira Ishii, and Ryoichi Ito, both of Osaka, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Nov. 23, 1988, Ser. No. 275,563
Claims priority, application Japan, Dec. 2, 1987, 62-306251
Int. Cl.[4] F02B *77/00*
U.S. Cl. 123—195 C **6 Claims**

1. In an engine working machine assembly with a soundproof cover,

there being provided a vertical shaft type air-cooled engine, a working machine, a cooling fan, a cooling air guide cover for the engine, a cooling air guide cover for the working machine, a fan case and a soundproof cover,

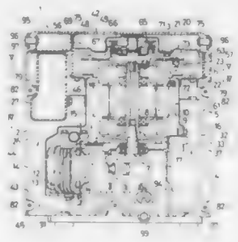
said working machine and said cooling fan being arranged in series in order above said vertical shaft type engine, and these working machine and cooling fan being interlockingly connected to the engine,

the outer peripheries of the cylinder and the cylinder head of said engine being enclosed with said cooling air guide cover for the engine, the outer periphery of the working machine being enclosed with said cooling air guide cover for the working machine, and the outer periphery of the cooling fan being enclosed with said fan case,

the front, back, left and right sides as well as the upper side of a subassembly whose outline being defined by the engine, the cooling air guide cover for the engine, the cooling air guide cover for the working machine and the fan case being enclosed with said soundproof cover,

said cooling air guide covers for the engine and the working machine being fixedly secured to the engine, and said fan case being fixedly secured at its lower wall portion to the cooling air guide cover for the working machine,

the lower space within said soundproof cover being in communication with the outer space outside the soundproof



cover through the inner spaces within the cooling air guide covers for the engine and for the working machine and within the fan case in order,

said soundproof cover comprising an upper side cover section, a front side cover section and a back side cover section,

said upper side cover section being detachably fixed to the fan case at its lower wall portion by means of fixing means,

at least one of said front side cover section and said back side cover section being detachably fixed to the upper side cover section by means of fixing means, and

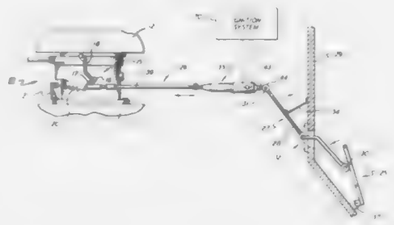
the other cover section being detachably fixed to said one cover section by means of fixing means.

4,856,471

AUTOMATIC ENGINE IGNITION SHUT-OFF DEVICE

Anthony J. Pettinelli, 413 Lawrence St., Rome, N.Y. 13440

Filed Nov. 30, 1987, Ser. No. 126,552
Int. Cl.[4] F02B *77/08*
U.S. Cl. 123—198 DC **14 Claims**



1. Apparatus for connecting the return spring of a throttle linkage to a movable accelerator for immediately shutting down the engine of a motor vehicle when the throttle fails in an open position that includes:

a switch housing attached to an accelerator means such that said switch housing will move with the accelerator means through a range of accelerator positions,

a normally closed switch for shutting down the engine, said switch being mounted in said housing,

a piston slidably mounted within the housing for cycling said switch, said piston being movable between a first normal position and a second switch opening position wherein the engine is shut down,

a member connecting the piston to the return spring in the throttle linkage whereby the return spring holds the piston in the first normal position as the accelerator is moved through its range of positions, and

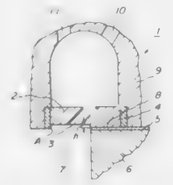
a cut-off spring acting between the housing and the piston, said cut-off spring having less spring strength than the return spring so that the cut-off spring will move the piston into the second switch opening position when the return spring force is removed from the piston.

4,856,472

CYLINDER HEAD WITH CERAMIC PRECOMBUSTION CHAMBER

Akinori Wakasa, Hiroshima; Minoru Machida; Yasuhiro Miyakawa, both of Nagoya, and Seiichi Asami, Okazaki, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed May 26, 1988, Ser. No. 199,160
Claims priority, application Japan, Jun. 2, 1987, 62-85541[U]
Int. Cl.[4] F02B *19/16*
U.S. Cl. 123—270 **3 Claims**



1. A cylinder head with a ceramic precombustion chamber for an internal combustion engine, comprising:

a precombustion chamber insert bore formed in a portion of said cylinder head;

a metal sleeve fitted in said precombustion chamber insert bore; and

a ceramic member fitted in said metal sleeve, said ceramic member having an injection aperture formed therethrough and including a surface adjacent to a main combustion chamber of said internal combustion engine, said surface having a first surface portion in direct communication with said main combustion chamber and a second surface portion isolated from said main combustion chamber by a head gasket and cylinder block of said internal combustion engine, a boundary of said first surface portion of adjoining said metal sleeve being axially inwardly spaced from an end of said metal sleeve adjacent said main combustion chamber, and said second surface portion being axially aligned with said end and in direct contact with said head gasket.

4,856,473

INTERNAL COMBUSTION ENGINE WITH MULTIPLE INTAKE VALVES AND EGR ARRANGEMENT

Taiyo Kawai; Norihisa Nakagawa, and Shin-ichi Sano, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 15, 1988, Ser. No. 232,211
Claims priority, application Japan, Aug. 25, 1987, 62-127988[U]; Dec. 9, 1987, 62-186400[U]
Int. Cl.[4] F02B *31/02*
U.S. Cl. 123—308 **9 Claims**

1. An internal combustion engine comprising:

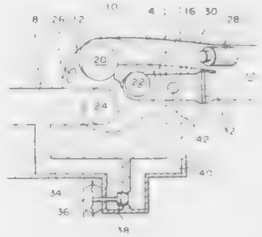
a cylinder block and a cylinder head secured thereto to define cylinders therein, a piston being inserted in each of said cylinders to define a combustion chamber thereabove;

first and second intake passage means for each cylinder in communication with the combustion chamber, said first intake passage means being arranged such that a swirl is generated in the combustion chamber by intake air introduced into the combustion chamber through said first intake passage means;

first and second intake valves arranged in said first and second intake passage means, respectively, and operating in synchronization with said engine;

exhaust passage means in communication with the combustion chamber, with an exhaust valve arranged therein;

fuel supply means for supplying fuel into said first intake passage means;



a flow control valve arranged in said second intake passage means upstream of said second intake valve and operating in response to running conditions of said engine; and

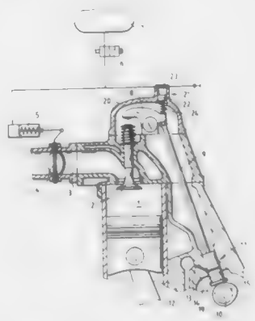
an exhaust gas recirculating means including an exhaust gas recirculating passage and an exhaust gas recirculating control valve arranged therein, said exhaust gas recirculating passage having an inlet at said exhaust passage means and an outlet arranged in said second intake passage means at a position between said second intake valve and said flow control valve.

4,856,474

VALVE CONTROL DEVICE

Siegfried Tisch, Gerlingen, Fed. Rep. of Germany, assignor to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Feb. 23, 1988, Ser. No. 159,270
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 3712020
Int. Cl.[4] F02D *9/06*
U.S. Cl. 123—323 **10 Claims**



1. A valve control device for a cam-shaft controlled exhaust valve of a cylinder of a motor vehicle internal combustion engine with an exhaust cutoff brake wherein an actuator closes a throttle valve in the exhaust of the cylinder to initiate a braking operation, characterized in that a hydraulic valve clearance compensation element is arranged between the cam-

shaft and the exhaust valve whereby an adjusting piston is guided in a cylindrical body and is loaded by a return spring and a control element is provided to retain the adjusting position respectively reached at the beginning of the braking operation wherein the control element acts upon the hydraulic valve clearance compensation element during braking operation with a force which exceeds or at least corresponds to the force of the return spring of the hydraulic valve clearance compensation element and counteracts the latter.

4,856,475

ROTATIONAL FREQUENCY CONTROL APPARATUS OF INTERNAL COMBUSTION ENGINE

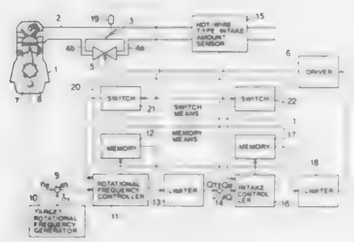
Setsuhiro Shimomura, and Yukinobu Nishimura, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,215

Claims priority, application Japan, Jan. 20, 1987, 62-10773; Feb. 2, 1987, 62-22683

Int. Cl.[4] F02D *41/16*

U.S. Cl. 123—339 **12 Claims**



1. A rotational frequency control apparatus of an internal combustion engine comprising:

rotational frequency adjusting means for generating a target intake amount of the engine on the basis of a respective actual rotational frequency and a target rotational frequency of the internal combustion engine;

intake amount detecting means arranged in an intake route of said engine for sending an electrical output corresponding to an intake amount by detecting said intake amount of said engine;

intake adjusting means for outputting an intake control signal on the basis of an actual intake amount detected by said intake amount detecting means and said target intake amount outputted from said rotational frequency adjusting means;

intake drive and control means for controling an increase and decrease of said intake amount corresponding to said intake control signal sent from said intake adjusting means;

switching means for operating said rotational frequency adjusting means and said intake adjusting means so that said actual rotational frequency coincides with said target rotational frequency while said engine operates under an unloaded operating condition and switches operation modes of both adjusting means so that operations of both adjusting means stop while said engine operates under a loaded operating condition; and

memory means for respectively storing said target intake amount outputted from said rotational frequency adjusting means and said intake control signal outputted from said intake adjusting means under said unloaded operating condition and for holding a final target intake amount and a final intake control signal under said loaded operating condition and also outputting the operating signal to said intake drive and control means based on said final target intake amount or said final intake control signal.

4,856,476

APPARATUS FOR CONTROLLING THROTTLE VALVE

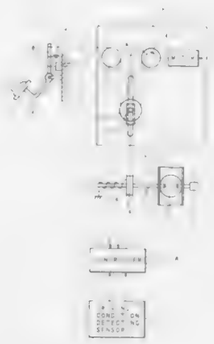
Hiroyuki Shirakawa, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 221,967

Claims priority, application Japan, Jul. 27, 1987, 62-187965

Int. Cl.[4] F02D *11/10*

U.S. Cl. 123—342 **6 Claims**



1. An apparatus for controlling a throttle valve (2) of a vehicle engine, comprising: a wire cable (11) extending between and connected at opposite ends to an accelerator pedal (19) and a first pulley (14) mounted on a motor (15) controlled by driving information of the vehicle, and a movable block (13) disposed in contact with said wire cable, said block being driven by said wire cable and operably connected to the throttle valve to open and close said throttle valve.

4,856,477

THROTTLE CONTROL SYSTEM FOR AUTOMOTIVE INTERNAL COMBUSTION ENGINE WITH FAIL-SAFE MECHANISM

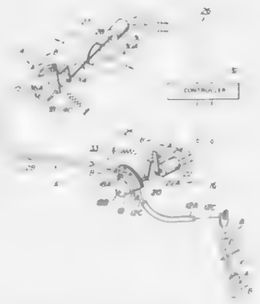
Motoyoshi Hanaoka, Tokyo, and Akira Nakamura, Kanagawa, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 21, 1988, Ser. No. 225,573

Claims priority, application Japan, Jul. 24, 1987, 62-184964

Int. Cl.[4] F02D *11/10*

U.S. Cl. 123—399 **18 Claims**



1. A throttle control system for an automotive internal combustion engine, comprising:

a manually operable accelerator;

a throttle servo actuator connected to a throttle valve shaft, to which a throttle valve is fixedly mounted, for driving said throttle valve shaft with said throttle valve to a desired angular position;

an accelerator position detector means connected to said accelerator via a mechanical linkage for detecting position of said accelerator to produce an accelerator position indicative signal;

a throttle control signal generator receiving said accelerator position indicative signal for deriving said desired angular position of said throttle valve and producing a throttle control signal for driving said throttle servo actuator to the position corresponding to said desired angular position;

a mechanical means connected to said throttle valve shaft for mechanically driving said throttle valve toward fully closed initial position independently of said throttle control signal; and

means, responsive to variation of said accelerator position in a direction commanding deceleration of the engine, for enabling said mechanical means active for driving said throttle valve shaft with said throttle valve for reducing throttle valve open angle at a magnitude corresponding to deceleration command, independently of said accelerator position detector means.

4,856,478

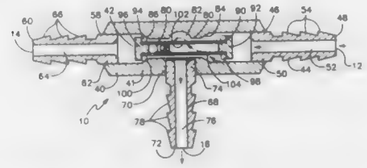
VACUUM CONTROL VALVE

James H. Weber, 888 South Dexter St. #602, Denver, Colo. 80228, and Rodney H. Cornish, 6966 South Franklin St., Littleton, Colo. 80122

Filed Dec. 14, 1987, Ser. No. 132,956

Int. Cl.[4] F02P *5/12*

U.S. Cl. 123—407 **16 Claims**



1. In an engine driven vehicle having an internal combustion engine with an intake manifold, a carburetor with a vacuum venturi and an ignition system with a vacuum advance normally connected to the vacuum venturi, a vacuum control valve comprising:

a body portion having an internal flow passageway communicating with a first inlet, a second inlet and an outlet;

first means for securing a first conduit in fluid communication with said first inlet, said first conduit being secured in fluid communication with the vacuum venturi to establish a pressure connection between the vacuum venturi and the passageway through the first inlet;

second means for securing a second conduit in fluid communication with said second inlet, said second conduit being secured in fluid communication with the intake manifold to establish a pressure connection between the intake manifold and the passageway through the second inlet;

third means for securing a third conduit in fluid communication with said outlet, said third conduit being secured in fluid communication with the vacuum advance to establish a pressure connection between the vacuum advance and the passageway through the outlet; and

a first valve element associated with said first inlet and a second valve element associated with said second inlet, each of said first and second valve elements having an open position establishing communication between the respective one of the first and second inlets and said outlet, said first valve element moving into the open position and said second valve element moving to a closed position when the pressure of the vacuum venturi is less than the pressure of the intake manifold and said first valve element moving into the closed position and said second valve element moving into the open position when the pressure of the intake manifold is less than the pressure of the vacuum venturi so that the vacuum advance is in fluid communication with whichever one of the vacuum venturi and intake manifold is at the lower relative pressure said first and second valve elements constructed to include an inertial mass operative to affect the rate of transition between the open and closed positions.

4,856,479

IGNITION TIMING CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

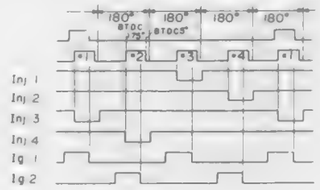
Takanori Fujimoto; Toshiro Hara, and Satoshi Komurasaki, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,616

Claims priority, application Japan, May 22, 1987, 62-126507; May 26, 1987, 62-130215

Int. Cl.[4] F02P *5/15*

U.S. Cl. 123—425 **8 Claims**



1. An ignition timing control apparatus for an internal combustion engine comprising a knocking sensor for detecting a knocking produced in said engine, a knocking discriminator for discriminating the knocking produced in each cylinder of said engine on the basis of an output from said knocking sensor, an integrating device for integrating an output from said knocking discriminator, a cylinder pulse generating device for generating a cylinder pulse signal at a predetermined crank angle which corresponds to ignition timing, and a micro-computer for operating ignition timing on the basis of the cylinder pulse signal from said cylinder pulse generating device and the value integrated in said integrating device, said ignition timing control device being characterized by comprising a resetting means to reset said integrated value in response to the operation of ignition timing, wherein the resetting operation by said resetting device is caused when both the cylinder pulse signal and the output signal of said micro-computer are inputted, and the resetting operation is cancelled when at least one of said signals disappears.

4,856,480

APPARATUS FOR CONTROLLING IGNITION TIMING IN INTERNAL COMBUSTION

Toyohei Nakajima; Toshiyuki Mieno; Akira Tanaka; Akira Nagao, and Yukihiko Suzaki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 67,076, Jun. 29, 1987, abandoned. This application Oct. 24, 1988, Ser. No. 262,049

Claims priority, application Japan, Jul. 1, 1986, 61-155696; Jul. 22, 1986, 61-170931; Jul. 22, 1986, 61-170936

Int. Cl.[4] F02P *5/14*

U.S. Cl. 123—425 **8 Claims**

1. An apparatus for controlling ignition timing in an internal combustion engine, comprising:

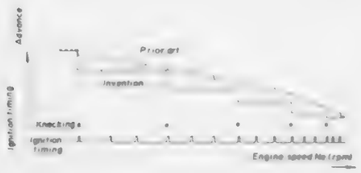
first means for detecting an angular position of an engine crankshaft to generate an output signal indicative of engine speed;

second means for detecting a state of engine load through an

intake air drawn into the engine to generate an output signal in response thereto;

third means for detecting a knock condition of the engine to generate an output signal in response thereto;

control means for receiving the output signals of the first, second and third means, for determining a basic ignition timing of the engine based upon the detected engine speed and engine load, and when the knock condition is detected by said third means, said control means retarding the basic



ignition timing by an amount which is inversely proportional to the engine speed, said amount being larger at a low engine speed than at a high engine speed such that retardation of the basic ignition timing is quicker at low engine speed, said control means generating an output signal based upon the determined ignition timing; and

ignition means for receiving the output signal of the control means to ignite an air/fuel mixture in a combustion chamber of the engine.

4,856,481

ENGINE KNOCKING CONTROL UNIT

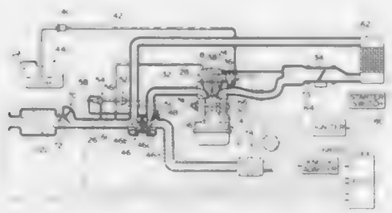
Katsuya Kamise; Shigeru Yamamoto, both of Hiroshima; Tetsushi Hosokai, Kure, and Koji Miyamoto, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 19, 1988, Ser. No. 183,712

Claims priority, application Japan, Apr. 20, 1987, 62-96938; Apr. 20, 1987, 62-96939

Int. Cl.[4] F02D *43/00*

U.S. Cl. 123—425 **24 Claims**



1. An engine knocking control unit for controlling knocking, which occurs in a gasoline engine, in a direction that will suppress such knocking, said unit comprising:

knocking sensing means for sensing knocking and outputting a signal indicative thereof;

engine control means for controlling the operating condition of the engine;

control variable correcting means which receives the output from said knocking sensing means, for correcting a control variable in said engine control means in a direction that will suppress knocking when knocking occurs;

engine temperature sensing means for sensing engine temperature and determining whether the engine is in a cold state or hot state; and

correction amount modifying means which, if the engine is determined to be in the cold state by said engine temperature sensing means, modifies the amount by which the control variable is corrected in the direction that will suppress knocking in such a manner that said amount is made smaller than that which prevails when the engine is in the hot state.

4,856,482

METHOD OF CONTROLLING THE DEMAGNETIZATION PHASE OF ELECTROMAGNETIC DEVICES, ESPECIALLY OF ELECTROMAGNETIC VALVES OF COMBUSTION ENGINES

Ernst Linder, Mühlacker; Helmut Rembold, Stuttgart, and Walter Teegen, Waiblingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

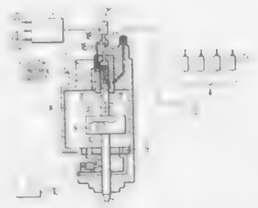
PCT No. PCT/DE86/00451, § 371 Date Nov. 6, 1987, § 102(e) Date Nov. 6, 1987, PCT Pub. No. WO87/05662, PCT Pub. Date Sep. 24, 1987

PCT Filed Nov. 6, 1986, Ser. No. 142,862

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609599

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—506 **8 Claims**



1. Method for controlling the demagnetization phase of electromagnetic devices, particularly of electromagnetic valves in combustion engines, characterized in that the exciting current of the electromagnetic device, proceeding from a high value corresponding to the holding current, is decreased, at least temporarily, to a lower, but positive, value below the holding current level for the duration of a time interval provided for the opening of the valve, the exciting current being decreased to a lower value for the duration of a switch-off dead time, wherein the time period between the switch-off pulse edge and the start of the opening of the valve needle of the valve is defined as the switch-off dead time.

4,856,483

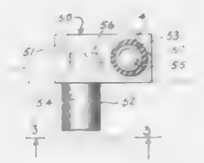
VACUUM BLEED AND FLOW RESTRICTOR FITTING FOR FUEL INJECTED ENGINES WITH VAPOR SEPARATOR

Glenn C. Beavis, and Robert J. Hensel, both of Oshkosh, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Jan. 4, 1988, Ser. No. 140,438

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—516 **5 Claims**



1. A marine fuel system for an internal combustion engine having an induction system for supplying combustion air to the engine and fuel injection means for mixing fuel with the combustion air, and having a remote fuel tank, said fuel system comprising a first fuel pump connected to draw fuel from said tank and a second fuel pump connected to receive fuel from said first pump and provide fuel under pressure to said fuel injection means, a vapor separator connected between said first and second fuel pumps to remove fuel vapors supplied to said second pump, and a vapor supply line connected between said vapor separator and said induction system to supply the vapor removed from said fuel to said induction system, means connected in said vapor supply line limiting fuel vapor supplied from said vapor separator to said induction system at peak vacuum from said induction system during rapid engine deceleration to prevent an overly rich fuel-air mixture in said induction system otherwise causing rough idling or stalling, wherein said last mentioned means comprises in combination vacuum bleed orifice means in said vapor supply line partially venting vacuum from said induction system to atmosphere to limit the peak vacuum applied to said vapor separator from said induction system, and flow restrictor means in said vapor supply line limiting the volume of flow of fuel vapor from said vapor separator to said induction system, wherein said vacuum bleed orifice means and said flow restrictor means are at all times in continuous communication with each other and with said vapor separator and with said induction system.

4,856,484

LIQUIFIED PETROLEUM GAS FUELLED TWO STROKE ENGINE

Robert S. Wilson, 8 Clyde Street, Ferntree Gully, 3156, Victoria, and William M. Lynch, 4 Kirrawee Avenue, Wantirna South, 3152, Victoria, both of Australia

Filed Jun. 30, 1987, Ser. No. 68,614

Int. Cl.[4] F02M *21/02*

U.S. Cl. 134—525 **5 Claims**



1. A two-stroke internal combustion engine fuelled by liquefied or compressed gas, said engine having a crankcase and including lubricating oil supply means for supplying lubricating oil to the crankcase of said engine, said lubricating oil supply means including dilution means for diluting said lubricating oil with a combustible thinning solvent, atomizing means for atomizing the solution of said lubricating oil and said thinning solvent in a stream of fuel gas and air, and introduction means for introducing the mixture of said atomized solution, air and fuel gas into a combustion chamber of said engine.

4,856,485

Patent Not Issued For This Number

4,856,485

INTERNAL COMBUSTION ENGINE

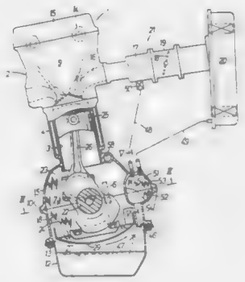
Seiji Mori, Tokyo; Toshinari Sonoda, and Yusuke Kinoshita, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

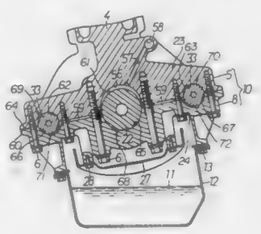
Filed May 16, 1988, Ser. No. 194,389

Claims priority, application Japan, May 15, 1987, 62-118380; Oct. 21, 1987, 62-161248

Int. Cl.[4] F02B *25/06*

U.S. Cl. 123—572 **11 Claims**





1. An internal combustion engine comprising:

a cylinder block having an array of cylinders defined therein;

a crankcase coupled to a lower end of said cylinder block, said crankcase including an upper case integrally formed with said cylinder block and a lower case fixed to said upper case, said upper and lower cases jointly defining a crank chamber therebetween, said upper and lower cases having a plurality of journal support walls projecting from inner wall surfaces thereof, said lower case having an open lower end;

an oil pan fixed to said open lower end of the lower case;

an air intake system coupled to said cylinders;

a crankshaft rotatably sandwiched by said journal support walls in said crankcase; and

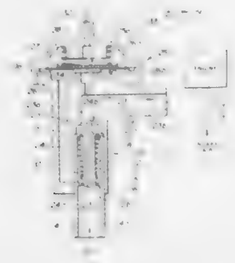
a breather chamber mounted on one side of said crankcase and defined by recesses on confronting surfaces of said upper and lower cases, said breather chamber having one end communicating with said crank chamber and an opposite end communicating with said air intake system.

4,856,487

GAS FLOW RATE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Katsuji Furuya, Tokyo, Japan, assignor to Kabushiki Kaisha Tsuchiya Seisakusho, Tokyo, Japan

Filed Dec. 23, 1986, Ser. No. 945,591
Claims priority, application Japan, Dec. 24, 1985, 60-289457; Feb. 28, 1986, 61-27348[U]; Feb. 28, 1986, 61-27349[U]
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—574 14 Claims



1. A gas flow rate control system for an internal combustion engine having an intake air passage through which intake air forming an air-fuel mixture to be inducted into an engine combustion chamber flows, said gas flow rate control system comprising:

means defining a gas flow passage through which amounts of gas discharged from the combustion chamber flow back to the combustion chamber, said gas flow passage being independent from the intake air passage;

a control valve disposed in said gas flow passage to control flow rate of the gas flowing in said gas flow passage in accordance with control characteristics, said control valve including a valve member which is disposed within said gas flow passage and along an axis of the gas flow passage movable in accordance with intake vacuum developed in the engine and introduced into said gas flow passage, said gas flow rate being determined in accordance with axial movement of said valve member; and

means for compensating the control characteristics of said control valve in accordance with an engine operating parameter, said control characteristics compensating means including means for changing said gas flow rate in accordance with said engine operating parameter wherein said means for compensating includes means defining a bypass passage connecting first and second portions of said gas flow passage, said first and second portions being located on upstream and downstream sides of a control valve flow rate control section, respectively, and compensation valve means for controlling flow of the gas passing through said bypass passage in accordance with said engine operating parameter.

4,856,488

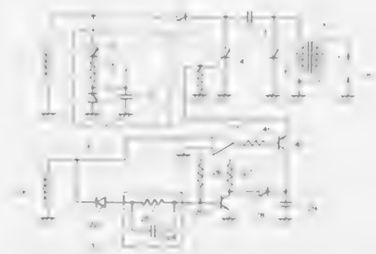
IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Hiroshi Okuda, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1987, Ser. No. 113,518
Claims priority, application Japan, Oct. 31, 1986, 61-261212
Int. Cl.[4] F02P *3/08*
U.S. Cl. 123—599 4 Claims

1. An ignition system for an internal combustion engine which periodically repeats charge and discharge of a capacitor on the basis of an output signal from a signal coil, by using as a power source a magnetogenerator in association with said internal combustion engine, thereby igniting said internal combustion engine, comprising:

a signal coil which generates an AC signal of one cycle for the time period corresponding to a predetermined crank angle range of said internal combustion engine, a charge circuit for charging said capacitor during a first half cycle in a the output signal from said signal coil, a zero-cross detectio circuit for detecting that the output signal from said signal coil reaches the zero-cross point when transferring from the first half cycle to the latter half cycle, a



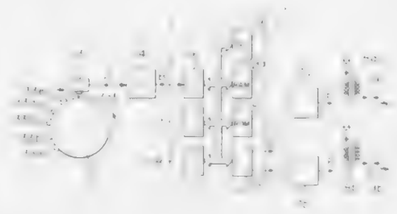
discharge circuit which allows said capacitor to discharge on the basis of an output signal from said zerocross detection circuit so as to use discharge voltage from said capacitor as an ignition timing signal for said internal combustion engine, and an ignition circuit which receives the discharge from said capacitor to thereby ignite said internal combustion engine.

4,856,489

IGNITION TIMING CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Masayuki Ozawa, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1988, Ser. No. 203,995
Claims priority, application Japan, Jun. 8, 1987, 62-142702; Jun. 8, 1987, 62-142703; Jun. 8, 1987, 62-142704
Int. Cl.[4] F02P *5/04*
U.S. Cl. 123—643 3 Claims



1. An ignition timing control apparatus for an internal combustions engine which comprises:

a signal rotor rotating in synchronism with the revolution of the engine,

a plurality of trigger poles attached on the outer circumference of said signal rotor at positions corresponding to an ignition timing for each of the cylinders.

a guide pole disposed in front of a specified trigger pole among said trigger poles,

a signal coil for generating an angle signal in correspondence to the angle between said specified trigger pole and said guide pole, and

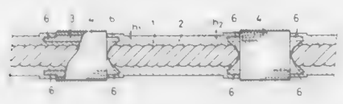
an ignition timing operation device comprising means for measuring the periods between said guide pole and the trigger poles on the basis of said angle signal, and means for comparing one of said periods with an other by alternately multiplying said periods by a given coefficient, to thereby discriminate said cylinders and operate ignition timing for said cylinders.

4,856,490

WIRE SAW

Tsunezo Kawase; Shuichiro Koroku, both of Fujieda, and Kunio Okada, Hiroshima, all of Japan, assignors to Osaka Diamond Industrial Co., Ltd., Sakai, Japan

Filed Sep. 8, 1988, Ser. No. 241,673
Claims priority, application Japan, Sep. 9, 1987, 62-137749; Jul. 20, 1988, 63-95802
Int. Cl.[4] B26D *1/547*
U.S. Cl. 125—21 7 Claims



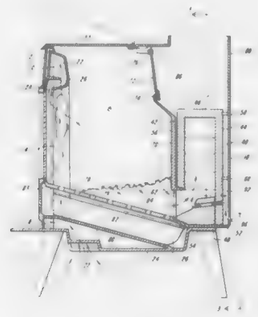
1. A wire saw comprising: a wire rope, a resilient layer covering the outer periphery of said wire rope, a plurality of sleeves mounted on said wire rope through said resilient layer and spaced at distances, said sleeves having an abrasive layer on outer periphery thereof, said resilient layer having its outer diameter which is smaller at portions between each pair of the adjacent ones of said sleeves than over and adjacent to said sleeves, to form shoulders on said resilient layer at portions corresponding to both ends of said each sleeve.

4,856,491

HIGH EFFICIENCY SOLID FUEL BURNING STOVE

Robert W. Ferguson, South Royalton, and Derik K. Andors, Randolph, both of Vt., assignors to Vermont Castings, Inc., Randolph, Vt.

Filed Mar. 25, 1988, Ser. No. 173,236
Int. Cl.[4] F24C *1/14*
U.S. Cl. 126—77 21 Claims



1. A heating apparatus for burning solid fuels comprising:

a frame assembly enclosing a primary combustion chamber for burning a supply of solid fuel contained therein, said frame assembly including a front wall, two side walls, a rear wall, a top and a bottom;

a grate for carrying a supply of solid fuel contained within said primary combustion chamber, said grate being disposed at an acute angle with respect to a selected one of said front, side and rear walls for promoting the accumulation of charcoal formed from combustion of the solid fuel against said selected one of said walls at a bottom end thereof; and

a secondary combustion chamber in gaseous communication with said primary combustion chamber for removal of pollutants from exhaust gases exiting said primary combustion chamber, said secondary combustion chamber comprising:

an entrance orifice disposed in said selected one of said walls at a bottom end thereof closely adjacent said grate, whereby said entrance orifice may be covered by charcoal during operation of said apparatus whereby exhaust gases exiting said primary combustion chamber into said secondary combustion chamber pass through charcoal;

means for metering secondary combustion air containing oxygen into said entrance orifice for mixing with exhaust gases exiting from said primary combustion chamber;

baffles arranged to enhance mixing of said combustion gases with secondary air to promote the more complete burning of pollutants, each of said baffles comprising a generally vertically oriented lower portion and an upper portion, said lower portions of said baffles being generally parallel to one another and said upper portions of said baffles having surfaces which are non-parallel and converging with respect to one another for causing convergence of exhaust gases and secondary combustion air; and

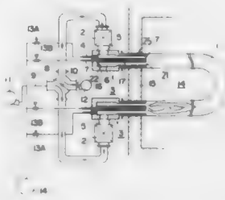
means for venting the exhaust gases from said secondary combustion chamber to an exhaust pipe.

4,856,492

RADIANT TUBE BURNER

Masao Kawamoto, Yokohama, Japan, assignor to Nippon Furnace Kogyo Kaisha Ltd., Kanagawa, Japan

Filed May 16, 1988, Ser. No. 195,107
Claims priority, application Japan, May 26, 1987, 62-126989; Sep. 29, 1987, 62-242715; Apr. 14, 1988, 63-90365
Int. Cl.[4] F24C *3/00*
U.S. Cl. 126—91 A 10 Claims



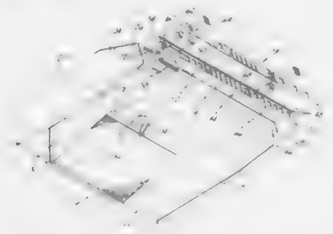
1. A radiant tube burner assembly for a furnace, the assembly having a radiant tube and a set of burners placed at both ends of the radiant tube, the radiant tube having a bung at each end and wherein each burner has a primary combustion chamber which is placed outside of the furnace, the burner having a combustion gas injection outlet located approximately more inside of the furnace than the bung of the radiant tube; the assembly comprising: a primary fuel nozzle which injects primary fuel into said primary combustion chamber and which is located away from the combustion gas injection outlet; and a secondary fuel nozzle which is surrounded with refractory materials and which injects secondary fuel into the radiant tube adjacent the combustion gas injection outlet; the assembly creating primary combustion by supplying the primary fuel and at least almost the total amount of combustion air into the primary combustion chamber to form generated primary combustion gas, and secondary combustion with the secondary fuel by combining the secondary fuel with low concentrated oxygen remaining in the generated primary combustion gas; and each burner being connected through a regenerative bed selectively connected either to an air supply system for combustion or to an exhaust combustion gas system, whereby the burners operate alternatively by supplying the combustion air through the regenerative bed or to exhaust the combustion gas through the regenerative bed.

4,856,493

QUICK CONNECT-DISCONNECT PANEL MOUNTING MEANS

Thomas W. Fleming, Van Nuys, and Gary D. Rose, Anaheim, both of Calif., assignors to Jensen General Corp., Los Angeles, Calif.

Filed Jul. 28, 1988, Ser. No. 225,469
Int. Cl.[4] F24C 15/20
U.S. Cl. 126—299 R 5 Claims



1. Quick connect-disconnect means as a part of a monitor panel, said panel for use in a range hood for recreational vehicles, said panel having top and bottom general parallel edges and a pair of generally parallel end edges, said panel forming a quadrilateral of a first area for releasable securement of said panel in a cut-out at the front of said range hood said cut-out is also a quadrilaterial having a top and bottom generally parallel edge and a pair of end edges forming a second area therebetween, and said first area of said panel is greater than said second cut-out area to allow said panel to overlay said cut out, the improvement including:

said monitor panel having a rear surface with an annular recess extending therearound inwardly from said panel top, bottom and pair of end edges forming an inner rear quadrilateral surface adapted to interfit within said second area formed by said cut out;

locking wall means on said inner rear quadrilateral surface of said panel extending at least toward said top and bottom generally parallel edges forming generally U shaped hood receiving recesses between said monitor panel and said locking wall mean, and said locking wall means at said top edge being longer than said other locking wall means at said bottom edge whereby said panel may be installed by passing the locking wall means behind said cut out and upward so that the top edge of said second area interfits within said U shaped hood receiving recess and then the bottom edge is moved inwardly so that said lower locking wall means passes into said cut-out along said bottom edge of said cut-out and then the monitor may be moved down so that the lower edge of said second area interfits within said U shaped hood receiving recess; and spacing extensions projecting into said U shaped hood receiving recesses adapted to reduce the size of said U shaped recess to accommodate the thickness of material in said range hood to achieve a relative tight fit.

4,856,494

SOLAR HEATING INSTALLATION WITH FAILURE-PROTECTED HEATING MEDIUM HOSE

Claus Schüssler, Königsbach-Stein; Janusz Wojcik, Pforzheim, and Rolf Hemminger, Keltern-Dietlingen, all of Fed. Rep. of Germany, assignors to Witzenmann GmbH Metallschlauch-Fabrik Pforzheim, Pforzheim, Fed. Rep. of Germany

Filed Dec. 11, 1987, Ser. No. 131,590
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1986, 3643038
Int. Cl.[4] F24J 2/38
U.S. Cl. 126—424 21 Claims

1. The combination of a solar heat installation dish mirror (1) movable between a night position and a sequence of a plurality of day positions, in which the mirror follows the passage of the sun relative to the earth for concentration of sun energy,

with

a flexible tube or hose (5) adapted to have a medium to be heated by solar energy passed therethrough,

one end of said flexible tube or hose (5) moving with the mirror and another end of the flexible tube or hose being secured to a fixed attachment element (4),

said flexible tube or hose (5) being bent and deformed into at least part-undulating multi-bend shape during movement of the mirror between the night position and a terminal day position,

the bend of the tube or hose (5) changing sign or direction as the mirror moves between said night and said terminal positions,



wherein said flexible tube or hose (5) includes a mesh or braid armor (9) and heat insulating material (11); and

wherein, in accordance with the invention,

the flexible tube or hose (5) comprises a layered flexible tube structure having at least two layers (6, 9),

one (9) of said layers being formed by the mesh armor (9) and another one (6) of said layers comprising a flexible tube structure (6); and

a stiffening jacket (10) is provided, surrounding one of the layers of the tube or hose (5) at least in the region of the bend of the tube or hose,

said stiffening jacket (10) having the characteristics to dampen said movement of the tube and to have the tendency to retain the tube in positions which includes at least one of:

straight position, and

single bend position,

to form a motion restrained composite tube.

4,856,495

ENDOSCOPE APPARATUS

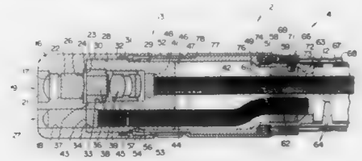
Yoshikazu Tohjoh; Akira Hasegawa, both of Hachioji, and Tomoaki Sato, Higashiyamato, Japan, assignors to Olympus Optical Co., Ltd., Japan

Continuation-in-part of Ser. No. 83,712, Aug. 10, 1987, abandoned. This application Oct. 27, 1988, Ser. No. 263,553
Claims priority, application Japan, Sep. 25, 1986, 61-147037
Int. Cl.[4] A61B 1/06
U.S. Cl. 128—6 7 Claims

1. An optical adapter for an endoscope to be detachably mounted on the distal end of the endoscope, said endoscope including an observation optical system and an illumination optical system, comprising:

an observation optical system;

an illumination optical system; and



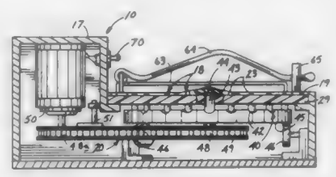
an aperture diaphragm disposed within said observation optical system of said optical adapter such that its optical axis is in agreement with that of the observation optical system of the endoscope.

4,856,496

REFLEX MASSAGER AND METHOD

Fred Chursinoff, Site 38, R.R. 1, C-1, Castlegar, B.C., Canada V1N 3H7

Filed Nov. 6, 1987, Ser. No. 118,233
Int. Cl.[4] A61H 7/00
U.S. Cl. 128—52 8 Claims



1. A reflex massager, comprising:

a frame;

a plurality of reflex massage pins, each having an upward massage end and a lower end;

hold dow means for releasably receiving a surface to be massaged and for selectively pressing the surface against the upward massage ends of the reflex massage pins;

guide means on the frame orienting the pins for individual linear reciprocating movement and for organizing the pins in a prescribed pattern; and

drive means operatively connected to the reflex massage pins for reciprocating individual reflex massage pins through a prescribed stroke, said drive means including a plate having a plurality of substantially radial grooves on one side thereof, the lower end of each of said pins resting upon the same side of said plate as said radial grooves, means to rotate said plate to cause said grooved surface to forcibly move said pins upwardly and to subsequently allow said pins to move downwardly in response to gravity to complete said prescribed stroke in response to rotation of said plate.

4,856,497

PORTABLE COLLAPSIBLE TREATMENT TABLE WITH DROP SECTIONS

Donald J. Westphal, South Elgin, Ill., assignor to Standex International Corporation, Salem, N.H.

Filed Nov. 12, 1987, Ser. No. 119,791
Int. Cl.[4] A61F 5/00
U.S. Cl. 128—70 26 Claims

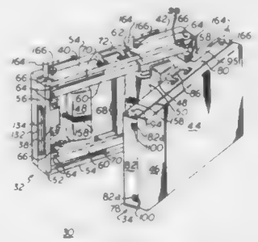
1. A portable patient treatment table, comprising:

a plurality of separate, patient body supporting table sections interconnectable for supporting a patient for treatment at a convenient working level above the floor while lying in a generally horizontal position;

each of said table sections including cushion means having an upper surface for supporting a portion of a patient's body and mounted on a frame and a plurality of pairs of supporting legs pivotally interconnected with said frame for movement between a folded-up position inside said frame for transporting said table sections and a downwardly extended position for engagement with the floor to support said cushion means in a treatment position above said floor;

first connector means for detachably interconnecting and securely locking together said frames of said table sections to maintain said cushion means of each of said sections in generally horizontal alignment when all of said legs are extended downwardly;

a head piece including inner and outer end portions for supporting the head of a patient while lying on said cushion means of said interconnected table sections; and



second connector means for detachably interconnecting said head piece and one of said table sections with said inner end portion of said head piece positioned adjacent said one table section and said outer end portion spaced outwardly thereof, said second connector means operable to permit said head piece to be completely detached from said one table section for storage inside said folded-up legs of a table section for transportation of said table;

said second connector means including means for interconnecting said head piece at a selected one of several different, generally horizontal levels relative to said upper surface of said cushion means of said one table section and an adjustable support for securing said head piece at a selected one of several different angularly sloping positions relative to said cushion means of said one table section.

4,856,498

VACUUM GENERATING AND CONSTRICTION APPARATUS FOR AUGMENTING MALE POTENCY

Julian W. Osbon, Augusta, Ga., assignor to Osbon Medical Systems, Ltd., Augusta, Ga.

Filed Mar. 30, 1987, Ser. No. 31,706
Int. Cl.[4] A61F 5/41
U.S. Cl. 128—79 5 Claims

1. An improved vacuum generating and constriction apparatus for augmenting male potency, comprising in combination:

an elongated, generally cylindrical configuration vacuum chamber of sufficient size to cover a male sex organ, such chamber being open at one longitudinal end thereof for receiving such organ and having pneumatic connector means contiguous to its opposite longitudinal end;

a tubular-configuration organ adapter means suitable for nestably fitting within the open end of such vacuum chamber so as to be retained within such cylindrical vacuum chamber contiguous to its open end and to effectively reduce the size of such open end for accommodating different user needs,

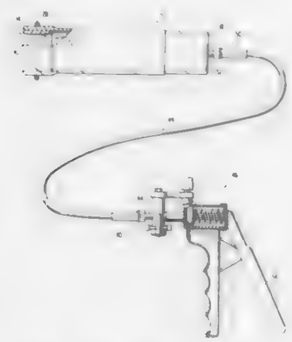
such adapter means having a proximal end for contact with a user,

such adapter means presenting at its proximal end a flange

extending radially outwardly of its internal surface tubular configuration at such open end of the cylindrical-configuration vacuum chamber to provide an extended surface area for contact with such user;

vacuum source means for evacuating such cylindrical-configuration chamber;

means for establishing pneumatic communication between such pneumatic connector means of the cylindrical-configuration vacuum chamber and such vacuum source means;



vacuum control means located on such vacuum source means for controlling generation, maintenance and release of a vacuum in such cylindrical-configuration vacuum chamber, and

stretchable elastic means of generally toroidal configuration having an inner diameter adapted to constrictive contact around the base of the male organ so as to retain blood engorgement in such organ contemporaneously with releasing vacuum in such cylindrical vacuum chamber.

4,856,499

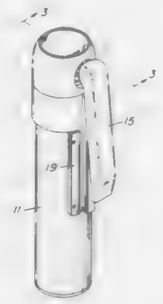
ERECTION DEVICE

Edward C. Kelly, Blue Bell, Pa., assignor to Assist Research Corp., Hatfield, Pa.

Filed Apr. 11, 1988, Ser. No. 180,010

Int. Cl.[4] A61F *5/41*

U.S. Cl. 128—79 **13 Claims**



1. A medical device for promoting an erection in the male genital organ, including a vacuum chamber, comprising:

a. a pump having a reciprocating piston moving within a cylinder and including an intake port and an exhaust port;

b. an elongate transparent cylindrical vacuum chamber releasably attached to said pump, said pump affixed to a first end of said cylindrical vacuum chamber and a second opposite end of said chamber having an opening for receiving the male penis, said pump having an actuation handle which is substantially parallel to said elongate vacuum chamber; and

c. air conduit means in fluid communication with said vacuum chamber and said pump, said air conduit means further including a safety valve being a portion of said air conduit means comprising a substantially straight elastomeric cylinder which is supported at opposite ends by two rigid port means affixed to a common support structure.

4,856,500

CUFF DEVICE

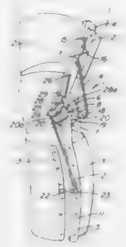
Richard G. Spademan, 200 P St., Sacramento, Calif. 95814

Filed Mar. 16, 1988, Ser. No. 168,702

The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.

Int. Cl.[4] A61F *5/04, 2/78, 5/01*

U.S. Cl. 128—80 C **38 Claims**



1. A dynamic support for first and second body parts which are articulated to each other comprising cuff components adapted to snugly engage the first and second body parts when the first and second body parts are in a resting position, the cuff components engaging the first and second body parts at locations spaced from the body area where the body parts are articulated, arms attached to and extending from each of the cuff components and terminating in end regions, said end regions being movably attached to each other at a point adjacent to the area where the body parts are articulated, a tightening system attached to at least one of the cuff components and at least one end region; said dynamic support being characterized in that the tightening system includes members responsive to a predetermined relative movement between the body parts in at least one direction away from the resting position for increasing the tightness with which at least one of the cuff components engages at least one of the body parts.

4,856,501

KNEE BRACE HAVING ADJUSTABLE WIDTH FRAME PIVOTED TO CUFFS

Edward L. Castillo; James D. Castillo, both of Mission Viejo, and Michael S. Castillo, San Clemente, all of Calif., assignors to Innovation Sports, Inc., Irvine, Calif.

Filed Jun. 29, 1987, Ser. No. 68,030

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—80 C **11 Claims**

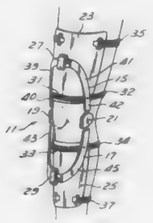
1. A knee brace comprising:

a pair of generally U-shaped frame members positioned in an inverted relative orientation above and below the knee joint of a user with the end portions of said frame members disposed laterally on opposide sides of the knee joint and the central portion of said frame members disposed adjacent the front of the user's leg;

a pair of hinge members disposed substantially adjacent the knee joint and connected to the end portions of said frame members to pivot said frame members about the knee joint;

a pair of cuffs removably attachable to the front of the user's leg above and below the knee joint; and

a clamping member rotatably mounted to each of said pair of cuffs and engageable with the central portion of a respective one of said frame members to affix and permit rotational movement of each of said frame members about an axis generally perpendicular to the front of the user's leg, said rotational movement allowing said knee brace to accomodate bowlegged and knock-kneed conditions of the user.



4,856,502

CURABLE RESIN COATED SHEETS HAVING REDUCED TACK

Dean A. Ersfeld, Maplewood; Paul E. Hansen, Lake Elmo; Matthew T. Scholz; Dennis C. Bartizal, both of Woodbury; Katherine E. Reed, Stillwater; Wayne K. Larson, Maplewood, all of Minn.; Timothy C. Sandvig, Woodville, Wis., and Richard S. Buckanin, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 47,006, May 5, 1987, and Ser. No. 784,671, Oct. 4, 1985, Pat. No. 4,667,661. This application May 22, 1987, Ser. No. 53,098

The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—90 **52 Claims**



1. An orthopedic support material, comprising a nonwoven, stretchable fabric impregnated with a pre-lubricated curable resin:

wherein a major surface of the material exhibits a kinetic coefficient of friction of less than about 1.2;

wherein said nonwoven fabric comprises a pattern of fiber bundles and apertures between said fiber bundles, each said fiber bundle comprising a plurality of fibers having interstices therebetween, the average cross-sectional area of each said fiber bundle being from about 0.2 mm^2 to about 1.2 mm^2; and

wherein said resin is impregnated into the interstices between said fibers of said fiber bundles so as to impart sufficient strength to the material upon curing to be used as an orthopedic support material while leaving the apertures between fiber bundles substantially unoccluded so as to permit sufficient water vapor permeability through the cured material.

4,856,503

DEVICE FOR CUTTING A THREAD IN A CUP-SHAPED BONE

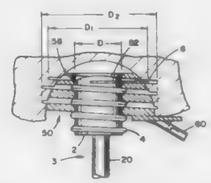
Klaus-Dieter Schelhas, Bremen, Fed. Rep. of Germany, assignor to Orthoplant Endoprothetik GmbH, Bremen, Fed. Rep. of Germany

Filed May 10, 1988, Ser. No. 192,211

Claims priority, application Fed. Rep. of Germany, Aug. 15, 1987, 8711113[U]

Int. Cl.[4] A61B *17/16*

U.S. Cl. 128—92 VJ **18 Claims**



1. Device for cutting a thread in a cup-shaped bone, in particular in the acetabulum of a human pelvis bone, comprising a cutter holder on a drive shaft with a radially, outwardly directed cutting blade on the cutter holder, a cutter gauge capable of being fixed in the socket space, said cutter gauge provided with a central boring and an open, helical cutting channel running spirally about the longitudinal axis of the boring, wherein the cutter holder is capable of being introduced centrally into the boring of the cutter gauge and is capable of being set into a forcefully guided helical cutting movement with the introduction of the cutting blade into the cutting channel.

4,856,504

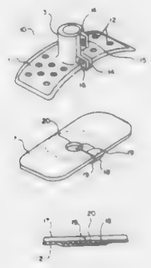
ANTIMICROBIAL WOUND DRESSING AND SKIN FIXATOR FOR ORTHOPEDIC PINS

Ronald Yamamoto; Stanley R. Conston, both of Redwood City, and Sophia Pesotchinsky, Palo Alto, all of Calif., assignors to Vitaphore Corp., Menlo Park, Calif.

Filed Oct. 15, 1987, Ser. No. 108,515

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 ZW **14 Claims**



1. An antimicrobial orthopedic pin percutaneous protection kit comprising a shield comprising a central elastomeric collar having a longitudinal orifice and having one end of said collar orthogonally disposed to an elastomeric, porous, peripheral flange, said flange extending around said end of said collar; and an absorbent patch containing an antimicrobial agent wherein said patch is centrally attached to a porous pad, said pad having a pressure-sensitive adhesive coating on the exposed surface thereof; the maximum dimensions of said pad being such

that when said pad is placed upon the skin of a patient the superimposition of said shield upon said pad prevents contact of said flange upon the skin of said patient;

wherein a first radial slit extends through said collar and flange from said longitudinal orifice of said collar to the circumferential edge of said flange to provide a lateral insertion route of an orthopedic pin into said collar;

and a second radial slit extends from a central point of said pad and patch to the respective circumferential edges of said pad and said patch to provide a lateral insertion route of said orthopedic pin into said central point;

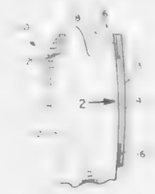
said shield adapted with means for securing said collar around said orthopedic pin to prevent longitudinal motion of said pin through said collar.

4,856,505

APPARATUS FOR RELIEVING PAIN AND DISCOMFORT OF A BUNION

David E. Shaffer, 386 Spruce La., East Meadow, N.Y. 11554, and Michael P. Della Corte, 283 Carnation Ave., Floral Park, N.Y. 11001

Filed Aug. 5, 1988, Ser. No. 228,471
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—81 R 1 Claim



1. An apparatus worn within a shoe for relieving pain and discomfort to a bunion on a big toe of a foot having an ankle, said apparatus comprising:

(a) a one size fits all mitten-like sock enclosing the entire foot up to the ankle and having a body portion, a big toe portion and a small toes portion, said sock worn on the foot so that the big toe fits into said big toe portion and other small toes fit into said small toes portion, said sock being reversible making said sock useable on the right and left foot with minimal adjustment; and

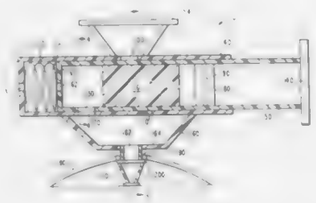
(b) means attached externally to said sock for physically realigning the big toe to a normal position so that the big toe is properly positioned to promote mobility and stability while the device is worn and thus relieving pain and discomfort from the bunion, said pulling back means running longitudinally in the direction of the length of the foot and including an elongated rectangular rigid restraining member and a pair of hook and loop pile fasteners, one of said fasteners attached to outside of said big toe portion and one end of said restraining member while other of said fasteners attached to outside of said body portion near the waist portion and other end of said restraining member so that said restraining member can be removably attached thereto to physically realign the big toe, said pair of hook and loop pile fasteners providing adjustability for different sized feet.

4,856,506

APPARATUS FOR MOUTH-TO-MOUTH RESUSCITATION

Walter J. Jinotti, 10 Scott St., New Brunswick, N.J. 08903

Continuation-in-part of Ser. No. 142,443, Jan. 11, 1988. This application Jan. 17, 1989, Ser. No. 297,326
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—203.11 11 Claims



1. Mouth-to-mouth resuscitation apparatus comprising

a hollow, open-ended tube adapted to be disposed horizontally above the mouth of a patient to be resuscitated,

said tube having a first end and a second end and first and second aligned opposed openings in its wall, the wall of said tube having a third opening close to said second end thereof,

a plunger slidably disposed in said tube and having a first end extending out of said first end of said tube and having finger-operating means adjacent to said first end of said tube for sliding said plunger within said tube,

said plunger having a second end disposed adjacent to said second end of said tube and having a vent opening in its wall near its second end, said finger-operating means sliding said vent opening in alignment with said third opening in the wall of said tube, said finger-operating means sliding said plunger within said tube thereby placing third opening out of alignment with said vent opening,

a spring disposed in said tube between said second end of said plunger and said second end of said tube and urging said plunger away from said second end of said tube,

a solid obstruction means in said plunger including a portion having a through hole which extends through said plunger transversely to the long axis thereof for aligning said through hold with said first and second aligned openings in said tube,

the slidability of said plunger permitting it to occupy several positions in said tube in one of which said third opening in said wall of said tube is aligned with said vent opening in the wall of said plunger, in another of which said through hole is aligned with said opposed aligned first and second openings in said tube,

an operator mouthpiece secured to said tube and aligned with said first opening in the wall of said tube, and

a patient mouthpiece secured to said wall of said tube and aligned with said second opening in said wall of said tube,

said operator mouthpiece in communication with said patient mouthpiece with said plunger being positioned with said through hole aligned with said first and second openings in said wall of said tube for directing air into the patient by the operator,

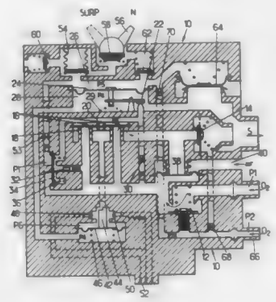
said operator mouthpiece in communication with said patient mouthpiece with said plunger being positioned with said third opening and said vent opening in alignment for allowing the patient to vent air through the patient mouthpiece and through said aligned third opening and vent opening and through the open second end of said tube.

4,856,507

TWO MAIN PILOTED VALVES DEMAND REGULATOR FOR AVIATORS

Rene Ouillon, Saulx Les Chartreux, and Roger Langlois, Versailles, both of France, assignors to Intertechnique, Plaisir, France

Filed Apr. 15, 1988, Ser. No. 182,014
Claims priority, application France, Apr. 15, 1987, 87 05379
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—204.26 11 Claims



1. Demand regulator for breathing apparatus, having in a housing:

a breathing gas supply inlet for connection with a generator of breathing gas under variable pressure,

an outlet for connection to a breathing mask,

pressure responsive valve means comprising at least two main piloted valves controlling communication between said inlet and said outlet responsive to pressure in a same control chamber,

rstriction means continuously communicating said control chamber to a zone at a reference pressure, and

a pilot valve controlled by the pressure prevailing in a demand chamber continuously connected to said outlet and controlling communication between the control chamber and the outlet.

4,856,508

FACE MASK

Amad Tayebi, Westford, Mass., assignor to New England Thermoplastics, Inc., Lawrence, Mass.

Filed Apr. 13, 1987, Ser. No. 41,001
Int. Cl.[4] A62B *7/10*
U.S. Cl. 128—206.12 7 Claims



1. A face mask for filtering air comprising:

a mask shell formed of a flexible, air impermeable, polymeric, closed cell foam that has physical properties that provide shape retention to said mask shell and elasticity-that enables the edge of said mask shell to conform and seal to the face of a wearer around their nose and mouth, said mask shell having one or more holes through the central portion thereof, and

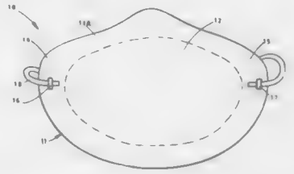
a filter cartridge mounted to cover said hole(s) to thereby filter all inhaled air passing through said holes.

4,856,509

FACE MASK AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Jul. 8, 1985, Ser. No. 752,829
Int. Cl.[4] A62B *7/10*
U.S. Cl. 128—206.19 25 Claims



1. A face mask comprising:

(a) a unitary mask base formed of a sheet material and shaped to be disposed across a portion of the face of a wearer in alignment with and surrounding the nose and mouth of the wearer of said mask,

(b) said mask base including a central portion adapted to be aligned with the nose and mouth of the wearer,

(c) said mask base being formed of a laminate of a plurality of layers of porous materials,

(d) a disease germ killing agent means disposed within said central portion and operable to destroy disease germs, such as bacteria and viruses, passing through said central portion,

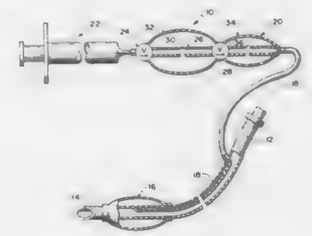
(e) said disease germ killing agent means being located between exterior and interior portions of said central portion for killing disease germs without normally contacting the skin of a person handling and/or wearing said mask.

4,856,510

TRACHEAL TUBE INFLATOR

Ryszard J. Kowalewski, 39 Delaronde Terrace, Saskatoon, Saskatchewan, Canada S7J 3Y9

Filed Apr. 6, 1988, Ser. No. 178,312
Int. Cl.[4] A61M *16/00, 25/00, 7/00*
U.S. Cl. 128—207.15 17 Claims



5. A tracheal tube inflator comprising:

a support tube having an inlet valve seat adjacent one end, an outlet valve seat adjacent the other end and at least one opening in the tube between the valve seats;

inlet and outlet valve elements in the tube, between the valve seats and comprising respective valve heads engagable with the respective valve seats and biasing means biasing

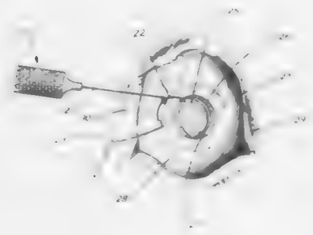
the valve heads into engagement with the respective valve seats;
a pilot balloon surrounding a portion of the tube with inlet and outlet openings secured to the tube on opposite sides of the at least one opening therein;
[illegible]
a control balloon higher in compliance than the pilot balloon with an inlet secured to the tube downstream of the pilot balloon and an outlet adapted for connection to a tracheal cuff inflating tube.

4,856,511

SURGICAL INSTRUMENT FOR INTRAOCULAR LENS IMPLANTATION

Benjamin Keitzman, 0N620 Indian Knoll Rd., West Chicago, Ill. 60185

Filed Jan. 23, 1989, Ser. No. 299,355
Int. Cl.[4] A61B *17/00*; A61F *2/16*
U.S. Cl. 128—303 R **3 Claims**



1. A surgical instrument for inserting an intraocular lens implant into the lens capsule of an eye comprising
a wire terminating in a loop;
a handle connecting to the end of the wire opposite said loop;
said loop, when observed from the handle, being bent toward the
observer about 45 degrees to the right from the axis of said wire to
a first position; and further having the side of the bent loop facing
the observer tilted downwardly about 45 degrees from the axis of the wire.

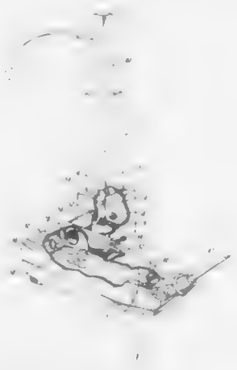
4,856,512

LASER HEAD AND MICROSCOPE ATTACHMENT ASSEMBLY WITH SWIVEL CAPABILITY

Igino Lombardo, Sharon, and Richard L. Walus, Norwell, both of Mass., assignors to I.L.Med, Inc., Walpole, Mass.

Filed Apr. 11, 1988, Ser. No. 179,819
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **17 Claims**

1. An adjustable laser assembly for mounting a surgical laser to a surgical microscope over an operative area and for directing a surgical laser beam into the surgical field of the microscope, comprising:
a microscope platform capable of receiving a laser beam at an entrance point and directing the beam through the microscope platform out to a desired point within the surgical field of the microscope;
a laser housing rotatably connected at a laser beam exit to the entrance point of the microscope platform, wherein the laser housing has a longitudinal axis and the laser beam exit has an axis perpendicular to the longitudinal axis, and wherein the laser housing is free in space with respect to the microscope platform and can rotate in an arc around the axis of the laser beam exit to be positioned with respect to the microscope platform in a selected location on the arc without disturbing during rotation the alignment of a laser beam passing from the laser beam exit of the laser housing to the entrance point of the microscope platform;
a surgical laser disposed within the laser housing and capable of generating a laser beam out of the laser housing along the axis of the laser beam exit; and



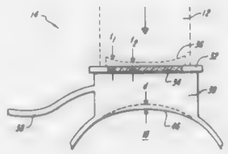
a microscope mount attached to said microscope platform for rigidly mounting the microscope platform to the surgical microscope over the operative area.

4,856,513

LASER REPROFILING SYSTEMS AND METHODS

David F. Muller, Boston, Mass., assignor to Summit Technology, Inc., Watertown, Mass.

Filed Mar. 9, 1987, Ser. No. 19,200
Int. Cl.[4] A61F *9/00*
U.S. Cl. 128—303.1 **5 Claims**



1. A masking apparatus for use in laser reprofiling of corneal tissue comprising a rigid support structure having a surface shaped for fixation upon an eye having a cornea, and a mask connected to an opposite surface of the support structure and adapted to be disposed above the cornea, the mask having a predefined profile of resistance to erosion by laser radiation, whereby upon irradiation of the mask, a portion of the laser is selectively absorbed and another portion is transmitted to the cornea in accordance with the mask profile to selectively erode the tissue.

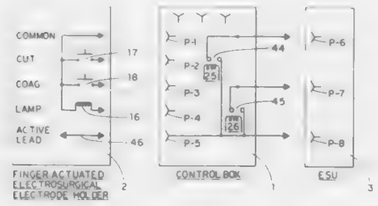
4,856,514

CONTROL APPARATUS FOR A LIGHTED, HAND HELD, SURGICAL ELECTRODE HOLDER

Dan Rabinowitz, Chicago, and John Saeli, Wheaton, both of Ill., assignors to Medi-Tech, Inc., Chicago, Ill.

Filed Jul. 23, 1987, Ser. No. 77,103
Int. Cl.[4] A61B *17/39*
U.S. Cl. 128—303.14 **12 Claims**

1. In electrosurgical apparatus having a hand held electrode holder for a surgical electrode therein, and including an electrosurgical current generator having output terminals for supplying current to said electrode, said electrosurgical apparatus also having control apparatus with means for operating said surgical electrode, said electrode holder also having a lamp for illuminating the region of surgery, the combination comprising:
a housing;
lamp circuit means in said housing for providing current to said lamp;
switching means in said holder for selectively causing current of said electrosurgical current generator to be delivered by connecting means, or to cease being delivered thereby, to the said holder's electrode for cutting or for coagulation;
first connecting means associated with said housing and



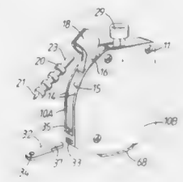
electrically connecting said control apparatus to output terminals of said electrosurgical current generator;
second connecting means associated with said housing and electrically connecting the said control apparatus to input terminals of the said electrode holder;
electrode isolating means for isolating the said electrode's switching means from its cut and coagualation current, whereby economical low current, low voltage switching means can be used;
holder isolating means for electrically isolating the said lamp circuit means and said second connecting means from radio frequency currents, whereby performance of the said lamp is not impaired, and whereby there is virtually no reduction in cut or coagulation power due to diversion of radio frequency current from said electrode.

4,856,515

AUTOMATIC LANCET

Robert C. Turner, 13 Belbroughton Road, Oxford OX2 6UZ, and Rury R. Holman, Shrublands, Faringdon Road, Cumnor, Oxford, OX2 9QY, both of England

Filed Jun. 19, 1987, Ser. No. 63,874
Claims priority, application United Kingdom, Jun. 19, 1986, 8614970
Int. Cl.[4] A61B *17/34*
U.S. Cl. 128—315 **1 Claim**



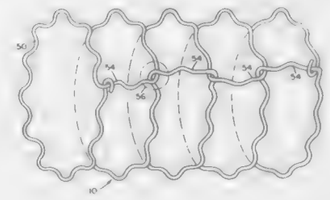
1. An automatic lancet device comprising a lancet, a mounting member and a housing with a first slot in one side through which the mounting member can move to carry the lancet over a path from a retracted to an operative position, and a finger guard positioned in the path followed by the lancet and being in juxtaposition with the lancet as the lancet makes a finger piercing movement in use; the finger guard being provided with a stem dimensioned to be removably located in a recess in the housing, said recess being spaced from said first slot, the finger guard thereby being capable of being mounted in the housing so as to be displaceable therefrom; displacement means permanently mounted on the device and movable from a first position to a second position to cause displacement of the finger guard from the slot, wherein the displacement means is a captive bolt having a limb thereon which engages the housing to hold the bolt in a second slot in the housing of the device, which second slot communicates with the recess in which the finger guard is mounted; the displacement means including an actuating member which on movement of the displacement means from the first to the second position displaces the finger guard; the displacement means further having a remote activator extending out through a surface of the housing remote from the finger guard so that a finger engaging the remote actuator can be used to move the displacement means from the first to the second position without the finger coming into contact with the finger guard.

4,856,516

ENDOVASCULAR STENT APPARATUS AND METHOD

Richard A. Hillstead, Hollywood, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Jan. 9, 1989, Ser. No. 295,129
Int. Cl.[4] A61M *29/00*; A61F *2/06*
U.S. Cl. 128—343 **10 Claims**



1. A stent for reinforcing a vessel within a subject comprising a cylindrical support dimensioned to fit within an interior of said vessel constructed from an elongated wire bent to define a series of relatively tightly spaced convolutions or bends, said wire also bent in the form of a plurality of loops spaced along an axial dimension of the stent and connected by a series of half hitch junctions where each of the plurality of loops includes a number of said regularly spaced convolutions around its circumference, said stent being radially expandable from a first outer diameter which fits within said vessel to a second increased diameter which contacts an inner wall surface of said vessel to reinforce said inner wall.

4,856,517

UMBILICAL CORD CLAMP APPARATUS

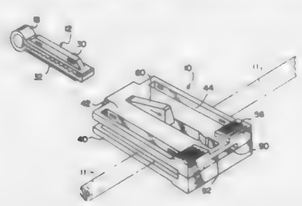
Jason H. Collins, 1344 Covington Highway, Slidell, La. 70460, and Robert G. Woodhead, 18 Krebbs Rd., Plainsboro, N.J. 08536

Continuation-in-part of Ser. No. 909,883, Sep. 22, 1986, Pat. No. 4,781,188. This application Jun. 26, 1987, Ser. No. 66,602
Int. Cl.[4] A61B *17/12*
U.S. Cl. 128—346 **9 Claims**

1. A composite umbilical cord cutter and clamp apparatus, comprising:
a. a base member having upper and lower portions, the upper and lower portions being hinged at a first end and including lock means at a second end, so that the second ends are normally spaced apart and movable between a first, open position and a second, closed, locked position, in relation to one another;
b. housing means contained on the upper and lower portions of the base member for housing at least a pair of umbilical

clamps in spaced relation, said clamps being of the type hingedly movable between open and closed positions as the base member moves between open and closed positions and said clamps being lockable in the closed position;

c. cutting means, including a blade, slidably positioned on the base member and intermediate the means for housing clamps, said cutting means being movable between the



first and second ends of the base member and cutting through the umbilical cord when said base member has been locked into the closed position;

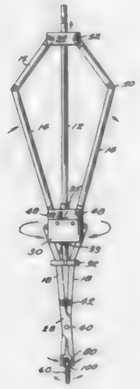
d. release means on the cutting means for unlocking the base member following the cutting movement of the blade through the umbilical cord, whereby in use the base member returns to the open position while the umbilical clamps remain in the locked position on the umbilical cord.

4,856,518

ARTICULABLE, ROTATABLE, SURGICAL CLAMPING DEVICE

Joseph T. McFadden, 513 Mowbray Arch, Norfolk, Va. 23507

Filed Dec. 9, 1987, Ser. No. 130,471
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—346 5 Claims



1. A clamping device comprising:

articulated handle means for manipulating said clamping device, said handle means having first and second ends;

said second end being connected to rotatable cuff means, said rotatable cuff means having split mutually rotatable first and second portions;

said second portion of said rotatable cuff means having scissor-type clamping means attached thereto;

said first end of said handle means being connected to a first end of a longitudinal spindle which extends from said first end of said handle means through said rotatable cuff means;

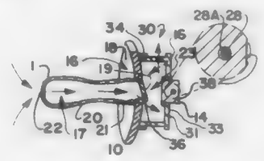
a second end of said longitudinal spindle being fixedly attached to clamp spreader means which slidably engage and operate said scissor-type clamping means.

4,856,519

SOUND GENERATING PACIFIER

Leonides Y. Teves, 623 - 39th Street West, Bradenton, Fla. 33505

Filed Jan. 28, 1988, Ser. No. 149,368
Int. Cl.[4] A61J *17/00*
U.S. Cl. 128—360 10 Claims



1. A sound generating pacifier for an infant's mouth comprising:

a pacifier body having a first end and a second end with an air passageway extending therebetween;

said pacifier body defining a pacifier guard for preventing in use the infant from completely drawing the pacifier into the infant's mouth;

a nipple disposed at said first end of said pacifier body;

said nipple further including an aperture formed therein to enable in use air communication between the mouth of the infant and said air passageway of said pacifier body;

a sound generating means for directly generating a sound upon a flow of air through said sound generating means positioned at said second end of said pacifier body;

said sound generating means being in air communication with said air passageway of said pacifier body; and

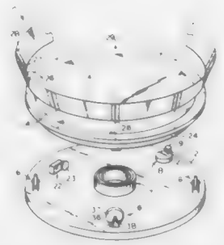
a one-way valve means positioned in said air passageway of said pacifier body for inhibiting in use the flow of air through said air passageway of said pacifier body and into the mouth of the infant when the infant sucks on the nipple and for enabling in use expired air from the mouth of the infant to flow through said aperture of said nipple, said air passageway of said pacifier body, said one-way valve means and said sound generating means to exit said sound generating means thereby generating sound.

4,856,520

TANNER'S PLATFORM

Donald G. Bilicki, 3066 Castleton Way, Marietta, Ga. 30062

Filed Mar. 10, 1988, Ser. No. 166,465
Int. Cl.[4] A61H *33/06*
U.S. Cl. 128—372 2 Claims



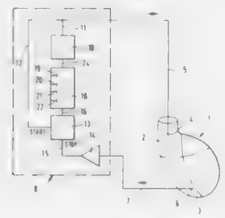
1. An apparatus for safe and even tanning of a tanner comprising disk-shaped first means for supporting the tanner in a generally horizontal position beneath a source of tanning radiation, a base member for supporting said first means, drive means for rotating said first means at a predetermined angular rate with respect to said base member, radiation reflecting means for reflecting tanning radiation in a direction generally toward the central portion of said first means, and signaling means adapted to produce an attention signal in response to a predetermined number of complete rotations of said first means relative to said base, said radiation reflecting means comprising an inverted substantially frustroconical radiation reflector releasibly attached to the peripheral portion of said first means and a reflective pad positioned at least partially to cover the central portion of said first means, said radiation reflector extending upwardly and outwardly from the periphery of said first means whereby radiation incident on the apparatus is reflected by the reflector and reflective pad in a direction generally toward a tanner supported on said first means.

4,856,521

CARDIAC PACEMAKER HAVING A VARIABLE STIMULATION FREQUENCY

Werner Irnich, Birkenweg 60, 6301 Wettenberg 3, Fed. Rep. of Germany

Filed Jul. 27, 1987, Ser. No. 78,049
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 3625894
Int. Cl.[4] A61N *1/00;* H05G *00/00*
U.S. Cl. 128—419 PG 6 Claims



1. A cardiac pacemaker having a variable stimulation frequency comprising,

a stimulation electrode for delivering electrical stimulation pulses at a stimulation frequency to an atrium of a heart of a patient,

a pulse generator coupled to said stimulation electrode for producing said electrical pulses at said stimulation frequency,

a monitoring electrode for sensing excitation signals in a ventricle of said heart in response to said electrical stimulation pulses delivered to said atrium,

timing means for measuring the AR time intervals (T_{AR}) between the electrical stimulation pulses and said excitation signals of said ventricle, and

processing means for controlling the stimulation frequency of said pulse generator to adjust said stimulation frequency in response to the measured AR intervals in accordance with a control function which linearly correlates a decreasing AR interval with an increasing stimulation rate.

4,856,522

RATE-RESPONSIVE, DISTRIBUTED-RATE PACEMAKER

James C. Hansen, Denver, Colo., assignor to Telectronics N.V., Curacao, Netherlands Antilles

Filed Jan. 29, 1988, Ser. No. 150,037
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 PG 8 Claims

1. A rate-responsive heart pacer comprising means for measuring the value of a rate-control parameter (RCP); means for generating pacing pulses; and control means for (a) calculating the total percentage of time, over an interval of at least one day, that said RCP is equal to or less than each of at least several values, (b) for representing a desired rate distribution which for each of different percentages of time indicates a rate equal to or greater than that which is desired, and (c) responsive to a measured value of said RCP, for relating the calculated total percentage of time for that RCP to the desired rate



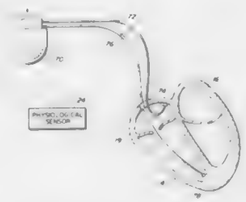
for that percentage of time and setting the rate at which said pulse generating means operates to said desire rate.

4,856,523

RATE-RESPONSIVE PACEMAKER WITH AUTOMATIC MODE SWITCHING AND/OR VARIABLE HYSTERESIS RATE

Jason A. Sholder; Brian M. Mann, and Joseph J. Florio, all of Los Angeles, Calif., assignors to Siemens-Pacesetter, Inc., Sylmar, Calif.

Filed Oct. 8, 1987, Ser. No. 107,063
Int. Cl.[4] A61N *1/00;* H05G *0/00*
U.S. Cl. 128—419 PG 19 Claims



1. A rate-responsive pacemaker for stimulating the heart of a patient comprising:

pulse generating means for generating stimulating pulses to stimulate heart chamber contractions;

sensing means for detecting ventricular heart signals;

means coupling said pulse generating means and said sensing means and adapted to couple with the ventricular region of the patient's heart;

physiological sensor means for sensing physiological need and providing a corresponding signal to control stimulating pulse rate;

control means responsive to said physiological sensor means for varying stimulating pulse escape interval to vary said stimulating pulse rate in accordance with physiological need; and

hysteresis means for selectively causing said control means to extend a stimulating pulse escape interval by adding a prescribed hysteresis value upon detection of a ventricular heart signal by said sensing means.

4,856,524

A-V RESPONSIVE RATE ADAPTIVE PACEMAKER

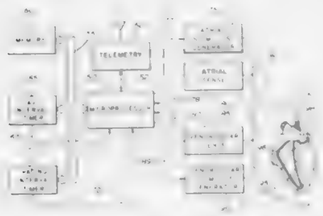
Ross G. Baker, Jr., Houston, Tex., assignor to Intermedics, Inc., Angleton, Tex.

Filed Aug. 29, 1988, Ser. No. 237,429
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG 18 Claims

1. A cardiac pacemaker, comprising:

means for measuring the duration of an A-V interval in a

heart and providing an output indicative of said measured interval; and



means responsive to said measuring means for applying cardiac stimuli to said heart at a rate related to said measured A-V interval duration.

4,856,525

MULTICHANNEL ELECTRICAL STIMULATOR WITH IMPROVED CHANNEL ISOLATION

Christopher van den Honert, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 786,193, Oct. 10, 1985, abandoned. This application Feb. 16, 1988, Ser. No. 158,089

Int. Cl.[4] A61N *1/04*

U.S. Cl. 128—421 4 Claims



1. An electrical stimulator having a plurality of channels having an electrical common, said stimulator adapted to stimulate tissue with an electrical current on each of said plurality of channels, comprising:

a first electrode and a second electrode for each of said plurality of channels, said first electrode and said second electrode adapted to be coupled to said tissue for passing said electrical current through said tissue between said first electrode and said second electrode; and

a first current source and a seoond current source for each of said plurality of channels, said first current source coupled between said electrical common and said first electrode and said second current source being coupled between said second electrode and said electrical common;

means for operating said first current source and said second current source simultaneously for more than one of said plurality of channels;

individually for each of said more than one of said plurality of channels, the current generated by said first current source being substantially equal in magnitude to the current generated by said second current source and being oppositely oriented at a given point in time;

whereby better isolation of stimulus between said plurality of channels is achieved.

4,856,526

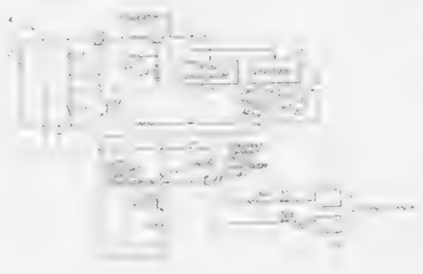
APPARATUS AND METHODOLOGY FOR TREATMENT OF HEADACHE SYNDROMES

Saul Liss, and Bernard Liss, both of Glen Rock, N.J., assignors to Pain Suppression Labs, Inc., Elmwood Park, N.J.

Continuation-in-part of Ser. No. 926,971, Nov. 4, 1986, Pat. No. 4,784,142, and a continuation-in-part of Ser. No. 868,652, May 30, 1986, and a continuation-in-part of Ser. No. 860,745, May 7, 1986, said Ser. No. 926,971, is a continuation-in-part of Ser. No. 868,652, which is a continuation-in-part of Ser. No. 860,745, said Ser. No. 868,652, is a continuation-in-part of Ser. No. 640,104, Aug. 13, 1984, Pat. No. 4,627,438, and a continuation-in-part of Ser. No. 618,144, Jun. 7, 1984, Pat. No. 4,614,193, said Ser. No. 860,745, is a continuation-in-part of Ser. No. 640,104, which is a continuation-in-part of Ser. No. 569,476, Jan. 9, 1984, Pat. No. 4,550,733, said Ser. No. 618,144, is a continuation-in-part of Ser. No. 569,476,. This application Mar. 3, 1987, Ser. No. 21,140

Int. Cl.[4] A61N *1/30*

U.S. Cl. 128—422 8 Claims



1. A method (for relieving pain and symptoms associated with migraine and vascular headache syndromes) comprising securing a pair of electrodes wherein a first contact electrode is secured at one side of the head and a second contact electrode is secured at the opposite side of the patient's head and supplying an electronic current wave comprising a high frequency electrical wave bearing a low frequency amplitude modulation to said first and said second electrodes.

4,856,527

AMNIOSCOPE

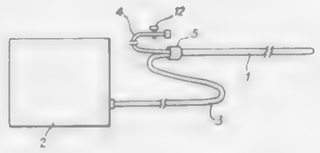
Gilles Karcher, 2, Rue Lafayette, Nancy, France 54000; Max Amor, 9, Square de Liege, Vandoeuvre, France 54500; David Abensour, 27, Rue Hermite, and Jean Cinqualbre, 30, Rue Hermite, both of Nancy, France (54000)

Filed Dec. 28, 1987, Ser. No. 138,637

Claims priority, application France, Dec. 30, 1986, 8618337

Int. Cl.[4] A61B *5/00, 1/06*

U.S. Cl. 128—634 15 Claims



1. An amnioscope for examining an amniotic fluid in utero, comprising:

light transmission means for transmitting light of a defined spectrum to illuminate the amniotic fluid and for transmitting the light after being diffused by the amniotic fluid, said light transmission means being flexible so as to not traumatize a bag of waters containing the amniotic fluid;

means for recognizing pigments in the amniotic fluid, said recognizing means including means for illuminating the amniotic fluid with the light of the defined spectrum and means for spectroscopically analyzing the light after being diffused by the amniotic fluid; and

means for conveying the light of the defined spectrum between said illuminating means and said light transmission means and for conveying the light after being diffused by the amniotic fluid between said light transmission means and said spectroscopically analyzing means.

4,856,528

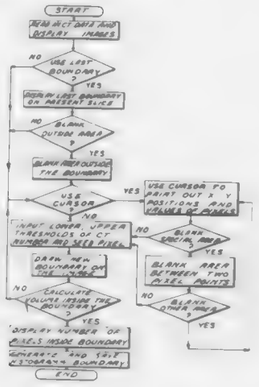
TUMOR VOLUME DETERMINATION

Nai-Chuen Yang, Baltimore, and Peter K. Leichner, Cockeysville, both of Md., assignors to John Hopkins University, Baltimore, Md.

Filed Jun. 26, 1987, Ser. No. 66,554

Int. Cl.[4] A61B *6/03*

U.S. Cl. 128—653 10 Claims



1. A computer-aided method for determining the volume of a tumor within a body organ from CT image data of that organ, comprising the steps of:

(a) obtaining CT image data for each of a plurality of slices of predetermined thickness of the body organ, the image data including a plurality of pixels and a CT number corresponding to each pixel;

(b) transferring the CT image data into a computer;

(c) displaying from the data in the computer an image of one of the slices;

(d) computer generating an approximate boundary of the organ and displaying the boundary superimposed on the image of the slice;

(e) operator interacting with the computer to modify the boundary generated by the computer to more accurately describe the boundary of the organ;

(f) identifying, by the computer, the particular pixels within the organ boundary and the CT number associated with each such pixel and generating therefrom a local histogram of the slice, the histogram including data indicative of the number of pixels within the boundary having a particular CT number;

(g) from the predetermined thickness and number of pixels identified within the boundary, determining by the computer, the volume of organ within the slice;

(h) repeating steps (c) through (g) for each slice to so as to determine a local histogram corresponding to each slice;

(i) summing the local histograms corresponding to the various slices to obtain a global histogram indicative of the number of pixels within the orga boundaries of respective slices having each particular CT number;

(j) determining from the global histogram a demarcation CT number that distinguishes between normal organ tissue and tumor;

(k) determining from the volume computations for each of the slices, the total volume of the organ; and

(l) computing from the global histogram and demarcation CT number, the volume of the tumor.

4,856,529

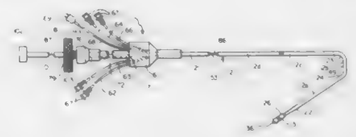
ULTRASONIC PULMONARY ARTERY CATHETER AND METHOD

Jerome Segal, Palo Alto, Calif., assignor to Cardiometrics, Inc., Moutain View, Calif.

Continuation-in-part of Ser. No. 2,585, Jan. 12, 1987, abandoned, which is a division of Ser. No. 737,650, May 24, 1985, Pat. No. 4,733,669. This application Feb. 6, 1987, Ser. No. 11,615

Int. Cl.[4] A61B *8/00*

U.S. Cl. 128—661.08 10 Claims



1. A catheter for making measurements in a vessel defined by a wall carrying a fluid, comprising an elongate flexible tubular member having a plurality of lumens extending therethrough and having proximal and distal extremities, an inflatable balloon carried by the distal extremity of the tubular member and having the interior of the balloon in communication with one of the lumens in the flexible tubular member, the tubular member having at least one preformed bend therein adjacent the distal extremity of the tubular member, a transducer carried by the tubular member in the region of the preformed band, conductive means connected to the transducer and carried by the tubular member and extending through one of the lumens in the tubular member to the proximal extremity of the tubular member, the tubular member having an opening in the distal extremity distal of the balloon in communication with one of the lumens in the tubular member, the tubular member having another opening proximal of the balloon and in communication with another lumen and straightening means carried by the tubular member for straightening the preformed end when it is extended through the preformed bend to facilitate insertion of the catheter into the vessel and for permitting the tubular member to assume the preformed bend with the vessel when it is retracted so that it does not extend through the preformed bend so that a portion of the preformed bend is urged toward the wall of the vessel to position the transducer so that radiation emitted thereby passes through the fluid in the vessel.

4,856,530

CATHETER IDENTIFIER AND METHOD

Cornelius K. Vandervelden, Salt Lake City, Utah, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed May 14, 1987, Ser. No. 50,668

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—692 12 Claims

1. A thermodilution catheter and cardiac output computer system comprising:

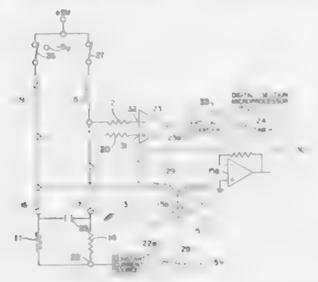
a catheter having a distal and a proximal end, with a temperature sensing means at said distal end and and a lumen extending between the ends of the passage of a bolus during a thermodilution procedure;

a catheter identification means at said proximal end as part of a cardiac output computer;

a cardiac output computer microprocessor circuit responsive to the temperature sensing means in the catheter;

a thermistor and resistor as part of the temperature sensing [illegible]

a capacitor at the distal end of the catheter, the capacitor of a predetermined value selected to indicate a characteristic of said catheter; said capacitor in circuit with said temperature sensing means and the capacitor arranged for being charged in both directions;



said microprocessor circuit at the proximal end including switching circuit means for selectively and automatically charging said capacitor to equilibrium and thereafter connecting said capacitor to discharge;

a timer in said microprocessor circuit activated at a time after said capacitor is fully charged to equilibrium and thereafter stopped when said capacitor is discharged to a point of zero charge, and

an analysis means in said microprocessor circuit connected to said timer for monitoring a measured time interval of capacitor discharge and ascribing a thermodilution catheter characteristic comparable to standards programmed into said microprocessor circuit.

4,856,531†

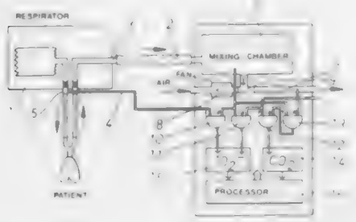
MEASURING DEVICE FOR METABOLIC QUANTITIES CONNECTABLE TO A RESPIRATOR

Pekka Meriläinen, Helsinki, Finland, assignor to Instrumentarium Corp., Finland

Continuation of Ser. No. 794,486, Nov. 4, 1985, abandoned. This application Aug. 17, 1987, Ser. No. 87,984

Int. Cl.[4] A61B *5/08*

U.S. Cl. 128—719 **5 Claims**



1. An apparatus for monitoring the carbon dioxide output, oxygen consumption and respiration quotient of a patient, comprising a respirator having an inlet conduit for supplying gas to a patient and having an outlet conduit for discharging exhalation gas from said patient, a mixing chamber connected to said outlet conduit and having an outlet means to discharge said gas from said chamber, air supply means connected to said outlet means for mixing air at a constant flow rate with said gas to provide a diluted gas, means for measuring the carbon dioxide content of said diluted gas, means for measuring the carbon dioxide content of said exhalation gas in said mixing chamber, means for measuring the oxygen content of said exhalation gas in said mixing chamber, means for measuring the oxygen content of the gas delivered through said inlet conduit to the patient, and means for determining the carbon dioxide output and oxygen consumption by direct calculation from said measured contents.

4,856,532

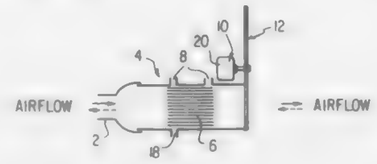
LARGE-SIGNAL AIRWAY RESISTANCE MEASUREMENT

Arthur T. Johnson, R.D. 2, Box 32, Darlington, Md. 21034

Filed Jul. 22, 1987, Ser. No. 76,221

Int. Cl.[4] A61B *5/08*

U.S. Cl. 128—720 **6 Claims**



1. A method for using an instrument which produces a periodic resistance in the airway of an animal to measure the large signal airway resistance comprising applying said instrument to the airway of an animal to perturb the flow of air in said airway, measuring the perturbation in flow rate and the perturbation in pressure caused by said instrument, and ascertaining said large signal airway resistance by determining coefficients from said perturbation in flow rate and said perturbation in pressure.

4,856,533

VACUUM BLOOD-COLLECTION TUBE

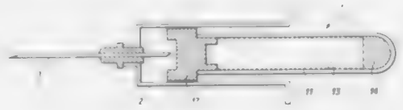
Hideo Aaraku, Ibaraki, and Yoshikata Shoji, Shiga, both of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 28, 1986, Ser. No. 823,437

Claims priority, application Japan, Jan. 29, 1985, 60-15155; Jan. 29, 1985, 60-15156; Feb. 28, 1985, 60-39674

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—763 **11 Claims**



1. A vacuum blood-collection tub comprising a tube-shaped vessel having an opening through which air can be removed, and a plug that makes the opening air-tight to maintain low-pressure conditions inside the said vessel, the raw materials of the said vessel being polyethyleneterephthalate, a copolymer of polyethyleneterephthalate, or an acrylonitrile resin, and the inner walls of said vessel incorporating a hydrophilic substance that is either difficult or impossible to dissolve in water and that prevents blood clots from adhering to the inner walls of said tube, a water-soluble substance, and an adsorptive inorganic substance.

4,856,534

CONDOM

Reubin Sorkin, and Larry Sorkin, both of 4721 University Dr., Coral Gables, Fla. 33146

Filed Oct. 19, 1987, Ser. No. 110,152

Int. Cl.[4] A61F *5/44*

U.S. Cl. 128—844 **6 Claims**



1. A condom device comprising:

(a) a thin-walled, elongated, resilient condom of rubbery impervious material having a closed distal end, an open proximal end zone, an intermediate zone between the end and the end zone, said tubular condom being sized to receive and jacket the penis of a wearer,

(b) a protective pubic shield comprising a relatively thick sheet relative to the condom wall thickness and being sized to overlie the pubic area of the wearer, said shield having a central opening bounded by a peripheral edge and being sized for passage therethrough of the penis of the wearer,

(c) said shield having an inner surface and an outer surface, means on the inner surface to adhere the inner surface to the pubic area of a wearer in covering relation thereof about the penis,

(d) an intercooperating means formed on the condom about the proximal end zone and on said shield about the opening for attaching the condom to said shield for use,

(e) said shield including a tubular neck extending from the edge of the opening and sized to receive and jacket a proximal end of the penis of the wearer,

(f) said neck including a distal portion having a bifurcated configuration at least partially defining said intercooperating means and comprising an annular outer member and an annular inner member both secured to and extending outwardly from said neck in surrounding relation to the distal end of the penis said outer and inner members having confronting surfaces,

(g) said outer and inner members spaced from one another along their length and defining an annular groove formed therebetween for receiving said open proximal end zone of the condom, and

(h) said intercooperating means further comprising annularly configured intermating male and female members formed on said confronting surfaces of said outer and inner members, said proximal end zone nested within the annular groove in sandwiched relation between said male and female members when interlocked with one another, whereby the proximal end zone is enclosed within the bifurcated neck.

4,856,535

PROTECTIVE FACE SHIELD

Christopher B. Forbes, 3737 Saint Johns Bluff Rd. #203, Jacksonville, Fla. 33216

Filed Nov. 25, 1987, Ser. No. 125,206

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—857 **17 Claims**



1. A protective face shield for a wearer comprising:

(a) a substantially flat transparent, flexible waterproof sheet material of a hexagonal geometric shape having an upper edge, and an upper and a lower side edge on each side, said upper edge and said upper and lower side edges on each side together forming a frustro trapezium shape with the bottom edge extending beyond the chin over the face of said wearer;

(b) A water resistant adhesive sealing means extending adjacent said upper and upper side edges, said sealing means for forming a continuous water right seal against the perimeter of the face of said wearer to form a tent-like structure of greater rigidity than said flat sheet material when applied to the perimeter of the face of said wearer to trail shower water away from the face; and

(c) means for protecting said adhesive sealing means prior to applying the face shielded to said perimeter of said face.

4,856,536

CIGARETTE MANUFACTURE

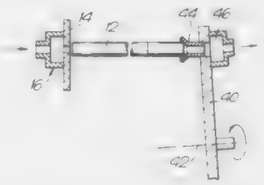
Michael J. Cahill, Coventry, England; Michael D. Simcoe, Canberra, Australia; John D. Stanton, Coventry, and Brian H. Warner, Bucks, both of England, assignors to Molins PLC, Wycombe, England

Filed May 15, 1987, Ser. No. 49,938

Claims priority, application United Kingdom, May 15, 1986, 8611874; Nov. 8, 1986, 8626728

Int. Cl.[4] A24B *15/28;* **A24C** *15/18;* **A24D** *1/00, 1/18*

U.S. Cl. 131—28 **14 Claims**



1. Apparatus for applying measured quantities of foamed adhesive to the ends of cigarettes comprising a drum arranged to carry cigarettes sideways, a plate having apertures aligned with the respective cigarettes and arranged to receive and hold foam from a source adjacent to the plate, and means for pneumatically transferring foam progressively from each aperture to the end of the corresponding cigarette by pneumatically inducing air flows through said apertures.

4,856,537

ASHTRAYS

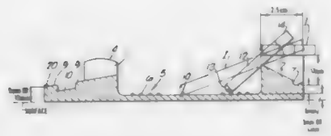
Yee M. Liu, 22 Framfield Way, Eastbourne, Sussex, England

Filed Jan. 11, 1988, Ser. No. 142,206

Int. Cl.[4] A24F *19/00*

U.S. Cl. 131—240.1 **8 Claims**





1. An improved safety ashtray having a peripheral wall surrounding a central ash-receiving well portion, said wall having one or more transverse channels extending from the outside to the inside, each channel having a width and depth such that a burning cigarette may freely be located therein for combustion reduction and extinguishment when the burning end reaches the inside of the wall at the channel, characterized in that the base of the channel slopes downwardly from the inside of the peripheral wall to the outside of the peripheral wall, the height of the base of the channel at the outside of the peripheral wall above a surface on which the ashtray stands being such that a cigarette end resting on such surface will be retained within the channel, the base of the channel adjacent the outside of the peripheral wall including inwardly directed formations adapted to grip and retain a cigarette located within the channel.

4,856,538

PROCESS AND APPARATUS FOR TESTING CIGARETTES

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Jan. 28, 1987, Ser. No. 7,545

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1986, 3602478

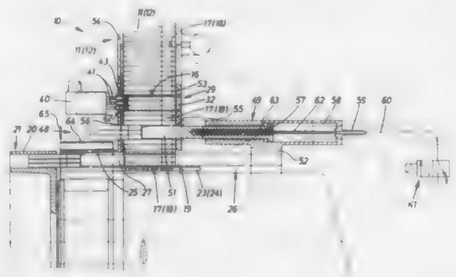
Int. Cl.[4] A24C *5/35, 5/47, 5/00;* B07C *5/00*

U.S. Cl. 131—282 **19 Claims**

16. In a process of testing cigarettes being downwardly transported in vertically inclined, substantially parallel, longitudinal magazine shafts of a cigarette magazine in which horizontally adjacent cigarettes form a cigarette layer, said process including testing at an end of each cigarette in a layer with a cigarette unit located outside the magazine and opposite the ends of cigarettes in the layer, and separating out defective cigarettes after further transport thereof; an improved testing process comprising the steps of:

providing a common testing plane (28) perpendicular to the longitudinal axes of said magazine shafts; and

displacing the cigarette layer by an amount corresponding approximately to half the diameter of a cigarette or half the width of a magazine shaft (13), 14), along said testing plane and in a direction transverse to the longitudinal axes of said magazine shafts, from an initial position in said magazine shafts to a test position where said cigarette



layer rests on supporting means in said testing plane and with the cigarette ends in the layer in alignment with the test unit.

4,856,539

METHOD OF AND APPARATUS FOR UNIFORMIZING THE MOISTURE CONTENT OF TOBACCO

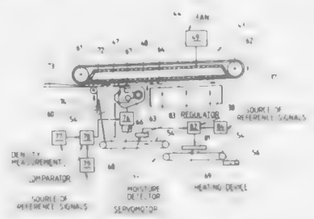
Heinz-Christen Lorenzen, Wentorf, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Dec. 5, 1986, Ser. No. 938,280

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1985, 3543358

Int. Cl.[4] A24C *5/14*

U.S. Cl. 131—290 **26 Claims**



1. A method of maintaining at a predetermined value the moisture content of fibrous material which is used in the tobacco processing industry, comprising the steps of establishing and maintaining a supply of fibrous material with a moisture content exceeding said predetermined value; advancing a flow of fibrous material from the source in a predetermined direction along a predetermined path; converting a portion of the flow into a smokers' product in a first portion of said path so that the remainder of the flow constitutes a surplus; removing the surplus in a second portion of said path upstream of said first portion; heating the surplus so as to reduce its moisture content; and returning the heated surplus into a third portion of said path upstream of said second portion so that the heated surplus with its reduced moisture content is added to the advancing flow.

4,856,540

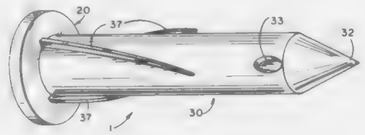
CIGARETTE FILTER MODIFIER

Donald Jansma, Grand Rapids, Mich., and Howard W. Stemm, Lenexa, Kans., assignors to Bissell Health Care Corporation, Grand Rapids, Mich.

Continuation-in-part of Ser. No. 42,325, Apr. 24, 1987, abandoned. This application Apr. 8, 1988, Ser. No. 271,735

Int. Cl.[4] A24D *3/04;* A24F *13/08*

U.S. Cl. 131—339 **24 Claims**



1. A cigarette filter modifier for insertion into a filter of a cigarette, the filter including an end area and a peripheral surface, said modifier comprising:

an annular, thin disk defining a base shield, said base shield being relatively thin with respect to a filter of a cigarette and wherein the disk is dimensioned to overlie only an end area of the filter and not the peripheral surface of the filter whereby the modifier is relatively unnoticeable and can be readily located entirely within a smoker's mouth in use;

an elongated probe projecting from said base shield;

holding means on said probe for assisting in holding said modifier within the cigarette filter when inserted therein;

a plurality of probe apertures in said probe communicating with the interior thereof;

an interior passage in flow communication with said probe apertures and extending through the interior of said probe at least from said probe apertures to and through said base shield;

said base shield being approximately as large in diameter as the diameter of the cigarette filter whereby passage of smoke is blocked by said shield and smoke is forced through said probe apertures and through said interior passage when a cigarette containing said probe is drawn upon; the perimeter of said base shield defining the lateral extremities of said modifier whereby said modifier is substantially unnoticeable when placed in the end of a cigarette and wherein said probe apertures open generally laterally with respect to the longitudinal axis of said probe whereby smoke being drawn from a cigarette into said probe apertures is forced to turn sharply with respect to the longitudinal axis of flow of smoke through the filter in order to enter said apertures and is forced to turn another sharp turn in order to pass down the length of said interior passage of said probe, each of said apertures having a length less than 0.1 inch along the longitudinal axis of said probe, the overall combined area of said apertures being less than about 0.0135 square inches and the interior passage of said probe having a cross section no greater than about 0.008 square inches.

4,856,541

BRUSH INCORPORATING A HYDROPHILIC FOAM PAD FOR HAIR CLEANING AND CONDITIONING

George W. Kellett, Cranford, and Betty J. Murphy, Upper Montclair, both of N.J., assignors to Creative Products Resource Associates, Ltd., Elizabeth, N.J.

Filed Aug. 6, 1987, Ser. No. 82,437

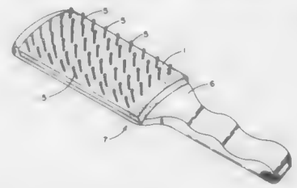
Int. Cl.[4] A45D *19/00, 24/00, 24/16*

U.S. Cl. 132—110 **26 Claims**

1. A hair cleaning and conditioning pad comprising a , resilient, open-celled, hydrophilic polyurethane foam matrix, wherein bound to said matrix is an aqueous phase incorporating about 70–90% water, about 1–20% of a water-immiscible organic solvent, about 0.05–1.5% of a polymeric organic film-forming hair conditioner and about 0.5–15% of a mixture of an anionic surfactant and a nonionic surfactant.

24. A method of cleaning and conditioning hair; said method comprising:

(a) providing an assembly comprising a base member with a pad member mounted hereon; said pad member comprising a resilient, open-celled, hydrophilic polyurethane



foam matrix, wherein bound to said matrix is an aqueous phase incorporating about 70–90% water, about 1–20% of a water-immissible organic solvent, about 0.05–1.5% of a polymeric organic film-forming hair conditioner and about 0.5–1.5% of a mixture of an anionic surfactant and a nonionic surfactant; and,

(b) manipulating said base member to bring said pad member into contact with hair to be cleaned and conditioned.

4,856,542

EXPANDABLE HAIR CURLER

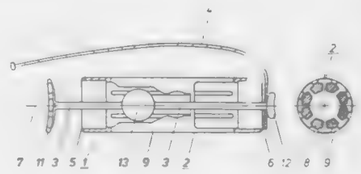
Detlef Hollenberg, Hilden; Hans Schneider, Schwalmtal, and Georg Weihrauch, Kreidach, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 21, 1986, Ser. No. 921,653

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1985, 3537374; Dec. 14, 1985, 3544275

Int. Cl.[4] A45D *2/24*

U.S. Cl. 132—265 **24 Claims**



1. A hair curler comprising:

(A) a hollow, radially, expandable and contractable, generally cylindrical curler body with a notional longitudinal central axis, said body including a plurality of relatively narrow bar-like lamellae each having a longitudinal axis parallel to said central axis, each being for forming said substantially cylindrically shaped body, each being substantially inelastic to radial bending forces;

(B) a detachable holding strap stretching from one longitudinal end of said body to the other; and

(C) expansion actuation means comprising;

(1) a movable element coaxial with and within said body, projecting longitudinally from at least one end of said boyd, and

(2) biasing means comprising at least one element inside the curler body cooperating between said movable element and said cylindrical body, so that said body will expand upon the application of bias generated from axial movement of said movable element in one direction, for acting upon said biasing means, and will con-

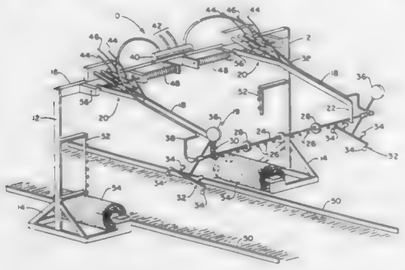
tract upon removal of such bias via axial movement of said moveable element in the opposite direction.

4,856,543

VEHICLE WASHING DEVICE

Thomas J. Petit, 6170 S. Oval Dr., Clinton, Ohio 44216

Continuation-in-part of Ser. No. 37,248, Apr. 10, 1987, Pat. No. 4,794,938. This application Sep. 22, 1988, Ser. No. 247,534
Int. Cl.[4] B60S *3/04*
U.S. Cl. 134—57 R **7 Claims**



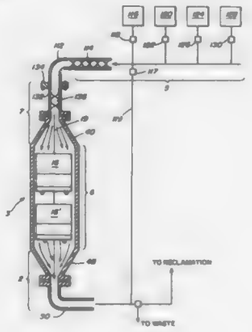
1. A vehicle washing device comprising in combination:
lateral vehicle profile detection means;
a horizontal spray bar adapted to distribute wash liquids;
spray bar vertical positioning means;
spray bar rotation means;
supporting structure for the preceding, and
a logic control unit,
wherein said profile detection means comprises at least two photoelectric cells, the components of which are mounted on, and at opposite ends of said spray bar, and which are adapted to detect the presence of an intervening, lateral vehicle surface, wherein when such presence is detected, electronic signals are sent from said cells to said logic control unit which is adapted to receive said input signals and to process them based on instructional logic contained in said unit, and based upon said processing, to generate and transmit output signals to said spray bar vertical positioning means which includes movable spray bar supporting structure adapted to be activated thereby, and raised or lowered according to said logic, and wherein said spray bar has a plurality of spray nozzles attached thereto and is connected to rotation means for rotating said spray bar in a plane at right angles to the longitudinal axis of said spray bar relative to said spray bar's movable supporting structure, said rotation means also being controlled by output signals received from said logic control unit, thereby positioning the direction of said spray bar, and therefore of the nozzles attached thereto, at a predetermined, substantially constant perpendicular angle relative to the exposed upper vehicle surfaces that are substantially perpendicular to the sides of said vehicle, wherein further, said cells are said spaced apart laterally from the longitudinal axis of said spray bar, and from each other, and wherein still further, said supporting structure comprises two vertical stanchion members mounted on base members and being pivotable thereabout by pivot means governed by instruction logic contained in said logic control unit which is responsive to signals received by said unit from said photoelectric cells, said stanchion members being connected together at their upper ends by a support beam to form a horizontal top structure, said spray bar supporting structure extending from, and being pivotally attached to said top structure.

4,856,544

VESSEL AND SYSTEM FOR TREATING WAFERS WITH FLUIDE

Christopher F. McConnell, Gulph Mills, Pa., assignor to CFM Technologies, Inc., Lionville, Pa.

Continuation of Ser. No. 747,895, Jun. 24, 1985, Pat. No. 4,738,272, and a continuation-in-part of Ser. No. 612,355, May 21, 1984, Pat. No. 4,577,650. This application Nov. 25, 1987, Ser. No. 125,245
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—95 **5 Claims**



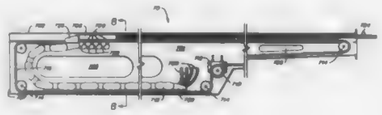
1. Apparatus comprising
A. a fluid flow line;
B. a treatment station comprising:
i. lateral walls disposed about a vertical axis along which fluids from said fluid flow line pass;
ii. a plurality of planar semiconductor wafers disposed within said walls;
iii. a sealable opening to permit the introduction and removal of said semiconductor wafers, and
iv. closure means for sealing engagement with said sealable opening;
C. a first inlet disposed beneath said treatment station for passing a semiconductor wafer treatment liquid from a first portion of said fluid flow line upwardly along a portion of said axis and about said wafers disposed within said walls; and
D. means for passing a fluid from a second portion of said fluid flow line downwardly along a portion of said axis about said wafers.

4,856,545

MULTI-LANGE TUBE BUNDLE CLEANER

Richard W. Krajicek, Houston, Tex., and Robert R. Cradeur, Sulphur, La., assignors to Serv-Tech, Inc., Houston, Tex.

Division of Ser. No. 773,642, Sep. 9, 1985, Pat. No. 4,805,653. This application Nov. 7, 1988, Ser. No. 268,338
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—166 C **10 Claims**



1. Multi-lance cleaning means for use in cleaning tubes of a tube bundle including:
an elongate chambered frame having an elongate channeled lance housing extending along the top thereof;

a hollow manifold block slidably mounted in said lance housing;
a plurality of tube cleaning lances slidably longitudinally positioned in said lance housing, fluidly connected at their rear ends to the hollow of said manifold block and longitudinally alignable with a corresponding plurality of tubes of a tube bundle, the interiors of which are to be cleaned;
a plurality of flexible water hoses connectable with a pressured water supply means extending into the chamber of said elongate chambered frame and fluidly interconnected with the hollow of said manifold block;
a drag chain mounted in said chamber of said elongate frame and connected at its free end with said manifold block, said plurality of hoses being nested in said drag chain;
hydraulically actuatable power means operably connected with said drag chain for independently moving the same in response to hydraulic pressure; and
remotely actuatable control means operably connected with said power means for moving said drag chain in response to a signal to thereby simultaneously move said cleaning lances in response to movement of said drag chain.

4,856,546

ARRANGEMENT FOR UMBRELLA

Pentti Kummunsalo, Jännetie 1 E 34 B, SF-00370 Helsinki, Finland

Filed Feb. 19, 1988, Ser. No. 157,805
Claims priority, application Finland, Feb. 27, 1987, 870854
Int. Cl.[4] A45B *11/00*
U.S. Cl. 135—20 R **9 Claims**



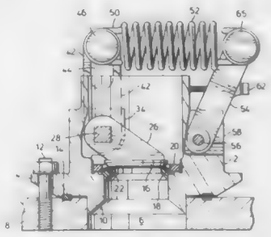
1. An improved umbrella, of the type having an elongated body, a shelter cover attached to one end of the body, said shelter cover adapted to be gathered around the body and put up around one end of the body in use, and a handle situated at a second opposite end of the body, wherein the improvement comprises:
(a) a fixing device including a collar mounted about said body and a pin mounted in said collar:
(b) an arm having first and second opposite ends, said arm pivotally attached to said pin at a fixing point, said fixing point closer to said lower surface of said arm than to said first end of said arm such that the first end of the arm includes an eccentric-like object with said fixing point, said arm being pivotal about said fixing point between a first carrying position and a second working position, such that in said working position said arm is supported substantially perpendicular to said umbrella body and said arm first end abuts said body preventing linear displacement of said arm with respect to said body by means of said eccentric-like object as a result of collaboration of the arm, the collar and the body of the umbrella and said arm being substantially parallel to said umbrella body in said carrying position, and said fixing device movable along said body.

4,856,547

PRESSURE RELIEF VALVE

Alberto Solaroli, P.O. Box 2717, Station F, Scarborough, Ontario, Canada M1W 3P3

Filed Feb. 3, 1989, Ser. No. 306,300
Int. Cl.[4] F16K *17/06, 17/38*
U.S. Cl. 137—73 **10 Claims**



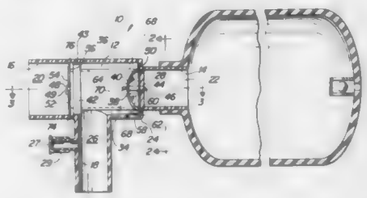
1. In an emergency pressure relief valve for a vessel containing pressurised fluid comprising a valve body defining a valve passage through the body from a first end communicating with the interior of the vessel to a second end communicating with the ambient atmosphere, a valve seat within and surrounding the passage, a flap valve, a shaft supporting the flap valve for rotation about an axis perpendicular to a longitudinal axis of the passage between a first position closing the passage and in fluid tight engagement with the valve seat and a second position within the body in which it does not substantially obstruct the passage, and spring means acting between the shaft and the body to urge the flap valve into said first position with a torque sufficient to retain the flap valve in said first position when the pressure difference between the first and second ends of the passage is less than a predetermined value; the improvement wherein said spring means includes at least one spring disposed for exposure to the thermal ambience of the vessel to which the valve is applied, the spring being made of a material which loses its spring temper on exposure to a thermal ambience likely to result in substantial weakening of walls of the pressure vessel, whereby substantially to reduce the closing torque applied by said spring means to the valve after exposure of the spring to such a thermal ambience.

4,856,548

RESUSCITATION VALVE

Bernard R. Paluch, 1607 Cedar La., Mount Prospect, Ill. 60056

Filed Mar. 10, 1988, Ser. No. 166,207
Int. Cl.[4] A62B *9/02*
U.S. Cl. 137—102 **22 Claims**



1. A resuscitation valve of the non-rebreathng type for forcing gas into the lungs of a person under pressure, said valve comprising:
a valve housing, said housing defining a chamber, an inlet port and a patient port in communication with said chamber, and an exhaust port;
an exhaust passage located within said housing having a first end in closed communication with said exhaust port and

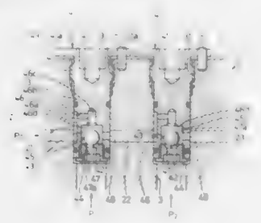
a second end communicating said passage with said chamber;
a first valve seat between said exhaust port and said passage;
a first valve element comprising a thin resilient membrane having at least its center fixed relative to said housing and positioned to occlude said exhaust port by sealingly contacting said first valve seat in response to negative pressure in said patient port;
a second valve seat between said inlet port and said chamber;
a third valve seat arranged about the second end of said passage and located opposite said first valve seat;
a second valve element comprising a thin, relatively flat, and resilient membrane having at least its center fixed relative to said housing and positioned to occlude said inlet port by sealingly contacting said second valve seat with an outer portion of said second valve element when pressure in said patient port exceeds pressure in said inlet port and occlude said second end of said exhaust passage when positive pressure in said inlet port exceeds positive pressure in said exhaust port be sealingly engaging said third valve seat with an outer portion of said second valve element;
and a chordal member extending parallel to said second valve element and positioned for contact with said second valve element such that said second valve member is bent about said chordal member when said second valve element occludes at least one of said inlet port and said second end of said passage.

4,856,549

SHUTTLE VALVE DEVICE

Katsumi Ueno, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1989, Ser. No. 298,970
Claims priority, application Japan, Feb. 22, 1988, 63-37419
Int. Cl.[4] F16K *11/10*
U.S. Cl. 137—112 **4 Claims**



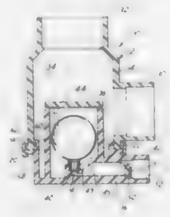
1. A shuttle valve device comprising:
(a) a device body formed by a single block, said device body having a communication passage extending straight and a plurality of fitting bores, each fitting bore extending straight from an outer surface of said block toward said communication passage and being intersected with the same, the fitting bore having a forward end portion extending beyond said communication passage, the forward end portion of the fitting bore serving as a pressure introducing section; and
(b) a plurality of shuttle valves inserted respectively in said fitting bores in said device body so as to divide said communication passage into a plurality of passage sections, the arrangement being such that each of said shuttle valves compares pressure introduced through one of said passage sections located on one side of the shuttle valve with pressure introduced through the forward end portion of a corresponding one of said fitting bores, to select one of the pressures thereby leading the selected pressure to one of said passage sections located on the other side of the shuttle valve.

4,856,550

CONDENSATE TRAP ON A CONDENSING GAS-FIRED FURNACE

Jimmy C. Smelcer, Carrollton, Tex., assignor to Lennox Industries Inc., Carrollton, Tex.

Filed Mar. 30, 1988, Ser. No. 175,266
Int. Cl.[4] F16T *1/20*
U.S. Cl. 137—192 **10 Claims**



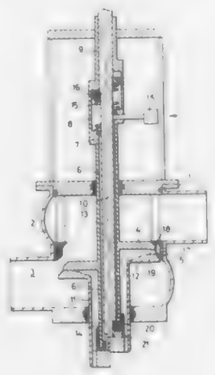
1. A condensate trap for a condensing pulsating combustion gas-fired furnace comprising a housing having an inlet adapted to be connected to a condensing heat exchanger, an outlet for flue gas and an outlet for condensate, said housing having a chamber therein, an opening defined in the chamber, a float valve in the chamber adapted to close the opening, and a drain orifice in the outlet for condensate forming a dam to prevent negative pressure from undesirably dislodging the float valve from the opening, said housing being comprised of two portions detachably connected to one another for allowing access for cleaning and inspection and also for allowing rotatable adjustment of one portion with respect to the other.

4,856,551

DOUBLE SEAT VALVE WITH TWO VALVE DISKS

Wolfgang Bräkelmann, Unna-Uelzen, Fed. Rep. of Germany, assignor to Holstein und Kappert GmbH, Dortmund, Fed. Rep. of Germany

Filed Nov. 21, 1983, Ser. No. 554,050
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1982, 3242947
Int. Cl.[4] F16K *11/20;* **B08B** *9/02*
U.S. Cl. 137—312 **7 Claims**



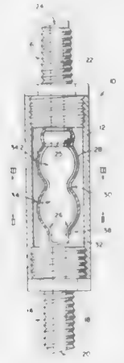
1. Double seat valve comprising a housing having an axis extending therethrough, a first valve disk and a second valve disk located within said housing and extending transversely of the housing axis from said first valve seat, means for independently moving said first and second valve disks in the direction of said housing axis relative to the respective said first and second valve seats between a first position in contact with the respective said valve seats and a second position spaced from the respective said valve seats, said first and second valve disks forming the opposite sides of a hollow leakage space, means within said housing for conveying leakage from said leakage space to the exterior of said housing, wherein the improvement comprises a wall surface extending continuously around the interior of said housing and between said first and second valve seats and forming the radially outer boundary of said hollow leakage space in the first position of said first and second valve disks, a seal member mounted in said first valve disk and disposed in sealing engagement with said first valve seat and with said wall surface when said first valve disk is in the first position, said first valve disk moves from the first position to the second position in the direction toward the second valve disk in the first position and is movable into contact with said second valve disk, and during the movement of said first valve disk into contact with said second valve disk, said seal member in said first valve disk remains in sealing contact with said wall surface and maintains a seal for said hollow leakage space.

4,856,552

FLOW REGULATING DEVICE

Lourens A. V. Hiemstra, Somerset West, South Africa, assignor to Silkbell Limited, Hong Kong, Hong Kong

Filed Nov. 10, 1987, Ser. No. 119,079
Claims priority, application South Africa, Nov. 12, 1986, [illegible]
Int. Cl.[4] G05D *7/01*
U.S. Cl. 137—497 **12 Claims**



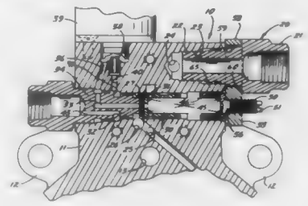
1. A flow regulating device which comprises means for defining an inlet port, an outlet port and a flow passage leading from the inlet port to the outlet port, said flow passage forming a first flow chamber and a second flow chamber downstream of the first flow chamber, the first flow chamber being partly defined by a first resiliently deflectable wall whose span across the width of the first flow chamber is substantially greater than the depth of the first flow chamber and which is configured such that fluid flowing through the first flow chamber, be Venturi action, causes deflection of a first deflectable wall inwardly of the first flow chamber to constrict the flow cross-section of the first flow chamber, and the second flow chamber being partly defined by a second resiliently deflectable wall whose span across the width of the second flow chamber is substantially greater than the depth of the second flow chamber and which is configured such that fluid flowing through the second flow chamber, by Venturi action, causes deflection of the second deflectable wall inwardly of the second flow chamber to constrict the flow cross-section of the second flow chamber.

4,856,553

PUMP WITH VALVE ADJUSTING SCREW

Frank L. Harwath, Rockford, Ill., assignor to Suntec Industries Incorporated, Rockford, Ill.

Filed Aug. 31, 1988, Ser. No. 238,416
Int. Cl.[4] F16K *17/06*
U.S. Cl. 137—509 **4 Claims**



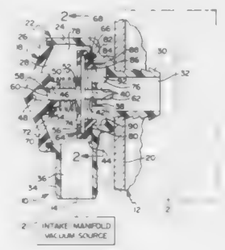
1. A pump having a body with a passage therein, a valve movable between open and closed positions with respect to said passage, a compression spring acting on said valve and biasing said valve toward one of said positions, and selectively adjustable mechanism for changing the force applied to said valve by said spring, said mechanism comprising a screw which is operable when turned to change the compression of said spring, said screw having an elongated externally threaded shank, a nut having a bore threadably receiving said shank, and means joined to and projecting radially from said nut and connected to said body so as to prevent rotation of said nut when said screw is turned, said means comprising a sleeve joined to said nut and having a bore spaced radially from the bore of the nut, and attaching means extending through the bore of said sleeve and connected releasably to said body.

4,856,554

VACUUM CHECK VALVE AND METHOD OF CONTROL

Donald L. Heffner, Miamisburg; Dennis G. Merical, Casstown, and David A. Homan, Centerville, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1988, Ser. No. 277,749
Int. Cl.[4] F16K *15/06*
U.S. Cl. 137—514 **3 Claims**



1. In a vacuum check valve assembly for a vacuum powered brake booster having:
a housing having a valve chamber formed therein, an inlet opening adapted to be connected to a vacuum powered brake booster, an outlet opening adapted to be connected to a source of vacuum pressure, and an annular valve seat surface in said valve chamber;

and a check valve in said valve chamber having a normal closed position preventing vacuum communication between said outlet opening and said inlet opening and an open position permitting vacuum communication between said outlet opening and said inlet opening;

said check valve having an axially guided disc including a disc body having a center and an annular rubberlike valve portion on the outer peripheral part of said disc body which has an annular bead seal, said bead seal having an annular valve seat-engagable surface for sealing said valve relative to said valve seat when said valve is in the closed position, said annular bead seal being axially spaced from said valve seat to permit air to flow therepast when said valve is in the open position;

the improvement comprising;

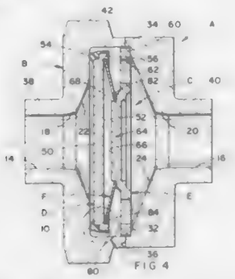
a plurality of circumferentially spaced feet formed on said rubberlike valve portion radially inward of said annular bead seal, said feet having valve engaging surfaces which extend axially beyond said annular bead seal so that said feet valve engaging surfaces engage said valve seat before said annular bead seal as said valve moved from the valve open position to the valve closed position, said feet being compressed axially by such valve movement to such an extent that said annular bead seal is in full annular sealing engagement with said valve surface and said valve is in the fully closed position, said feet during such compressive action performing as rate changing springs acting axially of said valve and as stabilizing members acting laterally of said valve.

4,856,555

CHECK VALVE

Theodore J. Gausman, Mentor, and Gary W. Scheffel, Streetsboro, both of Ohio, assignors to Nupro Company, Willoughby, Ohio

Filed Sep. 1, 1988, Ser. No. 239,557
Int. Cl.[4] F16K *15/02*
U.S. Cl. 137—543.17 **20 Claims**



1. A check valve comprising:

first and second body portions which define a valve chamber;

an inlet and an outlet communicating with said valve chamber;

a valve element received in said valve chamber for selective movement in response to pressure differentials;

a stop member received in said valve chamber adapted for operative engagement with said valve element to limit opening movement thereof;

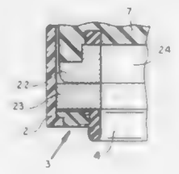
a guide member interposed between said valve element and stop member for urging said valve element to a closed position, a radially inner portion of said guide member being secured to a radially inner portion of said stop member and a radially outer portion of said guide member engaging a radially outer portion of said valve element.

4,856,556

WATER MIXING VALVE, ESPECIALLY FOR A SANITARY FIXTURE

Kurt Mennigmann, Fröndenberg, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany

Filed Nov. 16, 1988, Ser. No. 272,532
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1987, 3738854
Int. Cl.[4] F16K *11/078*
U.S. Cl. 137—625.4 **5 Claims**



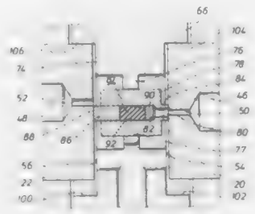
1. In a water mixing valve with a housing or cartridge insertable in a sanitary fixture, said housing or cartridge comprising a cuplike casing and a base member having a plurality of throughgoing water passages, said water mixing valve having at least one valve seat disk held substantially fixed therein and a control disk movable by an operating member mounted on said valve seat disk and sealing members made from a flexible rubber material positionable in said water passages for providing a seal between said valve seat disk and said sanitary fixture, the improvement wherein each of said sealing members are undetachably attached to said base member in the vicinity of a wall of said base member forming an opening to one of said water passages by means of a plurality of peripheral flanges formed as part of said sealing member on lateral sides thereof arranged so that said flanges surround an inwardly protruding section of said wall.

4,856,557

SLIDING METAL SEAL VALVE MECHANISM

Richard R. Watson, Missouri City, Tex., assignor to Gilmore Valve Company, Houston, Tex.

Filed Mar. 20, 1989, Ser. No. 325,537
Int. Cl.[4] F16K *3/18*
U.S. Cl. 137—625.25 **20 Claims**



1. A high pressure, low friction slide valve mechanism, comprising:

(a) a valve body forming a valve chamber and having spaced parallel sealing surface defined within said valve chamber, said valve body further defining flow passages in communication with said valve chamber;

(b) a seal carrier being in linearly movable relation with said valve body and having a portion thereof being linearly movable within said valve chamber;

(c) a seal cylinder being supported for rockable movement by said seal carrier and forming a transverse passage extending therethrough and having a sealing portion at one end thereof being disposed in sealing engagement with one of said sealing surfaces and located for registry with one of said flow passages;

(d) a seal rod being supported within said transverse passage and having an end surface thereof disposed in sealing engagement with the other of said sealing surfaces and located for registry with another of said flow passages; and

(e) a seal packing being located within said transverse passage and having engagement with the opposite end of said seal rod, said seal packing establishing a seal within transverse passage and transmitting pressure induced force to said opposite end of said seal rod.

4,856,558

FLAPPER CONTROL VALVE

Peter Kardos, Longmeadow, Mass., assignor to Gas Research Institute, Chicago, Ill.

Filed Aug. 5, 1988, Ser. No. 229,129
Int. Cl.[4] F16K *15/18*
U.S. Cl. 137—625.33 **10 Claims**



1. A one-directional flapper control valve comprising: a valve housing having at least one inlet fitting and at least one flat side, at least one valve port plate sealably secured to said at least one flat side of said valve housing, each said valve port plate having at least one valve port plate through hole;

at least one back plate, each said back plate having at least one back plate through hole, said back plate mounted in an open position relative to and at a distance from said valve port plate, in said open position said at least one valve port plate through hole in communication with said at least one back plate through hole; and

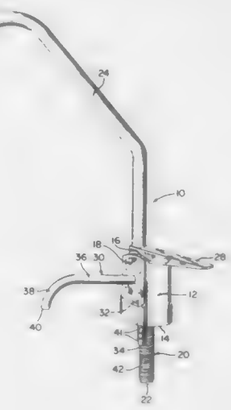
closing means for closing a gap between said back plate and said valve port plate thereby sealing the communication between said at least one valve port plate through hole and said at least one back plate through hole, said closing means further comprising a plurality of ring flappers mounted between each said valve port plate and a corresponding said back plate, in a closed position of said back plate with respect to said valve port plate each said ring flapper seating against and between said valve port plate and said back plate closing communication between each said back plate through hole and each said valve port plate through hole, solenoid means and control means for switching the flapper control valve between said open position and said closed position.

4,856,559

FAUCET PROVIDING AND UTILIZING AIR GAP

Mitchell Lipshultz, Ft. Lauderdale, and Alfred J. Lipshultz, Cocount Creek, both of Fla., assignors to Aquathin Corp., Ft. Lauderdale, Fla.

Continuation-in-part of Ser. No. 842,165, Mar. 21, 1986, Pat. No. 4,759,844. This application Jul. 6, 1988, Ser. No. 215,862
Int. Cl.[4] E03C *1/10*
U.S. Cl. 137—801 **1 Claim**



1. A carafe-type faucet arrangement for use in a brinewater system and for detachable connection to a horizontal surface, said carafe-type faucet arrangement comprising in combination:

a body having a lower end and an upper end and an intermediate portion having a sidewall therebetween, first and second independent liquid conduit systems for handling first and second liquids respectively, said first and second liquid conduit systems passing through said body in spaced parallel relationship to each other;

said first conduit system including a lower tubular portion entering said body at the lower end thereof and said lower end forming a liquid inlet end, said first conduit having an upper tubular portion and forming a liquid outlet end, said first conduit system having an intermediate portion within said intermediate portion to provide a passage between said lower and said upper tubular portions, and a handle operatively connected to a valve in said passage and movable between a first position in which said passage is closed and a second position in which said passage is open to permit said first liquid to pass through said first conduit system;

said second conduit system being an unobstructed tube having a lower tubular portion entering said lower body end and having a liquid inlet end, said second conduit system including a straight upper portion passing through said body sidewall and leading to a liquid outlet end above said lower end;

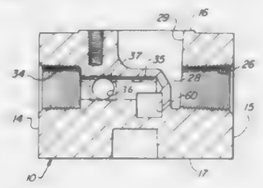
said lower tubular portion of said first conduit system connectable to a source of said first liquid and said lower tubular portion of said second conduit system being connectable to a source of said second liquid, the lower tubular portion of said first conduit system being externally threaded and said faucet being mountable onto a horizontal surface so that said lower tubular portion of said first conduit system may extend through a hole in said horizontal surface and be detachably connected thereto.

4,856,560

VALVE BASE WITH INTEGRAL FLOW CONTROL VALVES AND COMMON EXHAUST PASSAGE

James A. Neff, 2584 Amberly Rd., Birmingham, Mich. 48322, and Richard A. Fagerlie, 7291 Dunbrook, West Bloomfield, Mich. 48322

Filed Dec. 5, 1988, Ser. No. 280,307
Int. Cl.[4] F10K 77/00
U.S. Cl. 137—884 3 Claims



1. A four port, individual, valve base for a fluid pressure valve system, characterized by:
(a) said valve base having a substantial rectangular configuration with top, bottom, front side, rear side, and end surfaces;
(b) said valve base having an inlet pressure port formed in one of the valve base surfaces, which communicates with an inlet pressure passage means in the valve base that terminates at the top surface of the valve base;
(c) said valve base having a pair of cylinder ports formed in another of the valve surfaces, which communicate with separate cylinder supply and return passages in the valve base that terminate at the top surface of the valve base;
(d) said valve base having an exhaust outlet port formed in one of the valve surfaces, which communicates with a common outlet exhaust passage in the valve base;
(e) said valve base having a pair of internal inlet separate exhaust passage means, each of which has a first end communicating with the common exhaust outlet passage and a second end that terminates in an exhaust inlet port at the top surface of the valve base;
(f) said valve base having an electrical junction box formed in one end thereof; and,
(g) a pair of flow control valves mounted in the opposite end of the valve base and operatively united with said pair of internal inlet separate exhaust passage means, for controlling the flow of fluid exhausting through said pair of internal inlet separate exhaust passage means and into said common outlet exhaust passage and out said exhaust outlet port.

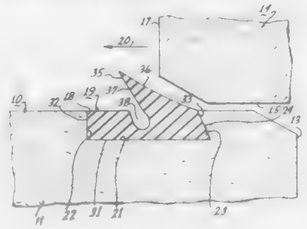
4,856,561

SEAL CONSTRUCTION FOR BELL AND SPIGOT PIPE

Joseph P. Zicaro, Corona, Calif., assignor to Hydro Conduit Corporation, Corona, Calif.

Filed Nov. 10, 1987, Ser. No. 119,143
Int. Cl.[4] F16L 9/18, 21/02
U.S. Cl. 138—109 1 Claim

1. An assembly comprising:
a pipe section of cementitious material having an integral bell end portion adapted to receive a spigot portion of another pipe section;
the bell portion terminating in a bell end having a radially inwardly facing seal groove;
said groove having axially spaced end walls with at least a major portion of the end wall nearer the bell end being inclined away from the bell end as it extends radially inwardly to at least partially define a ledge overhanging a part of said groove;
the other of said end walls extending substantially perpendicular to the longitudinal axis of the bell portion;
said groove having an annular cylindrical wall extending between said end walls;
a sealing ring in said groove and having a first annular surface facing generally radially outwardly to face the annular wall of the bell portion, a second annular surface extending radially and facing generally axially to face said other end wall of the bell portion, and an inclined annular surface facing the end wall nearer the bell end and interlocking therewith, said second annular surface and said inclined annular surface defining the opposite ends of the sealing ring and said first annular surface extending along the cylindrical wall from the second annular surface to the inclined annular surface;



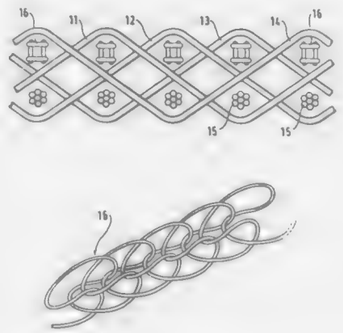
the sealing ring having an annular fin portion triangular in cross section which projects radially inwardly of the groove, the sealing ring having a leading surface contiguous with the apex of the triangular fin portion, the leading surface being inclined away from the bell end and extending radially inwardly; and
the sealing ring having an annular space which opens radially inwardly contiguous the fin portion and remote from said apex, said annular space extending into said groove, said fin portion being between the leading surface and the annular space.

4,856,562

PAPERMAKERS WET FELTS

Marcel Dufour, Sryrieix, France, assignor to Asten Group, Inc., Charleston, S.C.

Filed Mar. 11, 1982, Ser. No. 357,014
Claims priority, application France, Mar. 11, 1981, 81 04839
Int. Cl.[4] D03D 15/00; D21F 7/08, 1/00; B32B 5/02
U.S. Cl. 139—383 A 28 Claims



1. Papermarker's felt composed of a permeable fabric having interwoven warp yarns with weft yarns, characterized by the fact that at least certain of these yarns are made of compressible knitted yarns so as to give to the felt shock absorption

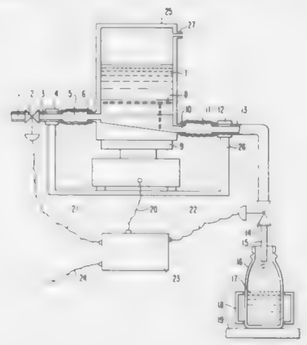
effect to vibrations between rolls and cylinders of the papermachine and to postpone crushing.

4,856,563

METHOD AND APPARATUS FOR FILLING LIQUID INTO CONTAINERS

Shogo Yamaguchi; Kazunori Araki; Hisashi Tazuke; Masayuki Murasaki, and Hirofumi Ito, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 1, 1987, Ser. No. 91,955
Claims priority, application Japan, Sep. 8, 1986, 61-209686
Int. Cl.[4] B65B 1/04; G01G 13/00
U.S. Cl. 141—1 6 Claims



1. An apparatus for filling a predetermined weight of a liquid sequentially into each of a plurality of containers such as bottles, cans, or the like, said apparatus comprising:
a metering container having a liquid inlet for receiving liquid and a liquid outlet for discharging liquid;
weighing balance means, having placed thereon said metering container, for determining the weight of said metering container and any liquid therein and for generating signals representative thereof;
liquid feed control valve means, connected to said liquid inlet with a flexible pipe therebetween, for controlling the supply of liquid into said metering container;
liquid filling control valve means, connected to said liquid outlet with a flexible pipe therebetween, for controlling the discharge of liquid from said metering container;
conveyor means for sequentially positioning the containers beneath said liquid filling control valve means; and
control unit means, operatively connected to said weighing balance means and to said liquid feed control valve means and said liquid filling control valve means, for, in response to said signals generated by said weighing balance means, opening and closing said liquid feed control valve means to thereby regulate the weight of liquid supplied into said metering container, and opening and closing said liquid filling control valve means to thereby regulate the weight of liquid discharged from said metering container into a container positioned by said conveyor means beneath said liquid filling control valve means.

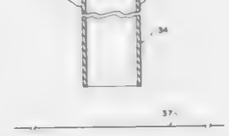
4. A method for filling a predetermined weight of a liquid sequentially into each of a plurality of containers such as bottles, cans, or the like, said method comprising:
providing a metering container, having a liquid inlet and a liquid outlet, placed on a weighing balance, and thereby determining the weight of said metering container and any liquid therein, and generating signals representative thereof;
providing a liquid feed control valve connected to said liquid inlet with a flexible pipe therebetween for controlling the supply of said liquid into said metering container, and providing a liquid filling control valve connected to said liquid outlet with a flexible pipe therebetween for controlling the discharge of said liquid from said metering container;
sequentially positioning said plurality of containers beneath said liquid filling control valve; and
controlling, in response to said signals generated by said weighing balance, opening and closing of said liquid feed control valve and thereby regulating the weight of said liquid supplied into said metering container, and opening and closing of said liquid filling control valve and thereby regulating the weight of said liquid discharged from said metering container into each said container positioned beneath said liquid filling control valve.

4,856,564

INDICATOR ASSEMBLY

Michael S. Obal, 2596 E. 2nd Ave., Vancouver, British Columbia, Canada V5N 1C6

Filed Mar. 7, 1988, Ser. No. 165,237
Int. Cl.[4] B67D 5/00
U.S. Cl. 141—95 29 Claims



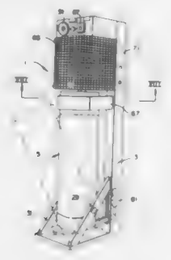
1. An indicator assembly for generating a sound when a liquid is flowing through a fill conduit for a storage tank, the assembly comprising:
(a) a body having first connection means for connection to a delivery conduit, second connection means for connection to the fill conduit for the storage tank, and a passageway for liquid extending between the first connection means and the second connection means;
(b) an open container connected to said body to receive liquid spilled in the vicinity of the body;
(c) an aspirator having an outer opening outside said body communicating with an inner opening positioned on the assembly to contact liquid
flowing from the delivery conduit when the assembly is installed on the tank, the outer opening being disposed inside said container to draw liquid from said container into the fill conduit; and
(d) sound generating means for generating a sound when air flows therethrough, the sound generating means being connected to the outer opening of said aspirator so that, when the liquid flows through the passageway for liquid, air is drawn through the aspirator and said sound generating means to generate said sound.

4,856,565

PROTECTIVE ENCLOSURE DEVICE FOR FILLING TANKS WITH COMPRESSED GAS

Manfred Schoefft, Munich, and Erich Lex, Weil/Schwabhausen, both of Fed. Rep. of Germany, assignors to Bauer-Kompressoren GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 85,746
Int. Cl.[4] B65B *1/04*
U.S. Cl. 141—97 23 Claims



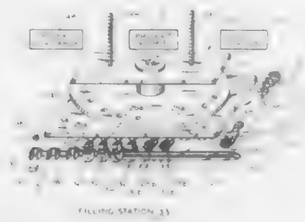
1. Protective enclosure device for filling tanks with compressed gas comprising a cylindrical body member defining a receiving space for a tank to be filled with highly pressurized gas, said cylindrical body member having an opening at one end through which said tank to be filled is insertable into said receiving space; closure means for closing said opening comprising a closure plug and locking means for securing said closure plug within said opening; and supply means extending through said body member for connecting a tank enclosed within said receiving space with a source of pressurized gas outside of said body member; wherein said cylindrical body member has a wall thickness sufficient to prevent rupturing thereof and to provide sufficient overall mass to prevent jumping thereof during uncontrolled rupturing within said receiving space of a tank containing gases pressurized up to 350 bar; and wherein said enclosure device is provided with vent means for venting of gases, released during said uncontrolled rupturing, from said receiving space at a controlled escape rate which will prevent damaging pressure increases in the environment surrounding said body member.

4,856,566

FAST ACTING LOADING SYSTEM FOR AUTOMATIC PACKAGING MACHINE

Steven Tisma, Chicago, Ill., assignor to Tisma Machine Corporation, Chicago, Ill.

Filed Mar. 4, 1988, Ser. No. 164,010
Int. Cl.[4] B65B *57/04*
U.S. Cl. 141—142 20 Claims



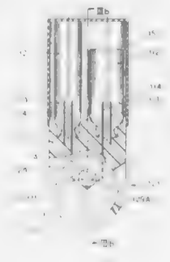
1. An automatic packaging machine comprising a source of product, transport means for successively moving measured volumes of product from said source toward a fill station, a plurality of transfer means also moving toward said fill station in synchronism with said transport means for receiving said measured volumes of product during the moving thereof, conveyor means moving in synchronism with said transport and transfer means for presenting a sequence of empty boxes to said fill station, said transfer means converging with said boxes at said fill station for dumping product from said transfer means into said boxes, means for sensing an absence of a box in said sequence of empty boxes on said conveyor means, and means responsive to said sensing means for diverting a particular one of said transfer means corresponding to the position in said sequence of said absent box, said diversion of said transfer means occurring before it reaches said fill station to prevent said dumping of said product into the position in said sequence where said box is absent.

4,856,567

LOADER-MIXER DEVICE FOR ENDERMIC INJECTORS

Pietro Cosmai, Gorizia, Italy, assignor to Sicim SpA, Romans D'Isonzo, Italy

Filed Jul. 22, 1987, Ser. No. 76,362
Claims priority, application Italy, Aug. 4, 1986, 83390 A/86
Int. Cl.[4] B65B *3/02;* A61M *5/30*
U.S. Cl. 141—302 7 Claims



1. Loader-mixer device for endermic injectors which is suitable to cooperate with a portable endermic injector momentarily in loading, by means of aspiration through an injection-aspiration nozzle included in an injection head of the portable endermic injector, the product to be injected, the loader-mixer device comprising:

at least one seating to lodge and position a respective phial together with two needles,

a socket to position the injection head, and

a selector assembly to connect one of the two needles to the injection head, in which the selector assembly comprises at least one delivery nozzle positioned eccentrically in said socket for cooperating with at least one angular limit position (A-B) of an injection head to be inserted in said socket, namely an injection head of a kind having an injection-aspiration nozzle which is not aligned with a central longitudinal axis of angular rotation of the endermic injector.

4,856,568

FUNNEL APPARATUS

Jimmy D. Murphy, 622 E. Rosewood, and Ted Hicks, 437 N. Main, both of Republic, Mo. 65738

Filed Oct. 30, 1987, Ser. No. 115,042
Int. Cl.[4] B67C *11/00;* B65B *39/02*
U.S. Cl. 141—337 1 Claim

1. A funnel apparatus comprising:

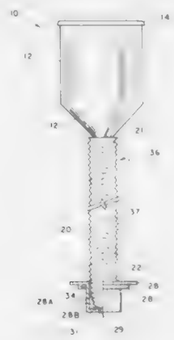
a cylindrical fluid receiving member having a bottom orifice;

a flexible, elongated extension member having an uppermost end attached to said receiving member adjacent said bottom orifice and having a lowermost end;

cap fastening means on said extension member lowermost end;

said cap fastening means including a hollow member having an upper vertically walled cylindrical portion and a lower tapered portion terminating in a bottom; securing means on said hollow member upper and lower portions;

an adapter cap adapted to engage within a fluid-receiving opening; said adapter cap comprising a cylindrical member having a cylindrical vertically walled interior cavity bounded by a flat bottom having a central bottom opening; said bottom opening having a diameter less than that of said cap fastening means bottom;



said cap fastening means inserted within said adapter cap cavity with at least a portion of said securing means engaging said adapter cap; said securing means allowing for removable engagement of the cap fastening means and adapter cap and

said cap fastening means bottom abutting said adapter cap flat bottom, whereby

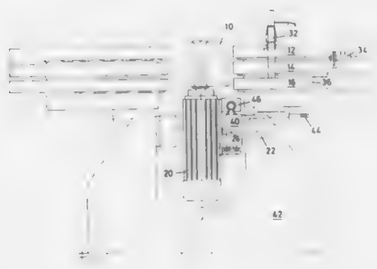
said adapter cap central bottom opening is disposed flat relative said cap fastening means bottom in a concentric manner relative said bottom opening.

4,856,569

MACHINES FOR CUTTING END JOINTS

Thomas Robson, Houghton-le-Spring, United Kingdom, assignor to Wadkin plc, Leicester, England

PCT No. PCT/GB87/00166, § 371 Date Sep. 12, 1988, § 102(e) Date Sep. 12, 1988, PCT Pub. No. WO87/06175, PCT Pub. Date Oct. 22, 1987
PCT Filed Mar. 11, 1987, Ser. No. 246,547
Claims priority, application United Kingdom, Apr. 11, 1986, 8608892
Int. Cl.[4] B27F *1/16*
U.S. Cl. 144—91 5 Claims



1. A machine for cutting end joints comprising a rotary cutter, having a plurality of coaxial cutting discs, spacer means between adjacent discs, means for effecting travel of said cutter along a pre-determined path on said machine, at least two work supporting tables provided adjacent the path of travel of said cutter, means for securing the work pieces on the tables, and adjustable means for presenting said tables at different preselected levels with respect to each other and to the machine.

4,856,570

MULTI-USE HANDBAG

Jim Rushing, and Linda Rushing, both of 577 S. Coast Hwy., Laguna Beach, Calif. 92652

Continuation of Ser. No. 926,388, Nov. 3, 1986, abandoned. This application Aug. 11, 1988, Ser. No. 231,639
Int. Cl.[4] A45C *3/06, 13/10, 13/26*
U.S. Cl. 150—107 13 Claims



1. A multi-configurational handbag comprising:

a main storage area having at least one upper edge, at least one lower edge and first and second flexible lateral edges extending between said upper and lower edges and joining therewith to form at least two upper corners and at least two lower corners;

connecting tabs located on each of said corners;

at least one fastener mounted on each lateral edge at a point between one of said upper corners and one of said lower corners;

said connecting tabs being selectively connectable to said fasteners, in direct abutting relationship therewith so as to cause repositioning of said corners with resultant pliable distortions of the main storage area of the handbag thereby rendering the handbag alternately covertible between at least four configurations, said four configurations comprising:

(a) a first configuration wherein no corner connecting tabs are fastened to fasteners on said lateral edges:

(b) a second configuration wherein two upper corner connecting tabs are fastened to fasteners on said lateral edges;

(c) a third configuration wherein two lower corner connecting tabs are fastened to fasteners on said lateral edges; and

(D) a fourth configuration wherein two upper corner connecting tabs and two lower corner connecting tabs are fastened to fasteners on said lateral edges.

4,856,571

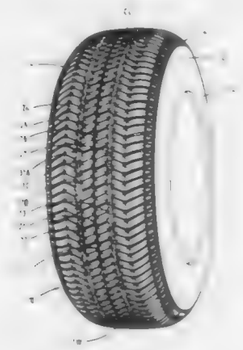
PNEUMATIC TIRE

Jean J. Collette, Bastogne, Belgium; Pierre M. J. Dauvister, Mersch, Luxembourg; Bernard Jonette, Fischbach, Luxembourg, and Claude Lardo, Luxembourg, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 60,594, Jun. 11, 1987, Pat. No. 4,807,679. This application Jul. 25, 1988, Ser. No. 223,838
Int. Cl.[4] B60C *11/11*
U.S. Cl. 152—209 R 8 Claims

1. A pneumatic tire comprising a ground contacting tread having two tread edges, at least three grooves in said tread extend circumferentially thereabout, a circumferentially extending series of decoupling sipes is located close to each tread edge axially outwardly of all of aid circumferentially extending grooves, a central one of said circumferentially extending

grooves being located midway between said tread edges and at least one circumferentially extending groove being disposed on each side thereof, said circumferentially extending grooves and decoupling sipes cooperating to divide the tread into at least four axially spaced circumferentially extending arrays of pairs of blocks, each of said blocks have only four sides all of which are straight, the blocks in each said pair being separated from one another by sipes extending in substantially axial directions and the blocks of each pair of blocks being separated from the circumferentially next adjacent pairs of blocks of the same array by grooves extending in directions oriented at substan-



tially the same acute bias angles with respect to the mid-circumferential plane of the tire, said grooves which are oriented at acute bias angles with respect to the mid-circumferential plane of the tire are in the form of first and second grooves having different widths, and the first and second grooves alternate circumferentially in each said array, the blocks in each pair of blocks being arranged axially offset relative to each other thereby forming walls of the circumferentially extending grooves having a series of spaced notches, each said circumferentially extending series of decoupling sipes separating one of said arrays of pairs of blocks from a circumferentially extending array of shoulder blocks.

4,856,572

TIRE WITH RADIAL CARCASS REINFORCEMENT PROVIDED WITH A PROTECTIVE RIB ON AT LEAST ONE SIDE WALL

Philippe Casanova, Clermont-Ferrand, and Jean-Louis Lateulere, Chamalieres, both of France, assignors to Compagnie Generale des Etablissements Michelin-Michelin et cie, Clermont-Ferrand Cedex, France

Filed Sep. 11, 1987, Ser. No. 96,608
Claims priority, application France, Sep. 30, 1986, 86 13723
Int. Cl.[4] B60C *13/00*
U.S. Cl. 152—454 **4 Claims**

1. A tire for off-road use on loading, earth-moving and transportation vehicles comprising a radial carcass reinforcement anchored to at least one bead wire in each bead, a crown reinforcement formed of at least two superimposed plies of cables parallel to each other in each ply and crossed from one ply to the next forming acute angles with the circumferential direction, two sidewalls, at least one of which is provided with a circumferential protective rib located radially substantially at the level of the largest axial width of the carcass reinforcement, and a tread connecting said sidewalls,

characterized by the fact that, with the tire viewed in cross section and mounted on its service rim and inflated to its service pressure without load, the protective rib

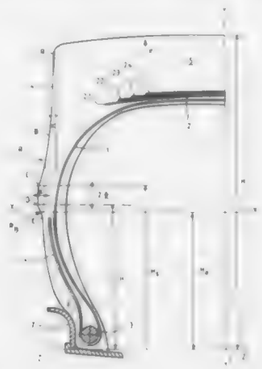
has a linear outer face CD forming an angle equal to $0° \pm 5°$ with a vertical plane perpendicular to the axis of the tire and delimited radially by an upper end C and a lower end D having heights H_s and H_i, respectively, such that

$$0.05H < H_s - H_i = 2k < 0.07H$$

with H_i between $H_e - 0.5k$ and $H_e + 0.5k$, H being the height of the tire, H_e being the height corresponding to the largest axial width of the carcass reinforcement and 2k being the length of the linear outer face CD,

and has a thickness e of between 0.5k and k;

the linear outer face CD of the rib being extended, on the one hand, radially outwards by a concave portion CB having a curvature radius R_H of between 10e and 45e and a curvature center located axially outside the tire, the concave portion CB being extended radially outwards by a linear portion BA forming an angle between 0° and 5° with a central vertical plane of the tire, A being a point on



the sidewall surface adjacent the surface of the tread, the tread surface having a transverse radius of curvature ρ at least equal to 1.5 times its circumferential radius of curvature, and, on the other hand, radially inwards by a concave portion DE having a curvature radius R_B of between e and 4e and a curvature center located axially outside the tire, the concave portion DE being extended radially inwards by a convex portion EF having a curvature center located axially inside the tire, F being the tangency point of the sidewall surface with a flange of the service rim;

said heights H, H_e, H_i and H_s being measured from the bead seat of the rim;

said thickness e being measured on the axis of symmetry of the linear outer face CD and being the distance between the linear outer face CD and an imaginary linear face BE representing the sidewall contour in the absence of the protective rib.

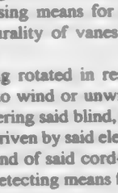
4,856,573

PNEUMATIC TIRE

Tuneo Morikawa, Hadano; Kazuyuki Kabe, and Shuichi Tsukada, both of Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 724,154, Apr. 18, 1984, abandoned. This application Sep. 15, 1987, Ser. No. 97,417
Claims priority, application Japan, Apr. 18, 1984, 59-76650
Int. Cl.[4] B60C *9/02*
U.S. Cl. 152—556 **1 Claim**

1. In a pneumatic tire which comprises bead portions, side wall portions, a tread portion and carcass layers of carcass cords and a carcass coat, the improvement comprising said carcass cords each consisting of fiber of raw aromatic polyamide yarn having a tensile strength of at least 150 kg/mm^2 and a Young's modulus of at least 3000 kg/mm^2, with a twisting angle of 31.3 to 39.3 degrees, the number of carcass cords per



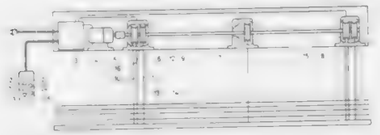
50 mm of carcass layer is 20 to 60 and wherein the carcass coat is rubber and has a 100% modulus of 30% to 70 kg/cm^2.

4,856,574

ELECTRIC BLIND APPARATUS

Katsuji Minami, Osaka; Shinichi Murata, Yao; Susumu Tsujimoto, Fujiidera; Yukinori Matuzaki, Yao; Shogo Yukawa, Osaka, and Susumu Osaka, Machida, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka and Kabushiki Kaisha Nichibei, Tokyo, both of, Japan

Filed Dec. 29, 1987, Ser. No. 139,024
Claims priority, application Japan, Dec. 29, 1986, 61-314183; Dec. 29, 1986, 61-314184; Dec. 29, 1986, 61-314185; Dec. 29, 1986, 61-314186; Dec. 29, 1986, 61-314187; Dec. 29, 1986, 61-314188; Dec. 29, 1986, 61-314189; Dec. 29, 1986, 61-314190; Jun. 3, 1987, 62-139544
Int. Cl.[4] E06B *9/30*
U.S. Cl. 160—168.1 **13 Claims**



1. An electric blind apparatus for raising/lowering a plurality of strip-shaped vanes forming a blind by driving an electric motor, said electric blind apparatus comprising:

an electric motor; a plurality of strip-shaped vanes;

a cord-like member for raising/lowering said plurality of vanes by driving force of said electric motor;

vane opening/closing means for simultaneously opening/closing said plurality of vanes by driving force of said electric motor;

lifting means being rotated in response to rotation of said electric motor to wind or unwind said cord-like member for raising/lowering said blind, said lifting means includes a rotary drum driven by said electric motor for winding or unwinding an end of said cord-like member;

rotational speed detecting means for detecting the rotational speed of the rotary drum;

command means for commanding raising/lowering and stoppage of said blind and opening/closing of said plurality of vanes; and

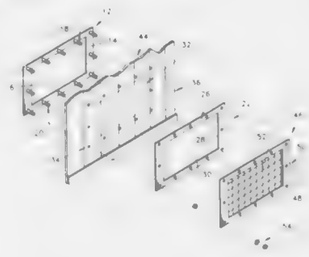
control means for driving said electric motor in response to a raising/lowering command from said command means to raise/lower said blind by said lifting means and driving said electric motor by an opening/closing command from said command means to open/close said plurality of vanes by said vane opening/closing means, said control means further including vertical position judging means for judging the vertical position of said blind by counting detecting output of said rotational speed detecting means.

4,856,575

WINDOW ASSEMBLY FOR SEGMENTED STRUCTURE

David F. Wells, 17006 Meekland Ave., Hayward, Calif. 94541

Filed Jun. 24, 1988, Ser. No. 210,833
Int. Cl.[4] A47G *5/00*
U.S. Cl. 160—353 **5 Claims**



1. A window assembly for a segmented structure having a series of passages therethrough comprising:

a. a first frame having a first border member surrounding a space, said first border member including a plurality of openings therethrough;

b. a second frame having a first border member surrounding a space, said first border member including a plurality of openings therethrough;

c. a plurality of elongated members each being capable of extending through one of said openings through, in order, said first border member, through one of the passages through the segmented edifice, and through one of said openings through said second border member;

d. first keeper means for holding each of said plurality of elongated members in a position through said first and second border members and the segmented structure and thereby being able to hold the first and second frames in respective positions to engage opposite sides of the segmented structure;

e. a third frame having a third border member surrounding a space said third border member including a plurality of openings therethrough, said third frame including a cross member extending across said space within said third border member, each of said elongated members extending through a respective one of said third border member openings; and

f. second keeper means for holding said third frame on said plurality of elongated members, said first and second keeper means each comprising a plurality of elements capable of frictionally engaging said plurality of elongated members to limit movement of said plurality of elongated members through the series of passages of the segmented structure.

4,856,576

ZIRCONIUM-CONTAINING COATING COMPOSITION

John R. Peterson, Salem, Oreg., assignor to Teledyne Industries, Inc., Albany, Oreg.

Filed Sep. 2, 1988, Ser. No. 240,001
Int. Cl.[4] B22D *41/02*
U.S. Cl. 164—495 **4 Claims**

1. A method of making a Zirconium ingot comprising the steps of:

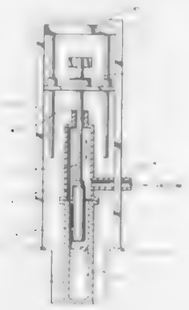
(a) forming a cylindrical consumable electrode from cylindrical compacts of sized Zirconium;

(b) providing a consumable electrode vacuum arc furnace into which said Zirconium electrode is fitted, said furnace including a water cooled Copper crucible for receiving the molten Zirconium during the operation of the furnace arc;

(c) providing a coating for the Copper crucible consisting of

Zirconium Oxide suspended in an aqueous basic gel of Zirconyl Nitrate and Ammonium Hydroxide, which coating composition is acidified before application to the Copper to a pH value of from about 3 to about 4;

(d) melting the consumable Zirconium compact electrode in



the vacuum arc melting furnace under conditions which will produce a melt of Zirconium in the coated Copper crucible; and

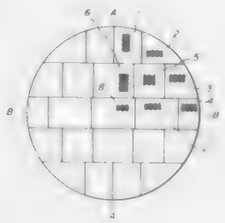
(e) cooling the melt to produce a Zirconium ingot whereby the Zirconium ingot has less than 15 ppm of adsorbed hydrogen in the surface of the ingot.

4,856,577

ROTARY REGENERATIVE HEAT EXCHANGING CERAMIC BODY

Masanori Katsu, Aichi, and Mikio Makino, Toyokawa, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Apr. 12, 1988, Ser. No. 180,789
Claims priority, application Japan, Apr. 17, 1987, 62-95688
Int. Cl.[4] F28D *19/04*
U.S. Cl. 165—8 6 Claims



1. A rotary regenerative heat exchanging ceramic body, comprising a plurality of ceramic honeycomb structure matrix segments joined to form a disk, each of said segments comprising a plurality of intersecting partition walls defining a plurality of cells having anisotropic Young's moduli in their cross-sectional planes;

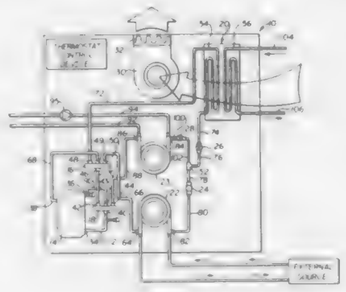
wherein said matrix segments are arranged such that directions in which the Young's modulus of the matrix segments is low are substantially coincident with circumferential directions of said disk at least at four locations near an outer circumference of said disk, and directions in which the Young's modulus of the matrix segments is high are substantially perpendicular to said circumferential directions.

4,856,578

MULTI-FUNCTION SELF-CONTAINED HEAT PUMP SYSTEM

David I. McCahill, Champion, Pa., assignor to Nepco, Inc., Monroeville, Pa.

Filed Apr. 26, 1988, Ser. No. 186,231
Int. Cl.[4] F25B *29/00*
U.S. Cl. 165—29 34 Claims



1. An improved heat pump unit for heating and cooling a conditioned space utilizing a recirculating refrigerant with potable water heating capability, said heat pump unit of the type having a compressor, a refrigerant-air heat exchanger, an external source-refrigerant heat exchanger interconnected to recirculate refrigerant and transfer heat from a low temperature reservoir to a higher temperature reservoir, wherein the improvement comprises:

a refrigerant-potable water heat exchanger adapted to be connected to a reservoir of potable water through inlet and outlet pipes for passage of potable water therethrough;

a valve means, when positioned for a potable water heating cycle, for evacuating refrigerant from said refrigerant-air heat exchanger and for circulating refrigerant from the compressor to said refrigerant-potable water heat exchanger to heat potable water passing therethrough, and for then circulating said refrigerant to the external source-refrigerant heat exchanger for return to said compressor, and when positioned for a cooling cycle, for evacuating refrigerant from said refrigerant-potable water heat exchanger and for circulating refrigerant from said compressor to the external source-refrigerant heat exchanger and then to the refrigerant-air heat exchanger for return to the compressor; and when positioned for a heating cycle, for evacuating refrigerant from said refrigerant-potable water heat exchanger and for circulating refrigerant from said compressor to the external source-refrigerant heat exchanger and then to the refrigerant-air heat exchanger for return to the compressor; and

a thermostat control device responsive to a temperature of the potable water reservoir and conditioned space for activation of said valve means from said hot potable water heating cycle position to said heating and cooling cycle position.

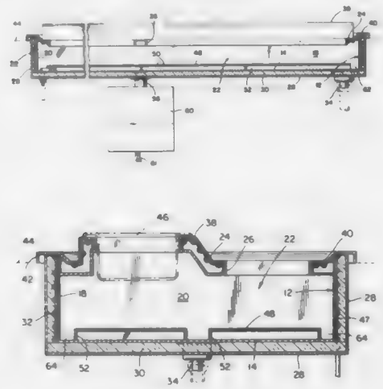
4,856,579

HOT AND COLD FROSTOP FOR FOOD AND SALAD BAR

John J. Wolfe, P.O. Box 497, Savannah, Tenn. 38372

Filed Apr. 22, 1988, Ser. No. 184,983
Int. Cl.[4] F25B *29/00*
U.S. Cl. 165—48.1 5 Claims

1. A hot and cold frostop unit for food and salad bars comprising a pan including a bottom wall and a peripheral wall enclosing a hollow cavity and a top for the pan, said top including at least one opening for supporting a food container, means in heat exchange relation to the top and peripheral wall for cooling the top and hollow cavity and to form frost on the upper surface of the top around the periphery of the opening and the food container supported therein when in a cold operational mode, a water heating unit communicated with the pan for circulating a quantity of water and heating the water to a desired temperature in relation to the cavity in the pan when in the hot operational mode with the water in the pan being in



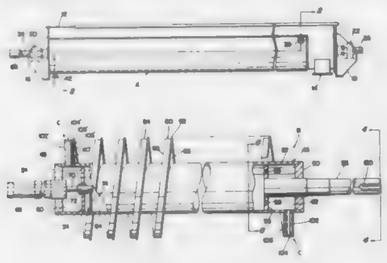
heat exchange relation to the food container supported in the top opening, and a baffle plate mounted in the pan in spaced relation to the bottom of the pan, said baffle having side and end edges, said baffle plate including a laterally extending flange engaging the bottom of the pan, said side and end edges being spaced from the peripheral wall of the pan, the water heating unit including an inlet and outlet in the bottom of the pan for circulating water with hot water entering the pan being evenly distributed by the baffle plate.

4,856,580

HEAT EXCHANGER

Richard A. Ley, Minneapolis, Minn., assignor to Berwind Corporation, Philadelphia, Pa.

Filed Oct. 30, 1987, Ser. No. 114,837
Int. Cl.[4] F28F *5/06*
U.S. Cl. 165—87 13 Claims



8. A heat exchanger comprising an elongated housing having an inlet and an outlet, a conveying screw rotatably mounted in said housing for conveying material therealong between said inlet and outlet, said conveying screw including a cylindrical body having opposite ends, a hollow interior and an outer surface, a tubular helical flight extending along said outer surface of said body and having opposite flight end portions, said helical flight defining a material engaging surface, said material engaging surface having an inner surface portion positioned closely adjacent said outer surface of said cylindrical body, and said material engaging surface extending outwardly from said inner surface portion whereby material can be conveyed upon screw rotation, attachment means for attaching said flight end portions to said body in communication with said hollow interior, said tubular helical flight being substantially unattached to said body intermediate said flight end portions, and means for introducing heat exchange medium to said hollow interior for transfer through said tubular helical flight.

4,856,581

HEAT EXCHANGER UNIT FORMED OF A PLURALITY OF MODULAR UNITS INCLUDING CONNECTION COUPLERS

Gennaro Santoro, 102 via Abbrescia, I-70121 Bari BA, Italy

PCT No. PCT/IT87/00077, § 371 Date Apr. 5, 1988, § 102(e) Date Apr. 5, 1988, PCT Pub. No. WO88/01039, PCT Pub. Date Feb. 11, 1988
PCT Filed Jul. 31, 1987, Ser. No. 189,243
Claims priority, application Italy, Aug. 8, 1986, 48373 A/86
Int. Cl.[4] F24H *3/00*
U.S. Cl. 165—130 18 Claims



1. Heat exchanger unit for the climatization of buildings, in which an extruded tubular element of radiator of an aluminum alloy adapted for extrusion, has an inner longitudinal canal and outer fins, die-cast T-shaped header elements of die-casting aluminum alloy are mounted by means of an interference engagement on each end of the tubular element in fluid communication with the inner longitudinal canal of said tubular element, and connection couplers sealingly connect headers of adjacent units to each other to form a heat exchanger characterized in that

the header element comprises on the outer surface of the vertical branch of T shape, an abutment for an abutment engagement with an end portion of the tubular element, a circular groove adjacent to said abutment and an O-ring gasket housed into said circular groove, the tubular element having the end portion thereof tapered and bent which is sealingly engaged to said O-ring;

said header element further comprises, projecting from the outer surface of the horizontal branch of the T shape, a plurality of pins for engagement with said couplers;

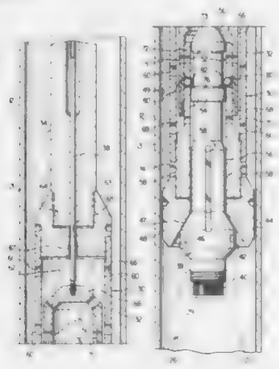
and said connection coupler is provided with cam slots with an open end at the end of said coupler and an inclined flank directed to the middle of the coupler from said open end, for a cam force fit of said pins on the header elements and said flank on the cam slots, in a bayonet coupling of header elements of adjacent units.

4,856,582

MOTORIZED WELLBORE FISHING TOOL

Lonnie E. Smith, Allen, and Thomas Schasteen, Garland, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 20, 1988, Ser. No. 221,831
Int. Cl.[4] E21B *31/18*
U.S. Cl. 166—98 7 Claims



1. A fishing tool for retrieving an article located in a wellbore, wherein said fishing tool may be lowered into said wellbore by means connected to one end of the fishing tool, said fishing tool comprising:

an elongated tubular body;

an inner sleeve member secured to said body and extending axially within said body, said inner sleeve member including an axially extending central bore and a plurality of circumferentially spaced openings formed on said sleeve member and opening into said bore;

a ball key disposed within each of said openings and movable at least partially into said bore in locking registration with a fishing head connected to said article;

an outer sleeve member disposed in sleeved relationship around said inner sleeve member and movable axially between first and second positions with respect to said inner sleeve member, said outer sleeve member being operable to prevent, in said first position, radial outward movement of said ball keys out of said bore, said outer sleeve member including recess means formed thereon such that in said second position of said outer sleeve member said recess means is adjacent to said circumferentially spaced openings to allow limited radial outward movement of said ball keys; and

means for axially moving said outer sleeve member between said first and second positions for engaging and releasing said fishing head with respect to said tool.

4,856,583

APPARATUS FOR TREATING WELL BORES

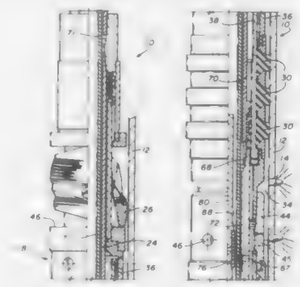
Donald R. Greenlee, Cedar Hill, and Willie C. Skinner, Sr., Midland, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

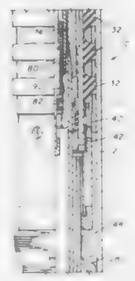
Filed Nov. 20, 1987, Ser. No. 123,332
Int. Cl.[4] E21B *33/124, 43/12*
U.S. Cl. 166—127 5 Claims

1. Apparatus for treating well bores arranged to be positioned in the well bores on tubing and the like, said apparatus comprising:

packer means having an elongated, hollow, mandrel extending axially therethrough, first and second spaced, deformable packer elements encircling said mandrel for isolating a portion of the well bore, gripping slips for locking said packer means in said wellbore, said mandrel having first ports therein providing communication between the interior of said mandrel and the well bore above the packer elements, and second ports located therein between said packer elements and providing communication between the interior of said mandrel and the well bore;

hollow, elongated valve means including a valve seal member slidingly disposed within said mandrel for movement between a first open position permitting fluid flow through said second ports to said isolated portion, a second closed position preventing fluid flow through said second ports to said isolated portion and a third circulate position permitting circulation of fluid through said first





ports, said valve seal member being movably located within said mandrel and movable therein among said open, closed, and circulate positions and having spaced annular seal members thereon in sliding and sealing engagement with said mandrel and having a port therein between said seal members for communicating with said second ports in said mandrel when said valve means is in the open position; and,

operating means for setting said gripping slips and deforming said packer elements, operating means for moving said valve means, and operating means for releasing said gripping slips and said packer elements.

4,856,584

METHOD FOR MONITORING AND CONTROLLING SCALE FORMATION IN A WELL

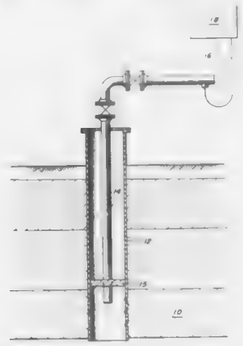
David S. Seidner, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Aug. 30, 1988, Ser. No. 238,939
Int. Cl.[4] E21B *41/02, 43/00, 47/00*
U.S. Cl. 166—250 4 Claims

1. A method for inhibiting formation of scale in the flow system of a well which is subject to formation of radioactive scale comprising the steps of:

(a) applying a scale inhibitor treatment to the flow system;

(b) monitoring the radiation level at a point in the flow system which is subject to formation of said scale; and



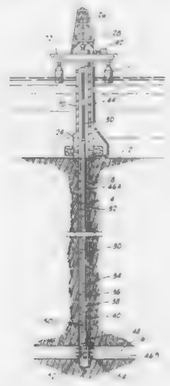
(c) upon obtaining a radiation level at said point in an amount greater that the background level during normal operation, applying additional scale inhibitor treatment to said system.

4,856,585

TUBING CONVEYED SAMPLER

Kevin M. White, Tequesta, Fla., and Harold K. Beck, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 16, 1988, Ser. No. 209,116
Int. Cl.[4] F21B *49/08*
U.S. Cl. 166—250 20 Claims



1. A sampler apparatus for use in a well, comprising:

a housing having a full opening bore therethrough; and

a first removable sample chamber means for trapping a well fluid sample, said sample chamber means being removably disposed in said housing in a location such as to avoid restricting said full opening bore regardless of whether said sample chamber means is in an open or closed position, said sample chamber means further having an outside diameter after removal no greater than one-half a difference between an outside diameter of said housing and a diameter of said full opening bore.

4,856,586

METHOD FOR IMPARTING SELECTIVITY TO OTHERWISE NONSELECTIVE POLYMER PROFILE CONTROL GELS

Craig H. Phelps, Carrollton, and E. Thomas Strom, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 2, 1988, Ser. No. 201,239
Int. Cl.[4] E21B *43/22, 43/24, 33/138*
U.S. Cl. 166—270 21 Claims

1. A method for sequential gellation in a formation having varying permeabilities comprising:

(a) making an aqueous solution containing a composition sufficient to form a first gel in an amount sufficient to enter pores in a formation's zone of greater permeability which gel forms ex-situ and is shear thinning;

(b) allowing sufficient time for the composition to form a gel ex-situ;

(c) placing into said first gel an aqueous solution containing a precursor system for a second gel which forms in-situ and make a gel substantially more resistant to formation conditions than said first gel; and

(d) injecting said aqueous solution containing said first gel into said zone of greater permeability where said solution enters the zone of greater permeability and subsequentially forms a second solid gel substantially more resistant to formation conditions than said first gel.

14. A method for gellation of a formation having zones of varying permeability comprising:

(a) placing into an aqueous solution a first composition sufficient to form ex-situ a size selective shear thinning first gel which comprises

(i) a Xanthan biopolymer;

(ii) sodium hydroxide, and

(iii) a polyvalent metal ion

(b) placing into said aqueous solution a second composition sufficient to from a second in-situ gel which is substantially more resistant to formation conditions than said first gel which comprises

(i) a polyacrylamide polymer,

(ii) an organic cross-linker,

(iii) an initiator, and

(iv) a polymerization retarder

(c) allowing said aqueous solution sufficient time to form the ex-situ gel; and

(d) injecting said aqueous solution containing said gel into the formation where it enters a zone of greater permeability, reheals and thereafter forms a solid gel substantially more resistant to formation conditions than said first gel.

4,856,587

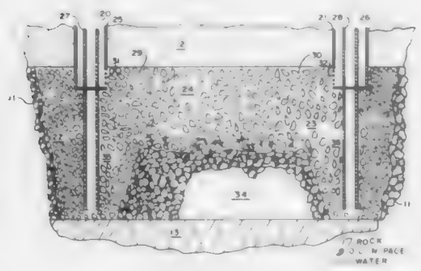
RECOVERY OF OIL FROM OIL-BEARING FORMATION BY CONTINUALLY FLOWING PRESSURIZED HEATED GAS THROUGH CHANNEL ALONGSIDE MATRIX

Jay P. Nielson, 3490 Monte Verde Dr., Salt Lake City, Utah 84109

Filed Oct. 27, 1988, Ser. No. 263,433
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—272 12 Claims

1. A thermal method for producing oil from a natural reservoir of oil distributed throughout an underground oil-bearing formation, comprising the steps of continually flowing a pressurized heated non-aqueous gas along and in heat exchange relationship with a sensible boundary of said reservoir so as to impart sufficient heat and dissolve sufficient gas into oil-in-place which is in close proximity to said boundary of said reservoir to mobilize said oil-in-place by decreasing its viscos-

ity; effecting flow of said mobilized oil into one or more collection reservoirs; producing said oil from said one or more collection reservoirs; and extracting at least some of the gas with reduced heat content from said formation.



4,856,589

SELECTIVE PERMEABILITY REDUCTION OF OIL-FREE ZONES OF SUBTERRANEAN FORMATIONS

John K. Borchardt, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 16, 1988, Ser. No. 194,658
Int. Cl.[4] E21B *43/22, 33/138, 43/267*
U.S. Cl. 166—273 **22 Claims**

1. A process for enhancing control over the mobility of fluids in a substantially oil-free zone of a subterranean formation, which comprises introducing into the zone a composition comprising (a) water, (b) a component selected from the group consisting of supercritical carbon dioxide and gaseous nitrogen, carbon dioxide and C_1 to C_3 hydrocarbons, and mixtures thereof, and (c) one or more polysaccharide surfactants of the formula $RO(R^1O)_xSacc_z$, wherein R is a monovalent organic radical having a carbon number in the range from about 7 to 24, R^1 represents a divalent hydrocarbon radical containing from about 2 to about 4 carbon atoms, x is a number having an average value in the range from 0 to about 12.0, and $Sacc_z$ represents an average number z between about 0.7 and 10.0 of moieties derived from reducing saccharides containing 5 or 6 carbon atoms.

14. An improved process for the recovery of oil from a subterranean formation having one or more aqueous zones, substantially free of oil, and one or more zones of high oil saturation, which comprises injecting into the formation a drive fluid which has mobility into and through the high oil saturation zones, wherein the improvement comprises

(a) a step for introducing into one or more of the aqueous zones of the formation a composition comprising (i) water, (ii) a component selected from the group consisting of supercritical carbon dioxide and gaseous nitrogen, carbon dioxide and C_1 to C_3 hydrocarbons, and mixtures thereof, and (iii) one or more polysaccharide surfactants of the formula $RO(R^1O)_xSacc_z$, wherein R is a monovalent organic radical having a carbon number in the range from about 7 to 24, R^1 represents a divalent hydrocarbon radical containing from about 2 to about 4 carbon atoms, x is a number having an average value in the range from 0 to about 12.0, and $Sacc_z$ represents an average number z between about 0.7 and 10.0 of moieties derived from reducing saccharides containing 5 or 6 carbon atoms, which is followed by

(b) a step for injecting the drive fluid into the formation.

4,856,591

GAS FLOODING WITH DILUTE SURFACTANT SOLUTIONS

Myron I. Kuhlman; John K. Borchardt, both of Houston, and Andrew H. Falls, Sugarland, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 30, 1988, Ser. No. 238,634
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—273 **43 Claims**



1. A process for recovering oil from a reservoir, penetrated by at least one injection well and one production well, comprising:

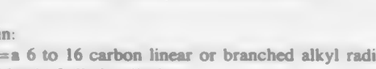
(a) formulating an aqueous surfactant solution such that the surfactant is present in the solution at a concentration less than its critical micelle concentration;

(b) injecting the surfactant solution into the reservoir; and

(c) injecting a gas to displace the surfactant solution through the reservoir to assist in the recovery of hydrocarbons at the production well.

38. A process for recovering oil from a reservoir, penetrated by at least one injection well and one production well, comprising:

(a) formulating two aqueous surfactant solutions wherein the first surfactant solution contains surfactant that is present in the solution at a concentration that is more than its critical micelle concentration and wherein the second surfactant solution contains surfactant that is present in the solution at a concentration that is less than its critical micelle concentration, and wherein the second surfactant is selected from the group consisting of:



Wherein:

R=a 6 to 16 carbon linear or branched alkyl radical or blend of alkyl radicals

R^1=ethyl or i-propyl group

R^2=ethyl or i-propyl group

R^3=OH when R^4=CH_2, or H when R^4 is absent

R^4=CH_2 when R^3=OH, or absent when R^3=H

M=sodium, potassium, or ammonium

x=0–9

y=0–9

n=0–1

(b) injecting the surfactant mixture solution into the reservoir;

(c) injecting carbon dioxide gas into the reservior;

(d) injecting the second surfactant solution into the reservoir;

(e) injecting the carbon dioxide gas into the reservoir;

(f) repeating steps (d) and (e) at least once; and

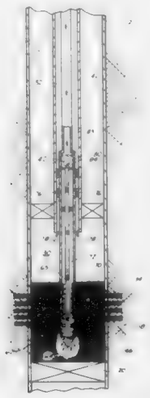
(g) displacing the carbon dioxide gas within the reservoir with a brine solution, wherein the volumetric ratio of second surfactant solution plus brine solution to carbon dioxide gas is from about 5:1 to about 20:1.

4,856,590

PROCESS FOR WASHING THROUGH FILTER MEDIA IN A PRODUCTION ZONE WITH A PRE-PACKED SCREEN AND COIL TUBING

Mike Caillier, 261 Rees St., Breaux Bridge, La. 70517

Filed Nov. 28, 1986, Ser. No. 935,742
Int. Cl.[4] E21B *19/22, 43/04, 43/08*
U.S. Cl. 166—278 **5 Claims**



1. In a production zone, in which there is located an exterior production casing, having a plurality of perforations defining a production flow space from the zone into the interior of the casing, and an interior production tubing for allowing the production flow into the production casing to flow up through the production tubing to the surface, wherein formation sand has become mixed with the hydrocarbons produced, a process for washing through and setting a pre-packed system across the production zone, to prevent further intrusion of formation sand into the external production casing, the process comprising the following steps:

a. washing to the surface formation sand situated within the production casing at the level of the production zone;

b. inserting coil tubing down the production tubing within the production casing to the depth of the production zone;

c. lowering down through the coil tubing into the collection zone a mass of spherical media, having an absolute diameter of not less than 5 times greater the than diameter of 50% of the formation sand in the production zone;

d. filling the space within the production zone and any perforations within the wall of the production casing with spherical media; and

e. placing a pre-packed filter between the media and the production tubing for allowing hydrocarbons to flow through the media to the production tubing, yet preventing any of the spherical media from flowing into the production tubing.

4,856,591

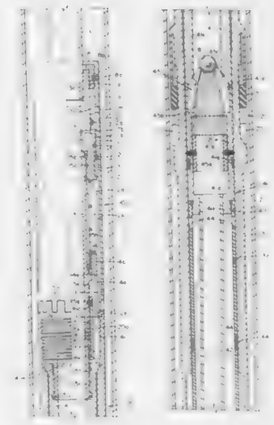
METHOD AND APPARATUS FOR COMPLETING A NON-VERTICAL PORTION OF A SUBTERRANEAN WELL BORE

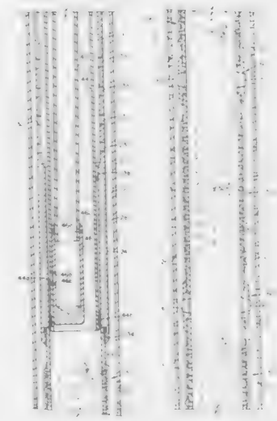
Joseph F. Donovan, Spring; Edward C. Spatz, Houston; John V. Salerni, Kingwood; Elmer R. Peterson, The Woodlands, and John B. Weirich, Tomball, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Mar. 23, 1988, Ser. No. 172,025
Int. Cl.[4] E21B *23/04, 23/06, 34/10, 43/04*
U.S. Cl. 166—278 **65 Claims**

42. Apparatus for completing a well bore having a deviated configuration including an essentially vertical entry portion communicating with a curved portion extending away from the top surface of the well and communicating with a generally linear bore portion traversable with a production formation, comprising, in combination:

a plurality of tubular screen elements;





a plurality of tubular stabilizer housings threadably interconnecting said tubular screen elements, thereby forming a tool string;

said stabilizer housings each including peripherally spaced, radially expandable stabilizer elements;

means for securing said stabilizer elements in a radially retracted position during run-in of said screen elements into said generally linear portion of the well bore; and

fluid pressure means for radially expanding said stabilizer elements into engagement with the wall of said generally linear portion of the well bore, thereby centering said tubular screen elements relative to said generally linear portion of the well bore.

65. The method of completing a deviated subterranean well bore having a generally vertical entry portion and a nonvertical bore portion traversing a production formation, comprising the steps of:

inserting in said non-vertical well portion a plurality of tubular screen elements interconnected by tubular stabilizing housings;

each stabilizer housing mounting a plurality of peripherally spaced, radially shiftable stabilizer elements;

placing said stabilizer elements in a radially retracted position during run-in;

said stabilizer elements being movable from retracted position and movable radially outwardly to engage the well bore when said tubular screen elements are positioned in said production formation.

4,856,592

ANNULUS CEMENTING AND WASHOUT SYSTEMS FOR WELLS

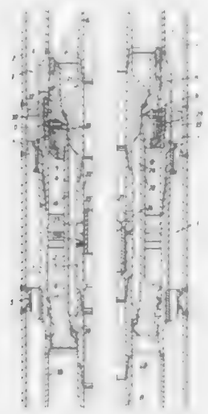
Bernard H. Van Bilderbeek, Aberdeen, and Ian F. Milne, Aberdeenshire, both of Scotland, assignors to Plexus Ocean Systems Limited, Scotland

Filed Dec. 16, 1987, Ser. No. 134,628

Claims priority, application United Kingdom, Dec. 18, 1986, 8630280; Jan. 16, 1987, 8700907

Int. Cl.⁴ E21B *33/13, 21/00*

U.S. Cl. 166—285 **9 Claims**



1. A casing string for use in a well, including an upper casing string and a lower casing string interconnected by a hanger running tool, the hanger running tool being detachably connected to the lower casing string for detachment when the lower casing string is fixed in position by cementation, the casing string including a washout casing section which comprises a hollow cylinder body adapted to form part of the length of said casing string and having at least one washport extending through said body between radially inner and outer surfaces thereof, said washout casing section further comprising a hollow cylindrical seal sleeve mounted within said body for axial movement relative thereto between a first position in which said at least one washport is closed to the passage of wash fluid therethrough, and a second position in which said at least one washport is open to the passage of wash fluid therethrough and said hollow cylindrical body being connected to a lower end of the upper casing string to form said hanger running tool.

6. An annulus cementing and washout procedure for cementing an annulus between an outer casing and a second-outer casing which is the casing radially next inwards from said outer casing, at the termination of said procedure said annulus being cement-filled substantially up to a predetermined level and washed substantially free of cement above said predetermined level, said procedure comprising the steps of providing said second-outer casing with a washout casing section substantially at said predetermined level, said washout casing section comprising a hollow cylindrical body adapted to form part of the length of said casing string and having at least one washport extending through said body between radially inner and outer surfaces thereof, said washout casing section further comprising a hollow cylindrical seal sleeve mounted within said body for axial movement relative thereto between a first position in which said at least one washport is closed to the passage of wash fluid therethrough, and a second position in which said at least one washport is open to the passage of wash fluid therethrough, moving said hollow cylindrical seal sleeve to said first position if not already in said first position, pumping liquid cement into said annulus until said annulus is filled with cement at least up to said predetermined level, moving said sleeve to said second position thereby to open said at least one washport, and pressurising at least the interior of said washout casing section with wash fluid to cause said wash fluid to pass through said at least one washport into said annulus to wash cement out of said annulus above said predetermined level.

4,856,593

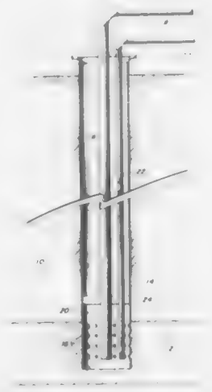
INHIBITION OF HYDRATE FORMATION

Robert R. Matthews, and Charles R. Clark, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Sep. 21, 1987, Ser. No. 99,358

Int. Cl.⁴ E21B *43/00, 43/28*

U.S. Cl. 106—310 **5 Claims**



1. A method for preventing flow stoppage of a wet gas stream flowing under conditions of temperature and pressure conducive to the formation of gas hydrates, which comprises incorporating in the wet gas stream a surface-active agent selected from the group consisting of organic phosphonates, phosphate esters, phosphonic acids, salts and esters of phosphonic acids, inorganic polyphosphates, esters of inorganic polyphosphates, polyacrylamides and polyacrylates which inhibits the formation of gas hydrates and/or the agglomeration of hydrate crystallites into large crystalline masses, in a sufficient amount to prevent stoppage of the flowing stream.

4,856,594

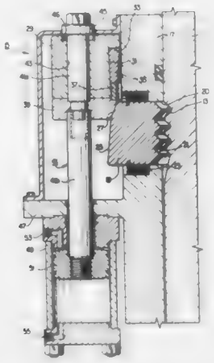
WELLHEAD CONNECTOR LOCKING DEVICE

Charles E. Jennings, Houston, Tex., assignor to Vetco Gray Inc., Houston, Tex.

Filed Aug. 26, 1988, Ser. No. 237,585

Int. Cl.⁴ E21B *33/038;* **F16L** *55/00*

U.S. Cl. 166—338 **5 Claims**



1. In a connector for connecting a conduit to a tubular member, the connector having a housing which slides over the tubular member, a plurality of dogs carried by the housing for radial movement into engagement with a set of grooves formed on the exterior of the tubular member, an axially movable cam ring movable between an unlocked and a locked position for moving the dogs radially inward, and piston means for moving the cam ring between the unlocked and locked positions, the improvement comprising:

a wedge ring having an inner side that engages an outer side of each of the dogs when the cam ring is in the locked position, the wedge ring having an outer side that engages an inner side of the cam ring;

the inner side of the cam ring and the outer sides of the dogs each inclining relative to a longitudinal axis of the tubular member, the inner side of the cam ring converging toward the outer sides of the dogs; and

the inner and outer sides of the wedge ring inclining relative to the longitudinal axis of the tubular member and converging toward each other for wedging the cam ring in the locked position.

4,856,595

WELL TOOL CONTROL SYSTEM AND METHOD

James M. Upchurch, Sugarland, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Division of Ser. No. 198,968, May 26, 1988, Pat. No. 4,796,699.

This application Sep. 12, 1988, Ser. No. 243,565

Int. Cl.⁴ E21B *34/10, 34/16, 47/06, 49/08*

U.S. Cl. 166—374 **25 Claims**

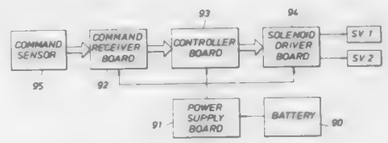
1. A well testing system including a valve adapted to be disposed in a borehole, comprising:

controller means responsive to an input stimulus for storing at least two signatures therein, the input stimulus having a particular signature, the controller means comparing said particular signature of said input stimulus with each of the stored at least two signatures and generating a first output signal when said particular signature matches one of said at least two signatures and generating a second output signal when said particular signature matches another of said at least two signatures;

first means responsive to said first output signal for changing a state of said valve from a first state to a second state in responses to said first output signal; and

second means responsive to said second output signal for changing the state of said valve from said second state to said first state in response to said second output signal.

19. A method of operating a valve in a well tool, said well tool adapted to be disposed in a borehole, comprising the steps of:



(a) generating an input stimulus;

(b) receiving said input stimulus by a sensor means in said well tool and determining a particular signature of said input stimulus;

(c) comparing said particular signature with at least two stored signatures, a first stored signature being associated with a change to a second state of said valve, a second stored signature being associated with a change to a first state of said valve;

(d) operating said valve from said first state to said second state when said particular signature matches said first stored signature; and

(e) operating said valve from said second state to said first state when said particular signature matches said second stored signature.

4,856,596

LATCHING VALVE ACTUATOR, NOZZLE AND PRESSURIZED FIRE EXTINGUISHER UTILIZING SAME

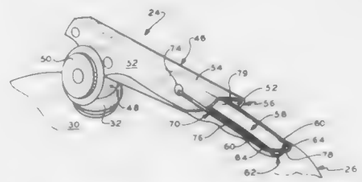
John Hamernik, 8A Provost Dr., New Windsor, N.Y. 12550

Continuation of Ser. No. 930,434, Nov. 14, 1986, abandoned.

This application Nov. 17, 1987, Ser. No. 122,056

Int. Cl.⁴ A62C *31/02*

U.S. Cl. 169—74 **19 Claims**



1. A fire extinguisher; comprising:

(a) container means for holding a predetermined quantity of fire extinguishing agent under pressure;

(b) valve means carried by said container means for permitting fire extinguishing agent to flow from said container means;

(c) said valve means having an actuated condition when fire extinguishing agent may flow under pressure from said container means and an unactuated condition preventing the flow of fire extinguishing agent from said container means;

(d) valve actuator means disposed for coaction with said valve means and operable to place said valve means in said valve actuated condition;

(e) directing means for directing fire extinguishing agent from said container means when said valve means is in said actuated condition;

(f) said valve actuator means including at least a first valve actuating lever movable from a first position towards a second position to place said valve in said valve actuated condition; and

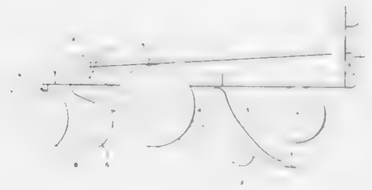
(g) latching means disposed for coaction with said first valve actuating lever and operable upon movement of said first valve actuating lever towards substantially into said second position so as to latch said valve actuator means and said valve means in said actuated condition; said latching means being released solely upon further movement of said first valve actuating lever in said direction of said second position.

4,856,597

SOIL WORKING MACHINE

Shmuel Gal, Tel Aviv, Israel, assignor to Shoshana RAM, Jerusalem, Israel

Filed Jun. 24, 1987, Ser. No. 65,549
Claims priority, application Israel, Jul. 9, 1986, 79366
Int. Cl.[4] A01B *9/00*
U.S. Cl. 172—33 **10 Claims**



1. A machine which is propelled by a tractor and is used for preparing a bed of soil for sowing plants in rows, whilst burying remains of previous season plants in a method in which the tractor travels on a permanent track which remains in place from season to season, and the rows of plants are permanent from season to season, said machine comprising:

(1) A frame attached to a tractor;

(2) A blade held on said frame in a direction perpendicular to the machines travelling direction, said blade slanting forward in the travelling direction and reaching the desired depth of soil cultivating;

(3) A slanted belt conveyor extending along the length of the machine, said conveyor having a forward end which is low and close to the upper edge of said blade, the conveyor having a rear end which is above the desired height of the bed, said blade and said conveyor having widths which are smaller than the distance between the rows of plants;

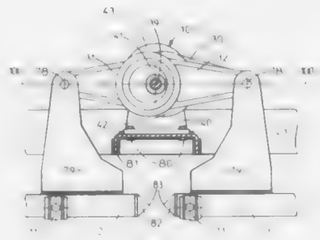
(4) Means for upturning the remains of the previous season plants together with soil underneath them, said upturning means being held on said frame, overlapping the place of the rows of plants but not reaching the permanent track of the tractor and situated before the rear end of said conveyor.

4,856,598

MACHINE FOR WORKING SOIL

Edmond M. Oberle, Saverne, and Jean M. Klein, Bouxwiller, both of France, assignors to Kuhn s.a., Saverne, France

Filed Oct. 21, 1987, Ser. No. 110,861
Claims priority, application France, Oct. 22, 1986, 86 14767
Int. Cl.[4] A01B *19/06*
U.S. Cl. 172—54.5 **6 Claims**



1. A machine for working soil, said machine comprising:

(a) a chassis having a direction of advance and being equipped with a device for hitching to a tractor vehicle;

(b) at least one row of at least two bars equipped with tools for working the soil, each of said at least two bars being connected to said chassis by a plurality of oscillating arms;

(c) a power source; and

(d) a device for transforming rotary movement received from said power source into a reciprocal movement crosswise to the direction of advance, said device comprising an eccentric-connecting rods device comprising a plurality of eccentrics and a plurality of connecting rods, each one of said plurality of connecting rods having two ends and serving to transmit the reciprocal movement of the corresponding one of said plurality of eccentrics to a corresponding one of said at least two bars to which it is connected by one of its ends, said device being arranged to give said at least two bars opposite movement, whereby said at least two bars have an approaching phase and a separating phase,

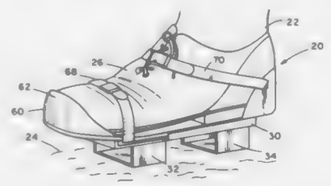
(e) wherein the ends opposite one another of adjacent ones of said at least two bars taper towards one another so as to push back hard objects which come between said adjacent ones of said at least two bars during their approaching phase.

4,856,599

GROUND-WORKING TOOL FOR ATTACHMENT TO THE FOOT OF A WEARER

Joseph L. Stammen, Rte. 10, Box 389, Crossville, Tenn. 38555

Filed Aug. 23, 1988, Ser. No. 216,639
Int. Cl.[4] A43C *17/02*; A01B *1/06*
U.S. Cl. 172—370 **16 Claims**



1. A ground-working tool for wear upon the foot comprising:

a base plate for attachment against the underside of the foot of a wearer and defining an upper surface adapted to be overlain by the foot when said tool is operatively worn, said base plate including a forward portion adapted to be positioned beneath the forwardmost portion of the foot when operatively overlain thereby and a rearward portion adapted to be positioned beneath the heel portion of the foot when operatively overlain thereby;

two ground-working hoe blades each arranged generally parallel to and disposed in a spaced relationship with said base plate so as to be positioned on the side of said plate opposite said upper surface, one of said hoe blades being positioned beneath the forward portion of the base plate and the other of the hoe blades being positioned beneath the rearward portion of the base plate; and

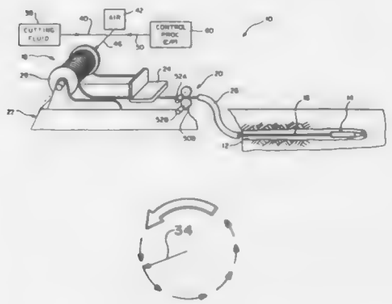
support means joining said hoe blades to said base plate for rigidly holding said hoe blades in the aforesaid parallel and spaced relationship with said base plate so that ground beneath the foot of the wearer can be worked with the hoe blades by operative manipulation of said tool by the wearer's foot.

4,856,600

TECHNIQUE FOR PROVIDING AN UNDERGROUND TUNNEL UTILIZING A POWERED BORING DEVICE

Glen Baker, Kent; Albert W. Chau, Redmond; James A. Fikse, Kirkland, and John E. Mercer, Kent, all of Wash., assignors to FlowMole Corporation, Kent, Wash.

Continuation of Ser. No. 866,240, May 22, 1986, Pat. No. 4,821,815. This application Oct. 21, 1988, Ser. No. 260,937
The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.
Int. Cl.[4] E21B *7/08, 44/00*
U.S. Cl. 175—26 **7 Claims**



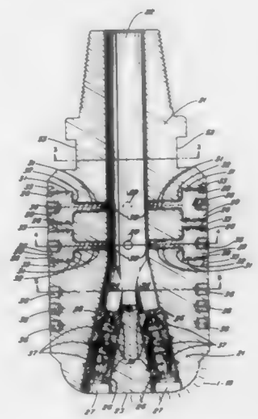
1. In an apparatus for providing a continuous under-ground tunnel by means of an elongated boring device including forward facing off-axis cutting means, said device being rotated at a constant rate about its elongation axis while being urged forward through the soil, whereby to cause the device to move forward along a straight line path while boring a tunnel in the soil as it does so, the improvement comprising means for varying the speed and/or the direction of rotation of said boring device in a controlled way depending upon the desired direction to be taken by the device as it moves forward through the soil, whereby to cause the boring device to move along a curved path of movement in a controlled way, said controlled way of varying the speed and/or direction of rotation of said boring device being such that said cutting means spends more time along a particular segment of its rotating path than on the rest of its path of movement so that the particular segment of said rotating path determines the particular curved path taken by the boring device.

4,856,601

DRILL BIT WITH FLOW CONTROL MEANS

Richard C. Raney, 3609 Godfrey Ct., Midland, Tex. 79707

Continuation-in-part of Ser. No. 76,910, Jul. 23, 1987, abandoned, which is a continuation of Ser. No. 820,742, Jan. 22, 1986, Pat. No. 4,690,229. This application Oct. 25, 1988, Ser. No. 262,280
Int. Cl.[4] E21B *10/38*
U.S. Cl. 175—393 **11 Claims**



2. A rotary drill bit comprising: a main body having means at an upper end thereof for attachment to a driving means; a drilling face formed at the lower end of said main body, drilling cutters secured to said face; a throat formed through said main body; fluid outlet means connected to said throat for passage of drilling fluid to said face; said fluid outlet means contains a flow restricting means arranged to provide first an effectual constricted flow then, serially thereafter, a diffused flow initiated within said restricting means and thereafter a fluid discharge of reduced constriction;

said flow restricting means is positioned in the fluid path of said throat, and is arranged to provide a fluid pressure drop onto said face;

said flow restricting means includes; a first nozzle stage shaped, sized, and arranged to provide a combination of effectual fluid flow constriction and diffused fluid flow; an intermediate nozzle stage shaped, sized, and arranged to provide a combination of minimal fluid flow constriction and optimum diffused fluid flow; and an outlet nozzle stage shaped, sized, and arranged to provide a combination of minimal fluid flow constriction and practically straightened fluid flow.

4,856,602

APPARATUS AND METHOD OF WEIGHING ARTICLES BASED UPON HARMONIC MOTION

Robert A. Cordery, Danbury, and David W. Hubbard, Stamford, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 7, 1988, Ser. No. 141,441
Int. Cl.[4] G01G *3/14, 3/08*
U.S. Cl. 177—210 FP **23 Claims**

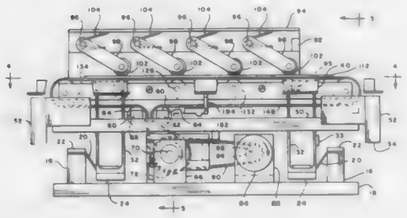
1. A weighing scale comprising:

a base,

an article supporting tray,

at least one flexible member connecting said tray to said

base, said flexible member having a parallelogram configuration,



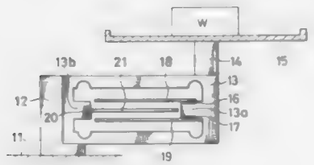
a transducer attached to said flexible member, and means for providing free oscillation to said tray.

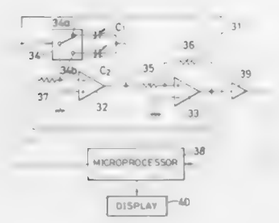
4,856,603

ELECTRONIC WEIGHING INSTRUMENT OF THE ELECTROSTATIC CAPACITY TYPE

Toshiyuki Murakoso, Mishima; Shoichi Sato, Tokyo, and Motoi Yagi, Zushi, all of Japan, assignors to Tokyo Electric, Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,557
Claims priority, application Japan, Dec. 23, 1987, 62-323741
Int. Cl.[4] G01G *3/14*
U.S. Cl. 177—210 C **3 Claims**





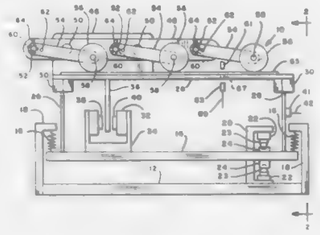
1. An electronic weighing instrument, comprising first and second capacitors having capacitances which are differentially varied by a displacement caused by a load, an oscillating circuit including said first and second capacitors each as an element for determining an oscillation frequency thereof, a capacitor changing over means for alternately connecting said first and second capacitors to said oscillating circuit at predetermined intervals of time, and an operating means for fetching an oscillation frequency from said oscillating circuit each time said first and second capacitors are alternately connected to said oscillating circuit by said capacitor changing over means, calculating a difference and a sum between two different frequencies fetched successively from said oscillating circuit and dividing the difference by the sum to obtain a measured weight value.

4,856,604

APPARATUS AND METHOD OF DETERMINING THE AUTHENTICITY OF WEIGHT OBTAINED FROM A VIBRATING TRAY SCALE

Robert W. Sisson, Norwalk, Conn., and Richard A. Connell, South Salem, N.Y., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Apr. 1, 1988, Ser. No. 176,585
Int. Cl.[4] G01G *3/14, 19/52*
U.S. Cl. 177—210 FP **18 Claims**



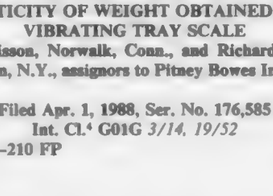
1. A weighing scale comprising:
a horizontally extending article supporting means,
means for securely holding an article on said article supporting means to allow unity of movement,
means for oscillating said article supporting means,
means for a generating a sinusoidal wave signal in response to the oscillation of said article supporting means,
means for monitoring said sinusoidal wave signal to determine the regularity of the frequency of oscillation, and
means for determining the mass of an article on said article supporting means in response to said sinusoidal signal upon said monitoring determining a regular oscillation.

4,856,605

NONSYSTEM-CONNECTED ELECTRONIC BALANCE

Klaus Cornelius, Lenglern, and Rainer Exner, Wollbrandshausen, both of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Sep. 27, 1988, Ser. No. 249,826
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1987, 68715820
Int. Cl.[4] G01G *3/14*
U.S. Cl. 177—210 R **10 Claims**



1. Electronic balance comprising
a balance scale (**2, 12, 32**) actuable in response to electric current from a power source and providing an electrical output,
solar cells (**5, 15, 25, 35, 45, 55, 65, 75**) for generating electric current and coupled to the balance scale for supplying electronic energy in a manner suitable for the requirements of the balance,
storage means (**76**) connected to the solar cells are provided for storing the electric current generated by the solar cells, and

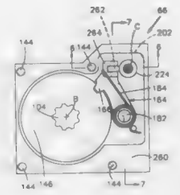
display means (**9, 80**) are provided for indicating a state of charge of storage of the storage means (**76**).

4,856,606

LOCK MECHANISM FOR REAR WHEEL STEER APPARATUS

Louis R. Brown, Livonia, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Jun. 7, 1988, Ser. No. 203,682
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—140 **21 Claims**



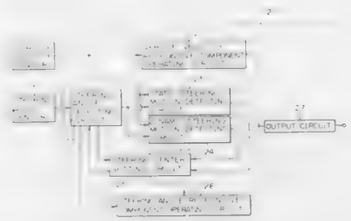
1. An apparatus for use in a vehicle having steerable front wheels and steerable rear wheels, said apparatus comprising:
a movable rack member connected with the rear wheels to steer the rear wheels upon movement of said rack member;
a rotatable pinion member rotatably driven by a force of a first magnitude by movement of said rack member;
means for applying a force to said rack member to move said rack member to steer the rear wheels in response to steering of the front wheels; and
lock means including a locking member movable between an unlocking position and a locking position for blocking rotation of said pinion member by application of a force of a second magnitude to block movement of said rack member and thereby block steering of the rear wheels, said second magnitude being less than said first magnitude.

4,856,607

APPARATUS FOR AUTOMATICALLY SETTING STEERING CENTER FOR USE IN POWER STEERING APPARATUS

Hirotaka Sueshige, and Masayuki Hayashi, both of Aichi, Japan, assignors to Tokai TRW & Co., Ltd., Aichi, Japan

Filed Apr. 5, 1988, Ser. No. 177,672
Claims priority, application Japan, Apr. 7, 1987, 62-85043
Int. Cl.[4] B62D *5/00*
U.S. Cl. 180—142 **7 Claims**



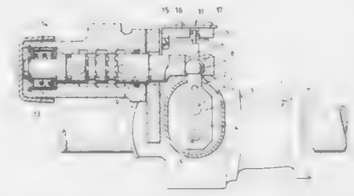
7. An automatic steering center setting apparatus for a vehicle comprising:
steering angle detecting means for detecting a steering angle and for outputting a steering angle position signal;
static steering motion detecting means for detecting steering angles within a predetermined steering angle range and for outputting a static steering center instruction signal in response to the steering angles being within said predetermined steering angle range for a predetermined period of time;
dynamic steering motion detecting means for detecting steering angles outside said predetermined steering angle range and for outputting a dynamic steering center instruction signal; and
steering center setting means for comparing the static steering center instruction signal or the dynamic steering center instruction signal with the steering angle position signal and for outputting a steering center set signal when the static steering center instruction signal or the dynamic steering center instruction signal coincides with the steering angle position signal.

4,856,608

POWER ASSISTED VEHICLE STEERING MECHANISM

Frederick J. Adams, Clevedon, Great Britain, assignor to TRW Cam Gears Limited, Great Britain

Filed Apr. 13, 1988, Ser. No. 181,190
Claims priority, application United Kingdom, Apr. 15, 1987, 8709112; May 14, 1987, 8711340
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—148 **2 Claims**



1. An apparatus for use in a vehicle power assisted steering mechanism comprising a pinion shaft rotable in response to a steering torque being applied thereto, a pinion on the pinion shaft, a rack having a meshing engagement with the pinion and displaceable in response to rotation of the pinion to effect steering of the vehicle, a hydraulic motor for providing power assist to vehicle steering, a pump for supplying hydraulic fluid to the hydraulic motor, an electric motor for driving the pump, and a hydraulic valve for controlling fluid flow from the pump to the hydraulic motor, said apparatus comprising:
electric sensor means for actuating the electric motor; and
a control lever mounted on the pinion shaft and displaceable about a pivot axis in response to rotation of the pinion shaft, said control lever having a first portion operatively connected with said electric sensor means for actuating the same in response to applying a steering torque to the pinion shaft, and a second portion spaced from said first portion and operatively connected to the hydraulic valve for actuating the same.

4,856,609

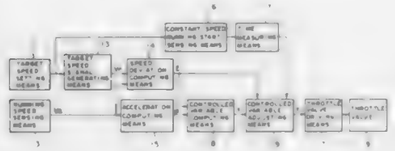
CONSTANT-SPEED RUNNING CONTROL DEVICE FOR VEHICLES

Yasuo Naito, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP87/00515, § 371 Date Mar. 9, 1988, § 102(e) Date Mar. 9, 1988
PCT Filed Jul. 15, 1987, Ser. No. 186,474
Claims priority, application Japan, Jul. 18, 1986, 170150/86
Int. Cl.[4] B60K *31/04*
U.S. Cl. 180—179 **1 Claim**

1. A constant-speed running control device for a vehicle, comprising: a running speed sensing means which senses the running speed of the vehicle; an acceleration computing means which determines acceleration of the vehicle at specific periods of time from a running speed signal sensed by said running

speed sensing means; a target speed setting means which sets a target speed in order in maintain a fixed target speed of the vehicle; a target speed signal generating means which generates said target speed; a speed deviation computing means which determines speed deviation between said running speed signal and said target speed signal; a throttle valve driving means which control a throttle valve of the vehicle; a controlled variable computing means which inputs an acceleration signal and a speed deviation signal and computes a controlled variable for controlling the throttle valve of the vehicle such that said running speed will correspond to said target speed; a constant-speed running start sensing means for sensing the start of constant-speed running by said target speed setting means; a



time measuring means which measures a specific time from the time when this constant-speed running is started; and a controlled variable adjusting means which adjusts said controlled variable in accordance with said speed deviation signal and a time measuring information given from said time measuring means, unconditionally outputting said adjusted controlled variable to said throttle valve driving means when a specific time is not over, and similarly outputting a controlled variable to said throttle valve driving means when said speed deviation exceeds a specific value when said specific time is over, and outputting a non-adjusted controlled variable to said throttle valve driving means when said speed deviation decreases under said specific value.

4,856,610

SYSTEM FOR CONTROLLING AT LEAST ONE VARIABLE INFLUENCING THE DRIVE TORQUE OF AN INTERNAL COMBUSTION ENGINE OF A MOTOR VEHICLE

Heinz Leiber, Oberriexingen; Hans-Joachim Ohnemüller, Reutlingen, and Klaus Kastner, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,322

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1987, 3728573

Int. Cl.[4] B60K *31/00*

U.S. Cl. 180—197 **12 Claims**



1. System for controlling at least one variable influencing the drive torque of a spark-ignition internal combustion engine of a motor vehicle, having an electronic throttle control, having an electronic ignition timing control with a sensor for the engine speed, and having a control means for controlling at least one variable influencing the drive torque whenever at least one driven wheel of the motor vehicle tends to spin, wherein said control means:

whenever a predetermined threshold value is exceeded by a preselected variable of a driven wheel, (a) reduces the instantaneous value of engine speed by a certain amount and stores the reduced value, of the engine speed; (b) reducing the drive torque by modification of the throttle angle or of the fuel injection quantity to a value assigned to the stored value of the engine speed; and, (c) reduces the drive torque additionally by modification of the ignition point by a certain predetermined value; and

whenever the preselected variable drops below the predetermined threshold value, (a) increases the drive torque by initially increasing the ignition point at most as far as a predetermined value (1) at a rate of rise effecting a predetermined rapid rate of rise of the engine speed, as long as the engine speed is below the stored value; and (2) at a rate of rise effecting a predetermined slow rate of rise of the engine speed as soon as the engine speed has exceeded the stored value; and (b) subsequently increasing the throttle angle or the fuel injection quantity until either the value of the drive torque predetermined by an accelerator pedal is reached or once again the predetermined threshold value is exceeded by the preselected variable.

4,856,611

PROPELLING TRANSMISSION SYSTEM OF TRACTOR

Akira Teraoka, and Hajime Shikiya, both of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Sep. 23, 1988, Ser. No. 248,361

Claims priority, application Japan, Jul. 6, 1988, 63-168567

Int. Cl.[4] B60K *17/34*

U.S. Cl. 180—233 **8 Claims**



1. A propelling transmission system of a tractor comprising;

a main transmission mechanism including an input shaft for receiving, through a main clutch mechanism, drive from an engine mounted at a front position of the tractor, and a first transmission shaft disposed parallel to the input shaft and operatively connected thereto,

a rear transmission disposed at a rear position of the tractor for receiving the drive from the first transmission shaft,

front wheel drive means including a second transmission shaft disposed parallel to the first transmission shaft and receiving the drive from the rear transmission,

front wheel change speed means for receiving the drive from the second transmission shaft and transmitting the drive to front wheels selectively in a standard drive mode for driving the front wheels substantially at the same speed as the rear wheels and in a high speed mode for driving the front wheels at a higher speed than the rear wheels, and

a front transmission case housing the main transmission mechanism, front wheel drive means and front wheel change speed means, the front transmission case being directly connected to a lower rearward position of a main clutch case.

4,856,612

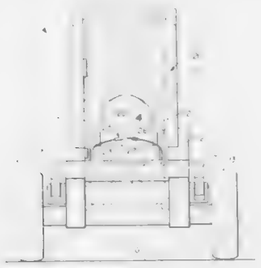
METHOD OF CONTROLLING THE OPERATION OF A LOADER

James T. Clevenger, Jr., Lancaster; Dale A. Ashcroft, New Holland; Richard P. Strosser, Akron, all of Pa., and Mark S. Anderson, Prior Lake, Minn., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Feb. 10, 1988, Ser. No. 154,676

Int. Cl.[4] B60K *28/04;* **B60R** *22/00*

U.S. Cl. 180—273 **12 Claims**



1. A method of controlling the operation of an implement having a mobile frame; an engine supported on said frame for providing operative power; a working tool apparatus supported from said frame and operably movable relative thereto; an operator compartment including a seat on which the operator sits to control operation of said implement and said working tool; and an operator restraint mechanism movable between an operative position in which the operator is restrained from leaving said seat and an inoperative position in which the operator is permitted to leave his seat, comprising the steps of:

sensing the presence of the operator in said seat;

then sensing the movement of said operator restraint mechanism into said operative position; enabling the starting of said engine only after the movement of said operator restraint mechanism into said operative position is sensed subsequent to the sensing of the presence of the operator in said seat; and

disabling the movement of said working tool apparatus unless said operator restraint mechanism is moved into said operative position subsequent to the sensing of the presence of the operator in said seat each time the operator leaves said seat.

4,856,613

SAFETY ENGINE LOAD SENSING SYSTEM

G. S. Reginold, Coram, N.Y., assignor to General Safety Research, Inc., Coram, N.Y.

Continuation of Ser. No. 84,402, Aug. 10, 1987, abandoned. This application Sep. 8, 1988, Ser. No. 242,035

Int. Cl.[4] B60K *28/12*

U.S. Cl. 180—282 **18 Claims**

1. In a fuel burning engine powered vehicle equipped with an automatic transmission which includes a gear selector movable between non-drive and drive positions, the combination comprising means for measuring the vehicle load on said engine, timer means for initiating the production of a signal when said gear selector is moved into said drive position and terminating said signal after a predetermined length of time, engine killer means responsive to said signal for disabling said engine, means for blocking the delivery of said signal to said killer means, and means responsive to a predetermined vehicle load on said engine as measured by said measuring means for unblocking said blocking means thereby passing said signal to said engine killer means to disable said engine.



4,856,614

PROCESS AND DEVICE FOR SEISMIC PROSPECTING OF A MEDIUM WITH INDUCED WAVES CREATED ARTIFICIALLY IN A BORE-HOLE

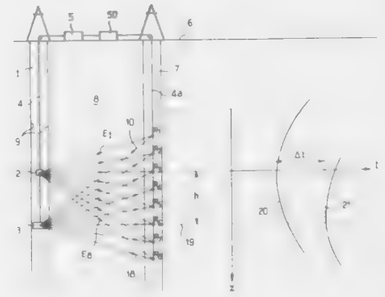
Georges Arens, Croissy sur Seine; Jacques Delvaux, Pau, and Pierre Gros, Buc, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Jun. 17, 1988, Ser. No. 208,087

Claims priority, application France, Jun. 19, 1987, 87 08599

Int. Cl.[4] G01V *1/40*

U.S. Cl. 181—104 **23 Claims**



1. A process for seismic prospecting of a medium based on induced waves created artificially in a bore-hole, comprising:

generating, starting from a primary source of emission, at least one primary tube wave and at least one primary volume wave, said primary tube wave being propagated along the walls of said bore-hole, said primary volume wave being propagated through a medium to be explored,

placing an artificial reflecting element for said primary tube wave within the bore-hole,

inducing at least one secondary volume wave with said reflecting element, said secondary wave propagates through said medium to be explored,

recording the times of emission of the induced secondary waves which are radiated by said reflecting element,

receiving by receiving devices at least part of the induced secondary waves and primary volume waves,

recording, in the form of signals, the waves received by the receiving devices,

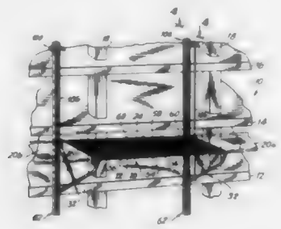
processing said signals in order to determine characteristics of the medium to be explored.

4,856,615

SAFETY NET ARRANGEMENT FOR MULTI-FLOOR BUILDINGS UNDER CONSTRUCTION, AND METHOD

Arthur Nusbaum, 1500 Palisade Ave., Fort Lee, N.J. 07024

Filed Sep. 20, 1988, Ser. No. 247,044
Int. Cl.[4] E04G *21/32*
U.S. Cl. 182—82 20 Claims



1. A safety arrangement for multi-floor floor buildings under construction, comprising:

(a) a plurality of upright elongated guide rails attached to a building adjacent an outer face of the building;

(b) a safety net having opposite end regions;

(c) support means including a pair of support structures, each supporting a respective end region of the safety net, for suspending the safety net in a fully deployed condition in which the safety net extends generally outwardly away from the outer face of the building over a predetermined distance;

(d) means for mounting the support structures on the guide rails for independent movement lengthwise along the guide rails; and

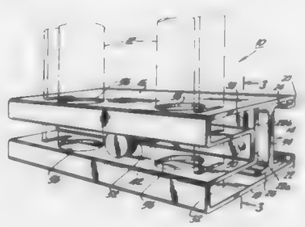
(e) moving means for moving the support structures independently of each other and in alternate succession to different elevations along the guide rails while constantly maintaining the safety net in the fully deployed condition during each movement.

4,856,616

RAILING SUPPORT CLAMP FOR SCAFFOLD

Carl Anderson, c/o Alum-A-Pole Corporation, 2589 Richmond Ter., Staten Island, N.Y. 10303

Filed Jul. 5, 1988, Ser. No. 215,245
Int. Cl.[4] E04G *1/26*
U.S. Cl. 182—113 13 Claims



1. A support clamp for a safety rail or similar device adapted for mounting on a beam having two end flanges and perpendicular connecting web, the clamp comprising:

first and second substantially parallel flange members spaced apart from each other, each said flange member having a beam engaging lip at one extremity thereof adapted to engage an end flange of said beam;

web means coupled between extremities of said flange members remote from their beam engaging lips;

adjusting means coupled to said web means for permitting movement of said beam engaging lips away from and toward each other so as to facilitate engagement of said lips with said beam flanges;

fastening means extending through said web means and adapted to engage the web of said beam so as to cause the end flanges of said beam to bear against at least one of said lips and thereby fasten said support clamp to said beam; and

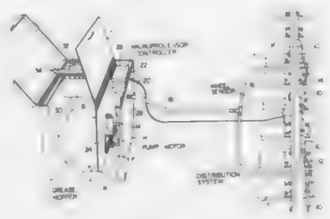
post receiving means in at least one of said flange members for supporting a post in upright relation and adjacent to said beam.

4,856,617

RAILWAY LUBRICATING SYSTEM AND METHOD

Stephen M. Lounsberry, III; Peter C. Lounsberry, both of Nichols; James D. Rodems, Syracuse, and Gary A. Carner, Manlius, all of N.Y., assignors to Moore & Steele Corporation, Owego, N.Y.

Filed Dec. 21, 1987, Ser. No. 135,383
Int. Cl.[4] B61K *3/00*
U.S. Cl. 184—3.1 12 Claims



1. In a rail lubricant dispensing assembly for railway systems, the combination of pump means for repetitively dispensing a desired amount of lubricant sufficient properly to lubricate between a rail and the flanged wheels of a rail vehicle irrespective of resistance offered by the lubricant to its being pumped, power means set for operating the drive means to dispense an amount of lubricant which may be different from the desired amount, control means for actuating the power means, and means for determining the actual amount of lubricant dispensed during a lubrication cycle and for adjusting the power means to alter the actual amount of lubricant dispensed during a subsequent lubricating cycle to the desired amount.

4,856,618

MECHANISM FOR PREVENTING A CARRIAGE OF A SYSTEM FOR LIFTING A VEHICLE FOR REPAIR THEREOF FROM LOWERING

Shunji Isogai, Hekinan, Japan, assignor to Sugiyasu Industries Co., Ltd., Japan

Filed Jan. 20, 1988, Ser. No. 146,225
Claims priority, application Japan, Aug. 25, 1987, 62-128947
Int. Cl.[4] B66F *7/00*
U.S. Cl. 187—8.5 1 Claim

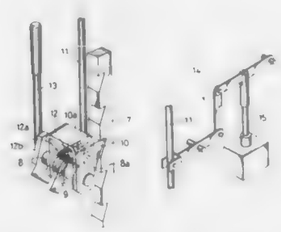
1. In a system for lifting a vehicle for repair thereof which includes at least a pair of opposed posts each having a carriage connected thereto and having an inner space wherein a vertical cylinder with a piston rod is disposed, a deflecting member being connected to the top of the rod, and the carriage being interconnected to the piston rod by means of a connecting means which has one end fixed to the carriage and another end fixed to the inner surface of the post and also has a portion fitted on the deflecting member, the interconnection of the

carriage to the piston rod being such that the carriage is vertically moved when the piston rod is actuated, a mechanism for preventing the carriage from lowering from a raised position which includes

(a) a rack provided in the inner space of the post and connected to the piston rod in parallel therewith,

(b) a horizontal shaft extending through and rotatably supported by a bracket which is fixed to the outside of the post,

(c) a locking member having one end portion fixed to a first end of the shaft and a distal end portion projecting into the post through an opening which is made through the wall of the post,



(d) means for urging the distal end portion of the locking member against the rack so as to lock the rack,

(e) a lever with one end fixed to a second end of the locking member for rotating the shaft so as to disengage the locking member from the rack,

(f) interlock means interconnected to a middle portion of the shaft for simultaneous movement with the shaft, and

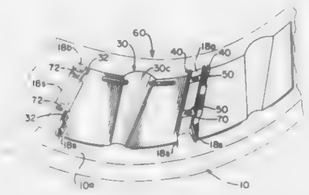
(g) a valve connected to the shaft through the interlock means and to open to release a hydraulic pressure from the cylinder when the lever is operated to disengage the locking member from the rack.

4,856,619

AIRCRAFT WHEEL DRIVE KEY AND HEATSHIELD ASSEMBLY

Don W. Petersen, North Canton, Ohio, assignor to Loral Corporation, New York, N.Y.

Filed Jun. 6, 1988, Ser. No. 202,614
Int. Cl.[4] B64C *25/36;* B60B *19/00*
U.S. Cl. 188—18 A 10 Claims



1. A wheel drive key and heatshield assembly adapted for mounting in association with a plurality of wheel drive key bosses which are axially and longitudinally oriented and formed as integral parts within an inboard-facing bore of a forged wheel comprising in combination:

a plurality of flat, rectangular, metallic drive key wearplates, the number being equal to twice the number of wheel key bosses and mounted in pairs to the bosses, each wearplate being in contacting engagement with a longitudinal side surface of a wheel key boss and having at least two slots in spaced relationship within top and bottom longitudinal edges thereof;

retaining means mounted transversely across the top of each of said wheel key bosses and having a length which extends beyond the width of the boss to engage the pair of wearplates in the slots formed within the top edges of the wearplates; and

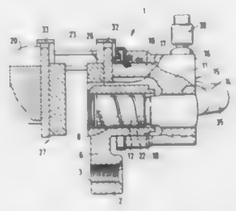
a plurality of substantially rectangular heatshields positioned within the wheel bore between adjacent wheel key bosses, each said heatshield having at least two tabs extending from opposite lateral edges thereof to engage the wearplates within the slots formed in the bottom edges of the wearplates, said heatshields being restricted by said wearplate engagement in both axial and radial directions within the bore of the wheel.

4,856,620

SPOT-TYPE DISC BRAKE

Rudolf Thiel, Frankfurt am Main; Ulrich Klimt, Gross-Umstadt, and Helmut Kast, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,445
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412062
Int. Cl.[4] F16D *65/02*
U.S. Cl. 188—72.4 4 Claims



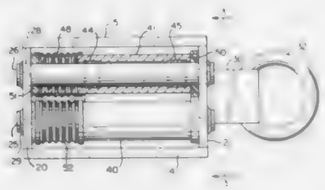
1. A spot-type disc brake, comprising a brake support member including a pair of spaced apart retaining arms one arm disposed at a brake disc entrance end of said support member with respect to a main forward direction of rotation of said brake disc and the second retaining arm disposed at a brake disc exit end of said support member, a pair of guide pins one fixed in each of said retaining arms, a brake caliper having a pair of openings, each of said pins slidably guided in one of said openings, a piston slidably sealingly disposed in a bore in said brake caliper with a predetermined clearance fit between said piston and said bore, two brake shoes disposed on opposite sides of said brake disc, one brake shoe being adjacent to the piston and frictionally engaging said piston in clamping relationship therewith and taking lateral support directly on the brake support member by way of said retaining arm disposed at said exit end, the second of said brake shoes on the side of said disc opposite said piston bears laterally against the brake caliper, and the retaining arm arranged in the brake disc's main direction of rotation at the exit is dimensioned in its cross-section such that, during braking, its elastic deformation in a circumferential direction of the brake disc does not exceed the clearance fit between the piston and the bore thereby to avoid transmission of braking forces from said piston onto said brake caliper.

4,856,621

HEAVY DUTY ACTUATING MEANS IN COMBINATION WITH SURGE OR INERTIA TYPE TRAILER BRAKE SYSTEM FOR USE WITH "LOW BOY", "GOOSENECK" OR FIFTH WHEEL TRAILERS AND THE LIKE

Herbert G. Yoder, 2260 Township Rd. 190 E., Bellefontaine, Ohio 43311

Filed Mar. 20, 1989, Ser. No. 325,818
Int. Cl.[4] B60T 7/20
U.S. Cl. 188—112 R 14 Claims



1. In a heavy duty surge brake in which a movable section is connected to the front end of a trailer for coupling to a towing vehicle and for transmitting the front end load of the trailer to the vehicle, and a fixed section is connected to the trailer frame, and a hydraulic master cylinder is operated by relative movement between the movable and fixed sections, the improvement in coupling the movable section to the fixed section comprising:

at least one cylindrical rod, means attaching said rod to said fixed section;

a sleeve, means mounting said sleeve on said rod for movement with said movable section; and

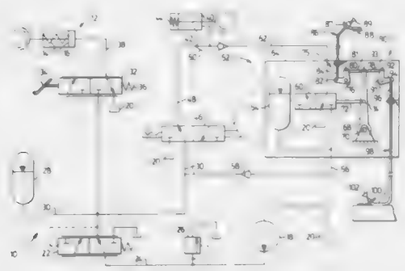
low friction sleeve bearing means between said sleeve and rod for transferring the front end load therethrough from said fixed section to said movable section.

4,856,622

AUXILIARY ACTUATION MECHANISM FOR A BRAKE ASSEMBLY

Stephen C. Sartain, Plainfield, and Richard W. Chamberlain, Montgomery, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 121,186, Nov. 16, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,294
Int. Cl.[4] F16D 65/24
U.S. Cl. 188—170 13 Claims



1. In a vehicle having a brake system that includes a brake assembly of the type that is spring applied and fluid pressure released, and a primary means for actuating said brake assembly under normal operating conditions, including a fluid reservoir, a source of pressurized fluid, and a valve means that selectively directs the pressurized fluid between the brake assembly and the fluid reservoir, an auxiliary actuation mechanism adapted to be mounted to said vehicle, comprising:

an accumulator;

a valve means having a first position wherein fluid is communicated between the accumulator and the brake assembly to cause the disengagement thereof and a second position wherein fluid is communicated between the brake assembly and the fluid reservoir to allow engagement of the brake assembly;

an actuating lever pivotally mounted to the vehicle and being positioned adjacent the valve means and connected thereto;

a pair of bellcranks pivotally mounted to the vehicle on opposite sides of the actuating lever, each bellcrank having a first arm connected with a distal end portion of the actuating lever and a second arm; and

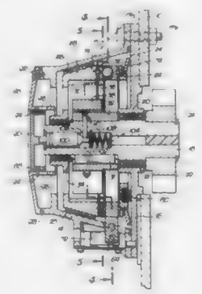
means for actuating said valve means connected to the second arms of the respective bellcranks, said actuating means being separate from the primary actuating means having at least two remote locations from which said valve means may be actuated between said first and second positions.

4,856,623

OVERSPEED BRAKE

Byron A. Romig, Jr., 19400 San Jose Ave., City of Industry, Calif. 91748

Continuation of Ser. No. 447,275, Dec. 6, 1982, abandoned. This application Jun. 13, 1985, Ser. No. 744,646
Int. Cl.[4] B60T 7/12
U.S. Cl. 188—180 12 Claims



1. An overspeed brake for arresting longitudinal movement comprising:

a shaft;

drive means for causing said shaft to rotate at a speed proportional to longitudinal movement;

a carrier connected to said shaft for rotation therewith;

a dog mounted on said carrier and outwardly moveable with respect to said carrier in response to centrifugal force;

restraining means for resisting centrifugal force and thereby releasably holding said dog inwardly toward said carrier as said carrier rotates until a predetermined centrifugal force level is reached, said restraining means including at least one dog spring urging said dog toward said carrier and magnetic means for magnetically holding said dog inwardly against said carrier;

first and second separation rings;

spreader means for axially separating said rings in response to relative rotational motion between said rings, said spreader means comprising at least one race extending circumferentially between said separation rings and tapered in a circumferential direction, and a ball disposed within said race;

means for preventing rotation of said first ring;

rotation means for causing rotation of said second ring upon engagement thereof in response to outward movement by said dog; and

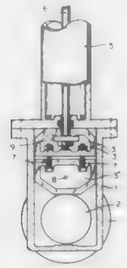
actuation means including first and second opposing friction surfaces for applying a brake force to stop rotation of said shaft in response to separation of said rings.

4,856,624

SLIDE TYPE EXHAUST BRAKE SYSTEM

Masayoshi Usui, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Sunto, Japan

Filed Nov. 23, 1988, Ser. No. 276,207
Claims priority, application Japan, Nov. 25, 1987, 62-297167
Int. Cl.[4] F02D 9/06
U.S. Cl. 188—273 7 Claims



1. A slide type exhaust brake system comprising:

a housing having an exhaust passageway with opposed ends connectable respectively to exhaust pipes and a reciprocatory operation passageway communicating with the exhaust passageway and angularly aligned thereto;

a cylinder unit mounted in proximity to said housing, said cylinder unit comprising a cylinder and a piston rod reciprocally movable into and out of the cylinder, said piston rod having an end disposed in the operation passageway and movable reciprocally toward and away from the exhaust passageway; and

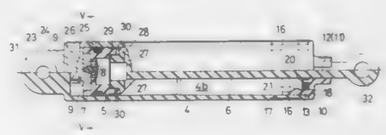
a tabular valve member slidably movable between said reciprocatory operation passageway and said exhaust passageway and being dimensioned for substantially blocking said exhaust passageway, said tabular valve member comprising a first valve component rigidly mounted to the piston rod adjacent the end thereof and movable with said piston rod as an integral structure, said tabular valve member further comprising a second valve component buffer-fitted to said first valve component on a side thereof generally opposite said piston rod, the buffer-fitting permitting limited relative movement between said first and second valve components, such that in a first relative position said first and second valve components are in abutting contact with one another, and such that in a second relative position said first and second valve components are in limited spaced relationship to one another to define a flowage spacing therebetween, whereby the movement of said piston rod from said cylinder urges said first valve component into said second valve component and urges said first and second valve components into said exhaust passageway, and whereby the movement of said piston rod into said cylinder initially urges said first valve component away from said second valve component to define the flowage spacing therebetween, and subsequently urges said first and second valve components into said reciprocatory operation passageway to open said exhaust passageway.

4,856,625

CYLINDER TYPE AIR DAMPER WITH FILTER FOR STORAGE BOX

Tsutomu Oshida, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Mar. 1, 1988, Ser. No. 162,662
Claims priority, application Japan, Mar. 13, 1987, 62-56723
Int. Cl.[4] F16F 9/50; E05F 3/00; B01D 39/04; B65D 51/16
U.S. Cl. 188—282 2 Claims



1. A cylinder type damper device for braking one direction of movement of a storage box which is openable and closable with respect to a housing, said damper device comprising:

a cylinder member enclosing air therein and having an open end substantially sealed by a cylindrical cap member; and

a rod reciprocally movably inserted into said cylinder member and provided at its front end with a piston for dividing the interior of said cylinder member into a head chamber and a rod chamber, said rod being moved in association with an opening and closing movement of said storage box;

said piston including an orifice formed throughout its entire length in the axial direction thereof for interchanging air in said head chamber and rod chamber by an axial movement of said piston, and air holes formed likewise throughout its entire length in the axial direction thereof and provided with a check valve for blocking the interchanging of air between said head chamber and said rod chamber according to one directional movement in the axial direction of said piston; and

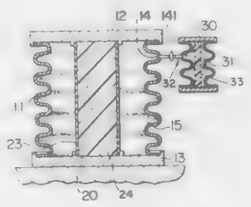
said cap having an inserting hole for receiving said rod and a filter mounted in said cap, said filter having a preformed opening for receiving said rod and being adapted to filter any external air which may enter said cylinder through said hole in said cap, and said cap having arm portions projecting into opposite ends of said preformed opening in said filter and at opposite sides of said rod.

4,856,626

BELLOWS TYPE SHOCK ABSORBER

Motoyasu Nakanishi, Fujishi, Japan, assignor to Kabushiki Kaisha Cubic Engineering, Shizuokaken, Japan

Continuation of Ser. No. 40,475, Apr. 20, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 271,697
Claims priority, application Japan, May 9, 1986, 61-106032
Int. Cl.[4] F16F 9/30, 5/00, 9/08; B60G 15/12
U.S. Cl. 188—371 8 Claims



1. A bellows type shock absorber comprising:

a compressible and expansible bellows body having a first and second open ends, said bellows body being a rigid material;

a first and a second cover member attached to and covering said first and second open ends of said expansible bellows body;

a compressible and expansible gelled material shock absorbing column having first and second ends attached to said first and second cover members, said gelled material shock absorbing column containing fine hollow particles, said gelled material having a penetration value of approximately 50 to 200, said gelled material shock absorbing column being surrounded by and spaced apart from said bellows body for defining an internal chamber around said shock absorbing column, the external surface of said shock absorbing column contracting and expanding along with the compression and expansion of said bellows body without contacting said bellows body for absorbing repeated shocks applied to at least one of said first and second cover members; and

a through hole in one of said first and second cover members for communicating said internal chamber defined by said gelled material shock absorbing column and said bellows body with the outside environment.

4,856,627

WORK BRIEFCASE AND TABLE SYSTEM

Paul Polatov, 63 Buckeye Rd., Glen Cove, N.Y. 11542

Filed Dec. 27, 1988, Ser. No. 290,142

Int. Cl.[4] A47B *3/10*

U.S. Cl. 190—11 **13 Claims**



1. A handy work briefcase and table system, comprising:

a briefcase including:

a briefcase body portion, and

a briefcase cover portion attached to the body portion for relative movement between an open position and a closed position;

a set of extensible legs each mounted at an underside of said body portion for supporting said briefcase a desired height above a floor surface when the legs are set at an extended position;

the body portion of said briefcase having recessed compartments that open at the underside of the body portion for storing said legs in a storage position; and

at least one shelf supported in the briefcase cover portion for sliding movement between a retracted position in which the shelf is carried inside said cover portion, and a working position in which the shelf projects out from said briefcase cover portion substantially parallel with a top surface of said cover portion, so that the projecting shelf and the cover portion together define a generally flat table surface when the legs are in the extended position and the cover portion is in the closed position.

4,856,628

AUTOMATED MECHANICAL TRANSMISSION SYSTEM FOR USE IN COMMERCIAL VEHICLES

Fujio Momiyama, Hino, Japan, assignor to Hino Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1987, Ser. No. 119,476

Int. Cl.[4] B60K *41/22;* **F16D** *25/063, 13/74*

U.S. Cl. 192—3.58 **15 Claims**



1. An automated mechanical transmission system for use in commercial vehicles comprising:

an oil spray type oil hydraulic clutch having a fly wheel, a pressure plate mounted on the fly wheel, a clutch cover secured to the fly wheel, a clutch disk rotatably mounted between the clutch cover and pressure plate, and an oil hydraulic clutch control cylinder disposed in the fly wheel for moving the pressure plate such that the clutch disk is sandwiched between the pressure plate and the clutch cover;

a mechanical transmission coupled to the clutch having a shift cylinder, a plurality of shift valves, a select cylinder, and a plurality of select valves;

a hydraulic system control circuit coupled to the clutch and transmission and including an oil hydraulic pump, a high pressure side clutch line and a low pressure side hydraulic clutch control line coupled to the clutch, a hydraulic transmission control line connected with said shift cylinder and select cylinder of the transmission through said plurality of shift valves and select valves, and a flow control valve for controlling the flow rate of pressure oil discharged from the oil hydraulic pump;

a clutch oil spray circuit coupled to the clutch and the hydraulic control system and having an oil spray control valve for controlling the flow rate of oil which is sprayed to said clutch disk;

a clutch/transmission select valve disposed in said high pressure side hydraulic clutch control line; and

a pressure control valve disposed at said low pressure side hydraulic clutch control line and having a pressure control pilot valve.

4,856,629

BRAKE ACTUATING MECHANISM FOR BICYCLES WITH MULTI-SPEED CHAIN DRIVE

Artur Paselt, Weinheimer Strasse 71, 6804 Ilvesheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 433,983, Jan. 21, 1983, abandoned. This application Nov. 12, 1987, Ser. No. 120,082

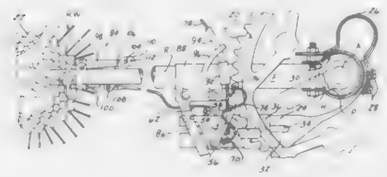
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1982, 3226037

Int. Cl.[4] B60K *41/26;* **B62L** *5/00*

U.S. Cl. 192—5 **11 Claims**

1. In a bicycle having a frame, front and rear wheels rotatably mounted on said frame, a pedal driven main sprocket, having sprocket teeth, mounted on said frame for forward and reverse rotation relative to said frame about a main sprocket axis, rear sprocket means coupled to said rear wheel, a chain operatively trained about said main sprocket and said rear sprocket means for transmitting pedal driven rotation of said main sprocket to said rear sprocket means, said rear sprocket means being coupled to said rear wheel to transmit only forward rotation of said main sprocket to said rear wheel, brake means mounted on said frame operable when applied to brake at least the rear wheel of said bicycle, cable means operable when tensioned to apply said brake means, and brake actuating means operable to apply tension to said cable means;

the improvement wherein said brake actuating means comprises a rigid lever having a main section lying in a vertical general plane in adjacent spaced parallel relationship to the general plane of said main sprocket, means mounting one end of said lever upon said frame for resiliently resisted pivotal movement about a lever axis parallel to and adjacent said main sprocket axis from a normally maintained rest position, said lever when in said rest position extending horizontally rearwardly from a front end located below and slightly to the rear of said main sprocket axis to a rear end spaced rearwardly from said main sprocket, a pawl arm mounted at one end on said lever at



the side of said main section thereof remote from said main sprocket for pivotal movement relative to said lever about an axis parallel to said main sprocket axis, a roller member mounted on the other end of said arm and projecting horizontally from said arm across the vertical general plane of said main section of said lever above said lever and across the general plane of said main sprocket, pawl actuating means coupled to said pawl arm and slidably engageable with the teeth of said main sprocket operable during forward rotation of said main sprocket to locate said arm in a rest position wherein said roller member is spaced rearwardly of the path of movement of said main sprocket teeth and spaced upwardly from said lever and operable upon reverse rotation of said main sprocket to pivot said arm to an actuated position wherein said roller is engaged beneath a tooth of said main sprocket on the lower rear quadrant of said main sprocket and rests upon the top of said lever rearwardly of said lever axis, and cable tensioning means operable in response to a predetermined downward pivoting movement of said lever from its rest position to apply tension to said cable means.

4,856,630

MOTOR VEHICLE

Hans D. Sommer, Graz, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Apr. 27, 1988, Ser. No. 192,324

Claims priority, application Austria, Apr. 29, 1987, 1067/87

Int. Cl.[4] B60K *41/24;* **F16D** *67/02*

U.S. Cl. 192—13 R **13 Claims**

1. A motor vehicle, comprising

a primary driven axle,

a secondary driven axle,

braking means for applying a rising brake pressure for braking said axles,

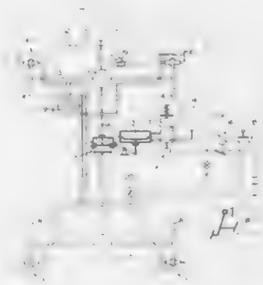
a drive train operatively connected to said secondary axle and comprising a clutch,

a clutch controller operative to engage and disengage said clutch,

clutch engaging means connected to said clutch controller for causing said clutch controller to engage said clutch, and

clutch releasing means connected to said clutch controller for causing said clutch controller to release said clutch, and to maintain said clutch in released condition until said clutch engaging means are operated,

said clutch-engaging means including first electromechanical switch means responsive to manual pressure for causing said clutch controller to engage said clutch,



said clutch-releasing means including second electromechanical switch means responsive to vehicle speed, and third electromechanical switch means responsive to actuation of said braking means, said second and third electromechanical switch means causing said clutch controller to release said clutch and to maintain said clutch in released condition when said vehicle speed exceeds a predetermined value and when said brake means are actuated.

4,856,631

PERMANENT MAGNET COUPLING TORQUE LIMITER

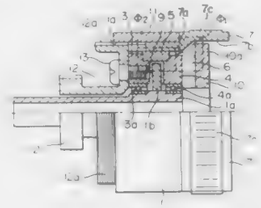
Kiyohide Okamoto; Ryosuke Okita, and Masaya Yamada, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 11, 1988, Ser. No. 217,293

Claims priority, application Japan, Jul. 24, 1987, 62-114013

Int. Cl.[4] F16F *15/03;* **F16D** *43/20*

U.S. Cl. 192—21.5 **9 Claims**



1. A torque limiter for transmitting torque which is less than or equal to a pre-set magnitude that can be varied comprising:

a hollow cylindrical member;

a disk of magnetic material fixedly secured to said hollow cylindrical member and extending radially from an outer circumferential surface of said hollow cylindrical member;

first and second annular members of magnetic material rotatably supported on said hollow cylindrical member, said annular members being disposed at two axial sides of said disk to form gaps between axially directed surfaces of said disk and axially directed surfaces of said annular members

opposing said axially directed surfaces of said disk, said annular members having first and second outer circumferential surfaces, respectively;

an amount of powdered magnetic material disposed in said gaps between said disk and said first and second annular members;

an annular disk-shaped permanent magnet fixedly secured to said second annular member at an axially directed surface thereof opposite to the axially directed surface opposing said disk; and

a substantially tube-shaped adjustment member of magnetic material axially slidably disposed around said annular members and said permanent magnet, said tube-shaped adjustment member having an inner circumferential surface including third and fourth portions opposing the first and second outer circumferential surfaces through small first and second gaps of different constant radial dimensions over first and second areas, respectively, which vary substantially inversely as said adjustment member slides axially, said tube-shaped adjustment member forming part of a first and a second magnetic circuit, each having magnetic flux flowing through the respective circuit, the magnetic flux generated by said permanent magnet;

said first magnetic circuit passing through said permanent magnet, a portion of said adjustment member, said second gap, and said second annular member;

said second magnetic circuit passing through said permanent magnet, a portion of said adjustment member, said first gap, both said first and second annular members, said disk disposed between said annular members, and said amount of powder of magnetic material disposed in the gaps between said disk and said first and second annular members;

the first magnetic circuit having a reluctance determined in part by the radial dimension of said second gap, the second magnetic circuit having a reluctance determined in part by the radial dimension of said first gap and said gaps having said powdered magnetic material, the second gap having a greater constant radial dimension than the constant radial dimension of the first gap, and the sum of the magnetic reluctances of the first and second magnetic circuits being substantially constant as said adjustment member is adjusted, such that the total flux flowing through the magnetic circuits and generated by said permanent magnet remains substantially constant and whereby said permanent magnet remains at a substantially constant magnetization level over long periods of usage notwithstanding repeated axial adjustments of said adjustment member.

4,856,632

SAFETY CLUTCH FOR ROTATING DRIVES

Othmar Stieger, Kindhausen, Switzerland, assignor to Elpa-tronic AG, Zug, Switzerland

Filed Mar. 3, 1988, Ser. No. 163,648

Claims priority, application Switzerland, Apr. 2, 1987, 01271/87

Int. Cl.⁴ F16D *46/20, 23/00*

U.S. Cl. 192—56 F **10 Claims**

1. A safety clutch for rotating drives having

a driving and a driven hub (10,16), which are mounted for rotation in relation to one another,

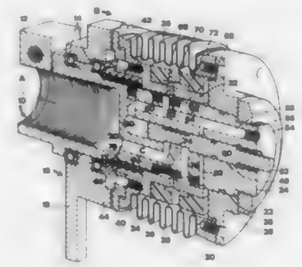
two locking arrangements (40,44), each of which is connected to one of the hubs (10,16) for joint rotation,

at least one detent member (42) which, in an engaged position, couples the two locking arrangements (40,44) to one another and produces an axial disengaging force (B) depending on the transmitted torque, and

a loading device to produce an engaging force (C) which can be overcome by the disengaging force (B) if a certain torque is exceeded, characterised in that

the loading device comprises a cylinder compartment (36) to which a fluid under pressure can be supplied from an inlet (56) so long as the detent member (42) is engaged, and

the detent member (42) is connected to a distributing slide valve (32) for joint axial displacement, which distributing slide valve disconnects the cylinder compartment (36)



from the inlet (56) and connects it to a relief passage (76) if the detent member (42) is at least partially disengaged.

4,856,633

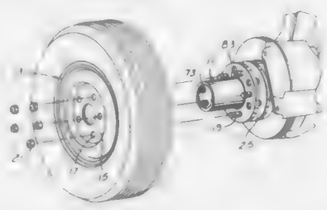
WHEEL HUB ASSEMBLY

Victor J. Specht, Kohl's Transmission, 44 Mildred, Fort Myers, Fla. 33901

Filed Mar. 31, 1988, Ser. No. 175,959

Int. Cl.⁴ F16D *11/04*

U.S. Cl. 192—67 R **28 Claims**



1. A wheel hub assembly comprising a spindle adapted for connection to a drive train for a vehicle and rotatable upon a horizontal axis, said spindle including a shank having a first longitudinal spline around said shank at one end thereof, a threaded portion intermediate its ends and an apertured mount flange at one end thereof;

a cylindrical wheel hub having an axial bore and being adapted to mount a vehicle wheel having an apertured mount flange;

said hub being coaxial of and surrounding said spindle and extending axially outwardly of said shank;

bearing means mounted upon said spindle interposed between said spindle and wheel hub supportably and retainingly engaging said hub;

screw means upon said threaded portion retainingly engaging said bearing means, retaining said hub against endwise movement relative to said spindle;

a second spline upon and around the interior of said hub radially spaced from said first spline; and

drive key means having inner and outer longitudinal splines thereon registerable with and interlocked with said first and second splines respectively, thereby said spindle and hub rotate in unison, with said drive key means adapted to transmit a drive torque to said hub.

4,856,634

CLUTCH

Seiichi Kitano; Yasunobu Fukatani; Masaaki Asada, and Kazuhiko Yoneda, all of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusbo, Osaka, Japan

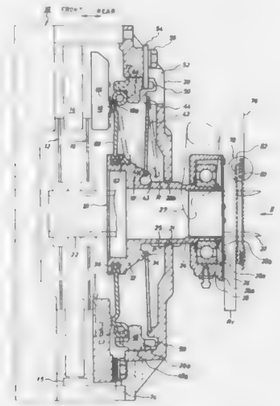
PCT No. PCT/JP87/00375, § 371 Date Feb. 17, 1988, § 102(e) Date Feb. 17, 1988, PCT Pub. No. WO87/07930, PCT Pub. Date Dec. 30, 1987

PCT Filed Jun. 10, 1987, Ser. No. 169,200

Claims priority, application Japan, Jun. 17, 1986, 61-142141

Int. Cl.⁴ F16D *13/38, 13/50, 23/14*

U.S. Cl. 192—70.3 **4 Claims**



1. In a clutch having a releasing operation by pulling a release bearing away from a flywheel by means of a releasing lever connected to a clutch pedal; a flywheel, a transmission having an input shaft, a clutch disc between said flywheel and said transmission and spline fitted onto said input shaft, a sleeved releasing retainer on the outer periphery of said input shaft, a release bearing fastened to the transmission end of the sleeve part of said retainer, the sleeve part and the releasing retainer part of said sleeved releasing retainer being integrally formed into a one piece unit with said releasing retainer part at the flywheel end of said unit, said releasing retainer part projecting radially outward from said sleeve part at said flywheel end of said unit; a clutch cover connected to said flywheel and covering the pressure plate for pressing said clutch disc against said flywheel; a disc-formed spring member disposed between said clutch cover and said releasing retainer part, a lever transmitting member for transmitting the spring force of said spring member to said pressure plate disposed between said releasing retainer part and said pressure plate; a spline extending outwardly and axially along said sleeve part and extending into an axial spline groove in said clutch cover for permitting axial sliding of said sleeved releasing retainer on said input shaft without rotation relative to said cover.

4,856,635

STARTING CLUTCH FOR A CONTINUOUSLY VARIABLE TRANSMISSION

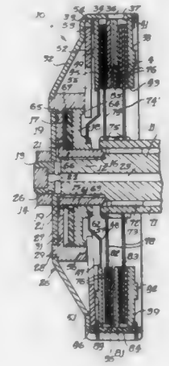
Maria S. Vlamakis, Justice, Ill., assignor to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Sep. 29, 1987, Ser. No. 102,450

Int. Cl.⁴ F16D *25/064, 13/64, 13/72*

U.S. Cl. 192—70.12 **12 Claims**

1. A hydraulically-actuated starting clutch assembly for a vehicle transmission comprising a driving shaft, an enclosure secured to the shaft for rotation therewith and defining an annular pressure chamber therein, an annular piston reciprocably mounted in the chamber, the enclosure having an outer wall, a reciprocable pressure plate actuated by said piston and an end plate mounted in said enclosure for rotation therewith, and a sleeve shaft encompassing and rotably mounted on said driving shaft, the improvement comprising a pair of clutch plates mounted on said sleeve shaft for rotation therewith and having friction facings located between said pressure plate and end plate, a separator located between said clutch plates and



mounted in said enclosure for rotation therewith, said separator comprising a pair of generally parallel plates, and means to evenly distribute the applied load of the clutch on the friction faces comprising an annular fulcrum ridge formed on one of the two parallel plates and contacting the other plate.

4,856,636

APPARATUS FOR DAMPING FLUCTUATIONS OF TORQUE

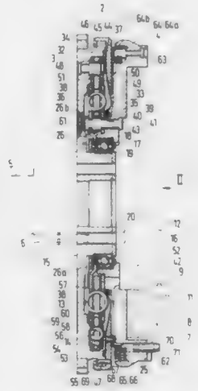
Rolf Meinhard, Bühl/Baden, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Feb. 4, 1988, Ser. No. 152,067

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1987, 3703808

Int. Cl.⁴ F16F *15/12, 15/30*

U.S. Cl. 192—70.17 **20 Claims**



1. Apparatus for damping fluctuations of torque, particularity for damping fluctuations of torque which is transmitted by the engine of a motor vehicle, comprising a composite flywheel assembly including coaxial first and second flywheels which are rotatable relative to each other; at least one elastic

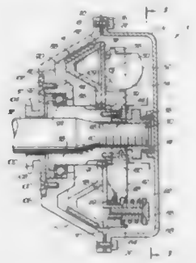
damper which is operative to yieldably oppose rotation of said flywheels relative to each other; and at least one friction generating device operative to oppose rotation of said flywheels relative to each other with a first force within a lower range of rotational speeds of said flywheels and with a lesser second force within a higher second range of rotational speeds of said flywheels, said friction generating device comprising a plurality of arcuate jaws radially movably mounted on one of said flywheels and having internal friction generating surfaces, and a brake drum provided on the other of said flywheels and having an external surface confronting said internal surfaces, said internal surfaces being in frictional engagement with said external surface within said first range of rotational speeds and being out of contact with said external surface under the action of centrifugal force within said second range of rotational speeds, said other flywheel including a primary section which is arranged to receive torque from the engine of the motor vehicle and a wall defining with said primary section an annular chamber for a supply of viscous fluid, said damper being installed in said chamber.

4,856,637

CENTRIFUGAL CONE CLUTCH

Gary R. Gebhart, Arcadia, Calif., assignor to Horstman Manufacturing Co., Monrovia, Calif.

Filed Jul. 25, 1988, Ser. No. 223,414
Int. Cl.[4] F16D *43/10*
U.S. Cl. 192—105 C **7 Claims**



1. A centrifugal friction clutch for transmission of torque from a rotating input connector means for supplying rotational power to an output connector means for receiving said rotational power, and having frictional surfaces adapted to be engaged at a predetermined engagement speed of rotation of said input connector means, comprising:

(a) a pressure plate means having a peripheral frusto-conical pressure application surface;

(b) a pressure drum having a frusto-conical cavity having a peripheral pressure receiving surface adapted to frictionally engage said pressure application surface;

(c) a centrifugal force lever support member having a plurality of apertures therein and operatively engaged with said input connector means;

(d) means for applying an adjustable biasing force on said support member towards said pressure plate means comprising a plurality of threaded apertures in said pressure plate means aligned with said support member apertures, a plurality of threaded members engaging said threaded apertures, and a plurality of compression springs, each of which extends between one of said threaded members and said support member;

(e) a plurality of centrifugal force levers symmetrically disposed on an pivotally attached to said support member, each of said levers having a radius portion, a weighted portion and a pivotal point of attachment to said support member, each radius portion being adapted to bias said pressure application surface towards said pressure drum pressure receiving surface due to centrifugal force exerted on said levers during rotation of said support member; and

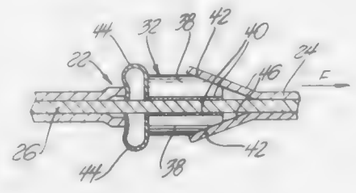
(f) said pressure plate means comprising a flat contact plate member including said threaded apertures, adjacent said centrifugal force levers, and a pressure plate member adjacent said contact plate member having a flat central portion and a peripheral portion, said frusto-conical pressure application surface being formed in said peripheral portion of said pressure plate member, whereby said biasing from said centrifugal force levers is transmitted to said pressure plate member through said contact plate member.

4,856,638

CLUTCH DAMPER WITH FRICTION LAG

William H. Roth, Centerville, and Dennis C. Dull, Arcanum, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1988, Ser. No. 232,979
Int. Cl.[4] F16D *3/14*
U.S. Cl. 192—106.1 **3 Claims**



1. A clutch damper having a friction lag device, said damper being subjected to forward and reverse transient torque impulses from a drive source; said damper comprising: a drive member selectively engageable with the drive source; a driven member connected for continuous drive to an output member; spring means disposed between said drive member and said driven member for transmitting drive torque therebetween and for permitting relative angular motion when abrupt changes in drive torque occur; and friction lag means for providing a hysteresis in the relative angular motion in the reverse torque direction comprising a wedge-shaped pocket on one of said drive and driven members, a wedge-shaped pad freely disposed in said pocket and urged into said pocket by a retainer spring means, and friction surface means on said pad, the other of said drive and driven members having a surface adjacent said friction surface means, said pad being movable away from said pocket due to friction between said surface and said friction surface means during forwardly directed transient torque impulses to reduce a friction load on said other members and said pad being forced into said pocket during reversely directed transient torque impulses, the wedge-shapes performing as cam members to increase the friction load on said other member and provide the hysteresis in the relative angular motion.

4,856,639

FLYWHEEL ASSEMBLY

Hirotaka Fukushima, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Division of Ser. No. 8,224, Jan. 29, 1987. This application Mar. 9, 1988, Ser. No. 165,689
Claims priority, application Japan, Jan. 30, 1986, 61-12168; Feb. 4, 1986, 61-14966; Feb. 4, 1986, 61-22427; Feb. 4, 1986, 61-12428
Int. Cl.[4] F16D *13/50, 3/14*
U.S. Cl. 192—106.2 **4 Claims**

1. A flywheel assembly including a first flywheel fastened to an engine crankshaft and engaged and disengaged by a clutch

disc having a spline hub, a second flywheel supported concentrically with the first flywheel and set to a specific mass, said second flywheel having a damper inertial part, a damper mechanism resiliently connecting the flywheels to each other, and a friction damping mechanism which transmits power from the second flywheel to the spline hub of the clutch disc and damps vibration only when said clutch disc contacts with the first flywheel; characterized by that an outer peripheral part of said first flywheel and the crankshaft are connected by the comparatively thin connecting plate disposed along an end face of the



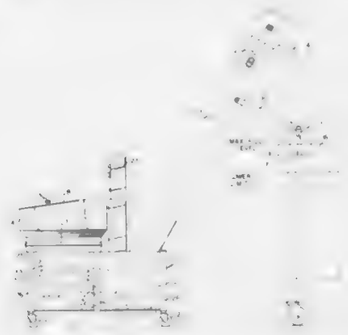
second flywheel opposite to the clutch disc, a bearing on said crank shaft supports said second flywheel for limited circumferentially rockable movement on said crank shaft, a pressure surface on which a friction member of the friction damping mechanism presses is formed on said damper inertial part, the friction member being fixed to an approximately annular friction plate provided on the spline hub of the clutch disc in an axially sliding manner, and a spring member urging the friction plate and the friction member toward the second flywheel is interposed between the friction plate and the spline hub.

4,856,640

STOPPER ELEVATOR CONVEYOR

Frank Beswick, Phoenixville, and Robert W. Winship, Downingtown, both of Pa., assignors to The West Company, Phoenixville, Pa.

Filed Jul. 17, 1987, Ser. No. 76,777
Int. Cl.[4] B65G *47/18*
U.S. Cl. 198—311 **34 Claims**



1. A device for transferring small discrete objects such as pharmaceutical stoppers and caps, comprising:

a frame movably positionable at a predetermined location for delivery of said objects;

an angularly displaced conveyor on said frame and having a discharge chute at said predetermined location for discharging objects thereto, said conveyor including a conveyor chain means defining a path from a transfer point to said discharge chute, said chain having bucket flight means for conveying said objects along said path;

a delivery chute on said frame for transferring said objects to said transfer point, said delivery chute including a first tray inclined with respect to the horizontal and having an open lower terminal end adjacent said transfer point positioned to feed said objects to said conveyor chain, said delivery chute further including a second tray located within said first tray at the same or greater angle with the horizontal and positioned to receive said objects, said second tray having an open lower terminal end for feeding said objects to said first tray, said delivery chute further including vibrating means for oscillating said trays to impart movement of said objects toward the lower terminal ends of said trays; and

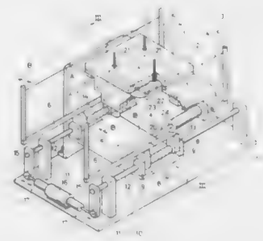
hopper means removably mounted on said frame for holding a quantity of said objects including a hopper chute for gravity feed of said objects to said delivery chute.

4,856,641

APPARATUS AND A METHOD FOR CARRYING WAFERS

Yoshio Matsumura, Shiga, and Hiroshi Matsui, Kyoto, both of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Nov. 16, 1987, Ser. No. 120,987
Claims priority, application Japan, Nov. 25, 1986, 61-280043
Int. Cl.[4] B65G *47/00*
U.S. Cl. 198—346.2 **19 Claims**



1. A wafer processing apparatus, comprising:

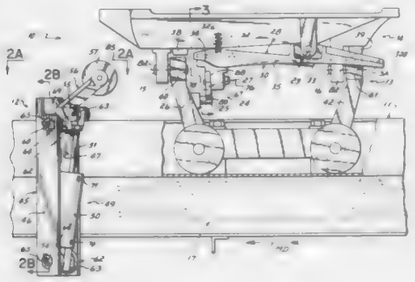
a heat treatment plate having a main surface, said apparatus being effective for carrying a wafer onto and off said main surface of said heat treatment plate for effecting a heat treatment of said wafer, said main surface having a plurality of spaced through-holes passing therethrough, but otherwise, said main surface thereof being flat and contiguous;

wafer elevating means having a placing portion for supporting said wafer thereon, said wafer elevating means being mounted to selectively protrude above said main surface and retract into said main surface of said heat treatment plate through said plurality of through-holes, said wafer elevating means comprising a plurality of pins movable up and down through said through-holes and having pin tip ends maintained at the same height, said pin tip ends of said plurality of pins forming said placing portion;

said wafer elevating means being effective to selectively lift said wafer above the main surface of said heat treatment plate and to selectively place said wafer on said main surface of said heat treatment plate upon retraction of said wafer elevating means below said heat treatment plate; and

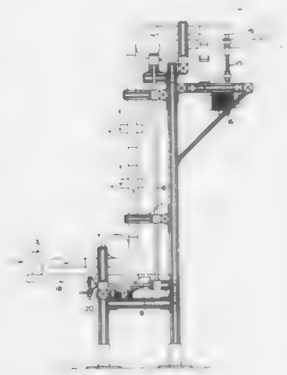
wafer holding means for selectively holding said wafer and for transferring and retrieving said wafer to and from said wafer elevating means, said wafer holding means comprising support arm means and a pair of spaced elongated members extending at opposite sides of and above said heat treatment plate and mounted to and stationarily relative to said support arm means, and means for moving said support arm means.

4,856,642
SORTATION CONVEYOR
Robert J. Nicholson, Sheperdsville, Ky., and Anthony D. Jape, Doraville, Ga., assignors to Figgie International Inc., Westlake, Ohio
Filed Oct. 30, 1987, Ser. No. 116,019
Int. Cl.[4] B65G *47/46*
U.S. Cl. 198—365 9 Claims



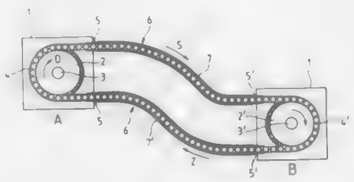
1. A method for sorting articles from a tilt tray conveyor into predetermined sort locations including the steps of:
operating the conveyor at a speed approximately equal to a predetermined line speed; and
positively tipping an article carrying tray proximate a predetermined sort location at a constant angular acceleration to discharge an article thereon into said sort location; and
the constant angular acceleration being such that the tangential acceleration at the outermost portions of the tray is less than or equal to the acceleration of a free falling body at all times during said step of positively tipping said tray.

4,856,643
DEVICE FOR RETAINING TWO PARALLEL TRACKS
Leif Lachonius, Surte, and Göran Abbestam, Gothenburg, both of Sweden, assignors to Aktiebolaget SKF, Sweden
Filed May 4, 1988, Ser. No. 189,991
Claims priority, application Sweden, May 5, 1987, 8701838
Int. Cl.[4] B65G *15/14*
U.S. Cl. 198—627 1 Claim



1. A conveyor system comprising:
elongated generally parallel movable tracks for conveying objects therebetween having at least two angularly offset run sections,
means for selectively varying the distance between the tracks to accommodate objects of different sizes including a plurality of mounting assemblies cooperatively associated with the tracks,
each mounting assembly including a pair of units connected by a shaft member rotatable in one direction to move the units away from one another to increase the distance between the tracks and in an opposite direction to move the units toward one another to decrease the distance between the tracks,
at least one mounting assembly located in each run section and spaced along the length of the tracks,
and actuation means defining a plurality of shaft segments generally parallel to the run sections and connected by angular gear means to effect simultaneous activation of all mounting assemblies.

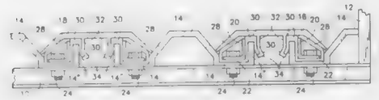
4,856,644
FLEXIBLE DRIVE TRANSMISSION
Walter Reist, Hinwil, Switzerland, assignor to SFT AG Spontanfördertechnik, Weinfelden, Switzerland
Filed Aug. 8, 1984, Ser. No. 638,712
Claims priority, application Switzerland, Aug. 22, 1983, 4562/83; Jul. 16, 1984, 3442/84
Int. Cl.[4] B65G *19/14*
U.S. Cl. 198—716 5 Claims



1. A chain drive apparatus for transmitting rotary movement comprising the combination of
a drive unit having a chain channel therein and means for exerting longitudinal force on a chain extending through said channel;
a power take-off unit having a chain channel therein and means for being acted on by force exerted by a chain extending through said channel;
a plurality of flexible, elastic chain guide tubes interconnecting said chain channels to form an endless chain path; and
an endless chain of elements interconnected in said chain path such that force exerted on said chain is transmitted along portions of said chain by pushing forces and concurrently along other portions of said chain by pulling forces, said chain having a length substantially equal to the length of said chain path in an inoperative state,
said guide tubes being sufficiently elastic to extend and contract in response to the imposition on said portions of said chain of pushing and pulling forces, respectively, while the total length of said path remains substantially constant, whereby sudden alternations in the direction of force exerted by said drive unit are at least partially absorbed and smoothed before reaching said take-off unit.

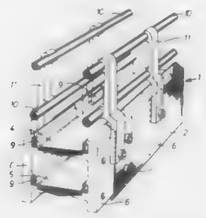
4,856,645
RECIPROCATING CONVEYOR
Olof A. Hallstrom, Jr., 1920 Hallstrom Rd., Tillamook, Oreg. 97141
Continuation of Ser. No. 110,165, Oct. 19, 1987, abandoned.
This application Oct. 24, 1988, Ser. No. 262,078
Int. Cl.[4] B65G *25/04*
U.S. Cl. 198—750 8 Claims

1. A slat type reciprocating conveyor, comprising:
(a) an elongated framework,
(b) at least one longitudinally extending elongated load engaging fixed slat secured to the framework and extending the desired length of a conveyor bed,
(c) first and second longitudinally slidable elongated load engaging reciprocative slats disposed on opposite lateral sides of and parallel to the longitudinally extending fixed slats, each of the fixed and reciprocative slats having a longitudinally extending load engaging surface, the load engaging surfaces of the fixed and reciprocative slats being in the same longitudinally extending plane at all times during operation of the conveyor,



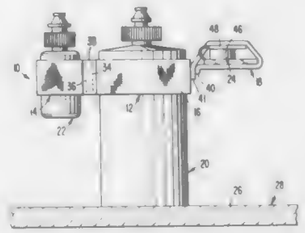
(d) bearing means on the framework for supporting the reciprocative slats for longitudinal sliding movement relative to the fixed slats,
(e) lock means interengaging the framework and reciprocative slats for securing the reciprocative slats against vertical displacement relative to the fixed slat, and
(f) first and second drive means on the framework connected to said first and second reciprocative slats, respectively, for moving the first and second slats longitudinally simultaneously in a load-conveying direction and independently of each other in the opposite, slat-retracting direction.

4,856,646
CONVEYOR ASSEMBLIES
Uno Sjöstrand, Flyinge, Sweden, assignor to Aktiebolaget Profor, Lund, Sweden
Filed Dec. 31, 1987, Ser. No. 140,138
Claims priority, application Sweden, Jan. 22, 1987, 8700242
Int. Cl.[4] B65G *15/00*
U.S. Cl. 198—836 2 Claims



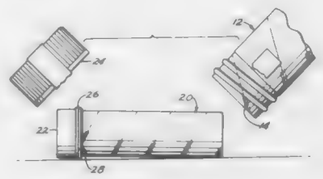
1. A conveyor assembly with supporting parts able to be joined together to a required length, comprising:
two supporting sides;
a first slideway for an endless chain;
said first slideway being mounted between said two supporting sides to serve as a spacer element between the supporting sides so that the supporting sides are fixed at a predetermined distance from one another;
a second slideway arranged at some distance underneath the first slideway;
guide panels at the second slideway so arranged that the supporting sides are extended downwards by means of said guide panels, between which is located a wheel freely suspended in the chain and adapted so that by its weight the required stretching of the chain is produced; and
further comprising a guide pin and a spring, wherein the wheel is guided by means of the guide pin which is located in a center hole of the wheel and adapted so that the guide pin is pressed outwards against the guide panels by means of the spring.

4,856,647
APPARATUS FOR CONNECTING CONTAINERS
Cynthia F. Dahne, 4 Tentmill La., Apartment C, Baltimore, Md. 21208
Filed Aug. 19, 1988, Ser. No. 234,155
Int. Cl.[4] A45C *11/04*
U.S. Cl. 206—5.1 11 Claims



1. An apparatus for storing contact lenses and cleaning material for cleaning contact lenses, the combination comprising:
a contact lens case for storing the contact lenses;
a first container for storing a saline solution for cleaning contact lenses;
a second container for storing a daily contact lens cleaning material; and
a connecting assembly for connecting together said contact lens case, said first container and said second container,
said connecting assembly including
a first elastic loop for receiving said first container, said first elastic loop having a longitudinal axis A,
a second elastic loop for receiving said second container, said second elastic loop having a longitudinal axis B substantially parallel to said axis A, said axes A and B defining a plane,
means, coupled to said first and second elastic loops, for coupling said first and second elastic loops together,
a third elastic loop for receiving said contact lens case, said third elastic loop having a longitudinal axis C substantially perpendicular to said axes A and B and substantially perpendicular to said plane, and
means, coupled to said first and third elastic loops, for coupling said first and third elastic loops together.

4,856,648
PACKAGING & INSTALLING IMPLANTS
Kenneth K. Krueger, Laguna Niguel, Calif., assignor to Steri-Oss, Inc., Anaheim, Calif.
Filed Dec. 31, 1987, Ser. No. 140,255
Int. Cl.[4] B65D *85/32*
U.S. Cl. 206—63.5 10 Claims



5. In the combination of a container having an open end, an implant located within said container and a cap removably secured to said open end of said container, said cap closing off said open end of said container, the interior of said container being sterile, the improvement comprising:

a secondary container located within said first mentioned container, said secondary container having an open end and being capable of being removed from said first mentioned container through said open end of said first mentioned open container,

a closure removably secured to said open end of said secondary container, said closure closing off said open end of said secondary container from the interior of said first mentioned container,

an implant having a head which is adapted to be held as said implant is inserted in a desired location within a body, said implant being located within said secondary container,

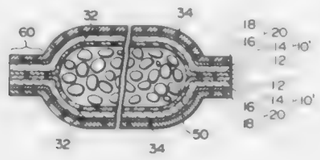
said closure including holding means for temporarily holding said head when said closure is in place on said secondary closure and as said closure and said implant are removed from said secondary container as a unit and as said implant is located in substantially a desired position in a body.

4,856,649

DEOXIDIZER PARCEL

Yoshiaki Inoue, Tokyo, Japan, assignor to Mitsubishi Gas Chemical Company, Inc., Japan

Filed Feb. 29, 1988, Ser. No. 162,267
Claims priority, application Japan, Mar. 2, 1987, 62-45162
Int. Cl.[4] B65D *81/26*
U.S. Cl. 206—204 **27 Claims**



1. A deoxidizer parcel having a parcel body and a deoxidizer contained in said parcel body, at least a part of said parcel body being made of a composite sheet comprising:

a gas-permeable sheet; and

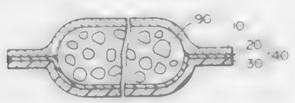
a plastic film laminated on and bonded to at least one surface of said gas-permeable sheet and having a multiplicity of uniform minute laser-formed pores, said pores formed after lamination and bonding of said plastic film to said gas-permeable sheet and having a gas-permeability of 1 to 50,000 sec/100 ml.

4,856,650

OXYGEN ABSORBENT PACKAGE

Yoshiaki Inoue, Tokyo, Japan, assignor to Mitsubishi Gas Chemical Co., Inc., Japan

Filed Oct. 26, 1987, Ser. No. 112,264
Claims priority, application Japan, Oct. 27, 1986, 61-253759; Nov. 13, 1986, 61-268542; Mar. 10, 1987, 62-52963
Int. Cl.[4] B65D *81/26*
U.S. Cl. 206—204 **28 Claims**



1. An oxygen absorbent package comprising a package made of an oxygen absorbent packed in said package and a packaging material which is at least partly formed from an air-permeable sheet obtained by making a sheet from plastic fiber by wet processing of the plastic fiber, drying the sheet, impregnating the sheet with a fluorine resin and pressing the resin-impregnated sheet by heated rolls.

4,856,651

CHEMICAL THERMAL PACK AND METHOD OF MAKING SAME

Sam E. Francis, Jr., 5260 Lake Washington Rd., Melbourne, Fla. 32935

Filed Dec. 22, 1987, Ser. No. 136,621
Int. Cl.[4] A61F *7/00*; B65D *81/32*
U.S. Cl. 206—219 **26 Claims**



1. A thermal pack comprising:

an outer pouch having a pair of opposed faces arranged generally parallel to each other and defined by a single sheet of flexible plastic film folded along a predetermined fold line;

a second sheet of flexible plastic film disposed between said pair of opposed faces;

a continuous weld line circumscribing and sealing the periphery of said faces, said weld line bonding together the periphery of said faces and the periphery of said second sheet so that said second sheet and said opposed faces define first and second volumes within said outer pouch, said second sheet providing a common wall between said first and second volumes;

a heat transfer material disposed in said first volume; and

an insulating layer disposed in said second volume and substantially covering said second sheet.

11. A thermal pack comprising:

an outer pouch having a pair of opposed faces arranged generally parallel to each other and defined by a single sheet of flexible plastic film folded along a predetermined fold line, each of said opposed faces being shaped like an elongated rectangle having a longitudinal axis;

a second sheet of flexible plastic film disposed between said pair of opposed faces;

a continuous weld line circumscribing and sealing the periphery of said faces, said weld line bonding together the periphery of said faces and the periphery of said second sheet so that said second sheet and said opposed faces define first and second volumes within said outer pouch, said second sheet providing a common wall between said first and second volumes, said weld line being defined by two side welds disposed generally parallel to said longitudinal axis, a bottom weld disposed generally perpendicular to said longitudinal axis and a top weld disposed generally perpendicular to said longitudinal axis;

a heat transfer material disposed in said first volume; and

an insulating layer disposed in said second volume and substantially covering said second sheet, said insulating layer being bonded within said two side welds.

20. A thermal pack comprising:

an outer pouch having a pair of opposed faces arranged generally parallel to each other and defined by a single sheet of flexible plastic film folded along a predetermined fold line, each of said opposed faces being shaped like an elongated rectangle having a longitudinal axis;

a continuous weld line circumscribing and sealing the periphery of said faces, said weld line bonding together the periphery of said faces to define a first sealed volume;

a second sheet disposed within said first sealed volume, said second sheet means being sealed between said faces along at least a portion of said continuous weld line to define a second sealed volume, said weld line being defined by at least two side welds disposed generally parallel to said longitudinal axis, and a top weld disposed generally perpendicular to said longitudinal axis;

a heat transfer material disposed in said second volume; and

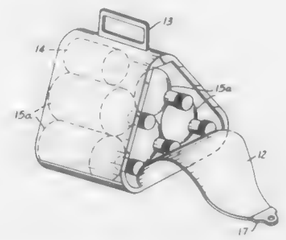
an insulating layer disposed in said first volume and sized to substantially conform to the size of one of said opposed faces.

4,856,652

SELF-CONTAINED OIL SOURCE AND DRAIN PACKAGE

Robert O. Bowland, Grosse Pointe, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 4, 1988, Ser. No. 178,038
Int. Cl.[4] B65D *69/00*
U.S. Cl. 206—223 **6 Claims**



1. A self-contained oil source and drain package for use in changing the engine oil of an automobile, the package comprising:

a container to house and carry oil canisters and an oil filter;

said container defining one space for the oil canisters and oil filter, said container being sized such that the portion of the space occupied by used oil drained form the engine into said container is less than the total space defined by said container;

said container further comprising:

a generally triangular shaped top and base where said top is at least partially tear-away removable, by aids such as perforations, from said container; and

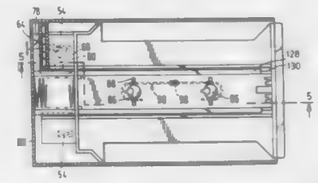
an outer panel spanning the top and base such that the oil canisters and oil filter are stacked and carried in the space so spanned so as to form a triangle as viewed from the top or the base.

4,856,653

STORAGE CONTAINER FOR COMPACT CASSETTES

Peter Ackeret, Kusnacht, Switzerland, assignor to IDN Inventions and Development of Novelties A.G., Chur, Switzerland

Division of Ser. No. 817,232, Jan. 8, 1986, Pat. No. 4,702,372. This application Oct. 16, 1987, Ser. No. 109,706
Claims priority, application European Pat. Off., Aug. 29, 1983, 83108473.6
Int. Cl.[4] B65D *85/672*
U.S. Cl. 206—387 **14 Claims**



1. Apparatus for storage of cassettes containing recording media comprising:

a housing, said housing being open at one narrow side and having a floor, said housing open side defining a plane which is generally transverse to said floor, said housing including internal guide rails which are integral with said floor, said guide rails extending in a direction which is generally transverse to said plane, at least a first of said guide rails cooperating with said floor to define at least a first open-sided guide channel;

a slider member, said slider member having a front wall, a rear wall and a bottom which extends between said front and rear walls, said slider member further comprising guide bar means extending from said bottom and being received in said guide channel and overlapped by said housing guide rails whereby said slider member is guided for movement relative to said housing;

spring means for biasing said slider member in the direction of said housing open side;

stop means for limiting the motion of said slider member in the direction of said spring means bias;

retaining projections extending from said bottom of said slider member in a direction which is away from said housing floor, said retaining projections being sized and shaped to receive and lock against rotation the winding hubs of a recording media cassette inserted in said slider member, said projections being arranged one behind the other in the direction of movement of the slider member, the length of said guide rails and guide bars and the position of said stop means being selected such that both of said retaining projection are displaced outwardly with respect to said plane when said slider member is positioned at its limit of movement under the influence of said biasing spring means; and

manually releasable locking means for retaining said slider member in said housing against the bias of said spring means;

wherein said guide bar means extends beyond said slider member rear wall.

4,856,654

PACKAGE OF AUTOMOBILE MATS WITH MOUNTING PADS FOR MOUNTING MATS ON AN AUTOMOBILE CARPET

Harold Reuben, Akron, Ohio, assignor to Akro Corporation, Canton, Ohio

Filed May 26, 1988, Ser. No. 199,024
Int. Cl.[4] B65D *21/00*; B32B *3/06*; B60J *9/00*
U.S. Cl. 206—449 **13 Claims**

1. A package comprising a pair of car mats, means engaging said pair of car mats and serving for positioning the car mats

together in overlying relationship to each other, each of said mats comprising a fibrous body portion and a backing secured to said fibrous body portion and having a plurality of outwardly extending integrally formed spaced apart projections adapted for maintaining the car mats in a placed relationship when positioned on top of the carpet in an automobile, and pad means connected alongside said pair of car mats for further aiding in maintaining the car mats in a desired placed relationship when positioned on the carpet of an automobile, said pad



means comprising a pair of relatively small pads of elastomeric material each having a unitary group of integrally formed spaced apart projections extending outwardly from one side of the pad and adapted for being positioned in intermeshing relationship with the projections extending from the back of one of said car mats, a layer of pressure sensitive adhesive on the opposing side of each of said elastomeric pads, and a release cover releasably secured to said layer of pressure sensitive adhesive to protect and maintain the tackiness of the adhesive layer for releasable securement to an automobile carpet.

4,856,655

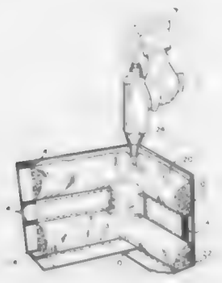
COMBINATION BOX AND PACKAGE CUSHIONING AND METHOD

Samuel M. Barsky, 28 Charles St., Wakefield, Mass. 01880

Filed Sep. 28, 1987, Ser. No. 101,846

Int. Cl.[4] B65D *81/04*

U.S. Cl. 206—524 **14 Claims**



1. An erectable and cushionable box structure comprising:
a flat box blank having an inner face and an outer face;
a plurality of fold lines disposed at selected positions on said inner face of said flat box blank;
a plurality of adhesive lines disposed at selected positions on said inner face of said flat box blank;
at least one shaped and extendable pocket of definable spatial volume adapted to be filled with a cushioning material integral with said inner face of said flat box blank, said shaped pocket comprising at least one sheet of extendable material disposed over at least a portion of said inner face and adhering to said positioned adhesive lines on said inner face, the spatial volume of said shaped pocket being extendable on demand by filling said pocket with a cushioning material; and
means for introducing a cushioning material into the spatial volume of said shaped and extendable pocket.

4,856,656

MULTI-LAYER FILM AND PACKAGE

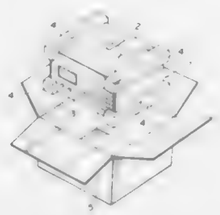
Keiji Sugimoto; Takeo Hayashi, and Masahiro Fujimoto, all of Chiba, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 20,708, Mar. 2, 1987. This application Mar. 9, 1988, Ser. No. 169,101

Claims priority, application Japan, Mar. 17, 1986, 61-57070; Dec. 25, 1986, 61-307805

Int. Cl.[4] B65D *81/02*

U.S. Cl. 206—523 **14 Claims**



1. A package for packaging an article such as appliances, television sets, audio sets, business instruments, precision instruments and furniture, said packages comprising
a coextruded multi-layer film comprising (A) an ethylene-vinyl acetate copolymer-based resin layer, (B) a polyethylene-based resin expanded layer of low density polyethylene with a density of 0.910 to 0.930 g/cm^3 and (C) a high density polyethylene-based resin layer, said multi-layer film being used in packaging the article in such a manner that the ethylene-vinyl acetate copolymer-based resin layer is in contact with the article; and a buffering material is used to fix the article.

4,856,657

CONTAINER WITH SLEEVE INTERLOCKING LATCH

Lyle H. Shuert, 817 N. Fieldstone, Rochester, Mich. 48063

Continuation of Ser. No. 80,230, Jul. 28, 1987, Pat. No. 4,765,252, which is a continuation of Ser. No. 858,524, Apr. 23, 1986, abandoned, which is a continuation of Ser. No. 642,778, Aug. 21, 1984, abandoned. This application Jun. 9, 1988, Ser. No. 204,478

The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

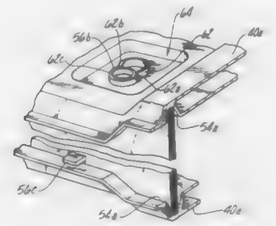
Int. Cl.[4] B65D *19/06*

U.S. Cl. 206—600 **26 Claims**

1. A container comprising:
a base member having an upper face and a lower face;
said lower face including first surfaces arranged at a first level to define a support surface for the base member and second surfaces arranged at a second level, above said first level, to define indentations for receiving the forks of a fork-lift truck;
said upper face defining an upwardly facing seat means on peripheral portions of said base member substantially at said first level; and
a sleeve member having a lower edge including lower portions adapted to seat on said seat means.

10. A container comprising:
a generally rectangular reusable plastic pallet having a lower face configured so that at least the corners of the pallet have bottom surfaces which are adapted to rest on a supporting surface for the containers and defining a plurality of indentations running laterally across said lower face and inboard of the corners providing relieved areas for receiving the skids of a fork-life truck or the like;
an open ended rectangular sleeve made of corrugated material providing side walls for the container;
said pallet further defining seat means formed on the upper face of the pallet at substantially the level of said bottom surfaces and adapted to receive lower edge portions of the sleeve; and
coacting releasable attachment means on said sleeve and on said pallet for releasably attaching said sleeve to said pallet.

19. A generally rectangular pallet for use with an open ended sleeve member to form a container, said pallet comprising:
(A) a main body generally planar rectangular platform portion;



(B) a plurality of legs extending downwardly from said main body platform portion at circumferentially spaced locations around the periphery of said platform portion;
(C) means defining seat means on the peripheral of the upper face of said platform portion for receipt of the lower edge of the open ended sleeve to form the container;
(D) a plurality of latch members; and
(E) means mounting each of said latch members on said platform portion between a pair of circumferentially spaced legs for generally horizontal reciprocal movement between a released position clear of said seat means and a latching position extending across said seats means
whereby, with said latch members in their released positions, the lower edge of the sleeve may be positioned on said seat means whereafter said latch members may be moved to their latched positions to pass through slots in the lower edge of the sleeve to releasably secure the sleeve to said pallet.

4,856,658

REMOTE CONTROL UNIT HOLDER ASSEMBLY

Miloslav Novak, 300 S. 880 East #32, Salt Lake City, Utah 84103

Filed Apr. 25, 1988, Ser. No. 186,100

Int. Cl.[4] A47B *65/00*

U.S. Cl. 211—13 **3 Claims**



1. A holder for remote control units comprising
a first angle member having a base leg and a wall leg extending normal to said bas leg, said base leg having a top platform surface and a central recessed portion that is partially cut into said top platform surface of the base leg to extend from the wall leg to a remote end of the base leg and with parallel opposite edges of the recessed portion having a rack of teeth formed thereon and with a portion of the base leg extending between the racks of teeth and below the teeth;
a second angle member having a second base leg and a second wall leg extending normal to said second base leg, said second base leg having a thickness corresponding to the depth of the central recessed portion whereby an upper surface of said second base leg will form a continuation of the platform surface, and having parallel side edges with a rack of teeth on opposite sides thereof interlocking with the teeth on the edges of the central recessed portion, the teeth of the first and second angle members being resilient and shaped to allow insertion of the second base leg of the second angle member into the central recessed portion while preventing withdrawal therefrom;
a mortise formed on a rear surface of one of said wall legs;
a tenon sized to slide snugly into the mortise, formed on a rear surface of the other of said wall legs;
an extension member having racks of teeth on opposite sides thereof; and
mean to releasably couple said extension member to the remote end of the base leg of the second angle member, with the teeth on the extension member forming a continuation of the teeth on the base leg of the second angle member.

4,856,659

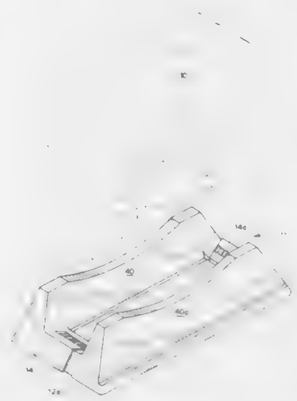
INTERLOCKING SUPPORT SYSTEM

Jimmy M. Krebs, 33 E. Palatine Rd., Prospect Heights, Ill. 60070

Filed Oct. 14, 1988, Ser. No. 257,886

Int. Cl.[4] A47F *7/04*

U.S. Cl. 211—24 **5 Claims**



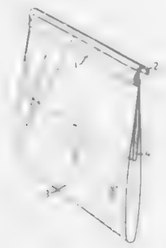
1. An improved support apparatus for vehicle tires comprising:
first and second support members, wherein each support member comprises a first and second horizontally extending leg and an upright portion affixed thereto, and wherein each leg comprises opposing side surfaces and a top surface transverse to said side surfaces, said top surface having a corrugated portion defined thereon,
whereby said legs from said first and second support members are overlappingly engaged so that said corrugated portions interlock and to provide a free standing structure having a gap between said first and second legs to accommodate the vehicle tire.

4,856,661

DOCUMENT SUSPENSION APPARATUS

Clive Selwyn-Smith, Weston-on-the-Green, England, assignor to Locwyn Limited, England

Filed Oct. 13, 1987, Ser. No. 106,597
Int. Cl.[4] A47F *7/16*
U.S. Cl. 211—46 7 Claims



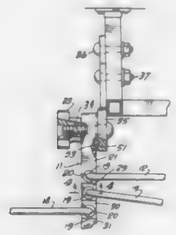
1. Document suspension apparatus comprising:
a rail member arranged to be suspended from fixed suspension means; and
document containing means secured to said rail member so as to be dependent therefrom;
wherein said document containing means comprises at least one smaller sleeve member within a larger sleeve member, both of said sleeve members being secured to the rail for providing support to documents inserted therein, the arrangement being such that documents may be inserted into said sleeve members from a direction substantially parallel to said rail member, and supported below the rail member, within said sleeve members by said sleeve members alone.

4,856,661

RETRACTABLE CLOTHES HANGER

Richard H. Guillen, and Patricia S. Guillen, both of 9027 Rendalia, Bellflower, Calif. 90706

Filed Nov. 7, 1988, Ser. No. 268,288
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—100 12 Claims



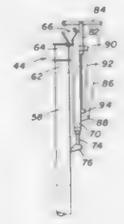
1. A retractable clothes hanger capable of withstanding travel when affixed to a motor vehicle, said clothes hanger comprising:
a hanger rod support block held by pivot means so that it is movable between a horizontal position and a vertical position, said hanger rod support block having a lower surface and an upper surface when in its horizontal position which upper surface has a plurality of stepped rod washer surfaces and a plurality of vertical holes passing through said hanger rod support block at said stepped rod washer surfaces;
a plurality of hanger rods having an elongated hanger portion and a support length at a right angle with respect to said hanger portion, the support length having a washer near the intersection of the hanger portion and the support length, said washer of each hanger abutting said stepped rod washer surfaces of said support block; and
means for holding said support length of each hanger rod in said support block, said means being tight enough to permit the hanger rods to remain in any set angular position while being free enough to permit the hanger rod to be turned into a desired angular orientation.

4,856,662

PEDESTAL CRANE AND METHOD OF ASSEMBLING AND ERECTING IT

Jack C. Marvin, and Benjamin G. Shepherd, both of Spring, Tex., assignors to CBI Research Corporation, Oak Brook, Ill.

Filed Dec. 9, 1987, Ser. No. 130,424
Int. Cl.[4] B66C *23/32*
U.S. Cl. 212—176 12 Claims



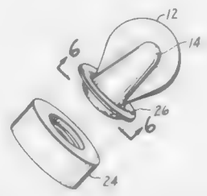
8. A pedestal crane comprising:
a high vertical tower with a top;
an adapter having a hollow upper portion with a top and being rotatably mounted on bearing means supported by an adapter lower portion with means releasably securing the adapter lower portion to the tower top;
a boom turret pivotally joined to the top of the adapter upper portion to rotate about a horizontal axis;
a boom having a base section, at least one extendable section and a load lifting end;
means joining the boom base end to the turret by a horizontal boom footpin;
means within the adapter hollow upper portion for tilting the turret into contact with the adapter upper portion top and means releasably securing the turret to the adapter; and
means for pivoting the boom vertically about the horizontal boom footpin.

4,856,663

NURSING DEVICE FOR INFANT WITH CLEFT LIP OR CLEFT PALATE

Lyda Epp, 29533 Tulare Ave., Shafter, Calif. 93263

Filed Apr. 19, 1988, Ser. No. 183,109
Int. Cl.[4] A61J *11/04, 13/00, 17/00*
U.S. Cl. 215—11.1 2 Claims



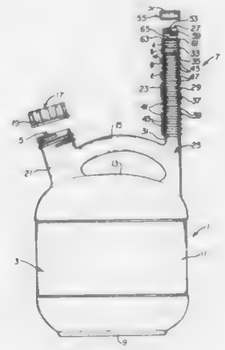
1. In connection with a child with a cleft palate and/or cleft lip, a device to allow the child to effectively suck by mouth, comprising:
a sealing means for sealably closing the cleft in the child's palate;
a nipple merged with and recessed under the sealing means; and
the sealing means having a substantially solid, resilient elongated first portion substantially shaped in the form of the recessed nipple and a second portion in the form of a disk located on the periphery of said first portion and recessed nipple which substantially conforms to the periphery of the child's palate to substantially prevent the nipple from being pulled into the cleft palate and cleft lip.

4,856,664

THERMOPLASTIC CONTAINER, HAVING AN INTEGRAL NOZZLE, FOR A FLAMMABLE LIQUID

John G. Gillispie, and Donald J. Mitchell, both of Wellsburg, W. Va., assignors to Eagle Manufacturing Company, Wellsburg, W. Va.

Filed Nov. 17, 1987, Ser. No. 121,620
Int. Cl.[4] B65D *1/02*
U.S. Cl. 215—31 5 Claims



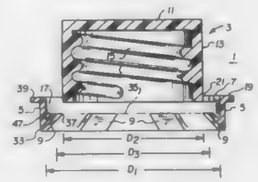
1. A container, formed of high density polyethylene, for flammable liquids comprising:
a container body defined by a bottom surface, upstanding sidewall, a top surface, and a handle, and adapted for holding a flammable liquid;
an opening in said top surface of said container body, sealable with a closure, and surrounded by a raised surface, through which said container can be filled with a flammable liquid;
a flexible corrugated nozzle portion integrally formed with said top surface of said container body, for dispensing a flammable liquid therefrom, said flexible corrugated nozzle portion having a generally circular cross-section, and being defined by a hollow elongated section, an inlet section, and an outlet section;
said hollow elongated section of said nozzle portion being defined by a sidewall, a first end, a second end opposite said first end, and a passageway therethrough from said first end to said second end and having at least one flexible, corrugated portion, coextensive with said hollow elongated section of said nozzle portion, that includes a plurality of corrugations and is capable of being shaped into an extended straight configuration, a curved configuration, a collapsed configuration, and a continuum of configurations in between, such that when said flexible, corrugated portion is placed in one of said configurations, said flexible, corrugated portion is capable of keeping the shape of such configuration until said flexible, corrugated portion is reshaped, each said corrugation including a hinge and a root, and being formed by an upwardly sloping leg and a downwardly, outwardly sloping leg, which extend in opposite directions from each said root to the adjacent said hinges, the thickness of said sidewall of said hollow elongated section being less at each said hinge than at the other portions of said hollow elongated section and the thickness at each said hinge being substantially less than the thickness at each said root, each said hinge being rounded and having a base and a tip, said flexible, corrugated portion of said hollow elongated section of said nozzle portion being tapered from a first hinge of said corrugated portion adjacent the first said end to a last hinge of said corrugated portion adjacent said second end so that the diameter of each said corrugation at each said hinge, and the diameter of each said corrugation at each said root, is progressively smaller from said first end to said second end of said hollow elongated section of said nozzle portion;
said inlet section of said nozzle portion being integrally formed with said top surface of said container body and said first end of said hollow elongated section of said nozzle portion, and in liquid flow communication with said container body and said passageway through said hollow elongated section of said nozzle portion so that a flammable liquid in said container body can flow from said container body through said inlet to said hollow elongated section of said nozzle portion; and
said outlet section of said nozzle portion being integrally formed with said second end of said hollow elongated section of said nozzle portion, adapted to receive the said flammable liquid from said second end of said hollow elongated section of said nozzle portion, and having an opening therein, sealable with a closure, through which the said flammable liquid can be dispensed from said nozzle portion.

4,856,665

TAMPER EVIDENT CLOSURE WITH HOOK-LIKE LOCKING TABS

Herbert V. Dutt, Sarasota, Fla., and Duane H. Lewis, Claysville, Pa., assignors to Continental Plastics, Inc., Triadelphia, W. Va.

Filed Dec. 15, 1988, Ser. No. 284,959
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 14 Claims



1. A tamper indicating closure for a container having a neck portion defining a container opening, external engagement means on said neck portion for receiving and retaining the closure, and a radial bead on the neck portion spaced from said opening by said engagement means, and having a preset outer diameter, said closure comprising:
a cap having an end wall and a cylindrical skirt extending axially from the end wall and terminating in a free end having a predetermined outer diameter, said skirt having internal engagement means complimentary to the external engagement means on the neck portion of the container for selectively securing the cap to the container to close said container opening;
an annular tamper indicating band having an inner diameter at least as great as the preset outer diameter of the radial bead on the container and greater than the outer diameter of the free end of the skirt, forming an annular gap be-

tween the free end of the skirt and the tamper indicating band,

a plurality of circumferentially spaced frangible bridges extending across said gap and detachably securing said tamper indicating band to said skirt; and

a number of locking tabs extending from said tamper indicating band axially toward said cap and radially inward and terminating in end portions defining a circle having a diameter less than the outer diameter of said radial bead on the container but greater than the outer diameter of said skirt, said locking tabs being circumferentially spaced from the frangible bridges and deflecting outward to pass over the radial bead as the closure is applied to the container and then springing inward, whereby the tamper indicating band is secured to the container by engagement of the locking tabs with said radial bead, and said frangible bridges fracture as said cap is removed.

4,856,666

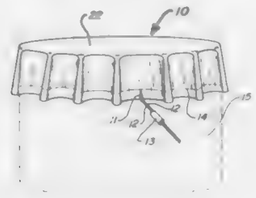
FOOD COVERING

Mary J. M. Easley, P.O. Box 3265, Redding, Calif. 96049-3265

Filed May 27, 1988, Ser. No. 199,432

Int. Cl.[4] B65D *41/02*

U.S. Cl. 215—272 **4 Claims**



2. A food covering comprising:

a sheet of thin-film material which is substantially impervious to air and moisture having a perimeter and having a pocket extending substantially about said perimeter of said thin-film material and an opening in said perimeter;

a tie means passed through said pocket, extending around said perimeter of said thin-film material and exiting said pocket at said opening so that, when said tie means is pulled, said perimeter of said thin-film material cinches tightly around a receptacle, and

an attaching means positioned on said tie means for holding said tie means in position against said receptacle after said perimeter of said thin-film material has been cinched tightly about said receptacle.

4,856,667

CONTAINER AND CAP

Mortimer S. Thompson, Maumee, Ohio, assignor to Tri-Tech Systems International Inc., Maumee, Ohio

Filed Jun. 17, 1987, Ser. No. 63,118

Int. Cl.[4] B65D *41/04*

U.S. Cl. 215—318 **13 Claims**



10. A container and cap for receiving, housing and discharging a product wherein:

(a) said container comprises:

(1) an opening for receiving or discharging the product,

(2) a neck surrounding the opening including a rim, and

(3) a flexible, plastic annular projection integral with and extending from said rim having a curled free end portion for sealingly engaging the cap as the cap is placed on said neck to close the container; and

(b) said cap comprises:

(1) a top wall, and

(2) an outer peripheral skirt depending from said top wall, including an inner substantially annular surface, an annular bead projecting inwardly from said inner surface at the lower end of said skirt adapted to snap past and engage said flexible, plastic annular projection of the container to close the cap on the container with said flexible, plastic annular projection in engagement with said inner surface, and at least one thread about said inner surface between said bead and top wall and projecting outwardly from said inner surface to engage and form at least one substantially matching groove in said flexible, plastic annular projection whereupon the cap thereafter can be twisted off and on the container because of engagement between said engaging threads on the cap and in said flexible, plastic annular projection of the container.

4,856,668

BOTTLE CLOSURE FOR CHAMPAGNE BOTTLE AND THE LIKE HAVING THREADED MOUTHS

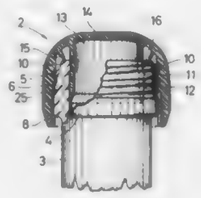
Bernd Pfefferkorn; Hans Pfefferkorn, and Viktor Reiter, all of Simmern, Fed. Rep. of Germany, assignors to Pfefferkorn & Co. GmbH, Simmern, Fed. Rep. of Germany

Continuation of Ser. No. 145,886, Jan. 20, 1988, abandoned. This application Feb. 14, 1989, Ser. No. 311,428

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1987, 3732112

Int. Cl.[4] B65D *41/04*

U.S. Cl. 215—329 **7 Claims**



1. A bottle closure for a champagne type bottle having a bead surrounding a neck of the bottle and an external screw thread provided between said bead and an upper edge of the neck of the bottle comprising a unitary body made of plastic, said body comprising a cap of a substantially dome form having a stopper like sealing shank of a hollow cylindrical shape which penetrates into the neck of the bottle, said shank running substantially centrally from an inner end surface of said cap, said shank having a wall having a smooth outer surface, an internal thread provided on an internal surface of the wall of the cap which is engageable with the external thread of the neck of the bottle, said sealing shank projecting beyond an area carrying the internal thread, and an inner diameter of a lower edge of the cap well being larger than a diameter of said bead, and a sealing lip provided between an upper end of the sealing shank and a first turn of the internal thread on said inner end surface of said cap, said sealing lip bearing upon the upper edge of the champagne type bottle when the bottle closure is in place with said lower edge of the cap covering said bead when the bottle closure is in place whereby when said champagne type bottle is opened, a plop noise occurs.

4,856,669

REVOLVING REFUSE HOLDER

Chester C. Averitt, 904 N. Cedar St., Foley, Ala. 36535, and Thomas R. Byrne, 10231 Bayou Cir., Fairhope, Ala. 36532

Filed Jul. 11, 1988, Ser. No. 217,672

Int. Cl.[4] B65B *67/12*; A47F *5/02*

U.S. Cl. 220—1 T **2 Claims**



1. A revolving refuse holder comprising the following: A circular shaped concaved rigid member lying in a horizontal plane, said concave member having aperatures, whereby providing a means for drainage of water or the like through said member, and having an integrally mounted center stem extending downward from said concave members' bottom surface, said center stem having a setscrew collar placed around the stems circumference with an inside diameter slightly larger than said center stems' outside diameter whereby providing a means of adjustment of said collar along said stem, and a circular post lying in a vertical plane having an inside diameter slightly larger than said stems' outside diameter which is hollow in nature providing a means of accepting said stem in its top, and providing a means of anchoring its bottom in a strata for support.

4,856,670

LOW TEMPERATURE PROCESSING TRANSFER PRINTING INK

Kenneth W. Hang, Princeton Jct., and Wayne M. Anderson, Trenton, both of N.J., assignors to RCA Licensing Corp., Princeton, N.J.

Filed Jan. 12, 1988, Ser. No. 142,963

Int. Cl.[4] C08K *3/40*; C08F *265/06*; B32B *17/06*; H01J *61/40*

U.S. Cl. 220—2.1 A **18 Claims**

1. A cathode-ray tube having an envelope with a faceplate panel including a coded marking thereon, said coded marking comprising a transfer printing ink of a monofunctional resin component including one or more liquid acrylate monomers, one or more difunctional acrylate monomers, one or more polymeric acrylate binders and one or more photoinitiators wherein the binders and the photoinitiators are soluble in the monomers and, dispersed in said liquid resin component, a solid component comprising a suitable quantity of one or more pigments and a glass frit mixture consisting of three wetting agents and a frit flux, said wetting agents providing means to fuse said pigments and said frit flux to said faceplate panel.

4,856,671

SELF-SUPPORTING STORAGE CONTAINER

Paul Reppel, Olmuhlerweg 5, 5883 Kierspe 3-Ronsahl, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 142,635

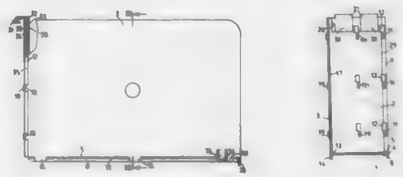
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1987, 3701316

Int. Cl.[4] B65D *13/00*

U.S. Cl. 220—4 F **18 Claims**

1. A self-supporting multiple storage container, comprising:

a plurality of receptacle elements wherein each receptacle element of said plurality of receptacle elements includes a bottom wall, said bottom wall having at least one free edge and at least one connecting edge, a rear wall having free edges and connecting edges, and a side wall so that adjacent receptacle elements stocked in a side-by-side manner would utilize a single side wall as a common wall, said bottom wall, said rear wall and said side wall being connected to one another along common edges to form each of said receptacle elements, said bottom wall having a step at said free edge which overlaps said side wall, said step being offset downward by an amount equal to the thickness of said bottom wall and having a series of slits, said series of slits being parallel to said free edge, each of said receptacle elements further including a closure element in which a series of retaining members, fitting one inside another in pairs, are provided at the free edges of said bottom wall and said rear wall, which are opposite said side wall, and at the connecting edges of said bottom wall and said rear wall which are attached to said side wall;



a support strip, said support strip being attached to said step;

a series of insertion studs being located in said side wall or in said connecting edge of said bottom wall; said insertion studs having a height that is substantially the same as the height of said support strip, said series of insertion studs and said support strip lying in a common plane with each of said series of insertion studs having a head which is supported on said step, the width of each of said heads corresponding to the length of one of said slits, with said insertion studs located in said side wall having a widened root; and,

a series of detent tongues being located on said side wall or on said connecting edge of said bottom wall of said receptacle element which, in combination with said series of insertion studs, serve as said retaining members for engaging said side walls or said connecting edge of said bottom wall.

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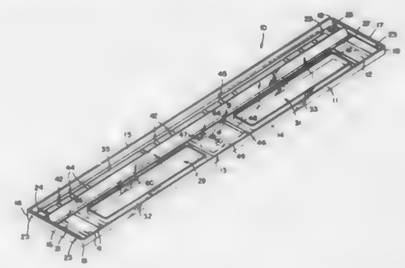
CONDENSATION PAN/CONVERTER TRAY FOR A FAN COIL UNIT

John Sullivan, 3910 Madison St., Hyattsville, Md. 20781

Filed Sep. 30, 1988, Ser. No. 251,602

Int. Cl.[4] B65D *6/10*

U.S. Cl. 220—82 **20 Claims**



1. A convector tray comprising a tray body constructed

from polymeric/copolymeric material, said tray body including a bottom wall and an upstanding peripheral wall collectively defining a condensation chamber, means for effecting the passage of air through said bottom wall upon the utilization of said convector tray with an associated fan coil unit, means positioned within said condensation chamber along said bottom wall for reinforcing/rigidifying said tray body, and condensate passage means for conducting condensate generally transversely across said bottom wall and across and beneath said reinforcing/ rigidifying means whereby condensate upon said bottom wall will be conducted by said condensate passage means toward a condensate drain area.

4,856,673

CONTAINER CONVERTIBLE TO A CHILD'S PAIL

Joseph Thompson, Upper Saddle River, N.J., assignor to Sterling Drug Inc., New York, N.Y.

Filed Jun. 27, 1988, Ser. No. 211,922
Int. Cl.[4] B65D *23/10*; A63H *33/32*
U.S. Cl. 220—94 R **11 Claims**





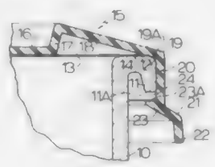
1. A container convertible to a child's pail comprising:
a generally hollow container body having a top opening, an inner peripheral surface, an outer peripheral surface, an annular handle-accommodating groove extending thereabout and open to one of said peripheral surfaces, and attachment means exposed at said outer peripheral surface and including a first pair of attachment elements disposed diametrically opposite one another adjacent said top opening; and
a handle having opposite ends, and respective securing means at each of said ends, each of said securing means detachably securable to a respective one of said attachment elements,
said handle supportable by said container in a stored position at which said handle extends in said handle-accommodating groove, and
said handle detachably mountable to said container in a pail-facilitating position at which the securing means of said handle are detachably secured to the pair of attachment elements of said container body, respectively.

4,856,674

COVER FOR PLASTIC CONTAINER

Sheldon Berney, Winnipeg, Canada, assignor to Reliance Products, Division of Larson Mardon Group Limited, Winnipeg, Canada

Filed Aug. 23, 1988, Ser. No. 235,118
Claims priority, application United Kingdom, Nov. 3, 1987, 8725738
Int. Cl.[4] B65D *51/22*
U.S. Cl. 220—258 **19 Claims**



1. A container lid comprising:
a peripheral flange adapted to surround an upper edge of a container;
an outer panel with an outer edge coincident with an upper edge of the peripheral flange and sloping upwardly and inwardly from the outer edge to an inner edge;
a circular flat center panel within the outer panel and positioned below the inner edge thereof; and
an intermediate panel with an inner edge coincident with a peripheral edge of the flat center panel and extending upwardly and outwardly from the peripheral edge of the center panel to the inner edge of the outer panel.

4,856,675

WASTEBASKET BAG RETAINER

Sam Palazzola, 12365 Tiara, N. Hollywood, Calif. 91607

Filed Sep. 28, 1987, Ser. No. 101,791
Int. Cl.[4] B65D *90/00*
U.S. Cl. 220—404 **3 Claims**



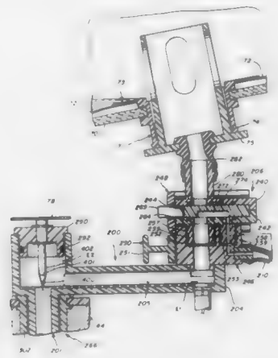
1. A device for retaining and supporting a bag within a waste receptacle, the bag of the type having a pair of integral handles, said device comprising a retainer having a generally planar vertical flange and two generally planar horizontal flanges, said horizontal flanges each joined along an edge thereof to said vertical flange such that said retainer has a cross section generally in the shape of the letter "F", said retainer further having a clip extending downwardly from said horizontal flange, said clip including a horizontal member for engagement with an underside of a rim of a receptacle such that said retainer may be secured to said rim of said receptacle with said horizontal flanges extending in a direction away from an opening of the receptacle so that a handle of a bag placed inside the receptacle may be placed over an upper of said two horizontal flanges and retained between said upper and lower horizontal flanges, whereby a bag may be supported in an open position within a waste receptacle by a pair of said retainers disposed at opposing sides of the receptacle.

4,856,676

POST MIX DISPENSER

Kenneth J. Emody, Foxboro, Mass., assignor to Jet Spray Corp., Norwood, Mass.

Filed Sep. 3, 1987, Ser. No. 92,433
Int. Cl.[4] B67D *5/56*
U.S. Cl. 222—66 **29 Claims**



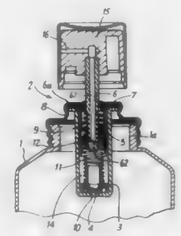
1. A beverage dispenser comprising:
a housing including a base and an insulated cabinet on the base,
an ice bath at the rear of the cabinet and at least one concentrate container in the front of the cabinet,
said concentrate container comprising a rigid box member having supported therein a liquid tight bag member for storing the concentrate and having coupling therefrom an outlet member,
a beverage discharge assembly including a mixing block and a dispensing nozzle,
means coupling potable water to the mixing block,
a pump means supported in the housing between the outlet member and the mixing block,
a concentrate control valve for coupling the container outlet member to the pump means,
said concentrate control valve comprising separate quick-disconnect members including a first base member held stationary in the housing and a second member adapted to be held to the container outlet member for quick-disconnect mating with the first member,
an out-of-concentrate sensor downstream of said control valve having a pair of spacedly disposed electrodes and means for sensing the impedance between the electrodes,
said out-of-concentrate sensor includes means defining a first passage with one electrode disposed at one end thereof and means defining a second passage with a second electrode disposed at the junction between said first and second passages,
said first and second passages being disposed at substantially orthogonal directions to each other,
said second electrode comprising a probe electrode having a free downwardly depending end extending substantially transverse to said first passage and substantially parallel to and disposed over said second passage.

4,856,677

PORTIONING DEVICE FOR PASTE OR SEMI-LIQUID PRODUCTS

Michel Brunet, Sainte Colombe La Commanderie, and Claude Jouillat, Montigny Sur Avre, both of France, assignors to Valois, Societe Anonyme, Le Neubourg, France

Filed Aug. 18, 1987, Ser. No. 86,458
Claims priority, application France, Mar. 26, 1987, 87 04211
Int. Cl.[4] B67D *5/40*
U.S. Cl. 222—94 **2 Claims**



1. A portioning device for dispensing paste or semi-liquid products, comprising in combination: a flexible, collapsible, externally accessible metal or plastics tube containing a supply of the product to be dispensed, and a portioning system of the pump type sealingly mounted to a mouth of the tube such that the product does not come into contact with air, and comprising a pump casing (30) defining a portioning chamber (70), a piston (50) slidably disposed within the pump casing for movement between a depressed position and a rest position, the piston being biased towards the rest position by a return spring (66), a closable suction orifice (69), a closable delivery orifice (61), and a push button (15) for controlling the movement of the piston through the intermediary of an actuating rod (60), the filling of the pump casing chamber being effected at least in part by manually squeezing the tube, and the discharge of the chamber being effected by depressing the push button, wherein the pump is of the precompression type, the closable delivery orifice extends through the piston and inside the actuating rod, and further comprising a valve (65) slidably disposed within the portioning chamber between the return spring and the piston for closing the delivery orifice under the biasing of said spring, said valve being opened when the pressure in the pump casing exceeds a predetermined threshold established by the spring.

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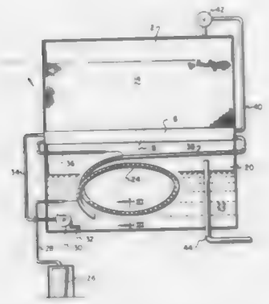
BEVERAGE DISPENSER WITH ICE WATER PRECOOLER

Ted M. Stanfill, Fort Worth, Tex., and Joe K. Dugger, 3512 Elm Creek Ct., Fort Worth, Tex. 76109, assignors to Joe K. Dugger, Fort Worth, Tex.

Filed Feb. 29, 1988, Ser. No. 162,032
Int. Cl.[4] B67D *5/62*
U.S. Cl. 222—108 **10 Claims**

1. Beverage dispensing means comprising:
an ice storage bin for receiving ice, said ice storage bin having a cold plate disposed at the bottom thereof having at least one aperture there through wherein waste liquid from melting ice will pass through said cold plate;
a plurality of fluid passages disposed within said cold plate;
a waste liquid bin disposed at least partially below said ice storage bin for receiving waste liquid from melting ice within said ice storage bin;
a length of concentric tubing disposed at least partially within said waste liquid bin, said length of concentric tubing having an inner conduit substantially concentrically disposed within an outer conduit;
means for coupling a source of beverage to one end of one of

said concentric conduits and means connecting the other end of said concentric conduit to a first end of a first fluid passage disposed within said cold plate; and



means for coupling said waste liquid to one end of a second of said concentric conduits and means connecting the other end of said second concentric conduit to a first end of a second fluid passage disposed within said cold plate.

4,856,679

DISPENSER FOR PASTY PRODUCTS

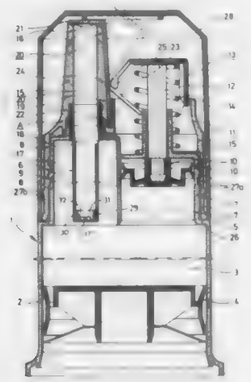
Joachim Czech, Jahnstr. 19, 8405 Donaustauf, Fed. Rep. of Germany

Filed Feb. 2, 1988, Ser. No. 151,400

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737832

Int. Cl.[4] B67D *5/52, 5/42;* G01F *11/00*

U.S. Cl. 222—136 **23 Claims**



1. A dispenser for pasty products comprising a container (2) having a wall defining a cavity (3) for containing the product, top and bottom ends and a following piston (4) slidably mounted in said container cavity to close said bottom end,

a head assembly mounted in said top upper end including

a manually operable delivery unit having a pump chamber (5) and a delivery piston (10) reciprocally mounted therein, said delivery piston said delivery piston having an actuating cap (13) attached to an end thereof said pump chamber being connected in valve-free, open, unrestricted flow relation with said container cavity to freely communicate therewith, and

a dispensing unit (A) including: means defining a product dispensing passage (20') having a product outlet opening (16), and an inlet opening (17') in flow communication with said product cavity; a nonreturn closure valve means (29) mounted in said inlet opening; and a stripe chamber (6) disposed adjacent said pump chamber in side-by-side relation thereto, said stripe chamber being connected in valve-free open, unrestricted flow relation with said product cavity to freely communicate therewith and having a striping material dispensing opening (18) to provide direct flow communication with said product dispensing passage;

said pump chamber comprising a pump cylinder; said dispensing unit (A) comprising a stripe chamber cylinder (8) defining said stripe chamber (6), wherein said means defining said dispensing passage comprises a first nozzle body (15, 17), a shutter member (20) mounted for movement to selectively open and close said outlet opening (16) of said nozzle body (15, 17);

said nozzle body (15), having a pocket 19, said pump cylinder (7) having a guide sleeve portion (11) and said shutter member (20) is formed in the shape of an angular strip member having a closure portion (21) and a foot portion (22) received in said pocket (!9) of said nozzle body (15), with two actuating fingers (23) angularly projecting at both sides of said foot portion (22) to extend in the direction towards said guide sleeve portion (11) of said pump cylinder (7).

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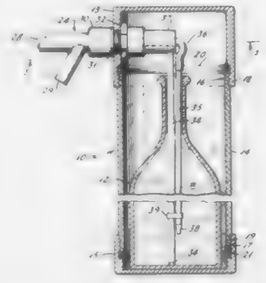
METHOD AND APPARATUS FOR DISPENSING BEVERAGES

Robert E. Sitton, 4829 Bay Court Ave., Tampa, Fla. 33611

Continuation of Ser. No. 785,645, Oct. 9, 1985, abandoned. This application May 17, 1988, Ser. No. 196,815

Int. Cl.[4] B67D *1/08;* B65D *83/14*

U.S. Cl. 222—152 **2 Claims**



1. A beverage preserving and dispensing apparatus for dispensing the fluid contents from an opened container of the beverage comprising an enclosure means, said enclosure means having a body portion within which the opened container is housed, removable closure means for sealing said body portion of said enclosure means from the outside atmosphere, a dispensing tube means extending inwardly of said body portion and within the opened container, first dispensing valve means connected to said dispensing tube means for selectively dispensing the fluid contents of the opened container exteriorly of said enclosure means, an inlet gas valve means in said enclosure means for permitting the supply of an inert gas into said enclosure means, a pressure release valve mounted to said enclosure means for permitting the release of gases therein when pressures above a predetermined maximum are achieved within the enclosure means, a fluid discharge opening within said enclosure means, said dispensing tube means including a first tube section within said enclosure means extending into the opened container, a second tube section within said enclosure means communicating said first tube section with said first dispensing valve means, and a third tube section within said enclosure means communicating said first tube section with said fluid

discharge opening, a second dispensing valve means and means for connecting said second dispensing valve means to said fluid discharge opening so as to be in open communication with said third tube section of said dispensing tube means, and said first dispensing valve means being mounted directly to said enclosure means and said second dispensing valve means being disposed remotely of said enclosure means.

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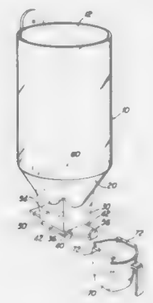
DISPENSER FOR GRANULAR AND POWDERED DRY MATERIALS

Charles T. Murray, 1214 Overton Dr., Box 93, Lawrenceville, Ga. 30245

Filed Aug. 29, 1988, Ser. No. 237,785

Int. Cl.[4] B67D *5/38;* G01F *11/14*

U.S. Cl. 222—158 **6 Claims**



6. A device for dispensing granulated and powdered dry materials comprising:

(a) a hopper having a top end and a bottom end for storing said dry materials which is opened at its top end and tapers to a smaller opening at its bottom end;

(b) a mounting for supporting said hopper therein having a top portion for receiving said hopper and a bottom surface with a mounting hole placed therein which aligns with said bottom opening of said hopper, said bottom surface having four parallel channels attached thereto, said channels being located along the same horizontal plane, two of said channels located on one side of said mounting hole and two of said channels located on the opposite side of said mounting hole such that two of the channels form a pair of interior channels about said mounting hole and the other two channels form an exterior pair of channels about said mounting hole;

(c) a sliding valve plate having a valve opening therein and a valve handle at one end wherein said sliding valve plate is slidable back and forth underneath said mounting hole between said interior channels serving to open the hopper for dispensation when said valve hole aligns with said mounting hole and close the hopper when the valve hole is not aligned with the mounting hole;

(d) an agitating means mounted on said sliding valve plate at a location adjacent to said valve hole and extending into the interior of said hopper for agitating said dry material stored within said hopper, each time said sliding valve plate is operated; and

(e) a receiving cup with substantially parallel runners extending above said cup which are receivable within the exterior pair of channels under said mounting for holding said cup within close proximity but below said mounting allowing said sliding valve plate to move within said interior channels without interference from said receiving cup.

4,856,682

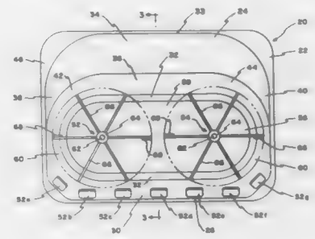
HOPPER AND AGITATOR ASSEMBLY FOR AN ICE DISPENSER

Benjamin D. Miller, Chicago, and Thaddeus M. Jablonski, Palatine, both of Ill., assignors to Remcor Products Company, Franklin Park, Ill.

Filed Mar. 31, 1988, Ser. No. 175,532

Int. Cl.[4] G01F *11/20;* B67D *5/62*

U.S. Cl. 222—238 **9 Claims**



1. A hopper and agitator assembly for an ice dispenser, said assembly comprising a hopper for storage of a mass of particles of ice and having generally straight and back walls, a bottom wall and curved side walls and at least three dispensing openings above said bottom wall and in generally horizontal alignment through a lower end of said front wall through which ice particles are delivered; and a pair of agitators mounted side by side for rotation in said hopper in a generally horizontal plane and generally at the level of said dispensing openings for urging ice particles through said openings, each said agitator having a plurality of radially extending arms the ends of which sweep closely past and follow an associated one of said curved side walls and sweep closely past at least an associated one of said dispensing openings in said front wall upon rotation of said agitators, at least one of said dispensing openings in said front wall being located generally intermediate the axes of rotation of said agitators.

4,856,683

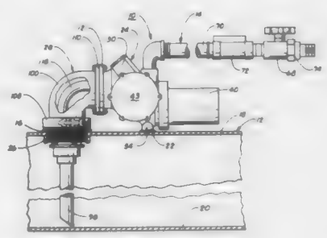
HERBICIDE DISPENSER

Brook J. Beaston, Wichita, Kans., assignor to Great Plains Industries, Inc., Wichita, Kans.

Filed Dec. 31, 1987, Ser. No. 140,020

Int. Cl.[4] B65D *88/54*

U.S. Cl. 222—318 **7 Claims**



4. A self-sealing dispensing adapter for a tank having a bung formed through the wall thereof, comprising:

a first tubular member mounted in the bung of the tank;

means for forming an annular seating surface on the inner periphery of the first tubular member;

a second tubular member extending into the first tubular member to terminate in an annular upper end facing the

seating surface formed on the inner periphery of the first tubular member and substantially coaxial thereto;

a sealing ring positioned between the seating surface on the inner periphery of the first tubular member and the upper end of the second tubular member, the sealing ring having a central opening formed therethrough substantially coaxial to the seating surface on the first tubular member and the upper end of the second tubular member and the sealing ring having means for alternatively forming a seal with the seating surface formed on the first tubular member and the upper end of the second tubular member; and

closure means, mounted in the second tubular member and having a portion extensible from the upper end thereof, for concurrently closing the aperture through the sealing ring and urging the sealing ring against the seating surface formed on the first tubular member.

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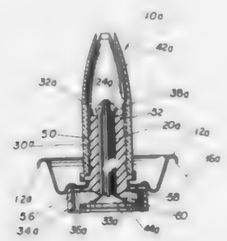
VALVE FOR A PRESSURIZED DISPENSING CAN CONTAINING FLOWABLE MATERIALS

William Gerstung, 27705 Hyssop La., Santa Clarita, Calif. 91350-1645

Continuation-in-part of Ser. No. 34,679, Apr. 6, 1987, abandoned, and a continuation of Ser. No. 113,995, Oct. 29, 1987, abandoned. This application Mar. 21, 1988, Ser. No. 171,070

Int. Cl.[4] B65D *83/00*

U.S. Cl. 222—402.23 **6 Claims**



1. An improved valve for attachment to the open upper end of a container for controlling discharge of pressurized, flowable material from the container,

said valve including sealing means effective for preventing "blow-by" and oozing through a range of pressures, from an initial, elevated pressure to a lower pressure when the flowable material is substantially discharged from the container,

said valve comprising, in combination:

(a) a generally horizontally extending can connector of rigid material adapted to sealingly close the container about the open upper end, said connector having a vertical opening extending therethrough bounded by an edge,

(b) a valve stem of rigid material comprising a generally horizontal base positioned below said connector and said opening, and said stem including a generally vertical rod extending upwardly from said base and through said opening, said rod including an upper distal end comprising a peripherally extending expanded open work head defining a surface facing said valve stem base, and said base having a generally conical portion having a surface extending upwardly and converging from said base to said rod, and said base having an upper axially facing surface including said conical portion surface,

(c) a flexible, resilient, tubular grommet having an axial through passageway, said grommet including a lower portion defining an inverted dome-shaped axially downwardly facing surface having a lip about the passageway, and said grommet further including an upper axially extending portion surrounding said valve stem, said grommet extending up through said connector opening and being disposed around said valve stem rod with said rod in said passageway, and with said valve stem base closely adjacent said inverted dome-shaped surface, said grommet having an upper face about said passageway and said surface of said valve stem head facing said valve stem base being sized to normally dwell on said upper grommet face, said lower portion of said grommet being below said connector opening with said inverted dome-shaped axially downwardly facing surface confronting the upper surface of said valve stem base, said grommet and valve stem being sized and configured with the lip in a normal position in close adjacent relation to said conical surface,

(d) mutually interengaging means on the grommet and on said connector to sealingly close about the edge of said vertical opening,

(e) said grommet lip comprising a sealing ring in said passageway in sealing engagement with said generally conical surface of said rod when said valve is installed in closing relation of the open upper end of a pressurized container and axially upwardly directed forces are exerted on said valve stem base, said grommet lip comprising an annular, deformable, pointed grommet portion of generally triangular transverse cross-section as seen in elevation with the apex of said grommet portion defining a generally radially, inwardly and downwardly pointed, distally weakened, lip portion for sealing engagement with said conical portion of said rod,

said inverted dome-shaped axially downwardly facing surface and lip apex being effective to deformingly and sealingly contact said upper axially facing surface including said conical portion surface when the container is under elevated, initial pressure to prevent "blow-by" of pressurized liquid and to eliminate entrapment of entrained solids between said grommet and valve stem, and

as the pressure is reduced on removal of the flowable material from the container, said inverted dome-shaped axially downwardly facing surface and said pointed distally weakened portion are adapted to gradually relax returning toward its normal position with the apex of said lip portion maintaining sealing contact with the conical portion,

(f) an open-topped tubular vertically extending cover releasably secured to the tubular portion of said grommet above said connector opening for removal of said cover and cleaning of said rod, rod head, cover and grommet, said cover being of rigid material and having an inside surface closely adjacent the upper vertically extending tubular grommet portion and having a portion extending above the grommet, so that when the cover is tilted sideways by finger pressure, said grommet will yieldingly tilt together with said rigid valve stem from said vertical position causing a corresponding tilt of said stem base and rod out of sealing engagement of the apex of said grommet lip and said upwardly facing surface including said conical portion surface of said rod for temporarily dispensing pressurized flowable material from said container, the elasticity of said grommet automatically returning said stem to a sealing position with said lip again being in sealing engagement of said conical portion upon removal of said tilting pressure.

4,856,685

DISPENSING CONTAINER

Daniel P. Gaffney, Durango, Colo., assignor to MLW Corporation, LaGrange, Ill.

Filed Feb. 2, 1988, Ser. No. 151,458

Int. Cl.[4] G01F *11/26*

U.S. Cl. 222—454 **6 Claims**

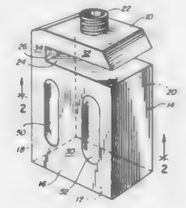
1. A normally upright liquid container for storing and dispensing a liquid and having a longitudinal axis which extends substantially vertically when said container is upright, comprising:

top, bottom and side walls impervious to the passage of fluids and interconnected to one another in fluid-tight relationship to define such liquid storage container;

means defining a discharge opening through said walls at the top end of said container for discharging liquid therefrom;

a baffle extending transversely of said axis and disposed internally of said container below said discharge opening and above the level to which said container normally is filled with liquid, said baffle joining said walls in fluid-tight relationship and cooperating therewidth to divide said container into a top discharge chamber above said baffle and a storage chamber including the remainder of said container therebelow;

an open passageway through said baffle from said storage chamber to said discharge chamber for free flow of liquid from said storage chamber to said discharge chamber when said container is appropriately tilted, said passageway limited to an area proximate to one side of said container;



said baffle and said walls being impervious to and precluding the passage of fluid between said chambers other than through said passageway;

each of said chambers being open and unobstructed to free flow of liquid in said storage to and through said passageway and to said discharge opening when said container is so tilted;

wherein said baffle is in a position to leave an unfilled volume within said storage chamber, below said baffle and above said normal filling level, which volume is approximately equal to the volume defined by said one side of said container and a liquid surface which is level with the lower edge of said passageway when said axis is horizontal and said one side is upwardly disposed;

whereby gravity-flow of liquid from said storage chamber to said discharge opening is prevented until said container is tilted to or beyond a substantially horizontal position of said axis and is permitted upon further tilting of said container toward an inverted position.

4,856,686

CARGO CARRIER

Larry Workentine, Fresno, Calif., assignor to Hike-A-Bike Incorporated, Fresno, Calif.

Filed Feb. 5, 1988, Ser. No. 152,695

Int. Cl.[4] B60R *9/10*

U.S. Cl. 224—42.07 **13 Claims**

1. A cargo carrier for use with a receiver hitch of the type having a receiver with a rectangular opening, the receiver mounted to a vehicle, a receiver insert sized for mating engagement within the opening, and means for securing the receiver insert to the receiver, the cargo carrier comprising:

an upright support having a single vertical support bar with an upper end and a lower end;

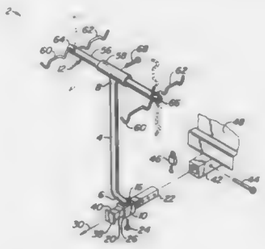
a collar, nonremovably fixed to the lower end of the upright support, defining a through hole sized for slidably mating engagement with the receiver insert of the receiver hitch with which the cargo carrier is used;

means for securing the collar at a chosen position along the receiver insert;

a generally horizontal bar having ends in perpendicular relation to said hole through said collar;

means for movably mounting the horizontal bar to the upper end of the upright support;

arms, adapted to receive receiving cargo, extending transversely from each end of the bar in parallel relation to each other; and



means for positioning the horizontal bar in a first position, at which the arms extend generally horizontally for receiving cargo, and a second position, at which the arms extend generally vertically;

whereby the vehicle may tow a load connected to the receiver insert while carrying cargo with the cargo carrier, and positioning the horizontal bar in the second position stows the arms.

4,856,687

WATCH CASE AND BAND ATTACHMENT STRUCTURE

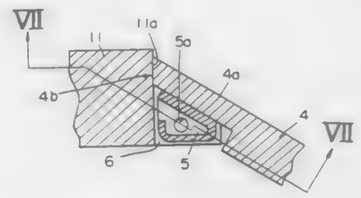
Hichihiro Iwamura, Sayama, and Eiichi Kitabayashi, Tokorozawa, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 11,038, Feb. 5, 1987, Pat. No. 4,785,982. This application Jun. 23, 1988, Ser. No. 210,740

Claims priority, application Japan, Feb. 21, 1986, 61-37050; Jul. 25, 1986, 61-114155

Int. Cl.[4] G04B *37/00;* **A44C** *5/00*

U.S. Cl. 224—169 **3 Claims**



1. A structure comprising:

a watch case having front and back surfaces and at least two sides;

two pairs of lugs, each pair extending from one of said sides of said watch case and each lug being provided with a threaded hole and having a top surface which is lower in position than said front surface of said watch case;

a band having opposite end portion with a top side and an underside;

a pair of cone point screws;

a connector secured to said underside of each end portion of said band, said connector being bent into a U-shape to define a base wall and a pair of side walls said base wall being secured to said underside in a direction of a width of the band, with said side walls extending downwardly as viewed from said top of the band, said side walls being provided with a pair of attachment openings, said band

being closely attached to the watch case by placing each end portion of the band on the top surfaces of the lugs and tightening the cone point screws respectively into the threaded holes of the side lugs so that the cone points engage with the pair of attachment openings provided in said connector, said end portions of the band and sides of the watch case being configured so that the band together with tee connector is held against the watch case, and so that an edge of the band is attached to the side wall of the watch case without any clearance; and

a bend preventing member comprising a bending wall extending from said base wall of said connector, said bending wall being bent so as to cause a fold in the direction of the width of the band and inserted between said pair of side walls so that the bending wall can support the pair of walls of the connector from the inside so as to keep a fixed space between the side walls against forces exerted by said cone point screws towards the inside.

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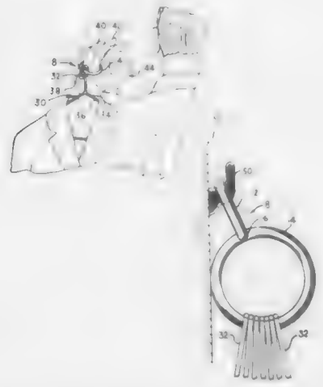
HANGER CARRYING/HOLDING DEVICE

Martin E. Ackmann, 851 Bode Rd., Elgin, Ill. 60120

Filed Feb. 13, 1987, Ser. No. 14,447

Int. Cl.[4] A47G *25/06*

U.S. Cl. 224—217 **5 Claims**



1. A device to hold/carry hangers each having a downwardly open hook portion, the device comprising:

a unitary structurally nondeformable rigid piece formed as two generally planar loops, meeting edge-to-edge like a figure eight, except with the loops being rotated to be normal to one another;

each loop being formed unitary, endless and in the shape of a circle continuously throughout its full 360 degrees and having no moving parts;

each loop moreover being formed of a circular cross-section, and the centers of said cross-sections crossing where the loops meet, and the loops being diametrically aligned on opposite sides of where the loops meet; the cross-section of each loop being between 0.2–0.5 of an inch;

the device thereby being substantially symmetrical in the direction through the loops, except for one loop being slightly smaller than the other loop: said one smaller loop being between 1 and ¾ inch and 2 inches in internal diameter, and the other larger loop being between 2 and 4 inches in internal diameter; whereby the device allows the hook portions of said hangers to be hooked loosely onto either loop to be retained thereon solely by gravity, and the remaining loop to be fitted loosely over and carried on at least one and more commonly several of the user's fingers, or over a hook, such as in an automobile, and because of the device symmetry, the hanger(s) will be retained loosely on said either loop at a location approximately diametrically opposite where the remaining loop is carried on the user's finger(s) or the hook.

4,856,689

ARTICLE CARRIER

Dennis Shore, 4219 Fort Donelson Dr., Stockton, Calif. 95209

Filed Aug. 30, 1985, Ser. No. 771,576

Int. Cl.[4] A45C *7/00*

U.S. Cl. 224—218 **17 Claims**



1. A ski, boot and pole carrier comprising in combination:

a first strand of flexible cord having free ends provided with fastening means, said free ends circumscribing a pair of skis and poles with each said fastening means further reattached to said first strand just upstream from an area of circumscription which girds the skis and poles,

a second strand of flexible cord embodied as a closed loop adapted to engage buckles on ski boots, thereby supporting the boots,

and flexible membrane means for jointly supporting said first and second strands whereby the skis, boots and poles can concurrently be placed in depending relation from said supporting means whereby in use said flexible membrane support means can conform to the portion of one's body which actually does the carrying and when in storage, said flexible membrane means provides a soft object which protects a falling skier.

4,856,690

TRANSMISSION OF ROTARY POWER, PARTICULARLY IN PRINTING MACHINES

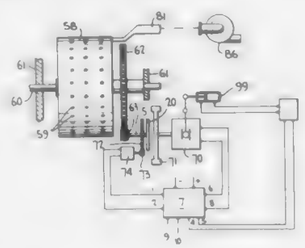
Richard C. Rolt, Stanley Pontlarge, Nr. Winchombe, Gloucestershire, GL54 5HD, Great Britain

Filed Jul. 17, 1987, Ser. No. 74,863

Claims priority, application United Kingdom, Jul. 17, 1986, 8617408

Int. Cl.[4] B65H *20/00*; F16D *21/02*

U.S. Cl. 226—24 **9 Claims**



1. Apparatus for transmitting rotary movement comprising:

a first power input shaft;

a second power input shaft;

a first annular disc member fixed to said first power input shaft;

a second disc member fixed to said second power input shaft;

a power output shaft; and

a third disc member carried on said power output shaft, with said power output shaft being coaxial with said first power input shaft and passing through the center of said first annular disc member, and being axially movable along their common axis between a first position in which said third disc member engages said first annular disc member to transmit power from said first power input shaft to said output shaft, and a second position in which the third disc member engages the second disc member and transmits power from said second power input shaft to said output shaft via a neutral position in which neutral position neither of the first and second disc members is engaged by the third disc member.

4,856,691

YARN GUIDE DEVICE

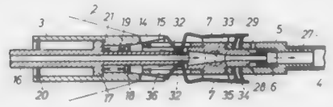
Tatsuo Takehana, and Fumio Matsuda, both of Ishikawa, Japan, assignors to Tsudakoma Corp., Ishikawa, Japan

Filed Mar. 16, 1988, Ser. No. 168,656

Claims priority, application Japan, Mar. 16, 1987, 62-062290; Aug. 26, 1987, 62-212336

Int. Cl.[4] B65H *51/16*; D03D *47/30, 47/34*; D04B *15/48*

U.S. Cl. 226—91 **16 Claims**



1. A yarn guide device, comprising:

a yarn guide means for positioning and holding yarn;

a yarn guide tube means for receiving and guiding yarn from said yarn guide means at a yarn receiving position, said yarn guide tube means comprising a yarn guide tube;

at least one of said yarn guide means and said yarn guide tube means being reciprocable relative to the other of said yarn guide means and said yarn guide tube means, said yarn guide means comprising a hollow yarn guide member;

a yarn inserter means for transferring yarn from said yarn guide means to said yarn guide tube means, said yarn inserter means comprising a yarn inserter member disposed inside of said yarn guide member, said yarn inserter member being movable relative to said yarn guide member to transfer yarn from said yarn guide means into said yarn guide tube means; and

at least one of said yarn guide means and said yarn guide tube means having a nozzle means for generating an air flow to assist transfer of yarn to said yarn guide tube means.

9. A yarn guide device, comprising:

a yarn guide means for positioning and holding yarn;

a yarn guide tube means for receiving and guiding yarn from said yarn guide means at a yarn receiving position, said yarn guide tube means comprising a yarn guide tube;

at least one of said yarn guide means and said yarn guide tube means being movable relative to the other of said yarn guide means and said yarn guide tube means to transfer yarn from said yarn guide means to said yarn guide tube means;

at least one of said yarn guide means and said yarn guide tube means having a nozzle means for generating an air flow to assist transfer of yarn from said yarn guide means to said yarn guide tube means; and

clamping means provided on one of said yarn guide means and said yarn guide tube means for clamping said yarn during transfer of yarn from said yarn guide means to said yarn guide tube means and subsequently releasing said yarn from clamping to complete transfer of yarn from said yarn guide means to said yarn guide tube means.

4,856,692

FEEDING APPARATUS

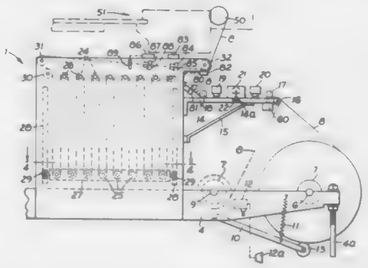
Christopher T. Harper, Eastleigh, United Kingdom, assignor to William R. Warner & Co. Limited, United Kingdom

Filed Aug. 5, 1987, Ser. No. 82,014

Claims priority, application United Kingdom, Aug. 15, 1986, 8619906; Dec. 11, 1986, 862946

Int. Cl.[4] G65H *20/00, 27/00*

U.S. Cl. 226—119 **3 Claims**



1. A feeding apparatus for feeding a material from a material supply to a further apparatus, said feeding apparatus comprising storage means for storing an amount of said material, and feed means for feeding said material from the material supply to the storage means and thence to the further apparatus, wherein said storage means comprises:

a substantially rectangular-shaped frame;

a plurality of movable rollers;

a plurality of fixed rollers mounted on the frame and disposed above the movable rollers, the material being wound alternately between the fixed and movable rollers, and said movable rollers being movable toward the fixed rollers by the tension in the material, and being movable away from the fixed rollers under the influence of gravity, whereby said material can be fed continuously to the further apparatus during an interruption of the material supply;

a substantially rectangular-shaped carriage to which the movable rollers are mounted, said carriage being movable with the movable rollers; and

guide means for guiding movement of said carriage, said guide means comprising interengaged toothed rack and pinion means at each corner of the carriage with a rack mounted on the frame and a respective pinion mounted on the carriage for each of the rack and pinion means for maintaining said carriage in a substantially constant orientation during movement toward and away from the fixed rollers.

4,856,693

WORKING OUT CONTAINER OF BAR SHAPED ARTICLE

Shubei Kageyama; Tadashi Yamamoto, and Tadayoshi Ebinuma, all of Kawagoeshi, Japan, assignors to Kotobuki and Company, Ltd., Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 159,258

Claims priority, application Japan, Feb. 23, 1987, 62-26097[U]; Apr. 28, 1987, 62-65560[U]; Jul. 14, 1987, 62-108497[U]

Int. Cl.[4] B43K *24/12, 24/18*

U.S. Cl. 226—127 **2 Claims**

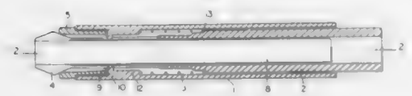
1. A container for feeding bar shaped articles comprising:

an outer sleeve (1);

an inner sleeve (2) insertable in said outer sleeve (1);

an axially biasing elastic member (3) between said inner

sleeve (2) and said outer sleeve (1) biasing said inner sleeve (2) against said outer sleeve (1);
chuck means (4) at one end of said inner sleeve (2), said chuck means having a split (7);
said split (7), in said chuck means (4) narrowing at an interior portion so that said chuck means (4) is forced open when the end of said inner sleeve (2) opposite said chuck means (4) is pressed
a chuck ring (5) between said chuck means (4) and said outer sleeve (1);



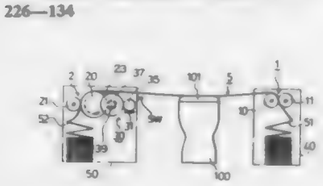
a projection on an interior surface of said chuck ring (5) engaging said split (7) in said chuck means (4);
a connecting hole (6) at a rear portion of said chuck ring (5) away from said chuck means (4);
an insert (10) on an interior surface of said outer sleeve (1) slidably connected in said connecting hole (6); and
a projection (9) on said insert (10) engaging a bar shaped article inserted in said inner sleeve.

4,856,694

PAPER SHIFTING APPARATUS FOR TOILET SEATS

Lei-Chen Shih, No. 1, 12th Fl., Chung-Hsiao E. Rd., Sec. 5, Taipei, Taiwan

Filed Jan. 7, 1988, Ser. No. 203,428
Int. Cl.[4] B65H *20/02*; A47K *13/18*
U.S. Cl. 226—134 1 Claim



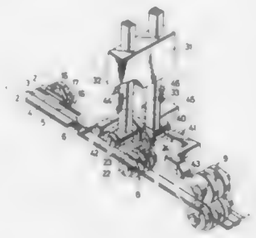
1. A paper shifting apparatus for toilet seats comprising:
a supply case adapted to be fixed at a proper place close to one side of a toilet bowl;
a supply mechanism with a first roller and a second roller pivotally installed in an upper portion of said supply case with said first roller and said second roller rotatably coupled with each other therein for being driven to rotate at the same time;
a take-up case adapted to be positioned at a proper place close to another side of the toilet bowl;
a take-up mechanism with a third roller and fourth roller pivotally installed in an upper portion of said take-up case with said third roller and said fourth roller rotatably coupled with each other therein for being driven to rotate at the same time in connection with said supply mechanism;
a locating and driving means installed in said take-up case and mechanically coupled with said take-up mechanism for being electrically operated to drive said take-up mechanism to rotate a predetermined distance; and
a continuous toilet-seat covering means having a feed portion at one end in said supply case and a running portion at another end in said take-up case movably arranged between said supply mechanism and said take-up mechanism with one piece of said continuous toilet-seat covering means located over the toilet seat of a toilet bowl, and the length of each piece of said continuous toilet-seat covering means is equal to a diameter of said third roller; so that, by starting said locating and driving means, one piece of said continuous toilet-seat covering means will be automatically shifted over the toilet seat as a replacement.

4,856,695

METHOD OF AND APPARATUS FOR FEEDING SLIDE FASTENER CHAIN WITH FLY STRIPS

Akio Yunoki, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 21, 1988, Ser. No. 184,594
Claims priority, application Japan, Apr. 22, 1987, 62-100412
Int. Cl.[4] B65H *20/02*, *20/04*
U.S. Cl. 226—154 5 Claims



1. A method of feeding a continuous slide fastener chain with successive fly strips along a horizontal straight path in a slide-fastener finishing machine including a slider threading station for threading sliders one at a time onto the slide fastener chain, the slide fastener chain having a pair of substantially endless tapes and successive pairs of intermeshed rows of fastener elements mounted on and along inner longitudinal edges of the tapes separated by longitudinally spaced element-free spaces defined therebetween, the successive fly strips being attached to one of the tapes in a posture folded on the one tape, said method comprising the steps of:
(a) feeding the slide fastener chain with the successive fly strips along the straight path by applying driving force only to the other tape free of the fly strips until each respective element-free space arrives at the slider threading station; and
(b) feeding the slide fastener chain with the successive fly strips along the straight path by applying the driving force to both of the tapes while the slide fastener chain is being threaded through a slider at the slider threading station.

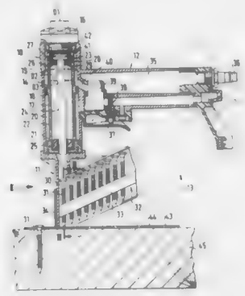
4,856,696

PNEUMATICALLY OPERATED DRIVING TOOL FOR FASTENERS

Sigurd V. Seld, Hamburg, Fed. Rep. of Germany, assignor to Joh. Friedrich Behrens AG, Ahrensburg, Fed. Rep. of Germany

Filed Jun. 23, 1988, Ser. No. 210,235
Claims priority, application European Pat. Off., Jul. 1, 1987, [illegible]
Int. Cl.[4] B25C *1/04*
U.S. Cl. 227—130 7 Claims

1. A pneumatically operated driving tool for fasteners comprising a working cylinder, a working piston assembly within said working cylinder, stop means in said working cylinder limiting the working stroke of said working piston assembly, a control valve adapted to be actuated by a trigger, a working space above said working piston assembly when said piston is in its upper dead point position, said control valve being adapted to alternatingly connect said working space with a pressurized air source or with atmosphere, respectively, piston return means connected to said working cylinder through an opening adjacent said stop means in order to return said piston assembly from a lower deadpoint position at said stop means to an upper deadpoint position said working piston assembly having a first piston with a smaller diameter than said working cylinder a driver connected to said first piston, an annular piston being sealingly displaceable on said driver and sealingly engaging the wall of said working cylinder, said annular piston also sealingly engaging said first piston, said annular piston being adapted to freely slide on said driver, the proportion of the effective areas and the masses of said first piston and said driver blade on one side and of said annular piston on the other



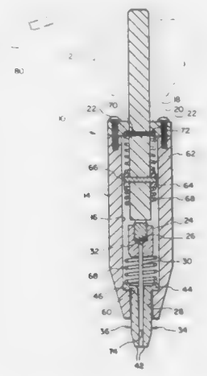
side being such that the acceleration of said annular piston during the working stroke is not larger than that of the first piston, and the upon sudden deceleration of said driver with said first piston being between said upper and said lower deadpoint position, said annular piston disengages said first piston and continues its travel towards said stop means and is returned form said lower deadpoint position into engagement with said first piston by said piston return means.

4,856,697

MANUAL PIN DRIVER

Malcolm T. Duffee, Brooklyn, Conn., assignor to Spirol International Corporation, Killingly, Conn.

Filed Feb. 5, 1988, Ser. No. 152,902
Int. Cl.[4] B25C *1/00*
U.S. Cl. 227—149 17 Claims



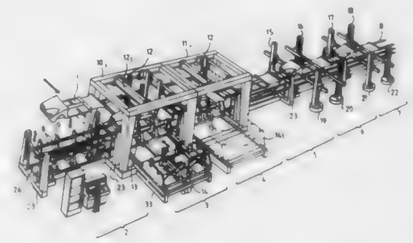
1. Apparatus for inserting a pin into a hole in a workpiece and comprising
a body having a bore therein,
jaw means supported on the body within the bore for pivotal movement between relatively closed and relatively opened jaw positions,
a quill mounted within the bore for reciprocating movement within the jaw means for driving a pin from the jaw means into a hole in a workpiece, and
jaw preloading means for preloading the jaw means to continuously urge it into relatively closed position, the jaw preloading means acting in response to movement of the quill in a pin driving direction for simultaneously applying increased forces to the jaw means in a jaw closing direction.

4,856,698

INSTALLATION FOR AUTOMATIC ASSEMBLY OF COMPONENTS AND, IN PARTICULAR, COMPONENTS OF MOTOR VEHICLE BODIES

Jean J. Marianne, Combs La Ville, and Pierre Jablonski, Creteil, both of France, assignors to Sciaky S.A., Vitry Sur Seine, France

Continuation of Ser. No. 855,804, Apr. 24, 1986, abandoned.
This application Jun. 16, 1988, Ser. No. 208,168
Int. Cl.[4] B23K *37/00*
U.S. Cl. 228—4.1 4 Claims



1. Installation for assembling various constitute or subassembly parts, said installation including:
at least one programmable welding robot;
a transfer line having a plurality of consecutively arranged stations spaced apart by equal distances with each of the distances corresponding to a predetermined length dimension;
at least one gantry having a length corresponding to said predetermined length dimension for forming part of one of said station, said gantry including an upper elevated frame with at least one horizontally movable cross member supporting said programmable welding robot for vertical movement of the robot relative to the cross member;
a base movable transversely of said transfer line into and out of a lower part of said gantry below said elevated frame, said base carrying positioning members for said parts;
transfer bars extending along the plurality of said stations of said transfer line for carrying a subassembly to said gantry for support by said base; and
means for lowering said transfer bars to place said parts on positioning members of said base by lowering of said bar when the base is in the lower part of said gantry.

4,856,699

DRIVING MECHANISM FOR A HIGH-SPEED WIRE CONTACTING DEVICE

Kraib Wolfgang, and Gerard Joachim, both of Ddresden, German Democratic Rep., assignors to VEB Elektromat Dresden, Dresden, German Democratic Rep.

Filed Dec. 8, 1987, Ser. No. 130,051
Claims priority, application German Democratic Rep., Mar. 2, 1987, 3003535
Int. Cl.[4] B23K *37/02*
U.S. Cl. 228—4.5 9 Claims

1. A drive mechanism for a high speed wire bonding device

used to connect bonding loci via wire bridges, said drive mechanism comprising:

(a) a bonding head including a generator system, a pincer system and a wire drag device;

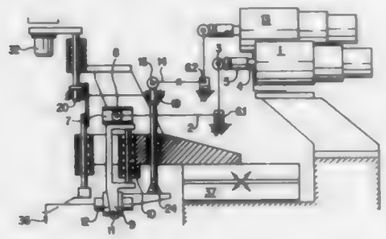
(b) z-movement drive motor means affixed to a machine frame for moving said bonding head in a vertical direction;

(c) first angle lever means rotatably and pivotable mounted with respect to the machine frame and coupled to said bonding head for providing vertical movement to said bonding head;

(d) x-compensating guide means for coupling said z-movement drive motor means with said first angle lever means;

(e) bearing yoke means for rotatably and pivotably mounting said first angle lever means with respect to the machine frame;

(f) bearing and carrier piece means for connecting said first angle lever means with the bonding head;



(g) first guide bushing means for permitting movement of said bonding head in the vertical direction;

(h) an optical objective;

(i) second guide bushing means for permitting vertical movement of said optical objective;

(j) a radio device;

(k) third guide bushing means for permitting vertical movement of said radio device;

(l) a generator lever attached to said generator system;

(m) a sliding piece which engages said generator lever;

(n) second drive motor means affixes to the machine frame for providing vertical movement to said optical objective, said radio device and said sliding piece; and

(o) second angle lever means for coupling said second drive motor means to said optical objective, said radio device and said sliding piece.

4,856,700

APPARATUS FOR ASSEMBLING A STRUCTURAL PANEL IN ORDER TO PREVENT THE SAG THEREOF

Akira Sakaguchi; Hisashi Uchibe, and Toshiyuki Tange, all of Hyogo, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Continuation-in-part of Ser. No. 930,185, Nov. 13, 1986, abandoned. This application Sep. 19, 1988, Ser. No. 246,113

Claims priority, application Japan, Nov. 29, 1985, 60-269858

Int. Cl.[4] B23K *9/225, 9/235*

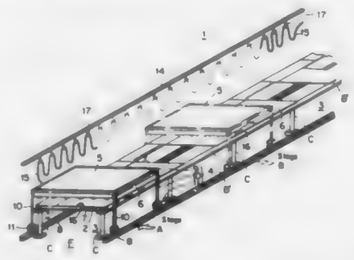
U.S. Cl. 228—5.1 **15 Claims**

1. Apparatus for preventing the sag of a panel which comprises a skeleton beam framework and a plate disposed upon said skeleton beam framework and to which said plate is to be secured, comprising:

a support surface;

a pair of laterally spaced support means extending upwardly from said support surface for supporting opposite sides of said skeleton beam framework, and said plate disposed upon said skeleton beam framework, at an elevated level above said support surface so as to provide substantially unobstructed access to the undersurface of said panel formed by said skeleton beam framework and said plate in order to facilitate securement of said plate to said skeleton beam framework; and

radiation heating means, relatively movable with respect to said plate, said skeleton beam framework, and said support means between a first position above said plate, at which downwardly projecting heating elements of said heating means can preheat said plate to a predetermined temperature so as to initially thermally expand said plate in preparation for subsequent securement of said plate to said



skeleton beam framework, and a second position remote from said plate so as to provide substantially unobstructed access to the upper surface of said panel formed by said skeleton beam framework and said plate in order to facilitate securement of said plate to said skeleton beam framework whereby the sag of said panel will be prevented as a result of a residual tensile stress being developed within said plate attendant thermal shrinkage deformation of said plate upon cooling of said plate after said plate has been secured to said skeleton beam framework.

4,856,701

DEVICE FOR POSITIONING TENTERING FRAMES INTO ASSOCIATION WITH A WORKPIECE WHICH IS BEING ASSEMBLED ALONG A TRANSFER LINE

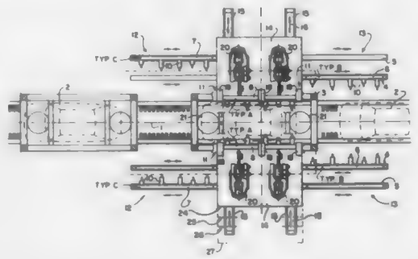
Franz Pöckl, Augsburg, Fed. Rep. of Germany, assignor to Kuka, Fed. Rep. of Germany

Filed Jun. 14, 1988, Ser. No. 207,335

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1987, 3720175

Int. Cl.[4] B23K *37/04*

U.S. Cl. 228—6.1 **8 Claims**



1. A device for positioning tentering frames into associating with a workpiece, the workpiece being assembled along a transfer line, the transfer line having a working station, comprising:

a movable guiding section arranged substantially parallel to the transfer line, the guiding section being movable in a direction substantially perpendicular to the transfer line;

at least one stationary guiding section arranged substantially parallel to the transfer line;

at least two tentering frames each tentering frame being slidable on said movable guiding section and said stationary guiding section;

a waiting position defined by said tentering frames being on one of said at least one stationary guiding section;

a working position defined by one of said tentering frames being on said movable guiding section and said movable guiding section being close to said transfer line;

said movable guiding section being alignable with each of said at least one stationary guiding section defining at least one aligning position;

each of said tentering frames being slidable from said movable guiding section to said stationary guiding section and from said stationary guiding section to said movable guiding section in said at least one aligning position.

4,856,702

METHOD FOR MANUFACTURING SEMICONDUCTOR COMPONENTS

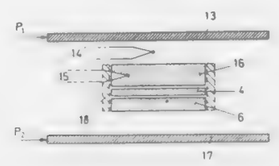
Franz Kloucek, Wettingen, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Mar. 22, 1988, Ser. No. 171,791

Claims priority, application Switzerland, Apr. 3, 1987, 1288/87

Int. Cl.[4] B23K *1/04*

U.S. Cl. 228—123 **5 Claims**



1. A method for manufacturing semiconductor components, in particular those of higher power, in which method a wafer-shaped semiconductor substrate on at least one substrate side is materially bonded to a metal contact wafer, and which method comprises the following steps:

(a) arranging between the semiconductor substrate and the contact wafer to be bonded thereto at least one layer of a solder, which solder can form a eutectic alloy with the semiconductor material of the semiconductor substrate; and

(b) heating the layer arrangement of contact wafer, solder layer and semiconductor substrate to a temperature above the eutectic temperature of the alloy of solder and semiconductor material; wherein

(c) the heating of the layer arrangement takes place individually through thermal radiation in a vacuum; and

(d) the heating is effected with two parallel panel heating elements, one on either side of said layer arrangement, whose area is larger than the area of the layer arrangement to be bonded, the plane of the material bond between the semiconductor substrate and the contact wafer being orientated parallel to the surfaces of the panel heating elements.

4,856,703

METHOD FOR DRAWING SEAMLESS METAL TUBING PARTICULARLY COPPER TUBING UNDER INCLUSION OF A FLOATING MANDREL AND A DIAMETER REDUCING DIE

Klaus P. Uhlmann, Koenigstrasse 58a, D-5632 Wermelskirchen, Fed. Rep. of Germany

Filed Nov. 23, 1988, Ser. No. 275,585

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1987, 3739730; Feb. 25, 1988, 3805838

Int. Cl.[4] B23K *31/06;* **B21C** *1/24*

U.S. Cl. 228—156 **19 Claims**



1. Method for drawing seamless metal tubing particularly copper tubing under inclusion of a floating mandrel and a diameter reducing die wherein the wall thickness is reduced under cooperation of the mandrel and of the die in an action zone defined by a drawing gap between the mandrel and the die, there being means to apply a drawing force to the drawn tube downstream from the die, comprising the steps of:

connecting a plurality of tubings end-to-end to each other thereby providing a joint in each instance of connection; normally and regularly drawing the tubing in portions not having any joint;

shifting the mandrel away from the action zone of the die as a joint between two of said tubings approaches the mandrel and keeping the mandrel out of the action zone in relation to the die as the joint passes through the die;

hollow drawing the tubing so that as a consequence of the shifting step, only a portion of the combined tubing including the joint is deformed, for a diameter reduction without concurring wall thickness reduction;

returning the mandrel to the action zone of the die following passage of the joint through the die; and

applying a pulling force to resume drawing to be effective downstream from the die but upstream from the joint that just passed through the die.

4,856,704

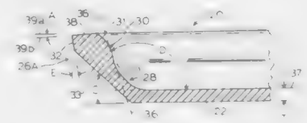
MACHINE PACKAGING TRAY

Sidney S. Tolson, Scotland Neck, N.C., and Charles S. Brumberg, Richmond, Va., assignors to Ossid Corporation, Scotland Neck, N.C.

Filed May 9, 1988, Ser. No. 191,547

Int. Cl.[4] B65O *1/34*

U.S. Cl. 229—2.5 R **13 Claims**



1. A molded tray for the packaging of a product such as poultry in conjunction with an overwrap film applied while the tray is transported through a packaging machine having a pair of conveyor belts with opposed vertical belt surfaces between which the tray is gripped and travels during packaging, comprising:

(a) a substantially flat bottom wall for supporting the product being packaged;

(b) upwardly and outwardly inclined side walls having and

extending from upper ends to the bottom wall and joined by a smooth transitional inner surface to said bottom wall along an inner boundary and forming the sides and ends of said tray, said side walls each having an outer peripheral substantially vertical planar gripping surface to enable said tray to be engaged by the vertical surfaces pressing inwardly against said planar gripping surfaces on the sides of the tray in a manner wherein said tray tends not to slip relative to the conveyor belts while being transported thereby; and

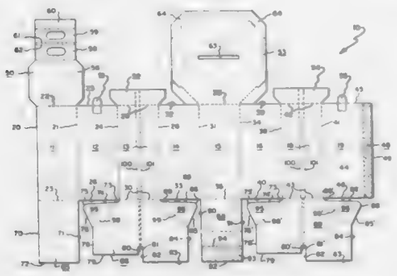
(c) a reinforcing rib portion at the inner boundary of said side and bottom walls formed to rigidify and strengthen said tray to prevent breakage thereof during gripping and transport by said belts and to permit the outer surface of said walls to be formed with planar surfaces for flat sealing of the film, said rib portion forming said smooth transitional inner surface.

4,856,705

AUTOMATICALLY-OPERATING BOTTOM STRUCTURE

Timothy H. Carr, Niagara Falls, and Donald W. Felton, Buffalo, both of N.Y., assignors to Lawless Container Corporation, North Tonawanda, N.Y.

Filed Sep. 29, 1988, Ser. No. 250,912
Int. Cl.[4] B65D *5/36*
U.S. Cl. 229—109 **13 Claims**



1. An automatically-operating bottom structure for a collapsible container adapted to be selectively moved between a folded-flat condition and a fully-expanded condition, said container having 4n rectangular side panels where n is an integer of one or more, said panels being of substantially equal width and being pivotally connectd along their adjacent longitudinal edges so as to be arranged in series with one another, said panels being arranged in opposing pairs when said container is in said fully-expanded condition, the improvement which comprises:

a bottom flap pivotally connected of each of a first pair of said panels, each bottom flap forming an included angle of about 0° with respect to its associated first panel when said container is in said folded-flap condition and forming an included angle of about 90° with respect to its associated panel when said container is in said fully-expanded condition;

each of said first pair of panels and is associated bottom flap being folded about a longitudinal axis substantially midway between the longitudinal edges of said panel, the respective halves of said first pair of panels being arranged at an included angle of about 0° when said container is in said folded-flat condition and being arranged at an included angle of about 180° when said container is in said fully-expanded condition;

a band pivotally connected to each of a second pair of said panels arranged substantially perpendicular to said first pair of panels, said band having two sections pivotally connected to one another about an intermediate pivotal axis substantially parallel to the pivotal axes between said band and said second pair of panels, said sections being arranged with respect to one another at an included angle of about 0° when said container is in said folded-flat condition and being arranged with respect to one another at an included angle of about 180° when said container is said fully-expanded condition; and

interlock means for interlocking said bottom flaps when said container is in said fully-expanded condition;

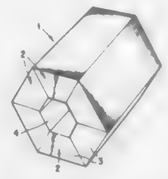
whereby when said container is moved from said folded-flat condition to said fully-expanded condition, said band will prevent said flaps from moving pivotally relative to their associated first panels through an angle of more than about 90°.

4,856,706

PACKING DEVICE

Berend G. Van Der Straten, Deventer, Netherlands, assignor to Zedek, B.V., Netherlands

Filed Feb. 17, 1988, Ser. No. 157,295
Claims priority, application Netherlands, Feb. 17, 1987, 8700390
Int. Cl.[4] B65D *5/48*
U.S. Cl. 229—110 **13 Claims**



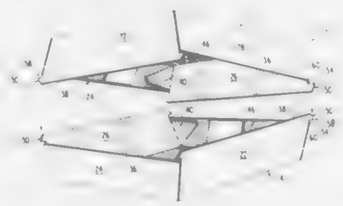
1. A packing device comprising a continuous row of at least one elements in a flat extended position, each element composed of a bottom, a top panel, at least one end wall and side walls, said elements hingeably connected together substantially along longitudinal ribs formed between said bottoms to form said continuous row of elements, characterized in that the packing device has been made from one unitary blank and that the row of elements can be rolled up from its flat extended position to a closed polygonal block having a casing and end faces in which the interconnected bottoms and said side walls of the elements are combined to form said casing and said end faces, respectively, of said block.

4,856,707

CONTAINER FOR FOOD PRODUCTS

Achim R. Lorenz, Marietta, Ga., assignor to MacMillan Bloedel Containers, Atlanta, Ga.

Filed Aug. 8, 1988, Ser. No. 229,499
Int. Cl.[4] B65D *5/28*
U.S. Cl. 229—114 **25 Claims**



1. A container comprising a tray piece and a cover piece closable over said tray piece,

said pieces each including a bottom wall and upstanding sidewalls connected to said bottom wall,

said sidewalls having central portions,

two opposing sidewalls of each piece having portions extending upwardly from said central portions thereof,

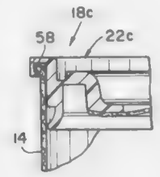
said upwardly extending portions each having a tip portion projecting outwardly through a plane determined by the central portion of a sidewall adjacent said sidewalls having said extending portions.

4,856,708

ADHESIVELY SECURED CONTAINER COVER

Joseph Giasi, 20 W. Park Ave., Long Beach, N.Y. 11561

Filed Sep. 22, 1988, Ser. No. 247,721
Int. Cl.[4] B65D *53/00*
U.S. Cl. 229—125.17 **4 Claims**



1. Improvements for a product container having an adhesively secured closure: said product container being of the type formed with a cylindrical body providing a product compartment and having an upper edge bounding an opening into said product compartment; said closure being of the type formed as a cover having about its periphery a pair of outer and inner spaced apart walls bounding a cavity for adhesive therebetween and having an operative position in which said walls are in straddling relation over said product container upper edge incident to adhesive in said cavity bonding said cover as a closure to said cylindrical body; and said improvements comprising a radially outwardly extending lip means on said product container upper edge and in overlapped relation therewith a radially inwardly extending lip means on said outer wall of said cover, whereby said overlapping lip means contribute to minimizing any loss of adhesive from said adhesive cavity during the adhesive securement of said closure to said product container.

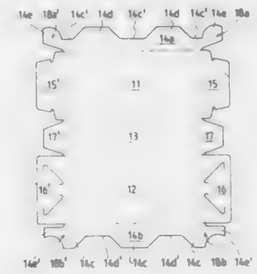
4,856,709

FOLDING BOX

Owe Axelsson, Lund; Harry Holmgren, Loddekopinge, both of Sweden, and Heinz Birkenbeul, Neider-Olm, Fed. Rep. of Germany, assignors to AB Akerlund & Rausing, Sweden

Filed Nov. 3, 1987, Ser. No. 116,447
Claims priority, application Sweden, Nov. 6, 1986, 8604759; Nov. 20, 1986, 8604959
Int. Cl.[4] B65D *5/06, 5/56*
U.S. Cl. 229—125.34 **11 Claims**

1. A folding box of cardboard or similar material having at least an inner surface of a heat sealable material, said box comprising, a casing having side walls to define an exterior and an interior and a longitudinal axis, longitudinally extending end flaps integrally connected to said side walls, said end flaps forming first and second closures on said casing, each said end flap having an interior surface and an exterior surface, a longitudinal joint on one side wall, said longitudinal joint extending from said side wall through at least one end flap, said longitudinal joint being an abutting edge joint having along a substantial length thereof at least one portion which is not parallel to said longitudinal axis of said casing, a thin strip heat sealed to the interior of said casing to cover said longitudinal joint thereby adding strength to said abutting edge joint, said thin strip providing only a minimal discontinuity on the interior surface of said end flap, and a sealing membrane of a flexible material attached to said interior surface of said end flaps on the first closure of said casing to provide a hermetic seal beneath said



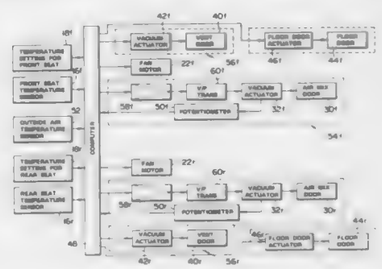
closure formed by said membrane sealed end flaps even in the area of said thin strip on the interior surface of the end flap with the longitudinal joint.

4,856,710

DUAL AIR CONDITIONER FOR A VEHICLE

Yutaka Takada; Koichi Doi; Tsutomu Yamazaki, and Yutaka Obata, all of Atsugi, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Oct. 20, 1983, Ser. No. 543,537
Claims priority, application Japan, Nov. 5, 1982, 57-193396
Int. Cl.[4] F24F *7/00;* **B60H** *1/00*
U.S. Cl. 236—13 **39 Claims**



1. A method of conditioning the temperatures of air provided to front and rear seats, respectively, within the passenger compartment of a vehicle, comprising the steps of:

selecting a desired air temperature for each seat, respectively;

sensing a typical temperature Ti within said compartment;

calculating a temperature $To=C\times(Ts-Ti)-C\times k\times(Ts-Ts1)$ where C is a constant, and Ts is the temperature desired at a given one of the seats and where k is a constant and Ts1 is a desired temperature in the other seat;

feeding air at the temperature To to said given seat.

4,856,711

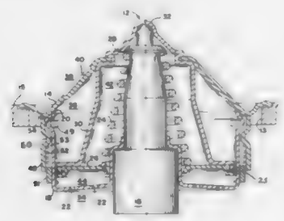
DOUBLE SEAL THERMOSTAT

James J. Grinsteiner, Roselle, Ill., and George J. Maat, Pompano Beach, Fla., assignors to Navistar International Transportation Corp., Chicago, Ill.

Division of Ser. No. 51,241, May 13, 1987, Pat. No. 4,776,513, and a continuation of Ser. No. 738,621, May 28, 1985, abandoned. This application Aug. 24, 1988, Ser. No. 236,097

Int. Cl.[4] F01P *7/02*

U.S. Cl. 236—34.5 2 Claims



1. A choke type double seal thermostat comprising:

a circular valve body having an outer flange adapted for mounting in an engine and a valve seat tapered in the axial direction toward the axis of said of said valve body;

a thermoelongating valve pin disposed on the axis of said valve body, said valve body having means to retain a first end of said valve pin thereagainst;

a primary valve choke of cup-shaped configuration fixably attached to said valve pin, said primary valve choke having an open end defining a circular axial edge disposed to gradually move axially and independently of the pressure differential across the valve seat into sealing contact with said tapered valve seat;

a valve spring disposed between said first cylindrical valve choke and said valve pin to bias said first valve choke against said valve seat;

a secondary valve choke comprising a metallic cylinder axially slidably disposed concentrically adjacent the periphery of said primary valve choke, said secondary valve choke having a circular axial edge disposed in first spring biased position of said secondary valve choke to make, upon axial movement of said primary choke toward said valve seat, sealing contact with said valve seat prior to said primary choke contacting said valve seat; and

a secondary choke compression spring operatively disposed between said primary valve choke and said secondary valve choke to bias said secondary valve choke to said spring biased position, said secondary choke spring being substantially smaller than said valve spring such that, upon said primary valve choke moving toward said valve seat, said secondary valve choke telescopingly retracts upon contact with said valve seat until said primary valve choke engages said valve seat.

4,856,712

WATERSPRAY DEVICE FOR ICE MAKING MACHINES

Emanuele Lanzani, Milan, Italy, assignor to King-Seeley Thermos Co., Prospect Heights, Ill

Filed Mar. 23, 1988, Ser. No. 172,020

Claims priority, application Italy, Apr. 7, 1987, 20006A/87

Int. Cl.[4] F23D *11/38*

U.S. Cl. 239—106 3 Claims

1. Apparatus for the delivery of a water spray to an ice cube making machine, comprising:

a hollow tubular spray arm having a longitudinal axis;

a support bearing for said spray arm permitting rotation of said spray in a horizontal plane about a vertical axis bisecting the said longitudinal axis of said spray arm, said support bearing providing for the supply of water under pressure to the interior of said spray arm;

water reception chambers mounted externally on said tubular spray arm at selected distances spaced from said vertical axis, each said water receptive chamber being comprised of a hollow cylindrical wall portion arranged with a longitudinal axis thereof at an angle to said vertical axis, and with said hollow cylindrical wall portion intersecting said hollow tubular spray arm at a tangent to said hollow cylindrical wall portion and communicating with the interior of said hollow tubular spray arm to provide a vortex flow of water within each said water receptive chamber;

end closure members closing the respective ends of each said



hollow cylindrical wall portion, an uppermost end wall of each said water receptive chamber including spray means for directing a spray of water in an upward direction, a lower most one of said end closure members being manually removable to permit the removal of debris from the associated water reception chamber; and

a jet for water in communication with the interior of said spray arm and providing propulsive power for rotating said arm about said vertical axis;

whereby, debris or particulate matter entrained in said supply of water is separated by centrifugal action from said water supply within said water reception chambers and is retained within said water reception chambers for subsequent removal therefrom by removal of said lowermost end closure members of said water reception chambers.

4,856,713

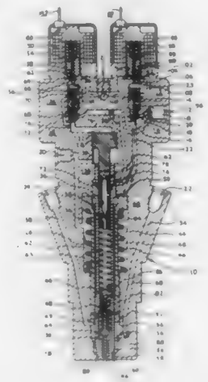
DUAL-FUEL INJECTOR

Lauren W. Burnett, Blue Springs, Mo., assignor to Energy Conservation Innovations, Inc., Oak Grove, Mo.

Filed Aug. 4, 1988, Ser. No. 228,326

Int. Cl.[4] B05B *1/30;* F02M *61/06*

U.S. Cl. 239—113 13 Claims



1. A dual-fuel injector for injecting a liquid fuel and a slurry fuel into a combustion chamber or the like, the slurry fuel including a solid material suspended in a liquid carrier, the dual-fuel injector comprising:

a housing having structure defining respective liquid and slurry fuel inlets for receiving liquid and slurry fuels from respective sources thereof, and having housing walls defining a discharge opening;

a liquid fuel assembly;

a slurry fuel assembly,

said assemblies and housing walls defining respective liquid and slurry fuel discharge nozzles,

said liquid fuel assembly including

selectively actuatable liquid fuel injection means operably received within said housing for selectively discharging liquid fuel received from said liquid fuel inlet through said liquid fuel nozzle, and

liquid fuel actuator means for selectively actuating said liquid fuel injection means,

said slurry fuel assembly including

selectively actuatable slurry fuel injection means operably received within said housing for selectively discharging slurry fuel received from said slurry fuel inlet through said slurry fuel nozzle, and

slurry fuel actuator means for selectively actuating said slurry fuel injection means.

4,856,714

FUEL INJECTION NOZZLES

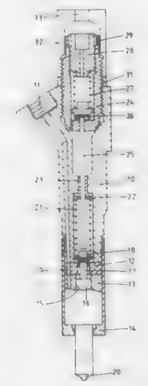
Ronald F. Turner, London, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Apr. 19, 1988, Ser. No. 183,610

Claims priority, application United Kingdom, Apr. 24, 1987, 8709715; Oct. 1, 1987, 8723028

Int. Cl.[4] F02M *61/20*

U.S. Cl. 239—533.9 4 Claims



1. A fuel injection nozzle of the inwardly opening type comprising an elongated valve member movable in a bore and a nozzle body, said valve member being shaped at one end for cooperation with a seating, a first spring abutment mounted on said valve member at the other end thereof, a first coiled compression spring having one end engaging said first spring abutment to bias said valve member into engagement with said seating to prevent flow of fuel from an inlet to and outlet, said first coiled compression spring being housed within a holder to which said nozzle body is secured, said valve member being lifted from said seating by fuel under pressure supplied to an inlet, a second coiled compression spring housed within an insert which is adjustably mounted in a holder, a second spring abutment located in said insert adjacent a base wall thereof, and engaged by on end of said second spring, an aperture formed in said base wall, an abutment rod loosely located between said spring abutments to define a gap in the closed position of the valve member, the initial movement of said valve member being against the action of said first spring until said gap is closed, and further movement of said valve member being against the action of said first and said second springs, said abutment rod at one end being guided by the surfaces of said opening in the base wall of said insert, and at a distance from said one end by guide means located apart from said insert.

4,856,715

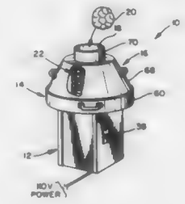
LETTUCE TEARING MACHINE

Donald E. Fordyce, 5337 Bastille, El Paso, Tex. 79924

Continuation-in-part of Ser. No. 773,651, Sep. 9, 1985, abandoned. This application Jun. 12, 1987, Ser. No. 62,106

Int. Cl.[4] B02C *19/12*

U.S. Cl. 241—5 16 Claims



1. Method of tearing heads of lettuce into bite size portions comprising the steps of:

(1) mounting two concentric containers, one within the other, to provide an upwardly opening, inner rotatable container and an outer container; with the inner and outer containers being spaced apart to provide an annular storage area therebetween;

(2) there being perforations within the sidewall of the inner container of a size to tear the heads of lettuce into the bite size pieces when the inner container is rotated and the heads of lettuce are dropped into the rotating inner container;

(3) gravitating a head of lettuce through the opening and into the inner container, and

(4) accelerating the head of lettuce by rotating the inner container at a rotational velocity to force a head of lettuce dropped into the inner container to bear against the sidewall of the inner container with sufficient force to tear the smaller bite size pieces of lettuce from a head of lettuce as the head of lettuce is accelerated by the inner container due to the head of lettuce being accelerated solely by the inner container;

(5) moving the bite size pieces through said perforations and against the inner wall of the outer container and gravitating the pieces towards the bottom of the annular storage area.

4,856,716

GYRATORY CRUSHER CONTROL

Jan E. Burstedt, Mobackavägen, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed Sep. 15, 1987, Ser. No. 96,444

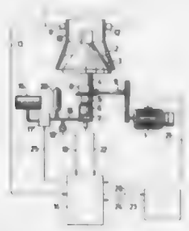
Int. Cl.[4] B02C *2/00, 25/00*

U.S. Cl. 241—30 14 Claims

1. A method for controlling a crushing gap width between a crusher head and a crusher shell of a gyratory crusher, said crusher head being adjustable in relation to the crusher shell by a hydraulic motor for adjusting said crushing gap width, comprising the steps of:

driving the crusher head by a power unit,

continuously determining power consumption of the crusher,
continuously determining pressure load acting on the crusher head,
continuously determining the width of the crushing gap,
selecting a gap width control function which is conditionally dependent on both the power consumption and the pressure load to provide an intended crushing effect on material being crushed,



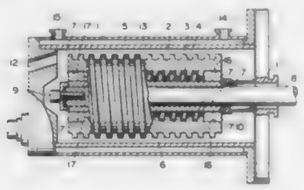
calculating a preferred gap width in accordance with said control function, and
adjusting the crushing gap width, when the crushing gap width is above a pre-determined minimum crushing gap width, so that said crushing gap width is adjusted to said preferred gap width calculated in accordance with said control function by means of said hydraulic motor and physical contact between the crusher head and the crusher shell is prevented.

4,856,717

DISPERSING AND GRINDING APPARATUS

Mitsuo Kamiwano, Yokohama, and Yoshitaka Inoue, Tokyo, both of Japan, assignors to Inoue Seisakusho (MFG) Co., Ltd., Japan

Filed Jun. 22, 1987, Ser. No. 65,259
Claims priority, application Japan, Jun. 20, 1986, 61-144193; May 11, 1987, 62-112623
Int. Cl.[4] B02C *17/16*
U.S. Cl. 241—65 **19 Claims**



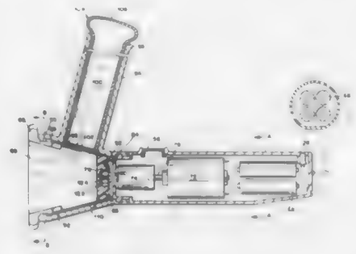
1. A dispersing and grinding apparatus for grinding a material and dispersing it into liquid by interaction with a grinding medium, comprising:
a grinding vessel having an elongate inner wall;
a cylindrical rotor rotatably disposed within said grinding vessel for agitating a mixture of grinding medium and material within said grinding vessel; and
a forward screw provided on an outer surface of said rotor to positively induce the mixture to flow forwardly and a backward screw provided on an inner surface of said rotor to positively induce the mixture to flow backwardly, the forward screw being spaced from the vessel inner wall to define therebetween a narrow space through which the mixture forwardly flows, and the forward and backward screws being configured to impart a generally uniform motion to the grinding medium in response to rotation of said rotor to effect circulation of the mixture within the grinding vessel accompanied by thorough dispersion of the material.

4,856,718

FOOD PROCESSOR AND FOOD CUTTING DEVICES THEREFOR

Ira Gaber, West Norwalk, Conn., and Cooper C. Woodring, Plandome, N.Y., assignors to Better Mousetraps Inc., Plandome, N.Y.

Filed Dec. 4, 1987, Ser. No. 128,689
Int. Cl.[4] A47J *43/25*
U.S. Cl. 241—93 **21 Claims**



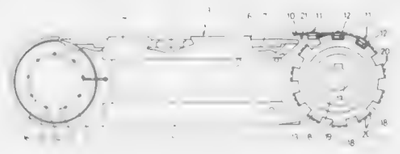
1. A food processor for cutting, slicing, shredding or grating and for discharging excised food from the front thereof, comprising:
(a) a housing including two portions;
(b) one portion of said housing containing an electrical power supply and an actuator for said power supply, and wherein said one portion is adapted to be held and supported by the hand of the user for positioning the food processor in various orientations during operation thereof;
(c) a conically shaped hollow second portion of said housing into which food is fed and from which excised food is discharged having a smaller rearward open end rotatably and releasably connected to said first portion of said housing, and having a larger forward open end at the front of the food processor for the discharge of excised food;
(d) a rotatable hollow conical food cutter positionable in said second portion of said housing for cutting, slicing, shredding or grating food fed into said second conical portion and through which excised food passes having a smaller rearward at said rearward smaller end of said second portion for operative rotational engagement with said power supply without being secured thereto and for ready release and removal of said food cutter from said second conical portion, and having a larger forward open end for the discharge of excised food from said forward end of said second portion;
(e) a chute intermediate said open ends of said second conical portion of said housing and extending from and above said second portion through which food is fed into said food cutter, whereupon the food is excised by and passed into and through said food cutter and is discharged from the open forward ends of said food cutter and said second conical portion at the front of the food processor; and
(f) a collar operatively connected to said larger end of said second conical portion of said housing movable into and out of contact with said food cutter for releasably retaining said food cutter in operative engagement with said power supply and within said second portion.

4,856,719

CUTTING ARM

Charles P. Hallez, Tellin, Belgium, assignor to Diamant Boart, Bruxelles, Belgium

Filed Mar. 23, 1988, Ser. No. 172,092
Claims priority, application Belgium, Mar. 23, 1987, 8700290
Int. Cl.[4] B02C *19/00*
U.S. Cl. 241—200 **7 Claims**



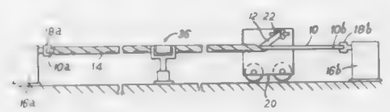
1. An elongated cutting arm on which is stretched an endless component (10) which is driven in rotation by a motor wheel (8) and a return wheel (9), which is fitted on its exterior with cutting tools (11) for the cutting and demolition of rocks, and which is fitted on its interior with guide plates (12) which follow a groove (6) provided along said arm, characterized in that the peripheries of the motor wheel (8) and the return wheel (9) have grooves (18) which are separated from one another by ridges (19) and which receive said guide plates (12) without any contact of the guide plates against the wheels.

4,856,720

HELICAL WINDING APPARATUS

Alfio Deregibus, Padova, Italy, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 440,160, Nov. 8, 1982, abandoned, which is a continuation of Ser. No. 256,345, Apr. 21, 1981, abandoned, which is a continuation of Ser. No. 124,681, Feb. 26, 1980, abandoned, which is a division of Ser. No. 29,801, Apr. 13, 1979, abandoned. This application Mar. 27, 1984, Ser. No. 593,198
Int. Cl.[4] B65H *81/08*
U.S. Cl. 242—7.02 **1 Claim**



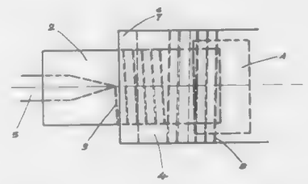
1. The method of fabricating as a continuous whole an extremely elongated hose which comprises steps of:
(i) rotating a correspondingly elongated cylindrical core by independently driving each of the core ends at a fixed speed with a separate motive means and maintaining said separate motive means in synchronism with each other whilst supporting said core simultaneously externally at plural positions intermediate its ends and applying force axially to said core to tension it,
(ii) moving, at constant speed along a path parallel to said core a carrier having a bobbin with a length of rubber tape wound thereon, and
(iii) feeding said length of tape from said bobbin onto said core, as the core rotates, thereby to form a helix building a hose on said core.

4,856,721

WINDING DEVICE

Philippe Bonello, Grand-Saconnex, Switzerland, and Jacques Noirot, Annemasse, France, assignors to Sarcem S.A., Meyrin, Switzerland

PCT No. PCT/CH85/00156, § 371 Date Aug. 12, 1986, § 102(e) Date Aug. 12, 1986, PCT Pub. No. WO86/02485, PCT Pub. Date Apr. 24, 1986
PCT Filed Oct. 18, 1985, Ser. No. 881,361
Claims priority, application Switzerland, Oct. 18, 1984, 5077/84
Int. Cl.[4] H01F *41/06*
U.S. Cl. 242—7.14 **11 Claims**



1. A winding device for winding a wire around a non-rigid planar coil support to form a wound coil which comprises:
means to render substantially non-flexible a portion of a non-rigid planar coil support which is acted upon by tension applied to said wire during said winding of said wire about said support, said means comprising two opposed members having opposed surfaces which are substantially planar in configuration positioned on opposite sides of said non-rigid planar coil support and spaced apart a distance slightly greater than the width of the wound coil, said opposed surfaces being spaced apart sufficiently to permit said coil support to pass therebetween in the form of a wound coil while rendering substantially non-flexible said portion of said coil support between said opposed members;
said opposed members each including a lateral portion extending toward said coil support and a longitudinal portion extending transversely to said lateral portion, said lateral portions of said opposed members including said opposed surfaces serving to render substantially non-flexible said portion of said coil support passing therebetween,
means to wind said wire about a portion of said non-rigid coil support adjacent said opposed members;
positioning means to render substantially immobile an end portion of said non-rigid coil support during said winding of said wire upon said coil support, said opposed members being positioned between said positioning means and said winding means; and
means to effect axial displacement between said coil support in relation to said opposed members during said winding of said wire.

4,856,722

APPARATUS AND PROCESS FOR AUTOMATICALLY TAKING UP A CONTINUOUSLY SUPPLIED YARN

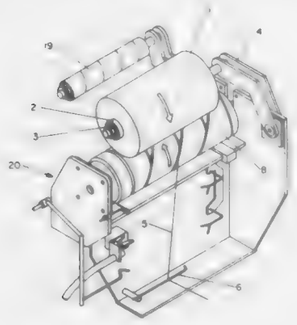
Robert W. Horsey, Kanata; Laurent C. Pilon; Grant M. Fletcher, both of Arnprior, and Arland W. Horner, Kanata, all of Canada, assignors to BASF Fibres, Inc., Arnprior, Canada

Continuation of Ser. No. 107,724, Oct. 8, 1987, abandoned. This application Nov. 7, 1988, Ser. No. 268,680
Int. Cl.[4] B65H *67/044*
U.S. Cl. 242—18 A **2 Claims**

1. A process for transferring a continuously supplied yarn traveling within a yarn traversing triangle from a first take-up tube to a second take-up tube, comprising the steps of:
(a) capturing the yarn between upper and lower yarn contact members in a yarn catcher moving from a disengaged position to an engaged position;

(b) moving said captured yarn adjacent a stationary upper yarn cutter and lower aspirator positioned between said upper and lower yarn contact members at said engaged position;

(c) cutting the yarn between the upper and lower yarn contact members, the downstream end of the yarn continuing to the first tube, the upstream end of the yarn continuing to be captured between the aspirator and the lower yarn contact member;



(d) moving a yarn hook attached to an actuator lever through the path of the captured yarn in step (c), altering the path of the yarn until the yarn contacts a yarn snagging device adjacent said second take-up tube;

(e) snagging the yarn with the yarn snagging device and breaking the yarn downstream of the snagging device, and;

(f) returning the yarn catcher to its unengaged position, releasing the yarn to said traversing triangle.

4,856,723

METHOD AND APPARATUS FOR CHANGING BOBBINS IN LOT FOR AN AUTOMATIC WINDER

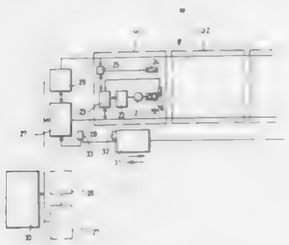
Shoichi Tone, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Continuation-in-part of Ser. No. 165,520, Mar. 8, 1988, abandoned. This application Mar. 11, 1988, Ser. No. 166,700

Claims priority, application Japan, Mar. 12, 1987, 62-57500

Int. Cl.[4] B65H *54/20, 63/00, 67/06*

U.S. Cl. 242—35.5 R **17 Claims**



1. A method of changing bobbins in lot for an automatic winder having a plurality of winding units, each winding unit being associated with a yarn package and being operable to receive a plurality of spinning bobbins from a spinning bobbin lot and to wind yarn from received spinning bobbins to the associated yarn package, said method comprising the steps of:

doffing a fully wound package from the winding unit by which the fully wound package is wound;

detecting the condition of the amount of residual yarn supply being less than a predetermined value, the residual yarn supply being defined as the amount of yarn remaining on the spinning bobbins of the spinning bobbin lot;

preventing the winding unit, in which the fully wound package is doffed, from further winding yarns when an amount of a residual yarn supply becomes less than a predetermined value;

discharging spinning bobbins received by the winding unit by which the fully wound package is wound when an amount of residual yarn supply becomes less than a predetermined value; and

delivering discharged spinning bobbins to the other winding units being in winding operation so that the winding of the lot is completed with substantially zero amount of residual yarn supply.

4,856,724

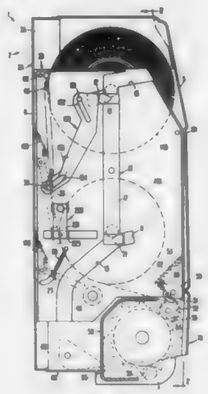
FLEXIBLE SHEET MATERIAL DISPENSER WITH AUTOMATIC ROLL TRANSFERRING MECHANISM

Paul Jespersen, Houston, Tex., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Jul. 14, 1988, Ser. No. 218,994

Int. Cl.[4] B65H *19/00*

U.S. Cl. 242—55.3 **33 Claims**



1. A dispenser for rolls of flexible sheet material wound on cores, the cores having ends extending beyond the sides of the rolls, the dispenser comprising:

a housing having opposite sidewalls, each sidewall having a guide track comprising a substantially vertical channel formed between lateral walls for receiving and guiding the core ends;

a substantially vertically disposed holding lever pivotably attached to each sidewall, said holding levers including an upper projection adjacent an upper end of said guide track for retaining a reserve roll of flexible sheet material at an upper reserve position along said guide track and a lower projection adjacent a lower end of said guide track for retaining a dispensing roll of flexible material at a lower dispensing position along said guide track;

a transfer roller supported in said housing adjacent the lower end of said guide track for contacting a full roll of sheet material; and

dispensing means including at least one roller supported in said housing adjacent the dispensing roll and laterally of said transfer roller for dispensing sheet material from the dispensing roll and out of said dispenser;

said transfer roller and said lower projections of said holding levers being located in said housing a predetermined vertical distance from one another so that said transfer roller contacts the roll surface of a full dispensing roll until a predetermined amount of sheet material is dispensed from the dispensing roll, said lower end of said guide tracks being positioned with respect to said dispensing means to locate the dispensing roll out of contact with rollers of said dispensing means.

4,856,725

WEB WINDING MACHINE AND METHOD

John J. Bradley, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Division of Ser. No. 845,187, Apr. 1, 1986, Pat. No. 4,723,724, which is a continuation-in-part of Ser. No. 724,180, Apr. 17, 1985, abandoned. This application Dec. 28, 1987, Ser. No. 138,661

Int. Cl.[4] B65H *18/16, 20/02*

U.S. Cl. 242—66 **3 Claims**



1. A method of operating a surface winder having a source of cores and a nip for receiving cores to be wound comprising sequentially moving cores from said source to said nip along a path characterized by a plurality of cusps, a first cusp being located adjacent said source, a second cusp being located adjacent adhesive applying means and a third cusp being located adjacent said nip, a core transport member being provided for supporting said cores along said path, said member being orbited while a supported core is revolved therearound to provide said cusps, and selectively communicating vacuum to said member to engage a core at said source and to disengage a core at said nip.

4,856,726

TAPE MEASURE

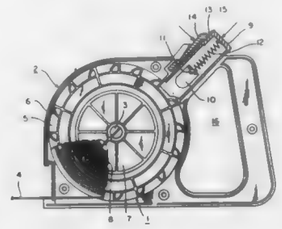
Dong M. Kang, Seoul, Rep. of Korea, assignor to Korea Measures Co., Ltd., Busan, Rep. of Korea

Filed Dec. 22, 1987, Ser. No. 137,425

Claims priority, application Rep. of Korea, Dec. 23, 1986, [illegible]/1986

Int. Cl.[4] B65H *75/48;* **G01B** *3/10*

U.S. Cl. 242—84.8 **13 Claims**



1. A tape measure, comprising:

a housing having an opening to the exterior of said housing;

a flanged spool rotatably mounted within said housing and having a pair of spaced apart flange sidewalls, said spool including a plurality of circumferentially distributed protrusions attached to one side of at least one of said flange sidewalls with regular intervals between said protrusions;

a measuring tape coiled about said spool between said flange sidewalls and having a free end portion extending through said housing opening, said spool being rotatable to move said tape between retracted and extended positions;

lock means for selectively locking said spool against rotation within said housing without directly contacting said tape to selectively prevent extension or retraction of said tape with respect to said housing, said lock means including a spool lock member selectively movable between a first position in which said spool lock member is positioned within one of said intervals between a pair of said protrusions to prevent rotation of said spool and extension or retraction of said tape, and a second position in which said spool lock member is positioned clear of said protrusions to allow rotation of said spool and extension and retraction of said tape, said spool lock member being slidably positioned within an aperture in said housing for movement between said first and second positions, a contact portion of said spool lock member projecting out of said housing and being engageable by a finger or thumb of the tape measure user to selectively cause said spool lock member to slidably move between said first and second positions; said spool lock member having an engagement shoulder; and

a catch attached to said housing and having an engagement portion sized to engage and cooperate with said engagement shoulder of said spool lock member when said contact portion of said spool lock member is engaged by a finger or thumb of the tape measure user and thereby slidably moved to position said spool lock member in said first position, said catch engagement portion and engagement should being lockably engageable to hold said spool lock member in said first position to lock said spool against rotation until said catch engagement portion and engagement shoulder are disengaged by the tape measure user to permit slidable movement of said spool lock member into said second position.

4,856,727

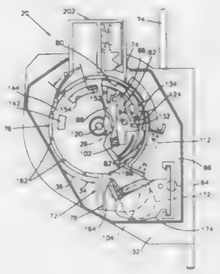
RETRACTOR WITH CINCH

Utz H. Schmidt, Utica, and Richard E. Asfour, New Baltimore, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Apr. 7, 1988, Ser. No. 178,972

Int. Cl.[4] B60R *22/38, 22/40*

U.S. Cl. 242—107.4 B **17 Claims**



1. A seat belt retractor comprising:

a spindle having seat belt webbing wound thereon, said spindle being supported for rotation in belt withdrawal and belt retraction directions;

means for blocking rotation of said spindle in the belt withdrawal direction;

a disk supported for rotation relative to said spindle for

actuating said blocking means in response to rotation of said spindle in the belt withdrawal direction relative to said disk, said disk having a plurality of teeth extending therefrom; and

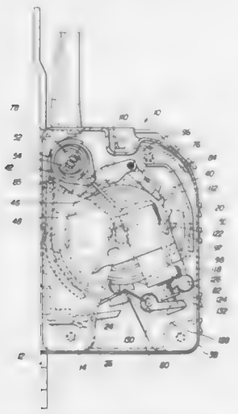
a manually movable member having a portion for engaging one of said plurality of teeth on said disk to block rotation of said disk in the belt withdrawal direction thereby enabling rotation of said spindle in the belt withdrawal direction relative to said disk upon rotation of said spindle in the belt withdrawal direction.

4,856,728

PASSIVE SEAT BELT RETRACTOR ASSEMBLY

Timothy J. Schmidt, Troy, and Valentim Jacob, Jr., Mt. Clemens, both of Mich., assignors to General Safety Corporation, St. Clair Shores, Mich.

Filed Mar. 21, 1988, Ser. No. 170,776
Int. Cl.[4] B60R *22/40*
U.S. Cl. 242—107.7 **13 Claims**



1. A seat belt retractor for providing motor vehicle occupant protection comprising:

a rotatable spool for storing seat belt webbing,

a rewind spring exerting a retraction force on said webbing,

comfort means for releasing tension on said webbing exerted by said rewind spring, and

means for cancelling said comfort means including operating means movable between a first position for acting upon and cancelling said comfort means and a second position enabling normal operation of said comfort means, biasing means urging said operating means toward said first position, actuation means for moving said operating means from said first to said second position upon rotation of said spool, release means for maintaining said operating means in said second position, and latch means for acting on said release means to release said operating means to enable said operating means to return to said first position.

4,856,729

HOLD AND UNWIND REEL FOR COILED MATERIAL

Ned D. Maraman, Savannah, Ga., assignor to Patents Unlimited, Inc., Savannah, Ga.

Filed Feb. 4, 1988, Ser. No. 152,325
Int. Cl.[4] B65H *49/00*
U.S. Cl. 242—129 **11 Claims**

1. A device for holding and permitting the unwinding of coiled material comprising:

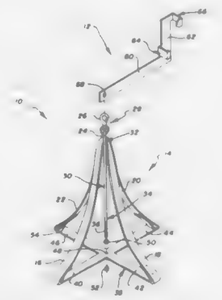
means defining a generally conically shaped mandrel or supporting a coil of material in a balanced attitude;

said mandrel means including a plurality of flexible support members each having bottom and top ends;

means for spreading apart the bottom ends of the flexible support members;

means for joining the upper ends of said flexible support members together;

means for adjusting the tension of said flexible support members so that the desired degree of slack is established therein prior to receiving the coil of material and for establishing the desired support of the coil following placement of the coil on said device;



said device further including support means for supporting the device; and

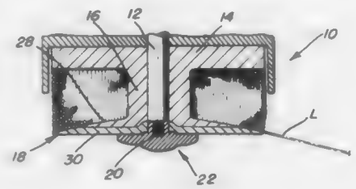
means for rotatably connecting said mandrel to said support means.

4,856,730

LINE SPOOL FOR FISHING REELS

Scott M. Jorgensen, P.O. Box 181, Adel, Iowa 50003

Filed Feb. 17, 1988, Ser. No. 156,550
Int. Cl.[4] B65H *75/24, 75/14*
U.S. Cl. 242—118.4 **5 Claims**



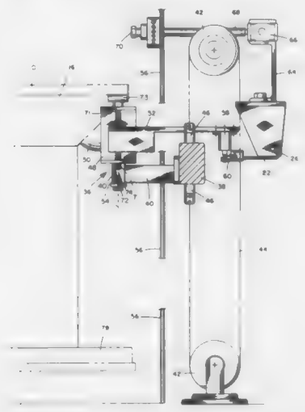
1. A spool for fishing reels permitting use of substantially all line wound thereon when casting, said spool comprising an inner flange and an outer flange spaced apart by a hub, said hub being adapted for receiving wound line thereon, said outer flange comprising a fixed plate member disposed adjacent said hub and having an outer wall surface and an inner wall surface, said inner wall surface extending from said huo for engaging and contacting line wound on said hub, said fixed plate member having a circumferential periphery of a diameter permitting a predetermined amount of line wound on said hub to be contained thereon, a removable plate member having an inner wall surface and an outer wall surface, the inner wall surface of said removable plate member and of the outer wall surface of said fixed plate member having cooperating surfaces for permitting said removable plate member to be mounted in abutting relationship with the outer wall surface of said fixed plate member, said removable plate member having a circumferential periphery of a diameter substantially larger than that of the fixed plate member such that when mounted in abutting relationship with said fixed plate member a greater amount of line than said predetermined amount may be mounted on said hub, a bore extending through said flanges and said hub for receiving a real mounting shaft, a reel lock having means for attachment to said shaft to secure the spool to said shaft selectively with the removable plate member thereon and with the removable plate member removed therefrom, said outer wall surface of said fixed plate member and said outer wall surface of said removable plate in the vicinity of said bore comprising substantially identical configurations both in shape and size and said inner wall surface of said removable plate member in the vicinity of said bore comprising a shape and size complementary to said configurations for permitting an interlocking connection between said inner wall surface of said removable plate member with the outer wall surface of said fixed plate member, and said reel lock including means for interlocking with the outer wall surface of said fixed plate member and with the outer wall surface of said removable plate member selectively, whereby when the amount of line on said spool is greater than said predetermined amount said removable plate member is attached to said spool and may be removed therefrom when the amount of line on said spool is no more than said predetermined amount.

4,856,731

TRAVERSE ASSEMBLY FOR USE ON TAPERED FLANGE SPOOLS

Donald E. Rorick, New Haven, Ind.; Frank M. Hayes, Hopkinsville, Ky., and Robert O. Aspy, Fort Wayne, Ind., assignors to Phelps Dodge Industries, Inc., New York, N.Y.

Continuation of Ser. No. 827,392, Feb. 10, 1986, abandoned.
This application Jun. 21, 1988, Ser. No. 211,117
Int. Cl.[4] B65H *54/32, 54/12*
U.S. Cl. 242—158 R **16 Claims**



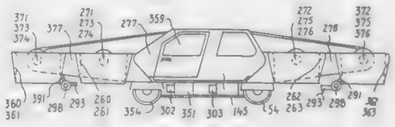
1. An apparatus for spooling a filamentary material onto a spool rotating about an axis having at least one tapered flange, said apparatus comprising a mounting arm having first and second ends, said mounting arm second end being a pivot point, a sheave, said sheave being generally circular and having a peripheral groove thereon, said sheave being pivotably connected to said second end of said mounting arm to automatically vary in position radially of the spool as the diameter of the spooled filamentary material increases, means for traversing said sheave longitudinally of the spool, said traversing means being connected to said first end of said mounting arm, and means for controlling relative to the tapered flange of the spool the traverse of said sheave, said spool being on one side of said sheave, said filamentary material being introduced from a path on the opposite side of said sheave, said filamentary material being guidingly engaged by said peripheral groove and being spooled at a right angle to the axis of the spool.

4,856,732

AIRBORNE VEHICLE WITH HYDRAULIC DRIVE AND CONTROL

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Filed May 1, 1987, Ser. No. 45,638
Int. Cl.[4] B64C *37/00*
U.S. Cl. 244—2 **1 Claim**



1. A vehicle capable of travel on a road as a car and capable of lifting away from the road to fly through the air while it is also capable of landing onto a road, comprising, in combination,

a body provided with at least four wheels, a power plant and holding arms which extend forward and rearward from said body,

said wheels freewheeling on axes which extend perpendicular to the longitudinal direction of said body to run said body on said road in forward and rearward directions,

a plurality of ducts pivotably provided on said arms with an equal number of said ducts provided on said foreward and said rearward extending arms,

propellers individually provided in said ducts and borne in said ducts to revolve around their axes,

drive sets individually provided to said axes of said propellers,

individual transmissions extending from said power plant to said drive sets to drive said propellers, a common adjustment means provided to said ducts to pivot said ducts in unison from a horizontal to a vertical position and vice versa,

wherein said transmission is a hydrostatic transmission;

wherein said drive sets are hydrostatic motors,

wherein said transmission includes a multi flow pump with individual outlets equal in number to the number of said ducts and with at all times proportionate rates of flow in all of said outlets,

wherein said transmission includes individual delivery fluid lines and individual return fluid lines between said pump and said motors, and,

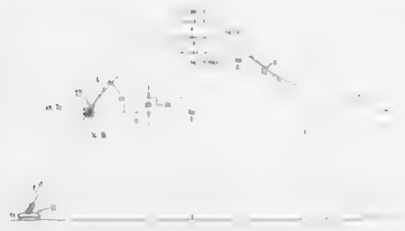
wherein said number of said ducts defines eight ducts with four of them in pairs located on said forward extending arm and four of them located in said rearward extending arm,

whereby the ducts of said pairs are located laterally of each other and said pairs are located with one pair behind another pair, for obtaining a balanced thrust of all propellers in all ducts respective to a longitudinal axis of said vehicle and for obtaining a capability to lift said vehicle in the lateral size of a car.

4,856,733
METHOD AND ARRANGEMENT FOR DETERMINING PASSAGE THROUGH AN APOGEE

Karl-Heinz Lachmann, Lauf/Pegn., Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed May 9, 1988, Ser. No. 191,588
Claims priority, application Fed. Rep. of Germany, May 18, 1987, 3716606
Int. Cl.[4] F41G 7/00
U.S. Cl. 244—3.15 10 Claims

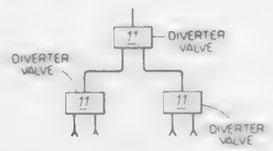


1. A method for the on board determination of the passage by a ballistically launched projectile through the apogee of a trajectory through the receipt and comparison of a sequence of measured values fluctuating specifically relative to the trajectory; comprising repeatedly determining changes in trajectory-dependent environmental or system measured values upon said projectile reaching a stable condition of flight along said trajectory; comparing the change in the measured values with predicted changes obtained from a mathematic-parametric model of the behavior of said projectile; correlating the parameters of the model on the basis of the actual development of the measured values with the actual movement of said projectile; and computing the point in time of the passage through the apogee of the ballistic trajectory from the model with recursively correlated parameters.

4,856,734
REACTION JET CONTROL SYSTEM

Guy E. Davies, Hampshire, England, assignor to Plessey Overseas Limited, Essex, England

PCT No. PCT/GB87/00133, § 371 Date Dec. 17, 1987, § 102(e) Date Dec. 17, 1987, PCT Pub. No. WO87/04989, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 23, 1987, Ser. No. 124,797
Claims priority, application United Kingdom, Feb. 21, 1986, [illegible]
Int. Cl.[4] F42B 15/033
U.S. Cl. 244—3.22 6 Claims

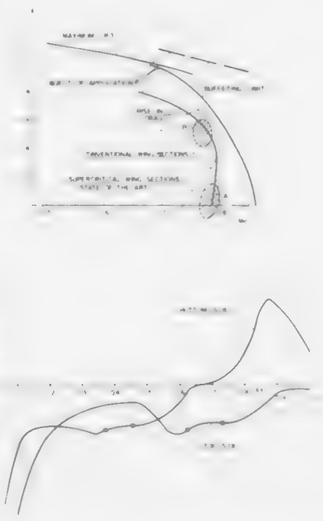


1. A reaction jet control system for a flying vehicle, the system comprising pairs of jet reaction nozzles with associated gas flow supply ducts, the duct between two nozzles of any one pair including a first gas diverter valve and the duct between two pairs of nozzles including a second gas diverter valve.

4,856,735
WING SECTIONS, IN PARTICULAR LIFT-WING SECTIONS FOR AIRCRAFT

Michael Lotz, deceased, late of Immenstaad (by Carla Lotz née Post, heir and Andreas Lotz, heir); Rüdiger Vanino, deceased, late of Hagnau (H. L. I. M. Vanino, heir); Peter Kühl, Immenstaad; Dieter Welte, Markdorf, and Herbert Zimmer, Friedrichshafen, all of Fed. Rep. of Germany, assignors to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Oct. 12, 1982, Ser. No. 433,890
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1981, 3140350
Int. Cl.[4] B64C 3/14
U.S. Cl. 244—35 R 5 Claims



1. Wing sections, in particular lift-wing sections for aircraft, with means for gap formation, based on a design Mach number between 0.2 and 0.9 and with a usable lift coefficient between −0.1 and 1.5 in the high-speed range and with a lift coefficient up to 2.5 in the low-speed range, in which

(a) the curvature changes only slightly at the top and bottom sides of the lift-wing section in that contour area where supersonic flow may occur;

the curvature of the bottom side of the wing section varies from −0.5 to −0.6 in the range of the wing depth from 12.5 to 34 percent, the first maximum of curvature of the bottom side of the section is −0.6 and is located at 34 percent of the section depth;

the curvature of the top side of the section varies from −0.2 to −0.4 in the range of wing depth from 26 to 53 percent, the maximum of curvature of the top side of

the section is −0.6 and is located at 57 percent of teh wing depth;

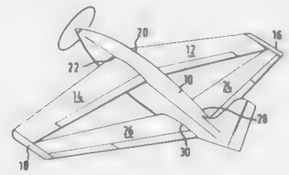
(b) there being a region of recompression with a pronounced maximum of curvature in each both at the top and bottom sides of the wing section and comprising in each case two closely following inflection points therebehind, in which the first inflection point both at the top and the bottom side of the section is located at a spacing of 2 to 5 percent of the section depth behind the first maximum of curvature, the second maximum of curvature is located at a spacing of 10 to 16 percent of the section depth behind the first maximum of curvature both on the top and the bottom sides of the section; and

(c) a flow gap being selectively set in such a manner that the gap is located behind the recompression region of the top side of the wing section.

4,856,736
AIRCRAFT WITH PAIRED AEROFOILS

Gordon V. Adkins; John R. McDonald, both of Wimborne, and Olav N. Sivertsen, Isswich, all of United Kingdom, assignors to Skywardens Limited, Dorset, United Kingdom

Filed Jun. 27, 1988, Ser. No. 211,754
Claims priority, application United Kingdom, Jun. 26, 1987, 8715073; Mar. 21, 1988, 88006681
Int. Cl.[4] B64C 3/00, 39/08
U.S. Cl. 244—45 R 9 Claims

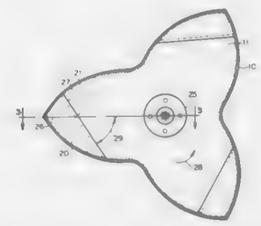


1. An aircraft having at least one set of paired aerofoils in the form of a forward pair of wings and a rearward pair of wings, the wings extending from a fuselage to wing tips, the wing tips being joined in the same plane one behind the other, the trailing edge of the forward wing and the leading edge of the rearward wing being substantially coincidental at the wing tips in plan view, at least one wing being cranked, the minimum angle between the wings in the front view being 4 degrees at the tips of the wings, a substantial part of the forward wings being higher than the rearward wings at the tip section.

4,856,737
SPINNING RAM AIR DECELERATOR

Alexey T. Zacharin, 37 Copeland Rd., Denville, N.J. 07834

Filed Sep. 25, 1987, Ser. No. 101,330
Int. Cl.[4] B64D 17/80
U.S. Cl. 244—113 8 Claims



1. An inflatable decelerator for deployment with an attached load unit in an air stream comprising:

an inflatable chamber having a center and a plurality of radially outwardly projecting lobes relative to the center and in spaced-apart relationship to each other;

at least one air inlet means for inletting air to the inflatable chamber;

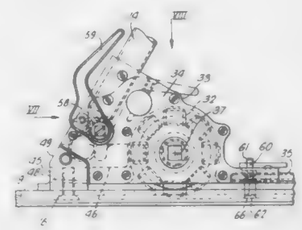
air scoop means angularly offset along a line passing from a point of a first lobe, to the indented point between lobes opposite the first lobe and operatively related to each said air inlet means for capturing a portion of external airflow around said chamber and directing said portion into said inlet to inflate said chamber and produce a desired rotational speed in a selected direction; and

a mounting means for mounting a body to the inflatable decelerator.

4,856,738
ADJUSTABLE SEATING ARRANGEMENT FOR AIRCRAFT

John C. Martin, Herts, England, assignor to British Aerospace Public Limited Company, Hatfield, United Kingdom

Filed Mar. 7, 1988, Ser. No. 164,960
Claims priority, application United Kingdom, Mar. 7, 1987, 8705393
Int. Cl.[4] B64D 11/06
U.S. Cl. 244—122 R 3 Claims

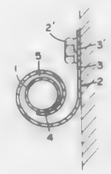


3. A seating unit for a vehicle including seat adjustment means and locking means for use with an adjustable seating means and locking means for use with an adjustable seating system in a passenger vehicle, for example an aircraft, said adjustment means comprising a sprocket wheel assembly including at least two operatively interconnected sprocket wheels for engaging a related one of two seat mounting rails, each of said sprocket wheels having a circumferential portion incorporating a plurality of radially disposed spigots extending outwardly therefrom in which each of said spigots is substantially cylindrical and incorporates a concentric bore over at least a portion of its length for engaging said locking means, said locking means including a draw bolt having a spigot engaging shank portion for engaging said concentric bore in an aligned and adjacent one of said spigots and restraining said sprocket wheel against rotation.

4,856,739
ELONGATED MEMBER FIXING DEVICE BY USE OF 'CLAMP'

Kazunori Takikawa, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Jul. 20, 1988, Ser. No. 221,646
Claims priority, application Japan, Jul. 21, 1987, 62-111681[U]; Sep. 17, 1987, 62-142160[U]
Int. Cl.[4] F16L 3/08
U.S. Cl. 248—74.2 20 Claims



1. A fixing device for attaching a small-sized elongated member to a basic structure, said fixing device comprising a bandlike clamp having a fitting means to be attached to the basic structure and a coiled section formed at least one end thereof, said coiled section having an inner surface defining a cross section greater than the cross section of the small-sized elongated member, said small-sized elongated member being

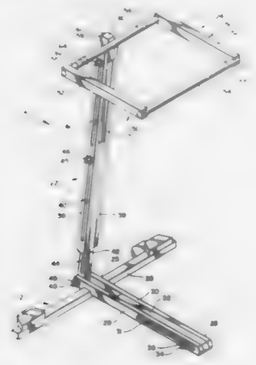
fixed to a selected portion of the inner surface of the coiled section of the clamp, and being spaced from other portions of the inner surface.

4,856,740

MULTI-PURPOSE INDOOR/OUTDOOR REFUSE BAG SUPPORT

Edwin A. MacLeod, 1133 Pipeline Road, #89, Port Coquitlam, BC, Canada V3B 4R8, and E. Wesley Frank, P.O. Box 873, Sumas, Wash. 98295

Filed Mar. 7, 1988, Ser. No. 164,544
Int. Cl.[4] B65B *67/12*
U.S. Cl. 248—97 **10 Claims**



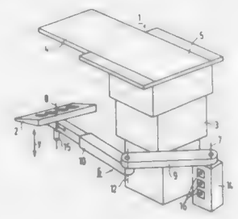
1. A portable, articulated, refuse bag support assembly comprising, in combination:
(a) a ground/floor engaging base subassembly including a generally T-shaped support base;
(b) an axially extensible upright support stanchion subassembly pivotally interconnected at its lowermost end to said ground/floor engaging base subassembly;
(c) first means for releasably locking said ground/floor engaging base subassembly and said upright support stanchion subassembly together in any desired position defining an included angle therebetween ranging from approximately 0° to approximately 180°;
(d) a generally rectilinear bag engaging support subassembly pivotally interconnected at one edge thereof to said upright support stanchion subassembly, said generally rectilinear bag engaging support subassembly including: (i) a pair of mating telescopically interconnected C-shaped support elements adapted to be slidably moved away from one another and/or slidably moved towards one another so as to adjust the size of the rectilinear opening defined thereby to accommodate various sized refuse bags; and (ii), second means for releasably locking said pair of C-shaped support elements together in any desired position defining a rectilinear bag engaging support subassembly capable of supporting the open end of any conventional refuse bag; and,
(e) third means for releasably locking said generally rectilinear bag engaging support subassembly and said upright support stanchion subassembly together in any desired position defining an included angle therebetween ranging from approximately 0° to approximately 180°;
whereby, said first, second and third releasable locking means can be loosened to permit said ground/floor engaging base subassembly, said upright support stanchion subassembly, and said bag engaging support subassembly to be collapsed and folded into a compact generally planar configuration for storage, yet permitting such subassemblies to be deployed for use in supporting a refuse bag wherein said ground/floor engaging base subassembly and said bag engaging support subassembly can be selectively unfolded from the compact, stored, planar configuration and deployed in selected ones of operative and/or inoperative planes for permitting support of a conventional refuse bag in either a generally vertical orientation or a generally horizontal orientation with the open end of the bag being maintained in the open state.

4,856,741

ADJUSTABLE PATIENT SUPPORT TABLE FOR AN X-RAY DIAGNOSTICS INSTALLATION

Willi Schaefer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 8, 1987, Ser. No. 130,279
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 8634352[U]
Int. Cl.[4] A61B *6/00*
U.S. Cl. 248—122 **15 Claims**



1. A patient support system for use in an x-ray diagnostics installation having a plurality of components, said system comprising:
a control box having controls thereon for controlling at least said patient support system;
a patient support table having a head end and a foot end defining a longitudinal axis therebetween, said patient support table having longitudinal edges parallel to said longitudinal axis; and
bracket means for permitting movement of said control box to a standby position at said foot end of said patient support table, said control box in said stand by position lying adjacent said foot end of said patient support table generally parallel to said longitudinal axis to permit access to said patient support table;
said bracket means having a first end attached at said foot end of said patient support table and a second end attached to said control box for permitting displacement of said control box parallel to a longitudinal edge of said patient support table.

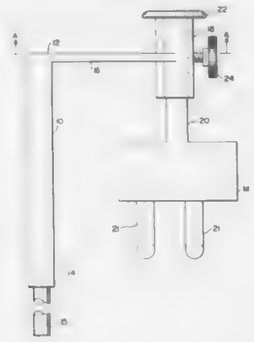
4,856,742

CONVERSION BRACKET FOR PORTABLE MICROSCOPES

Robert C. Welsh, 1600 Onaway Dr., Miami, Fla. 33133

Filed May 18, 1988, Ser. No. 195,157
Int. Cl.[4] G02B *21/00*
U.S. Cl. 248—124 **5 Claims**

1. A microscope supporting device, comprising:
a microscope having a vertical neck support which defines a first external diameter, and a lock member selectively engaging a portion of the vertical neck support, the lock member having a second external diameter greater than the first external diameter;
a bracket for supporting the microscope by the neck support, the bracket comprising
an inverted L-shaped support member having a vertical arm and a horizontal arm, one end of said vertical arm having means for securing the support member to a foundation;
a vertical support cylinder attached to an end of said horizontal arm for receiving the neck support of the microscope, said support cylinder having an internal diameter greater than the first external diameter of said neck support and less than the second external diameter of the lock member so that the lock member abuts against a top surface of the support cylinder; and



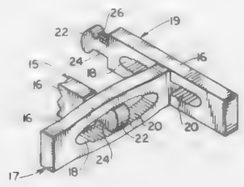
fastening means for securing the vertical neck support of the microscope in said support cylinder, said fastening means selectively decreasing the internal diameter of said support cylinder relative to the external diameter of said vertical neck support to fix said neck support in said support cylinder.

4,856,743

CONTAINER HOLDER

John E. Sweeney, 3628 Highbury Ct., Simi Valley, Calif. 93063

Filed Jan. 12, 1989, Ser. No. 295,994
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—149 **2 Claims**



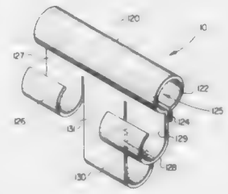
1. A container holder for preventing accidental spillage of an open container comprising:
a plurality of members, said members being interconnected defining an enclosed area within which there is adapted to be located the open container, said members including adjustment means for varying the size of said enclosed area, said adjustment means comprising:
each said member having a main body section, an elongated slot formed within each said main body section, each said member having an integral knob at one end thereof, a necked-down area formed between said knob and said main body section, a said necked-down area of one said member to connect with a said elongated slot of another said member with the one member being slidable relative to the other member; and
said main body section being elastically deflectable to increase the width of said elongated slot to thereby permit direct insertion of said knob through said slot to connect said necked-down area with said slot.

4,856,744

HANDLE SUPPORT ASSEMBLY

Gail Frankel, 5710 Glen Heather Dr., Dallas, Tex. 75252

Filed Jun. 1, 1988, Ser. No. 201,480
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—215 **10 Claims**



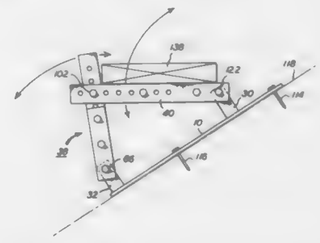
1. A support assembly for use with a horizontal bar, handle, or structural member on a mobile ambulation assistance device of the like comprising:
an integrally formed body portion;
handle engaging means integral with and extending generally upwardly from said body portion and having means adapted to engage a generally horizontal bar, handle, or structural member portion of a mobile ambulation assistance device, said engaging means further comprising gripping means frictionally engagable with said horizontal bar, handle, or structural member; and
hook means integral with and extending generally downwardly from said body portion for selective hooking engagement with an article to be supported by said assembly, said hook engaging means comprising at least two hooks facing in opposite directions.

4,856,745

ADJUSTABLE ROOF SCAFFOLD SUPPORT

Dana Mabie, 49 Potomac St., Rochester, N.Y. 14611

Filed Feb. 21, 1989, Ser. No. 312,862
Int. Cl.[4] A47G *29/02*
U.S. Cl. 248—237 **20 Claims**



1. A triangular, adjustable roof scaffolding support which weighs from about 3 to about 4.5 pounds, comprising a steel base, means for attaching said steel base to the surface of a roof, a first adjustable aluminum arm hingably attached to one portion of said base, means for hingably attaching said first aluminum arm to one portion of said base, a second adjustable aluminum arm hingably attached to another portion of said base, means for attaching said second aluminum arm to said other portion of said base, means for attaching said first aluminum arm and said second aluminum arm to each other, and means for securing a plank to at least one of said adjustable aluminum arms, wherein:
(a) said steel base is comprised of a steel plate and two U-shaped brackets attached to and extending upwardly from the surface of said steel plate, wherein each of said U-

shaped brackets comprises a hole extending through both of the walls of said bracket;

(b) said first adjustable aluminum arm comprises a first aluminum plate comprised of a multiplicity of holes extending through its side, a second aluminum plate comprised of a multiplicity of holes extending through its side, a first aluminum square tubular section comprised of a multiplicity of holes extending through at least two of its opposing sides, means for securing said first aluminumn plate to one side of said first aluminum square tubular member, and means for securing said second aluminum plate to the opposing side of said first aluminum square tubular member; and

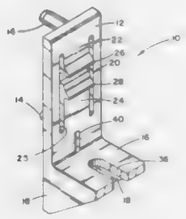
(c) said second adjustable aluminum arm comprises a third aluminum plate comprised of a multiplicity of holes extending through its side, a fourth aluminum plate comprised of a multiplicity of holes extending through its side, a second aluminum square tubular section comprised of a multiplicity of holes extending through at least two of its opposing sides, means for securing said third aluminumn plate to one side of said second aluminum square tubular member, and means for securing said fourth aluminum plate to the opposing side of said second aluminum square tubular member.

4,856,746

INTERCHANGEABLE SHELF SUPPORT BRACKET

Keith A. Wrobel, Rogers, and Joel D. Mechelke, Stillwater, both of Minn., assignors to LSI Corporation of America, Inc., Minneapolis, Minn.

Filed Oct. 24, 1988, Ser. No. 261,682
Int. Cl.[4] A47B *96/00*
U.S. Cl. 248—250 **14 Claims**



1. An interchangeable shelf support bracket, which comprises:

an upright plate having front and back sides and top and bottom ends;

at least one mounting pin extending from the back side of said plate, said pin being adapted for receipt in a mating hole in a side wall;

a flange extending from the front side of said plate adjacent the bottom end thereof; and

retention means including opposing yieldable tabs located in said plate between said flange and the top end of said plate for releaseably engaging the edge of a shelf of either one of two predetermined thicknesses.

4,856,747

RATCHET JACK STAND

David A. Gano, Salem, Ohio, assignor to Ganeaux Industries, Inc., Salem, Ohio

Filed Sep. 30, 1988, Ser. No. 251,336
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—354.7 **8 Claims**

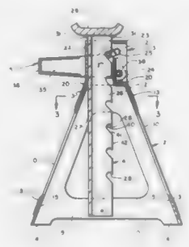
1. A ratchet jack stand assembly of the type intended for supporting a raised load including:

(a) a base;

(b) an elongated post having a plurality of inclined, longitudinally spaced notches formed therein and a saddle attached to an upper end thereof;

(c) a housing attached to the base for slideably supporting the post in an upright position, said housing including a pair of spaced sidewalls having a pair of inclined, horizontally spaced and aligned slots formed therein; and

(d) a gravity-biased handle including a pair of spaced sidewalls having spaced upper and lower pins attached thereto, said handle being pivotally mounted on the housing sidewalls by a certain one of the upper and lower pins, said certain one of the pins extending between the handle sidewalls and passing through a pair of generally complementary-sized and shaped openings formed in the housing sidewalls for pivotally mounting the handle on the hous-



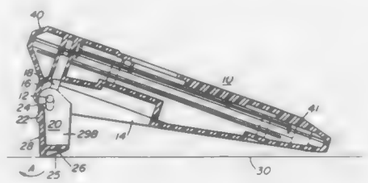
ing, and the other of said pins extending between the handle sidewalls and passing through the housing slots, and being positioned and adapted to slideably move along the aligned housing slots to a locked position as the handle moves to its biased position when a selected one of the post notches is manually aligned with said housing slots, so that said other pin is generally vertically aligned with said certain pin when the handle is moved against its bias to an unlocked position, and said other pin is out of vertical alignment with said certain pin and is positioned closer to the post than said certain pin when the handle moves to its biased position, for positive locking engagement with said post notch to adjustably support the post at a predetermined height for supporting a raised load.

4,856,748

LEG ASSEMBLY FOR A KEYBOARD OR THE LIKE

Mark W. Obermeyer, Oakville, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 88,752, Aug. 24, 1987, abandoned. This application Oct. 6, 1988, Ser. No. 256,179
Int. Cl.[4] F16F *15/00*
U.S. Cl. 248—688 **5 Claims**



1. A leg assembly for a keyboard comprising:

a single leg extending substantially for the length of said keyboard said single leg comprising an elongate base member attached to an elongate back member, and two side members attached to opposite ends of said base and back members;

said elongate back member having thereon at least one rib which acts as a foot when said leg is in a retracted position and which supports a back edge of said keyboard when said leg is in a deployed position; and,

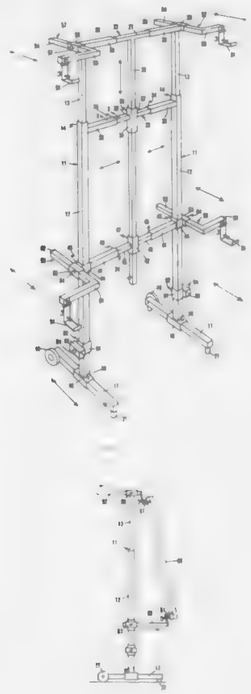
means for axial pivotal mounting of said leg to said keyboard; wherein said leg is movable between two stable positions, a first position being said retracted position, the second position being said deployed position beyond a quiescent position of said leg, and further wherein said leg is moved from said retracted position to said deployed position solely by means of gravity and rotational inertia thereby causing said leg to pass from said retracted position, beyond said quiescent position and into said deployed position.

4,856,749

EXPANDABLE EASEL

Patrick R. Habermann, 750 Conn Valley Rd., St. Helena, Calif. 94574

Continuation of Ser. No. 50,329, May 18, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 290,884
Int. Cl.[4] A47B *27/04*
U.S. Cl. 248—448 **20 Claims**



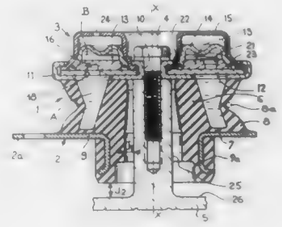
20. In an easel for holding a work piece comprising a canvas mounted on a peripheral frame: a support, a first work piece holder mounted on the support for engagement with a first side of the frame, and a second work piece holder mounted on the support for engagement with a side of the frame opposite the first side, each of said work piece holders comprising a J-shaped hook which is adapted to extend through an opening in the peripheral frame from the back side of the canvas and to engage the front side of the frame, and a clamping screw threadably mounted in the hook for engagement with the back side of the frame to secure the frame and the hook together, said J-shaped hooks having openings which face away from each other and are adapted to receive the opposite sides of the frame therein.

4,856,750

HYDROELASTIC SUPPORT, IN PARTICULAR FOR THE SUSPENSION OF A VEHICLE ENGINE

Marcel Le Fol, Chateaugiron, France, assignor to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly/Seine, both of, France

Filed Apr. 13, 1988, Ser. No. 181,112
Claims priority, application France, Apr. 13, 1987, 87 05226
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—562 **12 Claims**



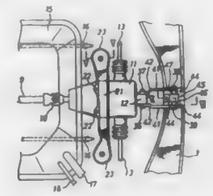
1. A hydroelastic support having a longitudinal axis and for interposition between two units, such as for example a power unit and the structure of a vehicle, said support comprising a first frame for connection to one of said units, a second frame, a fixing member extending axially throughout said support for fixing the second frame to the other of said units, a body of an elastomer material of annular shape disposed between said two frames, an annular working chamber partly defined by said body of elastomer material, a fluid filling said working chamber, an expansion chamber, a fluid filling said expansion chamber, a rigid partition wall separating the expansion chamber from the working chamber and defining at least one passage of communication between said two chambers, and a flexible elastically yieldable wall in the shape of a bellows connected in a sealed manner to each of said two frames and partly defining said annular working chamber.

4,856,751

MOUNT STRUCTURE FOR DIFFERENTIAL GEARBOX

Naohiko Ohba, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1988, Ser. No. 195,254
Claims priority, application Japan, May 20, 1987, 62-75735[U]
Int. Cl.[4] F16M *3/00*
U.S. Cl. 248—638 **9 Claims**



1. A mount structure supporting on a vehicle frame assembly a differential gearbox disposed behind a fuel tank, said mount structure, comprising:

first coupling means supporting said differential gearbox on a first frame member of said vehicle frame assembly above said differential gearbox; and

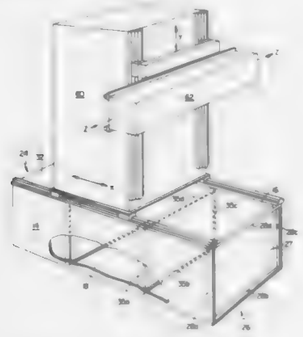
second coupling means extending between a second frame member of said vehicle frame assembly behind said differential gearbox and said differential gearbox, and supporting said differential gearbox on said second frame member, said second coupling means having a selected stiffness in a vertical direction and being collapsible under shocks applied longitudinally of said vehicle frame assembly.

4,856,752

STRUCTURAL ELEMENT FOR A MACHINE TOOL

Thomas D. Linn, Holliston, Mass., assignor to Boston Digital Corporation, Milford, Mass.

Filed Apr. 7, 1987, Ser. No. 35,462
Int. Cl.[4] B23B *37/00*
U.S. Cl. 248—678 8 Claims



1. A structural element for supporting a precision linear motion system while allowing linear motion of the system comprising:

(1) a closed box, said box being formed from at least one sheet of sheet metal sheared and bent to form essentially parallel first and second side wall surfaces which are perpendicular to a third wall surface to form an essentially U-shaped structure having a flat third wall surface and two perpendicular first and second side wall surfaces; said closed box being closed at each end by end surface members, each end surface member being formed from a flat piece of end sheet metal having a rim running along its periphery whose plane is perpendicular to the plane formed by said end sheet metal, each of said end surface members being sized to fit within said U-shaped structure to close off both ends of said closed box, the rim being spot welded to said U-shaped structure; one or more baffles, each baffle being formed from a flat piece of baffle sheet metal having a rim running along its periphery whose plane is perpendicular to the plane formed by said baffle sheet metal, said baffles being spot welded to inner walls of said U-shaped structure and being oriented in a plane parallel to said end surface members to provide structural support for a linear motion system; and a sheet metal fourth wall surface oriented in a plane parallel to the third wall surface said first and second side wall surface have top edges which are bent to form lips, said lips extending in directions away from each other along each outside wall of said U-shaped structure and forming essentially right angles with said outside wall to support said sheet metal fourth surface, and being supported by the rims of said end surface members and by the rims of said baffles and joining said first and second side wall surfaces, and being spot welded along the rims of the end surface members to close said box; and

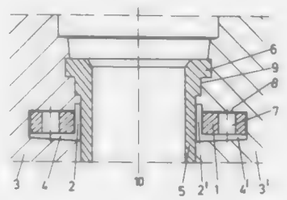
(2) a way system attached to a wall surface to provide means for movably supporting a precision linear motion system, the combination of the sheet metal wall surfaces and said end surface members and said baffles forming a structure which is light in weight but provides acceptable rigidity for supporting a precision linear motion system while allowing linear motion.

4,856,753

DIE MOLD FOR THE PRODUCTION OF INJECTION MOLDED PRODUCTS AND HAVING IMPROVED CLOSURE MEMBER FOR CLOSING A RING-RECEIVING RECESS

Ernst Schwaiger, and Erich Mitteregger, both of Micheldorf, Austria, assignors to IFW-Manfred Otte Gesellschaft m.b.H. & Co. KG., Micheldorf, Austria

Filed May 11, 1988, Ser. No. 193,275
Claims priority, application Austria, May 13, 1987, 1207/87
Int. Cl.[4] B29C *45/36*
U.S. Cl. 249—94 3 Claims



1. A die mold for injection molding a fitting, said fitting having a longitudinal axis and a flanged end, with a single-piece ring-shaped flange having axially spaced end surfaces nonremovably mounted about the flanged end of the fitting, said die mold including mold components separable along a plane extending parallel to the longitudinal axis of a fitting to be produced and having inner surfaces, said components having therein an annular recess spaced outwardly of said inner surfaces of said components and into which is to be inserted the flange, said recess having axially spaced annular surfaces, and a closure member for closing said recess and for forming with said inner surfaces of said components in a closed position thereof inner mold surfaces to define outer surfaces of the fitting, said closure member being divided circumferentially thereof into plural portions, the improvement wherein:

said recess is dimensioned such that at least one end surface of the flange abuts a respective said annular surface of said recess; and

each said closure member portion is of unitary and single-piece construction in a direction parallel to said longitudinal axis and extends in said direction beyond said respective annular surface of said recess.

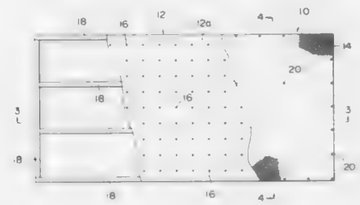
4,856,754

CONCRETE FORM SHUTTERING HAVING DOUBLE WOVEN FABRIC COVERING

Takayoshi Yokota, Kodaira; Shigekazu Horiya, Sagamihara; Sadao Uno, Chiba; Kozo Katayama, and Daijiro Tanabe, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Kumagaigumi, Fukui, Japan

Filed Jun. 3, 1988, Ser. No. 202,108
Claims priority, application Japan, Nov. 6, 1987, 62-280393; Dec. 4, 1987, 62-305749
Int. Cl.[4] E04G *9/10*; B28B *7/36*
U.S. Cl. 249—113 7 Claims

1. Shuttering for forming concrete comprising a plate with a plurality of through holes opening on both a face surface and a reverse surface of said plate; and a double woven fabric attached to the shuttering to cover said face surface and having a face against which concrete is formed, said fabric consisting of a face tissue which permits passage of water but prevents concrete from passing and a reverse tissue opposed to the face surface of said plate and relatively displaceable with respect to said face surface of the plate.

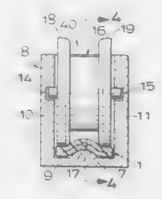


4,856,755

FLOW CONTROL

Ellis W. Clarke, 47 Deramore Avenue, Belfast, Northern Ireland BT9 5JS

Filed Nov. 28, 1988, Ser. No. 276,600
Claims priority, application United Kingdom, Nov. 26, 1987, 8727683
Int. Cl.[4] F16K *7/04*
U.S. Cl. 251—6 7 Claims



1. A device for controlling fluid flow comprising a tubular body defining a passageway having opposed flexible and resilient walls which for at least a portion of the axial length of the tubular body are capable of being held in mutual contact throughout their cross-section except for a limited non-contacting region, this region being of a cross-section which varies along the general direction of flow through the passageway, and regulating means comprising a longitudinally extensive support by means of which said portion of the tubular body is supported, and an operating element which is movable lengthwise of the support, the support and the operating element co-operating to cause flexure of a relatively short length of said portion of the tubular body immediately adjacent to the operating element, about a substantially longitudinal axis, the walls of said length of the tubular body not being clamped together but being prevented from separating, when subjected to the pressure of fluid in the tube, owing to the cross-sectional shape of said length resulting from said flexure, the walls of the remainder of said portion of the body being parted in use, unless restrained by other means, so that the rate of flow of fluid through said portion of the tubular body is determined by the cross-section of the non-contacting region of the walls at said length.

4,856,756

WELL BOTTOM RELEASE VALVE

Linsey L. Combs, Rte. 4, Box 185, Holdenville, Okla. 74848

Filed Oct. 31, 1988, Ser. No. 264,366
Int. Cl.[4] F16K *31/46*, *35/02*
U.S. Cl. 251—297 7 Claims

1. A valve assembly for draining a liquid from a well pipe comprising a pipe member having a permanently fixed lower flange and a removable upper flange, means for connecting said pipe member above said removable flange to a well pipe, a slidable sleeve circumscribing said pipe member, a coiled spring circumscribing said pipe member and positioned between said removable upper flange and said slidable sleeve to continually urge said sleeve downwardly to sealably enclose a liquid exit port bored in said pipe member above said permanently fixed lower flange and said slidable sleeve when said sleeve is in its maximum upward position, a complimentary spring biased detent functioning locking means including a groove and spring biased bearing means carried in communicable relationship on either said pipe or said sleeve for retaining said sleeve in a locked upward position and an external remote pulling means attached to said sleeve and extending upwardly to a point above ground surface for moving said slidable sleeve upwardly and engaging said locking means and thereby exposing said liquid exit port to permit liquid contained in said well pipe to drain therefrom and to permit said sleeve to be released from said locking means by further pulling said sleeve upwardly and thereby increasing said spring tension force to a degree where it is sufficient to override and bypass any containment of said spring biased bearing in said groove when said pulling means is released and thereby permit said sleeve to return to its normal position and enclose said liquid exit port.

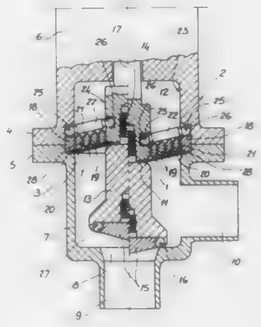


4,856,757

FLEXIBLE MEMBRANE FOR HEAVY DUTY APPLICATION APPARATUS

Marco Dall'Aglio, Via A. Grandi, 1-43045, Fornovo Taro (Parma), Italy

Filed Mar. 22, 1988, Ser. No. 171,908
Claims priority, application Italy, Mar. 27, 1987, 46823 A/87
Int. Cl.[4] F16K *31/00*
U.S. Cl. 251—335.2 3 Claims



1. A flexible membrane adapted to resist against high operating forces acting on said membrane, comprising a corrosion

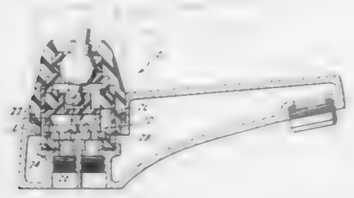
rsistant easily deformable sheet body, rigidly tightly coupled along peripheral outer and inner edges thereof, a plurality of concentric annular bodies, which can mutually slide and are held in their positions and adhering to a side of said sheet body by radially extending round cross-section pins having ball shaped ends engaging in peripheral seats formed on fixed and movable bodies therebetween said sheet body is arranged, said concentric annular bodies being provided with rounded ends adapted to contact and adhere to the surface of said sheet body and with pointed ends adapted to contact and adhere to the outer surface of said radially extending round cross-section pins, said pointed ends being so designed as to favour a point contact between said concentric annular bodies and said radially extending round cross-section pins so as to always discharge in a vertical direction the operating forces acting on said membrane.

4,856,758

SILICON CARBIDE VALVE ELEMENTS

Alfons Knapp, Bibevach, Fed. Rep. of Germany, assignor to Masco Corporation, Taylor, Mich.

Filed Jun. 30, 1983, Ser. No. 509,301
Claims priority, application Italy, Jun. 11, 1982, 67746 A/82
Int. Cl.[4] F16L *5/00*
U.S. Cl. 251—368 11 Claims



1. A valve comprising a first valve member and a second valve member slidably mounted against each other under compressive force for movement to a closed position and an open position, one said first and second valve members being composed substantially of silicon carbide;

said other of said first and second valve members being made of a ceramic material of lower hardness than said one valve member.

4,856,759

WOODY PLANT EXTRACTOR

Thomas O. Ness, 3435 Army St. #330, San Francisco, Calif. 94111

Filed Mar. 31, 1989, Ser. No. 331,444
Int. Cl.[4] A01B *1/18*
U.S. Cl. 254—132 3 Claims



1. A tool for removing a woody plant or other rigid, vertically emplaced object from the ground, comprising:

(a) an elongated lever means, having a lower pivot point and an upper pivot point, both situated at its lower end,

(b) a lifter arm means, the rear end thereof being pivotally attached to said lever means at said lower pivot point,

(c) said lifter arm means having a fixed jaw face means at its front end,

(d) a fulcrum means, being positioned under said lifter arm means at its rear end,

(e) a movable jaw means, being pivotally attached to said lever means at said upper pivot point,

(f) a guide means whereby said movable jaw means is retained in parallel relation to said lifter arm means,

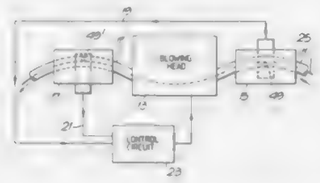
(g) a movable jaw face means, being positioned on said movable jaw means at its front end and oriented toward the rear so as to oppose and approximate said fixed jaw face means, in parallel relation thereto.

4,856,760

CONTROL METHOD AND APPARATUS

Peter L. J. Frost; Robert A. Freeman, both of Ipswich; John A. Warren, Friston, and Peter J. Keeble, Ipswich, all of England, assignors to British Telecommunications, London, England

PCT No. PCT/GB87/00497, § 371 Date Mar. 14, 1988, § 102(e) Date Mar. 14, 1988, PCT Pub. No. WO88/00713, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 14, 1987, Ser. No. 165,990
Claims priority, application United Kingdom, Jul. 16, 1986, 8617390; May 29, 1987, 8712638
Int. Cl.[4] B65H *59/00*
U.S. Cl. 254—134.4 44 Claims



1. Apparatus for controlling longitudinal forces on a flexible transmission line member moving within and through a curved passageway, the apparatus comprising:

sensing means for identifying lateral deviation of the transmission line member from a predetermined central position within said curved passageway, and

control means responsive to the sensing means for adjusting propulsive forces on the transmission line member in response to data from the sensing means so as to return said member towards said predetermined central position.

4,856,761

POSITION ADJUSTABLE HANDRAIL FOR USE ALONG STAIRWAYS

John M. Berner, 4927 St. Croix Ave., Golden Valley, Minn. 55422

Filed Jul. 18, 1988, Ser. No. 220,325
Int. Cl.[4] E04F *11/18*
U.S. Cl. 256—59 17 Claims

1. A handrail positioning structure comprising:

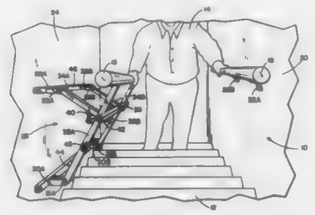
upper pivot means to be supported on a fixed support with an upper pivot axis;

lower pivot means to be supported on said fixed support with a lower pivot axis parallel to the upper pivot axis;

strut means mounted on the lower pivot means for pivoting away from a vertical upright position adjacent said fixed support;

a handrail supported on the strut means;

retaining arm means mounted for pivoting on the upper pivot means; and a retaining brace mounted on the retaining arm means and cooperating with the strut means for providing a maximum pivoted position of the strut means



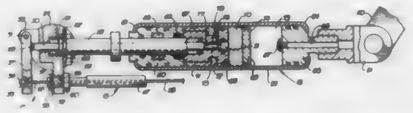
away from said vertical upright position of the strut means on the lower pivot means.

4,856,762

FIRE RETARDANT GAS SPRING ASSEMBLY FOR A PASSENGER SEAT CONTROL

Günther Selzer, Gartenstrasse 9, 5603 Wuelfrath, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 883,063, Jul. 8, 1986, abandoned. This application Feb. 19, 1988, Ser. No. 157,893
Int. Cl.[4] F16F *5/00, 9/06;* B64D *45/00;* A62C *37/30*
U.S. Cl. 267—64.12 10 Claims



1. A gas spring assembly having an elongated housing and an inner working chamber therein comprising:

(a) first and second pistons slidably disposed within the inner working chamber and dividing the inner working chamber into three separate chambers, an intermediate chamber between the first and second pistons, a first end chamber adjacent the side of the first piston opposite the side adjacent the intermediate chamber and a second end chamber adjacent the side of the second piston opposite the side adjacent the intermediate chamber, the intermediate chamber and the first end chamber adapted to be filled with working liquid and the second end chamber adapted to be filled with compressed gas;

(b) a piston rod secured at one end thereof to the first piston and the other end thereof extending out of the elongated housing;

(c) valve means to control the flow of working liquid between the intermediate chamber and the first end chamber; and

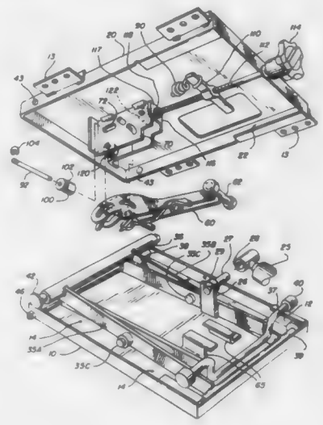
(d) a conduit in fluid communication between the second end chamber and the exterior of the housing which is blocked off by a plug disposed therein, the plug made of materials which melt at relatively low temperatures unblocking the conduit and permitting the escape of compressed gas from the second end chamber.

4,856,763

MECHANICAL SEAT SUSPENSION WITH CONCENTRIC CAM SURFACES

Cole T. Broderson, Davenport, and Danny S. Foster, Bluegrass, both of Iowa, assignors to Sears Manufacturing Company, Davenport, Iowa

Filed May 19, 1988, Ser. No. 195,793
Int. Cl.[4] A47C *7/14;* F16M *13/00;* B60N *1/02*
U.S. Cl. 267—131 12 Claims



1. An adjustable seat suspension comprising:

a moveable suspension housing;

a support arm assembly, pivotable within said housing, comprising a cam and a height adjustment means, said cam including two concentric arcuate surfaces having a center point about which said cam pivots;

parallel pairs of scissor arms connected to said housing;

resilient suspension means operatively connected to said support arm assembly; and

damping means connected to said scissor arms, said damping means being movable in a generally constant linear relationship to the movement of said suspension housing.

4,856,764

FLUID-FILLED RESILIENT BUSHING HAVING DAMPING MEANS WITHIN FLUID CHAMBERS

Ryouji Kanda, Inuyama, Japan, assignor to Tokai Rubber Industries, Ltd., Aichi, Japan

Continuation-in-part of Ser. No. 866,017, Jun. 24, 1987, Pat. No. 4,749,173. This application Mar. 24, 1988, Ser. No. 172,582
Claims priority, application Japan, Jun. 30, 1986, 61-100615
The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.
Int. Cl.[4] F16M *9/04, 5/00*
U.S. Cl. 267—140.1 17 Claims

1. A fluid-filled resilient bushing, comprising:

an inner sleeve;

an outer sleeve disposed in radially outwardly spaced-apart relation with said inner sleeve;

a generally annular resilient member interposed between said inner and outer sleeves so as to connect the inner and outer sleeves, and having a pocket and an axial void which are located opposite to each other in a diametric direction of said inner sleeve parallel to a first direction in which the bushing receives a vibrational load, said void being formed over an entire axial length of said resilient member,

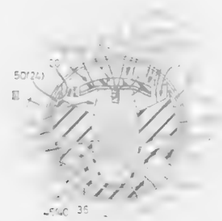
said outer sleeve and said resilient member cooperating to define a fluid-tight pressure-receiving chamber such that said pocket is fluid-tightly closed by the outer sleeve, said

pressure-receiving chamber being filled with an incompressible fluid;

an elastically yieldable thin-walled partition member disposed in said axial void, so as to form at least one recess, said outer sleeve and said partition member cooperating to define at least one equilibrium chamber such that said at least one recess is fluid-tightly closed by the outer sleeve, said at least one equilibrium chamber being filled with said incompressible fluid;

means for defining at least one orifice which communicates with said pressure-receiving chamber and said at least one equilibrium chamber, and which permits flows of said incompressible fluid between the pressure-receiving chamber and the at least one equilibrium chamber; and

damping means disposed within said pressure-receiving chamber, and extending from a bottom of said pocket substantially in said first direction, said damping means including a first portion extending from said bottom of the pocket and a second portion provided on said first portion,



said first portion of the damping means having a radial end face spaced apart from said outer sleeve by a predetermined radial distance in said first direction, said radial end face having a peripheral edge which is spaced apart from a periphery of said pressure-receiving chamber in a second direction perpendicular to said first direction, said peripheral edge of the radial end face and said periphery of the pressure-receiving chamber cooperating to define therebetween an annular spacing in a plane which is parallel to said second direction and an axial direction of said resilient member,

said second portion of the damping means projecting from said first portion substantially in said second direction, such that said second portion cooperates with said periphery of the pressure-receiving chamber, to define in said plane an annular gap which is smaller than said annular spacing.

4,856,765

SPRING APPARATUS

Masahiro Kohno, 1-506, Minamikosugaya-Jutaku, 2000-10, Kosugaya-cho, Totsuka-ku, Yokohama-shi; Akira Obata, Kamakura; Takayuki Kitamura, Yokosuka, and Kakuma Okazaki, Yokohama, all of Japan, assignors to Masahiro Kohno and Japan Aircraft Mfg., Co., Ltd., both of Yokohama, Japan

Filed Oct. 5, 1987, Ser. No. 105,599

Claims priority, application Japan, Oct. 9, 1986, 61-240322; Oct. 9, 1986, 61-240330

Int. Cl.[4] F16F *1/06*

U.S. Cl. 267—166 **20 Claims**

1. A spring apparatus comprising:

a plurality of elastic wire spring rods (4) forming a spring body and defining its periphery, said spring body being elongated along a given line and having two opposed ends, said rods being spaced at respective predetermined intervals around the periphery of the spring body;

a support (1);

first means for coupling (8) one of the opposed ends of the spring body to said support,

at least one spacer means (5) coupled to said rods between said opposed ends for maintaining said rods spaced at certain intervals along the periphery of the spring body, said certain intervals corresponding to said respective predetermined intervals;

a load receiving member (2);



second means (6,7) for rotatably coupling the load receiving member to the other of the opposed ends of the spring body for rotation around an axis parallel to said given line such that a change in elongation of said spring body, in response to force applied to the load receiving member in the direction of said given line, imparts rotation between the opposed ends of the spring body relative to each other and a consequent spiraling of said rods.

4,856,766

VACUUM APPARATUS FOR HOLDING WORKPIECES

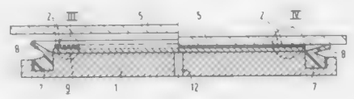
Petrus A. A. Huberts, Mierlo, Netherlands, assignor to Philips & Du Pont Optical Company, New York, N.Y.

Filed Mar. 14, 1988, Ser. No. 167,812

Claims priority, application Netherlands, Jul. 8, 1987, 8701640

Int. Cl.[4] B25B *11/00*

U.S. Cl. 269—21 **6 Claims**



1. A vacuum apparatus for holding workpieces and comprising:

a base (1) carrying a set of spaced-apart support members (2) whose free end surfaces (3) define a supporting plane (4) for a workpiece (5), the spacings (6) between the support members forming part of an evacuable vacuum space, and

sealing means (7) which surround the set of support members and which provide vacuum-tight sealing to a workpiece (5) to be held, wherein said set of support members includes a plurality of pin shaped elastic support members (2) made of an elastically axially deformable material, and

the sealing means (7) comprise movable parts (8), so that after positioning a workpiece (5) and upon evacuation of the vacuum space (6) said parts (8) of the sealing means perform a movement under simultaneous axial deformation of the pin shaped elastic support members, causing the dimensions of the elastic support members transverse to their axes to increase and at the same time the volume of the vacuum space to be reduced.

4,856,767

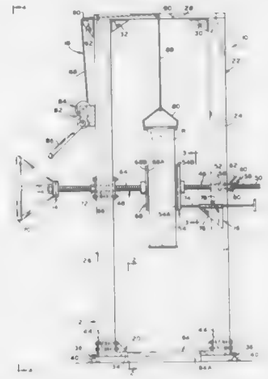
RADIATOR LIFTING AND HOLDING APPARATUS

Kenneth R. Wood, Fort Wayne, Ind., assignor to John M. Wood, Fort Wayne, Ind., a part interest

Filed May 26, 1988, Ser. No. 200,017

Int. Cl.[4] B23Q *1/00*

U.S. Cl. 269—46 **17 Claims**



1. A radiator lifting and holding apparatus comprising:

an upright support stand having a ground-supported stabilizing base and a support structure mounted upright on said base having opposed upright members;

a clamping means mounted to said upright structure of said support stand at a desired elevation above the ground between a top of said support stand elongated structure and said base of said support stand, said clamping means being operable for clamping a radiator at the desired elevation while at the same time allowing rotation of the radiator to a desired angular position, said clamping means comprising first and second pressure pad means associated with respective opposed upright members for frictionally gripping a radiator, one of said pressure pad means being coupled to said stand for adjustable movement toward and away from the other said pressure pad means along a clamping axis, each of said pressure pad means being rotatable relative to said stand about said clamping axis to thereby hold a radiator at a desired elevation and at the same time permit rotation of the radiator after it has been clamped at the desired position;

stop means mounted on said apparatus for locking one of said pressure pad means against further rotation and thus maintain a radiator gripped thereby stationary at the desired angular position; and

a lifting means mounted to said support structure of said support stand independently of said clamping means and being operable independently of operation of said clamping means for elevating the radiator from a ground level position at said base to the desired elevation thereabove and into alignment with said clamping means.

4,856,768

SEPARATING DEVICE FOR A SHEET COLLECTION APPARATUS

Hisayuki Hiroki, Tokyo; Yoshio Ariga, and Hajime Watanabe, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jun. 8, 1987, Ser. No. 59,506

Claims priority, application Japan, Jun. 9, 1986, 61-133202

Int. Cl.[4] B65H *29/00, 29/38*

U.S. Cl. 271—186 **5 Claims**

1. A collecting device for collecting sheets conveyed one by one along a predetermined convey path comprising:

means for detecting the side orientation of the conveyed sheet and for discriminating between the obverse and reverse side orientations;

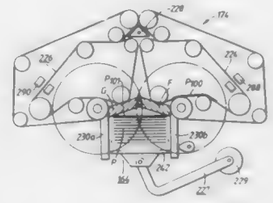
obverse sheet convey means for conveying the sheets which are discriminated by the discriminating means to have the obverse side orientation, the obverse sheet convey means having a first outlet;

reverse sheet convey means for conveying the sheets which are discriminated by the discriminating means to have the reverse side orientation, the reverse sheet convey means having a second outlet facing the first outlet;

means for guiding the sheet to one of the obverse sheet convey means and reverse sheet convey means in response to the detecting means;

means for collecting the sheets conveyed from both the obverse convey means and the reverse convey means;

means for receiving a predetermined plurality of the sheets collected by the collecting means; and



first and second individually movable separating means for interrupting during a predetermined time the passage of sheets between the first and second outlets and the collecting means so that the predetermined plurality of sheets collected in the collecting means can be conveyed to the receiving means, the first separating means and second separating means interacting to support sheets conveyed from the first and second outlets during the predetermined time while the predetermined plurality of sheets are conveyed to the receiving means;

each of the first and second separating means including a plurality of support arms and a rotatable shaft, a first end of each of the plurality of arms being fixed to the corresponding rotatable shaft and a second end of each of the plurality of arms extending in opposing relation toward one another with a portion of each arm extending in overlapping intermeshed relation to a portion of each opposing arm.

4,856,769

APPARATUS FOR CONVEYING SHEETS

Edward D. Andrew, Dinckley, and Peter Hayhurst, Tottington, both of United Kingdom, assignors to Edward W. Andrew, Ltd., Bury, United Kingdom

Filed Nov. 9, 1987, Ser. No. 117,877

Claims priority, application United Kingdom, Nov. 8, 1986, 8626718

Int. Cl.[4] B65H *29/16*

U.S. Cl. 271—193 **30 Claims**

1. Apparatus for conveying sheets of substantially non-conducting material susceptible to electrostatic forces, said apparatus including a conveying surface of substantially electrically non-conductive materials, divided into areas, some of said areas being of a material whose triboelectric properties place it in a first position in a triboelectric series and others of said areas being of a material whose triboelectric properties place it in a second position in said triboelectric series, said second position being spaced from said first position, the areas being arranged so that when conveying a charged sheet electrostatic

repulsion forces and electrostatic attraction forces between the said sheet and said conveyor surface essentially balance to



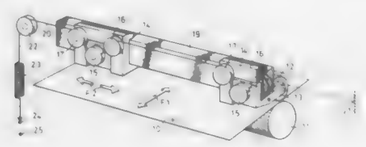
ensure that essentially no net electrostatic force influences said sheet towards or away from said conveyor surface.

4,856,770

PRESSURE WHEEL DEVICE FOR MOVING A PRINT MEDIUM IN A PLOTTER OR PRINTER

Laurent A. Farlotti, Maisons Alfort, France, assignor to Benson S.A., France

Filed Jan. 6, 1987, Ser. No. 691
Claims priority, application France, Jan. 17, 1986, 86 00637
Int. Cl.[4] B65H *5/06*
U.S. Cl. 271—274 **9 Claims**



1. A pressure wheel device for a system for driving a print medium, said device comprising at least two pressure wheels mounted on respective support parts together with means for pressing each of the wheels against selected portions of the print medium,

characterized by said wheels being put under pressure by common force-applying means acting substantially equally on at least two mechanical devices on which the pressure wheels are mounted, thereby transmitting substantially identical forces thereto,

that each wheel is mounted at one end of a lever hinged to the corresponding support part, and

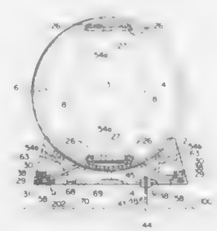
that each lever carries a pulley and the common force applying means comprises a cable which passes over the pulleys together with means for putting the cable under tension to exert forces on the pulleys which forces are transmitted to the pressure wheels by the levers.

4,856,771

VIDEO SIMULATION APPARATUS

Darrell R. Nelson, Clearbrook, and Greg W. Berg, Abbotsford, both of Canada, assignors to Nelson, Berg Enterprises, Vancouver, Canada

Filed Oct. 22, 1987, Ser. No. 111,070
Int. Cl.[4] A63G *31/14*
U.S. Cl. 272—18 **31 Claims**



19. A video simulation apparatus comprising:

(a) a stationary base mounted on a supporting surface and defining longitudinal and lateral axes, and a normal axis perpendicular to said longitudinal and lateral axes;

(b) a rotating base mounted for rotation on said stationary base;

(c) base carriage assemblies located intermediate and within said stationary base and said rotating base, said base carriage assemblies rotatably securing said rotating base to said stationary base, such that said rotating base is able to rotate 360° about the normal axis of said apparatus; each of said base carriage assemblies including an upper base frame which supports a base track, and a lower base frame which supports sets of pairs of wheels, each of said wheels being affixed to said lower base frame by an adjustable wheel bracket, one of the adjustable wheel brackets being mounted to said lower base frame by a spring assembly such that the wheels of each of said pairs of wheels are in substantial parallel alignment with one another and are adapted to receive said base track therebetween; each of said base carriage assemblies also including a pair of motors to drive at least one of the wheels mounted to said lower base frame;

(d) a master ring mounted on said rotating base and comprising a pair of master ring tracks and a master power/signal rail;

(e) master ring carriage assemblies for rotatably securing said master ring within said rotating base such that said master ring is able to rotate 360° about the longitudinal axis of the apparatus; each of said master ring carriage assemblies including a master ring carriage frame, said master ring carriage frame supporting a plurality of wheels, said wheels being arranged on said master ring carriage frame so as to secure therebetween, on either side of said master ring carriage frame, one of said pair of master ring tracks, said master ring tracks running substantially parallel to the length of said master ring carriage frame; and each of said master ring carriage frames being secured to said rotating base by an adjustable position frame secured to the upper base frame of the base carriage assemblies, each of said master ring carriage assemblies also including a motor to drive at least one of the wheels mounted on the master ring carriage frame;

(f) a sphere housing mounted within said master ring and having mounted thereon a pair of sphere tracks and a sphere power/signal rail;

(g) sphere carriage assemblies rotatably securing said sphere housing within said master ring, such that said sphere housing is able to rotate 360° about the lateral axis of said apparatus; each of said sphere carriage assemblies including a sphere carriage frame supporting a plurality of wheels arranged on either side of said sphere carriage frame so as to secure therebetween one of said pair of sphere tracks, said sphere carriage frame also supporting a motor for driving at least one of the wheels mounted on said sphere carriage frame;

(h) a cockpit mounted within said sphere housing;

(i) a video monitor system mounted within said cockpit for displaying visual effects of flight; and

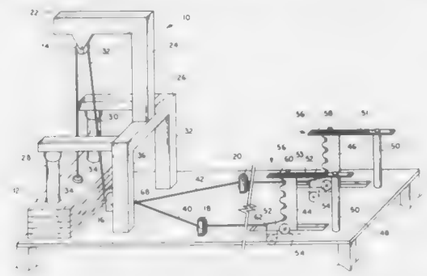
(j) control means mounted within said cockpit and operable by a user for controlling the movement of said sphere housing relative to the master ring, movement of the master ring relative to the rotating base, and movement of the rotating base relative to the stationary base, said control means including a computer, a joystick control means and a foot control means.

4,856,772

WRIST AND GRIPPING MUSCLE EXERCISING APPARATUS

Hal L. Kaplan, 415 College Pkwy., Rockville, Md. 20850

Filed Mar. 23, 1988, Ser. No. 172,292
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—67 **3 Claims**



1. An exercise apparatus for simultaneously exercising both the wrist and gripping muscles comprising:

a horizontal support platform;

grasping means including right and left vertical thumb grips rigidly affixed to said platform, and right and left vertical finger grips slidably attached to said support platform, each of said grasping means having upper and lower portions;

confining means joining the upper portions of each said right and left finger grips to each said right and left thumb grips respectively, and said support platform having slots confining the lower portions of said right and left finger grips, said confining means and said slots cooperating to retain each respective said right and said left finger and thumb grips in a horizontally coplanar orientation; and,

biasing means including weights, lines and at least four pulleys, said lines secured at one end to said right and left finger grips respectively and at a second end to said weights, and said four pulleys including pulleys affixed to said support platform and aligned with said right and left thumb and finger grips respectively, whereby a user may exercise their hands individually or concurrently against the resistance of said weights, said weights normally providing a constant tension on the line and applying a resistance to movement of both said right and left finger grips toward said thumb grip.

4,856,773

WEIGHTLIFTING EXERCISE DEVICE

James A. Deola, 6 Temple Rd., Vineland, N.J. 08360

Continuation-in-part of Ser. No. 53,392, May 22, 1987, Pat. No. 4,784,384, which is a continuation-in-part of Ser. No. 816,744, Jan. 6, 1986, abandoned. This application Sep. 14, 1988, Ser. No. 244,117
The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 **19 Claims**

1. An exercise device comprising:

(a) frame means comprising two vertical frame members supported structurally,

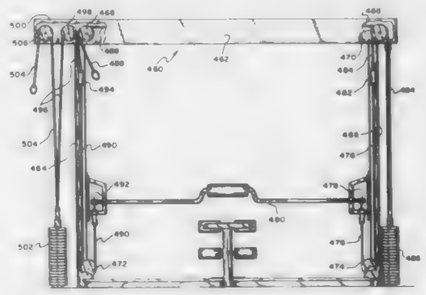
(b) two carriage means, one each freely riding up and down on opposite vertical frame members,

(c) exercise grasping means comprising a horizontal bar detachably attached at ends of the bar to the two carriage means,

(d) resisting force means to provide an adjustable amount of continuous force resistance, the force being present when the grasping means is moved against the force and when the grasping means is allowed to move back towards a starting position,

(e) cable means comprising two separate cables supported on the frame means and connecting two separate connection points on the grasping means to the resisting force means, wherein movement of either connection point moves against the resisting force means,

(f) cable directioning means supported on the frame means



to train the cable means to training point locations positioned in a flat plane common with the connection points of the grasping means, allowing simultaneous movement of the attachment points against the resisting force means, and

(g) releasable locking means to detachably attach ends of the bar to the two carriage means,

wherein the carriage means are isolated from forces from the resisting force means and any vertical force.

4,856,774

WEIGHT RELEASE

Robert A. Kowalcyk, 1073 W. Hannah St., Houtzdale, Pa. 16651

Filed Jun. 15, 1988, Ser. No. 206,748
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 **5 Claims**



1. A weight lifting aid for use with a barbell comprising:

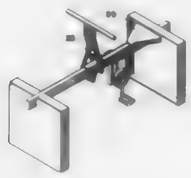
a base, said base having a floor engaging surface and a weight receiving portion for receiving and retaining exercise weight plates,

a bar mounted on and extending upwardly from said base at an angle to said floor engaging surface,

a hook adjustably mounted on said bar facing the base, said hook permitting attachment of the device and retained weight plates to a barbell for use in barbell lowering exercise,

said angle between said bar and said base floor engaging portion being sufficient to effect movement of the bar away from the barbell upon release of the hook from the barbell when the floor engaging surface is seated on the floor.

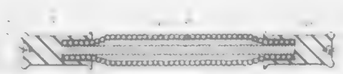
4,856,775
PORTABLE MULTI-PURPOSE EXERCISE DEVICE
Alan L. Colledge, 35 E. 400 North, Lindon, Utah 84042, and Hugh I. Johnson, 637 E. 875 North, American Fork, Utah 84003
Filed Aug. 14, 1987, Ser. No. 85,194
Int. Cl.[4] H63B *21/00*
U.S. Cl. 272—134 1 Claim



1. A fully contained, fully transportable, multi-configurable apparatus for physical exercises of the upper and lower body comprising:
a first rigid case half of substantially rectangular shape having an open receiving means for receiving and adjustably attaching an exercise bar in a plurality of positions,
a second rigid case half of substantially rectangular shape having an enclosed receiving means for receiving and adjustably attaching an exercise bar in a plurality of positions,
wherein the rigid case halves are detachably secured together to form a case which when closed forms a hollow compartment for the storage of components of the exercise apparatus, wherein the components include;
a multi-sectional exercise bar wherein said bar is adjustably attachable to the said rigid case halves in horizontal, vertical, or diagonal configurations,
various exercise components and means for attaching said components to said exercise bar,
a means of attaching said the rigid case halves together to form a single flat base member for use as a body support when the exercise bar is supported either vertically or diagonally,
a second means of attaching said rigid case halves to opposite ends of said exercise bar to form a two-sided ground supported base member for various embodiments, wherein the exercise bar is horizontally supported above the ground in a position to receive exercise components,
a removably and adjustably attachable support device for enhancing the use of the apparatus by maintaining the users knees in a proper position during some exercises and for supporting the user's body during other exercises,
a removably and adjustably attachable seat component for supporting the users body during some exercises.

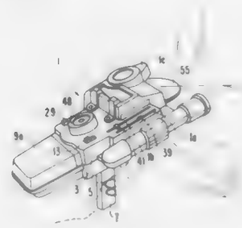
4,856,776
COIL SPRING EXERCISER
Liu Ching-Liang, No. 63, Ta Jen Rd., Herng Shan Tsan, Yann Chaur Hsiang, Kaohsiung Hsien, Taiwan
Filed Dec. 31, 1987, Ser. No. 140,228
Int. Cl.[4] A63B *21/00, 21/02*
U.S. Cl. 272—142 2 Claims

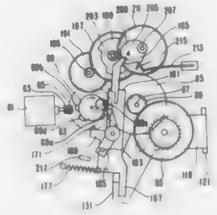
1. A coil spring exerciser
an internal coil spring;
an external coil spring, coaxially surrounding said internal coil spring, having an intermediate portion spaced from internal coil spring at a predetermined distance whereby said spacing reduces frictional contact between the springs during bending of the device, and two opposite end portions having diameter-reduced turns for being sleeved tightly on said internal coil spring whereby said



sleeving fixes the ends of the internal spring relative to the ends of the external spring; and
two hollow plastic grips each having an open end which is heat pressed to sleeve tightly on of said end portions of said external coil spring.

4,856,777
SIMULATOR TOY
Tomiyuki Hirose, and Hiroyuki Shimizu, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed May 9, 1988, Ser. No. 191,367
Claims priority, application Japan, Jun. 24, 1987, 62-156282
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—1 GA 17 Claims





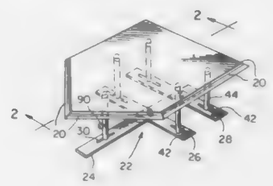
1. A simulator toy comprising:
a body having a front portion, a rear portion, an upper portion and a lower portion,
a rotation plate having an upper surface with projectable structures formed thereon and a lower surface with abutments formed thereon corresponding in position to the position of the projectable structures,
a projection member linearly movable under the rotation plate and having a projectable vehicle image at a distal end thereof,
drive means located within the body for rotating the rotation plate,
a projecting light source supported above the rotation plate and being movable with the projection member, and
a turning knob for moving the projection member around the abutments on the lower surface of the rotation plate while the rotation plate is rotatable.

4,856,778
SCORER'S TABLE
Grant Harrison, 2778 E. Kentucky Ave., Salt Lake City, Utah 84117
Continuation of Ser. No. 871,493, Jun. 6, 1986, Pat. No. 4,747,596. This application May 10, 1988, Ser. No. 192,191
The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.
Int. Cl.[4] A63B *71/06*
U.S. Cl. 273—1 ES 3 Claims



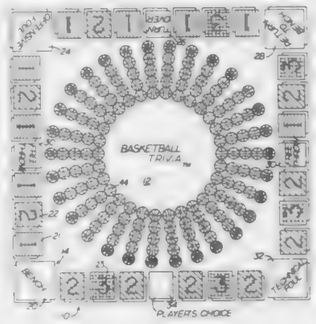
1. A scorer's table for a sporting event having a first side adapted to be disposed toward the sporting event and a second side adapted for seating one or more persons at said table for viewing the sporting event, said scorer's table comprising:
a table top;
means for supporting said table top in a horizontal position;
at least one vertically disposed display screen panel located at said first side of said table for displaying different messages during the sporting event;
at least one vertically disposed panel located at said first side of said table separate from but adjacent to said panel displaying different messages during the sporting event for displaying a separate fixed message during the sporting event; and
means for electronically controlling and changing the messages appearing on said display screen panel displaying different messages during the sporting event.

4,856,779
GROUND ANCHOR FOR HOME PLATE AND PITCHER'S PLATE AND METHOD OF INSTALLATION
Craig D. Wallendal, Rte. 3, Markesan, Wis. 53946
Filed Feb. 12, 1988, Ser. No. 155,472
Int. Cl.[4] A63B *71/00*
U.S. Cl. 273—25 6 Claims



1. An assembly including a below ground surface anchor and a ground surface attachment anchored relative to said anchor, said anchor including a horizontally elongated substantially planar anchor structure in the form of a horizontal skeletal frame of first and second relatively angulated and rigidly interconnected elongated horizontal members, a plurality of upstanding tubular members including lower ends anchored to horizontally spaced apart portions of said skeletal frame and projecting substantially vertically upwardly therefrom, said tubular members including open upper ends terminating in a horizontal plane and spaced a predetermined distance above said frame, said attachment including a conventional baseball or softball pitcher's mount or home plate having a horizontal undersurface and depending anchor members attached thereto, said anchor members being removably and telescopingly received within said tubular members to a depth with said undersurface at least substantially abutting said upper ends.

4,856,780
SPORTS TRIVIA BOARD GAME
Samuel E. Begley, and Lana H. Begley, both of London, Ky., assignors to Chipnjay, Inc., London, Ky.
Filed Mar. 28, 1988, Ser. No. 172,784
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—244 12 Claims



1. A board game apparatus for testing a player's sports trivia knowledge, comprising:
a plurality of player tokens;
a game board including a plurality of playing spaces, said spaces defining a continous path for advancing said tokens; said spaces including indicia to instruct the player;
random generating means for determining by chance the number of spaces to advance said tokens;
a plurality of question cards having a number of trivia questions printed thereon; and
chance means corresponding to the indicia on said spaces said chance means further including second indicia corresponding to the trivia questions on each question card to determine which said trivia question the player is to answer;
whereby, during play the player advances his token a number of spaces indicated by said random number generating means, determines the question to be answered by utilizing the chance means corresponding to the particular indicia in the space upon which the token rests and answers the question scoring a number of points for a correct answer.

4,856,781
GAME BALL
Hideomi Shishido; Shigeo Doi; Hideki Sumida, and Masayuki Tanaka, all of Hiroshima, Japan, assignors to Molten Corporation, Hiroshima, Japan
Filed Dec. 23, 1986, Ser. No. 945,617
Claims priority, application Japan, Jan. 16, 1986, 61-4964; Mar. 31, 1986, 61-47207; Apr. 8, 1986, 61-81438
Int. Cl.[4] A63B *41/00*
U.S. Cl. 273—65 E 10 Claims

1. A ball for a ball game comprising:
a rubber hollow spherical bladder;
a valve holder fixed to the bladder for charging air into the bladder;
a valve member attached to the valve holder;
a fabric layer covering a surface of the bladder composed of a plurality of equilateral quadrilateral pieces sewn together to form a sphere, the fabric layer giving sphericity, dimensional stability and durability to the ball, said equilateral quadrilateral pieces each comprising two sheets of

approximately trapezoidal fabric pieces that are sewed together symmetrically at a central seam line, said equilateral quadrilateral pieces being sewed together such that



said central seam lines of adjacent equilateral quadrilateral pieces fall at right angles to each other; and

a leather layer adhered to the fabric layer.

4,856,782

RELEASE-JOINTED GOLF CLUB

William D. Cannan, 105 Mendota Dr., Greece, N.Y. 14626

Filed Jun. 23, 1988, Ser. No. 210,351
Int. Cl.[4] A63B *69/36, 53/12, 53/08*
U.S. Cl. 273—80 B 2 Claims



1. A golf club including a shaft (10) having a lower section (12) and an upper section (14) connected to each other in alignment by an articulated release joint (20), said joint being responsive to impact on said shaft to permit said lower section to rotate relative to said upper section in the plane of swing of said club, said release joint including a threaded hinge pin (31) extending through one of said sections and threaded into the other of said sections to pull said sections together in frictional engagement with each other and with said hinge pin, and adjustment means (32) to vary the responsiveness of said release joint to said impact, said adjustment means including indicia (33) of the setting thereof.

4,856,783

STRIKING APPLIANCE FOR A GAME OF GOLF, PLAYING AREA INCLUDING THE USE OF SAID APPLIANCE, AND A GAME ASSEMBLY COMPRISING THE APPLIANCE AND THE AREA

Charles Soulard, 174 Rue des Herses, 44240 Suce sur Erdre, France

Filed Dec. 15, 1987, Ser. No. 134,298
Claims priority, application France, Dec. 18, 1986, 86 17753
Int. Cl.[4] F63F *7/00*
U.S. Cl. 273—87.2 7 Claims

1. A striking appliance for practicing a game of golf on a playing area disposed on a raised support such as a table, said appliance comprising a rigid unit including a rectilinear arm having a longitudinal axis and a first end and an opposite second end, said arm comprising means for swinging a striking member having a golf club head of reduced size for striking a ball by manually supporting said arm in one user's hand and rotating said arm about said longitudinal axis with the other user's hand, a handle comprising means for manually rotating said arm about said longitudinal axis provided at said second end of said arm, said striking member comprising a stem having a first end fixed to said first end of the arm and forming an elbow with said arm and said golf club head comprising means for striking a ball located at an end of said stem opposed to said first end of said stem, said head defining a ball-striking surface oriented laterally relative to the stem, said appliance being



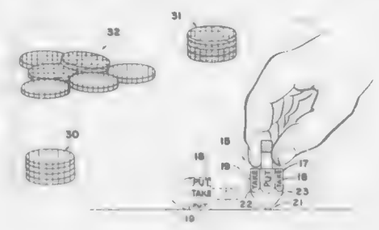
adapted to be positioned on said area with one hand of the user resting against said area and rotatably supporting said arm and the other hand of the user orienting said striking surface relative to the ball by acting on said arm and causing said striking surface to strike the ball by rotation of said arm about said axis, said appliance thereby permitting a faithful reproduction on a reduced scale of the practice of golf out in the open by a sensitive control of the ball similar to that of the full-scale game to the exclusion of any mechanical aid facilitating the striking of the ball.

4,856,784

CASINO GAME

Lillian K. Magee, 225 Grand Ave., Billings, Mont. 59101

Continuation-in-part of Ser. No. 9,830, Feb. 2, 1987, abandoned.
This application Dec. 19, 1988, Ser. No. 286,043
Int. Cl.[4] A63F *5/04*
U.S. Cl. 273—147 5 Claims



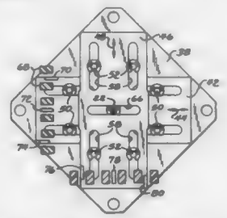
1. A casino type game including a plurality of distinguishable sets of playing pieces with a multiplicity of pieces in each set; a spinnable unitary solid brass top member, said top member including a central section including an even number and at least four faces disposed around the periphery thereof with uniform angularity between adjoining faces and opposite faces being substantially parallel, each face of said central section being inscribed with a legend of "put", "take" or "lose spin" and different legends on adjoining faces, a tapered pointed section at one end of said central section and cylindrical gripping means extending axially from an opposite end of said central section remote from said pointed section, and a shiny tightly adherent uniform continuous metal coating over the exterior surface of said top member.

4,856,785

OPTICAL DUAL FUNCTION JOYSTICK

Kenneth F. Lantz, Chicago; Walter E. Smolucha, Melrose Park, and Leslie G. Struck, Arlington Heights, all of Ill., assignors to Williams Electronics, Inc., Chicago, Ill.

Filed Mar. 1, 1983, Ser. No. 471,026
Int. Cl.[4] A63B *71/04*
U.S. Cl. 273—148 B 7 Claims



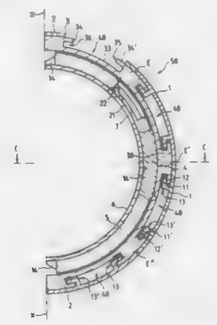
1. A joystick control apparatus having a control column retained for pivotal movement on a mounting member and a column position detection means operatively coupled to the column adapted to generate a unique output corresponding to predetermined control column positions; the improvement comprising optical position detection means including a plurality of optical switches and means remote from said switches for selectively actuating the switches, means for supporting the switch actuating means for rectilinear reciprocal sliding motion on the mounting member whereby the optical switches are actuated without direct mechanical contact.

4,856,786

SPHERICAL PUZZLE TOY

Geza Gyovai, Höglerstrasse 53, Dübendorf, Switzerland

Filed Mar. 2, 1988, Ser. No. 163,302
Claims priority, application Switzerland, Mar. 23, 1987, 1086/87; Sep. 24, 1987, 3704/87
Int. Cl.[4] A63F *9/08*
U.S. Cl. 273—153 S 15 Claims



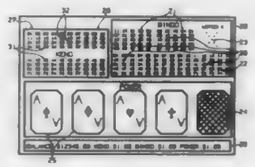
1. A spherical puzzle toy, comprising a substantially spherical multi-part body with a plurality of sliding parts subdivided into great circles and meridian sectional planes and engaging with correspondingly associated and constructed holding and connecting members, said sliding parts being adjustable with respect to one another to assume a specific position on a spherical body surface along the individual great circles and the individual meridians, said multi-part body comprising a first inner spherical body, a second central spherical body, and a third outer spherical body and the sliding parts adjustably arranged thereon, said central spherical body and said outer spherical body being in each case subdivided into an equal number of segmental parts and for performing the adjusting movement along the meridians being operatively interconnected by means of corresponding holding and connecting members and each individual segmental part of the outer spherical body being provided on an outside thereof with spaced pockets which, in the assembled state, form guideways oriented in a circumferential direction and in which are guided the sliding parts adjustable along the great circles, the individual segmental parts of said central spherical body being spherical shell-shaped and being joined together by means of correspondingly constructed, positively engaging connecting members to constitute the central spherical body.

4,856,787

CONCURRENT GAME NETWORK

Boris Itkis, Arcadia, Calif., assignor to Yuri Itkis, Arcadia, Calif.

Continuation of Ser. No. 826,269, Feb. 5, 1986, abandoned. This application May 3, 1988, Ser. No. 198,599
Int. Cl.[4] A63F *3/06*
U.S. Cl. 273—237 7 Claims



1. Game network comprising at least one master game device interconnected with at least one slave game device; said slave game device executing concurrently at least two different distinct and independent games; each of said different distinct and independent games comprising its own unique rules of play and unique random factors; said different distinct and independent games including bingo, keno, poker, blackjack, roulette, slots, gin and sports book; said master game device providing data for playing said games; and at least one of said two different distinct and independent games being at least partially responsive to said data from said master game device

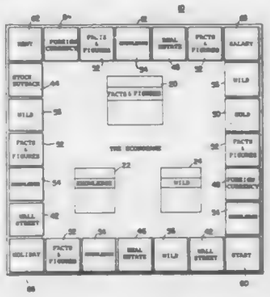
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4,856,788

METHOD OF PLAYING A GAME OF ECONOMICS AND FINANCE

Mario Fischel, Jakob-Klar-Str. 5, 8000 Munich 40, Fed. Rep. of Germany

Filed Aug. 26, 1987, Ser. No. 89,536
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—256 7 Claims



1. A method of playing a board game simulating situations of economics and finance using a board game comprising (1) a game board defining a multiplicity of contiguous marked space playing positions defining a continuous closed track extending about said game board, space playing positions bearing indicia of instructions for play of the game; (2) a plurality of playing pieces each representing a player; (3) means for determining how many space playing positions to move each playing piece about the track independent of any predetermined economic cycle; (4) simulated money or different denominations for use in play of the game; (5) means for indicating ownership of assets for purchase and sale by players using said simulated

money; and (6) means for indicating a microeconomic or macroeconomic occurrence having a potential economic effect on the game value of an asset held by a player, and means for subsequently revealing the economic effects of said occurrence, after one or more players had an opportunity to act upon an expected economic effect of said occurrence having potential economic effect and including one or more second spaces permitting a player to buy and/or sell said means for indicating ownership of an asset;

said method comprising:

(a) each player, in turn, constituting an initial portfolio of assets by exchange of simulated money for means indicating ownership of assets;

(b) each player, in turn, actuating said means for determining how many space playing positions to move his playing piece, and advancing his playing piece the determined number of positions along the closed track about the game board;

(c) each said player on landing his playing piece upon a said first space consults said means for indicating an occurrence having potential economic effect, acts as he considers appropriate to maximize the total of his simulated money and asset value by buying or selling assets or by taking no action, and thereafter consults said means for subsequently revealing the economic effect of the occurrence, players thereafter receiving or paying simulated money on the basis of said economic effect of the occurrence on the assets in their respective portfolios;

(d) each said player on landing his playing piece on a said second space buys and/or sells assets or takes no action as he desires; and

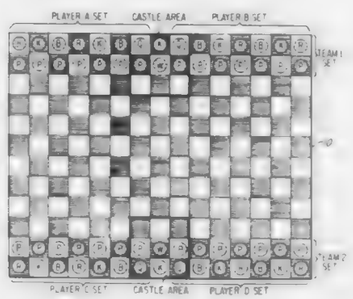
(e) play of the game continues with each player acting in turn until the value of all assets and simulated money held by one player exceeds a predetermined total and that player is declared the winner.

4,856,789

CHESS GAMES

Richard A. Carlson, 1514 Ambrose Ave., Cincinnati, Ohio 45224

Filed Nov. 16, 1987, Ser. No. 121,689
Int. Cl.[4] A63F *3/02, 3/00*
U.S. Cl. 273—261 **9 Claims**



1. An improved chess game, for play by opposing two-man teams, said game comprising a game board having a plurality of squares disposed in aligned columns and rows, and

a set of playing pieces, said set of playing pieces comprising one set of pieces for a first team and another set for a second team, with each set consisting of corresponding pieces,

the set of pieces for a team comprising a single king and two sets of principal playing pieces, one for each team member, each player set including a rook, a knight, a bishop and a queen, plus a pawn for each of said principal pieces,

each of said team sets of playing pieces having first identification means separately identifying the two team sets,

each of said team sets of playing pieces further having second identification means separately identifying the player sets of each team set, wherein the king piece of each team having only said first identification means separately identifying it from the pieces of the player sets,

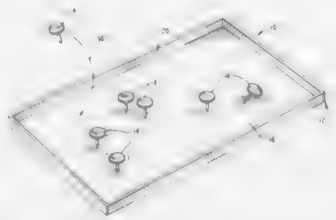
said game board having a row of squares, on each side, on which the king and the principal playing pieces may be separately positioned at the beginning of a game, with the king on a central square and the principal pieces of the player sets respectively disposed towards opposite ends of the board and the pawns disposed on the row of squares immediately ahead of the squares occupied by the principal pieces.

4,856,790

GAME OF SKILL AND METHOD OF PLAYING SAME

Jack J. Camillo, 24 Barchester Way, Westfield, N.J. 07090

Filed Jun. 3, 1988, Ser. No. 202,221
Int. Cl.[4] A63B *67/00*
U.S. Cl. 273—317 **27 Claims**



1. In combination, a smooth, obstacle-free playing surface and a plurality of game pieces, each game piece including a body and a combined stem and spindle which extends outwardly from one side of said body, said combined stem and spindle including engaging means for engaging said playing surface and gripping means for gripping by a player between his or her thumb and finger in such a manner that said gripping means can be twirled so as to impart a spinning motion to said game piece while said game piece is projected onto said playing surface such that said engaging means lands on said playing surface as said game piece continues to spin, and each of said game pieces which has been projected onto said playing surface creating an obstacle to be avoided by the other of said game pieces.

4,856,791

PROTECTIVE MAT ASSEMBLY AND INSTALLATION METHOD THEREFOR

John O. McQuade, Cheshire, Conn., assignor to Linatex Corporation of America, Stafford Springs, Conn.

Filed Sep. 1, 1988, Ser. No. 239,620
Int. Cl.[4] F41J *1/20, 1/12*
U.S. Cl. 273—410 **16 Claims**

11. A method for installing a protective mat assembly comprising:

(a) bonding an elastomeric sheet to a cellular substrate;

(b) bonding said cellular substrate to a rigid panel to form a mat sub-assembly;

(c) positioning said mat sub-assembly against an armor proof plate so that said panel generally engages said plate in surface-to-surface relationship; and

(d) fastening said panel to said plate by driving fasteners through said sheet and substrate to engage against said panel and secure said panel to said plate.

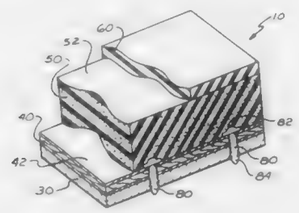
13. A target range enclosure defined by four walls, including a floor and a ceiling, at least one of said walls comprising a protective mat assembly encompassing substantially the entire extent thereof, said protective mat assembly comprising:

outer plate means for absorbing the impact of a projectile and resisting the penetration thereof;

support panel means overlying said plate means;

a cellular substrate;

an elastomeric sheet of material defining an interior enclosure surface, said substrate being disposed between said elastomeric sheet and said panel means; and



a plurality of fasteners securing said support panel means to said plate means, said fasteners having a securing head which engages said support panel means and a shank which penetrates said plate means, said head being substantially covered by said substrate and said elastomeric sheet,

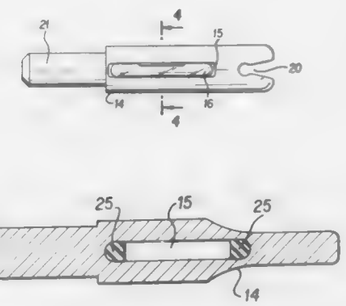
so that a projectile directed at said assembly penetrates said elastomeric sheet and said substrate and strikes said plate means wherein any projectile fragmentation is substantially completely contained within said assembly.

4,856,792

ARCHERS ARROW WITH CHEMICAL LIGHT SOURCE

Philip M. Hardison, Rte. 1, Box 262, Plymouth, N.C. 27962

Filed Nov. 28, 1988, Ser. No. 276,547
Int. Cl.[4] F41B *5/02*
U.S. Cl. 273—416 **2 Claims**



1. An archer's arrow having a chemical light source, comprising:

(a) an elongated body forming arrow shaft, said shaft having sharp point and fletching;

(b) a plastic body forming nock, having at one end an insert for attaching to said shaft, and at other end a notch to receive a bow string, said nock having a cavity in main body; and

(c) a chemical lightstick inserted in said cavity of said nock for light emission;

(d) two backstop plates located off center at each end of said cavity for retaining said lightstick.

4,856,793

CONTINUOUS SOUND MAKING BOOMERANG

Matt B. Hannifin, 2307 Gulf, Midland, Tex. 78791

Filed Apr. 4, 1988, Ser. No. 171,406
Int. Cl.[4] A63B *65/08*
U.S. Cl. 273—426 **1 Claim**



1. A boomerang with a continuous sound producing assembly comprising:

a central cup area

three airfoils extending radially from said cup area at 120° spacing about said cup area:

wing weights attached near the outer ends of each airfoil;

said cup area and airfoils being formed from a light weight resilient material, and;

a continuous sound producing assembly having;

a cup;

a battery holder with one open side, a pair of electrical contacts, and reinforced with fiberglass reinforced adhesive tape, held in said cup by two plastic straps;

a battery for mounting inside said holder with its opposite poles in contact with said contacts;

a buzzer fixedly mounted to the base of said cup;

a first wire connecting one contact of said holder directly to a first electrical contact on said buzzer and a second wire connecting the other contact of said holder directly to a second electrical contact on said buzzer whereby when said battery is mounted in said holder with its poles in contact with said holder contacts a circuit is completed with said buzzer to cause it to continuously emit sound; and a resilient band stretched across the open side of the holder for biasing the battery into contact with said holder contacts, said resilient band permitting at least one pole of said battery to be manually lifted out of contact with its holder contact and permitting a portion of said battery to be positioned to rest on said holder adjacent said opening and biasing said battery to maintain it in said rest position with said pole out of contact with said holder contact whereby said circuit is maintained open.

4,856,794

OIL SEAL WITH ANTIROTATION RIBS

Douglas B. Boyers, Union Lake, and Steven R. Wilkening, Redford, both of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed Jul. 23, 1987, Ser. No. 77,132
Int. Cl.[4] F16J *15/32*
U.S. Cl. 277—37 **9 Claims**

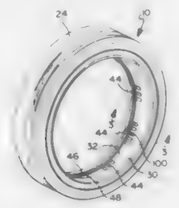
1. A lubricant seal, comprising:

an outer annular sealing member having a first sealing surface adapted for frictional non-rotational sealing engagement in a bore;

an inner annular sealing member having a second sealing surface adapted for frictional non-rotational sealing engagement about a shaft;

sealing means secured to one of said members and providing rotational sealing engagement with the other one of said members; and

anti-rotational seal means provided on one of said first and second sealing surfaces including a radially-extending annular sealing portion for providing an oil impermeble seal between the respective sealing member and its respective shaft or bore, said seal means further including a plurality of axially-extending circumferentially-spaced radially-protruding ribs for preventing rotational movement between one of said inner annular sealing member and said outer annular sealing member and the corresponding shaft or bore, said ribs protruding radially further than said annular sealing portion, said ribs being elongated in the axial direction such that their axial length is greater than their circumferential width, and such that said ribs provide substantial anti-rotational resistance without generating a corresponding axial resistance; and



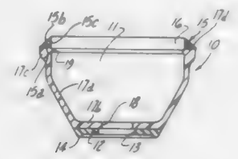
said annular sealing portion being radially compressed during installation to an extent less than the corresponding radial compression of said ribs.

4,856,795

MULTIPLE DUROMETER SHIELD FOR BALL JOINT

Don L. DeLano, Mount Clemens, and Edward K. Benda, Farmington Hills, both of Mich., assignors to Chemcast Corporation, Madison Heights, Mich.

Filed Jul. 21, 1987, Ser. No. 76,107
Int. Cl.[4] F16O *3/84;* **F16J** *15/16, 15/52*
U.S. Cl. 277—212 FB **11 Claims**



1. A multiple durometer dust and moisture shield for a ball-joint assembly, said shield comprising a one-piece bowl-shaped plastic body defining a part-receiving bowl, said body having an annular base defining one axial end of said body around a shaft-receiving opening through said base into said bowl, said base also having a plane axially inner surface, the axially outer surface of said base comprising a wear-resistant bearing surface, said body also having an annular rim defining the opposite axial end of said body around a major opening through said rim into said bowl, said body having a resilient portion comprising the sidewall of said bowl axially spacing said rim and base, said resilient portion extending axially from said rim around said major opening to said base and having an annular base liner, the axially outer surface of said base liner comprising a plane surface flush with and intimately bonded to the plane axially inner surface of said base, said plane surface of said base liner extending radially inwardly beyond said base and terminating at an axial opening coaxial with said shaft-receiving opening and of smaller circumference for effecting an interference fit with a shaft extending freely through said shaft receiving opening, said base extending radially outwardly at least to the radially outer periphery of said resilient portion, said resilient portion comprising a resiliently flexible material adapted to buckle radially and to fold axially within its elastic limit during operation to maintain resilient pressure urging said rim and base axially away from each other, said base comprising material appreciably harder and more rigid than the material of said resilient portion and essentially form-sustaining during operation, said base also having an annularly arranged wearing surface extending axially outwardly around said shaft-receiving opening and beyond said resilient portion to provide said wear-resistant bearing surface with an annularly arranged axially endwise facing surface of reduced area with respect to the total area of said outer surface of said base.

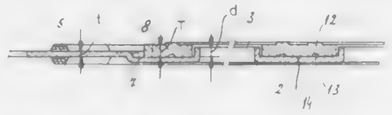
9. A multiple durometer dust and moisture shield for a ball-joint assembly, said shield comprising a one-piece bowl-shaped plastic body defining a part-receiving bowl, said body having an annular base defining one axial end of said body around a shaft-receiving opening through said base into said bowl, the axially outer surface of said base comprising a wear-resistant bearing surface, said body also having an annular rim defining the opposite axial end of said body around a major opening through said rim into said bowl, said body having a resilient portion comprising the sidewall of said bowl axially spacing said rim and base, said resilient portion extending axially from said rim around said major opening to said base, said resilient portion comprising a resiliently flexible material adapted to buckle radially and to fold axially within its elastic limit during operation to maintain resilient pressure urging said rim and base axially away from each other, said rim comprising a material appreciably harder and more rigid than the material of said resilient portion and essentially form-sustaining during operation, said resilient portion having an annular axial end portion intimately bonded to the axially inner surface of said rim, said annular axial end portion of said resilient portion bonded to said rim comprising a radially thickened sidewall portion of said bowl, said axially inner surface of said rim being coextensive with said thickened annular axial end portion and being bonded thereto throughout its coextensive surface, said rim having an outer surface sloping radially outwardly of said bowl in the axial direction from said rim toward said base, the coextensive bonded together axially inner surfaces of said rim and thickened axial end portion of said flexible material being flush with each other in a plane normal to the axis of said annular base.

4,856,796

CYLINDER-HEAD GASKET FOR INTERNAL-COMBUSTION ENGINE

Bernard C. Genin, Venissieux, France, assignor to Curty, Saint Priest, France

Filed Sep. 30, 1988, Ser. No. 252,858
Claims priority, application France, Oct. 2, 1987, 87 14141
Int. Cl.[4] F16J *15/12*
U.S. Cl. 277—235 B **5 Claims**



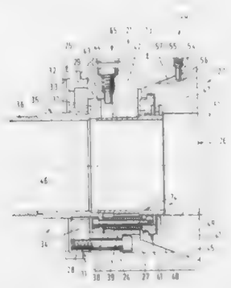
1. A cylinder-head gasket comprising:
a metal core plate having two faces and formed with
a plurality of cylinder holes,
an annular groove of a predetermined depth around each cylinder hole on one of the plate faces,
a plurality of stud holes, and
a plurality of lubricant/coolant holes;
a resilient seal on each of the core-plate faces around the lubricant/coolant holes; and
a cylinder plate of a thickness greater than the groove depth and forming respective cylinder rings of the plate thickness sitting in the grooves around each of the cylinder holes.

4,856,797

CHUCK FOR GRIPPING A WORKPIECE

Gerhard Rall, Sommerhalde 72, D-7142 Marbach, Fed. Rep. of Germany

Filed Sep. 1, 1987, Ser. No. 91,922
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1986, 3629722
Int. Cl.[4] B23B *5/22, 5/34*
U.S. Cl. 279—41 R **11 Claims**



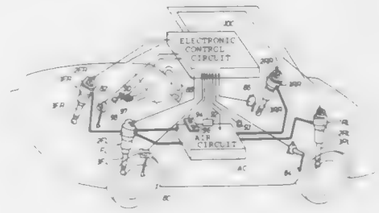
1. A chuck assembly having an axis for releasably securing a workpiece to a machine having a means for drawing the chuck assembly toward the machine, the chuck comprising:
a chuck body having a front and a rear end, the chuck body having a guide surface substantially in the shape of a truncated cone which is coaxial with the axis and which widens in the direction of the rear end of the chuck body;
a coupling part slidably carried in the chuck body and displaceable relative to the chuck body along the axis, the coupling part having a generally ring-shaped contact surface adapted to face the front end of the chuck body, the coupling part being adapted to be displaced relative to the chuck body by the means for drawing the chuck toward the machine; and
chuck jaw means movably receivable in the chuck body and having a plurality of chuck jaws, each chuck jaw comprising an inner gripping surface radially displaceable relative to the axis for gripping and releasing the workpiece and an outer guide surface, the chuck jaws being secured adjacent one another with spring elements positioned therebetween so that the outer guide surfaces of the chuck jaws form a surface substantially in the shape of a truncated cone which corresponds to the shape of the guide surface of the chuck body, whereby the plurality of chuck jaws can be snugly received within the chuck body, each chuck jaw further comprising a shoulder defining a contact surface adapted to abut the contact surface of the coupling part, whereby the coupling part is axially displaceable to pull the chuck jaws into the chuck body so that the outer guide surfaces of the chuck jaws slidingly contact the guide surface of the chuck body and radially displace the inner gripping surfaces of the chuck jaws to grip the workpiece.

4,856,798

ELECTRONICALLY CONTROLLED FLUID SUSPENSION SYSTEM

Shuuichi Buma; Nobutaka Ohwa, both of Toyota; Osamu Takeda, Susono, and Toshio Aburaya, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 6, 1988, Ser. No. 215,872
Claims priority, application Japan, Jul. 6, 1987, 62-103540[U]; Jul. 6, 1987, 62-103541[U]
Int. Cl.[4] B60S *9/00;* **B62D** *37/00*
U.S. Cl. 280—6.11 **14 Claims**



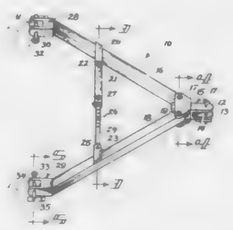
1. A fluid suspension system for a vehicle comprising:
a fluid suspension having a fluid actuator;
fluid supply/release means for supplying and releasing working fluid to and from the fluid actuator;
inclination detection means for detecting an inclination of the vehicle; and
inclination control means responsive to the inclination detection means for controlling the supply/release means such that a height-raising quantity for a lowered portion of the vehicle is less than a height-lowering quantity for a raised portion of the vehicle.

4,856,799

SNOWMOBILE TOW BAR APPARATUS

Douglas L. Hawn, P.O. Box 258, Piedmont, S. Dak. 57769

Filed Jun. 8, 1988, Ser. No. 204,006
Int. Cl.[4] B60D *1/02, 1/14*
U.S. Cl. 280—24 **1 Claim**



1. A snowmobile tow bar apparatus for securement to forward portions of spaced snowmobile skis, said apparatus comprising,
a forward mount including a forward yoke orthogonally and integrally secured to said mount and projecting forwardly of said mount from a forward face thereof, and
first and second arms pivotally mounted to said mount at first and second pivot connections, and
said first and second arms pivotally mounted to opposite ends of said mount wherein said first and second arms diverge relative to one another rearwardly of said mount in a first position, and
said first and second arms are adjacent to another and projecting forwardly of said mounts in a second position, and
first and second links adjustably securable to each other at

first ends of said links and pivotally mounted relative to said respective first and second arms at remote second ends of said links, and

said first and second arms terminating in clevis yokes at respective ends of said arms remote from said mount, and

wherein said mount is of a trapezoidal configuration with spaced upper and lower plates wherein said first and second arms are pivotally mounted between said plates, and said forward yoke is integrally secured to said mount to a plate orthogonally and integrally connecting said upper and lower plates, and

wherein said second link is formed with a series of aligned apertures and said second link is telescopingly received within said first link wherein a through extending pin positionable through said first link captures said second link and extends through one of said apertures, and

wherein said first and second links are secured to said respective first and second arms by respective first and second support mounts including spaced plates, wherein said spaced plates are secured to upper and lower surfaces of said first and second arms to capture pivotally therebetween said respective first and second links, and

wherein the clevis yokes integrally secured to said first and second arms each include a plurality of spaced parallel legs, and said forward yoke includes a plurality of spaced parallel legs wherein the legs of said forward yoke are orthogonally oriented relative to said legs of said clevis yokes.

4,856,800

PIPE JOINING CONSTRUCTION OF A BICYCLE FRAME

Masaki Hashimoto, Osaka, and Noboru Yamaguchi, Settsu, both of Japan, assignors to Araya Industrial Co., Ltd., Osaka, Japan

Filed Apr. 26, 1988, Ser. No. 186,146
Claims priority, application Japan, Nov. 11, 1987, 62-171428[U]
Int. Cl.[4] B62K *19/28*
U.S. Cl. 280—281.1 2 Claims



1. A pipe joint construction for a bicycle frame comprising,

a circular pipe formed from fiber reinforced plastic;

a lug having a cylindrical projecting part made of thin wall light alloy, said alloy part in the form of a circular pipe having a diameter to enable overlapping of said alloy part and said fiber reinforced plastic pipe; said fiber reinforced plastic pipe overlapping and being bonded to said cylindrical part of the lug; and a joining part of chopped fiber reinforced plastic surrounding said cylindrical projecting part of the lug and the fiber reinforced plastic pipe surrounding the projecting part, said fiber in the reinforced plastic pipe and joining part being of the same material bonded into one body.

4,856,801

INTEGRAL REAR WHEEL SUSPENSION FOR COMPOSITE MATERIAL BICYCLE FRAME

Ritchie D. Hollingsworth, Fair Oaks, Calif., assignor to Cycle Composites, Inc., Watsonville, Calif.

Filed Dec. 16, 1987, Ser. No. 133,562
Int. Cl.[4] B60K *25/04*
U.S. Cl. 280—284 19 Claims



1. A bicycle frame formed at least in part of composite material, comprising:

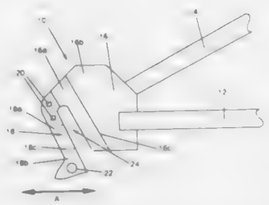
a rear wheel suspension means being formed of composite materials including a plurality of plies of fibrous material, said plies that form said suspension means being interwoven with plies of composite material forming other portions of said bicycle frame, such that said suspension means is fixedly engaged to said bicycle frame in a cantilevered manner through a continuous composite material interface, said rear wheel suspension means being the only structural support from said rear wheel.

4,856,802

DROPOUT ASSEMBLY

Frederick C. Schilplin, Rte. 3, Annandale, Minn. 55302

Filed Oct. 12, 1988, Ser. No. 256,656
Int. Cl.[4] B62K *25/02*
U.S. Cl. 280—288 10 Claims



1. A dropout assembly for mounting a rear axle and a derailleur assembly on a bicycle frame, said dropout assembly comprising:

a main plate attached to the chainstay tube and the seatstay tube of said frame, said main plate having means therein to mount said rear axle;

a derailleur plate for attachment to said derailleur; and

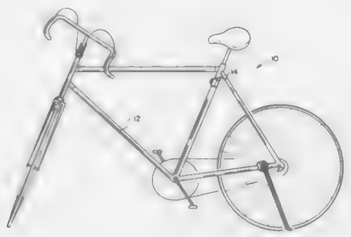
means attaching said derailleur plate to said main plate, said attachment means having strength sufficient to maintain attachment during normal use but designed to fail when subjected to stresses just short of those which would damage said main plate and said frame.

4,856,803

BICYCLE STAND ASSEMBLY AND STORAGE STRUCTURE

Frederic D. Carter, P.O. Box 5192, Redwood City, Calif. 94063

Filed Jul. 20, 1988, Ser. No. 221,702
Int. Cl.[4] B62H *1/00*
U.S. Cl. 280—293 14 Claims



1. A bicycle assembly for supporting a bicycle in the upright position while the bicycle is at rest, the assembly comprising:

elongated support means for supporting a bicycle in an upright position; and

a housing adapted for removable connection to the frame of the bicycle, the housing including:

a first housing member and a second housing member, each member having an inside surface for mating contact with the bicycle frame;

means for connecting the first and second members with the frame between the members; and

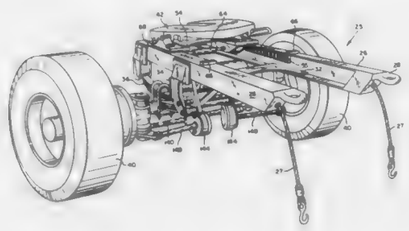
the first member including means for removably connecting the support means, the means for removably connecting the support means including the first housing member having a recessed outer surface with a plurality of cylindrical projections and the support means comprising a rod-like structure having openings at one end for compatible connection with the cylindrical projections.

4,856,804

SELF UNLOADING MULTIPLE TRAILER ARRANGEMENT

Boyd B. Nash, Yakima, assignor to Independent Trailer & Repair, Inc., Yakima, Wash.

Division of Ser. No. 855,516, Apr. 23, 1986, Pat. No. 4,759,563.
This application Apr. 11, 1988, Ser. No. 179,849
Int. Cl.[4] B62D *53/06;* B65G *67/32*
U.S. Cl. 280—430 7 Claims



1. A dolly for detachably coupling front and rear trailers together for adjustment between a first position in which the confronting ends of the trailers are spaced apart and a second position in which the confronting ends of the trailers are in substantial abutment with each other, the dolly comprising:

(a) an elongated frame having a front end portion including a pair of laterally spaced, substantially parallel, elongated, flexible drawbars and a rear end portion supported on laterally spaced wheels,

(b) connector means on the front end of each drawbar for detachable coupling to the rear end of a front trailer,

(c) coupling means configured for detachable coupling to the front end of a rear trailer, and

(d) carriage means supporting the coupling means and mounted movably along the drawbars for adjusting the coupling means between a rearward position for spacing the confronting ends of front and rear trailers apart and a forward position for placing the confronting ends of front and rear trailers substantially in abutment with each other.

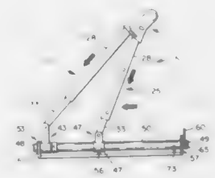
4,856,805

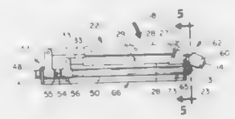
FOLDABLE TOW BAR

Darrel B. Davis, 170 MacCleay Rd., Sequim, Wash. 98382

Filed Jun. 22, 1987, Ser. No. 64,658
Int. Cl.[4] B60D *1/00*
U.S. Cl. 280—491.4 9 Claims







1. A tow bar adapted to be folded into a compact structure for storage adjacent to a vehicle front bumper prior to towing, which comprises:

a tow bar apparatus having spaced ends of an L-shaped beam secured to short extensions on the front of a vehicular frame, the beam including inside and outside vertical and horizontal surfaces with a lug extending outwardly from the inside vertical surface adjacent to a right end,

a left end mounting plate and a right end mounting plate having outside and inside faces and an opening therethrough, each left and right end plate including a pair of adjoining contoured side edges mounted vertically on the inside surfaces of said beam, and further including an upstanding finger-like extension with a lower end attached to the outside face of the right end plate with a small hole including a cotter pin therein extending through the outer end of the extension,

an elongated tube supported at the opposite ends in the left and right end mounting plate opening,

a left end collar and a right end collar mounted rotatably on

opposite ends of the elongated tube on the inside of said left and right end plates and including a pair of spaced flanges having a hole therethrough for a hinge connection extending from the top, the right end collar also includes an arcuate lug on the bottom portion adapted to engage the lug on said L-shaped beam in a locked connection,

a left side telescopic arm and a right side telescopic arm having a rear and front end, the rear end being pivotally connected to the hinge connection on the left and right end collars, and the left and right side arms consisting of a second square tube slidably enclosed in a similar first square tube, and including means for locking each together,

a coupler comprising a pair of spaced Y-shaped plates separated by a short length of square tubing and having a conventional towing hitch including a short length of round tubing mounted thereon, the coupler being connected to the front end of said left side telescopic arm and fixedly secured on the other side of the front end of the right side telescopic arm,

whereby said left and right side arms in horizontal towing condition being unlocked and raised vertically so as to initiate rotation of said left and right end collars on said elongated tube which rotates said right end collar arcuate lug out of the locked connection with said L-shaped beam lug, and with downward movement the pivotal connection of said left and right side arms with said hinge connection of said left and right end collars urges said right end collar to slide along said elongated tube from right to left and bring said left and right side arms and said round tubing in enclosing contact with a finger-like extension on the outside face of said right end plate, and

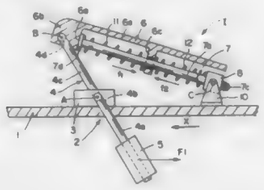
whereby said coupler being released from said finger-like extension and raised upwardly to allow said right end collar to return to the right end of said elongated tube, and lowered so as to rotate said left and right end collars and engage the locked connection between said arcuate lug on said right end collar and said lug on said L-shaped beam, whereby at horizontal level said left and right side arms may be locked in rigid extension for towing.

4,856,806

REVERSIBLE SKI BRAKE

Joel Arduin, Annecy-le-Vieux, France, assignor to Salomon S.A., Annecy-Cedex, France

Filed Nov. 30, 1987, Ser. No. 126,858
Claims priority, application France, Dec. 4, 1986, 86 16992
Int. Cl.⁴ A63C *7/10*
U.S. Cl. 280—605 **37 Claims**



1. A ski brake for use with a ski, said ski brake comprising:

(a) a spade including an arm pivotably mounted around a first pivot axis adapted to be fixed relative to said ski, said arm having a posterior end section equipped with an element adapted to engage snow, and an opposite anterior end section;

(b) a brake pedal pivotably connected anteriorly around a second pivot axis to said anterior end section of said arm, said brake pedal being pivotably mounted around a third pivot axis adapted to be fixed relative to said ski posteriorly of said pivot axis; and

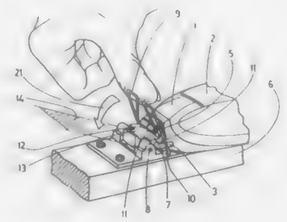
(c) means for elastically biasing said spade in a manner so as to move said spade from an inactive position to an activated braking position wherein said element is projected and maintained under said ski, said elastic means comprising means for absorbing shock when said spade is forced into a position beyond said activated braking position and means for returning said spade towards said activated braking position, wherein said second pivot axis is movable relative to said third pivot axis such that in said activated braking position of said spade, said second pivot axis is spaced from said third pivot axis by a lesser amount than in said inactive position of said spade.

4,856,807

APPARATUS FOR THE RETENTION OF A BOOT ON A SKI

Josiane Dunand, Cran-Gevrier; Paul Arnule, Alby sur Cheran, and Denis Gasquet, Annecy, all of France, assignors to Salomon S.A., Annecy Cedex, France

Filed Feb. 25, 1986, Ser. No. 832,700
Claims priority, application European Pat. Off., Mar. 5, 1985, 85400413.2
Int. Cl.⁴ A63C *9/00*
U.S. Cl. 280—615 **13 Claims**



1. An apparatus for retaining a boot on a ski comprising:

(a) a mobile lock distinct from said boot and adapted to be positioned in a retention position for retaining said boot on a ski; and

(b) means for biasing said mobile lock in said retention position, wherein said biasing means comprises a stirrup, said stirrup comprising a spring having the general shape of a U having first and second ends, wherein said first and second ends are to be pivotally connected to said ski, said stirrup comprising a projection elastically biased against said mobile lock for translational movement relative thereto, said projection extending toward said first and second ends of said springs, wherein said stirrup further comprises a median portion, wherein said median portion comprises said projection, wherein said stirrup further comprises an elastic deformation zone extending at least partially into said median portion wherein said generally U shaped spring comprises first and second spaced apart lateral arms and said median portion further comprises two transverse arms connecting said first and second lateral arms, wherein said first and second lateral arms are connected to said ski, whein said first end of said spring is on said first lateral arm, wherein said second end of said spring is on said second lateral arm, wherein said projection extends from said two transverse arms downwardly towards said first and second ends of said spring,

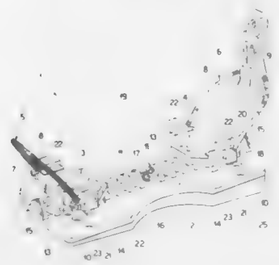
wherein said mobile lock is adapted to be displaced between open and retention positions, wherein in said open position, said mobile lock permits said boot to be attached thereto and to be disengaged therefrom, wherein in said retention position said mobile lock retains said boot on said mobile lock and said ski, wherein said mobile lock is displaced from one of said positions to the other of said positions in response to pivoting of said biasing means, wherein said biasing means is adapted to be pivoted between open and closed positions, and wherein said mobile lock and said biasing means together form a toggle for producing substantially stable open and closed positions of said biasing means and susbstantially stable open and retention positions for said mobile lock.

4,856,808

BINDING DEVICE FOR SNOW BOARDS

Andrea Longoni, Via Leoni, 9 - Como, Italy

Filed Nov. 30, 1987, Ser. No. 126,503
Claims priority, application Italy, Dec. 3, 1986, 7211 A/86
Int. Cl.⁴ A63C *9/08*
U.S. Cl. 280—617 **26 Claims**



1. A binding device having a pair of bindings for securing each foot of a user to a snow board, each binding comprising first plate means fixedly mountable to the snow board, second plate means generally overlying said first plate means and including means for releasably engaging a boot worn by a snow board user, a displaceably fixed pivot pin assembly formed integral with said first plate means, said pivot pin assembly comprising at least one fixedly mounted pivot pin that extends in a direction generally parallel to a longitudinal axis of said first plate means, said second plate means being supported by said pivot pin assembly and said first plate means and said second plate means being interconnected and pivotable relative to one another about said displaceably fixed, longitudinally-extending pivot pin assembly.

4,856,809

COLLAPSIBLE STROLLER WITH STOWABLE TRAY

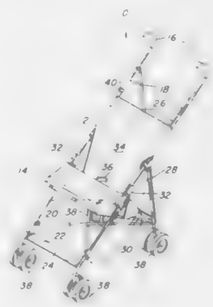
Louis M. Kohus; John V. Mariol, both of Cincinnati, Ohio, and David Saint, Elverson, Pa., assignors to Graco Metal Products Inc., Elverson, Pa.

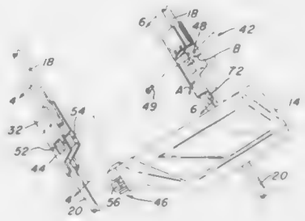
Continuation of Ser. No. 928,079, Nov. 7, 1986, abandoned. This application Jun. 24, 1988, Ser. No. 211,322
Int. Cl.⁴ B62B *7/08, 9/12*
U.S. Cl. 280—644 **5 Claims**

1. A stroller comprises:

stroller means for collapsing and folding to a compact shape;

tray means operatively associated with said stroller means and including a tray portion, swivel means located at one end of said tray portion and latching means located at an opposite end of said tray portion, said swivel means including a sleeve which engages a member of said stroller means and allows the sleeve to rotate about said member and pivot means affixed to said tray portion and being perpendicular to said member of said stroller means, said tray portion engages said pivot means for rotation about said pivot means, said latching means includes a latch portion and a catch portion, said latch portion includes a pair of grip surfaces, each said grip surface being affixed to a spring arm, said catch portion being affixed to a member of said stroller means, said catch portion being generally U-shaped in cross-section and having a semi-circular base and upstanding leg portions and having slot means provided for each said leg portion, said slot means providing a surface upon which said grip surface may engage and providing a means for guiding said latch portion into said catch portion whereby said pair of grip surfaces engage said slot means, and said tray means is locked in place.



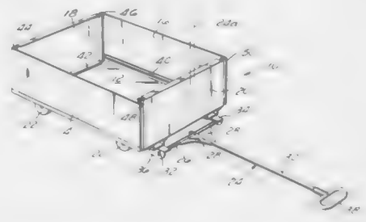


4,856,810

SELF-ACTUATING COLLAPSIBLE TRANSPORT CART

Gordon N. Smith, 821 W. Clarion Dr., Torrance, Calif. 90502

Filed Dec. 14, 1987, Ser. No. 132,149
Int. Cl.⁴ B62B *3/00*
U.S. Cl. 280—639 **15 Claims**



6. A collapsible transport cart comprising:

a floor;

a plurality of walls pivotally attached to said floor to be alternately disposable in a first collapsed position wherein said walls are generally parallel to said floor and a second operative position wherein said walls are generally perpendicular to said floor;

means cooperating with said walls for biasing at least one of said walls in said first collapsed position and at least one of said walls in said second operative position;

at least one wheel rotatably connected to said transport cart; and

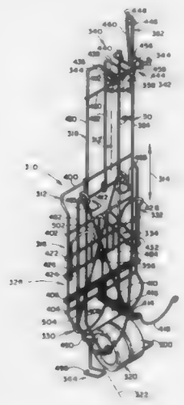
a tow bar connected to said transport cart.

4,856,811

DEVICE FOR TRANSPORTING SKI EQUIPMENT

Peter W. Bressler, Philadelphia, Pa.; Peter D. Byar, Willingboro, N.J.; Benjamin J. Beck; G. Gordon Fluke, Jr., both of Philadelphia, Pa.; Brad Magill, Wayne, Pa.; Gary Winig, Lafayette Hills, Pa., and Tracy H. Magill, Wayne, Pa., assignors to Magwin Enterprises, Inc., Philadelphia, Pa.

Filed Mar. 12, 1987, Ser. No. 25,241
Int. Cl.[4] A63C *11/02*
U.S. Cl. 280—652 **21 Claims**



1. A device for transporting ski equipment comprising:
frame means adapted for collapsed and extended orientations and having an elongated direction in the extended orientation for receiving and supporting a pair of skis and including first and second frame members rotatably collapsably coupled together for providing said collapsed and extended orientations;
first bracket means on the first frame member extending transversely to the elongated direction and having a central opening for receiving ends of a pair of skis;
second bracket means on the second frame member extending transversely to the elongated direction and having an open side for receiving the pair of skis received in the first bracket means; and
latching means positionable across said open side of the second bracket means for closing said open side and securing the pair of skis received in both the first bracket means and the second bracket means to the frame means.

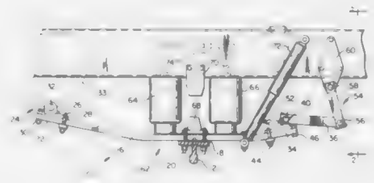
4,856,812

AXLE SUSPENSION SYSTEM

Donald L. Stephens, Skagit County, and James Saunders, Burlington, both of Wash., assignors to Paccar Inc., Bellevue, Wash.

Filed Mar. 31, 1988, Ser. No. 175,747
Int. Cl.[4] B60G *5/00*
U.S. Cl. 280—678 **32 Claims**

1. A suspension system for a vehicle, comprising:
an axle;
a single rigid beam coupled to said axle, said beam being pivotally coupled at a first end to a frame of said vehicle and coupled at a second end to said frame, said coupling at said second end permitting free vertical displacement of



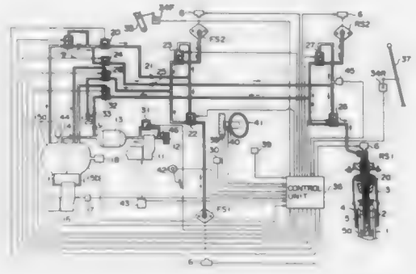
said second end but precluding twisting or side-to-side movement; and
at least one air bag coupled to said beam and to said frame.

4,856,813

VEHICLE SUSPENSION APPARATUS

Tadao Tanaka; Mitsuhiko Harara, both of Okazaki; Yasutaka Taniguchi, Nagoya; Shozo Takizawa; Minoru Tatemoto, both of Okazaki; Tetsuya Terada, Nagoya; Shunichi Wada, Himeji; Shigeki Ohtagaki, Himeji, and Kouji Mitsuhata, Himeji, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 255,778
Claims priority, application Japan, Oct. 15, 1987, 62-260468
Int. Cl.[4] B60G *3/00*
U.S. Cl. 280—703 **5 Claims**



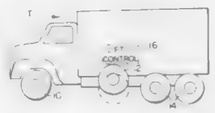
1. A vehicle suspension apparatus, comprising:
front and rear suspensions, each having a fluid spring chamber, for supporting front and rear wheels;
fluid supply means for supplying a fluid to said fluid spring chambers through front- and rear-wheel supply valves;
fluid exhaust means for exhausting the fluid from said fluid spring chambers through front- and rear-wheel exhaust valves;
brake operation detecting means for detecting an operation state of brake operating means;
deceleration detecting means for detecting a deceleration of a vehicle;
fluid spring chamber control means for outputting a first control signal for opening said front-wheel supply valves for a set control time when said brake operation detecting means and said deceleration detecting means detects that said brake operating means is operated and a deceleration exceeds a first set value within a first set time from a timing at which said brake operating means is started,
outputting a second control signal for opening said rear-wheel exhaust valves for a set control time when said brake operation detecting means and said deceleration detecting means then detect that while said brake operating means is operated, the deceleration of said vehicle exceeds a second set value which is larger than the first set value, and
outputting a third control signal to said front wheel exhaust valves and rear-wheel supply valves so as to return a fluid amount in each of said fluid spring chambers to a value prior to a control operation when said brake operation detecting means detect after the above operation that the brake operating means is set in an inoperative state, or when the deceleration detecting means detect after the above operation that the deceleration of said vehicle becomes smaller than a third set value which is not more than the first set value.

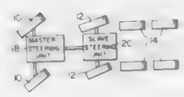
4,856,814

ADJUSTABLE, PROPORTIONALLY STEERABLE AUXILIARY WHEEL ASEMBLIES FOR TRUCKS

Everett W. Jones, R.F.D. Rt. 80, Deep River, Conn. 06417

Filed Feb. 5, 1987, Ser. No. 11,196
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—704 **15 Claims**





1. In a wheeled over the road vehicle comprising a set of steerable front wheels which are steerable in response to vehicle steering means, at least one set of fixed rear wheels, and an intermediate set of liftable, auxiliary wheels including means for raising and lowering the auxiliary wheels so that the auxiliary wheels are movable between a first, raised position out of contact with the road surface and a second position in which the auxiliary wheels are in contact with that surface, the improvement comprising proportional steering means, responsive to the vehicle steering means for the front wheels, for providing proportional steering of the auxiliary wheels relative to the steering of the front wheels provided by the vehicle steering means as a fixed percentage of the steering of the front wheels corresponding to the ratio of the distance between the front wheels and the auxiliary wheels to the distance between the front wheels and the rear wheels.

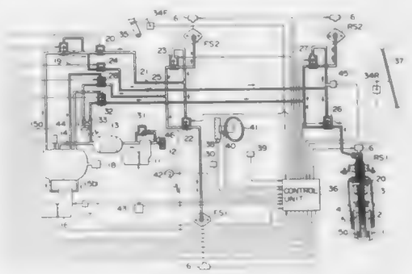
4,856,815

VEHICLE SUSPENSION APPARATUS

Tadao Tanaka; Mitsuhiko Harara, both of Okazaki; Yasutaka Taniguchi, Nagoya; Shozo Takizawa; Minoru Tatemoto, both of Okazaki; Tetsuya Terada, Nagoya; Shunichi Wada, Himeji; Shigeki Ohtagaki, Himeji, and Kouji Mitsuhata, Himeji, all of Japan, assignors to Mitsubishi Jidoshia Kogyo Kabushiki Kaisha and Mitsubhishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 255,777
Claims priority, application Japan, Oct. 15, 1987, 62-260469
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—707 **4 Claims**

1. A vehicle suspension apparatus comprising: suspension units interposed between wheels and a vehicle body and having fluid spring chambers;
fluid supply means for supplying a fluid to said fluid spring chambers through supply valves;
fluid exhaust means for exhausting the fluid from said fluid spring chambers through exhaust valves;
changing means for changing a damping force of shock absorbers arranged on said suspension units;
a vehicle height sensor for detecting a distance between said wheels and said vehicle body; and
control means for outputting a first control signal to increase the damping force by using said changing means when a vibration period of vehicle height detected by said vehicle height sensor falls within a predetermined range with respect to a reference vehicle height as the center of the



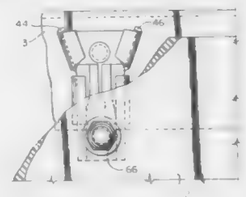
range and if an amplitude of the vibrations exceeds a first predetermined value, and
outputting a second control signal to increase the damping force by using said changing means while opening said supply valves for a predetermined time in response to an upward displacement of vehicle height and open said exhaust valves for a predetermined time in response to a downward displacement of vehicle height when the amplitude exceeds a second predetermined value larger than the first predetermined value.

4,856,816

METHOD AND MEANS FOR RELEASABLE ATTACHMENT OF MUD FLAP ON VEHICLE

Timothy M. Francis, 175 Burning Tree Dr., San Jose, Calif. 95119

Filed Mar. 28, 1988, Ser. No. 174,119
Int. Cl.[4] B62B *9/16*
U.S. Cl. 280—851 **12 Claims**



1. In combination:
(a) a vehicle having a set of rear wheels;
(b) a set of mud flaps suspended on said vehicle behind said set of rear wheels; and
(c) suspension means interposed between each said flap of said set of flaps and said vehicle whereby said flaps are normally retained suspended from said vehicle in operative position behind said wheels;
(d) said suspension means including at least one non-resilient socket having open top and bottom ends and attached to said vehicle and a complementary elastically compressible non-metallic insert attached to said flap and adapted to be releasably engaged with said socket by insertion into the open top thereof to normally retain the flap suspended in operative position and release the flap without damage by

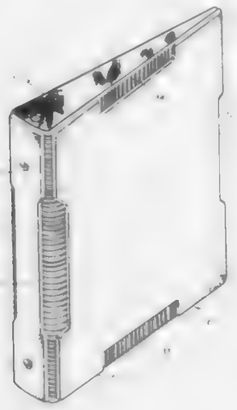
elastic compression of said insert and withdrawal thereof through the open bottom of the socket when more than a predetermined downwardly directed force is imposed on said flap said socket including a pair of convergent channels, and said insert including a pair of laterally spaced convergent compression members normally complementary to and seated in said convergent channels, whereby when a downwardly directed force exceeding a predetermined amount is imposed on said flap, said insert is displaced longitudinally in relation to said flap, said insert is displaced longitudinally in relation to said socket to thereby release said insert and the attached flap from the socket.

4,856,817

EASY GRIP BINDER

Marc L. Moor, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 12, 1988, Ser. No. 231,559
Int. Cl.[4] B42D *3/00, 3/02, 3/08;* **B42F** *3/00*
U.S. Cl. 281—29 **3 Claims**



1. In a binder comprising a front cover board, a rear cover board, a spine board positioned between said front cover board and said rear cover board to define front and rear hinge lines therebetween, said front and rear cover boards and said spine board being joined together by being laminated between an inside cover sheet and an outside cover sheet, the improvement wherein said binder is provided with a pair of opposed spine recesses, each of said spine recesses defined by a medial cutout on said spine board and by a matching medial cutout on said cover board, said outside cover sheet being depressed conformingly into said cutouts.

4,856,818

FOLDED RECORD MEDIUM AND A BLANK FOR A RECORD MEDIUM

Horst Rabenecker, Stockelsdorf, and Jurgen Kruger, Lorrach-/Buhl, both of Fed. Rep. of Germany, assignors to Draegerwerk, AG, Fed. Rep. of Germany

Filed Mar. 25, 1988, Ser. No. 173,713
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 3710228
Int. Cl.[4] G09B *29/00, 19/00;* **B42F** *21/00;* **B65D** *27/08*
U.S. Cl. 283—34 **7 Claims**

1. A folded record medium for a plurality of different segmentally arranged information portions, comprising interconnected first and second substantially square pieces of sheets joined together along a first fold line forming a first joined pair of sheets, said first joined pair of sheets being joined together along a second fold line which is perpendicular to said first fold line to interconnect third and fourth substantially square pieces of sheets, said third and fourth substantially square pieces being joined along a third fold line to form a second joined pair of sheets, said second joined pair of sheets being joined together along a fourth fold line, perpendicular to the third fold line to interconnected fifth and sixth substantially square pieces of sheets, said fifth and sixth substantially square pieces being joined along a fifth fold line to form a third joined pair of sheets, a plurality of coherent displays formed of said information portions, a first information portion of a first display being positioned on said first substantially square piece and a second



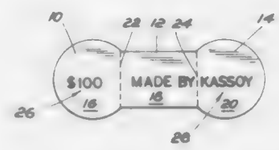
information portion of said first display being positioned on said second substantially square piece, a first information portion of a second display being positioned on said third substantially square piece and a second information portion of said second display being positioned on said fourth substantially square piece, a fourth information portion of said first display being positioned on the fifth substantially square piece and the fourth information portion of the first display being positioned on the sixth substantially square piece, said second fold line being of a length of one side of said sheet pieces and said record medium having an outline in an unfolded position resembling a stairway.

4,856,819

TAG

Peter J. Gollon, 15 Eleanor Pl., Huntington, N.Y. 11743

Continuation-in-part of Ser. No. 120,013, Nov. 13, 1987. This application Oct. 14, 1988, Ser. No. 257,796
Int. Cl.[4] B42D *15/00*
U.S. Cl. 283—79 **6 Claims**



1. In a tag having:
at least first, second and third planar segments, each segment having opposite, front and back planar surfaces bounded by at least one edge extending between the planar surfaces, the front surfaces being for printing;
at least two, flexible, segment-connector means for respectively connecting portions of the edges of the first and second and second and third segments in a manner such that at least the front surfaces of the segments are in a common plane when the segment-connector means are not flexed, whereby the front surfaces of the segments may be printed in one-sided printing operation, and for juxtaposing the front surfaces of the first and second segments when the segment-connector means between these segments is flexed, and for juxtaposing one of the surfaces of the third segment with a back surface of one of the first and second segments when the segment-connector means between the second and third segments is flexed;
attaching means for attaching at least one of the segments to an item; and
closing means for holding the segment-connector means flexed until it is desired to unflex at least one, whereby to expose the printing on the front surface of at least one of the segments, the improvement wherein:
the closing means comprises adhesive (**56**, **56'**) on the back surfaces of each of the segments;
the attaching means comprises a tail strap (**54**, **54'**) axially projecting from an end on an edge of one of the segments (**50**, **50'**) opposite the other segments (**10c**, **12c**, **14c**; **10c'**, **12c'**, **14c'**) to an opposite, free end for flexing to loop through an object;
the segment-connector means each comprise fold lines (**22c**, **24c**, **49**; **22c'**, **24c'**, **49'**) between edges of the segments; and
the segments additionally comprise a fourth segment (**10c**, **10c'**), the first, second and third segments (**50**, **14c**, **12c**; **50'**, **14c'**, **12c'**) being congruent and in line with each other and the tail strap, and the fourth segment being in line with the other segments opposite the tail strap and only similar to the other segments in being axially shorter than the other segments.

4,856,820

CODING SYSTEM

Paul L. Kasprzak, Sutton, Mass., and Michael E. Moy, Lafayette, Colo., assignors to Wright Line Inc., Worcester, Mass.

Filed Jan. 21, 1987, Ser. No. 5,922
Int. Cl.[4] B42D *15/00;* **B42F** *21/04;* **G06K** *7/10;* **G09F** *3/00*
U.S. Cl. 283—81 **20 Claims**



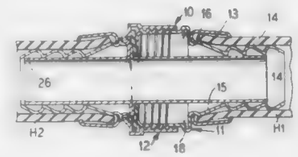
1. A machine-readable, human-readable coding system comprising:
a one piece, pre-printed coded label having at least two identical messages,
a first column on the label,
a series of data characters of an optical character recognition code being located in the first column, the data characters forming a message in a first code which is both machine-readable and human-readable, and
a second column containing a single machine-readable bar code symbol,
the bar code symbol comprising a message in a second code which is machine-readable and which corresponds to the first message,
the messages in the first and second columns being printed to be read in opposite directions.

4,856,821

HOSE COUPLING

Arthur P. Swanson, 1454 Estate La., Glenview, Ill. 60025

Filed Sep. 30, 1988, Ser. No. 251,296
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—24 **8 Claims**



1. A coupling for the ends of conduits for fluid flow without leakage through the conduits which comprises first and second tubular components each having an outboard extension for receiving said ends of the conduits therearound, said first coupling having an inner end with an external peripheral groove and an abutment surface, a collar having an end rotatably mounted in said peripheral groove receiving said inner end of the first component in the collar, said collar having an internally threaded sleeve portion projecting beyond said inner end of said first component, a tube slideably seated in the outboard extension end of said first component projecting beyond said collar, said tube having an external shoulder intermediate the ends thereof bottomed on said inner end abutment surface of the first component, a seal ring in said collar overlying said shoulder and inner end abutment surface of the first component, said second component having an externally threaded portion with an end abutment for engaging said seal ring when the collar is threaded onto the external threads thereof whereby the tube will project into the outboard end of the second coupling component and the seal ring will sealingly connect the shoulder of the tube with the inner end abutment surface of the first component for sealed fluid flow through the tube.

4,856,822

FLEXIBLE JOINT FOR CONNECTING TWO PIPES

Birch F. Parker, Quarry House, Over Whitacre, Near Coleshill, England

PCT No. PCT/GB86/00702, § 371 Date Jul. 14, 1987, § 102(e) Date Jul. 14, 1987, PCT Pub. No. WO87/03038, PCT Pub. Date May 21, 1987
PCT Filed Nov. 14, 1986, Ser. No. 97,966
Claims priority, application United Kingdom, Nov. 14, 1985, [redacted]
Int. Cl.[4] F16L *3/16*
U.S. Cl. 285—62 **4 Claims**



1. In a vehicle, an improved hollow flexible joint connected

between the ends of two tubular exhaust pipes and permitting relative angulation therebetween, which includes:

a first tubular coupling member having a part-spherical end providing an external mating surface;

a second tubular coupling member having a part-spherical end providing an internal mating surface, the internal mating surface being of the same effective radius as said external mating surface, the said mating surfaces being adapted both to mate and pivot one relative to the other;

a plurality of resilient finger-like extensions projecting from said second tubular coupling member around part of the part-spherical end of the first coupling member,

a force-transmitting pad located by each finger-like extension against the part-spherical end of the first tubular coupling member,

said extensions each having a section which exerts by way of said pad a force externally on the part-spherical end of the first tubular coupling member in a direction to urge said mating surfaces into sealing engagement,

the remainder of the extensions being spaced outwardly from the part-spherical end of the first tubular coupling member;

an extension part on each of the finger-like extensions;

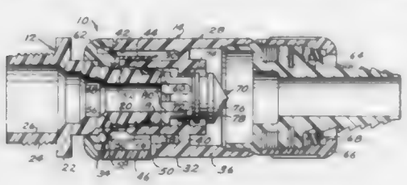
and means to urge each extension part inwardly towards the first tubular coupling member to increase the force urging the said mating surfaces into sealing engagement.

4,856,823

COUPLING WITH IMPROVED LOCKING/UNLOCKING MEMBER

Lawrence P. Heren, Peoria, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.

Filed Jul. 1, 1988, Ser. No. 214,517
Int. Cl.[4] F16L *37/12*
U.S. Cl. 285—81 27 Claims



1. An assembly for quick connect/disconnect with respect to a tubular male member including a connecting end portion having an interior for confining the flow of water under pressure therethrough and an exterior providing a sealing surface and an exterior annular locking surface facing in a direction away from said end portion, said assembly including

an annular structure providing interior peripheral surface means having one end adapted to receive a flow of water under pressure therethrough and an opposite end portion open to receive the connecting end portion of the male member in an operative position therein,

said interior peripheral surface means including a sealing surface in the opposite end portion thereof for sealingly engaging the sealing surface of the tubular male member when the latter is in its operative position so as to prevent leakage of water under pressure communicating between the interior of the male member and the one end of the interior peripheral surface means,

a separate unitary thin walled annular locking/unlocking member molded of plastic material so as to provide a pair of locking portions disposed in normal positions of diametrically opposed relation and a pair of diametrically opposed unlocking portions disposed in normal positions of diametrically opposed relation displaced 90° with respect to the normal positions of said locking portions,

the thin walled construction and plastic material of said locking/unlocking member being such that the locking/unlocking member is capable of resilient flexure such that a manual movement of said unlocking portions radially relatively in a direction toward one another out of their normal positions results in said locking portions moving radially away from one another out of their normal positions, and

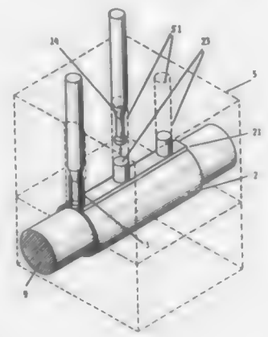
means mounting said annular locking/unlocking member on said annular structure axially inwardly of the opposite open end portion thereof in generally coaxial relation therewith (1) with said locking portions in their normal positions extending radially inwardly beyond said interior peripheral surface means at positions of locking engagement with the annular locking surface of the male member when the latter is moved away from its operative position so as to lockingly prevent the same and (2) with at least one of said unlocking portions in their normal positions extending outwardly of the exterior of said annular structure so as to be capable of manual movement radially relatively toward one another out of their normal positions so that the resultant movement of said locking portions relatively away from one another out of their normal positions is sufficient to be out of positions of locking engagement with the annular locking surface of the male member.

4,856,824

METHOD OF MANUFACTURE OF MANIFOLDS AND MANIFOLD PROVIDED BY SUCH METHOD

Edvin L. Clausen, Tonder, Denmark, assignor to Norsk Hydro a.s., Oslo, Norway

Continuation of Ser. No. 890,950, Jul. 31, 1986, abandoned, which is a division of Ser. No. 833,711, Feb. 27, 1986, Pat. No. 4,633,812. This application Feb. 22, 1988, Ser. No. 161,392
Int. Cl.[4] F16L *39/00*; F28F *9/02*
U.S. Cl. 285—137.1 4 Claims



1. A manifold comprising:

an elongated extruded metallic hollow member having an interior and being free of longitudinally extending seams;

a plurality of individual hollow risers extending outwardly from the outer surface of said hollow member, said hollow risers being formed integrally from a portion of the material of said hollow member by performing reverse impact extrusion thereof; and

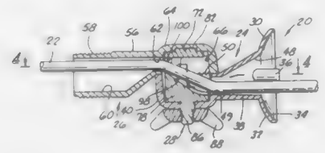
at least some of said hollow risers having interiors connected to said interior of said hollow member by means of respective apertures extending through said hollow member.

4,856,825

SWIVEL JOINT FOR ELECTRICAL CONDUIT

J. Ward Blakely, North Hollywood, Calif., assignor to Ward Engineering, Inc., No. Hollywood, Calif.

Filed Feb. 29, 1988, Ser. No. 162,288
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—175 5 Claims



1. A swivel joint when fully assembled particularly adapted for use with an electrical conduit wherein there is a first half and a second half each having a longitudinal axis and each half includes a cup portion at one end thereof, the cups each having an outer rim and the said cup rims are mateable one with the other forming an enclosure, said enclosure having a central axis passing therethrough normal to said longitudinal axis and means associated with said cups to retain the halves together and said halves are angularly adjustable about said central axis one to the other and the ends opposite said cups include securement means for mounting said joint to a structure and to an electrical fixture respectively, wherein said joint includes:

extension arms offset one from the other in one elevation extending between the cup and opposite end of each of said halves and each arm includes a bore offset one from the other in one direction that extends throughout the length of each of said arms along the respective longitudinal axes thereof communicating with the interior of the respective cup portions, at least one of said bores includes a reduced tapered guide diameter in the vicinity of said cup portion communicating therewith whereby the conduit may be threaded through said bore and guided to said enclosure formed by said cup portions; and

conduit guide means mounted within said enclosure and secured in one of said cup portions, said conduit guide means includes a body portion having a wall and also having a channel to receive said conduit and said channel extends angularly diametrically across said cup between said offset bores whereby when said halves are secured together said groove extends angularly uninterruptly between said offset bores of said halves; wherein movement of one of said halves to a position up to normal to the other will not damage the conduit due to its bending when threaded therethrough.

4,856,826

AIR TRANSFER SYSTEM

Donald F. Engel, Prior Lake, and Steven S. Gieseke, Richfield, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Apr. 27, 1988, Ser. No. 186,585
Int. Cl.[4] F16L *43/00*
U.S. Cl. 285—181 20 Claims

1. A conduit system for providing air flow communication between an air filter assembly and an air intake manifold, said conduit system comprising:

(a) a substantially rigid first conduit member having: inner and outer surfaces; first and second opposite ends, and first and second opposite end portions;

(i) said first conduit member first end portion being constructed and arranged for air flow communication with an exit port on the air filter assembly;

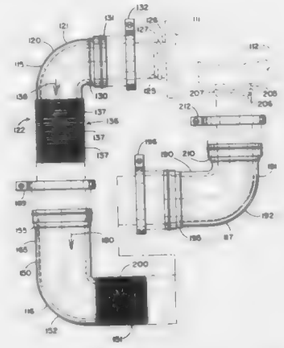
(ii) said first conduit member second end portion comprising a narrow end portion with a plurality of spaced annular ribs thereon, each of said ribs having a sharply defined central ridge;

(b) a central conduit arrangement having: inner and outer surfaces; first and second opposite ends; and, first and second opposite end portions;

(i) said central conduit arrangement first end portion being a broad end portion constructed and arranged for receipt of said first conduit member second end portion therein, through said central conduit arrangement first end;

(ii) said central conduit arrangement second end portion comprising a narrow end portion with a plurality of spaced annular ribs thereon, each of said ribs having a sharply defined central ridge;

(c) a substantially rigid end conduit member having: inner and outer surfaces; first and second opposite conduit ends; and, first and second opposite end portions;



(i) said end conduit member first end portion being a broad end portion constructed and arranged for receipt of said central conduit arrangement second end portion therein, through said end conduit member first end;

(ii) said end conduit member second end portion being constructed and arranged for air flow communication with an inlet port on the air intake manifold;

(d) a first elastomeric seal member positionable between annular ribs on said first conduit member second end portion, and said central conduit-arrangement first end portion; and,

(e) a second elastomeric seal member positionable between annular ribs on said central conduit arrangement second end portion and said end conduit member first end portion.

4,856,827

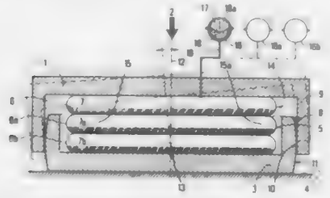
RESILIENT BALL JOINT SUPPORT

Guy-Robert Delamare, Herblay, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

Filed Dec. 10, 1986, Ser. No. 940,486
Claims priority, application France, Dec. 11, 1985, 85 18569
Int. Cl.[4] F16L *27/04*; F16C *11/06*
U.S. Cl. 285—268 19 Claims

1. A resilient ball joint support comprising two plates, at least one ball joint for connecting the two plates so as to be movable with respect to each other and for centering the plate with respect to each other, at least one cushion disposed between the two plates and being formed of at least one sealed envelope confining at least one fluid pressurized by an action of a load applied between said plates so that substantially no torque occurs upon a transmission of the load between said plates, wherein a plurality of cushions are provided and are

formed of a superimposition of sealed envelopes of substantially circular contour having peripheral edges assuming a



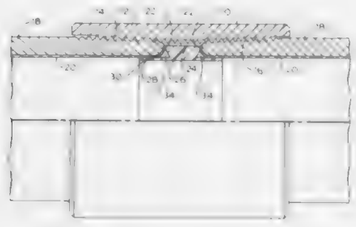
substantially toroidal shape and said at least one ball joint is disposed about said sealed envelopes coaxially therewith.

4,856,828

COUPLING ASSEMBLY FOR TUBULAR ARTICLES

Newlin W. Kessler, and Ray D. Willis, both of Houston, Tex., assignors to Tuboscope Inc., Houston, Tex.

Filed Dec. 8, 1987, Ser. No. 130,796
Int. Cl.[4] F16L *25/00*
U.S. Cl. 285—334.1 **2 Claims**



1. A coupling assembly comprising an annular coupling having internal threads and opposed tubes having external threads inserted into said coupling with said internal threads and said external threads being in threaded engagement, an annular gasket of rigid material mounted between and in engagement with opposed ends of said tubes within said coupling, said gasket having a continuous radial portion extending between said opposed ends of said tubes, said radial portion having opposed side portions adjacent said opposed ends and a top portion spaced apart from said coupling, and a pair of opposed flanges extending from opposite sides of said continuous radial portion of said gasket and into sealing contact with an interior marginal portion extending from each opposed end of said tubes and sealing means for producing a seal between said opposed ends of said tubes and each said opposed side portions of said radial portion, said sealing means being spaced apart from said coupling and including a continuous, annular groove formed between each of said flanges and said continuous radial portion of said gasket with each said opposed ends of said tubes extending into one said groove in sealing engagement with said gasket.

4,856,829

PAWL STRUCTURE IN A DOOR LOCKING DEVICE FOR A VEHICLE

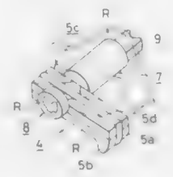
Hitoshi Nakamura, and Yasuaki Hori, both of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd., Kanagawa, Japan

Filed Feb. 16, 1988, Ser. No. 156,171
Claims priority, application Japan, May 20, 1987, 62-121395
Int. Cl.[4] E05C *3/26*
U.S. Cl. 292—216 **5 Claims**

1. A pawl structure in a door locking device for a vehicle in which latch means is rotatably supported, said structure comprising:

claw means engageable with the latch means to prevent the latch means from being rotated, said claw means having at least a portion thereof covered with a resin material; and

base shaft means extended substantially perpendicular to the claw means and connected to the claw means and being rotatably connected to the door locking device, said base



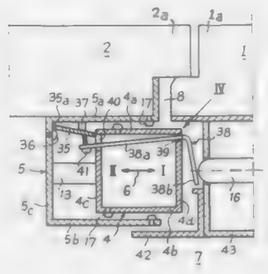
shaft means having at least a portion thereof covered with a resin materail so as to significantly suppress noise between said claw means and said latch means and reduced in said claw means and said base shaft means wear due to friction.

4,856,830

DOOR BLOCKING DEVICE

Michel M. Chateau, 9, rue Louis David, 75016 Paris, France

Filed Nov. 17, 1987, Ser. No. 121,431
Claims priority, application France, Nov. 18, 1986, 86 16018
Int. Cl.[4] E05C *1/06*
U.S. Cl. 292—254 **10 Claims**



1. A blocking device for use with a door which comprises an openable panel having an edge mounted opposite a door jamb having an edge, a gap between the openable panel edge and the door jamb edge when said door is in the closed position, said blocking device comprising:

a bar which extends vertically along a length of said door jamb edge; a formed section having walls for housing said bar, said formed section being fixed with respect to said door jamb edge and being L-shaped with respect to the door jamb to prevent the bar from moving perpendicularly to the plane of said openable panel when said openable panel is in its closed position, the L-shape comprising two walls, one wall of which extends out perpendicularly from the door jamb and the other wall of which extends from the end of said one wall parallel to the said plane of said openable panel; said bar being movable parallel to the plane of said door by an actuating device; said actuating device moving said bar between a blocking position in which said bar extends laterally from said formed section and overlaps said gap between said edges, and a releasing position in which said bar retracts into the formed section thereby uncovering said gap and permitting opening of said door; said bar having resilient means for returning it to the blocking position; and a locking device comprising a blocking member which is in an active position to lock said bar in place when said bar is in its blocking position, and is movable to an inactive position by said actuating

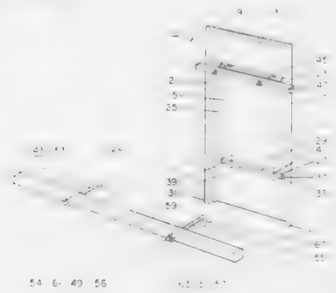
device, said locking member in its active position being situated in said formed section between said bar and said other wall of the L-shape.

4,856,831

SECURITY DEVICE FOR AN OUTWARDLY SWINGING DOOR

Ralph V. Roden, Jr., P.O. Box 8276, Fort Worth, Tex. 76124

Continuation of Ser. No. 752,483, Jul. 11, 1985, abandoned, which is a continuation of Ser. No. 529,208, Sep. 6, 1983, abandoned. This application Aug. 30, 1988, Ser. No. 239,009
Int. Cl.[4] E05C *19/00*
U.S. Cl. 292—259 R **2 Claims**



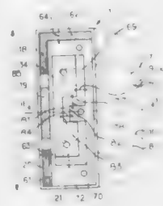
1. In combination, a door mounted on a door frame for swinging movement between open and closed position, said door frame having a door stop preventing swinging movement of the door in one direction with the door engaging the door stop when in closed position and a security device releasably retaining the door in closed position against the door stop by preventing swinging movement of the door away from the door stop, said security device comprising an elongated, rigid, one-piece bar mounted on the door surface that engages the door stop when the door is in closed position, said bar extending continuously from end-to-end and extending along substantially the entire distance between opposite edges of the door, said bar extending laterally from the door surface a distance less than the distance between the surface of the door stop engageable by the door and the edge of the door frame remote from the door when in closed position, said bar including at least a pair of parallel openings extending vertically therethrough, said openings being parallel to the door surface on which the bar is mounted, said security device also comprising an elongated, rigid, one-piece, removable locking bar having a length greater than the door mounted bar with the ends of the removable bar extending beyond opposed edges of the door and disposed in spaced relation to the door mounted bar with the ends of the removable bar engaging the door frame at opposite edges thereof and means on the removable bar engaged with the openings in the door mounted bar to retain the removable bar mounted from the door mounted bar with the ends of the removable bar engaged with the edges of the door frame thereby preventing movement of the door away from the door stop, said means comprising at least a pair of L-shaped membes having a long leg and a short leg perpendicular to the long leg, the long leg of each L-shaped member being connected to said removable bar with the short leg of each L-shaped member extending vertically downwardly from the end of the long leg and received in an opening in said door mounted bar and entering the opening from the upper end and enabling quick removal of the removable bar by lifting the removable bar upwardly to lift the short legs out of the opening in the door mounted bar, each L-shaped member being of one-piece construction and having a substantially constant cross-sectional area and shape throughout its length, said removable bar having at least a pair of holes along a center line thereof for receiving the long legs of said L-shaped members, each of the long legs being threaded, and nut means on said threaded legs to secure said removable bar to said L-shaped members, each of said L-shaped members, openings and holes having a circular cross-section with the holes in the removable bar being spaced apart a distance equal to the distance between the openings in the door mounted bar, said nut means enabling adjustment of the distance between the door mounted bar and the removable bar when the short legs of the L-shaped members are positioned in the openings to enable installation of the security device on doors and door frames having dimensional variations between the door surface and edge of the door frame, the surface of said door mounted bar engaging the door surface being flat and generally rectangular in configuration, the surface of said removable bar engaging the edges of the door frame being flat and generally rectangular with the flat surface of the removable bar being supported in parallel relation to the flat surface on the door mounted bar by engagement of the short legs of the L-shaped members in said openings.

4,856,832

STRIKER PLATE FOR SLIDING WINDOWS, DOORS OR THE LIKE

Gérard Prevot, Willerwald, France, assignor to Ferco International, Sarrebourg, France

Filed Nov. 24, 1987, Ser. No. 124,605
Claims priority, application France, Dec. 3, 1986, 86 17020
Int. Cl.[4] E05C *21/02*
U.S. Cl. 292—341.19 **14 Claims**



1. A striker plate for mounting upon an interior surface of a relatively fixed frame of a relatively movable closure such as a window or door and for cooperation with a latch bolt mounted upon said closure for securing said movable closure to said fixed frame, said closure being movable in a substantially rectilinear predetermined direction, said striker plate comprising:

(a) a body having (i) a bearing face for being positioned and secured upon a predetermined surface of said fixed frame and (ii) a lug having a portion for engagement with a portion of said latch bolt for securing said latch bolt of said lug and said movable closure to said fixed frame; and

(b) means for bidirectionally adjusting the position of said body and said lug upon said predetermined surface of said fixed frame within a plane of movement which is substantially parallel to said predetermined direction of movement of said movable closure, said bidirectional adjustment means being positionable between said body and said predetermined surface of said fixed frame.

4,856,833

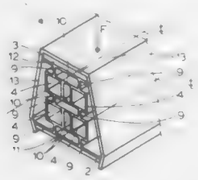
BUMPER

Arie W. Beekman, Schinnen, Netherlands, assignor to Stamicarbon B.V., AC Geleen, Netherlands

Filed Apr. 24, 1987, Ser. No. 42,368
Int. Cl.[4] B60R *19/03*
U.S. Cl. 293—120 **6 Claims**

1. A bumper comprising a bearing member and an elastic deformable plastic element provided with an impact surface, which element is substantially comprised of a number of interconnected box-shaped formations the cross sections of which are regular polygons having an even number of sides and a

length dimension extending along the longitudinal centerline thereof, said polygons being arranged parallel to the impact surface, the bumper being characterized in that near the mid-points of two opposite sides the box-shaped formations are



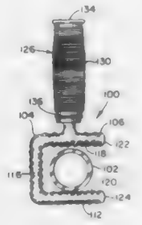
connected with each other and with the impact surface by connecting webs extending lengthwise along the length dimension of the box-shaped formations and heightwise in a direction perpendicular to the impact surface and to the said sides.

4,856,834

FIRE HOSE GRIPPING DEVICE AND PROCESS FOR FIGHTING FIRES IN OIL REFINERIES AND THE LIKE

David R. Lancaster, Casper, and Richard J. Everding, Evansville, both of Wyo., assignors to Amoco Corporation, Chicago, Ill.

Filed Jul. 15, 1987, Ser. No. 73,526
Int. Cl.[4] B65G 7/12
U.S. Cl. 294—15 **5 Claims**



1. A firefighting process, comprising the steps of:
attaching one end of a fire hose to a fire hydrant when said end of said fire hose is in a generally collapsed flattened position;
uncoiling said fire hose;
attaching a manually grippable spray nozzle to the other end of said fire hose;
inflating and substantially filling said fire hose with water from said water supply means to expand said hose to a semirigid expanded position;
grasping, lifting, and carrying said filled fire hose with one hand;
gripping a vertical elastomeric handle of a hose clamp with the other hand, said hose clamp having a generally U-shaped hose-engaging member, said U-shaped hose-engaging member having an open end defining an access opening for receiving said hose, said access opening being larger than the maximum diameter and transverse span of said uncoiled filled fire hose;
inserting said hose-engaging member on said fire hose such that there is sufficient clearance between said hose-engaging member and said fire hose to side said hose clamp to another position;
moving said hose clamp at an acute angle of inclination relative to said hose to detachably secure and inter-lockingly engage said hose-engaging member to said filled fire hose;
manually lifting said vertical elastomeric handle of said hose clamp to elevate said fire hose;
pointing said nozzle towards said fire; and
spraying water from said nozzle on said fire.

4,856,835

TOOL FOR PICKING UP LITTER

Albert J. Pacione, 656 Elm St., Englewood, Fla. 34223

Filed Sep. 29, 1987, Ser. No. 102,167
Int. Cl.[4] B08B 1/00
U.S. Cl. 294—61 **3 Claims**



1. A tool for picking up litter comprising a hollow elongated tubular member, a pair of parallel spaced apart elongated abutment means secured to the bottom of said tubular member and extending orthogonal relative to said tubular member, an elongated operating member slidably mounted within said tubular member and having one end thereof extending outwardly of said tubular member and spike means secured to said one end of said operating member whereby upon longitudinal movement of said operating member relative to said tubular member in one direction said spike means will protrude beyond said abutment members for penetrating litter and upon movement in the opposite direction will be withdrawn past said abutment members to strip the litter from said spike means.

4,856,836

SLING ASSEMBLY FOR USE WITH A CRANE

Joseph P. Delphin, Buras, La., assignor to Conoco Inc., Ponca City, Okla.

Filed Nov. 13, 1987, Ser. No. 119,865
Int. Cl.[4] B66C 1/18
U.S. Cl. 294—74 **7 Claims**



1. A sling assembly for use with a crane for lifting and shifting an article or group of articles, said assembly comprising:
(a) a first strap formed of a high strength fabric, said first strap having a first end and a second end;

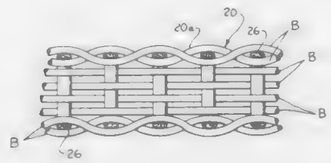
(b) a second strap formed of a high strength fabric, said second strap having a first end and a second end;
(c) means for interconnecting said first and second fabric straps to a hoisting hook on said crane;
(d) first and second article-encircling loops formed in said first and second straps, respectively, by forming an eyelet in said first end of each strap and passing said second respective end of each strap through said eyelet;
(e) first and second tight fitting choker sleeves engaging said first and second straps, respectively, between said second end and the point at which said eyelet on said first end engages its respective strap, said choker sleeves eaach being slidable along its respective strap to a position immediately adjacent its loop's eyelet to hold said article-encircling loops in engagement with said article.

4,856,837

REINFORCED CARGO SLING AND METHOD

Robert L. Hammersla, Jr., Greenville, S.C., assignor to Woven Electronics Corporation, Mauldin, S.C.

Filed Feb. 16, 1988, Ser. No. 156,528
Int. Cl.[4] B66C 1/12
U.S. Cl. 294—74 **10 Claims**



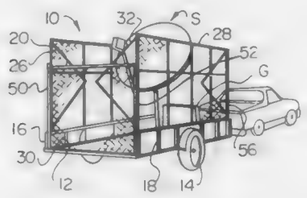
1. A method of protecting the edges of a cargo webbing sling against abrasion and cutting continuously along its length while retaining flexibility for handling cargo, said webbing being formed from warp and weft yarns woven together, comprising:
including protective abrasion resistant warp yarns woven continuously along opposing first and second side edges of said webbing sling having a higher resistance to abrasion than a remainder of said warp yarns in said webbing to prevent cutting of the side edges of said webbing sling and resulting sling failure.

4,856,838

PROTECTIVE TRAILER

Robert A. Reshke, 8616 21st Ave. NW., Bradenton, Fla. 34209, and Rocco T. Piergrossi, 5200 SW. 164th Ter., Ft. Lauderdale, Fla. 33331

Filed Jun. 8, 1988, Ser. No. 204,074
Int. Cl.[4] B60P 3/00
U.S. Cl. 296—14 **7 Claims**



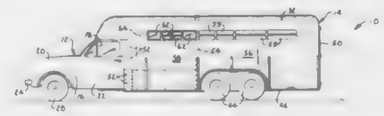
1. A protective trailer for transporting, erecting and using a portable two-way satellite communications station comprising:
a generally flat, rigid trailer bed supported above the ground by spaced apart wheels operably connected to the trailer bed for rotation;
said trailer bed having a trailer tongue adapting said trailer bed to be towable by a vehicle;
said trailer bed adapted to support a two-way satellite dish and its power source thereon;
front and rear rigid framed end screen panels connected transversely to, and upwardly extending from, said trailer bed front and rear margins respectively;
said front end panel including two spaced apart left and right panels and a hinged access gate swingable about a vertically oriented hinge axis, said access gate providing operator access to the satellite communications station;
a rigid framed side screen panel pivotally connected along its lower margin to each longitudinally extending side margin of said trailer bed;
each of said side panels having rigid framed triangular screen panels inwardly disposed from the front and rear upwardly extending margins respectively of each said side panel;
each of said side panels having a closed position and an open position;
each said side panel generally upright and cooperating with said front and rear end panels to render continuous screened protection around the entire perimeter of the trailer bed when in its closed position;
each said front and rear triangular panel inwardly extending and overlapping said front and rear end panels respectively when each said side panel is in its closed position;
each said side panel generally diagonally outwardly and upwardly extending from said respective trailer bed side margin when each said side panel is in its open position;
each said front and rear triangular panels generally extending to cover the transverse area above said trailer front and rear margins respectively defined by the upright margins of said front and rear end panels respectively and said side panel front and rear end margins respectively to render continuous screen protection around the entire perimeter of said trailer bed when each said side panel is in its open position.

4,856,839

SELF PROPELLED CARRIER

Harold C. Scott, 2587 W. Armstrong Rd., and Carl O. Martin, 1364 Fairchild Rd., both of Salina, Kans. 67401

Filed Nov. 23, 1987, Ser. No. 123,767
Int. Cl.[4] B60P 3/00
U.S. Cl. 296—24.2 **3 Claims**



1. A self propelled vehicle for carrying animals, comprising:
a cab portion having a rigid cab frame supported on a pair of front wheels and a cab body on the cab frame providing an enclosed driver's compartment, said cab frame having a pair of spaced apart frame members extending generally fore and aft;
an engine compartment on said cab frame having an engine therein drivingly connected with said front wheels to propel the vehicle;
a trailer portion having a rigid trailer frame supported on rear wheels and a trailer body on the trailer frame providing an enclosed trailer compartment accessible from the rear to accommodate entry of animals into the trailer compartment, said trailer frame having a plurality of transverse frame members extending generally transversely across the trailer frame;

a floor of said trailer compartment support on the trailer frame at a low to the ground elevation to facilitate loading of animals into the trailer compartment and unloading of the animals therefrom;

a pair of structural members extending along and rigidly secured to said frame members of the cab frame and rigidly secured to said frame members of the trailer frame, thereby rigidly connecting the cab and trailer frames together;

a pair of braces extending from the respective frame members of the cab frame to one of said frame members of the trailer frame, said braces angling outwardly away from the frame members of the cab frame and being rigidly connected to said frame members of the cab frame and to said one frame member of the trailer frame to reinforce the connection between the cab and trailer frames; and

means for rigidly securing said cab body and said trailer body together to connect said cab and trailer portions together in a unitized structure,

said securing means including a rigid metal plate at a junction between the cab body and trailer body, said plate being secured rigidly to said cab and trailer bodies on opposite sides of said junction.

4,856,840

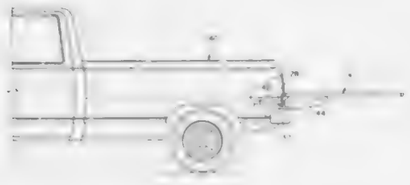
METHOD AND APPARATUS FOR EXTENDING THE BED OF A TRUCK

Dennis S. Hanley, 3 Frost St., Cambridge, Mass. 02140

Filed Nov. 30, 1987, Ser. No. 126,609

Int. Cl.[4] B62D *33/02*

U.S. Cl. 296—26 **13 Claims**



1. A truck bed extender comprising:

a platform; and

means for attaching and supporting the platform to the rear end of a truck, wherein the means for attaching and supporting the platform to the rear end of the truck is comprised of a plurality of rods attached to a side of the platform, the rods extending downwardly in the same direction from the side of the platform, the end of each rod distal from the side of the platform having a lip attached to and projecting from said end, said lip being pointed away from the platform such that the rods can be inserted between the rear end of the truck bed and the front end of the tailgate when the tailgate is in a horizontal open position and said lips are engageable with a rear portion of the truck bed.

4,856,841

ADJUSTABLE FOLDING ARM FOR VEHICLE COVER

Hassan Rafi-Zadeh, 5301 E. Mockingbird Ln., Paradise Valley, Ariz. 85253

Filed Oct. 20, 1988, Ser. No. 260,386

Int. Cl.[4] B60J *7/08*

U.S. Cl. 296—100 **4 Claims**

1. A vertically extendible cover assembly for use on the bed of a pickup truck, comprising, in combination.

(a) a rigid cover;

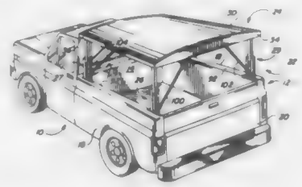
(b) a plurality of folding arms each having a lower base leg and an upper extending leg, said legs each including an upper end and a lower end, said upper end of said base leg being pivotally attached to said lower end of said extending leg;

(c) bracket means attached to each of said lower ends of said base legs to attach said lower end to the upper ledge means of the pickup truck bed;

(d) mounting means for securing each of said upper ends of said extending leg to said cover, said mounting means including

(i) a foot pivotally attached to said upper end of said extending leg,

(ii) sleeve means fixedly attached to said cover to slidably receive said foot to permit said foot to be slidably laterally positioned at a selected position in said sleeve; and,



(iii) attachment means for fixedly securing said foot in said sleeve in said selected position;

each of said folding arms being movable between first and second operative positions when said attachment means fixedly secures said foot in said selected position;

(e) a first operative folded position with said cover in a lowered position on said pickup bed and with said legs extending from said ledge means inwardly into said pickup truck bed, and

(f) a second operative unfolded extended position with said cover raised from said pickup truck bed and said legs extending from said ledge means upwardly to said cover.

4,856,842

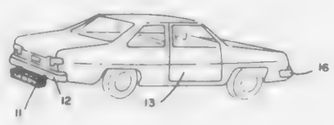
SELF-STORING, RETRACTABLE AUTOMOBILE COVER

Richard E. Ross, 1026 Oak Grove Rd., Concord, Calif. 94518, and Donald R. Harvey, P.O. Box 399, Benicia, Calif. 94510

Continuation-in-part of Ser. No. 924,754, Oct. 30, 1986, Pat. No. 4,732,421. This application Feb. 16, 1988, Ser. No. 156,161

Int. Cl.[4] B60J *7/20*

U.S. Cl. 296—136 **18 Claims**



1. A self-storing, retractable automobile cover apparatus, including; a pair of end members; a plurality of rigid tubes, extending between said end members and rigidly joined thereto to maintain said end members disposed in spaced apart disposition; a tubular reel assembly rotatably secured between said end members; a motor housing secured to one of said end members; an electric motor disposed in said motor housing, means for coupling said electric motor to said tubular reel assembly; a fabric auto cover adapted to be wound about said tubular reel assembly, two of said rigid tubes disposed in closely adjacent, parallel opposition, said fabric auto cover having a free end extending between said two rigid tubes as fixed roller guides, means for actuating said electric motor to rotate said tubular steel assembly and wind said auto cover thereabout, means for removably securing said apparatus to one bumper of the auto, said means for actuating said electric motor including a switch mounted on said auto cover, and a flexible conductor connected between said switch and said motor.

4,856,843

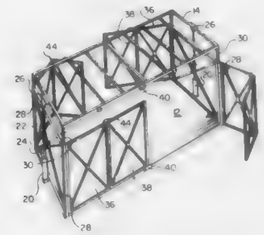
SIDE LOADING TRAILER BODY

John Elliott, Cobden, Canada, assignor to Herb Shaw & Sons Limited, Pembroke, Canada

Filed Jun. 17, 1987, Ser. No. 62,977

Int. Cl.[4] B60P *3/42;* **E05C** *3/04*

U.S. Cl. 296—181 **12 Claims**



1. A trailer body for providing access to the trailer body interior for cargo loading and unloading, comprising front, back and side walls, a roof and a platform enclosing the interior, the side walls comprising doors opening to the front and back, each of which, when opened, exposing the interior along that entire side of the body for loading purposes, the roof releasably secured to the tops of the walls, means for raising, as required, the roof from closed position on tops of the walls to a position a predetermined distance above the tops of the walls, tubular posts provided on either side of the front and back walls as support frames for those walls, and wherein each of the doors is a bi-fold door and has two sections, one section of each being hinged to a corresponding post, that section being wider than the other section to allow for complete folding of the door away from the trailer platform when the doors are open.

4,856,844

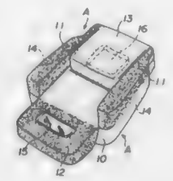
CUSHIONING BODY OF A SEAT FOR VEHICLES

Hiroyuki Isono, Tokyo, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1984, Ser. No. 656,153

Int. Cl.[4] A47C *3/00*

U.S. Cl. 297—284 **2 Claims**



1. A cushion body for a seat for vehicles which comprises:

a main pad portion made of a foam material and having an upper surface;

front and back portions made of a foam material and each having a superimposing surface, said front and back portions being each integrally connected with corresponding forward and back edges of said main pad portion and bendable therefrom, whereby said respective front and back portions can be folded at said corresponding forward and back edges with said superimposing surfaces thereof being superimposed on said upper surface of said main pad portion, said superimposed front and back defining a front pad portion and back pad portion on said main pad portion;

left and right side portions made of a foam material and each having a superimposing surface, said left and right side portions being each integrally connected with corresponding left and right side edges of said main pad portion, and bendable therefrom, whereby said respective left and right portions can be folded at said corresponding left and right side edges with said superimposing surface thereof being superimposed on said upper surface of said main pad portion, said superimposed left and right portions defining a left side pad portion and right side pad portion on said main pad portion; and

a recessed portion formed in one of all before said superimposing surfaces and said upper surface of said main pad portion, or in both of all before said superimposing surfaces and said upper surface of said main pad portion, said recessed portion being adapted to store an air bag therein.

4,856,845

ARMCHAIR WITH SUPPLE BACKREST

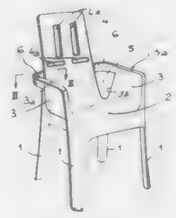
Henry Massonnet, Nurieux-Volognat, France, assignor to Societe Pour la Transformation des Matieres Plastiques Stamp, Nurieux-Volognat, France

Filed Aug. 3, 1988, Ser. No. 228,002

Claims priority, application France, Aug. 18, 1987, 87 11787

Int. Cl.[4] A47C *3/00*

U.S. Cl. 297—286 **4 Claims**



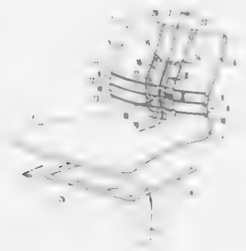
1. In an armchair having legs, a seat, a pair of armrests extending generally upwardly from either side of the seat and a backrest which extends upwardly from the seat intermediate the armrests, wherein the legs, seat, armrest and backrest are integrally molded of a semi-rigid plastic material, the improvement comprising the backrest having a thickness so as to permit the backrest to deflect relative to the seat when pressure is applied thereto, the armrests including a main portion which is spaced relationship with respect to the backrest, said main portion of each armrest having an upper surface, each of said armrests having a generally arcuate connecting element extending from adjacent said upper surface of said main portion and integrally connecting said armrest with the backrest at a point spaced above the seat so as to define an opening between each armrest and the backrest which opening extends toward the seat, each of said connecting elements being yieldable so as to permit a limited deflection of the backrest relative to the seat when pressure is applied against the backrest.

4,856,846

CHAIR WITH A SEAT AND AN INHERENTLY ELASTICALLY PLIABLE BACK REST

Hartmut Lohmeyer, Flemingstr. 94A, D-8000 Munich 81, Fed. Rep. of Germany

PCT No. PCT/DE87/00046, § 371 Date Oct. 13, 1987, § 102(e) Date Oct. 13, 1987, PCT Pub. No. WO87/04909, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 5, 1987, Ser. No. 126,128
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1986, 3604534
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—300 9 Claims



1. A chair having a seat, a back, and an inherently elastically compliant back rest in the hip area, said chair comprising:
said back rest being formed of a plurality of transverse ribs, said ribs being separated from one another by interspaces;
a plurality of connectors holding said ribs together and holding said ribs to said seat and said back, said connectors allowing said transverse ribs to rotate around horizontal axes with respect with one another, said connectors being formed of mutually coacting film hinges, spring means and rotation limiting means, said connectors being molded of plastic in one piece over continuous cross-sections together with said seat, said back and said back rest.

4,856,847

AUTOMOTIVE SEAT WITH WALK-IN DEVICE

Shigeru Kanai, Akishima, Japan, assignor to Tachi-S Co., Ltd., Akishima, Japan

Filed Feb. 24, 1989, Ser. No. 315,453
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—341 6 Claims



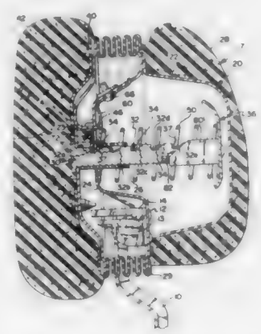
1. An automotive seat with a walk-in device, comprising:
a seat cushion;
a seat back connected rotatably with said seat cushion;
a pair of slide rails provided under said seat cushion, each of said slide rails including a a lower rail fixed to a floor of automobile and an upper rail fitted slidably in said lower rail; and
a locking mechanism for locking and unlocking said upper rail of said slide rail with respect to said lower rail thereof;
wherein said walk-in device includes:
a link member which is provided on one of said pair of slide rails and is to be moved in response to a forward inclination of said seat back;
a rotatable lever plate which is provided on said one of said pair of slide rails in a free-to-rotate manner;
a conecting wire which is at its one end fixed to one end of said rotatable lever plate and at its other end fixed to said link member;
a latching means which is rotatably provided on the other end of said rotatable lever plate;
an actuator pin provided at said the other end of said rotatable lever plate, said actuator pin being so arranged as to actuate said locking mechanism to lock and unlock said slide rail in response to a rotation of said rotatable lever plate; and
an engagement means provided at said upper rail of said slide rail, said engagment means being so adapted that said latching means is to engage said engagement means, to thereby retain an unlocked state of said locking mechanism;

4,856,848

MANUAL HEADREST

Terence J. O'Sullivan, Sterling Height; George W. Mould, Utica; David E. Armstrong, Rochester; Graham S. Foulkes, Sterling Height, and Michael B. Davis, Bloomfield Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 30, 1988, Ser. No. 213,668
Int. Cl.[4] A47C *7/36*
U.S. Cl. 297—391 8 Claims



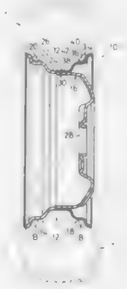
1. A manual fore and aft longitudinally adjustable vehicle seat headrest, said headrest in combination comprising:
a base providing means of attachment of said headrest to said vehicle seat;
a frame connected with said base;
a cushion support providing a cranial contact surface, said cushion support further including an attached shaft, said shaft being slidably mounted with said frame for forward and rearward movement, said shaft having a series of unidirectional cam slots;
spring means biasing said cushion support to an extreme rearward position with respect to said frame;
lever means connecting with said frame for engagement with said shaft slots to set the position of said headrest;
release means to remove said lever and retain said lever from reengagement with said slots upon extreme forward movement of said cushion support thereby allowing said spring to return said cushion support to said extreme rearward position;
means to reengage said lever with said slots whereby said cushion support is reset in said extreme rearward position.

4,856,849

DISK WHEEL FOR A MOTOR VEHICLE

Katsuhiko Fujii; Shiro Sato; Yasuhiro Miyanaga; Heizo Asami; Susumu Takekoshi, and Yasuo Kasai, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1987, Ser. No. 34,960
Claims priority, application Japan, Apr. 4, 1986, 61-49784[U]; Apr. 4, 1986, 61-49785[U]
Int. Cl.[4] B60B *21/02*
U.S. Cl. 301—63 R 2 Claims



1. A disk wheel for a motor vehicle, comprising:
an inner rim portion and an outer rim portion for supporting a tire; and
a disk portion for mounting on a wheel hub of said motor vehicle;
said inner rim portion and said disk portion being integrally formed with each other with a shoulder means therebetween, said outer rim portion being formed independently of said inner rim portion and said disk portion, said integrally formed inner rim portion and disk portion being made by press-forming a first steel sheet and said independently formed outer rim portion being made by press-forming a second steel sheet which is thinner than said first steel sheet so that said inner rim portion and said disk portion are thicker than said outer rim portion;
wherein said outer rim portion is fitted on an outer circumferential surface of said disk portion such that an end face of said outer rim portion abuts said shoulder means and the outer circumferential surface of said inner rim portion and the outer circumferential surface of said outer rim portion smoothly connect to each other.

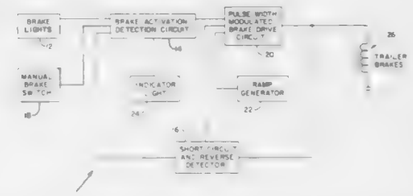
4,856,850

BRAKING CONTROL SYSTEM FOR A TRAILER

William H. Aichele; James O. Hopkins, Jr., and Dale H. Krauskopf, all of Fort Wayne, Ind., assignors to EPCO Products, Inc., New Haven, Ind.

Continuation of Ser. No. 920,569, Oct. 17, 1986, abandoned.
This application Jun. 3, 1988, Ser. No. 205,568
Int. Cl.[4] B60T *13/66;* F16D *65/36*
U.S. Cl. 303—20 8 Claims

1. A trailer brake control system for use in a trailer which is adapted to be towed by a towing vehicle, said trailer including an electrically operated brake mechanism, said towing vehicle including a brake pedal, at least one brake light, and a brake switch operated by said brake pedal to energize said brake light, the control system comprising:
first means responsive to a short circuit condition in said trailer brake mechanism for providing a short circuit signal;
manual switch means for manually actuating said trailer brake mechanism and for providing a manual brake actuation signal;
second means coupled to said first means and said manual switch means for providing a variable amplitude brake actuation signal in response to the closure of said brake switch;
disabling means coupled to said first means, said manual switch means, and said second means, responsive to said short circuit signal for disabling said second means, said disabling means disabling said second means in response to the presence of said manual brake actuation signal independently of the presence or absence of said short circuit signal;



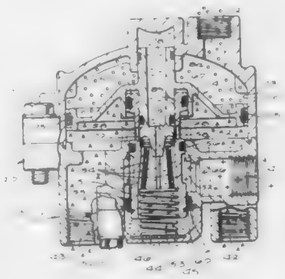
indicator means coupled to said second means responsive to said brake actuation signal or providing a perceptible brake actuation indication signal;
oscillator means for providing a stream of sawtooth pulses;
voltage comparator means coupled to said oscillator means responsive to said stream of pulses and said variable amplitude brake actuation signal for providing a stream of variable width drive pulses; and
switch means coupled to said voltage comparator means and said second means, responsive to said stream of variable width drive pulses to cyclically and repetitively actuate said trailer brake mechanism, thereby applying braking force to the brakes of said trailer.

4,856,851

RELAY AND BOOSTER VALVES FOR AIR BRAKE SYSTEMS

Clarence R. Herring, and Curtis E. Radcliffe, both of 13530 Nelson Ave., P.O. Box 2385, City of Industry, Calif. 91746

Filed Jun. 5, 1987, Ser. No. 58,406
Int. Cl.[4] B60T *11/12*
U.S. Cl. 303—40 21 Claims



1. A relay valve for a fluid operated braking system including a source of brake control pressure for operating the relay valve and a source of supply pressure to be applied to the service brakes of a vehicle comprising:
a valve body defining a supply pressure inlet port, at least one service brake pressure delivery port and an exhaust port;

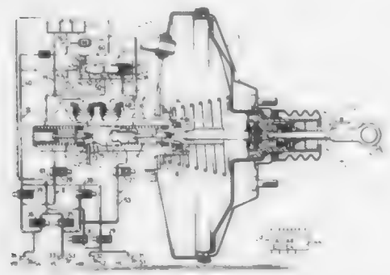
said valve body further defining a control pressure inlet and with said valve body defining a first cylinder for receiving a piston to be operated responsive to control pressure from said control pressure inlet;
a piston within said first cylinder having a pair of faces of the same dimension whereby substantially a 1:1 pressure relationship can be developed on the opposite sides of said piston in a non-operated condition;
said body defining a second cylinder aligned with said first cylinder;
a spool within said second cylinder including the outer surface thereof exposed to supply pressure from said supply inlet;
means sealing said spool within said second cylinder and applying supply pressure balanced in the directions of movement of said spool within said cylinder being responsive to movement of said piston in the presence of piston actuating control pressure;
first internal port means within said valve body for normally exposing the delivery port to said exhaust port;
means responsive to movement of said piston in response to control pressure at said control pressure inlet for closing communication through said first internal port means;
second internal port means communicating between said supply pressure inlet port and said delivery pressure port; and
means responsive to movement of said piston in response to control pressure at said control pressure inlet for opening said second internal port means to allow supply pressure to be applied to said service brake pressure delivery port.

4,856,852

BRAKE SYSTEM WITH SLIP CONTROL

Norbert Ocvirk, Offenbach am Main, and Lutz Weise, Mainz, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 3, 1987, Ser. No. 57,762
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1986, 3619207
Int. Cl.[4] B60T *8/26, 8/32, 8/44*
U.S. Cl. 303—114 **5 Claims**



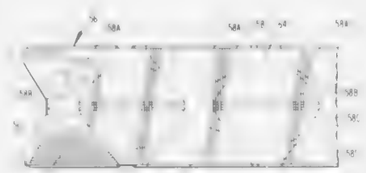
1. A brake system with slip control for an automotive vehicle having front and rear vehicle wheels with wheel brakes, said system comprising, in combination:
a pedal-actuating vacuum booster (3);
a dual-circuit master cylinder (2) operatively connected to said booster (3) and said master cylinder (2) having first and second working chambers (8, 9) therein;
an auxiliary-pressure source (62) having a pump (26) whose input is connected to a pressure-fluid supply reservoir (20);
a plurality of wheel sensors (S1–S4) coupled to said wheels for generating electric signals indicative of wheel rotational behavior;
an electronic circuit (44) respective of said electric signals for providing braking-pressure control signals;
pressure fluid lines respectively coupled between said auxiliary-pressure source (62), said reservoir (20), said first and second chambers (8, 9) and said wheel brakes;
first, second and third normally closed outlet valves (30, 35, 36) respectively connected in the pressure fluid lines between said reservoir (20) and a first one of said front wheels, a second one of said front wheels and a joint connection of said rear wheels;
first and second normally open inlet valves (27, 28) respectively connected in the pressure fluid lines between said first and second chambers (8, 9) and selected ones of said wheel brakes;
a third normally open inlet valve (29) connected between said auxiliary-pressure source (62) and said joint connection of said rear wheels;
first and second normally closed inlet valves (38, 39) respectively connected between said auxiliary-pressure source (62) and said first and second ones of said front wheels; and,
wherein said first and second normally closed inlet valves (38, 39) open during anti-skid control.

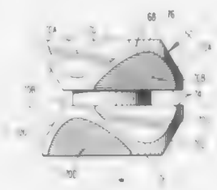
4,856,853

ENDLESS BELT-TYPE DRIVE MECHANISM

Salah E. A. Bayoumi, 26 Nile St., Dokki, Giza, Egypt, assignor to Salah E. A. Bayoumi, Giza, Egypt and Abbas F. Souka, Reston, Va.

Continuation-in-part of Ser. No. 31,679, Mar. 30, 1987, abandoned. This application Jan. 15, 1988, Ser. No. 144,098
Int. Cl.[4] B62D *55/205*
U.S. Cl. 305—35 EB **19 Claims**





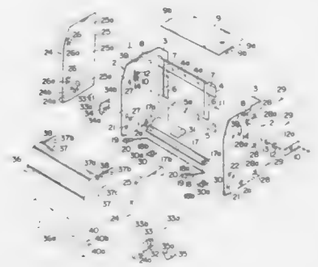
14. A belt mountable on a driven vehicle wheel, said belt comprising flexible band means, a plurality of rows of shoes carried by said band means so as to form axially adjacent, circumferentially extending rows when said band means is mounted on said wheel, said shoes of a first of said rows being circumferentially offset and overlapped relative to said shoes of a second of said rows, said shoes formed of substantially rigid material.

4,856,854

TOWEL DISPENSER

Masanobu Nishiyama; Haruo Nishimura, both of Osaka; Katsuji Nakano, Nishinomiya; Ozaki: Tatsuo, Kyoto, and Akira Kitamoto, Ikoma, all of Japan, assignors to Duskin Co., Ltd., Osaka and Matsushita Electric Industrial Co., Kadoma, both of, Japan

Filed Jun. 19, 1987, Ser. No. 63,629
Int. Cl.[4] B65H *19/00*
U.S. Cl. 312—38 **8 Claims**



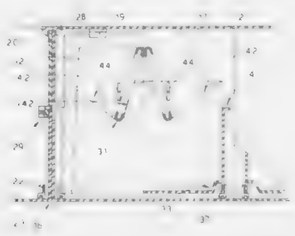
1. A towel dispenser incorporating:
a cover secured to upper end portions of two side plates of a towel dispenser body as a front lid in such a manner as to be openable;
a pin for pivotally supporting said cover, said pin being provided on a tab projecting toward the body from each edge of an upper end portion of said cover;
a pivot arm having one end which is pivotally supported on an outer side of each of said side plates of the body and another, free end which can be pivoted upward; and
a roller provided at the free end of said pivot arm and located at a position where said roller can be engaged with each of said tabs of said cover through an opening formed on each of said side plates.

4,856,855

MODULAR CABINET

Makio Hasuike, Milan, Italy, assignor to Seima Italiana SpA, Tolmezzo, Italy

Filed Apr. 15, 1988, Ser. No. 182,136
Claims priority, application Italy, Jul. 21, 1987, 60412/87[U]
Int. Cl.[4] F16B *12/00*
U.S. Cl. 312—111 **12 Claims**



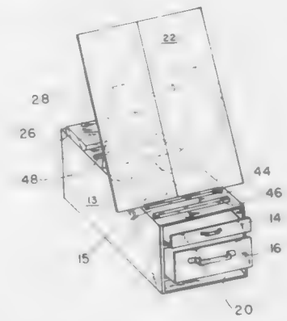
1. A modular cabinet (10) to hold and transport floppy-disks, mini-disks, cards and other office materials in an organized manner, which comprises a cabinet case (39) adapted for attachment to other cabinets, at least one drawer (12) with a front panel (20) and rear closure panel (21), the panels (20–21) being connected by a well (38) having lateral upstanding edges (41), two inner lengthwise handles disposed in said well (38) of said drawer (12), said handles (17) extending between said front and rear panels (20, 21) and being pivotally connected thereto, each said handle (17) being pivotably movable between first and second positions, said first position overlying a central portion of said well (38), and said second position overlying a respective said lateral upstanding edge of said well (38).

4,856,856

PORTABLE ARTIST'S SUPPLY BOX AND EASEL

Violet M. Winstone, Laverne, Calif., assignor to Rebecca Drusilla Winston, Laverne, Calif.

Filed Jul. 20, 1988, Ser. No. 221,870
Int. Cl.[4] H02K *13/00*
U.S. Cl. 312—231 **20 Claims**



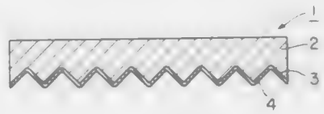
1. A portable combined artist's supply box and easel, comprising:
a frame defining a top working surface;
a permanent easel affixed to said top working surface, said permanent easel comprising at least one section having at least a first sloping surface;
a portable easel of greater size than said permanent easel, said portable easel comprising at least one fold line about which it is foldable for storage, and a lower edge surface;
said top working surface of said frame comprising at least one canvas stop against which said lower edge surface may abut, said portable easel being capable of support by said at least one first sloping surface of said permanent easel and said at least one canvas stop, whereby an artist has the option of choosing to use either easel.

4,856,857

TRANSPARENT REFLECTION-TYPE

Satoshi Takeuchi, Kawasaki; Koutaro Danjo, Tokyo; Shigehiko Tahara, Tokyo; Yoshiharu Yui, Tokyo, and Satoshi Ikeda, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 857,640, Apr. 30, 1986, abandoned. This application Sep. 26, 1988, Ser. No. 249,194
Claims priority, application Japan, May 7, 1985, 60-96469; May 28, 1985, 60-115067; Dec. 2, 1985, 60-271174
Int. Cl.[4] G03H *1/18*
U.S. Cl. 350—3.6 **43 Claims**



1. A transparent reflection-type hologram comprising:
a transparent hologram-forming layer including a relief-hologram forming surface, and

a holographic effect-enhancing layer comprising a thin transparent film,

said holographic effect-enhancing layer having a refractive index n_2 different from a refractive index n_1 of said transparent hologram-forming layer and being formed on the relief-hologram forming surface of the transparent hologram-forming layer, the difference between the refractive index n_1 and the refractive index n_2 being more than 0.2.

4,856,858

OPTICAL SCANNER

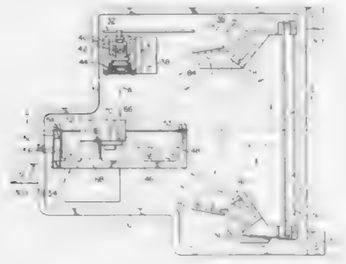
Hirofumi Koike, Tokyo; Yukio Endo, and Tadashi Mitsuhashi, both of Saitama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1988, Ser. No. 145,885

Claims priority, application Japan, Jan. 30, 1987, 62-21331; Jan. 30, 1987, 62-21332; Feb. 23, 1987, 62-41077

Int. Cl.⁴ G02B *26/10*; H02K *33/00*

U.S. Cl. 350—6.6 **6 Claims**



1. An optical scanner comprising:

a base plate disposed in the horizontal direction and having a flat reference surface;

a light source unit rigidly mounted on said base plate and adapted to emit a condensed beam of light;

an optical scanning unit for reflecting said condensed light beam in a repetitive scan cycle; and

an optical system unit for conducting the reflected scanning beam to a surface to be irradiated;

said optical scanning unit comprising a unit base rigidly mounted on said base plate, a torsion bar rigidly supported at the opposite ends of said unit base with said torsion bar being disposed transversely of said optical scanning unit and horizontally and parallel to said base plate, a rotor rigidly mounted on the twistable portion of said torsion bar and including a first mirror for reflecting said light beam, an electromagnetic drive mechanism for applying a rotational drive force to said rotor and a second mirror coupled to said unit base for reflecting the reflected light from said first mirror in a direction substantially perpendicular to the optical path of said reflected light beam from said first mirror, and the unit base of said optical scanning unit being transversely mounted on said base plate such that said torsion bar will be disposed parallel to the base plate, whereby the light beam can be scanned along a plane perpendicular to that of said base plate on the rotation of said rotor and said reflected light beam from said second mirror can be scanned along a plane substantially parallel to that of said base plate through said second mirror.

4,856,859

OPTICAL WAVEGUIDE AND METHOD FOR FABRICATING THE SAME

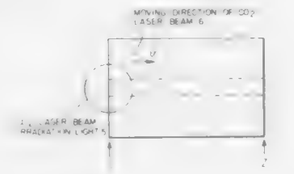
Katsuyuki Imoto, Sayama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

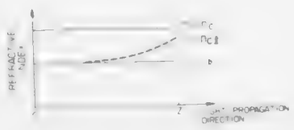
Filed Feb. 17, 1988, Ser. No. 156,593

Claims priority, application Japan, Mar. 13, 1987, 62-56526

Int. Cl.⁴ G12B *6/10*

U.S. Cl. 350—96.12 **17 Claims**





1. An optical waveguide comprising a low refractive index layer having a refractive index of n_b, a core waveguide formed on said low refractive index layer and having a refractive index of n_c (where $n_c > n_b$) and a cladding formed on said core waveguide and having a refractive index n_{cl} (where $n_{cl} < n_c$, $n_{cl} \neq n_b$) varying in the propagation direction of optical signals.

4. A method for fabricating an optical waveguide comprising the steps of:

forming, on a low refractive index layer having a refractive index of n_b, a core waveguide having a refractive index of n_c (where $n_c > n_b$);

forming, on said core waveguide, a cladding having a refractive index n_{cl} (where $n_{cl} < n_c$, $n_{cl} \neq n_b$) varying in the propagation direction of optical signals; and

applying heat energy onto the cladding along the propagation direction of optical signals in the optical wave so as to vary the refractive index of said cladding in the propagation direction of optical signals.

4,856,860

INTEGRATED ALL-OPTICAL SWITCHING DEVICES

Yaron Silberberg, Princeton Township, Mercer County, and Peter W. Smith, Colts Neck Township, Monmouth County, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed May 26, 1988, Ser. No. 199,169

Int. Cl.⁴ G02B *6/10*

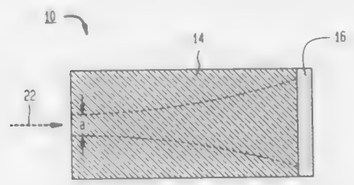
U.S. Cl. 350—96.12 **3 Claims**

1. A two-dimensional self-focused optical device having a hysteresis characteristic and comprising:

means defining a planar non-linear single-mode waveguide;

reflective means at one end of said waveguide defining means; and

means for introducing an input light beam at an opposite end of said waveguide defining means, whereby there is no self-focusing in the device for an input beam less than a critical hysteretic value but there is self-focusing for an input light beam above above critical hysteretic value and



for as long as the input light beam remains above a minimum holding value.

4,856,861

LIGHT WAVEGUIDE LENS

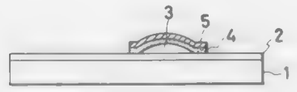
Mamoru Miyawaki; Shigetaro Ogura, both of Tokyo, and Kazuya Matsumoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

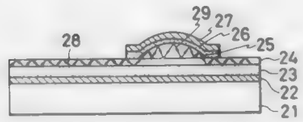
Continuation of Ser. No. 635,518, Jul. 30, 1984, abandoned. This application Jun. 4, 1987, Ser. No. 58,603

Claims priority, application Japan, Aug. 3, 1983, 58-142211; Aug. 4, 1983, 58-142956

Int. Cl.⁴ G02B *6/10*

U.S. Cl. 350—96.14 **8 Claims**





1. A light waveguide lens comprising:

a light waveguide;

a lens portion provided in a portion of said light waveguide, said lens portion having a finite focal distance; and

a thermoelectric converting element provided in proximity of at least one of said light waveguide and said lens portion, said converting element reversibly varying the refractive index of at least one of said light waveguide and said lens portion by varying the temperature thereof and thereby reversibly varying the focal length of said lens portion.

4,856,862

OPTICAL STORAGE METHOD AND APPARATUS

Charles G. Passmore, Palos Verdes Estates; Robert D. Mowry, Huntington Beach, and Alan G. Brown, Manhattan Beach, all of Calif., assignors to Photonics Laboratories, Inc., Los Angeles, Calif.

Filed Apr. 22, 1988, Ser. No. 185,103

Int. Cl.⁴ G02B *6/26*

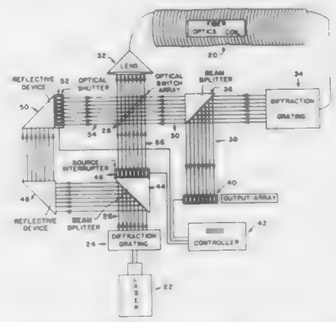
U.S. Cl. 350—96.15 **31 Claims**

18. Apparatus for maintaining information contained in the modulation of light comprising:

optical means for defining an optical path of substantial length having an input end and an output end;

light source means for directing light toward the input end of said optical means;

optical control means between the light source means and the input end of the optical path, said optical control means being a means for controlling the passage of light from the light source means to the input end of the optical path responsive to control light directed thereto;



means for directing light from the output end of said optical means to said optical control means as the control light therefore;

whereby the information in the light coming from the output end of the optical means is replicated and regenerated in the light directed into the input end of the optical means.

4,856,863

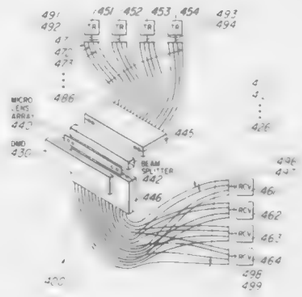
OPTICAL FIBER INTERCONNECTION NETWORK INCLUDING SPATIAL LIGHT MODULATOR

Jeffrey B. Sampsell, and Terrance G. McDonald, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 22, 1988, Ser. No. 209,655

Int. Cl.⁴ G02B *6/28*; H01S *3/00*; H01J *5/16*; G02F *1/00*

U.S. Cl. 350—96.16 **14 Claims**



1. An optical interconnection network, comprising:

(a) a spatial light modulator with a plurality of reflective pixels, each of said pixels having at least first and second states.

(b) an optical system, said optical system (i) imaging light emitted from one of a plurality of optical inputs onto a corresponding pixel of said spatial light modulator and (ii) reimaging said light afer reflection from said corresponding pixel if said corresponding pixel is in said first state but not if said corresponding pixel is in said second state onto one of a plurality of optical outputs, said reimaging sub-

stantially retracting the rays of said imaging through said optical system.

4,856,864

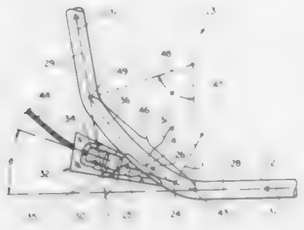
OPTICAL FIBER DISTRIBUTION NETWORK INCLUDING NON-DESTRUCTIVE TAPS AND METHOD OF USING SAME

Campbell, Bruce D., Portola Valley, and Joseph Zucker, Foster City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 754,035, Jul. 11, 1985. This application Aug. 31, 1988, Ser. No. 239,085

Int. Cl.[4] G02B *6/28; H04B 9/00; H01J 5/16; G02F 1/00*

U.S. Cl. 350—96.16 3 Claims



1. An apparatus for reducing a magnitude of an optical signal excess loss created by a light read tap which withdraws part of an optical signal representative of information out of an optical fiber through a side thereof, comprising:

N means for modifying an energy distribution of an optical signal within an optical fiber upstream of a first location so as to reduce an integrated energy ratio between an outermost and an innermost section of a core of the optical fiber in a vicinity of the first location, N being an integer;

a first light read tap for withdrawing a first part of the optical signal at the first location through a side of an optical fiber section, an optical signal excess loss created by the first light read tap being less than an optical signal excess loss which would be created if the integrated energy ratio was not modified; and

means for detecting the first part of the optical signal so as to detect information represented by the optical signal.

2. An apparatus for multiplexing an optical signal at a first location into an optical fiber using a first light write tap so as to reduce an attenuation of a pre-existing optical signal in the optical fiber caused by the first light write tap, comprising:

N means for modifying an energy distribution of a pre-existing optical signal within an optical fiber upstream of a first location so as to reduce an integrated energy ratio between an outermost and an innermost section of a core of the optical fiber in a vicinity of the first location, N being an integer; and

a first light write tap for injecting a first optical signal into a first optical fiber section through a side of the first optical fiber section at the first location, an attenuation of the pre-existing optical signal created by the first light write tap being less than an attenuation of the pre-existing optical signal if the integrated energy ratio was not modified.

4,856,865

TUNABLE SPLICE FOR FIBER OPTICS

Nicholas A. Lee, Eagan, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 19, 1988, Ser. No. 145,132

Int. Cl.[4] G02B *6/38*

U.S. Cl. 350—96.21 23 Claims

1. A tunable fiber optic connector comprising

a deformable housing;

a V-groove block in said housing; and

first and second ferrules inserted in said housing and lying in said V-groove such that when said housing is deformed in a predetermined manner by externally applied pressure said ferrules may be rotated and when said pressure is



released, said ferrules are held in place, said ferrules having first and second diameters respectively, said first and second diameters being unequal, and each of said ferrules having a major axis and a bore for receiving and holding an optical fiber parallel to but offset from said major axis.

4,856,866

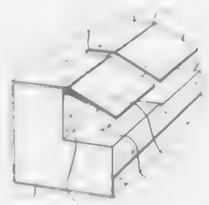
OPTICAL FIBER CONNECTING MEANS

Lucius J. Freeman, Hartwell, and Paul F. Gagen, Duluth, both of Ga., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 912,021, Sep. 29, 1986, abandoned. This application Aug. 15, 1988, Ser. No. 232,516

Int. Cl.[4] G02B *6/38*

U.S. Cl. 350—96.21 7 Claims



1. In combination, a first length of an optical fiber signal-transmissively joined to a second length of optical fiber by means of an optical fiber connector, the connector comprising

(a) first and second cylindrical plugs, the first and second plug each having an outer diameter, an axis, a cylinder surface, an end face and a longitudinal bore adapted for receiving therein a portion of the first and second optical fibers, respectively, the fiber to be fixed in the respective bore, the bore having an axis that is essentially coincident with the axis of the respective plug, the end of the optical fiber to be essentially flush with the end face of the respective plug;

(b) alignment means for maintaining the first and second plugs aligned such that the axis of the first plug is substantially collinear with the axis of the second plug, with opposed plug end faces, the alignment means contacting the first and second plug cylinder surfaces and comprising spring clip means having two (not necessarily identical) halves, such that the connector can accommodate a first plug whose outer diameter differs by a relatively large amount from that of the second plug, wherein

(i) the alignment means comprise an alignment block having two arms and being of basically L-shaped cross section and adapted for receiving the plugs in the space defined by the two arms; and

(ii) the spring clip means are adapted for urging the first and the second plugs into the space defined by the two

arms of the alignment block, and at least partially circumferentially surround at least a portion of the alignment block and extend over at least part of the space defined by the two arms of the alignment block, and furthermore comprise a transverse slit that defines the two halves, with one half of the spring clip urging the first plug and with the other half urging the second plug.

4,856,867

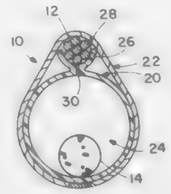
CARRIER CABLE, FIBER OPTIC CABLE, AND SHEATH SUPPORT ASSEMBLY

Wayne L. Gaylin, 2330 Athena Rd., West Linn, Oreg. 97068

Filed Sep. 10, 1984, Ser. No. 648,475

Int. Cl.[4] G02B *6/44*

U.S. Cl. 350—96.23 9 Claims



1. In combination with an elongate messenger strand extending in a suspended expanse between spaced uprights supporting the ends of the expanse of strand, the messenger strand having a given coefficient of linear expansion, the combination further including a cable at least coextensive with the expanse of messenger strand having a coefficient of linear expansion which is substantially less than that of the messenger strand,

a sheath support assembly interconnecting the strand expanse and cable throughout essentially the length of the expanse whereby the cable becomes suspended by the expanse of strand, the assembly comprising

an elongate, flexible sheath extending the length of the assembly having passage means extending therealong, said passage means including a first portion extending the length of the assembly having a floor and said first portion receiving said cable with the cable loosely and slideably resting on said floor, said passage means further including a second portion receiving said messenger strand, said sheath having entry means extending the length thereof for allowing introduction of the cable and the strand to said passage means of said sheath, and

means extending about said sheath securing said sheath circumferentially and throughout the length of the assembly with said cable and strand received in said passage means.

4,856,868

CABLES COMPRISING OPTICAL FIBRES OF HALIDE GLASS

Paul W. France; Steven F. Carter, and Martin W. Moore, all of Ipswich, England, assignors to British Telecommunications public limited company, Great Britain

Filed Feb. 19, 1988, Ser. No. 157,569

Claims priority, application United Kingdom, Feb. 24, 1987, 8704217

Int. Cl.[4] G02B *6/44*

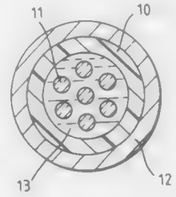
U.S. Cl. 350—96.23 13 Claims

13. An optical fibre cable comprising:

a bundle of optical halide glass fibres including at least a portion made from fluoride glass and therefore susceptible to catastrophic damage if exposed at all to water;

a flexible sheath surrounding said bundle of halide fibres; and

a protective organic liquid filling a substantial portion of the interstices between said fibres and said sheath, said liquid including dissolved water therein and being capable of continuing to dissolve further water thereinto over the life of said cable thereby protecting said halide glass fibres



from catastrophic damage due to water exposure even though the liquid itself is at all times contaminated with dissolved water.

4,856,869

DISPLAY ELEMENT AND OBSERVATION APPARATUS HAVING THE SAME

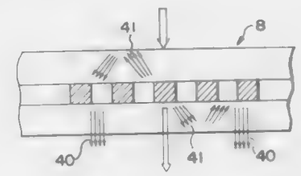
Hajime Sakata; Yasuyuki Watanabe, both of Hiratsuka; Masato Yamanobe, Machida; Yukitoshi Ohkubo, Yokohama, and Akihiro Nagano, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1987, Ser. No. 35,017

Claims priority, application Japan, Apr. 8, 1986, 61-81393; Apr. 8, 1986, 61-81394; Apr. 10, 1986, 61-82527; Mar. 6, 1987, 62-51630; Mar. 6, 1987, 62-51631; Mar. 6, 1987, 62-51632

Int. Cl.[4] G02B *5/18*

U.S. Cl. 350—162.18 12 Claims



1. A display element comprising:

a substrate; and

a display pattern formed on said substrate, said display pattern including a diffraction grating,

wherein the width in the direction perpendicular to grating lines of said diffraction grating is selected so as to prevent rediffraction of the light diffracted by said diffraction grating.

4,856,870

LASER MODULE

Jacobus A. P. Berkers, Helden, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Filed Mar. 28, 1988, Ser. No. 173,881

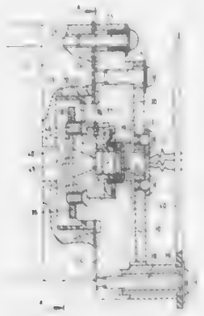
Claims priority, application Netherlands, Apr. 9, 1987, 8700836

Int. Cl.[4] G02B *7/02*

U.S. Cl. 350—252 11 Claims

1. A laser module comprising: a laser holder and a solid state laser mounted thereon; a lens system mounted in a lens holder for receiving light emitted by the laser, the lens holder being movable with respect to the laser holder and being provided with a cylindrical part having a first screwthread; the laser holder being provided with a first cylindrical recess having a second screwthread, and a means for preventing rotation of the

lens holder; and a rotatable intermediate ring which is disposed between the two screwthreads and is provided with an internal screwthread in engagement with the first screwthread and an



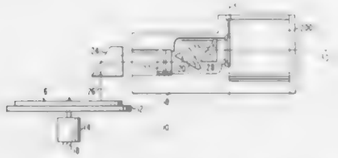
external screwthread in engagement with the second screwthread, the pitch of the internal screwthread being different from and less than the pitch of the external screwthread.

4,856,871

REPLACEABLE LASER AND LENS ASSEMBLY

Glen J. Van Sant, Peandel, Pa., assignor to General Electric Company, Moorestown, N.J.

Filed Aug. 31, 1987, Ser. No. 91,182
Int. Cl.[4] G02B *7/02*
U.S. Cl. 350—253 **20 Claims**



1. A replaceable assembly including a light-emitting device for an optical apparatus requiring a focussed light beam at a predetermined distance from a reference plane, said assembly comprising:

a light-emitting device for emitting light in a forwardly direction parallel with an axis, said light emitting device requiring cooling during normal operation;

a lens to focus said light;

a heat pump including a cold surface and a hot surface;

first mechanical and thermal coupling means coupled to said light-emitting device, to said lens, and at a heat transfer surface to said cold surface of said heat pump, for forming a mechanical combination, said first mechanical and thermal coupling means being arranged for holding said lens in a selectable position before said light-emitting device, said first mechanical and thermal coupling means being constructed from a material dimensioned and thermally isolated from adjacent structures such that, in operation, said lens and said light emitting device are at least thermally cantilevered from said cold surface of said heat pump, and a substantially uniform temperature is maintained over the entirety of said first mechanical and thermal coupling means,

second mechanical and thermal coupling means, said second mechanical and thermal coupling means being at least thermally coupled at a heat transfer surface to said hot surface of said heat pump and mechanically coupled to at least said first mechanical and thermal coupling means for holding said mechanical combination of said light emitting device, said lens, said first mechanical and thermal coupling means, and said heat pump in a position with said axis substantially orthogonal relative to a reference plane, said second mechanical and thermal coupling means being thermally coupled for sinking heat transferred thereto by said hot surface of said heat pump; and

wherein said selectable position of said lens relative to said light-emitting device is selected at normal operating temperature and condition of said lens, light-emitting device, heat pump, and first and second mechanical and thermal coupling means to produce focus at said predetermined distance from said reference plane, whereby the positions of said lens and said light emitting device relative to said reference plane are repeatable at said operating temperature and condition, and said assembly may be freely substituted for another like assembly for producing focussed light at said predetermined distance from any reference plane.

4,856,872

ATTACHMENT FOR MICROSCOPES

M. Spitznas, Bonn; Wolfgang Veit, Solms-Burgsolms, and Rainer Kirchhuebel, Asslar, all of Fed. Rep. of Germany, assignors to Oculus Optikgeraete GmbH, Wetzlar, Fed. Rep. of Germany

Filed Mar. 12, 1987, Ser. No. 25,111
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1986, 3608515
Int. Cl.[4] G02B *7/02*
U.S. Cl. 350—255 **10 Claims**



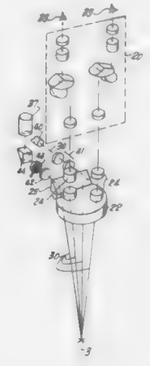
8. In an attachment for a microscope, in particular stereomicroscopes for facilitating a contact-free viewing of an eye freely movable by the patient, in particular the fundus of the eye, the improvement wherein the attachment has two lens means arranged in a housing thereof, the distance between said lens means being adjustable for the purpose of compensating for the sight deficiency of said eye, said lens means replacing the objective lens of the microscope, wherein said attachment having an adapter is connected to the microscope, wherein a quick-change adapter is adapted to be attached to said adapter, which quick-change adapter has an axis of rotation to which a lever is secured, on which lever, at an equal distance from the axis of rotation, is arranged, on one side, said attachment, and on the other side, said normal objective lens of said microscope, wherein an outer lens of said lens means of said attachment is arranged easily movably relative to said housing in the axial direction thereof to prevent injury to said eye should the microscope be inadvertently adjusted to bring the lens into engagement with said eye, and wherein all reciprocally movable and turnable parts of said attachment are provided with a coating which consists of pressed and sintered PTFE polymers containing Al_2O_3 particles.

4,856,873

DOCUMENTATION ILLUMINATION MODULE

Larry K. Kleinberg, Toluca Lake, Calif., assignor to Storz Instrument Company, St. Louis, Mo.

Filed May 15, 1987, Ser. No. 50,948
Int. Cl.[4] G02B *21/06, 21/18*
U.S. Cl. 350—502 **14 Claims**



1. In a microscope system having at least one eyepiece for viewing a field of view and having a documentation means for receiving and recording optical images and further having a source of illumination, the improvement comprising:

a module comprising a housing for attaching to said microscope system and to said documentation means;

said housing having an illumination port for receiving illumination from said source of illumination;

said housing having a means defining an illumination channel and an image channel, said illumination channel optically communicating with said illumination port and said image channel optically communicating with said documentation means;

a common optical directing means disposed in said microscope system and communicating with said illumination channel and with said image channel for directing light from said illumination channel onto said field of view and for directing light reflected from said field of view into said image channel;

an objective lens system disposed in said microscope system for directing light reflected from said field of view to said eyepiece, said objective lens system being disposed on a line of sight different from that of said optical directing means such that the light directed into said image channel via said optical directing means and the light directed to said eyepiece via said objective lens system are derived from different lines of sight.

4,856,874

SAFETY DEVICES FOR SUBMARINE LASERS

Robert F. Tusting, Ft. Pierce, Fla., assignor to Harbor Oceanographic Institution, Inc., Ft. Pierce, Fla.

Continuation-in-part of Ser. No. 40,991, Apr. 20, 1987. This application Apr. 25, 1988, Ser. No. 185,548
Int. Cl.[4] G02B *26/02*
U.S. Cl. 350—267 **10 Claims**

1. A laser device for use in submarine service comprising:

a laser unit capable of emitting a coherent light beam,

a waterproof housing enclosing said laser unit,

a window portion in said housing through which said coherent light beam exists said laser device, and means to permit said coherent light beam to issue from said laser device through said window portion only when said laser device is immersed in water.



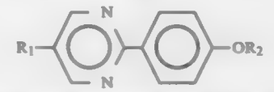
4,856,875

LIQUID-CRYSTAL DISPLAY DEVICES OF TWISTED NEMATIC TYPE

Shyuichi Kozaki, Nara; Yukiko Ichimura, Tenri, and Yozo Narutako, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 29, 1987, Ser. No. 139,025
Claims priority, application Japan, Dec. 29, 1986, 61-312753
Int. Cl.[4] G02F *1/13;* **C09K** *19/34*
U.S. Cl. 350—341 **8 Claims**

1. A liquid-crystal display device of the twisted nematic type which comprises (1) a pair of electrode substrates facing each other, each being provided with an orientation membrane, the surface of which is treated by rubbing, and (2) a nematic liquid-crystal composition having a positive dielectric anisotropy and containing an optically active substance, sandwiched between the two electrode substrates and arranged so that the axes of the liquid-crystal molecules will be twisted by a prescribed angle ϕ, said nematic liquid-crystal composition comprising at least 5 weight % of liquid-crystals of a pyrimidine derivative represented by the following formula (I),



(I)

wherein R_1 and R_2 are each a straight-chain alkyl group of 1 to 12 carbon atoms, and said angle ϕ being set at a level in the range of $210° \leqq \phi \leqq 300°$ under the condition of $(\phi/360° - 1.4) < d/p < \phi/360°$, in which p represents the helical pitch of liquid-crystal molecules and d represents the thickness of liquid-crystal layer.

4,856,876

FLUORESCENT COLORED ENCAPSULATED LIQUID CRYSTAL APPARATUS USING ENHANCED SCATTERING

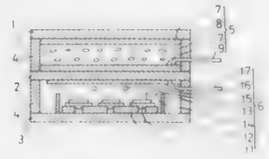
James L. Fergason, Atherton, Calif., assignor to Manchester R & D Partnership, Pepper Pike, Ohio

Continuation-in-part of Ser. No. 480,466, Mar. 30, 1983, Pat. No. 4,596,445. This application Jun. 23, 1986, Ser. No. 877,109
The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—350 F **99 Claims**



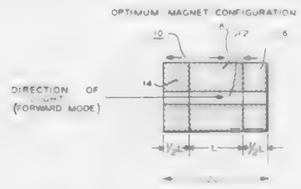
1. A liquid crystal apparatus, comprising liquid crystal material, surface means for distorting the natural structure of said liquid crystal material in the absence of a prescribed input to cause scattering of light, said liquid crystal being responsive to a prescribed input to reduce the amount of such scattering, and fluorescent means for fluorescing during such scattering of light.

4,856,877
DISPLAY UNIT
Kadotaro Nishimori, and Masazumi Ito, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Nov. 30, 1987, Ser. No. 126,964
Claims priority, application Japan, Nov. 29, 1986, 61-285163
Int. Cl.[4] G02F *1/135, 1/01*
U.S. Cl. 350—356 **10 Claims**



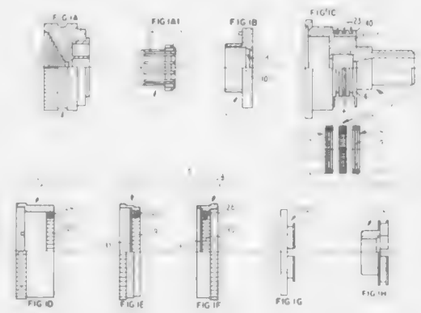
1. A display unit, comprising:
a light-receiving type display means for displaying information by receiving light from an external light source, said light receiving type display means having a first predetermined pattern to be displayed; and
a self-illuminating type display means for displaying by self-illumination information different from the information displayed by said light-receiving type display means, said self-illuminating type display means having a second predetermined pattern to be displayed, and said self-illuminating type display means disposed under said light-receiving type display means so as to act as the external light source for said light-receiving type display means;
said self-illuminating type display means illuminating all of said light-receiving type display means when said first predetermined pattern is displayed by said light-receiving type display means, and said light-receiving type display means being unenergized to transmit light from said self illuminating type display means when said second predetermined pattern is displayed by said self-illuminating type display means.

4,856,878
MAGNETIC CONFIGURATION FOR FARADAY ROTATORS
Donald K. Wilson, 102 Hillside Ave., West Caldwell, N.J. 07006, and Allan Heiney, 292 N. Fifth Ave., Highland Park, N.J. 08904
Filed Dec. 4, 1987, Ser. No. 128,598
Int. Cl.[4] G02F *1/09*
U.S. Cl. 350—375 **12 Claims**



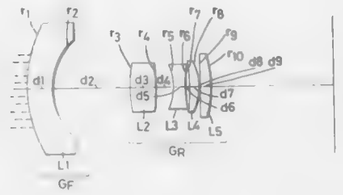
1. A Faraday rotator comprising:
an optical element having an optical axis, said optical element being made of a light transmitting material;
a first magnet for generating a magnetic field along the optical axis of said optical element, said magnet having a front end and a rear end, said magnetic field being generated in one direction and said first magnet having a specified length 1.0L; and
a pair of tuning magnets, each tuning magnet being located at a front end or a rear end of said first magnet, each tuning magnet generating a magnetic field in a direction opposite to the direction of the magnetic field being generated by said first magnet, and the total combined length of said tuning magnets being from about 0.8L to about 1.4L.

4,856,879
AIMING DEVICE
Walter Gehmann, Karlstrasse 40, 7500 Karlsruhe, Fed. Rep. of Germany
Filed Mar. 17, 1987, Ser. No. 26,952
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1986, 3623513
Int. Cl.[4] G02B *5/30, 26/02, 27/28*
U.S. Cl. 350—407 **9 Claims**



1. An aiming device comprising: a tubular housing portion, an eyepiece containing an adjustable diaphragm mounted onto said housing portion from one axial end thereof, said housing portion having formed therein at the other axial end thereof a partially annular cavity arranged eccentrically so as to be open at one side, a color filter disc and two polarizing filter discs disposed in said cavity side by side so as to permit their rotation relative to one another within said cavity and having a diameter so as to be essentially tangential to a circle defined by the part of the tubular housing portion in which said discs are disposed, an operating ring for each of said discs disposed around said tubular housing portion from said other axial end thereof and receiving therein the respective disc, each of said discs having a circumferential gear structure and each of said rings having an internal gear structure in engagement with the exposed side of the associated disc and in engagement with the circumferential gear structure thereon for rotating said discs as desired, the tubular housing portion defining said cavity having partially circular guide grooves formed in the outer surface thereof in planar alignment with said discs and said operating rings having inwardly projecting pins received in said grooves for engaging said operating rings in position and said tubular housing portion having an axial slot intersecting said guide grooves, said axial slot being adapted to accommodate said projecting pins during mounting of said operating rings and said guide grooves further including stop members adapted to limit rotational movement of said operating rings and said discs to a desired angle and removable means for retaining said operating rings in their engaged positions around said housing portion.

4,856,880
PHOTO-TAKING LENS FOR AN UNDERWATER CAMERA
Koichi Ohshita, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Jul. 19, 1988, Ser. No. 221,201
Claims priority, application Japan, Jul. 27, 1987, 62-186919
Int. Cl.[4] G02B *13/04*
U.S. Cl. 350—418 **8 Claims**

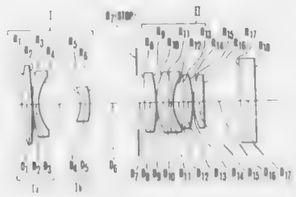


1. A photo-taking lens of a two-unit construction for an underwater camera comprising, in succession from the object side, a fixed forward unit having a first element having a meniscus lens having its convex surface facing the object side and having a negative refractive power when the medium on the object side is water, and a rearward unit having a positive second element having a biconvex positive lens, a negative third element having a biconcave negative lens, a positive fourth element having a positive meniscus lens having its convex surface facing the image side, and a positive fifth element having a positive lens having its surface of sharper curvature facing the image side, and movable as a whole along the optic axis for focusing, characterized in that said photo-taking lens satisfies the following condition:

$$0.75f < r_2 < 2f,$$

where f is the rearward focal length of the entire system during focusing at infinity when the medium on the object side is water, and r_2 is the radius of curvature of that surface of said first element which is adjacent to the image side.

4,856,881
PHOTOGRAPHIC LENS OF LONG BACK FOCAL LENGTH
Akihiko Shiraishi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 23, 1987, Ser. No. 100,358
Claims priority, application Japan, Sep. 25, 1986, 61-226541; Sep. 25, 1986, 61-226543
Int. Cl.[4] G02B *9/64*
U.S. Cl. 350—463 **25 Claims**



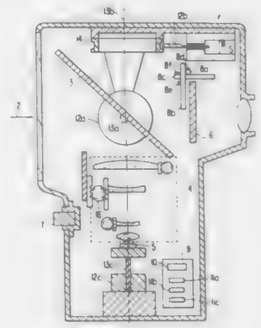
1. A photographic lens comprising:
from front to rear,
a first lens unit having a negative refractive power, said first lens unit including a first lens having a positive refractive power and whose front surface is convex toward the front, a meniscus-shaped second lens having a negative refractive power and convex toward the front, and a lens whose frontmost surface is concave toward the front; and
a second lens unit having a positive refractive power, wherein said lens concave toward the front is a third lens in the form of a singlet, and further wherein the photographic lens satisfies the following conditions:

$$1.2 \leqq |f_I/f| \leqq 2.8$$

$$0.6 \leqq |f_I/f_{II}| \leqq 2.2$$

where f is the focal length of the entire lens system, and f_I and f_{II} are the focal lengths of said first and said second lens units, respectively.

4,856,882
CAMERA APPARATUS WITH MEANS FOR SUPPRESSING FLUCTUATIONS OF THE IMAGE
Mitsuaki Oshima, Moriguchi; Masataka Izaki, Yawata; Jirou Kajino, Neyagawa; Yoshiaki Igarashi, Ikoma, and Hiroshi Mitani, Daito, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Division of Ser. No. 688,154, Dec. 31, 1984, Pat. No. 4,623,930.
This application Jul. 17, 1986, Ser. No. 886,424
Claims priority, application Japan, Dec. 29, 1983, 58-251306
Int. Cl.[4] G02B *27/64*; G03B *15/00*
U.S. Cl. 350—500 **8 Claims**



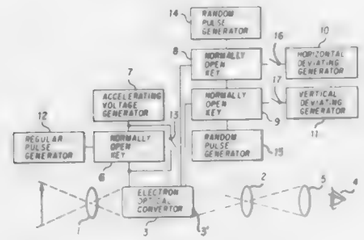
1. A camera apparatus comprising:
focusing means for optically focusing a beam of light from an object;
imaging means for converting an optical image produced by the focusing means into electrical or physicochemical information and issuing or recording the information as an image,
means for detecting fluctuations of the camera apparatus and issuing a fluctuation detecting signal;
means responsive to the fluctuation detecting signal for issuing an image fluctuation control signal;
means responsive to the image fluctuation control signal for suppressing fluctuations of the image due to the fluctuations of the apparatus,
wherein said image fluctuation control signal issuing means comprises:
means for generating a specific constant signal;
means for adding the specific constant signal and the fluctuation detecting signal; and
means for integrating an added output signal from said adding means to obtain said image fluctuation control signal for controlling said suppressing means to change the image-taking direction substantially at a constant angular velocity with respect to an absolute coordinate system.

4,856,883

METHOD OF AND DEVICE FOR SEEING OBJECTS INCLUDING JUMP-LIKE MOVEMENTS OF AN OUTPUT IMAGE ABOUT A STATIONARY MAIN OPTICAL AXIS

Iosif Baumberg, 69 Bay 29 St., Brooklyn, N.Y. 11235

Filed Jan. 11, 1988, Ser. No. 142,421
Int. Cl.[4] G02B *23/00, 27/00, 27/64*
U.S. Cl. 350—538 6 Claims



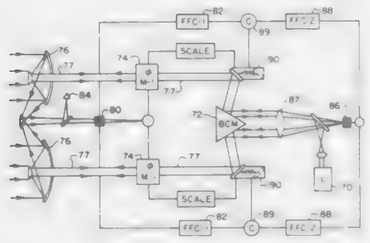
1. A method of seeing objects, comprising the steps of
seeing through an optical system having a stationary main optical axis throughout the optical system; and
deviating an output image of the optical system away of the stationary main optical axis by jump-like movements with randomly distributed intervals.

4,856,884

DYNAMICALLY MATCHED OPTICAL FILTERING IN A MULTIPLE TELESCOPE IMAGING SYSTEM

Janet S. Fender, and Petras V. Avizonis, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 16, 1988, Ser. No. 169,241
Int. Cl.[4] G02B *23/00, 27/14;* H01J *40/14;* G01R *9/02*
U.S. Cl. 350—557 2 Claims



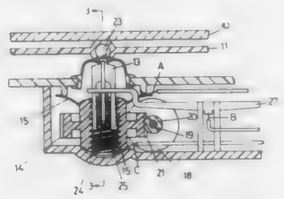
1. A multiple telescope optical imaging system having a dynamically matched optical filtering capability comprising:
a plurality of optical telescopes each forming a subaperture beam of a composite image beam;
beam combining means having a plurality of reflective surfaces;
translatable beam displacement means in the beam path between each of said optical telescopes and an associated one of said reflective surfaces of said beam combining means, and reflecting a subaperture beam to a prescribed area on said associated one of said reflective surfaces;
imaging means for receiving subaperture beams reflected from said beam combining means;
said subaperture beams impinging on said imaging means being separated at said imaging means in accordance with particular displacements of said beam displacement means, whereby said subaperture beams are combined by said imaging means in a manner to enhance or suppress spatial frequencies of interest;
means for driving said beam displacement means in a direction along the path of an associated subaperture beam and to a position for deriving the maximum output signal from said imaging means; and
means for dithering said beam displacement means at a prescribed rate to vary the spatial frequency response of said imaging system.

4,856,885

MIRROR ORIENTATION CONTROL MEANS

Garry G. L. Fimeri, Lonsdale, Australia, assignor to Britax Rainsfords Pty. Ltd., Lonsdale, Australia

Filed May 4, 1988, Ser. No. 190,013
Claims priority, application Australia, May 4, 1987, PI1719
Int. Cl.[4] B60R *1/06;* G02B *5/08*
U.S. Cl. 350—633 6 Claims



1. Control means for controlling the orientation of a rear vision mirror of a mirror assembly of a motor vehicle wherein a pair of electric motors drive respective gear nuts which threadably engage respective non-rotational screw shafts pivoted to a mirror backing plate which retains said mirror, each said gear nut comprising conductive material, wiper contacts comprising bearings contacting the ends of each gear nut, each gear nut having sufficient resistance between its ends to provide a potential gradient when a voltage is applied to the wiper contacts from the vehicle's electrical system, and
a conductive wiper in contact with a surface of said gear nut, thereby receiving a voltage signal from said potential gradient which is a function of the position of the screw shaft within the nut, thereby in turn sensing orientation of the mirror.

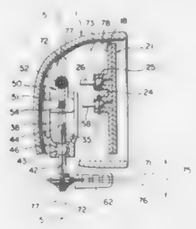
4,856,886

OUTSIDE REAR-VIEW MIRROR HAVING A MECHANICALLY ADJUSTABLE MIRROR GLASS FOR A VEHICLE

Herwig W. Polzer, Miltenberg, and Edwin Seitz, Neuenbuch, both of Fed. Rep. of Germany, assignors to Hohe KG, Collenberg, Fed. Rep. of Germany

Filed Nov. 9, 1987, Ser. No. 118,071
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1986, 3638245; Nov. 14, 1986, 3638876
Int. Cl.[4] G02B *7/18;* B60R *1/06*
U.S. Cl. 350—635 14 Claims

1. An outside rear-view mirror for a vehicle, said rear-view mirror comprising:
a mirror housing mounted to a pedestal such that said mirror housing may rock relative to said pedestal upon impact,
a mirror glass held within said mirror housing,
pivot means holding said mirror glass within said mirror housing for pivoting said mirror glass about at least one of two perpendicular pivot axes, one of said pivot axes being normally upright and the other of said pivot axes running transversely to a vehicle to which said pedestal is fastened,
an adjusting device for adjusting the position of said mirror glass,
said adjusting device including a lever mounted to said mirror housing and adapted to rotate about rotational axes running parallel to said pivot axes of said mirror glass, and
a first arm of said lever being coupled to a handle which may be manipulated from an interior of the vehicle, a second arm of said lever being coupled to said mirror glass through two spaced articulation joints, the first of said articulation joints being placed within a plane including one of said pivot axes and extending perpendicular to the other of said pivot axes positioned outside said plane, both of said two articulation joints including a coupling arm and a link, one end of said coupling arm being integral with said lever and one end of said link being secured to said mirror glass, the other end of said coupling arm and the other end of said link forming a ball captured within a cage for pivotal movement of said link by movement of said lever to pivot said mirror glass about said pivot means.

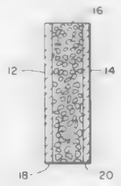


4,856,887

LIGHTWEIGHT SILICON CARBIDE MIRROR

Jason M. Wakugawa, El Segundo; Lawrence S. Gresko, Long Beach, and Kenneth M. Brown, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 1, 1987, Ser. No. 33,480
Int. Cl.[4] G02B *5/08, 7/18*
U.S. Cl. 350—641 7 Claims



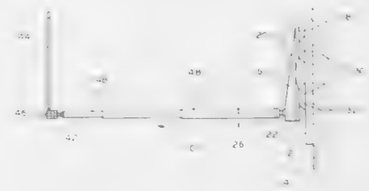
1. A mirror comprising:
a substrate which comprises foam-like silicon carbide material having a solid to void ratio such that the substrate has a bulk density which is substantially less than a maximum possible bulk density; and
at least one facesheet integrally formed upon a surface of said substrate, said facesheet being comprised of a layer of fully dense silicon carbide, said facesheet having a polished surface for providing said facesheet with reflective properties.

4,856,888

ADJUSTABLE TELESCOPING MIRRORS

John F. Wahl, Sterling, Ill., assignor to Wahl Clipper Corporation, Sterling, Ill.

Filed Jan. 19, 1988, Ser. No. 145,056
Int. Cl.[4] G02B *7/18, 5/08*
U.S. Cl. 350—639 3 Claims



1. Portable adjustable mirror apparatus which may be removably secured to a surface comprising
a base having an underside surface, an outside surface, an outer edge, a first center line passing through the center of said base, and a second center line passing through the center of said base perpendicular to said first center line;
a first coupling permanently secured to said outside surface of said base along said first center line, said first coupling being a first selected distance away from said edge, said first distance being less than the distance from said edge to the center of said base;
a plurality of suction cups secured to said underside surface of said base, at least two of said suction cups being on opposite sides of said second center line;
a telescoping rod having two ends, said first end being secured to said first coupling; and
a mirror secured to said second end of said telescope by a second coupling, said second coupling being adjacent an edge of said mirror;
whereby said telescoping rod may be collapsed and said mirror may be compactly folded over on top of said base for shipment or storage.

4,856,889

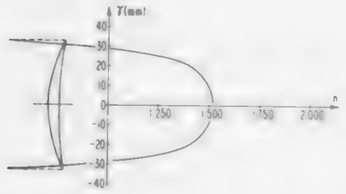
UNIFORM STRENGTH OPHTHALMIC LENS HAVING A GRADIENT REFRACTIVE INDEX CHANGING ROTATION-SYMMETRICALLY ABOUT THE OPTICAL AXIS AND METHOD OF MAKING IT

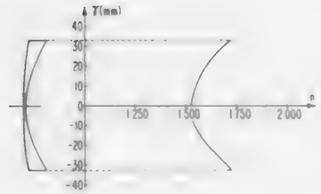
Günther Guilino, and Herbert Pfeiffer, both of Munich, Fed. Rep. of Germany, assignors to Optische Werke G. Rodenstock, Munich, Fed. Rep. of Germany

Filed May 20, 1987, Ser. No. 51,700
Claims priority, application Fed. Rep. of Germany, May 20, 1986, 3616888
Int. Cl.[4] G02C *7/02;* GC02 *13/18*
U.S. Cl. 351—159 17 Claims

1. A uniform strength ophthalmic lens having a gradient refractive index changing rotation-symmetrically about the optical axis,
wherein the course of curvature of at least one of the two surfaces of the optical lenses is selected without consideration of the correction of aberration so that the critical

thickness of the opthalmic lenses does not exceed a specific value, and





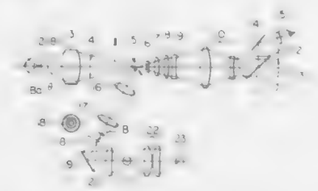
that the correction of the aberration is effected due to the change in the refractive index rotation-symmetrically about the optical axis of the lens.

[illegible]

OPHTHALMIC PHOTOGRAPHING DEVICE

Yuji Itoh, Chigasaki, and Junichi Takahashi, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 884,305, Jul. 15, 1986, Pat. No. 4,679,919, Continuation of Ser. No. 589,740, Mar. 15, 1984, abandoned. This application Jan. 22, 1987, Ser. No. 6,430
Claims priority, application Japan, Mar. 22, 1983, 48095
Int. Cl.[4] A61B *3/14;* **G03B** *29/00*
U.S. Cl. 351—206 **4 Claims**



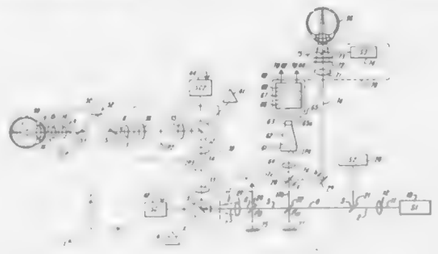
1. An ophthalmic photographing apparatus, comprising:
a variable magnification photographing means for photographing a fundus of an eye to be examined;
an illuminating means to make an image of an annular aperture having an outside diameter and an inside diameter substantially at the front-eye-part of the eye to be examined for illuminating the fundus of the eye;
means to decrease the size of the inside diameter of said image of said annular aperture at the front eye part of the eye to be examined when the magnification level of said variable magnification photographing means is increased;
[illegible]
means to increase the light-transmitting area of the image of said annular aperture at the front eye part of the eye to be examined when the magnification level of said variable magnification photographing means is increased.

4,856,891

EYE FUNDUS TRACKER/STABILIZER

Kent P. Pflibsen, Franklin, and Michael T. Milbocker, Boston, both of Mass., assignors to Eye Research Institute of Retina Foundation, Boston, Mass.

Filed Feb. 17, 1987, Ser. No. 14,994
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—210 **21 Claims**



1. Apparatus for directing a first beam of light energy onto the fundus of an eye and for stabilizing the beam during eye movement, such apparatus comprising
means defining an optical path to the fundus for directing a first beam of light energy to be stabilized on the fundus,
means for producing and directing at the fundus a tracking beam of light energy, distinct from the first beam, for illuminating a region surrounding a microscopic tissue feature constituting a narrow tracking target extending along a line,
angular correction means responsive to a control signal for controllably redirecting the optical path to the fundus,
imaging means for focusing light reflected from the fundus through the angular correction means so as to form a fundus image including an image of the tracking target,
alignment means in the optical path for aligning the image of the tracking target to place said line in a selected position,
[illegible]
tracking means responsive to movement of the image of the tracking target transverse to said line for developing a control signal representative of eye movement, said control signal being provided to said angular correction means to redirect the optical path so that the first beam is stabilized on the fundus in a fixed position during eye movement.

4,856,892

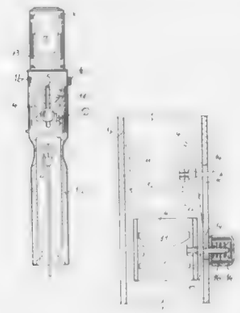
OPHTHALMOSCOPE

Nathan Ben-Tovim, 16 Pney Hagiv'a, Ramath Gan, Israel

Filed Dec. 7, 1987, Ser. No. 129,310
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—218 **19 Claims**

1. An ophthalmoscope comprising:
a casing,
a source of light located in said casing,
a vertically movable mirror located in said casing,
a condenser located in said casing,
means for simultaneously moving said condenser both in a longitudinal direction of said casing and also crosswise to said longitudinal direction, said means including an oblique surface located on an inside surface of said casing,

said condenser including a set of lenses accommodated in a sleeve which is carried on a shaft extending across said



casing, a portion of said shaft gliding on said oblique surface with the movement of said condenser.

4,856,893

LASER DISTANCE MEASURING METHOD AND APPARATUS

Michael T. Breen, Garden City, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 30, 1987, Ser. No. 103,092
Int. Cl.[4] G01C *3/08;* **G01P** *3/36*
U.S. Cl. 356—5 **7 Claims**



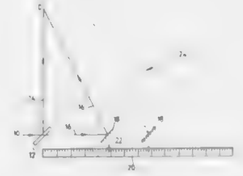
1. Laser distance measuring apparatus for measuring distances to points on a target object, comprising:
a source of a pulse laser beam;
a source of a CW laser beam;
splitting means for providing a reference beam and a target beam from said pulse laser beam;
splitting means for providing a reference beam and a target beam from said CW laser beam;
means for combining said pulse target beam and said CW target beam to provide a composite target beam for measuring distances to points where the target beam impinges upon the target object;
scanning means for controllably directing said composite target beam to illuminate a point on the target, said scanning means comprising dwell means for holding said composite target beam at an area of the target to obtain a greater density of distance measurements, especially where information of higher accuracy is desired;
computer means for processing data of distance measurements to utilize the redundancy of the greater density of data to increase the accuracy where said higher accuracy is desired;
means receiving the composite beam after reflection from the target, for separating the reflected pulse target beam component from the reflected CW target beam component;
frequency discriminator means for measuring Doppler frequency shift of the CW target beam relative to said CW reference beam and providing Doppler shift data;
integration means for integrating said Doppler shift data to provide relative distance data;
phase comparison means measuring the phase difference between said reflected pulse target beam component and said pulse target reference beam, for acquiring target distance data based upon the time of flight of a pulse;
computer means combining said pulse data and said Doppler data for providing output data, said output data comprising distance measurements corresponding to points on the target object at which said controllably directed composite beam impinges upon said target object.

4,856,894

DISTANCE MEASURING METHOD AND MEANS

Nigel I. Anderson, Transvaal, South Africa, assignor to Afgen (Proprietary) Limited, South Africa

Filed May 4, 1987, Ser. No. 46,425
Claims priority, application South Africa, May 5, 1986, 86/3335; Jun. 2, 1986, 86/4089; Jan. 14, 1987, 87/0231
Int. Cl.[4] G01C *3/24*
U.S. Cl. 356—15 **18 Claims**



1. A method of determining the distance of an object from a station, the method including the following steps:
(a) projecting relatively inclined beams of visible laser light from spaced locations at the station towards the object so as to illuminate a first and a second zone on the object;
(b) fanning one of the beams of visible laser light such that the first zone appears as an illuminated spot while the second zone appears as an illuminated line;
(c) while maintaining the relative inclination between the beams of light, moving the locations relative to one another along a linear path so as to bring the first and second illuminated zones into coincidence with one another; and
(d) deriving the distance of the object from the station from the spacing along the linear path between the locations when the first and second zones are coincident with one another.

4,856,895

METHOD AND APPARATUS FOR HEADBOX JET VELOCITY MEASUREMENT

Daniel Parker, Caledonia, Ill., assignor to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 573,387, Jan. 24, 1984, abandoned. This application Apr. 5, 1988, Ser. No. 178,825
The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.
Int. Cl.[4] G01P *3/36, 5/22*
U.S. Cl. 356—28 **11 Claims**

1. Apparatus for measuring the headbox liquid jet velocity, said apparatus comprising:

variable intensity light generating means mounted adjacent to the liquid jet for generating light such that the velocity of the jet is able to be determined;

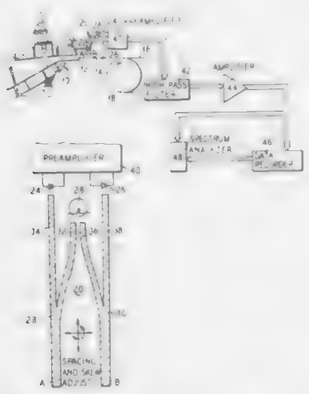
first bifurcated fiber optic light coupling means disposed between said generating means and the liquid jet for conducting light between said generating means and the liquid jet;

first light sensing means disposed adjacent to said generating means for sensing light generated by said generating means and conducted through said first coupling means and reflected from the liquid jet back through said first coupling means;

first signal generating means electrically-connected to said first light sensing means for generating a first electrical signal proportional to said light reflected back towards said first sensing means;

second bifurcated fiberoptic light coupling means disposed between said generating means and the liquid jet, said second coupling means being disposed downstream relative to said first coupling means for conducting light through said second coupling means between said generating means and the liquid jet;

second light sensing means disposed adjacent to said generating means for sensing light generated by said generating means and conducted through said second coupling means and reflected from the liquid jet at said downstream disposition back through said second coupling means;



second signal generating means electrically-connected to said second sensing means for generating a second electrical signal proportional to said light reflected back toward said second sensing means;

high pass filter means connected to said first and second signal generating means for filtering out components of said first and second signals below a predetermined frequency;

amplifier means connected to said high pass filter means for amplifying the filtered first and second signals;

analyzing means connected to said amplifier means and operable to cross correlate AC components of the amplified first and second signals for obtaining an output representing the velocity of the liquid jet;

adjustable mounting means connected to said first and second coupling means for permitting adjustment of the spacing between said first and second coupling means, and for permitting adjustment of the horizontal skew of said first and second coupling means such that the optimum sensitivity of the apparatus is obtained and any misalignment of the coupling means relative to the direction of flow of the jet may be compensated for; and

said first and second coupling means having elongate ends adjacent to the surface of the jet for generating first and second light spots respectively on the surface of the jet, said spots being elongate in a direction transverse to the direction of flow of the jet such that misalignment of said spots relative to said direction of flow results in substantially the same surface area of the jet flowing past said first and second spots so that said first and second signals are substantially the same.

4,856,896

OPTICAL GUIDANCE SYSTEM AND APPARATUS

Aaron V. Farr, Ogden, Utah, assignor to Abex Corporation, Boston, Mass.

Filed Oct. 16, 1987, Ser. No. 109,622
Int. Cl.[4] G01B *11/26*
U.S. Cl. 356—153 15 Claims



1. An optical guidance system for directing a vehicle operator, comprising:

a housing, a positive lens, said positive lens mounted in said housing, said positive lens having a focal point spaced from said lens, said focal point located within said housing, a multiple color film, said multiple color film located in the vicinity of said focal point, said multiple color film having at least two different colors thereon;

a backlight located at a position with respect to said focal point to substantially project said colors of said multiple color film substantially outward of said housing in a lane after passing through said positive lens;

a second color film positioned between said multiple color film and said operator to provide a background color wherein said second color film allows said projected multiple color of said multiple color film to pass therethrough unimpeded; and

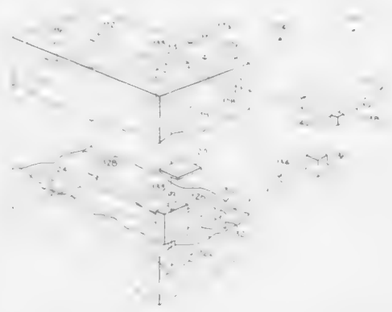
wherein said projected colors of said multiple colored film are encompassed by said background color.

4,856,897

RAMAN SPECTROMETER HAVING HADAMARD ELECTROOPTICAL MASK AND DIODE DETECTOR

William G. Fateley, Manhattan, Kans., and David C. Tilotta, Des Moines, Iowa, assignors to D.O.M. Associates, Inc., Manhattan, Kans.

Filed Aug. 14, 1987, Ser. No. 85,530
Int. Cl.[4] G01N *21/65*
U.S. Cl. 356—301 19 Claims



1. An apparatus for detecting Raman spectra in electromagnetic radiation emanating from a sample to be analyzed as a result of directing a beam of monochromatic light from a source thereof into the sample, the radiation including Raman and Rayleigh scattered radiation, said apparatus comprising:

dispersing means for receiving and dispersing said radiation as dispersed radiation along a path, said dispersed radiation including Raman and Raleigh scattered radiation;

a stationary, electro-optical device situated for impingement of at least a portion of said dispersed radiation thereon and including;

a body presenting a pair of opposed faces,

zone defining means carried by said body for dividing at least one of said faces into a plurality of discrete, electrically alterable zones, and

zone altering means operably coupled with said zone defining means for selective alteration of each zone respectively between a relatively transmissive condition relative to said dispersed radiation and a relatively opaque condition relative to said dispersed radiation;

means for preventing passage of Rayleigh scattered radiation present in said dispersed radiation through relatively transmissive ones of said zones during analysis of the sample and for allowing passage of at least a portion of said Raman scattered radiation present in said dispersed radiation through transmissive ones of said zones during analysis of the sample;

dedispersing means for receiving and dedispersing radiation passing through transmissive ones of said zones; and

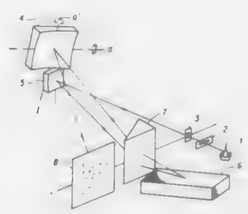
detector means for receiving and detecting dedispersing radiation from said dedispersing means in order to detect Raman spectra thereof.

4,856,898

ADJUSTABLE ECHELLE SPECTROMETER ARRANGEMENT AND METHOD FOR ITS ADJUSTMENT

Helmut Becker-Ross; Stefan Florek, both of Berlin; Felix Kerstan; Guenther Moebius, both of Jena, and Horst Sanders, Teltow, all of German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed Mar. 11, 1988, Ser. No. 166,870
Claims priority, application German Democratic Rep., May 4, 1987, 3024066
Int. Cl.[4] G01J *3/18*
U.S. Cl. 356—328 6 Claims



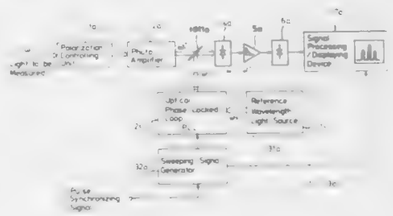
1. In an adjustable Echelle spectrometer arrangement which is fastened on a base plate and which is comprised, sequentially, along the optical path of an entry slit arrangement, a collimator mirror, a dispersion prism, an Echelle grid, a camera mirror, and a beam exit in the focal plane, the improvement comprising means for compensating for all errors in the fabrication and setup of said arrangement, said compensating means comprising solely means for changing the height of the entry slit arrangement above the base plate and for rotating the dispersion prism about a first axis that is approximately parallel to the roof edge of the dispersion prism as well as about a second axis that is perpendicular thereto, the Echelle grid and the collimator mirror being rigidly connected to the base plate.

4,856,899

OPTICAL FREQUENCY ANALYZER USING A LOCAL OSCILLATOR HETERODYNE DETECTION OF INCIDENT LIGHT

Hideto Iwaoka; Akira Ohte, and Koji Akiyama, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Dec. 18, 1986, Ser. No. 943,670
Claims priority, application Japan, Dec. 20, 1985, 60-287162; Dec. 26, 1985, 60-294342; Dec. 27, 1985, 60-296073; Dec. 27, 1985, 60-296070; Jan. 24, 1986, 61-11894; Feb. 26, 1986, 61-40772; Feb. 26, 1986, 61-40773; Jun. 24, 1986, 61-96170; Jun. 26, 1986, 61-98194[U]; Jun. 27, 1986, 61-97611[U]; Jun. 27, 1986, 61-149777; Jul. 17, 1986, 61-168924; Aug. 13, 1986, 61-189944; Aug. 26, 1986, 61-199364; Sep. 19, 1986, 61-221668; Oct. 31, 1986, 61-260338
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—346 34 Claims



1. An optical frequency analyzer for measuring frequency characteristics of an object on the basis of incident light, said optical frequency analyzer comprising

means for applying incident light to an object;

an optical frequency sweeping means for frequency sweeping light and for outputting frequency swept light of a first frequency;

an optical heterodyne detector means for heterodyning said frequency swept light of said first frequency from said optical frequency sweeping means and light of a second frequency indicative of said incident light, and for outputting an electrical signal having a frequency corresponding to the difference between said first and second frequencies;

first filter means for filtering said electrical signal from said optical heterodyne detector means and for producing an electrical output indicative of the filtered results; and

a signal processing/displaying means for processing and displaying said electrical signal from said first filter means.

4,856,900

QUADRUPOLE-WOUND FIBER OPTIC SENSING COIL AND METHOD OF MANUFACTURE THEREOF

Mirko Ivancevic, North Hollywood, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jun. 3, 1987, Ser. No. 57,626
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—350 4 Claims

1. A method for winding an optical fiber in a quadrupole configuration from first and second supplies onto a sensor spool comprising a central core and opposed flanges comprising the steps of:

(a) locating a point of said fiber intermediate said supplies; then

(b) positioning said point of said fiber adjacent the inside surface of the first flange of said sensor spool; then

(c) winding a layer of said fiber from said first supply in a first direction along the width of said core; then

(d) forming a first supply lead by winding three concentric turns continuous with and about the end turn of said

last-named layer adjacent the second flange of said spool; and

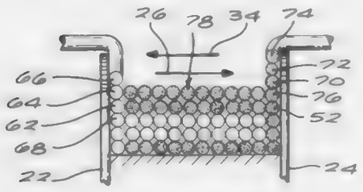
(e) securing said three concentric turns of said first supply lead to the inner surface of said second flange; then

(f) winding a layer of said fiber from said second supply in said first direction along the width of said central core to said first supply lead; then

(g) winding a layer of said fiber from said second supply reel in a second, opposite direction, along the width of said central core; then

(h) forming a second supply lead by winding three concentric turns continuous with and about the end turn of said last-named layer adjacent said first flange of said spool; and

(i) securing said three concentric turns of said second supply lead to the inner surface of said first flange; then



(j) winding a pair of layers from said first supply continuous with said first supply lead substantially in accordance with steps f through h above so that said second layer of said pair of layers from said first supply terminates with three turns concentric with the last turn of said layer thereby forming a first supply lead adjacent said second flange of said spool; and

(k) securing said three turns of said first supply lead to the inner surface of said first flange; then

(l) winding pairs of layers alternately from said first and second supplies in accordance with steps f through j whereby said concentric turns form first supply leads and second supply leads of concentric turns adhesively secured to the inner surfaces of the opposed flanges that bridge each overlying layer pair wound from each of said supplies.

4,856,901

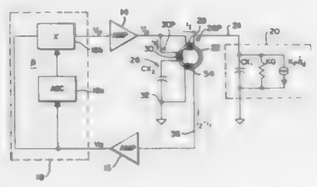
VELOCITY CONTROL SYSTEM USING PIEZOELECTRIC TRANSDUCERS

Lincoln S. Ferriss, Denville, and Mark A. Weitzner, Union, both of N.J., assignors to Kearfott Guidance & Navigation Corporation, Wayne, N.J.

Filed May 4, 1988, Ser. No. 190,195

Int. Cl.[4] G01C *19/64;* **B06B** *1/06;* **H02N** *2/00*

U.S. Cl. 356—350 **23 Claims**



22. In an assembly having a plurality of piezoelectric elements each fixedly coupled to a corresponding movable element of the assembly, a method of utilizing all of the piezoelectric elements to both torque their respective movable elements and to respond to deflections resulting therefrom, the deflections setting the assembly in motion, the method comprising the steps of:

electrically connecting each piezoelectric element in parallel to an output of a first amplifier;

feeding an output signal from the first amplifier to the piezoelectric elements to effect a deflection rate thereto to move the assembly, the piezoelectric elements producing a first current in response to the rate of movement of the assembly;

interposing a resistor means between the first amplifier and the piezoelectric elements to convert the first current into a first voltage;

inserting a series connected resistor and capacitor means between the first amplifier and ground to produce a second voltage;

subtracting the second voltage from the first voltage to produce a difference voltage representative of the motion of the assembly;

utilizing the difference voltage to generate a feedback signal to the first amplifier, thereby completing an electrical circuit to effect an optimal deflection rate for the assembly.

4,856,902

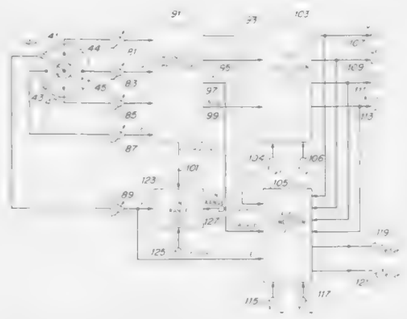
IMAGING AND INSPECTION APPARATUS AND METHOD

Rudolf A. Wiedemann, Sunnyvale, Calif., assignor to Lasersense, Inc., Santa Clara, Calif.

Filed Nov. 13, 1987, Ser. No. 120,130

Int. Cl.[4] G01B *11/00*

U.S. Cl. 356—375 **17 Claims**



1. The method of detecting the edge of an object interposed in the beam of a laser having Gaussian distribution of power density across the beam thereof, the method comprising the steps of:

orienting the object for relative movement along an axis substantially orthogonal to the path of the beam for altering the beam propagation initially at the periphery thereof;

detecting the relative intensities of the altered beam in at least four peripheral sectors oriented about a central sector with opposite pairs thereof disposed in substantial alignment with respective ones of orthogonal axes of relative movement of the object in a plane substantially orthogonal to the beam to produce representative outputs;

amplifying the outputs representative of the peripheral sectors of the beam with substantially the same selected gain and additively combining the amplified outputs to provide a composite signal;

amplifying the output representative of the central sector of the beam with substantially twice the selected gain;

subtracting one half the composite signal from the amplified output representative of the central sector of the beam to provide an output indication that varies as a function of the position of the object within the beam along the axis of movement; and

comparing the composite signal with a reference to produce an output in response to the composite signal and the reference attaining a predetermined relationship, said output indicating the position of the edge of the object along the axis within the beam.

4,856,903

ELECTRONIC DEVICE FOR DETERMINING A REGISTER ERROR IN MULTI-COLOR PRINTING MACHINES

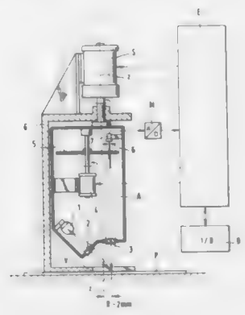
Helmut Kipphan, Schwetzingen; Willi Jeschke, Heidelberg, both of Fed. Rep. of Germany; Hans Ott, Regensdorf, and Jean-Pierre Graf, Massagno, both of Switzerland, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Apr. 17, 1987, Ser. No. 40,570

Claims priority, application Switzerland, Apr. 18, 1986, 01567/86; Jun. 13, 1986, 02392/86

Int. Cl.[4] B41F *13/24*

U.S. Cl. 356—400 **14 Claims**



1. Device for determining a register error between individual colors in a multicolor printing machine, comprising a photoelectric scanning apparatus for scanning differently colored register marks printed together on a printed sheet, an evaluation apparatus interacting with the scanning apparatus for determining the relative positions of the individual register marks, the scanning apparatus being disposed in a single housing to be positioned at a given measuring location on the stationary printed sheet, the scanning apparatus comprising a scanning head movably disposed in the housing, and a single motor drive provided in the housing and having a drive shaft eccentric to said scanning head for rotating said scanning head so as to produce the scanning movement of the scanning head relative to the printed sheet within a relatively small scanning region.

4,856,904

WAFER INSPECTING APPARATUS

Masayuki Akagawa, Kawaguchi, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 819,057, Jan. 15, 1986, abandoned. This application Feb. 10, 1988, Ser. No. 157,128

Claims priority, application Japan, Jan. 21, 1985, 60-8655; Aug. 9, 1985, 60-174369; Aug. 9, 1985, 60-174370

Int. Cl.[4] G01B *11/00*

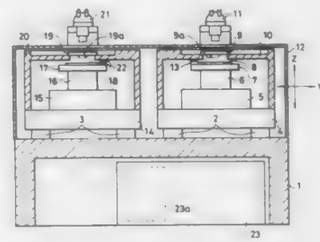
U.S. Cl. 356—400 **14 Claims**

1. Apparatus comprising:

(a) inspection means for inspecting a wafer, said inspection means having support means for supporting said wafer while the wafer is inspected;

(b) transport means for transporting said wafer to said support means;

(c) scanning means for scanning said wafer photoelectrically and for generating output signals during said transporting of said wafer by said transport means; and



(d) alignment means for aligning said wafer with respect to said apparatus in response to said output signals generated by said scanning means during said transporting of said wafer by said transport means.

4,856,905

PROJECTION EXPOSURE APPARATUS

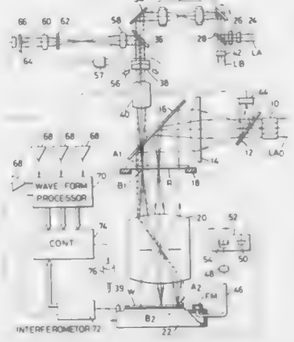
Kenji Nishi, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed May 10, 1988, Ser. No. 192,684

Claims priority, application Japan, May 14, 1987, 61-115942

Int. Cl.[4] G01B *11/00*

U.S. Cl. 356—401 **4 Claims**



1. A projection exposure apparatus comprising:

an imaging optical system for projecting the image of an object placed on a first plane onto a second plane, wherein said first and second planes are mutually conjugate for a first wavelength with respect to said imaging optical system;

first and second alignment mark means respectively formed on said first and second planes;

means for supplying a first radiation beam of said first wavelength;

means for supplying a second radiation beam of a second wavelength different from said first wavelength;

optical means for focusing, through a common light path, said first and second radiation beams on said first plane in the vicinity of said first alignment mark means, and further focusing said beams through said imaging optical system on said second plane in the vicinity of said second alignment mark means; and

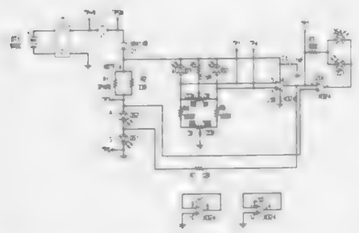
deflection means for simultaneously varying the direction of said first and second radiation beams in such a manner that

said first and second radiation beams scan said first and second alignment mark means.

4,856,906
ENHANCED SYSTEM FOR TRANSMISSION LOSS COMPARISON

Drew E. Sunstein, Hollis, and Clifford D. Caseley, Hudson, both of N.H., assignors to Circuits and Systems, Inc., Amherst, N.H.

Continuation-in-part of Ser. No. 912,953, Sep. 29, 1986, Pat. No. 4,759,631. This application Sep. 8, 1987, Ser. No. 93,929
Int. Cl.[4] G01N *21/00*
U.S. Cl. 356—435 18 Claims



1. A system for determining relative transmission loss over a reference path and a sample path, the system comprising:

reference and sample transmitters, each having an output signal and a transfer characteristic, transmitting over reference and sample paths respectively, to reference and sample receivers respectively, each receiver having a signal output;

comparison means, having an output, and having a pair of inputs connected to the outputs of the reference and sample receivers, for comparing the outputs of the reference and sample receivers;

each associated transmitter, path, and receiver constituting collectively a channel, the system therefore having a reference channel and a sample channel, each channel having a gain, the system further comprising:

gain balance means for adjusting the relative gains of the reference and sample means over a first dynamic range, wherein there is relatively little transmission loss, and over a second dynamic range, wherein there is substantial transmission loss, so as to compensate for differences in the waveform characteristics of the signals generated by the reference and sample transmitters.

4,856,907
KNEADER

Masao N. Moriyama, No. 508-13, Tendocho 17, Nishinomiya, Hyogo, 663, Japan

Filed May 31, 1988, Ser. No. 201,597
Claims priority, application Japan, May 29, 1987, 62-136193
Int. Cl.[4] B01F *7/04;* B29B *1/06*
U.S. Cl. 366—97 9 Claims

1. A kneader comprising:

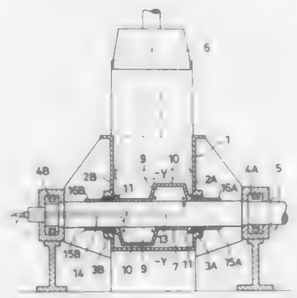
a vessel;

rotor shafts passing through said vessel, those portions of said rotor shafts located inside of said vessel being straight;

bearings for supporting said rotor shafts at positions remote, from said vessel;

external members including cylindrical portions and blades; and

means for fixedly fitting the cylindrical portions of said external members at both ends thereof onto said rotor

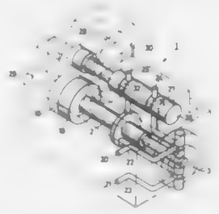


shafts, said cylindrical portions extending to the outside of said vessel.

4,856,908
MIXING HEAD OF INJECTION MOLDING MACHINE

Noboru Hara, and Shogo Sugiyama, both of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Feb. 29, 1988, Ser. No. 162,206
Claims priority, application Japan, Mar. 6, 1987, 62-52638; Mar. 11, 1987, 62-57503
Int. Cl.[4] B29C *45/03*
U.S. Cl. 366—182 11 Claims



1. A mixing head for an injection molding machine for injecting two or more kinds of liquids under a high pressure while mixing with each other in a mixing chamber, which comprises:

a first plunger for opening and closing simultaneously two or more orifices from which said liquids are injected into said mixing chamber; and;

a spool plunger for opening and closing simultaneously two or more paths through which said liquids are respectively circulated, the first plunger and the spool plunger being so disposed as to be moved reciprocally and parallel to each other;

wherein the plunger is accommodated in a bore into which a sleeve is removably disposed for receiving at least a part of the plunger, the sleeve having a wall containing two or more recesses for forming parts of said two or more orifices.

4,856,909
PHARMACOLOGICAL DISSOLUTION METHOD AND APPARATUS

Gunvant N. Mehta, Bensalem; Dennis J. Wertan, Philadelphia, and Wayne M. Grim, Doylestown, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Filed Jun. 23, 1986, Ser. No. 877,146
Int. Cl.[4] B01F *1/00*
U.S. Cl. 366—208 10 Claims



1. Apparatus for accomplishing the dissolution of a pharmacologic dosage unit such as a pill, pellet, capsule or the like, in a solvent bath, comprising:

cylindrical basket means having an interior volume sufficiently greater than the volume of said dosage unit to permit said dosage unit to move freely in all directions within said basket means;

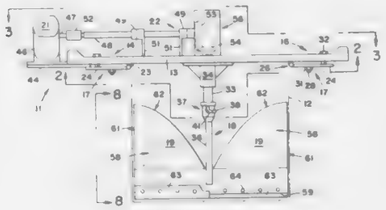
first means for orbiting said basket means in said solvent about a first axis outside said basket means and at right angles to the cylinder axis of said basket means; and

second means for simultaneously spinning said basket means in said solvent about its cylinder axis.

4,856,910
MOTORIZED STIRRING APPARATUS

Casper Cuschera, 967 Industrial Pkwy. West, Hayward, Calif. 94544

Filed Feb. 27, 1989, Ser. No. 315,587
Int. Cl.[4] B01F *7/16*
U.S. Cl. 366—282 12 Claims



1. Apparatus for stirring the contents of a container comprising:

a cross-beam having a length sufficient to span the top of said container and to extend laterally outward therefrom at a first end portion of the cross-beam,

clamping means for releasably securing said cross-beam to the rim of said container in an orientation at which said cross-beam extends across the top of said container with said first end portion extending laterally outward from the rim of said container,

a rotatable stirrer shaft extending downward from the central region of said cross-beam,

a stirring blade secured to said stirrer shaft and extending radially therefrom,

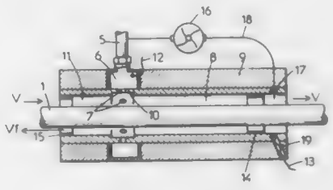
an electrical drive motor mounted on said first end portion of said cross-beam at a location which is laterally spaced apart from the location of said container when said cross-beam is engaged thereon, and

means for transmitting rotary drive from said motor to said stirrer shaft.

4,856,911
METHOD AND DEVICES FOR MEASURING THE TEMPERATURE OF A RUNNING FILIFORM ELEMENT

Bernard M. Roth, Boulogne Billancourt; Daniel R. M. Neveu, Sur Marne, and Catherine Delikat, Paris, all of France, assignors to Bertin & Cie, Cedex, France

PCT No. PCT/FR85/00149, § 371 Date Feb. 14, 1986, § 102(e) Date Feb. 14, 1986, PCT Pub. No. WO86/00132, PCT Pub. Date Jan. 3, 1986
Continuation of Ser. No. 848,044, Feb. 14, 1986, abandoned.
This PCT application Jun. 13, 1985, Ser. No. 115,611
Claims priority, application France, Jun. 5, 1984, 84 09369
Int. Cl.[4] G01K *11/00, 13/06*
U.S. Cl. 374—135 5 Claims



1. Method for measuring the temperature of a running filiform element with measuring means without mechanical contact being made between said measuring means and said element comprising the steps of (a) passing a filiform element through a first exchange zone while a delivered gas at a measured flow rate is caused to impinge upon and all around said filiform element, and wherein a delivered gas flow in said first zone is selected to be as low as possible while maintaining a minimum flow to provide said gas with a speed higher than the speed of entrainment of ambient gas by the filiform element, and measuring the temperature of the delivered gas; (b) passing said filiform element from said first zone through a second longitudinal exchange zone wherein said filiform element is bathed in said gas, and measuring the temperature of said gas near an extremity of said second zone opposed to said first exchange zone; and (c) determining the temperature of the filiform element from a relationship between the temperature of the delivered gas in the first zone, the temperature of the gas near the extremity of the second zone and the rate of flow of the delivered gas.

4,856,912
COMBINATION BEACH TOWEL AND TOTE BAG

Diane Damus, 200 C, Rte. 3, and John F. Kleinstuber, 202 C, #3, both of Fenwick Island, Del. 19944

Filed May 3, 1988, Ser. No. 189,715
Int. Cl.[4] B65D *30/00*
U.S. Cl. 383—4 15 Claims

1. A combination beach towel and beach bag comprising a towel having upper and lower portions and edge portions, a pull cord means disposed between said upper and lower portions of said towel and having first and second spaced segments which are spaced with respect to one another between said upper and lower portions, means for securing said pull cord

means between said upper and lower portions of said towel, at least one opening between said upper and lower portions of said towel, said pull cord means having an outer portion which extends through said opening in said upper and lower portions of said towel, said towel including a general central portion which is disposed between said first and second segments of said pull cord means so as to be substantially surrounded thereby, said outer portion of said pull cord means which extends exteriorly of said opening being movable outwardly with respect to said upper and lower portions of said towel so



as to thereby form said central portion of said towel into a beach bag having a pouch means with an opening which is selectively closable by said first and second segments of said pull cord means, said towel having opposite side and end portions which define four corner portions, at least one pocket secured to one of said four corner portions of said towel, said pocket having a storage portion and an opening extending generally diagonally between one of said end and said side wall portions of said towel, and said opening in said pocket being vertically elevated with respect to said storage portions when said towel is converted to a beach bag.

4,856,913

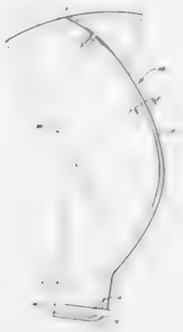
POOL SWEEP BAG

Sanford F. Campbell, 1850 Crestmont Dr., Redding, Calif. 96002

Filed Feb. 12, 1988, Ser. No. 155,307

Int. Cl.[4] B65D *33/16*

U.S. Cl. 383—42 **2 Claims**



1. A pool sweep bag for use with pool cleaners, pool sweeps and the like, comprising:

a body constructed of substantially flexible porous material having a top end and a bottom end, a left end and a right end, and a cavity therein;

a top seam extending substantially across said top end of said body constructed of hook-and-loop-type material to facilitate opening to provide access to said cavity in said body and closing of said top seam;

a side seam extending substantially from said top end to said bottom end of said body oriented substantially perpendicularly with respect to said top seam and positioned so that said side seam intersects said top seam substantially midway between said right end and said left end of said body;

a snout section positioned near said bottom end of said body having an opening therein which communicates with said cavity of said body, being constructed of material which collapses to hold debris in said pool sweep bag, and

attaching means for securing said snout section of said pool sweep bag to an outlet of a pool cleaner.

4,856,914

THRUST BEARING ARRANGEMENT

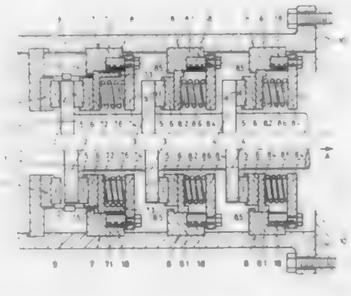
Hans Sigg, Mutschellen, Switzerland, assignor to Maag Gear-Wheel & Machine Company Limited, Zarich, Switzerland

Filed Dec. 28, 1987, Ser. No. 138,147

Claims priority, application Switzerland, Jan. 26, 1987, 214/87

Int. Cl.[4] F16C *17/06, 27/02*

U.S. Cl. 384—223 **26 Claims**



1. A thrust bearing arrangement for taking up high thrust forces on a shaft comprising a thrust bearing housing and bearing means in said bearing housing having a plurality of bearing elements for taking up the thrust forces, said bearing means including first and second thrust force adjustment devices arranged respectively in first and second stages spaced axially from each other, each of said adjustment devices comprising:

a thrust force adjustment housing carried by said bearing housing;

a first pressure member secured to said adjustment housing;

a second pressure member seated in said adjustment housing in spaced relation to said first pressure member and disposed for axial movement relative to said first pressure member in response to the thrust forces on said shaft, said second pressure member having first and second sides and at least one of said bearing elements being mounted on said first side of said second pressure member;

resistance means for providing a resistance force resisting movement of said members toward each other; and,

adjusting means for adjusting the share of the thrust load borne by the respective stages.

4,856,915

SUBMERSIBLE BEARING AND HUB ASSEMBLY

Barry F. Ryan, 69 Doonside Road, Blacktown, Australia (2148)

Filed Jan. 27, 1988, Ser. No. 149,030

Claims priority, application Australia, Apr. 14, 1987, PI1474; Jul. 20, 1987, PI3205; Jan. 12, 1988, PH9827

Int. Cl.[4] F16C *19/00*

U.S. Cl. 384—473 **7 Claims**



1. A submersible wheel bearing assembly comprising:

a wheel hub housing,

a liquid lubricant reservoir positioned above said housing,

a tube connecting said reservoir to an oil relief port means associated with said housing, said port means communicating with the interior of the hub housing for filling of the interior with lubricant when said hub housing is stationary or rotating at low speed, said port means being operable to provide the escape of lubricant into the reservoir from the hub housing when said hub housing is in rapid motion.

4,856,916

CONDUCTING ROLLING BEARING

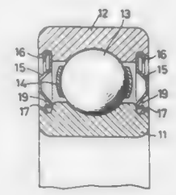
Hideji Ito, Kuwana; Koji Kametaka, Kawasaki, and Yukihisa Tsumori, Kuwana, all of Japan, assignors to NTN Toyo Bearing Co., Ltd., Osaka, Japan

PCT No. PCT/JP87/00692, § 371 Date Mar. 30, 1988, § 102(e) Date Mar. 30, 1988

PCT Filed Sep. 19, 1987, Ser. No. 221,827

Int. Cl.[4] F16C *33/72*

U.S. Cl. 384—477 **7 Claims**



1. A conductive rolling bearing, comprising:

an inner bearing ring;

an outer bearing ring;

a plurality of rolling elements mounted between said inner bearing ring and said outer bearing ring;

at least one electrically-conductive relative rigid metallic seal member for sealing a space between said inner bearing ring and said outer bearing ring, said at least one seal member having one end secured to one of said inner bearing ring and said outer bearing ring and an opposite end having a bent portion bent in a direction away from said plurality of rolling elements adjacent the other of said inner bearing ring and said outer bearing ring;

said other of said inner bearing ring and said outer bearing ring having a seal wall surface disposed thereon;

said bent portion Comprising a curved contact segment elastically and slidably contacting said seal wall surface and a terminal end segment connected to said curved contact segment but held out of contact with said seal wall surface.

4,856,917

DEVICE FOR THE SYNCHRONOUS GUIDANCE OF A ROLLER BEARING CAGE FOR A ROLLER BEARING EXECUTING SWIVEL MOTION

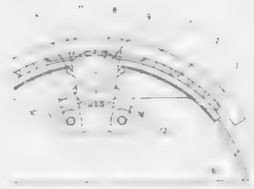
Horst Schröder; Klaus Kispert; Robert Stolz, all of Schweinfurt, and Werner Jacob, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 27, 1988, Ser. No. 263,616

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1987, 3737387

Int. Cl.[4] F16C *19/50, 32/00;* **F01B** *13/04*

U.S. Cl. 384—550 **5 Claims**



1. An arrangement for synchronously guiding a roller bearing cage for a roller bearing performing a swivel motion, said arrangement comprising a roller cage and bearing parts having teeth and which swivel relative to one another, said roller cage provided with a pinion gear being provided on two diametrically opposed sites with curved toothed segments each having different pitch circle diameters with respect to the other, said toothed segments meshing with the teeth of said bearing parts.

4,856,918

BEARING DEVICE

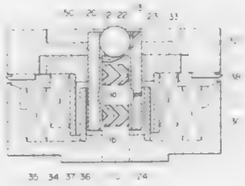
Gentei Inoue; Ikunori Sakatani, both of Fujisawa, and Katsuhiko Tanaka, Yamato, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1988, Ser. No. 176,038

Claims priority, application Japan, Mar. 10, 1987, 62-54387; May 11, 1987, 62-112282; Jul. 31, 1987, 62-191724

Int. Cl.[4] F16C *19/50, 32/06, 17/04*

U.S. Cl. 384—610 **3 Claims**



1. A bearing device, comprising:

a shaft member having a hardness in a range of H_RC40 or higher;

a sleeve fitted around said shaft member so that one of said shaft member and said sleeve is rotatably supported by the other through a radial bearing; and

a thrust receiver secured to one end portion of said sleeve in an axial direction thereof, said thrust receiver and an end surface of said shaft member opposing to each other in the axial direction forming a thrust bearing therebetween, said thrust receiver having a hardness in a range of H_RC 60 or higher;

said thrust receiver having a convex spherical surface extending in an axial direction at the center of the surface opposing to said end surface of said shaft member;

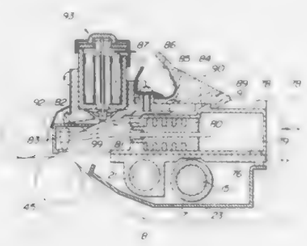
said end surface of said shaft member opposing to said convex spherical surface having a concave spherical surface formed thereon by a plastic deformation, and having a radius of curvature larger than a radius of curvature of said convex spherical surface of said thrust receiver, said concave spherical surface being strain hardened due to the plastic deformation.

4,856,919

PEN PRINTER

Hiroshi Takeuchi, Kanagawa; Daiju Kohga, and Yasuo Yukita, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 10, 1986, Ser. No. 917,470
Claims priority, application Japan, Nov. 5, 1985, 60-247320
Int. Cl.[4] B41J *29/26*
U.S. Cl. 400—18 **8 Claims**



1. A pen printer for converting data into printed form on a print sheet placed on a platen, comprising:

means, including a plurality of ink pens movable into direct contact with said print sheet, for printing information on said print sheet in different colors;

a pen carriage mounted for reciprocating movement above said platen, said pen carriage having means for removably attaching each of said ink pens juxtaposed in the direction of movement of said pen carriage, said pen carriage has a plurality of cartridge guide slots for receiving said respective ink pens thereon, lock members rotatably mounted on said pen carriage, each of said lock members having a hook resiliently urged for engagement with corresponding one of said ink pens, and resilient means for urging said ink pens to hold the same in engagement with said hooks, respectively;

pen actuators mounted on said pen carriage apart from said ink pens, said pen actuators being free from attachment to said ink pens, and each pen actuator being responsive to an electrical signal for bringing a corresponding one of said ink pens toward said platen into contact with said print sheet;

a carriage actuator responsive to an electrical signal for moving said pen carriage;

a sheet feed mechanism responsive to arrival of said pen carriage to at least one of first and second predetermined positions separated from each other for feeding said print sheet a predetermined length on said platen; and

a control circuit for converting said data into electrical signals to control said pen actuators and said carriage actuator.

4,856,920

DOT MATRIX PRINTING AND SCANNING

Royden C. Sanders, Jr., Burton Hwy., Wilton, N.H. 03086

Continuation-in-part of Ser. No. 815,984, Jan. 3, 1986, Pat. No. 4,794,387, which is a continuation-in-part of Ser. No. 799,843, Nov. 18, 1985, abandoned. This application Apr. 22, 1987, Ser. No. 43,551
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 **8 Claims**



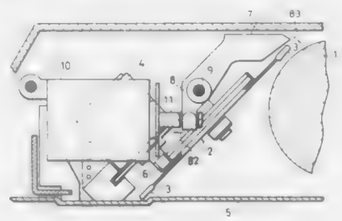
1. A device for recording data on a display medium by use of dot matrix recording means having a predetermined matrix size, first and second dot creating means having refire times for creating dots, means for scanning the recording means with a linear motion in a major direction normal to advancement of the display medium relative to the dot matrix recording means occurring between scans in the major direction, said second dot creating means being spaced a predetermined distance from said first dot creating means in a direction normal to the major direction, and means for imposing on said motion is said major direction a cyclic variation transverse to said major direction, said cyclic variation having a peak to peak amplitude at least equal to said predetermined distance to provide an integral number of possible print positions of at least two during each cycle of said cyclic variation.

4,856,921

ROTARY WHEEL PRINTER

Osamu Hatakeyama, Morioka, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jun. 28, 1984, Ser. No. 625,809
Claims priority, application Japan, Jun. 28, 1983, 58-98750[U]; Jun. 28, 1983, 58-98752[U]; Jun. 28, 1983, 58-98753[U]; Jun. 30, 1983, 58-100074[U]; Jul. 1, 1983, 58-101040[U]; Jul. 1, 1983, 58-101041[U]
Int. Cl.[4] B41J *1/24*
U.S. Cl. 400—144.2 **8 Claims**



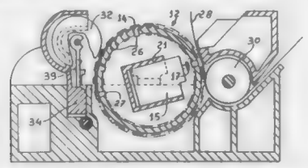
1. A rotary wheel printer according to claim 1, wherein said hammer means has an engagement portion on a distal end thereof, said type wheel having positioning portions on rear surfaces of said type elements and correction section for engagement with said engagement portion of said hammer means, said type wheel also having a recess at a proximal end of said correcting spoke.

4,856,922

TWO-COLOR PRINTER

Pierangelo Berruti, Chivasso, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jan. 11, 1988, Ser. No. 141,976
Claims priority, application Italy, Jan. 30, 1987, 67058 A/87
Int. Cl.[4] B41J *1/22, 27/02*
U.S. Cl. 400—145.2 **8 Claims**



1. A two color parallel printer for impact printing alfanumeric symbols on a printing line, comprising a frame, a hollow character drum rotatable on said frame and extending through the entire length of said line, said drum carrying a plurality of characters disposed on the outside surface of the drum at a constant angular spacing on a plurality of pairs of adjacent circumferences axially spaced by a constant pitch in confronting relation with said printing positions, inking means for alternately inking the characters of the circumferences of each one of said pairs with a first and second color, a plurality of hammer elements selectively operable for printing said characters in said printing positions and mounted on said frame and linearly arranged inside said hollow drum parallel to said printing line, drum supporting means comprising a first and a second cylindrical element respectively mounted at the ends of said drum and rotatable on said frame, said first element driving said drum at a rotational speed twice the rotational speed of said second element, said second element being connected with the drum for an axial displacement thereof and comprising a continuous cam element divided into a first and a second cam portion connected to each other and axially spaced therebetween by said pitch, each cam portion extending over 180° on the outside surface of said second cylindrical element, and color selecting means comprising a cam follow member selectively engageable with said first and said second cam portions to axially shift said drum during a second revolution thereof by one pitch in a first direction and respectively in an opposite direction with respect to a central position, whereby said hammer elements are so operable as to print characters of said first color successively in odd positions and in even positions of said printing line during two subsequent revolution of said drum when said cam follower member engages said first cam portion, while said hammer elements are so energized as to print characters of said second color successively in said even and in said odd positions during two subsequent revolutions of the drum when said cam follower engages said second cam portion.

4,856,923

RIBBON SHIELD

Phil N. Smith, Valencia, Calif., assignor to Dataproducts Corporation, Woodland Hills, Calif.

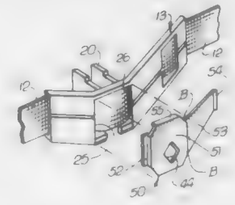
Filed May 18, 1987, Ser. No. 51,478
Int. Cl.[4] B41J *13/10*
U.S. Cl. 400—247 **3 Claims**

1. An easily removable thin metal ribbon shield for use with a ribbon guide of a data processing printer having print impact elements for imprinting a print medium, the ribbon guide having an open portion for exposing a section of ribbon, the ribbon shield comprising:

(a) a shield face, for preventing general contact of the ribbon with the print medium through the open portion of the ribbon guide, and having an opening for permitting the ribbon to be impressed through the ribbon shield onto a print medium by print impact elements;

(b) a short insert tab means disposed on one side of the shield face, and formed in a shape and of sufficient length for secure engagement under an edge of the open portion of the ribbon guide and such that the shield face can be flush mounted over the exterior of the open portion of the ribbon guide; and

(c) a long insert tab means disposed on an opposing side of the shield face, the long insert tab means (1)having a first part attached to the shield face and formed in a shape and of a sufficient length such that the shield face can be flush mounted over the open portion of the ribbon guide, and (2) having a second, elongated part attached at an angle to the first part and being flexible around its juncture with the first part, for insertion under the opposing edge of the open portion of the ribbon guide, the long insert tab means being at least 3 times longer than the short insert tab means and bent at its far end to form a heel to aid in insertion of



the long insert tab means under its corresponding edge of the open portion of the ribbon guide;

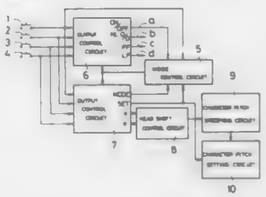
wherein the ribbon shield is flush mounted on the foremost surface of the ribbon guide upon complete engagement of the short insert tab means and the long insert tab means under their respective edges of the ribbon guide, and is removable by disengaging the insert tabs means from beneath their respective edges of the ribbon guide, and wherein essentially no flexure occurs across the shield face when the ribbon shield is inserted or removed from a ribbon guide.

4,856,924

PRINTER

Kouichi Sugino, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Jun. 23, 1987, Ser. No. 65,361
Claims priority, application Japan, Jun. 23, 1986, 61-146745
Int. Cl.[4] B41J *19/50*
U.S. Cl. 400—283 **5 Claims**



1. In a serial printer having a displaceable printing head and being selectively operative in a setting mode for setting a variable character pitch and in a normal mode for effecting a printing operation according to the set character pitch: a plurality of manually operable switches each having assigned thereto a normal function which is performed when the switch is operated when the printer is in the normal mode and having assigned thereto a setting function which is performed when the switch is operated when the printer is in the setting mode, at least one of the switches having a setting function which effects selective displacement of the printing head to one of a plurality of predetermined positions each corresponding to a different character pitch; means for producing character pitch data effective to specify a desired character pitch according to

the selected position to which the printing head is selectively displaced; and storage means operative when the printer is in the setting mode for setting therein the desired character pitch data for use during a printing operation of the printer in the normal mode.

4,856,925

DEVICE FOR FIXING APPLICATOR ONTO COATING INSTRUMENT

Yoshiomi Konose, Fujioka, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

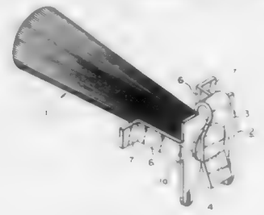
Filed Feb. 25, 1988, Ser. No. 160,235
Claims priority, application Japan, Feb. 26, 1987, 62-27734
Int. Cl.[4] A46B *11/00*
U.S. Cl. 401—290 1 Claim

1. A device for securely fastening a writing or coating member into a writing or coating tool which comprises:

a main body having an aperture therethrough of a smaller diameter than the outer diameter of a plate portion provided at the rear end of said wriring or coating member;

a leaf spring portion which protrudes from a side of said main body and extends in a plane generally parallel to said main body having a central portion convex with respect to said main body so as to resiliently close said aperture, with the space between said convex portion and said main body being less than the thickness of said plate portion; and

two projections protruding from side edges of said main body substantially vertically to the plane of said main body and in the direction opposite to the side where said



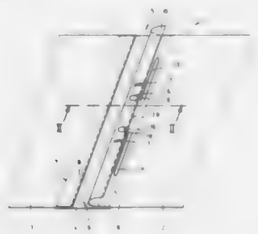
leaf spring portion is located, the tops of said projections being bent oppositely and outwardly so as to allow fastening of said main body to said writing or coating tool.

4,856,926

SHEET BINDER

Karl Hirsch, Linsenberg 26, A-9064 Pischeldorf (Karnten), Austria

Filed Sep. 13, 1988, Ser. No. 243,708
Claims priority, application Austria, Sep. 16, 1987, 2340/87
Int. Cl.[4] B42F *3/00, 13/12*
U.S. Cl. 402—13 22 Claims



1. Sheet binder (1) consisting of a rear cover (2) and a front cover (3) connected with each other by means of a spline strip (4), wherein the spline strip (4) connecting the front cover (3) with the rear cover (2) consists of a flexible material, characterized in that between the rear cover (2) and the front cover (3) in the area of the fold (5) a strap (10) extending over substantially the entire height of the binder (1) and connected with the binder (1) is provided, that a plurality of prongs (13, 14, 20, 21) are provided, said prongs being punched from the rear cover (2) in the area of the fold (5) or from a strip (26) connected with the binder, that in the strap (10) in the area of each of the prongs (13, 14, 20, 21) in which said prong is connected with the rear cover (2) of the binder or the strip (26), a hole (16) is provided and that spaced apart from said hole (16), another hole (17) is provided in the strap (10).

4,856,927

MIDPOINT CONNECTION FOR INTERMEDIATE SHAFT SUBASSEMBLY

Ward R. Cusati, Farmington, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Jun. 6, 1988, Ser. No. 202,366
Int. Cl.[4] F16B *7/10*
U.S. Cl. 403—104 2 Claims

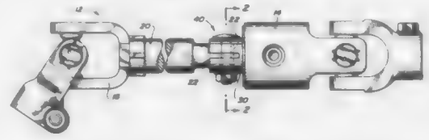
1. An intermediate shaft subassemlby connecting upper and lower sections of a intermediate shaft of a steering column, said subassembly comprising:

an inner intermediate rigid shaft member having an elongated slot oriented along the longitudinal axis of said shaft member;

an outer intermediate deformable tube member adapted to make a sliding fit around said shaft member, said tube member having aligned first and second holes therethrough;

means for connecting said shaft member and said tube member to said upper and lower sections of said intermediate shaft; and

a midpoint connection adapted to occupy a relatively small volume while providing means for locking said shaft



member and said tube member together in a variable and predetermined relative position, said midpoint connection comprising a bolt positioned through said first and second aligned holes in said tube member and through said elongated slot in said shaft member, said bolt having on one end a bolt head configured to nonrotatably fit through said first aligned hole and the opposite end of said bolt being threaded to receive a nut providing means to tighten the connection between said shaft member and said tube member and thereby deform said tube member around said shaft member so as to form a tight connection providing minimal rotational lash.

4,856,928

SYSTEM FOR ASSEMBLING PANELS IN VARIOUS ANGULAR POSITIONS AND PANELS SUITABLE FOR THE USE OF THIS SYSTEM

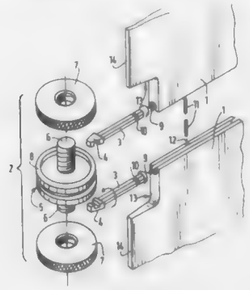
Yves Savale, 5 rue des Tanneroiles, 92210 Saint-Cloud, France

Filed Dec. 1, 1987, Ser. No. 127,201
Claims priority, application France, Dec. 1, 1986, 86 16721
Int. Cl.[4] F16B *1/00*
U.S. Cl. 403—217 7 Claims

1. A system for assembling panels without the use of tools, comprising

a connection piece having a threaded male part with a cylindrical head and a cylindrical female part of the same outside diameter as said head, the face of said head confronting said female part being recessed internally, in such a way that a peripheral edge of the head projects laterally

relative to said face in a direction towards said female part;



a straight prism-shaped rod having a cross-section in the form of a regular polygon which cooperates with a receptacle of matching shape provided in said panels, said rod having, at one of its ends, a hook profile for engaging said peripheral edge of said head; and

a removable locking means for locking said rod in position in the receptacles of matching shape of said panels; wherein said locking means for locking the rod in said receptacle comprises a pin, a staple, a clip or the like, said pin being engagable into an annular groove on the periphery of said rod and into an orifice in the associated panel.

4,856,929

INTERIOR CLAMPING DEVICE FOR TUBULAR POLES

Aloys J. Smahlik, Valley Springs; Michael A. Smahlik, Oakland, and Richard D. Phipps, Morgan Hill, all of Calif., assignors to Steccone Products Co., Oakland, Calif.

Filed Oct. 21, 1987, Ser. No. 111,203
Int. Cl.[4] F16B *7/00*
U.S. Cl. 403—297 17 Claims



1. An interior clamping device adaptable for mounting in the interior of telescopic cylindrical tubular members or the like to secure said tubular members together, said clamping device comprising

a driver having an inner portion mounted inside one of said tubular members and a tapered portion projecting outwardly therefrom,

an expandable sleeve having an exterior surface for contacting the interior surface of said other tubular member and an internal surface for engagement with said driver, the interior of said sleeve having a plurality of longitudinal grooves, and

a fastener disposed longitudinally through a recess n said sleeve, said fastener being secured at its one end to said driver and at its other end by locking means disposed proximate the inner end portion of said sleeve whereby the relative rotation between said driver and said sleeve in one direction causes the tapered portion of said driver to engage the interior surface of said sleeve and said sleeve is moved radially outwardly to wedge against the inner surface of said other tubular member, causing said tubular members to be locked in axial alignment.

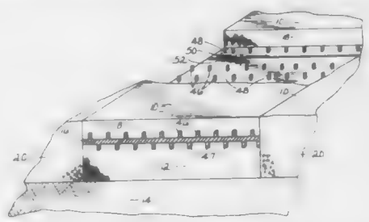
4,856,930

PAVEMENT AND METHODS FOR PRODUCING AND RESURFACING PAVEMENT

Gary R. Deuning, P.O. Box 497, Payne, Ohio 45880

Continuation of Ser. No. 52,282, May 21, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 274,710
Int. Cl.[4] E01C *3/00, 11/16*
U.S. Cl. 404—31 16 Claims

1. A pavement comprising a pair of base layers superimposed upon a subgrade, said base layers being a worn pavement layer and a leveling layer discontinuously superimposed on said worn pavement layer, one or more surface layers overlaying said base layers, said surface layers being composed of flexible paving materials, a planar bearing member interposed between said base layers and said surface layers, said bearing member being substantially imperforate, said bearing member separating said surface layers from said base layers, said bearing member having about the same longitudinal and transverse dimensions as said surface layers, said bearing member being sufficiently rigid to at least generally prevent said surface layers from conforming, during useful life of said base layers, to irregularities of said base layers, and means a plurality of fastening for uniformly fastening said bearing member to said base layers and said surface layers in both longitudinal and



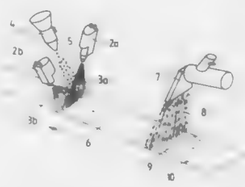
transverse directions, each of said fastening means generally having a uniform geometry about center lines extending from said bearing member through each of said fastening means, said surface layers and said worn pavement having interposed between them only said bearing member, said means for fastening, and said discontinuous leveling layer.

4,856,931

PROCESS AND DEVICE FOR PRODUCING OR RENEWING A HORIZONTAL MARKING ON ROADS AND HORIZONTAL MARKING PRODUCED IN ACCORDANCE WITH THE PROCESS

Moses Bollag, Geneva, Switzerland, assignor to Plastiroute S.A., Geneva, Switzerland

Filed Mar. 31, 1988, Ser. No. 177,911
Int. Cl.[4] E01C *7/32*
U.S. Cl. 404—75 12 Claims



1. Process for producing or renewing a horizontal marking on roads, in particular of boundary lines, broken lines and warning lines, whereby a painted line is applied by spraying a marking composition and subsequently reflective beads are scattered on the still fresh painted line, characterized in that, before the reflective beads are scattered thereon, profile particles, whose minimum dimension is greater than the dry film

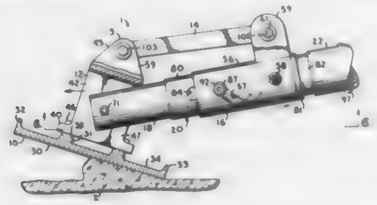
thickness of the newly applied painted line, are introduced into the painted line and are completely enveloped in marking compositions, so that a marking having profile elevations is produced, and further characterized in that profile particles are used whose minimum dimension is greater than the dry film thickness of the applied painted line by at least 0.6 mm.

4,856,932

CONCRETE FINISHING FLOAT HAVING SPIRALLY SLOTTED SLEEVE

Simon Kraft, 7501 W. 99th Ter., Overland Park, Kans. 66212

Filed May 4, 1988, Ser. No. 190,027
Int. Cl.[4] E01C *19/22*
U.S. Cl. 404—118 8 Claims



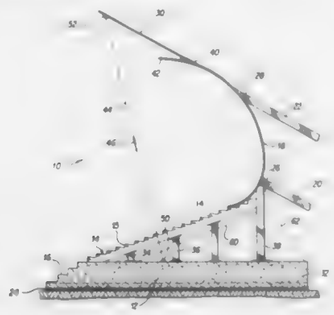
1. A concrete float tilting mechanism adapted for connection to a concrete float, comprising:
(a) a support means mounted on said float;
(b) an elongated shaft rotatably connected to said support means and extending transversely to said float;
(c) a sleeve, said shaft rotatable in said sleeve;
(d) linkage means pivotally secured to said sleeve and to said support means, said linkage means permitting tilting of said support means with respect to said shaft but preventing rotation of said sleeve with respect to said support [illegible];
(e) a cam member projecting laterally from said shaft;
(f) a slot formed generally in the lower half of said sleeve and spirally extending thereabout, said slot receiving said cam member thereto;
(g) whereby rotational movement of said shaft produces linear movement of said sleeve on said shaft which translates to tilting motion of said float.

4,856,933

HIGH ENERGY RETURN SEAWALL

Arthur E. Tubbs, Jr., 921 Saratoga Blvd., Jacksonville, Fla. [illegible]

Filed Feb. 7, 1989, Ser. No. 306,854
Int. Cl.[4] E02B *3/04*
U.S. Cl. 405—30 16 Claims



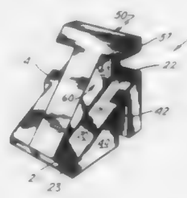
1. A high energy return seawall system comprising a modular unit having:
an underlying support structure,
a plurality of stair steps mounted upon said support structure and disposed in an upwardly inclined manner extending away from and substantially broadside to the advance of sea waves for dissipating energy,
curved baffle means attached to an upper end of said stair steps, said baffle means extending upwardly and thence outwardly in a smoothly curved manner and having a terminal end disposed substantially spaced above an intermediate portion of said plurality of stair steps, said terminal end extending toward the direction of the sea, and
means extending outwardly toward the sea from the upper reaches of said baffle means to provide a splash panel whereby, sea waves striking said baffle means produce terminal paths of energy with at least some of said terminal paths of wave energy being returned to the area located over and above said stair steps.

4,856,934

BEACH BUILDER BLOCK

Merlin L. Nelson, Kenosha, Wis., assignor to Nelco, Inc., Cadillac, Mich.

Filed Aug. 6, 1987, Ser. No. 82,848
Int. Cl.[4] E02B *3/06*
U.S. Cl. 405—33 42 Claims



1. A beach builder block comprising:
a bottom;
a first front face inclined upwardly from a leading lower edge to an upper edge at an angle of from about 20 to about 40 degrees with respect to said bottom;
a vertical wave divider rib projecting upwardly from approximately the middle of said first front face and being approximately one-third the width of said first front face, said rib including an inclined rib front face extending upwardly generally from said bottom leading edge of said first front face to a point above the upper edge of said first front face and being approximately one-third the width of said first front face, and being inclined at an angle of from about 30 to about 60 degrees with respect to said bottom and greater than said angle of inclination of said first front face.

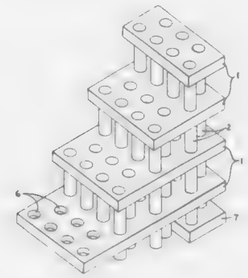
4,856,935

BEACHFRONT WAVE ENERGY DISSIPATION STRUCTURE

William S. Haras, 28 Meyer Drive, Guelph, Ontario, Canada N1E 4H2

Filed Aug. 3, 1987, Ser. No. 81,059
Int. Cl.[4] E02B *3/04, 3/06*
U.S. Cl. 405—35 6 Claims

1. A beachfront wave energy dissipation structure, comprising a plurality of spaced-apart vertically stacked parallel plates each having two lateral edges, a shore-facing edge, and a water-facing edge, and a plurality of columns disposed between and connecting said plates, said columns being laterally and longitudinally distributed over a substantial portion of the



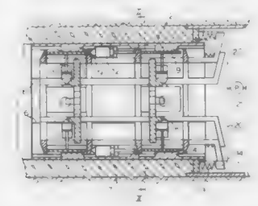
area between said plates so as to impede free passage of waves between said plates.

4,856,936

FORM FOR CONCRETE-PLACEMENT TUNNEL LINING

Volker Hentschel, Hildesheim-Itzum; Clemens Versteegen; Jens Glöyer, both of Essen, and Siegmund Babendererde, Lübeck-Travemünde, all of Fed. Rep. of Germany, assignors to Hochtief Aktiengesellschaft Vorm. Gebr. Helfmann, Essen, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 213,636
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 37247697
Int. Cl.[4] E21D *11/10, 9/06*
U.S. Cl. 405—145 5 Claims



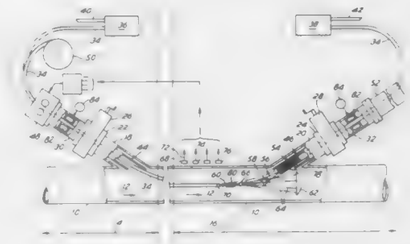
1. In a form of a concrete tunnel lining with a traveling shield, said form comprising an inner tunnel-lining sheathing and a form front, said inner tunnel-lining sheathing being divided into a plurality of independently movable sheathing segments with a plurality of intervening segment-bridging yieldable joints and said form front positioned between said inner tunnel-lining sheathing and said traveling shield being movable forward by said concrete which is forcible into an annular space formed by said traveling shield and/or the surrounding earth and by said form front, the improvement wherein said inner tunnel-lining sheathing is constructed and arranged with means for forward motion of at least one of said sheathing segments or at least two of said sheathing segments singly or in groups one after the other relative to remaining sheathing segments at rest, and wherein said means for forward motion includes that said sheathing segments are each supported by at least one separate sliding longitudinal guide with a hydraulic or pneumatic jack held in a supporting frame to support each of said sheathing segments and allow said segments to be movable with the help of a feed piston-cylinder device in the tunneling direction said form front is supported by at least one adjustable spring device on a cantilevered arm of said supporting frame.

4,856,937

PIPELINE SYSTEMS

Geoffrey J. Grocott, Haslemere, and Ralph E. J. Baskett, Harlow, both of United Kingdom, assignors to British Pipeline Agency Limited and STC PLC, London, England

Filed Jun. 2, 1988, Ser. No. 201,691
Claims priority, application United Kingdom, Jun. 4, 1987, [illegible]
Int. Cl.[4] B65H *59/00;* F16L *1/00*
U.S. Cl. 405—154 14 Claims



1. A method of deploying a cable or other line associated with a fluid transportation pipeline, which method comprises the following steps performed whilst the pipeline continues in normal operation full of and transporting a fluid under a positive pressure:
(1) introducing the leading end of the cable into the pipeline at an upstream cable inlet position, and at an acute angle to the fluid flow direction, through a first fluid sealing means connected to the pipeline at that inlet position;
(2) feeding the cable into the pipeline until the leading end reaches a predetermined downstream cable exit position; and
(3) extracting the leading end of the cable from the pipeline at an acute angle to the fluid flow direction through a second fluid sealing means connected to the pipeline at that cable exit position.

4,856,938

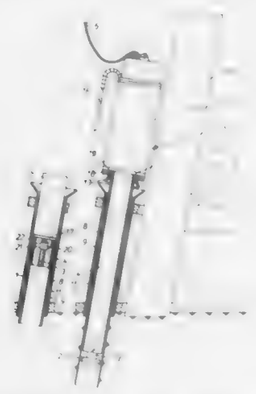
METHOD OF AND ARRANGEMENT FOR SEPARATING TUBULAR FOUNDATION PILES UNDER WATER

Hans Kuehn, Hamburg, Fed. Rep. of Germany, assignor to Bomag-Menck GmbH, Boppard, Fed. Rep. of Germany

Filed Dec. 15, 1987, Ser. No. 133,903
Claims priority, application European Pat. Off., Jul. 28, 1987, [illegible]
Int. Cl.[4] E02D *9/04*
U.S. Cl. 405—227 40 Claims

1. An arrangement for separating tubular foundation piles with upper edges under water, comprising a working device provided with downwardly extending supporting shaft, a tool holder provided with a conical shape at its lower end, and at least one separating tool carried by said tool holder and connected with said supporting shaft, said working device having a supporting surface arranged to be placed on an upper edge of a pile to be separated so that said separating tool extends into an inner space of the pile, said supporting shaft being connected with said supporting surface; means for fixing said

working device relative to a pile wall; and means for rotating said separating tool on the pile wall about a longitudinal axis of



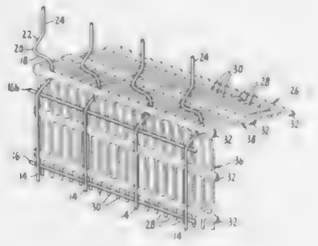
said supporting shaft so that said separating tool penetrates through the pile wall.

4,856,939

METHOD AND APPARATUS FOR CONSTRUCTING GEOGRID EARTHEN RETAINING WALLS

William K. Hilfiker, 3900 Broadway, Eureka, Calif. 95501

Filed Dec. 28, 1988, Ser. No. 291,182
Int. Cl.[4] E02D *29/02*
U.S. Cl. 405—284 **10 Claims**



1. A retaining wall structure comprising:

(a) a generally rectangular steel wire tray defined by an upstanding face section with a floor section extending from one side thereof, said tray having longitudinal rods extending continuously over the length thereof in spaced generally parallel relationship to one another and cross-rods welded to and extending transversely across said longitudinal rods in spaced relationship to one another, said sections intersecting at a fold line having one of said cross-rods extending thereacross and each having a free distal end;

(b) a plurality of wires fixed to and extending from the distal end of the face section, said wires being elongate and each having a hook portion extending back from the side of the face section from which the floor section extends; and,

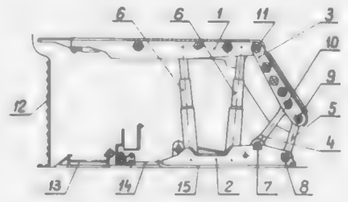
(c) an elongate polymer geogrid extending over the side of the face section from which the floor section extends and over the top of the floor section, said geogrid extending beyond the free distal end of the floor section and having a proximal portion with a cross-element hooked over said wires and received within the hook portions thereof.

4,856,940

LEMNISCATE MINING SUPPORTS

Jerzy Cieslik, Gliwice; Marek Flak, Tarnowskie Gory; Eugeniusz Kuczka, Katowice; Franciszek Oles, Ruda Slaska; Zdzislaw Marszycki, and Kornel Olender, both of Gliwice, all of Poland, assignors to Gwarectwo Mechanizacji Gornictwa "Polmag" Przedsiebiorstwo Panstwowe Fabryka Zmechanizowanych Obudow Scianowych Fazos, Tranowskie Gory, Poland

Filed Mar. 18, 1988, Ser. No. 169,932
Claims priority, application Poland, Mar. 20, 1987, 264767
Int. Cl.[4] E21D *23/04*
U.S. Cl. 405—296 **1 Claim**



1. A lemniscate support comprising:

a foot piece;

a roof bar;

at least one movable prop connected between said roof bar and said foot piece so as to move said roof bar; and

an anti-fall shield connected to said roof bar at a first end by a first joint and connected to said foot piece at a second end by a front connector and a rear connector having longitudinal axes which are spaced a distance (L_3) apart from each other along said anti-fall shield, said front connector is joined to said anti-fall shield by a second joint and joined to said foot piece at a third joint so that said second and third joints are spaced apart from one another by a length (L_2) along said front connector, whereas said rear connector is joined to said anti-fall shield at a fourth joint and joined to said foot piece at a fifth joint so that said fourth and fifth joints are spaced apart from one another by a length (L_1) along said rear connector, wherein said third joint is positioned on said foot piece so that the ratio of a vertical height (h) of said third joint, measured from a horizontal x-axis passing through said fifth joint, to the horizontal distance (s) of said fifth joint, measured from a vertical y-axis passing through said third joint, is 1:(2.25–2.26), and wherein the ratio between L_1 and L_2 is 1: (1.25 - 1.26) and the ratio between L_3 and the square root of the sum of the square of h and s is 1: (1.75–1.76) so that said first joint is restricted to move within an angle defined by lines $Y_1 = 0.036\times + h$ and $Y_2 = -0.1\times + h$.

4,856,941

HIGH DENSITY PNEUMATIC TRANSPORT METHOD FOR USE IN POWDER OR GRANULAR MATERIAL AND SYSTEM FOR PRACTICING THE METHOD

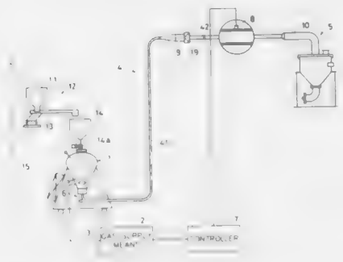
Kiyoshi Morimoto, Mishima; Akikazu Iwamoto, Shizuoka; Masuo Moriyama, Numazu, and Atsuroh Sonoda, Hirakata, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo and Kabushiki Kaisha Matsui Seisakusho, Osaka, both of, Japan

Filed Oct. 20, 1987, Ser. No. 112,106
Claims priority, application Japan, Oct. 21, 1986, 61-251172
Int. Cl.[4] B65G *53/00*
U.S. Cl. 406—85 **9 Claims**

1. A high density pneumatic transport method of pneumatically transporting a powder or granular material placed in an airtight storage container to a collector through a transport pipe by the use of pressurized gas, the method comprising the steps of:

supplying pressurized gas intermittently to the airtight storage container containing a powder or granular material therein so as to take the material out of the container and feed the same into the transport pipe;

feeding a hollow, elongated transport plug into a base end of



the transport pipe in synchronism with the intermittent supply of the pressurized gas so as to section the material, whereby the material is successively formed into a long column in high density and pneumatically transported to the collector at very slow speed; and

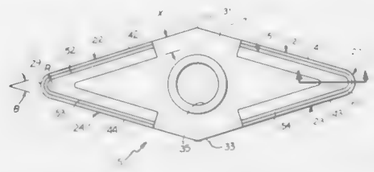
finally receiving the material which has been transported in the form of a long column into the collector in the state of substantially gravitational fall.

4,856,942

POLYGONAL CUTTING INSERT

Thomas Bernadic, Madison Heights; John Patterson, Hazel Park, and Tony Lowe, Royal Oak, all of Mich., assignors to GTE Valenite Corporaaag30tion, Troy, Mich.

Filed Jul. 19, 1988, Ser. No. 221,392
Int. Cl.[4] B23B *27/22*
U.S. Cl. 407—114 **7 Claims**



1. A polygonal indexable cutting insert comprising a top face forming a central island and a bottom face, said faces being substantially parallel,

four peripheral straight side surfaces having a clearance angle of from about 82 to about 88 degrees with respect to said top face,

said peripheral side surfaces forming a pair of adjacent side surfaces and a pair of opposite side surfaces, said opposite side surfaces being substantially parallel and said adjacent side surfaces merging at an angle of from about 32 to about 38 degrees,

a pair of rounded cutting corners having a radius of from about 0.3 to about 0.6 inches and being formed at the juncture of said adjacent side surfaces,

a pair of cutting edges being substantially positioned in or immediately below the plane of said top face and having straight portions extending away from each corner and,

grooved recesses extending rearwardly from said cutting edges a distance of from about 0.04 to about 0.06 inches and merging at said corners to from a chip breaker, each of said grooves recesses terminating at said central island at a distance spaced from said remaining grooved recesses

each of said grooved recesses comprising a descending surface of uniform width extending downwardly from a respective cutting edge, and an ascending surface extending upwardly from said descending surface to said central island, said ascending surface is at an angle of from about 16 to about 20 degrees with respect to said top face,

said descending surface comprises a first surface of uniform width directly adjoining said cutting edge and a second surface of uniform width joining said first surface to said ascending surface, said first surface is at an angle of from about 4 to about 6 degrees with respect to said top face and said second surface is at an angle of from about 17 to about 23 degrees with respect to said top face,

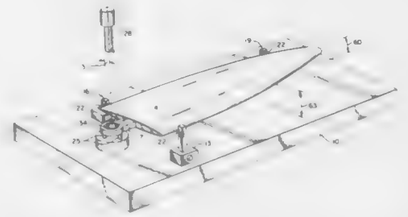
said respective first and second surfaces being uniformly spaced from and extending entirely around a respective rounded corner and said ascending surface forming a rounded contour at the juncture with said central island for providing enhanced chip flow.

4,856,943

AIRFOIL INCIDENCE ANGLE ADJUSTMENT METHOD

Carl W. Nelson, Huntsville; Donald S. Smith, Arab, and Frank P. Turner, Decatur, all of Ala., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 29, 1988, Ser. No. 188,527
Int. Cl.[4] B23B *35/00*
U.S. Cl. 408—1 R **1 Claim**



1. A method of boring a hole in an airfoil attachment member, said member connected to an airfoil, said hole used for attaching said airfoil to an aircraft, said airfoil having an angle of twist, comprising:

(a) determining the angle of twist of said airfoil;

(b) supporting said airfoil on at least three supports spaced about said airfoil so that said airfoil attachment member is aligned with a hole boring means;

(c) adjusting said supports so that said hole when bored through the airfoil attachment member will provide the airfoil with angles of incidence and dihedral that substantially cancel the angle of twist; and

(d) boring said hole through said airfoil attachment member.

4,856,944

COUPLING BETWEEN A TOOL HEAD AND A TOOL SUPPORT

Josef Reinauer, Sigmaringen, Fed. Rep. of Germany, assignor to Gottlieb Guhring KG, Ebingen, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 167,297
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1987, 3709878
Int. Cl.[4] B23B *51/02*
U.S. Cl. 408—59 **11 Claims**

1. A tool comprising:

(a) a tool head having:

(i) a longitudinal axis and

(ii) at least one first internal thread having a first pitch and being parallel to said longitudinal axis of said tool head;

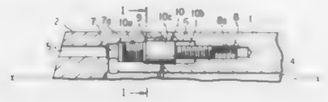
(b) a tool support having:

(i) a longitudinal axis that is coaxial with the longitudinal axis of said tool head and

(ii) at least one second internal thread having a pitch different from said first pitch and being parallel to said longitudinal axis of said tool support, said at least one second internal thread being coaxial and synchronized with said at least one first internal thread; and

(c) at least one fastening bolt comprising:

(i) a first external thread section threadably engaged in said at least one first internal thread and



(ii) a second external thread section threadably engaged in said at least one second internal thread, wherein:

(d) said tool head has at least one first borehole that is coaxial with said at least one first internal thread and that is open towards said tool support;

(e) said tool support has at least one second borehole that is coaxial with said at least one second internal thread and that is open towards said tool head; and

(f) said at least one fastening bolt further comprises an unthreaded, cylindrical centering section intermediate said thread sections, said centering section being received without play in said at least one first borehole and in said at least one second borehole.

4,856,945

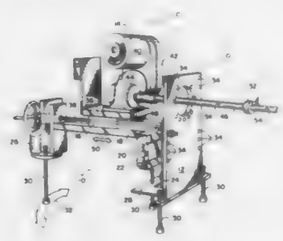
IN-SITU PORTABLE BORING-REAMING SYSTEM

Robert Bareis, R.D. 1, Box 374, Altamont, N.Y. 12009

Filed May 27, 1988, Ser. No. 199,769

Int. Cl.[4] B23B *47/28*

U.S. Cl. 408—72 R **13 Claims**



1. A portable boring apparatus for in-situ hole boring in a work piece comprising:

a jig assembly having thereon a translation platform for advancing and retracting a rotating elongate bar and further said platform moveably mounted on orientation means so that said translation platform may be vertically and horizontally referenced in relation to a work piece, said orientation means comprising a horizontal translation table coupled by suitable means to a vertical translation table; and

an elongate bar having therein means for holding cutting tools.

4,856,946

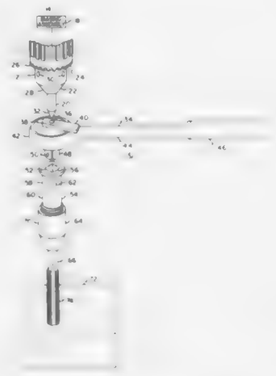
THREADING ASSEMBLY

Hong K. Park, 203 Southcrest, Huntsville, Ala. 35802

Filed Jul. 23, 1984, Ser. No. 633,707

Int. Cl.[4] B23B *45/12*

U.S. Cl. 408—122 **1 Claim**



1. A system for threading a workpiece comprising:

an elongated, generally cylindrical, threading tool chuck having a central axis, one longitudinal end of said chuck having a square receptacle and the other end having clamping means for clamping a threading tool about said central axis, and including a threaded rotatable adjustment member for adjustably clamping a threading tool about a central axis, said threading chuck including a passageway transverse to said central axis for the insertion of a turning tool;

drive means comprising:

a ratchet assembly operable about said central axis and including a direction selection arm on one side of said ratchet assembly and positioned to intercept said central axis for effecting selected direction of rotation of drive of said ratchet assembly,

a conical notch formed in and about said central axis in said selector arm;

a square shaft on an opposite side, with respect to said one side of said ratchet assembly and insertable into said square receptacle of said chuck, and

handle means coupled to said central ratchet assembly for rotating said central ratchet assembly about said central axis; and

biasing means comprising a conical tip adapted to fit within said conical notch for applying a biasing force to said conical notch and thereby along said axis to a threading tool, bias being applicable simultaneously with the rotation of said drive means.

4,856,947

CUTTING CURVED MOLD SURFACES

Horst Fischer, Osnabrueck; Werner Wichmann, Muenster; Gernot Wilhelms, and Guenter Wiltmann, both of Osnabrueck, all of Fed. Rep. of Germany, assignors to Kabel-und Metallwerke AG, Osnabrueck, Fed. Rep. of Germany

Filed Mar. 8, 1988, Ser. No. 165,578

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708150

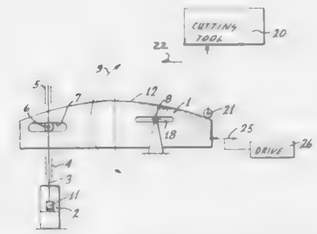
Int. Cl.[4] B23C *1/16;* **B43L** *13/10*

U.S. Cl. 409—119 **8 Claims**

1. Apparatus for controlling milling or cutting of curved surfaces particularly of mjold plates under utilization of a first template, defining a cam surface to be scanned for operating said tool, the improvement comprising:

means for pivotably mounting said first template;

a second template in engagement with said first template for causing said first template to pivot; and



additional means for moving said second template to tehreby move the first template in relation to the center of the second template so that said first template is pivoted on moving of said second template.

4,856,948

MILLING DEVICE FOR WORKING, AND IN PARTICULAR FOR TRIMMING THE EDGES OF SHEET METAL STRIPS, SHEET METAL PLATES OR THE LIKE

Josef Pomikacsek, Gmunden, Austria, assignor to Linsinger Maschinenbau GmbH, Steyrermühl, Austria

Filed Nov. 9, 1987, Ser. No. 117,866

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1986, 3638068

Int. Cl.[4] B23C *3/12*

U.S. Cl. 409—138 **6 Claims**



1. A milling device for working and trimming the edges of sheet metal, said milling device being movable in any desired shape or direction relative to the working position between guide rollers, said device comprising:

a cutter head turnable by a motor;

said cutter head having a rotational axis, the rotational axis of said cutter head located approximately parallel to the plane of the workpiece and approximately vertical to the direction of advancement of the device;

the device having at least one cutting element which is provided with a convex arcuate cutting edge and disposed on the front of the cutter head wherein the face of the cutter element has a particular radius, and the center of the cutting edge face is located less than the distance of the particular radius from the rotational axis;

the cutting edge face forming an angle α with a plane which is perpendicular to the rotational axis of the cutter head, said angle α being viewed parallel to the direction of travel of the edge of the sheet metal;

said cutting edge face also forming an angle β with said plane which is perpendicular to the rotational axis of the cutter head, said angle β being viewed perpendicularly to the direction of travel of the edge of the sheet metal from above;

the rotating cutting edge having a contact point located close to the rotational axis and a contact point located at a greater radial distance, thereby creating a relatively long cutting edge segment for the creation of a drawing cut along the cutting edge segment and for working the workpiece along a large contact arc ϕ.

4,856,949

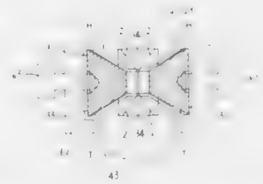
ROTATIVE TOOL FOR REPAIRING ELECTRODES FOR SPOT WELDING

Toshiaki Shimada, 41-2, Kawauchi 2-chome, Asaminami-ku, Hiroshima-shi, Hiroshima-ken 731-01, Japan

Filed Oct. 7, 1988, Ser. No. 255,653

Int. Cl.[4] B23C *3/12*

U.S. Cl. 409—140 **4 Claims**



1. A rotative tool for repairing electrodes for spot welding comprising:

(a) a cylindrical tool member (**1***a*);

(b) upper and lower recesses (H, J) having respectively frustoconical shape and formed by cutting upper and lower ends of the cylindrical tool memeber (**1***a*) along horizontal planes (B, D), then cutting front and rear ends of the cylindrical tool member (**1***a*) along vertical planes (E, F);

(c) four fan shaped upper projections (**11** through **14**) and four fan shaped lower projections (**31** through **34**) provided at front and rear portions, left and right portions, and upper and lower portions respectively of outer peripheral walls of the upper and lower recesses (H, J);

(d) four upper notched portions (**15** through **18**) and four lower notched portions (**35** through **38**) provided at the peripheral walls notched along same planes (P, Q) as those flushing to bottoms of the recesses (H, J);

(e) through holes (**55** through **58**) provided in vertical direction at each notched portion, two through holes (**55, 58**) among through holes (**55** through **58**) being communicated with each other by an extended portion **61** formed by extending over perforated bottoms of the recesses (H, J); and

(f) edged portions (**2**) provided at inclined edges of the upper and the lower projections (**11** through **14**; **31** through **34**) and at upper edges (**3**) along the diameter of the extended portion (**61**).

4,856,950

RE-USABLE PLASTIC DRIVE RIVETS

Raymond N. Bushnell, Newbury, England, assignor to ITW, Ltd., Camberley, England

Filed Feb. 18, 1988, Ser. No. 156,884

Int. Cl.[4] F16B *13/06*

U.S. Cl. 411—41 **12 Claims**

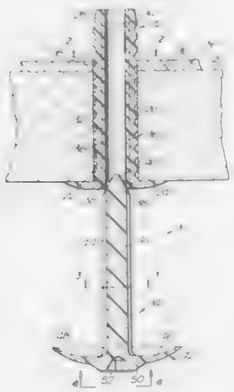
1. A re-useable drive rivet for insertion within a bore defined within a support means, and within a bore defined within a component to be mounted upon said support means, comprising:

an axially extending shank, having an axially extending bore defined therein, flat-crested thread means defined upon the exterior peripheral surface thereof for permitting axially directed translatable insertion of said axially extending shank within said bores defined within said sup-

port means and said component, and head means defined upon one end of said axially extending shank for engaging a surface of said component to be secured to said support means;

axially extending drive pin means for insertion within said axially extending bore of said axially extending shank so as to radially expand said axially extending shank into secured engagement with interior peripheral wall portions of said bore defined within said support means whereby said rivet comprising said shank and drive pin means will be secured within said support means and can secure said component upon said support means;

first axially extending means defined upon said axially extending shank for guiding said drive pin means within said axially extending shank as said drive pin means is inserted within said axially extending shank, and for transmitting torque to said axially extending shank from said axially extending drive pin means; and



second axially extending means defined upon said axially extending drive pin means for cooperating with said first axially extending means defined upon said axially extending shank for guiding said axially extending drive pin means into said axially extending shank as said axially extending drive pin means is inserted within said axially extending shank, and for transmitting torque from said axially extending drive pin means to said axially extending shank whereby when torque is transmitted from said axially extending drive pin means to said axially extending shank in an unscrewing direction, said drive rivet comprising said axially extending shank and said axially extending drive pin means will be removable from said bores of said support means and said component as a result of the threaded cooperation defined between said flat-crested thread means of said axially extending shank and said interior peripheral wall portions of said bores defined within said support means and said component.

4,856,951

FASTENING ASSEMBLY FOR ROOFS OF SOFT MATERIALS

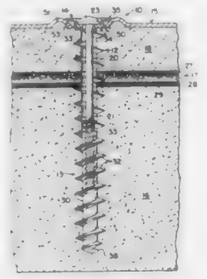
William J. Blucher, Addison; Richard J. Ernst, Palatine, and Francis C. Peterson, St. Charles, all of Ill., assignors to Illinois Tool Works, Inc., Chicago, Ill.

Continuation of Ser. No. 609,160, May 11, 1984, Pat. No. 4,642,012. This application Jun. 23, 1986, Ser. No. 877,535

Int. Cl.[4] F16B *37/12*

U.S. Cl. 411—178 **1 Claim**

1. A fastening assembly comprising: an elongated screw having a shank with a head at one end and a thread at the other end, said head having torque transmitting surfaces thereon a helical element having an axial bore in one end thereof, said element having at least one screw thread disposed on its exterior defining a crest diameter and a root diameter, said crest diameter being generally twice as large as said root diameter, the thread of said screw being dimensioned so as to engage said bore and rotationally and axially fix said screw to said element, a freely rotating washer captivated between said screw and



said element, said washer having a diameter generally greater than said crest diameter, a plate with an opening generally less than the diameter of said washer and greater than said crest diameter, wherein said washer is initially integrally molded with said helical element and connected thereto by a perforated frangible neck.

4,856,952

DEFORMED BAR FOR ADHESION AND APPLYING TENSION

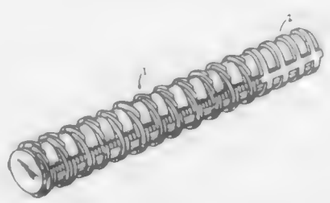
Roland J. Shaw, New Lambton Heights, Australia, assignor to Titan Mining & Engineering PTY. LTD., Sydney, Australia

Continuation of Ser. No. 923,146, Sep. 18, 1986, abandoned. This application Jan. 22, 1988, Ser. No. 147,606

Claims priority, application Australia, Jan. 25, 1985, PG9036

Int. Cl.[4] F16B *35/04*

U.S. Cl. 411—413 **5 Claims**



1. A length of substantially circular cross-section rock-bolt bar having a rolled deformation located thereon; said deformation comprising raised surfaces above a minor diameter of said bar; at least one end portion of said length having a standard, helically threaded portion of constant maximum depth included in said raised surfaces; said threaded portion being receivable of a correspondingly standard helically threaded nut thereon; said maximum depth of said threaded portion not extending in depth to said minor diameter; and wherein said deformation is formed by continuous rolling and said thread is formed by machining with no intermediate processing steps occurring between said formation steps; said rolled deformation thereby providing a basis for said threaded portion to be of a larger nominal thread diameter than that possible to be otherwise applied to said rock-bolt bar, said raised surfaces of said deformation comprising a plurality of pairs of opposed semicircumferential strips of predetermined width raised a predetermined height above said minor diameter; opposed ends of said pairs being joined by respective longitudinal strips also raised the same predetermined height; said opposed ends being offset longitudinally so that said opposed ends partially overlap in a logintudinal direction.

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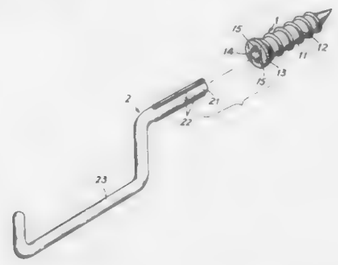
HOOK-DRIVEN SCREW WITH REPLACEABLE HOOK

Ming-Tang Lin, P. O. Box 10160, Taipei, Taiwan

Filed Jun. 29, 1988, Ser. No. 213,128

Int. Cl.[4] F16B *15/02, 23/00*

U.S. Cl. 411—383 **1 Claim**



1. A hook-driven screw means comprising:

a screw means adapted to be fixed in a wall having a screw shank formed with a flange secured on a head portion of the screw shank, and having a cylindrical hole longitudinally formed in the screw means through said flange; and

a hook means having a cylindrical hook shank engageable with said cylindrical hole in said screw means, and a hook portion protruding outwardly from said hook shank for hanging an article thereon;

the improvement which comprises:

said flange of said screw means formed with a pair of first longitudinal grooves longitudinally recessed in the cylindrical hole formed in said flange;

said screw shank formed with a pair of second longitudinal grooves longitudinally recessed in said cylindrical hole in said screw shank, said second longitudinal groove longitudinally communicated with said first longitudinal groove and enlarged clockwise along a circumferential surface of a cylindrical wall confined by the cylindrical hole in said screw shank to have a width twice of a width of said first longitudinal groove in said flange;

said hook shank having a pair of longitudinal extensions longitudinally formed thereon, each said extension having a width and a height respectively equal to a width and a depth of said first longitudinal groove;

said second longitudinal groove having a depth equal to the height of said longitudinal extension and having a width twice of the width of said longitudinal extension of said hook shank, whereby upon a rotation of said hook means when the hook shank is engaged in the screw shank to rotatively bias each said extension in said second longitudinal groove to projectively deviate from said first longitudinal groove at a central angle around a longitudinal axis of said screw means, each said extension of said hook means is limited by said flange, unable to be withdrawn from said screw means.

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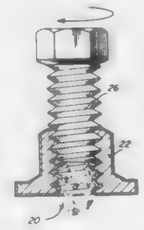
METHOD OF THREAD MASKING AND THREAD MASKED PART

Francis C. Peterson, Woodbury, Conn., assignor to Buell Industries, Inc., Waterbury, Conn.

Filed May 18, 1988, Ser. No. 195,970

Int. Cl.[4] F16B *37/00*

U.S. Cl. 411—427 **14 Claims**



7. A threaded masked threaded fastener part, comprising:

a threaded fastener part; and

a coating of a heat activated foaming polymeric material applied to the threads of said part, said foaming material having sufficient foaming ability such that it will foam and be detached from the threads of said fastener part after foaming by the fitting together of said fastener part with a matching fastener part.

4,856,955

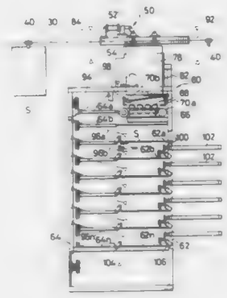
LITHOGRAPHIC PLATE TRANSFER SYSTEM

Akio Yaguchi, Hidaka, and Takayuki Kondo, Hanno, both of Japan, assignors to Tsubakimoto Chain Co., Japan

Filed Apr. 8, 1988, Ser. No. 179,487

Int. Cl.[4] B65G *47/00*

U.S. Cl. 414—278 **4 Claims**



1. A lithographic plate transfer system, comprising:

a lithographic plate pickup (10);

a transfer conveyer (30); and

an allocator (60);

said pickup (10) including a lift means (20) for hooking and lifting lithographic plates (S) delivered by conveyers (12) and (14), and a transfer means (24) for transferring said lithographic plates to said transfer conveyer (30);

said transfer conveyer (30) including grippers (40) for gripping a folded upper end portion (S1) of each lithographic plate, and gripper opening and closing cam mechanisms (50, 50') located in loading and unloading positions between said pickup and allocator; and

said allocator (60) including a mechanism for allocating the

unloaded lithographic plates from said conveyer (30) to shelves (62, 64).

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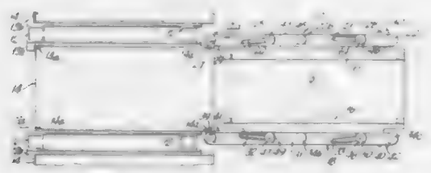
CONTAINER EXTRACTION AND TRANSFER MECHANISM FOR AN AUTOMATED STORAGE AND RETRIEVAL SYSTEM

Joseph G. Zar, Piscataway, N.J., assignor to Supac Systems, Inc., Piscataway, N.J.

Continuation-in-part of Ser. No. 63,388, Jun. 18, 1987, abandoned. This application Aug. 12, 1988, Ser. No. 231,657

Int. Cl.[4] **B65G** *1/02*

U.S. Cl. 414—280 **11 Claims**



1. An improved container extraction and transfer mechanism for an automated storage and retrieval system of the type having at least one storage matrix of vertically and horizontally spaced storage openings adapted to hold a plurality of modular containers of substantially uniform width, each container defining hook engagement recesses in the ends thereof on the opposite sides thereof, said system also including a horizontally movable stacker crane with a vertically movable platform and a transfer shelf thereon, said crane arranged to position said transfer shelf in laterally spaced alignment with the bottom of a selected one of said containers, said improved container extraction and transfer mechanism comprising:

a pair of laterally extending, horizontally spaced hook and belt assemblies mounted for lateral movement on said platform and disposed on either side of said transfer shelf, each said assembly comprising a continuous loop friction belt and at least a first hook connected to travel substantially parallel to the path of said belt and vertically aligned with one of said container hook engagement recesses when said transfer shelf is so positioned, first reversible drive means connected to move said assemblies laterally on said platform so as to grasp the end of a selected modular container with said friction belts engaging opposite sides of said containers, and

second reversible drive means connected to rotate said belt and hook assemblies to cause said first hooks to engage in said hook engageable recesses for extracting said selected container from said storage matrix onto said transfer shelf with the first hooks engaged in said container recesses and the friction belts engaged with the sides of said containers.

4,856,957

SEMICONDUCTOR WAFER TRANSFER APPARATUS WITH BACK-TO-BACK POSITIONING AND SEPARATION

John J. Lau, Dallas, and Si-Ming Fang, Plano, both of Tex., assignors to Mactronix, Inc., Dallas, Tex.

Filed Jan. 11, 1988, Ser. No. 142,439

Int. Cl.[4] **B65G** *65/00*

U.S. Cl. 414—404 **22 Claims**

1. A wafer handling apparatus, comprising:

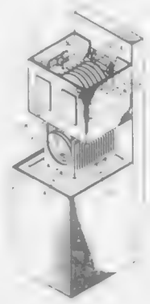
a first boat for containing pairs of first and second wafers in a back-to-back configuration, each pair of back-to-back wafers contained in an upright and vertical position;

elevator means for raising the back-to-back configured wafers out of said first boat to a predetermined height;

alignment means for contacting the edges of said back-to-back wafers and positioning a point between the backs of each pair of the back-to-back wafers over a predetermined alignment point along the peripheral edge thereof;

first and second separation edges operable to be disposed on diametrically opposite sides of said back-to-back wafers at said predetermined alignment point and equi-distant and below a center of the back-to-back wafers at a distance less than a diameter of the wafers;

first and second retainer means associated with each of said first and second separation edges and disposed below said first and second separation edges and a predetermined distance apart to receive and hold peripheral edges of the first and second wafers when separated;



guiding means for guiding the first and second wafers away from said first and second separation edges to said associated first and second retainer means by gravity; and

said alignment means operable to be controlled to align the back-to-back wafers above said predetermined alignment point and then allow said back-to-back wafers to fall by gravity onto said separation edges and be separated, said elevator means operable to remove the separated first and second wafers from said first and second retainer means and lower them into a second boat.

4,856,958

APPARATUS FOR CONVERTING DISCRETE ARRAYS OF ROD-SHAPED ARTICLES INTO A MASS FLOW

Jürgen Bantien, Hamwarde, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Mar. 26, 1987, Ser. No. 31,256

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1986, 3612040

Int. Cl.[4] **A24C** *5/352, 5/356*

U.S. Cl. 414—414 **17 Claims**



1. Apparatus for converting successive individual arrays of parallel rod-shaped articles of the tobacco processing industry wherein each array has a predetermined height and length into a continuous mass flow, comprising a magazine having upright front and rear walls and a bottom wall defining with said front and rear walls a compartment having a length corresponding to said predetermined length and a height at least matching said predetermined height; elevator means movable between an upper position above and a lower position in the region of said bottom wall; means for delivering discrete arrays to said elevator means; transporting means for supporting the mass flow adjacent said front wall and for advancing the mass flow in a predetermined direction away from said magazine, said transporting means including said bottom wall and said rear wall being movable in synchronism with said transporting means; first drive means for moving said front wall relative to said transporting means substantially transversely of said direction between an extended position and a retracted position so that an array in said compartment constitutes the trailing end of the mass flow on said transporting means in response to movement of the front wall relative to said transporting means to said retracted position; and second drive means for moving said rear wall and said transporting means reciprocably in and counter to said direction independently of said front wall a distance substantially equal to said predetermined length.

4,856,959

CARRIER FOR CYLINDRICAL CONTAINERS

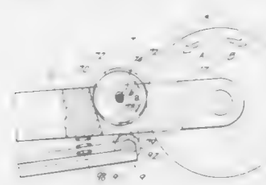
Toshikazu Tabayashi, Suita, Japan, assignor to Osaka Taiyu Co., Ltd., Osaka, Japan

Filed Nov. 17, 1987, Ser. No. 122,805

Claims priority, application Japan, Nov. 19, 1986, 61-177771[U]; Nov. 27, 1986, 61-183176[U]

Int. Cl.[4] **B62B** *3/04;* **B66F** *9/18*

U.S. Cl. 414—451 **8 Claims**



1. A barrel carrier for lifting and carrying a cylindrical container comprising:

a movable dolly having at least one rear wheel at a rearward side thereof, at least a pair of front wheels at a forward side thereof and a substantially upright guide bar positioned between the rear and front wheels;

a lift frame means for holding and lifting the cylindrical container and being supported by the substantially upright guide bar, the lift frame means being provided with a pair of arms each extending between the pair of front wheels with a space therebetween smaller than a diameter of the cylindrical container;

a clamp means provided at the top of the lift frame means for releasably clamping a top corner of the cylindrical container;

a lift drive means for vertically moving the lift frame means; and

at least one brake means provided at at least one of the pair of front wheels for releasably braking the front wheel, the brake means having a bearing face provided upon the movable dolly adjacent to the front wheel, a movable brake roller provided between the bearing face and the front wheel, and release means for releasing the movable brake roller out of the contact with the bearing face and the front wheel such that rotational movement of the front wherein is prevented by contact of the brake roller with the bearing face and the front wheel and is released by moving the brake roller out of contact by action of the release means.

4,856,960

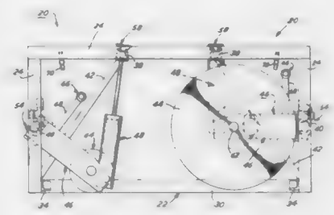
IMPROVED MACHINE FOR LIFTING AND LOADING WEB ROLLS

Roger R. Wheeler, Roscoe, and John R. Martin, Rockford, both of Ill., assignors to Martin Automatic, Inc., Rockford, Ill.

Continuation of Ser. No. 910,361, Sep. 22, 1986, abandoned. This application May 5, 1988, Ser. No. 193,290

Int. Cl.[4] **B66C** *23/00*

U.S. Cl. 414—684 **10 Claims**



1. An improved machine for lifting and loading a web roll, that has substantially parallel ends and a central core opening extending from one end to the other, from an unloaded position, where the web roll is disposed on a relatively fixed surface adjacent to the machine and is spaced forwardly of the machine in a first predetermined direction and where the longitudinal axis of the central core opening is substantially parallel to the first predetermined direction, to an unwind position, where the web from the web roll may be unwound by rotation of the web roll about the longitudinal axis of its central core opening and where the web roll is rearwardly of its unloaded position, the improved lifting and loading machine comprising:

a frame for supporting the web roll in its unwind position;

a lift arm having a first end and a second end;

a spindle that is mounted on and cantilevered from the first end of the lift arm, with the longitudinal axis of the spindle being substantially perpendicular to the plane of the lift arm and extending in the first predetermined direction and toward the one end of the web roll when the web roll is in its unloaded position and that is adapted to be received within the central core opening of the web roll;

means for mounting the lift arm on the frame, the mounting means including a first rod that is mounted on the frame so that its longitudinal axis is substantially parallel to the longitudinal axis of the spindle and first bearing means that are mounted on the second end of the lift arm and that engage the first rod whereby the first end of the lift arm may be selectively pivoted vertically, with respect to its second end about a first axis substantially parallel to the longitudinal axis of the spindle and whereby the lift arm may be moved forwardly and rearwardly along a horizontal path of travel substantially parallel to the longitudinal axis of the spindle; and

means for moving the first end of the lift arm vertically between an upper position where the web roll, when mounted on the spindle, may be rotated about the longitudinal axis of its central core opening so that the web on the web roll may be unwound from the web roll and a lower position where the spindle may be inserted into the central core opening of the web roll when the web roll is in its unloaded position, the means for moving the lift arm vertically including a power cylinder that has its one end pivotably connected with the first end of the lift arm and that has its other end pivotably connected with the frame; a second rod that is mounted on the frame so that the longitudinal axis of the second rod is substantially parallel to the horizontal path of travel; and second bearing means that are connected with the other end of the power cylinder and engage the second rod so that the other end of the power cylinder may be moved along the longitudinal axis of the second rod and may be pivoted about the longitudi-

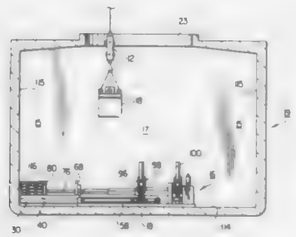
nal axis of the second rod; and means for moving the lift arm along the horizontal path of travel forwardly and rearwardly in a direction substantially parallel to the first predetermined direction between a forward position, where the spindle may be inserted in the central core opening of the web roll when the web roll is in its unloaded position, and a rearward position, with the moving means being adapted to selectively move the web roll between its unloaded position and its unwind position.

4,856,961

LARGE CAPACITY WING LOADER AND UNLOADER APPARATUS FOR CARGO SHIPS

Melvin E. Shell, P.O. Box 1121, Stephenville, Tex. 76401

Filed Mar. 31, 1987, Ser. No. 32,774
Int. Cl.[4] B63B 27/16; B65G 67/60
U.S. Cl. 414—749 15 Claims



1. Apparatus for relatively relocating cargo between paired locations within a haulage vehicle, said apparatus being portable for placement in and removal from the haulage vehicle in which it is to be utilized and comprising:

a plurality of relatively displaceable, interfitting and elongated trays including:

an uppermost tray adapted to receive cargo at one of said paired locations and being horizontally movable between an extended position and a retracted position, and

an underlying tray positioned lower than said uppermost tray and being horizontally movable between an extended position in which said underlying tray is positioned beneath and supports said uppermost tray in its extended position, and a retracted position in which said underlying tray is positioned beneath and supports said uppermost tray in its retracted position;

first operating means for controllably extending and retracting said uppermost tray and said underlying tray to relocate cargo received by said uppermost tray at said one of said paired locations toward the other of said paired locations to which the received cargo is to be relocated, said first operating means being operative to extend said underlying tray in a controlled timed relation to the extension of said uppermost tray and to extend said underlying tray before said uppermost tray is extended, whereby said underlying tray, when extended, provides support for said uppermost tray during the course of said uppermost tray being extended and retracted;

coupling means for coupling said uppermost tray and said underlying tray, when in their extended positions, to enable their concomitant retraction by said first operating means,

said first operating means including first drive means for extending one of said uppermost tray and said underlying tray, and second drive means for extending the other of said uppermost tray and said underlying tray, and for conconcomitantly retracting said trays when the same are coupled by said coupling means; and

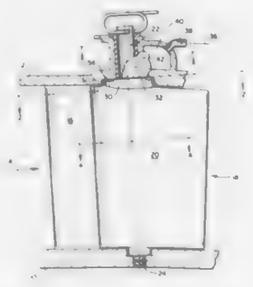
second operating means, controllably operative when said uppermost tray and said underlying tray are substantially in their retracted positions, for laterally displacing said trays to other paired locations at which received cargo is to be relocated.

4,856,962

VARIABLE INLET GUIDE VANE

Robert W. McDow, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 24, 1988, Ser. No. 159,802
Int. Cl.[4] F01D 9/02
U.S. Cl. 415—115 4 Claims



1. A heated inlet variable guide vane assembly for a gas turbine compressor inlet comprising:

an outer casing;

an inner casing, forming an annular airflow passage between said inner and outer casings;

an airfoil having openings therethrough for the passage of heated air, an air inlet end, and having a convex side and a concave side;

a trunnion having an axis and secured to said airfoil at the air inlet end and offset toward the concave side of said airfoil, and rotatably secured in said outer casing;

a second trunnion at the other end of said airfoil coaxial with said first trunnion and rotatably secured to said inner casing;

means for selectably positioning said airfoil around said axis;

a button interposed between said first trunnion and said airfoil, and having a planar surface perpendicular to said axis and facing said first trunnion;

said planar surface having a recess therein in fluid communication with an opening within said airfoil;

a seal on said planar surface surrounding said recess and abutting the inner surface of said outer casing; and

an air supply opening located in said outer casing adjacent to said first trunnion, and said recess in fluid communication with said air supply opening.

4,856,963

STATOR ASSEMBLY FOR AN AXIAL FLOW ROTARY MACHINE

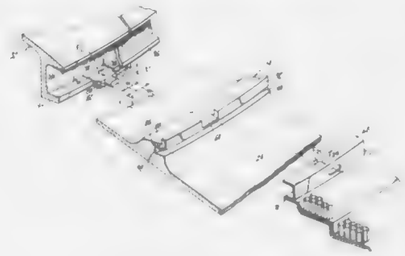
Kenneth H. Klapproth, Middletown; William C. Blimmel, West Hartford, and Merle L. Dinse, South Windsor, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 23, 1988, Ser. No. 172,038
Int. Cl.[4] F04D 29/54
U.S. Cl. 415—190 11 Claims

3. An improved arcuate stator vane assembly of the type used in a gas turbine engine, the stator vane assembly having at least one radially extending airfoil wherein the improvement comprises:

a key extending axially from the vane which has a first section integral with the vane, a second section which adapts the vane to circumferentially engage a support structure to block circumferential movement of the vane,

the second section having a radial projection from the key which increases the area of the key facing in the circumferential direction, and, a third section extending from the second section of the key which adapts the key to engage an axially adjacent arcuate segment.

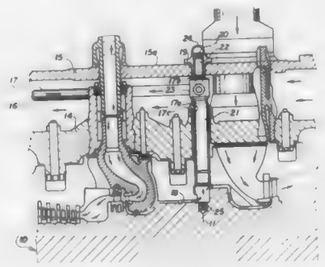


4,856,964

METHOD AND APPARATUS FOR BALANCING A TURBINE ROTOR

Alvin L. Stock, Casselberry, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 3, 1988, Ser. No. 201,714
Int. Cl.[4] F04D 29/66
U.S. Cl. 415—201 7 Claims



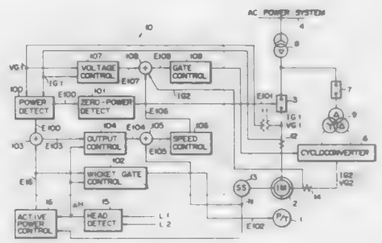
4. An apparatus for improving the balance of a turbine rotor having an outer surface, said turbine motor being housed within an inner cylinder, said inner cylinder being housed within an outer housing, said inner cylinder and outer housing having a gap therebetween, said apparatus comprising a sleeve having a top portion, said sleeve extending substantially from said rotor outer surface through said inner cylinder and to said outer housing, said outer housing having an outer entry point therein, such that a passageway exists, said passageway extending from said outer entry point through said outer housing through said sleeve to said rotor, said passage permitting passage of balancing weights therethrough for placement within said rotor, said sleeve including an equilibrium pipe extending from said sleeve along said gap, said sleeve and said pipe being connected with each other, said sleeve further including a plug positioned within said sleeve, said plug sealing said top portion of said sleeve, thereby permitting said sleeve and said equilibrium pipe to equalize pressures in said turbine during operation of said turbine, and said plug preventing any gas contained within said sleeve and said equilibrium pipe from leaking through said outer housing.

4,856,965

CONTROL SYSTEM OF PUMPING OPERATION USING AC EXCITING GENERATOR-MOTOR

Masahiro Katsuie; Michiyuki Abe, both of Tokyo; Katsuyuki Kawahara, and Taizo Nakamura, both of Hachioji, all of Japan, assignors to The Tokyo Electric Power Co. Inc., Tokyo and Kabushiki Kaisha Toshiba, Kawasaki, both of, Japan

Filed Oct. 21, 1988, Ser. No. 260,690
Claims priority, application Japan, Oct. 23, 1987, 62-267913
Int. Cl.[4] F04B 49/02
U.S. Cl. 417—19 16 Claims



1. A control system of pumping operation comprising:

power source means, coupled to an AC power system, for converting AC power from the AC power system into AC power having a given frequency;

an AC exciting generator-motor, having a stator side electrically connected to said AC power system, having a rotor side electrically connected to said power source means, and having a rotor shaft mechanically coupled to a pump-turbine by which the pumping operation is carried out;

a circuit breaker inserted between said AC power system and the stator side of said AC exciting generator-motor;

rotation speed control means, coupled to said AC exciting generator-motor and said power source means, for controlling a rotation speed of said AC exciting generator-motor such that the rotation speed becomes slow when the pumping operation is to be stopped;

AC excitation control means, coupled to said power source means which excites the rotor side of said AC exciting generator-motor, for decreasing a degree of the excitation effected by said power source means, wherein the decreasing of the excitation degree starts when the rotation speed of said AC exciting generator-motor, reduced by said rotation speed control means, reaches a predetermined specific value; and

circuit breaker off means, coupled to said circuit breaker and said AC exciting generator-motor, for turning off said circuit breaker when input power, supplied from said AC power system to the stator side of said AC exciting generator-motor, becomes substantially zero.

4,856,966

VARIABLE DISPLACEMENT DIAPHRAGM PUMP

Ken Ozawa, Quincy, Wash., assignor to Ozawa R & D., Inc., Portland, Oreg.

Filed Jan. 11, 1988, Ser. No. 142,537
Int. Cl.[4] F04B 49/00
U.S. Cl. 417—214 2 Claims

1. A fluid feed pump, comprising:

(a) a pumping chamber;

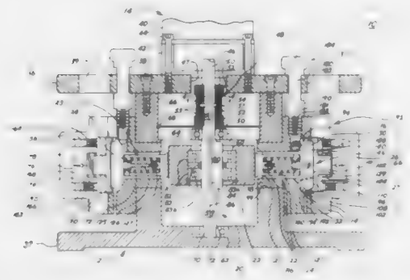
(b) a fluid inlet and outlet in communication with the pumping chamber;

(c) a flexible diaphragm extending across the pumping chamber;

(d) a reciprocable piston having a head bearing against the diaphragm for pumping fluid through the pumping chamber and an elongate skirt for guiding the piston during

reciprocating movement along the longitudinal axis of the piston;

(e) adjustable means for precisely and infinitely adjusting the stroke of the piston along a finite stroke range, the adjustable means comprising a ramp surface incorporated into the external contours of the piston, the ramp surface disposed at an acute angle relative to the plane of the diaphragm, a selectively adjustable stop member bearing against the ramp surface, and adjustable means f. r moving the stop member relative to the ramp surface in a direction of approach and reproach that is at an acute angle from the plane of the ramp surface;



(f) wherein the piston includes an enlarged head having a forward portion facing toward the diaphragm and a rearward portion facing away from the diaphragm, and wherein the ramp surface is located on the rearward portion of the piston;

(g) wherein the rearward portion of piston head constituting the ramp surface is frustoconically shaped; and,

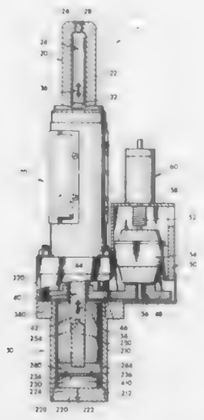
(h) wherein the frustoconically-shaped ramp surface extends from the diameter of the skirt to the outside diameter of the piston head.

4,856,967

HYBRID HIGH PRESSURE PUMP FOR GAS-LIQUID PERMEAMETERS

Stanley C. Jones, 875 Front Range Rd., Littleton, Colo. 80120

Filed Sep. 29, 1987, Ser. No. 102,513
Int. Cl.[4] F04B *17/00*
U.S. Cl. 417—342 **12 Claims**



1. A hybrid fluid pump (**10**) for delivering a high pressure fluid in a fluidsystem, said hybrid fluid pump comprising

an upper drive cylinder (**22**),

an upper drive piston (**32**) disposed in said upper drive cylinder, said upper drive cylinder having a formed port (**28**) through which said high pressure fluid is delivered,

an upper chamber (**24**) formed above said drive piston and in said upper drive cylinder for carrying said high pressure fluid,

a screw (**40**),

means connected to one end of said screw for coupling to said upper drive piston to move said upper drive piston in said upper drive cylinder thereby displacing said high pressure fluid in said upper chamber to a desired output pressure (**P1**) for displacement through port (**28**),

driving means (**46, 48**) coupled to said screw for axially driving said screw,

a booster cylinder (**210**),

a booster piston (**240**) disposed in said booster cylinder and connected to the opposing end of said screw, the area of said booster piston area being at least an order of magnitude greater in size than the area of said upper drive piston,

a booster chamber (**410**) formed under said booster piston and in said booster cylinder and means for maintaining a predetermined constant intensifying pressure (**PB**), said predetermined constant intensifying pressure providing a booster motive force (**FB**) on said screw in the direction of moving said drive piston into said upper dive cylinder in order to displace high pressure fluid from said upper chamber, and

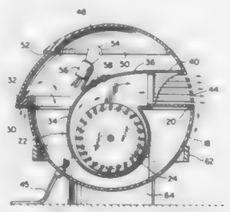
a stepper motor and reducer (**50,60**) connected to said driving means for delivering additional motive force (**FM1**) to axially move said screw in a drive stroke to displace said high pressure fluid in said upper chamber, said additiional motive force (**FM1**) being equal to the differential pressure of said system multiplied by the cross sectional area of said upper drive piston plus the frictional forces present in said hybrid pump but less than said booster motive force, said stepper motor being capable of moving said screw in a return stroke.

4,856,968

AIR CIRCULATION DEVICE

Joseph M. Armbruster, 2700 N.E. 47th St., Lighthouse Point, Fla. 33064

Filed Feb. 2, 1988, Ser. No. 151,606
Int. Cl.[4] F04B *39/14*
U.S. Cl. 417—360 **10 Claims**



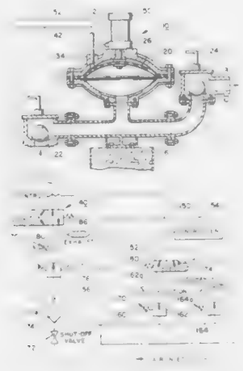
1. An air circulation device comprising a hollow housing, an air blower mounted in said housing and including an impeller and an impeller casing having an air inlet and outlet, said hollow housing including an air inlet and air outlet with the air outlet from the casing being connected to the air outlet in the housing for discharging pressurized air from the housing, the inlet for the hollow housing being spaced from the casing to enable inlet air to completely enclose the blower for entry into the air inlet of the impeller casing and means adjustably supporting said hollow housing, said hollow housing including a curved external surface with the air inlet being defined by a slot extending around a substantial portion of the curved surface of the housing, said air inlet for the housing being formed by a downwardly opening arcuate slot aiong a portion of the hollow housing opposite the air outlet, said hollow housing being substantially spherical in configuration, said supporting means for the housing including an annular member engaging and supporting the lower surface portion of the hollow housing and enabling the hollow housing to be pivoted about a vertical axis and a horizontal axis to direct the air outlet in a desired direction.

4,856,969

FLUID POWERED DIAPHRAGM PUMP WITH CYCLE TIMER

Carl Forsythe; John L. Dorminy, both of Sand Springs, and Joseph W. Raymon, Skiatook, all of Okla., assignors to The Gorman-Rupp Company, Mansfield, Ohio

Continuation-in-part of Ser. No. 34,013, Apr. 1, 1987, abandoned. This application Jun. 27, 1988, Ser. No. 211,972
Int. Cl.[4] F04B *43/06*
U.S. Cl. 417—395 **8 Claims**



1. Diaphragm pump apparatus comprising:

(a) a pump housing that defines a pumping chamber having an effluent inlet to deliver effluent to the chamber, a flexible diaphragm supported within the chamber to apply pressure to effluent entering the pumping chamber, and an effluent outlet to discharge effluent from the pumping chamber, said housing having a fluid port for routing pressurized fluid into the pumping chamber against the flexible diaphragm;

(b) return means including a pressure cylinder having a drive piston attached to the diaphragm for reversing the direction of diaphragm movement within the pumping chamber during a return stroke, said pressure cylinder having a cylinder input port to pressurize said cylinder;

(c) pressure means for directing fluid at a regulated pressure against the diaphragm to move the diaphragm during the pump discharge stroke and for directing fluid at a regulated pressure to the pressure cylinder during the return stroke;

(d) reversing valve means having a reversing valve including pressure inlet coupled to the pressure means, an exhaust outlet to atmosphere, a first valve port coupled to the fluid port of the pump housing, and a second valve port coupled to the inlet port of said pressure cylinder; said reversing valve including a movable valve actuator wherein a first actuator position routes fluid from the pressure inlet and out said first valve port to the fluid port of the pump housing and vents the pressure cylinder input port to atmosphere through the second valve port and out the exhaust outlet during the pump discharge stroke and a second actuator position routes pressurized fluid from the pressure inlet out said second valve port to the pressure cylinder input port and vents the pumping chamber to atmosphere through the first valve port and out the exhaust outlet during the return stroke; and

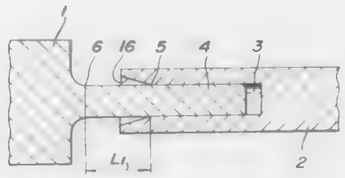
(e) timer means including control means for adjusting a pump cycle time, said timer means coupled to said reversing valve means to switch the movable valve actuator between said first and second valve actuator positions and cycle the pump through alternate discharge and return strokes at a controlled cycle rate.

4,856,970

METAL-CERAMIC COMBINATION

Isao Oda, and Yoshihiko Ishida, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Mar. 10, 1986, Ser. No. 837,203
Claims priority, application Japan, Mar. 25, 1985, 60-60352
Int. Cl.[4] F04B *17/00*
U.S. Cl. 417—407 **8 Claims**



1. A metal-ceramic combination comprising:

a ceramic member including a base portion, a protrusion extending from and integrally formed with said base portion, and an easement portion formed between said base portion and said protrusion, said easement portion having a cross-sectional area which gradually increases from said protrusion toward said base portion;

a metallic member having a recess or bore in which said protrusion is fitted to form a contact surface therebetween, an outside diameter of said protrusion being 0.1–10% larger than an inside diameter of said recess or bore before fitting of said protrusion into said recess or bore; and

wherein a clearance of at least 0.5 mm exists between an interface of said protrusion and said easement portion and an interface of said protrusion and said metallic member closest to said base portion.

4,856,971

EVAPORATIVE COOLER PUMP APPARATUS

Robert L. Koble, Jr., 1011 W. Picadilly, Phoenix, Ariz. 85013

Filed Sep. 16, 1988, Ser. No. 245,026
Int. Cl.[4] F04D *7/02*
U.S. Cl. 417—423.8 **24 Claims**

1. Housing apparatus for a pump and a motor, comprising in combination:

bottom housing means for receiving water to be pumped, including a water intake portion having a first plurality of slots spaced apart from each other to allow water to flow through the slots and to prevent undesirable debris from flowing through the slots with the water;

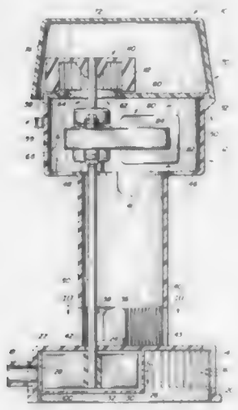
middle housing means connected to and extending upwardly from the bottom housing means;

upper housing means secured to the middle housing means for receiving a motor, comprising a generally round motor housing and including a bottom wall;

passage means through which air flows for cooling the motor in the upper housing means;

a generally round cap secured to the upper housing means

for receiving the air flowing into the upper housing means and from which the air flows out of the apparatus; and



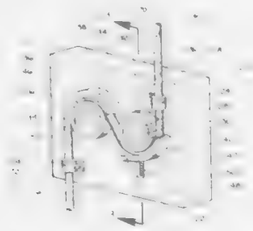
means disposed within the cap for causing the air to flow into the upper housing means, upwardly over the motor, and into and out of the round cap.

4,856,972

DUAL ROLLER PERISTALTIC PUMP

Peter Van Benschoten, Rancho Santa Fe, and David Burkett, San Diego, both of Calif., assignors to Fisher Scientific Co., Pittsburgh, Pa.

Filed Jun. 9, 1988, Ser. No. 204,382
Int. Cl.[4] F04B *43/12*
U.S. Cl. 417—477 15 Claims



1. A peristaltic pump for pumping fluids through a flexible tube comprising:
- a base;
- a first drive shaft rotatably mounted on said base;
- a second drive shaft mounted on said base substantially parallel to said first drive shaft for counterrotation with respect thereto;
- a first curvilinear platen mounted on said base concentric with said first drive shaft;
- a second curvilinear platen mounted on said base concentric to said second drive shaft;
- a first roller eccentrically mounted on said first drive shaft for rotation therewith and positioned to create a slot between said first roller and said first platen to receive said tube therein for progressively squeezing said tube against said first platen; and
- a second roller eccentrically mounted on said second drive shaft for rotation therewith and positioned to create a slot between said second roller and said second platen to receive said tube therein for progressively squeezing said tube against said second platen.

4,856,973

SCROLL-TYPE FLUID MACHINE WITH SPECIFIC INNER CURVE SEGMENTS

Takahisa Hirano; Kiyoshi Hagimoto, both of Nagoya, and Kimiharu Takeda, Aza-asahi, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Jan. 21, 1988, Ser. No. 146,618
Claims priority, application Japan, Jan. 27, 1987, 62-17074; Jul. 3, 1987, 62-166450
Int. Cl.[4] F01C *1/04*
U.S. Cl. 418—55 2 Claims



1. A scroll-type fluid machine including a stationary spiral element and a revolving spiral element having a substantially identical configuration and a central small chamber defined between abutting points of both the spiral elements a volume of which is adapted to be reduced to substantially zero with relative rotation of both the spiral elements, wherein each of said both spiral elements is defined in profile with an outer curve segment and an inner curve segment consisting of involute curves, and a portion between said outer curve segment and said inner curve segment is substantially formed of a connection inner curve expressed by the following equation (23) and a connection outer curve expressed by the following equation (24):

$$\begin{vmatrix} x(t) \\ y(t) \end{vmatrix} = \phi(t) \begin{vmatrix} r(t) \\ 0 \end{vmatrix} - \phi(\beta) \begin{vmatrix} b \\ d \end{vmatrix} \quad (23)$$

$$\begin{vmatrix} x(t) \\ y(t) \end{vmatrix} = \phi\left(t - \tan^{-1}\left\{\frac{\frac{dr(t)}{dt}}{r(t)}\right\}\right) \begin{vmatrix} \rho \\ 0 \end{vmatrix} - \phi(t) \begin{vmatrix} r(t) \\ 0 \end{vmatrix} + \phi(\beta) \begin{vmatrix} b \\ d \end{vmatrix} \quad (24)$$

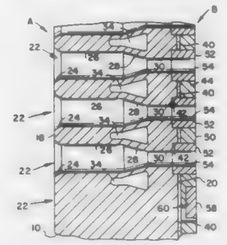
where t is a variable with $t_c \leqq t \leqq \pi/2+\beta$
- β is the starting angle of the involute curve of the inside of the revolving and stationary spiral elements and the outside of the revolving spiral elements and the correction inner curve of the stationary spiral element
- b is the radius of the base
- ρ is the radius of revolution
- $d=\{b^2-(\rho/2+b\beta)^2\}/2(\rho/2+b\beta)$.

4,856,974

INTERNALLY INSULATED EXTRUSION DIE

John R. Wolfe, Jr., Rogers, Ark., assignor to Rogers Tool Works, Inc., Rogers, Ark.

Continuation of Ser. No. 863,997, May 22, 1986, Pat. No. 4,752,196. This application Jun. 8, 1988, Ser. No. 203,812
The portion of the term of this patent subsequent to Jun. 21, 2005, has been disclaimed.
Int. Cl.[4] B29C *47/30, 47/86*
U.S. Cl. 425—67 15 Claims



1. An extrusion die assembly for plastic pelletizing apparatus of the type including a cooling bath into which plastic pellets are extruded comprising:
- a main body having first and second oppositely disposed exterior faces;
- a plurality of plastic extrusion passageways extending through said body between said first and second faces;
- a layer of thermal insulation material overlying said second face; means for applying heat to said main body;
- a cover member positioned over said thermal insulation material and joined to said main body, said cover member having an outer surface exposed to said cooling bath and having a plurality of recesses therein;
- wear resistant insert members extending from said outer surface through said cover member and said layer of insulation into said main body, substantially all of said insert members having an outer end lying in a common plane with said outer surface;
- wear pad members mounted on said outer surface of said cover member in said plurality of recesses at locations spaced from said insert members, said wear pad members having an outer surface lying in the plane of said outer ends of said insert members; and,
- extrusion orifices extending through said insert members and forming continuations of said extrusion passageways of said main body.

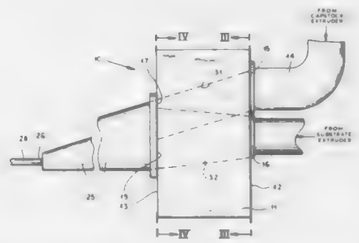
4,856,975

COEXTRUSION BLOCK, ESPECIALLY FOR THE COEXTRUSION OF GENERALLY FLAT PVC ARTICLES, SUCH AS SIDING

Kenton Gearhart, Moundridge, Kans., assignor to American Maplan Corporation, McPherson, Kans.

Filed Aug. 26, 1988, Ser. No. 237,211
Int. Cl.[4] B29C *47/04*
U.S. Cl. 425—131.1 10 Claims

1. A coextrusion assembly for the extrusion of wide generally flat workpieces in the form of extruded siding, said assembly comprising:
- a first extruder for supplying a synthetic resin capstock material;
- a second extruder for supplying a synthetic resin substrate material;
- a coextrusion block having an upstream side and a downstream side, said block being formed at said upstream side with spaced apart first and second circular inlets opening on a common face of said block and connected respectively to said first and second extruders for receiving said capstock material and said substrate material, respectively, said block being formed at said downstream side with a first outlet for said capstock material and a second outlet for said substrate material, said first outlet having generally an elongated arcuate kidney shape with terminal lobes connected by an arcuate region extending arcuately around and strangling said second outlet, said second outlet having a generally acorn-shaped outline with opposite rounded segments of different radii of curvature having S-shaped transitions between them, said first and second outlets having diametrically opposite margins lying along a common circle, said coextrusion block being further formed with respective passages smoothly connecting said first inlet with said first outlet and said second inlet with said second outlet whereby flow from said first outlet wraps around flow from said second outlet; and
- a die having a circular inlet coaxially with said common circle and registering with both sides outlets, a wide mouth from which a flat workpiece consisting of said materials in respective layers emerges, and a passage flaring from said circular inlet of the die to said mouth.

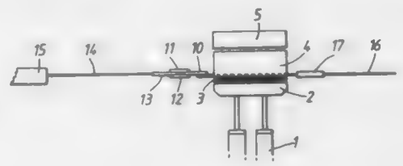


4,856,976

DEVICE FOR MANUFACTURING STONES

Cornelis Rook, Krimpen, and Willem Klein, Laren, both of Netherlands, assignors to Gebroeders Rook Beheer B.V., Ijssel, Netherlands

Filed Apr. 29, 1988, Ser. No. 187,841
Claims priority, application Netherlands, May 8, 1987, 8701096
Int. Cl.[4] B29C *43/42*
U.S. Cl. 425—320 16 Claims



1. A device for manufacturing stones, said device comprising:
- (a) a frame;
- (b) a mould mounted on said frame and having boundary walls that define moulding rooms inside said mould;
- (c) a stamp mounted on said frame and movable up-and-down arranged above said mould;
- (d) a table arranged under said mould in position to receive stones ejected from said mould by said stamp;
- (e) a plurality of filling pieces which are movable in a direction of movement between:
  - (i) a first position, in which said plurality of filling pieces are located under said mould and wherein, seen in top view, at least parts of said plurality of filling pieces

project from said boundary walls for forming recesses, and

(ii) a second position, in which said plurality of filling pieces are located beside said mould, seen in top view; and (f) extensions connected to said plurality of filling pieces, said extensions:

(i) being movable forward and backward;

(ii) co-operating with guide means for guiding said plurality of filling pieces; and

(iii) projecting from said mould when said plurality of filling pieces are in their first position.

4,856,977

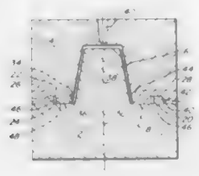
TWO STAGE MOLD CENTERING SYSTEM

John W. Von Holdt, 6864 Lexington La., Niles, Ill. 60648

Filed Jul. 1, 1988, Ser. No. 214,389

Int. Cl.[4] B29C *45/36*

U.S. Cl. 425—468 27 Claims



15. In a mold which comprises a mold core and a mold cavity movable between open and closed positions and together defining a molding chamber in the closed position, and sprue means for supplying plastic molding compound to the molding chamber in the closed position, said mold core and mold cavity defining a parting line between them in the closed position, and one of said mold core and mold cavity defining centering projection means at said parting line defining radially inner and outer surfaces, which projection means project into a recess means defined by the other of said mold core and mold cavity in the closed position to center said mold core and cavity, the improvement comprising, in combination:

one of said radially inward and outward surfaces of the projection means engaging a mating, tapered face of the recess means upon moving into the closed position for further mold centering action, the other of the radially inner and outer surfaces of the projection means being spaced by a short distance from a mating face of the recess means on entering the closed position, whereby pressurization of said molding chamber during molding can expand said mold cavity to cause engagement of the spaced surface of the projection means and its mating face of the recess for mold centering during said pressurization.

4,856,978

APPARATUS FOR CONVEYING PREFORMS

Hermann Voss, Seevetal, and Manfred Mank, Hamburg, both of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

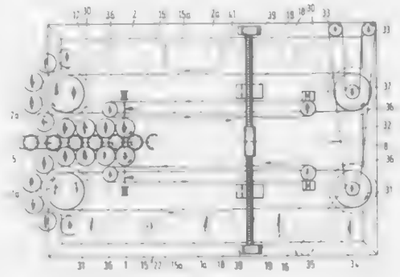
Filed Sep. 1, 1988, Ser. No. 239,533

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 3729452

Int. Cl.[4] B29C *49/68*

U.S. Cl. 425—526 5 Claims

1. An apparatus for the conveying of preforms through a heating station during the production of hollow bodies formed from thermoplastic plastics material, said preforms each including a support ring or collar, said conveying apparatus comprising a housing and conveyor means disposed within said housing, said conveyor means comprising a pair of endless toothed belts, said pair of belts being disposed parallel to, but spaced apart from one another to define a conveyor path therebetween, drive means associated with each belt for driving said belts in opposite directions to one another, whereby the surfaces of said belts defining said path are caused to travel in the same direction as one another, means for adjusting said spacing of said belts from one another, a plurality of bearing assemblies fixedly mounted on each of said belts, each said bearing assembly including a bearing ring, whereby, in use, pairs of said assemblies, comprising one assembly from each belt, cooperate with one another and jointly support and convey said preforms by engagement, from opposed sides, with said support ring or collar, means for rotating said bearing rings, said means for rotating comprising a further pair of endless drive belts, said further pair of drive belts extending parallel to, but spaced apart from, one another and parallel to, but vertically spaced from, said pair of toothed belts, said



further pair of belts being disposed one on each side of said conveyor path, drive means associated with each belt of said further pair of belts for driving said belts in the same direction as one another whereby the surfaces of said belts facing said conveyor path travel, in use, in opposite directions to one another, means for adjusting said drive means for said further pair of belts, drive roller means co-operating with each said belt of said further pair of belts, said drive roller means being connected to each said bearing ring, and heating means for heating said preforms during said conveyance, whereby actuation of said toothed pair of belts causes support and conveyance of said preforms along said conveyor path and simultaneous actuation of said further pair of drive belts causes rotation of said preforms about their own axis during said conveyance.

4,856,979

HEATED CHANNEL FOR PLASTIC INJECTION MACHINES

Hans Schreck, Wolkersdorfer Str. 28, D-3559 Burgwald-Bottendorf, Fed. Rep. of Germany

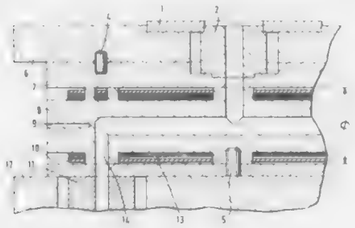
Filed Mar. 25, 1988, Ser. No. 173,125

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710139

Int. Cl.[4] B29C *45/74*

U.S. Cl. 425—547 9 Claims

1. In a heated channel for use between a clamping plate and a mold plate of a plastic injection machine, comprising: a heated-channel member directly engaging said clamping plate and said mold plate and adapted to transmit mold clamping forces between said clamping plate and said mold plate, said heated-channel member having at least one longitudinal bore and at least one cross bore therein for facilitating an interconnecting of connecting and branching nozzles and a delivering and a discharging, respectively, of a liquidy plastic into and out of said heated-channel member, an insert member with material-guiding bores therein for providing a fluid connection of said connecting and branching nozzles, said insert member being received into said longitudinal bore to facilitate said fluid connection, said insert member having grooves on an external surface thereof for receiving heating elements therein for heating said insert member and regions whereat liquidy plastic is delivered to and discharged from said heated-channel member,



and connecting means for providing both a radial and an axial fixing of said heated-channel member and insert member to one another and to said clamping plate and said mold plate.

4,856,980

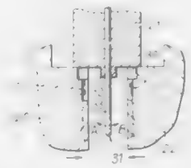
INJECTION MOLDING APPARATUS FOR MAKING PARTS HAVING COMPLEX GEOMETRIC SHAPES

Joseph N. Laurita, Wayne, N.J., assignor to Schmid Laboratories, Inc., Little Falls, N.J.

Filed Sep. 18, 1987, Ser. No. 99,147

Int. Cl.[4] B29C *45/32*

U.S. Cl. 425—572 3 Claims



1. Injection molding apparatus comprising: means for supplying molten plastic to a mold;

said mold including:

(a) an injector plate having at least one mold cavity for making a part and having a passageway to allow molten plastic to enter said mold cavity;

(b) an ejector plate having at least one mold cavity corresponding to said mold cavity in said injector plate; and

(c) a floating plate having at least one projection; said plates adapted to fit together when said mold is closed so that said floating plate is between said injector and ejector plates and the projection fits centrally between the cavities of said injector and ejector plates, which cavities are made to oppose each other, said cavities defining the outer surface of a part to be made and said projection defining the inner surface of a part to be made;

means for moving said injector plate, ejector plate and floating plate with respect to one another so as to allow said plates to be brought together when the molten plastic is injected in the mold, to be partially separated with the injector plate being apart from the floating and ejector plates during a first cooling period and to allow all three plates to be totally separated during a second cooling period; and

means for forwardly jack-screwing said projection when a molded part is still in a deformable state while restraining the base of the part from movement so as to substantially remove the parting line from the molded part.

4,856,981

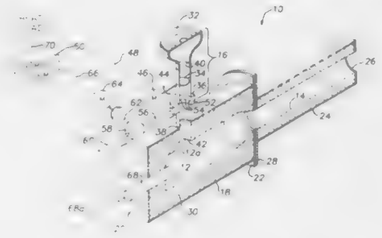
MIXING RATE CONTROLLED PULSE COMBUSTION BURNER

Paul Flanagan, Northfield, Ohio, assignor to Gas Research Institute, Chicago, Ill.

Filed May 24, 1988, Ser. No. 197,991

Int. Cl.[4] F23C *11/04*

U.S. Cl. 431—1 23 Claims



1. A pulse combustion burner comprising a combustion chamber for explosive cyclic combustion of a combustible gaseous mixture of air and fuel gas with gas pressure oscillations occurring in the burner, said combustion chamber having an inlet for admitting said combustible gaseous mixture and an outlet for discharge of products of combustion of the gaseous mixture, a passageway having an axial flow direction for conveying said air, fuel gas, and combustible gaseous mixture thereof into said chamber inlet, air supply means including a self-feeding flapper valve and an adjustable air flow valve for delivering a controlled flow of air through said passageway, fuel gas supply means including an adjustable fuel gas flow valve and an injector for delivering a controlled flow of fuel gas through said passageway, said adjustable air and fuel gas flow valves being operable to vary the operation of said burner over a burner turn-down range and to vary the air-to-fuel ratio, said flapper valve, air flow valve and injector being located in close proximity along said passageway to cause mixing of said air and fuel gas within said passageway and to provide said combustible gaseous mixture as a homogeneous blend of air and fuel gas over said turn-down range.

4,856,982

APPARATUS FOR EXHAUSTING COMBUSTION GASES FROM A GAS WATER HEATER

Kenneth A. Olson, Minneapolis, Minn., assignor to Tjernlund Products, Inc., White Bear Lake, Minn.

Continuation of Ser. No. 72,420, Jul. 13, 1987, abandoned. This application Mar. 3, 1988, Ser. No. 166,758

Int. Cl.[4] F23N *3/00*

U.S. Cl. 431—20 7 Claims

1. An apparatus for exhausting combustion gases from a gas fuel water heater having a gas burner to which fuel is supplied by a fuel line and a flue which allows ventilation of the combustion bases from the interior of a building in which the heater is installed to the exterior, comprising

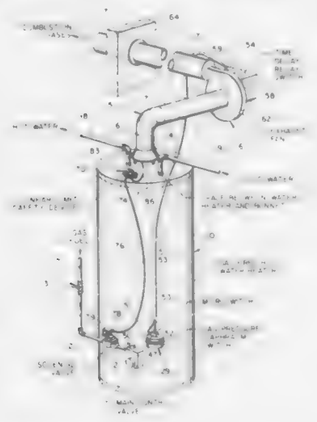
an exhaust fan adapted for connection to the gas water heater for drawing and exhausting combustion gases to the exterior of the building,

switch means connected with said exhaust fan for operating said exhaust fan,

and control means connected with said switch means for operating said switch means, said control means including sensing means for sensing fuel flow to the burner of the water heater, said control means causing closing of said switch means in response to sensed fuel flow to the burner of the water heater, said sensing means also sensing the lack of fuel flow to the burner of the water heater, said control means causing reopening of said switch means in

response to sensed lack of fuel flow to the burner of the water heater,

said control means including time delay means for producing a time delay between said sensing of the lack of fuel flow by said sensing means and said reopening of said switch



means so that said exhaust fan remains energized during said time delay to allow residual combustion gases to be exhausted after fuel flow to and operation of the burner have ceased, said time delay means including a time delay relay switch.

4,856,983

HOT SURFACE DIRECT IGNITION SYSTEM FOR GAS FURNACES

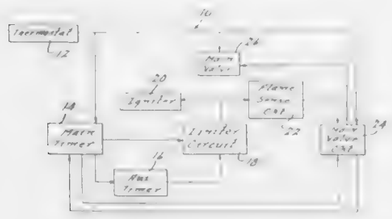
Frederick J. Geary, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 917,800, Oct. 10, 1986, Pat. No. 4,746,284, which is a division of Ser. No. 624,014, Jun. 25, 1984, Pat. No. 4,643,668. This application Mar. 9, 1988, Ser. No. 165,771

The portion of the term of this patent subsequent to Feb. 17, 2004, has been disclaimed.

Int. Cl.[4] F23N *5/00*

U.S. Cl. 431—27 **2 Claims**



1. A hot surface direct ignition system for gas furnaces and the like, said system comprising, in combination, a high voltage circuit adapted to be connected to a source of high voltage AC current, said high voltage circuit including a silicon carbide hot surface igniter disposed in the path of incoming gas and being subjected to the heat of the flame when gas ignition is obtained whereby flame rectification is effected by said igniter, a low voltage circuit adapted to be connected to a source of low voltage AC current, said low voltage circuit including a thermostatically actuated switch controlling the energization of said low voltage circuit, an electrically operable gas valve, and first and second relays, said first relay having normally open contacts in said high voltage circuit connected in series with said igniter and controlling the energization of said igniter, said second relay having normally open contacts controlling the energization of said gas valve and normally closed contacts controlling the application of low voltage to said low voltage circuit, means for energizing said first relay and said igniter upon closure of said thermostatically actuated switch, first timing means effective to maintain the energization of said first relay and said igniter for a first predetermined period of time, means effective to open said gas valve after said first predetermined period of time to initiate the flow of gas, means operable upon the opening of said gas valve and maintaining the energization of said first relay and said igniter for a second predetermined period of time less than said first predetermined period of time and thereafter deenergizing said first relay, and means responsive to flame rectification effected by said igniter after deenergization of said first relay for maintaining energization of said second relay and said gas valve.

4,856,984

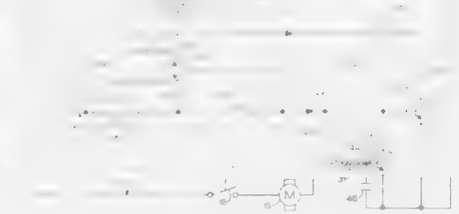
TIME-DELAY FOR AUTOMATIC RESET OF FURNACE

Roger W. Williams, Jr., Springfield, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Mar. 10, 1989, Ser. No. 321,842

Int. Cl.[4] F23N *5/00*

U.S. Cl. 431—30 **5 Claims**



1. An automatic reset for a furnace control which includes a power source connected by relay contacts to a fan motor in response to operation of a relay controller, an airflow switch pneumatically operated in response to airflow from the fan within said furnace, a primary burner control for operating the fuel valve of said furnace, a space thermostat to selectively supply energy to the primary burner control and relay controller in response to the temperature sensed by said thermostat, said automatic reset comprising a relay switch and airflow switch connected in a parallel circuit and in series with said thermostat, first electronic switching means for energizing said relay controller and connected to be actuated by said energy source by closure of either the relay switch or the airflow switch, timing means connected in circuit with said parallel circuit and providing an alternate circuit path for shunting the energy which actuates said first switching means to thereby deenergize said relay controller to "open" said relay switch and said relay contacts so that the fan motor and primary burner control are "cut off", whereby the burner control is automatically reset.

4,856,985

DEVICE FOR FEEDING GASES INTO COMBUSTION CHAMBERS AND PROCESS FOR DIMINISHING POLLUTANTS DURING COMBUSTION OPERATIONS

Klaus-Peter Ochel, Pullheim; Joachim Krupp; Josef Heger, both of Dormagen, and Martin Schweitzer, Odenthal, all of Fed. Rep. of Germany, assignors to Ec Erdolchemie GmbH, Koeln-Worringen and Bayer Aktiengesellschaft, Leverkusen, both of, Fed. Rep. of Germany

Filed Sep. 6, 1988, Ser. No. 240,889

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731205

Int. Cl.[4] F23D *13/20*

U.S. Cl. 431—202 **6 Claims**



1. A device for feeding gases, aerosols and/or mixtures of gases and solids into a combustion chamber using heat, comprising: a gas collecting tube having a longitudinal axis, means forming an outlet opening and a protective attachment positioned in the center of the outlet opening of the gas collecting tube and including a cooling device positioned one of on and above the protective attachment, wherein the means forming the outlet opening and the protective attachment define an aperture through which gas, aerosol and gas-solid compound is fed into the combustion chamber at an angle of $>90°$ with respect to the longitudinal axis of the tube and $>0°$ with respect to the horizontal.

4,856,986

VERTICAL FURNACE FOR FIRING WIRE-LIKE PRODUCTS

Dino Macocco, Venaria Reale, and Michele Riccó, Collegno, both of Italy, assignors to Societa' Industriale Costruzioni Microelettriche S.I.C.M.E. S.p.A., Turin, Italy

Filed Jan. 29, 1988, Ser. No. 150,031

Claims priority, application Italy, Jan. 30, 1987, 52927/87[U]

Int. Cl.[4] F23J *13/00;* **F27B** *9/28*

U.S. Cl. 432—72 **15 Claims**

1. A furnace for firing wire-like products, in particular copper wires clad with plastics resin, of the type comprising:

a principal chamber of elongate form within which said products translate axially in a longitudinal direction between an inlet opening and an outlet opening, said principal chamber defining a first portion in which evaporation of solvents from the plastics resin takes place and a second portion in which polymerization and cross linking of the plastics resin take place;

an auxiliary unit including an aspiration opening communicating with said principal chamber, means for aspirating a first stream of air and solvent vapours from said principal chamber and means for heating said first stream to cause combustion of the said vapours to form a second stream exiting from said auxiliary unit;

means for introducing of a gas stream into the first portion of said principal chamber;

characterized by the fact that the means for introduction of the gas stream (**43**) comprises: a diffuser (**50**) provided with separator means (**45**) operable to divide the gas stream (**43**) into a plurality of partial streams (**43***a*, **43***b*, **43***c*, **43***d*, **43***e*, **43***f*, **43***g*, **43***h*), means (**52**, **53**) for distribution of the said partial streams (**43***a*, **43***b*, **43***c*, **43***d*, **43***e*, **43***f*, **43***g*, **43***h*) and means for introduction of the partial streams (**43***a*, **43***b*, **43***c*, **43***d*, **43***e*, **43***f*, **43***g*, **43***h*) into a peripheral



region of the first portion (**6**) of said principal chamber (**2**) in a direction substantially parallel to at least one lateral surface (**8**) of the first portion (**6**).

4,856,987

TUNNEL KILN FOR CERAMIC FIRING

Keiji Yasuda, Niwa; Kazuo Nakasako, and Kazuhiro Miyahara, both of Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Jan. 22, 1988, Ser. No. 147,179

Claims priority, application Japan, Jan. 30, 1987, 62-11561[U]

Int. Cl.[4] F27B *9/02*

U.S. Cl. 432—128 **4 Claims**



1. A tunnel kiln for firing ceramic articles, said tunnel kiln comprising:

a preheating zone for preheating a shaped ceramic body containing a shaping assistant;

a firing zone for sintering the shaped ceramic body;

a cooling zone for cooling the resulting sintered body; and

a recovery circuit arranged in said pre-heating zone for recovering a decomposition product of said shaping assistant which initially adheres to inner side walls of said tunnel kiln and subsequently falls along said walls in a gravitationally downward direction therefrom, said recovery circuit comprising a decomposition product receiving part for recovering said decomposition product and a discharge port in direct communication with said receiving part for discharging the recovered decomposition product from the tunnel kiln;

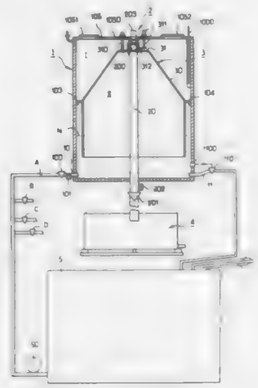
wherein said recovery circuit includes means for preventing the decomposition product from falling below the level of the decomposition product receiving part.

4,856,988

HIGH-PRECISION MELTING AND METERING ASSEMBLY FOR MELTABLE OR LIQUID MATERIAL

Paul Wenmaekers, 22 bis Avenue de Suffren, 75015 Paris, France

Filed Jan. 12, 1988, Ser. No. 142,922
Claims priority, application France, Jan. 16, 1987, 87 00442
Int. Cl.[4] F27B *5/14*
U.S. Cl. 432—210 **19 Claims**



13. Melting and metering assembly for processing solid and liquid material comprising,

a tank/furnace (1) for heating the material and containing a quantity of heating water for supporting the material to be processed,

means for controlling the level of the heating water within the tank/furnace including a heating water tank at the base of said tank/furnace and means for circulating the heating water between said tank/furnace and said heating water tank,

overflow means for drawing material from said tank/furnace including an overflow nozzle (420) having an overflow orifice communicating with the interior of said tank-/furnace near the upper end thereof for allowing material to flow into and through said overflow nozzle (420),

protecting means for separating a portion of the interior of said tank/furnace containing said overflow orifice from the remainder of said tank/furnace to prevent clogging of said overflow orifice,

and weighing means including a vessel located above the level of said heating water tank and below the level of said overflow nozzle (420) for receiving material from said overflow nozzle (420) to indicate the quantity of material drawn from said tank/furnace by said overflow means.

4,856,989

PREHEATER FOR HEAT-SEALING SYSTEM FOR PLASTIC CONTAINERS

Lester D. Siebert, Carbondale, Ill., assignor to Uly-Pak, Inc., Carbondale, Ill.

Filed Jul. 25, 1988, Ser. No. 223,379
Int. Cl.[4] F24J *3/00*
U.S. Cl. 432—225 **13 Claims**

1. A preheater assembly for plastic stock material comprising:

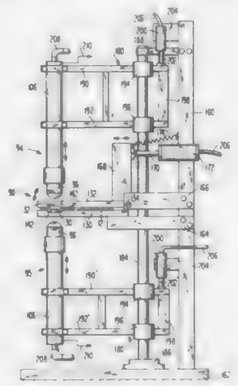
a preheater having a tip portion and a heating cavity;

means directing heated air through said heating cavity to heat said tip portion and to maintain it at a controlled temperature;

clamping means adjacent said preheater for gripping a stock material;

mounting means securing said preheater adjacent to said stock material;

means producing contact between said gripped stock material and said heated tip portion, for maintaining said contact therebetween for a time sufficient to soften said plastic stock material; and for thereafter releasing said contact.

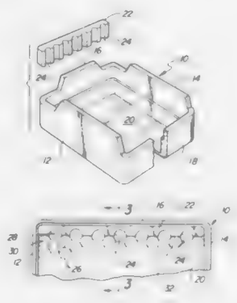


4,856,990

SAGGER CONSTRUCTION

Raymond P. DeSantis, Troy, Mich., assignor to PTX-Pentronix, Inc., Lincoln Park, Mich.

Filed Jun. 30, 1988, Ser. No. 213,324
Int. Cl.[4] F27D *5/00*
U.S. Cl. 432—258 **5 Claims**



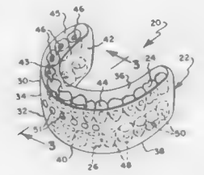
1. A sagger for use in firing elongated articles in a substantially vertical position comprising: a topless rectangular box including four side walls and a bottom wall; and an article oriented serrated fixture extending inwardly from one side wall, said fixture having uniformly spaced notches to accommodate a first row of articles therein substantially parallel to said one side wall and said notches having a depth and configuration which allows said articles to extend outwardly a distance so that articles placed in a second row will be nested within adjacent articles in said first row and will contact adjacent articles in said first row.

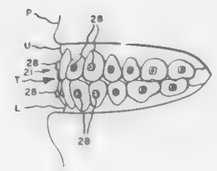
4,856,991

ORTHODONTIC FINISHING POSITIONER AND METHOD OF CONSTRUCTION

Peter R. Breads, Grand Island; Gerard P. Abbatte, Buffalo, and Stephen P. Warunek, West Seneca, N.Y., assignors to Great Lakes Orthodontics, Ltd., Tonawanda, N.Y.

Filed May 5, 1987, Ser. No. 46,087
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—6 **18 Claims**





1. An orthodontic appliance for malocclude teeth to which are operatively secured coupling members of the type including portions protruding from the sides of the teeth, said appliance comprising:

a monolithic body constructed of an elastomer base material having an arcuate-shaped portion along which is defined a recess for receiving teeth of on dental arch of the patient wherein said teeth include malocclude teeth to which are secured coupling members of the aforesaid type, the recess having walls defining teeth-engaging surfaces shaped generally]complementary to the surfaces of the teeth of said one arch when the malocclude teeth thereof are positioned in a predetermined orientation and defining a series of indentations formed in the material of said body and disposed across said teeth-engaging surfaces, each indentation shaped in the material of said body to nestingly accept a corresponding protruding coupling member portion when placed thereabout so that when said appliance body is operatively positioned within the patient's mouth and stretched about the teeth of the one dental arch so that the teeth thereof are accepted by the recess of said arcuate-shaped portion and each protruding coupling member portion is nestingly accepted by a corresponding indentation, the stretched body acts directly against the teeth and the coupling member portion to effectively bias the teeth of said one arch toward the predetermined orientation.

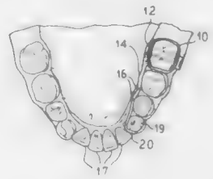
4,856,992

PREFORMED BANDS WITH LINGUAL EXTENSIONS

Earl O. Bergersen, 950 Green Bay Rd., Winnetka, Ill. 60093

Filed Nov. 4, 1987, Ser. No. 116,671
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—18 **15 Claims**

1. A preformed band for use in human dentition correction to be applied to a molar tooth and having an extension wire extending from a lingual surface of said band, a retaining means formed at an anterior end of said wire and adapted to be manually deformable into engagement with a tooth positioned anterior to said molar tooth said retaining means comprising an anterior portion of said wire which is more easily bendable than a posterior portion of said wire.

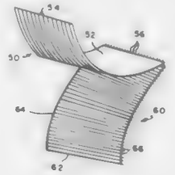


4,856,993

PRESSURE AND CONTACT SENSOR SYSTEM FOR MEASURING DENTAL OCCLUSION

William L. Maness; Robert F. Golden, both of Boston; Michael H. Benjamin, Quincy, and Robert M. Podoloff, Cambridge, all of Mass., assignors to Tekscan, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 717,532, Mar. 29, 1985, Pat. No. 4,734,034. This application Oct. 2, 1987, Ser. No. 104,731
The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.
Int. Cl.[4] A61C *19/04*
U.S. Cl. 433—68 **32 Claims**



1. Apparatus for measuring a person's dental occulsion, comprising:

a thin, flexible sensor, including:

a plurality of flexible parallel electrodes attached to and supported by a thin flexible backing sheet to provide a set of driven electrodes;

a second plurality of flexible, generally parallel electrodes attached to and supported by a thin flexible backing sheet to provide a set of sensed electrodes;

a resistive layer applied to at least one of the sensed and driven electrode sets and made of a resistive material whose resistance changes as a function of the pressure applied thereto;

means for positioning the driven and sensed electrodes so that the two electrodes sets face one another separated by the resistive layer so as to form a thin, flexible sensor with the electrodes oriented at an angle to one another so that the electrodes of one set cross the electrodes of the other set at an angle to create a plurality of intersections where driven electrodes cross over sensed electrodes;

the resistive layer having a thickness substantially less than the spacing between the electrodes and being arranged so as to provide a layer of resistive material between the driven and sensed electrodes at each intersection while maintaining comparative electrical isolation between the individual sensed electrodes in the absence of pressure applied to the sensor;

said means for positioning being such as to allow insertion of the sensor into the person's mouth so that the facing

electrode sets are between the person's upper and lower teeth; and

measuring means connected to the sensed and driven electrodes for measuring the resistance between the driven and sensed electrodes at each intersection and for providing an output in response thereto representative of the force between contacting points of the person's bite.

4,856,994

PERIODONTAL RESTORATION COMPONENTS

Richard J. Lazzara, Lake Worth, and Keith D. Beaty, West Palm Beach, both of Fla., assignors to Implant Innovations, Inc., West Palm Beach, Fla.

Filed Jan. 25, 1988, Ser. No. 148,056
Int. Cl.[4] A61C *8/00*
U.S. Cl. 433—173 **5 Claims**



1. In combination, an auxiliary component for a dental device implanted in bone of a patient's jaw, said implanted device having a gingivally-oriented terminating surface, and an opening through said terminating surface into a bore extending axially into said device for receiving a prosthodontic restoration, said auxiliary component having at a first end a post extending from said component for engaging in said bore, said auxiliary component having an outer surface at a second end opposite said first end, and a non-circular manipulating socket opening through said outer surface into said auxiliary component, said socket tapering in cross-section from wider at said outer surface to narrower within said auxiliary component, and a manipulating tool having a shank fitted with a bit of non-circular cross-section substantially matching the cross-section of said socket, said bit being tapered similarly to the taper in cross-section of said socket from a narrower portion at its extremity having a cross-sectional dimension similar to the narrower portion of said socket, to a wider portion toward said shank having cross-sectional dimensions similar to the wider opening into said socket, for facilitating the entrance of said bit into said socket and frictionally engaging said bit in said socket.

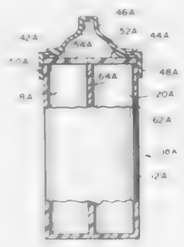
4,856,995

MULTIPLE RESERVOIR NURSING BOTTLE, VALVE ASSEMBLY AND METHOD

Eugene Wagner, c/o Dental Concepts, 9 N. Goodwin Ave., Elmsford, N.Y. 10523

Filed Feb. 26, 1988, Ser. No. 160,836
Int. Cl.[4] A61C *5/00;* **A61J** *9/00, 11/04;* **F16K** *51/00*
U.S. Cl. 433—215 **17 Claims**

1. A nursing bottle suitable for use in a program of prophylaxis against tooth decay, the bottle comprising a bottle body including a plurality of reservoir means for carrying different liquids, nipple means for providing a liquid conduit into a child's oral cavity and valve means interconnecting the reservoir means with the nipple means, the valve means for selectively coupling the nipple means in fluid communication with each of the reservoir means whereby liquid carried in one of the reservoir means can be substituted for liquid carried in



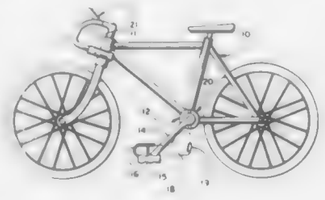
another reservoir means without removing the nipple means from a child's oral cavity.

4,856,996

CYCLING PEDAL STROKE MONITORING SYSTEM

Jerry H. Henson, 4775 Annistown Rd., Stone Mountain, Ga. 30087

Filed Jun. 24, 1988, Ser. No. 211,421
Int. Cl.[4] G09B *9/00*
U.S. Cl. 434—61 **10 Claims**



1. A pedal stroke monitoring system for informing a cycle rider as to performance in pedalling, pedals on the cycle being carried on crank arms moving in a circle and having a down stroke and an up stroke, said monitoring system including means for indicating pedal position, means for determining if said rider is pushing on a pedal, and visual indicating means within the normal visual field of said rider, said visual indicating means including a "right" indicator and at least one "wrong" indicator, the arrangement being such that, when said pedal is in a down stroke and said means for determining if said rider is pushing does indicate pushing, said "right" indicator is selected.

4,856,997

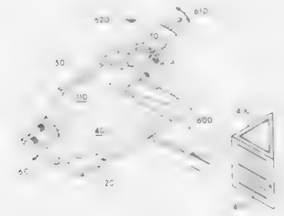
ARCHITECTURAL SCALE MODEL VIEWER AND METHOD FOR USING

Joseph L. Mellecker, 2373 Haskell Way P.O. Box 172, Watkins, Colo. 80137

Filed Mar. 30, 1988, Ser. No. 175,205
Int. Cl.[4] G09B *25/00;* **G02B** *17/06*
U.S. Cl. 434—72 **14 Claims**

1. A scale model viewer for viewing an architectural scale model from an eye level perspective, said viewer comprising a base component, a first reflective surface on said base component, a vertical component angularly mounted on said base component, a second reflective surface on said vertical component to reflect from said model for producing a first image of said model, said first reflective surface receiving said first image from said second reflective surface for producing a second image of said model, a viewfinder for viewing said second image of said model on said first reflective surface, and adjusting means comprising separate gross adjustment means

and fine adjustment means to adjust said viewer to different scale settings, said gross adjustment means comprising means



to change the angular mounting of said vertical component relative to said base component.

4,856,998

TEACHING AIDS

Letha Silas, 6595 Peppermill La., College Park, Ga. 30349

Filed Feb. 29, 1988, Ser. No. 161,773
Int. Cl.[4] G09B *19/02*
U.S. Cl. 434—210 **13 Claims**



1. A learning aid for use by a student in comprehending mathematical concepts comprising:

an opaque member formed to provide a channel and with the word "DECIMALS" and a first decimal point on one side and with the words "WHOLE NUMBERS" and a second decimal point on the other side; and

a strip of material with a plurality of numerals printed thereon receivable in the channel whereby the strip of material may be moved from one end of the opaque member to the other to demonstrate one of a plurality of whole numbers or to demonstrate one of a plurality of decimals as a function of the side of the opaque member read by the student and the position of the strip with respect to the opaque member.

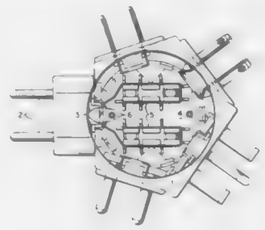
4,856,999

ELECTRIC ADAPTER CONNECTOR

Peter Flohr, Ringheim, Fed. Rep. of Germany, assignor to Heinrich Kopp GmbH & Co. KG

PCT No. PCT/EP86/00017, § 371 Date Oct. 9, 1987, § 102(e) Date Oct. 9, 1987, PCT Pub. No. WO87/04570, PCT Pub. Date Jul. 30, 1987
PCT Filed Jan. 20, 1986, Ser. No. 116,077
Int. Cl.[4] H01R *29/00*
U.S. Cl. 439—52 **20 Claims**

1. Electric adapter for an elective adaptation of a certain plug system to a plurality of different plug systems, characterized in that two-pole plug-in arrangements (2) of different types of plug systems are inserted into a side face of a pentagonal-prismatically formed plug body (1) of insulating material and which different types of plug systems protrude inwardly with pole contact terminals as fixed contact pieces (3), disposed on a circular path, in order to be contacted by sliding contact arms of respective socket elements (5) contained on a cylindrical rotary body (4,7), which rotary body (4,7) is centrally and lockably adjustable inside of the plug body (1) and where the socket elements (5) are accessible through plug-in



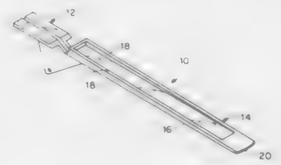
openings in a cover surface of the rotary body (4,7) or in the cover surface and in a base surface.

4,857,000

CIRCUIT BOARD EJECTOR/GUIDE

Joseph D. VanDomelen, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 16, 1988, Ser. No. 156,055
Int. Cl.[4] H01R *9/09, 13/64*
U.S. Cl. 439—64 **7 Claims**



1. A circuit board ejector/guide for providing access to a circuit board to be tested comprising:

an ejector end having a first bearing surface;

a guide end integral with the ejector end and having a second bearing surface, the guide end having means for holding the circuit board; and

means integral with and between the ejector and guide ends for pivotally mounting the circuit board ejector/guide on an extender circuit board so that when the circuit board ejector/guide is in a first position with respect to the extender circuit board, pivoting of the circuit board ejector/guide causes the first bearing surface to contact a housing surface to provide a lifting force to the extender circuit board, and when the circuit board ejector/guide is in a second position with respect to the extender circuit board such that the guide end is capable of holding the circuit board, pivoting of the circuit board ejector/guide causes the second bearing surface to contact the housing surface to provide the lifting force to the extender circuit board.

4,857,001

ELECTRICAL CONNECTORS FOR LEADLESS CIRCUIT BOARDS

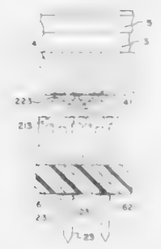
Kenichi Nakano; Yoshihiro Umezawa; Tetsuro Tokaichi; Yoshiaki Ichimura, and Natsuki Kawabe, all of Tokyo, Japan, assignors to Nippon Telegraph & Telephone Public Corporation; Nippon Electric Co., Ltd. and Japan Aviation Electronics Industry Limited, all of, Japan

Continuation of Ser. No. 9,611, Jan. 21, 1987, abandoned, which is a continuation of Ser. No. 873,473, Jun. 9, 1986, abandoned, which is a continuation of Ser. No. 746,454, Jun. 19, 1985, abandoned, which is a continuation of Ser. No. 611,400, May 18, 1984, abandoned, which is a continuation of Ser. No. 321,757, Nov. 16, 1981, abandoned. This application Apr. 6, 1988, Ser. No. 183,271

Claims priority, application Japan, Nov. 14, 1980, 55-159410

Int. Cl.[4] H01R *13/42*

U.S. Cl. 439—68 10 Claims



1. A connector for electronically interconnecting terminal pads on a first printed circuit board with conductor elements on a second printed circuit board, said second board having a plurality of through-holes formed therein, each of said through-holes having a central axis and a diameter D; said connector comprising a housing made of insulating material and defining an upwardly opening central chamber for receiving and supporting said first printed circuit board, said housing having a bottom surface and a plurality of apertures longitudinally arranged in first and second spaced parallel rows along at least one lower edge of said central chamber; a plurality of contact elements received in individually associated ones of said apertures, each of said contact elements having an upper portion, a lower portion, and a central portion bridging said upper and lower portions; each of said central portions bei .g secured in an associated one of said apertures; each of said upper portions having a contact spring portion generally extending from said central portion into said central chamber for making contact with one of the terminal pads on said first printed circuit board; each of said lower portions having a terminal pin portion projecting downwardly from said bottom surface and through one of said through-holes for making contact with said conductor elements on said second printed circuit board, each of said terminal pin portions having a width of W, each of said terminal pin portions extending downwardly from one of said central portions; each of said terminal pin portions having a triangular shaped pennant projecting from said terminal pin portion to define an area between said bottom surface and said pennant which is approximately equal to the thickness of said second printed circuit for receiving and capturing said second printed circuit board, each of said pennants having a projecting height h which is given by:

$$D-W>h>(D-W)/2-\Delta$$

where Δ is a distance between the central axis of said through-hole hole and the central axis of said terminal pin portion extending through said through-hole when said connector is mounted on said second printed circuit board; a first group of said contact elements being secured in said first row of said apertures with said pennants projecting in a first direction from said first group of contact elements; a second group of said contact elements being secured in said second row of said apertures with said pennants projecting in a second direction which is opposite to said first direction, whereby said connector can be readily mounted on said second printed circuit board by inserting said terminal pin portions into said through-hole, and said pennant of each contact element of either of said first and second groups of contact elements reliably engages the lower opening edge of a corresponding one of said through-holes in said second printed circuit board to capture said second printed circuit board between said bottom surface and said pennants of said either one group when said connector is mounted on said second printed circuit board.

4,857,002

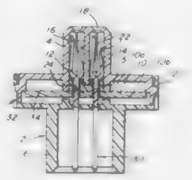
TERMINATOR ASSEMBLY FOR INTERCONNECTING COMPUTER DEVICES

William T. Jensen, Mundelein; Vincent B. Brown, Prospect Heights; Cathy J. Edgerton, Barrington, all of Ill., and Robert W. Masterson, Denver, Colo., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed Jan. 18, 1984, Ser. No. 572,173

Int. Cl.[4] H01R *9/09, 13/66*

U.S. Cl. 439—76 8 Claims



1. In an assembly for providing code compatibility between a computer and peripheral devices, and including a housing for supporting a plurality of electrical contact members, said housing defining a plurality of openings at one end thereof to form a female receptacle, each of said electrical contact members having one end which is disposed within one of said openings to provide electrical contact with a male pin that is inserted into the respective opening, the improvement comprising, in combination:

a circuit board formed of insulative material and defining a plurality of holes therethrough;

an electrically conductive plating extending through said holes;

a resistor network carried by said circuit board, said resistor network comprising thick film polymer resistors conductively connected to said conductive plating in a selected array;

said electrical contact members extending through said plated holes, whereby said housing, electrical contact members and said circuit board form a compact, unitary assembly.

4,857,003

APPARATUS FOR ELECTRICAL CONNECTION OF ELECTROMAGNETICALLY ACTUATABLE FUEL INJECTION VALVES

Udo Hafner, Lorch, and Ferdinand Reiter, Markgroningen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

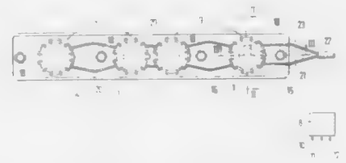
Filed Dec. 17, 1987, Ser. No. 134,128

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1987, 3703592; Aug. 5, 1987, 3725980

Int. Cl.[4] F01L *1/34;* F02M *53/04*

U.S. Cl. 439—130 25 Claims

1. An apparatus for connecting an electronic control unit to electrical contacts of at least two electromagnetically actuatable fuel injection valves of a fuel injection system for an internal combustion engine which comprises a common connection strip including at least two connection plugs, electrically conductive elements disposed in said plugs, electrically



conductive conductors disposed on said connection strip and connected to said electronic control unit and to said electrically conductive elements in said plugs.

4,857,004

SAFETY GUARD FOR ELECTRICAL WALL OUTLET

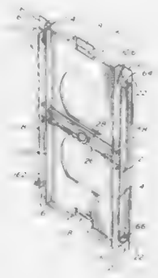
Michel Poirier, 2, 7th Avenue, Forestville, Quebec, Canada

Continuation-in-part of Ser. No. 110,867, Oct. 21, 1987, Pat. No. 4,793,818. This application Sep. 9, 1988, Ser. No. 242,339

Claims priority, application Canada, Sep. 16, 1987, 547004

Int. Cl.[4] H01R *13/44*

U.S. Cl. 439—140 7 Claims



1. A safety guard for an electrical outlet having one or more sockets, comprising:

a cover adapted to be mounted over said electrical outlet and having a top wall with one or more opening means allowing an electrical plug to be connectingly received in said sockets; said cover having a top edge, a bottom edge and opposite side edges; flexible means integrally formed along said top and bottom edges, said flexible means including engaging means thereon;

closure means movably mounted to said cover to expose or to cover said opening means; said closure means including a top wall adapted to lie over at least a portion of the top wall of said cover and a pair of opposite side walls adapted to lie adjacent and parallel to said side edges of said cover; ramp means on said top wall of said closure means adapted to ride on said flexible means of said cover and to lockingly contact said engaging means of said cover; said engaging means and said ramp means cooperating to require

two movements to displace said closure means from a socket-covering position to a socket-exposing position; and

resilient means connected between said cover and said closure means to bias said closure means to said socket-covering position as said closure means are moved to expose said opening means.

4,857,005

IC CARD CONNECTING MECHANISM

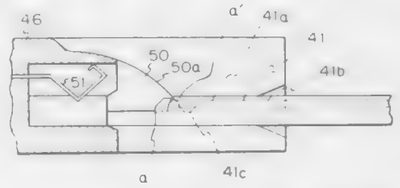
Hiroshi Kikuchi; Jiro Tanuma; Hideaki Ishimiza; Takao Uchida, and Toshiyuki Asaka, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1988, Ser. No. 227,540

Claims priority, application Japan, Aug. 7, 1987, 62-196373; Aug. 7, 1987, 62-193674; Jun. 10, 1988, 63-141687

Int. Cl.[4] H01R *13/44*

U.S. Cl. 439—140 5 Claims



1. An IC card connecting mechanism for connecting an IC card having a terminal array in a front end thereof, and a connector for connecting the IC card to external equipment and having contacts to be electrically connected to respective connection terminals of the terminal array, said IC card connecting mechanism comprising:

a frame of the IC card, said frame having a peripheral rim provided with recesses at opposite ends of a front portion thereof;

a terminal protecting means of the IC card, positioned in said frame at a fixed position to cover the terminal erray protectively, to cover said recesses of said frame and to be lifted up away from the terminal array upon connecting the IC card to the connector;

a top cover of the IC card fixedly placed on top of said frame to hold said terminal protecting means in place on said frame;

a body of the connector having guide legs extending from respective opposite longitudinal sides thereof, said guide legs having guide groooves formed in respective inner surfaces thereof to receive respective front portions of opposite longitudinal side edges of the IC card to guide the IC card upon connecting the IC card to the connector; and

lifting means provided in the body of the connector for entering said recesses of said frame to lift up said terminal protecting means so that the terminal array is exposed for connection with the contacts of the connector.

4,857,006

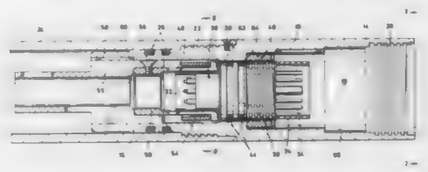
QUICK CHANGE ELECTRICAL COUPLING

Eugene J. Linyeav, and Chi-Huang M. Chang, both of Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Jun. 30, 1988, Ser. No. 213,712

Int. Cl.[4] H01R *4/64*

U.S. Cl. 439—271 20 Claims



1. An electrical coupling for interconnecting electrical conductors between a first downhole electrical tool having a first exterior housing and a second downhole electrical tool having a second exterior housing, the coupling having male and fe-

male bodies each having a conductor receiving end and a coupling mating end, the conductor receiving end of the male coupling body adapted for sealing engagement with the first downhole tool housing, and the conductor receiving end of the female coupling body adapted for sealing engagement with the second downhole tool housing, the coupling further comprising:

a primary coupling seal for sealing engagement between the male and female bodies when the coupling is mated;

a pin connector removably positioned within one of the coupling bodies and having at least one electrical connector pin extending axially therefrom;

a socket connector removably positioned within the other of the coupling bodies and having at least one electrical connector socket adapted to engage the at least one pin, the pin connector and socket connector forming a mated connector when the coupling is mated;

the male coupling body having a first stop surface for limiting axial movement of the mated connector toward the conductor receiving end of the male coupling body;

the female coupling body having a second stop surface for limiting axial movement of the mated connector toward the conductor receiving end of the female coupling body;

a first stop member removably fixed to the connector within the male coupling body for engagement with the first stop surface to limit axial movement of the mated connector with respect to the male coupling body, the first stop member projecting radially outward from an exterior surface of the connector within the male coupling body such that the first stop member may be disconnected from the connector, and the male coupling body then moved axially with respect to the connector to remove the connector from the male coupling body through the conductor receiving end of the male coupling body;

a second stop member fixed to the connector within the female coupling body for engagement with the second stop surface for limiting axial movement of the mated connector with respect to the female coupling body, the second stop member projecting radially outward from an exterior surface of the connector within the female coupling body such that the second stop member may be disconnected from the connector, and the female coupling body then moved axially with respect to the connector to remove the connector from within the female coupling body through the conductor receiving end of the female conducting body;

a first backup seal for sealing engagement between the male coupling body and the connector within the male coupling body while the first stop member is in engagement with the first stop surface; and

a second backup seal for sealing engagement between the female coupling body and the connector within the female coupling body while the second stop member is in engagement with the second stop surface.

4,857,007

MOLDED ENVIRONMENTAL SEAL FOR ELECTRICAL CONNECTION

Leonard H. Michaels, Warrenville, and Robert A. Miller, Woodridge, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jul. 1, 1988, Ser. No. 214,073

Int. Cl.[4] H01R *13/52*

U.S. Cl. 439—283 **1 Claim**

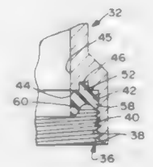
1. An electrical connector backshell for environmentally sealed mounting to any of a plurality of different cylindrical frontshells, said backshell being of generally cylindrical configuration having opposed forward and rearward ends, said backshell comprising:

an array of internal threads adjacent the forward end thereof for mounting to said frontshell, said array of internal thread extending from said forward end to a location intermediate said forward and rearward ends, said array of internal threads having a major diameter and a minor diameter;

an interior cylindrical surface adjacent said array of internal threads and extending axially to a location intermediate said array of internal threads and the rearward end of said backshell, said interior cylindrical surface having a diameter substantially equal to the major diameter defined by said array of internal threads;

a generally annular mounting shoulder adjacent the rearward end of said interior cylindrical surface and extending radially inwardly therefrom, said shoulder being characterized by a rearwardly extending annular groove intermediate the radially innermost portion of said shoulder and the interior cylindrical surface of said backshell; and

a generally annular resilient seal having an outer diameter substantially equal to the diameter defined by the interior cylindrical surface of said backshell and an outer circumferential surface having an axial length substantially equal to the axial length of said interior cylindrical surface of the backshell, said seal further comprising a rearward mounting end and a forward mating end, said rearward end including a rearwardly projecting annular mounting flange, said seal being disposed that the annular mounting



flange is engaged in the annular groove formed in the mounting shoulder, the outer circumferential surface of the seal being disposed adjacent the interior cylindrical surface of said backshell, the forward mating end of said seal being defined by an annular locking ridge disposed along a radially outermost portion of the mating end of the seal for engagement adjacent the rearwardmost portion of said array of internal threads, said annular locking ridge including a radially inner portion defining a generally concave frustoconical surface, said forward mating end of the seal being further defined by a radially inwardly disposed forwardly projecting annular deflectable sealing ridge, said annular sealing ridge of said seal including a radially outwardly disposed inclined surface oriented to the central axis of the backshell assembly to define a forwardly projecting convex frustoconical surface,

whereby, upon mounting of said backshell assembly to said frontshell, the sealing ridge is urged into a radially inward deflection to form a tight environmentally sealed engagement between any of a plurality of frontshells and the mounting shoulder and the locking ridge is urged radially outwardly into environmentally sealing engagement with said interior cylindrical surface and annular mounting shoulder, respectively.

4,857,008

ELECTRICAL CONNECTOR

William C. Kee, Lusk; Patrick M. Brannigan, Templeoque, and Cornelius B. Clarke, Dublin, all of Ireland, assignors to Anner Research and Development Limited, Dublin, Ireland

Filed Feb. 2, 1988, Ser. No. 151,402

Claims priority, application Ireland, Feb. 3, 1987, 269/87; Sep. 1, 1987, 2338/87

Int. Cl.[4] H01R *13/58*

U.S. Cl. 439—352 **6 Claims**

1. An electrical connector assembly comprising: a male connector and a female connector, means for locating one connector relative to the other for mating engagement, and

means for engaging the connectors one with the other, the male connector comprising:

an inner insulator member having a plurality of axially extending bores;

a plurality of male contacts mounted in the bores of the insulator member;

each said male contact having a forward end and a rear end including means for attachment to a conductor of a multi-core cable;

a longitudinally extending shielding shell having a forward portion embracing the insulator member and a rearward portion extending rearwardly over the male contacts; and

an outer body of insulating material moulded around the rearward portion of the shell, the rear end of the contacts and the conductors and a portion of the cable, encapsulating the connections between the conductors and the contacts and defining a cable strain and flexure relief so that the connector is non-rewirable,

the female connector comprising:

a second inner insulator member having a plurality of axially extending bores;

a plurality of female contacts mounted in the bores of the second insulator member;

each said female contact having a forward end for mating with the forward end of the corresponding male contact of the male connector, and a rear end including means for attachment to a conductor of a second multi-core cable;



a second longitudinally extending shielding shell having a forward portion embracing the second insulator member and a rearward portion extending rearwardly over the female contacts; and

a second outer body of insulating material moulded around the rearward portion of the second shell, the rear end of the female contact and the conductors and a portion of the second cable, encapsulating the connections between the conductors and the contacts and defining a cable strain and flexure relief so that the connector is non-rewirable;

the locating means comprising a polarising groove formed on the inner bore of one said shielding shell of said one connector and polarising key formed in the shielding shell of the other connector, the key engaging in the polarising groove on mating engagement between the connectors;

the engagement means comprising a latch mechanism partially housed in a recess in one said connector, the latch mechanism comprising a latch member and a latch biasing spring for the latch member, the latch member having a catch which is spring biased by the latch spring into engagement with a complementary receiver formed in the shielding shell of the other connector and a finger engaging portion for overcoming the biasing of the latch spring to release the catch from the receiver and

the connector assembly includes secondary engagement means for preventing operation of the latch mechanism to prevent unauthorized or accidental disconnection of the connectors.

4,857,009

FIXTURE LATCHING MECHANISM

Michael L. Christensen, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 21, 1988, Ser. No. 222,437

Int. Cl.[4] G01R *15/12*

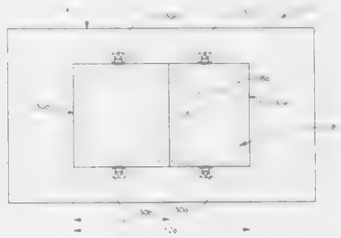
U.S. Cl. 439—372 **17 Claims**

1. A latching mechanism for bringing a fixture into and out of contact with at least one electrical test probe, said latching mechanism comprising:

(1) a housing having an internal guidewall for guiding a pulldown rack and wherein said guidewall further comprises a caming surface;

(2) a pulldown rack having gear means for receiving a mating gear means of a lever gear arm and receiver means for receiving a pulldown which is slidably mounted to said receiver means;

(3) a lever gear arm having a mating gear means which



engages the gear means of the rack and which is pivotally mounted in the housing; and

(4) a pulldown having a nosepiece and a caming surface and which is: (a) slidably mounted to the receiver, (b) biased to a forward position in order to engage the nosepiece with a fixture as the pulldown rack moves in one direction and (c) pulled to a rearward position under a caming action imparted by the caming surface on the housing's internal guidewall to a cam follower attached to the pulldown as the rack moves in an opposite direction and thereby disengaging the nosepiece from the fixture.

4,857,010

RIBBON CABLE HARNESS AND METHOD OF MAKING SAME

Timothy R. Pond, Aurora, Ill., assignor to Molex Incorporated, Lisle, Ill.

Continuation-in-part of Ser. No. 487,377, Apr. 21, 1983, abandoned. This application Mar. 12, 1984, Ser. No. 588,622

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—417 **1 Claim**



1. A method of connecting an electrical ribbon cable to an electrical connector,

said connector including a housing with a plurality of terminal receiving cavities formed therein, a plurality of terminals, one mounted in each cavity, each terminal having a conductor engaging end with an insulation displacement slot formed therein, each conductor engaging end extending out of the housing and being separated by walls defining extensions of said cavities, said walls having upper free ends with angled surfaces forming funnel-shaped wire-receiving openings communicating with said slots,

said cable including a plurality of parallel, spaced-apart

conductors, each of said conductors being embedded in a continuous, generally planar layer of insulation with a plurality of webs integrally formed between said conductors, each web having at least one groove extending parallel to said conductors, the method comprising the steps of:

aligning the conductors over their respective insulation displacement slots with said webs generally overlying said free ends of said walls, and

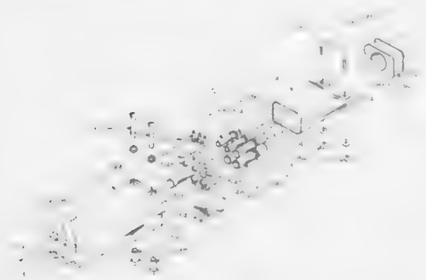
forcing the conductors downwardly laterally of their longitudinal axes so that said webs are forced against the free ends of the walls to tear each web along its groove a short distance adjacent the connector so that said conductors retain a substantially uniform coating of insulation around the portion of the circumference received in the slots and to guide said conductors into their respective slots.

4,857,011

FIELD REPAIRABLE CABLE CONNECTOR

Preston D. Shultz, and William Owen, both of Canyon Lake, Calif., assignors to Wyle Laboratories, El Segundo, Calif.

Filed Feb. 8, 1988, Ser. No. 154,120
Int. Cl.[4] H01R *13/52, 13/58*
U.S. Cl. 439—469 **9 Claims**



1. A connector which can be coupled to a cable having a plurality of wires and a sheath around most of the length of the wires, comprising:

a housing of insulative material having a front end forming a plurality of contact-receiving holes and a rear end forming a tray-passing hole;

a tray having an open rear end, said tray having a clamp at said rear end for clamping to said cable, said tray having a front end and a contact retainer portion at said front end forming a plurality of contact locating holes;

a plurality of contacts mountable on said retainer portion in said locating holes;

said tray being slideable fully into said housing through said tray-passing hole, said housing closely surrounding said tray with said contact locating holes aligned with said contact-receiving holes of said housing when the tray is fully in said housing;

a rear seal grommet which closely fits into said tray-passing hole and blocks said tray, said grommet having a cable-passing hole which closely passes said sheathed cable.

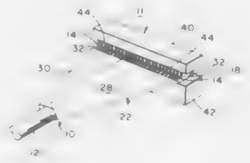
4,857,012

MULTIPURPOSE BOOT FOR ROUND-TO-FLAT ELECTRICAL CABLE

Kenneth G. Yard, 10 Saratoga Dr., Worcester, Mass. 01606

Continuation-in-part of Ser. No. 876,671, Jun. 12, 1986, Pat. No. 4,708,664. This application Nov. 23, 1987, Ser. No. 123,775
Int. Cl.[4] H01R *13/56*
U.S. Cl. 439—471 **20 Claims**

1. A cable system comprising an insulation displacement connector which is mass terminatable, a round-to-flat multiconductor cable and a boot, said round-to-flat multiconductor cable having an end portion where the conductors are in a flat configuration, a round portion where the conductors are in a round configuration and enclosed over at least a portion thereof in a jacket and a transitory portion where the conductors are not in a flat configuration and not in a round configuration and not jacketed, at least a portion of said end portion



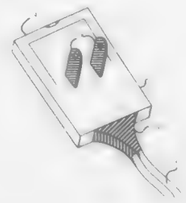
extending into and being secured to said insulation displacement connector, said boot comprising a sheet of flexible non-conductive material, said boot being attached to said end portion and to said round portion and encompassing said conductors in said transitory portion.

4,857,013

ELECTRIC ATTACHMENT PLUG

Glen R. Peters, 509 - 825 Granville St., Vancouver, B.C. V6Z 1K9, Canada

Filed Apr. 18, 1988, Ser. No. 182,463
Claims priority, application Canada, Dec. 30, 1985, 498727
Int. Cl.[4] H01R *19/04*
U.S. Cl. 439—484 **14 Claims**



1. A device for the attachment of an electrical appliance cord to an electrical outlet comprising a flat one-piece insulating plug of virtually the same thickness as the electrical cord, in which plug are embedded the flat bases of at least two electrical contact prongs, said prongs extending at right angles to said plug, said bases being affixed within the plug to conductor wires within the electrical cord and on which plug there is a pivoting tab whose end can be swung away from the main body of the plug to facilitate grasping for disengaging the plug from the outlet.

4,857,014

AUTOMOTIVE ANTENNA COAXIAL CONVERSION PLUG-RECEPTACLE COMBINATION ELEMENT

Reinhard Alf, and Wolfgang Warzecha, both of Berlin, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 9, 1988, Ser. No. 230,140
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727116
Int. Cl.[4] H01R *17/06*
U.S. Cl. 439—578 **14 Claims**

1. Coaxial conversion receptacle and plug combination for connection of a new-model antenna terminal to an old-model antenna receptacle,

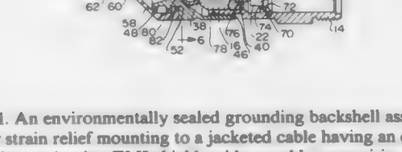
in which the new-model antenna terminal has a cup-shaped connection element (**51**) adapted to make an electrical connection with its radially inner surface;

an insulating jacket (**50**) resiliently surrounding said cup-shaped connection element and insulating the outer surface thereof; and

a projecting pin connection element (**52**) forming a center terminal, located essentially centrally within said cup-shaped connection element and being shielded thereby against high-frequency radio interference disturbances; and

wherein the old-model antenna receptacle has a tubular sleeve (**40***b*) adapted to receive a pin element forming the center terminal for connection to a central conductor of the coaxial conversion plug and, axially offset with respect to said tubular sleeve (**40***b*), an outer bushing terminal (**40***a*) which forms at its inner surface, the outer terminal for an outer conductor of the coaxial conversion plug, said conversion plug including

a pin-like tubular inner conductor (**12, 18**);



an insulating sleeve (**20**) surrounding, at least in part, the pin-like tubular inner conductor; and

an outer conductor (**19**) located at an outer surface of the insulating sleeve,

wherein, in accordance with the invention, the inner conductor comprises

a pin portion (**18**) and a bushing-like receptacle portion (**15**) electrically coupled to said pin portion;

the insulating sleeve (**20**) is formed with a central opening (**21**) receiving and retaining the inner conductor (**12, 18**); and

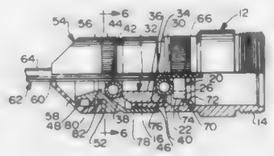
the outer conductor (**19**) is tubular and secured over the insulating sleeve (**20**) and comprises a first connecting portion (**13**) dimensioned to fit into the outer bushing terminal (**40***a*) of the old-model receptacle, and a second connecting portion (**16**) having an outer diameter dimensioned to fit into the cup-shaped connecting element (**51**) of the new-model plug (**50, 53**) and forming a unitary element with said first connecting portion.

4,857,015

EVIRONMENTALLY SEALED GROUNDING BACKSHELL WITH STRAIN RELIEF

Leonard H. Michaels, Warrenville, and Robert A. Miller, Woodridge, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jul. 1, 1988, Ser. No. 214,074
Int. Cl.[4] H01R *13/648*
U.S. Cl. 439—610 **20 Claims**



1. An environmentally sealed grounding backshell assembly for strain relief mounting to a jacketed cable having an electrically conductive EMI shield, said assembly comprising:

a metallic backshell having opposed forward and rearward ends and a cable receiving aperture extending therethrough;

a toroidally configured, radially compressible, metallic coil grounding spring disposed in said backshell for surrounding the cable disposed therein;

restriction means in said backshell forwardly of said grounding spring for limiting axial movement of the grounding spring relative to said backshell;

plunger means disposed in the backshell for selective longitudinal movement relative thereto, said plunger means comprising opposed forward and rearward ends, the forward end of said plunger means defining a cam for urging the grounding spring against the restriction means and for radially compressing said grounding spring;

a toroidally configured, radially compressible strain relief spring for surrounding the cable and disposed adjacent the rear end of said plunger means;

compression means engageable with the backshell for selective longitudinal movement relative thereto, said compression means comprising a forwardly facing concave cam surface for engaging and radially compressing the strain relief spring; and

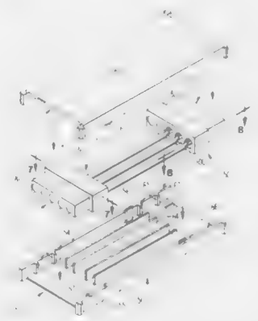
environmental sealing means for mounting to the compression means and for environmentally sealing the cable mounted in said assembly, whereby the axial advancement of said compression means relative to said backshell radially compresses the grounding spring into grounding contact with the shield of the cable and radially compresses the strain relief spring into strain relief engagement with the jacketed cable.

4,857,016

COMPONENTS FOR FLEXIBLE WIRING SYSTEMS

Richard D. Benscoter, Vienna, W. Va.; Charles Domigan, Coolville, Ohio; Charles T. Flachbarth, Parkersburg, W. Va., and James E. Sheridan, Williamstown, both of W. Va., assignors to Butler Manufacturing Company, Kansas City, Mo.

Filed Mar. 30, 1983, Ser. No. 480,470
Int. Cl.[4] H01R *13/64*
U.S. Cl. 439—680 **5 Claims**



1. For an electrical power distribution system, a component in the form of an improved cable coupler comprising:

elongated first and second outer housing means, each of identical construction;

each said outer housing means having a generally flat, rectangular-shaped main wall and a pair of sub walls extending normally outwardly thereform along the respective edges of the main wall and the inside surface of each sub wall having a stopper that extends outwardly beyond the edge of its sub wall;

corresponding sub walls of the first and second outer housing means abutting one another along corresponding edges and being sonically welded to secuee the housing

means together and the respective sub walls forming side walls, the main walls and side walls forming a hollow structure with opposite ends open and in said abutting condition of the housing, said stoppers being spaced from one another;

adjacent each of said open ends, the inside of each sub wall being formed with a pair of abutments, the abutments being arranged to form, on the respectives side walls, a pair of facing contact block sockets;

each of said outer housing means including the main walls, the side walls, and the abutments being molded from plastic material as a unitary piece;

at each of said open ends, the interior of the main walls and the interior of the side forming an interior support surface;

a first contact block secured in one pair of said sockets;

a second contact block secured in the other pair of said sockets;

said first contact block being formed with a first contact shield section, a first contact mounting section, and a first contact-crimp section, the sections being serially arranged one after another;

a first exterior support surface formed on said first contact shield section and facing one of said interior support surfaces;

a plurality of spaced-apart, parallel, cylindrical bores formed in said first contact shield section;

a plurality of spaced-apart, parallel bores formed in said first contact mounting section respectively co-axial with said bores in the first contact shield section;

a plurality of spaced-apart, parallel bores formed in said first contact crimp section respectively co-axaal with said bores in the first contact mounting section;

said plurality of co-axial bores respectively forming a plurality of first contact cavities extending through the first contact block;

a first set of elongated contacts respectively in said cavities and each contact having a joinder head;

means securing said first set of contacts respectively to said bores of said first contact mounting section with the joinder heads respectively disposed in said bores of said first contact shield section and the end of each joinder head being spaced inwardly from the mouth of its bore whereby said first exterior support surface and said first shield section overline the contacts;

said second contact block being formed with a second contact shield section, a second contact mounting section, and a second contact crimp section, said second sections being serially arranged one after another;

a second exterior support formed on said second contact shield section and facing the other of said interior support surfaces;

a plurality of spaced-apart, parallel, cylilndrical bores formed in said second contact shield section;

a plurality of spaced-apart, parallel bores formed in said second contact mounting section respectively co-axial with the bores in the second contact shield section;

a plurality of spaced-apart, parallel bores formed in said second contact crimp section respectively co-axial with the bores in the second contact mounting section;

said plurality of co-axial bores respectively forming a plurality of second contact cavities extending through the second contact block;

a second set of elongated contacts respectively in said second contact cavities, each contact including a joinder head;

means securing said second set of contacts respectively to said bores of said second mounting section with the joinder heads respectively disposed in said bores of said second contact shield section and the end of last said joinder heads being spaced inwardly from the mouth of its bore whereby said second exterior support surface and said second shield section overlie the contacts;

a plurality of conductors in the form of buss bars; and

the opposite ends of each buss bar being respectively connected to a contact of said first set and a contact of said second set, each last said connections being respectively disposed in said contact crimp section.

4,857,017

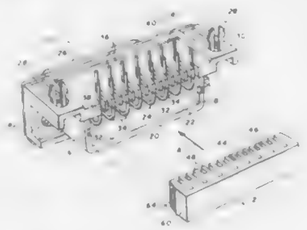
SUPPORT DEVICE FOR WIRES IN MULTI-CONTACT CONNECTORS

Kaya Erk, San Jose, Calif., assignor to Maxconn, Inc., San Jose, Calif.

Continuation of Ser. No. 42,385, Apr. 24, 1987, abandoned. This application Sep. 27, 1988, Ser. No. 252,008

Int. Cl.[4] H01R *13/502*

U.S. Cl. 439—695 **8 Claims**



1. A multiple contact connector comprising,

a connector body having a body interior and having a front mating surface and an open-end body cavity,

a plurality of angulate contact elements, each contact element having a first and second rectilinear segment and an angulate segment coupling said rectilinear segments, said first rectilinear segments fixed to the front mating surface in an array of at least two rows, said second rectilinear segments arranged at an angle to the first segments in at least two rows in an alternating fashion relative to a plane extending parallel to said second rectilinear segments through a base coupling surface, and

a locking reinforcement support member having a mating means for selectively engaging said connector body at said open-end body cavity, said locking support member having a plurality of teeth spaced apart to define indentations, said indentations each being partially defined by rearward walls, said rearward walls having a staggered distance relative to said front mating surface when said locking support member engages said connector body, each indentation correspondingly housing and supporting a portion of a second rectilinear segment and a portion of an angulate segment of a contact element when said locking support member is brought into mating engagement with said connector body, said indentations each partially defined by a cover portion, said cover portions staggered in distance relative to a plane parallel to said first rectilinear segments so as to coincide with said array of the first rectilinear segments.

4,857,018

COMPLIANT PIN HAVING IMPROVED ADAPTABILITY

Charles S. Pickles, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 1, 1988, Ser. No. 239,561

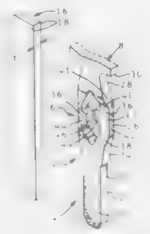
Int. Cl.[4] H01R *13/428*

U.S. Cl. 439—751 **18 Claims**

14. A contact pin which is inserted into a circular hole in a panel member such as a back panel, the pin having a compliant portion which is in the hole and which is in electrical contact with conductive surface portions of the hole, the pin having a pilot portion which extends from the compliant portion at one end thereof and an adjacent portion which extends from the other end of the compliant portion, the compliant portion having contact edge surfaces which face laterally of the pin axis in opposite directions, the contact pin being characterized

the compliant portion has a lead-in portion, an intermediate portion, and a trailing end portion, the intermediate portion being deformed by the hole whereby it maintains the pin in the hole and maintains the contact edge surfaces in contact with the conductive surface portions of the hole,

the compliant portion comprising a pair of side-by-side beams, each beam having one fixed end at the lead-in portion and one fixed end at the trailing end portion, the contact edge surfaces being edge surfaces of the beams,



the beams being displaced laterally of the pin axis away from each other in first opposite directions whereby portions of the beams are offset in the first opposite directions,

the beams being flexed in second opposite directions towards each other, the second opposite directions being normal to the first opposite directions so that the beams have overlapping portions, the overlapping portion of each beam overlapping the other beam and supporting the other beam intermediate its ends.

4,857,019

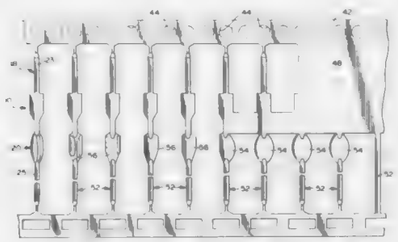
TERMINAL PIN WITH S-SHAPED COMPLAINT PORTION

Weldon L. Brubaker, San Clemente, Calif.; Frederick J. Gierut, Tinley Park, Ill.; James T. Kowalkowski, Maple Park, Ill., and Francesco Liburdi, Naperville, Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Feb. 29, 1988, Ser. No. 161,696

Int. Cl.[4] H01R *13/415*

U.S. Cl. 439—751 **15 Claims**



1. A generally elongated electrical terminal pin adapted to be inserted into a plated-through hole in a circuit board, said pin including a mating portion adapted to contact an electrically conductive element and a compliant portion extending from said mating portion adapted to make electrical contact with conductive plating material defining the interior surface of said plated-through hole, said compliant portion including, in the axial direction, a transition section tapering from a first axial end to a fully developed contact section defining the axial extent of contact with the interior surface of the plated-through hole, said compliant portion further including, in the lateral direction, a generally S-shaped cross-section, the improvement in said compliant portion comprising:

said S-shaped contact section having a width that varies throughout substantially all of the length of the contact section and that gradually increases from the transition section toward at least the middle of the axial length of the contact section.

4,857,020

TAP CONNECTOR

Nobel W. Crosby, Trenton, Canada, assignor to Tridem Manufactured Products Inc., Ajax, Canada

Filed Feb. 8, 1988, Ser. No. 151,375

Claims priority, application Canada, Feb. 10, 1987, 529425

Int. Cl.[4] H01R *11/01*

U.S. Cl. 439—783 **5 Claims**



4. A tap connector for electrically connecting a pair of electrical conductors comprising:

a body of substantially C-shaped cross-section having a pair of parallel opposed transversely directed sides defining a channel having a longitudinal axis and adapted to partly confine respective conductors in use;

a wedge assembly for clamping the conductors, one each, between opposed lateral sides of the assembly and said transversely directed sides of the body, the wedge assembly including two congruent blocks, said blocks including a driven block and a driving block mating along respective opposed ramp surfaces inclined to said longitudinal axis so that sliding of the driving block along the channel in a first longitudinal direction towards the driven block with said ramp surfaces in juxtaposed operative engagement causes lateral expansion of the assembly thereby to clamp said conductors as aforesaid, and sliding of the driving block in a second opposite longitudinal direction allows lateral contraction of the assembly thereby to unclamp said conductors, each of said two blocks having an aperture therethrough which in use lies generally parallel to said longitudinal axis and which is of sufficient lateral dimension to allow at least a portion of each aperture to register with a portion of the other aperture in a range of relative positions of the driven block and driving block allowing for clamping and unclamping of the conductors; and

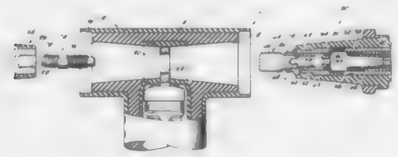
locating means including a bolt and a nut, the bolt being dimensioned to, in use, traverse the wedge assembly through said apertures, so as to lie with a head in abutment with a transverse end of the driven block and a threaded shank protruding from an opposed transverse end of the driving block for support of the nut such that tightening of the nut on the shank towards the head causes the driving block to slide in said first longitudinal direction and slackening of the nut allows the driving block to be slid in said second longitudinal direction.

4,857,021

ELECTRICAL CONNECTOR ASSEMBLY AND METHOD FOR CONNECTING THE SAME

Vincent J. Boliver, Brookfield; Paul M. Roscizewski, Franksville; Edward L. Sankey, Fox Lake, and Roy W. DeMeyer, Oconomowoc, all of Wis., assignors to Cooper Power Systems, Inc., Houston, Tex.

Filed Oct. 17, 1988, Ser. No. 258,619
Int. Cl.[4] H01R *4/56*
U.S. Cl. 439—801 26 Claims



1. An electrical device adapted to be connected to a conductive member, said device comprising

a housing,

a first member which is rotatably supported by said housing, which is fixed against movement in both directions axially of said housing, and which includes means for threadedly engaging the conductive member, and

a second member which is supported by said housing and which includes an externally threaded portion extending from said housing and having therein a bore centered on an axis,

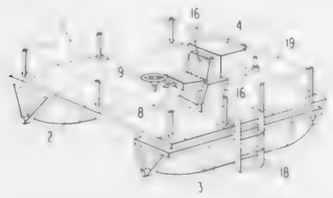
said first member being supported by said second member for rotation about said axis and being fixed against movement axially of said second member.

4,857,022

AMPHIBIOUS VESSEL

David M. Slonim, P.O. Box 1869, 3, Ourania Str., Nicosia, Cyprus

Continuation of Ser. No. 031,690, Mar. 27, 1987, abandoned.
This application Aug. 29, 1988, Ser. No. 239,012
Int. Cl.[4] B63H *1/28*
U.S. Cl. 440—48 6 Claims



1. An amphibious vessel comprising a deck and at least two substantially parallel, elongate flotation members operable as hulls and disposed under the deck, at least part of each flotation member being rotatable about a longitudinal axis thereof for rolling travel over land, each flotation member having a ground-engaging surface, means separate from said flotation members for propelling the vessel in water in a direction parallel to said flotation members, means for selectively driving only said flotation members on land and only said propelling means in water, means to steer at least one of the flotation members, said at least one steerable flotation member being rotatably mounted within a frame extending lengthwise thereof about an upright axis perpendicular to the longitudinal axis thereof, said frame including uprights that are disposed in vertical planes and that are supported at their lower ends on opposite ends of said at least one steerable flotation member, and rollers at each end of the frame, said rollers being disposed in the vertical planes of said uprights and in movable contact with the underside of the deck to reduce stress in the frame.

4,857,023

COOLING WATER DRAINAGE SYSTEM FOR MARINE PROPULSION ENGINE

Kazutoshi Takashima, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 12, 1988, Ser. No. 155,209
Claims priority, application Japan, Feb. 21, 1987, 62-36906
Int. Cl.[4] B63H *21/10*
U.S. Cl. 440—88 6 Claims



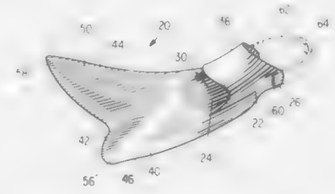
1. In a marine propulsion system for a watercraft, an engine for powering said watercraft, said engine having a cooling jacket and means for circulating water from the body of water in which the watercraft is operating through said cooling jacket and returning the circulated water back to the body of water, the improvement comprising a pump driven when said engine is not running and having an inlet communicating with said cooling jacket and an outlet communicating with the body of water for emptying said cooling jacket of water when said engine is not running without drawing further water into said cooling jacket.

4,857,024

SWIM FIN WITH FLEXIBLE FIN MEMBER HAVING MOVABLE TIPS

Robert B. Evans, 28 Anacapa St., Santa Barbara, Calif. 93101

Continuation of Ser. No. 311,436, Oct. 14, 1981, abandoned.
This application Jun. 21, 1985, Ser. No. 747,973
Int. Cl.[4] A63B *31/08*
U.S. Cl. 441—64 11 Claims



1. A swim fin adapted to be mounted onto a foot of a swimmer comprising

a foot receiving portion having a substantially planar base section terminating at one end thereof in an integrally downwardly extending heel section and terminating at the other end thereof in an open toe section which encloses only the upper portion of the foot;

an elongated flexible fin member formed of a resilient material and being integral with and extending from said substantially planar base section of the foot receiving portion, said elongated flexible fin member being trapezoidal in shape having a short end, a deflectable end, sloping sides and an upper surface and a lower surface with the short end thereof positioned adjacent the open toe section of said foot receiving portion and with the deflectable end thereof terminating in a pair of upwardly extending, symmetrically spaced movable tips, which are deflectable, said elongated flexible fin member having along a line normal to a center line extending substantially perpendicular between said short end and said deflectable end of the elongated flexible fin member a cross-sectional shape which varies its thickness from a center thickness to a relatively smaller thickness to define a valley in each side of the lower surface of the elongated flexible fin member and then back to a slightly greater thickness which then tapers from each such greater thickness to the thin edge of each of the sloping sides of said elongated flexible fin member;

said elongated flexible fin member being responsive to a force being urged against the upper surface thereof to flex its deflectable end including the movable tips formed thereon through an arcuate shaped path curling away from the open toe section and toward the heel section creating a build-up of water pressure within the flexed lower surface and being responsive to a reaction force produced by the thicker portions of the lower surface when the force being urged against the upper surface is discontinued which reaction force immediately deflects the deflectable end of said elongated flexible fin member causing the movable tips to exhibit a snapping action wherein the movable tips abruptly reverse direction terminating with the movable tips collapsing the upper portion of the elongated flexible fin member into a v-shape formed from the center line portion of the fin and extending to the movable tips of the elongated flexible fin member wherein the combination of the flexing of the deflectable end and the snapping action of the movable tips produces a propelling force as water is channeled from the thin edges adjacent to the foot pocket over the valleys of the lower surface and through the v-shape of the movable tips collapsed from the center line and over and under the tapered edges of the lower and upper surfaces of the elongated flexible fin member.

4,857,025

TOWABLE MODIFIED DEEP VEE SURFBOARD

James H. Brown, 274 Palmier St., Costa Mesa, Calif. 92626, and Richard N. Ricca, 4627 Fairfield Dr., Corona Del Mar, Calif. 92625

Filed Aug. 17, 1987, Ser. No. 85,845
Int. Cl.[4] A63C *15/00*
U.S. Cl. 441—65 22 Claims



1. A high performance towable modified deep vee surfboard for carrying a rider thereon for being towed by a tow rope having a handle and comprising:

a hull having sufficient buoyancy to support such a rider on a body of water, said hull having an upper surface defining a deck for carrying such rider and a bottom surface for contacting the water, the forward extremity of such hull defining a bow and the rearwardly extremity defining a stern;

a seat disposed rearwardly on said deck for supporting such rider in a sitting position;

laterally spaced apart heel cups mounted on said deck adjacent said bow and so disposed relative to said seat as to, when such rider is seated on said seat, receive the respective feet of such rider for pressing forwardly and outwardly thereon relative to such seat;

said bottom surface being formed at its forward portion with oppositely disposed downwardly facing port and starboard running areas inclined downwardly and inwardly at a predetermined angle relative to the horizontal to form a relatively deep vee running section;

a relatively narrow ski interposed between said running areas and projecting rearwardly from the bow to a location substantially midship; and

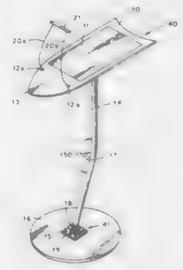
said bottom surface extending rearwardly from said forward section to form a gradual transition into oppositely disposed downwardly facing port and starboard riding surfaces inclined, relative to the horizontal, at an angle less than said predetermined angle and extending rearwardly under said seat to the stern to form a relatively shallow vee riding section whereby a rider may sit inclined rearwardly on said seat with his feet received in said heel cups and grasp such rope handle directly in his hands such that towing forces applied to the rider will drive the surfboard forwardly over the water with said running section inclined upwardly and forwardly to cause said ski and running surfaces to slice into the water and oncoming waves while the majority of the weight of said rider is carried on said riding surface such that when the surfboard is maneuvered through a turn the relatively shallow vee shape of said riding section allows for relatively free lateral travel of said surfboard over the water surface.

4,857,026

WATER SKI DEVICE

Ronald K. Hull, Rt. 4, Box 370, Harriman, Tenn. 37748

Filed May 12, 1988, Ser. No. 192,967
Int. Cl.[4] B63B *21/00*
U.S. Cl. 441—65 3 Claims



1. A towed water sports apparatus comprising a riding platform adapted to support a person above and below the surface thereof, a single planar hydrofoil member positioned beneath said riding platform in nonparallel alignment therewith, and detachable rigid means for attaching said hydrofoil member to the center of said riding platform whereby the person upon being towed through a body of water can, by shifting his weight, plane with the hydrofoil either on or below the water surface.

4,857,027

METHOD OF MANUFACTURING COLOR SCREEN STRUCTURE FOR A CATHODE RAY TUBE

Toshio Makita, and Koichi Tago, both of Aichi, Japan, assignors to Sony Corporation, Tokyo, Japan

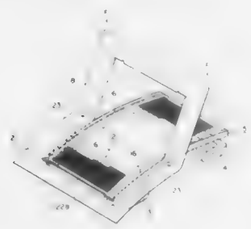
Filed Sep. 9, 1988, Ser. No. 242,216
Claims priority, application Japan, Sep. 25, 1987, 62-241936
Int. Cl.[4] H01J *9/20*
U.S. Cl. 445—37 6 Claims

1. A method of manufacturing a color screening structure for a CRT, comprising steps of:

forming a frame by placing a pair of supporting members substantially in parallel to each other and interconnecting

the respective opposite ends of the pair of supporting members by a pair of connecting members;

forming grooves in a color screen member having a plurality of parallel slits in a color screen region thereof and a pair of slots respectively extending outside and alongside the outermost slits so as to extend respectively along lines corresponding to the outer upper edges of the pair of supporing members;



welding the color screening member to the pair of supporting members of the frame so that the grooves of the color screen member extend respectively along the outer upper edges of the supporting member; and

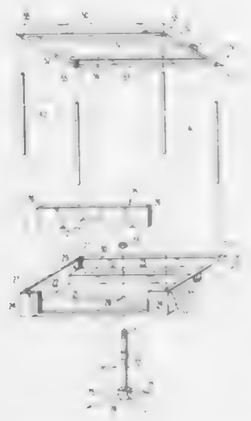
tearing off the unnecessary peripheral portions of the color screening member along the grooves.

4,857,028

PORTABLE PUPPET THEATER KIT

Ofer Pail, 960 6th Ave., Suite 1010, New York, N.Y. 10001

Filed Jun. 23, 1987, Ser. No. 65,769
Int. Cl.[4] A63H *33/42*
U.S. Cl. 446—82 14 Claims



1. A portable puppet theater kit, comprising:

(a) a carrying case comprising a base and a lid, said base being separable from said lid and convertible into a floor of a puppet theater, said floor functioning as a main stage for the puppet theater;

(b) said lid being convertible into a ceiling of the puppet theater, said lid having an outer face providing an outer housing for the puppet theater kit and an inner face;

(c) means removably received in the carrying case and being convertible into support means for supporting the ceiling in fixed, spaced relation relative to the floor, said support means being securable to the inner face of said lid and to the floor; and

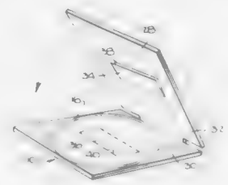
(d) a front curtain set removably received in the carrying case and being convertible into a curtain supported by the ceiling and at least partially shielding the space between the floor and ceiling from view during operation of the puppet theater.

4,857,029

BALLOON STORAGE AND INFLATION ASSEMBLY

Tony F. J. Dierick, Zwijnaarde; Nicholas J. Kite, Antwerp, and Michael J. Moran, Kapellen, all of Belgium, assignors to Enviro-Spray Systems, Inc., Hoboken, N.J.

Filed Jul. 7, 1987, Ser. No. 70,365
Int. Cl.[4] A63H *3/06;* G09F *1/10;* B63C *9/12;* B65D *77/00*
U.S. Cl. 446—220 22 Claims



1. A balloon storage and inflation assembly comprising in combination:

a deflated sealed balloon;

gas generating means including at least one chemical substance in said balloon for generating a gas to inflate said balloon;

frangible means including, in said balloon, a burstable container holding said chemical substance in a preactivation state;

storage means for preventing unintentional rupture of said container and thereby protecting said balloon from unintentional inflation during shipping and handling operations, said storage means including a substantially rigid support structure, said storage means further including a recess in said support structure for receiving and at least partially enclosing said container and a portion of said toy balloon during said shipping and handling operations, thereby preventing accidental rupture of said burstable container; and

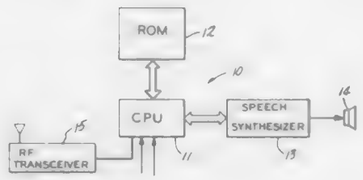
said storage means further including rupture facilitating means on said support structure, angularly displaceable from said recess, for bursting said container and thereby inflating said balloon.

4,857,030

CONVERSING DOLLS

William J. Rose, West Hartford, Conn., assignor to Coleco Industries, Inc., West Hartford, Conn.

Filed Feb. 6, 1987, Ser. No. 11,600
Int. Cl.[4] A63H *3/28;* G08C *19/00*
U.S. Cl. 446—303 17 Claims



1. A plurality of talking toys, each including

a central processing unit,

a speech synthesizer including a digital to analog converter,

a memory for storing speech data in digital form,

a speaker coupled to said digital to analog converter to produce synthesized human speech,

said central processing unit being arranged to access said memory to select speech data therefrom and supply said accessed data to said synthesizer,

said speech data being stored in said memory in addresses which may be accessed to produce phrases of human speech,

said speech data being categorized into speech routines where a routine is a series of statements from one toy to another and answers from said another toy, where each routine is one or more statements from said one toy and intelligent answer from said another toy,

each toy having a radio frequency transmitter and receiver coupled to its central processing unit to broadcast a binary encoded signal and to receive a binary encoded signal indicative of a routine and a session within said routine,

each central processing unit having means for randomly selecting a routine and transmitting a first broadcast including an identification of said routine,

each toy having means for receiving said broadcast of a routine and responding with a second broadcast that said first broadcast has been received,

said toy making said first broadcast upon receipt of said second broadcast being effective to access its associated memory for digital speech data from its memory for said routine and supply said speech data to said synthesizer for conversion to synthesized speech, and further effective to make a third broadcast of digital data over said RF transmitter indicating that speech has been synthesized, and further indicating that the third transmission requests an answer,

said toy making said second broadcast and receiving said third broadcast being effective to randomly access one of a plurality of intelligent responses from its associated memory in accordance with the identified routine and cause its associated synthesizer to synthesize a response and further broadcast a fourth binary encoded signal to said other central processing unit indicative of the response made.

first driving means for rotating said skewer;

second driving means for rotating said spaced apart support rods; and

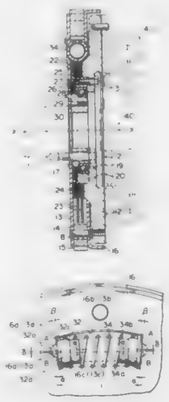
third driving means for simultaneously driving the first and second driving means.

4,857,032

TORQUE VARIATION ABSORBING DEVICE

Shigetaka Aiki, Kariya; Kiyonori Kobayashi, Chiryu, and Satoshi Kato, Anjo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 766,659, Aug. 19, 1985, abandoned.
This application Jul. 7, 1987, Ser. No. 71,549
Claims priority, application Japan, Aug. 21, 1984, 59-174450; Aug. 21, 1984, 59-174451; Aug. 21, 1984, 59-174452
Int. Cl.[4] F16D *3/14;* F16F *15/12*
U.S. Cl. 464—68 10 Claims



1. A torque variation absorbing device comprising:

a driving member fixed to a drive shaft, said driving member defining a window therein;

a driven member arranged coaxially with and rotatable relative to said driving member; and

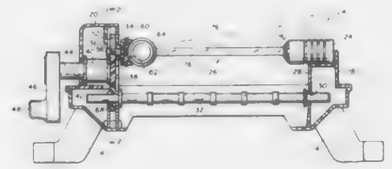
a torque limiting mechanism and a damping mechanism interposed between said driving member and said driven member, said damping mechanism including a coil spring having first and second ends and a seat member having a rounded convex portion and a flange portion, said seat member being capable of inclining around an inclining center defined by a center of curvature of said convex portion according to relative rotation between said driving member and said driven member, a center of each end of said coil spring being offset from said inclining center of said seat member toward a center of relative rotation between said driving member and said driven member, said seat member being set at said window of said driving member with an axis of said flange portion set at an angle with respect to a line connecting centers of said first and second ends of said coil spring by pre-constructing a portion of said driving member defining an end of said window to incline by said angle with respect to a plate perpendicular to the line connecting the center first and second ends of said coil spring such that a coil spring portion close to said center of relative rotation is set to be compressed more than another coil spring portion far from said center of relative rotation.

4,857,031

TOY ROTATABLE GRILL KABOB

Eric E. Lucas, Buffalo, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Aug. 15, 1988, Ser. No. 232,488
Int. Cl.[4] A63H *33/30, 3/52;* A47J *37/04*
U.S. Cl. 446—481 8 Claims



1. A toy grill kabob comprising:

at least one pair of spaced apart support rods for supporting and turning a simulated food item;

a simulated skewer mounted above said pair of support rods a distance sufficient to allow said food item to be supported on said rods;

4,857,033

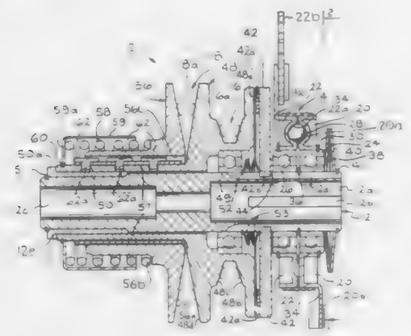
CLUTCH ASSEMBLY WITH COMBINED VARIABLE AND FIXED SPEED PULLEYS

Michael W. Czarka, Mount Pleasant, Mich., assignor to Dana Corporation, Toledo, Ohio

Continuation of Ser. No. 812,820, Dec. 23, 1985, abandoned. This application May 14, 1987, Ser. No. 51,190

Int. Cl.[4] F16H *11/06*

U.S. Cl. 474—14 **5 Claims**



1. A clutch and pulley assembly adapted to be driven by a rotatable drive shaft and the drive at least two external devices, said assembly comprising:

an axially extending mounting hub having one end provided with an opening for receiving one end of the rotatable drive shaft;

means for securing said hub relative to the drive shaft;

a first fixed speed pulley means rotatably mounted on said hub and adapted to be coupled to a first belt means for driving a first external device;

a second variable speed pulley means rotatably mounted on said hub and adapted to be coupled to a second belt means for driving a second external device, said second pulley means including a first disc member having a first inclined belt engaging surface and a second disc member having a second inclined belt engaging surface in facing relationship with said first surface, means for permitting axial movement of said second disc member relative to said first disc member to vary the spacing between said first and second inclined surfaces, and means for preventing rotational movement of said first disc member relative to said second disc member;

means for preventing relative rotation of said first pulley means relative to said second pulley means;

retaining means independent of said securing means for mounting said first pulley means and said second pulley means on said hub means;

said retaining means including bushing means positioned between an opposite end of said hub and said first disc member for rotatably supporting said first disc member on said hub, said retaining means including means secured to the opposite end of said hub for preventing axial movement of said bushing means outwardly off said hub, said retaining means including means for engaging an outer end surface of said first disc member for preventing outer axial movement of said first disc member off said bushing means; and

clutch means mounted on said hub for selectively locking said hub to said first and second pulley means, said clutch means shiftable between a released position wherein said first and second pulley means can rotate relative to said hub and an engaged position wherein said clutch means resists relative rotational movement between said hub and said first and second pulley means.

4,857,034

HYDRAULIC CONTROL SYSTEM FOR CONTINUOUSLY VARIABLE TRANSMISSION FOR AUTOMOTIVE VEHICLE

Katsumi Kouno, Susono; Susumu Okawa, Aichi; Masami Sugaya, and Yoshinobu Soga, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 19, 1987, Ser. No. 16,661

Claims priority, application Japan, Feb. 22, 1986, 61-37571; Feb. 22, 1986, 61-37573; Feb. 22, 1986, 61-37575; Feb. 22, 1986, 61-37577; Feb. 22, 1986, 61-37578; Feb. 22, 1986, 61-37579; Feb. 22, 1986, 61-37580; Feb. 22, 1986, 61-37581

Int. Cl.[4] F16H *11/04*

U.S. Cl. 474—28 **27 Claims**



1. A hydraulic control system for a continuously variable transmission of a belt-and-pulley type for an automotive vehicle, the transmission having a first and a second shaft, a first and a second variable-diameter pulley provided on the first and second shafts, respectively, a transmission belt connecting the first and second pulleys to transmit power from one of the pulleys to the other, and a first and a second hydraulic cylinder for changing effective diameters of the first and second pulleys, said hydraulic control system comprising:

a hydraulic pressure source for pressurizing a working fluid;

a first pressure regulating valve for regulating the pressure of the pressurized fluid delivered from said hydraulic pressure source, and thereby establishing a first line pressure;

a shift-control valve for applying said first line pressure to one of said first and second hydraulic cylinders, while simultaneously permitting a flow of the fluid from the other hydraulic cylinder, thereby changing the effective diameters of said first and second pulleys to control a speed ratio of said transmission; and

a second pressure regulating valve for regulating the pressure of a discharge flow of the fluid flowing from said other hydraulic cylinder through said shift-control valve, and thereby establishing a second line pressure which is lower than said first line pressure.

4,857,035

CONTINUOUS, VARIABLE POWER BICYCLE TRANSMISSION DEVICE

Cyril F. Anderson, 1491 Ute Dr., Salt Lake City, Utah 84108

Filed Jul. 21, 1988, Ser. No. 222,040

Int. Cl.[4] F16H *9/00*

U.S. Cl. 474—69 **24 Claims**

1. A continuous, variable power transmission device for use with a crank driven power train wherein crank lever arm movement passes through a prescribed arc of less than 180 degrees in a reciprocating sequence applicable to a rotary drive wheel which is coupled by chain or drive belt in continuous tension to a load, said device comprising:

(a) a frame for supporting moving parts of the transmission device and including a fixed reference point; (b) a support arm movably attached to the frame in a manner such that the support arm may be variably displaced in forward and rearward directions with respect to the frame reference point;

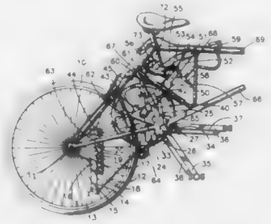
(c) means for attaching the rotary drive wheel to the support arm such that the wheel axis is displaced in concert with support arm movement in the forward and rearward directions;

(d) means for rotationally coupling one end of a crank lever arm to the frame, with the remaining end being free to be reciprocated through a portion of the defined arm along a crank path which is adjacent a perimeter segment of the rotary drive wheel;

(e) a guide track disposed along a length of the crank lever arm;

(f) tracking means coupled within the guide track and adapted for displacement in reciprocating movement along the guide track;

(g) force transfer means for transferring an applied force from the crank lever arm to the rotary wheel for movement in one rotational direction;



(h) connector means coupling the tracking means to the force transfer means to enable the force applied at the crank lever arm to pass through the connector means and tracking guide to the transfer means and rotary wheel; and

(i) biasing means coupled to the support arm for urging the support arm toward a forward position (counter to the rearward displacement urged by force applied to the crank) with respect to the frame reference point which causes the tracking member to pass through a larger perimeter segment than would occur without the biasing means, thereby creating a lesser moment arm with respect to the rotary drive wheel;

said device being operated to cooperatively cause relative displacement of the tracking member along the guide track to variably increase the moment arm with respect to the rotary wheel in response to increasing force applied at the crank lever arm to thereby convert the transmission device to a lower gear as the force applied at the crank lever arm increases, said device permitting return of the tracking member responsive to the biasing means to a lesser moment arm as crank lever arm force decreases.

4,857,036

REAR DERAILING DEVICE FOR BICYCLE GEARS

Antonio Romano, Padua, Italy, assignor to Campagnolo S.p.A., Vincenza, Italy

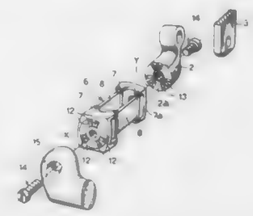
Filed Jan. 12, 1988, Ser. No. 143,086

Claims priority, application Italy, Jan. 12, 1987, 52822B/87[U]

Int. Cl.[4] F16H *11/00*

U.S. Cl. 474—80 **3 Claims**

1. A rear derailing device for bicycle gears on a bicycle having a frame, comprising: a first body intended to be fixed to the frame, a second body carrying means for driving a bicycle chain, and an articulated parallelogram joint connecting the first body to the second body, said joint having two end heads connected to each other by two connecting rods said end heads being connected to the first body and the second body respectively by means of swiveling hinge connections, wherein each hinge connection is comprised of two elements arranged for relative rotation and having facing surfaces with frontal teeth which cooperate with each other to hold said two elements in a preselected relative position, and in that a locking screw is provided to press said facing surfaces against each other so as to lock said two elements in the preselected relative position.



4,857,037

PORTABLE PACKING BAG MADE OF PLASTIC FILM, AND METHOD OF PRODUCING THE SAME

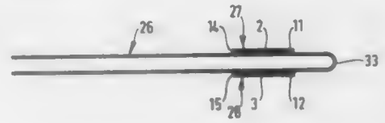
Georg Schwinn, Gronau, Fed. Rep. of Germany, assignor to M.U.W. Verpackungen, Gronau, Fed. Rep. of Germany

Division of Ser. No. 930,360, Nov. 12, 1986. This application Apr. 12, 1988, Ser. No. 180,393

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 3626303; Aug. 30, 1986, 3629563

Int. Cl.[4] B65H *37/04, 45/09*

U.S. Cl. 493—195 **6 Claims**



1. A method of producing a portable packing bag, said method comprising the steps of:

(a) placing on a planar worktable a continuous film web with the intended outer surface of the packing bag directed upwards;

(b) applying a pair of handle strips to said film web in parallel with, and equally spaced from a longitudinal line of said film web which is substantially midway between the longitudinal edges of said film web;

(c) joining said handle strips to said film web along parallel seams which are adjacent to the edges of said handle strips that are closest to said longitudinal line;

(d) folding said film web into the shape of a semi-tube with said handle strips positioned in parallel adjacent relationship on the exterior, opposite sides of said film web;

(e) folding back inward upon itself a center portion of said semi-tube between said handle strips to define a folded top cover section and front and rear side panel sections, said center portion forming an inner crease line at the center of said cover section and a pair of outer crease lines at its edges thereby defining inner sides between said inner and outer crease lines, whereby said seams of said handle strips come to lie on the inner sides of said center portion in the vicinity of said outer crease lines in a closely spaced and parallel relation adjacent to said outer crease lines, such that said handle strips are disposed approximately in the plane of said side panel sections;

(f) joining together the vertical edges of said side panel sections along vertical seams to form a tubular shape; and

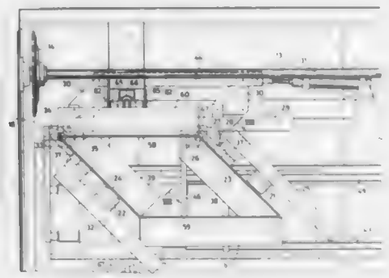
(g) joining said handle strips together at their outer edges.

4,857,038

MACHINE FOR FORMING CARDBOARD BOXES FROM BLANKS FOLDED FLAT

Franco Tacchini, Nebbiuno, Italy, assignor to Comarme Marchetti FASpA, Milan, Italy

Filed Sep. 15, 1987, Ser. No. 96,584
Claims priority, application Italy, Sep. 15, 1986, 23018 B/86
Int. Cl.[4] B31B *1/78, 5/80*
U.S. Cl. 493—316 **10 Claims**



1. A carton erecting machine comprising:
a support frame;
a magazine for containing a vertical stack of flattened carton blanks;
means for picking up the lowest blank of the stack and putting it vertical in a pre-opening position;
carton opening means including first and second grasping means relatively movable from a carton grasping position, in which said first and second grasping means are arranged in parallel vertical planes and engageable with opposite portions of the blank in the pre-opening position which correspond to a first pair of opposite walls of the desired erected carton, to a carton opening position in which said first and second grasping means are arranged in parallel spaced vertical planes to keep the carton in open position;
means for closing a first pair of lower carton flaps depending from a second pair of opposite walls of the erected carton during movement of said grasping means to said carton opening position;
means for closing a second pair of lower carton flaps depending from said first pair of opposite side walls of the erected carton after the end of movement of said grasping means; and
carton ejecting means for finally moving the erected carton perpendicularly to said second pair of side walls to a carton delivering position.

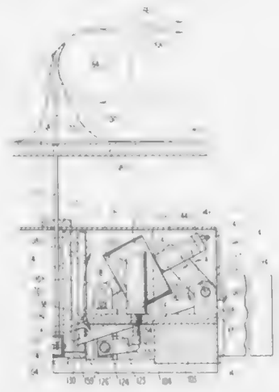
4,857,039

FLEXIBLE MATERIAL FOLDING APPARATUS

Paul V. Osborn, Webster, N.Y., and Clyde C. Tendick, Jacksonville, Ill., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 21, 1987, Ser. No. 99,277
Int. Cl.[4] B31F *1/00*
U.S. Cl. 493—416 **18 Claims**

1. A mechanical folder apparatus comprising:
an air table;
first conveyor means encircling the air table for receiving a length of flexible foldable materials;
mechanical lifting means extending through the air table and at least partially extendable through said first conveyor means for at least partially raising and folding a length of flexible foldable material from said first conveyor means;
spring coupled with said lifting means for driving said mechanical lifting means at least partially through said first conveyor means into a length of flexible foldable material on the conveyor means;
locking means for holding said mechanical lifting means within said first conveyor means;
means for loading said spring means in a direction to move said mechanical lifting means through the first conveyor means;



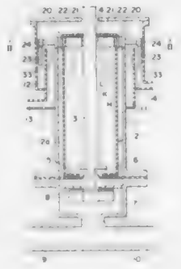
means for releasing said locking means; and
second conveyor means opposite and spaced from said first conveyor means and opposite said mechanical lifting means for catching a length flexible foldable material raised by said mechanical lifting means.

4,857,040

HIGH-SPEED CENTRIFUGAL EXTRACTOR HAVING IMPROVED WEIRS

Hidechiyo Kashihara, Mito; Shin-ichi Nemoto, and Kazuhiro Ueno, both of Ibaraki, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Jun. 15, 1987, Ser. No. 62,120
Claims priority, application Japan, Jun. 19, 1986, 61-143530
Int. Cl.[4] B04B *1/00*
U.S. Cl. 494—22 **3 Claims**



1. In a high speed centrifugal extractor for separating the liquid phases of a mixed liquid comprising a heavy liquid phase and a light liquid phase, and having a cylindrical rotor in which the liquid phases are separated including a peripheral wall disposed vertically so as to have a bottom and an upper part, a rotary shaft extending in and connected to said rotor for rotating said rotor at a high speed, an inlet disposed at the bottom of the rotor for introducing the mixed liquid into the rotor, a heavy liquid outlet and a light liquid outlet each disposed at the upper part of the rotor, a heavy liquid selection weir disposed within the rotor at the upper part thereof and in communication with the heavy liquid outlet for guiding the heavy liquid phase separated from the mixed liquid in the rotor to the heavy liquid outlet, and a light liquid selection weir disposed within the rotor at the upper part thereof and in communication with the light liquid outlet for guiding the light liquid phase separated from the mixed liquid in the rotor to the light liquid outlet, the improvement comprising:
each of said liquid selection weirs comprising an outer cylinder extending from the peripheral wall of the rotor toward the rotary shaft, and an inner cylinder having open ends and extending through the peripheral wall of the rotor and within said outer cylinder over an insertion distance, said inner cylinder being movable relative to the peripheral wall of the rotor for adjusting the insertion distance over which the inner cylinder extends in said outer cylinder,
the heavy liquid selection weir having a heavy liquid withdraw port extending through the outer cylinder thereof adjacent the peripheral wall of the rotor for allowing the heavy liquid phase of the mixed liquid separated in the rotor to pass therethrough to the heavy liquid outlet, and
the light liquid selection weir having a light liquid withdraw port extending through the outer cylinder thereof at a position spaced inwardly toward the rotary shaft with respect to the heavy liquid withdraw port for allowing the light liquid phase of the mixed liquid separated in the rotor to pass therethrough to the light liquid outlet.

4,857,041

URINARY INCONTINENCE PROSTHESES

David Annis, Bromborough; Malcolm C. Brown, Wirral, and John R. Sutherst, Waterloo, all of England, assignors to National Research Development Corporation, London, England

Filed May 7, 1987, Ser. No. 46,690
Claims priority, application United Kingdom, May 7, 1986, 8611129
Int. Cl.[4] A61B *19/00*
U.S. Cl. 600—30 **3 Claims**



1. A method of treating female urinary incontinence occurring due to prolapse of the bladder, comprising:
elevating the bladder from the pelvic floor by locating adjacent to the proximal urethra below the bladder a body composed predominantly of cross-linked synthetic polymer hydrogel material having a water content of the order of 90% by weight at least over the exterior surface of said body.

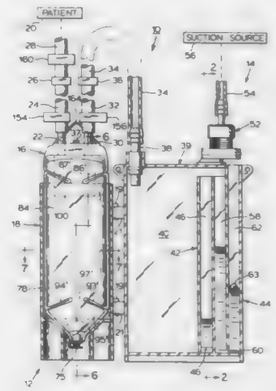
4,857,042

BODY FLUID COLLECTION DEVICE

James G. Schneider, St. Louis, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Mar. 16, 1988, Ser. No. 168,834
Int. Cl.[4] A61M *1/03*
U.S. Cl. 604—4 **23 Claims**

1. A body fluid collection device comprising a collapsible fluid collection bag assembly including a collapsible fluid collection bag having opposed flexible sidewalls in close facing relation when said bag is collapsed, an inlet adjacent one end of said assembly in fluid communication with the interior of said bag for receiving body fluid, an outlet adjacent said one end of said assembly in fluid communication with the interior of said bag for connection with a source of suction, a pair of stiffener members of stiffer material than that of said sidewalls and disposed adjacent the exterior sides of said sidewalls respectively, and enclosure means sealingly enclosing and securing said stiffener members between said bag and said enclosure



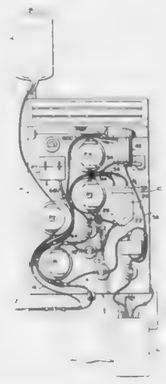
means, said stiffener members having portions between opposed side edges thereof bendable outwardly in opposite directions to expand the interior of said bag in response to predetermined compressive forces applied to the opposed side edges thereof.

4,857,043

APPARATUS AND METHODS FOR MEASURING PULSATILE BLOOD PROCESS STREAM PRESSURE

Grant S. Benjamin, Costa Mesa, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 25, 1987, Ser. No. 125,100
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—6 **17 Claims**



1. Apparatus for transmitting a positive gauge liquid pressure signal to a gas column from a pulsatile fluid stream at a pressure monitoring location hydrostatically higher than a pressure transducer used to measure pressure in the gas column, comprising;
a first conduit in communication at one end with the fluid stream at the pressure monitoring location for transmission of the fluid therethrough, said first conduit having a predetermined internal diameter of a size sufficient to

maintain the meniscus of the fluid intact as the fluid flows through the first conduit;

a second conduit in communication at one end with the opposite end of said first conduit and in communication at its opposite end with the pressure transducer for containing the gas column, said second conduit having a predetermined internal diameter greater than the internal diameter of said first conduit;

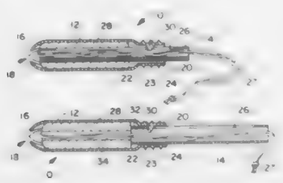
said first and second conduits being disposed such that a portion of said first conduit lies below the pressure transducer and substantially reverses direction before connecting with said second conduit whereby the pressure of the gas in the second conduit at the pressure transducer provides a direct measurement of the pressure of the pulsatile fluid stream at the monitoring location without passing fluid into the pressure transducer.

4,857,044

COMPACT TAMPON APPLICATOR WITH HOLLOW TAMPON AND RADIALLY EXPANDABLE APPLICATOR TUBE

Patrick G. Lennon, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 17, 1987, Ser. No. 134,425
Int. Cl.[4] A61F *13/20*
U.S. Cl. 604—14 **30 Claims**



1. A compact tampon applicator comprising:

(a) a first member having a forward end and a rearward end with an aperture extending therebetween;

(b) an absorbent slidably positioned in said aperture having a longitudinal opening formed therein and a withdrawal string attached to said aborbent; and

(c) a second member having a forward end and a rearward end, said forward end being initially retained in said opening formed in said absorbent and said rearward end initially extending out of said rearward end of said first member, said second member capable of radially expanding once said forward end is removed from said absorbent and acquire a larger diameter such that it can be manually moved forward to eject said absorbent from said first member.

4,857,045

ATHERECTOMY CATHETER

Mark A. Rydell, Golden Valley, Minn., assignor to Schneider (USA) Inc., A Pfizer Company, Minneapolis, Minn.

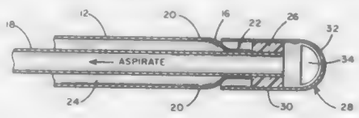
Continuation-in-part of Ser. No. 44,357, Apr. 30, 1987, abandoned. This application Oct. 23, 1987, Ser. No. 111,715
Int. Cl.[4] A61B *17/32*
U.S. Cl. 604—22 **9 Claims**

1. A surgical device for excising tissue deposits from the interior of a blood vessel comprising:

(a) an outer elongated flexible tubular member having an outside diameter which is less than the diameter of the lumen of a blood vessel to be treated and capable of being advanced through said blood vessel lumen without the use of a guidewire, said outer tubular member having a proximal end and a distal end, said distal end having an outside diameter which is less than the outside diameter of the remaining portion of said outer tubular member with said remaining portion of said outer tubular member having at least one fluid passing orifice formed therethrough;

(b) a single inner elongated flexible tubular member coaxially disposed within said outer tubular member and having a proximal end and a distal end with the outside diameter of said inner tubular member conforming to the inside diameter of said outer tubular member at said distal end of said outer tubular member to journal said inner tubular member for rotation, said distal end of said inner tubular member extending out beyond the distal end of said outer tubular member and axially fixed to be non-translatable relative to said outer tubular member;

(c) a single-piece cutter member affixed to said distal end of said single inner tubular member, said single-piece cutter member having a tubular proximal portion surrounding



the reduced diameter portion of said distal end of said outer tubular member and a dome-shaped distal end portion, the outside diameter of said tubular portion of said cutter member being generally equal to the outside diameter of said remaining portion of said outer tubular member, and a plurality of openings formed through said dome-shaped portion and in fluid communication with the lumen of said inner tubular member for allowing fluid exiting said fluid passing orifice to be drawing back through said plurality of openings and the lumen of said inner tubular member;

(d) drive means disposed at the proximal ends of said outer and inner tubular members for rotating said inner tubular member relative to said outer tubular member at a speed sufficient to cause said cutter member to effectively liquefy said tissue deposits.

4,857,046

DRIVE CATHETER HAVING HELICAL PUMP DRIVE SHAFT

Robert C. Stevens, Williston, and Robert R. Braun, Hialeah, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Oct. 21, 1987, Ser. No. 111,036
Int. Cl.[4] A61F *17/20, 17/32*
U.S. Cl. 604—22 **8 Claims**



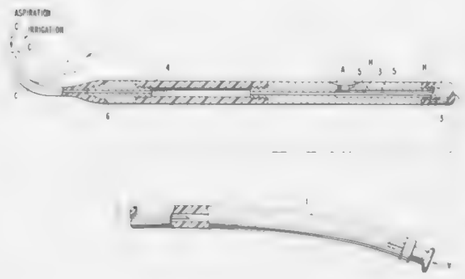
1. A catheter for removing deposits from the inner walls of an obstructed region of a blood vessel comprising an elongated flexible catheter core of a sufficient length and flexibility to extend from outside a subject through a subject's cardiovascular system to the obstructed region within the blood vessel, said catheter core comprising a center portion having a helical pumping surface that spirals around the center portion along a substantial length of said catheter core for moving deposits separated from the blood vessel inner wall from a distal to a proximal end of said core; said core having an enlarged distal tip for abrading deposits from an inner wall of the blood vessel; an elongated catheter sheath for covering the helical pumping surface of said core; and proximal drive means coupled to the catheter core for rotating the core within the sheath to move deposits removed from the vessel wall out of said blood vessel through a region between said pumping surface of said core and an inner wall of the sheath.

4,857,047

FINGER OPERATED VACUUM BYPASS SUCTION HANDPIECE/HOLDER APPARATUS FOR OCULAR CORTEX ASPIRATION AND REFLUXING

Selig P. Amoils, 1202 Medical Arts, Jeppe Street, Johannesburg, South Africa

Filed Jan. 11, 1988, Ser. No. 142,681
Claims priority, application South Africa, Jan. 27, 1987, 87/0575
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—30 **10 Claims**



1. In a suction-operated aspiration apparatus as for withdrawing opaque crystalline lens cortex and the like through a cannula inserted into the eyeball, a finger-operated bypass suction handpiece having, in combination, a pair of tubes at least one of which is flexible, said one tube being in fluid communication at one end with a continuously operable suction source and being in fluid communication at its other end with a bypass aperture in the handpiece that may be finger covered to control the bypass, the other tube being of diameter much smaller than that of the said one tube and extending past the bypass and being in fluid communication at one end with said suction source at its other end with said aspiration cannula by way of a squeezable reflux chamber means connected between the handpiece and said aspiration cannula to control refluxing.

4,857,048

IV PUMP AND DISPOSABLE FLOW CHAMBER WITH FLOW CONTROL

Tad D. Simons, Menlo Park; Frederick A. Stawitcke, Sunnyvale, both of Calif.; William M. Reed, Carlisle, and Paul A. Tessier, Hudson, both of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 56,189, May 29, 1987, abandoned. This application Mar. 21, 1988, Ser. No. 173,021
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—50 **3 Claims**

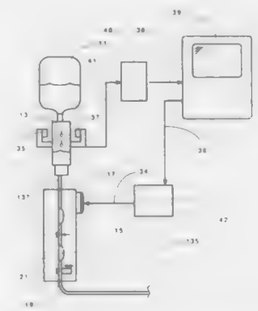
1. A method of calibrating an infusion system to achieve a given flow rate for infusing fluids into patients comprising the steps of:

connecting a drip chamber, which is adapted to receive an infusate, to a volumetric pump;

pumping said volumetric pump for a first time period at a rate to achieve said given flow rate;

counting the number of drops per unit time through said drip chamber during said pumping step to arrive at a drip rate corresponding to said given flow rate in order to calibrate the drop size;

stopping said pumping; and



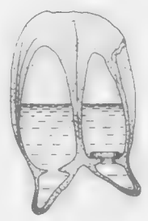
while said pumping is stopped, adjusting said drip rate to be equal to the number of drops counted per unit time to achieve said given flow rate for a passive infusion.

4,857,049

METHOD AND APPARATUS FOR INDUCING IMMUNOLOGICAL AND RESISTANT RESPONSE IN MAMMARY GLANDS

William M. Kortum, Petaluma, Calif., assignor to Kortum, Inc., Petaluma, Calif.

Filed Aug. 5, 1986, Ser. No. 893,396
Int. Cl.[4] A61M *31/00*; A61B *19/00*
U.S. Cl. 604—54 **20 Claims**



1. A method for inhibiting bacterial infection without significantly degrading milk quality in the udder of a host susceptible to bacterial infection consisting essentially of continuously applying pressure on the epithelial lining cells of at least one gland cistern of said udder, said pressure eliciting a cell response sufficient to inhibit bacterial infection in the udder.

4,857,050

RATIOMETRIC AIR-IN-LINE DETECTOR

David Lentz; Larry Wilson, both of Poway, and Curt Deckert, Santa Anna, all of Calif., assignors to Fisher Scientific Company, Pittsburgh, Pa.

Filed Sep. 23, 1987, Ser. No. 100,218
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—67 **18 Claims**

1. An IV tube air-in-line detector comprising:

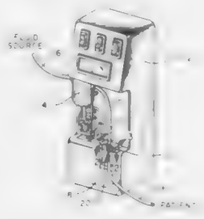
a first light emitter;

a receiver having juxtaposed first and second sensor means for independently sensing the intensity of light from said emitter respectively incident thereon;

means for holding said emitter and said receiver with said tube therebetween;

a first comparator electronically connected with said first

and second sensor means to indicate an air-in-line condition when the intensity of light incident on said first sensor means is more than the intensity of light incident on said second sensor means and to indicate a fluid-in-line condition when the intensity of light incident on said second sensor means is more than the intensity of light incident on said first sensor means;



a second emitter mounted on said holding means to transmit light from said second emitter to said first sensor means; and

a strobe means electrically connected to said first and second light emitters to alternatingly cause light emissions from said first and second light emitters.

4,857,051

BREASTPUMP

Karl O. A. H. Larsson, Zug, Switzerland, assignor to ISG/AG, Zug, Switzerland

Continuation-in-part of Ser. No. 874,879, Jun. 6, 1986, abandoned, which is a continuation of Ser. No. 612,602, May 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 296,081, Aug. 25, 1981, abandoned. This application May 22, 1987, Ser. No. 53,055

Claims priority, application Switzerland, Sep. 5, 1980, 6706/80; May 20, 1983, 2782/83

Int. Cl.[4] A61M *1/06*

U.S. Cl. 604—74 **5 Claims**



1. A breastpump comprising:

a hood body for placement over a breast, said hood body having a main funnel-shaped portion within which the breast is received and a tubular extension extending downstream from said main funnel portion;

means for connecting said tubular extension of said hood body with a vacuum line to periodically withdraw air from said hood body in a manner that draws the breast into said main funnel portion and thereby express milk from the breast into said tubular extension;

a wall formed interiorally of said tubular extension separating said vacuum line connecting means from the breast-milk flow, said wall depending from an upper interior side wall of said tubular extension with said vacuum line connecting means having a connection with said tubular extension above the bottom of said wall, said wall forming a baffle preventing milk from entering said vacuum line;

a catch chamber for expressed milk connected with said tubular extension, said catch chamber being located downstream from said tubular extension and having an inlet and an outlet;

a valve mechanism located at said catch chamber outlet, said valve mechanism having a valve member which closes said catch chamber outlet when a vacuum is applied to said hood body and opens said catch chamber outlet when said vacuum is removed;

said valve mechanism comprising a tubular valve housing having a circumferential slot formed therethrough dividing said housing into an upper portion and a lower portion, a solid disk-shaped valve member sized larger than said collecting chamber outlet and adapted to seat against a lip defining said outlet when a vacuum is applied to said hood body to thereby close said outlet, said disk-shaped valve member having radially extended nibs which engage an edge formed on the bottom of said upper valve housing portion when said valve mechanism is not attached to said hood body, with ribs extended between said upper and lower valve housing portions joining said upper and lower housing portions without substantially obstructing said slot, said ribs preventing lateral movement of said disk-shaped valve member out of said circumferential slot, and stand-off bosses formed on said lower housing portion on which said disk-shaped valve member rests in the absence of vacuum;

means for removably attaching said valve mechanism to said hood body adjacent said catch chamber such that said hood mechanism can be readily removed for cleaning; and

a container communicating with said catch chamber and valve mechanism to receive and hold milk released through said catch chamber outlet.

4,857,052

INTRAVENOUS SYSTEM FOR DELIVERING A BENEFICIAL AGENT

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 702,292, Feb. 15, 1985, Pat. No. 4,740,148, which is a division of Ser. No. 310,047, Oct. 8, 1981, Pat. No. 4,511,353, which is a continuation-in-part of Ser. No. 283,077, Jul. 13, 1981, abandoned. This application May 4, 1987, Ser. No. 45,358

The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.

Int. Cl.[4] A61M *37/00*

U.S. Cl. 604—85 **22 Claims**



1. A method for adding a beneficial parenterally administrable drug to a parenterally acceptable fluid for forming a parenterally administrable fluid beneficial drug formulation, which method comprises:

(a) admitting the parenteral fluid into a formulation chamber, the formulation chamber comprising:

(1) a wall surrounding a space provided with a first and second compartment therein;

(2) fluid inlet and outlet means communicating with the first compartment to provide a flow path;

(3) means for permitting fluid to flow from the flow path through the second compartment;

(4) a beneficial parenterally administrable solid drug in the second compartment; and,

(b) adding the beneficial drug to the fluid by permitting fluid to flow through the second compartment, wherein the beneficial drug is added to the fluid thereby forming a parenterally administerable fluid beneficial drug formulation.

4,857,053

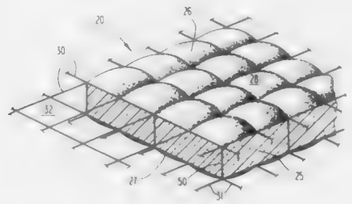
MATRIX SEPTUM

Michael J. Dalton, 9432 Monticello Ave., Evanston, Ill. 60203

Filed Aug. 29, 1988, Ser. No. 238,042

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—93 **20 Claims**



1. A matrix septum material which comprises

at least one penetrable, resilient, elastomeric layer having front and back faces;

a plurality of webs having perforations with peripheries, each web in contact with at least one layer face; together with

means for urging said webs toward each other, compressing said layer without substantially obstructing said perforations;

whereby each perforation frames an individual penetrable, self-sealing cell in the matrix septum.

4,857,054

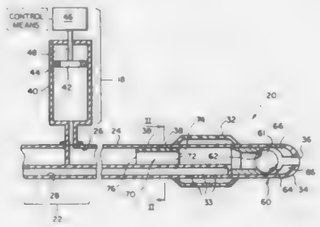
PERFUSION ANGIOPLASTY CATHETER WITH PUMP ASSIST

Jeffrey L. Helfer, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 15, 1988, Ser. No. 219,526

Int. Cl.[4] A61M *75/00*

U.S. Cl. 604—102 **11 Claims**



1. In a perfusion angioplasty catheter comprising a tube having a distal end including means for effecting angioplasty treatment of a body vessel, and a proximal end containing control means, said tube further comprising at least a perfusion lumen extending most of the length of said tube, and means in said tube adjacent said distal end, defining a plurality of apertures providing for fluid movement from or to said lumen, to or from a body vessel;

the improvement wherein said catheter further comprises:

a plurality of one-way valves, each disposed at one of said apertures, at least one of said valves being constructed to admit fluid only into said lumen from a body vessel, and at least one other of said valves being constructed to admit fluid only to a body vessel from said lumen.

4,857,055

COMPRESSION DEVICE ENABLING FLEXIBLE SOLUTION CONTAINERS TO PRODUCE CONSTANT DELIVERY RATE

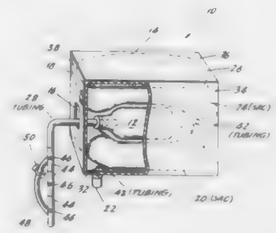
Paul Y. Wang, 47 Marblemount Crescent, Agincourt, Ontario, Canada M1T 2H5

Filed Apr. 14, 1987, Ser. No. 38,244

Claims priority, application Canada, Apr. 15, 1986, 506759

Int. Cl.[4] A61M *37/00*

U.S. Cl. 604—133 **12 Claims**



1. A portable external compression device capable of pressing a solution through a flow moderator system for infusion at constant flow rate from a flexible solution container positioned therein comprising a pair of inflatable compartments enclosed in stiff casing disposed as to capture said flexible container therebetween, means to inflate said compartments so as to impose a constant pressure on said flexible container, and a flow moderator system adapted to be connected to an outlet of said flexible container.

4,857,056

AUTO-FLUSH SYRINGE PUMP

Daniel A. Talona, University City, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Jul. 6, 1988, Ser. No. 215,649

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—135 **14 Claims**

1. A device for administering medication to a patient through a fluid conduit and thereafter automatically flushing said conduit with a flush solution, said device comprising;

a first syringe having a first barrel for holding said medication, a first dispensing end, and a first plunger located within said first barrel for expelling said medication through said first dispensing end;

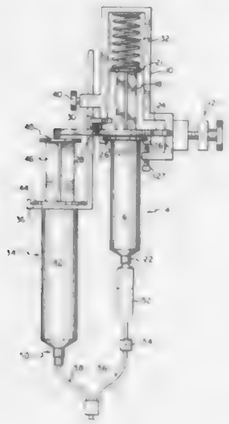
a second syringe having a second barrel for holding said flush solution, a second dispensing end, and a second plunger for expelling said solution through said second dispensing end;

means connecting said fluid conduit to said dispensing ends of both syringes and to said patient;

means for providing a force to said first plunger for dispensing said medication from said first syringe into said fluid conduit; and

means for transferring said force exerted on said first plunger

to said second plunger for dispensing said flush solution from said second syringe into said conduit, said transfer-



ring means responsive to the completion of the dispensing of a predetermined amount of said medication from said first syringe.

4,857,057

ENDOSCOPE TREATMENT DEVICE

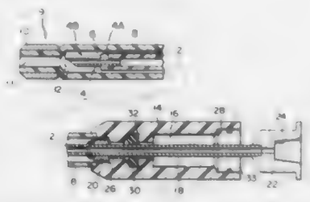
Kenichiro Sanagi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Jun. 18, 1986, Ser. No. 875,714

Claims priority, application Japan, Jun. 28, 1985, 60-142183; Aug. 9, 1985, 60-175508

Int. Cl.[4] A61M *5/18*

U.S. Cl. 604—164 **6 Claims**



1. An endoscope treatment device comprising:

an elongated flexible member having a distal end portion;

a treatment section mounted at the distal end portion of said elongated flexible member and having a sharp distal end portion, a proximal end portion mounted on ssid elongated flexible member distal end portion and a shoulder portion located between said treatment section proximal and distal end portions;

an outer tube through which said treatment section and said elongated member are inserted to be movable forward and backward, said outer tube including a distal end portion having an inner surface adjacent to said elongated flexible member and an outer surface;

a regulating member mounted on said outer tube distal end portion outer surface, said regulating member comprising a hard tubular pipe having an inner surface adhered to said outer tube distal end portion outer surface; and

an abutting portion formed on said outer tube inner surface adjacent to a proximal end portion of said regulating member, said abutting portion having an inner diameter smaller than that of a remaining portion of said outer tube, and being located to be engaged with said shoulder portion of said treatment section to regulate a projecting amount of said treatment section, when said treatment section is inserted into the distal end portion of said outer tube.

4,857,058

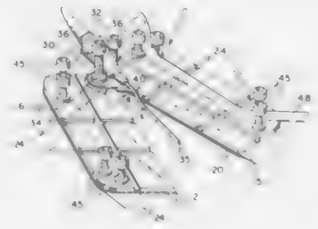
SUPPORT PATCH FOR INTRAVENOUS CATHETER

Payton Hugh W., 36 S. Main St., Jeffersonville, Ohio 43128

Filed Jul. 11, 1988, Ser. No. 217,247

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—180 **7 Claims**



1. An improved support patch for the protection and support of an infusion intravenous catheter, comprising:

a first patch section and a second patch section,

means on said sections defining a common parting line therebetween,

pivot means joining said sections together for opening and closing movement about said common parting line,

means on an upper surface of one of said sections for supporting the head of an infusion catheter with the needle thereof extending diagonally between said sections, said sections being movable about said pivot means to close about an infusion needle at said parting line, and

adhesive on the bottom surfaces of said sections for supporting said patch on the skin.

4,857,059

RECHARGEABLE IMPLANTABLE DEVICE FOR DOSED AND REPEATED SELF-INJECTION OF MEDICAMENT

Pierre Rey, Lagny; Jacqueline Leandri, Paris; Clément Abbou, Fontenay sous Bois, and Alain Sezeur, Cachan, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

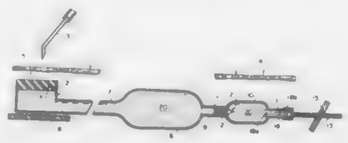
PCT No. PCT/FR87/00138, § 371 Date Dec. 10, 1987, § 102(e) Date Dec. 10, 1987, PCT Pub. No. WO87/06473, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 24, 1987, Ser. No. 141,309

Claims priority, application France, Apr. 24, 1986, 86 05927

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—185 **14 Claims**



1. Device for repeated injection of medicament (20) in unitary doses and at a frequency which is a function of therapeutic treatment needs, said device being implantable in a body of a patient and comprising:

a site (5) for injection of the medicament (20) implantable below the skin (1) of the patient;

an external supplying means for supplying said site (5);

a catheter (13), implantable in a therapeutic action zone of the patient, for injecting each unitary dose of medicament;

a reservoir (6), made from a flexible plastic material, for storing the medicament, between two restocking operations, by means of said external supplying means and through said site (5);

a first connection tube (7), made from a flexible plastic material, for connecting said reservoir (6) to said site (5);

a pre-dosed balloon (10) made from a flexible plastic material;

a second tube (9) for connecting between said balloon (10) and said reservoir (6), said second tube (9) also being made from a flexible plastic material;

a capillary, for controlling the flowrate of a medicament disposed upstream of said balloon (10), positioned between said balloon (10) and said reservoir (6), so as to control the filling time of said balloon (10);

valve means (16), disposed between said balloon (10) and said catheter (13), responsive only to pressure exerted on said balloon (10), said balloon (10) having a volume which is a function of the unitary dose of medicament to be injected through said catheter (13) by pressure exerted upon said balloon (10) by cutaneous digital deformation and forming means for controlling the injection of medicament in cooperation with said valve means (16);

said valve means (16) comprising a valve rod, a clamping means for holding said valve rod and means for initiating slackening of said clamping means of said valve rod as a result of fluid pressure of medicament exerted by a cutaneous digital control of said balloon (10).

4,857,060

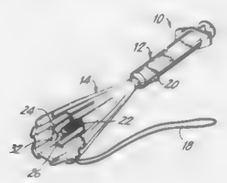
PROTECTIVE DEVICE FOR HYPODERMIC NEEDLE

Michael E. Rosenberg, 121 Tekening Dr., Tenafly, N.J. 07670

Filed Jun. 13, 1988, Ser. No. 206,117

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—192 **8 Claims**



1. A device for protecting a hypodermic needle having a cylinder and a plunger and an end wall with a needle coaxially disposed along an axis comprising:

an annular, radially projecting, web member coaxially disposed about the hypodermic needle, said web member having a radially inner edge portion and a radially outer edge portion;

a collar having a hinge-like connection to the radially inner edge portion, said collar connecting to the hypodermic needle; and,

closing means connected to the radially outer edge portion for closing the web portion after the hypodermic needle is withdrawn from a skin puncture.

4,857,061

SINGLE-FLOW VALVE-HYPODERMIC NEEDLE COMBINATION

Michael D. Miller, 287 Dartmouth St., Rochester, N.Y. 14607

Filed Apr. 15, 1988, Ser. No. 181,835

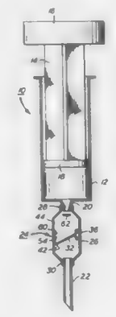
Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—207 **44 Claims**

1. A single flow valve for use in a hypodermic needle comprising:

a valve chamber; and

valve means mounted within the chamber for controlling solution flow through the chamber to a single-shot of solution in one direction, the valve means having an optimum tensioned position and a latched closed position and being movable to its optimum tensioned position in response to the flow of the single shot of solution through the valve chamber in the one direction, and movable to its latched closed position in response to its tensioned condition when the flow of solution is abated, whereby further solution flow in the one direction through the valve chamber is prevented.



4,857,062

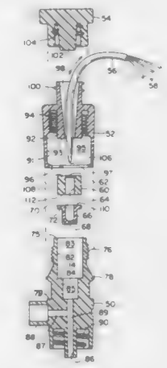
CATHETER INTRODUCER VALVE

Michael A. Russell, Cohasset, Mass., assignor to Medical Parameters, Inc., Woburn, Mass.

Filed Mar. 9, 1988, Ser. No. 166,000

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—256 **12 Claims**



1. A locking valve assembly for sealing about a catheter comprising:

a first tubular body for housing a seal wherein said body has a circumferential ridge in a peripheral surface of the body and is externally threaded at a proximal end such that the threads are positioned between the end and the ridge; and

a second tubular body having a proportioned diameter at a distal end to receive the proximal end of said first tubular body, said second tubular body having a bore member forming a tubular pathway with said first body and being partially threaded on an internal surface such that said internal threads can mate with the threads of said first tubular body and wherein the internal surface extends to

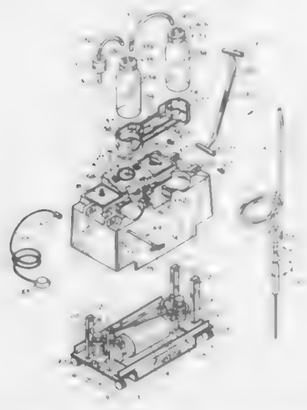
the distal end where said surface protrudes inwardly to form a rim that extends over and retains said ridge of the first tubular body such that said first tubular body cannot be manually removed from the second tubular body.

4,857,063

SURGICAL ASPIRATOR

Luke H. Glenn, Ogden, Utah, assignor to USA Medical, Ogden, Utah

Filed Jan. 19, 1988, Ser. No. 145,262
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—317 **18 Claims**



1. A surgical aspirator comprising, a housing having a top surface with equal opposite (leads) ends and front and rear faces and is mounted to a base plate that is supported at its corners to roll on caster means and contains means for generating, on demand, a vacuum that is available at a vacuum port that projects from said housing and is open to receive a vacuum hose means fitted thereover; cannula means that includes an open tube fitted to a handle means that is for receiving an operator's hand fitted therearound, the open tube for connection to said vacuum hose means; a pair of vacuum bottles with stoppers that include hose connectors for serial connection in said vacuum hose means; bottle caddy means for maintaining said pair of vacuum bottles arranged for releasable mounting to said housing top surface that is molded to include a recess to maintain the bottle caddy means nested therein, and the releasable mounting is a U-shaped bracket that includes parallel legs that extend outwardly from ends of a web portion thereof, the one U-shaped bracket leg for connection to the housing top surface at the center of the interior edge of the bottle caddy means recess, the U-shaped bracket other leg to extend over and to contact an edge of said bottle caddy means when said bottle caddy means is seated or nested on said housing.

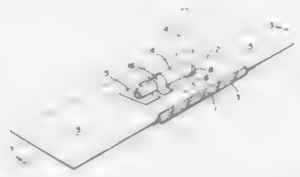
4,857,064

FEMININE DISPOSABLE URINATING DEVICE

Roberto Mendoza, KM 3, Carretera a Pto. Cortes Apdo 1000, San Pedro Sula, Honduras

Filed Nov. 25, 1988, Ser. No. 276,037
Int. Cl.[4] A61F *5/44*; A47K *11/12*
U.S. Cl. 604—347 **7 Claims**

1. A feminine disposable urinating device comprising: an elongate impermeable layer; an elongate impermeable layer adhesively attached to the absorbent layer, and being longer than the absorbent layer, having front and rear ends extending beyond the ends of the abosrbent layer; a flexible tubular conduit having a flange at one end adhesively attached to one side of the absorbent opposite the impermeable layer, an aperture through the absorbent layer and the impermeable layer for admitting the other end of the tubular conduit; a flexible partition embedded in the absorbent layer proximal to the side of



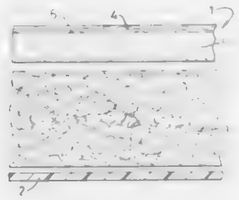
the aperture facing the rear end of the impermeable layer; and a hip belt having a front and rear strap attached to the respective front and rear end of the impermeable layer.

4,857,065

ABSORBENT PRODUCTS

Michael J. Seal, Dunblane, Scotland, assignor to Bonar Carelle Limited, Dundee, Scotland

Filed Aug. 15, 1989, Ser. No. 122,357
Claims priority, application United Kingdom, Nov. 21, 1986, 8627916
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—368 **11 Claims**



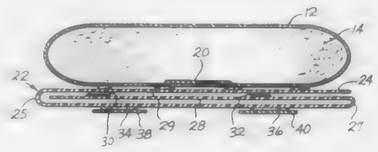
1. An absorbent product comprising an absorbent member at least part of which is overlaid with a sheet of particle-bonded nonwoven material having a first phase that is in an unlofted state and a second phase that is in a lofted state and that has been formed by the heat treatment of a precursor phase comprising crimped fibers, the second phase being between the first phase and the absorbent member.

4,857,066

SANITARY NAPKIN OR LIKE ARTICLE HAVING AN INTEGRAL CARRYING/DISPOSAL ENVELOPE

Kathleen S. Allison, Tacoma, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Feb. 8, 1988, Ser. No. 153,120
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385.1 **5 Claims**



1. A sanitary napkin or like article which comprises a fluid absorbent pad with a moisture permeable wrapper enclosing the pad, said sanitary napkin having a body facing major surface and an opposed undergarment facing major surface, and

further having a flexible moisture impervious barrier bonded to and essentially completely covering the undergarment facing surface;

the moisture impervious barrier comprising an envelope having longitudinal and transverse edges with dimensions similar to those of the pad, the transverse edge portions and one longitudinal edge portion of the envelope being permanently sealed, the other longitudinal edge being open, an extending flap being located along said open edge with one or more areas of pressure sensitive adhesive being located on the flap, said flap being normally tucked inside the envelope and retained therein by the adhesive,

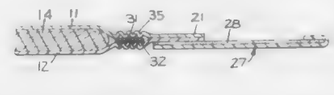
wherein the flap can be withdrawn from the envelope, the envelope turned inside out to entirely enclose the attached pad, and the flap sealed with the area of pressure sensitive adhesive to close the envelope so as to maintain cleanliness while carrying the article or for sanitary disposal of the article.

4,857,067

DISPOSABLE DIAPER HAVING SHIRRED EARS

Leigh E. Wood, Woodbury, and Anthony J. Zoia, North Oaks, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 219,803, Jul. 14, 1988, which is a continuation of Ser. No. 128,790, Dec. 4, 1987, abandoned. This application Dec. 29, 1988, Ser. No. 290,846
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—389 **15 Claims**



1. A contoured diaper, which comprises a liquid permeable topsheet, a liquid impermeable backsheet, and an absorbent element interposed between the topsheet and backsheet, at least one of the topsheet and backsheet being flared to form a pair of back ears, each back ear having a fastening tab, at least one of the back ears being elastically shirred in an area aligned with its fastening tab, which shirring extends over a height of at least 3 cm and permits the back ear to be stretched elastically at least one cm under ordinary fingertip force applied to the fastening tab.

4,857,068

UNIVERSAL SPIKE FOR USE WITH RIGID AND COLLAPSIBLE PARENTERAL FLUID DISPENSING CONTAINER

Paul Kahn, San Francisco, Calif., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 945,269, Dec. 22, 1986, abandoned. This application Jul. 22, 1988, Ser. No. 223,194
Int. Cl.[4] A61B *19/00*
U.S. Cl. 604—405 **8 Claims**

1. A universal piercer device for a parenteral fluid dispensing container comprising:

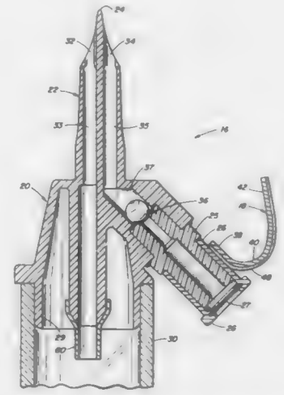
a spike having a base and a piercing member with a sharp end for piercing the closure of a parental fluid container;

said spike including means for defining first and second conduits extending downwardly when said container is in dispensing position;

said first fluid conduit being adapted for dispensing fluid from said container;

said second fluid conduit having a non-removable internal check valve for allowing fluid to flow into said container under a pressure greater than that in said container adjacent said second conduit, but preventing the reverse flow of fluid from said container;

said second conduit including a vent passage and a removable air filter for venting said parenteral fluid container



when the filter is present and allowing fluid to be injected into or removed from the container when the filter is removed;

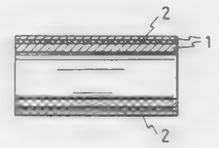
and a removable sealing member for unsealing said vent passage when the device is used with a rigid container.

4,857,069

ARTIFICIAL VESSEL AND PROCESS FOR PREPARING THE SAME

Kazuaki Kira, Kobe, Japan, assignor to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 840,169, Mar. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 706,693, Feb. 28, 1985, abandoned. This application Feb. 29, 1988, Ser. No. 165,365
Claims priority, application Japan, Mar. 1, 1984, 59-39972; Mar. 7, 1984, 59-44396; Mar. 16, 1984, 59-51768; Mar. 19, 1984, 59-52674; Jan. 29, 1985, 60-14909; Feb. 9, 1985, 60-23983
Int. Cl.[4] A61F *2/06*
U.S. Cl. 623—1 **10 Claims**



1. An artificial vessel consisting essentially of first and second groups of concentric layers, said first group consisting essentially of porous fibrous material and comprising at least one concentric layer, said second group consisting essentially of porous segmented polyurethane elastomer and comprising at least one concentric layer, wherein the innermost layer of the artificial vessel is a layer of said porous segmented polyurethane elastomer, and wherein said groups have pores which communicate the inner surface of the vessel to the outer surface of the vessel, said vessel having a compliance and a stress-strain curve approximate to the compliance and the stress strain curve of a vital vessel.

4,857,070

2,4-DIAMINOPHENYL TETRAHYDROFURFURYL ETHERS, PROCESSES FOR THEIR PREPARATION AND TINTING COMPOSITIONS, WHICH CONTAIN THEM FOR KERATINIC FIBRES

Winfried Seidel, Fuchsrute 25, D-2087 Ellerbek, and Horst Tappe, Dietzenbach, both of Fed. Rep. of Germany

Continuation of Ser. No. 855,245, Apr. 24, 1986, abandoned. This application Feb. 8, 1988, Ser. No. 154,495

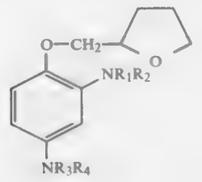
Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3516906

Int. Cl.[4] A61K *7/13;* **C07D** *305/04*

U.S. Cl. 8—408 **13 Claims**

1. A 2,4-Diaminophenyl tetrahydrofurfuryl ether of the formula VIII or a salt thereof with an inorganic or organic acid or mixtures thereof,

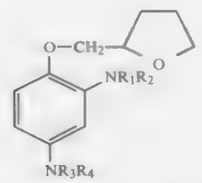
(VIII)



in which R_1, R_2, R_3 and R_4, independently of one another, each represent a hydrogen atom, a (C_1–C_4)-alkyl group, hydroxy(C_2–C_4)alkyl group, dihydroxy-(C_3–C_4)alkyl group, halogeno(C_2–C_4)alkyl group, amino(C_2–C_4)alkyl group or an amino(C_2–C_4)alkyl group which is substituted once or twice by methyl, ethyl or hydroxyethyl radicals on the nitrogen, the carbon chain being straight or branched, and it being a proviso that at least one of R_1, R_2, R_3 and R_4 represents a hydrogen atom.

8. An aqueous tinting dyeing composition for human hair comprising at least one coupler and an effective amount of at least one developing component, in which the coupler corresponds to the formula VIII or to a physiologically acceptable acid salt thereof

(VIII)



in which R_1, R_2, R_3 and R_4, independently of one another, each represent a hydrogen atom, a (C_1–C_4)alkyl group, hydroxy(C_2–C_4)alkyl group, dihydroxy(C_3–C_4)alkyl group, halogeno(C_2–C_4)alkyl group, amino(C_2–C_4)alkyl group or an amino(C_2–C_4)alkyl group which is substituted once or twice by methyl, ethyl or hydroxyethyl radicals on the nitrogen, the carbon chain being straight or branched, and it being a proviso that at least one of R_1, R_2, R_3 and R_4 represents a hydrogen atom.

4,857,071

NOVEL HAIR DYE AND METHOD OF USE

James S. Anderson, Danbury, Conn., assignor to Clairol, Inc., New York, N.Y.

Filed Aug. 21, 1987, Ser. No. 88,185

Int. Cl.[4] A61K *7/13;* **C07C** *87/60, 119/10*

U.S. Cl. 8—414 **11 Claims**

1. A method of dyeing hair comprising applying to said hair an amount sufficient to dye same of at least one compound selected from the group consisting of: 4-[(2-hydroxyethyl)-amino]-3-nitrobenzaldehyde, N-(2-hydroxyethyl)-4-[(2-hydroxyethyl)amino]-3-nitro-benzylimine, and N-ethyl-(4-ethylamino-3-nitro)benzylimine.

4,857,072

HYDROPHILIC COLORED CONTACT LENSES

Kenneth W. Narducy, Cupertino, Calif.; Richard L. Jahnke, Villa Park, and Samuel Loshaek, Chicago, both of Ill., assignors to Schering Corporation, Kenilworth, N.J.

Filed Nov. 24, 1987, Ser. No. 124,724

Int. Cl.[4] D06P *3/52*

U.S. Cl. 8—507 **26 Claims**

1. A method for making a colored hydrophilic contact lens comprising the steps of:

(a) providing a contact lens constructed of hydrophilic polymer having been produced by copolymerizing from about 50 to about 90 weight percent of a hydrophilic vinyl heterocyclic nitrogen containing monomer that is substantially devoid of the functional groups —COOH, —OH, —NH—R wherein R is hydrogen or C_1 to C_8 alkyl, —NCO and epoxy,

(b) coating at least a portion of a surface of the lens with a color coat comprising at least one pigment, binding polymer having functional groups selected from at least one of —COOH, —OH, and —NH—R, wherein R is hydrogen or C_1 to C_8 alkyl, and an additional compound having at least two groups per molecule of —NCO, and

(c) subjecting the coated lens to conditions which cause the color coat to adhere to the lens.

14. A lens made by the method of claim **1**.

4,857,073

DIESEL FUEL ADDITIVE

Marcel Vataru, Los Angeles, and Mark S. Filowitz, Fullerton, both of Calif., assignors to Wynn Oil Company, Fullerton, Calif.

Continuation-in-part of Ser. No. 89,598, Aug. 27, 1987. This application Mar. 28, 1988, Ser. No. 182,299

The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.

Int. Cl.[4] C01L *1/18, 1/22*

U.S. Cl. 44—57 **8 Claims**

1. A Diesel fuel additive composition comprising:

(a) about 6.0 weight percent di-tertiary butyl peroxide,

(b) about 1.0 weight percent tall oil fatty imidazoline,

(c) about 0.5 weight percent neo decanoic acid,

(d) the balance being a hydrocarbon solvent carrier.

4,857,074

FLAVOR-IMPARTING PERMANENT BRIQUETTE FOR GAS AND ELECTRIC GRILLS

R. Joseph Crace, Brentwood, Tenn., assignor to Hickory Specialties, Inc., Brentwood, Tenn.

Filed Jan. 25, 1988, Ser. No. 148,026

Int. Cl.[4] C10L *5/00*

U.S. Cl. 44—540 **9 Claims**

1. A permanent briquette for imparting wood flavor to food being cooked on gas and electric grills comprising a permanent non-combustible briquette saturated therethrough with a liquid smoke food flavoring composition.

5. A method of manufacturing a permanent briquette for gas and electric grills which has enhanced capability to impart wood flavor to food being cooked including the steps of:

providing a permanent non-combustible briquette;

applying liquid smoke food flavoring solution to said briquette so as to saturate saids briquette therethrough; and

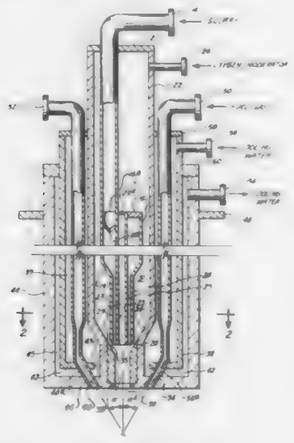
packing said liquid smoke solution-soaked briquette in a container so as to inhibit evaporation of said smoke solution prior to use of said permanent briquette in a grill.

4,857,075

APPARATUS FOR USE WITH PRESSURIZED REACTORS

Charles W. Lipp, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 19, 1988, Ser. No. 196,155
Int. Cl.[4] C10V 3/48
U.S. Cl. 48—86 R 8 Claims



1. A process burner which comprises:

(a) concentric and radially spaced central and middle conduits, wherein

(i) the central conduit defines a cylindrical passageway having an open discharge end and closed at its upstream end except for having a first fluid feed inlet upstream of its discharge end for a first fluid feed, and

(ii) the middle conduit and central conduit define an annular passageway concentric with the central passageway, the annular passageway having an open discharge end, a closed upstream and except for a second fluid feed inlet for a second fluid feed, the annular passageway upstream end having a sufficiently larger cross-sectional area than said discharge end to form a distribution chamber whereby the pressure of the second fluid feed is equalized and said second fluid feed enters the relatively smaller downstream end of said annular passageway free from high fluid flow regions, said distribution chamber containing a mixing plate adjacent and below the second fluid feed inlet, disposed at such an angle to the entering second fluid feed that the generally axial flow of said second fluid feed is changed to substantially radial flow whereby high fluid feed regions are prevented and having the discharge end of the annular passageway lying substantially in the same plane as the discharge end of the central passageway;

(b) a frusto-conical conduit defining a frusto-conical passageway which is coaxial with and displaced radially outward from the annular passageway and is in fluid communication with the central conduit and sized such that from about 70 to about 95 weight percent of the first fluid feed flows through the frusto-conical passageway which converges towards a point downstream of the discharge ends of the central and annular passageways; and

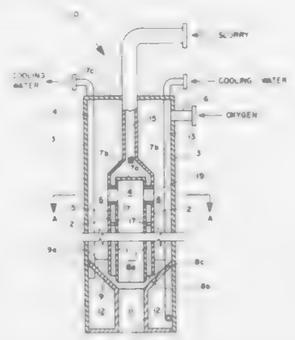
(c) an acceleration conduit defining a coaxial acceleration passageway which is coaxial and in fluid communication with and located downstream from the central, middle and frusto-conical passageways, and connected to the apex of the frusto-conical conduit, the acceleration passageway having a cross-section area for flow less than the combined cross-sectional areas for flow of the central, middle and frusto-conical conduits at their discharge ends, said acceleration conduit having a longitudinal cross-section which converges in a smooth curve to a cylindrical bore, so that excessive wear rates are prevented.

4,857,076

ANNULAR NOZZLE

Stanley R. Pearson; Douglas D. Merrick, both of Baton Rouge; William P. White, Greenwell Springs, and Charles W. Lipp, Baton Rouge, all of La., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 723,767, Apr. 16, 1985, abandoned. This application Mar. 23, 1987, Ser. No. 29,296
Int. Cl.[4] C10J 3/48
U.S. Cl. 48—86 R 6 Claims



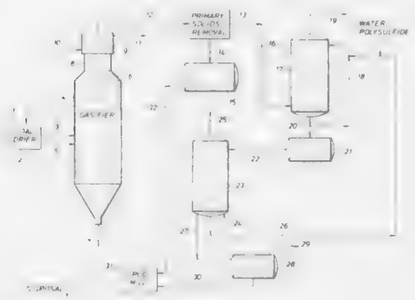
1. A burner nozzle for a free flowing, hollow reactor used to make a gas mixture containing hydrogen and carbon monoxide by a process of partially oxidizing a slurry of solid carbonaceous fuel in a liquid carrier admixed with a gas containing free oxygen, the nozzle consisting essentially of (a) a central conduit forming a central passageway for transporting a gas stream containing free oxygen, (b) a spaced coaxial second conduit forming an annular second passageway between the central and second conduits for transporting a stream of slurry, (c) a spaced coaxial third conduit forming an annular third passageway between the second and third conduits for transporting a gas stream containing free oxygen, the first and third passageways being closed at their upstream ends and operatively connected to an inlet for a gas feedstream, the second passageway being interconnected at its upstream end with a distribution chamber which is, in turn, connected with an inlet for a slurry feedstream, the first and second passageways being open at downstream discharge ports formed by the termination of the central and second conduits, the distribution chamber having a cross-sectional area which is substantially larger than that of the annular second passageway thereby providing a pressure of the slurry stream which is substantially uniform throughout the area where the distribution chamber interconnects with the second passageway, (d) a nozzle diffuser interconnecting with the end of the third passageway forming a discharge port of the third passageway, and having a continuously converging section which extends inwardly to a point at which an extension of the central conduit would intersect with the converging section, and (e) a cylindrical acceleration conduit interconnecting with the downstream end of the continuously converging section of said diffuser, being coaxial with the central conduit and terminating in a discharge orifice.

4,857,077

PROCESS FOR REMOVING FLYSLAG FROM GAS

Michael W. Potter, Sugarland, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 22, 1986, Ser. No. 944,907
Int. Cl.[4] C10J 3/46; C10K 1/02
U.S. Cl. 48—197 R 9 Claims



1. A process for removing flyslag from a synthesis gas stream from which the bulk of the flyslag has already been removed comprising

(a) passing said gas stream to a scrubbing zone which includes a loaded scrubbing solution stripping section, and scrubbing said gas stream with an effective amount of an aqueous scrubbing solution, and removing remaining flyslag particles and HCN, NH_3, and COS from said gas stream, producing a partially purified gas stream substantially free of flyslag, and an aqueous stream containing flyslag particles from said stripping section, and passing said aqueous stream to a concentrating zone;

(b) removing from said concentrating zone a concentrated aqueous stream derived from said aqueous stream and having a ratio of flyslag particulate solids to liquid greater than that of the aqueous stream entering said concentrating zone;

(c) mixing a major portion of flyslag having sulfides present therein, a minor portion of cementitious material and an effective amount of a composition capable of converting sulfides in said flyslag at least to sulfur, with at least a portion of the concentrated aqueous stream from step (b), the concentrated aqueous stream being supplied in a ratio of from about one part to about five parts concentrated aqueous stream per part, by weight, combined total solids of flyslag and cementitious material, and producing a solid flyslag composite having improved disposal properties.

4,857,078

PROCESS FOR SEPARATING HIGHER HYDROCARBONS FROM NATURAL OR PRODUCED GAS STREAMS

Kenneth G. Watler, Houston, Tex., assignor to Membrane Technology & Research, Inc., Menlo Park, Calif. and K. Watler, Houston, Tex.

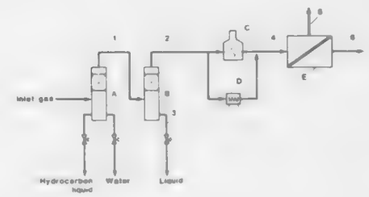
Filed Dec. 31, 1987, Ser. No. 139,914
Int. Cl.[4] B01D 53/22
U.S. Cl. 55—16 8 Claims

1. A gas separation process, comprising the steps of:

passing a first gas mixture comprising methane as its major constituent, and further comprising at least one gas from the group consisting of ethane and heavier hydrocarbons, across the feed side of a membrane having a feed side and a permeate side, said membrane comprising a microporous support layer and an ultrathin permselective layer, and wherein said membrane has a selectivity for propane over methane of 8 or more;

withdrawing from said permeate side a second gas mixture enriched in at least one gas from the group consisting of ethane and heavier hydrocarbons compared with said first gas mixture, wherein the ratio of the volume flows of said second gas mixture and said first gas mixture is less than about 27%, and the ratio of the concentration of said one gas in said second gas mixture and said first gas mixture is at least about 3; and

withdrawing from said feed side a third gas mixture enriched in methane compared with said first gas mixture.



4,857,079

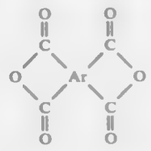
CO-POLY (IMIDE ETHER) COPOLYMER FROM DIAMINATED POLYALKYLENEGLYCOL

Yoshiharu Kimura, Ohmihachiman, Japan, assignor to TOA Nenryo Kogyo K.K., Tokyo, Japan

Division of Ser. No. 919,869, Oct. 17, 1986, abandoned. This application Apr. 7, 1988, Ser. No. 180,636
Int. Cl.[4] B01D 53/22
U.S. Cl. 55—16 7 Claims

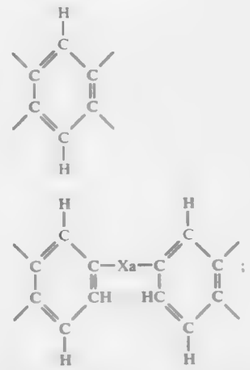
1. A process for separating oxygen from a gas mixture containing oxygen, comprising passing the gas mixture through a film which comprises a co-poly (imide ether) copolymer consisting essentially of:

(A) organic acid dianhydride of the formula (I):

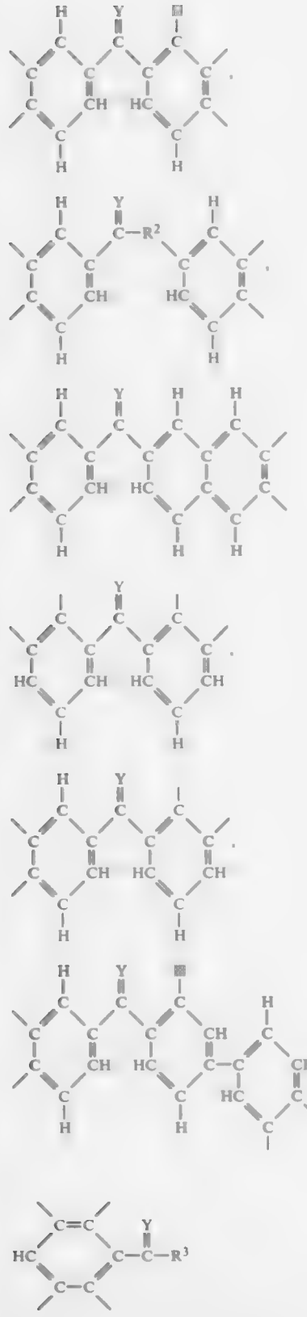


(I)

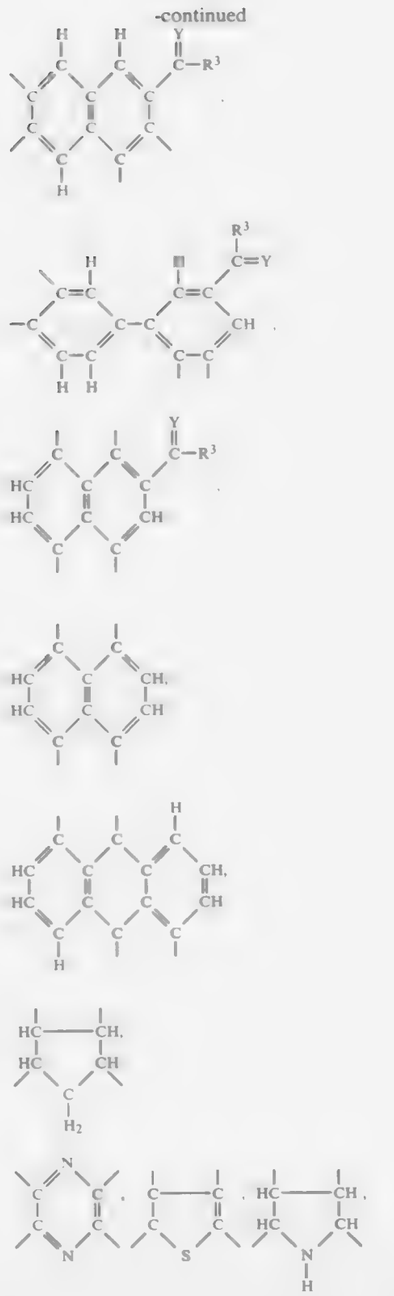
wherein Ar represents



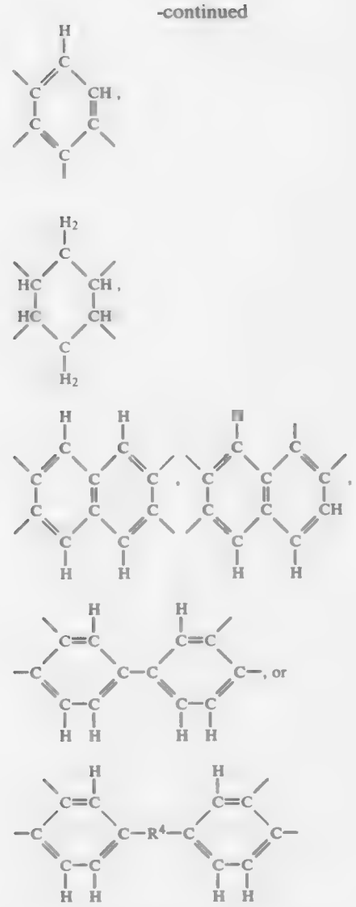
wherein X a represents —O— or —CH_2—.



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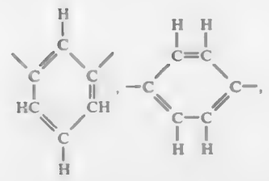


wherein =Y represents =O or =N—R^5—NH_2, wherein R^5 represents a divalent organic group, R^2 represents alkylene or arylene, R^3 represents alkyl, and R^4 represents an alkylene group having at least 2 carbon atoms,

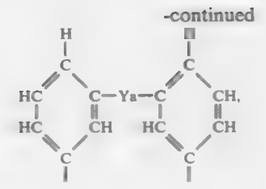
(B) diamine of the formula (II)

$$H_2N—Re—NH_2 \quad \text{(II)}$$

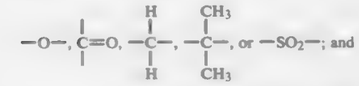
wherein Re represents



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wherein Ya represents



(C) di-aminated poly ether of the formula (III):

$$NH_2CH_2CH_2CH_2O(CH_2CHO)_m—CH_2CH_2CH_2NH_2 \quad \text{(III)}$$

wherein R^1 represents hydrogen or methyl, m represents an integer from 3 to 300;

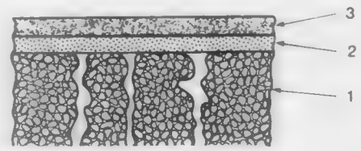
the percentage of the component (C) in the total of the components (B) and (C) being 5 to 40% by weight, the molecular weight of the co-poly (imide ether) copolymer being 5,000 to 100,000.

4,857,080

ULTRATHIN COMPOSITE METAL MEMBRANES

Richard W. Baker, Palo Alto; Jenny Louie, Fremont; Peter H. Pfromm, Palo Alto, and Johannes G. Wijmans, Menlo Park, all of Calif., assignors to Membrane Technology & Research, Inc., Menlo Park, Calif.

Filed Dec. 2, 1987, Ser. No. 127,946
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—16 **17 Claims**



1. A gas separation membrane for separating a preferentially permeating component and a non-preferentially permeating component from a gas mixture, comprising a polymeric substrate layer and an ultrathin metal layer coating said substrate layer, said substrate layer exhibiting a flux of said preferentially permeating component of at least 1×10^{-4} cm^3(STP)/cm^2-s-cmHg, and said gas separation membrane exhibiting a flux of said preferentially permeating component of at least 1×10^{-5} cm^3(STP)/cm^2-s-cmHg and wherein the selectivity for said preferentially permeating component over

said non-preferentially permeating component is greater than the selectivity of said substrate layer for said components.

15. A method for preparing a gas separation membrane, for separating a preferentially permeating component and a non-preferentially permeating component from a gas mixture, comprising:

providing a polymeric substrate layer, coated with a first sealing layer and exhibiting a flux of said preferentially permeating component of at least 1×10^{-4}cm^3(STP)/cm^2·s·cmHg;

depositing on said substrate layer an ultrathin metal layer; and

overcoating said metal layer with a second sealing layer; wherein the resultant gas separation membrane exhibits a flux of said preferentially permeating component of at least 1×10^{-5} cm^3(STP)/cm^2·s·cmHg and wherein the selectivity for said preferentially permeating component over said non-preferentially permeating component is greater than the selectivity of said substrate layer for said components.

4,857,081

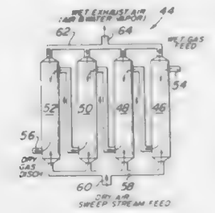
SEPARATION OF WATER FROM HYDROCARBONS AND HALOGENATED HYDROCARBONS

John A. Taylor, Pinckney, Mich., assignor to Separation Dynamics, Inc., Southfield, Mich.

Continuation-in-part of Ser. No. 108,752, Oct. 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 880,783, Jul. 1, 1986, abandoned. This application May 17, 1988, Ser. No. 194,984

Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—16 **7 Claims**



1. In a method for drying a wet stream of hydrocarbon gas by the use of a hollow fiber membrane while producing a hydrocarbon free water permeate, the steps of; employing as a membrane nonporous self-supported hollow fibers of cuproammonium cellulose, conducting the wet hydrocarbon gas stream into contact with the outside of the fibers, osmotically imbibing water independently of convective pressure of the stream of gas from the stream into the fibers while preventing imbibing or permeation of hydrocarbons; diffusing the water free of hydrocarbons to the bores of the fibers, removing the imbibed water free of hydrocarbons from inside the bores, and removing the dry gas from outside of the membrane.

4,857,082

MEMBRANE UNIT TURN-DOWN CONTROL SYSTEM

Stephen P. DiMartino, Sr., Topton; Jeffrey A. Hopkins, Whitehall, and Ruth A. Davis, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 15, 1988, Ser. No. 244,769

Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—16 **22 Claims**

1. In a process for separating a component of feed gas mixture containing at least one other component by passing said feed gas to a membrane unit containing a semi-permeable membrane such that one component is separated by preferential permeation through said membrane and is subsequently removed or recovered from the membrane unit as permeate product through a permeate gas outlet while non-permeating components are removed as residual gas through a reject gas outlet, the improvement for maintaining high permeate product purity during periods of turn-down in feed flow capacity which comprises:

(a) maintaining a substantially constant permeate backpressure in said permeate gas outlet; and

(b) maintaining the flow of residual gas through said reject gas outlet at a substantially constant value.

8. A permeator system for separating at least one gaseous component from a feed gas mixture containing at least one other component, said system comprising:

a membrane unit comprising at least one semi-permeable membrane which is more permeable to one component in said feed gas mixture than to at least one other component, said semi-permeable membrane having a reject side and a permeate side;

a feed inlet in fluid communication with the membrane unit, positioned such that said feed gas mixture can be passed through said feed inlet to contact the reject side of said semi-permeable membrane;



a reject gas outlet in fluid communication with said membrane unit positioned such that gas which does not permeate through the semi-permeable membrane can be removed from the membrane unit via said reject gas outlet;

a volumetric flow valve positioned along said reject gas outlet to control the flow of reject gas through said reject gas outlet;

a flow controller positioned along said reject gas outlet which measures the volumetric flow of gas through said reject gas outlet, and controls said volumetric flow valve to regulate the gas flow through said reject outlet;

a permeate gas outlet in fluid communication with the membrane unit, positioned such that the portion of said feed gas which permeates through the semi-permeable membrane can be removed form the membrane unit;

a permeate valve means, positioned along said permeate gas outlet to control permeate backpressure and;

a pressure controller positioned along said permeate gas outlet which measures the pressure in the permeate gas outlet upstream of said permeate valve means, and controls said permeate valve means.

4,857,083

VACUUM SWING ADSORPTION PROCESS WITH VACUUM AIDED INTERNAL RINSE

Stephen P. DiMartino, Topton, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 25, 1988, Ser. No. 262,414

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—26 **6 Claims**

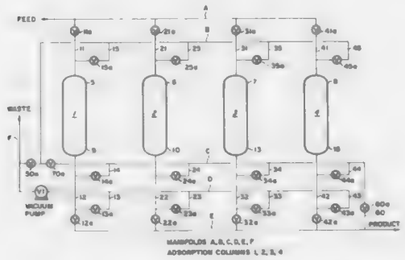
1. The method of separating the components of a gaseous mixture into a primary gaseous product and a secondary gaseous product in a system comprising a plurality of adsorption columns operated in cycle in a predetermined timed sequence, each adsorption column containing a bed of solid adsorbent preferentially selective for retention of said secondary gaseous product, which method comprises the following sequence of operational steps performed in the order recited in each of said adsorption zones in its turn:

(a) introducing the gaseous mixture to be separated into a first adsorption column and passing the gaseous mixture through the bed of adsorbent in said first column while discharging from said first column unadsorbed gas as primary gaseous product, said first adsorption column having been previously brought to superatmospheric feed gas pressure in step (f) with primary gaseous product withdrawn from another adsorbent column of said system;

(b) terminating operation of step (a) as applied to the first adsorption column and reducing the pressure in the first adsorption column to an intermediate pressure level by connecting the discharge end of the first column to the inlet end of a second adsorption column which has been previously evacuated thereby causing the residual gas in the first adsorption column to flow into the second adsorption column;

(c) further depressurizing the first adsorption column by venting to near ambient pressure;

(d) evacuating said first adsorption column to sub-atmospheric level;



(e) equalizing the pressure within the first and second adsorption columns by introducing into the first column primary gaseous product from the second adsorption column already pressurized to the desired superatmospheric gas pressure thereby equalizing said first and second adsorption columns to said intermediate pressure level;

(f) repressurizing the first adsorption column to an intermediate pressure level relative to the feed gas pressure by admitting the discharge gas of the second column which is rich in secondary components, said second adsorption column having been previously repressurized to superatmospheric pressure; and

(g) repressurizing said first adsorption column to said superatmospheric feed pressure with primary gas product.

4,857,084

PRESSURE SWING ADSORPTION APPARATUS AND PROCESS FOR RECOVERY OF OIL-SOLUBLE VAPORS

Lanny A. Robbins, and Timothy C. Frank, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 10, 1988, Ser. No. 204,824

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—58 **17 Claims**

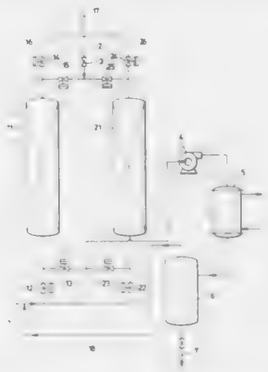
1. A process for recovering oil-soluble solvent, monomer or hydrocarbon vapor from a gaseous feedstream comprising the steps of

(1) passing said gaseous feedstream containing oil-soluble vapor through a first adsorption bed containing a material that is effective to adsorb said oil-soluble vapor under conditions at which substantial oil-soluble vapor is adsorbed;

(2) redirecting the flow of said gaseous feedstream to a second adsorption bed;

(3) placing said first adsorption bed under reduced pressure generated by an oil-sealed vacuum pump in the presence of a backpurge gas stream running counter to the direction in which said gaseous feedstream flowed, under conditions such that oil-soluble vapor adsorbed upon said bed is desorbed and flows out of said bed with said backpurge stream;

(4) drawing said desorbed oil-soluble vapor and backpurge gas stream through said oil-sealed vacuum pump while



maintaining the oil in said pump at a temperature such that adsorption of vapor into the oil is restricted; and

(5) passing desorbed oil-soluble vapor and backpurge gas from said vacuum pump to a vapor receiving step wherein said desorbed vapor is used, recovered or disposed of.

4,857,085

PROCESS FOR ABATEMENT OF ASBESTOS FIBERS

John D. Egri II, 5200 Moore Rd., Lincoln, Calif. 95648

Filed May 20, 1988, Ser. No. 196,669

Int. Cl.[4] B01D *49/00*

U.S. Cl. 55—83 **6 Claims**

1. A method of asbestos fiber abatement by application of gaseous cyanoacrylate comprising the steps of,

a. selecting a treatment area to define an enclosure, and

b. applying a first sealing means to seal selected interior components of said enclosure to prevent contact by said gaseous cyanoacrylate, and

c. positioning a heating means within said enclosure and positioning liquid cyanoacrylate in heating communication with said heating means, and

d. applying a second sealing means to seal exterior portions of said enclosure to prevent said gaseous cyanoacrylate from escaping from within said enclosure, and

e. heating said cyanoacrylate to a gaseous state, and

f. allowing passage of sufficient time to enable said gaseous cyanoacrylate to solidity, and

g. removing said first and second sealing means.

4,857,086

GAS SEPARATOR SYSTEM

Masaki Kawai, Fujisawa, Japan, assignor to Tokico Ltd, Kawasaki, Japan

Filed Oct. 11, 1988, Ser. No. 255,986

Claims priority, application Japan, Oct. 17, 1987, 62-262398

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—162 **10 Claims**

1. A gas separator system for producing a product gas by separation of molecular species contained in the air comprising:

adsorption column means supplied with a compressed air and adapted for accommodating an adsorbent which selectively adsorbs a first molecular species from the supplied compressed air for producing a product gas by removal of said first molecular species from the supplied compressed air in a form of a by-product gas;

first valve means connected to the adsorption column means for controlling the supply of the compressed air to the adsorption column means;
second valve means connected to the adsorption column means for controlling the release of said by-product gas from the adsorbent to an exterior of the gas separator system;
a tank for storing the product gas produced in said adsorption column means;
third valve means connected to said adsorption column means and to the tank for controlling the inflow of the product gas from the adsorption column means to the tank;
concentration measuring means provided for measuring the purity of the product gas contained in said tank and for producing an output signal indicating the purity of the product gas in the tank; and
a controller electrically connected to said first, second and third valve means for controlling the opening and closure of the valve means such that a cyclic operation is per-



formed repeatedly with a predetermined period of repetition, said cyclic operation comprising a first half cycle operation which in turn comprises a first step in which said first valve means is opened and the second and third valve means are closed so that the compressed air is introduced to the adsorption column means and the adsorption column means is held in a pressurized state and a second step in which the third valve means is opened and the first and second valve means are closed so that the product gas in the adsorption column means is delivered to the tank, and a second half cycle in which said second valve means is opened and said first and third valve means are closed so that the adsorption column means is held in the depressurized state and the by-product gas in the adsorption column means is released to an exterior of the gas separator system, said controller being further supplied with the output signal indicating the purity of the product gas in the tank from the concentration measuring means and changing said predetermined cycle of repetition of said cyclic operation responsive to the purity of the product gas.

4,857,087

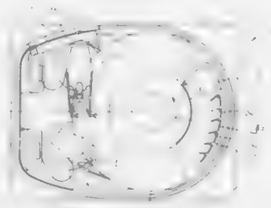
DISK FILE EMPLOYING DUAL FILTERS

Ivor W. Bolton, Winchester; Richard N. Gibbons, Hamble, and Gerald Dixon, Winchester, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 16, 1987, Ser. No. 120,889
Claims priority, application United Kingdom, Mar. 6, 1987, 8705274
Int. Cl.⁴ B01D *46/10*; **G11B** *5/012*
U.S. Cl. 55—385.6 **9 Claims**

1. A disk file including an enclosure for enclosing a stack of disks,

means for rotatably mounting the disk stack for rotation past magnetic heads mounted within the enclosure for reading information from and/or writing information on the disks during rotation thereof, such rotation causing air flow within the enclosure; and
air filter means located within the enclosure for removing particulate contamination borne by air circulating within the enclosure in which:



the air filter means comprises a first relatively coarse recirculating filter for trapping relatively large particles and a second relatively fine recirculating filter capable of trapping relatively fine particles.
said coarse and fine filters being located in substantially independent air flow paths.

4,857,088

FILTER FOR CLEANING THE EXHAUST GASES FROM DIESEL ENGINES

Tiberiu Mizrah, Schaffhausen; Albert Maurer, Thayngen, and Ludwig Gauckler, Schaffhausen, all of Switzerland, assignors to Swiss Aluminum Ltd., Chippis, Switzerland

Filed Dec. 3, 1987, Ser. No. 128,222
Claims priority, application Switzerland, Dec. 23, 1986, 5123/86
Int. Cl.⁴ B01D *46/00*
U.S. Cl. 55—523 **10 Claims**

1. Filter for cleaning exhaust gases from diesel engines, said filter being positioned within a stream of said exhaust gases and being formed from an open pored foamed ceramic body comprising a first ceramic material having a relatively fine pore structure and a second ceramic material having a coarser pore structure as compared to said pore structure of said first material, said filter having a surface first exposed to said exhaust gases comprising a first and a second portion wherein from about 20% to about 50% of the area of the first portion of said surface first exposed to said exhaust gas is formed from said relatively fine first material so as to lower the inflammation temperature of soot deposited in said filter and the second portion of said first surface being formed from said coarser second material.

4,857,089

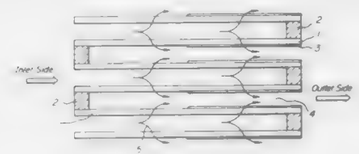
CERAMIC HONEYCOMB FILTER FOR PURIFYING EXHAUST GASES

Jun Kitagawa; Toshihiko Hijikata, and Kazuo Ishikawa, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Jan. 25, 1988, Ser. No. 147,997
Claims priority, application Japan, Jan. 28, 1987, 62-16124
Int. Cl.⁴ B01D *46/00*
U.S. Cl. 55—523 **2 Claims**

1. A ceramic honeycomb filter for purifying exhaust gases, comprising:

an extruded cordierite ceramic honeycomb structure having an inlet side, an outlet side, and a plurality of longitudinal, intersecting partition walls extending from said inlet side towards said outlet side and defining a plurality of adjacent, longitudinal through-passages;
a plurality of ceramic closure members located in alternate ends of said longitudinal through-passages, such that at least all of those through-passages which are open on said inlet side are closed on said outlet side; and
porous cordierite ceramic layers deposited on portions of said partition walls, said layers extending along said parti-



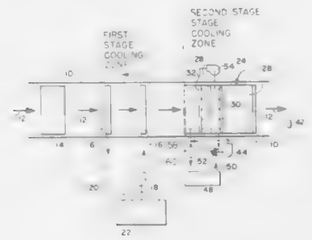
tion walls from said outlet side towards said inlet side to a distance of 1/10–8/10 of an effective length of said filter, said effective length being defined by a length of said through-passages minus a thickness of said closure members.

4,857,090

ENERGY CONSERVATION SYSTEM FOR COOLING AND CONDITIONING AIR

Roy Hartness, Mount Holly, N.C., assignor to Pneumafil Corporation, Charlotte, N.C.

Filed Feb. 23, 1988, Ser. No. 159,220
Int. Cl.⁴ F25D *17/02*
U.S. Cl. 62—91 **9 Claims**



1. An energy conservation system for cooling and conditioning air, said system comprising:

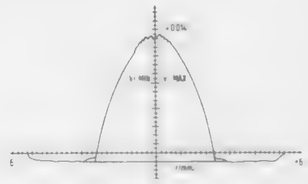
(a) means for directing air along a predetermined flow path;
(b) cooling coil means disposed in said flow path so that said air flows over the external surfaces of said cooling coils means, said cooling coil means having a heat exchange fluid passing internally thereof;
(c) cooling means associated with said cooling coil means for cooling said first heat exchange fluid by exposing it to a cooling medium having a temperature less than the temperature of said first heat exchange fluid;
(d) circulating means for circulating said heat exchange medium through said cooling coil means and said cooling means;
(e) air washer means located in said flow path downstream of said cooling coil means and having spray means for spraying water into said moving air, said air washer spray means including a first water spray pipe and a second water spray pipe located upstream of said first spray pipe, first collector means for collecting water sprayed from said first water spray pipe, and first pump means for delivering water from said first collection means to said first and second water spray pipes for spraying therefrom; and
(f) refrigerating means for mechanically chilling water and delivering said chilled water to said air washer means for spraying therefrom into said moving air, and means for selectively mixing said mechanically chilled water with said water delivered from said first collection means to said first and second water spray pipes.

4,857,091

METHOD OF MANUFACTURING OPTICAL FIBERS

Peter E. E. Geittner, Aachen; Hans-Jürgen Lydtin, Stolberg, and Howard J. C. Wilson, Aachen, all of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Oct. 8, 1987, Ser. No. 106,839
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1986, 3635034
Int. Cl.⁴ C03B *37/018*
U.S. Cl. 65—3.12 **15 Claims**



1. A method of manufacturing optical fibers whose refractive index profiles comprise defined peripheral and/or radial and/or axial optical modulation structures which comprises the steps of coating the inside of a glass tube with glass by chemical deposition from the gaseous phase while varying one or more deposition parameters, collapsing the glass tube to form a rod and drawing the rod to form a fiber, wherein

(1) the internal coating is carried out according to the PCVD method in which method parameters are varied which influence the uniformity of the material transport to the inner wall of the tube and/or the deposition yields of the glass over the circumference of the tube;
(2) to achieve peripheral optical profile modulations, a specific rotational asymmetry of the external temperature field used for heating the tube is adjusted, the amplitude and number of profile modulations being adjusted over the tube circumference by the amplitude and the number of temperature variations in the external temperature field; and
(3) elliptical profile structures with polarization-maintaining properties are obtained by adjusting a temperature field which comprises totally two maxima and two minima over the circumference of the tube, adjacent maxima and minima being each time shifted with respect to each other over an angle $\pi/2$.

4,857,092

METHOD OF DENSIFYING A PREFORMED POROUS BODY OF A MATERIAL THE MAIN CONSTITUENT OF WHICH IS SiO_2

Wilhelmus C. P. M. Meerman, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 694,569, Jan. 24, 1985, abandoned. This application Nov. 21, 1986, Ser. No. 933,310
Claims priority, application Netherlands, Nov. 7, 1984, 8403380
The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.
Int. Cl.⁴ C03B *23/20*
U.S. Cl. 65—18.4 **7 Claims**

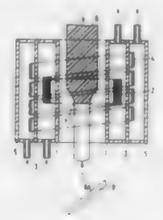
1. A method of densifying a preformed porous body of an optically transparent glass having a main constituent of SiO_2 comprising the steps of

applying infrared radiation from a radiation source to a zone of a preformed porous body of an optically transparent glass, said infrared radiation having first wavelengths that are absorbed by said transparent glass and second wavelengths that are not absorbed by transparent glass, said second wavelengths being absorbed substantially in areas of reflection or scattering the said preformed porous body;

moving said infrared radiation source and said porous body relative to one another; and

preventing said porous body from being heated by at least infrared radiation having wavelengths absorbed by said transparent glass in both a non-densified condition of said body and a condition after densification of said body;

wherein a transparent silica glass screen between the source



of infrared radiation and said porous body absorbs infrared radiation having first wavelengths thereby preventing said heating and passes infrared radiation having said second wavelengths, said second wavelengths being smaller than said first wavelengths, and wherein the density of said preformed body is increased by a progressing zone of high temperature when the preformed body and the radiation source are moved relative to each other.

4,857,093

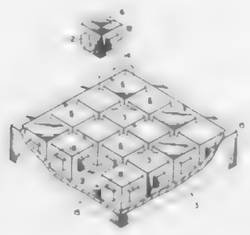
METHOD FOR PRODUCING INTEGRAL CHOPPED FIBER REINFORCED GLASS OR GLASS-CERAMIC STRUCTURES

Karl M. Prewo, Vernon, and Eric Minford, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 23, 1987, Ser. No. 124,324

Int. Cl.⁴ C03B *29/02*

U.S. Cl. 65—36 **2 Claims**



1. A method of fabricating of lightweight integral chopped fiber reinforced glass or glass-ceramic matrix mirror structure comprising:

(a) disposing at least two mold inserts in a mold housing having a bottom and sides, said mold inserts disposed in contact to prevent lateral movement and in an array that follows the surface contours of said mold;

(b) impregnating continuous multifilament carbon fiber yarn with a slurry comprising glass, glass-ceramic powder or a mixture thereof;

(c) chopping said impregnated multifilament yarn into discontinous lengths;

(d) exposing said chopped impregnated multifilament yarn to a temperature sufficient so that said matrix softens

(e) applying a pressure to said heated chopped impregnated multifilament yarn sufficient to displace said heated chopped impregnated multifilament yarn into said mold;

(f) maintaining a mold pressure sufficient to prevent relaxation of the composite on cooling until the strain point of the glass is reached;

(g) cooling said composite; and

(h) removing said mold inserts by chemical dissolution.

4,857,094

METHOD FOR THE MANUFACTURE OF A TOUGHENED AND/OR BENT PANE WITH SOLAR CONTROL COATING CONTAINING PLATINUM OR THE LIKE

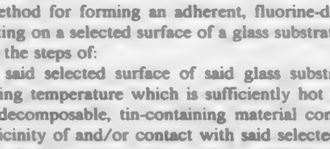
Rolf Groth, Bochum, and Franz-Josef Schmitte, Gelsenkirchen, both of Fed. Rep. of Germany, assignors to Flachglas Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 22,267, Mar. 15, 1987, abandoned. This application Sep. 6, 1988, Ser. No. 241,822

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1986, 3611844

Int. Cl.⁴ C03B *27/00*

U.S. Cl. 65—60.2 **5 Claims**



1. A method for manufacturing a toughened and/or bent glass pane constructed from soda-lime-silica glass and having a reduced transmission of solar radiation consisting of the steps of:

vacuum coating at least one side of a transparent glass carrier with a metal layer comprising at least one constituent chosen from the group consisting of: platinum, iridium, rhodium, platinum alloys, iridium alloys, rhodium alloys at ambient temperature;

the metal layer being applied being applied in a thickness such that the light transmittance of a laminate formed from the glass carrier and the metal layer is between approximately 10 to about 90 percent of that of the glass carrier alone;

vacuum coating at ambient temperature the resultant metal layer with an oxide stabilizing layer having an oxide of at least one metal chosen from the group consisting of: Bi, In, Ni, Sb, Sn, Ta, Ti, and Zn, the stabilizing layer being applied in a thickness of approximately 2 to about 20 mm; and

heating to bend and/or toughen the glass pane at a temperature of approximately 580° to about 680° C. without further steps to prevent metal migration into the glass pane to occur.

4,857,095

METHOD FOR FORMING A FLUORINE-DOPED TIN OXIDE COATING ON A GLASS SUBSTRATE

Franklin I. Brown, Riverview, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 10, 1987, Ser. No. 83,480

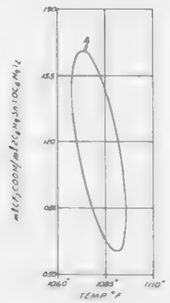
Int. Cl.⁴ C03C *17/28*

U.S. Cl. 65—60.3 **3 Claims**

1. A method for forming an adherent, fluorine-doped, tin oxide coating on a selected surface of a glass substrate, which comprises the steps of:

heating said selected surface of said glass substrate to a spraying temperature which is sufficiently hot so that a heat decomposable, tin-containing material coming into the vicinity of and/or contact with said selected surface will be heat decomposed permitting said tin contained in said tin-containing material to be oxidized and deposited as tin oxide on said selected surface; and

in an oxygen ambient, applying to said heated selected surface of said glass substrate as said tin-containing spray material a solution of dibutyltin dibutoxide [$(C_4H_9)_2Sn(OC_4H_9)_2$] and trifluoroacetic acid [CF_3COOH];



said heating and application steps being undertaken under conditions (I) that said spraying temperature to which said selected surface of said glass substrate is heated prior to application of said tin-containing spray material thereto, and (II) that the ratio of milliliters of trifluoroacetic acid to milliliters of dibutyltin dibutoxide contained in said tin-containing spray material fall at some point located on or within the island area designated by the letter A in the map of these variables as set forth in FIG. 1.

4,857,096

METHOD OF FORMING A GLASS SHEET WITH A UV-BASE CERAMIC PAINT THEREON

Premakaran T. Boaz, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 19, 1987, Ser. No. 122,964

The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.

Int. Cl.⁴ C03B *23/023;* **C03C** *8/04*

U.S. Cl. 65—60.51 **8 Claims**

1. A method of forming a glass sheet with a ceramic paint thereon, which method comprises the steps of:

applying a UV-base ceramic paint to the said glass sheet, said UV-base base ceramic paint including finely divided zinc metal powder as a constituent thereof;

subjecting said glass sheet with said UV-base ceramic paint thereon to UV radiation to cure said paint;

heating said glass sheet to a temperature which softens said glass sheet sufficiently so that said glass sheet can be formed, said heating burning off any remaining organic material contained in said UV-base ceramic paint and binding said remaining portion of said UV-base ceramic paint to said glass sheet;

engaging said glass sheet and said UV-base ceramic paint thereon with a fiberglass covered forming die to form said heated glass sheet to a desired shape; and

removing said forming die from engagement with said glass sheet, said zinc metal addition to said UV-base ceramic paint being effective to prevent sticking of any of said UV-base ceramic paint to said forming die.

4,857,097

METHOD AND APPARATUS FOR COATING GLASS

Ronald F. Berry, Wigan, United Kingdom, assignor to Pilkington plc, St. Helens, England

Filed Dec. 23, 1987, Ser. No. 137,077

Claims priority, application United Kingdom, Aug. 28, 1987, [redacted]

Int. Cl.⁴ C03C *25/02*

U.S. Cl. 65—60.52 **17 Claims**

1. A method of coating flat glass by chemical vapor deposition at a coating station comprising passing a coating gas over a hot glass surface in a coating zone, directing used gas away from the glass to an exhaust channel at a downstream end of the coating zone by diverting means disposed above the glass surface to form a gap therebetween, the gap defined by a portion of a surface means of the diverting means which extends along the gap and into the exhaust channel, and inducing a flow of inert gas inwardly through the gap to the exhaust channel to inhibit the formation of a deposit from the coating gas onto the gap-forming portion of the surface means, whereby the inert gas travels smoothly along the surface means from within the gap to within the exhaust channel to inhibit disruption of the flow of coating gas.

4,857,098

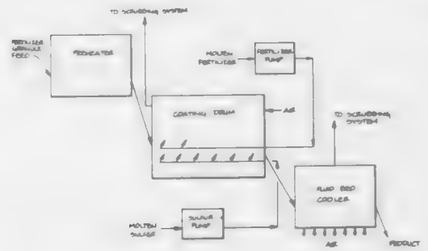
SULFUR-COATED FERTILIZER GRANULES AND PROCESS OF MAKING SAME

Arthur R. Shirley, Jr., Florence, Ala., assignor to Pursell Industries, Sylacauga, Ala.

Filed Aug. 11, 1987, Ser. No. 84,039

Int. Cl.⁴ C05C *9/00, 1/00, 5/00*

U.S. Cl. 71—28 **20 Claims**



4. A sulfur coated plant fertilizer granule having improved resistance to physical damage during handling comprising:

a granule of fertilizer including a crystalline component;

a bonding layer including a mixture of said fertilizer granule crystalline component and crystalline sulfur, coating said granule, said bonding layer crystalline fertilizer component being integral with said fertilizer granule crystalline component at the bonding layer-granule interface; and

an outer layer of sulfur including crystallized sulfur, said outer layer sulfur being integral with said bonding layer sulfur at the bonding layer-outer layer interface, said crystalline fertilizer component of said bonding layer and said sulfur of said bonding layer being interwoven, en-

abling the sulfur outer layer to be tightly bound to the fertilizer granule.

4,857,099

TERRESTRIAL AND AQUATIC HERBICIDAL METHODS

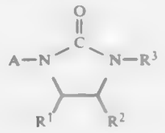
Jerome M. Lavanish, Akron, and Barry Van Gemert, Massillon, both of Ohio, assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 626,916, Jul. 2, 1984, abandoned, which is a continuation-in-part of Ser. No. 544,938, Oct. 19, 1983, abandoned, which is a division of Ser. No. 348,479, Feb. 12, 1982, Pat. No. 4,426,527. This application May 19, 1986, Ser. No. 864,931

Int. Cl.[4] A01N *43/82*

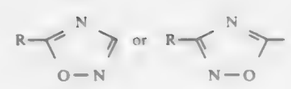
U.S. Cl. 71—92 **4 Claims**

1. A method for controlling the growth of terrestrial plants by contacting the plants or the soil in which the plants are growing with a terrestrially herbicidally effective amount of compound represented by the formula:

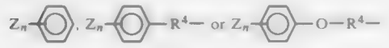


wherein:

A is

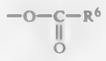


R is alkyl or haloalkyl of up to 6 carbon atoms, cycloalkyl of from 3 to 8 carbon atoms, alkenyl or alkynyl of up to 5 carbon atoms, $-R^4-O-R^5$ or R^4-S-R^5 wherein R^4 is alkylene of up to 6 carbon atoms and R^5 is alkyl of up to 6 carbon atoms,



wherein Z is nitro, halogen, trifluoromethyl or R^5 and n is 0, 1, 2, or 3;

R^1 is hydroxy, halogen,



wherein R^6 is alkyl or haloalkyl of up to 6 carbon atoms, cycloalkyl of from 3 to 8 carbon atoms, alkenyl or alkynyl of up to 5 carbon atoms or



wherein Z^1 is nitro, halogen, trifluoromethyl, alkyl or alkoxy of up to 8 carbon atoms and n is 0, 1, 2 or 3 or



wherein R^7 and R^8 are the same or different and represent hydrogen, alkyl or haloalkyl of up to 6 carbon atoms; or R^7 can be



R^2 is hydrogen, hydroxy, alkyl, or haloalkyl of up to 4 carbon atoms or allyl; and

R^3 is alkyl of up to 3 carbon atoms or allyl.

4,857,100

PHENYLSULFONYLUREAS

Willy Meyer, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

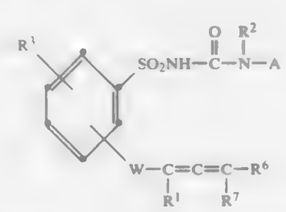
Division of Ser. No. 53,915, May 26, 1987, Pat. No. 4,759,792. This application May 16, 1988, Ser. No. 194,651

Claims priority, application Switzerland, Jun. 5, 1986, 2291/86

Int. Cl.[4] A01N *43/66;* **C07D** *251/42*

U.S. Cl. 71—93 **7 Claims**

1. An N-phenylsulfonyl, N'-triazolylurea or N'-triazinylurea of formula I



(I)

wherein

R^1 and R^2, independently of each other, are hydrogen or C_1–C_2alkyl,

R^3 is hydrogen, halogen, nitro, C_1C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, C_1–C_4alkoxycarbonyl, C_1–C_4alkylthio, C_1–C_4alkylsulfinyl, C_1–C_4alkylsulfonyl or C_2–C_5alkoxyalkoxy or $-SO_2NR^4R^5$,

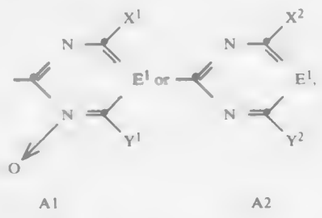
R^4 is hydrogen, C_1–C_2alkoxy or C_1–C_4alkyl,

R^5 is hydrogen, methyl or ethyl,

R^6 and R^7 are each hydrogen, methyl or ethyl,

W is oxygen, sulfur, a sulfinyl or sulfonyl bridge

A is a radical selected from



A1 A2

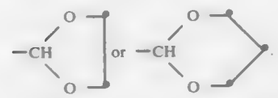
in which

X^1, X^2 and Y^1 are each independently halogen, C_1–C_4haloalkoxy, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4alkyl,

dimethylamino, methylamino, ethylamino, amino or C_2–C_4alkoxyalkyl,

E^1 is nitrogen,

Y^2 has the same meaning as Y^1 or is cyclopropyl, dimethoxymethyl, diethoxymethyl



6. A method for selectively controlling weeds in crops of useful plants, which comprises applying an effective amount of a compound according to claim 1, or a composition containing said compound, to the crops or to the locus thereof.

4,857,101

METHOD OF SELECTIVELY CONTROLLING WEEDS IN CROPS OF CEREALS

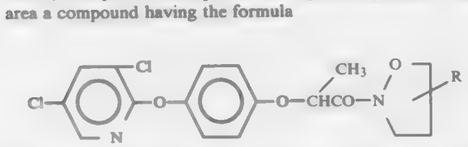
Vincent A. Musco, Southampton, Pa.; Donald E. Kelley, Germantown, Tenn., and Carl O. Hansen, Fort Washington, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 806,148, Dec. 6, 1985. This application Nov. 19, 1986, Ser. No. 929,225

Int. Cl.[4] A01N *43/40*

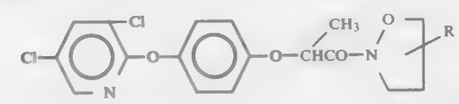
U.S. Cl. 71—94 **14 Claims**

1. A method for selectively controlling growth of undesirable monocotyledonous plants in an area containing growing undesirable monocotyledonous plants and an established wheat, barley or rice crop which comprises applying to said area a compound having the formula



wherein R is hydrogen or $(C_1$–$C_4)$alkyl at a rate of application of between about 0.01 and about 0.5 pounds of said compound per acre.

14. A method for selectively controlling growth of undesirable monocotyledonous plants in an area containing growing undesirable monocotyledonous plants and an established rice crop which comprises applying to said area a compound having the formula



wherein R is hydrogen or $(C_1$–$C_4)$alkyl at a rate of application of between about 0.01 and about 0.5 pounds of solid compound per acre.

4,857,102

ALDITOL ESTER DERIVATIVE OF TRICLOPYR, AND HERBICIDAL USE THEREOF

Nicholas Dennis, King's Lynn, and Donald C. Burrell, Newbury, both of England, assignors to The Dow Chemical Company, Midland, Mich.

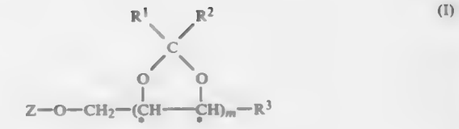
Filed Apr. 10, 1987, Ser. No. 36,947

Claims priority, application United Kingdom, May 28, 1986, 8612940

Int. Cl.[4] C07D *401/12, 401/14;* **A01N** *43/40*

U.S. Cl. 71—94 **48 Claims**

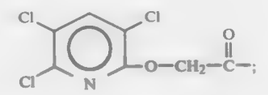
1. A compound corresponding to one of the general formula



(I)

wherein

Z represents

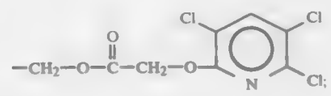


(A)

R^1 and R^2 are each independently any sterically compatible combination of H, a C_1–C_6 straight chain or branched alkyl group, a C_3–C_6 cycloalkyl group, or phenyl;

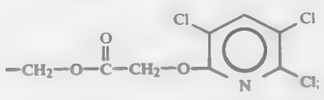
R^1 and R^2 taken together represent a divalent polymethylene group $(CH_2)_n$, thereby forming a carbocyclic ring having n+1 carbon atoms wherein n is 3, 4, 5 or 6;

R^3 is H or a group of the formula:



(B)

R^3 is H or a group of the formula:



(B)

R^4 is H, CH_2OH or a group of formula B; and

m is 1 or 2.

4,857,103

INFLUENCING THE DEVELOPMENT OF CROPS WITH 7-CHLOROQUINOLINE-8-CARBOXYLIC ACIDS

Henning Rosebrock, Bad Durkheim; Johann Jung; Wilhelm Rademacher, both of Limburgerhof; Max Luib, Durkheim; Volker Fischer, Erpolzheim; Helmut Hagen, Frankenthal; Rolf-Dieter Kohler, Edingen-Neckarhausen; Juergen Markert, Mutterstadt, all of Fed. Rep. of Germany, and Akihide Watanabe, Ayasei, Japan, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

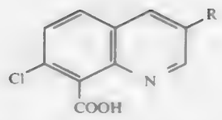
Filed Nov. 23, 1987, Ser. No. 123,914

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1986, 3639837

Int. Cl.[4] A01N *43/42*

U.S. Cl. 71—94 **7 Claims**

1. A method of increasing the yield and/or quality of Solanaceae, Rosaceae, Fabaceae or Malavaceae which comprises: applying to the crops, to the soil in which the crops are planted or are to be planted or to the seeds of the crops a yield increasing and/or quality improving amount of 0.0001 to 10 g per kilogram of seed for seed treatment, 0.001 to less than 50 g per hectare for crop treatment and/or soil treatment or 0.001 to 100 ppm for seedling, tuber or inflorescence treatment of one or more 7-chloroquinoline-8-carboxylic acids of the formula I



(I)

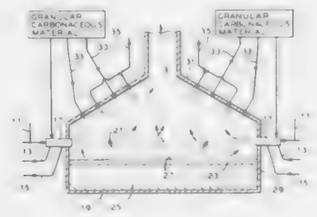
Where r is fluorine, chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-haloalkyl.

4,857,104

PROCESS FOR REDUCTION SMELTING OF MATERIALS CONTAINING BASE METALS

Grigori S. Victorovich, Toronto, and Charles E. O'Neill, Mississauga, both of Canada, assignors to Inco Limited, Toronto, Canada

Filed Mar. 9, 1988, Ser. No. 165,911
Int. Cl.[4] C22B *1/02, 23/00*
U.S. Cl. 75—21 **17 Claims**



1. A process for reduction smelting of finely dividely material containing at least one base metal from the group of copper, nickel and cobalt at least partly in oxidic form comprising:
(a) injecting said material along with fuel and oxygen and finely divided flux, if any, into a bounded space while combusting said fuel with at least an aeration ratio of about 90% to produce an essentially non-reducing high temperature flame;
(b) superheating in said essentially non-reducing flame finely divided particles containing said base metal to a temperature in excess of the highest melting point of reduced product to be produced;
(c) projecting said superheated particles essentially evenly onto as thin layer of particulate coke floating on the surface of a molten bath of said reduced products, said thin layer of coke and the adjacent atmosphere comprising a reduction zone;
(d) reducing oxides of said base metals in said reduction zone with the reduced products being obtained in the liquid state, while supplying all required heat to the reduction zone solely in the form of sensible heat of said superheated particles and by radiation from said non-reducing flame;
(e) percolating said reduced products through said coke layer to said molten bath;
(f) withdrawing said reduced products from said molten bath; and
(g) supplying a solid, granular, carbonaceous material to said thin layer of granular coke to replenish coke consumed in the reduction.

4,857,105

PROCESS FOR PRODUCING PIG IRON USING COAL DEGASSING REACTOR TO FORM REDUCTANTS

Rolf Hauk, Düsseldorf, and Gero Papst, Kaarst, both of Fed. Rep. of Germany, assignors to Korf Engineering GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 15, 1987, Ser. No. 133,054
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644775
Int. Cl.[4] C22B *13/02*
U.S. Cl. 75—38 **21 Claims**



1. A process for producing molten pig iron or steel raw material comprising the steps of:
a. introducing iron ore into a reducing shaft furnace supplied with a reducing gas to produce an at least partially reduced iron and a shaft furnace exhaust gas,
b. transporting the at least partially reduced iron to a melting gasifier,
c. introducing coal into a degassing reactor,
d. supplying the degassing reactor with a hot coal degassing gas to form both coke and flammable gasses,
e. mixing a portion of the flammable gasses with an oxygen containing gas in a hot gas generator to form the hot coal degassing gas for supplying the degassing reactor;
f. supplying the melting gasifier with said coke; and
g. melting at least partially the at least partially reduced iron in the melting gasifier.

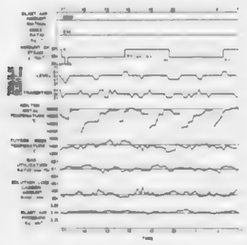
4,857,106

METHOD FOR CONTROLLING OPERATION OF A BLAST FURNACE

Kazumasa Wakimoto; Motohiro Shibata; Takaharu Ishii, and Masaaki Sakurai, all of Tokyo, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 45,126, Apr. 30, 1987, abandoned. This application Jul. 27, 1988, Ser. No. 224,753
Claims priority, application Japan, May 20, 1986, 61-113795
Int. Cl.[4] C21B *5/00*
U.S. Cl. 75—41 **16 Claims**

1. A method for controlling operation of a blast furnace, wherein the blast furnace includes a sensor means which outputs first data, corresponding to conditions in said blast furnace which comprises the steps of:
supplying a central processing unit with said first data outputted from said sensor means;
storing standard data corresponding to predetermined values of data corresponding to said conditions in said blast furnace;
preparing true-and-false data by comparing said first data with said standard data;
storing information on operation and control characteristics of said blast furnace based on accumulated actual knowledge and experience of at least one operator of said blast furnace, said information being stored as data in a knowledge base means;
inferring and judging heat conditions in said blast furnace, on the basis of said true-and-false data and said data in said knowledge base means and formed by accumulated experience on the operation of the blast furnace; and
controlling heat conditions in the blast furnace in accordance with results of said inferring and judging step.

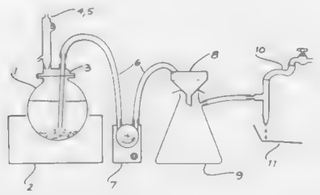


4,857,107

GOLD INQUARTATION PROCESS

Edward E. Davis, Castle Cove, Australia, assignor to Fine Metals Export Corporation Limited, Marrickville, Australia

PCT No. PCT/AU86/00269, § 371 Date May 18, 1987, § 102(e) Date May 18, 1987, PCT Pub. No. WO87/01732, PCT Pub. Date Mar. 26, 1987
PCT Filed Sep. 12, 1986, Ser. No. 82,405
Claims priority, application Australia, Sep. 12, 1985, PH 02406
Int. Cl.[4] C22C *3/00, 11/04*
U.S. Cl. 75—97 A **4 Claims**



1. A method of refining gold comprising the steps of:
(a) assaying the material, containing the gold to be extracted, to determine the concentration of the gold in the material;
(b) inquartating the material containing the gold to be extracted into an alloy with a known quantity of a base metal to form an alloy having between 15% and 40% gold;
(c) pouring the metal alloy into water in order to form porous open-faced granules;
(d) dissolving the base metal in nitric acid to leave the refined gold; and
(e) filtering the gold from the thus formed solution.

4,857,108

CEMENTED CARBONITRIDE ALLOY WITH IMPROVED PLASTIC DEFORMATION RESISTANCE

Nils G. L. Brandt, Solna, and Ake B. Byhlin, Bandhagen, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden

Filed Nov. 17, 1987, Ser. No. 121,797
Claims priority, application Sweden, Nov. 20, 1986, 8604971; Dec. 22, 1986, 8605519
Int. Cl.[4] C22C *29/04*
U.S. Cl. 75—238 **12 Claims**

1. Alloy for cutting tools comprising 75–97% by weight of a hard carbonitride component and 3–25% by weight of a binder metal, said hard carbonitride component comprising titanium as the main metallic component, 10–40% by weight of one or both of tungsten and molybdenum and 3–25% by weight of tantalum, the proportion of nitrogen in the hard carbonitride component being 5–40% by weight of the total carbon and nitrogen, the binder metal being at least one element selected from the group consisting of iron, cobalt and nickel, the carbonitride component of the alloy being a two phase mixture comprising a titanium and tantalum rich phase poor in nitrogen and another phase which is rich in group VI metal components and rich in nitrogen, the two phase mixture forming a structure in which the titanium and tantalum rich phase is surrounded by the phase rich in group VI metals and forms the main interface with the binder alloy.

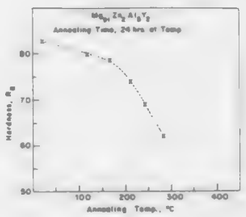


4,857,109

RAPIDLY SOLIDIFIED HIGH STRENGTH, CORROSION RESISTANT MAGNESIUM BASE METAL ALLOYS

Santosh K. Das, Randolph, and Chin-Fong Chang, Morris Plains, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 781,620, Sep. 30, 1985, Pat. No. 4,765,954. This application May 11, 1987, Ser. No. 48,339
The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.
Int. Cl.[4] C22C *23/02;* **F42B** *13/16;* **B64C** *1/00*
U.S. Cl. 75—249 **16 Claims**



1. A forging consolidated from a rapidly solidified magnesium based alloy powder consisting of the formula $Mg_{bal}Al_aZn_bX_c$, wherein X is at least one element selected from the group consisting of manganese, cerium, neodymium, praseodymium, yttrium and silver, "a" ranges from about 0 to 15 atom percent, "b" ranges from about 0 to 4 atom percent, "c" ranges from about 0.2 to 3 atom percent, the balance being magnesium and incidental impurities, with the proviso that the sum of aluminum and zinc present ranges from about 2 to 15 atom percent, said alloy having a microstructure comprised of a substantially uniform cellular network of solid solution phase of a size ranging from 0.2–1.0 μm together with precipitates of magnesium containing intermetallic phases of a size less than 0.5 μm.

4,857,110

AGENT FOR IMPROVING THE PRINTABILITY OF PAPER AND BOARD

Guido Dessauer, and Helmut Berenbold, both of Hoechst Aktiengesellschaft, P.O. Box 80 03 20, D-6230 Frankfurt am Main 80, Fed. Rep. of Germany

Filed Oct. 6, 1987, Ser. No. 106,562

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1986, 3634277

Int. Cl.[4] C08L *3/00*

U.S. Cl. 106—211 **9 Claims**

1. An agent for improving the printability of paper and board, consisting essentially of

50 to 95% by weight of water, and

5 to 50% by weight of a mixture of

I. 1 to 50% by weight of

(a) an organic quaternary ammonium salt having at least one C_8–C_{22}-alkyl group,

(b) a mixture of 50 to 99.5% by weight of an organic quaternary ammonium salt and 0.5 to 50% by weight of a saturated or unsaturated C_8–C_{22}-fatty acid, an oxidized wax or a polyglycol having a molecular weight of greater than 4,000 or

(c) a mixture of 50 to 99.5% by weight of an organic amine which has been partly neutralized using a mineral acid or a lower carboxylic acid, and 0.5 to 50% by weight of a saturated or unsaturated C_8–C_{22}-fatty acid, an oxidized wax or a polyglycol having a molecular weight of greater than 4,000 and

II. 50 to 99% by weight of a water-soluble or water-swellable polymer containing anionic groups.

4,857,111

THIXOTROPIC FORMULATIONS, USE OF POLYCARBOXYLIC ACID AMIDES TO PRODUCE THEM, AND SILICA COATED WITH POLYCARBOXYLIC ACID AMIDES

Karl-Heinz Haubennestel, Wesel; Holger Heilmann, Hamminkeln, and Andreas Diez, Wesel, all of Fed. Rep. of Germany, assignors to BYK-Chemie GmbH, Wesel, Fed. Rep. of Germany

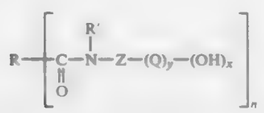
Filed Mar. 2, 1988, Ser. No. 162,901

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706860

Int. Cl.[4] C09C *1/28;* **C08J** *3/00*

U.S. Cl. 106—504 **32 Claims**

1. A thixotropic formulation comprising a liquid base, an effective thixotropy imparting amount of highly disperse silica, and an effective silica activity enhancing amount of a hydroxyfunctional polycarboxylic acid amide of formula I Ser. No. 162,901



(I)

wherein the symbols have the following meanings:

R=aliphatic hydrocarbon groups having 2 to 60 carbon atoms or aromatic hydrocarbon groups having 6 to 20 carbon atoms or aliphatic or aliphatic/aromatic hydrocarbon radicals having 6 to 150 carbon atoms which are interrupted by 2, 4, 6 or 8 carboxamide groups, or aliphatic hydrocarbon radicals having 4 to 150 carbon atoms, which are interrupted by 2 to 75 —O— (oxygen) groups;

R′=H or C_1 to C_4 alkyl or $-Z'-(Q)_y-(OH)_x$;

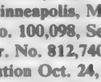
x=1 to 3;

y=0 or 1;

Z=an alkylene radical having 2 to 6 carbon atoms;

Z′=an alkylene radical which is identical to or different from Z, having 2 to 6 carbon atoms;

Q=an aliphatic hydrocarbon radical having 2 to 200 carbon atoms, which is linked via —O— or



to Z or Z′ and is interrupted by zero to 99 oxygen atoms and/or carboxylic acid ester groups, and

n=2 to 3.

4,857,112

METHOD AND APPARATUS FOR CLEANING A PIPE SYSTEM PROVIDED FOR THE OPERATION OF BATHS

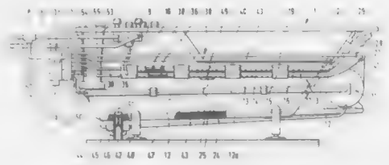
Thomas K. Fränninge, Luks Road Old Windsor, Berkshire SL4 2QX, Great Britain

Filed Jul. 6, 1987, Ser. No. 70,222

Claims priority, application Sweden, Jul. 7, 1986, 8603014; Oct. 3, 1986, 8604204; Feb. 23, 1987, 8700739

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—22.12 **21 Claims**



1. A method of cleaning a pipe system having a plurality of conduits in baths comprising flushing said pipe system by passing flushing water from a supply system to the pipe system in a plurality of stages such that flushing water form the supply system is passed in each flushing stage to one conduit or one group of conduits while the supply of flushing water to the other conduits in the pipe system is closed so that the pressure of the flushing water in the conduit or group of conduits being flushed in each flushing stage is higher than the pressure of the flushing water would be if all conduits of the pipe system were flushed simultaneously.

4,857,113

VEHICLE CLEANSING METHOD

Robert J. Hodge, Colorado Springs, Colo., assignor to Grace-Lee Products, Inc., Minneapolis, Minn.

Continuation of Ser. No. 100,098, Sep. 23, 1987, abandoned, which is a division of Ser. No. 812,740, Dec. 23, 1985, Pat. No. 4,716,916. This application Oct. 24, 1988, Ser. No. 261,521

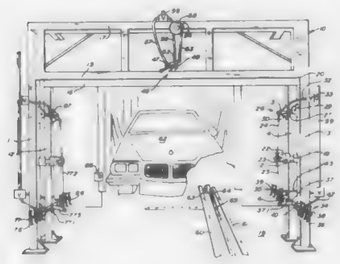
Int. Cl.[4] B08B *1/02*

U.S. Cl. 134—32 **12 Claims**

1. In a method for cleansing exterior surfaces of vehicles wherein relative linear motion is effected between the vehicle undergoing treatment and nozzle assemblies, with the relative linear motion being parallel to the length of the vehicle, the improvement comprising:

(a) applying a liquid detergent solution upon exterior surfaces of the vehicle, and

(b) impinging upon an end and side surface of the vehicle during said linear motion a compact zig-zap pattern of a plurality of bullet-like solid streams of cleansing fluid from zero degree solid stream nozzles fixedly arranged in a horizontal array extending parallel to the length of the vehicle and while said horizontal array is undergoing oscillation in a direction transverse to the length direction thereof, with the zero degree nozzles of the array each being at an angular orientation with respect to the length direction of said array such that the solid streams emitted therefrom are from about 40° up to about 80° from said length direction and thus impact upon the end and side vehicular surfaces at an angle never in excess of about 80°



with respect to the overall planar extent of such surfaces, whereby perpendicular solid stream impingement upon such surfaces is essentially avoided and debris upon the surfaces is pushed off at an angle.

4,857,114

FLOOR POLISH REMOVER

Ernest Brumbaugh, and Roy M. Taylor, Jr., both of Rockford, Mich., assignors to Amway Corporation, Ada, Mich.

Filed Apr. 13, 1987, Ser. No. 37,473

Int. Cl.[4] C11D *3/075, 3/30*

U.S. Cl. 134—42 **10 Claims**

1. A liquid floor polish remover composition consisting of: from about 0.1 percent to about 30 percent by weight of a nonionic surfactant, said surfactant being selected from the group of nonionic surfactants which are the condensation products of an alcohol component having an average of from about 5 to about 11 carbon atoms condensed with from about 2 to about 8 moles of an alkylene oxide per mole of said alcohol; from about 0.1 percent to about 30 percent by weight of an alkalinity builder; up to about 30 percent by weight of a hydrotrope; from about 0.1 to about 30 percent by weight of an amine; and from about 1 percent to about 99 percent substantially demineralized water, wherein said alkalinity builder is selected from the group consisting of alkali metal phosphates, alkali metal silicates, alkali metal carbonates, alkali metal borates, alkali metal bicarbonates, and combinations thereof.

4,857,115

PHOTOVOLTAIC DEVICE

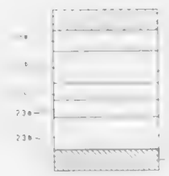
Masayuki Iwamoto, Itami; Kouji Minami, Higashiosaka, and Kaneo Watanabe, Yawata, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed May 4, 1988, Ser. No. 190,137

Claims priority, application Japan, May 15, 1987, 62-73152[U]

Int. Cl.[4] H01L *31/06*

U.S. Cl. 136—249 **11 Claims**



4. A photovoltaic device comprising a front electrode, a first power generating element whose main constituent is amorphous silicon, a second power generating element, and a back electrode arranged in this order, said first power generating element having a photo-active layer of which comprises hydrogenated amorphous silicon wherein the ratio of the number of silicon atoms bonded to hydrogen atoms to the total number of silicon atoms expressed as a percentage is at most 1%, and the density of dangling bonds of the silicon atoms is at most 1×10^{17} cm^{-3}, said photo-active layer having a conductivity type that is substantially I-type.

4,857,116

PROCESS FOR APPLYING COATINGS OF ZIRCONIUM AND/OR TITANIUM AND A LESS NOBLE METAL TO METAL SUBSTRATES AND FOR CONVERTING THE ZIRCONIUM AND/OR TITANIUM TO A NITRIDE, CARBIDE, BORIDE, OR SILICIDE

Ibrahim M. Allam, Dhahran, Saudi Arabia, and David J. Rowcliffe, Stockholm, Sweden, assignors to S R I International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 325,504, Nov. 27, 1981, Pat. No. 4,483,720, Continuation-in-part of Ser. No. 662,253, Oct. 17, 1984, abandoned, Continuation-in-part of Ser. No. 662,252, Oct. 17, 1984, abandoned. This application Oct. 21, 1987, Ser. No. 111,202

Int. Cl.[4] C23C *11/00, 11/10*

U.S. Cl. 148—279 **23 Claims**



1. A method of coating a metal substrate with a protective coating of a compound of zirconium and/or titanium and the element X, X being nitrogen, carbon, boron or silicon, said method comprising:

(a) providing a metal substrate to be coated,

(b) providing a coating alloy or mixture containing a metal M_1 which is at least one of the metals zirconium and titanium, such alloy or mixture also containing a metal M_2 which forms no compound with X or which forms a compound with X which is less thermodynamically stable than a compound of M_1 and X,

(c) M_1 constituting a major portion by weight of the alloy or mixture

(d) applying such alloy or mixture to a surface of the substrate by dip coating or by application of a slurry of the alloy or mixture in a volatile liquid,

(e) then, after vaporization of volatile liquid if present, exposing the resulting coating to an elevated temperature in an atmosphere containing element X or a dissociable compound of X such that M_1 forms, and M_2 does not form a compound with X,

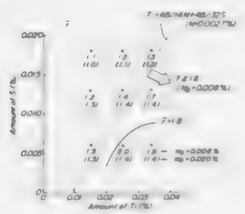
(f) the quantity of M_2 in the alloy or mixture being sufficient to bond the compound of X and M_1 firmly to the substrate.

4,857,117

METHOD OF MANUFACTURING A COLD-ROLLED STEEL SHEET HAVING A GOOD DEEP DRAWABILITY

Kei Sakata; Koichi Hashiguchi, and Shinobu Okano, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation of Ser. No. 866,220, May 22, 1986, abandoned.
This application Feb. 25, 1988, Ser. No. 161,438
Claims priority, application Japan, May 31, 1985, 60-116661
Int. Cl.[4] C21D *8/04*
U.S. Cl. 148—12 C 2 Claims



1. A method of manufacturing a cold rolled steel sheet having a good deep drawability, which comprises beginning a cooling within 2 seconds after the completion of finisher rolling of a hot rolled sheet of steel having a composition of not more than 0.0035% of C, not more than 1.0% of Si, not more than 1.0% of Mn, 0.005–0.10% of Al, not more than 0.15% of P, not more than 0.0035% of N, not more than 0.015% of S, $(48/14N(\%)+48/32S(\%))\sim(3\cdot48/12C(\%)+48/32S(\%))$ of Ti and $(0.2\cdot93/12C(\%))\sim(93/12C(\%))$ of Nb;

cooling the final rolled steel sheet at an average cooling rate of not less than 10° C./sec until it arrives at a coiling step;

coiling the cooled steel sheet at a temperature of not more than 710° C.;

subjecting the coiled steel sheet to a cold rolling at a reduction of not less than 50%; and

subjecting the cold rolled steel sheet to a continuous annealing in a heatcycle inclusive of heating from 400° C. to 600° C. at a heating rate of not less than 5° C./sec and soaking at a temperature range of 700° C.-Ac_3 point for not less than one second.

4,857,118

METHOD OF MANUFACTURING A PERMANENT MAGNET

Reinoud Van Mens, Eindhoven, and Gijsbertus W. Turk, Mijdrecht, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 9, 1987, Ser. No. 107,625
Claims priority, application Netherlands, Oct. 13, 1986, 8602566
Int. Cl.[4] H01F *1/09*
U.S. Cl. 148—103 5 Claims

1. A method of manufacturing a permanent magnet from a material comprising a finely crystalline rare earth metal transition element boride of the formula $RE_2(Fe,Co)_{14}B$ wherein RE is at least one rare earth metal, comprising grinding said crystalline material, orienting the resultant ground material in a magnetic field, compressing the resulting magnetically oriented ground material into a densified body and then sintering said densified body in such a manner as to form a first liquid phase while sintering to form thereby a mechanically stable densified body, wherein during the grinding step a material of a different composition is added to stoichiometric $RE_2(Fe,Co)_{14}B$ which material is a hydride of a rare earth metal or of an alloy of a rare earth metal and which, during the sintering step, forms a second liquid phase on the surface of the grains of the $RE_2(Fe,Co)_{14}B$.

4,857,119

CASE-HARDENED PLATE ARMOR AND METHOD OF MAKING

David A. Karst, Kincheloe; Felix R. Pawlowski, Warren; William A. Potrafke, Rochester, and Harold E. Schuneman, North Street, all of Mich., assignors to General Dynamics Lands Systems, Inc., Sterling Heights, Mich.

Filed Mar. 1, 1988, Ser. No. 162,558
Int. Cl.[4] C21D *9/42*
U.S. Cl. 148—318 12 Claims



1. Case-hardened plate armor comprising: a steel plate having holes formed therethrough prior to a subsequent heat treatment that provides carbonitride surfaces and a tough, ductile core; said carbonitride surfaces having a hardness after the heat treatment of at least 67 on the Rockwell C scale to prevent surface penetration; and the steel plate being selected from the group consisting of:

(a) rolled homogenous armor and having a core hardness after the heat treatment in the range of 45 to 50 on the Rockwell C scale to prevent brittle fracture of the steel plate, and

(b) high-hard armor and having a core hardness after the heat treatment in the range of 52 to 54 on the Rockwell C scale to prevent brittle fracture of the steel plate.

4,857,120

HEAT-RESISTING STEEL TURBINE PART

Osamu Watanabe; mituo Kawai, both of Yokohama, and Kanzi Kawaguchi, Shizuoka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 742,302, Jun. 7, 1985, abandoned. This application Jan. 6, 1987, Ser. No. 4,273
Claims priority, application Japan, Jun. 21, 1984, 59-126481
Int. Cl.[4] C22C *38/44*
U.S. Cl. 148—325 5 Claims

1. A turbine part which is formed of a heat-resisting chromium steel,

said steel essentially consisting of:

a carbon content of 0.13 percent to 0.25 percent by weight;

a silicon content of over 0.2 percent to 1.0 percent by weight;

a manganese content of 1.0 percent or less by weight;

a nickel content of 0.3 percent to 2.0 percent by weight;

a chromium content of 8.0 percent to 11.0 percent by weight;

a molybdenum content of 0.5 percent to 2.0 percent by weight;

a vanadium content of 0.1 percent to 0.3 percent by weight;

niobium and/or tantalum contents of over 0.03 percent to 0.3 percent by weight in total;

a nitrogen content of 0.01 percent to 0.2 percent by weight;

a tungsten content of over 1.1 percent to 2.0 percent by weight; and

an iron content basically constituting the remainder,

the chromium equivalent given by the following expression being from 9 to 10: chromium equivalent $=-40\times[\%C]-30\times[\%N]-2\times[\%Mn]-4\times[\%Ni]+[\%Cr]+4\times[\%Mo]+6\times[\%Si]+11\times[\%V]+5\times\%Nb]+2.5\times[\%Ta]+1.5\times[\%W]$;

said steel substantially having a tempered martensitic structure; and

said steel having an elongation of not less than 18% and a reduction in area of not less than 60% at room temperature and a creep rupture time of not less than 850 hours at 600° C. with an applied stress of 30 kg/mm^2.

4,857,121

METHOD FOR PRINTING AND APPLYING LABELS

Richard L. Markley, Vandalia, and Therell D. Hoblit, Covington, both of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Mar. 31, 1988, Ser. No. 175,717
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—64 8 Claims



1. A method for printing and applying at least two different labels each including human readable information onto a substantially rectangular package having a top surface, a bottom surface and four side edges such that said human readable information is oriented to be read from one side edge of at least two selected side edges of said package, said method comprising the steps of:

printing a first label including human readable information:

selecting a desired physical angular orientation for applying said first label such that said first label can be read from one side edge of said package in accordance with how said package is to be displayed for sale;

adjusting an angular orientation control means on a first label applier such that said first label applier will apply said first label to said package in said selected desired physical angular orientation;

operating said first label applier to apply said first label to a defined portion of said package in said selected physical angular orientation;

printing a second label including human readable information which is printed onto said second label in an orientation to be read from said one side edge of said package when said second label is applied onto said package in a set physical angular orientation; and

operating a second label applier to apply said second label onto said package in said set physical angular orientation.

4,857,122

PROCESS FOR INJECTION MOLDING TIRE TREADS

Norbert Majerus, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 37,509, Apr. 13, 1987, Pat. No. 4,795,329. This application Sep. 26, 1988, Ser. No. 248,607
Int. Cl.[4] B29C *45/00, 35/02*
U.S. Cl. 156—125 13 Claims

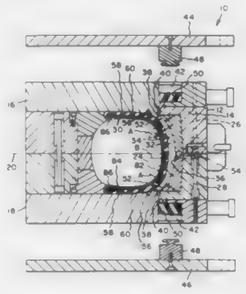
1. A method of injecting a tread on an inflated flexible annular body positioned in a mold with a radially outer surface of said flexible annular body spaced from a tread molding surface of said mold to form a tire tread cavity comprising:

(a) inflating said flexible annular body to a first pressure;

(b) injecting a fluid molding material into said cavity at circumferentially spaced positions around said mold;

(c) regulating the flow of said fluid molding material;

(d) inflating said flexible annular body to a second pressure substantially higher than said first pressure after said molding material is injected;



(e) heating said fluid molding material in said tire tread cavity to vulcanize said material;

(f) reducing said pressure in said flexible annular body;

(g) opening said mold; and

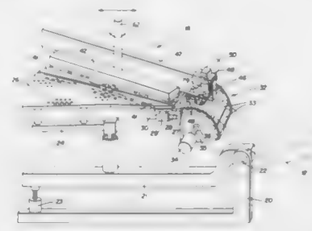
(h) removing said flexible annular body and said tread from said mold.

4,857,123

METHOD FOR PLY APPLICATION

Donald O. Still, Akron; Hubert T. Hovance, Ravenna, and George J. Burley, Clinton, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 493,108, May 9, 1983. This application Aug. 12, 1985, Ser. No. 764,804
Int. Cl.[4] B29D *30/30*
U.S. Cl. 156—133 12 Claims



1. A method of applying an elongated piece of elastomeric material, having substantially parallel cords disposed therein at a bias angle cut from a longer strip of such material, to a cylindrical drum comprising the steps of:

(a) cutting through the strip between adjacent parallel cords to form a first edge extending at an acute angle to a longitudinal axis of said strip;

(b) sensing the position of cutting means during cutting for determining the angle of said first edge with respect to a predetermined theoretical line on said strip;

(c) applying the first edge of the strip to the cylindrical drum;

(d) cutting through the strip between adjacent parallel cords to form a second edge extending at a second acute angle to the longitudinal axis of said strip;

(e) sensing the position of cutting means during cutting for determining the angle of said second edge with respect to said predetermined theoretical line; and

(f) stretching the strip to adjust the angle of one of said edges to coincide with the angle of the other of said edges with means for changing the angular orientation of one of said edges prior to its application to said cylindrical drum responsive to an angle difference between the first and second edges to form a splice wherein the angle of the second edge is substantially the same as the angle of the first edge.

4. A method of cutting an elongated strip of elastomeric material from a length of such elastomeric material having cords therein biased at an angle to a longitudinal axis of said elastomeric material for applying said strip to a tire building drum, including the steps of:

(a) cutting through the strip between adjacent cords to form a first edge;

(b) sensing the position of cutting means during cutting for determining the angle of said first edge with respect to a predetermined theoretical line;

(c) applying the first edge of the strip to the tire building drum;

(d) cutting through the strip between other adjacent cords to form a second edge and to form the elongated strip of elastomeric material, said strip being shorter in length than the circumference of the drum;

(e) sensing the position of cutting means during cutting for determining the angle of said second edge with respect to said predetermined theoretical line;

(f) stretching the strip to adjust one of said angles of one of said edges to coincide with the angle of the other of said edges with means for changing the angular orientation of one of said edges prior to its application to said cylindrical drum responsive to an angle difference between the first and second edges to form a splice wherein the angle of the second edge is substantially the same as the angle of the first edge.

4,857,124

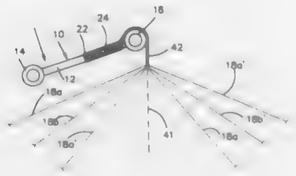
FIBER-REINFORCED PLASTIC STRUT CONNECTING LINK

James P. Shobert, South Bend, and Elson B. Fish, Lakeville, both of Ind., assignors to Plas/Steel Products, Inc., Walkerton, Ind.

Filed Dec. 14, 1987, Ser. No. 132,774

Int. Cl.[4] D04C *1/00*

U.S. Cl. 156—149 **23 Claims**



1. A method of fabricating a fiber-reinforced plastic article having first and second intersecting cylindrical portions which have angularly related longitudinal axes, comprising the steps of producing a braid of woven continuous filaments, applying said braid to said first cylir drical portion as a first cylindrical sleeve which conforms to and encases the outside surface of said first cylindrical portion, passing said second cylindrical portion through the filaments forming said braid, continuing to form said braid of woven continuous filaments as a substantially flat double-ply braided ribbon, and wrapping said ribbon about the outer surface of said second intersecting cylindrical portion.

4,857,125

METHOD FOR REINFORCING CONICAL SHAPED OBJECT

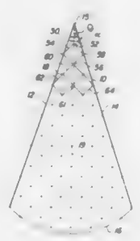
Richard M. Fenton, Hatboro, Pa., assignor to General Electric Company, Philadelphia, Pa.

Division of Ser. No. 944,173, Dec. 22, 1986, Pat. No. 4,751,135.

This application Oct. 19, 1987, Ser. No. 110,196

Int. Cl.[4] B32B *5/12*

U.S. Cl. 156—169 **14 Claims**



1. A method for reinforcing an object having a conical surface, the surface disposed about an axis, comprising:

conformally mapping a plurality of contiguous congruent squares onto the conical surface, the conical surface defined by a conformed sector of a circle having the vertices of the plurality of squares identifiable thereon, wherein predetermined ones of the plurality of squares include a respective diagonal lying coincident with the radius of the circle that bisects the sector and, further wherein the vertex of the square closest the center of the circle and lying coincident with the radial bisector is spaced a distance equal to an integral number of diagonals of one of the squares from the center of the circle;

providing a plurality of first elements and a plurality of second elements;

disposing a respective one of the plurality of first elements at a respective vertex of the plurality of contiguous congruent squares; and

laying a respective one of the plurality of second elements between respective predetermined ones of the plurality of first elements for forming a first layer conforming to the conical surface, wherein the first and second elements form a seamless structure having an invariant fiber volume fraction along the axis and circumference of the conical surface.

4,857,126

PROCESS FOR TREATMENT OF PAPER SURFACES

Christer Söremark, and Ingemar Olsson, both of Stromsnasbruk, Sweden, assignors to Sodra Skogsagarna AB, Stromsnasbruk, Sweden

Filed Apr. 25, 1984, Ser. No. 603,617

Int. Cl.[4] B31F *1/22*; B05D *3/02, 5/12*

U.S. Cl. 156—205 **8 Claims**

1. In a process for making coated paper products and for separating wet, semi-dry or dried coated paper or non-woven fabric from machine parts of an application unit or a drying roll, drum or felt, the improvement comprising the steps of

(1) adding to a coating solution a release additive consisting essentially of:

(a) an amount of 0.5 to 6% by weight of said coating solution, of an aqueous solution consisting essentially of the reaction product of alkanolamine selected from the group consisting of monoethanolamine, diethanolamine, triethanolamine, monoisopropanolamine, diisopropanolamine, triisopropanolamine, aminoethylethanolamine, diethylethanolamine and methyldiethanolamine, and a fatty acid wherein the carbon chain contains from 11 to 18 carbon atoms;

(b) said alkanolamine and said fatty acid being present in substantially equimolar proportions to each other;

(c) an agent to maintain the pH of said coating layer or film at from 8 to 10, and being volatilizable under the conditions of operation;

(d) an amount of a viscosity reducing substance to enable intimate admixture of the release agent with the wet coating formulation and to make the addition product easier to handle in its concentrated form; and

(e) water and

(2) applying said coating solution to the paper or fabric surfaces coming into contact with said machine parts.

4,857,127

PROCESS FOR PREPARING IMPROVED ORIENTED POLYMER FILMS AND TAPES

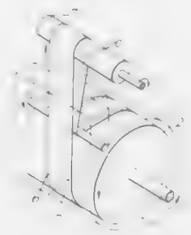
Malcolm R. Mackley, Cambridge, Great Britain, and Christopher Anton, Gwynedd, Wales, assignors to National Research Development Corporation, London, Great Britain

Filed Mar. 25, 1987, Ser. No. 29,798

Claims priority, application United Kingdom, Mar. 26, 1986, 8607819

Int. Cl.[4] B29D *7/01, 9/00*

U.S. Cl. 156—242 **14 Claims**



14. A post forming process for an oriented film or tape of polymer material, which process comprises:

(a) obtaining an oriented film or tape of polymer material, which oriented film or tape of polymer material is preparable by the steps of:

(i) shearing at least one film of a solution or gel of the polymer material between at least one set of two surfaces which are in motion relative to one another, at least one of which surfaces being endless so as to cause, by said shearing, solidification of said polymer material from said solution or gel to a degree sufficient that a coherent, oriented film or tape of said polymer material is formed on one of said surfaces, which film or tape is sufficiently coherent to be capable of being removed from the surface on which it is formed; and

(ii) continuously removing the or each oriented film or tape of polymer material from the surface on which it is formed,

and comprises oriented fibrils embedded in a matrix of unoriented material, the fibrils and matrix being compositionally uniform; and

(b) subjecting at least one layer of such an oriented film or tape to a pressure greater than ambient pressure while heating said oriented film or tape to a temperature at which partial melting thereof occurs but which does not exceed 145° C.

4,857,128

METHOD FOR MAKING REINFORCING ASSEMBLIES COMPRISING REINFORCEMENT THREADS AND A MATRIX

Jean-Louis Bocquet, Artonne; Jacques Gouttebessis, Chanat-la-Mouteyre, and Maurice Rey, La Raye-Dieu, all of France, assignors to Compagnie Generale des Etablissements Michelin-Michelin et Cie, Clermont-Ferrand Cedex, France

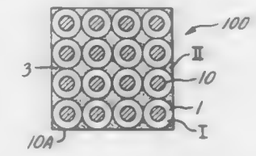
Division of Ser. No. 817,906, Jan. 10, 1986, Pat. No. 4,754,794.

This application Feb. 29, 1988, Ser. No. 161,901

Claims priority, application France, Jan. 18, 1985, 85 00875

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—244.12 **12 Claims**



1. A method of obtaining an assembly intended to reinforce a pneumatic tire, the assembly having reinforcement threads and a solid matrix in which these threads are arranged, the method being characterized by the following features:

(a) reinforcement threads surrounded individually by a sheathing of organic material I and furthermore surrounded individually by another sheathing of organic material II are grouped together;

(b) material II is caused to migrate into voids between the threads sheathed with material I so as to fill the voids with the material II which is then in liquid or pasty state, the threads sheathed with material I being grouped in such a manner that the sheathings of material I of two adjacent reinforcement threads are in contact with each other at the end of the migration of the material II;

(c) the materials I and II are thermoplastic materials such that the melting point of material I is higher than the melting point of material II, the temperature of material II upon the migration of the material II being greater than the melting point of the material II and less than the melting point of material I;

(d) the material II is caused to solidify, it thus constituting the solid matrix in which the threads sheathed with material I are arranged;

(e) during the migration and the solidification of the material II, the threads and their sheathings of material I remain solid; and

(f) material I adheres to the threads which it surrounds and to the matrix with which it is in contact.

4,857,129

METHOD OF BONDING THERMOPLASTIC MATERIAL USING RADIO FREQUENCY ENERGY

Richard K. Jensen, Salt Lake City, Utah, and Barbara Mandano, Flagstaff, Ariz., assignors to Plastic Welding Technologies, Inc., Indianapolis, Ind.

Filed Jul. 31, 1987, Ser. No. 80,627

Int. Cl.[4] B32B *31/20, 31/24*

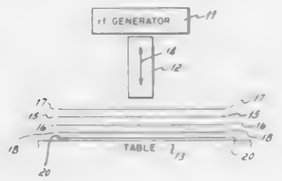
U.S. Cl. 156—273.7 **11 Claims**

1. A method of bonding a first thermoplastic material having a first and second surface to a second adjacent material having a first and second surface said materials each having a dielectric loss factor less than about 0.1 at 27 MHz; the method comprising:

positioning said first and second material so that their respective first surfaces overlie and contact each other;

positioning plasticized polyvinyl chloride sheets each having a first surface above and below the first and second materials with one each of said first surfaces of said first and

second polyvinyl chloride sheets in contact with one each of said second surfaces of said first and second thermoplastic materials, said first thermoplastic material having a minumum bonding temperature higher than a temperature at which said plasticized polyvinyl chloride flow;



applying pressure from above and below said polyvinyl chloride thereby comprising said first and second materials together and applying rf energy at about 27 MHz to the polyvinyl chloride sheets and first and second materials to effectively soften and then bond said first and second materials to each other.

4,857,130

TEMPERATURE STABLE OPTICAL BONDING METHOD AND APPARATUS OBTAINED THEREBY

Daniel L. Curtis, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 3, 1987, Ser. No. 128,372
Int. Cl.[4] B32B *31/04*
U.S. Cl. 156—292 **18 Claims**



1. In a bonding of an optical element to a support, the improvement comprising:

spaced rails on and extending from the support and supporting the optical element; and

a resilient bonding agent, having the property of shrinking upon curing, bonding the optical element to the support and securely pulling the element against said rails under tension of the agent.

4,857,131

TWO-PART ADHESIVE FOR BONDING PLASTICS AND METALS

Dennis J. Damico; Kenneth W. Mushrush, and Ruth M. Bennett, all of Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Filed Nov. 27, 1987, Ser. No. 125,852
Int. Cl.[4] C08F *279/02;* **C08L** *63/00*
U.S. Cl. 156—331.4 **12 Claims**

1. A two-part pack for providing on mixing of the two parts a heat stable adhesive composition curable at ambient temperature, said two part pack comprising:

Part A comprising:

(1) about 2 to 50%, based on the total weight of Part A of a polymeric material selected from the group consisting of

(a) at least one unsaturated urethane product of at least one isocyanate-functional prepolymer and at least one hydroxy-functional monomer having at least one unit of polymerizable olefinic unsaturation, such reaction product being characterized by the presence of at least two units of olefinic unsaturation and the substantial absence of free isocyanate groups;

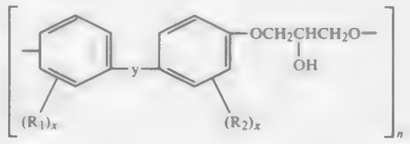
(b) at least one butadiene-based elastomeric polymeric material selected from the group consisting of

(i) homopolymer of butadiene;

(ii) copolymer of butadiene and at least one monomer copolymerizable therewith selected from the group consisting of styrene, acrylontrile, methacrylontrile and mixtures thereof;

(iii) modified elastomeric polymeric material selected from the group consisting of butadiene homopolymer and copolymer as previously defined, such homopolymer and copolymer having been modified by copolymerization therein by trace amounts up to 5 percent by weight, based on weight of modified elastomeric material, of at least one functional monomer;

(c) at least one phenoxy resin comprised of recurring units represented by the formula



wherein y is selected from the group consisting of alkylene, oxygen, thio, sulfonyl and carboxyl; Rhd 1 and R_2 are selected from the group consisting of hydrogen, halogen, alkyl, alkoxy, cycloalkyl, alkylenecycloalkyl, aryl; x is zero or an integer 1–4; n is 10 to 250; and

(d) at least one polymer-in-monomer syrup consisting essentially of

(i) from 2 to 90 percent by weight of at least one polymer derived from at least one olefinically unsaturated monomer;

(ii) from zero to 30 percent by weight of at least one polymer containing the group $(CH_2—C(Cl)=CHCH_2)n$, wherein n is an integer;

wherein (d) (i) is present as a partial polymerization product of said olefinically unsaturated monomer or of said olefinically unsaturated monomer in the presence of (d) (ii); the mixture of said olefinically unsaturated monomer and (d) (i) or (d) (ii) and (d) (iii) being a syrup of polymer dissolved or dispersed in unpolymerized monomer, in which syrup the amount of (d) (i) derived from said olefinically unsaturated monomer is in the range from 2 to 90 percent, based on the total weight of (d) (i) and (d) (ii);

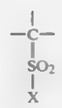
(e) at least one polymeric material selected from the group consisting of polyvinyl alkyl ether, styrene-acrylonitrile resin, unsaturated polyester resin and mixtures thereof, the alkyl moiety of such ether containing from 1 to 8 carbon atoms;

(f) at least one homopolymer or copolymer of at least one olefinically unsaturated monomer selected from the group consisting of styrene and alkyl or hydroxyalkyl esters of acrylic and methacrylic acid, said ester having 1 to 18 carbon atoms in the alkyl moiety and

(g) mixtures thereof;

(2) about 20 to 80%, based on the total weight of Part A, of an olefin monomer;

(3) about 0.1 to 4%, based on the total weight of Part A, of at least one compound containing at least one sulfonyl halide group having the structure



wherein X is selected from the group consisting of chlorine, bromine and iodine;

(4) about 0.1 to 4%, based on the total weight of Part A, of at least one reducible organic or inorganic compound containing at least one transition metal, said metal having its valence elections in a "d" subshell, said metal selected from the elements of classes Ib, IIb, IIIb, IVb, Vb, VIb, VIIb, and VIII on the periodic chart of the element; and

Part B comprising:

(1) about 2 to 50%, based on the total weight of Part B, of at least one phenoxy resin;

(2) about 20 to 80%, based on the total weight of Part B, of an olefin monomer; and

(3) about 0.2 to 8%, based on the total weight of Part B, of a metallic powder selected from the group consisting of zinc, copper and cadmium metal powders; the proportions by weight of Part A to Part B being about 3:1 to 1:3.

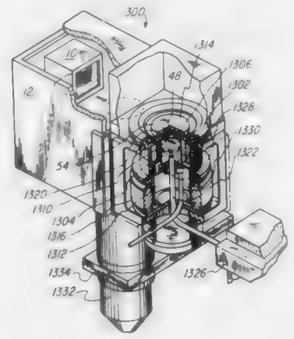
12. A method of adhering two metal or plastic surfaces one to the other comprising mixing together Part A and Part B of claim 1 in proportions by weight of Part A to Part B of about 3:1 to 1:3, applying the resulting adhesive mixture to at least one of said surfaces, engaging the said two surfaces with said adhesive mixture therebetween, maintaining the metal surfaces and interposed adhesive composition in engagement until the adhesive material has cured sufficiently to bond said surfaces.

4,857,132

PROCESSING APPARATUS FOR WAFERS

Wayne G. Fisher, Allen, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 74,418, Jul. 16, 1987, abandoned. This application May 27, 1988, Ser. No. 203,582
Int. Cl.[4] B44C *1/22;* **B05D** *3/06;* **C03C** *15/00;* **H01L** *21/306*
U.S. Cl. 156—345 **20 Claims**



1. An apparatus for processing wafers comprising:

(a) a vacuum processing chamber;

(b) at least one process gas source;

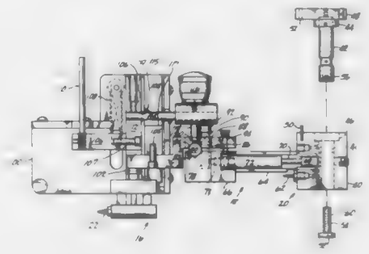
(c) at least one internally ribbed tube capable of reducing the pressure exerted on a particle which is initially at rest on the wall of said tube and connected between said gas source and said process chamber.

4,857,133

METHOD AND APPARATUS FOR BONDING WITH CONSISTENT UNIFORM BOND THICKNESS

Gerald G. Mullen, Torrance, Calif., assignor to Hybond, Inc., Escondido, Calif.

Filed May 20, 1988, Ser. No. 196,321
Int. Cl.[4] B23K *1/02*
U.S. Cl. 156—378 **2 Claims**



1. In bonding two objects together, an apparatus comprising:

a holding fixture for retaining the first object;

a clamp for retaining the second object, the clamp comprising a clamp block and an object holder slidably mounted to the clamp block and the clamp being movable from a position in which the two objects are in physical contact, to a position in which the two objects are sufficiently spaced apart to allow a bonding substance to be placed on at least one of the two objects;

an arm for supporting the clamp;

a support for supporting the arm, the arm being pivotally mounted to the support;

means for recording the position of the holding fixture and the clamp when the two objects are in physical contact. the means for recording comprising a brake for fixing the position of the object holder with respect to the clamp block;

micrometer means for moving the clamp with respect to the holding fixture so that the distance between the two objects can be adjusted; and

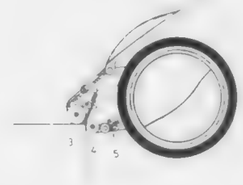
means for returning the holding fixture and the clamp to the recorded position, the means being subject to the adjustments of the micrometer means.

4,857,134

STRUCTURE OF CARTON SEALING STICKER AND CUTTER

Shuh-Chin Lin, No. 5, 35th Lane, 4th Alley, An-Lo Rd., Chung-Ho City, Tapei Hsien, Taiwan

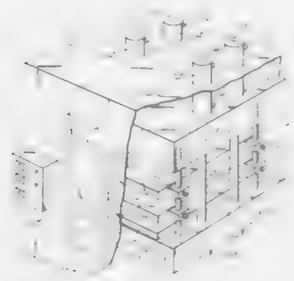
Filed Dec. 3, 1987, Ser. No. 129,318
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—385 **4 Claims**



1. A manual carton taping device comprising:

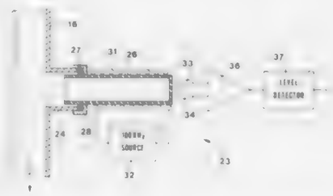
a body having two side boards, a top board and a rear part, the first side board being short and the second side board being long with respect to the first side board, a front part of the top board having an inner rim;
a hollow, cylindrical form tape sleeve ring, said ring being joined to a rear part of the right side board, a semi-circular hole being provided on an upper half part of the right side board covered by the tape sleeve ring;
a cylindrically shaped main roller having an outer diameter;
a cylindrically shaped auxiliary roller pivoted behind the main roller, having an outer diameter smaller than the diameter of the main roller;
a printing device comprising a word roller device and a color printing roller device, pivoted behind the auxiliary roller;
a cut-off device installed in a slide slot under a lower rim of the top board, between the main roller and the auxiliary roller and joined to the inner rim of the top board;
wherein a front part of said body and said first side board both pivot about said main roller, said auxiliary roller and said word printing device and catch and mesh with the blade of the cut-off device, whereby the delivery and use of the tape drives the word printing device automatically so as to print words and figures which are set on a surface of the word roller on a back side of the taper, the tape being pasted immediately on the carton as directed by the user of the device and wherein the auxiliary roller is pivoted at a position between the main roller and the word printing device to aid the main roller in turning 90° to continually paste printed tape on contiguous sides of the carton.

4,857,135
COMPOSITE BOARD PRESS
John B. Copp, 1208 Luanne, Fullerton, Calif. 92631
Continuation of Ser. No. 832,818, Feb. 24, 1986, abandoned. This application Jun. 29, 1988, Ser. No. 214,897
Int. Cl.[4] B30B *1/32, 7/02, 15/04*
U.S. Cl. 156—580 **15 Claims**



1. A press comprising:
a pair of outer platens;
a plurality of pistons and piston rods disposed about the periphery of said outer platens for pulling one of said outer platens towards the other of said outer platens, said pistons being connected to said piston rods;
a plurality of cylinders, said pistons and said piston rods being displaceable within said cylinders when hydraulic fluid is introduced into said cylinders;
a plurality of inner platens located between said outer platens;
a plurality of inner platen guides for providing a substantial amount of inner platen guidance yet allowing said inner platens to be substantially non-parallel during a pressing operation whereby a composite of non-uniform thickness being pressed is subject to a substantially even amount of pressure across its area regardless of differences in height; and
a plurality of vertical hanger rods for horizontally supporting said inner platens between said outer platens, at least one of said hanger rods having means supporting each of said inner platens in spaced relation when said outer platens are fully displaced from one another said hanger rods passing through said inner platens guides.

4,857,136
REACTOR MONITORING SYSTEM AND METHOD
John Zajac, 1137 Angmar Ct., San Jose, Calif. 95121
Filed Jun. 23, 1988, Ser. No. 210,650
Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **B05D** *3/06;* **C23C** *14/00*
U.S. Cl. 156—626 **16 Claims**



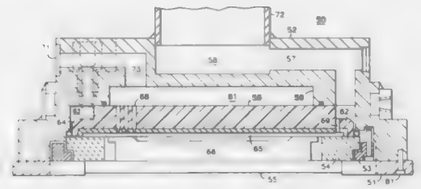
11. In a method of detecting a change in the operating conditions in a semiconductor processing reactor: monitoring the relative amounts of two substances which are present in the reactor, and providing an output signal when the relative amounts change in a predetermined manner.

4,857,137
PROCESS FOR SURFACE TREATMENT
Shinichi Tachi, Sayama; Sadayuki Okudaira, Ome; Kazunori Tsujimoto, and Kiichiro Mukai, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 2, 1987, Ser. No. 9,784
Claims priority, application Japan, Jan. 31, 1986, 61-18017; May 6, 1986, 61-102028; Jun. 11, 1986, 61-133651
Int. Cl.[4] H01L *21/306*
U.S. Cl. 156—640 **17 Claims**



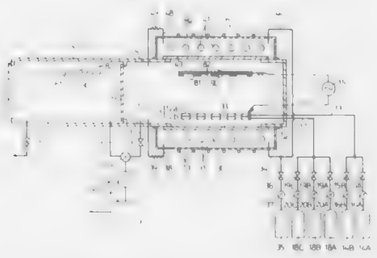
1. A process for surface treatment, which comprises striking the surface of a solid target with an ion beam comprising at least one element species to thereby forward scattering particles and produce a forward scattered particle beam comprising said at least one element species, and then directing the forward scattered particle beam toward the surface of a workpiece, striking the workpiece surface to etch or modify the surface of the workpiece or deposit a film on the surface of the workpiece.

4,857,138
SILICON TRENCH ETCH
David J. Drage, Sebastopol, Calif., and Toufic Safi, Boston, Mass., assignors to Tegal Corporation, Petaluma, Calif.
Filed Apr. 3, 1985, Ser. No. 719,783
Int. Cl.[4] H01L *21/306*
U.S. Cl. 156—643 **6 Claims**



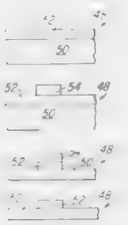
1. A plasma trench etch process comprising the steps of:
enclosing a silicon substrate in a plasma reactor having an electrode gap of 3–10 mm;
providing a gas mixture, comprising CCl_3F and an inert gas wherein the amount of CCl_3F is less than the amount of inert gas, at a pressure of from 1.0 to 5.0 torr;
applying an RF signal, at a power in excess of 400 watts, to said reactor for forming a plasma within said reactor; and
continuing said process for a period sufficient to etch said silicon substrate.

4,857,139
METHOD AND APPARATUS FOR FORMING A LAYER
Mamoru Tashiro; Kazuo Urata, and Shunpei Yamazaki, all of Tokyo, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 801,769, Nov. 16, 1985, abandoned. This application Jan. 4, 1988, Ser. No. 140,903
Claims priority, application Japan, Nov. 26, 1984, 59-250339; Nov. 26, 1984, 59-250341
Int. Cl.[4] B44C *1/22;* **B05D** *3/06;* **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **28 Claims**



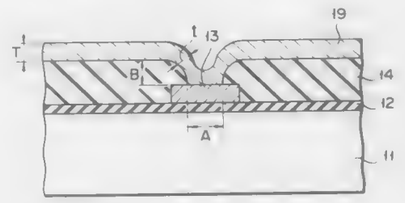
1. A layer forming method comprising the steps of:
forming a layer on a substrate by a photo CVD process in a reaction chamber which is held to 2.5 to 3 Torr; and
cleaning the reaction chamber by plasma etching before or after the layer forming step.

4,857,140
METHOD FOR ETCHING SILICON NITRIDE
Lee M. Loewenstein, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation-in-part of Ser. No. 73,937, Jul. 16, 1987, abandoned, and a continuation-in-part of Ser. No. 75,017, Jul. 16, 1987. This application Mar. 31, 1988, Ser. No. 175,474
Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **55 Claims**



14. A process for etch of a Silicon Nitride film comprising the steps of:
(a) disposing said film in a low pressure process chamber;
(b) generating at least free radicals from a gas comprised of a gas taken from the group of CF_4, F_2, SF_6, CFH_3, and C_2F_6 and an inert carrier taken from the group of helium, argon, or nitrogen; and
(c) introducing said gas and a source of hydrogen taken from the group of CH_4, H_2, NH_3, hydrocarbon or any molecule with an abstractable hydrogen atom to said film.

4,857,141
METHOD OF FORMING HOLES IN SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE
Masahiro Abe, Yokohama, and Yasukazu Mase, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 13, 1988, Ser. No. 181,108
Claims priority, application Japan, Apr. 16, 1987, 62-91876
Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—644 **12 Claims**



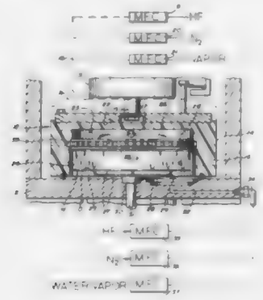
1. A hole forming method for semiconductor integrated circuit device comprising the steps of:
forming an insulation layer on a conductive layer;
forming a recess in the surface area of said insulation layer on said conductive layer by an isotropic etching process;
forming a hole in said recess to reach said conductive layer by a first anisotropic etching process, said hole being narrow in width than said recess;
effecting a second anisotropic etching process to taper said recess and said hole; and
forming a metal wiring layer on part of said insulation layer and in said hole.

4,857,142

METHOD AND APPARATUS FOR CONTROLLING SIMULTANEOUS ETCHING OF FRONT AND BACK SIDES OF WAFE[illegible]

Daniel J. Syverson, Robbinsdale, Minn., assignor to FSI International, Inc., Chaska, Minn.

Filed Sep. 22, 1988, Ser. No. 247,712
Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—646 **18 Claims**



1. A method of controlling etching of the oxides on the front and back sides of a spinning wafer, comprising

treating portions of one side of the wafer with a flow of inert gas as to minimize likelihood of any etching of the oxide on said one side,

and simultaneously treating portions of the other side of the wafer with an etchant gas to etch away portions of the oxide on said other side.

4,857,143

WET ETCHING OF CURED POLYIMIDE

John J. Glenning, Vestal; Caryn J. Johnson, Binghamton; Walter P. Pawlowski, and Kenneth G. Sakorafos, both of Endicott, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 16, 1988, Ser. No. 285,261
Int. Cl.[4] B44C *1/22;* **B29C** *37/00;* **C03C** *15/00, 25/06*
U.S. Cl. 156—668 **16 Claims**

1. A process for etching a fully cured or substantially fully cured polyimide layer which comprises contacting said polyimide layer with an aqueous solution at least about 3 molar of a metal hydroxide and at least about 0.5 molar of a metallic compound including an anion selected from the group consisting of carbonates, sulfates and phosphates.

4,857,144

APPARATUS FOR IMPROVED TOP FEED DISTRIBUTION FOR FALLING FILM EVAPORATOR

Robert E. Casparian, Boonton, N.J., assignor to Hanover Research Corporation, East Hanover, N.J.

Filed Sep. 2, 1988, Ser. No. 239,657
Int. Cl.[4] B01D *1/06, 1/22*
U.S. Cl. 159—13.2 **20 Claims**

13. An evaporator comprising:

an elongated tubular chamber having one end and another end, and arranged for vertical mounting with one of said ends adapted to serve as a top end;

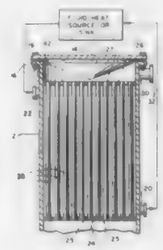
a pair of upper and lower tube sheets affixed transversely within said chamber near its respective ends, each of said tube sheets being characterized by a plurality of openings;

a plurality of vertical heat exchange tubes mounted in said openings between said upper and lower tube sheets;

means for inputting/outputting heated fluid into and from said chamber between said tube sheets so that that fluid will flow externally of said plurality of vertical heat exchange tubes;

a cover at the top end of said elongated tubular chamber in spaced relation to said upper tube sheet defining a top channel region therebetween;

means for inputting a fluid material to be evaporated into said top channel region, and



means for effecting even distribution and flow from said top channel region into said heat exchange tubes of said fluid material to be evaporated, that means including an inverted, imperforate cone filler mounted in said top channel region, the downwardly projected area of said cone filler being substantially the same as the area of the tube sheet directly below it including the aggregate area of openings through that sheet for heat exchange tubes.

4,857,145

PROCESS FOR MAKING A PULP FROM BAMBOO

Eduardo J. Villavicencio, San Angel, Mexico, assignor to Process Evaluation and Development Corporation, Dallas, Tex.

Filed Jul. 13, 1987, Ser. No. 72,320
The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.
Int. Cl.[4] D21C *3/26*
U.S. Cl. 162—19 **9 Claims**



1. A method for producing a bamboo pulp suitable for producing high strength products comprising:

(a) shredding bamboo stalks to produce shredded bamboo fibers;

(b) water washing the shredded bamboo fibers to at least partially remove any soluble and non-soluble contaminants therefrom and to wet the shredded fibers;

(c) depithing said wet fibers with the addition of further amounts of water to remove more soluble contaminants;

(d) flowing said wet depithed fibers to a first chmber of a continuous digester;

(e) adding steam and a black liquor solution to said first chamber;

(f) partially digesting said fibers in said first chamber at a super-atmsopehric pressure for a first period of time to impregnate said fibers with water and black liquor;

(g) removing the partially digested fibers from said first chamber and adding a chemical digestion solution thereto;

(h) rapidly reducing the pressure on said partially digested fibers by at least 0.5 kg/cm but not below atmospheric pressure and flowing said partially digested fibers to a second chamber of the continuous digester;

(i) further digesting said partially digested fibers in said second chamber for a second period of times;

(j) removing the digested fibers from said second chamber and rapidly reducing the pressure thereon to atmospheric pressure; and

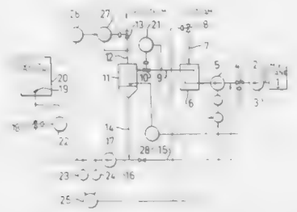
(k) washing and screening said digested fibers from said second chamber to remove any undersized and oversized pieces and any soluble components therefrom.

4,857,146

PROCESS FOR INCREASING THE SOLIDS CONTENT OF BLACK LIQUOR AT ITS RECOVERY IN A SULFATE PULPING PROCESS

Alf O. Andersson, 38 Kofallsägen, S-710 40 Frövi, Sweden

Filed Jun. 6, 1986, Ser. No. 871,553
Claims priority, application Sweden, Jun. 7, 1985, 8502833
Int. Cl.[4] D21C *11/12*
U.S. Cl. 162—31 **12 Claims**



1. A process for increasing the solids content of an aqueous black liquor recovered from a sulfate pulping process, comprising the steps of:

heating the black liquor to a temperature of at least about 200° C. and at a first pressure sufficient to maintain said black liquor in a liquefied state; and

evaporating a substantial portion of the water in said black liquor by reducing said first pressure to a second pressure of from about 1 to about 4 bars about atmospheric;

wherein said evaporation step increases the solids content of said black liquor to above about 65% by weight, thereby forming a concentrated liquor, the first pressure being reduced in the evaporating step by means of a pressure regulating valve;

measuring the viscosity of the concentrated liquor; and

adjusting the second pressure according to the measured viscosity such that the viscosity is reduced to a desired value and the solids content is maintained at above about 65% by weight.

4,857,147

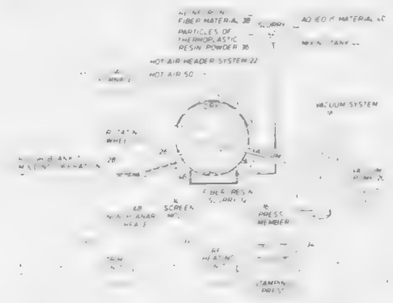
METHOD OF COMPOSITE PART FABRICATION

R. L. Danforth, Missouri City; W. P. Gergen, Houston, both of Tex., and J. A. Neate, Niles, Mich., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 18, 1988, Ser. No. 169,715
Int. Cl.[4] D21F *11/00;* **D21H** *5/18, 3/40;* **D21B** *3/00*
U.S. Cl. 162—156 **4 Claims**

1. A method for making a composite, wherein said composite is capable of being formed into a reinforced polymer article, said method comprising the steps of:

forming a dilute aqueous slurry of from about 20 to about 40% percent by weight of heat fusible polyketone polymer particles, having a specific gravity greater than one, and from about 80 to about 60% percent of a reinforcing material, the percentages being by weight;



collecting a portion of the particles and a portion of the reinforcing material on a non-planar surface moving relative to said slurry;

dewatering said collected particles and reinforcing material; and

drying said collected particles and reinforcing material.

4,857,148

STAPLE FIBER, FINISH THEREFOR AND PROCESS FOR USE OF SAME

Roland L. Hawkins, Spartanburg, S.C., assignor to Hoechst Fibers Industries, Spartanburg, S.C.

Continuation-in-part of Ser. No. 818,128, Jul. 22, 1977, abandoned, which is a division of Ser. No. 715,719, Aug. 19, 1976, Pat. No. 4,179,543. This application Aug. 17, 1979, Ser. No. 67,465
Int. Cl.[4] D21F *11/00*
U.S. Cl. 162—157.2 **5 Claims**

1. A method of preparing a stable aqueous dispersion of synthetic polymeric staple fibers comprising the steps of:

(a) placing a quantity of staple fibers in an aqueous medium;

(b) introducing into said aqueous medium a composition in an amount equivalent to at least 0.1 percent based on the weight of the fibers present in the medium, said composition being characterized as promoting dispersion of said fibers, as having a low foaming propensity and not adversely affecting bondability of said fibers in the presence of a chemical binder therefor, said composition comprising a primary emulsifier selected from the group consisting of ethoxylated castor oils, ethoxylated hydrogenated castor oils, ethoxylated coconut oil, ethoxylated sorbitol esters and mixtures of same, a lubricant for the fibers and a secondary emulsifier, said lubricant and said secondary emulsifier being compatible with said primary emulsifier, said composition being present on the fibers and exhibiting a surface tension of at least 30 dynes per centimeter in a 0.10 weight percent solution of same at about 25 degrees Centigrade; and

(c) producing agitation in said aqueous medium whereby individual fibers disperse throughout said medium without excess foaming.

4,857,149

METHOD AND PRODUCTS FOR SIZING PAPER AND SIMILAR MATERIALS

George T. Tiedeman, Seattle, and Jerome M. Gess, Bellevue, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 905,016, Sep. 8, 1986, abandoned. This application Nov. 20, 1987, Ser. No. 125,787

Int. Cl.[4] D21H *3/08*

U.S. Cl. 162—158 4 Claims

1. A method of sizing a cellulosic paper product which comprises:

first adding to a cellulosic fiber slurry an effective amount of a size anchoring and orienting agent, then adding an effective amount of an emulsified organic sizing compound, and finally adding a precipitant to break the sizing emulsion and bring the size onto the fibers, wherein

the anchoring and orienting agents are water soluble materials selected form the group consisting of polyvalent metals, polycationic polymers, and mixtures thereof used in an amount up to about 10 kg/t based on fiber, said agents making the pulp fiber surfaces receptive to receiving the sizing material;

the sizing compound molecule has both hydrophobic and hydrophilic portions, the hydrophilic portion being an alkoyl or alkenoyl hydroxamic acid and the hydrophobic portion of the molecule being a hydrocarbon group having at least 8 carbon atoms;

the size precipitating agent is a polycationic metal salt that serves to break any emulsions of the sizing compounds;

the pH of the system after addition of the sizing compound and precipitant being at least 5.5 or higher, and

the anchoring and orienting agent is selected to give a bond strength between the sizing material and pulp fibers so that size redistribution is minimized at room temperature but at least some redistribution to any unsized areas of the fibers occurs at temperatures encountered in paper machine dryer sections.

4,857,150

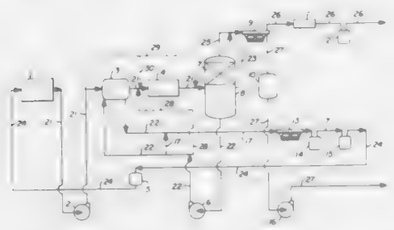
SILICONE OIL RECOVERY

Steven E. Rival, York, S.C., and William D. Prince, Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 22, 1988, Ser. No. 209,907

Int. Cl.[4] B01D *3/06, 3/10*

U.S. Cl. 203—41 14 Claims



1. A process for the recovery of silicone oil and chlorobenzenes from a mixture containing silicone oil, tri- and/or tetrachlorobenzenes, and polychlorinated biphenyls comprising:

(a) introducing the mixture into a distillation zone at a temperature and a pressure, which will cause the chlorobenzenes to flash overhead and the mixture of silicone oil and polychlorinated biphenyls to pass to the bottom of the zone; and

(b) removing the bottoms from step (a), cooling same, and passing the bottoms through at least one bed containing activated carbon.

11. A process for the recovery of silicone oil and chlorobenzenes from a mixture containing silicone oil, about 0.75 to about 20 parts by weight tri- and/or tetra-chlorobenzenes, and about 0.01 to about 0.25 part by weight polychlorinated biphenyls, the parts by weight being based on 100 parts by weight of silicone oil, comprising the following steps:

(a) introducing the mixture into a distillation zone at a temperature in the range of about 180° C. to about 230° C. and a pressure in the range of about 2 to about 50 millimeters of mercury so that the chlorobenzenes flash overhead and the silicone oil and polychlorinated biphenyls pass to the bottom of the zone; and

(b) removing the bottoms from step (a), cooling same, and passing the bottoms through at least two beds of activated carbon connected in series, said activated carbon being an adsorbent for the polychlorinated biphenyls.

4,857,151

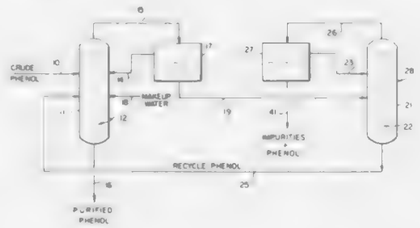
PHENOL PURIFICATION

George D. Suciu, Ridgewood; Ali M. Khonsari, Bloomfield, and Jamin Chen, Montville, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Jun. 28, 1982, Ser. No. 392,569

Int. Cl.[4] B01D *3/36;* C07C *37/78*

U.S. Cl. 203—82 5 Claims



1. A process for purifying phenol, comprising:

distilling a crude phenol containing impurities comprising methylbenzofuran in the presence of water to recover a light fraction comprising a mixture of phenol and water in which impurities are concentrated, and a heavy fraction comprising phenol having a reduced quantity of impurities;

condensing the light fraction to produce an aqueous phase essentially free of impurities, and an organic phase in which the impurities are concentrated;

separating the aqueous and organic phase;

recycling at least a portin of the separated aqueous phase to said distilling;

further distilling the separated organic phase in the presence of water to recover another light fraction comprising a mixture of phenol and water in which impurities are concentrated and another heavy fraction comprising phenol;

condensing another light fraction to produce another aqueous phase essentially free of impurities and another organic phase in which impurities are concentrated;

separating another aqueous phase from another organic phase;

recycling at least a portion of said another aqueous phase to at least one of said distilling and said further distilling; and

recycling at least a portion of said another heavy fraction to said distilling.

4,857,152

PEROXIDE ELECTRODES

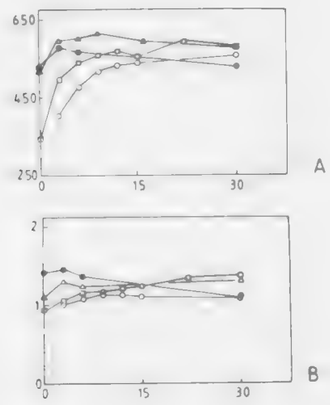
Fraser A. Armstrong, Ramsden, and Anthony M. Lannon, Manchester, both of Great Britain, assignors to Medisense, Inc., Cambridge, Mass.

Filed May 19, 1988, Ser. No. 196,039

Claims priority, application United Kingdom, May 19, 1987, 8711736

Int. Cl.[4] C12Q *1/28*

U.S. Cl. 204—1 T 12 Claims



1. A hydrogen peroxide-sensitive electrode comprising a pyrolytic graphite edge electrode at least partially coated with a mixture of an aminoglycoside and cytochrome c peroxidase.

10. A method for electrolytic detection of hydrogen peroxide comprising the steps of:

(a) bringing a pyrolytic graphite edge electrode, together with an aminoglycoside and cytochrome c peroxidase, into association with a sample suspected of containing hydrogen peroxide; and

(b) detecting the current generated.

4,857,153

PROCESS FOR THE PRODUCTION OF POROUS ELECTRODES

Jiri Divisek, and Heinz Schmitz, both of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Juelich Gesellschaft mit beschrankter Haftung, Juelich, Fed. Rep. of Germany

Filed Dec. 14, 1988, Ser. No. 284,357

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1987, 3743354

Int. Cl.[4] C25D *5/00*

U.S. Cl. 204—16 28 Claims

1. A process for the production of porous electrodes which comprises the steps of:

applying by dry rolling to at least one side of a framework-forming metallic support having adhesion-promoting surface roughness a layer which comprises a powder mixture comprising:

(a) finely divided carbonyl metal having a low bulk density and high frictional resistance, and

(b) a pulverulent component comprising a compound which is catalytically active or a compound which can be activated by alkali treatment, wherein the ratio of component (a) to component (b) is between about 3:1 and 1:3; and

consolidating said layer by electrochemical coating with metal.

4,857,154

METHOD FOR PRODUCING A ZN-SERIES ELECTROPLATED STEEL SHEET

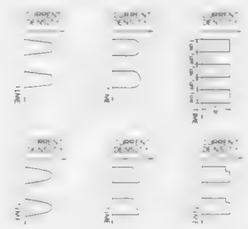
Yoshio Shindo; Fumio Yamazaki; Kouichi Wada; Hidehiro Tomio, and Katsushi Saito, all of Kimitsu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 29, 1987, Ser. No. 68,108

Claims priority, application Japan, Jun. 30, 1986, 61-153331; Jun. 30, 1986, 61-153333; Jun. 30, 1986, 61-153334; Jul. 4, 1986, 61-157603

Int. Cl.[4] C25D *5/48*

U.S. Cl. 204—27 3 Claims



1. A method for producing a coated steel sheet comprising the steps of: electrodepositing an initial layer of a zinc alloy or of a zinc alloy containing particles of a different material or metallic zinc containing particles of a different material, the initial layer being deposited in an amount of about 10–1000 mg/square meter; treating the initial layer in plating liquid identical in composition to that used to deposit the initial layer to dissolve part of the initial layer to relieve the electriodeposition strain of the initial layer, the amount dissolved being insufficient to result in the exposure of the surface of the steel sheet; and electrodepositing a main plating layer in plating liquid identical in composition to that used to deposit the initial layer, the main plating layer having a thickness substantially greater than that of the initial layer, thereby improving the adherence of the coating.

4,857,155

PROCESS OF SEPARATION OF HAFNIUM FROM ZIRCONIUM BY MOLTEN SALT ELECTROLYSIS

Tomoo Kirihara; Ippei Nakagawa, both of Aichi; Yoshinobu Seki, and Yutaka Honda, both of Ibaraki, all of Japan, assignors to Mitsubishi Nuclear Fuel Company, Ltd., Tokyo, Japan

Filed May 17, 1988, Ser. No. 195,623

Claims priority, application Japan, May 27, 1987, 62-130655

Int. Cl.[4] C25B *1/24;* C25C *3/26*

U.S. Cl. 204—61 2 Claims



1. A process of separation of hafnium from zirconium by molten salt electrolysis comprising of the steps:

(a) dissolving zirconium tetrachloride containing hafnium tetrachloride in naturally existing ratio in a molten salt, and

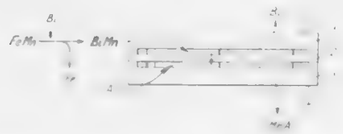
(b) forming zirconium trichloride containing a hafnium content lower than that of said zirconium tetrachloride at a cathode by electrolytic reduction of said zirconium tetrachloride in said molten salt.

4,857,156

SEPARATING A FERRO ALLOY

Derek J. Fray, and Alan J. Godsell, both of Cambridge, England, assignors to National Research Development Corporation, London, England

Filed Nov. 25, 1987, Ser. No. 125,285
Claims priority, application United Kingdom, Nov. 25, 1986, 8628136; Feb. 18, 1987, 8703697
Int. Cl.[4] C25C *3/00, 3/04, 3/26, 3/30*
U.S. Cl. 204—64 R **16 Claims**



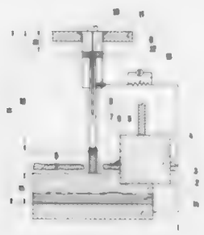
1. A method of separating a ferro alloy, comprising leaching the alloy with a substance which alloys preferentially with a non-ferrous metal, a temperature being above the melting point of the preferentially formed alloy but below the melting point of iron, whereby the iron remains or precipitates as a solid.

4,857,157

PROCESS AND APPARATUS FOR CONTROLLING SOLID ELECTROLYTE ADDITIONS TO ELECTROLYTIC CELLS FOR ALUMINUM PRODUCTION

Benoit Sulmont, and Alain Paternoga, both of St Jean De Maurienne, France, assignors to Aluminium Pechiney, Paris, France

Filed Apr. 18, 1988, Ser. No. 182,499
Claims priority, application France, Apr. 21, 1987, 87 05874
Int. Cl.[4] C25C *3/06, 3/20*
U.S. Cl. 204—67 **9 Claims**



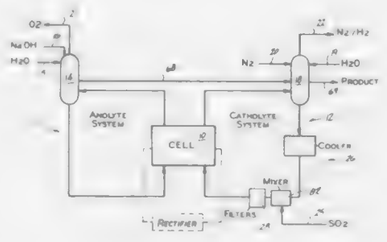
1. Process for controlling solid electrolyte additions to a cell for the production of aluminium in the Hall-Heroult process, by electrolysis of alumina dissolved in a molten cryolite bath 3 between a carbon-containing cathode substrate 1 having a liquid aluminium layer 2 thereon and a plurality of carbon-containing anodes 4 supported by an anode frame 33 having a height which can be regulated with respect to a fixed superstructure 11, comprising fixing a nominal value HBC for the bath height, periodically determining the distance between the top of the bath in the cell and a fixed reference point PF thereabove of known location with respect to the carbon-containing cathode substrate, determining from said distance the total height HT of the electrolytic bath layer HB and the liquid aluminium layer HM, determining the thickness HM of the liquid A1 layer on the cathode substrate from the bath layer height HB, where HB=HT−HM and comparing HB with the nominal value HBC and if said comparison reveals a bath deficiency, initiating ground bath addition from a storage means, through at least one opening made in the solidified electrolyte crust normally covering the cell, and if said comparison reveals a bath excess, tapping said bath, whereby fluctuations in the level of the bath can be limited to about +1 cm.

4,857,158

SODIUM HYDROSULFITE ELECTROLYTIC CELL PROCESS CONTROL SYSTEM

David W. Cawlfield, Cleveland, Tenn., assignor to Olin Corporation, Cheshire, Conn.

Continuation of Ser. No. 207,799, Jun. 17, 1988, Pat. No. 4,836,903. This application Jan. 26, 1989, Ser. No. 301,767
Int. Cl.[4] C25B *1/00, 15/02, 15/08*
U.S. Cl. 204—92 **15 Claims**



1. A centralized controller based process control system for the operation of an electrolytic membrane cell to continuously produce an aqueous product solution in the cell which has a cathode compartment, an anode compartment, a cation exchange membrane separating the anode compartment and the cathode compartment, comprising:

(a) a core process control program to control operating conditions including the feed of raw materials to the catholyte in the cathode compartment and to the anolyte in the anode compartment and to maintain the feed within tolerances of desired set points for a desired rate of feed by initiating self-correcting instructions to actuators controlling the rate of feed of the raw materials, the core process control program also sensing alarm conditions when an operating condition is out-of-tolerance;

(b) an alarm monitoring program to receive sensings of alarm conditions of out-of-tolerance conditions from the core process control program, to analyze the sensings and data on the operation of the cell, and to issue instruction and commands in response thereto;

(c) at least one sequencer program that is put into operation by a command from the alarm monitoring program and which sends commands to the core process control program to initiate a cell corrective procedure when any predetermined one of the alarm conditions sensed by the core process control program exists; and

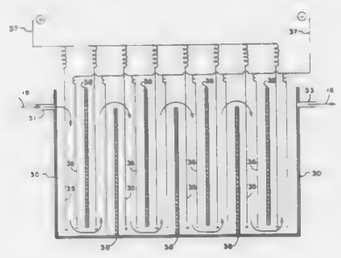
(d) a timer program that is initiated by the sequencer program to initiate timing an out-of-tolerance condition and activating at least one sequencer program to initiate the cell corrective procedure.

4,857,159

ELECTRODEPOSITION RECOVERY METHOD FOR METALS IN POLYMER CHELATES

James C. Davis, Hudson; Michael F. McGuiggan; Edward A. Cuellar, both of Shaker Heights, and Frederick W. Haas, University Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Mar. 25, 1987, Ser. No. 30,209
Int. Cl.[4] C02F *1/46;* **C25B** *1/12, 1/20*
U.S. Cl. 204—149 **22 Claims**



1. A process for the recovery of at least one metal species from the polymeric chelating agent stream comprising the steps of:

circulating said polymeric chelating agent stream through the electrolytic recovery cell, said polymeric chelating agent being loaded with metal ions or complexes of said species to be recovered, said species selected from the group consisting of Cr, CrO_4^{2-}, Pb, Ir, Ni, Cu, Zr, Ru, Pt, Pd, Ag, Cd, Sn, $[Ni(CN)_5]3-$, $Na_2Sn(OH)_6$, and $K_2Sn(OH)_6$;

reducing said metal ions or complexes from said polymeric chelating agent by application of voltage and current through said stream of loaded polymeric chelating; and

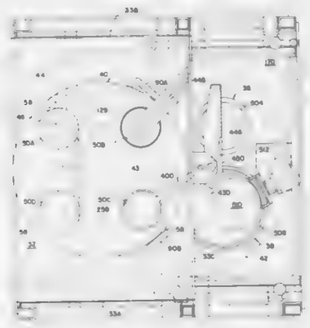
depositing said metal species from said stream at the cathode of said electrolytic recovery cell such that a bulk amount of said species is recovered.

4,857,160

HIGH VACUUM PROCESSING SYSTEM AND METHOD

Richard F. Landau, Londonderry, N.H.; William E. Millikin Jr., Acton, Mass.; Jerzy P. Puchacz; Manolito Q. Reyes, both of Nashua, N.H., and Walter Schadler, Triesen, Liechtenstein, assignors to Oerlikon-Buhrle U.S.A. Inc., New York, N.Y.

Filed Jul. 25, 1988, Ser. No. 224,450
Int. Cl.[4] C23C *14/56*
U.S. Cl. 204—192.12 **30 Claims**



16. Method of processing compact disks comprising the following steps:

(a) delivering a disk to a disk carrier disposed in a disk loading station, said disk carrier having a larger diameter than said disk and having a sealing element at its periphery;

(b) transferring said disk carrier and disk to a mask-receiving station;

(c) covering said disk with at least one mask component at said mask-receiving station;

(d) transferring said disk carrier with the mask-covered disk to a first carrier-transfer station that comprises an elongated input chamber at a controlled reduced pressure;

(e) shifting said disk carrier with the mask-covered disk along said input chamber to a second carrier-transfer station;

(f) transferring said disk carrier with the mask-covered disk from said second carrier-transfer station to at least one disk-processing station;

(g) treating said disk in at least one disk-processing station;

(h) transferring said disk carrier with the treated mask-covered disk from said at least one disk-processing station to a third carrier-transfer station that comprises an elongated output chamber;

(i) shifting said disk carrier with the treated mask-covered disk along said output chamber to a mask-removal station;

(j) removing said at least one mask component from the treated mask-covered disk at said mask-removal station and transferring said at least one mask component to another disk supported by another disk carrier located at said mask-receiving station;

(k) transferring said disk carrier with the treated mask-free disk from said mask-removal-station to a disk-unloading station;

(l) removing said treated mask-free disk from said disk carrier at said disk-unloading station;

(m) transferring the disk-free disk carrier from said disk-unloading station to said disk-loading station; and

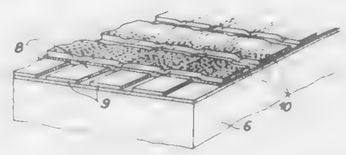
(n) repeating the foregoing steps commencing with delivery of a disk to the disk-free disk carrier at said disk-loading station.

4,857,161

PROCESS FOR THE PRODUCTION OF A DISPLAY MEANS BY CATHODOLUMINESCENCE EXCITED BY FIELD EMISSION

Michel Borel, Le Touvet; Jean-Francois Boronat, Grenoble; Robert Meyer, St Ismier, and Philippe Ramband, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 7, 1987, Ser. No. 1,159
Claims priority, application France, Jan. 24, 1986, 8601024
Int. Cl.[4] C23C *14/00;* **B05D** *5/06*
U.S. Cl. 204—192.26 **11 Claims**



1. A process of producing a display means by cathodoluminescence comprising the successive steps of:

(a) depositing a first, conductive coating on an insulating substrate,

(b) etching the first coating to form first parallel conductive strips serving as cathodes,

(c) depositing a second, insulating coating on the structure obtained in step (b),

(d) depositing a third, conductive coating on the second coating,

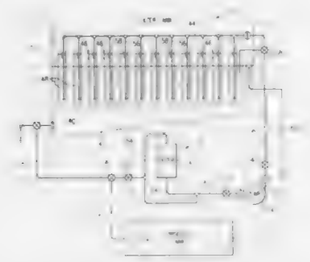
(e) making holes through the third and second coatings, said holes being distributed over the entire surface of the third and second coatings,
(f) depositing on the third coating a fourth coating not covering the holes,
(g) depositing on the structure obtained in step (f) a fifth coating of an electron emitting material,
(h) eliminating the fourth coating to thereby eliminate the electron emitting material surmounting said fourth coating and maintaining said emitting material in the holes,
(i) etching the third and second coatings to expose at least one of the ends of the first conductive strips,
(j) etching the third coating to form second parallel conductive strips serving as grids intersecting the first strips, without regard to location of the holes, and
(k) placing a facing anode and cathodoluminescent material on the second conductive strips.

4,857,162

CHROMIUM SOLUTION REGENERATOR

Pettice M. Phillips, Bedford, and Billy J. Swink, Euless, both of Tex., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Aug. 18, 1988, Ser. No. 233,464
Int. Cl.[4] C25B *15/08, 9/00, 13/00;* C25D *17/00*
U.S. Cl. 204—257 7 Claims



1. A chromium regeneration apparatus, comprising:
a tank having a fluid reservoir;
an anode assembly mounted in the fluid reservoir, the anode assembly having a frame, a cation selective membrane, and a membrane tensioner, the frame defining an opening therethrough with a portion of the frame forming a continuous periphery about the opening, the cation selective membrane positioned over the opening and being tensioned against the periphery of the frame by the membrane tensioner to define an anode chamber;
an anode suspended in the anode chamber;
a cathode suspended in the reservoir proximate the anode assembly;
means for generating an electrical potential between the anode and cathode;
means to supply a depleted chromium solution to the bottom of the anode chamber and the fluid reservoir external the anode chamber, the current flowing between the anode and cathode oxidizing trivalent chromium in the depleted chromium solution within the anode chamber to regenerate the chromium solution by forming hexavalent chromium, the regenerated chromium solution having a lesser density than the depleted chromium solution and rising above the depleted chromium solution in the anode chamber; and
means for draining off the regenerated chromium solution from the anode chamber.

4,857,163

HIGH RESOLUTION ELECTROPHORETIC GEL AND METHOD FOR SEPARATING SERUM PROTEINS

William A. Gurske, Sunnyvale; Cynthia R. Blessum, Pedley; Min-Lee Cheng, Placentia, and Mark S. Andrade, San Diego, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 17, 1987, Ser. No. 74,744
Int. Cl.[4] G01N *27/28, 27/26*
U.S. Cl. 204—299 R 22 Claims



12. An electrophoretic gel comprising agarose, water, barbital, 2-amino-2-hydroxymethyl-1,3-propane diol, a salt, and a resolution enhancer selected from the group consisting of hippurate, glycine and mixtures thereof.

4,857,164

OXYGEN ANALYZER

Toru Kodachi, Nagoya, and Jun Usami, Aichi, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Oct. 13, 1987, Ser. No. 107,397
Claims priority, application Japan, Oct. 16, 1986, 61-244038; Nov. 7, 1986, 61-264099
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—406 5 Claims



1. An oxygen analyzer comprising:
an oxygen sensing element comprising a diffusion chamber in which a measurement gas diffuses and detecting means including an oxygen concentration cell and an oxygen pump surrounding said diffusion chamber;
setting voltage means for setting a reference voltage to which is compared an electromotive force produced by said oxygen concentration cell; and
control means for controlling an amount of pumping current applied to said oxygen pump based on a deviation between said reference voltage and said electromotive force, said control means detecting an oxygen concentration of said measurement gas based on a predetermined relationship between oxygen concentration and said amount of pumping current;
wherein the setting voltage means sets said reference voltage by detecting said amount of pumping current applied to said oxygen pump or a control signal for controlling said pumping current, and setting the reference voltage at an electromotive force value corresponding to said amount of pumping current or said control signal based on a predetermined relationship between pumping current or control signal and electromotive force measured using a calibration gas having a known oxygen concentration, such that said reference voltage is varied relatively when the amount of pumping current or control signal is varied.

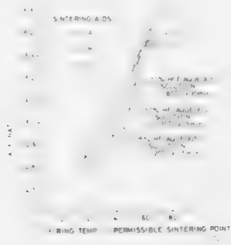
3. An oxygen analyzer comprising:
an oxygen sensing element comprising a diffusion chamber in which a measurement gas diffuses and detecting means including an oxygen concentration cell and an oxygen pump surrounding said diffusion chamber;
setting voltage means for setting a reference voltage to which is compared an electromotive force produced by said oxygen concentration cell; and
control means for controlling an amount of pumping current applied to said oxygen pump, said control means comprising a proportional operation circuit and an integration operation circuit for providing a control signal for controlling the current amount applied to said oxygen pump based on a deviation between said reference voltage and said electromotive force; and
means for decreasing the proportional gain of the proportional operation circuit based on the amount of pumping current applied to said oxygen pump;
wherein the setting voltage means sets said reference voltage by detecting said amount of pumping current applied to said oxygen pump or a control signal for controlling said pumping current, and setting the reference voltage at an electromotive force value corresponding to said amount of pumping current or said control signal based on a predetermined relationship between pumping current or control signal and electromotive force measured using a calibration gas having a known oxygen concentration, such that said reference voltage is varied relatively when the amount of pumping current or control signal is varied.

4,857,165

OXYGEN SENSING ELEMENT AND PROCESS OF MANUFACTURING THE SAME

Fujio Ishiguro, and Takumi Narahara, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Feb. 9, 1988, Ser. No. 154,030
Claims priority, application Japan, Feb. 16, 1987, 62-32932
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—424 8 Claims



1. A process of manufacturing an oxygen sensing element having a solid electrolyte body made of an oxygen-ion conductive solid electrolyte material, and a measuring electrode and a reference electrode formed on the solid electrolyte body in communication with a measurement gas and a reference gas having a predetermined oxygen concentration, respectively, such that an electromotive force is induced between the measuring and reference electrodes based on a difference in oxygen concentration between the measurement gas and the reference gas, said method comprising the steps of:
preparing an unfired formed body of said solid electrolyte body using said oxygen-ion conductive solid electrolyte material mixed with a sintering aid;
firing said unfired formed body into said solid electrolyte body at a temperature within a range which is defined by a permissible lowest sintering point of said unfired formed body and a point which is 60° C. above said permissible lowest sintering point; and
chemically treating the fired surface of said solid electrolyte body under a condition whereby the oxygen-ion conductive solid electrolyte material is not deteriorated and the strength of the solid electrolyte body is not reduced;
said chemical treatment being carried out to such an extent that an amount of the sintering aid left on the surface of said solid electrolyte body is smaller than that left within an interior structure of the solid electrolyte body, as viewed in a transverse cross sectional plane of the solid electrolyte body.

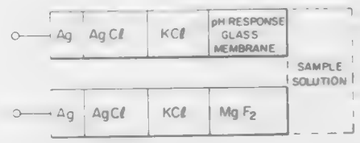
4. An oxygen sensing element having an oxygen-ion conductive solid electrolyte body, a measuring electrode formed on the solid electrolyte body in communication with a measurement gas, and a reference electrode formed on the solid electrolyte body in communication with a reference gas having a predetermined oxygen concentration, such that an electromotive force is induced between the measuring and reference electrodes based on a difference in oxygen concentration between the measurement gas and the reference gas;
wherein said oxygen-ion conductive solid electrolyte body is formed by a process comprising:
preparing an unfired formed body of the solid electrolyte body from an oxygen-ion conductive solid electrolyte material mixed with a sintering aid;
firing said unfired formed body into said solid electrolyte body at a firing temperature selected within a range which is defined by a lower limit equal to a permissible lowest sintering point of said unfired formed body and an upper limit which is 60° C. above the permissible lowest sintering point; and
chemically treating the fired surface of said solid electrolyte body under a condition whereby the oxygen-ion conductive solid electrolyte material is not deteriorated and the strength of the solid electrolyte body is not reduced;
said chemical treatment being carried out to such an extent that an amount of the sintering aid left on the surface of said solid electrolyte body is smaller than that left within an interior structure of the solid electrolyte body, as viewed in a transverse cross sectional plane of the solid electrolyte body.

4,857,166

REFERENCE ELECTRODE

Haruo Kotani, Miyanohigashi, Japan, assignor to Horiba Ltd., Kyoto, Japan

Filed Nov. 24, 1987, Ser. No. 124,690
Claims priority, application Japan, Nov. 29, 1986, 61-286269
Int. Cl.[4] G01N *27/30*
U.S. Cl. 204—435 12 Claims



1. A reference electrode comprising a liquid junction portion having a film member in a plate-like configuration to act as a liquid junction member for a sheet-type electrode and formed of MgF_2 or CaF2, which are substances having both a transport coefficient of a cation and a transport coefficient of an anion substantially equal to each other with a low solubility in water and an aqueous solution, said film member being formed from crystalline powder having a particle diameter of about 1 to 20 microns.

4,857,167

OXYGEN-STABLE SUBSTITUTED FERROCENE REFERENCE ELECTRODE

James K. Beshkin, Clayton, and Patrick J. Kinlen, High Ridge, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 5, 1987, Ser. No. 58,484
Int. Cl.[4] G01N *27/30, 27/46*
U.S. Cl. 204—435 12 Claims

1. A solid state reference electrode comprising an electronically conductive material in contact with substituted ferrocene/ferrocenium ion selected from the group consisting of octamethyl ferrocene, decamethyl ferrocene, octaphenyl ferrocene, octaethyl ferrocene, nonaethyl ferrocene, trimethyl pentaethyl ferrocene, pentaphenylpentaethyl ferrocene, heptapropyl ferrocene and polymers of octamethyl distyrylmethyl ferrocene, octamethyl vinyl ferrocene, octamethyldivinyl ferrocene, octaethylvinyl ferrocene and triethylpentamethylvinyl ferrocene.

4,857,168

METHOD FOR HYDROCRACKING HEAVY FRACTION OIL

Junichi Kubo, Yokohama, and Kenji Suzuki, Tokyo, both of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1988, Ser. No. 146,234
Claims priority, application Japan, Mar. 30, 1987, 62-74273
Int. Cl.[4] C10G *65/12*
U.S. Cl. 208—58 3 Claims

1. A method for hydrocracking a heavy fraction oil which consists of the steps of:

cracking a heavy fraction oil containing 1% up to 30% of asphaltene and at least 50% of a fraction of boiling point at least 350° C. in the presence of a circulating solvent comprising a hydrogen donating solvent, hydrogen gas and a catalyst capable of hydrogenation in a cracking reactor at a temperature of 380° C.–470° C., at a pressure of 30–150 $kg/cm^2.g$;

hydrogenating the fractions obtained by the cracking of said heavy fraction oil, in presence of a hydrogenating catalyst in a hydrogenating reactor at a temperature of 320°–440° C. and at a pressure of 30–150 $kg/cm^2.g$;

separating the thus hydrogenated fractions into a liquid and gases in a separator,

fractionating the thus separated liquid in a distillation apparatus to obtain a specific fraction in which at least 90 wt. % is boiling in the range of 150°–250° C., at least 60 wt. % is boiling in the range of 190°–230° C. and at least 30 wt. % is tetralin,

circulating said specific fraction as the circulating solvent through said cracking reactor, in the absence of added hydrogen donating solvent.

4,857,169

HYDROCRACKING PROCESS UTILIZING A CATALYST HAVING A REDUCED ZEOLITE CONTENT

Suheil F. Abdo, Diamond Bar, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 673,520, Nov. 20, 1984, abandoned. This application Nov. 10, 1987, Ser. No. 119,168
Int. Cl.[4] C10G *65/10*
U.S. Cl. 208—59 22 Claims

20. A process for refining hydrocarbon feedback containing organonitrogen components, organosulfur components or a mixture thereof, which process comprises:

(a) contacting said feedback with molecular hydrogen under hydrotreating conditions in the presence of a hydrotreating catalyst comprising a Group VIB metal component and a Group VIII metal component such that a substantial proportion of the organonitrogen components, organosulfur components or mixture thereof is converted to ammonia, hydrogen sulfide or a mixture thereof;

(b) contacting substantially all of the effluent from step (a) with molecular hydrogen in a first hydrocracking zone in the presence of a first hydrocracking catalyst comprising a zeolite and a hydrogenation component to produce a hydrocracking product of substantially lower boiling point;

(c) separating said hydrocracking product into a higher boiling fraction and a lower boiling fraction;

(d) contacting said higher boiling fraction with molecular hydrogen in a second hydrocracking zone under hydrocracking conditions in an atmosphere which contains no more than about 200 ppmv ammonia and in the presence of a second hydrocracking catalyst to convert said higher boiling fraction into lower boiling products, wherein said second hydrocracking catalysts comprises;

(1) a porous, inorganic refractory oxide component; and

(2) between about 40 weight percent and about 70 weight percent of a crystalline aluminosilicate Y zeolite having a silica-to-alumina mole ratio above about 6.0 intimately mixed with said refractory oxide component, said crystalline aluminosilicate Y zeolite having been ion-exchanged with Group VIII noble metal cations.

4,857,170

HYDROCARBON CONVERSION CATALYSTS

Arend Hoek; Tom Huizinga, and Ian E. Maxwell, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 29, 1987, Ser. No. 55,652
Claims priority, application United Kingdom, May 30, 1986, 8613132
Int. Cl.[4] C10G *47/12*
U.S. Cl. 208—111 15 Claims

1. A process for hydrocracking hydrocarbon oils into products of lower average molecular weight and lower average boiling point comprising contacting a hydrocarbon oil at a temperature between 250° C. and 500° C. and a pressure up to 300 bar in the presence of hydrogen with a catalyst consisting esssentially of a Y zeolite modified to have a unit cell size below 24.35Å, a water adsorption capacity (at 25° C. and a p/p_o value of 0.2) of at least 8% by weight of the zeolite and a pore volume of at least 0.25 ml/g wherein between 10% and 60% of the total pore volume is made up of pores having a diameter of at least 8 nm; an alumina binder and at least one hydrogenation component selected from the group consisting of a Group VI metal, a Group VIII metal and mixtures thereof.

4,857,171

HYDROCARBON CONVERSION PROCESS AND CATALYSTS

Arend Hoek; Tom Huizinga, and Ian E. Maxwell, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 29, 1987, Ser. No. 55,672
Claims priority, application United Kingdom, May 30, 1986, 8613131
Int. Cl.[4] C10G *47/12*
U.S. Cl. 208—111 21 Claims

1. A process for hydrocracking hydrocarbon oils into products of lower average molecular weight and lower average boilng point comprising contacting a hydrocarbon oil at a temperature between 250° C. and 500° C. and a pressure up to 300 bar in the presence of hydrogen with a catalyst consisting essentially of a Y zeolite modified to have a unit cell size below 24.40 Å, a water adsorption capacity (at 25° C. and a p/p_o value of 0.2) of between 10% and 15% by weight of the zeolite and a pore volume of at least 0.25 ml/g wherein between 10% and 60% of the total pore volume is made up of pores having a diameter of at least 8 nm; an amorphous cracking component, a binder and at least one hydrogenation component selected from the group consisting of a Group VI metal, a Group VIII metal and mixtures thereof.

4,857,172

HEAVY MEDIUM SEPARATION TRACER ELEMENT

Noel J. Pipkin, 138/140 Pritchard Street, Johannesburg North, Randburg, Transvaal, and Michael S. Hunt, 52 Ararat Street, Westdene, Johannesburg, Transvaal, both of South Africa

Filed Dec. 15, 1987, Ser. No. 133,462
Claims priority, application South Africa, Dec. 19, 1986, 86/9561
Int. Cl.[4] B03B *13/00;* B04C *11/00*
U.S. Cl. 209—1 10 Claims

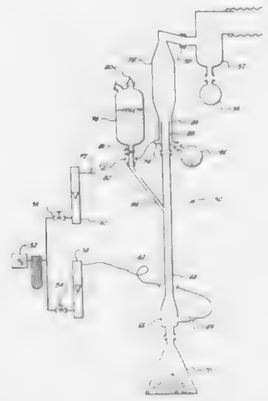
1. A tracer element for use in determining the efficiency of a heavy medium separation method which is made of a material selected from aluminum, an aluminum/zinc alloy of density greater than about 2.7 grams/cc and containing up to about 40 percent by weight zinc and an aluminum magnesium alloy of density less than about 2.7 grams/cc and containing up to about 40 percent by weight magnesium.

4,857,173

PARTICLE CLASSIFIER AND METHOD

Thomas J. Belk, St. Louis, Mo., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 824,537, Jan. 31, 1986, abandoned. This application Oct. 8, 1987, Ser. No. 105,867
Int. Cl.[4] B07B *4/02*
U.S. Cl. 209—2 8 Claims



1. A process for classifying a mixture of high purity silicon particles including small dust particles, product particles, and large heavy particles, said process comprising the steps of:

(a) injecting a motive, inert gas upwardly through a vertically oriented unpacked classifier column that is non-contaiminating to high purity silicon and of substantially constant cross-section, said column having an upper end and a lower end, at a velocity sufficient to entrain said small dust particles and said product particles but insufficient to prevent said large heavy particles from falling unimpeded to the lower end of said column by the force of gravity, said motive gas being introduced at a port at the side of said column above a large particle receiver;

(b) dispensing said mixture of sizes of particles into said classifier column at an intermediate point between said upper end and said lower end;

(c) flowing said motive gas and entrained small dust particles out of said upper end of said classifier column into a vertically oriented product disengagement section having a larger cross-sectional flow path than that of said classifier column whereby the velocity of said motive gas is sufficient to entrain said small dust particles but insufficient to entrain said product particles;

(d) collecting product particles by force of gravity in an angularly disposed product receiver fluidly connected above said intermediate point; and

(e) introducing a second flow of motive gas into said product disengaging section.

4,857,174

METHOD OF BENEFICIATING PHOSPHATE ORES

Brij M. Moudgil, and Dursun Ince, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Division of Ser. No. 147,307, Jan. 22, 1988, Continuation-in-part of Ser. No. 833,070, Feb. 26, 1986, abandoned. This application Nov. 28, 1988, Ser. No. 276,477
Int. Cl.[4] B03D *1/02*
U.S. Cl. 209—3 4 Claims

1. A method of beneficiating a phosphate ore comprising apatite and including dolomite impurities, said method consisting essentially of the steps of:

(a) reagentizing a sample of said ore having a particle size in the range of from about 75 microns to 420 microns, with an aqueous solution having a pH of from about 4.0 to about 7.0 and containing from about 0.05% to about 0.2%, by weight of the ore, of cationic collector and from about 0.04% to about 0.12%, by weight of the aqueous solution, of sodium chloride,

(b) subjecting said reagentized ore sample to flotation to float said apatite fraction, and

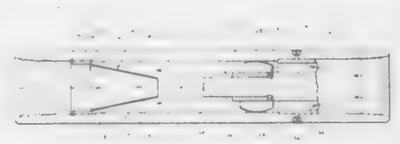
(c) recovering, as the float fraction, an apatite concentrate.

4,857,175

CENTRIFUGAL DEBRIS CATCHER

Ralph F. Spinnler, Glastonbury, Conn., assignor to Teleco Oilfield Services Inc., Meriden, Conn.

Filed Jul. 9, 1987, Ser. No. 72,129
Int. Cl.[4] B07B *1/18*
U.S. Cl. 209—235 29 Claims



1. Apparatus for catching debris in fluid flowing through a pipe segment comprising:

means for imparting a helical flow pattern to the fluid; and

filter means spaced downstream from said helical flow pattern imparting means, said filter means extending axially along said pipe segment and defining an annular accumulation space between the pipe segment and said filter means, said filter means having spaced apart first and second open ends and said filter means being conical and tapering outwardly from the end closest to said means for imparting a helical flow pattern.

4,857,176

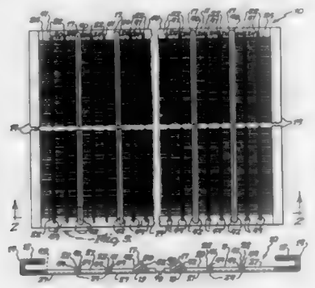
REINFORCED MOLDED POLYURETHANE VIBRATORY SCREEN

James W. Derrick, East Aurora, and L. Charles Matsch, Buffalo, both of N.Y., assignors to Derrick Manufacturing Corporation, Buffalo, N.Y.

Continuation of Ser. No. 892,307, Aug. 4, 1986, abandoned. This application Jun. 17, 1988, Ser. No. 210,153
The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.
Int. Cl.[4] B07B *1/46*
U.S. Cl. 209—392 20 Claims

1. A vibratory screen for mounting on a vibratory screening machine comprising an integral flexible molded polyurethane body having a creep characteristic, an upper surface and a

lower surface on said body, side edge portions forming an integral molded portion of said body, screen openings in said body extending between said upper and lower surfaces, flexible dividing strips forming an integral molded portion of said body and defining opposite sides of each of said screen openings, ribs molded integrally with said dividing strips and extending transversely thereto and defining the ends of said openings, said screen openings being elongated with a greater length dimension along said sides and between said ribs than a width dimension between said sides and with their length dimensions extending in a direction transverse to said side edge portions, said screen openings also diverging downwardly between said upper surface and said lower surface, and continuous elongated flexible aramid fiber means molded integrally with each



of said flexible dividing strips and extending continuously throughout said body and into said side edge portions for enabling tensioning of both said dividing strips and said fibers in a direction along the length of said flexible aramid fibers and said flexible dividing strips when tensile forces are applied to said side edge portions and said fibers therein and thus preventing said body from elongating between said side edge portions due to said creep characteristic while permitting said dividing strips to vibrate due to their flexibility when said body is mounted under high tension and is being operated on said vibratory screening machine, said aramid fiber means and said molded polyurethane body being sufficiently flexible to enable said vibratory screen to be bent into an arcuate condition for installation into said vibratory screening machine.

4,857,177

DRY SEPARATION OF SOLIDS

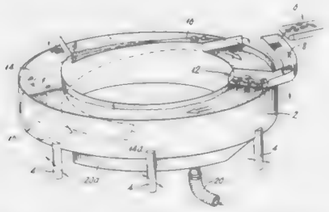
John M. Lupton, Lincolnshire, England, assignor to National Research Development Corporation, London, United Kingdom

Filed Jan. 28, 1988, Ser. No. 149,591

Claims priority, application United Kingdom, Jan. 30, 1987, 8702166; Apr. 22, 1987, 8709501

Int. Cl.[4] B07B *4/08, 13/08*

U.S. Cl. 209—466 **9 Claims**



1. A solids separator, comprising a trough defining an endless generally horizontal path the trough having

a base and in use containing a particulate material as an entraining medium; a distributor for solids onto the trough; and a depthwise partition in said trough, characterized in that the base is air-permeable for only a portion of the length of the trough, the partition being situated over said portion and the

distributor being situated off said portion and there are means to vibrate the separator with simultaneous horizontal and vertical components.

4,857,178

CENTRIFUGAL CLASSIFIER

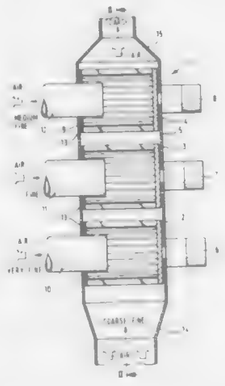
Ulrich Barthelmess, Postfach 16, D 7908 Niederstotzingen, Fed. Rep. of Germany

Filed May 1, 1987, Ser. No. 44,830

Claims priority, application Fed. Rep. of Germany, May 7, 1986, 3615494

Int. Cl.[4] B07B *7/083*

U.S. Cl. 209—143 **4 Claims**



1. A centrifugal classifier for classifying air, feed solids, fines and coarse particles, comprising:

(a) a substantially parallelepipedic housing;

(b) inlet means in said housing for said air and feed solids;

(c) a plurality of outlets in said housing for said fines and coarse particles;

(d) a plurality of classifier rotors mounted in said housing parallel to one another and each of said rotors connected to a separate one of said outlets; and

(e) a plurality of drives each of which is connected to one of said rotors.

4,857,179

ORE FLOTATION AND MINERAL FLOTATION AGENTS FOR USE THEREIN

Kenneth B. Kimble, Borger; Gary D. Macdonell, Houston, both of Tex., and Harold W. Mark, Summerville, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 19, 1988, Ser. No. 286,343

Int. Cl.[4] B03D *1/02*

U.S. Cl. 209—166 **19 Claims**

1. In a process for the recovery of a metal containing mineral from an ore or concentrate containing said mineral wherein the mineral is recovered in a froth from an aqueous flotation pulp containing the ore or concentrate, said process comprising subjecting said ore or concentrate to froth flotation, wherein a mineral floation agent is employed in the aqueous flotation pulp in an amount sufficient to control the type of minerals in the froth, the improvement comprising employing as said mineral flotation agent a compound formed by the chemical reaction of hydrogen sulfide with dicyclopentadiene.

4,857,180

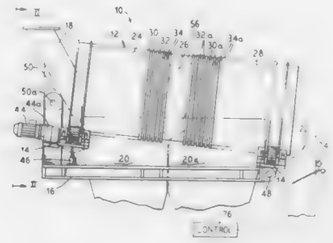
ROTATING DISC SCREEN

Arne Eriksson, GustavsbergRuten, Sweden, assignor to Beloit Corporation, Beloit, Wis.

Filed Feb. 26, 1988, Ser. No. 160,741

Int. Cl.[4] B07B *1/26*

U.S. Cl. 209—664 **4 Claims**



3. A screening apparatus comprising:

a plurality of axially aligned longitudinally spaced discs, said discs having a large central aperture defining a hollow drum with spaced circumferential slots of selected width between said discs to pass particles of a desired size;

spacer means between adjacent discs for providing said slots between said discs;

means for affixing said plurality of discs and said spacer means into a drum;

means for rotating said drum about its central longitudinal axis;

inlet means for receiving and delivering material to be separated into one end of said drum;

outlet means for receiving non-acceptable material at the other end of said drum;

means for receiving accepted material along the exterior longitudinal length of said drum, whereby said accepted material passes through the slots between said discs while said drum is rotating;

jack means at one end of said drum for elevating said drum; and

sensor means at said outlet means for sensing material flow rate through said outlet means, said sensor means being connected to a feedback control system which is capable of adjusting said jack means to provide the proper material flow rate through said apparatus and said outlet means.

4,857,181

CONTROL OF CLEANING OF DIALYSATE PREPARATION APPARATUS

David R. Shouldice, Lakewood; Dennis M. Treu, Morrison; Daniel A. Powell, Littleton, and Thomas Cernich, Denver, all of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Oct. 30, 1986, Ser. No. 925,822

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—87 **8 Claims**

1. Dialysate preparation apparatus comprising

a main flow line having one end connected to a source of water and another end for connecting to a dialyzer for providing dialysate to said dialyzer,

a concentrate flow line having one end connected to a junction on said main flow line and another end with a connector for alternatively connecting said concentrate line to a source of dialysate concentrate or a source of cleaning fluid,

a source of dialysate connectable to said connector,

a source of cleaning fluid including a cleaning fluid flow line with an end that is connectable to said connector,

a flow sensing switch means on said cleaning fluid flow line for providing a verification signal indicating fluid flowing in said flow line, and

a controller means connected to receive said verification



signal from said flow sensing switch for verifying that said apparatus is in a cleaning mode when said flow sensing switch indicates fluid flowing in said cleaning fluid flow line.

4,857,182

PROTECTION DEVICES FOR BAR SCREENS

Jerry E. Jackson, Mechanicsville, Va., assignor to Infilico Degremont Inc., Richmond, Va.

Filed Mar. 16, 1988, Ser. No. 168,940

Int. Cl.[4] B01D *35/02, 35/16;* **E02B** *5/08*

U.S. Cl. 270—104 **8 Claims**



1. In a reciprocating rake bar screen apparatus comprising a motorized rake assembly including an electric drive motor with associated electrical components that moves said assembly along a guide frame in a closed, approximately vertical path from an upper parking position to and through a lower reversing direction position, the improvement of protection means to prevent said drive motor and associated electrical components from being submerged in a stream of sewage passing said apparatus at a predetermined level relative to said lower position which comprises:

detection means to detect the presence of liquid that may exist at or above said predetermined level,

monitor means for determining the position of said motorized rake assembly along said path during operation of said apparatus, and

logic means for determining by input from said monitor means whether said motorized rake assembly should move in a forward direction or in a reverse direction along said path from a given location on said path to return with the least amount of travel from said given location to said upper parking position and causing said rake assembly to travel either in said forward direction or said reverse

direction depending on the input received from said monitor means.

4,857,183

APPARATUS FOR PURIFYING AND NEUTRALIZING RESIDUES FROM FURNACES

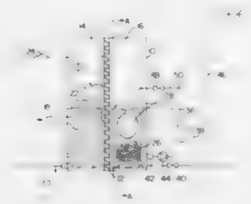
Rolf Bommer, Hochbildstrasse 21, 7770 Ueberlingen, Fed. Rep. of Germany

Filed Jan. 15, 1988, Ser. No. 144,472

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1987, 8700987[U]

Int. Cl.[4] B01D *23/14*

U.S. Cl. 210—127 **22 Claims**



1. Apparatus for purifying and neutralizing residues from furnaces burning liquid or gaseous fuels comprising a settling tank (14,80) having an inlet (14) for the liquid containing the residues, at least one oil absorption body (22,23) in the settling tank (14,80), a clean water tank (16,82) separated from said settling tank (14,80) by at least one filter, means for raising the pH in the clean water tank (16,82), and a filtration unit containing activated carbon (34) between the clean water tank (16,82) and outlet (36) said apparatus including means for conveying fluids from said inlet to said outlet.

4,857,184

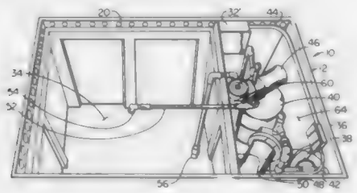
SELF-CONTAINED WATER TREATMENT SYSTEM AND ENCLOSURE

Anthony DeLoach, 1631 Jewel Dr., Sarasota, Fla. 34240

Filed Sep. 7, 1988, Ser. No. 241,841

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—128 **17 Claims**



1. A self-contained water treatment system enclosure structured for placement atop the ground, comprising:

a base having a bottom and upwardly extending side walls forming an upper opening and having a partition upwardly extending from said base and between two opposing side walls to said opening to form a first water tight compartment and a second compartment;

a removable lid structured to sealably engage against and cover said opening, said partition extending upwardly to sealably engage against said lid;

said first compartment structured to receive and store a quantity of water;

said second compartment having a removable side wall panel and structured to supportively receive components of a means for treating water having an inlet and an outlet and connected therewithin;

an inlet tube connected through one said side wall structured for interconnection between a source of well water and the water treating means inlet;

an outlet tube connected through one said side wall structured for interconnection between a house water inlet conduit and the water treating means outlet;

a spray nozzle connected to said partition structured to be operably interconnected within the water treating means and to spray discharge water pressurized within the water treating means above the surface of the water stored in said first compartment;

a water pickup conduit connected to said partition structured to be operably interconnected within the water treating means and to convey water stored in said first compartment to a pump in the water treating means, the pump discharging water to said outlet tube; and

a plurality of apertures in one said side wall adjacent its upper margin structured to allow gases released from well water discharging from said spray nozzle into said first compartment to vent outside said enclosure.

4,857,185

AERATED FACULTATIVE BASIN HAVING A DUAL FUNCTION AERATION AND SLUDGE REMOVAL PUMP IN ADJACENT WELL

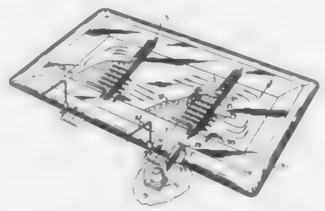
Gaétan Desjardins, 8170 Yves Prévost, Anjou, Quebec, Canada

Filed Mar. 21, 1988, Ser. No. 170,742

Claims priority, application United Kingdom, Apr. 13, 1987, 8708844

Int. Cl.[4] B01D *21/00*

U.S. Cl. 210—150 **9 Claims**



1. A waste water and sewage treatment system for use in a facultative aeration-sedimentation basin, said system comprising:

a well constructed near or adjacent the facultative aeration-sedimentation basin;

water connection means to allow water from the basin to enter the well;

a submerged water pump mounted in the well, said pump having an inlet and an outlet;

a water header extending from the well over a given distance into the basin;

at least one aerating means mounted onto the water header for oxygenating the waste water or sewage in the basin, each of said aerating means consisting of a water jet connected to said header and incorporating an air-sucking venturi, each of said water jets being positioned onto the header in such a manner as to create a forced water circulation inside the basin;

a sludge collecting duct extending from the well over a given distance into the basin, said sludge collecting duct having a plurality of sludge collecting openings located at the vicinity of the bottom of the basin;

a sludge disposal pipe extending from the well to drain the sludge out of said well; and

interconnection means located in the well, said valve interconnection means including means for selectively opening

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Patent Not Issued For This Number

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the water connection means and simultaneously connecting the pump outlet to the water header to allow water to enter the well and be pumped through the pump inlet and then be supplied under pressure to the header in order to activate the water jets and cause aeration and circulation of the water in the basin, and means for selectively opening the sludge collecting duct in the well while the water connection means is closed and connecting the pump outlet to the sludge disposal pipe to allow at least part of the sludge settled at the bottom of the basin to be sucked in the well out of said basin and then pumped out of said well whenever desired.

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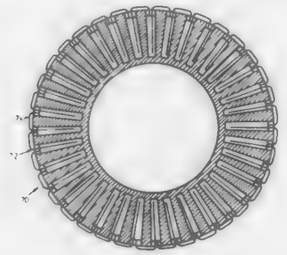
MULTISTAGE MIXER-SETTLER CENTRIFUGE

Yoichiro Ito, Bethesda, Md., assignor to The Government of the U.S. as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Sep. 28, 1987, Ser. No. 101,970

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—198.2 **7 Claims**



1. A planetary centrifuge comprising a separation column comprising a plurality of essentially cylindrical receptacles connected in series between a supply means and a collection means by a plurality of flow tubes;

at least one of said flow tube being for transferring a mobile phase from said supply means to the first receptacle in said series;

at least another one of said flow tubes being for transferring a mobile phase from the last receptacle of said series to said collection means;

the remainder of said flow tubes being for transferring a mobile phase from one receptacle in said series to the succeeding receptacle in said series;

mixing means with each said receptacle comprising an elastic elongated rod having a free end within said receptacle and a fixed end, outside said receptacle, said rod extending axially within said receptacle for at least a majority of the depth of said receptacle, said free end of said rod being adapted to oscillate when its respective receptacle is subjected to an oscillating force field;

the flow tubes and rods extending through one end of said receptacles; and

the separation column being mounted about a column holder so that the cylindrical axes of said receptacles are radially oriented with respect to a central axis said column holder about which said column holder is rotatable, said column holder being fixed within a frame so as to be revolvable about a planetary axis spaced way form said central axis.

4,857,188

IRON POWDER ATTRACTING MAGNET

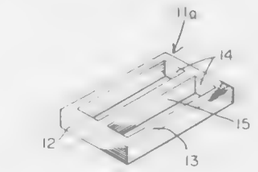
Junzo Aisa, and Eizi Kosugi, both of Shizuoka, Japan, assignors to Ishikawa Tekko Kabushiki Kaisha, Tokyo, Japan

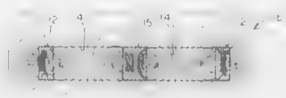
Filed Apr. 18, 1988, Ser. No. 182,858

Claims priority, application Japan, May 12, 1987, 62-115300

Int. Cl.[4] B01D *35/06;* **F01M** *1/10*

U.S. Cl. 210—222 **5 Claims**





1. As an article of manufacture, a magnet for attracting and removing iron powder contained in a fluid, said magnet comprising magnetic material embedded in solidified plastic material, said magnet having opposite sides and a periphery and further having a plurality of unconnected spaces located inwardly of said periphery and opening to said opposite sides so as to define a partition between each pair of adjacent spaces and so as to define an outer frame portion located between each space and said outer periphery, all surfaces of said magnet being magnetic surfaces capable of attracting and removing iron powder contain in fluid in contact therewith, each outer frame portion and each partition exhibiting a magnetic field, and wherein, with respect to a given space, the outer frame portion confronting said given space exhibits a polarity in said given space which is opposite to the polarity in said given space exhibited by the partition confronting said given space.

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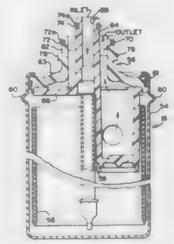
FILTER CARTRIDGE WITH A LUGGED CONCENTRIC CLOSURE PORTION

Jack W. Thomsen, La Grange Park; Perialwar Regunathan, Wheaton, and John W. Tadlock, West Chicago, all of Ill., assignors to Everpure, Inc., Westmont, Ill.

Filed Oct. 13, 1988, Ser. No. 257,338

Int. Cl.[4] B01D *27/08, 35/30*

U.S. Cl. 210—232 **14 Claims**



8. A filter cartridge for insertion into a filter head having

fluid inlet and outlet ports and adapted to be permanently mounted in a fluid conduit comprising:

(a) a pressure vessel closed at one end and adapted to have a filter element disposed therein;

(b) a closure member in sealed relationship with the open end of said pressure vessel,

said closure member being formed with inlet and outlet ports therein for communicating with inlet and outlet ports in a filter head with which the filter cartridge is adapted to be associated,

said closure member also being formed with a pair of unequal diameter concentrically disposed axially projecting tubular portions which define inlet and outlet ports to and from the pressure vessel, one of said tubular portions extending axially beyond the other; and

(c) a pair of laterally extending oppositely disposed lug members formed on the outer surface of the tubular portion having the larger diameter.

4,857,190

CONTAINER FOR FINE SEPARATION OF BLOOD AND BLOOD COMPONENTS

Shohachi Wada, Oakland, and Bruce Kuhlemann, Hayward, both of Calif., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Mar. 2, 1984, Ser. No. 585,793
Int. Cl.[4] B65D *35/22*
U.S. Cl. 210—232 **10 Claims**



1. In a container for blood or blood components, the improvements comprising a receptacle having a top portion in continuous communication with the container and adapted to receive a blood component when the contents of the container are subjected to centrifugal or sedimentary forces, and a closed bottom portion adapted to assist in containing a separated blood component, the maximum internal cross sectional area where the receptacle communicates with the container and the receptacle itself being less than any internal cross sectional area beyond said communication area and toward the container, thereby providing means for obtaining a reduced interface between a component in the receptacle and the contents remaining in the container, the container also including receptacle support means adapted to conform generally to the external dimensions of the container and receptacle and help maintain said dimensions when the container is subjected to centrifugal forces.

4,857,191

FILTER DEVICE

Joachim Wolf, Malmsheimer Str. 67, D-7252 Weil der Stadt, Fed. Rep. of Germany

Filed Mar. 28, 1988, Ser. No. 174,388
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1987, 3740418
Int. Cl.[4] B01D *35/30*
U.S. Cl. 210—286 **19 Claims**

1. A filter apparatus for the filtering of liquids, said filter apparatus having a volume of from 30 to 2000 cm3, comprising:

a filter housing having a top wall, a bottom wall, and an adjoining peripheral wall, with a first and a second perforation in said top wall,

an inlet connection piece in said first perforation and an outlet connection piece in said second perforation, said inlet and outlet connection pieces being connectable to feed and discharge lines located on an appliance intended for the liquid to be filtered,

filtering material in said filter housing,

and the improvement wherein:

(a) said top wall is resistant to bending, thicker than said adjoining peripheral wall and connected unreleasably thereto; and

(b) said inlet and outlet connection pieces are equipped with coupling ends for easily releasable pressure-tight connection to the appliance feed and discharge lines respectively.

4,857,192

IN PHASE CORRUGATED PLATE MEMBRANE MODULE SUPPORT

Masataka Kusuda; Shuji Fukuma, and Masaki Nishiyama, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 27, 1987, Ser. No. 89,801
Claims priority, application Japan, Aug. 27, 1986, 61-201144; Sep. 11, 1986, 61-215677; Dec. 12, 1986, 61-297283
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—321.84 **4 Claims**



1. A plate type membrane module comprising a plurality of units, each unit comprising:

a membrane supporting plate having both sides corrugated; and

membranes formed on said corrugated sides, with permeate passageways formed between said membranes and said corrugated sides;

wherein said units are laminated in such a manner that raw solution passageways of substantially constant width are formed between said units for fluid flow in directions substantially parallel to said corrugated sides, such that the shape of said raw solution passageways are determined solely by the shape of said corrugated sides and said membranes; and

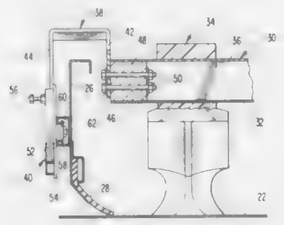
wherein waveforms of said corrugated sides of immediate adjacent ones of said membrane supporting plates which are confronted with each other are in phase with each other.

4,857,193

FLOATING CHICANE SYSTEM FOR LIQUID-SOLID SEPARATION EQUIPMENT

Brice P. Clements; Tatsuo Kurihara, both of Arlington; Sammy D. Marshall, Grand Prairie, all of Tex., and Rupert Syrowatka, Graz, Austria, assignors to Arus-Andritz Ruthner, Inc., Arlington, Tex.

Filed Jun. 1, 1987, Ser. No. 55,831
Int. Cl.[4] B01D *33/34*
U.S. Cl. 210—396 **18 Claims**



1. A chicane system for a belt filter, comprising:

a gravity drainage zone having a movable filter conveyor belt, inlet means for receiving a suspension on said filter belt, outlet means for discharging separated liquid and solid components of the suspension, and lateral retaining walls;

a support member mounted over said filter belt and having a longitudinal axis generally perpendicular to filter belt movement;

a plurality of flow turners depending from said support member and engaging said filter belt to prevent clogging of said filter belt by solid components of the suspension, each of said flow turners including a plow portion to extend into the suspension engaging and resting on said filter belt and a coupling portion fixed to said support member; and

sliding support means mounting said support member over said filter belt for floating translatory movement of said support member and flow turners in a vertical direction toward and away from said filter belt during operation and operatable for response to obstructive conditions on said filter belt and in the suspension.

4,857,194

INTERMITTENT VACUUM FILTER APPARATUS INCORPORATING A DOUBLE VALVE ARRANGEMENT

Henri G. W. Pierson, Tenerife, Spain, assignor to D & C Limited, Monrovia, Liberia

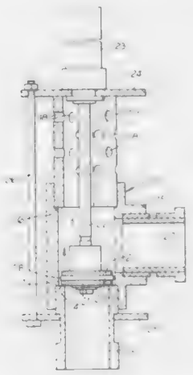
Filed Apr. 13, 1988, Ser. No. 181,103
Claims priority, application United Kingdom, Apr. 13, 1987, 8708779
Int. Cl.[4] B01D *29/02, 33/04*
U.S. Cl. 210—406 **5 Claims**

1. An intermittent vacuum filter apparatus including a filter means, means defining a vacuum source, means for communicating with the atmosphere, and a double valve arrangement installed in a pipeline connecting said filter means to said means defining a vacuum source and said means for communicating with the atmosphere, said arrangement comprising:

a pipe section having a first end connected to said means defining a vacuum source, a second end connected to said means for communicating with the atmosphere, and a lateral opening means connected to said filter means, said pipe section also being provided, internally, with mutually facing annular shoulders which are disposed at respective sides of said lateral opening means;

a pneumatic cylinder having a piston projecting into and reciprocable within said pipe section; and

a sealing disc, of smaller diameter than said pipe section, mounted on said piston and reciprocable thereby inside said pipe section to abut sealingly against the one or the other of said shoulders and thereby bring said lateral opening means alternately into communication with said first and second ends of said pipe section, which are connected, respectively to the means defining a vacuum source and to the means for communicating with the atmosphere, an annular gap always being present between the periphery of said disc and the internal surface of said pipe section.

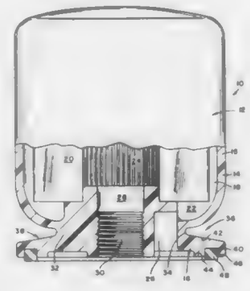


4,857,195

LIQUID FILTER WITH A DISTORTING PORTION FOR TRANSMITTING HYDRAULIC FORCES

Peter Brownell, Providence; Joseph A. Borgia, Cranston, and Robert Gabrielson, Smithfield, all of R.I., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Jul. 15, 1988, Ser. No. 219,410
Int. Cl.[4] B01D *27/08*
U.S. Cl. 210—443 **13 Claims**



1. Liquid filter comprising a housing having a pressure chamber portion including a circumferentially extending wall defining a pressure chamber therewithin, filtering media mounted in said pressure chamber for removing contaminant particles from a liquid filtrate, and inlet and outlet means for communicating the liquid filtrate into and out of said pressure chamber, said housing including a support engaging portion extending from said pressure chamber portion and including opposed circumferentially extending surfaces, one of said surfaces cooperating with the circumferentially extending wall of the pressure chamber portion to define a circumferentially extending, radially projecting recess between said one surface

and said circumferentially extending wall of said pressure chamber portion, said support engaging portion including mounting means for installing said liquid filter on a fixed support, said mounting means permitting relative deflection of said pressure chamber portion with respect to the mounting means, said recess inhibiting transfer of deflection of said pressure chamber portion with respect to said mounting means to the section of the support engaging portion separated from the pressure chamber portion by said recess.

4,857,196

POROUS HOLLOW FIBER MEMBRANE AND A METHOD FOR THE REMOVAL OF A VIRUS BY USING THE SAME

Sei-ichi Manabe, Ibaraki, and Masuo Satani, Moriyama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 82,730, Aug. 7, 1987, Pat. No. 4,808,315. This application Dec. 1, 1988, Ser. No. 278,337
Int. Cl.[4] B01D *13/01*
U.S. Cl. 210—500.3 **9 Claims**



1. A porous hollow fiber membrane comprising structure enabling essentially complete removal of a virus from a solution containing a virus at commercially acceptable filtration rates, including a porous polymer wall having a substantially annular cross-section and a hollow space defined by the inner wall surface of said porous polymer wall which hollow space extends in the longitudinal direction of said porous polymer wall, said porous polymer wall having pores which form through-passages passing from the inner wall surface to the outer wall surface of said polymer wall, and wherein the inner and outer wall surfaces of said porous polymer wall have an in-a-plane average pore diameter of 0.01 to 10 μm, said in-a-plane average pore diameter being an average pore diameter as measured in a plane perpendicular to a radial direction of said annular cross-section, and said porous polymer wall has an in-a-plane porosity of not less than 10% measured in every plane perpendicular to a radial direction of said annular cross-section, said in-a-plane porosity varying continuously between said inner wall surface and said outer wall surface, wherein said in-a-plane porosity increases in the vicinity of each of said inner and outer wall surfaces and exhibits at least one minimum value between said inner and outer wall surfaces, said in-a-plane porosity at each of said inner and outer wall surfaces being at least 1.5 times the lowest value of the in-a-plane porosity within said porous polymer wall.

4,857,197

LIQUID SEPARATOR WITH TANGENTIAL DRIVE FLUID INTRODUCTION

Grant A. Young, Tulsa, Okla.; Roy D. Lister, Keller, Tex.; William D. Wakley, Broken Arrow, and Steven L. Andrews, Tulsa, both of Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Jun. 29, 1988, Ser. No. 212,830
Int. Cl.[4] B01D *17/038*
U.S. Cl. 210—512.1 **8 Claims**

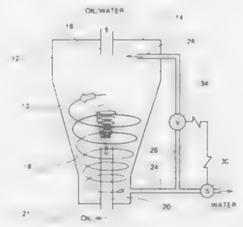
1. A hydrocyclone separator useful for separating a liquid mixture having first and second liquids of different densities, the hydrocyclone separator comprising:

means defining a substantially conical chamber having a closed upper portion and means defining a central lower opening;

means for substantially avoiding shear on said liquid mixture when first introduced into said separator including,

means defining an essentially vertical liquid mixture inlet within the closed upper portion for downwardly introducing the liquid mixture into the conical chamber;

a first liquid collecting means provided in a lower portion of the conical chamber for collecting and removing a first separated liquid;



a second liquid collecting means surrounding the central lower opening for collecting and removing a second separated liquid of a higher density; and

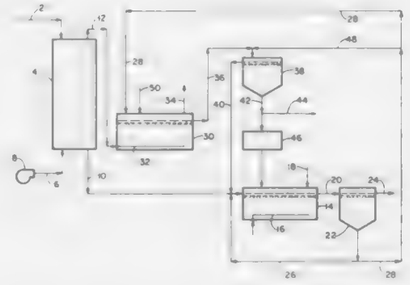
piping means for returning from the central lower opening a portion of the second separated liquid tangentially into an upper portion of the conical chamber to cause the introduced liquid mixture to rotate within the hydrocyclone separator.

4,857,198

PROCESS FOR TREATMENT OF WATER CONTAINING VOLATILE AND TOXIC COMPOUNDS

John A. Meidl, Weston, Wis., assignor to Zimpro/Passavant Inc., Rothschild, Wis.

Filed Jul. 29, 1988, Ser. No. 226,028
Int. Cl.[4] C02F *3/08*
U.S. Cl. 210—603 **31 Claims**



1. A process for treating wastewater contaminated with at least one volatile compound comprising the steps;

(a) stripping said volatile compound from said wastewater by gas stripping means to produce a gas phase containing said volatile compound and a partially-treated wastewater containing a substantially lower concentration of said volatile compound;

(b) contacting said volatile compound containing gas phase with an aqueous mixture of biological solids and powdered adsorbent, in a contacting means, to transfer a substantial portion of said volatile compound from said gas phase to said aqueous mixture of biological solids and powdered adsorbent, to form a purified gas phase which is released from said contacting means and a volatile compound contaminated aqueous mixture of biological solids and powdered adsorbent; and

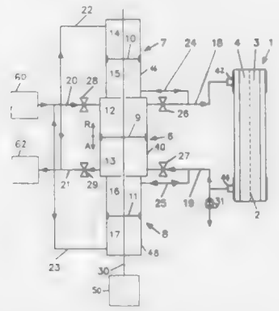
(c) treating said partially-treated wastewater from step a) by a biophysical aerobic treatment process which produces said aqueous mixture of biological solids and powdered adsorbent used in step (b), to produce a treated wastewater which is discharged from said treatment process.

4,857,199

METHOD AND SYSTEM FOR PUMPING TWO LIQUIDS IN EQUAL QUANTITIES IN AN ARTIFICIAL KIDNEY

Jean-Loup Cortial, Lyon, France, assignor to Hospal Industrie, Cedex, France

Filed Oct. 20, 1987, Ser. No. 110,347
Claims priority, application France, Oct. 20, 1986, 86 14849
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—646 **21 Claims**



1. In an artificial kidney pumping system, a method for pumping a predetermined quantity of a first liquid from a source into a first discharge line outlet, and for pumping an equal quantity of a second liquid from a second intake line inlet into evacuation means, at a substantially constant flow, said pumping system including main reciprocating pump means having first and second complementary main chambers, wherein reciprocation of said main pump means displaces a substantially equal first volume from each of said main chambers; first auxiliary reciprocating pump means having first and second complementary auxiliary chambers, wherein reciprocation of said first auxiliary pump means displaces a substantially equal second volume from each of said first and second auxiliary chambers, said second volume being substantially equal to one half said first volume; and second auxiliary pump means having third and fourth complementary auxiliary chambers, wherein reciprocation of said second auxiliary pump means displaces a substantially equal third volume from each of said third and fourth auxiliary chambers, said third volume being substantially equal to one half said first volume, comprising the steps of:

reciprocating said main pump means and said first and second auxiliary pump means between a first and a second direction such that the volume of said first main chamber varies inversely with the volume of said second and fourth auxiliary chambers, and directly with the volume of said first and third auxiliary chambers;

aspirating said predetermined quantity of said first liquid into said first main chamber from both said fourth auxiliary chamber and from said source of said first liquid during reciprocation of said pump means in said first direction;

aspirating said quantity of said first liquid into said fourth auxiliary chamber from said source of said first liquid during reciprocation of said pump means in said second direction;

discharging said quantity of said first liquid into both said second auxiliary chamber and said first discharge line outlet during reciprocation of said pump means in said second direction;

discharging said quantity of said first liquid into said first discharge line outlet from said second auxiliary chamber during reciprocation of said pump means in said first direction;

aspirating said quantity of said second liquid into said second main chamber from both said second intake line inlet and said third auxiliary chamber during reciprocation of said pump means in said second direction;

aspirating said quantity of said second liquid into said third auxiliary chamber from said second intake line inlet during reciprocation of said pump means in said first direction;

discharging said quantity of said second liquid from

discharging said quantity of said second liquid from said second main chamber into both said first auxiliary chamber and said evacuation means during reciprocation of said pump means in said first direction; and

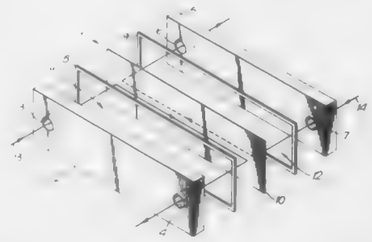
discharging said quantity of said second liquid into said evacuation means from said first auxiliary chamber during reciprocation of said pump means in said second direction whereby the same said quantity of first and second liquid flows through said first discharge line outlet and said second intake line inlet respectively, in a substantially constant flow during reciprocation of said pump means in both said first and said second direction.

4,857,200

DECHLORINATION OF AQUEOUS ALKALI METAL CHLORIDE SOLUTION

Stephen F. Kelham, Appleton, Great Britain, assignor to Imperial Chemical Industries PLC, London, England

Filed May 18, 1987, Ser. No. 50,546
Claims priority, application United Kingdom, May 23, 1986, 8612627
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—651 **15 Claims**



1. A process for dechlorinating a chlorine-containing aqueous solution of an alkali metal chloride which process comprises contacting the solution with a face of a porous membrane of a hydrophobic material and contacting an aqueous liquid with an opposite face of the membrane.

4,857,201

REVERSE OSMOSIS CELLULOSE AND CELLULOSIC MEMBRANES PREPARED BY REPEATED DRYING AND REWETTING

Laura E. Black, and Wan-Kei Wan, both of Sarnia, Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Aug. 26, 1988, Ser. No. 236,804
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—655 **14 Claims**

7. In a method for separating extraction solvents from extract or raffinate phases by selectively permeating the extraction solvent through a cellulose or cellulosic membrane under reverse conditions, the improvement comprising using a cellu-

lose or cellulosic membrane which has been dried, rewet and redried before being used to effect the desired separation.

4,857,202

SODIUM-SELECTIVE CATION EXCHANGE RESINS FOR AMMONIA-CYCLE CONDENSATE POLISHING

James T. McNulty, Perkasie, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 735,410, May 17, 1985, abandoned.
This application Apr. 3, 1987, Ser. No. 34,524
Int. Cl.[4] C02F *1/42*
U.S. Cl. 210—662 10 Claims

1. A process for selectively removing sodium cations from a solution containing sodium and ammonium cations which comprises contacting the solution with a polysulfonated aromatic cation exchange resin.

4,857,203

PROCESS FOR THE REMOVAL OF METAL IONS FROM AN AQUEOUS MEDIUM UTILIZING A COAL GASIFIER SLAG COMPOSITION

Brian G. Pope, and Daniel J. Najvar, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 21, 1987, Ser. No. 135,420
Int. Cl.[4] B01D *15/00*
U.S. Cl. 210—681 9 Claims

1. A process for removing at least one ion of a metal selected from the group consisting of Groups IB through VIIB, IIA through VA, and VIII of the Periodic Table of the Elements from an aqueous medium within which said at least one metal ion is dispersed which comprises:

forming a particulate mass of a coal gasifier slag comprising a mixed metals oxide glass, the metal oxide constituents of which are given as follows:

SiO_2	20–35 wt.
Fe_2O_3	3–12
Al_2O_3	10–22
CaO	15–35
MgO	1–5
K_2O, Na_2O	0.1–3, and

contacting together said metal ion-containing aqueous medium and said mass of coal gasifier slag sufficient to deposit said metal ion into said coal gasifier slag.

4,857,204

METHOD OF AN APPARATUS FOR STERILIZING AQUEOUS MEDIA, MORE PARTICULARLY DRINKING WATER

Otto F. Joklik, Gersthofer Strasse 120, A-1180 Wien, Austria

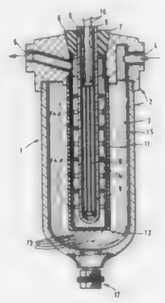
Filed Nov. 16, 1987, Ser. No. 120,900
Claims priority, application Australia, Nov. 17, 1986, 3045/86
Int. Cl.[4] C02F *1/32, 1/48, 1/78*
U.S. Cl. 210—695 16 Claims

1. An apparatus for sterilizing an aqueous medium comprising:

means for passing an aqueous medium along a path;

means along said path for producing ultraviolet rays and subjecting said aqueous medium to said ultraviolet rays; and

means along said path in a region in which said aqueous medium is subject to said ultraviolet rays for subjecting said aqueous medium, while it is subjected to said ultraviolet rays, to a magnetic field, said means for subjecting said aqueous medium to said magnetic field including a plural-



ity of magnets having poles arranged in opposite directions to one another.

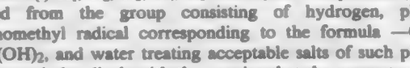
4,857,205

METHOD FOR INHIBITION OF SCALE FORMATION

Derek Redmore; Balram Dhawan, and John L. Przybylinski, all of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Feb. 22, 1988, Ser. No. 158,830
Int. Cl.[4] C02F *5/14*
U.S. Cl. 210—700 5 Claims

1. A method for inhibiting of barite scale formation in an aqueous environment, the method comprising introducing an effective amount of a barite scale inhibiting composition to an aqueous environment susceptible to barite formation, said environment having a pH of at least about 2 and at most about 10, and said barite scale inhibiting composition comprising an N-phosphonomethylated amino-2-hydroxypropylene polymer corresponding to the formula:



wherein (i) R_1, R_2, R_3, R_4, R_5 and R_6 are independently selected from the group consisting of hydrogen, phosphonomethyl radical corresponding to the formula $—CH_2PO(OH)_2$, and water treating acceptable salts of such phosphonomethyl radical, with the proviso that the percentage of R_1, R_2, R_3, R_4, R_5 and R_6 being hydrogen does not exceed about 30; (ii) R is a divalent radical selected from the group consisting of (a) unsubstituted alkylene groups having at least about 2 and at most about 12 carbon atoms atoms, (b) substituted alkylene groups having at least about 2 and at most about 12 carbon atoms wherein at least one hydrogen of the alkylene group is substituted with a radical selected from the group consisting of methyl, ethyl, propyl, butyl, methyl ammonium, ethyl ammonium and ammonium groups, and the other hydrogens of the substituted alkylene group are unsubstituted, (c) cycloalkylene groups having at least about 3 and at most about 12 carbon atoms, and (d)



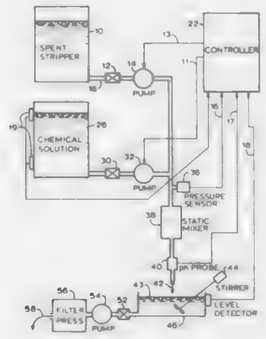
wherein R_7 is defined as R_1, R_2, R_3, R_4, R_5 and R_6 above, with the proviso that the percentage of R_1, R_2, R_3, R_4, R_5, R_6 and R_7 being hydrogen not exceed about 30, and R′ and R″ are independently selected from the group consisting of (a) unsubstituted alyklene groups having at least about 2 and at most about 12 carbon atoms atoms, (b) substituted alkylene groups having at least about 2 and at most about 12 carbon atoms wherein at least one hydrogen of the alkylene group is substituted with a radical selected from the group consisting of methyl, ethyl, propyl, butyl, methyl ammonium, ethyl ammonium and ammonium groups, and the other hydrogens of the substituted alkylene group are unsubstituted, (c) cycloalkylene groups having at least about 3 and at most about 12 carbon atoms, and (iii) n is from about 1 to about 25.

4,857,206

METHOD FOR TREATING, SPENT DRYFILM STRIPPING AND DEVELOPING SOLUTIONS

Tat Y. Choo, Dracut, Mass., assignor to TMC Corp., Lowell, Mass.

Filed Nov. 2, 1987, Ser. No. 115,515
Int. Cl.[4] C02F *1/52*
U.S. Cl. 210—709 2 Claims



1. A method of treating spent alkaline dryfilm resist stripper solutions or developer solutions or a mixture of both these solutions, used in the manufacture of printed circuit boards, leaving dissolved heavy metals in solution, which comprises the steps of:

first controllable pumping of said spent dryfilm resist stripper solutions and developer solutions containing dry film polymers and dissolved heavy metals;

second controllable pumping of a solution of aluminum sulfate and borax;

mixing the controllably pumped solutions in a mixing means, said mixing resulting in a chemical reaction of said solutions which forms a slurry of a non-sticky precipitate, composed of said dryfilm polymers, sodium and potassium sulfate, borax and aluminum hydroxide, in a supernatant liquid containing said dissolved heavy metals, and where said reaction produces negligible heat and fumes, and where sufficient aluminum sulfate and borax are mixed to neutralize the alkaline solutions and produce said non-sticky precipitate;

measuring the pH of said slurry with a pH meter to ensure completeness of said reaction;

controlling, responsive to said ph meter, said first and second pumping in proportion such that said reaction is complete;

receiving and accumulating said slurry, after said measuring means;

stirring said accumulated slurry to maintain a uniform consistency;

transferring said accumulated slurry to a filter press; and

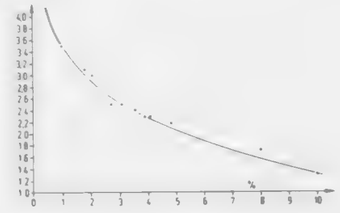
separating said precipitate from said supernatant liquid with said filter press.

4,857,207

PROCESS FOR REDUCING THE PHENOL CONTENT IN PHENOL-CONTAINING WATERS

Ulrich Hars, Dassendorf; Rolf Staiger, Hoisdorf, and Karl Westphal, Hamburg, all of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany

Filed Apr. 8, 1988, Ser. No. 179,473
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712362
Int. Cl.[4] C02F *1/52*
U.S. Cl. 210—725 4 Claims



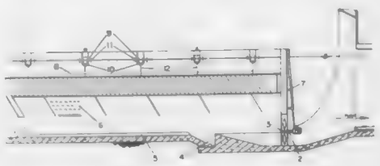
1. A process for reducing the phenol content in phenol-containing waters comprising adding formaldehyde and sufficient alkali metal hydroxide to the phenol-containing water, wherein at least 1 mole of alkali metal hydroxide is present per mole of phenolic hydroxyl groups, warming the treated water in the alkaline pH region to a temperature of 50° to 100° C. until acidification of a sample of said treated water forms a filterable precipitate of phenol formaldehyde condensate, acidifying the treated water at said temperature to form said filterable precipitate, and separating said filterable precipitate from the water.

4,857,208

HYDRAULIC SWEEP CLARIFIER AND METHOD

Ernest M. Jeanelle, 1711 Fox Run Ct., Vienna, Va. 22180

Division of Ser. No. 49,408, May 14, 1987, Pat. No. 4,816,157.
This application Sep. 8, 1988, Ser. No. 241,954
Int. Cl.[4] B01D *21/32*
U.S. Cl. 210—745 3 Claims



1. Method of clarifying liquids from a solids containing liquid body comprising the steps of:

(1) creating a horizontally flowing turbulent liquid flow path in an area defined by two side walls, two end walls and a bottom, said liquid body flowing from an inlet to an outlet formed in the end walls;

(2) creating an at least partially upwardly flowing turbulent zone above said flowpath by placing a plurality of spaced first baffle members along said flow path and disposed at a uniform distance above said bottom, said baffle members being positioned and shaped so as to minimize horizontal liquid flow in said turbulent zone and to create turbulence in an area adjacent to said spaced baffle members;

(3) forming a first quiescent zone above said turbulent zone by placing a plurality of turbulence interrupting members above said first baffle members of the turbulent zone, said turbulence interrupting members being spaced and shaped so as to divert upward turbulence at least partially trans-

versely from the vertical and shaped so as to minimize interruption of solids settling through the zone;

(4) forming a second quiescent zone above said first quiescent zone by placing a plurality of horizontal flow interrupting second baffle members above said first quiescent zone, the second baffle members being spaced along the length of said zone, and being shaped so as to minimize horizontal flow but not interrupt the settling of solids from said second quiescent zone;

(5) removing clarified liquid from the top of said second quiescent zone.

4,857,209

METHOD FOR CONTROLLING MACROINVERTEBRATES

Larry A. Lyons, Woodbury, N.J.; Dwight P. Davis, Newtown, and Paul Swered, Philadelphia, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation of Ser. No. 889,441, Jul. 23, 1986. This application Jan. 13, 1988, Ser. No. 145,659

Int. Cl.[4] C02F *1/50*

U.S. Cl. 210—755 **2 Claims**

1. A method for controlling the fouling potential of Asiatic clams in a fresh water system of the type prone to such fouling, said method consisting essentially of adding to said fresh water system an effective amount to control said Asiatic clam-based fouling of a water-soluble alkyl dimethyl benzyl ammonium chloride having an n-alkyl distribution of about 40% C_{12}, 50% C_{14}, and 10% C_{16} said alkyl dimethyl benzyl ammonium chloride compound being capable of killing at least a portion of said Asiatic clams within a 72-hour period of time after an initial exposure of up to about 24 hours to said compound.

4,857,210

METHOD AND APPARATUS FOR PREVENTION OF BLINDING OF CENTRIFUGE FILTER SCREENS

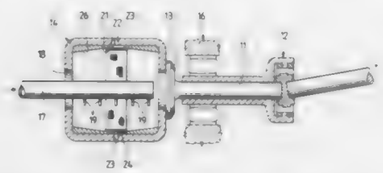
Lloyd B. Smith, Bristol, Tenn., assignor to The United Company, Bristol, Va.

Filed Apr. 7, 1988, Ser. No. 178,659

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.[4] B01D *21/26, 33/02;* **B04B** *1/06*

U.S. Cl. 210—781 **11 Claims**



8. A method of extracting water from wet particulate matter introduced into a centrifuge in the form of a slurry, with said centrifuge having a fine screen filter media internally of the bowl thereof, comprising the steps of:

(a) introducing said slurry into the rotating bowl of said centrifuge such that a turbulent condition is induced in said slurry as said bowl is being filled; and

(b) restricting the flow rate of water removed from said wet particulate matter such that fine particulate material remains suspended in said slurry while coarser particulate material is deposited on or near said filter media.

4,857,211

CLEANING OF FILTER SURFACES

Guy Nineuil, Bihorel, and Louis Rivoirard, Saint-Etienne, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed May 7, 1987, Ser. No. 46,715

Claims priority, application France, May 7, 1986, 86/06612

Int. Cl.[4] B01D *41/00*

U.S. Cl. 210—797 **15 Claims**

1. A process for the cleaning of a filter surface that has been used for the filtration of a wet process phosphoric acid slurry, comprising washing said filter surface with a solution consisting essentially of fluosilicic acid, wherein said filter surface has been preliminarily mechanically stripped of the solid filter cake formed thereon the preliminarily stripped filter surface bearing encrusted deposits of crystalline solids which are removed by said solution.

4,857,212

FIBER-TREATING COMPOSITION COMPRISING MICROEMULSION OF CARBOXY-SUBSTITUTED SILOXANE POLYMER AND USE THEREOF

Isao Ona, and Masaru Ozaki, both of Chiba, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1988, Ser. No. 184,320

Claims priority, application Japan, Apr. 24, 1987, 62-101637

Int. Cl.[4] D06M *15/63*

U.S. Cl. 252—8.6 **6 Claims**

1. A fiber-treatment composition comprising a microemulsion of a carboxyl-modified organopolysiloxane having the general formula

$$AR_2SiO(R_2SiO)_{x-1}(RASiO)_yR_2SiA$$

wherein R is a monovalent hydrocarbon group, A is R or R^1COOH, R^1 is a divalent organic group, x=350 to 2,000, y=0 to 200, and x+y=350 to 2,000 and having at least two R^1COOH groups in each molecule, said microemulsion having an averge particle size not larger than 0.15 micrometers and containing a sufficient amount of base wherein the pH of the microemulsion is 6.5 to 9.0.

4,857,213

LIQUID DETERGENT CONTAINING CONDITIONING AGENT AND HIGH LEVELS OF ALKYL SULFATE/ALKYL ETHOXYLATED SULFATE

Debra S. Caswell, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 8, 1988, Ser. No. 153,173

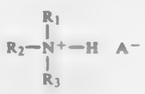
Int. Cl.[4] D06M *13/36;* **C11D** *1/65, 3/43, 17/08*

U.S. Cl. 252—8.75 **17 Claims**

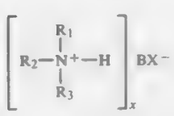
1. A liquid detergent composition comprising:

(a) from 5.0% to about 40% of a surfactant component, said surfactant component containing surfactants selected from the group consisting of alkyl sulfates, alkyl ethoxylated sulfates having an average of less than about 4.0 ethoxylate groups per alkyl sulfate molecule, and mixtures of alkyl sulfates and alkyl ethoxylated sulfates, said mixtures having an average of less than about 4.0 ethoxylate groups per molecule of said surfactants;

(b) from about 0.1% to about 20% of water-insoluble conditioning particles having an average diameter of from about 10 microns to about 500 microns, said particles comprising (i) from about 5% to about 95%, total particle weight basis, of an amine-organic anion ion-pair complex having the formula:



wherein each R_1 and R_2 independently is C_{12}–C_{20} alkyl or alkenyl, each R_3 is H or CH_3, and A is an organic anion selected from the group consisting of alkyl sulfonates, aryl sulfonates, alkylaryl sulfonates, alkyl sulfates, dialkyl sulfosuccinates, alkyl oxybenzene sulfonates, acyl isethionates, acylalkyl taurates, alkyl ethoxylated sulfates, and olefin sulfonates, and mixtures of said ion-pair complexes; and (ii) from about 95% to about 5%, total particle weight basis, of an amine-inorganic anion ion pair complex or mixture of complexes having the formula:



wherein each R_1 and R_2 independently is C_{12}–C_{20} alkyl or alkenyl, each R_3 is H or CH_3, and B is an inorganic anion selected from the group consisting or nitrate, sulfate, hydrogen sulfate, phosphate, hydrogen phosphate, and dihydrogen phosphate, and x is an integer between 1 and 3, inclusive; and

(c) a liquid base;

said detergent composition having a pH of between about 5 and about 10.

4,857,214

OIL-SOLUBLE PHOSPHORUS ANTIWEAR ADDITIVES FOR LUBRICANTS

Andrew G. Papay, Manchester, and Rolfe J. Hartley, Lemay, both of Mo., assignors to Ethylk Petroleum Additives, Inc., St. Louis, Mo.

Filed Sep. 16, 1988, Ser. No. 245,405

Int. Cl.[4] C10M *133/44, 137/02*

U.S. Cl. 252—32.5 **35 Claims**

1. An oil-soluble lubricant additive composition comprising the reaction product of an inorganic phosphorus acid or anhydride, including partial and total sulfur analogs thereof, a boron compound, and an ashless dispersant which contains basic nitrogen and/or a hydroxyl group.

4,857,215

SEMI-FLUID LUBRICANT FOR EXTREME CLIMATES

John L. Wong, 9211 Darley Dr., Louisville, Ky. 40222

Continuation-in-part of Ser. No. 844,033, Mar. 25, 1986, abandoned. This application Jul. 24, 1987, Ser. No. 77,283

Int. Cl.[4] C10M *105/50, 105/74*

U.S. Cl. 252—32.500 **31 Claims**

1. An extreme climate, semi-fluid lubricant comprising an intimate mixture of about 25% to 60% by weight of a trialkyl phosphate having a freezing point below about −20 degrees C. and the balance a grease comprising (a) perfluorocarbon polymer in powder form suitable for use as a lubricant in combination with (b) base oil and (c) lubricant additives.

4,857,216

LUBRICANT SYSTEM FOR THE PROCESSING OF POLYVINYL CHLORIDE

Kurt Worschech; Peter Wedl, both of Loxstedt; Helmut Kachel, Bremerhaven, and Guenter Schult, Loxstedt, all of Fed. Rep. of Germany, assignors to Neynaber Chemie GmbH, Loxstedt, Fed. Rep. of Germany

Filed Sep. 10, 1987, Ser. No. 95,286

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1986, 3630778

Int. Cl.[4] C10M *129/74*

U.S. Cl. 252—39 **25 Claims**

1. A lubricant system for emulsion polyvinyl chloride of high K-value comprising at least one ester from each of sections (A) and (B):

A. a neutral ester substantially free from hydroxyl and carboxyl groups which is:

(1) a mixed ester of an aliphatic, cycloaliphatic, or aromatic C_2–C_{22}-dicarboxylic acid, or a mixture thereof; an aliphatic polyol containing from 2 to 6 hydroxyl groups; and an aliphatic C_{12}–C_{30}-monocarboxylic acid; or is

(2) a fatty acid fatty alcohol ester containing a total of 36 to 44 carbon atoms; or is

(3) a mixture of (1) and (2); and

B. a partial ester containing on average at least one free hydroxyl or carboxyl group which is:



(1) a mixed ester of an aliphatic, cycloaliphatic, or aromatic C_2–C_{22}-dicarboxylic acid, or a mixture thereof; and aliphatic polyol containing from 2 to 6 hydroxyl groups; and an aliphatic C_{12}–C_{30}- monocarboxylic acid; said ester containing an average at least one hydroxyl grup per molecule of mixed ester; or is

(2) an ester of an aliphatic, cycloaliphatic, or aromatic polycarboxylic acid or an aliphatic, cycloaliphatic or aromatic hydroxycarboxylic acid, or a mixture thereof; and an aliphatic C_{12}–C_{24}-monohydric alcohol; said ester containing on average at least one hydroxyl or carboxyl group per molecule of ester; or is

(3) a mixture of (1) and (2).

4,857,217

DISPERSANT ADDITIVES DERIVED FROM AMIDO-AMINES

Antonio Gutierrez, Mercerville, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Nov. 30, 1987, Ser. No. 126,405

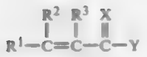
Int. Cl.[4] C10M *105/60*

U.S. Cl. 252—47 **39 Claims**

1. An oil soluble dispersant mixture useful as an oil additive comprising an adduct of:

(A) a long chain hydrocarbyl substituted C_4 to C_{10} monounsaturated dicarboxylic acid producing material formed by reacting an olefin polymer of C_2 to C_{10} monoolefin having a number average molecular weight of about 300 to 10,000 and a C_4 to C_{10} monounsaturated acid material, said acid producing material having an average of at least about 0.8 dicarboxylic acid producing moieties, per molecule of said olefin polymer present in the reaction mixture used to form said acid producing material; and

(B) an amido-amine or a thioamido-amine by being a reaction product of at least a polyamine and an alpha, beta-unsaturated compound of the formula:



wherein X is sulfur or oxygen, Y is —OR^4, —SR^4, or —NR^4(R^5), and R^1, R^2, R^3, R^4 and R^5 are the same or different and are hydrogen or substituted or unsubstituted hydrocarbyl.

4,857,218

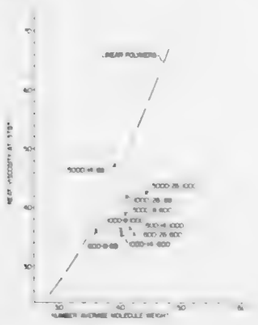
LUBRICATION METHOD AND COMPOSITIONS FOR USE THEREIN

Debra J. Meschke, Valley Cottage, N.Y., and Kenneth L. Hoy, St. Albans, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 641,640, Aug. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 468,670, Feb. 22, 1983, abandoned. This application Aug. 22, 1985, Ser. No. 768,473

Int. Cl.⁴ C10M *145/00, 173/02*

U.S. Cl. 252—49.3 **73 Claims**



1. In a method of reducing friction between two articles moving relative to, and closely adjacent, one another by disposing between adjacent surfaces of the two articles a lubricant composition comprising water and a polymer dissolved therein, the improvement which comprises using as the polymer a connected branch copolymer comprising:

(A) a core segment having a valence of v, wherein v is an integer, and having correspondingly v terminal bonds each connected to one of a group of:

(B) v polyvalent, non-crosslinked branched polymer segments each having an average of t terminal bonds, wherein t is greater than about two, one of said terminal bonds being connected to said core segment, and each of said branched polymer segments being connected via its remaining (t−1) terminal bonds to:

(C) a set of linear polymer segments, with an average of (t−1) linear polymer segments per set, to provide a group of about v(t−1) linear polymer segments wherein the linear polymer segments have substantially similar chain lengths and composition within the group, the connected branch copolymer having a group of terminal linear polymer segments bearing terminal groups capable of hydrogen bonding.

4,857,219

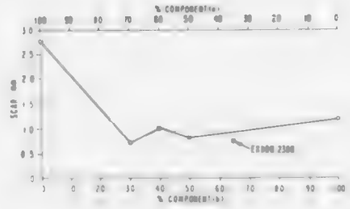
LUBRICATING COMPOSITION

Louis A. Cargnel, Unity Township, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 9, 1988, Ser. No. 191,630

Int. Cl.⁴ C10M *111/02*

U.S. Cl. 252—52 R **9 Claims**



1. A composition suitable for use as a high temperature coolant and lubricant comprising a mixture of:

(a) a mixture of monobenzylated ethyl benzene dibenzylated ethyl benzene and tribenzylated ethyl benzene; and

(b) a polyphenyl ether.

4,857,220

BASE OIL OF LUBRICATING OIL FOR MECHANICAL APPARATUSES WITH ORIFICE MECHANISM

Katsumi Hashimoto, Ichihara, Japan, assignor to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed May 2, 1988, Ser. No. 190,262

Claims priority, application Japan, May 14, 1987, 62-115967

Int. Cl.⁴ C10M *145/14*

U.S. Cl. 252—56 R **6 Claims**

1. A base oil for a lubricating oil to be used in a mechanical apparatus with an orifice mechanism, having a kinematic viscosity at 40° C. of 3 to 500 cSt, a pour point of −25° C. or lower, and a cloud point of −25° C. or lower.

4,857,221

RECOVERING COAL FINES

Gerald F. Brookes, Cotgrave, and Lynne Spencer, Alvaston, both of England, assignors to Fospur Limited, Derbyshire, England

Continuation of Ser. No. 109,036, Oct. 16, 1987. This application Aug. 12, 1988, Ser. No. 231,675

Int. Cl.⁴ B03D *1/02*

U.S. Cl. 252—61 **9 Claims**

1. An additive composition for use in recovering coal fines in preference to shale fines in a froth flotation process, said composition comprising a hydrophobic polyvinyl ether present in an amount sufficient to selectively flocculate coal fines in preference to shale fines in said froth flotation process, a frother present in an amount sufficient to provide a froth in said froth flotation process, and a liquid organic carrier.

4,857,222

ABSORPTION TYPE REFRIGERATOR AND ABSORBING SOLUTION THEREFOR

Masahiko Itoh, Hitachioota; Heihatiro Midorikawa, Hitachi; Yasumasa Furutani, Katsuta, and Michihiko Aizawa, Ushiku, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1988, Ser. No. 149,476

Claims priority, application Japan, Jan. 30, 1987, 62-18424

Int. Cl.⁴ C09K *5/04*

U.S. Cl. 252—69 **9 Claims**

1. In an absorption type refrigerator comprising an absorber containing therein an absorbing solution for absorbing a refrigerant to form a diluted absorbing solution and generate absorption heat, said absorbing solution comprising a lithium bromide aqueous solution containing an inhibitor, a regenerator provided with heating tubes for regenerating the diluted absorbing solution by heating the diluted absorbing solution to concentrate the absorbing solution through evaporation of the refrigerant, a condensor for condensing the evaporated refrigerant and an evaporator for evaporating the condensed refrigerant to cool a coolant and for supplying said absorber with an evaporated refrigerant, the improvement comprising an aqueous absorbing solution that is a 65 wt % lithium bromide aqueous solution and an inhibitor consisting of $LiNO_3$ of which the NO_3— concentration is in a range of 5–150 ppm by weight and 0.1–0.4% by weight of LiOH, based on the weight of the lithium bromide aqueous solution.

4,857,223

NON-CAKING BLEACHING DETERGENT COMPOSITION CONTAINING A LOWER HYDRATE OF SODIUM PERBORATE

Giuseppe Borrello, Anzio, Italy, assignor to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 784,437, Oct. 3, 1985, Pat. No. 4,741,851. This application Apr. 22, 1988, Ser. No. 185,014

The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

Int. Cl.⁴ C11D *1/66, 3/39, 17/06, 11/00*

U.S. Cl. 252—91 **20 Claims**

1. A process for the manufacture of a particulate bleaching detergent component for incorporation in a non-caking particulate bleaching detergent composition which is stable when stored in a sealed container at elevated temperature, which comprises absorbing a synthetic organic nonionic detergent which is normally in a solid state at room temperature, in liquid state at elevated temperature by particulate sodium per-borate hydrate, the hydration of which corresponds to 1 to 15% of water in the hydrate, with the proportion of the nonionic detergent being about 5 to 30% in the particulate bleaching detergent component, and cooling the nonionic detergent in the perborate hydrate particles to solidify it.

4,857,224

MONOPERSULFATE-CONTAINING CLEANSERS

Anthony B. J. Eoga, Boonton, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 594,085, Mar. 28, 1984, abandoned. This application Feb. 23, 1989, Ser. No. 314,604

The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.

Int. Cl.⁴ C11D *7/18, 7/10, 17/00*

U.S. Cl. 252—99 **20 Claims**

1. A cleansing composition in tablet form especially useful for cleaning dentures comprising:

(a) a pre-granulated mixture of an anhydrous perborate, a perborate monohydrate and a polymeric fluorocarbon compound, the ratio of the anhydrous to the monohydrate being about 0.5:1 to about 1.75:1 and the polymeric fluorocarbon being present in amounts of about 0.05% to about 0.85% by weight of the pre-granulated mixture; and

(b) about 30% to about 65% by weight of a monopersulfate compound, based on the weight of the total cleansing composition.

12. A process for preparing a cleansing composition comprising

(a) preparing a compacted mixture comprising anhydrous perborate salts and perborate monohydrate salts in combination with a polymeric fluorocarbon as a compacting aid compound; and

(b) grinding said compacted mixture into a pre-granulation having a particle size which will pass through a standard screen with a mesh size of about 10 to about 20; and

(c) blending the pre-granulation with a monopersulfate salt compound; and

(d) forming the resultant blended mixture into a tablet.

4,857,225

CLEANING CHEMICAL FOR ALUMINIUM SURFACE

Haruyoshi Terada; Youji Ono; Yokichi Satoh, and Hideaki Kaneko, all of Tokyo, Japan, assignors to Nihon Parkerizing Co., Ltd., Japan

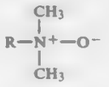
Filed Jan. 11, 1988, Ser. No. 142,128

Claims priority, application Japan, Jan. 12, 1987, 62-4778

Int. Cl.⁴ C11D *7/54;* **D06L** *3/00*

U.S. Cl. 252—100 **9 Claims**

1. A cleaning chemical for removing lubricants and press oils from an aluminum containing surface comprising an aqueous acidic liquid which contains water, 0.05 to 10 grams per liter of a peroxy acid or salt thereof, 0.05 to 2 grams per liter of an alkyl dimethylamine oxide surface active agent of the formula



in which R is C_{12-22} alkyl, and at least one member of the group consisting of sulfuric acid, phosphoric acid and nitric acid containing 0.005 to 0.5 gram per liter of fluoride ion and said liquid having a pH of from 0.6 to 2.0.

4,857,226

THIXOTROPIC CLAY AQUEOUS SUSPENSIONS CONTAINING POLYACRYLIC ACID POLYMER OR COPOLYMER STABILIZERS

Julien Drapier, Seraing; Chantal Gallant, Cheratte, and Daniel van de Gaer, Flemalle, all of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 29, 1986, Ser. No. 924,385

Int. Cl.⁴ C11D *17/00*

U.S. Cl. 252—174.25 **36 Claims**

1. An aqueous thixotropic automatic dishwasher composition comprising approximately by weight:

(a) 5 to 35% alkali metal tripolyphosphate;

(b) 2.5 to 20% sodium silicate;

(c) 0 to 9% alkali metal carbonate;

(d) 0.1 to 5% chlorine bleach stable, water-dispersible organic detergent active material;

(e) 0 to 5% chlorine bleach stable foam depressant;

(f) chlorine bleach compound in an amount to provide about 0.1 to 4% of available chlorine;

(g) thixotropic thickener in an amount sufficient to provide the composition with a thixotropy index of about 2 to 10;

(h) 0 to 8% of sodium hydroxide;

(i) a physical and rheological properties stabilizing agent comprising about 0.5 to 1.5 percent of a water soluble polyacrylic acid polymer or copolymer with a polycarboxylic acid or polycarboxylic acid anhydride, or salts thereof, said polyacrylic acid polymer or copolymer containing acrylic acid units of the formula



wherein R_1, R_2 and R_3 can be the same or different and can be hydrogen, C_1–C_4 lower alkyl, M represents hydrogen, or an alkali metal, n=5 to 2,000 and the polymer or copolymer has a molecular weight of 1,000 to 200,000, and about 0.1 to 0.5 percent of a polyvalent metal salt of a long chain fatty acid; and

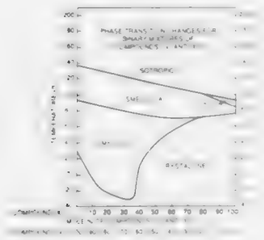
(j) balance water.

4,857,227

LIQUID CRYSTAL MIXTURES HAVING WIDENED SMECTIC TEMPERATURE RANGE

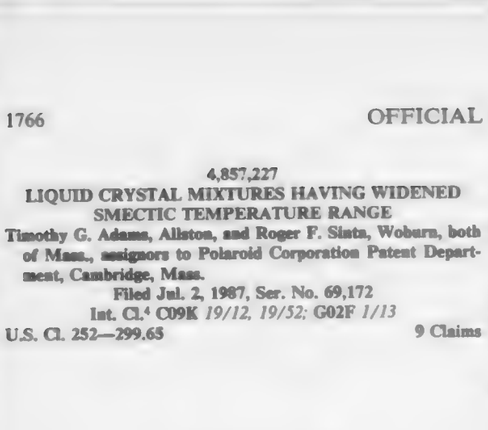
Timothy G. Adams, Allston, and Roger F. Sinta, Woburn, both of Mass., assignors to Polaroid Corporation Patent Department, Cambridge, Mass.

Filed Jul. 2, 1987, Ser. No. 69,172
Int. Cl.[4] C09K *19/12, 19/52;* G02F *1/13*
U.S. Cl. 252—299.65 9 Claims



1. A liquid crystal composition exhibiting a smectic C mesomorphic phase and comprising a mixture of liquid crystal ester compounds, said mixture comprising

at least one ester compound from each of the classes of ester compounds having, respectively, the following first and second formulas



wherein, in each of said first and second formulas, R^1 has from 1 to 4 carbon atoms,



p is zero or one, and R^4 and R^5 are dissimilar alkyl groups, said first and second formula esters being present in said liquid crystal composition in a molar ratio, respectively, of from 98:2 to 60:40.

4,857,228

PHOSPHORS AND METHODS OF PREPARING THE SAME

Gabriella H. Kabay, and Ernest Kabay, both of Sovizzo, Italy, assignors to Sunstone Inc., Dayton, N.J.

Continuation of Ser. No. 922,864, Oct. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 842,731, Mar. 20, 1986, abandoned, which is a continuation of Ser. No. 603,304, Apr. 24, 1984, abandoned. This application Nov. 23, 1988, Ser. No. 275,689
Int. Cl.[4] C09K *11/88*
U.S. Cl. 252—301.4 S 22 Claims

1. An infrared stimulable phosphor consisting essentially of:

(a) an alkaline earth sulfur selenium crystalline matrix the alkaline-earth metal selected from the group consisting of strontium, calcium and combinations thereof, wherein the molar ratio of S to Se is between about 1:10 and 10:1;

(b) Eu as a first activator in an amount of about 5 to about 500 ppm by weight based on the weight of the matrix; and

(c) Bi, Sm or combinations thereof, as a second activator each in an amount of about 5 to about 500 ppm by weight based on the weight of the matrix,

said activators being dispersed within said matrix, said matrix and said activators cooperatively defining active sites adapted to store energy upon exposure of the phosphor to visible or ultraviolet light, said active sites being adapted to emit said stored energy as visible light upon exposure of the phosphor to infrared light, said phosphor including at least about 5×10^{17} of said active sites per cm^3 and having a stimulation quantum efficiency of at least 5 percent.

10. A method of making an infrared-stimulable phosphor as defined in claim 1 comprising the steps of:

(a) firing a mass of starting material comprising one or more fluxes selected from the group consisting of CaF_2, SrF_2, LiF, MgF_2, NaCl, $SrSO_4$, $SrCl_2$, SrO, $SrSO_3$ and combinations thereof, said first and second activators, and a matrix-forming material comprising one or more alkaline-earth metals selected from the group consisting of Ca and Sr and one or more chalcogens selected from the group consisting of S and Se at an elevated exposure temperature sufficient to cause recrystallization of said matrix-forming material into a crystalline matrix consisting essentially of said alkaline-earth metals and said chalcogens, and disperse said activators in said matrix;

(b) exposing said mass during said firing step at said exposure temperature to a treating atmosphere comprising S vapor and Se vapor by keeping the reaction mass in a closed or semi-closed vessel during firing wherein the ratio of internal volume to starting material volume is about 10:1 or less, said exposure temperature being sufficient to cause release of S, Se or both from said mass and replacement thereof by said vapors; and then

(c) cooling said matrix.

4,857,229

PARTIAL OXIDATION PROCESS OF SULFUR, NICKEL, AND VANADIUM-CONTAINING FUELS

Mitri S. Najjar, Hopewell Junction, N.Y., and James Roland, Blacksburg, Va., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 51,982, May 19, 1987. This application Oct. 17, 1988, Ser. No. 258,947
Int. Cl.[4] C01B *3/22, 3/24*
U.S. Cl. 252—373 35 Claims

1. A process for the production of gaseous mixtures comprising H_2+CO by the partial oxidation of a fuel feedstock comprising a heavy liquid hydrocarbonaceous fuel having a nickel and vanadium containing ash or petroleum coke having a nickel and vanadium-containing ash or mixtures thereof; and said feedstock includes a minimum of 0.5 wt. % of sulfur; and said ash includes a minimum of 5.0 wt. % vanadium and a minimum of 0.5 ppm nickel, said process comprising:

(1) mixing together a basalt additive with said fuel feedstock; wherein the weight ratio of basalt additive to ash in said fuel feedstock is in the range of about 1.0–8.0 and there is at least 10 parts by weight of Si+Fe+Ca for each part by weight of vanadium; and wherein said basalt additive has the following composition comprising in weight percent (wt. %) SiO_2 in the range of about 38 to 53, and the oxides Fe, Ca, Al, and Mg each in the range of about 5 to 15;

(2) reacting said mixture from (1) at a temperature in the range of 2100° F. to 2600° F. and a pressure in the range of about 5 to 250 atmospheres in a free-flow refractory lined partial oxidation reaction zone with a free-oxygen containing gas in the presence of a temperature moderator and in a reducing atmosphere to produce a hot raw effluent gas stream comprising H_2+CO and entrained molten slag; and where in said reaction zone said basalt additive interacts with the said ash and sulfur from said feedstock to produce molten slag comprising a minor amount of oxysulfide liquid phase washing agent, and a major amount of liquid silicate phase; and wherein from about 5.0 to 35 wt. % of vanadium-containing oxide laths and spinels and other ash components and bits of refractory are washed out of the reaction zone by said oxysulfide liquid phase, and the remainder of said vanadium-containing oxide laths and spinels are washed out of the reaction zone and/or are dissolved by said silicate phase; and

(3) separating nongaseous materials from said hot raw effluent gas stream.

4,857,230

STABILIZING COMPOSITION FOR POLYOLEFINS

Tooru Matsumura, Kanagawa, Japan, assignor to Tonen Sekiyukagaku K.K., Tokyo, Japan

Filed Jan. 14, 1988, Ser. No. 143,984
Claims priority, application Japan, Jan. 23, 1987, 62-12484
Int. Cl.[4] C08K *5/34, 5/52;* C09K *15/30, 15/32*
U.S. Cl. 252—400.24 9 Claims

1. A stabilizing composition for polyolefins suitable for use in formed articles, said stabilizing composition consisting of a relatively high molecular weight hindered amine compound, and an organic phosphorous compound having relatively low hygroscopicity, and a hydrotalcite.

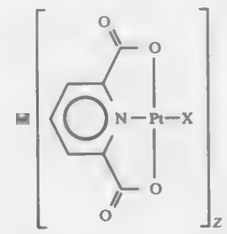
4,857,231

THERMOCHROMIC PLATINUM COMPLEXES

Nenad M. Kostic, and Xia-Ying Zhou, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jun. 6, 1988, Ser. No. 202,456
Int. Cl.[4] C07D *279/00, 285/00*
U.S. Cl. 252—408.1 11 Claims

1. Thermochromic platinum(II) complexes of the formula:



wherein M is a cation, X is a halide ion, and Z is a whole number equal to the positive charge of M.

4,857,232

CABLE CONDUCTOR SHIELD

Norman M. Burns, Jr., North Plainfield, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 23, 1988, Ser. No. 172,217
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—511 2 Claims

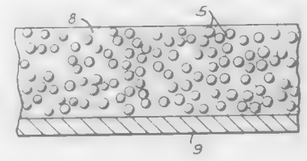
1. An extruded crosslinked cable conductor shield consisting essentially of (i) 100 parts by weight of ethylene-vinyl acetate copolymer wherein the vinyl acetate is present in an amount of about 8 to about 14 parts by weight; (ii) polyethylene having a density of about 0.90 to about 0.95 gram per cubic centimeter in an amount of about 29 to about 36 parts by weight; and (iii) carbon black having a surface area of about 650 to about 1200 square meters per gram in an amount of about 19 to about 25 parts by weight

4,857,233

NICKEL PARTICLE PLATING SYSTEM

Robert J. Teichmann, Belleville; James F. Walther, Mountain Lakes, and Mulhall Robert C., Verona, all of N.J., assignors to Potters Industries, Inc., Carlstadt, N.J.

Filed May 26, 1988, Ser. No. 199,196
Int. Cl.[4] H01B *1/16, 1/22*
U.S. Cl. 252—513 8 Claims



1. A particulate material for an electroconductive body, the material comprising, in combination:

a multiplicity of nickel particles having an average particle size of from 10 to 500 microns in maximum dimension;

a copper-containing coating on each of the nickel particles, the copper-containing coating on each particle being at least about 20 percent by weight of the particle; and

a coating of noble metal surrounding the copper coating on each particle and having a maximum thickness of about 15 percent of the maximum particle dimension.

7. An electroconductive body comprising, in combination:

a nonconductive matrix;

a multiplicity of nickel particles embedded in the matrix and having an average particle size of from 10 to 500 microns in maximum dimension;

a copper coating on each of the nickel particles, the copper on each particle being at least about 50 percent by weight of the particle; and

a silver coating surrounding the copper coating on each particle and having a maximum thickness of about 15 percent of the maximum particle dimension.

4,857,234

METHOD FOR MAKING A PARTITIONING RADIOACTIVE TRACER

Preston L. Gant, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Mar. 31, 1988, Ser. No. 176,074
Int. Cl.[4] C09K *11/00, 11/04;* G21G *4/00;* G01V *5/00*
U.S. Cl. 252—645 5 Claims

1. A method of preparing a radioactive iodoethanol tracer material comprising:

(a) combining chloroethanol and an alkali-metal salt of radioactive iodine;

(b) reacting the combined materials in the presence of acti-

vated carbon for a time sufficient to exchange substantially all the iodine in the salt with chlorine in the chloroethanol; and

(c) recovering a reaction product containing radioactive iodoethanol produced by the reaction.

4,857,235

PROCESS OF PREPARATION OF NOVEL RHODIUM HYDROGENATION CATALYSTS AND THEIR APPLICATION

William Heggie, Barreiro; Philip R. Page, Sintra; Ivan Villax, Lisboa Codex, all of Portugal; Indira Ghatak, London, and Michael Hursthouse, Chelmsford, both of England, assignors to Pluripharm Aastalt, Switzerland

Filed May 15, 1987, Ser. No. 50,932

Claims priority, application Portugal, Mar. 25, 1987, 76061

Int. Cl.[4] C07C *103/19*; C07F *15/00*

U.S. Cl. 260—351.5 13 Claims

1. In a process for the stereospecific hydrogenation of an acid addition salt of 6-demethyl-6-deoxy-6-methylene-5-hydroxytetracycline in the presence of a catalyst to prepare α-6-deoxy-5-hydroxytetracycline, wherein the hydrogenation is carried out at a temperature between 60° C. and 100° C., at a pressure of 1 to 10 kg/cm^2 and under acid conditions, until the reaction is complete, followed by isolation of the thus formed compound, the improvement which comprises the catalyst being the product of the reaction between rhodium trinitrate, a hydrazine and a tertiary phosphine, whereby the thus formed compound is obtained in high yield and purity.

4,857,236

PROCESS FOR ISOLATING PHOSPHATIDYLCHOLINE FREE OF LYSOPHOSPHATIDYLCHOLINE FROM EGG POWDER

Bernd-Rainer Günther, Bergheim, Fed. Rep. of Germany, assignor to A. Nattermann & Cie GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 806,769, Dec. 9, 1985. This application May 26, 1987, Ser. No. 57,695

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1984, 3445950

Int. Cl.[4] C07F *9/10*

U.S. Cl. 260—403 11 Claims

1. A process for isolating phosphatidylcholine free of lysophospholipid from egg powder wherein the egg powder is extracted with a solvent mixture of a low boiling petroleum ether fraction (40° to 80° C.), a lower C_1–C_4-alkanol and water, the undissolved material is separated from the solution phase, the solution phase is introduced into a column filled with silica gel at a temperature in the range from 20°to 50° C., the elution is carried out at that temperature with the same solvent mixture, the main run is collected and the dissolved phosphatidylcholine is isolated therefrom.

4,857,237

PROCESS FOR PREPARING REFINED OIL

Heinz-Peter J. Kopp, Brake, Fed. Rep. of Germany; Jannes G. Lammers, Maasluis, Netherlands; Jacob A. van der Wolk, Dordrecht, Netherlands, and Willibrordus T. De Groot, Mijnsheerenland, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Sep. 2, 1987, Ser. No. 92,013

Claims priority, application United Kingdom, Sep. 8, 1986, 8621614

Int. Cl.[4] C11B *3/16*

U.S. Cl. 260—409 17 Claims

1. Process for preparing refined oil comprising removing nickel, by incorporating into a crude edible oil an aqueous substance selected from water and steam in an effective amount to accomplish nickel agglomeration but no higher than 4%, forming with said aqueous substance and crude edible oil a dispersion containing water, nickel and oil, and maintaining said dispersion at a temperature from 60° C. to 220° C. and thereafter filtering the dispersion.

4,857,238

MANUFACTURING METHOD FOR ALKYLDIHALOGENOPHOSPHINES

Hiromu Tsuchiya; Shukichi Nabekawa, and Masao Takada, all of Tokyo, Japan, assignors to Nippon Chemical Industrial Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1988, Ser. No. 225,169

Claims priority, application Japan, Apr. 28, 1988, 63-103794

Int. Cl.[4] C07F *9/52*

U.S. Cl. 562—820 8 Claims

1. A manufacturing method for an alkyldihalogenophosphine, comprising reducing the reaction product of a Friedel-Crafts reaction between an alkyl halide and a trihalide of phosphorus using yellow phosphorus in the presence of iodine as a catalyst.

4,857,239

PROCESS FOR THE SYNTHESIS OF (MATH)ACRYLIC ANHYDRIDES

Patrice Hurtel; Denis Laurent, both of Saint Avold, and Joseph Rondini, Ham Sous Varsberg, all of France, assignors to Norsolor, Paris Defense, France

Continuation of Ser. No. 945,989, Dec. 24, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 188,585

Claims priority, application France, Dec. 24, 1985, 85 19116

Int. Cl.[4] C07C *57/04*

U.S. Cl. 562—896 9 Claims

1. Process for the synthesis of (meth)acrylic anhydrides according to which (meth)acrylic acid is reacted with acetic anhydride in the presence of at least one polymerization inhibitor, in a reactor surmounted by a distillation column, the process being characterized in that the mole ratio of (meth)acrylic acid to acetic anhydride is chosen to be between 2.05 and 5, in that the reaction is performed in the absence of catalyst, and in that:

the acetic acid formed during the reaction is drawn off, and

at least one polymerization inhibitor is gradually introduced into the top of the distillation column during the reaction and the distillation enabling the (meth)acrylic anhydride formed to be separated.

4,857,240

FRAGRANCE VAPOR DISPENSER MOUNTING BRACKET

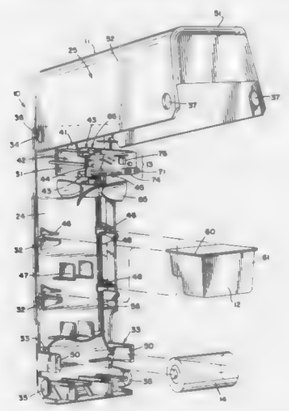
Thom Kearnes, Akron; Joel Wennerstrom, Streetsboro, and William Glover, Chesterland, all of Ohio, assignors to The State Chemical Mfg. Co., Cleveland, Ohio

Filed Aug. 8, 1988, Ser. No. 229,838

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—26 1 Claim

1. In a fragrance dispenser having a fragrance pack mounting onto a cabinet, the improvement of the fragrance pack having two laterally disposed sidewards extending upper lips and a cut out inset back edge and said mounting including three



brackets, two for the laterally disposed upper lips respectively and one for the inset back edge of the fragrance pack.

4,857,241

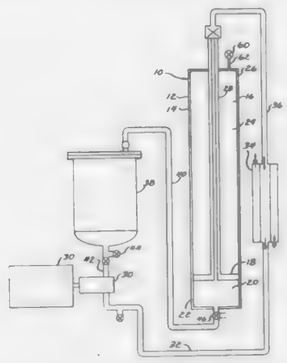
APPARATUS FOR MAKING POST-FOAMING GELS AND METHOD

Alan Straw, Cheshire, and Roger D. Ellis, Lancashire, both of Great Britain, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 10, 1987, Ser. No. 131,203

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—152 9 Claims



1. An apparatus for making post-foaming gels, comprising:

a piston chamber having an outer case defining a chamber, a piston being slidably received in the case and separating the chamber into a first compartment adjacent one end of the case for retaining a gel base, and a second compartment adjacent the other end of the case for retaining a compressed gas, said piston having a hollow stem extending out of the other end of the case;

means for circulating the gel base through the stem and first compartment; and

means for introducing a foaming agent to the gel base while it is being circulated through the piston chamber.

4,857,242

METHOD FOR MANUFACTURING A LIGHT WAVEGUIDE CABLE

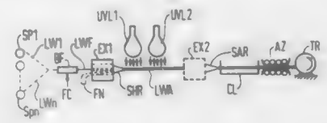
Thomas Hoffmann, Augsburg; Ernst Mayr, Starnberg, and Helmut Sailer, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 25, 1988, Ser. No. 198,757

Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717852

Int. Cl.[4] B29D *11/00*

U.S. Cl. 264—1.4 14 Claims



1. A method for manufacturing a light waveguide lead having at least one light waveguide which is provided with an outer coating and which is disposed in an outer protective sheath, said method comprising the steps of providing at least one light waveguide with an at least partially cross-linkable filling compound, extruding a protective sheath on said waveguide with the filling compound on it, said protective sheath being fabricated of at least a partially light permeable material, drawing the extruded sheath into a stretch cone with the cone having a small end of the desired diameter for the sheath, hardening the protective outer sheath with the desired diameter, illuminating the hardened outer protective sheath by a light radiation which passes through the sheath to irradiate the filing compound and cross-link the filling compound following the formation of the outer sheath.

4,857,243

PROCESS OF MAKING MICROSPHERULES OF ACTIVATED CARBON

Hubert Von Blücher, Freytagstr. 45; Hasso Von Blücher, Columbusstr. 58, both of 4000 Düsseldorf, 1, and Ernest De Ruiter, Höhenstr. 57a, 5090 Leverkusen 1, all of Fed. Rep. of Germany

Division of Ser. No. 855,195, Apr. 23, 1986, which is a continuation-in-part of Ser. No. 788,279, Oct. 17, 1985, abandoned. This application Dec. 24, 1987, Ser. No. 138,240

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1985, 3510209; European Pat. Off., Feb. 15, 1986, 86101960

Int. Cl.[4] B29B *9/00*; B29C *67/02*

U.S. Cl. 264—13 6 Claims

1. A method for producing microspherules of activated carbon, comprising kneading activated carbon particles of a size below 100 μm, together with a dispersion of a water-insoluble synthetic resin to form an intimate mixture; pressing the mixture through a screen having holes related to the size of the desired microspherules; powdering the pressed material; and granulating and drying the resulting microspherules, the resulting microspherules having a diameter of from 0.1 to 1 mm.

4,857,244

PROCESS OF MAKING A COMPOSITE PRODUCT, ESPECIALLY A VEHICLE TIRE

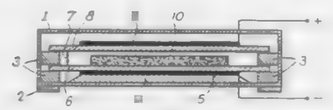
Michel Berger, Castelnau-de-Medoc, France, assignor to Pradom Limited, London, United Kingdom

Continuation-in-part of Ser. No. 777,622, Sep. 19, 1985, Pat. No. 4,707,231. This application Mar. 19, 1987, Ser. No. 27,793

Claims priority, application France, Sep. 26, 1984, 84 14800; Jan. 23, 1987, 87 00797; Feb. 18, 1987, 87 02106; Feb. 18, 1987, 87 02105

Int. Cl.[4] B29B *15/08*; B29C *35/02, 43/18*

U.S. Cl. 264—24 26 Claims



1. A process for the manufacturer of a vulcanized composite material having improved mechanical and wear properties, the composite material having reinforcing fibers that reinforce a vulcanizable matrix, comprising the steps of:

subjecting the fibers in a dry state to an electrostatic field that is induced by a high-voltage electric current to prepare the fibers to be impregnated;

impregnating said fibers with a vulcanizable liquid matrix or precursor of a vulcanizable matrix while still under the effect of said electrostatic field thereby consolidating bonding between the fibers and the matrix; and

vulcanizing the impregnated fibers/matrix composite, thereby obtaining said vulcanized composite material.

14. A process for the manufacturer of a composite material usable as a vehicle tire having improved mechanical and wear properties, the composite material having tire reinforcing fibers that reinforce a tire matrix, comprising the steps of:

subjecting the fibers in a dry state to an electrostatic field that is induced by a high-voltage electric current to prepare the fibers to be impregnated;

impregnating said fibers with a liquid matrix or precursor of a matrix while still under the effect of said electrostatic field thereby consolidating bonding between the fibers and the matrix; and

vulcanizing the impregnated fibers/matrix composite, so that the resulting vulcanized material is usable as a vehicle tire.

4,857,245

METHOD OF DRYING CERAMIC CYLINDRICAL BODIES

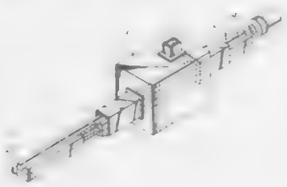
Shinji Oshima, Ama, and Hiromi Shimada, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Sep. 28, 1987, Ser. No. 101,405

Claims priority, application Japan, Oct. 18, 1986, 61-248149

Int. Cl.[4] B29C *47/86*

U.S. Cl. 264—25 5 Claims



1. A method of drying an extruded ceramic cylindrical body, comprising:

providing a porous support immediately proximate to an extrusion opening of an extrusion die, said porous support including an upper surface having a recessed portion which corresponds to a shape of said extruded ceramic cylindrical body, a porosity of 30–50%, and a pore size of about 1–20 μm;

supporting an immediately extruded ceramic cylindrical body at a floating state on said porous support adjacent said upper surface by an air pressure jetted from an inside of said porous support through said upper surface;

drying said extruded ceramic cylindrical body while said body is at said floating state; and

simultaneously supplying hot air to an inside of said extruded ceramic cylindrical body, such that said hot air provides drying of an inner portion of said extruded ceramic cylindrical body, whereby an outer portion of said body and the inner portion of said body are substantially simultaneously dried and said extruded ceramic cylindrical body is substantially free from deformation.

4,857,246

ALUMINUM NITRIDE ARTICLES BY CARBOTHERMAL NITRIDATION

John D. Bolt, Landenberg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 21, 1988, Ser. No. 146,407

Int. Cl.[4] C04B *35/58*

U.S. Cl. 264—29.2 10 Claims

1. In a process for producing aluminum nitride fibers or films by carbonizing and nitriding a precursor fiber or film comprising a source yielding carbon and a source yielding alumina, and sintering the nitrided fiber or film in an inert atmosphere, the improvement comprising:

(a) stabilizing the precursor fiber or film at a temperature of 200°–400° C. prior to carbonizing;

(b) providing sufficient carbon source in the precursor fiber or film such that the mole ratio of carbon to alumina in the carbonized fiber or film is from 3.0–4.2;

(c) heating the nitrided fiber or film at a temperature of 500°–750° C. in the presence of oxygen for from 1 to 60 minutes to remove excess carbon; and

(d) incorporating a sintering aid source in the fiber or film prior to sintering such that the sintering aid will be present in an amount up to 7% by weight based on AlN in the fiber or film.

4,857,247

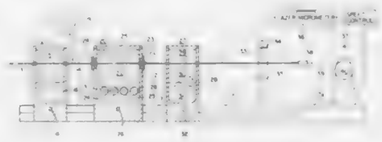
METHOD FOR DRAWING THERMOPLASTIC TUBING

Jan Raczkowski, Glendale, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 897,385, Aug. 18, 1986, abandoned. This application Dec. 23, 1987, Ser. No. 137,066

Int. Cl.[4] B29C *55/30, 55/22*

U.S. Cl. 264—40.7 29 Claims



8. A method for drawing fluoropolymer tubing to enhance the optical and dimensional properties thereof, said method comprising:

(a) heating a fluorocarbon resin tubing with a high temperature oil bath, said oil bath having a temperature of at least 150° C.,

(b) drawing said tubing through a heated and polished diamond die, said die being heated by said oil bath, said tubing having a drawing diameter at least 10% smaller that the diameter of the tube to be drawn,

(c) rapidly cooling the tubing to enhance the optical transmittance of the fluoropolymer tubing.

4,857,248

METHOD OF MANUFACTURING COSMETIC PUFF AND MANUFACTURING FRAMEWORK FOR USE IN THE METHOD

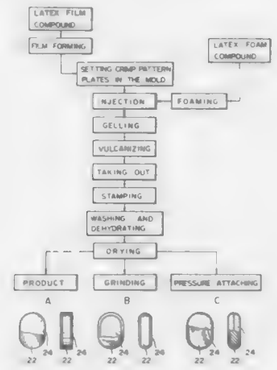
Yoshihiro Marume, and Tadao Iwamoto, both of Hiroshima, Japan, assignors to Nishikawa Rubber Co., Ltd., Hiroshima, Japan

Filed Dec. 7, 1987, Ser. No. 129,556

Claims priority, application Japan, Feb. 14, 1987, 62-31897

Int. Cl.[4] C08J *9/30*; B29C *67/20, 39/12, 41/22*

U.S. Cl. 264—46.4 3 Claims



1. A method of manufacturing a cosmetic puff for liquid foundation comprising the steps of:

preparing a latex compound;

preparing a latex film compound;

forming a latex film coating on one side of a crimp pattern plate by applying the latex film compound thereon;

setting the latex film coating crimp pattern plates in a manufacturing framework;

foaming the latex compound to form a latex foam compound;

injecting the foamed latex foam compound into the manufacturing framework through inlet ports while adding coagulant and activator therein to produce a gelled latex foam covered with latex films on both surfaces; and

vulcanizing the gelled latex foam and the latex films simultaneously to bond the latex films onto the gelled latex foam.

4,857,249

FABRICATION OF RODS OF UNIFORM HIGH DENSITY FROM POWDERS OF REFRACTORY MATERIALS

Antonio C. Pastor, Santa Monica; Anthony L. Gentile, Thousand Oaks, and Joseph A. Wysocki, Oxnard, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 931,310, Nov. 17, 1986, abandoned. This application Aug. 16, 1988, Ser. No. 233,920

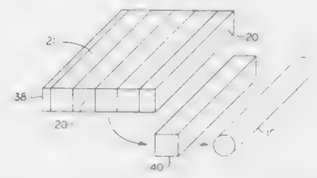
Int. Cl.[4] B28B *11/08, 11/14*; B29C *43/00*

U.S. Cl. 264—67 7 Claims

1. A process for preparing a uniformly dense cylindrical rod having a length greater than its diameter, comprising the steps of:

furnishing a refractory material powder;

hot pressing the powder into a plate having two parallel faces with dimensions greater than the dimension through the thickness of the plate, the plate having at least one face dimension as long as the required length of the rod and a thickness greater than the diameter of the cylindrical rod, said step of hot pressing to occur at elevated temperature and with uniaxial pressing pressure applied parallel to the thickness direction of the plate;



cutting bars of the hot pressed material from the plate; and machining the cut bars to a cylindrical rod form.

4,857,250

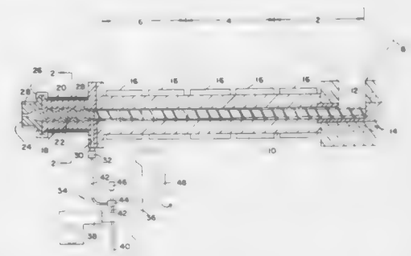
ONE-EXTRUSION METHOD OF MAKING A SHAPED CROSSLINKABLE EXTRUDED POLYMERIC PRODUCT

George M. Gale, Shrewsbury, United Kingdom, and Aldo A. Sorlo, Geneva, Switzerland, assignors to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 13, 1984, Ser. No. 599,954

Int. Cl.[4] B29C *47/50*

U.S. Cl. 264—83 17 Claims



11. An extruder specially adapted to provide a silane crosslinked polymeric product having

(a) a hollow barrel;

(b) a forwarding screw rotatably mounted in said barrel to advance a thermoplastic polymer therethrough and to compact and melt said polymer therein;

(c) an extruder mixer positioned at the discharge end of said extruder, said mixer having a hollow stator in axial alignment with the discharge end of said barrel to receive compacted, melted polymer therefrom, and a rotor positioned within said stator in axial alignment with said screw and rotatable thereby within said stator, the surfaces of the rotor and stator being formed with pluralities of rows of concave cavities extending peripherally around said stator and rotor, said rows being spaced apart axially so that the rows on the stator are axially offset from the rows on the rotor and there is axial overlap of the cavities in adjacent rows on the stator and rotor, the cavities in adjacent rows on the stator being circumferentially offset and the cavities in adjacent rows on the rotor being circumferentially offset for subjecting said compacted, melted polymer passing through said mixer to rapid distributive mixing action;

(d) injection means positioned in the upstream end portion of said stator for injecting fluid compounding ingredients into said compacted, melted polymer passing through said stator, said injection means having a discharge tip disposed below the surface of the compacted, melted polymer flowing through said stator; and

(e) one-way valve means connected to said injection means

to allow the flow of compounding ingredients into said compacted, melted polymer but prevent flow out of said stator into said injection means.

13. The method of making a cross-linked extruded elongated product comprising:

(a) feeding into the hopper of a screw extruder which has a barrel and a screw extending from end to end of the barrel, a polymer capable of being cross-linked by the use of a liquid silane compound which comprises a hydrolyzable, olefinically unsaturated silane, a free-radical generator, and a condensation catalyst;

(b) conveying the polymer through the barrel of the extruder;

(c) heating and melting while conveying the polymer through the barrel of the screw extruder;

(d) metering and injecting a liquid silane compound comprising a hydrolyzable, olefinically unsaturated silane, a free-radical generator, and a condensation catalyst into the melted polymer;

(e) mixing and blending said silane compound and said melted polymer to obtain a uniform blended mixture thereof;

(f) extruding said blended mixture through an extrusion die to form an elongated product of a required final shape; and

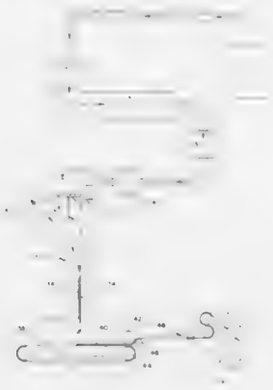
(g) subjecting said elongated product to the action of moisture until said polymer is cross-linked.

4,857,251

METHOD OF FORMING A NONWOVEN WEB FROM A SURFACE-SEGREGATABLE THERMOPLASTIC COMPOSITION

Ronald S. Nohr, Roswell, and J. Gavin MacDonald, Decatur, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 14, 1988, Ser. No. 181,282
Int. Cl.[4] D04H *3/00*; D02J *3/00, 13/00*
U.S. Cl. 264—103 **94 Claims**



1. A method of forming a nonwoven web from a surface-segregatable, melt-extrudable thermoplastic composition which comprises at least one thermoplastic polymer and at least one siloxane-containing additive having at least two moieties, A and B, which method comprises the steps of:

(A) forming fibers by extruding a molten thermoplastic composition through a die;

(B) drawing said fibers;

(C) collecting said fibers on a moving foraminous surface as a web of entangled fibers, which fibers have less than about 0.35 percent by weight, based on the weight of said fibers, of solvent-extractable additive at their interfacial surfaces and have surface properties characteristic of said at least one thermoplastic polymer; and

(D) heating said web at a temperature of from about 27° to about 95° C. for a period of time sufficient to provide at least about 0.35 percent by weight, based on the weight of said fibers, of solvent-extractable additive at the interfacial surfaces of the fibers, which fibers have a surface property characteristic of said at least one additive as a consequence of said heating; in which:

(1) said moiety A and moiety B act as a single molecular unit which is compatible with said polymer at melt extrusion temperatures but is incompatible at temperatures below melt extrusion temperatures, but each of said moiety A and moiety B, taken as separate molecular units, is incompatible with said polymer at melt extrusion temperatures and at temperatures below melt extrusion temperatures;

(2) moiety B has at least one functional group which imparts to said additive said at least one characteristic;

(3) the molecular weight of said additive is in the range of from about 400 to about 10,000; and

(4) said additive is present in said thermoplastic composition at a level of from about 0.5 to about 2 percent by weight, based on the weight of said polymer.

4,857,252

FIBERBOARD SHIMS CONTAINING BLOCKED ISOCYANATES

Wayne R. Melchior, Plymouth, and Mieczyslaw Talik, Dearborn Heights, both of Mich., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Sep. 11, 1987, Ser. No. 95,161
Int. Cl.[4] B27N *3/18*
U.S. Cl. 264—118 **6 Claims**

1. A process for manufacturing hardened fiberboard shims comprising:

combining cellulosic fiber, a blocked isocyanate and water soluble thermosetting resin said thermosetting resin having a cure temperature below a cure temperature of said blocked isocyanate to from a pulp furnish;

forming a fiberboard from said furnish by forming an uncured sheet and heating said sheet to a temperature above the cure temperature of said thermosetting resin and less than the cure temperature of said blocked isocyanate thereby curing said thermosetting resin;

cutting said fiberboard to form a shim; and

curing said shim, thereby causing said blocked isocyanate to react with said cellulosic fiber.

4,857,253

METHOD OF MANUFACTURING A FLUID ACTUATOR FOR BRAKES AND CLUTCHES

Richard D. Candle, and Robert C. Schisler, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 22,920, Mar. 6, 1987, Pat. No. 4,773,519. This application Jun. 20, 1988, Ser. No. 208,519
Int. Cl.[4] B29C *45/14*
U.S. Cl. 264—130 **5 Claims**

1. A method of manufacturing a closed, hollow toroidal structure having an interior working cavity bounded by an interior surface and a rigid internal annular plate adhered on an annular surface thereof to said interior surface comprising:

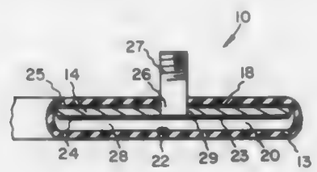
(a) treating a first annular surface of said rigid annular plate with a release coating for preventing sticking of a later applied elastomer to said plate:

(b) applying to a second annular surface of said rigid annular plate adhesion promoting coating capable of intimately adhering said plate to said later applied elastomer;

(c) positioning said plate within a mold having a generally toroidal internal cavity, said plate being medially positioned within said cavity;

(d) placing a fluid conduit having an internal and an external end within said cavity such that said internal end extends into said internal cavity of said mold substantially adjacent to said first flat annular surface of said flat annular plate, and said external end of said conduit extends outside of said toroidal internal cavity of said mold:

(e) filling said toroidal internal cavity with an elastomer; and



(f) subjecting said elastomer simultaneously to sufficient heat and pressure to cure said elastomer and adhere it to said second annular surface while said first annular surface remains unattached to said elastomer, thereby forming said closed, hollow toroidal structure with said interior working cavity communicating with said fluid conduit.

4,857,254

METHOD FOR GRAFTING MONOMERS ONTO MOLTEN HYDROCARBON POLYMER

Chun S. Wong, Kingston, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Filed Feb. 22, 1988, Ser. No. 158,676
Int. Cl.[4] B29C *47/36*
U.S. Cl. 264—211.24 **3 Claims**

1. A method for the preparation of a graft polymer in the absence of an initiator, comprising the steps of:

(a) feeding one polymer selected from the group consisting of homopolymers of ethylene and propylene and copolymers of ethylene or of propylene with at least one of butene-1, hexene-1, 4-methyl pentene-1, and octene-1 to an extruder and conveying the polymer, in a molten condition, through the extruder;

(b) feeding two grafting monomers, one monomer being styrene and the other monomer being maleic anhydride, to the extruder, said grafting monomers being capable of undergoing thermally-induced copolymerization at a temperature lower than the temperature of the starting polymer in said extruder, said grafting monomers being fed to the extruder such that one of said grafting monomers is contacted with the other of said grafting monomers in the presence of molten polymer and under admixing conditions such that the polymer and grafting monomers are rapidly admixed;

(c) rapidly admixing said monomers and polymer for a period of at least ten seconds; and

(d) extruding the resultant modified polymer from the extruder.

4,857,255

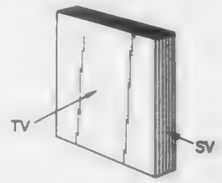
POLY-P-PHENYLENE-TEREPHTHALAMIDE FILM AND PROCESS FOR PRODUCING THE SAME

Taichi Imanishi, and Shigemitsu Muraoka, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 847,741, Apr. 3, 1986, Pat. No. 4,752,643. This application Oct. 2, 1987, Ser. No. 103,641
Claims priority, application Japan, Apr. 4, 1985, 60-71663; Apr. 4, 1985, 60-71664
Int. Cl.[4] B29C *39/42, 15/00*
U.S. Cl. 264—216 **8 Claims**

1. A process for producing a poly-p-phenyleneterephthalamide film, which comprises forming an optically anisotropic dope containing a poly-p-phenyleneterephthalamide having an inherent viscosity ηinh of 2.5 dl/g or higher and at least one solvent selected from the group consisting of sulfuric acid, chlorosulfuric acid and fluorosulfuric acid into a film while maintaining its optical anisotropy, placing said film-shaped dope under an atomosphere of either (A) or (B) shown below:

(A) in a gas of an absolute humidity of 3 g (water)/Kg (dry air) or higher and a relative humidity of 99% or lower;



(B) in a gas of 45° C. or higher containing water in the form of saturated steam, super-saturated steam or mist,

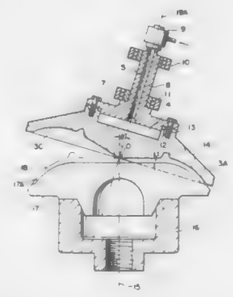
thereby to convert substantially said film-shaped dope to optically isotropic, then coagulating the dope, subsequently washing the coagulated product and drying the washed product while restricting shrinkage.

4,857,256

JIGGERING METHOD AND PROFILE TOOL FOR CERAMIC WARE PLASTIC CLAY

Shigemi Fujii, Handa; Eisuke Kumazaki, Nagoya, and Kazutoshi Shigematsu, Tajimi, all of Japan

Continuation-in-part of Ser. No. 785,355, Oct. 7, 1985, Pat. No. 4,786,457. This application May 7, 1987, Ser. No. 47,173
Claims priority, application Japan, Oct. 8, 1984, 59-209771
Int. Cl.[4] B28B *1/02*
U.S. Cl. 264—310 **16 Claims**



1. A jiggering method for ceramic ware plastic clay comprising:

(a) providing a charge of said plastic clay on a jigger;

(b) providing a jiggering profile tool having a jiggering surface disposed relative to said jigger and plastic clay such that during the jiggering operation the jiggering surface of said profile tool is in contact with less than the entire surface area of said plastic clay charge; and

(c) jiggering said plastic clay charge into ceramic ware by contacting said surface of the profile tool to said plastic clay charge while rotating said profile tool and said plastic clay charge and providing a thin gas film between said plastic clay and said jiggering surface of the profile tool by supplying said jiggering surface of the profile tool with a gas by ejecting the gas from the outside of said jiggering surface while heating said jiggering profile tool at a tem-

perature in the range of about 50° C. to about 60° C. by heat separate from said ejected gas, thereby preventing said plastic clay from sticking to said profile tool.

16. A jiggering apparatus for ceramic ware plastic clay, comprising:

a rotatable jiggering profile tool having a jiggering surface disposed relative to a jigger and plastic clay such that during the jiggering operation, the jiggering surface of said profile tool is in contact with less than the entire surface area of said plastic clay charge,

a jigger driven by a driving unit,

a mold secured on the jigger,

gas supply means for ejecting a gas from the outside of said jiggering surface into a space between the jiggering surface of said tool and a charge of plastic clay,

means separate from the heat of said ejected gas for heating and temperature-controlling said jiggering profile tool at a temperature in the range of about 50° C. to about 60° C., and

means for controlling the relative rotational speed difference between the mold and the profile tool in relation with the amount of the gas to be ejected,

thereby providing a thin film between said plastic clay and the jiggering surface of said tool to prevent the plastic clay from sticking to said jiggering surface during jiggering operation.

4,857,257

ROTATIONALLY MOLDING CROSSLINKABLE POLYETHYLENE COMPOSITION

Shu P. Chen; Theodore R. Engelmann, and Harold D. Oltmann, all of Baton Rouge, La., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jun. 13, 1983, Ser. No. 503,989

Int. Cl.[4] B29C *41/04*

U.S. Cl. 264—310 **10 Claims**

1. A method comprising rotationally molding a composition consisting essentially of:

a polymer selected from the group consisting of ethylene homopolymers, ethylene copolymers, and mixtures thereof, the polymer having substantially complete terminal saturation;

an organic peroxide crosslinking agent;

an allyl crosslinking co-agent;

a metal compound having a cation selected from Group IIA and IIB of the Periodic Table of Elements; and

a peroxide scavenger.

4,857,258

PROCESS FOR THE MANUFACTURING OF A MULTILAYER PLASTIC CONTAINER

Georges F. J. Le Doux, St. Bernardusstraat 14, 6211 HL Maastricht, and Johannes H. Geesink, Holsterbeek 5, 6166 JS Geleen, both of Netherlands

Filed Feb. 28, 1986, Ser. No. 834,358

Claims priority, application Netherlands, Feb. 1, 1986, 8600251

Int. Cl.[4] B29C *49/22*

U.S. Cl. 264—515 **5 Claims**

1. A process for the preparation of a multilayer plastic container, comprising the steps of:

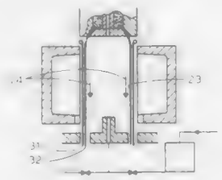
(a) introducing a first multi-ply plastic layer between sections of an opened container mold;

(b) thereafter introducing a second inflatable layer between said sections of the opened container mold, wherein said second layer is surrounded by said first layer, whereby a first inner surface of the first layer faces a second outer surface of the second layer, and wherein said second, inflatable layer is in the melt phase and is introduced by extrusion from a first point above said mold;

(c) after step (b), mechanically clamping the first and second layers together at a second point below said mold;

(d) after step (c), inflating said second layer until said first and second layers are in contact over substantially all of said first and second surfaces;

(e) after step (d), closing the sections of the mold around said first and second layers; and



(f) after step (e), further inflating the second layer to force the first and second layers against the mold, whereby a multilayer plastic container is prepared.

4,857,259

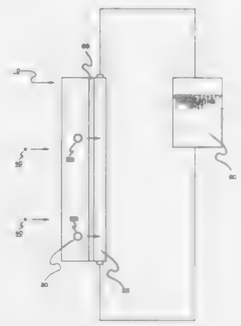
NEUTRON DOSIMETER

John Bartko, Monroeville; Karl F. Schoch, Jr., Wilkins Township, Allegheny County; Thomas V. Congedo, Edgewood, and Stanwood L. Anderson, Jr., Plum Boro, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 16, 1986, Ser. No. 863,899

Int. Cl.[4] G21C *17/00*

U.S. Cl. 376—154 **10 Claims**



10. A nuclear reactor comprising:

(a) a reactor core;

(b) a thermal shield surrounding said reactor core;

(c) a pressure vessel surrounding said thermal shield;

(d) a neutron dosimeter positioned outside of said thermal shield, said neutron dosimeter comprising a layer of fissile material and a second layer made of a material having an electrical conductivity which permanently varies as a function of its cumulative ion radiation dose; and

(e) means, outside said pressure vessel and electrically connected to said layer of second material, for measuring electrical conductivity of said layer of second material.

4,857,260

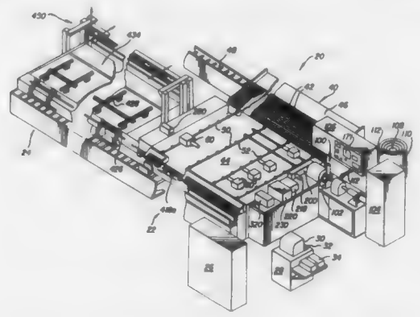
APPARATUS FOR ASSEMBLING AND WELDING END PLUGS TO NUCLEAR FUEL CLADDING TUBES AND INSPECTING THE END PLUG WELDS ON AN AUTOMATED BASIS

Frederick C. Schoenig, Jr.; Edward S. Walker, both of Wilmington, N.C.; Michael K. Caeman, Niskayuna, N.Y.; Robert A. Haughton, and Jaime A. Zuloaga, Jr., both of Wilmington, N.C., assignors to General Electric Company, San Jose, Calif.

Filed Sep. 28, 1988, Ser. No. 250,059

Int. Cl.[4] G21C *21/00, 17/00*

U.S. Cl. 376—245 **35 Claims**



26. Automated apparatus for welding a separate end plug to one open end of each of a succession of nuclear fuel cladding tubes and for inspecting each end plug weld, said apparatus comprising, in combination:

A. a welding station including

(1) a supply of end plugs,

(2) end plug handling means for picking individual end plugs from said supply for mating with one open end of each tube successively presented to said welding station, and

(3) a welder operating to weld the mated end plug to the tube;

B. a cooldown statior for cooling each end plug weld in an inert gas atmosphere;

C. a serial number reader station for reading a unique serial number inprinted on each end plug;

D. a first weld inspection station for inspecting each end plug weld and for generating first weld inspection data indicative of the weld internal characteristics;

E. a second weld inspection station for inspecting each end plug weld and generating second weld inspection data indicative of the weld external characteristics;

F. a computer system linked with said serial number reader and said first and second weld inspection stations, said computer system operating to correlate said first and second weld inspection data with the associated end plug serial number for each end plug weld and processing said inspection data to determine whether each end plug weld meets established engineering standards pursuant to issuing appropriate accept/reject signals in correlation with the associated end plug serial number;

G. an input queue for holding a plurality of tubes;

H. a tube transporter for periodically picking individual tubes from said input queque and conveying the tubes in a direction transverse to their tube axis in indexing steps to index positions respectively axially aligned with said welding, serial number reader, and first and second weld inspection stations, said tube transporter including separate drive means positioned at said index positions for axially reciprocating the tubes into and out of said welding, serial number reader, and first and second weld inspection stations; and

I. a sorter positioned at an output end of said tube transporter and operating in response to said accept/reject signals from said computer system to sort the tubes successively transported thereto into separate accept and reject lots.

4,857,261

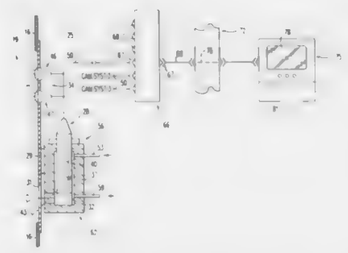
REACTOR VESSEL HEAD AREA MONITORING SYSTEM

James R. Marshall, Penn Hills, and Mary F. Thorn, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 31, 1988, Ser. No. 238,380

Int. Cl.[4] G21C *17/00*

U.S. Cl. 376—248 **20 Claims**



1. In a nuclear reactor pressure vessel having a removable closure head with a plurality of ports projecting therethrough, and an upwardly extending shroud enclosing said ports, the shroud having a plurality of openings therein, a reactor vessel head area monitor comprising:

(i) a video camera attached to the cooling shroud adjacent one of said openings;

(ii) a lens operably attached to the camera such that the video camera receives video images of the reactor vessel head area within the shroud; and

(iii) a light source attached to the shroud for illuminating the reactor vessel head area

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4,857,262

SYSTEM FOR SINGULARIZING FUEL RODS IN A FUEL ELEMENT

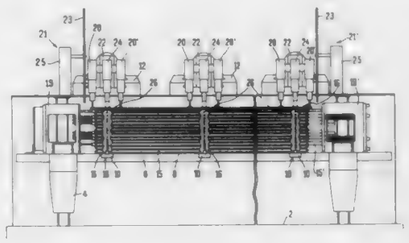
Harry Spilker, Bad Munder, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 830,056, Feb. 14, 1986, abandoned. This application Mar. 2, 1988, Ser. No. 163,274

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1985, 3505242

Int. Cl.[4] G21C *19/33*

U.S. Cl. 376—261 **20 Claims**



1. A method for singularizing fuel rods in a fuel element, whereby the fuel rods are retained in a spacer grid arrangement between a head piece and a foot piece, characterized by:

severing said head piece and foot piece, wherein the spacer grid arrangement is progressively severed layer by layer from fuel rod plane to fuel rod plane and removed from the fuel rods to expose said fuel rods; and

lifting said exposed fuel rods out of said fuel element layer by layer and reshuffling said fuel rods in a more compact arrangement.

4,857,263

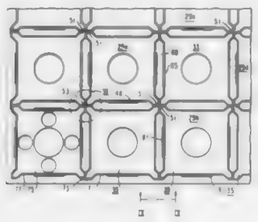
STORAGE OF SPENT NUCLEAR FUEL

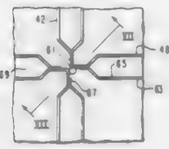
Octavio J. Machado, Pensacola; Jay T. Moore, Milton, both of Fla., and Barry F. Cooney, Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 470,905, Mar. 1, 1983, abandoned. This application Nov. 30, 1987, Ser. No. 127,615

Int. Cl.[4] G21C *19/40*

U.S. Cl. 376—272 6 Claims





1. A rack for storing nuclear fuel assemblies, said rack including a base, an array of side-by-side fuel-storage locations, each location being a hollow body of rectangular transverse cross section formed of metallic sheet means which is readily bent, each said body having a volume therein dimensioned to receive a fuel assembly, said bodies being mounted on said base with each body secured to bodies adjacent said each body along welded joints, each said joint joining directly the respective contiguous corners of said each body and of said bodies adjacent to said each body and being formed by a series of separate welds spaced longitudinally between the tops and bottoms of the secured bodies along said each joint, the spacings of the separate welds being such that the response of the rack when it is subjected to the anticipated seismic acceleration of the rack, characteristic of the geographical region where the rack is installed, is minimized.

4,857,264

FRICTIONALLY LOADED TOP END SUPPORTS FOR CANTILEVER-MOUNTED ROD GUIDES OF A PRESSURIZED WATER REACTOR

Luciano Veronesi, O'Hara Township, Allegheny County, and Larry A. Shockling, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 926,302, Nov. 3, 1986. This application May 29, 1987, Ser. No. 55,590

Int. Cl.[4] G21C *1/01*

U.S. Cl. 376—353 36 Claims

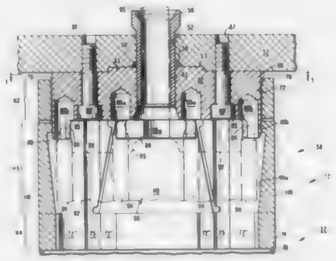
1. A frictionally loaded top end support for each of plural rod guides disposed in closely spaced, parallel axial relationship within the inner barrel assembly of a pressurized water reactor vessel, the inner barrel assembly occupying a central portion of the vessel and being of a vertical height extending from a first plate of lower elevation to a second plate of higher elevation within the vessel, said second plate being moveable axially into and out of assembled relationship with the inner barrel assembly, each said rod guide having a thin sidewall portion of elongated configuration and being of an axial length corresponding substantially to the vertical height of said inner barrel assembly and mounted at the lower end thereof to the first plate for accommodating in axial, sliding relationship therewithin a respectively associated cluster of elongated rods, said frictionally loaded top end support comprising, for each said rod guide:

a fixed, generally cylindrical support having an upper end closure adapted for being secured to the lower surface of the second plate and having an integral depending sidewall of generally cylindrical configuration;

means for securing said fixed cylindrical support to the second plate;

an axially extending sleeve, comprising lower and upper axial portions of continuous, annular configuration integrally joined by a central portion, affixed at a lower end thereof to the upper end of the associated thin sidewall of said rod guide and having a generally cylindrical interior surface and being of an axial length for telescopingly receiving said fixed cylindrical support and disposing the upper end of said sleeve closely adjacent to but displaced from the lower surface of the second plate when in the assembled relationship; and

a plurality of leaf springs formed at angularly displaced positions in said central portion of said sleeve, each extending axially and integrally from said lower portion of said sleeve and having a free end adjacent said upper portion of said sleeve, the free ends of said leaf springs defining interior arcuate segments lying on a diameter less than the diameter of said sidewall of said associated, fixed cylindrical support and being engaged thereby for resiliently, outwardly deflecting said leaf spring in said assembled relationship, and said leaf springs producing frictional loading on said fixed cylindrical support sufficient to maintain alignment of said associated sleeve and fixed cylindrical support with said upper annular portion nominally, concentrically spaced from said sidewall of said fixed cylindrical support.



4,857,265

WIRING INSTALLATION FOR CONNECTION OF ELECTRIC DEVICES OF A NUCLEAR REACTOR

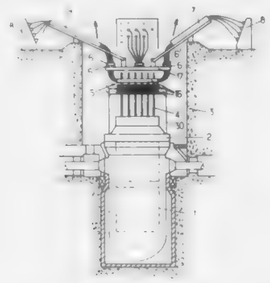
Dejeux Pol, Nogent Sur Marne, and Desfountaines Guy, Puteaux, both of France, assignors to Framatome, Courbevoie, France

Filed Dec. 23, 1987, Ser. No. 137,029

Claims priority, application France, Dec. 24, 1986, 8618165

Int. Cl.[4] G21C *17/00;* G21D *1/02*

U.S. Cl. 376—463 8 Claims



1. In combination with a nuclear reactor having a vessel provided with a removable cover, a wiring installation for elctrical connections of a piurality of devices of the nuclear reactor, comprising:

(a) a plurality of first multiwire cables each extending at least from certain ones of said devices and terminated with a first connector located above said cover at an end remote from said device,

(b) a plurality of second multiwire cables each for connection with a respective one of the first cables and each having:

(b_1) a first section having at a proximal end thereof one second connector for disconnectable connection to one of said first connectors and at a distal end thereof a third connector,

(b_2) a second section having at a proximal end thereof a fourth connector for disconnectable connection to said third connector and at a distal end thereof a first multicables connector having a plurality of electrical contacts connected to respective wires of said second section, said first multicables connector being common to at least ten independent second sections,

(b_3) a third section having at a proximal end thereof a second multicables connector having a plurality of electrical contacts connected to respective wires of said third section and corresponding to respective wires of said second section, said second multicables connector being common to at least ten independent third sections corresponding to said independent second sections for removable connection to said first multicables connector, and at a distal end thereof a fifth connector for connection with a respective sixth connector fixed on a plate remote from the reactor vessel,

and further comprising:

(c) a plurality of movable supports each for receiving all those of said third sections which are connected to predetermined ones of said second multicables connectors, all said third sections being supported by respective ones of said movable supports and each of said supports being movable between a position where the respective second multicables connector is coupled with the associated first multicables connector and a second position where the movable support clears the access above the nuclear reactor vessel.

4,857,266

DISPERSION STRENGTHENED COPPER

Haskell Sheinberg, Los Alamos, N. Mex.; Thomas T. Meek, Knoxville, Tenn., and Rodger D. Blake, Santa Fe, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 5, 1988, Ser. No. 281,158

Int. Cl.[4] B22F *1/00*

U.S. Cl. 419—22 9 Claims

1. A method for making a composition of matter comprised of copper and particles which are dispersed throughout the copper, where the particles are comprised of copper oxide or copper having a coating of copper oxide, said method comprising;

a. oxidizing at least a portion of copper which is in the form of a powder to form particles, each particle consisting of copper having a thin film of copper oxide on its surface;

b. consolidating said powder and particles to form a workpiece; and

c. exposing said workpiece to microwave radiation in an inert atmosphere until a surface of said workpiece reaches a temperature of at least 500° C.

4,857,267

ALUMINUM BASE BEARING ALLOY AND METHOD OF PRODUCING SAME

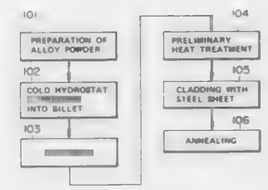
Yoshihiro Maki, Miura; Akira Matsuyama, Kamakura; Katsuji Tanizaki, Yokosuka; Noboru Okabe, Funabashi; Katsuhiro Kishida, Yokosuka; Takeshi Sakai, Chiba; Toshinaga Ohgaki, Yachiyo, and Masahito Fujita, Funabashi, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and NDC Co., Ltd., Naraschino, both of, Japan

Division of Ser. No. 934,861, Nov. 25, 1986, abandoned. This application Sep. 29, 1987, Ser. No. 104,595

Claims priority, application Japan, Nov. 29, 1985, 60-268866

Int. Cl.[4] C22C *21/02, 21/04*

U.S. Cl. 419—31 15 Claims



1. A method of producing an aluminum base bearing alloy comprising the steps of:

heating a powder of a first aluminum base alloy consisting essentially of 8–12 wt% of Pb, 0.4–1.8 wt% of Sn, 1.0–15 wt% of Si, 0.2–5.0 wt% of at least one reinforcing element selected from the group consisting of Cu, Cr, Mg, Mn, Zn and Fe and the balance of Al at a temperature in the range from 350° to 550° C. until the Si grains in the alloy powder grow to 6–12 μm;

after the heating step, mixing the first aluminum base alloy powder with a powder of a second aluminum base alloy which contains at least one lubricating element selected from the group consisting of Pb, Sn, In, Sb and Bi;

compacting said alloy powder mixture into a billet;

extruding said billet at an extrusion ratio not lower than 10;

[redacted]

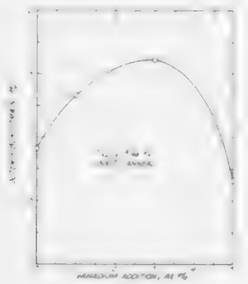
the mixing of the first and second aluminum base alloy powders and the extrusion of said billet being made such that in the extruded aluminum base alloy the content of Si is in the range from 0.01 to 0.17 by sectional area ratio to the aluminum matrix and the total content of Pb and Sn as essential lubricating elements and In, Sb and Bi as optional lubricating elements is more than 0.04 and not more than

0.07 by sectional area ratio to the aluminum matrix, while the total content of said at least one reinforcing element is 0.2–5.0 wt%, in the extruded alloy the grain size of Si being not larger then 12 μm and the grain size of every lubricating element being not larger than 8 μm.

4,857,268
METHOD OF MAKING VANADIUM-MODIFIED TITANIUM ALUMINUM ALLOYS

Shyh-Chin Huang, Latham, and Michael F. X. Gigliotti, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,476
Int. Cl.[4] C22C *14/00*; C21D *1/00*
U.S. Cl. 420—418 **8 Claims**



1. A method of forming a titanium aluminum alloy of high strength and significant ductility which comprises providing a titanium, aluminum composition, doping the titanium aluminum composition to achieve the following approximate atomc ratio:

$$Ti_{52-46}Al_{46-50}V_{2-4},$$

rapidly solidifying the composition from a melt thereof, and consolidating the solidified composition by isostatic pressing and extrusion.

4,857,269
HIGH STRENGTH, LOW MODULUS, DUCTILE, BIOPCOMPATIBLE TITANIUM ALLOY

Kathy K. Wang, Suffern, N.Y.; Larry J. Gustavson, Dover, and John H. Dumbleton, Ridgewood, both of N.J., assignors to Pfizer Hospital Products Group Inc., New York, N.Y.

Filed Sep. 9, 1988, Ser. No. 242,750
Int. Cl.[4] C22C *14/00*
U.S. Cl. 420—417 **6 Claims**

1. A high strength, low modulus, ductile, biocompatible titanium base alloy consisting essentially of the following alloying components:

an amount up to 24% by weight of at least one isomorphous beta stabilizer selected from the group consisting of molybdenum, tantalum, niobium and zirconium, provided that molybdenum, when present, is in an amount of at least 10% by weight, and when molybdenum is present with zirconium the molybdenum is in an amount of 10 to 13% by weight and the zirconium is in an amount of 5 to 7% by weight;

an amount up to 3.0% by weight of at least one eutectoid beta stabilizer selected from the group consisting of iron, manganese, chromium, cobalt and nickel Wherein the combined amount of isomorphous beta stabilizer and eutectoid beta stabilizer is at lest 10.2 percent by weight;

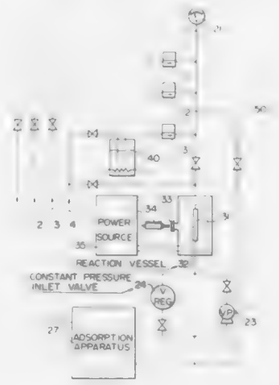
optionally an amount up to 3.0% by weight of at least one metallic alpha stabilizer selected from the group consisting of aluminum and lanthanum;

and the balance titanium, apart from incidental impurities, but not exceeding by weight, among the non-metallic alpha stabilizers, 0.05% carbon, 0.30% oxygen and 0.02% nitrogen; and not exceeding 0.02% of the eutectoid former hydrogen; the proportion of each of the alloying components being balanced to provide an alloy having a modulus of elasticity not exceeding 100 GPa.

4,857,270
PROCESS FOR MANUFACTURING SILICON-GERMANIUM ALLOYS

Shinji Maruya, Hiratsuka; Yoshifumi Yatsurugi, Fujisawa, and Kazuya Togashi, Tokyo, all of Japan, assignors to Komatsu Electronic Metals Co., Ltd., Kanagawa, Japan

Filed Apr. 20, 1988, Ser. No. 184,002
Claims priority, application Japan, May 19, 1987, 62-120319
Int. Cl.[4] C23C *14/14*
U.S. Cl. 420—578 **3 Claims**



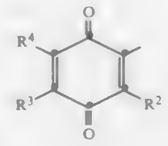
1. A process for manufacturing a silicon-germanium alloy comprising introducing SiH_4 gas, $GeCl_4$ gas and P-type or N-type doping gas into a reaction vessel, heating a substrate up to a temperature not lower than 750°, and depositing a thickly-grown bulky silicon-germanium alloy upon the substrate within the reaction vessel.

4,857,271
REDUCIBLE COMPOUNDS AND ANALYTICAL COMPOSITIONS, ELEMENTS AND METHODS UTILIZING SAME

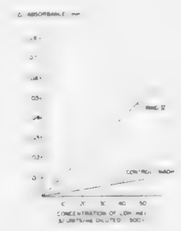
Robert T. Belly, Webster; Albert J. Mura, Rochester; Theodore W. Esders, Webster, and Brent A. Burdick, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 699,386, Feb. 7, 1985, Pat. No. 4,746,607. This application Jan. 31, 1986, Ser. No. 824,766
The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.
Int. Cl.[4] G01N *21/78*; C07C *50/12*
U.S. Cl. 422—55 **21 Claims**

1. A reducible compound of the structure CAR—R^1 wherein CAR— is



R^1 is



$$\left(R^5\right)_m\!\!-\!\!N(R^6)\!-\!Q\!-\!FRAG,$$

R^2 and R^4 are selected from the group consisting of hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted aryl and an electron withdrawing group,

R^3 is selected from the group consisting of R^1, hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted aryl and an electron withdrawing group, or R^3 and R^4, taken together, represent the atoms necessary to complete a substituted or unsubstituted fused carbocyclic ring,

R^5 is substituted or unsubstituted alkylene of 1 or 2 carbon atoms,

R^6 is selected from the group consisting of substituted or unsubstituted alkyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted heterocycle and substituted or unsubstituted aryl, provided that when FRAG is a fluorogen, R^6 is methyl,

Q is carbonyl or thiocarbonyl,

FRAG is a shiftable detectable chromogen, fluorogen, phosphorescent species or a chemiluminescent species constructed such that it provides a detectable species when released from said reducible compound, and

m is 0 or 1,

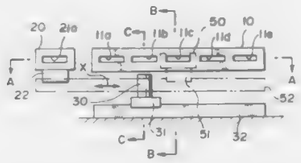
provided that said reducible compound is constructed such that when R^1 is replaced with H, CAR-H has an $E_{\frac{1}{4}}$ of either at least about +100 mV when measured in water, or of at least about −650 mV when measured in acetonitrile, and

further provided that said reducible compound is constructed such that when said compound is reduced at about pH 7, at least about 50% of said FRAG is released within about 30 minutes.

4,857,272
CHEMICAL ASSAY SYSTEM

Fumio Sugaya, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 18, 1986, Ser. No. 875,489
Claims priority, application Japan, Jun. 21, 1985, 60-135612
The portion of the term of this patent subsequent to Apr. 22, 2003, has been disclaimed.
Int. Cl.[4] G01N *35/04*
U.S. Cl. 422—65 **3 Claims**



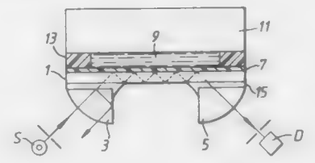
1. In a chemical assay system comprising at least one incubator having a plurality of slide receiving chambers each for receiving a chemical assay slide, the chambers being arranged in a row so that chemical assay slides received in the chambers are arranged in a row in one plane and each chamber is provided with an opening for exposing a chemical assay slide received therein; a slide insertion means for inserting chemical assay slides into the slide receiving chambers; and a probe means for projecting light onto a chemical assay slide in each slide receiving chamber and measuring the intensity of the light reflected therefrom, the probe means being movable along the row of the slide receiving chambers to measuring positions in front of each of the openings;

the improvement which comprises said slide insertion means being movable bi-directionally with respect to the incubators such that any slide can be inserted into said slide receiving chambers independently of any other slide.

4,857,273
BIOSENSORS

William J. Stewart, Blakesley, United Kingdom, assignor to Plessey Overseas Limited, Ilford Essex, United Kingdom

Filed Apr. 4, 1986, Ser. No. 848,680
Claims priority, application United Kingdom, Apr. 12, 1985, 8509491
Int. Cl.[4] G01N *21/77*
U.S. Cl. 422—68 **6 Claims**



1. A biosensor comprising: an optically dense body having a coating sensitized for a given assay species, light coupling means positioned in operative adjacent relation to the optically dense body for directing light into and out of the same, and means operatively associated with the light coupling means for esablishing a mirrored resonant cavity within the optically dense body by frustrated total internal reflection, including a light reflecting and partially transmissive medium operatively interposed between the optically dense body and the light coupling means.

4,857,274
DEVICE FOR ANALYZING A LIQUID SAMPLE

Jean-Pierre Simon, Grenoble, France, assignor to Kis Photo Industrie, France

Filed Jun. 22, 1987, Ser. No. 64,696
Claims priority, application France, Jun. 26, 1986, 86 09488
Int. Cl.[4] G01N *9/30*
U.S. Cl. 422—72 **7 Claims**

1. A device for analyzing a sample of a liquid comprising:

a compartmented casing comprising an inlet, a container for at least one dose of a reagent of diluent, a chamber for calibration of a calibrated quantity obtained from the sample, and a chamber for mixing at least the calibrated quantity and the reagent of diluent, such that when said casing interacts with a centrifuging apparatus centrifugal force causes contents of the casing to circulate within the casing; and

a cartridge including an inlet for directly introducing a sample into the cartridge from a source, a receptacle for collecting the introduced sample, means for metering the collected sample, said means for metering connected to the receptacle via a capillary duct extending into the casing, means for irreversibly clipping the cartridge to said casing, and an outlet passage communicating with the

casing inlet when said cartridge is irreversibly clipped to said casing to pass a metered quantity from said cartridge to said casing, wherein said outlet of the cartridge is positioned in a vicinity of, but separate from, said cartridge inlet.

4,857,275

THICK-FILM GAS-SENSITIVE ELEMENT

Keizo Furusaki; Mineji Nasu; Toshitaka Matsuura; Akio Takami, and Teppei Okawa, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Mar. 18, 1987, Ser. No. 27,357

Claims priority, application Japan, Mar. 19, 1986, 61-172; Mar. 19, 1986, 61-173; Mar. 19, 1986, 61-174

Int. Cl.[4] G01N *27/22*

U.S. Cl. 422—98 **9 Claims**



1. A thick-film gas-sensitive element of a laminate structure, comprising a ceramic substrate having a pair of electrodes disposed on an upper surface thereof; and a laminate gas-sensitive thick film deposited on said ceramic substrate upper surface so as to extend across the ends of the pair of electrodes, said gas-sensitive thick film consisting of ceramic semiconductor and metallic catalyzer distributed in the ceramic semiconductor and said gas-sensitive thick film having an inner portion adjacent said substrate upper surface and at least one outer surface layer disposed on said inner portion, said outer surface layer of the gas-sensitive thick film containing a smaller amount of metallic catalyzer than said inner portion of the gas-sensitive thick film.

4,857,276

APPARATUS FOR TREATING EXHAUST GAS

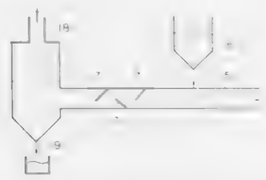
Toru Seto; Shigeaki Mitsuoka, both of Kanonshin; Atsushi Morii, Chiyoda, and Norihisa Kobayashi, Akunoura, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1987, Ser. No. 51.734

Claims priority, application Japan, May 26, 1986, 61-119072

Int. Cl.[4] B01D *50/00*

U.S. Cl. 422—171 **1 Claim**



1. In an apparatus for treating exhaust gas containing dust composed of a glassy component and a sticky component including a gas parallel flow type solid-gas contact reactor, the improvement which comprises means for separating the glassy component from the sticky component of the dust, said means comprising barriers positioned in a duct upstream of the reactor so as to collide with the dust contained in the gas flowing toward the reactor, wherein the barriers comprise flat plates, the surfaces of which are positioned at an angle of inclination ranging from 30 to 60 degrees relative to the duct wall, and wherein said barriers are V-shaped and formed by adjoining said plates at an intersection point, and disposed in an opening ratio of $l_1/l_2 \times 100$ of from 30 to 70 % and a space ratio $l_3/2l_1$ of from 1 to 4, and wherein l_1 is also the distance between the midpoint of said duct and the end of said flat plate extending away from said duct wall, l_2 is the distance between said duct wall and the intersection of two side plates forming said v-shaped barrier, and l_3 is the shortest distance between two barriers.

4,857,277

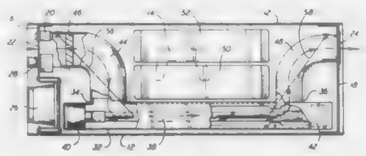
OZONE GENERATING DEVICE

Paul A. Broomfield, Holland Patent, N.Y., assignor to Broomfield, U.S.A., Inc., Holland Patent, N.Y.

Filed Nov. 9, 1987, Ser. No. 117,996

Int. Cl.[4] C01B *13/11*

U.S. Cl. 422—186.07 **5 Claims**



1. An ozone generating device comprising an enclosure; an input duct conducting air from the ambient into the enclosure; an output duct conducting air out of the enclosure into the ambient; a tunnel within said enclosure which has an input end connected to said input duct and an output end connected to said output duct so that an air flow is conducted through the tunnel from the input end to the output end; an ultraviolet lamp within said tunnel producing a wavelength suitable to generate ozone from oxygen in said air flow through said tunnel; and means for supplying electrical power to said lamp, including means for selectively controlling the amount of ultraviolet light generated by said lamp thus controlling the relative amount of ozone in the air delivered from the output duct, wherein said tunnel includes a straight member and said inlet and outlet ducts each include a 90-degree conduit bend precluding a direct line of sight from the respective port at the straight tunnel to the associated port on the enclosure.

4,857,278

CONTROL SYSTEM FOR THE CZOCHRALSKI PROCESS

Michael A. Gevelber, Belmont, and George Stephanopoulos, Winchester, both of Mass., assignors to Massachusetts Institute Of Technology, Cambridge, Mass.

Filed Jul. 13, 1987, Ser. No. 72,554

Int. Cl.[4] C03B *15/26*

U.S. Cl. 422—249 **12 Claims**

1. Apparatus for controlling crystal growth from a melt comprising:

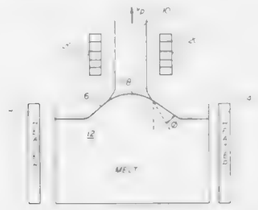
a sensor responsive to crystal diameter;

an estimator adapted to generate an estimate of melt meniscus angle;

a first filter adapted to partition the signal from the diameter sensor and the estimator into a high frequency signal and a second filter adapted to partition the signal from the diameter sensor and the estimator into a low frequency signal;

a puller responsive to the high frequency signal for withdrawing the crystal from the melt; and

a melt heater responsive to the low frequency signal to adjust the melt temperature;



whereby the crystal diameter and crystal/melt interface shape are controlled.

4,857,279

APPARATUS FOR EXTRACTING FATS AND OILS

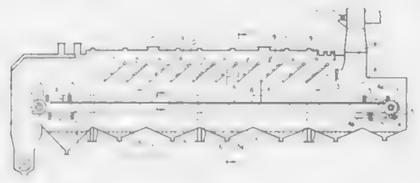
Yoshio Kawamata, Katsuta, and Kiyoshi Iwai, Yokohama, both of Japan, assignors to Showa Sangyo Co., Ltd., Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 946,059

Claims priority, application Japan, Dec. 27, 1985, 60-293921

Int. Cl.[4] B01D *11/02*

U.S. Cl. 422—268 **12 Claims**



1. An apparatus for extracting edible fats and oils from a material, comprising:

a flat and stationary surface for supporting a conveyed material, said surface comprising a parallel array of wires defining elongate slits therebetween;

means for feeding the material onto an inlet end of said surface;

means for discharging the material from an outlet end of said surface;

means for advancing the material from said inlet end to said outlet end without supporting the material, whereby the material rests on said flat and stationary surface between said inlet end and said outlet end;

spray means comprising a plurality of fluid spray pipes arranged over said surface;

an inclined overflowing plate positioned beneath each of said fluid spray pipes for receiving sprayed fluid therefrom;

a saw-toothed overflow leaf attached to each of said overflowing plates for spreading the sprayed fluid, whereby the fluid can extract oil from the material on said surface to produce miscella;

at least one first hopper positioned beneath said surface for collecting miscella which has flowed through said slits; and

means for feeding the miscella from said at least one first hopper to said spray means.

4,857,280

METHOD FOR THE REGENERATION OF SULFIDED CERIUM OXIDE BACK TO A FORM THAT IS AGAIN CAPABLE OF REMOVING SULFUR FROM FLUID MATERIALS

D. Alan R. Kay, Burlington, Ontario, Canada, and William G. Wilson, Pittsburgh Allegheny County, Pa.

Continuation-in-part of Ser. No. 99,058, Sep. 21, 1987, Pat. No. 4,826,664, which is a continuation of Ser. No. 846,272, Mar. 31, 1986, Pat. No.

Int. Cl.[4] C01F *17/00*

U.S. Cl. 423—21.1 **19 Claims**

1. A method for the regeneration of sulfur-containing cerium compounds formed by the desulfurization of fluid materials containing sulfur with cerium oxide back to its original form, CeO_2, comprising the steps of:

(a) Removing the sulfur-containing cerium compounds from contact with the fluid material containing sulfur;

(b) Raising the temperature of the sulfur-containing cerium compounds above the temperature at which cerium sulfate dissociates; and

(c) Exposing the sulfur-containing cerium compounds whose temperature is above the temperature at which cerium sulfate dissociates to an oxidizing atmosphere.

4,857,281

PAULING BOILER AND PROCESS FOR THE CONCENTRATION OF SULPHURIC ACID

Heiko Beckhaus, Leverkusen; Harro Witt, Kuden, and Peter Klein, Itzehoe, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 15, 1988, Ser. No. 144,292

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1987, 3702541

Int. Cl.[4] C01B *12/90, 17/48;* **B01J** *1/20;* **C10B** *29/00*

U.S. Cl. 423—531 **3 Claims**



1. In a cast iron Pauling boiler for the concentration of sulphuric acid by underfiring with gas or liquid fuels, wherein the improvement comprises that the external surface of the Pauling boiler is coated with aluminum, wherein the aluminum a has purity of from 50 to 99.99%, whereby the underfiring is carried out with circulated flue gas which has an oxygen content of 2 to 5 volume %.

4,857,282

COMBUSTION OF BLACK LIQUOR

Walter T. Mullen, Burlington, Canada, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 13, 1988, Ser. No. 143,904

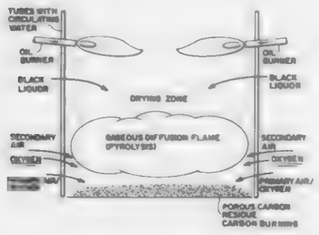
Int. Cl.[4] D21C *11/12, 11/14;* **G22B** *26/10;* **B01J** *17/60*

U.S. Cl. 423—207 **2 Claims**

1. In the combustion of black liquor in an existing Tomlison recovery boiler unit in which black liquor is sprayed into a furnace in which it is successively dried, pyrolyzed and converted to a bed of solid carbonaceous residue, using a primary air stream and a secondary air stream and said residue is subse-

quently converted to a smelt, the improvement which comprises:

the addition of between an effective amount up to 5% oxygen by volume to the primary air stream directed at said bed of solid carbonaceous residue, the amount of oxygen added being sufficient to increase the adiabatic flame temperature, the combustion rate of the solid carbonaceous material, the rate of pyrolysis, the temperature in



the lower portion of the furnace, and the drying rate of black liquor droplets, and to decrease the temperature of the gases entering the heat transfer surfaces in the upper portion of the furnace and the rate of deposit formation on said surfaces and wherein the amount of black liquor combusted is increased as compared with the amount combusted in the same furnace operated without the addition of oxygen to the primary air.

4,857,283

USE OF SULFUR DIOXIDE FOR CORROSION INHIBITION IN ACID GAS SCRUBBING PROCESSES

Patrick C. Madden, II, Whippany, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 28, 1987, Ser. No. 138,752

Int. Cl.[4] C01B *17/16, 31/20*

U.S. Cl. 423—228 **8 Claims**

1. In a process for removing acidic gases from an H_2S-containing acid gas stream, when said acid gas stream is contacted with an amine-containing scrubbing solution at elevated temperatures to remove acid gases, the improvement which comprises pretreating the metal surfaces which will be in contact with the H_2S-containing acid gas stream with a mixture comprised of: SO_2, an H_2S-containing gas, and an amine scrubbing solution, such that: (i) the acid gas loading is 0.3 or less when expressed as moles of H_2S-containing acid gas/moles of amine; and (ii) the amount of SO_2 is such that the resulting polysulfide film on said metal surfaces, expressed as total weight of elemental sulfur, ranges from about 0.01 to 6 wt %.

4,857,284

PROCESS FOR REMOVING SULPHUR FROM THE WASTE GAS OF A REDUCTION SHAFT FURNACE

Rolf Hauk, Duesseldorf, Fed. Rep. of Germany, assignor to Korf Engineering GmbH, Duesseldorf, Fed. Rep. of Germany

Filed May 10, 1988, Ser. No. 191,590

Claims priority, application Fed. Rep. of Germany, May 16, 1987, 3716511

Int. Cl.[4] C01B *17/16, 31/20*

U.S. Cl. 423—231 **11 Claims**

1. A method for desulfurization of at least part of a waste gas produced by a reduction shaft furnace, the method comprising the steps of:

scrubbing the waste gas to form a first stream of gas substantially free of carbon dioxide and a second stream of gas containing gaseous sulfur compounds and carbon dioxide;

contacting the second stream of gas with a sponge iron to form a sulfur compound-containing sponge iron and a gas substantially free from sulfur compounds; and

feeding the sulfur compound-containing sponge iron into a melting gasifier and introducing fluxes into the melting gasifier to bend the sulfur compounds in a slag produced in the melting gasifier.

4,857,285

METHOD AND SYSTEM FOR REMOVAL OF SULFUR COMPOUNDS FROM GASES AND FOR REGENERATING SPENT SORBENTS

Eli Gal, Lancaster, Pa., assignor to General Electric Environmental Services, Inc., Lebanon, Pa.

Filed Jun. 4, 1987, Ser. No. 58,060

Int. Cl.[4] B01J *8/00;* **C01B** *17/00*

U.S. Cl. 423—230 **44 Claims**

1. A method for removing hydrogen sulfide and other sulfur compounds from a hot gas consisting essentially of the steps of:

(a) contacting the hot gas with at least one metal oxide sorbent in a packed, non-fluidized bed of metal oxide sorbent which moves countercurrently to the hot gas, whereby the metal oxide sorbent reacts with the hydrogen sulfide and other sulfide compounds to form a sulfur-rich metal sorbent and a hot gas lean in sulfur compounds;

(b) removing the hot gas lean in sulfur from the bed of metal oxide sorbent;

(c) contacting the sulfur-rich metal sorbent with a first oxygen-containing gas which moves non-fluidized bed of the sulfur-rich metal sorbent in a first phase regeneration to convert sulfur-rich metal sorbent to a partially-sulfided sorbent, thereby forming a sulfur dioxide containing gas;

(d) contacting the partially-sulfided metal sorbent with a second oxygen-containing gas which moves co-currently in the direction of a movable, packed, non-fluidized bed of the partially-sulfided metal sorbent in a second phase regeneration to convert the partially-sulfided metal sorbent to regenerated metal oxide and thereby forming additional sulfur dioxide-containing gas, the first oxygen-containing gas having a concentration of oxygen which is less than the concentration of oxygen in the second oxygen-containing gas;

(e) contacting the regenerated metal oxide with air, oxygen-enriched air or oxygen which moves countercurrently to the direction of a movable, packed, non-fluidized bed of the regenerated metal oxide to convert any remaining sulfided metal sorbent to regenerated metal oxide, to cool the regenerated metal oxide or to purge the regenerated metal oxide of sulfur dioxide-containing gas;

(f) removing the sulfur dioxide-containing gas purged from the regenerated metal oxide; and

(g) re-using the regenerated metal oxide in step (a).

4,857,286

METHOD FOR PRODUCING SODIUM TETRABORATE PENTAHYDRATE

Paolo Mazzinghi, Pomarance, Italy, assignor to Societa Chimica Larderello S.p.A., Milan, Italy

Filed Jun. 29, 1987, Ser. No. 68,114

Claims priority, application Italy, Jul. 25, 1986, 21259 A/86

Int. Cl.[4] C01B *35/10*

U.S. Cl. 423—282 **7 Claims**

1. In the process of preparing sodium tetraborate pentahydrate ($Na_2B_4O_7 \cdot 5H_2O$) from colemanite ore by treatment with sodium carbonate and boric acid, the improvement comprising

(a) first reacting the mineral colemanite ($2CaO \cdot 3B_2O_3 \cdot 5H_2O$) with sodium carbonate (Na_2CO_3) in an aqueous environment in the absence of boric acid to produce an aqueous solution of sodium tetraborate and sodium hydroxide, with precipitation of solid calcium carbonate;

(b) treating the aqueous solution obtained in stage (a), after separating the precipitated calcium carbonate, with boric acid (H_3BO_3) with no further addition of sodium carbonate to neutralise the sodium hydroxide and form a further quantity of sodium tetraborate;

(c) separating sodium tetraborate pentahydrate by crystallisation from the aqueous solution obtained in stage (b).

4,857,287

FAST-DISSOLVING, NON-CAKING, FOOD GRADE SODIUM TRIPOLYPHOSPHATE

Chris C. Dick, Princeton, N.J.; Barry Schwartz, Yardley, Pa.; Bert D. McMunn, Princeton Junction, N.J., and Peter H. Zeh, Fremont, Calif., assignors to FMC Corporation, Philadelphia, Pa.

Filed Aug. 16, 1988, Ser. No. 232,727

Int. Cl.[4] C01B *15/16, 25/26*

U.S. Cl. 423—315 **4 Claims**

1. A spray drying process wherein spraying, rapid dehydration and intermolecular condensation are carried out in a single operation to produce a fast-dissolving, non-caking, food grade sodium tripolyphosphate having a Form I concentration greater than 75% consisting essentially of the steps of spraying into a spray dryer an aqueous sodium orthophosphate feed liquor having an $Na_2O:P_2O_5$ ratio of 1.60 to 1.67 and containing potassium hydroxide or a soluble potassium salt in amounts to yield about 0.4% to 0.8% by weight potassium in the final product, dehydrating the sprayed feed with a hot gas stream, heating the dehydrated feed to a temperature of at least 440° C. up to 630° C. to produce sodium tripolyphosphate, removing the sodium tripolyphosphate having a temperature of at least 440° C. from the spray dryer, passing the sodium tripolyphosphate into a cooler to cool the product and adding at least about 1% moisture to the sodium tripolyphosphate product.

4,857,288

ZEOLITE LZ-135 AND PROCESS FOR PREPARING SAME

Bonita K. Marcus, Rye, and Brent M. Lok, New City, both of N.Y., assignors to UOP, Des Plaines, Ill.

Filed May 15, 1987, Ser. No. 50,017

Int. Cl.[4] C01B *33/28*

U.S. Cl. 423—328 **7 Claims**

1. Crystalline aluminosilicate zeolite composition having a chemical composition in the anhydrous state and in terms of mole ratios of oxides:

$$xM_{2/n}O:Al_2O_3:ySiO_2$$

wherein "M" is at least one cation having the valence "n", "x" has a value of from zero to 3.5, and "y" has a value of from 3.5 to 6.5, said aluminosilicate having pore diameters of 4.3A and having an x-ray powder diffraction pattern containing at least the following d-spacings:

TABLE I

2θ	d,A	Relative Intensity
011.1–11.4	7.97–7.76	M–VS
14.0–14.3	6.33–6.19	M–VS
21.0–21.7	4.23–4.10	VW–VS
23.0–23.6	3.87–3.77	M–VS
23.9–24.3	3.72–3.66	M–VS
31.0–31.4	2.849–2.814	M–VS

4,857,289

PROCESS FOR PREPARING PRECIPITATED SILICA

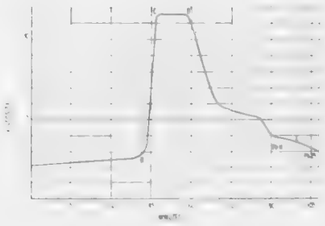
Peter Nauroth, Wesseling; Robert Kuhlmann, Erftstadt; Gunter Turk, Hanau, and Adam Becker, Bornheim-Hersel, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 852,595, Apr. 16, 1986, abandoned, which is a continuation of Ser. No. 674,883, Nov. 26, 1984, abandoned. This application May 5, 1988, Ser. No. 191,751

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114493

Int. Cl.[4] C01B *33/93*

U.S. Cl. 423—339 **8 Claims**



1. A process for the preparation of a precipitated silica having the following physical-chemical characteristics:

BET surface area determined according to DIN 66,131	m^2/g	15–110
Tamped density determined according to DIN 53,194	g/l	150–750
Cu abrasion in 10% strength glycerol dispersion	mg	5–30
Lightness value A according to DIN 55,921	%	86–96
Particle size distribution curve of the secondary particles according to FIG. 1, using the Coulter Counter		
"ALPINE screen retainings" >63 μm	% by weight	<1.5
Viscosiy of a 30% strength dispersion in a L;L glycerol/water mixture (Brookfield RTV, Sp5) mPa.s		30,000–60,000

comprising:

preparing a precipitated silica suspension by precipitating silica from an initial charge of sodium silicate solution having a concentration of about 5–25 g of SiO_2 per liter of solution by the simultaneous addition to said silicate solution of sulfuric acid and sodium silicate of particular concentration at particular feed rate defining precipitation conditions to thereby form a reaction medium suspension while maintaining a precipitation temperature in the reaction medium between 80° and 90° C.,

maintaining the pH of the reaction medium between 10 and 12 during the precipitation by said simultaneous addition,

said precipitation conditions being such that the viscosity of the reaction medium is kept for at least 30% of the total precipitation time uniformly low and the pH is maintained between 10 and 12 and during said simultaneous addition the viscosity of the reaction medium changing by rapidly rising to a higher viscosity than the viscosity value before said simultaneous addition and passing through a maximum viscosity value and then rapidly decreasing to a lower viscosity value,

thereafter terminating the simultaneous addition of said acid

and silicate solution, said terminating occurring only when the viscosity has passed through a maximum and decreased to a value less than 100% higher than the viscosity of the reaction medium prior to said simultaneous addition,

diluting the precipitated silica suspension obtained thereby with hot water to obtain a precipitated silica content of 10–30 g/l and a sodium sulfate content of 6–20 g/l of Na_2SO_4, in said suspension,

heating said suspension to 85°–95° C., the pH of said suspension being brought to 7–9 by addition of sulfuric acid

and, while keeping this pH value of 7–9 constant, adding simultaneously sodium silicate solution, sulfuric acid and, if necessary, hot water over a precipitation period of 15 to 180 minutes so as to give a final concentration of precipitated silica of 40 to 80 g/l,

acidifying the suspension with concentrated sulfuric acid to a pH below 7,

and separating the precipitated silica from the suspension and subsequently milling the silica by a pendulum roller mill.

4,857,290

PROCESS FOR PRODUCING SILICA OF HIGH PURITY

Shumpei Shimizu, Moses Lake, Wash., assignor to Moses Lake Industries, Inc., Moses Lake, Wash.

Continuation of Ser. No. 55,802, May 27, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 229,760

Claims priority, application Japan, Jun. 13, 1986, 61-136320

Int. Cl.[4] C01B *33/12*

U.S. Cl. 423—339 **12 Claims**

1. A process for producing silica having a Ti impurity concentration of 0.3 to 1.2 ppm. comprising:

(a) preparing an acidic silica sol from an aqueous solution of an alkali silicate by reacting an aqueous solution of an alkali silicate with an inorganic acid, an organic acid or by contacting an aqueous solution of the alkali silicate with a strongly acidic cation exchange resin to form an acidic silicate sol composition;

(b) treating said acidic silicate sol composition with hydrogen peroxide;

(c) adjusting the pH of the aqueous sol composition to 0 to 5 by addition of a base selected from the group consisting of sodium hydroxide and potassium hydroxide;

(d) purifying the silica sol obtained by pH adjustment by contacting the acidic silica sol with a cationic ion exchange resin to obtain a silica sol having an Ti impurity level of 0.3 to 1.2 ppm.;

(e) neutralizing the silica sol with an aqueous alkali solution;

(f) adding the neutralized silica sol to an aqueous solution of ammonium salt; and

(g) separating the precipitated silica.

4,857,291

PROCESS OF PRODUCING PLATE-SHAPED CALCIUM CARBONATE PARTICLES

Yoshio Ota; Norifumi Goto; Iwao Motoyama; Tetsushi Iwashita, and Kunio Nomura, all of Ogaki, Japan, assignors to Yabashi Industries Co., Ltd., Gifu, Japan

Filed Mar. 10, 1988, Ser. No. 166,439

Int. Cl.[4] C09C *1/02;* **C01F** *5/24, 11/18*

U.S. Cl. 423—430 **7 Claims**

1. A process of producing plate-shaped calcium carbonate particles comprising the steps of mixing an aqueous calcium hydrogen carbonate solution of a concentration of 0.1-0.4 % by weight and with a temperature of not more than 50° C. into water held at a temperature of between 65° C. and 90° C. to generate plate-shaped calcium carbonate particles in the water, the temperature of the water being kept between 65° C. and 90° C. during the mixing of the aqueous calcium hydrogen carbon-



ate solution into the water; and recovering the generated plate-shaped calcium carbonate particles.

4,857,292

PROCESS FOR THE PRODUCTION OF CALCIUM HYPOCHLORITE AND PRODUCT OBTAINED BY THIS PROCESS

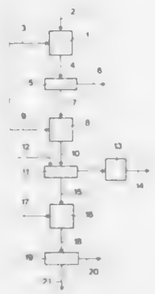
Jacques Brahm, Grimbergen, Belgium; Pierre Cornu, Tavaux; Pierre Garnier, Chaussin, both of France; Jean Verlaeten, Brussels, and Jacques Van Diest, Rhode-Saint-Genese, both of Belgium, assignors to SOLVAY & Cie (Societe Anonyme), Brussels, Belgium

Filed Dec. 11, 1987, Ser. No. 131,675

Claims priority, application France, Dec. 15, 1986, 86 17620

Int. Cl.[4] C01B *11/06*

U.S. Cl. 423—473 **8 Claims**



1. Process for the production of calcium hypochlorite by reacting an aqueous sodium hypochlorite solution with calcium chloride, characterized in that the calcium chloride is employed in the form of an aqueous solution, a fraction of the sodium hypochlorite solution which is less than the stoichiometric quantity required to decompose the entire amount of calcium chloride is added to the calcium chloride solution, the sodium chloride that precipitates is separated from the resulting reaction medium, and the remaining amount of the sodium hypochlorite solution is then added to the reaction medium.

4,857,293

PROCESS FOR THE PREPARATION OF ULTRAPURE HEAVY METAL FLUORIDES

Ricardo C. Pastor, Manhattan Beach, and Luisa E. Gorre, Oxnard, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 686,773, Dec. 27, 1984, abandoned. This application Oct. 15, 1987, Ser. No. 109,360

Int. Cl.[4] C01B *9/08;* **C01G** *21/16*

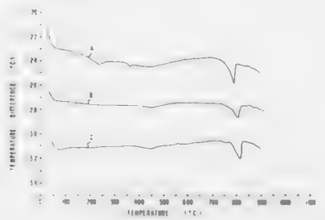
U.S. Cl. 423—489 **7 Claims**

1. A process for the preparation of a heavy metal fluoride,

whose heavy metal component behaves as a pseudo-noble metal, from its heavy metal oxide comprising the steps of:

(a) reacting the oxide of said heavy metal with an aqueous hydrofluoride acid to form a solid reaction product;

(b) drying said solid reaction product by heating to remove water and to form a hydrated fluoride of said chosen heavy metal; and



(c) exposing said hydrated heavy metal fluoride to a reactive atmosphere of hydrofluoric acid vapor in a carbon dioxide reactive carrier gas while simultaneously raising the temperature of said reaction mixture to a maximum of approximately 900° C.; and

(d) at approximately 900° C., cooling the reaction mixture whereupon carbon tetrachloride gas is introduced into the reaction mixture while still gradually reducing the temperature of the reaction mixture.

4,857,294

PROCESS FOR THE PREPARATION OF METAL FLUORIDES USABLE FOR THE PRODUCTION OF FLUORIDE GLASSES

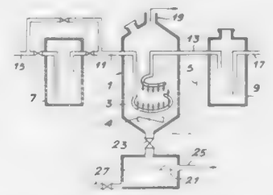
Martine Bridenne Alaux, Paris; Hubert Marquet-Ellis, Versailles; Nelly Keller, Les Ulis, and Gerard Folcher, deceased, late of Orsay, all of France (by Vereina Folcher, heiress, Vincent Folcher and Marc Folcher, heirs), assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Jul. 22, 1987, Ser. No. 76,309

Claims priority, application France, Jul. 23, 1986, 8610697

Int. Cl.[4] C01B *9/08;* **C01F** *7/50;* **C01G** *25/04*

U.S. Cl. 423—489 **17 Claims**



1. A process for the preparation of a metal fluoride, wherein it comprises:

(1) reacting, in an organic liquid medium comprising an aliphatic or aromatic hydrocarbon or a perfluorinated liquid,

(a) a compound of said metal able to react with a fluorinating agent and chosen from among the compounds of said metal that are gaseous at room temperature, the compounds of said metal soluble in the organic liquid medium and the

(a)compounds of said metal soluble in an organic solvent miscible with said medium, said compound being selected from the group consisting of borohydrides, chlorides, bromides and oxychlorides of said metal, and

(b) a fluorinating agent chosen from among gaseous fluorinating agents, fluorinatig agents partly soluble in the organic medium and fluorinating agents partly soluble in an organic solvent miscible with said medium, for forming in the organic medium a fluoride precipitate of said metal, the organic liquid medium being such that it reacts neither with the compound of the metal, nore with the fluorinating agent and does not dissolve the fluoride from the organic liquid medium,

and

(2) separating the metal fluoride from the organic liquid medium.

4,857,295

PROCESS FOR THE MANUFACTURE OF IODINE

Giuseppe Paparatto, and Guglielmo Gregorio, both of Milan, Italy, assignors to Montedipe S.p.A., Milan, Italy

Continuation of Ser. No. 917,953, Oct. 14, 1986, abandoned. This application Jul. 15, 1988, Ser. No. 219,818

Claims priority, application Italy, Oct. 15, 1985, 22497 A/85

Int. Cl.[4] C01B *7/14*

U.S. Cl. 423—502 **16 Claims**

1. A process for the manufacture of iodine in the presence of a catalyst selected from the group consisting of copper, gold, and a transition metal, or a compound thereof, consisting essentially of oxidizing an aqueous solution of an alkali metal iodide with oxygen, air, or other oxygen-containing gas in the presence of carbon dioxide, an alkali metal carbonate and/or bicarbonate being thus formed.

4,857,296

CEO CATALYTIC DESULFURIZATION OF INDUSTRIAL GASES

Jean-Pierre Brunelle, Saint Brice Sous Foret; Patrice Nortier, Romainville, and Eric Quemere, Cormeilles en Parisis, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Dec. 23, 1987, Ser. No. 136,989

Claims priority, application France, Dec. 23, 1986, 86 18056

Int. Cl.[4] C01B *17/02, 17/16, 31/20;* **B01J** *8/00*

U.S. Cl. 423—574 R **14 Claims**

1. A process for the desulfurization of industrial gases by the catalytic conversion of contaminating sulfur values therein, comprising a Claus reaction and the hydrolysis of organosulfur compounds, said process comprising utilizing as the catalyst therefor, a solid cerium oxide.

4,857,297

PROCESS FOR THE REDUCTION OF THE SULFUR CONTENT IN A GASEOUS STREAM

Roland Kettner, Heist; Norbert Liermann, Bergen, and Torsten Lubcke, Hambuhren, all of Fed. Rep. of Germany, assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 797,103, Nov. 12, 1985, abandoned, which is a continuation of Ser. No. 435,832, Oct. 21, 1982, Pat. No. 4,552,746. This application Apr. 9, 1987, Ser. No. 36,413

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1981, 3143400

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.[4] C01B *17/02*

U.S. Cl. 423—576.8 **13 Claims**

1. A process for the reduction of sulfur content in a gaseous stream with the production of elemental sulfur, comprising the steps of:

(a) treating the gaseous stream by at least one of hydrogenation and hydrolysis to convert substantially all of the sulfur components therein to hydrogen sulfide,

(b) then reducing the water content of the gaseous stream to less than 10 volume percent;

(c) introducing oxygen into the gaseous stream;

(d) treating the gaseous stream in an oxidation reactor, containing a catalyst comprising at least 80 percent by weight titanium dioxide, at a temperature of about 160° C. to 320°

C. wherein substantial conversion of H_2S to elemental sulfur occurs; and

(e) cooling the product gas after it leaves the oxidation reactor to separate elemental sulfur by condensation.

4,857,298

I°-DIAGNOSTICS FOR MONOAMINE RECEPTORS USING ERGOLINES

Helmut Wachtel; Herbert H. Schneider; Peter-Andreas Löschmann; Rainer Dorow; Reinhard Horowski; Bernard Ackstaller; Paul-Eberhard Schulze, and Gerhard Sauer, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

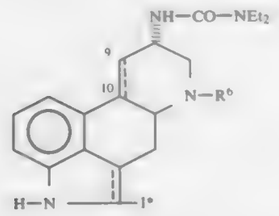
Filed Jul. 10, 1987, Ser. No. 72,090

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1986, 3623438

Int. Cl.[4] A61K *49/02;* C07D *457/12*

U.S. Cl. 424—1.1 31 Claims

1. A 2-(radioactive iodo)ergoline of formula II



II

wherein

R^6 is a C_1–C_6 aliphatic hydrocarbon residue and C_2–C_3 and C_9–C_{10} each independently represent a single or a double bond,

or a pharmaceutically acceptable acid addition salt thereof.

4,857,299

STABLE RADIODIAGNOSTIC PRODUCT

Han-Lie Chia, Reinach; Horia Popescu, Basel, and Gabrielle Boehmer, Reinach, all of Switzerland, assignors to Solco Basel AG, Basel, Switzerland

Filed Nov. 25, 1987, Ser. No. 125,608

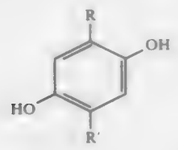
Int. Cl.[4] A61K *49/02;* C07F *13/00;* C07C *143/42*

U.S. Cl. 424—1.1 17 Claims

1. A stable product for use as a radiodiagnostic aid, which comprises

(a) an organ-specific or tissue-specific carrier which is labeled with radionuclide Tc-99m, and

(b) for stabilization of the product a compound of the formula:



(I)

in which R denotes hydrogen, and R′ denotes a sulpho- or carboxymethyl group, or R and R′ each denote a sulpho- or a carboxymethyl group, or a water-soluble salt thereof, the compound (b) being present in a concentration which is less than that of the carrier.

4,857,300

CYTOLOGICAL AND HISTOLOGICAL FIXATIVE FORMULATION AND METHODS FOR USING SAME

John A. Maksem, Cleveland Heights, Ohio, assignor to Cytocorp, Inc., Cleveland, Ohio

Filed Jul. 27, 1987, Ser. No. 78,376

Int. Cl.[4] G01N *1/30*

U.S. Cl. 424—3 3 Claims

1. A method for the preparation of a cytologic specimen slide comprising the following steps:

(a) collecting a cell sample;

(b) suspending the cell sample in a suitable volume of balanced salt solution and fixing that suspended cell sample by adding about 2 to about 3 volumes of a fixative formulation comprising:

(i) N,N-dimethylformamide, about 10 to about 50 percent by volume;

(ii) an alcohol, from about 0 to about 50 percent by volume;

(iii) water or other diluent, from about 80 to about 0 percent by volume;

(iv) formalin, from about 0 to about 3 percent by volume;

(v) polyethylene glycol, from about 0 to about 10 percent by volume; and

(vi) a tertiary amine or other suitable buffer solution having pH greater than about 7.6, from about 0 to about 2 percent by volume, and;

(c) applying the fixed, suspended sample to a slide at any time after fixation.

4,857,301

SULFONAMIDE COMPOUNDS, COMPOSITIONS AND METHOD OF USE

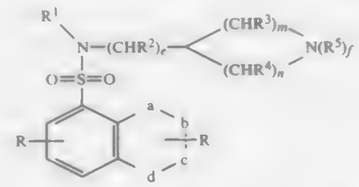
Michael F. Czarniecki, Westfield, and Barr E. Bauer, Elmwood Park, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Sep. 25, 1987, Ser. No. 101,038

Int. Cl.[4] A61K *31/47;* C07D *401/12*

U.S. Cl. 424—40 22 Claims

1. A compound represented by the structural formula I



or a pharmaceutically acceptable salt or solvate thereof wherein:

one of a, b, c and d is =N— and the remaining a, b, c and d groups are =CH— one of which may be substituted with R;

R optionally represents halo, hydroxy, lower alkyl, alkenyl, alkynyl, or aryl;

R^1 and R^2 independently represent H or lower alkyl;

e is an integer of from 0 to 5;

R^3 and R^4 independently represent H, lower alkyl, alkenyl, alkynyl, or aryl;

m and n are independently 0, 1, 2, 3 or 4 such that the sum of m and n is 3, 4, 5 or 6; and

R^5 represents H, lower alkyl, aminoiminomethyl, $—CO_2R^a$ or lower alkyl substituted with $—CO_2R^a$, where R^a is H or lower alkyl, such that when R^5 is H or lower alkyl, f is an integer 1 or 2, and when R^5 is $—CO_2R^a$ or aminoiminomethyl, f is 1.

22. A method of treating allergy in a mammal comprising administering to said mammal in need of such treatment an anti-allergic effective amount of a compound as defined in claim 1.

4,857,302

SOLUBILIZED BENZOYL PEROXIDE AND COSMETIC SOLUTION INCLUDING SOLUBILIZED BENZOYL PEROXIDE

Donald F. Decker, Jr., 358 W. 46 St., Hialeah, Fla. 33012; Deborah A. Decker, 7425 SW. 12 Court, North Lauderdale, Fla. 33068, and Kathleen S. Duggins, 4059 Wimbledon Dr., #14, Cooper City, Fla. 33026

Filed Feb. 20, 1987, Ser. No. 16,839

Int. Cl.[4] A61K *47/00*

U.S. Cl. 424—47 10 Claims

1. A benzoyl peroxide composition, comprising:

between about 2% and about 16%, by weight, benzoyl peroxide;

between about 23% and about 98%, by weight, silicone glycol copolymer; and,

optionally a suitable carrier,

whereby said benzoyl peroxide is solubilized in said silicone glycol copolymer.

4,857,303

DENTIFRICE GEL

Jean F. Grollier, Paris, France, assignor to L'Oreal, Paris, France

Filed Sep. 14, 1987, Ser. No. 95,858

Claims priority, application Luxembourg, Sep. 17, 1986, 86596

Int. Cl.[4] A61K *7/16, 7/18, 7/22*

U.S. Cl. 424—52 12 Claims

1. Dentifrice composition, in the form of a creamy gel containing at least one abrasive agent in proportions of between 5 and 75% by weight based on the total weight of the composition, at least one thickening agent in proportions of between 0.2 and 12% by weight based on the total weight of the composition, wherein the said thickening agent results from the ionic interaction in aqueous medium between a cationic polymer, consisting of a copolymer of cellulose or cellulose derivative grafted with a water-soluble quaternary ammonium monomer salt, and a carboxylic anionic polymer having an absolute capillary viscosity in dimethylformamide or methanol, at a concentration of 5% and at 30 degrees C., of less than or equal to 0.08 Pa.s, this thickener having an Epprecht-Drage, module 3, viscosity in 1% strength solution in water at 25 degrees C. greater than or equal to 0.45 Pa.s, and a surfactant in proportions of between 0.1 and 4% by weight based on the total weight of the composition, said surfactant being selected from nonionic surfactants of the poly(hydroxypropyl ether) family.

4,857,304

COSMETIC COMPOSITION

Masaaki Ishiwatari; Yuji Tsutsumi; Yoshiyuki Ogusu, and Yoshihiro Kimura, all of Yokohama, Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

Filed Jan. 27, 1987, Ser. No. 7,303

Claims priority, application Japan, Jan. 28, 1986, 61-16084

Int. Cl.[4] A61K *7/02, 7/031, 7/32, 7/42, 7/44, 7/48*

U.S. Cl. 424—59 4 Claims

1. An improved cosmetic make-up composition selected from the group consisting of foundation, eyeshadow, eyeliner, liquid mascara, lotion, suntan oil and liquid eye brow wherein the improvement comprises at least one fluorocarbon having the formula $C_nH_pF_qX_r$, wherein X represents chlorine or bromine, N is an interger of 1 to 8, q is an integer of 1 to 18, and p+q+r is 2n+2, which is liquid at an ambient temperature and has a boiling point of 200° C. or less, which extends and improves the cosmetic finish of the composition.

4,857,305

N-PHENYLPHTHALISOIMIDES AS ULTRAVIOLET RADIATION ABSORBERS

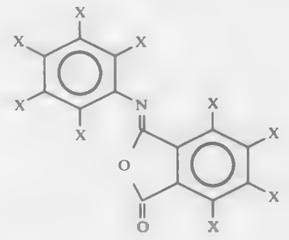
Randal J. Bernhardt, Mundelein, and William J. Ferrell, Des Plaines, both of Ill., assignors to Stepan Company, Northfield, Ill.

Division of Ser. No. 884,350, Jul. 11, 1986, Pat. No. 4,788,054. This application Oct. 3, 1988, Ser. No. 252,545

Int. Cl.[4] A61K *7/42, 31/74;* C08K *5/16;* D02G *3/00*

U.S. Cl. 424—59 8 Claims

1. A method of reducing ultraviolet radiation damage to a substance comprising exposing said substance to said ultraviolet radiation while maintaining between at least a portion of said substance and said ultraviolet radiation an effective amount of at least one compound of the class of N-phenylphthalisoimide having the formula:



wherein:

each X is independently selected from the group consisting of hydrogen, —OR, $—NR_1R_2$, —Cl, —Br, —I, $—NO_2$, —C(O)OR and hydrocarbyl; R is selected from the group consisting of alkyl radicals and alkenyl radicals containing less than 11 carbon atoms each; and R_1 and R_2 are each independently selected from the group consisting of hydrogen, alkyl radicals containing less than 11 carbon atoms each, and alkenyl radicals containing less than 11 carbon atoms each.

4,857,306

COSMETIC COMPOSITION, PARTICULARLY FOR DECORATIVE APPLICATIONS

Joachim Roller, Blumenstrasse 7A, Neustetten 1, Fed. Rep. of Germany (D-7401)

PCT No. PCT/DE86/00347, § 371 Date Jun. 15, 1987, § 102(e) Date Jun. 15, 1987, PCT Pub. No. WO87/01278, PCT Pub. Date Mar. 12, 1987

PCT Filed Aug. 29, 1986, Ser. No. 45,132

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1985, 3530902

Int. Cl.[4] A61K *7/021, 7/027, 7/031, 7/032*

U.S. Cl. 424—63 11 Claims

1. Cosmetic composition, particularly for decorative applications, characterized by a liquid, highly viscous or solid, dermatologically compatibe carrier masterial and a pure powder of precious stones selected from the group consisting of sapphire, ruby, emerald, gem topaz, moonstone, cat's eye, zirconium, rock crystal, agate, amethyst, aquamarine, aventurine, amber, beryl, bloodstone, chrysoberyl, chrysoprase, chrysolite, chrysocolla, chalcedony, dioptase, fire opal, fluorite, garnet, oriental topaz, hyacinth, hematite, jade, cornelian, lapis lazuli, labradorite, malachite, nephrite, onyx, opal, obsidian, padparsha, peridot, rhodolite, rhodochrosite, rubellite, blue quartz, sodalite, spinel, sardonyx, tansanite, topaz, tourmaline, tiger's-eye, zoisite, turquoise, Chile-lapis, quartz, smoky quartz, jasper, corals, pearls and mixtures thereof.

4,857,307

ALCOHOL FREE-LIQUID MAKEUP COMPOSITION

Harold Suss, Germantown, and Virginia F. Ner, Memphis, both of Tenn., assignors to Plough, Inc., Memphis, Tenn.

Filed Nov. 17, 1987, Ser. No. 121,550
Int. Cl.[4] A61K *7/021, 7/035*
U.S. Cl. 424—63 **5 Claims**

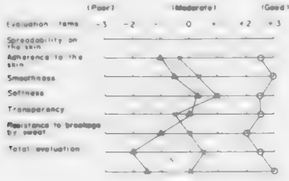
1. A liquid makeup composition comprising an oil-absorbing effective amount of distarch phosphate in an alcohol-free liquid makeup formulation wherein the effective oil-absorbing amount of distarch phosphate is in the range of from about 1 to about 10 weight percent of said liquid makeup composition.

4,857,308

COSMETIC POWDERS

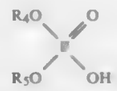
Junichi Fukasawa, Yokohama; Haruya Kato, Funabashi; Katsumasa Iwaya, Oyama; Takako Shimizu, Tokyo, and Atsushi Kawano, Sakura, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 694,279, Jan. 24, 1985, abandoned. This application Aug. 21, 1986, Ser. No. 898,801
Claims priority, application Japan, Feb. 6, 1984, 59-19769
Int. Cl.[4] A61K *7/02, 7/021, 7/031, 7/032*
U.S. Cl. 424—63 **6 Claims**



1. A make-up cosmetic or a body cosmetic selected from the group consisting of body powder and baby powder of improved water repellence and improved softness to the skin, which comprises:

a cosmetic powder selected from the group consisting of particles of inorganic loading pigments and composite pigments, said cosmetic powder particles being coasted by an amount of from 0.1 to 50 wt. % of a dialkyl phosphate of the formula:



where R_4 and R_5 independently each represent a linear alkyl group having from 14 to 22 carbon atoms.

4,857,309

ACTIVATED SILICON-CONTAINING ALUMINUM COMPLEX AND PROCESS OF PREPARATION AND USE

Fred B. Bernat, Cliffside Park, N.J., assignor to Research Corporation of America, Inc.

Continuation of Ser. No. 686,147, Dec. 26, 1984, abandoned, which is a division of Ser. No. 488,637, Apr. 26, 1983, Pat. No. 4,536,394. This application Jan. 8, 1987, Ser. No. 4,783
The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.
Int. Cl.[4] A61K *7/38, 33/06*
U.S. Cl. 424—68 **14 Claims**

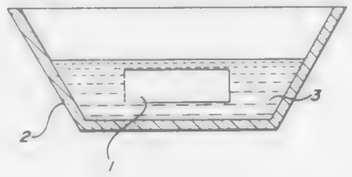
1. A process for preparing an activated silicon aluminum complex capable of releasing oxygen and hydrogen in the presence of a halogen compound when added to a fluid which contains oxygen and hydrogen, said process comprising:

(a) contacting aluminum metal having a purity of at least about 99.9% by weight and containing at least trace amounts of silicon, with a source of an acid of a type and concentration which will both remove and inhibit the formation of oxide on said metal;

(b) contacting said acid-treated aluminum metal with a source of mercury in an oxygen-containing atmosphere;

(c) immersing said mercury contacted aluminum in a hydrogen halide solution for sufficient time to produce a slurry of said mercury-contacted aluminum in said acidic solution;

(d) increasing the pH of said slurry to such an extent that the halogen which is contained in said slurry is neither chemically bound as a halide nor liberated as a halogen gas;



(e) adding a source of oxygen gas to said slurry in an amount which depends upon the desired amount of oxygen gas to be released from the final activated silicon aluminum complex;

(f) drying said slurry;

(g) at least partially redissolving the solid within said slurry in a hydrogen halide acid solution;

(h) cooling the resulting product; and

(i) increasing the pH of said cooled product to from about 5.0 to about 5.8.

14. A process for deodorant treatment of skin comprising applying the product of claims 7, 8, 9, 10 or 11 to said skin for a sufficient period of time and in sufficient to effect a deodorant change.

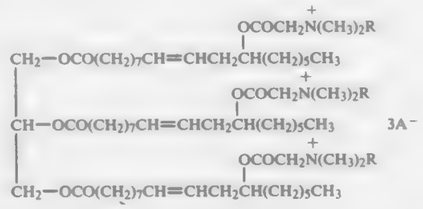
4,857,310

TRIGLYCERIDE QUATERNARY AMMONIUM COMPOUNDS, THEIR PREPARATION AND USE

Ahmet E. Baydar, London, England, assignor to The Gillette Company, Boston, Mass.

Filed Mar. 21, 1988, Ser. No. 170,965
Claims priority, application United Kingdom, Mar. 25, 1987, [redacted]
Int. Cl.[4] A61K *7/08, 7/48, 31/14;* **C11C** *3/00*
U.S. Cl. 424—70 **10 Claims**

1. Triglyceride quaternary ammonium compounds according to the formula



in which R is an alkyl group having 10 to 20 carbon atoms, and A^- is a physiologically acceptable anion.

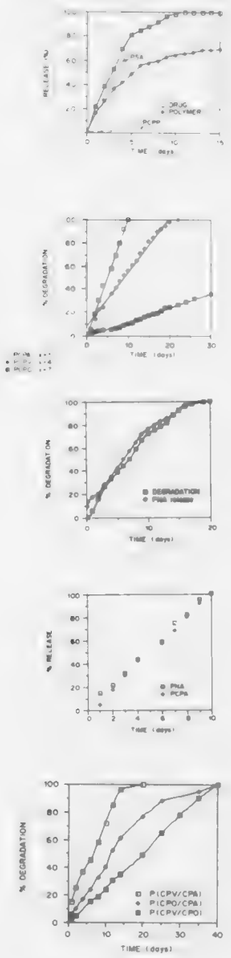
8. A moisturizing lotion or cream which comprises an effective amount of a compound as defined in claim 1, in which R is an alkyl group having 16 to 20 carbon atoms and a lotion or cream carrier.

4,857,311

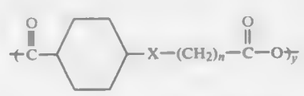
POLYANHYDRIDES WITH IMPROVED HYDROLYTIC DEGRADATION PROPERTIES

Abraham J. Domb, Brookline, and Robert S. Langer, Somerville, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 31, 1987, Ser. No. 80,631
The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.
Int. Cl.[4] A61K *31/74;* **C08G** *63/00*
U.S. Cl. 424—78 **18 Claims**



1. A polyanhydride having the general formula



wherein X is selected from the group consisting of O and CH_2, n is an integer between 2 and 25, and y is at least 2, and wherein the polyanhydride is soluble in organic solvents and has a melting point of approximately 100° C. or less.

4,857,312

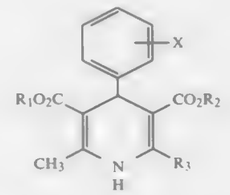
DIHYDROPYRIDINE SPRAY, PROCESS FOR ITS PREPARATION AND ITS PHARMACEUTICAL USE

Ahmed Hegasy, Leverkusen, and Klaus-Dieter Rämsch, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 942,479, Dec. 15, 1986, abandoned. This application Mar. 17, 1988, Ser. No. 169,566
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1985, 3544692
Int. Cl.[4] A61K *31/44, 31/79*
U.S. Cl. 424—80 **8 Claims**

1. A sprayable liquid formulation comprising, per 100 ml of the formulation,

(a) 0.5 to 4 grams of a dihydropyridine of the formula



in which

R^1 and R^2 each independently is alkyl with 1 to 10 carbon atoms optionally substituted by alkoxy with 1 to 3 carbon atoms, trifluoromethyl, halogen or N-methyl-N-benzylamino,

R^3 is alkyl with 1 to 4 carbon atoms, cyano or hydroxymethyl, and

X is a nitro group, one or two chlorine groups or the ring member =N—O—N=,

(b) 15 to 30 grams of polyethylene glycol with an average molecular weight of 400,

(c) 30 to 60 grams of ethyl alcohol, and

(d) 4 to 20 grams of polyvinylpyrrolidine with an average molecular weight of 12000 to 30000.

4,857,313

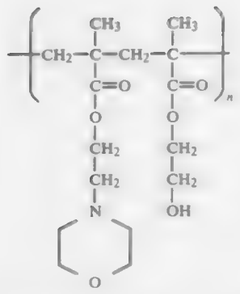
TRANSDERMAL DRUG DELIVERY DEVICE COMPRISING COPOLYMERS OF N-MORPHOLINOETHYL METHACRYLATE AND 2-HYDROXYLMETHACRYLATE

Suk-zu Song, Flanders; Zahra A. Rashidbaigi, Nutley; Russell U. Nesbitt, Somerville, and Mahdi B. Fawzi, Flanders, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 28, 1987, Ser. No. 55,095
Int. Cl.[4] C08F *226/06;* **A61K** *31/78*
U.S. Cl. 424—81 **3 Claims**

1. A pharmaceutical preparation for transdermal application comprising

(a) a copolymer having the formula



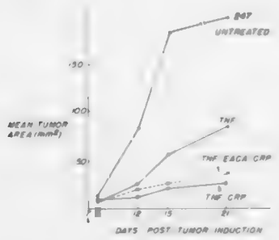
wherein n is an integer from 5 to 10,000 which copolymer is prepared by mixing N-morpholinoethyl methacrylate and 2-hydroxyl methacrylate with a free radical initiator in the presence of alcohol,
(b) glycerol or triacetin, and
(c) diphenhydramine hydrochloride.

4,857,314

C-REACTIVE PROTEINS IN TREATMENT OF ANIMAL AND HUMAN CANCERS

Timothy E. O'Connor, and Sherry L. Dupere, both of Williamsville, N.Y., assignors to Health Research , Inc., Buffalo, N.Y.

Filed Jul. 18, 1986, Ser. No. 886,656
Int. Cl.[4] A61K *37/02*
U.S. Cl. 424—85.1 **18 Claims**



1. A pharmaceutical composition comprising: an effective antitumor amount of human tumor necrosis factor; and an effective immune system stimulating amount of C-Reactive Protein to enhance the antitumor activity of said human tumor necrosis factor.

4,857,315

COMPOSITIONS CONTAINING GOLGI ALPHA-MANNOSIDASE II INHIBITORS

James W. Dennis, Etobicoke, Canada, assignor to Mount Sinai Hospital Corporation, Toronto, Canada

Continuation-in-part of Ser. No. 912,485, Sep. 29, 1986, abandoned, and a continuation-in-part of Ser. No. 912,486, Sep. 29, 1986, abandoned. This application Jun. 18, 1987, Ser. No. 65,348
Int. Cl.[4] A61K *45/02, 31/70*
U.S. Cl. 424—85.2 **18 Claims**

1. A composition which enhances the antiproliferative and antiviral effects of interferons or interferon inducers, and inhibits its neoplastic growth and metastasis, comprising an effective amount of swainsonine or an active analogue of swainsonine and an effective amount of an interferon or interferon inducer.

6. A method for the treatment of proliferative disorders, viral infections and neoplastic growth and metastasis, comprising administering to a patient an effective amount of swainsonine or an active analogue of swainsonine and an effective amount of an interferon or interferon inducer.

4,857,316

SYNERGISTIC ANTIVIRAL COMPOSITION

Deborah A. Eppstein, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 656,221, Oct. 3, 1984, Pat. No. 4,606,917. This application May 9, 1986, Ser. No. 861,172
Int. Cl.[4] A61K *45/02*
U.S. Cl. 424—85.6 **11 Claims**

1. A composition comprising an effective amount of natural β-interferon and 9-(1,3-dihydroxy-2-propoxymethyl)guanine or a pharmaceutically acceptable salt thereof.

11. A method of treating viral infections in a mammal having a viral infection which comprises administering an effective amount of the composition of claim 1.

4,857,317

PROCESS FOR THE EXTRACTION AND PURIFICATION OF PROTEINS FROM CULTURE MEDIA PRODUCING THEM

Frans V. Wijnendaele, Ottenburg; Daniel Gilles, Genval, and Guy Simonet, Perwez, all of Belgium, assignors to SmithKline Biologicals, Rixensart, Belgium

Division of Ser. No. 719,601, Apr. 3, 1985. This application Apr. 27, 1987, Ser. No. 42,914
Int. Cl.[4] A61K *39/29*
U.S. Cl. 424—89 **4 Claims**

1. Hepatitis B surface antigen/polysorbate composite micelle containing from 15 to 35% (w/v) of polysorbate.

4,857,318

BORDETELLA BRONCHISEPTICA PILUS SUBUNIT PROTEIN VACCINE EFFECTIVE AGAINST BORDETELLA PERTUSSIS

Simon W. Lee, San Jose, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 549,384, Nov. 7, 1983, abandoned. This application Mar. 25, 1985, Ser. No. 715,805
Int. Cl.[4] C12P *21/00;* A61K *39/00;* C07G *7/00*
U.S. Cl. 424—92 **20 Claims**

1. A vaccine for immunizing a human subject against *Bordetella pertussis* which comprises an effective amount of an antigen consisting essentially of a pilus subunit protein from *Bordetella bronchiseptica* characterized by having a molecular weight of about 22,000 daltons as determined by sodium dodecyl sulfate-polyacrylamide gel electrophoresis and having the amino acid composition (amino acid:number of residues per molecule of protein): aspartic acid/asparagine:26, threonine:22, serine:15, glutamic acid/glutamate:13, proline:14, glycine:20, alanine:19, cystine/2:present, valine:16, methionine:1, isoleucine:13, leucine:11, tyrosine:10, phenylalanine:5, histidine:2, lysine:13, tryptophan:2, and arginine:5.

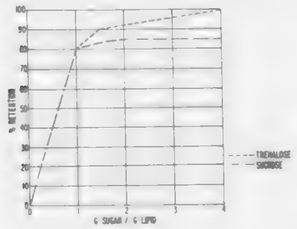
4,857,319

METHOD FOR PRESERVING LIPOSOMES

John H. Crowe, and Lois M. Crowe, both of Davis, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 690,679, Jan. 11, 1985, abandoned. This application May 21, 1987, Ser. No. 52,795
Int. Cl.[4] A61K *37/24, 37/48*
U.S. Cl. 424—94.1 **14 Claims**

1. A preserved liposomal composition comprising;
lyophilizates defining lipid vesicles having an average size of from about 50 nm to about 100 nm, an initial quantity of material being encapsulated by the vesicles, and a disaccharide component being present both interior and exterior to the lipid vesicles, and the disaccharide component



being from about 0.1:1 to about 4:1 with respect to the lipid component.

4,857,320

METHOD OF ENHANCING THE SOLUBILITY OF TISSUE PLASMINOGEN ACTIVATOR

Arthur J. Wittwer, Ellisville, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 19, 1987, Ser. No. 16,295
Int. Cl.[4] A61K *37/547*
U.S. Cl. 424—94.63 **1 Claim**

1. The method of enhancing the solubility of tissue plasminogen activator in aqueous physiological saline solution comprising incorporating in said solution about 0.01% Tween 80 and a non-toxic salt of arginine in an amount effective to increase the solubility of the t-PA without substantially inhibiting its potential biological activity upon administration.

4,857,321

SKIN OINTMENT

William C. Thomas, 8504 Punta Lora Dr., Pensacola, Fla. 32514

Filed Aug. 26, 1988, Ser. No. 240,064
Int. Cl.[4] A61K *35/12*
U.S. Cl. 424—95 **2 Claims**

1. An ointment, comprising:
(a) about twelve (12%) percent by volume mink oil;
(b) about nine (9%) percent by volume lanolin;
(c) about four (4%) percent by volume zinc stearate;
(d) about four (4%) percent by volume octylmethoxycinnamate;
(e) about four (4%) percent by volume methylgluceth—10;
(f) about four (4%) percent by volume peg 100 stearate;
(g) about three (3%) percent by volume cetal;
(h) about three (3%) percent by volume peanut oil;
(i) about two (2%) percent glyceral monostrearate;
(j) about two (2%) percent acetylated lanolin alcohol;
(k) about two (2%) percent spermaceti;
(l) about one (1%) percent propylene glycol;
(m) about one (1%) percent panthenol;
(n) about forty-seven (47%) percent by volume water;
(o) less than one (1%) percent tocopheryl acetate;
(p) less than one (1%) percent by volume retinol palmitate;
(q) less than one (1%) percent by volume aluminum sulfate;
(r) less than one (1%) percent by volume methyl paraben;
(s) less than one (1%) percent by volume ascorbal palmitate;
(t) less than one (1%) percent by volume E.D.T.A.;
(u) less than one (1%) percent by volume propyl paraben;
(v) less than one (1%) percent by volume tocopherol acetate;
(w) less than one (1%) percent by volume A/D-3;
(x) less than one (1%) percent by volume cholecalciferol; and,
(y) less than one (1%) percent by volume of a fragrance.

4,857,322

WOOD PRESERVATIVE

Reimer Goettsche, Baden-Baden; Hans-Norbert Marx, Buehl-Weitenung, and Wendelin Hettler, Sinzheim-Muellhofen, all of Fed. Rep. of Germany, assignors to Dr. Wolman GmbH, Sinzheim, Fed. Rep. of Germany

Filed Nov. 9, 1987, Ser. No. 118,011
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3639063
Int. Cl.[4] A01N *59/20, 55/02*
U.S. Cl. 424—633 **14 Claims**

1. A wood preservative, comprising:
(a) about 5–40 wt.% of a copper compound,
(b) about 10–40 wt.% of an aliphatic monocarboxylic acid, aliphatic dicarboxylic acid or polycarboxylic acid, or a mixture thereof, and
(c) about 5–40 wt.% of a polyamine containing 3–9 carbon atoms, 2–4 nitrogen atoms and containing at least one primary amino group, based upon the total weight of the mixture.

4,857,323

PRESERVATIVE FOR WOOD

Bror O. Hager, Forsetevagen 5, Djursholm, Sweden S-182 63

Filed Feb. 27, 1987, Ser. No. 19,655
Claims priority, application Sweden, Feb. 27, 1986, 8600888
Int. Cl.[4] A01N *55/02, 59/14*
U.S. Cl. 424—659 **12 Claims**

1. A preservative composition for organic fibrous materials comprising an effective preservative amount of zinc acetate and copper acetate, wherein said composition contains about 50% to about 90% by weight of copper acetate and about 10% to about 35% by weight of zinc acetate, based on the total metal acetate present.

4,857,324

EXOGENOUSLY ACIDIFIED ANTACID COMPOSITIONS HAVING CYTOPROTECTIVE PROPERTIES

Ghulam N. Mir, Buckingham, Pa.; Luis E. Borella, Princeton Junction; John F. DiJoseph, Woodbridge, both of N.J., and Gerald L. Reuter, Plattsburgh, N.Y., assignors to American Home Products Corporation (Del.), New York, N.Y.

Continuation-in-part of Ser. No. 785,417, Oct. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 831,756, Feb. 20, 1986, abandoned. This application Dec. 21, 1987, Ser. No. 135,788
Int. Cl.[4] A61K *33/08*
U.S. Cl. 424—690 **16 Claims**

1. A pharmaceutically cytoprotective exogenously acidified aluminum base containing composition acidified to a pH between about 2.25 to about 3.25 at which the aluminum base component is solubilized and obtained by exogenous acidification of a precursor aluminum base containing antacid composition and having a concentration of about 50 to about 98 grams of precursor antacid composition prior to acidification per 100 milliliters of acidified composition, the precursor antacid composition having an acid neutralizing capacity of at least 5mEq.

4,857,325

ANTIOXIDANT COMPOSITIONS AND METHODS

Michael Albeck, and Shlomo Grossman, both of Ramat-Gan, Israel, assignors to Bar-Ilan University, Ramat-Gan, Israel

Continuation-in-part of Ser. No. 726,540, Apr. 24, 1985, abandoned. This application Mar. 31, 1986, Ser. No. 846,599
Int. Cl.[4] A61K *35/78*
U.S. Cl. 424—195.1 **61 Claims**

1. A composition for application to the skin, said composition comprising a cosmetically acceptable carrier and cosmetically effective amounts of a water soluble extract from plant tissue, said extract and at least two distinct fractions chromato-

graphically separable therefrom being capable of being absorbed through the skin and lowering the peroxide level of the skin, said plant being selected from the group consisting of Spinacia, Trifolium, Medicago, Nicotiana, Penicillaria, Zea, and Allium.

4,857,326

STABLE NUTRITIVE AND THERAPEUTIC FLAX SEED COMPOSITIONS, METHODS OF PREPARING THE SAME, AND THERAPEUTIC METHODS EMPLOYING THE SAME

Paul A. Stitt, 123 Cleveland Ave., Manitowoc, Wis. 54220

Filed Dec. 29, 1986, Ser. No. 946,727
Int. Cl.[4] A61K *35/78, 33/30*
U.S. Cl. 424—195.1 **49 Claims**

1. A method for producing a stable dry composition of flax seed comprising grinding said flax seed in the presence of vitamin B-6 and zinc ion at a temperature of about 160° F. to just above freezing.

4,857,327

METHOD FOR SUPPRESSING STATES OF ILLNESS IN THE DIGESTIVE SYSTEM

Carl A. Virdaim, Starevagen 10, 872 00 Kramfors, Sweden

Continuation-in-part of Ser. No. 668,770, Oct. 16, 1984, abandoned. This application May 2, 1986, Ser. No. 858,783
Claims priority, application Sweden, Feb. 16, 1983, 8300847
Int. Cl.[4] A61K *35/78, 31/35*
U.S. Cl. 424—195.1 **20 Claims**

1. A method of suppressing states of illness in the digestive system generated by pathogenic microorganism, said states of illness manifesting themselves in indisposition, vomiting and diarrhea or only diarrhea, with a preparation comprising cellulose, weak organic acids and anthocyanins, said preparation being produced by the steps of:

(a) providing berries taken from the class consisting of *Ribes nigrus* L., *Vaccinium myrtillus* L., *Vaccinium vitis idaea* L., *Sambuccus nigra* and *Vitis vinifera;*

(b) removing from the berries the main portion of the pulp flesh, which pulp flesh contains sugar which is a nutriment for microorganisms;

(c) recovering the remainder of said berries amounting to from 10 to 70% by weight of the whole berries, said remainder constituting the skin and outer portion of the berries and thus containing from 1 to 60 mg/g of anthocyanins, giving a pH of from 1.5 to 5; and

(d) utilizing the preparation recovered in step (c) to suppress illness in the digestive system.

4,857,328

SKIN THERAPEUTIC MIXTURE CONTAINING ALOE VERA EXTRACT

Theodore Trenzeluk, Manville, N.J., assignor to Tecma Laboratories, Inc., Manville, N.J.

Filed Sep. 29, 1986, Ser. No. 912,590
Int. Cl.[4] A61K *35/78, 33/30, 31/425, 31/01*
U.S. Cl. 424—195.1 **2 Claims**

1. A mixture for alleviating the skin conditions of acne, psoriasis, burns, pimples, blackheads, and open sores, said mixture comprising:

a. the aqueous extract from the leaves of the aloe vera plant, said aqueous aloe vera extract being prepared as follows: said leaves being dried under moderate light, under warm temperature, and with frequent tossing; then said dried leaves being ground to a very small particle size; and then said ground leaves being extracted with water; said aqueous aloe vera extract comprising about 3% to about 50% by weight of said mixture;

b. a perservative being sulfathiazole, said preservative comprising about 5% to about 20% by weight of said mixture;

c. an inert pigment being zinc oxide, said inert pigment comprising about 5% to about 16% by weight of said mixture; and

d. an oil soluble base being petrolatum, said oil soluble base comprising about 14% to about 87% by weight of said mixture.

4,857,329

PROCESS FOR EXTRACTING LIPIDS FROM MORTIERELLA GENUS FUNGI

Takeshi Sako; Toshihiro Yokochi; Masahito Sato; Osamu Suzuki; Toshikatsu Hakuta; Tsutomu Sugeta, and Noriaki Nakazawa, all of Ibaraki, Japan, assignors to Agency of Industrial Science & Technology, Ibaraki, Japan

Filed Aug. 1, 1986, Ser. No. 891,912
Claims priority, application Japan, Aug. 19, 1985, 60-181481
Int. Cl.[4] A61K *35/84*
U.S. Cl. 424—195.1 **15 Claims**

1. A process for extracting lipids from Mortierella genus fungi, which comprises the steps of:

(a) heating Mortierella genus fungi cells and grinding the same by applying a mechanical force thereto or grinding the same by applying a nechanical force thereto in an alcoholic solvent; and

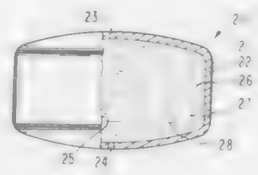
(b) extracting the lipids from said Mortierella genus fungi cells thus ground with a solvent selected from the group consisting of a solvent in a supercritical state, a solvent mixture of said solvent in a supercritical state and a lower aliphatic alcohol and a solvent mixture of said solvent in a supercritical state and a lower saturated aliphatic hydrocarbon.

4,857,330

CHLORPHENIRAMINE THERAPY

Sally I. Stephens, Mountain View; Lawrence G. Hamel; Glen E. Barclay, both of Sunnyvale, and Patrick S. L. Wong, Hayward, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 853,109, Apr. 17, 1986, abandoned. This application Apr. 1, 1988, Ser. No. 176,561
Int. Cl.[4] A61M *31/00*
U.S. Cl. 424—424 **9 Claims**



1. A dosage for delivering chlorpheniramine to a biological environment of use, the dosage form comprising:

(a) a wall comprising in at least a part a composition comprising a member selected from the group consisting of a cellulose acylate, a cellulose diacylate and a cellulose triacylate, which wall is permeable to the passage of an exterior fluid, substantially impermeable to the passage of chlorpheniramine, and surrounds and forms:

(b) a compartment;

(c) a composition in the compartment comprising a dosage unit amount of chlorpheniramine and mannitol, with the amount of mannitol and the amount of chlorpheniramine being selected to provide a mannitol concentration of from 1.5 to 6 times greater than the chlorpheniramine; and,

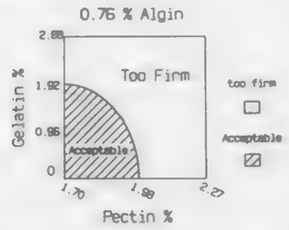
(d) at least one passageway in the wall connecting the compartment with the exterior of the dosage form for dispensing chlorpheniramine at a substantially even rate to the environment of use over time.

4,857,331

SUGARLESS PECTIN DELIVERY SYSTEM

James J. Shaw, Morristown, and Frank J. Bunick, Budd Lake, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 31, 1988, Ser. No. 175,818
Int. Cl.[4] A61K *9/68*
U.S. Cl. 424—440 **37 Claims**



1. A sugarless ingestible gel confectionery delivery system comprising:

(a) a pectin gel component in an amount of from about 1% to about 5% by weight of the final delivery system,

(b) an algin gel component in an amount of from about 0.2% to about 1.5% by weight of the final delivery system,

(c) a polymer network gel component in an amount of up to about 5% by weight of the final delivery system, and

(d) an edible insoluble solid in an amount sufficient to strengthen the internal gel network such that the gel retains its structural integrity during mold removal.

2. The delivery system of claim 1 wherein said insoluble solid is selected from the group consisting of cellulose, microcrystalline cellulose, gums, grains, seeds, seed husks, fruits and mixtures thereof.

4,857,332

COMPOSITION AND METHOD FOR INCREASING MILK FAT PRODUCTION IN RUMINANTS

Brian R. Schricker, Terre Haute, Ind., assignor to Pitman-Moore, Inc., Terre Haute, Ind.

Filed May 31, 1988, Ser. No. 200,454
Int. Cl.[4] A23K *1/17*
U.S. Cl. 424—442 **20 Claims**

1. A composition for synergistically increasing milk fat production in ruminants, comprising:

pellets which comprise an antacid selected from the group consisting of sodium and magnesium antacids and an electrolyte selected from the group consisting of potassium, sodium, and chlorine containing electrolytes, said pellets containing potassium, sodium, and chlorine in a weight ratio of from about 1.5 to about 1.8 parts of potassium and from about 1.2 to about 1.5 parts of chlorine per part of sodium, said potassium being present in sufficient amount to provide from about 0.8 to about 1 weight parts of potassium per weight part of any magnesium present; and

sodium bicarbonate.

4,857,333

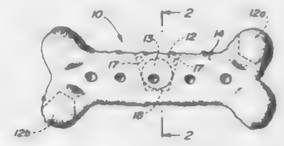
FOOD PRODUCT FOR ADMINISTERING MEDICATION TO ANIMALS

Robert G. Harold, 3724 Aster Ct., Philadelphia, Pa. 19136

Filed May 12, 1988, Ser. No. 192,962
Int. Cl.[4] A23K *1/17*
U.S. Cl. 424—442 **6 Claims**

4. An animal food product for administering medication to animals, comprising:

a formed, chewable food treat having at least one preformed empty pocket therein opening onto an outer surface of said treat, the pocket being sized to encompass a medicant to be placed therein, the food treat being semi-rigid and moist, whereby an animal may be habituated to the product as unmedicated, and which when necessary,



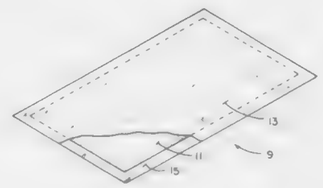
can have the medicant concealed therein, the pocket being deformed to close after placing the medicant therein.

4,857,334

SYNTHETIC RESIN MATRIX SYSTEM INCORPORATING HEALING ENHANCER

Bernard Korol, Highland Beach, Fla., and Paul Nathan, Cincinnati, Ohio, assignors to Enquay Pharmaceutical Associates, Boca Raton, Fla.

Continuation-in-part of Ser. No. 815,874, Jan. 3, 1986, Pat. No. 4,747,845, which is a continuation-in-part of Ser. No. 542,754, Oct. 17, 1983, Pat. No. 4,563,184. This application May 27, 1988, Ser. No. 199,375
Int. Cl.[4] A61L *15/00*
U.S. Cl. 424—445 **6 Claims**



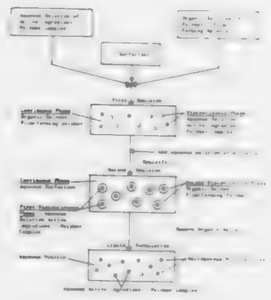
1. A synthetic resin matrix system for drug storage and extended duration drug release comprising a particulate, hydrophilic, water swellable polymer, and inert, non-toxic water miscible organic solvent, and a hydrogen bonding plasticizer; said polymer selected from the group consisting of a synthetic resin matrix system for drug storage and extended duration drug release comprising a particulate, hydrophilic, water swellable polymer, an inert, non-toxic water miscible organic solvent, and a hydrogen bonding plasticizer, said polymer selected from the group consisting of hydroxy(C_2–$_4$alkyl) methacrylate, hydroxy(C_2–$_4$alkyl) acrylate, hydroxy(C_2–$_4$alkoxyC_2–$_4$alkyl) methacrylate, hydroxy(C_2–$_4$alkoxyC_2–$_5$alkyl) acrylate, alkoxy(C_2–$_4$alkoxyC_2–$_4$alkyl) methacrylate, alkoxy(C_2–$_4$alkoxyC_2–$_4$alkyl)acrylate, N-(C_1–$_4$alkyl) acrylamide, N-(C_1–$_4$alkyl) methacrylamide, N,N-di(C_1–$_4$alkyl) acrylamide, N,N-di(C_1–$_4$alkyl) methacrylamide, vicinal-epoxy(C_1–$_4$alkyl) methacrylate, or vicinal-epoxy(C_1–$_4$alkyl) acrylate, said solvent selected from the group consisting of polyethylene glycol or polypropylene glycol having a molecular weight averaging between about 200–2000 gram molecular weight units, and wherein said plasticizer being selected from the group consisting of dimethylsulfoxide, dimethylphthalate, 2,3-butylene carbonate, dimethylformamide, dimethyltetramethylene sulfone, diethylsulfone, methylene glycolate, methylpropyl sulfone, or butyrolactone, with said polymer ranging between about 15%–50% by weight of said matrix system, with said solvent ranging between about 30%–65% by weight of said matrix system, with said plasticizer ranging up to about 20% by weight of said matrix system, and further including a medicament agent for local or systemic therapeutic effects, said medicament agent being a growth factor or healing enhancer.

4,857,335

LIQUID CONTROLLED RELEASE FORMULATIONS AND METHOD OF PRODUCING SAME VIA MULTIPLE EMULSION PROCESS

Howard A. Bohm, Richmond, Va., assignor to Lim Technology Laboratories, Inc., Richmond, Va.

Filed Mar. 27, 1987, Ser. No. 31,047
Int. Cl.[4] A61K *9/66*
U.S. Cl. 424—455 20 Claims



1. A method for preparing a liquid controlled release dosage formulation, comprising the steps of:
preparing an aqueous solution of an active ingredient and a complex-forming polymer to produce active ingredient-polymer complexes;
preparing an organic solution of a film-forming polymer in an organic solvent;
adding a first surfactant to said aqueous solution of to said organic solution or to both solutions;
emulsifying said solutions to produce an aqueous-organic first emulsion;
preparing an aqueous solution of a second surfactant;
emulsifying said aqueous solution of said second surfactant with said first emulsion to produce an aqueous-organic-aqueous second emulsion; and
removing said organic solvent from the second emulsion to produce an aqueous dispersion of microcapsules each having a permeable polymeric shell of said film-forming polymer encapsulating an aqueous core of active ingredient-polymer complexes.

4,857,336

ORAL THERAPEUTIC SYSTEM HAVING SYSTEMIC ACTION

Satish C. Khanna, Bottmingen, and Theresa Rüttimann, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 29, 1987, Ser. No. 79,055
Claims priority, application Switzerland, Aug. 7, 1986, 3172/86
Int. Cl.[4] A61K *9/24*
U.S. Cl. 424—473 7 Claims

1. An oral therapeutic system for administering carbamazepine comprising
(a) a wall made of acylated cellulose which is permeable to water but impermeable to the components of the drug containing core and to the ions present in gastric or intestinal juices;
(b) a core containing finely particulate carbamazepine as a drug, hydroxypropylmethyl cellulose as protective colloid, a swellable hydrophilic polymer selected from the group consisting of poly-N-vinyl-2-pyrrolidone, polyvinyl alcohol, alkylene oxide homopolymers, methyl cellulose, ethyl cellulose, hydroxypropyl cellulose, the copolymer of vinylpyrrolidone and vinyl acetate, the mixture of the copolymer of vinylpyrrolidone and vinyl acetate and the homopolymer of ethylene oxide and, a water soluble compound for inducing osmosis; and
(c) a passageway through the wall (a) for delivering the components present in the core to the environmental gastric or intestinal juices.

4,857,337

ENTERIC COATED ASPIRIN TABLETS

Ronald W. Miller, Langhorn, Pa., and Raymond W. Sutton, Medford, N.J., assignors to American Home Products Corp. (Del), New York, N.Y.

Filed May 24, 1988, Ser. No. 197,888
Int. Cl.[4] A61K *9/36*
U.S. Cl. 424—480 3 Claims

1. An enteric coated aspirin tablet/caplet comprising
(i) a tablet core consisting essentially of about 300–500 milligrams of aspirin as the principal active ingredient admixed with pharmaceutically acceptable excipients,
(ii) a film coat comprising up to about 0.5% based on the weight of the core of a cellulose polymer selected from the group consisting of hydroxypropyl methylcellulose, hydroxypropyl cellulose and mixtures thereof,
(iii) an enteric coat consisting essentially of polyvinylacetate phthalate in an amount of about 7% to about 12% by weight based on the weight of the core,
(iv) a protective coat consisting essentially of about 1.5% to about 5% by weight based on the weight of the core of hydroxypropyl methylcellulose, each of the film coat, the enteric coat and the protective coat having been applied from an aqueous solution or suspension of a film or enteric coating material.

4,857,338

METHOD OF PROMOTING THE HEALTH AND THE GROWTH OF PIGLETS

Jan Ybema, Borculo, and Gerhard Schutte, Holten both of Netherlands, assignors to Coop Weiproduktenfabriek "Borculo" W.A., Borculo, Netherlands

Filed Nov. 30, 1987, Ser. No. 126,158
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—2 5 Claims

1. A method of promoting the growth, the health, or both, of piglets comprising feeding said piglets a dry feed containing a dry composition consisting essentially of whey protein solids in an amount of 18–28 parts solids, calcium formate in an amount 3–5 parts and hydrochloric acid in an amount sufficient to give a pH below 4 in a 10% aqueous solution whereby growth rate is increased and mortality is decreased.

4,857,339

METHOD FOR MAKING CEREAL PRODUCTS NATURALLY SWEETENED WITH FRUCTOSE

John A. Maselli, Winston-Salem, N.C.; Saul L. Neidleman, Oakland, Calif.; Richard L. Antrim, Sparta, N.J., and Richard A. Johnson, Clinton, Iowa, assignors to Nabisco/Cetus Food Biotechnology Research Partnership, Emeryville, Calif.

Filed Sep. 28, 1987, Ser. No. 101,561
Int. Cl.[4] A23L *1/10*
U.S. Cl. 426—28 44 Claims

1. A method for producing an enzyme-saccharified cereal product, comprising:
(a) cooking cereal grains or at least one cereal grain fraction with water to at least partially gelatinize cereal starch;
(b) treating the cooked cereal grains or at least one cereal grain fraction of step (a) with water and enzymes comprising glucoamylase and glucose isomerase under conditions to produce fructose while retaining a sufficient amount of starch or high molecular weight dextrins for formability of the enzyme treated cereal grain or at least one enzyme treated cereal grain fraction into a breakfast cereal shape;
(c) forming the enzyme treated cereal grain or the at least one enzyme treated cereal grain fraction of step (b) into a breakfast cereal shape; and
(d) inactivating the enzymes, the amount of fructose produced being sufficient to provide a sweet taste to the cereal product.

4,857,340

AROMA RELEASE DURING MICROWAVE COOKING

Thomas H. Parliment, New City, N.Y.; Joseph J. Cipriano, Cranbury, and Richard Scarpellino, Ramsey, both of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 9, 1988, Ser. No. 166,067
Int. Cl.[4] A23L *1/025, 1/221, 1/226*
U.S. Cl. 426—96 6 Claims

1. An aroma-producing composition comprising:
(a) a first mixture of an aroma-producing material, admixed with an effective amount of a fusible encapsulating agent, said amount of said fusible encapsulating agent being effective to enrobe said aroma-producing material so as to inhibit the release of aroma at ambient or storage temperatures said fusible encapsulating agent being selected from the group consisting of high boiling esters, high boiling organic acids, lipids, waxes, paraffin and combinations thereof; and
(b) an effective amount of a microwave susceptible material selected from the group consisting of glycerol, propylene glycol and combinations thereof in conductive heat transfer relationship with said first mixture, said amount of said microwave susceptible material being effective, when irradiated with microwave energy, to provide sufficient heat to cause said fusible encapsulating agent to melt causing said aroma-producing material to release its aroma.

4,857,341

PROTEIN-FREE COFFEE WHITENER AND METHOD OF MAKING SAME

Kha M. Tran, Simi Valley, and Mark A. Einerson, Valencia, both of Calif., assignors to Nestec S.A., Vevey, Switzerland

Filed Aug. 19, 1985, Ser. No. 766,477
Int. Cl.[4] A23C *11/02*
U.S. Cl. 426—98 6 Claims

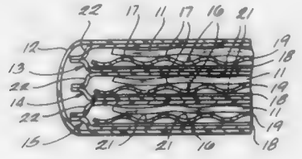
1. A dry protein-free coffee whitener comprising a spray dried emulsion concentrate consisting essentially of a major proportion by weight of carbohydrate, and finely divided particles of an edible fat encapsulated with gum arabic which is present in an amount of from 0.14 to 0.20 parts by weight of gum arabic per 1 part by weight of fat to provide a stable emulsion when the dry whitener is reconstituted in coffee.

4,857,342

OVENABLE PACKAGE FOR BACON AND THE LIKE

Kenneth C. Kappes, Waukesha, Wis., assignor to Milprint Inc., Milwaukee, Wis.

Filed Sep. 11, 1987, Ser. No. 96,125
Int. Cl.[4] B65B *25/22*; B65D *81/34*
U.S. Cl. 426—107 18 Claims



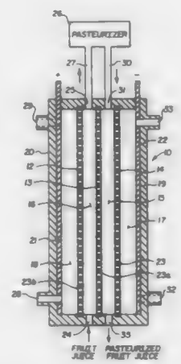
1. A microwavable package for containing a food product during storage and cooking, and microwavable package comprising:
a corrugated bed formed of absorbent material for supporting the food product during storage and cooking, the food product disposed in direct contact with the corrugated bed;
a substantially sealed and movable plastic sleeve forming a sealed envelope enclosing said corrugated bed and the food product; and
venting means in said plastic sleeve for permitting the passage of water vapor through said plastic sleeve at a controlled rate so that said plastic sleeve moves away from said corrugated bed and the food product during cooking.

4,857,343

PROCESS FOR THE LOW TEMPERATURE PASTEURIZATION OF LIQUID COMESTIBLES

Ihab M. Hekal, Stamford, Conn., assignor to Continental Can Company, Inc., Norwalk, Conn.

Filed Aug. 23, 1988, Ser. No. 235,256
Int. Cl.[4] A23L *2/22*
U.S. Cl. 426—239 9 Claims



1. A process for the treatment of liquid comestibles which comprises providing an electrochemical cell in which the liquid comestible and electrolyte are separately flowed through separate compartments of the cell, the cell being comprised of an enclosure, a plurality of ion-selective membranes disposed in spaced relation to define a plurality of permeation compartments within said enclosure wherein a first and a second membrane are cation permeable and form a first permeation compartment, a third membrane is anion permeable and disposed opposite one of said first and second membranes to form therewith a second permeation compartment, an anode disposed on one side of the first permeation compartment, a cathode disposed on one side of the second permeation compartment opposite the anode and separated therefrom by the membranes, the anode and cathodes forming anode and cathode compartments with the first and third membranes respectively,
circulating a liquid comestible containing metal cations and organic acid anions through said first compartment to effect removal of metal cations from the liquid comestible by permeation of the metal cations into the second permeation compartment,
circulating an alkali metal base through the cathode compartment and a mineral acid through the anode compartment,
applying an electrical field across the first and second permeation compartments between the anode and cathode,
withdrawing the liquid comestible from the first permeation compartment, the liquid comestible having a reduced metal cation content,
heating the liquid comestible withdrawn from the first permeation compartment at a temperature effective to pasteurize the liquid comestible,

passing the pasteurized liquid comestible through the second permeation compartment for recombination of metal cations with the organic acid anions in the pasteurized liquid comestible and then withdrawing the pasteurized liquid comestible from the second permeation compartment.

4,857,344

METHOD FOR TREATING PINEAPPLE TO INHIBIT BROWNING

Faustino P. Obrero, and Wilfred H. Schnitzler, both of Manila, Philippines, assignors to Del Monte Corporation, San Francisco, Calif.

Filed Dec. 31, 1986, Ser. No. 948,130
Int. Cl.[4] A23B *7/16*
U.S. Cl. 426—308 5 Claims

1. A method for extending the shelf life of freshly harvested pineapples subject to internal browning, which comprises the step of coating the surface of the pineapple with an amount of a wax-free aqueous solution of a non-phytotxic, and nonionic or anionic surfactant which is effective to limit entry of oxygen into the pineapple to inhibit internal browning thereof, wherein the aqueous solution comprises from about 5 to about 15% surfactant by weight and is free of sodium hypochlorite wherein said nonionic surfactant is selected from the group consisting of ethoxylated natural fats and oils, ethoxylated alkylphenols, ethoxylated alcohols, ethoxylated glycerol esters of fatty acids and mixtures thereof and said anionic surfactant is selected from the group consisting of alkylbenzene sulfonates, phosphate esters, sucrose esters and mixtures thereof.

4,857,345

COMPOSITIONS FOR THE TREATMENT OF FRUIT AND VEGETABLES BY THERMAL FOGGING AND PROCESSING METHOD USING SAID COMPOSITION

Alberto Sardo, Le Chesnay, France, assignor to Xeda International, Le Chesnay, France

Continuation of Ser. No. 732,431, May 6, 1985, abandoned. This application Jan. 16, 1987, Ser. No. 9,038
Claims priority, application France, May 9, 1984, 84 07148
Int. Cl.[4] A23B *7/156*
U.S. Cl. 426—310 4 Claims

1. A composition for the treatment of fruit and vegetables, comprising, in solution form,

from 2% to 20% by weight of active substance selected from ethoxyquine, butylhydroxyanisole, diphenylamine and chlorophenyl isopropyl carbamate

from 10% to 20% by weight of water

from 25% to 50% of propylene glycol, and

from 5% to 50% by weight of a mixture of emulsifiers each having an HLB value of 3 to 20, and said mixture having an average HLB value of 10 to 15 and comprising from 8% to 12% by weight of fatty acid and from 14% to 18% by weight of a fatty acid salt.

4. A method of treating fruits and vegetables comprising applying in an enclosure containing fruits and vegetables, by thermal fogging, a composition according to claim 1.

4,857,346

PROCESS FOR PREVENTING STALING OF STARCH-CONTAINING COMPOSITION

Akira Sato; Yasuo Sekizaka, and Satoshi Saito, all of Kanagawa, Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

Filed Mar. 13, 1987, Ser. No. 25,536
Claims priority, application Japan, Mar. 13, 1986, 61-53646
Int. Cl.[4] A21D *2/18*
U.S. Cl. 426—321 2 Claims

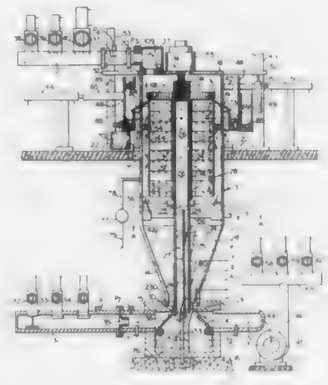
1. A method for preventing staling of a starch-containing food composition, comprising adding thereto, in an amount of from 0.3 to 50% by weight based on the food composition, a material selected from the group consisting of 1,6-anhydro-D-glucose, 1,2-anhydro-D-glucose, 3,6-anhydro-D-glucose, 3,6-anhydro-L-galactose, 3,6-anhydro-D-galactose, 2,5-anhydro-D-mannose, 1,5-anhydro-D-ribose, 2-O-methyl-3,6-anhydro-L-galactose, methyl-3,6-anhydro-D-glucoside, 4-O-D-galactosyl-3,6-anhydro-L-galactose, O-3,6-anhydro-L-galactosyl-(1–3)-D-galactose and mixtures thereof.

4,857,347

METHOD OF DEHYDRATING AND PUFFING FOOD PARTICLES

Wells A. Webb, 214½ E. Pine St. #5, Lodi, Calif. 95240

Filed Jan. 27, 1987, Ser. No. 7,807
Int. Cl.[4] A23L *1/212*
U.S. Cl. 426—438 13 Claims



1. A method of dehydrating and puffing food particles comprising the steps of:

selecting a pressure vessel defining a chamber having at least one rotatable support tray therein;

loading a charge of food particles on said tray;

establishing a vacuum in said chamber;

contacting said food particles with a cooking oil at a temperature sufficient to vaporize moisture therein;

maintaining said oil in contact with said particles until the moisture content thereof is reduced to about 2%;

cooling said particles while under said vacuum; and

rotating said tray at sufficient velocity to remove excess cooking oil therefrom while under said vacuum.

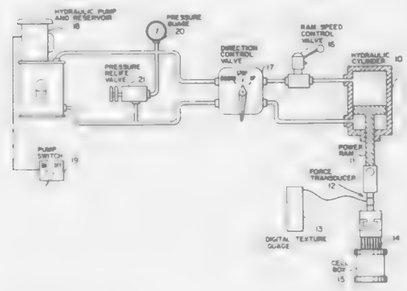
4,857,348

PROCESS FOR PRODUCING INSTANTIZED PARBOILED RICE

Thomas E. Abraham; Jacque L. Malfait, and Arnold J. White, all of Cobourg, Canada, assignors to General Foods Inc., Ontario, Canada

Filed Aug. 25, 1988, Ser. No. 236,565
Int. Cl.[4] A23L *1/182*
U.S. Cl. 426—462 7 Claims

1. A process for producing instantized parboiled rice which consists essentially of incorporating about 68 to about 78 weight percent water into long grain milled parboiled rice in which the starch has been substantially gelatinized, drying said water-containing rice at temperatures from about 260° F. to about 325° F. to reduce the water content of said rice to about 6 to about 14% over a period of time to obtain rice having a texture with a shear press value in the range from about 85 to about 110 lbs/force and having about a 4¼ to about 7¼ minute stand recipe when an equal volume of rice is combined with an equal volume of boiling water to produce an instantized eating quality parboiled finished rice product.

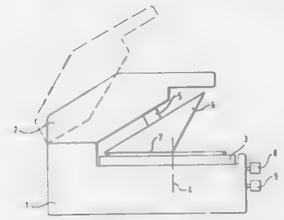


4,857,349

APPARATUS FOR ROLLING CIRCULAR DOUGH PRODUCT

Patrick A. Finlay, Slough, United Kingdom, assignor to Alkmar Products Limited, Beaconsfield, United Kingdom

Continuation-in-part of Ser. No. 864,344, May 8, 1986, abandoned. This application Jul. 29, 1988, Ser. No. 226,534
Claims priority, application United Kingdom, Aug. 14, 1984, 8420629; PCT Int'l Appl., Aug. 12, 1985, PCT/GB85/00358
Int. Cl.[4] A23P *1/0*; A21C *3/02*; B29C *43/08*
U.S. Cl. 426—502 22 Claims



1. A method of creating a circular dough product using an apparatus which includes a turntable having an upper planar surface, a turntable axis of rotation extending perpendicularly to the upper surface and a periphery surrounding the turntable axis of rotation and a conical roller having a base, an apex and a roller axis of rotation, a conical roller having a base, an apex defining an obtuse angle, a conical roll surface between the apex and the base, and a roller axis of rotation, and being located in relation to the upper surface so as to define a rolling line in a region of the roller closest to the upper surface, the turntable being rotatable about the turntable axis of rotation, said method comprising the steps of:

mixing the dough,

placing a predetermined quantity of the dough on the upper surface,

retaining the roller and the turntable at a predetermined spacing with a member therebetween to enable the roller to cooperate with the turntable to roll a portion of dough on the upper surface.

after said step of placing, effecting a relative rotational movement between the upper surface and the roller about the turntable axis of rotation,

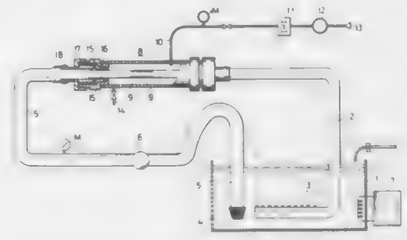
simultaneously with said step of effecting a relative rotational movement between the upper surface and the roller, effecting a rotation of the roller about the roller axis of rotation to form a substantially circular element of dough, the obtuse angle of the apex of the roller being of sufficient degree that the dough will not cling to the roll surface, after said steps of effecting relative rotation movement, cooking the resultant dough element.

4,857,350

METHOD FOR MAINTAINING OR RESTORING FRESHNESS OF PLANTS, VEGETABLES OR FRUITS BY TREATING WITH WATER SUPERSATURATED WITH AIR

Yoshihiko Iwasaki, Miyazaki, and Toyosaburo Noguchi, Saito, both of Japan, assignors to Kiyomoto Tekko Kabushiki Kaisha and Kabushiki Kaisha Saito Hyakkaten, both of Miyazaki, Japan

Filed Mar. 10, 1987, Ser. No. 24,337
Int. Cl.[4] A23B *7/00*
U.S. Cl. 426—506 7 Claims



1. A method of holding freshness of plants, vegetables or fruits comprising, feeding air under pressure to an air absorbing tank from outside or inside of a hollow porous pipe, providing the porous pipe with a plurality of pores having a diameter in the range of 0.1 to 10 microns, locating the porous pipe in said air absorbing tank, passing water into said air absorbing tank to allow the water in said air absorbing tank to combine with the pressurized air and supersaturate with air, thereby absorbing oxygen sufficiently such that the water with supersaturated air contains supersaturated oxygen, feeding the water with supersaturated air through jet holes to cold water held at a temperature of from 0° to 10° C. in an immersion tank for immersing the plants, vegetables or fruits such that the plants, vegetables or fruits immersed in the immersion tank are permitted to absorb oxygen from the cold water with supersaturated air and circulating the water cooled in the immersion tank at the temperature of from 0° to 10° C. by using a pump to draw the water out of the immersion tank for passage to the air absorbing tank and back into the immersion tank.

4,857,351

PROCESS FOR TREATING COFFEE BEANS TO MAKE A BETTER-TASTING COFFEE

Diane H. R. Neilson, Fairfield, Ohio; Sara L. R. Work, Dry Ridge, Ky.; Edward L. Whaley, Cincinnati, Ohio; Steven J. Kirkpatrick, Cincinnati, Ohio, and James P. McCarthy, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 944,140, Dec. 19, 1986. This application Apr. 11, 1988, Ser. No. 179,704
Int. Cl.[4] A23F *5/00*
U.S. Cl. 426—533 15 Claims

1. A process for treating coffee beans to make a better-tasting coffee, comprising the steps of:

(a) partially roasting green coffee beans to a Hunter a-color between about 3 and about 9, under roasting conditions sufficient to increase the Hunter a-color of the beans by at least about 1.5 a-color units during the partial roasting; then

(b) treating the partially roasted beans with a coffee bean extract solution comprising water and from about 1% to about 12% coffee solids, at a temperature between about 40° F. (4° C.) and about 350° F. (177° C.) for a time between about 5 seconds and about 48 hours; and then

(c) final roasting the treated beans to a Hunter L-color between about 16 and about 24, under roasting conditions sufficient to lower the Hunter L-color of the beans by at least about 10 L-color units during the final roasting step.

4,857,352

LOW CALORIE ICE POP

William B. Miller, and Jit F. Ang, both of Berlin, N.H., assignors to James River Corporation, Richmond, Va.

Filed Jun. 16, 1987, Ser. No. 62,517
Int. Cl.[4] A23L *1/04*
U.S. Cl. 426—548 20 Claims

1. An ice pop formulation comprising

(a) at least 1 percent by weight powdered cellulose having an average particle size of less than about 20 microns;

(b) a polyhydric alcohol in an amount sufficient to effectively lower the freezing point of said pop;

(c) a gum in an amount sufficient to keep the powdered cellulose suspended; and

(d) water.

4,857,353

DRY MIX FOR MICROWAVE LAYER CAKE

Glenn M. Jackson, Mound, and John G. Roufs, Maple Grove, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed May 11, 1988, Ser. No. 192,579
Int. Cl.[4] A21D *10/04*
U.S. Cl. 426—554 20 Claims

1. A culinary mix useful in the preparation of a layer cake or muffin which upon microwave baking yields a baked good of improved volume and texture, comprising:

A. about 20% to 50% by weight of the mix of flour;

B. about 30% to 55% by weight (dry basis) of the mix of sugar, the ratio of sugar to flour being about 1:1 to 1.7:1;

C. about 5% to 20% by weight of the mix of shortening, said shortening comprising

(1) about 90% to 99% fatty triglycerides, and

(2) about 1% to 10% of an emulsifier;

D. about 0.1% to 5% by weight of the mix of a nucleating agent, said nucleating agent being water insoluble and having a particle size ranging from about 20 microns to about 200 microns and selected from the group consisting of microcrystalline cellulose, cellulose flour, powdered cellulose, silicon dioxide, calcium carbonate and mixtures thereof;

E. about 0.1% to 4% by weight of the dry mix of a leavening system consisting essentially of

(1) a baking soda,

(2) a solid, fast acting leavening acid selected from the group consisting of citric acid, lactic acid, acetic acid, propionic acid, cream of tartar, monocalcium phosphate monohydrate, fast acting sodium acid pyrophosphate and mixtures thereof and wherein the weight ratio of baking soda to acid ranges from about 1:0.75 to 1.25.

4,857,354

METHOD FOR PRODUCING BAKED PRODUCTS

Kunio Ishida, Kawasaki; Satoshi Saito, Tokyo; Akinaka Habuto; Tadahiko Murata, both of Yokohama; Hisayoshi Oiso, Tokyo; Norio Joyama, Yokohama, and Kazuhiro Fujimoto, Yachiyo, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 3,431, Jan. 15, 1987, abandoned, which is a division of Ser. No. 809,820, Dec. 17, 1985, Pat. No. 4,655,125. This application Oct. 26, 1988, Ser. No. 266,282
Claims priority, application Japan, Feb. 15, 1985, 60-26502; May 28, 1985, 60-78427
Int. Cl.[4] A21D *10/00*
U.S. Cl. 426—558 3 Claims

1. A composition for producing a sponge cake or crepe sheet consisting essentially of:

(a) wheat flour, sucrose, egg, edible oil or fat, and milk;

(b) at least one of 0.1 to 0.5% dry weight basis of a water-soluble thickening agent selected from the group consisting of gelatin, locust bean gum, guar gum and xanthan gum, and also 1.0 to 1.5% dry weight basis of gluten; and

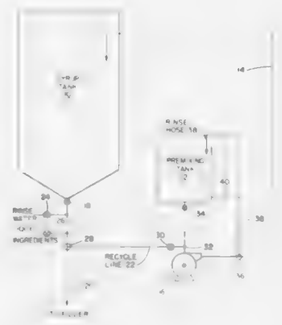
(c) 20–60% dry weight basis of a starch hydrolysate having a mean molecular weight of at least 655 and selected from the group consisting of glucose syrups, dextrins and hydrogenated starch hydrolysates, the hydrogenated starch hydrolysate obtained by hydrogenation of a material selected from the group consisting of glucose syrups, dextrins and maltodextrins.

4,857,355

SYRUP BATCHING LOOP

John A. Gregg, Pleasant Valley, N.Y., assignor to PepsiCo Inc., Purchase, N.Y.

Filed Feb. 10, 1987, Ser. No. 12,942
Int. Cl.[4] A23L *2/00*
U.S. Cl. 426—590 2 Claims



1. A batch mixing process for a beverage syrup which contains a number of components, including a plurality of separate and different salt components each of which must be diluted in a premixing step prior to being added to the beverage syrup mixture to prevent negative chemical interactions from occurring between undiluted components, comprising:

(a) mixing a partially completed beverage syrup in a syrup tank;

(b) premixing an additional component of the beverage syrup in a premixing tank with water to dilute the premixed component, and then adding the diluted premixed component to the partially completed beverage syrup in the syrup tank through a feed line extending from the premixing tank to the syrup tank;

(c) providing a recycle line which extends from the syrup tank to the premixing tank;

(d) rinsing the premixing vessel, the feed line extending thereto, and the recycle line, with the partially completed beverage syrup from the syrup vessel;

(e) repeating steps (b) and (d) at least once, said repeating steps being effected for each additional component of the beverage syrup mixture which must be premixed so as to prevent negative chemical interactions from occurring between undiluted components, such that separate additions of water for rinsing are not required.

4,857,356

DIETETIC STARCH-CONTAINING PREPARATION

Hubert Reinl, Tuessling (Schmidt; Elke), and Elke Schmidt, Waldkraiburg, both of Fed. Rep. of Germany, assignors to Nestec S.A., Vevey, Switzerland

Filed Aug. 24, 1987, Ser. No. 88,877
Claims priority, application European Pat. Off., Sep. 5, 1986, 86112790.4
Int. Cl.[4] A23L *1/164, 1/10*
U.S. Cl. 426—620 16 Claims

1. A fluid food product comprising by weight a mixture of more than 50% of food selected from the group consisting of fruits and vegetables, at least 10% cereal which, based on dry matter, comprises from 2.5% to 3.5% oatmeal and from 20% to 25% enzymatically hydrolyzed cereal in liquid form, and water and oil for providing a fat content of from 2% to 4%.

4,857,357

SOYA FOOD PRODUCT AND PROCESS

Ulrich Ammann, Pfaffhausen, Switzerland, assignor to Nestec S.A., Vevey, Switzerland

Filed Jul. 28, 1986, Ser. No. 891,191
Claims priority, application Switzerland, Jul. 29, 1985, 3276/85
Int. Cl.[4] A23L *1/20*
U.S. Cl. 426—634 17 Claims

1. A process for the preparation of a soya food product comprising treating soya beans with steam for from 30s to 15 min at from 100° C. to 130° C., grinding the steam treated beans to a particle size having a mean diameter below about 1 mm, mixing the ground beans with water to form a paste having a dry matter content of from 50% to 70% by weight, shaping the paste by a means selected from the group of rolling and extrusion under conditions substantially avoiding friction effects on the paste wherein rolling is effected between rollers under linear pressure of from about 5 to 1500×10^3 N/m and wherein extrusion is effected under a pressure of from about 2 to 20 bar, treating the shaped paste with steam for 30s to 15 min at from 100° C. to 130° C. and then drying the steam treated shaped pasta in hot air.

12. The product of the process of claim 1.

4,857,358

POWDERY COMPOUND EMULSIFIER AND ITS PRODUCTION

Minoru Okumura, Hyogo, Japan, assignor to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Jun. 29, 1987, Ser. No. 70,139
Claims priority, application Japan, Dec. 29, 1986, 61-313324
Int. Cl.[4] A23L *1/035;* B01F *17/00*
U.S. Cl. 426—654 10 Claims

4. A process for preparing a powdery compound emulsifier, comprising:

adding 0.5 to 15 parts by weight of crystalline alpha-maltose to one part by weight of a liquid or paste compound emulsifier containing at least two members selected from the group consisting of sucrose fatty acid ester, glycerine fatty acid ester and sorbitan fatty acid ester; and

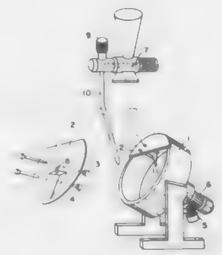
ageing the resultant mixture at a temperature of 20°–70° C. from 1 to 5 days to allow the crystalline alpha-maltose to convert to crystalline beta-maltose hydrate to effect pulverization of the mixture.

4,857,359

PROCESS FOR OVERCOATING GRANULAR MATERIALS

Manfred Groher, Goldbach; Werner Heit, Linsengericht; Walter Schmittner, Waldaschaff, and Wolfgang Warzawa, Hanau, all of Fed. Rep. of Germany, assignors to Hobeg mbH, Hanau, Fed. Rep. of Germany

Filed Feb. 10, 1988, Ser. No. 154,554
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1987, 3704167
Int. Cl.[4] B05D *1/28, 1/40*
U.S. Cl. 427—6 3 Claims



1. A process for overcoating coated fuel particles with binder-containing graphite powder for high-temperature reactors comprising adding to the inside surface of a rotatable granulator adapted to provide a flowing particle bed, before introduction of the granules, a layer of overcoating material, intended to overcoat said granules, in a thickness of 0.1 to 1 mm, maintaining a present entrainment height of the granules during subsequent granulation by varying the inclination and/or rotational speed of the granulator, and adding the covering material by pipe means immersed in the midst of the granules in a flowing particle bed.

4,857,360

PROCESS FOR THE MANUFACTURE OF NBN SUPERCONDUCTING CAVITY RESONATORS

Jürgen Halbritter, Bruchsal-Untergrombach, and Hartmut Baumgärtner, Neuthard-Karlsdorf, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Mar. 12, 1987, Ser. No. 24,830
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608160
Int. Cl.[4] B05D *5/12;* C23C *8/06*
U.S. Cl. 427—62 20 Claims

1. A process for making a superconducting cavity resonator having at least one surface comprising niobium nitride, said process comprising the following steps:

heating a cavity for a superconducting cavity resonator having at least one surface comprising niobium to a temperature in a predetermined temperature range; and

rapidly cooling by flooding to a temperature below 200° C. said at least one surface comprising niobium with a gas chosen from a member of the group consisting essentially of nitrogen gas and a mixture of at least one noble gas and nitrogen gas and forming a niobium nitride layer on said at least one surface comprising niobium;

said heating temperature being in a range of from about 300° C. to about 1800° C. to permit formation of said niobium nitride layer for superconducting resonance on said at least one surface comprising niobium upon said rapid cooling.

4,857,361

HAZE-FREE INFRARED-REFLECTING COATED GLASS

Karl H. Bloss, Pittsburgh; James A. Davis, Apollo, and George A. Neuman, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 18, 1988, Ser. No. 182,643
Int. Cl.[4] B05D 5/12, 5/06
U.S. Cl. 427—109 10 Claims

1. A method of forming a tin oxide coating comprising contacting a surface of a substrate in an oxidizing atmosphere with a mixture consisting essentially of tributyltin dimethylpropionate vapor and a carrier gas at a temperature sufficient to thermally react said tributyltin dimethylpropionate to deposit a tin oxide film on said surface.

4,857,362

POWDER COATABLE EPOXY COMPOSITION AND POST-TENSIONING CABLE COATED THEREWITH

Stephen C. Hart, Warsaw, Ind., assignor to Morton Thiokol, Inc., Chicago, Ill.

Division of Ser. No. 681,521, Dec. 14, 1984, and Ser. No. 15,241, Feb. 17, 1987, Pat. No. 4,761,336. This application Jun. 17, 1988, Ser. No. 207,999
Int. Cl.[4] B05D 3/02, 3/08, 3/10
U.S. Cl. 427—195 2 Claims

1. A process for protecting a metal cable against corrosion comprising applying to the cable a thermosetting powder coating composition comprising about 80 to about 130 parts by weight of an epoxy resin or mixture of epoxy resins having an epoxide equivalent weight of at least about 2250, about 0.1 to about 3.0 parts by weight of a cure catalyst for the epoxy resin, about 0.5 to 3.0 parts by weight of an acrylic resin, and about 0.5 to about 10.0 parts by weight of a polyamide resin, and curing said powder coating, whereby an essentially crack-free coating is formed on the cable.

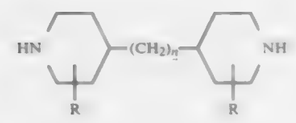
4,857,363

PROCESS FOR PREPARATION OF SEMIPERMEABLE COMPOSITE MEMBRANE

Tatsuo Sasaki, Ohtsu; Hideo Fujimaki, Shiga; Tadahiro Uemura, Kyoto, and Masaru Kurihara, Ohtsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

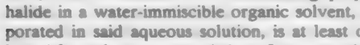
Division of Ser. No. 906,175, Sep. 11, 1986, Pat. No. 4,758,343. This application May 2, 1988, Ser. No. 165,783
Claims priority, application Japan, Sep. 20, 1985, 60-206219; Nov. 6, 1985, 60-247139
Int. Cl.[4] B05D 3/02, 3/10, 5/00
U.S. Cl. 427—245 12 Claims

1. A process for the preparation of a semipermeable composite membrane, which comprises forming an ultrathin crosslinked polyamide membrane on a microporous substrate by interfacial polycondensation by contacting an aqueous solution containing piperazine and a secondary amine represented by the following formula (III):



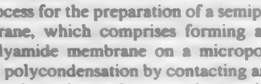
(III)

wherein R stands for —H or —CH_3 and n is an integer from 0 to 3, with a solution of a crosslinking polyfunctional acid halide in a water-immiscible organic solvent, wherein, incorporated in said aqueous solution, is at least one member selected from the group consisting of compounds represented by the following formulae (IV), (V) and (VI):



(IV)

-continued



(V)

wherein n is 1 or 2, A and A', which may be the same or different, stand for an aliphatic or aromatic hydrocarbon group, and X stands for —CH_2—, —O— or —S—, and

(VI)

wherein B stands for an aliphatic hydrocarbon group and n is an integer of from 1 to 6.

4,857,364

INTUMESCENT COMPOSITIONS AND THE USE THEREOF

Wulf von Bonin, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 14, 1987, Ser. No. 132,513
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1986, 3643708
Int. Cl.[4] C08G 18/28
U.S. Cl. 427—255 7 Claims

1. A propellant-free intumescent composition consisting essentially of product of the reaction of a phosphorus-containing and phosphorus-free polyol and a polyisocyanate, which is a reaction mixture, produced on mixing and reacting the following components:

(A) 5 to 25% by weight, relative to the total weight of components A to G, o a polyether polyol containing at least 1.75 OH groups per molecule and having an OH number from 150 to 400;

(B) 5 to 35% by weight, relative to the total weight of components A to G, of a polyester polyol containing at least 2OH groups per molecule and having an OH number from 120 to 400;

(C) 5 to 25% by weight, relative to the total weight of components A to G, of a phosphorus-containing polyol containing at least two OH groups per molecule and having a phosphorus content between 6 and 21% by weight, with the proviso that the total weight of components A+B+C makes up 15 to 70% by weight of the total weight of the reaction mixtures;

(D) 0 to 10% by weight, relative to the total weight of components A to G, of an inert desiccant;

(E) 20 to 85% by weight, relative to the total weight of the reaction mixture, of a dehydratable filler;

(F) 0 to 30% by weight, relative to the total weight of the reaction mixture, of other inorganic auxiliaries and fillers, with the proviso that the total weight of components D+E+F is 20 to 90% by weight relative to the total weight of the reaction mixture; and

(G) 0 to 3% by weight, relative to the total weight of components A+B+C, of a catalyst; and

(H) 70 to 130% b weight, relative to the amount which is stoichiometrically necessary for reaction of the active hydrogen atoms contained in the mixture of components A, B, and C, of a polyisocyanate.

4,857,365

METHOD OF MANUFACTURING MODIFIED WOOD MATERIAL

Shozo Hirao; Hiroaki Usui; Yoshihiro Ohta; Takashi Nakai; Hiroyuki Ishikawa, and Satoru Konishi, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Feb. 18, 1988, Ser. No. 157,228
Claims priority, application Japan, Feb. 24, 1987, 62-41704; Apr. 24, 1987, 62-102311; Nov. 24, 1987, 62-296434; Nov. 26, 1987, 62-298174; Nov. 26, 1987, 62-298176
Int. Cl.[4] B05D 3/00
U.S. Cl. 427—297 7 Claims

1. A method for making a modified wood material, comprising alternately immersing a raw wood material in two types of solutions, a cation-containing solution and an anion-containing solution, the cations and anions being such as to form a nonflammable, water-insoluble, inorganic compound within the raw wood material, wherein said raw wood material is alternately immersed a total of at least three times in one of said two types of solutions and then in the other of said two types of solution and wherein the solution employed for the third immersing is made higher in concentration than that used for the first immersing.

4,857,366

METHOD FOR OBTAINING ADHESION OF URETHANE SEALANT TO A PAINTED OR GLASS SURFACE

Gerald E. Schumacher, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 11, 1988, Ser. No. 166,636
Int. Cl.[4] B05D 3/10; C09J 3/14
U.S. Cl. 427—302 26 Claims

1. A method for treatment of a painted surface of a substrate or a glass surface so as to provide improved adhesion of a urethane sealant applied thereafter, comprising:

applying a solution of from about 0.25% to about 5% by weight p-toluenesulfonic acid, about 2.5% by weight organofunctional silane, and from about 92.5% to about 97.25% by weight of a solvent selected from the group consisting of ketones, alcohols and aliphatic esters to the painted or the glass surface, the painted surface being cured and devoid of a resin top coating; and

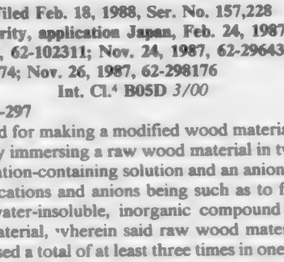
thereafter contacting the painted or glass surface with an uncured urethane sealant.

4,857,367

METHOD OF AND APPARATUS FOR SPRAYING

Brent A. Thorn, 37285 Little Mack, Mt. Clemens, Mich. 48043, and William Hill, Clio, Mich.

Filed Oct. 16, 1987, Ser. No. 109,817
Int. Cl.[4] B05D 1/02
U.S. Cl. 427—348 5 Claims



1. A method of coating a defined marginal area of a surface comprising the steps of:

establishing an air curtain impinging on the surface spaced from the edge by the width of the marginal area to be coated;

creating a partial vacuum outwardly of the edge of the surface to be coated to establish an air flow across the area to be coated from the curtain toward the vacuum; and

spraying the coating through said air flow and entraining overspray therein while moving the spray, air curtain and partial vacuum linearly along the edge of the surface.

4,857,368

COATING METHOD

Rudolf Klein, Oberhausen, Fed. Rep. of Germany, assignor to C. Voigt Söhne GmbH & Co., Fed. Rep. of Germany

Filed May 16, 1988, Ser. No. 194,485
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1987, 3735305
Int. Cl.[4] B05D 3/02
U.S. Cl. 427—393 13 Claims

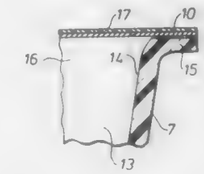
1. A method for forming a polyurethane coating on a substrate comprising mixing an effective amount of a liquid polyurethane prepolymer with an isocyanate content of 2.5 to 8.5% with water containing an effective amount of a carbon dioxide binding agent, an effective amount of a water absorbing agent and optionally at least one member of the group consisting of fillers and additives, casting the mixture onto a substrate within the processing time and curing the mixture at room temperature to obtain a polyurethane coating securely attached to the substrate.

4,857,369

METHOD FOR THE CLOSING OF CONTAINERS

Ulla Oehlenschlaeger; Jan R. Pedersen, and Erling Sörensen, all of Odense, Denmark, assignors to PLM AB, Malmo, Sweden

Filed Dec. 14, 1987, Ser. No. 133,612
Claims priority, application Sweden, Dec. 18, 1986, 8605443
Int. Cl.[4] B65D 43/02
U.S. Cl. 428—35.7 6 Claims



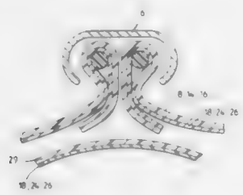
1. A container of thermoplastic material comprising a body of oriented thermoplastic material having an opening and including an annular portion surrounding said opening, a film joined to said annular portion to close said opening and a layer of non-oriented thermoplastic material between said film and said oriented thermoplastic material of aid annular portion for joining said film to said annular portion.

4,857,370

HEAT RECOVERABLE ARTICLE

Noel M. M. Overbergh, Bertem, and Jan L. M. F. G. Vansant, Leuven, both of Belgium, assignors to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 4, 1987, Ser. No. 94,193
Claims priority, application United Kingdom, Oct. 20, 1986, 8628126
Int. Cl.[4] D03D 3/00
U.S. Cl. 422—34.9 24 Claims



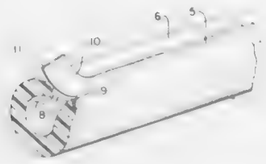
1. A heat recoverable article which comprises:
(a) a recoverable fabric cover; and
(b) a strengthening layer laminated to a surface of the fabric cover said strengthening layer includes at least one layer of a material impervious to air.

4,857,371

METHOD OF MAKING AN ADHESIVE CONSTRUCTION FOR ARTICLES AND SAID ARTICLES

Jack M. McClintock, Stow, Ohio, assignor to Morgan Adhesives Company, Ohio

Filed Mar. 20, 1987, Ser. No. 28,218
Int. Cl.[4] B29D 23/22; B32B 7/06, 7/12
U.S. Cl. 428—36.5 5 Claims



1. An adhesive construction, on an elongated foamed pipe insulation having an elongated slit, that forms a first face and another face which fit in contact with each other unless held apart, an adhesive on at least one face held from adhesive contact with said other face by a release member positioned over said adhesive, said release member covering at least said adhesive and being capable of being pulled to move said release member off the adhesive to permit the two faces to make contact over a pipe and bond said faces in integral relationship.

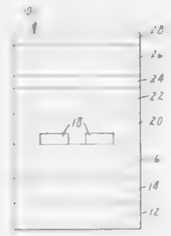
4,857,372

GRAPHIC COMPOSITE WITH THERMALLY DETACKIFIABLE ADHESIVE PREMASK TAPE

Scott T. Ginkel, and Dennis O. Falaas, both of Stillwater, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 10, 1986, Ser. No. 905,871
Int. Cl.[4] C09J 7/02
U.S. Cl. 428—42 6 Claims

1. A graphic composite comprising:
(a) a carrier film having a bonding adhesive on the bottom surface thereof:
(b) a graphic design adhered to the top surface of said carrier film;
(c) a protective coating over said graphic design;
(d) a heat detackifiable premask adhesive layer on said protective coating; and
(e) a premask carrier web adhered to said premask adhesive layer; wherein, upon exposure of said graphic composite



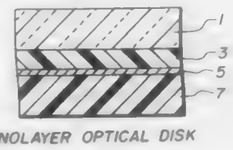
to an elevated temperature, said premask adhesive layer decreases substantially in adhesion compared to the adhesion of said bonding adhesive such that said premask carrier web and said premask adhesive layer can be easily removed from said protective coating.

4,857,373

OPTICAL RECORDING ELEMENT

Peter F. Carcia, and Franklin D. Kalk, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 31, 1987, Ser. No. 32,376
Int. Cl.[4] G11B 5/84; B32B 3/02
U.S. Cl. 428—64 12 Claims



1. A non-ablative optical recording element comprising a light-absorptive layer supported upon a dimensionally stable substrate in which the light-absorptive layer is a continuous morphologically stable amorphous layer of an alloy of Te and Cu selected from an alloy having an eutectic melting point and near-eutectic alloys, the compositions of which deviate no more than 6%, atomic basis, from the true eutectic composition.

4,857,374

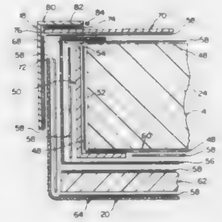
STRUCTURALLY STRONG, NON VAPOR, NON MOISTURE ABSORBING, SPA/HOT TUB COVER

Gary L. Perry, 19007 105th St. Ct. E., Sumner, Wash. 98390

Filed Nov. 15, 1988, Ser. No. 272,513
Int. Cl.[4] B32B 3/26
U.S. Cl. 428—71 20 Claims

1. A structurally strong, non vapor, non moisture absorbing, spa/hot tub cover, comprising the assembled combination of laminations of materials, adhesives, sealants, and both aluminum and plastic angle reinforcements arranged as follows:
(a) an overall shape defining volume of expanded polystyrene cut or formed as a cover to match the respective top planar opening of a particular spa/hot tub;
(b) a complete surrounding layer of contact cement adhered to all the surfaces of the expanded polystyrene and dried to become an impervious vapor, moisture, and water, barrier to keep the expanded polystyrene dry;

(c) selected lengths of aluminum angle placed at selected places about the periphery of the expanded polystyrene and adhered thereto to serve as places to receive fasteners, later selected to hold in place selected items such as handles and hinges;
(d) a continuous polypropylene scrim foil adhered to and extending throughout the entire bottom, entire sides, and entire peripheral top edges of the expanded polystyrene, being secured by contact cement;
(f) a continuous closed cell foam of polyethylene extending entirely underneath the continuous polypropylene scrim foil and adhered thereto in selected places;;
(g) a continuous thermally stable and gas impermeable polyvinylchloride polyester laminate extending entirely underneath the continuous closed cell foam, and entirely up and alongside the side edges of the continuous closed cell foam and the side edges of the continuous polypropylene scrim foil, and adhered thereto;



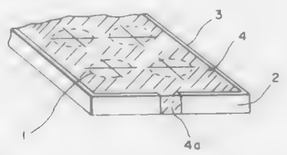
(h) a continuous weatherable plastic extending entirely over the contact cement coated overall shape defining volume of expanded polystyrene, the top edge of aluminum angles, the folded over edge of the continuous polypropylene scrim foil, and adhered to all of them;
(i) A cyanoacrylate instant adhesive spread near all the edges of the continuous weatherable plastic;
(j) a plastic angle positioned about all the top and side edges of the continuous weatherable plastic and adhered thereto via the cyanoacrylate instant adhesive, and about the top and side portions of the upturned portions of the continuous thermally stable and gas impermeable polyvinylchloride polyester laminate and adhered thereto via the cyanoacrylate instant adhesive; and
(k) a continuous sealing bead of a weatherable plastic in an applying solution of methylene chloride located where the plastic angle stops above the continuous weatherable plastic and where the plastic angle stops by the polyester reinforced laminate, to create a vapor, moisture, and water seal.

4,857,375

SHIELDING OF SEMICONDUCTOR MODULE

Shigeyuki Uehira, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 17, 1988, Ser. No. 169,826
Claims priority, application Japan, Mar. 31, 1987, 62-48145[U]
Int. Cl.[4] B32B 3/00
U.S. Cl. 428—75 6 Claims



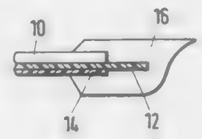
1. In a shielding structure for a case of a semiconductor module having on an external surface thereof protruding parts with a dome-shaped contour, the improvement wherein said shielding structure comprises a copper foil shielding sheet provided with cross-cut lines corresponding to the positions of said protruding parts said shielding sheet having a contacting surface thereof coated with an adhesive and being pasted on said external surface of said semiconductor module inclusive of said protruding parts along said dome-shaped contour with said contacting surface contacting said external surface of said semiconductor module case and said protruding parts.

4,857,376

MOTOR VEHICLE GLASS PANE

Wolf Von Reis; Paul Derner; Rudolf Quenett, all of Gelsenkirchen, and Guenter Armbruster, Krefeld, all of Fed. Rep. of Germany, assignors to Flachglas Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 21, 1987, Ser. No. 98,803
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632472
Int. Cl.[4] B60J 1/00; E06B 3/62; C03C 27/12
U.S. Cl. 428—83 30 Claims



1. A motor vehicle glass pane including a sheet of glass, a plastic deformable lamination film, a splinter protection film, and a frame gasket, the plastic deformable lamination film being secured to the sheet of glass and the splinter protection film being secured to the lamination film, the frame gasket consisting of a plastic material extending around a peripheral edge of the sheet of glass enclosing a width of the peripheral edge as well as a portion of the peripheral side of the sheet of glass and the slinter protection film, the lamination film is connected in a forced locking manner to the frame gasket by a direct adhesive connection between at least one of the side surfaces of the lamination film and the frame gasket.

4,857,377

ELECTROCONDUCTIVE FABRIC SHEET AND MOLDED ARTICLE HAVING IT ON SURFACE THEREOF

Takashi Daimon; Hideshi Sakamoto, both of Ichihara, and Tatsuya Adachi, Kitakyushu, all of Japan, assignors to Chisso Corporation, Japan

Filed Feb. 22, 1988, Ser. No. 158,774
Claims priority, application Japan, Feb. 27, 1987, 62-44315; Feb. 27, 1987, 62-44316; Mar. 2, 1987, 62-47409; Mar. 2, 1987, 62-47410
Int. Cl.[4] B32B 33/00
U.S. Cl. 428—90 14 Claims

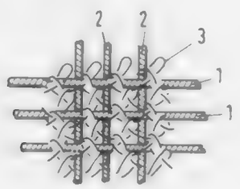
1. A flocked electroconductive fabric sheet which is obtained by forming an adhesive layer on either surface of an electroconductive fabric selected from the group consisting of electroconductive nonwoven, woven and knitted fabric each composed mainly of heat fusible fiber and electroconductive fiber, and planting and fixing, on said surface having said adhesive layer, flocks of short fiber containing 1% by weight or more of electroconductive fiber.

4,857,378
MOLDED SLANTED FRONT PANEL BEZEL FOR ELECTRONICS ENCLOSURE
Vikram Bhargava, Alpharetta, and James R. Heberling, Lawrenceville, both of Ga., assignors to Hayes Microcomputer Products, Inc., Norcross, Ga.
Filed Jun. 3, 1988, Ser. No. 202,073
Int. Cl.[4] B65D *1/24*
U.S. Cl. 428—99 14 Claims



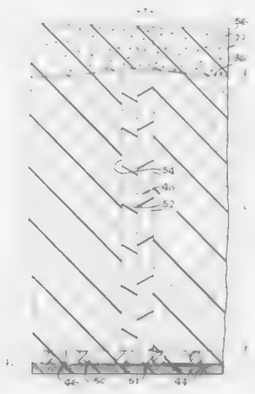
1. An injection molded member having a substantially planar surface and also having a plurality of positioning tab elements extending perpendicular to said surface, and being configured for engaging the opening of an enclosure, the improvement comprising:
a protrusion extending perpendicular to said surface, said protrusion defining an arch shaped vacant area therein, said vacant area having a side wall surface portion which forms no angle less than 90 degrees, between such side wall surface portion, and the nearest adjacent portion of said planar surface, said vacant area configured for accepting an assembly screw therein.

4,857,379
SHEETLIKE STRUCTURE OF FIBERS, ESPECIALLY AS A REINFORCEMENT FOR PLASTICS COMPONENTS
Margret Plöntges, Kempen, and Herbert Cox, Geldern, both of Fed. Rep. of Germany, assignors to Verseidag Industrietextilien GmbH, Fed. Rep. of Germany
Filed Oct. 19, 1987, Ser. No. 110,205
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636300; Apr. 3, 1987, 3711213
Int. Cl.[4] B32B *3/06*
U.S. Cl. 428—102 9 Claims



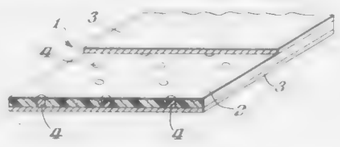
1. A sheetlike structure of fibres comprising:
a plurality of threads arranged in directions crossing each other and in intimate contact with a plastic material which they reinforce, wherein at least some of the threads comprise a material which shrinks when subjected to heat treatment at a temperature below its melting point and which substantially regains its original strength upon cooling after being subjected to heat shrinking, whereby at least some of the threads, after heat shrinking, are prestressed in said plastic.

4,857,380
FOAM-HONEYCOMB ARTICLE AND METHOD
Sherwood Kent, 2612 Highland Ave., Santa Monica, Calif. 90405
Continuation of Ser. No. 103,449, Sep. 30, 1987, Pat. No. 4,797,312. This application Jan. 6, 1989, Ser. No. 294,179
Int. Cl.[4] B32B *1/04, 3/02*
U.S. Cl. 428—117 6 Claims



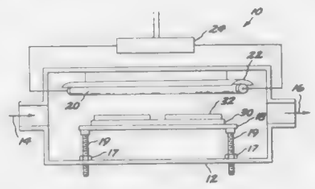
1. A surface-reinforced article, comprising:
a core of foam material having a first outer side;
a surface region of said article which includes a multi-cell honeycomb-type sheet structure lying on said first outer side of said core and a porous but flow-through resistant layer lying outside said honeycomb-type structure;
said cells of said honeycomb-type sheet structure, and said flow-through resistant layer each being impregnated with the same foam material as said core, the foam material in said core, cells, and layer being integral, and the foam in said cells being at least as dense as the foam in said core.

4,857,381
REINFORCED DIELECTRIC SHEET
Hirosuke Suzuki, Saitama, Japan, assignor to Jankosha Co., Ltd., Japan
Continuation-in-part of Ser. No. 91,645, Aug. 31, 1987, abandoned. This application May 5, 1988, Ser. No. 190,458
Claims priority, application Japan, Mar. 17, 1986, 61-38470
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—120 4 Claims



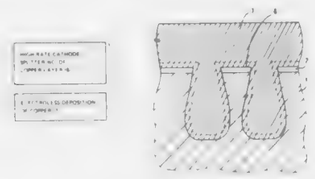
1. A reinforced porous dielectric sheet comprising a porous dielectric sheet of expanded, porous polytetrafluoroethylene having at least three solid reinforcement elements of another plastic extending through said dielectric sheet from one surface to the other, said reinforcement elements being distributed within the sheet, wherein said other plastic is selected from the class consisting of tetrafluoroethylene/ethylene copolymer and epoxy resin.

4,857,382
APPARATUS AND METHOD FOR PHOTOETCHING OF POLYIMIDES, POLYCARBONATES AND POLYETHERIMIDES
Yung S. Liu, and Willard T. Grubb, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Apr. 26, 1988, Ser. No. 186,254
Int. Cl.[4] B44C *1/22;* B29C *37/00*
U.S. Cl. 428—156 24 Claims



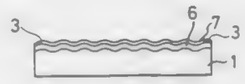
1. A method of etching, by photodecomposition, an organic polymer selected from the group consisting of polyimides, polycarbonates and polyetherimides, comprising:
providing a broad area source of continuous ultraviolet light in the form of a high-current-density mercury lamp operating at a current density of at least 1.0 amp/cm^2 of lamp internal cross-sectional area, said ultraviolet light including wavelengths shorter than 200 nanometers; and
exposing the portion of said polymer to be etched to the broad area continuous ultraviolet light emanating from said source.

4,857,383
SYNTHETIC SUBSTRATE WITH ADHESIVE METAL LAYER
Johann Greschner, Pliezhausen; Friedrich W. Schwerdt, Herrenberg, and Hans J. Trumpp, Stuttgart, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 924,469, Oct. 29, 1986, abandoned, which is a division of Ser. No. 547,553, Oct. 31, 1983, Pat. No. 4,642,163. This application Nov. 9, 1987, Ser. No. 119,272
Claims priority, application European Pat. Off., Feb. 23, 1983, 83-101752
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—156 2 Claims



1. A thin printed circuit board layer comprising:
a synthetic resin substrate having a surface having discrete shallow recesses which have a first width at the surface of the substrate, and a second width greater than the first width in a region of the substrate below the surface;
a metallic layer bonded to said synthetic resin substrate portions of said metallic layer being within said shallow recesses and bonding said metallic layer to said synthetic resin layer with an adherence characteristic on the order of 1000 n/m.

4,857,384
EXOTHERMIC CONDUCTING PASTE
Mitsushi Mio, Sumoto Hyogo, and Hisao Negita, Higashi, both of Japan, assignors to Awaji Sangyo K. K., Hyogo, Japan, part of interest
Filed May 29, 1987, Ser. No. 55,606
Claims priority, application Japan, Jun. 6, 1986, 61-131162; Jan. 29, 1987, 62-17333; Jan. 29, 1987, 62-17334
Int. Cl.[4] B32B *3/00;* H05B *3/16;* H01B *5/06*
U.S. Cl. 428—164 4 Claims



3. An electric resistance heating unit wherein a desirably shaped solid or solid surface is coated or impregnated with a coating or paste, said coating or paste consisting of a synthetic resin and a heat stable metal oxide, said metal oxide having a positive temperature coefficient of electric resistance, an electric specific resistance of not more than 5×10^3 μΩcm, and is selected from the group consisting of V_2O_3, CrO_2 and mixtures thereof, and said synthetic resin is contained in an amount of 30 to 360 parts by weight per 100 parts by weight of the metal oxide.

4,857,385
COMPOSITES OF STRETCH BROKEN ALIGNED FIBERS OF CARBON AND GLASS REINFORCED RESIN
Thomas E. Armiger, Newark; David H. Edison, Hockessin; Herbert G. Lauterbach, Wilmington, all of Del.; James R. Layton, Kinston, N.C., and Richard K. Okine, Wilmington, Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.
Division of Ser. No. 942,441, Dec. 16, 1986, Pat. No. 4,759,985. This application Jun. 10, 1988, Ser. No. 205,182
Int. Cl.[4] B32B *3/00;* D02G *3/00*
U.S. Cl. 428—189 9 Claims



1. A composite comprising a layer of a matrix resin reinforced with a sliver of substantially axially aligned stretch broken carbon staple fibers having an average length greater than 0.50 inches and a cohesion of at least 0.01 grams/denier, said fibers having a coating finish thereon comprising a viscous lubricant.

4,857,386
INKABLE SHEET
Alan Butters, Ipswich; Diana C. Blackmore, and Darrin J. Page, both of Colchester, all of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom
Filed Feb. 3, 1987, Ser. No. 10,523
Claims priority, application United Kingdom, Feb. 3, 1986, 8602593
Int. Cl.[4] B41M *5/18;* B05D *3/02;* B32B *27/06;* G03C *5/54*
U.S. Cl. 428—206 8 Claims



1. An inkable sheet comprising a base sheet having at a surface thereof an ink-absorbent polymeric resin layer wherein said resin comprises a vinyl pyrrolidone polymer and an acrylic or methacrylic polymer.

4,857,387
COMPENSATING ELEMENT FOR STRESSES OF THERMAL OR MECHANICAL ORGIN, ESPECIALLY FOR PRINTED CIRCUITS, AND PROCESS FOR MAKING SUCH AN ELEMENT EMPLOYED IN A PRINTED CIRCUIT
Eberhardt, André , Metz; Serge Dominiak, Ars sur Moselle; Marcel Berveiller, Woippy; Jean P. Lucas, Metz, and Robert P. Y. Guyon, Vigy, all of France, assignors to Cimulec, S.A., Vigy, France
Filed Oct. 27, 1987, Ser. No. 113,420
Claims priority, application France, Oct. 28, 1986, 86 15101
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—209 9 Claims

1. A printed circuit comprising an electrically insulating substrate and an electrically conductive layer on said substrate, said layer having a thickness between 30μ and 200μ and being a pseudo-elastic alloy that undergoes significant deformations in a reversible manner, said layer being a copper alloy consisting essentially of at least 50% by weight copper in the form of large-grained polycrystals that undergo martensitic transformation and at least one other metal selected from the group consisting of tin, zinc, aluminum, nickel, silver, gold cadmium, gallium, indium, germamium, antimony and silicon.

4,857,388
MAGNETIC RECORDING MEDIUM
Hiroshi Ogawa, and Yasuo Tamai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 20, 1987, Ser. No. 110,296
Claims priority, application Japan, Oct. 20, 1986, 61-248858
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—212 7 Claims



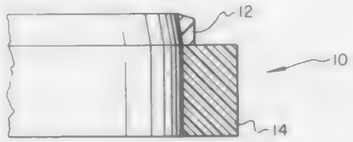
1. A magnetic recording tape comprising a nonmagnetic support and a magnetic recording layer provided on the support which comprises two layers including a first magnetic recording layer and a second magnetic recording layer, each of said first and second magnetic recording layers comprising a binder and a ferromagnetic powder having a coercive force of not less than 500 Oe dispersed therein, wherein:

said first magnetic recording layer provided on the nonmagnetic support has a Young's modulus in the longitudinal direction of 500 to 1,000 kg/mm^2;

said second magnetic recording layer provided on the first magnetic recording layer has a Young's modulus in the longitudinal direction of not less than 1,300 kg/mm^2; and

the magnetic recording layers as a whole show a Young's modulus in the longitudinal direction of not less than 900 kg/mm^2.

4,857,389
COMPOSITION AND METHOD OF MAKING POLYMER SEALS
John H. Wheeler, Dallas, Tex., assignor to Texacone Company, Mesquite, Tex.
Filed Jan. 25, 1988, Ser. No. 148,389
Int. Cl.[4] B32B *7/02*
U.S. Cl. 428—217 5 Claims



1. A polymer seal comprising:

a first pre-polymer being a polyether-based pre-polymer yielding on curing an 80–90 shore A hardness urethane; and

a second pre-polymer being a polyether-based pre-polymer yielding on curing an 80–90 shore D hardness urethane cured and bonded together to form a multi-layered seal having a first layer to give shape stability to the seal and a second relatively softer layer to give malleable elasticity to the seal.

4,857,390
LOW DENSITY EXTRUDED FOAM HAVING HIGH COMPRESSIVE STRENGTH
Richard B. Allen, Pittsfield, Mass.; Barbara M. Bacskai, Shaumburg, Ill.; Daniel L. Roberts, Albany, and Richard C. Bopp, West Coxsackie, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.
Filed Jun. 26, 1987, Ser. No. 67,556
Int. Cl.[4] B32B *5/20;* B29C *67/22;* C08J *9/14*
U.S. Cl. 428—220 23 Claims



1. A low density, high compressive strength extruded structural foamed article of manufacture comprising either an engineering thermoplastic resin alone, or an engineering thermoplastic resin in combination with an alkenyl aromatic polymer wherein said engineering thermoplastic resin comprises at least 20 weight percent of said combined resin, and a blowing agent having closed cell structure produced by the steps comprising

(a) feeding the resin composition into an extruder;

(b) melting and mixing the resin;

(c) introducing a blowing agent that is essentially insoluble in the resin at room temperature but soluble in the melt into said extruder;

(d) mixing the blowing agent with the resin in said extruder;

(e) cooling the mixture, optionally in a second extruder; and

(f) foaming the mixture through a die.

4,857,391
NON-WOVEN PAPER MACHINE DRYER FABRIC WITHOUT SLACK EDGES
William T. Westhead, Waycross, Ga., assignor to Scapa Inc., Waycross, Ga.
Filed Dec. 22, 1987, Ser. No. 136,414
Int. Cl.[4] D03D *13/00*
U.S. Cl. 428—222 9 Claims



1. A dryer fabric comprising:

a plurality of hinge yarns, each of said hinge yarns extending in a machine direction continuously throughout the length of said dryer fabric and circumferentially about a loop formed by said dryer fabric;

a plurality of spiral coils disposed in a side by side relationship in a cross-machine direction substantially perpendicular to said machine direction, each of said coils forming a spiral about a central axis which extends in said machine direction circumferentially about said loop,

adjacent coils of said spiral coils intermeshed and held together in intermeshing relationship by at least one of said hinge yarns.

4,857,392
STAINBLOCKER AND FLUOROCARBON OIL REPELLENTS
Alexander S. Kirjanov, Reading, Pa., and Dieter Hoecklin, Charlotte, N.C., assignors to Crompton & Knowles Corporation, Stamford, Conn.
Filed Jun. 15, 1988, Ser. No. 207,150
Int. Cl.[4] B05D *1/18;* B32B *27/08, 27/34, 27/42*
U.S. Cl. 428—267 18 Claims

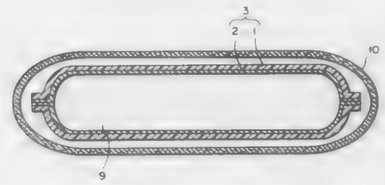
10. A one bath-one step total stain protection process comprising adding an effective amount of a sulfomethylated phenol-formaldehyde condensate and an effective amount of a nonionic aqueous fluorocarbon solution to a polyamide substrate.

17. A polyamide textile fiber protected by the process of claim 10.

18. A polyamide carpet fiber protected by the process of claim 10.

4,857,393
WATERPROOF WATER-VAPOR-PERMEABLE LAMINATED STRUCTURE AND APPLICATIONS OF THE SAME
Takeo Kato, Oomiya; Hideki Yamamoto, Yokohama, and Naoki Miyazaki, Fukuoka, all of Japan, assignors to Toppan Printing Co., Ltd., Japan
Filed Jun. 15, 1988, Ser. No. 206,660
Claims priority, application Japan, Jun. 19, 1987, 62-153064; Dec. 1, 1987, 62-184101[U]
Int. Cl.[4] B32B *3/26*
U.S. Cl. 428—289 12 Claims

1. A waterproof water-vapor-permeable laminated structure obtained by extrusion-laminating a thermoplastic resin layer having a melt viscosity of 5×10^4 poise at a temperature lower than an extrusion temperature by 20° C. (measurement conditions: load = 10 kgf, nozzle diameter = 1 mm, nozzle length = 1 mm: JIS K 7311, 10) on a porous base material.



4,857,394
FLAME RETARDANT FOAMS
Francis P. McCullough, Jr., Lake Jackson; R. Vernon Snelgrove, Damon, both of Tex., and Bhuvenesh C. Goswami, Clemson, S.C., assignors to The Dow Chemical Company, Midland, Mich.
Filed Jan. 29, 1988, Ser. No. 149,748
Int. Cl.[4] B32B *5/06*
U.S. Cl. 428—303 17 Claims

1. A flame retardant polymeric foam, said foam having a flame retarding effective amount of heat set carbonaceous polymeric fibers

incorporated therein and/or provided on at least one surface of the foam, said fibers having an LOI value greater than 40

a reversible deflection ratio of greater than 1.2:1 and an aspect ratio greater than 10:1.

4,857,395
GRAPHITE COMPOSITES AND PROCESS FOR THE MANUFACTURE THEREOF
Kenneth C. Benton, Macedonia; David A. Pierman, Cleveland, and Joseph R. Fox, Solon, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio
Filed Oct. 8, 1987, Ser. No. 106,642
Int. Cl.[4] B05D *3/02;* B32B *9/00*
U.S. Cl. 428—306.6 18 Claims

1. Graphite composite articles having low permeability comprising:

a graphite structure formed from a porous graphite material; and

a glass or ceramic layer bonded thereto derived from a hydrolyzed impregnant serving to fill the pores and coat the surface of said graphite structure, selected from the group consisting of alkoxides, alkyls, alkylalkoxides, halides and acetates of the elements of Groups IA through VIIA, Groups IB through VB, Group VIII and the rare earth elements, said hydrolyzable compound impregnant constituting a precursor of said glass or ceramic.

4,857,396
MINUTE-CELLULAR POLYESTER FILM PROVIDED WITH COATING
Satoshi Otonari; Yoshinori Sato, both of Machida; Narihiro Masuda, and Tomoyuki Kotani, both of Yokohama, all of Japan, assignors to Daifoil Company, Ltd., Tokyo, Japan
Filed Jul. 14, 1988, Ser. No. 219,049
Claims priority, application Japan, Feb. 5, 1987, 62-25245; Jul. 15, 1987, 62-176237
Int. Cl.[4] B32B *3/26*
U.S. Cl. 428—315.5 3 Claims

1. A film comprising a uniaxially or biaxially stretched minute-cellular polyester film having an apparent specific gravity

in the range of 0.4 to 1.3 and an opacifying power of not less than 0.2, and a coating applied to either or both of the surfaces of said polyester film, said coating comprising at least one compound selected from the group consisting of thermoplastic polyesters soluble in organic solvents; water-dispersible thermoplastic polyesters containing sulfonates; alkyd type polyesters; acryl modified polyesters; polyurethane resins soluble in organic solvents or dispersible in water; polyisocyanate compounds; terminal-blocked polyurethane resins; vinyl type resins soluble in organic solvents or dispersible in water; epoxy type resins; silicon type resins; urea type resins; and melamine type resins.

4,857,397

TIRE COATING COMPOSITION AND USE FOR CURING TIRES

Syed K. Mowdood, Akron, and Bharat K. Kansupada, Mogadore, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 8, 1988, Ser. No. 179,351
Int. Cl.[4] B29D *30/08*; B32B *25/04, 25/16*
U.S. Cl. 428—323 18 Claims

1. An uncured rubber tire having on its outer surface a coating composition which comprises

(a) 100 parts by weight of at least one rubber selected from polybutadiene rubber and styrene/butadiene copolymer rubber;

(b) about 300 to about 1000 parts by weight of carbon black characterized by having a particle size in the range of about 50 to about 100 nanometers (nm).

4,857,398

ELECTROSENSITIVE RECORDING

John A. Hill, III, Milton; Richard G. Miekka, Sudbury, and Norman B. Cohen, Wayland, all of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation of Ser. No. 415,106, Sep. 7, 1982, abandoned. This application Apr. 23, 1984, Ser. No. 603,060
Int. Cl.[4] G01D *15/34*
U.S. Cl. 428—331 15 Claims

1. An electrosensitive recording material comprising:

(a) a support,

(b) a coating layer upon said support comprising a film-forming resin, a hydrophobic lubricating agent, and a filler selected from the class consisting of acicular particles of silica and acicular particles of silicates, said acicular particles having a hardness on the MOH scale of betweem about 3.0 and 8.0, said filler further comprising amorphous silicon dioxide, wherein said acicular particles have an average particle size between about 2.0 and 8.0 microns and the amorphous silicon dioxide has an average particle size of between about 2.0 and 9.0 microns, said hydrophobic lubricating agent selected from the class consisting of an organic C_4 to C_{22} fatty acid and the metal salt of an organic C_4 to C_{22} fatty acid, and

(c) a metallic layer vapor-deposited upon said coating layer, wherein the surface of said metallic layer is vaporized selectively along points of contract of a stylus on the metallic layer as said stylus is electrically activated thereon exposing points of the underlying coating layer (b) forming a visual recording on the surface of the electrosensitive recording material.

4,857,399

SHRINK FILM

Stephen J. Vicik, Darien, Ill., assignor to Viskase Corporation, Chicago, Ill.

Filed Mar. 25, 1988, Ser. No. 172,832
Claims priority, application Canada, Dec. 18, 1987, 554878; European Pat. Off., Dec. 21, 1987, 87-118920.5
The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.
Int. Cl.[4] B32B *27/08, 27/16*
U.S. Cl. 428—332 30 Claims

1. A four layer shrink film comprising:

(a) a first or meat contact layer comprising an ethylene-propylene random copolymer;

(b) a second or inner core layer directly adhered to one side of said first layer comprising a blend of between about 20 and 60 wt. % anhydride-modified ethylene copolymer adhesive having a Vicat softening point of at least about 90° C. and between about 40 and 80 wt. % ethylene vinyl acetate containing between about 4 and 15 wt. % vinyl acetate, said blend having a melt index up to and including about 0.9;

(c) a third or barrier layer directly adhered to the opposite side of said second layer from said first layer and comprising a blend of between about 60 and 90 wt. % hydrolyzed ethylene vinyl acetate copolymer (EVOH) containing between about 32 and 52 wt. % ethylene, and between about 10 and 40 wt. % amide polymer having a melting point within about 25° C. of the EVOH melting point; and

(d) a fourth or abuse layer directly adhered to the opposite side of said third layer from said second layer comprising a blend of between about 10 to 40 wt. % anhydride-modified ethylene copolymer adhesive having a Vicat softening point of at least about 90° C. and between about 60 and 90 wt. % ethylene vinyl acetate containing between about 4 and 15 wt. % vinyl acetate, said blend having a melt index up to and including about 0.9.

4,857,400

STRATIFORM PRESS PADS AND METHODS FOR USE THEREOF IN LAMINATING FLEXIBLE PRINTED CIRCUITS

Thomas M. Kloss, Jr., Tempe, Ariz., assignor to Gila River Products, Inc., Chandler, Ariz.

Continuation of Ser. No. 793,452, Oct. 28, 1985, Pat. No. 4,690,845, which is a continuation of Ser. No. 582,303, Feb. 22, 1984, abandoned. This application Aug. 14, 1987, Ser. No. 85,882
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—334 15 Claims



1. A separate laminated stratiform press sheet for subsequent use in the flat press process of laminating the components of printed circuits to each other comprising a polymeric thermoplastic layer having a glass transition point lower than the laminating temperature peak and a melting point higher than the laminating temperature peak for uniform transmission of pressure in said subsequent laminating process, said polymeric thermoplastic layer having a first side and a second side, a polymeric release layer having a first side and a second side, a polymeric release layer having a first side bonded to said first side of said thermoplastic layer and having a second side for releasable disposition against a printed circuit to be laminated, a polymeric stabilizing layer having a melting point higher than the laminating temperature peak and having a first side bonded to said second side of said thermoplastic layer for prevention of lateral movement of said thermoplastic layer when in a plastic state in said subsequent laminating process, means for joining said first side of said polymeric release layer to said first side of said thermoplastic layer and said first side of said polymeric stabilizing layer to said second side of said thermoplastic layer to unite said layers in a single, stratiform press sheet, said press sheet being further characterized by substantial freedom from creases, entrapped gases, contaminants between said layers.

4,857,401

DECORATIVE FOILS AND DECALS

David L. Sieverding, 7260 Mount Sherman Rd., Longmont, Colo. 80501

Filed Jun. 15, 1987, Ser. No. 61,962
Int. Cl.[4] B32B *15/08*
U.S. Cl. 428—336 12 Claims

1. A heat shapeable and deformable composite comprising (i) a thermoplastic layer of a high molecular weight poly(epsilon caprolactone) which softens to a flowable condition at temperatures in the range of above about 20° C. to about 110° C. and which is solid and non-flowable at a temperature of about 20° C., adhesively bonded to (ii) a foil layer comprising a thin layer of metal therein having a thickness less than about 0.000254 cm. and the foil layer has a thickness less than that of (i).

4,857,402

MAGNETIC RECORDING MEDIUM

Yasuo Nishikawa; Hajime Miyazuka, and Nobuo Tsuji, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 3, 1987, Ser. No. 33,704
Claims priority, application Japan, Apr. 3, 1986, 61-77325
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—336 10 Claims

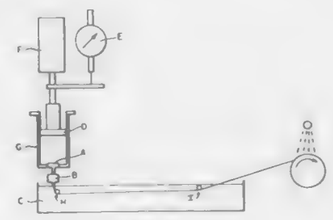
1. A magnetic recording medium comprising a non-magnetic support having provided thereon a magnetic layer containing ferromagnetic particles and a binder, wherein said magnetic layer contains on the surface thereof at least one lubricating agent selected from the group consisting of a salt of a sulfonic acid and a salt of a sulfuric acid ester wherein said salt of a sulfonic acid or said salt of a sulfuric acid ester is coated on said magnetic layer in an amount of from 10 to 500 mg/m2.

4,857,403

HIGH STRENGTH FIBERS FROM CHITIN DERIVATIVES

George V. De Lucca; Hollis S. Kezar, III, both of Wilmington, Del., and John P. O'Brien, Oxford, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 16, 1986, Ser. No. 942,442
Int. Cl.[4] D02G *3/06*
U.S. Cl. 428—364 1 Claim



1. Chitin acetate fiber having an as-spun tenacity of at least 4 g/den, a modulus of at least 100 g/den and a degree of acetylation of less than 2.2.

4,857,404

FLUORINATED CARBONACEOUS FIBERS

Francis P. McCullough, Jr., and Leo J. Novak, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 24, 1988, Ser. No. 236,478
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—367 12 Claims



1. A fiber product comprising a core of a flexible, nonflammable carbonaceous polymeric fibers having an aspect ratio greater than 10:1 and a reversible deflection ratio of greater than 1.2:1, and a non-electrically conductive fluorinated surface.

4,857,405

FIBER FOR REINFORCING PLASTIC COMPOSITES AND REINFORCED PLASTIC COMPOSITES THEREFROM

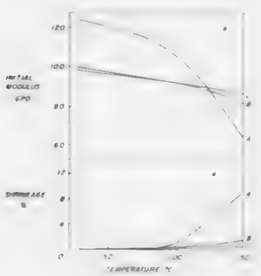
David S. Cordova; David R. Coffin, both of Richmond; Stanley D. Lazarus, Petersburgh, all of Va., and Steven A. Young, Cary, N.C., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jul. 18, 1984, Ser. No. 631,978
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—378 15 Claims

1. A high tenacity reinforcing fiber selected from the group consisting of polyester, aliphatic polyamide, and combinations thereof, for reinforcing plastic composites, said fiber being coated with a composition comprising an aqueous solution of carboxyl-terminated, oil-free alkyd resin which is the reaction product of at least one aliphatic glycol containing 2 to 12 carbons with a combination of aromatic di- or trifunctional carboxylic acids and, optionally, an unsaturated aliphatic car-

boxylic acid, said resin having a degree of esterification below the gel point of the resin to enhance stiffness of the fiber for cutting;

wherein the aliphatic glycol is selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol, tetraethylene glycol, butane diol, butene diol, butyne diol, and combinations thereof;



and wherein the aromatic carboxylic acid is selected from the group consisting of orthophthalic acid, orthophthalic anhydride, isophthalic acid, terephthalic acid, trimellitic acid, trimellitic anhydride, 2,6-naphthalene dicarboxylic acid, phenylindane dicarboxylic acid, trimesic acid, 4,4'-diphenyl-dicarboxylic acid, 2,6-pyridine dicarboxylic acid, p-hydroxymethyl benzoic acid, 5-tert-butyl isophthalic acid, bimesitylene-4,4'-dicarboxylic acid, and combinations thereof.

4,857,406

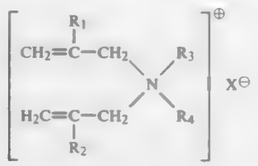
MICROCAPSULES WITH POLYSALT CAPSULE WALLS AND THEIR FORMATION

Gerhart Schwab, and Richard L. Brandon, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Apr. 10, 1987, Ser. No. 36,658
Int. Cl.[4] B01J *13/02*
U.S. Cl. 428—402.22 **16 Claims**

1. A process for forming microcapsules having discrete capsule walls comprising the steps of:

forming an emulsion of an oily core material in a continuous aqueous phase, said aqueous phase containing a polymeric anionic emulsifier, a free radical addition polymerizable cationic monomer represented by the formula

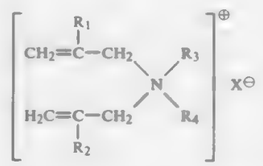


where R_1 and R_2 are selected from the group consisting of hydrogen and alkyl groups; R_3 and R_4 are selected from the groups consisting of alkyl groups, aryl groups, cycloalkyl groups, hydroxyalkyl groups and alkoxyalkyl groups having 1 to 18 carbon atoms; and x is an anion; and a free-radical initiator; and

polymerizing said cationic monomer so as to enwrap particles of said oily core material in a polymerizate of said cationic monomer.

11. Microcapsules prepared by the process comprising the steps of:

forming an emulsion of an oily core material in a continuous aqueous phase said aqueous phase containing an anionic emulsifier, a free radical addition polymerizable cationic monomer represented by the formula



wherein R_1 and R_2 are selected from the group consisting of hydrogen and alkyl groups; R_3 and R_4 are selected from the groups consisting of alkyl groups, aryl groups, cycloalkyl groups, hydroxyalkyl groups and alkoxyalkyl groups having 1 to 18 carbon atom; and x is an anion; and a free-radical initiator; and

polymerizing said cationic monomer so as to enwrap particles of said oily core material in a polymerizate of said cationic monomer produced by polymerization of said cationic monomer.

4,857,407

LOW MODULUS INTERLAYER

Charles R. Coleman, Pittsburgh, and Thomas G. Rukavina, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 16, 1987, Ser. No. 62,757
Int. Cl.[4] B32B *27/36*
U.S. Cl. 428—412 **10 Claims**

1. A laminated article comprising two rigid plies wherein the difference between the coefficients of thermal expansion of the two plies is sufficiently great that a flat laminate comprising said plies becomes warped as said laminate cools from a laminating temperature greater than 140° F. to ambient temperature, further comprising between said rigid plies a thermoplastic polyurethane interlayer having a sufficiently low shear modulus to reduce warpage, said polyurethane being the reaction product of a cycloaliphatic diisocyanate, a hydroxy-terminated polymer and a monomeric aliphatic diol selected from the group consisting of diethylene glycol, 1,6-hexanediol, thiodiethanol and 1,5-pentanediol.

4,857,408

MEAT ADHERABLE COOK-IN SHRINK FILM

Stephen J. Vicik, Darien, Ill., assignor to Viskase Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 946,722, Dec. 29, 1986, Pat. No. 4,734,327. This application Mar. 25, 1988, Ser. No. 172,831
Claims priority, application Canada, Dec. 18, 1987, 554879; European Pat. Off., Dec. 21, 1987, 87-118920.5
The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.
Int. Cl.[4] B32B *27/08, 27/16*
U.S. Cl. 428—474.4 **25 Claims**

1. A four layer meat-adherable cook-in shrink film comprising:

(a) a first or meat adherable layer comprising an ionomer of a metal salt-neutralized copolymer of an olefin and a carboxylic acid;

(b) a second or inner core layer directly adhered to one side of said first layer comprising a blend of between about 20 and 60 wt.% anhydride-modified ethylene copolymer adhesive having a Vicat softening point of at least about 194° F. and a melting point between said first layer and the hydrolyzed ethylene vinyl acetate copolymer of the third layer, and between about 40 and 80 wt.% ethylene vinyl acetate containing between about 9 and 15 wt.% vinyl acetate, said blend having a melt index up to and including about 0.9;

(c) a third or barrier layer directly adhered to the opposite side of said second layer from said first layer and comprising a blend of between about 60 and 90 wt.% hydrolyzed ethylene vinyl acetate copolymer containing between about 28 and 40 wt.% ethylene, and between about 10 and 40 wt.% amide polymer having a melting point below about 420° F.;

(d) a fourth or abuse layer directly adhered to the opposite side of said third layer from said second layer comprising a blend of between about 10 to 40 wt.% anhydride-modified ethylene copolymer adhesive having a Vicat softening point of at least about 194° F. and a melting point between said first layer and said hydrolyzed ethylene vinyl acetate copolymer of said third layer, and between about 60 and 90 wt.% ethylene vinyl acetate containing between about 9 and 15 wt.% vinyl acetate, said blend having a melt index up to and including about 0.9; and

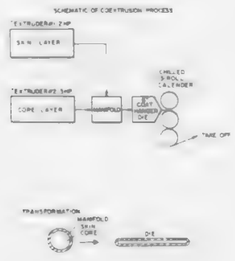
(e) the entire film being irradiated.

4,857,409

CLEAR BARRIER COMPOSITES CONTAINING POLYISOBUTYLENE/POLYOLEFIN ALLOY COMPONENTS

Donald R. Hazelton, Chatham, and Cindy B. Shulman, Cliffside Park, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 699,832, Feb. 8, 1985, abandoned. This application Jul. 17, 1987, Ser. No. 74,981
Int. Cl.[4] B32B *25/08*
U.S. Cl. 428—494 **32 Claims**



1. A composite film composition comprising a rubber containing core component and at least one skin layer wherein the skin layer comprises a polyolefin resin and the rubber containing core component comprises about 50 wt % to 85 wt % of rubber and about 50 wt % to 15 wt % polyolefin wherein said rubber is selected from the group consisting of polyisobutylene, butyl rubber, halogenated butyl rubber, ethylene propylene rubber, ethylene-propylene-diene rubber, and polychloroprene.

4,857,410

MULTI-TYPE HEAT-SENSITIVE TRANSFERRING MEDIUM

Takashi Yamahata, Koriyama, Japan, assignor to General Company Limited, Osaka, Japan

Division of Ser. No. 759,857, Jul. 29, 1985, Pat. No. 4,689,274. This application Jun. 10, 1987, Ser. No. 60,260
Claims priority, application Japan, Aug. 13, 1984, 59-167912
The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.
Int. Cl.[4] B41M *5/26*
U.S. Cl. 428—522 **5 Claims**

1. A multi-type heat-sensitive transferring medium which comprises a substrate and a heat-sensitive transferring ink layer overlying the substrate and comprising a resin component, a solid component immiscible with the resin component and capable of becoming liquid by heating while solid at room temperature, and a coloring agent, the resin component being a mixture of

(a) a vinyl chloride-vinyl acetate copolymer having a monomer weight ratio of vinyl chloride to vinyl acetate of from about 65:35 to 90:10 and having a viscosity average degree of polymerization of 200–1000, and

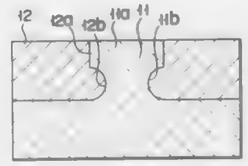
(b) a polymethacrylic acid ester having a viscosity average degree of polymerization of 100–3000, wherein said solid component and said coloring agent are transferred upon the application of heat while said resin component is not transferred upon the application of heat.

4,857,411

COMPOSITE BODY AND METHOD OF MANUFACTURING THE SAME

Morie Yamaguchi; Chiezo Horita; Shigeo Suzuki, and Yasuo Sakata, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 832,770, Feb. 25, 1986, abandoned. This application Nov. 27, 1987, Ser. No. 125,783
Claims priority, application Japan, Feb. 26, 1985, 60-36975
Int. Cl.[4] B22F *3/00*
U.S. Cl. 428—546 **46 Claims**



1. A composite body, comprising:

a sintered ceramic body having a predetermined shape and having a bonding portion formed on its outer circumferential surface;

a sintered metal body obtained from a powder containing a metal powder as a main component and disposed to cover the outer surface of the ceramic body, said metal body being physically bonded with said ceramic body after fitting with said bonding portion thereof;

a matrix body combined with an outer circumferential surface of said metal body, the thermal expansion coefficient of the matrix body being larger than that of the ceramic body and smaller than that of the metal body; and

an infiltrator disposed in the bonding portion.

4,857,412

METHOD FOR FORMING A PLANAR SHEET OR PLATE TO A CURVED SHAPE

Paul Fleury, 74, Chemin Lemieux,, St-Vallier-de-Bellechasse, Quebec, Canada G0R 4J0

Filed Jan. 14, 1987, Ser. No. 3,155
Claims priority, application Canada, Jan. 16, 1986, 499743
Int. Cl.[4] B21C *1/00, 27/00;* **B21H** *3/00;* **B21B** *19/14*
U.S. Cl. 428—577 **8 Claims**

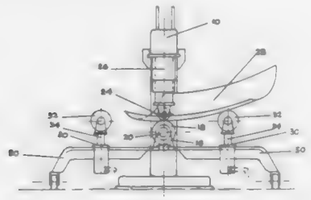
1. A method for forming a portion of a planar metal sheet or plate to a curved shape, comprising the steps of:

providing at least one rotating cylinder and a wheel; and

compressing to plastically deform said metal sheet or plate along juxtaposed strips between said at least one rotating cylinder placed on one side of said metal sheet or plate and said wheel placed on the other side of said metal sheet or plate so as to create a first compression stroke that develops a plurality of plastically deformed strips therein to form said sheet or plate to the curved shape;

said compression being completed so as to keep an undeformed border frame or variable width on a perphery of

said portion to maintain the original peripheral shape of the sheet or plate.



8. A product obtained by using the method described in any one of claim 1, 2, 3, 4, 5, 6 or 7.

4,857,413

METAL-MADE CARRIER BODY FOR EXHAUST GAS CLEANING CATALYST

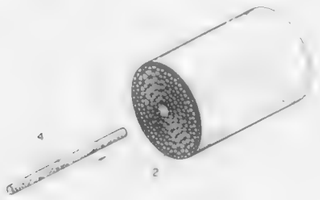
Yasuaki Hashimoto, and Haruo Serizawa, both of Shizuoka, Japan, assignors to Usui Kokusai Sangyo Kabushiki Kaisha, Japan

Filed Dec. 23, 1988, Ser. No. 289,022

Claims priority, application Japan, Dec. 28, 1987, 62-197358[U]

Int. Cl.[4] B01J *35/04;* F01N *3/28*

U.S. Cl. 428—592 4 Claims



1. In a metal-made carrier body for an exhaust gas cleaning catalyst, including a cylindrical metal casing and a metal-made multi-layered composite body obtained by superposing one over the other at least one planar metal band made of a thin metal sheet and at least one corrugated metal band made of another thin metal sheet and then rolling both the bands together into a spiral form, defining many network-patterned gas flow passages along the central axis thereof and enclosed within the metal casing, the improvement wherein a gas-permeable insert is centrally and axially embedded within the multi-layered composite body of the planar metal band and the corrugated metal band.

4,857,414

AMORPHOUS METAL-METAL COMPOSITE ARTICLE AND A METHOD FOR PRODUCING THE SAME

Masatada Araki, Handa; Yutaka Kuroyama; Yukihisa Takeuchi, both of Chita; Makoto Takagi, Okazaki; Yoshihito Kawamura, Ohbu, and Toru Imura, Nagoya, all of Japan, assignors to Nippon Oil & Fats Co., Ltd., Japan

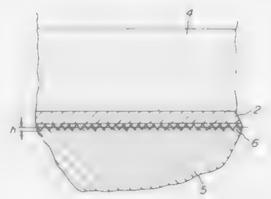
Filed Apr. 12, 1988, Ser. No. 180,764

Claims priority, application Japan, Apr. 20, 1987, 62-95281

Int. Cl.[4] B32B *15/04;* B23K *20/08*

U.S. Cl. 428—612 5 Claims

2. A method for producing an amorphous metal-metal composite article, wherein an amorphous metal thin sheet is bonded to a metal by applying an explosion shock to an assembly comprising the metal and the amorphous metal thin sheet superposed thereon, the improvement comprising plastically deforming a rough portion on the metal surface by the collision of the amorphous metal, which has been closed in contact tightly to the rough surface of the metal sheet, at a high velocity to the rough surface of the metal such that the moving velocity of the colliding portion, at which the amorphous metal thin sheet is pressed to the metal, is higher than the sound velocity in the amorphous metal and the width of that portion of the amorphous metal which is heated to a temperature higher than 900° C. is smaller than the value obtained by subtracting 10 μm from the thickness of the amorphous metal under an assumption that the rough portion on that surface of the metal which is faced to the amorphous metal has been wholly melted by the heat generated by the collision, and the heat has been equally distributed to the limited width of the amorphous metal and the metal.



4,857,415

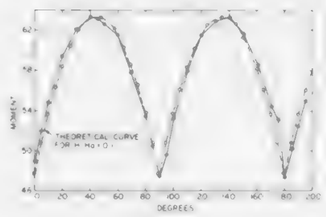
METHOD OF PRODUCING SINGLE CRYSTALLINE MAGNETIC FILM HAVING BI-AXIAL ANISOTROPY

Randal W. Tustison, Lexington, and Thomas Varitimos, Norwood, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 29, 1987, Ser. No. 56,618

Int. Cl.[4] H01L *29/12;* B32B *15/01*

U.S. Cl. 428—620 17 Claims



1. In combination:

a layer comprising gallium arsenide having a <100> oriented surface; and

a layer comprising a single crystal of a metal disposed on said <100> surface of the gallium arsenide.

4,857,416

INFRA-RED EMITTING ELECTROLUMINESCENT LAMP STRUCTURES

William H. Kreiling, Lebanon, N.H., and William A. Tower, South Royalton, Vt., assignors to Loctite Luminescent Systems, Inc., Lebanon, Mass.

Filed Dec. 31, 1987, Ser. No. 139,966

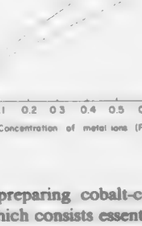
Int. Cl.[4] H05B *33/02, 33/22*

U.S. Cl. 428—690 16 Claims

1. A structure for providing electromagnetic wave energy primarily in the near infra-red region of the spectrum, said structure comprising

an electroluminescent lamp element including a red fluorescent dye material for emitting electromagnetic wave energy in the visible and in the near infra-red regions of the spectrum from a surface thereof; and

at least one layer of optical filter material having selected color filter characteristics positioned over said emitting surface of said electroluminescent lamp element for transmitting electromagnetic wave energy therefrom in a manner such that the amount of energy transmitted in the near infra-red region of the spectrum is substantially increased and the amount of energy transmitted in the visible region of the spectrum is substantially decreased.



4,857,417

COBALT-CONTAINING IRON OXIDE MAGNETIC PARTICLES AND METHOD FOR THE PREPARATION OF THE SAME

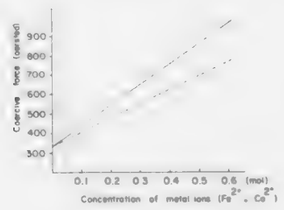
Susumu Kitaoka, Kyoto; Haruo Andoh, Takatsuki, and Junichi Hirata, Otokuni, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Division of Ser. No. 858,575, Apr. 24, 1986, Pat. No. 4,741,921, which is a continuation of Ser. No. 739,765, Jun. 3, 1985, abandoned, which is a continuation of Ser. No. 650,993, Sep. 17, 1984, abandoned, which is a continuation of Ser. No. 427,531, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 898,127, Apr. 20, 1978, abandoned. This application Jan. 5, 1988, Ser. No. 141,073

Claims priority, application Japan, Apr. 20, 1977, 52-46046; Apr. 20, 1977, 52-46045; Apr. 20, 1977, 52-46047; Jun. 23, 1977, 52-74993; Jun. 23, 1977, 52-74991

Int. Cl.[4] G11B *5/66*

U.S. Cl. 428—694 22 Claims



1. A method for preparing cobalt-containing iron oxide magnetic particles, which consists essentially of:

reducing and dispersing acicular gamma-Fe_2O_3 particles in an aqueous solution containing a ferrous ssalt, a cobalt salt and an alkali of one equivalent to the cobalt and ferrous salts to raise the ratio of divalent iron to trivalent iron (Fe^{2+}/Fe^{3+}) until the Fe^{2+}/Fe^{3+} ratio becomes about 0.074 to 0.101; and

heating the mixture at a temperature higher than room temperature up to a boiling point of the mixture under an atmosphere such that the divalent iron is substantially not oxidized and thereby cobalt is predominantly incorporated into the outermost layer of the acicular iron oxide particles in an amount of 0.2% by weight or more based on the weight of the total metal.

4,857,418

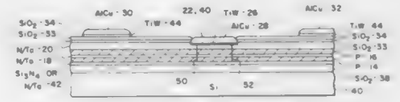
RESISTIVE OVERLAYER FOR MAGNETIC FILMS

James A. Schuetz, Maple Grove, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 8, 1986, Ser. No. 939,315

Int. Cl.[4] G11C *11/15*

U.S. Cl. 428—693 3 Claims



1. A magnetic, solid state device, wherein electrical current can flow through said device from a first to a second location, said device comprising:

a first layer of a ferromagnetic, magnetoresistive material;

a second layer of a ferromagnetic, magnetoresistive material;

a third layer interposed between, and in contact with, said first and said second layers, wherein said third layer prevents exchange coupling between said first and said second layers;

a fourth layer of a restrictive material, said fourth layer overlying, at least in part, and in contact with, said first layer, wherein said fourth layer includes nitrogen doped tantalum, wherein said first and said second locations are, at least in part, on a surface of said fourth layer with said surface being oppositely disposed from said first layer, wherein the resistivity and dimensions of said fourth layer are such that less than half of said current will flow solely within said fourth layer in passing between said first and second locations, and such that the magnitude of said current will remain above a desired signal level; and

first and second electrical contacts connected, directly or indirectly, to said first and second locations, respectively.

4,857,419

METHOD OF OPERATING ZINC-HALOGEN SECONDARY BATTERY

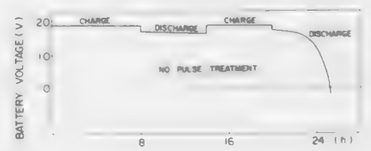
Kenichiro Jinnai, Higashimine, and Takafumi Hashimoto, Asahi, both of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Continuation of Ser. No. 874,448, Jun. 16, 1986, abandoned. This application Jan. 19, 1988, Ser. No. 144,749

Claims priority, application Japan, Jun. 19, 1985, 60-131995

Int. Cl.[4] H01M *8/00, 10/44*

U.S. Cl. 429—13 12 Claims



1. A method of operating a zinc-halogen battery having a plurality of secondary cells, each cell comprising a zinc negative electrode, a halogen positive electrode, and an electrolyte therebetween, the method including the steps of:

(a) charging the secondary cells by applying a direct current to the secondary cells for a first predetermined time;

(b) after the step (a), discharging the secondary cells; and

(c) before the step (a), applying a series of electric pulses to

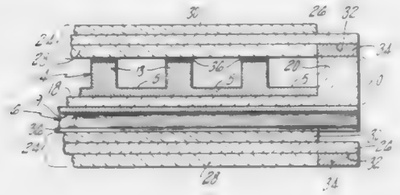
the negative electrodes of the respective secondary cells for a second predetermined time to prevent formation of zinc dendrites on the negative electrodes of the respective secondary cells, the second predetermined time being shorter than the first predetermined time.

4,857,420

METHOD OF MAKING MONOLITHIC SOLID OXIDE FUEL CELL STACK

Donald L. Maricle, and Richard F. Buswell, both of Glastonbury, Conn., assignors to International Fuel Cell Corporation, South Windsor, Conn.

Filed Oct. 13, 1987, Ser. No. 107,817
Int. Cl.[4] H04M *8/10*; B05D *5/12*
U.S. Cl. 429—30 **18 Claims**



1. A method for forming a monolithic solid oxide fuel cell stack, said method comprising the steps of:

(a) forming a plurality of electrode subassemblies by:

(i) providing appropriately sized green unsintered tapes of solid oxide electrolyte material;

(ii) sintering said tapes to form sintered plates of said electrolyte material of appropriate cperational density;

(iii) forming a finished layer of anode material on one surface of said sintered electrolyte plates; and

(iv) forming a finished layer of cathode material on an opposite surface of said sintered electrolyte plates;

(b) forming a plurality of gas separator-reactant flow field subassemblies by:

(i) providing appropriately sized green unsintered sheets of interconnect material;

(ii) sintering said sheets to form laminae of said interconnect material of appropriate operational density;

(iii) forming a finished anode flow field layer of anode material on one surface of said laminae, said anode flow field layers including a plurality of parallel ribs and intervening grooves extending across said laminae in a first direction; and

(iv) forming a finished cathode flow field layer on an opposite surface of said laminae, said cathode flow field layers including a plurality of parallel ribs and intervening grooves extending across said laminae in a second direction perpendicular to said first direction;

(c) stacking said electrode subassemblies and said gas separator-reactant flow field subassemblies one atop the other in alternating fashion with said cathode material layers abutting said cathode flow field layers, and with anode material layers abutting said anode flow field layers to form a stack preassembly;

(d) heating said stack preassembly to an elevated subsintering temperature thereby softening said subassemblies and creep flattening the latter to form intimate interfacial contact between said subassemblies; and

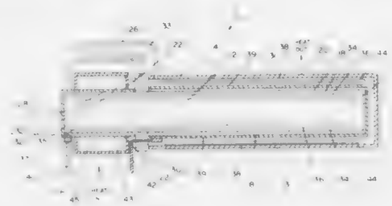
(e) applying a light compressive load axially of said stack preassembly during said heating step to cause said subassemblies to fuse together to form a monolithic stack structure.

4,857,421

ALKALI METAL THERMOELECTRIC GENREATOR

Donald M. Ernst, Leola, Pa., assignor to Thermacore, Inc., Lancaster, Pa.

Filed Nov. 14, 1988, Ser. No. 271,594
Int. Cl.[4] H01M *10/39*
U.S. Cl. 429—104 **15 Claims**



1. A thermoelectric generator comprising:

a sealed heated chamber with one wall portion being a first side of a wall constructed of a selectively porous material through which only ions of a working fluid can migrate;

a first capillary wick structure located in the interior of the heated chamber and in contact with a wall of the heated chamber at a heat source and at the wall portion of selectively porous material;

a second capillary wick structure located within the interior of the heated chamber and in contact with a wall of the heated chamber at a heat source;

a sealed second chamber with one wall portion being the second side of the same wall of selectively porous material as is in the heated chamber and another wall which is cooled;

a third capillary wick structure located in the interior of the second chamber and in contact with the cooled wall of the second chamber;

a capillary structure fluid return path interconnecting the second capillary wick structure within the heated chamber and the third capillary wick structure within the second chamber;

a first electrical connector attached to the heated chamber and in electrical contact with a working fluid on the wall of porous material in the heated chamber;

a second electrical connector attached to the second chamber and in electrical contact with a working fluid on the wall of porous material in the cooled chamber;

a quantity of liquifiable and vaporizable working fluid which is ionized by heating and of which only the ions can migrate through the wall portion of porous material; and

at least one heat source applying heat to the heated chamber.

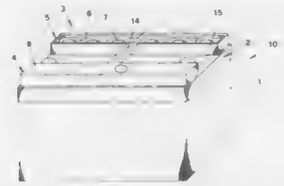
4,857,422

LID FOR ACCUMULATOR BATTERIES WITH AN INCORPORATED HANDLE

Olimpio Stocchiero, 5 Via Kennedy, 36050 Montorso Vicentino (VI), Italy

Filed Dec. 30, 1988, Ser. No. 292,534
Claims priority, application Italy, Jan. 11, 1983, 85502 A/88
Int. Cl.[4] H01M *2/04*
U.S. Cl. 429—175 **2 Claims**

1. A lid for accumulator batteries made of plastic material, characterized in that it comprises at least two parallelepiped elements obtained with the single moulding of the lid, having an equal height and being positioned parallel with each other along the longer sides of the battery, wherein one of said elements presents the holes for the re-fill of the cells and wherein said parallelepiped elements are joined together by at least one transverse piece functioning as a handle made in a single moulding process together with the lid.

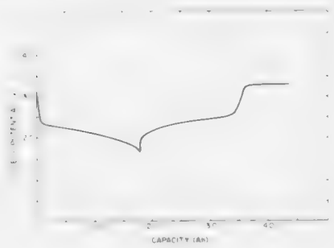


4,857,423

OVERCHARGE PROTECTION OF SECONDARY, NON-AQUEOUS BATTERIES

Kuzhikalail M. Abraham, Needham, Mass., and David M. Pasquariello, Pawtucket, R.I., assignors to EIC Labotatories, Inc., Norwood, Mass.

Continuation of Ser. No. 126,629, Nov. 30, 1987, abandoned.
This application Dec. 9, 1988, Ser. No. 284,746
Int. Cl.[4] H01M *6/14, 6/16*
U.S. Cl. 429—194 **13 Claims**



1. A rechargeable electrochemical cell having an anode, cathode and nonaqueous electrolyte in contact with said anode and cathode,

said electrolyte including at least one nonaqueous solvent in which at least one salt and a redox reagent are dissolved,

said redox reagent being present in an amount sufficient to maintain proper mass transport for a predetermined steady overcharge current for said rechargeable electrochemical cell to provide overcharge protection.

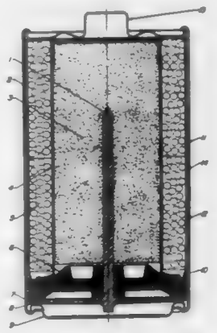
4,857,424

ZINC ALKALINE ELECTROCHEMICAL CELLS WITH REDUCED MERCURY ANODES

Duane M. Larsen, McFarland, and Robert B. Dopp, Madison, both of Wis., assignors to Rayovac Corporation, Madison, Wis.

Filed Oct. 11, 1988, Ser. No. 255,606
Int. Cl.[4] H01M *4/42*
U.S. Cl. 429—206 **9 Claims**

1. An alkaline zinc electrochemical cell having a manganese dioxide cathode, a zinc anode containing no more than four percent mercury based on the weight of zinc and an alkaline electrolyte, said zinc anode further comprising a zinc corrosion and hydrogen gas inhibiting amount of a siliconated, film-forming organic wetting agent, wherein said siliconated, film-forming organic wetting agent further provides for improved storage stability and cell capacity under comparable conditions for said cell as provided by a cell otherwise identical except having an absence of said siliconated, film-forming organic wetting agent.

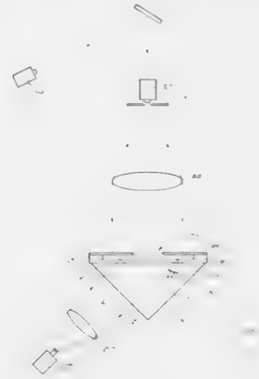


4,857,425

MANUFACTURE OF INTEGRATED CIRCUITS USING HOLOGRAPHIC TECHNIQUES

Nicholas J. Phillips, Loughborough, England, assignor to Holtronic Technologies Limited, London, Great Britain

Filed Jun. 26, 1987, Ser. No. 67,207
Claims priority, application United Kingdom, Jun. 30, 1986, 8615908
Int. Cl.[4] G02B *1/20*; G03H *1/04*
U.S. Cl. 430—1 **15 Claims**



1. A method of manufacturing integrated circuits using holographic techniques including the steps of:

(a) providing a first recording medium exhibiting negligible scatter and high resolution without shrinking or distorting during the course of manufacture.

(b) forming a volume holographic image of the integrated circuit on the first recording medium by interference between an input beam of coherent light which passes through a mask window containing the design of the integrated circuit, and a reference beam of coherent light which is totally internally reflected at the surface on which the recording medium is located, the interference taking place both with the incident and the reflected reference beam;

(c) removing the mask window and placing in its place a

silicon slice having a second recording medium on which the formed holographic image is to be reproduced;

(d) forming an image of the hologram on the second recording medium of the silicon slice by interference between the input beam and another reference beam which travels in the reverse direction from the first reference beam which formed the hologram; and

(e) repeating step (d) with another silicon slice as many times as required to manufacture a plurality of silicon slices containing an image of the integrated circuit formed thereon.

4,857,426

PHOTO POLYMERS AND USES THEREOF

David C. Bott, Warwickshire, and Lucy M. Connors, Sunbury-on-Thames, both of England, assignors to The British Petroleum Company p.l.c., London, United Kingdom

Filed Jul. 27, 1988, Ser. No. 224,982

Claims priority, application United Kingdom, Aug. 1, 1987, 8718274; Jan. 27, 1988, 8801824

Int. Cl.[4] G03C *5/00*

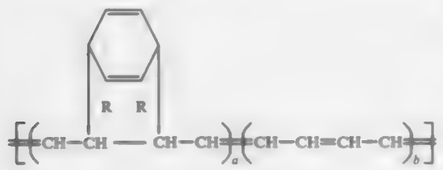
U.S. Cl. 430—18 9 Claims

1. A coherent polymer film, said polymer film having localised zones of a material with modified optical and surface relief properties, said zones being integral with the polymer film and being derivable by the steps of

(i) photo-oxidation comprising irradiation of selective areas followed by

(ii) thermal oxidation comprising heating, the step(s) being carried out in the presence of an oxidising gas, of a film of a precursor polymer of the formula (I) or containing repeating units of formula (I)

(I)



wherein

R is a group selected from —H, an alkyl, a haloalkyl, an ester and combinations thereof,

a and b are such that

(a+b) has a value from 20–50,000, and

a/(a+b) has a value from 0.1 to 1.

4. A process for producing coherent polymer films having localised zones of a material with modified optical and surface relief properties, said process comprising:

(a) subjecting discrete areas of a film of the precursor polymer comprising structural units of formula (I) to photo-oxidation by selectively irradiating in the presence of oxygen or a gas containing oxygen with a light source having a wave-length in the ultraviolet and/or visible regions followed by

(b) subjecting the selectively irradiated polymer film from step (a) to thermal oxidation by heating in an atmosphere of oxygen or a gas containing oxygen to a temperature from 20° to 200° C. so that the resultant film has zones with modified optical and surface relief properties.

4,857,427

RECORDING MEDIUM

Hiroyuki Itoh, Kawasaki; Takafumi Ishii, and Tetsuo Satoh, both of Yokohama, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Continuation of Ser. No. 7,650, Jan. 28, 1987, abandoned. This application Aug. 19, 1988, Ser. No. 236,338

Claims priority, application Japan, Jan. 29, 1986, 61-15779

Int. Cl.[4] G03C *11/00;* C09K *19/00;* G02F *1/03*

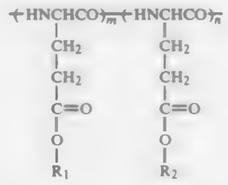
U.S. Cl. 430—19 4 Claims

1. a method of recording information on a recording medium which comprises:

(a) contacting a cholesteric liquid crystal forming recording layer with laser beam radiation effective to increase the temperature of the film to form a cholesteric liquid crystal; and

(b) removing the laser beam radiation from the layer, to rapidly cool the irradiated area of the layer and fix the cholesteric liquid crystal structure whereby information is recorded in the liquid crystal structure,

said cholesteric liquid crystal forming recording layer being provided on a base to form the recording medium and said recording layer consisting essentially of a thermotropic cholesteric liquid crystalline glutamate copolymer represented by the following general formula:



wherein R_1 is an alkyl, cycloalkyl, aryl or arylalkyl group having not more than 10 carbon atoms, R_2 is an alkyl, cycloalkyl, aryl or arylalkyl group having 6 to 30 carbon atoms, provided R_1 and R_2 are not the same, m and n are in the relation of $50 \leqq m+n$ 2,000, $m/n = 80 \sim 10/20 \sim 90$ and the number of carbon atoms of R_2 is larger by at least five than that of R_1.

3. A method according to claim 1 including the following additional step of erasing recorded information from the recording layer which comprises:

heating and then cooling the irradiated area of the recording medium under conditions effective to cause relaxation of the cholesteric structure of the irradiated area to take place and the selective reflection ability of the irradiated area to be eliminated thereby causing the recorded information to be erased.

4,857,428

METHOD FOR FORMING LIGHT ABSORBING PATTERN USING PHOTORESIST COMPOSITION ON PHOSPHOR SCREENS OF COLOR PICTURE TUBES WHEREIN COMPOSITION INCLUDES AZIDE COMPOUND AND DIAZO FORMALDEHYDE PHOSPHATE

Norio Koike, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 14, 1988, Ser. No. 143,718

Claims priority, application Japan, Jan. 22, 1987, 62-11255

Int. Cl.[4] G03C *5/00;* H01J *9/20*

U.S. Cl. 430—25 3 Claims

1. A method for forming a light absorbing pattern on a phosphor screen of a color picture tube comprising the steps of:

forming a solution containing at least a phosphate of a formalin condensation product of diazodiphenylamine, an adhesion accelerating amount of a silane coupling agent, 2,5-bis(4'-azide-2'-sulphobenzilidene)cyclopentanone and its salts, polyvinylalcohol, and polyvinylpyrrolidone, the ratio of the phosphate of the formalin condensation product of diazodiphenylamine to the 2.5-bis(4'azide-2'-sulphobenzilidene)cyclopentanone and its salts being within the range of about 1:5 to 1:15 by weight and the ratio of the polyvinylalcohol to polyvinylpyrrolidone being within the range of about 1:1 to about 1:8 by weight,

coating a layer of the solution on an inner surface of a picture tube faceplate to form a photosensitive film;

exposing predetermine portions of the photoresist film to light from a light source through a shadow mask having a plurality of apertures therein to harden the portions;

coating the surface of the photoresist film with a light absorbing film; and

removing the hardened portions of the photoresist film and the overlying parts of the light absorbing film on the hardened portions.

4,857,429

PROCESS OF IMPROVING OPTICAL CONTACT OF PATTERNWISE POWDERY COATING LAYER AND PHOSPHOR SCREEN PROVIDED THEREFORE

Nobuaki Hayashi, Saitma; Shoichi Uchino, Hachioji; Yoshifumi Tomita, Mobara; Saburo Nonogaki, Tokyo, and Masahiro Nishizawa, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 668,017, Nov. 5, 1984, abandoned. This application Dec. 3, 1986, Ser. No. 937,425

Claims priority, application Japan, Nov. 7, 1983, 58-207470

Int. Cl.[4] G03C *5/00;* H01J *9/227*

U.S. Cl. 430—28 6 Claims

1. A process for improving an optical contact of a patternwise phosphor coating layer, which comprises forming a film of a photo-tackifiable composition comprising a water-soluble aromatic diazonium salt on the inner surface of a face plate of a color picture tube as a substrate; conducting at least one run of exposing the film to actinic radiation in a pattern and contacting the exposed film with phosphor, thereby depositing the phosphor on exposed parts of the film, so as to form a resulting patternwise phosphor layer, the phosphor being in the form of phosphor particles deposited on exposed parts of the film such that the resulting patternwise phosphor layer has voids; subsequent to forming the resulting patternwise phosphor layer, impregnating the resulting patternwise phosphor layer with a substantially transparent inorganic material having a refractive index of 1.2 to 2.0, to provide a layer of the substantially transparent inorganic material in the resulting patternwise phosphor, the substantially transparent inorganic material filling the voids of the resulting patternwise phosphor layer, so as to improve an optical contact between the substrate and the phosphor layer as compared with the optical contact between the substrate and the phosphor layer without the substantially transparent inorganic layer; aluminizing the patternwise phosphor layer; and baking the face plate having the phosphor layer.

4,857,430

PROCESS AND SYSTEM FOR DETERMINING PHOTORESIST DEVELOPMENT ENDPOINT BY EFFLUENT ANALYSIS

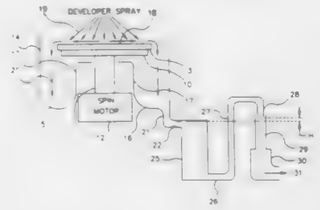
Edwin G. Millis, Dallas, and Samuel J. Wood, Jr., Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 17, 1987, Ser. No. 134,439

Int. Cl.[4] G03C *5/24*

U.S. Cl. 430—30 11 Claims

1. In a method of developing patterned photoresist polymer on a semiconductor wafer and detecting the endpoint of the develop process, the steps of spraying developer fluid onto a semiconductor wafer mounted and spinning on a spinning vacuum chuck, catching the developer fluid as it is spun from the surface of the semiconductor wafer, draining the developer fluid into an analysis chamber, analyzing the developer fluid for the amount of dissolved photoresist polymer therein, and rinsing the semiconductor wafer to remove developer fluid



therefrom when the detected amount of dissolved photoresist polymer in the developer fluid reaches a predetermined amount.

4,857,431

PHOTOCONDUCTIVE COMPOSITION

Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 16, 1987, Ser. No. 121,250

Claims priority, application Japan, Nov. 14, 1986, 61-269954

Int. Cl.[4] G03G *5/087, 5/09*

U.S. Cl. 430—91 14 Claims

1. A photoconductive composition comprising an inorganic photoconductive material, a resin binder, and a sensitizing amount of a sensitizing dye containing at least one sulfo group represented by formula (I):

(I)



wherein:

Q_1 is a substituted or unsubstituted atomic group necessary for forming a 5-membered or 6-membered heterocyclic ring or a condensed ring containing a 5-membered or 6-membered heterocyclic ring;

R_0 is an alkyl group, a hydroxyalkyl group, an alkoxyalkyl group, an aralkyl group, a carboxyalkyl group, or a sulfoalkyl group;

Z is an oxygen atom, a sulfur atom, a selenium atom or a tellurium atom;

Q_2 is a substituted or unsubstituted atomic group necessary for forming pyrylium, benzopyrylium, naphthopyrylium, thiopyrylium, benzothiopyrylium, naphthothiopyrylium, selenapyrylium, benzoselenapyrylium, naphthoselenapyrylium, ternapyrylium, benzoternapyrylium, or naphtoterhnapyrylium, which may be substituted;

Y_1 and Y_2, which may be the same or different, each is a hydrogen atom, an aliphatic group or an aromatic group;

each L is a methine group or a substituted methine group;

p and q each is 0 or 1;

r is 2 or 3; and

the compound of formula (I) forms an inner salt.

4,857,432

TONER FOR DEVELOPING ELECTROSTATIC CHARGE IMAGE

Hirohide Tanikawa, Kawasaki; Toshiaki Nakahara, Tokyo, and Keita Nozawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1988, Ser. No. 194,173

Claims priority, application Japan, May 18, 1987, 62-118882; May 18, 1987, 62-118883

Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—106 32 Claims

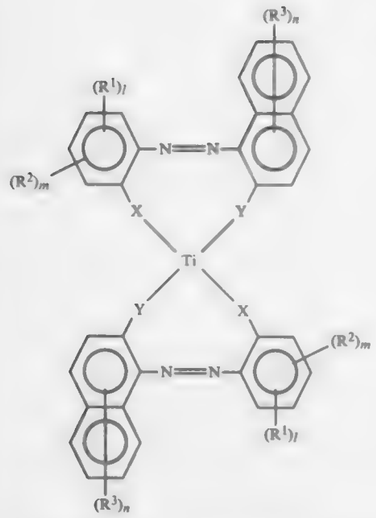
1. A toner for developing electrostatic latent images comprising:

100 parts by weight of a binder resin containing 70% by weight or less of a tetrahydrofuran insoluble component and a tetrahydrofuran soluble component having an acid value of 50 or less;

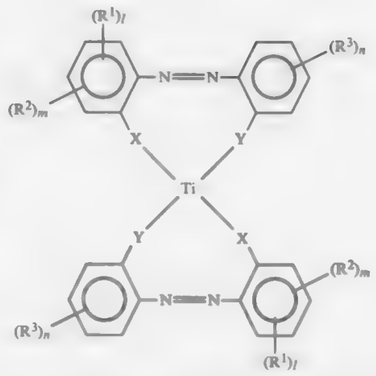
20 to 200 parts by weight of magnetic powder; and

0.01 to 10 parts by weight of a compound represented by the following formula (III), (IV) or (VI):

(III)



(IV)



wherein R^1 is an alkyl group having 1 to 18 carbon atoms, an alkenyl group having 2 to 18 carbon atoms, an aralkyl group having 7 to 18 carbon atoms or an aryl group having 6 to 18 carbon atoms; R^2 is a hydrogen, a halogen, a nitro group, or an alkoxy group having 1 to 18 carbon atoms; R^3 is a hydrogen, a halogen, a nitro group, a carboxyl group, an anilide group, an alkyl having 1 to 18 carbon atoms, an alkenyl group having 2 to 18 carbon atoms, an aralkyl group having 7 to 18 carbon atoms, an aryl group having 6 to 18 carbon atoms, an alkoxy group having 1 to 18 carbon atoms or a carboxyester group having 2 to 18 carbon atoms; X and Y each are —O—, —COO—, —S— or —NR^4, where R^4 is an alkyl having 1 to 4 carbon atoms; C is hydrogen, sodium, potassium, ammonium or organic ammonium; *l* is 1 or 2; m and n each are 1, 2, or 3; with the proviso that when the phenylene group in the formula (IV) has plural substituents, they may be either the same or different; and

(VI)



wherein A^1 is a phenylene group, which may have a substitutent selected form the group consisting of a nitro group, a halogen atom or an alkoxy group having 1 to 18 carbon atoms; B^1 is a phenylene residue or naphthylene residue which may have a substituent selected from the group consisting of a nitro group, a halogen atom, a carboxyl group, an anilide group, an alkoxy group having 1 to 18 carbon atoms or a carboxylester group; X and Y each are —O—, —COO—, —S— or —NR— where R is hydrogen or an alkyl having 1 to 4 carbon atoms; C is hydrogen, sodium, potassium, ammonium or organic ammonium; with the proviso that when A^1 and B^1 has plural substituents, they may be either the same or different.

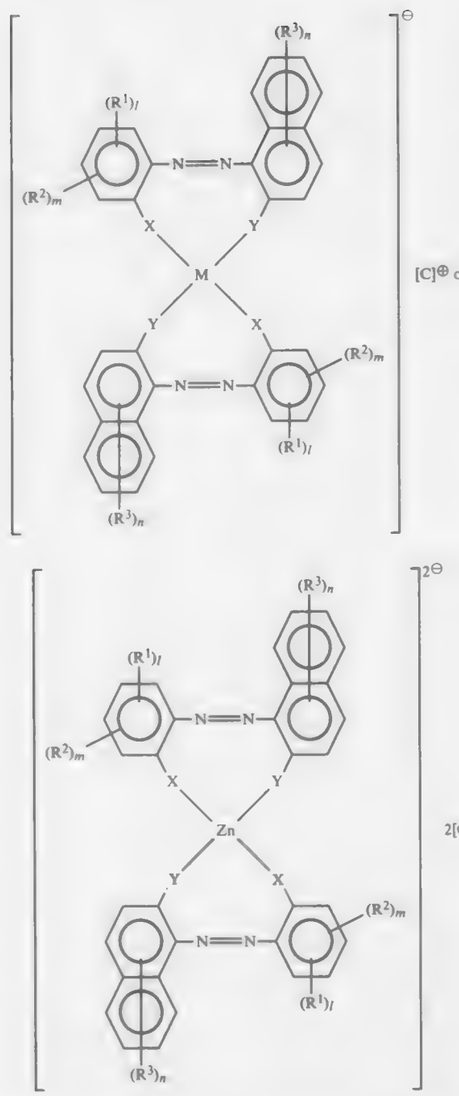
16. A toner for developing electrostatic latent images, comprising:

100 parts by weight of a binder resin containing 70% by weight or less of a tetrahydrofuran insoluble component and a tetrahydrofuran soluble component having an acid value of 50 or less;

20 to 200 parts by weight of magnetic powder; and

0.01 to 10 parts by weight of a compound represeated by the following formula (I) or (II),

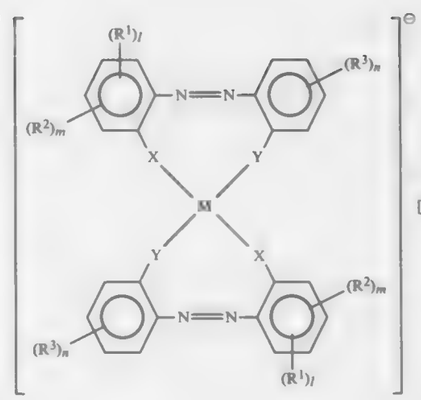
(I)



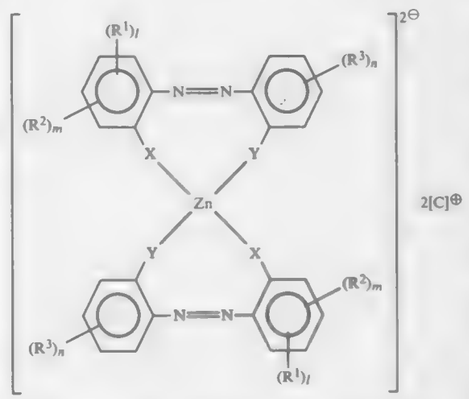
[C]⊕ or

2[C]⊕

(II)



[C]⊕ or



2[C]⊕

where R^1 is an alkyl group having 1 to 8 carbon atoms; R^2 is a hydrogen, a halogen, a nitro group, or an alkoxy having 1 to 18 carbon atoms; R^3 is a hydrogen, a halogen, a nitro group, a carboxyl group, an anilide group, an alkyl having 1 to 18 carbon atoms, an alkenyl group having 2 to 18 carbon atoms, an aralkyl group having 7 to 18 carbon atoms, an aryl group having 6 to 18 carbon atoms, an alkoxy group having 1 to 18 carbon atoms or a carboxyester group having 2 to 18 carbon atoms; X and Y each are —O—, —COO—, —S— or —NR^4— where R^4 is an alkyl having 1 to 4 carbon atoms; M is scandium, vanadium or manganese; C is hydrogen, sodium, potassium, ammonium or organic ammonium, *l* is 1 or 2; m and n each are 1, 2 or 3; with the proviso that when the phenylene group in the formula (II) has plural substituents, they may be either the same or different.

wherein R^1 is an alkyl group having 1 to 8 carbon atoms; R^2 is a hydrogen, a halogen, a nitro group, or an alkoxy having 1 to 18 carbon atoms; R^3 is a hydrogen, a halogen, a nitro group, a carboxyl group, an anilide group, an alkyl having 1 to 18 carbon atoms, an alkenyl group having 2 to 18 carbon atoms, an aralkyl group having 7 to 18 carbon atoms, an aryl group having 6 to 18 carbon atoms, an alkoxy group having 1 to 18 carbon atoms or a carboxyester group having 2 to 18 carbon atoms; X and Y each are —O—, —COO—, —S— or NR^4 where R^4 is an alkyl having 1 to 4 carbon atoms; M is scandium, vanadium or manganese; C is hydrogen, sodium, potassium, ammonium or organic ammonium; *l* is 1 or 2; m and n each are 1, 2 or 3; with the proviso that when the phenylene group or naphthylene group in the formula (I) has plural substituents, they may be either the same or different; or

4,857,433

ELECTROPHOTOGRAPHIC TONER FOR HIGH SPEED ELECTROPHOTOGRAPHY

Masaaki Shin, Fujisawa; Akio Fujiwara, and Hiroshi Taniwaki, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 891,177, Jul. 31, 1986, Pat. No. 4,727,010. This application Oct. 8, 1987, Ser. No. 105,577

The portion of the term of this patent subsequent to Feb. 23, 2005, has been disclaimed.

Int. Cl.[4] G03G *13/08*

U.S. Cl. 430—120 9 Claims

1. In a process of developing latent electrostatic images in a

high speed electrophotographic copying machine, the improvement comprising:

contacting the latent electrostatic images with a toner material comprising a coloringly effective amount of a colorant in combination with a resin blend composed of: (A) 40–90 wt. % of a vinyl copolymer (I) forced of 70–97 wt. % of an aromatic vinyl monomer, 3–30 wt. % of an alkyl fumerate which is a C_{1-8} monoalkyl or dialkyl ester and 0–5 wt. % of an acid monomer and having a number average molecular weight of 2,000–15,000; and (B) 10–60 wt. % of a vinyl polymer (II) having a number average molecular eight of 20,000–500,000.

4,857,434

RADIATION CURABLE LIQUID (METH) ACRYLATED POLYMERIC HYDROCARBON MALEATE PREPOLYMERS AND FORMULATIONS CONTAINING SAME

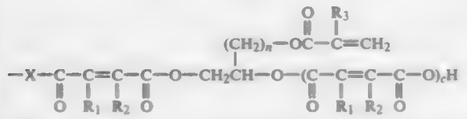
Lori J. Klinger, Columbia, Md., assignor to W. R. Grace & Co., Lexington, Mass.

Continuation-in-part of Ser. No. 910,580, Sep. 23, 1986, abandoned. This application Sep. 2, 1987, Ser. No. 91,169

Int. Cl.[4] C08F *222/06, 222/20, 236/06, 236/08*

U.S. Cl. 430—286 **16 Claims**

1. A liquid thermal or radiation curable composition comprising a (meth)acrylate terminated, olefinically unsaturated maleate prepolymer having pendant maleate groups, said prepolymer having the formula P(Y)a wherein P is a homopolymer or copolymer of butadiene, isoprene, or chloroprene, a copolymer of butadiene, isoprene, or chloroprene with styrene, isobutylene, propylene, ethylene, acrylonitrile, acrylic acid, or neohexene, or corresponding partially hydrogenated polymers, a is one or more, and Y is a pendant or terminal group attached to P having the structure



wherein R_1 and R_2 are each individually hydrogen, halogen, carboxy, linear or cyclic alkyl containing 1–20 carbon atoms, aryl, alkaryl and aralkyl containing 6–20 cargon atoms, R_3 is hydrogen or methyl, X is —O—, —S—, or —NR—, R is hydrogen or alkyl of 1 to 6 carbon atoms, n is an integer from 1 to 6, and c has an average value of 0.1 to 1.0.

4,857,435

POSITIVE PHOTORESIST THERMALLY STABLE COMPOSITIONS AND ELEMENTS HAVING DEEP UV RESPONSE WITH MALEIMIDE COPOLYMER

Frederick R. Hopf, Parsippany; Michael J. McFarland, Morristown, and Christopher E. Ouach, Mine Hill, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

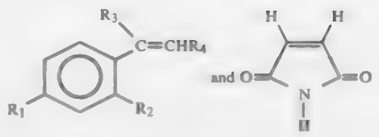
Continuation of Ser. No. 814,591, Jan. 2, 1986, abandoned, which is a continuation of Ser. No. 547,815, Nov. 1, 1983, abandoned. This application Mar. 17, 1987, Ser. No. 24,875

Int. Cl.[4] G03C *1/495, 1/60*

U.S. Cl. 430—192 **13 Claims**

1. A positive photoresist composition comprising a mixture of

(a) about 65–99 weight percent of a copolymer prepared from



wherein the maleimide moiety is present in an amount of at least 10 mol percent based on the mol amount of co-monomers in the copolymer so as to render the copolymer soluble in an aqueous alkaline developer solution, wherein R_1 and R_4 are independently H or (C_1–C_5) alkyl; and

(b) about 1–35 weight percent of a photoactive compound, which, upon exposure to actinic radiation, is transformed into compounds containing acidic groups that are more soluble in aqueous alkaline developers than the photoactive compound before exposure.

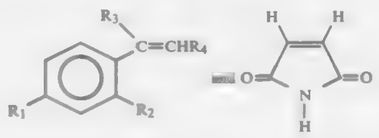
9. An alkali-insoluble positive photoresist composition comprising a mixture of

(a) about 1–35 weight percent of a photoactive transformed into compounds containing acidic groups that are more soluble in aqueous alkaline developers than the photoactive compound before exposure; and

(b) about 65–99 weight percent of a polymer comprising a copolymer formed from polymerization of a film-forming monomer selected from styrene, a-methylstyrene, 4-(C_1–C_5 alkyl) styrene, 2-(C_1–C_5 alkyl) styrene, 2,4-di(C_1–C_5 alkyl) styrene or a monomer having the formula $H_2C{=}CR_aM$ and at least about 10 mol percent maleimide based on the mol about of co-monomers in the copolymer to render the copolymer soluble in an aqueous alkaline developer solution, wherein M is CN or CO_2R_b, wherein R_b is methyl or allyl and wherein R_a is H or methyl.

12. A photosensitive element comprising a substrate bearing a layer of a photoresist composition comprising a mixture of

(a) about 65–99 percent of a copolymer prepared from



wherein the maleimide moiety is present in an amount of at least 10 mol percent based on the mol amount of comonomers in the copolymer so as to render the copolymer soluble in an aqueous alkaline developer solution wherein R_1 to R_4 are independently H or (C_1–C_5) alkyl, and

(b) about 1–35 weight percent of photoactive compound, which, upon exposure to actinic radiation, is transformed into compounds containing acidic groups that are more soluble in aqueous alkaline developers than the photoactive compound before exposure.

4,857,436

OFFSET PLATES WITH TWO CHROMIUM LAYERS

Jean-Marie Nouel, 67 rue Miromesnil 75008, Paris, France

Continuation of Ser. No. 138,289, Dec. 28, 1987, abandoned, which is a continuation of Ser. No. 481,766, Apr. 4, 1983, abandoned, which is a continuation of Ser. No. 168,003, Jul. 14, 1980, abandoned. This application Sep. 15, 1988, Ser. No. 245,558

Int. Cl.[4] B41N *1/08*

U.S. Cl. 430—276 **2 Claims**

1. An offset printing plate, comprising:

A base material of steel:

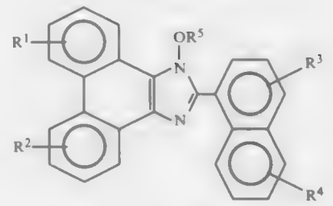
A first coating of smooth, hard and shiny hydrophilic chromium applied directly to the steel base;

A second coating of dull matte hydrophilic chromium applied directly to the first chromium coating, the combined thickness of the first and second coatings being no more than one micron, said first and second coatings being substantially ink rejecting; and

A layer of photosensitive material applied directly to the second coating of chromium, said photosensitive material being hydrophobic and ink receptive after insolation.

-continued

(II)



where R^1, R^2, R^3 and R^4 are identical or different and are each hydrogen, alkyl, alkoxy, halogen or amino, R^5 is hydrogen, alkyl, aralkyl, alkylsulfonyl, arylsulfonyl, dialkoxyphosphoryl, dialkylphosphoryl, diarylphosphoryl or a carbonyl radical

and R^6 is alkyl, alkoxy, phenyl or dialkylamino.

4,857,437

PROCESS FOR THE FORMATION OF AN IMAGE

Christopher P. Banks; Christopher G. Demmer, both of Saffron Walden, and Edward Irving, Burwell, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 7, 1987, Ser. No. 129,579

Claims priority, application United Kingdom, Dec. 17, 1986, 8630129; Apr. 22, 1987, 8709520

Int. Cl.[4] G03C *5/00, 1/727, 1/495, 1/68*

U.S. Cl. 430—327 **19 Claims**

1. A process for the formation of an image which comprises

(i) applying to a substrate a layer of a liquid composition comprising

(A) a group or combination of groups which is cationically polymerizable or polymerizable by means of free radicals,

(B) a radiation-activated polymerization initiator for (A) and

(C) a radiation-solubilizable group, the groups (A) and (C) being in the same substance or in different substances,

(ii) subjecting the composition to radiation having a wavelength at which (B) is activated but at which (C) is not substantially activated, or subjecting the composition to said radiation followed by heating, thereby polymerizing (A) such that the layer of liquid composition is solidified,

(iii) subjecting the solidified layer in a predetermined pattern to radiation having a wavelength which is different from that of the radiation used in stage (ii) at which the group (C) is activated, such that the solidified layer is rendered more soluble in a developer in exposed areas than in unexposed areas, and

(iv) removing the exposed areas by treatment with a developer.

4,857,438

PHOTOCHROMIC SYSTEM AND LAYERS PRODUCED THEREWITH

Thomas Loerzer, Frankenthal, and Reinhold J. Leyrer, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 20, 1987, Ser. No. 28,587

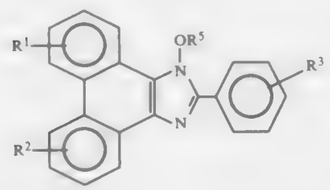
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1986, 3609320

Int. Cl.[4] G03C *1/733*

U.S. Cl. 430—332 **3 Claims**

1. A photochromic composition containing an oxidizable leuco dye and a photochemically activated initiator which converts the leuco dye to the dye, wherein the initiator is a compound of the formula (I) or (II)

(I)



4,857,439

PHOTOTHERMOGRAPHIC ELEMENT AND PROCESS

Edward L. Dedio, Pittsford, and John W. Reeves, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 4, 1988, Ser. No. 177,558

Int. Cl.[4] G03C *1/06*

U.S. Cl. 430—349 **9 Claims**

1. A method of making a photothermographic element comprising a support bearing at least one layer comprising

(a) photosensitive silver halide,

(b) an oxidation-reduction image forming combination comprising

(i) a silver salt of a carboxylic acid as an oxidizing agent and

(ii) an organic reducing agent for the silver salt of the carboxylic acid, and

(c) a polymeric binder,

comprising the combination of

(I) adding an alkyl carboxylic acid containing 8 to 16 carbon atoms at any stage of preparation of the layer, and

(II) after preparation of said layer and before exposure to light, uniformly heating the layer to a temperature within the range of 75° C. to 105° C. for a time of 60 to 210 seconds.

4,857,440

PHOTOGRAPHIC MATERIAL AND PROCESS (B)

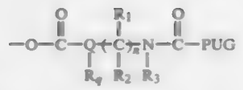
William J. Begley; Michael J. Carmody, both of Webster, and John M. Buchanan, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 30, 1988, Ser. No. 214,090

Int. Cl.[4] G03C *5/54, 7/26, 7/34, 7/36*

U.S. Cl. 430—382 **10 Claims**

1. A photographic element comprising a support, at least one photographic silver halide emulsion layer and at least one compound (A) represented by the formula CAR-LINK-PUG where CAR is a carrier moiety capable of releasing LINK-PUG during photographic processing upon reaction with oxidized developing agent; LINK-PUG is in turn capable of releasing a photographically useful group (PUG) by an intramolecular nucleophilic displacement reaction; and LINK-PUG is represented by the formula:



wherein

Q is N or CR_q;

R_q is alkyl, cycloalkyl, heterocyclyl or aryl, or R_q together with R_1, R_2 or R_3 can represent the atoms necessary to complete a non-aromatic ring;

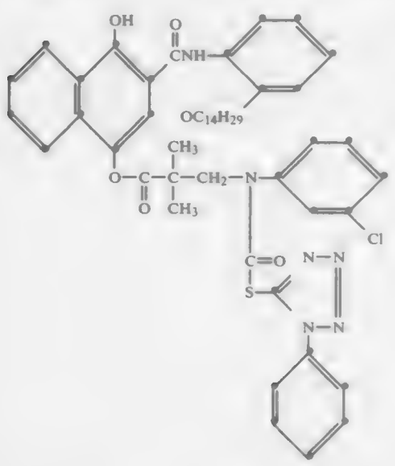
R_p, R_1 and R_2 are independently alkyl, cycloalkyl, heterocyclyl, aryl or hydrogen;

R_3 is alkyl, cycloalkyl, heterocyclyl or aryl;

n is 0 or 1; and the LINK moiety enables increased resistance to hydrolysis.

8. A process of forming a photographic image which comprises developing an exposed photographic silver halide emulsion layer with a color developing agent in the presence of a compound (A) as defined in claim 1.

10. A process as in claim 8 wherein the compound (A) is:



4,857,441

METHOD FOR PROCESSING SILVER HALIDE-CONTAINING PHOTOSENSITIVE MATERIAL FOR COLOR PHOTOGRAPHY

Akira Abe; Junya Nakajima; Haruo Takase; Kazushige Uenaka, and Ryuzi Otomo, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 9, 1987, Ser. No. 12,461

Claims priority, application Japan, Feb. 7, 1986, 61-25173

Int. Cl.[4] G03C *5/24, 5/38, 5/44*

U.S. Cl. 430—393 **14 Claims**

1. A method of processing a silver halide-containing photosensitive material for color photography, which has the color developing step in which the silver halide in said photo-sensitive material is reduced to silver, and the silver-removing step in which the silver formed in said color developing step is oxidized by a bleaching agent and further changed into a soluble silver complex by the action of a fixing agent so as to be removed through dissolution, wherein the improvement comprises:

providing a bleaching bath and a bleach-fixing bath which is disposed at the downstream side of said bleaching bath;

carrying out bleaching in both said bleaching and bleach-fixing baths;

carrying out fixing in said bleach-fixing bath; and

bringing a stream of bleach-fixing solution in contact with the emulsion coating surface of said photosensitive material in said bleach-fixing bath at a flow velocity which is greater than the flow velocity of bleach-fixing solution which is circulated in said bleach-fixing bath.

4,857,442

METHOD FOR THE PROCESSING OF SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Yoshihiro Fujita, and Toshihiro Nishikawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 17, 1986, Ser. No. 920,137

Claims priority, application Japan, Oct. 19, 1985, 60-234090

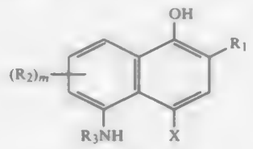
Int. Cl.[4] G03C *1/08, 7/00, 7/40, 7/32*

U.S. Cl. 430—393 **22 Claims**

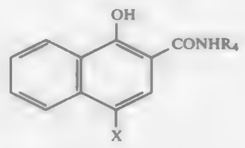
1. A method for the processing of silver halide color photographic materials comprising:

fixing or bleach-fixing a silver halide color photographic material; and

washing said photographic material with a replenisher in two or more baths, wherein said silver halide color photographic material contains at least one cyan dye-forming coupler of the following formula (I) or (II) and the amount of the washing replenisher in a particular one of said baths is from 3 to 50 times the amount of the processing solution carried over from a previous bath, based on the unit area of the photographic material being processed:



(I)



(II)

wherein,

R_1 represents $-CONR_5R_6$, $-NHCOR_5$, $-NHCOOR_7$, $-NHSO_2R_7$, $-NHCONR_5R_6$ or $-NHSO_2NR_5R_6$;

R_2 represents a substituent on the naphthol ring;

m is an integer of 0 to 3;

R_3 represents a mono-valent organic group;

R_4 represents a subtituted or unsubstituted aryl group;

X represents a hydrogen atom or a group capable of being released by the coupling reaction with an oxidized aromatic primary amine developing agent;

R_5 and R_6 each represents a hydrogen atom, an aliphatic group, an aromatic group or a heterocyclic group;

R_7 represents an aliphatic group, an aromatic group or a heterocyclic group;

when m is a plural number in the formula, R_2's may be the same or different or may be bonded to each other to form a ring; and

R_2 and R_3, or R_3 and X may be bonded to each other to form a ring.

4,857,443

PHOTOGRAPHIC ELEMENT WITH BENZOGUANAMINE-FORMALDEHYDE POLYMER PARTICLES

Toshiaki Aono; Takeshi Shibata, and Kazuma Takeno, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

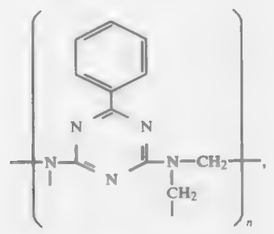
Filed May 6, 1988, Ser. No. 190,855

Claims priority, application Japan, May 6, 1987, 62-110064; May 6, 1987, 62-110065

Int. Cl.[4] C03C *5/54, 1/32*

U.S. Cl. 430—496 **5 Claims**

1. A photographic element comprising particles of a benzoguanamine-formaldehyde condensation polymer having the formula:



wherein n is a positive integer.

4,857,444

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Takeshi Hirose; Tadashi Ogawa, and Nobuo Furutachi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

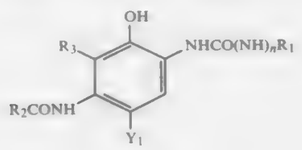
Filed Dec. 29, 1986, Ser. No. 947,443

Claims priority, application Japan, Dec. 27, 1985, 60-295895

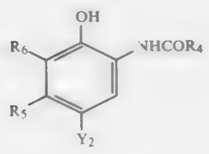
Int. Cl.[4] G03C *7/32*

U.S. Cl. 430—505 **32 Claims**

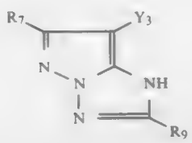
1. A silver halide color photographic material comprising a support having provided thereon a red-sensitive layer containing at least one of couplers represented by formulae (I) and/or (II), a green-sensitive layer containing at least one of couplers represented by the following formula (III-2) or formula (III-3), and a blue-sensitive layer containing at least one of couplers represented by the following formula (IV):



(I)

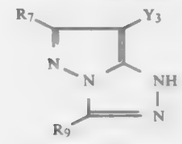


(II)

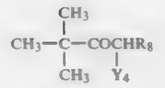


(III-2)

-continued



(III-3)



(IV)

wherein:

R_1, R_2, and R_4 each represents a substituted or unsubstituted aliphatic, aromatic or heterocyclic group;

R_3, R_5, and R_6 each represents a hydrogen atom, a halogen atom, an aliphatic group, an aromatic group, or an acylamino group, or, when taken together, R_3 and R_2 represent non-metallic atoms necessary for forming a nitrogen-containing 5- or 6-membered ring;

R_7 represents an alkoxy group, an aryloxy group, or a heterocyclic oxy group;

R_8 represents a substituted or unsubstituted N-phenylcarbamoyl group;

wherein R_9 represents a hydrogen atom, a halogen atom, an alkyl group, an aryl group, a heterocyclic group, a cyano group, an alkoxy group, an aryloxy group, a heterocyclic oxy group, an acyloxy group, a carbamoyloxy group, a silyloxy group, a sulfonyloxy group, an acylamino group, an anilino group, a ureido group, an imido group, a sulfamoylamino group, a carbamoylamino group, an alkylthio group, an arylthio group, a heterocyclic thio group, an alkoxycarbonylamino group, an aryloxycarbonylamino group, a sulfonamido group, a carbamoyl group, an acyl group, a sulfamoyl group, a sulfonyl group, a sulfinyl group, an alkoxycarbonyl group, or an aryloxycarbonyl group; or R_9 represents a divalent group forming a bis-compound;

Za and Zb each represents methine, substituted methine, or =N—;

Y_1, Y_2, Y_3 and Y_4 each represents a hydrogen atom or a group capable of being split off upon coupling reaction with an oxidation product of a developing agent; and

n represents 0 or 1.

4,857,445

DIRECT POSITIVE PHOTO-SENSITIVE MATERIALS

Tetsuo Yoshida, and Tatsuo Heki, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

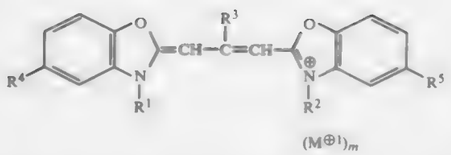
Filed Feb. 19, 1987, Ser. No. 16,551

Claims priority, application Japan, Feb. 20, 1986, 61-36420; Apr. 17, 1986, 61-88628

Int. Cl.[4] G03C *1/19, 1/485*

U.S. Cl. 430—509 **17 Claims**

1. A direct positive photo-sensitive material comprising, on a support, at least one internal latent image-type silver halide emulsion layer containing core/shell-type silver halide grains consisting of substantially cubic or tetradecahedral grains of mainly the face (100) and being spectrally-sensitized with at least one sensitizing dye of the following general formula (I):



$(M^{\oplus 1})_m$

wherein R^1 and R^2 each represent a lower alkyl group substituted with a sulfonato, carboxyl or hydroxyl group, at least one of R^1 and R^2 being a sulfonatoalkyl group, R^3 represents a hydrogen atom or a lower alkyl or substituted or unsubstituted phenethyl group, R^4 represents a chlorine atom, a methoxy or ethoxy group or a hydrogen atom, R^5 represents a chlorine atom or a phenyl, alkoxy or alkyl group, M^{+1} represents a cationic residue, m represents 0 or 1 with the proviso that when an inner salt is formed, m is 0.

15. The material of claim 12, wherein the smaller grains are contained in a layer adjacent to said support and the larger grains are contained in a layer remote from said support.

4,857,446

FILTER DYE FOR PHOTOGRAPHIC ELEMENT

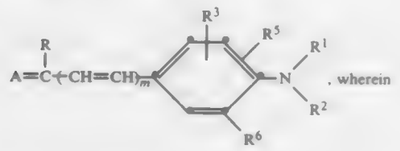
Donald R. Diehl, and Ronda E. Factor, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 104,468, Oct. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 945,634, Dec. 23, 1986, abandoned. This application Dec. 23, 1987, Ser. No. 137,490

Int. Cl.[4] G03C *1/84*

U.S. Cl. 430—510 **10 Claims**

1. A photographic element comprising a support and a radiation-sensitive silver halide emulsion layer and a filter layer comprising a hydrophilic binder and an amount effective as a photographic filter dye of a solid particle dispersion of a compound having the formula:



, wherein

A represents a substituted or unsubstituted acidic 2-pyrazolin-5-one nucleus free of any carboxyl substituent bonded thereto, said nucleus having a carboxyphenol or sulfonamidophenyl substituent,

R represents hydrogen, substituted or unsubstituted alkyl of 1 to 4 carbon atoms, or benzyl,

R^1 and R^2 each independently represents substituted or unsubstituted alkyl or aryl, or taken together with R^5, R^6, N, and the carbon atoms to which they are attached, represent the atoms needed to complete a julolydyl ring,

R^3 represents H, or substituted or unsubstituted alkyl or aryl,

R^5 and R^6 each independently represents H, or R^5 taken together with R^1, or R^6 taken together with R^2, represent the atoms necessary to complete a carbocyclic ring, and

m is 0 or 1,

the particles of said dispersion having a mean diameter of from about 0.01 to 10 μm.

4,857,447

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING A COUPLER HAVING A DYE MOIETY

Koji Tamoto, and Mitsunori Ono, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 28, 1986, Ser. No. 867,718

Claims priority, application Japan, May 28, 1985, 60-114732

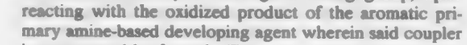
Int. Cl.[4] G03C *1/08, 7/26, 7/32*

U.S. Cl. 430—544 **16 Claims**

1. A silver halide color photographic light-sensitive material comprising:

a coupler having a dye moiety, the maximum absorption wavelength of which is shifted to the shorter wavelength by a bond cleaving, directly or through a timing group, due to a coupling reaction with an oxidized product of an aromatic primary amine developing agent, and, as a result of the coupling reaction, forming a compound having a dye moiety which has the same maximum absorption wavelength as before the shifting to the shorter wavelength side; and

a compound releasing a development inhibitor or a precursor thereof, directly or through a timing group, upon reacting with the oxidized product of the aromatic primary amine-based developing agent wherein said coupler is represented by formula (I)



(I)

wherein Cp is a coupler radical and the bond between Cp and $(TIME)_n$—X—DYE is capable to cleave upon the coupling reaction with an oxidized product of an aromatic primary amine developing agent, TIME is a timing group, n is 0, 1 or 2, Dye is a dye moiety, X is an auxochrome radical of the dye and TIME is selected from the group consisting of groups represented by the following formulae (T-4), (T-5), (T-6), (T-7), (T-8), (T-9) or (T-10):

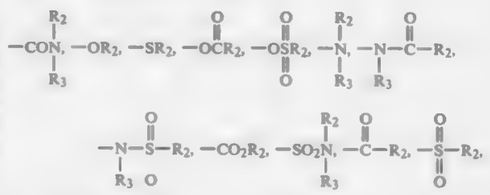


(T-4)

wherein Z_3 represents —S— or

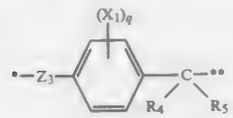


wherein R_6 expresses an aliphatic-, alicyclic- or aromatic-hydrocarbon group, acyl, sulfonyl or heterocyclic group; R_4 and R_5 each represents a hydrogen atom, an aliphatic-, alicyclic-, or aromatic hydrocarbon group, or a heterocyclic group; q represents an integer of from 0 to the total number of hydrogen atoms in the ring which are able to be substituted; X_1 represents an aliphatic-, aromatic, or alicyclic-hydrocarbon group or a heterocyclic group,



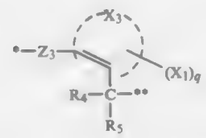
a cyano group, halogen atoms or a nitro group (wherein R_2 and

R_3 each represents the same groups as described for R_4), or when q is 2 or more, X_1 links to each other to form a ring;



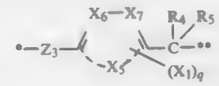
(T-5)

wherein Z_3, X_1, R_4, R_5, and q denote the same meanings as those defined for formula (T-4);



(T-6)

wherein X_3 is an atomic group which comprises at least one atom selected from the class consisting of carbon, nitrogen, oxygen and sulfur and which is necessary to form a 5- to 7-membered heterocyclic group, or X_3 is a condensed ring of said heterocyclic group with a benzene ring or a 5- to 7-membered heterocyclic group; and R_4, R_5, Z_3, X_1 and q denote the same meanings as those defined for formula (T-4);

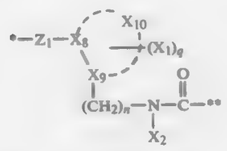


(T-7)

wherein X_5 is an atomic group which comprises at least one atom selected from the class consisting of carbon, nitrogen, oxygen, and sulfur and which is necessary to form a 5- or 7-membered heterocyclic group, or X_5 is a condensed ring of said heterocyclic group with a benzene ring or a 5- to 7-membered heterocyclic group; X_6 and X_7 is

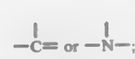


—N= (wherein R_7 expresses a hydrogen atom, an aliphatic-, alicyclic- or aromatic-hydrocarbon group); and R_4, R_5, Z_3, X_1 and q denote the same meanings as those defined for formula (T-4);

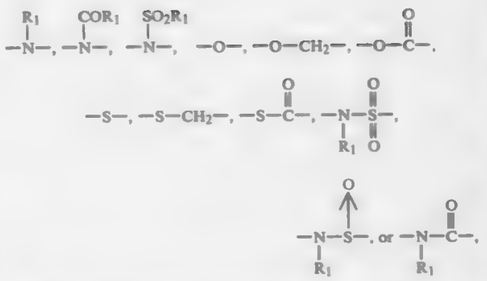


(T-8)

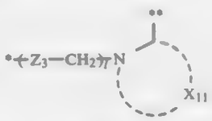
wherein X_{10} is an atomic group which comprises at least one atom selected from the class consisting of carbon, nitrogen, oxygen, and sulfur and which is necessary to form a 5- to 7-membered heterocyclic group, or X_{10} is a condensed ring of said heterocyclic group with a benzene ring or a 5- to 7-membered heterocyclic group; X_8 and X_9 are



Z_1 represents

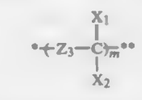


X_1, and q denote the same meanings as those defined for formula (T-4), n represents 0, 1 or 2, X_2 represents the same groups as described for R_4;



(T-9)

wherein X_{11} denotes the same meaning as X_{10} defined for formula (T-8), Z_3 denotes the same meaning as that defind for formula (T-4) and l expresses 0 or 1;



(T-10)

wherein X_1 denotes the same meanings as defined for formula (T-4), X_2 denotes the same meaning as R_4 in formula (T-4), Z_3 denotes the same meaning as that for formula (T-4) and m is an integer of from 1 to 4; in said formulae (T-4) to (T-10), aliphatic-, alicyclic-, and aromatic-hydrocarbon group, heterocyclic group and condensed ring are substituted and unsubstituted.

4,857,448

PHOTOGRAPHIC SILVER HALIDE ELEMENT AND PROCESS

Michael J. Simons, Eastcote, United Kingdom, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 11, 1988, Ser. No. 167,271

Claims priority, application United Kingdom, Apr. 7, 1987, 8708275; May 19, 1987, 8711829

Int. Cl.[4] G03C *7/26, 7/32, 5/24, 1/46*

U.S. Cl. 430—544 **10 Claims**

1. A photographic silver halide color element comprising a support, an emulsion layer unit containing one or more photographic silver halide emulsions sensitized to the same spectral region and, adjacent each side of said emulsion layer unit,

a layer substantially free of active silver halide and which layer contains an image-modifying compound capable of imagewise releasing an image-modifying compound on silver halide development

wherein at least one of said layers contains a dye image-forming coupler.

4,857,449

SILVER HALIDE COLOR PHOTOGRAPHIC PHOTOSENSITIVE MATERIALS

Tadashi Ogawa, and Osamu Takahashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 23, 1988, Ser. No. 159,074

Claims priority, application Japan, Feb. 23, 1987, 62-39825; Jun. 26, 1987, 62-158948

Int. Cl.[4] G03C *7/26, 7/32*

U.S. Cl. 430—546 25 Claims

1. A silver halide color photographic photosensitive material comprising on a support, at least one silver halide photographic emulsion layer comprising an emulsified dispersion of fine lipophilic particles comprising at least one type of oil-soluble coupler which is nondiffusible and which forms a dye by coupling with the oxidized form of a primary aromatic amine color developing agent and at least one type of high boiling point organic solvent, said emulsified dispersion of fine lipophilic particles comprises a dispersion obtained by emulsifying and dispersing a mixed solution which comprises at least one type of coupler, and at least one type of high boiling point organic solvent as mentioned above, and at least one type of homopolymer or copolymer which is water-insoluble and soluble in organic solvent and which comprises at least one type of repeating unit which does not have acid groups on the main chain or on a side chain, and said silver halide emulsion comprises a monodispersed silver chloride, silver chlorobromide or silver bromide emulsion, containing essentially no silver iodide and of which the (100) plane has, in the main, been enclosed.

4,857,450

SILVER HALIDE PHOTOGRAPHIC MATERIALS

Ronald W. Burrows, Harlow; Keith A. Penfound, Walden, and Bernard A. Lea, London, all of England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

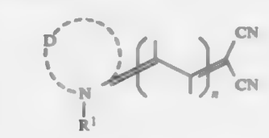
Filed Apr. 27, 1987, Ser. No. 43,172

Claims priority, application United Kingdom, Apr. 28, 1986, 8610382

Int. Cl.[4] G03C *1/02, 1/06*

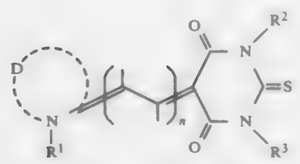
U.S. Cl. 430—603 20 Claims

1. A photographic silver halide emulsion containing one or more Group VIII metal compound characterised in that the emulsion contains a sensitising amount in the range of 10^{-5} to 10^{-2} mole per mole of silver halide of a compound of the general formula:



(I)

or



(II)

in which:

n is 0, 1 or 2;

R^1 represents an alkyl group of 1 to 4 carbon atoms, a carboxyalkyl group of 1 to 4 carbon atoms or a sulphoalkyl group of 1 to 4 carbon atoms;

R^2 and R^3 independently represent an alkyl group of 1 to 12 carbon atoms, an alkenyl group of 2 to 12 carbon atoms, an aryl group of up to 15 carbon atoms or an aralkyl group of up to 15 carbon atoms;

the free bonds on the chain may be satisfied by hydrogen or any chain substituent known in the cyanine dye art or two or more chain substituents together with the carbon atoms to which they are attached may form a 5- or 6-membered carbocyclic ring;

D represents the non-metal atoms necessary to complete a heterocyclic nucleus containing 5 or 6 atoms in the heterocyclic ring, the nucleus optionally possessing substituents which may optionally be fused to the heterocyclic ring.

4,857,451

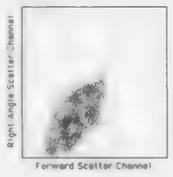
METHOD OF COMPENSATING AND CALIBRATING A FLOW CYTOMETER, AND MICROBEAD STANDARDS KIT THEREFOR

Abraham Schwartz, Durham, N.C., assignor to Flow Cytometry Standards Corporation, Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 805,654, Dec. 11, 1985, Pat. No. 4,774,189, which is a continuation-in-part of Ser. No. 685,464, Dec. 24, 1984, Pat. No. 4,767,206. This application Dec. 4, 1987, Ser. No. 128,786

Int. Cl.[4] G01N *53/00, 31/00*

U.S. Cl. 435—7 22 Claims



1. A microbead standards kit for alignment, compensation, and calibration of a flow cytometer for subsequent measurement of a selected fluorescently labeled sample, said kit comprising:

(a) a population of microbeads characterized by a same fluoresence spectra and fluoresence intensity as a selected fluorescently unlabeled sample prior to the selected fluorescently uniabeled sample being fluorescently labeled to yield a selected fluorescently labeled sample, said microbead population being selected from the group consisting of fluorescently unlabeled microbeads and autofluorescent microbeads;

(b) populations of microbeads which are labeled with at least two fluorescent dyes such that said labeled microbead populations comprise microbeads which are characterized by fluorescence intensity levels registerable in multiple fluorescence channels of a flow cytometer, each same labeled population comprising a series of sub-populations of said labeled microbeads characterized by differing selected levels of fluorescence intensity to substantially encompass a range of fluorescence intensity of said selected fluorescently labeled sample to be measured by a flow cytometer, when said selected fluorescently labeled sample is fluorescently labeled with a same fluorescent dye;

(c) said microbead populations (a) and (b) being constituted by highly uniform same sized microbeads having a coefficient of variation of diameter of about 2% or less, with said size of said microbeads being substantially equivalent to a size of said selected fluorescently labeled sample to be measured by a flow cytometer; and

(d) container means enclosing said microbead populations (a) and (b).

4,857,452

ASSAY FOR CARCINOMA OF BREAST, COLON AND OVARY

May-Kin Ho, Carlisle, Mass., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 4, 1986, Ser. No. 937,771

Int. Cl.[4] G01N *33/53, 33/577*

U.S. Cl. 435—7 3 Claims

1. A method of assisting in th diagnosis of or monitoring breast, colorectal or ovarian cancer which comprises assaying the blood, plasma, serum, urine or feces of a person suspected of having or known to have breast, colorectal or ovarian cancer by reacting monoclonal antibody 47D10 or an immunoreactive fragment thereof with the blood, plasma, serum, urine or feces and determining whether antibody binding has occurred.

4,857,453

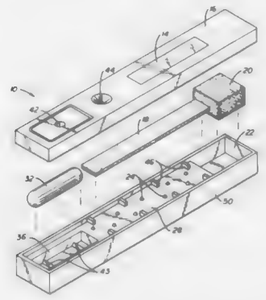
IMMUNOASSAY DEVICE

Edwin F. Ullman, Atherton; Pyare Khanna, Fremont, and Rohan Peries, Mountain View, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Apr. 7, 1987, Ser. No. 35,562

Int. Cl.[4] G01N *33/558*

U.S. Cl. 435—7 36 Claims



1. A device for conducting an assay method, said device comprising:

(a) a housing,

(b) means enclosed in said housing for capturing a member of a specific binding pair in a zone and for allowing the liquid to be transported by capillary action away from said zone,

(c) one or more liquid reagents confined for subsequent release in at least one breakable container enclosed in said housing for conducting an assay method for the determination of an analyte in a sample, and

(d) means in said housing for introducing the sample into the device.

4,857,454

SPECTROPHOTOMETRIC METHOD FOR KINETIC ABSORBANCE MEASUREMENTS IN TWO-PHASE ENZYME IMMUNOASSAY AND APPARATUS THEREFOR

Lawrence F. Freundlich, New Hyde Park, N.Y.; Vadiraja V. Murthy, Teaneck, N.J., and Arthur Karmen, Manhasset, N.Y., assignors to a Division of Yeshiva University Albert Einstein College of Medicine of Yeshiva University, Bronx, N.Y.

Filed Apr. 9, 1987, Ser. No. 36,360

Int. Cl.[4] G01N *33/53, 33/557, 33/546, 33/543*

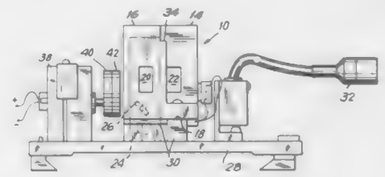
U.S. Cl. 435—7 10 Claims

1. A spectrophotometric method for kinetic absorbance measurements in a two phase enzyme immunoassay for an analyte comprising the steps of:

(A) immobilizing a labeling enzyme on the surface of a solid phase member by an antibody-antigen reaction involving the analyte;

(B) incubating the solid phase member in an enzyme substrate solution in a sample cell to produce a product; and

(C) during incubation, at least intermittently spectrophotometrically monitoring the development of optical absorbance in the solution while agitating both the solution and the solid phase member with a stirrer to diffuse the substrate and product throughout the solution, the stirrer



during the monitoring of absorbance development being maintained above the bottom of the sample cell and at least partially above the solid phase member, but below the level of the path of the light beam of the spectrophotometer and intermittently directly physically contacting the solid phase member to maintain the same in motion below the level of the path of the light beam of the spectrophotometer during the monitoring of absorbance development.

4,857,455

METHOD FOR THE DETERMINATION OF PEROXIDASE USING FLUOROGENIC SUBSTRATES

Pyare L. Khanna, San Jose; Chiu C. Chang, Santa Clara, and Edwin F. Ullman, Atherton, all of Calif., assignors to Syntex (U.S.A) Inc., Palo Alto, Calif.

Filed Nov. 26, 1982, Ser. No. 444,658

Int. Cl.[4] G01N *33/535;* C12Q *1/26, 1/28;* C12N *9/96*

U.S. Cl. 435—7 12 Claims

1. In a method for determining the catalystic activity of a perioxidase by measuring the amount of a product produced from a subtrate of said peroxidase, which product provides a fluorometric signal,

the improvement which comprises employing as fluorogenic substrate a diaryl organic compound consisting of an aryl fluorescent compound linked by means of a linking group to a carbocyclic aryl group wherein said linking group has a nitrogen or oxygen bonded to a ring carbon atom of said aryl fluorescent compound and an oxygen bonded to a ring carbon atom of said carbocylic aryl group, which diaryl organic compound is non-fluorescent at the excitation wavelength of said aryl fluorescent compound when said aryl fluorescent compound is linked to said carbocylic aryl group, said carbocylic aryl group having an oxy or amino substituent on a ring carbon atom separated by 2 or 4 ring carbon atoms from the ring carbon atom attached to said linking group, which carbocyclic aryl group undergoes perioxidase catalyzed removal as a result of cleavage of said linking group to produce said aryl fluorescent compound.

4,857,456

ASSAY OF BONE MORPHOGENETIC PROTEIN (BMP) AND ANTI-BMP ANTIBODY FOR THE DIAGNOSIS OF BONE DISORDERS

Marshall R. Urist, Pacific Palisades, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 30, 1985, Ser. No. 728,774
Int. Cl.[4] G01N *33/535, 33/68, 33/543*
U.S. Cl. 435—7 48 Claims

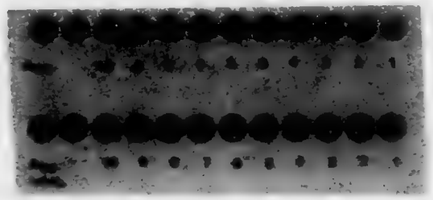
1. A method for diagnosing bone disorder comprising the step of comparing the quantity of bone morphogenetic protein (BMP) in a test body fluid sample with the quantity of BMP in a control sample.

4,857,457

SCREENING TEST FOR LARGE INTESTINAL CANCER

Abulkalam M. Shamsuddin, 2916 Old Court Rd., Baltimore, Md. 21208; Alaaeldeen M. Elsayed, 6458 Root Dr., Glen Burnie, Md. 21061, and Glenn A. Jockle, 511 S. Sharp St., Baltimore, Md. 21201

Filed Jul. 24, 1986, Ser. No. 889,022
Int. Cl.[4] C12Q *1/26, 1/54;* G01N *33/543, 33/574*
U.S. Cl. 435—7 16 Claims



1. A method for detecting the presence of precancer or cancer of the large intestine, which comprises:
(a) obtaining a sample of large intestinal mucus from the rectum of a patient;
(b) assaying said sample to detect the disaccharide marker beta-D-Gal(1->3)-D-GalNAc therein; and
(c) diagnosing precancer or cancer of the large intestine based upon the presence of the disaccharide detected in the mucus.

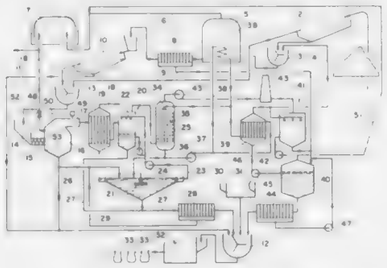
4,857,458

INSTALLATION AND PLANT FOR THE RECOVERY OF ENERGY FROM WASTE AND RESIDUES

Bernard Noblet, Bouc Bel Air; Michel Bonhomme, Montpellier, and Philippe Desplat, Eguilles, all of France, assignors to Propiorga, Puyricard, France

Filed Apr. 6, 1988, Ser. No. 178,302
Claims priority, application France, Dec. 5, 1985, 85 18019; PCT Int'l Appl., Dec. 4, 1986, PCT/FR86/00418
Int. Cl.[4] C05F *9/02, 11/06*
U.S. Cl. 435—311 3 Claims

1. An installation for facilitating the recovery and exploitation of a starting material comprising solid residues or rejects of industrial, agricultural or domestic origin, of the type in which the residues are subjected to an operation of bacterial digestion in a methanization digester for production of a digestate which includes a recoverable and storable combustible gas, while a solid phase of the digestate leaving the digester is subjected to incineration in a furnace for the purpose of producing thermal energy, and in which the conditions of incineration are improved by injecting into the furnace part of the gas coming from the methanization digester and the conditions of production of methane are improved by using the heat of the furnace to provide heat to the bacterial digestion process in the methanization digester, said installation comprising:
(a) a sieve (2) for separating, within the starting material, the coarsest particles from the finest particles and including means for conveying the coarsest particles to the furnace (16) and the finest particles to the digester (5);
(b) a first mixer (3) for mixing said fine particles of said starting material with a liquid phase constituted by liquors separated from the digestate leaving the methanization digester (5), said mixing occurring before said fine particles are conveyed to said digester (5);
(c) a gasometer (7) for storing the combustible gas produced in said digester (5);
(d) means (8) for separating said digestate leaving said digester (5) into a solid phase and a liquid phase, said liquid phase constituting said liquors, whereby said liquors are recycled to said first mixer (3) by suitable conveying means (9);
(e) a sieve (10) operatively connected with annd disposed downstream from, said digester (5) and said separating means (8) into which said solid phase of said digestate is directed, said sieve (10) useful in separating the finest particles of said solid phase of said digestate from the coarsest particles or oversize of said solid phase of said digestate, said sieve (10) operatively connected to suitable means for conveying said coarsest particles, along with the coarsest particles separated by said first sieve (3) towards the incineration furnace (16), whereby said material constitutes the principal solid fuel supply for said furnace (16), said principal solid fuel being incinerated by said furnace (16) whereby heated combustion gases and ashes are formed;



(f) means for introducing a metered quantity of combustible gas from said gasometer (7) into said furnace (16) whereby the calorific power of said principal solid fuel is augmented and the conditions of combustion are thus made more regular, said means further including at least one gas burner (53) and means for monitoring the parameters of combustion (49);
(g) a first heat recuperator (19) disposed downstream from, and operably connected with, said furnace (16) for converting the heated combustion gases formed by said furnace (16) into a high-temperature heat-bearing fluid, whereby said high-temperature heat-bearing fluid may be used for industrial purposes;
(h) a vat (21) for preparing a neutralization milk, said milk being useful in washing said heated combustion gases after said gases have passed through said first heat recuperator (19), said neutralization milk having a basic pH and including the ashes formed by said furnace (16) which are held in suspension by an aqueous solution;
(i) a second mixer (12) into which the portion of said ashes which resists being held in suspension within said neutralization milk may be conducted, said portion of said ashes being useful in forming an organo-mineral improvement for the soil, whereby said portion of said ashes which resists being held in suspension within said neutralization milk may be mixed with the fine particles separated out of the digestate by said sieve (10) of part (e) hereinabove;
(j) a neutralization chamber (20) for washing said heated

combustion gases after said heated combustion gases have passed through said first heat recuperator (19), said neutralization chamber (20) including means for contacting and mixing (22) said neutralization milk with said heated combustion gases, whereby said heated combustion gases are neutralized and humidified and a quantity of insoluble salts is precipitated out of the mixture of heated combustion gases and said neutralization milk, and including means for draining (28) said insoluble salts out of said neutralization chamber (20) and thereafter conveying said insoluble salts to said second mixer (12) for use in the formation of said organo-mineral improvement for the soil;
(k) a condenser (25) for condensing and collecting the moisture from said neutralized heated humid combustion gases after said gases have been conducted into said condenser (25) by suitable conveying means, said condenser (25) including a closed circuit of tubing into the top of which cold water may be poured and, whereupon through the contact of said neutralized heated combustion gases with said circuit of tubing within said condenser (25), hot water may be collected at the base of said condenser (25), said condenser (25) adapted to convert said neutralized heated humid combustion gases into water and neutralized humid air, said humid air being thereafter released into the atmosphere; and
(l) a second heat recuperator (38) into which the heated water formed within the circuit of tubing within said condenser (25) is conducted, said second heat recuperator (38) including a section (38') which enters said methanization digester (5), whereby said heated water within said second heat recuperator (38) provides additional calories to said material within said methanization digester (5) and thereby accelerates the digestion of said material.

4,857,459

STAIN FOR ACID-FAST BACILLI

Jayakumar Reuben, Baltimore, Md., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Apr. 6, 1987, Ser. No. 34,237
Int. Cl.[4] C12Q *1/04;* C12N *1/20;* C12R *1/32*
U.S. Cl. 435—34 4 Claims

1. A staining system for acid-fast, bacilli comprising a primary stain and a separate decolorizing counter-stain wherein
said primary stain is an aqueous solution containing for each 100 ml of solution the following constituents:
from 1.75 to 2.25 gm basic fuchsin;
from 16 to 18.5 ml ethyl alcohol;
from 0.925 to 1.025 ml isopropyl alcohol; and
from 7.2 to 7.8 gm phenol; and
said separate decolorizing counter-stain is an aqueous solution containing for each 100 ml of solution the following constituents
from 0.2 to 0.25 gm methylene blue;
from 20 to 25 ml ethyl alcohol;
from 0.0075 to 0.0125 gm potassium hydroxide;
from 9.5 to 10.5 ml glycerol
from 4 to 5 ml acetic acid; and
from 0.05 to 0.1 polyvinylpyrrolidone (0.01 V/V % solution).

4,857,460

CYCLOHEXIMIDE RESISTANT GENE

Masamichi Takagi, Fuchu; Keiji Yano, Tokyo; Ichiro Shibuya, and Minoru Morikawa, both of Kashiwa, all of Japan, assignors to Nikka Whisky Distilling Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1985, Ser. No. 808,121
Claims priority, application Japan, Aug. 27, 1985, 60-188291
Int. Cl.[4] C12N *5/00, 15/00;* C12P *19/34*
U.S. Cl. 435—91 6 Claims

1. An isolated cycloheximide resistant gene, comprising a base sequence of

CTAGAGCACA	ATTATTATTC
AACGTTATTA	CAAACAAGCA
TATTGAATTG	GAATATTTTT
GGTTGGTTTA	AAAAAAAAAT
CCAAAACATA	AAAAAAAATAA
ATTGTGTGAC	AAAAAAATGT
ACGTTTATCT	ACAGAATAAG
GAAGTTGTAA	AGAAAACCCA
TACACACACA	CACCCCCGCT
AAAATATTAT	ATAAATAAAC
CATGAGTTTT	CCAAATTTTT
CAAAAAAAAA	ATTCCCCCTT
TTTCTTTTAG	AAAAGATTCC
TTAATTTGTG	CATTACTTTC
TGATTTTGCT	AGACTGATAC
TATGGGTACG	TAATTGAATC
AATTGTTATC	TGACGTTCTC
AAAATATGCT	AACCAAAAAC
TAGTTAATAT	TCCAAAAACA
AGAAATACTT	ATTGTAAAGG
AAAAGGGTGT	CGTAAACATA
CGATTCACAA	GGTGACTCAA
TACAAATCAG	GTAGAGCTTC
CTTATTTGCT	CAAGGTAAAA
GAAGATACGA	TAGGAAACAA
TCTGGGTATG	GTGGTCAAAC
AAAGCAAGTT	TTCCATAAGA
AGGCTAAAAC	GACTAAGAAG
ATTGTGTTGA	AGTTGGAATG
TACTGTTTGT	AAAACCAAGA
AACAATTGCC	ATTGAAAAGA
TGTAAACATA	TTGAATTGGG
TGGTGAAAAA	AAACAAAAAG
GTCAAGCATT	ACAGTTCTAG
GTACATGTTG	TATATATTTT
GCATTATCCC	CAATAATACA
AGAAAGAAGA	CAAAACTAGT
TTTGTAGATT	GTAATAGTAA
TTTCTGTATG	TGTGTGTTTT
TCTTTTTTTT	GCAGATTACA
CACGTCAAAA	AAATGATTAA
ACACACACGC	AACACTTTTT
TTTCTTTCCT	TTGAACAAGA
AATCAACAAC	AAACACCTTA
AAAGGAGGAA	AAAAAAAATT
CGCTTATTTC	CTTTCACTCT
CTATTACATA	TCACCACTAA
TATTTAACAT	TTCAATCACC
ATCCCAACTA	ACATTCATTT
CCTTATATAC	ACCTTTTCTT
TATCTTTATT	CTAGCATCTA
CACCCATAAA	TAACTGACTT
CATTCACTAC	AACCATTCCT
CATATCATTT	CATTTCTTTT
TCAACAACTT	TTTTTTTTTC
AAATCAAAGT	TTTACTGTCC
ATAGATAATG	AACTTTGATC

4,857,461

CONTINUOUS PROCESS FOR THE ENZYMATIC PREFARATION OF ISOMALTULOSE

Peter Egerer, Kirschseeon; Wulf Crueger, Erkrath, and Günter Schmidt-Kastner, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 23, 1986, Ser. No. 855,222
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515284; Aug. 10, 1985, 3528752
Int. Cl.[4] C12P *19/24*
U.S. Cl. 435—94 13 Claims

1. A continuous process for the enzymatic preparation of isomaltulose which can be operated under sterile conditions comprising
(a) preparing sucrose-mutase by fermentation of microorganisms which form sucrose-mutase, treating the cells

with salt solution and surface-active reagents before the end of the logarithmic growth phase,
(b) preparing a cell-free crude enzyme extract by cell digestion and cross-flow microfiltration,
(c) simultaneously purifying and immobliizing the sucrosemutase from this crude extract by selective bonding to a sulfonic acid cation exchanger matrix and
(d) bringing the matrix thereby obtained into contact with sucrose.

4,857,462
PROCESS FOR OBTAINING D(+)-NAPROXEN

Josef Maier; Manfred Gloger, both of Weilheim; Detlef V. Hoerschelmann, Wielenbach; Jan Strejcek, Iffeldorf, and Sebastian Heimerl, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

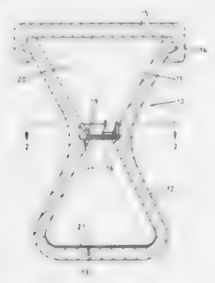
Continuation of Ser. No. 680,984, Dec. 12, 1984, abandoned. This application Oct. 27, 1986, Ser. No. 924,140
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1983, 3345660
Int. Cl.[4] C12N *9/18;* C07P *41/00*
U.S. Cl. 435—197 16 Claims

1. A process for obtaining D-2-(6-methoxy-2-napthyl)-propionic acid from a mixture of D- and L-2-(6-methoxy-2-naphthyl)-propionic acid lower alkyl esters comprising contacting said mixture with a sample of microorganisms which contain an enzyme which asymmetrically hydrolyzes said L-ester said microorganisms selected from the group consisting of *Aspergillus oryzae* DSM 2808 (ATCC 1192), *Aspergillus flavus* DSM 2807, *Aspergillus sojae* DSM 2809, and *Bacillus subtilis* DSM 2806 under conditions favoring asymmetric hydrolysis of said L-ester to a corresponding L-acid, separating the L-2-(6-methoxy-2-naphthyl)-propionic-acid from the D-(6-methoxy-2-naphthyl)-propionic acid lower alkyl ester and saponifying said D-ester free of L- ester with an esterase from pig liver or from *Pleurotus ostreatus* by contacting said D-ester with said enzyme under conditions favoring saponification to said D-acid.

4,857,463
METHOD OF PREPARING INTRACELLULAR PARASITES FOR STORAGE

Gordon R. B. Skinner, Dorridge, and Alexander Buchan, Birmingham, both of England, assignors to Medical Research International Ltd., Dorridge, England

Filed Apr. 16, 1987, Ser. No. 39,015
Claims priority, application United Kingdom, Apr. 19, 1986, [illegible]
Int. Cl.[4] C12N *7/00*
U.S. Cl. 435—235 4 Claims



1. A method of preparing intracellular parasites for storage comprising the steps of:
(a) preparing a layer of living cells susceptible to infection by the parasite which cells are attached to surface in a container which is substantially filled with a buffered antibiotic medium,
(b) adding material containing the intracellular parasites to be stored to said medium and allowing the parasites to infect the layer of living cells, and
(c) incubating the infected cells at a temperature of between 32° C. and 37° C. for between 8 and 12 hours.

4,857,464
MIST CULTIVATION OF CELLS

Pamela Weathers, Stowe, Mass., and Kenneth Giles, Shepton Malet, England, assignors to Bio-Rational Technologies, Inc., Worcester, Mass.

Filed Feb. 21, 1986, Ser. No. 831,579
Int. Cl.[4] C12N *5/00*
U.S. Cl. 435—240.23 5 Claims



1. A method of cultivating cells, said cells originating from plants, animals and microbes in both a differentiated and undifferentiated state, comprising:
(a) supporting the cells on a liquid and gas permeable member;
(b) supporting the member within a sealable container;
(c) misting a liquid nutrient with droplets having a droplet size of between about 0.1 and about 10 microns into the chamber to provide a nutrient humid environment.

4,857,465
WHOLE PLANT REGENERATION VIA ORGANOGENESIS AND SOMACLONAL VARIATION IN GLYCINE SPECIES

Usha B. Barwale, and Jack M. Widholm, both of Champaign, Ill., assignors to Lubrizol Genetics, Inc., Wickliffe, Ohio

Filed Dec. 2, 1986, Ser. No. 936,812
Int. Cl.[4] C12N *5/00*
U.S. Cl. 435—240.49 11 Claims

1. A method for the production of an organogenic tissue culture comprising cells of *Glycine max* comprising culturing an immature embryo of *Glycine max* to form an organogenic callus culture on a medium comprising BAP at a concentration between about 10 μM and about 15 μM and minor elements at a concentration between about four and about six times normal concentration of the micronutrients of MS medium such that germination of the embryo is prevented and organogenic shoot production is promoted.

4,857,466
PROBE FOR DETECTION OF SPECIFIC HUMAN LEUKEMIAS

Grady F. Saunders, and Wendy M. Mars, both of Houston, Tex., assignors to The Board of Regents of the University of Texas System, Austin, Tex.

Continuation of Ser. No. 655,942, Sep. 28, 1984, abandoned. This application Sep. 4, 1987, Ser. No. 94,099
Int. Cl.[4] C12N *1/20, 1/00*
U.S. Cl. 435—252.33 1 Claim

1. *E. coli* (ATCC no. 39868) which has been transformed by a recombinant plasmid that includes genetic sequences that code for proteins for which the corresponding mRNA is moderately or highly abundant in chronic myelogenous leukemia.

4,857,467
CARBON AND ENERGY SOURCE MARKERS FOR TRANSFORMATION OF STRAINS OF THE GENES PICHIA

Kotikanyadan Sreekrishna, and Motohiro Fuke, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 23, 1986, Ser. No. 887,300
Int. Cl.[4] C12N *1/16, 15/00, 5/00*
U.S. Cl. 435—255 3 Claims

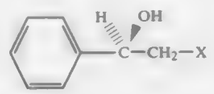
1. The pure culture comprising *Pichia pastoris* NRRL y-11430/pTSUI.

4,857,468
PROCESS FOR PREPARING OPTICALLY ACTIVE 2-HALO-1-PHENYL ETHANOL

Hidetoshi Kutsuki, Kobe; Ikuo Sawa; Natsuki Mori, both of Takasago; Junzo Hasegawa, and Kiyoshi Watanabe, both of Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

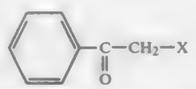
Filed Apr. 10, 1986, Ser. No. 849,985
Claims priority, application Japan, Apr. 13, 1985, 60-79114; Apr. 13, 1985, 60-79115; Sep. 14, 1985, 60-203643; Sep. 14, 1985, 60-203644
Int. Cl.[4] C07P *41/00*
U.S. Cl. 435—280 4 Claims

3. A process for preparing (R)-2-halo-1-phenyl ethanol having the formula [(R)-I]:



[(R)-I]

wherein X is a halogen atom, which comprises subjecting a 2-halo-acetophenone having the formula [II]:



[II]

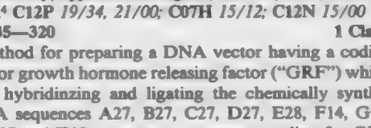
wherein X is as above, to the action of microorganism selected from the group consisting of *Hansenula anomala* IFO 0120, *Hansenula anomala* IFO 0146, *Candida sake* CBS 220, *Candida humicola* CBS 2756, *Candida humicola* CBS 1896, *Rhodotorula glutinis* IFO 1099, *Rhodotorula glutinis var dairensis* IFO 0415, *Torulopsis pinus* IFO 0741, *Hanseniaspora valbyensis* IFO 1758, *Filobasidium capsuligenus* IFO 1119, *Hormoascus platyodis* IFO 1471 and *Koeckera africana* IFO 0869.

4,857,469
PROCESS FOR PREPARING OPTICALLY ACTIVE MERCAPTO COMPOUND

Fumihiro Ishimura; Satoru Ishikawa, both of Ohito, and Seiji Akiyama, Shizuoka, all of Japan, assignors to Toyo Jozo Co., Ltd., Ohito, Japan

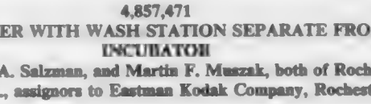
Filed Mar. 21, 1988, Ser. No. 171,380
Claims priority, application Japan, Apr. 9, 1987, 62-087744
Int. Cl.[4] C12P *41/00*
U.S. Cl. 435—280 6 Claims

1. A process for preparing an optically active mercapto compound having the formula (A):



(A)

wherein R_1 is alkyl, R is hydrogen or alkyl, C* is an asymmetric carbon atom, and n is 1 or 2, comprising:
contacting a compound of the formula (B):



(B)

wherein R_2 is alkyl and R_1 and n are as defined above with a cultured product or a treated product thereof of a species of microorganism, said cultured product or treated product thereof having the capability of selectively hydrolyzing the ester bonds of an enantiomer of the compound of formula (B); and
separating said compound of formula (A) from the resulting mixture.

4,857,470
METHOD FOR THE PREPARATION OF BACTERIAL CLONES CARRYING OPTIMAL GENETIC INFORMATION FOR THE PRODUCTION OF THE FACTOR FOR RELEASE OF HUMAN GROWTH HORMONE IN *ESCHERICHIA COLI*

Alfredo J. Morais Cravador, Rhode St Genese; Paul Jacobs, Lanquesaint; Alex J. Bollen, Itterbeek; Ary Van Elsen, Brussels, and Albert A. M. Herzog, Eppegem, all of Belgium, assignors to Smith Kline-RIT, s.a., Rixensart, Belgium

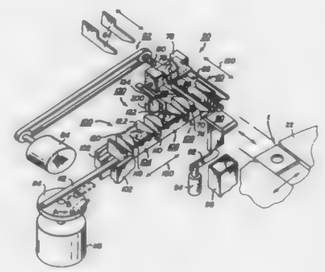
Filed Jan. 8, 1985, Ser. No. 689,679
Claims priority, application Belgium, Jan. 12, 1984, 212201
Int. Cl.[4] C12P *19/34, 21/00;* C07H *15/12;* C12N *15/00*
U.S. Cl. 435—320 1 Claim

1. A method for preparing a DNA vector having a coding sequence for growth hormone releasing factor ("GRF") which comprises hybridinzing and ligating the chemically synthesized DNA sequences A27, B27, C27, D27, E28, F14, G27, H27, I26,J27 and K19 to prepare a sequence coding for GRF and inserting the sequence into a plasmid vector.

4,857,471
ANALYZER WITH WASH STATION SEPARATE FROM INCUBATOR

Catherine A. Salzman, and Martin F. Muszak, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 20, 1987, Ser. No. 75,476
Int. Cl.[4] G01N *35/00*
U.S. Cl. 436—43 12 Claims



1. In an analyzer for processing a slide element to determine analytes of a body liquid, the analyzer comprising

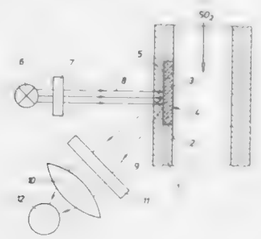
means for moving a plurality of slide elements bearing a body liquid, each independently through the analyzer;
means for incubating each slide element;
and means for detecting a signal generated in the slide element after incubation, indicative of the concentration of the analyte;
the improvement wherein said analyzer further includes a wash station off-line from said incubator and adjacent to said incubator, for washing a slide element with liquid, and second means capable of moving a slide element independently of others in said incubator, to said wash station, and from said wash station to said incubating means;
whereby a wash step capable of separating reaction product from reagents, is available for independent ones of said elements in the analyzer.

4,857,472

METHOD FOR CONTINUOUS QUANTITATIVE DETECTION OF SULPHUR DIOXIDE AND AN ARRANGEMENT FOR IMPLEMENTING THIS METHOD

Otto S. Wolfbeis, Graz, Austria, assignor to AVL AG, Schaffhausen, Switzerland

Filed May 25, 1988, Ser. No. 198,759
Claims priority, application Austria, May 27, 1987, 1371/87
Int. Cl.[4] G01N *33/00, 21/76*
U.S. Cl. 436—122 **11 Claims**



1. A method for the continuous quantitative detection of sulphur dioxide in gaseous or liquid media, comprising the steps of bringing said medium to be analyzed into contact with a fluorescent indicator emitting fluorescence radiation upon excitation, said fluorescent indicator being selected from the group consisting of triphenylmethane dyes, and measuring the extent of fluorescence-quenching caused by sulphur dioxide contained in said gaseous or liquid media to enable a quantitative determination of the content of sulphur dioxide in said medium to be obtained.

4,857,473

WATER SAMPLING SYSTEM

Mordeckai Margaritz, Rehovot; Daniel Rosen, Kfar Saba, and Itzhak Levy, Ramat Gan, all of Israel, assignors to State of Israel, Ministry of Agriculture, Water Commission, Tel-Aviv and YEDA Research and Development Co., Ltd., Rehovot, both of, Israel

Filed Aug. 29, 1986, Ser. No. 901,791
Claims priority, application Israel, Sep. 2, 1985, 76275
Int. Cl.[4] G01N *1/16, 1/20*
U.S. Cl. 436—177 **10 Claims**

1. A method for establishing the chemical profile of the contaminants or constituents of a body of liquid comprising:
introducing into the body of liquid a sampling device in a substantially vertical orientation;
said sampling device comprising an elongated member having a longitudinal axis and having means defining a plurality of throughgoing holes at predetermined intervals, each of said plurality of holes having a longitudinal axis perpendicular to a longitudinal axis of said elongated member;
a plurality of dialysis cells, each of said plurality of cells being disposed in one of said plurality of throughgoing holes of said elongated member and each of said plurality of cells having first and second ends and a shape corresponding to a respective one of said plurality of throughgoing holes in which each of said plurality of cells is disposed so as to fit therewith, and each of said plurality of cells having dialysis membranes covering the first and second ends thereof;
leaving said sampling device in place, undisturbed, in the body of liquid until equilibrium is established within each of the dialysis cells of said sampling device; and
removing the sampling device form the body of liquid; and analyzing the contents of each of said dialysis cells.



3. A sampling device for establishing the concentration and concentration profile of contaminants or constituents of a liquid to be sampled which are able to permeate through a dialysis membrane, comprising:
an elongated member having a longitudinal axis and having means defining a plurality of throughgoing holes at predetermined intervals, each of said plurality of holes having a longitudinal axis perpendicular to the longitudinal axis of said elongated member; and
a plurality of dialysis cells, each of said plurality of cells being disposed in one of said plurality of throughgoing holes of said elongated member and each of said plurality of cells having first and second ends and a shape corresponding to a respective one of said plurality of throughgoing holes in which each of said plurality of cells is disposed so as to fit therewithin, and each of said plurality of cells having dialysis membranes covering the first and second ends thereof.

4,857,474

PHYCOERYTHRINS USEFUL IN FLUORESCENT CONJUGATES

John B. Waterbury; Stanley W. Watson, both of Woods Hole, Mass.; Alexander N. Glazer, Orinda, and Linda J. Ong, Hayward, both of Calif., assignors to Research Corporation, New York, N.Y.

Filed Mar. 29, 1985, Ser. No. 717,634
Int. Cl.[4] G01N *33/566, 33/533, 33/542;* **C12N** *1/20*
U.S. Cl. 436—501 **16 Claims**

1. In a fluorescent immunoassay method employing as a reagent a fluorescent biliprotein isolated from a marine cyanobacterium of the genus Synechococcus, conjugated to a member of a specific binding pair selected from the group consisting of ligand and receptor the improvement which comprises employing a biliprotein having absorption maxima at about 542 and at about 492, a 542/492 ratio of less than about 2, a PUB/-

PEB ratio of greater than 0.36, and an emission maximum at 560 nm.

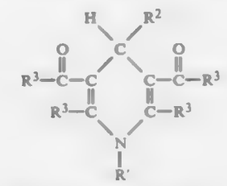
4,857,475

LABELLED AND LABELLABLE REAGENTS FOR FLUOROMETRIC ASSAYS

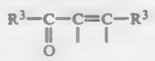
Salifu Dakubu, Winchester, Mass., assignor to Roger Philip Ekins, United Kingdom, a part interest

PCT No. PCT/GB85/00377, § 371 Date Apr. 17, 1986, § 102(e) Date Apr. 17, 1986, PCT Pub. No. WO86/01604, PCT Pub. Date Mar. 13, 1986
PCT Filed Aug. 22, 1985, Ser. No. 862,215
Claims priority, application United Kingdom, Aug. 22, 1984, [redacted]
Int. Cl.[4] G01N *33/533*
U.S. Cl. 436—546 **9 Claims**

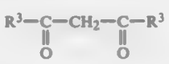
1. A substance capable of being labelled with a metal ion for use in a fluorometric assay technique, comprising a cyclic condensation product of an NH_2-bearing macromolecule, a β-diketone and an aldehyde and having the formula:



where R'N is the residue of an antibody or antigen of the formula $R'NH_2$ or R'N is the residue remaining after subtraction of two hydrogen atoms of an NH_2 group from an NH_2 containing compound covalently bonded to an antibody or antigen or R'N is the residue of a polylysine of the formula $R'NH_2$ having a functional group through which it can be covalently bonded to an antibody or antigen; R^2 is hydrogen or alkyl of 1 to 4 carbon atoms derived from formaldehyde or a C_1–C_4-alkylaldehyde and the moieties



are residues of β-diketones of the formula



selected from the group consisting of trifluoroacetylacetone, thenoyltrifluoroacetone, 4,4,4-trifluoro-1(2-furyl)-1,3-butanedione, α-naphthoyltrifluoroacetone, benzoylacetone, dibenzoylmethane, β-naphthoyl-2-furoylmethane, di(p-fluorobenzoyl)methane, hexafluoroacetylacetone, benzoyltrifluoroacetone, p-methoxybenzoyltrifluoroacetone, p-fluorobenzoyltrifluoroacetone and dithenoylmethane.

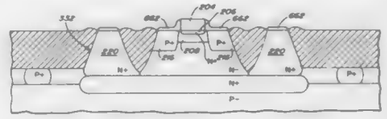
4,857,476

BIPOLAR TRANSISTOR PROCESS USING SIDEWALL SPACER FOR ALIGNING BASE INSERT

Jean-Pierre Colinge, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 26, 1988, Ser. No. 148,419
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—33 **4 Claims**

1. A method of fabricating a bipolar transistor comprising the steps of:
forming a collector as a heavily doped buried layer on a silicon substrate covered with an epitaxial silicon layer;
defining inner and outer field oxide regions with a collector insert region therebetween, said inner field oxide region separating said collector insert region from a base-emitter region;
forming channel stops around said collector, said channel stops being heavily doped and having a conductivity opposite that of said collector;
forming silicon dioxide in said inner and outer field oxide regions;
doping said collector insert region to form a collector insert extending to said collector, said collector insert being heavily doped and having the same conductivity type as said collector;
photo-lithographically defining a polysilicon pedestal with a silicon nitride cap on a top surface thereof over an emitter subregion of said base-emitter region, said pedestal having a wall surface extending generally orthogonal to said substrate;



depositing silicon dioxide and performing a collimating etch thereof to define sidewall spacers on said pedetal;
implanting base insert dopant of conductivity opposite that of said collector and diffusing it to form a base insert region between said emitter subregion and said inner field oxide region;
implanting base dopant of conductivity type opposite that of said collector into said emitter contact pedestal and diffusing it into said epitaxial silicon layer to define a base for said bipolar transistor, and
implanting dopant of conductivity type the same as that of said collector into said emitter contact pedestal and diffusing it into said epitaxial layer to a lesser extent than said base dopant so that an emitter is defined for said bipolar transistor.

4,857,477

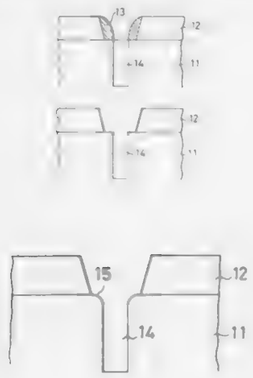
PROCESS FOR FABRICATING A SEMICONDUCTOR DEVICE

Jun Kanamori, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1987, Ser. No. 95,147
Claims priority, application Japan, Sep. 18, 1986, 61-217973
Int. Cl.[4] H01L *27/10*
U.S. Cl. 437—47 **9 Claims**

1. A process for fabricating a semiconductor device which includes a semiconductor substrate having a trench formed at a predetermined area in a surface thereof, said trench having a rounded corner at the surface of said substrate, wherein said process comprises the steps of:
(a) forming a first mask layer on said surface of said substrate, said first mask layer having an opening therein with a side spaced from said predetermined area;
(b) forming a second mask layer on said side of the opening of said first mask layer, said second mask layer having an opening therein with a side wall substantially aligned with said predetermined area where said trench is to be formed;
(c) forming a trench in said substrate at said predetermined area using said first and second mask layers as a mask;
(d) removing said second mask layer; and

(e) dry etching said substrate at said predetermined area using said first mask layer as a mask, whereby the edge of



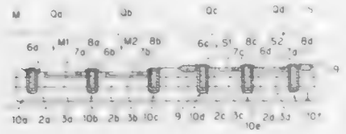
said trench, which has a higher etching rate than the remainder of said substrate under dry etching, is rounded.

4,857,478

METHOD OF MANUFACTURING A SEMICONDUCTOR MEMORY DEVICE

Kazuhito Niwano, and Tatsuhiko Ikeda, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1988, Ser. No. 267,374
Claims priority, application Japan, Apr. 26, 1988, 63-104714
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—61 **4 Claims**



1. A method of manufacturing a semiconductor memory device comprising a memory element area formed by a plurality of bipolar transitors in a first area of a first conductivity type semiconductor substrate and a peripheral circuit area formed by a plurality of circuit elements in a second area of said semiconductor substrate, said method comprising:

a first step of preparing said semiconductor substrate;

a second step of forming a second conductivity type subcollector layer on said semiconductor substrate;

a third step of forming a second conductivity type collector layer on said second conductivity type subcollector layer;

a fourth step of simultaneously forming first and second insulation layers in a region corresponding to said memory element are and regions corresponding to prescribed regions of said peripheral circuit area within an upper layer part of said second conductivity type collector layer;

a fifth step of selectively removing said first insulation layer; and

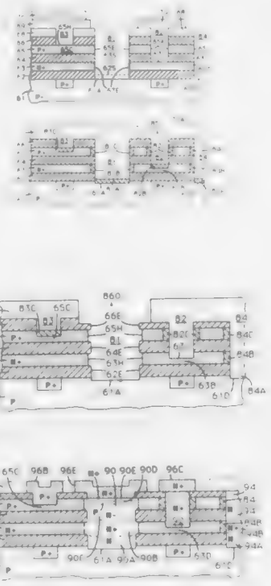
a sixth step of isolating regions for forming said plurality of bipolar transistors from each other and isolating regions for forming said plurality of circuit elements from each other respectively by a trench isolation process.

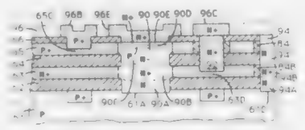
4,857,479

METHOD OF MAKING POLY-SIDEWALL CONTACT TRANSISTORS

Kevin L. McLaughlin, Chandler, and Thomas P. Bushey, Phoenix, both of Ariz., assignors to Motorola, Schaumburg, Ill.

Division of Ser. No. 58,637, Jun. 3, 1987, Pat. No. 4,764,801, which is a continuation of Ser. No. 785,415, Oct. 8, 1985, abandoned. This application May 9, 1988, Ser. No. 191,923
Int. Cl.[4] H01L *21/36, 21/38*
U.S. Cl. 437—162 **4 Claims**





1. A process for forming sidewall contact semiconductor devices comprising:

providing a semiconductor substrate having thereon superposed layers comprising a first layer of a first dielectric, a first layer of a first polycrystalline conductor, a second layer of a second dielectric, a second layer of a second polycrystalline conductor, and a third layer of a third dielectric having an outer surface;

forming on said outer surface a first masking layer having first, second and third openings above first, second and third portions, respectively, of each of said substrate, said first, second and third dielectric layers and said first and second polycrystalline conductor layers;

removing said first, second and third portions of said third dielectric layer exposing said first, second and third portions of said second polycrystalline conductor layer;

forming a second masking layer covering said third portion of said second polycrystalline conductor layer;

removing said first and second portions of said second polycrystalline conductor layer and second dielectric layer exposing said first and second portions of said first polycrystalline conductor layer;

providing a third masking layer covering said second portion of said first polycrystalline conductor layer;

removing said first portion of said first polycrystalline conductor layer and said first portion of said first dielectric layer;

partly oxidizing said first portion of said substrate, said second portion of said first polycrystalline conductor layer, said third portion of said second polycrystalline conductor layer, and first edge portions of said first and second polycrystalline conductor layers exposed under said first opening and second edge portions of said second polycrystalline conductor layer exposed under said second opening;

then in either order, (a) providing a fourth masking layer having a fourth opening larger than said first opening and above said second portion of said first polycrystalline conductor layer and anisotropically etching through said fourth opening to said second portion of said first polycrystalline conductor layer while substantially leaving in place said oxide on said second edge portion of said second polycrystalline conductor layer, and (b) providing a fifth masking layer having a fifth opening larger than said first opening and above said first portion of said substrate and isotropically etching through said fifth opening to expose said first portion of said substrate and said first edge portions of said first and second polycrystalline conductor layers;

then forming a single crystal semiconductor region above said first portion of said substrate and in contact with said first edge portions of said first and second polycrystalline conductor layers;

forming a polycrystalline conductor contact region above said second portion of said first polycrystalline conductor layer;

forming a device in said single crystal semiconductor region; and

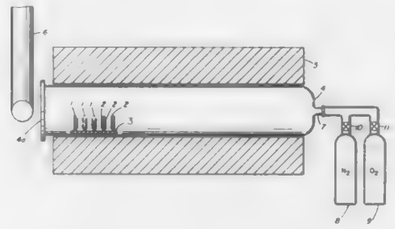
forming electrical connections to said third portion of said second polycrystalline conductor region, said single crystal region, and said polycrystalline conductor contact region.

4,857,480

METHOD FOR DIFFUSING P-TYPE MATERIAL USING BORON DISKS

Manon Plante, St. Alphonsede Granby, Canada, assignor to Mitel Corporation, Ontario, Canada

Filed Oct. 26, 1987, Ser. No. 112,147
Claims priority, application Canada, Oct. 29, 1986, 521720
Int. Cl.[4] H01L *21/385*
U.S. Cl. 437—168 **18 Claims**



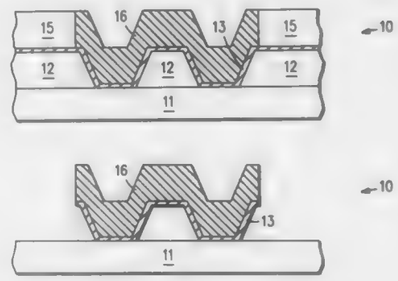
1. In a process of fabricating metal oxide silicon field effect devices in wafers of silicon semiconductor substrate, a method of depositing P-type material on one or more of said wafers comprising the steps of passivating one or more boron disks in the absence of said wafers, oxidizing said disks in the absence of said wafers, then subsequently flowing nitrogen gas over said disks and wafers within a reaction chamber while raising the termperature of the chamber to a diffusion temperature, and thereafter flowing a gaseous mixture of nitrogen and oxygen over said disks and wafers at said diffusion temperature whereby P-type material from said boron disks is deposited onto the surface of said wafers for diffusion therein.

4,857,481

METHOD OF FABRICATING AIRBRIDGE METAL INTERCONNECTS

Gordon Tam, Chandler, Ariz., and Lisa R. Granick, Philadelphia, Pa., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 14, 1989, Ser. No. 322,943
Int. Cl.[4] H01L *21/283*
U.S. Cl. 437—182 **9 Claims**



1. A method of fabricating an airbridge metal interconnect, comprising the steps of:

providing a semiconductor substrate;

applying a first polymer to the substrate;

patterning the first polymer to provide openings therein;

forming a first metal layer on the first polymer and on the substrate through the openings in the first polymer;

applying a second polymer on the first metal layer, the second polymer having different solubility characteristics than the first polymer;

patterning the second polymer to provide openings therein;

forming a second layer of metal onto a portion of the first metal layer through the openings of the second polymer;

removing the second polymer with a solution which does not dissolve the first polymer;

removing the first metal layer not underneath the second metal layer; and

removing the first polymer, thereby forming the airbridge metal interconnect.

4,857,482

METHOD OF FORMING BUMP ELECTRODE AND ELECTRONIC CIRCUIT DEVICE

Masayuki Saito; Akira Niitsuma, both of Yokohama; Hiroei Ohdaira, Chigasaki; Chiaki Tanuma, Tokyo, and Miki Mori, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 29, 1988, Ser. No. 213,249
Claims priority, application Japan, Jan. 30, 1987, 62-163084; Aug. 13, 1987, 62-200777; Mar. 31, 1988, 63-78781
Int. Cl.[4] H01L *21/68*
U.S. Cl. a37—209 **16 Claims**

1. A method of forming a bump electrode on an electrode terminal of an electronic component, comprising the steps of:

preparing a support having a recess formed in a surface portion thereof, at a position corresponding to said electrode terminal of said electronic component;

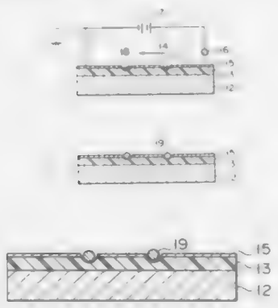
electrically charging said recess of said support, to create static electricity in said recess;

placing a particulate metal member in said recess, said metal member being retained therein by way of said static electricity; and

bonding said electrode terminal to said particulate metal member while said electronic component is opposed to said support.

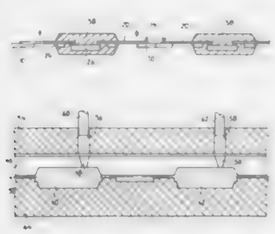
16. A method of manufacturing an electronic circuit device, comprising the steps of:

preparing an electronic circuit module having a plurality of electronic parts including a semiconductor element buried in a resin, and electrode terminals formed of a conductive paste and formed on each of electronic component;
preparing a support having a recess formed on a surface portion thereof, at a position corresponding to said electrode terminal of said electronic circuit module;
electrically charging said recess of said support, to create static electricity in said recess;



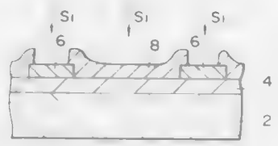
placing a particulate metal member in said recess, said metal member being retained therein by way of said static electricity;
bonding said electrode terminal to said particulate metal member while said electronic circuit module is opposed to said support; and
bonding said particulate metal member to an electrode of a printed wiring board to mount said electronic circuit module on said printed wiring board.

4,857,483
METHOD FOR THE ENCAPSULATION OF INTEGRATED CIRCUITS
Francis Steffen, and Jean Labelle, both of Aix-Les-Bains, France, assignors to SGS-Thomson Microelectronics S.A., Paris, France
PCT No. PCT/FR87/00143, § 371 Date Dec. 29, 1987, § 102(e) Date Dec. 29, 1987, PCT Pub. No. WO87/06763, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 29, 1987, Ser. No. 148,655
Claims priority, application France, Apr. 30, 1986, 86 06333
Int. Cl.⁴ H01L *21/56*
U.S. Cl. 437—209 **3 Claims**



1. A method for the encapsulation in a thermosetting resin of integrated circuits fixed to a flexible dielectrical strip bearing printed electrical conductors constituting the external connection pins of the integrated circuits, wherein the dielectric strip is laid flat between a first plate and a second plate of a mold, the two plates demarcating between them, when they are in contact with the strip, a parting plane in which the strip is placed and at least one cavity surrounding an integrated circuit and partially surrounding the printed conductors located around this circuit, the cavity being provided with a resin-injection hole located outside the parting plane, and wherein a thermosetting resin is injected into the cavity through the hole.

4,857,484
METHOD OF MAKING AN ION-IMPLANTED BONDING CONNECTION OF A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE
Masami Nishikawa, Takatsuki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Feb. 22, 1988, Ser. No. 158,763
Claims priority, application Japan, Feb. 21, 1987, 62-38500
Int. Cl.⁴ H01L *21/265*
U.S. Cl. 437—209 **1 Claim**



1. A method for forming a bonding connection in a semiconductor integrated circuit device, comprising:
(a) forming a bonding pad of aluminum on a semiconductor substrate over an intervening insulation layer;
(b) ion implanting silicon ions into said bonding pad to a depth of about 500 Å from the bonding pad surface; and
(c) bonding an electrically conductive wire to said bonding pad.

4,857,485
OXIDATION RESISTANT FIBER REINFORCED COMPOSITE ARTICLE
John J. Brennan, Portland; George K. Layden, Hartford, and Karl M. Prewo, Vernon, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Oct. 14, 1987, Ser. No. 108,855
Int. Cl.⁴ C03L *10/04;* C04B *35/56*
U.S. Cl. 501—7 **2 Claims**

1. A fiber reinforced composite article, comprising:
from about 20 volume percent to about 60 volume percent silicon carbide fibers, and
from about 40 volume percent to about 80 volume percent glass-ceramic matrix,
said glass-ceramic matrix having
from about 60 weight percent to about 75 weight percent SiO_2,
from about 15 weight percent to about 25 weight percent Al_2O_3,
from about 1.5 weight percent to about 5 weight percent Li_2O,
from about 1 weight percent to about 5 weight percent MgO,
up to about 3 weight percent ZnO_2,
up to about 3 weight percent As_2O_3, and
from about 2 weight percent to about 5 weight percent B_2O_3
said composite article exhibiting both high flexural strength at temperatures of up to about 1000° C. and oxidative stability at temperatures above about 450° C. in an oxidizing environment.

4,857,486
ADHESIVE FOR OXIDE CERAMICS AND METHOD OF BONDING OXIDE CERAMICS USING IT
Yoshihiro Ebata, Kawanishi; Masanori Kouyama; Nobuyuki Tama-i, both of Ikeda, and Takamichi Kawamoto, Ashiya, all of Japan, assignors to Japan as represented by Director General of Agency of Industrial Science and Technology, Tokyo, Japan
PCT No. PCT/JP87/00200, § 371 Date May 12, 1988, § 102(e) Date May 12, 1988, PCT Pub. No. WO88/01987, PCT Pub. Date Mar. 4, 1988
PCT Filed Mar. 31, 1987, Ser. No. 199,410
Claims priority, application Japan, Sep. 22, 1986, 61-224661
Int. Cl.⁴ C03C *8/22, 8/02*
U.S. Cl. 501—21 **5 Claims**

1. An adhesive frit for oxide ceramics consisting essentially of 50 to 70 wt. % of a crystallized glass and 50 to 30 wt. % of a low-melting glass, wherein said crystallized glass comprises 60 to 70 wt. % of SiO_2, 19 to 23 wt. % of Al_2O_3, 2 to 6 wt. % of Li_2O, 1 to 8 wt. % of MgO and/or ZnO and 3 to 5 wt. % of TiO_2 and/or ZrO_2, and wherein said low-melting glass is a P_2O_5-based low-melting glass, a ZnO-based low-melting glass or a hard borosilicate glass.

4,857,487
OPTICAL FLUOROPHOSPHATE GLASSES POSSESSING POSITIVE ANOMALOUS PARTIAL DISPERSION AND IMPROVED PHYSICO-CHEMICAL PROPERTIES, AND A PROCESS FOR THEIR PREPARATION
Heinz Broemer, Wetzlar; Werner Huber, and Norbert Meinert, both of Solms-Albshausen, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany
Continuation of Ser. No. 63,436, Jun. 18, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 268,634
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1985, 3537293; Oct. 11, 1986, 3634676
Int. Cl.⁴ C03C *3/247, 4/00*
U.S. Cl. 501—44 **4 Claims**

1. Optical fluorophosphate glass based on $Ba(PO_3)_2$, $Al(PO_3)_3$, alkaline earth metal fluorides and AlF_3, said glass having a refractive index n_e of between 1.47 and 1.50, an Abbe-value ν_e of between 85 and 80 and a positive anomalous partial dispersion value $+\Delta\nu_e$ of between 17 and 22, and
(a) consisting essentially of the following atomic composition (in wt.-%):

Mg	0.5–3.0
Ca	8–10
Sr	12–20
Ba	9–12
Al	7–9
Ti	0–1
Na	0–1
K	0–3
P	5–9
O	8–12
F	35–38
H	0–0.5 and

(b) having the following physical characteristics: Linear thermal expansion coefficient $\alpha_{20/300}$°C.[10^{-6}.1/°C.]: 14.6–14.7;

Glass transition temp. T_g	472–480° C.;
Density ζ	3.51–3.61 g/cm^3;
Knoop-hardness HK	385–390.

4,857,488
CASTING NOZZLE
Yoshiro Aiba; Kazumi Arakawa; Takashi Watanabe, and Kazuhide Kawai, all of Kariya, Japan, assignors to Toshiba Ceramics Co., Ltd., Japan
Filed Feb. 28, 1987, Ser. No. 7,468
Claims priority, application Japan, Mar. 13, 1986, 61-53777
Int. Cl.⁴ C04B *35/10*
U.S. Cl. 501—89 **8 Claims**

1. A method for making a casting nozzle comprising the steps of:
providing a first mixture consisting essentially of:
about 30–60 wt.% ZrO_2
about 20–50 wt.% Al_2O_3
about 10–20 wt.% SiO_2
about 5–40 wt.% SiC
electrofusing said first mixture to form electrofused aggregates;
mixing (1) about 70–95 wt.% of a primary casting nozzle material comprising alumina and carbon with (2) about 5–30 wt.% of said electrofused aggregates together with a binder to form a second mixture;
shaping said second mixture into the shape of a casting nozzle to thereby make a formed body; and
sintering the formed body to produce the casting nozzle.

4,857,489
MOLTEN ALUMINUM RESISTANT CERAMIC FIBER COMPOSITION
James M. Bearden, Mexico, Mo., assignor to A. P. Green Industries, Inc., Mexico, Mo.
Filed Nov. 22, 1985, Ser. No. 801,028
Int. Cl.⁴ C04B *35/76*
U.S. Cl. 501—95 **12 Claims**

1. A moldable refractory composition comprising a ceramic fiber, a colloidal silica, wollastonite, an organic adhesive, and a sufficient amount of liquid vehicle to give the composition a putty-like consistency, wherein the wollastonite is from about 3.5% to about 10% of the total weight of the composition.

7. A molten aluminum-resistant refractory comprising a ceramic fiber, a colloidal silica, and wollastonite, wherein the wollastonite is from about 11.9% to about 15.6% of the composition.

4,857,490
PROCESS OF MANUFACTURING BORON CERAMICS FROM CARBORALATED DIACETYLENE POLYMERS
Robert E. Johnson, Hoboken, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.
Continuation of Ser. No. 90,999, Aug. 31, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 273,154
Int. Cl.⁴ C04B *35/56, 35/58*
U.S. Cl. 501—96 **8 Claims**

1. A process for producing a boron-containing ceramic from organoboron preceramic polymers comprising: forming a preceramic polymer by carboralating a polydiacetylene polymer which contains as a repeating unit a conjugated double and triple bond so as to form carborane units at the location of said triple bonds of said polydiacetylene and pyrolyzing said carboralated polydiacetylene at a temperature sufficient to convert said carboralated polydiacetylene to a boron-containing ceramic.

4,857,491

VISCOSIFYING ALCOHOLIC MEDIA

Howard Goodman, St. Austell, England, assignor to ECC International Limited, Great Britain

Filed Aug. 13, 1986, Ser. No. 896,396
Claims priority, application United Kingdom, Aug. 15, 1985, 8520453
Int. Cl.[4] C04B 14/00, 33/00
U.S. Cl. 501—148 6 Claims

1. A thixotropic liquid composition containing a significant amount of one or more aliphatic alcohols having from 1 to 4 carbon atoms and containing from 1% to 10% by weight, based on the weight of the aliphatic alcohol, of an organo-clay which has been prepared by treating a smectite clay mineral with a mixture of a di(lower alkyl) aralkyl (higher alkyl) ammonium compound and a di(lower alkyl) di(higher alkyl) ammonium compound wherein the higher alkyl group of each of the quaternary ammonium compound contains from 10 to 24 carbon atoms and the lower alkyl group of each of the quaternary ammonium compounds contains less than 10 atoms; the mole ratio of said di(lower alkyl) aralkyl (higher alkyl) ammonium compound to said di(lower alkyl) di(higher alkyl) ammonium compound in said mixture being in the range of from 99:1 to 20:80; said clay mineral being suspended in water and the suspension thus formed mixed with the said mixture of ammonium compounds in proportions such that there are present from 95 to 140 milliequivalents of quaternary ammonium cation per 100 g of dry clay material; and thereafter subjecting the treated clay mineral to high shear mixing for a time sufficient to dissipate in the mixture at least 100 kJ of energy per kg of dry solids in the mixture.

4,857,492

TRANSITION METAL ORGANOSOLS STABILIZED BY ORGANOMETALLIC POLYMERS

John S. Bradley, Gladstone, and Ernestine W. Hill, Piscataway, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Mar. 28, 1988, Ser. No. 174,135
Int. Cl.[4] B01J 31/12, 31/14, 31/02
U.S. Cl. 502—117 5 Claims

1. A polymer stabilized collodial metal (M) solution wherein said metal, M′ is a transition metal and said polymer is an organometallic polymer having the monomer unit with the chemical formula (R_x′O) where R is an alkyl group, cycloalkyl group or an alkoxy and M′ is any metal satisfying said formula and x is 2 less than the valence of M′ and wherein said polymer is soluble in an inert liquid, interacts with said collodial particles of M so as to solubilize said particles of M in said liquid, and able to react with, water so as to produce the oxide of M′, M'_2O_z or its hydrate $M'_2O_z-nH_2O$, where z is the valence of M′ and n is the number of molecules of water.

2. The polymer stabilized colloidal metal solution of claim 1 wherein said transition metal is selected from the group consisting of palladium, platinum, copper, nickel, cobalt and chromium.

4,857,493

POLYMER LATEXES CONTAINING METAL IONS AND COMPLEXES

Warren T. Ford, 217 S. Ridge, Stillwater, Okla. 74078; Rama S. Chandran, 2 Aquarius Ct., Apt. 7, Somerville, N.J. 08876-4910; Mahmoud Hassanein, 101-5 N. University Pl., Stillwater, Okla. 74078, and Hayrettin Turk, P.O. Box 1113, Stillwater, Okla. 74076

Filed Jun. 27, 1988, Ser. No. 212,172
Int. Cl.[4] B01J 31/06
U.S. Cl. 502—159 8 Claims

1. Charged polymer latex particles of from about 0.01 to about 1.5 micrometers in diameter which contain from about 0.01 to about 3.0 millimoles of metal complex per gram of dry polymer, and wherein the polymer may be either uncrosslinked, or crosslinked with up to 25 mole percent of a polyfunctional monomer.

4,857,494

MILD HYDROCRACKING CATALYST FOR THE PRODUCTION OF MIDDLE DISTILLATES

Nelson P. Martinez; Roberto E. Galiasso, both of San Antonio de Los Altos; Jose R. Velasquez, Caracas; Juan Lujano, Caracas, and Carlos Zerpa, Caracas, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Continuation-in-part of Ser. No. 85,339, Aug. 14, 1987, abandoned, which is a division of Ser. No. 859,506, May 5, 1986, Pat. No. 4,689,314. This application Oct. 19, 1987, Ser. No. 109,592
Int. Cl.[4] B01J 21/12, 27/182, 27/185, 27/188
U.S. Cl. 502—210 1 Claim

1. A catalyst for use in the hydrocracking of a heavy hydrocarbon feedstock so as to increase cracking activity and obtain high quality middle distillate products boiling in the range of about between 300° F. to 700° F. comprises an alumina carrier having deposited thereon the following surface chemical composition as measured by X-Ray Photoelectronic Spectroscopy (XPS) to give values of: (1) Group VIB metal Xs/(Al+K)s of between 4 to 15 where X equals the Group VIB metal, (2) Group VIII metal Ys/(Al+Y)s of between 2 to 5 where Y equals the Group VIII metal, (3) phosphorus Ps/(Al+P)s of between 0.1 to 8, and (4) silica $SiO_2/(Al+SiO_2)$ of between 1 to 10; a bulk chemical composition as follows: (1) 2.0 to 15.0 wt. % Group VIB metal, (2) 1.0 to 4 wt. % Group VIII metal, (3) 0.4 to 2 wt. % phosphorus, and (4) 0.1 to 5 wt. % silica; and having the following surface properties: (1) a silica-alumina material having textural and crystallorgaphic properties substantially similiar to the alumina carrier, (2) a large amount of Group VIII element tetrahedral sites as measured by diffused reflectance spectroscopy and no crystalline silica compound as measured by X-ray diffraction and (3) a ratio of Bronsted type acid centers to Lewis type centers of between 1.0 to 2.5 as measured by pyridine adsorption.

4,857,495

HYDROCRACKING CATALYSTS AND PROCESSES EMPLOYING SILICOALUMINOPHOSPHATE MOLECULAR SIEVES

Frank P. Gortsema, Pleasantville; Regis J. Pellet, Croton-on-Hudson; Albert R. Springer, Yonkers; Jule A. Rabo, Armonk, and Gary N. Long, Putnam Valley, all of N.Y., assignors to UOP

Continuation of Ser. No. 682,946, Dec. 18, 1984, abandoned. This application Oct. 28, 1986, Ser. No. 925,537
Int. Cl.[4] B01J 27/182
U.S. Cl. 502—214 30 Claims

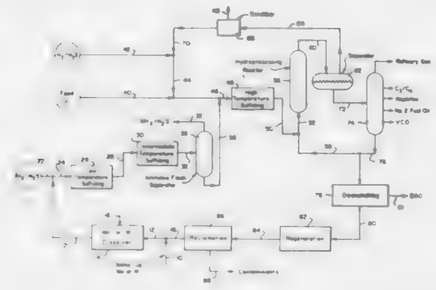
1. A hydrocracking catalyst comprising a traditional hydrocracking catalyst component comprising a large pore zeolite, at least one silicoaluminophosphate (SAPO) characterized in its calcined form by an adsorption of isobutane of at least 2 percent by weight at a partial pressure of 500 torr and a temperature of 20° C., and an amount of at least one hydrogenation catalyst selected from the group consisting of cobalt, nickel, molybdenum, tungsten, platinum, palladium, chromium, rhodium, ruthenium and iridium effective to provide the hydrogenation function of the hydrocracking catalyst.

4,857,496

HEAVY OIL HYDROPROCESSING WITH GROUP VI METAL SLURRY CATALYST

Jaime Lopez, Benicia, Calif., and Eugene A. Pasek, Export, Pa., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 767,767, Aug. 21, 1985, abandoned, which is a continuation-in-part of Ser. No. 527,414, Aug. 29, 1983, Pat. No. 4,557,821. This application Dec. 15, 1986, Ser. No. 941,456
Int. Cl.[4] B01J 27/147
U.S. Cl. 502—220 71 Claims



1. A process comprising the preparation of a dispersed Group VIB metal sulfide hydrocarbon oil hydroprocessing catalyst comprising reacting ammonia and a Group VIB metal compound in water to form an aqueous ammonium Group VIB metal compounds, reacting said aqueous ammonium Group VIB metal compounds with hydrogen sulfide essentially in the absence of feed oil in a low temperature sulfiding step at a temperature in the range 70° to 350° F., continuing the reaction of aqueous ammonium Group VIB metal compound with hydrogen sulfide in an intermediate temperature sulfiding step at a temperature in the range 180° to 700° F. which is higher than the temperature in said low temperature sulfiding step and essentially without feed oil, withdrawing an aqueous effluent stream from said intermediate temperature sulfiding step, passing said effluent stream to a separator zone, removing ammonia from said aqueous effluent stream in said separator zone leaving a separator residue, passing said separator residue together with feed hydrocarbon oil and hydrogen sulfide to a high temperature sulfiding step at a temperature in the range 500° to 750° F. which is higher than the temperature in said intermediate temperature sulfiding step, the residence time in each of said sulfiding steps being at least 0.02 hours, and withdrawing from said high temperature sulfiding step an aqueous-oil slurry containing dispersed Group VIB metal sulfide slurry catalyst.

4,857,497

SUPPORTED METAL CATALYSTS AND USE THEREOF

Krijn P. De Jong; Johannes H. E. Glezer, and Martin F. M. Post, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 924,004, Oct. 28, 1986, abandoned. This application Apr. 25, 1988, Ser. No. 186,782
Claims priority, application United Kingdom, Nov. 8, 1985, 8527549
Int. Cl.[4] B01J 21/06, 21/08, 23/74
U.S. Cl. 502—242 10 Claims

1. A process for the preparation of a catalyst useful for the preparation of hydrocarbons, the majority of which have more than three carbon atoms, from carbon monoxide and hydrogen which comprises contacting a porous silica-containing carrier with metal compounds comprising a cobalt compound, a zirconium compound and a noble metal compound selected from Group VIII of the Periodic Table and mixtures thereof dissolved in a liquid selected from the group consisting of water and ethanol, followed by the removal of the liquid, calcination of the resulting composition at elevated temperature and reduction in the presence of hydrogen at temperature in the range of from about 50° C. to about 300° C. for a period of time in the range of from about 30 minutes to about 24 hours; wherein the amount of cobalt in the catalyst is from about 5 to about 40 pbw per 100 pbw of silica-containing carrier, the amount of zirconium in the catalyst is from about 0.25 to about 50 pbw and the amount of the noble metal compounds in the catalyst is from about 0.0001 to about 5 pbw, on the same basis.

4,857,498

DEHYDROGENATION CATALYST

Pierre E. Dejaifve; Jean-Paul Darnanville; Jacques J. J. Dufour, and Roland A. C. Garin, all of Grand Couronne, France, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 21, 1988, Ser. No. 209,385
Claims priority, application France, Jun. 29, 1987, 87 09149
Int. Cl.[4] B01J 23/10, 23/78, 23/82
U.S. Cl. 502—304 9 Claims

1. A dehydrogenation catalyst comprising:
1 to 25% by weight of an alkali metal compound, calculated as stable alkali metal oxide,
0.5 to 20% by weight of a rare earth metal compound, calculated as the oxide,
0.5 to 10% by weight of a calcium compound, calculated as CaO,
0.5 to 10% by weight of a germanium-, tin- and/or lead compound, calculated as the dioxide, and
35 to 97.5% by weight of an iron compound, calculated as Fe_2O_3.

4,857,499

HIGH TEMPERATURE COMBUSTION CATALYST AND METHOD FOR PRODUCING THE SAME

Masamichi Ito, Yokosuka; Akio Ohkoshi, Abiko; Kenjiro Shizukawa, Katori; Terunobu Hayata, Kawasaki; Tomiaki Furuya, Yokohama; Susumu Yamanaka, Kawasaki, and Junji Koezuka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Tokyo Electric Power Company, Tokyo, both of, Japan

Filed Mar. 18, 1988, Ser. No. 170,350
Claims priority, application Japan, Mar. 20, 1987, 62-064261; Mar. 20, 1987, 62-064262; Mar. 23, 1987, 62-065575; Mar. 23, 1987, 62-065867
Int. Cl.[4] B01J 21/06, 23/10, 23/58, 23/89
U.S. Cl. 502—326 18 Claims

1. A high temperature combustion catalyst consisting essentially of a porous carrier layer, a catalyst component and first, second and third promoter components, the latter four components being carried on the porous carrier layer; the catalyst component including at least one noble metal element from the group consisting of palladium and platinum; the first promoter component including at least one substance from the group consisting of lanthanum, cerium, praseodymium, neodymium, barium, strontium, calcium, and oxides thereof; the second promoter component including at least one substance from the group consisting of magnesium, silicon, and oxides thereof; the third promoter component including at least one substance from the group consisting of nickel, zirconium, cobalt, iron, manganese, and oxides thereof.

4,857,500

METHOD FOR MANUFACTURING THE METALLIC CARRIER BASE MATERIAL FOR MAINTAINING A CATALYST FOR EXHAUST GAS PURIFICATION

Yuzo Hitachi, and Haruo Serizawa, both of Shizuoka, Japan, assignors to Usui Kokusai Sangyo Kabushiki Kaisha, Japan

Filed May 4, 1988, Ser. No. 190,092
Claims priority, application Japan, May 7, 1987, 62-109845
Int. Cl.[4] B01J *32/00*
U.S. Cl. 502—439 24 Claims

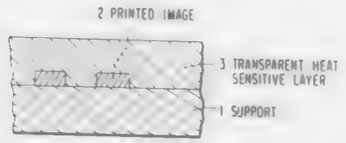
1. A method for manufacturing a metallic carrier base material having a multi-layer structure for use in maintaining a catalyst for exhaust gas purification, comprising assembling alternate layers of a planar band material made of a thin steel strip and a corrugated band material made of a thin steel strip to form a multi-layer body having a plurality of screen-like vent holes in an axial direction, said multi-layer body serving as a contact portion, and immersion treating the multi-layer body in a molten aluminum bath.

4,857,501

MANUFACTURING METHOD OF A HEAT SENSITIVE RECORDING MATERIAL

Toshimasa Usami; Akihiro Shimomura; Sumitaka Tatsuta, and Seiji Hatakeyama, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 28, 1987, Ser. No. 138,163
Claims priority, application Japan, Dec. 25, 1986, 61-203748; Apr. 9, 1987, 62-088196; Apr. 9, 1987, 62-088197
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—200 6 Claims



1. Heat sensitive recording materials comprising a support having thereon at least one heat sensitive layer containing a colorless or light colored electron donating dye precursor enclosed in a microcapsule and a color developer, which recording material is manufactured by a method which comprises coating a composition containing (a) an emulsified dispersion prepared by dissolving said color developer in an organic solvent slightly soluble or insoluble in water and dispersing said developer containing solvent, and (b) said microcapsules on a support then drying the coat to provide a transparent heat sensitive layer.

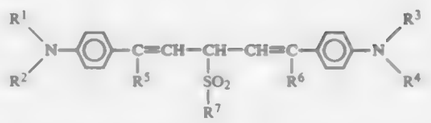
4,857,502

THERMOSENSITIVE RECORDING MATERIAL

Takashi Ueda; Keiichi Maruta, and Hiroshi Yaguchi, all of Numazu, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

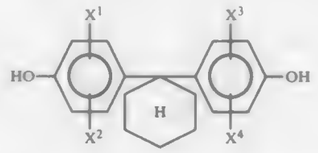
Filed Jun. 19, 1987, Ser. No. 63,869
Claims priority, application Japan, Jun. 19, 1986, 61-143946; Sep. 10, 1986, 61-213593
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—217 6 Claims

1. In a thermosensitive recording material comprising a support material and a thermosensitive coloring layer formed on said support material, said thermosensitive coloring layer comprising a colorless or light-colored leuco dye and a color developer capable of inducing color formation in said leuco dye upon application of heat thereto, the improvement wherein said leuco dye is a compound having general formula (I),



(I)

wherein R^1, R^2, R^3 and R^4 each represent hydrogen or an alkyl group having a substituent, R^5 and R^6 each represent hydrogen or a phenyl group which may have a substituent, and R^7 represents an alkyl group which may have a substituent or a phenyl group which may have a substituent,
and said color developer is a compound having general formula (II),



(II)

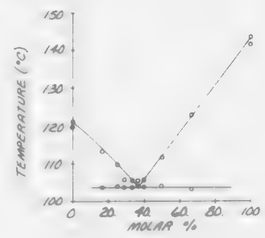
wherein X^1, X^2, X^3 and X^4 each represent hydrogen or an alkyl group having 1 to 4 carbon atoms.

4,857,503

THERMAL DYE TRANSFER MATERIALS

Susan K. Jongewaard, St. Paul; Terrance P. Smith, Woodbury, and Krzysztof A. Zaklika, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 13, 1988, Ser. No. 193,947
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 22 Claims



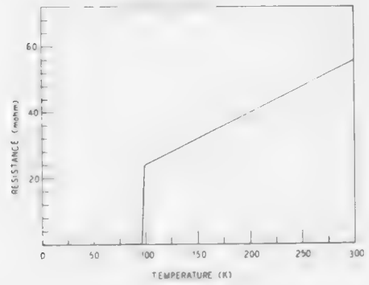
1. A thermal dye transfer element comprising a substrate having on one side thereof a layer of a polymeric binder having a mixture of at least two dyes therein, said dyes being capable of forming a eutectic composition and at least one pair of said dyes being present within said binder in a ratio which is between 0.25 and 4.0 times the ratio of said pair of dyes in a eutectic point composition, said mixture of dyes comprising at least 20% by weight of said layer and said eutectic composition has a melting point which is at least 5° C. lower than the lowest melting temperature of any of said dyes in said eutectic composition.

4,857,504

MELT-PRODUCED HIGH TEMPERATURE RARE EARTH BARIUM COPPER OXIDE SUPERCONDUCTOR AND PROCESSES FOR MAKING SAME

Allen M. Hermann, and Zhengzhi Sheng, both of Fayetteville, Ark., assignors to University of Arkansas, Fayetteville, Ark.

Filed Aug. 25, 1987, Ser. No. 89,067
Int. Cl.[4] C01F *17/00;* C01G *3/02;* C04B *35/62;* H01L *39/12*
U.S. Cl. 505—1 35 Claims



1. A method for making a melt-produced high temperature superconductor comprising the steps of:
mixing and grinding $BaCO_3$ and CuO with nominal compositions of at least one compound chosen from the group consisting of $Ba_2Cu_3O_5$, $BaCu_3O_4$, $BaCu_4O_5$, $BaCu_6O_7$, and $BaCu_{12}O_{13}$;
pressing the resultant mixture into a pellet;
placing the pellet on a powder comprising at least one compound chosen from the group consisting of $R_{1.2}Ba_{0.8}CuO_{3.6}$, $RBa_2Cu_3O_{4.5}F_4$, $RBa_2O_{3.5}$, $RBa_2O_{2.5}$, or R_2O_3 wherein R is chosen from the group of rare earth metals excluding: Tb, Pr, and Ce;
heating the pellet and the powder in a furnace to a temperature of greater than or equal to 950° C. and less than or equal to 1000° C. to form a melt at a pellet: powder interface; and
removing the melt-produced superconductor from the powder in which the superconductor is embedded.

35. A process for making melt-produced superconductor components of arbitrary shape comprising the steps of:
mixing and grinding $BaCO_3$ and CuO in a nominal composition of $BaCu_3O_4$;
heating the mixture in air at about 900° C. for about 12 hours, cooling the mixture, and grinding it;
mixing and grinding Y_2O_3, $BaCO_3$, and CuO in a nominal composition of $Y_{1.2}Ba_{0.8}CuO_{3.6}$ powder;
heating the mixture in air at about 950° C. for about 12 hours, then cooling it and grinding it;
pressing the $BaCu_3O_4$ powder into an arbitrary shape and placing it onto the $Y_{1.2}Ba_{0.8}CuO_{3.6}$ powder;
heating the $BaCu_3O_4$ and $Y_{1.2}Ba_{0.8}CuO_{3.6}$ in flowing O_2 at about 950° C. for about 12 hours to form a melt at the pellet:powder interface;
holding the furnace at 650° C. for about 4 hours;
cooling the furnace to less than 200° C. and removing from the furnace the heated materials to bring them to room temperature; and
separating a black melt-produced superconductor from the remaining $Y_{1.2}Ba_{0.8}CuO_{3.6}$ powder in which the superconductor is embedded.

4,857,505

SUSTAINED RELEASE COMPOSITIONS FOR PARENTERAL ADMINISTRATION AND THEIR USE

Volker D. Arendt, Princeton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 9, 1987, Ser. No. 23,427
Int. Cl.[4] A61K *37/02, 37/24, 37/36*
U.S. Cl. 514—2 21 Claims

1. A biologically active sustained release composition consisting essentially of an adduct of a growth hormone, growth factor, somatomedin or biologically active fragment thereof, covalently bonded through a carbamate or carbonate linkage to an activated polysaccharide.

4,857,506

SUSTAINED RELEASE GROWTH HORMONE COMPOSITIONS FOR PARENTERAL ADMINISTRATION AND THEIR USE

Praveen Tyle, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 12, 1987, Ser. No. 2,536
Int. Cl.[4] A61K *37/02, 37/24, 37/36*
U.S. Cl. 514—12 14 Claims

1. A parenteral biologically active sustained release multiple water-in oil-in water, emulsion consisting essentially of an internal aqueous phase W_1 containing on a weight basis of about 55.0% to 99.7% water, 0.2% to 5.0% carbonated buffered saline, 0.1% to 40.0% growth hormone, growth factor, somatomedin or a biologically active fragment or derivatives thereof; 0% to 40.0% polyol, glycol or sugar, and 0% to 2.0% preservatives or stabilizers, the oil phase O is comprised on a weight basis of about 65.0% to 98% pharmaceutically and pharmacologically acceptable oil or water immiscible liquid, 0% to 15.0% thickening agent, gelling agent or a mixture thereof, 2.0% to 40.0% non-ionic surfactant(s), the external aqueous phase W_2 is comprised on a weight basis of about 38.0% to 98.0% water, 0.2% to 5.0% carbonated buffered saline, 2.0% to 20.0% non-ionic surfactant(s), 0% to 15.0% thickening agent, gelling agent or a mixture thereof, 0% to 2.0% preservative and/or stabilizer and 0% to 60% polyol, glycol, or a sugar.

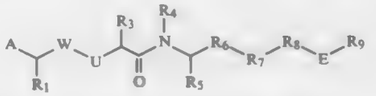
4,857,507

ANGIOTENSINOGEN ANALOGS

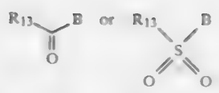
Saul H. Rosenberg, Libertyville; Joseph Dellaria, Lindenhurst; Anthony K. L. Fung, Waukegan; Dale J. Kempf, Lake Villa; Jay R. Luly, and Jacob J. Plattner, both of Libertyville, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 850,802, Apr. 11, 1986, which is a continuation-in-part of Ser. No. 820,274, Jan. 16, 1986. This application Jan. 9, 1987, Ser. No. 946,883
The portion of the term of this patent subsequent to Feb. 24, 2004, has been disclaimed.
Int. Cl.[4] A61K *37/43;* C07K *5/08, 5/10*
U.S. Cl. 514—18 14 Claims

1. A compound of the formula:



wherein A is hydrogen; loweralkyl; arylalkyl; OR_{10} or SR_{10} wherein R_{10} is hydrogen, loweralkyl or aminoalkyl; $NR_{11}R_{12}$ wherein R_{11} and R_{12} are independently selected from hydrogen, loweralkyl, aminoalkyl, cyanoalkyl and hydroxyalkyl;



wherein B is NH, alkylamino, S, O, CH_2 or CHOH and R_{13} loweralkyl, cycloalkyl, aryl, arylalky, alkoxy, alkenyloxy, hydroxyalkoxy, dihydroxyalkoxy, arylalkoxy, arylalkoxyalkyl, amino, alkylamino, dialkylamino, (hydroxyalkyl)(alkyl-)amino, (dihydroxyalkyl)(alkyl)amino, aminoalkyl, alkoxycarbonylalkyl, carboxyalkyl, N-protected aminoalkyl, alkylaminoalkyl, (N-protected)(alkyl)aminoalkyl, dialkylaminoalkyl, (heterocyclic)alkyl or a substituted or unsubstituted heterocyclic; W is C or CHOH and U is CH_2 or NR_2 with the proviso that when W is CHOH then U is CH_2; R_1 is loweralkyl, cycloalkylmethyl, benzyl, α, α -dimethylbenzyl, 4-methoxybenzyl, halobenzyl, (1-naphthyl)methyl, (2-naphthyl)methyl, (4-imidazolyl)-methyl, phenethyl, phenoxy, thiophenoxy or anilino; provided if R_1 is phenoxy, thiophenoxy or anilino, B is CH_2 or CHOH or A is hydrogen; R_3 is loweralkyl, vinylloweralkyl, benzyl or heterocyclic ring-substituted methyl; R_5 is loweralkyl, cycloalkylmethyl or benzyl; R_2 and R_4 are independently selected from hydrogen and loweralkyl; R_6 is CHOH or CO; R_7 is CH_2, CF_2 or CF with the proviso that when R_6 is CO, R_7 is CF_2; R_8 is CH_2, CHR_{14} wherein R_{14} is loweralkyl, cycloalkyl, cycloalkylalkyl, aryl or arylalkyl, or R_7 and R_8 taken together can be



with the proviso that when R_7 is CF_2, R_8 is CH_2; E is S, SO, SO_2, NR_{15} wherein R_{16} is hydrogen or loweralkyl; R_9 is loweralkyl, cycloalkyl, cycloalkylalkyl, aryl, arylalkyl or an N-protected group, or E and R_9 taken together can be N_3, with the proviso that when E is NH, R_9 is an N-protecting group; and pharmaceutically acceptable salts thereof.

4,857,508

NOVEL PLATELET-AGGREGATION INHIBITOR PEPTIDE DERIVATIVES

Steven P. Adams, St. Charles, Mo.; Larry P. Feigen, Wauconda, and Masateru Miyano, Northbrook, both of Ill., assignors to Monsanto Company, St. Louis, Mo. and G. D. Searle & Co., Skokie, Ill.

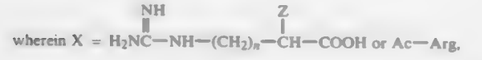
Filed Dec. 3, 1987, Ser. No. 128,379

Int. Cl.[4] A61K *37/20;* C07K *5/10*

U.S. Cl. 514—18 **16 Claims**

1. A tetrapeptide derivative having inhibitory activity toward platelet aggregation selected from the group consisting of

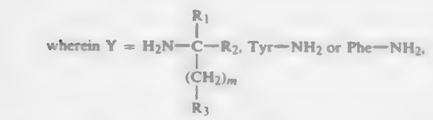
X-Gly-Asp-Y



wherein X = $H_2NC(=NH)-NH-(CH_2)_n-CH(Z)-COOH$ or Ac—Arg,

Z=H, NH_2 or NH-Acyl,

n=1 to 4,



wherein Y = $H_2N-C(R_1)(-(CH_2)_m-R_3)-R_2$, Tyr—$NH_2$ or Phe—NH_2,

R_1=H, alkyl, phenyl or phenylalkyl,

R_2=H, COOH, $CONH_2$, $COCH_3$, CH_2OH, CH_2NH_2, $C(NH)CH_3$ or $C(NH)NH_2$,

R_3=phenyl, unsubstituted biphenyl or naphthyl, each substituted with 1 to 3 alkyl or alkoxy groups, or an unsubstituted naphthyl, biphenyl or unsubstituted pyridyl group,

m=0 to 2,

wherein alkyl and alkoxy each have 1 to 4 carbons, provided that when Y is Tyr-NH_2 or Phe-NH_2, X is Acetyl-Arg, and provided further that when Z is NH_2 or NH-Acyl, X is in the D- or L-amino acid stereo-configuration.

4,857,509

13β-ALKYLMILBEMYCIN DERIVATIVES FOR CONTROLLING PARASITES OF ANIMALS AND PLANTS

Bruno Frei, Liestal; Anthony C. O'Sullivan, Basel, and Jean-Claude Gehret, Aesch, all of Switzerland, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.

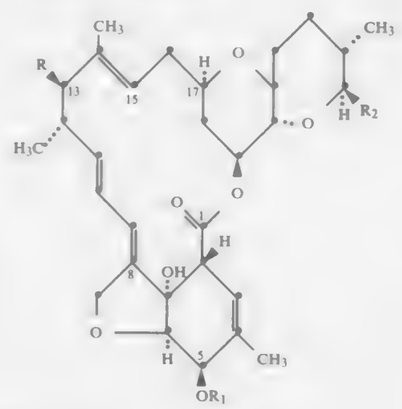
Filed Jan. 17, 1986, Ser. No. 820,490

Claims priority, application Switzerland, Jan. 22, 1985, 278/85

Int. Cl.[4] A61K *31/70;* C07M *17/04;* C07D *313/06*

U.S. Cl. 514—30 **18 Claims**

1. A compound of formula I



(I)

wherein

R is C_1–C_{10}alkyl;

R_1 is hydrogen, a silyl group or a mono-, di- or trisaccharide sugar residue in the furanosyl or pyranosyl form or in a form containing an amino radical, a thiol radical or a cyclic acetal radical; and

R_2 is methyl, ethyl, isopropyl or sec-butyl.

14. A method of combatting ecto- and endoparasites and harmful insects affecting animals, which process comprises treating the infested animal or the locus of the pest with a pesticidally effective amount of a compound of claim **1**.

4,857,510

COMPOSITIONS FOR COMBATING PESTS CONTAINING MACROCYCLIC LACTONES

Werner Knauf, Eppstein; Anna Waltersdorfer, Frankfurt am Main; Alfons Sagenmüller, Kelsterbach; Hubert Stier, Flörsheim am Main, all of Fed. Rep. of Germany, and Jan Lourens, Makati, Philippines, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 23, 1987, Ser. No. 6,569

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1986, 3602276; Sep. 17, 1986, 3631559

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—30 **1 Claim**

1. A composition for combating pests of the order of Homoptera, Lepidoptera or Acarina which composition comprises abamectin in combination with a synergistically effective amount of endosulfan, heptenophos, or hexythiazox, wherein the compounds are present at a proportion of from 1 part of abamectin to 32 parts of endosulfan, 1 part of abamectin to 32 parts of heptenophos, or 1 part of abamectin to 2 to 4 parts of hexythiazox.

4,857,511

TREATMENT OF HUMAN VIRAL INFECTIONS

Janet L. Rideout, Raleigh; David W. Barry, Chapel Hill; Sandra N. Lehrman, Durham; Martha H. St. Clair, Durham, and Phillip A. Furman, Durham, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 776,899, Sep. 17, 1985, Pat. No. 4,724,232. This application Feb. 8, 1988, Ser. No. 152,977

Int. Cl.[4] A61K *31/70, 31/52*

U.S. Cl. 514—50 **3 Claims**

1. A method of treating a human having AIDS and who is also being administered acyclovir, which comprises administering to said human an effective AIDS treatment amount of the compound 3'-azido-3'-deoxythymidine or a pharmaceutically acceptable salt thereof.

4,857,512

IMMUNOSTIMULATING POLYSACCHARIDES, METHOD FOR USING SUCH, AND PHARMACEUTICAL PREPARATIONS CONTAINING THEM

Hildebert Wagner, Breitbrunn; Meinhart H. Zenk, Munich, and Holger Ott, Emmerthal, all of Fed. Rep. of Germany, assignors to Lomapharm, Rudolf Lohmann GmbH KG, Pharmazeutische Fabrik, Langes Feld, Fed. Rep. of Germany

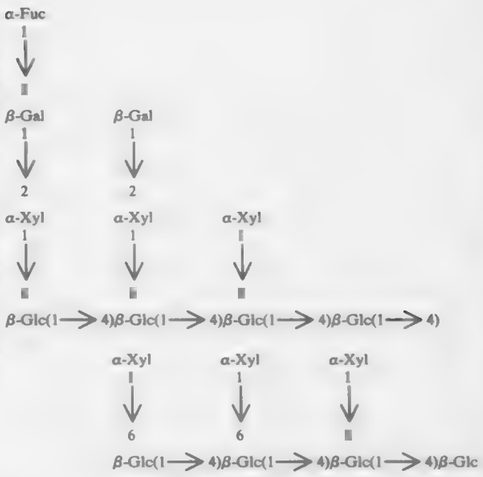
Filed Nov. 21, 1986, Ser. No. 933,482

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1985, 3541945

Int. Cl.[4] A61K *31/715, 31/70*

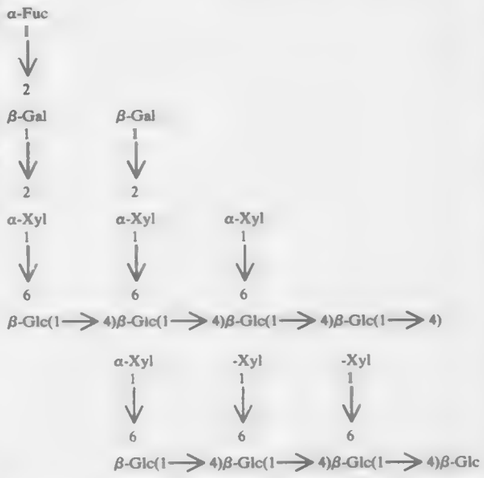
U.S. Cl. 514—54 **11 Claims**

1. Biochemically pure polysaccharide fractions having an average molecular weight of about 10,000 with a molecular weight range of from about 5,000 to about 15,000 of the general structure:



said polysaccharide fraction having immunostimulatory activity, wherein Fuc represents fucose, Gal represents galactose, Xyl represents xylose, and Glc represents glucose.

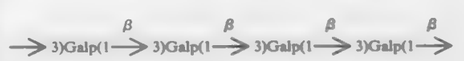
2. Biochemically pure polysaccharide fractions having an average molecular weight of about 25,000 with a molecular weight range of from about 20,000 to about 30,000 of the general structure:



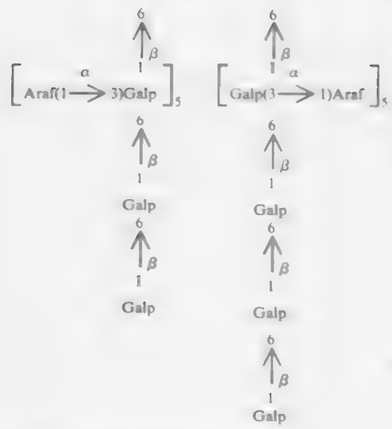
said polysaccharide fractions having immunostimulatory activity, wherein Fuc represents fucose, Gal represents galactose, Xyl represents xylose, and Glc represents glucose.

3. Biochemically pure polysaccharide fractions having an average molecular weight of about 110,000 and a molecular weight range of from about 100,000 to about 120,000 as measured in 0.2M phosphate buffer having a general structure comprising the following moieties:

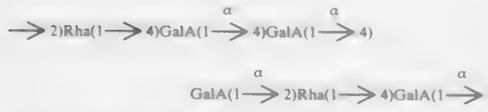
(a) an arabinagalactan moiety of the formula:



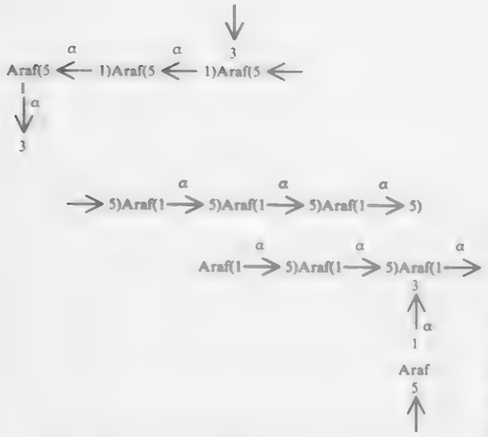
-continued



(b) a rhamnogalacturonan moiety of the formula:



(c) an arbinan moiety of the formula:



said polysaccharide fractions having immunostimulatory activity, wherein Galp represents galactopyranose, Rha represents rhamnose, GalA represents galacturonic acid and Araf represents arabinofuranose.

4,857,513

DIPHOSPHONIC ACID COMPOUNDS, PROCESSES FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Teruo Oku; Eishiro Todo; Chiyoshi Kasahara; Katsuya Nakamura; Hiroshi Kayakiri, and Masashi Hashimoto, all of Ibaraki, Japan, assignors to Fujisiwa Pharmaceutical Co., Ltd., Osaka, Japan

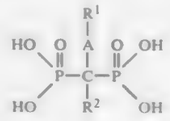
Filed Apr. 24, 1987, Ser. No. 42,444

Claims priority, application United Kingdom, Apr. 24, 1986, 8610019; Aug. 5, 1986, 8619074; Mar. 6, 1987, 8705347

Int. Cl.[4] C07F *9/38;* **A61K** *31/095, 31/16, 31/185*

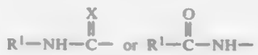
U.S. Cl. 514—76 **8 Claims**

1. A compound of the formula:



wherein

R^1—A— is a group of the formula:



in which

R^1 is aryl or a heterocyclic group, each of which may be substituted with substituent(s) selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, halo(lower)alkyl, acyl, acylamino and halogen, and

X is O or S, and

R^2 is hydrogen or lower alkyl,

and pharmaceutically acceptable salts thereof.

8. A method for the treatment of bone diseases characterized by abnormal bone metabolism in human beings or animals comprising administering an effective amount of a compound of claim 1 or pharmaceutically acceptable salts thereof.

4,857,514

VIRUS INACTIVATION

Arnold S. Lippa, Franklin Lakes, N.J., and David I. Scheer, Branford, Conn., assignors to Yeda Research and Development Company, Ltd., Rehovot, Israel

Filed Sep. 17, 1985, Ser. No. 776,918

Int. Cl.[4] A61K *31/685*

U.S. Cl. 514—78 **36 Claims**

1. A method for inactivating a virus having a lipid-containing capsid, comprising contacting a virus having a lipid-containing capsid with an inactivating amount of a composition comprising neutral lipids, phosphatidyl choline and phosphatidyl ethanolamine; the neutral lipids comprising glycerides; the neutral lipids, phosphatidyl choline and phosphatidyl ethanolamine being present in the composition in proportions that provide formation of integrated structures of said composition, which structures promote lipid exchange with said capsid to inactivate the virus.

4,857,515

CERTAIN ANTIHYPERTENSIVE 1,4-DIHYDRO-6-METHYL-5-PHOSPHONIC ACID-4-ARYL-3-CARBOXYLIC ACID-2-CYANO DIESTERS

Kiyoshi Kimura, Takatsuki; Masahiro Kise, Kyoto; Iwao Morita, Tsuzuki; Toshio Tomita, Kusatsu, and Masami Tsuda, Joyo, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

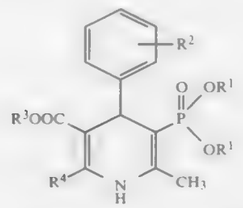
Filed Oct. 30, 1987, Ser. No. 115,170

Claims priority, application Japan, Oct. 31, 1986, 61261587

Int. Cl.[4] C07F *9/58;* **A61K** *31/44, 31/665*

U.S. Cl. 514—89 **10 Claims**

1. A compound of formula (I):



(I)

wherein R^1 is alkenyl of from two to six carbon atoms or alkyl of from one to about six carbon atoms or both of the depicted R^1 groups together represent trimethylene and form a six-membered ring together with the depicted oxygen and phosphorus atoms, R^2 is nitro, trifluoromethyl or halogen, R^3 is alkyl of from one to about six carbon atoms and R^4 is nitrile.

10. A method for the prophylaxis or treatment of hypertension, angina pectoris or cerebral circulation disorders in animals, including humans, which comprises administering to an animal, including humans, in need thereof an effective amount of a compound according to claim 1.

4,857,516

COUMARAN DERIVATIVES AND THEIR PHARMACEUTICAL USE

Shinji Terao, Osaka, Japan, and Yoshitaka Maki, Highland Park, Ill., assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

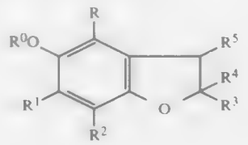
Filed Dec. 22, 1987, Ser. No. 136,273

Claims priority, application Japan, Dec. 27, 1986, 61-313380; Sep. 18, 1987, 62-235491

Int. Cl.[4] A61K *31/34;* **C07D** *307/79*

U.S. Cl. 514—100 **16 Claims**

1. A compound of the formula



wherein

R is a C_{1-6} alkyl group;

R^0 is (1) hydrogen, (2) a C_{1-10} alkanoyl group which may optionally be substituted by carboxyl, (3), a C_{3-7} cycloalkyl-carbonyl group, (4) a C_{6-14} aryl-carbonyl group, (5) a pyridinecarbonyl group which may optionally be substituted by C_{1-6} alkyl or phenyl and which may be made quaternary or (6) a sulfonic acid or phosphoric acid acyl which contains as a substituent a C_{1-6} alkyl or phenyl group;

R^1 and R^2 each are a C_{1-6} alkyl group which may optionally be substituted by 1 to 3 hydroxy, halogen, nitro, trifluoromethyl, carboxy, C_{1-3} alkoxy-carbonyl, 3-pyridyl, 1-imidazolyl or 5-thiazolyl groups, or wherein R^1 and R^2 are combined to form a benzene or naphthalene ring which may optionally be substituted by 1 to 3 C_{1-3} alkyl, C_{1-3} alkoxy, hydroxy, nitro or halogen groups;

R^3 and R^4 each are hydrogen or a C_{1-20} alkyl group which may optionally be substituted by 1 to 5 groups of the class consisting of (1) hydroxy, (2) carboxy, (3) C_{1-4} alkoxycarbonyl groups or (4) C_{6-14} aryl groups which may optionally be substituted by 1 to 5 hydroxy, C_{1-3} alkyl, halogen, C_{1-3} alkoxy, carboxy, trifluoromethyl, 3-pyridyl, 1-imidazolyl or 5-thiazolyl groups, or wherein R^3 and R^4 are combined to form a C_{2-5} alkylene group;

R^5 is a pyridyl, 1-imidazolyl or 5-thiazolyl group, which may optionally be made quaternary at the ring-constituting nitrogen atom with a C_{1-3} alkyl group, a thienyl group or a phenyl, 1- or 2-naphthyl, indanyl or tetralyl group, in which groups each may optionally be substituted by 1 to 5 groups the class consisiting of (1) C_{1-20} alkyl, (2) C_{1-6} alkyl which is substituted by hydroxy, carboxy, C_{1-4} alkoxycarbonyl, piperidinyl or phenylthio, (3) C_{2-4} alkenyl which may be substituted by carboxy or C_{1-6} alkoxycarbonyl, (4) hydroxy, (5) halogen, (6) formyl, (7) C_{1-3} alkoxy, (8) carboxy, (9) trifluoromethyl, (10) di-C_{1-3} alkylamino, (11) C_{5-7} cycloalkyl or (12) C_{1-3} alkylthio groups,

or a pharmaceutically acceptable salt thereof.

4,857,517

QUINUCLIDYL BENZOXEPINS AS 5-HT$_3$ ANTAGONISTS

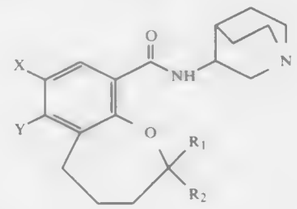
Raymond Youssefyeh, Princeton Junction, N.J.; Scott I. Klein, Audubon, Pa.; Henry F. Campbell, North Wales, Pa., and Donald E. Kuhla, Doylestown, Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Filed Feb. 4, 1988, Ser. No. 152,112

Int. Cl.[4] A61K *31/625;* **C07D** *453/02*

U.S. Cl. 514—161 **14 Claims**

1. A compound of the formula:



where:

X is hydrogen or halo;

Y is hydrogen, amino or loweralkylamino;

R_1 and R_2 are independently hydrogen or loweralkyl; or a pharmaceutically acceptable thereof.

13. A method for the treatment of gastric prokinetic disorders in humans and mammals comprising administering thereto an effective amount of a compound of the formula according to claim 1.

4,857,518

HYDROXYLATED 24-HOMO-VITAMIN D DERIVATIVES AND METHODS FOR PREPARING SAME

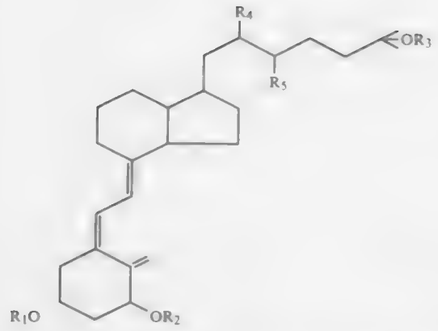
Hector F. DeLuca, Madison, Wis.; Nobuo Ikekawa, Tokyo, Japan, and Yoko Tanaka, Delmar, N.Y., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 657,549, Oct. 4, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 835,065

Int. Cl.[4] A61K *31/59;* **C07J** *9/00*

U.S. Cl. 514—167 **10 Claims**

1. Compounds having the formula



where R_1, R_2 and R_3 are each selected from the group consisting of hydrogen, an acyl group having from 1 to about 4 carbon atoms and benzoyl and R_4 and R_5 each represent hydrogen atoms or taken together form a carbon to carbon double bond.

4,857,519

NOVEL PHARMACEUTICAL COMPOSITIONS ENDOWED WITH ANTI-PROGESTERONIC PROPERTIES AND A PROCESS FOR MAKING THE SAME

Jacques Paris, 31 Cap de Croix, 06100 Nice, France

Filed May 5, 1987, Ser. No. 46,936
Claims priority, application France, May 5, 1986, 86 06457
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—182 **8 Claims**

1. A method of inducing menses, impairing nidation, or inducing abortion in a mammal comprising the step of reducing endometrial proliferation in said mammal by administering to said mammal at an appropriate time in its menstrual cycle a pharmaceutically effective amount of 17β-OR-17α-ethynyl-5α-androst-2-ene, wherein R is hydrogen, an acyl residue of an organic carboxylic acid having from one to ten carbon atoms, a lower alkyl radical having from one to ten carbon atoms, or a tetrahydropyranyl radical.

4,857,520

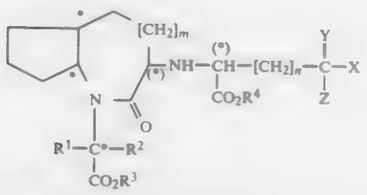
FUSED AZEPINONE AND AZOCINONE DERIVATIVES, PROCESSES FOR THEIR PREPARATION, AGENTS CONTAINING THEM AND THEIR USE, AND INTERMEDIATES IN THEIR PREPARATION

Hansjörg Urbach, Kronberg/Taunus; Rainer Henning, Hattersheim am Main; Berward Schölkens, Kelkheim, and Reinhard Becker, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

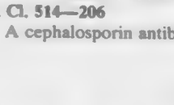
Filed Feb. 12, 1988, Ser. No. 155,595
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1987, 3704661
Int. Cl.[4] A61K *31/555;* **C07D** *223/10, 225/04*
U.S. Cl. 514—183 **10 Claims**

1. A compound of the formula

(I)



in which
m is 1 or 2,
n is 0, 1 or 2 and
R^1 and R^2 are identical or different and are hydrogen, (C_1–C_6)-alkyl or (C_1–C_6)-alkyl which is monosubstituted by hydroxyl, mercapto, (C_1–C_2)-alkoxyl, (C_1–C_2)-alkylmercapto, carboxyl, (C_1–C_2)-alkoxycarbonyl, 3-indolyl, imidazolyl, carbamoyl, amino or guanidino, (C_2–C_6)-alkenyl, (C_3–C_9)-cycloalkyl, (C_3–C_9)-cycloalkenyl, (C_3–C_7)-cycloalkyl-(C_1–C_4)-alkyl, (C_6–C_{92})-aryl, partly hydrogenated (C_6–C_{12})-aryl or (C_6–C_{12})-aryl-(C_1–C_4)-alkyl, which can carry a hydroxyl group in the aryl part,
R^3 and R^4 are identical or different and are hydrogen, (C_1–C_6)-alkyl, (C_2–C_6)-alkenyl or (C_6–C_{12})-aryl-(C_1–C_4)-alkyl, which can be monosubstituted in the aryl part by methoxy or nitro,
Y is hydrogen or hydroxyl,
Z is hydrogen or
Y and Z together are oxygen, and
X is (C_1–C_6)-alkyl, which can be substituted by one or more of amino, acylamino, (C_1–C_4)-alkylamino or di-(C_1–C_9)-alkyamino, or by (C_2–C_6)-alkenyl, (C_5–C_9)-cycloalkyl,



(C_6–C_{12})-aryl, which can be mono-, di- or trisubstituted by one or more of (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, hydroxyl, halogen, nitro, amino, (C_1–C_4)-alkylamino, di-(C_1–C_4)-alkylamino or methylenedioxy, or by indol-3-yl, and
(C_6–C_{12})-aryl is phenyl, naphthyl or biphenylyl, and in the above-defined radicals R^1, R^2 and X:
a free phenolic OH group can be optionally protected by benzyloxycarbonyl, 2-bromobenzyloxycarbonyl, benzyl, 4-methoxybenzyl, picolyl or t-butyl;
a free alcoholic OH group can be protected by t-butyl or benzyl;
a free carboxyl group can be protected by methyl, ethyl, benzyl, 4-nitrobenzyl, 4-methoxybenzyl, 4-picolyl, t-butyl or benzoylmethyl;
a free amino group can be protected by t-butoxycarbonyl, benzyloxycarbonyl, 4-picolyl-oxycarbonyl, 9-fluorenylmethoxycarbonyl, 2,2,2-trichloro-t-butoxycarbonyl, a,a-dimethyl-3,5-dimethoxybenzyloxycarbonyl, 4-biphenylyldimethylmethoxycarbonyl, 4-nitrobenzyloxycarbonyl, 4-methoxybenzyloxycarbonyl, 1-methyl-cyclobutyloxycarbonyl, isobornyloxycarbonyl, 1-adamantyl- oxycarbonyl or 1-(1-adamantyl-1-methylethoxycarbonyl; and
a free guanidino group can be nitrated or can be protected by the protective groups defined above for a free amino group,
or a physiologically acceptable salt thereof.

9. A method of treating hypertension which comprises administering of an effective amount of a compound as claimed in claim 1 or a physiologically acceptable salt thereof.

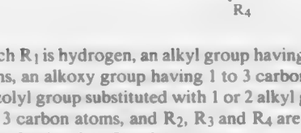
4,857,521

TRIALKYLSILYL PYRIDINIUM CEPHALOSPORIN ANTIBIOTICS

Masayasu Kurono, Sasao; Yutaka Baba, Iwakura; Takahiko Mitani, Mie; Masao Onishi; Yasuaki Kondo, both of Kasugai, and Kiichi Sawai, Funabashi, all of Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Nagoya-shi, Japan

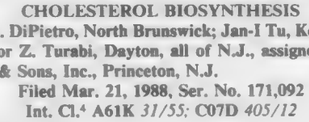
Filed Jan. 23, 1987, Ser. No. 6,199
Claims priority, application Japan, Jan. 29, 1986, 61-15821
Int. Cl.[4] C07D *501/38;* **A61K** *31/545*
U.S. Cl. 514—206 **8 Claims**

1. A cephalosporin antibiotic of the formula

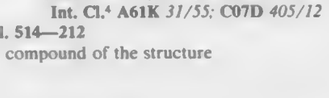


wherein the dotted lines mean a possible double bond;
R is selected from the group consisting of





and



Q is

in which R_1 is hydrogen, an alkyl group having 1 to 3 carbon atoms, an alkoxy group having 1 to 3 carbon atoms, or an oxazolyl group substituted with 1 or 2 alkyl groups having 1 to 3 carbon atoms, and R_2, R_3 and R_4 are each an alkyl group having 1 to 3 carbon atoms;
and a non-toxic salt thereof.

4,857,522

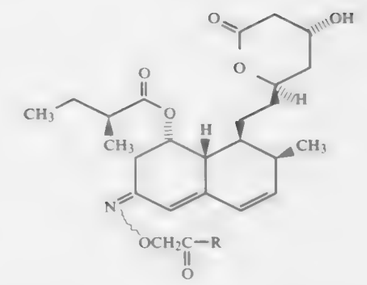
DERIVATIVES OF PRAVASTATIN FOR INHIBITING CHOLESTEROL BIOSYNTHESIS

Richard A. DiPietro, North Brunswick; Jan-I Tu, Kendall Park, and Noor Z. Turabi, Dayton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 21, 1988, Ser. No. 171,092
Int. Cl.[4] A61K *31/55;* **C07D** *405/12*
U.S. Cl. 514—212 **12 Claims**

1. A compound of the structure

(I)



wherein R is hydroxy, lower alkylamine, arylamine, arylalkylamine or heterocyclic alkylamine or an iodinated derivative thereof, which is 5-iodohistamine or methyl 3-iodo-tyrosinate, or an acid salt thereof, the aryl portion of an arylamine or arylalkylamine group being a monocyclic or bicyclic aromatic group which contains 6 to 10 carbons, and the heterocyclic portion of a heterocyclic-alkyl amine being a 5-, 6- or 7-membered ring containing 1-, 2- or 3-hetero atoms which are N, O and/or S.

12. A method for inhibiting cholesterol biosynthesis which comprises administering to a patient in need of such treatment an effective cholesterol biosynthesis inhibiting amount of a compound as defined in claim 1.

4,857,523

RAPID METHOD FOR ATTENUATING THE ALCOHOL DEPENDENCY SYNDROME

Howard S. Lotsof, Staten Island, N.Y., assignor to NDA International, Inc., Staten Island, N.Y.

Filed Jul. 18, 1988, Ser. No. 221,030
Int. Cl.[4] A61U *31/55*
U.S. Cl. 514—214 **9 Claims**

1. The method of treating alcohol dependency and abuse comprising internally administering to one dependent on and abusive of alcohol a dosage of between 4 mg and 25 mg per kg of weight of the abuser of ibogaine or a therapeutically active compound of ibogaine or a mixture thereof.

4,857,524

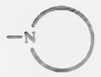
THIAZOLIDINE COMPOUNDS AND THERAPEUTIC METHOD

Sunao Furukawa; Tadashi Yoshimoto, both of Nagasaki; Yukiyoshi Ajisawa, Okaya; Seiichi Ikeguchi, Nagano, and Yukihiko Kinoshita, Matsumoto, all of Japan, assignors to Kissei Pharmaceutical Co., Ltd., Matsumoto, Japan

Filed Aug. 3, 1988, Ser. No. 227,864
Claims priority, application Japan, Aug. 8, 1987, 62-198380; Mar. 7, 1988, 63-53224
Int. Cl.[4] A01N *31/425, 31/54;* **C07D** *417/06*
U.S. Cl. 514—227.5 **27 Claims**

1. A thiazolidine compound corresponding to the formula:

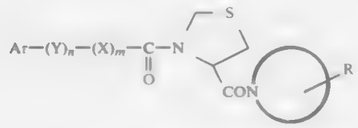
where Ar is a phenyl, naphthyl or pyridyl group; Y is a saturated or olefinically unsaturated alkylene group having 1–5 carbon atoms; n is an integer with a value of zero or 1;



is a 5- or 6-membered saturated heterocyclic group; X is an oxygen atom; m is an integer with a value of zero or 1;

R is hydrogen or an alkoxycarbonyl group having 2–6 carbon atoms; and pharmaceutically acceptable salts thereof.

24. A method of treatment for dementia or amnesia which comprises administering a prescribed dosage to a human patient of a therapeutic agent corresponding to the formula:



wherein Ar is a phenyl, naphthyl or pyridyl group; Y is a saturated or olefinically unsaturated alkylene group having 1–5 carbon atoms; n is an integer with a value of zero or 1;



is a 5- or 6-membered saturated heterocyclic group; X is an oxygen atom; m is an integer with a value of zero or 1; R is hydrogen or an alkoxycarbonyl group having 2–6 carbon atoms; or pharmaceutically acceptable salt thereof.

4,857,525

QUATERNARY AMMONIUM RETINOATES, THEIR USE IN COSMETICS AND IN DERMOPHARMACY

Michel Philippe, Drancy; Henri Sebag; Didier S. Leger, both of Paris, and Jean L. Leveque, Montfermeil, all of France, assignors to L'Oreal, Paris, France

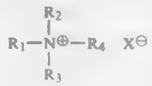
Filed May 5, 1988, Ser. No. 190,441

Claims priority, application Luxembourg, May 6, 1987, 86865

Int. Cl.[4] A61K *31/205, 31/535;* **C07D** *295/14*

U.S. Cl. 514—227.5 **8 Claims**

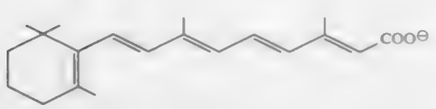
1. Quaternary ammonium retinoate of formula



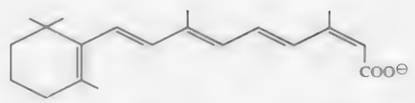
in which:

X^- denotes:

either an all-trans-retinoate of formula:



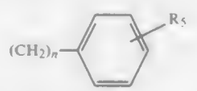
or a 13-cis-retinoate of formula:



(i) R_1, R_2 and R_3, which may be identical or different, denote a saturated C_1–C_4 linear alkyl group capable of bearing one or more hydroxyl group(s) at the end of the chain or in the chain;

R_4 denotes a C_{12}–C_{18} linear alkenyl or alkyl group;

(ii) R_3 denotes a group;



in which n equals 0 or 1, R_5 denotes a hydrogen atom, a hydroxyl, a halogen atom, a C_1–C_{18} hydroxyl alkyl or alkyl group;

R^1, R^2 and R^4 having the same meanings as those under (i);

R^3 and R^4 having the same meanings as those under (i) and (ii).

4. A composition, containing at least one compound as defined in claim **1** in a vehicle suitable for topical application.

4,857,526

AROMATIC 2-AMINOALKYL-1,2-BENZOISOTHIAZOL-3(2H)-ONE-1,1-DIOXIDE

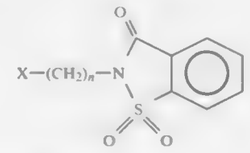
Marcel Hibert, Strasbourg, and Maurice W. Gittos, Plobsheim, both of France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 158,432, Feb. 22, 1988, Pat. No. 4,789,676, which is a division of Ser. No. 836,276, Mar. 5, 1986, Pat. No. 4,748,182. This application Sep. 12, 1988, Ser. No. 244,894

Int. Cl.[4] A61K *31/38;* **C07D** *265/28*

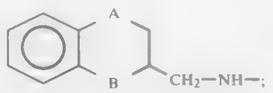
U.S. Cl. 514—230.5 **13 Claims**

1. An aromatic 2-aminoalkyl-1,2-benzoisothiazol-3(2H) one-1,1-dioxide derivative having the formula



wherein n is an integer of from 2 to 5;

X is



wherein one of A and B is an oxygen and the other is NR' wherein R' is hydrogen or methyl; or a pharmaceutically acceptable acid addition salt thereof.

10. A method for relieving the symptoms of anxiety in a patient in need thereof, which comprises the administration to said patient of an anxiolytic effective amount of a compound of one of claims **1–9**.

4,857,527

MORPHOLINE CONTAINING PYRIDINE COMPOUNDS, COMPOSITIONS AND USE

Takao Takaya, Kawanishi; Hisashi Takasugi, Osaka; Kimio Esumi, Kobe; Atsushi Kuno, Osaka; Hiroyoshi Sakai, Uji; Kazuhiro Maeda, Yamatotakada, and Yoshie Sakamoto, Yonago, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

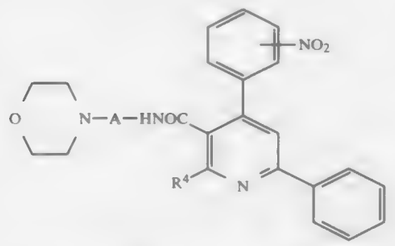
Continuation-in-part of Ser. No. 940,923, Dec. 12, 1986. This application Apr. 21, 1988, Ser. No. 184,195

Claims priority, application United Kingdom, Dec. 12, 1985, 8530602; Japan, Jun. 11, 1987, 62-145996; Oct. 5, 1987, 62-251771

Int. Cl.[4] A61K *31/535;* **C07D** *413/12*

U.S. Cl. 514—237.2 **7 Claims**

1. A compound of the formula:



wherein R_4 is lower alkyl and A is lower alkylene, and a pharmaceutically acceptable salt thereof.

4,857,528

SUBSTITUTED PYRROLIDINONES, PHARMACEUTICAL COMPOSITIONS AND USE

Karl-Heinz Weber, Gau-Algesheim; Claus Schneider, Ingelheim am Rhein; Gerhard Walther, Bingen am Rhein; Dieter Hinzen, Bingen; Franz J. Kuhn, Gau-Algesheim; Erich Lehr, Waldalgesheim; Helmut Ensinger, Wackernheim, and Wolfgang Tröger, Stromberg, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

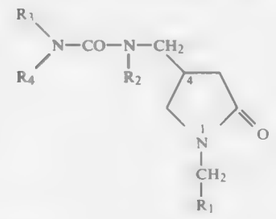
Division of Ser. No. 943,532, Dec. 18, 1986, Pat. No. 4,762,832, which is a division of Ser. No. 738,152, May 24, 1985, Pat. No. 4,670,456. This application Apr. 20, 1988, Ser. No. 183,819

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420193

Int. Cl.[4] A61K *31/435, 31/495;* **C07D** *401/12, 403/12*

U.S. Cl. 514—252 **7 Claims**

1. Substituted pyrrolidinones of the formula



(1)

wherein

R_1 is a phenyl group which can be mono- or di-substituted by methyl, methoxy, fluorine, chlorine, bromine or trifluoromethyl, or a pyridyl group;

R_2 is hydrogen or a straight-chained or branched alkyl group with 1–4 carbon atoms;

R_3 and R_4 together with the nitrogen atom form a piperidine or piperazine ring, which ring can be substituted by 1 or 2 methyl groups and, in the case of piperazine, can also be substituted at the 4-position nitrogen atom with a phenyl, chlorophenyl or benzyl group;

as well as physiologically acceptable acid addition salts thereof.

6. A pharmaceutical composition for treating cerebral insufficiency comprising a pharmaceutically acceptable carrier and an effective amount of a compound in accordance with claims **1, 2, 3** or **4**.

4,857,529

INTERFERON INDUCING, ANTI-VACCINIA, AND/OR ANTI-INFLUENZA COMPOSITIONS

Yoshiyuki Tahara, Ohi; Hiroyasu Koyama, Ageo; Yasuhiro Komatsu, Niiza; Reiko Kubota, Tokyo, and Toshihiro Takahashi, Ohi, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Japan

Division of Ser. No. 256,579, Apr. 22, 1981, Pat. No. 4,755,601. This application Apr. 7, 1988, Ser. No. 178,510

Claims priority, application Japan, Apr. 23, 1980, 55-55108

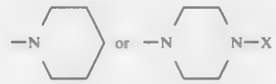
Int. Cl.[4] A61K *31/495, 31/445, 31/40, 31/415*

U.S. Cl. 514—255 **4 Claims**

1. A pharmaceutical composition comprising an interferon inducing, anti-vaccinia, and/or anti-influenza effective amount of a compound of the formula

$$H-(CH_2-C(CH_3)=CH-CH_2)_9-R \qquad I$$

wherein R is a heterocyclic group selected from



and X is selected from the group consisting of H and hydroxy-lower alkyl and non-toxic, pharmaceutically acceptable acid addition salts thereof and a pharmaceutically acceptable carrier.

4,857,530

SUBSTITUTED QUINAZOLINONES AS ANTICANCER AGENTS

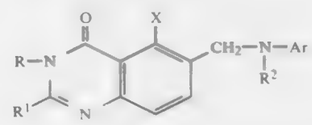
Ellen M. Berman; Leslie M. Werbel, and Dennis J. McNamara, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 3, 1987, Ser. No. 116,929

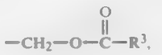
Int. Cl.[4] A61K *31/505;* **C07D** *401/12*

U.S. Cl. 514—259 **17 Claims**

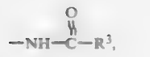
1. A compound of the formula



wherein R is hydrogen, an alkyl group of one to six carbon atoms, or

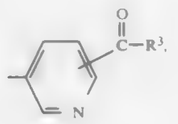


in which R^3 is an alkyl group of one to six carbon atoms; R^1 is hydrogen, an alkyl group of one to six carbon atoms, $-NR^4R^5$, in which R^4 and R^5 are each independently hydrogen or an alkyl group of one to six carbon atoms, or



in which R^3 is as defined above; R^2 is an alkyl group of one to six carbon atoms, an alkenyl group of two to six carbon atoms, an alkynyl group of two to six carbon atoms, an alkynyl group substituted by $—NR^4R^5$, in which R^4 and R^5 are as defined above; X is hydrogen, an alkyl group of one to six carbon atoms, or halogen;

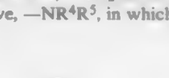
Ar is



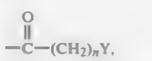
in which R^3 is as defined above, or



in which R^6 represents one or more substituents, the same or different, selected from the group consisting of hydrogen, hydroxy, alkoxy, halogen, nitro, cyano, $—OCF_3$, $—SO_2R^3$, in which R^3 is as defined above, $—SO_2NR^4R^5$, in which R^4 and R^5 are as defined above, $—NR^4R^5$, in which R^4 and R^5 are as defined above,



in which R^3 is as defined above,



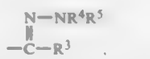
in which Y is halogen or NR^4R^5, in which R^4 and R^5 are as defined above and n is one to three,



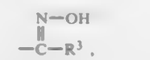
in which n, R^4, and R^5 are as defined above,



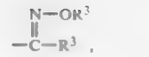
in which R^4 and R^5 are as defined above,



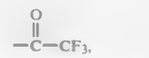
in which R^3, R^4, and R^5 are as defined above,



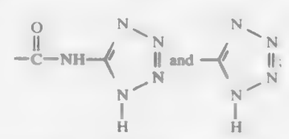
in which R^3 is as defined above,



in which R^3 is as defined above, and



with the proviso that when R^6 is a single substituent R^6 is also selected from the group consisting of



or a pharmaceutically acceptable acid or base addition salt thereof.

16. A method of inhibiting thymidylate synthase comprising administering to a host suffering therefrom a therapeutic effective amount of a compound according to claim 1 in unit dosage form.

4,857,531

GUANINE DERIVATIVES

David A. Borthwick, London; Barrie E. Kirk, Ickenham; Derek N. Evans, Greenford; Keith Biggadike, Northolt, and Leslie Stephenson, Coddenham near Ipswich, all of England, assignors to Glaxo Group Limited, London, England

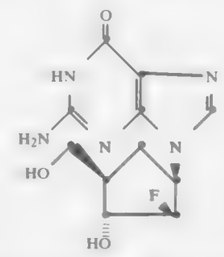
Filed Aug. 15, 1986, Ser. No. 896,957

Claims priority, application United Kingdom, Aug. 16, 1985, 8520553; Jun. 13, 1986, 8614395

Int. Cl.[4] C07D *473/18*; A61K *31/52*

U.S. Cl. 514—262 **9 Claims**

1. A compound of formula (I)



(I)

and physiologically acceptable salts and solvates thereof.

4,857,532

COCKROACH GROWTH REGULATING COMPOSITION AND METHOD

Philip G. Koehler, Gainesville, Fla.; Richard Kramer, Olney, Md., and Richard S. Patterson, Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed May 2, 1988, Ser. No. 189,037

Int. Cl.[4] A01N *43/90*

U.S. Cl. 514—262 **6 Claims**

1. A method for regulating the growth and mortality of cockroaches comprising administering thereto a cockroach growth regulating and mortality effective amount of allopurinol for a period of time of at least 3 weeks to affect the growth and mortality thereof.

4,857,533

METHOD OF TREATMENT FOR AUTOIMMUNE DISEASES

Fred P. Sherman, Hollywood, and David C. Atkinson, Pembroke Pines, both of Fla., assignors to Baker Cummins Pharmaceuticals, Inc., Miami, Fla.

Filed Dec. 15, 1988, Ser. No. 284,615

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—282 **10 Claims**

1. A method of treating a human or animal patient suffering from an autoimmune disease comprising the daily administration to the patient of from about 1 to about 100 mg of nalmefene or naltrexone.

4,857,534

METHOD OF MAINTAINING RUMINANTS ON HIGH ENERGY LOW FIBER DIET

Warren J. Croom, Jr., Cary, and Winston M. Hagler, Jr., Raleigh, both of N.C., assignors to North Carolina State University, Raleigh, N.C.

Continuation-in-part of Ser. No. 596,929, Apr. 5, 1984, Pat. No. 4,652,571. This application Jan. 12, 1987, Ser. No. 8,638

The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.

Int. Cl.[4] A61K *31/44, 31/415, 31/40, 31/27*

U.S. Cl. 514—299 **8 Claims**

1. A method of maintaining a ruminant on a relatively high energy, low fiber diet, said method comprising administering to said ruminant a parasympathomimetic compound or its salts, at a dosage insufficient to produce a refractory condition but sufficient to (a) increase salivation, (b) increase water flux through the rumen, and (c) increase the rate of flow of digesta from the rumen, whereby the risks of acidosis and displaced abomasum are decreased.

4,857,535

ANTI-SPASMODIC AGENTS HAVING A HETEROCYCLIC RING

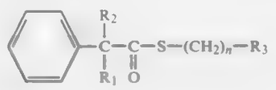
William M. Davis, Tucson, Ariz., assignor to United Pharmaceuticals, Tucson, Ariz.

Division of Ser. No. 817,443, Jan. 9, 1986, Pat. No. 4,721,783. This application Sep. 10, 1987, Ser. No. 95,318

Int. Cl.[4] A61K *31/40, 31/495, 31/535, 31/54*

U.S. Cl. 514—317 **9 Claims**

1. A method of treating a patient suffering smooth muscle spasm comprising administering to the patient an effective amount of an anti-spasmodic agent comprising a compound of formula I



(I)

wherein:

n is an integer from 0 to 2;

R_1 is aryl or cycloalkyl;

R_2 *is hydrogen or hydroxyl; and*

R_3 is a heterocyclic or bicycloheterocyclic nitrogen ring connected to the main chain and is selected from the group consisting of heterocyclic containing the nitrogen atom of a secondary or tertiary amine to which an alkyl group having 1 to 3 carbon atoms is bonded and no other hetero atoms are present in the ring structure; heterocyclic containing the nitrogen atom of a secondary or tertiary amine to which an alkyl group having from 1 to 3 carbon atoms is bonded and one or more hetero atoms selected from the group consisting of N, O and S are present in the ring structure; bicycloheterocyclic ring system containing the nitrogen atom of a secondary or tertiary amine to which an alkyl group having 1 to 3 carbon atoms is bonded and no other hetero atoms are present in the ring system; and bicycloheterocyclic ring system containing the nitrogen atom of a secondary or tertiary amine to which an alkyl group having from 1 to 3 carbon atoms is bonded and one or more hetero atoms selected from the group consisting of N, O and S are present in the ring system.

4,857,536

ANTIHISTAMINIC BENZIMIDAZOLE DERIVATIVES

Philippe Manoury, Verrieres le Buisson; Guy Rossey, Montigny le Bretonneux; Jean Binet, Breuillet; Gérard DeFosse, Paris, and Najib Jabri, Courbevoie, all of France, assignors to Synthelabo, Paris, France

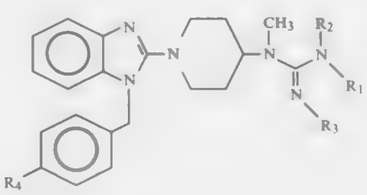
Filed Jul. 22, 1988, Ser. No. 222,758

Claims priority, application France, Jul. 23, 1987, 87 10409

Int. Cl.[4] A61K *31/445*; C07D *401/04*

U.S. Cl. 514—322 **5 Claims**

1. A compound which is a benzimidazole derivative of formula (I)



(I)

in which:

R_1 is hydrogen or methyl,

R_2 is hydrogen, methyl or acetyl,

R_3 is hydrogen, methyl or acetyl, and

R_4 is hydrogen or a halogen,

or a pharmaceutically acceptable acid addition salt thereof.

5. A method of treatment of an allergy which comprises administering to a subject suffering or liable to suffer therefrom an effective amount of a compound as defined in claim 1.

4,857,537

NOVEL THIAZOLIDINE DERIVATIVES

Masaaki Toda, Osaka; Shuichi Ohuchida, Kyoto, and Hiroyuki Ohno, Shiga, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Japan

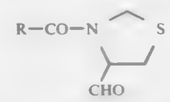
Filed Feb. 23, 1988, Ser. No. 159,073

Claims priority, application Japan, Feb. 23, 1987, 62-37844

Int. Cl.[4] C07D *277/04*; B61K *31/425*

U.S. Cl. 514—365 **18 Claims**

1. A novel thiazolidine derivative of general formula:

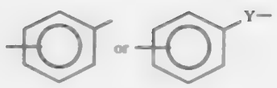


(I)

wherein R represents a group of general formula:

G-E-D-B-A-

wherein A represents single bond, alkylene group of from 1 to 6 carbon atoms(s), alkenylene group of from 2 to 6 carbon atoms, a group of general formulae:

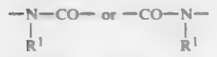


or saturated hydrocarbon ring of from 4 to 7 carbon atoms or mono heterocyclic ring containing 4 to 7 ring members including 1 or 2 hetero atom(s) selected from N, S and O, which may be partially or fully saturated or aromatic,

Y represents alkylene group of from 1 to 4 carbon atoms(s) or alkenylene group of from 2 to 4 carbon atoms,

B represents single bond or alkylene group of from 1 to 6 carbon atoms,

D represents single bond, oxygen atom, carbonyl group or a group of general formulae:



R^1 represents hydrogen atom, alkyl group of from 1 to 4 carbon atom(s), phenyl group or benzyl group,

E represents single bond, alkylene group of from 1 to 8 carbon atom(s) or alkylene group of from 1 to 8 carbon atoms(s) substituted by phenyl group or benzyl group,

G represents mono-, bi-, or tri-carbocyclic ring(s) containing not more than 15 carbon atoms which may be partially or fully saturated or aromatic or G represents mono-, bi-, or tri-heterocyclic ring(s) containing not more than 15 ring members including carbon and one or two hetero atom(s) selected from O, N and S which may be partially or fully saturated or aromatic, wherein said carbocyclic or heterocyclic ring(s) represented by G are unsubstituted or substituted by from 1 to 3 of alkyl group of from 1 to 6 carbon atom(s), alkoxy group of from 1 to 6 carbon atom(s), halogen atom, trifluoromethyl group or nitro group,

with the proviso that A nd B do not represent single bonds at the same time.

4,857,538

NEW COMPOUNDS FOR THE STUDY AND TREATMENT OF MICROFILAMENT ORGANIZATION IN CELLS

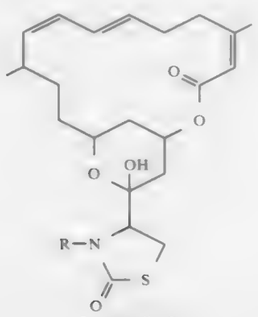
Yoel Kashman, Tel Aviv; Ilan Spector, Port Jefferson, N.Y.; Shmuel Carmely, Neve Monoson, and Dina Blasberger, Petah Tikva, both of Israel, assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed Nov. 30, 1987, Ser. No. 126,364

Int. Cl.[4] C07D *493/08;* A01K *31/425*

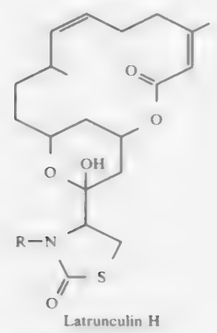
U.S. Cl. 514—369 **4 Claims**

1. A compound for disruption of cell morphology and inhibition of cell division selected from the group consisting of



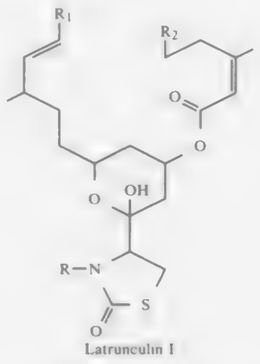
Latrunculin G

-continued



Latrunculin H

wherein R is $—CH_2OH$, and



Latrunculin I

wherein R is $—CH_2OH$, and R_1 and R_2 are —OH, alkyl or acyl.

4,857,539

HETEROCYCLIC SUBSTITUTED-PHENOXYALKYLISOXAZOLES AS ANTIVIRAL USEFUL AGENTS

Guy D. Diana, Stephentown, and Philip M. Carabateas, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

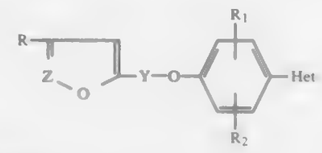
Continuation-in-part of Ser. No. 751,348, Jul. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 624,302, Jun. 25, 1984, abandoned, which is a continuation-in-part of Ser. No. 527,583, Aug. 29, 1983, abandoned. This application Jun. 16, 1987, Ser. No. 62,803

Claims priority, application Canada, Jun. 24, 1986, 512258

Int. Cl.[4] A61K *31/42;* C07D *413/10, 413/12*

U.S. Cl. 514—378 **21 Claims**

1. A compound of the formula:

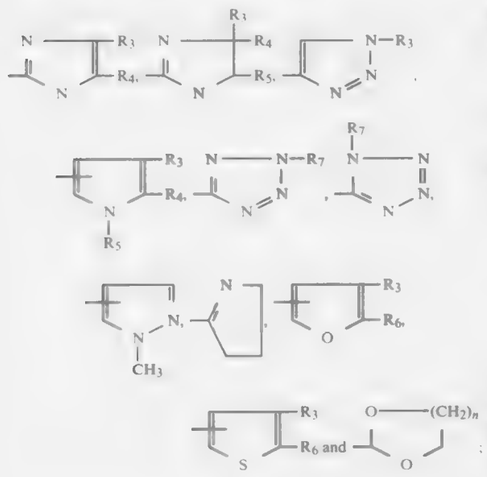


wherein:

Y is an alkylene bridge of 3-9 carbon atoms; Z in N; R is lower-alkyl of 1–5 carbon atoms;

R_1 and R_2 are hydrogen, halogen, lower-alkyl, lower-alkoxy, nitro, lower-alkoxycarbonyl or trifluoromethyl; and

Het is selected from the group consisting of:



where n is 2 or 3; and

R_3, R_4 and R_5 are hydrogen or lower-alkyl of 1–5 carbon atoms;

R_6 is hydrogen, lower-alkyl of 1-5 carbon atoms or chloro;

R_7 is hydrogen, or alkyl or hydroxyalkyl of 1–5 carbon atoms; or pharmaceutically acceptable acid-addition salts of basic members thereof.

4,857,540

DOPAMINE-β-HYDROXYLASE INHIBITORS

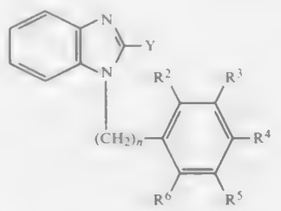
Carl Kaiser, Haddon Heights, and Lawrence I. Kruse, Haddonfield, both of N.J., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Division of Ser. No. 689,680, Jan. 8, 1985, Pat. No. 4,728,741. This application Nov. 27, 1987, Ser. No. 126,084

Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—387 **44 Claims**

1. A pharmaceutical composition having dopamine-β-hydroxylase inhibiting activity comprising an effective amount of a compound of structure (II)



(II)

in which:

Y is CH_2NH_2 or SR;

R is hydrogen or C_{1-4} alkyl;

n is 0 to 5; and

R^2 to R^6 are the same or different and are each hydrogen, halogen, hydroxy, C_{1-4} alkyl, CN, NO_2, SO_2NH_2, CO_2H, $CONH_2$, CHO, CH_2OH, CF_3, C_{1-4}alkoxy, SO_2C_{1-4}alkoxy, SO_2C_{1-4}fluoroalkyl or CO_2C_{1-4}alkyl, provided that, when Y is SH, R^2, R^3, R^5 and R^6 are all hydrogen and n is 0, R^4 is not methoxy;

or a pharmaceutically acceptable salt or hydrate thereof in association with a pharmaceutically acceptable carrier.

4,857,541

SUBSTITUTED BENZIMIDAZOLE FUNGICIDE

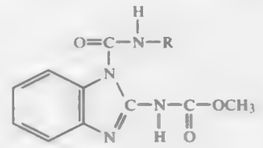
Mikio Chiba, St. Catharines, Canada, assignor to Canadian Patents and Development Limited/Societe Canadienne Des Brevets et D'Exploitation Limitee, Ottawa, Canada

Filed Aug. 7, 1986, Ser. No. 894,029

Int. Cl.[4] A01N *43/40*

U.S. Cl. 514—388 **8 Claims**

1. A method of using a fungicide against fungi which are resistant to benomyl said fungicide being selected from the group consisting of compounds represented by the formula:



wherein R is C_nH_{2n+1} and n is 1, 2, 3 or 6 or R is phenyl, said method comprising applying in a carrier a fungicidally effective amount of one or more fungicides selected from said group to fungi which are resistant to the fungicide, benomyl.

4,857,542

PROPHYLACTIC AND THERAPEUTIC COMPOSITION FOR CIRCULATORY DISORDERS AND METHOD OF TREATMENT

Hiroyoshi Nishi; Toshiaki Watanabe; Satoshi Yuki, all of Ami; Yasuhiro Morinaka, Tsuchiura; Katsuhiko Iseki, Abiko, and Hiroko Sakurai, Minori, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 862,091, May 12, 1986, abandoned. This application Nov. 19, 1987, Ser. No. 122,516

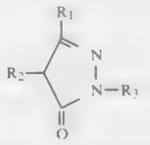
Claims priority, application Japan, May 20, 1985, 60-105798; Nov. 7, 1985, 60-248057

Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—404 **19 Claims**

1. A prophylactic and therapeutic pharmaceutical composition for inhibiting lipid peroxidation by active oxygen, which results from ischemia, comprising:

an effective amount of a pyrazoline derivative to inhibit lipid peroxidation by active oxygen, of the formula:



wherein R_1 represents a hydrogen atom, an aryl group, an alkyl group having 1 to 5 carbon atoms; R_2 represents a hydrogen atom, an aryloxy group, an alkyl group having 1 to 5 carbon atoms; or R_1 and R_2 taken together represent an alkylene group having 3 to 5 carbon atoms; R_3 represents a cycloalkyl group having 5 to 7 carbon atoms, a naphthyl group, or a phenyl group which is unsubstituted or para or meta substituted with 1 to 3 substituents which are the same or different selected from the group consisting of alkyl groups having 1 to 5 carbon atoms, alkoxy groups having 1 to 5 carbon atoms, alkoxycarbonyl groups having a total carbon number of 2 to 5, alkylmercapto groups having 1 to 3 carbon atoms, halogen atoms,

a trifluoromethyl group, a carboxyl group, a cyano group, a hydroxyl group, a nitro group or a pharmaceutically acceptable salt thereof as an active ingredient in a pharmaceutical carrier.

4,857,543

THIOPHENE DERIVATIVE AND PROCESS FOR PREPARING THE SAME

Kimiaki Hayashi, Suita; Yasuhiko Ozaki, Neyagawa; Kenji Yamada, Saitama; Hideyuki Takenaga, Urawa, and Ichizo Inoue, Kawanishi, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Jun. 27, 1988, Ser. No. 214,200

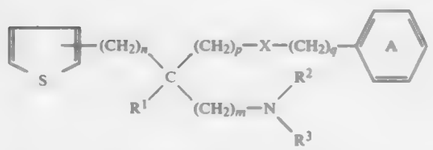
Claims priority, application Japan, Jun. 30, 1987, 62-164837

Int. Cl.[4] A61K *31/38;* **C07D** *409/00, 333/12*

U.S. Cl. 314—444 **8 Claims**

1. A thiophen derivative of the formula:

(I)



wherein R^1, R^2 and R_3 are a lower alkyl group, Ring A is phenyl, a lower alkylenedioxy-substituted phenyl, a phenyl group having 1 to 3 substitutent(s) selected from the group consisting of a lower alkyl group, a lower alkylthio group, a lower alkoxy group, a phenyl-lower alkoxy group, a lower alkoxycarbonyl group, a halogen atom, amino group and hydroxy group, X is —OCO—, —O— or —S—, m and n are an integer of zero or 1, and p and q are an integer of zero, 1 or 2, or a salt thereof.

4,857,544

27-HALO DERIVATIVES OF LL-F28249 COMPOUNDS

Susan Y. Tamura, Hamilton Square, and Goro Asato, Titusville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

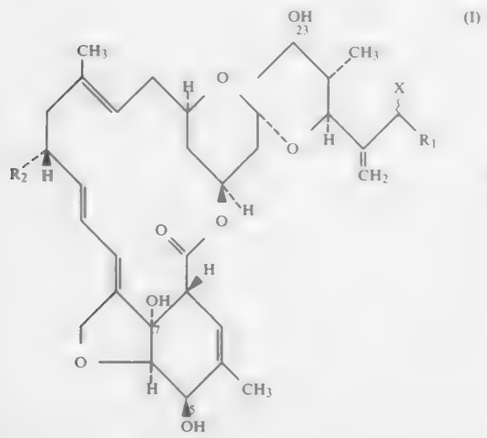
Filed Mar. 6, 1987, Ser. No. 22,906

Int. Cl.[4] A61K *35/66*

U.S. Cl. 514—450 **23 Claims**

1. A compound represented by the formula (I):

(I)



4,857,545

DIBENZO-P-DIOXANES USEFUL AS FUNGICIDES

Vivienne M. Anthony, Maidenhead; John M. Clough, Marlow, and Christopher R. A. Godfrey, Bracknell, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Filed Nov. 12, 1987, Ser. No. 119,485

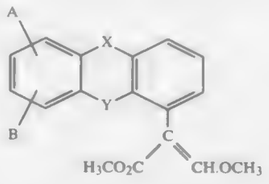
Claims priority, application Denmark, Nov. 11, 1986, 4792/85; United Kingdom, Dec. 3, 1986, 8628924

Int. Cl.[4] A01N *43/32;* **C07D** *319/24*

U.S. Cl. 514—452 **6 Claims**

1. A compound having the general formula (I):

(I)



and stereoisomers thereof, wherein X and Y are both oxygen; and A and B, which are the same or different, are hydrogen, halogen, alkyl, alkoxy, phenyl, phenoxy, or benzyloxy, the phenyl rings of any of the foregoing groups being unsubstituted or substituted by one or more of the following: halogen, C_{1-4} alkyl, C_{1-4} alkoxy, halo (C_{1-4})alkyl, cyano and nitro.

4,857,546

NOVEL HMG-COA REDUCTASE INHIBITORS

Mark Duggan, Wynnewood, and George D. Hartman, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

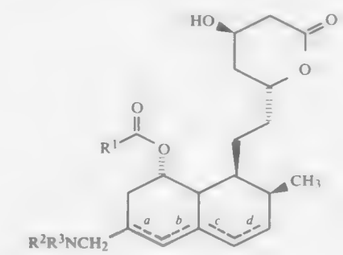
Filed Jan. 7, 1988, Ser. No. 142,378

Int. Cl.[4] A61K *31/365;* **C07D** *309/30*

U.S. Cl. 514—460 **19 Claims**

1. A compound represented by the following structural formula (I):

(I)



wherein:

R^1 is selected from:

(1) C_{1-10} alkyl;

(2) substituted C_{1-10} alkyl in which one or more substituent(s) is selected from

(a) halogen,

(b) hydroxy,

(c) C_{1-10} alkoxy,

(d) C_{1-5} alkoxycarbonyl,

(e) C_{1-5} acyloxy,

(f) C_{3-8} cycloalkyl,

(g) phenyl,

(h) substituted phenyl in which the substituents are X and Y,

(i) C_{1-10} alkylS(O)$_n$ in which n is 0 to 2,

(j) C_{3-8} cycloalkylS(O)$_n$,

(k) phenylS(O)$_n$,

(l) substituted phenylS(O)$_n$ in which the substituents are X and Y, and

(m) oxo;

(3) C_{1-10} alkoxy;

(4) C_{2-10} alkenyl;

(5) C_{3-8} cycloalkyl;

(6) substituted $C_{3\alpha 8}$ cycloalkyl in which one substituent is selected from

(a) C_{1-10} alkyl

(b) substituted C_{1-10} alkyl in which the substituent is selected from

(i) halogen,

(ii) hydroxy,

(iii) C_{1-10} alkoxy,

(iv) C_{1-5} alkoxycarbonyl,

(v) C_{1-5} acyloxy,

(vi) phenyl,

(vii) substituted phenyl in which the substituents are X and Y,

(viii) C_{1-10} alkylS(O)$_n$,

(ix) C_{3-8} cycloalkylS(O)$_n$,

(x) phenylS(O)$_n$,

(xi) substituted phenylC(O)$_n$ in which the substituents are X and Y, and

(xii) oxo,

(c) C_{1-10} alkylS(O)$_n$,

(d) C_{3-8} cycloalkylS(O)$_n$,

(e) phenylS(O)$_n$,

(f) substituted phenylS(O)$_n$ in which the substituents are X and Y,

(g) halogen,

(h) hydroxy,

(i) C_{1-10} alkoxy,

(j) C_{1-5} alkoxycarbonyl,

(k) C_{1-5} acyloxy,

(l) phenyl, and

(m) substituted phenyl in which the substituents are X and Y;

(7) phenyl;

(8) substituted phenyl in which the substituents are X and Y;

(9) amino;

(10) C_{1-5} alkylamino;

(11) di(C_{1-5} alkyl)amino;

(12) phenylamino;

(13) substituted phenylamino in which the substituents are X and Y;

(14) phenyl C_{1-10} alkylamino;

(15) Substituted phenyl C_{1-10} alkylamino in which the substituents are X and Y; and

(16) a member selected from

(a) C_{1-10} alkyl,

(b) phenyl, and

(c) substituted phenyl in which the substituents are X and Y;

R^2 and R^3 are independently selected from:

(1) hydrogen;

(2) C_{1-10} alkyl;

(3) substituted C_{1-10} alkyl in which one or more substituent(s) is selected from

(a) halogen,

(b) hydroxy,

(c) C_{1-10} alkoxy,

(d) C_{1-5} alkoxycarbonyl,

(e) C_{1-5} acyloxy,

(f) C_{3-8} cycloalkyl,

(g) phenyl,

(h) substituted phenyl in which the substituents are X and Y, and

(i) oxo;

(4) C_{1-10} acyl;

(5) substituted C_{1-10} acyl in which one or more substituent(s) is selected from

(a) halogen,

(b) hydroxy,

(c) C_{1-10} alkoxy,

(d) C_{1-5} alkoxycarbonyl,

(e) C_{1-5} acyloxy,

(f) C_{3-8} cycloalkyl,

(g) phenyl,

(h) substituted phenyl in which the substituents are X and Y, and

(i) oxo;

(6) phenylcarbonyl;

(7) substituted phenylcarbonyl in which the substituents are X and Y;

(8) C_{1-5} alkylaminocarbonyl;

(9) di(C_{1-5}alkyl)aminocarbonyl;

(10) phenylaminocarbonyl;

(10) substituted phenylaminocarbonyl in which the substituents are X and Y;

(11) phenyl C_{1-10} alkylaminocarbonyl;

(12) substituted phenyl C_{1-10} alkylaminocarbonyl in which the substituents are X and Y;

R^4 is selected from: trifluoromethyl, C_{1-3} alkyl, nitro, cyano or group selected from:

(1) $R^8O(CH_2)$ in which m is 0 to 3 and R^8 and hydrogen, C_{1-3}alkyl or hydroxy-C_{2-3}alkyl;

(2)

in which R^9 is hydrogen, C_{1-3}alkyl, hydroxy-C_{2-3}alkyl, phenyl, naphthyl, amino-C_{1-3}alkyl, C_{1-3}alkylamino-C_{1-3}alkyl, di(C_{1-3}alkyl)amino-C_{1-3}alkyl hydroxy-C_{2-3}alkylamino-C_{1-3}alkyl or di(hydroxy-C_{2-3}alkyl) amino-C_{1-3}alkyl;

(3)

in which R^{10} is hydrogen, C_{1-3}alkyl, hydroxy-C_{2-3} alkyl, C_{1-3}alkoxy-C_{1-3}alkyl, phenyl or naphthyl;



in which R^{11} and R^{12} independently are hydrogen, C_{1-3} alkyl or, hydroxy-C_{2-3}alkyl

(5) $R^{13}S(O)_n(CH_2)_m$ in which R^{13} is hydrogen, C_{1-3}alkyl, amino, C_{1-3}alkylamino or di(C_{1-3}alkyl)amino; and

a, b, c and d each represent single bonds or one of a, b, c and d represents a double bond or both a and c or b and d represent double bonds;

or a pharmaceutically acceptable salt thereof.

4,857,547

NOVEL HMG-COA REDUCTASE INHIBITORS

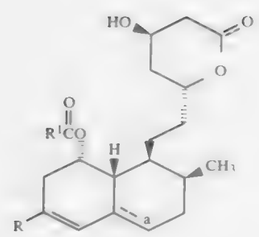
William F. Hoffman, and Ta J. Lee, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 7, 1988, Ser. No. 142,377

Int. Cl.[4] A61K *31/365;* **C07D** *309/30*

U.S. Cl. 514—460 **16 Claims**

1. A compound represented by the following structural formula (I):



(I)

wherein:
R is CH_2OH,



or CO_2R^4;
R^1 and R^3 are independently selected from:
(1) C_{1-10} alkyl;
(2) substituted C_{1-10} alkyl in which one or more substituent(s) is selected from
(a) halogen,
(b) hydroxy,
(c) C_{1-10} alkoxy,
(d) C_{1-5} alkoxycarbonyl,
(e) C_{1-5} acyloxy,
(f) C_{3-8} cycloalkyl,
(g) phenyl,
(h) substituted phenyl in which the substituents are X and Y, and
(i) oxo;
(3) C_{3-8} cycloalkyl;
(4) substituted C_{3-8} cycloalkyl in which one substituent is selected from
(a) C_{1-10} alkyl,
(b) substituted C_{1-10} alkyl in which the substituent is selected from
(i) halogen,
(ii) hydroxy,
(iii) C_{1-10} alkoxy
(iv) C_{1-5} acyloxy,
(v) C_{1-5} alkoxycarbonyl,
(vi) phenyl,
(vii) substituted phenyl in which the substituents are X and Y, and
(viii) oxo,
(c) halogen,
(d) hydroxy,
(e) C_{1-10} alkoxy,
(f) C_{1-5} alkoxycarbonyl,
(g) C_{1-5} acyloxy,
(h) phenyl,
(i) substituted phenyl in which the substituents are X and Y;
(5) phenylamino;
(6) substituted phenylamino in which the substituents are X and Y;
(7) phenyl C_{1-10} alkylamino; and
(8) substituted phenyl C_{1-10} alkylamino in which the substituents are X and Y.
R^4 is independently selected from
(a) hydrogen;
(b) C_{1-5} alkyl;
(c) substituted-C_{1-5} alkyl in which the substituent is selected from
(i) phenyl,
(ii) dimethylamino, and
(iii) acetylamino; and
(d) 2,3-dihydroxypropyl;
X and Y independently are hydrogen, halogen, trifluoromethyl, C_{1-3} alkyl, nitro, cyano or group selected from:
(1) $R^8O(CH_2)_m$ in which m is 0 to 3 and R^8 is hydrogen, C_{1-3}alkyl or hydroxy-C_{2-3}alkyl;
(2)



in which R^9 is hydrogen, C_{1-3}alkyl, hydroxy-C_{2-3}alkyl, phenyl, naphthyl, amino-C_{1-3}alkyl, C_{1-3}alkylamino-C_{1-3}alkyl, di(C_{1-3}alkyl)amino-C_{1-3}alkyl, hydroxy-C_{2-3} alkylamino-C_{1-3}alkyl or di(hydroxy-C_{2-3}alkyl) amino-C_{1-3}alkyl;
(3)

in which R^{10} is hydrogen, C_{1-3}alkyl, hydroxy-C_{2-3} alkyl, C_{1-3}alkoxy-C_{1-3}alkyl, phenyl or naphthyl;
(4) $R^{11}R^{12}N(CH_2)_m$,



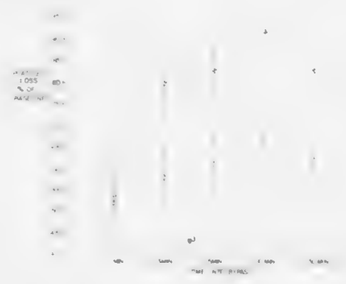
in which R^{11} and R^{12} independently are hydrogen,
(5) $R^{13}S(0)_n(CH_2)_m$ in which R^{13} is hydrogen, C_{1-3}alkyl, amino, C_{1-3}alkylamino or di(C_{1-3}alkyl)amino; and
a represents a single bond or a double bond; or a pharmaceutically acceptable salt thereof.

4,857,548

METHOD OF PREVENTING OR REDUCING PLATELET LOSS DURING EXTRACORPOREAL CIRCULATION USING A THROMBOXANE A_2 RECEPTOR ANTAGONIST

Gary J. Grover, Stockton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 165,065, Mar. 7, 1988. This application Nov. 17, 1988, Ser. No. 272,357
Int. Cl.[4] A61K *31/34*
U.S. Cl. 514—469 **20 Claims**



1. A method for preventing or reducing platelet loss during extracorporeal circulation, in a mammalian species, which comprises administering to a mammalian species in need of such treatment an effective amount of a thromboxane A_2 receptor antagonist alone or with an effective amount of prostacyclin and/or a prostacyclin mimic, said thromboxane A_2 receptor antagonist being a 7-oxabicycloheptane or a 7-oxabicycloheptane derivative.

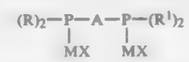
4,857,549

ANTITUMOR PHARMACEUTICAL COMPOSITIONS AND METHODS FOR TREATING TUMORS EMPLOYING α,ω-BIS(DISUBSTITUTEDPHOSPHINO)-HYDROCARBON DERIVATIVES OR (α,ω-BIS(DISUBSTITUTEDPHOSPHINO)HYDROCARBON) DIGOLD(I), DIGOLD(III), DISILVER(I), AND DICOPPER(I)

David T. Hill, North Wales; Randall K. Johnson, Ardmore, and Christopher K. Mirabelli, Malvern, all of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Division of Ser. No. 718,905, Apr. 2, 1985, Pat. No. 4,766,226, which is a continuation-in-part of Ser. No. 685,881, Dec. 24, 1984, abandoned, which is a continuation-in-part of Ser. No. 575,650, Feb. 1, 1984, abandoned. This application Feb. 26, 1988, Ser. No. 160,898
Int. Cl.[4] A61K *3/28*
U.S. Cl. 514—495 **14 Claims**

1. A pharmaceutical composition comprising an effective tumor cell growth-inhibiting amount of an active ingredient and an inert pharmaceutically acceptable carrier or diluent, wherein said composition is useful for inhibiting the growth of animal tumor cells sensitive to the active ingredient, and wherein the active ingredient is a compound of the formula:



wherein
R and R^1 are the same and are phenyl; perdeuterophenyl, cyclohexyl; benzyl; pentahalophenyl, monosubstituted phenyl wherein said substituent is selected from halo, methoxy, methylthio, or trihalomethyl; or R is ethyl provided that R^1 is phenyl;
A is a straight or branched alkanediyl chain of from one to six carbon atoms, cis-vinylene or transvinylene;
M is the same and is Au(I), Au(III), Ag(I) or Cu(I); and
X is the same and is halo, nitrato, C_{1-6} alkylcarboxylato, thiocyanato, perfluoroalkylthio, cysteine C_{1-6} alkylester, or C_{1-6} alkyldithiocarbanato.

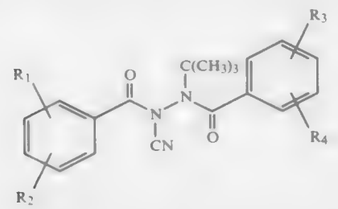
4,857,550

NOVEL INSECTICIDAL DIBENZOYL-TERT-BUTYLCARBAZONITRILE COMPOUNDS AND METHOD FOR THE PREPARATION THEREOF

Vekataraman Kameswaran, Princeton; Donald P. Wright, Jr., Pennington, and Rod A. Herman, Allentown, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 29, 1988, Ser. No. 237,346
Int. Cl.[4] C07C *121/60, 125/08;* A01N *37/34, 47/40*
U.S. Cl. 514—522 **15 Claims**

4. A method for protecting growing plants from insect attack, said method comprising: applying to the foliage of said plants or to the soil or water in which they are growing, a plant protecting, insecticidally effective, amount of a dibenzoyl-2-tert-butylcarbazonitrile having the structural formula,



wherein R_1, R_2, R_3 and R_4 are each independently H, F, Cl, Br, I, CH_3, OCH_3, OCF_3, CF_3, $OCHF_2$, CN or NO_2.

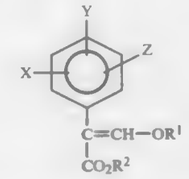
4,857,551

INSECTICIDES

David J. Tapolczay, Bracknell, and Mark A. Spinney, Workingham, United Kingdom, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Filed Aug. 31, 1987, Ser. No. 90,930
Claims priority, application United Kingdom, Sep. 15, 1986, 8622296; Apr. 2, 1987, 8707913
Int. Cl.[4] C07C *19/76*
U.S. Cl. 514—532 **8 Claims**

1. A method of killing or controlling insect, mite or nematode pests which method comprises applying to the pest or to the locus thereof an effective amount of a compound of formula (I):



(I)

wherein R^1 and R^2 are independently selected from hydrogen and C_{1-4} alkyl; and X, Y and Z are independently selected from hydrogen, halogen, or OR^3 where R^3 is an optionally substituted aryl group.

4,857,552

STABLE PHARMACEUTICAL COMPOSITION

Leonard S. Rosenberg, Lake Villa; Cheryl Black, Vernon Hills; Earl R. Speicher, Buffalo Grove, and Dietmar Wagenknecht, Waukegan, all of Ill., assignors to E. I. du Pont de Nemours and Co., Wilmington, Del.

Filed Jun. 8, 1988, Ser. No. 203,836
Int. Cl.[4] A61K *31/24, 31/195*
U.S. Cl. 514—538 **8 Claims**

1. An injectable, aqueous pharmaceutical composition for the treatment of cardiac conditions comprising an effective amount of Methyl 3-[4-(2-hydroxy-3-isopropylamino)propoxy]phenylpropionate hydrochloride (esmolol) for treating such a cardiac condition, said composition comprising about 1 mg to about 250 mg of esmolol/mL of solution; 0.01 to 0.04 M buffer; said composition having a pH range of about 4.5 to 5.5, the esmolol degrading in aqueous solution to produce 3-[4-(3-propionic acid)-phenoxy]-1-isopropylamino-2-propanol hydrochloride, said 3-[4-(3-propionic acid)-phenoxy]-1-isopropylamino-2-propanol hydrochloride having a pK in the pH range of said composition to thereby act as a secondary buffer to increase the buffer capacity without the addition of buffer and minimize the change in pH as degradation occurs, whereby the stability of esmolol in an aqueous composition is enhanced.

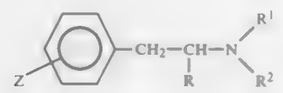
4,857,553

METHOD OF TREATING NAUSEA AND VOMITING WITH CERTAIN SUBSTITUTED-PHENYLALKYLAMINO (AND AMINOACID) DERIVATIVES AND OTHER SEROTONIN DEPLETING AGENTS

John W. Ward, Richmond, Va., and William L. Smith, Sunnyvale, Calif., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 82,170, Aug. 6, 1987, abandoned. This application Aug. 10, 1988, Ser. No. 230,487
Int. Cl.[4] A61K *31/19, 31/135*
U.S. Cl. 514—557 22 Claims

1. A method for treating mammals for emesis which method comprises internally administering to a mammal in need thereof an emesis inhibiting amount of a compound having the formula:



wherein,
R is hydrogen, loweralkyl, trifluoromethyl, carboxyl or loweralkoxycarbonyl,
R^1 and R^2 are hydrogen or loweralkyl;
Z is, same or different, trifluoromethyl or halogen;
optical isomers thereof;
and pharmaceutically acceptable salts thereof.

4,857,554

METHOD FOR THE TREATMENT OF PSORIASIS

Georgios Kallimanis, 16, Proteos St., Athens, Greece

Filed Aug. 17, 1987, Ser. No. 85,757
Int. Cl.[4] A61K *31/19*
U.S. Cl. 514—557 2 Claims

1. A method for the treatment of psoriasis on the skin of a human, comprising applying to said skin affected with psoriasis an ointment comprising 0.3–0.9 part by weight of ursolic acid, 0.1–0.3 part by weight of oleanolic acid, 30–90 parts by weight of petroleum jelly and 10–30 parts by weight of anhydrous lanolin in the weight ratio of ursolic acid to oleanolic acid of 3:1 at the rate of 2 to 6 times daily until the symptoms of psoriasis have disappeared.

4,857,555

METHOD OF TREATING CATABOLIC DYSFUNCTION

Robert J. Smith, and Douglas W. Wilmore, both of Brookline, Mass., assignors to Brigham & Women's Hospital, Boston, Mass.

Continuation-in-part of Ser. No. 775,214, Sep. 12, 1985, abandoned. This application Sep. 12, 1986, Ser. No. 906,530
Int. Cl.[4] A61K *31/195*
U.S. Cl. 514—563 9 Claims

1. A method of treating atrophy of skeletal muscle, intestinal mucosa, or both, in an animal, which comprises parenterally administering to said animal a therapeutically effective amount of glutamine or a functional analogue thereof which retains the characteristics of glutamine in an amount greater than that present in the normal diet of said animal.

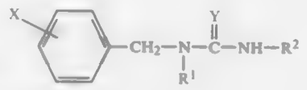
4,857,556

SUBSTITUTED BENZYLCYCLOALKENYLUREA DERIVATIVES

Yasuo Yamada; Junichi Saito; Tatsuo Tamura, and Shinji Sakawa, all of Tokyo, Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Continuation of Ser. No. 849,992, Apr. 10, 1986, abandoned, which is a continuation of Ser. No. 555,868, Nov. 28, 1983, abandoned. This application Dec. 8, 1987, Ser. No. 130,248
Claims priority, application Japan, Dec. 3, 1982, 57-211241
Int. Cl.[4] C07C *157/07, 157/09, 127/19, 127/17*
U.S. Cl. 514—585 10 Claims

1. A substituted benzylcycloalkenylurea derivative of the formula



in which
X is a halogen atom or a lower alkyl group with 1 to 6 carbon atoms,
Y is an oxygen atom or a sulfur atom,
R^1 is a cycloalkenyl group with 5 or 6 carbon atoms, and
R^2 is phenyl or a lower alkyl group with 1 to 6 carbon atoms.

10. A fungicidal composition comprising a fungicidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,857,557

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF 2-BROMO-2-NITROPROPANE-1,3-DIOL AND BIS (TRICHLOROMETHYL)SULFONE

Deborah K. Donofrio, The Woodlands, and Wilson K. Whitekettle, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Sep. 12, 1988, Ser. No. 242,831
Int. Cl.[4] A01N *33/18, 41/10*
U.S. Cl. 514—711 7 Claims

1. A bacterial inhibiting composition comprising a synergistic aqueous mixture of (a) 2-bromo-2-nitropropane-1, 3-diol (BNPD) and (b) bis(trichloromethyl) sulfone (BTCMS) wherein the weight ratio of said BNPD to said BTCMS is from about 16:1 to 1:32.

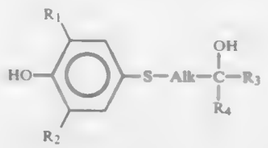
4,857,558

METHODS AND COMPOSITIONS FOR INHIBITING LIPOXYGENASE

Richard A. Mueller, Glencoe, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 736,887, May 20, 1985, abandoned. This application May 20, 1988, Ser. No. 196,927
Int. Cl.[4] A61K *31/10*
U.S. Cl. 514—712 15 Claims

1. A pharmceutical composition in solid oral unit dosage form for use in the treatment of inflammatory or allergic conditions in mammals comprising a pharmaceutically acceptable carrier and from 1.75 to 750 mg of a compound of the formula:



wherein: R_1 and R_2 are the same or different members of the group consisting of 1,1-dimethylethyl, halo, phenyl and substituted phenyl having one or more substituents selected from the group consisting of halo, hydroxy, lower alkyl and lower alkoxy; Alk is straight or branched chain lower alkylene; R_4 is hydrogen or lower alkyl; R_3 is hydrogen, lower alkyl or a cycloalkyl group of from 3 to 8 carbon atoms.

4,857,559

PROCESS FOR PRODUCTION OF HYDROCARBONS

Sigrid Eri, Trondheim, Norway, and James G. Goodwin, Jr., Pittsburgh, Pa., assignors to Gas-To-Oil, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 113,095, Oct. 23, 1987, Pat. No. 4,801,573. This application Oct. 18, 1988, Ser. No. 259,221
Int. Cl.[4] C07C *1/04, 1/06*
U.S. Cl. 518—700 16 Claims

1. A process for the production of hydrocarbons comprising the step of contacting a synthesis gas feed comprised of hydrogen and carbon monoxide over a catalyst comprised of cobalt and rhenium composited on an alumina support wherein rhenium is present in relatively lesser amounts than the cobalt content of the catalyst, at a temperature, gaseous hourly space velocity and a pressure useful for promoting a Fischer-Tropsch Synthesis.

4,857,560

REACTION PRODUCTS USEFUL AS CATALYSTS IN THE PRODUCTION OF ISOCYANATE-BASED PLASTICS

Manfred Schmidt, Dormagen; Claus-Dieter Sommerfeld, Much, both of Fed. Rep. of Germany; Christoph Prolingheuer, Pittsburgh, Pa., and Walter Kliin, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Division of Ser. No. 18,240, Feb. 24, 1987. This application Jul. 11, 1988, Ser. No. 217,528
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607667; Mar. 27, 1986, 3610434
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—103 13 Claims

1. A method for catalyzing the formation of isocyanate-based plastics comprising using as catalyst the reaction product of
(a) tertiary amine with
(b) a mixture of
(i) boric acid and
(ii) a carboxylic acid.

4,857,561

NOVEL NEOPENTYLADIPATE BASED PREPOLYMERS AND REACTION INJECTION MOLDED PRODUCTS MADE THEREFROM

Robson Mafoti, and Neil H. Nodelman, both of Pittsburgh, Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Aug. 30, 1988, Ser. No. 238,436
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—159 7 Claims

1. A polyisocyanate comprising the reaction product of
(a) an isocyanate selected from the group consisting of methylenebis(phenylisocyanate), polymethylenepoly(phenylisocyanate), and mixtures thereof, and
(b) a polyester polyol having a hydroxyl functionality of from 2 to 3 and a molecular weight of from about 750 to about 3500, said polyester polyol prepared by reacting neopentyl glycol and adipic acid,
the isocyanate group content of said reaction product from about 14% to about 28% by weight.

4,857,562

UV CURABLE EPOXY RESIN COMPOSITIONS WITH DELAYED CURE

Thomas P. Wacker, Schenectady, and Raymond J. Zabinski, Albany, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 8,905, Jan. 30, 1987, abandoned. This application Mar. 7, 1988, Ser. No. 168,528
Int. Cl.[4] C08L *63/02*
U.S. Cl. 522—31 22 Claims

1. A curable composition consisting essentially of:
(a) a bisphenol-A epoxy resin,
(b) a sufficient amount of UV catalyst to render the composition UV curable, and
(c) a sufficient amount of fixing agent capable of delaying the cure of the composition for a fixed period of time after exposure to UV radiation, the fixing agent having the general formula:

$$R^7\text{-}(\text{-}OR^6\text{-})_n OR^7$$

wherein R^6 is selected from the group consisting of $—CH_2CH_2—$ and $—CH_2CH(CH_3)—$, R^7 is epoxy hydrocarbon and n is at least 2.

4,857,563

ENCAPSULANT COMPOSITIONS FOR USE IN SIGNAL TRANSMISSION DEVICES

Thomas S. Croft, and Hartwick A. Haugen, both of Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 9, 1987, Ser. No. 19,295
Int. Cl.[4] H02G *15/00*
U.S. Cl. 523—173 12 Claims

1. A grease compatible dielectric encapsulant capable of being used to encapsulate a splice of a signal transmission conducting device comprising: the extended reaction product of an admixture of
(a) an effective amount of an anhydride functionalized compound having reactive anhydride sites; and
(b) an effective amount of a crosslinking agent which reacts with the anhydride sites of said compound to form a cured cross-linked material; and
wherein said reaction product is extended with at least one plasticizer present in the range of between 5 and 95 percent by weight of the encapsulant, forming a plasticized system which is essentially inert to the reaction product and substantially non-exuding therefrom; and
wherein said encapsulant has a C-H adhesion value of at least 4.

4,857,564

HIGH CONSISTENCY ORGANOSILOXANE ELASTOMER COMPOSITIONS CURABLE BY A PLATINUM-CATALYZED HYDROSILATION REACTION

Myron T. Maxson, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sep. 29, 1988, Ser. No. 250,583
Int. Cl.[4] C08K *9/06*
U.S. Cl. 523—212 5 Claims

1. In an improved curable silicone elastomer composition comprising the product obtained by blending to homogeneity
A. 100 parts by weight of a polydiorganosiloxane gum wherein from 0.1 to 3 mol percent of the non-terminal siloxane contain an aliphatically unsaturated hydrocarbon radical,
B. an amount sufficient to cure said composition of an organohydrogensiloxane that is miscible with said polydiorganosiloxane gum and contains an average of more than 2 silicon-bonded hydrogen atoms per molecule,
C. a platinum-containing hydrosilation catalyst in an amount sufficient to promote curing of said composition,

D. from 20 to 100 parts by weight of a reinforcing silica, and
E. an amount of silica treating agent sufficient to avoid crepe hardening of said composition,
where the improvement comprises the presence in said composition of (1) from 0.1 to 5 parts by weight per 100 parts by weight of said polydiorganosiloxane gum of a liquid polydiorganosiloxane exhibiting a viscosity of less than 1,000 Pa.s at 25° C., where said liquid polydiorganosiloxane and said gum are incompatible and immiscible, and said liquid polydiorganosiloxane contains from 5 to 30 mole percent of siloxane groups having an aliphatically unsaturated hydrocarbon radical bonded to silicon.

4,857,565

PROCESS FOR THE CONTINUOUS PRODUCTION OF AQUEOUS POLYURETHANE DISPERSIONS AND THEIR USE AS A COATING COMPOSITION OR AS AN ADHESIVE

Wolfgang Henning, Kuerten; Walter Meckel, Neuss, and Peter Fuhrmann, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 7,293, Jan. 27, 1987, abandoned. This application Sep. 8, 1988, Ser. No. 242,015

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1986, 3603996

Int. Cl.[4] C08L *75/04*

U.S. Cl. 523—343 **6 Claims**

1. A continuous process for the production of an aqueous polyurethane dispersion which comprises continuously mixing a solution of

(a1) a polyurethane free from isocyanate groups wherein the dispersibility in water is provided by a member selected from the group consisting of chemically incorporated potential ionic groups which are subsequently neutralized, chemically incorporated ionic groups, chemically incorporated ethylene oxide units present within terminal polyether chains, chemically incorporated ethylene oxide units present within lateral polyether chains, external emulsifiers in physical admixture with said polyurethane and mixtures thereof, or

(a2) an isocyanate prepolymer containing free isocyanate groups wherein the dispersibility in water is provided by a member selected from the group consisting of chemically incorporated potential ionic groups which are subsequently neutralized, chemically incorporated ionic groups, chemically incorporated ethylene oxide units present within terminal polyether chains, chemically incorporated ethylene oxide units present within lateral polyether chains, external emulsifiers present in physical admixture with said prepolymer and mixtures thereof,

in

(b) an organic solvent having a boiling point below 100° C. or a mixture of said solvent with up to about 50% by weight, based on the total weight of component (b), of water,

with

(c) water in an amount sufficient to provide an oil-in-water emulsion, and subsequently removing by continuous distillation at least a portion of the solvent (b) from the resulting aqueous dispersion by means of a circulation-type evaporator having flooded evaporator surfaces.

4,857,566

CURABLE LATEX COMPOSITION, FILMS AND FOAMS FORMED THEREFROM AND METHOD FOR CURING THE COMPOSITION

Alois Helbling, Pialba, Australia, assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 40,975, Apr. 21, 1987, abandoned. This application Dec. 28, 1987, Ser. No. 137,984

Int. Cl.[4] C08L *33/02, 63/00*

U.S. Cl. 523—409 **17 Claims**

1. A curable latex composition comprising

(a) a carboxylated latex comprising a copolymer of a vinyl aromatic monomer, a diene monomer and an ethylenically unsaturated carboxylic acid monomer,

(b) an epoxy resin emulsion comprising an epoxy resin having more than one 1,2-epoxy group, said emulsion additionally comprising a first catalyst selected from the group consisting of ethyltriphenyl phosphonium acetate, ethyltriphenyh phosphonium phosphate, methyltrioctyl ammonium chloride, alkybenzyl dimethyl ammonium chloride, benzyl trimethyl ammonium chloride, tetraethyl ammonium bromide, N-dodecyl pyridinium chloride and tetrabutyl ammonium iodine and

(c) a second catalyst selected from the group consisting of tridimethylaminomethyl phenol, dimethyl aminomethyl phenol, dicyandiamide, ethylenediamine, diethylenetriamine, triethylene tetramine, tetraethylene pentamine and isophorone diamine.

4,857,567

FLEXIBLE ARYL ALKYL EPOXY RESINS, THEIR AMINE RESIN DERIVATIVES AND THEIR USE IN ELECTRODEPOSITION COATINGS

James A. Laugal, Union Lake; Glenn E. Martin, Farmington Hills; Donald L. St. Aubin, Westland, and Gerald G. Wold, Brighton, all of Mich., assignors to BASF Corporation, Inmont Division, Clifton, N.J.

Filed Jul. 24, 1987, Ser. No. 77,492

Int. Cl.[4] C08G *59/20;* **C08L** *63/00*

U.S. Cl. 523—415 **17 Claims**

1. A 2D2E epoxide compound comprising the addition reaction oligomer of the monomers Diol D1, Diol D2, Diepoxide E1 and Diepoxide E2 wherein:

Diol D1 has at least one aryl group having at least two nuclear rings between the hydroxyls,

Diol D2 has only one aryl group having one nuclear ring between the hydroxyls,

Diepoxide E1 is a bis(glycidyl ether) of Diol D1, and

Diepoxide E2 is a bis(glycidyl ether) of a bis(labile hydrogen functionalized alkoxy) arylene.

10. An 2D2E amine resin comprising the reaction product of:

(A) the 2D2E epoxide compound according to claim 1; and

(B) an amine.

4,857,568

COATING COMPOSITION

Alan Butters, and Graham A. Page, both of Ipswich, England, assignors to Imperial Chemical Industries PLC, London, England

Filed Mar. 31, 1987, Ser. No. 32,400

Claims priority, application United Kingdom, Apr. 21, 1986, [illegible]

Int. Cl.[4] C08K *5/13;* **C08L** *63/00*

U.S. Cl. 523—456 **1 Claim**

1. A composition for coating a plastics substrate wherein the composition comprises a polymeric amine, a polyepoxy resin and an etchant having a solvent or swelling action on the substrate, the polymeric amine, polyepoxy resin and etchant being present in the composition in a weight ratio of 10 to 1:1.0:450 to 1, the polymeric amine being poly(ethyleneimine),

the polyepoxy resin being a bisphenol A-epichlorohydrin condensate and the etchant being a halogenated phenol.

4,857,569

POLYMER ALLOY COMPOSITIONS OF ROD-LIKE AROMATIC POLYAMIDES AND POLYURETHANES

David B. Cotts, and Louisa Brodrecht, both of Menlo Park, Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jul. 27, 1987, Ser. No. 78,335

Int. Cl.[4] C08L *75/04*

U.S. Cl. 524—104 **10 Claims**

1. A novel engineering thermoplastic composition comprising a homogeneous polymer blend of at least two components:

(a) one or more of a thermoplastic polyurethane and

(b) a reinforcing amount of one or more of a rod-like aromatic polyamide; said polymer blend having an initial modulus of at least 10^3 psi, a tensile strength of at least 400 psi, and a melt viscosity at 120° C. of at least 5×10^6 poise.

4,857,570

STABILIZED POLYMERS

Edgar J. Smutny, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 24, 1988, Ser. No. 198,549

Int. Cl.[4] C08K *5/15, 5/09*

U.S. Cl. 524—112 **27 Claims**

1. A composition stabilized against the loss of apparent crystallinity during melt processing which comprises a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and a stabilizing quantity of a succinic anhydride or hydrolysis product thereof.

4,857,571

PREVULCANIZATION RETARDATION OF FREE-RADICAL CURED RUBBER

Ralph H. Reiter, River Vale, N.J., and C. Raymond Ekwall, Stratford, Conn., assignors to Sartomer Company, Inc., West Chester, Pa.

Continuation-in-part of Ser. No. 166,797, Mar. 3, 1988, abandoned, which is a continuation of Ser. No. 789,526, Oct. 21, 1985, abandoned. This application Sep. 1, 1988, Ser. No. 239,281

Int. Cl.[4] C08K *5/17*

U.S. Cl. 524—248 **28 Claims**

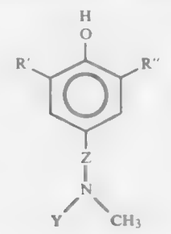
1. A curable elastomer composition, comprising:

(a) a free radical-curable elastomer capable of being vulcanized with a free radical generating compound;

(b) a free radical generating compound present as curing agent in an amount of between about 0.1 and about 10 parts by weight per 100 parts by weight of the elastomer;

(c) a polyfunctional monomer coagent capable of reacting with said free radical generating compound to crosslink said elastomer, present in an amount of from about 0.5 to about 50 parts by weight per 100 parts by weight of the elastomer;

(d) a vulcanization inhibitor corresponding to the formula:



(Formula I)

wherein R′ and R″ are each independently lower alkyl of from 1 to 6 carbon atoms, Z is an alkylene radical containing from 1 to 12 carbon atoms, and Y is a member selected from the group consisting of an alkyl, cycloalkyl, aryl, alkaryl and aralkyl radical containing from 1 to 12 carbon atoms, said inhibitor being present in an amount of from about 0.01 to about 5 parts, by weight, per 100 parts by weight of the elastomer;

wherein said free radical curable elastomer is selected from the group consisting of synthetic polyisoprene, styrenebutadiene elastomer, polybutadiene elastomer, butyl elastomer, bromobutyl elastomer, chlorobutyl elastomer, a neoprene, ethylene propylene elastomer, a nitrile elastomer, a fluoroelastomer, a high styrene butadiene copolymer, a vinyl acetate ethylene copolymer, chlorinated polyethylene elastomer, a chlorosulfonated polyethylene elastomer, reclaimed elastomer and mixtures thereof; and

wherein said polyfunctional monomer coagent is selected from the group consisting of trimethylol propane trimethacrylate, pentaerythritol tetramethacrylate, glycerol trimethacrylate, glycerol triacrylate, trimethylol propane triacylate, pentaerythritol tetraacrylate, trimethylol ethane trimethacrylate, trimethylol ethane triacrylate, 1,3-butylene glycol dimethacrylate, ethylene glycol dimethacrylate, 1,3-butylene glycol diacrylate, 1,4-butylene glycol dimethacrylate, polyethylene glycol 200 dimethacrylate, a di-α-olefin derived polymethylene diacrylate or methacrylate, and mixtures of any of the above with an alkyl mono(meth)acrylate, dipentaerythritol tetra(penta)acrylate and methacrylate, di-trimethylol propane tetraacrylate and methacrylate, diallyl phthalate, diallyl chloroendate, diallyl isophthalate, diallyl terephthalate, triallyl cyanurate, triallyl isocyanurate, triallyl trimellitate, the diallyl ethers or the triallyl ethers of trimethylol propane, trimethylol ethane and pentaerythritol, zinc diacrylate or the monobasic salts thereof, zince dimethacrylate or the monobasic salts thereof, a poly(meth)acrylate derivative of an oxyalkylated polyol and mixtures thereof.

4,857,572

SUBSTITUTED PHENOLS AS STABILIZERS

Hans-Rudolf Meier, Marly, and Gerrit Knobloch, Arisdorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 59,235, Jun. 8, 1987, abandoned, which is a continuation of Ser. No. 928,130, Nov. 7, 1986, abandoned. This application Feb. 10, 1988, Ser. No. 157,116

Claims priority, application Switzerland, Nov. 13, 1985, 4871/85; Sep. 24, 1986, 3826/86

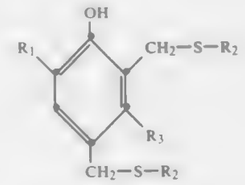
Int. Cl.[4] C08K *5/36;* **C07C** *149/273;* **C10M** *135/30*

U.S. Cl. 524—289 **13 Claims**

1. A stabilized composition which comprises

(a) an elastomer or a tackifying resin, and

(b) a stabilizing amount of at least one compound of formula I



(I)

wherein R_1 is C_1–C_4-alkyl,

R_2, each independently of the other, are C_1–C_{18}-alkyl, —CH_2COOR_5 with R_5 being C_1–C_{20}-alkyl, —CH_2CH_2OH, phenyl or benzyl, and

R_3 is hydrogen or methyl, with the proviso that, when R_1 is other than methyl, then R_3 is methyl.

4,857,573

PLASTIC MATERIAL CONTAINING A TETRACARBOXYLIC ACID TETRAESTER-PLASTICIZER

Wilhelm Simon, Zurich, Switzerland, and Urs Oesch, Holliston, Mass., assignors to Firma Willi Moller, Zurich, Switzerland

Filed Oct. 6, 1987, Ser. No. 105,626

Claims priority, application Switzerland, Oct. 7, 1986, 4007/86

Int. Cl.[4] C08K *5/09*

U.S. Cl. 524—291 21 Claims

1. A plastic material containing a benzhydrol-tetracarboxylic acid tetraester as a plasticizer wherein migration of said tetraester-plasticizer in the plastic material is inhibited and migration of the tetraester-plasticizer from the plastic material into solid or liquid materials which contact the plastic material is avoided, and wherein the carboxylate group of said tetraester-plasticizer is bonded directly to the aromatic nuclei of the benzhydrol group of said tetraester-plasticizer, and wherein the esterifying alcohol moiety of said tetraester-plasticizer is selected from the group consisting of alkanols having 4–24 carbon atoms, alkenols having 4–24 carbon atoms and alkinols having 4–24 carbon atoms.

4,857,574

DISPERSION OF ADDITION (CO)POLYMERS IN AN ORGANIC LIQUID

Roelof Buter, Dieren, Netherlands, assignor to Akzo nv, Arnhem, Netherlands

Division of Ser. No. 933,334, Nov. 20, 1986, which is a continuation of Ser. No. 756,258, Jul. 8, 1985, abandoned. This application Feb. 11, 1988, Ser. No. 155,09[illegible]

Claims priority, application Netherlands, Jul. 20, 1984, 8402308

Int. Cl.[4] C08F *279/06, 2/14;* C08K *5/01, 5/56*

U.S. Cl. 524—396 21 Claims

1. A stable dispersion of addition (co)polymers in an inert relatively non-polar organic hydrocarbon liquid, the dispersed particles embracing both a (co)polymer and a polymer containing an ethylenically unsaturated monomer, characterized in that the (co)polymers are substantially composed of:

a. 5 to 100 mole % of styrene and/or methyl styrene;

b. 0 to 95 mole % of alkyl methacrylate having 1 or 2 carbon atoms in the alkyl group and/or alkoxyalkylene methacrylate having 1 to 2 carbon atoms in the alkoxy group and the alkylene group; and an effective amount of at least one of,

c. up to 40 mole % of alkyl methacrylate having 3 to 12 carbon atoms in the alkyl group;

d. up to 40 mole % of hydroxyalkyl methacrylate having 2 to 12 carbon atoms in the alkyl group and/or glycidyl methacrylate; and

e. up to 20 mole % of methacrylic acid, and that they are grafted to a functionalized or a non-functionalized polymer of a number average molecular weight of 2,000 to 10,000, at least 60% by weight of which consists of butadiene, the weight percentage of the butadiene-containing polymer being 20 to 200% of that of the (co)polymer and the sum of this percentage and the percentage of styrene and/or methyl styrene in the copolymer being higher than or equal to 50, said dispersion containing solid particles having a number average molecular weight in the range of 60,000 to 1,000,000, and said dispersion drying at room temperature to yield essentially a smooth film having a high gloss.

4,857,575

STABILIZED POLYPHENYLENE ETHER-POLYAMIDE COMPOSITIONS

Roelof F. van der Meer, Je Halsteren, Netherlands, and Roger W. Avakian, Brasschaat, Belgium, assignors to General Electric Company, Selkirk, N.Y.

Filed Oct. 9, 1987, Ser. No. 107,621

Int. Cl.[4] C08K *5/09, 3/16*

U.S. Cl. 524—398 28 Claims

1. A thermoplastic composition having improved retention of physical properties upon thermal aging comprising:

a. a compatibilized polyphenylene ether-polyamide resin blend comprised of, approximately 5 to 95 parts by weight polyphenylene ether resin, and 95 to 5 parts by weight polyamide resin; and

b. approximately 0.001 to 0.5 parts by weight per 100 parts of resin composition a. of a metal salt of the formula

$$M_n X^{\frac{n \cdot y}{z}}$$

where M represents a metal ion selected from the group consisting of copper, nickel, tin and cerium, X is an ion radical selected from the group consisting of halide ion and carboxylate ion, y is an integer representing the positive ionic charge of M and z is an integer representing the negative ionic charge of X.

4,857,576

METHOD FOR RENDERING A FLAMMABLE POLYMER MATERIAL FLAME-RESISTANT

Hiromi Kochi; Kenji Fukunaga, both of Fukuyama; Takaharu Itagaki, Yokohama, and Tsuyoshi Ito, Machida, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo and MANAC Incorporated, Fukuyama, both of, Japan

Continuation of Ser. No. 646,079, Aug. 31, 1984, abandoned. This application Mar. 21, 1986, Ser. No. 843,914

Claims priority, application Japan, Sep. 20, 1983, 58-173656

Int. Cl.[4] C08K *3/22*

U.S. Cl. 524—409 16 Claims

1. A method for rendering a flammable polymer material flame-resistant, which comprises incorporating into the flammable polymer material a powdered, cross-linked vinyl aromatic polymer brominated to contain from 30 to 70% by weight of bromine and optionally a flame retardant assistant, said brominated cross-linked polymer being substantially non-meltable by heat, wherein said brominated cross-linked vinyl aromatic polymer is prepared by (1) brominating a cross-linked vinyl aromatic copolymer obtained by the copolymerization of a monovinyl aromatic compound with a polyvinyl compound, or (2) brominating a cross-linked vinyl aromatic polymer obtained by cross-linking a vinyl aromatic polymer.

4,857,577

DISPERSION STABILIZER AND POLYMERIC AQUEOUS DISPERSION PREPARED THEREFROM

Roelof Buter, Ht Dieren, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Jan. 28, 1987, Ser. No. 8,680

Claims priority, application Netherlands, Jan. 28, 1986, 8600188

Int. Cl.[4] C08F *2/16*

U.S. Cl. 524—458 14 Claims

1. An aqueous dispersion comprising

(a) an addition polymer prepared from an acrylate monomer and/or methacrylate monomer; and

(b) 5–100 weight percent (based on the addition polymer) of a dispersion stabilizer obtained by the copolymerization of

(i) 100 weight parts of a mixture of

(1) 20–75 mole % of

(A) styrene and/or

(B) methyl styrene;

(2) 21–60 mole % of

(A) acrylic acid,

(B) methacrylic acid, and/or

(C) an amino group-containing

(a) acrylic and/or

(b) methacrylic ester; and

(3) 0–40 mole % of a different monoethylenically saturated compound;

in the presence of

(ii) 40–200 weight parts of polybutadiene prepared from at least 60 weight % of 1,3-butadiene and having a molecular weight of 1500–10,000;

at least a portion of the carboxylic acid groups of the (2) (A) acrylic acid and/or (2) (B) methacrylic acid, and/or a portion of the amino groups of the amino group-containing (2)(C)(a) acrylic and/or (2)(C)(b) methacrylic ester being ionized.

4,857,578

WOOD COATING COMPOSITION FROM ALKYD RESIN, PTFE AND MICROCRYSTALLINE WAX

Robert M. Hall, Des Plaines, Ill., assignor to Rust-Oleum Corporation, Evanston, Ill.

Filed Jul. 29, 1988, Ser. No. 226,225

Int. Cl.[4] D21H *1/48, 1/36, 1/40*

U.S. Cl. 524—488 10 Claims

1. A protective coating for wood having water resistant properties comprising an admixture of alkyd resin, polytetrafluoroethylene and microcrystalline wax uniformly dispersed in an organic solvent.

4,857,579

THERMOSETTABLE FIBER REINFORCED RESIN COMPOSITIONS

Linda A. Domeier, Somerville, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 854,722, Apr. 16, 1986, abandoned, which is a continuation of Ser. No. 746,464, Jun. 20, 1985, abandoned, which is a continuation of Ser. No. 603,985, Apr. 26, 1984, abandoned, and a continuation of Ser. No. 487,023, Apr. 21, 1983, abandoned, and a continuation of Ser. No. 209,423, Nov. 24, 1980, abandoned. This application Nov. 25, 1987, Ser. No. 125,358

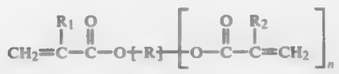
Int. Cl.[4] C08K *7/02, 7/04, 7/14;* G08G *18/14*

U.S. Cl. 524—507 12 Claims

1. A curable molding composition consisting of a mixture of:

I. from about 25 to 50 weight percent of a thermosetting resin containing:

(a) from about 25 to about 75 weight percent of a polyesfter resin produced by the coreaction of a poly(acrylate) and styrene in the presence of a catalyst for said coreaction, said poly(acrylate) being essentially free from functional groups reactive with the polyol or the polyisocyanate of (b); said poly(acrylate) being characterized by the following emprical formula:



wherein R is the residue of an organic polyhydric alcohol which contained alcoholic hydroxyl groups bonded to different carbon atoms, R_1 and R_2 are independently hydrogen or methyl, and n is 1 to 3;

(b) from about 75 to about 25 weight percent of a polyurethane produced by the reaction of (i) a saturated polyol having a functionality of from about 2 to about 8 and an equivalent weight of from about 30 to about 350 and (ii) a polyisocyanate having an isocyanate equivalent weight of less than about 300, said polyol and polyisocyante being free from unsaturated groups capable of copolymerizing with the poly(acrylate) or styrene of (a); and

II. from about 75 to about 50 weight percent of one or more fibers having a melting point or a glass transition temperature above about 130° C.;

wherein (b) constitutes less than 40 weight percent of (I) and (II).

4,857,580

CROSSLINKED COATING RESIN

Hans-Peter Patzschke; Peter W. Cerny; Armin Goebel, and Karlheinz Stransky, all of Wuppertal, Fed. Rep. of Germany, assignors to Herberts Gesellschaft mit beschraenkter Haftung, Wuppertal, Fed. Rep. of Germany

Continuation of Ser. No. 783,832, Oct. 3, 1985, abandoned. This application Jul. 12, 1988, Ser. No. 219,863

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1984, 3436346

Int. Cl.[4] C08F *8/32*

U.S. Cl. 524—507 3 Claims

1. A cathodically depositable aqueous electrodeposition lacquer coating composition (CED bath) which contains a synthetic resin binder containing amino groups, which may be solubilized in water by protonization by acids, and comprising an externally crosslinkable aminopoly(meth)acrylate resin free from epoxy groups for water-dilutable lacquers having an amine number of from 30 to 150 and a hydroxyl number of from 30 to 450 said composition further contains, from 50 to 5% by weight of a crosslinking agent of a blocked isocyanate and/or a resin containing a transesterifiable ester group, and up to a maximum of 30% by weight of a hydroxyfunctional resin which is reactive with the blocked isocyanates and the transesterifiable esters of said crosslinking agent; said externally crosslinkable aminopoly(meth)acrylate resin being obtained by reacting poly(meth)acrylate resin containing epoxy groups and having an average molecular weight (Mn) of from 600 to 10,000 and an epoxy equivalent weight of from 300 to 4,000 with an excess of primary and/or secondary monoamines and/or aminoalcohols to react the free epoxy groups with the amine groups, and distilling off the unreacted excess amine compounds.

4,857,581

CATIONIC PAINT BINDERS COMPRISING THE REACTION PRODUCT OF SUBSTITUTED UREAS, FORMALDEHYDE, AND PHENOLS

Willibald Paar, Graz, and Anton Arzt, Leibnitz, both of Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Dec. 15, 1987, Ser. No. 133,436

Claims priority, application Austria, Dec. 15, 1986, 3318/86

Int. Cl.[4] C08G *14/08*

U.S. Cl. 524—591 28 Claims

1. A process for producing cationic paint binders water-dilutable on protonation comprising (A) reacting an isocyanate compound having at least one free NCO-group with a secondary non-aromatic amine to provide a substituted urea, the quantity of said amine utilized being equivalent to the said free isocyanate groups; and (B) condensing the substituted urea of (A) with formaldehyde and a phenol to form a condensate.

4,857,582

PROCESS FOR PREPARING COLLOIDAL SUSPENSIONS OF ORGANOPOLYSILOXANES

Matthias Wolfgruber; Berward Deubzer, and Volker Frey, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed May 18, 1988, Ser. No. 195,567

Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717075

Int. Cl.[4] C08K *5/54*

U.S. Cl. 524—730 **4 Claims**

1. A process for preparing colloidal suspensions of organopolysiloxanes which comprises mixing an organosilicon compound selected from the group consisting of (a) mixtures of alkoxysilanes of the formula

$$R_aSi(OR^1)_{4-a},$$

and/or partial hydrolysates thereof, where R is selected from the group consisting of a hydrogen atom, a monovalent hydrocarbon radical having from 1 to 8 carbon atoms per radical, and a substituted monovalent hydrocarbon radical in which the substituents are inert to water, R^1 is selected from the group consisting of an alkyl radical having from 1 to 4 carbon atoms per radical, an alkoxyalkylene radical having from 1 to 4 carbon atoms per radical and a radical selected from the group consisting of $—COCH_3$, $—COC_2H_5$ and $—CH_2CH_2OH$, a is 0, 1, 2 or 3, with the proviso that the mixtures contain at least two different silanes where each have a different value for a, and a has an average of from 1.0 to 2.0, and (b) an organo(poly)siloxane which contains a maximum of 8 siloxane units, and is mixed with at least one alkoxysilane and/or a partial hydrolysate thereof, with water, in the presence of an emulsifier at a maximum rate of 5 moles of organosilicon compound per hour per liter of water, in which the organosilicon compound and water are fed continuously, but separately, to a reactor and at least one of the two substances contain the emulsifier, removing an alkanol continuously from the aqueous suspension emerging continuously from the reactor and thereafter continuously recycling the aqueous suspension from which the alkanol has been removed into the reactor.

4,857,583

PROCESS FOR THE PREPARATION OF ORGANOPOLYSILOXANE SURFACTANTS

Paul E. Austin, Williamstown; David D. Farris; James D. Reedy, both of Marietta, all of Ohio; Charles Blevins, Beacon, and Philbert E. Ramdatt, New York, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 2, 1987, Ser. No. 69,527

Int. Cl.[4] C08Y *5/06*

U.S. Cl. 524—761 **16 Claims**

1. An improved process for the preparation of organosiloxane copolymer surfactants in a saturated, polar, high boiling point polyol solvent, and wherein said surfactant can be employed directly in the production of urethane foam without the need for removing residual solvent, said process comprising the steps of:

(1) forming a mixture of:

(a) an organosiloxane having the average formula:

$$R_aH_bSiO_{(4-a-b)/2}$$

wherein R represents a monovalent hydrogen radical, a has a value of from 1 to 3.0, b has a value of from 0 to 1, and the sum of a+b has a value of from 1.5 to 3.0;

(b) a polyoxyalkylene having the average formula

$$R^1(OCH_2CH_2)_z(OCH_2\underset{\displaystyle CH_3}{\underset{|}{CH}})_w—OR^2$$

wherein the ethylene oxide and propylene oxide may be blocked or random and wherein R^1 is an alkenyl group; R^2 is selected from the group consisting of hydrogen, alkyl, acyl and trialkylsilyl groups; z has a value of from 0 to 70 and w has a value of 0 to 120;

(c) a liquid, saturated, polar, polyol solvent having a boiling point of greater that 175° C., and

(d) optionally a salt of a carboxylic acid as a reaction promoter,

(2) maintaining said mixture in an inert atmosphere and adding to said mixture a catalytic amount of a noble metal hydrosilation catalyst,

(3) reacting the mixture at a temperature below about 92° C. and

(4) recovering said surfactant in admixture with residual polyol solvent.

4,857,584

TWO-COMPONENT POLYURETHANES

Jean Vandermeersch, Montreuil, and Guy Durand, Honfleur, both of France, assignors to Ceca, S.A., France

Filed Feb. 19, 1988, Ser. No. 157,854

Int. Cl.[4] C08L *75/04*

U.S. Cl. 524—791 **6 Claims**

1. A method for preparing polyurethanes free of gas inclusions by mixing a component containing a hydroxylated reagent and a component containing the polyisocyanate reagent which can be stored separately without any major change in reactivity, characterized in that the component containing the hydroxylated reagent contains a dehydrating agent formed by a zeolite having the general formula in its anhydrous form:

$$aNa_2O.bK_2O.cMO.Al_2O_3.mSiO_2$$

in which

b is a number between 0.1 and 0.5, and

c is a number between 0.1 and 0.5,

in which

a is a number such that

$$a+b+c=1;$$

in which

m is a number between 1.35 and 2.35,

in which

M is calcium or magnesium.

4,857,585

STABLE AMPHOTERIC AQUEOUS DISPERSIONS OF SYNTHETIC POLYMERS

Frederic Leising, Vaujours, France, assignor to Rhone-Poulenc Specialities Chimiques, Courbevoie, France

Filed Jan. 25, 1984, Ser. No. 573,728

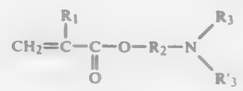
Claims priority, application France, Jan. 28, 1983, 83 01300

Int. Cl.[4] C08L *0/00*

U.S. Cl. 524—815 **21 Claims**

1. Stable amphoteric aqueous dispersions of synthetic polymers obtained by reacting:

(a) at least one unsaturated nitrogen compound having the following formula



wherein R_1 is a hydrogen atom or a methyl group, R_2 is a methylene or ethylene group, R_3 is a hydrogen atom or a linear alkyl group with 1 to 4 carbon atoms, and R'_3 is either a hydrogen atom or a linear alkyl group with 1 to 4 carbon atoms, or, if R_3 represents a hydrogen atom, a branched alkyl group with 3 or 4 carbon atoms, wherein the total number of carbon atoms in groups R_2, R_3, and R'_3, taken together, is less than or equal to 8, said nitrogen compound being capable of generating anionic charges by total or partial hydrolysis in a basic medium, with

(b) a cationic aqueous emulsion mixture free or at least substantially free from anionic species and containing:

(i) at least one non-ionic monomer selected from the group consisting of vinylaromatic compounds, vinyl esters, ethylenic nitriles, ethylenic carboxylic esters, dialkyl esters of ethylenic dicarboxylic acids, ethylenic amides, and the N-substituted derivatives of ethylenic amides,

(ii) an unsaturated salt of a polycoordinated onium of a group 5a or 6a element capable of copolymerizing with said monomer,

(iii) a cationic or non-ionic polymerization initiator,

(iv) and a cationic or non-ionic emulsifier, the amount of said unsaturated nitrogen compound being such that the ratio of the number of anionic charges generated by said unsaturated nitrogen compound in a basic medium to the number of cationic charges of the cationic aqueous emulsion mixture in a basic medium is more than 1.

4,857,586

NITROGEN-CONTAINING WATER-SOLUBLE COMPOUNDS

Henning Bachem, Cologne; Janos Muszik; Wolf-Dieter Schröer, both of Leverkusen, and Carlhans Süling, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 8, 1988, Ser. No. 165,658

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1987, 3708544

Int. Cl.[4] C08G *65/26*

U.S. Cl. 524—845 **13 Claims**

1. Water-soluble crosslinkable compounds which are obtainable by a reaction of reaction products, containing halogenohydrin groups, of polyamines and an epihalogenohydrin or 1,3-dihalogeno-2-hydroxy-propane with inorganic bases and a subsequent reaction of the resulting compounds, which contain epoxy groups, with halogen-free mineral acids, mono- or polycarboxylic acids or derivatives thereof.

4,857,587

CONTINUOUS PROCESS INCLUDING RECYCLE STREAM TREATMENT FOR THE PRODUCTION OF HIGH IMPACT POLYSTYRENE

Jose M. Sosa, Big Spring, and Jeffrey Morris, Roanoke, both of Tex., assignors to Fina Technology, Inc., Dallas, Tex.

Filed Dec. 24, 1987, Ser. No. 137,743

Int. Cl.[4] C08L *51/04;* **C08F** *2/00*

U.S. Cl. 525—53 **10 Claims**



1. In a continuous process for producing high impact polystyrene, said process having a volatilized recycle stream with at least 0.08% by weight of acid component by-products of at least one free radical initiator, the improvement comprising:

polymerizing a mixture of at least one vinylaromatic monomer and a rubber in the presence of a free radical initiator in at least one polymerization reactor;

feeding said mixture to a pre-heater to heat said mixture, thereby producing a heated mixture;

feeding said heated mixture to a devolatilizer to eliminate volatile components from said heated mixture, thereby producing a high impact polystyrene polymer;

feeding said volatile components as a recycle stream to a recycle treatment vessel;

removing initiator inhibiting impurities from said recycle stream in said recycle treatment vessel to produce a treated recycle stream containing less than 0.08% by weight of acid component by-products of said free radical initiator; and

feeding said treated recycle stream to said polymerization reactor.

4,857,588

PROCESS FOR THE PREPARATION OF HYDROCARBYL-GRAFTED CELLULOSE FIBERS

Seetha Coleman-Kammula, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 2, 1987, Ser. No. 69,136

Claims priority, application United Kingdom, Jul. 2, 1986, 8616164

Int. Cl.[4] C08F *283/02, 283/04*

U.S. Cl. 525—54.2 **15 Claims**

1. A process for the preparation of hydrocarbyl chain-grafted cellulose fibers, which process comprises:

(a) contacting pre-treated cellulose fibers having attached hydroxyl groups, said pre-treated fibers being obtained by contacting cellulose fibers with aqueous sodium hydroxide, with an alkali metal methoxide in the presence of methanol, thereby converting between about 0.25 to 33.3% of the hydroxyl groups into the corresponding alkali metal oxy groups, and

(b) contacting the resulting product with an organic compound comprising a hydrocarbyl chain having a molecular weight of at least 150 and wherein said chain carries an electrophilic functional group, at a temperature in the range of from 20° to 150° C.

4,857,589

HYDROLYZED ETHYLENE-VINYL ACETATE COPOLYMER

Shinji Okamoto, Kurashiki; Masaaki Minakawa, Hirakata; Youiti Neki, and Masasi Nakagiri, both of Kurashiki, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 15, 1987, Ser. No. 73,722

Claims priority, application Japan, Jul. 16, 1986, 61-168580

Int. Cl.[4] C08F *8/12*

U.S. Cl. 525—60 **3 Claims**

1. A hydrolyzed ethylene-vinyl acetate copolymer having an ethylene content of 20 to 60% by mole and a degree of hydrolysis in the vinyl acetate component of at least 95% by mole, and having an ash content of not more than 20 ppm and an alkali metal content of not more than 5 ppm.

4,857,590

POLYMER BLEND COMPOSITIONS

Satish K. Gaggar; James M. Dumler, and Thomas B. Cleveland, all of Parkersburg, W. Va., assignors to GE Chemicals, Inc., Parkersburg, W. Va.

Filed Jun. 8, 1987, Ser. No. 59,178

Int. Cl.[4] C08L *35/06, 33/08, 55/02, 71/00*

U.S. Cl. 525—64 **17 Claims**

1. A polymer blend composition, comprising:

(a) from about 40 to about 96 percent by weight of a styrenic polymer comprising a polymer or copolymer of styrene;

(b) from about 2 to about 50 percent by weight of an epihalohydrin copolymer; and

(c) from about 2 to about 50 percent by weight of an acrylate polymer selected from the group consisting of acrylate homopolymers and acrylate copolymers formed from greater than 50 percent by weight acrylate monomer, the amounts of each of components (a), (b) and (c) of the blend adding up to 100 weight percent.

4,857,591

THERMOPLASTIC MOULDING COMPOSITIONS OF ABS AND HYDROGENATED NITRILE RUBBER

Herbert Eichenauer; Hartmuth Buding, both of Dormagen; Joachim Döring, Cologne; Rudolf Casper, and Karl-Heinz Ott, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 22, 1987, Ser. No. 65,024

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1986, 3622208

Int. Cl.[4] C08L *37/00, 51/00*

U.S. Cl. 525—74 4 Claims

1. A thermoplastic moulding composition comprising

I. 75 to 99.5% by weight of

A. 95% or less by weight of a graft copolymer prepared by graft polymerization of

A.1 5 to 95% by weight of a mixture of

A.1.1 50 to 95% by weight of styrene, α-methylstyrene, nuclear-substituted styrene, methyl methacrylate or mixtures thereof and

A.1.2 50 to 5% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide or mixtures thereof on

A.2 95 to 5% by weight of a rubber with a glass transition temperature, Tg, of <0° C., and

B. 100 to 5% by weight of a thermoplastic polymer of

B.1 95 to 50% by weight of styrene, α-methylstyrene, nuclear-substitued styrene or methyl methacrylate or mixtures thereof and

B.2 5 to 50% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide or mixtures thereof and

II. 25 to 0.5% by weight of a hydrogenated nitrile rubber.

4,857,592

POLYVINYL CHLORIDE RESIN COMPOSITION

Mitsuru Hoshino, Iwaki; Haruhiko Yusa, Tokyo, and Katsumi Suzuki, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo K. K., Japan

Filed Feb. 11, 1988, Ser. No. 159,407

Claims priority, application Japan, Feb. 13, 1987, 62-029729

Int. Cl.[4] C08L *27/06, 51/04*

U.S. Cl. 525—82 4 Claims

1. A polyvinyl chloride resin composition comprising 3–30 wt. % of a graft copolymer and 97–70 wt. % of a polyvinyl chloride resin and having highly-balanced properties between impact resistance, transparency and stress-whitening resistance and excellent processing characteristics, said graft copolymer having been obtained by graft-polymerizing, in the presence of a latex containing greater than 75 but not exceeding 85 parts by weight of a rubbery butadiene-styrene copolymer, formed of 65–85 wt. % of butadiene, 15–35 wt. % of styrene and 0–3 wt. % of crosslinkable monomer, (i) 5–24 parts by weight of a first monomer mixture as a first-stage component, said first monomer mixture being composed of 70–97 wt. % of methyl methacrylate and 30–3 wt. % of an alkyl acrylate whose alkyl group has 1–8 carbon atoms; and then (ii) 3–21 parts by weight of a second monomer mixture as a second-stage component, said second monomer mixture being composed of 97–100 wt. % of styrene and 0–3 wt. % of a second crosslinkable monomer, the sum of said first and second monomer mixtures and said rubbery butadiene-styrene copolymer being 100 parts by weight, and the monomers grafted in the first stage amounting to 30–80 wt. % of the sum of the grafted monomers.

4,857,593

PROCESS FOR PROCESSING THERMOPLASTIC POLYMERS

Pak S. Leung, Highland Mills, N.Y.; Errol D. Goddard, Haworth, and Fred H. Ancker, Warren, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 8, 1988, Ser. No. 165,536

Int. Cl.[4] C08L *53/00, 83/00, 63/00, 51/08*

U.S. Cl. 525—92 28 Claims

1. A process for improving the processing of thermoplastic polymers in fabrication equipment which comprises adding to the thermoplastic polymer from 0.01 to 1 part, per hundred parts of thermo polymer, of a mixture comprising:

(a) a processing additive, said processing additive being a polymeric material with a molecular weight ranging from 500 to 100,000, and having on its molecule at least two monofunctional groups selected from the group consisting of hydroxy, alkoxy, epoxy carboxy and amino groups, and

(b) a processing adjuvant, said processing adjuvant being a molecule having at least two monofunctional groups or at least one multifunctional group wherein at least one functional group provides preferential adsorption over the processing additive for the fabrication surface and wherein at least one other functional group is capable of bonding with the processing additive, wherein (a) and (b) are present in a ratio of from 1 to 1:20.

4,857,594

MELT ADHESIVE COMPOSITIONS

Pallavoor R. Lakshmanan, and Son T. Nguyen, both of Houston, Tex., assignors to Baychem International, Inc.

Filed Apr. 28, 1988, Ser. No. 187,546

Int. Cl.[4] C08L *53/02, 23/10*

U.S. Cl. 525—98 18 Claims

1. A melt adhesive composition especially useful in adhering polyolefin bodies to themselves, to other polyolefin bodies and to other non-polyolefinic bodies consisting of (A) from about 60 to 100 weight percent of a mixture consisting of an amorphous polypropylene, a block copolymer selected from the group consisting of styrene-ethylene/butene-1 block copolymers and styrene-ethylene/propylene block copolymers and a hydrocarbon tackifier, wherein said amorphous polypropylene has a crystallinity of less than about 10 weight percent and a molecular weight in the range of about 300 to about 50,000 and said hydrocarbon tackifier has a ring and ball softening point in the range of about 10° to about 150° C.; the above components being present in the following relative amounts:

(B) from about 0 to about five weight percent, based on the weight of the final adhesive composition of an antioxidant and (C) from about 0 to about 40 weight percent, based on the weight of the final adhesive composition of a compound or a mixture of compounds selected from the group consisting of an isotactic polypropylene, ethylene-propylene copolymers, paraffin and microcrystalline waxes, Fischer-Tropsch waxes, low molecular weight polybutenes, polyisobutylene, low molecular weight polyethylene, low density polyethylene and process oils.

4,857,595

POLYMER BOUND HINDERED AMINE LIGHT STABILIZERS

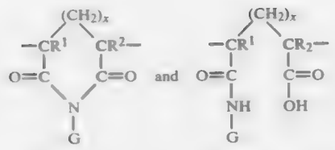
Robert T. Kazmierzak, and Ronald E. MacLeay, both of Erie, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 12, 1987, Ser. No. 84,603

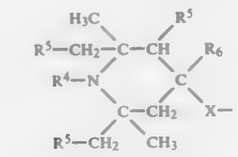
Int. Cl.[4] C08F *8/32*

U.S. Cl. 525—142 19 Claims

1. A polymer with recurring units selected from



or both in which the units occur either in the polymer backbone, or as pendant units, or both and wherein R^1 and R^2 are independently selected from hydrogen, alkyl of 1 to 6 carbons, cycloakyl of 5 to 7 carbons, phenyl, chlorine, or bromine, x is an integer of 0 or 1, and



represents the residue of a hydrazido substituted hindered amine light stabilizer group.

4,857,596

POLYMER BOUND ANTIOXIDANT STABILIZERS

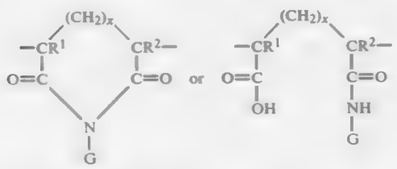
Ronald E. MacLeay, and Terry N. Myers, both of Williamsville, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 12, 1987, Ser. No. 84,537

Int. Cl.[4] C08F *8/30*

U.S. Cl. 525—142 11 Claims

1. A polymer with recurring units selected from the formulas



or both in which the units occur either in the polymer backbone, on grafted side chains, as pendant units, or combinations thereof and wherein x is 0 or 1, R^1 and R^2 are independently selected from hydrogen, alkyl of 1–6 carbons, cycloalkyl or 5–7 carbons, phenyl, chlorine or bromine, and each



is the residue of a hydrazido substituted stabilizer group selected from (a) hindered phenols, (b) dialkyl sulfides, (c) secondary aromatic amines, and (d) benzothiazoles or benzimidazoles, with the proviso that only one class of antioxidant stabilizer selected from (a) through (d) are attached to the polymer but multiple combinations of stabilizers within the same class are permitted.

4,857,597

THERMOPLASTIC FORMULATIONS

Robert A. Schleifstein, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 1, 1988, Ser. No. 150,923

Int. Cl.[4] C08K *5/34*

U.S. Cl. 525—151 15 Claims

1. A thermoplastic formulation having:

(a) a first part comprising,

(i) a blend of polyphenylene ether and a polyvinyl aromatic, and

(ii) a nuclear halogenated polyvinyl aromatic flame retardant; and

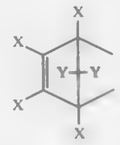
(b) a second part, in admixture with said first part, said second part comprising, a Diels-Alder adduct having the formula,

$$A—R—(A)_n$$

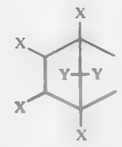
wherein

n=0, 1, or 2,

A is a polyhalogenated cycloalkylene group having the structure,

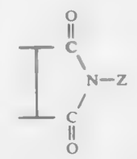


or a polyhalogenated cycloalkyl group having the structure



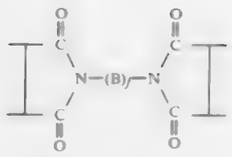
in which each X is independently a chloro, bromo or hydro group and each Y is independently a chloro, bromo, hydro, hydrocarbyl or hydrocarbyloxy group, and the total of said X's and Y's which are chloro or bromo groups, is at least two,

R, when n=0, is a divalent saturated cyclic polybromohydrocarbon group having 7 to 20 carbon atoms and 2 to 6 bromine atoms which are paired in vicinal positions, or a group having the structure,



in which Z has up to 8 carbon atoms and is an alkyl, aryl, alkaryl, aralkyl cycloalkyl group, or a halogenated derivative thereof, and

R, when n=1 or 2, is, respectively, tetra- or hexavalent saturated cyclic hydrocarbon group having 7 to 20 carbon atoms and 0 to 4 chloro or bromo atoms which are paired in vicinal positions, or a group having the structure,



in which f=0 or 1 and B has up to 8 carbon atoms and is an alkylene, arylene, alkarylene, aralkylene, cycloalkene group or a halogenated derivative thereof,

said Diels-Alder adduct being present in an amount sufficient to provide said formulation with a melt index, as measured by ASTM 1238, which is greater than that obtainable with said first portion alone.

4,857,598

CO-VULCANIZABLE COMPOSITIONS OF FLUOROELASTOMERS

Giovanni Moggi, Milan; Graziella Chiodini, Saronno; Gianna Cirillo, Genova, and Sergio Geri, Milan, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

Continuation of Ser. No. 875,406, Jun. 17, 1986, abandoned. This application Dec. 1, 1987, Ser. No. 127,082

Claims priority, application Italy, Jun. 19, 1985, 21212 A/85

Int. Cl.[4] C08F *27/20, 27/18*

U.S. Cl. 525—194 **6 Claims**

1. Co-vulcanizable compositions of fluoroelastomers comprising:

(A) 15–85% by weight of a fluoroelastomer composed by 40–85% by mol of vinylidene fluoride, 15–35% by mol of perfluoropropene and 0–30% by mol of tetrafluoroethylene;

(B) 15–85% by weight of a copolymer constituted by 40–60% by mol of tetrafluoroethylene and 40–60% by mol of propylene;

(C) 1–12 parts by weight, as referred to 100 parts of (A)+(B) blend, of an organic curing system consisting solely of a bisperoxydicarbamate with vulcanizing accelerating action, of formula

R—OO—C(O)—NH—R_1—NH—C(O)—OO—R (I)

wherein R is a saturated hydrocarbon group containing a tertiary carbon atom, which is bound to alkyl or phenyl or alkyl and phenyl substituents, said hydrocarbon group having a number of carbon atoms comprised within the range of from 4 to 25, and R_1 is a difunctional alkyl, cycloalkyl or alkyl-cycloalkyl radical with a number of carbon atoms comprised within the range of from 1 to 25.

4,857,599

MODIFIED DENSE STAR POLYMERS

Donald A. Tomalia, and James R. Stahlbush, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 8, 1988, Ser. No. 153,185

Int. Cl.[4] C08G *69/00*

U.S. Cl. 525—259 **9 Claims**

1. An improved dense star polymer prepared in a reaction medium having at least one branch emanating from an immobilized core which core and its precursor are insoluble in the reaction medium in which the dense star polymer is prepared, said branch called a core branch having at least two terminal groups provided that (1) the ratio of terminal groups to the core branches is more than one, (2) the density of terminal groups per unit volume in the polymer is at least 1.5 times that of an extended conventional star polymer having similar core and monomeric moieties and a comparable molecular weight and number of core branches, each of such branches of the extended conventional star polymer bearing only one terminal group, and (3) a molecular volume that is no more than about 80 percent of the molecular volume of said extended conventional star polymer as determined by dimensional studies using scaled Core-Pauling molecular models.

4,857,600

PROCESS FOR GRAFTING DIACID ANHYDRIDES

Laurence H. Gross, Bridgewater, N.J., and Thorne M. Bartlett, Victoria, Tex., assignors to Union Carbide Corporation, Danbury, Conn.

Filed May 23, 1988, Ser. No. 197,331

Int. Cl.[4] C08L *255/02, 255/04, 255/08*

U.S. Cl. 525—285 **33 Claims**

1. A process for producing a polyolefin grafted with an unsaturated aliphatic diacid anhydride which comprises:

(a) adding and mixing molten polyolefin, one or more aliphatic diacid anhydride compositions, organic peroxide, and inert organic solvent in a first reaction zone, under reaction conditions, to produce a partially grafted polyolefin product;

(b) sequentially passing said partially grafted polyolefin product from said first reaction zone through a series of one or more reaction zones; and

(c) mixing additional aliphatic diacid anhydride, organic peroxide, and inert solvent with said partially grafted product, under reaction conditions, in each successive reaction zone until the desired level of grafting is achieved.

4,857,601

SELECTIVE HYDROLYSIS OF COPOLYMERS OF PARA-ACETOXY STYRENE AND DIALKYL MUCONATES OR ALKYL SORBATES

Balaram Gupta, North Plainfield, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Filed Sep. 11, 1987, Ser. No. 99,429

The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.

Int. Cl.[4] C08F *8/12*

U.S. Cl. 525—344 **18 Claims**

1. A process for preparing copolymers of p-vinylphenol and dialkyl muconates or alkyl sorbates which comprises slurrying copolymers of p-acetoxystyrene and dialkyl muconates or alkyl sorbates in water or an alcohol followed by hydrolyzing the acetoxy groups with an acid or a base with substantially no saponification of the alkyl muconate or alkyl sorbate groups.

4,857,602

BIOABSORBABLE SURGICAL SUTURE COATING

Donald J. Casey, Ridgefield; Louis Rosati, Norwalk; Peter K. Jarrett, Trumbull, and Leonard T. Lehmann, Fairfield, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 5, 1986, Ser. No. 903,798

The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.

Int. Cl.[4] C08L *71/02;* **C08G** *63/06*

U.S. Cl. 525—408 **28 Claims**

1. A bioabsorbable coating for a surgical suture or ligature comprising a diblock copolymer having a first block comprising a polyalkylene oxide and a second block consisting essentially of glycolic acid ester and trimethylene carbonate linkages such that said diblock copolymer has a melting point (Tm) less than 65 degrees centigrade and a glass transition temperature (Tg) less than 20 degrees centigrade and is soluble in methylene chloride or chloroform or both.

4,857,603

CHAIN EXTENSION OF POLYETHYLENE TEREPHTHALATE WITH POLYACYLLACTAMS

Murali K. Akkapeddi, Morris Plains, and Jay A. Gervasi, Succasunna, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Feb. 29, 1988, Ser. No. 161,927

Int. Cl.[4] C08F *20/20, 20/34;* **C08L** *67/02, 77/12*

U.S. Cl. 525—437 **9 Claims**

1. A high molecular weight polyethylene terephthalate resin consisting essentially of a resin consisting of repeating units of ethylene terephthalate and optionally up to five percent of components selected from the group consisting of 1,4-cyclohexanedimethanol, butylenediol, neopentylenediol, diethylene glycol, glutaric acid and combinations thereof, and having incorporated in the polymer chain a chain extending linkage derived from terephthaloyl bislaurolactam.

4,857,604

BLENDS OF ELASTOMERIC POLYETHERESTER COPOLYMERS WITH THERMOPLASTIC POLYCARBONATES AND THERMOPLASTIC POLYALKYLENE TEREPHTHALATES

Surendra H. Agarwal, Bombay, India, assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 567,986, Jan. 14, 1984, abandoned. This application Jul. 22, 1986, Ser. No. 889,584

Int. Cl.[4] C08K *5/13;* **C08L** *69/00*

U.S. Cl. 525—439 **20 Claims**

1. A copolyetherester-containing blend consisting essentially of a copolyetherester resin, a polycarbonate resin and a poly(alkylene terephthalate) resin wherein the polycarbonate is present in an amount of from about 5 to about 150 parts by weight per 100 parts copolyetherester, and the poly(alkylene terephthalate) is present in an amount up to about 70% by weight based on the combined weight of copolyetherester and polycarbonate.

20. The composition of claim 1 which further consists of an effective flame retarding amount of a bromine-containing flame retardant alone or in combination with a flame retardant synergist.

4,857,605

POLYMER BLEND

Robert G. Lutz, Santa Rosa, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 25, 1988, Ser. No. 147,401

Int. Cl.[4] C08L *67/02, 67/04, 65/00*

U.S. Cl. 525—445 **20 Claims**

1. A polymeric composition comprising a blend of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon with a thermoplastic polyester selected from the group consisting of (a) polyesters formed by the polycondensation of a dicarboxylic acid with a glycol or (b) polylactones.

4,857,606

WETTABLE, FLEXIBLE, OXYGEN PERMEABLE, SUBSTANTIALLY NON-SWELLABLE CONTACT LENS CONTAINING POLYOXYALKYLENE BACKBONE UNITS, AND USE THEREOF

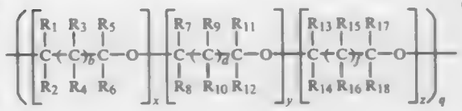
Kai C. Su, Alpharetta, and Frank F. Molock, Lawrenceville, both of Ga., assignors to Ciga-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 58,496, Jun. 5, 1987. This application Jul. 21, 1988, Ser. No. 222,581

Int. Cl.[4] C08F *283/04*

U.S. Cl. 525—455 **2 Claims**

1. An optically clear, wettable, flexible, hydrolytically stable, biologically inert, substantially siloxane-free, substantially non-swellable in ocular tear fluid, and oxygen permeable polymer fabricated from a crosslinkable polymer having units of the formula I



(I)

wherein each b, d and f is independently 0–4; q is a number from 1 to 1000; each x, y and z is independently 0 to a number such that (x+y+z) times q=4 to 1000; each of R_1–R_{18} are selected from the group consisting of hydrogen, an aliphatic, aromatic or alicyclic containing radical, each optionally interrupted by a heteroatom provided no carbon atom in said unit is geminally bound to oxygen atoms; or 2 adjacent groups R_1–R_{18}, together with the atoms to which they are attached can form a 5–8 membered ring, and R_1–R_{18} may be further selected from or have a substituent selected from crosslinkable moieties provided that no carbon atoms bearing geminal oxygen atoms results and the terminal oxygen within a unit of formula I may be replaced by —NR_{19}— wherein R_{19} is hydrogen, C_{1-4}alkyl, or phenyl, provided that when b, d and f are all 0, at lest one of R_1, R_2, R_5–R_8, R_{11}–R_{14}, R_{17} and R_{18} in at least a portion of the units of formula I is other than hydrogen and such R_1, R_2, R_5–R_8, R_{11}–R_{14}, R_{17} and R_{18} individually or in the aggregate is sufficiently hydrophobic such that the resulting polymer is substantially non-swellable in water; said ophthalmic device having a receding contact angle with distilled water of less than 60° when measured at 20° C.; contains less than about 10% water; and having an oxygen permeability, Dk ($\times 10^{-10}$[cm.mm/sec] [mlO_2/ml.mmHg]), greater than about 7.

4,857,607

EPOXIDIZED POLYCYCLOACETALS

Jacques-Alain Cotting, Düdingen, and Alfred Renner, Muntelier, both of Switzerland, assignors to Ciba-Geigy Corporation, Hawthorne, N.Y.

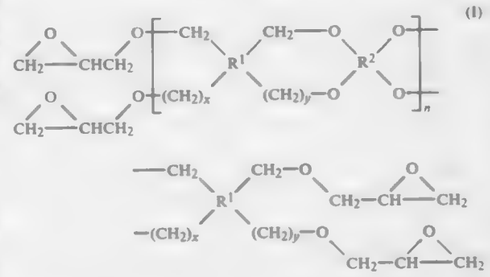
Filed May 18, 1988, Ser. No. 195,312

Claims priority, application Switzerland, May 27, 1987, 2050/87

Int. Cl.[4] C08G *59/24*

U.S. Cl. 525—471 **14 Claims**

1. An epoxidized polycycloacetal of formula I



(I)

wherein n is as integer from 1 to 500, x and y are each independently of the other 0 or 1, R^1 is a carbon atom, a tetravalent hydrocarbon radical having a molecular weight not greater than 1000 or a tetravalent hydrocarbon radical having a molecular weight not greater than 1000 which contains ether oxygen atoms, hydroxyl, carbonyl or epoxy groups, and R^2 is a tetravalent hydrocarbon radical derived from a dialdehyde or a diketone.

4,857,608

PROCESS FOR PREPARING WEATHER-RESISTANT COATINGS

Christian Herzig, Taching; Bernward Deubzer; Volker Frey, both of Burghausen, all of Fed. Rep. of Germany, and Esterbauer Josef, Hochburg, Austria, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 166,950

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1987, 3709045

Int. Cl.[4] B05D *3/02*; B32B *9/04*; C08F *283/00*; C08G *65/32*

U.S. Cl. 525—476 5 Claims

1. A process for preparing weather-resistant coatings which comprises applying a paint to a substrate to form a coating thereon containing as the major components an epoxy resin and a silicon compound containing basic nitrogen which is bonded to the silicon via a carbon and which has at least one hydrogen atom bonded directed to the nitrogen, where said silicon compound is selected from the group consisting of organopolysiloxanes consisting of units of the formula

$$Y_aR_bSi(OR^1)_cO_{\frac{4-a-b-c}{2}},$$

where R is a monovalent hydrocarbon radical having from 1 to 8 carbon atoms, R^1 is an alkyl group having from 1 to 4 carbon atoms, Y is a monovalent SiC-bonded organic radical containing basic nitrogen, which is bonded to silicon via carbon and has at least one hydrogen atom bonded to the nitrogen, a is 0 or 1, with an average of from 0.02 to 1.0, b is 0, 1, 2, or 3, with an average of from 0.0 to 2.0, and c is 0, 1, 2, or 3, with an average of from 0.0 to 2.0 and silcarbanes of the formula

$$Y(OR^1)_2Si(CH_2)_2Si(OR^1)_2Y$$

where R^1 is an alkyl group having from 1 to 4 carbon atoms and Y is a monovalent SiC-bonded organic radical containing basic nitrogen which is bonded to silicon via carbon and has at least one hydrogen bonded to the nitrogen.

4,857,609

AMINO RESIN AND A METHOD FOR ITS PRODUCTION

Leif A. Flodman, Sundsvall, and Per Erik G. Gabrielsson, Kvissleby, both of Sweden, assignors to Dynobel A/S, Stockholm, Sweden

Filed Jan. 22, 1988, Ser. No. 147,298

Claims priority, application Sweden, Jan. 26, 1987, 8700292; Dec. 1, 1987, 8704793

Int. Cl.[4] C08L *61/00*

U.S. Cl. 525—497 14 Claims

1. A resin for the production of adhesive for cellulose based products, such as particle boards, comprising one of (a) a condensation product of formaldehyde, urea and phenol and (b) a condensation product of formaldehyde, urea, phenol and melamine, with a molar ratio per mole formaldehyde of 1.4–0.8 moles of urea, 0.006–0.04 moles of phenol and 0–0.04 moles of melamine, and wherein the phenol in the resin is in the form of a cross-linking agent comprising a co-condensate of phenol, formaldehyde and urea.

4,857,610

PROCESS FOR THE CONTINUOUS PRODUCTION OF POLYMERS AND COPOLYMERS OF WATER-SOLUBLE MONOMERS

Miroslav Chmelir, Krefeld, and Josef Pauen, Willich, both of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhausen GmbH, Krefeld, Fed. Rep. of Germany

Filed Dec. 16, 1986, Ser. No. 942,330

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1985, 3544770

Int. Cl.[4] B01J *19/22*; C08F *2/10, 20/06*

U.S. Cl. 526—88 19 Claims



1. In a process for the continuous production of polymers and copolymers of water-soluble monomers, by polymerization of an aqueous monomer solution containing 2.2–8.3 moles of polymerizable double bonds per kilo of monomer solution at a temperature in the range from about −10 to 120° C., the liquid reaction components being applied in a layer at least one centimeter thick on a moving endless conveyor belt and polymerized, the improvement which comprises adding the liquid reaction components to a trough formed by the moving conveyor belt, the trough shape of the conveyor belt being continuously changed to an extended and flat profile during the polymerization of the reaction components, and the resulting polymer gel strand being continuously released from the side edges towards the center of the trough formed by the conveyor belt, as the curved trough shape of the conveyor belt changes to the extended, flat profile, the release of the polymer gel strand from the surface of the conveyor belt, as a result of the changing shape of the trough formed by the conveyor belt during the course of polymerization, proceeding under the condition P>A.F. wherein P is the force with which the conveyor belt is converted from the trough shape to the extended, flat profile; A. is the contact area between the gel strand and the conveyor belt; and F. is the force of adhesion of the gel strand to the conveyor belt.

4,857,611

GAS FLUIDIZED BED TERPOLYMERIZATION OF OLEFINS

Daniel C. Durand, Battersea, England, and Frederic R. Morterol, Sausset-les-Pins, France, assignors to BP Chemicals Limited, London, England

PCT No. PCT/GB85/00184, § 371 Date Dec. 9, 1985, § 102(e) Date Dec. 9, 1985, PCT Pub. No. WO85/05111, PCT Pub. Date Nov. 21, 1985

Continuation of Ser. No. 85,255, Aug. 11, 1987, abandoned, which is a continuation of Ser. No. 810,328, Dec. 9, 1985, abandoned. This PCT application Apr. 30, 1985, Ser. No. 204,983

Claims priority, application France, May 2, 1984, 8406773

Int. Cl.[4] C08F *2/34, 210/16*

U.S. Cl. 526—88 11 Claims

1. a Gas fluidized bed process for the production of copolymers having a density comprised between 0.900 and 0.935, this process being characterised in that it comprises a copolymerization of (a) ethylene, (b) propylene and/or 1-butene, and (c) alpha-olefins comprising 5 to 8 carbon atoms in the gaseous state in admixture with an inert gas and optionally hydrogen, the gas mixture circulating from bottom to top through the fluidised bed of the copolymer in course of formation, the copolymerization being effected at a temperature comprised between 50° C. and 100° C. under a total pressure comprised between 0.5 to 4 MPa with a speed of fluidization from 40 to 80 cm/sec in the presence of a catalyst system comprising:

a solid catalyst prepared by reacting at between −20° C. and 150° C. magnesium metal with an alkyl halide R_2X and one or more tetravalent titanium compounds having the formula $TiX_{4-t}(OR_11)_t$, wherein R_1 is an alkyl group containing 2 to 8 carbon atoms, R_2 is an alkyl group containing 2 to 12 carbon atoms, X is chlorine or bromine and t is an integer or fraction from 0 to 3; in molar ratios such that:

$0.1 \leqq TiX_{4-t}(OR_1)_t/Mg \leqq 0.33$

and $0.5 \leqq (R_2X/Mg \leqq 8$

and, a cocatalyst consisting of at least one organoaluminium or halogen-organoaluminium compound in a quantity such that the atomic ratio of the quantity of aluminium to the quantity of titanium is comprised between 1 and 30, the partial pressure (pp) of the various ingredients of the gas mixture being such that:

$0.05 \leqq$ pp comonomer (b)/pp ethylene $\leqq 0.4$

$0.05 \leqq$ pp comonomer (c)/pp ethylene $\leqq 0.2$

$0 \leqq$ pp hydrogen/pp ethylene $\leqq 0.5$

$0.2 \leqq$ pp inert gas/total pressure $\leqq 0.8$, and

0.01 Mpa $\leqq$ pp comonomer (c) $\leqq 0.1$ MPa

and such that the ratio by weight of the quantity of comonomer (c) to the quantity of comonomer (b) fixed in the copolymer is comprised between 0.1 and 1.5, comonomer (b) being propylene or 1-butene or a mixture of these two olefins, comonomer (c) being an alpha-olefin comprising 5 to 8 carbon atoms or a mixture of these alpha olefins, further characterised in that before performing in said copolymerisation, the catalyst system is subjected to prepolymerisation during which the catalyst and cocatalyst are brought into contact with ethylene, so as to obtain from 0.1 to 300 g of polyethylene or copolymer of ethylene per milligramme atom of titanium.

4,857,612

PROCESS FOR THE POLYMERIZATION OF ALPHA OLEFINS

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 508,434, Jun. 27, 1983, abandoned. This application May 4, 1987, Ser. No. 46,207

The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.

Int. Cl.[4] C08F *4/48, 4/46, 10/06*

U.S. Cl. 526—125 18 Claims

1. A process for the stereoregular polymerization of alpha olefins which comprises polymerizing an alpha olefin having from 2 to 8 carbon atoms in the presence of a catalyst comprising:

(a) a solid supported titanium tetrahalide complex, wherein said complex is prepared by contacting a mechanically pulverized solid support with titanium tetrahalide in the absence of mechanical pulverization, and

(b) a cocatalyst comprising a mixture of a dialkyl aluminum halide and a dialkyl magnesium or alkyl lithium compound.

4,857,613

PREPARATION OF HOMOPOLYMERS AND COPOLYMERS OF PROPENE USING A ZIEGLER-NATTA CATALYST SYSTEM

Ralf Zolk, Hessheim; Juergen Kerth, Carlsberg, and Rainer Hemmerich, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Akteingesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,213

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1987, 3730022

Int. Cl.[4] C08F *4/64*

U.S. Cl. 526—128 3 Claims

1. A process for the preparation of a homopolymer of propene or a copolymer of propene with minor amounts of other C_2–C_{12}-α-monoolefins by polymerization of the monomer or monomers at from 20° to 160° C. and under from 1 to 100 bar using a Ziegler-Natta catalyst system consisting of

(1) a titanium component which is based on a finely divided, shape-imparting silica gel and contains titanium, magnesium, chlorine and a benzenecarboxylic acid derivative,

(2) an aluminum component of the formula

$$AlR_3$$

where R is alkyl of not more than 8 carbon atoms, and

(3) a silane component of the formula

$$R^1_nSi(OR^2)_{4-n}$$

where R^1 is a saturated aliphatic and/or aromatic hydrocarbon radical of not more than 16 carbon atoms,

R^2 is alkyl of not more than 15 carbon atoms and n is from 0 to 3,

with the provisos that the atomic ratio of titanium from the titanium component (1) to aluminum from the aluminum component (2) is from 1:10 to 1:800 and the molar ratio of aluminum component (2) to silane component (3) is from 1:0.01 to 1:0.8, wherein the titanium component

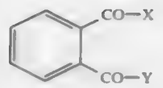
(1) used is one which is obtained by a procedure in which first

(1.1) in a first stage (I), a carrier is prepared from (Ia) a finely divided silica gel which has a particle diameter of from 1 to 1,000 μm, a pore volume of from 0.3 to 5 cm^3/g and a specific surface area of from 100 to 1,000 m^2/g, is of the formula SiO_2. a Al_2O_3, where a is from 0 to 2, and has a moisture content such that it loses from 1 to 20% by weight, based on the initial total weight of the silica gel, of water at 1000° C. in the course of 0.5 hour, (Ib) an organomagnesium compound of the formula MgR^3R^4. where R^3 and R^4 are each C_2–C_{10}-alkyl, and (Ic) a gaseous chlorinating agent of the formula ClZ, where Z is Cl or H, by a procedure in which first

(1.1.1) in a first sub-stage, the finely divided silica gel (Ia) and the organomagnesium compound (Ib) are combined in an inert liquid hydrocarbon with constant thorough mixing at from 10 to 120° C., from 1 to 10 molar parts of the organomagnesium compound (Ib) being used per 10 molar parts of silicon of the silica gel (Ia), and the substances combined are kept at from 20° to 140° C. for from 0.5 to 5 hours, then

(1.1.2) in a second sub-stage, the gaseous chlorinating agent (Ic) is passed, with constant thorough mixing and at from −20° to +80° C., into the mixture obtained in the first sub-stage, from 2 to 40 molar parts of the chlorinating agent (Ic) being used per molar part of the organomagnesium compound (Ib), the entire mixture is kept at a temperature in the stated range for from 0.5 to 5 hours and the resulting solid-phase product, ie. the carrier (I), is isolated with removal of the liquid phase, thereafter

(1.2) in a second stage, a solid-phase intermediate is prepared from (I) the carrier obtained in the first stage, (II) a C_1–C_8-alkanol, (III) titanium tetrachloride and (IV) a phthalic acid derivative of the formula



where X and Y together are oxygen or X and Y are each chlorine or C_1–C_{10}-alkoxy, by a procedure in which first (1.2.1) in a first sub-stage, the carrier (I) and the alkanol (II) are combined in an inert liquid hydrocarbon, with constant thorough mixing at room temperature, from 1 to 5 molar parts of the alkanol (II) being used per molar part of magnesium of the carrier (I), and the substances combined are kept at from 20° to 140° C. for from 0.5 to 5 hours, then

(1.2.2) in a second sub-stage, the titanium tetrachloride (III) is introduced, with constant thorough mixing and at room temperature, into the reaction mixture resulting from the first sub-stage, from 2 to 20 molar parts of the titanium tetrachloride (III) being used per molar part of magnesium of the carrier (I), the substances combined are kept at from 10° to 150° C. from 0.5 to 5 hours and the resulting solid-phase intermediate is isolated with removal of the liquid phase, with the proviso that the phthalic acid derivative (IV) is introduced in the course of one or both of the substages (1.2.1) and (1.2.2), from 0.01 to 1 molar part of the phthalic acid derivative (IV) being used per molar part of magnesium of the carrier (I), then

(1.3) in a third stage, the solid-phase intermediate obtained in the second stage is subjected, at from 100° to 150° C. for from 0.2 to 5 hours, to a single-stage or multi-stage or continuous extraction with titanium tetrachloride or a mixture of titanium tetrachloride and an alkylbenzene of not more than 12 carbon atoms, the said mixture containing not less than 5% by weight of titanium tetrachloride, and a total of from 10 to 1,000 parts by weight of the extracting agent being used per 10 parts by weight of the solid-phase intermediate obtained in the second stage, and finally

(1.4) in a fourth stage, the solid-phase product formed in the third stage is washed with an inert liquid hydrocarbon until the hydrocarbon contains less than 2% by weight of titanium tetrachloride, and the titanium component (1) is obtained in this manner.

4,857,614

RADIATION-SENSITIVE POLYMERS WHICH FORM A METAL COMPLEX, PROCESS FOR THE POLYMERIZATION OF ACETYLENE, AND COATED MATERIAL

Jürgen Kaschig, and Jürgen Finter, both of Freiburg, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 889,585, Jul. 22, 1986, Pat. No. 4,713,422. This application Sep. 11, 1987, Ser. No. 99,374

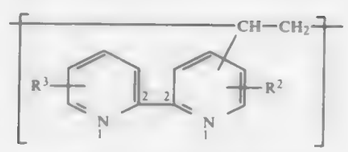
Claims priority, application Switzerland, Mar. 23, 1984, [illegible]

Int. Cl.[4] C08F *4/06, 38/00*

U.S. Cl. 526—172 **2 Claims**

1. A process for the polymerization of acetylene to polyvinylene under the action of a cobalt catalyst, wherein the cobalt catalyst is a polymer which has a mean molecular weight of 1,000 to 5,000,000 and consists of:

(a) 1 to 100 mol %, relative to the polymer, of repeating structural elements of the formula I



(I)

which are complexed with a cobalt compound, in which R^1 is hydrogen, C_1–C_6-alkyl, C_1–C_6-alkoxy, phenyl or phenoxy and R^2 is hydrogen or methyl and the —CH—CH_2— group is bonded in the 4- or 6-position,

(b) 0 to 99 mol % of structural elements of at least one olefin which contains a radiation-sensitive group which is bonded to the olefin directly or via a bridging group and possesses a photodimerizable ethylenically unsaturated bond, and

(c) 0 to 99 mol % of structural elements with at least one olefin which differs from (a) and (b).

4,857,615

METHOD OF MAKING CONDENSED PHASE POLYMERS

William R. Broan, Maplewood; Spencer F. Silver, White Bear Lake, and Eugene G. Joseph, Arden Hills, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 9, 1987, Ser. No. 107,262

Int. Cl.[4] C08F *212/08, 230/00, 230/08, 230/10*

U.S. Cl. 526—173 **10 Claims**

1. A method of preparing an elastomeric copolymer having a condensed phase structure wherein polymer branches occur along a polymer backbone, said method comprising the step of reacting, under polymerization conditions, the following:

(a) hydrocarbyl lithium initiator;

(b) at least one anionically polymerizable compound; and

(c) a condensing agent having the general formula

$$CH_2{=}C(R')QY(R)_n(X)_m$$

wherein

Y is a tetravalent Si, Ge, Sn, or Pb;

X is H, —OR'', Cl Br or F, wherein R'' is a monovalent lower alkyl group having from 1 to 6 carbon atoms;

R is hydrogen, a monovalent lower alkyl group having from 1 to 6 carbon atoms, or phenly;

Q is phenylene;

R' is hydrogen, a monovalent lower alkyl group having from 1 to 6 carbon atoms, or phenyl;

m is an interger of 1, 2 or 3; and

n is an interger equal to 3−m;

in a mole ratio (a) to (c) of about (1+m):1 to form a condensed phase copolymer and wherein the mole percentage of the condensing agent in each copolymer segment containing said condensing agent is in the range of about 0.01% to about 5%.

4,857,616

PROCESS FOR THE PREPARATION OF POLYCHLOROPRENE

Rüdiger Musch, Bergisch-Gladbach; Eberhard Müller, Dormagen; Gerhard Hohmann, Leverkusen, and Karl-Heinz Schabel, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 12,362, Feb. 9, 1987, abandoned. This application Feb. 11, 1988, Ser. No. 154,936

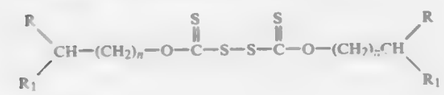
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1986, 3605333

Int. Cl.[4] C08F *2/38, 2/24*

U.S. Cl. 526—204 **2 Claims**

1. Process for the preparation of polychloroprene by aqueous emulsion polymerization of chloroprene and from 0 to 20% by weight, based on the total quantity of monomer to be polymerized, of monomers copolymerizable with chloroprene, in the presence of an effective amount of polymerization initiator and

from 0.3 to 5 mmol per 100 g of monomers of xanthogen disulphide corresponding to the formula



in which

n denotes 0 to 4,

R and R_1, independently of one another, denote hydrogen, C_1–C_6-alkyl, C_5–C_8-cycloalkyl or, together with the CH group, denote an oxygen-containing heterocyclic ring system having 5–8 ring members, which is unsubstituted, mono-, di- or trisubstituted by C_1–C_4-alkyl,

with the proviso that the xanthogen disulphide contains less than 2% by weight, based on xanthogen disulphide, of free sulphur as the single sulphur source, and working up the polymer suspension to the solid rubber, characterized in that from 2×10^{-5} to 3×10^{-3} mol per 100 g of monomers of tetra(C_1–C_4)alkylthiuram disulphide is added after the end of the polymerization.

4,857,617

PROCESS FOR PRODUCING A HIGH SOFTENING POINT HYDROCARBON RESIN

Koji Tanaka, Yokkaichi; Katsuo Takemoto, Aichi, and Yasushi Sakai, Yokkaichi, all of Japan, assignors to Tosoh Corporation, Shin-nanyo, Japan

Filed Jul. 29, 1988, Ser. No. 225,786

Claims priority, application Japan, Jul. 30, 1987, 62-188876

Int. Cl.[4] C08F *4/14, 236/20*

U.S. Cl. 526—237 **3 Claims**

1. A process for producing a high softening point hydrocarbon resin, which comprises polymerizing (a) an oil fraction having a boiling point within a range of from 140° to 220° C. selected from cracked oil fractions obtained by thermal cracking of petroleum and (b) a turpentine oil in the presence of a cationic polymerization catalyst, wherein the oil fraction (a) is adjusted to have a conjugated diolefin content of at most 1.5% by weight and a dicyclopentadiene content of from 7 to 17% by weight, the turpentine oil (b) is selected from the group consising of α-pinene, β-pinene, dipentene and mixtures thereof and used in an amount of from 5 to 15% by weight, the cationic polymerization catalyst is at least one member selected from the group consisting of boron trifluoride, aluminum trichloride and complexes thereof, and the polymerization is conducted at a temperature of from 0° to 70° C.

4,857,618

CONDENSED PHASE POLYMERS

Spencer F. Silver, White Bear Lake; William R. Broan, Maplewood, and Eugene G. Joseph, Arden, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 9, 1987, Ser. No. 107,292

Int. Cl.[4] C08F *212/08, 230/00, 230/08, 230/10*

U.S. Cl. 526—240 **5 Claims**

1. An elastomeric anionic copolymer having a condensed phase structure wherein polymer branches occur along a polymer backbone, said elastomeric anionic copolymer comprising the copolymerized reaction product of

(a) hydrocarbyl lithium initiator;

(b) at least one anionically polymerizable monomer; and

(c) a condensing agent monomer having the general formula

$$CH_2{=}C(R')QY(R)_n(X)_m$$

wherein

Y is tetravalent Si, Ge, Sn, or Pb;

X is H, —OR'', Cl, Br or F, wherein R'' is a monovalent lower alkyl group having from 1 to 6 carbon atoms;

R is hydrogen, a monovalent lower alkyl group having from 1 to 6 carbon atoms, or phenyl;

Q is pheylene;

R' is hydrogen, a monovalent lower alkyl group having from 1 to 6 carbon atoms, or phenyl;

m is an integer of 1, 2 or 3; and

n is an integer equal to 3-m; and

wherein the mole ratio of (a) to (c) is about (1+m):1 and wherein the mole percentage of condensing agent in each copolymer segment containing said condensing agent is in the range of about 0.01% to about 5%.

4,857,619

FLUORINE CONTAINING POLYMER HAVING A TERMINAL ESTER GROUP

Jason L. Chou, Wexford, and Gregory J. McCollum, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 29, 1988, Ser. No. 213,048

Int. Cl.[4] C08F *12/20*

U.S. Cl. 526—249 **9 Claims**

1. A fluorine containing polymer having a terminal ester group which is prepared from the free radical initiated polymerization of an acyclic ketene acetal with a vinyl monomer component comprising a fluorine containing vinyl monomer.

4,857,620

FLUORINE CONTAINING POLYMERS AND COATING COMPOSITIONS PREPARED THEREFROM

Gregory J. McCollum, Gibsonia; Jason L. Chou, Wexford; James R. Bodwell, and Suryya K. Das, both of Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 29, 1988, Ser. No. 213,049

Int. Cl.[4] C08F *14/18*

U.S. Cl. 526—255 **9 Claims**

1. A fluorine containing polymer containing ester groups in the backbone of the polymer which is prepared by the ring opening free radical polymerization of a cyclic ketene acetal with a vinyl monomer component comprising a fluorine containing vinyl monomer.

4,857,621

CATIONIC POLYMERIC STABILIZERS FOR OIL-IN-WATER EMULSIONS

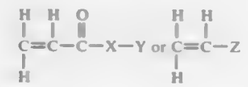
Lawrence E. Ball, Akron, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 937,285, Dec. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 706,230, Feb. 27, 1985, abandoned. This application Feb. 1, 1988, Ser. No. 151,051

Int. Cl.[4] C08F *26/06, 20/60, 22/00*

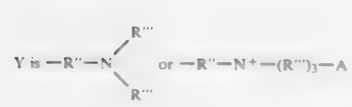
U.S. Cl. 526—265 **6 Claims**

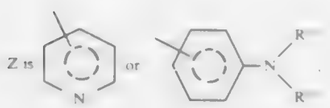
1. A terpolymer having emulsifying and emulsion stabilizing properties resulting from the polymerization of (1) a water soluble vinyl monomer selected from the group consisting of acrylamide and methacrylamide, (2) a water insoluble vinyl monomer having an alkyl chain containing about 6 to 30 carbon atoms selected from the group consisting of alkyl acrylate esters, alkyl methacrylate esters, N-alkyl acrylamides, N-alkyl methacrylamides and vinyl esters, and (3) a polymerizable vinyl monomer containing a basic group or salt thereof selected from the group consisting of:



wherein X is —O— or







A— is inorganic anion,

R'' is a divalent saturated organic group containing one to six carbons atoms, and

R''' is hydrogen or an alkyl group containing one to six carbon atoms.

4,857,622

SCALE AND SETTLEMENT INHIBITING AGENT FOR USE IN TREATING INDUSTRIAL AND/OR HOUSEHOLD WATER

Hubert Bousquet, Caluire; Georges Ravet, Craponne, and Jacky Rousset, Chatillon sur Chalaronne, all of France, assignors to Coatex S.A., Caluire, France

Continuation of Ser. No. 945,187, Dec. 22, 1986, abandoned, which is a continuation of Ser. No. 773,507, Sep. 5, 1985, abandoned, which is a continuation of Ser. No. 424,348, Sep. 27, 1982, abandoned. This application Sep. 30, 1987, Ser. No. 104,519

Claims priority, application France, Oct. 20, 1981, 81 19802

Int. Cl.[4] C08F *20/04, 120/18*

U.S. Cl. 526—317.1 **3 Claims**

1. An agent for use in the treatment of water and aqueous media contacting heat transfer surfaces for inhibiting the build-up of scale and settlement of alkaline earth material consisting essentially of polymers of a monomer solely selected from the group consisting of acrylic acid and methacrylic acid, said polymers having 100% of their molecular weights lower than 1200 at least 90% of their molecular weights within the range of 400–1000, the distribution of molecular weights of said polymers being a symmetrical single-mode distribution and centered on an average molecular weight of about 800.

4,857,623

ALKOXYSILANE-TERMINATED, MOISTURE-HARDENING POLYURETHANES AND THEIR USE IN ADHESIVES AND SEALING COMPOSITIONS

Winfried Emmerling, Erkrath, and Tore Podola, Monheim, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 25, 1987, Ser. No. 89,383

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1986, 3629237

Int. Cl.[4] C08G *77/04, 77/22, 77/26*

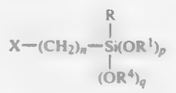
U.S. Cl. 528—28 **16 Claims**

1. An alkoxysilane-terminated, moisture-hardening polyurethane prepared by the process comprising the steps of

(a) reacting at least one OH-terminated linear diol or triol with at least one diisocyanate to form an NCO-terminated polyurethane having a number average NCO functionality of at least 2,

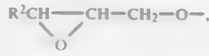
(b) reacting some of the NCO-groups on the polyurethane obtained in step (a) with at least one linear or branched aliphatic alcohol containing from 1 to 18 carbon atoms or a monoalkylpolyalkylene glycol to form a polyurethane having a number average NCO functionality of at least 1 and less than 2, and

(c) reacting substantially all the free NCO-groups in the polyurethane obtained from step (b) with at least one alkoxysilane corresponding to the formula



in which

X=—SH, —NHR[2],



—(NH—CH$_2$—CH$_2$)$_{n'}$—NHR[2];

n'=1 or 2;

R=—CH$_3$, —CH$_2$—CH$_3$, or OR[1];

R[1]=—(CH$_2$—CH$_2$—O)$_m$—R[3];

R[2]=H or an aliphatic or cycloaliphatic or aromatic hydrocarbon radical containing from 1 to 10 carbon atoms and optionally substituted with one or more C$_1$–C$_3$ alkyl and/or C$_1$–C$_3$ alkoxy groups;

R[3]=an alkyl radical containing from 1 to 10 carbon atoms and optionally substituted with one or more C$_1$–C$_3$ alkyl and/or C$_1$–C$_3$ alkoxy groups;

R[4]=an alkyl radical containing from 1 to 4 carbon atoms; and

n=1–8; m=1–30; p≧1; and q+p=2.

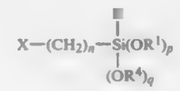
9. A process for the preparation of an alkoxysilane-terminated, moisture-hardening polyurethane comprising the steps of

(a) reacting at least one OH-terminated linear diol or triol with at least one diisocyanate to form an NCO-terminated polyurethane having a number average NCO functionality of at least 2,

(b) reacting some of the NCO-groups on the polyurethane from step (a) with at least one linear or branched aliphatic alcohol containing from 1 to 18 carbon atoms or a monoalkylpolyalkylene glycol to form a polyurethane having

a number average NCO functionality of at least 1 and less than 2, and

(c) reacting substantially all the free NCO-groups in the polyurethane obtained from step (b) with at least one alkoxysilane corresponding to the formula



in which

X=—SH, —NHR[2], R[2]CH—CH—CH$_2$—O—,

—(NH—CH$_2$—CH$_2$)$_{n'}$—NHR[2];

n'=1 or 2;

R=—CH$_3$, —CH$_2$—CH$_3$, or OR[1];

R[1]=—(CH$_2$—CH$_2$—O)$_m$—R[3];

R[2]=H or an aliphatic or cycloaliphatic or aromatic hydrocarbon radical containing from 1 to 10 carbon atoms and optionally substituted with one or more C$_1$–C$_3$ alkyl and/or C$_1$–C$_3$ alkoxy groups;

R[3]=an alkyl radical containing from 1 to 10 carbon atoms and optionally substituted with one or more C$_1$–C$_3$ alkyl and/or C$_1$–C$_3$ alkoxy groups;

R[4]=an alkyl radical containing from 1 to 4 carbon atoms; and

n=1–8; m=1–30; p≧1; and q+p=2.

4,857,624

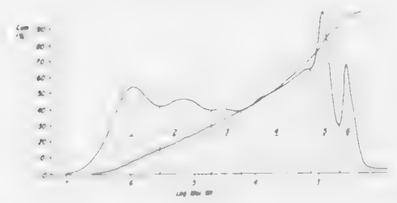
PHENOLIC-MODIFIED ROSIN ESTER PRINTING INKS

Douglas S. DeBiasi, Fairfield, and John P. Walsh, Whippany, both of N.J., assignors to BASF Corporation, Clifton, N.J.

Filed May 27, 1988, Ser. No. 199,555

Int. Cl.[4] C08G *14/04*

U.S. Cl. 528—129 **19 Claims**



1. A method for the production of compositions particularly suitable for use in gravure printing comprising the steps of:

reacting a rosin with a sufficient amount of dienophile to produce a modified rosin,

cooling the modified rosin to about 120°–140° C.,

adding sufficient amounts of a formaldehyde source and a phenolic compound in a ratio of about 0.25 to about 1.0 equivalents of formaldehyde per equivalent of phenol, to produce from about 0.05 to about 0.30 moles of an in situ phenolic per mole of rosin,

refluxing the reaction mixture to form a phenolic resin,

heating the phenolic resin for a sufficient time to cause self-condensation of the phenolic resin, and

esterifying the phenolic resin with a polyfunctional hydroxy compound to produce a resin product.

4,857,625

AROMATIC AMORPHOUS THERMOPLASTIC TERPOLYMERS

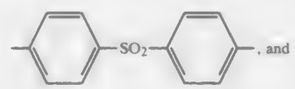
Robert A. Clendinning, New Providence; Louis M. Maresca, Belle Mead; Markus Matzner, Edison, and Thomas H. Schwab, North Brunswick, all of N.J., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 854,683, Apr. 18, 1986, which is a continuation of Ser. No. 452,454, Dec. 23, 1982, abandoned. This application Apr. 2, 1987, Ser. No. 35,259

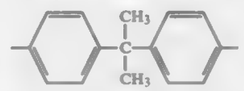
Int. Cl.[4] C08L *27/18*

U.S. Cl. 528—171 **3 Claims**

1. A process for the production of an amorphous thermoplastic polymer containing units of formula:



(I)



(II)

wherein the ratio of unit (I) to unit (II) is greater than (I); said units (I) and (II) being attached to each other by an —O— bond, comprising reacting under substantially anhydrous conditions bisphenol A, dichlorodiphenyl sulfone dihydroxydiphenyl sulfone, in an aprotic solvent in the presence of alkali metal carbonate, wherein the ratio of the concentration of OH groups to halo groups is from about 0.90 to about 1.10.

4,857,626

WHOLLY AROMATIC POLYESTER AND PROCESS FOR ITS PRODUCTION

Osamu Kishiro, Atsugi; Atsushi Kasai, Machida; Seiichi Nozawa, Yamato, and Hiroshi Kamata, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Dec. 22, 1987, Ser. No. 136,758

Claims priority, application Japan, Dec. 23, 1986, 61-305299

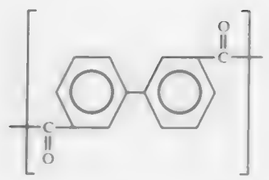
Int. Cl.[4] C08G *63/02*

U.S. Cl. 528—176 **19 Claims**



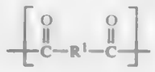
1. A wholly aromatic polyester consisting essentially of:

(a) from 2 to 50 equivalent % of a 3,3'-biphenyldicarboxylic acid residue of the formula:



(1)

(b) from 10 to 40 equivalent % of a dicarboxylic acid residue of the formula:



(2)

wherein R^1 is a bivalent aromatic hydrocarbon group or a group of the formula $R^4—X—R^5$ wherein each of R^4 and R^5 is a bivalent aromatic hydrocarbon group and X is an oxygen atom, a sulfur atom, a sulfonyl group, a carbonyl group, an alkylene group, an ester group or a direct bond, provided that R^1 is not a 3,3'-biphenyl group,

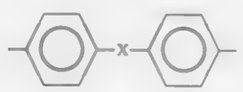
(c) from 10 to 52 equivalent % of a dioxy compound residue of the formula:



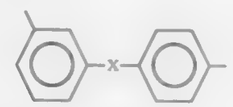
(3)

wherein R^2 is a group of the formula

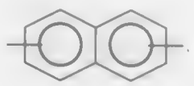
wherein R^6 is a C_1–C_4 alkyl group or a phenyl group and n is 0 or an integer of up to 4,



wherein X is as defined above,



wherein X is as defined above, and/or



and

(d) from 0 to 80 equivalent % of an oxycarboxylic acid residue of the formula:



(4)

wherein R^3 is a bivalent aromatic hydrocarbon group or $R^4—X—R^5$ wherein R^4, R^5 and X are as defined above, and having a melt viscosity of at least 50 poise as measured at 275° C. at 100 sec^{-1}.

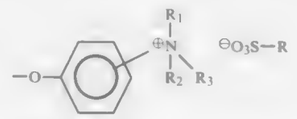
4,857,627

AMINO PHENOL END CAPPED AROMATIC POLYCARBONATE REACTED WITH SULFONATE

Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Oct. 19, 1984, Ser. No. 662,695
Int. Cl.[4] C08G *63/62*
U.S. Cl. 528—199 **4 Claims**

1. A composition comprising an aromatic carbonate polymer at least partially end-capped with a group of the structure



wherein $+\text{-}NR_1R_2R_3$ is meta or para to the 0 and R_1, R_2 and R_3 are the same or different and are alkyl of one to three carbon atoms; R is alkyl of one to six carbon atoms, perfluoroalkyl of one to eight carbon atoms, inclusive, phenyl or phenyl substituted with one to three substituents.

4,857,628

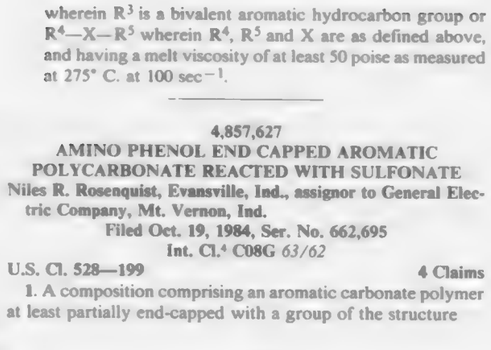
BRANCHED POLYCARBONATE FROM 2,4,6-TRIS(4'-HYDROXYARYL)-AMINO-S-TRIAZINE

Alberto Petri, Milan, Italy, assignor to Enichem Tecnoresine, S.p.A., Palermo, Italy

Filed Jul. 2, 1986, Ser. No. 881,093
Claims priority, application Italy, Jul. 10, 1985, 21509 A/85
Int. Cl.[4] C08G *63/62*
U.S. Cl. 528—203 **7 Claims**

1. A blow moldable, branched polycarbonate obtained by a process comprising the polymerization reaction of at least one

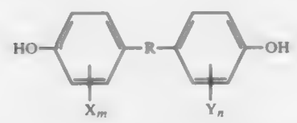
(a) tris(4'-hydroxyaryl)amino-s-triazine having the formula (I)



(I)

wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, a linear alkyl group or branched alkyl group having 1 to 5 carbon atoms, or halogen;

(b) an aromatic dihydroxy compound having the formula (II)



(II)

wherein R is selected from a direct bond, or R represents a substituted or unsubstituted alkylene group having 1 to 5 carbon atoms, —O—, —S—, SO_2—, or —CO—; X and Y are independently selected from hydrogen, methyl, or halogen; m and n are, independently, integers from 1 to 4; and

(c) a carbonate precursor.

4,857,629

PROCESS FOR THE PREPARATION OF COPOLY(ARYLENE SULFIDE)

Mark Rule; David R. Fagerburg, and Joseph J. Watkins, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 246,902, Sep. 16, 1988, abandoned. This application Feb. 13, 1989, Ser. No. 308,918
Int. Cl.[4] C08G *75/14*
U.S. Cl. 528—217 **15 Claims**

1. A process for producing elemental iodine and a copoly-(arylene sulfide) corresponding to the structure:

$$[(—A—S—)_{1-x}(—A—S—S—)_x]_n$$

wherein A is a divalent substituted or unsubstituted aromatic radical, x is in the range of 0.5 to 0.001 and n is at least 200, comprising

(1) reacting at a temperature above about 175° C. a mixture of a diiodoaromatic compound and elemental sulfur in the absence of a basic material and in the presence of a catalytic amount of iron to produce the elemental iodine and the copoly(arylene sulfide), and

(2) recovering the elemental iodine.

4,857,630

HYPERBRANCHED POLYARYLENE

Young H. Kim, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 7, 1987, Ser. No. 129,151
Int. Cl.[4] C08G *61/00*
U.S. Cl. 528—397 **3 Claims**

1. A soluble hyperbranched polyarylene having

(i) at least one branch per 10 repeating monomer units;

(ii) $(n-1)x+1$ functional groups selected from Br, I or Cl wherein n is the number of halogen atoms per monomer and is at least 2, and x is the number of repeating monomer units; and

(iii) a spherical diameter of less than 1000 Angstrom units.

4,857,631

METHOD FOR PRODUCING DE-WATERED GRAFTED RUBBER CONCENTRATE

Eugene R. Moore, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 720,333, Apr. 5, 1985, abandoned. This application Nov. 6, 1987, Ser. No. 117,265
Int. Cl.[4] C08F *6/22*; C08L *9/04, 9/10*
U.S. Cl. 528—481 **12 Claims**

1. A method for producing a de-watered modified rubber concentrate comprising a graft rubber made from a process including the peparation of a latex emulsion of the modified rubber concentrate wherein the improvement comprises:

insuring that the rubber content of the emulsified modified rubber concentrate is from about 57 to about 88% by weight of the rubber concentrate itself;

freeze coagulating the modified rubber concentrate from the emulsion to create a readily de-waterable modified rubber concentrate without the addition of organic liquids either simultaneously with or after freeze coagulation and prior to de-watering; and

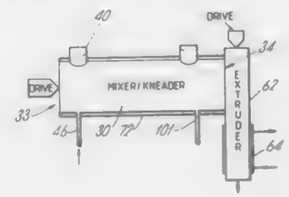
mechanically de-watering the freeze coagulated modified rubber concentrate.

4,857,632

RESIDUE REMOVAL PROCESS

David T. Ahlberg; Dilipkumar Padliya, and Jeffery T. Reed, all of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Jun. 13, 1988, Ser. No. 205,813
Int. Cl.[4] C08F *6/00*
U.S. Cl. 528—487 **7 Claims**



1. A solvent-free process to extract residue from hydrogenated nitrile rubber, said process comprising:

(i) adding residue-containing hydrogenated nitrile rubber to a mixing/kneading zone which comprises a housing with at least one mixing shaft therein, said mixing shaft having mixing elements attached thereto and being rotatably mounted within said housing;

(ii) adding from 20 to 500 parts weight, per 100 parts by weight of said rubber, of an extractant liquid to said mixing/kneading zone, at a temperature below the boiling point of said extractant liquid;

(iii) subjecting said hydrogenated nitrile rubber and said extractant liquid to a period of continuous mixing/kneading within said mixing/kneading zone;

(iv) repeatedly mechanically cleaning the mixing/kneading zone;

(v) discharging said hydrogenated nitrile rubber from said mixing/kneading zone;

(vi) discharging said extractant liquid from said mixing/kneading zone, and separating said liquid from said rubber;

wherein said extractant liquid is not a good solvent for said rubber but is miscible with at least part of said residue, characterized in that said process is completed without the addition of a solvent for said hydrogenated nitrile rubber.

4,857,633

METHOD FOR HIGH TEMPERATURE PHASE SEPARATION OF SOLUTIONS CONTAINING POLYMERS

Cyrus A. Irani, Katy, Tex.; Charles Cozewith, Westfield, and Stephen S. Kasegrande, Lincoln Park, both of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 727,283, Apr. 25, 1985, abandoned, Continuation-in-part of Ser. No. 623,850, Jun. 25, 1984, Pat. No. 4,623,712, Continuation-in-part of Ser. No. 473,741, Mar. 9, 1983, abandoned. This application Aug. 27, 1986, Ser. No. 900,843

The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.

Int. Cl.[4] C08F *6/12*

U.S. Cl. 528—498 24 Claims

1. A process for the separation of a hydrocarbon or halogenated rubber polymer solution into polymer-rich and polymer-lean phases comprising:

(i) preparing the solution of polymer in a reactor;

(ii) adding to the thus prepared solution of polymer an effective amount of at least one low molecular weight substituted or unsubstituted hydrocarbon selected from the group consisting of methane, halogenated C_1 alkanes; C_2–C_4 alkanes, alkenes and alkynes; and halogenated C_2–C_3 alkanes, alkenes, and alkynes with the proviso that said hydrocarbon is a gas at atmospheric temperature and pressure; the effective amount of said hydrocarbon being an amount sufficient to render said solution of polymer capable of separation into polymer-rich and polymer-lean liquid phases at a temperature below that temperature at which said separation would commence in the absence of said hydrocarbon;

(iii) subjecting said solution including said hydrocarbon to temperature and pressure conditions at which a polymer-rich liquid phase and a polymer-lean liquid phase are formed.

4,857,634

PEPTIDES USEFUL IN VACCINATION AGAINST ENTEROVIRUSES

Philip D. Minor, London; David M. A. Evans, Hertfordshire; Geoffrey C. Schild, London; Jeffrey W. Almond, Leicester, and Morag Ferguson, Hertfordshire, all of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 847,455, Apr. 3, 1986, abandoned. This application Aug. 24, 1987, Ser. No. 89,037

Claims priority, application United Kingdom, Apr. 3, 1985, 8508585

Int. Cl.[4] C07K *7/06, 7/08, 7/10;* A61K *39/12*

U.S. Cl. 530—324 21 Claims

1. A synthetic peptide, suitable for use in vaccination against or diagnosis of a disease caused by an enterovirus, which is a peptide coded for by codons 286 to 288 in the RNA sequence coding for the structural capsid protein VP1 of poliovirus type 3 Sabin strain or by equivalent codons of another enterovirus or is an antogenic equivalent of such a peptide, the antigenic equivalent being:

(i) a said peptide modified by the inclusion therein of one or more changes to the amino acid sequence;

(ii) a first longer peptide which incorporates the sequence of a said peptide or a said modified peptide and which has up to four extra amino acid residues attached to the C-terminal end of the said sequence or up to four extra amino acid residues attached to the N-terminal end of said sequence or up to four extra amino acid residues attached to the C-terminal end and up to four extra amino acid residues attached to the N-terminal end of said sequence;

(iii) a second longer peptide which incorporates the sequence of a said peptide, a said modified peptide or a said first longer peptide, to which sequence is linked directly, by means of a further amino acid residue or by means of a disulphide bridge between Cys residues attached to each sequence of up to eighteen amino acid residues which comprises a hexapeptide sequence coded for by codons 93 to 98 in said RNA sequence or by equivalent codons of another enterovirus; or

(iv) a third longer peptide which incorporates the sequence of a said peptide, a said modified peptide or a said first longer peptide, to which sequence is linked directly, by means of a further amino acid residue or by means of a disulphide bridge between Cys residues attached to each sequence, a sequence comprising residues 58 and 59 of the VP3 capsid protein of an enterovirus of the same type but starting with a residue numbered no lower than 53 and ending with a residue numbered no higher than 68;

each said antigenic equivalent being capable of raising antobodies capable of neutralizing the same strain and type of enterovirus as said peptide to which said antigenic equivalent corresponds and the numbers of the codons being counted from the 5'-terminus of the nucleotide sequence for the VP1 capsid protein.

4,857,635

FACTOR VIII COAGULANT POLYPEPTIDES AND MONOCLONAL ANTIBODIES TOF THEM

Theodore S. Zimmerman, and Carol A. Fulcher, both of La Jolla, Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Continuation of Ser. No. 556,508, Nov. 30, 1983, abandoned, which is a continuation-in-part of Ser. No. 481,105, Mar. 31, 1983, abandoned. This application Sep. 20, 1985, Ser. No. 778,297

The portion of the term of this patent subsequent to Apr. 14, 2004, has been disclaimed.

Int. Cl.[4] A61K *37/02;* C07K *15/06*

U.S. Cl. 530—383 18 Claims

1. A factor VIII:C coagulant polypeptide complex characterized in that:

(i) the complex consists essentially of one or more polypeptides which exhibit a band at a point corresponding to an M_r of about 92,000; or bands at points corresponding to M_r values of about 92,000, about 80,000, and about 79,000; of about 92,000, about 72,000, and about 71,000; or of about 92,000, about 80,000, about 79,000, about 72,000, and about 71,000; when subjected to sodium dodecyl sulfate-polyacrylamide gel electrophoresis;

(ii) the complex exhibits specific coagulant activity higher than 1800 Units/mg;

(iii) the complex exhibits the activity in step (ii) over a continuous period of at least about 10 minutes; and

(iv) the complex binds to an antibody for human factor VIII:C.

4,857,636

PASTEURIZABLE, FREEZE-DRIABLE HEMOGLOBIN-BASED BLOOD SUBSTITUTE

Jen-Chang Hsia, 10 Cherry Hills Road, Concord, Ontario, Canada M4K 2M4

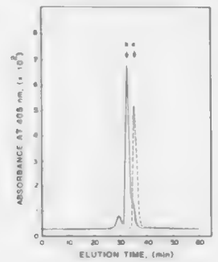
Filed Apr. 29, 1988, Ser. No. 187,721

Claims priority, application United Kingdom, May 5, 1987, 8710898

Int. Cl.[4] C07K *15/22*

U.S. Cl. 530—385 15 Claims

1. A stabilized hemoglobin product consisting essentially of tetrameric hemoglobin units stabilized against dissociation into dimers, and stabilized against conformational change between the T-conformation and the R-conformation upon formation of aqueous preparations thereof, said tetrameric units having covalent chemical linkages between globin chains of the subunits to effect the stabilization, the covalent linkages being secondary amino linkages, formed by reaction of the hemoglobin with an aldehyde produced by oxidative ring opening of an oligosaccharide having at least two sugar moieties, followed by reduction of the so-formed Schiff base linkages to secondary amino linkages.



4,857,637

METHODS AND COMPOSITIONS FOR IMMUNOLOGICALLY MODULATING GROWTH HORMONE RECEPTOR ACTIVITY

R. Glenn Hammonds, San Francisco; David W. Leung, Foster; David W. Martin, Jr., San Francisco; Steven A. Spencer, and William I. Wood, both of San Mateo, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 861,236, May 7, 1986, which is a continuation of Ser. No. 737,302, May 22, 1985, abandoned. This application Jun. 12, 1987, Ser. No. 61,942

Int. Cl.[4] C12P *21/00, 19/34;* C12N *15/00;* C07H *15/12*

U.S. Cl. 530—403 10 Claims



1. A method for immunizing an animal against its growth hormone receptor comprising vaccinating the animal against a growth hormone receptor extracellular domain derivative, said derivative having been predetermined to raise polyclonal antisera in a predetermined animal species which affect the receptor as a growth hormone agonist.

4,857,638

LIGNIN HAVING NITROGEN AND SULFUR AND PROCESS THEREFOR EMPLOYING THIOUREA

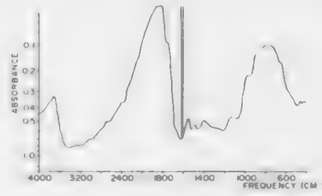
Manssar Yalpani, Kirkland, and Leon Magdzinski, Montreal, both of Canada, assignors to Domtar Inc., Montréal, Canada

Filed Dec. 28, 1987, Ser. No. 138,100

Int. Cl.[4] C08F *45/48, 3/30*

U.S. Cl. 530—505 26 Claims

1. A product comprising a substantially water insoluble lignin material having by weight of said lignin material a N-content of at least 4.5%, a sulfur content of at least 3.1%, IR bands in the vicinity of 1550 to 1670 cm^{-1}, 1460 to 1520 cm^{-1} and 1200 to 1230 cm^{-1}, said IR band in the vicinity of 1550 to 1670 cm^{-1} having a peak width of at least 60 cm^{-1} and an intensity from 3.6 to 11 relative to the band at 1200 to 1230 cm^{-1}, said IR band in the vicinity of 1550 to 1670 cm^{-1} having an intensity from 2 to 11 relative to the intensity of the band at 1460 to 1520 cm^{-1}, said lignin material being substantially free from thiourea and isothiuronium salts, having chelating capacities for gold at pH 2 in excess of three millimoles of gold per gram of said lignin and being able to absorb metals.



4,857,639

A-ASSOCIATED H-ANTIGENS, MONOCLONAL ANTIBODIES SPECIFIC THERETO AND METHODS FOR EMPLOYING THE SAME IN BLOOD TYPING

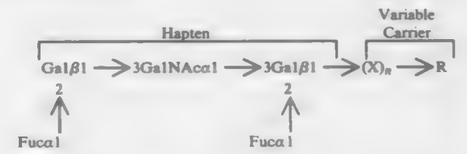
Henrik Clausen, Seattle, Wash., assignor to The Biomembrane Institute, Seattle, Wash.

Filed Jan. 12, 1987, Ser. No. 2,467

Int. Cl.[4] C08B *37/00;* C07H *1/00, 3/00;* A61K *37/00*

U.S. Cl. 536—1.1 10 Claims

1. An substantially pure A-associated H-antigen having the following structure:



wherein X is a sugar residue and n=0 or a positive integer and wherein R is a primary amino group containing material selected from the group consisting of a polypeptide, a primary amino group containing lipid or a primary amino group containing support.

4,857,640

PROCESS AND REAGENT FOR THE DETERMINATION OF α-AMYLASE

Eberhard Henkel, Hanover; Barkew Dolabdjian, Gross-Gerau; Roland Helger; Rainer Klink, both of Darmstadt, and Uwe Würzburg, Dieburg, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 625,482, Jun. 28, 1984, Pat. No. 4,698,300. This application Aug. 4, 1987, Ser. No. 81,380

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1983, 3323245

Int. Cl.[4] C07H *15/04*

U.S. Cl. 536—4.1 1 Claim

1. 2-Chloro-4-nitrophenyl-β,D-maltoheptaoside.

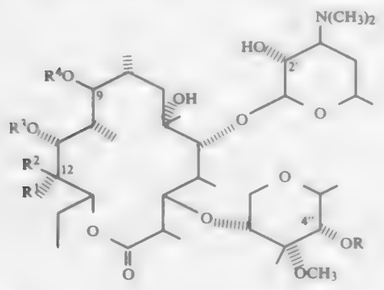
4,857,641

C.12 MODIFIED ERYTHROMYCIN A DERIVATIVES

James R. Hanske, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

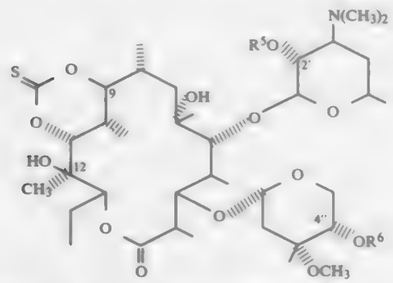
Filed Aug. 14, 1987, Ser. No. 85,446
Int. Cl.[4] C07H *17/08*
U.S. Cl. 536—7.3 **10 Claims**

1. A compound of the absolute stereochemical formula



wherein
R is hydrogen or (C_2–C_4) alkanoyl;
R^1 and R^2 are taken separately, R^1 is hydroxymethyl and R^2 is hydroxy; or
R^1 and R^2 are taken together and are methylene; and
R^3 and R^4 are taken separately and are each hydrogen; or
R^3 and R^4 are taken together and are thiocarbonyl; with the proviso that when R^3 and R^4 are so taken, R is other than hydrogen;
or a pharmaceutically acceptable acid addition salt thereof.

8. A compound of the absolute stereochemical formula



wherein R^5 is (C_2–C_4) alkanoyl or benzoyl; and
R^6 is (C_2–C_4) alkanoyl.

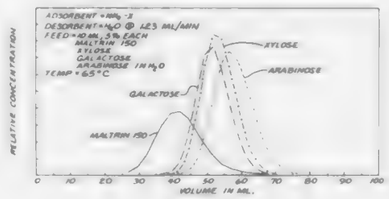
4,857,642

PROCESS FOR SEPARATING ARABINOSE FROM A MIXTURE OF OTHER ALDOSES

Santi Kulprathipanja, Hoffman Estates, Ill., assignor to UOP, Des Plaines, Ill.

Filed Dec. 31, 1986, Ser. No. 948,382
Int. Cl.[4] C07H *1/06;* **C13D** *3/12;* **C13K** *13/00*
U.S. Cl. 536—127 **8 Claims**

1. A process for separating arabinose from an aqueous feed mixture containing arabinose and at least one other monosaccharide, selected from the group consisting of aldoses and ketoses, which comprises contacting at adsorption conditions said mixture with an adsorbent comprising a type X zeolite having ammonium cations at exchangeable cationic sites, selectively adsorbing said arabinose to the substantial exclusion of the other monosaccharides, removing the nonadsorbed portion of the feed mixture from contact with the adsorbent, and thereafter recovering high purity arabinose by desorption with a desorbent at desorption conditions.



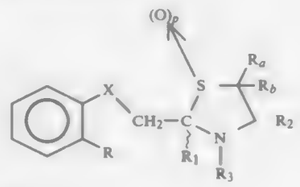
4,857,643

ANTITUSSIVE AND MUCUS REGULATING 2-SUBSTITUTED THIAZOLIDINES

Carmelo A. Gandolfi; Silvano Spinelli; Odoardo Tofanetti; Raimondo Russo, and Sergio Tognella, all of Milan, Italy, assignors to Boehringer Biochemia Robin S.p.A., Milan, Italy

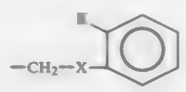
Division of Ser. No. 755,834, Jul. 17, 1985, Pat. No. 4,798,898.
This application Nov. 3, 1988, Ser. No. 266,559
Claims priority, application United Kingdom, Jul. 27, 1984, 8419254; Jul. 11, 1985, 8517553
Int. Cl.[4] C07D *415.00, 277/04, 417/12*
U.S. Cl. 544—121 **14 Claims**

1. Compound of formula I

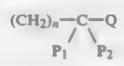


(I)

wherein:
X is a CH_2, O, S;
R is hydroxy, or an ester thereof of formula R_c—CO_2—, lower C_1–C_6-alkoxy, CH_2=CH—CH_2O—; HC≡C—CH_2—O—; or methyl
R_1 is hydrogen or

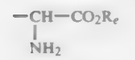


p is zero or 1 with the proviso that when X is sulfur p is zero;
both R_a and R_b, are hydrogen or methyl;
R_2 is hydrogen and
R_3 is hydrogen, a C_1–C_2 alkylsulphonyl group, an unsubstituted or mono or polysubstituted phenylsulfonyl group or an acyl group of formula R_dCO—;
Rc and Rd, which are the same or different are: hydrogen, —O—$C(CH_3)_3$, —$(CH_2)_n$—Q and

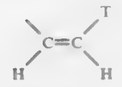


wherein n is 0 or an integer from 1 to 7;
P_1 and P_2 are both hydrogen or one of them is hydrogen and the other one is lower C_1–C_4 alkyl or phenyl and Q is selected from the group consisting of:

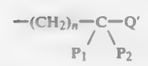
hydrogen; a C_3–C_4-branched alkyl; a C_3–C_7 cycloalkyl; free or esterified carboxy group; a halogen atom; SH; —NH_2; a mono or disubstituted amino, t-butoxy carbonylamino or C_1–C_2 acylamino group; an ether —O—$(CH_2)_m$—T or thioether —S—T chain, wherein T is an unsubstituted or mono- or polysubstituted phenyl ring or a group of formula —$(CH_2)_m$—T_1, wherein T_1 is selected from the group consisting of H, OH, —OCH_3, —OC_2H_5, HOCH-2—CH_2—, free or esterified carboxy group, —NH_2, a C_1–C_2-acylamino or mono or disubstituted amino group, or a group of formula



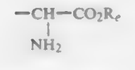
wherein R_e is hydrogen, methyl or ethyl and m is an integer from 1 to 3; a phenyl, phenoxy or phenylthio ring unsubstituted or mono- or polysubstituted in the m, o, and p-positions;
a group of formula —$(CH_2)_m$—SCO—$(CH_2)_n$$P_3$ wherein m and n have the above defined meanings and P_3 is a lower C_1–C_7 linear or branched alkyl chain, a C_3–C_6-cycloalkyl, a disubstituted amino group, a phenyl or phenoxy ring, optionally mono- or polysubstituted in the o, m and p-positions; an alkenyl chain of formula



wherein
T, in addition to the above defined meanings, is also hydrogen; or
R_2 is a free or esterified carboxy group; and
R_3 is hydrogen, a C_1–C_2 alkylsulphonyl group, an unsubstituted or mono- or polysubstituted phenylsulfonyl group or an acyl group of formula R'_dCO—;
wherein R'_d is hydrogen, —O—$C(CH_3)_3$, —$(CH_2)_n$—Q' and

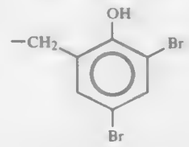


wherein n is 0 or an integer from 1 to 7; P_1, P_2, are both hydrogen or one of them is hydrogen and the other one is lower C_1–C_4 alkyl or phenyl and Q' is selected from the group consisting of:
hydrogen; a C_3–C_4-branched alkyl; a C_3–C_7 cycloalkyl; free or esterified carboxy group; —NH_2; a mono or disubstituted amino, t-butoxy carbonylamino or C_1–C_2 acylamino group; an ether —O—$(CH_2)_m$—T or thioether—S—T chain, wherein T is an unsubstituted or mono- or polysubstituted phenyl ring or a group of formula —$(CH_2)_m$$T_1$, wherein T_1 is selected from the group consisting of H, OH, —OCH_3, —OC_2H_5, $HOCH_2$—CH_2—, free and esterified carboxy group, NH_2, a C_1—C_2-acylamino or mono or disubstituted amino group, or a group of formula

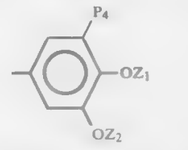


wherein R_e is hydrogen, methyl or ethyl
and m is an integer from 1 to 3; a phenyl, phenoxy or phenylthio ring unsubstituted or mono- or polysubstituted in the m, o, and p-positions;
wherein the term "mono substituted amino group" means an amino group substituted by a C_1–C_6 linear or branched alkyl group or by groups having the formula:

—CH_2—CH_2—O—CH_2—CH_3,
—CH_2—CH_2—O—CH_2—CH_2—OH,
—CH_2—CH_2—NH—CH_2—CH_3,
—CH_2—CH_2—NH—CH_2—CH_2—OH or



wherein the substituents of a disubstituted amino group are linear or branched C_1–C_6 alkyl groups or, taken together, are an unsaturated or saturated nitrogen containing ring selected from the group consisting of:
morpholin-1-yl, pyrrolidin-1-yl, piperidin-1-yl, 4-methyl-piperazin-1-yl, 4-ethyl-piperazin-1-yl, 4-(2'-hydroxyethyl)piperazin-1-yl, 4-phenyl-piperazin-1-yl, 4-(3'chlorophenyl)piperazin-1-yl, 4-(4'-fluorophenyl)piperazin-1-yl; imidazol-1-yl, 3-pyridyl, 4-pyridyl;
and wherein the term "mono- or polysubstituted phenyl" means phenyl which is substituted by a fluorine atom in the para position, by chlorine atoms in the meta and/or para positions, or by a CF_3 group in the meta position, or a phenyl group of the formula



wherein Z_1 is H or —$COCH_3$ or —$COCH_3$ and Z_2 is H, CH_3 or $COCH_3$ and P_4 is hydrogen, aminomethyl, C_1–C_2-acylaminomethyl or a mono or disubstituted aminomethyl group, as above defined; provided, however, that said compound contains, at least one disubstituted amino group having the substituents thereof being said unsaturated or saturated nitrogen-containing ring; or salts with non-toxic bases or acids thereof, enantiomers, diastereoisomers or mixtures thereof.

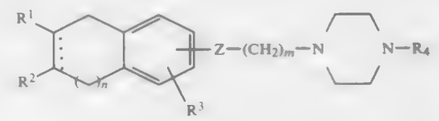
4,857,644

ARYL SULFONOPIPERAZINES AS ANTI-INFLAMMATORY AGENTS

Magid A. Abou-Gharbia, Wilmington, Del., assignor to American Home Products Corporation, New York, N.Y.

Filed Jun. 9, 1988, Ser. No. 204,459
Int. Cl.[4] G07D *241/04*
U.S. Cl. 544—295 **6 Claims**

1. A compound having the formula:



wherein
R^1 and R^2 are each, independently, hydrogen, lower alkyl or phenyl; or R^1 and R^2 taken together represent —$(CH_2)_4$— or



where the dotted line represents an optional double bond;
R^3 is hydrogen, lower alkyl, lower alkoxy or halo;
R^4 is pyridinyl, pyrimidinyl, pyrazinyl, benzyl, phenyl or phenyl substituted by lower alkyl, lower alkoxy or halo;
Z is $-SO_2-$ or



where R^5 is hydrogen or lower alkyl;
m is 0–4;
n is 0–2; and
the pharmaceutically acceptable salts thereof.

4,857,645

PROCESS FOR INTRODUCING A THIOCARBOXYLIC ESTER GROUP AT THE ORTHOPOSITION OF PHENOLS OR PHENYLAMINES

Adachi Makoto, Nara; Hiromu Matsumura, and Tsutomu Sugasawa, both of Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

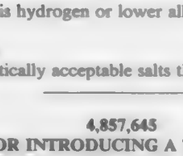
Filed Nov. 5, 1987, Ser. No. 116,792
Claims priority, application Japan, Nov. 6, 1986, 61-264658
Int. Cl.[4] C07D *241/36, 471/00, 487/00, 211/56*
U.S. Cl. 544—349 **9 Claims**

1. A process for introducing a thiocarboxylic acid ester group at the ortho-position of a phenol or a phenylamine which comprises:

reacting a phenyl compound of the formula:

(II)

wherein the ring is benzene ring, R^1, R^2, R^3 and R^4 each is hydrogen, halogen, C_1–C_5 alkyl, C_1–C_5 alkoxy, C_1–C_5 alkylthio, C_6–C_{12} aryloxy, C_7–C_{15} aralkyl, C_7–C_{15} aralkoxy or C_1–C_{10} acylamino, or (R^1 and R^2) or (R_2 and R^3) each taken together may form a condensed benzene ring optionally substituted by halogen, C_1–C_5alkyl or C_1–C_5 alkoxy, Y is hydroxy, amino or NHR, and R is C_1–C_5 alkyl, C_7–C_{13} aralkyl, C_6–C_{12} aryl or N-(methyl- or benzyl-substituted aza (C_3–C_7) cycloalkyl, or R and R^1 taken together may form a 5- or 6-membered heterocycle of the formula:



(II')

in which x is a single bond, O, S or N(methyl)- and the B ring which have a condensed benzene, pyridine or cyclohexane ring each optionally substituted by halogen, C_1–C_5 alkyl or C_1–C_5 alkoxy, and the A ring, R^2, R^3, and R^4 are the same as defined above, with C_1–C_5 alkyl thiocyanate, C_7–C_{13} aralkyl thiocyanate or C_6–C_{12} aryl thiocyanate in a solvent in the presence of a boron trihalide at a temperature of 10° C. to about the boiling point of the solvent; and

hydrolyzing the resultant product under acidic conditions at a temperature of 0°–100° C.

4,857,646

MODIFIED BETA-QUINACRIDONE PIGMENT

Edward E. Jaffe, Wilmington, Del., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 24, 1987, Ser. No. 88,751
Int. Cl.[4] C09B *48/00*
U.S. Cl. 546—49 **27 Claims**

1. A magenta quinacridone pigment in beta crystal form characterized by an X-ray diffraction pattern exhibiting two strong lines corresponding to interplanar spacings of 14.88 Å and 3.26 Å, four medium strength lines corresponding to 7.49 Å, 5.59 Å, 5.50 Å and 3.99 Å, and four relatively weak lines corresponding to 5.05 Å, 4.77 Å, 4.24 Å and 3.73 Å.

5. A process for preparing the magenta beta crystal phase quinacridone of claim 1, which comprises milling alpha-phase quinacridone in the presence of effective converting amounts of an alcohol and a base and isolating the magenta beta phase quinacridone.

4,857,647

4-AMINO-5-CHLORO-2-METHOXY-N-(6-(1-AZABICYCLO[3,2,1]OCTYL)BENZAMIDE

Francis D. King, Newport, England, assignor to Beecham Group p.l.c., Brentford, United Kingdom

Division of Ser. No. 824,205, Mar. 21, 1986, Pat. No. 4,697,019. This application Jun. 4, 1987, Ser. No. 38,333
Claims priority, application United Kingdom, Apr. 14, 1982, 8210847; Apr. 14, 1982, 8210848
Int. Cl.[4] C07D *221/02*
U.S. Cl. 546—112 **1 Claim**

1. The compound 4-amino-5-chloro-2-methoxy-N-(6-(1-azabicyclo-(3,2,1)octyl)benzamide.

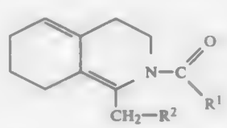
4,857,648

ISOQUINOLINE DERIVATIVES

Emil A. Broger, Magden; Yvo Crameri, Oberwil, both of Switzerland, and Bernd Heiser, Inzlingen, Fed. Rep. of Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 8, 1988, Ser. No. 268,441
Claims priority, application European Pat. Off., Nov. 11, 1987, 87810651.7
Int. Cl.[4] C07D *217/20*
U.S. Cl. 546—147 **5 Claims**

1. A compound of the formula



I

wherein R^1 is hydrogen, lower alkyl, lower alkoxy, aryl, aryloxy, aryl-lower alkyl or aryl-lower alkoxy and R^2 is phenyl or p-methoxyphenyl.

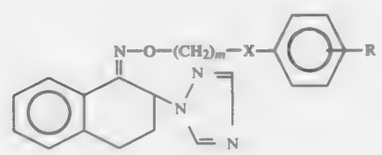
4,857,649

AZOLE DERIVATIVES OF NAPHTHALENONE OXIME ESTERS

Hoi K. Lai, Guelph, Canada; Robert A. Davis, and Allen R. Blem, both of Cheshire, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn. and Uniroyal Chemical LTD/LTEE, Don Mills, Canada

Filed Jul. 21, 1988, Ser. No. 223,054
Int. Cl.[4] C07D *249/08;* **A01N** *43/653*
U.S. Cl. 548—262 **8 Claims**

1. A compound having the structural formula (I)



(I)

in which:
R is a substituent or a group of substituents representing halogen, low alkyl of 1 to 6 carbon atoms, phenyl, phenoxy, naphthyl, nitro, cyano, low alkoxy, alkoxycarbonyl, or trifluoromethyl;
X is single bond, oxygen, sulfur or sulfonyl:
m is an integer from 1 to 4.

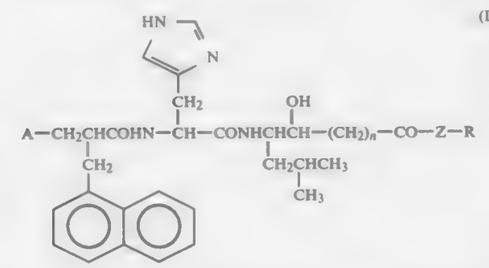
4,857,650

NOVEL RENIN INHIBITORY AMINO ACID DERIVATIVES

Kinji Iizuka; Tetsuhide Kamijo; Tetsuhiro Kubota, all of Nagano; Kenji Akahane, Tokyo; Hideaki Umeyama, Chiba, and Yoshiaki Kiso, Osaka, all of Japan, assignors to Kissei Pharmaceutical Co., Ltd., Nagano, Japan

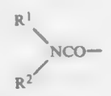
Filed Jun. 27, 1986, Ser. No. 879,741
Claims priority, application Japan, Jun. 28, 1985, 60-143593; Aug. 5, 1985, 60-171975; Nov. 20, 1985, 60-260904
The portion of the term of this patent subsequent to Apr. 7, 2004, has been disclaimed.
Int. Cl.[4] C07D *233/64*
U.S. Cl. 548—336 **32 Claims**

1. An amino acid derivative represented by the formula:

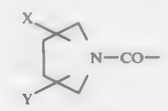


(I)

wherein A represents an alkoxycarbonyl group having 2 to 7 carbon atoms,



wherein R^1 represents hydrogen atom, an alkyl group having 1 to 6 carbon atoms, a hydroxy alkyl group and R^2 represents a hydrogen atom or a straight- or branched-chain alkyl group having 1 to 4 carbon atoms with one or two substituents selected from a hydroxy group, an alkoxycarbonyl group having 2 to 7 carbon atoms, a carbamoyl group and an N-alkylcarbamoyl group or



wherein X represents an alkoxycarbonyl group or a hydroxymethyl group and Y represents a hydrogen atom or a hydroxy group, the histidyl structure in formula (I) is an L-histidyl group, n represents zero or one, Z represents —O— or —NH—, and R represents a straight- or branched-chain alkyl group having 1 to 7 carbon atoms, and pharmaceutically acceptable rennin inhibiting acid addition salts thereof.

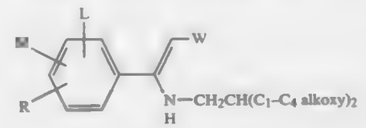
4,857,651

α-(2,3-DI(C_1–C_4 ALKOXY)ETHYLAMINO)-β-CYANOSTYRENE AND β-NITROSTYRENE COMPOUNDS USEFUL AS INTERMEDIATES IN THE PREPARATION OF INSECTICIDAL, ACARICIDAL AND NEMATICIDAL ARYLPYRROLES AND METHOD FOR THE PREPARATION THEREOF

Dale G. Brown, Hunterdon; Jack K. Siddens, Princeton Junction; Robert E. Diehl, Lawrenceville, and Donald P. Wright, Jr., Pennington, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 29, 1987, Ser. No. 79,543
Int. Cl.[4] C07D *317/44*
U.S. Cl. 549—443 **16 Claims**

1. A compound having the structural formula:



wherein W is CN or NO_2; L is H, F, Cl, or Br; M and R are each independently H, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, cyano, F, Cl, Br, I, nitro, CF_3, R_1CF_2Z, R_2CO, or NR_3R_4 and when on adjacent positions and taken together with the carbon atoms to which they are attached M and R may form a ring in which MR represent the structure: $—OCH_2O—$, $—OCF_2O—$ or



Z is SO_n or O; R_1 is H, F, CHF_2, CHFCl, or CF_3; R_2 is C_1–C_3 alkyl, C_1–C_3 alkoxy, or NR_3R_4; R_3 is H or C_1–C_3 alkyl; R_4 is H, C_1–C_3 alkyl, or R_5CO; R_5 is H or C_1–C_3 alkyl; and n is an integer equal to 0, 1 or 2.

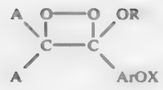
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CHEMILUMINESCENT 1,2-DIOXETANE COMPOUNDS

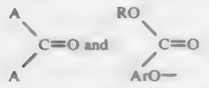
Arthur P. Schaap, Detroit, Mich., assignor to Board of Governors of Wayne State University, Detroit, Mich.

Division of Ser. No. 887,139, Jul. 17, 1986. This application Aug. 23, 1988, Ser. No. 235,199
Int. Cl.[4] C07D *321/00*
U.S. Cl. 549—510 **14 Claims**

1. In a process for producing a compound of the formula



wherein ArOX is an aryl group having an aryl ring substituted with an X-oxy group which forms an unstable oxide intermediate 1,2-dioxetane compound when triggered to remove X by an activating agent so that the unstable 1,2-dioxetane compound decomposes to form light and two carbonyl containing compounds of the formula

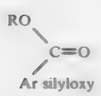


wherein X is a chemically labile group which is removed by the activating agent selected from acid, base, salt, enzyme, inorganic and organic catalysts, and electron donors to form the unstable oxide intermediate 1,2-dioxetane and wherein A and R are passive organic groups which allow the light to be produced wherein the dioxethane is produced by reacting a carbonyl containing compound with an ester compound to form an alkene which forms the dioxetane by reaction with oxygen, the improvement which comprises:

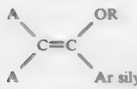
reacting a carbonyl containing compound of the formula:



with an ester compound of the formula:

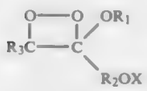


wherein Ar silyloxy in an aryl ring substituted with a silyloxy protecting group in a polar organic solvent in the presence of a metal hydride, a transition metal salt and a tertiary amine base to form an alkene of the formula



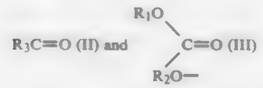
which forms the dioxetane by reaction with oxygen.

7. In a process for producing a dioxetane of the formula



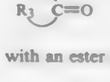
(I)

wherein R_1 is selected from lower alkyl containing 1 to 8 carbon atoms, R_2 is selected from aryl, biaryl and fused ring polycyclic aryl groups which can be substituted or unsubstituted, and R_3C— is selected from polycyclic alkyl groups containing 6 to 30 carbon atoms, wherein OX is an X-oxy group substituted on an aryl ring which forms an unstable oxide intermediate 1,2-dioxetane compound when triggered to remove X by an activating agent selected from acid, base salt, enzyme, inorganic and organic catalysts, and electron donor sources and X is a chemically labile group which is removed by the activating agent to form the unstable oxide intermediate and wherein (I) decomposes in the presence of an activating agent to produce light and carbonyl containing compounds of the formula

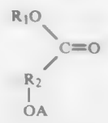


wherein the dioxetane is produced by reacting a carbonyl containing compound with an ester compound to form an alkene and which forms the dioxetane by reaction with oxygen, the improvement which comprises:

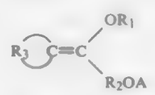
reacting a carbonyl containing compound of the formula:



with an ester compound of the formula:



wherein OA is a silyloxy protecting group in a polar organic solvent in the presence of a metal hydride, a transition metal salt, and a tertiary amine base to give a vinyl ether of the formula (IV)



(IV)

which forms the dioxetane by reaction with oxygen.

4,857,653

PROCESS FOR THE PREPARATION OF TAXOL AND 10-DEACETYLTAXOL

Michel Colin, Thoiry; Daniel Guenard, Montrouge; Francoise Gueritte-Voegelein, and Pierre Potier, both of Paris, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

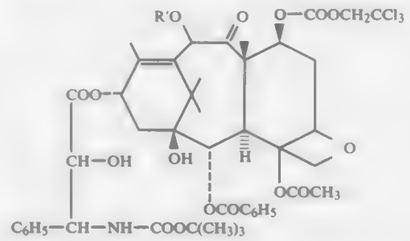
Filed Jul. 14, 1987, Ser. No. 73,154

Claims priority, application France, Jul. 17, 1986, 86 10401

Int. Cl.[4] C07D *505/14*

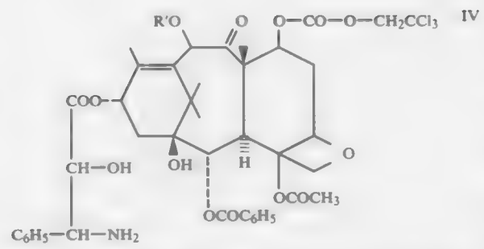
U.S. Cl. 549—511 **4 Claims**

1. A process for the preparation of taxol or 10-deacetyltaxol, and their 2'S, 3'R isomers which comprises reacting halotrialkylsilane with a compound of formula:



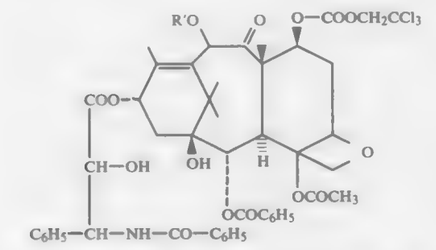
III

in which R' represents acetyl or 2,2,2-trichloroethoxycarbonyl, in an organic solvent at about 0° C. to produce a product of formula:



IV

in which R' is as defined above, and reacting the said product with benzoyl chloride in the presence of an acid acceptor to produce a product of formula:



V

in which R' is as defined above, and then reacting this product with zinc in acetic acid to produce taxol, when R' in the starting material is acetyl, or 10-deacetyltaxol, when R' in the starting material is 2,2,2-trichloroethoxycarbonyl.

4,857,654

TITANOCENES AND THEIR USE

Martin Riediker, Riehen; Eginhard Steiner, Füllinsdorf; Harry Beyeler, Basel; Manfred Rembold, Aesch, and Franciszek Sitek, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 24, 1987, Ser. No. 77,261

Claims priority, application Switzerland, Aug. 1, 1986, 3101/86

Int. Cl.[4] C07F *7/28*

U.S. Cl. 556—53 **12 Claims**

1. A titanocene of the formula I



(I)

in which the two radicals Rl independently of one another are cyclpentadienyl⊖, indenyl⊖, or 4,5,6,7-tetrahydroindenyl⊖ or said cyclopentadienyl, said indenyl or said 4,5,6,7-tetrahydroindenyl mono- or polysubstituted by C_1—C_{18}-alkyl, by C_1—C_{18}-alkoxy, by C_2–C_{18}-alkenyl, by C_5–C_8-cycloalkyl, by C_6–C_{16}-aryl, by C_7–C_{16}-arakyl, by cyano or by halogen, or the two radicals R^1 together are a radical of formula II



(II)

in which X is (—CH_2—) n where n is 1, 2 or 3, alkylidene of 2 to 12 carbon atoms, or said alkylidene substituted by phenyl, cycloalkylidene of 5 to 7 ring carbon atoms, SiR_2^4 or SnR_2^4 where R^4 is C_1—C_{12}-alkyl, C_5–C_{12}-cycloalkyl, C_6–C_{16}-aryl or C_7–C_{16}-aralkyl; or said radical of formula Ii monosubstituted or polysubstituted by C_1—C_{18}-alkyl, by C_1—C_{18}-alkoxy, by C_2–C_{18}-alkenyl, by C_5–C_8-cycloalkyl, by C_6,C_{16}-aryl, by C_7–C_{16}-aralkyl, by cyano or by halogen;

R^2 is an 6-membered carbocyclic aromatic ring or a 5- or 6-membered heterocyclic aromatic ring which is substituted by fluorine atoms in at least one of the two ortho-positions relative to the metal-carbon bond, or

R^2 and R^3 together are a radical of formula III

Q—Y—Q—(III)

in which Q is a carbocyclic aromatic ring, the two bonds in each case being in the ortho-position relative to the Y group, and the meta-position relative to the Y group in each case being substituted by a fluorine atom, or

R^2 or Q is further substituted by alkyl or 1 to 18 carbon atoms, by alkoxy of 1 to 18 carbon atoms, by cycloalkyl of 5 to 6 ring carbon atoms, by aralkyl of 7 to 16 carbon atoms, by aryl of 6 to 16 carbon atoms, by hydroxyl, by carboxyl, by cyano, by halogen, by tertiary or quaternary amino, by alkoxycarbonyl of 1 to 18 carbon atoms in the alkoxy group, or by mono- or dialkylaminocarbonyl of 1 to 12 carbon atoms in the atoms alkyl group,

Y is CH_2, alkylidene of 2 to 12 carbon atoms, cycloalkylidene of 5 to 7 ring carbon atoms, a direct bond, NR^4, O, S, SO, SO_2, CO, SiR^4_2 or SnR^4_2 where R^4 is defined above,

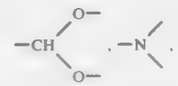
R^3 has the same meaning as R^2, or

R^3 is alkynyl of 2 to 6 carbon atoms, phenylethynyl or said phenylehtynyl substituted by halogen, by tertiary amino with 1 to 6 carbon atoms, by alkoxy of 1 to 6 carbon atoms, by carboxyl, by alkoxy or by cyano; N_3, CN, SiR_3^4 or SnR_3^4;

in which titanocenes R^2 contains at least one polyoxaalkylene radical of the formula

$(—C_zH_{2z}O)_o—R^9$

in which z is a number from 2 to 6, o is a number from 1 to 20 and R^9 is H or C_1—C_{18}-alkyl, wherein said polyoxaalkylene radical is attached to the aromatic radical R^2 or Q by a direct bond or through a bridging group which is —S—, —O—, —OSO_2—, —CH—$_2$O—, —CH(CH_3)—, —SO_2—, —C(O)O—



—NR^{10} —, $NR^{10}CH_2CH_2—NR^{10}$——$CH_2CH_2NR^{10}—CH_2NR^{10}$—, —CH($COO—)_2$, —$CH_2COO$—, —$CONR^{10}$—, —$CH(CONR^{10}—)_2$,



—OC(O)O—, —$N(R^{10})$—COO—, —$CH_2N(R^{10})$—COO—, —$N(R^{10})$—CONH—, —$CH_2N(R^{10})$—CONH—or —$C_nN-_{2n}OC(O)C_mH2_mO$—

where n=0, 1 or 2 and m=1–6, —$C_nH_{2n}OSiR_{3-y}{}^{11}Oy$—, where and R^{11} is C_1—C_{12}-alkyl or phenyl,

where the valence on the left of the bridging group is attached to the aromatic ring R@ or Q and the other valences in the bridging group are attached to the polyoxaalkylene radical.

4,857,655

PROCESS FOR MAKING ALKYL ARSINE COMPOUNDS

Donald Valentine, Jr., Ridgefield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 20, 1988, Ser. No. 145,935
Int. Cl.[4] C07C *9/72*
U.S. Cl. 556—70 6 Claims

1. A process for alkylating an arsine having at most one alkyl group, the other groups being H, comprising the step of reacting said arsine with a hydrocarbon olefin, which may have an aryl substituent; said olefin having exactly one olefinic double bond and 3 to 12 carbon atoms, wherein the reactants are contacted in the presence of a liquid containing a nonoxidizing strong acid catalyst.

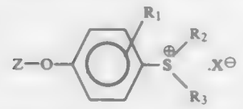
4,857,656

ACTIVE ESTERS USED FOR PRODUCTION OF ESTERS OR AMIDES AND PROCESS FOR PRODUCING ESTERS OR AMIDES

Katsuhige Kouge, Yamaguchi, Japan, assignor to Sanshin Kagaku Kogyo Co., Ltd., Yanai, Japan

Filed Mar. 9, 1987, Ser. No. 23,251
Int. Cl.[4] C07C *69/96*
U.S. Cl. 558—271 1 Claim

1. An ester represented by the general formula:



wherein Z represents a group represented by R_4—CO—, wherein R_4 represents a member selected from the group consisting of a tert-butyloxy group, a benzyloxy group, a p-methoxybenzyloxy group, and a fluorenyl-methoxy group; R_1 represents a member selected from the group consisting of a hydrogen, an alkyl group, a halogen group, a nitro group and an alkoxy group; R_2 and R_3 each represents an alkyl group selected from the group consisting of the same alkyl group and different alkyl groups; and X^- represents an anion selected from the group consisting of a halogen ion, a perchloric acid ion, a hydrogensulfuric acid ion, a methylsulfuric acid ion, and a p-toluenesulfonic acid ion.

4,857,657

PREPARATION OF HEXENEDIOIC ACID DIESTERS

Philippe Denis, Decines, and Jean-Marc Frances, Villeurbanne, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Nov. 16, 1987, Ser. No. 121,283
Claims priority, application France, Nov. 14, 1986, 86 16046
Int. Cl.[4] C07C *67/38*
U.S. Cl. 560—193 30 Claims

1. A process for the preparation of a hexene-1,6-dioate, comprising alkoxycarbonylating at least one dichlorobutene with carbon monoxide and an alcohol, in the presence of a catalytically effective amount of palladium or a palladium compound and no more than about two equivalents, relative to the chlorobutene, of a tertiary amine reaction promoter.

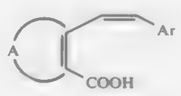
4,857,658

PREPARATION OF (Z)-2-(2-ARYLETHENYL)ARYLCARBOXYLIC ACIDS

Marco Thyes, Ludwigshafen, and Gerd Steiner, Kirchheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

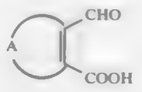
Filed Dec. 17, 1987, Ser. No. 134,108
Int. Cl.[4] C07C *63/64*
U.S. Cl. 562—495 4 Claims

1. A process for preparing predominately the isomer (Z)-2-(2-arylethenyl)aryl-carboxylic acid of the formula I



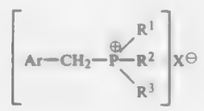
(I)

where A is a group for completing an aromatic ring system and Ar is an aromatic radical, which comprises: reacting a 2-formylarylcarboxylic acid of the formula II



(II)

with an (arylmethyl)phosphonium salt of the general formula III



(III)

where R^1, R^2 and R^3 are each organic radicals and X is halogen, in the presence of a base at from (−20°) to +30° C. which comprises carrying out the reaction in the presence of a C_1–C_5-alkanol and/or a C_2–C_4-alkanediol.

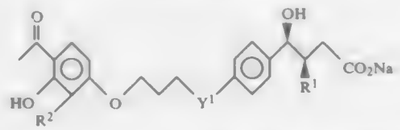
4,857,659

STEREOSELECTIVE SYNTHESIS OF LEUKOTRIENE ANTAGONISTS

Richard Frenette; Jacques-Yves Gauthier, both of Laval; Robert N. Young, Senneville; Robert Zamboni, Longueuil, all of Canada; Masatoshi Kakushima, Yokohama, Japan, and Thomas R. Verhoeven, Cranford, N.J., assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Continuation-in-part of Ser. No. 856,910, Apr. 28, 1986, abandoned. This application Apr. 15, 1987, Ser. No. 38,814
Int. Cl.[4] C07C *149/40*
U.S. Cl. 562—426 3 Claims

1. A method of preparing the compound I:



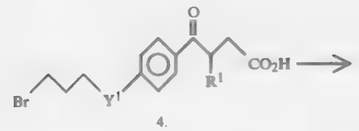
(I)

wherein Y^1 is O, S or SO_2 and R^1 and R^2 are independently C_1–C_6 alkyl which comprises:

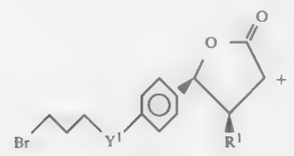
(a) stereoselectively reducing a compound of structure 4 to give the lactone 5;

(b) reacting the lactone 5 with a phenol 9a to give 10;

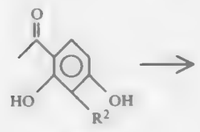
(c) hydrolyzing 10 to give the compound I:



4.



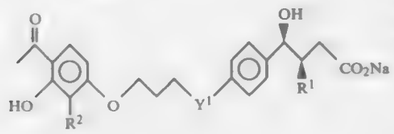
5.



9a.



10



I.

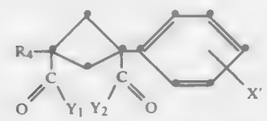
4,857,660

CERTAIN 1-PHENYL-CYCLOBUTANE-1,3-DICARBOXYLIC ACID TYPE COMPOUNDS

Alex Alder, Basel; Jaroslav Stanek, Birsfelden, and Daniel Bellus, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 32,656, Apr. 1, 1987, Pat. No. 4,764,640, which is a division of Ser. No. 746,814, Jun. 20, 1985, Pat. No. 4,677,129. This application Apr. 22, 1988, Ser. No. 185,205
Claims priority, application Switzerland, Jun. 20, 1984, 2987/84
Int. Cl.[4] C07C *79/46*
U.S. Cl. 562—435 5 Claims

1. A compound of formula



(VII)

in which R_4 represents hydrogen, lower alkyl, phenyl or phenyl substituted by X'; and Y_1 represent, independently of the other, hydroxy, halogen, lower alkoxy, tri-lower alkylsilyloxy, lower alkanesulphonyloxy, benzene-sulphonyloxy or p-toluenesulphonyloxy; or Y_1 and Y_2 together represent -O-; and X' represents a nitro, nitroso, hydroxyamino or azido group, halogen, carbamoyl, azidocarbonyl or a protected amino group; or a salt thereof.

4,857,661

BICYCLIC KETO-ACIDS PREPARATION

Rodney L. Sung, Fishkill, and Benjamin J. Kaufman, Hopewell Junction, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 23, 1986, Ser. No. 821,713
Int. Cl.[4] C07C *51/083*
U.S. Cl. 562—502 13 Claims

1. A process for preparing unsaturated bicyclic keto-acids, said process comprising:

(a) cyclizing an unsaturated, unsubstituted or alkyl substituted tetrahydrophthalic acid anhydride in the presence of a strong Bronsted acid catalyst at a temperature of about 25° C. to about 160° C. for about 1 to about 48 hours, thereby forming bicyclic keto-acids; and

(b) recovering said cyclic keto-acids.

4,857,662

N-PHENYLBENZAMIDE DERIVATIVES

Gerhard Satzinger, Denzlingen; Manfred Hermann; Edgar Fritschi, both of St. Peter, and Ute Weiershausen, Gundelfingen, all of Fed. Rep. of Germany, assignors to Gödecke Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Feb. 9, 1984, Ser. No. 578,466
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1983, 3305755
Int. Cl.[4] C07C *103/82*; A61K *31/165*
U.S. Cl. 564—168 3 Claims

1. A compound of the formula wherein one of the radicals R^4 and R^5 represents methyl and the other hydrogen; R^6 is hydrogen or methyl, or a pharmacologically acceptable acid addition salt thereof.

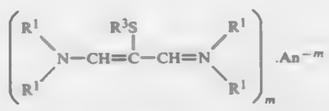
4,857,663

HYPOGLYCEMIC N-(2-SUBSTITUTED-3-DIALKYLAMINO-2-PROPENYLIDENE)-N-ALKYLALKANAMINIUM SALTS

Eugene R. Wagner, Carmel; Donald P. Matthews, and Charlotte L. Barney, both of Indianapolis, all of Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 111,373, Oct. 20, 1987, Pat. No. 4,788,335, which is a continuation of Ser. No. 656,827, Oct. 2, 1984, abandoned, which is a division of Ser. No. 494,471, May 16, 1983, Pat. No. 4,533,677. This application Nov. 16, 1988, Ser. No. 272,151
Int. Cl.[4] C07C *119/08*
U.S. Cl. 564—279 2 Claims

1. A method for the preparation of a compound of the formula



wherein R^1 is methyl or ethyl; R^3 is selected from the group consisting of straight or branched chain alkyl having from 1 to 12 carbon atoms, straight or branched chain alkenyl having from 2 to 12 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms, cycloalkylalkyl having from 4 to 10 carbon atoms, benzyl, or phenyl optionally substituted by from 1 to 3 substituents selected from the group consisting of lower alkyl, lower alkoxy, halogen, hydroxy, benzyloxy, di(lower alkyl-)amino, nitro, phenyl or benzyl, or by a single 2,3- or 3,4-methylenedioxy moiety; An is a pharmaceutically acceptable

anion; and m is an integer corresponding to the valence of the anion; which comprises:

(a) reacting a substituted sulfenyl bromide of formula R^3SBr with a dialkylaminoacrolein of formula $(R^1)_2NCH{=}CHCHO$;

(b) reacting the resulting 3-dialkylamino-2-(substituted thio)-2-propenal of formula $(R^1)_2NCH{=}C(SR^3)CHO$ with a dialkylcarbamoyl halide of formula $(R^1)_2NCO\text{-hal}$, wherein hal represents a chlorine or bromine; and

(c) reacting the product thus formed with a salt of the formula M_mAn, wherein M represents an alkali metal ion.

4,857,664

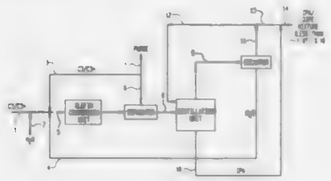
PROCESS FOR THE PRODUCTION OF ETHER AND ALCOHOL

Tracy J. Huang, Lawrenceville; Rene B. LaPierre, Medford, and Samuel A. Tabak, Wenonah, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 139,543, Dec. 30, 1987, abandoned. This application Oct. 27, 1988, Ser. No. 265,324

Int. Cl.[4] C07C *41/06, 41/09, 41/01*

U.S. Cl. 568—695 **13 Claims**



1. A process for producing ether containing at most relatively minor amounts of water which comprises:

(a) contacting at least one light olefin with water in an olefin conversion unit in the presence of an acidic zeolite as catalyst to provide an aqueous mixture of alcohol and ether, the olefin conversion unit being operated under conditions which are effective to provide alcohol by the reaction of olefin and water therein and ether by the dehydration of alcohol and/or by the reaction of olefin and alcohol therein;

(b) introducing the aqueous mixture of alcohol and ether into a distillation unit supplied with at least a part of the ether layer recovered from a downstream decantation operation, said distillation unit being operated under conditions which are effective to provide an azeotropic overheads fraction comprising ether, water, oligomer and minor amounts of alcohol, and a bottoms fraction comprising a major amount of alcohol and a minor amount of ether;

(c) introducing the azeotropic overheads fraction into a decanter unit operated under conditions which are effective to provide an ether layer containing at most negligible amounts of water and an aqueous product containing negligible amounts of alcohol; and,

(d) introducing at least part of the ether layer into the distillation unit to reduce the water content of the final ether product.

4,857,665

PROCESS FOR WORKING UP THE FILTRATION RESIDUE OF CRUDE SODIUM PREPARED BY FUSION ELECTROLYSIS INTO A HIGH-PURITY SODIUM ALCHOLATE

Walter Hinrichs, Bruehl; Herbert Hovestadt, Erftstadt; Ludwig Lange, Bruehl; Kurt A. Ruppert, Langenselbold, and Erich Splett, Huerth-Berrenrath, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 15, 1988, Ser. No. 144,346

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 3702052

Int. Cl.[4] C07C *31/30*

U.S. Cl. 568—851 **10 Claims**

1. A process for converting the sodium contained in the residue accumulating in the filtration of liquid crude sodium from fusion electrolysis into a sodium alcoholate with a low content of sodium oxide, sodium hydroxide and sodium carbonate in the form of a solution in said alcohol used for reacting the sodium comprising:

heating the filtration residue containing sodium, alloyed and suspended calcium, and oxidation products of sodium and calcium, under intense mixing to temperatures in the range from 300° to 600° C. for 2 to 6 hours, adding the so heat treated residue to an alcohol corresponding to the desired sodium alcoholate and being present in an amount required to achieve the desired final concentration in the solution, said alcohol being selected from the group consisting of lower aliphatic alcohols of 1 to 6 carbon atoms and aromatic alcohols of 6 to 12 carbon atoms, and separating the resulting alcoholate solution from insoluble impurities by filtering, all foregoing steps be carried out under inert gas atmosphere.

4,857,666

ALKYLATION/TRANSALKYLATION PROCESS

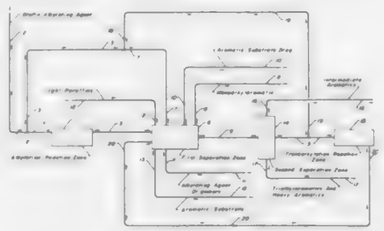
Paul T. Barger, Arlington Heights; Gregory J. Thompson, Waukegan; Raymond R. Herber, Medinah, and Tamotsu Imai, Mt. Prospect, all of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 95,184, Sep. 11, 1987, Pat. No. 4,774,377. This application Sep. 21, 1988, Ser. No. 247,810

The portion of the term of this patent subsequent to Sep. 27, 2005, has been disclaimed.

Int. Cl.[4] C07C *1/00, 2/68, 5/22*

U.S. Cl. 585—323 **13 Claims**



1. A process for the production of alkylated aromatics and containing a regenerable transalkylation catalyst which comprises the steps of:

(a) passing a feedstream comprising an alkylating agent and an aromatic substrate to an alkylation reaction zone and into contact with a solid phosphoric acid containing catalyst under conditions providing for the liquid phase alkylation of said aromatic substrate;

(b) separating in a first separation zone the product from the alkylation reaction zone and a hereinafter described transalkylation reaction zone product into fractions comprising (1) an aromatic substrate fraction, (2) a substantially pure monoalkylated aromatic fraction, and (3) a fraction comprising compounds with boiling points higher than the desired monoalkylated aromatic;

(c) separating in a second separation zone the fraction comprising compounds with boiling points higher than the desired monoalkylated aromatic of the first separation zone into a dialkylated aromatic-rich fraction, and into fractions with higher and lower boiling points than the dialkylated aromatic-rich fraction;

(d) passing a feed stream of an aromatic substrate and the separated dialkylated aromatic-rich hydrocarbon fraction of the second separation zone to a transalkylation reaction zone containing crystalline aluminosilicate catalyst under conditions providing for the transalkylation of said dialkylated aromatic-rich hydrocarbon fraction to produce a transalkylation reaction zone product;

(e) introducing the transalkylation reaction zone product from step (d) into the separation zone of step (b);

(f) recovering the monoalkylaromatic fraction; and

(g) intermittently halting the flow of the separated dialkylated aromatic-rich hydrocarbon fraction of the second separation zone to the transalkylation reaction step (d) and thereby allowing only the aromatic substrate to contact and regenerate the crystalline aluminosilicate transalkylation catalyst until essentially no catalyst deactivating material remains on the catalyst and thereafter resuming the flow of the separated dialkylated aromatic-rich hydrocarbon fraction to the transalkylation reaction step.

4,857,667

SYSTEM FOR CONVERSION OF CRUDE OXYGENATE TO GASOLINE WITH FEEDSTOCK EXTRACTION

Mohsen N. Harandi, Sewell, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 43,718, Apr. 29, 1987, Pat. No. 4,709,113. This application Oct. 7, 1987, Ser. No. 105,425

Int. Cl.[4] C07C *1/20*

U.S. Cl. 585—403 **6 Claims**

1. A continuous feedstock extractions and reactor system for converting crude oxygenated hydrocarbon feedstock to gasoline boiling range hydrocarbons comprising:

extractor means for contacting oxygenate liquid containing a minor amount of water with a liquid hydrocarbon extraction stream under extraction conditions favorable to selective extraction of oxygenate, thereby providing an extract liquid stream rich in oxygenate and an aqueous raffinate stream lean in oxygenate;

catalytic reactor means for contacting at least a portion of the extract stream in a catalytic reaction zone with conversion catalyst under process conditions to convert substantially all oxygenate to hydrocarbons;

separation means for receiving reactor effluent to recover an aqueous liquid byproduct stream, a gaseous stream rich in C_2- hydrocarbons, a liquid product stream comprising C_5+ liquid hydrocarbons, and a liquid stream rich in C_3–C_4 hydrocarbons;

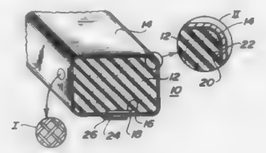
means for recycling at least a portion of at least one liquid phase to said extractor means for use as extraction liquid.

4,857,668

MULTI-FUNCTION GASKET

Samuel S. Buonanno, Monroe, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Apr. 15, 1988, Ser. No. 181,834
Int. Cl.[4] H05K 9/00
U.S. Cl. 174—35 GC 18 Claims



1. A multi-function gasket for electrical apparatus and the like, operation of which tends to generate or be adversely affected by electromagnetic and radio frequency interference (EMI/RFI), comprising:

a continuous, molded, resilient foam core having a sealed outer boundary layer;

a flexible, electrically conductive and substantially abrasion resistant sheath externally surrounding the foam core and bonded to the boundary layer, the foam filling the interior of the sheath and,

means for mounting the gasket, whereby an apparatus may be sealed against EMI/RFI leakage, noise emission and environmental infiltration through perimeter gaps of electrically conductive doors, access panels and the like by the actions and interactions of the sheath, the foam core and the boundary layer, the flexible sheath being continuously pressed by the resilient foam core into positive engagement with conductive surfaces between which the gasket may be mounted, forming a continuous electrical path enclosing the foam core, extending continuously across the gaps, and preventing EMI/RFI leakage through the gaps, the boundary layer preventing noise emission and environmental infiltration across the gaps and the sheath protecting the boundary layer against damage from abrasion and the like.

4,857,669

BRACKET FOR MOUNTING WIRING DEVICES

Masuo Kitamura; Mitsuhiro Takagi, both of Tsu, and Masaaki Nakamura, Mie, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed May 4, 1988, Ser. No. 188,330
Claims priority, application Japan, Oct. 23, 1987, 62-267415
Int. Cl.[4] H01H 9/20
U.S. Cl. 174—53 9 Claims

1. A bracket for mounting devices comprising:

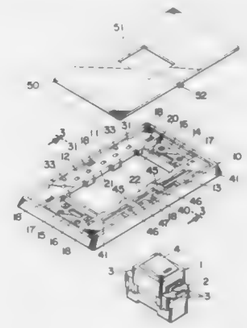
a flat frame having first and second parallel jambs which define therebetween a rectangular opening capable of receiving a plurality of wiring devices in side-by-side relation;

each of said wiring devices having a body portion to be fitted through said opening and having a strap provided on each side thereof with at least one mounting ear by which each wring device is attachable to said frame;

said first jamb having a series of longitudinally spaced first slots open to said opening for receiving said mounting ear on one side of each wiring device;

a resilient strip integrally formed in said frame to extend along said second jamb in a spaced relation thereto outwardly thereof and having a series of second slots open to said opening for receiving said mounting ear on the other side of each wiring device; and

said resilient strip integrally connected at its longitudinal ends to the longitudinal ends of said second jamb respectively through U-shaped hinge sections which are bent within the plane of said frame so that said resilient strip is capable of flexing outwardly within that plane to allow



the engagement and disengagement of the mounting ear of each wiring device into and out of the corresponding second slot.

4,857,670

WIRING DUCT UNIT

Richard E. Frank, deceased, late of Bayside, Wis., and by Pat P. Frank, heir, 740 E. Bay Point Rd., Bayside, Wis. 53217

Filed Jan. 28, 1988, Ser. No. 149,409
Int. Cl.[4] H02G 3/04, 3/06
U.S. Cl. 174—68.3 11 Claims



1. An elongated wiring duct-like enclosure for surface mounting of electrical wiring to a support structure, comprising a base member having a first sidewall and a second sidewall joined by a bottom wall and said sidewalls having substantially aligned outer ends, a cover integrally connected to the outer end of said first sidewall, said cover having an outer edge, said base member including its sidewalls and bottom wall being formed of plastic, the outer edge of said cover adapted to mate with the outer end of said second sidewall, said cover and said second sidewall having a releasable connection means for releasably securing of said cover to said second sidewall, and means for securing said base member to a support structure with said cover located in spaced relation to said support structure for movement of the cover between a closed position and an open position, a first locking wall secured to said first sidewall and projecting toward said second sidewall in spaced relation to said bottom wall, a second locking wall secured to said second sidewall and projecting partially inwardly toward said first sidewall in substantial alignment with said first locking wall, said first and second locking walls being aligned and defining a locking slot for receiving a locking tab for interconnection of similar abutting enclosures.

4,857,671

FILM CARRIER AND BONDING METHOD USING THE FILM CARRIER

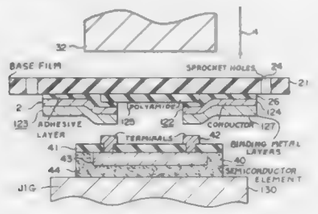
Hirotaka Nakano, Yokohama, and Thunekazu Yoshino, Kamakura, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 101,245, Sep. 25, 1987. This application Oct. 17, 1988, Ser. No. 260,472

Claims priority, application Japan, Sep. 25, 1986, 61-224764; Oct. 16, 1986, 61-244164; Oct. 30, 1986, 61-256823

Int. Cl.[4] H05K *1/00*

U.S. Cl. 174—68.5 2 Claims



1. A film carrier comprising:

a base film;

a plurality of conductors formed on the base film; and

a plurality of layers formed on the conductors, each being made of a bonding metal having a melting point of approximately 160° C. and a softening point of approximately 134° C.

4,857,672

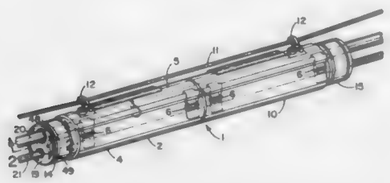
CABLE CLOSURE END CAP

Kenneth D. Rebers; William J. Seim, both of Austin, and Dean C. Krenz, Round Rock, all of Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 131,913, Dec. 11, 1987. This application May 12, 1988, Ser. No. 193,736

Int. Cl.[4] H02G *15/013*

U.S. Cl. 174—93 31 Claims



24. An end cap arrangement for sealing an end of a splice closure about at least one cable member directed therein; said end cap arrangement comprising:

(a) a wall member having first and second opposite faces and having an outer peripheral edge and at least one longitudinal cable bore; the at least one cable bore being defined by a plurality of substantially concentric ring members spaced from one another by transverse wall sections; and,

(b) mounting means constructed and arranged to facilitate mounting said end cap arrangement on a cable member directed through said at least one cable bore; said mounting means including a slot arrangement communicating partially through said wall member, from a position adjacent to, but spaced from, said wall member outer peripheral edge and toward said at least one cable bore; said slot arrangement also communicating partially through said wall member between said first and second opposite faces.

4,857,673

POLYOLEFIN COMPOUNDS HAVING IMPROVED THERMAL STABILITY AND ELECTRICAL CONDUCTORS COATED THEREWITH

Edward V. Wilkus, Trumbull; Ida Fridland, Huntington, and Joseph E. Betts, Westport, all of Conn., assignors to Vulkor Incorporated, Lowell, Mass.

Continuation of Ser. No. 590,603, Mar. 19, 1984, abandoned. This application Mar. 13, 1986, Ser. No. 840,979

Int. Cl.[4] C08K *5/34*

U.S. Cl. 174—110 PM 19 Claims

1. A curable, flame retardant insulating composition which consists essentially of:

(a) an ethylene containing polymer;

(b) ethylene-bis (tetrahalophthalimide;

(c) an antimony compound

(d) from 0.25 parts by weight to 2.5 parts by weight of lead compound per 100 parts by weight of ethylene containing polymer;

(e) a combination of a sterically hindered phenol with at least one zinc salt of a mercaptoimidazole selected from the group consisting of a zinc salt of 2-mercapto-benzimidazole and a zinc salt of 2-mercaptotolyl-imidazole; and

(f) a peroxide curing agent.

4,857,674

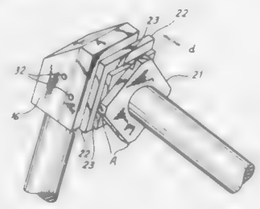
STRAIN RELIEF DEVICE

Jacques Filbert, Longueuil, Canada, assignor to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Filed Aug. 12, 1985, Ser. No. 764,121

Int. Cl.[4] H02G *15/007, 3/22*

U.S. Cl. 174—135 1 Claim



1. A flexible relief device for installing wire or cable into a square aperture disposed in panelling, comprising:

a flexible body,

means defining a wire or cable supporting conduit having an entrance in said body at a bottom portion thereof and an exit in said body at a rear portion thereof,

a first approximately square flange slightly smaller than the square aperture, disposed at said rear portion,

a second flange, including a rearward facing surface that is larger than the square aperture so that it cannot pass through the square aperture,

an approximately square spacer portion, at least as thick as the panelling and slightly smaller than the square aperture, located between said first and second flanges, said first flange and said spacer portion having an orientation of approximately 45 degrees with respect to each other as measured about a central axis in said body, the corners of said first flange being chamfered so as to pass unhindered through said square aperture at approximately a 45 degree angle of orientation with respect to an upright position,

ramps, at the corners of said first flange, recessed within the surface that is facing the rearward surface of said second flange,

each ramp opening to a radial edge of said first flange for receiving the panel, and to a radial edge of said spacer portion for delivering the panel, and having its ramping surface angled so that camming forces upon said first sand second flanges and spacer portion are applied annularly and so that minimal force is applied on flange and spacer portion corners radially toward the central axis,

so that upon insertion of said strain relief device in said square aperture of said panelling by orienting said body at approximately 45 degrees with respect to an upright position such that said first flange passes through said square aperture in said panelling, and then rotating said strain relief device approximately 45 degrees back to said upright position, said ramps cam against the panelling until the spacer portion moves into the square aperture, resisting further rotation, whereby said first flange becomes locked behind said panelling, and said panelling is disposed between said first and said second flanges, said body including a pair of holes for receiving teeth of a torquing tool for rotating said body with respect to said panelling, said body further comprising a snub-nosed section for shock force protection, and

said second flange being spaced from said snub-nosed section for resilient absorption of bending forces.

4,857,675

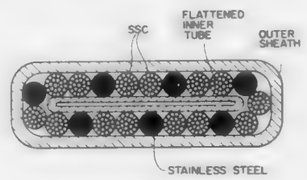
FORCED FLOW SUPERCONDUCTING CABLE AND METHOD OF MANUFACTURE

William G. Marancik, Plainfield; Seungok Hong, New Providence, and Glean W. Grabinsky, Montville, all of N.J., assignors to Oxford Superconducting Technology, Carteret, N.J.

Filed May 28, 1987, Ser. No. 55,520

Int. Cl.[4] H01B *12/16*

U.S. Cl. 174—15.4 15 Claims



1. A method of manufacturing a forced flow type supeconducting cable-in-conduit which comprises the following steps:

(a) providing multifilamentary superconducting subcables (SSC's) having void spaces within;

(b) cabling around a first tube, SSC's from step (a) while alternately cabling stainless steel cable or wire between SSC's;

(c) forming a second tube around the composite formed from step (b); and

(d) flattening the double tube composite from step (c) to form a cable-in-conduit.

8. A structure comprising a forced flow superconducting cable-in-conduit substantially having the configuration of a parallelepiped, comprising a flat metal support substantially in the center of said structure and extending longitudinally therein, cabled around said support an array of multifilamentary superconducting subclass (SSC's) alternated with stainless steel cables or wires, and a metal jacket around the assembly to form said structure; said structure having interior passages for the flow of a cooling fluid comprising void spaces both around and within the SSC's.

4,857,676

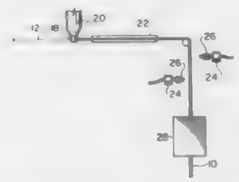
MAGNETICALLY PERMEABLE PARTICLES IN TELECOMMUNICATIONS CABLE

John N. Garner; G. Douglas Baxter, and James C. Grant, all of Kingston, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 13, 1988, Ser. No. 256,931

Int. Cl.[4] H01B *11/12;* H04B *3/26*

U.S. Cl. 178—45 20 Claims



15. An insulated conductor wire comprising a conductor wire surrounded by a layer of dielectric material devoid of magnetically permeable particles and a hardened sprayed deposit comprising a mixture of a dielectric carrier material having magnetically permeable particles substantially dispersed therein.

4,857,677

DIAL DEVICE

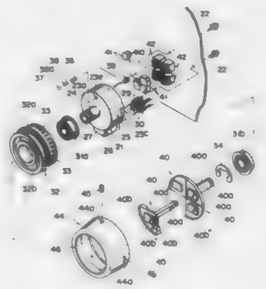
Tomeo Tanaka, Kanagawa, and Toshikazu Oda, Atsugi, both of Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 162,061

Claims priority, application Japan, Mar. 4, 1987, 62-50978

Int. Cl.[4] H01H *9/00*

U.S. Cl. 200—5 R 6 Claims



1. A dial device adapted to be mounted on a base plate, said dial device comprising:

a hollow base mountable on said base plate;

a cylindrical shaft, mounted to said base and projecting forwardly from said base, said cylindrical shaft having a through-hole therein extending in the axial direction thereof, a front end of said through-hole being open at a front surface of said shaft, and a back end of said through-hole opening into a space extending inside of said hollow base;

a dial knob, rotatably supported by said shaft, said dial knob having a front surface which has an opening therein;

means coupled to said dial knob for converting a rotated amount of said dial knob into an electrical signal;

at least one switch mounted in the space inside of said hollow base; and

at least one key top, said at least one key top including a shaft portion freely slidably passing through said through-hole

of said shaft, a back end of said shaft portion of said key top being mechanically connected to said at least one switch so as to operate said at least one switch via said shaft portion of said at least one key top, a front end of said shaft portion projecting forwardly from said cylindrical shaft and having a front plate thereon, said front plate being exposed through said opening of said dial knob;

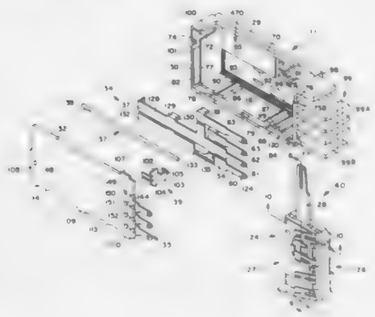
said at least one switch being operable by depressing said front plate of said at least one key top so that said shaft portion of said at least one key top slides rearwardly relative to said cylindrical shaft to operate said at least one switch.

4,857,678

COMBINATION PLUNGER AND SLIDER SWITCH

Ellis P. Lipp, Charlottesville, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Sep. 23, 1988, Ser. No. 248,049
Int. Cl.[4] H01H *15/00*
U.S. Cl. 200—16 R **8 Claims**



1. An electrical switch comprising:

manually operable contact carrier means for sliding linearly in a first direction;

housing means for slidably supporting said carrier means;

terminal means mounted on said housing;

contact means mounted on said carrier means for contacting said terminal means;

plunger means mounted on and slidable with said contact carrier means for moving linearly in a second direction substantially perpendicular to said first direction to cause said contact means to engage or disengage said terminal means, said plunger means manually operable independently of the sliding of said contact carrier means.

4,857,679

ALARM SYSTEM

Brian S. Bennett, 3 Milton Avenue, Barnet, Hertfordshire, and David Smith, 31 Eastry Avenue, Hayes, Kent, both of England

Filed Nov. 19, 1987, Ser. No. 135,297
Claims priority, application United Kingdom, Nov. 20, 1986, 8627788; Jun. 4, 1987, 8713115
Int. Cl.[4] H01H *3/16, 9/02;* **G08B** *25/00*
U.S. Cl. 200—61.62 **6 Claims**

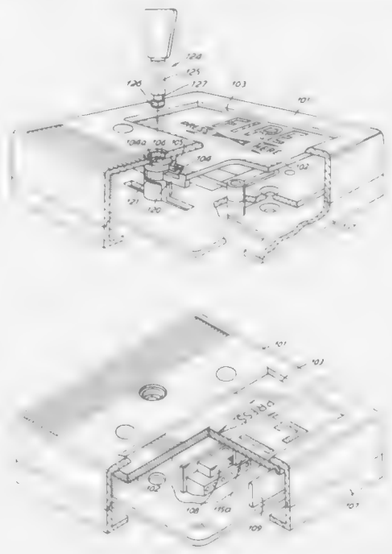
1. An alarm switch, comprising:

a box for mounting on a supporting surface;

a front plate movably mounted in said box;

a frangible element having a plurality of frangible areas spaced in succession thereon and each of which can be broken off said frangible element;

a stop element on one of said box and said front plate, and said frangible element being on the other of said box and said front plate, said stop element and said frangible element being positioned for, when said front plate is moved from a normal position relative to said box, said stop element and one of said frangible areas are engaged for causing the frangible area to be broken off said frangible element, and said frangible element and said stop element being shiftable relative to each other for, after one frangible area has been broken off, bringing the stop element and the next frangible area in succession into position for being



engaged with each other when said front plate is moved again; and

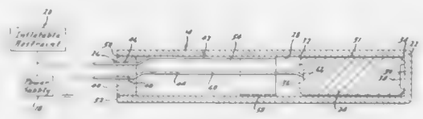
a switch unit operatively connected to said front plate for being operated when said front plate is moved sufficiently far from said normal position to cause a frangible area to be broken off said frangible element.

4,857,680

ACCELERATION SENSOR

Adam M. Janotik, Grosse Ile, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1988, Ser. No. 288,382
Int. Cl.[4] H01H *35/14*
U.S. Cl. 200—61.45 R **21 Claims**



21. An acceleration sensor for transmitting an electrical signal from a power supply to an inflatable occupant restraint system of an automobile, the sensor comprising:

a housing having an axially extending bore including a closed end;

a sensing mass mounted in the housing at the closed end for damped slidable movement along an axis of the housing bore in response to changes in the velocity of the automobile with respect to the axis;

a fixed electrical contact fixedly mounted within the housing bore; and

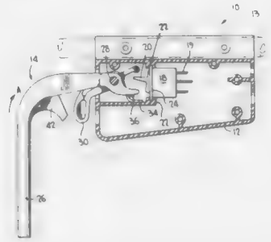
a deflectable electrical contact having an end fixedly carried with the housing and having a contact portion resiliently engaging the sensing mass in columnar fashion to bias the mass in one direction with respect to the housing, the sensing mass being operative upon the occurrence of an acceleration pulse of predetermined magnitude to move to collapse the deflectable contact, reducing the biasing force thereof porportional to the movement and causing portions of the deflectable contact to engage the fixed electrical contact, thereby transmitting the electrical signal.

4,857,681

DEAD MAN-TYPE ELECTRICAL CONTROL DEVICE FOR POWER TOOLS

Robert W. Rush, Jr., Amherst, Ohio, and Michael K. Huizenga, Tupelo, Miss., assignors to Aircap Industries Corp., Topelo, Miss.

Continuation-in-part of Ser. No. 108,004, Oct. 14, 1987, abandoned. This application Dec. 23, 1987, Ser. No. 136,965
Int. Cl.[4] H01H *9/06*
U.S. Cl. 200—61.85 **6 Claims**



1. A dead man-type electrical control device for an electrical tool which comprises

a housing,

an electrical switch mounted within said housing, said electrical switch including a projecting actuator having opposite first and second sides and being movable into an on position or an off position,

a handle assembly, said handle assembly including an elongated handle element which is mounted to pivot around an axis within said housing and which defines a first end that extends away of said housing and a second end that is within said housing and is movable against said first side of said projecting actuator, and a trigger element which is pivotally mounted with respect to said handle element and which defines a first end that extends away of said housing and a second end that is within said housing and is movable against said second side of said projecting actuator,

biasing means which contacts said second end of said handle element to pivot said handle element such that said second end of said handle element contacts said first side of said actuator and moves said projecting actuator into said off position, whereas manual pivoting of said handle element against the bias of said biasing means and the manual pivoting of said trigger element with respect to said handle element will cause said second end of said trigger element to contact said second side of said projecting actuator and move said projecting actuator into said on position.

4,857,682

PRECISELY ALIGNED SWITCH ACTUATOR ASSEMBLY FOR MULTIPLE SWITCHES

Theodore L. Jones, Lancaster, Pa., assignor to Burle Technologies, Inc., Lancaster, Pa.

Filed Oct. 14, 1988, Ser. No. 257,764
Int. Cl.[4] H01H *3/20, 15/00, 21/24*
U.S. Cl. 200—330 **10 Claims**





1. A switch comprising:

a switch body;

an actuator moveably attached to the switch body by a retaining means;

a rub bar with a rounded surface protruding from the rub bar, the rub bar being interconnected to and moving with the actuator;

at least one set of two spring fingers attached to the switch body and extending generally in the direction of the movement of the rub bar, each spring finger anchored to the switch body by an attachment means located at one end of the spring finger, beyond the movement of the rub bar, and each spring finger having an angular bend in the direction toward the rub bar, the angular bends being located so that when the actuator is in a prescribed position the rounded surface of the rub bar rests between the angular bends in the two spring fingers and is in contact with both angular bends and when the rub bar is in any position in contact with either angular bend other than in the prescribed position, the reaction force of the angular bend directs the rub bar toward the prescribed position;

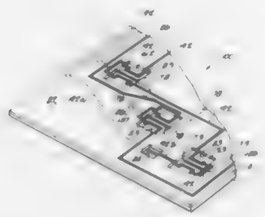
at least two pushbutton switches, attached to the switch body, each with a pushbutton aligned with a movable operator section of one of the spring fingers, so that movement of the rub bar causes deflection of a a spring finger and the spring finger operator section moves a switch pushbutton.

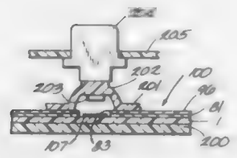
4,857,683

MEMBRANE SWITCHCORES WITH KEY CELL CONTACT ELEMENTS CONNECTED TOGETHER FOR CONTINUOUS PATH TESTING

Thomas L. Maser, Mequon, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Dec. 28, 1988, Ser. No. 290,784
Int. Cl.[4] H01H 13/70; H05K 1/00
U.S. Cl. 200—5 A 5 Claims





1. In a membrane switchcore comprising a flexible plastic film substrate, a conductive first circuit including a plurality of conductive first traces and a plurality of conductive first contact elements connected to each first trace, and a conductive second circuit including a plurality of conductive second traces and a plurality of conductive second contact elements connected to each second trace, wherein a first contact element and a second contact element are at each key cell of the matrix and adapted to be bridged by a movable contact for actuation of a key cell,

the improvement wherein:

each first contact element consists of an integral section of its respective first trace;

each second contact element consists of an integral section of its respective second trace; and

each first trace and its respective first contact elements define a continuous conductive path, and each second trace and its respective second contact elements define a continuous conductive path.

4,857,684

CAPACITANCE MEMBRANE SWITCHCORE WITH INTERTRACE CAPACITIVE COUPLING AND/OR INTRATRACE CAPACITIVE COUPLING

Norman G. Gratke, Elm Grove, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

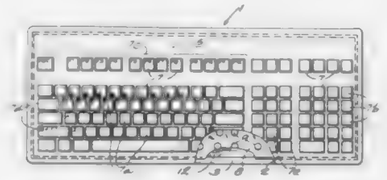
Filed Oct. 25, 1988, Ser. No. 262,906
Int. Cl.[4] H03K 17/975; H03M 11/00
U.S. Cl. 200—600 39 Claims

1. A capacitance membrane switchcore for a keyboard having a plurality of operator actuatable key sites and including drive circuitry and sense circuitry to be connected to the switchcore, the capacitance membrane switchcore comprising (i) a dielectric layer, (ii) a conductive first circuit along a first surface of the dielectric layer that includes a plurality of conductive first traces and a plurality of first capacitor plates, (iii) a conductive second circuit along a second surface of the dielectric layer opposite from the first surface thereof that includes a plurality of conductive second traces and a plurality of second capacitor plates, and (iv) the first traces and the second traces are arranged relative to each other so as to define a matrix comprising a plurality of key cells, each including a fixed capacitor consisting of a first capacitor plate and a second capacitor plate that is unique to each key cell,

the improvement wherein the capacitance membrane switchcore further includes:

a conductive third circuit along the same surface of the dielectric layer as the first circuit and including a plurality of conductive third traces, there being one third trace for each second trace of the second circuit;

an intertrace coupling capacitor coupling each second trace of the second circuit to a selected third trace of the third circuit, there being one intertrace coupling capacitor for each second trace, each intertrace coupling capacitor including a capacitor plate along the same surface of said dielectric layer as the second circuit and a capacitor plate along the same surface of said dielectric layer as the third circuit; and





the first traces and third traces are arranged for connection to drive circuitry and sense circuitry of a keyboard.

39. In a capacitance membrane switchcore of the type including conductive first and second circuits including conductive traces along opposed surfaces of a dielectric layer, the circuits defining a matrix comprising a plurality of key cells and adapted for combining with a data entry keyboard including drive circuitry and sense circuitry,

the improvement wherein:

at least one conductive trace of the first and second circuits includes a first branch along one surface of the dielectric layer, a second branch along the opposite surface of the dielectric layer, a third branch along said one surface of the dielectric layer, and (i) a first intratrace coupling capacitor coupling the first branch to the second branch and (ii) a second intratrace coupling capacitor coupling the second branch to the third branch.

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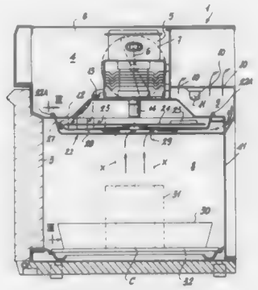
MICROWAVE OVEN WITH IMPROVED HUMIDITY SENSING MEANS

Liliana Vigano, Arese; Franciscus Kokkeler, Mainate, and Mario Fioroli, Brezzo di Bedero, all of Italy, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 154,167, Feb. 8, 1988, abandoned. This application Feb. 13, 1989, Ser. No. 311,364
Claims priority, application Italy, Feb. 13, 1987, 19384 A/87
Int. Cl.[4] H05B 6/68
U.S. Cl. 219—10.55 F 3 Claims

1. A microwave oven comprising a cooking chamber (2) in which food to be heated can be placed, a microwave generator (5) for radiating microwave energy into said chamber to heat

said food, fan means (6) for producing an air flow to cool said generator and directing said air flow into said cooking chamber (2), and toward said food being heated and then away from said food and away from said cooking chamber (2) and into a sensor compartment (9) provided with humidity sensor means (11) and positioned in the path of a part of said air flow after said air flow passes away from said food, said sensor means (11) being capable of sensing a change in humidity of the air in said cooking chamber (2), said cooking chamber (2) having a plurality of inlet apertures (25, 26) for conveying said air flow into said cooking chamber (2), an oven plate means (32) for supporting said food within said cooking chamber, an outlet opening (29) communicating with said sensor compartment (9) for conveying a portion of said air flow, after passing away from said food, into said sensor compartment (9) and positioned along an axis passing through substantially the center of said oven plate means (32) and substantially perpendicular to said oven plate means (32) and a plurality of vent holes (40) provided in a wall of said oven and directly communicating with the exterior of said oven for discharging the remaining portion of the air flow, after passing away from said food, into said exterior.

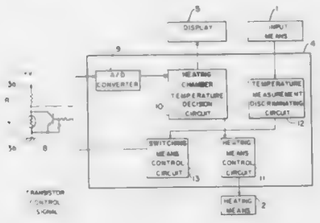


4,857,686

MICROWAVE OVEN WITH HEATING CHAMBER TEMPERATURE DETECTING CIRCUIT

Kengo Hirata, Nara, and Katsumi Ishifuro, Yao, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 108,961, Oct. 16, 1987, abandoned. This application Nov. 15, 1988, Ser. No. 271,392
Claims priority, application Japan, Jan. 23, 1987, 62-14454
Int. Cl.[4] H05B 6/68
U.S. Cl. 219—10.55 B 7 Claims



1. An electronically controlled cooking system, comprising:

heating chamber means for providing a place for performing a plurality of cooking operations on an item to be cooked;

cooking source means, operatively communicating with said heating chamber means, for conducting said plurality of cooking operations within said heating chamber;

a heating chamber thermistor, operatively connected to said heating chamber means, for selectively detecting temperature in said heating chamber means;

input means, operatively communicating with said cooking source means, for selecting one of said plurality of cooking operations, some of said plurality of cooking operations being performed by said cooking source means without detecting temperature by said heating chamber thermistor; and

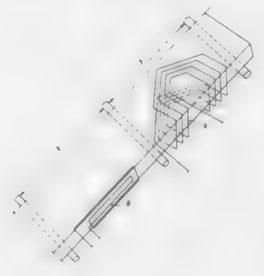
corrosion prevention means for preventing corrosion of said heating chamber thermistor by selectively disconnecting said heating chamber thermistor from detecting temperature in response to detecting one of said plurality of cooking operations which does not require detecting temperature by said heating chamber thermistor to avoid unnecessary temperature detection and associated corrosion of said heating chamber thermsistor.

4,857,687

INDUCTION APPARATUS FOR HEATING EDGE PORTION OF BILLET

Lars Andersson, and Zdenek Klimt, both of Västerås, Sweden, assignors to Asea Aktiebolag, Västerås, Sweden

Continuation of Ser. No. 18,600, Feb. 25, 1987, abandoned. This application Oct. 12, 1988, Ser. No. 257,142
Claims priority, application Sweden, Mar. 3, 1986, 8600940
Int. Cl.[4] H05B 6/40
U.S. Cl. 219—10.57 1 Claim



1. An apparatus for heating a side edge portion of a traveling flat billet, and comprising a first induction coil bent into a U-shaped form having horizontal sides which are triangular in shape and interspaced and positioned to overlie the mutually opposite sides of a flat billet travelling between said horizontal sides of said first induction coil, and a second induction coil which is flat in shape and positioned in a vertical plane parallel to the billet's side edge, the second coil having a vertical height less than the interspacing of the horizontal sides of the first coil so that the second coil can be positioned between the horizontal sides of the first coil, the second coil being positioned at least adjacent to the first coil and co-operating with the first coil.

4,857,688

MACHINING FLUID SUPPLY CONTROLLING SYSTEM FOR A WIRE CUT ELECTRICAL DISCHARGE MACHINE

Toshiyuki Aso, Hino; Yuuki Kita, Hachioji, and Sadahiro Watanabe, Kunitachi, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP87/00652, § 371 Date Apr. 28, 1988, § 102(e) Date Apr. 28, 1988, PCT Pub. No. WO88/01548, PCT Pub. Date Mar. 10, 1988
PCT Filed Sep. 2, 1987, Ser. No. 196,192
Claims priority, application Japan, Sep. 6, 1986, 61-208848
Int. Cl.[4] B23H 1/10
U.S. Cl. 219—69.14 4 Claims

1. A machining fluid supply controlling system for a wire cut electrical discharge machine having a rough-machining fluid

supply system and a finish-machining fluid supply system, which are connected to the machining section thereof, capable of supplying machining fluids respectively having different qualities respectively for rough machining and for finish machining, said machining fluid supply controlling system comprising:

a first machining fluid tank having a filtering device and provided in the rough-machining fluid supply system;

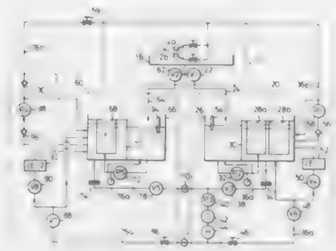
a second machining fluid tank having a filtering device and provided in the finish-machining fluid supply system;

a first machining fluid supply passage through which a machining fluid is supplied under pressure from the first machining fluid tank to the machining section;

a second machining fluid supply passage through which a machinig fluid is supplied under pressure from the second machining fluid tank to the machining section;

first and second machining fluid return passages for returning the machining fluid respectively to the first and second machining fluid tanks;

a first machining fluid quality regulating circuit for regulating the quality of the machining fluid to be supplied under pressure from the first machining fluid tank to the machining section including means for detecting the specific resistance of the first machining fluid, an ion exchange device for increasing the specific resistance of the first machining fluid and a flow control valve which opens in response to a detected specific resistance of the first machining fluid below a predetermined level to permit said first machining fluid to flow to said ion exchange device; and



a second machining fluid quality regulating circuit for regulating the quality of the machining fluid to be supplied under pressure from the second machining fluid tank to the machining section including means for detecting the specific resistance of the second machinig fluid, a second ion exchange device for increasing the specific resistance of the second machining fluid and a second flow control valve which opens in response to a detected specific resistance of the second machining fluid below a predetermined level to permit said second machining fluid to flow to said second ion exchange device.

4,857,689

RAPID THERMAL FURNACE FOR SEMICONDUCTOR PROCESSING

Chunghsin Lee, Lynnfield, Mass., assignor to High Temperature Engineering Corporation, Danvers, Mass.

Filed Mar. 23, 1988, Ser. No. 173,137

Int. Cl.[4] H05B *6/06*

U.S. Cl. 219—10.71 **28 Claims**

1. A semiconductor wafer processing furnace comprising:

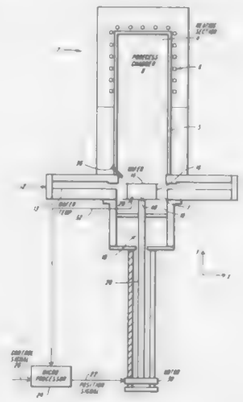
(a) an elongated processing chamber enclosing a first zone and a second zone extending along a first reference axis;

(b) a wafer support assembly including a support member and an associated translation means for selectively translating said support member between said zones along said first reference axis in response to an applied position signal;

(c) first temperature means, including heating means for generating heat, for controlling said first zone to be substantially at a first temperature;

(d) second temperature means for controlling said second zone to be substantially at a second temperature; and

(e) a controller including means responsive to an applied



control signal for generating said position signal and for applying said position signal to said translation means, said control signal being representative of a desired temperature of a region proximal to said support member,

so that, in response to said position signal, said translation means translates said support member to position said support member along said reference axis such that the temperature of said region substantially matches said desired temperature.

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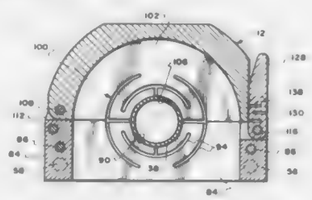
CASSETTE WELDING HEAD APPARATUS

Gasparas Kazlauskas, 1134 Tower Rd., Beverly Hills, Calif. 90210

Filed Aug. 22, 1988, Ser. No. 234,489

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—60 A **2 Claims**



1. A cassette welding head apparatus comprising:

a welding electrode housing, a welding electrode mounted within said welding electrode housing, said welding electrode housing having tube clamping means, said tube clamping means being adapted to clamp onto a pair of tubes to be welded together;

a mounting housing, said mounting housing including structure for operating said welding electrode in the welding of the pair of tubes, the improvement comprising:

said welding electrode housing being separable from said mounting housing, said welding electrode housing being attachable by latching means to said mounting housing, said latching means including quick disconnect means, said quick disconnect means being operable to positively secure together said welding electrode housing and said mounting housing and also operable to permit disengagement of said welding electrode housing and said mounting housing; and

said tube clamping means having a pair of fixed plates and a pair of movable plates, a said movable plate to be in alignment with a said fixed plate, the aligned pair of a said fixed plate and a said movable plate being located in a parallel spaced apart relationship relative to the other said movable plate and said fixed plate, each said aligned pair of said fixed plate and said movable plate defining a center opening, a tube to connect with each said center opening, toggle means for securing each said movable plate relative to its respective said fixed plate with therebeing a separate said toggle means for each said movable plate, each said toggle means including a clamping lever, each said clamping lever including slot means, said slot means permitting slight longitudinal expansion of said clamping lever during installation of the said clamping lever into a clamping position.

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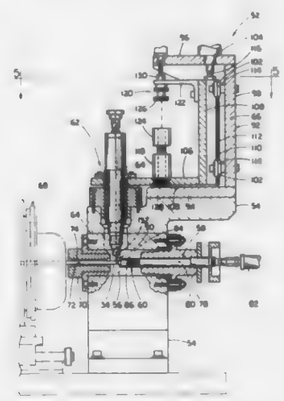
BURNABLE ABSORBER ROD END PLUG WELDING APPARATUS AND METHOD

David A. Boatwright, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 2, 1988, Ser. No. 201,224

Int. Cl.[4] B23K *9/225*

U.S. Cl. 219—60 R **22 Claims**



19. An apparatus for welding an end plug to a tube at an interface between an end of the tube and a reduced diameter trailing shoulder on the end plug, the end plug having a central passage defined therethrough and an enlarged diameter leading head portion of a diameter larger than that of the tube end and the reduced diameter trailing end plug shoulder, said welding apparatus comprising:

(a) a stationary housing defining a welding chamber and an access opening at one end of said chamber, said access opening being of a diameter size large enough to allow passage therethrough, and insertion to and from a welding position within said chamber, of the tube end fitted with the end plug having the enlarged diameter head portion thereon and to create an annular air gap between the larger diameter of said access opening and the smaller diameter of the tube extending therethrough;

(b) an elongated support member rotatably mounted to said housing and axially aligned with said access opening to said welding chamber, said support member having a channel defined therethrough for supplying a flow of inert cover gas;

(c) an end stop mounted to an inner end of said support member and disposed at an end of said chamber opposite from and axially aligned with said access opening thereof, said end stop for supporting the end plug on the tube end at said welding position within said chamber, said end stop having an outer portion being configured to frictionally engage the exterior of the end plug about its enlarged diameter head portion and an inner portion being configured to frictionally engage the interior of the end plug within its central passage, said inner portion of said end stop having an orifice in communication with said channel of said support member for communicating the flow of inert gas from said support member channel into the interior of the tube via the end plug central passage for purging atmospheric air from the interior of the tube out through an opposite open end thereof;

(d) a welding assembly having an electrode with a leading end;

(e) means supporting said welding assembly with said electrode leading end disposed within said welding chamber, said supporting means being mounted on said housing for movement toward and away from said chamber for moving said electrode leading end toward and away from the tube and end plug between an extended working position wherein said electrode is disposed close enough to the tube end and end plug shoulder to perform a welding operation but also interfere with movement of the enlarged diameter head portion of the end plug past said electrode leading end and a retracted non-working position wherein said electrode is withdrawn far enough away from the tube and end plug to allow axial movement of the enlarged diameter head portion of the end plug past said electrode leading end;

(f) drive means positioned adjacent said housing access opening outside said welding chamber and being operable to receive, engage and rotate the tube and thereby rotate the tube end and end plug within said welding chamber and said end stop engaged with the end plug therewith; and

(g) means for supplying a flow of inert cover gas into said chamber and about the exterior of the tube end and end plug for purging atmosphere air from said chamber out through said annular air gap in said access opening of said housing about the tube.

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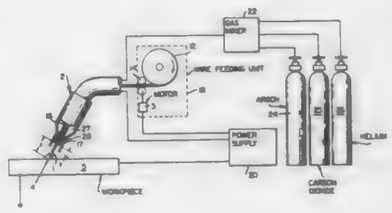
SPRAY MODE GAS METAL ARC WELDING PROCESS

Nils E. Larson, Ridgefield, Conn.; David B. Leturno, Country Club Hills, Ill., and Lawrence W. Cherne, Hubertus, Wis., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 17, 1988, Ser. No. 233,046

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—74 **8 Claims**



1. A process for spray mode gas metal arc welding with a consumable wire electrode comprising:

(a) forming an arc between said consumable wire electrode and a workpiece;

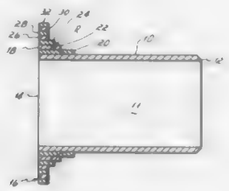
(b) maintaining a substantially constant arc voltage between said wire electrode and the workpiece;
(c) feeding the consumable wire electrode through a welding torch contact tube into said arc;
(d) transferring metal from the electrode to the workpiece; and
(e) shielding the arc with a gas mixture consisting essentially of:
(A) 3 to 8 volume percent carbon dioxide;
(B) 30 to 40 volume percent argon;
(C) balance helium.

4,857,693

METHOD OF FORMING STUB ENDS

Jerome R. Rump, Crestview Hills, Ky., assignor to Jero Incorporated, Florence, Ky.

Continuation of Ser. No. 942,930, Dec. 22, 1986, abandoned, which is a continuation of Ser. No. 709,050, Mar. 7, 1985, abandoned. This application Dec. 22, 1987, Ser. No. 136,466
Int. Cl.[4] B23K *9/04*
U.S. Cl. 219—76.12 6 Claims



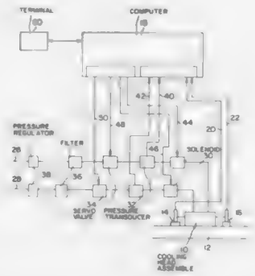
5. A method of forming a stub end including a flange at one end thereof comprising the steps of:
providing a length of pipe;
electronically coupling a capacitance between said pipe and a length of weld wire;
continuously rotating said length of pipe;
inductively charging said capacitance when the end of said length of wire is out of electrical communication with said pipe;
discharging said capacitance through said weld wire to establish an arc between said end of said length of weld wire and said pipe by bringing said end into electrical communication with said pipe whereby to deposit said weld wire end as molten weld metal onto said pipe while pinching off said end from the rest of said weld wire;
continuously feeding weld wire to said arc;
shielding said arc from surrounding air;
depositing on the outer circumference of said rotating pipe a first layer of molten weld metal by oscillating said weld wire a predetermined distance on either side of a fixed first center line thereby forming an annular layer of weld metal on said pipe having a first edge and a second edge;
shifting the said end of said weld wire away from said pipe and shifting the center line of said weld wire toward said first edge of said first layer to a fixed second center line and depositing a second layer of molten weld metal on said first layer by oscillating said weld wire a predetermined distance on either side of said second center line to form said second layer of weld metal having a first edge common with said first edge of said first layer and second edge offset toward said second center line with respect to said second edge of said first layer;
successively shifting said end of said weld wire away from said pipe and successively shifting the center line of said weld wire toward said first edges of said layers and oscillating said weld a successively decreasing distance about said shifted center lines to deposit successive layers of molten weld metal on underlying layers of weld metal, each said successive layer having a first edge common with said first edge of the underlying layer and a second edge offset toward said shifted center lines with respect to said second edge of the underlying layer, thereby depositing an amount of weld metal sufficient to permit the machining of a radius joining said flange to said pipe;
thereafter depositing successive layers of molten weld metal by successively shifting said end of said weld wire from the pipe and oscillating said weld wire a predetermined distance on either side of a fixed center line, said successive layers having a first edge common with the first edges of the underlying layers and having a second edge common with each other but offset toward the first edge with respect to the second edges of the underlying layers; and
continuing deposition of said successive layers to form said flange of predetermined outer diameter having a substantially flat forward face.

4,857,694

METHOD AND APPARATUS FOR AUTOMATIC VAPOR COOLING WHEN SHAPE MELTING A COMPONENT

Thomas E. Doyle, Louisville, and Patrick M. Ryan, Alliance, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed May 6, 1988, Ser. No. 190,791
Int. Cl.[4] B23K *9/04*
U.S. Cl. 219—76.12 8 Claims



1. An apparatus for automatically cooling a workpiece being manufactured by shape melting, comprising:
at least one spray head directed externally at the workpiece, each spray head being supplied with a coolant and a gas;
at least one housing covering at least one spray head for facilitating the removal of coolant vapor;
at least two temperature sensors for sensing the external temperature of the workpiece and establishing control signals indicative of same, one of said sensors being situated to sense the temperature or the workpiece before cooling, the other sensor being situated to sense the temperature of the workpiece after cooling;
means for aspirating coolant vapor from each housing;
means for regulating the supply of coolant and gas to each spray head responsive to the signals of said temperature sensors; and
means for translating each housing about the workpiece.

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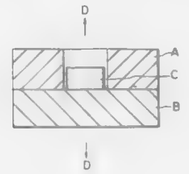
SOLDER AND SOLDERING METHOD FOR SINTERED METAL PARTS

Yukio Monden, and Akira Masabe, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 30, 1987, Ser. No. 139,633
Claims priority, application Japan, Jan. 26, 1987, 62-15458
Int. Cl.[4] B23K *1/00*
U.S. Cl. 219—85.22 18 Claims

9. A process for soldering sintered metal parts which comprises performing dewaxing at 650°–750° C. for 20–40 minutes and subsequently performing soldering at 1100°–1150° C. for

20–40 minutes with a solder for sintered metal parts which comprises by weight, 5–40% of at least one of Fe and Cr, 1–5%



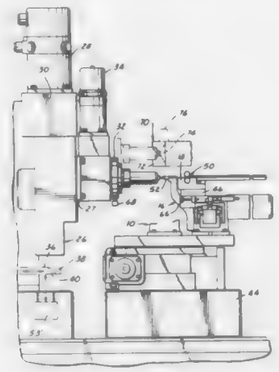
of at least one of Si and B, 20–65% Cu, 5–30% Mn, and 20% and up Ni.

4,857,696

LASER/EDM DRILLING MANUFACTURING CELL

David R. Taeusch, Ypsilanti, Mich., and Clinton J. Wohlmuth, Columbus, Ind., assignors to Raycon Textron Inc., Ann Arbor, Mich.

Continuation of Ser. No. 60,826, Jun. 12, 1987, abandoned. This application Apr. 22, 1988, Ser. No. 185,128
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.7 10 Claims



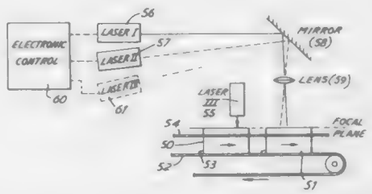
1. In a dual drilling process for forming a finished precision hole through a part having a wall with an inside surface defining an internal cavity, the improvement comprising:
high speed laser drilling the wall by focusing a beam of laser energy on an imperforate segment of the wall to form an undersized hole of irregular form through the wall from the exterior thereof to the internal cavity while maintaining the internal cavity under ambient pressure conditions;
shielding the surface of the internal cavity to prevent erosion thereof during the laser drilling step;
removing the shielding and sequentially aligning an electrode with respect to the undersized hole and applying current between the electrode and the wall of the undersized hole to spark erode a predetermined thickness of the wall at the previously laser formed undersized hole to shape the irregularly formed undersized hole as a right cylindrical passage from the interior surface to the exterior surface of the wall.

4,857,697

CONTINUOUS SEAM WELDING APPARATUS AND METHODS

Martin J. Melville, Sparsholt, England, assignor to Metal Box Public Limited Company, Reading, United Kingdom

Filed Jan. 15, 1988, Ser. No. 144,267
Claims priority, application United Kingdom, Jan. 21, 1987, 8715546
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.63 26 Claims



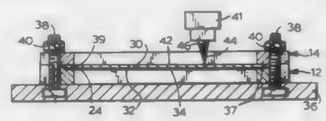
1. A method of producing a continuous seam weld between two mating surfaces during the passage of the surfaces relative to an energy source in a single pass, the method comprising the steps of
supplying a bolus of energy from said energy source at alternate spaced locations along the line of the mating surfaces to effect local melting of the mating surfaces to form melt pools,
allowing the bolus of energy to dissipate initially by way of an enlargement in the size of the melt pool and subsequently by cooling to a level at which the pool solidifies,
supplying the bolus of energy from said energy source at intervening spaced locations along the line of the mating surfaces to effect local melting of the mating surfaces, and
allowing the bolus of energy to dissipate initially by way of an increase in the size of the melt pool and subsequently by cooling, the spacing between the alternate and intervening locations and the power of the bolus of energy being of such magnitude that each pool produced at each intervening location increases in size sufficiently to overlap of said solidified pool at a said alternate location.

4,857,698

LASER PERFORATING PROCESS AND ARTICLE PRODUCED THEREIN

Kenneth R. Perun, Los Angeles, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif. and Lumonics, Limited, Rugby, England

Continuation of Ser. No. 66,488, Aug. 26, 1988, abandoned. This application Mar. 22, 1988, Ser. No. 171,800
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.71 18 Claims



1. A process for perforating a metal sheet with holes of substantially uniform size and shape, which comprises:
placing a suitable transparent backing tape in adhesive contact with one surface of a metal sheet,
impinging a laser beam generated by a pulsed Nd:YAG laser on the opposite surface of said sheet,
controlling the laser beam to penetrate the metal sheet and form a plurality of small holes therein but without penetrating through the tape, and

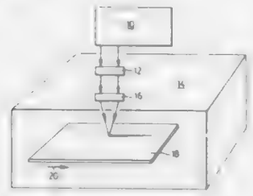
removing said tape from said metal sheet.

4,857,699

MEANS OF ENHANCING LASER PROCESSING EFFICIENCY OF METALS

Walter W. Duley, P.O. Box 453, King City, Ontario, Canada (LOG 1KO), and Grant Kinsman, York University, 4700 Keele Street, Downsview, Ontario, Canada (M3J 1P3)

Filed Jan. 30, 1987, Ser. No. 8,656
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.85 **27 Claims**



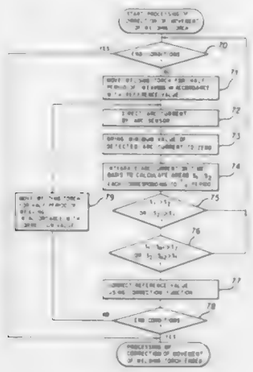
1. A method of preparing the surface of a material for subsequent processing by radiation of a first laser of a first wavelength by directing radiation of a second laser of a second wavelength, different from said first wavelength, to impinge upon said surface and decrease the reflectivity thereof to radiation of said first laser, said second wavelength being shorter than said first wavelength, and said second laser producing pulses of radiation.

4,857,700

CONTROL APPARATUS FOR AUTOMATIC ARC WELDING MACHINE

Kenichi Toyoda; Tohru Mizuno; Nobutoshi Torii; Yuichi Kanda, all of Tokyo, and Shigehiro Morikawa, Atsugi, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP87/00854, § 371 Date Aug. 9, 1988, § 102(e) Date Aug. 9, 1988, PCT Pub. No. WO88/04971, PCT Pub. Date Jul. 14, 1988
PCT Filed Nov. 5, 1987, Ser. No. 243,564
Claims priority, application Japan, Dec. 27, 1986, 61-309258
Int. Cl.[4] B23K *9/12*
U.S. Cl. 219—124.34 **6 Claims**



1. A control apparatus for an automatic arc welding machine for automatically performing arc welding by weaving a welding torch along a weld line, using an arc sensor to detect an arc current caused by the weaving, and compensating movement of said welding torch, said control apparatus comprising:

an area calculating means for detecting the arc current at every half period of the welding, and integrating the arc current on a time basis to calculate two areas each corresponding to a ½ period;

first area comparing discriminating means for comparing the two areas calculated by said area calculated means and for discriminating between a first area and a second area;

a second area comparing discriminating means for calculating a first correction area by subtracting a predetermined area from the first area discriminated by said first area comparing discrimination means, the predetermined area corresponding to a predetermined time period at an end portion of the first area, and for comparing the first correction with the second area discriminated by said first area comparing discriminating means; and

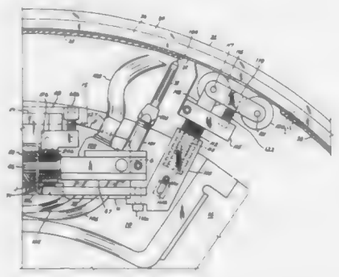
movement compensating means for correcting a reference value by using a correction function to compensate for the movement of said welding torch when the first correction area is larger than the second area.

4,857,701

INTERNAL WELDING HEAD ASSEMBLY

Clyde M. Slavens, Houston, Tex., assignor to CRC-Evans Pipeline International, Inc., Houston, Tex.

Filed May 14, 1984, Ser. No. 610,317
The portion of the term of this patent subsequent to Apr. 15, 2004, has been disclaimed.
Int. Cl.[4] B23K *9/00, 9/12*
U.S. Cl. 219—125.12 **16 Claims**



1. Internal welding head apparatus, comprising a pivotal welding head support, means spring biasing said support in one pivotal direction about a pivot, fluid cylinder means for moving said support in the other pivotal direction about said pivot, means adjustably limiting said pivotal movement of said support in at least one direction of pivotal movement thereof about said pivot, said support carrying a pivot block through which a pivot shaft rotatably extends, a welding torch mounted on said pivot shaft to be rotatable therewith, a yoke fixed at its base to said pivot shaft and having a pair of yoke arms extending outwardly therefrom, a rotatable eccentric disposed between said yoke arms whereby when said eccentric is rotated said yoke is oscillated dependent on the eccentricity of said eccentric whereby said welding torch is oscillated when said eccentric is rotated to spread a weld bead formed by said torch transversely of a weld path.

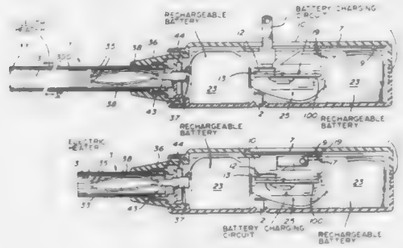
11. Internal welding head apparatus for welding an internal weld bead between the ends of two pipes disposed end to end, comprising a support plate adapted for attachment to a support for carrying the apparatus around the interior of a pipe, a second support pivotally connected parallel to said support plate, a support block supported by said second support and having a rotative shaft supported therethrough, welding torch means pivotally connected to one end of said rotative shaft for movement in a plane through said rotatable shaft, means for oscillating said rotative shaft in rotative motion about its axis whereby said welding torch means is oscillated therewith, means for pivotally moving said second support to move said welding torch toward and away from a welding path around the ends of said pipes.

4,857,702

BATTERY POWERED ELECTRICAL CURLING IRON WITH DETACHABLE WAND AND SELF-CONTAINED BATTERY CHARGER

Michael Cafaro, Montreal, Canada, assignor to Giovanni Management Canada Ltd., Montreal, Canada

Filed Dec. 1, 1987, Ser. No. 127,064
Int. Cl.[4] H05B *3/00*; A45D *1/04, 2/36*; H01C *7/00*
U.S. Cl. 219—225 **4 Claims**



1. A battery powered electrical curling/brush iron, comprising:

A. a wand comprising a first hollow longitudinally extending cylindrical member, and including:

i. an electrically insulatingly covered heating element extending into said cylindrical member and having a pair of input terminals at one end of said cylindrical member;

B. a handle comprising a second hollow longitudinally extending housing member, and including:

i. a space within said housing receiving a rechargeable battery for providing electrical power;

ii. a pair of output terminals at one end of said second housing member;

iii. an opening through a surface of said second housing member;

iv. a plug means disposed in said housing in registry with said opening and movably mounted in said housing to occupy a first, retracted position in said housing and a second, extended, position projecting through said opening;

v. a cover member slidably mounted over said opening to occupy one of three predetermined positions:

a. a first position of said cover member wherein said cover member completely covers said opening;

b. a second position of said cover member wherein said cover member partially covers said opening; and

c. a third position of said cover member wherein said opening is substantially completely uncovered by said cover member;

said plug means being in said retracted position thereof in said first and second positions of said cover member, and said plug means being movable to said extended position and extending through said opening in said third position of said cover member;

said plug means having a first tine and a second time and being insertable directly into an A.C. household source of power;

d. said sliding cover including a protrusion extending downwardly at one end thereof;

vi. a fixed contact member mounted in said housing;

vii. a movable contact member mounted in alignment with said fixed contact member;

said protrusion moving said movable contact member to abut said fixed contact member in response to movement of said cover member to said second position thereof;

said fixed contact member and said movable contact member being disconnected from each other in the other positions of said cover member;

viii. a circuit arrangement in said housing, comprising:

a. a rectifier bridge comprising:

1. a first diode having an anode and a cathode;

2. a second diode having an anode and a cathode;

3. a third diode having an anode and a cathode;

4. a fourth diode having an anode and a cathode;

5. said cathode of said first diode being connected to said anode of said second diode at a first junction;

6. said cathode of said second diode being connected to said cathode of said third diode at a second junction;

7. said anode of said third diode being connected to said cathode of said fourth diode at a third junction;

8. said anode of said fourth diode being connected to said anode of said first diode at a fourth junction;

9. said first junction being connected to a first power terminal in said housing;

10. said third junction being connected to a second power terminal in said housing through a parallel resistor capacitor combination;

11. first means on said plug means electrically connecting said first tine of said plug means to said first power terminal when said plug is moved to said extended position;

12. second means on said plug means electrically connecting said second tine of said plug means to said second power terminal when said plug is moved to said extended position;

whereby, when said plug means is in said extended position and is inserted into an A.C. household source of power, said A.C. household source of power is connected across said first and third junctions of said rectifier bridge;

13. said fourth junction being connected to ground;

14 said second junction being connected to the positive terminal of said rechargeable battery, the negative terminal of said rechargeable battery being connected to ground;

b. a fifth diode having an anode and a cathode, the anode of the fifth diode being connected to said second junction, the cathode of said fifth diode being connected to a fifth junction;

c. a sixth diode having an anode and a cathode, the anode of said sixth diode being connected to said third junction, the cathode of said sixth diode being connected to said fifth junction;

d. an LED diode having an anode and a cathode, the anode of the LED diode being connected to said fifth junction, the cathode of said LED diode being connected to ground;

e. said heating element having one end connected to one of said input terminals and the other end connected to the other one of said pair of input terminals;

f. said pair of input terminals being connected to respective ones of said pair of output terminals;

g. one of said pair of output terminals being connected to ground;

h. the other one of said pair of output terminals being connected to said movable contact member;

i. said fixed contact member being connected to said second junction;

C. said one end of said first cylindrical member being removably connected to said one end of said second cylindrical housing member such that, when said first cylindrical member is connected to said second cylindrical housing member, said pair of input terminals are in contact with said pair of output terminals;

whereby, when said cover member is in said second position, said rechargeable battery is connected to said heating

element whereby to provide power to heat said heating element; and

when said cover member is in said third position and said plug means is extended outwardly through said opening for insertion into an A.C. household source of power, A.C. power is applied to said battery through said circuit means to recharge said rechargeable battery.

4,857,703

STEAM GENERATOR

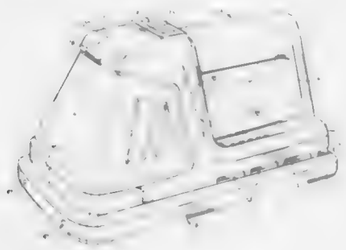
Peter R. Wilkins, Blackwell, England, assignor to Black & Decker Inc., Newark, Del.

Filed Nov. 19, 1987, Ser. No. 123,081

Claims priority, application United Kingdom, Nov. 20, 1986, [illegible]

Int. Cl.[4] F22B *1/28*

U.S. Cl. 219—271 29 Claims



1. A steam generator comprising:

a heat conducting member having an inlet for receiving water to be vaporized and first and second groups of spaced steam exits;

electrical heating means for heating said electrical member; and

passage means formed in said heat conducting member for interconnecting said inlet and said first and second groups of steam exits, said passage means including

a water chamber, said inlet opening into said water chamber,

a first pair of elongated passages each having one end opening into said water chamber and extending outwardly away from said water chamber,

a second pair of elongated passages each having one end in fluid communication with said first pair of elongated passages, said second pair of elongated passages extending to one of said first and second groups of steam exits, the other ends of said second pair of elongated passages being joined together, and

additional passages also having one end in fluid communication with said first pair of elongated passages and extending to said second group of spaced steam exits.

4,857,704

APPARATUS FOR THERMAL TREATMENTS OF THIN PARTS SUCH AS SILICON WAFERS

Marcel A. J. Jannot, Sarcelles, and Jean-Pierre Patureau, Marly le Roi, both of France, assignors to Bertin & Cie, Cedex, France

PCT No. PCT/FR87/00043, § 371 Date Dec. 14, 1987, § 102(e) Date Dec. 14, 1987, PCT Pub. No. WO87/05054, PCT Pub. Date Aug. 27, 1987

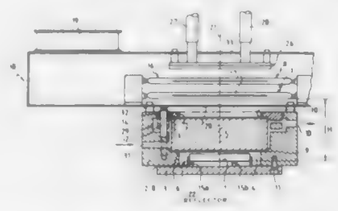
PCT Filed Feb. 18, 1987, Ser. No. 123,858

Claims priority, application France, Feb. 19, 1986, 86 02239

Int. Cl.[4] H05B *3/62*

U.S. Cl. 219—354 19 Claims

2. Apparatus for the thermal treatment of at least one thin part (1), comprising a thermal light source (16, 16*a*) including linear lamps (17) of very high unitary power, and a housing (2) containing said at least one part (1) to be treated and whose geometric axis of symmetry (21) coincides with an optical axis of symmetry (21) of said thermal light source, which apparatus is characterized in that it includes inside the housing (2), which has a circular symmetry, a chamber (4) making it possible to create, about said at least one part to be treated (1), particular heat treatment conditions, which treatment chamber has its geometrical axis of symmetry coinciding with said optical axis of symmetry and comprises means (9, 10) ensuring sealing with respect to the housing (2) which contains it, and in that in the treatment chamber is disposed a compensation means for thermal losses of said at least one part to be treated (1) through the faces and small side wall and end or radial losses of said at least one part thus making it possible to maintain substantially uniform temperature of said at least one part further characterized in that the compensating means for thermal losses through the peripheral surface of the at least one part to be treated is formed by an annular reflector (22, 22*a*) placed in said chamber surrounding said at least one part (1), said annular reflector having an internal diameter and height chosen so that there is no partial occultation of the source (16, 16*a*) whatever the surface element of said at least one part to be treated (1).



4,857,705

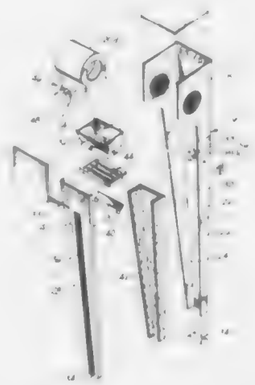
WALL MOUNTED ELECTRIC AIR HEATING DEVICE FOR DRYING OR WARMING A PERSON

Gene Blevins, Bremerton, Wash., assignor to Galaxy Machine, Inc., Redmond, Wash.

Filed Sep. 16, 1987, Ser. No. 97,794

Int. Cl.[4] H05B *1/02;* F26B *19/00;* F24H *3/04*

U.S. Cl. 219—370 4 Claims



1 A device mounted to a wall surface for drying a standing person, comprising:

a housing having an elongated vertical vent portion and a blower portion connected to and positioned immediately above said vent portion, said both portions being at least partially defined by a single rearward wall and a pair of laterally converging side walls, said rearward and said side walls all being flat and extending continuously from the top of said blower portion to the bottom of said vent portion, said rearward wall being adapted to be mounted to a wall surface and defining the backs of said both portions and having lateral side edges which continuously converge symmetrically with respect to each other, said side walls projecting forwardly of said rearward wall with the lateral edges of said rearward wall defining the angle of convergence of said side walls, and with said vent portion being further defined by a forward side wall that extends from immediately below said blower portion to the bottom of said vent portion, said forward side wall in cooperation with said rearward wall and said lateral side walls defining a downwardly converging airflow conduit having a closed bottom and a rectangular cross-section which decreases continuously along the downward length of said vent portion, and a narrow elongated rectangular vent positioned in and through said forward side wall and extending substantially the length thereof;

an electric motor driven blower received in said blower portion and operable to generate a downwardly directed airflow into said vent portion, said lateral side walls each having an air inlet vent positioned adjacent said blower;

a port member positioned inside said housing substantially at the interface of said blower and vent portions, said member supporting said blower and having an upwardly directed opening in airflow communication with said blower for receiving said downwardly directed airflow, said port member further having a downwardly directed opening communicating in the upper end of said vent portion conduit for directing said airflow into said conduit; and

an electric heating element, positioned immediately below the downwardly directed opening of said port member, and operable to heat said airflow.

4,857,706

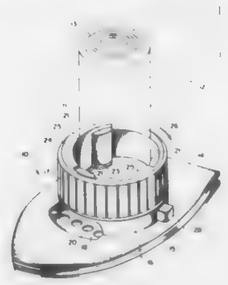
IRONING ACCESSORY

Paul J. Diamond, 25617 Cielo Ct., Valencia, Calif. 91355

Filed Feb. 29, 1988, Ser. No. 162,209

Int. Cl.[4] D06F *75/38;* F24H *3/02;* H05B *1/00*

U.S. Cl. 219—373 4 Claims



1. In an ironing accessory for use in combination with a hot air discharge nozzle of a standard hand-held hair blow dryer, the combination which comprises:

an elongated base having a top surface and a bottom surface;

an ironing plate secured to said base bottom surface in fixed spaced-apart relationship to define a spatial cavity therebetween for exhaust of hot hair from a nozzle about a periphery of said base and plate;

a circular collar carried on said base top surface resiliently supporting gripper means on its inner surface for radial movement of said gripper means into and out of engagement with said nozzle;

means rotatably carried on said collar for moving said gripper means in said radial movement;

release means operably disposed on said collar for releasing said gripper means from engagement with said nozzle;

said gripper means includes a plurality of fingers disposed with said collar and mounted thereon by a resilient cantilevered arm;

said rotatable means includes a retaining ring having cam means disposed immediately behind each of said gripper fingers so as to advance said gripper fingers against said nozzle in response to rotation of said retaining ring;

ratchet mechanism cooperatively disposed between said collar and said retaining ring to ensure movement of said retaining ring in a direction to close said gripper fingers about said nozzle; and

a spring biased release means carried on said base for disconnecting said ratchet mechanism to permit disengagement of said gripper means with said nozzle.

4,857,707

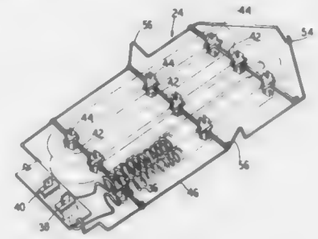
FLEXIBLE FRAME HEATER ELEMENT FOR DRYER

Larry N. Dull, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 11, 1988, Ser. No. 180,100

Int. Cl.[4] H05B *3/64*

U.S. Cl. 219—375 8 Claims



1. A heater element for a dryer comprising:

a flexible electrical heating means;

a plurality of rigid wire form lateral frame elements;

a plurality of support members securing said heating means to said lateral frame elements;

at least one flexible wire form frame element longitudinally interconnecting said lateral frame elements at the lateral ends of said lateral frame elements and forming a perimeter of said heater element;

said flexible frame element being sufficiently rigid so as to normally prevent flexure of said frame element, but being sufficiently flexible so as to permit flexure of said frame element upon application of a predetermined manual force.

4,857,708

TOWELETTE HEATING DEVICE

Robert A. DeMars, 7932 Maestro, Canoga Park, Calif. 91304

Filed May 2, 1988, Ser. No. 188,711

Int. Cl.[4] H05B *3/36*

U.S. Cl. 219—385 12 Claims

9. A towelette heating device comprising:

(a) top, bottom and sides walls forming a housing;

(b) a compartment within said housing and cover means on said top of said housing to permit access to said compartment, said cover means hingedly attached at one end to said housing, with said housing provided with a depression at the opposite end thereof to permit access to lift said cover;

(c) a downwardly depending tab at said one end to prevent the cover from opening beyond 90°;

(d) a rubber heating pad cooperatively retained within said compartment, said pad comprising wires embedded in a silicone rubber matrix;
(e) heat-insulative means for supporting at least one towelette immediately above said heating element, said means comprising a fiber glass mesh screen;



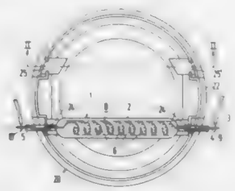
(f) means for substantially uniformly directing heat from said heating pad onto said at least one towelette, said means comprising a metal plate cooperatively retained in said compartment between said heating element and said support means; and
(g) circuit means adapted to supply power to said heating pad and to be connected to a power source.

4,857,709

ELECTRIC COOKING UNIT HAVING AN ELECTRIC LAMP WITH A HELICAL FILAMENT CONTACT WITH THE LAMP VESSEL WALL

Edsard J. P. Janssen, and Victor R. Noteiteirs, both of Turnhout, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 15, 1988, Ser. No. 181,880
Claims priority, application Netherlands, Apr. 15, 1987, 8700836
Int. Cl.[4] H05B *3/74*
U.S. Cl. 219—464 10 Claims



1. An electric cooking apparatus, comprising:
an electric infrared lamp, said lamp comprising
a tubular glass lamp envelope having a pair of ends, a pinch seal at each end sealing said envelope in a gas-tight manner, said lamp envelope comprising glass having an SiO_2 content of at least 95% by weight and having an inner surface having a circular cross section,
a helically coiled filament disposed within said lamp envelope, said filament having an outer diameter chosen such that said filament contacts said inner surface of said lamp envelope along a helical path defined by said filament for supporting said filament within said lamp envelope, said filament comprising tungsten wire having a predetermined diameter and being free of any heat insulative coating, the length of said filament and the diameter of said filament wire being chosen such that said filament has a temperature during lamp operation of between approximately 1200 degrees Celsius and 1500 degrees Celsius, and
a pair of current-supply conductors each connected to said filament, passing through a respective pinch seal and extending away from said lamp envelope; and
a housing in which said lamp is disposed, said housing comprising a base, and a wall portion having a pair of apertures shaped and positioned for receiving a respective pinch seal of said lamp envelope for supporting said lamp envelope in said housing.

4,857,710

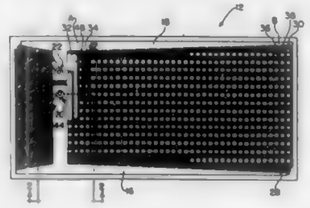
Patent Not Issued For This Number

4,857,711

POSITIVE TEMPERATURE COEFFICIENT HEATER

Leslie M. Watts, Elmhurst, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 16, 1988, Ser. No. 233,271
Int. Cl.[4] H05B *1/00*
U.S. Cl. 219—548 10 Claims



1. A heating device comprising:
a planer electrically insulative substrate;
an electrical buss system on one surface of said substrate, including a pair of buss bars and two electrode patterns having a plurality of spaced apart parallel interdigitated electrodes, adjacent electrodes of said plurality of interdigitated electrodes connect to different ones of said pair of buss bars, each buss bar extending from one of a pair of terminal connection points along generally opposite portions of a peripheral edge of said substrate;
an electrically resistive layer of material having a positive temperature coefficient, and resistive layer deposited over said electrical buss system in a plurality of parallel spaced apart stripes orientated perpendicular to said interdigitated electrodes defining a plurality of heater areas between adjacent electrodes;
a first adhesive layer deposited over said electrically resistive layer including the spaces between said spaced apart stripes, whereby said adhesive layer contacts and adheres to said substrate in areas of said substrate between said heater areas;
an electrically insulative barrier layer on said adhesive layer;
a second adhesive layer on said electrically insulative barrier layer; and
means providing for achieving a predetermined power density at any location along each of said buss bars from said respective terminal connection point to a free end of each buss bar substantially equal to an average power of all of said heater areas.

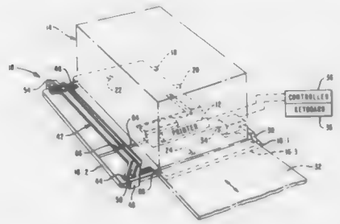
4,857,712

SLIP TABLE WITH INTEGRATED SLIP GUIDE

George Heys, Jr., Cambridge, and David M. J. Allgeier, Cumberland, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 18, 1988, Ser. No. 273,293
Int. Cl.[4] G06C *29/00*
U.S. Cl. 235—58 P 12 Claims

1. An assembly for use in positioning a document relative to a print station, comprising:
a generally planar table having positioning means to enable said assembly to be positioned in operative relationship with said print station when said assembly is used in conjunction with said print station; and
a guide member which is adjustably fixed on said planar table;
said planar table having a first side portion having a fixed guide thereon, a second side portion to receive said guide member, and a third side portion positioned between said first and second side portions to function as at least a document entry side of said assembly;
said second side portion having a first plurality of parallel grooves therein and a second plurality of parallel grooves therein, with said second plurality of grooves being



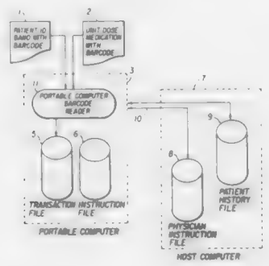
spaced from and parallel to said first plurality of grooves; and
said guide member having securing means coacting with said first and second pluralities of grooves for adjustably securing said guide member to said second portion to enable said fixed guide and said guide member to guide a document positioned therebetween to said print station.

4,857,713

HOSPITAL ERROR AVOIDANCE SYSTEM

Jack D. Brown, Rte. 1, Box 193, Fall Branch, Tenn. 37656

Filed Feb. 14, 1986, Ser. No. 829,199
Int. Cl.[4] G06F *15/42;* G06K *5/00*
U.S. Cl. 235—375 1 Claim



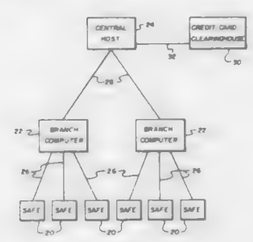
1. A hospital error limiting system employing bar codes for identifying patients, medications, goods, services and procedures comprising:
host computer means for maintaining a patient history file, which indicates when particular medications, goods, services or procedures were delivered to a particular patient in the past, and a physician instruction file, which indicate what particular medications, goods, services or procedures are to be given to a particular patient at a particular time interval.
communication link means to link said host computer means to a portable computer means for transferring said patient history file and said physician instruction file between said host computer means and said portable computer means.
wherein said portable computer means comprises a portable memory means for storing said patient history file and said physician instruction file,
portable bar code reading means for identifying a patient by reading a bar code provided to said patient, and for identifying medications, good, services or procedures proposed to be delivered to said patient, by reading a bar code provided on said medications, goods, services or procedures,
portable processing means for processing the bar codes read by said portable bar code reading means so as to determine if said identified medications, goods, services or procedures are permitted to be delivered to said identified patient, according to said patient history file and said physician instruction file in said portable memory means, and for updating said patient history file in said portable memory means if said identified medications, goods, services or procedures are permitted to be delivered to said identified patient,
wherein said determination requires that said identified medications, goods, services or procedures are related to said identified patient in said physician instruction file in the portable memory means and that said identified medications, goods, services or procedures would be delivered to said identified patient at an appropriate time according to when identified medications, goods, services or procedures were lasts delivered to the identified patient in the past as indicated in the patient history file in the portable memory means and according to the time interval in said physician instruction file in said portable memory means to grant permission to deliver said identified medications, goods, services or procedures, and portable display means for indicating the determination of said portable processing means,
Wherein said patient history file in said host computer means is updated periodically by transferring said updated patient history file in said portable computer means to said host computer means via said communication link means.

4,857,714

CREDIT CARD STORAGE SYSTEM

Steven L. Sunyich, 402 E. Springhill Cir., North Salt Lake, Utah 84054

Filed Mar. 18, 1988, Ser. No. 170,310
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—382 20 Claims



1. A credit card operable storage system, comprising:
a secure container for storage of items;
a door associated with said container;
a locking mechanism associated with said door to selectively actuate between a locked position to lock said door in a closed position and an unlocked position to allow said door to open;
a card reader associated with said container;
a user input means for receiving use information from a user associated with said container;
a processor communicatively linked to said locking mechanism, said card reader, and said user input means, said processor being programmed to receive card information from said card reader, to receive user input from said user input means, to open said locking mechanism based on appropriate card information and user input, to develop use information, and to relay said use information to a billing development means; and
a billing development means communicatively linked to said

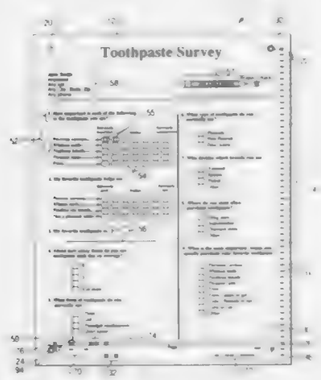
processor for receiving use information from said processor and for developing billing information.

4,857,715

OVERPRINT REGISTRATION SYSTEM FOR PRINTING A CUSTOMIZED SURVEY FORM AND SCANNABLE FORM THEREFOR

Vernon F. Koch, Prior Lake; John G. Fahnlander, Shakopee, and Lester A. Wanninger, Edina, all of Minn., assignors to National Computer Systems, Inc., Minneapolis, Minn.

Filed Apr. 1, 1988, Ser. No. 176,610
Int. Cl.[4] B06K *7/10*
U.S. Cl. 235—456 **6 Claims**



1. A scanner system for creating a survey form to be printed on a scannable form having a preprinted timing track and a plurality of preprinted quality assurance marks in specified relation thereto, said survey form having at least one stimulus and a corresponding response area, said scanner system comprising:

means for printing a plurality of overprint registration marks and said stimulus and its response area on a scannable form;

means for entering data specifying the degree to which the overprint registration marks are out of registration with said preprinted quality assurance marks;

data processing means for maintaining and adjusting data representing the location on said scannable form of said overprint registration marks and for formatting, maintaining and adjusting data representing the location of said stimulus and its response area relative to said overprint registration marks; and

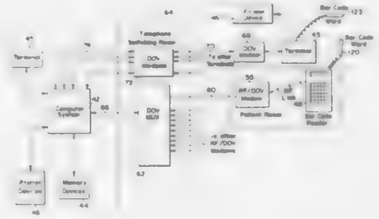
means for entering data specifying said stimulus item and its response area.

4,857,716

PATIENT IDENTIFICATION AND VERIFICATION SYSTEM AND METHOD

Peter P. Gombrich; Ronald E. Zook, both of Boulder, Colo., and Max S. Hendrickson, Forest Lake, Minn., assignors to CliniCom Incorporated, Boulder, Colo.

Continuation of Ser. No. 862,278, May 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 757,277, Jul. 19, 1985, abandoned. This application Jun. 8, 1988, Ser. No. 205,527
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—462 **4 Claims**



1. A patient identification and verification system comprising:

(a) programmed system computer means for processing and storing patient data;

(b) input means operatively interconnected to the programmed system computer means for input of data to the programmed system computer means;

(c) output means operatively interconnected to the programmed system computer means for output of data from the programmed system computer means;

(d) first bar code identifier means adapted for attachment to a patient for identification of the patient, the bar code identifier means including a patient unique code;

(e) a plurality of second bar code identifier means for identifying patient care related items, such as medication, etc.;

(f) the input means and output means including:

(i) microprocessor controlled portable handheld patient terminal means having bar code reader means for scanning the first bar code identifier means to identify the patient and for scanning the second bar code identifier means for relating various items to a specific patient, the portable handheld patient terminal means further including keyboard means for data entry and display means for display of information, the portable handheld patient terminal means including electromagnetic wave transceiver means including means for transmission of patient and item data as an electromagnetic wave which is representative of the first and second bar code identifier means scanned by the bar code reader means and including means for receipt of data as an electromagnetic wave;

(ii) microprocessor controlled base station means including electromagnetic wave transceiver means for receipt of and transmission of the patient and item data as an electromagnetic wave to the electromagnetic wave transceiver means of the portable handheld patient terminal means, the base station means being interconnected to the programmed system computer means at least in part by electrical lines for receipt and transmission of the patient and item data on the electrical lines to the programmed system computer means, the base station means includes a programmable unique identifier, the base station means including means for only allowing communication with a portable handheld patent terminal means having a corresponding program identifier, the patient system including means for programming the portable handheld patient terminal means with the corresponding identifier; and

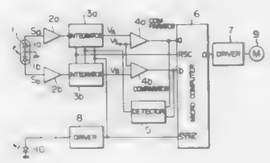
(iii) the programmed system computer means including program means for verifying the patient and item data properly correspond and transmitting an alarm signal if improper correspondence noted.

4,857,717

AUTOMATIC FOCUSING DEVICE USING A LIGHT SENSOR OF CENTER-SPLIT TYPE

Yasuaki Chino, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 14, 1987, Ser. No. 108,432
Claims priority, application Japan, Oct. 14, 1986, 61-242094
Int. Cl.[4] G02B *7/04;* **G03B** *3/10*
U.S. Cl. 250—201 **4 Claims**





1. An automatic focusing device comprising:

light sensing means including first and second light-receiving elements for receiving light from an object to be focussed and producing outputs, respectively, representing intensity of lights received by said first and second light-receiving element;

integrating means including first and second integration circuits connected to said first and second light-receiving elements, respectively, each of said first and second integration circuits being selectively operated in one of a proportional integration mode for integrating a predetermined value at a rate proportional to the output of the associated light-receiving element and a constant rate integration mode for integrating at a predetermined constant rate;

comparing means including first and second comparators connected to said first and second integration circuits, respectively, each of said first and second comparators comparing and integration output of the associated integration circuit with a predetermined reference value and generating an output signal when the integration output of said associated integration circuit reaches the predetermined reference value; and

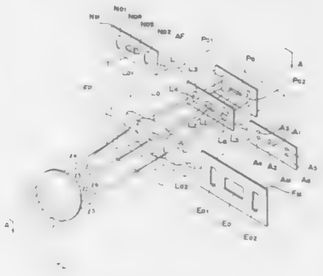
control means including mode control means for controlling the operating mode of said integrating circuit so that each of said first and second integrating circuits initially operate in the proportional integration mode and, upon generation of a first output signal of one of said first and second comparators, said mode control means causes the one of the first and second integration circuits associated with the other of said first and second comparators to operate in the constant rate integration mode, and determining means for determining a focusing signal based on a time interval between a first time point when the first output signal of said one of said first and second comparators is generated and a second time point when a second output signal is generated by said other of said first and second comparators.

4,857,718

FOCUS DETECTING DEVICE

Toshihiko Karasaki, and Kazumi Sugitani, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 12, 1988, Ser. No. 193,816
Claims priority, application Japan, May 15, 1987, 62-119362; May 21, 1987, 62-126825
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **17 Claims**



1. A focus detecting device, comprising:

an objective lens for forming an image of an object;

a plurality of focus detecting blocks each of which includes;

a condenser lens located nearby a predetermined focal plane of the objective lens; a pair of image re-forming lenses, located behind the condenser lens, for re-forming a pair of secondary images of the image formed by the objective lens; a mask plate, located nearby the pair of image re-forming lenses, having a pair of aperture openings through which a light bundle forming the secondary images passes; a light receiving means for receiving the pair of the secondary images formed by the pair of image re-forming lenses to produce a light intensity distribution signal representing the light intensity distribution of the secondary images; and a light interrupting means, located between the condenser lens and the light receiving means, for prohibiting the harmful light from being incident on the light receiving means; and

a focus condition calculating means for calculating a focus condition of the objective lens in accordance with the light intensity distribution signals produced by the plurality of focus detecting blocks.

4,857,719

FLAT TYPE OPTICAL HEAD FOR FOCUSING A LIGHT BEAM ONTO AN OPTICAL MEMORY

Hideo Ando, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

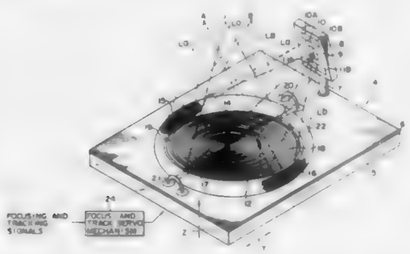
Filed Mar. 9, 1988, Ser. No. 165,937
Claims priority, application Japan, Mar. 10, 1987, 62-54641
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **16 Claims**

1. An optical apparatus for focusing a light beam onto an optical memory comprising:

means for generating a light beam;

reflecting means for reflecting the light beam incident

thereon and converging the light beam toward the optical memory; and



detecting means for detecting the light beam which is incident on the optical memory and is reflected therefrom and for generating an electrical signal.

4,857,720

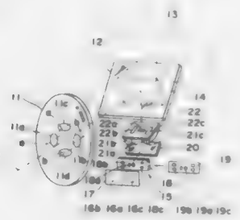
FOCUS DETECTING SYSTEM USING MULTIPLE PORTIONS OF THE IMAGE TO BE FOCUSSED

Toshihiko Karasaki, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 65,904, Jun. 24, 1987, abandoned. This application Dec. 27, 1988, Ser. No. 289,513

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—201 **3 Claims**



1. A focus detecting system comprising:

a first light receiving means, including a first pair of photoelectric arrays, for receiving light passed through a pair of first portions defined in an exit pupil of a photo-taking lens, said first pair of photoelectric arrays corresponding to an axial focus detecting area extended in a first direction on a photo-taking field;

a second light receiving means, including at least a second pair of photoelectric arrays, for receiving light passed through a pair of second portions defined in an exit pupil of the photo-taking lens, said second pair of photo-electric arrays corresponding to an off-axis focus detecting extended in a second direction on a photo-taking field, and said second direction being perpendicular to an imaginary line connecting the optical axis of the photo-taking lens with the off-axis focus detecting area and not being parallel to said first direction; and

means for calculating the focusing condition of the photo-taking lens on the basis of a plurality of outputs of the first and second light receiving means.

4,857,721

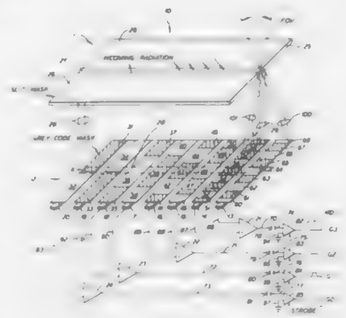
OPTICAL DIRECTION SENSOR HAVING GRAY CODE MASK SPACED FROM A PLURALITY OF INTERDIGITATED DETECTORS

David S. Dunavan, Norwalk; Rene Abreu, New Fairfield; Stephen Messelt, Roxbury, and Edward Siebert, New Fairfield, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 28, 1988, Ser. No. 174,059

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—203 R **13 Claims**



1. A direction of arrival sensor having particular utility for detecting and determining the angle of incoming radiation comprising:

a slit mask having at least one narrow transparent slit;

a plurality of detector elements spaced from said slit mask and being responsive to incoming radiation passing through said transparent slit; said plurality of detector elements forming pairs of first and second detector combinations;

differential means, coupled to each of said pairs of said first and second detector combinations, for providing an output signal indicative of the difference between the two input signals from said first and second detector combinations; and

means, responsive to said differential means, for providing a digital signal indicative of the angle of incidence of the incoming radiation.

4,857,722

APPARATUS FOR STABILIZING THE AMPLIFICATION DEGREE OF PHOTOMULTIPLIERS

Yoshihiko Kumazawa, and Tsunekazu Matsuyama, both of Kyoto, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

PCT No. PCT/JP86/00440, § 371 Date Dec. 28, 1987, § 102(e) Date Dec. 28, 1987, PCT Pub. No. WO88/01751, PCT Pub. Date Mar. 10, 1988

PCT Filed Aug. 28, 1986, Ser. No. 165,194

Int. Cl.[4] G01T *1/20;* **H01J** *40/14*

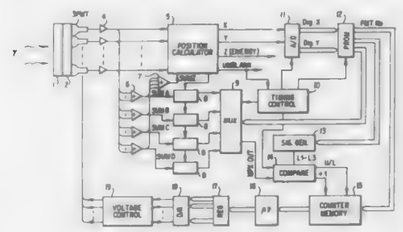
U.S. Cl. 250—207 **6 Claims**

1. An apparatus for stabilizing the amplification degrees of photomultipliers in a detector for detecting the position of a radioactive ray, said detector comprising a scintillator, a plurality of photomultipliers arranged behind said scintillator and exposed to light caused by a scintillation occuring in said scintillator, and a position calculation circuit adapted to calculate the position of said scintillation on the basis of outputs taken from said photomultipliers and develop position signals, characterized in that said apparatus comprises:

means for summing up signals relating to said outputs taken from said photomultipliers, said photomultipliers being classified into a plurality of groups and arranged such that photomultipliers falling under the same group are not disposed adjacently to each other, said signals relating to said outputs being summed up for each of said groups so as to be formed into a sum signal for each group;

means responsive to said position signals for determining a specific photomultiplier disposed closest to a position in which a scintillation occurs;

pulse height analyzer means for carrying out a pulse-height



analysis of a sum signal taken from a group under which said specific photomultiplier falls;

collecting means responsive to said pulse height analyzer means for collecting the results of said pulse-height analysis as statistical data on said specific photomultiplier; and

means responsive to said collecting means for controlling the amplification degree of said specific photomultiplier on the basis of said statistical data.

4,857,723

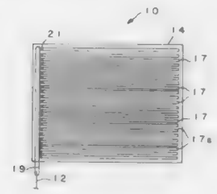
SEGMENTED IMAGING PLATE STRUCTURE

J. Everett Modisette, San Antonio, Tex., assignor to Texas Medical Instruments, Inc., Schertz, Tex.

Continuation-in-part of Ser. No. 95,884, Sep. 14, 1987, Pat. No. 4,778,985. This application Dec. 7, 1987, Ser. No. 129,235

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—213 R **20 Claims**



1. An imaging plate structure comprising:

a first conductive layer having a plurality of conductive segments each being larger in length and width than the pixel size defining the resolution of said plate structure and said conductive segments arranged thereabout, said conductive segments electrically connected to a conductor such that each of said conductive segments are selectively addressable;

a photoconductive sandwich structure means integrally affixed to said first conductive layer, said photoconductive sandwich structure means being responsive when said imaging plate structure is exposed to radiation of known energies; and

a second conductive layer integrally affixed to the side of said photoconductive sandwich structure means opposite said first conductive layer.

4,857,724

PICTURE PICK-UP AND DISPLAY SYSTEM AND PICTURE PICK-UP DEVICE SUITABLE FOR SAID SYSTEM

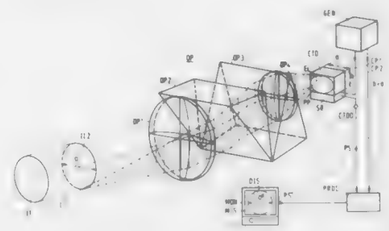
Rudolph M. Snoeren, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed May 11, 1988, Ser. No. 192,810

Claims priority, application Netherlands, May 15, 1987, [illegible]

Int. Cl.[4] H01J *31/50*

U.S. Cl. 250—213 VT **3 Claims**



1. A picture pick-up and display system comprising an image intensifier for intensifying radiation from a scene to be picked up, for which purpose the image intensifier has a radiation entrance surface and a radiation exit surface, an image sensor for picking up on a picture pick-up surface a picture corresponding to the scene on the radiation exit surface and for supplying a line and field-sequentially generated picture signal corresponding thereto, an optical coupling system arranged between the radiation exit surface of the image intensifier and the picture pick-up surface of the image sensor for adapting the shape of the radiation exit surface to that of the picture pick-up surface, a signal correction device for compensating the adaptation of the optical coupling system by supplying a corrected picture signal, and a display device provided with a display screen for displaying a picture corresponding to the scene whilst applying the corrected picture signal to the display device, characterized in that in the case of circularity of the radiation exit surface of the image intensifier and rectangularity of the picture pick-up surface of the image sensor the optical coupling system produces an ellipsoidal image of the circular radiation exit surface within or at least partly around the rectangular picture pick-up surface, the image sensor being a solid state sensor supplying the picture signal from a sensor output under the control of clock pulses for the purpose of applying said signal to the display device, a clock pulse frequency being active in the signal correction device for line-sequentially obtaining the correct picture signal which, upon display, produces the image in a circular surface on the display screen.

4,857,725

DIFFERENTIAL OFFSET CORRECTED CURRENT MIRROR

Mark A. Goodnough, Buellton; John A. Stineman, Jr., and Alan W. Hoffman, both of Goleta, all of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Jul. 6, 1988, Ser. No. 215,839

Int. Cl.[4] H03F *17/00*

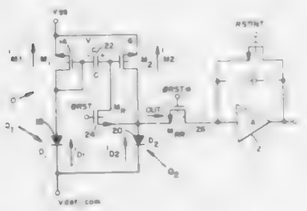
U.S. Cl. 250—214 A **13 Claims**

1. A circuit for coupling a first photodetector and a second photodetector to an amplifier, the first and the second photodetectors each having a current output proportional to an amount of radiation flux incident thereon, comprising:

a first transistor having an input terminal coupled to an output terminal of the first photodetector;

a second transistor having an input terminal coupled to an output terminal of the second photodetector;

a capacitance coupled between a control terminal of said first transistor and a control terminal of said second transistor, said control terminal of said first transistor further being coupled to said input terminal of said first transistor;



a first switch coupled between the control terminal of said second transistor and said input terminal of said second transistor; and

a second switch coupled between said second transistor input terminal and an input of the amplifier for coupling an output current signal to the amplifier.

4,857,726

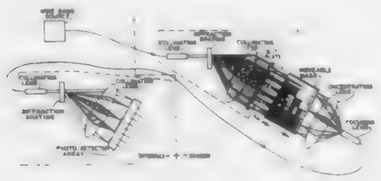
METHOD TO DECODE RELATIVE SPECTRAL DATA

Terrance R. Kinney, and Eric M. Arnett, both of South Bend, Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Feb. 29, 1988, Ser. No. 161,533

Int. Cl.[4] G01J *3/50;* **H01J** *5/16, 40/14*

U.S. Cl. 250—226 **16 Claims**



1. A method for decoding relative spectral data comprising the steps of:

generating a spectrum of light having at least a predetermined minimum bandwidth, said bandwidth having discrete spectral elements of radiant energy;

modulating said discrete spectral elements to generate a modulated spectrum where a spectral element is a spectral portion of the generated spectrum and where an on spectral element is a relative high intensity as compared to adjacent spectral elements and an off spectral element is a relative low intensity as compared to adjacent spectral elements, said modulated spectrum having:

(a) an always on first spectral element followed by an always off spectral element;

(b) an always on last spectral element preceded by an always off spectral element; and

(c) modulating all other elements of said spectrum as a function of data bits from a data source;

interpreting said modulated spectrum with an array of detectors having spectral response including said bandwidth such that individual elements of said spectrum engage upon at least one of the detectors of said array; and

determining the positions of said individual spectral elements by analyzing the positions of said first spectral element and last spectral element.

4,857,727

OPTICALLY POWERED REMOTE SENSORS WITH TIMING DISCRIMINATION

James E. Lenz, Brooklyn Park; Paul E. Bjork, New Brighton, and Hisatoshi Fujiwara, Brooklyn Park, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 12, 1988, Ser. No. 193,008

Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—227 **19 Claims**

1. An optically micro-powered sensor apparatus comprising:

timing means for generating timing signals;

source means, connected to said timing means, for providing power and the timing signals in the form of light;

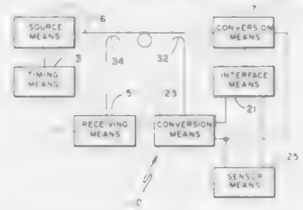
light conducting means for conveying the power and the timing signals from said source means;

first conversion means for receiving the power and the timing signals from said light conducting means and for converting the power and the timing signals into electrical energy and electrical timing signals;

sensor means for sensing desired parameters and for converting the parameters into electrical parameter signals;

interface means, connected to said first conversion means and to said sensing means, for processing the electrical timing and parameter signals;

second conversion means, connected to said interface means and to said light conducting means, for converting logic signals from said interface means into return light signals



and for providing the return light signals to said light conducting means; and

receiving means having high information communication efficiency, connected to said light conducting means and to said timing means, for receiving the return light signals from said light conducting means.

4,857,728

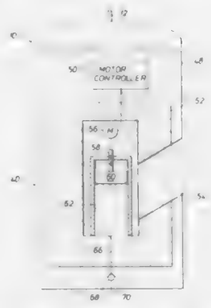
METHOD AND APPARATUS FOR REDUCING RADIOACTIVE HAZARDS IN WELL BOREHOLES

Harry D. Smith, Jr., Houston, Tex., assignor to Halliburton Logging Services Inc., Houston, Tex.

Filed May 31, 1988, Ser. No. 200,227

Int. Cl.[4] G01V *5/04*

U.S. Cl. 250—260 **24 Claims**



1. A logging tool adapted to be used in a well borehole for obtaining measurements by irradiation from a radioactive source, comprising:

(a) an elongate logging tool body adapted to be lowered into a well borehole;

(b) a radioactive source in said body for forming radiation enabling a logging activity to be conducted in the well borehole, said source having a half life of less than about 10 days and comprising a radioactive isotope of iodine or gold; and

(c) wherein said radioactive source is carried within an enclosure means.

10. A logging tool adapted to be used in a well borehole for obtaining measurements by irradiation from a radioactive source, comprising:

(a) and elongate logging tool body adapted to be lowered into a well borehole;

(b) a radioactive source in said body for forming radiation enabling a logging activity to be conducted in the well borehole; and

(c) wherein said radioactive source is formed of a fluid radioactive isotope within an enclosure means.

4,857,729

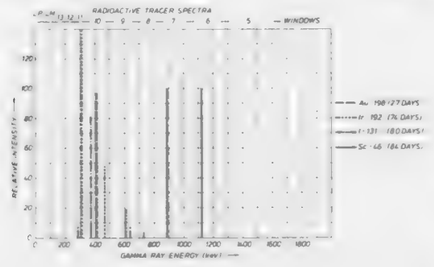
METHOD OF RADIOACTIVE WELL LOGGING

Larry L. Gadeken, and Harry D. Smith, Jr., both of Houston, Tex., assignors to Halliburton Logging Services, Inc., Houston, Tex.

Filed Apr. 22, 1988, Ser. No. 184,742

Int. Cl.[4] G01V *5/04*

U.S. Cl. 250—260 **7 Claims**



1. A method for determining the relative amount of a low energy isotope in a steel casing lined well bore relative to the amount of said isotope outside the casing and wherein said isotope is a relatively low energy gamma ray emitting isotope which tags the liquid phase of fracturing material which has been hydraulically injected from the well bore into the surrounding earth formations and has migrated into the borehole, said method comprising the steps of:

(1) detecting the intensity of gamma radiation from the tracer distributed in the borehole and the surrounding earth formations by a gamma ray detector positioned in said borehole in proximity to the formation interval of interest and obtaining data representative of said radiation intensity;

(2) separating the gamma ray intensity data into an observed energy spectrum of detected gamma rays;

(3) obtaining from said observed energy spectrum count rates of gamma radiation in an energy region associated with gamma radiation emitted by said relatively low energy tracer in at least two relatively low energy ranges, a first of which is highly sensitive to photoelectric attenuation by iron in the well casing and a second of which is a higher energy range which is primarily sensitive to Compton scattered gamma rays and much less sensitive to photoelectric absorption by iron;

(4) combining said count rates to obtain an observed photoelectric ratio of count rates in said second energy range to count rates in said first energy range;

(5) obtaining count rates of radiation in all the energy regions associated with gamma radiation emitted by said low energy tracer and processing the count rates to obtain the total elemental concentration of said low energy tracer in the borehole and the formations; and

(6) determining the amount of the low energy tracer in the borehole relative to the amount of said low energy tracer outside the casing from the observed photoelectric ratio of low energy tracer obtained in step (4), the total observed concentration of the low energy tracer obtained in step (5), and low energy photoelectric ratios calibrated for the tracer in the borehole and in the formation, respectively.

4,857,730

APPARATUS AND METHOD FOR LOCAL CHEMICAL ANALYSES AT THE SURFACE OF SOLID MATERIALS BY SPECTROSCOPY OF X PHOTOELECTRONS

Morin Pierre, Sathonay Camp, France, assignor to Instruments S.A., France

PCT No. PCT/FR87/00187, § 371 Date Jan. 27, 1988, § 102(e) Date Jan. 27, 1988, PCT Pub. No. WO87/07429, PCT Pub. Date Dec. 3, 1987

PCT Filed May 27, 1987, Ser. No. 156,940

Claims priority, application France, May 29, 1986, 86 07740

Int. Cl.[4] H01J *37/256;* **G01N** *23/227*

U.S. Cl. 250—305 **19 Claims**



1. Apparatus for local chemical analyses at a surface of a solid material by X-ray photoelectron spectroscopy, comprising:

(a) an ultra high vacuum analysis chamber for housing a sample to be analyzed;

(b) support means for supporting said sample, said support means extending outside said chamber;

(c) an analyzer positioned within said ultra high vacuum analysis chamber in the vicinity of the sample;

(d) an electron source capable of emitting an electron beam; and

(e) a microsource of X-ray photons positioned between said electron source and said sample along the path of said electron beam provided as close as possible to said solid sample, comprising:

(i) a body comprising three staged cylinders, the diameter of the first cylinder being relatively large compared with that of the electron beam;

(ii) an anode contained within said body; and

(iii) a collimator, wherein said body blocks incident electrons of said electron beam so that said electrons are not detected after reflection on said sample, said anode being thick enough to stop most of the electrons of said electron beam but sufficiently thin to limit absorption of X-ray photons generated and said collimator reduces an emission angle of the photons and masks an emissive face of said anode with respect to the analyzer, as well as an inner cylinder of the colimator, photoelectrons being emitted by the sample being received by said analyzer.

4,857,731

INSTRUMENT FOR ANALYZING SPECIMEN

Shojiro Tagata, Tokyo, Japan, assignor to JEOL Ltd., Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 180,891

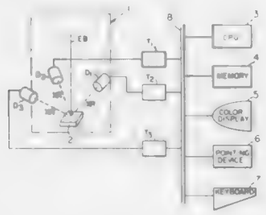
Claims priority, application Japan, Apr. 17, 1987, 62-94715; Apr. 17, 1987, 62-94716

Int. Cl.[4] H01J *37/00*

U.S. Cl. 250—310 **6 Claims**

1. In an instrument for analyzing a specimen, said instrument having an analytical means for collecting data $I_1(x, y)$, $I_2(x, y)$, . . . , $I_n(x, y)$ about the intensities of characteristic x-rays ema-

nating from chemical elements $\Theta_1, \Theta_2, \ldots, \Theta_n$ ($n \geqq 2$) at the positions of object elements (x, y) defined in a two-dimensional surface on the specimen, a storage means for storing the data collected by the analytical means, and a display means for reading data $I_i(x, y)$ about the intensities of characteristic x-rays emanating from an arbitrary chemical element Θ_i (i is any one of 1, 2, . . . , n) from the storage means and said display means having a viewing screen defining picture elements for displaying the data in a color coded image representing the distribution of the chemical element Θ_i over the surface of the specimen, the improvement comprising:



a means for designating a region S on the viewing screen of the display means upon which is also displayed a color coded image of a selected chemical element Θ_i enabling selection of the stored data corresponding to a region on the surface of the specimen for further analysis; and

means for drawing or displaying a chart representing the frequency distribution of the intensities of x-rays emanating from an arbitrary chemical Θ_j (j is any one of 1, 2, . . . , n) over said object elements (x, y) corresponding to the picture elements contained in the region S.

4,857,732

RADIATION IMAGE RECORDING AND READ-OUT APPARATUS

Kazuo Shimura, and Masamitsu Ishida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

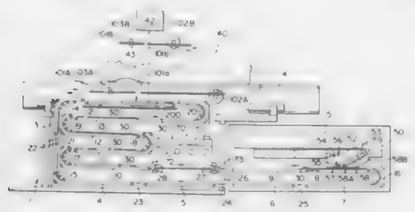
Filed Oct. 18, 1985, Ser. No. 789,293

Claims priority, application Japan, Oct. 19, 1984, 59-220280

The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[4] G01N *23/04*

U.S. Cl. 250—327.2 **7 Claims**



1. A radiation image recording and read-out apparatus comprising:

(i) a circulation and conveyance means for conveying at least one stimulable phosphor sheet for recording a radiation image thereon along a predetermined circulation path,

(ii) an image recording means positioned on said circulation path for recording a radiation image of an object on said stimulable phosphor sheet by exposing said stimulable phosphor sheet to a radiation passing through said object,

(iii) an image read-out means positioned on said circulation path and provided with a stimulating ray source for emitting stimulating rays for scanning said stimulable phosphor sheet carrying said radiation image stored thereon at said image recording means, and a photoelectric read-out device for detecting light emitted by said stimulable phosphor sheet scanned by said stimulating rays to obtain an electric image signal,

(iv) an erasing means for, prior to the next image recording on said stimulable phosphor sheet for which the image read-out has been conducted at said image read-out means, having said stimulable phosphor sheet release the radiation energy remaining on said stimulable phosphor sheet,

(v) at least two slits provided between said image recording means and the source of said radiation such that at least one slit is positioned on either side of the object,

(vi) drive means for synchronously driving the slits, and

(vii) wherein said circulation and conveyance means comprises a plurality of separate, independently speed controlled conveyors, at least one of said independently speed controlled conveyors are provided at said image recording means, said image read-out means and said erasing means an said circulation path wherein said stimulable phosphor sheets are conveyed by said conveyors at different speeds due to the friction between the stimulable phosphor sheets and said conveyors wherein the conveying speed of the stimulable phosphor sheet at a given station is independent of the conveying speed of different stimulable phosphor sheets at the other stations and keyed to the time required for processing said stimulable phosphor sheets at said image recording means, said image read-out means and said erasing means.

4,857,733

RADIATION IMAGE READ-OUT METHOD AND APPARATUS, AND RADIATION IMAGE READ-OUT AND REPRODUCING METHOD AND APPARATUS

Shigeru Saotome, and Nobuyoshi Nakajima, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

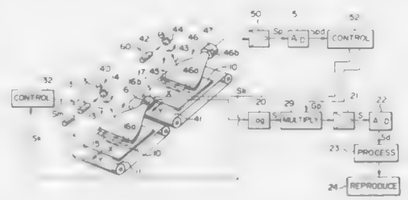
Filed Jun. 16, 1987, Ser. No. 62,800

Claims priority, application Japan, Jun. 16, 1986, 61-139718; Jun. 16, 1986, 61-139719

The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.

Int. Cl.[4] G01N *23/04*

U.S. Cl. 250—327.2 **6 Claims**



1. A radiation image read-out method in which a stimulable phosphor sheet carrying a radiation image stored thereon is exposed to a stimulating ray beam which causes the stimulable phosphor sheet to emit light in proportion to the stored radiation energy, and the light emitted by the portion of the stimulable phosphor sheet exposed to the stimulating ray beam is photoelectrically detected by use of a photodetector to obtain an image signal representing the radiation image,

wherein the improvement comprises the steps of:

(i) detecting a level of radiation energy stored on said stimulable phosphor sheet,

(ii) making said stimulating ray beam pass through a beam diameter adjusting means, and

(iii) expanding the beam diameter of said stimulating ray beam by said beam diameter adjusting means in accordance with a decrease in said level of radiation energy stored on said stimulable phosphor sheet.

4,857,734

READ SYSTEM FOR A LUMINESCENT IMAGE STORAGE SCREEN IN AN X-RAY DIAGNOSTICS INSTALLATION

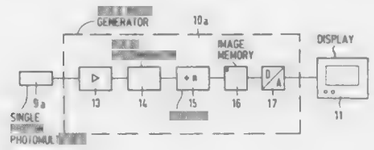
Hans-Erich Reinfelder, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 2, 1987, Ser. No. 33,264

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1986, 3613370

Int. Cl.[4] G01N *23/04*

U.S. Cl. 250—327.2 **3 Claims**



1. In an x-ray diagnostics installation having means for generating a latent image of an examination subject by irradiating the subject by irradiating the subject with x-rays and storing the resulting image in a luminescent image storage screen, and means for reading that latent image from said storage screen pixel-by-pixel by stimulating emission of photons from said storage screen and generating a video image therefrom on a video display, the improvement comprising:

a single-photon-multiplier having a light-sensitive entry face disposed with respect to said luminescent storage screen such that said photons therefrom are incident on said entry face, said single-photon multiplier generating one pulse for each photon incident on said light entry face and thereby generating a pulse sequence having a pulse rate dependent on the brightness incident on said entry face;

a counter connected to the output of said single-photon-multiplier which counts the pulses therefrom for each pixel;

means for storing the count for each pixel in a complete image; and

means for converting the output of said means for storing to a signal suitable for said video display.

4,857,735

LIGHT EMITTING DIODE SPECTROPHOTOMETER

Hans G. Noller, 2631 Blueridge Ave., Orange, Calif. 92668

Filed Oct. 23, 1987, Ser. No. 113,230

Int. Cl.[4] G01J *3/42*

U.S. Cl. 250—339 **25 Claims**



1. A spectrophotometer with a high signal to noise ratio, comprising:

a first light emitting diode for emitting light through a solution having a spectrophotometric absorbance maximum within the band of wavelengths of light emitted by said light emitting diode;

a first pulse generator connected to said light emitting diode, said pulse generator providing pulses having a duty cycle and voltage selected so that said light emitting diode emits light of higher intensity during pulses generated by said pulse generator than that maximum intensity that said light emitting diode could produce with a continuous voltage without damage to said light emitting diode;

a photodetector optically coupled to said light emitting diode for detecting light emitted from said light emitting diode and passed through said solution; and

a first signal generator coupled to said photodetector for generating a signal representative of the intensity of the light detected by said photodetector.

4,857,736

WAXY BUILDUP MEASUREMENT

Thomas E. Long, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 750,398, Jun. 28, 1985, abandoned. This application Apr. 15, 1987, Ser. No. 39,826

Int. Cl.[4] G01N *23/04*

U.S. Cl. 250—358.1 **11 Claims**



1. A method for determining the amount of radiation transparent material deposited inside a container of a fluid bearing the radiation transparent material, comprising:

disposing a radiation-opaque material inside the container;

providing a radiation source outside the container;

positioning a radiation receptor film on the opposite of the container from the radiation source; and

measuring the distance on the film between a shadow cast by a wall of the container and a shadow cast by the radiation-opaque material to determine the thickness of radiation transparent material deposited on the container.

4,857,737

GAMMA RAY MEASUREMENT UTILIZING MULTIPLE COMPTON SCATTERING

Tuneyoshi Kamae, Tokyo, and Ryoji Enomoto, Sakura, Japan, assignors to Hamamatsu Photonics K. K., Shizuoka, Japan

Filed Jul. 31, 1987, Ser. No. 80,015

Claims priority, application Japan, Aug. 4, 1986, 61-183145; Dec. 25, 1986, 61-314126

Int. Cl.[4] G01T *1/164*

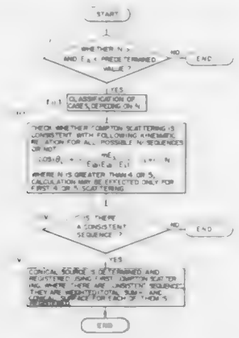
U.S. Cl. 250—370.09 **10 Claims**

1. A γ-ray measuring device comprising:

a plurality of γ-ray detectors superposed on each other, in each including means to determine the position of a reaction, when a γ -ray induces it therein and to measure the energy imparted to an electron by the γ-ray; and

calculation processing means treating measured data according to a predetermined program, which sets all the possible sequences of reactions for a plurality of reactions measured almost simultaneously, and treats the measured data on said plurality of reactions while checking for each

of the sequences of reactions to determine whether they satisfy the energy and the momentum conservation laws,



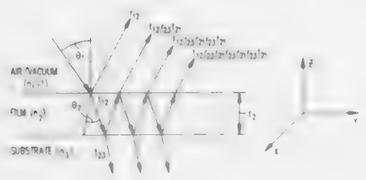
and leaving only the data with an estimated sequence of reactions which satisfy both the conservation laws.

4,857,738

ABSORPTION MEASUREMENTS OF MATERIALS

David W. Myers; Robert G. Ozarski, both of Livermore; Thiloma I. Perera, Sunnyvale; John F. Schipper, Palo Alto; Raul V. Tan, San Jose, and Michael P. C. Watts, Portola Valley, all of Calif., assignors to General Signal Corporation, Stamford, Conn.

Filed Dec. 18, 1987, Ser. No. 135,119
Int. Cl.[4] G01N *21/21, 21/75*
U.S. Cl. 250—372 **19 Claims**



1. A method for determining the absorption $a=1-e^{-\alpha_2 L_2}$ corresponding to propagation of light of a predetermined wavelength λ linearly through a predetermined first material of path length L_2, where α_2 is the linear absorption parameter of this first material, where a substantially planar film of refractive index $n_2(\lambda)$ of this first material of predetermined thickness t_2 is mounted on a substrate layer of a second predetermined material having refractive index $n_3(\lambda)$, the method comprising the steps of:

providing a source of light of wavelength λ;

positioning the film-substrate combination so that the film lies between at least a portion of the substrate and the light source;

propagating an incident beam of the light in a vacuum or in air from the light source toward the exposed face of the film at a predetermined incidence angle of θ_1;

allowing the light beam to be reflected at the exposed face of the film and at the interface between film and substrate and measuring the total reflectivity $R=I_r/I_o$ of this light beam from the film-substrate combination, where I_o is the intensity of the incident light beam and I_r is the measured intensity of the reflected light beam; and

determining the absorption a substantially from the expressions

$$1-a=\left\{\left[-r_{12}(1-R)\cos\left(\frac{4\pi n_2 t_2}{\lambda}\cos\theta_2\right)\pm\right.\right.$$

$$\left[r_{12}^2(1-R)^2\cos^2\left(\frac{4\pi n_2 t_2}{\lambda}\cos\theta_2\right)+\right.$$

$$\left.\left.(R-r_{12}^2)(1-Rr_{12}^2)\right]^{\frac{1}{2}}\right]/r_{23}(1-Rr_{12}^2)\Big\},$$

$$\cos\theta_2=\sqrt{1-\sin^2\theta_1/n_2^2},$$

$$\cos\theta_3=\sqrt{1-\sin\theta_1^2/n_3^2},$$

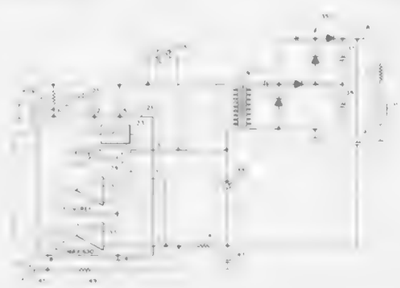
and where $r_{12}=r_{12,k}(\theta_1, \theta_2)$ and $r_{23}=r_{23,k}(\theta_2, \theta_3)$ are, respectively, the amplitude reflection coefficients appropriate for the vacuum-film interface at incidence angle θ_1 in the vacuum and for the film-substrate interface at incidence angle θ_2 in the film and k(=p or s) is the polarized index corresponding to the incident beam.

4,857,739

PACKET PERSONAL RADIATION MONITOR

James E. Phelps, Knoxville, Tenn., assignor to United States Department of Energy, Washington, D.C.

Filed Mar. 31, 1988, Ser. No. 176,010
Int. Cl.[4] G01T *1/18*
U.S. Cl. 250—388 **5 Claims**



1. A personal radiation monitor for detecting ionizing radiation, comprising:

an ionizing radiation detector means having an anode and a cathode electrodes, said cathode electrode being connected to ground potential;

a low voltage DC power source;

a high voltage capacitive charge storing means coupled to said anode of said radiation detector for applying a high voltage bias to said anode of said detector;

a high voltage generating means for generating and applying a selected high voltage DC charge to said capacitive charge storage means from said low voltage DC power source in response to a feedback signal proportional to the stored charge voltage of said capacitive charge storage means to repeatedly recharge said capacitive charge storage means to a selected maximum high voltage level during a charging period each time said capacitance storage means is discharged to a selected minimum high voltage level by current pulses generated in said radiation detector in response to the detection of ionizing radiation therein;

a feedback signal generating means for generating said feedback signal proportional to the voltage level of said capacitive storage means and applying said feedback signal to said high voltage generating means; and

an audio signal generating means for generating an audible signal pulse each time said capacitive storage means is recharged as an indication of the ionizing radiation field intensity being sensed by said detector means, whereby the audible pulse rate is proportional to the ionizing radiation field intensity being detected.

4,857,740

WIRE CHAMBER

Muzaffer Atac, Wheaton, Ill., assignor to The United States of American as represented by the United States Department of Energy, Washington, D.C.

Filed May 12, 1987, Ser. No. 49,058
Int. Cl.[4] G01T *1/185*
U.S. Cl. 250—374 **5 Claims**



1. A wire chamber capable of converting the passage of subatomic particles and photons through an enclosure into electrical discharges, said wire chamber having a gas, and, at least one positive electrode within said enclosure, and at least one negative electrode within said enclosure the improvement comprised of;

a gas mixture enclosed within said chamber comprised of ethane, argon gas and between 1% and 0.25% isopropyl alcohol vapor.

4,857,741

X-RAY INTENSIFYING SCREEN

Kazuto Yokota, and Akihisa Saito, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawagawa, Japan

Filed Mar. 30, 1987, Ser. No. 31,140
Claims priority, application Japan, Mar. 31, 1986, 61-073416
Int. Cl.[4] C09K *11/78*
U.S. Cl. 250—486.1 **4 Claims**

1. X-Ray intensifying screen composed substantially of a substrate, a phosphor layer superposed on said substrate, and a protective layer superposed on said phosphor layer as opposed to said substrate across said phosphor layer, in which said phosphor layer comprises a first phosphor layer containing a phosphor represented by the general formula (I):

$$M_aLn_{1-x-(\natural)a}DO_4:XR^{3+} \quad (I)$$

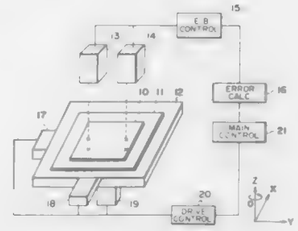
(wherein M stands for at least one divalent metal element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Zn, and Cd, Ln for at least one element selected from the group consisting of Y, Gd, La, and Lu, D for either or both of Ta and Nb, R for at least one member selected from the group consisting of Tm, Pr, Sm, Eu, Tb, Dy, Yb, and self-activators, a for a value satisfying the expression, $0<a\leqq 1$, and x for a value satisfying the expression, $0\leqq x\leqq 0.05$) and formed on said substrate side and a second phosphor layer containing $CaWO_4$ and formed on said protective layer side.

4,857,742

POSITION DETECTING DEVICE USING VARIABLE RADIATION

Yuzo Kato, Yokohama, and Yasuo Kawai, Shizuoka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1987, Ser. No. 136,419
Claims priority, application Japan, Dec. 27, 1986, 61-309208
Int. Cl.[4] H01J *37/304*
U.S. Cl. 250—491.1 **28 Claims**



1. A mark detecting device for detecting a first alignment mark formed on a first object and a second alignment mark of a second object that is to be aligned with the first object, said device comprising:

supplying means for supplying an electron beam to irradiate the first and second alignment marks with the electron beam;

control means operable to control said supplying means; and

detecting means for detecting the first and second alignment marks on the basis of the irradiation of the first and second alignment marks with the electron beam;

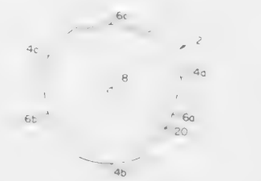
wherein said control means is operable to cause said supplying means to change the condition of irradiation of the first and second alignment marks in accordance with the response characteristics of the marks to be received electrons, so that the first and second alignment marks are irradiated with the electron beam under different irradiation conditions.

4,857,743

DISPOSABLE SPRAY APERTURE

Kenneth Lambert, North Reading, Mass., assignor to ElectroScan Corporation, Danvers, Mass.

Filed Aug. 4, 1988, Ser. No. 229,158
Int. Cl.[4] H01V *37/09*
U.S. Cl. 250—505.1 **20 Claims**



1. An electron spray aperture disk for use in the column liner of an electron microscope comprising: a substantially circular flexible disk having a central aperture and tab means, said tab means located on the circumferential periphery of said disk and designed to hold said aperture disk within said column liner, the outermost diameter of said disk at said tabs being greater than the internal diameter of the column liner where said aperture disk is to be positioned.

4,857,744

OPTICAL PROJECTION PRINTING APPARATUS WHEREIN WAFER MARK HAS A GRATING PITCH IN THE SAGITTAL PLANE OF THE FIRST OPTICAL SYSTEM

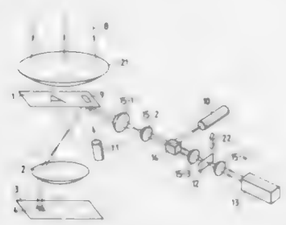
Keiji Kataoka, Kawagoe; Toshiei Karosaki, Kodaira; Seiji Yonezawa, and Soichi Katagiri, both of Hachiouji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 224,654

Claims priority, application Japan, Jul. 29, 1987, 62-187744; Feb. 3, 1988, 63-21947

Int. Cl.[4] G01N *21/86*; G01B *11/00*

U.S. Cl. 250—548 **12 Claims**



1. An optical projection printing apparatus comprising a first optical system for irradiating a mask with light coming from a first light source to focus the mask image on a wafer, said apparatus further comprising:

a wafer having a wafer mark shaped such that the wafer mark having a grating pattern shape formed on said wafer has its grating pitch direction arranged in the sagittal plane of said first optical system; and

a second optical system including means for irradiating said wafer mark with light from a second light source adapted for a wavelength different from that of the light from said first light source, and means for focusing the light reflected by the irradiated wafer mark onto a photo-detector.

4,857,745

METHOD AND APPARATUS FOR MONITORING THE PASSAGE OF MARKS ON A WEB

Martin Gough, Berkhamsted, England, assignor to Crosfield Electronics Limited, London, England

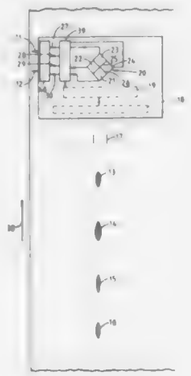
Filed Apr. 28, 1988, Ser. No. 187,195

Claims priority, application United Kingdom, Apr. 28, 1987, 8710021

Int. Cl.[4] G01N *21/86*; G06K *15/00*

U.S. Cl. 250—548 **14 Claims**

1. A method of monitoring the passage of a mark on a portion of a web (5), the method comprising causing a web to move through a detection station (7) and illuminating at least said portion of the web carrying said mark; causing an image of said mark to be projected onto a symmetrical array (20) of detector elements (21–24) at said detection station, said detector elements defining at least two axes (25, 26) between them transverse to the direction of movement of said web; determining the times (t_1, t_2) at which substantially equal areas of said mark are projected on either side of said axes; and determining a time (t_3), at which said mark crosses a first line (37) orthogonal to the direction of movement (38) of said web, wherein $t_3=(t_1+t_2)/2$.



4,857,746

METHOD FOR PRODUCING AN OPTOCOUPLER

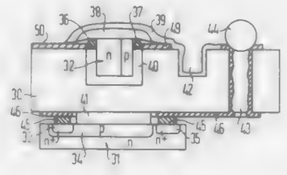
Werner Kuhlmann, Munich; Werner Spaeth, Holzkirchen; Guenter Waitl, Regensburg, and Joerg Klann, Thannhausen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 28, 1987, Ser. No. 101,617

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633181

Int. Cl.[4] H01L *31/12*

U.S. Cl. 250—551 **4 Claims**



1. A method for manufacturing optocouplers comprising the steps of: forming arrays of semiconductor light transmitters and semiconductor light receivers arranged on opposite sides of a single substrate wafer, forming reflective light barriers respectively covering the light transmitters on the side of the wafer opposite the light receivers, optically coupling through the wafer and by reflection off the respective light barriers each one of the transmitters to at least one of the light receivers thus forming respective optocouplers on the wafer, and subsequently separating the respective optocouplers into discrete units.

4,857,747

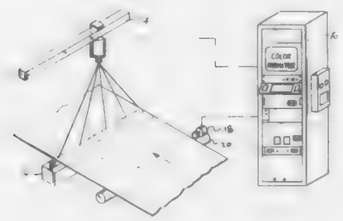
METHOD AND APPARATUS FOR ANALYZING THE FORMATION OF A WEB OF MATERIAL VIA GENERATING A FORMATION INDEX

Joseph A. Bolton, Queensbury, N.Y., and Steven K. Harbaugh, Castro Valley, Calif., assignors to Albany International Corporation, Menands, N.Y.

Filed Feb. 24, 1988, Ser. No. 159,830

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—559 **9 Claims**



1. A method of analyzing a web of material for generating a formation index comprising the following steps:

providing a light source on one side of the web of material for shining a light through the entire width of the web at a predetermined location;

providing a sensor comprising at least one camera at a predetermined distance from the web of material on the opposite side of that of the light source;

scanning the entire width of the web across a path defined by the light source with said camera to sense and measure variations in light intensities in a pixel by pixel basis across said width;

generating signals which correspond to the light intensity detected by said camera at respective pixels across said web width;

assigning a predetermined value level within a predetermined range for said respective signals corresponding to said pixel locations;

normalizing each pixel to compensate for static or dynamic variations in light intensities through the web of material;

determining an average light intensity at predetermined locations across the web and calculating a formation index based upon adding the absolute differences in light intensity at the same pixel locations on successive scans and dividing the results by the average light intensity for said predetermined location; and

generating a formation index for the entire width of the web by successive calculation of formation indexes taken across said web of material at successive predetermined location.

4,857,748

APPARATUS FOR OPTICALLY MEASURING THE THREE-DIMENSIONAL SURFACE SHAPE AND INNER STRUCTURE OF AN OBJECT

Yoshihiro Takiguchi, Shizuoka, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Jul. 17, 1987, Ser. No. 74,879

Claims priority, application Japan, Jul. 18, 1986, 61-170654

Int. Cl.[4] G01N *21/86*

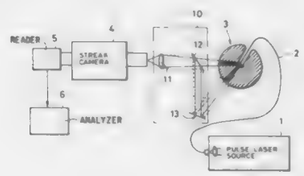
U.S. Cl. 250—560 **17 Claims**

1. An apparatus for optically measuring a three-dimensional surface shape and inner structure of an object, comprising:

a pulse light source for generating pulsed light having a first pulse width;

light conducting means for guiding said pulsed light from said pulse light source to said object;

light detecting means for detecting one of a flux of reflected light pulses from a flux of transmitted light pulses through said object and measuring the change of the intensity of said one flux with respect to time and space, each of said flux of reflected light pulses and flux of transmitted light pulses having a time-delay distribution; and



analyzing means for analyzing outputs of said ultrahigh speed light detecting means.

4,857,749

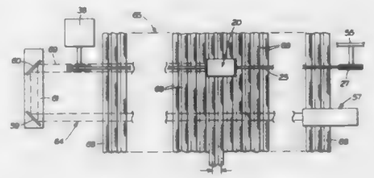
APPARATUS AND METHOD FOR MEASURING THE SPACING BETWEEN THE CORDS OF A FABRIC

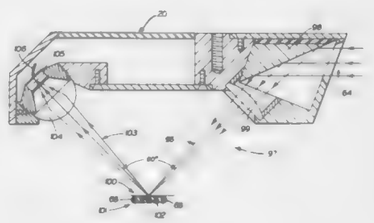
John R. McCarty, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jan. 6, 1988, Ser. No. 141,232

Int. Cl.[4] G01N *21/86, 21/89*

U.S. Cl. 250—571 **23 Claims**





1. An apparatus for measuring the spacings between individual cords in a fabric containing a plurality of said cords arranged in a generally parallel relationship; said apparatus including:

(a) a source of radiant energy;

(b) a carriage mounted for linear movement across the fabric transverse to the running direction of the cords;

(c) focusing means mounted on the carriage for focusing at least a portion of the radiant energy against the fabric as the carriage means moves across said fabric;

(d) collecting means mounted on the carriage for collecting at least a portion of the radiant energy reflected from said fabric; and

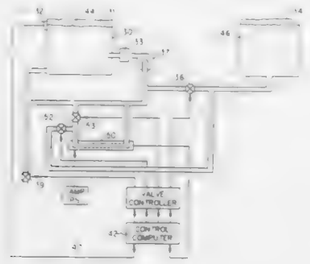
(e) means for calculating the spacing between the cords by the relationship between the intensity of the reflected radiant energy and speed of the carriage moving across the fabric.

4,857,750

SENSOR FOR DETERMINING PHOTORESIST DEVELOPER STRENGTH

Edwin G. Millis, Dallas, and Samuel J. Wood, Jr., Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 17, 1987, Ser. No. 134,438
Int. Cl.[4] G01N *15/06;* G01J *1/42*
U.S. Cl. 250—573 8 Claims



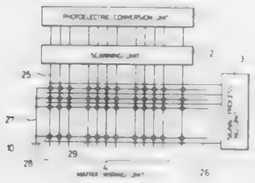
1. A system for analyzing the strength of a developer fluid and replenishing the developer fluid to maintain its strength comprising; an immersion tank into which an object having a layer of material to be developed is placed, an inlet and outlet to said immersion tank, means for recirculating the fluid from said outlet back to said inlet, a liquid analyser for analyzing the developer in said immersion tank comprising a mercury-argon lamp immersed in said fluid recirculating between said outlet and inlet of said immersion tank, a first valve for introducing fresh developer into said immersion tank, based on the results of analyzing said developer in said analyzer, and a second valve for removing developer from said tank.

4,857,751

PHOTOELECTRIC CONVERSION APPARATUS WITH SEPARATING ELECTRODES

Katsunori Hatanaka, Yokohama; Toshihiro Saika; Takayuki Ishii, both of Hiratsuka, and Katsuhiko Yamada, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1988, Ser. No. 209,583
Claims priority, application Japan, Jun. 26, 1987, 62-160508
Int. Cl.[4] H01J *40/14;* H04N *3/14*
U.S. Cl. 250—578 1 Claim



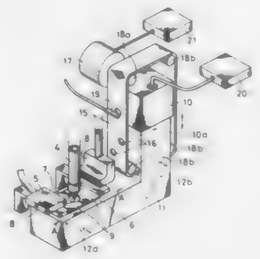
1. A photoelectric conversion apparatus comprising:
a plurality of one-dimensionally arranged photoelectric conversion elements, each of said photoelectric conversion elements comprising an individual output electrode;
a plurality of common electrodes each commonly connecting at least two of said individual output electrodes; and
separating electrodes respectively formed between said common electrodes so as to maintain potentials at a predetermined level, wherein the number of intersections between said individual output electrodes and said separating electrodes is the same for each of said individual output electrodes.

4,857,752

PARTS RECOGNITION METHOD AND APPARATUS THEREFOR

Kanji Hata, Katano; Masahiro Maruyama, Minoo, and Eiji Itemadani, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 25, 1988, Ser. No. 176,369
Claims priority, application Japan, Mar. 26, 1987, 62-72425
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—578 5 Claims



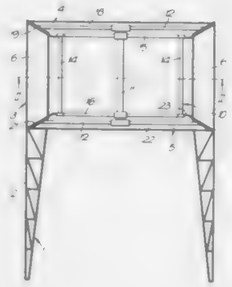
1. A parts recognition method comprising the steps of:
holding a part,
irradiating said part by diffused light,
dividing a picture area including said part into plural portions and assigning them to plural optical systems,
selecting one of said plural optical systems that is assigned to the portion enclosing part by shutter means, and
sensing said portion by an image sensor through said selected one optical system.

4,857,753

WIND ENERGY CONVERTOR

Anthony J. S. Mewburn-Crook, Isleworth; Peter Bullen, London, and Simon Read, Stonely, all of England, assignors to Mewburn-Crook Company Limited, Egham, United Kingdom

Filed Nov. 3, 1987, Ser. No. 116,456
Claims priority, application United Kingdom, Oct. 4, 1986, 8626347
Int. Cl.[4] F03D *9/00*
U.S. Cl. 290—55 13 Claims



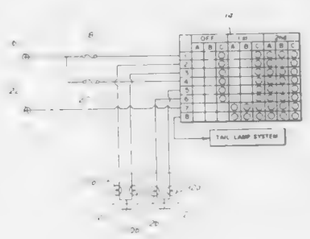
1. An improved wind energy convertor of the type having an upstanding support having a central vertical axis, a substantially circular turbine rotatably supported by the support whereby said turbine is freely rotatable about said vertical axis, said turbine having an upper end and a lower end and having a plurality of circumferentially spaced blades extending lengthwise with respect to the support and, coaxial with and surrounding a vertical axis of the turbine, a stator having an upper annular ring having a central opening therein, said upper ring positioned adjacent and above the upper end of the turbine, a lower annular ring having a central opening therein, said lower ring positioned adjacent and below the lower end of the turbine, and a plurality of circumferentially spaced venturi blades extending lengthwise between the annular rings which define, between adjacent blades, a plurality of venturi through which wind is directed on to the blades of the turbine, wherein the improvement comprises said upper annular ring having an upwardly facing top frusto-conical surface and a downwardly facing bottom frusto-conical surface, each of said top and bottom surfaces of the upper annular ring inclining downwardly towards the central vertical axis over substantially the entire width of the upper annular ring from an outer peripheral edge to an inner circumferential edge thereof whereby wind blowing across and over the top of the outer peripheral edge of the upper annular ring towards the central vertical axis is deflected over the downwardly inclined upwardly facing top frusto-conical surface of the upper annular ring to cause such turbulence in the wind that the air pressure in the central opening bounded by the upper annular body is decreased causing wind blowing through the venturi and against the blades of the turbine and driving the turbine rotatably about said central vertical axis to be drawn upwardly within the turbine and out of the upper annular ring through the central opening therein.

4,857,754

POWER SUPPLY CIRCUIT FOR AUTOMOTIVE HEADLAMP

Yukio Yamamoto, Atsugi, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 23, 1988, Ser. No. 172,186
Claims priority, application Japan, Apr. 13, 1987, 62-90400
Int. Cl.[4] B60Q *1/08;* H02G *3/00*
U.S. Cl. 307—10.8 13 Claims



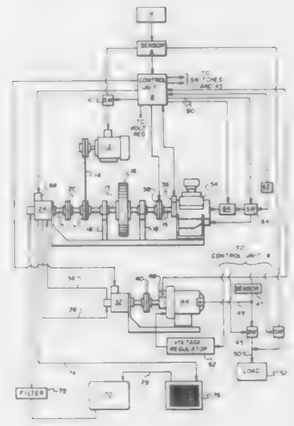
1. A power supply circuit for an automotive headlamp system which includes first and second headlamp assemblies, each of which includes a low-beam valve for low-beam lighting and a high-beam valve for highbeam lighting, said power supply circuit comprising:
a power source for supplying electrical power;
a switch assembly selectively operable between a plurality of switch positions including a first position in which the electrical power is supplied to said high-beam valves of said headlamp assemblies, and a second position in wihch the electrical power is supplied to said low-beam valves of said headlamp assemblies; and
means for establishing communication between said power source and said low-beam valves at said first position in a high-beam and a flash mode.

4,857,755

CONSTANT POWER SYSTEM AND METHOD

W. Kenneth Comstock, 8152 South Danish Rd., Sandy, Utah 84120

Filed Sep. 27, 1988, Ser. No. 249,672
Int. Cl.[4] H02J *3/06, 9/08;* H02P *9/06*
U.S. Cl. 307—47 10 Claims



1. For use in conjunction with a commericial source of power which may be interrupted, a power supply for maintaining a substantially constant output of electrical power comprising
an engine for operating in response to an activate signal,
an electric motor,
a flywheel mounted to rotate when either the engine or the electric motor is operated,
means for determining the power level of the commercial source of power,
a generator for producing electrical power when operated,
first switch means responsive to a first signal for connecting the commercial source of power to the electric motor, and responsive to a second signal for disconnecting the commercial source of power from the electric motor,
a bus connected to a load,
second switch means responsive to a third signal for connecting the commercial source of power to the bus, and responsive to a fourth signal for disconnecting the commercial source of power from the bus,
third switch means responsive to a fifth signal for connecting the generator to the bus, and responsive to a sixth signal for disconnecting the generator from the bus,
control means coupled to the power level determining means for supplying a first signal to the first switch means, a third signal to the second switch means, and a fifth signal to the third switch means when the power output of the commercial power is within a certain range, and for supplying a second signal to the first switch means, a fourth signal to the second switch means, and an activate signal to the engine when the power output of the commercial source is outside said range,
a shaft mounted to rotate and on which the flywheel is mounted so that when the flywheel is rotated, the shaft is caused to rotate, and
a hydraulic fluid drive means which includes
a hydraulic variable displacement pump coupled to the shaft to pump hydraulic fluid when the shaft is rotated,
a hydraulic variable displacement motor coupled to the generator to cause the generator to operate when hydraulic fluid is pumped to the hydraulic motor,
a first conduit for carrying fluid from the hydraulic pump

to the hydraulic motor when the hydraulic pump is operated, and

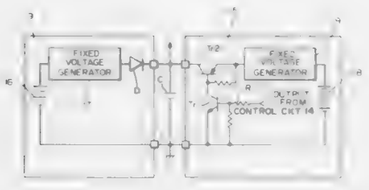
a second conduit for carrying fluid from the hydraulic motor back to the hydraulic pump when the pump is operated.

4,857,756

POWER CONTROL UNIT FOR A COMPUTER SYSTEM

Isamu Haneda, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 11, 1988, Ser. No. 166,650
Claims priority, application Japan, Mar. 17, 1987, 62-63068
Int. Cl.[4] H02J *7/00*
U.S. Cl. 307—66 **2 Claims**



1. In a power control unit for controlling the electrical power source of a system including a main computer with a source battery for generating a system source voltage and a peripheral device having a higher operating voltage than said system source voltage and a source voltage generator circuit which generates a source voltage corresponding to said operating voltage, the improvement wherein

said power control unit comprises

a first voltage generating means connected to a system bus for generating a lower voltage,

a second voltage generating means for generating a higher voltage,

a control means serving to output a high output signal or a low output signal, depending on whether an output of power at said higher voltage through said system bus is desired or not,

a first transistor having the base thereof connected to said control means and the emitter thereof grounded, and

a second transistor having the base thereof connected to the collector of said first transistor, the emitter and the base thereof connected to said second voltage generating means and the collector therof connected to said system bus.

4,857,757

DRIVE CIRCUIT FOR A TWO LAYER LAMINATED ELECTROSTRICTION ELEMENT

Ryuichi Sato; Tsutomu Taniguchi, both of Kyoto, and Masatoshi Ohba, Nagaokakyo, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

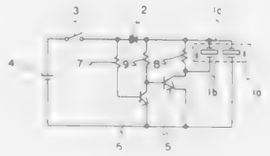
Filed Jul. 1, 1985, Ser. No. 750,212
Claims priority, application Japan, Jun. 29, 1984, 59-135843
The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.
Int. Cl.[4] H01L *41/00*
U.S. Cl. 307—113 **7 Claims**

1. A drive circuit for a two layer laminated electrostriction element which is formed by laminating two sheets of electrostrictive deflection elements at adjacent surfaces thereof, comprising:

a first circuit for charging a first of said deflection elements by applying voltage thereto causing said first deflection element, and thereby said electrostriction element, to deflect in a first direction,

a second circuit for discharging said first deflection element after said first circuit is deactivated and no longer applying voltage to said first deflection element and

a third circuit for charging a second of said deflection elements, said second circuit being connected to said third circuit such that a part of the discharging current from



said first of said deflection elements is coupled to said third circuit for charging said second deflection element thereby causing said second deflection element, and thereby said electrostriction element, to deflect in a direction opposite to the direction of deflection of said first deflection element.

4,857,758

CYCLE TIMER FOR HOUSEHOLD APPLIANCE

Anthony W. Rigazio, Oglesby, and Gerald C. Koehler, Peru, both of Ill., assignors to Worldtronics International, Oglesby, Ill.

Filed Apr. 8, 1988, Ser. No. 179,410
Int. Cl.[4] H01H *43/00*
U.S. Cl. 307—140 **25 Claims**



1. An electronic timer responsive to the occurrence of a selected time of day, said electronic timer comprising:

(a) a mechanical clock movement driven by a synchronous motor and providing an analog display indicating the current time of day, said mechanical clock movement including a cycle switch sensing when the current time of day reaches said selected time of day, and

(b) an electronic control circuit, said control circuit including an activation interval timer having an input responsive to said cycle switch, an output, and means for generating an activation signal on said output for a limited activation interval when said cycle switch senses that said current time of day reaches said selected time of day,

wherein said timer further comprises a power line energized power supply for powering said control circuit, said power supply including means for providing a clocking signal at the power line frequency, and said control circuit includes a digital divider having an input for receiving said clock signal and an output or driving said synchronous motor in synchronism with said clocking signal.

4,857,759

ALTERNATING CURRENT OUTLET ADAPTER

Gordon J. Murphy, 638 Garden Ct., Glenview, Ill. 60025, and Martin A. Plonus, 2525 Orrington, Evanston, Ill. 60201

Filed Feb. 17, 1988, Ser. No. 156,832
Int. Cl.[4] G01R *21/00;* **H01H** *43/04*
U.S. Cl. 307—141 **8 Claims**

1. An alternating current outlet adapter for automatically

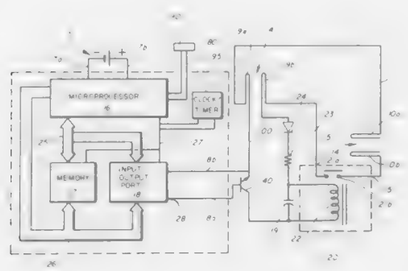
switching an electric outlet on and off at certain times of the day, in which those certain times of the day vary throughout the year in accordance with a pattern built into the system and are not intended to be altered by the user, which comprises:

a household male plug for connection to a household alternating current receptacle;

an electric clock for providing the time of day and selected periods of the year;

a battery for insuring that the time and the period of the year are maintained by the clock;

memory means permanently programmed with unalterable data which are stored to provide switch-on times and switch-off times for each period of the year, said switch-on times and switch-off times being variable for different periods of the year;



switching means for providing switch-on signals and switch-off signals;

means for comparing the clock time and period of the year with the switch-on times and switch-off times stored in said memory means and for operating said switching means in accordance therewith;

an electric outlet for receiving an electrical connector from a lamp or other electric appliance to be switched on and off in accordance with the program; and

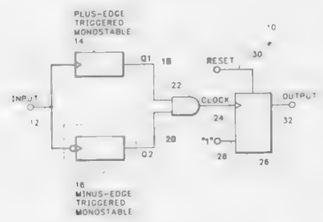
means for coupling the switching means to said male plug and to said electric outlet so that said male plug and said electric outlet will be electrically connected from each switch-on time to the next later switch-off time and electrically disconnected at all other times.

4,857,760

BIPOLAR GLITCH DETECTOR CIRCUIT

Carlton Stuebing, Tigard, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 10, 1988, Ser. No. 154,679
Int. Cl.[4] H03K *5/22, 5/04*
U.S. Cl. 307—234 **3 Claims**



1. A circuit for detecting positive and negative pulses of a predetermined maximum duration of an input signal comprising:

a first monostable circuit for generating a first pulse having a duration equal to the predetermined maximum duration when a positive-going edge of a pulse occurs in the input signal;

a second monostable circuit for generating a second pulse also having a duration equal to the predetermined maximum duration when a negative-going edge of a pulse occurs in the input signal;

AND gate means coupled to said first and second monostable circuits for generating a signal having a third pulse equal to the period of time both of said first and second pulses are present; and

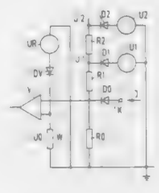
flip-flop means coupled to the output of said AND gate means for generating an output signal of a first logic state when the third pulse is generated, said flip-flop means also being responsive to an external reset signal for setting the output signal at a second logic state.

4,857,761

CIRCUIT FOR MONITORING A PLURALITY OF ANALOG QUANTITIES

Werner Jacopich; Kurt Winter, and Siegfried Mayr, all of Vienna, Austria, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 1, 1988, Ser. No. 176,780
Claims priority, application Austria, Apr. 4, 1987, 861/87
Int. Cl.[4] H03K *5/24*
U.S. Cl. 307—350 **5 Claims**



1. A circuit for monitoring a plurality of analog quantities for exceeding threshold values with the use of a differential amplifier signaling the exceeding of the threshold values, the circuit has a reference voltage source connected between a grounded potential and a first input of the differential amplifier and a reference resistor connected between the grounded potential and a second input of the differential amplifier, whereby the quantities to be monitored are represented by representative voltages and by impressed currents that are supplied to the second input of the differential amplifier via coupling diodes and coupling resistors, comprising a plurality of coupling resistors connected in series to the reference resistor to form a single voltage divider whose taps receive the representative voltages and impressed currents; and voltage drops from the taps to the grounded potential produced by the representative voltages and the impressed currents having values relative to the reference voltage source in the same proportion as the values of resistance measured from the taps to a terminal of the grounded potential have relative to the value of resistance of the reference resistor.

4,857,762

DIGITAL 2-OF-3 SELECTION AND OUTPUT CIRCUIT

Lutz Gaebel, Denkte, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

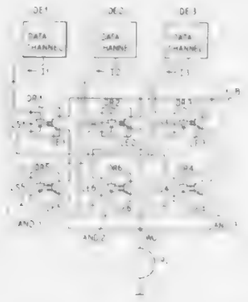
Filed Oct. 28, 1987, Ser. No. 113,478
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637238
Int. Cl.[4] H03K *19/003, 19/20;* **G02B** *27/00*
U.S. Cl. 307—441 **2 Claims**

1. A digital 2-of-3 selection and output circuit comprising, in combination:

three AND elements (AND1, AND2, AND3,) each consist-

ing of parts of two optocouplers (OR1/OR5, OR2/OR6, OR3/OR4), each optocoupler (OR1) comprising a light transmitter (LS1) and a light receiver (LE1),

two light transmitters (LS1/LS4, LS2/LS5, LS3/LS6) of two optocouplers (OR1/OR4, OR2/OR5, OR3/OR6) of different AND elements (AND1/AND3, AND2/AND1, AND3/AND2) are connected in series to one of three data channels (DE1, DE2, DE3), to be fed with an electri-



cal signal at level "1" and the light receivers (LE1/LE5, LE2/LE6, LE3/LE4) of first said two optocouplers (OR1/OR5, OR2/OR6), OR3/OR5) allocated with their light transmitters (LS1/LS5, LS2/LS6, LS3/LS4) to different data channels (DE1/DE2, DE2/DE3, DE3/-DE1) being connected in series to form the output of the AND element,

and an OR arrangement having three inputs connected to the outputs of said three AND elements.

4,857,763

MOS SEMICONDUCTOR INTEGRATED CIRCUIT IN WHICH THE PRODUCTION OF HOT CARRIERS NEAR THE DRAIN OF A SHORT N CHANNEL CONDUCTIVITY TYPE MOS TRANSISTOR IS DECREASED

Takayasu Sakurai, Tokyo, and Tetsuya Iizuka, Funabashi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

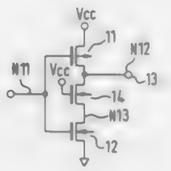
Division of Ser. No. 815,026, Dec. 30, 1985. This application Jan. 6, 1988, Ser. No. 140,493

Claims priority, application Japan, Jan. 26, 1985, 60-13068

The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

Int. Cl.[4] H03K *17/16*

U.S. Cl. 307—443 **2 Claims**



1. Semiconductor integrated circuit having a signal input terminal supplied with an input signal and a signal output terminal, and a power supply terminal for application of a power supply voltage thereto and a reference voltage terminal for application of a reference voltage thereto, comprising:

a P channel transistor having a source connected to said power supply terminal, a drain connected to said output terminal, and a gate supplied with said input signal;

an N channel MOS transistor circuit including a short N channel MOS transistor of about 1 micron or less effective channel length having a drain coupled to said output terminal, a source coupled to said reference voltage terminal, and a gate of predetermined gate width and being supplied with said input signal; and

N channel conductivity enhancement type MOS transistor means for decreasing the production of hot carriers in the vicinity of the drain of said short N channel MOS transistor, said N channel conductivity enhancement type MOS transistor means having a gate of wider gate width than the predetermined gate width of the short N channel MOS transistor, said MOS transistor means coupled between the drain of said short N channel MOS transistor and the signal output terminal, and supplied with a fixed gate voltage to the gate electrode thereof.

4,857,764

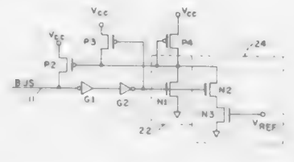
CURRENT COMPENSATED PRECHARGED BUS

William R. Young, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jun. 30, 1988, Ser. No. 213,823

Int. Cl.[4] H03K *17/14*

U.S. Cl. 307—443 **16 Claims**



1. A precharge circuit for a bus having a plurality of input means connected in parallel between said bus and a first voltage source for creating a first output logic voltage on said bus if any one of said input means is activated in response to a first input logic signal at its input, said precharge circuit comprising:

Pull means connected between said bus and a second voltage source for creating a second output logic voltage on said bus in response to a precharge signal at an input to said pull means;

a latch means connected between said bus and said second voltage source for maintaining said bus at said second output logic voltage until voltage produced by activation of one of said input means on said bus exceeds a deactivation voltage level of said latch means; and

tracking means connected to said latch means for maintaining a fixed deactivation voltage level of said latch means.

4,857,765

NOISE CONTROL IN AN INTEGRATED CIRCUIT CHIP

Joseph J. Cahill; Charles L. Johnson; Steven D. Lewis; Timothy J. Mullins, and Bruce R. Petz, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 121,434, Nov. 17, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 314,223

Int. Cl.[4] H03K *17/16*

U.S. Cl. 307—443 **3 Claims**

1. An integrated circuit construction and arrangement, comprising

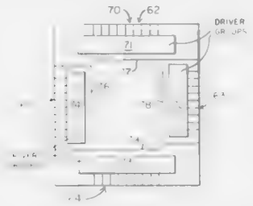
logic means integrated into a semiconductor substrate,

a plurality of N of groups of switchable driver circuit means integrated into said semiconductor substrate, each group of driver circuit means including a plurality of individual driver circuits, each individual driver circuit having a switching signal input means, an enable signal input means, and an output signal means,

means connecting the switching signal input means of each of said individual driver circuits to said logic means,

a source of enable signals operable to provide a like plurality N of enable signals, each individual enable signal of which occurs at a different time,

means connecting a different one of said enable signals to a different one of said N groups of driver circuit means and to the driver enable signal input means of each individual driver circuit in the group, to thereby inhibit an overlap in switching activity of the output signal means of said plurality N of driver circuit means,



a second logic means having clocked receiver circuits connected to said output signal means and having repeating machine cycles, wherein the state of said logic means is to be interrogate in at least one of said machine cycles, and wherein said plurality N of enable signals are repeated in each cycle in which the state of said logic means is to be interrogated, and

said plurality N of driver circuit means groups being physically grouped on said substrate such that a driver circuit means group that is active during a given portion of said at least one machine cycle is physically separated from the driver circuit means groups that are to be stable during said given portion of said at least one machine cycle.

4,857,766

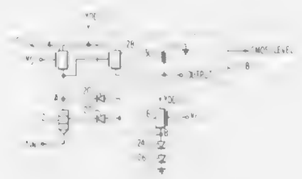
BIMOS INPUT CIRCUIT

Wilbur D. Pricer, Burlington, and Francis W. Wiedman, Stowe, both of Vt., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Oct. 30, 1987, Ser. No. 114,973

Int. Cl.[4] H03K *19/02, 19/007, 19/084*

U.S. Cl. 307—446 **14 Claims**



1. An input circuit for receiving an ECL input signal and for generating, in response to the input signal, a CMOS-compatible output signal, comprising:

a bipolar transistor having emitter, base and collector regions, the emitter region connected to receive the ECL input signal;

first current source means coupled to the collector region of said bipolar transistor;

second current source means coupled to the base and collector regions of said bipolar transistor; and

output circuit means, directly connected to the collector region of said bipolar transistor, for providing the CMOS-compatible output signal.

4,857,767

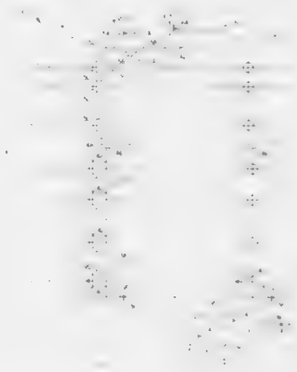
HIGH-DENSITY LOW-POWER CIRCUIT FOR SUSTAINING A PRECHARGE LEVEL

Wendell L. Little, Carrollton, and Michael D. Smith, Lewisville, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Mar. 3, 1988, Ser. No. 106,537

Int. Cl.[4] H03K *17/16*

U.S. Cl. 307—448 **40 Claims**



1. A pull-up circuit for a plurality of voltage nodes, comprising:

a first current source having a pull-up transistor and a voltage output terminal coupled to a control terminal of said pull-up transistor; and

a plurality of current mirror transistors, each coupled between a respective one of said voltage nodes and a reference voltage, the control terminal of each of said current mirror transistors being coupled to said voltage output terminal of said first current source;

a second current source having a pull-down transistor and a voltage output terminal coupled to a control terminal of said pull-down transistor; and

said first current source containing a current setting transistor, the control terminal of which is coupled to said voltage output terminal of said second current source.

4,857,768

TRIPLE RAIL LOGIC GATE

Scott J. Griffith, Waltham, and Steven E. Golson, Carlisle, both of Mass., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Apr. 27, 1988, Ser. No. 186,626

Int. Cl.[4] H03K *17/16, 19/20, 5/22*

U.S. Cl. 307—443 **24 Claims**

1. An improved logic gate, comprising:

a drive rail line;

a sense rail line;

a reference rail line;

first transistor means coupled between said drive rail and said sense rail for selectively permitting current to pass between said drive and sense rails;

a plurality of input lines, each of said input lines coupled to a gate of said first transistor means, respectively, such that if an input line is in a first state the transistor means to which said input line is coupled passes current;

second transistor means coupled between a known voltage source (V_{dd}) and said sense rail;
third transistor means coupled between said voltage source (V_{dd}) and said reference rail, said third transistor means being sized to pass less current than said second transistor means;
fourth transistor means coupled between said drive rail and ground;



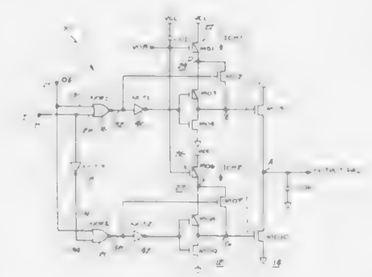
detection signaling means for generating a detect signal and providing said signal to the gates of said second, third and fourth transistor means, the receipt of said signal resulting in the passage of current through said second, third and fourth transistor means;
sensing means coupled to said sense and reference rails for sensing the voltage on said rails and generating a predetermined output if the voltage on one of said rails exceeds the voltage on the other.

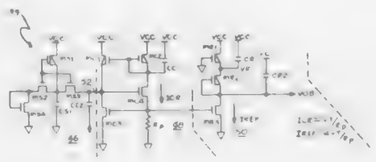
4,857,769
THRESHOLD VOLTAGE FLUCTUATION COMPENSATION CIRCUIT FOR FETS
Nobuo Kotera, Kokubunji; Kiichi Yamashita, Kanagawa; Taizo Kinoshita, Kokubunji; Hirotoshi Tanaka, Yamanashi; Satoshi Tanaka, Kokubunji, and Minoru Nagata, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 13, 1988, Ser. No. 143,385
Claims priority, application Japan, Jan. 14, 1987, 62-4829
Int. Cl.[4] H03K *17/14*
U.S. Cl. 307—450 **23 Claims**



1. A semiconductor circuit comprising:
(1) a plurality of first FETs having source-drain paths thereof connected in series; and
(2) at least one second FET having the same conductivity type as that of said plurality of first FETs and substantially the same threshold voltage as that of said plurality of first FETs, and having the source-drain path thereof connected in series to the source-drain paths of said plurality of first FETs,
wherein said plurality of first FETs operate in their linear region, the gates and drains of each of said first FETs being respectively connected electrically,
wherein said second FET operates in its saturation region, the gate and source of said second FET being connected electrically
wherein a voltage associated with said threshold voltage can be obtained between the drain and source of said first FETs when the conductances of said first FETs and that of said second FET are set to a predetermined ratio,
wherein said first and second FETs are depletion mode FETs, and
wherein said conductance ratio of said first and second FETs is set so that said voltage obtained between the drain and source of said first FETs is a predetermined multiple of said threshold voltage.

4,857,770
OUTPUT BUFFER ARRANGEMENT FOR REDUCING CHIP NOISE WITHOUT SPEED PENALTY
Hamid Partovi, Westborough, Mass., and Michael A. Van Buskirk, San Jose, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Feb. 29, 1988, Ser. No. 161,810
Int. Cl.[4] H03K *19/017, 19/094, 3/01*
U.S. Cl. 307—451 **17 Claims**

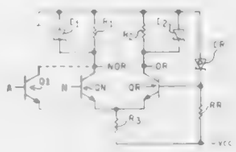




1. An output buffer circuit for reducing chip noise at low temperature and high power supply voltage and having a high operational speed, comprising:
an output stage formed of a first N-channel pull-up transistor (MO5) and a second N-channel transistor (MO10), said pull-up transistor (MO5) having its drain connected to a supply potential and its source connected to an output node, said pull-down transistor (MO10) having its drain connected to the output node and its source connected to a ground potential;
first output driver means for generating a first stable, controlled current to charge up the gate of said pull-up transistor (MO5), said first output driver means being formed of first controlled current source means and first bidirectional-switching means;
said first current source means being formed of a first P-channel transistor (MO1) having its source connected to the supply potential and its gate connected to receive a bias voltage;
said first bidirectional-switching means being formed of a first inverter (40), a first CMOS transmission gate, and a third N-channel transistor (MO4);
said first inverter (40) having an input and an output;
said first transmission gate including a fourth N-channel transistor (MO2) and a second P-channel transistor (MO3);
said third N-channel transistor (MO4) having its drain connected to the gate of said first N-channel transistor (MO5), its gate connected to the output of the first inverter (40), and its source connected to ground potential;
said fourth N-channel transistor (MO2) having its drain connected to the source of said second P-channel transistor (MO3) and to the drain of said first P-channel transistor (MO1), said fourth N-channel transistor (MO2) having its source connected to the drain of said second P-channel transistor (MO3), said fourth N-channel transistor (MO2) having its gate connected to the input of said first inverter (40) and to a first control signal, said second P-channel transistor (MO3) having its gate connected to the output of said first inverter (40);
second output driver means for generating a second stable, controlled current to charge up the gate of said pull-down transistor (MO10), said second output driver means being formed of second controlled current source means and second bidirectional-switching means;
said second current source means being formed of a third P-channel transistor (MO6) having its source connected to the supply potential and its gate connected to receive the bias voltage;
said second bidirectional-switching means being formed of a second inverter (42), a second CMOS transmission gate, and a fifth N-channel transistor (MO9);
said second inverter (42) having an input and an output;
said second transmission gate including a sixth N-channel transistor (MO7) and a fourth P-channel transistor (MO8);
said fifth N-channel transistor (MO9) having its drain connected to the gate of said second N-channel transistor (MO10), its gate connected to the output of the second inverter (42), and its source connected to ground potential; and
said sixth N-channel transistor (MO7) having its drain connected to the source of said fourth P-channel transistor (MO8) and to the drain of said third P-channel transistor (MO6), said sixth N-channel transistor (MO7) having its source connected to the drain of said fourth P-channel transistor (MO8), said sixth N-channel transistor (MO7) having its gate connected to the input of said second inverter (42) and to a second control signal, said fourth P-channel transistor (MO8) having its gate connected to the output of said second inverter (42).

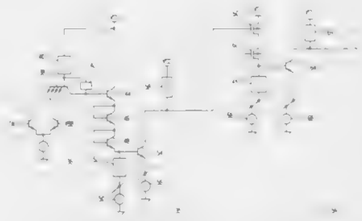
4,857,771
METHOD OF MAKING AN ECL LOGIC CIRCUIT HAVING DIODE-CLAMPED LOADS AND REFERENCE [illegible]
Kevin M. Ovens, and Bobby D. Strong, both of Garland, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 942,326, Dec. 16, 1986. This application Aug. 8, 1988, Ser. No. 229,933
The portion of the term of this patent subsequent to Dec. 20, 2005, has been disclaimed.
Int. Cl.[4] H03K *19/086*
U.S. Cl. 307—455 **20 Claims**

1. A method of making an ECL logic circuit using diode-clamped loads comprising:
(a) commonly connecting emitter electrodes of at least a first and a second semiconductor device, each of said semiconductor devices having a collector electrode, a control electrode and an emitter electrode;
(b) coupling a source of voltage to said emitter electrodes;
(c) coupling a reference voltage source to said collector electrodes;
(d) connecting a first Schottky diode and a first resistor in series therewith between said source of voltage and said reference voltage source, the junction of said first Schottky diode and said first resistor being coupled to said control electrode of said first semiconductor device to provide a threshold voltage equal to the forward bias voltage of the first Schottky diode,



(e) connecting a logic signal input to the control electrode of said second semiconductor device,
(f) connecting a first output means to one of the collector electrodes of one of said semiconductor devices; and
(g) coupling a parallel connected combination of a second diode and a second resistor between said reference voltage source and the collector connected to said first output means, to provide a difference in high and low output levels equal to the forward bias of the second diode.

4,857,772
BIPMOS DECODER CIRCUIT
William H. Herndon, Sunnyvale, Calif., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.
Filed Apr. 27, 1987, Ser. No. 42,995
Int. Cl.[4] H03K *17/16, 19/082, 17/60*
U.S. Cl. 307—463 **27 Claims**



1. 1-of-N^2 decoder having N^2 output lines each of which carries a binary logic signal with a value that is referenced to only a single power source voltage, comprising:
a pair of 1-of-N predecoders each having N control lines and being responsive to an input signal to produce a signal at one binary voltage level on one of said control lines and a signal at a complementary binary level on the other N—1 control lines;
N_2 p-channel MOS transistors each having a drain-source current path connected between said power source voltage and a current sink commonly connected to all of said MOS transistors through respective loads;
N^2 bipolar NPN transistors each having a collector connected to said power source voltage and an emitter connected to a current sink common to all of said bipolar transistors, the collector-emitter paths of said bipolar transistors being respectively connected to said N^2 output lines, each of said bipolar transistors having a base that is

connected to the drain-source current path of a respective one of said MOS transistors; and

logic selection means connected to the gates of said MOS transistors and responsive to the binary signals on the control lines of said predecoders to cause one of said MOS transistors to conduct current along its drain-source current path and thereby actuate the bipolar transistor connected to said one MOS transistor so that said bipolar transistor conducts current and produces on the associated output line a binary signal having a predetermined voltage relative to said power source voltage.

4,857,773

PROGRAMMING LOGIC DEVICE WITH TEST-SIGNAL ENABLED OUTPUT

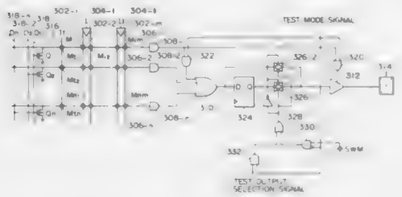
Akira Takata, and Koichi Fujii, both of Toyonaka, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Division of Ser. No. 903,781, Sep. 4, 1986. This application Aug. 1, 1988, Ser. No. 199,122

Claims priority, application Japan, Sep. 6, 1985, 60-201358; Sep. 10, 1985, 60-204157; Sep. 13, 1985, 60-232992; Oct. 17, 1985, 60-198102

Int. Cl.⁴ H03K *19/177*

U.S. Cl. 307—465 **7 Claims**



1. A programmable logic device, comprising:

a plurality of input terminals;

an AND plane connected to said plurality of input terminals;

an OR plane connected to said AND plane;

an output buffer circuit connected to said OR plane, said output buffer circuit being enabled by a logic sum between a selected product term supplied from said AND plane and an internally supplied test mode signal, whereby said output buffer circuit is enabled by said test mode signal when it is in an enabled state irrespective of the state of said selected product term; and

an output terminal connected to said output buffer circuit.

4,857,774

TESTING APPARATUS AND DIAGNOSTIC METHOD FOR USE WITH PROGRAMMABLE INTERCONNECT ARCHITECTURE

Khaled A. El-Ayat, Cupertino; Abbas El Gamal, Pal Alto, and Amr M. Mohsen, Saratoga, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 117,074, Nov. 3, 1987, abandoned, which is a division of Ser. No. 909,261, Sep. 19, 1986, Pat. No. 4,758,745. This application Sep. 30, 1988, Ser. No. 251,518

Int. Cl.⁴ H03K *19/177*

U.S. Cl. 307—465 **6 Claims**

1. In an integrated circuit having a plurality of function modules each having at least one output, circuitry for testing the output states of said modules in real time, comprising:

means for selecting an output of any one of said plurality of function modules,



means for selectively connecting said output to an input/output pin on said integrated circuit.

4,857,775

LOGIC INTEGRATED CIRCUIT DEVICE SELECTING AS OUTPUTS ANY TWO OF TWO INPUTS AND TWO LOGICAL COMBINATIONS OF THE INPUTS

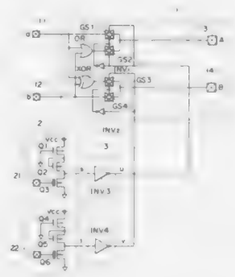
Takeo Obata, Osaka; Akira Takata, Amagasaki, and Takuro Fujioka, Minoo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 14, 1988, Ser. No. 181,737

Claims priority, application Japan, Apr. 17, 1987, 62-95751

Int. Cl.⁴ H03K *19/094*

U.S. Cl. 307—468 **6 Claims**



1. A logic integrated circuit device comprising:

a first input terminal for receiving a first input logic signal and a second input terminal for receiving a second input logic signal

first means receiving said first and second input logic signals and producing a logical sum signal of said first and second input logic signals, and having a first output supplying said logical sum signal;

second means receiving said first and second input logic signals and producing an exclusive logical sum signal of said first and second input logic signals, and having a second output supplying said exclusive logical sum signal;

first selecting means coupled to said first input terminal and said first output for selecting one of said first input logic signal and said logical sum signal as a first output of said device; and

second selecting means coupled to said second input terminal and to said second output for selecting one of said second input logic signal and said exclusive logical sum signal as a second output of said device;

wherein said first selecting means includes a first MOS transistor having a first gate connected to a third input terminal and having first source/drain terminals connected between a first pair of predetermined voltages, with a first

load connected between one of said first predetermined voltages and one of said first source/drain terminals, and a first inverter having an input connected to the junction between the first load and the first MOS transistor and having an output coupled to said first input terminal and said first output.

4,857,776

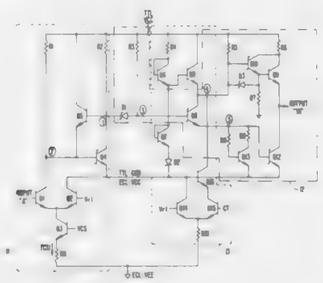
TRUE TTL OUTPUT TRANSLATOR-DRIVER WITH TRUE ECL TRI-STATE CONTROL

Aurangzeb K. Khan, San Bruno, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Filed Nov. 20, 1987, Ser. No. 123,093

Int. Cl.⁴ H03K *19/092, 19/00, 5/22, 19/086*

U.S. Cl. 307—475 **5 Claims**



1. A circuit for translating true ECL input signals, which have a HIGH state and a LOW state, and true ECL tri-state control signals, which have a HIGH state and a LOW state, to true TTL tri-state output signals which have a HIGH state, a LOW state, and a high impedance state, the circuit comprising:

(a) a translator means for translating said true ECL input signals which have a HIGH state and a LOW state to corresponding true TTL signals which have a HIGH state and a LOW state;

(b) an output driver means for receiving said true TTL signals which have a HIGH state and a LOW state from said translator means and generating corresponding true TTL tri-state output signals which have a HIGH state and a LOW state, the output driver means comprising:

(i) a first output transistor capable of generating a true TTL signal with a HIGH state and capable of holding a high impedance state; and

(ii) a second output transistor coupled to said first output transistor generating a true TT: signal with a LOW state and capable of holding a high impedance state; and

(c) a tri-state controller means coupled to the output driver means and connected to receive the true ECL tri-state control signals for switching the output driver means into a true TTL tri-state high impedance state based on said true ECL tri-state control signals without converting said true ECL tri-state control signals into TTL tri-state control signals, the tri-state controller means comprising:

(i) a comparator for comparing a true ECL tri-state control signal with a reference signal and providing a comparison signal if the control signal is in a HIGH state; and

(ii) a controller electrically coupled to the first output transistor, the second output transistor, and the comparator, for causing the first output transistor to generate a true TTL signal with a HIGH state if the true TTL signal received from the translator is in a HIGH state an the comparator is not providing a comparison signal, for causing the second output transistor to generate a true TTL signal with a LOW state if the true TTL signal received from the translator is in a LOW state and the comparator is not providing a comparison signal, and for causing both the first output transistor and the second output transistor to enter a high impedance state if the comparator is providing a comparison signal.

4,857,777

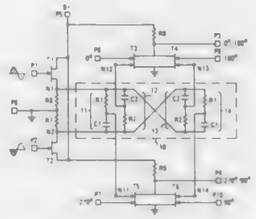
MONOLITHIC MICROWAVE PHASE SHIFTING NETWORK

Stephen K. Altes, Fayetteville, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Mar. 16, 1987, Ser. No. 25,971

Int. Cl.⁴ G01R *25/04*

U.S. Cl. 307—511 **14 Claims**



1. A phase shifting circuit with multiple outputs between which a constant phase difference is maintained over a large frequency range, said circuit comprising:

A. input means including

(1) a first input port for application of an input signal at reference phase,

(2) a second input port for application of said input signal at 180° from reference phase;

B. output means including

(1) a first output port for derivation of a first output signal at a predetermined phase,

(2) a second output port for derivation of a second output signal having a constant phase difference from said first output signal;

C. a four branch all pass network in which

(1) said first branch comprises a first resistor of value R1 and a first capacitor of value C1 joined and serially connected in the order recited between said first and second input ports,

(2) said second branch comprises a second capacitor of value C2 and a second resistor of value R2 joined and serially connected in the order recited between said first and said second input port, the joint thereof being connected to said first output port,

(3) said third branch comprises a third capacitor of value C2 and a third resistor of value R2 joined and serially connected in the order recited between said second first input port and said first input port,

(4) said fourth branch comprises a fourth resistor of value R1 and a fourth capacitor of value C1 joined and serially connected in the order recited between said second and said first input ports; the joint thereof being connected to said second output port, and

said first and fourth branches providing inverted like networks of elements to effect a phase difference of 180° at the joints of said first and fourth branches, and said second and said third branches providing inverted like networks of elements to effect a phase difference of 180° at the joints of said second and third branches,

the element values of said first and second branches providing a phase difference of 90° at the joints of first and second branches, whereby outputs at said first and second output ports are provided at 0° and 90° in relation to said predetermined phase.

4,857,778

PROGRAMMABLE UNIVERSAL ACTIVE FILTER

Yusuf A. Hague, San Jose, Calif., assignor to Maxim Integrated Products, Sunnyvale, Calif.

Filed Jan. 28, 1988, Ser. No. 149,491
Int. Cl.[4] H03K *5/00*; H03H *7/01*
U.S. Cl. 307—521 **17 Claims**



1. A programmable universal active filter comprising:
an input section including an input terminal and switching means for coupling and decoupling said input terminal to the filter;
an operational amplifier having an operating cycle and two inputs, one of which is coupled to said input section and the other of which is adapted to be connected to a voltage source, and an output,
control circuitry having its input coupled to said input section, and an output, said control circuitry being capable during a portion of the operating cycle of the amplifier, of bringing said one input substantially to within an amplifier offset voltage of the voltage connected to the other input;
a bandpass section having switching means capable of synchronous operation with said control circuit and having an output, an input coupled to the output of said control circuitry, a second input, and a first feedback loop coupling said output of said bandpass section to said one input of said operational amplifier;
a lowpass section having switching means capable of synchronous operation with said control circuitry and having an input coupled to the output of said bandpass section, and an output; and
a second feedback loop coupling either the output of said lowpass section to said one input of said operational amplifier or coupling the output of said lowpass section to said second input of said bandpass section.
clock means coupled to said switching means in each of said input, bandpass and lowpass sections and also coupled to said control circuitry for timing the control circuitry to synchronize the switching of said input, bandpass and lowpass sections of the filter.

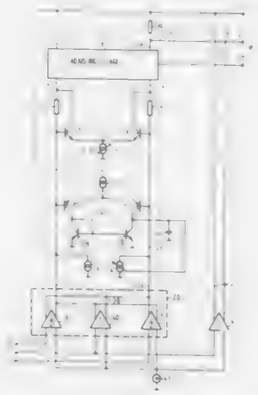
4,857,779

CIRCUIT ARRANGEMENT FOR REDUCING NOISE

Hartmut Harlos, Hamburg, and Peter Kelting, Elmshorn, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 16, 1988, Ser. No. 208,195
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1987, 3720871; Mar. 16, 1988, 3808737
Int. Cl.[4] H03K *5/08*
U.S. Cl. 307—542 **9 Claims**

1. A circuit arrangement for reducing noise when peaking the edges of a useful signal by combination with a peaking signal derived therefrom, which signal only influences the useful signal when a predetermined amplitude threshold is exceeded, said arrangement comprising a peaking signal stage for supplying the peaking signal and a noise suppression stage in which a noise suppression signal is generated and is superimposed on the peaking signal, the peaking signal stage applying the peaking signal to two push-pull current outputs, characterized in that each of the push-pull current outputs (**21, 22**) in the noise suppression stage (**7**) is connected to a series resistor (**23, 24**) and to the control terminal of one of two transistors (**25, 26**) whose main current paths at one end are connected together and to a supply current source (**27**) and at the other end are



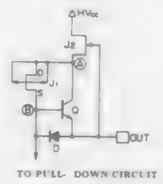
connected to the terminal of the associated series resistor (**23, 24**) remote from the push-pull current output (**21, 22**, respectively).

4,857,780

HIGH WITHSTAND VOLTAGE OUTPUT

Hiromichi Kuwano, Tokyo, Japan, assignor to Texas Instrument Incorporated, Dallas, Tex.

Continuation of Ser. No. 55,492, May 28, 1987, abandoned. This application Sep. 14, 1988, Ser. No. 245,999
Claims priority, application Japan, Jun. 9, 1986, 61-134503
Int. Cl.[4] H03K *17/10*
U.S. Cl. 307—574 **6 Claims**



TO PULL- DOWN CIRCUIT

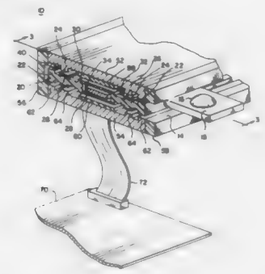
1. A high withstand voltage output circuit having a voltage terminal and a pull-down terminal, the high withstand voltage output circuit being a part of a monolithic integrated circuit and comprising: a pull-up constant current source having a first and second circuit element connected in series between the pull-down terminal and supply terminal and said second circuit element includes a FET; an output circuit connected in parallel with the first circuit element and wherein the voltage across said first circuit element is limited by the pinch-off voltage of said FET.

4,857,781

HIGH-SPEED NON-CONTACT LINEAR MOTOR WITH MAGNETIC LEVITATION

Liang Shih, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 13, 1988, Ser. No. 218,179
Int. Cl.[4] H02K *41/02*; G11B *7/09*
U.S. Cl. 310—12 **8 Claims**



1. A linear motor comprising:
a first member having a substantially rectangular cross section and an elongated shape;
a second member, having an upper portion formed from a magnetic material, a lower portion formed from a magnetic material and a pair of side portions formed from non-magnetic material for rigidly holding said upper portion and said lower portion in a spaced configuration to define a substantially rectangular opening for receiving said first member;
a first permanent magnet affixed to said upper portion of said second member;
a second permanent magnet affixed to said lower portion of said second member;
a motor winding affixed to said first member for generating a magnetic field for inducing relative motion between said first and said second members along the elongated axis of said first member in response to a position signal;
sensing means for sensing the spacing of said first member within the defined opening of said second member and for providing a signal indicative of the sensed spacing; and
magnetic means responsive to the signal provided by said sensing means for maintaining a desired spacing between said first member and said second member.

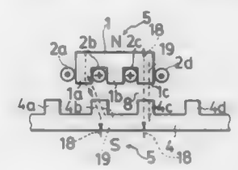
4,857,782

STEP MOTOR

Uetsuhara Tokio, Urawa, and Iwasaki Hiroji, Kyoto, both of Japan, assignors to Mitsubishi Mining & Cement Co. Ltd., Tokyo and Iwasaki Electronics Co. Ltd., Kyoto, both of, Japan

Continuation-in-part of Ser. No. 823,499, Jan. 21, 1986, abandoned. This application Sep. 22, 1987, Ser. No. 99,474
Claims priority, application Japan, Jun. 5, 1984, 59-113817; Apr. 2, 1985, 60-69801
Int. Cl.[4] H02K *41/02*
U.S. Cl. 310—12 **1 Claim**

1. A step motor comprising magnetic stationary members (**1,11**) containing a plurality of series of magnetic poles (**1*a*, 1*b*, . . . 11*a*, 11*b*, . . .**) arranged at a predetermined regular pitch; a magnetic movable member (**4**) containing a plurality of series of magnetic poles (**4*a*, 4*b* . . . , 41*a*, 41*b*, . . .**) arranged at a predetermined regular pitch different from the magnetic pole series (**1*a*, 1*b*, . . . 11*a*, 11*b*, . . .**), each magnet pole (**4*b*, . . . 41*a*, 41*b*,**) having a magnetic surface opposing the magnetic surface of each of the pole series (**1*a*, 1*b*, . . . 11*a*, 11*b*, . . .**) through a gap; electric coils (**2*a*, 2*b*, . . .**) wound so as to energize the magnetic pole series and generating a first flux; a permanent magnet (**5**) containing a first magnetic pole face fixed to the magnetic stationary member (**1,11**) and a second magnetic pole face which is arranged opposite the magnetic movable member (**4**) through a gap and generating a second flux; and means (**6, 7**) for mechanically displacing the magnetic movable member (**4**) with respect to the magnetic stationary members (**1,11**), characterized in that said electric coils (**2*a*, 2*b*, . . .**) are so wound as to energize one magnetic pole, which belongs to one of groups each which includes a predetermined number of



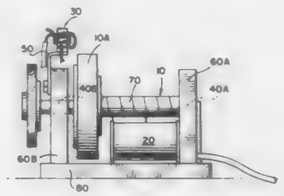
poles classified from the magnetic poles (**1*a*, 1*b*, . . . 4*a*, 4*b*, . . . 41*a*, 41*b*, . . .**) said electric coils (**2*a*, 2*b*, . . .**) generate the first flux in the same direction of the second flux, said electric coils (**2*a*, 2*b*, . . .**) energize the other magnetic poles and generate the first flux in the counter direction of the second flux and the all electric coils (**2*a*, 2*b*, . . .**) energize said poles simultaneously and the permanent magnet (**5**) is so arranged that the first flux generated by the coils do not flow through the permanent magnet (**5**).

4,857,783

BRUSHLESS DIRECT CURRENT MOTOR INCORPORATING A MAGNETICALLY INFLUENCED SWITCH

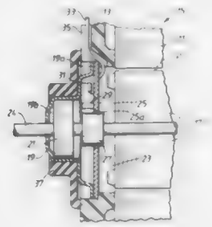
Randall K. Prunkard, Woodbridge, Va., assignor to James N. Papanicolas, Fairfax, Va.

Filed Feb. 18, 1988, Ser. No. 156,975
Int. Cl.[4] H02K *21/14, 11/00*
U.S. Cl. 310—68 B **10 Claims**



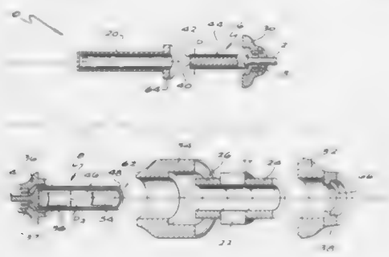
1. A brushless DC motor comprising:
a source of direct electrical current;
a ferrous metal rotational output shaft;
an annular, unitary, flat, two-pole permanent magnet mounted upon said output shaft transversely to the axis of rotation;
a stator coil provided with a ferrous metal core located within the magnetic field of said two-pole permanent magnet and energized by said source of direct electrical current; and
a magnetically influenced switch mounted within the magnetic field of said two-pole permanent magnet, but removed from the magnetic influence of said stator coil, and connected in series with said source of direct electrical current and said stator coil for controlling the current applied to said coil based upon the position of said two-pole permanent magnet with respect to said switch, whereby said switch is operated in a smooth manner.

4,857,784
MOTOR HAVING ROTATION SPEED DETECTION MECHANISM
Jyunichi Mukaekubo, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Nov. 25, 1987, Ser. No. 125,283
Claims priority, application Japan, Nov. 27, 1986, 61-280604
Int. Cl.[4] H02K *37/00*
U.S. Cl. 310—68 B **3 Claims**



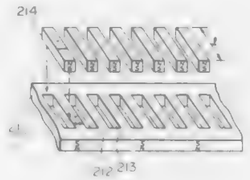
1. A motor comprising:
a stator;
a rotor;
a rotation shaft extending through the rotor;
bracket means for rotatably supporting the rotation shaft;
magnet means disposed on a portion of the rotation shaft between the rotor and the bracket means for generating a magnetic field change in response to the rotation speed of the rotor;
a printed circuit substrate disposed between the rotor and the bracket means, the printed circuit substrate having a hole, the magnet means being disposed in the hole; and
magnetic sensing means disposed on the printed circuit substrate close to the magnet means for outputting a sensing signal corresponding to the rotation speed of the rotor when sensing the magnetic field change.

4,857,785
TORQUE COUPLING DEVICE
Frederick B. McCarty, San Pedro, Calif., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Sep. 9, 1988, Ser. No. 242,449
Int. Cl.[4] H02K *7/10*
U.S. Cl. 310—78 **20 Claims**



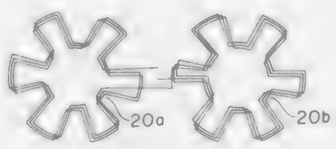
1. A torque coupling device for coupling power between first and second shafts, comprising:
a first cylindrical rotor attached to the end of said first shaft;
a second hollow cylindrical rotor attached to the end of said second shaft and mounted axially concentric with said first rotor;
means for producing a magnetic flux field having a segment of a preferred magnetic circuit aligned with the concentric axis of said first and second rotors; and
means for changing the magnetic co-energy of said magnetic circuit with a change in the relative angular position of said first and second rotors by occlusion of said magnetic flux from penetrating said first cylindrical rotor.

4,857,786
STRUCTURE OF STEPPING MOTOR AND METHOD OF DRIVING THE STEPPING MOTOR
Hideki Nihei; Kunio Miyashita, both of Hitachi; Kouichi Saitoh, Kitaibaraki, and Seizi Yamashita, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 6, 1988, Ser. No. 178,213
Claims priority, application Japan, Apr. 6, 1987, 62-82914; Apr. 13, 1987, 62-88818; May 25, 1987, 62-125893
Int. Cl.[4] H02K *21/12, 1/02*
U.S. Cl. 310—156 **10 Claims**



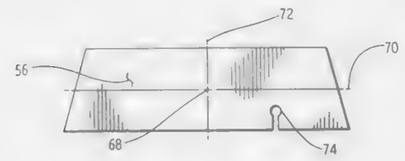
1. A field magnet comprising:
a permanent magnet substrate having a plurality of through holes or slots formed to penetrate the substrate in a first direction of its thickness and disposed at a predetermined pitch along a predetermined second direction on one surface of the substrate, said magnet substrate being magnetized at one polarity in said first direction; and
permanent magnets inserted in said through holes or slots and magnetized in said first direction and at a polarity opposite to the polarity of magnetization of said magnet substrate so that elements of said magnet substrate between every adjacent two of said through holes and said permanent magnets provide magnet poles of said one and opposite polarities disposed alternately.

4,857,787
ARMATURE OF A.C. GENERATOR FOR A CAR AND METHOD OF MANUFACTURING THE SAME
Ryoichi Taji, and Hideo Imori, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 884,602, Jul. 11, 1986, abandoned. This application Nov. 23, 1987, Ser. No. 124,261
Claims priority, application Japan, Jul. 15, 1985, 60-156580
Int. Cl.[4] H02K *3/00*
U.S. Cl. 310—180 **2 Claims**



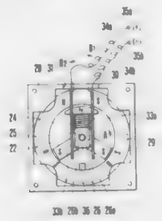
1. An armature of an A.C. generator for an automobile comprising:
a stator core having a plurality of slots;
at least one stator coil fitted in said slots;
said coil being a single coil with a first portion wound in one direction and a second portion wound in the opposite direction, said first and second portions being electrically connected in series, said first and second portions being overlaid, with the radially extending part of said first and second portions being fitted together into the same slots and with the coil ends of said first and second portions being on opposite sides of said stator core from each other.

4,857,788
MAGNETIC TOP WEDGE
Bruce Hein, Muskego, Wis., and Charles Shufflebarger, Goodland, Ind., assignors to MagneTek, Inc., Los Angeles, Calif.
Division of Ser. No. 63,264, Jun. 19, 1987, Pat. No. 4,761,580. This application May 13, 1988, Ser. No. 194,079
Int. Cl.[4] H02K *3/48*
U.S. Cl. 310—214 **7 Claims**



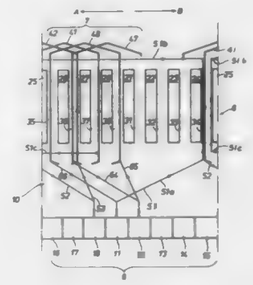
1. In a magnetic wedge of the type having a stack of laminations of ferromagnetic material for retaining a coil in a dynamoelectric machine core structure, the improvement comprising a keyhole-shaped opening in each lamination perpendicular to the plane of the lamination, said opening being spaced substantially apart from the center of gravity of the lamination such that said laminations will align themselves into a congruent stack when threaded on and supported by a filament passing through said opening.

4,857,789
ROTARY-TYPE ELECTROMAGNETIC ACTUATOR FOR TOYS
Yoshio Suimon, Tokyo, Japan, assignor to Kabushiki Kaisha Hanzawa Corporation, Tokyo, Japan
Filed Dec. 16, 1987, Ser. No. 134,180
Claims priority, application Japan, Jun. 26, 1987, 62-157802
Int. Cl.[4] H02K *15/16;* **H01R** *39/44, 41/00;* **A63H** *33/26*
U.S. Cl. 310—233 **2 Claims**



1. A rotary-type electromagnetic actuator for a toy, comprising:
a housing having a sealed-type structure;
a cylindrical stator comprising a magnet fixedly mounted within said housing;
a rotor arranged within said stator in concentric relation therewith and having a shaft by which it is supported so as to be rotatable within said housing;
a coil wound on said rotor for causing said rotor to rotate back and forth by being energized and deenergized;
a commutator having a generally rectangular outer periphery and a pair of commutator bars and fixedly secured to the shaft of said rotor for supplying current to said coil;
an electrically isulated rotor position correcting member turnably provided inside said housing in opposition to said commutator and in concentric relation with respect to said housing; and
a pair of current feeding brushes embracing said commutator from both sides thereof, each of said current brushes having a first end secured to said position correcting member and a second end in pressing contact with a respective one of said commutator bars.

4,857,790
WINDING PATTERNS FOR ARMATURES
Akira Kamiyama; Nobuhisa Hongo; Toyomi Matsuki, and Kenji Kanai, all of Gunma, Japan, assignors to Mitsuba Electric Mfg. Co., Ltd., Japan
Filed Mar. 1, 1988, Ser. No. 162,440
Claims priority, application Japan, Mar. 6, 1987, 62-51723
Int. Cl.[4] H02K *13/00*
U.S. Cl. 310—234 **7 Claims**

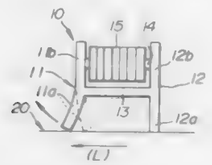


1. A winding pattern for a motor rotor comprising an armature mounted on a rotary shaft and provided with a plurality of longitudinal slots defined by a plurality of core teeth; a commutator mounted on the rotary shaft at a longitudinally spaced relationship to the armature and provided with circumferentially divided segments; and at least one set of coils wound around the core teeth through the core slots, wherein:
a very first starting lead of the at least one set of coils comprises a first span which is anchored to and extends from a first commutator segment into a first core slot, a second span which extends out of the first core slot and is wrapped over a first angle around the rotary shaft at a position opposite to the commutator with respect to the armature, and a third span which is passed into a second core slot from the second span towards the commutator and extends out of the second core slot to be wrapped over a second angle around a part of the rotary shaft intermediate between the armature and the commutator.

4,857,791
LINEAR MOTOR
Kenji Uchino, Yokohama, and Kazumasa Ohnishi, Nagaoka, both of Japan, assignors to Nissan Motor CO., Ltd., Yokohama and Alps Electric Co., Ltd., Tokyo, both of, Japan
Filed Jun. 3, 1988, Ser. No. 201,895
Claims priority, application Japan, Jun. 5, 1987, 62-141017; Dec. 8, 1987, 62-310673
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—321 **7 Claims**

1. A linear motor comprising:
a chassis, said chassis having first and second leg portions, said first leg portion having a first resonance frequency, said second leg portion having a second resonance frequency which is different from the first one;
a vibrator, said vibration being secured to said chassis in a manner to induce said chassis to vibrate when energized,

said vibrator being connected to a control circuit and arranged to selectively vibrate said member at first and



second frequencies which correspond to said first and second resonance frequencies.

4,857,792

CIRCULAR DIRECTION VIBRATOR

Shinsuke Miura; Susumu Ishizuka, and Setsuo Kojima, all of Tokyo, Japan, assignors to Yamaichi Electric Mfg. Ltd., Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,638
Claims priority, application Japan, Apr. 30, 1987, 62-107390
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—323 **4 Claims**



1. A circular direction vibrator comprising:
a support shaft;
a carrier member integral with said support shaft; and
a pair of vibrators each of which comprises a piezoelectric bimorph polarized such that the vibrator is capable of producing vibratory motion in a direction of thickness thereof when voltage is applied thereto,
each of said vibrators having a fixed end mounted to said carrier member and a free end that is unrestrained in the vibrator so that each of said vibrators is supported by said carrier member in a cantilever manner,
said vibrators extending from the fixed ends thereof in opposite directions from one another and symmetrically with respect to said support shaft, and
the polarization directions of said vibrators oriented such that when vibration is transmitted to said vibrators through said support shaft in direction of rotation of said support shaft, said vibrators generate voltage having the same phase, while when voltage is applied to said vibrators, said vibrators produce vibrations acting in a circular direction corresponding to a direction of rotation of said support shaft and which vibrations are transmitted to said support shaft through said carrier member integral therewith.

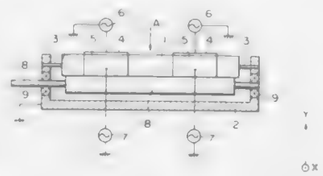
4,857,793

VIBRATION WAVE MOTOR

Takuo Okuno, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1987, Ser. No. 87,708
Claims priority, application Japan, Aug. 29, 1986, 61-202823
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—328 **11 Claims**

1. A vibration wave motor comprising:
(a) a bar-like member;
(b) means for supporting at least one end of said bar-like member;
(c) an electro-mechanical energy converting element provided in at least two different planes in mutually perpendicular planes in the lengthwise direction of said bar-like member, rotational movement being generated in the



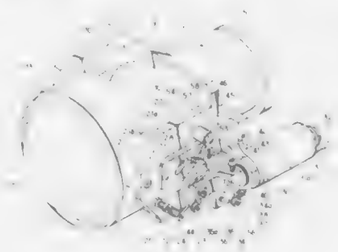
surface of said bar-like member when an electrical signal is applied to said converting element;
(d) a rotational member having an output shaft at one end thereof and rotatably supported; and
(e) urging means for imparting an urging force between said bar-like member and said rotational member.

4,857,794

SINGLE-FILAMENT HEADLAMP UNIT CAPABLE OF THROWING BOTH UPPER AND LOWER BEAMS

Saburo Watanabe, Shizuoka, Japan, assignor to Koito Seisakusho Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1987, Ser. No. 93,091
Claims priority, application Japan, Sep. 3, 1986, 61-208428; Jul. 11, 1987, 62-173698
Int. Cl.[4] H01K *1/30*
U.S. Cl. 313—113 **7 Claims**



1. An electric lamp unit for particular use as a vehicular headlamp capable of selectively throwing upper and lower beams, comprising:
(a) a reflector having an optical axis extending horizontally, a first focus, and a second focus disposed farther away from the reflector than is the first focus;
(b) a light source disposed at the first focus of the reflector, the reflector being capable of reflecting rays of light from the source so as to converge at the second focus thereof;
(c) a shade disposed adjacent the second focus of the reflector;
(d) a converging lens disposed opposite the reflector and having a focus in the vicinity of the shade;
(e) means for selectively and pivotally moving both the converging lens and the shade in fixed relation relative to the reflector between a "lower beam" position in which an optical axis of the converging lens is aligned with the optical axis of the reflector and in which the shade is placed adjacent the second focus thereby to permit the rays that have been reflected from approximately an upper half of the reflector to impinge on the converging lens, and an "upper beam" position which is disposed upwardly

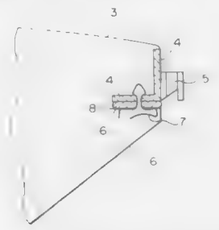
from the "lower beam" position and in which the shade is placed downward away from the adjacency of the second focus thereby to permit substantially all the rays that have been reflected from the reflector to impinge on the converging lens.

4,857,795

INTERNAL MAGNETIC SHIELD SUPPORT APPARATUS FOR COLOR PICTURE TUBE

Shoichi Wakita, Ichihara, and Shigemi Hirasawa, Chiba, both of Japan, assignors to Hitachi, Ltd. and Hitachi Device Eng. Co. Ltd., both of Tokyo, Japan

Filed Jul. 1, 1987, Ser. No. 68,410
Claims priority, application Japan, Jul. 2, 1986, 61-154028
Int. Cl.[4] H01J *29/02*
U.S. Cl. 313—402 **19 Claims**



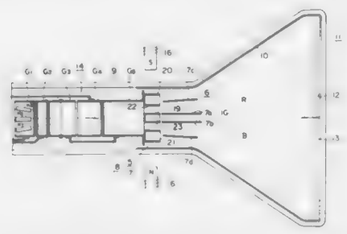
1. An internal magnetic shield support apparatus for a color picture tube, comprising: a mask frame secured to the interior surface of the periphery of a panel of the color picture tube, an internal magnetic shield arranged along the interior wall surface of a funnel of the color picture tube, and means including a fixing spring for fixedly positioning the internal magnetic shield to the mask frame and having a separate buffer member of a flexible material interposed therebetween so as to prevent contact between said internal magnetic shield and said mask frame, said buffer member having a pair of main surfaces respectively facing and in contact with said mask frame and said internal magnetic shield when they are fixedly positioned, and said buffer member being of such flexible material and disposed such that sliding between its main surfaces and said mask frame and said internal magnetic shield, respectively, is substantially prevented.

4,857,796

CATHODE-RAY TUBE WITH ELECTROSTATIC CONVERGENCE MEANS AND MAGNETIC MISCONVERGENCE CORRECTING MECHANISM

Yasunobu Amano, Tokyo, and Masayuki Sudo, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,577
Claims priority, application Japan, Dec. 27, 1986, 61-309736
Int. Cl.[4] H01J *29/72, 29/51*
U.S. Cl. 313—428 **2 Claims**



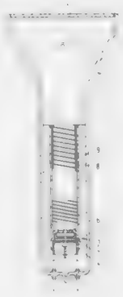
1. In a cathode-ray tube which has an envelope in which red, blue and green electron guns are mounted in one end which produce three color beams and a luminescent screen on the other end of the tube, a color selecting electrode mounted adjacent said luminescent screen, a plurality of grids mounted in said envelope and positioned so as to effect the electron beams from said red, blue and green electron guns, a convergence means comprising first, second, third and fourth conducting plates mounted between said fifth grid and said color selecting electrode and positioned so that one of said three color beams passes between said first and second conducting plates, a second one of said three color beams passes between said second and third conducting plates and a third one of said three color beams passes between said third and said fourth conducting plates, the improvement comprising, a correcting mechanism for correcting the vertical unsymmetrical misconvergence in said cathode tube including a magnet mounted outside said envelope and having a magnetic core with a south pole mounted on one side of said envelope and a north pole on the other side of said envelope so that flux passes between said north and south poles and a first magnetic metallic member which is hollow and has two opposite flat sides which are normal to the magnetic field of said magnet mounted in said envelope such that one of said three color beams passes therethrough so as to shield it from magnetic flux from said magnet, and including second and third hollow magnetic metallic members on opposite sides of said first electrically conductive member and a second one of said three color beams passes between said first and second hollow magnetic metallic members and a third of said three color beams passes between said first and third members.

4,857,797

CATHODE RAY TUBE HAVING A TUBULAR ELECTRON GUN STRUCTURE

Gerardus A. H. M. Vrijssen, and Tjerk G. Spanjer, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 843,367, Mar. 24, 1986, abandoned. This application Feb. 16, 1988, Ser. No. 156,373
Claims priority, application Netherlands, Feb. 17, 1986, 8600391
Int. Cl.[4] H01J *29/62, 29/88*
U.S. Cl. 313—450 **11 Claims**



1. A cathode ray tube comprising an envelope containing a screen and an electron gun for producing an electron beam directed at said screen, said electron gun comprising:
a. an insulating tube having a longitudinal axis and including a portion having a stepped inner surface defined by a plurality of inner wall sections situated at different positions along said axis and having differing perimeters;
b. a plurality of electrodes disposed in respective ones of the inner wall sections of the insulating tube, said electrodes including means for supporting an electron-emitting cathode and for forming the emitted electrons into the electron beam; and

c. a high-resistance layer disposed on an inner surface of the insulating tube and forming a spiral focusing lens at a position along the axis which will effect focusing of the electron beam at the screen.

4,857,798

FLUORESCENT LAMP WITH SILICA LAYER

Cheryl A. Ford, Byfield, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Jun. 12, 1987, Ser. No. 62,259
Int. Cl.[4] H01J *61/44, 61/35*
U.S. Cl. 313—487 5 Claims



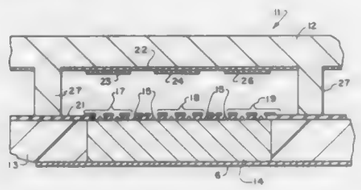
1. A fluorescent lamp comprising a glass lamp envelope having an inner surface; a pair of electrodes sealed in the envelope; a fill including an inert gas and mercury disposed within the envelope; a fine particle-size silica layer disposed on the inner surface of the lamp envelope, the silica layer containing greater than 0.7 mg/cm^2 of the fine particle-size silica; and a coating of phosphor having a CRI disposed over the silica layer, the fluorescent lamp having a CRI substantially equal to the CRI of the phosphor coating.

4,857,799

MATRIX-ADDRESSED FLAT PANEL DISPLAY

Charles A. Spindt, Menlo Park, and Christopher E. Holland, Redwood City, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jul. 30, 1986, Ser. No. 891,853
Int. Cl.[4] H01J *1/62*
U.S. Cl. 313—495 12 Claims



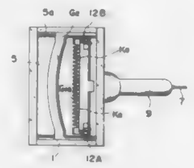
1. A flat panel display comprising:
A. a backing structure of a semiconductive material of a first conductivity type;
B. a transparent face structure spaced a selected distance from said backing structure;
C. a matrix array of individually addressable light generating means positioned between said backing structure and said face structure;
D. electrical drive means for energizing selected ones of said light generating means of said matrix array; and
E. electrical connections for each of said light generating means extending through said backing structure and fabricated of a semiconductive material of a second conductivity type opposite the conductivity type of said first-mentioned semiconductive material.

4,857,800

ELECTRON BEAM INDICATOR TUBE WITH ACCELERATING ELECTRODE

Akio Ohkoshi; Hideaki Nakagawa, both of Tokyo; Koji Tsuruta, Kanagawa; Yasuyoshi Sugii, Tokyo, and Haruaki Wada, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 2, 1988, Ser. No. 201,181
Claims priority, application Japan, Jun. 9, 1987, 62-143777
Int. Cl.[4] H01J *19/38, 63/06*
U.S. Cl. 313—495 6 Claims



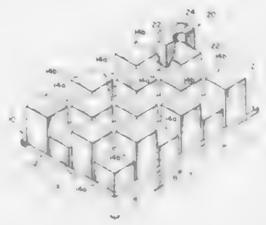
1. An electron beam indicator tube comprising:
fluorescent trios;
a plurality of linear cathodes disposed respectively opposite to the fluorescent layers of the fluorescent trios;
control electrodes; and
a common accelerating electrode disposed between the fluorescent trios and control electrodes;
characterized in that the common accelerating electrode is curved with respect to the direction of extension of the linear cathodes in a convex shape bulging out toward the fluorescent layers, and is formed so that the width of electron beam transmission apertures decreases from the central portion toward the opposite ends of the electron beam transmission apertures.

4,857,801

DENSE LED MATRIX FOR HIGH RESOLUTION FULL COLOR VIDEO

James F. Farrell, Downsview, Canada, assignor to Litton Systems Canada Limited, Rexdale, Canada

Continuation of Ser. No. 486,197, Apr. 18, 1983, abandoned.
This application May 28, 1987, Ser. No. 56,360
Int. Cl.[4] H05B *33/02, 33/10*
U.S. Cl. 313—500 10 Claims



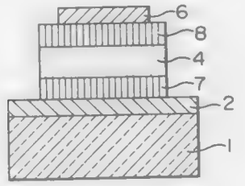
1. In a LED matrix of the type that includes a plurality of physically separate, addressable dice fixed to a substrate, the improvement comprising, in combination:
(a) individual LED dice being of at least two distinct predetermined heights; and
b) said dice being of such heights and positioned onto said substrate in a predetermined pattern whereby the heights of adjacent dice differ so that the closeness of inter-die spacing is not limited by the size of a positioning tool for grasping dice adjacent the upper portions thereof.

4,857,802

THIN FILM EL ELEMENT AND PROCESS FOR PRODUCING THE SAME

Moriaki Fuyama; Katsumi Tamura, both of Hitachi; Kazuo Taguchi, Katsuta; Kenichi Onisawa, Hitachi; Akira Sato, Takahagi; Kenichi Hashimoto, Katsuta; Takahiro Nakayama, and Yoshio Abe, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 24, 1987, Ser. No. 100,758
Claims priority, application Japan, Sep. 25, 1986, 61-224879
Int. Cl.[4] H01J *1/70;* C23C *15/00*
U.S. Cl. 313—506 10 Claims



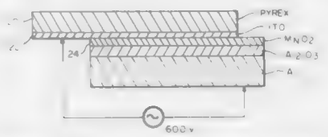
1. A thin film EL element which comprises an insulating substrate, a transparent electrode, a first insulating layer, a light-emitting layer, a second insulating layer and a back side electrode, successively laid one upon another, at least one of the first and second insulating layers being composed of a material of perovskite crystal structure whose crystal has been grown preferentially in the (111) plane such that the crystal has a diffraction intensity ratio of (111) plane to (110) plane, I(111-)/I(110), of more than 0.5.

4,857,803

METHOD OF PRODUCING ELECTROLUMINESCENCE AND ELECTROLUMINESCING LAMP

Scott Anderson, Sr., Champaign, Ill., assignor to Advanced Lighting International, Oak Wood Village, Ohio

Filed May 21, 1986, Ser. No. 865,392
Int. Cl.[4] H05B *33/14, 33/22, 33/28*
U.S. Cl. 313—509 26 Claims



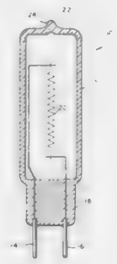
1. A method of producing electroluminescence in a metal oxide which comprises:
(a) providing a porous metal oxide electrolytically grown in an oxalic acid bath, wherein the metal of said metal oxide is selected from the group consisting of Al, Mn, Ta, Ti, Tl, W, Zr, Zn and mixtures thereof, and
(b) introducing electrons into the metal oxide in the absence of a chemical reaction by providing an insulator which includes silicon adjacent the oxide and subjecting the insulator to an electric field, the insulator having a thickness about the length of the mean free path of an electron in the electric field to which it is subjected, and said oxide having a thickness about the length of the mean free path of an electron in the electric field to which said insulator is subjected, to thereby excite electrons of the metal ions thereof sufficiently to cause the emission of photons upon the relaxation of such electrons to a valence band energy level.

4,857,804

TUNGSTEN-HALOGEN LAMP WITH METAL ADDITIVE

Robert M. Griffin, South Hamilton, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 706,245, Feb. 28, 1985, abandoned, and a continuation-in-part of Ser. No. 372,512, Apr. 28, 1982, abandoned. This application Mar. 31, 1986, Ser. No. 849,652
Int. Cl.[4] H01K *1/56, 1/50*
U.S. Cl. 313—557 13 Claims



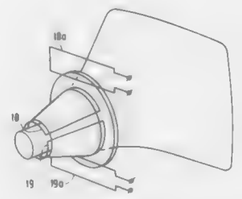
1. An incandescent lamp comprising:
a light-transmitting hermetically sealed, glass envelope having a longitudinal axis;
two lead-in wires of metallic material sealed in said envelope;
a tungsten filament attached to said lead-in wires and extending substantially along said longitudinal axis;
a fill gas within said envelope, said fill gas including a halogen; and
an amount of copper deposited on the surface of said filament and being in the form of a thin layer of substantially copper metal prior to initial lightup of said tungsten filament contained within said envelope, said copper metal being in addition to said metallic material of said lead-in wires, said copper being effective to substantially eliminate sagging of said filament regardless of the physical orientation of said lamp during use.

4,857,805

PICTURE DISPLAY DEVICE WITH STRAY FIELD COMPENSATION MEANS

Gerrit Bosch; Tjebbe R. Pasma; Albertus A. S. Sluyterman; Fransiscus M. P. P. Doomernik, and Steven M. Wielink, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 28, 1988, Ser. No. 187,614
Claims priority, application Netherlands, May 11, 1987, 8701109
Int. Cl.[4] H01F *13/00;* H01J *31/20*
U.S. Cl. 315—8 12 Claims



1. A picture display device having a display tube the rear part of which comprises a cylindrical neck accommodating a device for generating electron beams, whilst the front part is

funnel-shaped, the widest part being provided on the front side and comprising a display phosphor screen, said display device also being provided with an electromagnetic deflection unit mounted around part of the display tube for deflecting electron beams across the display screen and comprising a line deflection coil and a field deflection coil, and with a compensation coil system comprising at least one compensation coil for generating at least a magnetic dipole field, which compensation coil system is oriented in such manner and in operation is energisable in such manner that, measured at a predetermined distance from the operative display device, the magnetic field generated by the line deflection coil is at least partly compensated, characterized in that the compensation coil system is electrically connected to the line deflection coil and is provided with means to shift the phase of the current through the compensation coil with respect to the phase of the current through the line deflection coil.

4,857,806

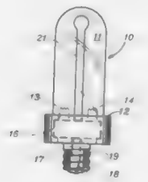
SELF-BALLASTED SCREW-IN FLUORESCENT LAMP

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Continuation-in-part of Ser. No. 262,542, May 5, 1981, Pat. No. 4,677,345, which is a division of Ser. No. 178,107, Aug. 14, 1980, abandoned. This application Mar. 2, 1987, Ser. No. 20,478

Int. Cl.[4] H01J 7/44

U.S. Cl. 315—72 21 Claims



1. An arrangement comprising:

gas discharge lamp means having lamp terminals;

frequency-converting power supply and ballasting means having input terminals and output terminals, the output terminals being: (i) connected with the lamp terminals, and (ii) operative, whenever either an AC voltage or a DC voltage of magnitude about equal to that of an ordinary power line voltage is applied to the input terminals, to provide operating voltage to the lamp terminals, the frequency of the operating voltage being different from that of the ordinary power line voltage; and

base means operative to rigidly and non-detachably hold together the lamp means and the frequency-converting power supply and ballasting means, thereby to form an integral lamp unit, the base means having: (i) a screw base operative to be screwed into and held by an ordinary Edison-type lamp socket, the lamp socket having socket electrodes, and (ii) electrode means connected with the input terminals and operative, after the base means having been screwed into the Edison-type lamp socket, to make contact with the socket electrodes.

4,857,807

AUXILIARY LIGHT MODULE FOR VEHICLES

Charles W. Hargis, Rte. 17, Paradise Lake, Brazil, Ind. 47834

Filed Sep. 2, 1987, Ser. No. 92,368

Int. Cl.[4] H05B 37/00

U.S. Cl. 315—77 17 Claims

1. An auxiliary light module for vehicles having a first type light system and a second type light system, both of which light systems are connected to and engergized by the vehicle's battery independently of the vehicle being provided with an auxiliary light module as defined below, and an input jack means having a first terminal for the first type light system and a second terminal for the second type light system,

the vehicle also having a battery and an output jack means having a first terminal for electrically energizing the vehicle's first type light system and a second terminal for electrically energizing the vehicle's second type light system,

the vehicle also having a first switch means for regulating the energization of the first type light system from the vehicle's battery, and second switch means for regulating energization of the second type light system from the vehicle's battery, the vehicle's said first switch means and said second switch means being operative to regulate the energization of the vehicle's first type light system and second type light system independently of the auxiliary light module defined below;

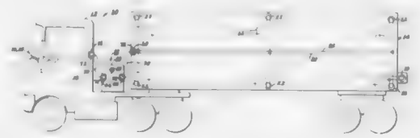
the module comprising:

a switch means;

a battery;

a first input jack means and a second output jack means;

the module's first input jack means having a first terminal for connection to the vehicle's output jack means' first terminal for energizing the vehicle's first type light system, and a second terminal for connection to the vehicle's output jack means' second terminal for energizing the vehicle's second type light system;



the module's second output jack means having a first terminal for connection to the vehicle's input jack means' first terminal for energizing the vehicle's first type light system, and a second terminal for connection to the vehicle's input jack means' second terminal energizing the vehicle's second type light system;

the module also comprising first circuitry for interconnecting the said first terminals of the vehicle's said output jack means and of the vehicle's said input jack means, and second circuitry for interconnecting the said second terminals of the vehicle's said output jack means and of the vehicle's said input jack means;

the module also having energizing circuitry connecting, in parallel, the said module's first circuitry to the module's switch means and connecting the said module's second circuitry to the module's switch means;

and energizing circuitry connecting the module's battery to the module's switch means;

the module's components and circuitry providing that if its second jack means is connected to the vehicle's input jack means, the module's switch means will permit the module's battery to energize one or both of the vehicle's first type light system and second type light system independently of any energization by the vehicle's battery.

4,857,808

MODIFIED IMPEDANCE RAPID START FLUORESCENT LAMP SYSTEM

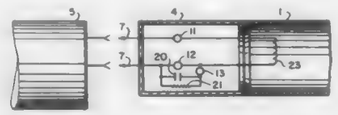
William J. Lally, Verona, N.J., and Edward W. Morton, Boston, Mass., assignors to North American Philips Corporation, New York, N.Y.

Filed Sep. 1, 1988, Ser. No. 240,436

Int. Cl.[4] H05B 41/36

U.S. Cl. 315—100 10 Claims

1. A rapid start fluorescent lamp system comprising at one end of a lamp a normally closed thermal bimetal switch at each side of a cathode, and a circuit connected in parallel with one said bimetal switch, said circuit including a parallel connection of a current limiting capacitor and a bleeder resistor, and a



third normally closed thermal bimetal switch connected in series with the parallel connection of said current limiting capacitor and said bleeder resistor.

4,857,809

MICROWAVE ION SOURCE

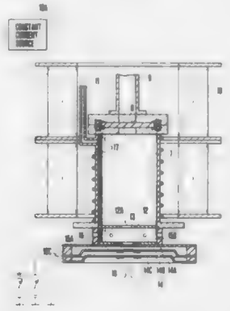
Yasuhiro Torii; Seitaro Matsuo; Iwao Watanabe, and Masaru Shimada, all of Kanagawa, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Continuation of Ser. No. 743,166, Jun. 10, 1985, abandoned. This application Jun. 27, 1988, Ser. No. 210,137

Claims priority, application Japan, Jun. 11, 1984, 59-118258

Int. Cl.[4] H01J 7/24

U.S. Cl. 315—111.31 11 Claims



1. A microwave ion source utilizing a microwave and a magnetic field, comprising: a microwave waveguide, a plasma generation chamber having a cylindrical or rectangular cavity and having an inner wall, said chamber having a cross-section which corresponds to a plasma generation region, said plasma generation region being wider than that of said microwave waveguide, a microwave introducing window disposed at an inlet port of said plasma generation chamber for introduction of a microwave from said microwave waveguide, said microwave being introduced to said plasma generation chamber through said microwave introducing window; a magnetic circuit, arranged outside said plasma generation chamber, for generating in said plasma generation chamber a magnetic field having a higher intensity than that given by electron cyclotron resonance conditions so as to form a narrow high-density plasma portion in the center of said plasma generation region around the central axis of said plasma generation chamber, said magnetic circuit including a plurality of coils surrounding said plasma generation chamber along a longitudinal direction thereof such that said magnetic field is generated by said plurality of coils at the inlet port of said plasma generation chamber, said magnetic field being stronger near said microwave introducing window and weaker near an outlet port of said chamber such that the intensity of said magnetic field at the inlet port along the lateral direction is substantially uniform, and an ion extraction electrode system which has an ion extraction window whose contour falls within a restricted center region of said narrow high density plasma part of said plasma generation region and whose diameter is smaller than that of said plasma generation region, whereby said high density plasma portion is generated about the center portion of the plasma generation region to thereby extract a high-density ion beam and reduce the quantity of plasma which is contaminated by contact with the inner wall of said plasma generation chamber.

4,857,810

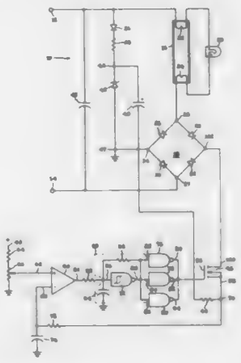
CURRENT INTERRUPTION OPERATING CIRCUIT FOR A GASEOUS DISCHARGE LAMP

Kenneth A. Roll, Kirtland; John M. Davenport, Lyndhurst, and Pieter J. von Herrmann, Shaker Heights, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 17, 1987, Ser. No. 26,808

Int. Cl.[4] H05B 41/36

U.S. Cl. 315—194 22 Claims



6. A method for operating low pressure, gas discharge lamps having electrodes comprising the steps of:

applying a sinusoidal input waveform across a first pair of a-c terminals of a rectifier circuit connected electrically in series with a low pressure gas discharge lamp, having an envelope containing discharge gas atoms, and a current interrupt switch, said current interrupt switch controlling, on a periodic basis, the durations of the current flowing through the lamp, said durations having an on-time for ionization of said discharge gas atoms and an off-time for deionization of said discharge gas atoms,

imposing a voltage upon the electrodes of the low pressure, gas discharge lamp to start said lamp;

imposing, by means of said current interrupt switch, a high frequency waveform across said lamp, said current interrupt switch having duty cycle or on-off times which are controlled in response to the amplitude of said sinusoidal input waveform, said off times of said current interrupt switch having durations which vary inversely as said amplitude of said input waveform, and

controlling said duty cycle to maintain a predetermined level of ionization of discharge gas atoms within the envelope of said lamp by controlling the on-off times of said gas discharge lamp.

4,857,811

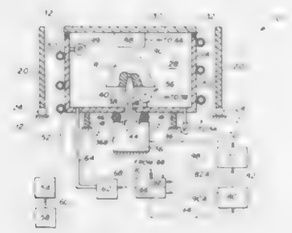
EVACUATION PUMP CONTROL FOR A CENTRIFUGE INSTRUMENT

Lawrence R. Barrett, Brookfield, Conn.; Ronald C. Robertson, Wilmington, Del., and Mark A. Sullivan, Woodbury, Conn., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Mar. 31, 1988, Ser. No. 175,823

Int. Cl.[4] H02D *5/06*

U.S. Cl. 318—3 **4 Claims**



1. A centrifuge instrument comprising:
a framework;
a bowl having a volume defined therein, the bowl being supported on the framework;
a drive motor mounted to the framework, the motor having a drive shaft that projects into the interior of the bowl, the shaft having an upper end thereon, the upper end of the shaft being arranged to accept any one of a predetermined plurality of centrifuge rotor elements thereon;
a pump for evacuating the interior volume of the bowl to a predetermined pressure level;
means for identifying the particular one of the plurality of rotor elements mounted within the bowl and for generating a signal representative thereof; and
pump control means responsive to the signal representative of the particular rotor mounted within the blow for controlling the pressure within the bowl at a predetermined level corresponding to the particular rotor.

4,857,812

ELECTRIC MOTOR SYSTEM FOR AUTOMOBILES

Wataru Mochizuki; Seiichi Ogino, and Hirohiko Takano, all of Kiryu, Japan, assignors to Mitsuba Electric Mfg. Co., Ltd., Gunma, Japan

Filed Jul. 6, 1987, Ser. No. 69,970

Claims priority, application Japan, Jul. 7, 1986, 61-159356; Jul. 7, 1986, 61-159357; Jul. 7, 1986, 61-159358; Aug. 11, 1986, 61-[illegible]

Int. Cl.[4] H02K *7/116*

U.S. Cl. 318—15 **8 Claims**



1. An electric motor system for automobiles having an electric motor and a control circuit for the motor, wherein the control circuit is attached to a detachable cover of the motor in a mutually heat conducting relationship, said motor system further comprises a speed reduction unit and said detachable cover is detachably attached to a housing for the speed reduction unit wherein said control circuit comprises a circuit board mounted with printed circuit elements and chip circuit elements including a semi-conductor device, said control circuit is encapsulated in resin material, wherein the control circuit comprises a switch which is activated by a moving part of the speed reduction unit.

4,857,813

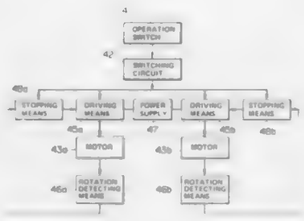
SELF-STOPPING MOTOR CONTROL CIRCUIT

Yasuki Matsumoto, Sagamihara, and Masaru Kato, Hiratsuka, both of Japan, assignors to Jidosha Denki Kogyo Kabushiki Kaisha, Kanagawa, Japan

Filed Mar. 17, 1987, Ser. No. 26,707

Int. Cl.[4] H02P *3/08, 7/68*

U.S. Cl. 318—54 **5 Claims**



1. A motor control circuit, comprising:
an operation switch to issue a forward rotation or reverse rotation signal;
driving means to operate a motor in a forward or reverse direction in response to the forward rotation or reverse rotation signal from said operation switch;
rotation detecting means to detect a rotating condition of said motor;
stopping means to cut off the power to said motor when, during the operation of said operation switch, said rotation detecting means continues to detect that the rotation of the motor has been stopped for a certain period of time; and
cancelling means for turning said stopping means to a non-operating condition when the forward rotation or reverse rotation signal from said operation switch is interrupted.

2. A motor control circuit, comprising:
a single operation switch to issue a forward rotation or a reverse rotation signal;
a plurality of motors;
a plurality of driving means to operate the motors respectively in a forward or reverse direction in response to the forward rotation or reverse rotation signal from said single operation switch;
a plurality of rotation detecting means to detect rotating conditions of said motors; and
a plurality of stopping means to automatically cut off the power to respective ones of said motors independently of the supply of power to others of said plurality of motors when said rotation detecting means continue to detect that the rotation of said respective ones of said motors has been stopped.

4,857,814

ELECTRONIC MOTOR CONTROLS, LAUNDRY MACHINES INCLUDING SUCH CONTROLS AND/OR METHODS OF OPERATING SUCH CONTROLS

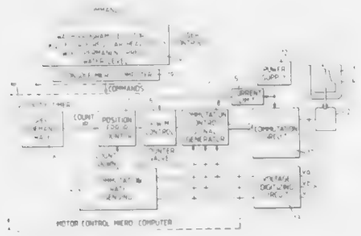
Gerald D. Duncan, Remuera, New Zealand, assignor to Fisher & Paykel, Auckland, New Zealand

Filed Sep. 16, 1986, Ser. No. 908,176

Claims priority, application United Kingdom, Sep. 16, 1985, 213489; Sep. 16, 1985, 213490

Int. Cl.[4] H02P *1/22, 3/12*

U.S. Cl. 318—281 **34 Claims**



6. A method for driving an electronically commutated motor cyclically in opposite directions during each of a sequence of half cycles, each half cycle comprising the steps of
applying electrical power driving the motor in a reverse direction from the prior cycle causing acceleration of the motor towards a desired speed, switching power off to the motor and reducing the speed of the motor to a condition where applying power in the next half cycle will reverse the direction of motor rotation,
determining resistance to rotation of the motor, and
adjusting the power applied to the motor in the step of applying power so as to cause acceleration of the motor in accordance with the resistance to motor rotation determined during the prior half cycle.

10. Electrical control means for cyclically controlling the supply of electrical power to an electric motor having a rotor said control means comprising switching means to switch power on and off to said motor, power on timing means to time the length of power on time when power is switched on, coasting timing means to time the length of coasting time said rotor takes from the time power is switched off thereto to the time when said rotor has slowed to a condition in which the rotor rotation may be reversed (condition for reversing), the control means controlling the amount of power applied to the motor in accordance with the coast time and reversing means to reverse the direction of said rotor when said rotor is in the condition for reversing and to switch power by said switching means when reversing is to be effected.

32. A method of cyclically reversing an electronically commutated motor having a plurality of windings on a stator and a rotor having magnetic poles rotatable relative to said stator, said method comprising the steps of
(a) removing substantially all the power from the windings and, while the rotor is rotating, allowing the rotor to coast towards zero speed of rotation, and
(b) when the rotor has slowed to a condition in which application of a reversed commutation will cause reversal of rotation at any time between a still rotating condition of the rotor and substantially the time the rotor has stopped rotation (condition for reversing) and without delay, applying power to the stator windings and effecting entry at the correct sequence of commutations of power to the windings to cause the rotor to change direction and to maintain rotor rotation in the changed direction.

4,857,815

SWITCH FOR ENERGIZING AN ELECTRIC MOTOR OF A WIPER SYSTEM

Herbert Erdelitsch; Otto Machalitzky, and Josef-Elmar Prang, all of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to SWE Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

PCT No. PCT/EP87/00298, § 371 Date Apr. 11, 1988, § 102(e) Date Apr. 11, 1988, PCT Pub. No. WO87/07567, PCT Pub. Date Dec. 17, 1987

PCT Filed Jun. 5, 1987, Ser. No. 172,726

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1986, 3619587

Int. Cl.[4] H02P *1/04*

U.S. Cl. 318—443 **13 Claims**



1. An electric switch for energizing an electric motor of a windshield wiper system especially used for automotive vehicles having a voltage source, comprising a switching member with two bridging contacts and further comprising a plurality of stationary contacts arranged along two contact paths, said switch being manually adjustable into several switching positions for continuous operation and one position for intermittent operation of the windshield wiper system, a first one of said bridging contacts engaging stationary contacts on a first contact path and a second one of said bridging contacts engaging alternate stationary contacts on a second contact path, having at least one position of the switching member in which the first bridging contact energizes a mode of operation other than intermittent operation, and having at least one other position of the switching member in which the second bridging contact also energizes a mode of continuous operation.

4,857,816

PRECISE POSITIONING APPARATUS

Joseph Rogozinski, 14 Motza Street, 52366 Ramat Gan, and Ilan Cohen, 90 Zahal St., Kiron, both of Israel

Filed Oct. 8, 1987, Ser. No. 107,481

Claims priority, application Israel, Feb. 5, 1987, 81487; Sep. 10, 1987, 83854

Int. Cl.[4] G05B *11/01*

U.S. Cl. 318—632 **31 Claims**

1. A positioning apparatus comprising:
driving means;
transmission means coupled to said driving means and to a load;
position sensing means coupled to said driving means;
means for sensing input power to said driving means;
inaccuracy compensation control means receiving a first input from said position sensing means indicating the position of said driving means and a second input from said means for sensing input power and providing a compensated output indication indicating the position of the load on the basis of information regarding non-linearities

in position changes between the driving means and the load including information indicative of whether or not



the load is driving the driving apparatus or the driving means is driving the load.

4,857,817

DRIVE CIRCUIT FOR STEPPING MOTOR

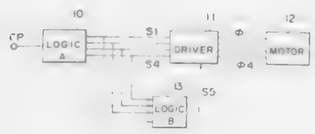
Michihiro Kugioka, Yokohama, Japan, assignor to Canon Kabushiki Kaisha and Canon Seki Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 26, 1988, Ser. No. 148,690

Claims priority, application Japan, Jan. 30, 1987, 62-020169[U]

Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—696 4 Claims



1. A stepping motor for alternately repeating 1- and 2-phase excitation modes comprising:

drive signal generating means for sequentially generating a drive signal so that the 1- and 2-phase excitation modes are alternately repeated;

a plurality of excitation coils which are driven in the 1- or 2-phase excitation mode in accordance with the drive signal from said drive signal generating means;

switching signal generating means for generating a switching signal corresponding to the 1- or 2-phase excitation mode in accordance with the drive signal from said drive signal generating means; and

setting means for switching and setting an excitation current value to said excitation coils in accordance with the 1- or 2-phase excitation mode,

wherein said setting means switches and sets said excitation current value by changing resistance, said setting means having a first circuit and a second circuit for changing said excitation current value by changing resistance, and said first circuit and said second circuit being switched in accordance with said switching signal.

4,857,818

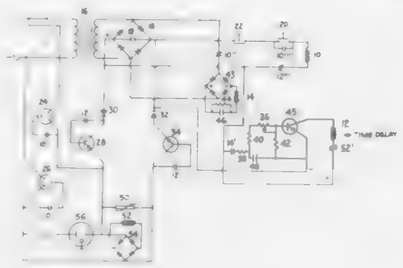
ELECTRIC MOTOR BRAKE

Taz D. Hobbs, 600 Orange, LaMarque, Tex. 77568

Filed May 3, 1988, Ser. No. 189,721

Int. Cl.[4] H02P *3/24*

U.S. Cl. 318—762 4 Claims



1. A device for selectively supplying AC power and DC braking current to an AC electrical motor having a power cord, comprising:

a transformer;

means connecting a primary stage of said transformer to an external AC source;

rectifier means connected to a secondary stage of said transformer for producing a DC source;

an output plug for supplying current to the AC electric motor through the power cord thereof;

a pair of triacs connecting said output plug to said primary transformer stage;

relay means connected to said secondary transformer stage and operatively connected to energize said triacs to allow flow from said primary transformer stage to said output plug;

first switch means connected to said secondary transformer stage for selectively activating said relay means;

second switch means for simultaneously deactivating said relay means, stopping current flow from said primary transformer stage through said triacs to said output plug, and for connecting said DC source to said output plug; and

adjustable timing circuit means for regulating the time duration of said DC supplied to said out plug.

4,857,819

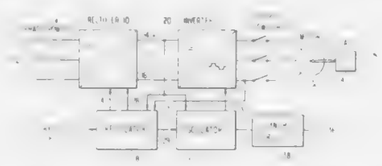
CONNECTION OF STATIC INVERTER TO A RUNNING MOTOR

James Maurice; David J. Collins, both of Swindon, Wilts; Michael O. Hall, Gloucester, and Peter D. McLoughlin, Swindon, Wilts, all of United Kingdom, assignors to Emerson Electric Co., Santa Ana, Calif.

Filed Oct. 1, 1981, Ser. No. 307,433

Int. Cl.[4] H02P *1/30*

U.S. Cl. 318—778 7 Claims



1. A method of attaching a free running induction motor to an inverter which characteristically outputs a variable-frequency waveform for driving the motor, said method comprising the steps of:

establishing the frequency of the variable-frequency waveform output from the inverter at a level exceeding the rotational speed of the motor,

establishing a current limit for the inverter,

connecting the inverter to the free running motor,

lowering the frequency of the variable-frequency waveform output from the inverter at a controlled rate while permitting the voltage level of the variable frequency waveform to drop until the frequency of the variable-frequency waveform is substantially equal to the rotational speed of the motor, and

allowing the output voltage of the inverter to rise and provide primary power to the motor.

4,857,820

CORDLESS BATTERY CHARGER

John C. Tompkins, 202 W. Heard, and Charles E. Cook, 607 E. Ymbacion, both of Refugio, Tex. 78377

Filed Sep. 8, 1987, Ser. No. 94,115

Int. Cl.[4] H02J *7/00*

U.S. Cl. 320—2 20 Claims



1. A self-contained battery charger for use in charging an automotive-type battery that has a pair of terminals, said battery charger comprising:

battery means providing a predetermined battery voltage;

means powered by said predetermined battery voltage for creating an AC voltage signal of predetermined magnitude;

rectifier means for converting said AC voltage signal to a DC voltage of predetermined magnitude;

summing means for creating a battery charging signal formed by adding said predetermined battery voltage to said DC voltage; and

conveying means for conveying said battery charging signal from said summing means to the terminals of said automotive-type battery to charge the automotive-type battery.

4,857,821

REACTIVE POWER COMPENSATION SYSTEM

Masatoshi Takeda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,459

Claims priority, application Japan, Mar. 27, 1987, 62-71734

Int. Cl.[4] G05F *1/70*

U.S. Cl. 323—210 1 Claim

1. A reactive power compensation system operating to compensate a variation of reactive power created by a load in connection with a power system in such a manner of feeding a compensating reactive power produced on the basis of the load reactive power by a reactive power compensating circuit back to said power system, said reactive power compensating circuit comprising an inverter which compensates a sharp varying component of the load reactive power by being controlled in a fast, pulse-width modulation mode by a control circuit, and a capacitor which compensates an average-level component of the load reactive power by being connected to said power system through a switch wherein said control circuit comprises a reactive power calculating circuit which calculates the value of reactive power flowing into said load, a comparison circuit which compares the value of reactive power calculated by said calculating circuit with preset power levels, a switch control circuit which controls said switch in response to a command from said comparison circuit, a subtraction circuit which receives the value of reactive power dealt with by said capacitor through an electronic switch to



subtract the reactive power value of said capacitor from the reactive power value of said load, a pulse-width modulation (PWM) control circuit which receives the output of said subtraction circuit to produce a PWM signal, and a switch drive circuit which controls said inverter in response to the output signal of said PWM control circuit.

4,857,822

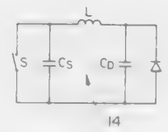
ZERO-VOLTAGE-SWITCHED MULTI-RESONANT CONVERTERS INCLUDING THE BUCK AND FORWARD TYPE

Wojciech A. Tabisz, and Fred C. Lee, both of Blacksburg, Va., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Continuation-in-part of Ser. No. 99,965, Sep. 23, 1987, Pat. No. 4,841,220. This application Apr. 11, 1988, Ser. No. 179,926

Int. Cl.[4] G05F *1/56*

U.S. Cl. 323—282 4 Claims



1. A zero-voltage-switched multi-resonant converter comprising:

switching means operative in open and closed circuit positions;

first resonant capacitor means in parallel with said switching means;

rectifying diode means in series with said switching means, said rectifying means and said switching means forming a closed-loop;

second resonant capacitor means in parallel with said rectifying diode means; and

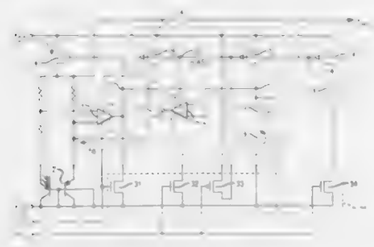
inductor means inserted in said closed loop for forming a resonant circuit with the first and second resonant capacitor means.

4,857,823

BANDGAP VOLTAGE REFERENCE INCLUDING A PROCESS AND TEMPERATURE INSENSITIVE START-UP CIRCUIT AND POWER-DOWN CAPABILITY

Ricky F. Bitting, Fort Collins, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 22, 1988, Ser. No. 248,218
Int. Cl.[4] G05F *3/16*
U.S. Cl. 323—314 9 Claims



1. A bandgap reference circuit with reliable start-up comprising:
- a first path for current flow having a first bipolar transistor connected in electrical series with a first resistive element;
- a second path for current flow having a second bipolar transistor, of materially different emitter electrode area than the first transistor, connected in electrical series with a second resistive element;
- a node defined by the common connection of the base electrodes of the first and second bipolar transistors and a bipolar transistor collector electrode;
- means for detecting differences in the magnitudes of the currents flowing in the first and second paths, and providing an output signal proportional thereto;
- means for regulating the current flow through the first and second paths responsive to the output signals from the means for detecting;
- a third path for current flow having a third bipolar transistor, of similar emitter electrode area to that of the first bipolar transistor, connected in electrical series with a load element;
- means for detecting a current flow in the third path, for detecting the enablement state of the means for regulating, and for injecting current into the first path bipolar transistor upon coincidence of a current flow in the third path and a disabled state in the means for regulating.

4,857,824

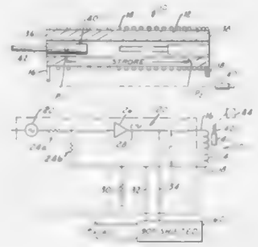
MOVABLE CORE POSITION TRANSDUCER

Sydney K. Tew, New Baltimore, Mich., assignor to Cadillac Gage Textron Inc., Warren, Mich.

Continuation of Ser. No. 74,355, Jul. 16, 1987, abandoned. This application Aug. 29, 1988, Ser. No. 237,439
Int. Cl.[4] G05F *3/04*
U.S. Cl. 323—347 4 Claims

1. A position measuring system comprising:
- a mechanical device having a mechanical displacement;
- a drive rod operatively coupled to said mechanical device to be moved linearly in response to mechanical displacement of said mechanical device;
- a transducer for measuring the mechanical displacement of said mechanical device;
- a single coil wound on said coil former means having only two leads;
- a constant current source connected across said leads;
- means connected across said leads for suppressing the real component of the output voltage produced across said leads corresponding to the imaginary component of the output voltage produced across said leads by the constant current source;
- a finite length core of high permeability material located within said coil former means connected to said drive rod to be moved linearly within said coil former means;

said core being positioned by said drive rod at an initial position wholly within said coil former means to be electromagnetically coupled with first segments of said single



coil to produce an initial signal corresponding to an initial position of said mechanical device;

said single coil having a non-linear winding pattern between said two leads, said core progressively electromagnetically coupling to said single coil as said core moves linearly within said coil former means so that movement of said core will produce a linear inductance variation across said leads which corresponds to the linear movement of said core within said coil former means.

4,857,825

VOLTAGE CONTROLLED RESISTOR

Robert D. Andersen, West Covina, Calif., assignor to Datatape, Inc., Pasadena, Calif.

Filed Sep. 16, 1988, Ser. No. 245,473
Int. Cl.[4] G05B *24/02*
U.S. Cl. 323—353 13 Claims



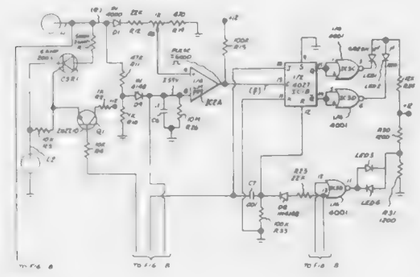
1. A voltage controlled resistor circuit comprising:
- an operational amplifier having an output and an input;
- a radiation source electrically connected to said output of said operational amplifier;
- a feedback radiation sensitive resistor which is optically coupled to said radiation source and which is electrically connected to the input of said operational amplifier;
- a controlled radiation sensitive resistor which is optically coupled to said radiation source, but which is electrically isolated from said radiation source;
- controllable voltage means for applying a preselected control voltage to said input of said operational amplifier to change the radiation output of said radiation source in order to produce a preselected resistance of both said feedback radiation sensitive resistor and said controlled radiation sensitive resistor, wherein said preselected resistances are a function of said preselected control voltage; and
- a compensation circuit, electrically connected between said input and output of said operational amplifier, for stabilizing the preselected resistance of said controlled radiation sensitive resistor to a precise constant value, wherein said compensation circuit has a time constant which compensates for the lag produced by the optical feedback response of said feedback radiation resistor to said radiation source.

4,857,826

TESTER SYSTEM FOR ELECTRICAL POWER CIRCUITS TERMINATED AT AN OUTLET PLUG RECEPTACLE

George A. Graham, Buffalo, N.Y., assignor to Polytronics, Inc., Buffalo, N.Y.

Filed Nov. 26, 1986, Ser. No. 936,684
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—508 14 Claims



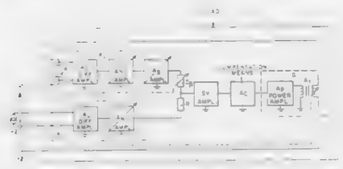
1. A tester system which automatically and safely tests the capacity of an electrical power circuit having AC liners, which lines are terminated at an outlet to operate at rated load current when said system is connected to said electrical power circuit at said outlet, said system comprising means for deriving from said electrical power circuit a reference voltage corresponding to the AC line voltage at said outlet, means for deriving from said electrical power circuit a pulse of current at the rated load of said circuit which pulse commences sufficiently close to the zero crossover in the AC cycle to avoid unsafe transients in said electrical power circuit, and means for comparing a voltage corresponding to said pulse and said reference voltage for providing an indication of said capacity.

4,857,827

ELECTRONIC LOAD FOR TESTING TRANSFORMERS

István Zoltán, Budapest, Hungary, assignor to Tettex AG, Zurich, Switzerland

Filed Apr. 6, 1987, Ser. No. 35,055
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611261
Int. Cl.[4] G01R *31/00*
U.S. Cl. 324—55 18 Claims



1. An adjustable electronic load for use in testing current transformers, comprising:

input voltage terminals (U_1, U_2) and input current terminals (I_1, I_2) adapted to be coupled to a transformer to be tested;

current-to-voltage converter means (K_I) having an input and an output;

voltage-to-voltage converter means (K_U) having an input coupled between input voltage terminals (U_1, U_2) of the electronic load, and further having an output;

controlled voltage generator means (G) having a control input and an output;

a series connection of said input of said current-to-voltage converter means (K_I) and said output of said controlled voltage generator (G) being connected between input current terminals (I_1, I_2) of the electronic load;

first impedance means (Z_B) coupling the output of said current-to-voltage converter means (K_I) to said control input of said controlled voltage generator means (G);

second impedance means (R) coupling the output of said voltage-to-voltage converter means (K_U) to said control input of said controlled voltage generator means (G);

said voltage-to-voltage converter means (K_U) and said current-to-voltage converter means (K_I) each comprising at least one respective adjustable amplifier having an adjustable amplification factor;

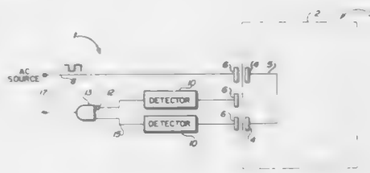
adjusting means coupled to said adjustable amplifiers of said voltage-to-voltage converter means (K_U) and of said current-to-voltage converter means (K_I) for adjusting said amplification factors of said adjustable amplifiers jointly in opposite directions such that the amplification factor of one of said adjustable amplifiers increases while the amplification factor of the other of said adjustable amplifiers decreases and vice versa, so that with a given rated secondary power of a current transformer being tested, the amplification of said current-to-voltage converter means (K_I) is decreased and the amplification of said voltage-to-voltage converter means (K_U) is increased for increasing the rated secondary current of a current transformer being tested, and the amplification of the voltage-to-voltage converter means (K_U) is decreased and the amplification of the current-to-voltage converter means (K_I) is increased for decreasing the rated secondary current of a current transformer being tested.

4,857,828

METHOD AND APPARATUS FOR DETECTING PRESENCE OF OBJECTS

David H. Celine, Durban, South Africa, assignor to Control Logic (Proprietary) Limited, Duran, South Africa

Filed May 29, 1987, Ser. No. 55,417
Claims priority, application South Africa, May 30, 1986, [illegible]/4045
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—61 R 10 Claims



1. A method of detecting the presence of a tape cassette in a predetermined position comprising: locating first electrically connected surfaces in a coded pattern on said tape cassette, the surfaces each defining first electrodes of respective capacitors; locating at the predetermined position, and in accordance with the coded pattern on said tape cassette, second surfaces, which define opposite electrodes of said respective capacitors when the tape cassette is in the predetermined position; and, testing by means of an alternating electrical signal source and detector, applied at the predetermined position, whether the opposite and first electrodes match to form capacitances thereby completing an electrical circuit from source to detector

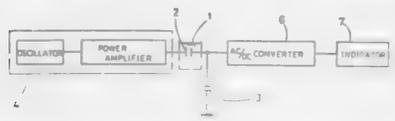
through the tape cassette, said first electrically connected surfaces being located behind a side wall of said tape cassette which serves as a spacing between the first and opposite electrodes in use.

4,857,829

WATER-SOLUBLE OIL PROPERTY DETECTION DEVICE

Takashi Sagae, Tokai, and Takayuki Kato, Aichi, both of Japan, assignors to Aichi Steel Works Ltd., Tokai, Japan

Filed Apr. 4, 1988, Ser. No. 177,445
Int. Cl.[4] G01R *27/26;* **G01N** *33/28*
U.S. Cl. 324—61 R **6 Claims**



1. A device for detecting a lubricating and rust preventing property of water-soluble oil used in hydraulic pressure-operated devices, said device comprising:
- a pair of electrodes placed in the water-soluble oil;
- a capacitor connected in series between one end of said pair of electrodes and ground and forming a filter circuit with the resistance of said water-soluble oil between said pair of electrodes;
- a high-frequency power source including a high-frequency oscillator circuit and a power amplifier and which is connected across the series combination of said capacitor and pair of electrodes;
- an AC-DC converter circuit for detecting a high-frequency voltage value occurring across said capacitor and for converting said value to a direct current voltage signal;
- an indicator for indicating the output of said converter circuit in correspondence to changes in said property of said water-soluble oil,

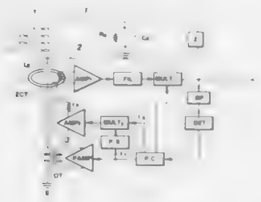
said high-frequency power source generating a high-frequency voltage of a frequency at which the voltage occurring across said capacitor is in a range of about one-fifth to four-fifths of the voltage generated by said high-frequency power source.

4,857,830

METHOD FOR MEASURING INSULATION RESISTANCE OF ELECTRIC LINE

Tatsuji Matsuno, Kanagawa, Japan, assignor to Toyo Communication Equipment Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1988, Ser. No. 266,695
Int. Cl.[4] G01R *31/00, 31/12*
U.S. Cl. 324—62 **2 Claims**



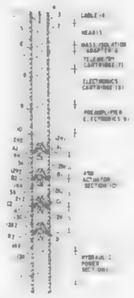
2. A method of measuring an insulation resistance of an electric line, in which a low frequency signal having a frequency f_1 different from a commercial frequency is applied to said electric line through a first transformer coupled to a grounding conductor of a voltage transformer of the electric line or to the electric line, a leakage current component of said low frequency signal fed back to said grounding conductor is applied to a first input of synchronous detecting means to obtain a synchronous detection signal, and said synchronous detection signal is used to measure said insulation resistance between the electric line and the earth; said method comprising the steps of:
- branching said low frequency signal;
- changing with a frequency f_2 a current value of said branched low frequency signal shifted by 90 degrees;
- causing said frequency-changed current to act on leakage current component extracting means; and
- controlling a phase of a signal applied to a second input of said synchronous detecting means so that a component of said synchronous detection signal having the frequency f_2 becomes minimum.

4,857,831

BOREHOLE CASING DIAGNOSTIC APPARATUS AND METHOD

Dylan H. Davies, Tokyo, and Jiro Takeda, Yokohama, both of Japan, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 29, 1986, Ser. No. 947,314
Int. Cl.[4] G01R *27/00*
U.S. Cl. 324—65 CR **28 Claims**



1. An apparatus for investigating an elongated casing, comprising:
- (a) a housing which is connected to a cable such that said apparatus is movable along the length of said casing;
- (b) a plurality of electrodes;
- (c) positioning means provided in said housing for positioning said plurality of electrodes in an extended position where said plurality of electrodes are in contact with said casing and in a retracted position where said plurality of electrodes are held closer to said housing and said apparatus is free to move along the length of said casing;
- (d) measuring means provided inside of said housing and electrically connected to said plurality of electrodes for measuring at least the potential difference of said casing between the locations where said plurality of electrodes are in contact with said casing, wherein the potential difference information of said casing measured by said measuring means is amplified by said measuring means, and the amplified information is transmitted through said cable for processing; and
- (e) control means provided in said housing for controlling the operation of said positioning means and said mesuring means.

4,857,832

METHOD OF AND APPARATUS FOR THE MEASUREMENT OF SLOWLY CHANGING OR STATIC ELECTRICAL POLARIZATION

James H. Appleby, 5, Tweddle Terrace, Bowburn, Co. Durham, United Kingdom (DH6 5AF)

Filed Feb. 16, 1988, Ser. No. 155,857
Int. Cl.[4] G01R *19/14*
U.S. Cl. 324—72 **12 Claims**



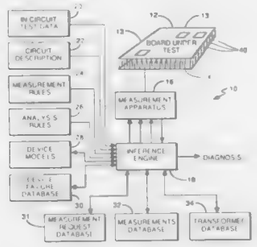
1. A method for measuring changes in electrical polarization utilizing a measuring circuit, the method including the steps of:
- (a) detecting when the polarization reaches a first voltage level;
- (b) changing the input impedance of the measuring circuit from high to low when said first voltage level has been reached;
- (c) detecting when the polarization has reached a second voltage level as a result of the low impedance change;
- (d) changing the input impedance of the measuring circuit from low to high when the polarization reaches the second voltage level;
- (e) summing over a period of time the number of occurrences of the changes of input impedance of the measuring circuit set forth in steps (b) and (d); and
- (f) determining from the summation the magnitude of the change in electrical polarization.

4,857,833

DIAGNOSIS OF FAULTS ON CIRCUIT BOARD

Roberto Gonzalez, Franklin, and Lawrence S. Apfelbaum, West Newton, both of Mass., assignors to Teradyne, Inc., Boston, Mass.

Filed Aug. 27, 1987, Ser. No. 89,828
Int. Cl.[4] G01R *31/00, 31/02*
U.S. Cl. 324—73 R **76 Claims**



2. A method of determining which of a plurality of electrical devices connected to a single node is causing a failure at that node comprising

taking passive voltage measurements between said node and a reference voltage when a device driving the node is in different states, said voltage measurements including injecting a small current into said node and measuring a resulting change in voltage, said small current not being enough to change said state of said device, and

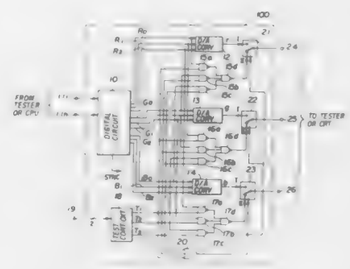
analyzing measured voltages to determine if the device is faulty.

4,857,834

SEMICONDUCTOR INTEGRATED CIRCUIT

Takao Sukemura, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 17, 1987, Ser. No. 97,891
Claims priority, application Japan, Sep. 20, 1986, 61-222646
Int. Cl.[4] G01R *31/28*
U.S. Cl. 324—73 R **13 Claims**



1. A semiconductor integrated circuit comprising:

digital signal producing means for producing a digital signal composed of a plurality of bits;

digital-to-analog converting means for converting the digital signal produced by said digital signal producing means to an analog signal;

logic means for selectively extracting a predetermined number of bits from the digital signal in accordance with a mode signal indicating a test mode or a non-test mode;

switching means for selecting either one of an output signal of said logic means and said analog signal supplied from said digital-to-analog converting means, an output of the switching means being supplied to an external circuit; and

test controlling means for controlling the switching means such that the analog signal is selected during said non-test mode and the extracted predetermined bits are selected during said test mode and for producing said mode signal provided to said logic means for indicating which bits are to be extracted from the digital signal in the logic means.

4,857,835

GLOBAL EVENT QUALIFICATION SYSTEM

Lee D. Whetsel, Jr., Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 5, 1987, Ser. No. 117,114
Int. Cl.[4] G01R *31/00*
U.S. Cl. 324—73 R **11 Claims**

1. A test system comprising:
- a logic circuit having input and output adapted for signal data;
- selected ones of said logic circuit's input and output having a test cell coupled thereto;
- each said test cell having plural storages each for storing a condition;
- each said test cell also having plural comparators each for comparing said signal data with said respective stored conditions; and

said comparators each generating a control signal indicating a true comparison between said signal data nd said respec-



tive stored condition, wherein said control signals are used to effectuate testing of said logic circuit.

4,857,836

MECHANICAL PROBE FOR OPTICAL MEASUREMENT OF ELECTRICAL SIGNALS

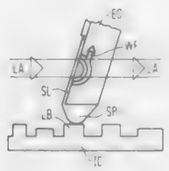
Gerald Söelkner, Linz, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 28, 1988, Ser. No. 187,336

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3719203

Int. Cl.[4] G01R *31/00, 31/02*

U.S. Cl. 324—96 **12 Claims**



7. A mechanical probe for optical measurement of electrical signals having an electro-optical crystal penetrated by electromagnetic radiation, comprising:

a measuring tip located on an end of the crystal; and

a waveguide structure conductively connected to the measuring tip and located on a face of the crystal which is aligned relative to the radiation such that a component of the speed of light of the electro-magnetic radiation in the electro-optical crystal is approximately identical to the speed of an electrical traveling wave signal in the waveguide structure.

4,857,837

MAGNETO RESISTIVE CURRENT SENSOR WITH IMPROVED FIDELITY

Mich S. Baran, Wauwatosa; Bruce C. Beihoff, Glendale; Michael A. Damiano, Germantown; James E. Hansen, Oak Creek; Jerome K. Hastings, Sussex; Allen J. Slomczewski, Milwaukee, and Charles J. Tennies, Waukesha, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 29, 1987, Ser. No. 139,352

Int. Cl.[4] G01R *19/00, 1/20*

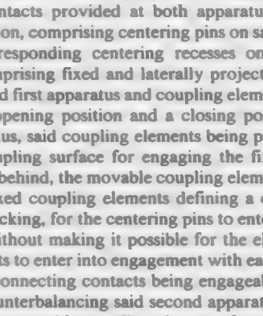
U.S. Cl. 324—117 R **13 Claims**

1. A current sensor for measuring the current flow in an electrical conductor comprising:

a magnetic flux concentrator comprising a pair of magnetic pole structures disposed to substantially encircle the electrical conductor and spaced to have a magnetic sensing region therebetween, whereby electrical current flowing through the electrical conductor induces a magnetic field within said magnetic sensing region along a principle axis which is proportional to the electrical current;

a magnetic field means disposed to generate a magnetic field within said magnetic sensing region along an axis substantially normal to said principle axis, said magnetic field along said substantially normal axis having a constant magnitude substantially unaffected by the flow of electrical current through the electrical conductor;

a magneto resistive device disposed in said magnetic sensing region having a resistance proportional to the magnitude of magnetic field along said principle axis;



a constant current source connected to said magneto resistive device for supplying a predetermined constant current to said magneto resistive device; and

a voltage sensing circuit connected to said magneto resistive device for sensing the resistance proportional to the magnitude of magnetic field along said principle axis by sensing at least one voltage induced within said magneto resistive device by said constant current and generating a current indicative signal corresponding to said at least one induced voltage.

4,857,838

APPARATUS FOR TESTING ELECTRONIC COMPONENTS, IN PARTICULAR IC'S

Hans-Heinrich Willberg, Malerwinkelweg 23, D-8201 Altofing-/Bad Feilnbach, Fed. Rep. of Germany

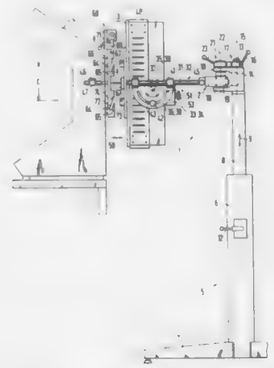
Filed May 4, 1987, Ser. No. 45,429

Claims priority, application Fed. Rep. of Germany, May 12, 1986, 3615941

Int. Cl.[4] G01R *1/04*

U.S. Cl. 324—158 F **5 Claims**

1. A system for docking a first apparatus comprising a testing computer to a second apparatus comprising a handler for electrical components for the purpose of engaging electrical connecting contacts provided at both apparatus and corresponding position, comprising centering pins on said first apparatus and corresponding centering recesses on the second apparatus, comprising fixed and laterally projecting coupling elements on said first apparatus and coupling elements movable between and opening position and a closing position on the second apparatus, said coupling elements being provided with an oblique coupling surface for engaging the fixed coupling elements from behind, the movable coupling elements having a stop for the fixed coupling elements defining a certain initial distance for docking, for the centering pins to enter the centering recesses without making it possible for the electrical connecting contacts to enter into engagement with each other, and the electrical connecting contacts being engageable in precise position by counterbalancing said second apparatus as a result of adjusting the movable coupling elements from the opening position to the closing position, characterized in that the movable coupling elements are formed by two rails provided on said second apparatus, and two oblique guidance surfaces are provided on each rail, said guidance surfaces running in a longitudinal direction of the rails, wherein each oblique guid-



ance surface co-acts with one of four fixed coupling elements, such that the rails are displaceable in their longitudinal direction for engagement and disengagement.

4,857,839

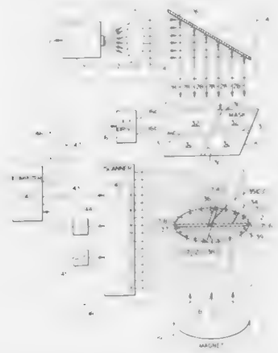
METHOD AND APPARATUS FOR MEASURING AVERAGE RESISTIVITY AND HALL-EFFECT OF SEMICONDUCTOR WAFERS

David C. Look, and Eileen Pimentel, both of Dayton, Ohio, assignors to Wright State University, Dayton, Ohio

Filed Mar. 2, 1988, Ser. No. 163,002

Int. Cl.[4] G01R *19/00, 31/02*

U.S. Cl. 324—158 R **22 Claims**



1. Apparatus adapted to measure the average dark characteristics of a semiconductor wafer, said apparatus comprising:

four electrical contacts removably connected to the wafer at generally equidistant positions on the periphery of the wafer;

magnetic means comprising a flat permanent magnet positioned adjacent the wafer is provided for applying a substantially uniform magnetic field to one surface of the wafer; and,

control means, having separate inputs connected to each of said electrical contacts, for applying current successively to each of four sets of adjacent electrical contacts and measuring the voltage across the opposing set of adjacent electrical contacts in response to each application of current and to each of two sets of opposing electrical contacts and measuring the voltage across the other set of opposing electrical contacts in response to each application of current;

whereby an average dark resistivity, average dark carrier mobility and average dark carrier concentration of the wafer are determined.

4,857,840

INFORMATION AND GUIDING SYSTEM INCLUDING A PORTABLE RECEIVER DEVICE HAVING AN ELECTROMAGNETIC WAVE ANTENNA AND MAGNETIC FIELD SENSOR

Michel Lanchais, 42, terrasse de l'Iris, La Defense 2, F-92400 Courbevoie, France

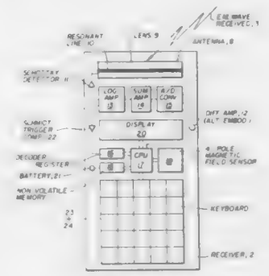
PCT No. PCT/FR85/00160, § 371 Date Apr. 9, 1986, § 102(e) Date Apr. 9, 1986, PCT Pub. No. WO86/00419, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 18, 1985, Ser. No. 862,496

Claims priority, application France, Jun. 18, 1984, 84 09474; Oct. 29, 1984, 84 16478; Feb. 7, 1985, 85 01686

Int. Cl.[4] G01S *5/02, 11/00;* **G01C** *17/02;* **H04B** *7/00*

U.S. Cl. 324—207 **16 Claims**



1. A system for providing information to a user, comprising

transmitter means for transmitting to an area for service in which said user is moving at least two predetermined frequencies of electromagnetic radiation in alternating succession, said two frequencies being absorbed by different amounts during travel of said electromagnetic radiation from said transmitter means to said user, and

portable receiver means carried by said user for receiving said at least two frequencies, and for determining the distance between said transmitter means and said portable receiver means based on the difference in said absorption during transmission,

said portable receiver means including (1) magnetic field detection means for determining values corresponding to at least two components of the magnetic field where said user is located, corresponding to angular orientation of said portable receiver means with respect to said magnetic field and (2) user information means for determining information to be provided to said user, said user information means including indicator means for indicating said information to said user,

wherein:

said user is guided by said information indicated by said portable receiver means from his or her current position as determined by said portable receiver means to at least one of a predetermined target location and a selected target location selected by said user; and

said information indicated to said user depends on said distance and angular orientation as determined by said portable receiver means.

4,857,841

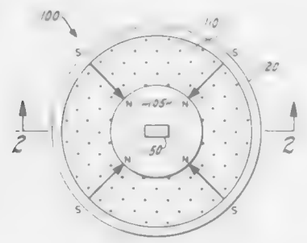
PROXIMITY DETECTOR EMPLOYING MAGNETO RESISTIVE SENSOR IN THE CENTRAL MAGNETIC FIELD NULL OF A TOROIDAL MAGNET

Jerome K. Hastings, Sussex; Bruce C. Beihoff, Glendale, and Mark A. Juds, New Berlin, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 29, 1987, Ser. No. 139,350

Int. Cl.[4] G01B *7/30;* **G01P** *3/48;* **H03K** *17/95;* **H01F** *7/02*

U.S. Cl. 324—208 **14 Claims**



14. A proximity sensor comprising:

a toroidal magnet having a central aperture, an inner circumference and an outer circumference with a first magnetic pole at said inner circumference and a second magnetic pole at said outer circumference thereby creating a magnetic null at a center position of said central aperture; and

a magneto resistive structure disposed at said center position of said central aperture of said toroidal magnetic having an electrical resistance proportional to the magnetic flux therethrough from said toroidal magnet resulting from a shift in the position of said magnetic null caused by the proximity of a magnetically permeable target to said toroidal magnet.

4,857,842

TEMPERATURE COMPENSATED HALL EFFECT POSITION SENSOR

Oded E. Sturman; Benjamin Grill, both of Northridge, and Lynn Harrison, Newhall, all of Calif., assignors to Kineret Engineering, Northride, Calif.

Filed Jun. 3, 1987, Ser. No. 57,507

Int. Cl.[4] G01B *7/14;* **G01R** *33/06;* **H01L** *43/06*

U.S. Cl. 324—225 **20 Claims**



1. A proximity sensor for providing a signal indicative of the separation between an object having magnetic characteristics and the proximity sensor within a predetermined separation comprising:

a permanent magnet means having north and south magnetic poles disposed within said proximity sensor for providing a magnetic field having increasing linkage with the object to be sensed as said object approaches and moves within said predetermined separation from a remote position;

first and second Hall effect sensor means disposed within said proximity sensor in the magnetic field formed between said permanent magnet and said object to be sensed when at said predetermined separation, said first and second Hall effect sensor means being positioned such that the relative magnetic field sensed by said first Hall effect sensor means is opposite in polarity to the relative magnetic field sensed by said second Hall effect sensor means, each of said first and second Hall effect sensor means having first and second input leads and an output lead, and being a means for providing an electrical signal on said output lead dependent on the magnitude and direction of the relative magnetic field sensed by said Hall effect sensor means; and

summing and compound means coupled to said output lead of each of said first and second Hall effect sensor means for providing a net electrical signal whose magnitude corresponds to the difference between said electrical signals provided by said first and second Hall effect sensor means;

whereby the magnitude of said net signal is dependent on the strength of the magnetic field sensed by said first and second Hall effect sensor means but is independent of the temperature of said proximity sensor.

4,857,843

SELF-REFERENCING MAGNETIC RESONANCE SPECTROSCOPY SYSTEM

Albert Macovski, Menlo Park, Calif., assignor to Stanford University, Stanford, Calif.

Continuation of Ser. No. 939,053, Dec. 8, 1986, abandoned. This application Sep. 6, 1988, Ser. No. 241,785

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—307 **13 Claims**



1. In a method for deriving the amplitude of a weak spectroscopic component in a magnetic resonance signal received from a volume positioned in a magnetic field having unknown localized magnetic field variations, said magnetic resonance signal having a strong spectroscopic component therein, the method comprising the steps of

receiving a magnetic resonance signal,

identifying a first reference spectroscopic component in said magnetic resoance signal,

deriving a difference frequency spectrum between said reference spectroscopic component and other spectroscopic components including a second spectroscopic component,

obtaining the amplitude of said second spectroscopic component from said difference frequency spectrum by using a known frequency difference between said reference spectroscopic component and said second spectroscopic component, and

measuring the amplitude of said second spectroscopic component.

4,857,844

METHOD OF AND DEVICE FOR AUTOMATIC PHASE CORRECTION OF COMPLEX NMR SPECTRA

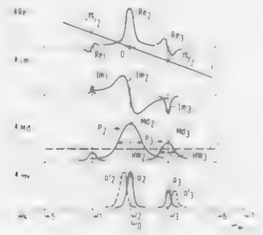
Johannes J. Van Vaals, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1988, Ser. No. 270,923

Claims priority, application Netherlands, Nov. 12, 1987, 8702701

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—307 **12 Claims**



1. A method of correcting the phase of a complex magnetic resonance spectrum obtained, using Fourier transformation, from sampling values of at least one resonance signal, which resonance signals are generated by means of RF electromagnetic pulses in an object which is situated in a steady, uniform magnetic field, a model of the complex magnetic resonance spectrum being formed by means of the magnetic resonance spectrum obtained, the phase being corrected on the basis of the model, characterized in that the model is formed by means of at least one peak of a modulus spectrum or of a power spectrum, which modulus spectrum or power spectrum is determined from the complex magnetic resonance spectrum, for the determination of coefficients of a frequency-dependent phase function which extends across the complex spectrum a given phase shift being step-wise imparted to the model until the phase at edges of the complex spectrum approximates the phase at the edges of the model in accordance with a predetermined criterion, after which the phase of the complex spectrum is corrected by means of the frequency-dependent phase function determined.

4,857,845

METHOD FOR THE APPLICATION OF GRADIENT PULSES IN AN IMAGING EXPERIMENT USING A NUCLEAR MAGNETIC RESONNANCE MACHINE

Eric Breton, Voisin le Bretonneux, France, assignor to General Electric CGR SA, Issy Les Moulineaux, France

PCT No. PCT/FR87/00299, § 371 Date Mar. 22, 1988, § 102(e) Date Mar. 22, 1988, PCT Pub. No. WO88/01381, PCT Pub. Date Feb. 25, 1988

PCT Filed Jul. 28, 1987, Ser. No. 180,111

Claims priority, application France, Aug. 14, 1986, 86 11730

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **5 Claims**

1. A method for the application of electrical gradient pulses in an imaging experiment using an NMR machine, said machine comprising gradient coils, said gradient coils being supplied by aid electrical gradient pulses, said gradient coils being distributed in three sets, each of said three sets being involved in providing magnetic field pulses whose values vary linearly as a function of an abscissa measured on one of the three axes of an intangible three dimensional reference bound to said machine, said experiment comprising the steps of:

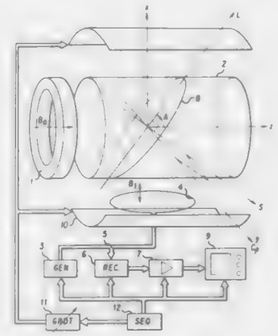
performing a temporal exciting-measuring sequences for sequentially exciting a body to be examined in said machine by a radio frequency excitation while submitting said body to said magnetic field pulses and measuring excitation radio frequency signals emitted by said body,

reconstructing a computerized structure corresponding to said body from said measurements,

said computerized structure being expressed as a collection of data, each data corresponding to a voxel of said body, each data comprising a magnetic information and an address information,

said address information representing the coordinates of said voxel with regard to imaging axes, said imaging axes being inclined with regard to said reference axes, and

making an image of said body from said reconstruction, said method comprising the following steps:



separating said electrical gradient pulses into strength components of said magnetic field pulses distributed over the reference axes of said machine, said strength components being a function of direction cosines of the inclination of said imaging axes with respect to said machine reference axes,

choosing common homothetic forms for the evolution in time for gradient pulses that are applied to said gradient coils substantially at the same time during said sequences of said experiment;

choosing common instants during said sequences for the temporal application of said electrical gradient pulses.

4,857,846

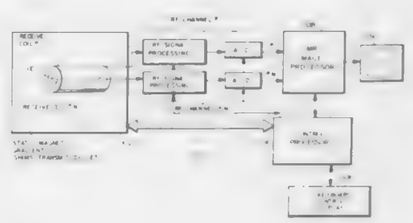
RAPID MRI USING MULTIPLE RECEIVERS PRODUCING MULTIPLY PHASE-ENCODED DATA DERIVED FROM A SINGLE NMR RESPONSE

Joseph W. Carlson, San Francisco, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Mar. 31, 1988, Ser. No. 176,251

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **23 Claims**



1. A method for rapidly capturing MRI data, said method comprising the steps of:

(i) receiving and recording NMR RF responses in plural substantially independent RF signal receiving and processing channels during the occurrence of at least one NMR RF response; and

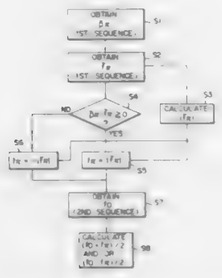
(ii) processing plural data sets respectively provided by said plural RF channels to produce multiply phase-encoded MRI data from said at least one NMR RF response.

4,857,847

METHOD AND SYSTEM FOR MAGNETIC RESONANCE IMAGING

Yoshio Machida, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 14, 1987, Ser. No. 95,775
Claims priority, application Japan, Sep. 18, 1986, 61-220631
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—311 **10 Claims**



6. In a magnetic resonance imaging system, in which magnetic resonance is caused on a spin of a specific nucleus using a static field, a gradient field and an excitation pulse, and, through observation of a magnetic resonance signal, an image representing a density distribution of said specific nucleus in a target region of a body under examination is attained, in order to provide at least one of a density distribution image of water protons in said body and that of fat protons in said body, a magnetic resonance imaging method comprising the steps of:

comparing first image data comprising first complex image data indicating a magnetic resonance distribution in a water phantom, said complex first image data being acquired in a first excitation sequence in which a phase of a magnetic resonance signal for water protons is opposite to that of said magnetic resonance signal for fat protons, with second image data comprising second image data indicating a magnetic resonance distribution in said body, said second complex image data being acquired in said first excitation sequence, thereby discriminating which one of densities of said water and fat protons is dominant;

correcting a distortion component of said static field in said second image data based on the discrimination result, thereby obtaining third image data comprising third complex image data indicating a density distribution of protons in said body; and

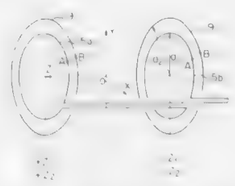
providing at least one of fourth and fifth image data, respectively, indicating density distributions of water and fat protons in said body, by processing said third image data and sixth image data, said sixth image data comprising fourth complex image data indicating a density distribution of magnetic resonance of protons in said body, said fourth complex image data being acquired in a second excitation sequence in which a magnetic resonance signal for water protons is in phase with a magnetic resonance signal of fat protons.

4,857,848

NUCLEAR MAGNETIC RESONANCE IMAGING APPARATUS

Moriaki Takechi, and Yuji Simada, both of Ako, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,273
Claims priority, application Japan, Mar. 18, 1987, 62-64851
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **2 Claims**



1. A nuclear magnetic resonance imaging apparatus having superconducting coil which generates a static magnetic field, an electrically-conducting cylindrical thermal shield which surrounds said superconducting coil, and a pair of confronting circular coils which are coaxial with the longitudinal axis of said cylindrical thermal shield and generate a gradient field in the longitudinal direction of said thermal shield with the magnetic field generated by said circular coils inducing eddy currents in said thermal shield, said eddy currents generating magnetic fields which form a composite magnetic field together with the magnetic field generated by said circular coils, wherein the magnetic flux density of said composite magnetic field contains two terms which are proportional to the cube of a distance in said longitudinal direction of said thermal shield and wherein said circular coils are positioned so that said proportional terms in said expression for said magnetic flux density of said composite magnetic field cancel one another.

4,857,849

HIGH FREQUENCY MAGNETIC FIELD GENERATOR FOR NUCLEAR MAGNETIC RESONANCE

Hidenobu Sakamoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 172,885
Claims priority, application Japan, Mar. 25, 1987, 62-69034; Aug. 11, 1987, 62-199063
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **9 Claims**



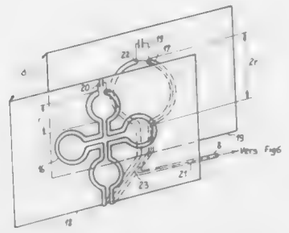
1. A high frequency magnetic field generator comprising at least a pair of parallel, saddle-shaped high frequency magnetic field generating portions arranged oppositely about a longitudinal axis and phase shifting means for producing a phase shift corresponding to an amount of spatial positional deviation between said high frequency magnetic field generating portions and in turn between corresponding high frequency currents supplied to said respective high frequency magnetic field generating portions.

4,857,850

PASSIVE-DECOUPLING RECEIVING ANTENNA, IN PARTICULAR FOR A NUCLEAR MAGNETIC RESONANCE IMAGING APPARATUS

Henri-José Mametsa, Montigny le Bretonneux, and Hervé Jacob, Gyf sur Yvette, both of France, assignors to General Electric CGR SA., Paris, France

Filed May 3, 1988, Ser. No. 189,803
Claims priority, application France, May 7, 1987, 87 06488
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **13 Claims**



1. A passive-decoupling receiving antenna, in particular for a nuclear magnetic resonance imaging apparatus, wherein said antenna has two adjacent and opposing magnetic circuits for mutually opposing their induced electromotive force when these electromotive forces are induced by a transmitter which emits a substantial uniform field opposed to said antenna the first circuit being constituted by at least one magnetic loop, the second circuit being constituted by a plurality of magnetic loops having a total area which is substantially equal to area of said at least one loop of the first circuit, and wherein the plane of the loops of the second circuit is displaced with respect to the plane of said at least one loop of the first circuit, wherein each of said circuits is flat, said antenna further including a single flat support with said first circuit being mounted on one face of said support and said second circuit being mounted on a second face of said support wherein said first and second circuits are flat and are lying flat respectively on each of said faces of said single flat support.

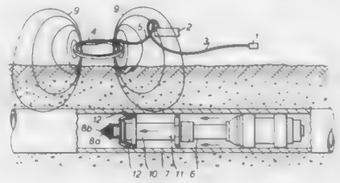
4,857,851

FIXING A GEOGRAPHICAL REFERENCE OF A VEHICLE TRAVELING THROUGH A PIPELINE

Donald W. Anderson, Gosforth, and Charles W. Gregory, Blyth, both of England, assignors to British Gas Corporation, London, England

Continuation of Ser. No. 415,932, Sep. 8, 1982, abandoned. This application Jan. 29, 1985, Ser. No. 695,750
Claims priority, application United Kingdom, Sep. 23, 1981, 8128728
Int. Cl.[4] G01V *3/08*; G01N *27/72*
U.S. Cl. 324—326 **24 Claims**

12. Apparatus for correlating a geographical reference point located externally of a natural gas transmission pipeline with a corresponding point in the pipeline, the apparatus comprising a pipeline vehicle for movement along the pipeline from an initial position to a final position by way of the geographical reference point; a magnetic flux transmitter for location at the geographical reference point, the transmitter being capable of transmitting magnetic flux of sufficient strength to penetrate the pipeline; a vehicle detector for location externally of the pipeline between the transmitter and the initial position of the vehicle, the detector being adapted to activate the transmitter to transmit magnetic flux before the vehicle is level with the transmitter; a sensor on board said vehicle for sensing any flux penetrating the pipeline and for emitting a signal upon sensing



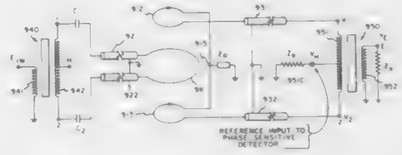
such flux, the signal having an amplitude which reaches a peak when the sensor is level with the transmitter; and means for recording the signal.

4,857,852

INDUCTION WELL LOGGING APPARATUS WITH TRANSFORMER COUPLED PHASE SENSITIVE DETECTOR

Robert L. Kleinberg, Ridgefield, Conn.; Brian Clark, Missouri City, Tex.; Weng C. Chew, Champaign, Ill., and David Mariani, Darien, Conn., assignors to Schlumberger Technology Corp., New York, N.Y.

Division of Ser. No. 876,514, Jun. 20, 1986, Pat. No. 4,766,384. This application Apr. 27, 1988, Ser. No. 186,986
Int. Cl.[4] G01V *3/18, 3/28*
U.S. Cl. 324—339 **4 Claims**



1. An induction well logging apparatus for investing earth formations surrounding a borehole, comprising:

a logging device movable in said borehole;

an induction transmitting antenna and first and second induction receiving antenna coils mounted on said logging device, said receiving antenna coils having respective ones of their ends coupled together to put said coils in series opposition;

means for electronically energizing said transmitting antenna to induce currents in said earth formations, said currents inducing voltages in said receiving antenna coils;

a phase-sensitive detector having a measurement signal input terminal and a reference signal input terminal, for determining the magnitude of a signal applied to the measurement signal input terminal that is in a given phase relationship with a signal applied to the reference signal input terminal;

a transformer balanced/unbalanced circuit comprising a transformer primary winding across which are connected the respective other ends of said first and second receiving antenna coils, said primary winding having a center tap coupled to the reference signal input terminal of said phase-sensitive detector circuit, and said transformer having a secondary winding coupled to the measurement signal input terminal of said phase-sensitive detector;

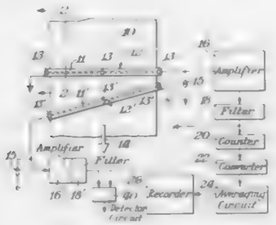
the output of said phase-sensitive detector providing indications of the conductivity of said earth formations surrounding the borehole.

4,857,853

ON-LINE ELECTROSTATIC DEFECT DETECTOR FOR POLYESTER BASE

Henry W. Cook, Jr., Brevard, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 23, 1987, Ser. No. 76,726
Int. Cl.[4] G01N *27/61*; G01R *5/28*
U.S. Cl. 324—456 11 Claims



1. A method for detecting the presence of surface irregularities on an electrically insulating web, the web having an electrostatic surface charge and an electrostatic field associated therewith, comprising the steps of:

effecting relative movement between the web and a first electrical conductor positioned across and close to the surface of the web to induce in the conductor a first electrical signal corresponding to electrostatic field variations resulting from the distribution of the electrostatic surface charge on the web and from the relative movement of the web and the first electrical conductor, and

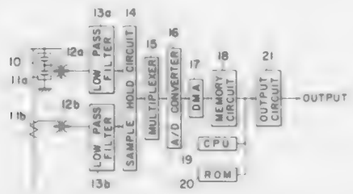
detecting the sharp voltage changes having frequency components from about 200 Hz and above of the first signal which are indicative of the presence of a surface irregularity on the web.

4,857,854

DIGITAL FAULT LOCATOR

Tetsuo Matsushima, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 5, 1986, Ser. No. 927,190
Claims priority, application Japan, Nov. 8, 1985, 60-250238
Int. Cl.[4] G10R *31/08*
U.S. Cl. 324—512 7 Claims



1. A digital fault locator for locating a fault point of a power transmission system by using digital voltage and current data of the power transmission system, comprising:

a memory portion for storing digital data of the power transmission system,

a plurality of digital filters having different filter functions, for receiving said data from said memory portion,

a fault time measuring means for measuring a total time duration for which a fault persisted, using said digital voltage and current data of a faulty period,

a switching means connected to said fault time measuring means and being only responsive to the total time duration of said fault measured by said fault time measuring means for selecting an output of only one of said digital filters after the expiration of said total time duration, and

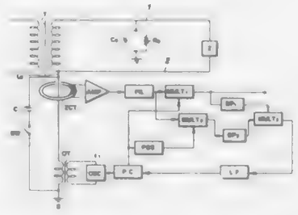
a fault locating calculation means for locating the fault point by using the output of the digital filter selected by said switching means.

4,857,855

METHOD FOR COMPENSATING FOR PHASE OF INSULATION RESISTANCE MEASURING CIRCUIT

Tatsuji Matsuno, Kanagawa, Japan, assignor to Toyo Communication Equipment Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1988, Ser. No. 266,697
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—521 4 Claims



1. A method of compensating for a phase of an insulation resistance measuring circuit for an electric line, in which a low frequency signal having a frequency f_1 different from a commercial frequency is applied to said electric line to be measured through a first transformer coupled to a grounding conductor of a voltage transformer of the electric line or to the electric line, a leakage current component of said low frequency signal fed back to said grounding conductor is extracted through a second transformer coupled to the grounding conductor or to the electric line and is then applied to a first input of synchronous detecting means to measure said insulation resistance between the one electric line and the earth; said method comprising the steps of:

varying a current value of a signal in phase with said low frequency signal or shifted by a phase of 90 degrees with respect to the low frequency signal at intervals of a period T or at intervals of a random period including said period T;

causing said current to act on leakage current component extracting means;

calculating a product of components having a frequency of 1/T both contained in effective and ineffective components of said synchronous detection output; and

controlling a phase of a signal applied to a second input of said synchronous detecting means so that a DC component contained in said product output becomes maximum or minimum.

4,857,856

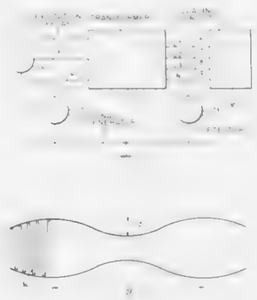
TRANSFORMER TESTING

Raymond L. Coleman, Cheshire, and Peter A. Kara, Surrey, both of England, assignors to ERA Patents Limited, England

Filed Feb. 16, 1988, Ser. No. 155,860
Claims priority, application United Kingdom, Feb. 16, 1987, 8703543
Int. Cl.[4] G01R *31/06*
U.S. Cl. 324—547 7 Claims

1. A method of monitoring displacement of a conductor in a winding said winding having stray capacitances and industances, and said method comprising generating a supply-frequency alternating current of a predetermined amplitude in said conductor; injecting into said conductor a high-frequency alternating signal substantially at a resonance frequency of said stray capacitances and inductances; and monitoring at least one

of magnitude and frequency response of amplitude modulation of said high-frequency signal carried by said conductor and



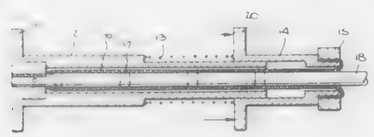
resulting from displacement of said conductor in said winding, to determine thereby the parameters relating to displacement of said conductor in said winding.

4,857,857

ELECTRODE CATHETER TESTING DEVICE

Andrew Valenti, Uniondale; Antonio Perez, Flushing, both of, and Seymour Ben-Zvi, Brooklyn, all of N.Y., assignors to The Research Foundation of State University of New York, New York, N.Y.

Filed Nov. 23, 1988, Ser. No. 275,277
Int. Cl.[4] G01R *31/12*
U.S. Cl. 324—555 3 Claims



1. A testing apparatus for testing an electrode catheter having a plurality of electrodes at one end thereof comprising an electrically conductive member configured to expand and contract radially; means for radially expanding said member to receive said electrodes and for thereafter causing said member to contract radially to electrically short said electrodes whereby the electrical continuity of the electrode circuits may be checked.

4,857,858

DIGITAL DEMODULATION SYSTEM HAVING INDEPENDENTLY OPERATING CROSS-POLARIZATION CANCELLERS

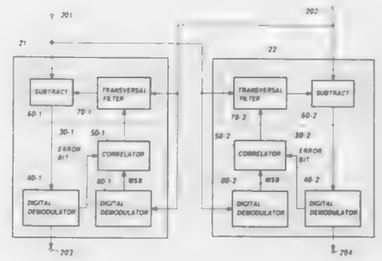
Masato Tahara, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Apr. 26, 1988, Ser. No. 186,285
Claims priority, application Japan, Apr. 30, 1987, 62-106933
Int. Cl.[4] H04B *1/10*
U.S. Cl. 329—50 4 Claims

1. A demodulation system for digital radio transmission in which first- and second-channel radio frequency (RF) digital signals are transmitted respectively on orthogonally polarized radiowaves and intermediate frequency (IF) versions of said first- and second-channel radio frequency signals are derived from said radio frequency digital signals, said system comprising:

variable coupling means for proportioning the IF version of said second-channel RF signal in response to a control signal applied thereto and subtractively combining the proportioned IF version of said second-channel RF signal with the IF version of said first-channel RF signal;

main digital demodulator means for demodulating an output of said variable coupling means to generate a main (N+1)-bit output and deriving an N-bit information signal as a data component of said first-channel RF signal from N higher significant bits of said main (N+1)-bit output and an error component of said first-channel RF signal from the least significant bit of the main (N+1)-bit output;



auxiliary digital demodulator means for demodulating the IF version of said second-channel RF signal to generate an auxiliary (N+1)-bit output and deriving a data component of said second-channel RF signal from the most significant bit of said auxiliary (N+1)-bit output; and

means for determining a correlation between said error component and said data component and deriving therefrom said control signal.

4,857,859

AM DIGITAL DEMODULATOR

Nobumitsu Asahi, Sagamihara, and Akira Nakazawa, Tokyo, both of Japan, assignors to Kabushiki Kaisha Kenwood, Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 208,134
Claims priority, application Japan, Jun. 18, 1987, 62-150106
Int. Cl.[4] H03D *1/02*; H03K *9/02*
U.S. Cl. 329—104 5 Claims



1. An AM demodulator of a digital signal processing type wherein an analog AM signal is converted to a digital AM signal, the digital AM signal is squared and a one sample-delayed version of the digital AM signal is squared, these squared signals are added, and the square root of the resulting sum of the squared signals is extracted as an AM demodulated signal, comprising:

a level detector for detecting the level of a sum signal representing the sum of the squared signals;

an upward bit shifter for bit shifting upwardly the sum signal on the basis of the output from the level detector to correct the level of the sum signal;

a polynomial calculator for approximately extracting the square root of the level corrected sum signal; and

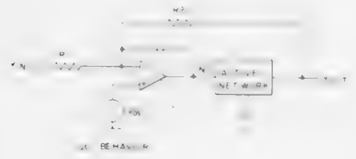
a downward bit shifter for bit shifting downwardly the output signal from the polynomial calculator to correct the level of the just mentioned output signal.

4,857,860

CLOCK-SWEEPABLE LOW-PASS FILTER HAVING DC GAIN ACCURACY AND REDUCED DC OFFSET

Nello G. Sevastopoulos, San Jose, Calif., assignor to Linear Technology Corporation, Milpitas, Calif.

Filed Jun. 6, 1988, Ser. No. 202,952
Int. Cl.[4] H03F *1/34*
U.S. Cl. 330—107 3 Claims



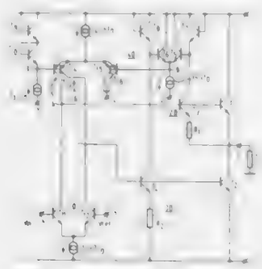
1. A filter circuit comprising
an operational amplifier having first and second inputs and an output,
a first resistive means connecting a signal input terminal to said first input,
means for grounding said second input,
capacitive means interconnected between said output and said first input,
an active low-pass filter network having an input and an output, said low-pass filter network comprising an all-pole filter having a transform function based in part on said first resistive means, said capacitive means, and a second resistive means,
means connecting said input of said active filter network with said output of said operational amplifier,
said second resistive means connecting said output of said active filter network to said first input of said operational amplifier.

4,857,861

AMPLIFIER ARRANGEMENT WITH IMPROVED QUIESCENT CURRENT CONTROL

Evert Seevinck, Eindhoven; Willem De Jager, Enschede, and Buitendijk, Nijmegen, all of Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Mar. 2, 1988, Ser. No. 162,921
Claims priority, application Netherlands, Sep. 23, 1987, 8702261
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—255 11 Claims



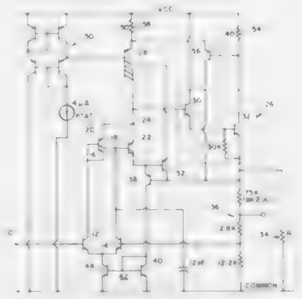
1. An amplifier arrangement comprising:
a first and a second output transistor of the same conductivity type, each having a first main terminal, a second main terminal and a control terminal, the first and the second main terminal of the first output transistor being coupled to a first power supply terminal and an output for connecting a load, and the first and the second main terminal of the second transistor being coupled to the output and a second power supply terminal,
drive means for driving the first and the second transistor in phase opposition, said drive means having a first input for applying an input signal, a second input, a first output which is coupled to the control terminal of the first transistor and to a power supply terminal by means of a first current source, and a second output which is coupled to the control terminal of the second transistor and to the power supply terminal by means of a second current source,
quiescent current means for causing a quiescent current to flow through the first and the second output transistor, said quiescent current means having first and second current measuring means for generating a first and a second measuring current which are a measure of the current flowing through the first and the second output transistor, respectively, and having feedback means for controlling the quiescent current flowing through the first and the second output transistor by way of the first and the second measuring current, characterized in that
the second input of the drive means is coupled to a point for conveying a reference potential and
the negative feedback means are provided with a control circuit for controlling the current intensities of the first and the second current source in order to render the harmonic mean value of the first and the measuring current substantially equal to a reference value.

4,857,862

HIGH-GAIN IC AMPLIFIER

Adrian P. Brokaw, Burlington, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Filed Apr. 6, 1988, Ser. No. 178,121
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—261 15 Claims



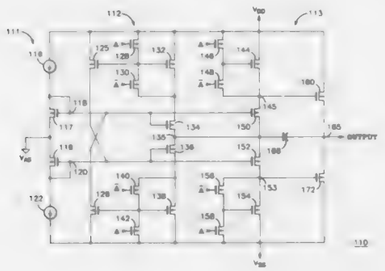
1. An integrated-circuit high-gain amplifier comprising:
a differential amplifier stage including a pair of transistors with common emitters;
an input circuit connected to the base of one of said pair of transistors to receive an input signal;
transistor means arranged as a differential-to-single-ended converter and driven by said differential amplifier;
said transistor means having an output element producing a single-ended output signal;
an output circuit connected to said output element;
signal means coupled to the base of the other of said pair of transistors; and
bias means for said differential amplifier, said bias means including circuit means for maintaining the currents through said differential pair of transistors in constant ratio substantially without regard to changes in load at said output element.

4,857,863

LOW POWER OUTPUT DRIVER CIRCUIT WITH SLEW RATE LIMITING

Jeffrey D. Ganger, Austin, and Roger A. Whatley, Georgetown, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 25, 1988, Ser. No. 236,386
Int. Cl.[4] H03F *3/26, 3/16*
U.S. Cl. 330—264 6 Claims



1. A low power output driver circuit having a slew rate limited output, comprising:
output means for providing a slewed output signal at an output terminal, said output terminal varying between first and second voltage potentials respectively coupled to first and second voltage terminals, said output signal varying in response to first and second control signals;
a capacitor having a first electrode coupled to the output terminal and having a second electrode;
input means coupled to the output means and to the second electrode of the capacitor, said input means receiving an input data signal and providing the first and second control signals, said input means maintaining the second electrode of the capacitor at a reference voltage between the first and second voltage potentials to restrict current conducted by the capacitor to a predetermined maximum value while conducting a feedback current thru the capacitor, said feedback current being used by the input means with the input data signal to form first and second control signals, said first and second control signals limiting voltage transistions at the output terminal when the output terminal transitions from the first voltage potential to the second voltage potential and from the second voltage potential to the first voltage potential; and
bias means coupled to the input means for providing biasing of the input means.

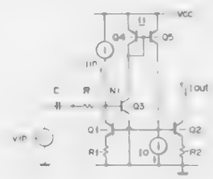
4,857,864

CURRENT MIRROR CIRCUIT

Tatsuo Tanaka, Yokohama, and Yoshihiro Yoshida, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 2, 1988, Ser. No. 201,218
Claims priority, application Japan, Jun. 5, 1987, 62-140994; Jun. 5, 1987, 62-140995
Int. Cl.[4] H03F *3/04*
U.S. Cl. 330—288 10 Claims

1. A current mirror circuit comprising:
a current input terminal;
a current output terminal;
input-current supplying means for supplying an input current to said current input terminal;
a first transistor having a collector coupled to said current input terminal, an emitter coupled to a first power-supply potential terminal, and a base;
a second transistor having a collector connected to the current output terminal, an emitter coupled to the first power-supply potential terminal, and a base connected to the base of said first transistor;
a third transistor having a base connected to the collector of said first transistor, an emitter coupled to the first power-supply potential terminal, and a collector;



current mirror means coupled to the collector of said third transistor for supplying the bases of said first and second transistors with a current which is proportionate to the current in the collector of said third transistor; and
a current source connected between the bases of said first and second transistors and said first power-supply potential terminal.

4,857,865

SELF EQUALIZING MULTI-STAGE RADIO FREQUENCY POWER AMPLIFIER

Arnold L. Berman, Los Angeles; Carl J. Hahn, III, Inglewood, and Marvin R. Wachs, Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 10, 1988, Ser. No. 269,840
Int. Cl.[4] H03F *3/191*
U.S. Cl. 330—304 16 Claims



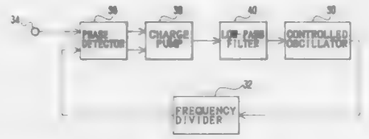
12. A method of combining stages of a multi-stage solid state radio frequency power amplifier together in order to eliminate intermodulation components associated therewith, said multi-stage amplifier containing a driver stage and a high power stage each having an input and output, and wherein said intermodulation components are attributable to the output of each of the individual stages, said method comprising:
(a) tuning the high power stage for efficiency, linearity and power output; and
(b) tuning the driver stage such that the intermodulation components which are produced are of alternate phase angle than the intermodulation components produced in the high power stage such that the intermodulation output components of the stages will subtract from each other or cancel.

4,857,866

PHASE-LOCKED LOOP HAVING ELONGATED TIME FOR CHARGE AND DISCHARGE

Hisao Tateishi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 17, 1988, Ser. No. 232,981
Claims priority, application Japan, Aug. 17, 1987, 62-204715
Int. Cl.[4] H03L *7/06, 7/08, 7/18*
U.S. Cl. 331—1 A **9 Claims**



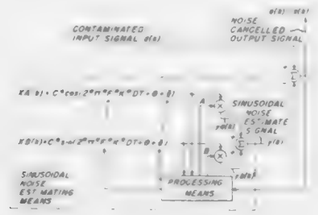
1. A phase-locked loop circuit comprising a controlled oscillator receiving a control signal for generating an oscillation signal of a frequency corresponding to the received control signal, a frequency divider receiving said oscillation signal for generating a frequency-divided signal having a frequency divided by a given frequency division ratio, a phase detector means receiving an input signal and said frequency-divided signal for generating a phase difference signal, and a phase output means receiving said phase difference signal for outputting said control signal to the controlled oscillator, said phase detector means generating a first phase difference signal starting at the input signal and terminating at one of a rising edge and a falling edge of said frequency-divided signal, and also generating a second phase difference signal having a constant pulse width in an interval period between each pair of adjacent first phase difference signals without substantially overlapping said first phase difference signal, said phase output means responding to said first phase difference signal to change the oscillation frequency of said controlled oscillator in a first direction, and also responding to said second phase difference signal to change the oscillation frequency of said controlled oscillator in a second direction opposite to said first direction.

4,857,867

METHOD AND APPARATUS FOR LOCKING THE FREQUENCY AND PHASE OF A LOCAL OSCILLATOR

Paul G. Griffith, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 6, 1988, Ser. No. 240,325
Int. Cl.[4] H03L *7/06;* **G01V** *1/00*
U.S. Cl. 331—10 **13 Claims**



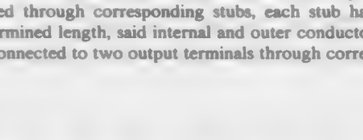
1. A method for phase locking an output of a local oscillator with an external signal, said output produced from amplitude, frequency and phase parameters, comprising the steps of:
applying said local oscillator output signal to said external signal to produce a feedback error control signal;
adjusting said amplitude, frequency and phase parameters based on said feed back error control signal;
producing a modified local oscillator output signal from said adjusted amplitude, frequency and phase parameters;
repeating the steps of applying said local oscillator output signal to said external signal to produce a modified feedback error control signal, adjusting said amplitude, frequency and phase parameters based one said modified feedback error control signal, and producing a next modified local oscillator output signal from said adjusted amplitude, frequency and phase parameters until said next modified local oscillator output signal is phased locked with said external signal;
providing a first pair of components of said local oscillator output signal, said pair of components separated by ninety degrees, said pair of components produced using a pair of amplitude parameters, a frequency parameter, and a phase parameter; and
summing said pair of components to produce said output signal from said local oscillator.

4,857,868

DATA DRIVEN CLOCK GENERATOR

James R. Robb, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 30, 1988, Ser. No. 176,078
Int. Cl.[4] H03B *1/00*
U.S. Cl. 331—135 **3 Claims**



1. A clock synchronization circuit, comprising:
a first logic circuit for receiving a clock signal and an asynchronous data valid signal and for generating a trigger signal having first and second states;
a second logic circuit for receiving said trigger signal and a delay signal and for generating said clock signal;
a delay circuit for receiving said clock signal and generating said delay signal;
wherein said second logic circuit and said delay circuit form a free-running oscillator with said clock signal having a predetermined clock cycle when said trigger signal is in said first state, and wherein said clock cycle is stretched when said trigger signal is in said second state;
said data valid signal controlling the state of said trigger signal; and
said clock signal input to said first logic circuit stabilizing said trigger signal during instability of said data valid signal.

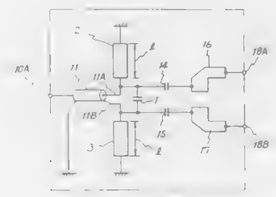
4,857,869

HIGH FREQUENCY PUSH-PULL TRANSFORMER

Takashige Terakawa; Noriyuki Akaba, and Sadayoshi Hattori, all of Yokohama, Japan, assignors to Tokyo Keiki Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,423
Claims priority, application Japan, Apr. 1, 1987, 62-80165
Int. Cl.[4] H01P *5/10*
U.S. Cl. 333—26 **12 Claims**

1. A high frequency push-pull transformer comprising a coaxial line having an internal conductor and an outer conductor, a first end of said coaxial line being connected to a single input terminal, said internal conductor and said outer conductor at a second end of said coaxial line are respectively grounded through corresponding stubs, each stub having a predetermined length, said internal and outer conductors also being connected to two output terminals through corresponding output lines, and a reflection absorbing means having a proper capacity which is disposed between said internal con-



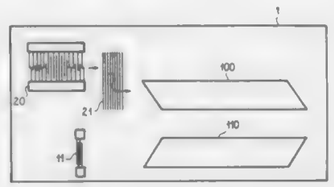
ductor and said outer conductor at said second end of said coaxial line.

4,857,870

METHOD OF MANUFACTURING A SURFACE WAVE DISPERSIVE FILTER AND A FILTER MANUFACTURED IN ACCORDANCE WITH THIS METHOD

Hervé Gautier, Antibes, and Claude Lardat, Rochquefort Les Pins, both of France, assignors to Thomson-CSF, Paris, France

PCT No. PCT/FR86/00402, § 371 Date Jul. 20, 1987, § 102(e) Date Jul. 20, 1987, PCT Pub. No. WO87/03756, PCT Pub. Date Jun. 18, 1987
PCT Filed Nov. 25, 1986, Ser. No. 86,142
Claims priority, application France, Dec. 4, 1985, 85 17947
Int. Cl.[4] H04H *3/10*
U.S. Cl. 333—195 **11 Claims**



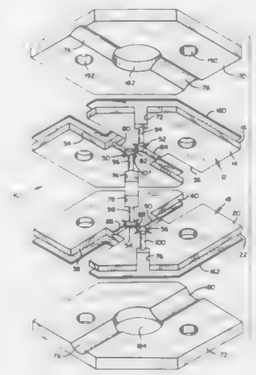
1. A method of manufacturing a dispersive wave filter having a desired transfer function of the type including a substrate, an input transducer for transmitting an acoustic wave over the surface of the substrate, an output transducer for receiving these waves, and dispersive means situated in the path of the waves for modifying the travel time thereof between the two transducers as a function of their frequency, including the following steps:
manufacture of a conventional noncorrected dispersive filter, at least one of the input and output transducers of which has a known transfer function;
measurement of the transfer function of this filter by applying an input signal to said input transducer and monitoring the corresponding output signal from said output transducer;
determining the undesired effects of the transfer function by comparing the desired transfer function with the measured transfer function;
designing in response to said measurement of the transfer function of said filter a correction transducer having a transfer function having effects opposed to the undesired effects of the transfer function of this filter for correcting the transfer function of this filter;
producing this correction transducer on the substrate to replace the transducer having a known transfer function.

4,857,871

MAGNETIC FIELD-TUNABLE FILTER WITH PLURAL SECTION HOUSING AND METHOD OF MAKING THE SAME

David L. Harris, 2837 SW. 219th Ave., Hillsboro, Oreg. 97123

Filed Oct. 31, 1988, Ser. No. 264,725
Int. Cl.[4] H01P *1/202, 1/218, 7/06*
U.S. Cl. 333—202 **16 Claims**



7. A magnetic tunable filter comprising:
a housing having a body which includes first and second body laminations of a nonmagnetic metal, each body lamination having opposed side surfaces and defining a cavity opening extending through the body lamination between the opposed side surfaces, the cavity opening of the first body lamination being aligned with the cavity opening of the second body lamination to form a resonator receiving cavity with the ends of the resonator receiving cavity exposed when the first and second body laminations are joined together, the body laminations also defining a coupling structure passageway communicating between the exterior of the body and the resonator receiving cavity when the first and second body laminations are joined;
a first ferrimagnetic resonator element supported within the resonator receiving cavity;
coupling structure means including an elongate conductor extending through the coupling structure passageway and into the resonator receiving cavity for coupling magnetically with the resonator element;
nonmagnetic metallic closure means for closing the ends of the resonator receiving cavity; and
the housing also including first and second reinforcing cover laminations which are positioned to hold the body laminations therebetween, the reinforcing cover laminations each being of a nonmetallic material and having a magnet pole piece receiving opening positioned to overlie the resonator receiving cavity.

4,857,872

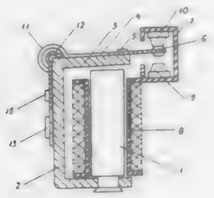
RELAY

Walter Bassino, Sao Paulo, Brazil, assignor to Uninorm Anstalt, Vaduz, Austria

Filed Mar. 17, 1987, Ser. No. 26,520
Claims priority, application Austria, Mar. 24, 1986, 782/86
Int. Cl.[4] H01H *51/22*
U.S. Cl. 335—80 **7 Claims**

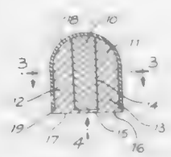
1. A relay comprising:
a core;
a coil which surrounds said core;
an armature displaced from one end of said core;
a yoke attached to another end of said core;

a yoke attached to another end of said core and having an end surface upon which rests one end of said armature;
a flat plate spring including:
a first portion connected to said yoke,
a second portion connected to said armature,
at least one arcuate area interconnecting said first and said second portion, and



a reed portion connected to said first portion that presses against said end of said armature substantially at right angles to said yoke which creates a force that is directed normally through said armature in a downward direction onto said end surface of said yoke;
a contact fixed with respect to said yoke; and
at least one contact which moves when said armature [illegible]

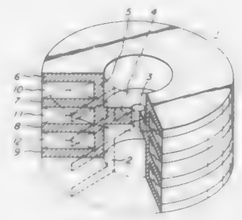
4,857,873
MAGNET STRUCTURE
Anthony R. Gillings, Unit 3/33 Binney Road, Blacktown, New South Wales 2148, Australia
Filed Aug. 12, 1988, Ser. No. 232,325
Claims priority, application Australia, Aug. 14, 1987, PI3743
Int. Cl.[4] H01F 7/20
U.S. Cl. 335—285 8 Claims



1. A magnet structure which comprises a high strength permanent magnet element and a carrier for the permanent magnet element, the carrier having a pair of spaced-apart pole pieces which are formed from a magnetisable material, which sandwich the magnet element, which are connected by a web of metal and which have pole face portions disposed in a common plane with the connecting web, the pole face portions and the connecting web forming a substantially flat base surface of the magnet structure, and a cap of non-magnetisable material being fitted to the magnet structure in a manner such that it envelopes all but the base surface of the structure.

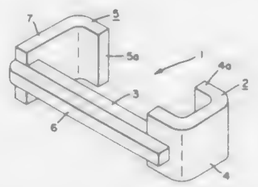
4,857,874
MULTILAYERED-EDDY-CURRENT-TYPE STRONG MAGNETIC FIELD GENERATOR
Kazuo Bessho, and Setoshi Yamada, both of Kanazawa, Japan, assignors to Kanazawa University, Kanazawa, Japan
Filed Feb. 25, 1988, Ser. No. 160,294
Claims priority, application Japan, Jul. 30, 1987, 62-188921
Int. Cl.[4] H01F 3/00
U.S. Cl. 335—296 1 Claim

1. A multilayered-eddy-current type strong magnetic field generator characterized by comprising:
a conductor body composed of a cylinder portion, a single circular plate portion connected with an inner wall of said cylinder portion and provided with a hole at a center of said single circular plate portion and a plurality of torus-shaped plate portions individually connected with an outer wall of said cylinder portion apart from each other in an axial direction, a slit extending in a radial direction from a periphery of said conductor body to said central hole being provided throughout all of said portions; and
a plurality of exciting coils individually disposed between each of said torus-shaped plate portions of said conductor body along said outer wall of said cylinder portion,



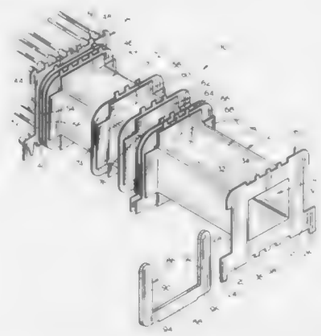
wherein eddy currents respectively generated in each of said torus-shaped plate portions of said conductor body under the excitation of said exciting coils in single phase or multiple phases are converged around said central hole of said single circular plate portion of said conductor body through said cylinder portion of said conductor body, so as to generate a concentrated strong magnetic field in said central hole.

4,857,875
YOKE
Kenichi Matsuo; Muneo Nakata, and Toru Ohara, all of Iida, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan
Filed Feb. 11, 1987, Ser. No. 13,570
Claims priority, application Japan, Feb. 13, 1986, 61-30497
Int. Cl.[4] H01F 3/00
U.S. Cl. 335—297 9 Claims



1. An electromagnetic yoke device, comprising:
a first yoke segment having a transverse width;
a second yoke segment having a transverse width, wherein the first and second yoke segments extend in substantially the same direction;
a first coil winding part extending longitudinally between the first yoke segment and the second yoke segment, thereby contacting with the first and second yoke segments and having a transverse width across the portion contacting with the second yoke segment less than the transverse width of the second yoke segment; and
a second coil winding part contiguous with at least a portion of the first coil winding part, contacting the first and second yoke segments and having a transverse width across the portion contacting with the first yoke segment less than the transverse width of the first yoke segment,
wherein the first yoke segment and the second yoke segment are shaped so that equal contact is obtained with the first and second coil winding parts.

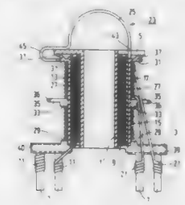
4,857,876
SHUNT LATCH
Larry J. Costa, Danville, Ill., assignor to Valmont Industries, Inc., Valley, Nebr.
Filed Feb. 27, 1989, Ser. No. 315,938
Int. Cl.[4] H01F 27/26
U.S. Cl. 336—165 6 Claims



1. A core-coil means for a fluorescent light ballast comprising,
an elongated rectangular bobbin having opposite ends, a top wall, a bottom wall, opposite side walls, and a central opening extending therethrough,
said bobbin having a plurality of spaced-apart flanges extending radially therefrom,
at least some of said flanges defining coil compartments,
a primary winding wrapped around said bobbin in one of said compartments,
at least one secondary winding wrapped around said bobbin in another of said compartments,
a core means associated with said bobbin and comprising opposite end portions, opposite side portions, and a central portion extending between said side portions,
said center portion of said core means being positioned in, and extending through, said central opening of said bobbin,
said side portions of said core means being positioned outwardly of the side walls of said bobbin,
said end portions of said core means being positioned outwardly of the ends of said bobbin,
two of said flanges being closely spaced apart to define a shunt receiving compartment therebetween,
a substantially U-shaped metal shunt positioned in said shunt receiving compartment and including a flat base portion having flat legs depending therefrom,
and means on at least one of said flanges for maintaining said shunt in said shunt receiving compartment.

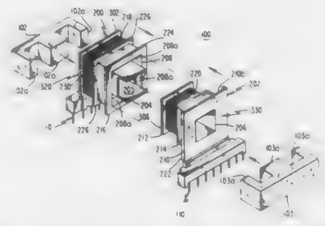
4,857,877
TRANSFORMER HAVING COAXIAL COILS
Henri-Pierre Y. Dethienne, Wavre, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 914,089, Oct. 1, 1986, Pat. No. 4,774,756. This application Jul. 5, 1988, Ser. No. 215,702
Claims priority, application Netherlands, Oct. 11, 1985, #8502776
Int. Cl.[4] H01F 41/06
U.S. Cl. 336—170 7 Claims

1. A transformer comprising: a coil bobbin having first and second spaced apart end flanges which define a winding space therebetween, at least the first end flange having radially extending edge slots, a first wire conductor coil mounted on the bobbin in said winding space and with the wire ends led out via at least one of the edge slots, an electrical insulating foil located about the first coil, a U-shaped spacer made of electrical insulating material positioned over the insulating foil, said spacer having members extending axially into the winding space, each of said members having first and second radial projections located near the first and second end flanges, respectively, and second coil means wound on the spacer coaxially with the first



coil and with said first and second projections defining a minimum distance between ends of the second coil means and the first and second end flanges.

4,857,878
MODULAR HIGH FREQUENCY POWER TRANSFORMER
Benjamin Eng, Jr., 13215 Hwy. 99 South, Everett, Wash. 98204, and Margaret E. Winsor, 10576 15th NW., Seattle, Wash. 98177
Filed Jan. 19, 1988, Ser. No. 145,365
Int. Cl.[4] H01F 15/10, 27/30
U.S. Cl. 336—192 9 Claims



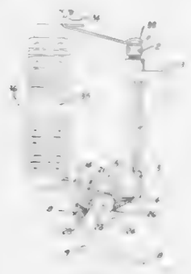
1. A miniature high frequency power transformer, comprising:
a highly permeable transformer core;
inner and outer modular transformer bobbins comprising, respectively, a primary shank and a secondary shank;
said primary shank having a plurality of flanges formed thereon, said flanges establishing an area for receiving primary windings of said transformer, said primary shank having a first aperture formed therethrough, an end wall of said first aperture having a protrusion extending therefrom axially through said aperture and terminating at one end of said transformer at first core retaining ears;
second core retaining ears extending from an opposite end of said transformer; and
said secondary shank slightly smaller in diameter than the diameter of the first aperture formed in the primary shank, and having an area thereon receiving secondary windings of said transformer, said secondary shank having a second aperture extending axially therethrough that is slightly larger in diameter than the diameter of the first protrusion formed in the primary shank;
said secondary shank of said inner modular transformer bobbin inserted into said first aperture formed in said primary shank, with said first protrusion extending from said primary shank inserted into said second aperture formed in said secondary shank so that said secondary windings on said secondary shank are within said primary windings formed on said primary shank;
said highly permeable core supported within said first and second core retaining ears surrounding said inner and outer modular transformer bobbins.

4,857,879

DROP-OUT EXPULSION FUSE

David E. Morgan, Carlingford, Australia, assignor to Brown Boveri (Australia) Pty, Limited, Marayong, Australia

Filed Jun. 23, 1988, Ser. No. 210,401
Claims priority, application Australia, Jul. 2, 1987, PI2846
Int. Cl.[4] H01H *71/10, 85/02*
U.S. Cl. 337—173 8 Claims



1. In a drop-out expulsion fuse of the type comprising an elongate insulating body with a conductive head fitting and tail socket, said tail socket being pivotally connected to a tail fitting, and said head fitting and said tail fitting being electrically and mechanically engaged to a head terminal and a tail terminal, respectively, fuse means connected within said body between said head fitting and said tail fitting, and an ejecta trap to collect ejected fuse means material; in combination therewith the improvement wherein said trap is pivotally mounted on said tail terminal by pivot means such that said trap may be swung between an in-use position immediately below said tail fitting and another position.

4,857,880

ELECTRICAL DEVICES COMPRISING CROSS-LINKED CONDUCTIVE POLYMERS

Andrew N. Au, Union City; Marguerite E. Deep, Los Altos; Timothy E. Fahey, San Jose, and Stephen M. Jacobs, Cupertino, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 711,910, Mar. 14, 1985, Pat. No. 4,724,417. This application Feb. 8, 1988, Ser. No. 153,178
Int. Cl.[4] H01C *7/10*
U.S. Cl. 338—22 R 20 Claims

1. A process for the preparation of an electrical device which comprises

(1) a laminar PTC element composed of a cross-linked conductive polymer composition which exhibits PTC behavior and which comprises a polymeric component comprising a crystalline polymer and, dispersed in the polymeric component, a particulate conductive filler; and

(2) two laminar electrodes which are electrically connected to the PTC element and which are connectable to a source of electrical power to cause current to pass through the PTC element, which process comprises the steps of:

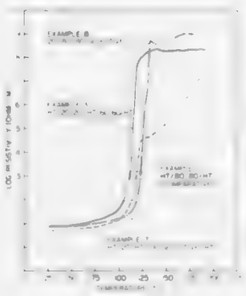
(a) melt-extruding the conductive polymer composition to form a laminar PTC element which does not contain an electrode;

(b) subjecting at least part of the PTC element to a first cross-linking step;

(c) heating at least part of the crosslinked PTC element to a temperature above T_I, where T_I is the temperature at which the conductive polymer starts to melt;

(d) cooling the cross-linked and heated PTC element to recrystallize the polymer;





(e) subjecting at least part of the cross-linked, heated and cooled PTC element to a second cross-linking step to effect further cross-linking thereof; and

(f) securing laminar electrodes to the PTC element.

4,857,881

JOYSTICK WITH SPRING DISCONNECT

Charles L. Hayes, Carlsbad, Calif., assignor to Hayes Technology, San Marcos, Calif.

Filed Jul. 8, 1988, Ser. No. 216,830
Int. Cl.[4] H01C *10/16*
U.S. Cl. 338—128 28 Claims



1. An improved joystick mechanism, comprising:

a housing;

a barrel-shaped rotating means supported for rotation along a first axis in said housing;

a stick shaft engaging and protruding through an aperture in said barrel rotating means and being hinged thereto for rotating along a second axis;

a first potentiometer connected to said barrel rotating means for activation thereby;

a fork member supported for rotation along a second axis in said housing, said stick shaft having one end thereof engaging and rotating said fork member; and

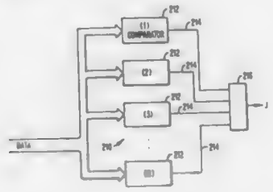
a second potentiometer connected to said fork member for activation thereby.

4,857,882

COMPARATOR ARRAY LOGIC

Lawrence F. Wagner, Berkeley; Wayne P. Burleson, Palo Alto, and John P. Gusdagna, Morgan Hill, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 751,270, Jul. 2, 1985, abandoned. This application Sep. 14, 1988, Ser. No. 245,930
Int. Cl.[4] G06F *7/02*
U.S. Cl. 340—146.2 4 Claims



1. A comparator array logic circuit comprising:

means for receiving an input digital data signal in binary form, representing an input value;

a plurality of interconnected bit Comparators, arranged in a two-dimensional array comprising a plurality of rows and a plurality of columns, storing a plurality of digital values in a monotonically increasing or decreasing order, each bit comparator has a bit value stored therein and compares a bit of said input digital data signal to said bit value stored therein; and

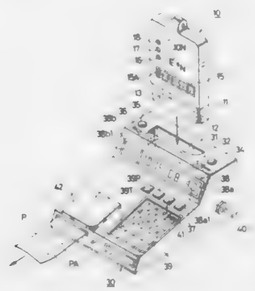
each comparator having means for receiving said input digital data signal, means for comparing said input digital data signal to said digital value stored in said comparator; means for generating a comparison signal in response to said comparison; means for receiving the comparison signal from an immediately adjacent comparator; and means responsive to the comparison signal from each comparator and the comparison signal from the adjacent comparator for generating an output signal.

4,857,883

CALL DEVICE-ATTACHED PATROL RECORDER

Shinichi Mama, Yokohama, Japan, assignor to Amano Corporation, Yokohama, Japan

Filed Aug. 11, 1986, Ser. No. 895,484
Claims priority, application Japan, Aug. 23, 1985, 60-185446
Int. Cl.[4] H04Q *1/30*; G08B *25/00*
U.S. Cl. 340—311.1 3 Claims



1. A call device-attached patrol recorder system comprising:

a plurality of coders, each having a unique position code, said coders arranged along check positions of a patrol course such that said position codes respectively correspond to said check positions;

at least one movable patrol recorder including a means for storing patrol information, wherein said patrol information includes a position code and a patrol time of one of said plurality of coders, said position code and patrol time being stored by inserting said patrol recorder into said one of said plurality of coders;

a fixed central unit including a means for reading out and printing out said patrol information recorded in said at least one patrol recorder on paper;

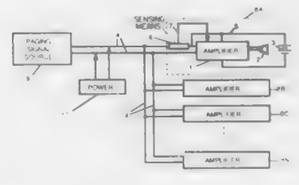
said at least one patrol recorder also including a call signal receiving means for receiving a call signal emitted from a transmitter means disposed by said central unit and a call signal acknowledging means for acknowledging the receipt of said call signal.

4,857,884

PAGING SYSTEM

Michael T. O'Malley, Carp, and Robert G. Johnston, Nepean, both of Canada, assignors to Newbridge Networks Corp., Ontario, Canada

Filed Jan. 12, 1988, Ser. No. 143,115
Claims priority, application Canada, Jul. 10, 1987, 541760
Int. Cl.[4] H04M *11/02*
U.S. Cl. 340—311.1 11 Claims



1. A paging system comprising:

(a) a plurality of paging amplifiers,

(b) a pair of wires connected to said amplifiers for carrying a paging signal to said amplifiers, the wires having narrow gauge and of insufficient capacity to carry operating power to said plurality of amplifiers,

(c) each of said amplifiers having a local chargeable battery connected to receive charging current from the pair of wires and for operating the associated paging amplifier, and

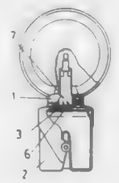
(d) means for applying charging power to the pair of wires for charging the batteries associated with said plurality of amplifiers during the intervals when no paging signal is being carried by the wires.

4,857,885

BATTERY COUPLINGS TO PORTABLE SIGNALS WITH LONG PERIODS OUT OF SERVICE

Ignacio Z. Umerez, Onati, Spain, assignor to Celaya, Emparanza y Galdos, S.A. (Cegasa), Spain

Filed Mar. 25, 1988, Ser. No. 173,415
Claims priority, application Spain, Mar. 26, 1987, 8700863
Int. Cl.[4] G08B *5/00*
U.S. Cl. 340—321 7 Claims



1. Improvements in battery couplings to portable signals with long periods out of service, said portable signal having an

upper reflector body (1) with optical, lighting and control elements and a lower battery body (2) with electrochemical storage cells, said reflector and battery body coupled by a plug-in connector (6, 7) and a general switch (3) for putting said portable signal into service, characterized in that said battery body (2) has an upper face (29) which faces said reflector body (1) when said reflector and battery body are coupled, said upper face (29) having vents (5) therein into a zone of coupling between said reflector body (1) and said battery body (2); a displaceable stopper element (4) that is displaceable by said general switch (3) such that when said general switch (3) is in an off position said stopper element (4) occludes vents (5); the general switch (3) and the stopper element (4) form part of the battery body (2) and are integrated in the same conductor plate capable of sliding, guided on two parallel rails (8) drawn from the same material as the upper face (29) of the battery body (2) and in the space between which are situated the vents (5) and two contacts (9) of the plug-in connector (6) corresponding to the body (2), contactor prominences (10) existing on the conductor plate along with the stopper element (4), and the distance separating the contactor prominences (10) and stopper element (4) being greater than the distance separating the contacts (9) and the vents (5).

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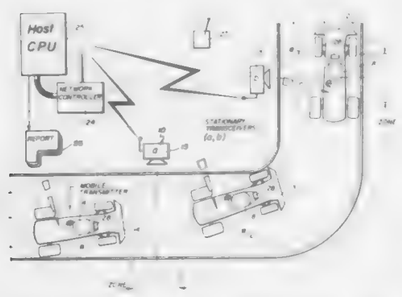
TIMING SYSTEM

Eric J. Crews, 9 Sycamore St., Millbury, Mass. 01527

Filed Feb. 26, 1988, Ser. No. 161,005

Int. Cl.[4] G08B *23/00, 1/12*

U.S. Cl. 340—323 R **4 Claims**



1. Timing system for use with a predetermined traffic course along which a plurality of vehicles travel in random sequence, comprising:

(a) stationary transceiver located at each of several selected locations along the course, each transceiver having a receiver portion with a short range, narrow receiving pattern directed across the course and a transmitter portion with a relatively long range, broad transmitting pattern, wherein the receiver portion associated with each transceiver stores data packets in a memory that include both vehicle code and arrival time for all vehicles that pass the transceiver,

(b) a mobile transmitter located on each vehicle and transmitting a distinctive coded transmission of short time duration, the transmitter having a short range, broad pattern of transmission, and

(c) a network controller located in the vicinity of the course for receiving transmissions from the transmitter portion of all the transceivers, whereby the controller receives all information of the time of arrival of each vehicle at each transceiver, irrespective of coincidental arrival of more than one vehicle at a given transceiver, wherein a main computer is provided to receive information from the network controller relative to all transceivers and all vehicles to generate reports on the individual vehicles, wherein said computer includes means for directing the network controller to cause the transmitter of each respective transceiver to transmit the data packets from each memory to the network controller, wherein a plurality of mobile receivers are provided to receive coded information from the network controller, each mobile receiver displaying only information on a selected vehicle by virtue of the coding of the information, and wherein at least one mobile receiver is located in a vehicle which receives coded information pertaining only to that vehicle.

4,857,887

LAMINATED PIEZOELECTRIC KEYBOARD

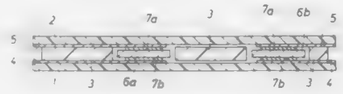
Thomas Iten, Zug, Switzerland, assignor to Schenk & Co., Switzerland

Continuation of Ser. No. 887,784, Jul. 21, 1986, abandoned. This application Oct. 5, 1988, Ser. No. 253,436

Claims priority, application Switzerland, Jul. 23, 1985, 03191/85

Int. Cl.[4] H01H *3/12*

U.S. Cl. 341—34 **10 Claims**



1. Keyboard having a plurality of key locations comprising:

a support layer;

an intermediate laminate;

a cover laminate;

a plurality of piezoelectric crystal elements, each of said crystal elements being arranged at one of said key locations for generating an electrical signal upon a pressure acting thereon;

supporting means for each of said crystal elements;

wherein each of said crystal elements has electric contact areas at upper and lower surfaces of said crystal elements, one of said contact areas being a substantially rigid plate;

wherein said supporting means are provided to support the respective crystal element substantially along its periphery to allow the crystal element to flex upon loading at its center area;

wherein said cover laminate has a thickness to allow pressure transmission to a crystal element therebelow at a key location almost without travel;

wherein said intermediate laminate is made of incompressible material and has an opening at each of said key location for receiving one of said crystal elements, each of said crystal elements, together with its electric contact areas, having a thickness which substantially corresponds to a thickness of the intermediate laminate, so as to provide a flat surface of substantially uniform thickness and to prevent forces applied to a key location from being transmitted to crystal elements at adjacent key locations; and

wherein said cover laminate, said intermediate laminate and said support layer are glued to each other except at the crystal elements to form a single body providing a closed casing for each of said crystal elements.

4,857,888

AUTOMOTIVE ALARM

Enrique R. Torres, Villa Kennedy, Edif. 28 #417, Villa Palmeras Sant., P.R. 00915

Filed Feb. 8, 1988, Ser. No. 152,962

Int. Cl.[4] B60R *25/00*

U.S. Cl. 340—426 **1 Claim**

1. An automotive alarm apparatus in combination with an automobile to effect delayed deactivation of the automobile's ignition system and simultaneous activation of an audible alarm upon unauthorized use of the automobile comprising,

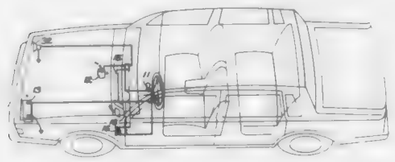
an electrical circuit including:

a plurality of switches comprising a first disarmed switch means for disarming the alarm apparatus secured under an engine hood of the automobile, and

a second pressure actuatable switch means mounted on a floor of a passenger compartment of the automobile for foot actuation and activation of the audible alarm by an individual, and

a relay circuit means electrically associated with the plurality of switches and an SCR element and a plurality of triode transistors for effecting a time delay to actuate the relay circuit means to deactivate the ignition system and actuate the audible alarm, and

wherein said plurality of switches further includes a third hidden switch secured in the passenger compartment of the automobile for activation of the relay circuit means upon unauthorized use of the automobile, and



wherein the plurality of switches are electrically associated in the electrical circuit including the SCR element and the relay circuit,

wherein the SCR element is electrically associated in electrical series with a first resistor wherein said first resistor has a value of IM Ohms, and

wherein a second resistor is electrically associated in parallel to said first resistor and said SCR element is of a value of 5.1K Ohms, and

wherein said relay circuit means includes a relay coil actuatable to actuate a plurality of contacts including a first contact to deactivate the ignition system and a second contact to actuate the audible alarm, and

wherein said audible alarm comprises a horn positioned under the hood of the automobile, and

wherein said first triode transistor comprises a 2N2222 transistor and said second triode transistor comprises an ECG 152 NPN transistor.

4,857,889

LIQUID-CRYSTAL INDICATOR CONTROL SYSTEM

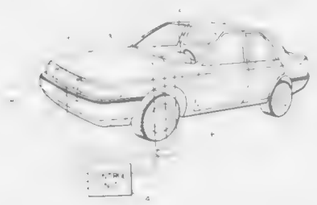
Takashi Terano, Hiroshima; Masayuki Jinno, Higashihiroshima, and Munetoshi Saijo, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 1, 1988, Ser. No. 226,710

Claims priority, application Japan, Aug. 3, 1987, 62-119627

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 340—461 **8 Claims**



1. A vehicle having a liquid-crystal indicator control system for display of at least two different information alternatively, for predetermined times comprising;

(a) a vehicle

(b) a liquid-crystal indicator for mounting in said vehicle, and

(c) a control system therefore comprising

(i) a temperature detecting means for detecting ambient temperature relative to said liquid-crystal indicator,

(ii) a comparator means for comparing said detected ambient temperature with a predetermined temperature value,

(iii) output means for outputing a signal when said detected ambient temperature is less than said predetermined temperature, and

(iv) display time changing means for changing the predetermined time of display responsive to said output signal.

4,857,890

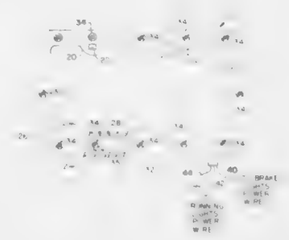
SAFETY REAR LICENSE PLATE FRAME

Joseph E. Solow, Plainview, N.Y., assignor to Wolo Manufacturing Co., Deer Park, N.Y.

Filed Mar. 2, 1988, Ser. No. 162,996

Int. Cl.[4] B60Q *1/44*

U.S. Cl. 340—479 **2 Claims**



1. A safety license plate frame for use on a vehicle having a brake light circuit and a running light circuit, said license plate frame comprising:

a frame member defining an opening for a license plate and having means for mounting a license plate to the frame member;

a plurality of lamp means positioned about said frame member;

means for electrically connecting the lamp means between an input and ground;

a running lights connecting wire having opposite ends;

first electrical connector means, including resistor means connected on one end of said running lights connecting wire and said input;

a brake lights connecting wire having opposite ends; and

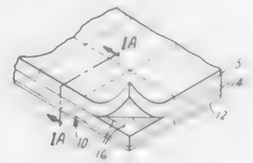
second electrical connector means, including diode means, connected between one end of said brake lights connecting wire and said input without a resistance drop for permitting current flow through said brake lights connecting wire in the direction of said input only; wherein the opposite ends of said running lights connecting wire and brake lights connecting wire may be connected to the running light circuit and brake light circuit, respectively, of the vehicle and the lamp means will be brighter when powered by the brake light circuit than the running lights circuit.

4,857,891

RANDOM-FILAMENT, MULTI-DIRECTIONALLY RESPONSIVE MARKER FOR USE IN ELECTRONIC ARTICLE SURVEILLANCE SYSTEMS

Eugene C. Heltemes, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 29, 1988, Ser. No. 188,456
Int. Cl.[4] G08B *13/24*
U.S. Cl. 340—551 4 Claims



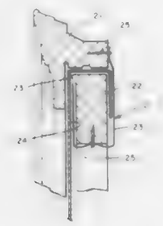
1. A marker for use in an electronic article surveillance system of the type in which an alternating magnetic field in an interrogation zone produces remotely detectable magnetization changes in the marker, wherein the marker comprises a substantially two-dimensional, sheet-like substrate and multiple metallic filaments randomly dispersed in or adhered thereto so as to be substantially parallel to the plane thereof, said filaments being selected of a high permeability, low coercive force, magnetic material, with said filaments thereby randomly intersecting each other to magnetically couple therewith.

4,857,892

ART ALARM BACKING FOR PROTECTING A WORK OF ART

Dennis E. Riordan, 2326 Sawtelle Blvd., Los Angeles, Calif. 90064

Filed Mar. 16, 1988, Ser. No. 168,853
Int. Cl.[4] G08B *13/00, 13/12*
U.S. Cl. 340—568 3 Claims



1. An art alarm backing for use with an alarm device in order to protect a work of art which includes a painting canvas having a front side and a back side, a stretcher frame including a plurality of individual frame members which are specifically designed to permit each of four peripheral edges of the front side of the painting canvas to be folded over so that it is adjacent to the back side of the painting canvas wherein the outer peripheral dimensions of the stretcher frame may be expanded in order to stretch the painting canvas, a decorative frame on which the stretcher frame and the painting canvas are mounted, said art alarm backing comprising:

a. a strip of backing material which has a first surface and a second surface, said first surface being disposed adjacent to one of the four folded-over peripheral edges of the front side of the painting canvas;

b. a strand of conductive wire which is mechanically coupled to said second surface of said strip of backing material whereby said strand of conductive wire is electrically coupled to the alarm device; and

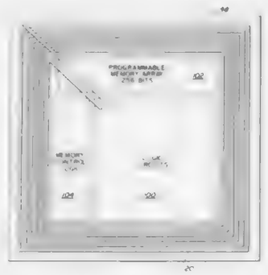
c. securing means for securing said strand of conductive wire to the painting canvas, the stretcher frame and the decorative frame.

4,857,893

SINGLE CHIP TRANSPONDER DEVICE

Gary T. Carroll, Boulder, Colo., assignor to Bi Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 888,246, Jul. 18, 1986. This application Feb. 8, 1988, Ser. No. 153,237
Int. Cl.[4] G08B *13/14*
U.S. Cl. 340—572 14 Claims



1. A transponder device comprising:

a single monolithic semiconductor chip;

receiving means for receiving a carrier signal from an external source;

diode means for rectifying the received carrier signal in order to generate operating power for the transponder device, and for mixing an encoded data word with the carrier signal in order to generate sum and difference signals;

digital circuit means for deriving a clock signal from said carrier signal;

data generating means responsive to said clock signal for generating the encoded data word that is mixed with the carrier signal in said diode means; and

transmitting means for transmitting the sum and difference signals to a location external from said transponder device;

said diode means, digital circuit means, and data generating means comprising electrical circuits that are realized on said single monolithic semiconductor chip.

4,857,894

LIQUID LEVEL MEASUREMENT SYSTEM FOR ANALOG AND DIGITAL READOUT

Ernest A. Dahl, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 27, 1988, Ser. No. 213,032
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—619 4 Claims

1. An improved liquid level indicating system for measuring the liquid level within a tank, comprising:

a. a transparent tubular plastic housing;

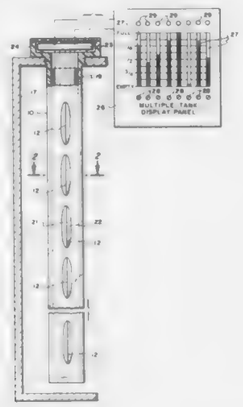
b. a plurality of transparent prismatic formations located along the vertical length of and extending from said housing such that said prismatic formations are made a part of one continuous formation along the vertical length of said housing;

c. a plurality of LED cells and a plurality of corresponding photodetectors located along the vertical length of said housing;

d. each of said LED cells and corresponding photodetector being positioned opposite one of said prismatic formations; each of said prismatic formations having two outer surfaces thereof exposed to the liquid to be measured;

e. each of said prismatic formations being operable to reflect light therewithin from said LED cell positioned opposite said prismatic formation to said corresponding photodetector when said liquid media being measured is absent from the outer surfaces of said prismatic formation positioned opposite said LED cell and said corresponding photodetector, and light from said LED cell being refracted out into said liquid media and not reflected to said photodetector when said liquid media is present at a measured location;

f. a plurality of electrical conductors located within said housing;



g. a signal voltage from each of said photodetectors being fed via one of said plurality of electrical conductors to one of a plurality of sensor circuits mounted in the top of said housing; said respective sensor circuit being operable to provide a signal indicative of the presence of said liquid media;

h. a liquid crystal bar graph having a plurality of inputs, each input of said bar graph being connected to the output of one of said plurality of sensor circuits; and

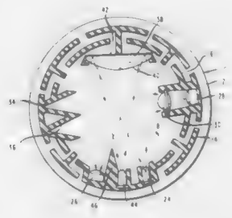
i. said bar graph operable to indicate the liquid level within said tank in response to the signals from said sensor circuits indicative of the presence of said liquid media within said tank.

4,857,895

COMBINED SCATTER AND LIGHT OBSCURATION SMOKE DETECTOR

Edward K. Kaprelian, 15 Lowery La., Mendham, N.J. 07945

Filed Aug. 31, 1987, Ser. No. 91,588
Int. Cl.[4] G08B *17/10*
U.S. Cl. 340—630 18 Claims



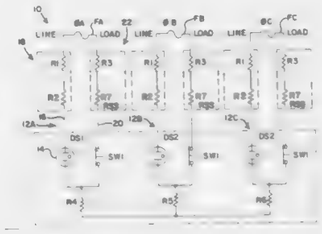
5. A smoke detector having a smoke chamber comprising side walls provided with light-trapped openings for the admission of smoke and a pair of substantially parallel top and bottom walls, said chamber containing an image-forming optical component having its optical axis substantially parallel to said top and bottom walls, a first light emitter within said chamber and spaced from and coaxial with said image-forming optical component a distance equal to twice the focal length of the optical component so that light emitted from the first light emitter is focused back on itself, a second light emitter within said chamber and displaced to one side of said optical axis and directing light to said optical component along an off-axis path, a first light sensor within said chamber and displaced to the opposite side of said optical axis and receiving light from said second light emitter via an off-axis path from said optical component and a second with sensor within said chamber having its axis intercepting the axis of the optical element.

4,857,896

POLYPHASE CIRCUIT FUSE CONDITION INDICATING DEVICE

Stanley J. Brooks, Palm Harbor, Fla., assignor to Square D Company, Palatine, Ill.

Filed Oct. 19, 1987, Ser. No. 110,117
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—639 16 Claims



1. A fuse condition indicating device adapted to be connected to a polyphase electric circuit in which said electric circuit includes plural line leads, corresponding plural load leads and plural fuses with each fuse being connected in series between corresponding line and load leads, said device comprising:

plural indicator means, one associated with each of said phases of said polyphase electric circuit, each of said indicator means having first and second sides, and each of said indicator means for producing user recognizable indications of the condition of its corresponding fuse;

plural first resistor means, one associated with each of said phases of said polyphase electric circuit, each of said first resistor means having first and second sides, each adapted to be connected between said first side of said corresponding indicator means and one of either the line or load leads of its corresponding fuse, each of said plural first resistor means providing a substantially resistive load;

plural second resistor means, one associated with each of said phases of said polyphase electric circuit, each of said second resistor means having first and second sides, each adapted to be connected between said second side of said corresponding indicator means and the other of said plural second resistor means providing a substantially resistive load;

plural third resistor means, each connected between said second side of said corresponding indicator means and said second sides of said other indicator means, each of said plural third resistor means providing a substantially resistive load between said second side of its corresponding indicator means and said second sides of said other indicator means.

4,857,897
ELECTRONIC BOILING POINT MUSICAL ALARM
Mu H. Chen, No. 47, Lane 58, Wu Ku Wang North Street, San Chung City, Taipei Hsien, Taiwan
Filed Apr. 11, 1988, Ser. No. 180,350
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—692 **2 Claims**

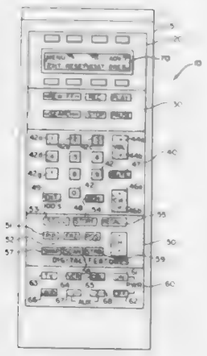


1. An electronic boiling point musical alarm comprising a body member (1), an upper plate (8), a sensor (2), a speaker (12) and an electronic assembly (14), a cavity (81) being formed within said upper plate (8) with said speaker (12) facing said cavity (81), a frusta-conical channel (11) being provided in said body member (1) forming a passage for the voice of said speaker (12) to propagate through and preventing said speaker (12) from possible damage caused by accumulation of vapor, an encasement (13) being provided for encasing said electronic assembly (14);

said sensor (2) being disposed within an inner hole (31) of a threaded portion of a sensing plate (32), a head (21) of said sensor (2) being received in a receptacle (15) at said encasement (13);

said electronic boiling point musical alarm being further characterized in that said sensor (2) detects vapor temperature variations of a teapot or the like thereby activating said speaker (12) to sound when said water temperature reaches a certain predetermined level.

4,857,898
DATA COMPRESSION TECHNIQUE FOR RECONFIGURABLE REMOTE CONTROL APPARATUS
Bobby J. Smith, Knoxville, Tenn., assignor to North American Philips Consumer Electronics Corp., Knoxville, Tenn.
Filed Dec. 9, 1987, Ser. No. 130,818
Int. Cl.[4] H04Q *9/14;* **G08C** *19/00*
U.S. Cl. 341—22 **14 Claims**



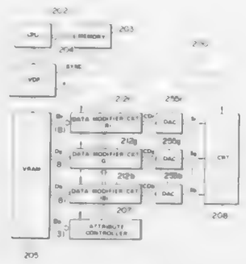
1. A method for compressing formatted code obtained from a remote control means, wherein said formatted code includes at least information regarding pause times between pulses output by said remote control means, comprising:

(a) determining for said formatted code all different pause time information represented in said formatted code and arranging said different pause time information as elements of a first array, each element having a representative element number;

(b) generating a second array with second array elements from said obtained code and said first array element numbers, wherein said second array elements are comprised of at least two nibbles, each nibble representing an element number of said first array, wherein,

said second array further represents the obtained formatted code.

4,857,899
IMAGE DISPLAY APPARATUS
Takatoshi Ishii, Tokyo, Japan, assignor to ASCII Corporation, Tokyo, Japan
Filed Dec. 10, 1986, Ser. No. 940,530
Claims priority, application Japan, Dec. 10, 1985, 60-277364; Jan. 28, 1986, 61-16350; Feb. 20, 1986, 61-35537
Int. Cl.[4] G09G *1/28*
U.S. Cl. 340—701 **15 Claims**



1. An image display apparatus for use with a color display unit responsive to a plurality of color signals, and for displaying a color graphic image having at least one region defined by boundaries and being composed of a plurality of display dots whose colors are determined respectively by the color signals, said image display apparatus comprising:

(a) storage means for storing a plurality of display data corresponding to said boundaries of said region of said color graphic image, each display data including color data relating to a color of one of the plurality of display dots and attribute data representative of an attribute of said each display data;

(b) readout means for selectively reading said plurality of display data one by one from said storage means in synchronization with a display timing of each of the display dots on the color display unit;

(c) data modifier means responsive to the display data read from said storage means, and for performing a data-modifying operation on the color data corresponding to said boundaries so as to provide the color data of the display dots composing said region of said color graphic image, said data-modifying operation being determined by the attribute data of said read display data and involving the color data corresponding to said boundaries so as to provide the color data of the display dots composing said region of the color graphic image to be displayed on the color display, said data modifier means outputting the result of said data-modifying operation; and

(d) signal feeding means for feeding the result of said data-modifying operation outputted from said data modifier means to the color display unit as the color signal.

4,857,900
DISPLAY DEVICE WITH COLOR CORRECTION
Masahiro Rachi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 12, 1985, Ser. No. 808,087
Claims priority, application Japan, Dec. 15, 1984, 59-263742; Dec. 15, 1984, 59-263743
Int. Cl.[4] G09G *1/28*
U.S. Cl. 340—703 **8 Claims**



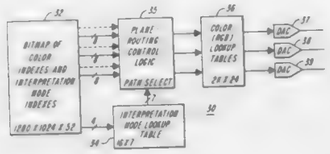
1. A display device comprising:

a plurality of light emission units each having an anode emission member, a cathode member and a grid member, the light emission efficiencies in the light emission units being different for respective colors;

drive means for supplying electrical power to said light emission units; and

control means for controlling the drive means so that a small electrical power is supplied to the anode emission member and the grid member in the light emission units having the higher light emission efficiency while a large electrical power is supplied to the anode emission member and the grid member in the light emission units having lower light emission efficiency, and the electrical power supplied to the anode emission member being proportional to that supplied to the grid member.

4,857,901
DISPLAY CONTROLLER UTILIZING ATTRIBUTE BITS
Olin G. Lathrop, Groton, Mass., assignor to Apollo Computer, Inc., Chelmsford, Mass.
Filed Jul. 24, 1987, Ser. No. 77,161
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—703 **12 Claims**



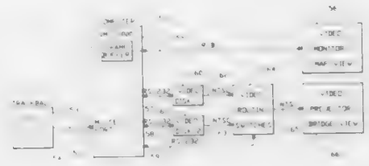
1. In a system for controlling a computer graphics display, wherein said system stores and processes digital pixel values corresponding to respective display pixels, said system including a color component lookup table element having an array of memory locations for storing digital color component values, the color component lookup table element being addressable by selected multiple-bit digital index values, the improvement comprising

storage means for storing first control values in association with each digital pixel value,

display mode lookup table means, including an array of memory locations, the display mode lookup table being addressable by said first control values, for generating second control values corresponding to respective pixels, and

control means, in communication with said display mode lookup table means and said storage means, for generating the multiple-bit digital index values in response to a combination of said second control values and said digital pixel values.

4,857,902
POSITION-DEPENDENT INTERACTIVITY SYSTEM FOR IMAGE DISPLAY
Michael Naimark, and Kenneth M. Carson, both of San Francisco, Calif., assignors to Advanced Interaction, Inc., Houston, Tex.
Filed May 14, 1987, Ser. No. 50,196
Int. Cl.[4] G06F *3/033*
U.S. Cl. 340—709 **19 Claims**



1. An apparatus for interactive display of visual images, comprising:

display means, responsive to image data, for displaying visual images;

storage means for storing a plurality of frames of image data in data locations identified by frame addresses and for supplying frames of image data to the display means in response to frame addresses, the image data in each frame in the plurality defining a visual image for display and each of the plurality of frames having a virtual position in a predefined virtual space in which the visual image in each frame is related to visual images in other frames by virtual position in the virtual space;

input means for generating an input signal indicating amount and direction of displacement within a time interval of an object;

translating means, connected to receive the input signal, for translating the input signal to an updated virtual position in the virtual space relative to a previous virtual position, and a next frame address of a data location that stores a frame having the updated virtual position and for supplying the next frame address to the storage means; and

means, connected to the translating means, for displaying a representation of the virtual space with an indication of the virtual position of a given frame of image data supplied to the display means.

4,857,903
ELECTRO-OPTICAL MOUSE WITH IMPROVED RESOLUTION FOR COMPENSATION OF OPTICAL DISTORTION
Thomas Zalenski, Killingworth, Conn., assignor to Summagraphics Corporation, Fairfield, Conn.
Filed May 6, 1986, Ser. No. 860,231
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—710 **35 Claims**

1. A position control system for a cursor, comprising:

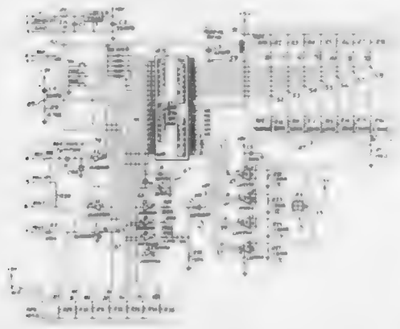
(a) a surface having a repetitive pattern of passive, optically contrasting indicia extending over said surface, said pat-

tern being comprised of spaced regions of a first optical characteristic substantially surrounded by at least one region of a second optical characteristic;

(b) a housing means movable in a plane substantially parallel to said surface and having a base with an opening formed therein, said opening facing said surface during movement of said housing in said plane;

(c) light-emitting means mounted within said housing and directed at said opening;

(d) light-detecting means mounted within said housing and positioned for receiving light passing through said opening, said light-detecting means outputting a voltage signal substantially proportional to the amount of light impinging on said light-detecting means;



(e) means for generating a plurality of reference voltage signals, each of said reference voltage signals being substantially proportional to any one of a plurality of predetermined threshold voltage levels; and

(f) coding means electrically coupled to receive said voltage signals proportional to the amount of light received and said reference voltage signals, said coding means outputting a coded detector signal representing one of two binary digits in response to the amplitude of said voltage signal being greater than or equal to the amplitude of a generated reference voltage signal and outputting a coded detector signal representing the other of said two binary digits in response to the amplitude of said voltage signal being less than the amplitude of said generated reference voltage signal.

4,857,904

COMBINATION OF TRANSITION-ENCODED FONT INFORMATION FOR GENERATION OF SUPERIMPOSED FONT IMAGES

David J. Schoon, St. Paul, Minn., assignor to Printware, Inc., St. Paul, Minn.

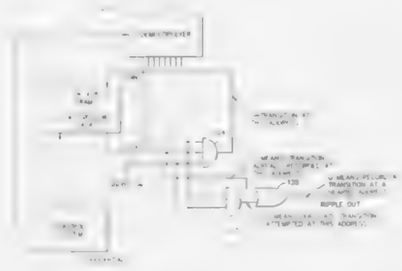
Filed Sep. 15, 1987, Ser. No. 96,959
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—730 **20 Claims**

1. In an image generating apparatus producing a scan line which is controlled to be white or black responsively to transition-encoded font image information within a memory, an improvement according that the transition-encoded information for two font images may be combined, the improvement comprising:

block reading means for reading at one time from a plurality of memory locations the transition-encoded font image information for a first font, which information corresponds to a like plurality of pixels in the first font image;

encoding means for producing the transition-encoded font image information for a second font, which information corresponds to at least one pixel of the plurality of pixels;

combining means for combining the transitionencoded font image information for the first font with the transition-encoded font image information for the second font into a combined font image information so that for any pixels wherein a transition is encoded in both the encoded font image information for both the first font and also for the second font then the combined font image information will likewise encode a transition at these pixels and will also encode a transition at selected nearby pixels, the total



transitions within the combined font image information preserving the numbers of transitions which are within the font image information for the first font and within the font image information for the second font; and

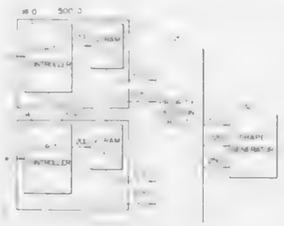
means for restoring the combined font image information to the memory.

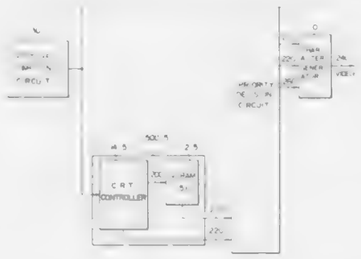
4,857,905

IMAGE DISPLAY APPARATUS

Toru Ogawa, Edogawa, Japan, assignor to Namco, Ltd., Tokyo, Japan

Filed Feb. 1, 1988, Ser. No. 150,908
Claims priority, application Japan, Feb. 5, 1987, 62-25672
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—748 **13 Claims**





1. An image display apparatus which synthesizes one color picture by placing a plurality of pictures with one on top of another, said image display apparatus comprising:

a picture display memory for dividing each of said pictures before synthesis into a plurality of character blocks, and registering addresses for reading the color characters to be displayed in the respective character blocks at the respective character block addresses;

a raster display controller for successively outputting the character block address signals of the respective pictures before synthesis to said picture display memory in synchronization with horizontal and vertical scans of a raster display so that said picture display memory successively outputs the corresponding character read address signals in the numerical order of said pictures, and for successively outputting vertical scanning position address signals for the corresponding character blocks of the respective pictures;

a shape generator in which a plurality of character shapes to be displayed in the respective character blocks are registered in advance, and which outputs, in the numerical order of said pictures, character shape data for one horizontal scan of the character blocks which are designated by the corresponding vertical scanning position address signals in accordance with the character shapes designated by the corresponding character read address signals which are successively input in the numerical order of said pictures before synthesis;

a priority decision circuit for comparing said character shape data for one horizontal scan which are output from said shape generator in the numerical order of said pictures with each other in accordance with predetermined priorities and determining the priority picture for each dot which is to be displayed at the time of a horizontal scan of said raster display; and

a character generator in which a plurality of color character data to be displayed in the respective character blocks are registered in advance, and which successively outputs color data for one dot which are specified by the corresponding vertical scanning position address signal and a horizontal scanning position address signal in accordance with said color character data designated by said character read address of said priority picture in synchronization with a scan of said raster display;

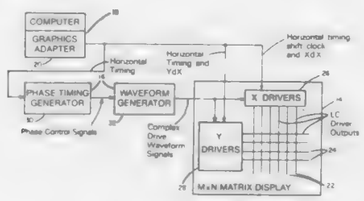
said shape generator and said character generator being provided for common use in synthesizing one color picture by placing said plurality of pictures with one on top of another.

4,857,906

COMPLEX WAVEFORM MULTIPLEXER FOR LIQUID CRYSTAL DISPLAYS

Arlie R. Conner, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 8, 1987, Ser. No. 105,842
Int. Cl.[4] G09G *3/36*
U.S. Cl. 340—784 **26 Claims**



1. A liquid crystal display comprising:

a matrix display panel having a two-dimensional array of liquid crystal display elements switchable between at least two display states;

at least one of a row and a column driver circuit means, each driver circuit means having at least two drive level inputs, a logical selection input, and a plurality of outputs connected to control lines of the display elements for switching the display elements between said display states;

display controller means connected to the logical selection input for connecting the display to a graphical data source for controlling selection of display states of the display elements, said controller means having a timing signal output controllably coupled to the driver circuit means:

waveform generator means having at least two outputs, each output being connected to one of the drive level inputs for applying a time variant signal to the driver circuit means, said waveform generator means further having timing and switching means and generating at least two predetermined waveforms for each driver circuit which vary among at least three levels within a predetermined dynamic range and through at least three phases in a predetermined sequence for each occurrence of the logical selection of the display state of the display elements, and providing each of said waveforms as said time variant signals to the drive level inputs, said timing and switching means including at least one phase timing signal input;

phase timing means having an output coupled to the phase timing signal input and responsive to the controller means timing signal to provide phase timing signals to the timing and switching means for synchronizing the waveforms to a predetermined phase with the logical selection of the display elements.

4,857,907

LIQUID-CRYSTAL DISPLAY DEVICE

Mitsuhiro Koden, Nara, Japan, assignor to 501 Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 28, 1987, Ser. No. 43,342
Claims priority, application Japan, Apr. 30, 1986, 61-102979; May 23, 1986, 61-119685; May 30, 1986, 61-126578; Jun. 25, 1986, 61-150569
Int. Cl.[4] G09G *3/36*
U.S. Cl. 340—784 **8 Claims**



1. A liquid-crystal display device comprising thin-film transistors arrayed in a matrix, wherein each of said thin-film transistors comprises:

an insulating substrate;

a gate electrode disposed on said insulating substrate;

a first insulating film covering said gate electrode;

an amorphous Si semiconductor film disposed on said first insulating film;

a second insulating film disposed on said amorphous Si semiconductor film;

a p-doped n^+-amorphous Si film forming both a source and a drain on said amorphous Si semiconductor film and said second insulating film;

a third insulating film covering said p-doped n^+-amorphous Si film, except for a part of said p-doped n^+-amorphous Si film, and said amorphous Si semiconductor film;

a source electrode and a drain electrode forming junctions

with said part of the p-doped n+-amorphous Si film and covering said third insulating film; and

a picture-element electrode, a part of which is superposed on said drain electrode.

4,857,908

WIDE SCREEN DISPLAY DEVICE USING AN ENDLESS BELT

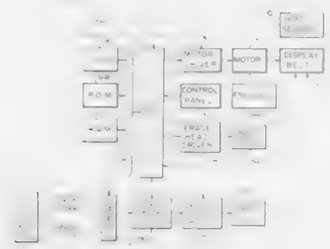
Masaaki Kogure; Yoshihiro Mitekura; Naoki Matsuyama, all of Tokyo, and Satoshi Shinguryo, Kawaguchi, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 9,992, Feb. 2, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 265,349

Claims priority, application Japan, Jan. 31, 1986, 61-19742; Feb. 7, 1986, 61-23676; Aug. 14, 1986, 61-191501; Aug. 15, 1986, 61-190610; Aug. 21, 1986, 61-196525

Int. Cl.[4] G09G *3/26*

U.S. Cl. 340—785 **10 Claims**



1. An image display device comprising:

a display member formed as an endless belt made of an electrochromic material which electrochemically shows oxidation-reduction reactions, said display member allowing information to be written and erased therein, said display member comprising a first layer made of said electrochromic material, a second layer laminated on one surface of said first layer for constituting a transparent common electrode, and a third layer laminated on the other surface of said first layer and produced by dispersing metal fibers in a polymer,

an information source separate from said display member for providing information to be written on said display member;

storage means for storing said information;

driving means for moving said belt at a controlled speed;

writing means for writing information in said display member at a predetermined density dependent on exposure time including voltage applying means for applying a voltage to said display member;

erasing means for erasing information which is written in said display member; and

control means for controlling said driving means and said writing means so that said writing means is actuated only when said belt is moving and so that the exposure time of the writing means and the speed of movement of the belt are controlled together to ensure that the information is written at said predetermined density.

4,857,909

IMAGE DISPLAY APPARATUS

Tatsuhiko Mizushima, Gumma, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 841,191, Mar. 19, 1986, abandoned. This application May 2, 1988, Ser. No. 191,733

Int. Cl.[4] H04N *7/00*

U.S. Cl. 340—793 **4 Claims**



1. An image display apparatus utilizing color image information for generating a monochrome image, comprising:

a central processing unit;

an image display memory for receiving color image information from the central processing unit and for storing the color image information in successive pluralities of bits of color image information wherein each plurality of bits defines a color of one corresponding pixel of a color image;

a display control circuit for cyclically reading the successive pluralities of bits of color image information out of the image display memory;

a conversion circuit for converting each plurality of bits of color image information read out of the image display memory into a corresponding pattern of bits of monochrome image information in which successive bits correspond to successive pixels in a monochrome image and in which different patterns of the bits of monochrome image information correspond to different colors defined by the color image information; and

monochrome video display means receiving the monochrome image information and for producing a monochrome video image from the monochrome image information.

4,857,910

BIT-MAP CRT DISPLAY CONTROL

Stephen C. Baunach, San Jose, Calif., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 19, 1983, Ser. No. 562,789

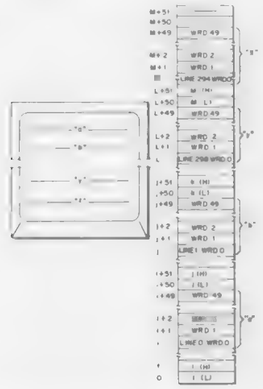
Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—799 **30 Claims**

1. An apparatus for controlling a bit-mapped CRT display raster comprising:

(a) a buffer memory for storing data, said stored data including mapping data constituting a picture element by picture element mapping of the information to be displayed, said mapping data consisting of groups of data words stored in sequential memory locations, each of said groups constituting a picture element by picture element mapping of one scan line of said raster, and said stored data further including pointers associated with said groups of data, each of said pointers indicating the starting address of the group associated with the next sequential scan line; and,

(b) output means, operatively associated with said memory and responsive to said pointers, for outputting said mapping data as a serial bit stream, each of said groups being synchronized with its associated scan line, whereby said mapping data is displayed in said display raster.



4,857,911

MULTIFUNCTIONAL PAGER RECEIVER CAPABLE OF REDUCING THE MEMBER OF MANUAL SWITCHES

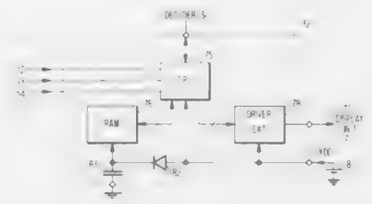
Toshihiro Mori; Takashi Oda, and Takashi Ohyagi, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 77,053, Jul. 9, 1987, abandoned, which is a continuation of Ser. No. 655,287, Sep. 28, 1984, abandoned. This application Mar. 18, 1988, Ser. No. 170,592

Claims priority, application Japan, Sep. 30, 1983, 58-180385; Sep. 30, 1983, 58-150665[U]; Sep. 30, 1983, 58-150666[U]; Sep. 30, 1983, 58-150667[U]

Int. Cl.[4] H04Q *1/00*

U.S. Cl. 340—825.44 **6 Claims**



1. A paper receiver operable in response to a message signal transmitted from a transmitting station, said paper receiver having a plurality of operational functions, each function being different from the other of said functions and comprising a storage element for storage each message carried by message signals transmitted from a transmitting station and a display unit for displaying each message stored in said storage element, said pager receiver further comprising:

mode specifying means for specifying a first plurality of manual modes, each said mode being indicative of at least one of said operational functions by manual operation thereof into a second plurality of positions, one after another at a time, to produce a unique mode signal, each such signal being indicative of each of said manual modes, said second plurality of positions being smaller in number than said first plurality of manual modes;

a memory unit for memorizing a third plurality of announcement signals representative of operation announcements, respectively, said operation announcements corresponding to the respective manual modes, each of said operation announcements being indicative of at least one of said manual modes that may be specified following the manual mode indicated by said mode signal; and

accessing means coupled to said specifying means and to said display unit for accessing said memory unit in response to said mode signal to send one of said announcement signals to said display unit as an active signal and to make said display unit display the operation announcement represented by said active signal.

4,857,912

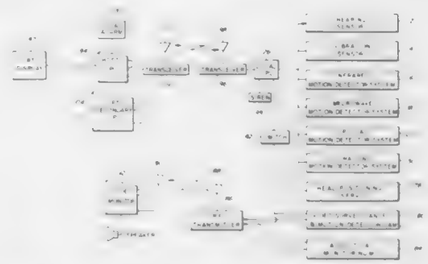
INTELLIGENT SECURITY ASSESSMENT SYSTEM

Hobart R. Everett, Jr., and Gary A. Gilbreath, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 27, 1988, Ser. No. 227,923

Int. Cl.[4] G08B *13/16;* **H04B** *9/00;* **B25J** *19/00*

U.S. Cl. 340—825.3 **14 Claims**



1. A system comprising:

m sensors, m being a positive integer, each for detecting intrusion into an area and each having an output, each said output having an on state and an off state;

computing means connected to said outputs of each of said m sensors for determining whether or not each of said outputs is in said on state, for assigning a weighting factor to each said output that is in said on state, for calculating the sum of all said weighting factors, for comparing said sum to a reference and for providing an output when said sum exceeds said reference;

n sensors, n being an integer, having an on state and an off state, for detecting intrusion into said area, operably coupled to said computing means for receiving said computing means output and being activated to said on state thereby.

4,857,913

CODED OBJECTS IDENTIFIABLE BY PROXIMITY AND DEVICES FOR CHANGING THE CODES OF THESE OBJECTS

Jacques Lewiner, Saint Cloud; Claude Hennion, and Didier Leonard, both of Paris, all of France, assignors to Societe Fontaine, Paris, France

Filed Nov. 25, 1987, Ser. No. 125,655

Claims priority, application France, Nov. 27, 1986, 86 16583

Int. Cl.[4] G06K *5/00;* **H04Q** *1/48*

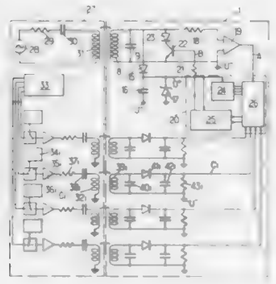
U.S. Cl. 340—825.310 **4 Claims**

1. A portable coded badge identifiable by proximity, said badge comprising an electronic identification circuit for forming a coded binary identification signal which is identifiable by an interrogator-reader situated at a short distance from the badge, without direct contact with the badge, said badge being passive in the sense that the electrical supply thereof is provided by a simple inductive coupling of a component of said badge with an external component in which there is generated an electrical voltage of a high frequency F, wherein said badge comprises,

for forming each coded binary signal, a programmable or

reprogrammable ROM of a semiconductor type which can store and preserve durably successive identification signals produced by said identification circuit,

and, for enabling modification of the contents of the ROM, a plurality of n oscillating circuits tuned to a like plurality



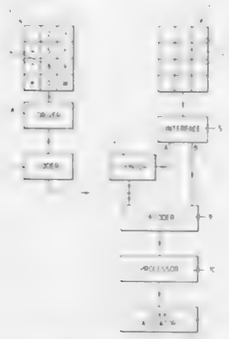
of high frequencies F_n different from F, n being an integer between 1 and 20, and the inductances of said oscillating circuits lending themselves easily to inductive coupling with programming or reprogramming circuits located externally of the badge.

4,857,914

ACCESS-CONTROL APPARATUS

Keith R. Thrower, Old Cedar, 12 Wychcotes, Caversham, Reading, RG4 7DA, England

Filed Jul. 23, 1987, Ser. No. 76,621
Int. Cl.[4] H04Q *1/00*; E05B *49/00*
U.S. Cl. 340—825.31 **4 Claims**



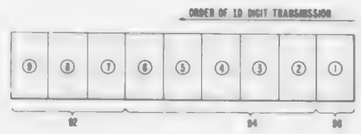
1. Access-control apparatus including a device for the entry of authorization or identification data represented as a sequence of characters, and means for providing means for providing access in response to the recognition of such data entered through said device; said data entry device comprising: rectangular array of selectively actuable keys for inputting members of a character set, the keys being equal in number to the number of characters in that set; means for assigning respective members of said character set to respective said keys; means for changing the character-to-key assignment of that same character set at specified events by scrolling the array of assigned characters in the sense that lines of the said characters are shifted stepwise in a coordinate direction of the array; with the line at the leading edge of the array in that direction reappearing at the opposite edge of the array, whereby all of the characters appear in changed positions within the array after each shift but the relative positions of the characters within each individual said line are retained; and means for displaying the currently-assigned characters in relation to the respective keys.

4,857,915

PAGING RECEIVER WITH PAGING RECEIVER IDENTIFICATION CODE DIGITS TRANSMITTED IN ORDER OF INCREASING SIGNIFICANCE

Andrew A. Andros, Spring, Tex., and Thomas J. Campana, Chicago, Ill., assignors to Telefind Corp., Coral Gabels, Fla.

Filed Oct. 20, 1987, Ser. No. 110,511
Int. Cl.[4] H04Q *7/00*; G08B *5/22*
U.S. Cl. 340—825.440 **24 Claims**



1. A battery powered RF paging receiver for receiving commands with each command specifying a different function to be performed by the paging receiver and containing an identical multi-digit paging receiver identification code which identifies the paging receiver with the digits of the identification code being transmitted from a transmitter to the paging receiver in an order of increasing significance preceding each command comprising:

(a) a RF tuner, powered by the battery, for receiving a channel on which the commands are to be transmitted;

(b) a memory for storing a multiple digit paging receiver identification code identifying the paging receiver; and

(c) control means, coupled to the RF tuner, for sequentially decoding digits of a transmitted paging receiver identification code specifying a paging receiver to receive one of the commands, and comparing the received digits sequentially with corresponding stored digits of the paging receiver identification code in an order of increasing significance of the digits until

(i) a match is not found between one of the stored and transmitted digits at which time the control means deactivates the RF tuner to stop the tuner from drawing power from the batter or

(ii) a complete match is found between the stored and transmitted digits of the paging receiver identification code at which time the command is decoded and caused to be executed by the control means;

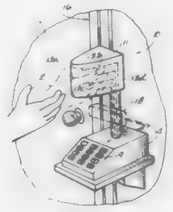
whereby the comparison of digits of the paging receiver identification code transmitted in an order of increasing significance and the stored paging receiver identification code minimizes time that the RF tuner draws power from the battery in determining that a page is not addressed to the paging receiver.

4,857,916

SYSTEM AND METHOD FOR IDENTIFYING AN INDIVIDUAL UTILIZING GRASPING PRESSURES

Robert W. Bellin, 4916 N. Highway 83, Hartland, Wis. 53029

Filed Feb. 26, 1987, Ser. No. 19,538
Int. Cl.[4] G06K *9/00*
U.S. Cl. 340—825.340 **20 Claims**



1. A device for identifying an individual comprising:

a non-uniplanar member; and

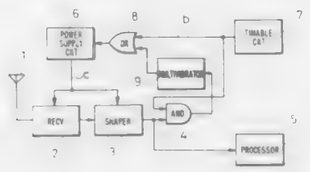
sensing means for sensing the pressure exerted at preselected locations on said non-uniplanar member when said non-uniplanar member is grasped by the individual's hand.

4,857,917

REMOTE CONTROL APPARATUS PROVIDING LEADER PULSE FOLLOWED BY DATA PULSES

Kazuo Sato, Iwanuma, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Feb. 9, 1987, Ser. No. 12,012
Claims priority, application Japan, May 16, 1986, 61-112145
The portion of the term of this patent subsequent to Aug. 2, 2005, has been disclaimed.
Int. Cl.[4] H04Q *7/00*
U.S. Cl. 340—825.570 **1 Claim**



1. In a communication apparatus in which a code signal is transmitted from a remote transmitter to a receiver which is powered by a battery power source,

the improvement comprising:

said transmitter having means for transmitting a code signal composed of a leader pulse signal which is ON for a predetermined leader time period, followed by a series of data pulse signals during a predetermined data time period; and

said receiver having:

a receiving circuit for receiving the transmitted code signal;

a power supply circuit for connecting and disconnecting said receiving circuit to/from the battery power source in accordance with an enabling pulse input, said receiving circuit being rendered operable when it is connected to said battery power source by said power supply circuit to receive the transmitted code signal and being non-operable so as not to consume power when it is disconnected from said power supply circuit;

a timable circuit for outputting a series of short enabling pulses of a short pulse duration and spaced apart at intervals longer than said short pulse duration and shorter than said leader time period;

a detector circuit, receiving said short enabling pulses from said timable circuit and an output of said receiving circuit, for detecting a synchronous occurrence of one of said short enabling pulses and the leader pulse signal received by said receiving circuit when it is rendered operable by said short enabling pulse, and for outputting a long enabling pulse of a duration greater than the time of said data pulse signals in said data time period following said leader time period, said detector circuit having an AND circuit receiving the output from said receiving circuit and said short enabling pulses from said timable circuit, and a multi-vibrator for providing said long enabling pulse output in response to a high output from said AND circuit; and

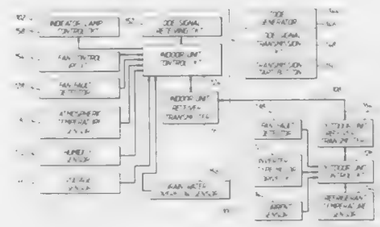
an OR circuit for receiving as one input the short enabling pulses from said timable circuit and as another input the long enabling pulse from said detecting circuit and for providing an OR output based on said two inputs as said enabling pulse input to said power supply circuit, whereby said receiving circuit is rendered operable only intermittently for said short pulse period by said short enabling pulses to save power when it is in a waiting state and no code signal has been trasmitted, and operable for a duration longer than said data pulse signals in said data time period when a code signal has been trasmitted and the leader pulse signal thereof has been detected by said detecting circuit.

4,857,918

FAULT DIAGNOSTIC APPARATUS FOR ELECTRIC APPLIANCE

Harunobu Nukushina, and Chiaki Sugimoto, both of Fuji, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 25, 1987, Ser. No. 18,713
Claims priority, application Japan, Feb. 25, 1986, 61-39949; Mar. 24, 1986, 61-64149
Int. Cl.[4] G08C *19/16*
U.S. Cl. 340—870.01 **12 Claims**



1. A fault detection diagnostic apparatus for a device subject to a plurality of predetermined fault conditions comprising:

means for detecting a fault occurrence for each of said plurality of predetermined fault conditions;

means for manually inputting one of a plurality of designated codes that corresponds to one of a plurality of corresponding groups, each corresponding group having at least two of said plurality of predetermined fault conditions;

control means that inputs said one designated code for determining if said fault occurrence exists for said at least two predetermined fault conditions in said corresponding group; and

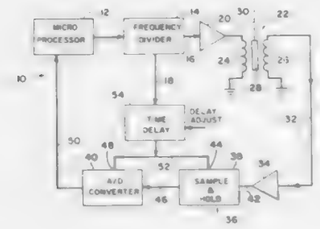
means responsive to said control means for indicating the existence of said fault occurrence in said corresponding group of said at least two predetermined fault conditions.

4,857,919

METHOD AND APPARATUS FOR INDICATING THE POSITION OF A CORE MEMBER OF A VARIABLE DIFFERENTIAL TRANSFORMER

Frank M. Braswell, Broken Arrow, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Sep. 14, 1987, Ser. No. 95,704
Int. Cl.[4] G08C *19/06*
U.S. Cl. 340—870.36 **25 Claims**



1. A method for indicating the position of a core member of a variable differential transformer having a primary coil and a secondary coil, said method comprising the steps of:

applying a substantially step signal to the primary coil;

sampling an induced signal from the secondary coil at a preselected time after applying said step holding the induced signal value; and

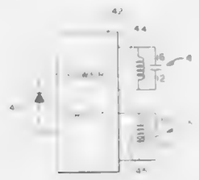
converting the induced signal value to a digital signal indicating position of said core member.

4,857,920

COMBINED TRAFFIC SIGNAL WITH STACKED EL ELEMENTS

Shoei Kataoka, Tokyo; Masaru Yoshida, and Shigeo Nakajima, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 6, 1987, Ser. No. 106,545
Claims priority, application Japan, Oct. 7, 1986, 61-239627
Int. Cl.[4] G08G *1/095*
U.S. Cl. 340—907 **13 Claims**



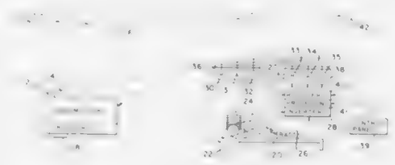
1. A traffic signal comprising a display section having at least two transparent EL elements for emitting light of different colors including red, said EL elements being stacked one on top of each other on top of a glass substrate at said display section, either one or both of said EL elements being adapted to emit light in response to a voltage applied on said one or both of said EL elements to display in said display section either of said different colors or a combination of said different colors, said traffic signal further comprising a transparent internal electrode film sandwiched between said EL elements.

4,857,921

DIGITAL TRAFFIC CONTROL SYSTEM

William B. McBride; William R. Wilson, Jr.; John C. Tomlinson; John A. McCarthy; Eugene W. Kochanowsky; Jefferson D. Hendricks, all of Tallahassee, and Arthur J. Houle, Miccosukee, all of Fla., assignors to Flagman, Inc., Tallahassee, Fla.

Filed May 30, 1986, Ser. No. 868,997
Int. Cl.[4] G08G *1/07*
U.S. Cl. 340—912 **35 Claims**



1. An improved digital control system for controlling the flow of traffic in selected directions in response to digital signals selectively transmitted from a common transmitting control unit to multiple separate receiving traffic control units respectively associated with each controlled direction, the improvements comprising:

(A) in the transmitting unit, a transmitter, a modulator, a digital command code generator operative when actuated to generate a character specific for each different receiving unit, and a command selector operative to select for delivery through said modulator to said transmitter a selected one of said command codes to be radiated as a digital signal;

(B) in each of said receiving traffic control units in the system:

(a) traffic control indication means operative in different modes to display to traffic flowing in a direction to be controlled multiple diverse traffic control indications;

(b) a receiver; a digital signal demodulator connected thereto and operative to deliver demodulated characters transmitted by the system's transmitting unit; a microprocessor; read only memory (ROM) means operative to program the microprocessor to process demodulated characters to produce variable indicating the operating mode of the traffic control indication means in said receiving traffic control unit and the operating mode of any of said receiving traffic control units in the system which is remote with respect thereto; random access memory (RAM) means coupled to the microprocessor and operative to receive and store said variables in tables which are specific to each of said receiving traffic control units and which represent the current operating mode of each of said receiving traffic control unit's traffic control indication means, the ROM means programming the microprocessor on each successive pass through the program to produce and store variable for a different one of said receiving traffic control units in the system, and the ROM means programming the microprocessor incident to processing variables for each of said receiving traffic control units to compare variables thereof to avoid conflicting modes of traffic control indications and then to deliver appropriate binary control outputs, and

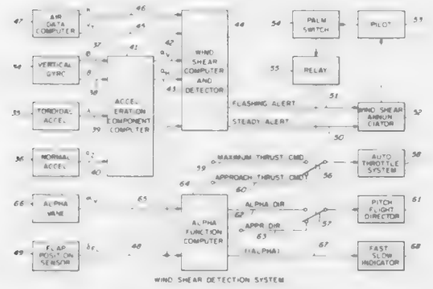
(c) said traffic control indication means being operative in response to said binary control outputs to display traffic control indications as determined by the receiving traffic control unit's variables.

4,857,922

WINDSHEAR DETECTION AND WARNING SYSTEM WITH EVASION COMMAND

Harry Miller, Scottsdale, and Terry Zweifel, Phoenix, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 492,085, May 6, 1983, Pat. No. 4,593,285. This application Feb. 28, 1986, Ser. No. 834,374
The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—968 **14 Claims**



1. Apparatus for generating a windshear warning control signal, of the type having detector means for sensing the difference of aircraft inertial acceleration with respect to a supporting airmass, and providing vertical or longitudinal components thereof, comprising:

means responsive to said difference of inertial acceleration for providing a windshear rate signal representative of a magnitude of windshear rate exceeding a predetermined limit corresponding to a threshold of detection,

means responsive to said windshear rate signal exceeding said predetermined limit for providing a first timing signal representative of a time duration of said rate signal,

means responsive to said windshear rate signal for generating a second timing signal representative of a maximum allowable duration that safe flight can be sustained at said windshear rate, and

means for combining said first timing signal and said second timing signal to obtain an algebraic difference thereof and generate said control signal when said first timing signal exceeds said second timing signal, so that said warning signal is generated after a time delay inversely as the magnitude of said windshear rate signal.

4,857,923

GROUND PROXIMITY WARNING SYSTEM FOR AN EXCESSIVE DESCENT RATE OVER UNDULATING TERRAIN

Charles D. Bateman, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jul. 15, 1986, Ser. No. 886,201
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—970 **14 Claims**

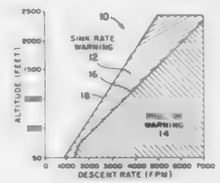
1. A ground proximity warning system for an aircraft comprising:

signal generating means for providing a warning signal representative of a dangerous flight condition;

a first source of signals representative of the radio altitude of the aircraft;

a second source of signals representative of the barometric altitude of the aircraft;

detecting means for detecting whether the aircraft is flying over undulating terrain wherein said detecting means does not require signals representative of the longitude and latitude of the aircraft, responsive to said first source of signals and said second source of signals, including com-



paring means for comparing said radio altitude signals with said barometric altitude signals for developing a difference signal which varies with time as a function of the undulating terrain; whereby when the difference signal exceeds a predetermined limit an undulating terrain condition exists and

biasing means responsive to said detecting means for biasing said warning signal when undulating terrain is detected.

4,857,924

Patent Not Issued For This Number

4,857,925

ROUTE INDICATING SIGNALLING SYSTEMS FOR TRANSPORT VEHICLES

Charles E. Brubaker, 2601 Robinson Dr. #35, Waco, Tex. 76706

Filed Jan. 11, 1988, Ser. No. 142,476
Int. Cl.[4] G08G *1/12*
U.S. Cl. 340—994 **1 Claim**

1. In apparatus for short range signaling from signal transmitters carried by moving vehicles of a transport system to receivers for said signals fixed at stops for said vehicles over designated routes,

the improvement comprising storage means at each transmitter for digitally encoded designations of said routes, selecting means at each transmitter for selecting a desired designation from said storage means,

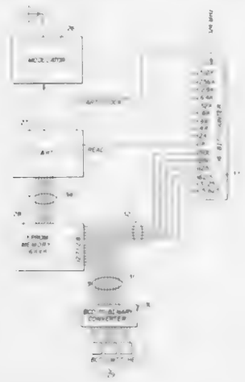
means at each transmitter for converting said selected designation into an output comprising a repeated succession of pulses indicative of the selected designation route only,

means at each receiver for receiving a modulated carrier and retrieving therefrom digitally said repeated succession of pulses,

storage means at each receiver for said digitally encoded designations of routes,

means at each receiver for comparing said retrieved succession of pulses with said stored digitally encoded designations of routes and for matching said retrieved succession of pulses with a single predetermined digitally encoded designation of route, and

means at each receiver for displaying said matched designation, the short range of each transmitter being not substantially greater than the length of said moving vehicle and



the range of each receiver being less than the short range of each transmitter, whereby each receiver receives successively but not simultaneously signals from a succession of said vehicles approaching each respective receiver one after another, wherein all transmitters and receivers operate on the same frequency, and each receiver only receives signals from a single transmitter at a time, said single transmitter being located on a vehicle within the range of the respective receiver, wherein only one matched designation is displayed at a time at each displaying means.

4,857,926

PHASE-RESPONSIVE ANGULAR TRACKING DEVICE

Joseph D. Neglia, Phoenix, and David C. Cunningham, Carefree, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 25, 1987, Ser. No. 89,279
Int. Cl.[4] H03M *1/64*
U.S. Cl. 341—116 **13 Claims**

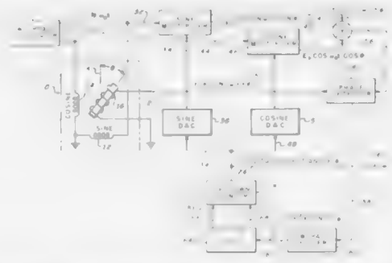
1. A method for generating a digital signal indicative of an angular displacement of a shaft, comprising:

providing a source of ac excitation at a predetermined frequency, for generating sinusoidal analog signals,

applying ones of said analog signals in time quadrature to a transducer, said transducer having corresponding elements in space quadrature relationship,

providing a sensor, coupled to said transducer elements, and having a rotor coupled to said shaft, for generating an analog rotor output signal having a phase shift with respect to said source of ac excitation proportional to said angular displacement, said sinusoidal analog signals being independent of said phase shift,

algebraically combining said analog signals and said rotor output signal, to provide products of sines and products of cosines and derive an error signal representative of a difference thereof, and



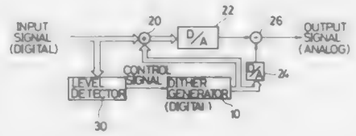
applying said combined signals to a bidirectional counter in a phase-lock loop to generate said digital signal whereby said error signal corresponds to differences between the angular displacement of the rotor and said digital signal indicative of said angular displacement, so that the value of said digital signal is urged to substantial identity with said analog rotor output signal.

4,857,927

DITHER CIRCUIT HAVING DITHER LEVEL CHANGING FUNCTION

Osamu Takabayashi, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Dec. 16, 1986, Ser. No. 942,974
Claims priority, application Japan, Dec. 27, 1985, 60-201346
Int. Cl.[4] H03M *1/20*
U.S. Cl. 341—131 **18 Claims**



1. A dither circuit comprising:

and A/D converter;

an adder provided in a prior stage to said A/D converter;

a subtractor provided in a posterior stage to said A/D converter;

a dither generator for supplying dither to said adder and subtractor and,

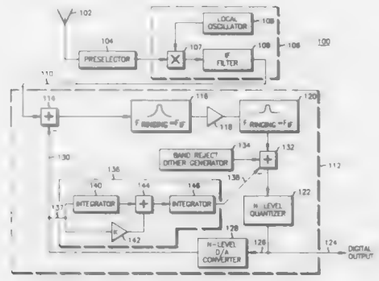
dither level changing means for detecting the level of an input signal to said A/D converter for controlling said dither generator to change the level of dither supplied by said dither generator in accordance with the level of the input signal to said A/D converter.

4,857,928

METHOD AND ARRANGEMENT FOR A SIGMA DELTA CONVERTER FOR BANDPASS SIGNALS

Paul H. Gailus, Prospect Heights; William J. Turney, Schaumburg, and Francis R. Yester, Jr., Arlington Heights, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 28, 1988, Ser. No. 149,350
Int. Cl.[4] H03M *3/00*
U.S. Cl. 341—143 **33 Claims**



1. An apparatus for converting a signal having a non-zero frequency carrier or suppressed carrier with modulation thereon from an analog signal to a digital signal with improved signal-to-noise ratio performance, the apparatus comprising:

(a) bandpass filtering means, having an input coupled to a first summing node, an output coupled to a positive input of a second summing node, and having an associated damped sinusoidal impulse response therein, for filtering the analog signal before applying it to the second summing node;

(b) n-level quantizing means, having an input coupled to said second summing node, for quantizing the analog signal into a digital signal by oversampling and providing a digital signal having a plurality of levels (n) at an output therefrom;

(c) n-level D/A converting means, having an input coupled to the output from said quantizing means and having an output coupled to said first summing node, for converting said n-level digital signal back to an analog signal to provide a negative feedback signal to the first summing node for providing improved signal-to-noise ratio performance; and

(d) direct current (DC) feedback means, having an input coupled to the output of said D/A converting means and an output coupled to a negative input of said second summing node, for feeding back a DC voltage to minimize DC offset voltages within the apparatus.

4,857,929

APPARATUS FOR CONVERTING DATA BETWEEN ANALOG AND DIGITAL VALUES

Henry S. Katzenstein, Pacific Palisades, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Continuation of Ser. No. 383,544, Jun. 1, 1982. This application Apr. 19, 1985, Ser. No. 724,829
Int. Cl.[4] H03M *1/76*
U.S. Cl. 341—148 **30 Claims**

1. In combination for providing a conversion between a binary coded input word defined by a plurality of bits and an analog value,

means for providing a plurality of binary coded input signals each corresponding to a particular bit in the binary coded input word

a plurality of switches each responsive only to a particular one of the binary coded input signals, the number of switches responsive to each particular binary coded input signal being dependent upon the binary value of such signal,

a plurality of current means each operative to pass a current,

a line,

means for connecting the switches to one another in an array having a repetitive pattern of switch connections to obtain the operation of the switches in a pattern dependent upon the binary coded input signals,

means for connecting the switches, the current means and the line to provide, for progressive increases in the binary



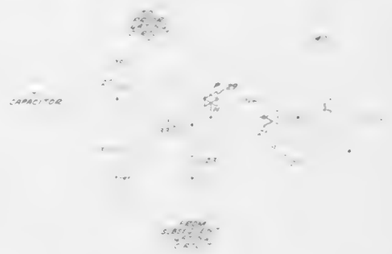
coded input word, corresponding increases in the number of the current means passing current to the line in accordance with the pattern of operation of the switches, such pattern causing a particular sequence for passing current from the current means to the line in response to progressive increases in the binary coded input word, that particular sequence being the passage of current from an additional one of the current means to the line with each increase in the value of the binary coded input word while the current means previously passing current to the line continue to pass current to the line.

4,857,930

CIRCUIT FOR REDUCING DIFFERENTIAL NONLINEARITIES IN MULTI-STAGE DIGITAL-TO-ANALOG CONVERTERS

Charles H. Lucas, Newport Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 27, 1986, Ser. No. 879,771
Int. Cl.[4] H03M *1/74*
U.S. Cl. 341—150 **12 Claims**



1. A digital-to-analog converter for use in a multi-stage digital-to-analog converter which is responsive to a digital input signal and to an analog input signal provided by a digital-to analog converter stage of lesser weight, said converter providing an analog output signal indicative of said analog input signal and the digital input signal, and comprising:

an operational amplifier having an inverting input and a noninverting input for providing the analog output signal at its output;

a feedback capacitance and a switch coupled in parallel

between the inverting input and the output of said operational amplifier;

M capacitors of substantially identical value, designated C(I) where I is an integer from 0 through M−1, each capacitor having first and second terminals, said first terminal, being coupled together to the inverting input of said operational amplifier;

input means responsive to a digital input signal having a value N for providing a logic output signal indicative of said digital input signal; and

selection means responsive to said logic output signal (1) for switching the second terminal of a selected capacitor C(N) to the analog input signal provided by the digital-to-analog converter stage of lesser weight, and (2) for sequentially switching the second terminals of the capacitors C(N−1) through C(0) to a predetermined voltage;

said switch being controllably closed prior to conversion of said digital input signal.

4,857,931

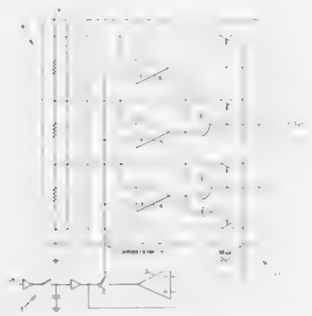
DUAL FLASH ANALOG-TO-DIGITAL CONVERTER

Zdzislaw Gulczynski, P.O. Box 441, Winchester, Mass. 01890

Filed Jul. 20, 1987, Ser. No. 75,448

Int. Cl.⁴ H03M *1/00*

U.S. Cl. 341—156 **7 Claims**



1. Analog-to-digital converter (ADC) for converting input signal into output code, comprising:

a pair of reference signal sources;

a resistive means coupled between the reference signal sources for providing a plurality of reference signals;

comparator means for comparing a first and second comparison signals against the reference signals, and producing respectively a first and second codes in response thereto;

a multiplexer means for selecting one of the reference signals in response to the first code;

an amplifying means for providing the first comparison signal in response to the ADC input signal, for amplifying a signal difference between the ADC input signal and the reference signal selected by the multiplexer means, and providing the second comparison signal in response thereto; and

a digital means for converting the first and second codes into the output code of the ADC.

4,857,932

FAST ANALOG/DIGITAL CONVERTER HAVING EQUAL PROPAGATION TIMES FOR THE CLOCK AND THE ANALOG SIGNAL

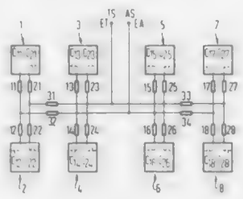
Bernhard Zojer, Villach, Austria, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 828,301, Feb. 11, 1986, abandoned. This application Mar. 12, 1987, Ser. No. 24,896

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1985, 3504746

Int. Cl.⁴ H03M *1/36*

U.S. Cl. 341—159 **7 Claims**



7. Analog/digital converter operating according to the parallel method, including a voltage divider for supplying a plurality of switched equidistant reference voltages, comprising: means for supplying a sampling clock; means for supplying an analog voltage; a plurality of clock-controlled comparators each having respective clock and analog inputs, said inputs having respective input capacitances; conducting means having conductor resistances, for connecting respectively said clock supply means and said clock inputs, and said analog voltage supply means and said analog inputs; wherein each comparator is assigned a respective reference voltage, wherein at each sampling moment, that one comparator only which has a reference voltage closest to the analog voltage at the sampling moment has an exact reference voltage, and wherein said one comparator has input capacitances and conductor resistances to said respective clock and analog supply means matched such that said conductors have propagation delays of equal magnitude.

4,857,933

ANALOGUE TO DIGITAL CONVERTER OF THE MULTI-SLOPE TYPE

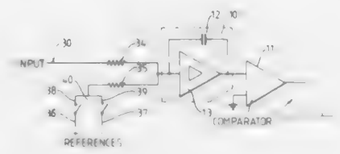
Richard B. D. Knight, Woking, United Kingdom, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 9, 1988, Ser. No. 154,037

Claims priority, application United Kingdom, Feb. 11, 1987, 8703100

Int. Cl.⁴ H03M *1/60*

U.S. Cl. 341—168 **4 Claims**



1. An analog-to-digital converter of the multi-slope type for converting an analog electrical signal to a digital output in at least one cycle of operation, said converter comprising:

an integrator having an input and an output;

application means for applying said electrical signal to said integrator input;

supply means for supplying positive and negative reference signals;

switch means for applying in a cycle, pulses of said reference signals to said integrator input in pairs of opposite polarity and with the same number of positive pulses as negative pulses;

a comparator having an input connected to said integrator output, said comparator having an output;

recognition means for recognizing a change of state of said comparator;

actuation means, responsive to said recognition means, for actuating said switch means to maintain application of said pulses of reference signals for a predetermined duration except for a final pulse in a final pair of pulses, where said final pulse is maintained until said recognition means indicates a change of state of said comparator;

bistable multi-vibrator means connected to said comparator output;

command means for commanding said bistable multi-vibrator means to memorize a state of said comparator;

timing means for providing a programmed series of timing pulses including timing pulses for operating said actuation means;

terminating means, responsive to a timing pulse from said timing means and further responsive to said recognition means, for terminating a cycle and starting another cycle;

subtraction means, responsive to time durations of said positive reference signal pulses and negative reference signal pulses, for providing a difference output indicative of the difference between total duration of applications of positive reference pulses and total duration of applications of negative reference pulses; and

conversion means, responsive to said subtraction means, for converting said time difference into a digital output.

4,857,934

TARGET DETECTORS

Roger Voles, London, England, assignor to Electrical & Musical Industries Limited, Hayes, England

Filed Feb. 20, 1969, Ser. No. 801,211

Claims priority, application United Kingdom, Feb. 21, 1968, 8518/68

Int. Cl.⁴ G01S *13/58*

U.S. Cl. 342—90 **7 Claims**



1. A target detector, including means for storing signals representing echoes received from the same range bracket and from substantially the same direction, means for integrating different combinations of elements from said echo signals, each combination being selected to include the elements which would correspond to a target moving with a particular velocity, and different combinations representing different velocities or different initial ranges, and means for signalling when the integral of any combination exceeds a threshold which indicates the presence of a target moving with the respective velocity.

4,857,935

RF CIRCUIT ARRANGEMENT

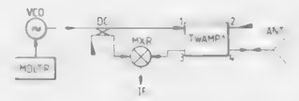
Robert N. Bates, Crawley, United Kingdom, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 911,589, Sep. 25, 1986, abandoned. This application Oct. 27, 1987, Ser. No. 117,350

Claims priority, application United Kingdom, Sep. 27, 1985, 8523866

Int. Cl.⁴ G01S *13/32;* **H03F** *3/60*

U.S. Cl. 342—128 **12 Claims**



1. A multiport RF circuit arrangement comprising:

(a) a first plurality of inductors electrically connected in series between a first terminal and a second terminal;

(b) a second plurality of inductors electrically connected in series between a third terminal and a fourth terminal;

(c) a plurality of amplifier devices each having an input coupled to a respective junction between a pair of the first plurality of inductors and having an output coupled to a respective junction between a corresponding pair of the second plurality of inductors, said devices having associated therewith respective input capacitances for cooperating with the first plurality of inductors to form an input transmission line and having associated therewith respective output capacitances for cooperating with the second plurality of inductors to form an output transmission line, said input and output transmission lines providing substantially equal phase delays for signals having frequencies in an operating frequency range of the circuit arrangement;

(d) signal supply means coupled to the first terminal;

(e) signal utilization means coupled to the fourth terminal for receiving an amplified version of a signal provided by the signal supply means;

(f) signal supply/utilization means coupled to one of the second and third terminals for signals propagating through the respective transmission line; and

(g) a terminating impedance coupled to the other one of the second and third terminals.

4,857,936

CONICAL SWEEP ARRAY ANTENNA AND A RADAR HAVING SUCH AN ANTENNA

Serge Drabowitch, Chatenay-Malabray, and Jean Bouko, Villemoisson, both of France, assignors to Thomson-CSF, Paris, France

Filed Oct. 14, 1986, Ser. No. 918,255

Claims priority, application France, Oct. 22, 1985, 8515663

Int. Cl.⁴ H01Q *3/26*

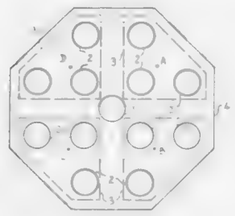
U.S. Cl. 342—368 **18 Claims**

1. A conical sweep array antenna, comprising:

flat antenna means having (1) a plurality of microstrip sources, disposed in a plurality of sections, and (2) at least one source disposed outside of said sections; and

means for phase-shifting said plurality of sources to cause a

conical sweep pattern of said antenna, and for maintaining a constant phase-shift amount to said at least one source



every time, so that said at least one source always has the same phase shift.

4,857,937

DATA ELEMENT POSITION INDICATION

Alan F. Dadds, Hartfield, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 14, 1987, Ser. No. 132,508
Int. Cl.[4] H01Q *3/00*; G01S *5/02*
U.S. Cl. 342—377 **5 Claims**



1. Apparatus for determining the direction of a signal received by an antenna having a multiplicity of feed elements arranged in a sequential order for receiving energy beams from a multiplicity of directions, said apparatus comprising:

a. signal strength determining means coupled to the feed elements for producing, for each feed element, either a first value data signal when a beam received by the feed element has a magnitude greater than a predetermined magnitude or a second value data signal when the beam received by the feed element has a magnitude smaller than said predetermined magnitude;

b. signal storage means coupled to the signal strength determining menas for storing the data signals in a sequence representative of the order of arrangement of the feed elements;

c. data processing means coupled to the signal storage means for determing where in the sequence of stored data signal is the center of the largest group of sequential first value data signals, said processing means including:

(1) means for finding all groups of successive first value data signals;

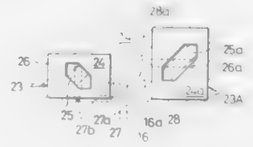
(2) means for processing the data signals in sequence to change the value of each first value data signal which is adjacent in sequence to a second value data signal to a second value data signal, said processing being repeated until at least one first value data signal of the largest group remains and all first value data signals outside of said largest group have been changed to second value data signals, said at least one data signal having a position in the sequence of storged data signals representing the direction of the signal received by the antenna.

4,857,938

PLANAR ANTENNA

Katsuya Tsukamoto; Yasuhiro Fujii, and Toshio Abiko, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Sep. 21, 1988, Ser. No. 247,082
Claims priority, application Japan, Oct. 15, 1987, 62-260032
Int. Cl.[4] H01Q *1/38*
U.S. Cl. 343—700 MS **5 Claims**



1. A planar antenna for receiving polarized waves transmitted as carried on SHF band from a satellite, the antenna comprising a radiation circuit of a conductive material and including a plurality of pairs of radiation elements each of said radiation elements comprising a slot made in said conductive material and a patch element disposed in said slot, one of said radiation elements in each of said pairs being rotated by 90 degrees relative to and made different in dimensions from the other radiation element with respect to both the slot and patch elements,

a power-supply circuit including power-supply terminals respectively opposed to each of the patch elements of said radiation elements in a plane adjacent a plane of said radiation circuit and electromagnetically coupled to each patch element, said power-supply terminals supplying power to each of said radiation elements of each pair at a phase difference of 90 degrees, and

an earthing conductor,

wherein said radiation and power-supply circuits and said earthing conductor are respectively disposed to be independent of one another with a layer of dielectric material interposed between each of them.

4,857,939

MOBILE COMMUNICATIONS ANTENNA

Tetsuo Shimazaki, Tokyo, Japan, assignor to Alliance Research Corporation, Chatsworth, Calif.

Filed Jun. 3, 1988, Ser. No. 202,123
Int. Cl.[4] H01Q *1/32*
U.S. Cl. 343—715 **39 Claims**

1. A mobile communication antenna assembly for use over a selected band of frequencies in the VHF and UHF ranges, comprising:

a radiating element having first, second and third, collinear radiating sections, said first and second sections each having an effective electrical length substantially equal to five-eighths of the center wavelength of the selected frequency band and said third section having an effective electrical length substantially equal to one-quarter of the center wavelength of the selected frequency band, said third section further adapted to have a radiating surface area substantially greater than the radiating surface areas of said first and second sections by having a diameter substantially greater than the diameter of each of said first and second sections, so as to increase the radiating surface area of said third section in comparison to the radiating surface areas of said first and second sections;

first phase inductance means electrically connecting said first and second sections for maintaining a predetermined phase relationship between electrical signals radiating from said first and second sections including an open air helical coil inductor formed from said radiating element;

second phase inductance means electrically connecting said second and third sections for maintaining a predetermined phase relationship between electrical signals radiating from said second and third sections including a helical coil inductor formed from said radiating element;

a base member electrically connected adjacent to a base end of said third section for mounting said radiating element to a non-conducting surface of a vehicle, so that said third section base end is elevated above said surface;

a first plate member connected to said third section base end including user adjustment means for positioning said radiating element in a generally vertical configuration with regard to the earth's surface;

impedance matching means comprising a user adjustable capacitance member and a series series tuned circuit which is selectively tunable to the nominal resonant frequency of said radiating element and electrically connected thereto, said impedance matching means displaying an impedance which varies between a first impedance value at said connection to said radiating element, said first value being substantially equal to the impedance at said base end, and a second impedance value that is at least several orders of magnitude less than said first impedance value;



transmission line means for communicating between the antenna assembly and a radio communications unit, said transmission line means having an impedance that is orders of magnitude less than the impedance of the antenna assembly at said base end of said third section; and

connecting means for coupling said transmission line means to said impedance matching means at a point where the impedance of said impedance matching means is substantially equal to the impedance of the transmission line means.

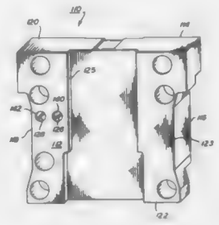
4,857,940

MOLDED ARTICLE WITH EXPOSED, CONFINED LEADS, AND PROCESS FOR MAKING

John E. Rueping, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 31, 1987, Ser. No. 91,171
Int. Cl.[4] A01D *15/18*; H05K *5/00*
U.S. Cl. 346—75 **3 Claims**

1. In a molded article constructed from a resin to have a three-dimensional shape with exterior surfaces and containing at least one aperture extending all the way through said three-dimensional shape, said article further including an electrical element having at least two leads for making external electrical contact to said element, said element being disposed within the three-dimensional confines of said article and covered with said resin, but at least portions of said leads being uncovered by said resin;



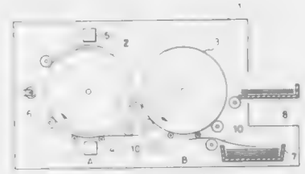
the improvement wherein said leads remain completely covered by said resin between said surfaces with the only exception being portions exposed within said at least one aperture.

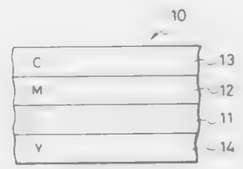
4,857,941

MULTICOLOR THERMAL RECORDING DEVICE

Shinichi Kaida, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 18, 1988, Ser. No. 182,684
Claims priority, application Japan, Apr. 16, 1987, 62-94214
Int. Cl.[4] G01D *15/10*; B41J *33/00*; B22B *9/06*
U.S. Cl. 346—76 PH **4 Claims**





1. A multicolor thermal recording device, comprising:

means for conveying along a path a heat-sensitive recording medium having at least one coupler layer on both a first side and a second side of a transparent support;

recording means for supplying heat to one of said coupler layers on said first side according to a first color signal to produce a first color image in said medium and for supplying heat to another of said coupler layers on said second side according to a second color signal to produce a second color image in said medium; and

means for fixing at least one of said first and second color images in said medium.

4,857,942

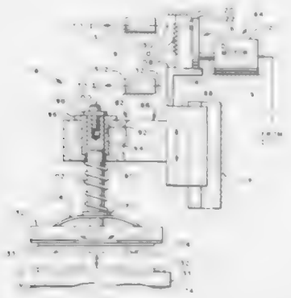
APPARATUS FOR PROCESSING IRREGULARLY-SHAPED LETTERS IN A THERMAL PRINTER

Patrick Murphy, Stamford, and Duc H. Tran, Bridgeport, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 28, 1987, Ser. No. 138,427

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH **13 Claims**



1. In apparatus for thermally transferring ink from a ribbon having backing and ink donor layers to a letter, wherein the apparatus includes a frame, a thermal printhead and a printhead backing roller, an improvement for urging a ribbon and upper surface of a letter of non-uniform thickness into engagement with one another, the improvement comprising:

a. the printhead backing roller connected to the frame for rotation in engagement and continuous contact with the lower surface of a letter of non-uniform thickness fed between the roller and a ribbon; and

b. the printhead backing roller including a generally cylindrical body portion adapted to flex when engaging said letter for urging said upper surface of said letter to remain in said continuous contact for the length of said letter with the ink donor layer of a ribbon.

4,857,943

IMAGE FORMING APPARATUS HAVING EDGE-GUIDING MEMBER FOR GUIDING A RECORDING MEDIUM

Shigeru Yoshimura, Yokohama; Tetsuo Suzuki, Kawasaki, and Makoto Takemura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 49,168, May 13, 1987, abandoned, Division of Ser. No. 844,132, Mar. 26, 1986, Pat. No. 4,692,778. This application May 2, 1988, Ser. No. 188,968

Claims priority, application Japan, Mar. 28, 1985, 60-65103; Mar. 28, 1985, 60-65106; Mar. 28, 1985, 60-65108; Mar. 28, 1985, 60-65112; Mar. 28, 1985, 60-65114; Mar. 28, 1985, 60-65116; Mar. 28, 1985, 60-65117; Mar. 28, 1985, 60-65118; Mar. 28, 1985, 60-65119; Mar. 28, 1985, 60-65120; Mar. 28, 1985, 60-65121

Int. Cl.[4] G01D *15/28*

U.S. Cl. 346—136 **9 Claims**

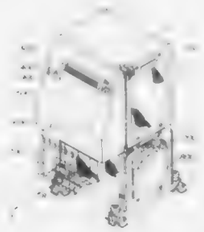
1. An image forming apparatus comprising:

a rotary member for conveying a recording medium in a conveying direction;

a pinch member for urging the recording medium against said rotary member;

an opening/closing mechanism for moving said rotary member and said pinch member relative to each other between a pinching position, wherein said pinch member urges the recording medium against said rotary member, and a retracted position, wherein said pinch member is separated from said rotary member; and

first and second guide members for contacting respective side edges of the recording medium and including means for placing said guide members so as to guide the record-



ing medium in the conveying direction when said rotary member and said pinch member are in the retracted position.

4,857,944

RECALIBRATION SYSTEM FOR LED ARRAY

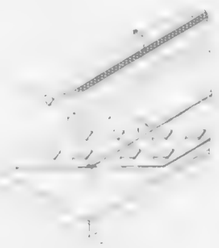
Peter B. Hart, Northampton; George A. A. Chilton, Buckinghamshire, and Richard A. Kirk, Northampton, all of England, assignors to Plessey Overseas Limited, Ilford, England

Filed Sep. 30, 1988, Ser. No. 251,497

Claims priority, application United Kingdom, Sep. 30, 1987, 8721944

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—154 **8 Claims**



1. A method of automatic recalibration of a print head comprising an array of light emitting diodes (LED) each providing one pixel of an image to be printed, the method comprising:

(a) providing one or more photodetectors for detecting the intensity of illumination of the diodes;

(b) storing in memory data relating to individual current levels to be applied to the respective diodes for illumination thereof, and storing in memory data relating to individual intensities of illumination;

(c) for each diode applying the respective current level and detecting the actual intensity of illumination with said one or more photodetectors, determining whether its actual intensity corresponds to the respective stored value of intensity of illumination, and if not adjusting the current level applied to the diode until the actual intensity corresponds with the respective stored value of intensity; and

(d) replacing the data stored in memory with data relating to the adjust current level.

4,857,945

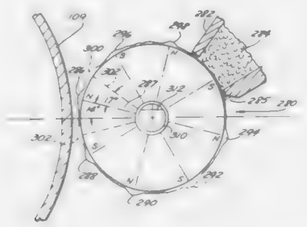
PRINTING DEVICE AND METHOD EMPLOYING LATENT ELECTROSTATIC IMAGE DEVELOPMENT AND SEPARATE TONER-BRUSH OPERATIONAL CYCLE

Steven M. Faes, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Filed May 12, 1988, Ser. No. 193,352

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—160.1 **18 Claims**



1. A printer for printing documents, said printer comprising, in combination:

(a) image forming means for forming latent electrostatic images from image-defining electrical signals;

(b) a drum for receiving and retaining said latent electrostatic images;

(c) a rotary toner brush adjacent the drum for transferring toner material to the drum to develop the latent images;

(d) first drive means for rotating the drum between a first position for receiving the electrostatic images and a second position for transferring the developed images onto the documents;

(e) means for causing said first drive means to operate continuously during a period in which a group of documents is being printed;

(f) means for feeding said documents to the second position;

(g) second drive means for rotating the toner brush independently of said first drive means; and

(h) means for causing said second drive means to operate intermittently during the period in which the group of documents is printed.

4,857,946

FILM WINDING-UP SYSTEM FOR PHOTOGRAPHIC CAMERA

Shinji Tominaga; Kouji Yamamoto, and Akira Yamanaka, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 25, 1986, Ser. No. 934,634

Claims priority, application Japan, Nov. 26, 1985, 60-181763[U]; Feb. 12, 1986, 61-18998[U]; Feb. 12, 1986, 61-18999[U]

Int. Cl.[4] G03B *1/00*

U.S. Cl. 354—173.1 **6 Claims**

1. A film winding-up system for a photographic camera, comprising:

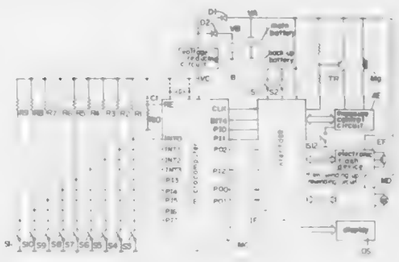
winding-up means for winding up one-frame of a film;

winding-up completion detection means for detecting a completion of operation of said winding-up means;

film advance detection means for detecting whether the film is properly advanced or not;

display means that is turned on to display that the film is being wound-up and including a liquid crystal device; and

control means responsive to said winding-up completion detection means and said film advance detection means and for controlling the display of said display means, said control means controlling said display means to turn on the display when the film is properly advanced, and to



turn off the display when the one-frame film winding-up operation is completed.

4,857,947

POSITION CONTROLLING DEVICE IN A LENS DRIVING APPARATUS FOR CAMERA

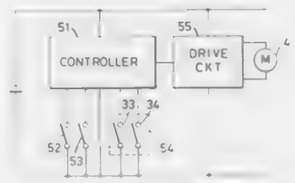
Hiroshi Wakabayashi, Yokohama; Kazuyuki Kazami; Toshiyuki Nakamura, both of Tokyo; Hidenori Miyamoto, Ichikawa; Daiki Tsukahara, Kawasaki; Kiyosada Machida, Urawa, and Yuji Katano, Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Dec. 3, 1987, Ser. No. 128,448

Claims priority, application Japan, Dec. 8, 1986, 61-291950; Dec. 12, 1986, 61-295889; May 14, 1987, 62-118450; May 18, 1987, 62-122205; May 18, 1987, 62-122206; May 22, 1987, 62-126117; May 22, 1987, 62-77961; Sep. 3, 1987, 62-134999

Int. Cl.[4] G03B *5/00, 3/10*

U.S. Cl. 354—195.1 **6 Claims**



1. A camera including:

a photo-taking optical system;

command means for commanding the position of said photo-taking optical system;

drive means for driving said photo-taking optical system in the direction of the optic axis;

position detecting means for detecting the position of said photo-taking optical system on the optic axis; and

drive control means for drivingly controlling said drive means on the basis of the position command from said command means and the detection result from said position detecting means and setting said phototaking optical system from the current position to a commanded position;

said drive control means controlling said drive means to reciprocally drive said photo-taking optical system alternately in first and second directions of movement and then driving said drive means at a low speed to move said photo-taking optical system in said first direction of movement and stopping said photo-taking optical system at said commanded position each time said commanded position is detected by said position detecting means, until said commanded position is detected n times when said com-

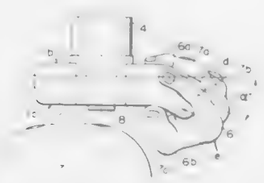
manded position is in the first direction of movement from said current position, and until said commanded position is detected n+1 times when said commanded position is in the second direction of movement opposite to said first direction of movement from said current position.

4,857,948

CAMERA

Jun Akabane; Ken Moro, both of Tokyo, and Masayasu Yamamoto, Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 167,149
Claims priority, application Japan, Mar. 19, 1987, 40397[U]
Int. Cl.[4] G03B *17/02*
U.S. Cl. 354—288 **10 Claims**



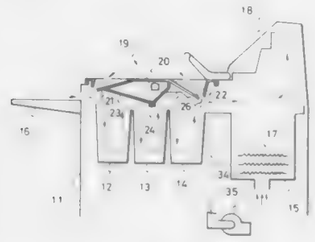
1. A still camera, comprising a camera body, a photographic lens at the front of the camera body, a viewfinder exit at the rear of the camera body, and a shutter release at the top of the camera body, wherein the right-hand end of the camera body as viewed from the rear is provided with a rearwardly bent holding portion dimensioned to be grasped by and to fit into the right hand of a photographer during picture taking, with the thumb of the right hand supporting the rear of the camera body, the middle finger of the right hand extending along a front surface of the holding portion and supporting the front of the camera body along substantially the entire finger length, and the forefinger of the right hand disposed on top of the holding portion, and wherein the shutter release is positioned to be operated by the forefinger of the right hand with the holding portion fitted into and grasped by the right hand as aforesaid.

4,857,949

DEVICE FOR VENTING FUMES GIVEN OFF BY AUTOMATIC DEVELOPING EQUIPMENT

Yoshihiro Masuda; Takashi Yagi, and Akira Murata, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jul. 13, 1988, Ser. No. 218,835
Claims priority, application Japan, Jul. 13, 1987, 62-106376
Int. Cl.[4] G03D *3/00*
U.S. Cl. 354—322 **8 Claims**



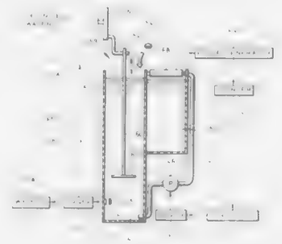
1. Apparatus comprising:
a housing defining a developing chamber;
developing and fixing tanks located in said developing chamber such that fumes will be emitted into said chamber when developing and fixing solutions are located in said tanks;
a suction case located in said developing chamber at a location above said developing and fixing tanks, said suction case having pores formed therein which face said developing and fixing tanks;
means for reducing the pressure within said suction case so as to cause said fumes located in said developing chamber to pass through said pores and into said suction case; and
means for removing said fumes from said suction case to a location outside of said suction case.

4,857,950

WASH WATER RESERVOIRING METHOD AND APPARATUS THEREFORE

Haruo Takase; Kazushige Uenaka, both of Tokyo; Akira Abe, and Yoshihiro Fujita, both of Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 12, 1988, Ser. No. 155,454
Claims priority, application Japan, Feb. 13, 1987, 62-30782; Feb. 14, 1987, 62-32184
Int. Cl.[4] G03D *3/06*
U.S. Cl. 354—324 **14 Claims**



1. In a photographic processor of the type wherein fresh wash water is supplied from a fresh wash water reservoir tank to at least a wash tank for washing developed photographic materials, a method comprising;
deionizing a supply of fresh water;
supplying a predetermined quantity of deionized fresh water into said fresh wash water reservoir tank;
adding a predetermined dose of a mixture of a conductivity increasing agent and sterilizer to said deionized fresh water in said fresh wash water reservoir tank every time said predetermined quantity of said deionized fresh water is added to said reservoir tank; and
electrically detecting the need for adding said predetermined quantity of deionized fresh water into said fresh wash water reservoir tank.

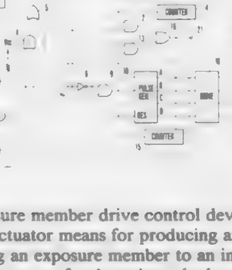
4,857,951

OUTPUT DEVICE FOR RANGE INFORMATION FOR USE IN AN INTERCHANGEABLE LENS

Yukio Nakajima, Kanagawa; Tetsuo Miyasaka, and Sumio Kawai, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Apr. 15, 1986, Ser. No. 852,140
Claims priority, application Japan, Jun. 20, 1985, 60-134800
Int. Cl.[4] G03B *3/00, 15/05, 17/18*
U.S. Cl. 354—400 **42 Claims**

1. An output device for developing range information in an interchangeable lens, comprising:
an interchangeable lens detachably mounted on a camera body and having an objective lens movable in two directions toward or away from said camera body and including a rotatable range ring for moving said objective lens;
rotation detecting means for producing pulses corresponding to rotation of said range ring of the interchangeable lens;
extreme position preset means for moving said range ring to an extreme position prior to calculation of range information;



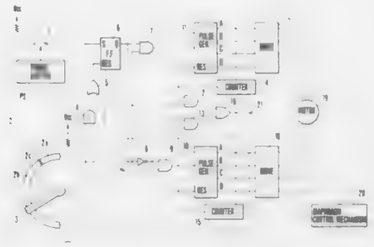
a first CPU disposed in the interchangeable lens and having data necessary for controlling the focussing of the individual lens of the interchangeable lens as part of a program, for calculating an absolute range value of the interchangeable lens at its focal point on the side of an object being photographed on the basis of the data and the pulses obtained from movement of the range ring from said extreme position; and
means for outputting said absolute range value to said camera body.

4,857,952

EXPOSURE MEMBER DRIVE CONTROL DEVICE

Nobuo Fukushima; Tadashi Okino, and Shinji Sakai, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha

Continuation of Ser. No. 906,583, Sep. 9, 1986, abandoned, which is a continuation of Ser. No. 756,062, Jul. 17, 1985, abandoned. This application Mar. 17, 1987, Ser. No. 27,997
Claims priority, application Japan, Jul. 23, 1984, 59-152359; Jul. 23, 1984, 59-152360
Int. Cl.[4] G03B *7/00;* **G05D** *3/00*
U.S. Cl. 354—452 **37 Claims**



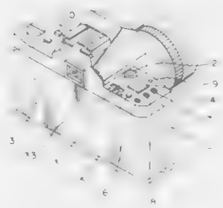
1. An exposure member drive control device comprising:
(a) setting actuator means for producing an actuating signal for setting an exposure member to an initial position;
(b) detecting means for detecting whether or not said exposure member lies in the prescribed initial position; and
(c) control means for controlling the exposure member to move the exposure member out of a predetermined position if the signal from the setting actuator means is obtained even when the exposure member is already in the prescribed initial position and then to bring it back to the initial position.

4,857,953

CAMERA SYSTEM

Nobuyuki Taniguchi, Tondabayashi; Masatake Niwa, Sakai; Akira Fujii, Osaka; Takeo Hoda, Sakai; Masaaki Nakai, Nara; Minoru Sekida, Sakai, and Masayoshi Sahara, Sennan, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka

Division of Ser. No. 43,758, Apr. 29, 1987, Pat. No. 4,763,144, which is a division of Ser. No. 888,600, Jul. 23, 1986, Pat. No. 4,712,904, which is a division of Ser. No. 634,474, Jul. 25, 1984, Pat. No. 4,621,914. This application Jul. 15, 1988, Ser. No. 219,752
Claims priority, application Japan, Jul. 27, 1983, 58-138129; Jul. 29, 1983, 58-139600; Aug. 8, 1983, 58-144547; Aug. 8, 1983, 58-144549; Aug. 17, 1983, 58-150572; Jun. 22, 1984, 59-129572; Jun. 25, 1984, 59-131452; Jun. 25, 1984, 59-131453
Int. Cl.[4] G03B *17/18*
U.S. Cl. 354—475 **3 Claims**



1. A camera adapted to function with stored data, comprising:
means for measuring light reflected from an object to generate a light measuring signal;
means for calculating exposure data in accordance with the light measuring signal;
means for storing data and co-acting in the calculation by said calculating means;
a manually operable means to be operated for altering the data stored in said storing means;
a shutter release member;
first means, responsive to a manual operation of said shutter release member, for providing an operation signal to make said measuring means and said calculating means operative; and
second means for providing the operation signal in response to a manual operation of said manually operable means.

4,857,954

IMAGE FORMING APPARATUS

Yasuo Abuyama, Ebina; Fumito Ide, Zama; Osamu Hamanaka, Yokohama, and Takeshi Sanbayashi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

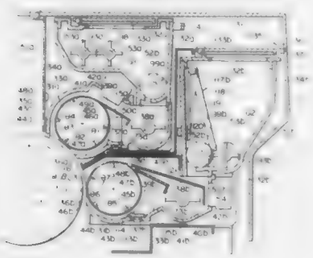
Continuation of Ser. No. 915,524, Oct. 6, 1986, abandoned, which is a division of Ser. No. 727,859, Apr. 26, 1985, abandoned. This application Mar. 7, 1988, Ser. No. 168,573
Claims priority, application Japan, Apr. 27, 1984, 59-85650
Int. Cl.[4] G03G *15/01, 15/09*
U.S. Cl. 355—245 **19 Claims**

1. An image-forming apparatus comprising:
an image carrier;
latent image-forming means for forming an electrostatic latent image on a surface of said image carrier;
first developing means for developing the electrostatic latent image formed on said image carrier, by means of a first color developing agent, said first developing means including first magnetic pole means, and drive means for causing said first magnetic pole means to assume a developing position in which the first developing agent is attracted magnetically and supplied to said image carrier, or

a non-developing position in which the supply of the first developing agent to said image carrier is stopped;

second developing means for developing the electrostatic latent image formed on said image carrier, by means of a second color developing agent different in color from said first developing agent, said second developing means including second magnetic pole means, and drive means for causing said second magnetic pole means to assume a developing position in which the second developing agent is attracted magnetically and supplied to said image carrier, or a non-developing position in which the supply of the second developing agent to said image carrier is stopped; and

selecting means for causing one of the first and second magnetic pole means to assume said developing position, and for causing the other of the first and second magnetic pole means to assume the non-developing position, to thereby



perform a developing operation by a selected one of said first and second developing means,

wherein said first and second developing means each include a developing roller which has a magnet roll and a sleeve surrounding said magnet roll, and a doctor arranged at a predetermined distance from a predetermined portion of an outer peripheral surface of said sleeve, and

said first and second magnetic pole means each include a conveying magnetic pole for permitting and prohibiting the conveying of the corresponding developing agent to the image carrier in the developing and non-developing positions, respectively, and a developing magnetic pole which is moved to a position closest to the image carrier in the developing position for supplying the corresponding developing agent to the image carrier, and which is moved away from the image carrier in the non-developing position.

4,857,955

ELECTRONIC PRINTER APPARATUS WITH INTELLIGENT ACCENT COLOR

Robert P. Crandall, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 28, 1987, Ser. No. 101,903

Int. Cl.[4] G03G *15/01, 15/00;* **G01D** *15/06;* **G06F** *15/40*

U.S. Cl. 355—328 **3 Claims**

1. A printer apparatus comprising:

first means for providing data signals representing non-color differentiated character data information to be printed;

second means for comparing data signals forming one page of character data with data signals representing a second page of character data to determine the data common to both pages; and

third means responsive to the determination of said second means to print said one and second pages of data on respective record members with data not common to both said one and second pages color highlighted in a color different than that used to print on said record members



the character data information common to both said one and second pages.

4,857,956

COPIER WITH RECIPROCATING DOCUMENT TABLE

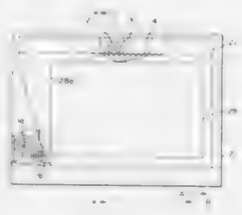
Iwakazu Honda, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 27, 1987, Ser. No. 114,071

Claims priority, application Japan, Oct. 28, 1986, 61-257171; Nov. 21, 1986, 61-180037[U]

Int. Cl.[4] G03G *15/04*

U.S. Cl. 355—234 **14 Claims**



1. In an image reading apparatus having a housing and a document table which moves reciprocatingly with respect to said housing, there being a home position, an exposure-starting position and an exposure-ending position of said document table separately defined with respect to said housing, the improvement wherein said apparatus further comprises

an elastic member capable of internally storing energy supplied from outside thereto and attached to said document table such that the amount of energy internally stored by said elastic member increases as said document table is moved from said exposure-ending position to said exposure-starting position and that said elastic member, when said document table is at said home position, has enough energy stored internally therein for moving said document table to said exposure-ending position,

a controllably retractable stopper for keeping said document table at said home position to thereby prevent dissipation of energy internally stored in said elastic member when said document table is kept at said home position, and

a damper for causing energy stored in said elastic member to be supplied to said document table at a constant rate.

4,857,957

IMAGE FORMING APPARATUS

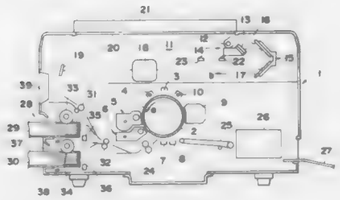
Keiji Kusumoto, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 156,483, Feb. 16, 1988, abandoned. This application Nov. 30, 1988, Ser. No. 277,810

Claims priority, application Japan, Feb. 17, 1987, 62-33707

Int. Cl.[4] G03G *15/06*

U.S. Cl. 355—314 **11 Claims**



1. An image forming apparatus capable of executing a copying operation by combining a plurality of copying conditions inclusive of at least a standard condition and a condition different from the standard condition comprising:

input means for inputting any one of conditions different from the standard condition;

reset means for automatically returning the condition inputted by the input means to the standard condition after a lapse of predetermined time after the copying operation;

first control means for allowing the input by the input means during the copying operation;

second control means for at least prohibiting the reset means from automatically returning the condition inputted by the input means to the standard condition or extending the predetermined time for automatically returning the condition inputted by the input means to the standard condition when the input by the input means is allowed during the copying operation.

4,857,958

ELECTRONIC COPYING APPARATUS HAVING FUNCTION OF PARTIALLY CHANGING IMAGE REPRODUCED FROM ORIGINAL IMAGE

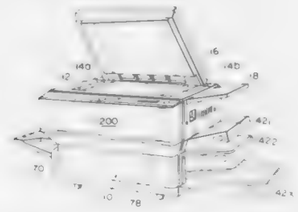
Shigenobu Osawa, Kawasaki, and Keiji Itaya, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 21, 1988, Ser. No. 171,733

Claims priority, application Japan, Mar. 25, 1987, 62-70767; Mar. 27, 1987, 62-71622

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—218 **15 Claims**



1. An image forming apparatus comprising:

image forming means for forming an image using a first image property or a second image property;

selecting means for selecting either the first image property or the second image property;

designation means for designating a range in which said image forming means is to reproduce a partial image, which is located within the designated range, using the image property selected by the selecting means;

tone changing means for changing a property of the image reproduced from the original in the designated range by varying a surface potential of an image carrier of said image forming means; and

control means for controlling the image forming operation of said image forming means based on the image property selected by the selecting means and the range designated by said designation means.

4,857,959

METHOD AND APPARATUS OF CHARGING FOR TRANSFER IN ELECTROPHOTOGRAPH DEVICE

Kazuyuki Shimbo, Kanagawa, and Katsuhiko Nishimura, Yamaguchi, both of Japan, assignors to Asahi Kogaku kogyo K.K., Tokyo, Japan

Filed Feb. 26, 1987, Ser. No. 19,432

Claims priority, application Japan, Feb. 28, 1986, 61-43393

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—276 **12 Claims**



11. An electrograph device comprising:

(a) means for forming an electrostatic latent image on a photosensitive drum and for charging said photosensitive drum uniformly with charges of a predetermined polarity;

(b) a developing unit for applying toner charged with charges of said predetermined polarity to said drum in order to develop said electrostatic latent image;

(c) a transferring charger for charging a movable paper sheet operatively associated with said drum in order to charge said sheet with charges of a polarity which is different from the polarity of said drum in order to transfer toner from said drum to said paper sheet;

(d) means for moving said paper sheet at variable speeds;

(e) a rotary encoder for detecting the speed of movement of said paper sheet, said rotary encoder comprising means for outputting a signal in the form of a pulse train of a frequency which is established in response to the detected speed of movement of said paper sheet, said rotary encoder comprising means for outputting said pulse train to a frequency control circuit which in turn comprises means for outputting a signal to a wave shaping circuit, said wave shaping circuit comprising means for outputting a generally rectangular wave to a triangular wave forming circuit, said triangular wave forming circuit in turn comprising means for outputting a triangular wave to a comparator which compares the triangular wave to a reference voltage inputted into said comparator; and

(f) a switching circuit for selectively applying high voltage

pulses at a controlled frequency to said charging means, said controlled frequency being proportional to the speed of movement of the paper sheet.

4,857,960

CONTROL DEVICE FOR IMAGE PROCESSING OR FORMING APPARATUS

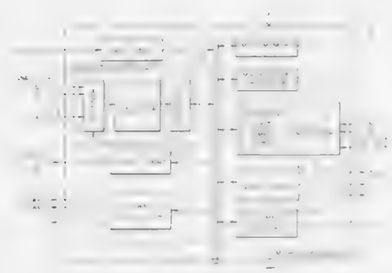
Masao Hosaka, Sagamihara; Kazutoshi Shimada, Kawasaki, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1986, Ser. No. 894,106

Claims priority, application Japan, Aug. 9, 1985, 60-174311; Aug. 30, 1985, 60-191730

Int. Cl.[4] G03G *15/00, 21/00*

U.S. Cl. 355—208 **21 Claims**



1. A control device for use in an image processing apparatus, comprising:

plural analog function means for image processing;

plural detection means for detecting analog variables of said plural analog function means;

analog-digital conversion means for converting analog signals from said plural detection means into digital signals;

first control means for controlling an image processing sequence, and for deciding, on the basis of the digital signals from said analog-digital conversion means, whether or not the analog variables of said plural analog function means should be changed, and for generating instructions for changing the analog variables to specific one or more of said plural analog function means; and

second control means for controlling the analog variables of said one or more analog function means specified by the instructions in response to the instructions.

4,857,961

IMAGE FORMING APPARATUS

Takasi Ogiso, Shizuoka; Yoshiyuki Monma, and Toshiaki Aono, both of Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 1, 1988, Ser. No. 200,882

Claims priority, application Japan, Jun. 3, 1987, 62-139601; Jun. 3, 1987, 62-139602

Int. Cl.[4] G03B *27/52*

U.S. Cl. 355—27 **10 Claims**

1. An image forming apparatus for fixing an image on a dye-fixing element in accordance with image information in a photosensitive element, comprising

first storage means for storing a dye-fixing element,

second storage means for storing a support,

bond means for bonding a dye-fixing element to a support, and

feed means for taking the dye-fixing element and the support out of the first and second storage means, respectively,



and feeding them to the bond means where the dye-fixing element is bonded to the support.

4,857,962

MASKING DEVICE FOR USE IN PHOTOGRAPHIC PRINTING

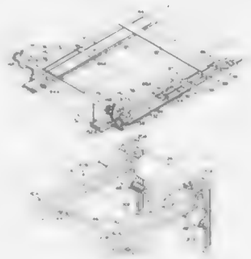
Hiroyuki Satou, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 10, 1988, Ser. No. 192,265

Claims priority, application Japan, May 11, 1987, 62-114299

Int. Cl.[4] G03B *29/00, 27/58*

U.S. Cl. 355—29 **17 Claims**



1. A masking device for use in photographic printing, disposed between a photographic printing light source and a lengthwise sheet of photosensitive medium and adapted to define the area of printing on said photosensitive medium, said masking device comprising:

a pair of moving bases capable of moving in a first direction generally perpendicular to a second direction corresponding to the lengthwise direction of said photosensitive medium, said moving bases being capable of moving toward or away from each other;

first mask members fixed to said pair of moving bases and moved together therewith so as to define the printing area in said first direction at the time of non-framed image printing over the entire area of said photosensitive medium; and

auxiliary mask members mounted on said first mask members and projected therefrom so as to define the printing area in said first direction, said printing area being reduced so that a peripheral portion of said photosensitive medium is not subjected to printing when said auxiliary mask members are projected.

4,857,963

IMAGE FORMING APPARATUS

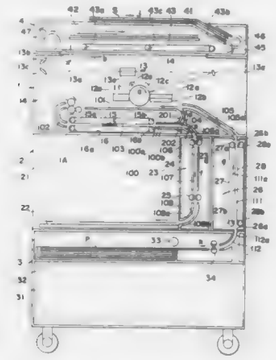
Masatoki Sutou, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 30, 1987, Ser. No. 139,749

Claims priority, application Japan, Jan. 9, 1987, 62-3801

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—321 **11 Claims**



1. An image forming apparatus comprising:

a main body provided with an image forming section for forming an image on a copy paper;

a paper supply unit, positioned below said main body, for supplying the copy paper to said main body; and

a paper discharge unit, positioned between said main body and said paper supply unit, including a paper tray means in communication with the exterior of the apparatus for receiving the copy paper with the image formed thereon;

wherein said main body, said paper supply unit and said paper discharge unit, each of which has a generally box-shape, are vertically arranged in an overlapped relationship, and the paper discharge unit includes;

a first conveyer means for vertically transporting the copy paper from said paper supply unit to said main body, and

a second conveyer means for vertically transporting the copy paper from said main body to said paper tray means.

4,857,964

APPARATUS FOR PRINTING CUSTOMIZED PHOTOGRAPHIC PRINTS

James M. Pohlman, Berkley, Mass., and Joseph A. Manico, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 85,670, Aug. 14, 1987, abandoned. This application May 2, 1988, Ser. No. 189,435

Int. Cl.[4] G03B *27/52*

U.S. Cl. 355—40 **11 Claims**

1. A photographic printer for exposing a film image and a print image onto a photosensitive medium, the printer comprising:

a. base means for supporting the film image, the base means including a first side, an opposing second side, a first opening extending between the first and second sides over which the film image is supported, and a second opening extending between the first and second sides;

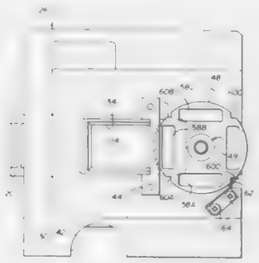
b. means for supporting the print image;

c. a single light source for projecting light (i) through the first opening to expose the film image onto the photosensitive medium and (ii) through the second opening;

d. first means for filtering the light prior to reaching the photosensitive medium;

e. means for connecting the print image supporting means to the base means in a manner that the print image supporting means is movable to a first location in general alignment with the second opening to allow the light to expose the print image onto the photosensitive medium; and

f. means for connecting the filtering means to the base means in a manner that the filtering means is movable to a second



location in general alignment with the second opening in order to filter the light travelling through the second opening which exposes the print image onto the photosensitive medium.

4,857,965

READER-PRINTER HAVING AN IMAGE ROTATION DEVICE

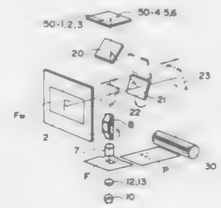
Kenjiro Ishli, Sagamihara; Yutaka Satoh, Yokohama; Fumio Fukumoto, Sagamihara; Hajime Otsuki, Yokohama; Yasuhide Kokura, Machida, and Shuichi Saito, Kawasaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 824,083, Jan. 30, 1986, Pat. No. 4,695,155. This application Jul. 1, 1987, Ser. No. 69,026

The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.

Int. Cl.[4] G03B *13/28*

U.S. Cl. 355—45 **6 Claims**



1. A reader-printer comprising:

projection means for projecting an image of a microfilm to a screen and onto a photosensitive medium;

copy forming means for forming the image projected onto the photosensitive medium into copies;

feed means for feeding copy papers toward the photosensitive medium;

an image rotation prism disposed in a light path of said projection means and having aberration between light axes incident thereto and emitted therefrom; and

elimination means for eliminating a difference between a location of the projected image and a location of the fed paper so as to form the image coincidentally onto the copy paper irrespective of aberration of the light axes.

4,857,966

READER-PRINTER HAVING AN IMAGE ROTATION DEVICE

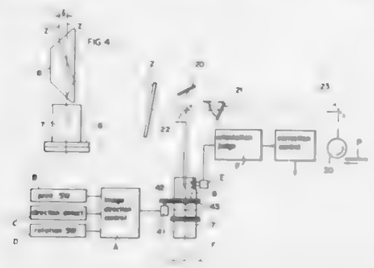
Kenjiro Ishii, Sagamihara; Yutaka Satoh, Yokohama; Fumio Fukumoto, Sagamihara; Hajime Otsuki, Yokohama; Yasuhide Kokura, Machida, and Shuichi Saito, Kawasaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 69,026, Jul. 1, 1987, which is a division of Ser. No. 824,083, Jan. 30, 1986, Pat. No. 4,695,155. This application Nov. 30, 1988, Ser. No. 277,933

Claims priority, application Japan, Jan. 31, 1985, 60-17826; Mar. 20, 1985, 60-57457

Int. Cl.[4] G03B *13/28*

U.S. Cl. 355—45 **4 Claims**



1. A reader-printer with a reader mode and a print mode, comprising:

projection means for projecting an image of a microfilm to a screen and onto a photosensitive medium;

copy forming means for forming the image projected onto the photosensitive medium into copies;

feed means for feeding copy papers toward the photosensitive medium;

an image rotation prism disposed in a light path of said projection means for optically rotating the image;

a motor for driving said image rotation prism in forward and reverse directions selectively;

a print switch for generating a copy start signal;

discrimination means for discriminating whether or not the orientation of the projected image agrees with the orientation of the fed paper;

manual adjusting means for adjustably rotating the projected image at the reader mode, said adjusting means including a bidirectional switch which generates a command for rotating the motor in the forward or reverse direction when turned on in one direction; and

control means for controlling the motor to rotate in response to the command generated by the manual adjusting means in a period during which the bidirectional switch is turned on, and in response to the discrimination means and the copy start signal till the orientation of the projected image agrees with the orientation of the fed paper.

4,857,967

LIGHT SOURCE DEVICE

Kazuhiko Naruse, and Hidetoshi Yasumoto, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 16, 1988, Ser. No. 156,424

Claims priority, application Japan, Feb. 16, 1987, 62-34738

Int. Cl.[4] G03B *27/72*

U.S. Cl. 355—69 **9 Claims**

1. An exposure light source device comprising:

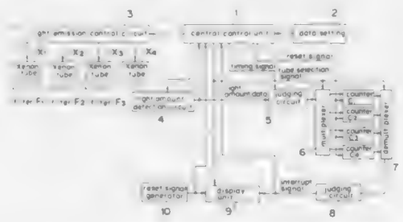
means, including at least one Xenon tube, for emitting exposure light;

means for successively energizing the Xenon tube for a plurality of successive light emissions;

means for measuring the amount or intensity of light emitted by the Xenon tube at each light emission;

means for discriminating whether or not the amount or intensity of light measured by the measuring means reaches a predetermined level;

means for counting the number of times in which the discriminating means discriminates that the amount or intensity of light measured by the measuring means does not reach a predetermined level;



means for comparing the number counted by the counting means with a predetermined number to produce an interruption signal when the counted number is over the predetermined level;

means for interrupting the light emission of the Xenon tube in response to the interruption signal; and

means for indicating a warning in response to the interruption signal.

4,857,968

APPARATUS, METHODS AND ARTICLES FOR INTERNEGATIVE COLOR BALANCING

Glen Peterson, 15 Midland Ave., Bronxville, N.Y. 10708

Filed Aug. 6, 1987, Ser. No. 83,232

Int. Cl.[4] G03B *27/58*

U.S. Cl. 355—72 **8 Claims**



1. Apparatus for color balancing of internegatives which will be subsequently used to print as positive on color printing paper or film, comprising: an enclosure including a top wall having a generally rectangular opening therein, a door on said top wall movable from a closed position over said opening to an open position to allow light having a selected filtration to pass through said opening, a gray scale holder for supporting below said opening a section of developed 35 mm color film which forms a gray scale having a series of portions forming steps with densities changing progressively from a certain minimum density to a certain maximum density and with the differences in density from one step to another being such as to produce a uniform tonal difference throughout the full range of steps on a positive test reproduction of the gray scale, and an internegative holder for supporting an internegative below and in close proximity to said section of developed 35 mm color film which forms said gray scale and for movement to allow sequential exposure of a series of selected progressively different filtrations on to separate portions of the internegative, support means in said enclosure for positioning said internegative holder for movement in a certain path relative to said enclosure, and means for controlling movement of said internegative holder to accurately establish a number of predetermined positions of said holder relative to said enclosure such that each exposed portion is isolated from the other exposed portions and while allowing a maximum number of exposures to be made on the internegative, whereby after completion of said exposures the internegative is developed and can be visually observed as a positive on a video color analyzer or on prints made on color paper or film thereby producing a visual examination capability of the most suitable color balance for the internegative.

4,857,969

COPYING MACHINE HAVING AN INTERMEDIATE TRAY

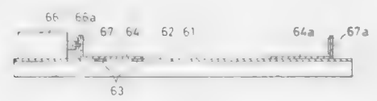
Takehiko Okada, Sakai, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 31,980, Mar. 30, 1987, abandoned. This application Jul. 13, 1988, Ser. No. 220,446

Claims priority, application Japan, Mar. 31, 1986, 61-74634; Mar. 31, 1986, 61-74633

Int. Cl.[4] G03B *27/58*

U.S. Cl. 355—72 **11 Claims**



1. A copying machine adapted for automatic two-side copying on copying paper of only fixed, predetermined sizes, said machine comprising:

means for forming an image on a copying paper;

means providing a path for copying paper through said machine;

means for moving copying paper through said path;

an intermediate copying paper tray, located in a portion of said path, for receiving a copying paper after a first image has been formed thereon by said image forming means and holding the copying paper having the image formed thereon until said moving means moves the paper having the image formed thereon to said image forming means for a subsequent image forming operation;

width arranging means disposed in said intermediate tray for arranging a copying paper received in said tray to a reference position, said arranging means including means for setting the width of said reference position to a width corresponding only to one of said fixed, predetermined copying paper sizes, said width setting means including a pair of slidable standing portions for contacting lateral sides of a copying paper received in said intermediate tray, a central link mechanism for guiding said standing portions together, and a solenoid connected to said standing portions for sliding said standing portions toward each other when copying paper is received in said intermediate tray;

judging means for judging whether said width of said reference position is the same as the width of a copying paper to be received in said tray; and

preventing means for preventing copying operations when said judging means judges that the copying paper width and said width of said reference position are not the same.

4,857,970

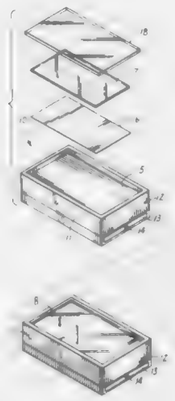
SOLAR PHOTO-DEVELOPING PROCESS

Joseph Mordini, 76 Suburban TR., Lynchburg, Va. 24501, and Robert Risner, 706 Baywood Dr., Sanford, Fla. 32773

Filed Oct. 6, 1987, Ser. No. 104,937

Int. Cl.[4] G03B *27/04*

U.S. Cl. 355—113 **1 Claim**



1. A process for imaging of designs and configurations onto light sensitive photographic type paper comprising the steps of,

a. providing an open top tray means of predetermined height and width, and

b. positioning light sensitive paper within said tray means, and

c. positioning at least one positive transparency onto said light sensitive paper, and

d. positioning a plexi-glass like filter member to completely overlie said light sensitive paper and said positive transparency to form an assembly, and

e. exposing said assembly to sunlight to thereby impart an image onto said light sensitive paper, and

f. removing said plexi-glass like filter and said tray means and further exposing said light sensitive paper to further sunlight to impart a final image onto said paper, and

wherein the providing of said open top tray means includes the step of providing of a removable storage tray within said open top tray means proximate the base thereof, and

wherein exposing said assembly to sunlight is for a period of approximately one-quarter to five minutes, and

wherein a plurality of positive transparencies are positioned onto said light sensitive paper to create an ornate configuration onto said light sensitive paper, and

wherein exposing said assembly to sunlight includes positioning said assembly to receive indirect sunlight as well as direct sunlight to effect an imaging on said light sensitive paper.

4,857,971

$(IV)_x(III\text{–}V)_{1-x}$ ALLOYS FORMED IN SITU IN III–V HETEROSTRUCTURES

Robert D. Burnham, Wheaton, Ill., assignor to Xerox Corporation, Stamford, Conn.

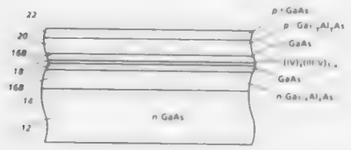
Division of Ser. No. 29,297, Mar. 23, 1987. This application Jul. 14, 1988, Ser. No. 219,036

Int. Cl.[4] H01L *29/88*

U.S. Cl. 357—4 **16 Claims**

1. In a heterostructure comprising at least one epitaxially deposited compound comprising a III–V constituent, the epi-

taxial deposition in situ of a $(IV)_x(III\text{–}V)_{1-x}$ alloy comprising a group IV elemental constituent and group III–V constituent



forming a majority carrier barrier or well in said heterostructure.

4,857,972

IMPATT DIODE

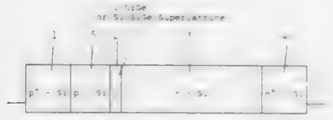
Helmut Jorke, Gerstetten, and Johann-Friedrich Luy, Ulm, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 28, 1987, Ser. No. 105,952

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1986, 3632921; Jul. 30, 1987, 3725214

Int. Cl.⁴ H01L *27/12, 45/00, 29/90, 29/161*

U.S. Cl. 357—4 **17 Claims**



1. In an IMPATT diode comprising a monocrystalline Si substrate layer to which a heterostructure semiconductor layer sequence has been applied and includes an alternating arrangement of at least two different semiconductor material layers forming at least one heterojunction to provide a generation zone within said layer sequence; the improvement wherein: said substrate layer is a heavily doped substrate layer of one conductivity type; said heterostructure semiconductor layer sequence is grown on said substrate layer and includes, in sequence, an undoped SiGe layer in said generation zone, a doped Si layer of a second conductivity type opposite said one conductivity type, and a heavily doped Si layer of said second conductivity type; said substrate has a charge carrier concentration of more than 10^{19} cm^{-3}; said doped Si layer has a charge carrier concentration of about 1.4×10^{17} cm^{-3}; and said heavily doped Si layer has a charge carrier concentration of about 5×10^{19} cm^{-3}.

4,857,973

SILICON WAVEGUIDE WITH MONOLITHICALLY INTEGRATED SCHOTTKY BARRIER PHOTODETECTOR

Andrew C. Yang, Concord; Joseph P. Lorenzo, Stow, and Richard A. Soref, Newton Centre, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 14, 1987, Ser. No. 49,352

Int. Cl.⁴ H01L *29/48, 27/14*

U.S. Cl. 357—15 **3 Claims**

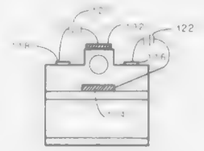
1. A photodetector comprising:

a crystalline substrate;

a first Schottky barrier contact positioned upon said crystalline substrate;

a crystalline silicon layer deposited on said crystalline substrate and said first Schottky barrier contact wherein said crystalline silicon layer is formed into a waveguide for the transmission of optic signals;

a second Schottky barrier contact position on top of said waveguide, said first and second Schottky barrier contacts



for detecting light transmission through said waveguides; and

an Ohmic contact electrically connected to said crystalline silicon layer.

4,857,974

CIRCUIT COMPRISING CONDUCTIVE LINES FOR THE TRANSFER OF HIGH-SPEED SIGNALS

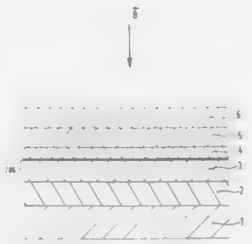
Jean-Noël Patillon; Bertrand Gabillard, and Gérard M. Martin, all of Paris, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 16, 1988, Ser. No. 156,375

Claims priority, application France, Feb. 20, 1987, 87 02233

Int. Cl.⁴ H01L *29/80*

U.S. Cl. 357—22 **7 Claims**



1. Integrated circuit comprising a semiconductor body with a plurality of circuit elements and interconnections between said circuit elements, characterized in that said semiconductor body comprises a stratified structure with at least a first semiconductor layer having a first energy gap and a second semiconductor layer having a second energy gap higher than said first energy gap, said first and second semiconductor layers forming an interface between them and a two-dimensional charge carrier gas forming a current path near said interface, in which on application of a sufficiently high magnetic field component perpendicular to said interface and at a sufficiently low temperature said current path becomes superconducting so that at least the longitudinal resistance of said current path is reduced substantially to zero.

4,857,975

GAAS FIELD EFFECT TRANSISTOR HAVING A WSI SCHOTTKY GATE ELECTRODE IMPROVED FOR HIGH-SPEED OPERATION

Hiromitsu Hirayama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

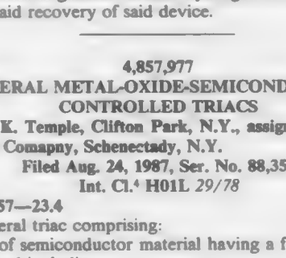
Filed Aug. 14, 1987, Ser. No. 85,978

Claims priority, application Japan, Aug. 15, 1986, 61-191330

Int. Cl.⁴ H01L *29/80*

U.S. Cl. 357—22 **10 Claims**

1. A GaAs field effect transistor comprising a GaAs substrate having an impurity concentration of 1 to 4×10^{17} cm^{-3}, source and drain electrodes attached to separated first and second parts of said GaAs substrate and a gate electrode made of WSi attached to a third part of said GaAs substrate between said first and second parts and forming a Schottky junction



with said third part of said GaAs substrate, said gate electrode having a thickness of 2000 to 5000 Å, a gate length of 0.5 to 1.5 μm in a direction from said first part to said second part of said GaAs substrate, and a gate width of 30 to 60 μm in a second direction perpendicular to said first direction.

4,857,976

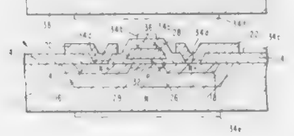
HYDROGEN-STABILIZED SEMICONDUCTOR DEVICES

Albert W. Overhauser, West Lafayette, Ind., and Joseph Maserjian, LaCrescenta, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 68,128, Jun. 30, 1987, abandoned. This application Dec. 13, 1988, Ser. No. 284,832

Int. Cl.⁴ H01L *29/78, 27/02, 23/36*

U.S. Cl. 357—23.1 **22 Claims**



1. A semiconductor device having passive means for providing a substantially continuous real-time recovery of said device from degradation caused by at least one of the following sources: hot carriers, photons, and ionizing radiation, said passive means comprising a source of a hydrogen-containing species and a material capable of cracking said hydrogen-containing species to generate atomic hydrogen as needed, which provides said recovery of said device.

4,857,977

LATERAL METAL-OXIDE-SEMICONDUCTOR CONTROLLED TRIACS

Victor A. K. Temple, Clifton Park, N.Y., assignor to General Electric Comapny, Schenectady, N.Y.

Filed Aug. 24, 1987, Ser. No. 88,353

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.4 **24 Claims**

1. A lateral triac comprising:

a body of semiconductor material having a first major surface and including:

a first region of one type conductivity extending to said first major surface;

a second region of an opposite type conductivity extending into said first region from said first major surface;

a third region of said one type conductivity extending into said second region from said first major surface and being spaced from said first region by said second region, said second region having a first channel region adjacent said first major surface and extending between said first and third regions;

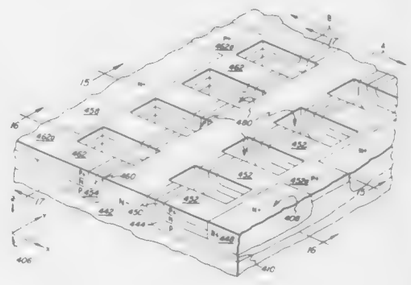
said second and third regions being elongated in a first direction;

a plurality of contact portions of said second region spaced apart in said first direction and each extending through said third region to said first major surface;

a fourth region of said opposite type conductivity extending into said first region from said first major surface and being spaced from said second region in a second direction perpendicular to said first direction by said first region;

a fifth region of said one type conductivity extending into said fourth region from said first major surface and being spaced from said first region by said fourth region, said fourth region having a second channel region adjacent said first major surface and extending between said first and fifth regions;

said fourth and fifth regions being elongated in said first direction;



a plurality of contact portions of said fourth region spaced apart in said first direction and each extending through said fifth region to said first major surface;

said first channel region having a serpentine configuration along an elongated side of said second region to provide a large channel-width-to-region-surface-area ratio for said second region;

said second channel region having a serpentine configuration along an elongated side of said fourth region to provide a large channel-width-to-region-surface-area ratio for said fourth region;

a first main electrode disposed in ohmic contact with said third region and said contact portions of said second region;

a second main electrode disposed in ohmic contact with said fifth region and said contact portions of said fourth region;

a first insulated gate electrode disposed on said first major surface in alignment with said first channel region for controlling conduction therethrough; and

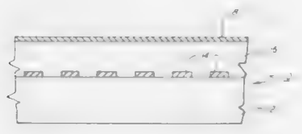
a second insulated gate electrode disposed on said first major surface in alignment with said second channel region for controlling conduction therethrough.

4,857,978

SOLID STATE LIGHT MODULATOR INCORPORATING METALLIZED GEL AND METHOD OF METALLIZATION

Efim S. Goldburt, and Richard E. Hemmer, both of Briarcliff Manor, N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Aug. 11, 1987, Ser. No. 84,260
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—24 5 Claims



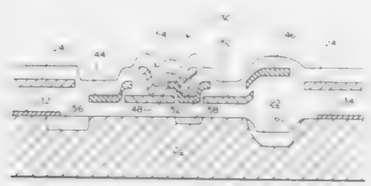
1. A solid state light modulator structure comprising:
(a) a solid state charge storage device comprising an array of charge storage elements formed in a semiconductor substrate, each element associated with at least one display electrode on the surface of the substrate,
(b) a deformable elastomer layer disposed on the solid state device, the layer covering the electrode array, and
(c) a thin pellicle layer on the surface of the elastomer layer, and
(d) a flexible, adherent and light reflective conductive metal layer disposed over the pellicle layer,
characterized in that the elastomer layer is a silicon and oxygen containing gel, and the pellicle layer is a silicon oxide layer bonded directly to the gel layer.

4,857,979

PLATINUM SILICIDE IMAGER

Michael J. McNutt, El Toro, Calif., assignor to Ford Aerospace & Communications Corporation, Newport Beach, Calif.

Filed Jun. 20, 1988, Ser. No. 209,242
Int. Cl.[4] H01L *29/78, 27/14, 31/00, 29/56*
U.S. Cl. 357—24 12 Claims



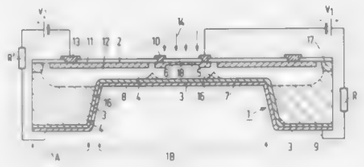
1. A platinum silicide imager, comprising:
(a) a substantially transparent semiconductor substrate;
(b) a substantially transparent platinum silicide layer forming with said substrate a reverse-biased Schottky barrier diode; and
(c) a metallic reflector plate adjacent to said platinum silicide layer on the side thereof opposite said substrate, said plate being electrically insulated from said platinum silicide layer and being dimensioned to extend beyond the edges of said platinum silicide layer;
(d) said plate being electrically biased with respect to said platinum silicide layer so as to create a surface depletion layer around the periphery of said diode.

4,857,980

RADIATION-SENSITIVE SEMICONDUCTOR DEVICE WITH ACTIVE SCREENING DIODE

Arthur M. E. Hoeberechts, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jan. 26, 1988, Ser. No. 148,512
Claims priority, application Netherlands, Feb. 16, 1987, 8700370
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 9 Claims



1. A radiation-sensitive semiconductor device comprising a semiconductor body in the form of a wafer having a relatively thicker edge portion and central portion thinner than said edge portion provided with a substantially flat first surface and an oppositely-arranged second surface having a central portion extending substantially parallel to the first surface, said device comprising a relatively high-ohmic first region of a first conductivity type adjoining the first surface, a second region of the second, opposite, conductivity type, which adjoins the first surface, which forms with the first region a photodiode comprising a radiation-sensitive p-n junction and which is entirely surrounded by the first region within the semiconductor body, and a relatively highly-doped contact layer of the first conductivity type which adjoins the second surface and the first region, a metal layer being provided on at least a part of the second surface, the metal layer and the second region being provided with connection conductors, the central portion of the semiconductor body being so thin that, in operation, it is depleted as far as the contact layer when a voltage of less than 10 V is applied in the reverse direction across said p-n junction, characterized in that the metal layer is reflecting for the radiation to be detected and in that a screening diode is provided partly in the central portion and partly in the edge portion, which diode adjoins the first surface, entirely surrounds but does not contact the second region within the central portion, extends into the relatively thicker edge portion and is entirety surrounded by the first region within the semiconductor body, said screening diode forming with the first region a rectifying ju.ction and being provided with a connection conductor for applying across the screening diode such a voltage in the reverse direction that the depletion zone thus formed extends in the central portion at least as far as the contact layer.

4,857,981

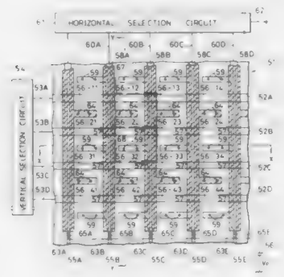
SEMICONDUCTOR IMAGING DEVICE

Kazuya Matsumoto, and Tsutomu Nakamura, both of Ina, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1987, Ser. No. 60,545
Claims priority, application Japan, Jul. 3, 1986, 61-156399
Int. Cl.[4] H01L *27/14, 29/78, 17/10*
U.S. Cl. 357—30 4 Claims

1. A semiconductor imaging device including lateral MOS static induction transistors including:
a semiconductor layer formed on an insulating substrate or a high-resistance semiconductor substrate; and
picture elements arranged in the form of a matrix over the surface of said semiconductor layer, said picture elements respectively constituted by lateral MOS static induction transistors each having a source region and a drain region both of which serve as main electrodes and a gate region for storing therein a photoelectric signal, wherein the

improvement comprises isolating regions formed between said respective picture elements in one direction only on



said matrix so that the respective adjacent ones of said picture elements share a source region with each other and a drain region with each other, in said one direction.

4,857,982

AVALANCHE PHOTODIODE WITH FLOATING GUARD RING

Stephen R. Forrest, Torrance, Calif., assignor to University of Southern California, Los Angeles, Calif.

Filed Jan. 6, 1988, Ser. No. 141,320
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 7 Claims



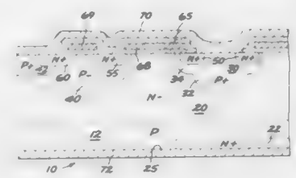
1. An avalanche photodiode, comprising:
a substrate composed of a first semiconductor material;
a buffer region composed of said first semiconductor material formed over said substrate;
a ternary light absorbing region composed of a second semiconductor material and doped with an impurity of a first conductivity type formed over said buffer region;
a multiplication region composed of said first semiconductor material, doped with an impurity of said first conductivity type, having its upper portion doped with a first concentration of an impurity of said first conductivity type; and, forming a heterojunction with said light absorbing region;
a central region composed of said first semiconductor material, doped to a second concentration with an impurity of a second conductivity type and implanted onto said multiplication region, said second concentration being greater than said first concentration;
at least one floating ring region, composed of said first semiconductor material, doped to the same high concentration as said central region with an impurity of said second type;
said floating ring region concentrically encircling said central region at the top surface of said photodiode, said ring region having no direct contact to a surface of electrical potential and being implanted into said multiplication region;
whereby, said floating ring region acts as a guard ring preventing breakdown at the junction edge of the photodiode, enhancing the gain and efficiency of said photodiode, in said central region.

4,857,983

MONOLITHICALLY INTEGRATED SEMICONDUCTOR DEVICE HAVING BIDIRECTIONAL CONDUCTING CAPABILITY AND METHOD OF FABRICATION

Bantval J. Baliga, and Deva N. Pattanayak, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 19, 1987, Ser. No. 51,430
Int. Cl.[4] H01L *29/74*
U.S. Cl. 357—38 24 Claims



1. A monolithically integrated insulated gate semiconductor device comprising:
a first layer of one type conductivity;
a second layer of opposite type conductivity
a first region of opposite type conductivity disposed within said first layer said first layer and said first region each forming a portion of
a first surface of said device;
second and third regions of one type conductivity disposed in said second layer and forming PN junctions therewith;
a fourth region of opposite type conductivity disposed within said second region, said second layer and said second and fourth regions each forming a portion of
a second surface of said device;
fifth and sixth regions of opposite type conductivity disposed within said third region and forming PN junctions therewith, said fifth and sixth regions being disposed in opposed relation with a portion of said third region disposed therebetween, said third, fifth and sixth regions each forming a portion of said second surface of said device;
a first electrode disposed in ohmic contact with said second, third, fourth and sixth regions;
a second electrode disposed in ohmic contact with said first layer and said first region;
insulated gate means for coupling said fourth
and fifth regions to said second layer; and
an additional insulated gate structure for coupling said fifth region to said sixth region.

4,857,984

THREE-TERMINAL MOS INTEGRATED CIRCUIT SWITCH

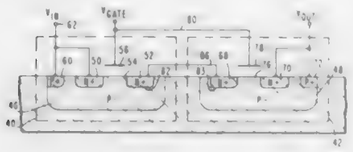
Charles H. Lucas, Newport Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 686,329, Dec. 26, 1984. This application Jul. 15, 1986, Ser. No. 885,813
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—41 2 Claims

1. A three-terminal integrated circuit switching structure comprising:
a semiconductor substrate of a first conductivity type;
first and second electrically isolated wells of a second conductivity type formed in said substrate;
a first MOS device formed in said first well, said first MOS device comprising source and drain regions of said first conductivity type and a channel region extending therebe-

tween, a gate electrode disposed over said channel region, and an input contact region of said second conductivity type, said source and input contact regions being connected to a common input terminal; and

a second MOS device formed in said second well, said second MOS device comprising source and drain regions of said first conductivity type and a channel region extending therebetween, a gate electrode disposed over said channel region, and an output contact region of said second conductivity type, said drain and output contact regions being connected to a common output terminal;



the gate electrodes of said first and second MOS devices being connected to a common gate terminal;

the drain region of said first MOS device being connected to the source region of said second MOS device;

whereby the application of a predetermined gate potential to said gate electrodes will simultaneously turn on both of said MOS devices and drive said structure to a conductive state, and whereby the removal of said gate potential will turn off both of said MOS devices.

4,857,985

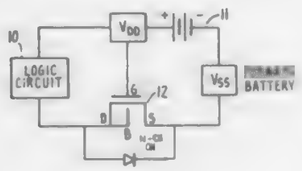
MOS IC REVERSE BATTERY PROTECTION

William E. Miller, Los Gatos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 91,266, Aug. 31, 1987, abandoned. This application Dec. 15, 1988, Ser. No. 285,290

Int. Cl.[4] H01L *27/02*

U.S. Cl. 357—42 **4 Claims**



1. In an integrated circuit which includes a power supply pad and a ground pad, one or more operative circuits to be protected from reverse voltage being connected between the power supply pad and the ground pad via a power supply distribution bus and a ground supply distribution bus, and wherein, under normal operating conditions, a battery is connected between the power supply pad and the ground pad such that the power supply pad provides a positive supply voltage to said operative circuit or circuits to be protected from reverse voltage, the improvement comprising a MOS field-effect transistor having its drain and source regions connected between said operative circuit or circuits to be protected from reverse voltage and one of the pads, the gate of the field effect transistor being connected to the other pad such that the gate of the field effect transistor is turned off during a reverse battery condition, the body of the field-effect transistor being connected to the source/drain node which is connected to said operative circuit or circuits to be protected from reverse voltage, preventing current flow through said operative circuit or circuits to be protected from reverse voltage.

4,857,986

SHORT CHANNEL CMOS ON 110 CRYSTAL PLANE

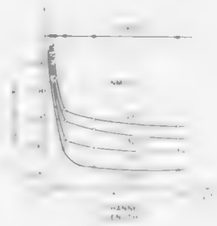
Masaaki Kinugawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 14, 1986, Ser. No. 884,962

Claims priority, application Japan, Oct. 17, 1985, 60-232253

Int. Cl.[4] H01L *27/02, 29/04*

U.S. Cl. 357—42 **4 Claims**



1. A semiconductor device of a CMOS type comprising:

a silicon substrate having a (110) crystal plane; and at least one CMOS transistor formed in said substrate, each CMOS transistor having a N channel MCS transistor which is formed on said (110) plane of said substrate and whose channel length is 1.5 μm or less, and a P channel MOS transistor formed in said silicon substrate.

4,857,987

SEMICONDUCTOR DEVICE

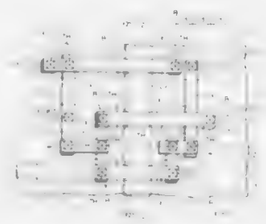
Setsuo Ogura, Takasaki; Kazuyuki Kamegaki, Tamamura; Kouichi Yamazaki, Takasaki; Hideo Miyazaki, Takasaki; Yukinori Kitamura, Takasaki, and Shirou Mayuzumi, Takasaki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., Tokyo, Japan

Continuation of Ser. No. 898,652, Aug. 21, 1986, abandoned. This application Sep. 19, 1988, Ser. No. 246,924

Claims priority, application Japan, Sep. 20, 1985, 60-206490

Int. Cl.[4] H01L *27/10*

U.S. Cl. 357—45 **25 Claims**



1. A semiconductor device comprising:

(1) an elongated injector region formed in a semiconductor substrate, which has an upper surface and is extended in one direction, said elongated injector region being interposed between first and second surface area of said substrate along said one direction thereof;

(2) a plurality of first spaced base regions with collectors therein constituting first IIL gates formed at said first surface area along said one direction of said injector region and closely spaced therefrom;

(3) a plurality of second spaced base regions with collectors therein constituting second IIL gates formed at said second surface area along said one direction of said injector region and closely spaced therefrom;

(4) first generally parallel conductive layers extending over said substrate and being connected to electrodes of selected ones of said first or second IIL gates; and

(5) second generally parallel conductive layers extending in a different direction to said first conductive layers over said substrate and being connected to electrodes of predetermined ones of said first or second IIL gates,

wherein said elongated injector is a doped region which is formed by selectively implanting an impurity into said substrate, and wherein at least one of said first conductive layers is formed along and in electrical contact with the whole upper surface of said doped region.

4,857,988

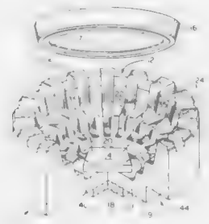
LEADLESS CERAMIC CHIP CARRIER

Stanley A. Fottler, 14 Bicentennial Dr., Lexington, Mass. 02173

Filed Feb. 9, 1988, Ser. No. 153,979

Int. Cl.[4] H01L *39/02, 23/02, 23/12, 29/44*

U.S. Cl. 357—74 **13 Claims**



1. A circular semiconductor chip carrying device comprising:

a circular ceramic insulating base having a cavity for carrying a semiconductor chip;

an insulating cap covering and sealing the chip within the cavity;

a circular floor within the cavity of said insulating base to which the chip is secured;

a contact surface configured about the chip along a peripheral wall of the cavity;

a sealing surface along the peripheral wall to which the insulating cap is hermetically sealed, the sealing surface being further removed from the floor and the contact surface such that the contact surface is completely enclosed when the insulating cap is sealed to the sealing surface of the cavity;

a plurality of spaced castellations outside of the sealed cavity and extending from the peripheral wall of the cavity;

a plurality of continuous conductive regions extending from each castellation along the peripheral wall to the contact surface; and

a conductive layer on the floor of the cavity contacting one of said conductive regions.

4,857,989

SEMICONDUCTOR DEVICE

Ryuichiro Mori; Katsuyuki Fukudome, and Toshinobu Banjo, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 4, 1987, Ser. No. 93,524

Claims priority, application Japan, Sep. 4, 1986, 61-210317; Sep. 8, 1986, 61-212090

Int. Cl.[4] H01L *23/14, 23/18, 23/32*

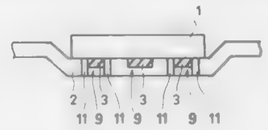
U.S. Cl. 357—80 **10 Claims**

1. A semiconductor device comprising:

a semiconductor element having a mounting surface,

a semiconductor element mounting member having an upper surface on which a concave portion is provided, said concave portion having a substantially smaller area than an area of the mounting surface of said semiconductor element, said semiconductor element mounted on said upper surface and completely covering and surrounding said concave portion, and

a bonding material set in said concave portion of said semiconductor element mounting member for bonding said semiconductor element to said semiconductor element



mounting member so that a portion of said semiconductor element surrounding said concave portion floats on, but is not attached to, a portion of said upper surface of said semiconductor mounting member sorrounding said convex portion, a volume of said bonding material being substantially equal to a volume of said concave portion.

4,857,990

DIGITAL VIDEO STORAGE

Thomas B. Horgan, Londonderry, N.H., assignor to Computer Devices, Inc., Nutting Lake, Mass.

Continuation of Ser. No. 876,717, Jun. 20, 1986, abandoned. This application Jun. 1, 1988, Ser. No. 205,622

Int. Cl.[4] H04N *9/45, 9/64*

U.S. Cl. 358—13 **25 Claims**



1. Apparatus for digitally encoding an analog composite color NTSC video signal, and for subsequently displaying the color picture signal appearing in each horizontal scan line of the resulting encoded signal, comprising

an analog-to-digital converter for generating digital samples of the color burst signal appearing in each said horizontal scan line, and

means for providing a reproduction of said color burst signal generated directly from and based solely on said digital samples of said color burst signal, said means for providing including means for storing a sequence of said samples, and means for repeatedly withdrawing said samples from said storing means for delivery at a rate and in an order such that said withdrawn samples represent a reproduction of said color burst signal having a predetermined phase relationship to said subsequently displayed color picture signal.

10. Apparatus for digitally encoding an analog composite color NTSC video signal, said apparatus comprising

an input port for receiving said signal,

an analog-to-digital converter for generating digital samples of said signal at a predetermined sampling rate, and

an output for delivering said digital samples at said rate, said

delivered digital samples spanning less than all of said color video signal,

said predetermined sampling rate being 8/3 times the subcarrier frequency of the NTSC signal, said samples including samples of some but less than all of the color burst signal.

4,857,991

METHOD AND SYSTEM FOR DECOMPRESSING COLOR VIDEO FEATURE ENCODED DATA

John Music, Irvine; Gordon H. Smith, Santa Ana, and James L. Thomas, Placentia, all of Calif., assignors to Universal Video Communications Corp., Irvine, Calif.

Filed Apr. 27, 1988, Ser. No. 186,574

Int. Cl.[4] H04N *11/04*

U.S. Cl. 358—13 **65 Claims**



1. A method of decompressing color video data in a video information communication system utilizing a plurality of digitized signals having a portion thereof representing run length and a portion of representing color of at least a portion of a plurality of pixels in a plurality of scan lines of a video picture frame, said digitized signals being of a first digital word size, said run length portion of said digitized signal being of a second digital word size, said color portion of said digitized signal being of a third digital word size, comprising the steps of:

(a) storing said run length portion and said color portion as an array in a memory means of run length data and color component data representing said plurality of pixels in said plurality of scan line in said video picture frame; and

(b) converting said color portion into three digital color component signals of fourth, fifth, and sixth digital word sizes, respectively; and

(c) generating a color video display signal comprising said three color component data from said run length and associated color components for said scan lines of said picture frame for each pixel of said picture frame, by mapping the pixels represented in said run length according to the associated color components for said run length from a starting pixel for said run length to the end pixel of said run length, to the end of the portion of each scan line to be mapped, and interpolating a smooth color transition from one of the group consisting of an intermediate decision point and one said starting pixel to one of the group consisting of an intermediate decision point and one said end pixel.

4,857,992

IMAGE DISPLAY APPARATUS AND METHOD

Norman D. Richards, Horsham, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 35,104, Apr. 6, 1987, and a continuation-in-part of Ser. No. 35,876, Dec. 21, 1987. This application Jan. 19, 1988, Ser. No. 146,446

Claims priority, application United Kingdom, Dec. 24, 1986, 8630887; Feb. 12, 1987, 8703279

Int. Cl.[4] H04N *7/137, 11/04*

U.S. Cl. 358—13 **19 Claims**

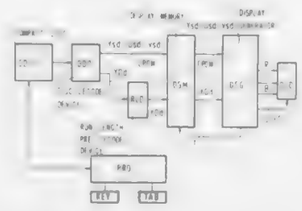
13. A method of displaying a selected color image resolved in predetermined number of pixels, responsive to a mass memory having stored digital luminance and chrominance component data for a plurality of images, said data being in two sets, a first set of luminance and chrominance data resolved in a reduced number of pixels, and a second set of data compression coded luminance differences resolved in said predetermined number of pixels, said method comprising:

transferring said first and second sets of data for a selected image from said mass memory to a display memory, while maintaining each set separate from the other, and while maintaining at least some of the data compression coding in said second set;

reading each set of data from said display memory;

decoding the data compression in said second set;





interpolation filtering signals from said first set so as to increase the number pixels from said reduced number of pixels to said predetermined number of pixels;

after said decoding and interpolation filtering adding signals from said first and second sets;

before or after said adding step, converting luminance and chrominance signals from said first and second sets to RGB signals;

before or after interpolation filtering step, converting digital signals to analog signals; and

driving a display with analog RGB signals.

4,857,993

METHOD AND SYSTEM FOR DECOMPRESSING DIGITAL COLOR VIDEO STATISTICALLY ENCODED DATA

John Music, Irvine; Gordon H. Smith, Santa Ana, and James L. Thomas, Placentia, all of Calif., assignors to Universal Video Communications Corp., Irvine, Calif.

Filed Apr. 27, 1988, Ser. No. 187,050

Int. Cl.[4] H04N *11/04*

U.S. Cl. 358—13 **30 Claims**

1. A method for decompressing digital color video data in a video communication system utilizing a plurality of digitized signals representing combinations of a plurality of run length of a first digital word size and digitally compressed color component codes of a second digital word size for at least a portion of a plurality of scan lines of a video picture frame, and

a look up table of said digitally compressed color component codes for three corresponding digital color components, said method comprising the steps of:

(a) decoding said digitally compressed color component codes according to said look up table to form a table in a memory means of said three digital color components for each said run length, said three decoded color component



having third, fourth, and fifth digital word sizes, respectively; and

(b) storing at least a portion of said run length and said corresponding color components in an array in a buffer memory means of run length and color component data representing said plurality of scan lines in said video picture frame.

4,857,994

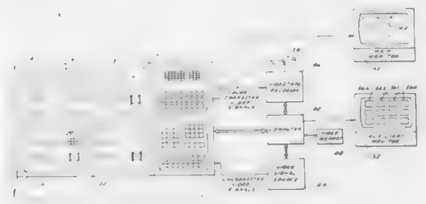
COLOR CORRECTION SYSTEM AND METHOD

Armand Belmares-Sarabia, Catskill, N.Y., and Stanley J. Chayka, Parsippany, N.J., assignors to Corporate Communications Consultants, Inc., Fairfield, N.J.

Division of Ser. No. 943,298, Dec. 17, 1986, Pat. No. 4,763,186, which is a continuation-in-part of Ser. No. 598,468, Apr. 9, 1984, Pat. No. 4,679,067, and a continuation-in-part of Ser. No. 851,164, Apr. 14, 1986, abandoned. This application Feb. 1, 1988, Ser. No. 150,626

Int. Cl.[4] H04N *9/74*

U.S. Cl. 358—22 **28 Claims**



15. A method for color correcting video picture signals representative of images stored in an image recording medium, comprising the steps of:

producing video picture signals representative of each of the images stored in the image recording medium;

selectively generating color correction signals for at least one selected image of each of a plurality of scenes recorded on said image recording medium;

selectively storing signals representative of a desired image in a digital random-access video storage device;

selectively retrieving the stored signals representative of said desired image from said video storage device;

automatically storing signals representative of the current image within said image recording medium in said video storage device;

automatically retrieving the stored signals representative of said current image from said video storage device; and

displaying on a monitor one video picture formed from the retrieved signals representative of said current image and another video picture formed from the retrieved signals representative of said desired image.

4,857,995

COLOR IMAGING APPARATUS INCLUDING CONTROL SYSTEM FOR STABILIZING PHASE AND FREQUENCY OF A VIDEO SIGNAL CARRIER FREQUENCY

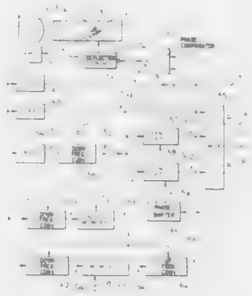
Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Fujisawa; Hiroshi Ichimura; Ichiro Negishi, both of Tokyo, and Masaru Osada, Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Continuation-in-part of Ser. No. 790,455, Oct. 23, 1985, Pat. No. 4,736,243. This application Oct. 14, 1987, Ser. No. 108,988

Claims priority, application Japan, Oct. 15, 1986, 61-157873[U]; Oct. 15, 1986, 61-157874[U]; Oct. 15, 1986, 61-157875[U]

Int. Cl.[4] H04N *9/083, 9/07*

U.S. Cl. 358—47 **6 Claims**



1. A color imaging apparatus comprising:

(a) a color filter having a plurality of successively arranged recurrent groups of different color stripes;

(b) an index signal generation pattern;

(c) an image pickup tube having a photoelectrical conversion target exposed to light passing through the color filter and the index pattern, the image pickup tube outputting a video signal including a plurality of periodic frames each including a plurality of scanning lines, said video signal containing a color signal component in the form of a carrier having a first carrier frequency and being modulated in frequency and phase in accordance with the individual color stripes of each said recurrent group of the color filter, the video signal outputted from the image pickup tube also containing an index signal component which depends on the index pattern;

(d) first holding means for holding a part of the index signal component, which part corresponds to at least one horizontal scanning line of said video signal, for periodically updating the part of the index signal component held therein in synchronism with a nominal vertical scanning frequency of said video signal, and for repeatedly reading out therefrom the part of the index signal component held therein at a reading rate synchronous with a nominal horizontal scanning frequency of said video signal, thereby generating a field signal having a second carrier

frequency corresponding to said index signal generation pattern;

(e) first frequency conversion means for converting the first carrier frequency of the color signal component into a third carrier frequency in response to the field signal having the second carrier frequency;

(f) second holding means for holding a portion of a signal outputted from said first frequency conversion means, which portion corresponds to scanning lines included in at least one frame period of the video signal, which scanning lines are obtained under conditions where the photoelectrical conversion target is exposed via the color filter to light having a color equal to the color of one of the color stripes, and for repeatedly reading out the held signal portion therefrom at a reading rate synchronous with the nominal horizontal scanning frequency and the nominal vertical scanning frequency, thereby generating a first frame signal having the third carrier frequency;

(g) second frequency conversion means for converting the third carrier frequency of the first frame signal into a fourth carrier frequency in response to the field signal having the second carrier frequency thereby generating a second frame signal having the fourth carrier frequency;

(h) means for modifying the phase of the carrier of the second frame signal having the fourth carrier frequency to produce reference signals having a predetermined phase difference therebetween; and

(i) means for detecting color component signals from the output video signal of the image pickup tube in response to the reference signals.

4,857,996

IMAGE PICKUP DEVICE WITH REDUCED FIXED PATTERN NOISE

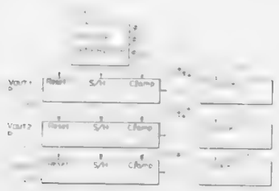
Yoshiaki Hirano, Kawagoe, and Teruo Hieda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1986, Ser. No. 925,215

Claims priority, application Japan, Nov. 6, 1985, 60-249619

Int. Cl.[4] H04N *9/077, 3/15, 5/335*

U.S. Cl. 358—48 **14 Claims**



1. An image pickup device comprising:

an image pickup means having three output channels for reading out an image signal output from said image pickup means, each of said output channels having clamp means, sample-and-hold means and reset means; and

a drive signal source for generating three different cyclical pulses to clamp, sample and hold, and reset the image signal read out from said image pickup means, said three different cyclical pulses being substantially 120 degrees out of phase with one another, having the same period as each other, and having the same pulse width less than $\frac{1}{3}$ of the period, wherein said drive signal source drives said three output channels using said three pulses.

4,857,997

COLOR TELEVISION CAMERA INCORPORATING A COLOR RESOLVING PRISM SYSTEM

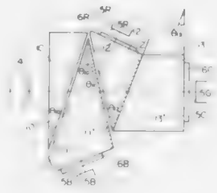
Kiyoshi Fukami, Yokohama; Takeshi Sekiguchi, and Shigeru Ohshima, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 639,143, Aug. 9, 1984, abandoned. This application Apr. 19, 1988, Ser. No. 186,654

Claims priority, application Japan, Aug. 17, 1983, 58-149759; Aug. 17, 1983, 58-149760

Int. Cl.[4] H04N *9/097;* **G02B** *27/14*

U.S. Cl. 358—55 **5 Claims**



1. A television camera having a color resolving prism system for forming monochromatic images on image pickup surfaces of a plurality of image pickup devices by an objective lens, said color resolving prism system having first, second, third and fourth prisms as is named in the order from a side of the objective lens along the optic axis of said objective lens, said first prism and said second prism being adjacent to each other with an air layer interposed therebetween, said second prism and said third prism being adjacent to each other with an air layer interposed therebetween, a first dichroic layer being formed on a surface of said second prism which faces a surface of said third prism, said third prism and said fourth prism being joined together with a second dichroic layer interposed therebetween, said color resolving prism system satisfying the following conditions:

$$5.2° < \theta_{10} < 12°$$

$$26.7° < \theta_{10} + \theta_{11} < 30°$$

where θ_{10} and $\theta_{10}+\theta_{11}$ are refracting angles of said first and second prisms, respectively.

4,857,998

AUTOMATIC PRIMARY COLOR CONVERGENCE ALIGNMENT SYSTEM FOR PROJECTION TELEVISION

Susumu Tsujihara, and Teruo Kataoka, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 25, 1988, Ser. No. 160,379

Claims priority, application Japan, Feb. 26, 1987, 62-43324; Mar. 26, 1987, 62-72440; May 15, 1987, 62-119442; Jul. 20, 1987, 62-180453

Int. Cl.[4] H04N *9/28, 9/31*

U.S. Cl. 358—60 **11 Claims**

1. An automatic convergence alignment system for a color television display apparatus which displays a television picture on a screen as a combination of primary color components, comprising:

convergence alignment means operable for position adjustment of said primary color components of the television picture;

photodetection means disposed peripherally on said screen;

alignment pattern generating means for controlling said display apparatus to periodically display an alignment pattern on peripheral regions of said screen in each of said primary color components during respective successively occurring correction intervals, said alignment pattern being positioned to be incident on said photodetection means;

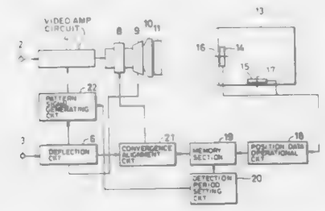
signal processing and memory means responsive to photoelectric transducer signals produced by said photodetection means by detection of said alignment pattern during each of said correction intervals for deriving position data for causing said convergence alignment means to align said alignment pattern with at least one predetermined reference position defined relative to said photodetection means, and for subsequently holding said position data and continuously supplying said position data to said convergence alignment means; and

detection period control means for controlling a detection period which is a repetition period of said corrections intervals.

9. An automatic convergence alignment system for a color television display apparatus which displays a television picture on a screen as a combination of primary color components, comprising:

convergence alignment means operable for position adjustment of said primary color components of the television picture;

first photodetection means disposed peripherally on a vertically extending side of said screen and second photodetection means disposed peripherally on a horizontally extending side of said screen, each said photodetection means comprising an array of photoelectric transducer elements;



alignment pattern generating means for controlling said display apparatus to periodically display an alignment pattern on peripheral regions of said screen in each of said primary color components during respective successively occurring correction intervals, first and second predetermined portions of said alignment pattern being positioned to be respectively incident on said first and second photodetection means; and

signal processing and memory means responsive to respective photoelectric transducer signals produced by said first and second photodetection means by detection of said first and second predetermined portions respectively of said alignment pattern during each of said correction intervals for deriving position data for causing said convergence alignment means to align said first and second predetermined portions of said alignment pattern with first and second predetermined reference positions, respectively, which are defined at respective central positions of said element arrays of said first and second photodetection means, and for subsequently holding said position data and continuously supplying said position data to said convergence alignment means.

4,857,999

VIDEO MONITORING SYSTEM

Russell J. Welsh, Toronto, Canada, assignor to PEAC Media Research, Inc., Toronto, Canada

Filed Dec. 20, 1988, Ser. No. 287,452

Int. Cl.[4] H04N *7/087*

U.S. Cl. 358—84 **27 Claims**

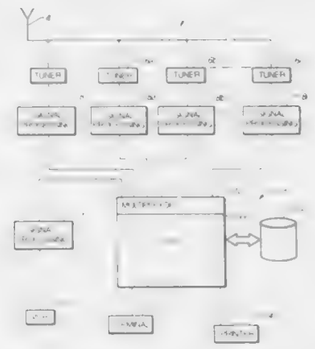
1. A method of monitoring broadcast television to detect specific program material comprising:

(a) monitoring at least one television signal;

(b) extracting a plurality of characters present in the closed captioned portion of the signal;

(c) comparing the extracted plurality characters to a predetermined plurality of characters to determine if a match exists; and

(d) recording each occurrence of a match between the extracted plurality of characters and the predetermined plurality of characters.



4,858,000

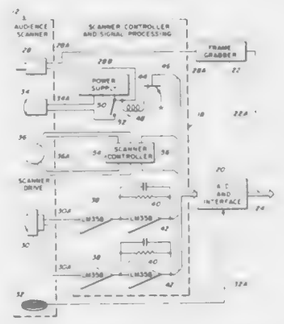
IMAGE RECOGNITION AUDIENCE MEASUREMENT SYSTEM AND METHOD

Daozheng Lu, Dunedin, Fla., assignor to A. C. Nielsen Company, Northbrook, Ill.

Filed Sep. 14, 1988, Ser. No. 244,916

Int. Cl.[4] H04H *9/00;* **H04N** *17/00;* **G06K** *9/00*

U.S. Cl. 358—84 **27 Claims**



1. An image recognition system for identifying predetermined individual members of a viewing audience in a monitored area:

means for storing a plurality of pattern image signatures, each of said pattern image signatures corresponding to one of the predetermined individual members;

means for locating individual members in the monitored area;

means for capturing an image of each of said located individual members in the monitored area;

means for comparing each of said captured images with said stored pattern image signatures to identify each of the predetermined individual members.

4,858,001

MODULAR ENDOSCOPIC APPARATUS WITH IMAGE ROTATION

Miles C. Milbank, San Ramon, and Perry M. Williams, San Carlos, both of Calif., assignors to High-Tech Medical Instrumentation, Inc., San Francisco, Calif.

Filed Oct. 8, 1987, Ser. No. 106,742
Int. Cl.[4] H04N *7/18;* **A61B** *1/04, 1/06*
U.S. Cl. 358—98 **19 Claims**

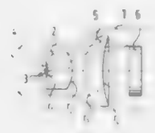
1. A video imaging device for presenting an image of a selected objective at a selected circular orientation, comprising:
a body member;
means carried by said body member capable of rotatably presenting an image for monitoring; and
means removably attached to said means for presenting an image for monitoring for selectively directing the focus of said means for presenting an image to a monitor.

4,858,002

WIDE-ANGLE OBJECTIVE FOR ENDOSCOPES

Jürgen Zobel, Bretten-Sprantal, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Apr. 11, 1988, Ser. No. 179,870
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712453
Int. Cl.[4] A61D *1/04*
U.S. Cl. 358—98 **6 Claims**



1. A wide-angle objective for an endoscope, said objective having a distal side facing an object and an image side, a meniscus being located at the distal side with a concave first surface facing towards the object, another optical component being of the meniscus, the improvements comprising said meniscus being a distal meniscus with said first surface having a first radius r1, said distal meniscus having a second surface with a second radius r2 facing toward said another optical component, said another optical component being a proximal meniscus having a first surface with a radius r3 facing toward the distal meniscus and a second surface with a radius r4 facing towards said image side of the objective, said objective having a field of view angle α and an overall focal length of F, said distal meniscus having a focal length of f1 and said proximal meniscus having a focal length f2, and the proximal and distal menisci having the following dimensions:

$$\alpha > 85°$$

$$nd > 1.7$$

$$Vd > 40$$

$$\infty > |r1| > |r2|$$

$$|r3| < |r4| \leqq \infty$$

$$2F < f1 < 3F$$

$$f2 > \frac{F \cdot f1}{f1 - F}$$

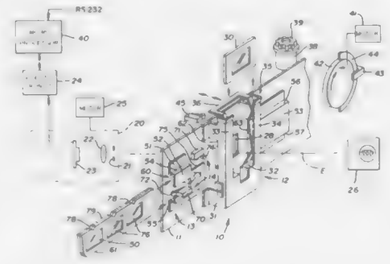
wherein nd is an index of refraction for a wavelength of 580 nm; and Vd is an abbe coefficient for a wavelength of 580 nm.

4,858,003

MECHANISM FOR HANDLING SLIDES AND FILM STRIPS

Michael L. Wirt, Avon; Jude Sangregory, Rochester, and Mark E. Bridges, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 12, 1988, Ser. No. 142,991
Int. Cl.[4] G03B *1/50*
U.S. Cl. 358—102 **14 Claims**



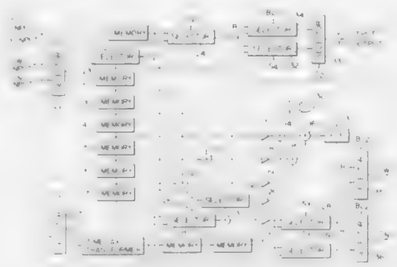
1. Apparatus for positioning film media in alignment with video imaging means comprising:
frame means having a window;
primary gate means mounted on said frame means for holding film media in a first plane;
secondary gate means mounted on said frame means for holding film media in a second plane; and
sensor means for detecting the presence or absence of film media whereby said video imaging means is caused to move with respect to said primary and secondary gate means to focus on said film media.

4,858,004

CODER/DECODER FOR TIME COMPRESSED INTEGRATION SYSTEM

Kazukuni Kitagaki, Kawasaki, and Takeshi Ohto, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 20, 1988, Ser. No. 146,188
Claims priority, application Japan, Jan. 21, 1987, 62-10093
Int. Cl.[4] H04N *7/12, 11/20, 9/79*
U.S. Cl. 358—133 **9 Claims**



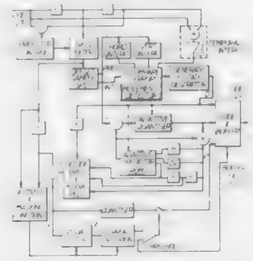
1. A coder/decoder for a time compressed integration selectively used in a coder mode or a decoder mode and arranged such that a coder and a decoder are substantially mounted on a single integrated circuit chip, said coder comprising a first phase compensation delay circuit for delaying a luminance signal, vertical filters for limiting frequency bands of wide- and narrow-band chrominance signals in a vertical direction, each of said vertical filters being provided with tapped delay means and logic circuit means connected to taps of said tapped delay means, and means for alternately extracting outputs from said vertical filters every horizontal scanning period and performing time-axis compression, said coder being arranged to perform time compressed integration of the compressed wide- and narrow-band chrominance signals and the luminance signal having passed through said first phase compensation delay circuit and to output a time compressed integration signal, said decoder comprising a second phase compensation delay circuit for delaying the luminance signal in the time compressed integration signal, means for expanding the wide- and narrow-band chrominance signals in the time compressed integration signal, and an interpolation filter for interpolating the wide- and narrow-band chrominance signals during periods of the expanded wide- and narrow-band chrominance signals, said interpolation filter being provided with tapped delay means and logic circuit means connected to taps of said tapped delay means, and said decoder being arranged to obtain an original luminance signal and original wide- and narrow-band chrominance signals, comprising:
first memory means having a memory capacity corresponding to the luminance signal of at least one horizontal scanning period;
second memory means with taps having a memory capacity corresponding to the wide- and narrow-band chrominance signals of a plurality of horizontal scanning periods; and
a plurality of switching means operated such that said first memory means serves as said first phase compensation delay circuit and one part of said second memory means serves as said tapped delay means in said vertical filters in the coder mode, and said first memory means and said one part of said second memory means serve as said second phase compensation delay means and the other part of said second memory means serves as said tapped delay means in said interpolation filter in the decoder mode.

4,858,005

SYSTEM FOR ENCODING BROADCAST QUALITY TELEVISION SIGNALS TO ENABLE TRANSMISSION AS AN EMBEDDED CODE

Nicolas K. Lodge, Hampshire, United Kingdom, assignor to Independent Broadcasting Authority, London, England

PCT No. PCT/GB87/00116, § 371 Date Oct. 14, 1987, § 102(e) Date Oct. 14, 1987, PCT Pub. No. WO87/05179, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 17, 1987, Ser. No. 113,822
Claims priority, application United Kingdom, Feb. 17, 1987, 8603880
Int. Cl.[4] H04N *7/12, 11/06, 7/04*
U.S. Cl. 358—135 **29 Claims**



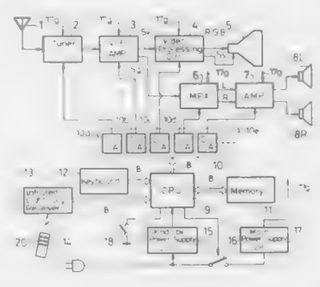
1. Apparatus for encoding a television signal to be transmitted, comprising:
means for sampling a television signal to be encoded;
means for selecting sites of samples to be interpolated by one of a plurality of interpolation schemes;
means for processing samples neighbouring each sample to be interpolated to evaluate which interpolation scheme applied to the neighbouring samples produces the best value for that interpolated sample;
means for generating a descriptor signal adapted, for each sample to be spatially interpolated, to generate a descriptor signal indicative of whether the best spatial interpolation scheme for that sample produces a value greater or less than the average of the values produced by the plurality of spatial interpolation schemes; and
means for transmitting the descriptor signals.

4,858,006

METHOD AND APPARATUS FOR ESTABLISHING A SERVICING MODE OF AN ELECTRONIC APPARATUS

Masakazu Suzuki, Saitama; Masayuki Suematsu, Tokyo, and Yoshinori Komiya, Kanagawa, all of Japan, assignors to Sony Corp., Tokyo, Japan

Filed Jun. 7, 1988, Ser. No. 203,165
Claims priority, application Japan, Jul. 28, 1987, 62-17037
Int. Cl.[4] H04N *29/12, 17/00, 5/63, 5/44*
U.S. Cl. 358—139 **15 Claims**



1. A method of controlling an electronic apparatus comprising a plurality of circuits which are individually adjustable in accordance with respective control signals, non-volatile memory means for storing a secret code and for storing data corresponding to predetermined conditions of said adjustable circuits, respectively, a central processing unit adapted to receive said data from said memory means and to provide said control signals to said adjustable circuits in correspondence with said data, a main power supply source for supplying electric power to said adjustable circuits, a stand-by power supply source for supplying electric power to said central processing unit, key input means selectively operable to provide input data to said central processing unit for representing an externally applied code and, in a servicing mode of the apparatus, for re-writing in said non-volatile memory means said data corresponding to predetermined conditions of said adjustable circuits, and inner bus means for connecting said central processing unit to said adjustable circuits, said non-volatile memory means and said key input means, said method comprising the steps of:
turning on said stand-by power supply source;
operating said key input means for inputting data representing said externally applied code to said central processing unit;
turning on said main power supply source for supplying power to said adjustable circuits; and
establishing said servicing mode of the apparatus only when said externally applied code coincides with said secret code stored in said non-volatile memory means and said turning on of the main power supply source is effected within a predetermined period after said externally applied code provided by operation of said key input means is made to be coincident with said secret code.

4,858,007

DIGITAL DATA SLICER CIRCUIT FOR DIGITAL TELETEXT SIGNALS

Reiner Schweer, Waldkirch; Manfred Juenke, Gundelfingen, and Ulrich K. Sieben, Reute, all of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Sep. 6, 1988, Ser. No. 240,310

Claims priority, application European Pat. Off., Sep. 8, 1987, 87113085.2; Dec. 3, 1987, 87117884.4

Int. Cl.[4] H04N *7/087, 7/08*

U.S. Cl. 358—147 **5 Claims**



1. A digital data slicer circuit for separating and recovering digital teletext signals from the demodulated composite color signals in color-television receivers and digitized at a sampling rate determined by a clock signal having a clock period, said color composite color signal being a start-value-containing color composite signal, said digital data slicer circuit providing a data slicing signal, said digital data slicer circuit comprising:

a first subtracter having a minuend input and a subtrahend input, said start-value-containing color composite signal applied to the minuend input of said first subtracter, said first subtracter having an output;

a second subtracter having a minuend input and a subtrahend input, said minuend input of said second subtracter coupled to receive the output of said first subtracter;

a digital delay line having an input and an output, said input of said digital delay line coupled to receive the output of said second subtracter and to provide a delayed signal output, said digital delay line providing a predetermined delay from said input to said delayed signal output that is twice said clock period;

a first changeover switch and a second changeover switch, each of said first and second changeover switches having a first input, a second input and an output, said first and second changeover switches further including a respective control input, said first inputs of each changeover switch connected to the output of said digital delay line to receive the delayed signal output therefrom, the second inputs of the two changeover switches being provided with a digital word corresponding to zero ("0");

a first sign inverter having a data input and an output, said first sign inverter further having a control input responsive to first and second logic levels, said data input of said first sign inverter connected to receive the output of said first changeover switch, said first sign inverter responsive to said first logic level on said control input to provide data at said output equal to the data at said data input, said first sign inverter responsive to said second logic level on said control input to provide inverted data on said output equal to the complement of the data on said data input, said control input of said first sign inverter coupled to receive a signal corresponding to the sign of said output of said first subtracter, said signal delayed by two clock periods from said output of said first subtracter so that when said output of said first subtracter is negative, said first sign inverter will provide inverted data on said output of said first sign inverter two clock periods later;

a first weighted accumulator having a data input, a weighting input and an output, said data input of said first weighted accumulator connected to said output of said first sign inverter, said weighting input receiving a first predetermined weighting factor, said output of said first weighted accumulator being responsive to the weighted sum of the data presented to the input of said first weighted accumulator from said first sign inverter;

a second sign inverter having a data input and an output, said second sign inverter further having a control input responsive to first and second logic levels, said data input of said second sign inverter connected to receive the output of said first accumulator, said second sign inverter responsive to said first logic level on said control input to provide data at said output equal to the data at said data input, said second sign inverter responsive to said second logic level on said control input to provide inverted data on said output equal to the complement of the data on said data input, said output of said second sign inverter connected to said subtrahend input of said second subtracter, said control input of said second sign inverter coupled to receive a signal responsive to the sign of the output of said first subtracter so that when said output of said first subtracter is negative, said second sign inverter will provide inverted data on said output of said second sign inverter;

a second weighted accumulator having a data input, a weighting input and an output, said data input of said second weighted accumulator connected to said output of said second changeover switch, said weighting input receiving a second predetermined weighting factor, said output of said second weighted accumulator being responsive to the weighted sum of the data presented to the input of said second weighted accumulator from said second changeover switch, said second weighted accumulator operating to integrate said output from said second changeover switch, said output of said second weighted accumulator being an unfiltered data slicing output signal, said output of said second weighted accumulator connected to said subtrahend input of said first subtracter;

a logic circuit having a first input (**e1**), a second input (**e2**), a third input (**e3**), a fourth input (**e4**), a fifth input (**e5**) and an output, said first input connected to receive said signal responsive to the sign of the output of said first subtracter; and

first, second, third and fourth delay elements, each having an input and an output, the output of each of said delay elements delayed from its respective input by one clock period, said first delay element connected to receive said signal responsive to the sign of the output of said first subtracter, said output of said first delay element coupled to said second input of said logic circuit and to said input of said second delay element, said output of said second delay element coupled to said third input of said logic circuit and to said input of said third delay element, said output of said third delay element coupled to said fourth input of said logic circuit and to said input of said fourth delay element, said output of said fourth delay element coupled to said fifth input of said logic circuit, the output of said logic circuit provided as the control inputs to said first and second changeover switches such that when said output of said logic circuit has first stage, said first and second changeover switches connect their respective first inputs to their respective outputs, and when said logic circuit has a second state, said first and second changeover switches connect their respective second inputs to their respective outputs, said logics circuit responsive to the first, second, third, fourth and fifth inputs of said logic circuit to provide said first output state when one of the combinations set forth in the following table are present on said inputs, where 0 and 1 are the two binary levels, and x indicates that either of the two binary levels may appear:

e1	e2	e3	e4	e5
x	[illegible]	x	[illegible]	x
x	1	x	1	x
0	1	1	0	x
1	0	0	1	x
x	0	1	1	0
x	1	0	0	1

said output of said logic circuit controlling said first and second changeover switches to suppress selected ones of the sample values near zero crossings of the start-value-containing composite color signal thereby preventing large changes in the data applied to the input of said second weighted accumulator.

4,858,008

APPARATUS FOR THE DIGITAL GENERATION OF VERTICAL SYNCHRONIZING AND FIELD IDENTIFICATION SIGNALS

Ulrich Sieben, Reute, and Heinrich Schemmann, VS-Villingen, both of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Sep. 26, 1988, Ser. No. 249,141

Claims priority, application European Pat. Off., Oct. 2, 1987, 87114403.6

Int. Cl.[4] H04N *5/04, 5/10*

U.S. Cl. 358—148 **10 Claims**



1. Apparatus for generating the vertical synchronizing signal and identification signals for the first and second fields of a television frame by operating on a digital television signal provided by an analog to digital converter for converting an analog television signal to said digital television signal, comprising:

sync separator means having an input adapted to receive said digital television signal for providing at an output digital vertical and horizontal synchronizing signals;

a sign inverter having one input coupled to the output of said sync separator means and having a control input adapted to receive an internal horizontal synchronizing signal for adding a sign bit to said output signal of said sync separator means so that the binary ones of said synchronizing signals provide at an output a first binary level representing a positive sign, while the zeros provide a second binary level representing a negative sign;

an accumulator means having an input coupled to the output of said sign inverter and having a reset and output enable input adapted to receive said internal horizontal synchronizing signal where said internal horizontal signal operates to transfer the contents of said accumulator means at a first output only on positive going edges of said internal horizontal input signal and having a second output for providing said accumulated signal for both positive and negative edges of said internal horizontal synchronizing signals;

a horizontal oscillator having a control input coupled to said first output of said accumulator means and having an output for providing said internal horizontal synchronizing signal with said output coupled to said control input of said sign inverter and to said reset and output enable input of said accumulator means to form a phase-locked loop with said horizontal oscillator which causes said oscillator to provide said internal horizontal synchronizing signal with a 1:1 mark/space ratio at said output;

an absolute value circuit coupled to said second output of said accumulator means to provide at an output the absolute value of said accumulator signal;

a comparator having a minuend input coupled to the output of said absolute value circuit and having a subtrahend input referenced to a threshold value equal to about half the positive maximum value of said accumulator signal, said comparator having an output which provides a signal when said signal at said minuend input is greater than or equal to said signal at said subtrahend input;

a counter having a count input coupled to the output of said horizontal oscillator for receiving said internal horizontal synchronizing signal and operative to provide a count at an output for each edge of said internal horizontal synchronizing signal with said counter having a count capacity greater than that required to count the total lines in a television field, said counter having a first output indicative of an upper count level, and a second output indicative of a total count level, and having a reset input;

a first AND gate having one input coupled to said comparator output and another input coupled to said first output of said counter and having an output;

an OR gate having one input coupled to the output of said first AND gate and another input coupled to said second output of said counter, with the output of said OR gate coupled to said reset input of said counter and said output providing said vertical synchronizing signal;

a second AND gate having one input coupled to said first output of said accumulator means and a second input coupled to the output of said OR gate for providing at an output said identification signal for said first field;

a third AND gate having one input coupled to said first output of said accumulator means and a second input coupled to the output of said OR gate to provide at an output said identification signal indicative of said second field.

4,858,009

TELEVISION SIGANL MEMORY WRITE CIRCUIT

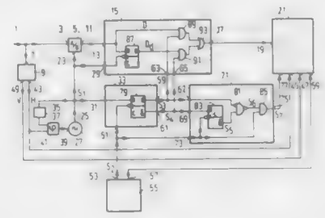
Gerardus J. J. Vos, and Louis J. Van Mal, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1987, Ser. No. 37,768

Claims priority, application Netherlands, Apr. 17, 1986, [illegible]

Int. Cl.[4] H04N *5/04*

U.S. Cl. 358—148 **3 Claims**



1. A television signal memory write circuit including a memory clock signal generator which is coupled to a write clock signal input of a memory for writing into the memory, samples of a television signal which are applied to a data signal input of said memory, said samples being obtained in response to a data clock signal generated by a data clock signal generator, said

data clock signal having a frequency which is coupled by a control loop to the line frequency of the television signal, characterized in that the memory clock signal generator is free running at a frequency which is higher than the highest data clock signal frequency, while a data shift circuit is coupled to the data signal input of said memory and a pulse suppression circuit is coupled to the write clock signal input of said memory, said data shift circuit and said pulse suppression circuit being coupled to an output combination of a phase detection circuit coupled to the data clock signal generator and the memory clock signal generator for shifting the data signal and suppressing a memory clock signal pulse, respectively, when a given phase relation between the data clock signal and the memory clock signal is exceeded.

4,858,010

METHOD OF AND APPARATUS FOR PROCESSING VIDEO SIGNALS

Anthony J. Field, Cambridge, Great Britain, assignor to U.S. Philips Corporation, New York, N.Y.

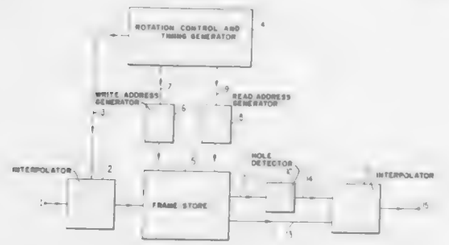
Continuation of Ser. No. 775,068, Sep. 11, 1985, Pat. No. 4,725,887. This application Jan. 19, 1988, Ser. No. 145,798

Claims priority, application United Kingdom, Sep. 14, 1984, 8423324

The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.

Int. Cl.[4] H04N *5/14*

U.S. Cl. 358—160 **8 Claims**



1. A method of processing a video signal the video signal having the form of successive digitally encoded samples being arranged so that said successive samples represent a television picture displayable by line and field sequential scanning, the method comprising the steps of:

(a) receiving from a video signal source said video signal comprising said successive samples representing said television picture;

(b) applying to said television picture a preselected geometrical modification by:

(b1) determining by characteristics of said preselected geometrical modification to be applied, a set of addresses for addressing selected memory locations of a video frame store;

(b2) generating on the basis of said preselected geometrical modification, a set of modified samples derived from said successive samples, said set of modified samples representing a modified television picture;

(b3) assigning to each sample of said set of modified samples, a respective memory location of the ones indicated by said set of addresses;

(b4) storing said set of modified samples at their assigned memory locations;

(c) reading successive memory locations of at least a selected part of said video frame store to produce a data stream;

(d) identifying locations in said data stream corresponding to ones of said successive memory locations being read in which no modified sample was stored;

(e) generating a control signal in response to each of the identified locations; and

(f) inserting under control of said control signal at each said identified location, a substitute sample generated from at least one of said modified samples located adjacently in said data stream to said each identified location.

4,858,011

VIDEO SWITCHER SYSTEM WITH MODULAR ARCHITECTURE

Richard A. Jackson, 10959 Genasci Rd., Nevada City, Calif. 95959; Peter D. Symes, 195 Ball Rd., Grass Valley, Calif. 95945; Richard S. Bannister, 251 Lawrence Way, Grass Valley, Calif. 95945; Thomas A. Grancey, 207 Upper Circle Dr., Grass Valley, Calif. 95945; Richard A. Frasier, 518 Walsh St., Grass Valley, Calif. 95945; John Abt, 13284 Red Dog Rd., Nevada City, Calif. 95959; Ronnie D. Barnett, 11971 Banner Mt. Trail, Nevada City, Calif. 95959; James E. Blecksmith, 12896 Quaker Hill Crossroad, Nevada City, Calif. 95959; Kevin D. Windrem, 157 Alta Sierra Dr., Grass Valley, Calif. 95945, and Neil R. Olmstead, 13641 Tranquillity La., Nevada City, Calif. 95959

Filed Apr. 4, 1988, Ser. No. 177,212

Int. Cl.[4] H04N *5/262*

U.S. Cl. 358—181 **23 Claims**



1. A video switcher system comprising:

at least first and second source selectors each having a plurality of input terminals, for connection to a plurality of video signal sources respectively, and at least two output terminals,

a set of video processors each having at least one input terminal and an output terminal,

switch means for connecting each source selector output terminal selectively to each video processor input terminal,

at least first and second output devices each having a plurality of input terminals connected to the output terminals of the video processors respectively and also an output terminal, and

control means connected to the switch means for defining a first subset of said video processors having their input terminals connected to the output terminals of the first source selector and a second subset of said video processors having their input terminals connected to the output terminals of the second source selector, said control means also being connected to the first output device for selecting at least one output terminal from the group consisting of output terminals of the first subset of said video processors and to the second output device for selecting at least one output terminal from the group consisting of output terminals of the second subset of said video processors.

4,858,012

CAMERA HAVING AUTOMATICALLY CONTROLLABLE SHOOTING FEATURES

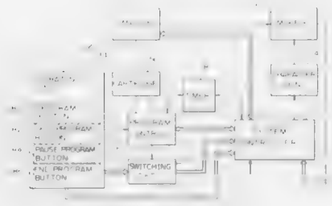
Hiromasa Hino, and Ikuo Fujimura, both c/o Fuji Photo Film Co., Ltd., 26-30, Nishi-Azabu 2-chome, Minato-ku, Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 170,362

Claims priority, application Japan, Mar. 19, 1987, 62-62389; Mar. 19, 1987, 62-62390

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—210 **2 Claims**



1. A camera comprising:

imaging means for picking up an image of an object field, said imaging means having a plurality of shooting features for achieving shooting of the image, said imaging means including,

an imaging device for imaging the object field to produce video signals representing the object field,

shooting feature means for causing the video signals to be processed in accordance with the plurality of shooting features;

operating means including a first manual operating member for entering a shooting instruction;

selecting means for entering a selecting instruction associated with the plurality of shooting features, said selecting means including second and third manual operating members;

control means responsive to be instructions from said operating means and said selecting means for controlling said imaging means to cause said shooting feature means to accomplish the plurality of shooting features;

said control means being responsive to actuation of said second manual operating member to cancel that one of the plurality of shooting features scheduled to follow the shooting feature being performed;

said control means being responsive to actuation of said third manual operating member to halt that one of the plurality of shooting features which is being performed until the next time said third manual operating member is actuated; and

memory means for storing feature setting information for selectively activating the plurality of shooting features under a prescribed sequence and condition;

said control means being responsive to the shooting instruction from said operating means to read out said feature setting information from said memory means to control said imaging means in accordance with the feature setting information to cause said imaging means to accomplish the plurality of shooting features in accordance with the feature setting information, said control means causing, when the selecting instruction is entered from said selecting means, said imaging means to preferentially accomplish any of the plurality of shooting features associated with the selecting instruction.

4,858,013

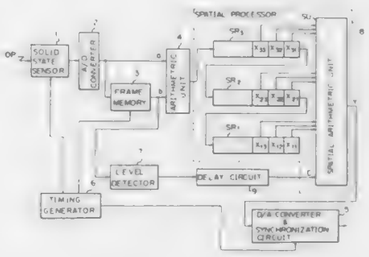
SOLID STATE IMAGING DEVICE WITH ADAPTIVE PIXEL CORRECTION

Hikaru Matsuda, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 169,411, Mar. 17, 1988. This application May 26, 1988, Ser. No. 199,161

Int. Cl.[4] H04N *3/15, 5/217*

U.S. Cl. 358—213.17 **33 Claims**



1. A solid state imaging device comprising:

a solid state sensor for converting an external scene into electrical signals;

an A/D converter for converting output signals transmitted from the solid state sensor into digital signals;

a frame memory for storing offset signals of the solid state sensor;

an arithmetic unit for subtracting the offset signals stored in the frame memory from the digital signals of the A/D converter;

a level detector for judging whether the offset signals stored in the frame memory exceed a predetermined level or not;

a delay circuit for delaying outputs of the level detector; and

a spatial processor for effecting interpolation with neighbouring peripheral pixel signals from the solid state sensor through the AD converter after judging a given pixel to be defective when the output of the level detector through the delay circuit is in excess of said predetermined level.

4,858,014

RANDOM SCAN SYSTEM

Yehoshua Zeevi, and Oliver Hilsenrath, both of Haifa, Israel, assignors to Technion Research & Development Foundation Ltd., Technion City, Israel

Filed Jun. 18, 1987, Ser. No. 64,088

Claims priority, application Israel, Jul. 21, 1986, 79485

Int. Cl.[4] H04N *5/228*

U.S. Cl. 358—217 **17 Claims**

1. A two-dimensional video data acquisition system comprising:

a video detector means for scanning a visual scene;

a controller means for generating scan pattern instructions;

a system interface means for selecting at least one scan pattern for acquisition of video data from said visual scene, said scan pattern being selected from a plurality of such patterns in accordance with said scan pattern instructions; and

a scan-video interface means comprising random scan driver means for generating scan control signals in accordance with said selected scan pattern,

said video detector means scanning said visual scene in accordance with said scan control signals to provide an output to said system interface such that an intensity data map is stored therein, said controller means performing data processing of said intensity data map in accordance with a predetermined set of video data characteristics,

wherein said system interface comprises a read only memory (ROM), a sample system, a random access memory

(RAM), a direct memory access controller (DMA), and a serial communication interface.

4,858,015

VIDEO DISPLAY DRIVER COUPLING CIRCUIT

John H. Furrey, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Princeton, N.J.

Filed Mar. 28, 1988, Ser. No. 174,056
Int. Cl.[4] H04N *5/68*
U.S. Cl. 358—242 **6 Claims**



1. A video signal processing system comprising:
an image display device having a signal input electrode with an associated parasitic capacitance;
a display driver amplifier having a signal input for receiving a video signal containing information to be displayed, and having an output circuit, including an impedance, for developing a high level video output signal with a magnitude suitable for driving said image display device; and
a signal coupling path for conveying said video output signal from said output circuit to said signal input electrode of said image display device, wherein said signal coupling path comprises:
an amplifier device with an input for receiving said video output signal, and a low impedance output;
first and second series resistors coupled in the order named from said low impedance output of said amplifier device to said input electrode of said image display device;
a capacitor coupled across one of said first and second resistors; and
means, including said amplifier device, for isolating said capacitor and said associated parasitic capacitance from said impedance in said output circuit of said display driver amplifier for both positive and negative amplitude excursions of said video output signal.

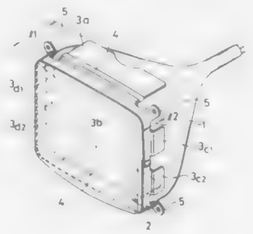
4,858,016

CATHODE RAY TUBE HAVING AN IMPROVED IMPLOSION PROOF STRUCTURE

Tsutomu Suehiro, Kanagawa; Hitoshi Uchiyama, Tokyo; Takahito Inukai, Tokyo, and Tsunenari Saito, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 7, 1988, Ser. No. 165,009
Claims priority, application Japan, Mar. 11, 1987, 62-056062
Int. Cl.[4] H04N *9/07*
U.S. Cl. 358—246 **8 Claims**

1. A cathode ray tube comprising:
a tube envelope,
an anti-explosion band wrapped around said tube envelope and having parallel upper and lower arm portions and parallel left and right arm portions,



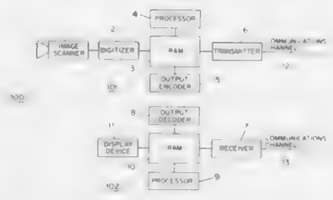
rear extension portions extending rearwardly from said band at said upper and lower arm portions, and
degaussing coils secured to said rear extension portions.

4,858,017

SYSTEM AND METHOD FOR HIERARCHAL IMAGE ENCODING AND DECODING

Habib H. Torbey, New York, N.Y., assignor to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Jan. 22, 1988, Ser. No. 146,781
Int. Cl.[4] H04N *4/17*
U.S. Cl. 358—426 **21 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 34 Pages)



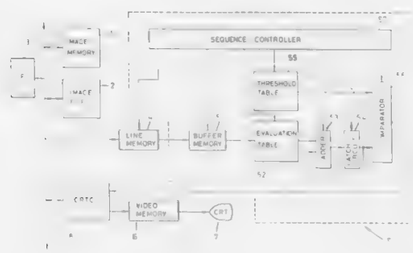
1. An image encoding system comprising
memory means having a multiplicity of addressable storage locations for storing data;
means for receiving first coded values representative of intensities of picture elements of an image, the first coded values being stored in a primary array in the memory means, the primary array having M rows and N columns where M and N are predetermined integers;
first encoding means responsive to the first coded values for generating a sequence of M×N second coded values stored in respective locations in the memory means, the sequence of second coded values having X selected first coded values followed by Y respective cyclic differences of Y selected distinct pairs of first coded values, where X is an integer less than M×N and Y is an integer equal to M×N−X; and
second encoding means responsive to the second coded values for generating a sequence of output codes corresponding to the sequence of second coded values.

4,858,018

IMAGE PROCESSING APPARATUS

Hiroshi Tanaka, Iwatsuki, Japan, assignor to Fuji Xerox Co., Ltd., Japan

Filed May 29, 1988, Ser. No. 174,591
Claims priority, application Japan, Jun. 24, 1987, 62-157086
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—456 **14 Claims**



1. An image processing apparatus for converting image data of an original image made up of a plurality of dots into image data of an image which has been reduced by a desired factor in a vertical direction and which has been reduced by a desired factor in a horizontal direction, comprising:
image evaluation means for dividing the original image data into a plurality of blocks arranged in a matrix whose number depends on the desired reductions in the vertical and horizontal directions of the original image, and for evaluating the image data of each of said blocks to determine evaluation values;
image determining means for determining whether the reduced image of each of said blocks is set to white or black by comparing the evaluation values of each of said blocks with threshold values set corresponding to each of said blocks said threshold values arranged in a matrix with the number of rows and columns equal to the number of rows and columns in the reduced image data matrix; and
executing means for executing the processing by said image evaluation means and said image determining means repeatedly for each of said blocks divided in accordance with the reduction factor so as to execute the processing of the reduced image for each of said blocks.

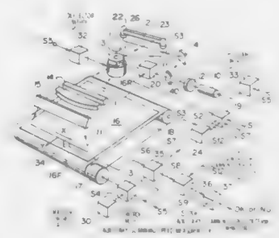
4,858,019

LIGHT SCANNING RECORDING DEVICE

Yuji Ohara, and Hideo Watanabe, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 8, 1988, Ser. No. 229,417
Claims priority, application Japan, Aug. 7, 1987, 62-197733
Int. Cl.[4] H04N *1/04, 1/12*
U.S. Cl. 358—474 **3 Claims**

1. A light scanning recording device for recording an image on a recording medium, comprising:
(i) a light source for emitting a light beam modulated by an image signal representing the image;
(ii) a light deflector for deflecting the modulated light beam to scan the recording medium in a main scanning direction;
(iii) feed means for feeding the recording medium through a feed path in an auxiliary scanning direction transverse to said main scanning direction to record the image two-dimensionally on the recording medium;
(iv) control means for controlling said light source and said light deflector to deflect the light beam during intervals before and after the recording medium is scanned by the modulated light beam;
(v) a light detector for detecting the light beam deflected during said intervals across said feed path;
(vi) scanning period detecting means for detecting a scanning period in which the recording medium is scanned by the modulated light beam, based on a change in an output signal from said light detector due to the presence of the recording medium in said feed path between said light detector and said light deflector; and



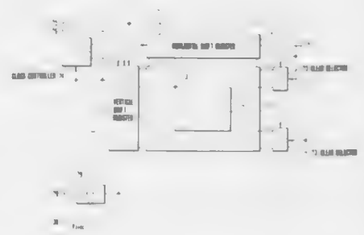
(vii) auxiliary scanning speed measuring means for measuring the speed at which the recording medium is fed through said feed path in said auxiliary scanning direction by counting pules of a reference clock signal during the scanning period which is detected by said scanning period detecting means.

4,858,020

IMAGE SENSING DEVICE

Hideo Homma, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1988, Ser. No. 148,688
Claims priority, application Japan, Jan. 28, 1987, 62-016211; Jan. 28, 1987, 62-016212; Jan. 28, 1987, 62-016213
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—287 **27 Claims**



1. An image sensing device comprising:
an image sensor;
area setting means for setting a reading area of said image sensor;
clock control means for reading out sensed image information from said reading area, and for setting a reading cycle for performing said reading; and
clearing means for clearing altogether the areas of said image sensor other than said reading area.

4,858,021

ELECTRONIC BLACKBOARD CAPABLE OF PROVIDING HARDCOPY

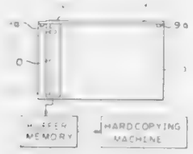
Takehito Toyota, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 18,826, Feb. 24, 1987, Pat. No. 4,755,882, which is a continuation of Ser. No. 780,564, Sep. 26, 1985, abandoned. This application Jun. 28, 1988, Ser. No. 212,712

Claims priority, application Japan, Sep. 27, 1984, 59-202620

Int. Cl.[4] H04N *1/10*

U.S. Cl. 358—494 **16 Claims**



1. An electronic blackboard system comprising:

a rigid board means on which information can be written;

optical converter means disposed to face said rigid board means for picking up a linear portion of an optical image thereon and for converting said linear portion into a corresponding electrical signal, said optical converter means being elongated vertically;

means for moving said optical converter means in a direction perpendicular to said linear portion;

said means for moving comprising guide means fixed horizontally to the upper edge of the rigid board means and driver means for moving said optical converter means, said optical converter means being supported by the guide means,

said driver means including a motor disposed at said optical converter means and roller means driven from said motor and contacting the surface of said rigid board means whereby the frictional force produced by rotation of the roller means causes the optical converter means to move,

means for storing said converted electrical signal; and

means for reading out the signal stored in said storing means and printing the contents thereof.

4,858,022

CONTACT-TYPE LINEAR IMAGE SENSOR

Kouhei Suzaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 27, 1987, Ser. No. 90,093

Claims priority, application Japan, Sep. 5, 1986, 61-209068; Sep. 5, 1986, 61-209069

Int. Cl.[4] H04M *1/024*

U.S. Cl. 358—471 **19 Claims**



1. A contact-type image sensor comprising:

(a) a substrate;

(b) a linear array of amorphous semiconductor photoconductive cells formed on said substrate, said photoconductive cells being divided into cell units each of which has a predetermined number of cells;

(c) drive means connected to said photoconductive cells, for sequentially selecting said units, and for generating drive voltage signals for sequentially activating the cells of a selected cell unit;

(d) signal readout means connected to said cell units, for generating a series of pixel voltage signals from pixel currents sequentially supplied from the cells of the selected cell unit, said signal readout means comprising,

a common signal output line connected to said cell units,

capacitor means connected to said common signal output line, for sequentially accumulating said pixel currents, and

analog switch means connected to said common signal output line, for resetting said common signal output line every time one of the cells of each cell unit is designated after a pixel current read out from another cell adjacent to this cell has been accumulated in said capacitor means; and

(e) noise-eliminator means connected to said common signal output line, for sampling and holding a switching noise voltage corresponding to reset noise generated by said analog switch and contained in each level voltage signal at an initial part of a signal readout period of the selected cell, and for detecting a difference between a voltage appearing on said common signal output line at a first part of the signal readout period and the switching noise voltage, to output said difference as an effective pixel signal, thus removing the reset noise from each pixel voltage signal.

4,858,023

IMAGE READ APPARATUS

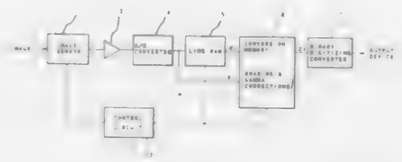
Kaoru Tada, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 16, 1988, Ser. No. 168,694

Claims priority, application Japan, Mar. 17, 1987, 62-64983

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—471 **6 Claims**



1. An image reading apparatus comprising:

a read means for scanning and reading an original placed on an original loading table and a reference white pattern provided at one edge of the original loading table, said read means comprised of an image sensor for reading images and further comprised of a scanning means for scanning said images and transferring said images to said image sensor;

A first memory means for temporarily storing therein an image signal of said read-out reference white pattern;

a second memory means for storing therein correction data regarding shading correction and correction with respect to an input-output characteristic of an output device connected thereto and for outputting as a corrected image signal said correction data corresponding to an original image signal and an image signal of said reference white pattern read-out from said first memory means corresponding to said original image signal, said second memory means comprised of a memory being accessed with said original image signal and said image signal of said reference white pattern as address signals, respectively; and

a binary digitizing means for binary-digitizing said corrected image signal and for outputting said binary-digitized corrected image signal to said output device.

4,858,024

APPARATUS FOR REPRODUCING FREQUENCY-DIVISION MULTIPLEXED VIDEO FM AND DIGITAL AUDIO SIGNALS

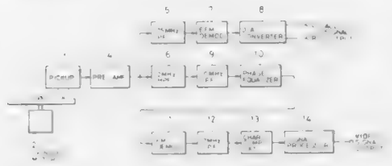
Hitoshi Kanamaru, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 1, 1988, Ser. No. 176,503

Claims priority, application Japan, Apr. 9, 1987, 62-88199

Int. Cl.[4] H04N *5/76*; **G11B** *7/00*

U.S. Cl. 358—310 **8 Claims**



1. An apparatus for reproducing recorded information form a recording medium having a video FM signal and a digital audio signal frequency-division multiplex recorded thereon, comprising: means for reading said signals recorded on said recording medium; and a low-pass filter for filtering a read-out signal produced by said reading means, a cut-off frequency of said low-pass filter being higher than a white peak frequency of said video FM signal and lower than a frequency of a color subcarrier contained in an upper sideband of said video FM signal.

4,858,025

ELECTRONIC STILL CAMERA

Masatoshi Tabei, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 3, 1987, Ser. No. 96,568

Claims priority, application Japan, Sep. 3, 1986, 61-205756; Sep. 29, 1986, 61-228435

Int. Cl.[4] H04N *5/92*

U.S. Cl. 358—310 **4 Claims**

1. An electronic still camera, comprising:

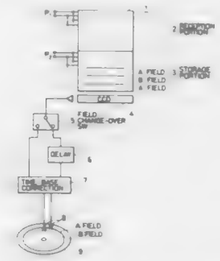
a CCD of a frame transfer type, said CCD having vertical picture elements substantially equal in number to television scanning lines, said CCD being arranged to be able to produce a picture signal corresponding to one frame;

means for reading out said picture signal corresponding to one frame at a first rate;

a field change-over means receiving said picture signal at said first rate for distributing the output of said CCD into a picture signal of an A-field and a picture signal of a B-field;

a delay circuit for delaying only one of said A-field picture signal and said B-field picture signal so as to make said A-field picture signal and B-field picture signal be in phase coincidence with each other;

a time base correction means for doubly expanding the time base of each of said A-field signal and said B-field signal to read out therefrom said A-field signal and said B-field signal at a second rate which is one half said first rate; and



means for simultaneously recording said two field signals which are expanded in time base and made to be in phase on two tracks of a rotary magnetic recording medium by a two-channel head.

4,858,026

IMAGE DISPLAY

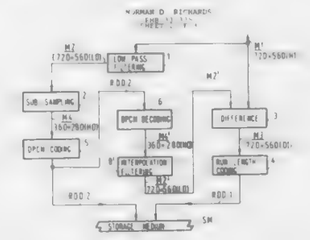
Norman D. Richards, Horsham, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 35,104, Apr. 6, 1987. This application Dec. 21, 1987, Ser. No. 135,876

Claims priority, application United Kingdom, Dec. 24, 1986, 8630887; Apr. 14, 1987, 8609078

Int. Cl.[4] H04N *7/137, 11/04*

U.S. Cl. 358—310 **17 Claims**



9. A coding apparatus by which pixel information for at least one pixel component value of m by n pixels forming a rectangular image is coded into digital data where m is an integer representing the number of pixels vertically and n is an integer representing the number of pixels horizontally in said image, comprising:

means for arranging said pixel information as a first matrix of m×n pixel component values,

means for low-pass filtering these pixel component values of the first matrix to produce a second matrix of m×n pixel component values, which are in respect of a lower resolution image compared with the pixel component values of the first matrix,

means for sub-sampling said second matrix of pixel component values to produce a fourth matrix of m/a×n/b pixel component values of reduced density, where a and b are factors of m and n, respectively,

means for coding said fourth matrix of pixel component values into a second set of digital data utilizing a code relating the value of each pixel component in said fourth matrix to the component value of an adjoining pixel,

means for decoding the second set of digital data to reconstitute the fourth matrix of pixel component values,

means for interpolation filtering said reconstituted fourth

matrix of pixel component values to restitute said second matrix of pixel component values,

means for subtracting the restituted second matrix from the first matrix pixel-by-pixel to produce a third matrix of m×n difference values, and

means for coding said third matrix of difference values into a first set of digital data.

4,858,027

VIDEO TAPE RECORDER EDIT CONTROL SYSTEM FOR PERFORMING COLOR FRAME EDITING

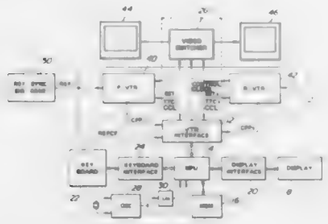
Hidehiko Sasbou, and Soujiro Kizu, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 9, 1987, Ser. No. 36,261

Claims priority, application Japan, Apr. 12, 1986, 61-084801

Int. Cl.[4] H04N 9/79

U.S. Cl. 358—311 16 Claims



1. An edit control system comprising:

A video tape player loaded with a playback video tape having recorded information including time code signals, color frame pulses, and a color subcarrier signal which has a phase variation cycle which returns to an initial phase after a given number of frames;

a video tape recorder loaded with a recording video tape having recorded thereon video information including time code signals, color frame pulses, and a color subcarrier signal which has the same number of phases as the color subcarrier signal recorded on said playback video tape;

control means for causing the video tape player and video tape recorder to move the playback and recording tapes to selected first and second editing points on said playback and recording video tapes, respectively, and reproduce the time code signals and color frame pulses recorded at said selected editing points, respectively;

means supplied with the reproduced time code signals and color frame pulses from the video tape player for deriving therefrom a first color subcarrier signal phase in said video information recorded on said playback video tape;

means supplied with the reproduced time code signals and color frame pulses from the video tape recorder for deriving therefrom a second color subcarrier signal phase in said video information recorded on said recording video tape; and

wherein said control means is connected to said means for deriving said first and second subcarrier signal phases so that when said first and second subcarrier signal phases are derived based on said time code signals and color frame pulses reproduced at said first and second editing points, and control means compares the derived first and second subcarrier signal phases at said first and second editing points, and causes one of the video tape player or the video tape recorder to shift one of said first and second editing points, respectively, so that said first and second subcarrier signal phases at said first and second editing points match.

4,858,028

IMAGE PROCESSING APPARATUS

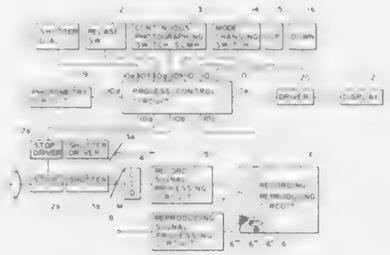
Tadashi Okino, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1987, Ser. No. 51,322

Claims priority, application Japan, May 21, 1986, 61-114906; May 21, 1986, 61-114909; May 21, 1986, 61-114910; May 21, 1986, 61-114913; May 21, 1986, 61-116372

Int. Cl.[4] H04N 5/76; G11B 17/22, 15/12

U.S. Cl. 368—335 9 Claims



1. An image processing apparatus comprising:

image pickup means for converting the image of an object into electric signals;

recording means for recording said electric signals at respective access positions on a medium having a plurality of blocks;

setting means for setting information;

a selecting means for selecting either of a first mode and a second mode;

control means for changing characteristics of said image pickup means according to said information set by said setting means when said first mode is selected by said selecting means, and for changing said respective access positions according to said information set by said setting means when said second mode is selected by said selecting means.

4,858,029

VIDEO RECORDER WITH FIELD MEMORY

Katsuhiro Ookawa, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1987, Ser. No. 66,547

Claims priority, application Japan, Jun. 26, 1986, 61-151233; Jun. 26, 1986, 61-151234

Int. Cl.[4] H04N 5/782

U.S. Cl. 358—340 10 Claims



1. A video tape reproducing apparatus for reproducing a video signal from a magnetic tape, comprising:

at least two video playback heads for reproducing said video signal from said magnetic tape having recording tracks arranged diagonally with respect to the running direction of said magnetic tape;

an envelope detector for generating an envelope signal of said video signal from the output signal of said video playback heads;

a comparator for generating and outputting a control signal by comparing the envelope signal from said envelope detector and a reference signal applied thereto;

means for generating said reference signal and adjusting the level thereof in response to the envelope signal from said envelope detector; and

a field memory for storing the content of said video signal in response to the control signal from said comparator, said stored content being thereafter read out to generate a reproduced video signal.

4,858,030

REPRODUCING APPARATUS OF A VIDEO DISC PLAYER

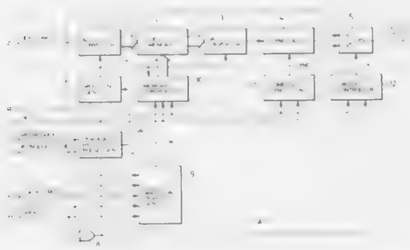
Masuo Oku, Kamakura; Yoshimichi Kudo, Yokohama; Tomomitsu Kuroyanagi, Katsuta; Kazuo Kondo, Hujisawa; Hisanobu Tsukazaki; Tetsuya Ikeda, both of Yokohama; Akio Nakashima, and Takashi Kimura, both of Yokohama, all of Japan, assignors to Hitachi, Ltd. and Hitachi Video Engineering, Inc., both of Tokyo, Japan

Filed Aug. 21, 1987, Ser. No. 87,706

Claims priority, application Japan, Aug. 22, 1986, 61-195391; Aug. 27, 1986, 61-198878

Int. Cl.[4] H04N 5/76

U.S. Cl. 358—342 19 Claims



1. A reproducing apparatus of a video disc player for reproducing a video signal from a CLV type disc having tracks thereon in a special mode of reproduction comprising:

field memory mean having a storing capacity of about at least one field of video signals;

first reference synchronizing signal generator means for generating at least a first reference synchronizing signal including a first reference horizontal synchronizing signal and a first reference vertical synchronizing signal;

means for writing reproduced videos signals in said field memory means synchronized with a reproduced horizontal synchronizing signal and a reproduced vertical synchronizing signal; and

means for reading the stored signals in said field memory means based on the first reference synchronizing signals generated from said first reference signal generator means;

wherein said first reference synchronizing signal generator means synchronizes said reproduced vertical synchronizing signal with said first reference vertical synchronizing signal.

4,858,031

RECORDING APPARATUS AND REGENERATING APPARATUS

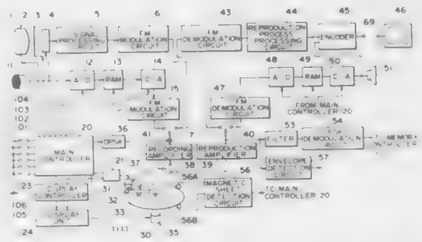
Yoshihiro Fukuta, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1987, Ser. No. 64,546

Claims priority, application Japan, Jun. 26, 1986, 61-151089

Int. Cl.[4] H04N 5/781

U.S. Cl. 358—342 47 Claims



1. A recording apparatus capable of recording video signal or audio signal in each memory block of a memory means, comprising:

(a) recording means for recording a video signal or an audio signal in the memory means;

(b) switch means for selecting audio signal recording or video signal recording to be performed by said recording means;

(c) display means for displaying numerical data; and

(d) control means for controlling display of data by said display means, wherein said control means controls said display means such that said display means displays elapsed time as numerical data when audio signal recording is selected by said switch means and displays information related to recording operation of said recording means when video signal recording is selected by said switch means.

4,858,032

DEVICE FOR EXTRACTING STILL PICTURE FRAMES FROM A MOVING IMAGE VIDEO SIGNAL AND RECORDING SAME ON A MAGNETIC RECORDING MEDIUM

Kazuo Okada, and Masahiro Konishi, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 26, 1987, Ser. No. 66,566

Claims priority, application Japan, Jun. 30, 1986, 61-153625; Jun. 30, 1986, 61-153626; Jun. 30, 1986, 61-153627; Jun. 30, 1986, 61-153628; Jun. 30, 1986, 61-153629; Aug. 20, 1986, 61-194539; Jan. 13, 1987, 62-5805

Int. Cl.[4] H04N 5/78, 9/491, 5/76

U.S. Cl. 360—91 9 Claims



1. A magnetic recording device of a helical scanning system

provided with rotary magnetic heads, for recording a PCM video signal representative of successive frames of a motion picture, comprising:

PCM still picture recording means for recording a still picture in a time division manner in a scanning period of said magnetic heads, said PCM still picture recording means including,

means for converting a selected frame of said motion picture into a digital video signal,

means for receiving said digital video signal for subjecting said digital video signal to a time axis expansion, and

means for converting said expanded digital video signal into said PCM signal and for recording said PCM signal on said magnetic tape over a plurality of continual head scanning periods.

4,858,033

APPARATUS FOR PACING, QUEING AND EQUIPMENT CONTROL IN AUDIOVISUAL WORK

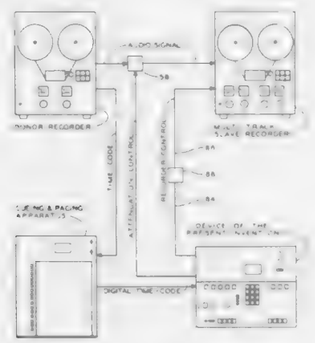
Arthur J. Chippendale, 1636 N. Verdugo, Glendale, Calif.

Filed Mar. 18, 1987, Ser. No. 27,605

The portion of the term of this patent subsequent to Apr. 21, 2004, has been disclaimed.

Int. Cl.[4] G11B *27/02*

U.S. Cl. 360—14.2 **11 Claims**



1. An apparatus for audio visual programming of the character including a cueing and pacing device adapted to generate a running time code in minutes and seconds, said cueing and pacing device comprising a base; a first display means carried by said base for visually indicating the passage of time; a second display means adapted to operate synchronously with said first display means said second display means comprising a multiplicity of spaced apart linearly aligned signal means carried by said base and adapted for sequential activation at predetermined intervals for indicating the passage of time; data display means carried by said base for use in recording and displaying data, said data display means including a writing surface having provided thereon a multiplicity of lines spaced apart by a distance corresponding to the distance between said spaced apart signal means; control means for simultaneously stopping and starting said first and second display means; and interconnection means for interconnecting said control means with a first audio visual means adapted to display audio or visual data and in which said control means is adapted to stop and start said first audio visual means simultaneously with stopping and starting said first and second display means, the improvement comprising:

(a) a second audio visual means adapted to display audio or visual data, said second audio visual means being operably associated with said first audio visual means of said cueing and pacing device;

(b) programming and automatic control means operably associated with said second audio visual means for receiving input signals said second audio visual means and for operably controlling said second audio visual means in response to said input signals;

(c) decoder means operably interconnected with said cueing and pacing device for accepting a first running time code in minutes and seconds from said cueing and pacing device;

(d) first supplemental means operably associated with said decoder means for receiving said first running time code and for augmenting said first running time code to include fractional second increments;

(e) second supplemental means operably associated with said decoder means for augmenting time codes received from said decoder means to include fractional second increments;

(f) memory means, including receiving means for selectively receiving said augmented time codes, said memory means being operably associated with said first and second supplemental means for selectively receiving therefrom augmented time codes and for storing said augmented time codes;

(g) manual data input means operably associated with said memory means for manually inputting time codes into said memory means;

(h) comparison means operably coupled with said memory means for comparing time codes inputted by said cueing and pacing device and by said manual data input means and stored within said memory means with augmented time-codes received by said receiving means of said memory means and for detecting coincidences therebetween, said comparison means further including signal generating means for generating an electrical signal upon the detection of a coincidence in said time codes; and

(i) multiple control means operably associated with said comparison means and said memory means for receiving an electrical signal from said comparison means and for transmitting said electrical signal to said programming and control means.

4,858,034

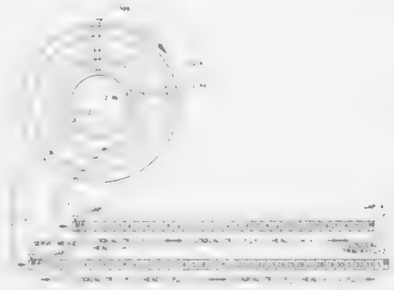
MODULAR UNITARY DISK FILE SUBSYSTEM WITH DIFFERING DENSITY ZONES

Michael J. Hassel, Milpitas; Ian C. Felix, Campbell, and Claude E. Camp, Milpitas, all of Calif., assignors to Plus Development Corporation, Milpitas, Calif.

Division of Ser. No. 52,709, May 20, 1987. This application Aug. 22, 1988, Ser. No. 234,556

Int. Cl.[4] G11B *5/09*

U.S. Cl. 360—51 **11 Claims**



9. A disk drive comprising a data storage disk rotating at controlled, substantially constant angular velocity, a data transducer head for flying in close proximity to a data storage surface of said data storage disk, said data transducer head including electromechanical mover means for moving the head among a plurality of concentric radially displaced zones, each zone having a multiplicity of concentric data tracks, said disk drive being adapted to transfer data to and from the data surface at a plurality of data transfer rates, there being a different data transfer rate for each zone adapted to optimize data bit density in the zone relative to radial offset from a center of said disk, said disk drive including data separator means for extrating digital data from analog information read back from said disk surface by said data transducer head, transducer head position control means connected to said electromechanical mover means for controlling the positioning of said transducer head, said position control means including single microprocessor means for supervising operations of said data transducer position control means and said data separator means, said single microprocessor means including sector location determination means for translating logical cylinder, head and sector address information supplied by a host computer via a disk drive interface to said disk drive into physical track and sector address information on a zone by zone basis, so that a logical sector location may thereby be directly correlated with a physical sector location on the data storage surface of the disk and so that a said data transfer rate may be automatically selected in said data separator means for a particular zone of a said physical sector location, said data separator means including phase lock oscillator means having plural voltage controlled oscillator means, there being a separate voltage controlled oscillator means adapted for the data rate for each of said zones, and a single charge pump means for generating a control voltage in response to incoming data rate from the data surface, which voltage is applied commonly to control the resonant frequencies of said plural voltage controlled oscillator means; and, oscillator disable means supervised by said user data controller means so that all of said voltage controlled oscillator means other than the one correlated to a zone in which the head transducer is located are automatically functionally disabled.

4,858,036

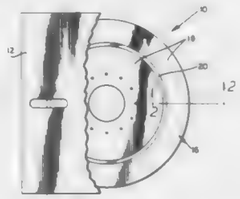
SOFTWARE PROTECTION AND IDENTIFICATION SYSTEM

Peter Ginkel, 1275 Northcliff Trace, Roswell, Ga. 30076

Filed Aug. 4, 1986, Ser. No. 388,036

Int. Cl.[4] G11B *5/02, 5/09*

U.S. Cl. 360—60 **59 Claims**



1. A copy protectable magnetic data recording medium for use with a machine capable of reading data recorded on said medium, of altering data recorded on said medium by erasing said data and/or by writing other data in its place and of executing instructions recorded on said medium, said medium comprising:

a substrate;

magnetic material supported on said substrate, said magnetic material having a first region which is both readable and alterable by said machine and a separate second region which is only readable by said machine;

a first sequence of instructions or data for said machine recorded on said medium in said first region for providing a predetermined function; and

a second sequence of instructions or data for said machine recorded on said medium for instructing said machine to erase or alter predetermined information or data originally provided on said second region, for thereafter instructing said machine to read said second region, and for thereafter instructing said machine to execute said first sequence of instructions if said machine correctly reads said originally provided information or data in said second region,

whereby said machine is prevented from executing said first sequence of instructions if said machine does not correctly read said originally provided information or data in said second region.

4,858,035

DIGITAL SIGNAL REPRODUCING SYSTEM

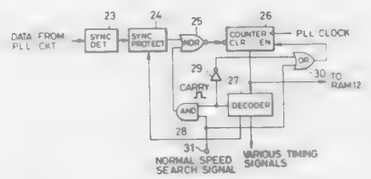
Kazuo Hikawa, Tokyo, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Oct. 1, 1987, Ser. No. 105,442

Claims priority, application Japan, Oct. 2, 1986, 61-234960

Int. Cl.[4] G11B *5/09*

U.S. Cl. 360—51 **5 Claims**



1. A digital signal reproducing system comprising:

(a) a rotatable cylinder;

(b) magnetic heads attached to the cylinder and having different azimuth angles, the magnetic heads being operative to reproduce a digital signal having signal blocks including sync signals;

(c) a counter counting clock signals and generating at least one timing signal in accordance with the count of the clock signals;

(d) means for processing the reproduced digital signal at a timing determined by the timing signal; and

(e) means for, during high tape speed reproduction for search, starting the counting operation of the counter when the sync signal is detected and stopping the counting operation of the counter when the count of the clocks reaches a predetermined number.

4,858,037

INFORMATION SIGNAL RECORDING AND/OR REPRODUCING APPARATUS

Masahiro Takei; Toshiyuki Masui, both of Kanagawa; Motokazu Kashida, Tokyo, and Kouji Takahashi, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1986, Ser. No. 850,974

Claims priority, application Japan, Apr. 13, 1985, 60-077575; Apr. 13, 1985, 60-077576; Apr. 13, 1985, 60-077577

Int. Cl.[4] G11B *15/14, 5/02*

U.S. Cl. 360—60 **13 Claims**

1. An information signal recording apparatus, comprising:

(a) main recording means for recording a main information signal on a tape-shaped record bearing medium;

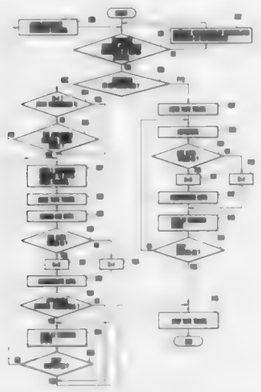
(b) subordinate recording means for recording a subordinate information signal on the medium;

(c) subordinate reproducing means for reproducing said subordinate information signal from the medium;

(d) more setting means for setting a mode of the apparatus among a plurality of modes, the plurality of modes including first mode where said main recording means records the main information signal and said subordinate reproducing means reproduces said subordinate information signal, and second mode where said main recording means does not record the information signal; and

(e) control means for controlling said mode setting means so

that the mode of the apparatus changes from said first mode to said second mode in response to said subordinate



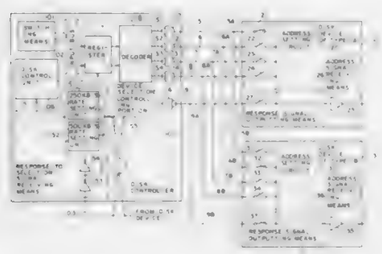
information signal reproduced by said subordinate reproducing means.

4,858,038

SYSTEM OF DISK DEVICE SELECTOR CIRCUITS FOR DISK CONTROLLER

Kouji Kazama, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1987, Ser. No. 33,745
Claims priority, application Japan, Apr. 4, 1986, 61-50505[U]
Int. Cl.[4] G11B *19/00, 5/012;* G06F *3/00*
U.S. Cl. 360—69 4 Claims



1. In a system of disk device selector circuits for a disk controller, provided for a disk controller having a selection controlling means for selecting an arbitrary one out of a plurality of magnetic disk devices constituted of different types and address signal transmitting means for delivering address signals of different bit patterns to different types of said magnetic disk devices to be selected by said selection controlling means; and the plurality of magnetic disk devices constituted of different types and connected with said disk controller via common control signal lines, each thereof having address setting means responsive to an address signal for confirming whether or not the device itself is selected by said disk controller and address signal receiving means for receiving the address signal when it is determined by said address setting means that the device itself has been selected; said system of disk device selector circuits for a disk controller comprising:

a response signal outputting means provided for each of said different types and plurality of magnetic disk devices for outputting a response signal to indicate that the device itself has been selected to said selection controlling means when the magnetic device is that device arbitrarily selected by said selection controlling means;

a response signal receiving means provided for said disk controller for receiving, via a common response signal line, the response signal from said response signal outputting means provided for each of said magnetic disk devices;

said address signal from said selection controlling means being in the form of a selection signal having one bit for selecting either one of two types of magnetic disk devices by each of a logical "1" or "0"; and

each of said response signal outputting means being formed of a response-to-selection signal setting switch settable to include in said response signal one bit of a logical "1" or "0" indicative of the respective type of magnetic disk device for which said response signal outputting means is provided;

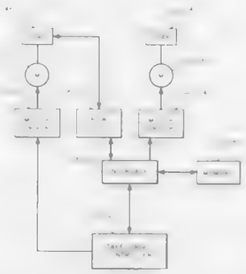
said response-to-selection signal setting switch being located in said response signal line between the junction point between an address setting circuit as said address setting means and a receiving gate as said address signal receiving means in each disk device and said response signal receiving means of said disk controller.

4,858,039

STREAMING TAPE DRIVE WITH DIRECT BLOCK ADDRESSABILITY

Roger G. Mintzlaff, Santa Ana, Calif., assignor to Archive Corporation, Costa Mesa, Calif.

Filed Feb. 4, 1988, Ser. No. 152,384
Int. Cl.[4] G11B *21/12*
U.S. Cl. 360—72.2 26 Claims



1. A streaming tape drive that provides direct addressability of the individual data blocks stored on magnetic tape in serpentine fashion to include a plurality of serpentine data tracks without requiring a sequential search of the entire magnetic tape, said streaming tape drive comprising:

a magnetic head for reading data recorded on magnetic tape in a plurality of serpentine data tracks; means for moving said magnetic head in a direction transverse to the longitudinal direction of the magnetic tape so that said magnetic head may be positioned to read data from the various data tracks recorded on the magnetic tape; and

means for locating the position of a selected data block, said locating means comprising:

means for performing an initial search for a data track, said initial search being performed by reading the block number of the data block to which said magnetic head is currently positioned, comparing the block number so read with the block number of the selected data block being sought, and moving said magnetic head up or down one data track, depending upon the difference between the block number read and the block number of the selected data block, said initial search terminating upon the magnetic head being positioned to a data track having a data block that is recorded within a predetermined distance of the selected data block being sought; and

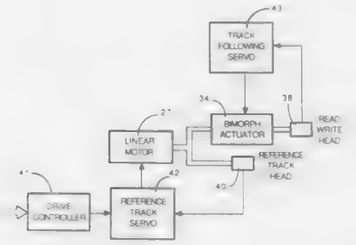
means for performing a subsequent search for the selected data block being sought, said subsequent search being performed by reading a plurality of data blocks from a point beginning on the data track located as a result of said initial search until the block number of a data block read matches the block number of the selected data block being sought, indicating that said magnetic head has located the selected data block.

4,858,040

BIMORPH ACTUATOR FOR A DISK DRIVE

Henry B. Hazebrouck, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Aug. 25, 1987, Ser. No. 89,097
Int. Cl.[4] G11B *5/55, 5/596*
U.S. Cl. 360—78.05 4 Claims



1. A transducing head positioning actuator for a magnetic disk having data-storage tracks thereon, comprising:

a fixed base and an actuator mounting element extending therefrom;

at least one head positioning member mounted on said element, said head positioning member formed to define a pair of fork arms extending generally toward the disk axis; and

an elongated piezo-electric bimorph member attached at both ends to and between the fork arms of said head positioning member, with the length thereof generally perpendicular to a radius of said disk, said bimorph member being structured for piezo-electric deformation so that the midportion thereof moves generally to and from along said disk radius; and at least one read/write head being mounted on said midportion of said piezo-electric bimorph member remote from said head positioning member;

first means for energizing said actuator mounting element to sweep said head positioning member across a predetermined set of said tracks;

second means for energizing said piezo-electric member to cause a deformation thereof and to thereby align the read/write head with a predetermined one of said tracks to achieve and to substantially hold a tracking relationship therewith.

4,858,041

TRACKING SERVO CONTROL

Stewart C. Brown, Newport Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 20, 1987, Ser. No. 110,995
Int. Cl.[4] G11B *21/08*
U.S. Cl. 360—78.09 15 Claims

6. In a closed loop servomotor controlled disc drive system containing transducer means for reading information stored on said disc and positionable by a servomotor to individual tracks in said disc, and sensor means for providing a tracking signal responsive to movement of said transducer, the improvement comprising:

means for generating a reference signal simulating sensor means tracking signals obtained during correct movement of said transducer means and substracting said reference



signal from said tracking signal to provide a difference signal; and

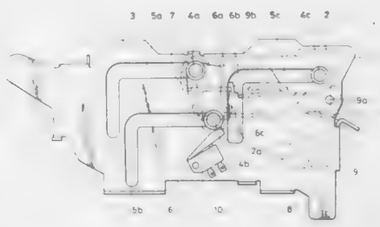
means for applying said difference signal to the control loop of said servo loop control servomotor controlled disc drive system.

4,858,042

CASSETTE INSERTION DETECTING MECHANISM

Yukio Ito; Kimichika Yamada, and Hiroyuki Ohkawa, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 100,217
Claims priority, application Japan, Sep. 30, 1986, 61-232210; Sep. 30, 1986, 61-232209; Sep. 30, 1986, 61-149813[U]
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—96.5 3 Claims



1. A cassette insertion detecting mechanism used in a cassette-type magnetic recording apparatus to detect insertion of a cassette into a cassette holder divided into right and left halves and to produce a subsequent cassette loading operation only when the cassette is properly positioned with respect to the cassette holder, said mechanism comprising:

a movable cassette holder having right and left halves and driven by a cassette loading driving motor;

insertion detecting members supported on said halves of said cassette holder for pivotal movement relative thereto, resiliently biased toward a front direction of said cassette holder, and pivotably moved in a rear direction against the resilient force upon insertion of a cassette;

right and left side plates supporting and guiding said cassette holder;

right and left insertion detecting switches supported on said side plates and turned on or off by said insertion detecting members; and

loading control means configured to activate the cassette loading driving motor to produce a cassette loading operation when both said insertion detecting switches are turned on or off by said insertion detecting members;

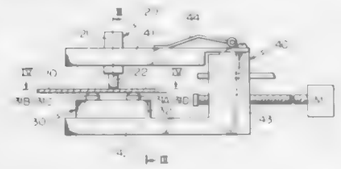
wherein said insertion detecting members are stoppers mounted on rear positions of said halves of said cassette holder movably with respect thereto, and are configured to hold one end of the cassette under said frontward resilient force.

4,858,043

MAGNETIC HEAD ASSEMBLY FOR A FLEXIBLE MAGNETIC DISK DRIVE UNIT

Sadao Kadokura, Hachioji; Kazuhiro Kawei, and Kazuhiko Honjyo, both of Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 27, 1987, Ser. No. 54,517
Claims priority, application Japan, May 28, 1986, 61-121268
Int. Cl.[4] G11B 5/22
U.S. Cl. 360—99.01 9 Claims



1. A flexible magnetic disk drive unit comprising a flexible magnetic disk with a metallic thin-film type recording layer thereon, the disk being enclosed in a jacket, the jacket having a radial opening which permits access to both sides of the magnetic disk along a radius from the center of the disk to its edge; motor means for rotating the disk at a preset speed, and a magnetic head assembly means for recording data on and retrieving data from the disk, the magnetic head assembly means further comprising:

a magnetic recording and retrieving head means for magnetic recording and retrieving having a magnetic recording and retrieving head arranged on one side of the flexible magnetic disk, capable of moving back and forth along the radial opening in the jacket, thereby permitting access to the disk, the head being in sliding contact with the metallic thin-film type recording layer of the flexible magnetic disk; and

first pad means for supporting the flexible magnetic disk on the side opposite to the side where the magnetic recording and retrieving head means contacts said disk while said disk rotates, the first pad means including a plurality of supporting pads with contact end faces disposed so as to surround the area which is opposite that area being contacted by said recording and retrieving head, the contact end faces of the supporting pads having a Vickers hardness equal to or more than 500.

4,858,044

DISC DRIVE SPINDLE MOTOR WITH LOW COGGING TORQUE

Alan D. Crapo, Santa Cruz County, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation-in-part of Ser. No. 46,234, May 4, 1987. This application Oct. 30, 1987, Ser. No. 115,268
Int. Cl.[4] G11B 17/00; H02K 3/00; H02P 7/00
U.S. Cl. 360—99.08 21 Claims

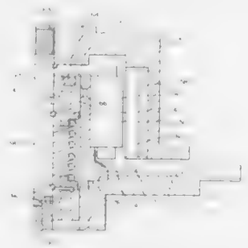
1. In a disc drive comprising a casting having a base portion supporting a spindle motor for rotating a hub supporting one or more discs, said spindle motor comprising a central support shaft having one end supported in said base and a second end supporting said hub for rotation thereon,

a housing surrounding said shaft and mounted in said base portion,

a stator mounted on said housing comprising nine windings of equal cross-section separated by slots,

a magnetic rotor supported within the hub having eight equally spaced poles radially oriented with respect to said stator and said central support shaft,

said rotor windings being connected to define first, second



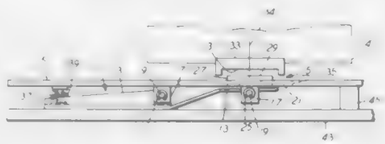
and third phases, said first phase comprising the first, third and fifth of said nine windings, the second phase comprising the fourth, sixth and eight of said nine windings, the third phase comprising the seventh, ninth and second of said nine windings, the three windings of each phase being connected in series to define a spindle motor having low cogging torque.

4,858,045

MAGNETIC DISK LOCK HAVING BRAKING APPARATUS

Jimmie D. New, Arlington, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 9, 1983, Ser. No. 560,057
Int. Cl.[4] G11B 5/016
U.S. Cl. 360—99.12 2 Claims



1. A disc drive brake for automatically locking a disc drive when the drive is lifted from its case, comprising

a lever rotatably connected to said disc drive, the point of rotating connection between said lever and said drive being relatively close to the center of said lever so that a first end of said lever will be forced into an upper position by said case when said drive is in its case, and will be allowed to drop into a lower position when said drive is lifted from its case,

a spring positioned between said drive and said first end of said lever which forces said first end of said lever into its lower position when said drive is lifted from its case, and is compressed by contact with said case when said drive is set into its case and said first end of said lever is forced into its upper position, and

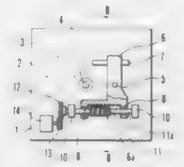
a brake pad mounted on the second end of said lever, and positioned such that when said first end of said lever is in its lower position and said second end of said lever is in its upper position said pad will contact a portion of the bottom surface of the drive that is adapted to rotate when the disk drive is operating.

4,858,046

HEAD FEED DEVICE

Masaya Maeda, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 895,346, Aug. 11, 1986, abandoned. This application Apr. 18, 1988, Ser. No. 183,418
Claims priority, application Japan, Aug. 12, 1985, 60-175777
Int. Cl.[4] G11B 5/55
U.S. Cl. 360—106 26 Claims



1. A head feed device comprising:

(a) a head arranged to perform a recording and/or reproducing operation on a recording medium;

(b) a carriage member arranged to carry said head and to be displaceable for causing said head to face different parts of said recording medium;

(c) guide means arranged to linearly guide the displacement of said carriage member along a surface of said recording medium, said guide means having two parallel guide shafts, one of said guide shafts having two parts on its axis provided so as to be engageable with two engaging portions of said carriage member so as to movably guide said carriage member; said two guide parts being shafts having smooth and uninterrupted cylindrical surfaces which provides a respective continuous surface for contact with each respective engaging portion;

(d) a transmission member arranged and fixed to a part of said one guide shaft between said two guide parts so as to displace said carriage member, said transmission member having a lead screw member provided so as to engage a portion of said carriage member between said two engaging portions; and

(e) a drive source arranged to rotate said transmission member.

4,858,047

FINE HEAD POSITIONING SYSTEM FOR A TAPE BACKUP DRIVE

Thomas G. Cannon, Loveland; Bruce D. Roemmich, Fort Collins, and Terry A. Precht, Loveland, all of Colo., assignors to Colorado Memory Systems, Inc., Loveland, Colo.

Filed Dec. 6, 1988, Ser. No. 280,507
Int. Cl.[4] G11B 5/54
U.S. Cl. 360—106 7 Claims

1. A fine tape head positioning system for positioning a magnetic tape head, said system comprising:

means for providing rotational bi-directional movement includes a shaft,

means engaging said providing means for producing linear movement corresponding to said rotational movement,

an elongated lever arm, said elongated lever arm having a first end engaging said producing means,

means connected to said elongated lever arm for pivoting said elongated lever arm at a first predetermined distance from said first end,

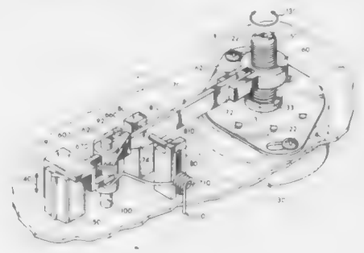
guide means oriented in the direction of said shaft,

a head mounting assembly for carrying said head, said assembly having:

a. a central portion having a formed hole for slidably engaging said guide means,

b. a rear portion connected to said central portion, said elongated lever arm having a second end, opposing said first end, engaging said rear portion at a second predetermined distance from said means connected to said lever arm for pivoting said elongated lever arm said first predetermined distance being longer with respect to said second predetermined distance thereby forming a mechanical advantage, said elongated lever arm being aligned with the major axis of said shaft of said providing means, said connection of said elongated lever arm to said pivoting means, and said rear portion,

c. a mounting portion connected to said central portion for carrying said head, and



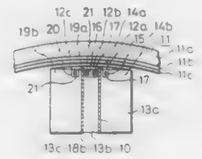
means connected to said assembly for biasing said assembly in a direction that firmly engages said rear portion against said second end of said elongated lever arm and firmly engages said first end of said elongated lever arm against said producing means so that as said shaft rotates, said first end of said elongated lever arm pivots in the direction of said linear movement thus causing said assembly t move in the direction opposite to said linear movement along said guide means thereby moving said head in spatial increments smaller due to said mechanical advantage than the relatively larger movement caused by said producing means.

4,858,048

COMPLEX MAGNETIC TRANSDUCER HEAD OF SINGLE MAGNETIC POLE TYPE FOR PERPENDICULAR MODE RECORDING

Kiyonori Hayakawa, Ebina, and Akio Mishima, Ayase, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 677,550, Nov. 21, 1984, abandoned. This application Aug. 10, 1987, Ser. No. 85,322
Claims priority, application Japan, Mar. 22, 1983, 58-47666; Mar. 28, 1983, 58-52157
Int. Cl.[4] G11B 5/265
U.S. Cl. 360—121 5 Claims



1. A complex magnetic transducer head of single magnetic pole type for perpendicular mode recording, characterized by

a perpendicular mode recording and reproducing magnetic transducer head portion which includes a recording and reproducing main magnetic pole made of a thin film of soft magnetic material, juxtaposed at its one end with a magnetic recording medium and having a predetermined width,

non-magnetic material guard members for sandwiching said

recording and reproducing main magnetic record medium,

a magnetic core portion integrated with said non-magnetic material guard members, in contact with at least one surface of said recording and reproducing main magnetic pole and spaced away from said magnetic recording medium by a predetermined distance,

a groove portion formed in said magnetic core portion opening toward said magnetic recording medium for separating a first auxiliary magnetic pole portion contacting with said recording and reproducing main magnetic pole from a return path portion serving as a return path for magnetic flux of said recording and reproducing main magnetic pole;

a winding wound on said recording and reproducing main magnetic pole through said groove portion;

a pair of erasing main magnetic poles facing said magnetic recording medium, spaced from said recording and reproducing main magnetic pole by a predetermined distance along its running direction relative to said record medium, said pair of erasing poles being spaced apart, transverse to said running direction by a distance smaller than said width of said recording and reproducing main magnetic pole; and

means for exciting said erasing main magnetic poles, wherein said recording and reproducing main magnetic pole and said erasing main magnetic poles are integrated on a surface in contact with said record medium through said non-magnetic guard member.

4,858,049

MAGNETIC FILM AND MAGNETIC HEAD USING THE SAME

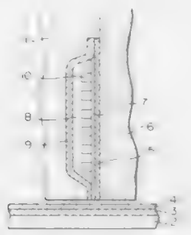
Toshio Kobayashi, Tokyo; Shigekazu Otomo, Sayama; Ryoichi Nakatani, Akikawa, and Noriyuki Kumasaka, Ome, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 1, 1987, Ser. No. 56,114

Claims priority, application Japan, May 30, 1986, 61-123323; Sep. 5, 1986, 61-207871

Int. Cl.[4] G11B *5/12*

U.S. Cl. 360—126 28 Claims



1. A magnetic film made of Fe or having Fe as its main component and containing 5–20 at. % of one or more elements selected from the group consisting of B, N, C and P which are interstitially soluble to Fe, said one or more elements being contained in said magnetic film in an interstitially soluble form.

4,858,050

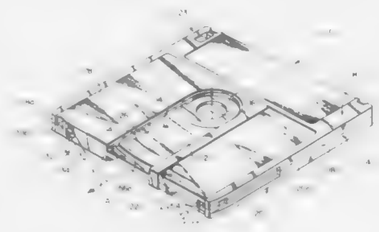
STRUCTURALLY RIGID DISK CARTRIDGE ADAPTABLE TO ELIMINATING RELATIVE AXIAL CARTRIDGE AND/OR TRANSDUCER HEAD LOADING/UNLOADING MOVEMENT

Philip R. Ashe, Hilton; James R. Carey, Rochester, both of N.Y.; Patrick J. Champagne, Cupertino, Calif., and David L. Rowden, Rochester, N.Y., assignors to Verbatim Corp., Sunnyvale, Calif.

Filed Jun. 9, 1987, Ser. No. 59,999

Int. Cl.[4] G11B *23/03*

U.S. Cl. 360—133 4 Claims



1. In a cartridge comprising an aligned pair of substantially rigid first and second plates spaced from each other to enable a disk disposed therebetween to rotate about a central axis for recording data on, and playing back data from, a plurality of record tracks encircling the rotational axis of the disk, the improvement comprising:

(a) each of said first and second plates including an elongate head-access opening extending outwardly from a centrally disposed area exposing a spindle-drive region of the disk to a common forwardly facing peripheral edge of said cartridge, to jointly expose an entire radial section of each side of the enclosed disk to a record and/or playback transducer head when the disk is rotated after said cartridge is operatively loaded into a disk drive mechanism; and

(b) first and second rigid relatively thin reinforcement structures integrally formed, respectively, with said first plate and said second plate by means of each of said reinforcement structures having first and second ends integrally connected to its associated plate on respectively opposing sides of the head-access opening, to provide a monolithic cartridge structure extending from one side to the other side of each head-access opening, each of said reinforcement structures further lying axially adjacent each other in the operative plane of the enclosed disk toward an outlying end of each head-access opening adjacent the peripheral edge, to cooperatively define a relatively narrow bridge-like member which (i) in the axial direction is no wider than the corresponding axial dimension of the operative plane of the disk enclosed, (ii) is integrally connected with each plate on both sides of each head-access opening, and (iii) extends laterally in the plane of the disk generally along the forwardly facing peripheral edge of said cartridge from one side to the other side of each head-access opening, to jointly maintain cartridge rigidity peripherally across the outlying end of each head-access opening while providing to a record and/or playback transducer head of a drive mechanism operative access to the record tracks of the disk through the outlying end of either head-access opening without the need to have relative movement in the axial direction between said cartridge and the record and/or playback transducer head as said cartridge is loaded into or unloaded from a drive mechanism.

4,858,051

SYSTEM FOR THE RECORDING AND/OR PLAYBACK OF SIGNALS

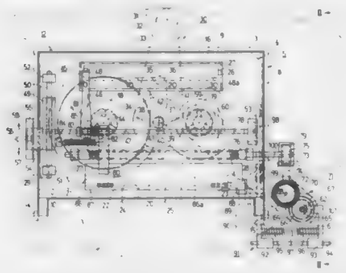
Karl Fischer, Perchtoldsdorf; Werner Köck, Leopoldsdorf, and Wolfgang Tuider, Oberdorf, all of Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1987, Ser. No. 119,607

Claims priority, application Australia, Nov. 14, 1986, A3038/86; European Pat. Off., Mar. 26, 1987, 87200576.4

Int. Cl.[4] G11B *15/00*

U.S. Cl. 360—137 9 Claims



1. A system for recording and/or reproducing signals on a tape-shaped record carrier, said system comprising a machine into which any one of a plurality of tape-shaped record carriers may be inserted, said plurality of tape-shaped record carriers having a number of different amounts of continuous total-recording time obtainable therefrom on said machine, wherein said machine includes a counter having an indicating element for indicating on an indicating scale of a predetermined total length, a continuous recording time corresponding to a particular quantity of a tape-shaped record carrier advanced in said machine, said machine further including a drive device for driving said record carrier and a speed change gear mechanism driven by said drive device for driving said counter, said speed change gear mechanism being switchable in a plurality of steps corresponding to said number of different amounts of continuous total-recording time of said plurality of said tape-shaped record carriers for driving said indicating element at different respective speeds inversely proportional to said different amounts of continuous total-recording time of said plurality of said tape-shaped record carriers, whereby each of said different amounts of continuous total-recording time can be indicated by said indicating element over the entire predetermined total length of said indicating scale, characterized in that said tape-shaped record carriers are contained in substantially identical cassettes, each of said cassettes having at least one indicator for indicating the amount of continuous total-recording time of the tape-shaped record carrier contained therein, and said machine comprises a sensing device for sensing said at least one indicator of said cassette inserted into said machine, said sensing device including means for switching said speed change gear mechanism for driving said indicating element in accordance with the amount of continuous total-recording time of said tape-shaped record carrier indicated by said at least one indicator.

4,858,052

METHOD AND MEANS FOR PROTECTING CONVERTER CIRCUITS

John E. McDonnal, Campbell, Calif., assignor to RO Associates, Sunnyvale, Calif.

Continuation of Ser. No. 935,715, Nov. 28, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 178,759

Int. Cl.[4] H02H *7/122*

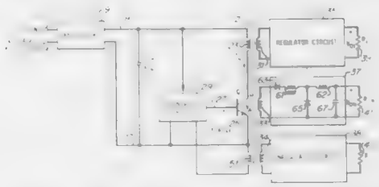
U.S. Cl. 361—18 6 Claims

1. The method of protecting from input overvoltage conditions circuitry which operates on the periodic conduction in a winding of a transformer of current from a source that operates on the input voltage to convert signal on another winding of the transformer into D.C. output voltage supplied to a load, the method comprising the steps of:

supplying current to one winding of the transformer periodically during controllable conduction intervals from the source that operates on the input voltage;

altering the duty cycle of the conduction interval in response to the amplitude of voltage of the source from which current is supplied to said one winding of the transformer;

converting the signal on another winding of the transformer into the D.C. output voltage which decreases in amplitude



in response to the conduction of current in one winding of the transformer for duty cycles of conduction interval shorter than the minimum duty cycle of conduction interval required to maintain the D.C. output voltage substantially constant; and

decreasing the duty cycle of the conduction interval continuously to shorter than said minimum duty cycle of conduction interval in response to the amplitude of said voltage from the input voltage source exceeding a predetermined limit to protect the circuitry against input overvoltage.

4,858,053

OPERATIONAL AMPLIFIER HAVING AN IMPROVED FEEDBACK SYSTEM INCLUDING AN INTEGRATOR HAVING A HURRY-UP CIRCUIT, AND AN ELECTRIC MOTOR CONTROL USING THE SAME FOR INVERSE TRIP SELECTION

Mark V. Profio, Wauwatosa, Wis., assignor to Square D Company, Palatine, Ill.

Continuation of Ser. No. 794,318, Nov. 1, 1985, abandoned, Continuation of Ser. No. 713,083, Mar. 15, 1985, abandoned, Continuation of Ser. No. 431,423, Sep. 30, 1982, abandoned. This application Aug. 4, 1987, Ser. No. 82,975

Int. Cl.[4] H02H *7/09*

U.S. Cl. 361—23 12 Claims



11. An improved operational amplifier (26) having,

an amplifier (90) having a first input (90*i*1), a second input (90*i*2) and an output 90 T,
an input resistor (96) having a first end and a second end, said first end of said input resistor forming an input (26*i*) of said operational amplifier (26) and said second end of said input resistor connected to said first input (90*i*1) of said first amplifier (90),
a feedback impedance (92, 94) connected between said output (90 T) of said first amplifier of said first input (90*i*1) of said first amplifier (90), wherein the improvement comprises:
means for comparing a voltage at said first end of said input resistor (96) with a voltage at said second end of said input resistor (96) for generating a signal voltage; and,
means, responsive to said signal voltage, for providing an auxiliary current path (24A) for said feedback impedance (92, 94) when said signal voltage has a predetermined value.

4,858,054

PROTECTIVE CIRCUITS AND DEVICES FOR THE PREVENTION OF FIRES

Frederick F. Franklin, 3501 Tiffany Ridge, Cincinnati, Ohio 45241

Continuation-in-part of Ser. No. 731,510, May 7, 1985, abandoned. This application May 18, 1988, Ser. No. 195,591
Int. Cl.[4] H02H *3/20*
U.S. Cl. 361—57 **27 Claims**



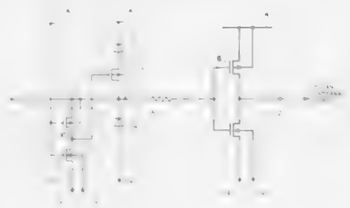
1. A protective circuit for protecting against electrical fires caused by "arc" short circuits in a load circuit connected across an electrical power source, said protective circuit comprising:
a current interrupter selected from the class consisting fuses and circuit breakers,
said interrupter being connected in series between one side of the power source and the load circuit and having, as operating characteristics:
a. a rated current reflecting the maximum current flow for steady state operation,
b. a minimum response time for actuation when current flow to the load circuit exceeds a magnitude several fold greater than the rated current flow, and
c. Non-responsiveness to current flows intermediate the rated current and the several fold value for periods of time generating energy levels moderately in excess of the energy limit of steady state, rated current flow,
means for sensing current flow to said load circuit, and
dumping means for providing a current flow path between the interrupter and the other side of said power source, said dumping means being normally inoperative and switchable to an operative state providing a current flow path connecting the interrupter across the power source,
characterized in that said dumping means are switched to an operative state in response to the current sensing means sensing an intermediate current level current greater than the maximum current flow for the energy levels of normal transient overloads, which sensed current level reflects an "arc" short circuit having an energy level in the same range as a normal transient overload,
whereby the current interrupter will be actuated substantially instantaneously when there is current flow indicative of an "arc" short circuit and protection provided against a fire being ignited thereby.

4,858,055

INPUT PROTECTING DEVICE FOR A SEMICONDUCTOR CIRCUIT DEVICE

Takenori Okitaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1987. Ser. No. 132,648
Claims priority, application Japan, Jul. 23, 1987, 62-184328
Int. Cl.[4] H02H *9/04*
U.S. Cl. 361—91 **6 Claims**



1. An input protecting device of a semiconductor circuit device comprising:
a signal input terminal;
first and second power supply terminals;
a first clamping diode provided between said first power supply terminal and said signal input terminal;
a second clamping diode provided between said second power supply terminal and said signal input terminal;
switching means provided between said first clamping diode and said signal input terminal for selectively cutting off a current path between said first clamping diode and said signal input terminal; and
controlling means responsive to a voltage applied to said first power supply terminal and connected to said control terminal of said switching means for controlling an on-off condition thereof.

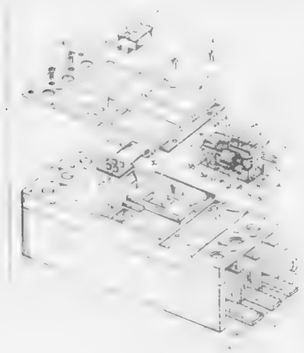
4,858,056

MOLDED CASE CIRCUIT BREAKER ACTUATOR-ACCESSORY MODULE

Ronald R. Russell, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jun. 6, 1988, Ser. No. 202,651
Int. Cl.[4] H02H *3/08*
U.S. Cl. 361—93 **51 Claims**

1. A circuit interrupter comprising:
a pair of separable contacts;
an operating mechanism arranged for separating said contacts upon command;
an overcurrent trip circuit and an electromagnetic overcurrent trip coil, said trip circuit determining overcurrent conditions through said separable contacts and energizing said trip coil to articulate said operating mechanism and separate said contacts when said overcurrent conditions exist for predetermined time periods;
an accessory coil associated with a plunger and a permanent magnet, said plunger restrained from interacting with said operating mechanism against the bias of a charged spring by attraction to said permanent magnet, said accessory coil being arranged for counteracting said permanent magnet to allow said plunger to interact with said operating mechanism when a current signal is applied to said accessory coil;
an accessory circuit associated with said accessory coil said accessory circuit including positive and negative voltage rails and connected with said accessory coil for controlling said current signal to said accessory coil, said accessory circuit including a storage capacitor receiving charging current from first and second charging circuits and supplying said current signal to said accessory coil, said



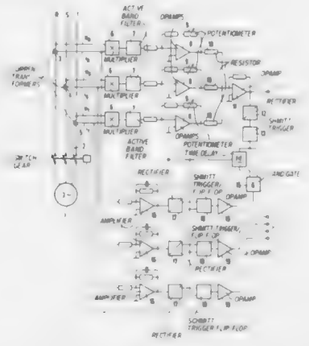
accessory circuit further including a first transistor switch for initiating said current signal to said accessory coil; and
ground fault terminal means arranged for receiving a ground fault signal to operate said first transistor switch to thereby actuate said accessory coil.

4,858,057

MULTIPHASE TRIPPING DEVICE WITH SHORT-CIRCUIT DETECTION

Reinhard Maier, Herzogenaurach, and Kurt Goth, Furth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 31, 1988, Ser. No. 240,411
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1986, 3626398
Int. Cl.[4] H02H *3/08*
U.S. Cl. 361—94 **5 Claims**



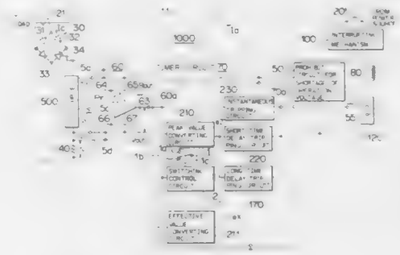
1. An electronic overcurrent tripping device which senses short circuit current in a multiphase grid with a grid frequency, comprising:
means for sensing an instantaneous current and an instantaneous voltage in each phase;
means for multiplying each instantaneous current and voltage for obtaining an instantaneous power for each phase;
means for filtering out all dc components of said instantaneous powers, having a passing frequency of twice said grid frequency to generate filtered signals;
a summing circuit, coupled to said means for filtering, which sums the filtered signals to generate a summing output signal;
a comparison circuit, coupled to said summing circuit, which determines when a deviation of said summing output signal exceeds a predetermined threshold level; and
a tripping command transmitter coupled to said comparison circuit and activated by said summing output signal when said summing output signal deviation exceeds said predetermined threshold level.

4,858,058

CIRCUIT BREAKER INCLUDING SELECTIVELY OPERABLE LONG-TIME-DELAY TRIPPING CIRCUIT

Kazuhiro Ishii, Hiroshima, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 2, 1988, Ser. No. 227,126
Claims priority, application Japan, Aug. 4, 1987, 62-195693
Int. Cl.[4] H02H *3/093*
U.S. Cl. 361—96 **8 Claims**



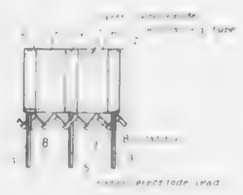
1. A circuit breaker comprising:
current transformer means having a primary winding electrically coupled to an AC (alternating current) power supply line and a secondary winding, for detecting a line current flowing from a power source to a load via said power supply line;
rectifier means for rectifying said line current derived from said secondary winding of the current transformer means;
fail current means for detecting a fail current from the rectified line current output from said rectifier means;
timer means connected to said fail current detecting means, for producing a predetermined time delay depending upon the magnitude of said fail current, said timer means including:
at least a peak value converting circuit for converting said fail current into a corresponding peak value voltage;
an effective value converting circuit for converting said fail current into a corresponding peak value voltage;
a long-time delay tripping circuit for producing a long-time delay tripping signal in response to one of said peak value voltage and effective value voltage;
switching means for selectively supplying one of said peak value voltage and effective value voltage to said long-time delay tripping circuit, and
switching control means for controlling said switching means in such a manner that said long-time delay tripping circuit receives said effective value voltage from said effective value converting circuit through said switching means when said fail current is lower than a predetermined threshold level, whereas said long-time delay tripping circuit receives said peak value voltage from said peak value converting circuit through said switching means when said fail current exceeds over said threshold level, and;
interrupting means for interrupting supply of said line current from said power source to said load in response to said long-time delay tripping signal from said long-time delay tripping circuit.

4,858,059

SHORT-CIRCUIT DEVICE OF A GAS-FILLED TRIPLE-POLE DISCHARGE-TUBE TYPE ARRESTER FOR TELEPHONE LINE USE

Masahiko Okura, 11-7, 4-Chome, Siroganedai, Minatoku, Tokyo, Japan

Filed Sep. 19, 1988, Ser. No. 246,211
Int. Cl.[4] H02H *3/22*
U.S. Cl. 361—124 1 Claim



1. In a gas-filled triple-pole discharge-tube type arrester including an arrester body (1), an earth electrode (4) being arranged in the middle of the body (1) to be sandwiched in between a pair of right and left cylindrical insulating tubes (6), (6) and having a lead (5) elongated downward out of the same, line electrodes (2), (2) arranged in the right and left end portions of the body (1) to gas-charge the insulating tubes (6), (6) and having leads (3), (3) elongated downward out of the same, said leads of the electrodes being arranged in parallel in the same direction to each other,

a short-circuit device comprising a resilient short-circuit lead (7) of coil-shaped wire being spot welded to the lead (5) in the middle portion thereof so as for the both end portions thereof to be in a pushing contact with the leads (3), (3) in a entwined condition, said pushing contact portion of the leads (3), (3) being coated with a low temperature meltable insulator (8), (8).

4,858,060

DRIVING DEVICE FOR DOOR LOCK-ACTUATOR

Toshio Iwaoka, and Masaru Inoue, both of Yokohama, Japan, assignors to Jidosha Denki Kogyo Kabushiki Kaisha, Kanagawa, Japan

Filed Dec. 11, 1987, Ser. No. 131,788
Claims priority, application Japan, Dec. 16, 1986, 61-192442[U]
Int. Cl.[4] E05B *47/00*
U.S. Cl. 361—185 1 Claim



1. A driving device for a door lock-actuator comprising;

at least one door lock actuator adjacent a passenger seat in a car,

a door locking switch producing a phase difference in output signals corresponding to a locking or unlocking operation of a door lock adjacent a driver seat in a car,

control means for giving a first output signal from said door locking switch priority and shutting off a succeeding output signal corresponding to the working of said door locking switch,

drive means for driving the door lock-actuator of said at least one door adjacent a passenger seat in the locking or unlocking direction corresponding to an output signal from said control means, and

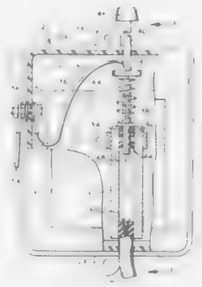
count means starting the counting of a prescribed time corresponding to the output signal from said control means and switching said drive means into a non-working state after the completion of the counting of said prescribed time.

4,858,061

ELECTROSTATIC DISCHARGE CONTROL DEVICE

Gary L. Hethcoat, Ontario, Calif., assignor to General Dynamics Corp., Pomona, Calif.

Filed Mar. 2, 1988, Ser. No. 164,169
Int. Cl.[4] H05F *3/02*
U.S. Cl. 361—215 16 Claims



1. A discharge control device for transferring accumulated electrostatic charge from containers or other apparatus used in spray painting, to a charge sink, comprising:

a housing;

a hermetically sealed discharge chamber disposed within said housing;

first electrical contact means for receiving an accumulated electrostatic charge mounted in said discharge chamber;

reciprocating electrical contact means for receiving and dissipating said accumulated electrostatic charge on said first contact slidably mounted on a surface of said discharge chamber and being movable between a first position in contact with said first electrical contact means and a second position spaced apart from said first electrical contact means; and

first electrical conduction means connected at one end to said first contact means and having securing means at its opposite end for securing it to said container for conducting electrostatic charge between said container and said first contact means; and

second electrical conduction means connected between said reciprocating contact means and said charge sink.

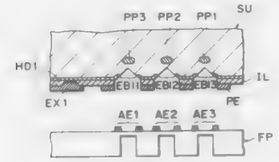
4,858,062

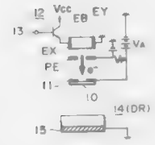
CHARGING DEVICE

Naoji Hayakawa, Yokohama; Masanori Takenouchi, Atsugi; Kenji Nakamura, Hadano; Fumitaka Kan, Tokyo; Yasuo Kozato, Sagamihara, and Isao Hakamada, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 55,512, May 29, 1987, abandoned. This application Apr. 14, 1988, Ser. No. 183,517
Claims priority, application Japan, Jun. 4, 1986, 61-128170; Jul. 11, 1986, 61-162077; Jul. 11, 1986, 61-162078; Jul. 11, 1986, 61-162079; Jul. 24, 1986, 61-174148
Int. Cl.[4] H01T *23/00;* H01L *29/90*
U.S. Cl. 361—225 11 Claims

1. A charging process for charging the surface of a chargeable member comprising the steps of: irradiating said surface with electron beams emitted by a solid-state electron beam generating means provided with plural electron beam sources; pulling said electron beams using a plurality of first electrodes of said solid-state electron beams generating means; accelerating the electrons of said electron beams pulled by said first electrodes using a plurality of second electrodes of said solid state electron beam generating means to take said electron beams outside a vacuum; and controlling the charges deposited on the surface of said chargeable member by charging voltages supplied to said second electrodes, independently of each other.



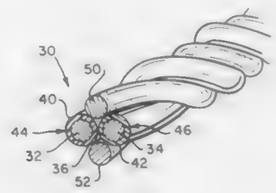


4,858,063

SPIRAL CONFIGURATION OF ELECTRODES AND DIELECTRIC MATERIAL FOR SENSING AN ENVIRONMENTAL PROPERTY

Eric G. Laue, San Marino, and James B. Stephens, La Crescenta, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Dec. 31, 1987, Ser. No. 140,295
Int. Cl.[4] H01G *7/00*
U.S. Cl. 361—286 4 Claims



1. A spiral sensor comprising

first and second elongated electrodes, and

a layer of dielectric material surrounding each of said elongated electrodes separately, said dielectric material having electrical properties that vary with a characteristic of the environment, and

at least one bare wire,

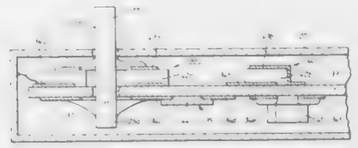
said elongated electrodes separately surrounded by dielectric material being spirally twisted, each one about the other, to form a pair of multiturn electrodes spiraled with said bare wire, each elongated electrode tightly engaging said dielectric material, said dielectric material being distributed throughout the length of said spiral sensor, whereby said electrodes and dielectric material surrounding each electrode are urged into constant contact with each other and said bare wire.

4,858,064

THICK-FILM HIGH FREQUENCY SIGNAL CIRCUIT APPARATUS WITH FEEDTHROUGH CAPACITOR

Masao Segawa, and Masayuki Arakawa, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 3, 1988, Ser. No. 251,747
Claims priority, application Japan, Oct. 29, 1987, 62-275202; Jan. 20, 1988, 63-11607
Int. Cl.[4] H01G *4/42;* H03H *7/01*
U.S. Cl. 361—302 24 Claims



1. A thick-film high frequency signal circuit apparatus with a feedthrough capacitor, comprising:

a thick-film circuit in which a high frequency signal circuit is constituted on a substrate in a thick-film configuration;

a shielding case for housing the thick-film circuit therein;

a feedthrough capacitor constituted on one surface of the substrate in the thick-film configuration; and

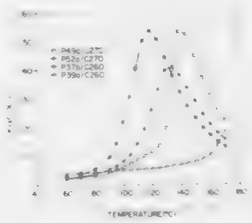
means for transmitting signals between the thick-film circuit and a circuit outside the shielding case, the signal transmitting means having a first end coupled to the thick-film circuit through the feedthrough capacitor and a second end protruding outside the shielding case through a hole defined therein.

4,858,066

NONLINEAR DIELECTRIC CAPACITOR FOR PULSE GENERATION APPLICATIONS

Robert T. McSweeney, Wakefield, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Dec. 22, 1988, Ser. No. 288,740
Int. Cl.[4] H01G *4/12;* C04S *35/00*
U.S. Cl. 361—321 7 Claims



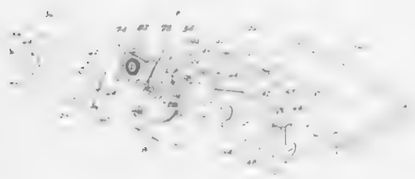
1. An improved ferroelectric ceramic capacitor comprised of a nonlinear dielectric based upon materials in the $Pb(Mg_{0.33}Nb_{0.67})O_3$—$PbTiO_3$—$Pb(Me_{0.50}W_{0.50})O_3$ system, wherein Me represents a metal ion having a +2 valence.

4,858,067

MODULAR ELECTRONIC CONTROL HOUSING ASSEMBLY

Gary P. Rochelle, Malibu, and Charles R. Lile, Tustin, both of Calif., assignors to CRL Electronics, Inc., Orange, Calif.

Filed Nov. 18, 1987, Ser. No. 122,123
Int. Cl.[4] H02B 1/08
U.S. Cl. 361—331 4 Claims



1. A modular electronic control housing assembly for a spa water conditioning system, the assembly comprising:

(a) a housing having an open front and an open bottom;

(b) a front plate removably attached to said housing to cover said open front of said housing;

(c) a chassis removably mounted within said housing, said chassis comprising a base, a front wall depending from said base; and

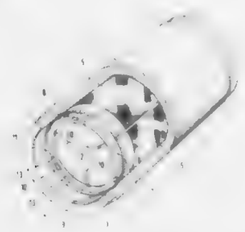
(d) a plurality of flanges projecting from said wall, each of said flanges comprising a first flange projecting forward from the side of said wall and a second flange projecting outward from said first flange, each of said flanges being clamped between said housing and said front plate to thereby support said chassis in said housing.

4,858,068

ELECTRONIC CIRCUIT HOUSING

Jean-Pierre Bitller, Plaisir; Pascal Faucher, Longjumeau; Monique Hang-Hu, Sainte Genevieve des Bois, and André Pelet, Maurepas, all of France, assignors to Alcatel CIT, Paris, France

Filed Mar. 23, 1988, Ser. No. 251,161
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—380 9 Claims



1. A housing for electronic circuits including a tubular shell in which are assembled frames each having the shape of a cylindrical sector containing the electronic circuits, wherein said housing is provided with means for fastening the frames within the tubular shell, said means being constituted at one end of said tubular shell by an internal radial flange which is integral with the internal wall of the tubular shell and to which the frames are attached at one end, and at the other end of the tubular shell by an expandable collar which is attached to said frames in such a manner as to produce expansion and locking within said tubular shell.

4,858,069

ELECTRONIC HOUSING FOR A SATELLITE EARTH STATION

Paul R. Hughes, Sudbury, Mass., assignor to GTE Spacenet Corporation, Waltham, Mass.

Filed Aug. 8, 1988, Ser. No. 229,944
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—384 28 Claims



1. A compact electronic housing for a satellite earth station comprising

a first compartment and a second compartment separated by a panel common to said first compartment and said second compartment;

said first compartment being atmospherically isolated from outside air and said second compartment, said first compartment having a top inside surface and an access means for accessing electronic components contained therein;

said electronic components comprising a first group of electronic components, a second group of electronic components, a third group of electronic components, and a fourth group of electronic components;

said first group of electronic components generating more heat and/or tolerating a higher maximum operating temperature than said second group of electronic components, said third group of electronic components, and said fourth group of electronic components, said first group of electronic components being located above said second group of electronic components and said third group of electronic components;

said third group of electronic components generating less heat and/or tolerating a lower maximum operating temperature than said first group of electronic components and said second group of electronic components, said third group of electronic components being located below said first group of electronic components, said second group of electronic components, and said fourth group of electronic components;

said fourth group of electronic components having a lower maximum operating temperature than said first, second, and third groups of electronic components;

said second compartment containing a plurality of heat exchanger means for transferring heat from said electronic components to said outside air, said plurality of heat exchanger means comprising a first heat exchanger means, a second heat exchanger means, a third heat exchanger means, and a fifth heat exchanger means;

said second compartment having a bottom opening and a top opening to provide for movement of outside air causing a chimney effect within said second compartment, said outside air entering said second compartment through said bottom opening, contacting and cooling said plurality of heat exchanger means and exiting said second compartment through said top opening;

said panel comprising a first, second , and third conductive heat transferring means for transferring heat from said electronic components and a fourth conductive heat transferring means for transferring heat from a fourth heat exchanger means contained in said first compartment to said plurality of heat exchanger means contained in said second compartment, said first, second, third, and fourth conductive heat transferring means each having a first side and a second side;

said first group of electronic components being connected to said first side of said first conductive heat transferring means and said first, heat exchanger means being connected to said second side of said first conductive heat transferring means opposite said first group of electronic components, said second group of electronic components being connected to said first side of said second conductive heat transferring means and said second heat exchanger means being connected to said second side of said second conductive heat transferring means opposite said second group of electronic components, said third group of electronic components being connected to said first side of said third conductive heat transferring means and said third heat exchanger means being connected to said second side of said third conductive heat transferring means opposite said third group of electronic components, said fourth group of electronic components being connected to said top inside surface of said first compartment and being isolated from said first conductive heat transferring means;

said first conductive heat transferring means being adjacent to and above said second conductive heat transferring means, said second conductive heat transferring means being insulated by an insulating material from said first conductive heat transferring means having said first group of electronic components being connected thereto, said second conductive heat transferring means being adjacent to and above said third conductive heat transferring means, said third conductive heat transferring means being insulated by an insulating material from said second conductive heat transferring means having said second group of electronic components being connected thereto, said third conductive heat transferring means being adjacent to and above said fourth conductive heat transferring means, said fourth conductive heat transferring means being insulated by an insulating material from said third conductive heat transferring means having said third group of electronic components being connected thereto; and

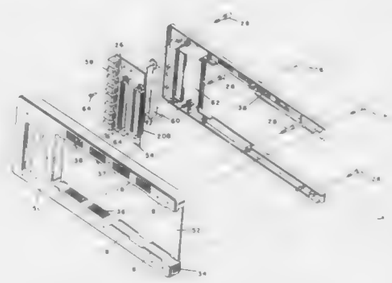
said first compartment containing an air moving means for removing convective heat generated by said groups of electronic components, said air moving means being adapted to conveying air by recycling said air within said first compartment by contacting said air to said fourth heat exchanger means connected to said first side of said fourth conductive heat transferring means, cooling said air, conveying said air after contacting said fourth heat exchanger means to said fourth group of electronic components, to said first group of electronic components, to said second group of electronic components, to said third group of electronic components, and back to said air moving means.

4,858,070

MODULAR EXPANDABLE HOUSING ARRANGEMENT FOR ELECTRONIC APPARATUS

Douglas J. Buron, Plantation; Sheldon Steinman, Miramar, and Donald L. Wray, Lauderhill, all of Fla., assignors to Racal Data Communications Inc., Sunrise, Fla.

Filed Apr. 24, 1987, Ser. No. 42,186
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—384 18 Claims



1. A modular housing for electronic apparatus, comprising in combination:

an approximately C-shaped enclosure member having an inner portion and first and second major sides; said enclosure member including:

a male stacking enclosure connector on said first major side;

a female stacking enclosure connector on said second major side;

said male stacking enclosure connector and said female stacking enclosure connector referenced collectively as stacking enclosure connector; and

a first cassette connector situated at said inner portion;

a cassette for carrying an electronic apparatus, said cassette being suitable for engaging said inner portion of said C-shaped enclosure member; said cassette including:

a second cassette connector situated on said cassette and suitable for engagement with said first cassette connector; and

slidable engaging means for slidably coupling said enclosure member and said cassette together, said engaging means including an elongated rail on said enclosure member and an elongated groove on said cassette, said rail being slidable within said groove to facilitate engagement and alignment of said cassette with said enclosure member.

4,858,071

ELECTRONIC CIRCUIT APPARATUS

Takahiro Manabe, Katano; Mikio Nozu, Yamatokouriyama; Yasuhito Osada, Katano, and Hiroyuki Nomura, Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd., Kadoma and Matsushita Electric Industrial Co., Ltd., Yokohama, both of, Japan

Filed Feb. 23, 1988, Ser. No. 159,098
Claims priority, application Japan, Feb. 24, 1987, 62-40892
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—386 12 Claims

1. An electronic apparatus comprising:

a flexible printed circuit substrate having wiring conductors of a predetermined pattern on which electronic parts are mounted, said flexible printed circuit substrate comprising:

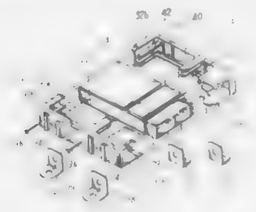
a first area having mounted thereon electronic parts which generate heat,

a second area continuous with and bent substantially perpen-

dicular to said first area and having means for connecting an external device,

a third area continuous with and bent substantially perpendicular to said second area and facing said first area and having mounted thereon electronic parts which are to avoid temperature rise,

a fourth area continuous with and bent substantially perpendicular to said first area, said fourth area being spaced from and substantially parallel to said second area, and



a fifth area continuous with and bent substantially perpendicular to said fourth area, said fifth area having connected thereto electronic parts which are to avoid temperature rise,

a heat radiating plate disposed on an outer surface of said first area facing away from said third area, and

a housing accommodating said flexible printed circuit substrate while covering at least a portion of said plate exposed to atmosphere.

4,858,072
INTERCONNECTION SYSTEM FOR INTEGRATED CIRCUIT CHIPS
Louis E. Chall, Jr., Costa Mesa, Calif., assignor to Ford Aerospace & Communications Corporation, Newport Beach, Calif.
Filed Nov. 6, 1987, Ser. No. 118,362
Int. Cl.[4] H01L *23/04, 23/34, 23/48*
U.S. Cl. 361—388 **17 Claims**

1. A leadless interconnection system for integrated circuits, comprising:

(a) a substrate for supporting chip carriers; and

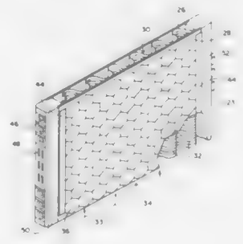
(b) a plurality of chip carriers mounted on said substrate adjacent to each other, each of said carriers including:

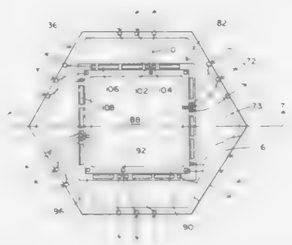
(i) a carrier body having a geometric shape such that said carriers may be disposed on said substrate to form a mosaic;

(ii) connection pads so arranged on the periphery of said geometric shape of said body that when said carriers are disposed in said mosaic, each connection pad is immediately adjacent to a corresponding connection pad of another carrier of the mosaic;

(iii) an integrated circuit chip mounted on said carrier body;

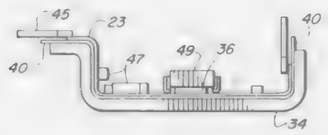
(iv) said chip, carrier and mosaic being so configured as to allow said chip to selectively transmit and receive data to and from a chip on any adjacent carrier in said mosaic through said connection pads;





(c) immediately adjacent ones of said connection pads being electrically connected to each other without the use of intervening wires or leads formed on said carrier.

4,858,073
METAL SUBSTRATED PRINTED CIRCUIT
Vernon C. Gregory, Escondido, Calif., assignor to Akzo America Inc., New York, N.Y.
Continuation-in-part of Ser. No. 940,523, Dec. 10, 1986, abandoned. This application Mar. 21, 1988, Ser. No. 170,546
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—388 **44 Claims**



1. An electronic metal printed circuit board structure including in combination:

a metal substrate;

an electrical insulation layer of plastic film having first and second sides;

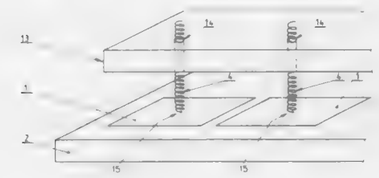
conductive foil means bonded to the first side of said plastic film, said conductive foil means having a first predetermined thickness;

a heat dissipating conductor plate having a thickness greater than said first predetermined thickness attached to at least a portion of said conductive foil means;

semiconductor means mounted in heat exchanging proximity to said conductor plate;

bonding means selected from the group consisting of polyetherimide, polysulphone and polyethersulphone bonding the second side of said plastic film to said metal substrate, the combined thickness of said plastic film and said bonding means being less than twenty microns, and substantially less than the thickness of said conductor plate and said metal substrate, to permit heat dissipation into said metal substrate from said foil means and said conductor plate while providing electrical insulation between said substrate and said conductive foil means.

4,858,074
METHOD OF ASSEMBLING POWER CIRCUITS AND CONTROL CIRCUITS ON SEVERAL LEVELS IN THE SAME MODULE AND A MODULE THUS OBTAINED
Jean-Louis Mallet, and Jean-Louis Landais, both of Merignac, France, assignors to Power Compact, Societe Anonyme, Merignac, France
Filed Apr. 22, 1988, Ser. No. 184,955
Claims priority, application France, Apr. 22, 1987, 87 05876
Int. Cl.[4] H05K *1/14, 3/36*
U.S. Cl. 361—388 **8 Claims**



1. A power module having power circuits and control circuits, comprising:

a ceramic substrate fixed to a heat dissipating base;

a plurality of power circuits mounted to said ceramic substrate to form a lower level;

a plurality of control circuits mounted to a desired substrate to form a middle level over said lower level;

at least one electrically conductive spring means providing electrical connection between said lower and middle levels;

said electrically conductive spring means being disposed substantially perpendicular to said lower and middle levels, said electrically conductive spring means being welded to desired positions in said lower level and said middle level; and

at least one resin material embedding said lower and middle levels.

6. A method of assembling a power module having power circuits and control circuits, comprising:

fixing a ceramic substrate to a heat dissipating base;

mounting a plurality of power circuits to said ceramic substrate a form a lower level;

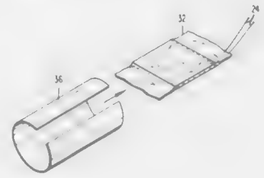
mounting a plurality of control circuits to a desired substrate to form a middle level over said lower level;

electrically connecting said lower and middle levels with at least one electrically conductive spring means;

fixing a wall which encloses said lower and middle levels to said heat dissipating base; and

providing the portion of the module bounded by said wall and said base with at least a first layer of a soft resin material to absorb any thermal expansion which occurs in said power circuits.

4,858,075
RF SHIELDED AND ELECTRICALLY INSULATED CIRCUIT BOARD STRUCTURE AND METHOD OF MAKING SAME
Donald J. Butterworth, Glen Mills, Pa., assignor to Bell of Pennsylvania, Philadelphia, Pa.
Filed Jan. 30, 1987, Ser. No. 8,664
The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.
Int. Cl.[4] H05K *1/14*
U.S. Cl. 361—395 **6 Claims**



1. An RF shielded and electrically insulated electronic circuit board structure, comprising:

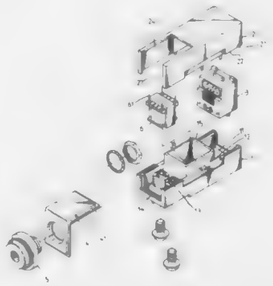
a circuit board for mounting electronic components thereon;

a first heat shrink tubing layer wrapping the circuit board and any wiring patterns and any components thereon;

an electrically conductive layer on said first heat shrink tubing layer; and

a second heat shrink tubing layer wrapping the conductive layer to retain said conductive layer to said board structure.

4,858,076
CONVERTER
Ming T. Tsai, No. 70, An Ping Rd., Tainan, Taiwan
Filed Sep. 30, 1987, Ser. No. 103,732
Int. Cl.[4] H05K *7/02*
U.S. Cl. 361—417 **1 Claim**



1. A converter, comprising:

a cast bottom, having an isolation trough defined in part by two vertical ribs, a trough stand, two connection cylinders and an inserting groove at one end, said isolation trough being formed to accommodate a receptacle stand, said isolation trough being separated by the two ribs from the trough stand wherein a transformer is mountable to four setting plates located at the inner bottom of the trough stand for holding the transformer tightly, said two connection cylinders enabling outer connection of the transformer, and said inserting groove enabling the insertion of a fixing bracket to fix the converter;

a cast top having an isolation trough for covering an upper

portion of a receptacle stand when one is installed in the isolation trough of said case bottom and a U-shaped recess trough with two setting points on each wall for preventing said fixing bracket from sliding down when inserted thereinto;

a receptacle stand installed within the isolation troughs of the cast bottom and the cast top, respectively;

said fixing bracket having a rim plate for insertion into said inserting groove formed in said cast bottom and a groove providd in the U-shaped recess trough of the cast top, said fixing bracket being formed to receive a receptacle for attachment thereto; and

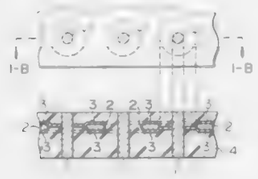
a receptacle mounted in selected alignment with respect to said fixing bracket and fixed thereto, preferably with a locking washer and a nut, said receptacle and said isolation troughs coacting so that when resin is poured into the trough stand of the cast bottom it will not flow randomly but will be confined by the walls of the trough stand to enable said resin to set around and under ssid transformer to hold said transformer in place, whereby the receptacle, the two connection cylinders, the transformer, the receptacle stand and any connecting wires will not be surrounded by nor adhered to by said poured in resin.

4,858,077

CONDENSER-CONTAINING, CERAMIC MULTI-LAYER CIRCUIT BOARD AND SEMICONDUCTOR MODULE AND COMPUTER HAVING THE CIRCUIT BOARD

Hiroichi Shinohara, Hitachi; Hideo Suzuki, Katsuta, and Satoru Ogihara, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 25, 1988, Ser. No. 276,029
Claims priority, application Japan, Nov. 25, 1987, 62-295360
Int. Cl.[4] H01L *23/02;* **H02M** *7/538;* **H05K** *1/18*
U.S. Cl. 361—414 **12 Claims**



5. A condenser-containing, ceramic multi-layer circuit board which comprises a plurality of layers of ceramic insulating material having circuit conductors, throughholes and condensers composed of ceramic dielectric condenser material having a higher dielectric constant than that of the ceramic insulating material and a pair of electrodes sandwiching the ceramic dielectric condenser material, the condensers being in a layer structure with openings concentric to the individual throughholes and having a larger diameter than the diameter of the throughholes with a distance between the condenser opening edges surrounding the corresponding throughholes and the throughhole peripheral edges, thereby forming clearances therebetween and the ceramic insulating material being filled in the clearances between the condenser opening edges and the corresponding throughhole peripheral edges without any contact with the ceramic dielectric condenser material and the throughholes.

4,858,078

SOLID ELECTROLYTIC CAPACITOR

Takeshi Morimoto; Eiji Endoh, and Satoshi Takemiya, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo and Elna Company Ltd., Fujisawa, both of, Japan

Filed Oct. 28, 1988, Ser. No. 264,036
Claims priority, application Japan, Oct. 30, 1987, 62-273428
Int. Cl.[4] H01G *9/05;* **H01B** *1/00*
U.S. Cl. 361—527 **9 Claims**

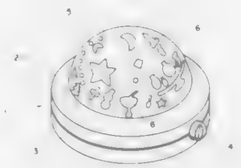
3. A solid electrolytic capacitor comprising a dielectric oxide layer and a solid electrolyte layer of a conductive polymer compound formed thereon, wherein a flexible polymer compound layer is formed on at least the surface of said conductive polymer compound.

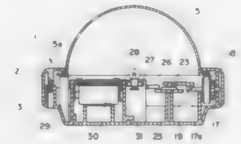
4,858,079

LIGHT PROJECTING TOY MUSICAL BOX

Michiya Ohashi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Aug. 31, 1988, Ser. No. 238,528
Claims priority, application Japan, Nov. 16, 1987, 62-174583[U]; Jan. 27, 1988, 63-9094[U]
Int. Cl.[4] F21V *21/30;* **A63H** *1/28*
U.S. Cl. 362—35 **20 Claims**





1. A light projecting toy musical box comprising:

a base;

a dome movably mounted on the base and being substantially translucent;

a lamp disposed within the base and projecting light through the dome;

an acoustic mechanism, disposed within the base, for generating musical sound; and

drive means, disposed within the base, for simultaneously moving the dome, actuating the acoustic mechanism, and switching on the lamp so that movement of the dome and lighting of the lamp are synchronized with the musical sound generated by the acoustic mechanism.

4,858,080

HEADLIGHT MOVING APPARATUS FOR AUTOMOTIVE VEHICLE

Takahiro Oikawa, Susono, Japan, assignor to Yazaki Corporation, Japan

Filed Mar. 9, 1988, Ser. No. 165,795
Int. Cl.[4] B60Q *1/08*
U.S. Cl. 362—61 **3 Claims**

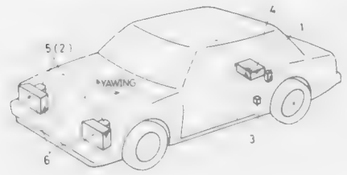
1. A headlight moving apparatus for an automotive vehicle provided with at least one headlight, which comprises:

(a) vibrational angular rate sensor means for detecting yaw rate of the automotive vehicle;

(b) means for detecting vehicle speed;

(c) means for detecting headlight position;

(d) means, coupled to said vibrational angular rate sensor means, vehicle speed detecting means, and headlight position detecting means, for generating a headlight actuating signal indicative of an appropriate headlight turning position on the basis of the detected yaw rate, vehicle speed, and headlight position; and



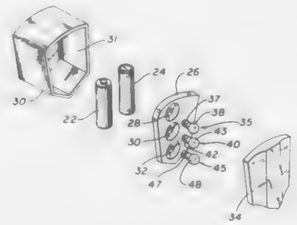
(e) means, coupled to said signal generating means, for actuating the headlight in response to the generated headlight actuating signal.

4,858,081

VEHICLE OPTICAL SAFETY APPARATUS

Terry J. James, 19545 Sherman Way, Reseda, Calif. 91335

Filed Dec. 28, 1987, Ser. No. 138,394
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—72 **3 Claims**



1. A multi-purpose optical safety apparatus for a vehicle having a tension controlled braking mechanism comprising:

a housing including an aperture and three socket indentations;

a first and a second light bulb socket mounted in two of said socket indentations with said first and second sockets electrically connected in parallel;

a third light bulb socket mounted in the remaining socket indentation;

four electrically conducting battery contacts attached within said housing;

a pair of batteries secured within said housing by said battery contacts;

mounting means for securing said housing to said vehicle;

a mirror including three holes with relief areas for focusing light energy surrounding said holes, wherein said mirror is positioned within said housing with said three holes axially coincident with said three sockets;

three light bulbs, each having a base and a neck, wherein the base of each is mounted in one of said sockets and the neck of each is circumscribed by one of said holes;

a reflector attached to said housing and eclipsing said aperture;

a manually actuated, electromechanical safety switch mounted on said housing and electrically coupled to said third socket, and

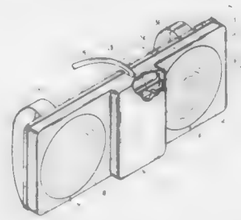
an electromechanical braking switch mounted on said vehicle, electrically connected to said first and second sockets and having a mechanical extension fastened to said braking mechanism, wherein application of said braking mechanism induces motion in said extension and mometary closing of said braking switch.

4,858,082

EMERGENCY LIGHT SYSTEM

Walter Hayward, 3307 N. Chestnut Ave., Loveland, Colo. 80538

Filed May 3, 1988, Ser. No. 189,701
Int. Cl.[4] B60Q *7/00*
U.S. Cl. 362—74 **9 Claims**



1. An emergency light system in use mounted in combination with a vehicle visor and comprising:

a housing of a size and shape to be mountable to and carried by said vehicle visor;

means for mounting said housing to said visor;

at least one portion of said housing having a conformation receptive of a strobotron exposed for directing light only outwardly of said vehicle away from said housing when in use;

another portion of said housing conformed to define a cavity;

a strobotron mounted to said one portion;

a firing unit mounted within said cavity and connected to cyclically ignite said strobotron;

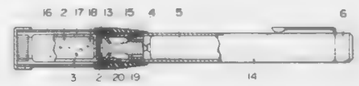
and means for energizing said firing unit.

4,858,083

COLOR CHANGEABLE PHOTO-DECORATIVE PENCIL TORCH

Yasuo Wakimoto, 3-6, Nishisakusa 1-chome, Taito-Ku, Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 286,897
Claims priority, application Japan, Dec. 25, 1987, 62-198799
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—101 **6 Claims**



1. A color changeable photo-decorative pencil torch comprising:

a transparent hollow body, said transparent hollow body having an incident port of illuminating light at a part thereof and containing light scattering liquid and a plurality of small pieces therein, each of said small pieces being substantially as same as the light scattering liquid in specific gravity and having reflecting plates on the surface thereof, and said small pieces floating in the light scattering liquid;

an illuminating light source, said illuminating light source being faced to the incident port of illuminating light of the hollow body;

a color plate, said color plate being placed at the connecting cross section of the transparent hollow body and the illuminating light source; and

a color plate housing chamber, said chamber housing the color plate.

4,858,084

ILLUMINATED COASTER FOR A DRINKING VESSEL

Richard Sheryll, 340 West 87th St., New York, N.Y. 10024

Filed Jul. 1, 1988, Ser. No. 214,287
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—101 12 Claims

1. An illuminated coaster for a drinking vessel comprising:

a battery powered light having first and second electrically conducting leads;

an integral base open at the top comprising a circular bottom wall and a cylindrical sidewall, said base including

a plurality of upstanding walls defining a holder for at least one battery; and

a cylindrical wall for receiving said light, said cylindrical wall having first and second openings for said first and second leads;

first and second electrically conducting contacts disposed at either end of said holder for contacting the poles of a battery disposed therein;

means for securing said first lead of said light to one of said contacts;

a third electrically conducting lead, means for securing one end of said third lead to the other of said contacts, the other end of said third lead crossing said second lead;

means for biasing said second and third leads in spaced apart relation; and

switch means disposed in said base for movement to a first position wherein said second and third leads are in electrical conducting contact when a drinking vessel is disposed in said open top of said base for completing the circuit comprised of said battery and said light thereby powering said light for illuminating said drinking vessel, and a second position wherein said second and third leads are retained by said biasing means in spaced apart relation for opening said circuit when said drinking vessel is out of said holder.

4,858,085

ILLUMINATING SYSTEM

Henry Von Kohorn, 945 Treasure La., Vero Beach, Fla. 32963

Filed Apr. 21, 1988, Ser. No. 184,117
Int. Cl.[4] F21P *1/02*
U.S. Cl. 362—122 14 Claims



1. An illuminating system comprising

an electric light source,

a light chamber adapted to contain said light source, having a bottom and a light-impervious wall permitting light to escape upwardly,

means to supply electricity to said light source,

a plurality of vertically extending, hollow structures disposed above and proximate to said light chamber, forming individual passageways for and adapted to conduct light, said structures

having inner non-reflective surface portions,

having lower ends in light-receiving relationship with said light chamber,

having upper light-emitting ends pointing upwardly,

said system further comprising light-blocking means restricting the upward passage of light through said structures in such manner that the cross-sections of the light beams emitted at said upper ends are smaller than the cross-sections of said structures at their upper ends, so that said restricted light beams passing through said structures do not substantially impinge upon the inner surfaces of said structures near their upper ends, and

means to support said structures without preventing the upward passage of light therethrough,

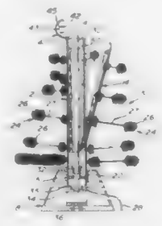
so that light projected upwardly by said light source passes through said structures and is emitted at the upper ends of said structures without being directly visible to nearby observers, said light being visible only by its reflections from illuminated objects.

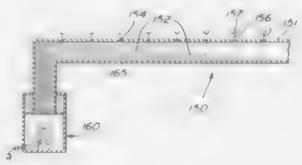
4,858,086

INTERNAL ILLUMINATED DECORATIVE DISPLAYS

Michael Pietrantonio, 7725 Dollier Street, St-Leonard, Quebec, Canada (H1S 2K1), and Giuseppe De Frenza, 7722 Dollier Street, St-Leonard, Quebec, Canada (H1S 2J9)

Filed Jun. 16, 1987, Ser. No. 62,639
Claims priority, application Canada, Nov. 26, 1986, 523807
Int. Cl.[4] F21P *1/02*
U.S. Cl. 362—123 11 Claims





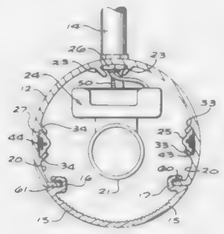
1. An illuminated decorative display in the form of a Christmas tree, including a structural housing with an enclosure wall in the form of a hollow tubular trunk of the tree, a light source extending throughout the hollow trunk, in the form of an elongated tubular light, solid light conducting members made of cast organic material each having a stem portion and branch portions cast and extending from the stem portion in such a manner that the stem portion and branch portions transmit visible light to the ends of the branch portions and the stem portion, the light conducting members forming the tree branches of the Christmas tree with the one end of the tree branch penetrating a discrete opening in the hollow tubular trunk and being in close proximity to the light source and the branches of the light conducting member being in the form of evergreen needles extending from the stem of the tree branch such that light is emitted at the end of the stem and at the end of the needles of the tree branch.

4,858,087

UNIVERSAL CIRCULAR ENCLOSURE FOR STANDARD STRIP FLUORESCENT FIXTURE

Gary Hartshorn, Glendale, Calif., assignor to Lee Vande Sande, Glendale, Calif.

Filed May 1, 1987, Ser. No. 44,966
Int. Cl.[4] F21V *21/00;* F21S *3/00*
U.S. Cl. 362—219 16 Claims



1. An enclosure for lighting fixtures comprising: an elongated open ended hollow member having an outer surface, an interior wall and an elongated light emitting opening therein;

said elongated hollow member including at least one integral track on the interior wall of said member for capturing a spline within said track;

a plurality of rigid splines dimensioned to enter the end of said member and move within said track and engage the interior surface of said member defining said track at various positions along said track;

longitudinally spaced means for securing said splines within said tracks wherein said splines may engage end regions of adjacent lengths of said elongated enclosure to lock said lengths into a continuous elongated structure; and

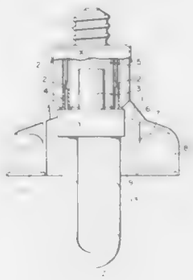
additional means engaging said splines for securing a lamp fixture thereto.

4,858,088

LIGHTING FIXTURE HAVING IMPROVED HEAT DISSIPATION CHARACTERISTICS

Michael S. Pietro, Staten Island, N.Y., assignor to Eastrock Technology, Inc., Hackettstown, N.J.

Filed Dec. 2, 1987, Ser. No. 127,472
Int. Cl.[4] F21V *29/00*
U.S. Cl. 362—294 20 Claims



said lateral wings and placed in front of said longitudinal opening,

said electric supply means comprising at least one insulating support element for receiving a succeeding series of electric contact pairs mounted thereon, each said electric contact pair being adapted to receive the electric connections at the end of a current consuming element such as a tubular electric lamp,

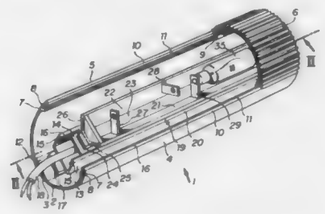
wherein said electric supply means further comprises an intermediate structure of insulating material, inserted between said housing bottom and said insulating support element, and having a bottom portion and a top portion, said bottom portion of said intermediate structure being fixed to said bottom of said housing, said top portion comprising means for mounting said insulating support element thereon, an inner height of said intermediate structure being chosen so as to allow the passage of at least one electric wire to be connected to a power supply.

4,858,089

ELONGATED LIGHTING DEVICE

Youri Agabekov, 73 route de Thonon, 1222 Vésenaz, Switzerland

Continuation of Ser. No. 833,407, Jan. 13, 1986, abandoned. This application Jun. 1, 1988, Ser. No. 203,644
Claims priority, application Switzerland, May 15, 1984, 2385/84
Int. Cl.[4] F21S *3/00;* H05B *33/02;* F21V *5/00*
U.S. Cl. 362—249 16 Claims



1. An elongated lighting device, comprising:

a housing having a bottom, two lateral wings, a longitudinal opening for receiving a light-transmitting closure, and electric supply means mounted on said bottom in the interior of said housing, such as to be enclosed between

1. An apparatus for operating a lamp, said apparatus comprising:

a housing having a mounting for mounting the lamp, and a connector for electrically connecting a lamp mounted in said apparatus to a source of electrical power, said connector comprising electrical contacts for engaging contacts of the lamp;

a ballast compartment for receiving a reactive ballast for stabilizing power applied to the lamp; and

cooling means comprising at least one vent disposed at a position intermediate said mounting and said ballast compartment to provide cooling to both the lamp and the reactive ballast during operation of the lamp.

4,858,090

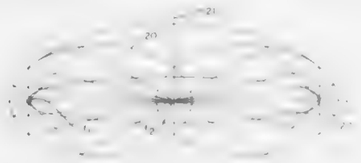
ELLIPSOIDAL REFLECTOR CONCENTRATION OF ENERGY SYSTEM

James W. Downs, 3846 Dunford Way, Santa Clara, Calif. 95051

Continuation-in-part of Ser. No. 68,811, Jun. 26, 1987, Pat. No. 4,754,381, Continuation of Ser. No. 815,521, Jan. 2, 1986, abandoned. This application Jun. 22, 1988, Ser. No. 209,962
Int. Cl.[4] F21V *7/00*
U.S. Cl. 362—297 14 Claims

1. An ellipsoidal reflector system for the concentration of energy comprising: a primary ellipsoidal reflector; a secondary reflector; said primary ellipsoidal reflector having a first focal location and a second focal point; said secondary reflector being confocal with said primary ellipsoidal reflector; struc-

tural means interconnecting said primary ellipsoidal reflector and said secondary reflector; energy source means generating radiated energy moving in paths coexistent with said first focal location; said primary ellipsoidal reflector shaped to reflect said radiated energy moving in paths coexistant with said first focal location toward said second focal point; with said sec-



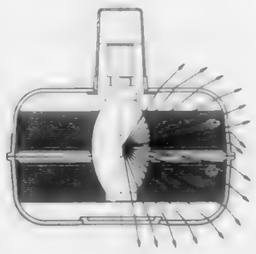
ondary reflector being shaped to reflect radiated energy reflected toward said second focal point to run along the major axis of said system normal to said secondary reflector approaching the major axis as an asymptote; wherein said primary ellipsoidal is one end of an ellipsoidal including said secondary reflector at the other ellipsoidal end.

4,858,091

LUMINAIRE WITH UPLIGHT CONTROL

Herbert A. Fouke, Newark, Ohio, assignor to Manville Corporation, Denver, Colo.

Filed Dec. 1, 1987, Ser. No. 127,339
Int. Cl.[4] F21V *5/02*
U.S. Cl. 362—332 3 Claims



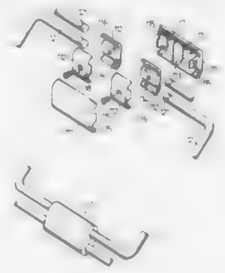
1. A luminaire comprising an HID light source, a first refractor having a substantially horizontal portion and a sidewall, prisms formed on the inner surface of said horizontal portion of said first refractor for the upward distribution of light rays, prisms formed on the outer surface of said sidewall of said first refractor for directing light rays upward from the horizontal, and prisms formed on the exterior of the sidewall of said first refractor for directing light rays below horizontal by an angle greater than 30° and a second refractor having a substantially horizontal portion and a sidewall, prisms formed on the exterior surface of said horizontal portion of said second refractor for directing light downward and prisms formed on the sidewall of said second refractor for directing light rays below horizontal by an angle greater than 30°.

4,858,092

CORDLESS CONDUCTING MEANS FOR LAMP

James Lu, 6-3 Fl., No. 512, Sec. 4, Chungsiao E. Rd., Taipei, Taiwan

Filed Dec. 7, 1988, Ser. No. 281,018
Int. Cl.[4] F21S *1/12;* F21V *21/26*
U.S. Cl. 362—413 1 Claim



1. A cordless conducting means for a lamp comprising the combination of:

(a) two half-casings which are substantially rectangular and which are made of insulating material, two semi-circular cutouts being provided on each side of each half-casing, an insulating baffle being positioned in one of said half-casings to divide said half-casings into two equal chambers;

(b) two pairs of positioning means which are conductive and splitable into two parts which match each other and which are retained in said chambers, each said pair fitting in a respective chamber, two semicircular recesses being provided in each part and a circular protrusion being arranged in each semicircular recess, each of the pairs of positioning means being threadably secured together; and

(c) a plurality of bent conductors which are retained in said semi-circular recesses, a circumferential slot being arranged in an end of each said bent conductors, said bent conductors projecting from said positioning means and having a coat of insulating

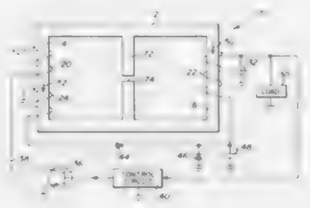
material thereon.

4,858,093

INTEGRATED MAGNETIC POWER CONVERTER

Clayton L. Sturgeon, Watauga, Tex., assignor to Qualitron, Inc., Dallas, Tex.

Filed Dec. 12, 1988, Ser. No. 283,191
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—20 27 Claims



1. An integrated magnetic power converter for supplying power to a load comprising:

a continuous magnetic structure having first and second legs and a magnetic path therebetween;

primary winding means wound on said first leg;

first secondary winding means wound on said second leg and connected to the load;

second secondary winding means in series with said first secondary winding means and wound on said first leg;

first circuit means connected to said primary winding means for supplying energy to the power converter;

second circuit means coupled to said secondary winding means for transferring energy to the load; and

third circuit means coupled to said secondary winding means for transferring energy from said first secondary winding means to the load, such that when energy is supplied to said primary winding means for transformation to said first secondary winding means, a magnetic flux is produced in said magnetic path for power transfer to the load and an amount of energy is stored in the area surrounding said magnetic structure and said magnetic path, and when energy applied to said primary winding means is removed, said stored energy induces a magnetic flux in said magnetic path and energy is transferred to the load via said first and second secondary winding means and said second circuit means.

4,858,094

SWITCHED MODE POWER SUPPLY WITH IMPROVED LOAD REGULATION

Francis M. Barlage, Tucson, Ariz., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 18, 1988, Ser. No. 259,218
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 10 Claims



1. A switched mode power supply having improved load regulation including an integrator circuit, a comparator circuit connected to said integrator circuit, a square wave generator, and AND circuit connected to said square wave generator, a power driver circuit connected to said AND circuit, an output transformer connected to said power driver circuit, an output circuit including load means connected across a secondary winding of said transformer, a diode connected between one end of said secondary winding and said load and a capacitor connected across said load, feedback means inductively connected to said output circuit and connected to said integrator characterized in that said integrator includes an operational amplifier having a controlled reference signal supplied to its non-inverting input terminal, said feedback means is connected to its inverting input terminal and a resistor is connected between said non-inverting terminal and the output terminal of said operational amplifier to provide positive feedback.

4,858,095

MAGNETRON DRIVE APPARATUS

Ryuho Narita, Yokohama; Hidenori Kako, Yokosuka, and Humihiro Imamura, Aichi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 19, 1988, Ser. No. 259,707
Claims priority, application Japan, Dec. 4, 1987, 62-306927
Int. Cl.[4] H02M *3/335;* H05B *9/06*
U.S. Cl. 363—21 11 Claims

1. A magnetron drive apparatus in which a high frequency voltage converted and outputted by a frequency converter is inputted to a primary winding of a transformer and a high voltage power outputted from a secondary winding of the transformer is rectified and supplied to an anode of the magnetron and a power outputted from a heater winding of the transformer is supplied to a heater of the magnetron, said apparatus comprising:

magnetic flux leakage means disposed in a magnetic path formed by the primary and secondary windings of the transformer and increasing a leakage magnetic flux in the magnetic path; and





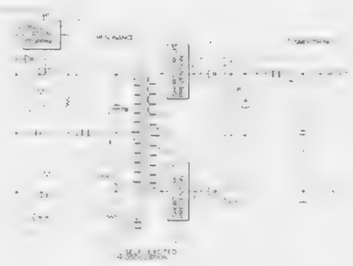
means for winding the secondary winding and the heater winding therearound in a position opposite the primary winding with the magnetic flux leakage means arranged therebetween.

4,858,096

RESONANT CONVERTER FOR STABILIZED OPERATION OF SWITCHING DEVICES

Kenichi Onda; Yasuo Matsuda; Kojin Abe; Yasunori Iwafuji; Hiroyuki Aoyama, all of Hitachi, and Hideo Yoshinaka, Kumagaya, all of Japan, assignors to Hitachi, Ltd. and Hitachi Metals, Ltd., Tokyo, Japan

Filed Apr. 6, 1988, Ser. No. 178,193
Claims priority, application Japan, Apr. 7, 1987, 62-83760; Sep. 9, 1987, 62-225654
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—22 20 Claims



4. A self excited resonant converter comprising:

a resonant circuit having a capacitor and a reactor;

a pair of switching devices connected with both ends of said reactor;

a D.C. power source, connected in series with an input reactor, for supplying electric power to said resonant circuit through said pair of switching devices;

a transformer having said reactor in said resonant circuit as a primary winding;

a self-excited oscillation circuit connected with control electrodes associated with said switching devices for alternately switching said pair of switching devices;

a rectifying circuit for rectifying the outputs from a second winding of said transformer;

a smoothing circuit for smoothing the outputs from said rectifying circuit; and

a pair of short-circuit prevention switching circuits which are connected in series between each end of said second-

ary winding and each input terminal of said rectifying circuit, and alternately switched in synchronism with voltage inversions in said capacitor to cancel the overlap of the currents flowing along two paths of said rectifying circuit.

4,858,097

SWITCHING POWER SUPPLY WITH AN INJECTION SIGNAL FREQUENCY LOCKING CIRCUIT

Donald A. Bradley, Morgan Hill, Calif., assignor to Wiltron Company, Morgan Hill, Calif.

Filed Dec. 22, 1988, Ser. No. 290,828
Int. Cl.[4] H02M *1/08*
U.S. Cl. 363—41 **10 Claims**



1. A switching power supply comprising:
an oscillator for providing a periodic sawtooth output signal which changes from a first potential toward a second potential; and
means responsive to a periodic reference signal having a predetermined frequency for resetting said output signal of said oscillator to said first potential before said output signal of said oscillator reaches said second potential at said predetermined frequency.

4,858,098

SPLIT-DIODE HIGH-VOLTAGE TRANSFORMER

Joel Vincent, Gray, France, assignor to Societe Orega Electronique et Mecanique, Paris, France

Continuation of Ser. No. 9,723, Feb. 2, 1987, abandoned. This application Oct. 21, 1988, Ser. No. 262,218
Claims priority, application France, Feb. 4, 1986, 86 01526
Int. Cl.[4] H02M *1/14*
U.S. Cl. 363—45 **5 Claims**



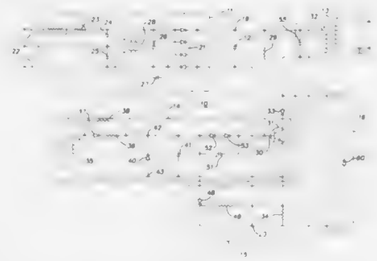
1. A split-diode technology, high-voltage transformer for trichromatic cathode tube of the secondary winding type wherein said secondary comprises:
two sections having at least one of said coil section with a tap, providing directly at said tap a direct-current voltage, wherein this tap is made at one point of the said coil section which divides this section into two parts wherein the ratio of the number of turns in the winding is substantially equal to the value of the reverse ratio of the stray capacitances, which are the mean value of the capacitance, among the values of stray capacitances, which are contained within a given production batch of that section of the secondary of the transformer which contains said tap.

4,858,099

RESONANT INVERTER

Thomas A. McMillan, Nashville; Carl A. Brooks, and Alan M. Smith, both of Franklin, all of Tenn., assignors to France/-Scott Fetzer Company, Westlake, Ohio

Filed Dec. 8, 1988, Ser. No. 281,518
Int. Cl.[4] H02M *7/537*
U.S. Cl. 363—97 **15 Claims**



1. A resonant inverter comprising, in combination:
input terminals energizable from a DC supply source and having a filter capacitor;
an energy storage transformer having a primary winding;
means to obtain an output from said transformer;
conducting, resonating, and clamping means connected to said transformer primary winding to established sequentially conducting, resonating, and clamping portions of repetitive cycles of operation, respectively;
said conducting means including a first semiconductor connected to said primary winding to conduct current therethrough;
said resonating means connected to resonate the energy in said primary winding including a storage capacitor connected to said primary winding;
a second semiconductor having a control element;
means responsive to the current of said first semiconductor to turn on said second semiconductor and to turn off said first semiconductor;
said resonating means reversing the current in said primary winding and establishing the energy stored in the inductance of the primary winding being released into said storage capacitor; and
said clamping means including unidirectional conducting means connected to establish a time for excess energy stored in the tank circuit composed of said primary winding and said storage capacitor to return to the input and be stored in said filter capacitor.

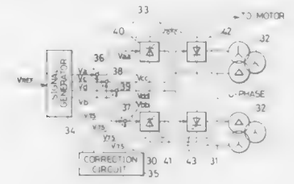
4,858,100

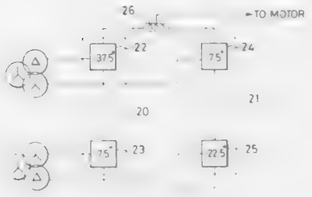
ELECTRIC POWER CONVERTER

Shinji Tatara, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 29, 1988, Ser. No. 174,903
Claims priority, application Japan, Mar. 30, 1987, 62-074304
Int. Cl.[4] H02M *5/257*
U.S. Cl. 363—161 **10 Claims**

1. An electric power converter comprising:
a plurality of means for convesting a first electric power having a first frequency into a second electric power having a second frequency and having output voltages with a plurality of phases, the second electric power being supplied to a load; and
correction control means for changing a reference voltage to generate phase angle shift signals to be supplied to the converting means in order to shift firing phase angles of the converting means so that phase differences among the output voltages of the second electric power will be 15°, thereby preventing a generation of higher harmonics of integer orders of the first electric power.



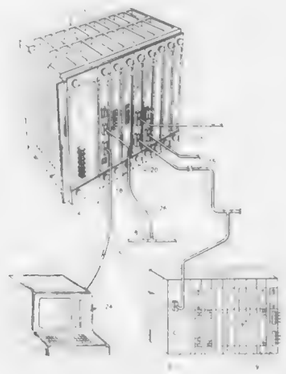


4,858,101

PROGRAMMABLE CONTROLLER WITH PARALLEL PROCESSORS

Daniel L. Stewart, Parma; Fredrick R. Immormino, Highland Heights; Daniel J. Galdun, Huntsburg, and Charles M. Rischar, Painsville, all of Ohio, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Aug. 26, 1987, Ser. No. 89,587
Int. Cl.[4] G05B *19/00*
U.S. Cl. 364—131 **21 Claims**



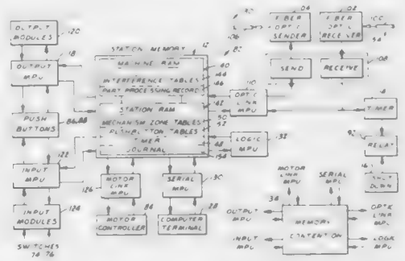
1. A programmable controller for operating a machine to carry out a plurality of programmed functions, which comprises:
a plurality of processor means each one for simultaneously executing a separate user control program that directs the programmable controller to operate the machine to perform a specific function, each of said processor means having means for receiving communications from the other processor means to control the execution of its user control program;
a means for storing a plurality of user control programs, each user control program designated for execution on one of the processor means; and
means for interconnecting said plurality of processor means and said storing means.

4,858,102

DISTRIBUTED LOGIC CONTROL SYSTEM AND METHOD

Rodger T. Lovrenich, Santa Teresa, N. Mex., assignor to El Paso Technologies Company, El Paso, Tex.

Continuation-in-part of Ser. No. 757,279, Jul. 19, 1985, abandoned. This application Apr. 14, 1987, Ser. No. 38,018
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—136 **27 Claims**



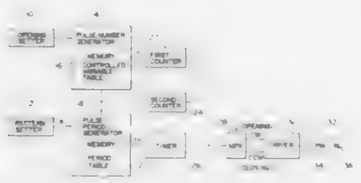
1. A machine control system which comprises, in combination, a machine including means for producing motion at said machine and means for sensing machine conditions, and control means responsive to a predefined input from said condition-sensing means for providing a predefined output to said motion-producing means, characterized in that said control means comprises:
means for tabulating said predefined input and output in a combination representative of a preselected set of operation of said machine, each said combination representing an input/output image indicative of a corresponding zone in said preselected set, and said corresponding zone having associated therewith an allowed next zone with at least one of said corresponding zones having associated therewith a plurality of allowed next zones;
means for monitoring said predefined input and output responsive to a change in said predefined input and output to formulate a new input/output image;
means for comparing said new input/output image to an input/output image in said tabulating means indicative of said allowed next zone; and
means for indicating an error condition in the event that said new input/output image does not match that of said next zone in said preselected set.

4,858,103

FLUID VALVE CONTROL SYSTEM FOR CONTROLLING FLUID PRESSURE OR FLOW

Kunihiko Takeuchi, Kawasaki; Kiyoshi Hayashi, and Yasuo Shimomura, both of Tokyo, all of Japan, assignors to Tokyo Keiki Company, Ltd., Tokyo, Japan

Filed Feb. 3, 1984, Ser. No. 576,924
Claims priority, application Japan, Feb. 7, 1983, 58-18651; Feb. 23, 1983, 58-29052; Mar. 17, 1983, 58-45057
The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.
Int. Cl.[4] G05B *11/32*
U.S. Cl. 364—174 6 Claims



1. In a fluid valve control system comprising a setting means for setting a desired flow rate or pressure of fluid and a desired control pattern, a pulse generating means for generating pulse signals corresponding to a controlled variable and a control pattern set by said setting means, and an actuating means for actuating said fluid valve in accordance with the pulse signals generated by said pulse generating means, the improvement comprising:

a first memory means for storing a plurality of different pulse number data blocks corresponding in number to a number of control pulses required for a maximum controlled variable of said fluid valve, each of said pulse number data blocks consisting of pulse number data obtained by dividing a given number of control pulses corresponding to the controlled variable of said fluid valve by a number N, said pulse number data being stored in N divisions such that a sum of pulse numbers stored in the respective divisions is equal to said given number of control pulses; and

a second memory means for storing control pattern data consisting of a plurality of different pulse period data blocks, each of said pulse period data blocks consisting of pulse period data stored in N pulse period divisions corresponding to said N divisions:

wherein said pulse generating means includes:

a timer means in which pulse period data T_0 to T_{N-1} of the respective pulse period divisions A_0 to A_{N-1} in a specified pulse period data block stored in said second memory means are preset one after another, wherein said timer means issues pulses of preset pulse periods;

a first counter in which pulse number data n_0 to n_{N-1} of the respective divisions A_0 to A_{N-1} in a specified pulse number data block stored in said first memory means are preset one after another, wherein said first counter counts said pulses issued from said timer means and produces an output whenever the counter coincides with a preset pulse number; and

a second counter for presetting, in response to a count output of said first counter, the pulse number data and pulse period data of the next divisions in said first counter and said timer means, respectively, wherein said second counter inhibits the issuance of pulses when its count coincides with the number N of divisions.

4,858,104

PRECEDING INSTRUCTION ADDRESS BASED BRANCH PREDICTION IN A PIPELINED PROCESSOR

Masahito Matsuo, and Toyohiko Yoshida, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1988, Ser. No. 143,547
Claims priority, application Japan, Jan. 16, 1987, 62-8394
Int. Cl.[4] G06F *9/38*
U.S. Cl. 364—200 6 Claims



1. In a data processor of the type having a pipeline system for executing pipeline processing on a sequence of instructions, including branch instructions, corresponding to associated instruction addresses and having a prefetch unit for preliminary fetching instructions corresponding to instruction addresses provided thereto, an instruction decoder that receives an instruction from said prefetch unit and that decodes the received instruction, and an instruction execution unit that receives the decoded instruction from said instruction decoder and executes said instruction, a branch prediction system comprising:

a branch prediction unit, having a branch prediction table with branch prediction information stored therein for predicting whether the branch condition of a given branch instruction will be established;

means for accessing the branch prediction information for said given branch instruction, prior to decoding the given branch instruction, with the instruction address of a selected instruction that precedes the given branch instruction in the sequence of instructions.

4,858,105

PIPELINED DATA PROCESSOR CAPABLE OF DECODING AND EXECUTING PLURAL INSTRUCTIONS IN PARALLEL

Kazunori Kuriyama; Yooichi Shintani, both of Kokubunji; Akira Yamaoka, Hachioji; Tohru Shonai, Kokubunji; Eiki Kamada, Hachioji, and Kiyoshi Inoue, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 26, 1987, Ser. No. 30,434
Claims priority, application Japan, Mar. 26, 1986, 61-65651
Int. Cl.[4] G06F *15/00*
U.S. Cl. 364—200 3 Claims

1. A pipelined data processor for executing in parallel an instruction of a kind other than a branch instruction and a branch instruction, said data processor comprising:

main storage means;

operation means for performing an operation in response to an instruction of a kind other than a branch instruction;

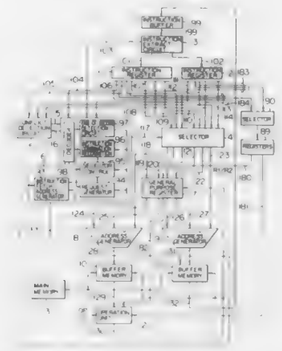
resource means responsive to a branch instruction for retrieving a branch-to instruction from said main storage means;

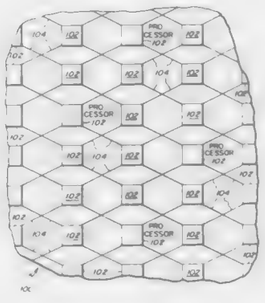
a pair of instruction registers;

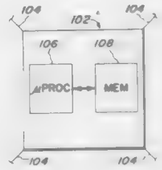
set means for retrieving from said main storage means and storing in said pair of instruction registers a first instruction for execution by said data processor during the next cycle of operation thereof and a second instruction for execution by said data processor;

detection means for detecting whether the first and second instructions in said pair of instruction registers are an instruction of a kind other than a branch instruction and a branch instruction; and

control means responsive to said detection means detecting that one of the first and second instructions is an instruction of a kind other than a branch instruction and the other of the first and second instructions is a branch instruction for controlling the execution of said one of the first and second instructions such that the operation requested by said one of the first and second instructions is executed in a plurality of stages, including a stage executed by said operation means, controlling the execution of said other of the first and second instructions such that the operation requested by said other of the first and second instructions is executed in a plurality of stages, including a stage executed by said resource means, said first and second instructions being executed in parallel, and controlling said set means to cause a third instruction and a fourth instruction to be retrieved from said main storage means and applied to said pair of instruction registers during the execution of said first and second instructions; said control means being responsive to said detection means failing to detect that one of the first and second instructions is an instruction of a kind other than a branch instruction and the other of the first and second instructions is a branch instruction for controlling the execution of said first instruction such that the operation requested by said first instruction is executed in a plurality of stages, including a stage executed by said operation means or said resource means, and controlling said set means to cause said second instruction and a third instruction to be stored in said pair of instruction registers during the execution of said first instruction.







4,858,106

AUTOMATED METHOD IMPLEMENTED ON A DISTRIBUTED DATA PROCESSING SYSTEM FOR PARTITIONING A DATA STRING INTO TWO SUBSTRINGS

Robert M. Mattheyses, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 3, 1987, Ser. No. 33,939
Int. Cl.[4] G06F *7/08, 7/20*
U.S. Cl. 364—200 8 Claims

1. An automated method implemented on a distributed data processing system for partitioning an original string of successive data elements into two substrings, each said element comprising a first pointer having a value that identifies an immediately succeeding element in said original string closer to a true head element thereof, each said element being of a first type or a second type as indicated by a type field value of said element, said original string being composed of at least one string fragment, each said fragment being composed of a sequence of said elements of the same type, the element type in each said fragment being different from the element type in the fragments immediately adjacent thereto in said original string, each said substring having only elements of the same type, each step of said method being performed in parallel at all of said elements in said original string, said method comprising using said processing system to perform the steps of:

(a) copying, at each said element, the value of said first pointer into a second pointer thereof, said second pointer identifying elements;

(b) determining at each said element, except said true head element, if the type field value thereof is the same as the type value of the immediately succeeding element;

(c) setting a first tag at all said elements that determined in step (b) that the immediately succeeding element is not the same type as said elements, respectively, each said element so setting said first tag being a string fragment head element, and not setting the first tag at all said elements that determined in step (b) that the immediately succeeding element is the same type;

(d) setting said first tag and a second tag only at said true head element, each said element having said first tag set or not set being respectively a tagged or untagged element;

(e) getting, at all said untagged elements, the values of said first and second tags and said second pointer from the element currently identified by said second pointer of said untagged element;

(f) substituting, for said first and second tags and said second pointer at all said untagged elements, the values of said first and second tags and said second pointer, respectively, obtained in step (e) from said currently identified element;

(g) repeating steps (e) and (f) until all of said elements in said original string are tagged;

(h) determining only at each said fragment head element if said second tag of the immediately succeeding element in said original string is set, said fragment head element being a substring head element if said second tag of the immediately succeeding element in said original string is set, said fragment head element not being a substring head element if said second tag of the immediately succeeding element in said original string is not set;

(i) getting, only at each said fragment head element, the second pointer value of said immediately succeeding element in said original string, the second pointer value so gotten being a substring pointer of said fragment head

element that identifies a tail element of a next string fragment having the same type elements as the fragment head element; and

(j) forming two said substrings by joining each said fragment head element to the fragment tail element identified by the substring pointer of said fragment head element, said true head element being the head element of one of said substrings, said substring head element identified in step (h) being the head element of the other one of said substrings.

4,858,107

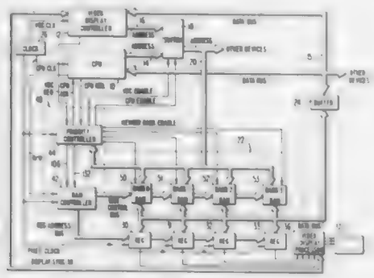
COMPUTER DEVICE DISPLAY SYSTEM USING CONDITIONALLY ASYNCHRONOUS MEMORY ACCESSING BY VIDEO DISPLAY CONTROLLER

Nicola J. Fedele, Kingston, N.J., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 710,292, Mar. 11, 1985, abandoned, and a continuation-in-part of Ser. No. 710,295, Mar. 11, 1985, abandoned. This application Jan. 28, 1987, Ser. No. 7,536

Int. Cl.[4] G06F *3/14, 3/153, 13/30, 15/62*

U.S. Cl. 364—200 15 Claims



1. A system comprising a plurality, n in number, of banks of digital memory, each bank having a respective m-bit-wide output port, m and n each being a respective positive integer greater than one;

a plurality, n in number, of shift registers, each respectively having m successive stages with respective input ports and each having a respective output port in its final stage, which said plurality of shift registers are synchronously clocked for transferring the contents of their stages serially through their output ports as n-bit-wide data streams;

a plurality, n in number, of latches, each corresponding to a different respective bank of the digital memory and to a different respective register and having one input port to which the output port of a corresponding bank of said digital memory connects, and each having an m-bit-wide output port corresponding to and connected to the m input port of a different respective one of said plurality of shift registers;

first means for normally cyclically accessing each bank at prescribed times in each cycle for delivering first data to the input port of each of said plurality of latches from the output port of its corresponding respective bank of said digital memory;

means for periodically loading the m successive stages of each of said shift registers from the m-bit-wide output port of its respective corresponding latch;

second means for otherwise accessing each bank of said digital memory at other times a synchronously relative to said prescribed times for delivering second data to the respective latch corresponding to that bank, said prescribed and other times tending to occassionally occur concurrently;

priority means responsive to the concurrence of said prescribed times and said other times for assigning priority to said second means in a terminal portion of each cycle; and

means for utilizing the n-bit-wide data stream clocked serially from the output ports of said plurality of shift registers, said means for utilizing comprising a display monitor responsive to raster scan video signals and a video data processor for generating, responsive to the n-bit-wide data stream, said video signals and for applying said video signals to said display monitor.

4,858,108

PRIORITY CONTROL ARCHITECTURE FOR INPUT/OUTPUT OPERATION

Tetsuji Ogawa, and Masao Kato, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 12, 1986, Ser. No. 838,717

Claims priority, application Japan, Mar. 20, 1985, 60-57029

Int. Cl.[4] G06F *13/00, 13/14, 13/20, 3/00*

U.S. Cl. 364—200 1 Claim



1. An input/output control system comprising:

(a) a plurality of input/output means;

(b) a main storage including:

(i) a respective first storage area having a plurality of areas corresponding to said plurality of input/output means, for storing control information in each area of said first storage area corresponding to an input/output means, and

(ii) a second storage area for storing first information in a form of a start queue in a plurality of areas of said storage areas corresponding to a plurality of classes, said start queue indicating a respective start priority for each of said input/output means;

(c) a central processing unit connected to said main storage and responsive to a start request specified by a program for providing control information necessary to start operation of a requested input/output means and a class code indicating a start priority of said requested input/output means to said first storage area of said main storage, and for updating said second storage area of said main storage so as to register first information indicating said requested input/output means to a predetermined area of said start queue corresponding to one of said plurality of classes indicated by said class code; and

(d) external data control means connected to said plurality of input/output means, said central processing unit and said main storage for reading first information from said start queue having a highest start priority, for reading from said main storage control information of a requested input/output means corresponding to said first information, and for initiating operation of said requested input/output means based on said control information;

(e) wherein said main storage further includes a third storage area for storing second information in an interruption queue having a plurality of areas corresponding to said plurality of classes indicating respective priorities of interruption requests from said plurality of input/output means;

(f) wherein said external data control means being responsive to an interruption request from an input/output means in a start state for referencing the class code provided to said first storage area of said main storage and for updating said third storage area so as to register said first information indicating said input/output means to the interruption queue corresponding to the class indicated by said class codes; and

(g) wherein said central processing unit operating to read said first information indicating an input/output means from an interruption queue having a highest priority and for effecting an interruption processing for said input/output means.

4,858,109

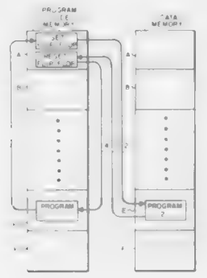
PROGRAM CODE FETCH FROM DATA MEMORY ARRANGEMENT

Robert C. Webber, Scottsdale, Ariz., assignor to AG Communication Systems Corporation, Phoenix, Ariz.

Continuation of Ser. No. 701,704, Feb. 14, 1985, abandoned, which is a continuation-in-part of Ser. No. 412,757, Aug. 30, 1982, abandoned. This application Sep. 14, 1987, Ser. No. 111,471

Int. Cl.[4] G06F *12/06*

U.S. Cl. 364—200 9 Claims



1. In a real time on-line computer processing system, a program code fetch from data memory arrangement for fetching program code from program code memory and from data memory, said program code fetch from data memory arrangement comprising:

a CPU for providing a program code fetch request;

memory including a plurality of pages of program code memory and a plurality of pages of data memory;

a data bus connected between said CPU and said memory, said data bus providing for writing data into said memory or for reading data from said memory;

a control bus connected between said CPU and said memory, said control bus including a plurality of status leads for transmitting signals indicating whether a next fetch from said memory is to be a program code fetch or a data fetch;

an address bus connected between said CPU and said memory;

Input/Output means connected to said address bus and to said CPU, said Input/Output means operating in response to an address of said address bus to produce a first output signal of a first value, said address indicating that said program code fetch is to occur from data memory, said first output signal otherwise being of a second value;

decoding means connected and responsive to said address bus and to said Input/Output means, said decoding means enabled by said first value of said first output signal to produce a first value of a second output signal indicating a presence of an allowable memory page address of a said data memory contained on said address bus, said second signal otherwise being of a second value;

first means for detecting on said status leads a request for data memory to produce a seventh output signal of a first value, otherwise said seventh output signal being of a second value, said first means for detecting connected to said control bus; said second means for detecting connected to said first means for detecting and to said decoding means, said second means for detecting responsive to said first values of said seventh and second output signals to produce a third signal for transmission to said memory to enable said data memory to transmit said program code to said CPU via said data bus; and

said second means for detecting further responsive to said second values of said seventh and second output signals for fetching said program code from said program code memory.

4,858,110

PARALLEL DATA PROCESSOR WITH SHIFT REGISTER INTER-PROCESSOR TRANSFER

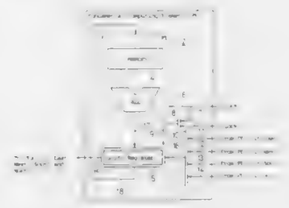
Hiroyuki Miyata, Kamakura, Japan, assignor to The President of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 24, 1987, Ser. No. 29,637

Claims priority, application Japan, Feb. 5, 1987, 62-23555

Int. Cl.[4] G06F *15/16*

U.S. Cl. 364—200 3 Claims



2. A method for transmitting data in a parallel data processor having a plurality of fundamental computing elements (1) interconnected in a two-dimensional lattice configuration, each fundamental computing element (1) having a computer unit (2) including a memory unit (3) for storing data and having a first speed of operation for processing data, and a shift register (5) for transmitting data to and from said memory (3) at a first speed corresponding to the speed of operation of the computer unit (2) and to and from a second plurality of adjacent fundamental computing elements (1) in the lattice configuration at second speed, said second speed different from said first speed, the method comprising the steps of:

operating the computer unit (2) of a first fundamental computing element (1) at said first speed;

transmitting data between a memory (3) of said first fundamental computing element (1) and the shift register (5) of said first fundamental computing element (1) at said first speed;

transmitting data between the shift register (5) of said first fundamental computing element and the shift registers of said second plurality of fundamental computing elements adjacent to said first fundamental computing element (1) at said second speed; and

continuing operation of the computer unit (2) of the first fundamental computing element at said first speed independently of and concurrently with the transmission of data between the shift registers of said first and said sec-

ond fundamental computing elements at said second speed.

4,858,111

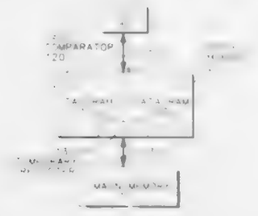
WRITE-BACK CACHE SYSTEM USING CONCURRENT ADDRESS TRANSFERS TO SETUP REQUESTED ADDRESS IN MAIN MEMORY BEFORE DIRTY MISS SIGNAL FROM CACHE

Steven C. Steps, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 518,610, Jul. 29, 1983, abandoned. This application Oct. 20, 1986, Ser. No. 921,876

Int. Cl.[4] G06F *7/02, 9/00, 12/02*

U.S. Cl. 364—200 **8 Claims**



1. In a computer system comprising a central processing unit (CPU), a write-back cache memory unit (cache) having a data store and a comparator for indicating whether information requested by the CPU from the cache is a hit, a clean miss, or a dirty miss, and a main memory unit (main memory), said units coupled so that the main memory can communicate only with the cache and so that the CPU can fetch information from and store information to the main memory only via the cache, and further coupled so that state machines representing the states of the cache and the main memory, respectively, are linked together, a method comprising the steps of:

(a) simultaneously sending an address of information desired to be read from the cache by the CPU from the CPU to both the cache and main memory at such a time that said address is set up in the main memory prior to receiving a dirty miss indication from the comparator;

(b) fetching the encached copy of said information from the data store and then temporarily buffering the fetched information in the computer system prior to receiving said dirty miss indication from said comparator; and,

(c) storing a copy of the desired information fetched from the main memory into the cache if either a clean or dirty miss indication is provided by the comparator;

wherein step (c) takes place before dirty information buffered in the system is written back to the main memory if the comparator provides a dirty miss indication.

4,858,112

INTERFACE COMPRISING MESSAGE AND PROTOCOL PROCESSORS FOR INTERFACING DIGITAL DATA WITH A BUS NETWORK

Bernard G. Puerzer, Milwaukee, and Royal R. Morse, III, Wales, both of Wis., assignors to General Electric Company

Filed Dec. 17, 1985, Ser. No. 809,893

Int. Cl.[4] G06F *3/00, 9/28, 13/12, 15/16*

U.S. Cl. 364—200 **4 Claims**

1. A network interface equipment for interfacing digital data on a bus with a user equipment, comprising:

a message processor;

a message random-access memory;

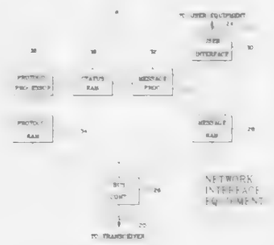
means in said message random-access memory for responding to data requests from said bus, said message processor and from said user equipment;

said message random-access memory including means for storing data portions of a data packet being transmitted or received;

a protocol processor;

a protocol random-access memory;

means in said protocol random-access memory for responding to protocol requests from said bus and said protocol processor;



said protocol processor including means for producing at least a header portion of said packet for storage in said protocol random-access memory for data packets to be transmitted and for testing correctness of received messages; and

said message random-access memory and said protocol random-access memory including means for responding to any of their respective data requests independently of the other.

4,858,113

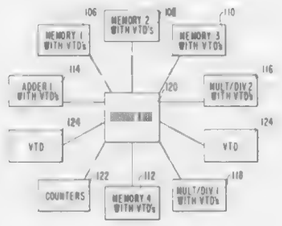
RECONFIGURABLE PIPELINED PROCESSOR

Raymond J. Saccardi, Laurel, Md., assignor to The United States of America as represented by the Director of the National Security Agency, Washington, D.C.

Filed Apr. 10, 1987, Ser. No. 38,382

Int. Cl.[4] G06F *7/00*

U.S. Cl. 364—200 **6 Claims**



1. A reconfigurable pipelined processor for processing data, comprising:

(a) a plurality of memory devices for storing bits of data;

(b) a plurality of arithmetic units for performing arithmetic functions with the data;

(c) cross bar means for connecting said memory devices with said arithmetic units for transferring data therebetween;

(d) at least one counter connected with said cross bar means for providing a source of addresses to said memory devices;

(e) at least one variable tick delay device connected with each of said memory devices and arithmetic units; and

(f) means for providing control bits to said variable tick delay device for variably controlling the input and output operations thereof to selectively delay said memory devices and arithmetic units to align the data for processing in a selected sequence.

4,858,114

EMULATION SYSTEM FOR AUTOMATICALLY MODIFYING I/O TRANSLATION TABLES IN PROGRAMS DESIGNED TO RUN ON DIFFERENT TYPES OF COMPUTER

Allen W. Heath, Cedar Park; Raymond Hernandez, Austin; Virginia M. Hoffman, Austin; Ronald K. Sheppard, Austin, and Susan D. Stratton, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 757,233, Jul. 22, 1985, abandoned. This application Dec. 11, 1987, Ser. No. 132,719

Int. Cl.[4] G06F *3/00, 3/023, 5/00, 13/00*

U.S. Cl. 364—200 **6 Claims**



1. A method for automatically modifying parameters within an execution of a reconfigurable, table driven computer program originally designed to run on a first type of computer system configured in a first way, to properly interface with I/O devices for said reconfigurable program to run on a different, second type of computer system configured in a second way, comprising:

(a) storing in a random access memory of said second type of computer system a set of exception tables to selectively alter particular entries of a set of code conversion tables within said reconfigurable program to redefine the meaning of selected codes within said reconfigurable program;

(b) providing initialization logic in said reconfigurable program and using said logic during initial loading of said reconfigurable program to cause said reconfigurable program to cause said second type of computer system to search for the presence of said set of exception tables in said random access memory in addition to said reconfigurable program during loading of said reconfigurable program into said second type of computer;

(c) utilizing said second type of computer and said exception tables, during said loading of said reconfigurable program into said second type of computer, upon the detection of the presence of said exception tables in said random access memory, to automatically, selectively alter, without operator intervention, said particular entries of said set of code conversion tables according to values stored in said exception tables.

4,858,115

LOOP CONTROL MECHANISM FOR SCIENTIFIC PROCESSOR

John T. Rusterholz, Roseville, and James R. Hamstra, Plymouth, both of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Jul. 31, 1985, Ser. No. 760,718

Int. Cl.[4] G06F *15/347, 9/30, 7/50, 9/18*

U.S. Cl. 364—200 **13 Claims**

1. In a vector oriented scientific data processing system, a control mechanism for controlling program loops comprising:

a first plurality of registers for storing a plurality of vector loop parameters;

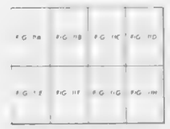
a current vector loop pointer register coupled to said first plurality of registers to select one of the first plurality of registers to provide current vector loop parameters;

a second plurality of registers for storing a plurality of element loop parameters;

a current element loop pointer register coupled to said second plurality of registers to select one of the second plurality or registers to provide current element loop parameters;

a loop manipulation means having an input and an output means, coupled via its input means to the selected register of said first plurality of registers and by its output means to the selected register of said second plurality of registers, said loop manipulation means to provide at its output means an output signal indicative of the length of the loop stored in the selected register of said first plurality of registers; and

said selected register of said second plurality of registers to provide an output signal indicative of a selected element in said length of the loop stored in the selected register of said second plurality of registers to provide a system for efficiently pre-computing loop lengths and thereby enhancing the speed of the vector oriented scientific data processing system.



4,858,116

METHOD AND APPARATUS FOR MANAGING MULTIPLE LOCK INDICATORS IN A MULTIPROCESSOR COMPUTER SYSTEM

Richard B. Gillett, Jr., Westford, and Douglas D. Williams, Pepperell, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed May 1, 1987, Ser. No. 44,954

Int. Cl.[4] G06F *12/16*

U.S. Cl. 364—200 **11 Claims**

1. A system for implementing exclusive read-modify-write operations, said operations having a set of distinct transactions including an interlock read command to retrieve information stored at a specified location and restrict access to said stored information by subsequent interlock read commands, and an unlock write command to store information in said specified location and restore access to said stored information, said system comprising:

a pended bus;

a plurality of first nodes coupled to said pended bus, each functioning as a commander node to initiate said interlock read and unlock write commands, said first nodes comprising means for receiving, at predetermined times subsequent to initiation of said interlock read command, ac-

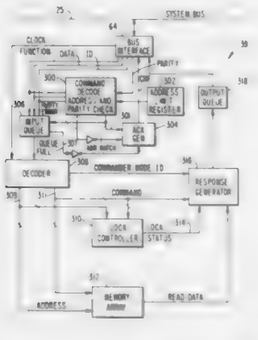
knowledge confirmations indicating receipt of said interlock read commands initiated by said first nodes and for receiving, at unspecified times subsequent to initiation of said interlock read commands, a lock status message indicating whether said interlock read commands were executed; and

a second node coupled to said pended bus, functioning as a responder node, said second node comprising:

means for receiving said interlock read commands from said first nodes and for transmitting said acknowledge confirmations to said first nodes at said predetermined times subsequent to initiation of said interlock read commands;

storage means, including said specified location, for storing information;

lock means, associated with said storage means and operable between an unlocked condition and a locked condi-



tion, for permitting access to said storage means when in an unlocked condition and for denying access to said storage means when in a locked condition;

command means responsive to an interlock read command from one of said first nodes for generating a lock status indication indicating the condition of said lock means and for switching said lock means from an unlocked condition to a locked condition, and responsive to an unlock write command for storing modified information in said specified location and for switching said lock means from the locked condition to the unlocked condition; and

status response means for transmitting to a first node which generated an interlock means command, at an unspecified time subsequent to initiation of said interlock read command, said lock status message including said lock status indication.

4,858,117

APPARATUS AND METHOD FOR PREVENTING COMPUTER ACCESS BY UNAUTHORIZED PERSONNEL

Joseph G. DiChiara, Burlington; Harry W. Brown, East Weymouth, and Joseph M. Valentine, Framingham, all of Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Aug. 7, 1987, Ser. No. 83,534
Int. Cl.[4] G06F *12/10, 12/12, 12/14*
U.S. Cl. 364—200 **5 Claims**

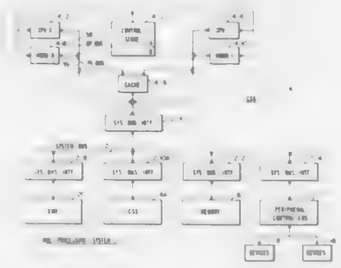
1. Apparatus for translating a virtual I/O command to a physical I/O command comprising:

first means for storing a virtual I/O command including a virtual channel number identifying a device;

second means for storing s descriptor segment identifying a user;

a first table means coupled to said first means and being responsive to a first portion of said channel number stored in said first means, said first table means coupled to said second means and being responsive to said descriptor segment identifying a user stored said second means for locating an I/O page descriptor identifying a family of devices available to said user;

a second table means coupled to said first means and said first table means and responsive to said channel number and said I/O page descriptor for locating an I/O descriptor including a physical channel number identifying said device; and



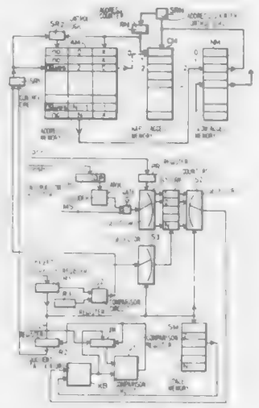
third means coupled to said first means and said second table means including comparison means for verifying user privilege by determining user access to a device via said user descriptor and proper virtual I/O command operation via said I/O descriptor, and in response to verification of user privilege, replacing said virtual channel number by said physical channel number, thereby generating said physical I/O command.

4,858,118

METHOD AND APPARATUS FOR DETERMINING IN A COMPUTER WHICH OF A NUMBER OF PROGRAMS ARE ALLOWED TO UTILIZE A RAPID ACCESS MEMORY

Hans E. Sundell, Stockholm; Terje Egeland, Älvsjö; Sten E. Johnson, Huddinge, and Erik B. Friman, Stockholm, all of Sweden, assignors to Telefonaktiebolaget L M. Ericsson, Stockholm, Sweden

Filed May 29, 1987, Ser. No. 55,317
Claims priority, application Sweden, Jun. 26, 1986, 8602858
Int. Cl.[4] G06F *12/06, 13/00*
U.S. Cl. 364—243.4 **2 Claims**



2. Apparatus for determining which of a plurality of programs should utilize a rapid access memory in a computer

having a slow access memory and a rapid access memory, comprising:

an instruction register containing program instructions;

a decoder for determining whether an instruction stored in said register requires access to memory;

a counter for counting the number of instructions in a program which require access to memory;

a memory field containing information regarding the total amount of memory required for all instructions of a given program;

a measuring circuit responsive to said counter and said memory field for determining a quotient for each program;

means for selecting the program having the highest quotient, and transferring it from the slow access memory to the rapid access memory; and

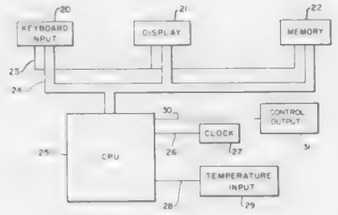
an address memory for storing an indication that the program with the highest quotient is stored in the rapid access memory and the starting address for the program in the rapid access memory.

4,858,119

INTELLIGENT COOKING APPLIANCE

Gerald Waugh; Charley Myers; John Davis, and John Sullivan, all of Shreveport, La., assignors to The Frymaster Corporation, Shreveport, La.

Continuation of Ser. No. 512,204, Jul. 8, 1983, Pat. No. 4,663,710, which is a continuation-in-part of Ser. No. 264,173, May 15, 1981, Pat. No. 4,437,159. This application Mar. 23, 1987, Ser. No. 29,524
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—400 **37 Claims**



1. A cooking appliance comprising:

heating means for providing heat to a cooking medium for cooking food;

temperature sensing means for detecting the cooking medium temperature and for generating a frequency proportional to the detected temperature;

control means connected to said temperature sensing means for receiving said frequency indicating the cooking medium temperature and for cooking the food according to data stored in the control means, by controlling the heating means, and said control means including temperature detect circuitry for detecting an excessive temperature of the cooking medium and providing an indication of the excessive temperature; and

means responsive to said control means for removing the food from the cooking medium in accordance with said data.

4,858,120

SYSTEM FOR REGULATING ARRIVALS OF CUSTOMERS TO SERVERS

Douglas A. Samuelson, Reston, Va., assignor to International Telesystems Corp., Herndon, Va.

Filed Mar. 18, 1987, Ser. No. 27,359
Int. Cl.[4] G06F *15/36*
U.S. Cl. 364—401 **20 Claims**

1. A method for controlling arrivals of customers to servers wherein customers are queued to await service by said servers, comprising the steps of:

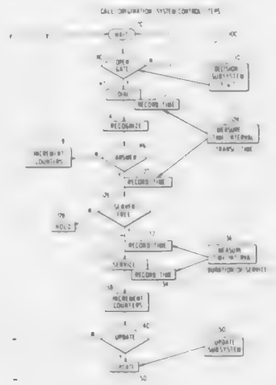
measuring durations of customer service;

computing and updating time statistics of services to customers, thereby estimating expected duration of customer service;

recording starting time of each current customer service and noting present time;

comparing present time to starting time, and thereby determining time in progress for each customer service;

comparing time in progress to expected duration of service, and estimating time remaining in service for each customer currently in service;



determining a number of currently busy servers expected to be available by the time another customer arrival could reach the currently busy servers;

measuring the number of available servers not currently serving a customer;

adding the number of currently available servers and the number of currently busy servers expected to be available, thereby computing total number of servers expected to be available;

subtracting the number of customer arrivals currently queued awaiting service thereby producing a resultant number of servers expected to be available; and

controlling a processor which regulates customer arrivals to correspond to the resultant number of servers expected to be available.

4,858,121

MEDICAL PAYMENT SYSTEM

William B. Barber, Berea; William H. Davis, Fairview Park, both of Ohio, and Karl Rautenkranz, Tucson, Ariz., assignors to Medical Payment Systems, Incorporated, Westlake, Ohio

Filed Dec. 12, 1986, Ser. No. 940,559
Int. Cl.[4] G06F *15/42, 15/30*
U.S. Cl. 364—406 **17 Claims**

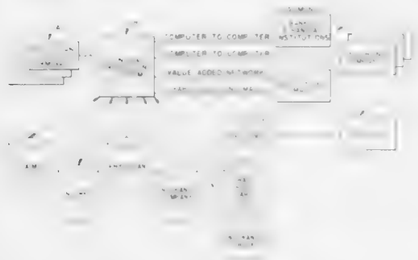
1. A financial transaction system for physician's offices, the system comprising:

a plurality of physician office terminals for location in physicians' offices, each terminal including a data entry means for entering medical insurance claim electronic data including at least patient identification data, medical service identification data, abbreviated routine medical service codes indicative of regularly performed medical procedures, physician identification data, and insurance carrier identification data, a modem means for transmitting the entered electronic data on a communications medium, and a terminal data processing means for processing the electronic data entered on the data entry means and providing

the processed data to the modem means for transmission, the terminal data processing means including:

a transaction library means for storing a record of entered medical claim data;

a routine medical procedure library means for storing medical procedure details for services which are regularly performed in a medical procedure memory means, the medical procedure memory means being accessed by the abbreviated routine service codes to retrieve a more complete medical service description electronic



data for transmission by the modem means, whereby only the abbreviated routine code is entered to cause a complete service description to be transmitted;

a physician library means for storing physician identification details which are retrieved for transmission by the modem means, whereby physician identification details need not be entered for each entered medical claim; and,

a central processing means for receiving data transmitted by the terminal modem means and processing the data to generate medical insurance claims.

4,858,122

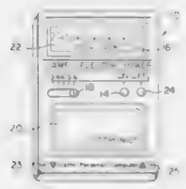
RANDOM LOTTERY COMPUTER

William Kreisner, 77 St. Marks La., Islip, N.Y. 11751

Continuation-in-part of Ser. No. 655,911, Sep. 28, 1984, abandoned. This application Sep. 19, 1986, Ser. No. 909,280

Int. Cl.[4] G06F *15/28*

U.S. Cl. 364—410 **14 Claims**



1. A random lottery computer for generating random numeric lottery selections, each lottery selection comprising a plurality of numeric entities, the random lottery computer comprising:

(a) a housing;

(b) a substantially visually unitary numeric display mounted in the housing for displaying the numeric lottery-selections generated by the random lottery computer;

(c) a microprocessor mounted in the housing having switch-state input terminals and display output terminals, the display output terminals being connected to the numeric display, the microprocessor being adapted to generate random numeric lottery selections in accordance with lottery-game requirements of a user-selectable one of a plurality of predetermined lottery games and transmitting display signals encoding such lottery selections from the display output terminals to cause such lottery selections to be displayed by the numeric display of the random lottery computer, a particular lottery game in accordance with which a lottery selection is made being specified by switch-state signals applied to switch-state input terminals of the microprocessor;

(d) electric power supply means located in the housing for supplying electric power to the microprocessor and the numeric display;

(e) a single user-positionable multiposition game-selector switch mounted in the housing of the random lottery computer and connected to switch-state input terminals of the microprocessor, each position of the game-selector switch being associated with a predetermined set of lottery-game requirements, the microprocessor being adapted to take account of the set of lottery-game requirements associated with any user-selected position of the game-selector switch in generating random numeric lottery selections, each such set of lottery-game requirements specifying at least a number of numeric entities included in the lottery selection for the game and a number of digits in each numeric entity, at least one first set of lottery-game requirements associated with a first position of the game-selector switch specifying one digit per numeric entity and at least one second set of lottery-game requirements associated with a second position of the game-selector switch different from said first position specifying two digits per numeric entity;

(f) an incrementing switch mounted in the housing and connected to a switch-state input terminal of the microprocessor, the microprocessor being adapted to increment in response to actuation of the incrementing switch an upper limit for the numeric entities for the random numeric lottery selections generated in accordance with the set of lottery-game requirements associated with at least one position of the game-selector switch, the position of the game-selector switch defining a settable-upper-limit-game position;

(g) a decrementing switch mounted in the housing and connected to a switch-state input terminal of the microprocessor, the microprocessor being adapted to decrement in response to actuation of the decrementing switch the upper limit for the numeric entities for the random numeric lottery selections generated in accordance with the set of lottery-game requirements associated with the settable-upper-limit-game position of the game-selector switch; and

(h) a lottery-selection play switch mounted in the housing of the random lottery computer and connected to a switch-state input terminal of the microprocessor, the microprocessor being adapted to generate a random numeric lottery selection in response to actuation of the lottery-selection play switch in accordance with the set of lottery-game switch in accordance with the set of lottery-game requirements associated with any user-selected one of the positions of the game-selector switch and, to an extend consistent with said set of lottery-game requirements, the upper limit for the numeric entities of the random numeric lottery selections specified by actuation of the incrementing switch and the decrementing switch.

4,858,123

MANUFACTURING LOTTERY TICKETS AND COMMERCIAL COUPONS

Carl Alexoff, Cherry Hill; Richard Rosetta, Kendall Park; Michael Dennis, Dayton, and Thomas E. Coll, Lambertville, all of N.J., assignors to Webcraft Games, Inc., Brunswick, N.J.

Continuation of Ser. No. 54,056, May 26, 1987, abandoned, which is a continuation of Ser. No. 643,722, Aug. 24, 1984, abandoned. This application Jul. 5, 1988, Ser. No. 217,137

Int. Cl.[4] B42D *15/00*

U.S. Cl. 364—412 **22 Claims**

1. A system for printing of instant lottery and coupon tickets

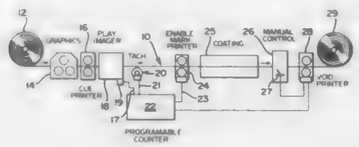
which provides improved security and prize structure integrity, comprising:

(a) a rotary press printing stage for graphically printing a series of successive tickets on a continuous fast moving web of ticket stock,

(b) first web marking means for automatically sensing whether correct graphics have been applied to the web and automatically placing a marking thereon indicative of whether that section of the web contains acceptably printed tickets,

(c) a first computer controlled ink jet imager responsive to a pseudo random program, for placing different game play data on each successive ticket of the web at a speed which precludes personal observation of individual ticket numbers and for also placing a pseudo random validation number on each ticket which is correlated in a seemingly random fashion with the game play data,

(d) coating means for immediately covering the game play data applied by the first computer controlled ink jet imager to preclude personal observation thereof,



(e) second web marking means for automatically sensing whether such tickets have been correctly imaged with game play data and validation numbers and for automatically placing a marking on the web indicative thereof,

(f) a second computer controlled ink jet imager for placing book-ticket numbers (serial numbers) on each successive ticket, which are uncorrelated with respect to the prior applied imaged game play data and validation numbers,

(g) sensing means physically positioned adjacent the web in line before the second computer controlled imager for scanning the web for markings indicating whether tickets are defective or valid and generating a signal indicative of the presence of these markings, and

(h) control means connected to the sensing means and to the second computer controlled imager for receiving the signal from the sensing means and generating a control signal which controls operation of the second imager so as to preclude the imaging of a book-ticket (serial number) on a given ticket when markings on the web indicate that such tickets are defective.

4,858,124

METHOD FOR ENHANCEMENT OF ULTRASONIC IMAGE DATA

Frederic L. Lizzi, Tenafly; Mykola M. Yaremko, Hoboken, both of N.J.; Ronald H. Silverman, Brooklyn, N.Y., and D. Jackson Coleman, Haworth, N.J., assignors to RiverSide Research Institute, New York, N.Y.

Continuation of Ser. No. 641,015, Aug. 15, 1984, abandoned. This application Aug. 11, 1987, Ser. No. 85,289

Int. Cl.[4] G06F *15/42*

U.S. Cl. 364—413.01 **43 Claims**

1. A method for processing reflected acoustic signals from a body of material and for generating a display of at least a portion of said body, representative of characteristics of said material comprising:

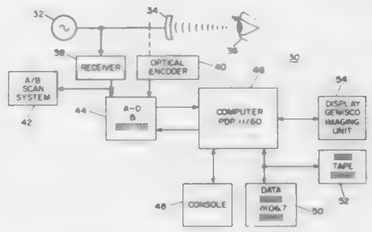
transmitting acoustic signals into a region of interest in said body in an ordered spatial progression;

receiving reflected acoustic signals from said body;

analyzing the frequency content of selected time portions of said received signal to derive spectral data representative of spectral power as a function of frequency for spatial samples of said body within said body region of interest; said spatial samples corresponding to said time portions of said received signal;

normalizing said spectral data to values of said spectral data for an object with known reflection characteristics;

deriving spectral characteristic values from said normalized spectral data independently for each of said spatial samples, said spectral characteristic values being selected



from the group comprising frequency specific normalized spectral amplitude, spectral slope and spectral amplitude uncertainty; and

generating a display of said body region of interest with a display characteristic for each of said spatial samples selected in accordance with said derived spectral characteristic values.

4,858,125

ELECTRONIC CONE WITH ENVIRONMENTAL AND HUMAN BODY CONDITION SENSORS AND ALARM FOR INDICATING EXISTENCE OF UNDESIRABLE CONDITIONS

Isamu Washizuka, Soraku; Shinji Tsugei, and Tomohiro Inoue, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 19, 1984, Ser. No. 602,170

Claims priority, application Japan, Apr. 26, 1983, 58-64561[U]; Apr. 26, 1983, 58-64560[U]; May 19, 1983, 58-75408[U]; May 19, 1983, 58-75407[U]; Jun. 1, 1983, 58-84392[U]

Int. Cl.[4] A45B *3/00*

U.S. Cl. 364—413.01 **5 Claims**



1. An electronic cane including a stick comprising:

grip means connected to said stick for sensing and processing information including,

sensor means for sensing information related to physical parameters of the surrounding environment and of a user of the cane;

microprocessor means, responsive to the information sensed by said sensor means, for processing said information sensed by said sensor means;

display means for displaying said processsed information;

key input means, operatively connected to said microprocessor means, for inputting data related to maximum and minimum values of said physical parameters to said microprocessor means;

said microprocessor means including means for comparing said sensed information from said sensor means with said maximum and minimum values and for generating alarm signal, and

alarm means, operatively connected to said means for comparing for receiving said alarm signal and for indicating that a sensed physical parameter is outside the range defined by said maximum and minimum values in response thereto.

4. The electronic cane of claim 1, wherein said physical parameters are selected from the group consisting of temperature of the environment, humidity of the environment, blood pressure of the user and pulse rate of the user.

4,858,126

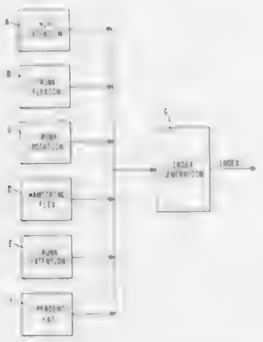
METHOD AND APPARATUS FOR QUANTITATIVE EVALUATION OF BACK HEALTH

Pasquale W. Croce, Jr., 977 Derring La., Bryn Mawr, Pa. 19010

Filed Feb. 26, 1987, Ser. No. 18,994

Int. Cl.[4] G06F *15/32*

U.S. Cl. 364—413.02 **26 Claims**



1. A method of establishing a quantitative index representative of the extent of back injury in a human patient comprising:

(a) positioning the patient in a first position, said first position including said patient lying supine on a rigid surface with both legs held as close as possible to the chest;

(b) measuring the angle through which the right femur of the patient passes as the patient slowly moves from said first position to a second position, said second position including the right leg of said patient being extended by said patient as far as possible along said rigid surface while said patient attempts to maintain the remainder of the body substantially as in said first position;

(c) measuring the angle through which the left femur of the patient passes as the patient slowly moves from said first position to a third position, said third position including the left leg of said patient being extended by said patient as far as possible along said rigid surface while said patient attempts to maintain the remainder of the body substantially as in said first position;

(d) positioning the patient in a fourth position on a rigid surface, said fourth position including said patient lying supine with knees bent and the heels at a distance of about 1 foot from the buttocks;

(e) measuring the angle through which the mid axilla passes as the patient moves from said fourth position to a fifth position, said fifth position including said patient holding the head and shoulder blades as high as possible off the rigid surface while maintaining the remainder of the body substantially in said fourth position;

(f) measuring the angle through which the left femur passes as the patient moves from said fourth position to a sixth position, said sixth position including the right leg being crossed over the left leg and the left knee being held by the patient as close as possible to the rigid surface and to the right of the patient;

(g) measuring the angle through which the right femur passes as the patient moves from said fourth position to a seventh position, said seventh position including the left leg being crossed over the right leg and the right knee of the patient being held as close as possible to the rigid surface and to the left of the patient;

(h) positioning the patient in an eighth position, said eighth position including said patient sitting with legs extended and together, the soles of the feet being substantially vertical;

(i) measuring the horizontal distance between the fingertips of the patient and the point along the legs about eight inches in front of the toes of the patient after the patient moves from the eighth position to a ninth position, the ninth position including the patient being bent at the waist as far forward as possible and with arms at maximum extension;

(j) positioning the patient in a tenth position, said tenth position including said patient lying prone on a rigid surface with chin lifted by the patient as far as possible off the rigid surface;

(k) measuring the vertical distance between the bottom of the chin and the rigid surface with the patient in said tenth position;

(l) providing an expected range of values for each of said measurements; and

(m) comparing each of said actual measurements to said expected range to generate an overall index value representative of the extent of back injury of the patient.

4,858,127

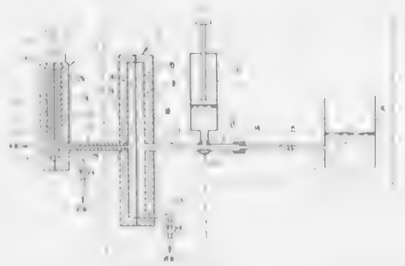
APPARATUS AND METHOD FOR MEASURING NATIVE MAMMALIAN BLOOD VISCOSITY

Reuben E. Kron, Bryn Mawr, and Mitchell Litt, Philadelphia, both of Pa., assignors to KDL Technologies, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 868,521, May 30, 1986, abandoned. This application Apr. 15, 1988, Ser. No. 182,176

Int. Cl.[4] A61B *5/02*; G01N *11/08*

U.S. Cl. 364—413.07 **10 Claims**



1. The method of measuring a continuous profile of viscosity versus shear rate of a sample of blood or other non-Newtonian liquid which comprises the steps of:

(1) acquiring a sample of blood,

(2) establishing a body of the sample within a constricted space, said body in one direction communicating with the atmosphere or other body of fluid of known pressure, and said body in the other direction communicating either with (a) an enclosed body of blood or any other liquid retained by a compliant diaphragm, or (b) with a body of blood having a free surface in contact with a body of air or other compressible fluid,

(3) establishing a body of air of known mass communicating on one side with either (a) the compliant diaphragm or (b) the free surface of said body of blood, and on the other side with means for sensing the change in the pressure with time of the known mass of air,

(4) establishing an initial viscous flow of blood in the constricted space, thereby changing the pressure of the body of air and deflecting any compliant diaphragm,

(5) allowing said compressed body of air and any deflected compliant diaphragm to relax, thereby establishing a transient viscous flow in the constricted space,

(6) sensing the changing pressure with time in the enclosed body of air during said transient viscous flow with said sensing means, and

(7) processing the output of said pressure sensing means to determine the time varying shear stress and shear rate of said sample and so as to calculate the changing viscosity of said sample as a function of shear rate during the relaxation of either said compliant diaphragm, said body of air, or both said compliant diaphragm and said body of air, thereby providing a continuous profile of viscosity versus shear rate of said sample.

3. An apparatus for measuring the viscosity profile (shear rate dependent viscosity) of blood or other non-Newtonian liquid comprising in combination (1) capillary or other constricted space means; (2) first conduit means in fluid flow communication with said capillary or constricted space means; (3) three-way valve means positioned medially of said conduit means and adapted to receive the contents of a hypodermic syringe or other source of liquid under pressure; (4) an enclosed assembly comprising a pair of mating recessed shell portions and a first compliant diaphragm sealed therebetween, the distal end of said conduit means communicating into the interior of said assembly through one shell portion; (5) second conduit means communicating at one end thereof into assembly (4) through the mating shell portion thereof; (6) an enclosed measuring assembly comprising a second pair of mating recessed shell portions having a second compliant diaphragm sealed therebetween, the distal end of said second conduit means communicating into the interior of said measuring assembly through one shell portion of said second pair of shell portions, the mating shell portion of said second pair of shell portions having an opening formed therein; (7) coil means embedded within each of said second pair of shell portions adapted to sense the deflection of the said compliant diaphragm; (8) wire means adapted to connect said coils to a modulator-demodulator adapted to generate an output voltage proportional to the deflection of said second compliant diaphragm.

4,858,128

VIEW-TO-VIEW IMAGE CORRECTION FOR OBJECT MOTION

David J. Nowak, Greendale, Wis., assignor to General Electric Company

Filed Aug. 11, 1986, Ser. No. 895,316

Int. Cl.[4] G06K *9/40*; G06F *15/42*

U.S. Cl. 364—413.13 **10 Claims**

1. Apparatus for correcting for inter-view motion in an imaging system, comprising: means for collecting first and second views of an object;

said first and second views being taken from first and second different angles;

each of said first and second views including at least one of M rows and N columns of image brightness data;

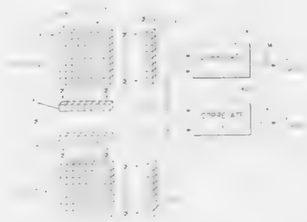
means for comparing a first pattern of said image brightness data from said first view with a corresponding second pattern of said image brightness data from said second view to produce a coefficient containing information about a similarity therebetween;

said means for comparing including means for applying a shift to one of said first and second patterns to a plurality of positions for producing a plurality of said coefficients, one at each of said plurality of positions;

means related to said plurality of coefficients for determining a value of said shift yielding a maximum of said similarity;

said means for comparing includes:

first means for summing a brightness of each pixel in one of each row and each column in said first view to produce a first one-dimensional summation array;



second means for summing a brightness of each pixel in one of each row and each column in said second view to produce a second one-dimensional summation array;

means for multiplying brightness values of corresponding elements in said first and second one-dimensional summation arrays to produce a plurality of products; and

means for summing said plurality of products to produce said coefficient.

4,858,129

X-RAY CT APPARATUS

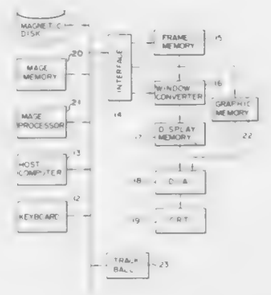
Issei Mori, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 22, 1987, Ser. No. 99,904

Claims priority, application Japan, Sep. 30, 1986, 61-229695; Sep. 30, 1986, 61-229703

Int. Cl.[4] G06F *15/42*

U.S. Cl. 364—413.14 **7 Claims**



1. A X-ray computerized tomograpy apparatus comprising:

memory means having a plurality of frame storage areas for storing, in each of said frame storage areas, pixel data of one frame of a plurality of tomographic images of a region of interest of a subject under examination, which have been obtained by repeatedly photographing said region of interest of said subject at successive photographing times;

display means coupled to said memory means, for displaying a frame of said plurality of tomographic images; and

processing means coupled to said memory means, for pick-

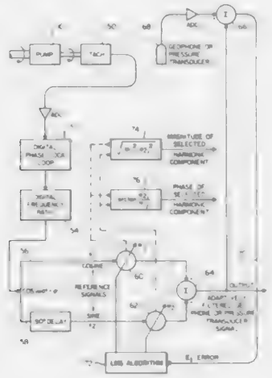
ing up data of pixels arranged on a corresponding line of said tomographic images from data of all pixels of said tomographic images, and storing the picked-up data of said pixels on the corresponding line of said tomographic images, in the order of photographing times of said tomographic images, in a predetermined frame storage area of said memory means, to provide a time series image formed of said pixels on said corresponding line of said tomographic images.

4,858,130

ESTIMATION OF HYDRAULIC FRACTURE GEOMETRY FROM PUMPING PRESSURE MEASUREMENTS

Bernard Widrow, Santa Clara County, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Aug. 10, 1987, Ser. No. 83,041
Int. Cl.[4] G01V *1/02, 1/40*; E21B *47/00*
U.S. Cl. 364—421 **20 Claims**



1. A method of determining the geometry or dimensions of a fracture comprising the steps of

defining a wellbore at least down to and intersecting the fracture,

inserting a well casing pipe in said wellbore, said pipe being open to said fracture and holding a fluid,

coupling a pump having a controllable operating speed to said pipe,

sweeping said operating speed of said pump through a known band of frequency to cause acoustic waves to travel from the pump through the fluid into the fracture,

locating at least one sensor in the vicinity of said fracture responsive to incident waves from said pumping step and reflected waves created by reflections from said fracture,

calculating the dimensions of said fracture from data generated by said sensors in response to said waves by analyzing resonances established by superposition of incident and reflected waves causing standing waves.

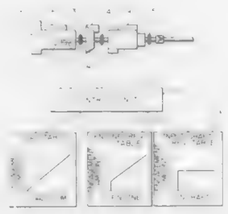
4,858,131

CLUTCH TARGET POSITION CONTROL SYSTEM

Toshiya Sugimura; Hitoshi Kasai, both of Numazu, and Hiroshi Yoshimura, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 28, 1987, Ser. No. 90,501
Claims priority, application Japan, Aug. 29, 1986, 61-203226; Aug. 29, 1986, 61-203227
Int. Cl.[4] G06F *15/50*; G06G *7/70*; F16D *43/22, 23/10*
U.S. Cl. 364—424.1 **15 Claims**

1. A method of operating a clutch target position control system of an engine which includes a transmission with an input shaft; a clutch having a clutch actuator controlling a clutch stroke; an accelerator pedal; a sensor detecting a parameter corresponding to an accelerator pedal depression amount and providing a detection signal; an engine sensor detecting a rotational speed of the engine and providing a detection signal; an input shaft sensor detecting a rotational speed of the input shaft and providing a detection signal; and stored reference data, said method comprising the steps of:



reading clutch engagement amounts from the stored reference data for each of the sensors, using the detection signals from each sensor as an address signal;

calculating a total engagement amount of the read clutch engagement amounts; and

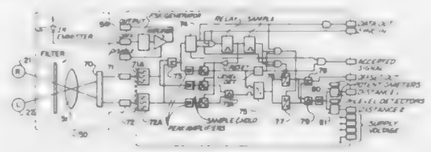
controlling the clutch actuator and clutch stroke on the basis of the calculated total engagement amount.

4,858,132

OPTICAL NAVIGATION SYSTEM FOR AN AUTOMATIC GUIDED VEHICLE, AND METHOD

Fredrik Holmquist, Charlotte, N.C., assignor to NDC Technologies, Inc., Charlotte, N.C.

Filed Sep. 11, 1987, Ser. No. 95,608
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—424.02 **5 Claims**



1. A navigation system for guiding an automatically guided vehicle having vehicle control means along a variable, predetermined path defined by a plurality of fixed, spaced-apart points, and comprising:

(a) a target positioned at each spaced-apart point defining the vehicle path, said target including a first light source for emitting a first light beam and a second light source horizontally spaced-apart from said first light source for emitting a second light beam;

(b) a light receiving camera and lens mounted on the vehicle for receiving said first and second horizontally spaced-apart light beams and focusing said beams on a detector, said detector having a vertically extending axis representing the path of the vehicle to the target, said beams being focused on said detector at two spaced-apart points on opposite sides of the vertically extending axis wherein a difference in distance from the vertical axis of the detector of said two spaced-apart points represents a deviation from the proper path of the vehicle to said target and an equality of distance of two said spaced-apart points to said vertically extending axis represents the proper path to the target; and

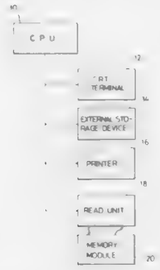
(c) said detector including means for converting said first and second light beams into a signal representing a bearing of the vehicle from the target and outputting said signal to the vehicle control means for controlling the vehicle position in relation to the target.

4,858,133

DRIVE MANAGEMENT SYSTEM

Kunihiko Takeuchi, Kawasaki; Hajime Ikeda, Yokohama, and Shinichi Horinouchi, Tokyo, all of Japan, assignors to Tokyo Keiki Company Ltd., Tokyo, Japan

Filed Mar. 15, 1988, Ser. No. 168,254
Claims priority, application Japan, Mar. 20, 1987, 62-671138
Int. Cl.[4] G06F *3/08, 15/74*
U.S. Cl. 364—424.04 **6 Claims**



1. A drive management system comprising:

a memory module having a memory medium for recording predetermined drive data as numerical valves in a state in which said memory module is attached to a vehicle;

reading means for reading out the drive data recorded in said memory module by detaching the memory module from the vehicle; and

management data processing means for calculating drive management data such as drive period of time, rest period of time, maximum drive velocity, drive distance, and the like on the basis of the drive data read out of the memory module by said reading means, and for making drive data classified for every driver and/or every vehicle;

and, wherein each of said memory module and said reading means has therein induction coils, and said system further comprises:

power supply means for supplying a power source from the reading means to the memory module by a contactless induction coupling of certain of said induction coils, and

data transmitting means for performing a bidirectional transmission to read out the drive data from the memory module to the reading means by a contactless induction coupling of said induction coils.

4,858,134

DEVICE FOR CONTROLLING STEERING FORCE IN POWER STEERING APPARATUS

Kunihiko Eto, Toyota; Shiro Takeuchi, Aichi; Yutaka Mori, Okazaki; Shigeo Tanooka, Okazaki; Kazumasa Kodama, Okazaki, and Tsutomu Matsumoto, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 18, 1987, Ser. No. 98,185
Claims priority, application Japan, Sep. 24, 1986, 61-225235
Int. Cl.[4] B62D *6/00*
U.S. Cl. 364—424.05 **11 Claims**

1. A device for controlling steering force in a power steering apparatus including an electromagnetic control valve for varying characteristics between manual steering torque and steering output torque by changing an amount of opening thereof in accordance with a control current to be applied,

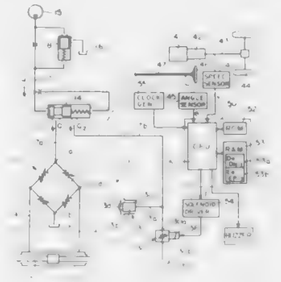
said device comprising:

a car speed sensor means for detecting a car speed or information varying in connection with said car speed;

a steering angle sensor for detecting a steering angle;

first arithmetic means for calculating a driving condition index corresponding to a driving condition determined by a driver on the basis of said information transmitted from said car speed sensor;

second arithmetic means for calculating a road condition index corresponding to a road condition on the basis of said steering angle transmitted from said steering angle sensor;



correcting means for modifying said driving condition index to form a correction driving condition index which takes any one of a plurality of discrete values which change stepwise depending upon the particular range of values to which said driving index belongs;

control current arithmetic means for calculating an output current value on the basis of said correction driving condition index and said road condition index; and

controlling means for applying said output control current having a value computed by said control current arithmetic means to said electromagnetic valve.

4,858,135

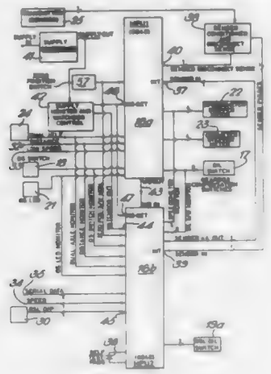
TACHOGRAPH AND VEHICLE SPEED CONTROL DEVICE

Frank Clish, Broughty Ferry, and John B. Franklin, Inchture, both of Scotland, assignors to Veeder-Root Limited, Smethwick, England

Continuation of Ser. No. 703,520, Feb. 20, 1985, abandoned. This application Oct. 9, 1987, Ser. No. 107,924
Claims priority, application United Kingdom, Feb. 24, 1984, 8404535
Int. Cl.[4] B60K *31/00*
U.S. Cl. 364—426.04 **6 Claims**

1. In a vehicle speed control device comprising means to provide a preset vehicle speed reference corresponding with a predetermined vehicle speed limit; input means for receiving an instantaneous vehicle speed input signal; and control means which responds to said instantaneous vehicle speed input signal and to said preset vehicle speed reference, whenever the instantaneous vehicle speed exceeds said vehicle speed limit, and which performs a vehicle speed control function and thereby produces a speed control output for reducing the vehicle speed; the improvement wherein said control means includes storage means for storing said preset vehicle speed reference as an initial data value of a floating speed reference, means for continuously and sequentially scanning said storage means and a current instantaneous vehicle speed signal, for determining, after each scan, whether or not the current instantaneous vehicle speed exceeds said predetermined speed limit, and for decrementing the stored data value by a predetermined amount whenever the current instantaneous vehicle speed is found to exceed said predetermined speed limit whereby said stored data value is reduced in steps in order to reduce said data value until the amount by which the current instantaneous

vehicle speed exceeds said predetermined vehicle speed limit is substantially reduced or eliminated, said reduced data value



providing a new effective speed reference to which said control means responds.

4,858,136

METHOD OF AND APPARATUS FOR CONTROLLING FUEL INJECTION QUANTITY FOR INTERNAL COMBUSTION ENGINE

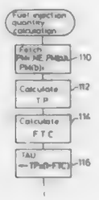
Yoshiyuki Tanaka, Nagoya; Akira Ii, Toyota; Taiichi Meguro, Okazaki, and Kenji Hayashi, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 29, 1986, Ser. No. 947,385

Claims priority, application Japan, Dec. 26, 1985, 60-295836; Jan. 14, 1986, 61-05724; Feb. 13, 1986, 61-29808; Mar. 3, 1986, 61-45633

Int. Cl.⁴ F02M *51/00*

U.S. Cl. 364—431.07 **20 Claims**



1. A fuel injection method for an internal combustion engine, comprising the steps of:

(a) determining a present first weighted mean value of intake-pipe pressure by using a first weighted means weight given to said first weighted means value determined in the past;

(b) determining a present second weighted means value of intake-pipe pressure and making a weight given to said second weighted means value determined in the past heavier than the weight given to said first weighted means value determined in the past in said step (a);

(c) subtracting said present second weighted mean value from said present first weighted mean value; and

(d) injecting fuel asynchronously with the crank angle when a result of said subtraction exceeds a predetermined value.

4,858,137

DETERMINATION OF THE STABILITY OF FLOATING STRUCTURES

Michael S. Bradley, Surrey, England, assignor to The British Petroleum Company p.l.c., London, England

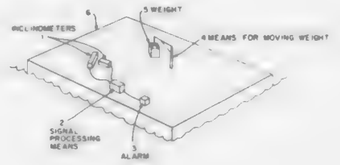
PCT No. PCT/GB86/00511, § 371 Date Mar. 31, 1987, § 102(e) Date Mar. 31, 1987, PCT Pub. No. WO87/01349, PCT Pub. Date Mar. 12, 1987

PCT Filed Aug. 29, 1986, Ser. No. 44,502

Claims priority, application United Kingdom, Aug. 31, 1985, 8521702

Int. Cl.⁴ G08B *23/00*; G01M *1/12*

U.S. Cl. 364—463 **7 Claims**



1. A method of measuring inclination, of a floating structure having a center of flotation, resulting from a change in weight distribution which comprises:

(a) making a plurality of changes in weight distribution of a structure, said changes being distributed about said structure's center of flotation, generating signals at intervals over a period of time by two inclinometers so as to measure said structure's inclination along two orthogonal non-vertical axes,

(b) feeding said signals to signal processing apparatus, which apparatus:

(i) determines from said signals a value of the change of inclinations along each of said two orthogonal non-vertical axes,

(ii) calculates an average value of maximum change of slope of a plane of inclination in said two orthogonal axes and an average value of direction in a horizontal plane, in relation to axes of said inclinometers of said maximum change of slope of said floating structure,

(iii) compares for each said change of weight distribution an observed direction of said maximum slope of inclination of said floating structure as determined from said inclinometer signals with a direction expected from a known change in weight distribution based on assumed values for ratio of rotational stiffness in said structure's principal stiffness axes,

(iv) recalculates, for the total number of changes of weight distribution, by an iterative process which varies said ratio of said stiffnesses of said floating structure until the predicted values of direction of maximum slope gives a closest match to said observed values,

(v) calculates a mean bias between said axes system of said inclinometers and said axes system in which the change in floating structure weight distribution has been made,

(vi) recalculates mean values of inclination along said axes of the inclinometers using said calculated bias to give mean values of inclinations along said axes of said floating structure.

4,858,138

SECURE VAULT HAVING ELECTRONIC INDICIA FOR A VALUE PRINTING SYSTEM

Paul C. Talmadge, Ansonia, Conn., assignor to Pitney Bowes, Inc., Stamford, Conn.

Filed Sep. 2, 1986, Ser. No. 902,903

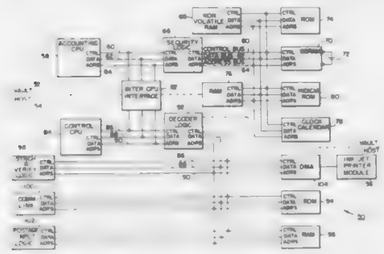
Int. Cl.⁴ G07B *17/00*; G06F *15/20*

U.S. Cl. 364—464.02 **24 Claims**

1. A value printing system for the printing of indicia, each of said indicia having at least a given value, each of said indicia

further having a fixed pattern to be printed together with said given value, said system comprising: first and second separate modules; secure metering means within the first module for maintaining a secure record of said given values printed, said secure metering means including a storage means of sufficient size for storing said pattern of said indicia within;

print control means within said second module and coupled to a printing means for printing said indicia, said print control means being operable upon receiving said fixed



pattern from said metering means for enabling printing of the given value to occur; and

communications means communicatively coupling together said metering means in said first module and said print control means in said second module, said communications means comprising means operable for communicating said pattern of said indicia stored in said storage means to said control means after which said control means enables the printing means to print said indicia.

4,858,139

PROCESS AND EXTRUSION APPARATUS FOR EXTRUDING A PLASTIC WEB

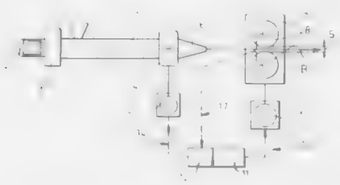
Robert Wirtz, Troisdorf, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Sep. 2, 1988, Ser. No. 240,257

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1987, 3730043

Int. Cl.⁴ B29C *43/58, 47/92*

U.S. Cl. 364—473 **6 Claims**



1. In a process for making a plastic web with an extrusion apparatus comprising a screw press, a metering pump with a volume flow rate depending on a rotation speed of said meter pump, an output die and a rolling unit with a plurality of calendaring rolls in which a flow of a melt made of thermoplastic material is regulated with said metering pump and a melt web issuing from said output die is cooled and calibrated in said rolling unit, said rotation speed of said metering pump over a regulated range thereof and the peripheral speed of said calendaring rolls being settable independently of each other, the improvement wherein said metering pump has a substantially linear volume-flow-rate/rotation-speed characteristic in the regulated range of said rotation speed and together with said rolling unit is part of a common computerized control system having a computer, said rolling unit in said control system being operated with said peripheral speed for said calendaring rolls which is proportional to said rotation speed of said metering pump in accordance with a proportionality factor which is given by the relationship:

$$\rho_1 V_p / \rho_2 SB$$

and said peripheral speed is determined by said computer, where ρ_1 indicates a predetermined density of said melt in the volume-rate of flow; V_p, is the flow volume per complete rotation of said metering pump; ρ_2 is a predetermined density of said plastic web in a roll nip between said calendaring rolls; S is a height of said roll nip between said calendaring rolls and B is a width of said plastic web and said ρ_1, V_p, ρ_2, S and B are inputted to said computer.

5. An extrusion apparatus for making a plastic web comprising a screw press, a metering pump with a volume flow rate depending on the rotation speed of said metering pump, an output die and a rolling unit with a plurality of calendaring rolls, the improvement wherein said metering pump and said rolling unit are part of a computerized control system including a computer for a peripheral speed of said calendaring rolls depending substantially linearly on said rotation speed of said metering pump and said control system has a computer which determines a proportionality factor as the ratio of said peripheral speed to said rotation speed

$$\rho_1 V_p / \rho_2 SB$$

where ρ_1 indicates a predetermined density in the volume-rate of flow of said melt; V_p is the flow volume per complete rotation of said metering pump; ρ_2 is a predetermined density of said plastic web in a roll nip between said calendaring rolls; S is a height of said roll nip between said calendaring rolls and B is a width of said plastic web and said ρ_1, V_p, ρ_2, S and B are inputted to said computer.

4,858,140

NUMERICAL CONTROL SYSTEM FOR HIGHLY DYNAMIC PROCESSES

Ernst Bühler, Losone, and Marco Boccadoro, Verscio, both of Switzerland, assignors to AG fur Industrielle, Losone Bei Locarno, Switzerland

Filed Nov. 30, 1987, Ser. No. 126,568

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1986, 3640987

Int. Cl.⁴ G05B *19/403*; B23H *7/06*

U.S. Cl. 364—474.31 **5 Claims**

1. A course interpolator for use in a numerical control system for performing path interpolation calculations for the control of highly dynamic processes having different path contour geometries wherein a vector having a length L connects in linear form a first point P1 to a second point P2, these points being located in three dimensional Cartesian space having axes x, y, and z, length L having Cartesian components X, Y and Z and being subject to an angular rotation C about the z axis, said interpolator comprising:

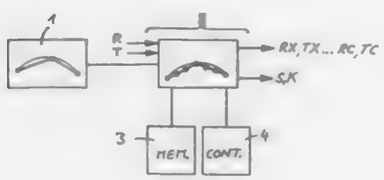
first means responsive to a group of predetermined vector lengths, starting with the maximum length, for calculating path elements L, X, Y, Z and C for a vector with the maximum length;

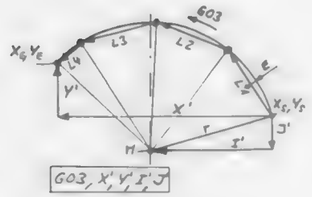
second means for determining a path error E for the calculated path elements of the first means;

third means for comparing the path error E with a predetermined maximum error value;

fourth means, actuated when the path error E does not exceed the maximum error value, for outputting the calculated path elements; and

fifth means, actuated when the path error E exceeds the maximum error value, for causing the first means to calcu-





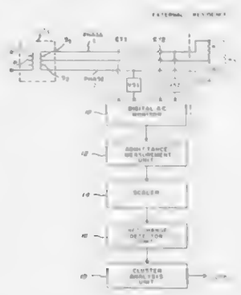
late the path elements for a vector which has the length next longest to said maximum length.

4,858,141

NON-INTRUSIVE APPLIANCE MONITOR APPARATUS

George W. Hart, Natick; Edward C. Kern, Jr., Lincoln, and Fred C. Schweppe, Carlisle, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass. and Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 14, 1986, Ser. No. 851,235
Int. Cl.[4] G01R *21/06;* G06F *15/46*
U.S. Cl. 364—483 20 Claims



1. Apparatus for non-intrusive measurement of energy usage and operating characteristics of each of a plurality of individual electric units, said units each contributing to a portion of a total electric load of a circuit of a facility, comprising:

(a) sensor means for measuring electrical characteristics of the total load of said circuit and producing an analog signal proportional thereto, said sensor means being coupled to said circuit at a location external to said facility;

(b) analog-to-digital conversion means for converting said analog signal into a digital signal; and

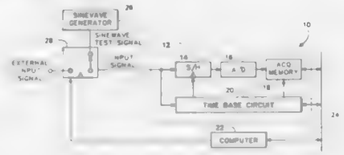
(c) signal processor means responsive to said digital signal for separating out said portion of the total load contributed by each of the plurality of units.

4,858,142

DIGITIZER EFFECTIVE RESOLUTION MEASUREMENT SYSTEM USING SINEWAVE PARAMETER ESTIMATION

Yih-Chyun Jenq, Lake Oswego, and Philip S. Crosby, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 5, 1987, Ser. No. 81,943
Int. Cl.[4] G01R *23/16*
U.S. Cl. 364—487 13 Claims



1. An apparatus for measuring the effective resolution of a digitizer of the type which samples an input signal at a sampling frequency f_s and produces a sequence of digital data representing sampled magnitudes of said input signal, the apparatus comprising:

means for generating a sinewave signal, said sinewave signal being applied as said input signal to said digitizer such that said digitizer produces an N-element digital data sequence representing measured magnitudes of said sinewave signal; and

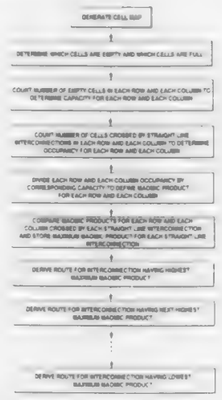
means responsive to said digital data sequence for determining therefrom estimated amplitude, frequency, phase angle and offset parameters characterizing said sinewave signal, for computing in accordance with said estimated parameters a set of data values representing estimated magnitudes of said sinewave signal, and for determining the effective resolution of said digitizer in accordance with a combination of differences between said measured magnitudes and said estimated magnitudes of said sinewave signal.

4,858,143

WORK ORDERING ROUTINE FOR USE IN A METHOD OF ROUTING

Serge Fournier, Montreal, Quebec, Canada, assignor to Bell-Northern Research, Ltd., Ottawa, Canada

Filed Sep. 25, 1986, Ser. No. 911,386
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—491 4 Claims



1. A method, to be carried out by a computer, of deriving routes of interconnections between elements in a connection medium, comprising the steps of:

generating a cell map consisting of a number of addressable cells representing grid positions in the connection medium;

designating certain of the cells which can accommodate routes as empty and designating remaining ones of the cells which cannot accommodate routes as full;

counting the number of empty cells in each of a plurality of rows of cells and columns of cells to define a capacity for each row and each column;

counting the number of cells in each row and each column which would be crossed by an interconnection if each interconnection extended along a straight line linking elements to be interconnected to define an occupancy for each row and each column;

dividing each row and column occupancy by a corresponding capacity to define a MAOMIC product for each row and each column;

comparing the MAOMIC products of each row and each column crossed by each straight line interconnection and storing the maximum MAOMIC product for each straight line interconnection; and

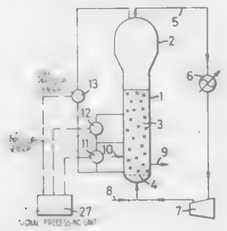
deriving routes for said interconnections in descending order of the MAOMIC products associated with said interconnections.

4,858,144

DETECTION OF ANOMALIES IN GAS FLUIDIZED BED POLYMERIZATION

Alain Marsaly, Gignac la Nerthe; Andre Martens, Chateauneuf les Martigues; Frederic R. M. M. Morterol, Sausset-les-Pins, and Charles Raufast, Saint Julien les Martigues, all of France, assignors to BP Chemicals Limited, London, England

Filed Feb. 12, 1987, Ser. No. 13,696
Claims priority, application France, Feb. 19, 1986, 8602270
Int. Cl.[4] F23G *5/00*
U.S. Cl. 364—496 13 Claims



1. A process for detecting anomalies in a fluidized bed contained in an enclosure and preventing further development of such anomalies comprising:

at least intermittently sensing the pressure at at least one level in the fluidised bed, the pressure being sensed by at least one pressure sensor which produces an analog signal;

determining the normal spectrum of frequencies present in the said signal when the fluidized bed operates under normal conditions free from anomalies;

detecting the appearance in the said signal of frequencies distinct from, and higher than, frequencies in said normal spectrum which correspond to the presence of anomalies in the fluid bed; and

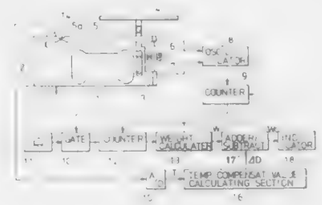
modifying the fluid bed conditions causing the anomalies upon detection of said frequencies distinct from the frequencies in said normal spectrum to prevent continuation of the increase of said anomalies.

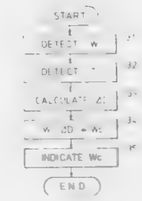
4,858,145

FORCE MEASURING DEVICE

Shinichi Inoue, Kobe, and Masami Yamanaka, Miki, both of Japan, assignors to Yamato Scale Company, Limited, Akashi, Japan

Filed Mar. 2, 1987, Ser. No. 20,433
Claims priority, application Japan, Apr. 21, 1986, 61-92600
Int. Cl.[4] G01G *3/14, 21/10*
U.S. Cl. 364—506 17 Claims





1. A force measuring device comprising:

main and auxiliary elastic cantilever members spaced parallel one from the other, said main member being adapted to receive a force to be measured at the free end thereof;

a string stretched between the free ends of said main and auxiliary members;

means for measuring the vibration frequency of said string and calculating therefrom the magnitude of said force to be measured;

means for sensing the temperature of at least one of said main and auxiliary members for providing data indicative of the temperature thereof;

means for calculating from said data a compensatory value corresponding to said temperature; and

means for correcting said calculated magnitude of force using said compensatory value.

4,858,146

AUTOMATED DESIGN OF STRUCTURES USING A FINITE ELEMENT DATABASE

Nader O. Shebini, Kenner, La., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Aug. 13, 1986, Ser. No. 895,971
Int. Cl.[4] G06F *9/44, 15/60;* G05B *17/02*
U.S. Cl. 364—512 28 Claims

5. In a design system controlling the input and output of modelling data to and from a finite element model database by a database management system having:

a source of modelling design data;

a database having a finite element structural model formed therein based on the modelling data provided from the source with the improvement comprising;

a network type database management system for communi-

cating the modelling design data between said database and said source of data; and



said database being an engineering database compatible with said network type database management system.

4,858,147

SPECIAL PURPOSE NEUROCOMPUTER SYSTEM FOR SOLVING OPTIMIZATION PROBLEMS

Peter R. Conwell, Salt Lake City, Utah, assignor to Unisys Corporation, Blue Bell, Pa.

Filed Jun. 15, 1987, Ser. No. 61,744
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—513 **13 Claims**



1. A network of binary processors forming a network and operable to seek global minimum energy states, comprising:

(1a) a plurality of N processor means wherein each said processor means includes a binary processor which is either "on"=1 or "off"=0 during each global machine cycle said 1 or 0 constituting status information;

(1b) a plurality of cross-connection means for connecting each one of said N processor means to each other one of said N processor means;

(1c) weight-delay means in each of said cross-connection means to carry said status information between any two processor means i and j as to whether i and j are "on"=1 or "off"=0 and to carry a weighted influence signal w_{ij} which tends to inhibit (−) its counterpart processor means from being "on" (off=0) or encourages (+) its counterpart processor means to go "on" (=1), said + or − value of w_{ij} being subject to a fixed delay time n_{ij} before its influence w_{ij} is effective on the said counterpart processor means;

(1d) a network history means for storing the processor state of 1="on" and 0="off", of each processor for each past number "P" of machine cycles such that each processor may access present or past status information to implement a decision algorithm after which said weight-delay means becomes operative;

(1e) processor-controller means for examining the status in said network history means, of each processor means over a past number of "P" machine cycles in order to evaluate the stability of a no-change condition for "P" machine cycles to indicate when the network of processors has reached a stable, non-changing state; and

(1f) decision algorithm means for establishing whether each processor means will have an "off" status (=0) or "on" status (=1) for any given machine cycle, said decision means including:

(1fa) an algorithm for evaluating inputs from other processor status and factoring in the fixed delay n_{ij} plus the weighted influence signal wij around a predetermined threshold value; and

(1fb) delay schedule means for delaying the execution of the algorithm evaluation for a predetermined number of machine cycles.

4,858,148

OUTPUT CONTROL SYSTEM

Hiroyuki Ueda, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,154
Claims priority, application Japan, Dec. 29, 1983, 58-249899
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—518 **7 Claims**



1. A printer for printing character information with an underline, said printer comprising:

store means for storing character code information to be printed and from which the character code information can be read out;

determination means for determining whether the character code information read out from said store means is to be printed with an underline; and

print control means, responsive to the determination by said determination means that the character code information read out from said store means is to be printed with the underline, for printing the underline for the character code information to be printed with the underline, and subsequently for printing character information associated with the character code information to be printed with the underline in accordance with a reference stepping amount of said printer.

4,858,149

METHOD AND SYSTEM FOR SOLID MODELLING

Peter Quarendon, Romsey, United Kingdom, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1987, Ser. No. 86,763
Claims priority, application United Kingdom, Sep. 3, 1986, 8621257
Int. Cl.[4] G06F *15/626*
U.S. Cl. 364—522 **10 Claims**

1. A method of generating a spatial representation of a three-dimensional solid object in a system comprising storage and processing means, the method comprising:

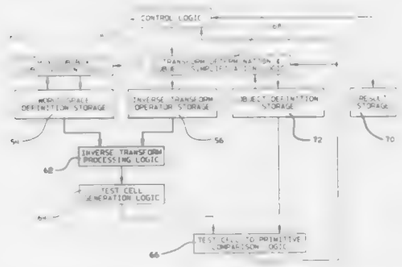
(a) the initial step of establishing in storage

a structure for defining the object, the structure including the functional definitions of at least one primitive and at least one transform operator; and

a functional definition of a three-dimensional box defining world space;

(b) followed by the step of

subdividing the box in world space into progressively smaller sub-boxes until sub-boxes are created whose size corresponds to at least a desired resolution and



for at least one primitive in the structure, traversing the structure to identify whether any transform operators are to be applied to the primitive as defined by the structure, and, if so, generating test-cells in primitive space from the sub-boxes using the inverse of each transform operator so identified and determining whether sub-boxes having the desired resolution have corresponding test-cells which intersect the primitive, or not,

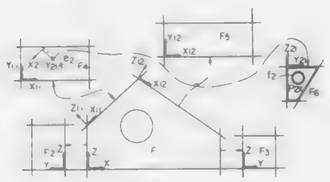
whereby a spatial representation of the object may be generated without performing transform operations on the object or the component primitives thereof.

4,858,150

SHAPE MODELING SYSTEM

Tamio Aizawa, and Kyoji Takahara, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 16, 1987, Ser. No. 25,979
Claims priority, application Japan, Jun. 27, 1986, 61-149531
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—522 **9 Claims**



1. A shape modeling method for generating a three dimensional shape, said method comprising the steps of:

generating data of a two-dimensional figure and a two-dimensional coordinate system through an input means using a computational device;

storing said two-dimensional figure and said two-dimensional coordinate system data in a data base;

transforming said two-dimensional coordinate system retrieved from said data base into a three-dimensional coordinate system;

generating a three-dimensional shape from said two-dimensional figure data and said three-dimensional coordinate system;

wherein said two-dimensional figure and said two-dimensional coordinate system data includes two-dimensional figure elements and two-dimensional coordinate system elements;

wherein an element of said two-dimension coordinate system which belongs to a two-dimensional figure element is made to be a master element and other elements are made to be slave elements; and

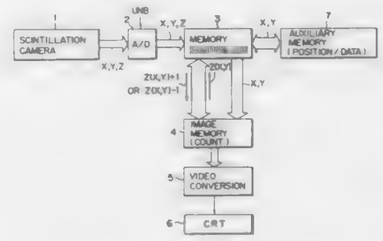
wherein said master element includes general data to which said slave elements are hierarchically related.

4,858,151

DATA PROCESSING DEVICE FOR USE IN SCINTILLATION CAMERA APPARATUS

Atsushi Habara, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 17, 1987, Ser. No. 98,194
Claims priority, application Japan, Sep. 29, 1986, 61-228236
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—527 **11 Claims**



1. An image processing system for displaying image data corresponding to gamma rays irradiated from radioisotopes injected into a subject under examination and detected by a scintillation camera, the image data being displayed on a display device as a distribution image of the radioisotopes within the subject, the system comprising:

an image memory for storing data representing the number of times gamma rays are detected at positions specified by position signals output from the scintillation camera;

memory control means, coupled to the image memory, for accessing the image memory in response to position signals output from the scintillation camera to increment the data stored at locations in the image memory corresponding to the position signals; and

an auxiliary memory, coupled to the memory control means, for sequentially storing position signals output from the scintillation camera, the auxiliary memory having a predetermined storage capacity, the auxiliary memory outputting the earliest-entered position signal at times when the number of position signals sequentially stored exceeds the storage capacity of the auxiliary memory; and wherein

the memory control means accesses the location in the image memory corresponding to the earliest-entered position signal output from the auxiliary memory to decrement the data stored at that location.

4,858,152

OPERATOR ACCESS TO MONITORING APPLICATIONS

Mark W. Estes, Dallas, Tex., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jan. 23, 1987, Ser. No. 6,514
Int. Cl.[4] G01F *15/06*
U.S. Cl. 364—550 **10 Claims**

1. In a networked system of a plurality of host computers running a plurality of host computer programs, a method of

simultaneously displaying data representative of operational parameters indicating performance of said plurality of host computer programs on a single work station display screen wherein each of said host computer programs is monitored by means of a monitor program associated therewith, each of said monitor programs detecting and storing operating parameter values during operation of its associated computer program, and said work station display screen includes a plurality of areas for displaying data, said method comprising an application program running on said single work station which performs the steps of:

receiving user inputs at said single work station and setting



thresholds of selected operating parameter values for each of said host computer programs;

scanning the stored operating parameter values for each of said host computer programs and displaying on a single line within a first area of said single work station display screen selected values for each of said host computer programs;

generating an alarm associated with any of said selected values for which a threshold is exceeded; and

responding to a user input on said single work station to log onto a host computer program using a second area of said work station display screen in order to allow diagnosing an alarm condition.

4,858,153

METHOD AND APPARATUS FOR FIXING AN INSTANTANEOUS MEASURED VALUE

Herbert Ziegler; Carl W. Clever, and Günter Roppelt, all of Nürnberg, Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Apr. 3, 1987, Ser. No. 34,783

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1986, 3611772

Int. Cl.[4] G06F *15/20;* **G01R** *15/08*

U.S. Cl. 364—550 **18 Claims**

1. Method for fixing an instantaneous measured value, which comprises creating measured values as mean values of a set of individual measured values, recording sequentially the individual measured values after initialization in a cycle determined by a flow control, checking in a first test with a control device that a new individual measured value exceeds a given base value, and that a difference between two latest individual measured values lies within a given limit range; before fixing a respective new measured value, checking with the control device that the difference between the two latest individual measured values resulting from the latest two individual measurements lies within the given limit range and fixing the last individual measured value when the differences between the



mean values and the differences between the individual measured values lie in the respective given limit range.

4,858,154

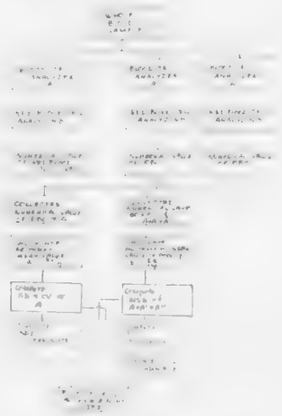
INTERLABORATORY QUALITY ASSURANCE PROGRAM

Frank C. Anderson, Hialeah, and Dean E. Twedt, Miami, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Apr. 7, 1986, Ser. No. 848,887

Int. Cl.[4] G01N *15/02*

U.S. Cl. 364—554 **15 Claims**



1. A procedure for evaluating statistically the performance of at least one apparatus in a pool of like apparatuses, by comparing the performance of said one apparatus with the performance of said like apparatuses, and by providing at least one comparative performance indicator of said one apparatus, said procedure comprising the steps of:

performing at least one substantially identical opertion by each of said apparatuses in said pool;

producing, as a result of said performing operation, associated resultant data by each of said apparatuses, for each separate operation;

collecting said resultant data from said one apparatus and said like apparatuses;

calculating from said resultant data the arithmetic mean data of all of the pool apparatuses;

translating mathematically said resultant data from said one apparatus and said arithmetic mean data from said pool apparatuses into at least one performance value for each said operation; and

providing said performance value as an indicator specific to the precision of performance of said one apparatus as compared to the precision of performance of the pool apparatuses.

4,858,155

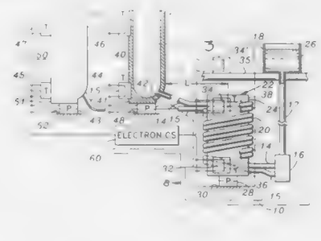
REACTION TEMPERATURE CONTROL SYSTEM

Dobson Okawa, Anaheim; Wing S. Pang, West Covina; Dang Ngo, Cypress, and George Shibata, Chino, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 24, 1985, Ser. No. 813,028

Int. Cl.[4] G01K *15/00, 7/02*

U.S. Cl. 364—557 **11 Claims**



1. A method for controlling a reaction temperature in a chemical analyzer, the method comprising the steps of:

(a) coupling a thermoelectric element to the reaction in the chemical analyzer;

(b) sensing a temperature proximate to the element in the chemical analyzer;

(c) powering the thermoelectric element for heating and cooling the reaction in response to a value of a control signal generated by control means; and

(d) generating the control signal by the steps of:

(i) determining a deviation of the sensed temperature from a desired temperature;

(ii) selecting from the control means a first control signal value for reducing the deviation;

(iii) determining a change in the sensed temperature for a first predetermined time interval;

(iv) determining a predicted change in the sensed temperature for a second predetermined time interval based on the change determined in the first predetermined time interval;

(v) comparing the deviation with the predicted change; and

(vi) depending on the result of the comparison, modifying the first control signal value by an amount proportional to the deviation.

4,858,156

APPARATUS FOR EXAMINING OBJECTS

Michael S. Martin, Royston, England, assignor to Soudronic AG, Bergdietikon, Switzerland

Filed Apr. 22, 1986, Ser. No. 854,604

Claims priority, application United Kingdom, May 22, 1985, 8512979

Int. Cl.[4] B07C *5/00*

U.S. Cl. 364—560 **14 Claims**

1. An apparatus for examining objects each having an elliptical cross sectional face extending in a plane and bounded by a perimeter rim, said apparatus comprising:

a test station adapted for location on the path of a means for conveying the objects in a direction through said test station;

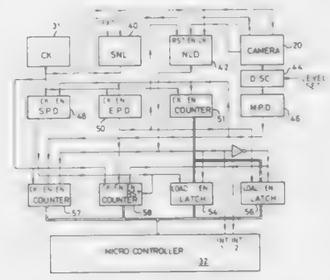
a means providing signals indicative of the conveying means speed of object conveyance;

a means for illuminating said object face with electromagnetic radiation;

electronic camera means at the test station for generating a plurality of electromagnetic scans of said object face presented thereto at least in a direction transverse to the conveying direction of the object, said camera means providing output signals associated with said electromagnetic scans;

means for processing the camera output signals including

a means for detecting signals corresponding to leading and



trailing edges of object rim first and second sections displaced from one another in a direction approximately parallel to said conveying direction,

a means for detecting signals corresponding to leading and trailing edges of object rim third and fourth sections displaced from one another in a direction approximately perpendicular to said conveying direction,

a computation means receiving and said scanned object rim signals for computing magnitudes of displacement between selected ones of said leading and trailing object rim section signals in accordance with said conveyor means speed signals, and computing from said displacement magnitudes signals indicative of the magnitude of ellipticity of said object face; and

comparator means for comparing the computed object face ellipticity signals with reference data signals indicative of a preferred magnitude thereof and determining therefrom whether each object complies with preset limits.

4,858,157

APPARATUS AND METHOD FOR DETERMINING THE COORDINATES OF A THREE-DIMENSIONAL OBJECT

Shunji Murai, Hachiouji; Fumio Ohtomo, Kawagoe, and Hitoshi Ohtani, Tokyo, all of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1986, Ser. No. 838,577

Claims priority, application Japan, Mar. 13, 1985, 60-49907; Mar. 13, 1985, 60-49908

Int. Cl.[4] G01B *9/00, 11/24;* **G06K** *9/00;* **G01C** *11/12*

U.S. Cl. 364—560 **7 Claims**

1. Apparatus for determining the coordinates of a measurement point on a three-dimensional object comprising, in combination:

first and second photoelectric conversion means disposed at a selected height from the object and spaced apart a predetermined distance in the direction of an x-axis and moveable together incrementally in the direction of a y-axis for respectively generating first and second data signals re-

spectively representing first and second images of said object each divided into a plurality of measurement points and together constituting a stereoscopic image;

first and second memory means respectively connected to said first and second photoelectric conversion means for respectively storing said first and second data signals representing said first image and said second image, respectively;

measurement point setting means for storing data signals representing x and y coordinates of measurement points in said first image;

correlation processing means connected to said first and second memory means and to said measurement point setting means for processing output signals from said first and second memory means and data signals from said measurement point setting means representing a selected measurement point in said first image and producing a measurement point in the second image substantially corresponding to the selected measurement point in said first image;

mark generating means connected to said first and second memory means for adding to the data signal representing said first image a mark data signal concerning said selected measurement point and for adding to the data signal representing said second image a corresponding mark data signal concerning the measurement point supplied from said correlation processing means;

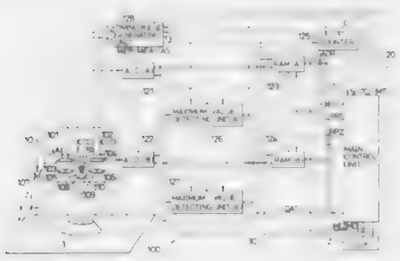


image display means including a display screen and video signal control circuit means for raster scanning said display screen at a predetermined vertical synchronization frequency;

signal processing means including means for applying the data signal representing said first image and containing said mark data signal to said image display means alternately with the data signal representing said second image and containing said corresponding mark data signal each at one-half the vertical synchronization frequency for producing on said display screen an image of said object including images of said mark data signal and said corresponding data signal, and means through which the display screen image of said object is viewed alternately with the left and right eye each at one-half said vertical synchronization frequency for presenting a three-dimensional image of said object and enabling visual examination to determine whether the image of the measurement point in said second image is correctly positioned in the viewed image; and

calculating means connected to said correlation processing means and to said measurement point setting means for calculating values of the x, y, and height (z) coordinates of said selected measurement point when the image of the measurement point in said second image is determined to be correctly positioned in the viewed image.

4,858,158

APPARATUS AND METHOD FOR CONVERTING ROTATION ANGLE WIDTH INTO TIME WIDTH

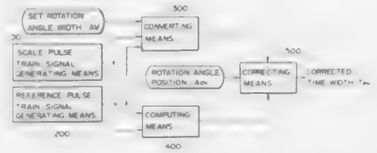
Masataka Ishikawa, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1987, Ser. No. 135,441

Claims priority, application Japan, Dec. 22, 1986, 61-306143

Int. Cl.⁴ G06F *15/46*; G01B *7/00*

U.S. Cl. 364—571.01 **15 Claims**



1. An apparatus for converting a set rotation angle width related to a rotary machine, of which rotation speed varies cyclically, into a time width required for said rotary machine to rotate by said set rotation angle width from a given rotation angle position comprising;

scale pulse train signal generating means for generating a scale pulse train signal having a scale pulse given whenever said rotary machine rotates a predetermined unit rotation angle;

reference pulse train signal generating means for generating a reference pulse train signal having a reference pulse for identifying each scale pulse of said scale pulse train signal;

converting means, responsive to said scale pulse train signal, said reference pulse train signal and said set rotation angle width, for detecting a spacing time of a specified scale pulse, based on identification by said reference pulse train signal, of each scale pulse of said scale pulse train signal, for converting said set rotation angle width to a time width by using the detected spacing time and said unit rotation angle, and for giving the converted time width;

operating means, responsive to said scale pulse train signal and said reference pulse train signal, for detecting, based on said identification by said reference pulse train signal of each scale pulse of said scale pulse train signal, each respective spacing time of a plurality of scale pulses predetermined in relation to said given rotation angle position and said set rotation angle width, computing a rotation speed variation value of said rotary machine based on each detected spacing time, and for giving the computed rotation speed variation value; and

Correcting means, responsive to the time width from said converting means, the rotation speed variation value from said operating means and said given rotation angle position, for computing, based on said rotation speed variation value and said given rotation angle position, a correcting coefficient for correcting an error between said set rotation angle width and an actual rotation angle width corresponding to said time width, correcting said time width by using said correcting coefficient, and for giving the corrected time width.

4,858,159

FREQUENCY-TUNEABLE FILTER CALIBRATION

Lynn M. Wheelwright, Santa Rosa; Vicky A. Hansen, Rohnert Park, and Mark D. Heerema, Santa Rosa, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 19, 1987, Ser. No. 111,843

Int. Cl.⁴ G01C *25/00*; G01R *23/00*; H03J *3/08, 3/00*

U.S. Cl. 364—571.01 **11 Claims**

5. In a calibration system for a tuneable frequency band pass filter having a selectable center frequency and also having a signal input, a signal output, and a tuning input, the improvement comprising:

means connected to the signal input for generating a reference signal;

measuring means, including a first local oscillator, connected to the signal output for producing a measurement signal having a predetermined relationship with the amplitude of a signal appearing at the signal output;

processing means connected to the measuring means and responsive to the measurement signal for producing control signals;

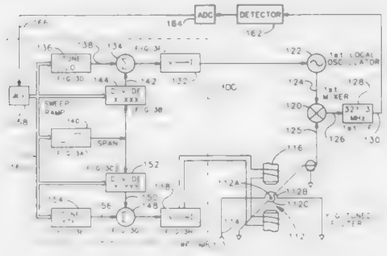
sweep ramp generating means connected to the processing means and responsive to a first control signal for generating a span signal;

first tune means connected to the processing means and responsive to a second control signal for producing a first tune signal;

the first local oscillator being driven by the span signal and the first tune signal; and

second tune means connected to the processing means and responsive to a third control signal for producing a second tune signal at the tuning input of the tuneable frequency filter;

the tuneable frequency filter being driven by the span signal and the second tune signal.



6. A method for calibrating a tuneable frequency band pass filter having a selectable center frequency and also having a signal input, a signal output, and a tuning input comprising the steps of:

generating control signals;

generating a span signal in response to a first control signal;

generating a first tune signal in response to a second control signal;

inputting the sum of the span signal and the first tune signal as a drive signal to a first local oscillator;

generating a second tune signal in response to a third control signal;

inputting the sum of the span signal and the second tune signal to the tuning input of the tuneable frequency filter;

inputting a reference signal to the signal input of the tuneable frequency filter;

measuring the amplitude of an output signal at the signal output of the tuneable frequency filter; and

varying the second tune signal in response to the third control signal until the measured amplitude is a predetermined value having a predetermined relationship with the center frequency of the tuneable frequency filter.

4,858,160

SYSTEM FOR SETTING REFERENCE REACTANCE FOR VECTOR CORRECTED MEASUREMENTS

Eric W. Strid, Portland, and Keith E. Jones, Beaverton, both of Oreg., assignors to Cascade Microtech, Inc., Beaverton, Oreg.

Filed Mar. 18, 1988, Ser. No. 169,844

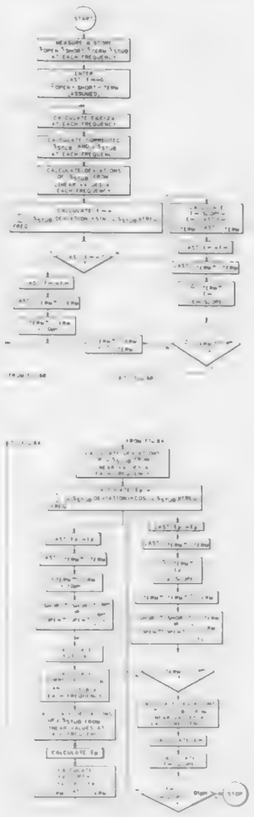
Int. Cl.⁴ G06F *15/20*; G01R *27/04*; G01C *25/00*

U.S. Cl. 364—571.01 **19 Claims**

1. A method of calibrating vector corrected electrical measurements by adjusting initial error factors, calculated from assumed reflection coefficients of respective impedance standards, so as to correct for distortions due to imperfect assumptions of the values of said reflection coefficients, said method comprising:

(a) measuring magnitudes and phases of respective complex reflection coefficients, at respective multiple frequencies, of at least one further impedance standard;

(b) utilizing said initial error factors to calculate corrected measurements of said magnitudes and phases;



(c) determining the presence of any of said distortions in said corrected measurements of both said magnitudes and said phases; and

(d) adjusting said initial error factors, and thereby adjusting said corrected measurements of said magnitudes and phases, so as to minimize said distortions.

4,858,161

METHOD FOR THE AUTOMATIC CALIBRATION OF A HIGH-RESOLUTION ELECTRONIC BALANCE

Arthur Baumann, Bertschikon, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Feb. 4, 1987, Ser. No. 10,866

Claims priority, application Switzerland, May 23, 1986, 095/86

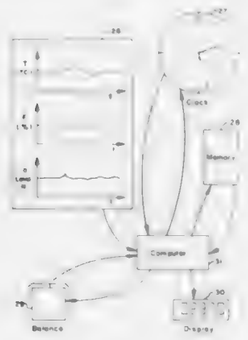
Int. Cl.⁴ G01G *23/01, 23/48*

U.S. Cl. 364—571.03 **24 Claims**

1. A method for determining whether to perform automatic calibration of a high-resolution electronic balance comprising the repeated execution of a checking program, the steps of said checking program comprising:

monitoring at least one environmental parameter which affects the weighing result, and

comparing said at least one environmental parameter with a



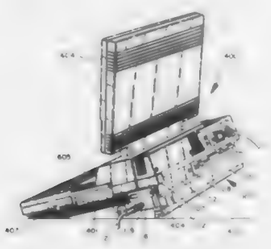
corresponding assigned threshold to determine that an automatic calibration should be performed if said at least one environmental parameter does not reach said threshold.

4,858,162

METHOD AND APPARATUS USED IN MOUNTING EXPANSION CARDS

Thomas M. Kieffer, St. Louis Park, and David J. Gaasedelen, Golden Valley, both of Minn., assignors to Connect Computer Company, Inc., Minneapolis, Minn.

Filed Aug. 28, 1987, Ser. No. 90,941
Int. Cl.[4] G06F *1/00;* **H05K** *5/00, 7/16*
U.S. Cl. 364—708 **10 Claims**



1. An expansion unit for a portable computer having a bottom surface, a back end, a front end, and a handle proximate the back end, the portable computer being supportable on a flat surface such as a desk top proximate its front end and a bottom surface of its handle so as to define a space between the bottom surface of the computer and a plane extending from the front end of the portable computer to the bottom surface of the handle, the expansion unit comprising:

a hollow, rigid expansion card holder mounted on the bottom surface of the portable computer proximate the back end of the portable computer in the space defined between the bottom surface of the portable computer and the plane extending from the front to the bottom surface of the handle; and

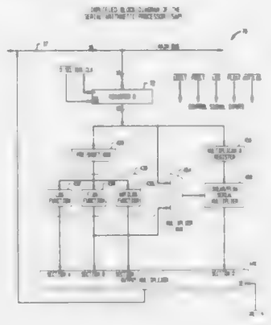
a conversion card having two ends said first end adapted to physically and electrically interconnect to said portable computer's expansion slot, said second end adapted to physically and electrically interconnect to a standard PC expansion card, said expansion card holder cooperating with the bottom surface of the portable computer to form a substantially enclosed compartment for holding the expansion card.

4,858,163

SERIAL ARITHMETIC PROCESSOR

Charles P. Boreland, Waterbury, Conn., assignor to General DataComm, Inc., Middlebury, Conn.

Filed Jul. 2, 1987, Ser. No. 69,432
Int. Cl.[4] G06F *7/00, 11/00, 7/38, 7/52*
U.S. Cl. 364—715.03 **19 Claims**



1. A serial arithmetic processor for performing arithmetically complex functions on incoming data values, comprising:

(a) first common means for converting an incoming linear domain data value into its logarithmic domain data value equivalent, for converting an incoming linear domain data value into its floating point domain data value equivalent, and for converting an incoming logarithmic domain data value into its linear domain data value equivalent, said first common means including controlled first logic and circuit means;

(b) second common means for multiplying two incoming data values and providing a data product and for multiplying two floating point values and providing a data product, said second common means including controlled second logic and circuit means;

(c) output means for receiving data converted by said first common means and products of said second common means, and or sending the received data and products in a desired format to a desired destination; and

(d) controller means for controlling said controlled first and second logic and circuit means, and said output means as a function of the desired conversion or multiplication to be performed on said incoming data.

4,858,164

COMPLEX ARITHMETIC PROCESSING

Alan W. Schildborn, East Northport, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 29, 1987, Ser. No. 56,627
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—736 **13 Claims**

1. An arrangement for performing complex arithmetic comprising:

(a) input register means for receiving along a selected set of bidirectional input buses the real and imaginary portions of selected complex numbers to be arithmetically processed;

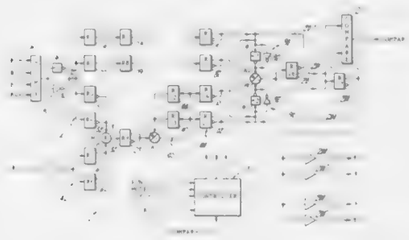
(b) multiplexer means connected to at last two of said input buses for passing input data from a selected input bus to a selected register on one of at least two data paths;

(c) multiplier means for separately multiplying portions of one of said selected complex numbers with portions of another of said numbers, said multiplier means comprising

a multiplier register means for receiving the results of said multiplication;

(d) first adder means for conducting addition operations, said addition operations including addition and subtraction of the results of multiplication, said first adder means further comprising first adder output register means for receiving the results of addition by said first adder means;

(e) additional adder means for conducting such addition operations including addition and subtraction, said additional adder means comprising additional adder inputs connected to said input register means for receiving the



real and complex portions of selected input complex numbers, and also connected to said first adder output register means for conducting addition operations thereupon, said additional adder means further comprising additional adder output register means for controllably storing selected results of addition operation by said additional adder means; and

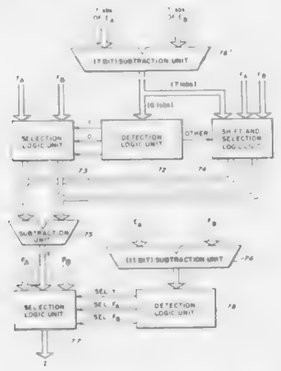
(f) control means for controlling the flow of data through said input register means, said multiplier means said first adder means and said additional adder means in at least two modes to perform at least two complex arithmetic operations.

4,858,165

APPARATUS AND METHOD FOR ACCELERATION OF EFFECTIVE SUBTRACTION PROCEDURES BY THE APPROXIMATION OF THE ABSOLUTE VALUE OF THE EXPONENT ARGUMENT DIFFERENCE

Paul E. Gronowski, Leominster; Victor Peng, Shrewsbury, and Nachum M. Gavrielov, Ashland, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 19, 1987, Ser. No. 64,835
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—748 **17 Claims**



1. Apparatus for performing floating point addition and subtraction operations, said apparatus comprising:

addition means for performing floating point effective addition; and

subtraction means for performing floating point effective subtraction, said subtraction means including:

first subtraction means responsive to initial operand exponent argument signals for identifying correct final fraction signals;

second subtraction means responsive to a subset of said initial operand exponent argument signals for identifying possible final fraction signals;

third subtraction means responsive to said second subtraction means and to said initial operand fraction signals for providing a first possible final fraction signals; and

selection means responsive to said first subtraction means for selecting said correct final fraction signals from said first possible final fraction signals and said initial operand fraction signals.

4,858,166

METHOD AND STRUCTURE FOR PERFORMING FLOATING POINT COMPARISON

Yeshayahu Schatzberger, Haifa, Israel; Yeshayahu Mor, and Leonardo Sandman, both of Cupertino, Calif., assignors to Performance Semiconductor Corporation, Sunnyvale, Calif.

Filed Sep. 19, 1986, Ser. No. 909,526
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—748 **1 Claim**



1. Means for comparing a first and a second floating point number comprising:

first means for providing an exponent difference signal indicating if the exponent of said first floating point number is greater than the exponent of said second floating point number;

second means for providing an equal exponent signal indicating if the exponents of said first and second floating point numbers are equal;

third means for providing a signal indicating if either or both of said first and second floating point numbers are equal to zero; and

fourth means for providing an output signal indicating if said first floating point number is greater than said second floating point number, by selecting as said output signal:

the most significant bit of said first floating point number when said exponent of said first floating point number is not greater than said exponent of said second floating point number, and neither of said first or second floating point numbers is equal to zero;

the sign bit resulting from the subtraction of the mantissas when the exponents of said first and second floating point numbers are equal and there has not been an

overflow when subtracting said first and second floating point numbers; and

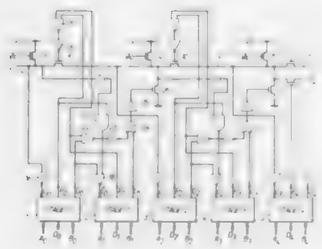
the inverse of the sign bit resulting from the subtraction of the mantissas when the exponents of said first and second floating point numbers are equal and there has been an overflow when subtracting said first and second floating point numbers.

4,858,167

PARALLEL BINARY ADDER HAVING GROUPED STAGES INCLUDING DYNAMIC LOGIC TO INCREASE CARRY PROPAGATION SPEED

Richard D. Simpson, Carlton, and Derek Roskell, Wellingborough, both of United Kingdom, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 942,905, Dec. 17, 1986, abandoned.
This application Dec. 14, 1988, Ser. No. 285,359
Claims priority, application United Kingdom, Dec. 20, 1985,
Int. Cl.[4] G06F 7/50
U.S. Cl. 364—787 **3 Claims**



1. A parallel binary adder circuit comprising:

a plurality of adder circuit stages coupled to a carry path, each of said stages including a first logic circuit for producing a carry propagate signal and a second logic circuit for producing a carry generate signal;

a third logic circuit for each group of two successive stages, no two groups containing the same stage, for combining the carry propogate signals and the carry generate signals from the stages of a particular group to produce a group carry propagate signal and a group carry generate signal, wherein for each group of stages the carry path has a group carry input conductor for receiving a group carry output signal from an immediately preceding group of stages and a group carry output conductor for conveying the group carry output signal from the particular group to the immediately following group;

a first transistor connecting the input conductor to a first reference voltage in response to a pre-charge clock signal prior to the generation of the carry propagate and the carry generate signals;

a second transistor responsive to the group carry propagate signal from the particular group to connect the group carry output conductor to the group carry input conductor for the particular group; and

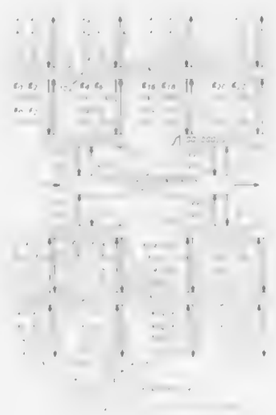
a third transistor responsible to the group carry generate signal from the particular group to connect the group carry output conductor to a second reference voltage.

4,858,168

CARRY LOOK-AHEAD TECHNIQUE HAVING A REDUCED NUMBER OF LOGIC LEVELS

InSeok S. Hwang, Lower Macungie Township, Pa., assignor to American Telephone and Telegraph Company, Murray Hill, N.J.

Filed Feb. 16, 1988, Ser. No. 157,187
Int. Cl.[4] G06F 7/50
U.S. Cl. 364—787 **6 Claims**



1. A circuit including 32-bit carry look-ahead means, comprising data inputs for a first word (a_i) and a second word (b_i), where i=0, 1, 2 . . . 31, and having a carry-in input, and further comprising:

first means for producing single bit generate terms (g_i), and

second means for producing single bit propagate terms (p_i), where i=0, 1, 2 . . . 31, except i≠3, 7, 11, 15, 19, 23, 27, and 31;

third means for producing double bit generate terms (dg_{i+1}), and

fourth means for producing double bit propagate terms (dp_{i+1}), where i=0, 2, 4 . . . 30;

and wherein said first, second, third and fourth means each receive said first and second words from said data inputs;

fifth means for producing group (4 bit) generate terms (gg_{i+3}), and

sixth means for producing group (4 bit) propagate terms (gp_{i+3}), where i=0, 8, 16, and 24;

seventh means for producing double group (8 bit) generate terms (dgg_{i+7}), and

eighth means for producing double group (8 bit) propagate terms (dgp_{i+7}), where i=0, 8, 16, and 24; and,

wherein said fifth and seventh means each receive said double bit generate terms from said third means and said double bit propagate terms from said fourth means; and,

wherein said sixth and eighth means each receive said double bit propagate terms from said fourth means;

ninth means coupled to said carry-in input, said seventh means, and said eighth means for producing group carry terms (gc_i) (for 8-bit blocks), where i=0, 8, 16 and 24;

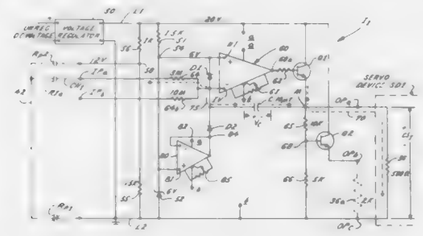
tenth means coupled to said first, second, fifth, sixth and ninth means for producing bit carry terms (c_i), where i=0, 1, 2 . . . 31.

4,858,169

ELECTRONIC INTEGRATOR USING AN OPERATIONAL AMPLIFIER AND WITH ALLEVIATION OF WIND-UP

Lary L. Fields, Caledonia, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Division of Ser. No. 810,402, Dec. 18, 1985, Pat. No. 4,724,516.
This application Jul. 29, 1987, Ser. No. 78,984
Int. Cl.[4] G06G 7/186
U.S. Cl. 364—829 **2 Claims**



2. A solid state electronic integrator comprising in combination

(a) an operational amplifier having non-inverting and inverting input terminals and an output,

(b) means for applying a reference voltage to said non-inverting terminal,

(c) a resistor having one end connected to said inverting terminal and adapted at its other end to receive an input voltage which at different times may be negative or positive relative to said reference voltage,

(d) a capacitor having one end connected to said inverting input terminal and its other end constituting a main output terminal, together with means for coupling the output of said amplifier to said main output terminal,

(e) means for coupling said main output terminal to a utilization device and thereby to create a load resistance at the output terminal,

(f) a first diode connected between said inverting and non-inverting input terminals and poled to conduct forwardly only from the latter toward the former, and

(g) a second diode connected from (i) a point residing substantially at or slightly less than said reference voltage to (ii) said non-inverting input terminal and poled to conduct forwardly only from the former toward the latter.

4,858,170

SHORTHAND NOTATION AND TRANSCRIBING METHOD

Robert S. DeWick, Sr., and Carolyn C. DeWick, both of 118 Everett Rd., Knoxville, Tenn. 37922

Filed Oct. 24, 1986, Ser. No. 923,006
Int. Cl.[4] G06F 9/00
U.S. Cl. 364—900 **10 Claims**

1. An improved method for recording vocalized speech comprising spoken words and transcribing said speech into commonly readable text, said method utilizing a programmable data processing system having an inputting keyboard, a central processing unit and an output device for producing printed text, said method comprising the steps of:

assigning selected alphabetic shorthand notations for individual and groups of said spoken words;

inputting said shorthand notations into said central processing unit using said keyboard;

selectively editing said input shorthand notations using said keyboard and a preprogammed text editing routine stored in said central processing unit, whereby corrections and alterations to said shorthand notations can be input into said central processing unit;

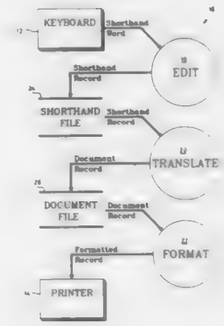
recording said selectively edited shorthand notations input to said central processing unit on magnetic media in said central processing unit whereby a shorthand file is created;

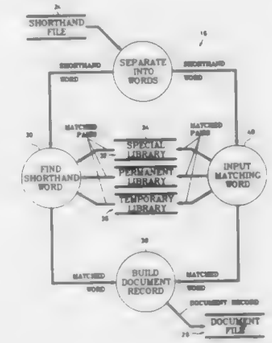
separating said shorthand file into individual shorthand words using a preprogrammed separate word routine in said central processing unit;

matching said separated individual shorthand words with matched pairs of said shorthand words and words of said commonly readable text stored on magnetic media in a first library in said central processing unit using a preprogrammed find shorthand word routine in said central processing unit, whereby said commonly readable text translations of said separated individual shorthand words are identified;

assembling said words of commonly readable text identified by said find shorthand word routine into a translated document file using a preprogrammed build document routine in said central processing unit; and

selectively arranging said words of said document file using a preprogrammed formatting routine in said central processing unit to produce a formatted record suitable for being printed by said output device.





4,858,171

WORD PROCESSOR WITH SELECTIVE PLACEMENT OF PRINTHEAD FOR PRINTING OF NEWLY INPUT PRINT DATA AFTER INTERRUPTION OF PRINTING

Tadao Furusawa; Hiroshi Mitsuyuki; Hironobu Sato; Yujiro Tatsuno, and Shigeru Matsuoka, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 13, 1987, Ser. No. 14,365
Claims priority, application Japan, Feb. 26, 1986, 61-39254
Int. Cl.[4] G06F *3/03, 3/09, 3/12*
U.S. Cl. 364—900 **2 Claims**



1. A word processor having an insert printing function comprising:

input means for inputting character data and code data;

display means for displaying characters and codes corresponding to data being inputted by said input means;

printing means for printing the characters and codes displayed on said display means; and

central control means responsive to said input means for controlling said display means and said printing means, including:

(a) input processing means for preparing document data consisting of characters and/or codes depending upon document data inputted by said input means and including a print interrupt control code;

(b) temporary storage means for storing said document data and print interrupt control code;

(c) print control means responsive to a start control from said input means for reading-out document data from said temporary storage means, for sending the read-out document data to said printing means so as to print the document data, and for temporarily interrupting the operation of said printing means when read out of said print interrupt control code is detected; and

(d) means responsive to detection of said print interrupt control code for operating said input processing means when the operation of said printing means is interrupted to process a new train of characters received from said input means by storing the new train of characters in said temporary storage means;

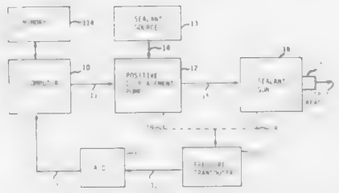
wherein said print control means includes means for selectively determining a position for printing said new train of characters input during the interruption of said printing means in response to a position control signal input from said input means during said interruption, so that the printing of said new train of characters may be effected at an arbitrary selected position.

4,858,172

SEALANT FLOW CONTROL FOR ROBOTIC APPLICATIONS

Howard Stern, Greenlawn, N.Y., assignor to Robotic Vision Systems, Hauppauge, N.Y.

Filed Oct. 5, 1987, Ser. No. 105,559
Int. Cl.[4] G05B *13/02;* **B25J** *11/00;* **G01F** *25/00*
U.S. Cl. 364—160 **10 Claims**



9. A method for reducing the pressure transient time in a closed loop flow meter flow control system comprising the steps of:

calibrating a closed loop flow meter flow control system by: commanding a flow rate of a flow material; determining the rate of pressure change applied by said flow control system; waiting until the rate of pressure change falls below a preset value; recording the amount of time of said waiting, said time defining a transient period; measuring pressure applied to said flow material; recording flow rate and pressure; and repeating said calibrating step for all flow rates of interest;

using the calibration recordings to apply pressure loop flow control during said transient period by:

selecting a flow rate; determining a corresponding steady state pressure from said calibration recordings, said steady state pressure defining a reference pressure; determining difference between current pressure and said reference pressure, said difference defining an error signal; commanding a flow rate proportional to said error signal; and repeating the steps of determining said error signal and flow rate commanding until said error signal becomes less than a predetermined value;

and switching to a closed loop flow meter flow control at the end of said transient period.

4,858,173

APPARATUS AND METHOD FOR RESPONDING TO AN ABORTED SIGNAL EXCHANGE BETWEEN SUBSYSTEMS IN A DATA PROCESSING SYSTEM

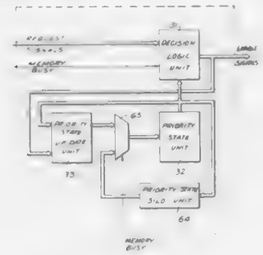
Robert E. Stewart, Stow; Paul J. Natusch, Westford; Eugene L. Yu, Groton, and James B. Keller, Arlington, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 29, 1986, Ser. No. 823,775
Int. Cl.[4] G06F *13/18, 15/16*
U.S. Cl. 364—900 **10 Claims**

3. In a data processing system having a system bus for transfering logic signal groups between a plurality of data processing units and a memory unit, apparatus for controlling access to said system bus by said data processing units comprising:

an arbitration unit for selecting a data processing unit to gain access to said system bus in response to request signals from said data processing units, said request signals being generated by respective ones of said data processing units requiring access to said system bus; and

signal means associated with said memory unit, said signal means applying a busy signal to said arbitration unit when said memory unit can accept no additional logic signal groups, said busy signal preventing said arbitration unit from selecting a data processing unit, said arbitration unit selecting a data processing unit to gain access to said system bus in response to at least one of said request signals from said respective ones of said data processing units after said busy signal is not applied for a period of time at least equal to the time for said selected data processing unit to generate a new request signal.



4,858,174

ELECTRONIC POSTAGE METER CONTROL SYSTEM EMPLOYING A MEMBRANE SWITCH MECHANISM

William W. Coville, Stamford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 3, 1983, Ser. No. 455,164
Int. Cl.[4] G06F *3/02;* **H01H** *13/74;* **G07G** *1/00*
U.S. Cl. 364—900 **8 Claims**



1. In a postage meter of the type having means for printing postage, the printing means movable between plurality of positions to print plurality of postage value, and means for accounting for postage printed by the printing means, the improvement comprising:

an actuating member coupled to the printing means;

switch means coupled to the actuating member between the printing means and the accounting means for providing information between the printing means and the accounting means of the position of the printing means;

the switch means comprising a membrane switch;

the membrane switch further comprising a shielding means coupled to the actuating member, circuit means which is attachably connected to and insulated from the shielding means, the circuit means having a plurality of switch contacts and a plurality of means for activating different ones of the switch contacts; and

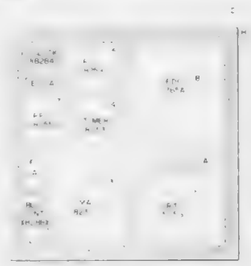
the switch means mounted such that different ones of the plurality of the activating means activates predetermined ones of the plurality of switch contacts depending upon the position of the actuating member of the printing means.

4,858,175

MONOLITHIC SEMI-CUSTOM IC HAVING STANDARD LSI SECTIONS AND COUPLING GATE ARRAY SECTIONS

Kazuyuki Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1985, Ser. No. 780,795
Claims priority, application Japan, Sep. 29, 1984, 59-204455; Sep. 29, 1984, 59-204456; Sep. 29, 1984, 59-204462
Int. Cl.[4] G06F *1/00;* **H01L** *27/10*
U.S. Cl. 364—900 **4 Claims**



1. A monolithic semi-custom system, large scale integration (LSI) circuit comprising:

a plurality of different types of standard LSI logic sections, each having a predetermined off-the-shelf logic configuration and wiring pattern;

glue circuit means for functionally coupling said standard LSI logic sections, said glue circuit means having a mask design standard suitable for the same manufacturing process conditions as the manufacturing process conditions of said standard LSI logic sections;

a wiring region for selectively connecting terminals between said standard LSI logic sections and said glue circuit means; and

a bonding pad section surrounding said standard LSI logic sections and said glue circuit means for connecting said terminals to lead wires,

wherein said standard LSI logic sections, said glue circuit means, said wiring region and said bonding pad section constitute common hardware as a master, and said standard LSI logic sections, said glue circuit means, said wiring region and said bonding pad section are connected to each other through a selected one or both of single- and multi-layer wiring pattern.

4,858,176

DISTRIBUTOR OF MACHINE WORDS BETWEEN UNITS OF A CENTRAL PROCESSOR

John E. Wilhite, Glendale, and William A. Shelly, Phoenix, both of Ariz., assignors to Honeywell Bull Inc., Phoenix, Ariz.

Continuation of Ser. No. 867,352, May 23, 1986, abandoned, and a continuation of Ser. No. 434,126, Oct. 13, 1982, abandoned. This application Jan. 19, 1988, Ser. No. 145,845
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—900 **6 Claims**

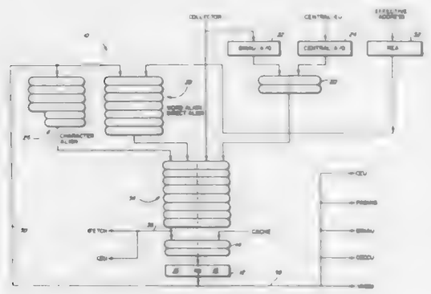
1. A distributor for a central execution pipeline unit of a central processor having a plurality of execution units including a central execution unit, said central processor also including an instruction fetch unit, a cache, and a collector; and cache, collector, and central execution pipeline units being sources of signals representing machine words applied to the distributor; said distributor comprising:

first switch means for producing a pair of first switch means output machine words selected from signals applied to the first switch means;

data register means including an even numbered register and an odd numbered register for storing a pair of machine words, one machine word being stored in the even numbered register and one machine word being stored in the odd numbered register thereof;

second switch means for producing as its output two second switch means output machine words selected from said first switch means output machine words or two machine words from the cache, and for applying said second switch means output words for storage in the registers of said data register means;

character alignment switch means to which a machine word from a data register of said data register means is applied for producing character alignment switch means output



signals which includes a character of the machine word applied thereto;

word alignment switch means to which both machine words stored in data registers of the data register means are applied for producing a word alignment means output machine word;

sources of signals applied to the first switch means including machine words from the collector, the central execution unit, the word alignment switch means, and signals from the character alignment switch means;

means for transmitting the first switch means output machine words to the instruction fetch unit and the central execution unit; and

means for transmitting machine words stored in the data register means to the execution units.

4,858,177

MINIMAL CONNECTIVITY PARALLEL DATA PROCESSING SYSTEM

Harry F. Smith, 7 Fern La., Newtown, Conn. 06470

Filed Mar. 27, 1987, Ser. No. 31,035
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 **11 Claims**

1. A data processing system for simultaneously processing a plurality of data words, comprising:

a control data processor; and

a data processing structure controlled by said control data processor, said structure comprising

one or more two dimensional data processing arrays each of which is organized as rows and columns of discrete data processing cells, each of said cells comprising

means for storing and retrieving data words;

means for storing and executing a stored program, the execution of said program generating at any given time one of a plurality of different processing states within said cell;

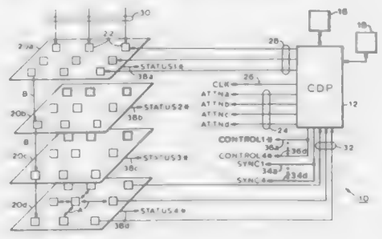
means for performing arithmetic and logical operations on said data words under the control of said stored program;

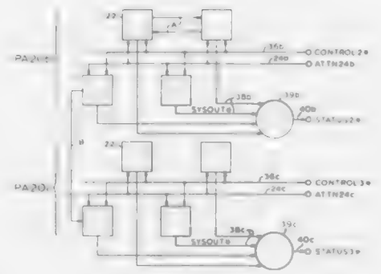
means for communicating with at least one other neighboring cell within a same row and with at least one other neighboring cell within an adjacent column; and

means for communicating with said control data processor, said means for communicating comprising a first plurality of signal lines individual ones of which are coupled in common to all of said cells within said array, said first plurality of commonly coupled signal lines including:

a first communications signal line operable for being asserted by said control data processor for transmitting data to said cells; and

a second communications signal line operable for being asserted by said control data processor, said second signal line, when asserted, causing said stored program to generate a data receiving processing state within each of said cells, said data receiving processing state being operable at least for receiving the transmitted data;





said means for communicating with said control data processor further including a second plurality of signal lines comprising a plurality of third communication signal lines, each of said third communication signal lines being coupled to and driven by an individual one of said cells, each of said third communication signal lines being input to a means for generating a logical signal having a state which is indicative of the occurrence of a particular one of said processing states which is common to all of said plurality of cells within said array, including the occurrence of a data received processing state within each of said cells whereby said control data processor is informed of the reception of the transmitted data by each of said cells.

4,858,178

PROGRAMMABLE SEQUENCE GENERATOR

Robert K. Breuninger, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 30, 1986, Ser. No. 919,925
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—900 **11 Claims**

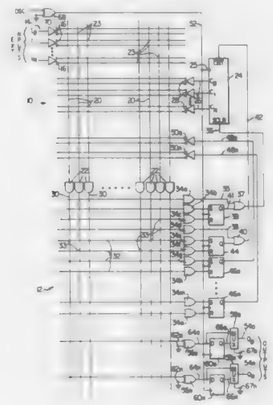
1. A programmable sequence generator comprising:

a programmable AND array receiving external and internal input signals and having product term output signals;

a programmable OR array receiving as input selected ones of said product term output signals and having sum term output signals;

a first plurality of state registers receiving as input first selected pairs of said sum term output signals and having first selected output signals coupled to said internal input signals of said AND array;

a second plurality of state registers receiving as input second selected pairs of said sum term output signals and having second selected output signals coupled to output signals of said generator; and



a counter receiving a input a first pair of control signals from a first selected pair of product term output signals and a second pair of control signals from a second selected pair of state registers, a series of selected output signals from said counter coupled to said internal input signals to said AND array.

4,858,179

APPARATUS FOR DETERMINING THE MINIMUM NUMBER OF STORAGE ELEMENTS REQUIRED TO STORE THE STATES OF A CIRCUIT

Shauchi Ong, Pleasantville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 14, 1985, Ser. No. 798,198
Int. Cl.[4] G06F *1/04, 12/00*
U.S. Cl. 364—900 **18 Claims**



1. A circuit for generating at least a single output during each interval of a clock wherein the number of storage elements and their associated combinatorial logic are reduced to a minimum comprising:

means for storing in binary form all possible states of said circuit which occur during successive adjacent pairs of said intervals of said clock, said means for storing being the minimum number of storage elements required to store the states of said circuit, which includes a plurality of output interconnections to provide at said output interconnections output gate conditioning signals representing one of said states of said circuit and logic gate conditioning signals,

a plurality of clocked output gates which provide said at least a single output during each interval of said clock, each of said plurality of output gates being connected to said clock and to said means for storing via said plurality of output interconnections, and

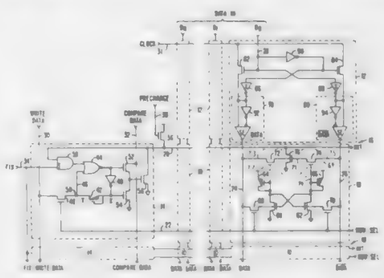
a combinatorial logic circuit for logically combining therein logic inputs and signals from said means for storing to deliver at the output thereof signals representing another of said states of said circuit, connected to said means for storing.

4,858,180

CONTENT ADDRESSABLE MEMORY AND SELF-BLOCKING DRIVER

Robert Murdoch, Sacramento, Calif., assignor to Data General Corporation, Westboro, Mass.

Filed Feb. 28, 1986, Ser. No. 835,107
Int. Cl.[4] G06F *1/00;* **G11C** *15/00;* **H03K** *5/153*
U.S. Cl. 365—49 **13 Claims**



1. An improved content addressable memory cell for storing data and responsive to data applied to complementary data-in lines, wherein the applied data in an uncomplemented form is carried on an uncomplemented data line, and the applied data in complemented form is carried on a complemented data line, so that the complemented data line has a logic state which is the complement of the logic states on the complemented data line, wherein the improved content addressable memory cell compares the applied data to data which has been previously stored therein and provides an indication on a hit line of whether the applied data matches the previously stored data, the improvement comprising

transistor means responsive to a control signal and coupled to the hit line for placing the hit line in a predetermined logic state in response to the control signal; and

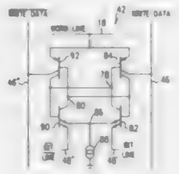
means responsive to the logic state of the previously stored data for selectively supplying the logic state from one of the complementary data-in lines as the control signal to the transistor means, wherein the logic state on the complemented data-in line is selected and supplied as the control signal when the previously stored data has a logic one state, and the logic state on the uncomplemented data-in line is selected and supplied as the control signal when the previously stored data has a logic zero state, so that the hit line is placed in the predetermined logic state when there is a mismatch between the applied data and the previously stored data.

4,858,181

FAST RECOVERY PNP LOADED BIPOLAR STATIC RAM MEMORY CELL WITH AN INDEPENDENT CURRENT PATH

Carl J. Scharrer, Plano, and Debbie S. Vogt, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 7, 1987, Ser. No. 70,769
Int. Cl.[4] G11C *11/00, 11/34, 13/00*
U.S. Cl. 365—155 **14 Claims**



11. A high speed memory cell comprising:
first and second sense nodes;
a first reference voltage node for being disposed at a first predetermined reference voltage;
a holding current node for providing a current sink;
first and second cross-coupled pairs of PNP and NPN transistors associated with said first and second sense nodes respectively, and disposed between said first reference voltage node and said holding current node, said first and second cross-coupled transistor pairs each operating in a saturated or a nonsaturated state and opposite each other, said saturated and nonsaturated states corresponding to a high or low logic state, respectively;
write circuitry for selectively providing an independent current path from an external reference voltage to said first and second sense node to change the state of the associated one of said first and second pairs from a saturated to a nonsaturated state when externally generated data is to be written to the memory cell that requires the logic state of the memory cell to be changed; and
read means for sensing the logic state of the memory cell.

4,858,182

HIGH SPEED ZERO POWER RESET CIRCUIT FOR CMOS MEMORY CELLS

Roland H. Pang, Plano, and Edison H. Chiu, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 19, 1986, Ser. No. 944,643
Int. Cl.[4] G11C *7/00, 11/40*
U.S. Cl. 365—156 **9 Claims**

1. A reset circuit for a memory array having at least one memory cell comprising:
(a) a source of reset signals;
(b) a source of supply voltage Vcc applied to said memory cells; and
(c) first and second parallel-connected transistors coupled between said supply voltage source and each said memory cell in said memory array, said first transistor turned off and said second transistor turned on in the presence of said reset signals, said second transistor shifting said supply voltage downward to Vcc2 in the presence of said reset



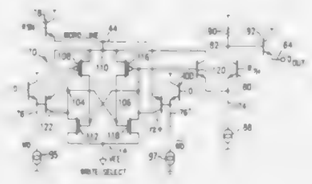
signals providing a current limited zero power condition in said cells of said array during reset.

4,858,183

ECL HIGH SPEED SEMICONDUCTOR MEMORY AND METHOD OF ACCESSING STORED INFORMATION THEREIN

Carl J. Scharrer, and Roland H. Pang, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 2, 1987, Ser. No. 57,399
Int. Cl.[4] G11C *11/34, 11/00*
U.S. Cl. 365—174 **11 Claims**



1. An ECL high speed semiconductor memory, comprising:
an array of memory cells arranged in rows and columns, each of said memory cells comprising a CMOS cross-coupled latch having first and second storage nodes, each of said storage nodes operable to store either a first or a second voltage level representative of first and second logic states and disposed at opposite ones of said first and second voltage levels;
a plurality of row lines each associated with a row of said memory cells;
a plurality of column read lines each associated with a column of said memory cells;
a plurality of column write lines each associated with a column of said memory cells;
ECL address circuitry for receiving and decoding row and column address and in generating a row select signal for a signal row and a column select signal for a select column;
row select circuitry for generating a row select voltage at a first predetermined voltage on said row line for the select one of the rows of said memory cells in response to generation of said row select signal, the remainder of said row lines associated with nonselected cells disposed at a second predetermined voltage, said first and second predetermined voltages being at ECL compatible voltage levels different from the first and second voltage levels of said CMOS latch;

read circuitry associated with each cell for sensing the voltage stored on one of said first and second nodes in the associated cell in response to said associated row line being at said row select voltage and sourcing current from said row line to the associated one of said column read lines when the voltage on said sense of storage node is at a predetermined one of such first or second voltage levels;
a current sense amp interfaced with each of said column read lines to sense current sourced from a selected of one of said row lines to said column read lines when said column line is selected in response to generation of said column select signal for the associated cell, said sense amp providing a data output;
ECL data circuitry for receiving external data and switching current through said column write line for the selected column of cells in response to generation of the column select signal and also in response to receiving an external Write Enable signal; and
current sense circuitry associated with each cell for sensing the current level in the column line associated with each of said memory cells for forcing said first and second storage nodes to a predetermined one of said first and second voltage levels corresponding to the logic state of the received data.

11. A method for accessing stored information in a semiconductor memory, comprising:
providing an array of memory cells arranged in rows and columns, each of the memory cells comprising an MOS latch for storing first and second voltage levels as first and second logic states, respectively;
receiving and decoding row and column addresses and generating a row select signal for a select row and a column select signal for a select column;
generating a row select voltage at a first predetermined voltage and applying it to the row line associated with the select one of the cells in response to generation of the row select signal, the remainder of the row lines associated with nonselected cells disposed at a second predetermined voltage;
said first and second predetermined voltages being at voltage levels different from the voltage levels of the MOS latch and compatible with emitter coupled logic voltage levels;
sensing the stored voltage of the associated cell in response to the associated row line being at the row select voltage, and driving the associated one of the column lines with a bipolar low source impedance to output a signal to the associated column line representative of the stored logic state;
sensing the representative logic state in response to generation of the column select signal for the associated cell;
receiving external data and interfacing the received data to the column line of the selected column of cells in response to generation of the column select signal and in response to receiving an external Write Enable signal; and
forcing the logic state in the one of the cells associated with the selected row and column to a voltage corresponding to the logic state of the receiving data on the selected column.

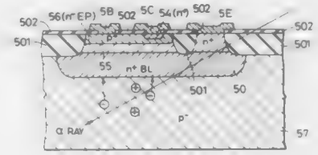
4,858,184

RADIATION RESISTANT BIPOLAR MEMORY

Noriyuki Homma, Kodaira; Tohru Nakamura, Tanashi; Kazuo Nakazato, Kokubunji; Motoaki Matsumoto, Ome; Tetsuya Hayashida, Tokyo; Masaharu Kubo, Hachioji, and Kazuhiko Sagara, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 27, 1987, Ser. No. 42,698
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—174 **12 Claims**

11. A semiconductor memory comprising memory cells each of which comprises at least two transistors with the collectors and bases cross-coupled, a first load circuit comprising a series circuit of a first resistor and a diode having a low forward voltage characteristic, said diode connected between the collector of each said transistor and a word line, and a second load resistor comprising a second resistor connected between the collector of said transistor and said word line, each said memory cell further comprising clamping transistors



each having the collector connected to a power source or said word line, the base connected to said word line or an intermediate point of said second resistor, and the emitter connected to the collector of said transistor or an intermediate point of said first resistor.

4,858,185

ZERO POWER, ELECTRICALLY ALTERABLE, NONVOLATILE LATCH

Vikram Kowshik, and Elroy M. Lucero, both of San Jose, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 28, 1988, Ser. No. 149,568
Int. Cl.[4] G11C *11/40, 13/00*
U.S. Cl. 365—181 **8 Claims**



6. An electrically alterable nonvolatile latch element comprising:
(a) first and second nonvolatile floating gate field effect transistor (FET) memory cell elements, the floating gates of the memory cell elements being capacitively coupled to their respective control gates, the floating gate of the first memory cell element being capacitively coupled to the control gate of the second memory cell element, the floating gate of the second memory cell element being capacitively coupled to the control gate of the first memory cell element, wherein capacitive coupling between the floating gate and the control gate of the first and second memory cell elements is via first and second tunnelling capacitors, respectively, each of the tunnelling capacitors being formed by the overlap of its associated floating gate and a buried N+ implant area separated from the associated floating gate by a dielectric layer;
(b) a static cross-coupled latch element comprising first and second P-channel FETS and first and second N-channel FETs, the drains of the first p-channel FET and the first N-channel FET and of the second P-channel FET and the second N-channel FET, respectively, being commonly connected, the sources of the first and second P-channel FETs being commonly connected to a first potential, the sources of the first and second N-channel FETs being

commonly connected to second potential more negative than the first potential, the gates of the first P-channel FET and the first N-channel FET being commonly connected to the drain of the first memory cell element and to a first output, the gates of the second P-channel Fet and the second N-channel FET being commonly connected to the drain of the second memory cell element and to a second output, the sources of the first and second memory cell elements being commonly connected to the second potential; and

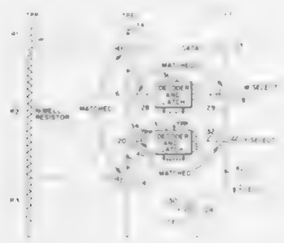
(c) means for programming the latch element by selectively placing either a net positive or a net negative charge on the floating gate of one of the first or second memory cell elements while simultaneously placing a complementary charge on the floating gate of the other memory cell element.

4,858,186

A CIRCUIT FOR PROVIDING A LOAD FOR THE CHARGING OF AN EPROM CELL

Owen W. Jungroth, Sonora, Calif., assignor to Intle Corporation, Santa Clara, Calif.

Filed Jan. 12, 1988, Ser. No. 144,569
Int. Cl.[4] G11C *11/34, 7/00*
U.S. Cl. 365—185 **8 Claims**



1. A circuit for providing a load for the charging of an electrically programmable, read-only memory cell comprising:

a resistive means;

a first and a second matched transistors coupled in series, the gates of said first and second transistors being coupled to said resistive means;

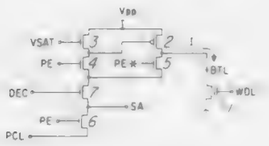
a third and a fourth matched transistors, said third transistor being coupled in series with said first and second transistors, said fourth transistor being coupled in series with said cell, the gate of said third and fourth transistors being coupled to a node disposed between said first and second transistors.

4,858,187

PROGRAMMING IMPLEMENTATION CIRCUIT

John F. Schreck, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 1, 1988, Ser. No. 150,861
Int. Cl.[4] G11C *11/34*
U.S. Cl. 365—185 **8 Claims**



1. A circuit for applying an optimized programming current to a floating-gate, metal-oxide-semiconductor transistor in response to enabling signals, to a current-limiting signal and to a decoder signal comprising:

a programming voltage source;

a programming control means connected to said programming voltage source and to the drain of said floating-gate transistor;

an enabling means connected to said enabling signals, to said control means, and to said current-limiting signal; and

a decoder switching means connected to said enabling means;

wherein during programming operation said programming control means is activated by said decoder switching means and said enabling means to allow a limited current to flow from said voltage source to said drain of said floating-gate transistor, and

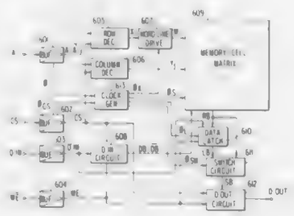
wherein during non-programming operation said programming control means permits negligible current flow from said voltage source to said drain of said floating-gate transistor.

4,858,188

SEMICONDUCTOR MEMORY WITH IMPROVED WRITE FUNCTION

Yasuo Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 8, 1987, Ser. No. 93,833
Claims priority, application Japan, Sep. 9, 1986, 61-213159
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189.05 **5 Claims**



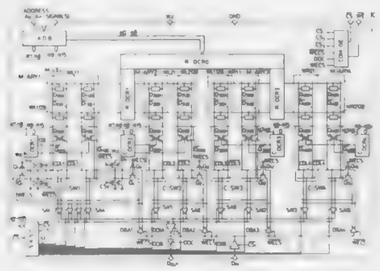
1. A memory circuit comprising a memory cell array having a plurality of memory cells, means for selecting a memory cell in said memory cell array, a sense amplifier for amplifying a signal from the selected memory cell, means for receiving an input data signal to be stored, an input data buffer for generating an internal data signal in response to said input data signal, means for writing said internal data signal to the selected memory cell, a latch circuit having inputs coupled to said input data buffer and said sense amplifier and an output, a switch circuit coupled to said latch circuit, said sense amplifier and said input data buffer circuit for applying the output of said sense amplifier to said latch circuit in a read mode and said internal data signal to said latch circuit in a write mode, an output terminal, and means for determining a level of said output terminal in accordance with data held in said latch circuit.

4,858,189

SEMICONDUCTOR INTEGRATED CIRCUIT

Katsumi Ogiue; Yukio Suzaki, both of Hinode; Ikuro Masuda, Hitachi; Masanori Odaka, Kodaira, and Hideaki Uchida, Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 701,226, Feb. 13, 1985, Pat. No. 4,713,796. This application Nov. 17, 1987, Ser. No. 121,914
Claims priority, application Japan, Feb. 13, 1984, 59-22811
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—203 **44 Claims**



1. A semiconductor integrated circuit comprising:

a plurality of storage means for storing information therein;

an address circuit for selecting a specified storage means from among said plurality of storage means;

a signal circuit coupled to said storage means and including means for respectively reading and writing information from and into said storage means; and

a timing circuit coupled to said signal circuit for controlling operations of reading and writing information,

wherein said signal circuit includes a data output buffer for obtaining an information output signal, said data output buffer including a principal portion constructed of a CMOS circuit, and a plurality of bipolar transistors, which execute charge and discharge of gate capacitances of N-channel and P-channel output MISFETs of said data output buffer.

4,858,190

DUAL PORT SEMICONDUCTOR MEMORY HAVING RANDOM AND SERIAL ACCESS MODES

Yasunori Yamaguchi, Tachikawa; Akirahiko Yoshida, Kawasaki; Masami Nei, Musashino; Masamichi Ishihara, Hinode, and Yukio Yamamoto, Musashino, all of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corp., Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 5,104
Claims priority, application Japan, Mar. 7, 1986, 61-48403
Int. Cl.[4] G11C *7/00, 8/00*
U.S. Cl. 365—189.05 **29 Claims**



1. A semiconductor memory formed on one chip comprising:

a memory array including a plurality of word lines, a plurality of data lines intersecting said word lines, and a between said word lines and said data lines;

a first common data line for inputting and outputting input and output data of said memory cells at random;

a plurality of first switch means interposed between each of said data lines and said first common data line, wherein each of said plurality of first switch means selectively connects a predetermined data line and said first common data line;

a plurality of data latching means for latching said output data read out from predetermined memory cells and said input data to be written into predetermined memory cells;

second switch means for connecting said data lines and said plurality of data latching means;

a second common data line for inputting and outputting said input and output data of said memory cells in series;

a plurality of third switch means interposed between said second common data line and said plurality of data latching means, wherein each of said plurality of third switch means selectively connects a predetermined data latching means and said second common data line;

serial input/output selection means for sequentially selecting said plurality of third switch means;

first address selecting means for selecting one of said plurality of first switch means in response to an external address signal and for designating one of said plurality of third switch means to be selected at first by said serial input-/output selection means; and

second address selecting means for selecting one of said word lines in response to an external address signal;

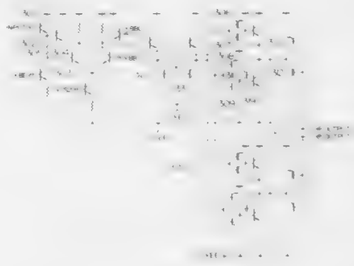
wherein said plurality of first switch means, said plurality of data latching means, said second switch means, said plurality of third switch means, and said serial input/output selection means are arranged on said chip between said memory array and said first address selecting means.

4,858,191

SEMICONDUCTOR INTEGRATED CIRCUIT

Hisayuki Higuchi, Kokubunji; Makoto Suzuki, Niiza, and Noriyuki Homma, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 11, 1987, Ser. No. 131,644
Claims priority, application Japan, Dec. 12, 1986, 61-297030; Apr. 30, 1987, 62-104688; Sep. 11, 1987, 62-226338
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189.05 **33 Claims**



1. A semiconductor integrated circuit comprising:

(a) an input buffer circuit having an input to which an input signal is applied;

(b) a decoder circuit having an input responding to the output signal of said input buffer circuit and having an output for providing an output signal; and

(c) a plurality of memory cells, which are address-selected by the output signal of said decoder circuit; wherein said input buffer circuit includes:

(1) a first bipolar transistor, to the base of which said input signal of said input buffer circuit is applied;

(2) a second bipolar transistor, the base of which responds to

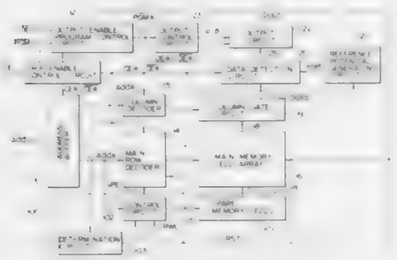
the signal at the emitter of said first bipolar transistor and the collector of which is connected with first load means;
(3) a third bipolar transistor, the emitter of which is differentially connected with the emitter of said second bipolar transistor, to the base of which a reference voltage is applied, and the collector of which is connected with second load means;
(4) means coupled between said base and said collector of said second bipolar transistor for preventing the saturation of said second bipolar transistor;
(5) a fourth bipolar transistor, the base of which responds to the signal produced by said first load means;
(6) a fifth bipolar transistor, the base of which responds to the signal produced by said second load means;
(7) a first MOS transistor, the drain and the gate of which are connected with the emitter of said fourth bipolar transistor and the emitter of said fifth bipolar transistor, respectively;
(8) a second MOS transistor, the drain and the gate of which are connected with the emitter of said fifth bipolar transistor and the emitter of said fourth bipolar transistor, respectively, and the source of which is connected with the source of said source of said first MOS transistor;
(9) a first MOS circuit having an input responding to the signal at said emitter of said fourth bipolar transistor and having an output;
(10) a second CMOS circuit having an input responding to the signal at said emitter of said fifth bipolar transistor and having an output;
(11) a sixth bipolar transistor, the base of which responds to the output of said first CMOS circuit; and
(12) a seventh bipolar transistor, the base of which responds to the output of said second CMOS circuit;
thereby complementary output signals being obtained from the emitter of said sixth bipolar transistor and the emitter of said seventh bipolar transistor.

4,858,192

SEMICONDUCTOR MEMORY DEVICE WITH REDUNDANCY CIRCUIT

Yuuichi Tatsumi, Tokyo; Hidenobu Minagawa, Kawasaki; Hiroshi Iwahashi, Yokohama; Masamichi Asano, Tokyo, and Mizuho Imai, Annaka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 28, 1988, Ser. No. 225,510
Claims priority, application Japan, Jul. 29, 1987, 62-189432
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—200 **7 Claims**



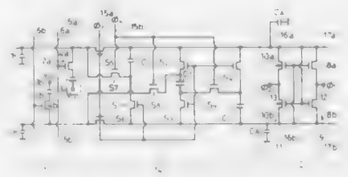
1. A semiconductor memory device comprising:
an address buffer connected to receive an address signal;
a main row decoder controlled in response to an output of said address buffer;
main row lines selectively driven by an output of said main row decoder;
main memory cells connected to said main row lines;
at least one spare memory cell which is used instead of at least one of said main memory cells if it is defective;
a spare row decoder for selecting the spare memory cell includes redundancy address setting means for determining whether or not said spare memory cell is to be used in response to an input address, and a buffer circuit connected to the spare memory cell;
de-activating means, for setting said main row decoder into a nonoperable condition when said spare memory cell is selected, is controlled by said redundancy address setting means;
programming means for applying a high voltage to said main and spare row lines; and
discharging means for discharging the main and spare row lines for a preset period of time after the programming operation with respect to said main or spare memory cells is effected by said programming means, said buffer circuit being controlled by said discharging means and said redundancy address setting means.

4,858,193

PREAMPLIFICATION METHOD AND APPARATUS FOR DRAM SENSE AMPLIFIERS

Kiyohiro Furutani, and Kazutami Arimoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1988, Ser. No. 212,058
Claims priority, application Japan, Jun. 23, 1987, 62-157054
Int. Cl.[4] G11C *13/00, 11/40*
U.S. Cl. 365—203 **5 Claims**



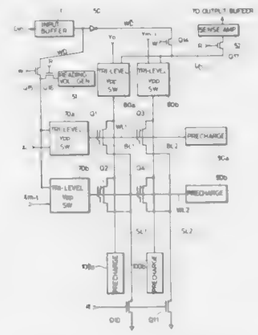
1. A semiconductor memory device comprising:
a memory cell array having a plurality of word lines, a plurality of bit lines arranged in a crossed manner at right angles with said word lines and a plurality of memory cells arranged at intersections between said word lines and bit lines,
said bit lines being first bit lines and second bit lines which constitute a plurality of bit line pairs, respectively;
a plurality of sense amplifiers connected between said first bit lines and said second bit lines of said bit line pairs lead from said memory cell array to amplify a potential difference produced between said first and second bit lines at the time of applying a reading signal to said memory cells through said word lines and to assure a level of rewriting into said memory cells after reading; and
a preamplifier provided between said memory cell array and each said sense amplifier to amplify a potential difference produced between said first and second bit lines at the time of applying said reading signal and to output the amplified potential difference to the corresponding one of said sense amplifiers,
each said preamplifier comprising a step-up capacitor for raising a potential of said corresponding first bit line, a step-down capacitor for lowering potential of said corresponding second bit line, first switching means for connecting said step-up capacitor and said step-down capacitor between said first bit line and said second bit line, and second switching means for connecting in series said step-up capacitor to one input terminal of said sense amplifier in a positive direction and for connecting in series said step-down capacitor to the other input terminal of said sense amplifier in a negative direction,
the number of said step-down capacitors being selected to be twice as many as that of said step-up capacitors.

4,858,194

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE USING SOURCE OF A SINGLE SUPPLY VOLTAGE

Yasushi Terada; Takeshi Nakayama, and Kazuo Kobayashi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1988, Ser. No. 154,573
Claims priority, application Japan, Jul. 21, 1987, 62-182698
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—203 **12 Claims**



1. In a nonvolatile semiconductor memory device having a plurality of word lines, a plurality of bit lines intersecting with said word lines, a plurality of memory cells, each said cell being a single transistor type cell provided in each intersection of said plurality of word lines and said plurality of bit lines for storing information in a nonvolatile manner:
means for generating a write high-voltage for writing data into said cells;
means for generating a precharge potential greater than a ground voltage and less than said write high-voltage;
addressing means for selecting a word line and a bit line intersecting a selected cell;
first means responsive to data to be written for providing selectively the write high-voltage or the ground voltage to the word line selected by said addressing means;
second means responsive to said data to be written for providing selectively the write high-voltage or the ground voltage to the bit line selected by said addressing means; and
means for maintaining a non-selected word line and a non-selected bit line at said precharge potential.

4,858,195

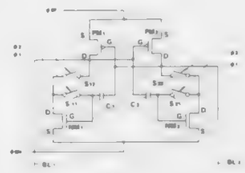
BIT LINE CHARGE SENSING APPARATUS HAVING CMOS THRESHOLD VOLTAGE COMPENSATION

Mitsuo Soneda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 30, 1987, Ser. No. 31,569
Claims priority, application Japan, May 22, 1986, 61-116116
Int. Cl.[4] G11C *7/00, 11/00*
U.S. Cl. 365—205 **11 Claims**

1. An apparatus for sensing an electric charge appearing on a bit line of a memory cell, comprising:
(a) a pair of P-channel MOS transistors whose sources are commonly connected;
(b) a pair of N-channel MOS transistors whose sources are commonly connected;
(c) first means connected between the bit line and a gate of at least one of the PMOS and NMOS transistors storing a voltage according to a threshold voltage of a corresponding transistor to which the first means is connected during a precharge interval of the memory cell;
(d) second means connected between the bit line and drain of at least one of the PMOS and NMOS transistors enabling the voltage according to the threshold voltage of the corresponding transistor to be stored in the first means during the precharge interval, the second means being operated to compensate the pairs of PMOS and NMOS transistors for divergence in the threshold voltages of the pairs of the PMOS and NMOS transistors during latching intervals of both pairs of PMOS and NMOS transistors.

3. An apparatus for sensing an electric charge appearing on a bit line of a memory cell, comprising:
(a) a pair of first MOS transistors whose sources are commonly connected;
(b) a pair of second MOS transistors whose sources are commonly connected;
(c) at least one pair of capacitors, each of the capacitors being connected between a gate of at least one of the first and second MOS transistors and the bit line; (d) at least



one pair of first switching elements, each of the first switching elements being connected between a drain of at least one of the first and second MOS transistors and the gate thereof and being turned on during a precharge interval and turned off during a sensing operation interval; and
(e) at least one pair of second switching elements, each of the second switching elements being connected between the bit line and drain of at least one of the first and second MOS transistors and being turned off during the precharge interval so that a voltage according to a threshold voltage of a corresponding MOS transistor to which the second switching element is connected is applied across a corresponding capacitor to which the gate of the corresponding transistor is connected and turned on during the sensing operation interval so that the gate potential of the corresponding transistor indicates the electric potential at the bit line with compensation for divergences in the threshold voltages of the respective first and second transistors.

4,858,196

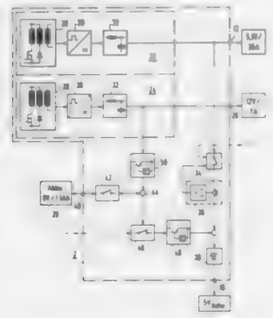
POWER SUPPLY ARRANGEMENT

Gerd Hein, Herzogenaurach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 25, 1988, Ser. No. 160,441
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723727
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—229 **4 Claims**

1. A power supply arrangement of the type having a controlled operating power output and a controlled buffer output, the buffer output being connected to a plurality of read-write memories of a computer, the read-write memories being switched to a stand-by mode and connected to a back-up power source upon a failure of the line voltage, the improvement therein comprising:
low impedance first switch means responsive to a first switch control signal for connecting the read-write memo-

ries for active operation to the power output during normal line conditions, and



second switch means responsive to a second switch control signal for connecting the back-up power source via a first series controller to the buffer output.

4,858,197

OUTPUT BUFFER CONTROL CIRCUIT OF MEMORY DEVICE

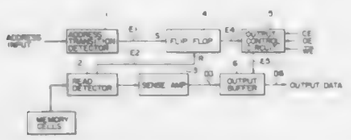
Akira Aono, and Mitsuo Isobe, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 24, 1988, Ser. No. 198,052

Claims priority, application Japan, May 26, 1987, 62-128811; May 26, 1987, 62-128817

Int. Cl.[4] G11C 8/00

U.S. Cl. 365—233.5 **18 Claims**



1. An output buffer control circuit of a semiconductor memory, comprising:

a switch circuit whose output state is controlled by a detection output from an address transition detector for detecting an address transition, and by a detection output from a read detector for detecting a completion point of data readout from a memory cell; and

an output buffer for outputting readout data from the memory cell, an active/inactive state of said output buffer being controlled by use of the output from said switch circuit.

4,858,198

DETERMINATION OF FORMATION PERMEABILITY FROM AN ACOUSTIC LOG

David Weissman, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 16, 1988, Ser. No. 156,070

Int. Cl.[4] G01V 1/28, 1/40

U.S. Cl. 367—31 **5 Claims**

1. A method for determining the permeability of formations surrounding a borehole, comprising the steps of:

(a) traversing the formations surrounding a borehole with a logging tool having a means for transmitting acoustic energy,

(b) pulsing said transmitting means at a plurality of locations in said borehole to produce acoustic energy therein,

(c) detecting for each location said produced energy at a pair of spaced-apart acoustic receivers,

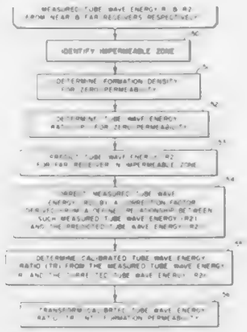
(d) measuring the energy of tube waves detected by said receivers for each location,

(e) identifying an impermeable zone in said formation,

(f) identifying the density of the impermeable zone of said formation,

(g) determining a tube wave energy ratio for said impermeable zone from a crossplot relating density to tube wave energy ratio as measured in zones of zero porosity,

(h) predicting tube wave energy for a second of said pair of receivers by multiplying the energy of tube waves measured in step (d) for the first of said pair of receivers by said tube wave energy ratio determined in step (g) for said impermeable zone,



(i) correcting the tube wave energy measured in step (d) for said second of said receivers by a correction factor derived from a defined relationship between the tube wave energy measured in step (d) for said second of said receivers and said tube wave energy predicted in step (h) for said second of said receivers,

(j) determining a calibrated tube wave energy ratio from the tube wave energy measured in step (d) for said first of said receivers and the measured tube wave energy for said second of said receivers corrected in step (i) by said correction factor, and

(k) determining formation permeability from the tube wave energy ratio calibrated in step (j) in accordance with a crossplot relating core permeability to tube wave energy ratio.

4,858,199

METHOD AND APPARATUS FOR CANCELLING NONSTATIONARY SINUSOIDAL NOISE FROM SEISMIC DATA

Paul G. Griffith, Irving, Tex., assignor to Mobile Oil Corporation, New York, N.Y.

Filed Sep. 6, 1988, Ser. No. 240,305

Int. Cl.[4] G01V 1/36

U.S. Cl. 367—45 **7 Claims**

1. In seismic exploration wherein seismic sources are activated at spaced locations along a line of exploration and the amplitude of reflections are recorded as a function of the time along said line to produce a series of seismic traces each comprised of a sinusoidal noise component and a seismic data component, a method of cancelling said sinusoidal noise components from said seismic traces comprising the steps of:

selecting an amplitude step parameter, a phase step parameter and a frequency step parameter, each said step parameter being a stepwise correction value representing a fractional change for revising amplitude, frequency and phase respectively based on estimations of their gradients;

estimating a first pair of amplitudes, a first frequency and a first phase;

providing a first pair of external signal separated by ninety degrees, said first pair of external signals produced using estimates of an amplitude, a frequency and a phase for each signal, said frequency and phase common for each of said external signals;

summing said first pair of external signals at a first point in time to produce a first estimate of said sinusoidal noise component;

applying said first estimate of said sinusoidal noise component to said seismic signal at said first point in time to provide an estimate of said seismic data component;

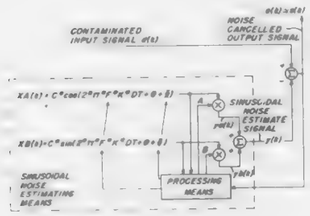
estimating gradients for said first pair of amplitudes based upon said estimate of said seismic data component and said pair of external signals;

estimating a next pair of amplitudes based upon said amplitude step parameters, said amplitude gradients and said first pair of amplitudes;

estimating a gradient for said phase based upon said estimate of said seismic data component, said pair of external signals and said next pair of amplitudes;

estimating a next phase based upon said phase step parameters, said phase gradient and said first phase estimate;

estimating a gradient for said frequency based upon said estimate of said seismic data component, said pair of external signals and said next pair of amplitudes;



estimating a next frequency based upon said frequency step parameter, said frequency gradient and said first frequency estimate; and

repeating the steps of providing a next pair of external signals using said next pair of amplitude estimates, said next frequency estimate and said next phase estimate, summing said next pair of external signals at a next point in time to produce a next estimate of said sinusoidal noise signal, applying said next estimate of said sinusoidal noise component to said seismic signal at said next point in time to provide a next estimate of said seismic data component, estimating next gradients for said next pair of amplitudes based upon said estimate of said seismic data component and said pair of external signals, estimating a next pair of amplitudes based upon said amplitude step parameters, said amplitude gradients and said first pair of amplitudes, estimating next gradients for said next pair of phases and frequencies based upon said estimate of said seismic data component and said pair of external signals, estimating a next pair of phases and frequencies based upon said next pair of amplitudes, said phase and frequency step parameters and said phase and frequency gradients and said pair of amplitude estimates until said sinusoidal noise estimate for each point in time has been applied to said series of seismic traces.

4,858,200

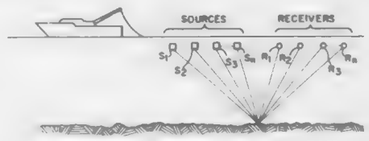
METHOD FOR DETERMINING THE PRESENCE OF HYDROCARBONS IN SUBSURFACE GEOLOGICAL FORMATIONS BY COMPARATIVE ASSESSMENT OF COMPRESSIONAL AND SHEAR WAVE REFLECTION DATA

Neal R. Goins, Rocky Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 41,964, Apr. 24, 1987, Pat. No. 4,736,349. This application Sep. 21, 1987, Ser. No. 99,451

Int. Cl.[4] G01V 1/36

U.S. Cl. 367—75 **4 Claims**



1. A method for determining the presence of hydrocarbons in subsurface geological formations by comparative assessment of acquired compressional wave reflection information and pseudoshear wave reflection information estimated from acquired compressional wave reflection information comprising the steps of:

generating descending acoustic compressional waves from a plurality of acoustic wave sources and receiving and recording at a plurality of receivers ascending compressional wave reflection information produced at a subsurface interface;

gathering said recorded compressional wave reflection information into sets of different source-receiver offsets having a common reflection boundary;

correcting said gathered compressional wave reflection information for normal moveout;

measuring amplitudes of said gathered compressional wave reflection information at given points in time for different source-receiver offset values;

determining directly from said measured amplitude offset values pseudoshear wave reflection information such that such said pseudoshear wave information is equivalent to shear wave reflection information that would be obtained by direct measurment using shear waves;

selecting compressional wave reflection information related to a subsurface geological formation of interest;

selecting produced pseudoshear wave reflection information determined from said selected compressional wave reflection information;

combining said selected compressional wave reflection information and said selected pseudoshear wave reflection information according to the relation $R_s - R_p$ where R_p is the selected compressional wave reflection information and Rs is the selected pseudoshear wave reflection information; and

comparing said combined wave reflection information to said selected compressional wave reflection information.

4,858,201

METHOD FOR ESTIMATING SHEAR WAVE REFLECTION DATA FROM ACQUIRED COMPRESSIONAL WAVE REFLECTION DATA

Neal R. Goins, Rocky Hill, N.J., and Ray S. Spratt, Lancaster, Calif., assignors to Mobil Oil Corporation, New York, N.Y.

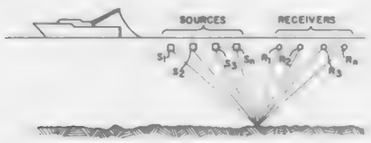
Continuation-in-part of Ser. No. 41,964, Apr. 24, 1987, Pat. No. 4,736,349. This application Sep. 21, 1987, Ser. No. 99,446

Int. Cl.[4] G01V 1/36

U.S. Cl. 367—75 **6 Claims**

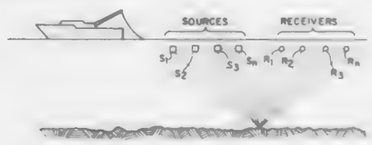
1. A method of producing shear wave reflection information estimated from compressional wave reflection information comprising the steps of:

generating descending acoustic waves from a plurality of acoustic wave sources and receiving and recording at a plurality of receivers ascending waves produced at a subsurface interface;
gathering said recorded reflection waves into sets of different source-receiver offsets having a common reflection boundary;
correcting said gathered reflection waves for normal moveout;
measuring amplitudes of said gathered waves at given points in time for different source-receiver offset values;
determining velocities of said acoustic wave at the top of each subsurface interface and within the earth medium below each of said subsurface interfaces,



averaging said velocities for each of said subsurface interfaces and the earth medium below and interpolating with time to provide smoothed interval velocity functions for said gathered traces over said subsurface interfaces;
determining incident angles of said gathered traces from said offset and said smoothed interval velocity functions; and
determining directly from said measured amplitude offset values and said incident angles of said gathered trace shear wave reflection information such that said information is equivalent to shear wave reflection information that would be obtained by direct measurement using shear waves.

4,858,202
METHOD FOR ESTIMATING SHEAR WAVE REFLECTION DATA FROM ACQUIRED COMPRESSIONAL WAVE REFLECTION DATA
Thomas J. Fitch, Colleyville, Tex.; Neal R. Goins, Rocky Hill, N.J., and Ray S. Spratt, Lancaster, Calif., assignors to Mobil Oil Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 41,964, Apr. 24, 1987, Pat. No. 4,736,349. This application Sep. 21, 1987, Ser. No. 99,178
Int. Cl.[4] G01V *1/36*
U.S. Cl. 367—75 5 Claims

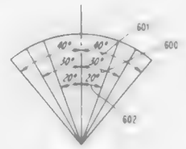


1. A method of producing shear wave reflection information estimated from compressional wave reflection information comprising the steps of:
generating descending acoustic waves from a plurality of acoustic wave sources and receiving and recording at a plurality of receivers ascending waves produced at a subsurface interface;
gathering said recorded reflection waves into sets of different source-receiver offsets having a common reflection boundary;
correcting said gathered reflection waves from normal moveout;
correcting said normal moveout corrected waves for residual normal moveout by correcting stacking velocities of said normal moveout corrected waves according to the equation:

$$V_{new} = V_{old} + \left[\frac{\delta V}{V_{old}} T_o \frac{V_o}{V_{old}}\right] \frac{V_{old}}{T_o} \left(\frac{V_{old}}{V_o}\right)^2;$$

where:
V_{new}=new stacking velocity
V_{old}=old stacking velocity
T_o=two way travel time at normal incidence
V_o=reference velocity
δV=differential between old and correct stacking velocity;
measuring amplitudes of said gathered waves at given points in time for different source-receiver offset values; and
determining directly from said measured amplitude offset values shear wave reflection information such that said information is equivalent to shear wave reflection information that would be obtained by direct measurement using shear waves.

4,858,203
OMNIDIRECTIONAL DISTANCE MEASUREMENT SYSTEM
Per K. Hansen, Burlington, Vt., assignor to Position Orientation Systems, Inc., Burlington, Vt.
Filed Sep. 26, 1985, Ser. No. 780,192
The portion of the term of this patent subsequent to Mar. 19, 2002, has been disclaimed.
Int. Cl.[4] G01S *15/08*
U.S. Cl. 367—103 26 Claims



1. A system for measuring a distance to at least one object in a predetermined non-liquid filled space comprising:
(a) a plurality of ultrasonic transducers, each said transducer being adapted to transmit and receive ultrasonic pulses;
(b) beam shaping means associated with each said transducer for shaping the beamwidth of each said transducer in a predetermined manner enabling both widening and narrowing of said beamwidth;
(c) control means for controlling said system connected to said transducers via integrated circuit means for directly controlling transmission of pulses from said transducers and for conveying signals related to echoes received by said transducers to said control means;
(d) said control means and integrated circuit means being preprogrammed to effect time gain control of said transducers to increase gain as a function of time; and
(e) said control means being programmed to (1) measure the time from transmission of pulses by said transducers to the time from transmission of pulses by said transducers to receiving of pulses reflected from said object, and (2) therefrom to calculate the distance between the object and said transducers.

4,858,204
UNDERWATER SIGNALING DEVICE
Robert W. Holston, 1605 N. Roosevelt Blvd., Key West, Fla. 33040, and Thomas H. Halford, 1508 Duncan St., Key West, Fla. 33040
Filed Mar. 1, 1989, Ser. No. 317,365
Int. Cl.[4] H04B *11/00;* G10K *1/34*
U.S. Cl. 367—141 6 Claims



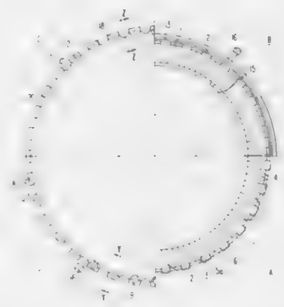
1. An underwater signaling device removably mounted between the tank and the strap holding the tank, comprising:
A. first rigid elongated member, having two ends, removably inserted between said tank and said strap;
B. Second rigid elongated member, having two ends, hingedly connected at one end to one of the ends of said first elongated member and further including a solid mass mounted substantially at the other end of said second elongated member so that when said first and second elongated members are urged toward each other said solid mass comes in contact with said tank; and
C. spring means for urging said first and second elongated members toward each other so that said second member can be retracted and released by the user causing said solid mass to impact against said tank thereby producing sound.

4,858,205
MULTI-BARREL AIR GUN MODULE
Earnest R. Harrison, Plano, Tex., assignor to Halliburton Geophysical Services, Inc., Houston, Tex.
Filed Aug. 24, 1988, Ser. No. 236,694
Int. Cl.[4] H04R *23/00*
U.S. Cl. 367—144 13 Claims



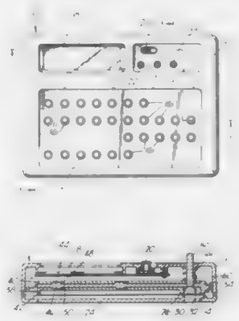
1. A module for the generation of seismic pulses in a marine environment, comprising:
control head means;
a plurality of pulse sources symmetrically disposed about and rigidly secured to said control head means; and
actuating means associated with said control head means for independently actuating each of said pulse sources; and wherein said plurality of sources comprises four airgun barrels, said module is suspended from longitudinally extending boom means, and two of said four barrels are oriented parallel to said boom means.

4,858,206
RING-SHELL PROJECTOR
Garfield W. McMahon, Dartmouth, Canada, assignor to Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada
Filed Jan. 10, 1989, Ser. No. 295,529
Claims priority, application Canada, Mar. 11, 1988, 561240
Int. Cl.[4] H04R *17/00*
U.S. Cl. 367—163 5 Claims



1. An underwater transducer having a driving ring and a pair of flexible diaphragms on either side of the ring with their rims attached to the ring, the ring being formed of an array of electrostrictive elements and spacer elements, each spacer element having a pair of radial, outward extensions, a pair of coupling rings each adapted to be positioned between the rim of one flexible diaphragm and a corresponding array of spacer element extensions to provide sealing engagement between the flexible diaphragms and the driving ring.

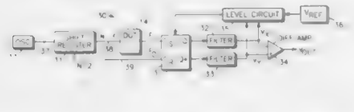
4,858,207
ALARM DEVICES
Albrecht Buchner, Central, Hong Kong, assignor to Micro Technologies International Limited, Hong Kong
Filed Mar. 4, 1988, Ser. No. 164,388
Claims priority, application United Kingdom, Mar. 6, 1987, 8705278; Taiwan, Mar. 11, 1987, 76101358
Int. Cl.[4] G04B *47/00;* B65D *8/304*
U.S. Cl. 368—10 6 Claims



1. An alarm device for reminding a user to take an individually packaged pill from a package of individually packaged pills, each of said pills being packaged in an individual compartment of said package, comprising:

a support for holding said package;
a number of buttons mounted to said support, each said button aligned with a compartment of said package and being depressable into a retained position to eject a package pill from said aligned compartment;
slidable actuating means mounted to said support and displaceable with respect to said support in response to depression of any one of said buttons into its retained position;
a timer for monitoring elapsed time after a push-button has been depressed, said timer being actuated upon displacement of said slidable actuating means with respect to said support; and
an alarm operatively associated with said timer to indicate when elapsed time reaches a preselected duration.

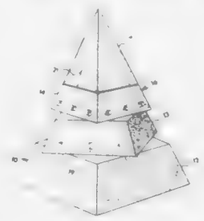
4,858,208
APPARATUS AND METHOD FOR TESTING SEMICONDUCTOR DEVICES
Mavin C. Swapp, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 11, 1988, Ser. No. 217,250
Int. Cl.[4] G04F *8/00*; G01R *25/00*
U.S. Cl. 368—118 20 Claims



12. An apparatus for measuring a delay of a signal transmitted through a semiconductor device comprising:
signal means for providing a signal of known period, said signal means having a first output coupled to an input of said semiconductor device and a second output;
a flip-flop having a first input coupled to an output of said semiconductor device, a second input coupled to said second output of said signal means, a correcting input, an inverted output, and a noninverted output;
level means for providing a correcting signal to said flip-flop, said level means having a first input coupled to said inverted and noninverted outputs of said flip-flop, a second input, and an output coupled to said correcting input of said flip-flop; and
a differential amplifier having a first input coupled to said noninverted output of said flip-flop, a second input coupled to said inverted output of said flip-flop, and an output.

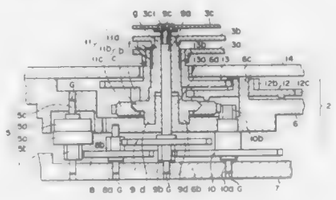
4,858,209
TRANSFIGURATING TIMEPIECES
Yaron Chaut, 2615 Travis Rd., Apt. G., Columbus, Ohio 43209
Filed Jul. 21, 1988, Ser. No. 222,953
Int. Cl.[4] G04B *19/00*
U.S. Cl. 368—223 26 Claims

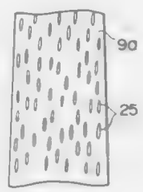
11. In apparatus for displaying time with relatively moving time display elements for displaying different units of time, the improvement comprising in combination:
an arrangement of said elements in a unitary solid geometrical structure having a predetermined symmetry; and
means for periodically breaking up said predetermined symmetry by ongoing contortion of said unitary solid geometrical structure itself and for periodically restoring said predetermined symmetry, including means for moving



said time display elements relative to each other in a display of time.

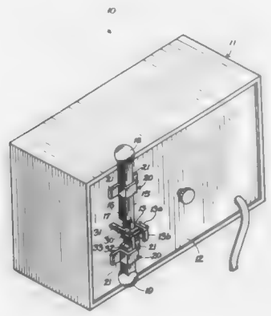
4,858,210
APPARATUS WITH SYNTHETIC RESIN HAND SHAFT
Wataru Yamada; Satoshi Fujio, and Kenichi Nakamura, all of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Nov. 9, 1987, Ser. No. 118,259
Claims priority, application Japan, Nov. 19, 1986, 61-276230; Nov. 19, 1986, 61-178007[U]; Nov. 19, 1986, 61-178015[U]
Int. Cl.[4] G04B *19/04*
U.S. Cl. 368—238 24 Claims





1. A rotatable hand shaft apparatus formed of synthetic resin for use in an analog display device, comprising:
a first hand shaft portion, on which a first hand is mounted so as to be rotatably driven therewith, said first hand shaft portion being formed of a synthetic resin in which fibrous reinforcing materials are contained, said first hand shaft portion having a longitudinal axis, and said fibrous reinforcing materials comprising a plurality of elongated fibers substantially all of which have respective longitudinal axes arranged substantially parallel to said longitudinal axis of said first hand shaft portion; and
a second hand shaft portion to the end of which a second hand is mounted, said second hand shaft portion having an insertion hole therein, said first hand shaft portion having an end which is insertable into said insertion hole so as to connect said first and second hand shaft portions together.

4,858,211
ALARM CLOCK LATCH DEVICE
Terry Olsovsky, 12723 SummerMill, Houston, Tex. 77070
Filed Nov. 21, 1988, Ser. No. 274,408
Int. Cl.[4] G04B *23/02*
U.S. Cl. 368—262 8 Claims



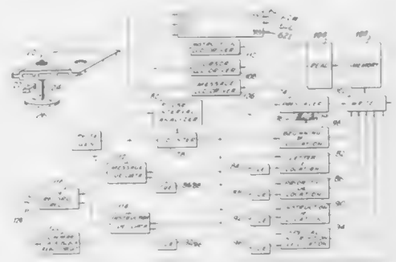
1. An alarm clock latch device in combination with an alarm clock wherein said alarm clock includes an audible alarm and a rear face formed with a reciprocating on/off alarm switch reciprocatable from an extended position to a retracted position relative to said rear face, and mounted orthogonally to said rear face in a first direction, said latch device comprising
an elongate control bar means including an elongate recess adjacent said switch wherein said elongate control bar means is mounted for reciprocating motion in a second direction orthogonally to said first direction of said switch, and
bracket means for slidingly securing said elongate control rod means to said face including a friction surface for mantaining said control rod means in a predetermined position relative to said switch, and
an abutment means reciprocatably mounted to said rear face adjacent said control rod aligned with and spaced from said switch.

4,858,212
RECORDING METHOD ON MAGNETOOPTICAL DISC WITH LASER MAGNETIC FIELD
Akira Takahashi, Nara; Yoshiteru Murakami, Nishinomiya; Michinobu Mieda; Tomoyuki Miyake, both of Tenri, and Kenji Ohta, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 927,857, Nov. 6, 1986, abandoned. This application Jul. 20, 1988, Ser. No. 222,422
Claims priority, application Japan, Nov. 8, 1985, 60-251143
Int. Cl.[4] G11B *11/12, 13/04*
U.S. Cl. 369—13 2 Claims



1. A method of recording data sequentially on a magnetooptical disc by exposing said disc to laser light and applying an external magnetic field thereto, said disc having sequentially numbered bits, said method comprising the steps of
initializing said disc by establishing an initial disc condition wherein the direction of magnetization in said disc is reversed from one to the next of said sequentially numbered bits,
reversing the direction of said external magnetic field whenever a new data is recorded on said disc, and
using a single laser beam to alternately record a data on odd-numbered ones of said bits while erasing data recorded on even-numbered ones of said bits and to record another data at even-numbered ones of said bits while erasing data recorded on odd-numbered ones of said bits.

4,858,213
DISPLAY FOR MODULAR DICTATION/TRANSCRIPTION SYSTEM
John J. Dwyer, Stratford; Emil F. Jachmann, Greenwich, both of Conn.; Mark N. Harris, Bronx, N.Y., and Brian F. Beloin, Milford, Conn., assignors to Dictaphone Corporation, Stratford, Conn.
Filed Aug. 8, 1986, Ser. No. 895,011
Int. Cl.[4] H04M *11/10*; G11B *27/34*
U.S. Cl. 369—28 25 Claims



1. Display apparatus for a dictate/transcribe device, said dictate/transcribe device providing location signals representative of the location of a record medium and cue signals representative of the generation of cues, in which cue indications representing respectively different types of recorded messages are displayed and a cursor indication representing the present location of the record medium used with said device also is displayed, said apparatus comprising:
a first display array of selectively energizable indicator elements for providing visual indications of the lengths of recorded messages;
a second array of selectively energizable indicator elements for providing visual indications of the positions on said record medium of recorded instructions;
a third array of selectively energizable indicator elements for providing a visual indication of the present relative location of said record medium; and
control means responsive to the cue signals, the location signals, and dictation for controlling said first, second and third arrays to provide their respective visual indications concurrently.

4,858,214
TRACKING CONTROL APPARATUS

Hisatoshi Baba, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1986, Ser. No. 828,872

Claims priority, application Japan, Feb. 15, 1985, 60-026450; Mar. 15, 1985, 60-051843; Mar. 15, 1985, 60-051844; Apr. 19, 1985, 60-084173; Jan. 16, 1986, 61-005055; Jan. 16, 1986, 61-005056

Int. Cl.[4] G11B *7/085, 21/08*

U.S. Cl. 369—32 **14 Claims**



1. A tracking control apparatus comprising:

irradiating means for irradiating a track arranged on a recording medium with a light beam;

error detecting means for detecting an error between a position of said track and a position of said light beam and for outputting an error signal;

inverting means for inverting a polarity of said error signal from said error detecting means;

moving means for moving an irradiating position of said light beam;

driving means for outputting a driving signal for driving said moving means, in response to a synthesized signal produced by synthesizing said error signal and an inverted signal of said error signal means for producing the synthesized signal; and

braking means for outputting to said driving means a braking signal with a polarity opposite to a polarity of said driving signal, in order to apply a braking force to said light beam moved by said moving means;

wherein said driving means includes synthesizing means for synthesizing said driving signal and said braking signal.

4,858,215
INTEGRATED OPTICAL DISC PICKUP THAT ALLOWS VARIATIONS IN THE WAVELENGTH OF THE LASER BEAM

Seiki Yano, Kashihara; Hiroaki Kudo, Tenri; Haruhisa Takiguchi, Nara; Toshiki Hijikata, Nara, and Shinji Kaneiwa, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

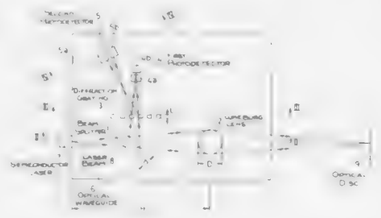
Filed Sep. 10, 1987, Ser. No. 95,566

Claims priority, application Japan, Sep. 12, 1986, 61-216214

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—45 **22 Claims**

1. An integrated optical disc pickup comprising an optical waveguide in the form of a semiconductor layer or insulation layer provided on the surface of a substrate, a semiconductor laser disposed outside the waveguide, a beam splitter and a mode index lens provided on the path of propagation of a laser beam from the semiconductor laser through the waveguide and arranged in the order mentioned in a direction away from the laser, a diffraction grating provided on the path through the waveguide to be followed by the laser beam upon having its direction changed by the beam splitter after emanating from the laser, passing through the beam splitter and the mode index lens, being reflected from an optical disc disposed outside the waveguide and passing through the mode index lens, and



photodetector means disposed on the paths of propagation through the waveguide of the two portions of the laser beam divided by the diffraction grating.

4,858,216
OPTICAL PICKUP CONTROL DEVICE

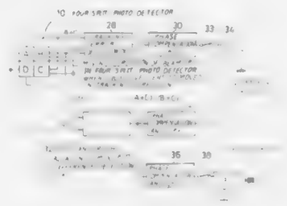
Shingo Kamiya, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed May 18, 1987, Ser. No. 51,863

Claims priority, application Japan, May 19, 1986, 61-114090

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—46 **7 Claims**



1. A control drive for use in an optical disc system having a laser, a photo-detector and a movable objective lens supported by a support system, light from the laser being reflected from a disc through the objective lens to the photo-detector, the objective lens having a neutral position determined by the support system which may not coincide with a desired neutral position in which the objective lens has a predetermined positional relationship with respect to the photo-detector, the control device comprising:

a tracking actuator for moving the objective lens;

a tracking servo system for generating a tracking error signal for application to the tracking actuator; and

a neutral position control means for generating a bias signal for application to the tracking actuator in addition to the tracking error signal, the bias signal having a value such that the objective lens will be located at said desired neutral position when the tracking error signal has a zero value.

4,858,217
OPTICAL DISK RECORDING AND REPRODUCING DEVICE

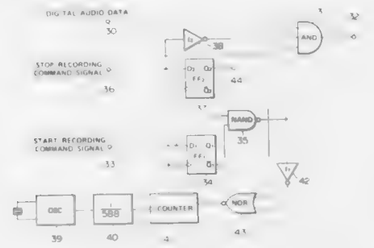
Kazuhiko Fujiie, Tokyo; Tadao Yoshida, Kanagawa, and Ryo Ando, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 16, 1987, Ser. No. 121,141

Claims priority, application Japan, Nov. 18, 1986, 61-272860

Int. Cl.[4] H04N *5/76;* **G11B** *5/09*

U.S. Cl. 369—59 **6 Claims**



1. An optical disk recording/reproducing device comprising:

analog to digital converting means for digitizing incoming analog audio signals;

encoding means for replacing digital audio data obtained as the converted output data due to the analog to digital converting means with zero data for a prescribed period by operating a record key;

data processing means for forming recorded data by executing an interleave processing for error correction on the encoded output data due to the encoding means; and

recording/reproducing means for recording the recorded data formed by the data processing means on a plurality of tracks of an optical disk and for reproducing the audio signals by optically reading the digital data recorded on the plurality of tracks of the optical disk,

characterized in that the digital audio data are recorded on the optical disk by adding zero data to a leading part of them for a prescribed period to allow a noise-free interleave processing for error correction.

4,858,218
OPTICAL RECORDING MEDIUM AND REPRODUCING APPARATUS

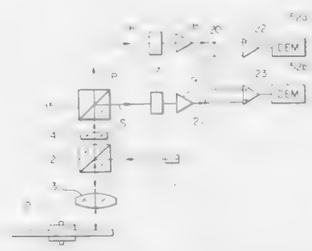
Akihiro Takagi, Kawasaki, and Kiyoshi Kimoto, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 772,473, Sep. 4, 1985, abandoned. This application Jan. 15, 1988, Ser. No. 145,704

Claims priority, application Japan, Sep. 12, 1984, 59-191310; Dec. 24, 1984, 59-272664

Int. Cl.[4] G11B *11/10, 7/00*

U.S. Cl. 369—109 **10 Claims**



1. A recording medium comprising disc-shaped substrate having laterally adjacent first and second circumferentially-extending recording tracks thereon, said tracks being at entirely different levels relative to said substrate, said first track having means thereon for significantly modifying only the polarization of polarized light incident thereon in accordance with magnetooptic information recorded on said first track, and said second track having means thereon for significantly modifying only the intensity of light incident thereon in accordance with light intensity information recorded on said second track.

4,858,219
OPTICAL INFORMATION RECORDING REPRODUCING MEMORY SYSTEM WITH BOTH POWER CONTROL AND OPTICAL IRRADIATION INHIBITING CIRCUIT

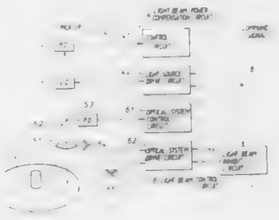
Shozi Yoshikawa, Hachioji, Japan, assignor to Olympus Optical Company Limited, Japan

Continuation of Ser. No. 799,902, Nov. 20, 1985, abandoned. This application Mar. 9, 1988, Ser. No. 169,106

Claims priority, application Japan, Nov. 20, 1984, 59-245483; Nov. 21, 1984, 59-246902

Int. Cl.[4] G11B *13/00, 7/00*

U.S. Cl. 369—116 **16 Claims**



1. An optical information recording and reproducing system for recording, reading and erasing data information by irradiation of light flux onto a data storing medium, comprising:

a light source for emitting a light flux;

a photo detector for detecting the power level of a first part of the light flux emitted from said light source and producing a corresponding monitor signal;

a light beam power compensation circuit for compensating for fluctuation of the power level of a second part of the light flux emitted from said light source in response to the detected monitor signal produced by said photo detector so as to maintain the power level of the light flux within a predetermined range;

light beam control means including at least one control loop circuit for controlling the tracking and focusing of the second light flux part emitted from said light source with respect to the data storing medium and directing the same to the data storing medium to carry out recording, reading or erasing of the data information; and

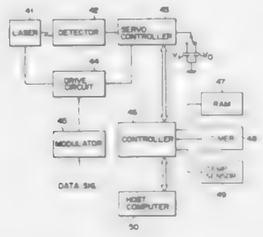
inhibiting means operative while the second light flux part is being emitted from the light source and connected to the light beam control means for inhibiting effective irradiation of the second light flux part onto the data storing medium to thereby enable the light beam power compensation circuit to effect the compensation of the power level of the second light flux part during the inhibition of the effective irradiation of the second light flux part.

4,858,220

LASER CONTROL CIRCUIT FOR OPTICAL DATA RECORDING/REPRODUCTION APPARATUS

Saburo Funada, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 14, 1987, Ser. No. 108,374
Claims priority, application Japan, Oct. 20, 1986, 61-249378
Int. Cl.[4] G11B *7/125*
U.S. Cl. 369—116 **17 Claims**



1. A laser controller for modulating an intensity of a laser beam from a laser source in accordance with data, comprising:

feedback control means including means for detecting an intensity of the laser beam, for generating, in a first mode wherein the laser beam is not modulated, a first drive signal to be supplied to the laser source in accordance with a result obtained by comparing an output from said detecting means with a prescribed reference signal to control the intensity of the laser beam;

first storing means for storing the first drive signal; and

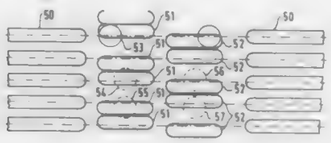
open loop control means including modulating means for reading out, in a second mode wherein the laser beam is modulated, the first drive signal from said first storing means, and generating a second drive signal to be supplied to the laser source, which has one of a first level corresponding to the readout first drive signal and a second level that is lower than the first level, said first and said second levels being switched in accordance with the data, so as to modulate the intensity of the laser beam.

4,858,221

PREFORMATTED INFORMATION MEDIUM AND OPTICAL READER DEVICE

René Roméas, Palaiseau, France, assignor to Societe Anonyme Dite: Alcatel Thomson Gigadisc, Paris, France

Filed May 9, 1986, Ser. No. 861,313
Claims priority, application France, May 10, 1985, 85 07131
Int. Cl.[4] G11B *7/09, 7/24*
U.S. Cl. 369—275 **12 Claims**



1. A pre-grooved information medium, comprising:

a recording surface;

a plurality of pre-recorded patterns in the form of spaced marks which define boundaries for tracking at least two tracks on said surface,

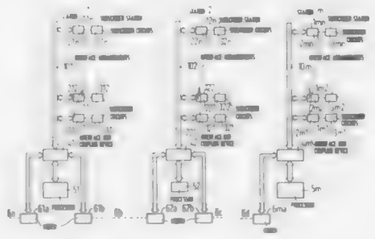
wherein said pre-recorded patterns are located to be symmetrical to a midline disposed mid-way between said two tracks for use in tracking control.

4,858,222

CIRCUIT ARRANGEMENT FOR SERIAL DATA TRANSMISSION

Guenter Weimert, and Ferdinand Narjes, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 29, 1987, Ser. No. 78,977
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1986, 3625613
Int. Cl.[4] H04J *3/02*
U.S. Cl. 370—13 **9 Claims**



1. In a circuit arrangement for serial data transmission among at least one remote subscriber station and a plurality of first subscriber stations (**111** . . . **1***mn*) interconnected by at least one bus (**101** . . . **10***m*), each of said subscriber stations comprising a subscriber circuit (**311** . . . **3***mn*) and an interface unit (**211** . . . **2***mn*) for seizing said bus and coupling the subscriber circuit (**311** . . . **3***mn*) to the bus (**101** . . . **10***m*), the combination comprising;

an interface control circuit (**8**) for at least one of said interface units including a first time circuit (**81**) for establishing a first time interval for seizing said bus by one of said first subscriber stations;

means connected to said time circuit and operative in the event of a fault within said one first subscriber station during seizure of the bus (**101** . . . **10***m*) by its interface unit, for discontinuing said seizure at the end of said first time interval;

a coupling device (**41** . . . **41***m*) for the selective coupling of said bus to a data transmission network for allowing serial data transmission between said one first subscriber station and said one remote subscriber station;

said coupling device having a coupling control circuit (**9**) incorporating a second time circuit (**91**) for establishing a second predetermined time interval for seizure of said bus, and means for producing a disconnect signal in order to discontinue the connection between said data transmission network (**61** . . . **6***d*) and said bus (**101** . . . **10***m*) when said bus seizure exceeds said second predetermined time interval, said second predetermined time interval being greater than said first predetermined time interval; and

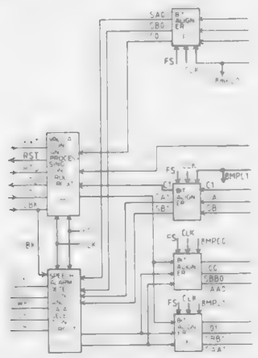
central control and analysis device means connected with said data transmission network, whereby data is transmitted from a plurality of stations over said network to said central control and analysis device.

4,858,223

SECURITY ARRANGEMENT FOR A TELECOMMUNICATIONS EXCHANGE SYSTEM

John W. Ansell, Poole; Geoffrey Chopping, Wimborne Minster, and Richard N. Waters, Bournemouth, all of England, assignors to The Plessey Company plc, Ilford, England

PCT No. PCT/GB87/00525, § 371 Date May 20, 1988, § 102(e) Date May 20, 1988, PCT Pub. No. WO88/00786, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 22, 1987, Ser. No. 170,384
Claims priority, application United Kingdom, Jul. 24, 1986, [redacted]
Int. Cl.[4] H24J *1/16*
U.S. Cl. 370—14 **6 Claims**



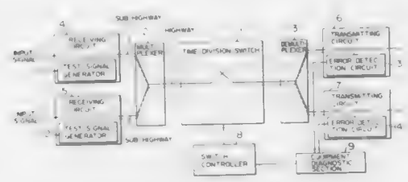
1. In a security telecommunications system having a plurality of peripherals respectively connected to corresponding peripheral card controllers interconnected by switching arrangements, said switching arrangements being respectively duplicated to form two security planes and transmitting data during time slots, a method wherein each of the peripheral card controllers performs the steps of: detecting discrepancies between data transmitted from the switching arrangements under no fault conditions with respect to each of the time slots; monitoring a path provided between the peripheral card controllers in response to said detection of the discrepancies for appearances of a first test pattern during said time slots; identifying the time slots during which the first test patterns appear on the path; monitoring said path for appearances of a second test pattern in said identified time slots; and detecting the absence of the second test pattern on the monitored path in the identified time slots to signify that one of the security planes is faulty.

4,858,224

DIAGNOSTIC METHOD OF EQUIPMENT AND SYSTEM USING THE SAME

Yukio Nakano, Hachioji, and Tadayuki Kanno, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 5, 1988, Ser. No. 140,791
Claims priority, application Japan, Jan. 9, 1987, 62-1847
Int. Cl.[4] H04J *3/14*
U.S. Cl. 370—16 **3 Claims**



1. A diagnostic method in a line equipment including a plurality of receiving circuits for receiving respective input signals and for converting the input signals into a plurality of sub-highways, a multiplexer connected to said plurality of receiving circuits for multiplexing the sub-highway to configure a highway having a plurality of time slots, a time division switch connected to said multiplexer for exchanging time slots of an information sequence including said highway, a demultiplexer connected to said time division switch for demultiplexing said highway outputted from said time division switch into a plurality of sub-highways, and a plurality of transmitting circuits connected to said demultiplexer for respectively transmitting said sub-highways, comprising the steps of:

providing each of said receiving circuits with a circuit for inserting a specific sequence into filling time slots of a corresponding sub-highway;

exchanging, by said time division switch, each filling time slot over a specific route in accordance with said specific sequence inserted therein;

providing each of said transmitting circuits with an error detection circuit for detecting whether an error exists in said specific sequence inserted into filling time slots supplied by a specific route, wherein each of said error detection circuits are connected to a specific route by said time division switch;

effecting, when one of said error detection circuits detects an error, a route change of the filling time slots supplied thereto by said time division switch; and

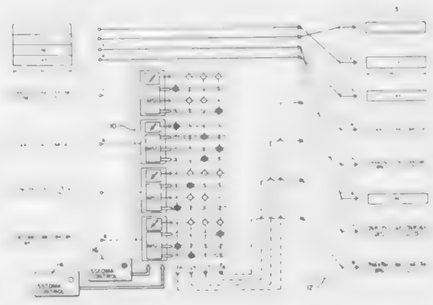
predicting a location of occurrence of a failure depending on a change in a detection state of said error detection circuits in association with said route change.

4,858,225

VARIABLE BANDWIDTH VARIABLE CENTER-FREQUENCY MULTIBEAM SATELLITE-SWITCHED ROUTER

Pietro deSantis, Rockville, Md., assignor to International Telecommunications Satellite, Washington, D.C.

Filed Nov. 5, 1987, Ser. No. 117,061
Int. Cl.[4] H04J *3/06*
U.S. Cl. 370—50 **13 Claims**



1. A variable bandwidth variable center frequency multibeam satellite communications system which includes multiple transponder channels for interconnecting plural incoming and outgoing communications paths, said system comprising:

A. receiving means for receiving at least one incoming transponder channel of constant bandwidth,

B. band-splitting means connected with said receiving means for dividing the bandwidth of said at least one transponder channel into a first portion and a second portion,

C. multistage channelizing means connected with said band-splitting means for receiving said second portion of said at least one transponder channel, said channelizing means for being operative for further dividing said second channel into multiple levels of subchannels of variable bandwidth,

D. switching means for connecting one-out-of-many input

signals with overlapping bands to at least one output port of said transponder at successive time intervals, and for simultaneously connecting plural input signals with non-overlapping band to at least one output port of said transponder, and

E. control means connected to said switching means for controlling the switching of SSTDMA input signals and of SSFDMA input signals.

4,858,226

METHOD FOR THE OPERATION OF AN INTERFACE CIRCUIT BETWEEN A CENTRAL PORTION AND LOCAL PORTIONS OF A SUBSCRIBER TERMINATION MODULE OF A DIGITAL TIME MULTIPLEX TELECOMMUNICATIONS NETWORK

Hans-Werner Rudolf; Harald Stader; Norbert Wingerath, all of Munich, Fed. Rep. of Germany, and Robert Lechner, St. Poelten, Austria, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 25, 1987, Ser. No. 101,112

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1986, 3633000

Int. Cl.[4] H04J *3/02*

U.S. Cl. 370—58 **2 Claims**



1. A method for the operation of interface circuits between a central portion and local portions of a subscriber termination module of a digital time multiplex telecommunication network wherein lines coupling the central portion and the local portions are selectively utilized on the one hand for transmission of information from the central portion to a respective local portion and on the other hand for transmission of information provided by the local portions simultaneously to the central portion as well as for transmission of status setting information to be likewise provided by the central portion to the local portions wherein, in said method, for providing for serial information transmission by which the central portion successively provides information to the local portions, those of said lines which are allocated individually to said local portions are utilized for transmission of information for selection of a corresponding local portion and those of said lines which are jointly provided for said local portions are utilized for said serial information transmission and lines jointly provided for transmission of state setting information to said local portions and lines individually provided for transmission of similar information to said central portion are utilized in the course of parallel information transmission wherein said local portions simultaneously provide said similar information to said central portion.

4,858,227

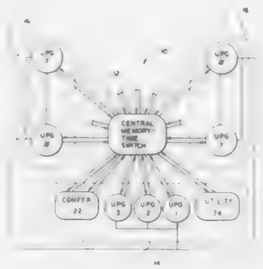
SPACE AND TIME HAVING MULTIPLEXED MEMORIES

Reginald Ratcliff, Atlanta, Ga., assignor to Solid State Systems, Inc., Kennesaw, Ga.

Filed Aug. 25, 1987, Ser. No. 72,059

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—59 **32 Claims**



26. A space and time switch, comprising:

input means for converting forty-six incoming serial PCM data streams formed of frames of data into forty-six eight-bit parallel streams and multiplexing said forty-six parallel streams into one eight-bit parallel data stream;

control interface means for receiving commands in the form of twenty-four bits appearing as three bytes in three separate operations, storing said bytes until all three bytes are ready and transferring said command bytes as a combination of address and data bits;

a speech RAM storing a complete frame of the data transferred within each time-slot;

a control RAM storing commands from said control interface means;

output means for receiving a multiplexed eight-bit parallel data stream from said first storage means and converting said stream to a serial stream; and

state control means for controlling operation of said input means, control interface means, first storage means, second storage means and output means, said state control means controlling readout of commands from said control RAM, said readout commands becoming addresses for said speech RAM.

4,858,228

COMMUNICATION SYSTEM EMPLOYING MULTI-CONJUNCTION ARCHITECTURE

Kazunori Hoshi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 12, 1988, Ser. No. 155,519

Claims priority, application Japan, Feb. 16, 1987, 62-31385; Feb. 24, 1987, 62-39058; May 25, 1987, 62-125810; May 25, 1987, 62-125811

Int. Cl.[4] H04J *3/26*

U.S. Cl. 370—60 **23 Claims**

1. A communication system employing a multi-conjunction architecture comprising:

a plurality of node apparatuses;

a plurality of terminal devices including a destination terminal device which is to receive a sending signal; and

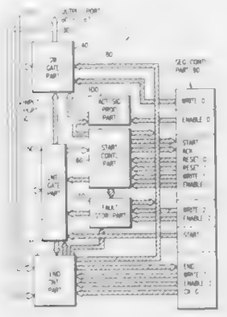
a plurality of transmission paths each coupling one node apparatus to another node apparatus or one terminal device,

each of said node apparatuses comprising an input port having a plurality of input channels connected to the transmission paths, an output port having a plurality of output channels connected to the transmission paths, a switching gate part for coupling the input and output channels of the input and output ports, and control means for controlling said switching gate part to selectively couple said input and output channels, said control means controlling said switching gate part to maintain said input and output channels coupled to each other in an initial state so that each input channel other than input channel included in a fixed communication path is coupled to all of said output channels other than an output channel having a corresponding channel number,

said control means comprising first input detecting means coupled to said input port for detecting a first receiving input channel which receives a signal first out of said plurality of input channels, and input signal detecting means for detecting whether or not said input channels receive a signal from the transmission paths,

said control means controlling said switching gate part responsive to the detection of said first receiving input channel in said first input detecting means so that all of said input channels other than said first receiving input channel are disconnected from said output channels, thereby transferring the sending signal received by said first receiving input channel to all of said output channels other than an output channel having a channel number corresponding to that of said first receiving input channel,

said input signal detecting means supervising whether or not a signal is received by predetermined input channels having channel numbers corresponding to those of the output channels which transfer the sending signal received by said first receiving input channel, so as to detect specific ones of said predetermined input channels which receive no signal and to detect a certain one of said predetermined input channels which receives a signal,



said control means controlling said switching gate part responsive to the detection of said certain input channel in said input signal detecting means so that said certain input channel is coupled to the output channel having the channel number corresponding to that of said first receiving input channel and said first receiving input channel is coupled to an output channel having a channel number corresponding to that of said certain input channel, thereby a communication path being fixed between said input and output ports, each of said input channels other than said first receiving input channel and said certain input channel being coupled to all of said output channels other than output channels having channel numbers corresponding to those of said first receiving input channel, said certain input channel, and the output channel having a channel number corresponding to its input channel,

said input signal detecting means of at least a predetermined one of said node apparatuses comprising supervising means for supervising said input port, said supervising means controlling said switching gate part to disconnect a given input channel from all of said output channels when said given input channel continues to receive the sending signal received by said first receiving input channel for a time exceeding a specific time.

4,858,229

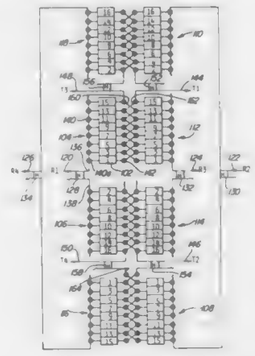
FILTER INTERCONNECTION MATRIX

Harold A. Rosen, Santa Monica, and James D. Thompson, Manhattan Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 14, 1986, Ser. No. 896,559

Int. Cl.[4] H04Q *11/02;* **H04J** *1/10;* **H04B** *7/185*

U.S. Cl. 370—75 **21 Claims**



1. A device for interconnecting a first set of communications lines with a second set of communications lines wherein the first set of lines each carry a frequency division multiplexed signal having a plurality of channels, comprising:

interconnection means having a plurality of inputs respectively connected with said first set of lines for receiving the corresponding ones of said frequency division multiplexed signals and having a plurality of outputs respectively connected with said second set of lines for outputting to each of said second set of lines the signals on certain preselected channels of each of said frequency division multiplexed signals respectively received on said inputs,

said interconnection means including a plurality of sets of filters respectively associated with said frequency division multiplexed signals and operative to pass only those signals in a corresponding channel,

said intersection means further including a plurality of circulators respectively coupled between each of the filters in a set thereof and one of the corresponding inputs for distributing frequency division multiplexed signals to each of the filters in the corresponding set thereof.

4,858,230

MULTIPORT/MULTIDROP COMPUTER COMMUNICATIONS

Robert J. Duggan, 20 Edgewood Rd., Monroe, Conn. 06468

Filed May 18, 1987, Ser. No. 50,692

Int. Cl.[4] H04J *3/02, 3/16*

U.S. Cl. 370—85 **40 Claims**

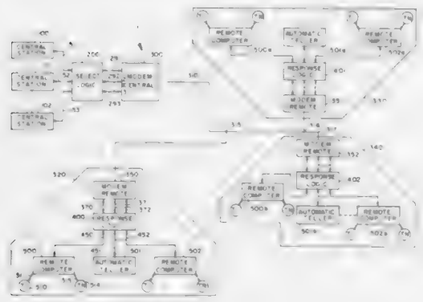
1. A method of controlling communication over a single communication facility between a plurality of central stations and at least one remote station respectively associated with each of the central stations, the method comprising:

(A) multiplexing transmissions from the plurality of central stations outbound to their respective remote stations;

(B) detecting that an invitation to respond has been transmitted by at least one of the plurality of central stations to their respective remote stations;

(C) preventing any remote station that has received an invi-

tation to respond from responding until it is permitted to do so;
(D) selecting one of the at least one of the plurality of central stations that has transmitted an invitation to respond;
(E) signaling an indication of the selected central station on the communication facility; and



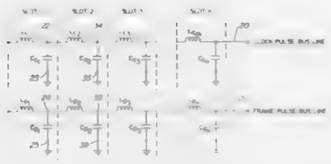
(F) permitting the remote station that received an invitation to respond from the selected central station to use the communication facility in response to the signal of the selected central station on the communication facility.

4,858,231

BUS INTERFACE LOADING ASSEMBLY

Douglas H. Patterson, Ontario, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed May 26, 1988, Ser. No. 199,743
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—85 **13 Claims**



1. A bus interface loading assembly used for establishing constant bus impedance on a backplane assembly, while allowing variable system configuration, said backplane having a plurality of termination slots interconnected by said bus, each slot having a predetermined characteristic impedance, comprising:
a removable loading circuit card adapted to be inserted into unused termination slots of said backplane; and
reactive load means so disposed on said card so as to become directly connected between said bus and ground, such that when said reactive load means is connected thereto, the characteristic impedance of said termination slot is changed to emulate a real load.

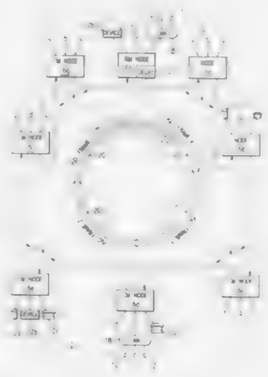
4,858,232

DISTRIBUTED SWITCHING SYSTEM

Felix V. Diaz, and Jack H. Stanley, both of Plano, Tex., assignors to DSC Communications Corporation, Plano, Tex.

Filed May 20, 1988, Ser. No. 197,104
Int. Cl.[4] H04J *3/00*
U.S. Cl. 370—86 **52 Claims**

1. A distributed switching system comprising:
a plurality of nodes coupled together at physical medium dependent sublayers thereof to form a ring wherein each of said nodes receives incoming data from a first adjacent one of said nodes and transmits outgoing data to a second adjacent one of said nodes, one of said nodes designated as a ring master node;
means, coupled to said physical medium dependent sublayer at said ring master node, for delaying outgoing data transmitted from said ring master node relative to incoming data received at said ring master node;
means for controlling said delaying means to maintain a constant quantity of data circulating in said ring wherein



said constant quantity of data is an integral number of frames;
means, coupled to said physical medium dependent sublayer within each of said nodes, for dedicating a first portion of each of said frames to a random access service; and
means, coupled to said physical medium dependent sublayer within each of said nodes, for dedicating a second portion of each of said frames to a deterministic access service.

4,858,233

REDUNDANCY SCHEME FOR MULTI-STAGE APPARATUS

Clive M. Dyson, Yate; Anthony D. King-Smith, Dursley, and Mohamad H. Yassate, Portishead, all of England, assignors to INMOS Limited, Bristol, United Kingdom

Filed May 19, 1987, Ser. No. 52,250
Claims priority, application United Kingdom, May 22, 1986, 8612454
Int. Cl.[4] G06F *11/20*
U.S. Cl. 371—9 **22 Claims**



1. Multistage signal processing apparatus comprising
(a) a plurality of similar linked processing, stages each including
(i) a signal processing element,

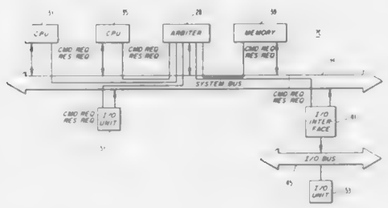
(ii) a first signal input to each stage,
(iii) an addressable second signal input to each stage, and
(iv) an output from each stage;
(b) a spare signal processing stage similar to each of said linked processing stages;
(c) coupling circuitry comprising
(i) first circuitry coupling said linked processing stages in a serial chain between a chain input terminal and a chain output terminal, said output of each stage being coupled to a said first signal input of an adjacent stage in the chain, said first circuitry also being coupled to said spare signal processing stage for selectively connecting the spare signal processing stage to said serial chain,
(ii) second circuitry coupled to said first circuitry and to said spare signal processing stage for selectively connecting the spare signal processing stage to said serial chain, and
(iii) third circuitry coupled between the first signal input and output of each linked processing stage to provide a by-pass for each stage;
(d) address decoding circuitry coupled to said linked processing stages for addressing selectively said second signal inputs in the chain; and
(e) logic circuitry coupled to said coupling circuitry and to said address decoding circuitry, said logic circuitry being effective to vary the coupling circuitry to by-pass a selected linked processing stage in said chain, to connect said spare signal processing stage into said chain to form a revised chain, and to alter coupling between the address decoding circuitry and said linked processing stages, whereby said signal inputs are correctly addressed in the revised chain.

4,858,234

METHOD AND APPARATUS FOR ERROR RECOVERY IN A MULTIBUS COMPUTER SYSTEM

David W. Hartwell, Boxboro; Elbert Bloom, Southboro, and Victoria M. Triolo, Boylston, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 4, 1987, Ser. No. 93,476
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—14 **10 Claims**



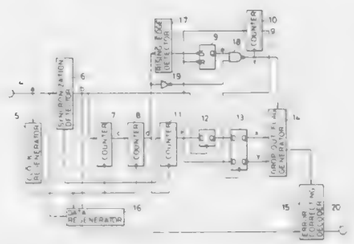
1. Apparatus for error recovery in a computer system including first and second busses, the second bus having a plurality of data lines and a plurality of command lines carrying command signals to initiate execution of a plurality of types of transactions on the second bus, the computer system responsive to a NON-RECOVERABLE ERROR signal to initiate a system shut-down, the apparatus comprising:
an interconnect bus;
a first interconnect interface circuit connected to the interconnect bus;
a first bus interface circuit connected to the first interconnect interface circuit and adapted for connection to the first bus;
a second interconnect interface circuit connected to the interconnect bus;
a second bus interface circuit connected to the second interconnect interface circuit and adapted for connection to the second bus;
first decoder means connected to the first interconnect interface circuit and responsive to command signals on the interconnect bus for asserting a first command signal;
error detection means for asserting an ERROR signal when an error is present on the interconnect bus;
second decoder means connected to the second bus interface circuit and responsive to command signals on the command lines for asserting a second command signal and for supplying the second command signal to the second interconnect interface circuit;
logic means responsive to the first and second command signals and to the ERROR signal for asserting RECOVERABLE ERROR and NON-RECOVERABLE ERROR signals; and
control means responsive to the RECOVERABLE ERROR signal for asserting a signal on the second bus indicating unsuccessful execution of the current transaction on the second bus.

4,858,235

INFORMATION STORAGE APPARATUS

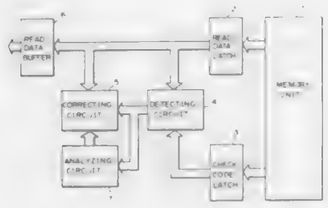
Fumio Matsuda, and Minoru Ozaki, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1987, Ser. No. 136,358
Claims priority, application Japan, Dec. 25, 1986, 61-315095
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—38 **2 Claims**



1. An information storage apparatus for retrieving digital information having an error-correcting code, said digital information together with check symbols being stored in groups of codewords which are divided into blocks of equal size, said blocks further including a synchronization field for data synchronization, the information storage apparatus comprising:
detection means for detecting errors in the synchronization fields of consecutive blocks when the digital information is read;
flag-setting means for setting dropout flags when a signal from the detection means indicates the occurrence of an error in synchronization fields of consecutive blocks, the flags being set for every block from which the last synchronization field is correctly detected before the error up to the block where the first synchronization field is correctly detected after the error; and
decoding means for decoding the codewords and correcting errors in them with reference to the dropout flags set by the flag-setting means.

4,858,236
METHOD FOR ERROR CORRECTION IN MEMORY SYSTEM
Koichi Ogasawara, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 23, 1987, Ser. No. 41,785
Claims priority, application Japan, Apr. 25, 1986, 61-96332
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—38 **15 Claims**

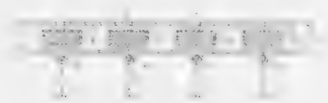


1. An error correction method for a memory system wherein a data word and a check code generated from information in said data word are written into a memory unit and subsequently read out of said memory unit and said check code is used to detect and correct at least one error in said data word, said error correcting method comprising the steps of:

A. examining data word and check code information read from said memory unit and determining from said check code whether at least one error exists and whether said at least one error is correctable; and

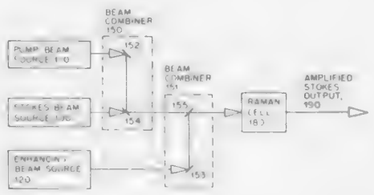
B. correcting said at least one error only when said at least one error is determined to exist in said data word and when said at least one error is determined to be correctable.

4,858,237
ELECTRON BEAM APPARATUS
Arthur Maitland, St Andrews, Scotland, and Clifford R. Weatherup, Chelmsford, United Kingdom, assignors to English Electric Valve Company Limited, Chelmsford, United Kingdom
Filed May 20, 1987, Ser. No. 51,793
Claims priority, application United Kingdom, Jun. 14, 1986, 8614534
Int. Cl.[4] H01S *3/03*
U.S. Cl. 372—2 **16 Claims**



1. Electron beam apparatus comprising: means for forming a highly directional electron beam having a beam path, the electron beam delivering energy to a media; a gas-filled envelope containing an electrode, said electrode having an aperture therethrough and, except within said aperture, being coated over substantially all its surface with electrically insulating material, said electrode being disposed so that said aperture lies along said beam path and said electrode extends in the direction of said beam path; and means for accelerating electrons of the beam through said aperture.

4,858,238
STIMULATED RAMAN SCATTERING ENHANCER
David A. Cardimona, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jan. 14, 1988, Ser. No. 144,310
Int. Cl.[4] H01S *3/094*
U.S. Cl. 372—3 **2 Claims**



1. An enhanced stimulated Raman scattering laser system which comprises:

a Raman cell which contains Raman scatterer material which may be excited from a ground energy level state to an excited energy level state by receipt of a pump beam, said Raman cell outputting a Stokes photon output beam when undergoing a de-excitation down from said excited energy level state, wherein said Raman cell comprises a gas molecular oxygen Raman cell;

a pump beam laser which outputs said pump beam which has a pump beam frequency which is selected to energize said Raman scatterer material from said ground energy level state to said exited energy level state, wherein said pump beam laser comprises an argon ion laser tuned to a first wavelength of 514 nm;

a Stokes beam laser which outputs Stokes seed photons which have a Stokes beam frequency to stimulate the de-excitation of said Raman cell down from said excited energy level state, wherein said Stokes beam laser comprises a dye laser tuned to a second wavelength of about 559 nm;

an enhancement beam source which emits an enhancement beam which has an enhancement beam frequency which enhances the Raman cell's Raman virtual state and increases thereby said Stokes photon output beam from said Raman cell, wherein said enhancement beam source comprises a dye laser which is tuned to a third wavelength of about 643 nm, and which produces an enhancement laser beam which has an angular frequency which is proportional to said change in energy level of said Raman scatterer material between its excited energy level state, and a vibrational state which is just above said excited energy level state, said angular frequency being given by

$$\omega = \frac{\Delta E}{h} \text{ where:}$$

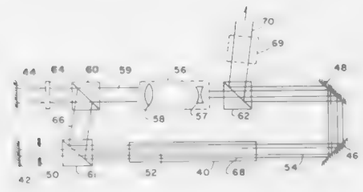
ω equals said angular frequency,

ΔE equals said change in energy level, in electron volts, of said Raman scatterer material between its excited energy level state, and a vibrational state, which is just above said excited energy level state, and

h equals Planck's constant divided by 2π; and

a means for combining said enhancement beam from said enhancement beam source with said pump beam from said pump beam laser along with said Stokes seed photons from said Stokes beam laser, said combining means thereby producing a combined beam which is directed towards said Raman cell.

4,858,239
LASER SYSTEM
Itamar Shoshan, Ramat, Israel, assignor to Elop Electrooptics Industries Ltd., Rehovot, Israel
Filed May 26, 1988, Ser. No. 199,283
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—9 **14 Claims**



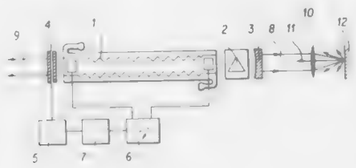
1. A method of generating a laser beam with an essentially constant angle of divergence which comprises:

a. generating a laser beam in a laser oscillator comprising a first solid-state medium,

b. passing the resulting beam through a second solid-state medium and second optical means which compensates the thermally-induced optical power of the second active medium under operating conditions at which optical power is maximal,

resulting in a desired constant divergence beam.

4,858,240
ARRANGEMENT FOR THE GENERATION OF CO_2 LASER PULSES OF HIGH POWER
Manfred Pöhler, Halle-Neustadt; Gisbert Staupendahl, and Richard Wittig, both of Halle, all of German Democratic Rep., assignors to VEB Kombinat Feinmechanische Werke Halle, Halle, German Democratic Rep.
Filed Nov. 26, 1986, Ser. No. 935,379
Claims priority, application German Democratic Rep., Jan. 9, 1986, 2860700
The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.
Int. Cl.[4] H01S *3/11*
U.S. Cl. 372—10 **7 Claims**



1. In an arrangement for the generation of CO_2-laser high-power pulses, wherein

power is supplied to a laser-gas discharge from a power supply unit, which permits the pulsed supply of pumping energy, the laser-gas discharge having an associated laser resonator, the improvement wherein the associated laser resonator is comprised of:

a first resonator mirror with a fixed reflectivity R_1,

a frequency-selective element,

an angle-selective gas discharge tube, and

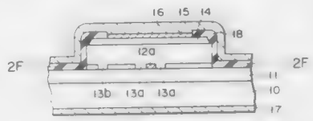
a component of a material transparent to the laser radiation, said component functioning as a second resonator mirror with a variable reflectivity R_2 and being a modulator with a high cutoff frequency, said second resonator mirror comprising a Fabry-Perot interferometer with a rapidly changeable optical wavelength, the optical wavelength of said interferometer being alterable by control signals, whereby the reflectivity R_2 can be adjusted to a value between zero and a maximum and the value of R_2 is a function of the laser wavelength, whereby

the laser resonator is forced by means of the frequency-selective and angle-selective elements to work at a specified, fixed wavelength, and

the reflectivity R_1 of said first resonator mirror is sufficient to enable the laser to operate steadily when the variable reflectivity R_2 is large, and the total resonator losses can be varied rapidly by means of the variable reflectivity R_2 of the Fabry-Perot interferometer between a state in which the laser is below its operating threshold and a state with full laser function, and wherein

a power supply for supplying electrical excitation energy of the gas discharge in pulsed fashion to the laser resonator synchronously with the electrical control signals of the interferometer with the variable reflectivity R_2, but with a precisely defined start in terms of time relative to them, whereby, with a minimum thermal load on the laser mixture, a maximum population inversion is attained at the moment at which the CO_2 laser exceeds its operating threshold due to the variable reflectivity R_2, so that radiation pulses of extremely high power magnification arise and leave the laser as operating beams.

4,858,241
SEMICONDUCTOR LASER DEVICE
Nobuo Suzuki, Tokyo; Motoyasu Morinaga, Yokohama; Hideto Furuyama, Tokyo; Yuzo Hirayama; Hajime Okuda, both of Yokohama; Masaru Nakamura, Kawaguchi, and Nawoto Motegi, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 26, 1988, Ser. No. 198,859
Claims priority, application Japan, May 26, 1987, 62-126944; Jan. 20, 1988, 63-8267; Jan. 21, 1988, 63-9587
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—46 **10 Claims**



1. A semiconductor laser device comprising:

a substrate having a first semiconductor layer of a first conductivity type;

a mesa portion having a second semiconductor layer of a second conductivity type formed above said first semiconductor layer;

an active region, formed between said first and second semiconductor layers, having a predetermined width, and consisting of a semiconductor having a forbidden band width smaller than those of said first and second semiconductor layers, said active regions having opposed edge surfaces which serve as mirrors, oscillate a laser beam between said edge surfaces and emit said laser beam from one of said edge surfaces, thereby contributing to light emission;

a pair of buried portions formed at both sides in a widthwise direction of and in contact with said active region and consisting of a semiconductor having a forbidden band width larger than that of said active region;

electrical insulating regions formed at both sides of said buried portions and between said first and second semiconductor layers;

supporting means for mechanically supporting said mesa portion with respect to said substrate to prevent stress concentration in said active region; and

first and second electrodes respectively provided on said mesa portion and said substrate.

4,858,242

UNITARY SOLID-STATE LASER

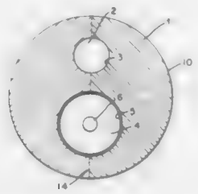
Jerry W. Kuper, Martinsville; William E. Langert, Budd Lake, and Joseph J. Barrett, Morris Plains, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jun. 27, 1988, Ser. No. 212,356

The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.

Int. Cl.[4] H01S *3/093*

U.S. Cl. 372—72 **10 Claims**



1. An improved unitary laser comprising, in combination,

(a) a transparent, thermally conductive solid housing comprising a pair of semi-cylindrical sections joined at one surface to be movable between a first open position and a second closed position:

(b) a laser medium that has two opposite ends and is embedded over its total length in a first cavity in the housing which is defined by the housing, when the housing is in the second, closed position

(c) a pump lamp for exciting the laser medium having an envelope and internal electrodes which pump lamp is embedded over the whole length of its arc and over a substantial length of each of its electrode regions in a second cavity in the housing, such that the external surface of the pump lamp and the internal surface of the second cavity are mated with a clearance there between of not more than about 0.1 millimeters: and

(d) reflector means adjacent to the opposite ends of the laser medium that define an optical resonant cavity and support coherent radiation laser emitted by the laser medium.

4,858,243

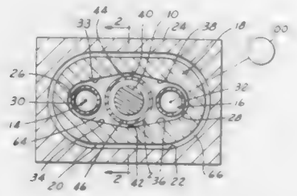
LASER PUMPING CAVITY

Dan Bar-Joseph, Ashdod, Israel, assignor to Raycon Corporation, Ann Arbor, Mich.

Filed Jun. 12, 1987, Ser. No. 60,827

Int. Cl.[4] H01S *3/093*

U.S. Cl. 372—72 **15 Claims**



1. In a laser pumping cavity, a laser rod of high gain material; a light source having an outer surface located in spaced parallel relationship to the laser rod to direct pumping radiation thereto and selectively energizable for emitting pumping radiation to establish a population inversion in the laser rod between first and second energy levels to cause laser light radiation therefrom and including a coolant flow tube for directing symmetrical water flow around the laser rod for cooling it during its operation, the improvement comprising:

a hollow single piece solid member of reflective glass ceramic material having an outer surface and an inner surface thereon spaced from the coolant flow tube and said hollow single piece solid member enclosing both the light source and the coolant flow tube to serve as the sole reflector surface for focusing light from the light source to the laser rod;

said hollow single piece solid member having the inner surface thereof located in spaced relationship with the outer surface of the light source to closely couple the reflective glass ceramic material to the light source; and

said hollow single piece solid member of ceramic material receiving light from said light source and reflecting light to said laser rod at a reflectance from said inner surface which is substantially equal to the combined diffusivity reflection of said hollow single piece solid member from said inner surface to said outer surface thereof.

4,858,244

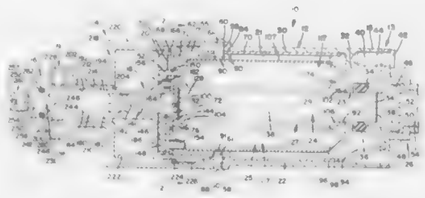
MECHANICALLY ACTUATED LASER INITIATOR

John P. Nordhaus, Northbrook, Ill., assignor to Scot, Incorporated, Downers Grove, Ill.

Filed Mar. 24, 1988, Ser. No. 173,116

Int. Cl.[4] H01S *3/091*

U.S. Cl. 372—77 **14 Claims**



1. A laser type initiator device for activating emergency equipment,

said initiator device comprising:

a housing having a generally cylindrical chamber and defining an aperture at one end of same and being open at the other end of same,

said housing aperture defining a through opening and being open to said chamber,

said housing chamber, through opening, and open end being coaxially related,

a laser rod coaxially received in said chamber and having one end of same disposed adjacent said through opening and the other end disposed adjacent said housing open end,

a tube of high strength transparent material received about said laser rod,

a plurality of elongate flash bulbs of the percussion type mounted in said chamber about said tubes and having their primed ends disposed adjacent said housing open end,

spring means for simultaneously striking the flash bulb primed ends to simultaneously ignite said flash bulbs,

actuator means for stroking and release of said spring means for actuating same to strike and ignite said flash bulbs,

and means for moving said actuator means for stroking said spring means when said device is to be actuated,

with said laser rod having means for effecting optical pumping of the light energy released on said ignition of said flash bulbs for generation of the laser beam to be emitted by the initiator device.

DESIGNS

AUGUST 15, 1989

302,760

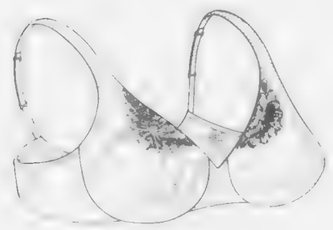
BRASSIERE

Margaret B. Shultz, Little Falls, N.J., assignor to Playtex Apparel, Inc., Stamford, Conn.

Filed Jan. 23, 1986, Ser. No. 821,627

Term of patent 14 years

U.S. Cl. D2—24



302,761

BRASSIERE

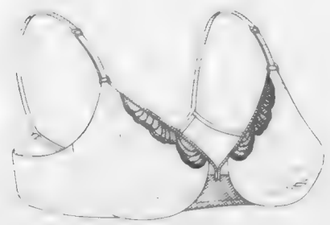
Michiko Akazaki, Wallington, N.J., assignor to Playtex Apparel, Inc., Stamford, Conn.

Filed Nov. 19, 1986, Ser. No. 932,980

The portion of the term of this patent subsequent to Jul. 4, 2003, has been disclaimed.

Term of patent 14 years

U.S. Cl. D2—24



302,762

GARMENT PROTECTOR

Nora A. Duke, 5942 Kitchel Rd., Richmond, Ind. 47374

Filed Jun. 5, 1986, Ser. No. 871,619

Term of patent 14 years

U.S. Cl. D2—225



302,763

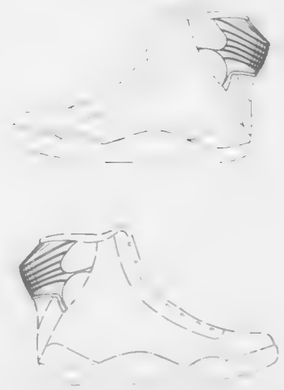
ELEMENT OF A SHOE UPPER

Bruce Kilgore, Lake Oswego, and Tinker Hatfield, Portland, both of Oreg., assignors to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.

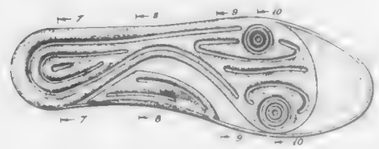
Filed Dec. 5, 1988, Ser. No. 280,241

Term of patent 14 years

U.S. Cl. D2—314



302,764
SHOE INNERSOLE
W. J. Peoples, and Neal Kramer, both of Allentown, Pa., assignors to Polymer Dynamics (Delaware) Ltd, Lehigh Valley, Pa.
Filed Aug. 26, 1986, Ser. No. 901,161
Term of patent 14 years
U.S. Cl. D2—318

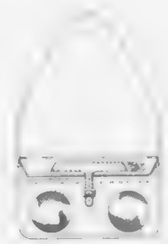




302,765
OUTSOLE FOR A SHOE
Jack Esser, Hingham, Mass., assignor to Knapp Shoes, Inc., Brockton, Mass.
Filed May 18, 1987, Ser. No. 50,382
Term of patent 14 years
U.S. Cl. D2—320



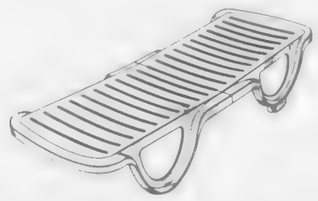
302,766
COMBINED PURSE AND RADIO
Thomas J. Johnston, 1466 Dogwood Cir., Mechanicsville, Md. 20659
Filed May 2, 1986, Ser. No. 859,245
Term of patent 14 years
U.S. Cl. D3—43



302,767
SELF-SUPPORTED MIRROR
Massimo Morrozzi, Milan, Italy, assignor to Fiam S.r.l., Tavullia, Italy
Filed Dec. 23, 1986, Ser. No. 946,284
Claims priority, application Italy, Jun. 25, 1986, 22372/86[U]
Term of patent 14 years
U.S. Cl. D6—310



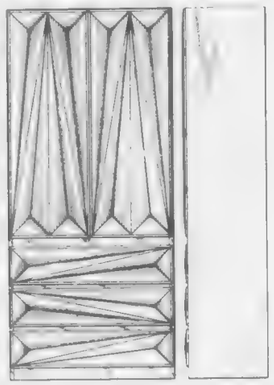
302,768
FOLDABLE CHAISE LOUNGE
Raymond Grosfillex, Arbent, 01107 Oyonnax, France
Filed Sep. 25, 1986, Ser. No. 911,654
Claims priority, application Hague, Mar. 25, 1986, DM/000483
Term of patent 14 years
U.S. Cl. D6—361



302,769
CHAIR
David C. Jenkins, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Mar. 31, 1986, Ser. No. 851,386
The portion of the term of this patent subsequent to Apr. 4, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—366



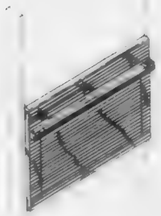
302,770
ARMOIRE
Albert Azzolina, 4 Catalpa La., Valley Stream, N.Y. 11581
Filed Apr. 15, 1987, Ser. No. 38,592
Term of patent 14 years
U.S. Cl. D6—446



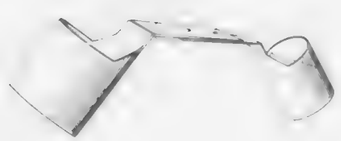
302,771
TABLE
Isaac Kubryk, Lodi, Calif., assignor to Elements by Grapevine, Inc., Lodi, Calif.
Filed Mar. 2, 1988, Ser. No. 162,857
Term of patent 14 years
U.S. Cl. D6—480



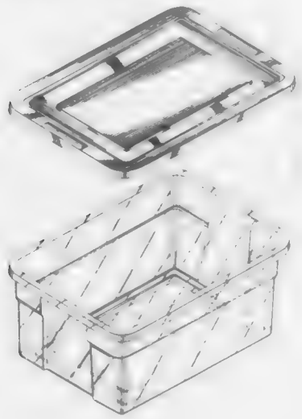
302,772
COMBINED WALL-MOUNTED PANEL AND FOLDING SHELF
Frank A. Friedman, San Francisco, Calif., assignor to Herman Miller, Inc., Zeeland, Mich.
Filed May 6, 1987, Ser. No. 47,331
Term of patent 14 years
U.S. Cl. D6—555



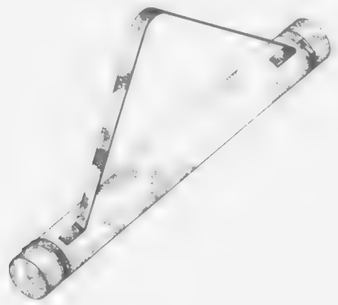
302,773
VACUUM BOTTLE HOLDER FOR VEHICLE CABS
Wan A. Nelson, 690 N. Main St., Kaysville, Utah 84037
Filed Jan. 24, 1986, Ser. No. 826,931
Term of patent 14 years
U.S. Cl. D7—71



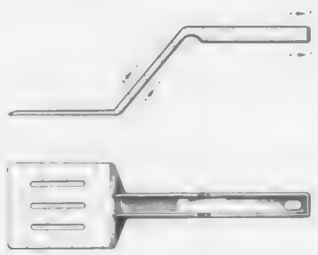
302,774
STORAGE CONTAINER
Kent W. Murphy, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Apr. 3, 1986, Ser. No. 847,864
Term of patent 14 years
U.S. Cl. D7—76



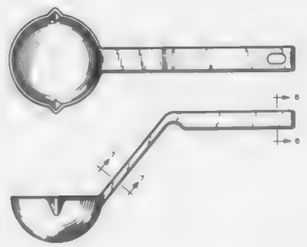
302,775
BEVERAGE TOTE BAG
Brad J. Sinoff, and L. David Sinoff, both of King of Prussia, Pa., assignors to Apple Marketing, Inc., King of Prussia, Pa.
Filed Jun. 30, 1986, Ser. No. 880,492
Term of patent 14 years
U.S. Cl. D7—76



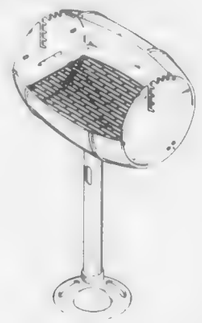
302,776
TURNER
William D. Hiscott, Chicago, Ill.; Ina Witlin, North Miami Beach, Fla.; Theodore J. Hasler, and Andrew T. Jastrzebski, both of Chicago, Ill., assignors to Ekco Housewares, Inc., Franklin Park, Ill.
Filed May 4, 1987, Ser. No. 45,150
Term of patent 14 years
U.S. Cl. D7—102



302,777
LADLE
William D. Hiscott, Chicago, Ill.; Ina Witlin, North Miami Beach, Fla.; Theodore J. Hasler, and Andrew T. Jastrzebski, both of Chicago, Ill., assignors to Ekco Housewares, Inc., Franklin Park, Ill.
Filed May 4, 1987, Ser. No. 45,305
Term of patent 14 years
U.S. Cl. D7—104



302,778
BARBEQUE GRILL
Douglas G. Tsai, P.O. Box 705, Taipei 10098, Taiwan
Filed Jan. 23, 1985, Ser. No. 693,734
Term of patent 14 years
U.S. Cl. D7—335



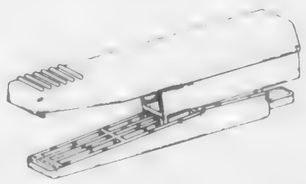
302,779
CORD CUTTER HEAD FOR A VEGETATION TRIMMER
Tooru Baba, Kanagawa, Japan, assignor to Kioritz Corporation, Yokosuka, Japan
Filed Mar. 6, 1987, Ser. No. 22,421
Claims priority, application Japan, Sep. 29, 1986, 61-38110
Term of patent 14 years
U.S. Cl. D8—8



302,780
COMBINED WOOD CHISEL AND EDGE COVER
THEREFOR
Hans Himbert, Bromma, and Erik C. Jansson, Enköping, both of Sweden, assignors to AB Bahco Verktyg, Enköping, Sweden
Filed Jun. 19, 1985, Ser. No. 746,375
Claims priority, application Sweden, Dec. 21, 1984, 84-3420
Term of patent 14 years
U.S. Cl. D8—47



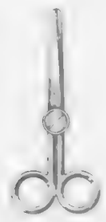
302,781
STAPLER
Yoshiyuki Ebihara, Tokyo, Japan, assignor to Etona Company, Limited, Tokyo, Japan
Filed May 1, 1986, Ser. No. 859,723
Claims priority, application Japan, Nov. 28, 1985, 60-49736
Term of patent 14 years
U.S. Cl. D8—50



302,782
STAPLER
Yoshiyuki Ebihara, Tokyo, Japan, assignor to Etona Company, Limited, Tokyo, Japan
Filed Sep. 18, 1986, Ser. No. 909,086
Claims priority, application Japan, May 14, 1986, 61-18150
Term of patent 14 years
U.S. Cl. D8—50



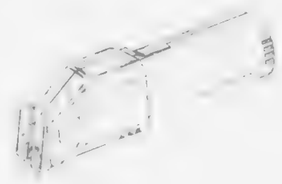
302,783
SCISSURS
Nakakuma Katsuhiko, Tokyo, Japan, assignor to Plus Corporation, Tokyo, Japan
Filed Dec. 2, 1986, Ser. No. 937,125
Claims priority, application Japan, Jun. 4, 1986, 61-21488
Term of patent 14 years
U.S. Cl. D8—57



302,784
SCISSORS
Katsuhiko Nakakuma, Tokyo, Japan, assignor to Plus Corporation, Tokyo, Japan
Filed Dec. 2, 1986, Ser. No. 937,126
Claims priority, application Japan, Jun. 4, 1986, 61-21487
Term of patent 14 years
U.S. Cl. D8—57



302,785
POWER PADSAW
Lawrence T. A. Cunningham, Cleveland, England, assignor to Black & Decker Inc., Newark, Del.
Filed Feb. 24, 1986, Ser. No. 836,464
Claims priority, application United Kingdom, Sep. 19, 1985, 1 029 307; Jan. 22, 1986, 1 031 748
Term of patent 14 years
U.S. Cl. D8—64



302,786
ELECTRIC SCREW DRIVER
Fusao Fushiya, and Tetsuhisa Kaneko, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Japan
Filed May 15, 1987, Ser. No. 51,064
Claims priority, application Japan, Nov. 10, 1986, 61-44378
Term of patent 14 years
U.S. Cl. D8—68



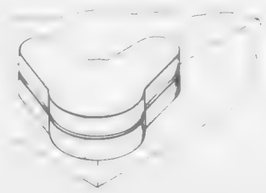
302,787
GUNSMITH TOOL SET
Erbin C. Wilson, and Edward E. Wilson, both of 1521 Florida St., Gastonia, N.C. 28052
Filed Feb. 25, 1985, Ser. No. 705,146
Term of patent 14 years
U.S. Cl. D8—107



302,788
PUSH BUTTON LOCK MODULE FOR ATTACHMENT TO A DOOR KNOB
Thomas K. McGourty, 9570 Chimney Rock Rd., and Lawrence F. McGourty, 6680 Linne Rd., both of Paso Robles, Calif. 93446
Filed Mar. 9, 1987, Ser. No. 23,308
Term of patent 14 years
U.S. Cl. D8—343



302,789
CORNER PAD
David Levine, 3555 Geary Blvd., San Francisco, Calif. 94118
Filed Dec. 9, 1988, Ser. No. 282,356
Term of patent 14 years
U.S. Cl. D8—403



302,790
CONTAINER
Keith A. Roe, Green Lane House, Green Lane North, Thorpe End, Norwich, Norfolk NR13 5BB, England
Filed Dec. 24, 1986, Ser. No. 946,293
Term of patent 14 years
U.S. Cl. D9—307



302,791
CONTAINER FOR CONFECTIONARY PRODUCTS
Pietro Ferrero, Brussels, Belgium, assignor to Ferrero S.p.A., Alba, Italy
Filed Nov. 14, 1986, Ser. No. 930,440
Claims priority, application Italy, Oct. 3, 1986, 53419/86[U]
Term of patent 14 years
U.S. Cl. D9—318



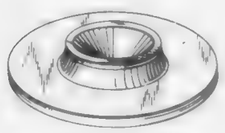
302,792
BOTTLE
Pierre Dinand, Levallois, France, assignor to Calvin Klein Cosmetics Corporation, New York, N.Y.
Filed Apr. 7, 1986, Ser. No. 850,408
Term of patent 14 years
U.S. Cl. D9—377



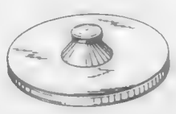
302,793
COMBINED CONTAINER CLOSURE AND SPOON
Kiyoshi Yamaguchi, No. 2-11-5, Ohana-Kita Finabashi-shi, Chiba, Japan
Filed Mar. 21, 1986, Ser. No. 845,420
Term of patent 14 years
U.S. Cl. D9—436



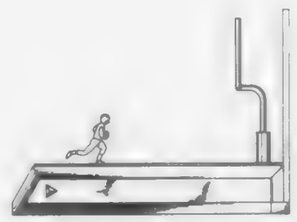
302,794
APERTURED LID OR THE LIKE
Donald R. Turner, Shelbyville, Ind.; Karl C. Kramer, Dunellen, and Gerald S. Wasserman, E. Brunswick, both of N.J., assignors to General Foods Corp. & Williams Industries, Del.
Filed May 7, 1986, Ser. No. 860,740
Term of patent 14 years
U.S. Cl. D9—447



302,795
LID
Jon E. Finger, New City, N.Y., and Ronald R. Turner, Shelbyville, Ind., assignors to General Foods Corp., White Plains, N.Y. and Williams Industries, Inc., Shelbyville, Ind.
Filed Apr. 22, 1986, Ser. No. 857,563
Term of patent 14 years
U.S. Cl. D9—454



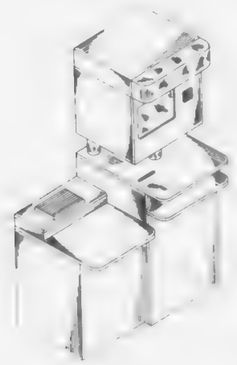
302,796
SPORTS CLOCK
Michael D. Goolsby, 5423 Woethington Forest, Columbus, Ohio 43229
Filed Apr. 18, 1986, Ser. No. 855,787
Term of patent 14 years
U.S. Cl. D10—8



302,797
WRIST WATCH
Jean-Francois Glauser, Founex, Switzerland, assignor to Baume & Mercier S.A., Les Acacias, Switzerland
Filed Apr. 3, 1986, Ser. No. 848,122
Claims priority, application Hague, Oct. 21, 1985, DMA/000 432
Term of patent 14 years
U.S. Cl. D10—32



302,798
SHIPPING CENTER KIOSK
William F. Wolff, Jr., Clearwater, Fla., assignor to Automated Shipping Machines, Inc., Sarasota, Fla.
Filed Sep. 5, 1986, Ser. No. 905,030
Term of patent 14 years
U.S. Cl. D10—91



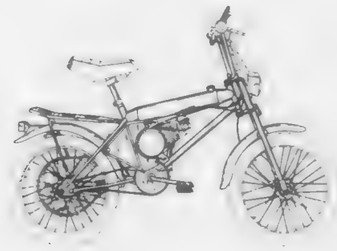
302,799
REFLECTIVE RING FOR BICYCLE WHEEL
Peter I. Kither, Ploegstraat 60, 1097 WJ Amsterdam, Netherlands
Filed Aug. 21, 1986, Ser. No. 899,210
Claims priority, application Hague, Feb. 21, 1986, 60882-00
Term of patent 14 years
U.S. Cl. D10—111



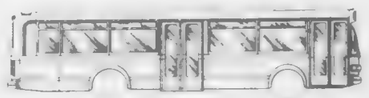
302,800
ORNAMENTAL DESIGN FOR A WATCH DIAL
Jean Robert, Zurich, Switzerland, assignor to Swatch (SA), Bienne, Switzerland
Filed Sep. 5, 1986, Ser. No. 904,304
Claims priority, application World Int. Prop. O., Mar. 6, 1986, DM/006 611
Term of patent 14 years
U.S. Cl. D10—126



302,801
MOPED
Bernard Lacroix, Montbeliard, France, assignor to Cycles Peugeot, Beaulieu, France
Filed Jan. 24, 1986, Ser. No. 822,034
Claims priority, application France, Jul. 25, 1985, 853626
Term of patent 14 years
U.S. Cl. D12—110



302,802
BUS BODY
Donald L. Manning, 4002 Normanwood Dr., Orchard Lake, Mich. 48033
Filed Feb. 24, 1987, Ser. No. 18,076
Term of patent 14 years
U.S. Cl. D12—84

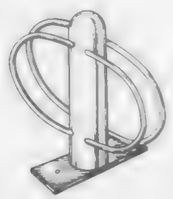


302,803
BICYCLE STAND
Xavier R. Villanueva, 1819 Howard St., San Ysidro, Calif. 92073
Filed Jan. 28, 1987, Ser. No. 8,407
Term of patent 14 years
U.S. Cl. D12—115

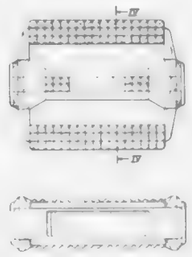


302,804
ANTITHEFT BICYCLE RACK
Jacques Mailhot, Rawdon, and Serge Morin, LaSalle, both of Canada, assignors to Rawdon Metal Inc., Rawdon, Canada
Filed Nov. 25, 1987, Ser. No. 126,281
Claims priority, application Canada, Jun. 1, 1987, 01-06-87-3
Term of patent 14 years
U.S. Cl. D12—115

302,805
BICYCLE RACK
Andrea Hoyt, 900 S. Edson, Lombard, Ill. 60148
Filed Dec. 15, 1987, Ser. No. 132,911
Term of patent 14 years
U.S. Cl. D12—115

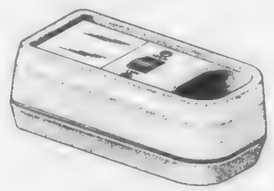


302,806
CYCLE PEDAL
Hermann Schieferstein, Detmold, Fed. Rep. of Germany, assignor to Union Sils, Frondenberg, Fed. Rep. of Germany
Filed Dec. 28, 1987, Ser. No. 138,695
Claims priority, application Int'l Pat. Institute, Jun. 29, 1987, DM/008860
Term of patent 14 years
U.S. Cl. D12—125

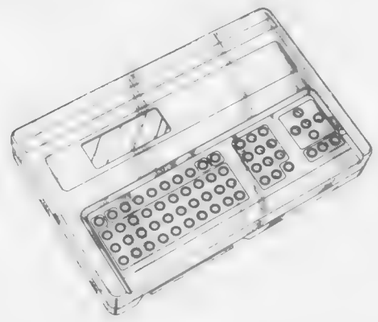


302,807
CONSOLE FOR BOAT
Michael Allbritton, Longview, Tex., assignor to Skeeter Products, Inc., Kilgore, Tex.
Filed Aug. 8, 1988, Ser. No. 229,350
Term of patent 14 years
U.S. Cl. D12—317

302,808
BATTERY CHARGER
Voyteck T. Skuza, Park Ridge, Ill., and Edward L. Williams, Southam, England, assignors to The Stanley Works, New Britain, Conn.
Filed Oct. 9, 1987, Ser. No. 106,333
Term of patent 14 years
U.S. Cl. D13—5

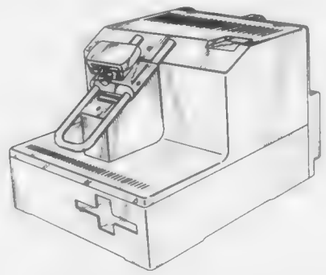


302,809
HOUSING FOR A PROGRAMMING TERMINAL
Guy Boucher, Paris, France, assignor to La Telemecanique Electrique, France
Division of Ser. No. 703,588, Feb. 20, 1985. This application Jan. 28, 1987, Ser. No. 8,459
Claims priority, application France, Aug. 24, 1984, 84 3762
Term of patent 14 years
U.S. Cl. D13—12

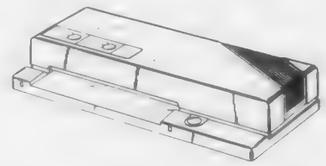


302,810
PAGER
Michael W. Vickers, Lees' Summit, and David W. Stubbs, Kansas City, both of Mo., assignors to Maxcom Electronics, Inc., Kansas City, Mo.
Filed Nov. 3, 1986, Ser. No. 926,246
Term of patent 14 years
U.S. Cl. D14—191

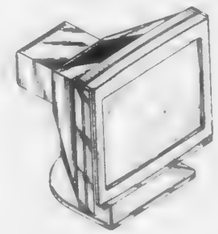
302,811
DATA PROCESSOR HOUSING WITH ADJUSTABLE SUPPORT FOR DISPLAY MONITOR
Vid Bratasevec, Koper, Yugoslavia, assignor to Iskra-Delta, Ljubljana, Yugoslavia
Filed Oct. 31, 1985, Ser. No. 793,347
Claims priority, application Yugoslavia, May 6, 1985, M-211/85
Term of patent 14 years
U.S. Cl. D14—100



302,812
IMAGE SCANNER FOR ELECTRONIC COMPUTERS
Shin-ichi Hiroki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Jan. 6, 1987, Ser. No. 1,082
Claims priority, application Japan, Aug. 8, 1986, 61-30880
Term of patent 14 years
U.S. Cl. D14—107



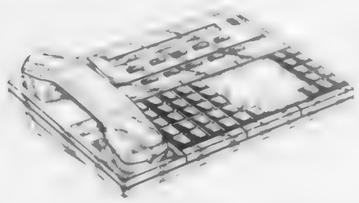
302,813
MONITOR OR SIMILAR ARTICLE
George Kao, Taipei, and Feng-Chih Chen, Yung Ho, both of Taiwan, assignors to Cal-Comp Electronics Inc., Taipei, Taiwan
Filed Oct. 10, 1986, Ser. No. 917,825
Term of patent 14 years
U.S. Cl. D14—113



302,814
CASH CALL PUBLIC PAY TELEPHONE STAND WITHOUT COIN BOX
Martin S. Rose, Sudbury, England, assignor to GEC Plessey Telecommunications Ltd., Coventry, England
Filed Jun. 14, 1988, Ser. No. 206,682
Claims priority, application United Kingdom, Dec. 16, 1987, 1407135
Term of patent 14 years
U.S. Cl. D14—142



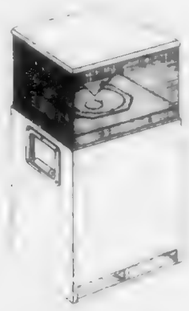
302,815
TELEPHONE SET
Michael C. Goatman, Tetbury, England, assignor to Philips Electronics & Associated Indus. Ltd., London, England
Filed Sep. 10, 1986, Ser. No. 905,991
Claims priority, application United Kingdom, Mar. 12, 1986, 1032775; Mar. 12, 1986, 1032776
Term of patent 14 years
U.S. Cl. D14—51



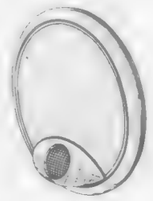
302,816
LOUDSPEAKER
Richard K. Macaulay, Dayton, Ohio, assignor to Macaulay Acoustics, Inc., Dayton, Ohio
Filed Apr. 7, 1986, Ser. No. 850,879
Term of patent 14 years
U.S. Cl. D14—210



302,817
LOUDSPEAKER
Richard K. Macaulay, Dayton, Ohio, assignor to Macaulay Acoustics, Inc., Dayton, Ohio
Filed Apr. 7, 1986, Ser. No. 850,885
Term of patent 14 years
U.S. Cl. D14—210



302,818
LOUDSPEAKER GRILLE
Murray I. C. Camens, 's-Hertogenbosch, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 14, 1986, Ser. No. 833,457
Claims priority, application United Kingdom, Aug. 21, 1985, [illegible]
Term of patent 14 years
U.S. Cl. D14—219



302,819
COMBINED MICROPHONE AND SHIELDER
Hiroshi Kubota, Kobe, Japan, assignor to Toa Tokushu Denki Kabushiki Kaisha, Kobe, Japan
Division of Ser. No. 783,313, Sep. 13, 1985. This application Mar. 11, 1988, Ser. No. 145,203
Claims priority, application Japan, Mar. 13, 1985, 60-10097; Jul. 3, 1985, 60-28444; Jul. 3, 1985, 60-28451
Term of patent 14 years
U.S. Cl. D14—228



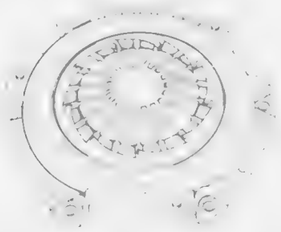
302,820
COMBINED FUEL PUMP AND CANOPY STRUCTURE FOR A SERVICE STATION
Saul Bass, Los Angeles, Calif., assignor to Standard Oil Company, Cleveland, Ohio
Filed Aug. 27, 1986, Ser. No. 901,168
Term of patent 14 years
U.S. Cl. D15—9.2



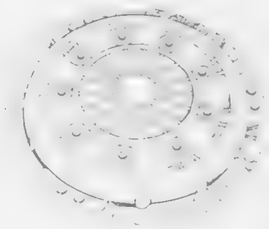
302,821
COMBINED DRILLING AND INSERTION MACHINE FOR FURNITURE FITTINGS
Dietmar Blum, Höchst, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria
Division of Ser. No. 698,595, Feb. 5, 1985, Pat. No. Des. 297,331. This application Jan. 28, 1988, Ser. No. 149,519
Claims priority, application Austria, Aug. 16, 1984, 26850/426/1984; Aug. 16, 1984, 26851/426/1934
Term of patent 14 years
U.S. Cl. D15—132



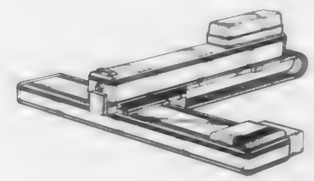
302,822
COVER SIDE OF A FRICTION CLUTCH
Lothar Huber, Bühl-Altscheier, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany
Filed Mar. 28, 1985, Ser. No. 716,894
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1984, 5MRII/63-BH
Term of patent 14 years
U.S. Cl. D15—148



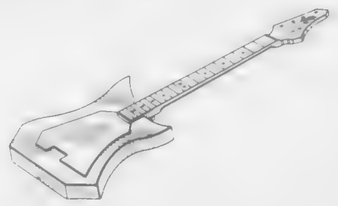
302,823
COVER SIDE OF A FRICTION CLUTCH
Lothar Huber, Bühl-Altscheier, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany
Filed Mar. 28, 1985, Ser. No. 717,154
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1984, 5 MR II/47-BH
Term of patent 14 years
U.S. Cl. D15—148



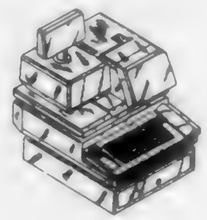
302,824
CARTESIAN COORDINATES TYPE ROBOT
Katsuji Kagayama, Nara; Benito Mishiro, and Ikuo Nishimura, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sep. 8, 1986, Ser. No. 905,110
Claims priority, application Japan, Apr. 22, 1986, 61-15006
Term of patent 14 years
U.S. Cl. D15—199



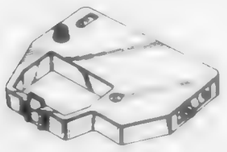
302,825
GUITAR BODY AND NECK
Robert B. Riley, and Robert E. Stefanski, 4879 Voltaire St., San Diego, Calif. 92107
Filed Mar. 10, 1986, Ser. No. 842,427
Term of patent 14 years
U.S. Cl. D17—14



302,826
CASH REGISTER OR SIMILAR ARTICLE
Shuzo Kato, Hiratsuka, and Asami Nemoto, Odawara, both of Japan, assignors to NCR Corporation, Dayton, Ohio
Filed Sep. 25, 1987, Ser. No. 101,350
Claims priority, application Japan, Apr. 30, 1987, 62-16662
Term of patent 14 years
U.S. Cl. D18—4



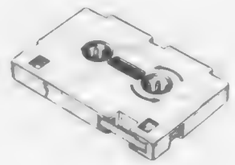
302,827
INK RIBBON CARTRIDGE
Takayuki Fujita, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan
Filed Mar. 24, 1987, Ser. No. 29,594
Claims priority, application Japan, Oct. 20, 1986, 61-41295
Term of patent 14 years
U.S. Cl. D18—12



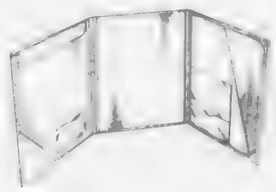
302,828
INK RIBBON CASSETTE FOR ELECTRONIC TYPEWRITER
Akio Endo, Tokyo, and Yasuo Ohba, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 28, 1987, Ser. No. 43,295
Claims priority, application Japan, Feb. 9, 1987, 62-4942
Term of patent 14 years
U.S. Cl. D18—12



302,829
INK RIBBON CASSETTE
Shigeru Neza, and Osamu Asakura, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 24, 1987, Ser. No. 88,191
Claims priority, application Japan, Feb. 25, 1987, 62-7340
Term of patent 14 years
U.S. Cl. D18—12



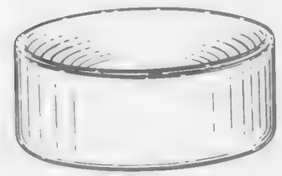
302,830
MAGNETIC FOLIO
Ghanshyam H. Popat, Alta Loma; Tien-Tsung Chen, Claremont; Christopher H. Binkley, Rancho Palos Verdes, and K. Fou Tsai, Rowland Hts., all of Calif., assignors to Avery International, Pasadena, Calif.
Filed May 28, 1986, Ser. No. 869,111
Term of patent 14 years
U.S. Cl. D19—26

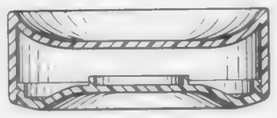


302,831
HEART-SHAPED PLASTIC PAPER CLIP
Po C. Lau, 8224 Wilkinson Ave., North Hollywood, Calif. 91605
Filed Apr. 25, 1986, Ser. No. 857,789
Term of patent 14 years
U.S. Cl. D19—65

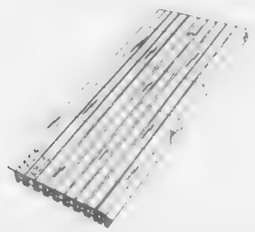


302,832
HOLDER FOR RETAINING SMALL OBJECTS MAGNETICALLY
Feather W. King, 165 Reiten Dr., Ashland, Oreg. 97520
Continuation-in-part of Ser. No. 442,156, Nov. 16, 1982, Pat. No. D. 282,380, which is a continuation-in-part of Ser. No. 133,434, Mar. 24, 1980, Pat. No. D. 266,934. This application Nov. 12, 1985, Ser. No. 804,747
The portion of the term of this patent subsequent to Apr. 11, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—75

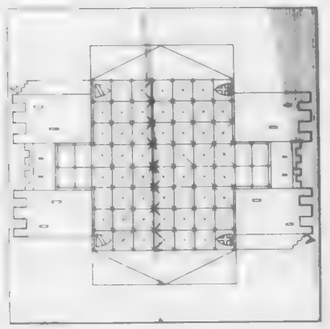




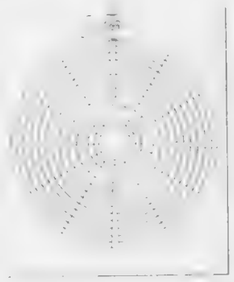
302,833
IDENTIFICATION MARKER UNIT FOR CABLES
Walter Jaffe, Lidköping, Sweden, assignor to Fleximark AB, Gothenburg, Sweden
Filed Apr. 17, 1986, Ser. No. 856,098
Claims priority, application Sweden, Oct. 17, 1985, 85-2508
Term of patent 14 years
U.S. Cl. D20—43



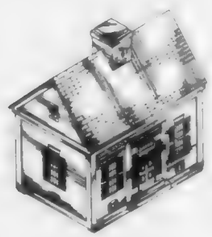
302,834
GAME BOARD
John Graviano, 423 Oak St., Methuen, Mass. 01844
Filed Oct. 6, 1986, Ser. No. 916,026
Term of patent 14 years
U.S. Cl. D21—31



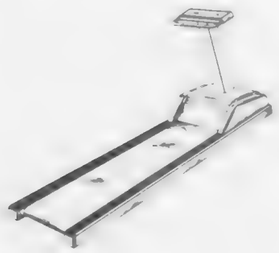
302,835
BOARD FOR PLAYING A GAME
Peter Simester, London, United Kingdom, assignor to Present Games Ltd., London, United Kingdom
Filed Jul. 11, 1986, Ser. No. 884,750
Claims priority, application United Kingdom, Jan. 14, 1986, 1033128
Term of patent 14 years
U.S. Cl. D21—35



302,836
PLAY HOUSE
Joseph C. Roy, 16 Berry Hill Rd., Columbia, S.C. 29210
Filed Aug. 30, 1987, Ser. No. 80,685
Term of patent 14 years
U.S. Cl. D21—114



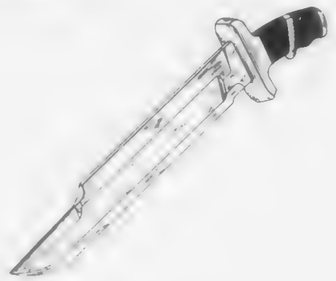
302,837
EXERCISE TREADMILL
Steven T. Sherrard, Bothell, Wash., assignor to Tunturi, Inc., Bellevue, Wash.
Filed Apr. 11, 1988, Ser. No. 180,265
Term of patent 14 years
U.S. Cl. D21—192



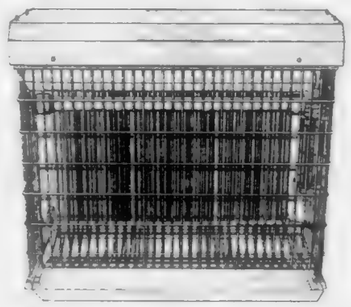
302,838
COMBINED ROLLER SKATE FOOTPLATE AND FASTENING THEREFOR
Joel K. Wendt, 635 Hudson Ave., Davis Island, Tampa, Fla. 33606
Filed Apr. 14, 1986, Ser. No. 852,520
Term of patent 14 years
U.S. Cl. D21—226



302,839
LIFE SUPPORT SYSTEM KNIFE
Jack W. Crain, Rte. 2, Box 221F, Weatherford, Tex. 76086
Filed Jun. 22, 1987, Ser. No. 64,442
Term of patent 14 years
U.S. Cl. D22—118



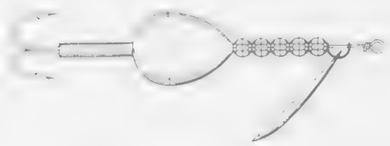
302,840
INSECT ELECTROCUTION TRAP
A. A. den Braber, Putten, Netherlands, assignor to Denka International B.V., Barneveld, Netherlands
Filed Apr. 28, 1987, Ser. No. 43,982
Claims priority, application Benelux, Oct. 31, 1986, 61542-00
Term of patent 14 years
U.S. Cl. D22—123



302,841
ICE BLADE FISHING LURE
Kelli Hugill, 511-44th St., Rock Island, Ill. 61201
Filed Aug. 22, 1986, Ser. No. 899,434
Term of patent 14 years
U.S. Cl. D22—129



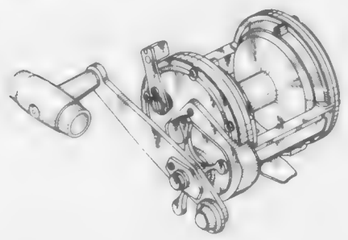
302,842
BUOYANT SPINNER
Robert P. Holzman, Portland, Oreg., assignor to Poulsen-Cascade Corporation, Portland, Oreg.
Filed Jun. 27, 1988, Ser. No. 211,846
Term of patent 14 years
U.S. Cl. D22—129



302,843
FISHING REEL
Seiji Myojo, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Continuation of Ser. No. 908,086, Sep. 16, 1986, abandoned. This application Dec. 2, 1988, Ser. No. 279,271
Claims priority, application Japan, Apr. 30, 1986, 61-16464
Term of patent 14 years
U.S. Cl. D22—140



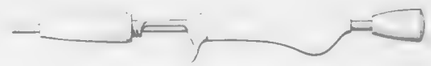
302,844
FISHING REEL
Seiji Myojo, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Continuation of Ser. No. 908,089, Sep. 16, 1986, abandoned. This application Dec. 2, 1988, Ser. No. 279,272
Claims priority, application Japan, Apr. 4, 1986, 61-12399
Term of patent 14 years
U.S. Cl. D22—140



302,845
SPINNING ROD HANDLE
James T. Rumbaugh, Tai Chung, Taiwan, and Brad J. Benit, Spirit Lake, Iowa, assignors to Berkley, Inc., Spirit Lake, Iowa
Filed Aug. 15, 1986, Ser. No. 896,738
Term of patent 14 years
U.S. Cl. D22—142



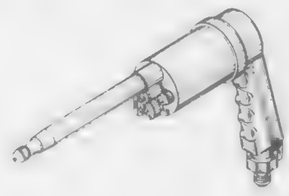
302,846
BAIT CASTING ROD HANDLE
James T. Rumbaugh, Tai Chung, Taiwan, and Brad J. Benit, Spirit Lake, Iowa, assignors to Berkley, Inc., Spirit Lake, Iowa
Filed Aug. 15, 1986, Ser. No. 896,853
Term of patent 14 years
U.S. Cl. D22—142



302,847
SPIN CASTING ROD HANDLE
James T. Rumbaugh, Tai Chung, Taiwan, and Brad J. Benit, Spirit Lake, Iowa, assignors to Berkley, Inc., Spirit Lake, Iowa
Filed Aug. 15, 1986, Ser. No. 896,887
Term of patent 14 years
U.S. Cl. D22—142



302,848
WATER INJECTING GUN OR SIMILAR ARTICLE
Aqee Kao, Keelung, Taiwan, assignor to Hung Mei Brush Co., Ltd., Keelung, Taiwan
Filed Apr. 28, 1987, Ser. No. 43,439
Term of patent 14 years
U.S. Cl. D23—226

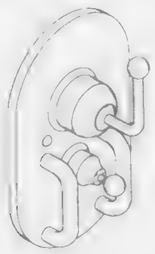


302,849
PLUMBING FITTING HANDLE
Herbert V. Kohler, Jr., Kohler, and Thomas W. Hillebrand, Janesville, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jan. 6, 1987, Ser. No. 1,084
Term of patent 14 years
U.S. Cl. D23—252





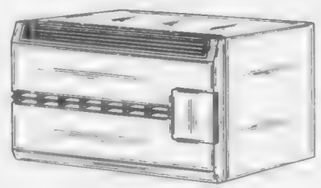
302,850
COMBINED WATER CONTROL HANDLES AND ESCUTCHEON
Bethany Lathrop, Los Angeles, Calif., assignor to Aloys F. Dornbracht GmbH & Co. KG, Muhle, Fed. Rep. of Germany
Filed Jan. 28, 1986, Ser. No. 823,376
Claims priority, application France, Oct. 9, 1985, 85 4715
Term of patent 14 years
U.S. Cl. D23—254



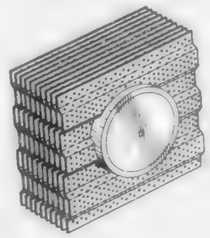
302,851
TUB ATTACHMENT FOR A CLOTHES WASHER OR DRYER
Eula G. Cochran, 3701 Papermill Rd., Knoxville, Tenn. 37919
Filed Jan. 21, 1986, Ser. No. 820,647
Term of patent 14 years
U.S. Cl. D23—284



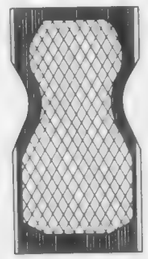
302,852
AIR CONDITIONER
Hiroshi Moritani, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 25, 1987, Ser. No. 125,051
Claims priority, application Japan, May 29, 1987, 62-22488
Term of patent 14 years
U.S. Cl. D23—353



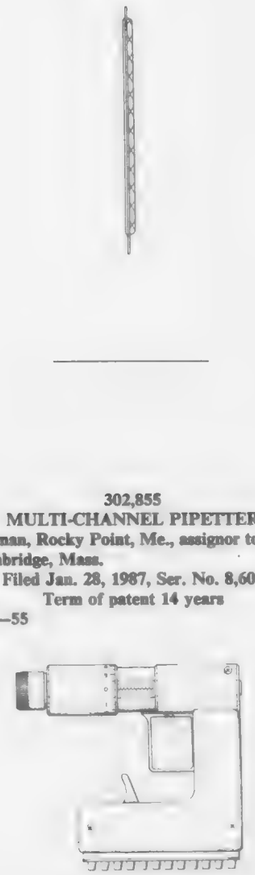
302,853
FINNED HEAT EXCHANGER FOR ELECTRONIC EQUIPMENT
Nobuyoshi Takahashi, Kadoma; Yoshihiko Yamamoto, Itami; Masao Fujii, Takarazuka, and Yu Seshimo, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 9, 1985, Ser. No. 773,614
Claims priority, application Japan, Apr. 24, 1985, 16900/1985
Term of patent 14 years
U.S. Cl. D23—386



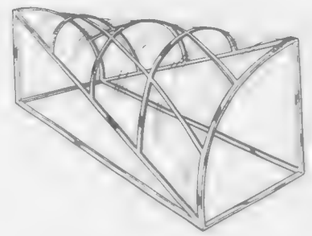
302,854
INCONTINENCE DIAPER
Jean Minot, Lille, France, assignor to S.A. Celatose, Tourcoing, France
Filed Jan. 9, 1987, Ser. No. 1,707
Term of patent 14 years
U.S. Cl. D24—50



302,855
MULTI-CHANNEL PIPETTER
George F. Lyman, Rocky Point, Me., assignor to Costar Corporation, Cambridge, Mass.
Filed Jan. 28, 1987, Ser. No. 8,606
Term of patent 14 years
U.S. Cl. D24—55

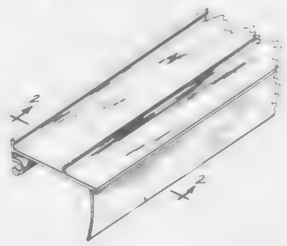


302,856
CANOPY
Raymond E. Bareiss, 234 Blackhorse Pike, Glendora, N.J. 08029
Filed Mar. 26, 1987, Ser. No. 30,228
Term of patent 14 years
U.S. Cl. 25—56

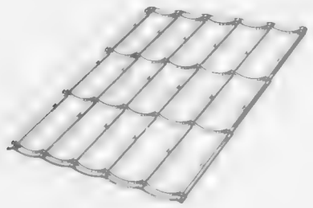


302,857
FRAME MEMBER FOR A WINDOW JAMB FOR A BOW WINDOW OR THE LIKE
Julian S. Dunnick, York, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Apr. 25, 1985, Ser. No. 727,116
Term of patent 14 years
U.S. Cl. D25—119

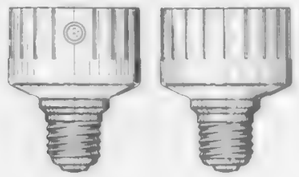
302,858
FRAME MEMBER FOR A WINDOW JAMB FOR A BOW WINDOW OR THE LIKE
Julian S. Dunnick, York, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Apr. 25, 1985, Ser. No. 727,145
Term of patent 14 years
U.S. Cl. D25—119



302,859
ROOFING ELEMENT OR THE LIKE
Ernst Kero, Luleå , Sweden, assignor to Plannja AB, Luleå , Sweden
Filed Nov. 18, 1985, Ser. No. 805,563
Claims priority, application Sweden, May 24, 1985, 85-1363
Term of patent 14 years
U.S. Cl. D25—141



302,860
LAMP BASE
Willem Anema, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 17, 1985, Ser. No. 810,446
Claims priority, application United Kingdom, Jul. 8, 1985, 1027803
Term of patent 14 years
U.S. Cl. D26—2



302,861
FLUORESCENT LAMP
Shuichi Tayama, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 9, 1987, Ser. No. 130,666
Claims priority, application Japan, Jun. 17, 1987, 62-24432
Term of patent 14 years
U.S. Cl. D26—3



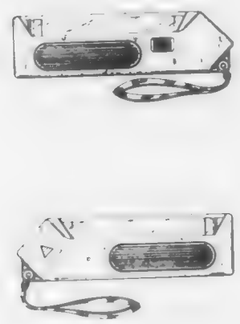
302,862
OIL CANDLE
Karen Boss, 125 Horse Shoe Hill, Bolinas, Calif. 94924
Filed Jul. 2, 1986, Ser. No. 881,313
Term of patent 14 years
U.S. Cl. D26—11



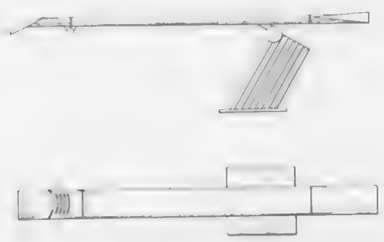
302,863
NIGHT-LIGHT
Leonardus A. C. Krol, Gorinchem, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 19, 1986, Ser. No. 945,448
Claims priority, application World Int. Prop. O., Aug. 18, 1986, DM/007371
Term of patent 14 years
U.S. Cl. D26—26



302,864
COMBINED RECHARGEABLE LANTERN AND POWER FAILURE LANTERN
Tik-Wing Poon, 2nd Floor, Tak King Ind. Bldg., 27 Lee Chung Street, Chai Wan, Hong Kong
Continuation of Ser. No. 898,353, Aug. 20, 1986, abandoned. This application Jan. 10, 1989, Ser. No. 296,308
Term of patent 14 years
U.S. Cl. D26—42



302,865
ADJUSTABLE TABLE LAMP
Hans von Klier, via Argelati, 30/A Milano, Italy
Filed Jul. 21, 1986, Ser. No. 887,285
Claims priority, application Italy, Feb. 25, 1986, 20905/86[U]
Term of patent 14 years
U.S. Cl. D26—63



302,866
ADJUSTABLE TABLE LAMP
Michele De Lucchi, Milan, Italy, assignor to Artemide S.p.A., Milan, Italy
Filed Jul. 6, 1987, Ser. No. 70,834
Claims priority, application Italy, Jan. 8, 1987, 20427/87[U]
Term of patent 14 years
U.S. Cl. D26—65



302,867
DECORATIVE PLASMA ARC DISPLAY
Warren E. Dennis, Pasadena, and Eric D. Plambeck, Carpenteria, both of Calif., assignors to Venture Research, Pasadena, Calif.
Filed Apr. 17, 1987, Ser. No. 39,366
Term of patent 14 years
U.S. Cl. D26—110



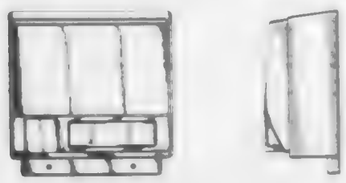
302,868
HAIR DRYER
Jih-Tu Tsai, No. 48, Lane 243, Section 3, Chung-Chin N. Road, Taipei, Taiwan
Filed Feb. 6, 1987, Ser. No. 11,672
Term of patent 14 years
U.S. Cl. D28—13



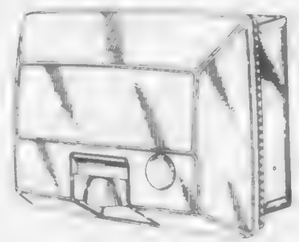
302,869
SAFETY RAZOR
Roland Beuchat, Cologny, Switzerland, assignor to Synertrade and Finance S.A., Carouge, Switzerland
Filed Oct. 10, 1986, Ser. No. 917,512
Claims priority, application Int'l Pat. Institute, Apr. 10, 1986, DM4/000 484
Term of patent 14 years
U.S. Cl. D28—46



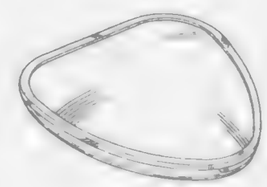
302,870
HAND DRYER
Joseph R. Mango, Midlothian, Ill., assignor to World Dryer Division of Specialty Equipment Companies, Inc., Berkeley, Ill.
Filed Apr. 18, 1986, Ser. No. 855,777
Term of patent 14 years
U.S. Cl. D28—54.1

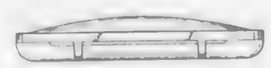


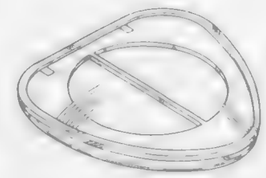
302,871
WALL MOUNTED RECESSED DRYER
Henry C. Keck, Pasadena, and Roy K. Fujitaki, Altadena, both of Calif., assignors to Bobrick Washroom Equipment, Inc., North Hollywood, Calif.
Filed Apr. 21, 1986, Ser. No. 856,118
Term of patent 14 years
U.S. Cl. D28—54.1



302,872
COSMETIC CASE
Karena Bakic, Varese, Italy, assignor to Cosmede Anstalt, Vaduz, Liechtenstein
Filed Dec. 2, 1986, Ser. No. 937,146
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1986, URA807/86
Term of patent 14 years
U.S. Cl. D28—78



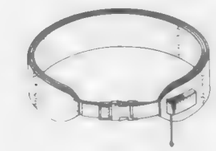


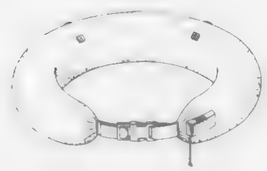


302,873
LIPSTICK TUBE
Marie C. Sayn Wittgenstein, Paris, France, assignor to Parfums Christian Dior, Paris, France
Filed Oct. 16, 1986, Ser. No. 919,740
Term of patent 14 years
U.S. Cl. D28—85

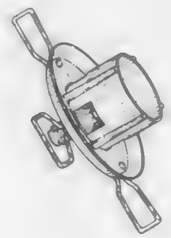


302,874
EMERGENCY INFLATABLE BELT
Douglas *N.* Bossart, 9909 Hemlock, Overland Park, Kans. 66212
Filed Jun. 19, 1986, Ser. No. 876,257
Term of patent 14 years
U.S. Cl. D29—6

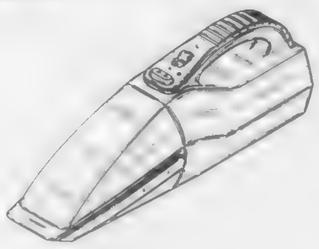




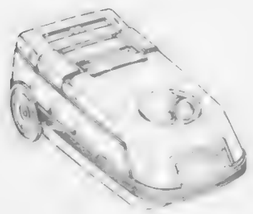
302,875
COMBINED HOLDER AND DISPENSER FOR BIRD FEED CONTAINER
Norman M. Earl, Bristol, Conn., assignor to The Bird Chef Co., Inc., Collinsville, Conn.
Filed Jun. 15, 1987, Ser. No. 61,399
Term of patent 14 years
U.S. Cl. D30—124

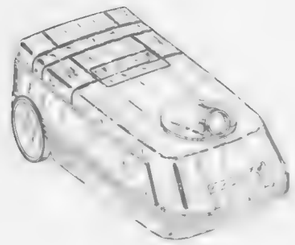


302,876
VACUUM CLEANER
Matafumi Ikeda; Chikashi Kuriya, and Mika Nakajima, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jul. 27, 1987, Ser. No. 78,241
Claims priority, application Japan, Mar. 5, 1987, 62-8436
Term of patent 14 years
U.S. Cl. D32—18

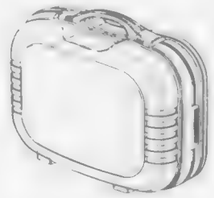


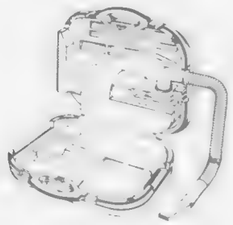
302,877
VACUUM CLEANER
Jan F. Van Asten, Leek, and Gerrit-Jan Van Surksum, Groningen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 9, 1987, Ser. No. 12,704
Claims priority, application Benelux, Aug. 14, 1986, 61299-01/02/03
Term of patent 14 years
U.S. Cl. D32—21





302,878
ELECTRIC VACUUM CLEANER
Shigetaka Kimura, Koganei; Kohichi Hasegawa, Tachikawa; Masao Sunagawa, Hitachi; Yoshitaro Ishii, Hitachi, and Fumio Jyoraku, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 3, 1987, Ser. No. 92,694
Claims priority, application Japan, Mar. 6, 1987, 62-8271
Term of patent 14 years
U.S. Cl. D32—24





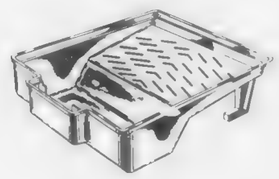
302,879
LOTTERY SCRAPER
Rosalie V. Duran, 13023 Brazil, Cerritos, Calif. 90701
Filed Mar. 13, 1986, Ser. No. 844,286
Term of patent 14 years
U.S. Cl. D32—46



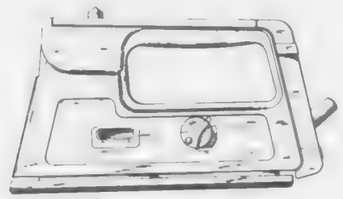
302,880
LOTTERY TICKET SCRAPER OR THE LIKE
John H. Terry, 11811 Washington Pl., #115, Los Angeles, Calif. 90066
Filed Mar. 20, 1986, Ser. No. 845,368
Term of patent 14 years
U.S. Cl. D32—46



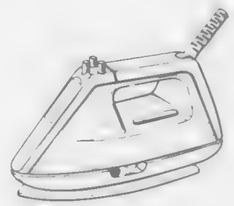
302,881
TRAY FOR PAINT ROLLER AND BRUSH
André Lussier, Rougemont, and Michel Morelli, Montreal, both of Canada, assignors to La Compagnie Resentel Ltee, Marieville, Canada
Filed Mar. 1, 1988, Ser. No. 162,585
Term of patent 14 years
U.S. Cl. D32—53.1



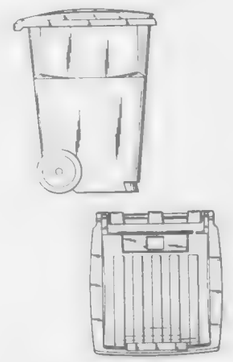
302,882
IRON
Lung W. Choi, Kowloon, Hong Kong, assignor to Goodway Electrical Company Limited, Kowloon, Hong Kong
Filed Sep. 17, 1987, Ser. No. 97,939
Claims priority, application United Kingdom, Mar. 17, 1987, 1040790
Term of patent 14 years
U.S. Cl. D32—70



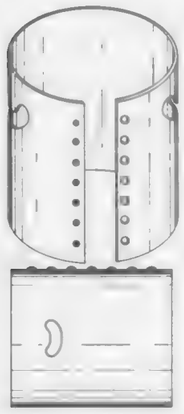
302,883
IRON
Lapo Baldacci, Florence, Italy, assignor to Bimak S.r.l., Settimello Di Calenzano Fi, Italy
Filed Nov. 12, 1987, Ser. No. 121,758
Claims priority, application Italy, May 12, 1987, 4854 B/87
Term of patent 14 years
U.S. Cl. D32—70



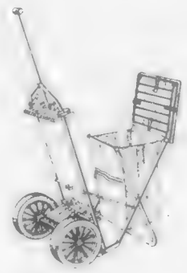
302,884
REFUSE CONTAINER
Michel Poisat, Langres, France, assignor to Compagnie Plastic Omnium, Lyons, France
Filed Nov. 13, 1986, Ser. No. 929,709
Claims priority, application World Int. Prop. O., May 16, 1986, DM/006935
Term of patent 14 years
U.S. Cl. D34—5



302,885
TRASH BAG SUPPORT
Jeffrey P. Barbee, 2744 N. Maryland St., Milwaukee, Wis. 53211
Filed Jun. 19, 1986, Ser. No. 876,341
Term of patent 14 years
U.S. Cl. D34—6



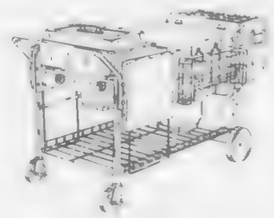
302,887
GOLF CART
Bo I. Ackerfeldt, åhusvägen 44, Båstad, Sweden (S-260 90)
Filed Aug. 31, 1987, Ser. No. 93,092
Claims priority, application Sweden, Mar. 3, 1987, 87-0485
Term of patent 14 years
U.S. Cl. D34—15



302,888
CADDY FOR GOLF CLUBS AND BEVERAGE CONTAINERS
Rubin Padilla, 1454 B. W. 160th St., Gardena, Calif. 90247
Filed Jul. 31, 1987, Ser. No. 79,915
Term of patent 14 years
U.S. Cl. D34—15



302,889
FOOD SERVICE CART
Donald R. Jung, Oconomowoc, Wis., assignor to Trico M Corp., Pewaukee, Wis.
Filed Nov. 27, 1987, Ser. No. 127,001
Term of patent 14 years
U.S. Cl. D34—20



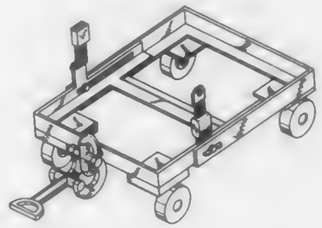
302,889
FOOD SERVING CART
Jeffrey M. Goodwin, 9 Moat End, Thorpe Bay, Essex, SS1 3QA, England
Filed May 15, 1986, Ser. No. 864,104
Claims priority, application United Kingdom, Nov. 15, 1985, 1030492
Term of patent 14 years
U.S. Cl. D34—21



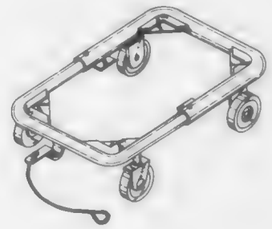
302,890
TWO-TIERED TABLE
Michael C. M. Ng, and Kheng L. Tan, both of Block 29, #01-132 Defu Lane 10, Singapore, Singapore 1953
Filed Nov. 10, 1986, Ser. No. 928,328
Term of patent 14 years
U.S. Cl. D34—21



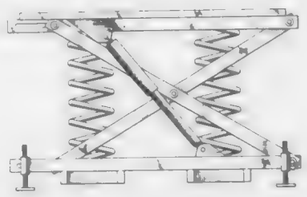
302,891
WHEELED HAND TRUCK FOR TRANSPORTING A COOLER OR THE LIKE
Howard Lardell, 2006 Oxford St., Twinsburg, Ohio 44087
Filed Apr. 18, 1986, Ser. No. 853,411
Term of patent 14 years
U.S. Cl. D34—23



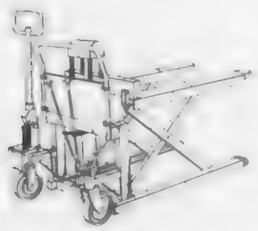
302,892
WHEELED HAND TRUCK FOR TRANSPORTING A COOLER OR THE LIKE
Sharron H. Callahan, 1589 W. 4300 South, Saltlake, Utah 84123
Filed Jan. 16, 1987, Ser. No. 3,916
Term of patent 14 years
U.S. Cl. D34—23



302,893
LOAD ELEVATING TABLE
Lindsay Wakefield, Toorak, Australia, assignor to Safetech Pty. Ltd., Moe, Australia
Filed May 20, 1986, Ser. No. 867,253
Term of patent 14 years
U.S. Cl. D34—31



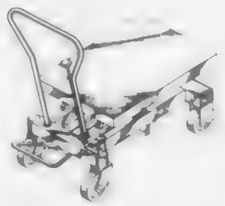
302,894
HAND-OPERATED LIFT TRUCK
Yoshisori Suzuki, Takahamachi, Japan, assignor to Sugiyasu Iron Works Inc., Japan
Filed Oct. 7, 1986, Ser. No. 916,455
Term of patent 14 years
U.S. Cl. D34—31



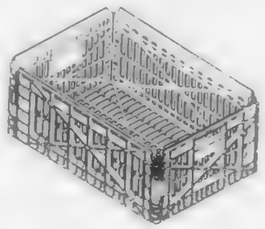
302,895
HAND-OPERATED LIFT TRUCK
Yusuke Kawana, Takahama, Japan, assignor to Sugiyasu Industries Co., Ltd., Takahama, Japan
Filed Sep. 18, 1987, Ser. No. 98,516
Term of patent 14 years
U.S. Cl. D34—31



302,896
HAND-OPERATED LIFT TRUCK
Yusuke Kawana, Takahama, Japan, assignor to Sugiyasu Industries Co., Ltd., Takahama, Japan
Filed Sep. 18, 1987, Ser. No. 98,665
Term of patent 14 years
U.S. Cl. D34—31



302,897
COLLAPSIBLE PLASTIC CONTAINER
Shlomo Shchamorov, Tel-Aviv, and Aharon Schnapp, Givatayim, both of Israel, assignors to Mercaz Haargazim Ltd., Tel Aviv, Israel
Filed Mar. 26, 1986, Ser. No. 846,976
Claims priority, application Israel, Sep. 27, 1985, 10896
Term of patent 14 years
U.S. Cl. D34—40



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF AUGUST, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

: *See*—
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A. Nattermann & Cie GmbH: *See*—
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Abbestam, Goran: *See*—
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Abbou, Clement: *See*—
Rey, Pierre; Leandri, Jacqueline; Abbou, Clement; and Sezeur, Alain, 4,857,059, Cl. 604-185.000.
Abdo, Suheil F., to Union Oil Company of California. Hydrocracking process utilizing a catalyst having a reduced zeolite content. 4,857,169, Cl. 208-59.000.
Abe, Akira; Nakajima, Junya; Takase, Haruo; Uenaka, Kazushige; and Otomo, Ruyzi, to Fuji Photo Film Co., Ltd. Method for processing silver halide-containing photosensitive material for color photography. 4,857,441, Cl. 430-393.000.
Abe, Akira: *See*—
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Abe, Kojin: *See*—
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Abe, Yoshio: *See*—
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Abou-Gharbia, Magid A., to American Home Products Corporation. Aryl sulfonopiperazines as anti-inflammatory agents. 4,857,644, Cl. 544-295.000.
Abraham, Kuzhikalail M.; and Pasquariello, David M., to EIC Labotatories, Inc. Overcharge protection of secondary, non-aqueous batteries. 4,857,423, Cl. 429-194.000.
Abraham, Thomas E.; Malfait, Jacque L.; and White, Arnold J., to General Foods Inc. Process for producing instantized parboiled rice. 4,857,348, Cl. 426-462.000.
Abreu, Rene: *See*—
Dunavan, David S.; Abreu, Rene; Messelt, Stephen; and Siebert, Edward, 4,857,721, Cl. 250-203.00R.
Abt, John: *See*—
Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; Frasier, Richard A.; Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; and Olmstead, Neil R., 4,858,011, Cl. 358-181.000.
Aburaya, Toshio: *See*—
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Aburaya, Toshio, 4,856,798, Cl. 280-6.110.
Abuyama, Yasuo; Ide, Fumito; Hamanaka, Osamu; and Sanbayashi, Takeshi, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,857,954, Cl. 355-245.000.
Acharya, Arun; Marchese, Michael A.; and Nowobilski, Jeffert J., to Union Carbide Corporation. Cryo-mechanical combination freezer. 4,856,285, Cl. 62-63.000.
Ackeret, Peter, to IDN Inventions and Development of Novelties A.G. Storage container for compact cassettes. 4,856,653, Cl. 206-387.000.
Ackmann, Martin E. Hanger carrying/holding device. 4,856,688, Cl. 224-217.000.
Acksteiner, Bernard: *See*—
Wachtel, Helmut; Schneider, Herbert H.; Loschmann, Peter-Andreas; Dorow, Rainer; Horowski, Reinhard; Acksteiner, Bernard; Schulze, Paul-Eberhard; and Sauer, Gerhard, 4,857,298, Cl. 424-1.100.
Actel Corporation: *See*—
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Adachi, Tatsuya: *See*—
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Adams, Frederick J., to TRW Cam Gears Limited. Power assisted vehicle steering mechanism. 4,856,608, Cl. 180-148.000.
Adams, Michael W. Office machine security system. 4,856,305, Cl. 70-58.000.
Adams, Steven P.; Feigen, Larry P.; and Miyano, Masateru, to Monsanto Company; and G. D. Searle & Co. Novel platelet-aggregation inhibitor peptide derivatives. 4,857,508, Cl. 514-18.000.
Adams, Timothy G.; and Sinta, Roger F., to Polaroid Corporation Patent Department. Liquid crystal mixtures having widened smectic temperature range. 4,857,227, Cl. 252-299.650.
Adkins, Gordon V.; McDonald, John R.; and Sivertsen, Olav N., to Skywardens Limited. Aircraft with paired aerofoils. 4,856,736, Cl. 244-45.00R.
Advanced Interaction, Inc.: *See*—
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AG Communication Systems Corporation: *See*—
Webber, Robert C., 4,858,109, Cl. 364-200.000.
AG fur Industrielle: *See*—
Buhler, Ernst; and Boccadoro, Marco, 4,858,140, Cl. 364-474.310.
Agabekov, Youri. Elongated lighting device. 4,858,088, Cl. 362-249.000.
Agarwal, Surendra H., to General Electric Company. Blends of elastomeric polyetherester copolymers with thermoplastic polycarbonates and thermoplastic polyalkylene terephthalates. 4,857,604, Cl. 525-439.000.
Agency of Industrial Science and Technology, The President of the: *See*—
Miyata, Hiroyuki, 4,858,110, Cl. 364-200.000.
Sako, Takeshi; Yokochi, Toshihiro; Sato, Masahito; Suzuki, Osamu; Hakuta, Toshikatsu; Sugeta, Tsutomu; and Nakazawa, Noriaki, 4,857,329, Cl. 424-195.100.
Ahlberg, David T.; Padliya, Dilipkumar; and Reed, Jeffery T., to Polysar Limited. Residue removal process. 4,857,632, Cl. 528-487.000.
Ahmed, Nazeer; and Tomlinson, Roger R., to Hughes Aircraft Company. Method for the strain-free mounting of optical components. 4,856,172, Cl. 29-434.000.
Aiba, Yoshiro; Arakawa, Kazumi; Watanabe, Takashi; and Kawai, Kazuhide, to Toshiba Ceramics Co., Ltd. Casting nozzle. 4,857,488, Cl. 501-89.000.
Aichele, William H.; Hopkins, James O., Jr.; and Krauskopf, Dale H., to EPCO Products, Inc. Braking control system for a trailer. 4,856,850, Cl. 303-20.000.
Aichi Steel Works Ltd.: *See*—
Sagae, Takashi; and Kato, Takayuki, 4,857,829, Cl. 324-61.00R.
Aichi Tokei Denki Co., Ltd: *See*—
Mochizuki, Tutomu, 4,856,345, Cl. 73-861.170.
Aiki, Shigetaka; Kobayashi, Kiyonori; and Kato, Satoshi, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Torque variation absorbing device. 4,857,032, Cl. 464-68.000.
Air Products and Chemicals, Inc.: *See*—
DiMartino, Stephen P., 4,857,083, Cl. 55-26.000.

DiMartino, Stephen P., Sr.; Hopkins, Jeffrey A.; and Davis, Ruth A., 4,857,082, Cl. 55-16.000
Mattiola, Paul A.; and Ommeren, James V., 4,856,284, Cl. 62-55.000.
Mullen, Walter T., 4,857,282, Cl. 423-207.000.

Aircap Industries Corp.: *See*—
Rush, Robert W., Jr.; and Huizenga, Michael K., 4,857,681, Cl. 200-61.850.

Aisa, Junzo; and Kosugi, Eizi, to Ishikawa Tekko Kabushiki Kaisha. Iron powder attracting magnet. 4,857,188, Cl. 210-222.000.

Aisin Seiki Kabushiki Kaisha: *See*—
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Aizawa, Michihiko: *See*—
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Aizawa, Tamio; and Takahara, Kyoji, to Hitachi, Ltd. Shape modeling system. 4,858,150, Cl. 364-522.000.

Ajisawa, Yukiyoshi: *See*—
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Ajus, Camille A.; and Ajus, Marguerite H. Method and device for constructing sleeves. 4,856,196, Cl. 33-17.00R.

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Akaba, Noriyuki: *See*—
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Akabane, Jun; Moro, Ken; and Yamamoto, Masayasu, to Nikon Corporation. Camera. 4,857,948, Cl. 354-288.000

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Akahane, Kenji: *See*—
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Akkapeddi, Murali K.; and Gervasi, Jay A., to Allied-Signal Inc. Chain extension of polyethylene terephthalate with polyacyllactams. 4,857,603, Cl. 525-437.000.

Akro Corporation: *See*—
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Albany International Corporation: *See*—
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Albeck, Michael; and Grossman, Shlomo, to Bar-Ilan University. Antioxidant compositions and methods. 4,857,325, Cl. 424-195.100.

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Alexander, James R. Grand piano actions. 4,856,402, Cl. 84-239.000.

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Alf, Reinhard; and Warzecha, Wolfgang, to Robert Bosch GmbH. Automotive antenna coaxial conversion plug-receptacle combination element. 4,857,014, Cl. 439-578.000.

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Allen, Richard B.; Bacskai, Barbara M.; Roberts, Daniel L.; and Bopp, Richard C., to General Electric Company. Low density extruded foam having high compressive strength. 4,857,390, Cl. 428-220.000.

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Amano Corporation: *See*—
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Casey, Donald J.; Rosati, Louis; Jarrett, Peter K.; and Lehmann, Leonard T., 4,857,602, Cl. 525-408.000.
Kameswaran, Vekataraman; Wright, Donald P., Jr.; and Herman, Rod A., 4,857,550, Cl. 514-522.000.
Lavanish, Jerome M.; and Van Gemert, Barry, 4,857,099, Cl. 71-92.000.
Tamura, Susan Y.; and Asato, Goro, 4,857,544, Cl. 514-450.000.
Tyle, Praveen, 4,857,506, Cl. 514-12.000.
Valentine, Donald, Jr., 4,857,655, Cl. 556-70.000.

American Home Products Corporation: *See*—
Abou-Gharbia, Magid A., 4,857,644, Cl. 544-295.000.

American Home Products Corp. (Del): *See*—
Miller, Ronald W.; and Sutton, Raymond W., 4,857,337, Cl. 424-480.000.
Mir, Ghulam N.; Borella, Luis E.; DiJoseph, John F.; and Reuter, Gerald L., 4,857,324, Cl. 424-690.000.

American Maplan Corporation: *See*—
Gearhart, Kenton, 4,856,975, Cl. 425-131.100.

American Optical Corporation: *See*—
Desy, Raoul O.; and Krusas, James J., 4,856,109, Cl. 2-9.000.

American Screen Printing Equipment Company: *See*—
Green, Melvin E.; and Motev, Efim, 4,856,428, Cl. 101-475.000.

American Standard Inc.: *See*—
Sulfstede, Louis E.; Helt, Robert W.; and Jensen, Thomas E., 4,856,286, Cl. 62-89.000

American Telephone and Telegraph Company: *See*—
Hwang, InSeok S., 4,858,168, Cl. 364-787.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: *See*—
Freeman, Lucius J.; and Gagen, Paul F., 4,856,866, Cl. 350-96.210.

Ammann, Ulrich, to Nestec S.A. Soya food product and process. 4,857,357, Cl. 426-634.000.

Amoco Corporation: *See*—
Clendinning, Robert A.; Maresca, Louis M.; Matzner, Markus; and Schwab, Thomas H., 4,857,625, Cl. 528-171.000.
Lancaster, David R.; and Everding, Richard J., 4,856,834, Cl. 294-15.000.
Smith, Michael P.; and Haines, Frank C., Jr., 4,856,351, Cl. 73-863.210.
Young, Grant A.; Lister, Roy D.; Wakley, William D.; and Andrews, Steven L., 4,857,197, Cl. 210-512.100.

Amoils, Selig P. Finger operated vacuum bypass suction handpiece/-holder apparatus for ocular cortex aspiration and refluxing. 4,857,047, Cl. 604-30.000.

Amor, Max: *See*—
Karcher, Gilles; Amor, Max; Abensour, David; and Cinqualbre, Jean, 4,856,527, Cl. 128-634.000.

AMP Incorporated: *See*—
Pickles, Charles S., 4,857,018, Cl. 439-751.000.
Yeomans, Michael A., 4,856,186, Cl. 29-863.000.

Ampex Corporation: *See*—
Hazebrouck, Henry B., 4,858,040, Cl. 360-78.050.

Amway Corporation: *See*—
Brumbaugh, Ernest; and Taylor, Roy M., Jr., 4,857,114, Cl. 134-42.000.

Analog Devices, Incorporated: *See*—
Brokaw, Adrian P., 4,857,862, Cl. 330-261.000.

Ancker, Fred H.: *See*—
Leung, Pak S.; Goddard, Errol D.; and Ancker, Fred H., 4,857,593, Cl. 525-92.000.

Andersen, Robert D., to Datatape, Inc. Voltage controlled resistor. 4,857,825, Cl. 323-353.000.

Anderson, Carl. Railing support clamp for scaffold. 4,856,616, Cl. 182-113.000.

Anderson, Cyril F. Continuous, variable power bicycle transmission device. 4,857,035, Cl. 474-69.000.

Anderson, Donald W.; and Gregory, Charles W., to British Gas Corporation. Fixing a geographical reference of a vehicle traveling through a pipeline. 4,857,851, Cl. 324-326.000.

Anderson, Frank C.; and Twedt, Dean E., to Coulter Electronics, Inc. Interlaboratory quality assurance program. 4,858,154, Cl. 364-554.000.

Anderson, James S., to Clairol, Inc. Novel hair dye and method of use. 4,857,071, Cl. 8-414.000.

Anderson, John A. Firearm. 4,856,410, Cl. 89-161.000.

Anderson, Mark S.: *See*—
Clevenger, James T., Jr.; Ashcroft, Dale A.; Strosser, Richard P.; and Anderson, Mark S., 4,856,612, Cl. 180-273.000.

Anderson, Nigel L., to Afgen (Proprietary) Limited. Distance measuring method and means. 4,856,894, Cl. 356-15.000.

Anderson, Scott, Sr., to Advanced Lighting International. Method of producing electroluminescence and electroluminescing lamp. 4,857,883, Cl. 313-509.000.

Anderson, Stanwood L., Jr.: *See*—
Bartko, John; Schoch, Karl F., Jr.; Congedo, Thomas V.; and Anderson, Stanwood L., Jr., 4,857,259, Cl. 376-154.000.

Anderson, Wayne M.: *See*—
Haag, Kenneth W.; and Anderson, Wayne M., 4,856,670, Cl. 220-2.10A.

Andersson, Alf O. Process for increasing the solids content of black liquor at its recovery in a sulfate pulping process. 4,857,146, Cl. 162-31.000.

Andersson, Lars; and Klimt, Zdenek, to Asea Aktiebolag. Induction apparatus for heating edge portion of billet. 4,857,687, Cl. 219-10.570.

Ando, Hideo, to Kabushiki Kaisha Toshiba. Flat type optical head for focusing a light beam onto an optical memory. 4,857,719, Cl. 250-201.000.

Ando, Ryo: *See*—
Fujiie, Kazuhiko; Yoshida, Tadao; and Ando, Ryo, 4,858,217, Cl. 369-59.000.

Andoh, Haruo: *See*—
Kitaoka, Susumu; Andoh, Haruo; and Hirata, Junichi, 4,857,417, Cl. 428-694.000.

Andors, Derik K.: *See*—
Ferguson, Robert W.; and Andors, Derik K., 4,856,491, Cl. 126-77.000.

Andrade, Mark S.: *See*—
Gurske, William A.; Blessum, Cynthia R.; Cheng, Min-Lee; and Andrade, Mark S., 4,857,163, Cl. 204-299.00R.

Andrew, Edward D.; and Hayhurst, Peter, to Edward W. Andrew, Ltd. Apparatus for conveying sheets. 4,856,769, Cl. 271-193.000.

Andrews, Steven L.: *See*—
Young, Grant A.; Lister, Roy D.; Wakley, William D.; and Andrews, Steven L., 4,857,197, Cl. 210-512.100.

Andros, Andrew A.; and Campana, Thomas J., to Telefind Corp. Paging receiver with paging receiver identification code digits transmitted in order of increasing significance. 4,857,915, Cl. 340-825.440.

Ang, Jit F.: *See*—
Miller, William B.; and Ang, Jit F., 4,857,352, Cl. 426-548.000.

Anner Research and Development Limited: *See*—
Kee, William C.; Brannigan, Patrick M.; and Clarke, Cornelius B., 4,857,008, Cl. 439-352.000.

Annis, David; Brown, Malcolm C.; and Sutherst, John R., to National Research Development Corporation. Urinary incontinence prostheses. 4,857,041, Cl. 600-30.000.

Anraku, Hideo; and Shoji, Yoshikata, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Vacuum blood-collection tube. 4,856,533, Cl. 128-763.000.

Anritsu Corporation: *See*—
Tanaka, Tomeo; and Oda, Toshikazu, 4,857,677, Cl. 200-5.00R.

Ansell, John W.; Chopping, Geoffrey; and Waters, Richard N., to Plessey Company plc, The. Security arrangement for a telecommunications exchange system. 4,858,223, Cl. 370-14.000.

Anthony, Vivienne M.; Clough, John M.; and Godfrey, Christopher R. A., to Imperial Chemical Industries PLC. Dibenzo-p-dioxanes useful as fungicides. 4,857,545, Cl. 514-452.000.

Anton, Christopher: *See*—
Mackley, Malcolm R.; and Anton, Christopher, 4,857,127, Cl. 156-242.000.

Antrim, Richard L.: *See*—
Maselli, John A.; Neidleman, Saul L.; Antrim, Richard L.; and Johnson, Richard A., 4,857,339, Cl. 426-28.000.

Aoki, Takashi: *See*—
Nishikawa, Masao; Aoki, Takashi; Sato, Yoichi; and Fukuda, Yukihiro, 4,856,382, Cl. 74-867.000.

Aono, Akira; and Isobe, Mitsuo, to Kabushiki Kaisha Toshiba. Output buffer control circuit of memory device. 4,858,197, Cl. 365-233.500.

Aono, Toshiaki; Shibata, Takeshi; and Takeno, Kazuma, to Fuji Photo Film Co., Ltd. Photographic element with benzoguanamine-formaldehyde polymer particles. 4,857,443, Cl. 430-496.000.

Aono, Toshiaki: *See*—
Ogiso, Takasi; Monma, Yoshiyuki; and Aono, Toshiaki, 4,857,961, Cl. 355-27.000.

Aoyama, Hiroyuki: *See*—
Onda, Kenichi; Matsuda, Yasuo; Abe, Kojin; Iwafuji, Yasunori; Aoyama, Hiroyuki; and Yoshinaka, Hideo, 4,858,096, Cl. 363-22.000.

Apfelbaum, Lawrence S.: *See*—
Gonzalez, Roberto; and Apfelbaum, Lawrence S., 4,857,833, Cl. 324-73.00R.

Apollo Computer, Inc.: *See*—
Lathrop, Olin G., 4,857,901, Cl. 340-703.000.

Appelberg, Gustaf T., to E-Lite Technologies, Inc. Apparatus and method for cutting multiple lamp outlines from electroluminescent strip. 4,856,392, Cl. 83-40.000.

Appleby, James H. Method of and apparatus for the measurement of slowly changing or static electrical polarization. 4,857,832, Cl. 324-72.000.

Aquathin Corp.: *See*—
Lipshultz, Mitchell; and Lipshultz, Alfred J., 4,856,559, Cl. 137-801.000.

Arakawa, Kazumi: *See*—
Aiba, Yoshiro; Arakawa, Kazumi; Watanabe, Takashi; and Kawai, Kazuhide, 4,857,488, Cl. 501-89.000.

Arakawa, Masayuki: *See*—
Segawa, Masao; and Arakawa, Masayuki, 4,858,064, Cl. 361-302.000.

Araki, Kazunori: *See*—
Yamaguchi, Shogo; Araki, Kazunori; Tazuke, Hisashi; Murasaki, Masayuki; and Ito, Hirofumi, 4,856,563, Cl. 141-1.000.

Araki, Masatada; Kuroyama, Yutaka; Takeuchi, Yukihisa; Takagi, Makoto; Kawamura, Yoshihito; and Imura, Toru, to Nippon Oil & Fats Co., Ltd. Amorphous metal-metal composite article and a method for producing the same. 4,857,414, Cl. 428-612.000.

Araya Industrial Co., Ltd.: *See*—
Hashimoto, Masaki; and Yamaguchi, Noboru, 4,856,800, Cl. 280-281.100.

Archive Corporation: *See*—
Mintzlaff, Roger G., 4,858,039, Cl. 360-72.200.

Arduin, Joel, to Salomon S.A. Reversible ski brake. 4,856,806, Cl. 280-605.000.

Arendt, Volker D., to American Cyanamid Company. Sustained release compositions for parenteral administration and their use. 4,857,505, Cl. 514-2.000.

Arens, Georges; Delvaux, Jacques; and Gros, Pierre, to Societe Nationale Elf Aquitaine (Production). Process and device for seismic prospecting of a medium with induced waves created artificially in a bore-hole. 4,856,614, Cl. 181-104.000.

Ariga, Yoshio: *See*—
Hiroki, Hisayuki; Ariga, Yoshio; and Watanabe, Hajime, 4,856,768, Cl. 271-186.000.

Arimoto, Kazutami: *See*—
Furutani, Kiyohiro; and Arimoto, Kazutami, 4,858,193, Cl. 365-203.000.

Armbruster, Guenter: *See*—
Von Reis, Wolf; Derner, Paul; Quenett, Rudolf; and Armbruster, Guenter, 4,857,376, Cl. 428-83.000.

Armbruster, Joseph M. Air circulation device. 4,856,968, Cl. 417-360.000.

Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., to Du Pont de Nemours, E. I., and Company. Composites of stretch broken aligned fibers of carbon and glass reinforced resin. 4,856,146, Cl. 19-0.350.

Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., to Du Pont de Nemours, E. I., and Company. Composites of stretch broken aligned fibers of carbon and glass reinforced resin. 4,856,147, Cl. 19-0.350.

Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., to Du Pont de Nemours, E. I., and Company. Composites of stretch broken aligned fibers of carbon and glass reinforced resin. 4,857,385, Cl. 428-189.000.

Armstrong, David E.: *See—*
O'Sullivan, Terence J.; Mould, George W.; Armstrong, David E.; Foulkes, Graham S.; and Davis, Michael B., 4,856,848, Cl. 297-391.000.

Armstrong, Fraser A.; and Lannon, Anthony M., to Medisense, Inc. Peroxide electrodes. 4,857,152, Cl. 204-1.00T

Arnett, Eric M.: *See—*
Kinney, Terrance R.; and Arnett, Eric M., 4,857,726, Cl. 250-226.000.

Arnett, Richard L.: *See—*
Barrett, Eugene R.; and Arnett, Richard L., 4,856,180, Cl. 29-596.000.

Arnule, Paul: *See—*
Dunand, Josiane; Arnule, Paul; and Gasquet, Denis, 4,856,807, Cl. 280-615.000.

Artos Engineering Company: *See—*
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Arus-Andritz Ruthner, Inc.: *See—*
Clements, Brice P.; Kurihara, Tatsuo; Marshall, Sammy D.; and Syrowatka, Rupert, 4,857,193, Cl. 210-396.000.

Arzenti, Thomas E.: *See—*
Metala, Michael J.; Clark, William G., Jr.; Junker, Warren R.; Burtner, Lee W.; Arzenti, Thomas E.; Johnson, Harold P.; Vestovich, Robert P.; and Bevilacqua, Bruce W., 4,856,337, Cl. 73-601.000

Arzt, Anton: *See—*
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Asada, Masaaki: *See—*
Kitano, Seiichi; Fukatani, Yasunobu; Asada, Masaaki; and Yoneda, Kazuhiko, 4,856,634, Cl. 192-70.300.

Asahi Glass Company Ltd.: *See—*
Morimoto, Takeshi; Endoh, Eiji; and Takemiya, Satoshi, 4,858,078, Cl. 361-527.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Imanishi, Taichi; and Muraoka, Shigemitsu, 4,857,255, Cl. 264-216.000.
Manabe, Sei-ichi; and Satani, Masuo, 4,857,196, Cl. 210-500.300.

Asahi Kogaku kogyo K.K.: *See—*
Shimbo, Kazuyuki; and Nishimura, Katsuhiko, 4,857,959, Cl. 355-276.000.

Asahi, Nobumitsu; and Nakazawa, Akira, to Kabushiki Kaisha Kenwood. AM digital demodulator. 4,857,859, Cl. 329-104.000.

Asaka, Toshiyuki: *See—*
Kikuchi, Hiroshi; Tanuma, Jiro; Ishimizu, Hideaki; Uchida, Takao; and Asaka, Toshiyuki, 4,857,005, Cl. 439-140.000.

Asami, Heizo: *See—*
Fujii, Katsuhiko; Sato, Shiro; Miyanaga, Yasuhiro; Asami, Heizo; Takekoshi, Susumu; and Kasai, Yasuo, 4,856,849, Cl. 301-63.00R.

Asami, Seiichi: *See—*
Wakasa, Akinori; Machida, Minoru; Miyakawa, Yasuhiro; and Asami, Seiichi, 4,856,472, Cl. 123-270.000.

Asano, Masamichi: *See—*
Tatsumi, Yuuichi; Minagawa, Hidenobu; Iwahashi, Hiroshi; Asano, Masamichi; and Imai, Mizuho, 4,858,192, Cl. 365-200.000.

Asato, Goro: *See—*
Tamura, Susan Y.; and Asato, Goro, 4,857,544, Cl. 514-450.000.

ASCII Corporation: *See—*
Ishii, Takatoshi, 4,857,899, Cl. 340-701.000.

Asea Aktiebolag: *See—*
Andersson, Lars; and Klimt, Zdenek, 4,857,687, Cl. 219-10.570.

Asfour, Richard E.: *See—*
Schmidt, Utz H.; and Asfour, Richard E., 4,856,727, Cl. 242-107.40B.

Ashcroft, Dale A.: *See—*
Clevenger, James T., Jr.; Ashcroft, Dale A.; Strosser, Richard P.; and Anderson, Mark S., 4,856,612, Cl. 180-273.000.

Ashe, Philip R.; Carey, James R.; Champagne, Patrick J.; and Rowden, David L., to Verbatim Corp. Structurally rigid disk cartridge adaptable to eliminating relative axial cartridge and/or transducer head loading/unloading movement. 4,858,050, Cl. 360-133.000.

Asinc, Inc.: *See—*
Salter, Richard J., Jr.; and Long, George S., III, 4,857,924, Cl. 340-973.000.

Aso, Toshiyuki; Kita, Yuuki; and Watanabe, Sadahiro, to Fanuc Ltd. Machining fluid supply controlling system for a wire cut electrical discharge machine. 4,857,688, Cl. 219-69.140.

Aspy, Robert O.: *See—*
Rorick, Donald E.; Hayes, Frank M.; and Aspy, Robert O., 4,856,731, Cl. 242-158.00R.

Assist Research Corp.: *See—*
Kelly, Edward C., 4,856,499, Cl. 128-79.000

Asten Group, Inc.: *See—*
Dufour, Marcel, 4,856,562, Cl. 139-383.00A.

Astronautical Science: *See—*
Horiuchi, Ryo; Saito, Satoshi; Suzuki, Koichi; and Higashino, Kazuyuki, 4,856,163, Cl. 29-157.00C

Atac, Muzaffer, to United States of America, Energy. Wire chamber. 4,857,740, Cl. 250-374.000.

Atkinson, David C.: *See—*
Sherman, Fred P.; and Atkinson, David C., 4,857,533, Cl. 514-282.000.

Atlantic Richfield Company: *See—*
Smith, Lonnie E.; and Schasteen, Thomas, 4,856,582, Cl. 166-98.000.

Au, Andrew N.; Deep, Marguerite E.; Fahey, Timothy E.; and Jacobs, Stephen M., to Raychem Corporation. Electrical devices comprising cross-linked conductive polymers. 4,857,880, Cl. 338-22.00R.

Auer, Robert T.; and Mayer, Richard J., to Buddy L Corporation. Drawing device having retractable stylus. 4,856,197, Cl. 33-18.100.

Ault, Russell L.; Legg, Wesley E.; and Mott, Richard A., to Owens-Corning Fiberglas Corporation. Assemblies for windows and doors. 4,856,243, Cl. 52-304.000.

Ausimont S.p.A.: *See—*
Moggi, Giovanni; Chiodini, Graziella; Cirillo, Gianna; and Geri, Sergio, 4,857,598, Cl. 525-194.000.

AusTek, Inc.: *See—*
Stewart, Jon K., 4,856,135, Cl. 15-105.500.

Austin, Paul E.; Farris, David D.; Reedy, James D.; Blevins, Charles; and Ramdatt, Philbert E., to Union Carbide Corporation. Process for the preparation of organopolysiloxane surfactants. 4,857,583, Cl. 524-761.000.

Automobiles Citroen: *See—*
Le Fol, Marcel, 4,856,750, Cl. 248-562.000

Automobiles Peugeot: *See—*
Le Fol, Marcel, 4,856,750, Cl. 248-562.000

Automotive Products plc: *See—*
Leigh-Monstevens, Keith V.; and Branum, Leslie P., 4,856,282, Cl. 60-589.000.
Nix, Richard A.; and Regula, Paul M., 4,856,416, Cl. 92-169.100.

Avakian, Roger W.: *See—*
van der Meer, Roelof F.; and Avakian, Roger W., 4,857,575, Cl. 524-398.000.

Averitt, Chester C.; and Byrne, Thomas R. Revolving refuse holder. 4,856,669, Cl. 220-1.00T.

Avizonis, Petras V.: *See—*
Fender, Janet S.; and Avizonis, Petras V., 4,856,884, Cl. 350-557.000.

AVL AG: *See—*
Wolfbeis, Otto S., 4,857,472, Cl. 436-122.000.

Awaji Sangyo K. K.: *See—*
Mio, Mitsushi; and Negita, Hisao, 4,857,384, Cl. 428-164.000.

Axelsson, Owe; Holmgren, Harry; and Birkenbeul, Heinz, to AB Akerlund & Rausing. Folding box. 4,856,709, Cl. 229-125.340.

Baba, Hisatoshi, to Canon Kabushiki Kaisha. Tracking control apparatus. 4,858,214, Cl. 369-32.000.

Baba, Yutaka: *See—*
Kurono, Masayasu; Baba, Yutaka; Mitani, Takahiko; Onishi, Masao; Kondo, Yasuaki; and Sawai, Kiichi, 4,857,521, Cl. 514-206.000

Babcock & Wilcox Company, The: *See—*
Daum, Edward D.; Downs, William; Jankura, Bryan J.; and McCoury, John M., Jr., 4,856,352, Cl. 73-863.250.
Doyle, Thomas E.; and Ryan, Patrick M., 4,857,694, Cl. 219-76.120.
Shebini, Nader O., 4,858,146, Cl. 364-512.000.

Babendererde, Siegmund: *See—*
Hentschel, Volker; Versteegen, Clemens; Gloyer, Jens; and Babendererde, Siegmund, 4,856,936, Cl. 405-145.000.

Bachem, Henning; Muszik, Janos; Schroer, Wolf-Dieter; and Suling, Carlhans, to Bayer Aktiengesellschaft. Nitrogen-containing water-soluble compounds. 4,857,586, Cl. 524-845.000

Bacskai, Barbara M.: *See—*
Allen, Richard B.; Bacskai, Barbara M.; Roberts, Daniel L.; and Bopp, Richard C., 4,857,390, Cl. 428-220.000.

Bacskai, Robert, to Chevron Research Company. Process for the polymerization of alpha olefins. 4,857,612, Cl. 526-125.000.

Baker Cummins Pharmaceuticals, Inc.: *See—*
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Baker, Glen; Chau, Albert W.; Fikse, James A.; and Mercer, John E., to FlowMole Corporation. Technique for providing an underground tunnel utilizing a powered boring device. 4,856,600, Cl. 175-26.000.

Baker Hughes Incorporated: *See—*
Donovan, Joseph F.; Spatz, Edward C.; Salerni, John V.; Peterson, Elmer R.; and Weirich, John B., 4,856,591, Cl. 166-278.000.

Baker, Richard W.; Louie, Jenny; Pfromm, Peter H.; and Wijmans, Johannes G., to Membrane Technology & Research, Inc. Ultrathin composite metal membranes. 4,857,080, Cl. 55-16.000.

Baker, Ross G., Jr., to Intermedics, Inc. A-V responsive rate adaptive pacemaker. 4,856,524, Cl. 128-419.0PG.

Baldwin Technology Corp.: *See—*
Gasparrini, Charles R., 4,856,427, Cl. 101-366.000.

Baliga, Bantval J.; and Pattanayak, Deva N., to General Electric Company. Monolithically integrated semiconductor device having bidirectional conducting capability and method of fabrication. 4,857,983, Cl. 357-38.000.

Ball, Lawrence E., to Standard Oil Company, The. Cationic polymeric stabilizers for oil-in-water emulsions. 4,857,621, Cl. 526-265.000.

Baloga, Mark A.; Trimborn, Edmond; and Fussler, Philippe, to Steelcase Inc. Space partition arrangement. 4,856,242, Cl. 52-239.000.

Balzano, Alfiero: *See—*
Visco, Frank; and Balzano, Alfiero, 4,856,140, Cl. 16-114.00R.

Bancroft Cap Company: *See—*
Goldman, Stephen; and Richardson, John, 4,856,117, Cl. 2-195.000.

Banjo, Toshinobu: *See—*
Mori, Ryuichiro; Fukudome, Katsuyuki; and Banjo, Toshinobu, 4,857,989, Cl. 357-80.000.

Banks, Christopher P.; Demmer, Christopher G.; and Irving, Edward, to Ciba-Geigy Corporation. Process for the formation of an image. 4,857,437, Cl. 430-327.000.

Bannister, Richard S.: *See—*
Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; Frasier, Richard A.; Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; and Olmstead, Neil R., 4,858,011, Cl. 358-181.000.

Bantien, Jurgen, to Korber AG. Apparatus for converting discrete arrays of rod-shaped articles into a mass flow. 4,856,958, Cl. 414-414.000.

Bar-Ilan University: *See—*
Albeck, Michael; and Grossman, Shlomo, 4,857,325, Cl. 424-195.100.

Bar-Joseph, Dan, to Raycon Corporation. Laser pumping cavity. 4,858,243, Cl. 372-72.000.

Baran, Mich S.; Beihoff, Bruce C.; Damiano, Michael A.; Hansen, James E.; Hastings, Jerome K.; Slomczewski, Allen J.; and Tennies, Charles J., to Eaton Corporation. Magneto resistive current sensor with improved fidelity. 4,857,837, Cl. 324-117.00R.

Barber-Colman Company: *See—*
Fields, Lary L., 4,858,169, Cl. 364-829.000.

Barber, William B.; Davis, William H.; and Rautenkranz, Karl, to Medical Payment Systems, Incorporated. Medical payment system. 4,858,121, Cl. 364-406.000.

Barclay, Glen E.: *See—*
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Bareis, Robert. In-situ portable boring-reaming system. 4,856,945, Cl. 408-72.00R.

Barger, Paul T.; Thompson, Gregory J.; Herber, Raymond R.; and Imai, Tamotsu, to UOP. Alkylation/transalkylation process. 4,857,666, Cl. 585-323.000.

Barlage, Francis M., to Allied-Signal Inc. Switched mode power supply with improved load regulation. 4,858,094, Cl. 363-21.000.

Barnett, Ronnie D.: *See—*
Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; Frasier, Richard A.; Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; and Olmstead, Neil R., 4,858,011, Cl. 358-181.000.

Barney, Charlotte L.: *See—*
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Barrett, Eugene R.; and Arnett, Richard L., to General Electric Company. Method of terminating winding leads. 4,856,180, Cl. 29-596.000.

Barrett, Joseph J.: *See—*
Kuper, Jerry W.; Langert, William E.; and Barrett, Joseph J., 4,858,242, Cl. 372-72.000.

Barrett, Lawrence R.; Robertson, Ronald C.; and Sullivan, Mark A., to Du Pont de Nemours, E. I., and Company. Evacuation pump control for a centrifuge instrument. 4,857,811, Cl. 318-3.000.

Barry, David W.: *See—*
Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Phillip A., 4,857,511, Cl. 514-50.000.

Barsky, Samuel M. Combination box and package cushioning and method. 4,856,655, Cl. 206-524.000.

Barthelmess, Ulrich. Centrifugal classifier. 4,857,178, Cl. 209-143.000.

Bartizal, Dennis C.: *See—*
Ersfeld, Dean A.; Hansen, Paul E.; Scholz, Matthew T.; Bartizal, Dennis C.; Reed, Katherine E.; Larson, Wayne K.; Sandvig, Timothy C.; and Buckanin, Richard S., 4,856,502, Cl. 128-90.000.

Bartko, John; Schoch, Karl F., Jr.; Congedo, Thomas V.; and Anderson, Stanwood L., Jr., to Westinghouse Electric Corp. Neutron dosimeter. 4,857,259, Cl. 376-154.000.

Bartlett, Thorne M.: *See—*
Gross, Laurence H.; and Bartlett, Thorne M., 4,857,600, Cl. 525-285.000.

Barwale, Usha B.; and Widholm, Jack M., to Lubrizol Genetics, Inc. Whole plant regeneration via organogenesis and somaclonal variation in glycine species. 4,857,465, Cl. 435-240.490.

BASF Akteingesellschaft: *See—*
Zolk, Ralf; Kerth, Juergen; and Hemmerich, Rainer, 4,857,613, Cl. 526-128.000.

BASF Aktiengesellschaft: *See—*
Loerzer, Thomas; and Leyrer, Reinhold J., 4,857,438, Cl. 430-332.000.
Rosebrock, Henning; Jung, Johann; Rademacher, Wilhelm; Luib, Max; Fischer, Volker; Hagen, Helmut; Kohler, Rolf-Dieter; Markert, Juergen; and Watanabe, Akihide, 4,857,103, Cl. 71-94.000.
Thyes, Marco; and Steiner, Gerd, 4,857,658, Cl. 562-495.000.

BASF Corporation: *See—*
DeBlasi, Douglas S.; and Walsh, John P., 4,857,624, Cl. 528-129.000.

BASF Corporation, Inmont Division: *See—*
Laugal, James A.; Martin, Glenn E.; St. Aubin, Donald L.; and Wold, Gerald G., 4,857,567, Cl. 523-415.000.

BASF Fibres, Inc.: *See—*
Horsey, Robert W.; Pilon, Laurent C.; Fletcher, Grant M.; and Horner, Arland W., 4,856,722, Cl. 242-18.00A.

Bashkin, James K.; and Kinlen, Patrick J., to Monsanto Company. Oxygen-stable substituted ferrocene reference electrode. 4,857,167, Cl. 204-435.000.

Baskett, Ralph E. J.: *See—*
Grocott, Geoffrey J.; and Baskett, Ralph E. J., 4,856,937, Cl. 405-154.000.

Bassino, Walter, to Uninorm Anstalt. Relay. 4,857,872, Cl. 335-80.000.

Bateman, Charles D., to Sundstrand Data Control, Inc. Ground proximity warning system for an excessive descent rate over undulating terrain. 4,857,923, Cl. 340-970.000.

Bates, Robert N., to U.S. Philips Corporation. RF circuit arrangement. 4,857,935, Cl. 342-128.000.

Baudonnel, Jacques: *See—*
Wertz, Jean-Luc; and Baudonnel, Jacques, 4,856,134, Cl. 15-104.930.

Bauer, A. William: *See—*
Gibb, Allan W. M.; Gartner, Hans R.; Bauer, A. William; and Chadwick, Dennis P., 4,856,430, Cl. 102-307.000.

Bauer, Barr E.: *See—*
Czarniecki, Michael F.; and Bauer, Barr E., 4,857,301, Cl. 424-40.000.

Bauer-Kompressoren GmbH: *See—*
Schoeffl, Manfred; and Lex, Erich, 4,856,565, Cl. 141-97.000.

Baumann, Arthur, to Mettler Instrumente AG. Method for the automatic calibration of a high-resolution electronic balance. 4,858,161, Cl. 364-571.030.

Baumberg, Iosif. Method of and device for seeing objects including jump-like movements of an output image about a stationary main optical axis. 4,856,883, Cl. 350-538.000.

Baumgartner, Hartmut: *See—*
Halbritter, Jurgen; and Baumgartner, Hartmut, 4,857,360, Cl. 427-62.000.

Baumgartner, Werner; and Fellinger, Johannes, to Siemens Aktiengesellschaft. Method for fastening electronic components to a substrate using a film. 4,856,185, Cl. 29-840.000.

Baunach, Stephen C., to Pitney Bowes Inc. Bit-map CRT display control. 4,857,910, Cl. 340-799.000

Baus, Heinz G. Shower partition. 4,856,126, Cl. 4-607.000.

Baxter, G. Douglas: *See—*
Garner, John N.; Baxter, G. Douglas; and Grant, James C., 4,857,676, Cl. 178-45.000.

Baxter International Inc.: *See—*
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Woo, Lecon; and Ling, Michael T. K., 4,856,260, Cl. 53-373.000.

Baxter Travenol Laboratories, Inc.: *See—*
Benjamin, Grant S., 4,857,043, Cl. 604-6.000.

Baychem International, Inc.: *See—*
Lakshmanan, Pallavoor R.; and Nguyen, Son T., 4,857,594, Cl. 525-98.000.

Baydar, Ahmet E., to Gillette Company, The. Triglyceride quaternary ammonium compounds, their preparation and use. 4,857,310, Cl. 424-70.000.

Bayer Aktiengesellschaft: *See—*
Bachem, Henning; Muszik, Janos; Schroer, Wolf-Dieter; and Suling, Carlhans, 4,857,586, Cl. 524-845.000.
Beckhaus, Heiko; Witt, Harro; and Klein, Peter, 4,857,281, Cl. 423-531.000.
Bottenbruch, Ludwig; Traenckner, Hans-Joachim; Hampe, Andreas; and Schumacher, Klaus, 4,856,342, Cl. 73-827.000.
Egerer, Peter; Crueger, Wulf; and Schmidt-Kastner, Gunter, 4,857,461, Cl. 435-94.000.
Eichenauer, Herbert; Buding, Hartmuth; Doring, Joachim; Casper, Rudolf; and Ott, Karl-Heinz, 4,857,591, Cl. 525-74.000.
Hegasy, Ahmed; and Ramsch, Klaus-Dieter, 4,857,312, Cl. 424-80.000.
Henning, Wolfgang; Meckel, Walter; and Fuhrmann, Peter, 4,857,565, Cl. 523-343.000.
Musch, Rudiger; Muller, Eberhard; Hohmann, Gerhard; and Schabel, Karl-Heinz, 4,857,616, Cl. 526-204.000.
Ochel, Klaus-Peter; Krupp, Joachim; Heger, Josef; and Schweitzer, Martin, 4,856,985, Cl. 431-202.000.
Schmidt, Manfred; Sommerfeld, Claus-Dieter; Prolingheuer, Christoph; and Klan, Walter, 4,857,560, Cl. 521-103.000.
von Bonin, Wulf, 4,857,364, Cl. 427-255.000.

Bayoumi, Salah E. A., to Bayoumi, Salah E. A.; and Souka, Abbas F. Endless belt-type drive mechanism. 4,856,853, Cl. 305-35.0EB.

Bazinet, Marc; and Sauron, Jean, to Gaz de France; and Societe Joseph Sauron Material Industriel. Apparatus for positioning the end of a first elongated synthetic piece with at least the end of a second elongated synthetic piece, for the coupling thereof. 4,856,168, Cl. 29-272.000.

BBC Brown Boveri AG: *See—*
Kloucek, Franz, 4,856,702, Cl. 228-123.000.

Beall, Frank C.: *See—*
Shearer, Dwayne M.; Beetham, Richard C.; Beall, Frank C.; and Rodgers, John M., 4,856,334, Cl. 73-588.000.

Bearden, James M., to A. P. Green Industries, Inc. Molten aluminum resistant ceramic fiber composition. 4,857,489, Cl. 501-95.000

Beaston, Brook J., to Great Plains Industries, Inc. Herbicide dispenser. 4,856,683, Cl. 222-318.000.

Beaty, Keith D.: *See—*
Lazzara, Richard J.; and Beaty, Keith D., 4,856,994, Cl. 433-173.000.

Beavis, Glenn C.; and Hensel, Robert J., to Brunswick Corporation. Vacuum bleed and flow restrictor fitting for fuel injected engines with vapor separator. 4,856,483, Cl. 123-516.000.

Beck, Benjamin J.: *See—*
Bressler, Peter W.; Byar, Peter D.; Beck, Benjamin J.; Fluke, G. Gordon, Jr.; Magill, Brad; Winig, Gary; and Magill, Tracy H., 4,856,811, Cl. 280-652.000.

Beck, Harold K.: *See—*
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Becker, Adam: *See*—
Nauroth, Peter; Kuhlmann, Robert; Turk, Gunter; and Becker, Adam, 4,857,289, Cl. 423-339.000.

Becker, Reinhard: *See*—
Urbach, Hansjorg; Henning, Rainer; Scholkens, Bernward; and Becker, Reinhard, 4,857,520, Cl. 514-183.000.

Becker-Ross, Helmut; Florek, Stefan; Kerstan, Felix; Moebius, Guenther; and Sanders, Horst, to Jenoptik Jena GmbH. Adjustable echelle spectrometer arrangement and method for its adjustment. 4,856,898, Cl. 356-328.000.

Beckhaus, Heiko; Witt, Harro; and Klein, Peter, to Bayer Aktiengesellschaft. Pauling boiler and process for the concentration of sulphuric acid. 4,857,281, Cl. 423-531.000.

Beckman Instruments, Inc.: *See*—
Gurske, William A.; Blessum, Cynthia R.; Cheng, Min-Lee; and Andrade, Mark S., 4,857,163, Cl. 204-299.00R.
Okawa, Dobson; Pang, Wing S.; Ngo, Dang; and Shibata, George, 4,858,155, Cl. 364-557.000.

Becton, Dickinson and Company: *See*—
Reuben, Jayakumar, 4,857,459, Cl. 435-34.000.
Vandervelden, Cornelius K., 4,856,530, Cl. 128-692.000.

Beecham Group p.l.c.: *See*—
King, Francis D., 4,857,647, Cl. 546-112.000.

Beekman, Arie W., to Stamicarbon B.V. Bumper. 4,856,833, Cl. 293-120.000.

Beetham, Richard C.: *See*—
Shearer, Dwayne M.; Beetham, Richard C.; Beall, Frank C.; and Rodgers, John M., 4,856,334, Cl. 73-588.000.

Begley, Lana H.: *See*—
Begley, Samuel E.; and Begley, Lana H., 4,856,780, Cl. 273-244.000.

Begley, Samuel E.; and Begley, Lana H., to Chipnjay, Inc. Sports trivia board game. 4,856,780, Cl. 273-244.000.

Begley, William J.; Carmody, Michael J.; and Buchanan, John M., to Eastman Kodak Company. Photographic material and process (B). 4,857,440, Cl. 430-382.000.

Behnk, Gunter; and Nuske, Dieter, to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG. Apparatus for mechanically processing fish of the Trachurus species. 4,856,145, Cl. 17-57.000.

Beihoff, Bruce C.: *See*—
Baran, Mich S.; Beihoff, Bruce C.; Damiano, Michael A.; Hansen, James E.; Hastings, Jerome K.; Slomczewski, Allen J.; and Tennies, Charles J., 4,857,837, Cl. 324-117.00R.
Hastings, Jerome K.; Beihoff, Bruce C.; and Juds, Mark A., 4,857,841, Cl. 324-208.000.

Beim, Rudolf, to Ford New Holland. Mechanism for synchronized shifting of a transmission using couplers. 4,856,375, Cl. 74-745.000.

Belaidouni, Ali; Benani, Andre; and Millet, Jean-Marie, to La Telemecanique Electrique. Device for fitting and crimping end pieces on electric conductors. 4,856,183, Cl. 29-753.000.

Belk, Thomas J., to Ethyl Corporation. Particle classifier and method. 4,857,173, Cl. 209-2.000.

Bell Communications Research, Inc.: *See*—
Silberberg, Yaron; and Smith, Peter W., 4,856,860, Cl. 350-96.120.

Bell-Northern Research, Ltd.: *See*—
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Bell of Pennsylvania: *See*—
Butterworth, Donald J., 4,858,075, Cl. 361-395.000.

Bellin, Robert W. System and method for identifying an individual utilizing grasping pressures. 4,857,916, Cl. 340-825.340.

Bellus, Daniel: *See*—
Alder, Alex; Stanek, Jaroslav; and Bellus, Daniel, 4,857,660, Cl. 562-435.000.

Belly, Robert T.; Mura, Albert J.; Esders, Theodore W.; and Burdick, Brent A., to Eastman Kodak Company. Reducible compounds and analytical compositions, elements and methods utilizing same. 4,857,271, Cl. 422-55.000.

Belmares-Sarabia, Armand; and Chayka, Stanley J., to Corporate Communications Consultants, Inc. Color correction system and method. 4,857,994, Cl. 358-22.000.

Beloin, Brian F.: *See*—
Dwyer, John J.; Jachmann, Emil F.; Harris, Mark N.; and Beloin, Brian F., 4,858,213, Cl. 369-28.000.

Beloit Corporation: *See*—
Eriksson, Arne, 4,857,180, Cl. 209-664.000.
Parker, Daniel, 4,856,895, Cl. 356-28.000.

Ben-Tovim, Nathan. Ophthalmoscope. 4,856,892, Cl. 351-218.000.

Ben-Zvi, Seymour: *See*—
Valenti, Andrew; Perez, Antonio; and Ben-Zvi, Seymour, 4,857,857, Cl. 324-555.000.

Benani, Andre: *See*—
Belaidouni, Ali; Benani, Andre; and Millet, Jean-Marie, 4,856,183, Cl. 29-753.000.

Benda, Edward K.: *See*—
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Benelli Armi S.p.A.: *See*—
Benelli, Paolo, 4,856,217, Cl. 42-17.000

Benelli, Paolo, to Benelli Armi S.p.A. Cartridge feeding assembly for smooth-bore guns with semiautomatic or pump operation. 4,856,217, Cl. 42-17.000.

Benjamin, Grant S., to Baxter Travenol Laboratories, Inc. Apparatus and methods for measuring pulsatile blood process stream pressure. 4,857,043, Cl. 604-6.000.

Benjamin, Michael H.: *See*—
Maness, William L.; Golden, Robert F.; Benjamin, Michael H.; and Podoloff, Robert M., 4,856,993, Cl. 433-68.000.

Bennett, Brian S.; and Smith, David. Alarm system. 4,857,679, Cl. 200-61.620.

Bennett, Ruth M.: *See*—
Damico, Dennis J.; Mushrush, Kenneth W.; and Bennett, Ruth M., 4,857,131, Cl. 156-331.400.

Benscoter, Richard D.; Domigan, Charles; Flachbarth, Charles T.; and Sheridan, James E., to Butler Manufacturing Company. Components for flexible wiring systems. 4,857,016, Cl. 439-680.000.

Benson S.A.: *See*—
Farlotti, Laurent A., 4,856,770, Cl. 271-274.000.

Benton, Kenneth C.; Fierman, David A.; and Fox, Joseph R., to Standard Oil Company, The. Graphite composites and process for the manufacture thereof. 4,857,395, Cl. 428-306.600.

Berenbold, Helmut: *See*—
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Berg, Greg W.: *See*—
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Berger, Michel, to Pradom Limited. Process of making a composite product, especially a vehicle tire. 4,857,244, Cl. 264-24.000.

Bergersen, Earl O. Preformed bands with lingual extensions. 4,856,992, Cl. 433-18.000.

Berkers, Jacobus A. P., to Oce-Nederland B.V. Laser module. 4,856,870, Cl. 350-252.000.

Berkovich, Shlomo. Device for rocking a baby carriage. 4,856,130, Cl. 5-109.000.

Berman, Arnold L.; Hahn, Carl J., III; and Wachs, Marvin R., to Hughes Aircraft Company. Self equalizing multi-stage radio frequency power amplifier. 4,857,865, Cl. 330-304.000.

Berman, Ellen M.; Werbel, Leslie M.; and McNamara, Dennis J., to Warner-Lambert Company. Substituted quinazolinones as anticancer agents. 4,857,530, Cl. 514-259.000.

Bernadic, Thomas; Patterson, John; and Lowe, Tony, to GTE Valenite Corporation. Polygonal cutting insert. 4,856,942, Cl. 407-114.000.

Bernat, Fred B., to Research Corporation of America, Inc. Activated silicon-containing aluminum complex and process of preparation and use. 4,857,309, Cl. 424-68.000.

Berner, John M. Position adjustable handrail for use along stairways. 4,856,761, Cl. 256-59.000.

Berney, Sheldon, to Reliance Products, Division of Larson Mardon Group Limited. Cover for plastic container. 4,856,674, Cl. 220-258.000.

Bernhardt, Randal J.; and Ferrell, William J., to Stepan Company. N-phenylphthalisoimides as ultraviolet radiation absorbers. 4,857,305, Cl. 424-59.000.

Berruti, Pierangelo, to Ing. C. Olivetti & C., S.p.A. Two-color printer. 4,856,922, Cl. 400-145.200.

Berry, Ronald F., to Pilkington plc. Method and apparatus for coating glass. 4,857,097, Cl. 65-60.520.

Bertin & Cie: *See*—
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Bertke, Heinrich: *See*—
Roese, Horst; Bertke, Heinrich; Bruggemann, Reinhard; and Hampel, Peter, 4,856,331, Cl. 73-268.000.

Berveiller, Marcel: *See*—
Eberhardt, Andre ; Dominiak, Serge; Berveiller, Marcel; Lucas, Jean P.; and Guyon, Robert P. Y., 4,857,387, Cl. 428-209.000.

Berwind Corporation: *See*—
Ley, Richard A., 4,856,580, Cl. 165-87.000.

Bessho, Kazuo; and Yamada, Sotoshi, to Kanazawa University. Multilayered-eddy-current-type strong magnetic field generator. 4,857,874, Cl. 335-296.000.

Beswick, Frank; and Winship, Robert W., to West Company, The. Stopper elevator conveyor. 4,856,640, Cl. 198-311.000.

Better Mousetraps Inc.: *See*—
Gaber, Ira; and Woodring, Cooper C., 4,856,718, Cl. 241-93.000.

Betts, Joseph E.: *See*—
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Betz Laboratories, Inc.: *See*—
Donofrio, Deborah K.; and Whitekettle, Wilson K., 4,857,557, Cl. 514-711.000.
Lyons, Larry A.; Davis, Dwight P.; and Swered, Paul, 4,857,209, Cl. 210-755.000.

Bevilacqua, Bruce W.: *See*—
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Beyeler, Harry: *See*—
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Bhargava, Vikram; and Heberling, James R., to Hayes Microcomputer Products, Inc. Molded slanted front panel bezel for electronics enclosure. 4,857,378, Cl. 428-99.000.

Bi Inc.: *See*—
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Biggadike, Keith: *See*—
Borthwick, David A.; Kirk, Barrie E.; Evans, Derek N.; Biggadike, Keith; and Stephenson, Leslie, 4,857,531, Cl. 514-262.000.

Bilicki, Donald G. Tanner's platform. 4,856,520, Cl. 128-372.000.

Billini, Francisco X. Gearing for multiple-use bicycles. 4,856,376, Cl. 74-750.00B.

Binet, Jean: *See*—
Manoury, Philippe; Rossey, Guy; Binet, Jean; DeFosse, Gerard; and Jabri, Najib, 4,857,536, Cl. 514-322.000.

Bio-Rational Technologies, Inc.: *See*—
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Biomembrane Institute, The: *See*—
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Birkenbeul, Heinz: *See*—
Axelsson, Owe; Holmgren, Harry; and Birkenbeul, Heinz, 4,856,709, Cl. 229-125.340.

Bissell Health Care Corporation: *See*—
Jansma, Donald; and Stemm, Howard W., 4,856,540, Cl. 131-339.000.

Bitller, Jean-Pierre; Faucher, Pascal; Hang-Hu, Monique; and Pelet, Andre , to Alcatel CIT. Electronic circuit housing. 4,858,068, Cl. 361-380.000.

Bitting, Ricky F., to NCR Corporation. Bandgap voltage reference including a process and temperature insensitive start-up circuit and power-down capability. 4,857,823, Cl. 323-314.000.

Bjork, Paul E.: *See*—
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Black, Cheryl: *See*—
Rosenberg, Leonard S.; Black, Cheryl; Speicher, Earl R.; and Wagenknecht, Dietmar, 4,857,552, Cl. 514-538.000.

Black & Decker Inc.: *See*—
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Wilkins, Peter R., 4,857,703, Cl. 219-271.000.

Black, Laura E.; and Wan, Wan-Kei, to Exxon Research and Engineering Company. Reverse osmosis cellulose and cellulosic membranes prepared by repeated drying and rewetting. 4,857,201, Cl. 210-655.000.

Blackmore, Diana C.: *See*—
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Blaha, Gerald, to Artos Engineering Company. Apparatus and methods for making terminated wire segments. 4,856,187, Cl. 29-867.000.

Blake, Rodger D.: *See*—
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Blakely, J. Ward, to Ward Engineering, Inc. Swivel joint for electrical conduit. 4,856,825, Cl. 285-175.000.

Blasberger, Dina: *See*—
Kashman, Yoel; Spector, Ilan; Carmely, Shmuel; and Blasberger, Dina, 4,857,538, Cl. 514-369.000.

Blecksmith, James E.: *See*—
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Blem, Allen R.: *See*—
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Blessum, Cynthia R.: *See*—
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Blevins, Charles: *See*—
Austin, Paul E.; Farris, David D.; Reedy, James D.; Blevins, Charles; and Ramdatt, Philbert E., 4,857,583, Cl. 524-761.000.

Blevins, Gene, to Galaxy Machine, Inc. Wall mounted electric air heating device for drying or warming a person. 4,857,705, Cl. 219-370.000.

Blimmel, William C.: *See*—
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Bloom, Elbert: *See*—
Hartwell, David W.; Bloom, Elbert; and Triolo, Victoria M., 4,858,234, Cl. 371-14.000.

Bloss, Karl H.; Davis, James A.; and Neuman, George A., to PPG Industries, Inc. Haze-free infrared-reflecting coated glass. 4,857,361, Cl. 427-109.000.

Blucher, William J.; Ernst, Richard J.; and Peterson, Francis C., to Illinois Tool Works, Inc. Fastening assembly for roofs of soft materials. 4,856,951, Cl. 411-178.000.

Board of Governors of Wayne State University: *See*—
Schaap, Arthur P., 4,857,652, Cl. 549-510.000.

Boatwright, David A., to Westinghouse Electric Corp. Burnable absorber rod end plug welding apparatus and method. 4,857,691, Cl. 219-60.00R.

Boaz, Premakaran T., to Ford Motor Company. Method of forming a glass sheet with a UV-base ceramic paint thereon. 4,857,096, Cl. 65-60.510.

Boccadoro, Marco: *See*—
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Bockstruck, Herman N.: *See*—
Habbe, Randall G.; and Bockstruck, Herman N., 4,856,160, Cl. 29-1.230.

Bocquet, Jean-Louis; Gouttebessis, Jacques; and Rey, Maurice, to Compagnie Generale des Etablissements Michelin-Michelin et Cie. Method for making reinforcing assemblies comprising reinforcement threads and a matrix. 4,857,128, Cl. 156-244.120.

Bodwell, James R.: *See*—
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Boehmer, Gabrielle: *See*—
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Boehringer Biochemia Robin S.p.A.: *See*—
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Boehringer Ingelheim KG: *See*—
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Boehringer Mannheim GmbH: *See*—
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Bohm, Howard A., to Lim Technology Laboratories, Inc. Liquid controlled release formulations and method of producing same via multiple emulsion process. 4,857,335, Cl. 424-455.000.

Boliden Aktiebolag: *See*—
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Boliver, Vincent J.; Roscizewski, Paul M.; Sankey, Edward L.; and DeMeyer, Roy W., to Cooper Power Systems, Inc. Electrical connector assembly and method for connecting the same. 4,857,021, Cl. 439-801.000.

Bollag, Moses, to Plastiroute S.A. Process and device for producing or renewing a horizontal marking on roads and horizontal marking produced in accordance with the process. 4,856,931, Cl. 404-75.000.

Bollen, Alex J.: *See*—
Morais Cravador, Alfredo J.; Jacobs, Paul; Bollen, Alex J.; Van Elsen, Ary; and Herzog, Albert A. M., 4,857,470, Cl. 435-320.000.

Bolt, John D., to Du Pont de Nemours, E. I., and Company. Aluminum nitride articles by carbothermal nitridation. 4,857,246, Cl. 264-29.200.

Bolton, Ivor W.; Gibbons, Richard N.; and Dixon, Gerald, to International Business Machines Corporation. Disk file employing dual filters. 4,857,087, Cl. 55-385.600.

Bolton, Joseph A.; and Harbaugh, Steven K., to Albany International Corporation. Method and apparatus for analyzing the formation of a web of material via generating a formation index. 4,857,747, Cl. 250-559.000.

Bolton, Theodore S.; and Lang, Richard D., to Carrier Corporation. Security lock for a room air conditioner. 4,856,295, Cl. 62-263.000.

Bomag-Menck GmbH: *See*—
Kuehn, Hans, 4,856,938, Cl. 405-227.000.

Bommer, Rolf. Apparatus for purifying and neutralizing residues from furnaces. 4,857,183, Cl. 210-127.000.

Bonar Carelle Limited: *See*—
Seal, Michael J., 4,857,065, Cl. 604-368.000.

Bonello, Philippe; and Noirot, Jacques, to Sarcem S.A. Winding device. 4,856,721, Cl. 242-7.140.

Bonhomme, Michel: *See*—
Nobilet, Bernard; Bonhomme, Michel; and Desplat, Philippe, 4,857,458, Cl. 435-311.000.

Bopp, Richard C.: *See*—
Allen, Richard B.; Bacskai, Barbara M.; Roberts, Daniel L.; and Bopp, Richard C., 4,857,390, Cl. 428-220.000.

Borchardt, John K., to Shell Oil Company. Selective permeability reduction of oil-free zones of subterranean formations. 4,856,588, Cl. 166-273.000.

Borchardt, John K.: *See*—
Kuhlman, Myron I.; Borchardt, John K.; and Falls, Andrew H., 4,856,589, Cl. 166-273.000.

Borel, Michel; Boronat, Jean-Francois; Meyer, Robert; and Rambaud, Philippe, to Commissariat a l'Energie Atomique. Process for the production of a display means by cathodoluminescence excited by field emission. 4,857,161, Cl. 204-192.260.

Boreland, Charles P., to General DataComm, Inc. Serial arithmetic processor. 4,858,163, Cl. 364-715.030.

Borella, Luis E.: *See*—
Mir, Ghulam N.; Borella, Luis E.; DiJoseph, John F.; and Reuter, Gerald L., 4,857,324, Cl. 424-690.000.

Borg-Warner Automotive, Inc.: *See*—
Vlamakis, Maria S., 4,856,635, Cl. 192-70.120.

Borgia, Joseph A.: *See*—
Brownell, Peter; Borgia, Joseph A.; and Gabrielson, Robert, 4,857,195, Cl. 210-443.000.

Boronat, Jean-Francois: *See*—
Borel, Michel; Boronat, Jean-Francois; Meyer, Robert; and Rambaud, Philippe, 4,857,161, Cl. 204-192.260.

Borrello, Giuseppe, to Colgate-Palmolive Company. Non-caking bleaching detergent composition containing a lower hydrate of sodium perborate. 4,857,223, Cl. 252-91.000.

Borthwick, David A.; Kirk, Barrie E.; Evans, Derek N.; Biggadike, Keith; and Stephenson, Leslie, to Glaxo Group Limited. Guanine derivatives. 4,857,531, Cl. 514-262.000.

Bosch, Gerrit; Pasma, Tjebbe R.; Sluyterman, Albertus A. S.; Doomernik, Fransiscus M. P. P.; and Wielink, Steven M., to U.S. Philips Corporation. Picture display device with stray field compensation means. 4,857,805, Cl. 315-8.000.

Bose Corporation: *See*—
Sapiejewski, Roman, 4,856,118, Cl. 2-209.000.

Bose, Tapan K.; Chahine, Richard; Marchildon, Louis; and St-Arnaud, Jean-Marie, to Universite du Quebec a Trois-Rivieres, Societe Quebecoise d'Initiatives Petrolieres and Gaz Metropolitain Inc. Method and

apparatus for measuring physical adsorption of gases based on dielectric measurements. 4,856,320, Cl. 73-30.000.

Bossert, Clayton E.: *See—*
Alsip, Allen W.; Bossert, Clayton E.; and LaVelle, Richard E., 4,856,128, Cl. 5-61.000.

Boston Digital Corporation: *See—*
Linn, Thomas D., 4,856,752, Cl. 248-678.000.

Bott, David C.; and Connors, Lucy M., to British Petroleum Company p.l.c., The. Photo polymers and uses thereof. 4,857,426, Cl. 430-18.000.

Bottenbruch, Ludwig; Traenckner, Hans-Joachim; Hampe, Andreas; and Schumacher, Klaus, to Bayer Aktiengesellschaft. Process and device for measuring the adhesion of fibres in fibre-reinforced synthetic materials. 4,856,342, Cl. 73-827.000.

Bouko, Jean: *See—*
Drabowitch, Serge; and Bouko, Jean, 4,857,936, Cl. 342-368.000.

Bousquet, Hubert; Ravet, Georges; and Rousset, Jacky, to Coatex S.A. Scale and settlement inhibiting agent for use in treating industrial and/or household water. 4,857,622, Cl. 526-317.100.

Bowden, Raymond F., to British Aerospace Public Limited Company. Missiles and launcher apparatus therefor. 4,856,409, Cl. 89-1.819

Bowland, Robert O., to Chrysler Motors Corporation. Self-contained oil source and drain package. 4,856,652, Cl. 206-223.000

Boyers, Douglas B.; and Wilkening, Steven R., to Federal-Mogul Corporation. Oil seal with antirotation ribs. 4,856,794, Cl. 277-37.000.

BP Chemicals Limited: *See—*
Durand, Daniel C.; and Morterol, Frederic R., 4,857,611, Cl 526-88.000
Marsaly, Alain; Martens, Andre; Morterol, Frederic R. M. M.; and Raufast, Charles, 4,858,144, Cl. 364-496.000

Braddon, George B. Method for die cutting plastic foam. 4,856,393, Cl. 83-50.000.

Bradley, Donald A., to Wiltron Company. Switching power supply with an injection signal frequency locking circuit. 4,858,097, Cl. 363-41.000.

Bradley, John J., to Paper Converting Machine Company. Web winding machine and method. 4,856,725, Cl. 242-66.000

Bradley, John S.; and Hill, Ernestine W., to Exxon Research and Engineering Company. Transition metal organosols stabilized by organometallic polymers. 4,857,492, Cl. 502-117.000

Bradley, Michael S., to British Petroleum Company p.l.c., The. Determination of the stability of floating structures. 4,858,137, Cl. 364-463.000.

Brahm, Jacques; Cornu, Pierre; Garnier, Pierre; Verlaeten, Jean; and Van Diest, Jacques, to SOLVAY & Cie (Societe Anonyme). Process for the production of calcium hypochlorite and product obtained by this process. 4,857,292, Cl. 423-473.000.

Brakelmann, Wolfgang, to Holstein und Kappert GmbH. Double seat valve with two valve disks. 4,856,551, Cl. 137-312.000.

Brame, William D. Tape leash. 4,856,149, Cl. 24-3.00A

Branaan, Timothy R.; Roberts, Jeffrey J.; and Schoenberger, Jack O., to General Physics Corporation. Method and apparatus for monitoring and measuring dynamic loads in thrust inducing systems. 4,856,327, Cl. 73-168.000.

Brandtser, Herbert: *See—*
Link, Christoph; and Brandtser, Herbert, 4,856,156, Cl. 29-115.000.

Brandon, Richard L.: *See—*
Schwab, Gerhart; and Brandon, Richard L., 4,857,406, Cl. 428-402.220

Brandt, Carl B.: *See—*
Radesky, Joseph A.; Brandt, Carl B.; Thomas, Gerald A.; and Aksins, William E., 4,856,225, Cl. 43-81.000.

Brandt, Nils G. L.; and Byhlin, Ake B., to Sandvik AB. Cemented carbonitride alloy with improved plastic deformation resistance. 4,857,108, Cl. 75-238.000.

Brannigan, Patrick M.: *See—*
Kee, William C.; Brannigan, Patrick M.; and Clarke, Cornelius B., 4,857,008, Cl. 439-352.000.

Branum, Leslie P.: *See—*
Leigh-Monstevens, Keith V.; and Branum, Leslie P., 4,856,282, Cl. 60-589.000.

Braswell, Frank M., to Conoco Inc. Method and apparatus for indicating the position of a core member of a variable differential transformer. 4,857,919, Cl. 340-870.360.

Braswell, Leonard D.: *See—*
Smalling, Jack W.; Braswell, Leonard D.; and Lynnworth, Lawrence C., 4,856,321, Cl. 73-40.50A

Braun, Robert R.: *See—*
Stevens, Robert C.; and Braun, Robert R., 4,857,046, Cl. 604-22.000.

Breads, Peter R.; Abbatte, Gerard P.; and Warunek, Stephen P., to Great Lakes Orthodontics, Ltd. Orthodontic finishing positioner and method of construction. 4,856,991, Cl. 433-6.000

Breen, Michael T., to Eaton Corporation. Laser distance measuring method and apparatus. 4,856,893, Cl. 356-5.000.

Brennan, John J.; Layden, George K.; and Prewo, Karl M., to United Technologies Corporation. Oxidation resistant fiber reinforced composite article. 4,857,485, Cl. 501-7.000.

Bressler, Peter W.; Byar, Peter D.; Beck, Benjamin J.; Fluke, G. Gordon, Jr.; Magill, Brad; Winig, Gary; and Magill, Tracy H., to Magwin Enterprises, Inc. Device for transporting ski equipment. 4,856,811, Cl. 280-652.000.

Breton, Eric, to General Electric CGR SA. Method for the application of gradient pulses in an imaging experiment using a nuclear magnetic resonnance machine. 4,857,845, Cl. 324-309.000

Breuninger, Robert K., to Texas Instruments Incorporated. Programmable sequence generator. 4,858,178, Cl. 364-900.000.

Bridenne Alaux, Martine; Marquet-Ellis, Hubert; Keller, Nelly; and Folcher, Gerard, deceased (by Folcher, Vereina, heiress, Vincent Folcher and Marc Folcher, heirs), to Commissariat A L'Energie Atomique. Process for the preparation of metal fluorides usable for the production of fluoride glasses. 4,857,294, Cl. 423-489.000.

Bridges, Mark E.: *See—*
Wirt, Michael L.; Sangregory, Jude; and Bridges, Mark E., 4,858,003, Cl. 358-102.000

Brigham & Women's Hospital: *See—*
Smith, Robert J.; and Wilmore, Douglas W., 4,857,555, Cl. 514-563.000.

Briner, Emil; and Wehrli, Samuel, to Maschinenfabrik Rieter AG. Device for starting or recommencing spinning of a yarn in a friction spinning apparatus. 4,856,269, Cl. 57-263.000

Brinkmeier, Friedhelm; and Eckelt, Ulrich, to Windmoller & Holscher Apparatus for selectively forming apertures or holes or venting pinholes in a continuously moving web. 4,856,396, Cl. 83-300.000.

Britax Rainsfords Pty. Ltd.: *See—*
Fimeri, Garry G. L., 4,856,885, Cl. 350-633.000.

British Aerospace Public Limited Company: *See—*
Bowden, Raymond F., 4,856,409, Cl. 89-1.819.
Martin, John C., 4,856,738, Cl. 244-122.00R

British Gas Corporation: *See—*
Anderson, Donald W.; and Gregory, Charles W., 4,857,851, Cl. 324-326.000.

British Petroleum Company p.l.c., The: *See—*
Bott, David C.; and Connors, Lucy M., 4,857,426, Cl. 430-18.000.
Bradley, Michael S., 4,858,137, Cl. 364-463.000.

British Pipeline Agency Limited and STC PLC: *See—*
Grocott, Geoffrey J.; and Baskett, Ralph E. J., 4,856,937, Cl. 405-154.000

British Telecommunications: *See—*
Frost, Peter L. J.; Freeman, Robert A.; Warren, John A.; and Keeble, Peter J., 4,856,760, Cl. 254-134.400.

British Telecommunications public limited company: *See—*
France, Paul W.; Carter, Steven F.; and Moore, Martin W., 4,856,868, Cl. 350-96.230.

Broadbent, John, to Ellis Corporation. Washing and extracting machine. 4,856,301, Cl. 68-12.00R.

Brocklehurst, Charles E., to Sew Simple Systems, Inc. Fitted sheet hemmer. 4,856,442, Cl. 112-147.000

Brocklehurst, Charles E., to Sew Simple Systems, Inc. Fitted sheet hemmer. 4,856,444, Cl. 112-262.300

Brodersen, Cole T.; and Foster, Danny S., to Sears Manufacturing Company. Mechanical seat suspension with concentric cam surfaces. 4,856,763, Cl. 267-131.000.

Brodrecht, Louisa: *See—*
Cotts, David B.; and Brodrecht, Louisa, 4,857,569, Cl. 524-104.000.

Broemer, Heinz; Huber, Werner; and Meinert, Norbert, to Ernst Leitz Wetzlar GmbH. Optical fluorophosphate glasses possessing positive anomalous partial dispersion and improved physico-chemical properties, and a process for their preparation. 4,857,487, Cl. 501-44.000.

Broger, Emil A.; Crameri, Yvo; and Heiser, Bernd, to Hoffmann-La Roche Inc. Isoquinoline derivatives. 4,857,648, Cl. 546-147.000.

Brokaw, Adrian P., to Analog Devices, Incorporated. High-gain IC amplifier. 4,857,862, Cl. 330-261.000.

Bronn, William R.; Silver, Spencer F.; and Joseph, Eugene G., to Minnesota Mining and Manufacturing Company. Method of making condensed phase polymers. 4,857,615, Cl. 526-173.000.

Bronn, William R.: *See—*
Silver, Spencer F.; Bronn, William R.; and Joseph, Eugene G., 4,857,618, Cl. 526-240.000.

Brookes, Gerald F.; and Spencer, Lynne, to Fospur Limited. Recovering coal fines. 4,857,221, Cl. 252-61.000.

Brooks, Carl A.: *See—*
McMillan, Thomas A.; Brooks, Carl A.; and Smith, Alan M., 4,858,099, Cl. 363-97.000.

Brooks, Stanley J., to Square D Company. Polyphase circuit fuse condition indicating device. 4,857,896, Cl. 340-639.000.

Brooktree Corporation: *See—*
Katzenstein, Henry S., 4,857,929, Cl. 341-148.000.

Broomfield, Paul A., to Broomfield, U.S.A., Inc. Ozone generating device. 4,857,277, Cl. 422-186.070.

Broomfield, U.S.A., Inc.: *See—*
Broomfield, Paul A., 4,857,277, Cl. 422-186.070.

Brown, Alan G.: *See—*
Passmore, Charles G.; Mowry, Robert D.; and Brown, Alan G., 4,856,862, Cl. 350-96.150.

Brown Boveri (Australia) Pty, Limited: *See—*
Morgan, David E., 4,857,879, Cl. 337-173.000.

Brown, Boveri & Cie AG: *See—*
Ziegler, Herbert; Clever, Carl W.; and Roppelt, Gunter, 4,858,153, Cl. 364-550.000

Brown, Dale G.; Siddens, Jack K.; Diehl, Robert E.; and Wright, Donald P., Jr., to American Cyanamid Company. α-(2,3-Di(C_1–C_4 alkoxy)ethylamino)-β-cyanostyrene and β-nitrostyrene compounds useful as intermediates in the preparation of insecticidal, acaricidal and nematicidal arylpyrroles and method for the preparation thereof. 4,857,651, Cl. 549-443.000

Brown, Franklin I., to Ford Motor Company. Method for forming a fluorine-doped tin oxide coating on a glass substrate. 4,857,095, Cl. 65-60.300.

Brown, Harry W.: *See—*
DiChiara, Joseph G.; Brown, Harry W.; and Valentine, Joseph M., 4,858,117, Cl 364-200.000.

Brown, Jack D. Hospital error avoidance system. 4,857,713, Cl. 235-375.000.

Brown, James H.; and Ricca, Richard N. Towable modified deep vee surfboard. 4,857,025, Cl. 441-65.000

Brown, Kenneth M.: *See—*
Wakugawa, Jason M.; Gresko, Lawrence S.; and Brown, Kenneth M., 4,856,887, Cl. 350-641.000.

Brown, Louis R., to TRW Inc. Lock mechanism for rear wheel steer apparatus. 4,856,606, Cl. 180-140.000.

Brown, Malcolm C.: *See—*
Annis, David; Brown, Malcolm C.; and Sutherst, John R., 4,857,041, Cl. 600-30.000.

Brown, Stewart C., to Mattel, Inc. Tracking servo control. 4,858,041, Cl. 360-78.090.

Brown, Vincent B.: *See—*
Jensen, William T.; Brown, Vincent B.; Edgerton, Cathy J.; and Masterson, Robert W., 4,857,002, Cl. 439-76.000.

Brownell, Peter; Borgia, Joseph A.; and Gabrielson, Robert, to Allied-Signal Inc. Liquid filter with a distorting portion for transmitting hydraulic forces. 4,857,195, Cl. 210-443.000.

Brubaker, Charles E. Route indicating signalling systems for transport vehicles. 4,857,925, Cl. 340-994.000.

Brubaker, Weldon L.; Gierut, Frederick J.; Kowalkowski, James T.; and Liburdi, Francesco, to Molex Incorporated. Terminal pin with s-shaped complaint portion. 4,857,019, Cl. 439-751.000.

Bruce, Peter, to Brupat Limited. Fluked burial devices. 4,856,451, Cl. 114-301.000.

Bruggemann, Reinhard: *See—*
Roese, Horst; Bertke, Heinrich; Bruggemann, Reinhard; and Hampel, Peter, 4,856,331, Cl. 73-268.000.

Brumbaugh, Ernest; and Taylor, Roy M., Jr., to Amway Corporation. Floor polish remover. 4,857,114, Cl. 134-42.000.

Brumberg, Charles S.: *See—*
Tolson, Sidney S.; and Brumberg, Charles S., 4,856,704, Cl. 229-2.50R.

Brunelle, Jean-Pierre; Nortier, Patrice; and Quemere, Eric, to Rhone-Poulenc Chimie. CeO catalytic desulfurization of industrial gases. 4,857,296, Cl. 423-574.00R

Brunet, Michel; and Jouillat, Claude, to Valois, Societe Anonyme. Portioning device for paste or semi-liquid products. 4,856,677, Cl. 222-94.000

Brunswick Corporation: *See—*
Beavis, Glenn C.; and Hensel, Robert J., 4,856,483, Cl. 123-516.000.

Brupat Limited: *See—*
Bruce, Peter, 4,856,451, Cl. 114-301.000.

Bryant, Kenneth G., to Conductex, Inc. Knitted fabric having improved electrical charge dissipation and absorption properties. 4,856,299, Cl. 66-202.000

Buchan, Alexander: *See—*
Skinner, Gordon R. B.; and Buchan, Alexander, 4,857,463, Cl. 435-235.000

Buchanan, John M.: *See—*
Begley, William J.; Carmody, Michael J.; and Buchanan, John M., 4,857,440, Cl. 430-382.000.

Buchler, Wilhelm: *See—*
Maier, Lorenz; Buchler, Wilhelm; Neumann, Harald; and Lonnecke, Karl H., 4,856,173, Cl. 29-445.000.

Buchner, Albrecht, to Micro Technologies International Limited. Alarm devices. 4,858,207, Cl. 368-10.000.

Buck, Donald A. Self-gauging, anti-ice damming, double sealed shingle system. 4,856,251, Cl. 52-553.000.

Buck, Robert; and Marhofer, Gerd. Heat transfer measurement device, in particular flow monitor. 4,856,329, Cl. 73-204.220.

Buckanin, Richard S.: *See—*
Ersfeld, Dean A.; Hansen, Paul E.; Scholz, Matthew T.; Bartizal, Dennis C.; Reed, Katherine E.; Larson, Wayne K.; Sandvig, Timothy C.; and Buckanin, Richard S., 4,856,502, Cl. 128-90.000.

Buckman, Jay A.: *See—*
Scaringe, Robert P.; Buckman, Jay A.; and Grzyll, Lawrence R., 4,856,294, Cl. 62-259.300.

Buddy L Corporation: *See—*
Auer, Robert T.; and Mayer, Richard J., 4,856,197, Cl. 33-18.100.

Buding, Hartmuth: *See—*
Eichenauer, Herbert; Buding, Hartmuth; Doring, Joachim; Casper, Rudolf; and Ott, Karl-Heinz, 4,857,591, Cl. 525-74.000.

Buell Industries, Inc.: *See—*
Peterson, Francis C., 4,856,954, Cl. 411-427.000.

Buhler, Ernst; and Boccadoro, Marco, to AG fur Industrielle. Numerical control system for highly dynamic processes. 4,858,140, Cl. 364-474.310.

Buitendijk: *See—*
Seevinck, Evert; De Jager, Willem; and Buitendijk, 4,857,861, Cl. 330-255.000.

Bull HN Information Systems Inc.: *See—*
DiChiara, Joseph G.; Brown, Harry W.; and Valentine, Joseph M., 4,858,117, Cl. 364-200.000.

Bullen, Peter: *See—*
Mewburn-Crook, Anthony J. S.; Bullen, Peter; and Read, Simon, 4,857,753, Cl. 290-55.000.

Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Aburaya, Toshio, to Toyota Jidosha Kabushiki Kaisha. Electronically controlled fluid suspension system. 4,856,798, Cl. 280-6.110.

Bunick, Frank J.: *See—*
Shaw, James J.; and Bunick, Frank J., 4,857,331, Cl. 424-440.000.

Buonanno, Samuel S., to Schlegel Corporation. Multi-function gasket. 4,857,668, Cl. 174-35.0GC.

Burdick, Brent A.: *See—*
Belly, Robert T.; Mura, Albert J.; Esders, Theodore W.; and Burdick, Brent A., 4,857,271, Cl. 422-55.000.

Burford, Charles E.; and Frazier, Jimmy R., to Burford Corp. Wire tying device. 4,856,258, Cl. 53-138.00A.

Burford Corp.: *See—*
Burford, Charles E.; and Frazier, Jimmy R., 4,856,258, Cl. 53-138.00A.

Burke, W. K., to Olin Corporation. Gas generator and generating method employing dual catalytic and thermal liquid propellant decomposition paths. 4,856,271, Cl. 60-39.020.

Burkett, David: *See—*
Van Benschoten, Peter; and Burkett, David, 4,856,972, Cl. 417-477.000.

Burle Technologies, Inc.: *See—*
Jones, Theodore L., 4,857,682, Cl. 200-330.000.

Burleson, Wayne P.: *See—*
Wagner, Lawrence F.; Burleson, Wayne P.; and Guadagna, John P., 4,857,882, Cl. 340-146.200.

Burley, George J.: *See—*
Still, Donald O.; Hovance, Hubert T.; and Burley, George J., 4,857,123, Cl. 156-133.000.

Burnett, Lauren W., to Energy Conservation Innovations, Inc. Dual-fuel injector. 4,856,713, Cl. 239-113.000.

Burnham, Robert D., to Xerox Corporation. $(IV)_X(III\text{–}V)_{1-X}$ alloys formed in situ in III–V heterostructures. 4,857,971, Cl. 357-4.000.

Burns, Nancy H.: *See—*
Burns, Walter T.; and Burns, Nancy H., 4,856,132, Cl. 7-118.000.

Burns, Norman M., Jr., to Union Carbide Corporation. Cable conductor shield. 4,857,232, Cl. 252-511.000.

Burns, Peter. Portable barbecue apparatus. 4,856,423, Cl. 99-421.00H.

Burns, Walter T.; and Burns, Nancy H. Utility golf tool. 4,856,132, Cl. 7-118.000.

Buron, Douglas J.; Steinman, Sheldon; and Wray, Donald L., to Racal Data Communications Inc. Modular expandable housing arrangement for electronic apparatus. 4,858,070, Cl. 361-384.000.

Burrell, Donald C.: *See—*
Dennis, Nicholas; and Burrell, Donald C., 4,857,102, Cl. 71-94.000.

Burroughs Wellcome Co.: *See—*
Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Phillip A., 4,857,511, Cl. 514-50.000.

Burrows, Ronald W.; Penfound, Keith A.; and Lea, Bernard A., to Minnesota Mining and Manufacturing Company. Silver halide photographic materials. 4,857,450, Cl. 430-603.000.

Burstedt, Jan E., to Boliden Aktiebolag. Gyratory crusher control. 4,856,716, Cl. 241-30.000.

Burtner, Lee W.: *See—*
Metala, Michael J.; Clark, William G., Jr.; Junker, Warren R.; Burtner, Lee W.; Arzenti, Thomas E.; Johnson, Harold P.; Vestovich, Robert P.; and Bevilacqua, Bruce W., 4,856,337, Cl. 73-601.000.

Bushey, Thomas P.: *See—*
McLaughlin, Kevin L.; and Bushey, Thomas P., 4,857,479, Cl. 437-162.000.

Bushnell, Raymond N., to ITW, Ltd. Re-usable plastic drive rivets. 4,856,950, Cl. 411-41.000.

Buswell, Richard F.: *See—*
Maricle, Donald L.; and Buswell, Richard F., 4,857,420, Cl. 429-30.000.

Buter, Roelof, to Akzo nv. Dispersion of addition (co)polymers in an organic liquid. 4,857,574, Cl. 524-396.000.

Buter, Roelof, to Akzo N.V. Dispersion stabilizer and polymeric aqueous dispersion prepared therefrom. 4,857,577, Cl. 524-458.000.

Butler Manufacturing Company: *See—*
Benscoter, Richard D.; Domigan, Charles; Flachbarth, Charles T.; and Sheridan, James E., 4,857,016, Cl. 439-680.000.

Butler, Wilbur T. Tiltable bed frame assembly. 4,856,129, Cl. 5-62.000.

Butters, Alan; Blackmore, Diana C.; and Page, Darrin J., to Imperial Chemical Industries PLC. Inkable sheet. 4,857,386, Cl. 428-206.000.

Butters, Alan; and Page, Graham A., to Imperial Chemical Industries PLC. Coating composition. 4,857,568, Cl. 523-456.000.

Butterworth, Donald J., to Bell of Pennsylvania. RF shielded and electrically insulated circuit board structure and method of making same. 4,858,075, Cl. 361-395.000.

Byar, Peter D.: *See—*
Bressler, Peter W.; Byar, Peter D.; Beck, Benjamin J.; Fluke, G. Gordon, Jr.; Magill, Brad; Winig, Gary; and Magill, Tracy H., 4,856,811, Cl. 280-652.000.

Byhlin, Ake B.: *See—*
Brandt, Nils G. L.; and Byhlin, Ake B., 4,857,108, Cl. 75-238.000.

BYK-Chemie GmbH: *See—*
Haubennestel, Karl-Heinz; Heilmann, Holger; and Diez, Andreas, 4,857,111, Cl. 106-504.000.

Byrne, Thomas R.: *See—*
Averitt, Chester C.; and Byrne, Thomas R., 4,856,669, Cl. 220-1.00T.

C. Voigt Sohne GmbH & Co.: *See—*
Klein, Rudolf, 4,857,368, Cl. 427-393.000.

Cadillac Gage Textron Inc.: *See—*
Tew, Sydney K., 4,857,824, Cl. 323-347.000.

Cafaro, Michael, to Giovanni Management Canada Ltd. Battery powered electrical curling iron with detachable wand and self-contained battery charger. 4,857,702, Cl. 219-225.000.

Caffrey, Stephen F.: *See—*
Ingermann, Donald E.; Caffrey, Stephen F.; DeVoe, Alan R.; Smith, Ronald L.; and Sullivan, Ronald G., 4,856,138, Cl. 15-320.000.

Cahill, Joseph J.; Johnson, Charles L.; Lewis, Steven D.; Mullins, Timothy J.; and Petz, Bruce R., to International Business Machines Corporation. Noise control in an integrated circuit chip. 4,857,765, Cl. 307-443.000.

Cahill, Michael J.; Simcoe, Michael D.; Stanton, John D.; and Warner, Brian H., to Molins PLC. Cigarette manufacture. 4,856,536, Cl. 131-28.000.

Caillier, Mike. Process for washing through filter media in a production zone with a pre-packed screen and coil tubing. 4,856,590, Cl. 166-278.000.

California Institute of Technology: *See—*
Laue, Eric G.; and Stephens, James B., 4,858,063, Cl. 361-286.000.
Overhauser, Albert W.; and Maserjian, Joseph, 4,857,976, Cl. 357-23.100.

Callsen, Hans; and Muuss, Peter, to Nordischer Maschinenbau Rud. Baader GmbH+CO KG. Apparatus for skinning poultry carcasses. 4,856,143, Cl. 17-11.000.

Camillo, Jack J. Game of skill and method of playing same. 4,856,790, Cl. 273-317.000.

Camp, Claude E.: *See—*
Hassel, Michael J.; Felix, Ian C.; and Camp, Claude E., 4,858,034, Cl. 360-51.000.

Campagnolo S.P.A.: *See—*
Romano, Antonio, 4,856,365, Cl. 74-594.600.
Romano, Antonio, 4,857,036, Cl. 474-80.000.

Campana, Thomas J.: *See—*
Andros, Andrew A.; and Campana, Thomas J., 4,857,915, Cl 340-825.440.

Campbell, Bruce D.; and Zucker, Joseph, to Raychem Corporation. Optical fiber distribution network including non-destructive taps and method of using same. 4,856,864, Cl. 350-96.160

Campbell, Henry F.: *See—*
Youssefyeh, Raymond; Klein, Scott I.; Campbell, Henry F.; and Kuhla, Donald E., 4,857,517, Cl. 514-161.000.

Campbell, Jonathan. Automatically expanding protective cover. 4,856,436, Cl. 109-1.00R.

Campbell, Sanford F. Pool sweep bag. 4,856,913, Cl. 383-42.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Gibb, Allan W. M.; Gartner, Hans R.; Bauer, A. William; and Chadwick, Dennis P., 4,856,430, Cl. 102-307.000.

Canadian Patents and Development Limited/Societe Canadienne Des Brevets et D'Exploitation Limitee: *See—*
Chiba, Mikio, 4,857,541, Cl. 514-388.000.

Candle, Richard D.; and Schisler, Robert C., to Goodyear Tire & Rubber Company, The. Method of manufacturing a fluid actuator for brakes and clutches. 4,857,253, Cl. 264-130.000.

Cannan, William D. Release-jointed golf club. 4,856,782, Cl. 273-[illegible].

Cannon, Thomas G.; Roemmich, Bruce D.; and Precht, Terry A., to Colorado Memory Systems, Inc. Fine head positioning system for a tape backup drive. 4,858,047, Cl. 360-106.000.

Canon Kabushiki Kaisha: *See—*
Baba, Hisatoshi, 4,858,214, Cl. 369-32.000.
Fukami, Kiyoshi; Sekiguchi, Takeshi; and Ohshima, Shigeru, 4,857,997, Cl. 358-55.000.
Fukushima, Nobuo; Okino, Tadashi; and Sakai, Shinji, 4,857,952, Cl. 354-452.000.
Fukuta, Yoshihiro, 4,858,031, Cl. 358-342.000.
Hatanaka, Katsunori; Saika, Toshihiro; Ishii, Takayuki; and Yamada, Katsuhiko, 4,857,751, Cl. 250-578.000.
Hayakawa, Naoji; Takenouchi, Masanori; Nakamura, Kenji; Kan, Fumitaka; Kozato, Yasuo; and Hakamada, Isao, 4,858,062, Cl. 361-225.000
Hirano, Yoshiaki; and Hieda, Teruo, 4,857,996, Cl. 358-48.000.
Homma, Hideo, 4,858,020, Cl. 358-287.000
Hosaka, Masao; Shimada, Kazutoshi; and Sakamaki, Hisashi, 4,857,960, Cl. 355-208.000.
Itoh, Yuji; and Takahashi, Junichi, 4,856,890, Cl. 351-206.000.
Kato, Yuzo; and Kawai, Yasuo, 4,857,742, Cl. 250-491.100.
Kugioka, Michihiro, 4,857,817, Cl. 318-696.000.
Maeda, Masaya, 4,858,046, Cl. 360-106.000.
Miyawaki, Mamoru; Ogura, Shigetaro; and Matsumoto, Kazuya, 4,856,861, Cl. 350-96.140.
Okino, Tadashi, 4,858,028, Cl. 368-335.000.
Okuno, Takuo, 4,857,793, Cl. 310-328.000
Rachi, Masahiro, 4,857,900, Cl. 340-703.000.
Sakata, Hajime; Watanabe, Yasuyuki; Yamanobe, Masato; Ohkubo, Yukitoshi; and Nagano, Akihiro, 4,856,869, Cl. 350-162.180.
Shiraishi, Akihiko, 4,856,881, Cl. 350-463.000
Takei, Masahiro; Masui, Toshiyuki; Kashida, Motokazu; and Takahashi, Kouji, 4,858,037, Cl. 360-60.000.
Tanikawa, Hirohide; Nakahara, Toshiaki; and Nozawa, Keita, 4,857,432, Cl. 430-106.000.
Ueda, Hiroyuki, 4,858,148, Cl. 364-518.000
Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, 4,857,943, Cl. 346-136.000

Canon Seki Kabushiki Kaisha: *See—*
Kugioka, Michihiro, 4,857,817, Cl. 318-696.000.

Carabateas, Philip M.: *See—*
Diana, Guy D.; and Carabateas, Philip M., 4,857,539, Cl. 514-378.000.

Carcia, Peter F.; and Kalk, Franklin D., to Du Pont de Nemours, E. I., and Company. Optical recording element. 4,857,373, Cl. 428-64.000.

Cardimona, David A., to United States of America, Air Force. Stimulated Raman scattering enhancer. 4,858,238, Cl. 372-3.000.

Cardiometrics, Inc.: *See—*
Segal, Jerome, 4,856,529, Cl. 128-661.080.

Carey, James R.: *See—*
Ashe, Philip R.; Carey, James R.; Champagne, Patrick J.; and Rowden, David L., 4,858,050, Cl. 360-133.000.

Cargnel, Louis A., to Westinghouse Electric Corp. Lubricating composition. 4,857,219, Cl. 252-52.00R.

Carlson, Joseph W., to University of California, The Regents of the. Rapid MRI using multiple receivers producing multiply phase-encoded data derived from a single NMR response. 4,857,846, Cl. 324-309.000

Carlson, Richard A. Chess games. 4,856,789, Cl. 273-261.000.

Carmely, Shmuel: *See—*
Kashman, Yoel; Spector, Ilan; Carmely, Shmuel; and Blasberger, Dina, 4,857,538, Cl. 514-369.000.

Carmody, Michael J.: *See—*
Begley, William J.; Carmody, Michael J.; and Buchanan, John M., 4,857,440, Cl. 430-382.000.

Carner, Gary A.: *See—*
Lounsberry, Stephen M., III; Lounsberry, Peter C.; Rodems, James D.; and Carner, Gary A., 4,856,617, Cl. 184-3.100.

Carr, Timothy H.; and Felton, Donald W., to Lawless Container Corporation. Automatically-operating bottom structure. 4,856,705, Cl. 229-109.000.

Carrier Corporation: *See—*
Bolton, Theodore S.; and Lang, Richard D., 4,856,295, Cl. 62-263.000.

Carroll, Gary T., to Bi Inc. Single chip transponder device. 4,857,893, Cl. 340-572.000

Carson, Kenneth M.: *See—*
Naimark, Michael; and Carson, Kenneth M., 4,857,902, Cl. 340-709.000

Carter, Frederic D. Bicycle stand assembly and storage structure. 4,856,803, Cl. 280-293.000.

Carter, Steven F.: *See—*
France, Paul W.; Carter, Steven F.; and Moore, Martin W., 4,856,868, Cl. 350-96.230.

Casanova, Philippe; and Lateulere, Jean-Louis, to Compagnie Generale des Etablissements Michelin-Michelin et cie. Tire with radial carcass reinforcement provided with a protective rib on at least one side wall. 4,856,572, Cl. 152-454.000.

Cascade Microtech, Inc.: *See—*
Strid, Eric W.; and Jones, Keith E., 4,858,160, Cl. 364-571.010.

Caseley, Clifford D.: *See—*
Sunstein, Drew E.; and Caseley, Clifford D., 4,856,906, Cl. 356-435.000

Casey, Donald J.; Rosati, Louis; Jarrett, Peter K.; and Lehmann, Leonard T., to American Cyanamid Company. Bioabsorbable surgical suture coating. 4,857,602, Cl. 525-408.000.

Casio Computer Co., Ltd.: *See—*
Yamada, Wataru; Fujio, Satoshi; and Nakamura, Kenichi, 4,858,210, Cl. 368-238.000.

Casparian, Robert E., to Hanover Research Corporation. Apparatus for improved top feed distribution for falling film evaporator. 4,857,144, Cl. 159-13.200

Casper, Rudolf: *See—*
Eichenauer, Herbert; Buding, Hartmuth; Doring, Joachim; Casper, Rudolf; and Ott, Karl-Heinz, 4,857,591, Cl. 525-74.000

Castillo, Edward L.; Castillo, James D.; and Castillo, Michael S., to Innovation Sports, Inc. Knee brace having adjustable width frame pivoted to cuffs. 4,856,501, Cl. 128-80.00C.

Castillo, James D.: *See—*
Castillo, Edward L.; Castillo, James D.; and Castillo, Michael S., 4,856,501, Cl. 128-80.00C.

Castillo, Michael S.: *See—*
Castillo, Edward L.; Castillo, James D.; and Castillo, Michael S., 4,856,501, Cl. 128-80.00C.

Caswell, Debra S.; and , to Procter & Gamble Company, The. Liquid detergent containing conditioning agent and high levels of alkyl sulfate/alkyl ethoxylated sulfate. 4,857,213, Cl. 252-8.750.

Caterpillar Inc.: *See—*
Sartain, Stephen C.; and Chamberlain, Richard W., 4,856,622, Cl. 188-170.000.

Cawlfield, David W., to Olin Corporation. Sodium hydrosulfite electrolytic cell process control system. 4,857,158, Cl. 204-92.000.

CBI Research Corporation: *See—*
Marvin, Jack C.; and Shepherd, Benjamin G., 4,856,662, Cl. 212-176.000.

Ceca, S. A.: *See—*
Vandermeersch, Jean; and Durand, Guy, 4,857,584, Cl. 524-791.000.

Celaya, Emparanza y Galdos, S.A. (Cegasa): *See—*
Umerez, Ignacio Z., 4,857,885, Cl. 340-321.000.

Celine, David H., to Control Logic (Proprietary) Limited. Method and apparatus for detecting presence of objects. 4,857,828, Cl. 324-61.00R.

Centaur Sciences, Inc.: *See—*
Williams, David R., 4,856,339, Cl. 73-714.000.

Centre National de la Recherche Scientifique: *See—*
Rey, Pierre; Leandri, Jacqueline; Abbou, Clement; and Sezeur, Alain, 4,857,059, Cl. 604-185.000.

Century International Corporation: *See—*
Ingermann, Donald E.; Caffrey, Stephen F.; DeVoe, Alan R.; Smith, Ronald L.; and Sullivan, Ronald G., 4,856,138, Cl. 15-320.000.

Cernich, Thomas: *See—*
Shouldice, David R.; Treu, Dennis M.; Powell, Daniel A.; and Cernich, Thomas, 4,857,181, Cl. 210-87.000.

Cerny, Peter W.: *See—*
Patzschke, Hans-Peter; Cerny, Peter W.; Goebel, Armin; and Stransky, Karlheinz, 4,857,580, Cl. 524-507.000.

Cestind - Centro Studi Industriali - S.R.L.: *See—*
Romagnoli, Andrea, 4,856,257, Cl. 53-134.000.

CFM Technologies, Inc.: *See—*
McConnell, Christopher F., 4,856,544, Cl. 134-95.000.

Chadwick, Dennis P.: *See—*
Gibb, Allan W. M.; Gartner, Hans R.; Bauer, A. William; and Chadwick, Dennis P., 4,856,430, Cl. 102-307.000.

Chagnot, Bruce J., to Stirling Technology, Inc. Apparatus and method for the speed or power control of stirling type machines. 4,856,280, Cl. 60-522.000.

Chahine, Richard: *See—*
Bose, Tapan K.; Chahine, Richard; Marchildon, Louis; and St-Arnaud, Jean-Marie, 4,856,320, Cl. 73-30.000.

Chall, Louis E., Jr., to Ford Aerospace & Communications Corporation. Interconnection system for integrated circuit chips. 4,858,072, Cl. 361-388.000.

Chamberlain, Richard W.: *See—*
Sartain, Stephen C.; and Chamberlain, Richard W., 4,856,622, Cl. 188-170.000.

Champagne, Patrick J.: *See—*
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Chandran, Rama S.: *See—*
Ford, Warren T.; Chandran, Rama S.; Hassanein, Mahmoud; and Turk, Hayrettin, 4,857,493, Cl. 502-159.000.

Chang, Chi-Huang M.: *See—*
Linyeav, Eugene J.; and Chang, Chi-Huang M., 4,857,006, Cl 439-271.000

Chang, Chin-Fong: *See—*
Das, Santosh K.; and Chang, Chin-Fong, 4,857,109, Cl. 75-249.000.

Chang, Chiu C.: *See—*
Khanna, Pyare L.; Chang, Chiu C.; and Ullman, Edwin F., 4,857,455, Cl. 435-7.000.

Chao, Hsun-Wei. Retractable tool-free window frame. 4,856,255, Cl. 52-769.000.

Chapin, Thomas B.: *See—*
Merrill, Marcellus S.; and Chapin, Thomas B., 4,856,199, Cl. 33-203.170.

Chateau, Michel M. Door blocking device. 4,856,830, Cl. 292-254.000.

Chau, Albert W.: *See—*
Baker, Glen; Chau, Albert W.; Fikse, James A.; and Mercer, John E., 4,856,600, Cl. 175-26.000.

Chaut, Yaron. Transfigurating timepieces. 4,858,209, Cl. 368-223.000.

Chayka, Stanley J.: *See—*
Belmares-Sarabia, Armand; and Chayka, Stanley J., 4,857,994, Cl. 358-22.000.

Chemcast Corporation: *See—*
DeLano, Don L.; and Benda, Edward K., 4,856,795, Cl. 277-212.0FB.

Chemische Fabrik Stockhausen GmbH: *See—*
Chmelir, Miroslav; and Pauen, Josef, 4,857,610, Cl. 526-88.000.

Chen, Ching-Hwa: *See—*
Chen, Jiann-Jong; and Chen, Ching-Hwa, 4,856,114, Cl. 2-149.000.

Chen, Jamin: *See—*
Suciu, George D.; Khonsari, Ali M.; and Chen, Jamin, 4,857,151, Cl. 203-82.000.

Chen, Jiann-Jong; and Chen, Ching-Hwa. Seaman style preset necktie. 4,856,114, Cl. 2-149.000.

Chen, Mu H. Electronic boiling point musical alarm. 4,857,897, Cl. 340-692.000.

Chen, Shu P.; Engelmann, Theodore R.; and Oltmann, Harold D., to Allied-Signal Inc. Rotationally molding crosslinkable polyethylene composition. 4,857,257, Cl. 264-310.000.

Cheng, Min-Lee: *See—*
Gurske, William A.; Blessum, Cynthia R.; Cheng, Min-Lee; and Andrade, Mark S., 4,857,163, Cl. 204-299.00R.

Cherne, Lawrence W.: *See—*
Larson, Nils E.; Leturno, David B.; and Cherne, Lawrence W., 4,857,692, Cl. 219-74.000.

Chevron Research Company: *See—*
Bacskai, Robert, 4,857,612, Cl. 526-125.000.
Lopez, Jaime; and Pasek, Eugene A., 4,857,496, Cl. 502-220.000.

Chew, Weng C.: *See—*
Kleinberg, Robert L.; Clark, Brian; Chew, Weng C.; and Mariani, David, 4,857,852, Cl. 324-339.000.

Chia, Han-Lie; Popescu, Horia; and Boehmer, Gabrielle, to Solco Basel AG. Stable radiodiagnostic product. 4,857,299, Cl. 424-1.100.

Chiba, Mikio, to Canadian Patents and Development Limited/Societe Canadienne Des Brevets et D'Exploitation Limitee. Substituted benzimidazole fungicide. 4,857,541, Cl. 514-388.000.

Chilton, George A. A.: *See—*
Hart, Peter B.; Chilton, George A. A.; and Kirk, Richard A., 4,857,944, Cl. 346-154.000.

Ching-Liang, Liu. Coil spring exerciser. 4,856,776, Cl. 272-142.000.

Chino, Yasuaki, to Hitachi, Ltd. Automatic focusing device using a light sensor of center-split type. 4,857,717, Cl. 250-201.000.

Chiodini, Graziella: *See—*
Moggi, Giovanni; Chiodini, Graziella; Cirillo, Gianna; and Geri, Sergio, 4,857,598, Cl. 525-194.000.

Chipnjay, Inc.: *See—*
Begley, Samuel E.; and Begley, Lana H., 4,856,780, Cl. 273-244.000.

Chippendale, Arthur J. Apparatus for pacing, queing and equipment control in audiovisual work. 4,858,033, Cl. 360-14.200.

Chisso Corporation: *See—*
Daimon, Takashi; Sakamoto, Hideshi; and Adachi, Tatsuya, 4,857,377, Cl. 428-90.000.

Chiu, Edison H.: *See—*
Pang, Roland H.; and Chiu, Edison H., 4,858,182, Cl. 365-156.000.

Chmelir, Miroslav; and Pauen, Josef, to Chemische Fabrik Stockhausen GmbH. Process for the continuous production of polymers and copolymers of water-soluble monomers. 4,857,610, Cl. 526-88.000.

Choo, Tat Y., to TMC Corp. Method for treating, spent dryfilm stripping and developing solutions. 4,857,206, Cl. 210-709.000.

Chopping, Geoffrey: *See—*
Ansell, John W.; Chopping, Geoffrey; and Waters, Richard N., 4,858,223, Cl. 370-14.000.

Chou, Jason L.; and McCollum, Gregory J., to PPG Industries, Inc. Fluorine containing polymer having a terminal ester group. 4,857,619, Cl. 526-249.000.

Chou, Jason L.: *See—*
McCollum, Gregory J.; Chou, Jason L.; Bodwell, James R.; and Das, Suryya K., 4,857,620, Cl. 526-255.000.

Christensen, Michael L., to Hewlett-Packard Company. Fixture latching mechanism. 4,857,009, Cl. 439-372.000.

Chrysler Motors Corporation: *See—*
Bowland, Robert O., 4,856,652, Cl. 206-223.000.

Chuan Erh Industrial Co., Ltd.: *See—*
Tserng, Ray L., 4,856,229, Cl. 49-56.000.

Chui, Granger K.: *See—*
Ting, Loi-Lou; Chui, Granger K.; and King, Edward T., 4,856,466, Cl. 123-90.330.

Churkin, Vladimir G.; Negrutsky, Sergei B.; Klimov, Sergei B.; and Negrutsky, Boris F., to Upravlenie po Montazhu, Demontazhu i Remontu Gornoshakhtnogo Oborudovania "Spetsshakhtomontazh" Karagandinskogo Proizvodstvennogo Obiedinenie po Dobyche Uglya "Karagandaugol" . Viscoelastoplastic-sealant packed flexible power transmission cable for hydraulic actuator. 4,856,414, Cl. 92-83.000.

Chursinoff, Fred. Reflex massager and method. 4,856,496, Cl. 128-52.000.

Ciba-Geigy Corporation: *See—*
Alder, Alex; Stanek, Jaroslav; and Bellus, Daniel, 4,857,660, Cl. 562-435.000.
Banks, Christopher P.; Demmer, Christopher G.; and Irving, Edward, 4,857,437, Cl. 430-327.000.
Cotting, Jacques-Alain; and Renner, Alfred, 4,857,607, Cl. 525-471.000.
Frei, Bruno; O'Sullivan, Anthony C.; and Gehret, Jean-Claude, 4,857,509, Cl. 514-30.000.
Jaffe, Edward E., 4,857,646, Cl. 546-49.000.
Kaschig, Jurgen; and Finter, Jurgen, 4,857,614, Cl. 526-172.000.
Khanna, Satish C.; and Ruttimann, Theresa, 4,857,336, Cl. 424-473.000.
Meier, Hans-Rudolf; and Knobloch, Gerrit, 4,857,572, Cl. 524-289.000.
Meyer, Willy, 4,857,100, Cl. 71-93.000.
Riediker, Martin; Steiner, Eginhard; Beyeler, Harry; Rembold, Manfred; and Sitek, Franciszek, 4,857,654, Cl. 556-53.000.

Cieslik, Jerzy; Flak, Marek; Kuczka, Eugeniusz; Oles, Franciszek; Marszycki, Zdsizlaw; and Olender, Kornel, to Gwarectwo Mechanizacji Gornictwa "Polmag" Przedsiebiorstwo Panstwowe Fabryka Zmechanizowanych Obudow Scianowych Fazos. Lemniscate mining supports. 4,856,940, Cl. 405-296.000.

Ciga-Geigy Corporation: *See—*
Su, Kai C.; and Molock, Frank F., 4,857,606, Cl. 525-455.000.

Cimulec, S.A.: *See—*
Eberhardt, Andre ; Dominiak, Serge; Berveiller, Marcel; Lucas, Jean P.; and Guyon, Robert P. Y., 4,857,387, Cl. 428-209.000.

Cinqualbre, Jean: *See—*
Karcher, Gilles; Amor, Max; Abensour, David; and Cinqualbre, Jean, 4,856,527, Cl. 128-634.000.

Cipriano, Joseph J.: *See—*
Parliment, Thomas H.; Cipriano, Joseph J.; and Scarpellino, Richard, 4,857,340, Cl. 426-96.000.

Circuits and Systems, Inc.: *See—*
Sunstein, Drew E.; and Caseley, Clifford D., 4,856,906, Cl. 356-435.000.

Cirillo, Gianna: *See—*
Moggi, Giovanni; Chiodini, Graziella; Cirillo, Gianna; and Geri, Sergio, 4,857,598, Cl. 525-194.000.

Citizen Watch Co., Ltd.: *See—*
Iwamura, Hichihiro; and Kitabayashi, Eiichi, 4,856,687, Cl. 224-169.000.
Koike, Hirofumi; Endo, Yukio; and Mitsuhashi, Tadashi, 4,856,858, Cl. 350-6.600.

Clairol, Inc.: *See—*
Anderson, James S., 4,857,071, Cl. 8-414.000.

Clapp, Guy C. Tilt-wall concrete panel and method of fabricating buildings therewith. 4,856,244, Cl. 52-309.700.
Clarion Co., Ltd.: *See—*
Ito, Yukio; Yamada, Kimichika; and Ohkawa, Hiroyuki, 4,858,042, Cl. 360-96.500.
Clark, Brian: *See—*
Kleinberg, Robert L.; Clark, Brian; Chew, Weng C.; and Mariani, David, 4,857,852, Cl. 324-339.000.
Clark, Charles R.: *See—*
Matthews, Robert R.; and Clark, Charles R., 4,856,593, Cl. 106-310.000.
Clark, William G., Jr.: *See—*
Metala, Michael J.; Clark, William G., Jr.; Junker, Warren R.; Burtner, Lee W.; Arzenti, Thomas E.; Johnson, Harold P.; Vestovich, Robert P.; and Bevilacqua, Bruce W., 4,856,337, Cl. 73-601.000.
Clarke, Cornelius B.: *See—*
Kee, William C.; Brannigan, Patrick M.; and Clarke, Cornelius B., 4,857,008, Cl. 439-352.000.
Clarke, Ellis W. Flow control. 4,856,755, Cl. 251-6.000.
Clausen, Edvin L., to Norsk Hydro a.s. Method of manufacture of manifolds and manifold provided by such method. 4,856,824, Cl. 285-137.100.
Clausen, Henrik, to Biomembrane Institute, The. A-associated H-antigens, monoclonal antibodies specific thereto and methods for employing the same in blood typing. 4,857,639, Cl. 536-1.100.
Clements, Brice P.; Kurihara, Tatsuo; Marshall, Sammy D.; and Syrowatka, Rupert, to Arus-Andritz Ruthner, Inc. Floating chicane system for liquid-solid separation equipment. 4,857,193, Cl. 210-396.000.
Clendinning, Robert A.; Maresca, Louis M.; Matzner, Markus; and Schwab, Thomas H., to Amoco Corporation. Aromatic amorphous thermoplastic terpolymers. 4,857,625, Cl. 528-171.000.
Cleveland, Thomas B.: *See—*
Gaggar, Satish K.; Dumler, James M.; and Cleveland, Thomas B., 4,857,590, Cl. 525-64.000
Clevenger, James T., Jr.; Ashcroft, Dale A.; Strosser, Richard P.; and Anderson, Mark S., to Ford New Holland, Inc. Method of controlling the operation of a loader. 4,856,612, Cl. 180-273.000.
Clever, Carl W.: *See—*
Ziegler, Herbert; Clever, Carl W.; and Roppelt, Gunter, 4,858,153, Cl. 364-550.000.
CliniCom Incorporated: *See—*
Gombrich, Peter P.; Zook, Ronald E.; and Hendrickson, Max S., 4,857,716, Cl. 235-462.000.
Clish, Frank; and Franklin, John B., to Veeder-Root Limited. Tachograph and vehicle speed control device. 4,858,135, Cl. 364-426.040.
Clough, John M.: *See—*
Anthony, Vivienne M.; Clough, John M.; and Godfrey, Christopher R. A., 4,857,545, Cl. 514-452.000.
Clowers, Earl R., to Porter-Cable Corporation. Portable circular saw. 4,856,394, Cl. 83-56.000.
Clyde Industries Limited: *See—*
Sanchez, George, 4,856,133, Cl. 15-29.000.
Coatex S.A.: *See—*
Bousquet, Hubert; Ravet, Georges; and Rousset, Jacky, 4,857,622, Cl. 526-317.100.
Cobe Laboratories, Inc.: *See—*
Shouldice, David R.; Treu, Dennis M.; Powell, Daniel A.; and Cernich, Thomas, 4,857,181, Cl. 210-87.000.
Coffin, David R.: *See—*
Cordova, David S.; Coffin, David R.; Lazarus, Stanley D.; and Young, Steven A., 4,857,405, Cl. 428-378.000.
Cohen, Ilan: *See—*
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Cohen, Norman B.: *See—*
Hill, John A., III; Miekka, Richard G.; and Cohen, Norman B., 4,857,398, Cl. 428-331.000.
Coleco Industries, Inc.: *See—*
Rose, William J., 4,857,030, Cl. 446-303.000.
Coleman, Charles R.; and Rukavina, Thomas G., to PPG Industries, Inc. Low modulus interlayer. 4,857,407, Cl. 428-412.000.
Coleman, D. Jackson: *See—*
Lizzi, Frederic L.; Yaremko, Mykola M.; Silverman, Ronald H.; and Coleman, D. Jackson, 4,858,124, Cl. 364-413.010.
Coleman-Kammula, Seetha, to Shell Oil Company. Process for the preparation of hydrocarbyl-grafted cellulose fibers. 4,857,588, Cl. 525-54.200.
Coleman, Raymond L.; and Kurn, Peter A., to ERA Patents Limited. Transformer testing. 4,857,856, Cl. 324-547.000.
Colgate-Palmolive Company: *See—*
Borrello, Giuseppe, 4,857,223, Cl. 252-91.000.
Drapier, Julien; Gallant, Chantal; and van de Gaer, Daniel, 4,857,226, Cl. 252-174.250.
Straw, Alan; and Ellis, Roger D., 4,857,241, Cl. 261-152.000.
Colin, Michel; Guenard, Daniel; Gueritte-Voegelein, Francoise; and Potier, Pierre, to Rhone-Poulenc Sante. Process for the preparation of taxol and 10-deacetyltaxol. 4,857,653, Cl. 549-511.000.
Colinge, Jean-Pierre, to Hewlett-Packard Company. Bipolar transistor process using sidewall spacer for aligning base insert. 4,857,476, Cl. 437-33.000.
Coll, Thomas E.: *See—*
Alexoff, Carl; Rosetta, Richard; Dennis, Michael; and Coll, Thomas E., 4,858,123, Cl. 364-412.000.
Colledge, Alan L.; and Johnson, Hugh I. Portable multi-purpose exercise device. 4,856,775, Cl. 272-134.000.
Collette, Jean J.; Dauvister, Pierre M. J.; Jonette, Bernard; and Lardo, Claude, to Goodyear Tire & Rubber Company, The. Pneumatic tire. 4,856,571, Cl. 152-209.00R.
Colli, Luigi, to Savio, S.p.A. Unwinder arm rotating about a pivot suspended above a two-for-one twisting spindle for unwinding superposed bobbins. 4,856,268, Cl. 57-58.520.
Collins, David J.: *See—*
Maurice, James; Collins, David J.; Hall, Michael O.; and McLoughlin, Peter D., 4,857,819, Cl. 318-778.000.
Collins, Jason H.; and Woodhead, Robert G. Umbilical cord clamp apparatus. 4,856,517, Cl. 128-346.000.
Collins, Walter W., to Wenoka Seastyle. Adapter for knife and sheath assembly. 4,856,192, Cl. 30-151.000.
Colorado Memory Systems, Inc.: *See—*
Cannon, Thomas G.; Roemmich, Bruce D.; and Precht, Terry A., 4,858,047, Cl. 360-106.000.
Columbia University in the City of New York, The Trustees of: *See—*
Torbey, Habib H., 4,858,017, Cl. 358-426.000.
Columbus, Eugene P., to United States of America, Agriculture. Differential ginning process and apparatus. 4,856,148, Cl. 19-55.00R.
Comarme Marchetti FASpA: *See—*
Tacchini, Franco, 4,857,038, Cl. 493-316.000.
Combs, Linsey L. Well bottom release valve. 4,856,756, Cl. 251-297.000.
Combustion Engineering, Inc.: *See—*
Hayes, James K., 4,856,461, Cl. 122-488.000.
Overbay, Mark A., 4,856,354, Cl. 73-866.500.
Commissariat a l'Energie Atomique: *See—*
Borel, Michel; Boronat, Jean-Francois; Meyer, Robert; and Rambaud, Philippe, 4,857,161, Cl. 204-192.260.
Bridenne Alaux, Martine; Marquet-Ellis, Hubert; Keller, Nelly; and Folcher, Gerard, deceased, 4,857,294, Cl. 423-489.000.
Compagnie Generale des Etablissements Michelin-Michelin et cie: *See—*
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Compangnie Generale des Etablissements Michelin-Michelin et Cie: *See—*
Bocquet, Jean-Louis; Gouttebessis, Jacques; and Rey, Maurice, 4,857,128, Cl. 156-244.120.
Computer Devices, Inc.: *See—*
Horgan, Thomas B., 4,857,990, Cl. 358-13.000.
Comstock, W. Kenneth. Constant power system and method. 4,857,755, Cl. 307-47.000.
Conaway, Robert M., to Vital Force, Inc. Apparatus and method for the rapid attainment of high hydrostatic pressures and concurrent delivery to a workpiece. 4,856,311, Cl. 72-56.000.
Conductex, Inc.: *See—*
Bryant, Kenneth G., 4,856,299, Cl. 66-202.000.
Congedo, Thomas V.: *See—*
Bartko, John; Schoch, Karl F., Jr.; Congedo, Thomas V.; and Anderson, Stanwood L., Jr., 4,857,259, Cl. 376-154.000.
Connect Computer Company, Inc.: *See—*
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Connell, Richard A.: *See—*
Sisson, Robert W.; and Connell, Richard A., 4,856,604, Cl. 177-210.0FP
Conner, Arlie R., to Tektronix, Inc. Complex waveform multiplexer for liquid crystal displays. 4,857,906, Cl. 340-784.000.
Connors, Lucy M.: *See—*
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Conoco Inc.: *See—*
Braswell, Frank M., 4,857,919, Cl. 340-870.360.
Delphin, Joseph P., 4,856,836, Cl. 294-74.000.
Gant, Preston L., 4,857,234, Cl. 252-645.000.
Matthews, Robert R.; and Clark, Charles R., 4,856,593, Cl. 106-310.000.
Seidner, David S., 4,856,584, Cl. 166-250.000.
Conprinta Ltd.: *See—*
Lauber, Peter, 4,856,429, Cl. 101-486.000.
Conston, Stanley R.: *See—*
Yamamoto, Ronald; Conston, Stanley R.; and Pesotchinsky, Sophia, 4,856,504, Cl. 128-92.0ZW.
Continental Can Company, Inc.: *See—*
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Control Logic (Proprietary) Limited: *See—*
Celine, David H., 4,857,828, Cl. 324-61.00R.
Conwell, Peter R., to Unisys Corporation. Special purpose neurocomputer system for solving optimization problems. 4,858,147, Cl. 364-513.000.
Cook, Charles E.: *See—*
Tompkins, John C.; and Cook, Charles E., 4,857,820, Cl. 320-2.000.
Cook, Henry W., Jr., to Du Pont de Nemours, E. I., and Company. On-line electrostatic defect detector for polyester base. 4,857,853, Cl. 324-456.000.
Cooney, Barry F.: *See—*
Machado, Octavio J.; Moore, Jay T.; and Cooney, Barry F., 4,857,263, Cl. 376-272.000.
Coop Weiproduktenfabriek "Borculo" W.A.: *See—*
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Cooper Power Systems, Inc.: *See—*
Boliver, Vincent J.; Roszizewski, Paul M.; Sankey, Edward L.; and DeMeyer, Roy W., 4,857,021, Cl. 439-801.000.

Copp, John B. Composite board press. 4,857,135, Cl. 156-580.000.
Cordery, Robert A.; and Hubbard, David W., to Pitney Bowes Inc. Apparatus and method of weighing articles based upon harmonic motion. 4,856,602, Cl. 177-210.0FP.
Cordis Corporation: *See—*
Hillstead, Richard A., 4,856,516, Cl. 128-343.000.
Stevens, Robert C.; and Braun, Robert R., 4,857,046, Cl. 604-22.000.
Cordova, David S.; Coffin, David R.; Lazarus, Stanley D.; and Young, Steven A., to Allied-Signal Inc. Fiber for reinforcing plastic composites and reinforced plastic composites therefrom. 4,857,405, Cl. 428-378.000.
Cornelius, Klaus; and Exner, Rainer, to Sartorius GmbH. Nonsystem-connected electronic balance. 4,856,605, Cl. 177-210.00R.
Cornell, James C. Joist hanger. 4,856,252, Cl. 52-702.000.
Cornish, Rodney H.: *See—*
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Cornu, Pierre: *See—*
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Corporate Communications Consultants, Inc.: *See—*
Belmares-Sarabia, Armand; and Chayka, Stanley J., 4,857,994, Cl. 358-22.000.
Cortial, Jean-Loup, to Hospal Industrie. Method and system for pumping two liquids in equal quantities in an artificial kidney. 4,857,199, Cl. 210-646.000.
Cosmai, Pietro, to Sicim SpA. Loader-mixer device for endermic injectors. 4,856,567, Cl. 141-302.000.
Costa, Larry J., to Valmont Industries, Inc. Shunt latch. 4,857,876, Cl. 336-165.000.
Cotting, Jacques-Alain; and Renner, Alfred, to Ciba-Geigy Corporation. Epoxidized polycycloacetals. 4,857,607, Cl. 525-471.000.
Cotts, David B.; and Brodrecht, Louisa, to SRI International. Polymer alloy compositions of rod-like aromatic polyamides and polyurethanes. 4,857,569, Cl. 524-104.000.
Coulter Electronics, Inc.: *See—*
Anderson, Frank C.; and Twedt, Dean E., 4,858,154, Cl. 364-554.000
Courtaulds Packaging Australia Limited: *See—*
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Coville, William W., to Pitney Bowes Inc. Electronic postage meter control system employing a membrane switch mechanism. 4,858,174, Cl. 364-900.000.
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Cox, Michael J., to Rolls-Royce plc. Method and apparatus for evaluating the working line characteristics of a compressor of a gas turbine engine. 4,856,274, Cl. 60-39.330.
Cozewith, Charles: *See—*
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Crace, R. Joseph, to Hickory Specialties, Inc. Flavor-imparting permanent briquette for gas and electric grills. 4,857,074, Cl. 44-540.000.
Cradeur, Robert R.: *See—*
Krajicek, Richard W.; and Cradeur, Robert R., 4,856,545, Cl. 134-166.00C.
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Broger, Emil A.; Crameri, Yvo; and Heiser, Bernd, 4,857,648, Cl. 546-147.000.
Crandall, Robert P., to Eastman Kodak Company. Electronic printer apparatus with intelligent accent color. 4,857,955, Cl. 355-328.000.
Crapo, Alan D., to Seagate Technology, Inc. Disc drive spindle motor with low cogging torque. 4,858,044, Cl. 360-99.080.
CRC-Evans Pipeline International, Inc.: *See—*
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Creative Products Resource Associates, Ltd.: *See—*
Kellett, George W.; and Murphy, Betty J., 4,856,541, Cl. 132-110.000.
Crews, Eric J. Timing system. 4,857,886, Cl. 340-323.00R.
CRL Electronics, Inc.: *See—*
Rochelle, Gary P.; and Lile, Charles R., 4,858,067, Cl. 361-331.000.
Croce, Pasquale W., Jr. Method and apparatus for quantitative evaluation of back health. 4,858,126, Cl. 364-413.020.
Croft, Thomas S.; and Haugen, Hartwick A., to Minnesota Mining and Manufacturing Company. Encapsulant compositions for use in signal transmission devices. 4,857,563, Cl. 523-173.000.
Crompton & Knowles Corporation: *See—*
Kirjanov, Alexander S.; and Hoecklin, Dieter, 4,857,392, Cl. 428-267.000.
Croom, Warren J., Jr.; and Hagler, Winston M., Jr., to North Carolina State University. Method of maintaining ruminants on high energy low fiber diet. 4,857,534, Cl. 514-299.000.
Crosby, Nobel W., to Tridem Manufactured Products Inc. Tap connector. 4,857,020, Cl. 439-783.000.
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Crosfield Electronics Limited: *See—*
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Crowe, John H.; and Crowe, Lois M., to University of California, The Regents of the. Method for preserving liposomes. 4,857,319, Cl. 424-94.100.
Crowe, Lois M.: *See—*
Crowe, John H.; and Crowe, Lois M., 4,857,319, Cl. 424-94.100.
Crueger, Wulf: *See—*
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Cueman, Michael K.: *See—*
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Curty: *See—*
Genin, Bernard C., 4,856,796, Cl. 277-235.00B.
Cusati, Ward R., to Torrington Company, The. Midpoint connection for intermediate shaft subassembly. 4,856,927, Cl. 403-104.000.
Cuschera, Casper. Motorized stirring apparatus. 4,856,910, Cl. 366-282.000.
Cycle Composites, Inc.: *See—*
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Maksem, John A., 4,857,300, Cl. 424-3.000.
Czarka, Michael W., to Dana Corporation. Clutch assembly with combined variable and fixed speed pulleys. 4,857,033, Cl. 474-14.000.
Czarniecki, Michael F.; and Bauer, Barr E., to Schering Corporation. Sulfonamide compounds, compositions and method of use. 4,857,301, Cl. 424-40.000.
Czech, Joachim. Dispenser for pasty products. 4,856,679, Cl. 222-136.000.
D & C Limited: *See—*
Pierson, Henri G. W., 4,857,194, Cl. 210-406.000.
D.O.M. Associates, Inc.: *See—*
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Dadds, Alan F., to U.S. Philips Corporation. Data element position indication. 4,857,937, Cl. 342-377.000.
Dahl, Ernest A., to United States of America, Navy. Liquid level measurement system for analog and digital readout. 4,857,894, Cl. 340-619.000.
Dahne, Cynthia F. Apparatus for connecting containers. 4,856,647, Cl. 206-5.100.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Takeuchi, Satoshi; Danjo, Koutaro; Tahara, Shigehiko; Yui, Yoshiharu; and Ikeda, Satoshi, 4,856,857, Cl. 350-3.600.
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Leiber, Heinz; Ohnemuller, Hans-Joachim; and Kastner, Klaus, 4,856,610, Cl. 180-197.000.
Daimon, Takashi; Sakamoto, Hideshi; and Adachi, Tatsuya, to Chisso Corporation. Electroconductive fabric sheet and molded article having it on surface thereof. 4,857,377, Cl. 428-90.000.
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Dakubu, Salifu, to Ekins, Roger Philip, a part interest. Labelled and labellable reagents for fluorometric assays. 4,857,475, Cl. 436-546.000.
Dall, Larry N., to Whirpool Corporation. Flexible frame heater element for dryer. 4,857,707, Cl. 219-375.000.
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Dallas Semiconductor Corporation: *See—*
Little, Wendell L.; and Smith, Michael D., 4,857,767, Cl. 307-448.000.
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Damico, Dennis J.; Mushrush, Kenneth W.; and Bennett, Ruth M., to Lord Corporation. Two-part adhesive for bonding plastics and metals. 4,857,131, Cl. 156-331.400.
Damus, Diane; and Kleinstuber, John F. Combination beach towel and tote bag. 4,856,912, Cl. 383-4.000.
Dana Corporation: *See—*
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Danforth, R. L.; Gergen, W. P.; and Neate, J. A., to Shell Oil Company. Method of composite part fabrication. 4,857,147, Cl. 162-156.000.
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Datatape, Inc.: *See—*
Andersen, Robert D., 4,857,825, Cl. 323-353.000.
Datson, Ian A. Shoe and gaiter. 4,856,207, Cl. 36-2.00R.
Daum, Edward D.; Downs, William; Jankura, Bryan J.; and McCoury, John M., Jr., to Babcock & Wilcox Company, The. Gas sampling system for reactive gas-solid mixtures. 4,856,352, Cl. 73-863.250.
Dauvister, Pierre M. J.: *See—*
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David, Constant V. Infinitely variable (IV) mechanical non-cylindrical drive. 4,856,357, Cl. 74-63.000.
Davies, Dylan H.; and Takeda, Jiro, to Schlumberger Technology Corporation. Borehole casing diagnostic apparatus and method. 4,857,831, Cl. 324-65.0CR.
Davies, Guy E., to Plessey Overseas Limited. Reaction jet control system. 4,856,734, Cl. 244-3.220.
Davies, James S. Stringed musical instrument. 4,856,403, Cl. 84-291.000.
Davis, Darrel B. Foldable tow bar. 4,856,805, Cl. 280-491.400.
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Davis, James C.; McGuiggan, Michael F.; Cuellar, Edward A.; and Haas, Frederick W., to Standard Oil Company, The. Electrodeposition recovery method for metals in polymer chelates. 4,857,159, Cl. 204-149.000.
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Decker, Donald F., Jr.; Decker, Deborah A.; and Duggins, Kathleen S. Solubilized benzoyl peroxide and cosmetic solution including solubilized benzoyl peroxide. 4,857,302, Cl. 424-47.000.
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Dejaifve, Pierre E.; Darnanville, Jean-Paul; Dufour, Jacques J. J.; and Garin, Roland A. C., to Shell Oil Company. Dehydrogenation catalyst. 4,857,498, Cl. 502-304.000.
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Del Monte Corporation: *See—*
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Delamare, Guy-Robert, to Institut Francais du Petrole. Resilient ball joint support. 4,856,827, Cl. 285-268.000.
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Delery, Marc, to Skis Rossignol. Closing device for ski boots and the like. 4,856,210, Cl. 36-117.000.
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Delphin, Joseph P., to Conoco Inc. Sling assembly for use with a crane. 4,856,836, Cl. 294-74.000.
DeLuca, Hector F.; Ikekawa, Nobuo; and Tanaka, Yoko, to Wisconsin Alumni Research Foundation. Hydroxylated 24-homo-vitamin D derivatives and methods for preparing same. 4,857,518, Cl. 514-167.000
De Lucca, George V.; Kezar, Hollis S., III; and O'Brien, John P., to Du Pont de Nemours, E. I., and Company. High strength fibers from chitin derivatives. 4,857,403, Cl. 428-364.000.
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Denis, Philippe; and Frances, Jean-Marc, to Rhone-Poulenc Chimie. Preparation of hexenedioic acid diesters. 4,857,657, Cl. 560-193.000.
Denning, Gary R. Pavement and methods for producing and resurfacing pavement. 4,856,930, Cl. 404-31.000.
Dennis, James W., to Mount Sinai Hospital Corporation. Compositions containing golgi alpha-mannosidase II inhibitors. 4,857,315, Cl. 424-85.200
Dennis, Michael: *See—*
Alexoff, Carl; Rosetta, Richard; Dennis, Michael; and Coll, Thomas E., 4,858,123, Cl. 364-412.000.
Dennis, Nicholas; and Burrell, Donald C., to Dow Chemical Company, The. Alditol ester derivative of triclopyr, and herbicidal use thereof. 4,857,102, Cl. 71-94.000.
Dennison Manufacturing Company: *See—*
Hill, John A., III; Miekka, Richard G.; and Cohen, Norman B., 4,857,398, Cl. 428-331.000.
Denz, Helmut; and Person, Martin, to Robert Bosch GmbH. Multidependent valve timing overlap control for the cylinders of an internal combustion engine. 4,856,465, Cl. 123-90.170.
Deola, James A. Weightlifting exercise device. 4,856,773, Cl. 272-118.000
Deregibus, Alfio, to Goodyear Tire & Rubber Company, The. Helical winding apparatus. 4,856,720, Cl. 242-7.020
Derman, Jay S. Security device for cassette tape decks or the like. 4,856,304, Cl. 70-14.000.
Derner, Paul: *See—*
Von Reis, Wolf; Derner, Paul; Quenett, Rudolf; and Armbruster, Guenter, 4,857,376, Cl. 428-83.000
Derrick, James W.; and Matsch, L. Charles, to Derrick Manufacturing Corporation. Reinforced molded polyurethane vibratory screen. 4,857,176, Cl. 209-392.000.
Derrick Manufacturing Corporation: *See—*
Derrick, James W.; and Matsch, L. Charles, 4,857,176, Cl. 209-392.000
De Ruiter, Ernest: *See—*
Von Blucher, Hubert; Von Blucher, Hasso; and De Ruiter, Ernest, 4,857,243, Cl. 264-13.000
deSantis, Pietro, to International Telecommunications Satellite. Variable bandwidth variable center-frequency multibeam satellite-switched router. 4,858,225, Cl. 370-50.000.

DeSantis, Raymond P., to PTX-Pentronix, Inc. Sagger construction. 4,856,990, Cl. 432-258.000.
Deshet, Gabriel, to Isoform. Apparatus for blanking thin sheets using a punch having localized regions of hand and soft elastic material. 4,856,399, Cl. 83-685.000.
Desjardins, Gaetan. Aerated facultative basin having a dual function aeration and sludge removal pump in adjacent well. 4,857,185, Cl. 210-150.000.
Desplat, Philippe: *See—*
Nobilet, Bernard; Bonhomme, Michel; and Desplat, Philippe, 4,857,458, Cl. 435-311.000.
Dessauer, Guido; and Berenbold, Helmut. Agent for improving the printability of paper and board. 4,857,110, Cl. 106-211.000.
Desy, Raoul O.; and Krusas, James J., to American Optical Corporation. Face protective device. 4,856,109, Cl. 2-9.000.
Dethienne, Henri-Pierre Y., to U.S. Philips Corporation. Transformer having coaxial coils. 4,857,877, Cl. 336-170.000.
Deubzer, Bernward: *See—*
Herzig, Christian; Deubzer, Bernward; Frey, Volker; and Esterbauer Josef, 4,857,608, Cl. 525-476.000.
Wolfgruber, Matthias; Deubzer, Bernward; and Frey, Volker, 4,857,582, Cl. 524-730.000.
Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Spilker, Harry, 4,857,262, Cl. 376-261.000.
Deutsche ITT Industries GmbH: *See—*
Schweer, Reiner; Juenke, Manfred; and Sieben, Ulrich K., 4,858,007, Cl. 358-147.000.
Sieben, Ulrich; and Schemmann, Heinrich, 4,858,008, Cl. 358-148.000.
DeVoe, Alan R.: *See—*
Ingermann, Donald E.; Caffrey, Stephen F.; DeVoe, Alan R.; Smith, Ronald L.; and Sullivan, Ronald G., 4,856,138, Cl. 15-320.000
de Waal, Jannetje A.: *See—*
Vinegar, Harold J.; Wellington, Scott L.; and de Waal, Jannetje A., 4,856,341, Cl. 73-798.000.
DeWick, Carolyn C.: *See—*
DeWick, Robert S., Sr.; and DeWick, Carolyn C., 4,858,170, Cl. 364-900.000.
DeWick, Robert S., Sr.; and DeWick, Carolyn C. Shorthand notation and transcribing method. 4,858,170, Cl. 364-900.000.
Dhawan, Balram: *See—*
Redmore, Derek; Dhawan, Balram; and Przybylinski, John L., 4,857,205, Cl. 210-700.000.
Diamant Boart: *See—*
Hallez, Charles P., 4,856,719, Cl. 241-200.000.
Diamond, Paul J. Ironing accessory. 4,857,706, Cl. 219-373.000.
Diana, Guy D.; and Carabateas, Philip M., to Sterling Drug Inc. Heterocyclic substituted-phenoxyalkylisoxazoles as antiviral useful agents. 4,857,539, Cl. 514-378.000.
Diaz, Felix V.; and Stanley, Jack H., to DSC Communications Corporation. Distributed switching system. 4,858,232, Cl. 370-86.000.
DiChiara, Joseph G.; Brown, Harry W.; and Valentine, Joseph M., to Bull HN Information Systems Inc. Apparatus and method for preventing computer access by unauthorized personnel. 4,858,117, Cl. 364-200.000.
Dick, Chris C.; Schwartz, Barry; McMunn, Bert D.; and Zeh, Peter H., to FMC Corporation. Fast-dissolving, non-caking, food grade sodium tripolyphosphate. 4,857,287, Cl. 423-315.000.
Dictaphone Corporation: *See—*
Dwyer, John J.; Jachmann, Emil F.; Harris, Mark N.; and Beloin, Brian F., 4,858,213, Cl. 369-28.000.
Diehl, Donald R.; and Factor, Ronda E., to Eastman Kodak Company. Filter dye for photographic element. 4,857,446, Cl. 430-510.000.
Diehl GmbH & Co.: *See—*
Lachmann, Karl-Heinz, 4,856,733, Cl. 244-3.150.
Diehl, Robert E.: *See—*
Brown, Dale G.; Siddens, Jack K.; Diehl, Robert E.; and Wright, Donald P., Jr., 4,857,651, Cl. 549-443.000.
Dierick, Tony F. J.; Kite, Nicholas J.; and Moran, Michael J., to Enviro-Spray Systems, Inc. Balloon storage and inflation assembly. 4,857,029, Cl. 446-220.000.
Diesel Kiki Co., Ltd.: *See—*
Ishikawa, Masataka, 4,858,158, Cl. 364-571.010.
Takahashi, Tadahiro, 4,856,291, Cl. 62-217.000.
Takahashi, Tadahiro, 4,856,293, Cl. 62-228.300.
Ueno, Katsumi, 4,856,549, Cl. 137-112.000.
Diez, Andreas: *See—*
Haubennestel, Karl-Heinz; Heilmann, Holger; and Diez, Andreas, 4,857,111, Cl. 106-504.000.
DiGirolamo, Robert: *See—*
Hogan, Paul J.; Sanders, Evan; and DiGirolamo, Robert, 4,856,318, Cl. 73-12.000.
Digital Equipment Corporation: *See—*
Gillett, Richard B., Jr.; and Williams, Douglas D., 4,858,116, Cl. 364-200.000.
Gronowski, Paul E.; Peng, Victor; and Gavrielov, Nachum M., 4,858,165, Cl. 364-748.000.
Hartwell, David W.; Bloom, Elbert; and Triolo, Victoria M., 4,858,234, Cl. 371-14.000.
Stewart, Robert E.; Natusch, Paul J.; Yu, Eugene L.; and Keller, James B., 4,858,173, Cl. 364-900.000.
Dijkhuizen, Okko K., to Ucosan B.V. Cleaning device for the piping system of a whirlpool tub outlet valve therefor. 4,856,125, Cl. 4-543.000.
DiJoseph, John F.: *See—*
Mir, Ghulam N.; Borella, Luis E.; DiJoseph, John F.; and Reuter, Gerald L., 4,857,324, Cl. 424-690.000.
Dikoff, Joseph. Cordless iron with high-temperature, non-scorching sole plate surface. 4,856,212, Cl. 38-93.000.
DiMartino, Stephen P., to Air Products and Chemicals, Inc. Vacuum swing adsorption process with vacuum aided internal rinse. 4,857,083, Cl. 55-26.000.
DiMartino, Stephen P., Sr.; Hopkins, Jeffrey A.; and Davis, Ruth A., to Air Products and Chemicals, Inc. Membrane unit turn-down control system. 4,857,082, Cl. 55-16.000.
Dinse, Merle L.: *See—*
Klapproth, Kenneth H.; Blimmel, William C.; and Dinse, Merle L., 4,856,963, Cl. 415-190.000.
DiPietro, Richard A.; Tu, Jan-I; and Turabi, Noor Z., to E. R. Squibb & Sons, Inc. Derivatives of pravastatin for inhibiting cholesterol biosynthesis. 4,857,522, Cl. 514-212.000.
Diver, James J.: *See—*
Schneider, Thomas C.; and Diver, James J., 4,856,263, Cl. 53-543.000
Divisek, Jiri; and Schmitz, Heinz, to Kernforschungsanlage Juelich Gesellschaft mit beschrankter Haftung. Process for the production of porous electrodes. 4,857,153, Cl. 204-16.000.
Dixon, Gerald: *See—*
Bolton, Ivor W.; Gibbons, Richard N.; and Dixon, Gerald, 4,857,087, Cl. 55-385.600.
Dixon, John. Handlebar device for containing a portable radio apparatus. 4,856,364, Cl. 74-551.800.
DJH Engineering Center, Inc.: *See—*
Hvolka, Dusan J., 4,856,378, Cl. 74-804.000.
Dr. Wolman GmbH: *See—*
Goettsche, Reimer; Marx, Hans-Norbert; and Hettler, Wendelin, 4,857,322, Cl. 424-633.000.
Dodge, Robert G.: *See—*
Hattan, Mark; and Dodge, Robert G., 4,856,198, Cl. 33-199.00R.
Doeling, Wallace D., to Tektronix, Inc. Method of fabricating a circuit board. 4,856,184, Cl. 29-852.000.
Doi, Koichi: *See—*
Takada, Yutaka; Doi, Koichi; Yamazaki, Tsutomu; and Obata, Yutaka, 4,856,710, Cl. 236-13.000.
Doi, Shigeo: *See—*
Shishido, Hideomi; Doi, Shigeo; Sumida, Hideki; and Tanaka, Masayuki, 4,856,781, Cl. 273-65.00E
Dokoupil, Jiri; and Kuzzora, Thaddaeus. System for conditioning of leather hides, furs and the like. 4,856,201, Cl. 34-1.000.
Dolabdjian, Barkew: *See—*
Henkel, Eberhard; Dolabdjian, Barkew; Helger, Roland; Klink, Rainer; and Wurzburg, Uwe, 4,857,640, Cl. 536-4.100.
Dom-Sicherheitstechnik GmbH & Co KG: *See—*
Hauser, Herbert P., 4,856,307, Cl. 70-165.000.
Domb, Abraham J.; and Langer, Robert S., to Massachusetts Institute of Technology. Polyanhydrides with improved hydrolytic degradation properties. 4,857,311, Cl. 424-78.000.
Domeier, Linda A., to Union Carbide Corporation. Thermosettable fiber reinforced resin compositions. 4,857,579, Cl. 524-507.000.
Domigan, Charles: *See—*
Benscoter, Richard D.; Domigan, Charles; Flachbarth, Charles T.; and Sheridan, James E., 4,857,016, Cl. 439-680.000.
Dominiak, Serge: *See—*
Eberhardt, Andre ; Dominiak, Serge; Berveiller, Marcel; Lucas, Jean P.; and Guyon, Robert P. Y., 4,857,387, Cl. 428-209.000.
Domtar Inc.: *See—*
Yalpani, Manssur; and Magdzinski, Leon, 4,857,638, Cl. 530-505.000.
Donaldson Company, Inc.: *See—*
Engel, Donald F.; and Gieseke, Steven S., 4,856,826, Cl. 285-181.000.
Donofrio, Deborah K.; and Whitekettle, Wilson K., to Betz Laboratories, Inc. Biocidal compositions and use thereof containing a synergistic mixture of 2-bromo-2-nitropropane-1,3-diol and bis (trichloromethyl)sulfone. 4,857,557, Cl. 514-711.000.
Donovan, Joseph F.; Spatz, Edward C.; Salerni, John V.; Peterson, Elmer R.; and Weirich, John B., to Baker Hughes Incorporated. Method and apparatus for completing a non-vertical portion of a subterranean well bore. 4,856,591, Cl. 166-278.000.
Doomernik, Fransiscus M. P. P.: *See—*
Bosch, Gerrit; Pasma, Tjebbe R.; Sluyterman, Albertus A. S.; Doomernik, Fransiscus M. P. P.; and Wielink, Steven M., 4,857,805, Cl. 315-8.000.
Dopp, Robert B.: *See—*
Larsen, Duane M.; and Dopp, Robert B., 4,857,424, Cl. 429-206.000.
Doring, Joachim: *See—*
Eichenauer, Herbert; Buding, Hartmuth; Doring, Joachim; Casper, Rudolf; and Ott, Karl-Heinz, 4,857,591, Cl. 525-74.000.
Dorminy, John L.: *See—*
Forsythe, Carl; Dorminy, John L.; and Raymon, Joseph W., 4,856,969, Cl. 417-395.000
Dornier GmbH: *See—*
Lotz, Michael, deceased; Vanino, Rudiger, deceased; Kuhl, Peter; Welte, Dieter; and Zimmer, Herbert, 4,856,735, Cl. 244-35.00R.
Dorow, Rainer: *See—*
Wachtel, Helmut; Schneider, Herbert H.; Loschmann, Peter-Andreas; Dorow, Rainer; Horowski, Reinhard; Acksteiner, Bernard; Schulze, Paul-Eberhard; and Sauer, Gerhard, 4,857,298, Cl. 424-1.100.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Kashihara, Hidechiyo; Nemoto, Shin-ichi; and Ueno, Kazuhiro, 4,857,040, Cl. 494-22.000

Douglas, James R.: *See—*
Sabroff, Alvin M.; and Douglas, James R., 4,856,167, Cl. 29-159.200.

Dow Chemical Company, The: *See—*
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Helbling, Alois, 4,857,566, Cl. 523-409.000
Lipp, Charles W., 4,857,075, Cl. 48-86.00R.
McCullough, Francis P., Jr.; Snelgrove, R. Vernon; and Goswami, Bhuvenesh C., 4,857,394, Cl. 428-303.000
McCullough, Francis P., Jr.; and Novak, Leo J., 4,857,404, Cl 428-367.000.
Moore, Eugene R., 4,857,631, Cl. 528-481.000
Pearson, Stanley R.; Merrick, Douglas D.; White, William P.; and Lipp, Charles W., 4,857,076, Cl. 48-86.00R.
Pope, Brian G.; and Najvar, Daniel J., 4,857,203, Cl. 210-681.000
Robbins, Lanny A.; and Frank, Timothy C., 4,857,084, Cl. 55-58.000.
Tomalia, Donald A.; and Stahlbush, James R., 4,857,599, Cl 525-259.000

Dow Corning Corporation: *See—*
Maxson, Myron T., 4,857,564, Cl. 523-212.000

Downs, James W. Ellipsoidal reflector concentration of energy system 4,858,090, Cl. 362-297.000.

Downs, William: *See—*
Daum, Edward D.; Downs, William; Jankura, Bryan J.; and McCoury, John M., Jr., 4,856,352, Cl. 73-863.250

Doyle, Thomas E.; and Ryan, Patrick M., to Babcock & Wilcox Company, The. Method and apparatus for automatic vapor cooling when shape melting a component. 4,857,694, Cl. 219-76.120

Drabowitch, Serge; and Bouko, Jean, to Thomson-CSF. Conical sweep array antenna and a radar having such an antenna. 4,857,936, Cl 342-368.000.

Draegerwerk, AG: *See—*
Rabenecker, Horst; and Kruger, Jurgen, 4,856,818, Cl. 283-34.000

Drage, Davod J.; and Safi, Toufic, to Tegal Corporation. Silicon trench etch. 4,857,138, Cl. 156-643.000

Drapier, Julien; Gallant, Chantal; and van de Gaer, Daniel, to Colgate-Palmolive Company. Thixotropic clay aqueous suspensions containing polyacrylic acid polymer or copolymer stabilizers. 4,857,226, Cl. 252-174.250

Dresser Industries, Inc.: *See—*
Greenlee, Donald R.; and Skinner, Willie C., Sr., 4,856,583, Cl. 166-127.000

Drug Delivery Systems Inc.: *See—*
Sibalis, Dan, 4,856,188, Cl. 29-877.000

DSC Communications Corporation: *See—*
Diaz, Felix V.; and Stanley, Jack H., 4,858,232, Cl. 370-86.000.

Du Pont Canada Inc.: *See—*
Wong, Chun S., 4,857,254, Cl. 264-211.240.

Duffee, Malcolm T., to Spirol International Corporation. Manual pin driver. 4,856,697, Cl. 227-149.000

Dufour, Jacques J. J.: *See—*
Dejaifve, Pierre E.; Darnanville, Jean-Paul; Dufour, Jacques J. J.; and Garin, Roland A. C., 4,857,498, Cl. 502-304.000

Dufour, Marcel, to Asten Group, Inc. Papermakers wet felts. 4,856,562, Cl. 139-383.00A

Duggan, Mark; and Hartman, George D., to Merck & Co., Inc. Novel HMG-CoA reductase inhibitors. 4,857,546, Cl. 514-460.000

Duggan, Robert J. Multiport/multidrop computer communications. 4,858,230, Cl. 370-85.000.

Dugger, Joe K.: *See—*
Stanfill, Ted M.; and Dugger, Joe K., 4,856,678, Cl. 222-108.000.

Duggins, Kathleen S.: *See—*
Decker, Donald F., Jr.; Decker, Deborah A.; and Duggins, Kathleen S., 4,857,302, Cl. 424-47.000

Duley, Walter W.; and Kinsman, Grant. Means of enhancing laser processing efficiency of metals. 4,857,699, Cl. 219-121.850.

Dull, Dennis C.: *See—*
Roth, William H.; and Dull, Dennis C., 4,856,638, Cl. 192-106.100.

Dumbleton, John H.: *See—*
Wang, Kathy K.; Gustavson, Larry J.; and Dumbleton, John H., 4,857,269, Cl. 420-417.000.

Dumler, James M.: *See—*
Gaggar, Satish K.; Dumler, James M.; and Cleveland, Thomas B., 4,857,590, Cl. 525-64.000.

Dunand, Josiane; Arnule, Paul; and Gasquet, Denis, to Salomon S.A. Apparatus for the retention of a boot on a ski. 4,856,807, Cl. 280-615.000.

Dunavan, David S.; Abreu, Rene; Messelt, Stephen; and Siebert, Edward, to Perkin-Elmer Corporation, The. Optical direction sensor having gray code mask spaced from a plurality of interdigitated detectors. 4,857,721, Cl. 250-203.00R

Duncan, Gerald D., to Fisher & Paykel. Electronic motor controls, laundry machines including such controls and/or methods of operating such controls. 4,857,814, Cl. 318-281.000.

Dupere, Sherry L.: *See—*
O'Connor, Timothy E.; and Dupere, Sherry L., 4,857,314, Cl. 424-85.100.

Du Pont de Nemours, E. I., and Company: *See—*
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,856,146, Cl. 19-0.350.
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,856,147, Cl. 19-0.350.
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,857,385, Cl. 428-189.000
Barrett, Lawrence R.; Robertson, Ronald C.; and Sullivan, Mark A., 4,857,811, Cl. 318-3.000.
Bolt, John D., 4,857,246, Cl. 264-29.200.
Carcia, Peter F.; and Kalk, Franklin D., 4,857,373, Cl. 428-64.000
Cook, Henry W., Jr., 4,857,853, Cl. 324-456.000
De Lucca, George V.; Kezar, Hollis S., III; and O'Brien, John P., 4,857,403, Cl. 428-364.000.
Ho, May-Kin, 4,857,452, Cl. 435-7.000.
Kim, Young H., 4,857,630, Cl. 528-397.000
Rosenberg, Leonard S.; Black, Cheryl; Speicher, Earl R.; and Wagenknecht, Dietmar, 4,857,552, Cl. 514-538.000.

Durand, Daniel C.; and Morterol, Frederic R., to BP Chemicals Limited. Gas fluidized bed terpolymerization of olefins. 4,857,611, Cl 526-88.000.

Durand, Guy: *See—*
Vandermeersch, Jean; and Durand, Guy, 4,857,584, Cl. 524-791.000

Duskin Co., Ltd.: *See—*
Nishiyama, Masanobu; Nishimura, Haruo; Nakano, Katsuji; Ozaki: Tatsuo; and Kitamoto, Akira, 4,856,854, Cl. 312-38.000

Dutt, Herbert V.; and Lewis, Duane H., to Continental Plastics, Inc. Tamper evident closure with hook-like locking tabs. 4,856,665, Cl. 215-252.000

Dwyer, John J.; Jachmann, Emil F.; Harris, Mark N.; and Beloin, Brian F., to Dictaphone Corporation. Display for modular dictation/transcription system. 4,858,213, Cl. 369-28.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Jungwirth, Dieter, 4,856,254, Cl. 52-741.000.
Maier, Lorenz; Buchler, Wilhelm; Neumann, Harald; and Lonnecke, Karl H., 4,856,173, Cl. 29-445.000

Dynobel A/S: *See—*
Flodman, Leif A.; and Gabrielsson, Per Erik G., 4,857,609, Cl. 525-497.000

Dyson, Clive M.; King-Smith, Anthony D.; and Yassate, Mohamad H., to INMOS Limited. Redundancy scheme for multi-stage apparatus 4,858,233, Cl. 371-9.000.

E-Lite Technologies, Inc.: *See—*
Appelberg, Gustaf T., 4,856,392, Cl. 83-40.000.

E. R. Squibb & Sons, Inc.: *See—*
DiPietro, Richard A.; Tu, Jan-I; and Turabi, Noor Z., 4,857,522, Cl. 514-212.000
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Eagle Manufacturing Company: *See—*
Gillispie, John G.; and Mitchell, Donald J., 4,856,664, Cl. 215-31.000

Eagle-Picher Industries, Inc.: *See—*
Melchior, Wayne R.; and Talik, Mieczyslaw, 4,857,252, Cl 264-118.000

Easley, Mary J. M. Food covering. 4,856,660, Cl. 215-272.000

Eastman Kodak Company: *See—*
Begley, William J.; Carmody, Michael J.; and Buchanan, John M., 4,857,440, Cl. 430-382.000.
Belly, Robert T.; Mura, Albert J.; Esders, Theodore W.; and Burdick, Brent A., 4,857,271, Cl. 422-55.000.
Crandall, Robert P., 4,857,955, Cl. 355-328.000
Dedio, Edward L.; and Reeves, John W., 4,857,439, Cl. 430-349.000
Diehl, Donald R.; and Factor, Ronda E., 4,857,446, Cl. 430-510.000
Helfer, Jeffrey L., 4,857,054, Cl. 604-102.000.
Pohlman, James M.; and Manico, Joseph A., 4,857,964, Cl. 355-40.000.
Rueping, John E., 4,857,940, Cl. 346-75.000.
Rule, Mark; Fagerburg, David R.; and Watkins, Joseph J., 4,857,629, Cl. 528-217.000.
Salzman, Catherine A.; and Muszak, Martin F., 4,857,471, Cl. 436-43.000
Shih, Liang, 4,857,781, Cl. 310-12.000.
Simons, Michael J., 4,857,448, Cl. 430-544.000.
Wirt, Michael L.; Sangregory, Jude; and Bridges, Mark E., 4,858,003, Cl. 358-102.000.

Eastrock Technology, Inc.: *See—*
Pietro, Michael S., 4,858,089, Cl. 362-294.000.

Eaton Corporation: *See—*
Baran, Mich S.; Beihoff, Bruce C.; Damiano, Michael A.; Hansen, James E.; Hastings, Jerome K.; Slomczewski, Allen J.; and Tennies, Charles J., 4,857,837, Cl. 324-117.00R.
Breen, Michael T., 4,856,893, Cl. 356-5.000.
Hastings, Jerome K.; Beihoff, Bruce C.; and Juds, Mark A., 4,857,841, Cl. 324-208.000.
Sabroff, Alvin M.; and Douglas, James R., 4,856,167, Cl. 29-159.200.

Ebata, Yoshihiro; Kouyama, Masanori; Tamari, Nobuyuki; and Kawamoto, Takamichi, to Japan as represented by Director General of Agency of Industrial Science and Technology. Adhesive for oxide ceramics and method of bonding oxide ceramics using it. 4,857,486, Cl. 501-21.000.

Eberhardt, Andre ; Dominiak, Serge; Berveiller, Marcel; Lucas, Jean P.; and Guyon, Robert P. Y., to Cimulec, S.A. Compensating element for stresses of thermal or mechanical orgin, especially for printed circuits, and process for making such an element employed in a printed circuit. 4,857,387, Cl. 428-209.000.

Ebinuma, Tadayoshi: *See—*
Kageyama, Shuhei; Yamamoto, Tadashi; and Ebinuma, Tadayoshi, 4,856,693, Cl. 226-127.000.

Ec Erdolchemie GmbH: *See—*
Ochel, Klaus-Peter; Krupp, Joachim; Heger, Josef; and Schweitzer, Martin, 4,856,985, Cl. 431-202.000.

ECC International Limited: *See—*
Goodman, Howard, 4,857,491, Cl. 501-148.000.

Eck, Werner, to Kleindienst GmbH Firma. Batch washing machine. 4,856,302, Cl. 68-27.000.

Eckelt, Ulrich: *See—*
Brinkmeier, Friedhelm; and Eckelt, Ulrich, 4,856,396, Cl. 83-300.000.

Edgerton, Cathy J.: *See—*
Jensen, William T., Brown, Vincent B.; Edgerton, Cathy J.; and Masterson, Robert W., 4,857,002, Cl. 439-76.000.

Edison, David H.: *See—*
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,856,146, Cl. 19-0.350.
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,856,147, Cl. 19-0.350.
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,857,385, Cl. 428-189.000.

Eduard Kusters Maschinenfabrik GmbH & Co. KG: *See—*
Kusters, Karl-Heinz, 4,856,157, Cl. 29-116.200.

Edward W. Andrew, Ltd.: *See—*
Andrew, Edward D.; and Hayhurst, Peter, 4,856,769, Cl. 271-193.000.

Effle, Michael D. Powder cuff. 4,856,112, Cl. 2-59.000.

Egeland, Terje: *See—*
Sundell, Hans E.; Egeland, Terje; Johnson, Sten E.; and Friman, Erik B., 4,858,118, Cl. 364-243.400.

Egerer, Peter; Crueger, Wulf; and Schmidt-Kastner, Gunter, to Bayer Aktiengesellschaft. Continuous process for the enzymatic preparation of isomaltulose. 4,857,461, Cl. 435-94.000.

Egri II, John D. Process for abatement of asbestos fibers. 4,857,085, Cl. 55-83.000.

EIC Labotatories, Inc.: *See—*
Abraham, Kuzhikalail M.; and Pasquariello, David M., 4,857,423, Cl. 429-194.000.

Eichenauer, Herbert; Buding, Hartmuth; Doring, Joachim; Casper, Rudolf; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Thermoplastic moulding compositions of ABS and hydrogenated nitrile rubber. 4,857,591, Cl. 525-74.000.

Eickmann, Karl. Airborne vehicle with hydraulic drive and control. 4,856,732, Cl. 244-2.000.

Einerson, Mark A.: *See—*
Tran, Kha M.; and Einerson, Mark A., 4,857,341, Cl. 426-98.000.

Eizen, Noach, to Mul-T-Lock, Ltd. Pin tumbler lock. 4,856,309, Cl. 70-359.000

Ekins, Roger Philip: *See—*
Dakubu, Salifu, 4,857,475, Cl. 436-546.000.

Ekwall, C. Raymond: *See—*
Reiter, Ralph H.; and Ekwall, C. Raymond, 4,857,571, Cl. 524-248.000

El Paso Technologies Company: *See—*
Lovrenich, Rodger T., 4,858,102, Cl. 364-136.000.

El-Ayat, Khaled A.; El Gamal, Abbas; and Mohsen, Amr M., to Actel Corporation. Testing apparatus and diagnostic method for use with programmable interconnect architecture. 4,857,774, Cl. 307-465.000.

Electric Power Research Institute, Inc.: *See—*
Hart, George W.; Kern, Edward C., Jr.; and Schweppe, Fred C., 4,858,141, Cl. 364-483.000.

Electrical & Musical Industries Limited: *See—*
Voles, Roger, 4,857,934, Cl. 342-90.000.

ElectroScan Corporation: *See—*
Lambert, Kenneth, 4,857,743, Cl. 250-505.100.

El Gamal, Abbas: *See—*
El-Ayat, Khaled A.; El Gamal, Abbas; and Mohsen, Amr M., 4,857,774, Cl. 307-465.000.

Elliott, John, to Herb Shaw & Sons Limited. Side loading trailer body. 4,856,843, Cl. 296-181.000.

Ellis Corporation: *See—*
Broadbent, John, 4,856,301, Cl. 68-12.00R.

Ellis, Roger D.: *See—*
Straw, Alan; and Ellis, Roger D., 4,857,241, Cl. 261-152.000.

Elna Company Ltd.: *See—*
Morimoto, Takeshi; Endoh, Eiji; and Takemiya, Satoshi, 4,858,078, Cl. 361-527.000.

Elop Electrooptics Industries Ltd.: *See—*
Shoshan, Itamar, 4,858,239, Cl. 372-9.000.

Elpatronic AG. *See—*
Alznauer, Kurt, 4,856,312, Cl. 72-133.000.
Stieger, Othmar, 4,856,632, Cl. 192-56.00F.

Elsasser, Glenn R., to Western Profiles Limited. Window frame member or rigid plastics material. 4,856,239, Cl. 52-98.000.

Elsayed, Alaaeldeen M.: *See—*
Shamsuddin, Abulkalam M.; Elsayed, Alaaeldeen M.; and Jockle, Glenn A., 4,857,457, Cl. 435-7.000.

Emerson Electric Co.: *See—*
Maurice, James; Collins, David J.; Hall, Michael O.; and McLoughlin, Peter D., 4,857,819, Cl. 318-778.000.

Emhart Industries, Inc.: *See—*
Lipp, Ellis P., 4,857,678, Cl. 200-16.00R.

Emmerling, Winfried; and Podola, Tore, to Henkel Kommanditgesellschaft auf Aktien. Alkoxysilane-terminated, moisture-hardening polyurethanes and their use in adhesives and sealing compositions. 4,857,623, Cl. 528-28.000.

Emody, Kenneth J., to Jet Spray Corp. Post mix dispenser. 4,856,676, Cl. 222-66.000.

Endo, Yukio: *See—*
Koike, Hirofumi; Endo, Yukio; and Mitsuhashi, Tadashi, 4,856,858, Cl. 350-6.600.

Endoh, Eiji: *See—*
Morimoto, Takeshi; Endoh, Eiji; and Takemiya, Satoshi, 4,858,078, Cl. 361-527.000.

Energy Conservation Innovations, Inc.: *See—*
Burnett, Lauren W., 4,856,713, Cl. 239-113.000.

Eng, Benjamin, Jr.; and Winsor, Margaret E. Modular high frequency power transformer. 4,857,878, Cl. 336-192.000.

Engel, Donald F.; and Gieseke, Steven S., to Donaldson Company, Inc. Air transfer system. 4,856,826, Cl. 285-181.000.

Engelmann, Theodore R.: *See—*
Chen, Shu P.; Engelmann, Theodore R.; and Oltmann, Harold D., 4,857,257, Cl. 264-310.000.

English Electric Valve Company Limited: *See—*
Maitland, Arthur; and Weatherup, Clifford R., 4,858,237, Cl. 372-2.000.

Enichem Tecnoresine, S.p.A.: *See—*
Petri, Alberto, 4,857,628, Cl. 528-203.000.

Enomoto, Ryoji: *See—*
Kamae, Tuneyoshi; and Enomoto, Ryoji, 4,857,737, Cl. 250-370.090.

Enquay Pharmaceutical Associates: *See—*
Korol, Bernard; and Nathan, Paul, 4,857,334, Cl. 424-445.000.

Ensinger, Helmut: *See—*
Weber, Karl-Heinz; Schneider, Claus; Walther, Gerhard; Hinzen, Dieter; Kuhn, Franz J.; Lehr, Erich; Ensinger, Helmut; and Troger, Wolfgang, 4,857,528, Cl. 514-252.000.

Enviro-Spray Systems, Inc.: *See—*
Dierick, Tony F. J.; Kite, Nicholas J.; and Moran, Michael J., 4,857,029, Cl. 446-220.000.

Eoga, Anthony B. J., to Warner-Lambert Company. Monopersulfate-containing cleansers. 4,857,224, Cl. 252-99.000.

EPCO Products, Inc.: *See—*
Aichele, William H.; Hopkins, James O., Jr.; and Krauskopf, Dale H., 4,856,850, Cl. 303-20.000.

Epp, Lyda. Nursing device for infant with cleft lip or cleft palate. 4,856,663, Cl. 215-11.100.

Eppstein, Deborah A., to Syntex (U.S.A.) Inc. Synergistic antiviral composition. 4,857,316, Cl. 424-85.600.

ERA Patents Limited: *See—*
Coleman, Raymond L.; and Kurn, Peter A., 4,857,856, Cl. 324-547.000.

Erdelitsch, Herbert; Machalitzky, Otto; and Prang, Josef-Elmar, to SWE Auto-Electric GmbH. Switch for energizing an electric motor of a wiper system. 4,857,815, Cl. 318-443.000.

Eri, Sigrid; and Goodwin, James G., Jr., to Gas-To-Oil, Inc. Process for production of hydrocarbons. 4,857,559, Cl. 518-700.000.

Eriksson, Arne, to Beloit Corporation. Rotating disc screen. 4,857,180, Cl. 209-664.000.

Eriksson, Lars, to Lagergren, Lars, a part interest. Device for fastening doors and windows to a wall opening. 4,856,241, Cl. 52-217.000

Erk, Kaya, to Maxconn, Inc. Support device for wires in multi-contact connectors. 4,857,017, Cl. 439-695.000.

Ernst, Donald M., to Thermacore, Inc. Alkali metal thermoelectric genreator. 4,857,421, Cl. 429-104.000.

Ernst Leitz Wetzlar GmbH: *See—*
Broemer, Heinz; Huber, Werner; and Meinert, Norbert, 4,857,487, Cl. 501-44.000.

Ernst, Richard J.: *See—*
Blucher, William J.; Ernst, Richard J.; and Peterson, Francis C., 4,856,951, Cl. 411-178.000.

Ersfeld, Dean A.; Hansen, Paul E.; Scholz, Matthew T.; Bartizal, Dennis C.; Reed, Katherine E.; Larson, Wayne K.; Sandvig, Timothy C.; and Buckanin, Richard S., to Minnesota Mining and Manufacturing Company. Curable resin coated sheets having reduced tack. 4,856,502, Cl. 128-90.000.

Esders, Theodore W.: *See—*
Belly, Robert T.; Mura, Albert J.; Esders, Theodore W.; and Burdick, Brent A., 4,857,271, Cl. 422-55.000.

Esterbauer Josef: *See—*
Herzig, Christian; Deubzer, Bernward; Frey, Volker; and Esterbauer Josef, 4,857,608, Cl. 525-476.000.

Estes, Mark W., to International Business Machines Corp. Operator access to monitoring applications. 4,858,152, Cl. 364-550.000.

Esumi, Kimio: *See—*
Takaya, Takao; Takasugi, Hisashi; Esumi, Kimio; Kuno, Atsushi; Sakai, Hiroyoshi; Maeda, Kazuhiro; and Sakamoto, Yoshie, 4,857,527, Cl. 514-237.200.

Etesin: *See—*
Wolf, Pierre, 4,856,265, Cl. 56-320.200.

Ethyl Corporation: *See—*
Belk, Thomas J., 4,857,173, Cl. 209-2.000.
Schleifstein, Robert A., 4,857,597, Cl. 525-151.000.

Ethylk Petroleum Additives, Inc.: *See—*
Papay, Andrew G.; and Hartley, Rolfe J., 4,857,214, Cl. 252-32.500.

Eto, Kunihiko; Takeuchi, Shiro; Mori, Yutaka; Tanooka, Shigeo; Kodama, Kazumasa; and Matsumoto, Tsutomu, to Toyoda Koki Kabushiki Kaisha. Device for controlling steering force in power steering apparatus. 4,858,134, Cl. 364-424.050.

Evans, David M. A.: *See—*
Minor, Philip D.; Evans, David M. A.; Schild, Geoffrey C.; Almond, Jeffrey W.; and Ferguson, Morag, 4,857,634, Cl. 530-324.000

Evans, Derek N.: *See—*
Borthwick, David A.; Kirk, Barrie E.; Evans, Derek N.; Biggadike, Keith; and Stephenson, Leslie, 4,857,531, Cl. 514-262.000.

Evans, Griffith S., to Scot, Incorporated. Initiator device with adiabatic compression ignition. 4,856,433, Cl. 102-530.000.

Evans, Robert B. Swim fin with flexible fin member having movable tips. 4,857,024, Cl. 441-64.000.

Evans, Steven C. Fishing lure. 4,856,223, Cl. 43-42.000.

Everding, Richard J.: *See—*
Lancaster, David R.; and Everding, Richard J., 4,856,834, Cl. 294-15.000.

Everett, Hobart R., Jr.; and Gilbreath, Gary A., to United States of America, Navy. Intelligent security assessment system. 4,857,912, Cl. 340-825.300.

Everpure, Inc.: *See—*
Thomsen, Jack W.; Regunathan, Perialwar; and Tadlock, John W., 4,857,189, Cl. 210-232.000.

Exner, Rainer: *See—*
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Expert System Technologies, Inc., The: *See—*
Tornberg, Neal E., 4,856,335, Cl. 73-597.000.

Exxon Chemical Patents Inc.: *See—*
Gutierrez, Antonio; and Lundberg, Robert D., 4,857,217, Cl. 252-47.000.
Hazelton, Donald R.; and Shulman, Cindy B., 4,857,409, Cl. 428-494.000.

Exxon Research and Engineering Company: *See—*
Black, Laura E.; and Wan, Wan-Kei, 4,857,201, Cl. 210-655.000.
Bradley, John S.; and Hill, Ernestine W., 4,857,492, Cl. 502-117.000.
Irani, Cyrus A.; Cozewith, Charles; and Kasegrande, Stephen S., 4,857,633, Cl. 528-498.000.
Madden, Patrick C., II, 4,857,283, Cl. 423-228.000.

Eye Research Institute of Retina Foundation: *See—*
Pflibsen, Kent P.; and Milbocker, Michael T., 4,856,891, Cl. 351-210.000.

Factor, Ronda E.: *See—*
Diehl, Donald R.; and Factor, Ronda E., 4,857,446, Cl. 430-510.000.

Faes, Steven M., to SCI Systems, Inc. Printing device and method employing latent electrostatic image development and separate toner-brush operational cycle. 4,857,945, Cl. 346-160.100.

Fagerburg, David R.: *See—*
Rule, Mark; Fagerburg, David R.; and Watkins, Joseph J., 4,857,629, Cl. 528-217.000.

Fagerlie, Richard A.: *See—*
Neff, James A.; and Fagerlie, Richard A., 4,856,560, Cl. 137-884.000.

Fahey, Timothy E.: *See—*
Au, Andrew N.; Deep, Marguerite E.; Fahey, Timothy E.; and Jacobs, Stephen M., 4,857,880, Cl. 338-22.00R.

Fahnlander, John G.: *See—*
Koch, Vernon F.; Fahnlander, John G.; and Wanninger, Lester A., 4,857,715, Cl. 235-456.000.

Failure Analysis Associates, Inc.: *See—*
Mercaldi, David W., 4,856,233, Cl. 51-281.00R.

Fairchild Semiconductor Corporation: *See—*
Herndon, William H., 4,857,772, Cl. 307-463.000.

Falaas, Dennis O.: *See—*
Ginkel, Scott T.; and Falaas, Dennis O., 4,857,372, Cl. 428-42.000.

Falkevich, Sergei A.; Naumov, Mikhail V.; Shkarlet, Jury M.; Sukhorukov, Dmitry V.; Fedotov, Viktor N.; and Sazonov, Jury I. Ultrasonic flaw detector. 4,856,336, Cl. 73-598.000.

Falls, Andrew H.: *See—*
Kuhlman, Myron I.; Borchardt, John K.; and Falls, Andrew H., 4,856,589, Cl. 166-273.000.

Fang, Si-Ming: *See—*
Lau, John J.; and Fang, Si-Ming, 4,856,957, Cl. 414-404.000.

Fanuc Ltd.: *See—*
Aso, Toshiyuki; Kita, Yuuki; and Watanabe, Sadahiro, 4,857,688, Cl. 219-69.140.
Toyoda, Kenichi; Mizuno, Tohru; Torii, Nobutoshi; Kanda, Yuichi; and Morikawa, Shigehiro, 4,857,700, Cl. 219-124.340.

Farlotti, Laurent A., to Benson S.A. Pressure wheel device for moving a print medium in a plotter or printer. 4,856,770, Cl. 271-274.000.

Farr, Aaron V., to Abex Corporation. Optical guidance system and apparatus. 4,856,896, Cl. 356-153.000.

Farrell, James P., to Litton Systems Canada Limited. Dense LED matrix for high resolution full color video. 4,857,801, Cl. 313-500.000.

Farris, David D.: *See—*
Austin, Paul E.; Farris, David D.; Reedy, James D.; Blevins, Charles; and Ramdatt, Philbert E., 4,857,583, Cl. 524-761.000.

Fateley, William G.; and Tilotta, David C., to D.O.M. Associates, Inc. Raman spectrometer having Hadamard electrooptical mask and diode detector. 4,856,897, Cl. 356-301.000.

Faucher, Pascal: *See—*
Bitller, Jean-Pierre; Faucher, Pascal; Hang-Hu, Monique; and Pelet, Andre , 4,858,068, Cl. 361-380.000.

Fawzi, Mahdi B.: *See—*
Song, Suk-zu; Rashidbaigi, Zahra A.; Nesbitt, Russell U.; and Fawzi, Mahdi B., 4,857,313, Cl. 424-81.000.

Fedele, Nicola J., to General Electric Company. Computer device display system using conditionally asynchronous memory accessing by video display controller. 4,858,107, Cl. 364-200.000.

Federal-Mogul Corporation: *See—*
Boyers, Douglas B.; and Wilkening, Steven R., 4,856,794, Cl. 277-37.000
Haynie, Robert N., 4,856,235, Cl. 51-289.00R.

Fedotov, Viktor N.: *See—*
Falkevich, Sergei A.; Naumov, Mikhail V.; Shkarlet, Jury M.; Sukhorukov, Dmitry V.; Fedotov, Viktor N.; and Sazonov, Jury I., 4,856,336, Cl. 73-598.000.

Feigen, Larry P.: *See—*
Adams, Steven P.; Feigen, Larry P.; and Miyano, Masateru, 4,857,508, Cl. 514-18.000.

Feinberg, Martin R.: *See—*
Scelba, Stephen S.; and Feinberg, Martin R., 4,856,306, Cl. 70-68.000.

Felix, Ian C.: *See—*
Hassel, Michael J.; Felix, Ian C.; and Camp, Claude E., 4,858,034, Cl. 360-51.000.

Fellinger, Johannes: *See—*
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Felton, Donald W.: *See—*
Carr, Timothy H.; and Felton, Donald W., 4,856,705, Cl. 229-109.000.

Fender, Janet S.; and Avizonis, Petras V., to United States of America, Air Force. Dynamically matched optical filtering in a multiple telescope imaging system. 4,856,884, Cl. 350-557.000.

Fenton, Richard M., to General Electric Company. Method for reinforcing conical shaped object. 4,857,125, Cl. 156-169.000.

Ferco International: *See—*
Prevot, Gerard, 4,856,832, Cl. 292-341.190.

Fergason, James L., to Manchester R & D Partnership. Fluorescent colored encapsulated liquid crystal apparatus using enhanced scattering. 4,856,876, Cl. 350-350.00F.

Ferguson, Morag: *See—*
Minor, Philip D.; Evans, David M. A.; Schild, Geoffrey C.; Almond, Jeffrey W.; and Ferguson, Morag, 4,857,634, Cl. 530-324.000.

Ferguson, Robert W.; and Andors, Derik K., to Vermont Castings, Inc. High efficiency solid fuel burning stove. 4,856,491, Cl. 126-77.000.

Ferrell, William J.: *See—*
Bernhardt, Randal J.; and Ferrell, William J., 4,857,305, Cl. 424-59.000.

Ferriss, Lincoln S.; and Weitzner, Mark A., to Kearfott Guidance & Navigation Corporation. Velocity control system using piezoelectric transducers. 4,856,901, Cl. 356-350.000.

Fiberoptic Sensor Technologies, Inc.: *See—*
Pidorenko, John; Hoffman, Alan R.; Hodge, Robert F.; and Wang, Wei-Min, 4,856,317, Cl. 73-4.00R.

Field, Anthony J., to U.S. Philips Corporation. Method of and apparatus for processing video signals. 4,858,010, Cl. 358-160.000.

Fields, Lary L., to Barber-Colman Company. Electronic integrator using an operational amplifier and with alleviation of wind-up. 4,858,169, Cl. 364-829.000.

Figgie International Inc.: *See—*
Nicholson, Robert J.; and Jape, Anthony D., 4,856,642, Cl. 198-365.000.

Fikse, James A.: *See—*
Baker, Glen; Chau, Albert W.; Fikse, James A.; and Mercer, John E., 4,856,600, Cl. 175-26.000.

Filbert, Jacques, to Leviton Manufacturing Company, Inc. Strain relief device. 4,857,674, Cl. 174-135.000.

Filowitz, Mark S.: *See—*
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Fimeri, Garry G. L., to Britax Rainsfords Pty. Ltd. Mirror orientation control means. 4,856,885, Cl. 350-633.000.

Fina Technology, Inc.: *See—*
Sosa, Jose M.; and Morris, Jeffrey, 4,857,587, Cl. 525-53.000.

Fincher, Harold L., Sr. Fishing rig retainer. 4,856,224, Cl. 43-43.120.

Fine Metals Export Corporation Limited: *See—*
Davis, Edward E., 4,857,107, Cl. 75-97.00A.

Fink, Heinz: *See—*
Langen, Manfred; and Fink, Heinz, 4,856,270, Cl. 57-281.000.

Finlay, Patrick A., to Alkmar Products Limited. Apparatus for rolling circular dough product. 4,857,349, Cl. 426-502.000.

Finter, Jurgen: *See—*
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Fioroli, Mario: *See—*
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Firestone Tire & Rubber Company, The: *See—*
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Still, Donald O.; Hovance, Hubert T.; and Burley, George J., 4,857,123, Cl. 156-133.000.

Fischel, Mario. Method of playing a game of economics and finance. 4,856,788, Cl. 273-256.000

Fischer, Horst; Wichmann, Werner; Wilhelms, Gernot; and Wiltmann, Guenter, to Kabel-und Metallwerke AG. Cutting curved mold surfaces. 4,856,947, Cl. 409-119.000.

Fischer, Karl; Kock, Werner; and Tuider, Wolfgang, to U.S. Philips Corporation. System for the recording and/or playback of signals. 4,858,051, Cl. 360-137.000.

Fischer, Volker: *See—*
Rosebrock, Henning; Jung, Johann; Rademacher, Wilhelm; Luib, Max; Fischer, Volker; Hagen, Helmut; Kohler, Rolf-Dieter; Markert, Juergen; and Watanabe, Akihide, 4,857,103, Cl. 71-94.000.

Fish, Elson B.: *See—*
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Fisher, Lynn E.; Wandler, Richard A.; and Frank, James P., to General Electric Company. Method of assembling a switch device with a supporting means thereof. 4,856,182, Cl. 29-622.000.

Fisher & Paykel: *See—*
Duncan, Gerald D., 4,857,814, Cl. 318-281.000.

Fisher Scientific Company: *See—*
Lentz, David; Wilson, Larry; and Deckert, Curt, 4,857,050, Cl. 604-67.000.
Van Benschoten, Peter; and Burkett, David, 4,856,972, Cl. 417-477.000.

Fisher, Wayne G., to Texas Instruments Incorporated. Processing apparatus for wafers. 4,857,132, Cl. 156-345.000.

Fister S.p.A: *See—*
Palu, Attilio D., 4,856,137, Cl. 15-250.310.

Fitch, Thomas J.; Goins, Neal R.; and Spratt, Ray S., to Mobil Oil Corporation. Method for estimating shear wave reflection data from acquired compressional wave reflection data. 4,858,202, Cl. 367-75.000.

Fitzpatrick Company, The: *See—*
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Flachbarth, Charles T.: *See—*
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Flachglas Aktiengesellschaft: *See—*
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Von Reis, Wolf; Derner, Paul; Quenett, Rudolf; and Armbruster, Guenter, 4,857,376, Cl. 428-83.000.

Flagman, Inc.: *See—*
McBride, William B.; Wilson, William R., Jr.; Tomlinson, John C.; McCarthy, John A.; Kochanowsky, Eugene W.; Hendricks, Jefferson D.; and Houle, Arthur J., 4,857,921, Cl. 340-912.000.

Flak, Marek: *See—*
Cieslik, Jerzy; Flak, Marek; Kuczka, Eugeniusz; Oles, Franciszek; Marszycki, Zdsizlaw; and Olender, Kornel, 4,856,940, Cl. 405-296.000.

Flanagan, Paul, to Gas Research Institute. Mixing rate controlled pulse combustion burner. 4,856,981, Cl. 431-1.000.

Fleming, Thomas W.; and Rose, Gary D., to Jensen General Corp. Quick connect-disconnect panel mounting means. 4,856,493, Cl. 126-299.00R.

Fletcher, Grant M.: *See—*
Horsey, Robert W.; Pilon, Laurent C.; Fletcher, Grant M.; and Horner, Arland W., 4,856,722, Cl. 242-18.00A.

Fleury, Paul. Method for forming a planar sheet or plate to a curved shape. 4,857,412, Cl. 428-577.000.

Flodman, Leif A.; and Gabrielsson, Per Erik G., to Dynobel A/S. Amino resin and a method for its production. 4,857,609, Cl. 525-497.000.

Flohr, Peter, to Heinrich Kopp GmbH & Co. KG. Electric adapter connector. 4,856,999, Cl. 439-52.000.

Florek, Stefan: *See—*
Becker-Ross, Helmut; Florek, Stefan; Kerstan, Felix; Moebius, Guenther; and Sanders, Horst, 4,856,898, Cl. 356-328.000.

Florio, Joseph J.: *See—*
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Flow Cytometry Standards Corporation: *See—*
Schwartz, Abraham, 4,857,451, Cl. 435-7.000.

FlowMole Corporation: *See—*
Baker, Glen; Chau, Albert W.; Fikse, James A.; and Mercer, John E., 4,856,600, Cl. 175-26.000.

Fluke, G. Gordon, Jr.: *See—*
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FMC Corporation: *See—*
Dick, Chris C.; Schwartz, Barry; McMunn, Bert D.; and Zeh, Peter H., 4,857,287, Cl. 423-315.000.

Focke & Co. (GmbH & Co.): *See—*
Focke, Heinz; and Liedtke, Kurt, 4,856,538, Cl. 131-282.000.

Focke, Heinz; and Liedtke, Kurt, to Focke & Co. (GmbH & Co.). Process and apparatus for testing cigarettes. 4,856,538, Cl. 131-282.000

Folcher, Gerard, deceased: *See—*
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Folcher, Vereina, heiress, Vincent Folcher and Marc Folcher, heirs: *See—*
Bridenne Alaux, Martine; Marquet-Ellis, Hubert; Keller, Nelly; and Folcher, Gerard, deceased, 4,857,294, Cl. 423-489.000.

Forbes, Christopher B. Protective face shield. 4,856,535, Cl. 128-857.000.

Ford Aerospace & Communications Corporation: *See—*
Chall, Louis E., Jr., 4,858,072, Cl. 361-388.000.
McNutt, Michael J., 4,857,979, Cl. 357-24.000.

Ford, Cheryl A., to GTE Products Corporation. Fluorescent lamp with silica layer. 4,857,798, Cl. 313-487.000.

Ford Motor Company: *See—*
Boaz, Premakaran T., 4,857,096, Cl. 65-60.510.
Brown, Franklin I., 4,857,095, Cl. 65-60.300.
Janotik, Adam M., 4,857,680, Cl. 200-61.45R.
Rosen, Stanley D., 4,856,383, Cl. 74-869.000.
Stockton, Thomas R., 4,856,369, Cl. 74-665.0GE.
Ting, Loi-Lou; Chui, Granger K.; and King, Edward T., 4,856,466, Cl. 123-90.330.

Ford New Holland: *See—*
Beim, Rudolf, 4,856,375, Cl. 74-745.000.

Ford New Holland, Inc.: *See—*
Clevenger, James T., Jr.; Ashcroft, Dale A.; Strosser, Richard P.; and Anderson, Mark S., 4,856,612, Cl. 180-273.000

Ford, Warren T.; Chandran, Rama S.; Hassanein, Mahmoud; and Turk, Hayrettin. Polymer latexes containing metal ions and complexes. 4,857,493, Cl. 502-159.000.

Fordyce, Donald E. Lettuce tearing machine. 4,856,715, Cl. 241-5.000.

Forrest, Stephen R., to University of Southern California. Avalanche photodiode with floating guard ring. 4,857,982, Cl. 357-30.000.

Forsythe, Carl; Dorminy, John L.; and Raymon, Joseph W., to Gorman-Rupp Company, The. Fluid powered diaphragm pump with cycle timer. 4,856,969, Cl. 417-395.000.

Fospur Limited: *See—*
Brookes, Gerald F.; and Spencer, Lynne, 4,857,221, Cl. 252-61.000.

Foster, Danny S.: *See—*
Brodersen, Cole T.; and Foster, Danny S., 4,856,763, Cl. 267-131.000.

Fottler, Stanley A. Leadless ceramic chip carrier. 4,857,988, Cl. 357-74.000.

Fouke, Herbert A., to Manville Corporation. Luminaire with uplight control. 4,858,091, Cl. 362-332.000.

Foulkes, Graham S.: *See—*
O'Sullivan, Terence J.; Mould, George W.; Armstrong, David E.; Foulkes, Graham S.; and Davis, Michael B., 4,856,848, Cl. 297-391.000.

Fournier, Serge, to Bell-Northern Research, Ltd. Work ordering routine for use in a method of routing. 4,858,143, Cl. 364-491.000.

Fox, Joseph R.: *See—*
Benton, Kenneth C.; Pierman, David A.; and Fox, Joseph R., 4,857,395, Cl. 428-306.600.

Framatome: *See—*
Pol, Dejeux; and Guy, Desfountaines, 4,857,265, Cl. 376-463.000.

France, Paul W.; Carter, Steven F.; and Moore, Martin W., to British Telecommunications public limited company. Cables comprising optical fibres of halide glass. 4,856,868, Cl. 350-96.230

France/Scott Fetzer Company: *See—*
McMillan, Thomas A.; Brooks, Carl A.; and Smith, Alan M., 4,858,099, Cl. 363-97.000.

Frances, Jean-Marc: *See—*
Denis, Philippe; and Frances, Jean-Marc, 4,857,657, Cl. 560-193.000.

Francis, Sam E., Jr. Chemical thermal pack and method of making same. 4,856,651, Cl. 206-219.000.

Francis, Timothy M. Method and means for releasable attachment of mud flap on vehicle. 4,856,816, Cl. 280-851.000.

Frank, E. Wesley: *See—*
MacLeod, Edwin A.; and Frank, E. Wesley, 4,856,740, Cl. 248-97.000.

Frank, James P.: *See—*
Fisher, Lynn E.; Wandler, Richard A.; and Frank, James P., 4,856,182, Cl. 29-622.000

Frank, Pat P., heir: *See—*
Frank, Richard E., deceased; and Frank, Pat P., heir, 4,857,670, Cl. 174-68.300.

Frank, Richard E., deceased; and by Frank, Pat P., heir. Wiring duct unit. 4,857,670, Cl. 174-68.300.

Frank, Timothy C.: *See—*
Robbins, Lanny A.; and Frank, Timothy C., 4,857,084, Cl. 55-58.000.

Frankel, Gail. Handle support assembly. 4,856,744, Cl. 248-215.000

Franklin, Frederick F. Protective circuits and devices for the prevention of fires. 4,858,054, Cl. 361-57.000.

Franklin, John B.: *See—*
Clish, Frank; and Franklin, John B., 4,858,135, Cl. 364-426.040

Franninge, Thomas K. Method and apparatus for cleaning a pipe system provided for the operation of baths. 4,857,112, Cl. 134-22.120.

Frasier, Richard A.: *See—*
Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; Frasier, Richard A.; Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; and Olmstead, Neil R., 4,858,011, Cl. 358-181.000.

Fray, Derek J.; and Godsell, Alan J., to National Research Development Corporation. Separating a ferro alloy. 4,857,156, Cl. 204-64.00R.

Frazier, Jimmy R.: *See—*
Burford, Charles E.; and Frazier, Jimmy R., 4,856,258, Cl. 53-138.00A.

Frederick, James R.: *See—*
Poblete, Rudolph G.; Rindoks, Kurt; and Frederick, James R., 4,856,420, Cl. 98-115.300.

Freeman, David L. Adjustable length extension. 4,856,388, Cl. 81-177.200.

Freeman, Lucius J.; and Gagen, Paul F., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical fiber connecting means. 4,856,866, Cl. 350-96.210.

Freeman, Robert A.: *See—*
Frost, Peter L. J.; Freeman, Robert A.; Warren, John A.; and Keeble, Peter J., 4,856,760, Cl. 254-134.400.

Frei, Bruno; O'Sullivan, Anthony C.; and Gehret, Jean-Claude, to CIBA-GEIGY Corporation. 13β-alkylmilbemycin derivatives for controlling parasites of animals and plants. 4,857,509, Cl. 514-30.000.

Frenette, Richard; Gauthier, Jacques-Yves; Young, Robert N.; Zamboni, Robert; Kakushima, Masatoshi; and Verhoeven, Thomas R., to Merck Frosst Canada, Inc. Stereoselective synthesis of leukotriene antagonists. 4,857,659, Cl. 562-426.000.

Freundlich, Lawrence F.; Murthy, Vadiraja V.; and Karmen, Arthur, to Albert Einstein College of Medicine of Yeshiva University, a Division of Yeshiva University. Spectrophotometric method for kinetic absorbance measurements in two-phase enzyme immunoassay and apparatus therefor. 4,857,454, Cl. 435-7.000.

Frey, Volker: *See*—
Herzig, Christian; Deubzer, Bernward; Frey, Volker; and Esterbauer Josef, 4,857,608, Cl. 525-476.000.
Wolfgruber, Matthias; Deubzer, Bernward; and Frey, Volker, 4,857,582, Cl. 524-730.000.

Fridland, Ida: *See*—
Wilkus, Edward V.; Fridland, Ida; and Betts, Joseph E., 4,857,673, Cl. 174-110.0PM.

Friedrich Grohe Armaturenfabrik GmbH & Co.: *See*—
Mennigmann, Kurt, 4,856,556, Cl. 137-625.400.

Friman, Erik B.: *See*—
Sundell, Hans E.; Egeland, Terje; Johnson, Sten E.; and Friman, Erik B., 4,858,118, Cl. 364-243.400.

Fritschi, Edgar: *See*—
Satzinger, Gerhard; Hermann, Manfred; Fritschi, Edgar; and Weiershausen, Ute, 4,857,662, Cl. 564-168.000.

Frost, Peter L. J.; Freeman, Robert A.; Warren, John A.; and Keeble, Peter J., to British Telecommunications. Control method and apparatus. 4,856,760, Cl. 254-134.400.

Frymaster Corporation, The: *See*—
Waugh, Gerald; Myers, Charley; Davis, John; and Sullivan, John, 4,858,119, Cl. 364-400.000.

FSI International, Inc.: *See*—
Syverson, Daniel J., 4,857,142, Cl. 156-646.000.

Fuhrmann, Peter: *See*—
Henning, Wolfgang; Meckel, Walter; and Fuhrmann, Peter, 4,857,565, Cl. 523-343.000.

Fuji Photo Film Co., Ltd.: *See*—
Abe, Akira; Nakajima, Junya; Takase, Haruo; Uenaka, Kazushige; and Otomo, Ruyzi, 4,857,441, Cl. 430-393.000.
Aono, Toshiaki; Shibata, Takeshi; and Takeno, Kazuma, 4,857,443, Cl. 430-496.000.
Fujita, Yoshihiro; and Nishikawa, Toshihiro, 4,857,442, Cl. 430-393.000.
Hirose, Takeshi; Ogawa, Tadashi; and Furutachi, Nobuo, 4,857,444, Cl. 430-505.000
Kaida, Shinichi, 4,857,941, Cl. 346-76.0PH.
Kato, Eiichi; and Ishii, Kazuo, 4,857,431, Cl. 430-91.000
Nishikawa, Yasuo; Miyazuka, Hajime; and Tsuji, Nobuo, 4,857,402, Cl. 428-336.000.
Ogawa, Hiroshi; and Tamai, Yasuo, 4,857,388, Cl. 428-212.000.
Ogawa, Tadashi; and Takahashi, Osamu, 4,857,449, Cl. 430-546.000.
Ogiso, Takasi; Monma, Yoshiyuki; and Aono, Toshiaki, 4,857,961, Cl. 355-27.000.
Ohara, Yuji; and Watanabe, Hideo, 4,858,019, Cl. 358-474.000.
Okada, Kazuo; and Konishi, Masahiro, 4,858,032, Cl. 360-91.000.
Saotome, Shigeru; and Nakajima, Nobuyoshi, 4,857,733, Cl. 250-327.200.
Satou, Hiroyuki, 4,857,962, Cl. 355-29.000.
Shimura, Kazuo; and Ishida, Masamitsu, 4,857,732, Cl. 250-327.200.
Sugaya, Fumio, 4,857,272, Cl. 422-65.000.
Tabei, Masatoshi, 4,858,025, Cl. 358-310.000.
Takase, Haruo; Uenaka, Kazushige; Abe, Akira; and Fujita, Yoshihiro, 4,857,950, Cl. 354-324.000.
Tamoto, Koji; and Ono, Mitsunori, 4,857,447, Cl. 430-544.000.
Usami, Toshimasa; Shimomura, Akihiro; Tatsuta, Sumitaka; and Hatakeyama, Seiji, 4,857,501, Cl. 503-200.000.
Yoshida, Tetsuo; and Heki, Tatsuo, 4,857,445, Cl. 430-509.000.

Fuji Xerox Co., Ltd.: *See*—
Tanaka, Hiroshi, 4,858,018, Cl. 358-456.000.

Fujii, Akira: *See*—
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,857,953, Cl. 354-475.000.

Fujii, Katsuhiko; Sato, Shiro; Miyanaga, Yasuhiro; Asami, Heizo; Takekoshi, Susumu; and Kasai, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Disk wheel for a motor vehicle. 4,856,849, Cl. 301-63.00R.

Fujii, Koichi: *See*—
Takata, Akira; and Fujii, Koichi, 4,857,773, Cl. 307-465.000

Fujii, Shigemi; Kumazaki, Eisuke; and Shigematsu, Kazutoshi. Jiggering method and profile tool for ceramic ware plastic clay. 4,857,256, Cl. 264-310.000

Fujii, Yasuhiro: *See*—
Tsukamoto, Katsuya; Fujii, Yasuhiro, and Abiko, Toshio, 4,857,938, Cl. 343-700.0MS

Fujiie, Kazuhiko; Yoshida, Tadao; and Ando, Ryo, to Sony Corporation. Optical disk recording and reproducing device. 4,858,217, Cl. 369-59.000.

Fujimaki, Hideo: *See*—
Sasaki, Tatsuo; Fujimaki, Hideo; Uemura, Tadahiro; and Kurihara, Masaru, 4,857,363, Cl. 427-245.000.

Fujimoto, Kazuhiro: *See*—
Ishida, Kunio; Saito, Satoshi; Habuto, Akinaka; Murata, Tadahiko; Oiso, Hisayoshi; Joyama, Norio; and Fujimoto, Kazuhiro, 4,857,354, Cl. 426-558.000.

Fujimoto, Masahiro: *See*—
Sugimoto, Keiji; Hayashi, Takeo; and Fujimoto, Masahiro, 4,856,656, Cl. 206-523.000.

Fujimoto, Nobuaki, to Kitagawa Industries Company, Ltd. Board spacer. 4,856,151, Cl. 24-453.000.

Fujimoto, Takanori; Hara, Toshiro; and Komurasaki, Satoshi, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing control apparatus for an internal combustion engine. 4,856,479, Cl. 123-425.000.

Fujimura, Ikuo: *See*—
Hino, Hiromasa; and Fujimura, Ikuo, 4,858,012, Cl. 358-210.000.

Fujio, Satoshi: *See*—
Yamada, Wataru; Fujio, Satoshi; and Nakamura, Kenichi, 4,858,210, Cl. 368-238.000.

Fujioka, Takuro: *See*—
Obata, Takeo; Takata, Akira; and Fujioka, Takuro, 4,857,775, Cl. 307-468.000.

Fujisaki, Koichiro; Ohashi, Ryota; and Nemoto, Shusuke, to Kanzaki Kokyukoki Mfg. Co. Ltd. HST (hydrostatic transmission) containing axle drive apparatus. 4,856,368, Cl. 74-606.00R.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Takasugi, Hisashi; Esumi, Kimio; Kuno, Atsushi; Sakai, Hiroyoshi; Maeda, Kazuhiro; and Sakamoto, Yoshie, 4,857,527, Cl. 514-237.200.

Fujisawa, Yoshikazu: *See*—
Ushio, Hideaki; Hayashi, Tadayoshi; Shibata, Kazuo; Hata, Tsunehisa; and Fujisawa, Yoshikazu, 4,856,462, Cl. 123-41.840.

Fujisiwa Pharmaceutical Co., Ltd.: *See*—
Oku, Teruo; Todo, Eishiro; Kasahara, Chiyoshi; Nakamura, Katsuya; Kayakiri, Hiroshi; and Hashimoto, Masashi, 4,857,513, Cl. 514-76.000.

Fujita, Masahito: *See*—
Maki, Yoshihiro; Matsuyama, Akira; Tanizaki, Katsuji; Okabe, Noboru; Kishida, Katsuhiro; Sakai, Takeshi; Ohgaki, Toshinaga; and Fujita, Masahito, 4,857,267, Cl. 419-31.000.

Fujita, Yoshihiro; and Nishikawa, Toshihiro, to Fuji Photo Film Co., Ltd. Method for the processing of silver halide color photographic materials. 4,857,442, Cl. 430-393.000.

Fujita, Yoshihiro: *See*—
Takase, Haruo; Uenaka, Kazushige; Abe, Akira; and Fujita, Yoshihiro, 4,857,950, Cl. 354-324.000.

Fujitsu Limited: *See*—
Sugimura, Toshiya; Kasai, Hitoshi; and Yoshimura, Hiroshi, 4,858,131, Cl. 364-424.100.
Sukemura, Takao, 4,857,834, Cl. 324-73.00R.

Fujiwara, Akio: *See*—
Shin, Masaaki; Fujiwara, Akio; and Taniwaki, Hiroshi, 4,857,433, Cl. 430-120.000

Fujiwara, Hisatoshi: *See*—
Lenz, James E.; Bjork, Paul E.; and Fujiwara, Hisatoshi, 4,857,727, Cl. 250-227.000.

Fukami, Kiyoshi; Sekiguchi, Takeshi; and Ohshima, Shigeru, to Canon Kabushiki Kaisha. Color television camera incorporating a color resolving prism system. 4,857,997, Cl. 358-55.000.

Fukasawa, Junichi; Kato, Haruya; Iwaya, Katsumasa; Shimizu, Takako; and Kawano, Atsushi, to Kao Corporation. Cosmetic powders. 4,857,308, Cl. 424-63.000.

Fukatani, Yasunobu: *See*—
Kitano, Seiichi; Fukatani, Yasunobu; Asada, Masaaki; and Yoneda, Kazuhiko, 4,856,634, Cl. 192-70.300.

Fuke, Motohiro: *See*—
Sreekrishna, Kotikanyadan; and Fuke, Motohiro, 4,857,467, Cl. 435-255.000

Fukuda, Yukihiro: *See*—
Nishikawa, Masao; Aoki, Takashi; Sato, Yoichi; and Fukuda, Yukihiro, 4,856,382, Cl. 74-867.000

Fukudome, Katsuyuki: *See*—
Mori, Ryuichiro; Fukudome, Katsuyuki; and Banjo, Toshinobu, 4,857,989, Cl. 357-80.000.

Fukuma, Shuji: *See*—
Kusuda, Masataka; Fukuma, Shuji; and Nishiyama, Masaki, 4,857,192, Cl. 210-321.840.

Fukumoto, Fumio: *See*—
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,857,965, Cl. 355-45.000.
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,857,966, Cl. 355-45.000.

Fukunaga, Kenji: *See*—
Kochi, Hiromi; Fukunaga, Kenji; Itagaki, Takaharu; and Ito, Tsuyoshi, 4,857,576, Cl. 524-409.000.

Fukunaga, Takahiro, to Sharp Kabushiki Kaisha. Hinge structure with torsion bars. 4,856,142, Cl. 16-298.000.

Fukushima, Hirotaka, to Kabushiki Kaisha Daikin Seisakusho. Flywheel assembly. 4,856,639, Cl. 192-106.200

Fukushima, Nobuo; Okino, Tadashi; and Sakai, Shinji, to Canon Kabushiki Kaisha. Exposure member drive control device. 4,857,952, Cl. 354-452.000.

Fukuta, Yoshihiro, to Canon Kabushiki Kaisha. Recording apparatus and regenerating apparatus. 4,858,031, Cl. 358-342.000.

Fulcher, Carol A.: *See*—
Zimmerman, Theodore S.; and Fulcher, Carol A., 4,857,635, Cl. 530-383.000.

Funada, Saburo, to Olympus Optical Co., Ltd. Laser control circuit for optical data recording/reproduction apparatus. 4,858,220, Cl. 369-116.000.

Funahashi, Makoto; Kubo, Seitoku; and Nakamura, Shinya, to Toyota Jidosha Kabushiki Kaisha. Fluid pressure control system for automatic transmission. 4,856,381, Cl. 74-867.000.

Fung, Anthony K, L.: *See*—
Rosenberg, Saul H.; Dellaria, Joseph; Fung, Anthony K, L.; Kempf, Dale J.; Luly, Jay R.; and Plattner, Jacob J., 4,857,507, Cl. 514-18.000.

Furman, Phillip A.: *See*—
Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Phillip A., 4,857,511, Cl. 514-50.000.

Furrey, John H., to Thomson Consumer Electronics, Inc. Video display driver coupling circuit. 4,858,015, Cl. 358-242.000.

Furuishi, Yoshiro: *See*—
Kazumoto, Yoshio; Furuishi, Yoshiro; and Kashiwamura, Kazuo, 4,856,283, Cl. 62-6.000.

Furukawa, Sunao; Yoshimoto, Tadashi; Ajisawa, Yukiyoshi; Ikeguchi, Seiichi; and Kinoshita, Yukihiko, to Kissei Pharmaceutical Co., Ltd. Thiazolidine compounds and therapeutic method. 4,857,524, Cl. 514-227.500.

Furusaki, Keizo; Nasu, Mineji; Matsuura, Toshitaka; Takami, Akio; and Okawa, Teppei, to NGK Spark Plug Co., Ltd. Thick-film gas-sensitive element. 4,857,275, Cl. 422-98.000.

Furusawa, Tadao; Mitsuyuki, Hiroshi; Sato, Hironobu; Tatsuno, Yujiro; and Matsuoka, Shigeru, to Hitachi, Ltd. Word processor with selective placement of printhead for printing of newly input print data after interruption of printing. 4,858,171, Cl. 364-900.000.

Furutachi, Nobuo: *See*—
Hirose, Takeshi; Ogawa, Tadashi; and Furutachi, Nobuo, 4,857,444, Cl. 430-505.000.

Furutani, Kiyohiro; and Arimoto, Kazutami, to Mitsubishi Denki Kabushiki Kaisha. Preamplification method and apparatus for dram sense amplifiers. 4,858,193, Cl. 365-203.000.

Furutani, Yasumasa: *See*—
Itoh, Masahiko; Midorikawa, Heihatiro; Furutani, Yasumasa; and Aizawa, Michihiko, 4,857,222, Cl. 252-69.000.

Furuya, Katsuji, to Kabushiki Kaisha Tsuchiya Seisakusho. Gas flow rate control system for internal combustion engine. 4,856,487, Cl. 123-574.000

Furuya, Tomiaki: *See*—
Ito, Masamichi; Ohkoshi, Akio; Shizukawa, Kenjiro; Hayata, Terunobu; Furuya, Tomiaki; Yamanaka, Susumu; and Koezuka, Junji, 4,857,499, Cl. 502-326.000.

Furuyama, Hideto: *See*—
Suzuki, Nobuo; Morinaga, Motoyasu; Furuyama, Hideto; Hirayama, Yuzo; Okuda, Hajime; Nakamura, Masaru; and Motegi, Nawoto, 4,858,241, Cl. 372-46.000.

Fussler, Philippe: *See*—
Baloga, Mark A.; Trimborn, Edmond; and Fussler, Philippe, 4,856,242, Cl. 52-239.000.

Fuyama, Moriaki; Tamura, Katsumi; Taguchi, Kazuo; Onisawa, Kenichi; Sato, Akira; Hashimoto, Kenichi; Nakayama, Takahiro; and Abe, Yoshio, to Hitachi, Ltd. Thin film EL element and process for producing the same. 4,857,802, Cl. 313-506.000.

G. D. Searle & Co.: *See*—
Adams, Steven P.; Feigen, Larry P.; and Miyano, Masateru, 4,857,508, Cl. 514-18.000.
Mueller, Richard A., 4,857,558, Cl. 514-712.000.

G. Kromschroder Aktiengesellschaft: *See*—
Roese, Horst; Bertke, Heinrich; Bruggemann, Reinhard; and Hampel, Peter, 4,856,331, Cl. 73-268.000.

Gaasedelen, David J.: *See*—
Kieffer, Thomas M.; and Gaasedelen, David J., 4,858,162, Cl. 364-708.000.

Gaastra Sails International Limited: *See*—
Magnan, Jeffrey J., 4,856,447, Cl. 114-103.000.

Gaber, Ira; and Woodring, Cooper C., to Better Mousetraps Inc. Food processor and food cutting devices therefor. 4,856,718, Cl. 241-93.000.

Gabillard, Bertrand: *See*—
Patillon, Jean-Noel; Gabillard, Bertrand; and Martin, Gerard M., 4,857,974, Cl. 357-22.000.

Gabrielson, Robert: *See*—
Brownell, Peter; Borgia, Joseph A.; and Gabrielson, Robert, 4,857,195, Cl. 210-443.000

Gabrielsson, Per Erik G.: *See*—
Flodman, Leif A.; and Gabrielsson, Per Erik G., 4,857,609, Cl. 525-497.000.

Gadeken, Larry L.; and Smith, Harry D., Jr., to Halliburton Logging Services, Inc. Method of radioactive well logging. 4,857,729, Cl. 250-260.000.

Gaebel, Lutz, to Siemens Aktiengesellschaft. Digital 2-of-3 selection and output circuit. 4,857,762, Cl. 307-441.000.

Gaffney, Daniel P., to MLW Corporation. Dispensing container. 4,856,685, Cl. 222-454.000.

Gagen, Paul F.: *See*—
Freeman, Lucius J.; and Gagen, Paul F., 4,856,866, Cl. 350-96.210.

Gaggar, Satish K.; Dumler, James M.; and Cleveland, Thomas B., to GE Chemicals, Inc. Polymer blend compositions. 4,857,590, Cl. 525-64.000

Gailus, Paul H.; Turney, William J.; and Yester, Francis R., Jr., to Motorola, Inc. Method and arrangement for a sigma delta converter for bandpass signals. 4,857,928, Cl. 341-143.000.

Gal, Eli, to General Electric Environmental Services, Inc. Method and system for removal of sulfur compounds from gases and for regenerating spent sorbents. 4,857,285, Cl. 423-230.000.

Gal, Shmuel, to Shoshana RAM. Soil working machine. 4,856,597, Cl. 172-33.000.

Galaxy Machine, Inc.: *See*—
Blevins, Gene, 4,857,705, Cl. 219-370.000.

Galdun, Daniel J.: *See*—
Stewart, Daniel L.; Immormino, Fredrick R.; Galdun, Daniel J.; and Rischar, Charles M., 4,858,101, Cl. 364-131.000.

Gale, George M.; and Sorio, Aldo A., to Union Carbide Corporation. One-extrusion method of making a shaped crosslinkable extruded polymeric product. 4,857,250, Cl. 264-83.000.

Galiasso, Roberto E.: *See*—
Martinez, Nelson P.; Galiasso, Roberto E.; Velasquez, Jose R.; Lujano, Juan; and Zerpa, Carlos, 4,857,494, Cl. 502-210.000.

Gallant, Chantal: *See*—
Drapier, Julien; Gallant, Chantal; and van de Gaer, Daniel, 4,857,226, Cl. 252-174.250.

Gandolfi, Carmelo A.; Spinelli, Silvano; Tofanetti, Odoardo; Russo, Raimondo; and Tognella, Sergio, to Boehringer Biochemia Robin S.p.A. Antitussive and mucus regulating 2-substituted thiazolidines. 4,857,643, Cl. 544-121.000.

Ganeaux Industries, Inc.: *See*—
Gano, David A., 4,856,747, Cl. 248-354.700.

Ganger, Jeffrey D.; and Whatley, Roger A., to Motorola, Inc. Low power output driver circuit with slew rate limiting. 4,857,863, Cl. 330-264.000

Gano, David A., to Ganeaux Industries, Inc. Ratchet jack stand. 4,856,747, Cl. 248-354.700.

Gant, Preston L., to Conoco Inc. Method for making a partitioning radioactive tracer. 4,857,234, Cl. 252-645.000.

Garin, Roland A. C.: *See*—
Dejaifve, Pierre E.; Darnanville, Jean-Paul; Dufour, Jacques J. J.; and Garin, Roland A. C., 4,857,498, Cl. 502-304.000.

Garner, John N., to Northern Telecom Limited. Method and apparatus for twisting together lengths of filamentary material. 4,856,267, Cl. 57-58.520.

Garner, John N.; Baxter, G. Douglas; and Grant, James C., to Northern Telecom Limited. Magnetically permeable particles in telecommunications cable. 4,857,676, Cl. 178-45.000.

Garnier, Pierre: *See*—
Brahm, Jacques; Cornu, Pierre; Garnier, Pierre; Verlaeten, Jean; and Van Diest, Jacques, 4,857,292, Cl. 423-473.000.

Garrison, Michi E., to Minimed Technologies. Pressure diaphragm for a medication infusion system. 4,856,340, Cl. 73-715.000.

Gartner, Hans R.: *See*—
Gibb, Allan W. M.; Gartner, Hans R.; Bauer, A. William; and Chadwick, Dennis P., 4,856,430, Cl. 102-307.000.

Gartner, Robert. Screw jack. 4,856,356, Cl. 74-25.000.

Gas Research Institute: *See*—
Flanagan, Paul, 4,856,981, Cl. 431-1.000.
Kardos, Peter, 4,856,558, Cl. 137-625.330.

Gas-To-Oil, Inc.: *See*—
Eri, Sigrid; and Goodwin, James G., Jr., 4,857,559, Cl. 518-700.000.

Gasparrini, Charles R., to Baldwin Technology Corp. Ink metering assembly. 4,856,427, Cl. 101-366.000.

Gasquet, Denis: *See*—
Dunand, Josiane; Arnule, Paul; and Gasquet, Denis, 4,856,807, Cl. 280-615.000.

Gauckler, Ludwig: *See*—
Mizrah, Tiberiu; Maurer, Albert; and Gauckler, Ludwig, 4,857,088, Cl. 55-523.000.

Gausman, Theodore J.; and Scheffel, Gary W., to Nupro Company. Check valve. 4,856,555, Cl. 137-543.170.

Gauthier, Jacques-Yves: *See*—
Frenette, Richard; Gauthier, Jacques-Yves; Young, Robert N.; Zamboni, Robert; Kakushima, Masatoshi; and Verhoeven, Thomas R., 4,857,659, Cl. 562-426.000.

Gautier, Herve ; and Lardat, Claude, to Thomson-CSF. Method of manufacturing a surface wave dispersive filter and a filter manufactured in accordance with this method. 4,857,870, Cl. 333-195.000.

Gavrielov, Nachum M.: *See*—
Gronowski, Paul E.; Peng, Victor; and Gavrielov, Nachum M., 4,858,165, Cl. 364-748.000.

Gaylin, Wayne L. Carrier cable, fiber optic cable, and sheath support assembly. 4,856,867, Cl. 350-96.230.

Gaz de France: *See*—
Bazinet, Marc; and Sauron, Jean, 4,856,168, Cl. 29-272.000.

GE Chemicals, Inc.: *See*—
Gaggar, Satish K.; Dumler, James M.; and Cleveland, Thomas B., 4,857,590, Cl. 525-64.000.

Gearhart, Kenton, to American Maplan Corporation. Coextrusion block, especially for the coextrusion of generally flat PVC articles, such as siding. 4,856,975, Cl. 425-131.100.

Geary, Frederick J., to Robertshaw Controls Company. Hot surface direct ignition system for gas furnaces. 4,856,983, Cl. 431-27.000.

Gebhart, Gary R., to Horstman Manufacturing Co. Centrifugal cone clutch. 4,856,637, Cl. 192-105.00C.

Gebroeders Rook Beheer B.V.: *See*—
Rook, Cornelis; and Klein, Willem, 4,856,976, Cl. 425-320.000.

Geesink, Johannes H.: *See*—
Le Doux, Georges F. J.; and Geesink, Johannes H., 4,857,258, Cl. 264-515.000.

Gehmann, Walter. Aiming device. 4,856,879, Cl. 350-407.000.

Gehret, Jean-Claude: *See—*
Frei, Bruno; O'Sullivan, Anthony C.; and Gehret, Jean-Claude, 4,857,509, Cl. 514-30.000

Geittner, Peter E. E.; Lydtin, Hans-Jurgen; and Wilson, Howard J. C., to U.S. Philips Corp. Method of manufacturing optical fibers. 4,857,091, Cl. 65-3.120.

Genentech, Inc.: *See—*
Hammonds, R. Glenn; Leung, David W.; Martin, David W., Jr.; Spencer, Steven A.; and Wood, William I., 4,857,637, Cl. 530-403.000.

General Company Limited: *See—*
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General DataComm, Inc.: *See—*
Boreland, Charles P., 4,858,163, Cl. 364-715.030.

General Dynamics Corp.: *See—*
Hethcoat, Gary L., 4,858,061, Cl. 361-215.000.

General Dynamics Lands Systems, Inc.: *See—*
Karst, David A.; Pawlowski, Felix R.; Potrafke, William A.; and Schuneman, Harold E., 4,857,119, Cl. 148-318.000.

General Electric CGR SA: *See—*
Breton, Eric, 4,857,845, Cl. 324-309.000.
Mametsa, Henri-Jose ; and Jacob, Herve , 4,857,850, Cl. 324-318.000

General Electric Comapny: *See—*
Temple, Victor A. K., 4,857,977, Cl. 357-23.400.

General Electric Company: *See—*
Agarwal, Surendra H., 4,857,604, Cl. 525-439.000.
Allen, Richard B.; Bacskai, Barbara M.; Roberts, Daniel L.; and Bopp, Richard C., 4,857,390, Cl. 428-220.000.
Altes, Stephen K., 4,857,777, Cl. 307-511.000.
Baliga, Bantval J.; and Pattanayak, Deva N., 4,857,983, Cl. 357-38.000
Barrett, Eugene R.; and Arnett, Richard L., 4,856,180, Cl. 29-596.000.
Fedele, Nicola J., 4,858,107, Cl. 364-200.000.
Fenton, Richard M., 4,857,125, Cl. 156-169.000.
Fisher, Lynn E.; Wandler, Richard A.; and Frank, James P., 4,856,182, Cl. 29-622.000
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Liu, Yung S.; and Grubb, Willard T., 4,857,382, Cl. 428-156.000.
Mattheyses, Robert M., 4,858,106, Cl. 364-200.000.
Nowak, David J., 4,858,128, Cl. 364-413.130.
Puerzer, Bernard G.; and Morse, Royal R., III, 4,858,112, Cl 364-200.000
Roll, Kenneth A.; Davenport, John M.; and von Herrmann, Pieter J., 4,857,810, Cl. 315-194.000.
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Russell, Ronald R., 4,858,056, Cl. 361-93.000.
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van der Meer, Roelof F.; and Avakian, Roger W., 4,857,575, Cl. 524-398.000
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General Electric Environmental Services, Inc.: *See—*
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General Foods Corporation: *See—*
Parliment, Thomas H.; Cipriano, Joseph J.; and Scarpellino, Richard, 4,857,340, Cl. 426-96.000

General Foods Inc.: *See—*
Abraham, Thomas E.; Malfait, Jacque L.; and White, Arnold J., 4,857,348, Cl. 426-462.000.

General Mills, Inc.: *See—*
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General Motors Corporation: *See—*
Heffner, Donald L.; Merical, Dennis G.; and Homan, David A., 4,856,554, Cl. 137-514.000
Murray, Stephen G., 4,856,273, Cl. 60-39.080
O'Sullivan, Terence J.; Mould, George W.; Armstrong, David E.; Foulkes, Graham S.; and Davis. Michael B., 4,856,848, Cl. 297-391.000.
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General Physics Corporation: *See—*
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General Safety Corporation: *See—*
Schmidt, Timothy J.; and Jacob, Valentim, Jr., 4,856,728, Cl. 242-107.700.

General Safety Research, Inc.: *See—*
Reginold, G. S., 4,856,613, Cl. 180-282.000

General Signal Corporation: *See—*
Myers, David W.; Ozarski, Robert G.; Perera, Thiloma I.; Schipper, John F.; Tan, Raul V.; and Watts, Michael P. C., 4,857,738, Cl. 250-372.000.

Genin, Bernard C., to Curty. Cylinder-head gasket for internal-combustion engine. 4,856,796, Cl. 277-235.00B

Gentile, Anthony L.: *See—*
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Georgia-Pacific Corporation: *See—*
Jespersen, Paul, 4,856,724, Cl. 242-55.300.

Georgino, John M. Article and method for installing insulation 4,856,247, Cl. 52-404.000.

Gergen, W. P.: *See—*
Danforth, R. L.; Gergen, W. P.; and Neate, J. A., 4,857,147, Cl. 162-156.000.

Geri, Sergio: *See—*
Moggi, Giovanni; Chiodini, Graziella; Cirillo, Gianna; and Geri, Sergio, 4,857,598, Cl. 525-194.000.

Gerstung, William. Valve for a pressurized dispensing can containing flowable materials. 4,856,684, Cl. 222-402.230.

Gervasi, Jay A.: *See—*
Akkapeddi, Murali K.; and Gervasi, Jay A., 4,857,603, Cl. 525-437.000

Gess, Jerome M.: *See—*
Tiedeman, George T.; and Gess, Jerome M., 4,857,149, Cl. 162-158.000

Gevelber, Michael A.; and Stephanopoulos, George, to Massachusetts Institute Of Technology. Control system for the czochralski process. 4,857,278, Cl. 422-249.000.

Ghatak, Indira: *See—*
Heggie, William; Page, Philip R.; Villax, Ivan; Ghatak, Indira; and Hursthouse, Michael, 4,857,235, Cl. 260-351.500.

Giasi, Joseph. Adhesively secured container cover. 4,856,708, Cl. 229-125.170

Gibb, Allan W. M.; Gartner, Hans R.; Bauer, A. William; and Chadwick, Dennis P., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Wall-breaching apparatus. 4,856,430, Cl. 102-307.000.

Gibbons, Richard N.: *See—*
Bolton, Ivor W.; Gibbons, Richard N.; and Dixon, Gerald, 4,857,087, Cl. 55-385.600.

Gibson, Peter O. Hermaphrodite wrench. 4,856,387, Cl. 81-124.400

Gierut, Frederick J.: *See—*
Brubaker, Weldon L.; Gierut, Frederick J.; Kowalkowski, James T.; and Liburdi, Francesco. 4,857,019, Cl. 439-751.000.

Gieseke, Steven S.: *See—*
Engel, Donald F.; and Gieseke, Steven S., 4,856,826, Cl. 285-181.000

Giesick, Gary. Athletic protective safety sock. 4,856,110, Cl. 2-22.000.

Gigliotti, Michael F. X., Jr.: *See—*
Huang, Shyh-Chin; and Gigliotti, Michael F. X., Jr., 4,857,268, Cl 420-418.000

Gila River Products, Inc.: *See—*
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Gilbreath, Gary A.: *See—*
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Giles, Kenneth: *See—*
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Gilles, Daniel: *See—*
Wijnendaele, Frans V.; Gilles, Daniel; and Simonet, Guy, 4,857,317, Cl. 424-89.000

Gillett, Richard B., Jr.; and Williams, Douglas D., to Digital Equipment Corporation. Method and apparatus for managing multiple lock indicators in a multiprocessor computer system. 4,858,116, Cl. 364-200.000

Gillette Company, The: *See—*
Baydar, Ahmet E., 4,857,310, Cl. 424-70.000.

Gillings, Anthony R. Magnet structure. 4,857,873, Cl. 335-285.000.

Gillispie, John G.; and Mitchell, Donald J., to Eagle Manufacturing Company. Thermoplastic container, having an integral nozzle, for a flammable liquid. 4,856,664, Cl. 215-31.000.

Gilmore Valve Company: *See—*
Watson, Richard R., 4,856,557, Cl. 137-625.250.

Ginkel, Peter. Software protection and identification system. 4,858,036, Cl. 360-60.000

Ginkel, Scott T.; and Falaas, Dennis O., to Minnesota Mining and Manufacturing Company. Graphic composite with thermally detackifiable adhesive premask tape. 4,857,372, Cl. 428-42.000.

Giovanni Management Canada Ltd.: *See—*
Cafaro, Michael, 4,857,702, Cl. 219-225.000.

Gittos, Maurice W.: *See—*
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Glaxo Group Limited: *See—*
Borthwick, David A.; Kirk, Barrie E.; Evans, Derek N.; Biggadike, Keith; and Stephenson, Leslie, 4,857,531, Cl. 514-262.000.

Glazer, Alexander N.: *See—*
Waterbury, John B.; Watson, Stanley W.; Glazer, Alexander N.; and Ong, Linda J., 4,857,474, Cl. 436-501.000.

Glenn, Luke H., to USA Medical. Surgical aspirator. 4,857,063, Cl. 604-317.000

Glenning, John J.; Johnson, Caryn J.; Pawlowski, Walter P.; and Sakorafos, Kenneth G., to International Business Machines Corp. Wet etching of cured polyimide. 4,857,143, Cl. 156-668.000.

Glezer, Johannes H. E.: *See—*
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Glezerman, Josef: *See—*
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Gloger, Manfred: *See—*
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Gloyer, Jens: *See—*
Hentschel, Volker; Versteegen, Clemens; Gloyer, Jens; and Babendererde, Siegmund, 4,856,936, Cl. 403-145.000

Goddard, Errol D.: *See—*
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Godecke Aktiengesellschaft: *See—*
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Godfrey, Christopher R. A.: *See—*
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Godsell, Alan J.: *See—*
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Goebel, Armin: *See—*
Patzschke, Hans-Peter; Cerny, Peter W.; Goebel, Armin; and Stransky, Karlheinz, 4,857,580, Cl. 524-507.000.

Goettsche, Reimer; Marx, Hans-Norbert; and Hettler, Wendelin, to Dr. Wolman GmbH. Wood preservative. 4,857,322, Cl. 424-633.000.

Goins, Gary D., to Research Machine Center, Inc. Optical lens manufacturing apparatus and method. 4,856,234, Cl. 51-284.00R.

Goins, Neal R., to Mobil Oil Corporation. Method for determining the presence of hydrocarbons in subsurface geological formations by comparative assessment of compressional and shear wave reflection data. 4,858,200, Cl. 367-75.000.

Goins, Neal R.; and Spratt, Ray S., to Mobil Oil Corporation. Method for estimating shear wave reflection data from acquired compressional wave reflection data. 4,858,201, Cl. 367-75.000.

Goins, Neal R.: *See—*
Fitch, Thomas J.; Goins, Neal R.; and Spratt, Ray S., 4,858,202, Cl. 367-75.000.

Golay, Marcel E., to Perkin-Elmer Corporation, The. Thermally switchable katharometer. 4,856,319, Cl. 73-23.100.

Goldberg, Harris A.; Kalnin, Ilmar L.; Williams, Clyde C.; and Spain, Ian L., to Hoechst Celanese Corp. Method of making an electrical device made of partially pyrolyzed polymer. 4,856,179, Cl. 29-592.100.

Goldburt, Efim S.; and Hemmer, Richard E., to North American Philips Corporation. Solid state light modulator incorporating metallized gel and method of metallization. 4,857,978, Cl. 357-24.000.

Golden, Robert F.: *See—*
Maness, William L.; Golden, Robert F.; Benjamin, Michael H.; and Podoloff, Robert M., 4,856,993, Cl. 433-68.000.

Goldman, Stephen; and Richardson, John, to Bancroft Cap Company. Collapsible cap. 4,856,117, Cl. 2-195.000.

Gollon, Peter J. Tag. 4,856,819, Cl. 283-79.000.

Golson, Steven E.: *See—*
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Gombrich, Peter P.; Zook, Ronald E.; and Hendrickson, Max S., to CliniCom Incorporated. Patient identification and verification system and method. 4,857,716, Cl. 235-462.000.

Gonzalez, Roberto; and Apfelbaum, Lawrence S., to Teradyne, Inc. Diagnosis of faults on circuit board. 4,857,833, Cl. 324-73.00R.

Goodman, Howard, to ECC International Limited. Viscosifying alcoholic media. 4,857,491, Cl. 501-148.000.

Goodnough, Mark A.; Stineman, John A., Jr.; and Hoffman, Alan W., to Santa Barbara Research Center. Differential offset corrected current mirror. 4,857,725, Cl. 250-214.00A.

Goodwin, James G., Jr.: *See—*
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Goodyear Tire & Rubber Company, The: *See—*
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Collette, Jean J.; Dauvister, Pierre M. J.; Jonette, Bernard; and Lardo, Claude, 4,856,571, Cl. 152-209.00R.
Deregibus, Alfio, 4,856,720, Cl. 242-7.020.
Majerus, Norbert, 4,857,122, Cl. 156-125.000.
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Gorman-Rupp Company, The: *See—*
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Gorre, Luisa E.: *See—*
Pastor, Ricardo C.; and Gorre, Luisa E., 4,857,293, Cl. 423-489.000.

Gortsema, Frank P.; Pellet, Regis J.; Springer, Albert R.; Rabo, Jule A.; and Long, Gary N., to UOP. Hydrocracking catalysts and processes employing silicoaluminophosphate molecular sieves. 4,857,495, Cl. 502-214.000.

Goswami, Bhuvenesh C.: *See—*
McCullough, Francis P., Jr.; Snelgrove, R. Vernon; and Goswami, Bhuvenesh C., 4,857,394, Cl. 428-303.000.

Goth, Kurt: *See—*
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Goto, Norifumi: *See—*
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Gottlieb Guhring KG: *See—*
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Goudreau, Roger; and Jobin, Jean-Jacques, to Pratt & Whitney Canada Inc. Planetary gear system for a gas turbine engine. 4,856,377, Cl. 74-768.000.

Gough, Martin, to Crosfield Electronics Limited. Method and apparatus for monitoring the passage of marks on a web. 4,857,745, Cl. 250-548.000.

Gouttebessis, Jacques: *See—*
Bocquet, Jean-Louis; Gouttebessis, Jacques; and Rey, Maurice, 4,857,128, Cl. 156-244.120.

Grabinsky, Glenn W.: *See—*
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Grace-Lee Products, Inc.: *See—*
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Grachan, Ronald A. Saw. 4,856,193, Cl. 30-166.100.

Graco Metal Products Inc.: *See—*
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Graf, Jean-Pierre: *See—*
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Graff, John M.; Nutter, Harry A., Jr.; and Stoltze, Leon, to United Technologies Corporation. Fabrication of bonded structures. 4,856,162, Cl. 29-156.80B.

Graham, George A., to Polytronics, Inc. Tester system for electrical power circuits terminated at an outlet plug receptacle. 4,857,826, Cl. 324-508.000.

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Granick, Lisa R.: *See—*
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Grant, James C.: *See—*
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Gratke, Norman G., to W. H. Brady Co. Capacitance membrane switchcore with intertrace capacitive coupling and/or intratrace capacitive coupling. 4,857,684, Cl. 200-600.000.

Great Lakes Orthodontics, Ltd.: *See—*
Breads, Peter R.; Abbatte, Gerard P.; and Warunek, Stephen P., 4,856,991, Cl. 433-6.000.

Great Plains Industries, Inc.: *See—*
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Green, Melvin E.; and Motev, Efim, to American Screen Printing Equipment Company. Extruded print cylinder. 4,856,428, Cl. 101-475.000.

Green, William P.: *See—*
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Greenlee, Donald R.; and Skinner, Willie C., Sr., to Dresser Industries, Inc. Apparatus for treating well bores. 4,856,583, Cl. 166-127.000.

Gregg, John A., to PepsiCo Inc. Syrup batching loop. 4,857,355, Cl. 426-590.000.

Gregorio, Guglielmo: *See—*
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Gregory, Charles W.: *See—*
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Gregory, Vernon C., to Akzo America Inc. Metal substrated printed circuit. 4,858,073, Cl. 361-388.000.

Greschner, Johann; Schwerdt, Friedrich W.; and Trumpp, Hans J., to International Business Machines Corporation. Synthetic substrate with adhesive metal layer. 4,857,383, Cl. 428-156.000.

Gresko, Lawrence S.: *See—*
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Griffin, Robert M., to GTE Products Corporation. Tungsten-halogen lamp with metal additive. 4,857,804, Cl. 313-557.000.

Griffith, Paul G., to Mobil Oil Corporation. Method and apparatus for locking the frequency and phase of a local oscillator. 4,857,867, Cl. 331-10.000.

Griffith, Paul G., to Mobile Oil Corporation. Method and apparatus for cancelling nonstationary sinusoidal noise from seismic data. 4,858,199, Cl. 367-45.000.

Griffith, Scott J.; and Golson, Steven E., to Sun Microsystems, Inc. Triple rail logic gate. 4,857,768, Cl. 307-443.000.

Grill, Benjamin: *See—*
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Grim, Wayne M.: *See—*
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Grinsteiner, James J.; and Maat, George J., to Navistar International Transportation Corp. Double seal thermostat. 4,856,711, Cl. 236-34.500.

Grocott, Geoffrey J.; and Baskett, Ralph E. J., to British Pipeline Agency Limited and STC PLC. Pipeline systems. 4,856,937, Cl. 405-154.000.

Groher, Manfred; Heit, Werner; Schmittner, Walter; and Warzawa, Wolfgang, to Hobeg mbH. Process for overcoating granular materials. 4,857,359, Cl. 427-6.000.

Grollier, Jean F., to L'Oreal. Dentifrice gel. 4,857,303, Cl. 424-52.000.

Gronau, Arthur W.; and Gronau, Gregory S. Sleeper for the attachment of covering material to a surface. 4,856,250, Cl. 52-480.000.

Gronau, Gregory S.: *See—*
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Gronowski, Paul E.; Peng, Victor; and Gavrielov, Nachum M., to Digital Equipment Corporation. Apparatus and method for acceleration of effective subtraction procedures by the approximation of the absolute value of the exponent argument difference. 4,858,165, Cl. 364-748.000.

Gros, Pierre: *See—*
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Gross, Jan S. Advertising cover for fluorescent lighting. 4,856,216, Cl. 40-559.000.

Gross, Laurence H.; and Bartlett, Thorne M., to Union Carbide Corporation. Process for grafting diacid anhydrides. 4,857,600, Cl. 525-285.000.

Grossman, Shlomo: *See—*
Albeck, Michael; and Grossman, Shlomo, 4,857,325, Cl. 424-195.100.

Grossmann, Horst; and Stirm, Michael, to Black & Decker Inc. Handle arrangement for portable power tool. 4,856,195, Cl. 30-369.000.

Groth, Rolf; and Schmitte, Franz-Josef, to Flachglas Aktiengesellschaft. Method for the manufacture of a toughened and/or bent pane with solar control coating containing platinum or the like. 4,857,094, Cl. 65-60.200.

Grover, Gary J., to E. R. Squibb & Sons, Inc. Method of preventing or reducing platelet loss during extracorporeal circulation using a thromboxane A_2 receptor antagonist. 4,857,548, Cl. 514-469.000.

Grubb, Willard T.: *See—*
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Grzyll, Lawrence R.: *See—*
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GTE Products Corporation: *See—*
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Griffin, Robert M., 4,857,804, Cl. 313-557.000.
McSweeney, Robert T., 4,858,066, Cl. 361-321.000.

GTE Spacenet Corporation: *See—*
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GTE Valenite Corporation: *See—*
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Guadagna, John P.: *See—*
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Guenard, Daniel: *See—*
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Gueritte-Voegelein, Francoise: *See—*
Colin, Michel; Guenard, Daniel; Gueritte-Voegelein, Francoise; and Potier, Pierre, 4,857,653, Cl. 549-511.000.

Gulino, Gunther; and Pfeiffer, Herbert, to Optische Werke G. Rodenstock. Uniform strength ophthalmic lens having a gradient refractive index changing rotation-symmetrically about the optical axis and method of making it. 4,856,889, Cl. 351-159.000.

Guillen, Patricia S.: *See—*
Guillen, Richard H.; and Guillen, Patricia S., 4,856,661, Cl. 211-100.000.

Guillen, Richard H.; and Guillen, Patricia S. Retractable clothes hanger. 4,856,661, Cl. 211-100.000.

Gulczynski, Zdzislaw. Dual flash analog-to-digital converter. 4,857,931, Cl. 341-156.000.

Gunther, Bernd-Rainer, to A. Nattermann & Cie GmbH. Process for isolating phosphatidylcholine free of lysophosphatidylcholine from egg powder. 4,857,236, Cl. 260-403.000.

Guo, Mow-Ho: *See—*
Shu, Chi-Yao, 4,856,296, Cl. 62-430.000.

Gupta, Balaram, to Hoechst Celanese Corp. Selective hydrolysis of copolymers of para-acetoxy styrene and dialkyl muconates or alkyl sorbates. 4,857,601, Cl. 525-344.000.

Gurske, William A.; Blessum, Cynthia R.; Cheng, Min-Lee; and Andrade, Mark S., to Beckman Instruments, Inc. High resolution electrophoretic gel and method for separating serum proteins. 4,857,163, Cl. 204-299.00R.

Gusching, Nagle V., to Monarch Machine Tool Company, The. Spindle mechanism. 4,856,153, Cl. 29-26.00A.

Gustavson, Larry J.: *See—*
Wang, Kathy K.; Gustavson, Larry J.; and Dumbleton, John H., 4,857,269, Cl. 420-417.000.

Gutierrez, Antonio; and Lundberg, Robert D., to Exxon Chemical Patents Inc. Dispersant additives derived from amido-amines. 4,857,217, Cl. 252-47.000.

Guy, Desfountaines: *See—*
Pol, Dejeux; and Guy, Desfountaines, 4,857,265, Cl. 376-463.000.

Guyon, Robert P. Y.: *See—*
Eberhardt, Andre ; Dominiak, Serge; Berveiller, Marcel; Lucas, Jean P.; and Guyon, Robert P. Y., 4,857,387, Cl. 428-209.000.

Gwarectwo Mechanizacji Gornictwa "Polmag" Przedsiebiorstwo Panstwowe Fabryka Zmechanizowanych Obudow Scianowych Fazos: *See—*
Cieslik, Jerzy; Flak, Marek; Kuczka, Eugeniusz; Oles, Franciszek; Marszycki, Zdsizlaw; and Olender, Kornel, 4,856,940, Cl. 405-296.000.

Gyovai, Geza. Spherical puzzle toy. 4,856,786, Cl. 273-153.00S.

Haas, Frederick W.: *See—*
Davis, James C.; McGuiggan, Michael F.; Cuellar, Edward A.; and Haas, Frederick W., 4,857,159, Cl. 204-149.000.

Habara, Atsushi, to Kabushiki Kaisha Toshiba. Data processing device for use in scintillation camera apparatus. 4,858,151, Cl. 364-527.000.

Habbe, Randall G.; and Bockstruck, Herman N., to Olin Corporation. Bullet with reverse taper interlock jacket and method of manufacturing the bullet. 4,856,160, Cl. 29-1.230

Haberle, Hermann, to Romer GmbH. Helmet with three-point chin strap. 4,856,119, Cl. 2-417.000.

Habermann, Patrick R. Expandable easel. 4,856,749, Cl. 248-448.000

Habuto, Akinaka: *See—*
Ishida, Kunio; Saito, Satoshi; Habuto, Akinaka; Murata, Tadahiko; Oiso, Hisayoshi; Joyama, Norio; and Fujimoto, Kazuhiro, 4,857,354, Cl. 426-558.000

Hackett, Malcolm J.; and Kalkipsakis, Charalambos G., to Courtaulds Packaging Australia Limited. Forming small flexible containers. 4,856,261, Cl. 53-469.000.

Hafner, Udo; and Reiter, Ferdinand, to Robert Bosch GmbH. Apparatus for electrical connection of electromagnetically actuatable fuel injection valves. 4,857,003, Cl. 439-130.000.

Hagen, Helmut: *See—*
Rosebrock, Henning; Jung, Johann; Rademacher, Wilhelm; Luib, Max; Fischer, Volker; Hagen, Helmut; Kohler, Rolf-Dieter; Markert, Juergen; and Watanabe, Akihide, 4,857,103, Cl. 71-94.000

Hager, Bror O. Preservative for wood. 4,857,323, Cl. 424-659.000.

Hagimoto, Kiyoshi: *See—*
Hirano, Takahisa; Hagimoto, Kiyoshi; and Takeda, Kimiharu, 4,856,973, Cl. 418-55.000.

Hagler, Winston M., Jr.: *See—*
Croom, Warren J., Jr.; and Hagler, Winston M., Jr., 4,857,534, Cl. 514-299.000.

Hague, Yusuf A., to Maxim Integrated Products. Programmable universal active filter. 4,857,778, Cl. 307-521.000.

Hahn, Carl J., III: *See—*
Berman, Arnold L.; Hahn, Carl J., III; and Wachs, Marvin R., 4,857,865, Cl. 330-304.000.

Haines, Frank C., Jr.: *See—*
Smith, Michael P.; and Haines, Frank C., Jr., 4,856,351, Cl 73-863.210.

Hakamada, Isao: *See—*
Hayakawa, Naoji; Takenouchi, Masanori; Nakamura, Kenji; Kan, Fumitaka; Kozato, Yasuo; and Hakamada, Isao, 4,858,062, Cl. 361-225.000.

Hakuta, Toshikatsu: *See—*
Sako, Takeshi; Yokochi, Toshihiro; Sato, Masahito; Suzuki, Osamu; Hakuta, Toshikatsu; Sugeta, Tsutomu; and Nakazawa, Noriaki, 4,857,329, Cl. 424-195.100

Halbritter, Jurgen; and Baumgartner, Hartmut, to Kernforschungszentrum Karlsruhe GmbH. Process for the manufacture of NbN superconducting cavity resonators. 4,857,360, Cl. 427-62.000

Halford, Thomas H.: *See—*
Holston, Robert W.; and Halford, Thomas H., 4,858,204, Cl. 367-141.000.

Hall, Michael O.: *See—*
Maurice, James; Collins, David J.; Hall, Michael O.; and McLoughlin, Peter D., 4,857,819, Cl. 318-778.000

Hall, Robert E., to Great Plains, Industries, Inc. Flow meter turbine. 4,856,348, Cl. 73-861.780.

Hall, Robert M., to Rust-Oleum Corporation. Wood coating composition from alkyd resin, PTFE and microcrystalline wax. 4,857,578, Cl. 524-488.000.

Hallez, Charles P., to Diamant Boart. Cutting arm. 4,856,719, Cl. 241-200.000.

Halliburton Company: *See—*
White, Kevin M.; and Beck, Harold K., 4,856,585, Cl. 166-250.000.

Halliburton Geophysical Services, Inc.: *See—*
Harrison, Earnest R., 4,858,205, Cl. 367-144.000.

Halliburton Logging Services, Inc.: *See—*
Gadeken, Larry L.; and Smith, Harry D., Jr., 4,857,729, Cl. 250-260.000.
Smith, Harry D., Jr., 4,857,728, Cl. 250-260.000.

Hallstrom, Olof A., Jr. Reciprocating conveyor. 4,856,645, Cl. 198-750.000.

Hamamatsu Photonics K. K.: *See—*
Kamae, Tuneyoshi; and Enomoto, Ryoji, 4,857,737, Cl. 250-370.090.

Hamamatsu Photonics Kabushiki Kaisha: *See—*
Takiguchi, Yoshihiro, 4,857,748, Cl. 250-560.000.

Hamanaka, Osamu: *See—*
Abuyama, Yasuo; Ide, Fumito; Hamanaka, Osamu; and Sanbayashi, Takeshi, 4,857,954, Cl. 355-245.000.

Hamatani, Toshiji: *See—*
Yamazaki, Shunpei; and Hamatani, Toshiji, 4,856,458, Cl. 118-722.000.

Hamel, Lawrence G.: *See—*
Stephens, Sally I.; Hamel, Lawrence G.; Barclay, Glen E.; and Wong, Patrick S. L., 4,857,330, Cl. 424-424.000.

Hamernik, John. Latching valve actuator, nozzle and pressurized fire extinguisher utilizing same. 4,856,596, Cl. 169-74.000.

Hammersla, Robert L., Jr., to Woven Electronics Corporation. Reinforced cargo sling and method. 4,856,837, Cl. 294-74.000.

Hammonds, R. Glenn; Leung, David W.; Martin, David W., Jr.; Spencer, Steven A.; and Wood, William I., to Genentech, Inc. Methods and compositions for immunologically modulating growth hormone receptor activity. 4,857,637, Cl. 530-403.000.

Hampe, Andreas: *See—*
Bottenbruch, Ludwig; Traenckner, Hans-Joachim; Hampe, Andreas; and Schumacher, Klaus, 4,856,342, Cl. 73-827.000.

Hampel, Peter: *See—*
Roese, Horst; Bertke, Heinrich; Bruggemann, Reinhard; and Hampel, Peter, 4,856,331, Cl. 73-268.000.

Hamstra, James R.: *See—*
Rusterholz, John T.; and Hamstra, James R., 4,858,115, Cl. 364-200.000.

Hanaoka, Motoyoshi; and Nakamura, Akira, to Nissan Motor Company, Limited. Throttle control system for automotive internal combustion engine with fail-safe mechanism. 4,856,477, Cl. 123-399.000.

Haneda, Isamu, to Sharp Kabushiki Kaisha. Power control unit for a computer system. 4,857,756, Cl. 307-66.000.

Hang-Hu, Monique: *See—*
Billler, Jean-Pierre; Faucher, Pascal; Hang-Hu, Monique; and Pelet, Andre , 4,858,068, Cl. 361-380.000.

Hang, Kenneth W.; and Anderson, Wayne M., to RCA Licensing Corp. Low temperature processing transfer printing ink. 4,856,670, Cl. 220-2.10A.

Hanley, Dennis S. Method and apparatus for extending the bed of a truck. 4,856,840, Cl. 296-26.000.

Hannam, Michael E. Remotely controlled fishing apparatus. 4,856,222, Cl. 43-26.100.

Hannifin, Matt B. Continuous sound making boomerang. 4,856,793, Cl. 273-426.000.

Hanover Research Corporation: *See—*
Casparian, Robert E., 4,857,144, Cl. 159-13.200.

Hansen, Carl O.: *See—*
Musco, Vincent A.; Kelley, Donald E.; and Hansen, Carl O., 4,857,101, Cl. 71-94.000.

Hansen, James C., to Telectronics N.V. Rate-responsive, distributed-rate pacemaker. 4,856,522, Cl. 128-419.0PG.

Hansen, James E.: *See—*
Baran, Mich S.; Beihoff, Bruce C.; Damiano, Michael A.; Hansen, James E.; Hastings, Jerome K.; Slomczewski, Allen J.; and Tennies, Charles J., 4,857,837, Cl. 324-117.00R.

Hansen, Paul E.: *See—*
Ersfeld, Dean A.; Hansen, Paul E ; Scholz, Matthew T.; Bartizal, Dennis C.; Reed, Katherine E.; Larson, Wayne K.; Sandvig, Timothy C.; and Buckanin, Richard S., 4,856,502, Cl. 128-90.000.

Hansen, Per K., to Position Orientation Systems, Inc. Omnidirectional distance measurement system. 4,858,203, Cl. 367-103.000.

Hansen, Vicky A.: *See—*
Wheelwright, Lynn M.; Hansen, Vicky A.; and Heerema, Mark D., 4,858,159, Cl. 364-571.010.

Hanson, Richard A. Force sensing device and method. 4,856,350, Cl. 73-862.590.

Hara, Noboru; and Sugiyama, Shogo, to Toyoda Gosei Co., Ltd. Mixing head of injection molding machine. 4,856,908, Cl. 366-182.000.

Hara, Tadayuki: *See—*
Morishita, Mitsuharu; Kohge, Shinichi; Hara, Tadayuki; Hata, Yasuaki; and Umemaru, Hisato, 4,856,323, Cl. 73-118.100.

Hara, Toshiro: *See—*
Fujimoto, Takanori; Hara, Toshiro; and Komurasaki, Satoshi, 4,856,479, Cl. 123-425.000.

Harandi, Mohsen N.; and Owen, Hartley, to Mobil Oil Corporation. System for conversion of crude oxygenate to gasoline with feedstock extraction. 4,857,667, Cl. 585-403.000.

Harara, Mitsuhiko: *See—*
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,813, Cl. 280-703.000.
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,815, Cl. 280-707.000.

Haras, William S. Beachfront wave energy dissipation structure. 4,856,935, Cl. 405-35.000.

Harbaugh, Steven K.: *See—*
Bolton, Joseph A.; and Harbaugh, Steven K., 4,857,747, Cl. 250-559.000.

Harbor Oceanographic Institution, Inc.: *See—*
Tusting, Robert F., 4,856,874, Cl. 350-267.000.

Hardison, Philip M. Archers arrow with chemical light source. 4,856,792, Cl. 273-416.000.

Hargis, Charles W. Auxiliary light module for vehicles. 4,857,807, Cl. 315-77.000.

Harlos, Hartmut; and Kelting, Peter, to U.S. Philips Corporation. Circuit arrangement for reducing noise. 4,857,779, Cl. 307-542.000.

Harold, Robert G. Food product for administering medication to animals. 4,857,333, Cl. 424-442.000.

Harper, Christopher T., to William R. Warner & Co. Limited. Feeding apparatus. 4,856,692, Cl. 226-119.000.

Harris Corporation: *See—*
Young, William R., 4,857,764, Cl. 307-443.000.

Harris, David L. Magnetic field-tunable filter with plural section housing and method of making the same. 4,857,871, Cl. 333-202.000.

Harris, Mark N.: *See—*
Dwyer, John J.; Jachmann, Emil F.; Harris, Mark N.; and Beloin, Brian F., 4,858,213, Cl. 369-28.000.

Harrison, Earnest R., to Halliburton Geophysical Services, Inc. Multi-barrel air gun module. 4,858,205, Cl. 367-144.000.

Harrison, Grant. Scorer's table. 4,856,778, Cl. 273-1.0ES.

Harrison, Lynn: *See—*
Sturman, Oded E.; Grill, Benjamin; and Harrison, Lynn, 4,857,842, Cl. 324-225.000.

Hars, Ulrich; Staiger, Rolf; and Westphal, Karl, to Hoechst AG. Process for reducing the phenol content in phenol-containing waters. 4,857,207, Cl. 210-725.000.

Hart, Dennis, to Undersea Industries, Inc. Dive mask. 4,856,120, Cl. 2-428.000.

Hart, George W.; Kern, Edward C., Jr.; and Schweppe, Fred C., to Massachusetts Institute of Technology; and Electric Power Research Institute, Inc. Non-intrusive appliance monitor apparatus. 4,858,141, Cl. 364-483.000.

Hart, Peter B.; Chilton, George A. A.; and Kirk, Richard A., to Plessey Overseas Limited. Recalibration system for LED array. 4,857,944, Cl. 346-154.000.

Hart, Stephen C., to Morton Thiokol, Inc. Powder coatable epoxy composition and post-tensioning cable coated therewith. 4,857,362, Cl. 427-195.000.

Hartley, Rolfe J.: *See—*
Papay, Andrew G.; and Hartley, Rolfe J., 4,857,214, Cl. 252-32.500.

Hartman, George D.: *See—*
Duggan, Mark; and Hartman, George D., 4,857,546, Cl. 514-460.000.

Hartness, Roy, to Pneumafil Corporation. Energy conservation system for cooling and conditioning air. 4,857,090, Cl. 62-91.000.

Hartshorn, Gary, to Vande Sande, Lee. Universal circular enclosure for standard strip fluorescent fixture. 4,858,087, Cl. 362-219.000.

Hartwell, David W.; Bloom, Elbert; and Triolo, Victoria M., to Digital Equipment Corporation. Method and apparatus for error recovery in a multibus computer system. 4,858,234, Cl. 371-14.000.

Harvey, Donald R.: *See—*
Ross, Richard E.; and Harvey, Donald R., 4,856,842, Cl. 296-136.000.

Harwath, Frank L., to Suntec Industries Incorporated. Pump with valve adjusting screw. 4,856,553, Cl. 137-509.000.

Hasegawa, Akira: *See—*
Tohjoh, Yoshikazu; Hasegawa, Akira; and Sato, Tomoaki, 4,856,495, Cl. 128-6.000.

Hasegawa, Junzo: *See—*
Kutsuki, Hidetoshi; Sawa, Ikuo; Mori, Natsuki; Hasegawa, Junzo; and Watanabe, Kiyoshi, 4,857,468, Cl. 435-280.000.

Hashiguchi, Koichi: *See—*
Sakata, Kei; Hashiguchi, Koichi; and Okano, Shinobu, 4,857,117, Cl. 148-12.00C.

Hashimoto, Katsumi, to Idemitsu Kosan Co., Ltd. Base oil of lubricating oil for mechanical apparatuses with orifice mechanism. 4,857,220, Cl. 252-56.00R.

Hashimoto, Kenichi: *See—*
Fuyama, Moriaki; Tamura, Katsumi; Taguchi, Kazuo; Onisawa, Kenichi; Sato, Akira; Hashimoto, Kenichi; Nakayama, Takahiro; and Abe, Yoshio, 4,857,802, Cl. 313-506.000.

Hashimoto, Masaki; and Yamaguchi, Noboru, to Araya Industrial Co., Ltd. Pipe joining construction of a bicycle frame. 4,856,800, Cl. 280-281.100.

Hashimoto, Masashi: *See—*
Oku, Teruo; Todo, Eishiro; Kasahara, Chiyoshi; Nakamura, Katsuya; Kayakiri, Hiroshi; and Hashimoto, Masashi, 4,857,513, Cl. 514-76.000.

Hashimoto, Takafumi: *See—*
Jinnai, Kenichiro; and Hashimoto, Takafumi, 4,857,419, Cl. 429-13.000.

Hashimoto, Yasuaki; and Serizawa, Haruo, to Usui Kokusai Sangyo Kabushiki Kaisha. Metal-made carrier body for exhaust gas cleaning catalyst. 4,857,413, Cl. 428-592.000.

Hassanein, Mahmoud: *See—*
Ford, Warren T.; Chandran, Rama S.; Hassanein, Mahmoud; and Turk, Hayrettin, 4,857,493, Cl. 502-159.000.

Hassel, Michael J.; Felix, Ian C.; and Camp, Claude E., to Plus Development Corporation. Modular unitary disk file subsystem with differing density zones. 4,858,034, Cl. 360-51.000.

Hastings, Jerome K.; Beihoff, Bruce C.; and Juds, Mark A., to Eaton Corporation. Proximity detector employing magneto resistive sensor in the central magnetic field null of a toroidal magnet. 4,857,841, Cl. 324-208.000.

Hastings, Jerome K.: *See—*
Baran, Mich S.; Beihoff, Bruce C.; Damiano, Michael A.; Hansen, James E.; Hastings, Jerome K.; Slomczewski, Allen J.; and Tennies, Charles J., 4,857,837, Cl. 324-117.00R.

Hasuike, Makio, to Seima Italiana SpA. Modular cabinet. 4,856,855, Cl. 312-111.000.

Hata, Kanji; Maruyama, Masahiro; and Itemadani, Eiji, to Matsushita Electric Industrial Co., Ltd. Parts recognition method and apparatus therefor. 4,857,752, Cl. 250-578.000.

Hata, Tsunehisa: *See—*
Ushio, Hideaki; Hayashi, Tadayoshi; Shibata, Kazuo; Hata, Tsunehisa; and Fujisawa, Yoshikazu, 4,856,462, Cl. 123-41.840

Hata, Yasuaki: *See—*
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Hatakeyama, Osamu, to Alps Electric Co., Ltd. Rotary wheel printer. 4,856,921, Cl. 400-144.200.

Hatakeyama, Seiji: *See—*
Usami, Toshimasa; Shimomura, Akihiro; Tatsuta, Sumitaka; and Hatakeyama, Seiji, 4,857,501, Cl. 503-200.000.

Hatanaka, Katsunori; Saika, Toshihiro; Ishii, Takayuki; and Yamada, Katsuhiko, to Canon Kabushiki Kaisha. Photoelectric conversion apparatus with separating electrodes. 4,857,751, Cl. 250-578.000.

Hattan, Mark; and Dodge, Robert G., to Green, William P. Gauge for internal threads. 4,856,198, Cl. 33-199.00R.

Hattori, Mitsuhiro: *See—*
Kawai, Katsunori; Suzuki, Shinichi; Hattori, Mitsuhiro; and Deguchi, Hiroyuki, 4,856,292, Cl. 62-217.000.

Hattori, Sadayoshi: *See—*
Terakawa, Takashige; Akaba, Noriyuki; and Hattori, Sadayoshi, 4,857,869, Cl. 333-26.000.

Haubennestel, Karl-Heinz; Heilmann, Holger; and Diez, Andreas, to BYK-Chemie GmbH. Thixotropic formulations, use of polycarboxylic acid amides to produce them, and silica coated with polycarboxylic acid amides. 4,857,111, Cl. 106-504.000.

Haugen, Hartwick A.: *See—*
Croft, Thomas S.; and Haugen, Hartwick A., 4,857,563, Cl. 523-173.000.

Haughton, Robert A.: *See—*
Schoenig, Frederick C., Jr.; Walker, Edward S.; Cueman, Michael K.; Haughton, Robert A.; and Zuloaga, Jaime A., Jr., 4,857,260, Cl. 376-245.000.

Hauk, Rolf; and Papst, Gero, to Korf Engineering GmbH. Process for producing pig iron using coal degassing reactor to form reductants. 4,857,105, Cl. 75-38.000.

Hauk, Rolf, to Korf Engineering GmbH. Process for removing sulphur from the waste gas of a reduction shaft furnace. 4,857,284, Cl. 423-231.000.

Hauser, Herbert P., to Dom-Sicherheitstechnik GmbH & Co KG. Device for protecting motor-vehicle wheels against theft. 4,856,307, Cl. 70-165.000.

Hauske, James R., to Pfizer Inc. C.12 modified erythromycin A derivatives. 4,857,641, Cl. 536-7.300.

Hawkins, Roland L., to Hoechst Fibers Industries. Staple fiber, finish therefor and process for use of same. 4,857,148, Cl. 162-157.200.

Hawn, Douglas L. Snowmobile tow bar apparatus. 4,856,799, Cl. 280-24.000.

Hayakawa, Kiyonori; and Mishima, Akio, to Sony Corporation. Complex magnetic transducer head of single magnetic pole type for perpendicular mode recording. 4,858,048, Cl. 360-121.000.

Hayakawa, Naoji; Takenouchi, Masanori; Nakamura, Kenji; Kan, Fumitaka; Kozato, Yasuo; and Hakamada, Isao, to Canon Kabushiki Kaisha. Charging device. 4,858,062, Cl. 361-225.000.

Hayashi, Kenji: *See—*
Tanaka, Yoshiyuki; Ii, Akira; Meguro, Taiichi; and Hayashi, Kenji, 4,858,136, Cl. 364-431.070.

Hayashi, Kimiaki; Ozaki, Yasuhiko; Yamada, Kenji; Takenaga, Hideyuki; and Inoue, Ichizo, to Tanabe Seiyaku Co., Ltd. Thiophene derivative and process for preparing the same. 4,857,543, Cl. 314-444.000

Hayashi, Kiyoshi: *See—*
Takeuchi, Kunihiko; Hayashi, Kiyoshi; and Shimomura, Yasuo, 4,858,103, Cl. 364-174.000.

Hayashi, Masayuki: *See—*
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Hayashi, Nobuaki; Uchino, Shoichi; Tomita, Yoshifumi; Nonogaki, Saburo; and Nishizawa, Masahiro, to Hitachi, Ltd. Process of improving optical contact of patternwise powdery coating layer and phosphor screen provided therefore. 4,857,429, Cl. 430-28.000.

Hayashi, Tadayoshi: *See—*
Ushio, Hideaki; Hayashi, Tadayoshi; Shibata, Kazuo; Hata, Tsunehisa; and Fujisawa, Yoshikazu, 4,856,462, Cl. 123-41.840.

Hayashi, Takeo: *See—*
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Hayashida, Tetsuya: *See—*
Homma, Noriyuki; Nakamura, Tohru; Nakazato, Kazuo; Matsumoto, Motoaki; Hayashida, Tetsuya; Kubo, Masaharu; and Sagara, Kazuhiko, 4,858,184, Cl. 365-174.000.

Hayata, Terunobu: *See—*
Ito, Masamichi; Ohkoshi, Akio; Shizukawa, Kenjiro; Hayata, Terunobu; Furuya, Tomiaki; Yamanaka, Susumu; and Koezuka, Junji, 4,857,499, Cl. 502-326.000.

Hayes, Charles L., to Hayes Technology. Joystick with spring disconnect. 4,857,881, Cl. 338-128.000.

Hayes, Frank M.: *See—*
Rorick, Donald E.; Hayes, Frank M.; and Aspy, Robert O., 4,856,731, Cl. 242-158.00R.

Hayes, James K., to Combustion Engineering, Inc. Multiple tube steam dryer for moisture separator reheater. 4,856,461, Cl. 122-488.000.

Hayes Microcomputer Products, Inc.: *See—*
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Hayes Technology: *See—*
Hayes, Charles L., 4,857,881, Cl. 338-128.000.

Hayhurst, Peter: *See—*
Andrew, Edward D.; and Hayhurst, Peter, 4,856,769, Cl. 271-193.000.

Haynie, Robert N., to Federal-Mogul Corporation. Method of making a bi-directional wear sleeve. 4,856,235, Cl. 51-289.00R.

Hayward, Walter. Emergency light system. 4,858,082, Cl. 362-74.000.

Hazebrouck, Henry B., to Ampex Corporation. Bimorph actuator for a disk drive. 4,858,040, Cl. 360-78.050.

Hazelton, Donald R.; and Shulman, Cindy B., to Exxon Chemical Patents Inc. Clear barrier composites containing polyisobutylene/-polyolefin alloy components. 4,857,409, Cl. 428-494.000.

Health Research , Inc.: *See—*
O'Connor, Timothy E.; and Dupere, Sherry L., 4,857,314, Cl 424-85.100.

Heath, Allen W.; Hernandez, Raymond; Hoffman, Virginia M.; Sheppard, Ronald K.; and Stratton, Susan D., to International Business Machines Corporation. Emulation system for automatically modifying I/O translation tables in programs designed to run on different types of computer. 4,858,114, Cl. 364-200.000.

Heberling, James R.: *See—*
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Heerema, Mark D.: *See—*
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Heffner, Donald L.; Merical, Dennis G.; and Homan, David A., to General Motors Corporation. Vacuum check valve and method of control. 4,856,554, Cl. 137-514.000.

Hegasy, Ahmed; and Ramsch, Klaus-Dieter, to Bayer Aktiengesellschaft. Dihydropyridine spray, process for its preparation and its pharmaceutical use. 4,857,312, Cl. 424-80.000.

Heger, Josef: *See—*
Ochel, Klaus-Peter; Krupp, Joachim; Heger, Josef; and Schweitzer, Martin, 4,856,985, Cl. 431-202.000.

Heggie, William; Page, Philip R.; Villax, Ivan; Ghatak, Indira; and Hursthouse, Michael, to Plurichemie Anstalt. Process of preparation of novel rhodium hydrogenation catalysts and their application. 4,857,235, Cl. 260-351.500.

Heidelberger Druckmaschinen AG: *See—*
Kipphan, Helmut; Jeschke, Willi; Ott, Hans; and Graf, Jean-Pierre, 4,856,903, Cl. 356-400.000.
Wirz, Arno, 4,856,426, Cl. 101-217.000.

Heilmann, Holger: *See—*
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Heimerl, Sebastian: *See—*
Maier, Josef; Gloger, Manfred; Hoerschelmann, Detlef V.; Strejcek, Jan; and Heimerl, Sebastian, 4,857,462, Cl. 435-197.000.

Hein, Bruce; and Shufflebarger, Charles, to MagneTek, Inc. Magnetic top wedge. 4,857,788, Cl. 310-214.000.

Hein, Gerd, to Siemens Aktiengesellschaft. Power supply arrangement. 4,858,196, Cl. 365-229.000.

Heiney, Allan: *See—*
Wilson, Donald K.; and Heiney, Allan, 4,856,878, Cl. 350-375.000.

Heinrich Kopp GmbH & Co. KG: *See—*
Flohr, Peter, 4,856,999, Cl. 439-52.000.

Heinzmann, Helmut: *See—*
Meyer, Richard; Muller, Wolfgang; and Heinzmann, Helmut, 4,856,205, Cl. 34-117.000.

Heiser, Bernd: *See—*
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Heit, Werner: *See—*
Groher, Manfred; Heit, Werner; Schmittner, Walter; and Warzawa, Wolfgang, 4,857,359, Cl. 427-6.000.

Hekal, Ihab M., to Continental Can Company, Inc. Process for the low temperature pasteurization of liquid comestibles. 4,857,343, Cl. 426-239.000

Heki, Tatsuo: *See—*
Yoshida, Tetsuo; and Heki, Tatsuo, 4,857,445, Cl. 430-509.000.

Helbling, Alois, to Dow Chemical Company, The. Curable latex composition, films and foams formed therefrom and method for curing the composition. 4,857,566, Cl. 523-409.000.

Helfer, Jeffrey L., to Eastman Kodak Company. Perfusion angioplasty catheter with pump assist. 4,857,054, Cl. 604-102.000.

Helger, Roland: *See—*
Henkel, Eberhard; Dolabdjian, Barkew; Helger, Roland; Klink, Rainer; and Wurzburg, Uwe, 4,857,640, Cl. 536-4.100.

Helt, Robert W.: *See—*
Sulfstede, Louis E.; Helt, Robert W.; and Jensen, Thomas E., 4,856,286, Cl. 62-89.000.

Heltemes, Eugene C., to Minnesota Mining and Manufacturing Company. Random-filament, multi-directionally responsive marker for use in electronic article surveillance systems. 4,857,891, Cl. 340-551.000

Hemmer, Richard E.: *See—*
Goldburt, Efim S.; and Hemmer, Richard E., 4,857,978, Cl. 357-24.000.

Hemmerich, Rainer: *See—*
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Hemminger, Rolf: *See—*
Schussler, Claus; Wojcik, Janusz; and Hemminger, Rolf, 4,856,494, Cl. 126-424.000.

Henderson, D. Grant; Yuill, Grenville K.; and Kroeker, David, to Henderson Medical Appliance Company Ltd. Toilet apparatus for use by bed ridden patients. 4,856,123, Cl. 4-480.000.

Henderson Medical Appliance Company Ltd.: *See—*
Henderson, D. Grant; Yuill, Grenville K.; and Kroeker, David, 4,856,123, Cl. 4-480.000.

Hendricks, Jefferson D.: *See—*
McBride, William B.; Wilson, William R., Jr.; Tomlinson, John C.; McCarthy, John A.; Kochanowsky, Eugene W.; Hendricks, Jefferson D.; and Houle, Arthur J., 4,857,921, Cl. 340-912.000.

Hendrickson, Max S.: *See—*
Gombrich, Peter P.; Zook, Ronald E.; and Hendrickson, Max S., 4,857,716, Cl. 235-462.000.

Hendrickson, Walter R. Shot and powder loading system. 4,856,408, Cl. 86-29.000

Henkel, Eberhard; Dolabdjian, Barkew; Helger, Roland; Klink, Rainer; and Wurzburg, Uwe, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Process and reagent for the determination of α-amylase. 4,857,640, Cl. 536-4.100.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Emmerling, Winfried; and Podola, Tore, 4,857,623, Cl. 528-28.000.

Hollenberg, Detlef; Schneider, Hans; and Weihrauch, Georg, 4,856,542, Cl. 132-265.000.

Henning, Rainer: *See—*
Urbach, Hansjorg; Henning, Rainer; Scholkens, Bernward; and Becker, Reinhard, 4,857,520, Cl. 514-183.000.

Henning, Wolfgang; Meckel, Walter; and Fuhrmann, Peter, to Bayer Aktiengesellschaft. Process for the continuous production of aqueous polyurethane dispersions and their use as a coating composition or as an adhesive. 4,857,565, Cl. 523-343.000.

Hennion, Claude: *See—*
Lewiner, Jacques; Hennion, Claude; and Leonard, Didier, 4,857,913, Cl. 340-825.310.

Hensel, Robert J.: *See—*
Beavis, Glenn C.; and Hensel, Robert J., 4,856,483, Cl. 123-516.000.

Henson, Jerry H. Cycling pedal stroke monitoring system. 4,856,996, Cl. 434-61.000.

Hentschel, Volker; Versteegen, Clemens; Gloyer, Jens; and Babendererde, Siegmund, to Hochtief Aktiengesellschaft Vorm. Gebr. Helfmann. Form for concrete-placement tunnel lining. 4,856,936, Cl. 405-145.000.

Herard, Yves. Collapsible fishing and/or leisure boat. 4,856,446, Cl. 114-61.000.

Herb Shaw & Sons Limited: *See—*
Elliott, John, 4,856,843, Cl. 296-181.000.

Herber, Raymond R.: *See—*
Barger, Paul T.; Thompson, Gregory J.; Herber, Raymond R.; and Imai, Tamotsu, 4,857,666, Cl. 585-323.000.

Herberts Gesellschaft mit beschraenkter Haftung: *See—*
Patzschke, Hans-Peter; Cerny, Peter W.; Goebel, Armin; and Stransky, Karlheinz, 4,857,580, Cl. 524-507.000.

Heren, Lawrence P., to L. R. Nelson Corporation. Coupling with improved locking/unlocking member. 4,856,823, Cl. 285-81.000.

Herman, Rod A.: *See—*
Kameswaran, Vekataraman; Wright, Donald P., Jr.; and Herman, Rod A., 4,857,550, Cl. 514-522.000.

Hermann, Allen M.; and Sheng, Zhengzhi, to University of Arkansas. Melt-produced high temperature rare earth barium copper oxide superconductor and processes for making same. 4,857,504, Cl. 505-1.000.

Hermann Berstorff Machinenbau GmbH: *See—*
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Hermann, Manfred: *See—*
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Hernandez, Raymond: *See—*
Heath, Allen W.; Hernandez, Raymond; Hoffman, Virginia M.; Sheppard, Ronald K.; and Stratton, Susan D., 4,858,114, Cl. 364-200.000.

Herndon, William H., to Fairchild Semiconductor Corporation. BIP-MOS decoder circuit. 4,857,772, Cl. 307-463.000.

Herring, Clarence R.; and Radcliffe, Curtis E. Relay and booster valves for air brake systems. 4,856,851, Cl. 303-40.000.

Hertema, Daryl J.: *See—*
Wiseman, Leland G.; and Hertema, Daryl J., 4,856,459, Cl. 119-73.000.

Hertrampf, Joachim: *See—*
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Herzig, Christian; Deubzer, Bernward; Frey, Volker; and Esterbauer Josef, to Wacker-Chemie GmbH. Process for preparing weather-resistant coatings. 4,857,608, Cl. 525-476.000.

Herzog, Albert A. M.: *See—*
Morais Cravador, Alfredo J.; Jacobs, Paul; Bollen, Alex J.; Van Elsen, Ary; and Herzog, Albert A. M., 4,857,470, Cl. 435-320.000.

Hethcoat, Gary L., to General Dynamics Corp. Electrostatic discharge control device. 4,858,061, Cl. 361-215.000.

Hettler, Wendelin: *See—*
Goettsche, Reimer; Marx, Hans-Norbert; and Hettler, Wendelin, 4,857,322, Cl. 424-633.000.

Hewlett-Packard Company: *See—*
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Simons, Tad D.; Stawitcke, Frederick A.; Reed, William M.; and Tessier, Paul A., 4,857,048, Cl. 604-50.000.
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Wheelwright, Lynn M.; Hansen, Vicky A.; and Heerema, Mark D., 4,858,159, Cl. 364-571.010.

Heys, George, Jr.; and Allgeier, David M. J., to NCR Corporation. Slip table with integrated slip guide. 4,857,712, Cl. 235-58.00P.

Hibert, Marcel; and Gittos, Maurice W., to Merrell Dow Pharmaceuticals Inc. Aromatic 2-aminoalkyl-1,2-benzoisothiazol-3(2H)-one-1,1-dioxide. 4,857,526, Cl. 514-230.500.

Hickory Specialties, Inc.: *See—*
Crace, R. Joseph, 4,857,074, Cl. 44-540.000.

Hicks, Ted: *See—*
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Hieda, Teruo: *See—*
Hirano, Yoshiaki; and Hieda, Teruo, 4,857,996, Cl. 358-48.000.

Hiemstra, Lourens A. V., to Silkbell Limited. Flow regulating device. 4,856,552, Cl. 137-497.000.

Higashino, Kazuyuki: *See—*
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High-Tech Medical Instrumentation, Inc.: *See—*
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High Temperature Engineering Corporation: *See—*
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Higuchi, Hisayuki; Suzuki, Makoto; and Homma, Noriyuki, to Hitachi, Ltd. Semiconductor integrated circuit. 4,858,191, Cl. 365-189.050.

Hijikata, Toshihiko: *See—*
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Hijikata, Toshiki: *See—*
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Hikawa, Kazuo, to Victor Company of Japan, Ltd. Digital signal reproducing system. 4,858,035, Cl. 360-51.000.

Hike-A-Bike Incorporated: *See—*
Workentine, Larry, 4,856,686, Cl. 224-42.070.

Hilfiker, William K. Method and apparatus for constructing geogrid earthen retaining walls. 4,856,939, Cl. 405-284.000.

Hill, David T.; Johnson, Randall K.; and Mirabelli, Christopher K., to SmithKline Beckman Corporation. Antitumor compounds. 4,857,549, Cl. 514-495.000.

Hill, Ernestine W.: *See—*
Bradley, John S.; and Hill, Ernestine W., 4,857,492, Cl. 502-117.000.

Hill, John A., III; Miekka, Richard G.; and Cohen, Norman B., to Dennison Manufacturing Company. Electrosensitive recording. 4,857,398, Cl. 428-331.000.

Hill, William: *See—*
Thorn, Brent A.; and Hill, William, 4,857,367, Cl. 427-348.000.

Hillman, Gary; Rubin, Richard H.; and Paulfus, Bernard H., to Machine Technology, Inc. Apparatus and method for the fluid treatment of a workpiece. 4,856,456, Cl. 118-500.000.

Hillstead, Richard A., to Cordis Corporation. Endovascular stent apparatus and method. 4,856,516, Cl. 128-343.000.

Hilsenrath, Oliver: *See—*
Zeevi, Yehoshua; and Hilsenrath, Oliver, 4,858,014, Cl. 358-217.000.

Hindstrom, Rolf, to Valmet Oy. Microporous plate and method for manufacturing the same and suction drier apparatus. 4,856,204, Cl 34-95.000.

Hino, Hiromasa; and Fujimura, Ikuo. Camera having automatically controllable shooting features. 4,858,012, Cl. 358-210.000.

Hino Jidosha Kogyo Kabushiki Kaisha: *See—*
Momiyama, Fujio, 4,856,628, Cl. 192-3.580.

Hinrichs, Walter; Hovestadt, Herbert; Lange, Ludwig; Ruppert, Kurt A.; and Splett, Erich, to Degussa Aktiengesellschaft. Process for working up the filtration residue of crude sodium prepared by fusion electrolysis into a high-purity sodium alcholate. 4,857,665, Cl. 568-851.000.

Hinzen, Dieter: *See—*
Weber, Karl-Heinz; Schneider, Claus; Walther, Gerhard; Hinzen, Dieter; Kuhn, Franz J.; Lehr, Erich; Ensinger, Helmut; and Troger, Wolfgang, 4,857,528, Cl. 514-252.000.

Hirano, Sadayuki: *See—*
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Hirano, Takahisa; Hagimoto, Kiyoshi; and Takeda, Kimiharu, to Mitsubishi Jukogyo Kabushiki Kaisha. Scroll-type fluid machine with specific inner curve segments. 4,856,973, Cl. 418-55.000.

Hirano, Yoshiaki; and Hieda, Teruo, to Canon Kabushiki Kaisha. Image pickup device with reduced fixed pattern noise. 4,857,996, Cl. 358-48.000.

Hirao, Shozo; Usui, Hiroaki; Ohta, Yoshihiro; Nakai, Takashi; Ishikawa, Hiroyuki; and Konishi, Satoru, to Matsushita Electric Works, Ltd. Method of manufacturing modified wood material. 4,857,365, Cl. 427-297.000.

Hirasawa, Shigemi: *See—*
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Hirata, Junichi: *See—*
Kitaoka, Susumu; Andoh, Haruo; and Hirata, Junichi, 4,857,417, Cl. 428-694.000.

Hirata, Kengo; and Ishifuro, Katsumi, to Sharp Kabushiki Kaisha. Microwave oven with heating chamber temperature detecting circuit. 4,857,686, Cl. 219-10.55B.

Hirayama, Hiromitsu, to NEC Corporation. GaAs field effect transistor having a WSi Schottky gate electrode improved for high-speed operation. 4,857,975, Cl. 357-22.000.

Hirayama, Yuzo: *See—*
Suzuki, Nobuo; Morinaga, Motoyasu; Furuyama, Hideto; Hirayama, Yuzo; Okuda, Hajime; Nakamura, Masaru; and Motegi, Nawoto, 4,858,241, Cl. 372-46.000.

Hiroji, Iwasaki: *See—*
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Hiroki, Hisayuki; Ariga, Yoshio; and Watanabe, Hajime, to Kabushiki Kaisha Toshiba. Separating device for a sheet collection apparatus. 4,856,768, Cl. 271-186.000.

Hirose, Takeshi; Ogawa, Tadashi; and Furutachi, Nobuo, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 4,857,444, Cl. 430-505.000.

Hirose, Tomiyuki; and Shimizu, Hiroyuki, to Tomy Kogyo Co., Inc. Simulator toy. 4,856,777, Cl. 273-1.0GA.

Hirsch, Karl. Sheet binder. 4,856,926, Cl. 402-13.000.

Hitachi Device Eng. Co. Ltd.: *See—*
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Hitachi, Ltd.: *See*—
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Fuyama, Moriaki; Tamura, Katsumi; Taguchi, Kazuo; Onisawa, Kenichi; Sato, Akira; Hashimoto, Kenichi; Nakayama, Takahiro; and Abe, Yoshio, 4,857,802, Cl. 313-506.000.
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Itoh, Masahiko; Midorikawa, Heihatiro; Furutani, Yasumasa; and Aizawa, Michihiko, 4,857,222, Cl. 252-69.000.
Kataoka, Keiji; Kurosaki, Toshiei; Yonezawa, Seiji; and Katagiri, Soichi, 4,857,744, Cl. 250-548.000.
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Kotera, Nobuo; Yamashita, Kiichi; Kinoshita, Taizo; Tanaka, Hirotoshi; Tanaka, Satoshi; and Nagata, Minoru, 4,857,769, Cl. 307-450.000
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Hitachi Maxell, Ltd.: *See*—
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Hitachi Metals, Ltd.: *See*—
Onda, Kenichi; Matsuda, Yasuo; Abe, Kojin; Iwafuji, Yasunori; Aoyama, Hiroyuki; and Yoshinaka, Hideo, 4,858,096, Cl. 363-22.000.

Hitachi Microcomputer Engineering Ltd.: *See*—
Ogura, Setsuo; Kamegaki, Kazuyuki; Yamazaki, Kouichi; Miyazaki, Hideo; Kitamura, Yukinori; and Mayuzumi, Shirou, 4,857,987, Cl. 357-45.000.

Hitachi Video Engineering, Inc.: *See*—
Oku, Masuo; Kudo, Yoshimichi; Kuroyanagi, Tomomitsu; Kondo, Kazuo; Tsukazaki, Hisanobu; Ikeda, Tetsuya; Nakashima, Akio; and Kimura, Takashi, 4,858,030, Cl. 358-342.000.

Hitachi VLSI Engineering Corp.: *See*—
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Hitachi, Yuzo; and Serizawa, Haruo, to Usui Kokusai Sangyo Kabushiki Kaisha. Method for manufacturing the metallic carrier base material for maintaining a catalyst for exhaust gas purification. 4,857,500, Cl. 502-439.000.

Ho, May-Kin, to Du Pont de Nemours, E. I., and Company. Assay for carcinoma of breast, colon and ovary. 4,857,452, Cl. 435-7.000

Hobart Corporation: *See*—
Markley, Richard L.; and Hoblit, Therell D., 4,857,121, Cl. 156-64.000.

Hobbs, Taz D. Electric motor brake. 4,857,818, Cl. 318-762.000.

Hobeg mbH: *See*—
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Hoblit, Therell D.: *See*—
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Hochtief Aktiengesellschaft Vorm. Gebr. Helfmann: *See*—
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Hoda, Takeo: *See*—
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Hodge, Robert J., to Grace-Lee Products, Inc. Vehicle cleansing method. 4,857,113, Cl. 134-32.000.

Hoeberechts, Arthur M. E., to U.S. Philips Corp. Radiation-sensitive semiconductor device with active screening diode. 4,857,980, Cl. 357-30.000.

Hoechst AG: *See*—
Hars, Ulrich; Staiger, Rolf; and Westphal, Karl, 4,857,207, Cl. 210-725.000.

Hoechst Aktiengesellschaft: *See*—
Knauf, Werner; Waltersdorfer, Anna; Sagenmuller, Alfons; Stier, Hubert; and Lourens, Jan, 4,857,510, Cl. 514-30.000.
Urbach, Hansjorg; Henning, Rainer; Scholkens, Bernward; and Becker, Reinhard, 4,857,520, Cl. 514-183.000.

Hoechst Celanese Corp.: *See*—
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Hoechst Fibers Industries: *See*—
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Hoecklin, Dieter: *See*—
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Hoek, Arend; Huizinga, Tom; and Maxwell, Ian E., to Shell Oil Company. Hydrocarbon conversion catalysts. 4,857,170, Cl. 208-111.000.

Hoek, Arend; Huizinga, Tom; and Maxwell, Ian E., to Shell Oil Company. Hydrocarbon conversion process and catalysts. 4,857,171, Cl. 208-111.000

Hoerschelmann, Detlef V.: *See*—
Maier, Josef; Gloger, Manfred; Hoerschelmann, Detlef V.; Strejcek, Jan; and Heimerl, Sebastian, 4,857,462, Cl. 435-197.000.

Hoffman, Alan R.: *See*—
Pidorenko, John; Hoffman, Alan R.; Hodge, Robert F.; and Wang, Wei-Min, 4,856,317, Cl. 73-4.00R.

Hoffman, Alan W.: *See*—
Goodnough, Mark A.; Stineman, John A., Jr.; and Hoffman, Alan W., 4,857,725, Cl. 250-214.00A.

Hoffman, Virginia M.: *See*—
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Hoffman, William F.; and Lee, Ta J., to Merck & Co., Inc. Novel HMG-CoA reductase inhibitors. 4,857,547, Cl. 514-460.000

Hoffmann-La Roche Inc.: *See*—
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Hoffmann, Thomas; Mayr, Ernst; and Saller, Helmut, to Siemens Aktiengesellschaft. Method for manufacturing a light waveguide cable. 4,857,242, Cl. 264-1.400.

Hogan, Paul J.; Sanders, Evan; and DiGirolamo, Robert, to Playground Clearing House, Inc. Surface resiliency tester. 4,856,318, Cl. 73-12.000.

Hohe KG: *See*—
Polzer, Herwig W.; and Seitz, Edwin, 4,856,886, Cl. 350-635.000.

Hohmann, Gerhard: *See*—
Musch, Rudiger; Muller, Eberhard; Hohmann, Gerhard; and Schabel, Karl-Heinz, 4,857,616, Cl. 526-204.000.

Holland, Christopher E.: *See*—
Spindt, Charles A.; and Holland, Christopher E., 4,857,799, Cl. 313-495.000

Hollenberg, Detlef; Schneider, Hans; and Weihrauch, Georg, to Henkel Kommanditgesellschaft auf Aktien. Expandable hair curler. 4,856,542, Cl. 132-265.000.

Hollingsworth, Ritchie D., to Cycle Composites, Inc. Integral rear wheel suspension for composite material bicycle frame. 4,856,801, Cl. 280-284.000

Holman, Rury R.: *See*—
Turner, Robert C.; and Holman, Rury R., 4,856,515, Cl. 128-315.000

Holmgren, Harry: *See*—
Axelsson, Owe; Holmgren, Harry; and Birkenbeul, Heinz, 4,856,709, Cl. 229-125.340.

Holmquist, Fredrik, to NDC Technologies, Inc. Optical navigation system for an automatic guided vehicle, and method. 4,858,132, Cl. 364-424.020

Holstein und Kappert GmbH: *See*—
Brakelmann, Wolfgang, 4,856,551, Cl. 137-312.000.

Holston, Robert W.; and Halford, Thomas H. Underwater signaling device. 4,858,204, Cl. 367-141.000

Holtronic Technologies Limited: *See*—
Phillips, Nicholas J., 4,857,425, Cl. 430-1.000.

Homan, David A.: *See*—
Heffner, Donald L.; Merical, Dennis G.; and Homan, David A., 4,856,554, Cl. 137-514.000.

Homma, Hideo, to Canon Kabushiki Kaisha. Image sensing device. 4,858,020, Cl. 358-287.000.

Homma, Noriyuki; Nakamura, Tohru; Nakazato, Kazuo; Matsumoto, Motoaki; Hayashida, Tetsuya; Kubo, Masaharu; and Sagara, Kazuhiko, to Hitachi, Ltd. Radiation resistant bipolar memory. 4,858,184, Cl. 365-174.000.

Homma, Noriyuki: *See*—
Higuchi, Hisayuki; Suzuki, Makoto; and Homma, Noriyuki, 4,858,191, Cl. 365-189.050.

Hon, Clarence C., to Mobil Oil Corporation. Monitoring liquid level infed tank and flow rate of liquid therefrom to point of use. 4,856,343, Cl. 73-861.000.

Honda Engineering Co., Ltd.: *See*—
Honda, Hideyuki; Kawasaki, Koichi; and Sato, Hiroshi, 4,856,330, Cl. 73-204.250.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Fujii, Katsuhiko; Sato, Shiro; Miyanaga, Yasuhiro; Asami, Heizo; Takekoshi, Susumu; and Kasai, Yasuo, 4,856,849, Cl. 301-63.00R.
Kawahara, Eiichiro; and Ikejiri, Kenichi, 4,856,279, Cl. 60-489.000.
Mori, Seiji; Sonoda, Toshinari; and Kinoshita, Yusuke, 4,856,486, Cl. 123-572.000.
Nakajima, Toyohei; Mieno, Toshiyuki; Tanaka, Akira; Nagao, Akira; and Suzaki, Yukihiko, 4,856,480, Cl. 123-425.000.
Nishikawa, Masao; Aoki, Takashi; Sato, Yoichi; and Fukuda, Yukihiro, 4,856,382, Cl. 74-867.000.
Nishimura, Sadanori; Makita, Hiroshige; and Ishikawa, Tomoaki, 4,856,264, Cl. 56-10.900.
Ohba, Naohiko, 4,856,751, Cl. 248-638.000.
Ushio, Hideaki; Hayashi, Tadayoshi; Shibata, Kazuo; Hata, Tsunehisa; and Fujisawa, Yoshikazu, 4,856,462, Cl. 123-41.840.
Washizawa, Yoshikazu, 4,856,373, Cl. 74-710.500.

Honda, Hideyuki; Kawasaki, Koichi; and Sato, Hiroshi, to Honda Engineering Co., Ltd.; and Tokyo Denshi Yakin Co., Ltd. Fluid speed or direction measuring apparatus. 4,856,330, Cl. 73-204.250.

Honda, Iwakazu, to Sharp Kabushiki Kaisha. Copier with reciprocating document table. 4,857,956, Cl. 355-234.000.

Honda, Yutaka: *See*—
Kirihara, Tomoo; Nakagawa, Ippei; Seki, Yoshinobu; and Honda, Yutaka, 4,857,155, Cl. 204-61.000.

Honeywell Bull Inc.: *See*—
Wilhite, John E.; and Shelly, William A., 4,858,176, Cl. 364-900.000.

Honeywell Inc.: *See*—
Johnson, Stewart D., 4,856,328, Cl. 73-202.000.
Lenz, James E.; Bjork, Paul E.; and Fujiwara, Hisatoshi, 4,857,727, Cl. 250-227.000
Miller, Harry; and Zweifel, Terry, 4,857,922, Cl. 340-968.000.
Neglia, Joseph D.; and Cunningham, David C., 4,857,926, Cl. 341-116.000
Schuetz, James A., 4,857,418, Cl. 428-693.000.

Hong, Seungok: *See*—
Marancik, William G.; Hong, Seungok; and Grabinsky, Glenn W., 4,857,675, Cl. 174-15.400

Hongo, Nobuhisa: *See*—
Kamiyama, Akira; Hongo, Nobuhisa; Matsuki, Toyomi; and Kanai, Kenji, 4,857,790, Cl. 310-234.000.

Honjyo, Kazuhiko: *See*—
Kadokura, Sadao; Kamei, Kazuhiro; and Honjyo, Kazuhiko, 4,858,043, Cl. 360-99.010.

Hood, Richard D., Jr.; Mueller, Dale E.; and Walker, Douglas J., to Whirlpool Corporation. Agitator thrust spacer for automatic washer. 4,856,303, Cl. 68-133.000.

Hooser, Delton D. Automobile ventilation device. 4,856,418, Cl. 98-2.130.

Hopf, Frederick R.; McFarland, Michael J.; and Osuch, Christopher E., to Hoechst Celanese Corporation. Positive photoresist thermally stable compositions and elements having deep UV response with maleimide copolymer. 4,857,435, Cl. 430-192.000.

Hopkins, James O., Jr.: *See*—
Aichele, William H.; Hopkins, James O., Jr.; and Krauskopf, Dale H., 4,856,850, Cl. 303-20.000.

Hopkins, Jeffrey A.: *See*—
DiMartino, Stephen P., Sr.; Hopkins, Jeffrey A.; and Davis, Ruth A., 4,857,082, Cl. 55-16.000.

Hord, H. S., to Micott Corp. Combination picture frame and video cassette holder. 4,856,213, Cl. 40-152.000.

Horgan, Thomas B., to Computer Devices, Inc. Digital video storage. 4,857,990, Cl. 358-13.000.

Hori, Yasuaki: *See*—
Nakamura, Hitoshi; and Hori, Yasuaki, 4,856,829, Cl. 292-216.000.

Horiba Ltd.: *See*—
Kotani, Haruo, 4,857,166, Cl. 204-435.000.

Horinouchi, Shinichi: *See*—
Takeuchi, Kunihiko; Oba, Masao; and Horinouchi, Shinichi, 4,856,177, Cl. 29-568.000.
Takeuchi, Kunihiko; Ikeda, Hajime; and Horinouchi, Shinichi, 4,858,133, Cl. 364-424.040.

Horita, Chiezo: *See*—
Yamaguchi, Morie; Horita, Chiezo; Suzuki, Shigeo; and Sakata, Yasuo, 4,857,411, Cl. 428-546.000.

Horiuchi, Ryo; Saito, Satoshi; Suzuki, Koichi; and Higashino, Kazuyuki, to Astronautical Science; and Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Combustor of high pressure burner for rocket engine and method of fabrication thereof. 4,856,163, Cl. 29-157.00C.

Horiya, Shigekazu: *See*—
Yokota, Takayoshi; Horiya, Shigekazu; Uno, Sadao; Katayama, Kozo; and Tanabe, Daijiro, 4,856,754, Cl. 249-113.000.

Horner, Arland W.: *See*—
Horsey, Robert W.; Pilon, Laurent C.; Fletcher, Grant M.; and Horner, Arland W., 4,856,722, Cl. 242-18.00A.

Horowski, Reinhard: *See*—
Wachtel, Helmut; Schneider, Herbert H.; Loschmann, Peter-Andreas; Dorow, Rainer; Horowski, Reinhard; Acksteiner, Bernard; Schulze, Paul-Eberhard; and Sauer, Gerhard, 4,857,298, Cl. 424-1.100.

Horsey, Robert W.; Pilon, Laurent C.; Fletcher, Grant M.; and Horner, Arland W., to BASF Fibres, Inc. Apparatus and process for automatically taking up a continuously supplied yarn. 4,856,722, Cl. 242-18.00A.

Horstman Manufacturing Co.: *See*—
Gebhart, Gary R., 4,856,637, Cl. 192-105.00C.

Hosaka, Masao; Shimada, Kazutoshi; and Sakamaki, Hisashi, to Canon Kabushiki Kaisha. Control device for image processing or forming apparatus. 4,857,960, Cl. 355-208.000.

Hoshi, Kazunori, to Ricoh Company, Ltd. Communication system employing multi-conjunction architecture. 4,858,228, Cl. 370-60.000.

Hoshino, Mitsuru; Yusa, Haruhiko; and Suzuki, Katsumi, to Kureha Kagaku Kogyo K. K. Polyvinyl chloride resin composition. 4,857,592, Cl. 525-82.000.

Hosoi, Keiji, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Air distribution apparatus for use with an internal combustion engine. 4,856,464, Cl. 123-52.00M.

Hosokai, Tetsushi: *See*—
Kamise, Katsuya; Yamamoto, Shigeru; Hosokai, Tetsushi; and Miyamoto, Koji, 4,856,481, Cl. 123-425.000.

Hospal Industrie: *See*—
Cortial, Jean-Loup, 4,857,199, Cl. 210-646.000.

Houle, Arthur J.: *See*—
McBride, William B.; Wilson, William R., Jr.; Tomlinson, John C.; McCarthy, John A.; Kochanowsky, Eugene W.; Hendricks, Jefferson D.; and Houle, Arthur J., 4,857,921, Cl. 340-912.000.

Hovan, Edward J.: *See*—
Putman, Robert L.; and Hovan, Edward J., 4,856,272, Cl. 60-39.020.

Hovance, Hubert T.: *See*—
Still, Donald O.; Hovance, Hubert T.; and Burley, George J., 4,857,123, Cl. 156-133.000.

Hovestadt, Herbert: *See*—
Hinrichs, Walter; Hovestadt, Herbert; Lange, Ludwig; Ruppert, Kurt A.; and Splett, Erich, 4,857,665, Cl. 568-851.000.

Howa Machinery, Ltd.: *See*—
Noda, Mitsuo, 4,856,415, Cl. 92-88.000.

Hoy, Kenneth L.: *See*—
Meschke, Debra J.; and Hoy, Kenneth L., 4,857,218, Cl. 252-49.300.

Hsia, Jen-Chang. Pasteurizable, freeze-driable hemoglobin-based blood substitute. 4,857,636, Cl. 530-385.000.

Hu, Shing-Bun: *See*—
Shu, Chi-Yao, 4,856,296, Cl. 62-430.000.

Huang, Shyh-Chin; and Gigliotti, Michael F. X., Jr., to General Electric Company. Method of making vanadium-modified titanium aluminum alloys. 4,857,268, Cl. 420-418.000.

Huang, Tracy J.; LaPierre, Rene B.; and Tabak, Samuel A., to Mobil Oil Corporation. Process for the production of ether and alcohol. 4,857,664, Cl. 568-695.000.

Hubbard, David W.: *See*—
Cordery, Robert A.; and Hubbard, David W., 4,856,602, Cl. 177-210.0FP.

Huber, Werner: *See*—
Broemer, Heinz; Huber, Werner; and Meinert, Norbert, 4,857,487, Cl. 501-44.000.

Huberts, Petrus A. A., to Philips & Du Pont Optical Company. Vacuum apparatus for holding workpieces. 4,856,766, Cl. 269-21.000.

Hughes Aircraft Company: *See*—
Ahmed, Nazeer; and Tomlinson, Roger R., 4,856,172, Cl. 29-434.000.
Berman, Arnold L.; Hahn, Carl J., III; and Wachs, Marvin R., 4,857,865, Cl. 330-304.000.
Curtis, Daniel L., 4,857,130, Cl. 156-292.000.
Knauer, Wolfgang, 4,856,457, Cl. 118-666.000.
Lucas, Charles H., 4,857,930, Cl. 341-150.000.
Lucas, Charles H., 4,857,984, Cl. 357-41.000.
Pastor, Antonio C.; Gentile, Anthony L.; and Wysocki, Joseph A., 4,857,249, Cl. 264-67.000.
Pastor, Ricardo C.; and Gorre, Luisa E., 4,857,293, Cl. 423-489.000.
Rosen, Harold A.; and Thompson, James D., 4,858,229, Cl. 370-75.000.
Wakugawa, Jason M.; Gresko, Lawrence S.; and Brown, Kenneth M., 4,856,887, Cl. 350-641.000.

Hughes, Paul R., to GTE Spacenet Corporation. Electronic housing for a satellite earth station. 4,858,069, Cl. 361-384.000.

Hughes, Samuel G., Sr. Guitar with tuning changing, key changing, chord changing and modulating capabilities. 4,856,404, Cl. 84-297.00R.

Huizenga, Michael K.: *See*—
Rush, Robert W., Jr.; and Huizenga, Michael K., 4,857,681, Cl. 200-61.850.

Huizinga, Tom: *See*—
Hoek, Arend; Huizinga, Tom; and Maxwell, Ian E., 4,857,170, Cl. 208-111.000.
Hoek, Arend; Huizinga, Tom; and Maxwell, Ian E., 4,857,171, Cl. 208-111.000.

Hull, Ronald K. Water ski device. 4,857,026, Cl. 441-65.000.

Humphrey, Sean P. Means and method for flavored wood reeds for woodwind instruments. 4,856,405, Cl. 84-383.00A.

Hunt, Andrew, to Schlumberger Technology Corporation. Measuring flow in a pipe. 4,856,344, Cl. 73-861.040.

Hunt, Michael S.: *See*—
Pipkin, Noel J.; and Hunt, Michael S., 4,857,172, Cl. 209-1.000.

Hursthouse, Michael: *See*—
Heggie, William; Page, Philip R.; Villax, Ivan; Ghatak, Indira; and Hursthouse, Michael, 4,857,235, Cl. 260-351.500.

Hurtel, Patrice; Laurent, Denis; and Rondini, Joseph, to Norsolor. Process for the synthesis of (math)acrylic anhydrides. 4,857,239, Cl. 562-[illegible].
Huser, Josef P. Process and device for measuring the draw-in force at the interface between a tool and the spindle end of a machine tool. 4,856,349, Cl. 73-862.540.
Hvolka, Dusan J., to DJH Engineering Center, Inc. Variable speed transmission. 4,856,378, Cl. 74-804.000
Hwang, InSeok S., to American Telephone and Telegraph Company. Carry look-ahead technique having a reduced number of logic levels. 4,858,168, Cl. 364-787.000.
Hyboud, Inc.: *See—*
Mullen, Gerald G., 4,857,133, Cl. 156-378.000.
Hydro Conduit Corporation: *See—*
Zicaro, Joseph P., 4,856,561, Cl. 138-109.000
I.L.Med, Inc.: *See—*
Lombardo, Igino; and Walus, Richard L., 4,856,512, Cl 128-303.100.
Ichimura, Hiroshi: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; Negishi, Ichiro; and Osada, Masaru, 4,857,995, Cl. 358-47.000.
Ichimura, Yoshiaki: *See—*
Nakano, Kenichi; Umezawa, Yoshihiro; Tokaichi, Tetsuro; Ichimura, Yoshiaki; and Kawabe, Natsuki, 4,857,001, Cl. 439-68.000
Ichimura, Yukiko: *See—*
Kozaki, Shyuichi; Ichimura, Yukiko; and Narutako, Yozo, 4,856,875, Cl. 350-341.000.
Ide, Fumito: *See—*
Abuyama, Yasuo; Ide, Fumito; Hamanaka, Osamu; and Sanbayashi, Takeshi, 4,857,954, Cl. 355-245.000
Idemitsu Kosan Co., Ltd.: *See—*
Hashimoto, Katsumi, 4,857,220, Cl. 252-56.00R
Idemitsu Petrochemical Co., Ltd.: *See—*
Sugimoto, Keiji; Hayashi, Takeo; and Fujimoto, Masahiro, 4,856,656, Cl. 206-523.000.
IDN Inventions and Development of Novelties A.G.: *See—*
Ackeret, Peter, 4,856,653, Cl. 206-387.000
IFW-Manfred Otte Gesellschaft m.b.H. & Co. KG.: *See—*
Schwaiger, Ernst; and Mitteregger, Erich, 4,856,753, Cl. 249-94.000
Igarashi, Yoshiaki: *See—*
Oshima, Mitsuaki; Izaki, Masataka; Kajino, Jirou; Igarashi, Yoshiaki; and Mitani, Hiroshi, 4,856,882, Cl. 350-500.000
Ii, Akira: *See—*
Tanaka, Yoshiyuki; Ii, Akira; Meguro, Taiichi; and Hayashi, Kenji, 4,858,136, Cl. 364-431.070.
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, to Kissei Pharmaceutical Co., Ltd. Novel renin inhibitory amino acid derivatives. 4,857,650, Cl. 548-336.000.
Iizuka, Tetsuya: *See—*
Sakurai, Takayasu; and Iizuka, Tetsuya, 4,857,763, Cl. 307-443.000.
Ikeda, Hajime: *See—*
Takeuchi, Kunihiko; Ikeda, Hajime; and Hornouchi, Shinichi, 4,858,133, Cl. 364-424.040.
Ikeda, Satoshi: *See—*
Takeuchi, Satoshi; Danjo, Koutaro; Tahara, Shigehiko; Yui, Yoshiharu; and Ikeda, Satoshi, 4,856,857, Cl. 350-3.600
Ikeda, Tatsuhiko: *See—*
Niwano, Kazuhito; and Ikeda, Tatsuhiko, 4,857,478, Cl. 437-61.000.
Ikeda, Tetsuya: *See—*
Oku, Masuo; Kudo, Yoshimichi; Kuroyanagi, Tomomitsu; Kondo, Kazuo; Tsukazaki, Hisanobu; Ikeda, Tetsuya; Nakashima, Akio; and Kimura, Takashi, 4,858,030, Cl. 358-342.000
Ikeguchi, Seiichi: *See—*
Furukawa, Sunao; Yoshimoto, Tadashi; Ajisawa, Yukiyoshi; Ikeguchi, Seiichi; and Kinoshita, Yukihiko, 4,857,524, Cl. 514-227.500.
Ikejiri, Kenichi: *See—*
Kawahara, Eiichiro; and Ikejiri, Kenichi, 4,856,279, Cl. 60-489.000.
Ikekawa, Nobuo: *See—*
DeLuca, Hector F.; Ikekawa, Nobuo; and Tanaka, Yoko, 4,857,518, Cl. 514-167.000.
Illinois Tool Works, Inc.: *See—*
Blucher, William J.; Ernst, Richard J.; and Peterson, Francis C., 4,856,951, Cl. 411-178.000
Watts, Leslie M., 4,857,711, Cl. 219-548.000.
Imai, Mizuho: *See—*
Tatsumi, Yuuichi; Minagawa, Hidenobu; Iwahashi, Hiroshi; Asano, Masamichi; and Imai, Mizuho, 4,858,192, Cl. 365-200.000
Imai, Takeo. Process for collecting a contaminated substance and apparatus thereof. 4,856,419, Cl. 98-115.100.
Imai, Tamotsu: *See—*
Barger, Paul T.; Thompson, Gregory J.; Herber, Raymond R.; and Imai, Tamotsu, 4,857,666, Cl. 585-323.000.
Imamura, Humihiro: *See—*
Narita, Ryuho; Kako, Hidenori; and Imamura, Humihiro, 4,858,095, Cl. 363-21.000.
Imanishi, Taichi; and Muraoka, Shigemitsu, to Asahi Kasei Kogyo Kabushiki Kaisha. Poly-p-phenylene-terephthalamide film and process for producing the same. 4,857,255, Cl. 264-216.000.
Immormino, Fredrick R.: *See—*
Stewart, Daniel L.; Immormino, Fredrick R.; Galdun, Daniel J.; and Rischar, Charles M., 4,858,101, Cl. 364-131.000.
Imori, Hideo: *See—*
Taji, Ryoichi; and Imori, Hideo, 4,857,787, Cl. 310-180.000.
Imoto, Katsuyuki, to Hitachi, Ltd. Optical waveguide and method for fabricating the same. 4,856,859, Cl. 350-96.120.
Imperial Chemical Industries PLC: *See—*
Anthony, Vivienne M.; Clough, John M.; and Godfrey, Christopher R. A., 4,857,545, Cl. 514-452.000.
Butters, Alan; Blackmore, Diana C.; and Page, Darrin J., 4,857,386, Cl. 428-206.000
Butters, Alan; and Page, Graham A., 4,857,568, Cl. 523-456.000.
Kelham, Stephen F., 4,857,200, Cl. 210-651.000
Tapolczay, David J.; and Spinney, Mark A., 4,857,551, Cl. 514-532.000
Implant Innovations, Inc.: *See—*
Lazzara, Richard J.; and Beaty, Keith D., 4,856,994, Cl. 433-173.000.
Imura, Toru: *See—*
Araki, Masatada; Kuroyama, Yutaka; Takeuchi, Yukihisa; Takagi, Makoto; Kawamura, Yoshihito; and Imura, Toru, 4,857,414, Cl. 428-612.000
INA Walzlager Schaeffler KG: *See—*
Speil, Walter; Schmidt, Dieter; and Zipprath, Michael, 4,856,468, Cl. 123-90.470.
Tisch, Siegfried, 4,856,474, Cl. 123-323.000.
Inada, Souichi: *See—*
Mirura, Ryozo; Okamoto, Yoshio; Takahashi, Hiroki; and Inada, Souichi, 4,856,313, Cl. 72-234.000.
Ince, Dursun: *See—*
Moudgil, Brij M.; and Ince, Dursun, 4,857,174, Cl. 209-3.000.
Inco Limited: *See—*
Victorovich, Grigori S.; and O'Neill, Charles E., 4,857,104, Cl. 75-21.000
Independent Broadcasting Authority: *See—*
Lodge, Nicolas K., 4,858,005, Cl. 358-135.000.
Independent Trailer & Repair, Inc.: *See—*
Nash, Boyd B., 4,856,804, Cl. 280-430.000.
Infilico Degremont Inc.: *See—*
Jackson, Jerry E., 4,857,182, Cl. 270-104.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Berruti, Pierangelo, 4,856,922, Cl. 400-145.200.
Ingermann, Donald E.; Caffrey, Stephen F.; DeVoe, Alan R.; Smith, Ronald L.; and Sullivan, Ronald G., to Century International Corporation. Bowling lane vacuum with floating head. 4,856,138, Cl. 15-320.000.
INMOS Limited: *See—*
Dyson, Clive M.; King-Smith, Anthony D.; and Yassate, Mohamad H., 4,858,233, Cl. 371-9.000.
Innovation Sports, Inc.: *See—*
Castillo, Edward L.; Castillo, James D.; and Castillo, Michael S., 4,856,501, Cl. 128-80.00C.
Innse Innocenti Santeustacchio S.p.A.: *See—*
Zurru, Sergio; and Alberti, Romano, 4,856,314, Cl. 72-263.000.
Inoue, Gentei; Sakatani, Ikunori; and Tanaka, Katsuhiko, to Nippon Seiko Kabushiki Kaisha. Bearing device. 4,856,918, Cl. 384-610.000.
Inoue, Ichizo: *See—*
Hayashi, Kimiaki; Ozaki, Yasuhiko; Yamada, Kenji; Takenaga, Hideyuki; and Inoue, Ichizo, 4,857,543, Cl. 314-444.000.
Inoue, Kiyoshi: *See—*
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Inoue, Masaru: *See—*
Iwaoka, Toshio; and Inoue, Masaru, 4,858,060, Cl. 361-185.000.
Inoue Seisakusho (MFG) Co., Ltd.: *See—*
Kamiwano, Mitsuo; and Inoue, Yoshitaka, 4,856,717, Cl. 241-65.000.
Inoue, Shinichi; and Yamanaka, Masami, to Yamato Scale Company, Limited. Force measuring device. 4,858,145, Cl. 364-506.000.
Inoue, Tomohiro: *See—*
Washizuka, Isamu; Tsugei, Shinji; and Inoue, Tomohiro, 4,858,125, Cl. 364-413.010.
Inoue, Yoshiaki, to Mitsubishi Gas Chemical Company, Inc. Deoxidizer parcel. 4,856,649, Cl. 206-204.000
Inoue, Yoshiaki, to Mitsubishi Gas Chemical Co., Inc. Oxygen absorbent package. 4,856,650, Cl. 206-204.000.
Inoue, Yoshitaka: *See—*
Kamiwano, Mitsuo; and Inoue, Yoshitaka, 4,856,717, Cl. 241-65.000
Institut Francais du Petrole: *See—*
Delamare, Guy-Robert, 4,856,827, Cl. 285-268.000.
Instrumentarium Corp.: *See—*
Merilainen, Pekka, 4,856,531, Cl. 128-719.000.
Instruments S.A.: *See—*
Pierre, Morin, 4,857,730, Cl. 250-305.000.
Inter Power Technologie: *See—*
Wied, Edwin; and Glezerman, Josef, 4,856,460, Cl. 122-4.00D.
Intermedics, Inc.: *See—*
Baker, Ross G., Jr., 4,856,524, Cl. 128-419.0PG.
International Business Machine Corporation: *See—*
Pricer, Wilbur D.; and Wiedman, Francis W., 4,857,766, Cl. 307-446.000.
International Business Machines Corporation: *See—*
Bolton, Ivor W.; Gibbons, Richard N.; and Dixon, Gerald, 4,857,087, Cl. 55-385.600.
Cahill, Joseph J.; Johnson, Charles L.; Lewis, Steven D.; Mullins, Timothy J.; and Petz, Bruce R., 4,857,765, Cl. 307-443.000.
Estes, Mark W., 4,858,152, Cl. 364-550.000.

Glenning, John J.; Johnson, Caryn J.; Pawlowski, Walter P.; and Sakorafos, Kenneth G., 4,857,143, Cl. 156-668.000.
Greschner, Johann; Schwerdt, Friedrich W.; and Trumpp, Hans J., 4,857,383, Cl. 428-156.000.
Heath, Allen W.; Hernandez, Raymond; Hoffman, Virginia M.; Sheppard, Ronald K.; and Stratton, Susan D., 4,858,114, Cl. 364-200.000.
Ong, Shauchi, 4,858,179, Cl. 364-900.000.
Quarendon, Peter, 4,858,149, Cl. 364-522.000.
International Fuel Cell Corporation: *See—*
Maricle, Donald L.; and Buswell, Richard F., 4,857,420, Cl. 429-30.000.
International Telecommunications Satellite: *See—*
deSantis, Pietro, 4,858,225, Cl. 370-50.000.
International Telesystems Corp.: *See—*
Samuelson, Douglas A., 4,858,120, Cl. 364-401.000.
Intertechnique: *See—*
Ouillon, Rene; and Langlois, Roger, 4,856,507, Cl. 128-204.260.
Intevep, S.A.: *See—*
Martinez, Nelson P.; Galiasso, Roberto E.; Velasquez, Jose R.; Lujano, Juan; and Zerpa, Carlos, 4,857,494, Cl. 502-210.000.
Intle Corporation: *See—*
Jungroth, Owen W., 4,858,186, Cl. 365-185.000.
Inukai, Takahito: *See—*
Suehiro, Tsutomu; Uchiyama, Hitoshi; Inukai, Takahito; and Saito, Tsunenari, 4,858,016, Cl. 358-246.000.
Iowa State University Research Foundation, Inc.: *See—*
Kostic, Nenad M.; and Zhou, Xia-Ying, 4,857,231, Cl. 252-408.100.
Irani, Cyrus A.; Cozewith, Charles; and Kasegrande, Stephen S., to Exxon Research & Engineering Company. Method for high temperature phase separation of solutions containing polymers. 4,857,633, Cl. 528-498.000.
Irnich, Werner. Cardiac pacemaker having a variable stimulation frequency. 4,856,521, Cl. 128-419.0PG.
Irving, Edward: *See—*
Banks, Christopher P.; Demmer, Christopher G.; and Irving, Edward, 4,857,437, Cl. 430-327.000.
Iseki, Katsuhiko: *See—*
Nishi, Hiroyoshi; Watanabe, Toshiaki; Yuki, Satoshi; Morinaka, Yasuhiro; Iseki, Katsuhiko; and Sakurai, Hiroko, 4,857,542, Cl. 514-404.000.
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Larsson, Karl O. A. H., 4,857,051, Cl. 604-74.000.
Ishida, Kunio; Saito, Satoshi; Habuto, Akinaka; Murata, Tadahiko; Oiso, Hisayoshi; Joyama, Norio; and Fujimoto, Kazuhiro, to Meiji Seika Kaisha, Ltd. Method for producing baked products. 4,857,354, Cl. 426-558.000.
Ishida, Masamitsu: *See—*
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Ishida, Yoshihiko: *See—*
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Ishifuro, Katsumi: *See—*
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Ishiguro, Fujio; and Narahara, Takumi, to NGK Insulators, Ltd. Oxygen sensing element and process of manufacturing the same. 4,857,165, Cl. 204-424.000.
Ishihara, Masamichi: *See—*
Yamaguchi, Yasunori; Yoshida, Akirahiko; Nei, Masami; Ishihara, Masamichi; and Yamamoto, Yukio, 4,858,190, Cl. 365-189.050.
Ishii, Akira; and Ito, Ryoichi, to Kubota Ltd. Engine working machine assembly with soundproof cover. 4,856,470, Cl. 123-195.00C.
Ishii, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker including selectively operable long-time-delay tripping circuit. 4,858,058, Cl. 361-96.000.
Ishii, Kazuo: *See—*
Kato, Eiichi; and Ishii, Kazuo, 4,857,431, Cl. 430-91.000.
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, to Minolta Camera Kabushiki Kaisha. Reader-printer having an image rotation device. 4,857,965, Cl. 355-45.000.
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, to Minolta Camera Kabushiki Kaisha. Reader-printer having an image rotation device. 4,857,966, Cl. 355-45.000.
Ishii, Takafumi: *See—*
Itoh, Hiroyuki; Ishii, Takafumi; and Satoh, Tetsuo, 4,857,427, Cl. 430-19.000.
Ishii, Takaharu: *See—*
Wakimoto, Kazumasa; Shibata, Motohiro; Ishii, Takaharu; and Sakurai, Masaaki, 4,857,106, Cl. 75-41.000.
Ishii, Takatoshi, to ASCII Corporation. Image display apparatus. 4,857,899, Cl. 340-701.000.
Ishii, Takayuki: *See—*
Hatanaka, Katsunori; Saika, Toshihiro; Ishii, Takayuki; and Yamada, Katsuhiko, 4,857,751, Cl. 250-578.000.
Ishikawa, Hiroyuki: *See—*
Hirao, Shozo; Usui, Hiroaki; Ohta, Yoshihiro; Nakai, Takashi; Ishikawa, Hiroyuki; and Konishi, Satoru, 4,857,365, Cl. 427-297.000.
Ishikawa, Kazuo: *See—*
Kitagawa, Jun; Hijikata, Toshihiko; and Ishikawa, Kazuo, 4,857,089, Cl. 55-523.000.
Ishikawa, Masataka, to Diesel Kiki Co., Ltd. Apparatus and method for converting rotation angle width into time width. 4,858,158, Cl 364-571.010.
Ishikawa, Satoru: *See—*
Ishimura, Fumihiro; Ishikawa, Satoru; and Akiyama, Seiji, 4,857,469, Cl. 435-280.000.
Ishikawa Tekko Kabushiki Kaisha: *See—*
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Ishikawa, Tomoaki: *See—*
Nishimura, Sadanori; Makita, Hiroshige; and Ishikawa, Tomoaki, 4,856,264, Cl. 56-10.900.
Ishikawa, Yoshikazu, to Nissan Motor Company, Limited. Trunk piston for use in an internal combustion engine. 4,856,417, Cl. 92-233.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Horiuchi, Ryo; Saito, Satoshi; Suzuki, Koichi; and Higashino, Kazuyuki, 4,856,163, Cl. 29-157.00C.
Ishikwajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Okabe, Yoshimi; and Kikuchi, Katsumi, 4,856,353, Cl. 73-865.800.
Ishimaru, Yoshitaka, to Kanzaki Kokyukoki Mfg., Co. Ltd. Transmission for a tractor. 4,856,355, Cl. 74-11.000.
Ishimizu, Hideaki: *See—*
Kikuchi, Hiroshi; Tanuma, Jiro; Ishimizu, Hideaki; Uchida, Takao; and Asaka, Toshiyuki, 4,857,005, Cl. 439-140.000.
Ishimura, Fumihiro; Ishikawa, Satoru; and Akiyama, Seiji, to Toyo Jozo Co., Ltd. Process for preparing optically active mercapto compound. 4,857,469, Cl. 435-280.000.
Ishiwatari, Masaaki; Tsutsumi, Yuji; Ogusu, Yoshiyuki; and Kimura, Yoshihiro, to Shiseido Company Ltd. Cosmetic composition. 4,857,304, Cl. 424-59.000.
Ishizaki, Hidetsurumaro; and Taguchi, Riyozo, to Zojirushi Vacuum Bottle Co., Ltd. Method of making a stainless steel vacuum bottle with a silver mirrored surface. 4,856,174, Cl. 29-455.100.
Ishizuka, Susumu: *See—*
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Isoform: *See—*
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Isogai, Shunji, to Sugiyasu Industries Co., Ltd. Mechanism for preventing a carriage of a system for lifting a vehicle for repair thereof from lowering. 4,856,618, Cl. 187-8.500.
Isono, Hiroyuki, to Tachikawa Spring Co., Ltd. Cushioning body of a seat for vehicles. 4,856,844, Cl. 297-284.000.
Isuzu Motor Limited: *See—*
Yoshimura, Hiroshi; Shirata, Akihiro; and Kuroyanagi, Junzo, 4,856,360, Cl. 74-335.000.
Itagaki, Takaharu: *See—*
Kochi, Hiromi; Fukunaga, Kenji; Itagaki, Takaharu; and Ito, Tsuyoshi, 4,857,576, Cl. 524-409.000.
Itaya, Keiji: *See—*
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Itemadani, Eiji: *See—*
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Iten, Thomas, to Schenk & Co. Laminated piezoelectric keyboard. 4,857,887, Cl. 341-34.000.
Itkis, Boris, to Yuri Itkis. Concurrent game network. 4,856,787, Cl. 273-237.000.
Ito, Akio, to Jeco Company Limited. Servo type accelerometer. 4,856,333, Cl. 73-517.00B.
Ito, Hideji; Kametaka, Koji; and Tsumori, Yukihisa, to NTN Toyo Bearing Co., Ltd. Conducting rolling bearing. 4,856,916, Cl. 384-477.000.
Ito, Hirofumi: *See—*
Yamaguchi, Shogo; Araki, Kazunori; Tazuke, Hisashi; Murasaki, Masayuki; and Ito, Hirofumi, 4,856,563, Cl. 141-1.000.
Ito, Masamichi; Ohkoshi, Akio; Shizukawa, Kenjiro; Hayata, Terunobu; Furuya, Tomiaki; Yamanaka, Susumu; and Koezuka, Junji, to Kabushiki Kaisha Toshiba; and Tokyo Electric Power Company. High temperature combustion catalyst and method for producing the same. 4,857,499, Cl. 502-326.000.
Ito, Masazumi: *See—*
Nishimori, Kadotaro; and Ito, Masazumi, 4,856,877, Cl. 350-356.000.
Ito, Noboru: *See—*
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Ito, Ryoichi: *See—*
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Ito, Tsuyoshi: *See—*
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Ito, Yasushi: *See—*
Ogawa, Kanagawa; and Ito, Yasushi, 4,856,266, Cl. 57-9.000.
Ito, Yoichiro, to United States of America, Health and Human Services. Multistage mixer-settler centrifuge. 4,857,187, Cl. 210-198.200.
Ito, Yukio; Yamada, Kimichika; and Ohkawa, Hiroyuki, to Clarion Co., Ltd. Cassette insertion detecting mechanism. 4,858,042, Cl. 360-96.500.
Itoh, Hiroyuki; Ishii, Takafumi; and Satoh, Tetsuo, to Nippon Oil Company, Limited. Recording medium. 4,857,427, Cl. 430-19.000.
Itoh, Masahiko; Midorikawa, Heihatiro; Furutani, Yasumasa; and Aizawa, Michihiko, to Hitachi, Ltd. Absorption type refrigerator and absorbing solution therefor. 4,857,222, Cl. 252-69.000.
Itoh, Yuji; and Takahashi, Junichi, to Canon Kabushiki Kaisha. Ophthalmic photographing device. 4,856,890, Cl. 351-206.000.
ITW, Ltd.: *See—*
Bushnell, Raymond N., 4,856,950, Cl. 411-41.000.

Ivancevic, Mirko, to Litton Systems, Inc. Quadrupole-wound fiber optic sensing coil and method of manufacture thereof. 4,856,900, Cl. 356-350.000

Iwafuji, Yasunori: *See—*
Onda, Kenichi; Matsuda, Yasuo; Abe, Kojin; Iwafuji, Yasunori; Aoyama, Hiroyuki; and Yoshinaka, Hideo, 4,858,096, Cl. 363-22.000.

Iwahashi, Hiroshi: *See—*
Tatsumi, Yuuichi; Minagawa, Hidenobu; Iwahashi, Hiroshi; Asano, Masamichi; and Imai, Mizuho, 4,858,192, Cl. 365-200.000.

Iwai, Kiyoshi: *See—*
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Iwamoto, Akikazu: *See—*
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Iwamoto, Masayuki; Minami, Kouji; and Watanabe, Kaneo, to Sanyo Electric Co., Ltd. Photovoltaic device. 4,857,115, Cl. 136-249.000.

Iwamoto, Tadao: *See—*
Marume, Yoshihiro; and Iwamoto, Tadao, 4,857,248, Cl. 264-46.400.

Iwamura, Hichihiro; and Kitabayashi, Eiichi, to Citizen Watch Co., Ltd. Watch case and band attachment structure. 4,856,687, Cl. 224-169.000.

Iwaoka, Hideto; Ohte, Akira; and Akiyama, Koji, to Yokogawa Electric Corporation. Optical frequency analyzer using a local oscillator heterodyne detection of incident light. 4,856,899, Cl. 356-346.000.

Iwaoka, Toshio; and Inoue, Masaru, to Jidosha Denki Kogyo Kabushiki Kaisha. Driving device for door lock-actuator. 4,858,060, Cl. 361-185.000.

Iwasaki Electronics Co. Ltd.: *See—*
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Iwasaki, Yoshihiko; and Noguchi, Toyosaburo, to Kiyomoto Tekko Kabushiki Kaisha; and Kabushiki Kaisha Saito Hyakkaten. Method for maintaining or restoring freshness of plants, vegetables or fruits by treating with water supersaturated with air. 4,857,350, Cl. 426-506.000.

Iwashita, Tetsushi: *See—*
Ota, Yoshio; Goto, Norifumi; Motoyama, Iwao; Iwashita, Tetsushi; and Nomura, Kunio, 4,857,291, Cl. 423-430.000.

Iwaya, Katsumasa: *See—*
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Izaki, Masataka: *See—*
Oshima, Mitsuaki; Izaki, Masataka; Kajino, Jirou; Igarashi, Yoshiaki; and Mitani, Hiroshi, 4,856,882, Cl. 350-500.000.

J.M. Voith GmbH: *See—*
Sieberth, Ralf; and Sollinger, Hans-Peter, 4,856,454, Cl. 118-126.000.

Jablonski, Pierre: *See—*
Marianne, Jean J.; and Jablonski, Pierre, 4,856,698, Cl. 228-4.100.

Jablonski, Thaddeus M.: *See—*
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Jabri, Najib: *See—*
Manoury, Philippe; Rossey, Guy; Binet, Jean; DeFosse, Gerard; and Jabri, Najib, 4,857,536, Cl. 514-322.000.

Jachmann, Emil F.: *See—*
Dwyer, John J.; Jachmann, Emil F.; Harris, Mark N.; and Beloin, Brian F., 4,858,213, Cl. 369-28.000.

Jackson, Glenn M.; and Roufs, John G., to General Mills, Inc. Dry mix for microwave layer cake. 4,857,353, Cl. 426-554.000.

Jackson, Jerry E., to Infilico Degremont Inc. Protection devices for bar screens. 4,857,182, Cl. 270-104.000.

Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; Frasier, Richard A.; Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; and Olmstead, Neil R. Video switcher system with modular architecture. 4,858,011, Cl. 358-181.000.

Jacob, Herve : *See—*
Mametsa, Henri-Jose ; and Jacob, Herve , 4,857,850, Cl. 324-318.000.

Jacob, Valentim, Jr.: *See—*
Schmidt, Timothy J.; and Jacob, Valentim, Jr., 4,856,728, Cl. 242-107.700.

Jacob, Werner: *See—*
Schroder, Horst; Kispert, Klaus; Stolz, Robert; and Jacob, Werner, 4,856,917, Cl. 384-550.000.

Jacobs, Paul: *See—*
Morais Cravador, Alfredo J.; Jacobs, Paul; Bollen, Alex J.; Van Elsen, Ary; and Herzog, Albert A. M., 4,857,470, Cl. 435-320.000.

Jacobs, Stephen M.: *See—*
Au, Andrew N.; Deep, Marguerite E.; Fahey, Timothy E.; and Jacobs, Stephen M., 4,857,880, Cl. 338-22.00R

Jacopich, Werner; Winter, Kurt; and Mayr, Siegfried, to Siemens Aktiengesellschaft. Circuit for monitoring a plurality of analog quantities. 4,857,761, Cl. 307-350.000.

Jafarey, Nozar, to Allied-Signal Inc. Non-jamming rotary mechanical actuator. 4,856,379, Cl. 74-805.000

Jaffe, Edward E., to Ciba-Geigy Corporation. Modified beta-quinacridone pigment. 4,857,646, Cl. 546-49.000.

Jahnke, Richard L.: *See—*
Narducy, Kenneth W.; Jahnke, Richard L.; and Loshaek, Samuel, 4,857,072, Cl. 8-507.000.

Jamco International, Inc.: *See—*
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James River Corporation: *See—*
Miller, William B.; and Ang, Jit F., 4,857,352, Cl. 426-548.000.

James, Terry J. Vehicle optical safety apparatus. 4,858,081, Cl. 362-72.000.

Jankura, Bryan J.: *See—*
Daum, Edward D.; Downs, William; Jankura, Bryan J.; and McCoury, John M., Jr., 4,856,352, Cl. 73-863.250.

Jannot, Marcel A. J.; and Patureau, Jean-Pierre, to Bertin & Cie. Apparatus for thermal treatments of thin parts such as silicon wafers. 4,857,704, Cl. 219-354.000.

Janotik, Adam M., to Ford Motor Company. Acceleration sensor. 4,857,680, Cl. 200-61.45R.

Jansma, Donald; and Stemm, Howard W., to Bissell Health Care Corporation. Cigarette filter modifier. 4,856,540, Cl. 131-339.000.

Janssen, Eduard J. P.; and Notelteirs, Victor R., to U.S. Philips Corporation. Electric cooking unit having an electric lamp with a helical filament contact with the lamp vessel wall. 4,857,709, Cl. 219-464.000.

Janssen, Robert I., to Padco, Inc. Flocked foam brush. 4,856,136, Cl. 15-244.300.

Japan Aircraft Mfg., Co., Ltd.: *See—*
Kohno, Masahiro; Obata, Akira; Kitamura, Takayuki; and Okazaki, Kakuma, 4,856,765, Cl. 267-166.000.

Japan as represented by Director General of Agency of Industrial Science and Technology: *See—*
Ebata, Yoshihiro; Kouyama, Masanori; Tamari, Nobuyuki; and Kawamoto, Takamichi, 4,857,486, Cl. 501-21.000.

Japan Aviation Electronics Industry Limited: *See—*
Nakano, Kenichi; Umezawa, Yoshihiro; Tokaichi, Tetsuro; Ichimura, Yoshiaki; and Kawabe, Natsuki, 4,857,001, Cl. 439-68.000.

Jape, Anthony D.: *See—*
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Jarrett, Peter K.: *See—*
Casey, Donald J.; Rosati, Louis; Jarrett, Peter K.; and Lehmann, Leonard T., 4,857,602, Cl. 525-408.000.

Jeco Company Limited: *See—*
Ito, Akio, 4,856,333, Cl. 73-517.00B

Jennelle, Ernest M. Hydraulic sweep clarifier and method. 4,857,208, Cl. 210-745.000.

Jennings, Charles E., to Vetco Gray Inc. Wellhead connector locking device. 4,856,594, Cl. 166-338.000.

Jenoptik Jena GmbH: *See—*
Becker-Ross, Helmut; Florek, Stefan; Kerstan, Felix; Moebius, Guenther; and Sanders, Horst, 4,856,898, Cl. 356-328.000.

Jenq, Yih-Chyun; and Crosby, Philip S., to Tektronix, Inc. Digitizer effective resolution measurement system using sinewave parameter estimation. 4,858,142, Cl. 364-487.000.

Jensen General Corp.: *See—*
Fleming, Thomas W.; and Rose, Gary D., 4,856,493, Cl. 126-299.00R

Jensen, Richard K.; and Mandano, Barbara, to Plastic Welding Technologies, Inc. Method of bonding thermoplastic material using radio frequency energy. 4,857,129, Cl. 156-273.700.

Jensen, Thomas E.: *See—*
Sulfstede, Louis E.; Helt, Robert W.; and Jensen, Thomas E., 4,856,286, Cl. 62-89.00

Jensen, William T.; Brown, Vincent B.; Edgerton, Cathy J.; and Masterson, Robert W., to Methode Electronics, Inc. Terminator assembly for interconnecting computer devices. 4,857,002, Cl. 439-76.000.

JEOL Ltd.: *See—*
Tagata, Shojiro, 4,857,731, Cl. 250-310.000.

Jero Incorporated: *See—*
Rump, Jerome R., 4,857,693, Cl. 219-76.120.

Jeschke, Willi: *See—*
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Jespersen, Paul, to Georgia-Pacific Corporation. Flexible sheet material dispenser with automatic roll transferring mechanism. 4,856,724, Cl. 242-55.300.

Jester, Terry L., to Dana Corporation. Transmission shift rail interlock. 4,856,362, Cl. 74-477.000.

Jet Spray Corp.: *See—*
Emody, Kenneth J., 4,856,676, Cl. 222-66.000.

Jidosha Denki Kogyo Kabushiki Kaisha: *See—*
Iwaoka, Toshio; and Inoue, Masaru, 4,858,060, Cl. 361-185.000.
Matsumoto, Yasuki; and Kato, Masaru, 4,857,813, Cl. 318-54.000.

Jinnai, Kenichiro; and Hashimoto, Takafumi, to Kabushiki Kaisha Meidensha. Method of operating zinc-halogen secondary battery. 4,857,419, Cl. 429-13.000.

Jinno, Masayuki: *See—*
Terano, Takashi; Jinno, Masayuki; and Saijo, Munetoshi, 4,857,889, Cl. 340-461.000.

Jinotti, Walter J. Apparatus for mouth-to-mouth resuscitation. 4,856,506, Cl. 128-203.110.

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Jobin, Jean-Jacques: *See—*
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Jockle, Glenn A.: *See—*
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Joh. Friedrich Behrens AG: *See—*
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John Hopkins University: *See—*
Yang, Nai-Chuen; and Leichner, Peter K., 4,856,528, Cl. 128-653.000.

Johnson, Arthur T. Large-signal airway resistance measurement. 4,856,532, Cl. 128-720.000.

Johnson, Caryn J.: *See—*
Glenning, John J.; Johnson, Caryn J.; Pawlowski, Walter P.; and Sakorafos, Kenneth G., 4,857,143, Cl. 156-668.000.

Johnson, Charles L.: *See—*
Cahill, Joseph J.; Johnson, Charles L.; Lewis, Steven D.; Mullins, Timothy J.; and Petz, Bruce R., 4,857,765, Cl. 307-443.000.

Johnson, Charles R., to Winner, James. Automobile steering lock. 4,856,308, Cl. 70-209.000.

Johnson, Hans K. Method and apparatus for measuring the flow rate and velocity of a liquid in a pipeline. 4,856,347, Cl. 73-861.720.

Johnson, Harold P.: *See—*
Metala, Michael J.; Clark, William G., Jr.; Junker, Warren R.; Burtner, Lee W.; Arzenti, Thomas E.; Johnson, Harold P.; Vestovich, Robert P.; and Bevilacqua, Bruce W., 4,856,337, Cl. 73-601.000.

Johnson, Hugh I.: *See—*
Colledge, Alan L.; and Johnson, Hugh I., 4,856,775, Cl. 272-134.000.

Johnson, John A. Container coupler. 4,856,150, Cl. 24-287.000.

Johnson, Randall K.: *See—*
Hill, David T.; Johnson, Randall K.; and Mirabelli, Christopher K., 4,857,549, Cl. 514-495.000.

Johnson, Richard A.: *See—*
Maselli, John A.; Neidleman, Saul L.; Antrim, Richard L.; and Johnson, Richard A., 4,857,339, Cl. 426-28.000.

Johnson, Robert E., to Hoechst Celanese Corp. Process of manufacturing boron ceramics from carboralated diacetylene polymers. 4,857,490, Cl. 501-96.000.

Johnson, Sten E.: *See—*
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Johnson, Stewart D., to Honeywell Inc. Sampling probe flow sensor. 4,856,328, Cl. 73-202.000.

Johnston, Richard P. Variable-cycle reciprocating internal combustion engine. 4,856,463, Cl. 123-51.0BA.

Johnston, Robert G.: *See—*
O'Malley, Michael T.; and Johnston, Robert G., 4,857,884, Cl. 340-311.100.

Joklik, Otto F. Method of an apparatus for sterilizing aqueous media, more particularly drinking water. 4,857,204, Cl. 210-695.000.

Jones, Everett W. Adjustable, proportionally steerable auxiliary wheel asemblies for trucks. 4,856,814, Cl. 280-704.000.

Jones, Keith E.: *See—*
Strid, Eric W.; and Jones, Keith E., 4,858,160, Cl. 364-571.010.

Jones, Stanley C. Hybrid high pressure pump for gas-liquid permeameters. 4,856,967, Cl. 417-342.000.

Jones, Theodore L., to Burle Technologies, Inc. Precisely aligned switch actuator assembly for multiple switches. 4,857,682, Cl. 200-330.000.

Jonette, Bernard: *See—*
Collette, Jean J.; Dauvister, Pierre M. J.; Jonette, Bernard; and Lardo, Claude, 4,856,571, Cl. 152-209.00R.

Jongewaard, Susan K.; Smith, Terrance P.; and Zaklika, Krzysztof A., to Minnesota Mining and Manufacturing Company. Thermal dye transfer materials. 4,857,503, Cl. 503-227.000.

Jorgensen, Scott M. Line spool for fishing reels. 4,856,730, Cl. 242-118.400.

Jorke, Helmut; and Luy, Johann-Friedrich, to Licentia Patent-Verwaltungs-GmbH. Impatt diode. 4,857,972, Cl. 357-4.000.

Joseph, Eugene G.: *See—*
Bronn, William R.; Silver, Spencer F.; and Joseph, Eugene G., 4,857,615, Cl. 526-173.000.
Silver, Spencer F.; Bronn, William R.; and Joseph, Eugene G., 4,857,618, Cl. 526-240.000.

Jou, Lin W. Channelled structural element. 4,856,253, Cl. 52-717.100.

Jouillat, Claude: *See—*
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Joy Technologies Inc.: *See—*
Wechner, Edward, 4,856,384, Cl. 81-57.110.

Joyama, Norio: *See—*
Ishida, Kunio; Saito, Satoshi; Habuto, Akinaka; Murata, Tadahiko; Oiso, Hisayoshi; Joyama, Norio; and Fujimoto, Kazuhiro, 4,857,354, Cl. 426-558.000.

Juds, Mark A.: *See—*
Hastings, Jerome K.; Beihoff, Bruce C.; and Juds, Mark A., 4,857,841, Cl. 324-208.000.

Juenke, Manfred: *See—*
Schweer, Reiner; Juenke, Manfred; and Sieben, Ulrich K., 4,858,007, Cl. 358-147.000.

Jung, Johann: *See—*
Rosebrock, Henning; Jung, Johann; Rademacher, Wilhelm; Luib, Max; Fischer, Volker; Hagen, Helmut; Kohler, Rolf-Dieter; Markert, Juergen; and Watanabe, Akihide, 4,857,103, Cl. 71-94.000.

Jungroth, Owen W., to Intle Corporation. A circuit for providing a load for the charging of an EPROM cell. 4,858,186, Cl. 365-185.000.

Jungwirth, Dieter, to Dyckerhoff & Widmann Aktiengesellschaft. Method of placing steel tendons through ducts in a concrete structural member. 4,856,254, Cl. 52-741.000.

Junker, Warren R.: *See—*
Metala, Michael J.; Clark, William G., Jr.; Junker, Warren R.; Burtner, Lee W.; Arzenti, Thomas E.; Johnson, Harold P.; Vestovich, Robert P.; and Bevilacqua, Bruce W., 4,856,337, Cl. 73-601.000.

Junkosha Co., Ltd.: *See—*
Suzuki, Hirosuke, 4,857,381, Cl. 428-120.000.

K-Flow Division of Kane Steel Company, Inc.: *See—*
Kane, Martin, 4,856,346, Cl. 73-861.380.

Kabay, Ernest: *See—*
Kabay, Gabriella H.; and Kabay, Ernest, 4,857,228, Cl. 252-301.40S.

Kabay, Gabriella H.; and Kabay, Ernest, to Sunstone Inc. Phosphors and methods of preparing the same. 4,857,228, Cl. 252-301.40S.

Kabe, Kazuyuki: *See—*
Morikawa, Tuneo; Kabe, Kazuyuki; and Tsukada, Shuichi, 4,856,573, Cl. 152-556.000.

Kabel-und Metallwerke AG: *See—*
Fischer, Horst; Wichmann, Werner; Wilhelms, Gernot; and Wiltmann, Guenter, 4,856,947, Cl. 409-119.000.

Kabushiki Kaisha Cubic Engineering: *See—*
Nakanishi, Motoyasu, 4,856,626, Cl. 188-371.000.

Kabushiki Kaisha Daikin Seisakusho: *See—*
Fukushima, Hirotaka, 4,856,639, Cl. 192-106.200.
Kitano, Seiichi; Fukatani, Yasunobu; Asada, Masaaki; and Yoneda, Kazuhiko, 4,856,634, Cl. 192-70.300.

Kabushiki Kaisha Hanzawa Corporation: *See—*
Suimon, Yoshio, 4,857,789, Cl. 310-233.000.

Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See—*
Okumura, Minoru, 4,857,358, Cl. 426-654.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See—*
Katsuta, Masanori; and Yamaguchi, Tsutomu, 4,856,407, Cl. 84-439.000.

Kabushiki Kaisha Kenwood: *See—*
Asahi, Nobumitsu; and Nakazawa, Akira, 4,857,859, Cl. 329-104.000.

Kabushiki Kaisha Kumagaigumi: *See—*
Yokota, Takayoshi; Horiya, Shigekazu; Uno, Sadao; Katayama, Kozo; and Tanabe, Daijiro, 4,856,754, Cl. 249-113.000.

Kabushiki Kaisha Matsui Seisakusho: *See—*
Morimoto, Kiyoshi; Iwamoto, Akikazu; Moriyama, Masuo; and Sonoda, Atsuroh, 4,856,941, Cl. 406-85.000.

Kabushiki Kaisha Meidensha: *See—*
Jinnai, Kenichiro; and Hashimoto, Takafumi, 4,857,419, Cl. 429-13.000.

Kabushiki Kaisha Nichibei: *See—*
Minami, Katsuji; Murata, Shinichi; Tsujimoto, Susumu; Matuzaki, Yukinori; Yukawa, Shogo; and Osaka, Susumu, 4,856,574, Cl. 160-168.100.

Kabushiki Kaisha Saito Hyakkaten: *See—*
Iwasaki, Yoshihiko; and Noguchi, Toyosaburo, 4,857,350, Cl. 426-506.000.

Kabushiki Kaisha Toshiba: *See—*
Abe, Masahiro; and Mase, Yasukazu, 4,857,141, Cl. 156-644.000.
Abuyama, Yasuo; Ide, Fumito; Hamanaka, Osamu; and Sanbayashi, Takeshi, 4,857,954, Cl. 355-245.000.
Ando, Hideo, 4,857,719, Cl. 250-201.000.
Aono, Akira; and Isobe, Mitsuo, 4,858,197, Cl. 365-233.500.
Habara, Atsushi, 4,858,151, Cl. 364-527.000.
Hiroki, Hisayuki; Ariga, Yoshio; and Watanabe, Hajime, 4,856,768, Cl. 271-186.000.
Ito, Masamichi; Ohkoshi, Akio; Shizukawa, Kenjiro; Hayata, Terunobu; Furuya, Tomiaki; Yamanaka, Susumu; and Koezuka, Junji, 4,857,499, Cl. 502-326.000.
Katsuie, Masahiro; Abe, Michiyuki; Kawahara, Katsuyuki; and Nakamura, Taizo, 4,856,965, Cl. 417-19.000.
Kinugawa, Masaaki, 4,857,986, Cl. 357-42.000.
Kitagaki, Kazukuni; and Ohto, Takeshi, 4,858,004, Cl. 358-133.000.
Koike, Norio, 4,857,428, Cl. 430-25.000.
Machida, Yoshio, 4,857,847, Cl. 324-311.000.
Matsushima, Tetsuo, 4,857,854, Cl. 324-512.000.
Mori, Issei, 4,858,129, Cl. 364-413.140.
Mukaekubo, Jyunichi, 4,857,784, Cl. 310-68.00B.
Nakano, Hirotaka; and Yoshino, Thunekazu, 4,857,671, Cl. 174-68.500.
Narita, Ryuho; Kako, Hidenori; and Imamura, Humihiro, 4,858,095, Cl. 363-21.000.
Nukushina, Harunobu; and Sugimoto, Chiaki, 4,857,918, Cl. 340-870.010.
Oike, Hiroshi, 4,856,287, Cl. 62-126.000.
Osawa, Shigenobu; and Itaya, Keiji, 4,857,958, Cl. 355-218.000.
Saito, Masayuki; Niitsuma, Akira; Ohdaira, Hiroai; Tanuma, Chiaki; and Mori, Miki, 4,857,482, Cl. a37-209.000.
Sakurai, Takayasu; and Iizuka, Tetsuya, 4,857,763, Cl. 307-443.000.
Sato, Kazuyuki, 4,858,175, Cl. 364-900.000.
Segawa, Masao; and Arakawa, Masayuki, 4,858,064, Cl. 361-302.000.
Suzuki, Kouhei, 4,858,022, Cl. 358-471.000.
Suzuki, Nobuo; Morinaga, Motoyasu; Furuyama, Hideto; Hirayama, Yuzo; Okuda, Hajime; Nakamura, Masaru; and Motegi, Nawoto, 4,858,241, Cl. 372-46.000.
Tanaka, Tatsuo; and Yoshida, Yoshihiro, 4,857,864, Cl. 330-288.000.
Tatara, Shinji, 4,858,100, Cl. 363-161.000.
Tatsumi, Yuuichi; Minagawa, Hidenobu; Iwahashi, Hiroshi; Asano, Masamichi; and Imai, Mizuho, 4,858,192, Cl. 365-200.000.
Watanabe, Osamu; Kawai, mituo; and Kawaguchi, Kanzi, 4,857,120, Cl. 148-325.000.

Yamaguchi, Morie; Horita, Chiezo; Suzuki, Shigeo; and Sakata, Yasuo, 4,857,411, Cl. 428-546.000.
Yokota, Kazuto; and Saito, Akihisa, 4,857,741, Cl. 250-486.100.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Kawai, Katsunori; Suzuki, Shinichi; Hattori, Mitsuhiro; and Deguchi, Hiroyuki, 4,856,292, Cl. 62-217.000.

Kabushiki Kaisha Tsuchiya Seisakusho: *See*—
Furuya, Katsuji, 4,856,487, Cl. 123-574.000.

Kachel, Helmut: *See*—
Worschech, Kurt; Wedl, Peter; Kachel, Helmut; and Schult, Guenter, 4,857,216, Cl. 252-39.000.

Kachik, Robert H., to Orgo-Thermit Inc. Rebuilding worn hammer mill hammers. 4,856,170, Cl. 29-402.180.

Kadokura, Sadao; Kamei, Kazuhiro; and Honjyo, Kazuhiko, to Teijin Limited. Magnetic head assembly for a flexible magnetic disk drive unit. 4,858,043, Cl. 360-99.010.

Kageyama, Shuhei; Yamamoto, Tadashi; and Ebinuma, Tadayoshi, to Kotobuki and Company, Ltd. Working out container of bar shaped article. 4,856,693, Cl. 226-127.000.

Kahn, Paul, to Miles Laboratories, Inc. Universal spike for use with rigid and collapsible parenteral fluid dispensing container. 4,857,068, Cl. 604-405.000.

Kaida, Shinichi, to Fuji Photo Film Co., Ltd. Multicolor thermal recording device. 4,857,941, Cl. 346-76.0PH.

Kainu, Vesa: *See*—
Nikulainen, Osmo; and Kainu, Vesa, 4,856,154, Cl. 29-113.100.

Kaiser, Carl; and Kruse, Lawrence I., to SmithKline Beckman Corporation. Dopamine-β-hydroxylase inhibitors. 4,857,540, Cl. 514-387.000.

Kajino, Jirou: *See*—
Oshima, Mitsuaki; Izaki, Masataka; Kajino, Jirou; Igarashi, Yoshiaki; and Mitani, Hiroshi, 4,856,882, Cl. 350-500.000.

Kako, Hidenori: *See*—
Narita, Ryuho; Kako, Hidenori; and Imamura, Humihiro, 4,858,095, Cl. 363-21.000.

Kakushima, Masatoshi: *See*—
Frenette, Richard; Gauthier, Jacques-Yves; Young, Robert N.; Zamboni, Robert; Kakushima, Masatoshi; and Verhoeven, Thomas R., 4,857,659, Cl. 562-426.000.

Kalk, Franklin D.: *See*—
Carcia, Peter F.; and Kalk, Franklin D., 4,857,373, Cl. 428-64.000.

Kalkipsakis, Charalambos G.: *See*—
Hackett, Malcolm J.; and Kalkipsakis, Charalambos G., 4,856,261, Cl. 53-469.000.

Kallimanis, Georgios. Method for the treatment of psoriasis. 4,857,554, Cl. 514-557.000.

Kalnin, Ilmar L.: *See*—
Goldberg, Harris A.; Kalnin, Ilmar L.; Williams, Clyde C.; and Spain, Ian L., 4,856,179, Cl. 29-592.100.

Kamada, Eiki: *See*—
Kuriyama, Kazunori; Shintani, Yooichi; Yamaoka, Akira; Shonai, Tohru; Kamada, Eiki; and Inoue, Kiyoshi, 4,858,105, Cl. 364-200.000.

Kamae, Tuneyoshi; and Enomoto, Ryoji, to Hamamatsu Photonics K. K. Gamma ray measurement utilizing multiple compton scattering. 4,857,737, Cl. 250-370.090.

Kamata, Hiroshi: *See*—
Kishiro, Osamu; Kasai, Atsushi; Nozawa, Seiichi; and Kamata, Hiroshi, 4,857,626, Cl. 528-176.000.

Kamegaki, Kazuyuki: *See*—
Ogura, Setsuo; Kamegaki, Kazuyuki; Yamazaki, Kouichi; Miyazaki, Hideo; Kitamura, Yukinori; and Mayuzumi, Shirou, 4,857,987, Cl. 357-45.000.

Kamei, Kazuhiro: *See*—
Kadokura, Sadao; Kamei, Kazuhiro; and Honjyo, Kazuhiko, 4,858,043, Cl. 360-99.010.

Kameswaran, Vekataraman; Wright, Donald P., Jr.; and Herman, Rod A., to American Cyanamid Company. Novel insecticidal dibenzoyl-tert-butylcarbazonitrile compounds and method for the preparation thereof. 4,857,550, Cl. 514-522.000.

Kametaka, Koji: *See*—
Ito, Hideji; Kametaka, Koji; and Tsumori, Yukihisa, 4,856,916, Cl. 384-477.000.

Kamijo, Tetsuhide: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,857,650, Cl. 548-336.000.

Kamise, Katsuya; Yamamoto, Shigeru; Hosokai, Tetsushi; and Miyamoto, Koji, to Mazda Motor Corporation. Engine knocking control unit. 4,856,481, Cl. 123-425.000.

Kamiwano, Mitsuo; and Inoue, Yoshitaka, to Inoue Seisakusho (MFG) Co., Ltd. Dispersing and grinding apparatus. 4,856,717, Cl. 241-65.000.

Kamiya, Shingo, to Yamaha Corporation. Optical pickup control device. 4,858,216, Cl. 369-46.000.

Kamiyama, Akira; Hongo, Nobuhisa; Matsuki, Toyomi; and Kanai, Kenji, to Mitsuba Electric Mfg. Co., Ltd. Winding patterns for armatures. 4,857,790, Cl. 310-234.000.

Kan, Fumitaka: *See*—
Hayakawa, Naoji; Takenouchi, Masanori; Nakamura, Kenji; Kan, Fumitaka; Kozato, Yasuo; and Hakamada, Isao, 4,858,062, Cl. 361-225.000.

Kanai, Kenji: *See*—
Kamiyama, Akira; Hongo, Nobuhisa; Matsuki, Toyomi; and Kanai, Kenji, 4,857,790, Cl. 310-234.000.

Kanai, Shigeru, to Tachi-S Co., Ltd. Automotive seat with walk-in device. 4,856,847, Cl. 297-341.000.

Kanamaru, Hitoshi, to Pioneer Electronic Corporation. Apparatus for reproducing frequency-division multiplexed video FM and digital audio signals. 4,858,024, Cl. 358-310.000.

Kanamori, Jun, to Oki Electric Industry Co., Ltd. Process for fabricating a semiconductor device. 4,857,477, Cl. 437-47.000.

Kanazawa University: *See*—
Bessho, Kazuo; and Yamada, Sotoshi, 4,857,874, Cl. 335-296.000.

Kanda, Ryouji, to Tokai Rubber Industries, Ltd. Fluid-filled resilient bushing having damping means within fluid chambers. 4,856,764, Cl. 267-140.100.

Kanda, Yuichi: *See*—
Toyoda, Kenichi; Mizuno, Tohru; Torii, Nobutoshi; Kanda, Yuichi; and Morikawa, Shigehiro, 4,857,700, Cl. 219-124.340.

Kane, Martin, to K-Flow Division of Kane Steel Company, Inc. Dual flexures for coriolis type mass flow meters. 4,856,346, Cl. 73-861.380.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Kira, Kazuaki, 4,857,069, Cl. 623-1.000.
Kutsuki, Hidetoshi; Sawa, Ikuo; Mori, Natsuki; Hasegawa, Junzo; and Watanabe, Kiyoshi, 4,857,468, Cl. 435-280.000.

Kaneiwa, Shinji: *See*—
Yano, Seiki; Kudo, Hiroaki; Takiguchi, Haruhisa; Hijikata, Toshiki; and Kaneiwa, Shinji, 4,858,215, Cl. 369-45.000.

Kaneko, Hideaki: *See*—
Terada, Haruyoshi; Ono, Youji; Satoh, Yokichi; and Kaneko, Hideaki, 4,857,225, Cl. 252-100.000.

Kang, Dong M., to Korea Measures Co., Ltd. Tape measure. 4,856,726, Cl. 242-84.800.

Kanno, Tadayuki: *See*—
Nakano, Yukio; and Kanno, Tadayuki, 4,858,224, Cl. 370-16.000.

Kansupada, Bharat K.: *See*—
Mowdood, Syed K.; and Kansupada, Bharat K., 4,857,397, Cl. 428-323.000.

Kanzaki Kokyukoki Mfg. Co. Ltd.: *See*—
Fujisaki, Koichiro; Ohashi, Ryota; and Nemoto, Shusuke, 4,856,368, Cl. 74-606.00R.
Ishimaru, Yoshitaka, 4,856,355, Cl. 74-11.000.
Nemoto, Shusuke, 4,856,367, Cl. 74-606.00R.
Ohashi, Ryota; Kawamura, Masahisa; and Shibata, Jiro, 4,856,277, Cl. 60-422.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Tomita, Osamu; Saiwai, Kazuhiko; and Kimura, Akira, 4,856,325, Cl. 73-150.00A.

Kao Corporation: *See*—
Fukasawa, Junichi; Kato, Haruya; Iwaya, Katsumasa; Shimizu, Takako; and Kawano, Atsushi, 4,857,308, Cl. 424-63.000.

Kaplan, Hal L. Wrist and gripping muscle exercising apparatus. 4,856,772, Cl. 272-67.000.

Kappes, Kenneth C., to Milprint Inc. Ovenable package for bacon and the like. 4,857,342, Cl. 426-107.000.

Kaprelian, Edward K. Combined scatter and light obscuration smoke detector. 4,857,895, Cl. 340-630.000.

Karasaki, Toshihiko; and Sugitani, Kazumi, to Minolta Camera Kabushiki Kaisha. Focus detecting device. 4,857,718, Cl. 250-201.000.

Karasaki, Toshihiko, to Minolta Camera Kabushiki Kaisha. Focus detecting system using multiple portions of the image to be focussed. 4,857,720, Cl. 250-201.000.

Karcher, Gilles; Amor, Max; Abensour, David; and Cinqualbre, Jean. Amnioscope. 4,856,527, Cl. 128-634.000.

Kardos, Peter, to Gas Research Institute. Flapper control valve. 4,856,558, Cl. 137-625.330.

Karl Lautenschlager GmbH & Co. KG: *See*—
Sassenberg, Gero, 4,856,141, Cl. 16-250.000.

Karmen, Arthur: *See*—
Freundlich, Lawrence F.; Murthy, Vadiraja V.; and Karmen, Arthur, 4,857,454, Cl. 435-7.000.

Karst, David A.; Pawlowski, Felix R.; Potrafke, William A.; and Schuneman, Harold E., to General Dynamics Lands Systems, Inc. Case-Hardened plate armor and method of making. 4,857,119, Cl. 148-318.000.

Kasahara, Chiyoshi: *See*—
Oku, Teruo; Todo, Eishiro; Kasahara, Chiyoshi; Nakamura, Katsuya; Kayakiri, Hiroshi; and Hashimoto, Masashi, 4,857,513, Cl. 514-76.000.

Kasai, Atsushi: *See*—
Kishiro, Osamu; Kasai, Atsushi; Nozawa, Seiichi; and Kamata, Hiroshi, 4,857,626, Cl. 528-176.000.

Kasai, Hitoshi: *See*—
Sugimura, Toshiya; Kasai, Hitoshi; and Yoshimura, Hiroshi, 4,858,131, Cl. 364-424.100.

Kasai, Yasuo: *See*—
Fujii, Katsuhiko; Sato, Shiro; Miyanaga, Yasuhiro; Asami, Heizo; Takekoshi, Susumu; and Kasai, Yasuo, 4,856,849, Cl. 301-63.00R.

Kaschig, Jurgen; and Finter, Jurgen, to Ciba-Geigy Corporation. Radiation-sensitive polymers which form a metal complex, process for the polymerization of acetylene, and coated material. 4,857,614, Cl. 526-172.000.

Kasegrande, Stephen S.: *See*—
Irani, Cyrus A.; Cozewith, Charles; and Kasegrande, Stephen S., 4,857,633, Cl. 528-498.000.

Kashida, Motokazu: *See*—
Takei, Masahiro; Masui, Toshiyuki; Kashida, Motokazu; and Takahashi, Kouji, 4,858,037, Cl. 360-60.000.

Kashihara, Hidechiyo; Nemoto, Shin-ichi; and Ueno, Kazuhiro, to Doryokuro Kakunenryo Kaihatsu Jigyodan. High-speed centrifugal extractor having improved weirs. 4,857,040, Cl. 494-22.000.

Kashiwamura, Kazuo: *See*—
Kazumoto, Yoshio; Furuishi, Yoshiro; and Kashiwamura, Kazuo, 4,856,283, Cl. 62-6.000.

Kashman, Yoel; Spector, Ilan; Carmely, Shmuel; and Blasberger, Dina, to Research Foundation of State University of New York, The. New compounds for the study and treatment of microfilament organization in cells. 4,857,538, Cl. 514-369.000.

Kasprzak, Paul L.; and Moy, Michael E., to Wright Line Inc. Coding system. 4,856,820, Cl. 283-81.000.

Kast, Helmut: *See*—
Thiel, Rudolf; Klimt, Ulrich; and Kast, Helmut, 4,856,620, Cl. 188-72.400.

Kastner, Klaus: *See*—
Leiber, Heinz; Ohnemuller, Hans-Joachim; and Kastner, Klaus, 4,856,610, Cl. 180-197.000.

Katagiri, Soichi: *See*—
Kataoka, Keiji; Kurosaki, Toshiei; Yonezawa, Seiji; and Katagiri, Soichi, 4,857,744, Cl. 250-548.000.

Katano, Yuji: *See*—
Wakabayashi, Hiroshi; Kazami, Kazuyuki; Nakamura, Toshiyuki; Miyamoto, Hidenori; Tsukahara, Daiki; Machida, Kiyosada; and Katano, Yuji, 4,857,947, Cl. 354-195.100.

Kataoka, Keiji; Kurosaki, Toshiei; Yonezawa, Seiji; and Katagiri, Soichi, to Hitachi, Ltd. Optical projection printing apparatus wherein wafer mark has a grating pitch in the sagittal plane of the first optical system. 4,857,744, Cl. 250-548.000.

Kataoka, Shoei; Yoshida, Masaru; and Nakajima, Shigeo, to Sharp Kabushiki Kaisha. Combined traffic signal with stacked EL elements. 4,857,920, Cl. 340-907.000.

Kataoka, Teruo: *See*—
Tsujihara, Susumu; and Kataoka, Teruo, 4,857,998, Cl. 358-60.000.

Katayama, Kozo: *See*—
Yokota, Takayoshi; Horiya, Shigekazu; Uno, Sadao; Katayama, Kozo; and Tanabe, Daijiro, 4,856,754, Cl. 249-113.000.

Kato, Eiichi; and Ishii, Kazuo, to Fuji Photo Film Co., Ltd. Photoconductive composition. 4,857,431, Cl. 430-91.000.

Kato, Haruya: *See*—
Fukasawa, Junichi; Kato, Haruya; Iwaya, Katsumasa; Shimizu, Takako; and Kawano, Atsushi, 4,857,308, Cl. 424-63.000.

Kato, Masao: *See*—
Ogawa, Tetsuji; and Kato, Masao, 4,858,108, Cl. 364-200.000.

Kato, Masaru: *See*—
Matsumoto, Yasuki; and Kato, Masaru, 4,857,813, Cl. 318-54.000.

Kato, Satoshi: *See*—
Aiki, Shigetaka; Kobayashi, Kiyonori; and Kato, Satoshi, 4,857,032, Cl. 464-68.000.

Kato, Takayuki: *See*—
Sagae, Takashi; and Kato, Takayuki, 4,857,829, Cl. 324-61.00R.

Kato, Takeo; Yamamoto, Hideki; and Miyazaki, Naoki, to Toppan Printing Co., Ltd. Waterproof water-vapor-permeable laminated structure and applications of the same. 4,857,393, Cl. 428-289.000.

Kato, Yuzo; and Kawai, Yasuo, to Canon Kabushiki Kaisha. Position detecting device using variable radiation. 4,857,742, Cl. 250-491.100.

Katsu, Masanori; and Makino, Mikio, to NGK Insulators, Ltd. Rotary regenerative heat exchanging ceramic body. 4,856,577, Cl. 165-8.000.

Katsuie, Masahiro; Abe, Michiyuki; Kawahara, Katsuyuki; and Nakamura, Taizo, to Tokyo Electric Power Co. Inc., The; and Kabushiki Kaisha Toshiba. Control system of pumping operation using AC exciting generator-motor. 4,856,965, Cl. 417-19.000.

Katsuta, Masanori; and Yamaguchi, Tsutomu, to Kabushiki Kaisha Kawai Gakki Seisakusho. Action mechanism for a keyboard of an electronic piano. 4,856,407, Cl. 84-439.000.

Katzenstein, Henry S., to Brooktree Corporation. Apparatus for converting data between analog and digital values. 4,857,929, Cl. 341-148.000.

Kaufman, Benjamin J.: *See*—
Sung, Rodney L.; and Kaufman, Benjamin J., 4,857,661, Cl. 562-502.000.

Kawabe, Natsuki: *See*—
Nakano, Kenichi; Umezawa, Yoshihiro; Tokaichi, Tetsuro; Ichimura, Yoshiaki; and Kawabe, Natsuki, 4,857,001, Cl. 439-68.000.

Kawaguchi, Kanzi: *See*—
Watanabe, Osamu; Kawai, mituo; and Kawaguchi, Kanzi, 4,857,120, Cl. 148-325.000.

Kawahara, Eiichiro; and Ikejiri, Kenichi, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulically operated continuously variable transmission. 4,856,279, Cl. 60-489.000.

Kawahara, Katsuyuki: *See*—
Katsuie, Masahiro; Abe, Michiyuki; Kawahara, Katsuyuki; and Nakamura, Taizo, 4,856,965, Cl. 417-19.000.

Kawai, Katsunori; Suzuki, Shinichi; Hattori, Mitsuhiro; and Deguchi, Hiroyuki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Pressure control valve assembly. 4,856,292, Cl. 62-217.000.

Kawai, Kazuhide: *See*—
Aiba, Yoshiro; Arakawa, Kazumi; Watanabe, Takashi; and Kawai, Kazuhide, 4,857,488, Cl. 501-89.000.

Kawai, Masaki, to Tokico Ltd. Gas separator system. 4,857,086, Cl. 55-162.000.

Kawai, mituo: *See*—
Watanabe, Osamu; Kawai, mituo; and Kawaguchi, Kanzi, 4,857,120, Cl. 148-325.000.

Kawai, Sumio: *See*—
Nakajima, Yukio; Miyasaka, Tetsuo; and Kawai, Sumio, 4,857,951, Cl. 354-400.000.

Kawai, Taiyo; Nakagawa, Norihisa; and Sano, Shin-ichi, to Toyota Jidosha Kabushiki Kaisha. Internal combustion engine with multiple intake valves and EGR arrangement. 4,856,473, Cl. 123-308.000.

Kawai, Yasuo: *See*—
Kato, Yuzo; and Kawai, Yasuo, 4,857,742, Cl. 250-491.100.

Kawamata, Yoshio; and Iwai, Kiyoshi, to Showa Sangyo Co., Ltd. Apparatus for extracting fats and oils. 4,857,279, Cl. 422-268.000.

Kawamoto, Masao, to Nippon Furnace Kogyo Kaisha Ltd. Radiant tube burner. 4,856,492, Cl. 126-91.00A.

Kawamoto, Takamichi: *See*—
Ebata, Yoshihiro; Kouyama, Masanori; Tamari, Nobuyuki; and Kawamoto, Takamichi, 4,857,486, Cl. 501-21.000.

Kawamura, Masahisa: *See*—
Ohashi, Ryota; Kawamura, Masahisa; and Shibata, Jiro, 4,856,277, Cl. 60-422.000.

Kawamura, Yoshihito: *See*—
Araki, Masatada; Kuroyama, Yutaka; Takeuchi, Yukihisa; Takagi, Makoto; Kawamura, Yoshihito; and Imura, Toru, 4,857,414, Cl. 428-612.000.

Kawano, Atsushi: *See*—
Fukasawa, Junichi; Kato, Haruya; Iwaya, Katsumasa; Shimizu, Takako; and Kawano, Atsushi, 4,857,308, Cl. 424-63.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Sakaguchi, Akira; Uchibe, Hisashi; and Tange, Toshiyuki, 4,856,700, Cl. 228-5.100.

Kawasaki, Koichi: *See*—
Honda, Hideyuki; Kawasaki, Koichi; and Sato, Hiroshi, 4,856,330, Cl. 73-204.250.

Kawasaki Steel Corporation: *See*—
Sakata, Kei; Hashiguchi, Koichi; and Okano, Shinobu, 4,857,117, Cl. 148-12.00C.

Kawase, Tsunezo; Koroku, Shuichiro; and Okada, Kunio, to Osaka Diamond Industrial Co., Ltd. Wire saw. 4,856,490, Cl. 125-21.000.

Kawasumi, Satoshi; Sugiura, Yuzuru; Kondo, Hiroyuki; Miwa, Akihiko; and Suzuki, Kazuhiko, to Aisin Seiki Kabushiki Kaisha. Vacuum operated booster. 4,856,412, Cl. 91-369.200.

Kay, D. Alan R.; and Wilson, William G. Method for the regeneration of sulfided cerium oxide back to a form that is again capable of removing sulfur from fluid materials. 4,857,280, Cl. 423-21.100.

Kayakiri, Hiroshi: *See*—
Oku, Teruo; Todo, Eishiro; Kasahara, Chiyoshi; Nakamura, Katsuya; Kayakiri, Hiroshi; and Hashimoto, Masashi, 4,857,513, Cl. 514-76.000.

Kazama, Kouji, to Mitsubishi Denki Kabushiki Kaisha. System of disk device selector circuits for disk controller. 4,858,038, Cl. 360-69.000.

Kazami, Kazuyuki: *See*—
Wakabayashi, Hiroshi; Kazami, Kazuyuki; Nakamura, Toshiyuki; Miyamoto, Hidenori; Tsukahara, Daiki; Machida, Kiyosada; and Katano, Yuji, 4,857,947, Cl. 354-195.100.

Kazlauskas, Gasparas. Cassette welding head apparatus. 4,857,690, Cl. 219-60.00A.

Kazmierzak, Robert T.; and MacLeay, Ronald E., to Pennwalt Corporation. Polymer bound hindered amine light stabilizers. 4,857,595, Cl. 525-142.000.

Kazumoto, Yoshio; Furuishi, Yoshiro; and Kashiwamura, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Refrigerator. 4,856,283, Cl. 62-6.000.

KDL Technologies, Inc.: *See*—
Kron, Reuben E.; and Litt, Mitchell, 4,858,127, Cl. 364-413.070.

Kearfott Guidance & Navigation Corporation: *See*—
Ferriss, Lincoln S.; and Weitzner, Mark A., 4,856,901, Cl. 356-350.000.

Kearnes, Thom; Wennerstrom, Joel; and Glover, William, to State Chemical Mfg. Co., The. Fragrance vapor dispenser mounting bracket. 4,857,240, Cl. 261-26.000.

Kee, William C.; Brannigan, Patrick M.; and Clarke, Cornelius B., to Anner Research and Development Limited. Electrical connector. 4,857,008, Cl. 439-352.000.

Keeble, Peter J.: *See*—
Frost, Peter L. J.; Freeman, Robert A.; Warren, John A.; and Keeble, Peter J., 4,856,760, Cl. 254-134.400.

Keitzman, Benjamin. Surgical instrument for intraocular lens implantation. 4,856,511, Cl. 128-303.00R.

Kelham, Stephen F., to Imperial Chemical Industries PLC. Dechlorination of aqueous alkali metal chloride solution. 4,857,200, Cl. 210-651.000.

Keller, James B.: *See*—
Stewart, Robert E.; Natusch, Paul J.; Yu, Eugene L.; and Keller, James B., 4,858,173, Cl. 364-900.000.

Keller, Nelly: *See*—
Bridenne Alaux, Martine; Marquet-Ellis, Hubert; Keller, Nelly; and Folcher, Gerard, deceased, 4,857,294, Cl. 423-489.000.

Kellett, George W.; and Murphy, Betty J., to Creative Products Resource Associates, Ltd. Brush incorporating a hydrophilic foam pad for hair cleaning and conditioning. 4,856,541, Cl. 132-110.000.

Kelley, Donald E.: *See*—
Musco, Vincent A.; Kelley, Donald E.; and Hansen, Carl O., 4,857,101, Cl. 71-94.000.

Kelly, Edward C., to Assist Research Corp. Erection device. 4,856,499, Cl. 128-79.000.

Kelting, Peter: *See*—
Harlos, Hartmut; and Kelting, Peter, 4,857,779, Cl. 307-542.000.

Kelzer, Robert A. Scoring cutter. 4,856,400, Cl. 83-885.000.

Kemper, Yves J., to Tractiontec Corporation. Traction drive transmission system. 4,856,371, Cl. 74-690.000.

Kempf, Dale J.: *See—*
Rosenberg, Saul H.; Dellaria, Joseph; Fung, Anthony K. L.; Kempf, Dale J.; Luly, Jay R.; and Plattner, Jacob J., 4,857,507, Cl. 514-18.000.

Kent, Sherwood. Foam-honeycomb article and method. 4,857,380, Cl. 428-117.000.

Kenyon, Arthur, to Red Wing Shoe Company, Inc. Walking shoe with padded collar. 4,856,209, Cl. 36-114.000

Kern, Edward C., Jr.: *See—*
Hart, George W.; Kern, Edward C., Jr.; and Schweppe, Fred C., 4,858,141, Cl. 364-483.000

Kernforschungsanlage Juelich Gesellschaft mit beschrankter Haftung: *See—*
Divisek, Jiri; and Schmitz, Heinz, 4,857,153, Cl. 204-16.000.

Kernforschungszentrum Karlsruhe GmbH: *See—*
Halbritter, Jurgen; and Baumgartner, Hartmut, 4,857,360, Cl. 427-62.000.

Kerstan, Felix: *See—*
Becker-Ross, Helmut; Florek, Stefan; Kerstan, Felix; Moebius, Guenther; and Sanders, Horst, 4,856,898, Cl. 356-328.000

Kerth, Juergen: *See—*
Zolk, Ralf; Kerth, Juergen; and Hemmerich, Rainer, 4,857,613, Cl 526-128.000.

Kessler, Newlin W.; and Willis, Ray D., to Tuboscope Inc. Coupling assembly for tubular articles. 4,856,828, Cl. 285-334.100.

Kesting, Lorenz. Prefabricated part for constructing a building air-conditioned via its walls. 4,856,238, Cl. 52-90.000

Kettner, Roland; Liermann, Norbert; and Lubcke, Torsten, to Mobil Oil Corporation. Process for the reduction of the sulfur content in a gaseous stream. 4,857,297, Cl. 423-576.800.

Kewaunee Scientific Corporation: *See—*
Poblete, Rudolph G.; Rindoks, Kurt; and Frederick, James R., 4,856,420, Cl. 98-115.300

Kezar, Hollis S., III: *See—*
De Lucca, George V.; Kezar, Hollis S., III; and O'Brien, John P., 4,857,403, Cl. 428-364.000

Khan, Aurangzeb K., to Tandem Computers Incorporated. True TTL output translator-driver with true ECL tri-state control. 4,857,776, Cl. 307-475.000

Khanna, Pyare: *See—*
Ullman, Edwin F.; Khanna, Pyare; and Peries, Rohan, 4,857,453, Cl. 435-7.000.

Khanna, Pyare L.; Chang, Chiu C.; and Ullman, Edwin F., to Syntex (U.S.A) Inc. Method for the determination of peroxidase using fluorogenic substrates. 4,857,455, Cl. 435-7.000.

Khanna, Satish C.; and Ruttimann, Theresa, to Ciba-Geigy Corporation. Oral therapeutic system having systemic action. 4,857,336, Cl. 424-473.000.

Khonsari, Ali M.: *See—*
Suciu, George D.; Khonsari, Ali M.; and Chen, Jamin, 4,857,151, Cl. 203-82.000.

Kieffer, Thomas M.; and Gaasedelen, David J., to Connect Computer Company, Inc. Method and apparatus used in mounting expansion cards. 4,858,162, Cl. 364-708.000

Kikuchi, Hiroshi; Tanuma, Jiro; Ishimizu, Hideaki; Uchida, Takao; and Asaka, Toshiyuki, to Oki Electric Industry Co., Ltd. IC card connecting mechanism. 4,857,005, Cl. 439-140.000

Kikuchi, Katsumi: *See—*
Okabe, Yoshimi; and Kikuchi, Katsumi, 4,856,353, Cl. 73-865.800

Kim, Young H., to Du Pont de Nemours, E. I., and Company. Hyperbranched polyarylene. 4,857,630, Cl. 528-397.000

Kimberly-Clark Corporation: *See—*
Lennon, Patrick G., 4,857,044, Cl. 604-14.000.
Nohr, Ronald S.; and MacDonald, J. Gavin, 4,857,251, Cl. 264-103.000

Kimble, Kenneth B.; Macdonell, Gary D.; and Mark, Harold W., to Phillips Petroleum Company. Ore flotation and mineral flotation agents for use therein. 4,857,179, Cl. 209-166.000

Kimoto, Kiyoshi: *See—*
Takagi, Akihiro; and Kimoto, Kiyoshi, 4,858,218, Cl. 369-109.000.

Kimura, Akira: *See—*
Tomita, Osamu; Saiwai, Kazuhiko; and Kimura, Akira, 4,856,325, Cl. 73-150.00A.

Kimura, Kiyoshi; Kise, Masahiro; Morita, Iwao; Tomita, Toshio; and Tsuda, Masami, to Nippon Shinyaku Co., Ltd. Certain antihypertensive 1,4-dihydro-6-methyl-5-phosphonic acid-4-aryl-3-carboxylic acid-2-cyano diesters. 4,857,515, Cl. 514-89.000

Kimura, Takashi: *See—*
Oku, Masuo; Kudo, Yoshimichi; Kuroyanagi, Tomomitsu; Kondo, Kazuo; Tsukazaki, Hisanobu; Ikeda, Tetsuya; Nakashima, Akio; and Kimura, Takashi, 4,858,030, Cl. 358-342.000.

Kimura, Yoshiharu, to TOA Nenryo Kogyo K.K. Co-poly (imide ether) copolymer from diaminated polyalkyleneglycol. 4,857,079, Cl. 55-16.000

Kimura, Yoshihiro: *See—*
Ishiwatari, Masaaki; Tsutsumi, Yuji; Ogusu, Yoshiyuki; and Kimura, Yoshihiro, 4,857,304, Cl. 424-59.000

Kineret Engineering: *See—*
Sturman, Oded E.; Grill, Benjamin; and Harrison, Lynn, 4,857,842, Cl. 324-225.000

King, Edward T.: *See—*
Ting, Loi-Lou; Chui, Granger K.; and King, Edward T., 4,856,466, Cl. 123-90.330.

King, Francis D., to Beecham Group p.l.c. 4-amino-5-chloro-2-methoxy-n-(6-(1-azabicyclo[3,2,1]octyl)benzamide. 4,857,647, Cl. 546-112.000

King-Seeley Thermos Co.: *See—*
Lanzani, Emanuele, 4,856,712, Cl. 239-106.000

King-Smith, Anthony D.: *See—*
Dyson, Clive M.; King-Smith, Anthony D.; and Yassate, Mohamad H., 4,858,233, Cl. 371-9.000.

Kinlen, Patrick J.: *See—*
Bashkin, James K.; and Kinlen, Patrick J., 4,857,167, Cl. 204-435.000.

Kinney, Terrance R.; and Arnett, Eric M., to Allied-Signal Inc. Method to decode relative spectral data. 4,857,726, Cl. 250-226.000.

Kinoshita, Taizo: *See—*
Kotera, Nobuo; Yamashita, Kiichi; Kinoshita, Taizo; Tanaka, Hirotoshi; Tanaka, Satoshi; and Nagata, Minoru, 4,857,769, Cl. 307-450.000.

Kinoshita, Yukihiko: *See—*
Furukawa, Sunao; Yoshimoto, Tadashi; Ajisawa, Yukiyoshi; Ikeguchi, Seiichi; and Kinoshita, Yukihiko, 4,857,524, Cl. 514-227.500.

Kinoshita, Yusuke: *See—*
Mori, Seiji; Sonoda, Toshinari; and Kinoshita, Yusuke, 4,856,486, Cl. 123-572.000.

Kinsman, Grant: *See—*
Duley, Walter W.; and Kinsman, Grant, 4,857,699, Cl. 219-121.850.

Kinugawa, Masaaki, to Kabushiki Kaisha Toshiba. Short channel CMOS on 110 crystal plane. 4,857,986, Cl. 357-42.000.

Kiper, James B. Sailboat construction. 4,856,445, Cl. 114-39.100.

Kipphan, Helmut; Jeschke, Willi; Ott, Hans; and Graf, Jean-Pierre, to Heidelberger Druckmaschinen AG. Electronic device for determining a register error in multi-color printing machines. 4,856,903, Cl. 356-400.000

Kira, Kazuaki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Artificial vessel and process for preparing the same. 4,857,069, Cl. 623-1.000.

Kirby, Aaron A.: *See—*
Severance, Marcus W.; and Kirby, Aaron A., 4,856,219, Cl. 43-17.500

Kirchhuebel, Rainer: *See—*
Spitznas, M.; Veit, Wolfgang; and Kirchhuebel, Rainer, 4,856,872, Cl. 350-255.000

Kirihara, Tomoo; Nakagawa, Ippei; Seki, Yoshinobu; and Honda, Yutaka, to Mitsubishi Nuclear Fuel Company, Ltd. Process of separation of hafnium from zirconium by molten salt electrolysis. 4,857,155, Cl. 204-61.000

Kirjanov, Alexander S.; and Hoecklin, Dieter, to Crompton & Knowles Corporation. Stainblocker and fluorocarbon oil repellents. 4,857,392, Cl. 428-267.000.

Kirk, Barrie E.: *See—*
Borthwick, David A.; Kirk, Barrie E.; Evans, Derek N.; Biggadike, Keith; and Stephenson, Leslie, 4,857,531, Cl. 514-262.000.

Kirk, Richard A.: *See—*
Hart, Peter B.; Chilton, George A. A.; and Kirk, Richard A., 4,857,944, Cl. 346-154.000.

Kirkpatrick, Steven J.: *See—*
Neilson, Diane H. R.; Work, Sara L. R.; Whaley, Edward L.; Kirkpatrick, Steven J.; and McCarthy, James P., 4,857,351, Cl. 426-533.000.

Kis, Ludwig, to Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft. Apparatus for needling a nonwoven web. 4,856,152, Cl. 28-114.000

Kis Photo Industrie: *See—*
Simon, Jean-Pierre, 4,857,274, Cl. 422-72.000.

Kise, Masahiro: *See—*
Kimura, Kiyoshi; Kise, Masahiro; Morita, Iwao; Tomita, Toshio; and Tsuda, Masami, 4,857,515, Cl. 514-89.000

Kishida, Katsuhiro: *See—*
Maki, Yoshihiro; Matsuyama, Akira; Tanizaki, Katsuji; Okabe, Noboru; Kishida, Katsuhiro; Sakai, Takeshi; Ohgaki, Toshinaga; and Fujita, Masahito, 4,857,267, Cl. 419-31.000.

Kishiro, Osamu; Kasai, Atsushi; Nozawa, Seiichi; and Kamata, Hiroshi, to Mitsubishi Chemical Industries Limited. Wholly aromatic polyester and process for its production. 4,857,626, Cl. 528-176.000.

Kiso, Yoshiaki: *See—*
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,857,650, Cl. 548-336.000

Kispert, Klaus: *See—*
Schroder, Horst; Kispert, Klaus; Stolz, Robert; and Jacob, Werner, 4,856,917, Cl. 384-550.000

Kissei Pharmaceutical Co., Ltd.: *See—*
Furukawa, Sunao; Yoshimoto, Tadashi; Ajisawa, Yukiyoshi; Ikeguchi, Seiichi; and Kinoshita, Yukihiko, 4,857,524, Cl. 514-227.500.
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,857,650, Cl. 548-336.000.

Kita, Yuuki: *See—*
Aso, Toshiyuki; Kita, Yuuki; and Watanabe, Sadahiro, 4,857,688, Cl. 219-69.140

Kitabayashi, Eiichi: *See—*
Iwamura, Hichihiro; and Kitabayashi, Eiichi, 4,856,687, Cl. 224-169.000

Kitagaki, Kazukuni; and Ohto, Takeshi, to Kabushiki Kaisha Toshiba. Coder/decoder for time compressed integration system. 4,858,004, Cl. 358-133.000

Kitagawa Industries Company, Ltd.: *See—*
Fujimoto, Nobuaki, 4,856,151, Cl. 24-453.000.

Kitagawa, Jun; Hijikata, Toshihiko; and Ishikawa, Kazuo, to NGK Insulators, Ltd. Ceramic honeycomb filter for purifying exhaust gases. 4,857,089, Cl. 55-523.000.

Kitamoto, Akira: *See—*
Nishiyama, Masanobu; Nishimura, Haruo; Nakano, Katsuji; Ozaki: Tatsuo; and Kitamoto, Akira, 4,856,854, Cl. 312-38.000.

Kitamura, Masuo; Takagi, Mitsuhiro; and Nakamura, Masaaki, to Matsushita Electric Works, Ltd. Bracket for mounting wiring devices. 4,857,669, Cl. 174-53.000.

Kitamura, Takayuki: *See—*
Kohno, Masahiro; Obata, Akira; Kitamura, Takayuki; and Okazaki, Kakuma, 4,856,765, Cl. 267-166.000.

Kitamura, Yukinori: *See—*
Ogura, Setsuo; Kamegaki, Kazuyuki; Yamazaki, Kouichi; Miyazaki, Hideo; Kitamura, Yukinori; and Mayuzumi, Shirou, 4,857,987, Cl. 357-45.000.

Kitano, Seiichi; Fukatani, Yasunobu; Asada, Masaaki; and Yoneda, Kazuhiko, to Kabushiki Kaisha Daikin Seisakusho. Clutch. 4,856,634, Cl. 192-70.300.

Kitaoka, Susumu; Andoh, Haruo; and Hirata, Junichi, to Hitachi Maxell, Ltd. Cobalt-containing iron oxide magnetic particles and method for the preparation of the same. 4,857,417, Cl. 428-694.000.

Kite, Nicholas J.: *See—*
Dierick, Tony F. J.; Kite, Nicholas J.; and Moran, Michael J., 4,857,029, Cl. 446-220.000.

Kiyomoto Tekko Kabushiki Kaisha: *See—*
Iwasaki, Yoshihiko; and Noguchi, Toyosaburo, 4,857,350, Cl. 426-506.000.

Kizu, Soujiro: *See—*
Sashou, Hidehiko; and Kizu, Soujiro, 4,858,027, Cl. 358-311.000.

Klan, Walter: *See—*
Schmidt, Manfred; Sommerfeld, Claus-Dieter; Prolingheuer, Christoph; and Klan, Walter, 4,857,560, Cl. 521-103.000.

Klann, Joerg: *See—*
Kuhlmann, Werner; Spaeth, Werner; Waitl, Guenter; and Klann, Joerg, 4,857,746, Cl. 250-551.000.

Klapproth, Kenneth H.; Blimmel, William C.; and Dinse, Merle L., to United Technologies Corporation. Stator assembly for an axial flow rotary machine. 4,856,963, Cl. 415-190.000.

Klein, Jean M.: *See—*
Oberle, Edmond M.; and Klein, Jean M., 4,856,598, Cl. 172-54.500.

Klein, Peter: *See—*
Beckhaus, Heiko; Witt, Harro; and Klein, Peter, 4,857,281, Cl. 423-531.000

Klein, Robert. Drying center. 4,856,206, Cl. 34-151.000.

Klein, Rudolf, to C. Voigt Sohne GmbH & Co. Coating method. 4,857,368, Cl. 427-393.000.

Klein, Scott I.: *See—*
Youssefyeh, Raymond; Klein, Scott I.; Campbell, Henry F.; and Kuhla, Donald E., 4,857,517, Cl. 514-161.000.

Klein, Willem: *See—*
Rook, Cornelis; and Klein, Willem, 4,856,976, Cl. 425-320.000.

Kleinberg, Larry K., to Storz Instrument Company. Documentation illumination module. 4,856,873, Cl. 350-502.000.

Kleinberg, Robert L.; Clark, Brian; Chew, Weng C.; and Mariani, David, to Schlumberger Technology Corp. Induction well logging apparatus with transformer coupled phase sensitive detector. 4,857,852, Cl. 324-339.000.

Kleindienst GmbH Firma: *See—*
Eck, Werner, 4,856,302, Cl. 68-27.000.

Kleinstuber, John F.: *See—*
Damus, Diane; and Kleinstuber, John F., 4,856,912, Cl. 383-4.000.

Klimov, Sergei B.: *See—*
Churkin, Vladimir G.; Negrutsky, Sergei B.; Klimov, Sergei B.; and Negrutsky, Boris F., 4,856,414, Cl. 92-83.000.

Klimt, Ulrich: *See—*
Thiel, Rudolf; Klimt, Ulrich; and Kast, Helmut, 4,856,620, Cl. 188-72.400.

Klimt, Zdenek: *See—*
Andersson, Lars; and Klimt, Zdenek, 4,857,687, Cl. 219-10.570.

Klinger, Lori J., to W. R. Grace & Co. Radiation curable liquid (meth) acrylated polymeric hydrocarbon maleate prepolymers and formulations containing same. 4,857,434, Cl. 430-286.000.

Klink, Rainer: *See—*
Henkel, Eberhard; Dolabdjian, Barkew; Helger, Roland; Klink, Rainer; and Wurzburg, Uwe, 4,857,640, Cl. 536-4.100.

Kloss, Thomas M., Jr., to Gila River Products, Inc. Stratiform press pads and methods for use thereof in laminating flexible printed circuits. 4,857,400, Cl. 428-334.000.

Kloucek, Franz, to BBC Brown Boveri AG. Method for manufacturing semiconductor components. 4,856,702, Cl. 228-123.000.

Knapp, Alfons, to Masco Corporation. Silicon carbide valve elements. 4,856,758, Cl. 251-368.000.

Knapp, Eddy L. Necktie with adjustable closure. 4,856,115, Cl. 2-155.000.

Knauer, Wolfgang, to Hughes Aircraft Company. Cluster source for nonvolatile species, having independent temperature control. 4,856,457, Cl. 118-666.000.

Knauf, Werner; Waltersdorfer, Anna; Sagenmuller, Alfons; Stier, Hubert; and Lourens, Jan, to Hoechst Aktiengesellschaft. Compositions for combating pests containing macrocyclic lactones. 4,857,510, Cl. 514-30.000.

Knight, Richard B. D., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Analogue to digital converter of the multi-slope type. 4,857,933, Cl. 341-168.000.

Knobloch, Gerrit: *See—*
Meier, Hans-Rudolf; and Knobloch, Gerrit, 4,857,572, Cl. 524-289.000.

Kobayashi, Kazuo: *See—*
Terada, Yasushi; Nakayama, Takeshi; and Kobayashi, Kazuo, 4,858,194, Cl. 365-203.000.

Kobayashi, Kiyonori: *See—*
Aiki, Shigetaka; Kobayashi, Kiyonori; and Kato, Satoshi, 4,857,032, Cl. 464-68.000.

Kobayashi, Norihisa: *See—*
Seto, Toru; Mitsuoka, Shigeaki; Morii, Atsushi; and Kobayashi, Norihisa, 4,857,276, Cl. 422-171.000.

Kobayashi, Toshio; Otomo, Shigekazu; Nakatani, Ryoichi; and Kumasaka, Noriyuki, to Hitachi, Ltd. Magnetic film and magnetic head using the same. 4,858,049, Cl. 360-126.000.

Kobayashi, Yasuo, to NEC Corporation. Semiconductor memory with improved write function. 4,858,188, Cl. 365-189.050.

Koble, Robert L., Jr. Evaporative cooler pump apparatus. 4,856,971, Cl. 417-423.800.

Kobler, Ingo, to M.A.N. Roland Druckmaschinen AG. Adjustable bearing arrangement for a printing machine cylinder. 4,856,425, Cl. 101-212.000.

Koch, Vernon F.; Fahnlander, John G.; and Wanninger, Lester A., to National Computer Systems, Inc. Overprint registration system for printing a customized survey form and scannable form therefor. 4,857,715, Cl. 235-456.000.

Kochanowsky, Eugene W.: *See—*
McBride, William B.; Wilson, William R., Jr.; Tomlinson, John C.; McCarthy, John A.; Kochanowsky, Eugene W.; Hendricks, Jefferson D.; and Houle, Arthur J., 4,857,921, Cl. 340-912.000.

Kochi, Hiromi; Fukunaga, Kenji; Itagaki, Takaharu; and Ito, Tsuyoshi, to Mitsubishi Kasei Corporation; and MANAC Incorporated. Method for rendering a flammable polymer material flame-resistant. 4,857,576, Cl. 524-409.000.

Kock, Werner: *See—*
Fischer, Karl; Kock, Werner; and Tuider, Wolfgang, 4,858,051, Cl. 360-137.000.

Kodachi, Toru; and Usami, Jun, to NGK Insulators, Ltd. Oxygen analyzer. 4,857,164, Cl. 204-406.000.

Kodama, Kazumasa: *See—*
Eto, Kunihiko; Takeuchi, Shiro; Mori, Yutaka; Tanooka, Shigeo; Kodama, Kazumasa; and Matsumoto, Tsutomu, 4,858,134, Cl. 364-424.050.

Koden, Mitsuhiro, to 501 Sharp Kabushiki Kaisha. Liquid-crystal display device. 4,857,907, Cl. 340-784.000.

Koehler, Gerald C.: *See—*
Rigazio, Anthony W.; and Koehler, Gerald C., 4,857,758, Cl. 307-140.000.

Koehler, Philip G.; Kramer, Richard; and Patterson, Richard S., to University of Florida. Cockroach growth regulating composition and method. 4,857,532, Cl. 514-262.000.

Koezuka, Junji: *See—*
Ito, Masamichi; Ohkoshi, Akio; Shizukawa, Kenjiro; Hayata, Terunobu; Furuya, Tomiaki; Yamanaka, Susumu; and Koezuka, Junji, 4,857,499, Cl. 502-326.000.

Kogure, Masaaki; Mitekura, Yoshihiro; Matsuyama, Naoki; and Shinguryo, Satoshi, to Ricoh Company, Ltd. Wide screen display device using an endless belt. 4,857,908, Cl. 340-785.000.

Kohga, Daiju: *See—*
Takeuchi, Hiroshi; Kohga, Daiju; and Yukita, Yasuo, 4,856,919, Cl. 400-18.000.

Kohge, Shinichi: *See—*
Morishita, Mitsuharu; Kohge, Shinichi; Hara, Tadayuki; Hata, Yasuaki; and Umemaru, Hisato, 4,856,323, Cl. 73-118.100.

Kohler, Rolf-Dieter: *See—*
Rosebrock, Henning; Jung, Johann; Rademacher, Wilhelm; Luib, Max; Fischer, Volker; Hagen, Helmut; Kohler, Rolf-Dieter; Markert, Juergen; and Watanabe, Akihide, 4,857,103, Cl. 71-94.000.

Kohno, Masahiro; Obata, Akira; Kitamura, Takayuki; and Okazaki, Kakuma, to Kohno, Masahiro; and Japan Aircraft Mfg., Co., Ltd. Spring apparatus. 4,856,765, Cl. 267-166.000.

Kohus, Louis M.; Mariol, John V.; and Saint, David, to Graco Metal Products Inc. Collapsible stroller with stowable tray. 4,856,809, Cl. 280-644.000.

Koike, Hirofumi; Endo, Yukio; and Mitsuhashi, Tadashi, to Citizen Watch Co., Ltd. Optical scanner. 4,856,858, Cl. 350-6.600.

Koike, Norio, to Kabushiki Kaisha Toshiba. Method for forming light absorbing pattern using photoresist composition on phosphor screens of color picture tubes wherein composition includes azide compound and diazo formaldehyde phosphate. 4,857,428, Cl. 430-25.000.

Koito Seisakusho Co., Ltd.: *See—*
Watanabe, Saburo, 4,857,794, Cl. 313-113.000.

Kojima, Setsuo: *See—*
Miura, Shinsuke; Ishizuka, Susumu; and Kojima, Setsuo, 4,857,792, Cl. 310-323.000.

Kokkeler, Franciscus: *See—*
Vigano, Liliana; Kokkeler, Franciscus; and Fioroli, Mario, 4,857,685, Cl. 219-10.55F.

Kokura, Yasuhide: *See—*
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,857,965, Cl. 355-45.000.
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,857,966, Cl. 355-45.000.

Komatsu Electronic Metals Co., Ltd.: *See—*
Maruya, Shinji; Yatsurugi, Yoshifumi; and Togashi, Kazuya, 4,857,270, Cl. 420-578.000.

Komatsu, Yasuhiro: *See—*
Tahara, Yoshiyuki; Koyama, Hiroyasu; Komatsu, Yasuhiro; Kubota, Reiko; and Takahashi, Toshihiro, 4,857,529, Cl. 514-255.000.

Komiya, Yoshinori: *See—*
Suzuki, Masakazu; Suematsu, Masayuki; and Komiya, Yoshinori, 4,858,006, Cl. 358-139.000.

Komurasaki, Satoshi: *See—*
Fujimoto, Takanori; Hara, Toshiro; and Komurasaki, Satoshi, 4,856,479, Cl. 123-425.000.

Kondo, Hiroyuki: *See—*
Kawasumi, Satoshi; Sugiura, Yuzuru; Kondo, Hiroyuki; Miwa, Akihiko; and Suzuki, Kazuhiko, 4,856,412, Cl. 91-369.200.

Kondo, Kazuo: *See—*
Oku, Masuo; Kudo, Yoshimichi; Kuroyanagi, Tomomitsu; Kondo, Kazuo; Tsukazaki, Hisanobu; Ikeda, Tetsuya; Nakashima, Akio; and Kimura, Takashi, 4,858,030, Cl. 358-342.000

Kondo, Takayuki: *See—*
Yaguchi, Akio; and Kondo, Takayuki, 4,856,955, Cl. 414-278.000.

Kondo, Takeshi: *See—*
Maruyama, Kakuji; Kondo, Takeshi; and Okubo, Yoshimitsu, 4,856,298, Cl. 66-40.000.

Kondo, Yasuaki: *See—*
Kurono, Masayasu; Baba, Yutaka; Mitani, Takahiko; Onishi, Masao; Kondo, Yasuaki; and Sawai, Kiichi, 4,857,521, Cl. 514-206.000.

Konishi, Masahiro: *See—*
Okada, Kazuo; and Konishi, Masahiro, 4,858,032, Cl. 360-91.000.

Konishi, Satoru: *See—*
Hirao, Shozo; Usui, Hiroaki; Ohta, Yoshihiro; Nakai, Takashi; Ishikawa, Hiroyuki; and Konishi, Satoru, 4,857,365, Cl. 427-297.000.

Konose, Yoshiomi, to Mitsubishi Pencil Co., Ltd. Device for fixing applicator onto coating instrument. 4,856,925, Cl. 401-290.000.

Kopp, Heinz-Peter J.; Lammers, Jannes G.; van der Wolk, Jacob A.; and De Groot, Willibrordus T., to Lever Brothers Company. Process for preparing refined oil. 4,857,237, Cl. 260-409.000.

Korber AG: *See—*
Bantien, Jurgen, 4,856,958, Cl. 414-414.000.
Lorenzen, Heinz-Christen, 4,856,539, Cl. 131-290.000.

Korea Measures Co., Ltd.: *See—*
Kang, Dong M., 4,856,726, Cl. 242-84.800.

Korf Engineering GmbH: *See—*
Hauk, Rolf; and Papst, Gero, 4,857,105, Cl. 75-38.000.
Hauk, Rolf, 4,857,284, Cl. 423-231.000.

Koroku, Shuchiro: *See—*
Kawase, Tsunezo; Koroku, Shuichiro; and Okada, Kunio, 4,856,490, Cl. 125-21.000

Korol, Bernard; and Nathan, Paul, to Enquay Pharmaceutical Associates. Synthetic resin matrix system incorporating healing enhancer. 4,857,334, Cl. 424-445.000

Koropp, Norbert, to U.S. Philips Corporation. Examination apparatus with mass balancing for a part thereof which is pivotable about an axis. 4,856,413, Cl. 91-454.000.

Kortum, Inc.: *See—*
Kortum, William M., 4,857,049, Cl. 604-54.000

Kortum, William M., to Kortum, Inc. Method and apparatus for inducing immunological and resistant response in mammary glands. 4,857,049, Cl. 604-54.000.

Kostic, Nenad M.; and Zhou, Xia-Ying, to Iowa State University Research Foundation, Inc. Thermochromic platinum complexes. 4,857,231, Cl. 252-408.100.

Kosugi, Eizi: *See—*
Aisa, Junzo; and Kosugi, Eizi, 4,857,188, Cl. 210-222.000.

Kotani, Haruo, to Horiba Ltd. Reference electrode. 4,857,166, Cl. 204-435.000.

Kotani, Tomoyuki: *See—*
Otonari, Satoshi; Sato, Yoshinori; Masuda, Narihiro; and Kotani, Tomoyuki, 4,857,396, Cl. 428-315.500.

Kotera, Nobuo; Yamashita, Kiichi; Kinoshita, Taizo; Tanaka, Hirotoshi; Tanaka, Satoshi; and Nagata, Minoru, to Hitachi, Ltd. Threshold voltage fluctuation compensation circuit for FETS. 4,857,769, Cl. 307-450.000.

Kotobuki and Company, Ltd.: *See—*
Kageyama, Shuhei; Yamamoto, Tadashi; and Ebinuma, Tadayoshi, 4,856,693, Cl. 226-127.000.

Kouge, Katsushige, to Sanshin Kagaku Kogyo Co., Ltd. Active esters used for production of esters or amides and process for producing esters or amides. 4,857,656, Cl. 558-271.000.

Kouno, Katsumi; Okawa, Susumu; Sugaya, Masami; and Soga, Yoshinobu, to Toyota Jidosha Kabushiki Kaisha. Hydraulic control system for continuously variable transmission for automotive vehicle. 4,857,034, Cl. 474-28.000.

Kouyama, Masanori: *See—*
Ebata, Yoshihiro; Kouyama, Masanori; Tamari, Nobuyuki; and Kawamoto, Takamichi, 4,857,486, Cl. 501-21.000.

Kowalcyk, Robert A. Weight release. 4,856,774, Cl. 272-123.000.

Kowalewski, Ryszard J. Tracheal tube inflator. 4,856,510, Cl. 128-207.150.

Kowalkowski, James T.: *See—*
Brubaker, Weldon L.; Gierut, Frederick J.; Kowalkowski, James T.; and Liburdi, Francesco, 4,857,019, Cl. 439-751.000.

Kowshik, Vikram; and Lucero, Elroy M., to National Semiconductor Corporation. Zero power, electrically alterable, nonvolatile latch. 4,858,185, Cl. 365-181.000.

Koyama, Hiroyasu: *See—*
Tahara, Yoshiyuki; Koyama, Hiroyasu; Komatsu, Yasuhiro; Kubota, Reiko; and Takahashi, Toshihiro, 4,857,529, Cl. 514-255.000.

Kozaki, Shyuichi; Ichimura, Yukiko; and Narutako, Yozo, to Sharp Kabushiki Kaisha. Liquid-crystal display devices of twisted nematic type. 4,856,875, Cl. 350-341.000.

Kozato, Yasuo: *See—*
Hayakawa, Naoji; Takenouchi, Masanori; Nakamura, Kenji; Kan, Fumitaka; Kozato, Yasuo; and Hakamada, Isao, 4,858,062, Cl. 361-225.000.

Kraft, Simon. Concrete finishing float having spirally slotted sleeve 4,856,932, Cl. 404-118.000.

Krajicek, Richard W.; and Cradeur, Robert R., to Serv-Tech, Inc. Multi-lange tube bundle cleaner. 4,856,545, Cl. 134-166.00C.

Kramer, Richard: *See—*
Koehler, Philip G.; Kramer, Richard; and Patterson, Richard S., 4,857,532, Cl. 514-262.000.

Krause, Ludwig. Mechanical servo unit. 4,856,359, Cl. 74-110.000.

Krauskopf, Dale H.: *See—*
Aichele, William H.; Hopkins, James O., Jr.; and Krauskopf, Dale H., 4,856,850, Cl. 303-20.000

Krebs, Jimmy M. Interlocking support system. 4,856,659, Cl. 211-24.000

Kreiling, William H.; and Tower, William A., to Loctite Luminescent Systems, Inc. Infra-red emitting electroluminescent lamp structures. 4,857,416, Cl. 428-690.000

Kreisner, William. Random lottery computer. 4,858,122, Cl. 364-410.000.

Krenz, Dean C.: *See—*
Rebers, Kenneth D.; Seim, William J.; and Krenz, Dean C., 4,857,672, Cl. 174-93.000.

Kreth, Norbert: *See—*
Widmann, Karlheinz; Kreth, Norbert; Schmitt, Martin; and Stellwagen, Armin, 4,856,278, Cl. 60-423.000.

Kreuzer, Hubert, to planetroll Antriebe GmbH. Adjustable transmission. 4,856,374, Cl. 74-740.000

Kroeker, David: *See—*
Henderson, D. Grant; Yuill, Grenville K.; and Kroeker, David, 4,856,123, Cl. 4-480.000.

Kron, Reuben E.; and Litt, Mitchell, to KDL Technologies, Inc. Apparatus and method for measuring native mammalian blood viscosity. 4,858,127, Cl. 364-413.070.

Kronich, Peter G., to Tecumseh Products Company. Adjustable lash valve train for overhead valve engine. 4,856,467, Cl. 123-90.430

Krueger, Kenneth K., to Steri-Oss, Inc. Packaging & installing implants. 4,856,648, Cl. 206-63.500.

Kruger, Jurgen: *See—*
Rabenecker, Horst; and Kruger, Jurgen, 4,856,818, Cl. 283-34.000.

Krupp, Joachim: *See—*
Ochel, Klaus-Peter; Krupp, Joachim; Heger, Josef; and Schweitzer, Martin, 4,856,985, Cl. 431-202.000.

Krusas, James J.: *See—*
Desy, Raoul O.; and Krusas, James J., 4,856,109, Cl. 2-9.000.

Kruse, Gary L.; and Petersen, Bernard L., to Oliver Products Company. Countertop bread slicer with manually actuated cradle. 4,856,398, Cl. 83-425.200.

Kruse, Lawrence I.: *See—*
Kaiser, Carl; and Kruse, Lawrence I., 4,857,540, Cl. 514-387.000.

Kubo, Isamu: *See—*
Seki, Kamcharu; and Kubo, Isamu, 4,856,424, Cl. 101-128.400.

Kubo, Junichi; and Suzuki, Kenji, to Nippon Oil Co., Ltd. Method for hydrocracking heavy fraction oil. 4,857,168, Cl. 208-58.000.

Kubo, Masaharu: *See—*
Homma, Noriyuki; Nakamura, Tohru; Nakazato, Kazuo; Matsumoto, Motoaki; Hayashida, Tetsuya; Kubo, Masaharu; and Sagara, Kazuhiko, 4,858,184, Cl. 365-174.000.

Kubo, Seitoku: *See—*
Funahashi, Makoto; Kubo, Seitoku; and Nakamura, Shinya, 4,856,381, Cl. 74-867.000.

Kubota Ltd.: *See—*
Ishii, Akira; and Ito, Ryoichi, 4,856,470, Cl. 123-195.00C.
Terasoka, Akira; and Shikiya, Hajime, 4,856,611, Cl. 180-233.000.

Kubota, Reiko: *See—*
Tahara, Yoshiyuki; Koyama, Hiroyasu; Komatsu, Yasuhiro; Kubota, Reiko; and Takahashi, Toshihiro, 4,857,529, Cl. 514-255.000.

Kubota, Tetsuhiro: *See—*
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,857,650, Cl. 548-336.000.

Kuczka, Eugeniusz: *See—*
Cieslik, Jerzy; Flak, Marek; Kuczka, Eugeniusz; Oles, Franciszek; Marszycki, Zdsizlaw; and Olender, Kornel, 4,856,940, Cl. 405-296.000.

Kudo, Hiroaki: *See—*
Yano, Seiki; Kudo, Hiroaki; Takiguchi, Haruhisa; Hijikata, Toshiki; and Kaneiwa, Shinji, 4,858,215, Cl. 369-45.000.

Kudo, Yoshimichi: *See—*
Oku, Masuo; Kudo, Yoshimichi; Kuroyanagi, Tomomitsu; Kondo, Kazuo; Tsukazaki, Hisanobu; Ikeda, Tetsuya; Nakashima, Akio; and Kimura, Takashi, 4,858,030, Cl. 358-342.000.

Kuehn, Hans, to Bomag-Menck GmbH. Method of and arrangement for separating tubular foundation piles under water. 4,856,938, Cl. 405-227.000.

Kugioka, Michihiro, to Canon Kabushiki Kaisha; and Canon Seki Kabushiki Kaisha. Drive circuit for stepping motor. 4,857,817, Cl. 318-696.000.

Kuhl, Peter: *See—*
Lotz, Michael, deceased; Vanino, Rudiger, deceased; Kuhl, Peter; Welte, Dieter; and Zimmer, Herbert, 4,856,735, Cl. 244-35.00R.

Kuhla, Donald E.: *See—*
Youssefyeh, Raymond; Klein, Scott I.; Campbell, Henry F.; and Kuhla, Donald E., 4,857,517, Cl. 514-161.000.

Kuhlman, Myron I.; Borchardt, John K.; and Falls, Andrew H., to Shell Oil Company. Gas flooding with dilute surfactant solutions. 4,856,589, Cl. 166-273.000.

Kuhlmann, Robert: *See—*
Nauroth, Peter; Kuhlmann, Robert; Turk, Gunter; and Becker, Adam, 4,857,289, Cl. 423-339.000.

Kuhlmann, Werner; Spaeth, Werner; Waitl, Guenter; and Klann, Joerg, to Siemens Aktiengesellschaft. Method for producing an optocoupler. 4,857,746, Cl. 250-551.000.

Kuhn, Franz J.: *See—*
Weber, Karl-Heinz; Schneider, Claus; Walther, Gerhard; Hinzen, Dieter; Kuhn, Franz J.; Lehr, Erich; Ensinger, Helmut; and Troger, Wolfgang, 4,857,528, Cl. 514-252.000.

Kuhn s.a.: *See—*
Oberle, Edmond M.; and Klein, Jean M., 4,856,598, Cl. 172-54.500.

Kuka: *See—*
Pockl, Franz, 4,856,701, Cl. 228-6.100.

Kulhlemann, Bruce: *See—*
Wada, Shohachi; and Kulhlemann, Bruce, 4,857,190, Cl. 210-232.000.

Kulprathipanja, Santi, to UOP. Process for separating arabinose from a mixture of other aldoses. 4,857,642, Cl. 536-127.000.

Kumasaka, Noriyuki: *See—*
Kobayashi, Toshio; Otomo, Shigekazu; Nakatani, Ryoichi; and Kumasaka, Noriyuki, 4,858,049, Cl. 360-126.000.

Kumazaki, Eisuke: *See—*
Fujii, Shigemi; Kumazaki, Eisuke; and Shigematsu, Kazutoshi, 4,857,256, Cl. 264-310.000.

Kumazawa, Yoshihiko; and Matsuyama, Tsunekazu, to Shimadzu Corporation. Apparatus for stabilizing the amplification degree of photomultipliers. 4,857,722, Cl. 250-207.000.

Kummunsalo, Pentti. Arrangement for umbrella. 4,856,546, Cl. 135-20.00R.

Kuno, Atsushi: *See—*
Takaya, Takao; Takasugi, Hisashi; Esumi, Kimio; Kuno, Atsushi; Sakai, Hiroyoshi; Maeda, Kazuhiro; and Sakamoto, Yoshie, 4,857,527, Cl. 514-237.200.

Kuper, Jerry W.; Langert, William E.; and Barrett, Joseph J., to Allied-Signal Inc. Unitary solid-state laser. 4,858,242, Cl. 372-72.000.

Kurata, Yoshiharu, to Nakagawa Seisakusho Co., Ltd. Pile yarn feeding device in tufting machine. 4,856,441, Cl. 112-80.730.

Kureha Kagaku Kogyo K. K.: *See—*
Hoshino, Mitsuru; Yusa, Haruhiko; and Suzuki, Katsumi, 4,857,592, Cl. 525-82.000.

Kurihara, Masaru: *See—*
Sasaki, Tatsuo; Fujimaki, Hideo; Uemura, Tadahiro; and Kurihara, Masaru, 4,857,363, Cl. 427-245.000.

Kurihara, Tatsuo: *See—*
Clements, Brice P.; Kurihara, Tatsuo; Marshall, Sammy D.; and Syrowatka, Rupert, 4,857,193, Cl. 210-396.000.

Kuriyama, Kazunori; Shintani, Yooichi; Yamaoka, Akira; Shonai, Tohru; Kamada, Eiki; and Inoue, Kiyoshi, to Hitachi, Ltd. Pipelined data processor capable of decoding and executing plural instructions in parallel. 4,858,105, Cl. 364-200.000.

Kurn, Peter A.: *See—*
Coleman, Raymond L.; and Kurn, Peter A., 4,857,856, Cl. 324-547.000.

Kurono, Masayasu; Baba, Yutaka; Mitani, Takahiko; Onishi, Masao; Kondo, Yasuaki; and Sawai, Kiichi, to Sanwa Kagaku Kenkyusho Co., Ltd. Trialkylsilyl pyridinium cephalosporin antibiotics. 4,857,521, Cl. 514-206.000.

Kurosaki, Toshiei: *See—*
Kataoka, Keiji; Kurosaki, Toshiei; Yonezawa, Seiji; and Katagiri, Soichi, 4,857,744, Cl. 250-548.000.

Kuroyama, Yutaka: *See—*
Araki, Masatada; Kuroyama, Yutaka; Takeuchi, Yukihisa; Takagi, Makoto; Kawamura, Yoshihito; and Imura, Toru, 4,857,414, Cl. 428-612.000.

Kuroyanagi, Junzo: *See—*
Yoshimura, Hiroshi; Shirata, Akihiro; and Kuroyanagi, Junzo, 4,856,360, Cl. 74-335.000.

Kuroyanagi, Tomomitsu: *See—*
Oku, Masuo; Kudo, Yoshimichi; Kuroyanagi, Tomomitsu; Kondo, Kazuo; Tsukazaki, Hisanobu; Ikeda, Tetsuya; Nakashima, Akio; and Kimura, Takashi, 4,858,030, Cl. 358-342.000.

Kusser, Josef. Machine for grinding large balls. 4,856,231, Cl. 51-129.000.

Kusters, Karl-Heinz, to Eduard Kusters Maschinenfabrik GmbH & Co. KG. Roll with controllable line pressure. 4,856,157, Cl. 29-116.200.

Kusuda, Masataka; Fukuma, Shuji; and Nishiyama, Masaki, to Nitto Electric Industrial Co., Ltd. In phase corrugated plate membrane module support. 4,857,192, Cl. 210-321.840.

Kusumoto, Keiji, to Minolta Camera Kabushiki Kaisha. Image forming apparatus. 4,857,957, Cl. 355-314.000.

Kutsuki, Hidetoshi; Sawa, Ikuo; Mori, Natsuki; Hasegawa, Junzo; and Watanabe, Kiyoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for preparing optically active 2-halo-1-phenyl ethanol. 4,857,468, Cl. 435-280.000.

Kuwano, Hiromichi, to Texas Instrument Incorporated. High withstand voltage output. 4,857,780, Cl. 307-574.000.

Kuzzora, Thaddaeus: *See—*
Dokoupil, Jiri; and Kuzzora, Thaddaeus, 4,856,201, Cl. 34-1.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Morimoto, Kiyoshi; Iwamoto, Akikazu; Moriyama, Masuo; and Sonoda, Atsuroh, 4,856,941, Cl. 406-85.000.

L. R. Nelson Corporation: *See—*
Heren, Lawrence P., 4,856,823, Cl. 285-81.000.

La Telemecanique Electrique: *See—*
Belaidouni, Ali; Benani, Andre; and Millet, Jean-Marie, 4,856,183, Cl. 29-753.000.

Labelle, Jean: *See—*
Steffen, Francis; and Labelle, Jean, 4,857,483, Cl. 437-209.000.

Lachmann, Karl-Heinz, to Diehl GmbH & Co. Method and arrangement for determining passage through an apogee. 4,856,733, Cl. 244-3.150.

Lachonius, Leif; and Abbestam, Goran, to Aktiebolaget SKF. Device for retaining two parallel tracks. 4,856,643, Cl. 198-627.000.

Lagergren, Lars: *See—*
Eriksson, Lars, 4,856,241, Cl. 52-217.000.

Lai, Hoi K.; Davis, Robert A.; and Blem, Allen R., to Uniroyal Chemical Company, Inc.; and Uniroyal Chemical LTD/LTEE. Azole derivatives of naphthalenone oxime esters. 4,857,649, Cl. 548-262.000.

Lakshmanan, Pallavoor R.; and Nguyen, Son T., to Baychem International, Inc. Melt adhesive compositions. 4,857,594, Cl. 525-98.000.

Lally, William J.; and Morton, Edward W., to North American Philips Corporation. Modified impedance rapid start fluorescent lamp system. 4,857,808, Cl. 315-100.000

Lambert, Kenneth, to ElectroScan Corporation. Disposable spray aperture. 4,857,743, Cl. 250-505.100.

Lammers, Jannes G.: *See—*
Kopp, Heinz-Peter J.; Lammers, Jannes G.; van der Wolk, Jacob A.; and De Groot, Willibrordus T., 4,857,237, Cl. 260-409.000.

Lancaster, David R.; and Everding, Richard J., to Amoco Corporation. Fire hose gripping device and process for fighting fires in oil refineries and the like. 4,856,834, Cl. 294-15.000.

Lanchais, Michel. Information and guiding system including a portable receiver device having an electromagnetic wave antenna and magnetic field sensor. 4,857,840, Cl. 324-207.000.

Landais, Jean-Louis: *See—*
Mallet, Jean-Louis; and Landais, Jean-Louis, 4,858,074, Cl. 361-388.000.

Landau, Richard F.; Millikin Jr., William E.; Puchacz, Jerzy P.; Reyes, Manolito Q.; and Schadler, Walter, to Oerlikon-Buhrle U.S.A. Inc. High vacuum processing system and method. 4,857,160, Cl. 204-192.120.

Lang, Richard D.: *See—*
Bolton, Theodore S.; and Lang, Richard D., 4,856,295, Cl. 62-263.000.

Lange, Ludwig: *See—*
Hinrichs, Walter; Hovestadt, Herbert; Lange, Ludwig; Ruppert, Kurt A.; and Splett, Erich, 4,857,665, Cl. 568-851.000.

Langen, Manfred; and Fink, Heinz, to Palitex Project Company GmbH. Automated textile thread processing system. 4,856,270, Cl. 57-281.000.

Langer, Robert S.: *See—*
Domb, Abraham J.; and Langer, Robert S., 4,857,311, Cl. 424-78.000.

Langert, William E.: *See—*
Kuper, Jerry W.; Langert, William E.; and Barrett, Joseph J., 4,858,242, Cl. 372-72.000.

Langlois, Roger: *See—*
Ouillon, Rene; and Langlois, Roger, 4,856,507, Cl. 128-204.260.

Langrick, David J.; and Smith, Mark, to Willett International Limited. Method and device for measuring the viscosity of an ink. 4,856,322, Cl. 73-56.000

Lannon, Anthony M.: *See—*
Armstrong, Fraser A.; and Lannon, Anthony M., 4,857,152, Cl. 204-1.00T.

Lantz, Kenneth F.; Smolucha, Walter E.; and Struck, Leslie G., to Williams Electronics, Inc. Optical dual function joystick. 4,856,785, Cl. 273-148.00B.

Lanzani, Emanuele, to King-Seeley Thermos Co. Waterspray device for ice making machines. 4,856,712, Cl. 239-106.000.

LaPierre, Rene B.: *See—*
Huang, Tracy J.; LaPierre, Rene B.; and Tabak, Samuel A., 4,857,664, Cl. 568-695.000.

Lardat, Claude: *See—*
Gautier, Herve ; and Lardat, Claude, 4,857,870, Cl. 333-195.000.

Lardo, Claude: *See—*
Collette, Jean J.; Dauvister, Pierre M. J.; Jonette, Bernard; and Lardo, Claude, 4,856,571, Cl. 152-209.00R.

LaRocca, William J.; and Trush, David M., to Wickes Manufacturing Company. Parking brake assembly. 4,856,363, Cl. 74-535.000.

La Rovere, Ruggiero, to Rheem Empreendimentos Industriais E. Comerciais S/A. Process and apparatus for assembling a tubular container. 4,856,176, Cl. 29-511.000.

Larsen, Duane M.; and Dopp, Robert B., to Rayovac Corporation. Zinc alkaline electrochemical cells with reduced mercury anodes. 4,857,424, Cl. 429-206.000.

Larson, heir & representative, Catherine J.: *See—*
Larson, Nils, F., deceased; Larson, heir & representative, Catherine J.; and von Loh, Knut, 4,856,248, Cl. 52-405.000.

Larson, Kevin D. Stowable work bench. 4,856,435, Cl. 108-134.000.

Larson, Nils E.; Leturno, David B.; and Cherne, Lawrence W., to Union Carbide Corporation. Spray mode gas metal arc welding process. 4,857,692, Cl. 219-74.000.

Larson, Nils, F., deceased; Larson, heir & representative, Catherine J.; and von Loh, Knut. Structural building element. 4,856,248, Cl. 52-405.000.

Larson, Wayne K.: *See—*
Ersfeld, Dean A.; Hansen, Paul E.; Scholz, Matthew T.; Bartizal, Dennis C.; Reed, Katherine E.; Larson, Wayne K.; Sandvig, Timothy C.; and Buckanin, Richard S., 4,856,502, Cl. 128-90.000.

Larsson, Karl O. A. H., to ISG/AG. Breastpump. 4,857,051, Cl. 604-74.000.

Laser Products Corporation: *See—*
Reynolds, Edward C., Jr., 4,856,218, Cl. 42-103.000.

Lasersense, Inc.: *See—*
Wiedemann, Rudolf A., 4,856,902, Cl. 356-375.000.

Lateulere, Jean-Louis: *See—*
Casanova, Philippe; and Lateulere, Jean-Louis, 4,856,572, Cl. 152-454.000.

Lathrop, Olin G., to Apollo Computer, Inc. Display controller utilizing attribute bits. 4,857,901, Cl. 340-703.000.

Lau, John J.; and Fang, Si-Ming, to Mactronix, Inc. Semiconductor wafer transfer apparatus with back-to-back positioning and separation. 4,856,957, Cl. 414-404.000.

Lauber, Peter, to Conprinta Ltd. Flexographic printing machine, especially for flexographic blank printing. 4,856,429, Cl. 101-486.000.

Laue, Eric G.; and Stephens, James B., to California Institute of Technology. Spiral configuration of electrodes and dielectric material for sensing an environmental property. 4,858,063, Cl. 361-286.000.

Laugal, James A.; Martin, Glenn E.; St. Aubin, Donald L.; and Wold, Gerald G., to BASF Corporation, Inmont Division. Flexible aryl alkyl epoxy resins, their amine resin derivatives and their use in electrodeposition coatings. 4,857,567, Cl. 523-415.000.

Laurent, Denis: *See—*
Hurtel, Patrice; Laurent, Denis; and Rondini, Joseph, 4,857,239, Cl. 562-896.000.

Laurita, Joseph N., to Schmid Laboratories, Inc. Injection molding apparatus for making parts having complex geometric shapes. 4,856,980, Cl. 425-572.000.

Lauterbach, Herbert G.: *See—*
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,856,146, Cl. 19-0.350.
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,856,147, Cl. 19-0.350.
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,857,385, Cl. 428-189.000.

Lavanish, Jerome M.; and Van Gemert, Barry, to American Cyanamid Company. Terrestrial and aquatic herbicidal methods. 4,857,099, Cl. 71-92.000.

LaVelle, Richard E.: *See—*
Alsip, Allen W.; Bossert, Clayton E.; and LaVelle, Richard E., 4,856,128, Cl. 5-61.000.

Lawless Container Corporation: *See—*
Carr, Timothy H.; and Felton, Donald W., 4,856,705, Cl. 229-109.000.

Layden, George K.: *See—*
Brennan, John J.; Layden, George K.; and Prewo, Karl M., 4,857,485, Cl. 501-7.000.

Layton, James R.: *See—*
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,856,146, Cl. 19-0.350.
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,856,147, Cl. 19-0.350.
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,857,385, Cl. 428-189.000.

Lazarus, Stanley D.: *See—*
Cordova, David S.; Coffin, David R.; Lazarus, Stanley D.; and Young, Steven A., 4,857,405, Cl. 428-378.000.

Lazzara, Richard J.; and Beaty, Keith D., to Implant Innovations, Inc. Periodontal restoration components. 4,856,994, Cl. 433-173.000.

Lea, Bernard A.: *See—*
Burrows, Ronald W.; Penfound, Keith A.; and Lea, Bernard A., 4,857,450, Cl. 430-603.000.

Leandri, Jacqueline: *See—*
Rey, Pierre; Leandri, Jacqueline; Abbou, Clement; and Sezeur, Alain, 4,857,059, Cl. 604-185.000.

Lechner, Robert: *See—*
Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; and Lechner, Robert, 4,858,226, Cl. 370-58.000.

Le Doux, Georges F. J.; and Geesink, Johannes H. Process for the manufacturing of a multilayer plastic container. 4,857,258, Cl. 264-515.000.

Lee, Anthony L. Cutting attachment for trimmers. 4,856,194, Cl. 30-276.000.

Lee, Chunghsin, to High Temperature Engineering Corporation. Rapid thermal furnace for semiconductor processing. 4,857,689, Cl. 219-10.710.

Lee, Fred C.: *See—*
Tabisz, Wojciech A.; and Lee, Fred C., 4,857,822, Cl. 323-282.000.

Lee, Nicholas A., to Minnesota Mining and Manufacturing Company. Tunable splice for fiber optics. 4,856,865, Cl. 350-96.210.

Lee, Simon W., to Syntex (U.S.A.) Inc. Bordetella bronchiseptica pilus subunit protein vaccine effective against bordetella pertussis. 4,857,318, Cl. 424-92.000.

Lee, Ta J.: *See—*
Hoffman, William F.; and Lee, Ta J., 4,857,547, Cl. 514-460.000.

Le Fol, Marcel, to Automobiles Peugeot; and Automobiles Citroen. Hydroelastic support, in particular for the suspension of a vehicle engine. 4,856,750, Cl. 248-562.000.

Leger, Didier S.: *See—*
Philippe, Michel; Sebag, Henri; Leger, Didier S.; and Leveque, Jean L., 4,857,525, Cl. 514-227.500.

Legg, Wesley E.: *See—*
Ault, Russell L.; Legg, Wesley E.; and Mott, Richard A., 4,856,243, Cl. 52-304.000.

Lehmann, Leonard T.: *See—*
Casey, Donald J.; Rosati, Louis; Jarrett, Peter K.; and Lehmann, Leonard T., 4,857,602, Cl. 525-408.000.

Lehr, Erich: *See—*
Weber, Karl-Heinz; Schneider, Claus; Walther, Gerhard; Hinzen, Dieter; Kuhn, Franz J.; Lehr, Erich; Ensinger, Helmut; and Troger, Wolfgang, 4,857,528, Cl. 514-252.000.

Lehrman, Sandra N.: *See—*
Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Phillip A., 4,857,511, Cl. 514-50.000.

Leiber, Heinz; Ohnemuller, Hans-Joachim; and Kastner, Klaus, to Daimler-Benz Aktiengesellschaft. System for controlling at least one variable influencing the drive torque of an internal combustion engine of a motor vehicle. 4,856,610, Cl. 180-197.000.

Leichner, Peter K.: *See—*
Yang, Nai-Chuen; and Leichner, Peter K., 4,856,528, Cl. 128-653.000.

Leigh-Monstevens, Keith V.; and Branum, Leslie P., to Automotive Products plc. Center-feed master cylinder with retainer for valve stem. 4,856,282, Cl. 60-589.000.

Leising, Frederic, to Rhone-Poulenc Specialities Chimiques. Stable amphoteric aqueous dispersions of synthetic polymers. 4,857,585, Cl. 524-815.000.

Leland Stanford Junior University, The Board of Trustees of the: *See—*
Widrow, Bernard, 4,858,130, Cl. 364-421.000.

Lemelson, Jerome H. Face mask and method. 4,856,509, Cl. 128-206.190.

Lenger, Sidney A., to Pilliod Cabinet Company, The. Expandable headboard for beds. 4,856,127, Cl. 5-53.00R.

Lennon, Patrick G., to Kimberly-Clark Corporation. Compact tampon applicator with hollow tampon and radially expandable applicator tube. 4,857,044, Cl. 604-14.000.

Lennox Industries Inc.: *See—*
Smelcer, Jimmy C., 4,856,550, Cl. 137-192.000.

Lentz, David; Wilson, Larry; and Deckert, Curt, to Fisher Scientific Company. Ratiometric air-in-line detector. 4,857,050, Cl. 604-67.000.

Lenz, James E.; Bjork, Paul E.; and Fujiwara, Hisatoshi, to Honeywell Inc. Optically powered remote sensors with timing discrimination. 4,857,727, Cl. 250-227.000.

Leonard, Didier: *See—*
Lewiner, Jacques; Hennion, Claude; and Leonard, Didier, 4,857,913, Cl. 340-825.310.

Les Produits Duvernay Ltee: *See—*
Croteau, Rene, 4,856,171, Cl. 29-417.000.

Leturno, David B.: *See—*
Larson, Nils E.; Leturno, David B.; and Cherne, Lawrence W., 4,857,692, Cl. 219-74.000.

Leung, David W.: *See—*
Hammonds, R. Glenn; Leung, David W.; Martin, David W., Jr.; Spencer, Steven A.; and Wood, William I., 4,857,637, Cl. 530-403.000.

Leung, Pak S.; Goddard, Errol D.; and Ancker, Fred H., to Union Carbide Corporation. Process for processing thermoplastic polymers. 4,857,593, Cl. 525-92.000.

Leveque, Jean L.: *See—*
Philippe, Michel; Sebag, Henri; Leger, Didier S.; and Leveque, Jean L., 4,857,525, Cl. 514-227.500.

Lever Brothers Company: *See—*
Kopp, Heinz-Peter J.; Lammers, Jannes G.; van der Wolk, Jacob A.; and De Groot, Willibrordus T., 4,857,237, Cl. 260-409.000.

Leviton Manufacturing Company, Inc.: *See—*
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Levy, Itzhak: *See—*
Margaritz, Mordeckai; Ronen, Daniel; and Levy, Itzhak, 4,857,473, Cl. 436-177.000.

Lewiner, Jacques; Hennion, Claude; and Leonard, Didier, to Societe Fontaine. Coded objects identifiable by proximity and devices for changing the codes of these objects. 4,857,913, Cl. 340-825.310.

Lewis, Duane H.: *See—*
Dutt, Herbert V.; and Lewis, Duane H., 4,856,665, Cl. 215-252.000.

Lewis, Steven D.: *See—*
Cahill, Joseph J.; Johnson, Charles L.; Lewis, Steven D.; Mullins, Timothy J.; and Petz, Bruce R., 4,857,765, Cl. 307-443.000.

Lex, Erich: *See—*
Schoeffl, Manfred; and Lex, Erich, 4,856,565, Cl. 141-97.000.

Ley, Richard A., to Berwind Corporation. Heat exchanger. 4,856,580, Cl. 165-87.000.

Leyrer, Reinhold J.: *See—*
Loerzer, Thomas; and Leyrer, Reinhold J., 4,857,438, Cl. 430-332.000.

Liao, Pen-Lin. Method for manufacturing multiple push-button and conductive members for DIP switches. 4,856,189, Cl. 29-882.000.

Liburdi, Francesco: *See—*
Brubaker, Weldon L.; Gierut, Frederick J.; Kowalkowski, James T.; and Liburdi, Francesco, 4,857,019, Cl. 439-751.000.

Licentia Patent-Verwaltungs-GmbH: *See—*
Jorke, Helmut; and Luy, Johann-Friedrich, 4,857,972, Cl. 357-4.000.

Liechty, Deryll, to Micro-Precision Operations Inc. Apparatus for compressing a retainer ring to assembly size. 4,856,169, Cl. 29-283.000.

Liedtke, Kurt: *See—*
Focke, Heinz; and Liedtke, Kurt, 4,856,538, Cl. 131-282.000.

Liermann, Norbert: *See—*
Kettner, Roland; Liermann, Norbert; and Lubcke, Torsten, 4,857,297, Cl. 423-576.800.

Lile, Charles R.: *See—*
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Lim Technology Laboratories, Inc.: *See—*
Bohm, Howard A., 4,857,335, Cl. 424-455.000.

Lin, Ming-Tang. Hook-driven screw with replaceable hook. 4,856,953, Cl. 411-383.000.

Lin, Shuh-Chin. Structure of carton sealing sticker and cutter. 4,857,134, Cl. 156-385.000.

Linatex Corporation of America: *See—*
McQuade, John O., 4,856,791, Cl. 273-410.000.

Linder, Ernst; Rembold, Helmut; and Teegen, Walter, to Robert Bosch GmbH. Method of controlling the demagnetization phase of electromagnetic devices, especially of electromagnetic valves of combustion engines. 4,856,482, Cl. 123-506.000.

Lindroos, Kaj; and Tohonen, Mauno, to Valmet Oy. Spreader roll or equivalent for a fabric in a paper machine, and method for manufacturing the same. 4,856,158, Cl. 29-116.100.

Linear Technology Corporation: *See—*
Sevastopoulos, Nello G., 4,857,860, Cl. 330-107.000.

Ling, Michael T. K.: *See—*
Woo, Lecon; and Ling, Michael T. K., 4,856,259, Cl. 53-373.000.
Woo, Lecon; and Ling, Michael T. K., 4,856,260, Cl. 53-373.000.

Link, Christoph; and Brandiser, Herbert, to Sulzer-Escher Wyss AG. Roll arrangement containing a controlled deflection roll. 4,856,156, Cl. 29-115.000.

Linn, Thomas D., to Boston Digital Corporation. Structural element for a machine tool. 4,856,752, Cl. 248-678.000.

Linsinger Maschinenbau GmbH: *See—*
Pomikacsek, Josef, 4,856,948, Cl. 409-138.000.

Linyeav, Eugene J.; and Chang, Chi-Huang M., to Western Atlas International, Inc. Quick change electrical coupling. 4,857,006, Cl. 439-271.000.

Lipp, Charles W., to Dow Chemical Company, The. Apparatus for use with pressurized reactors. 4,857,075, Cl. 48-86.00R.

Lipp, Charles W.: *See—*
Pearson, Stanley R.; Merrick, Douglas D.; White, William P.; and Lipp, Charles W., 4,857,076, Cl. 48-86.00R.

Lipp, Ellis P., to Emhart Industries, Inc. Combination plunger and slider switch. 4,857,678, Cl. 200-16.00R.

Lippa, Arnold S.; and Scheer, David I., to Yeda Research and Development Company, Ltd. Virus inactivation. 4,857,514, Cl. 514-78.000.

Lipshultz, Alfred J.: *See—*
Lipshultz, Mitchell; and Lipshultz, Alfred J., 4,856,559, Cl. 137-801.000.

Lipshultz, Mitchell; and Lipshultz, Alfred J., to Aquathin Corp. Faucet providing and utilizing air gap. 4,856,559, Cl. 137-801.000.

Liss, Bernard: *See—*
Liss, Saul; and Liss, Bernard, 4,856,526, Cl. 128-422.000.

Liss, Saul; and Liss, Bernard, to Pain Suppression Labs, Inc. Apparatus and methodology for treatment of headache syndromes. 4,856,526, Cl. 128-422.000.

Lister, Roy D.: *See—*
Young, Grant A.; Lister, Roy D.; Wakley, William D.; and Andrews, Steven L., 4,857,197, Cl. 210-512.100.

Litt, Mitchell: *See—*
Kron, Reuben E.; and Litt, Mitchell, 4,858,127, Cl. 364-413.070.

Little, Wendell L.; and Smith, Michael D., to Dallas Semiconductor Corporation. High-density low-power circuit for sustaining a precharge level. 4,857,767, Cl. 307-448.000.

Litton Systems Canada Limited: *See—*
Farrell, James F., 4,857,801, Cl. 313-500.000.

Litton Systems, Inc.: *See—*
Ivancevic, Mirko, 4,856,900, Cl. 356-350.000.

Liu, Yee M. Ashtrays. 4,856,537, Cl. 131-240.100.

Liu, Yung S.; and Grubb, Willard T., to General Electric Company. Apparatus and method for photoetching of polyimides, polycarbonates and polyetherimides. 4,857,382, Cl. 428-156.000.

Lizzi, Frederic L.; Yaremko, Mykola M.; Silverman, Ronald H.; and Coleman, D. Jackson, to RiverSide Research Institute. Method for enhancement of ultrasonic image data. 4,858,124, Cl. 364-413.010.

Lockheed Corporation: *See—*
Phillips, Pettice M.; and Swink, Billy J., 4,857,162, Cl. 204-257.000.

Loctite Luminescent Systems, Inc.: *See—*
Kreiling, William H.; and Tower, William A., 4,857,416, Cl. 428-690.000.

Locwyn Limited: *See—*
Selwyn-Smith, Clive, 4,856,660, Cl. 211-46.000.

Lodge, Nicolas K., to Independent Broadcasting Authority. System for encoding broadcast quality television signals to enable transmission as an embedded code. 4,858,005, Cl. 358-135.000.

Loerzer, Thomas; and Leyrer, Reinhold J., to BASF Aktiengesellschaft. Photochromic system and layers produced therewith. 4,857,438, Cl. 430-332.000.

Loewenstein, Lee M., to Texas Instruments Incorporated. Method for etching silicon nitride. 4,857,140, Cl. 156-643.000.

Lofland, Spencer G. Apparatus for reclaiming and purifying chlorinated fluorocarbons. 4,856,289, Cl. 62-149.000.

Lohmeyer, Hartmut. Chair with a seat and an inherently elastically pliable back rest. 4,856,846, Cl. 297-300.000.

Lok, Brent M.: *See—*
Marcus, Bonita K.; and Lok, Brent M., 4,857,288, Cl. 423-328.000.

Lomapharm, Rudolf Lohmann GmbH KG, Pharmazeutische Fabrik: *See—*
Wagner, Hildebert; Zenk, Meinhart H.; and Ott, Holger, 4,857,512, Cl. 514-54.000.

Lombardo, Igino; and Walus, Richard L., to I.L.Med, Inc. Laser head and microscope attachment assembly with swivel capability. 4,856,512, Cl. 128-303.100.

Lonati, Francesco, to Lonati S.p.A. Device for selecting needles in circular knitting machines for hosiery and the like. 4,856,300, Cl. 66-221.000.

Lonati S.p.A.: *See—*
Lonati, Francesco, 4,856,300, Cl. 66-221.000.

Long, Gary N.: *See—*
Gortsema, Frank P.; Pellet, Regis J.; Springer, Albert R.; Rabo, Jule A.; and Long, Gary N., 4,857,495, Cl. 502-214.000.

Long, George S., III: *See—*
Salter, Richard J., Jr.; and Long, George S., III, 4,857,924, Cl. 340-973.000.

Long, Thomas E., to Shell Oil Company. Waxy buildup measurement. 4,857,736, Cl. 250-358.100.

Longoni, Andrea. Binding device for snow boards. 4,856,808, Cl. 280-617.000.

Lonnecke, Karl H.: *See—*
Maier, Lorenz; Buchler, Wilhelm; Neumann, Harald; and Lonnecke, Karl H., 4,856,173, Cl. 29-445.000.

Look, David C.; and Pimentel, Eileen, to Wright State University. Method and apparatus for measuring average resistivity and hall-effect of semiconductor wafers. 4,857,839, Cl. 324-158.00R.

Lopez, Jaime; and Pasek, Eugene A., to Chevron Research Company. Heavy oil hydroprocessing with Group VI metal slurry catalyst. 4,857,496, Cl. 502-220.000.

Lopicolo, Mario T.; and Swarts, Richard E., to United Technologies Corporation. Angular rate sensor nozzle. 4,856,332, Cl. 73-505.000.

Loral Corporation: *See—*
Petersen, Don W., 4,856,619, Cl. 188-18.00A.

Lord Corporation: *See—*
Damico, Dennis J.; Mushrush, Kenneth W.; and Bennett, Ruth M., 4,857,131, Cl. 156-331.400.

L'Oreal: *See—*
Grollier, Jean F., 4,857,303, Cl. 424-52.000.
Philippe, Michel; Sebag, Henri; Leger, Didier S.; and Leveque, Jean L., 4,857,525, Cl. 514-227.500.

Lorenz, Achim R., to MacMillan Bloedel Containers. Container for food products. 4,856,707, Cl. 229-114.000.

Lorenzen, Heinz-Christen, to Korber AG. Method of and apparatus for uniformizing the moisture content of tobacco. 4,856,539, Cl. 131-290.000.

Lorenzo, Joseph P.: *See—*
Yang, Andrew C.; Lorenzo, Joseph P.; and Soref, Richard A., 4,857,973, Cl. 357-15.000.

Loschmann, Peter-Andreas: *See—*
Wachtel, Helmut; Schneider, Herbert H.; Loschmann, Peter-Andreas; Dorow, Rainer; Horowski, Reinhard; Acksteiner, Bernard; Schulze, Paul-Eberhard; and Sauer, Gerhard, 4,857,298, Cl. 424-1.100.

Loshaek, Samuel: *See—*
Narducy, Kenneth W.; Jahnke, Richard L.; and Loshaek, Samuel, 4,857,072, Cl. 8-507.000.

Lotsof, Howard S., to NDA International, Inc. Rapid method for attenuating the alcohol dependency syndrome. 4,857,523, Cl. 514-214.000.

Lotz, Michael, deceased (by Post, Carla Lotz nee, heir and Andreas Lotz, heir); Vanino, Rudiger, deceased (Vanino, H. L. I. M., heir); Kuhl, Peter; Welte, Dieter; and Zimmer, Herbert, to Dornier GmbH. Wing sections, in particular lift-wing sections for aircraft. 4,856,735, Cl. 244-35.00R.

Louie, Jenny: *See—*
Baker, Richard W.; Louie, Jenny; Pfromm, Peter H.; and Wijmans, Johannes G., 4,857,080, Cl. 55-16.000.

Lounsberry, Peter C.: *See—*
Lounsberry, Stephen M., III; Lounsberry, Peter C.; Rodems, James D.; and Carner, Gary A., 4,856,617, Cl. 184-3.100.

Lounsberry, Stephen M., III; Lounsberry, Peter C.; Rodems, James D.; and Carner, Gary A., to Moore & Steele Corporation. Railway lubricating system and method. 4,856,617, Cl. 184-3.100.

Lourens, Jan: *See—*
Knauf, Werner; Waltersdorfer, Anna; Sagenmuller, Alfons; Stier, Hubert; and Lourens, Jan, 4,857,510, Cl. 514-30.000.

Lovrenich, Rodger T., to El Paso Technologies Company. Distributed logic control system and method. 4,858,102, Cl. 364-136.000.

Lowe, Tony: *See—*
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LSI Corporation of America, Inc.: *See—*
Wrobel, Keith A.; and Mechelke, Joel D., 4,856,746, Cl. 248-250.000.
Lu, Daozheng, to A. C. Nielsen Company. Image recognition audience measurement system and method. 4,858,000, Cl. 358-84.000.
Lu, James. Cordless conducting means for lamp. 4,858,092, Cl. 362-413.000.
Lubahn, Douglas H. Anchoring method and display apparatus for use therein. 4,856,450, Cl. 114-293.000.
Lubcke, Torsten: *See—*
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Lubrizol Genetics, Inc.: *See—*
Barwale, Usha B.; and Widholm, Jack M., 4,857,465, Cl. 435-240.490.
Lucas, Charles H., to Hughes Aircraft Company. Circuit for reducing differential nonlinearities in multi-stage digital-to-analog converters. 4,857,930, Cl. 341-150.000.
Lucas, Charles H., to Hughes Aircraft Company. Three-terminal MOS integrated circuit switch. 4,857,984, Cl. 357-41.000.
Lucas, Eric E., to Quaker Oats Company, The. Toy rotatable grill kabob. 4,857,031, Cl. 446-481.000.
Lucas Industries: *See—*
Smith, Trevor S., 4,856,275, Cl. 60-39.281.
Lucas Industries Public Limited Company: *See—*
Turner, Ronald F., 4,856,714, Cl. 239-533.900.
Lucas, Jean P.: *See—*
Eberhardt, Andre ; Dominiak, Serge; Berveiller, Marcel; Lucas, Jean P.; and Guyon, Robert P. Y., 4,857,387, Cl. 428-209.000.
Lucero, Elroy M.: *See—*
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Ludlow, Trevor A.: *See—*
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Luib, Max: *See—*
Rosebrock, Henning; Jung, Johann; Rademacher, Wilhelm; Luib, Max; Fischer, Volker; Hagen, Helmut; Kohler, Rolf-Dieter; Markert, Juergen; and Watanabe, Akihide, 4,857,103, Cl. 71-94.000.
Lujano, Juan: *See—*
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Lummus Company, The: *See—*
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Lumonics, Limited: *See—*
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Lundberg, Robert D.: *See—*
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Lupton, John M., to National Research Development Corporation. Dry separation of solids. 4,857,177, Cl. 209-466.000.
Lutz, Robert G., to Shell Oil Company. Polymer blend. 4,857,605, Cl. 525-445.000.
Luy, Johann-Friedrich: *See—*
Jorke, Helmut; and Luy, Johann-Friedrich, 4,857,972, Cl. 357-4.000.
Lydtin, Hans-Jurgen: *See—*
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Lynnworth, Lawrence C.: *See—*
Smalling, Jack W.; Braswell, Leonard D.; and Lynnworth, Lawrence C., 4,856,321, Cl. 73-40.50A.
Lyons, Larry A.; Davis, Dwight P.; and Swered, Paul, to Betz Laboratories, Inc. Method for controlling macroinvertebrates. 4,857,209, Cl. 210-755.000.
M.A.N. Roland Druckmaschinen AG: *See—*
Kobler, Ingo, 4,856,425, Cl. 101-212.000.
M.U.W. Verpackungen: *See—*
Schwinn, Georg, 4,857,037, Cl. 493-195.000
Maag Gear-Wheel & Machine Company Limited: *See—*
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Maat, George J.: *See—*
Grinsteiner, James J.; and Maat, George J., 4,856,711, Cl. 236-34.500.
Mabie, Dana. Adjustable roof scaffold support. 4,856,745, Cl. 248-237.000.
MacDonald, J. Gavin: *See—*
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Macdonell, Gary D.: *See—*
Kimble, Kenneth B.; Macdonell, Gary D.; and Mark, Harold W., 4,857,179, Cl. 209-166.000.
Machado, Octavio J.; Moore, Jay T.; and Cooney, Barry F., to Westinghouse Electric Corp. Storage of spent nuclear fuel. 4,857,263, Cl. 376-272.000.
Machalitzky, Otto: *See—*
Erdelitsch, Herbert; Machalitzky, Otto; and Prang, Josef-Elmar, 4,857,815, Cl. 318-443.000.
Machen, James A., to Jamco International, Inc. Information clip-it. 4,856,214, Cl. 40-316.000.
Machida, Kiyosada: *See—*
Wakabayashi, Hiroshi; Kazami, Kazuyuki; Nakamura, Toshiyuki; Miyamoto, Hidenori; Tsukahara, Daiki; Machida, Kiyosada; and Katano, Yuji, 4,857,947, Cl. 354-195.100.
Machida, Minoru: *See—*
Wakasa, Akinori; Machida, Minoru; Miyakawa, Yasuhiro; and Asami, Seiichi, 4,856,472, Cl. 123-270.000.
Machida, Yoshio, to Kabushiki Kaisha Toshiba. Method and system for magnetic resonance imaging. 4,857,847, Cl. 324-311.000.
Machine Technology, Inc.: *See—*
Hillman, Gary; Rubin, Richard H.; and Paulfus, Bernard H., 4,856,456, Cl. 118-500.000.
Mackley, Malcolm R.; and Anton, Christopher, to National Research Development Corporation. Process for preparing improved oriented polymer films and tapes. 4,857,127, Cl. 156-242.000.
MacLeay, Ronald E.; and Myers, Terry N., to Pennwalt Corporation. Polymer bound antioxidant stabilizers. 4,857,596, Cl. 525-142.000.
MacLeay, Ronald E.: *See—*
Kazmierzak, Robert T.; and MacLeay, Ronald E., 4,857,595, Cl. 525-142.000.
MacLeod, Edwin A.; and Frank, E. Wesley. Multi-purpose indoor/outdoor refuse bag support. 4,856,740, Cl. 248-97.000.
MacMillan Bloedel Containers: *See—*
Lorenz, Achim R., 4,856,707, Cl. 229-114.000.
Macocco, Dino; and Ricco, Michele, to Societa' Industriale Costruzioni Microelettriche S.I.C.M.E. S.p.A. Vertical furnace for firing wire-like products. 4,856,986, Cl. 432-72.000.
Macovski, Albert, to Stanford University. Self-referencing magnetic resonance spectroscopy system. 4,857,843, Cl. 324-307.000.
Mactronix, Inc.: *See—*
Lau, John J.; and Fang, Si-Ming, 4,856,957, Cl. 414-404.000.
Madden, Patrick C., II, to Exxon Research and Engineering Company. Use of sulfur dioxide for corrosion inhibition in acid gas scrubbing processes. 4,857,283, Cl. 423-228.000.
Maeda, Kazuhiro: *See—*
Takaya, Takao; Takasugi, Hisashi; Esumi, Kimio; Kuno, Atsushi; Sakai, Hiroyoshi; Maeda, Kazuhiro; and Sakamoto, Yoshie, 4,857,527, Cl. 514-237.200
Maeda, Masaya, to Canon Kabushiki Kaisha. Head feed device. 4,858,046, Cl. 360-106.000.
Mafoti, Robson; and Nodelman, Neil H., to Mobay Corporation. Novel neopentyladipate based prepolymers and reaction injection molded products made therefrom. 4,857,561, Cl. 521-159.000.
Magdzinski, Leon: *See—*
Yalpani, Manssur; and Magdzinski, Leon, 4,857,638, Cl. 530-505.000.
Magee, Lillian K. Casino game. 4,856,784, Cl. 273-147.000.
Magill, Brad: *See—*
Bressler, Peter W.; Byar, Peter D.; Beck, Benjamin J.; Fluke, G. Gordon, Jr.; Magill, Brad; Winig, Gary; and Magill, Tracy H., 4,856,811, Cl. 280-652.000.
Magill, Tracy H.: *See—*
Bressler, Peter W.; Byar, Peter D.; Beck, Benjamin J.; Fluke, G. Gordon, Jr.; Magill, Brad; Winig, Gary; and Magill, Tracy H., 4,856,811, Cl. 280-652.000.
Magnan, Jeffrey J., to Gaastra Sails International Limited. Flex wing apparatus. 4,856,447, Cl. 114-103.000.
MagneTek, Inc.: *See—*
Hein, Bruce; and Shufflebarger, Charles, 4,857,788, Cl. 310-214.000.
Magwin Enterprises, Inc.: *See—*
Bressler, Peter W.; Byar, Peter D.; Beck, Benjamin J.; Fluke, G. Gordon, Jr.; Magill, Brad; Winig, Gary; and Magill, Tracy H., 4,856,811, Cl. 280-652.000.
Maier, Josef; Gloger, Manfred; Hoerschelmann, Detlef V.; Strejcek, Jan; and Heimerl, Sebastian, to Boehringer Mannheim GmbH. Process for obtaining D(+)-naproxen. 4,857,462, Cl. 435-197.000.
Maier, Lorenz; Buchler, Wilhelm; Neumann, Harald; and Lonnecke, Karl H., to Dyckerhoff & Widmann Aktiengesellschaft. Method of the formation of slide surfaces on a track for electromagnetically levitated vehicles. 4,856,173, Cl. 29-445.000.
Maier, Reinhard; and Goth, Kurt, to Siemens Aktiengesellschaft. Multiphase tripping device with short-circuit detection. 4,858,057, Cl. 361-94.000
Mainstream Engineering Corporation: *See—*
Scaringe, Robert P.; Buckman, Jay A.; and Grzyll, Lawrence R., 4,856,294, Cl. 62-259.300.
Maitland, Arthur; and Weatherup, Clifford R., to English Electric Valve Company Limited. Electron beam apparatus. 4,858,237, Cl. 372-2.000
Majerus, Norbert, to Goodyear Tire & Rubber Company, The. Process for injection molding tire treads. 4,857,122, Cl. 156-125.000.
Maki, Yoshihiro; Matsuyama, Akira; Tanizaki, Katsuji; Okabe, Noboru; Kishida, Katsuhiro; Sakai, Takeshi; Ohgaki, Toshinaga; and Fujita, Masahito, to Nissan Motor Co., Ltd.; and NDC Co., Ltd. Aluminum base bearing alloy and method of producing same. 4,857,267, Cl. 419-31.000
Maki, Yoshitaka: *See—*
Terao, Shinji; and Maki, Yoshitaka, 4,857,516, Cl. 514-100.000.
Makino, Mikio: *See—*
Katsu, Masanori; and Makino, Mikio, 4,856,577, Cl. 165-8.000.

Makita, Hiroshige: *See—*
Nishimura, Sadanori; Makita, Hiroshige; and Ishikawa, Tomoaki, 4,856,264, Cl. 56-10.900.
Makita, Toshio; and Tago, Koichi, to Sony Corporation. Method of manufacturing color screen structure for a cathode ray tube. 4,857,027, Cl. 445-37.000.
Makoto, Adachi; Matsumura, Hiromu; and Sugasawa, Tsutomu, to Shionogi & Co., Ltd. Process for introducing a thiocarboxylic ester group at the orthoposition of phenols or phenylamines. 4,857,645, Cl. 544-349.000.
Maksem, John A., to Cytocorp, Inc. Cytological and histological fixative formulation and methods for using same. 4,857,300, Cl. 424-3.000.
Malfait, Jacque L.: *See—*
Abraham, Thomas E.; Malfait, Jacque L.; and White, Arnold J., 4,857,348, Cl. 426-462.000.
Mallet, Jean-Louis; and Landais, Jean-Louis, to Power Compact, Societe Anonyme. Method of assembling power circuits and control circuits on several levels in the same module and a module thus obtained. 4,858,074, Cl. 361-388.000.
Mama, Shinichi, to Amano Corporation. Call device-attached patrol recorder. 4,857,883, Cl. 340-311.100.
Mametsa, Henri-Jose ; and Jacob, Herve , to General Electric CGR SA. Passive-decoupling receiving antenna, in particular for a nuclear magnetic resonance imaging apparatus. 4,857,850, Cl. 324-318.000.
Man Technologie GmbH: *See—*
Reuchlein, Gunter; and Schiessl, Gerhard, 4,856,165, Cl. 29-157.30A.
Manabe, Akira: *See—*
Monden, Yukio; and Manabe, Akira, 4,857,695, Cl. 219-85.220.
Manabe, Sei-ichi; and Satani, Masuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Porous hollow fiber membrane and a method for the removal of a virus by using the same. 4,857,196, Cl. 210-500.300.
Manabe, Takahiro; Nozu, Mikio; Osada, Yasuhito; and Nomura, Hiroyuki, to Nissan Motor Co., Ltd.; and Matsushita Electric Industrial Co., Ltd. Electronic circuit apparatus. 4,858,071, Cl. 361-386.000.
MANAC Incorporated: *See—*
Kochi, Hiromi; Fukunaga, Kenji; Itagaki, Takaharu; and Ito, Tsuyoshi, 4,857,576, Cl. 524-409.000.
Manchester R & D Partnership: *See—*
Fergason, James L., 4,856,876, Cl. 350-350.00F.
Mandano, Barbara: *See—*
Jensen, Richard K.; and Mandano, Barbara, 4,857,129, Cl. 156-273.700.
Maness, William L.; Golden, Robert F.; Benjamin, Michael H.; and Podoloff, Robert M., to Tekscan, Inc. Pressure and contact sensor system for measuring dental occlusion. 4,856,993, Cl. 433-68.000.
Manico, Joseph A.: *See—*
Pohlman, James M.; and Manico, Joseph A., 4,857,964, Cl. 355-40.000.
Manion, Francis M.: *See—*
Phillippi, R. Michael; and Manion, Francis M., 4,856,338, Cl. 73-701.000.
Mank, Manfred: *See—*
Voss, Hermann; and Mank, Manfred, 4,856,978, Cl. 425-526.000.
Mann, Brian M.: *See—*
Sholder, Jason A.; Mann, Brian M.; and Florio, Joseph J., 4,856,523, Cl. 128-419.0PG.
Mannesmann Rexroth GmbH: *See—*
Widmann, Karlheinz; Kreth, Norbert; Schmitt, Martin; and Stellwagen, Armin, 4,856,278, Cl. 60-423.000.
Manoury, Philippe; Rossey, Guy; Binet, Jean; DeFosse, Gerard; and Jabri, Najib, to Synthelabo. Antihistaminic benzimidazole derivatives. 4,857,536, Cl. 514-322.000.
Manville Corporation: *See—*
Fouke, Herbert A., 4,858,091, Cl. 362-332.000.
Maraman, Ned D., to Patents Unlimited, Inc. Hold and unwind reel for coiled material. 4,856,729, Cl. 242-129.000.
Marancik, William G.; Hong, Seungok; and Grabinsky, Glenn W., to Oxford Superconducting Technology. Forced flow superconducting cable and method of manufacture. 4,857,675, Cl. 174-15.400.
Marchese, Michael A.: *See—*
Acharya, Arun; Marchese, Michael A.; and Nowobilski, Jeffert J., 4,856,285, Cl. 62-63.000.
Marchildon, Louis: *See—*
Bose, Tapan K.; Chahine, Richard; Marchildon, Louis; and St-Arnaud, Jean-Marie, 4,856,320, Cl. 73-30.000.
Marcus, Bonita K.; and Lok, Brent M., to UOP. Zeolite LZ-135 and process for preparing same. 4,857,288, Cl. 423-328.000.
Maresca, Louis M.: *See—*
Clendinning, Robert A.; Maresca, Louis M.; Matzner, Markus; and Schwab, Thomas H., 4,857,625, Cl. 528-171.000.
Margaritz, Mordeckai; Ronen, Daniel; and Levy, Itzhak, to State of Israel, Ministry of Agriculture, Water Commission; and YEDA Research and Development Co., Ltd. Water sampling system. 4,857,473, Cl. 436-177.000.
Marhofer, Gerd: *See—*
Buck, Robert; and Marhofer, Gerd, 4,856,329, Cl. 73-204.220.
Mariani, David: *See—*
Kleinberg, Robert L.; Clark, Brian; Chew, Weng C.; and Mariani, David, 4,857,852, Cl. 324-339.000.
Marianne, Jean J.; and Jablonski, Pierre, to Sciaky S.A. Installation for automatic assembly of components and, in particular, components of motor vehicle bodies. 4,856,698, Cl. 228-4.100.
Maricle, Donald L.; and Buswell, Richard F., to International Fuel Cell Corporation. Method of making monolithic solid oxide fuel cell stack. 4,857,420, Cl. 429-30.000.
Mariol, John V.: *See—*
Kohus, Louis M.; Mariol, John V.; and Saint, David, 4,856,809, Cl. [illegible].
Mark, Harold W.: *See—*
Kimble, Kenneth B.; Macdonell, Gary D.; and Mark, Harold W., 4,857,179, Cl. 209-166.000.
Markert, Juergen: *See—*
Rosebrock, Henning; Jung, Johann; Rademacher, Wilhelm; Luib, Max; Fischer, Volker; Hagen, Helmut; Kohler, Rolf-Dieter; Markert, Juergen; and Watanabe, Akihide, 4,857,103, Cl. 71-94.000.
Markley, Richard L.; and Hoblit, Therell D., to Hobart Corporation. Method for printing and applying labels. 4,857,121, Cl. 156-64.000.
Marquet-Ellis, Hubert: *See—*
Bridenne Alaux, Martine; Marquet-Ellis, Hubert; Keller, Nelly; and Folcher, Gerard, deceased, 4,857,294, Cl. 423-489.000.
Mars, Wendy M.: *See—*
Saunders, Grady F.; and Mars, Wendy M., 4,857,466, Cl. 435-252.330.
Marsaly, Alain; Martens, Andre; Morterol, Frederic R. M. M.; and Raufast, Charles, to BP Chemicals Limited. Detection of anomalies in gas fluidized bed polymerization. 4,858,144, Cl. 364-496.000.
Marshall, James R.; and Thorn, Mary F., to Westinghouse Electric Corp. Reactor vessel head area monitoring system. 4,857,261, Cl. 376-248.000.
Marshall, Sammy D.: *See—*
Clements, Brice P.; Kurihara, Tatsuo; Marshall, Sammy D.; and Syrowatka, Rupert, 4,857,193, Cl. 210-396.000.
Marszycki, Zdsizlaw: *See—*
Cieslik, Jerzy; Flak, Marek; Kuczka, Eugeniusz; Oles, Franciszek; Marszycki, Zdsizlaw; and Olender, Kornel, 4,856,940, Cl. 405-296.000
Martens, Andre: *See—*
Marsaly, Alain; Martens, Andre; Morterol, Frederic R. M. M.; and Raufast, Charles, 4,858,144, Cl. 364-496.000.
Martin Automatic, Inc.: *See—*
Wheeler, Roger R.; and Martin, John R., 4,856,960, Cl. 414-684.000.
Martin, Carl O.: *See—*
Scott, Harold C.; and Martin, Carl O., 4,856,839, Cl. 296-24.200.
Martin, David W., Jr.: *See—*
Hammonds, R. Glenn; Leung, David W.; Martin, David W., Jr.; Spencer, Steven A.; and Wood, William I., 4,857,637, Cl 530-403.000.
Martin, Gerard M.: *See—*
Patillon, Jean-Noel; Gabillard, Bertrand; and Martin, Gerard M., 4,857,974, Cl. 357-22.000.
Martin, Glenn E.: *See—*
Laugal, James A.; Martin, Glenn E.; St. Aubin, Donald L.; and Wold, Gerald G., 4,857,567, Cl. 523-415.000.
Martin, John C., to British Aerospace Public Limited Company. Adjustable seating arrangement for aircraft. 4,856,738, Cl. 244-122.00R.
Martin, John R.: *See—*
Wheeler, Roger R.; and Martin, John R., 4,856,960, Cl. 414-684.000.
Martin, Michael S., to Soudronic AG. Apparatus for examining objects. 4,858,156, Cl. 364-560.000.
Martinez, Nelson P.; Galiasso, Roberto E.; Velasquez, Jose R.; Lujano, Juan; and Zerpa, Carlos, to Intevep, S.A. Mild hydrocracking catalyst for the production of middle distillates. 4,857,494, Cl. 502-210.000.
Marume, Yoshihiro; and Iwamoto, Tadao, to Nishikawa Rubber Co., Ltd. Method of manufacturing cosmetic puff and manufacturing framework for use in the method. 4,857,248, Cl. 264-46.400.
Maruta, Keiichi: *See—*
Ueda, Takashi; Maruta, Keiichi; and Yaguchi, Hiroshi, 4,857,502, Cl. 503-217.000.
Maruya, Shinji; Yatsurugi, Yoshifumi; and Togashi, Kazuya, to Komatsu Electronic Metals Co., Ltd. Process for manufacturing silicon-germanium alloys. 4,857,270, Cl. 420-578.000.
Maruyama, Kakuji; Kondo, Takeshi; and Okubo, Yoshimitsu, to Nagata Seiki Kabushiki Kaisha. Needle actuating device for a circular knitting machine. 4,856,298, Cl. 66-40.000.
Maruyama, Masahiro: *See—*
Hata, Kanji; Maruyama, Masahiro; and Itemadani, Eiji, 4,857,752, Cl. 250-578.000.
Marvin, Jack C.; and Shepherd, Benjamin G., to CBI Research Corporation. Pedestal crane and method of assembling and erecting it. 4,856,662, Cl. 212-176.000.
Marx, Hans-Norbert: *See—*
Goettsche, Reimer; Marx, Hans-Norbert; and Hettler, Wendelin, 4,857,322, Cl. 424-633.000.
Maschinenfabrik Rieter AG: *See—*
Briner, Emil; and Wehrli, Samuel, 4,856,269, Cl. 57-263.000.
Masco Corporation: *See—*
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Mase, Yasukazu: *See—*
Abe, Masahiro; and Mase, Yasukazu, 4,857,141, Cl. 156-644.000.
Maselli, John A.; Neidleman, Saul L.; Antrim, Richard L.; and Johnson, Richard A., to Nabisco/Cetus Food Biotechnology Research Partnership. Method for making cereal products naturally sweetened with fructose. 4,857,339, Cl. 426-28.000.

Maser, Thomas L., to W. H. Brady Co. Membrane switchcores with key cell contact elements connected together for continuous path testing. 4,857,683, Cl. 200-5.00A.
Maserjian, Joseph: *See—*
Overhauser, Albert W.; and Maserjian, Joseph, 4,857,976, Cl. 357-23.100
Massachusetts Institute of Technology: *See—*
Domb, Abraham J.; and Langer, Robert S., 4,857,311, Cl. 424-78.000
Gevelber, Michael A.; and Stephanopoulos, George, 4,857,278, Cl. 422-249.000
Hart, George W.; Kern, Edward C., Jr.; and Schweppe, Fred C., 4,858,141, Cl. 364-483.000.
Massonnet, Henry, to Societe Pour la Transformation des Matieres Plastiques Stamp. Armchair with supple backrest. 4,856,845, Cl. 297-286.000.
Masterson, Robert W.: *See—*
Jensen, William T.; Brown, Vincent B.; Edgerton, Cathy J.; and Masterson, Robert W., 4,857,002, Cl. 439-76.000.
Masuda, Ikuro: *See—*
Ogiue, Katsumi; Suzuki, Yukio; Masuda, Ikuro; Odaka, Masanori; and Uchida, Hideaki, 4,858,189, Cl. 365-203.000.
Masuda, Narihiro: *See—*
Otonari, Satoshi; Sato, Yoshinori; Masuda, Narihiro; and Kotani, Tomoyuki, 4,857,396, Cl. 428-315.500
Masuda, Yoshihiro; Yagi, Takashi; and Murata, Akira, to Dainippon Screen Mfg. Co., Ltd. Device for venting fumes given off by automatic developing equipment. 4,857,949, Cl. 354-322.000.
Masui, Toshiyuki: *See—*
Takei, Masahiro; Masui, Toshiyuki; Kashida, Motokazu; and Takahashi, Kouji, 4,858,037, Cl. 360-60.000.
Mathbirk Limited: *See—*
Matthews, Denis, 4,856,440, Cl. 112-27.000.
Matsch, L. Charles: *See—*
Derrick, James W.; and Matsch, L. Charles, 4,857,176, Cl. 209-392.000.
Matsuda, Fumio; and Ozaki, Minoru, to Mitsubishi Denki Kabushiki Kaisha. Information storage apparatus. 4,858,235, Cl. 371-38.000.
Matsuda, Fumio: *See—*
Takehana, Tatsuo; and Matsuda, Fumio, 4,856,691, Cl. 226-91.000.
Matsuda, Hikaru, to Mitsubishi Denki Kabushiki Kaisha. Solid state imaging device with adaptive pixel correction. 4,858,013, Cl. 358-213.170.
Matsuda, Yasuo: *See—*
Onda, Kenichi; Matsuda, Yasuo; Abe, Kojin; Iwafuji, Yasunori; Aoyama, Hiroyuki; and Yoshinaka, Hideo, 4,858,096, Cl. 363-22.000.
Matsui, Hiroshi: *See—*
Matsumura, Yoshio; and Matsui, Hiroshi, 4,856,641, Cl. 198-346.200
Matsuki, Toyomi: *See—*
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Matsumoto, Kazuya; and Nakamura, Tsutomu, to Olympus Optical Co., Ltd. Semiconductor imaging device. 4,857,981, Cl. 357-30.000.
Matsumoto, Kazuya: *See—*
Miyawaki, Mamoru; Ogura, Shigetaro; and Matsumoto, Kazuya, 4,856,861, Cl. 350-96.140.
Matsumoto, Motoaki: *See—*
Homma, Noriyuki; Nakamura, Tohru; Nakazato, Kazuo; Matsumoto, Motoaki; Hayashida, Tetsuya; Kubo, Masaharu; and Sagara, Kazuhiko, 4,858,184, Cl. 365-174.000.
Matsumoto, Tsutomu: *See—*
Eto, Kunihiko; Takeuchi, Shiro; Mori, Yutaka; Tanooka, Shigeo; Kodama, Kazumasa; and Matsumoto, Tsutomu, 4,858,134, Cl 364-424.050.
Matsumoto, Yasuki; and Kato, Masaru, to Jidosha Denki Kogyo Kabushiki Kaisha. Self-stopping motor control circuit. 4,857,813, Cl 318-54.000.
Matsumura, Hiromu: *See—*
Makoto, Adachi; Matsumura, Hiromu; and Sugasawa, Tsutomu, 4,857,645, Cl. 544-349.000.
Matsumura, Tooru, to Tonen Sekiyukagaku K.K. Stabilizing composition for polyolefins. 4,857,230, Cl. 252-400.240
Matsumura, Yoshio; and Matsui, Hiroshi, to Dainippon Screen Mfg. Co., Ltd. Apparatus and a method for carrying wafers. 4,856,641, Cl. 198-346.200
Matsuno, Tatsuji, to Toyo Communication Equipment Co., Ltd. Method for measuring insulation resistance of electric line. 4,857,830, Cl. 324-62.000.
Matsuno, Tatsuji, to Toyo Communication Equipment Co., Ltd. Method for compensating for phase of insulation resistance measuring circuit. 4,857,855, Cl. 324-521.000.
Matsuo, Kenichi; Nakata, Muneo; and Ohara, Toru, to Omron Tateisi Electronics Co. Yoke. 4,857,875, Cl. 335-297.000
Matsuo, Masahito; and Yoshida, Toyohiko, to Mitsubishi Denki Kabushiki Kaisha. Preceding instruction address based branch prediction in a pipelined processor. 4,858,104, Cl. 364-200.000.
Matsuo, Seitaro: *See—*
Torii, Yasuhiro; Matsuo, Seitaro; Watanabe, Iwao; and Shimada, Masaru, 4,857,809, Cl. 315-111.310.
Matsuoka, Shigeru: *See—*
Furusawa, Tadao; Mitsuyuki, Hiroshi; Sato, Hironobu; Tatsuno, Yujiro; and Matsuoka, Shigeru, 4,858,171, Cl. 364-900.000
Matsushima, Tetsuo, to Kabushiki Kaisha Toshiba. Digital fault locator. 4,857,854, Cl. 324-512.000.
Matsushita Electric Industrial Co.: *See—*
Nishiyama, Masanobu; Nishimura, Haruo; Nakano, Katsuji; Ozaki: Tatsuo; and Kitamoto, Akira, 4,856,854, Cl. 312-38.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Hata, Kanji; Maruyama, Masahiro; and Itemadani, Eiji, 4,857,752, Cl. 250-578.000.
Manabe, Takahiro; Nozu, Mikio; Osada, Yasuhito; and Nomura, Hiroyuki, 4,858,071, Cl. 361-386.000.
Oshima, Mitsuaki; Izaki, Masataka; Kajino, Jirou; Igarashi, Yoshiaki; and Mitani, Hiroshi, 4,856,882, Cl. 350-500.000
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Hirao, Shozo; Usui, Hiroaki; Ohta, Yoshihiro; Nakai, Takashi; Ishikawa, Hiroyuki; and Konishi, Satoru, 4,857,365, Cl. 427-297.000
Kitamura, Masuo; Takagi, Mitsuhiro; and Nakamura, Masaaki, 4,857,669, Cl. 174-53.000.
Tsukamoto, Katsuya; Fujii, Yasuhiro; and Abiko, Toshio, 4,857,938, Cl. 343-700.0MS.
Matsuura, Toshitaka: *See—*
Furusaki, Keizo; Nasu, Mineji; Matsuura, Toshitaka; Takami, Akio; and Okawa, Teppei, 4,857,275, Cl. 422-98.000.
Matsuyama, Akira: *See—*
Maki, Yoshihiro; Matsuyama, Akira; Tanizaki, Katsuji; Okabe, Noboru; Kishida, Katsuhiro; Sakai, Takeshi; Ohgaki, Toshinaga; and Fujita, Masahito, 4,857,267, Cl. 419-31.000.
Matsuyama, Naoki: *See—*
Kogure, Masaaki; Mitekura, Yoshihiro; Matsuyama, Naoki; and Shinguryo, Satoshi, 4,857,908, Cl. 340-785.000.
Matsuyama, Tsunekazu: *See—*
Kumazawa, Yoshihiko; and Matsuyama, Tsunekazu, 4,857,722, Cl. 250-207.000.
Mattel, Inc.: *See—*
Brown, Stewart C., 4,858,041, Cl. 360-78.090.
Matthews, Denis, to Mathbirk Limited. Linking machine. 4,856,440, Cl. 112-27.000
Matthews, Donald P.: *See—*
Wagner, Eugene R.; Matthews, Donald P.; and Barney, Charlotte L., 4,857,663, Cl. 564-279.000.
Matthews, James A.; and Rotola, Louis A., Jr., to Ryobi Motor Products Corp. Vacuum cleaner upper hose assembly. 4,856,139, Cl. 15-350.000
Matthews, Robert R.; and Clark, Charles R., to Conoco Inc. Inhibition of hydrate formation. 4,856,593, Cl. 106-310.000
Mattheyses, Robert M., to General Electric Company. Automated method implemented on a distributed data processing system for partitioning a data string into two substrings. 4,858,106, Cl. 364-200.000
Mattiola, Paul A.; and Ommeren, James V., to Air Products and Chemicals, Inc. Automated cylinder transfill system and method. 4,856,284, Cl. 62-55.000
Matuzaki, Yukinori: *See—*
Minami, Katsuji; Murata, Shinichi; Tsujimoto, Susumu; Matuzaki, Yukinori; Yukawa, Shogo; and Osaka, Susumu, 4,856,574, Cl. 160-168.100
Matzner, Markus: *See—*
Clendinning, Robert A.; Maresca, Louis M.; Matzner, Markus; and Schwab, Thomas H., 4,857,625, Cl. 528-171.000.
Maurer, Albert: *See—*
Mizrah, Tiberiu; Maurer, Albert; and Gauckler, Ludwig, 4,857,088, Cl. 55-523.000.
Maurer, Ruprecht; and Timtner, Karlheinz, to Ringspann Albrecht Maurer KG. Overload release system for an axially movable bolt. 4,856,411, Cl. 91-1.000
Maurice, James; Collins, David J.; Hall, Michael O.; and McLoughlin, Peter D., to Emerson Electric Co. Connection of static inverter to a running motor. 4,857,819, Cl. 318-778.000
Maxconn, Inc.: *See—*
Erk, Kaya, 4,857,017, Cl. 439-695.000.
Maxim Integrated Products: *See—*
Hague, Yusuf A., 4,857,778, Cl. 307-521.000.
Maxson, Myron T., to Dow Corning Corporation. High consistency organosiloxane elastomer compositions curable by a platinum-catalyzed hydrosilation reaction. 4,857,564, Cl. 523-212.000.
Maxwell, Ian E.: *See—*
Hoek, Arend; Huizinga, Tom; and Maxwell, Ian E., 4,857,170, Cl. 208-111.000
Hoek, Arend; Huizinga, Tom; and Maxwell, Ian E., 4,857,171, Cl. 208-111.000
Mayer, Richard J.: *See—*
Auer, Robert T.; and Mayer, Richard J., 4,856 197, Cl. 33-18.100.
Mayr, Ernst: *See—*
Hoffmann, Thomas; Mayr, Ernst; and Saller, Helmut, 4,857,242, Cl. 264-1.400
Mayr, Siegfried: *See—*
Jacopich, Werner; Winter, Kurt; and Mayr, Siegfried, 4,857,761, Cl. 307-350.000
Mayuzumi, Shirou: *See—*
Ogura, Setsuo; Kamegaki, Kazuyuki; Yamazaki, Kouichi; Miyazaki, Hideo; Kitamura, Yukinori; and Mayuzumi, Shirou, 4,857,987, Cl. 357-45.000.
Mazda Motor Corporation: *See—*
Kamise, Katsuya; Yamamoto, Shigeru; Hosokai, Tetsushi; and Miyamoto, Koji, 4,856,481, Cl. 123-425.000.
Miwa, Yoshihisa, 4,856,166, Cl. 29-159.200.

Okazaki, Ken; Satou, Kazuo; and Yamamoto, Junichi, 4,856,469, Cl. 123-90.510.
Shinmoto, Toshiharu, 4,856,361, Cl. 74-339.000.
Terano, Takashi; Jinno, Masayuki; and Saijo, Munetoshi, 4,857,889, Cl. 340-461.000.
Mazzinghi, Paolo, to Societa Chimica Larderello S.p.A. Method for producing sodium tetraborate pentahydrate. 4,857,286, Cl. 423-282.000.
McBride, William B.; Wilson, William R., Jr.; Tomlinson, John C.; McCarthy, John A.; Kochanowsky, Eugene W.; Hendricks, Jefferson D.; and Houle, Arthur J., to Flagman, Inc. Digital traffic control system. 4,857,921, Cl. 340-912.000.
McCahill, David I., to Nepco, Inc. Multi-function self-contained heat pump system. 4,856,578, Cl. 165-29.000.
McCarthy, James P.: *See—*
Neilson, Diane H. R.; Work, Sara L. R.; Whaley, Edward L.; Kirkpatrick, Steven J.; and McCarthy, James P., 4,857,351, Cl. 426-533.000.
McCarthy, John A.: *See—*
McBride, William B.; Wilson, William R., Jr.; Tomlinson, John C.; McCarthy, John A.; Kochanowsky, Eugene W.; Hendricks, Jefferson D.; and Houle, Arthur J., 4,857,921, Cl. 340-912.000.
McCarty, Frederick B., to Allied-Signal Inc. Torque coupling device. 4,857,785, Cl. 310-78.000.
McCarty, John R., to Firestone Tire & Rubber Company, The. Apparatus and method for measuring the spacing between the cords of a fabric. 4,857,749, Cl. 250-571.000.
McClintock, Jack M., to Morgan Adhesives Company. Method of making an adhesive construction for articles and said articles. 4,857,371, Cl. 428-36.500.
McClish, Richard E. D. Sub-harmonic tone generator for bowed musical instruments. 4,856,401, Cl. 84-1.110.
McCollum, Gregory J.; Chou, Jason L.; Bodwell, James R.; and Das, Suryya K., to PPG Industries, Inc. Fluorine containing polymers and coating compositions prepared therefrom. 4,857,620, Cl. 526-255.000.
McCollum, Gregory J.: *See—*
Chou, Jason L.; and McCollum, Gregory J., 4,857,619, Cl. 526-249.000
McConnell, Christopher F., to CFM Technologies, Inc. Vessel and system for treating wafers with fluids. 4,856,544, Cl. 134-95.000.
McCoury, John M., Jr.: *See—*
Daum, Edward D.; Downs, William; Jankura, Bryan J.; and McCoury, John M., Jr., 4,856,352, Cl. 73-863.250.
McCullough, Francis P., Jr.; Snelgrove, R. Vernon; and Goswami, Bhuvenesh C., to Dow Chemical Company, The. Flame retardant foams. 4,857,394, Cl. 428-303.000.
McCullough, Francis P., Jr.; and Novak, Leo J., to Dow Chemical Company, The. Fluorinated carbonaceous fibers. 4,857,404, Cl. 428-367.000
McDonald, John R.: *See—*
Adkins, Gordon V.; McDonald, John R.; and Sivertsen, Olav N., 4,856,736, Cl. 244-45.00R.
McDonald, Terrance G.: *See—*
Sampsell, Jeffrey B.; and McDonald, Terrance G., 4,856,863, Cl. 350-96.160.
McDonnal, John E., to RO Associates. Method and means for protecting converter circuits. 4,858,052, Cl. 361-18.000.
McDonnell Douglas Corporation: *See—*
Perun, Kenneth R., 4,857,698, Cl. 219-121.710.
McDow, Robert W., to United Technologies Corporation. Variable inlet guide vane. 4,856,962, Cl. 415-115.000.
McFadden, Joseph T. Articulable, rotatable, surgical clamping device. 4,856,518, Cl. 128-346.000.
McFarland, Michael J.: *See—*
Hopf, Frederick R.; McFarland, Michael J.; and Osuch, Christopher E., 4,857,435, Cl. 430-192.000.
McGuiggan, Michael F.: *See—*
Davis, James C.; McGuiggan, Michael F.; Cuellar, Edward A.; and Haas, Frederick W., 4,857,159, Cl. 204-149.000.
McHale, James J. Method for forming a soil moisture barrier in a stucco wall and stucco wall incorporating same. 4,856,240, Cl. 52-169.140.
McJunkin, Claude L. Swimming pool step guard. 4,856,124, Cl. 4-496.000.
McLaughlin, Kevin L.; and Bushey, Thomas P., to Motorola. Method of making poly-sidewall contact transistors. 4,857,479, Cl. 437-162.000.
McLoughlin, Peter D.: *See—*
Maurice, James; Collins, David J.; Hall, Michael O.; and McLoughlin, Peter D., 4,857,819, Cl. 318-778.000.
McMahon, Garfield W., to Minister of National Defence of Her Majesty's Canadian Government. Ring-shell projector. 4,858,206, Cl. 367-163.000.
McMillan, Thomas A.; Brooks, Carl A.; and Smith, Alan M., to France/Scott Fetzer Company. Resonant inverter. 4,858,099, Cl. 363-97.000
McMunn, Bert D.: *See—*
Dick, Chris C.; Schwartz, Barry; McMunn, Bert D.; and Zeh, Peter H., 4,857,287, Cl. 423-315.000.
McNamara, Dennis J.: *See—*
Berman, Ellen M.; Werbel, Leslie M.; and McNamara, Dennis J., 4,857,530, Cl. 514-259.000.
McNulty, James T., to Rohm and Haas Company. Sodium-selective cation exchange resins for ammonia-cycle condensate polishing. 4,857,202, Cl. 210-662.000.
McNutt, Michael J., to Ford Aerospace & Communications Corporation. Platinum silicide imager. 4,857,979, Cl. 357-24.000.
McQuade, John O., to Linatex Corporation of America. Protective mat assembly and installation method therefor. 4,856,791, Cl. 273-410.000.
McSweeney, Robert T., to GTE Products Corporation. Nonlinear dielectric capacitor for pulse generation applications. 4,858,066, Cl. 361-321.000.
Mead Corporation, The: *See—*
Moor, Marc L., 4,856,817, Cl. 281-29.000.
Schwab, Gerhart; and Brandon, Richard L., 4,857,406, Cl. 428-402.220.
Mechelke, Joel D.: *See—*
Wrobel, Keith A.; and Mechelke, Joel D., 4,856,746, Cl. 248-250.000.
Meckel, Walter: *See—*
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Medi-Tech, Inc.: *See—*
Rabinowitz, Dan; and Saeli, John, 4,856,514, Cl. 128-303.140.
Medical Parameters, Inc.: *See—*
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Medical Payment Systems, Incorporated: *See—*
Barber, William B.; Davis, William H.; and Rautenkranz, Karl, 4,858,121, Cl. 364-406.000
Medical Research International Ltd.: *See—*
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Medisense, Inc.: *See—*
Armstrong, Fraser A.; and Lannon, Anthony M., 4,857,152, Cl. 204-1.00T.
Meek, Thomas T.: *See—*
Sheinberg, Haskell; Meek, Thomas T.; and Blake, Rodger D., 4,857,266, Cl. 419-22.000.
Meerman, Wilhelmus C. P. M., to U.S. Philips Corp. Method of densifying a preformed porous body of a material the main constituent of which is SiO_2. 4,857,092, Cl. 65-18.400.
Meguro, Taiichi: *See—*
Tanaka, Yoshiyuki; Ii, Akira; Meguro, Taiichi; and Hayashi, Kenji, 4,858,136, Cl. 364-431.070.
Mehta, Gunvant N.; Wertan, Dennis J.; and Grim, Wayne M., to Rorer Pharmaceutical Corporation. Pharmacological dissolution method and apparatus. 4,856,909, Cl. 366-208.000.
Meidl, John A., to Zimpro/Passavant Inc. Process for treatment of water containing volatile and toxic compounds. 4,857,198, Cl. 210-603.000
Meier, Hans-Rudolf; and Knobloch, Gerrit, to Ciba-Geigy Corporation. Substituted phenols as stabilizers. 4,857,572, Cl. 524-289.000.
Meiji Seika Kaisha, Ltd.: *See—*
Ishida, Kunio; Saito, Satoshi; Habuto, Akinaka; Murata, Tadahiko; Oiso, Hisayoshi; Joyama, Norio; and Fujimoto, Kazuhiro, 4,857,354, Cl. 426-558.000
Sato, Akira; Sekizuka, Yasuo; and Saito, Satoshi, 4,857,346, Cl. 426-321.000.
Meinert, Norbert: *See—*
Broemer, Heinz; Huber, Werner; and Meinert, Norbert, 4,857,487, Cl. 501-44.000
Meinhard, Rolf, to Luk Lamellen und Kupplungsbau GmbH. Apparatus for damping fluctuations of torque. 4,856,636, Cl. 192-70.170
Meister, Siegfried. Heat treatment of food with flow-dependent control. 4,856,422, Cl. 99-330.000.
Melchior, Wayne R ; and Talik, Mieczyslaw, to Eagle-Picher Industries, Inc. Fiberboard shims containing blocked isocyanates. 4,857,252, Cl. 264-118.000.
Mellecker, Joseph L. Architectural scale model viewer and method for using. 4,856,997, Cl. 434-72.000.
Melville, Martin J., to Metal Box Public Limited Company. Continuous seam welding apparatus and methods. 4,857,697, Cl. 219-121.630.
Membrane Technology & Research, Inc.: *See—*
Baker, Richard W.; Louie, Jenny; Pfromm, Peter H.; and Wijmans, Johannes G., 4,857,080, Cl. 55-16.000.
Watler, Kenneth G., 4,857,078, Cl. 55-16.000
Mendoza, Roberto. Feminine disposable urinating device. 4,857,064, Cl. 604-347.000.
Mennigmann, Kurt, to Friedrich Grohe Armaturenfabrik GmbH & Co. Water mixing valve, especially for a sanitary fixture. 4,856,556, Cl. 137-625.400.
Mercaldi, David W., to Failure Analysis Associates, Inc. Method for sampling a workpiece. 4,856,233, Cl. 51-281.00R
Mercer, John E.: *See—*
Baker, Glen; Chau, Albert W.; Fikse, James A.; and Mercer, John E., 4,856,600, Cl. 175-26.000.
Merck & Co., Inc.: *See—*
Duggan, Mark; and Hartman, George D., 4,857,546, Cl 514-460.000.
Hoffman, William F.; and Lee, Ta J., 4,857,547, Cl. 514-460.000.
Merck Frosst Canada, Inc.: *See—*
Frenette, Richard; Gauthier, Jacques-Yves; Young, Robert N.; Zamboni, Robert; Kakushima, Masatoshi; and Verhoeven, Thomas R., 4,857,659, Cl. 562-426.000.
Merck Patent Gesellschaft Mit Beschrankter Haftung: *See—*
Henkel, Eberhard; Dolabdjian, Barkew; Helger, Roland; Klink, Rainer; and Wurzburg, Uwe, 4,857,640, Cl. 536-4.100.
Merical, Dennis G.: *See—*
Heffner, Donald L.; Merical, Dennis G.; and Homan, David A., 4,856,554, Cl. 137-514.000.
Merilainen, Pekka, to Instrumentarium Corp. Measuring device for metabolic quantities connectable to a respirator. 4,856,531, Cl. 128-719.000.

Merrell Dow Pharmaceuticals Inc.: *See—*
Hibert, Marcel; and Gittos, Maurice W., 4,857,526, Cl. 514-230.500
Wagner, Eugene R.; Matthews, Donald P.; and Barney, Charlotte L., 4,857,663, Cl. 564-279.000.

Merrick, Douglas D.: *See—*
Pearson, Stanley R.; Merrick, Douglas D.; White, William P.; and Lipp, Charles W., 4,857,076, Cl. 48-86.00R.

Merrill Engineering Laboratories, Inc.: *See—*
Merrill, Marcellus S.; and Chapin, Thomas B., 4,856,199, Cl 33-203.170.

Merrill, Marcellus S.; and Chapin, Thomas B., to Merrill Engineering Laboratories, Inc. Single contact point distance measuring for plane determination. 4,856,199, Cl. 33-203.170.

Meschke, Debra J.; and Hoy, Kenneth L., to Union Carbide Corporation. Lubrication method and compositions for use therein. 4,857,218, Cl. 252-49.300

Messelt, Stephen: *See—*
Dunavan, David S.; Abreu, Rene; Messelt, Stephen; and Siebert, Edward, 4,857,721, Cl. 250-203.00R.

Metal Box Public Limited Company: *See—*
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Metala, Michael J.; Clark, William G., Jr.; Junker, Warren R.; Burtner, Lee W.; Arzenti, Thomas E.; Johnson, Harold P.; Vestovich, Robert P.; and Bevilacqua, Bruce W., to Westinghouse Electric Corp. Apparatus and method for providing a combined ultrasonic and eddy current inspection of a tube. 4,856,337, Cl. 73-601.000.

Methode Electronics, Inc.: *See—*
Jensen, William T.; Brown, Vincent B.; Edgerton, Cathy J.; and Masterson, Robert W., 4,857,002, Cl. 439-76.000

Mettler Instrumente AG: *See—*
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Mewburn-Crook, Anthony J. S.; Bullen, Peter; and Read, Simon, to Mewburn-Crook Company Limited. Wind energy convertor 4,857,753, Cl. 290-55.000.

Mewburn-Crook Company Limited: *See—*
Mewburn-Crook, Anthony J. S.; Bullen, Peter; and Read, Simon, 4,857,753, Cl. 290-55.000

Meyer, Richard; Muller, Wolfgang; and Heinzmann, Helmut, to Voith, J. M. GmbH. Air guide box for the drying section of a high-speed paper machine. 4,856,205, Cl. 34-117.000.

Meyer, Robert: *See—*
Borel, Michel; Boronat, Jean-Francois; Meyer, Robert; and Rambaud, Philippe, 4,857,161, Cl. 204-192.260.

Meyer, Willy, to Ciba-Geigy Corporation. Phenylsulfonylureas. 4,857,100, Cl. 71-93.000.

Michaels, Leonard H.; and Miller, Robert A., to Molex Incorporated. Molded environmental seal for electrical connection. 4,857,007, Cl. 439-283.000

Michaels, Leonard H.; and Miller, Robert A., to Molex Incorporated. Evironmentally sealed grounding backshell with strain relief. 4,857,015, Cl. 439-610.000.

Micott Corp.: *See—*
Hord, H. S., 4,856,213, Cl. 40-152.000

Micro-Precision Operations Inc.: *See—*
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Micro Technologies International Limited: *See—*
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Midorikawa, Heihatiro: *See—*
Itoh, Masahiko; Midorikawa, Heihatiro; Furutani, Yasumasa; and Aizawa, Michihiko, 4,857,222, Cl. 252-69.000

Mieda, Michinobu: *See—*
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Miekka, Richard G.: *See—*
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Mieno, Toshiyuki: *See—*
Nakajima, Toyohei; Mieno, Toshiyuki; Tanaka, Akira; Nagao, Akira; and Suzaki, Yukihiko, 4,856,480, Cl. 123-425.000.

Miihkinen, Veijo, to Valmet Oy. Press roll. 4,856,161, Cl. 29-129.500.

Milbank, Miles C.; and Williams, Perry M., to High-Tech Medical Instrumentation, Inc. Modular endoscopic apparatus with image rotation. 4,858,001, Cl. 358-98.000.

Milbocker, Michael T.: *See—*
Pflibsen, Kent P.; and Milbocker, Michael T., 4,856,891, Cl. 351-210.000.

Miles Laboratories, Inc.: *See—*
Kahn, Paul, 4,857,068, Cl. 604-405.000.
Wada, Shohachi; and Kulhlemann, Bruce, 4,857,190, Cl. 210-232.000.

Miller, Benjamin D.; and Jablonski, Thaddeus M., to Remcor Products Company. Hopper and agitator assembly for an ice dispenser. 4,856,682, Cl. 222-238.000.

Miller, Harry; and Zweifel, Terry, to Honeywell Inc. Windshear detection and warning system with evasion command. 4,857,922, Cl. 340-968.000.

Miller, Michael D. Single-flow valve-hypodermic needle combination. 4,857,061, Cl. 604-207.000.

Miller, Robert A.: *See—*
Michaels, Leonard H.; and Miller, Robert A., 4,857,007, Cl. 439-283.000.
Michaels, Leonard H.; and Miller, Robert A., 4,857,015, Cl. 439-610.000.

Miller, Ronald W.; and Sutton, Raymond W., to American Home Products Corp. (Del). Enteric coated aspirin tablets. 4,857,337, Cl. 424-480.000.

Miller, William B.; and Ang, Jit F., to James River Corporation. Low calorie ice pop. 4,857,352, Cl. 426-548.000

Miller, William E., to National Semiconductor Corporation. MOS IC reverse battery protection. 4,857,985, Cl. 357-42.000.

Millet, Jean-Marie: *See—*
Belaidouni, Ali; Benani, Andre; and Millet, Jean-Marie, 4,856,183, Cl. 29-753.000

Millikin Jr., William E.: *See—*
Landau, Richard F.; Millikin Jr., William E.; Puchacz, Jerzy P.; Reyes, Manolito Q.; and Schadler, Walter, 4,857,160, Cl. 204-192.120.

Millis, Edwin G.; and Wood, Samuel J., Jr., to Texas Instruments Incorporated. Process and system for determining photoresist development endpoint by effluent analysis. 4,857,430, Cl. 430-30.000

Millis, Edwin G.; and Wood, Samuel J., Jr., to Texas Instruments Incorporated. Sensor for determining photoresist developer strength. 4,857,750, Cl. 250-573.000.

Mills, Carol B. Convertible doll and sleeping bag. 4,856,131, Cl. 5-413.000

Milne, Ian F.: *See—*
Van Bilderbeek, Bernard H.; and Milne, Ian F., 4,856,592, Cl. 166-285.000

Milprint Inc.: *See—*
Kappes, Kenneth C., 4,857,342, Cl. 426-107.000

Minagawa, Hidenobu: *See—*
Tatsumi, Yuuichi; Minagawa, Hidenobu; Iwahashi, Hiroshi; Asano, Masamichi; and Imai, Mizuho, 4,858,192, Cl. 365-200.000.

Minakawa, Masaaki: *See—*
Okamoto, Shinji; Minakawa, Masaaki; Neki, Youiti; and Nakagiri, Masasi, 4,857,589, Cl. 525-60.000.

Minami, Katsuji; Murata, Shinichi; Tsujimoto, Susumu; Matuzaki, Yukinori; Yukawa, Shogo; and Osaka, Susumu, to Sharp Kabushiki Kaisha; and Kabushiki Kaisha Nichibei. Electric blind apparatus. 4,856,574, Cl. 160-168.100.

Minami, Kouji: *See—*
Iwamoto, Masayuki; Minami, Kouji; and Watanabe, Kaneo, 4,857,115, Cl. 136-249.000

Minford, Eric: *See—*
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Minimed Technologies: *See—*
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Minister of National Defence of Her Majesty's Canadian Government: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
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Burrows, Ronald W.; Penfound, Keith A.; and Lea, Bernard A., 4,857,450, Cl. 430-603.000.
Croft, Thomas S.; and Haugen, Hartwick A., 4,857,563, Cl. 523-173.000.
Ersfeld, Dean A.; Hansen, Paul E.; Scholz, Matthew T.; Bartizal, Dennis C.; Reed, Katherine E.; Larson, Wayne K.; Sandvig, Timothy C.; and Buckanin, Richard S., 4,856,502, Cl. 128-90.000.
Ginkel, Scott T.; and Falaas, Dennis O., 4,857,372, Cl. 428-42.000.
Heltemes, Eugene C., 4,857,891, Cl. 340-551.000.
Jongewaard, Susan K.; Smith, Terrance P.; and Zaklika, Krzysztof A., 4,857,503, Cl. 503-227.000.
Lee, Nicholas A., 4,856,865, Cl. 350-96.210.
Rebers, Kenneth D.; Seim, William J.; and Krenz, Dean C., 4,857,672, Cl. 174-93.000.
Schumacher, Gerald E., 4,857,366, Cl. 427-302.000.
Silver, Spencer F.; Bronn, William R.; and Joseph, Eugene G., 4,857,618, Cl. 526-240.000.
van den Honert, Christopher, 4,856,525, Cl. 128-421.000.
Wood, Leigh E.; and Zoia, Anthony J., 4,857,067, Cl. 604-389.000.

Minolta Camera Kabushiki Kaisha: *See—*
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,857,965, Cl. 355-45.000.
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,857,966, Cl. 355-45.000.
Karasaki, Toshihiko; and Sugitani, Kazumi, 4,857,718, Cl. 250-201.000.
Karasaki, Toshihiko, 4,857,720, Cl. 250-201.000.
Kusumoto, Keiji, 4,857,957, Cl. 355-314.000.
Naruse, Kazuhiko; and Yasumoto, Hidetoshi, 4,857,967, Cl. 355-69.000.
Nishimori, Kadotaro; and Ito, Masazumi, 4,856,877, Cl. 350-356.000.
Sutou, Masatoki, 4,857,963, Cl. 355-321.000.
Tada, Kaoru, 4,858,023, Cl. 358-471.000.
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,857,553, Cl. 354-475.000.
Tominaga, Shinji; Yamamoto, Kouji; and Yamanaka, Akira, 4,857,946, Cl. 354-173.100.

Minor, Philip D.; Evans, David M. A.; Schild, Geoffrey C.; Almond, Jeffrey W.; and Ferguson, Morag, to National Research Development Corporation. Peptides useful in vaccination against enteroviruses. 4,857,634, Cl. 530-324.000.

Mintzlaff, Roger G., to Archive Corporation. Streaming tape drive with direct block addressability. 4,858,039, Cl. 360-72.200.

Mio, Mitsushi; and Negita, Hisao, to Awaji Sangyo K. K., part of interest. Exothermic conducting paste. 4,857,384, Cl. 428-164.000.

Mir, Ghulam N.; Borella, Luis E.; DiJoseph, John F.; and Reuter, Gerald L., to American Home Products Corporation (Del.). Exogenously acidified antacid compositions having cytoprotective properties. 4,857,324, Cl. 424-690.000.

Mirabelli, Christopher K.: *See—*
Hill, David T.; Johnson, Randall K.; and Mirabelli, Christopher K., 4,857,549, Cl. 514-495.000.

Mirura, Ryozo; Okamoto, Yoshio; Takahashi, Hiroki; and Inada, Souichi, to Nippon Yakin Kogyo Co., Ltd. Method of controlling strip crown in planetary rolling. 4,856,313, Cl. 72-234.000.

Mishima, Akio: *See—*
Hayakawa, Kiyonori; and Mishima, Akio, 4,858,048, Cl. 360-121.000.

Mishiro, Shoji, to Taga Electric Co., Ltd. Ultrasonic oscillation machining apparatus. 4,856,391, Cl. 82-137.000.

Mita Industrial Co., Ltd.: *See—*
Okada, Takehiko, 4,857,969, Cl. 355-72.000.

Mitani, Hiroshi: *See—*
Oshima, Mitsuaki; Izaki, Masataka; Kajino, Jirou; Igarashi, Yoshiaki; and Mitani, Hiroshi, 4,856,882, Cl. 350-500.000.

Mitani, Takahiko: *See—*
Kurono, Masayasu; Baba, Yutaka; Mitani, Takahiko; Onishi, Masao; Kondo, Yasuaki; and Sawai, Kiichi, 4,857,521, Cl. 514-206.000.

Mitchell, Donald J.: *See—*
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Mitekura, Yoshihiro: *See—*
Kogure, Masaaki; Mitekura, Yoshihiro; Matsuyama, Naoki; and Shinguryo, Satoshi, 4,857,908, Cl. 340-785.000.

Mitel Corporation: *See—*
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Mitsuba Electric Mfg. Co., Ltd.: *See—*
Kamiyama, Akira; Hongo, Nobuhisa; Matsuki, Toyomi; and Kanai, Kenji, 4,857,790, Cl. 310-234.000.
Mochizuki, Wataru; Ogino, Seiichi; and Takano, Hirohiko, 4,857,812, Cl. 318-15.000.

Mitsubhishi Denki Kabushiki Kaisha: *See—*
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,815, Cl. 280-707.000.

Mitsubishi Chemical Industries Limited: *See—*
Kishiro, Osamu; Kasai, Atsushi; Nozawa, Seiichi; and Kamata, Hiroshi, 4,857,626, Cl. 528-176.000.
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Mitsubishi Denki Kabushiki Kaisha: *See—*
Fujimoto, Takanori; Hara, Toshiro; and Komurasaki, Satoshi, 4,856,479, Cl. 123-425.000.
Furutani, Kiyohiro; and Arimoto, Kazutami, 4,858,193, Cl. 365-203.000.
Ishii, Kazuhiro, 4,858,058, Cl. 361-96.000.
Kazama, Kouji, 4,858,038, Cl. 360-69.000.
Kazumoto, Yoshio; Furuishi, Yoshiro; and Kashiwamura, Kazuo, 4,856,283, Cl. 62-6.000.
Matsuda, Fumio; and Ozaki, Minoru, 4,858,235, Cl. 371-38.000.
Matsuda, Hikaru, 4,858,013, Cl. 358-213.170.
Matsuo, Masahito; and Yoshida, Toyohiko, 4,858,104, Cl. 364-200.000.
Mizushima, Tatsuhiko, 4,857,909, Cl. 340-793.000.
Mori, Ryuichiro; Fukudome, Katsuyuki; and Banjo, Toshinobu, 4,857,989, Cl. 357-80.000.
Morishita, Mitsuharu; Kohge, Shinichi; Hara, Tadayuki; Hata, Yasuaki; and Umemaru, Hisato, 4,856,323, Cl. 73-118.100.
Murano, Katsuaki; Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 4,856,380, Cl. 74-866.000.
Naito, Yasuo, 4,856,609, Cl. 180-179.000.
Niwano, Kazuhito; and Ikeda, Tatsuhiko, 4,857,478, Cl. 437-61.000.
Ogasawara, Koichi, 4,858,236, Cl. 371-38.000.
Okamoto, Kiyohide; Okita, Ryosuke; and Yamada, Masaya, 4,856,631, Cl. 192-21.500.
Okitaka, Takenori, 4,858,055, Cl. 361-91.000.
Okuda, Hiroshi, 4,856,488, Cl. 123-599.000.
Ookawa, Katsuhiro, 4,858,029, Cl. 358-340.000.
Ozawa, Masayuki, 4,856,489, Cl. 123-643.000.
Sakamoto, Hidenobu, 4,857,849, Cl. 324-318.000.
Shimomura, Setsuhiro; and Nishimura, Yukinobu, 4,856,475, Cl. 123-339.000.
Shirakawa, Hiroyuki, 4,856,476, Cl. 123-342.000.
Taji, Ryoichi; and Imori, Hideo, 4,857,787, Cl. 310-180.000.
Takechi, Moriaki; and Simada, Yuji, 4,857,848, Cl. 324-318.000.
Takeda, Masatoshi, 4,857,821, Cl. 323-210.000.
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,813, Cl. 280-703.000.
Terada, Yasushi; Nakayama, Takeshi; and Kobayashi, Kazuo, 4,858,194, Cl. 365-203.000.
Toyota, Takehito, 4,858,021, Cl. 358-494.000.
Yasue, Takao, 4,856,297, Cl. 62-51.100.

Mitsubishi Gas Chemical Company, Inc.: *See—*
Inoue, Yoshiaki, 4,856,649, Cl. 206-204.000.
Inoue, Yoshiaki, 4,856,650, Cl. 206-204.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,813, Cl. 280-703.000.

Mitsubishi Jidoshia Kogyo Kabushiki Kaisha: *See—*
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,815, Cl. 280-707.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Hirano, Takahisa; Hagimoto, Kiyoshi; and Takeda, Kimiharu, 4,856,973, Cl. 418-55.000.
Seto, Toru; Mitsuoka, Shigeaki; Morii, Atsushi; and Kobayashi, Norihisa, 4,857,276, Cl. 422-171.000.
Yamaguchi, Shogo; Araki, Kazunori; Tazuke, Hisashi; Murasaki, Masayuki; and Ito, Hirofumi, 4,856,563, Cl. 141-1.000.

Mitsubishi Kasei Corporation: *See—*
Kochi, Hiromi; Fukunaga, Kenji; Itagaki, Takaharu; and Ito, Tsuyoshi, 4,857,576, Cl. 524-409.000.

Mitsubishi Mining & Cement Co. Ltd.: *See—*
Tokio, Uetsuhara; and Hiroji, Iwasaki, 4,857,782, Cl. 310-12.000.

Mitsubishi Nuclear Fuel Company, Ltd.: *See—*
Kirihara, Tomoo; Nakagawa, Ippei; Seki, Yoshinobu; and Honda, Yutaka, 4,857,155, Cl. 204-61.000.

Mitsubishi Pencil Co., Ltd.: *See—*
Konose, Yoshiomi, 4,856,925, Cl. 401-290.000.

Mitsuhashi, Tadashi: *See—*
Koike, Hirofumi; Endo, Yukio; and Mitsuhashi, Tadashi, 4,856,858, Cl. 350-6.600.

Mitsuhata, Kouji: *See—*
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,813, Cl. 280-703.000.
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,815, Cl. 280-707.000.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Shin, Masaaki; Fujiwara, Akio; and Taniwaki, Hiroshi, 4,857,433, Cl. 430-120.000.

Mitsuoka, Shigeaki: *See—*
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Mitsuyuki, Hiroshi: *See—*
Furusawa, Tadao; Mitsuyuki, Hiroshi; Sato, Hironobu; Tatsuno, Yujiro; and Matsuoka, Shigeru, 4,858,171, Cl. 364-900.000.

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Miura, Shinsuke; Ishizuka, Susumu; and Kojima, Setsuo, to Yamaichi Electric Mfg. Ltd. Circular direction vibrator. 4,857,792, Cl. 310-323.000.

Miwa, Akihiko: *See—*
Kawasumi, Satoshi; Sugiura, Yuzuru; Kondo, Hiroyuki; Miwa, Akihiko; and Suzuki, Kazuhiko, 4,856,412, Cl. 91-369.200.

Miwa, Yoshihisa, to Mazda Motor Corporation. Method for manufacturing a gear fit article and gear fit article produced thereby. 4,856,166, Cl. 29-159.200.

Miyahara, Kazuhiro: *See—*
Yasuda, Keiji; Nakasako, Kazuo; and Miyahara, Kazuhiro, 4,856,987, Cl. 432-128.000.

Miyakawa, Yasuhiro: *See—*
Wakasa, Akinori; Machida, Minoru; Miyakawa, Yasuhiro; and Asami, Seiichi, 4,856,472, Cl. 123-270.000.

Miyake, Tomoyuki: *See—*
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Miyamoto, Hidenori: *See—*
Wakabayashi, Hiroshi; Kazami, Kazuyuki; Nakamura, Toshiyuki; Miyamoto, Hidenori; Tsukahara, Daiki; Machida, Kiyosada; and Katano, Yuji, 4,857,947, Cl. 354-195.100.

Miyamoto, Koji: *See—*
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Miyanaga, Yasuhiro: *See—*
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Miyano, Masateru: *See—*
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Miyasaka, Tetsuo: *See—*
Nakajima, Yukio; Miyasaka, Tetsuo; and Kawai, Sumio, 4,857,951, Cl. 354-400.000.

Miyashita, Kunio: *See—*
Nihei, Hideki; Miyashita, Kunio; Saitoh, Kouichi; and Yamashita, Seizi, 4,857,786, Cl. 310-156.000

Miyata, Hiroyuki, to Agency of Industrial Science and Technology, The President of the. Parallel data processor with shift register inter-processor transfer. 4,858,110, Cl. 364-200.000.

Miyawaki, Mamoru; Ogura, Shigetaro; and Matsumoto, Kazuya, to Canon Kabushiki Kaisha. Light waveguide lens. 4,856,861, Cl. 350-96.140.

Miyazaki, Hideo: *See—*
Ogura, Setsuo; Kamegaki, Kazuyuki; Yamazaki, Kouichi; Miyazaki, Hideo; Kitamura, Yukinori; and Mayuzumi, Shirou, 4,857,987, Cl. 357-45.000.

Miyazaki, Naoki: *See*—
Kato, Takeo; Yamamoto, Hideki; and Miyazaki, Naoki, 4,857,393, Cl. 428-289.000.
Miyazuka, Hajime: *See*—
Nishikawa, Yasuo; Miyazuka, Hajime; and Tsuji, Nobuo, 4,857,402, Cl. 428-336.000.
Mizrah, Tiberiu; Maurer, Albert; and Gauckler, Ludwig, to Swiss Aluminum Ltd. Filter for cleaning the exhaust gases from diesel engines. 4,857,088, Cl. 55-523.000.
Mizuno, Tohru: *See*—
Toyoda, Kenichi; Mizuno, Tohru; Torii, Nobutoshi; Kanda, Yuichi; and Morikawa, Shigehiro, 4,857,700, Cl. 219-124.340.
Mizushima, Tatsuhiko, to Mitsubishi Denki Kabushiki Kaisha. Image display apparatus. 4,857,909, Cl. 340-793.000.
MLW Corporation: *See*—
Gaffney, Daniel P., 4,856,685, Cl. 222-454.000.
Mobay Corporation: *See*—
Mafoti, Robson; and Nodelman, Neil H., 4,857,561, Cl. 521-159.000.
Mobil Oil Corporation: *See*—
Fitch, Thomas J.; Goins, Neal R.; and Spratt, Ray S., 4,858,202, Cl. 367-75.000.
Goins, Neal R., 4,858,200, Cl. 367-75.000.
Goins, Neal R.; and Spratt, Ray S., 4,858,201, Cl. 367-75.000.
Griffith, Paul G., 4,857,867, Cl. 331-10.000.
Harandi, Mohsen N.; and Owen, Hartley, 4,857,667, Cl. 585-403.000.
Hon, Clarence C., 4,856,343, Cl. 73-861.000.
Huang, Tracy J.; LaPierre, Rene B.; and Tabak, Samuel A., 4,857,664, Cl. 568-695.000.
Kettner, Roland; Liermann, Norbert; and Lubcke, Torsten, 4,857,297, Cl. 423-576.800.
Osborn, Paul V.; and Tendick, Clyde C., 4,857,039, Cl. 493-416.000.
Phelps, Craig H.; and Strom, E. Thomas, 4,856,586, Cl. 166-270.000.
Weissman, David, 4,858,198, Cl. 367-31.000.
Mobile Oil Corporation: *See*—
Griffith, Paul G., 4,858,199, Cl. 367-45.000.
Mochizuki, Tutomu, to Aichi Tokei Denki Co., Ltd. Method and apparatus for making compensation for DC offset voltage generated in aplifying circuit in electromagnetic flowmeter. 4,856,345, Cl. 73-861.170.
Mochizuki, Wataru; Ogino, Seiichi; and Takano, Hirohiko, to Mitsuba Electric Mfg. Co., Ltd. Electric motor system for automobiles. 4,857,812, Cl. 318-15.000.
Modisette, J. Everett, to Texas Medical Instruments, Inc. Segmented imaging plate structure. 4,857,723, Cl. 250-213.00R.
Moebius, Guenther: *See*—
Becker-Ross, Helmut; Florek, Stefan; Kerstan, Felix; Moebius, Guenther; and Sanders, Horst, 4,856,898, Cl. 356-328.000.
Moggi, Giovanni; Chiodini, Graziella; Cirillo, Gianna; and Geri, Sergio, to Ausimont S.p.A. Co-vulcanizable compositions of fluoroelastomers. 4,857,598, Cl. 525-194.000.
Mohsen, Amr M.: *See*—
El-Ayat, Khaled A.; El Gamal, Abbas; and Mohsen, Amr M., 4,857,774, Cl. 307-465.000.
Molex Incorporated: *See*—
Brubaker, Weldon L.; Gierut, Frederick J.; Kowalkowski, James T.; and Liburdi, Francesco, 4,857,019, Cl. 439-751.000.
Michaels, Leonard H.; and Miller, Robert A., 4,857,007, Cl. 439-283.000.
Michaels, Leonard H.; and Miller, Robert A., 4,857,015, Cl. 439-610.000.
Pomm, Timothy R., 4,857,010, Cl. 439-417.000.
Molins PLC: *See*—
Cahill, Michael J.; Simcoe, Michael D.; Stanton, John D.; and Warner, Brian H., 4,856,536, Cl. 131-28.000.
Molock, Frank F.: *See*—
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Molten Corporation: *See*—
Shishido, Hideomi; Doi, Shigeo; Sumida, Hideki; and Tanaka, Masayuki, 4,856,781, Cl. 273-65.00E.
Momiyama, Fujio, to Hino Jidosha Kogyo Kabushiki Kaisha. Automated mechanical transmission system for use in commercial vehicles. 4,856,628, Cl. 192-3.580.
Monarch Machine Tool Company, The: *See*—
Gusching, Nagle V., 4,856,153, Cl. 29-26.00A.
Monden, Yukio; and Manabe, Akira, to Toyota Jidosha Kabushiki Kaisha. Solder and soldering method for sintered metal parts. 4,857,695, Cl. 219-85.220.
Monma, Yoshiyuki: *See*—
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Bashkin, James K.; and Kinlen, Patrick J., 4,857,167, Cl. 204-411.000.
Wittwer, Arthur J., 4,857,320, Cl. 424-94.630.
Montalbano, Paul J. Conversion of rotational output to linear force. 4,856,358, Cl. 74-84.00R.
Montedipe S.p.A.: *See*—
Paparatto, Giuseppe; and Gregorio, Guglielmo, 4,857,295, Cl. 423-501.000.
Moor, Marc L., to Mead Corporation, The. Easy grip binder. 4,856,817, Cl. 281-29.000.
Moore, Eugene R., to Dow Chemical Company, The. Method for producing de-watered grafted rubber concentrate. 4,857,631, Cl. 528-481.000.
Moore, Jay T.: *See*—
Machado, Octavio J.; Moore, Jay T.; and Cooney, Barry F., 4,857,263, Cl. 376-272.000.
Moore, Martin W.: *See*—
France, Paul W.; Carter, Steven F.; and Moore, Martin W., 4,856,868, Cl. 350-96.230.
Moore & Steele Corporation: *See*—
Lounsberry, Stephen M., III; Lounsberry, Peter C.; Rodems, James D.; and Carner, Gary A., 4,856,617, Cl. 184-3.100.
Mor, Yeshayahu: *See*—
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Morais Cravador, Alfredo J.; Jacobs, Paul; Bollen, Alex J.; Van Elsen, Ary; and Herzog, Albert A. M., to Smith Kline-RIT, s.a. Method for the preparation of bacterial clones carrying optimal genetic information for the production of the factor for release of human growth hormone in *Escherichia coli*. 4,857,470, Cl. 435-320.000.
Moran, Michael J.: *See*—
Dierick, Tony F. J.; Kite, Nicholas J.; and Moran, Michael J., 4,857,029, Cl. 446-220.000.
Mordini, Joseph; and Risner, Robert. Solar photo-developing process. 4,857,970, Cl. 355-113.000.
Morgan Adhesives Company: *See*—
McClintock, Jack M., 4,857,371, Cl. 428-36.500.
Morgan, David E., to Brown Boveri (Australia) Pty, Limited. Drop-out expulsion fuse. 4,857,879, Cl. 337-173.000.
Mori, Issei, to Kabushiki Kaisha Toshiba. X-ray CT apparatus. 4,858,129, Cl. 364-413.140.
Mori, Miki: *See*—
Saito, Masayuki; Niitsuma, Akira; Ohdaira, Hirosi; Tanuma, Chiaki; and Mori, Miki, 4,857,482, Cl. a37-209.000.
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Kutsuki, Hidetoshi; Sawa, Ikuo; Mori, Natsuki; Hasegawa, Junzo; and Watanabe, Kiyoshi, 4,857,468, Cl. 435-280.000.
Mori, Ryuichiro; Fukudome, Katsuyuki; and Banjo, Toshinobu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 4,857,989, Cl. 357-80.000.
Mori, Seiji; Sonoda, Toshinari; and Kinoshita, Yusuke, to Honda Giken Kogyo Kabushiki Kaisha. Internal combustion engine. 4,856,486, Cl. 123-572.000
Mori, Toshihiro; Oda, Takashi; and Ohyagi, Takashi, to NEC Corporation. Multifunctional pager receiver capable of reducing the member of manual switches. 4,857,911, Cl. 340-825.440.
Mori, Yutaka: *See*—
Eto, Kunihiko; Takeuchi, Shiro; Mori, Yutaka; Tanooka, Shigeo; Kodama, Kazumasa; and Matsumoto, Tsutomu, 4,858,134, Cl. 364-424.050.
Morii, Atsushi: *See*—
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Morikawa, Tuneo; Kabe, Kazuyuki; and Tsukada, Shuichi, to Yokohama Rubber Co., Ltd., The. Pneumatic tire. 4,856,573, Cl. 152-556.000.
Morimoto, Kiyoshi; Iwamoto, Akikazu; Moriyama, Masuo; and Sonoda, Atsuroh, to Kyowa Hakko Kogyo Co., Ltd.; and Kabushiki Kaisha Matsui Seisakusho. High density pneumatic transport method for use in powder or granular material and system for practicing the method. 4,856,941, Cl. 406-85.000.
Morimoto, Takeshi; Endoh, Eiji; and Takemiya, Satoshi, to Asahi Glass Company Ltd.; and Elna Company Ltd. Solid electrolytic capacitor. 4,858,078, Cl. 361-527.000.
Morinaga, Motoyasu: *See*—
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Morishita, Mitsuharu; Kohge, Shinichi; Hara, Tadayuki; Hata, Yasuaki; and Umemaru, Hisato, to Mitsubishi Denki Kabushiki Kaisha. Steering torque detecting device. 4,856,323, Cl. 73-118.100.
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Kimura, Kiyoshi; Kise, Masahiro; Morita, Iwao; Tomita, Toshio; and Tsuda, Masami, 4,857,515, Cl. 514-89.000.
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Solberg, Mark A., 4,856,276, Cl. 60-250.000.
Moscatelli, Romano, to Sekur S.p.A. Protective garment for operation in contaminated areas. 4,856,113, Cl. 2-84.000.
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Shimizu, Shumpei, 4,857,290, Cl. 423-339.000.
Motegi, Nawoto: *See*—
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Moudgil, Brij M.; and Ince, Dursun, to University of Florida. Method of beneficiating phosphate ores. 4,857,174, Cl. 209-3.000.
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Dennis, James W., 4,857,315, Cl. 424-85.200.
Mowdood, Syed K.; and Kansupada, Bharat K., to Goodyear Tire & Rubber Company, The. Tire coating composition and use for curing tires. 4,857,397, Cl. 428-323.000.
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Mueller, Richard A., to G. D. Searle & Co. Methods and compositions for inhibiting lipoxygenase. 4,857,558, Cl. 514-712.000.
Mukaekubo, Jyunichi, to Kabushiki Kaisha Toshiba. Motor having rotation speed detection mechanism. 4,857,784, Cl. 310-68.00B.
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Mullen, Walter T., to Air Products and Chemicals, Inc. Combustion of black liquor. 4,857,282, Cl. 423-207.000.
Muller, David F., to Summit Technology, Inc. Laser reprofiling systems and methods. 4,856,513, Cl. 128-303.100.
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Mullins, Timothy J.: *See*—
Cahill, Joseph J.; Johnson, Charles L.; Lewis, Steven D.; Mullins, Timothy J.; and Petz, Bruce R., 4,857,765, Cl. 307-443.000.
Mura, Albert J.: *See*—
Belly, Robert T.; Mura, Albert J.; Esders, Theodore W.; and Burdick, Brent A., 4,857,271, Cl. 422-55.000.
Murai, Shunji; Ohtomo, Fumio; and Ohtani, Hitoshi, to Tokyo Kogaku Kikai Kabushiki Kaisha. Apparatus and method for determining the coordinates of a three-dimensional object. 4,858,157, Cl. 364-560.000.
Murakami, Yoshiteru: *See*—
Takahashi, Akira; Murakami, Yoshiteru; Mieda, Michinobu; Miyake, Tomoyuki; and Ohta, Kenji, 4,858,212, Cl. 369-13.000.
Murakoso, Toshiyuki; Sato, Shoichi; and Yagi, Motoi, to Tokyo Electric, Co., Ltd. Electronic weighing instrument of the electrostatic capacity type. 4,856,603, Cl. 177-210.00C.
Murano, Katsuaki; Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, to Suzuki Jidosha Kogyo Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Method of controlling clutch pressure of continuously variable transmission system. 4,856,380, Cl. 74-866.000.
Muraoka, Shigemitsu: *See*—
Imanishi, Taichi; and Muraoka, Shigemitsu, 4,857,255, Cl. 264-216.000.
Murasaki, Masayuki: *See*—
Yamaguchi, Shogo; Araki, Kazunori; Tazuke, Hisashi; Murasaki, Masayuki; and Ito, Hirofumi, 4,856,563, Cl. 141-1.000.
Murata, Akira: *See*—
Masuda, Yoshihiro; Yagi, Takashi; and Murata, Akira, 4,857,949, Cl. 354-322.000.
Murata Kikai Kabushiki Kaisha: *See*—
Tone, Shoichi, 4,856,723, Cl. 242-35.50R.
Murata, Shinichi: *See*—
Minami, Katsuji; Murata, Shinichi; Tsujimoto, Susumu; Matuzaki, Yukinori; Yukawa, Shogo; and Osaka, Susumu, 4,856,574, Cl. 160-168.100.
Murata, Tadahiko: *See*—
Ishida, Kunio; Saito, Satoshi; Habuto, Akinaka; Murata, Tadahiko; Oiso, Hisayoshi; Joyama, Norio; and Fujimoto, Kazuhiro, 4,857,354, Cl. 426-558.000.
Murdoch, Robert, to Data General Corporation. Content addressable memory and self-blocking driver. 4,858,180, Cl. 365-49.000.
Murphy, Betty J.: *See*—
Kellett, George W.; and Murphy, Betty J., 4,856,541, Cl. 132-110.000.
Murphy, Gordon J.; and Plonus, Martin A. Alternating current outlet adapter. 4,857,759, Cl. 307-141.000.
Murphy, Jimmy D.; and Hicks, Ted. Funnel apparatus. 4,856,568, Cl. 141-337.000.
Murphy, Patrick; and Tran, Duc H., to Pitney Bowes Inc. Apparatus for processing irregularly-shaped letters in a thermal printer. 4,857,942, Cl. 346-76.0PH.
Murray, Charles T. Dispenser for granular and powdered dry materials. 4,856,681, Cl. 222-158.000.
Murray, Stephen G., to General Motors Corporation. Secondary oil system for gas turbine engine. 4,856,273, Cl. 60-39.080.
Murthy, Vadiraja V.: *See*—
Freundlich, Lawrence F.; Murthy, Vadiraja V.; and Karmen, Arthur, 4,857,454, Cl. 435-7.000.
Musch, Rudiger; Muller, Eberhard; Hohmann, Gerhard; and Schabel, Karl-Heinz, to Bayer Aktiengesellschaft. Process for the preparation of polychloroprene. 4,857,616, Cl. 526-204.000.
Musco, Vincent A.; Kelley, Donald E.; and Hansen, Carl O., to Rohm and Haas Company. Method of selectively controlling weeds in crops of cereals. 4,857,101, Cl. 71-94.000.
Mushrush, Kenneth W.: *See*—
Damico, Dennis J.; Mushrush, Kenneth W.; and Bennett, Ruth M., 4,857,131, Cl. 156-331.400.
Music, John; Smith, Gordon H.; and Thomas, James L., to Universal Video Communications Corp. Method and system for decompressing color video feature encoded data. 4,857,991, Cl. 358-13.000.
Music, John; Smith, Gordon H.; and Thomas, James L., to Universal Video Communications Corp. Method and system for decompressing digital color video statistically encoded data. 4,857,993, Cl. 358-13.000.
Muszak, Martin F.: *See*—
Salzman, Catherine A.; and Muszak, Martin F., 4,857,471, Cl. 436-43.000.
Muszik, Janos: *See*—
Bachem, Henning; Muszik, Janos; Schroer, Wolf-Dieter; and Suling, Carlhans, 4,857,586, Cl. 524-845.000.
Muuss, Peter: *See*—
Callsen, Hans; and Muuss, Peter, 4,856,143, Cl. 17-11.000.
Myers, Charley: *See*—
Waugh, Gerald; Myers, Charley; Davis, John; and Sullivan, John, 4,858,119, Cl. 364-400.000.
Myers, David W.; Ozarski, Robert G.; Perera, Thiloma I.; Schipper, John F.; Tan, Raul V.; and Watts, Michael P. C., to General Signal Corporation. Absorption measurements of materials. 4,857,738, Cl. 250-372.000.
Myers, Terry N.: *See*—
MacLeay, Ronald E.; and Myers, Terry N., 4,857,596, Cl. 525-142.000.
Nabekawa, Shukichi: *See*—
Tsuchiya, Hiromu; Nabekawa, Shukichi; and Takada, Masao, 4,857,238, Cl. 562-820.000.
Nabisco Brands, Inc.: *See*—
Verrico, Marsha K., 4,856,453, Cl. 118-24.000.
Nabisco/Cetus Food Biotechnology Research Partnership: *See*—
Maselli, John A.; Neidleman, Saul L.; Antrim, Richard L.; and Johnson, Richard A., 4,857,339, Cl. 426-28.000.
Nagano, Akihiro: *See*—
Sakata, Hajime; Watanabe, Yasuyuki; Yamanobe, Masato; Ohkubo, Yukitoshi; and Nagano, Akihiro, 4,856,869, Cl. 350-162.180.
Nagao, Akira: *See*—
Nakajima, Toyohei; Mieno, Toshiyuki; Tanaka, Akira; Nagao, Akira; and Suzaki, Yukihiko, 4,856,480, Cl. 123-425.000.
Nagata, Minoru: *See*—
Kotera, Nobuo; Yamashita, Kiichi; Kinoshita, Taizo; Tanaka, Hirotoshi; Tanaka, Satoshi; and Nagata, Minoru, 4,857,769, Cl. 307-450.000.

Nagata Seiki Kabushiki Kaisha: *See*—
Maruyama, Kakuji; Kondo, Takeshi; and Okubo, Yoshimitsu, 4,856,298, Cl. 66-40.000.

Naimark, Michael; and Carson, Kenneth M., to Advanced Interaction, Inc. Position-dependent interactivity system for image display. 4,857,902, Cl. 340-709.000.

Naito, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Constant-speed running control device for vehicles. 4,856,609, Cl. 180-179.000

Najjar, Mitri S.; and Roland, James, to Texaco Inc. Partial oxidation process of sulfur, nickel, and vanadium-containing fuels. 4,857,229, Cl. 252-373.000.

Najvar, Daniel J.: *See*—
Pope, Brian G.; and Najvar, Daniel J., 4,857,203, Cl. 210-681.000.

Nakagaki, Shintaro: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; Negishi, Ichiro; and Osada, Masaru, 4,857,995, Cl. 358-47.000.

Nakagawa, Hideaki: *See*—
Ohkoshi, Akio; Nakagawa, Hideaki; Tsuruta, Koji; Sugii, Yasuyoshi; and Wada, Haruaki, 4,857,800, Cl. 313-495.000.

Nakagawa, Ippei: *See*—
Kirihara, Tomoo; Nakagawa, Ippei; Seki, Yoshinobu; and Honda, Yutaka, 4,857,155, Cl. 204-61.000.

Nakagawa, Norihisa: *See*—
Kawai, Taiyo; Nakagawa, Norihisa; and Sano, Shin-ichi, 4,856,473, Cl. 123-308.000.

Nakagawa Seisakusho Co., Ltd.: *See*—
Kurata, Yoshiharu, 4,856,441, Cl. 112-80.730.

Nakagiri, Masasi: *See*—
Okamoto, Shinji; Minakawa, Masaaki; Neki, Youiti; and Nakagiri, Masasi, 4,857,589, Cl. 525-60.000.

Nakahara, Toshiaki: *See*—
Tanikawa, Hirohide; Nakahara, Toshiaki; and Nozawa, Keita, 4,857,432, Cl. 430-106.000.

Nakai, Masaaki: *See*—
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,857,953, Cl. 354-475.000.

Nakai, Takashi: *See*—
Hirao, Shozo; Usui, Hiroaki; Ohta, Yoshihiro; Nakai, Takashi; Ishikawa, Hiroyuki; and Konishi, Satoru, 4,857,365, Cl. 427-297.000.

Nakajima, Junya: *See*—
Abe, Akira; Nakajima, Junya; Takase, Haruo; Uenaka, Kazushige; and Otomo, Ruyzi, 4,857,441, Cl. 430-393.000.

Nakajima, Nobuyoshi: *See*—
Saotome, Shigeru; and Nakajima, Nobuyoshi, 4,857,733, Cl. 250-327.200.

Nakajima, Shigeo: *See*—
Kataoka, Shoei; Yoshida, Masaru; and Nakajima, Shigeo, 4,857,920, Cl. 340-907.000.

Nakajima, Toyohei; Mieno, Toshiyuki; Tanaka, Akira; Nagao, Akira; and Suzaki, Yukihiko, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for controlling ignition timing in internal combustion. 4,856,480, Cl. 123-425.000.

Nakajima, Yukio; Miyasaka, Tetsuo; and Kawai, Sumio, to Olympus Optical Co., Ltd. Output device for range information for use in an interchangeable lens. 4,857,951, Cl. 354-400.000.

Nakamura, Akira: *See*—
Hanaoka, Motoyoshi; and Nakamura, Akira, 4,856,477, Cl. 123-399.000.

Nakamura, Hitoshi; and Hori, Yasuaki, to Ohi Seisakusho Co., Ltd. Pawl structure in a door locking device for a vehicle. 4,856,829, Cl. 292-216.000.

Nakamura, Katsuya: *See*—
Oku, Teruo; Todo, Eishiro; Kasahara, Chiyoshi; Nakamura, Katsuya; Kayakiri, Hiroshi; and Hashimoto, Masashi, 4,857,513, Cl. 514-76.000.

Nakamura, Kenichi: *See*—
Yamada, Wataru; Fujio, Satoshi; and Nakamura, Kenichi, 4,858,210, Cl. 368-238.000.

Nakamura, Kenji: *See*—
Hayakawa, Naoji; Takenouchi, Masanori; Nakamura, Kenji; Kan, Fumitaka; Kozato, Yasuo; and Hakamada, Isao, 4,858,062, Cl. 361-225.000.

Nakamura, Masaaki: *See*—
Kitamura, Masuo; Takagi, Mitsuhiro; and Nakamura, Masaaki, 4,857,669, Cl. 174-53.000.

Nakamura, Masaru: *See*—
Suzuki, Nobuo; Morinaga, Motoyasu; Furuyama, Hideto; Hirayama, Yuzo; Okuda, Hajime; Nakamura, Masaru; and Motegi, Nawoto, 4,858,241, Cl. 372-46.000.

Nakamura, Shinya: *See*—
Funahashi, Makoto; Kubo, Seitoku; and Nakamura, Shinya, 4,856,331, Cl. 74-867.000.

Nakamura, Taizo: *See*—
Katsuie, Masahiro; Abe, Michiyuki; Kawahara, Katsuyuki; and Nakamura, Taizo, 4,856,965, Cl. 417-1?.000

Nakamura, Tohru: *See*—
Homma, Noriyuki; Nakamura, Tohru; Nakazato, Kazuo; Matsumoto, Motoaki; Hayashida, Tetsuya; Kubo, Masaharu; and Sagara, Kazuhiko, 4,858,184, Cl. 365-174.000.

Nakamura, Toshiyuki: *See*—
Wakabayashi, Hiroshi; Kazami, Kazuyuki; Nakamura, Toshiyuki; Miyamoto, Hidenori; Tsukahara, Daiki; Machida, Kiyosada; and Katano, Yuji, 4,857,947, Cl. 354-195.100.

Nakamura, Tsutomu: *See*—
Matsumoto, Kazuya; and Nakamura, Tsutomu, 4,857,981, Cl. 357-30.000.

Nakanishi, Motoyasu, to Kabushiki Kaisha Cubic Engineering. Bellows type shock absorber. 4,856,626, Cl. 188-371.000.

Nakano, Hirotaka; and Yoshino, Thunekazu, to Kabushiki Kaisha Toshiba. Film carrier and bonding method using the film carrier. 4,857,671, Cl. 174-68.500.

Nakano, Katsuji: *See*—
Nishiyama, Masanobu; Nishimura, Haruo; Nakano, Katsuji; Ozaki: Tatsuo; and Kitamoto, Akira, 4,856,854, Cl. 312-38.000.

Nakano, Kenichi; Umezawa, Yoshihiro; Tokaichi, Tetsuro; Ichimura, Yoshiaki; and Kawabe, Natsuki, to Nippon Telegraph & Telephone Public Corporation; Nippon Electric Co., Ltd.; and Japan Aviation Electronics Industry Limited. Electrical connectors for leadless circuit boards. 4,857,001, Cl. 439-68.000.

Nakano, Yukio; and Kanno, Tadayuki, to Hitachi, Ltd. Diagnostic method of equipment and system using the same. 4,858,224, Cl. 370-16.000.

Nakasako, Kazuo: *See*—
Yasuda, Keiji; Nakasako, Kazuo; and Miyahara, Kazuhiro, 4,856,987, Cl. 432-128.000.

Nakashima, Akio: *See*—
Oku, Masuo; Kudo, Yoshimichi; Kuroyanagi, Tomomitsu; Kondo, Kazuo; Tsukazaki, Hisanobu; Ikeda, Tetsuya; Nakashima, Akio; and Kimura, Takashi, 4,858,030, Cl. 358-342.000.

Nakata, Muneo: *See*—
Matsuo, Kenichi; Nakata, Muneo; and Ohara, Toru, 4,857,875, Cl. 335-297.000.

Nakatani, Ryoichi: *See*—
Kobayashi, Toshio; Otomo, Shigekazu; Nakatani, Ryoichi; and Kumasaka, Noriyuki, 4,858,049, Cl. 360-126.000.

Nakayama, Takahiro: *See*—
Fuyama, Moriaki; Tamura, Katsumi; Taguchi, Kazuo; Onisawa, Kenichi; Sato, Akira; Hashimoto, Kenichi; Nakayama, Takahiro; and Abe, Yoshio, 4,857,802, Cl. 313-506.000.

Nakayama, Takeshi: *See*—
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Nakazato, Kazuo: *See*—
Homma, Noriyuki; Nakamura, Tohru; Nakazato, Kazuo; Matsumoto, Motoaki; Hayashida, Tetsuya; Kubo, Masaharu; and Sagara, Kazuhiko, 4,858,184, Cl. 365-174.000.

Nakazawa, Akira: *See*—
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Nakazawa, Noriaki: *See*—
Sako, Takeshi; Yokochi, Toshihiro; Sato, Masahito; Suzuki, Osamu; Hakuta, Toshikatsu; Sugeta, Tsutomu; and Nakazawa, Noriaki, 4,857,329, Cl. 424-195.100.

Namco, Ltd.: *See*—
Ogawa, Toru, 4,857,905, Cl. 340-748.000.

Narahara, Takumi: *See*—
Ishiguro, Fujio; and Narahara, Takumi, 4,857,165, Cl. 204-424.000.

Narducy, Kenneth W.; Jahnke, Richard L.; and Loshaek, Samuel, to Schering Corporation. Hydrophilic colored contact lenses. 4,857,072, Cl. 8-507.000.

Narita, Ryuho; Kako, Hidenori; and Imamura, Humihiro, to Kabushiki Kaisha Toshiba. Magnetron drive apparatus. 4,858,095, Cl. 363-21.000.

Narjes, Ferdinand: *See*—
Weimert, Guenter; and Narjes, Ferdinand, 4,858,222, Cl. 370-13.000.

Naruse, Kazuhiko; and Yasumoto, Hidetoshi, to Minolta Camera Kabushiki Kaisha. Light source device. 4,857,967, Cl. 355-69.000.

Narutako, Yozo: *See*—
Kozaki, Shyuichi; Ichimura, Yukiko; and Narutako, Yozo, 4,856,875, Cl. 350-341.000.

Nash, Boyd B., to Independent Trailer & Repair, Inc. Self unloading multiple trailer arrangement. 4,856,804, Cl. 280-430.000.

Nasu, Mineji: *See*—
Furusaki, Keizo; Nasu, Mineji; Matsuura, Toshitaka; Takami, Akio; and Okawa, Teppei, 4,857,275, Cl. 422-98.000.

Nathan, Paul: *See*—
Korol, Bernard; and Nathan, Paul, 4,857,334, Cl. 424-445.000.

National Computer Systems, Inc.: *See*—
Koch, Vernon F.; Fahnlander, John G.; and Wanninger, Lester A., 4,857,715, Cl. 235-456.000.

National Research Development Corporation: *See*—
Annis, David; Brown, Malcolm C.; and Sutherst, John R., 4,857,041, Cl. 600-30.000.
Fray, Derek J.; and Godsell, Alan J., 4,857,156, Cl. 204-64.00R.
Lupton, John M., 4,857,177, Cl. 209-466.000.
Mackley, Malcolm R.; and Anton, Christopher, 4,857,127, Cl. 156-242.000
Minor, Philip D.; Evans, David M. A.; Schild, Geoffrey C.; Almond, Jeffrey W.; and Ferguson, Morag, 4,857,634, Cl. 530-324.000

National Semiconductor Corporation: *See*—
Kowshik, Vikram; and Lucero, Elroy M., 4,858,185, Cl. 365-181.000
Miller, William E., 4,857,985, Cl. 357-42.000.

Natusch, Paul J.: *See*—
Stewart, Robert E.; Natusch, Paul J.; Yu, Eugene L.; and Keller, James B., 4,858,173, Cl. 364-900.000.

Naumov, Mikhail V.: *See*—
Falkevich, Sergei A.; Naumov, Mikhail V.; Shkarlet, Jury M.; Sukhorukov, Dmitry V.; Fedotov, Viktor N.; and Sazonov, Jury I., 4,856,336, Cl. 73-598.000.

Nauroth, Peter; Kuhlmann, Robert; Turk, Gunter; and Becker, Adam, to Degussa Aktiengeselischaft. Process for preparing precipitated silica. 4,857,289, Cl. 423-339.000.

Navistar International Transportation Corp.: *See*—
Grinsteiner, James J.; and Maat, George J., 4,856,711, Cl. 236-34.500.

NCR Corporation: *See*—
Bitting, Ricky F., 4,857,823, Cl. 323-314.000.
Heys, George, Jr.; and Allgeier, David M. J., 4,857,712, Cl. 235-58.00P.

NDA International, Inc.: *See*—
Lotsof, Howard S., 4,857,523, Cl. 514-214.000.

NDC Co., Ltd.: *See*—
Maki, Yoshihiro; Matsuyama, Akira; Tanizaki, Katsuji; Okabe, Noboru; Kishida, Katsuhiro; Sakai, Takeshi; Ohgaki, Toshinaga; and Fujita, Masahito, 4,857,267, Cl. 419-31.000.

NDC Technologies, Inc.: *See*—
Holmquist, Fredrik, 4,858,132, Cl. 364-424.020.

Neate, J. A.: *See*—
Danforth, R. L.; Gergen, W. P.; and Neate, J. A., 4,857,147, Cl. 162-156.000.

NEC Corporation: *See*—
Hirayama, Hiromitsu, 4,857,975, Cl. 357-22.000.
Kobayashi, Yasuo, 4,858,188, Cl. 365-189.050.
Mori, Toshihiro; Oda, Takashi; and Ohyagi, Takashi, 4,857,911, Cl. 340-825.440.
Tahara, Masato, 4,857,858, Cl. 329-50.000.
Tateishi, Hisao, 4,857,866, Cl. 331-1.00A.
Tsukamoto, Yuji, 4,856,326, Cl. 73-150.00A.

Neff, James A.; and Fagerlie, Richard A. Valve base with integral flow control valves and common exhaust passage. 4,856,560, Cl. 137-884.000.

Negishi, Ichiro: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; Negishi, Ichiro; and Osada, Masaru, 4,857,995, Cl. 358-47.000.

Negita, Hisao: *See*—
Mio, Mitsushi; and Negita, Hisao, 4,857,384, Cl. 428-164.000.

Neglia, Joseph D.; and Cunningham, David C., to Honeywell Inc. Phase-responsive angular tracking device. 4,857,926, Cl. 341-116.000.

Negrutsky, Boris F.: *See*—
Churkin, Vladimir G.; Negrutsky, Sergei B.; Klimov, Sergei B.; and Negrutsky, Boris F., 4,856,414, Cl. 92-83.000.

Negrutsky, Sergei B.: *See*—
Churkin, Vladimir G.; Negrutsky, Sergei B.; Klimov, Sergei B.; and Negrutsky, Boris F., 4,856,414, Cl. 92-83.000.

Nei, Masami: *See*—
Yamaguchi, Yasunori; Yoshida, Akirahiko; Nei, Masami; Ishihara, Masamichi; and Yamamoto, Yukio, 4,858,190, Cl. 365-189.050.

Neidleman, Saul L.: *See*—
Maselli, John A.; Neidleman, Saul L.; Antrim, Richard L.; and Johnson, Richard A., 4,857,339, Cl. 426-28.000.

Neilson, Diane H. R.; Work, Sara L. R.; Whaley, Edward L.; Kirkpatrick, Steven J.; and McCarthy, James P., to Procter & Gamble Company, The. Process for treating coffee beans to make a better-tasting coffee. 4,857,351, Cl. 426-533.000.

Neki, Youiti: *See*—
Okamoto, Shinji; Minakawa, Masaaki; Neki, Youiti; and Nakagiri, Masasi, 4,857,589, Cl. 525-60.000.

Nellco, Inc.: *See*—
Nelson, Merlin L., 4,856,934, Cl. 405-33.000.

Nelson, Berg Enterprises: *See*—
Nelson, Darrell R.; and Berg, Greg W., 4,856,771, Cl. 272-18.000.

Nelson, Carl W.; Smith, Donald S.; and Turner, Frank P., to United Technologies Corporation. Airfoil incidence angle adjustment method. 4,856,943, Cl. 408-1.00R.

Nelson, Darrell R.; and Berg, Greg W., to Nelson, Berg Enterprises. Video simulation apparatus. 4,856,771, Cl. 272-18.000.

Nelson, Merlin L., to Nellco, Inc. Beach builder block. 4,856,934, Cl. 405-33.000.

Nemoto, Shin-ichi: *See*—
Kashihara, Hidechiyo; Nemoto, Shin-ichi; and Ueno, Kazuhiro, 4,857,040, Cl. 494-22.000.

Nemoto, Shusuke, to Kanzaki Kokyukoki Mfg., Co. Ltd. Driving power transmission. 4,856,367, Cl. 74-606.00R.

Nemoto, Shusuke: *See*—
Fujisaki, Koichiro; Ohashi, Ryota; and Nemoto, Shusuke, 4,856,368, Cl. 74-606.00R.

Nepco, Inc.: *See*—
McCahill, David I., 4,856,578, Cl. 165-29.000.

Ner, Virginia F.: *See*—
Suss, Harold; and Ner, Virginia F., 4,857,307, Cl. 424-63.000.

Nesbitt, Russell U.: *See*—
Song, Suk-zu; Rashidbaigi, Zahra A.; Nesbitt, Russell U.; and Fawzi, Mahdi B., 4,857,313, Cl. 424-81.000.

Ness, Thomas O. Woody plant extractor. 4,856,759, Cl. 254-132.000.

Nestec S.A.: *See*—
Ammann, Ulrich, 4,857,357, Cl. 426-634.000.
Reinl, Hubert; and Schmidt, Elke, 4,857,356, Cl. 426-620.000.
Tran, Kha M.; and Einerson, Mark A., 4,857,341, Cl. 426-98.000.

Neuman, George A.: *See*—
Bloss, Karl H.; Davis, James A.; and Neuman, George A., 4,857,361, Cl. 427-109.000.

Neumann, Harald: *See*—
Maier, Lorenz; Buchler, Wilhelm; Neumann, Harald; and Lonnecke, Karl H., 4,856,173, Cl. 29-445.000.

Neveu, Daniel R. M.: *See*—
Roth, Bernard M.; Neveu, Daniel R. M.; and Delikat, Catherine, 4,856,911, Cl. 374-135.000.

New England Thermoplastics, Inc.: *See*—
Tayebi, Amad, 4,856,508, Cl. 128-206.120.

New, Jimmie D., to Xerox Corporation. Magnetic disk lock having braking apparatus. 4,858,045, Cl. 360-99.120.

Newbridge Networks Corp.: *See*—
O'Malley, Michael T.; and Johnston, Robert G., 4,857,884, Cl. 340-311.100.

Neynaber Chemie GmbH: *See*—
Worschech, Kurt; Wedl, Peter; Kachel, Helmut; and Schult, Guenter, 4,857,216, Cl. 252-39.000.

NGK Insulators, Ltd.: *See*—
Ishiguro, Fujio; and Narahara, Takumi, 4,857,165, Cl. 204-424.000.
Katsu, Masanori; and Makino, Mikio, 4,856,577, Cl. 165-8.000
Kitagawa, Jun; Hijikata, Toshihiko; and Ishikawa, Kazuo, 4,857,089, Cl. 55-523.000.
Kodachi, Toru; and Usami, Jun, 4,857,164, Cl. 204-406.000.
Oda, Isao; and Ishida, Yoshihiko, 4,856,970, Cl. 417-407.000
Oshima, Shinji; and Shimada, Hiromi, 4,857,245, Cl. 264-25.000.
Wakasa, Akinori; Machida, Minoru; Miyakawa, Yasuhiro; and Asami, Seiichi, 4,856,472, Cl. 123-270.000.
Yasuda, Keiji; Nakasako, Kazuo; and Miyahara, Kazuhiro, 4,856,987, Cl. 432-128.000.

NGK Spark Plug Co., Ltd.: *See*—
Furusaki, Keizo; Nasu, Mineji; Matsuura, Toshitaka; Takami, Akio; and Okawa, Teppei, 4,857,275, Cl. 422-98.000.

Ngo, Dang: *See*—
Okawa, Dobson; Pang, Wing S.; Ngo, Dang; and Shibata, George, 4,858,155, Cl. 364-557.000.

Nguyen, Son T.: *See*—
Lakshmanan, Pallavoor R.; and Nguyen, Son T., 4,857,594, Cl. 525-98.000.

Nicholson, Robert J.; and Jape, Anthony D., to Figgie International Inc. Sortation conveyor. 4,856,642, Cl. 198-365.000

Nickerson, David L. Insulated building block. 4,856,249, Cl. 52-405.000.

Nielson, Jay P. Recovery of oil from oil-bearing formation by continually flowing pressurized heated gas through channel alongside matrix. 4,856,587, Cl. 166-272.000.

Nifco Inc.: *See*—
Oshida, Tsutomu, 4,856,625, Cl. 188-282.000.

Nihei, Hideki; Miyashita, Kunio; Saitoh, Kouichi; and Yamashita, Seizi, to Hitachi, Ltd. Structure of stepping motor and method of driving the stepping motor. 4,857,786, Cl. 310-156.000.

Nihon Kenkou K.K.: *See*—
Shimasaki, Shigetaka, 4,856,246, Cl. 52-386.000.

Nihon Parkerizing Co., Ltd.: *See*—
Terada, Haruyoshi; Ono, Youji; Satoh, Yokichi; and Kaneko, Hideaki, 4,857,225, Cl. 252-100.000.

Nihon Tokushu Noyaku Seizo K.K.: *See*—
Yamada, Yasuo; Saito, Junichi; Tamura, Tatsuo; and Sakawa, Shinji, 4,857,556, Cl. 514-585.000.

Niitsuma, Akira: *See*—
Saito, Masayuki; Niitsuma, Akira; Ohdaira, Hirosi; Tanuma, Chiaki; and Mori, Miki, 4,857,482, Cl. a37-209.000.

Nikka Whisky Distilling Co., Ltd.: *See*—
Takagi, Masamichi; Yano, Keiji; Shibuya, Ichiro; and Morikawa, Minoru, 4,857,460, Cl. 435-91.000.

Nikolaus, John G., to Vilter Manufacturing Company. Connecting rod bearing assembly. 4,856,366, Cl. 74-605.000.

Nikon Corporation: *See*—
Akabane, Jun; Moro, Ken; and Yamamoto, Masayasu, 4,857,948, Cl. 354-288.000.
Akagawa, Masayuki, 4,856,904, Cl. 356-400.000.
Nishi, Kenji, 4,856,905, Cl. 356-401.000.
Ohshita, Koichi, 4,856,880, Cl. 350-418.000.
Takagi, Akihiro; and Kimoto, Kiyoshi, 4,858,218, Cl. 369-109.000.
Wakabayashi, Hiroshi; Kazami, Kazuyuki; Nakamura, Toshiyuki; Miyamoto, Hidenori; Tsukahara, Daiki; Machida, Kiyosada; and Katano, Yuji, 4,857,947, Cl. 354-195.100.

Nikulainen, Osmo; and Kainu, Vesa, to Valmet Oy. Method and device in an adjustable crown roll. 4,856,154, Cl. 29-113.100.

Nilssen, Ole K. Self-ballasted screw-in fluorescent lamp. 4,857,806, Cl. 315-72.000.

Nineuil, Guy; and Rivoirard, Louis, to Rhone-Poulenc Chimie. Cleaning of filter surfaces. 4,857,211, Cl. 210-797.000.

Nippon Chemical Industrial Co., Ltd.: *See*—
Tsuchiya, Hiromu; Nabekawa, Shukichi; and Takada, Masao, 4,857,238, Cl. 562-820.000.

Nippon CMK Corporation: *See*—
Seki, Kameharu; and Kubo, Isamu, 4,856,424, Cl. 101-128.400.

Nippon Electric Co., Ltd.: *See*—
Nakano, Kenichi; Umezawa, Yoshihiro; Tokaichi, Tetsuro; Ichimura, Yoshiaki; and Kawabe, Natsuki, 4,857,001, Cl. 439-68.000.

Nippon Furnace Kogyo Kaisha Ltd.: *See*—
Kawamoto, Masao, 4,856,492, Cl. 126-91.00A.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See*—
Okamoto, Shinji; Minakawa, Masaaki; Neki, Youiti; and Nakagiri, Masasi, 4,857,589, Cl. 525-60.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Wakimoto, Kazumasa; Shibata, Motohiro; Ishii, Takaharu; and Sakurai, Masaaki, 4,857,106, Cl. 75-41.000.

Nippon Oil Company, Limited: *See—*
Itoh, Hiroyuki; Ishii, Takafumi; and Satoh, Tetsuo, 4,857,427, Cl. 430-19.000.
Kubo, Junichi; and Suzuki, Kenji, 4,857,168, Cl. 208-58.000.

Nippon Oil & Fats Co., Ltd.: *See—*
Araki, Masatada; Kuroyama, Yutaka; Takeuchi, Yukihisa; Takagi, Makoto; Kawamura, Yoshihito; and Imura, Toru, 4,857,414, Cl. 428-612.000

Nippon Seiko Kabushiki Kaisha: *See—*
Inoue, Gentei; Sakatani, Ikunori; and Tanaka, Katsuhiko, 4,856,918, Cl. 384-610.000

Nippon Shinyaku Co., Ltd.: *See—*
Kimura, Kiyoshi; Kise, Masahiro; Morita, Iwao; Tomita, Toshio; and Tsuda, Masami, 4,857,515, Cl. 514-89.000

Nippon Steel Corporation: *See—*
Shindo, Yoshio; Yamazaki, Fumio; Wada, Kouichi; Tomio, Hidehiro; and Saito, Katsushi, 4,857,154, Cl. 204-27.000.

Nippon Telegraph and Telephone Corporation: *See—*
Torii, Yasuhiro; Matsuo, Seitaro; Watanabe, Iwao; and Shimada, Masaru, 4,857,809, Cl. 315-111.310.

Nippon Telegraph & Telephone Public Corporation: *See—*
Nakano, Kenichi; Umezawa, Yoshihiro; Tokaichi, Tetsuro; Ichimura, Yoshiaki; and Kawabe, Natsuki, 4,857,001, Cl. 439-68.000

Nippon Yakin Kogyo Co., Ltd.: *See—*
Mirura, Ryozo; Okamoto, Yoshio; Takahashi, Hiroki; and Inada, Souichi, 4,856,313, Cl. 72-234.000.

Nishi, Hiroyoshi; Watanabe, Toshiaki; Yuki, Satoshi; Morinaka, Yasuhiro; Iseki, Katsuhiko; and Sakurai, Hiroko, to Mitsubishi Chemical Industries Limited. Prophylactic and therapeutic composition for circulatory disorders and method of treatment. 4,857,542, Cl. 514-404.000

Nishi, Kenji, to Nikon Corporation. Projection exposure apparatus. 4,856,905, Cl. 356-401.000

Nishikawa, Masami, to Ricoh Company, Ltd. Method of making an ion-implanted bonding connection of a semiconductor integrated circuit device. 4,857,484, Cl. 437-209.000.

Nishikawa, Masao; Aoki, Takashi; Sato, Yoichi; and Fukuda, Yukihiro, to Honda Giken Kogyo Kabushiki Kaisha. Automatic shift transmission for vehicles. 4,856,382, Cl. 74-867.000

Nishikawa Rubber Co., Ltd.: *See—*
Marume, Yoshihiro; and Iwamoto, Tadao, 4,857,248, Cl. 264-46.400.

Nishikawa, Toshihiro: *See—*
Fujita, Yoshihiro; and Nishikawa, Toshihiro, 4,857,442, Cl. 430-393.000.

Nishikawa, Yasuo; Miyazuka, Hajime; and Tsuji, Nobuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,857,402, Cl. 428-336.000.

Nishimori, Kadotaro; and Ito, Masazumi, to Minolta Camera Kabushiki Kaisha. Display unit. 4,856,877, Cl. 350-356.000.

Nishimura, Haruo: *See—*
Nishiyama, Masanobu; Nishimura, Haruo; Nakano, Katsuji; Ozaki: Tatsuo; and Kitamoto, Akira, 4,856,854, Cl. 312-38.000.

Nishimura, Katsuhiko: *See—*
Shimbo, Kazuyuki; and Nishimura, Katsuhiko, 4,857,959, Cl. 355-276.000

Nishimura, Sadanori; Makita, Hiroshige; and Ishikawa, Tomoaki, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic transmission apparatus. 4,856,264, Cl. 56-10.900.

Nishimura, Yukinobu: *See—*
Shimomura, Setsuhiro; and Nishimura, Yukinobu, 4,856,475, Cl. 123-339.000.

Nishiyama, Masaki: *See—*
Kusuda, Masataka; Fukuma, Shuji; and Nishiyama, Masaki, 4,857,192, Cl. 210-321.840

Nishiyama, Masanobu; Nishimura, Haruo; Nakano, Katsuji; Ozaki: Tatsuo; and Kitamoto, Akira, to Duskin Co., Ltd.; and Matsushita Electric Industrial Co. Towel dispenser. 4,856,854, Cl. 312-38.000

Nishizawa, Masahiro: *See—*
Hayashi, Nobuaki; Uchino, Shoichi; Tomita, Yoshifumi; Nonogaki, Saburo; and Nishizawa, Masahiro, 4,857,429, Cl. 430-28.000

Niskanen, Juhani; and Pullinen, Martti, to Valmet Oy. Method and device in an adjustable-crown roll. 4,856,155, Cl. 29-113.200.

Nissan Motor Company, Limited: *See—*
Hanaoka, Motoyoshi; and Nakamura, Akira, 4,856,477, Cl 123-399.000
Ishikawa, Yoshikazu, 4,856,417, Cl. 92-233.000.
Maki, Yoshihiro; Matsuyama, Akira; Tanizaki, Katsuji; Okabe, Noboru; Kishida, Katsuhiro; Sakai, Takeshi; Ohgaki, Toshinaga; and Fujita, Masahito, 4,857,267, Cl. 419-31.000
Manabe, Takahiro; Nozu, Mikio; Osada, Yasuhito; and Nomura, Hiroyuki, 4,858,071, Cl. 361-386.000.
Takada, Yutaka; Doi, Koichi; Yamazaki, Tsutomu; and Obata, Yutaka, 4,856,710, Cl. 236-13.000
Uchino, Kenji; and Ohnishi, Kazumasa, 4,857,791, Cl. 310-321.000.
Yamamoto, Yukio, 4,857,754, Cl. 307-10.800.

Nisshin Flour Milling Co., Ltd.: *See—*
Tahara, Yoshiyuki; Koyama, Hiroyasu; Komatsu, Yasuhiro; Kubota, Reiko; and Takahashi, Toshihiro, 4,857,529, Cl. 514-255.000.

Nitto Electric Industrial Co., Ltd.: *See—*
Kusuda, Masataka; Fukuma, Shuji; and Nishiyama, Masaki, 4,857,192, Cl. 210-321.840.

Niwa, Masatake: *See—*
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,857,953, Cl. 354-475.000.

Niwano, Kazuhito; and Ikeda, Tatsuhiko, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing a semiconductor memory device. 4,857,478, Cl. 437-61.000

Nix, Richard A.; and Regula, Paul M., to Automotive Products plc. Hydraulic cylinder structure. 4,856,416, Cl. 92-169.100.

Nobilet, Bernard; Bonhomme, Michel; and Desplat, Philippe, to Propiorga. Installation and plant for the recovery of energy from waste and residues. 4,857,458, Cl. 435-311.000.

Noda, Mitsuo, to Howa Machinery, Ltd. Rodless cylinder assembly. 4,856,415, Cl. 92-88.000.

Nodelman, Neil H.: *See—*
Mafoti, Robson; and Nodelman, Neil H., 4,857,561, Cl. 521-159.000.

Noguchi, Toyosaburo: *See—*
Iwasaki, Yoshihiko; and Noguchi, Toyosaburo, 4,857,350, Cl. 426-506.000

Nohr, Ronald S.; and MacDonald, J. Gavin, to Kimberly-Clark Corporation. Method of forming a nonwoven web from a surface-segregatable thermoplastic composition. 4,857,251, Cl. 264-103.000.

Noirot, Jacques: *See—*
Bonello, Philippe; and Noirot, Jacques, 4,856,721, Cl. 242-7.140.

Noller, Hans G. Light emitting diode spectrophotometer. 4,857,735, Cl. 250-339.000

Nomura, Hiroyuki: *See—*
Manabe, Takahiro; Nozu, Mikio; Osada, Yasuhito; and Nomura, Hiroyuki, 4,858,071, Cl. 361-386.000.

Nomura, Kunio: *See—*
Ota, Yoshio; Goto, Norifumi; Motoyama, Iwao; Iwashita, Tetsushi; and Nomura, Kunio, 4,857,291, Cl. 423-430.000.

Nonogaki, Saburo: *See—*
Hayashi, Nobuaki; Uchino, Shoichi; Tomita, Yoshifumi; Nonogaki, Saburo; and Nishizawa, Masahiro, 4,857,429, Cl. 430-28.000.

Nordhaus, John P., to Scot, Incorporated. Mechanically actuated laser initiator. 4,858,244, Cl. 372-77.000.

Nordischer Maschinenbau Rud. Baader GmbH & Co. KG: *See—*
Behnk, Gunter; and Nuske, Dieter, 4,856,145, Cl. 17-57.000.

Nordischer Maschinenbau Rud. Baader GmbH+CO KG: *See—*
Callsen, Hans; and Muuss, Peter, 4,856,143, Cl. 17-11.000.

Norsk Hydro a.s.: *See—*
Clausen, Edvin L., 4,856,824, Cl. 285-137.100.

Norsolor: *See—*
Hurtel, Patrice; Laurent, Denis; and Rondini, Joseph, 4,857,239, Cl. 562-896.000.

North American Philips Consumer Electronics Corp.: *See—*
Smith, Bobby J., 4,857,898, Cl. 341-22.000.

North American Philips Corporation: *See—*
Goldburt, Efim S.; and Hemmer, Richard E., 4,857,978, Cl. 357-24.000.
Lally, William J.; and Morton, Edward W., 4,857,808, Cl. 315-100.000

North Carolina State University: *See—*
Croom, Warren J., Jr.; and Hagler, Winston M., Jr., 4,857,534, Cl. 514-299.000.

Northern Telecom Limited: *See—*
Garner, John N., 4,856,267, Cl. 57-58.520.
Garner, John N.; Baxter, G. Douglas; and Grant, James C., 4,857,676, Cl. 178-45.000.
Obermeyer, Mark W., 4,856,748, Cl. 248-688.000.
Patterson, Douglas H., 4,858,231, Cl. 370-85.000.

Nortier, Patrice: *See—*
Brunelle, Jean-Pierre; Nortier, Patrice; and Quemere, Eric, 4,857,296, Cl. 423-574.00R.

Notelteirs, Victor R.: *See—*
Janssen, Eduard J. P.; and Notelteirs, Victor R., 4,857,709, Cl. 219-464.000

Nouel, Jean-Marie. Offset plates with two chromium layers. 4,857,436, Cl. 430-276.000.

Novak, Leo J.: *See—*
McCullough, Francis P., Jr.; and Novak, Leo J., 4,857,404, Cl. 428-367.000

Novak, Miloslav. Remote control unit holder assembly. 4,856,658, Cl 211-13.000.

Nowak, David J., to General Electric Company. View-to-view image correction for object motion. 4,858,128, Cl. 364-413.130.

Nowobilski, Jeffert J.: *See—*
Acharya, Arun; Marchese, Michael A.; and Nowobilski, Jeffert J., 4,856,285, Cl. 62-63.000.

Nozawa, Keita: *See—*
Tanikawa, Hirohide; Nakahara, Toshiaki; and Nozawa, Keita, 4,857,432, Cl. 430-106.000

Nozawa, Seiichi: *See—*
Kishiro, Osamu; Kasai, Atsushi; Nozawa, Seiichi; and Kamata, Hiroshi, 4,857,626, Cl. 528-176.000.

Nozu, Mikio: *See—*
Manabe, Takahiro; Nozu, Mikio; Osada, Yasuhito; and Nomura, Hiroyuki, 4,858,071, Cl. 361-386.000.

NTN Toyo Bearing Co., Ltd.: *See—*
Ito, Hideji; Kametaka, Koji; and Tsumori, Yukihisa, 4,856,916, Cl. 384-477.000.

Nukushina, Harunobu; and Sugimoto, Chiaki, to Kabushiki Kaisha Toshiba. Fault diagnostic apparatus for electric appliance. 4,857,918, Cl. 340-870.010.

Nupro Company: *See—*
Gausman, Theodore J.; and Scheffel, Gary W., 4,856,555, Cl. 137-543.170.

Nusbaum, Arthur. Safety net arrangement for multi-floor buildings under construction, and method. 4,856,615, Cl. 182-82.000.

Nuske, Dieter: *See—*
Behnk, Gunter; and Nuske, Dieter, 4,856,145, Cl. 17-57.000.

Nutter, Harry A., Jr.: *See—*
Graff, John M.; Nutter, Harry A., Jr.; and Stoltze, Leon, 4,856,162, Cl. 29-156.80B.

O M Kiki Co., Ltd.: *See—*
Tokuzo, Kobayashi, 4,856,256, Cl. 52-805.000.

Oak, Reginald O.; and Preinsberger, William J. Retainer cap for spinning rod holder. 4,856,220, Cl. 43-21.200.

Oba, Masao: *See—*
Takeuchi, Kunihiko; Oba, Masao; and Horinouchi, Shinichi, 4,856,177, Cl. 29-568.000.

Obal, Michael S. Indicator assembly. 4,856,564, Cl. 141-95.000.

Obata, Akira: *See—*
Kohno, Masahiro; Obata, Akira; Kitamura, Takayuki; and Okazaki, Kakuma, 4,856,765, Cl. 267-166.000.

Obata, Takeo; Takata, Akira; and Fujioka, Takuro, to Ricoh Company, Ltd. Logic integrated circuit device selecting as outputs any two of two inputs and two logical combinations of the inputs. 4,857,775, Cl. 307-468.000

Obata, Yutaka: *See—*
Takada, Yutaka; Doi, Koichi; Yamazaki, Tsutomu; and Obata, Yutaka, 4,856,710, Cl. 236-13.000.

Oberle, Edmond M.; and Klein, Jean M., to Kuhn s.a. Machine for working soil. 4,856,598, Cl. 172-54.500.

Obermeyer, Mark W., to Northern Telecom Limited. Leg assembly for a keyboard or the like. 4,856,748, Cl. 248-688.000.

Obrero, Faustino P.; and Schnitzler, Wilfred H., to Del Monte Corporation. Method for treating pineapple to inhibit browning. 4,857,344, Cl. 426-308.000

O'Brien, John P.: *See—*
De Lucca, George V.; Kezar, Hollis S., III; and O'Brien, John P., 4,857,403, Cl. 428-364.000.

Oce-Nederland B.V.: *See—*
Berkers, Jacobus A. P., 4,856,870, Cl. 350-252.000.

Ochel, Klaus-Peter; Krupp, Joachim; Heger, Josef; and Schweitzer, Martin, to Ec Erdolchemie GmbH; and Bayer Aktiengesellschaft. Device for feeding gases into combustion chambers and process for diminishing pollutants during combustion operations. 4,856,985, Cl. 431-202.000.

O'Connor, Timothy E.; and Dupere, Sherry L., to Health Research, Inc. C-reactive proteins in treatment of animal and human cancers. 4,857,314, Cl. 424-85.100.

OCS, Inc.: *See—*
Oglevee, James R.; and Oglevee, Kirk A., 4,856,227, Cl. 47-17.000.

Oculus Optikgeraete GmbH: *See—*
Spitznas, M.; Veit, Wolfgang; and Kirchhuebel, Rainer, 4,856,872, Cl. 350-255.000.

Ocvirk, Norbert; and Weise, Lutz, to Alfred Teves GmbH. Brake system with slip control. 4,856,852, Cl. 303-114.000.

Oda, Isao; and Ishida, Yoshihiko, to NGK Insulators, Ltd. Metal-ceramic combination. 4,856,970, Cl. 417-407.000.

Oda, Takashi: *See—*
Mori, Toshihiro; Oda, Takashi; and Ohyagi, Takashi, 4,857,911, Cl. 340-825.440.

Oda, Toshikazu: *See—*
Tanaka, Tomeo; and Oda, Toshikazu, 4,857,677, Cl. 200-5.00R.

Odaka, Masanori: *See—*
Ogiue, Katsumi; Suzuki, Yukio; Masuda, Ikuro; Odaka, Masanori; and Uchida, Hideaki, 4,858,189, Cl. 365-203.000.

Oehlenschlaeger, Ulla; Pedersen, Jan R.; and Sorensen, Erling, to PLM AB. Method for the closing of containers. 4,857,369, Cl. 428-35.700.

Oerlikon-Buhrle U.S.A. Inc.: *See—*
Landau, Richard F.; Millikin Jr., William E.; Puchacz, Jerzy P.; Reyes, Manolito Q.; and Schadler, Walter, 4,857,160, Cl. 204-192.120.

Oesch, Urs: *See—*
Simon, Wilhelm; and Oesch, Urs, 4,857,573, Cl. 524-291.000.

Ogasawara, Koichi, to Mitsubishi Denki Kabushiki Kaisha. Method for error correction in memory system. 4,858,236, Cl. 371-38.000.

Ogawa, Hiroshi; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,857,388, Cl. 428-212.000.

Ogawa, Kanagawa; and Ito, Yasushi, to Sumitomo Electric Industries, Ltd. Method of producing optical fiber cable. 4,856,266, Cl. 57-9.000.

Ogawa, Masao; Ito, Noboru; and Yamamura, Yukio, to Okamura & Co. Needle thread tensioning device for a swing machine. 4,856,443, Cl. 112-241.000.

Ogawa, Tadashi; and Takahashi, Osamu, to Fuji Photo Film Co., Ltd. Silver halide color photographic photosensitive materials. 4,857,449, Cl. 430-546.000.

Ogawa, Tadashi: *See—*
Hirose, Takeshi; Ogawa, Tadashi; and Furutachi, Nobuo, 4,857,444, Cl. 430-505.000.

Ogawa, Tetsuji; and Kato, Masao, to Hitachi, Ltd. Priority control architecture for input/output operation. 4,858,108, Cl. 364-200.000.

Ogawa, Toru, to Namco, Ltd. Image display apparatus. 4,857,905, Cl. 340-748.000.

Ogihara, Satoru: *See—*
Shinohara, Hiroichi; Suzuki, Hideo; and Ogihara, Satoru, 4,858,077, Cl. 361-414.000.

Ogilvie, Frank R.: *See—*
Ogilvie, James W.; and Ogilvie, Frank R., 4,856,385, Cl. 81-57.390.

Ogilvie, James W.; and Ogilvie, Frank R., to Reagents of the University of Minnesota. Squeeze motion to rotary motion tilt head driver. 4,856,385, Cl. 81-57.390.

Ogino, Seiichi: *See—*
Mochizuki, Wataru; Ogino, Seiichi; and Takano, Hirohiko, 4,857,812, Cl. 318-15.000.

Ogiso, Takasi; Monma, Yoshiyuki; and Aono, Toshiaki, to Fuji Photo Film Co., Ltd. Image forming apparatus. 4,857,961, Cl. 355-27.000.

Ogiue, Katsumi; Suzuki, Yukio; Masuda, Ikuro; Odaka, Masanori; and Uchida, Hideaki, to Hitachi, Ltd. Semiconductor integrated circuit. 4,858,189, Cl. 365-203.000.

Oglevee, James R.; and Oglevee, Kirk A., to OCS, Inc. Plant oriented control system based upon vapor pressure deficit data. 4,856,227, Cl. 47-17.000.

Oglevee, Kirk A.: *See—*
Oglevee, James R.; and Oglevee, Kirk A., 4,856,227, Cl. 47-17.000.

Ogura, Setsuo; Kamegaki, Kazuyuki; Yamazaki, Kouichi; Miyazaki, Hideo; Kitamura, Yukinori; and Mayuzumi, Shirou, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Semiconductor device. 4,857,987, Cl. 357-45.000.

Ogura, Shigetaro: *See—*
Miyawaki, Mamoru; Ogura, Shigetaro; and Matsumoto, Kazuya, 4,856,861, Cl. 350-96.140.

Ogusu, Yoshiyuki: *See—*
Ishiwatari, Masaaki; Tsutsumi, Yuji; Ogusu, Yoshiyuki; and Kimura, Yoshihiro, 4,857,304, Cl. 424-59.000.

Ohara, Toru: *See—*
Matsuo, Kenichi; Nakata, Muneo; and Ohara, Toru, 4,857,875, Cl. 335-297.000

Ohara, Yuji; and Watanabe, Hideo, to Fuji Photo Film Co., Ltd. Light scanning recording device. 4,858,019, Cl. 358-474.000.

Ohashi, Michiya, to Tomy Kogyo Co., Inc. Light projecting toy musical box. 4,858,079, Cl. 362-35.000.

Ohashi, Ryota; Kawamura, Masahisa; and Shibata, Jiro, to Kanzaki Kokyukoki Mfg. Co. Ltd. Two-stage flow divider with constant orifice first stage in hydraulic system for working vehicles. 4,856,277, Cl. 60-422.000.

Ohashi, Ryota: *See—*
Fujisaki, Koichiro; Ohashi, Ryota; and Nemoto, Shusuke, 4,856,368, Cl. 74-606.00R.

Ohba, Masatoshi: *See—*
Sato, Ryuichi; Taniguchi, Tsutomu; and Ohba, Masatoshi, 4,857,757, Cl. 307-113.000.

Ohba, Naohiko, to Honda Giken Kogyo Kabushiki Kaisha. Mount structure for differential gearbox. 4,856,751, Cl. 248-638.000.

Ohdaira, Hirosi: *See—*
Saito, Masayuki; Niitsuma, Akira; Ohdaira, Hirosi; Tanuma, Chiaki; and Mori, Miki, 4,857,482, Cl. a37-209.000.

Ohgaki, Toshinaga: *See—*
Maki, Yoshihiro; Matsuyama, Akira; Tanizaki, Katsuji; Okabe, Noboru; Kishida, Katsuhiro; Sakai, Takeshi; Ohgaki, Toshinaga; and Fujita, Masahito, 4,857,267, Cl. 419-31.000.

Ohi Seisakusho Co., Ltd.: *See—*
Nakamura, Hitoshi; and Hori, Yasuaki, 4,856,829, Cl. 292-216.000.

Ohkawa, Hiroyuki: *See—*
Ito, Yukio; Yamada, Kimichika; and Ohkawa, Hiroyuki, 4,858,042, Cl. 360-96.500.

Ohkoshi, Akio; Nakagawa, Hideaki; Tsuruta, Koji; Sugii, Yasuyoshi; and Wada, Haruaki, to Sony Corporation. Electron beam indicator tube with accelerating electrode. 4,857,800, Cl. 313-495.000.

Ohkoshi, Akio: *See—*
Ito, Masamichi; Ohkoshi, Akio; Shizukawa, Kenjiro; Hayata, Terunobu; Furuya, Tomiaki; Yamanaka, Susumu; and Koezuka, Junji, 4,857,499, Cl. 502-326.000.

Ohkubo, Yukitoshi: *See—*
Sakata, Hajime; Watanabe, Yasuyuki; Yamanobe, Masato; Ohkubo, Yukitoshi; and Nagano, Akihiro, 4,856,869, Cl. 350-162.180.

Ohmuro, Hiroaki, to Yamaha Corporation. Timpani. 4,856,406, Cl. 84-419.000.

Ohnemuller, Hans-Joachim: *See—*
Leiber, Heinz; Ohnemuller, Hans-Joachim; and Kastner, Klaus, 4,856,610, Cl. 180-197.000.

Ohnishi, Kazumasa: *See—*
Uchino, Kenji; and Ohnishi, Kazumasa, 4,857,791, Cl. 310-321.000.

Ohno, Hiroyuki: *See—*
Toda, Masaaki; Ohuchida, Shuichi; and Ohno, Hiroyuki, 4,857,537, Cl. 514-365.000.

Ohshima, Shigeru: *See—*
Fukami, Kiyoshi; Sekiguchi, Takeshi; and Ohshima, Shigeru, 4,857,997, Cl. 358-55.000.

Ohshita, Koichi, to Nikon Corporation. Photo-taking lens for an underwater camera. 4,856,880, Cl. 350-418.000.

Ohta, Kenji: *See—*
Takahashi, Akira; Murakami, Yoshiteru; Mieda, Michinobu; Miyake, Tomoyuki; and Ohta, Kenji, 4,858,212, Cl. 369-13.000.

Ohta, Yoshihiro: *See—*
Hirao, Shozo; Usui, Hiroaki; Ohta, Yoshihiro; Nakai, Takashi; Ishikawa, Hiroyuki; and Konishi, Satoru, 4,857,365, Cl. 427-297.000.

Ohtagaki, Shigeki: *See—*
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,813, Cl. 280-703.000.
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,815, Cl 280-707.000.

Ohtani, Hitoshi: *See—*
Murai, Shunji; Ohtomo, Fumio; and Ohtani, Hitoshi, 4,858,157, Cl. 364-560.000.

Ohte, Akira: *See—*
Iwaoka, Hideto; Ohte, Akira; and Akiyama, Koji, 4,856,899, Cl. 356-346.000.

Ohto, Takeshi: *See—*
Kitagaki, Kazukuni; and Ohto, Takeshi, 4,858,004, Cl. 358-133.000.

Ohtomo, Fumio: *See—*
Murai, Shunji; Ohtomo, Fumio; and Ohtani, Hitoshi, 4,858,157, Cl. 364-560.000.

Ohuchida, Shuichi: *See—*
Toda, Masaaki; Ohuchida, Shuichi; and Ohno, Hiroyuki, 4,857,537, Cl. 514-365.000.

Ohwa, Nobutaka: *See—*
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Aburaya, Toshio, 4,856,798, Cl. 280-6.110.

Ohyagi, Takashi: *See—*
Mori, Toshihiro; Oda, Takashi; and Ohyagi, Takashi, 4,857,911, Cl. 340-825.440.

Oikawa, Takahiro, to Yazaki Corporation. Headlight moving apparatus for automotive vehicle. 4,858,080, Cl. 362-61.000.

Oike, Hiroshi, to Kabushiki Kaisha Toshiba. Temperature controller and method of temperature control for use in a refrigerating device. 4,856,287, Cl. 62-126.000.

Oiso, Hisayoshi: *See—*
Ishida, Kunio; Saito, Satoshi; Habuto, Akinaka; Murata, Tadahiko; Oiso, Hisayoshi; Joyama, Norio; and Fujimoto, Kazuhiro, 4,857,354, Cl. 426-558.000.

Okabe, Noboru: *See—*
Maki, Yoshihiro; Matsuyama, Akira; Tanizaki, Katsuji; Okabe, Noboru; Kishida, Katsuhiro; Sakai, Takeshi; Ohgaki, Toshinaga; and Fujita, Masahito, 4,857,267, Cl. 419-31.000.

Okabe, Yoshimi; and Kikuchi, Katsumi, to Tokyo Electric Power Co., The; and Ishikwajima-Harima Jukogyo Kabushiki Kaisha. Nondestructive inspection apparatus for heat-transfer tubes in boilers. 4,856,353, Cl. 73-865.800.

Okada, Kazuo; and Konishi, Masahiro, to Fuji Photo Film Co., Ltd. Device for extracting still picture frames from a moving image video signal and recording same on a magnetic recording medium. 4,858,032, Cl. 360-91.000.

Okada, Kunio: *See—*
Kawase, Tsunezo; Koroku, Shuchiro; and Okada, Kunio, 4,856,490, Cl. 125-21.000.

Okada, Takehiko, to Mita Industrial Co., Ltd. Copying machine having an intermediate tray. 4,857,969, Cl. 355-72.000.

Okamoto, Kiyohide; Okita, Ryosuke; and Yamada, Masaya, to Mitsubishi Denki Kabushiki Kaisha. Permanent magnet coupling torque limiter. 4,856,631, Cl. 192-21.500.

Okamoto, Shinji; Minakawa, Masaaki; Neki, Youiti; and Nakagiri, Masasi, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Hydrolyzed ethylene-vinyl acetate copolymer. 4,857,589, Cl. 525-60.000.

Okamoto, Yoshio: *See—*
Mirura, Ryozo; Okamoto, Yoshio; Takahashi, Hiroki; and Inada, Souichi, 4,856,313, Cl. 72-234.000.

Okamura & Co.: *See—*
Ogawa, Masao; Ito, Noboru; and Yamamura, Yukio, 4,856,443, Cl 112-241.000.

Okano, Shinobu: *See—*
Sakata, Kei; Hashiguchi, Koichi; and Okano, Shinobu, 4,857,117, Cl. 148-12.00C.

Okawa, Dobson; Pang, Wing S.; Ngo, Dang; and Shibata, George, to Beckman Instruments, Inc. Reaction temperature control system. 4,858,155, Cl. 364-557.000.

Okawa, Susumu: *See—*
Kouno, Katsumi; Okawa, Susumu; Sugaya, Masami; and Soga, Yoshinobu, 4,857,034, Cl. 474-28.000.

Okawa, Teppei: *See—*
Furusaki, Keizo; Nasu, Mineji; Matsuura, Toshitaka; Takami, Akio; and Okawa, Teppei, 4,857,275, Cl. 422-98.000.

Okazaki, Kakuma: *See—*
Kohno, Masahiro; Obata, Akira; Kitamura, Takayuki; and Okazaki, Kakuma, 4,856,765, Cl. 267-166.000.

Okazaki, Ken; Satou, Kazuo; and Yamamoto, Junichi, to Mazda Motor Corporation. Mechanical parts of valve driving mechanism for internal combustion engine. 4,856,469, Cl. 123-90.510.

Oki Electric Industry Co., Ltd.: *See—*
Kanamori, Jun, 4,857,477, Cl. 437-47.000.
Kikuchi, Hiroshi; Tanuma, Jiro; Ishimizu, Hideaki; Uchida, Takao; and Asaka, Toshiyuki, 4,857,005, Cl. 439-140.000.

Okine, Richard K.: *See—*
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,856,146, Cl. 19-0.350.
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,856,147, Cl. 19-0.350.
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,857,385, Cl. 428-189.000.

Okino, Tadashi, to Canon Kabushiki Kaisha. Image processing apparatus. 4,858,028, Cl. 368-335.000.

Okino, Tadashi: *See—*
Fukushima, Nobuo; Okino, Tadashi; and Sakai, Shinji, 4,857,952, Cl. 354-452.000.

Okita, Ryosuke: *See—*
Okamoto, Kiyohide; Okita, Ryosuke; and Yamada, Masaya, 4,856,631, Cl. 192-21.500.

Okitaka, Takenori, to Mitsubishi Denki Kabushiki Kaisha. Input protecting device for a semiconductor circuit device. 4,858,055, Cl. 361-91.000.

Oku, Masuo; Kudo, Yoshimichi; Kuroyanagi, Tomomitsu; Kondo, Kazuo; Tsukazaki, Hisanobu; Ikeda, Tetsuya; Nakashima, Akio; and Kimura, Takashi, to Hitachi, Ltd.; and Hitachi Video Engineering, Inc. Reproducing apparatus of a video disc player. 4,858,030, Cl. 358-342.000.

Oku, Teruo; Todo, Eishiro; Kasahara, Chiyoshi; Nakamura, Katsuya; Kayakiri, Hiroshi; and Hashimoto, Masashi, to Fujisiwa Pharmaceutical Co., Ltd. Diphosphonic acid compounds, processes for the preparation thereof and pharmaceutical composition comprising the same. 4,857,513, Cl. 514-76.000.

Okubo, Yoshimitsu: *See—*
Maruyama, Kakuji; Kondo, Takeshi; and Okubo, Yoshimitsu, 4,856,298, Cl. 66-40.000.

Okuda, Hajime: *See—*
Suzuki, Nobuo; Morinaga, Motoyasu; Furuyama, Hideto; Hirayama, Yuzo; Okuda, Hajime; Nakamura, Masaru; and Motegi, Nawoto, 4,858,241, Cl. 372-46.000.

Okuda, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Ignition system for an internal combustion engine. 4,856,488, Cl. 123-599.000.

Okudaira, Sadayuki: *See—*
Tachi, Shinichi; Okudaira, Sadayuki; Tsujimoto, Kazunori; and Mukai, Kiichiro, 4,857,137, Cl. 156-640.000.

Okumura, Minoru, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Powdery compound emulisifier and its production. 4,857,358, Cl. 426-654.000.

Okuno, Takuo, to Canon Kabushiki Kaisha. Vibration wave motor. 4,857,793, Cl. 310-328.000.

Okura, Masahiko. Short-circuit device of a gas-filled triple-pole discharge-tube type arrester for telephone line use. 4,858,059, Cl. 361-124.000.

Oldacre, A. Q.: *See—*
Taylor, Adoyal, 4,856,226, Cl. 43-113.000.

Olender, Kornel: *See—*
Cieslik, Jerzy; Flak, Marek; Kuczka, Eugeniusz; Oles, Franciszek; Marszycki, Zdsizlaw; and Olender, Kornel, 4,856,940, Cl. 405-296.000.

Oles, Franciszek: *See—*
Cieslik, Jerzy; Flak, Marek; Kuczka, Eugeniusz; Oles, Franciszek; Marszycki, Zdsizlaw; and Olender, Kornel, 4,856,940, Cl. 405-296.000.

Olin Corporation: *See—*
Burke, W. K., 4,856,271, Cl. 60-39.020.
Cawlfield, David W., 4,857,158, Cl. 204-92.000.
Habbe, Randall G.; and Bo..kstruck, Herman N., 4,856,160, Cl. 29-1.230.

Oliver Products Company: *See—*
Kruse, Gary L.; and Petersen, Bernard L., 4,856,398, Cl. 83-425.200.

Olmstead, Neil R.: *See—*
Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; Frasier, Richard A.; Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; and Olmstead, Neil R., 4,858,011, Cl. 358-181.000

Olson, Kenneth A., to Tjernlund Products, Inc. Apparatus for exhausting combustion gases from a gas water heater. 4,856,982, Cl. 431-20.000.

Olsovsky, Terry. Alarm clock latch device. 4,858,211, Cl. 368-262.000.

Olsson, Ingemar: *See—*
Soremark, Christer; and Olsson, Ingemar, 4,857,126, Cl. 156-205.000.

Oltmann, Harold D.: *See—*
Chen, Shu P.; Engelmann, Theodore R.; and Oltmann, Harold D., 4,857,257, Cl. 264-310.000.

Olympus Optical Co., Ltd.: *See—*
Funada, Saburo, 4,858,220, Cl. 369-116.000.
Matsumoto, Kazuya; and Nakamura, Tsutomu, 4,857,981, Cl. 357-30.000.
Nakajima, Yukio; Miyasaka, Tetsuo; and Kawai, Sumio, 4,857,951, Cl. 354-400.000.
Sanagi, Kenichiro, 4,857,057, Cl. 604-164.000.
Tohjoh, Yoshikazu; Hasegawa, Akira; and Sato, Tomoaki, 4,856,495, Cl. 128-6.000.
Yoshikawa, Shozi, 4,858,219, Cl. 369-116.000.

O'Malley, Michael T.; and Johnston, Robert G., to Newbridge Networks Corp. Paging system. 4,857,884, Cl. 340-311.100.

Ommeren, James V.: *See—*
Mattiola, Paul A.; and Ommeren, James V., 4,856,284, Cl. 62-55.000.

Omron Tateisi Electronics Co.: *See—*
Matsuo, Kenichi; Nakata, Muneo; and Ohara, Toru, 4,857,875, Cl. 335-297.000.

Sato, Ryuichi; Taniguchi, Tsutomu; and Ohba, Masatoshi, 4,857,757, Cl. 307-113.000.

Ona, Isao; and Ozaki, Masaru, to Toray Silicone Co., Ltd. Fiber-treating composition comprising microemulsion of carboxy-substituted siloxane polymer and use thereof. 4,857,212, Cl. 252-8.600.

Onda, Kenichi; Matsuda, Yasuo; Abe, Kojin; Iwafuji, Yasunori; Aoyama, Hiroyuki; and Yoshinaka, Hideo, to Hitachi, Ltd.; and Hitachi Metals, Ltd. Resonant converter for stabilized operation of switching devices. 4,858,096, Cl. 363-22.000.

O'Neal, Darrell D.; and Stewart, Parks C. Apparatus for manufacturing pillowcases. 4,856,439, Cl. 112-10.000.

O'Neill, Charles E.: *See—*
Victorovich, Grigori S.; and O'Neill, Charles E., 4,857,104, Cl. 75-21.000.

Ong, Linda J.: *See—*
Waterbury, John B.; Watson, Stanley W.; Glazer, Alexander N.; and Ong, Linda J., 4,857,474, Cl. 436-501.000.

Ong, Shauchi, to International Business Machines Corporation. Apparatus for determining the minimum number of storage elements required to store the states of a circuit. 4,858,179, Cl. 364-900.000.

Onisawa, Kenichi: *See—*
Fuyama, Moriaki; Tamura, Katsumi; Taguchi, Kazuo; Onisawa, Kenichi; Sato, Akira; Hashimoto, Kenichi; Nakayama, Takahiro; and Abe, Yoshio, 4,857,802, Cl. 313-506.000.

Onishi, Masao: *See—*
Kurono, Masayasu; Baba, Yutaka; Mitani, Takahiko; Onishi, Masao; Kondo, Yasuaki; and Sawai, Kiichi, 4,857,521, Cl. 514-206.000.

Ono, Mitsunori: *See—*
Tamoto, Koji; and Ono, Mitsunori, 4,857,447, Cl. 430-544.000.

Ono Pharmaceutical Co., Ltd.: *See—*
Toda, Masaaki; Ohuchida, Shuichi; and Ohno, Hiroyuki, 4,857,537, Cl. 514-365.000.

Ono, Youji: *See—*
Terada, Haruyoshi; Ono, Youji; Satoh, Yokichi; and Kaneko, Hideaki, 4,857,225, Cl. 252-100.000.

Ookawa, Katsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Video recorder with field memory. 4,858,029, Cl. 358-340.000.

Optische Werke G. Rodenstock: *See—*
Guilino, Gunther; and Pfeiffer, Herbert, 4,856,889, Cl. 351-159.000.

Orgo-Thermit Inc.: *See—*
Kachik, Robert H., 4,856,170, Cl. 29-402.180.

Orthoplant Endoprothetik GmbH: *See—*
Schelhas, Klaus-Dieter, 4,856,503, Cl. 128-92.0VJ.

Osada, Masaru: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; Negishi, Ichiro; and Osada, Masaru, 4,857,995, Cl. 358-47.000.

Osada, Yasuhito: *See—*
Manabe, Takahiro; Nozu, Mikio; Osada, Yasuhito; and Nomura, Hiroyuki, 4,858,071, Cl. 361-386.000.

Osaka Diamond Industrial Co., Ltd.: *See—*
Kawase, Tsunezo; Koroku, Shuichiro; and Okada, Kunio, 4,856,490, Cl. 125-21.000.

Osaka, Susumu: *See—*
Minami, Katsuji; Murata, Shinichi; Tsujimoto, Susumu; Matuzaki, Yukinori; Yukawa, Shogo; and Osaka, Susumu, 4,856,574, Cl. 160-168.100.

Osaka Taiyu Co., Ltd.: *See—*
Tabayashi, Toshikazu, 4,856,959, Cl. 414-451.000.

Osawa, Shigenobu; and Itaya, Keiji, to Kabushiki Kaisha Toshiba. Electronic copying apparatus having function of partially changing image reproduced from original image. 4,857,958, Cl. 355-218.000.

Osawa, Yoshinori. Support plate for tiles. 4,856,245, Cl. 52-386.000.

Osbon, Julian W., to Osbon Medical Systems, Ltd. Vacuum generating and constriction apparatus for augmenting male potency. 4,856,498, Cl. 128-79.000.

Osbon Medical Systems, Ltd.: *See—*
Osbon, Julian W., 4,856,498, Cl. 128-79.000.

Osborn, Paul V.; and Tendick, Clyde C., to Mobil Oil Corporation. Flexible material folding apparatus. 4,857,039, Cl. 493-416.000.

Oshida, Tsutomu, to Nifco Inc. Cylinder type air damper with filter for storage box. 4,856,625, Cl. 188-282.000.

Oshima, Mitsuaki; Izaki, Masataka; Kajino, Jirou; Igarashi, Yoshiaki; and Mitani, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Camera apparatus with means for suppressing fluctuations of the image. 4,856,882, Cl. 350-500.000.

Oshima, Shinji; and Shimada, Hiromi, to NGK Insulators, Ltd. Method of drying ceramic cylindrical bodies. 4,857,245, Cl. 264-25.000.

Ossid Corporation: *See—*
Tolson, Sidney S.; and Brumberg, Charles S., 4,856,704, Cl. 229-2.50R.

Osuch, Christopher E.: *See—*
Hopf, Frederick R.; McFarland, Michael J.; and Osuch, Christopher E., 4,857,435, Cl. 430-192.000.

O'Sullivan, Anthony C.: *See—*
Frei, Bruno; O'Sullivan, Anthony C.; and Gehret, Jean-Claude, 4,857,509, Cl. 514-30.000.

O'Sullivan, Terence J.; Mould, George W.; Armstrong, David E.; Foulkes, Graham S.; and Davis, Michael B., to General Motors Corporation. Manual headrest. 4,856,848, Cl. 297-391.000.

Ota, Yoshio; Goto, Norifumi; Motoyama, Iwao; Iwashita, Tetsushi; and Nomura, Kunio, to Yabashi Industries Co., Ltd. Process of producing plate-shaped calcium carbonate particles. 4,857,291, Cl. 423-430.000.

Otomo, Ruyzi: *See—*
Abe, Akira; Nakajima, Junya; Takase, Haruo; Uenaka, Kazushige; and Otomo, Ruyzi, 4,857,441, Cl. 430-393.000.

Otomo, Shigekazu: *See—*
Kobayashi, Toshio; Otomo, Shigekazu; Nakatani, Ryoichi; and Kumasaka, Noriyuki, 4,858,049, Cl. 360-126.000.

Otonari, Satoshi; Sato, Yoshinori; Masuda, Narihiro; and Kotani, Tomoyuki, to Daifoil Company, Ltd. Minute-cellular polyester film provided with coating. 4,857,396, Cl. 428-315.500.

Otsuki, Hajime: *See—*
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,857,965, Cl. 355-45.000.
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,857,966, Cl. 355-45.000.

Ott, Hans: *See—*
Kipphan, Helmut; Jeschke, Willi; Ott, Hans; and Graf, Jean-Pierre, 4,856,903, Cl. 356-400.000.

Ott, Holger: *See—*
Wagner, Hildebert; Zenk, Meinhart H.; and Ott, Holger, 4,857,512, Cl. 514-54.000.

Ott, Karl-Heinz: *See—*
Eichenauer, Herbert; Buding, Hartmuth; Doring, Joachim; Casper, Rudolf; and Ott, Karl-Heinz, 4,857,591, Cl. 525-74.000.

Ouillon, Rene; and Langlois, Roger, to Intertechnique. Two main piloted valves demand regulator for aviators. 4,856,507, Cl. 128-204.260.

Ovens, Kevin M.; and Strong, Bobby D., to Texas Instruments Incorporated. Method of making an ECL logic circuit having diode-clamped loads and reference bias. 4,857,771, Cl. 307-455.000.

Overbay, Mark A., to Combustion Engineering, Inc. Inspection probe manipulator. 4,856,354, Cl. 73-866.500.

Overbergh, Noel M. M.; and Vansant, Jan L. M. F. G., to Raychem Corporation. Heat recoverable article. 4,857,370, Cl. 422-34.900.

Overhauser, Albert W.; and Maserjian, Joseph, to California Institute of Technology. Hydrogen-stabilized semiconductor devices. 4,857,976, Cl. 357-23.100.

Owen, Hartley: *See—*
Harandi, Mohsen N.; and Owen, Hartley, 4,857,667, Cl. 585-403.000.

Owen, William: *See—*
Shultz, Preston D.; and Owen, William, 4,857,011, Cl. 439-469.000

Owens-Corning Fiberglas Corporation: *See—*
Ault, Russell L.; Legg, Wesley E.; and Mott, Richard A., 4,856,243, Cl. 52-304.000.

Oxford Superconducting Technology: *See—*
Marancik, William G.; Hong, Seungok; and Grabinsky, Glenn W., 4,857,675, Cl. 174-15.400.

Ozaki, Masaru: *See—*
Ona, Isao; and Ozaki, Masaru, 4,857,212, Cl. 252-8.600.

Ozaki, Minoru: *See—*
Matsuda, Fumio; and Ozaki, Minoru, 4,858,235, Cl. 371-38.000.

Ozaki: Tatsuo: *See—*
Nishiyama, Masanobu; Nishimura, Haruo; Nakano, Katsuji; Ozaki: Tatsuo; and Kitamoto, Akira, 4,856,854, Cl. 312-38.000.

Ozaki, Yasuhiko: *See—*
Hayashi, Kimiaki; Ozaki, Yasuhiko; Yamada, Kenji; Takenaga, Hideyuki; and Inoue, Ichizo, 4,857,543, Cl. 314-444.000.

Ozarski, Robert G.: *See—*
Myers, David W.; Ozarski, Robert G.; Perera, Thiloma I.; Schipper, John F.; Tan, Raul V.; and Watts, Michael P. C., 4,857,738, Cl. 250-372.000.

Ozawa, Ken, to Ozawa R & D., Inc. Variable displacement diaphragm pump. 4,856,966, Cl. 417-214.000.

Ozawa, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing control apparatus for an internal combustion engine. 4,856,489, Cl. 123-643.000.

Ozawa R & D., Inc.: *See—*
Ozawa, Ken, 4,856,966, Cl. 417-214.000.

Paar, Willibald; and Arzt, Anton, to Vianova Kunstharz, A.G. Cationic paint binders comprising the reaction product of substituted ureas, formaldehyde, and phenols. 4,857,581, Cl. 524-591.000.

Paccar Inc.: *See—*
Stephens, Donald L.; and Saunders, James, 4,856,812, Cl. 280-678.000.

Pachonik, Horst: *See—*
Pichler, Alfred; Hertrampf, Joachim; and Pachonik, Horst, 4,856,181, Cl. 29-603.000.

Pacione, Albert J. Tool for picking up litter. 4,856,835, Cl. 294-61.000.

Padco, Inc.: *See—*
Janssen, Robert I., 4,856,136, Cl. 15-244.300.

Padliya, Dilipkumar: *See—*
Ahlberg, David T.; Padliya, Dilipkumar; and Reed, Jeffery T., 4,857,632, Cl. 528-487.000.

Page, Darrin J.: *See—*
Butters, Alan; Blackmore, Diana C.; and Page, Darrin J., 4,857,386, Cl. 428-206.000.

Page, Graham A.: *See—*
Butters, Alan; and Page, Graham A., 4,857,568, Cl. 523-456.000.

Page, Philip R.: *See—*
Heggie, William; Page, Philip R.; Villax, Ivan; Ghatak, Indira; and Hursthouse, Michael, 4,857,235, Cl. 260-351.500.

Pail, Ofer. Portable puppet theater kit. 4,857,028, Cl. 446-82.000.

Pain Suppression Labs, Inc.: *See—*
Liss, Saul; and Liss, Bernard, 4,856,526, Cl. 128-422.000.

Palazzola, Sam. Wastebasket bag retainer. 4,856,675, Cl. 220-404.000.

Palitex Project Company GmbH: *See—*
Langen, Manfred; and Fink, Heinz, 4,856,270, Cl. 57-281.000.

Palu, Attilio D., to Fister S.p.A. Windscreen wiper arm of improved type. 4,856,137, Cl. 15-250.310.

Paluch, Bernard R. Resuscitation valve. 4,856,548, Cl. 137-102.000.

Panametrics, Inc.: *See—*
Smalling, Jack W.; Braswell, Leonard D.; and Lynnworth, Lawrence C., 4,856,321, Cl. 73-40.50A.

Pang, Roland H.; and Chiu, Edison H., to Texas Instruments Incorporated. High speed zero power reset circuit for CMOS memory cells. 4,858,182, Cl. 365-156.000.

Pang, Roland H.: *See—*
Scharrer, Carl J.; and Pang, Roland H., 4,858,183, Cl. 365-174.000.

Pang, Wing S.: *See—*
Okawa, Dobson; Pang, Wing S.; Ngo, Dang; and Shibata, George, 4,858,155, Cl. 364-557.000.

Papanicolas, James N.: *See—*
Prunkard, Randall K., 4,857,783, Cl. 310-68.00B.

Paparatto, Giuseppe; and Gregorio, Guglielmo, to Montedipe S.p.A. Process for the manufacture of iodine. 4,857,295, Cl. 423-502.000.

Papay, Andrew G.; and Hartley, Rolfe J., to Ethylk Petroleum Additives, Inc. Oil-soluble phosphorus antiwear additives for lubricants. 4,857,214, Cl. 252-32.500.

Paper Converting Machine Company: *See—*
Bradley, John J., 4,856,725, Cl. 242-66.000.

Papst, Gero: *See—*
Hauk, Rolf; and Papst, Gero, 4,857,105, Cl. 75-38.000.

Parienti, Raoul. Electronic lock. 4,856,310, Cl. 70-379.00R.

Paris, Jacques. Novel pharmaceutical compositions endowed with anti-progesteronic properties and a process for making the same. 4,857,519, Cl. 514-182.000.

Park, Hong K. Threading assembly. 4,856,946, Cl. 408-122.000.

Parker, Birch F. Flexible joint for connecting two pipes. 4,856,822, Cl. 285-62.000.

Parker, Daniel, to Beloit Corporation. Method and apparatus for headbox jet velocity measurement. 4,856,895, Cl. 356-28.000.

Parker, Geoffrey C., to Parker Limited. Roof structure. 4,856,236, Cl. 52-11.000

Parker Limited: *See—*
Parker, Geoffrey C., 4,856,236, Cl. 52-11.000.

Parliment, Thomas H.; Cipriano, Joseph J.; and Scarpellino, Richard, to General Foods Corporation. Aroma release during microwave cooking. 4,857,340, Cl. 426-96.000.

Partovi, Hamid; and Van Buskirk, Michael A., to Advanced Micro Devices, Inc. Output buffer arrangement for reducing chip noise without speed penalty. 4,857,770, Cl. 307-451.000.

Pasek, Eugene A.: *See—*
Lopez, Jaime; and Pasek, Eugene A., 4,857,496, Cl. 50ₓ-220.000.

Paselt, Artur. Brake actuating mechanism for bicycles with multi-speed chain drive. 4,856,629, Cl. 192-5.000

Pasma, Tjebbe R.: *See—*
Bosch, Gerrit; Pasma, Tjebbe R.; Sluyterman, Albertus A. S.; Doomernik, Fransiscus M. P. P.; and Wielink, Steven M., 4,857,805, Cl. 315-8.000

Pasquariello, David M.: *See—*
Abraham, Kuzhikalail M.; and Pasquariello, David M., 4,857,423, Cl. 429-194.000.

Passmore, Charles G.; Mowry, Robert D.; and Brown, Alan G., to Photonics Laboratories, Inc. Optical storage method and apparatus. 4,856,862, Cl. 350-96.150.

Pastor, Antonio C.; Gentile, Anthony L.; and Wysocki, Joseph A., to Hughes Aircraft Company. Fabrication of rods of uniform high density from powders of refractory materials. 4,857,249, Cl 264-67.000

Pastor, Ricardo C.; and Gorre, Luisa E., to Hughes Aircraft Company. Process for the preparation of ultrapure heavy metal fluorides. 4,857,293, Cl. 423-489.000.

Patents Unlimited, Inc.: *See—*
Maraman, Ned D., 4,856,729, Cl. 242-129.000.

Paternoga, Alain: *See—*
Sulmont, Benoit; and Paternoga, Alain, 4,857,157, Cl. 204-67.000.

Patillon, Jean-Noel; Gabillard, Bertrand; and Martin, Gerard M., to U.S. Philips Corporation. Circuit comprising conductive lines for the transfer of high-speed signals. 4,857,974, Cl. 357-22.000.

Pattanayak, Deva N.: *See—*
Baliga, Bantval J.; and Pattanayak, Deva N., 4,857,983, Cl. 357-38.000.

Patterson, Douglas H., to Northern Telecom Limited. Bus interface loading assembly. 4,858,231, Cl. 370-85.000.

Patterson, John: *See—*
Bernadic, Thomas; Patterson, John; and Lowe, Tony, 4,856,942, Cl. 407-114.000.

Patterson, Richard S.: *See—*
Koehler, Philip G.; Kramer, Richard; and Patterson, Richard S., 4,857,532, Cl. 514-262.000.

Patureau, Jean-Pierre: *See—*
Jannot, Marcel A. J.; and Patureau, Jean-Pierre, 4,857,704, Cl. 219-354.000.

Patzschke, Hans-Peter; Cerny, Peter W.; Goebel, Armin; and Stransky, Karlheinz, to Herberts Gesellschaft mit beschraenkter Haftung. Crosslinked coating resin. 4,857,580, Cl. 524-507.000.

Pauen, Josef: *See—*
Chmelir, Miroslav; and Pauen, Josef, 4,857,610, Cl. 526-88.000.

Paulfus, Bernard H.: *See—*
Hillman, Gary; Rubin, Richard H.; and Paulfus, Bernard H., 4,856,456, Cl. 118-500.000.

Pawlowski, Felix R.: *See—*
Karst, David A.; Pawlowski, Felix R.; Potrafke, William A.; and Schuneman, Harold E., 4,857,119, Cl. 148-318.000.

Pawlowski, Walter P.: *See—*
Glenning, John J.; Johnson, Caryn J.; Pawlowski, Walter P.; and Sakorafos, Kenneth G., 4,857,143, Cl. 156-668.000.

Payton Hugh W. Support patch for intravenous catheter. 4,857,058, Cl. 604-180.000

PEAC Media Research, Inc.: *See—*
Welsh, Russell J., 4,857,999, Cl. 358-84.000.

Pearson, Stanley R.; Merrick, Douglas D.; White, William P.; and Lipp, Charles W., to Dow Chemical Company, The. Annular nozzle. 4,857,076, Cl. 48-86.00R.

Pedersen, Jan R.: *See—*
Oehlenschlaeger, Ulla; Pedersen, Jan R.; and Sorensen, Erling, 4,857,369, Cl. 428-35.700.

Pelet, Andre : *See—*
Bitller, Jean-Pierre; Faucher, Pascal; Hang-Hu, Monique; and Pelet, Andre , 4,858,068, Cl. 361-380.000.

Pellet, Regis J.: *See—*
Gortsema, Frank P.; Pellet, Regis J.; Springer, Albert R.; Rabo, Jule A.; and Long, Gary N., 4,857,495, Cl. 502-214.000.

Penfound, Keith A.: *See—*
Burrows, Ronald W.; Penfound, Keith A.; and Lea, Bernard A., 4,857,450, Cl. 430-603.000.

Peng, Victor: *See—*
Gronowski, Paul E.; Peng, Victor; and Gavrielov, Nachum M., 4,858,165, Cl. 364-748.000.

Pennwalt Corporation: *See—*
Kazmierzak, Robert T.; and MacLeay, Ronald E., 4,857,595, Cl 525-142 000.
MacLeay, Ronald E.; and Myers, Terry N., 4,857,596, Cl. 525-142 000.

PepsiCo Inc.: *See—*
Gregg, John A., 4,857,355, Cl. 426-590.000.

Perera, Thiloma I.: *See—*
Myers, David W.; Ozarski, Robert G.; Perera, Thiloma I.; Schipper, John F.; Tan, Raul V.; and Watts, Michael P. C., 4,857,738, Cl. 250-372.000

Perez, Antonio: *See—*
Valenti, Andrew; Perez, Antonio; and Ben-Zvi, Seymour, 4,857,857, Cl. 324-555.000.

Performance Semiconductor Corporation: *See—*
Schatzberger, Yeshayahu; Mor, Yeshayahu; and Sandman, Leonardo, 4,858,166, Cl. 364-748 000.

Peries, Rohan: *See—*
Ullman, Edwin F.; Khanna, Pyare; and Peries, Rohan, 4,857,453, Cl. 435-7.000.

Perkin-Elmer Corporation, The: *See—*
Dunavan, David S.; Abreu, Rene; Messelt, Stephen; and Siebert, Edward, 4,857,721, Cl. 250-203.00R.
Golay, Marcel E., 4,856,319, Cl. 73-23.100.

Perry, Gary L. Structurally strong, non vapor, non moisture absorbing, spa/hot tub cover. 4,857,374, Cl. 428-71.000.

Person, Martin: *See—*
Denz, Helmut; and Person, Martin, 4,856,465, Cl. 123-90.170.

Perun, Kenneth R., to McDonnell Douglas Corporation; and Lumonics, Limited. Laser perforating process and article produced therein. 4,857,698, Cl. 219-121.710.

Pesotchinsky, Sophia: *See—*
Yamamoto, Ronald; Conston, Stanley R.; and Pesotchinsky, Sophia, 4,856,504, Cl. 128-92.0ZW.

Peters, Glen R. Electric attachment plug. 4,857,013, Cl. 439-484.000.

Petersen, Bernard L.: *See—*
Kruse, Gary L.; and Petersen, Bernard L., 4,856,398, Cl. 83-425.200.

Petersen, Don W., to Loral Corporation. Aircraft wheel drive key and heatshield assembly. 4,856,619, Cl. 188-18.00A.

Peterson, Elmer R.: *See—*
Donovan, Joseph F.; Spatz, Edward C.; Salerni, John V.; Peterson, Elmer R.; and Weirich, John B., 4,856,591, Cl. 166-278.000.

Peterson, Francis C., to Buell Industries, Inc. Method of thread masking and thread masked part. 4,856,954, Cl. 411-427.000.

Peterson, Francis C.: *See—*
Blucher, William J.; Ernst, Richard J.; and Peterson, Francis C., 4,856,951, Cl. 411-178.000.

Peterson, Glen. Apparatus, methods and articles for internegative color balancing. 4,857,968, Cl. 355-72.000.

Peterson, John R., to Teledyne Industries, Inc. Zirconium-containing coating composition. 4,856,576, Cl. 164-495.000.

Petit, Thomas J. Vehicle washing device. 4,856,543, Cl. 134-57.00R.

Petri, Alberto, to Enichem Tecnoresine, S.p.A. Branched polycarbonate from 2,4,6-tris(4'-hydroxyaryl)-amino-S-triazine. 4,857,628, Cl. 528-203.000.

Petrolite Corporation: *See—*
Redmore, Derek; Dhawan, Balram; and Przybylinski, John L., 4,857,205, Cl. 210-700.000.

Pettinelli, Anthony J. Automatic engine ignition shut-off device. 4,856,471, Cl. 123-198.0DC.

Petz, Bruce R.: *See—*
Cahill, Joseph J.; Johnson, Charles L.; Lewis, Steven D.; Mullins, Timothy J.; and Petz, Bruce R., 4,857,765, Cl. 307-443.000.

Peugh, Dean. Furnace. 4,856,438, Cl. 110-233.000.

Peyman, R. Allan. Harmonica sail. 4,856,448, Cl. 114-103.000.

Pfefferkorn, Bernd; Pfefferkorn, Hans; and Reiter, Viktor, to Pfefferkorn & Co. GmbH. Bottle closure for champagne bottle and the like having threaded mouths. 4,856,668, Cl. 215-329.000.

Pfefferkorn & Co. GmbH: *See—*
Pfefferkorn, Bernd; Pfefferkorn, Hans; and Reiter, Viktor, 4,856,668, Cl. 215-329.000.

Pfefferkorn, Hans: *See—*
Pfefferkorn, Bernd; Pfefferkorn, Hans; and Reiter, Viktor, 4,856,668, Cl. 215-329.000.

Pfeiffer, Herbert: *See—*
Guilino, Gunther; and Pfeiffer, Herbert, 4,856,889, Cl. 351-159.000.

Pfizer Hospital Products Group Inc.: *See—*
Wang, Kathy K.; Gustavson, Larry J.; and Dumbleton, John H., 4,857,269, Cl. 420-417.000.

Pfizer Inc.: *See—*
Hauske, James R., 4,857,641, Cl. 536-7.300.

Pflibsen, Kent P.; and Milbocker, Michael T., to Eye Research Institute of Retina Foundation. Eye fundus tracker/stabilizer. 4,856,891, Cl. 351-210.000.

Pfromm, Peter H.: *See—*
Baker, Richard W.; Louie, Jenny; Pfromm, Peter H.; and Wijmans, Johannes G., 4,857,080, Cl. 55-16.000.

Phelps, Craig H.; and Strom, E. Thomas, to Mobil Oil Corporation. Method for imparting selectivity to otherwise nonselective polymer profile control gels. 4,856,586, Cl. 166-270.000.

Phelps Dodge Industries, Inc.: *See—*
Rorick, Donald E.; Hayes, Frank M.; and Aspy, Robert O., 4,856,731, Cl. 242-158.00R.

Phelps, James E., to United States of America, Energy. Packet personal radiation monitor. 4,857,739, Cl. 250-388.000.

Philippe, Michel; Sebag, Henri; Leger, Didier S.; and Leveque, Jean L., to L'Oreal. Quaternary ammonium retinoates, their use in cosmetics and in dermopharmacy. 4,857,525, Cl. 514-227.500.

Philips & Du Pont Optical Company: *See—*
Huberts, Petrus A. A., 4,856,766, Cl. 269-21.000.

Phillippi, R. Michael; and Manion, Francis M., to United States of America, Army. Technique for null balancing fluidic circuits. 4,856,338, Cl. 73-701.000.

Phillips, Nicholas J., to Holtronic Technologies Limited. Manufacture of integrated circuits using holographic techniques. 4,857,425, Cl. 430-1.000.

Phillips Petroleum Company: *See—*
Kimble, Kenneth B.; Macdonell, Gary D.; and Mark, Harold W., 4,857,179, Cl. 209-166.000.
Sreekrishna, Kotikanyadan; and Fuke, Motohiro, 4,857,467, Cl. 435-255.000.

Phillips, Pettice M.; and Swink, Billy J., to Lockheed Corporation. Chromium solution regenerator. 4,857,162, Cl. 204-257.000.

Phillips, Steven J. Bicycle pedal foot holder. 4,856,211, Cl. 36-131.000.

Phipps, Richard D.: *See—*
Smahlik, Aloys J.; Smahlik, Michael A.; and Phipps, Richard D., 4,856,929, Cl. 403-297.000.

Photonics Laboratories, Inc.: *See—*
Passmore, Charles G.; Mowry, Robert D.; and Brown, Alan G., 4,856,862, Cl. 350-96.150.

Pichler, Alfred; Hertrampf, Joachim; and Pachonik, Horst, to Simens Aktiengesellschaft. Method for manufacturing terminal contacts for thin-film magnetic heads. 4,856,181, Cl. 29-603.000.

Pickles, Charles S., to AMP Incorporated. Compliant pin having improved adaptability. 4,857,018, Cl. 439-751.000.

Pidorenko, John; Hoffman, Alan R.; Hodge, Robert F.; and Wang, Wei-Min, to Fiberoptic Sensor Technologies, Inc. Vacuum calibration system and method for fiberoptic pressure transducer. 4,856,317, Cl. 73-4.00R.

Piergrossi, Rocco T.: *See—*
Reshke, Robert A.; and Piergrossi, Rocco T., 4,856,838, Cl. 296-14.000.

Pierman, David A.: *See—*
Benton, Kenneth C.; Pierman, David A.; and Fox, Joseph R., 4,857,395, Cl. 428-306.600.

Pierre, Morin, to Instruments S.A. Apparatus and method for local chemical analyses at the surface of solid materials by spectroscopy of X photoelectrons. 4,857,730, Cl. 250-305.000.

Pierson, Henri G. W., to D & C Limited. Intermittent vacuum filter apparatus incorporating a double valve arrangement. 4,857,194, Cl. 210-406.000.

Pietrantonio, Michael; and De Frenza, Giuseppe. Internal illuminated decorative displays. 4,858,086, Cl. 362-123.000.

Pietro, Michael S., to Eastrock Technology, Inc. Lighting fixture having improved heat dissipation characteristics. 4,858,089, Cl. 362-294.000.

Pilkington plc: *See—*
Berry, Ronald F., 4,857,097, Cl. 65-60.520.

Pilliod Cabinet Company, The: *See—*
Lenger, Sidney A., 4,856,127, Cl. 5-53.00R.

Pilolla, Joseph J., to Sloan Valve Company. Anti-rotation device. 4,856,122, Cl. 4-192.000.

Pilon, Laurent C.: *See—*
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Pimentel, Eileen: *See—*
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Pingel, Matthias A.: *See—*
Pingel, Robert L.; and Pingel, Matthias A., 4,856,452, Cl. 114-364.000.

Pingel, Robert L.; and Pingel, Matthias A. Extendible stern light assembly. 4,856,452, Cl. 114-364.000.

Pioneer Electronic Corporation: *See—*
Kanamaru, Hitoshi, 4,858,024, Cl. 358-310.000.

Pipkin, Noel J.; and Hunt, Michael S. Heavy medium separation tracer element. 4,857,172, Cl. 209-1.000.

Pitman-Moore, Inc.: *See—*
Schricker, Brian R., 4,857,332, Cl. 424-442.000.

Pitney Bowes Inc.: *See—*
Baunach, Stephen C., 4,857,910, Cl. 340-799.000.
Cordery, Robert A.; and Hubbard, David W., 4,856,602, Cl. 177-210.0FP.
Coville, William W., 4,858,174, Cl. 364-900.000.
Murphy, Patrick; and Tran, Duc H., 4,857,942, Cl. 346-76.0PH.
Sisson, Robert W.; and Connell, Richard A., 4,856,604, Cl. 177-210.0FP.
Talmadge, Paul C., 4,858,138, Cl. 364-464.020.

planetroll Antriebe GmbH: *See—*
Kreuzer, Hubert, 4,856,374, Cl. 74-740.000.

Plante, Manon, to Mitel Corporation. Method for diffusing P-type material using boron disks. 4,857,480, Cl. 437-168.000.

Plas/Steel Products, Inc.: *See—*
Shobert, James P.; and Fish, Elson B., 4,857,124, Cl. 156-149.000.

Plastic Welding Technologies, Inc.: *See—*
Jensen, Richard K.; and Mandano, Barbara, 4,857,129, Cl. 156-273.700.

Plastiroute S.A.: *See—*
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Plattner, Jacob J.: *See—*
Rosenberg, Saul H.; Dellaria, Joseph; Fung, Anthony K, L.; Kempf, Dale J.; Luly, Jay R.; and Plattner, Jacob J., 4,857,507, Cl. 514-18.000.

Playground Clearing House, Inc.: *See—*
Hogan, Paul J.; Sanders, Evan; and DiGirolamo, Robert, 4,856,318, Cl. 73-12.000.

Plessey Company plc, The: *See—*
Ansell, John W.; Chopping, Geoffrey; and Waters, Richard N., 4,858,223, Cl. 370-14.000.

Plessey Overseas Limited: *See—*
Davies, Guy E., 4,856,734, Cl. 244-3.220.
Hart, Peter B.; Chilton, George A. A.; and Kirk, Richard A., 4,857,944, Cl. 346-154.000.
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Plexus Ocean Systems Limited: *See—*
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PLM AB: *See—*
Oehlenschlaeger, Ulla; Pedersen, Jan R.; and Sorensen, Erling, 4,857,369, Cl. 428-35.700.

Plontges, Margret; and Cox, Herbert, to Verseidag Industrietextilien GmbH. Sheetlike structure of fibers, especially as a reinforcement for plastics components. 4,857,379, Cl. 428-102.000.

Plonus, Martin A.: *See—*
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Plough, Inc.: *See—*
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Plurichemie Anstalt: *See—*
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Plus Development Corporation: *See—*
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Pneumafil Corporation: *See—*
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Poblete, Rudolph G.; Rindoks, Kurt; and Frederick, James R., to Kewaunee Scientific Corporation. Fume hood. 4,856,420, Cl. 98-115.300.

Pockl, Franz, to Kuka. Device for positioning tentering frames into association with a workpiece which is being assembled along a transfer line. 4,856,701, Cl. 228-6.100.

Podola, Tore: *See—*
Emmerling, Winfried; and Podola, Tore, 4,857,623, Cl. 528-28.000.

Podoloff, Robert M.: *See—*
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Pohler, Manfred; Staupendahl, Gisbert; and Wittig, Richard, to VEB Kombinat Feinmechanische Werke Halle. Arrangement for the generation of CO_2 laser pulses of high power. 4,858,240, Cl. 372-10.000.

Pohlman, James M.; and Manico, Joseph A., to Eastman Kodak Company. Apparatus for printing customized photographic prints. 4,857,964, Cl. 355-40.000

Poirier, Michel. Safety guard for electrical wall outlet. 4,857,004, Cl. 439-140.000.

Pol, Dejeux; and Guy, Desfountaines, to Framatome. Wiring installation for connection of electric devices of a nuclear reactor. 4,857,265, Cl. 376-463.000.

Polaroid Corporation Patent Department: *See—*
Adams, Timothy G.; and Sinta, Roger F., 4,857,227, Cl. 252-299.650.

Polatov, Paul. Work briefcase and table system. 4,856,627, Cl. 190-11.000.

Polysar Limited: *See—*
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Polytronics, Inc.: *See—*
Graham, George A., 4,857,826, Cl. 324-508.000.

Polzer, Herwig W.; and Seitz, Edwin, to Hohe KG. Outside rear-view mirror having a mechanically adjustable mirror glass for a vehicle. 4,856,886, Cl. 350-635.000.

Pomikacsek, Josef, to Linsinger Maschinenbau GmbH. Milling device for working, and in particular for trimming the edges of sheet metal strips, sheet metal plates or the like. 4,856,948, Cl. 409-138.000.

Ponn, Timothy R., to Molex Incorporated. Ribbon cable harness and method of making same. 4,857,010, Cl. 439-417.000.

Pope, Brian G.; and Najvar, Daniel J., to Dow Chemical Company, The. Process for the removal of metal ions from an aqueous medium utilizing a coal gasifier slag composition. 4,857,203, Cl. 210-681.000.

Popescu, Horia: *See—*
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Porter-Cable Corporation: *See—*
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Position Orientation Systems, Inc.: *See—*
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Post, Carla Lotz nee, heir and Andreas Lotz, heir: *See—*
Lotz, Michael, deceased; Vanino, Rudiger, deceased; Kuhl, Peter; Welte, Dieter; and Zimmer, Herbert, 4,856,735, Cl. 244-35.00R.

Post, Martin F. M.: *See—*
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Potier, Pierre: *See—*
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Potrafke, William A.: *See—*
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Potter, Michael W., to Shell Oil Company. Process for removing flyslag from gas. 4,857,077, Cl. 48-197.00R.

Potters Industries, Inc.: *See—*
Teichmann, Robert J.; Walther, James F.; and Mulhall Robert C., 4,857,233, Cl. 252-513.000

Potts, Gerald R. High speed tire testing device with compensated linkages. 4,856,324, Cl. 73-146.000.

Powell, Daniel A.: *See—*
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Power Compact, Societe Anonyme: *See—*
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PPG Industries, Inc.: *See—*
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Chou, Jason L.; and McCollum, Gregory J., 4,857,619, Cl 526-249.000.
Coleman, Charles R.; and Rukavina, Thomas G., 4,857,407, Cl. 428-412.000
McCollum, Gregory J.; Chou, Jason L.; Bodwell, James R.; and Das, Suryya K., 4,857,620, Cl. 526-255.000.

Pradom Limited: *See—*
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Prang, Josef-Elmar: *See—*
Erdelitsch, Herbert; Machalitzky, Otto; and Prang, Josef-Elmar, 4,857,815, Cl. 318-443.000

Pratt & Whitney Canada Inc.: *See—*
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Precht, Terry A.: *See—*
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Preinsberger, William J.: *See—*
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Presto Lock, Inc.: *See—*
Scelba, Stephen S.; and Feinberg, Martin R., 4,856,306, Cl. 70-68.000

Prevot, Gerard, to Ferco International. Striker plate for sliding windows, doors or the like. 4,856,832, Cl. 292-341.190.

Prewo, Karl M.; and Minford, Eric, to United Technologies Corporation. Method for producing integral chopped fiber reinforced glass or glass-ceramic structures. 4,857,093, Cl. 65-36.000

Prewo, Karl M.: *See—*
Brennan, John J.; Layden, George K.; and Prewo, Karl M., 4,857,485, Cl. 501-7.000

Pricer, Wilbur D.; and Wiedman, Francis W., to International Business Machine Corporation. BiMos input circuit. 4,857,766, Cl. 307-446.000

Prince, William D.: *See—*
Rival, Steven E.; and Prince, William D., 4,857,150, Cl. 203-41.000.

Printware, Inc.: *See—*
Schoon, David J., 4,857,904, Cl. 340-730.000

Process Evaluation and Development Corporation: *See—*
Villavicencio, Eduardo J., 4,857,145, Cl. 162-19.000.

Procter & Gamble Company, The: *See—*
Caswell, Debra S.; and , 4,857,213, Cl. 252-8.750.
Neilson, Diane H. R.; Work, Sara L. R.; Whaley, Edward L.; Kirkpatrick, Steven J.; and McCarthy, James P., 4,857,351, Cl. 426-533.000.

Profio, Mark V., to Square D Company. Operational amplifier having an improved feedback system including an integrator having a hurry-up circuit, and an electric motor control using the same for inverse trip selection. 4,858,053, Cl. 361-23.000

Prolingheuer, Christoph: *See—*
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Propiorga: *See—*
Nobilet, Bernard; Bonhomme, Michel; and Desplat, Philippe, 4,857,458, Cl. 435-311.000

Prunkard, Randall K., to Papanicolas, James N. Brushless direct current motor incorporating a magnetically influenced switch. 4,857,783, Cl. 310-68.00B

Przybylinski, John L.: *See—*
Redmore, Derek; Dhawan, Balram; and Przybylinski, John L., 4,857,205, Cl. 210-700.000.

PTX-Pentronix, Inc.: *See—*
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Puchacz, Jerzy P.: *See—*
Landau, Richard F.; Millikin Jr., William E.; Puchacz, Jerzy P.; Reyes, Manolito Q.; and Schadler, Walter, 4,857,160, Cl. 204-192.120.

Puerzer, Bernard G.; and Morse, Royal R., III, to General Electric Company. Interface comprising message and protocol processors for interfacing digital data with a bus network. 4,858,112, Cl. 364-200.000.

Pullinen, Martti: *See—*
Niskanen, Juhani; and Pullinen, Martti, 4,856,155, Cl. 29-113.200.

Pursell Industries: *See—*
Shirley, Arthur R., Jr., 4,857,098, Cl. 71-28.000.

Putman, Robert L.; and Hovan, Edward J., to United Technologies Corporation. Method for maintaining blade tip clearance. 4,856,272, Cl. 60-39.020.

Quaker Oats Company, The: *See—*
Lucas, Eric E., 4,857,031, Cl. 446-481.000.

Qualitron, Inc.: *See—*
Sturgeon, Clayton L., 4,858,093, Cl. 363-20.000

Quarendon, Peter, to International Business Machines Corporation. Method and system for solid modelling. 4,858,149, Cl. 364-522.000.

Quemere, Eric: *See—*
Brunelle, Jean-Pierre; Nortier, Patrice; and Quemere, Eric, 4,857,296, Cl. 423-574.00R.

Quenett, Rudolf: *See—*
Von Reis, Wolf; Derner, Paul; Quenett, Rudolf; and Armbruster, Guenter, 4,857,376, Cl. 428-83.000

R. E. Phelon Company, Inc.: *See—*
Williams, Roger W., Jr., 4,856,984, Cl. 431-30.000.

Rabenecker, Horst; and Kruger, Jurgen, to Draegerwerk, AG. Folded record medium and a blank for a record medium. 4,856,818, Cl. 283-34.000

Rabinowitz, Dan; and Saeli, John, to Medi-Tech, Inc. Control apparatus for a lighted, hand held, surgical electrode holder. 4,856,514, Cl. 128-303.140.

Rabo, Jule A.: *See—*
Gortsema, Frank P.; Pellet, Regis J.; Springer, Albert R.; Rabo, Jule A.; and Long, Gary N., 4,857,495, Cl. 502-214.000.

Racal Data Communications Inc.: *See—*
Buron, Douglas J.; Steinman, Sheldon; and Wray, Donald L., 4,858,070, Cl. 361-384.000

Rachi, Masahiro, to Canon Kabushiki Kaisha. Display device with color correction. 4,857,900, Cl. 340-703.000

Raczkowski, Jan, to Technicon Instruments Corporation. Method for drawing thermoplastic tubing. 4,857,247, Cl. 264-40.700.

Radcliffe, Curtis E.: *See—*
Herring, Clarence R.; and Radcliffe, Curtis E., 4,856,851, Cl. 303-40.000

Rademacher, Wilhelm: *See—*
Rosebrock, Henning; Jung, Johann; Rademacher, Wilhelm; Luib, Max; Fischer, Volker; Hagen, Helmut; Kohler, Rolf-Dieter; Markert, Juergen; and Watanabe, Akihide, 4,857,103, Cl. 71-94.000

Radesky, Joseph A.; Brandt, Carl B.; Thomas, Gerald A.; and Aksins, William E., to Woodstream Corporation. Gopher trap. 4,856,225, Cl 43-81.000

Radomsky, John, to Cyclean, Inc. Method and apparatus for treating asphaltic concrete paving materials. 4,856,202, Cl. 34-10.000.

Rafi-Zadeh, Hassan. Adjustable folding arm for vehicle cover. 4,856,841. Cl. 296-100.000

Rall, Gerhard. Chuck for gripping a workpiece. 4,856,797, Cl. 279-41.00R.

Rambaud, Philippe: *See—*
Borel, Michel; Boronat, Jean-Francois; Meyer, Robert; and Rambaud, Philippe, 4,857,161, Cl. 204-192.260.

Ramdatt, Philbert E.: *See—*
Austin, Paul E.; Farris, David D.; Reedy, James D.; Blevins, Charles; and Ramdatt, Philbert E., 4,857,583, Cl. 524-761.000.

Ramsch, Klaus-Dieter: *See—*
Hegasy, Ahmed; and Ramsch, Klaus-Dieter, 4,857,312, Cl. 424-80.000.

Raney, Richard C. Drill bit with flow control means. 4,856,601, Cl. 175-393.000.

Rashidbaigi, Zahra A.: *See—*
Song, Suk-zu: Rashidbaigi, Zahra A.; Nesbitt, Russell U.; and Fawzi, Mahdi B., 4,857,313, Cl. 424-81.000

Ratcliff, Reginald, to Solid State Systems, Inc. Space and time having multiplexed memories. 4,858,227, Cl. 370-59.000.

Raufast, Charles: *See—*
Marsaly, Alain; Martens, Andre; Morterol, Frederic R. M. M.; and Raufast, Charles, 4,858,144, Cl. 364-496.000

Rautenkranz, Karl: *See—*
Barber, William B.; Davis, William H.; and Rautenkranz, Karl, 4,858,121, Cl. 364-406.000.

Ravet, Georges: *See—*
Bousquet, Hubert; Ravet, Georges; and Rousset, Jacky, 4,857,622, Cl. 526-317.100.

Ray, George F., III: *See—*
Swensen, Eugene L.; and Ray, George F., III, 4,856,175, Cl. 29-460.000.

Raychem Corporation: *See—*
Au, Andrew N.; Deep, Marguerite E.; Fahey, Timothy E.; and Jacobs, Stephen M., 4,857,880, Cl. 338-22.00R.
Campbell, Bruce D.; and Zucker, Joseph, 4,856,864, Cl. 350-96.160.
Overbergh, Noel M. M.; and Vansant, Jan L. M. F. G., 4,857,370, Cl. 422-34.900.

Raycon Corporation: *See—*
Bar-Joseph, Dan, 4,858,243, Cl. 372-72.000.

Raycon Textron Inc.: *See—*
Taeusch, David R.; and Wohlmuth, Clinton J., 4,857,696, Cl. 219-121.700.

Raymon, Joseph W.: *See—*
Forsythe, Carl; Dorminy, John L.; and Raymon, Joseph W., 4,856,969, Cl. 417-395.000.

Rayovac Corporation: *See—*
Larsen, Duane M.; and Dopp, Robert B., 4,857,424, Cl. 429-206.000.

Raytheon Company: *See—*
Tustison, Randal W.; and Varitimos, Thomas, 4,857,415, Cl. 428-620.000.

RCA Licensing Corp.: *See—*
Hang, Kenneth W.; and Anderson, Wayne M., 4,856,670, Cl. 220-2.10A.

Read, Simon: *See—*
Mewburn-Crook, Anthony J. S.; Bullen, Peter; and Read, Simon, 4,857,753, Cl. 290-55.000.

Reagents of the University of Minnesota: *See—*
Ogilvie, James W.; and Ogilvie, Frank R., 4,856,385, Cl. 81-57.390.

Rebekale, Arshaloos N. Adhesive tape cutter. 4,856,397, Cl. 83-322.000.

Rebers, Kenneth D.; Seim, William J.; and Krenz, Dean C., to Minnesota Mining and Manufacturing Company. Cable closure end cap. 4,857,672, Cl. 174-93.000.

Red Wing Shoe Company, Inc.: *See—*
Kenyon, Arthur, 4,856,209, Cl. 36-114.000.

Redland Roof Tiles Limited: *See—*
Smith, Frank A. F.; and Ludlow, Trevor A., 4,856,395, Cl. 83-158.000.

Redmore, Derek; Dhawan, Balram; and Przybylinski, John L., to Petrolite Corporation. Method for inhibition of scale formation. 4,857,205, Cl. 210-700.000.

Reed, Jeffery T.: *See—*
Ahlberg, David T.; Padliya, Dilipkumar; and Reed, Jeffery T., 4,857,632, Cl. 528-487.000.

Reed, Katherine E.: *See—*
Ersfeld, Dean A.; Hansen, Paul E.; Scholz, Matthew T.; Bartizal, Dennis C.; Reed, Katherine E.; Larson, Wayne K.; Sandvig, Timothy C.; and Buckanin, Richard S., 4,856,502, Cl. 128-90.000.

Reed, William M.: *See—*
Simons, Tad D.; Stawitcke, Frederick A.; Reed, William M.; and Tessier, Paul A., 4,857,048, Cl. 604-50.000.

Reedy, James D.: *See—*
Austin, Paul E.; Farris, David D.; Reedy, James D.; Blevins, Charles; and Ramdatt, Philbert E., 4,857,583, Cl. 524-761.000.

Reeves, John W.: *See—*
Dedio, Edward L.; and Reeves, John W., 4,857,439, Cl. 430-349.000.

Reginold, G. S., to General Safety Research, Inc. Safety engine load sensing system. 4,856,613, Cl. 180-282.000.

Regula, Paul M.: *See—*
Nix, Richard A.; and Regula, Paul M., 4,856,416, Cl. 92-169.100.

Regunathan, Perialwar: *See—*
Thomsen, Jack W.; Regunathan, Perialwar; and Tadlock, John W., 4,857,189, Cl. 210-232.000.

Reifenhauser GmbH & Co. Maschinenfabrik: *See—*
Wirtz, Robert, 4,858,139, Cl. 364-473.000.

Reinauer, Josef, to Gottlieb Guhring KG. Coupling between a tool head and a tool support. 4,856,944, Cl. 408-59.000.

Reinfelder, Hans-Erich, to Siemens Aktiengesellschaft. Read system for a luminescent image storage screen in an x-ray diagnostics installation. 4,857,734, Cl. 250-327.200.

Reinl, Hubert; and Schmidt, Elke, to Nestec S.A. Dietetic starch-containing preparation. 4,857,356, Cl. 426-620.000.

Reist, Walter, to SFT AG Spontanfordertechnik. Flexible drive transmission. 4,856,644, Cl. 198-716.000.

Reiswig, Gary J. Single cut clipper for artificial nails. 4,856,190, Cl. 30-29.000.

Reiter, Ferdinand: *See—*
Hafner, Udo; and Reiter, Ferdinand, 4,857,003, Cl. 439-130.000.

Reiter, Ralph H.; and Ekwall, C. Raymond, to Sartomer Company, Inc. Prevulcanization retardation of free-radical cured rubber. 4,857,571, Cl. 524-248.000.

Reiter, Viktor: *See—*
Pfefferkorn, Bernd; Pfefferkorn, Hans; and Reiter, Viktor, 4,856,668, Cl. 215-329.000.

Reliance Products, Division of Larson Mardon Group Limited: *See—*
Berney, Sheldon, 4,856,674, Cl. 220-258.000.

Rembold, Helmut: *See—*
Linder, Ernst; Rembold, Helmut; and Teegen, Walter, 4,856,482, Cl. 123-506.000.

Rembold, Manfred: *See—*
Riediker, Martin; Steiner, Eginhard; Beyeler, Harry; Rembold, Manfred; and Sitek, Franciszek, 4,857,654, Cl. 556-53.000.

Remcor Products Company: *See—*
Miller, Benjamin D.; and Jablonski, Thaddeus M., 4,856,682, Cl. 222-238.000.

Renner, Alfred: *See—*
Cotting, Jacques-Alain; and Renner, Alfred, 4,857,607, Cl. 525-471.000.

Reppel, Paul. Self-supporting storage container. 4,856,671, Cl. 220-4.00F.

Research Corporation: *See—*
Waterbury, John B.; Watson, Stanley W.; Glazer, Alexander N.; and Ong, Linda J., 4,857,474, Cl. 436-501.000.

Research Corporation of America, Inc.: *See—*
Bernat, Fred B., 4,857,309, Cl. 424-68.000.

Research Foundation of State University of New York, The: *See—*
Kashman, Yoel; Spector, Ilan; Carmely, Shmuel; and Blasberger, Dina, 4,857,538, Cl. 514-369.000.
Valenti, Andrew; Perez, Antonio; and Ben-Zvi, Seymour, 4,857,857, Cl. 324-555.000.

Research Machine Center, Inc.: *See—*
Goins, Gary D., 4,856,234, Cl. 51-284.00R.

Reshke, Robert A.; and Piergrossi, Rocco T. Protective trailer. 4,856,838, Cl. 296-14.000.

Reuben, Harold, to Akro Corporation. Package of automobile mats with mounting pads for mounting mats on an automobile carpet. 4,856,654, Cl. 206-449.000.

Reuben, Jayakumar, to Becton, Dickinson and Company. Stain for acid-fast bacilli. 4,857,459, Cl. 435-34.000.

Reuchlein, Gunter; and Schiessl, Gerhard, to Man Technologie GmbH. Method for producing by welding a finned heat exchanger pipe. 4,856,165, Cl. 29-157.30A.

Reuter, Gerald L.: *See—*
Mir, Ghulam N.; Borella, Luis E.; DiJoseph, John F.; and Reuter, Gerald L., 4,857,324, Cl. 424-690.000.

Rey, Maurice: *See—*
Bocquet, Jean-Louis; Gouttebessis, Jacques; and Rey, Maurice, 4,857,128, Cl. 156-244.120.

Rey, Pierre; Leandri, Jacqueline; Abbou, Clement; and Sezeur, Alain, to Centre National de la Recherche Scientifique. Rechargeable implantable device for dosed and repeated self-injection of medicament. 4,857,059, Cl. 604-185.000.

Reyes, Manolito Q.: *See—*
Landau, Richard F.; Millikin Jr., William E.; Puchacz, Jerzy P.; Reyes, Manolito Q.; and Schadler, Walter, 4,857,160, Cl. 204-192.120.

Reynolds, Edward C., Jr., to Laser Products Corporation. Light beam assisted aiming of firearms. 4,856,218, Cl. 42-103.000.

Rheem Empreendimentos Industriais E. Comerciais S/A: *See—*
La Rovere, Ruggiero, 4,856,176, Cl. 29-511.000.

Rheinmetall GmbH: *See—*
Seidensticker, Jens, 4,856,431, Cl. 102-427.000.
Synofzik, Reinhard, 4,856,432, Cl. 102-489.000.

Rhone-Poulenc Chimie: *See—*
Brunelle, Jean-Pierre; Nortier, Patrice; and Quemere, Eric, 4,857,296, Cl. 423-574.00R.
Denis, Philippe; and Frances, Jean-Marc, 4,857,657, Cl 560-193.000.
Nineuil, Guy; and Rivoirard, Louis, 4,857,211, Cl. 210-797.000.

Rhone-Poulenc Sante: *See—*
Colin, Michel; Guenard, Danie!; Gueritte-Voegelein, Francoise; and Potier, Pierre, 4,857,653, Cl. 549-511.000.

Rhone-Poulenc Specialities Chimiques: *See—*
Leising, Frederic, 4,857,585, Cl. 524-815.000.

Ricca, Richard N.: *See—*
Brown, James H.; and Ricca, Richard N., 4,857,025, Cl. 441-65.000.

Ricci, Donato L. Valve reseater apparatus and method. 4,856,390, Cl. 82-172.000.

Ricco, Michele: *See—*
Macocco, Dino; and Ricco, Michele, 4,856,986, Cl. 432-72.000.

Richard Wolf GmbH: *See—*
Zobel, Jurgen, 4,858,002, Cl. 358-98.000.

Richards, Norman D., to U.S. Philips Corporation. Image display apparatus and method. 4,857,992, Cl. 358-13.000.

Richards, Norman D., to U.S. Philips Corporation. Image display. 4,858,026, Cl. 358-310.000.

Richardson, John: *See—*
Goldman, Stephen; and Richardson, John, 4,856,117, Cl. 2-195.000.

Ricoh Company, Ltd.: *See—*
Hoshi, Kazunori, 4,858,228, Cl. 370-60.000.
Kogure, Masaaki; Mitekura, Yoshihiro; Matsuyama, Naoki; and Shinguryo, Satoshi, 4,857,908, Cl. 340-785.000.
Nishikawa, Masami, 4,857,484, Cl. 437-209.000.
Obata, Takeo; Takata, Akira; and Fujioka, Takuro, 4,857,775, Cl. 307-468.000.
Takata, Akira; and Fujii, Koichi, 4,857,773, Cl. 307-465.000.
Ueda, Takashi; Maruta, Keiichi; and Yaguchi, Hiroshi, 4,857,502, Cl. 503-217.000.

Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Phillip A., to Burroughs Wellcome Co. Treatment of human viral infections. 4,857,511, Cl. 514-50.000.

Riediker, Martin; Steiner, Eginhard; Beyeler, Harry; Rembold, Manfred; and Sitek, Franciszek, to Ciba-Geigy Corporation. Titanocenes and their use. 4,857,654, Cl. 556-53.000

Rigazio, Anthony W.; and Koehler, Gerald C., to Worldtronics International. Cycle timer for household appliance. 4,857,758, Cl. 307-140.000

Riggs, Eugene W. Trailer hitch alignment device. 4,856,200, Cl. 33-264.000

Rindoks, Kurt: *See*—
Poblete, Rudolph G.; Rindoks, Kurt; and Frederick, James R., 4,856,420, Cl. 98-115.300.

Ring, Thomas J.: *See*—
Alsip, Allen W.; Bossert, Clayton E.; and LaVelle, Richard E., 4,856,128, Cl. 5-61.000.

Ringspann Albrecht Maurer KG: *See*—
Maurer, Ruprecht; and Timtner, Karlheinz, 4,856,411, Cl. 91-1.000.

Riordan, Dennis E. Art alarm backing for protecting a work of art. 4,857,892, Cl. 340-568.000.

Rischar, Charles M.: *See*—
Stewart, Daniel L.; Immormino, Fredrick R.; Galdun, Daniel J.; and Rischar, Charles M., 4,858,101, Cl. 364-131.000.

Risner, Robert: *See*—
Mordini, Joseph; and Risner, Robert, 4,857,970, Cl. 355-113.000.

Ritchie Industries, Inc.: *See*—
Wiseman, Leland G.; and Hertema, Daryl J., 4,856,459, Cl. 119-73.000.

Rival, Steven E.; and Prince, William D., to Union Carbide Corporation. Silicone oil recovery. 4,857,150, Cl. 203-41.000.

RiverSide Research Institute: *See*—
Lizzi, Frederic L.; Yaremko, Mykola M.; Silverman, Ronald H.; and Coleman, D. Jackson, 4,858,124, Cl. 364-413.010

Rivoirard, Louis: *See*—
Nineuil, Guy; and Rivoirard, Louis, 4,857,211, Cl. 210-797.000.

RO Associates: *See*—
McDonnal, John E., 4,858,052, Cl. 361-18.000

Robb, James R., to Rockwell International Corporation. Data driven clock generator. 4,857,868, Cl. 331-135.000.

Robbins, Lanny A.; and Frank, Timothy C., to Dow Chemical Company, The. Pressure swing adsorption apparatus and process for recovery of oil-soluble vapors. 4,857,084, Cl. 55-58.000.

Robert Bosch GmbH: *See*—
Alf, Reinhard; and Warzecha, Wolfgang, 4,857,014, Cl. 439-578.000
Denz, Helmut; and Person, Martin, 4,856,465, Cl. 123-90.170.
Hafner, Udo; and Reiter, Ferdinand, 4,857,003, Cl. 439-130.000.
Linder, Ernst; Rembold, Helmut; and Teegen, Walter, 4,856,482, Cl. 123-506.000.

Roberts, Daniel L.: *See*—
Allen, Richard B.; Bacskai, Barbara M.; Roberts, Daniel L.; and Bopp, Richard C., 4,857,390, Cl. 428-220.000.

Roberts, Jeffrey J.: *See*—
Branam, Timothy R.; Roberts, Jeffrey J.; and Schoenberger, Jack O., 4,856,327, Cl. 73-168.000

Robertshaw Controls Company: *See*—
Geary, Frederick J., 4,856,983, Cl. 431-27.000
Shopsky, Harvey J., 4,856,164, Cl. 29-157.10R

Robertson, Ronald C.: *See*—
Barrett, Lawrence R.; Robertson, Ronald C.; and Sullivan, Mark A., 4,857,811, Cl. 318-3.000

Robinson, Clell, Sr. Tunnel system for care or seeds, plants and the like. 4,856,228, Cl. 47-29.000.

Robotic Vision Systems: *See*—
Stern, Howard, 4,858,172, Cl. 364-160.000.

Robson, Thomas, to Wadkin plc. Machines for cutting end joints. 4,856,569, Cl. 144-91.000

Rochelle, Gary P.; and Lile, Charles R., to CRL Electronics, Inc. Modular electronic control housing assembly. 4,858,067, Cl. 361-331.000.

Rockwell International Corporation: *See*—
Robb, James R., 4,857,868, Cl. 331-135.000

Rodda, Richard K. Refrigerant reclamation system. 4,856,290, Cl. 62-149.000.

Rodems, James D.: *See*—
Lounsberry, Stephen M., III; Lounsberry, Peter C.; Rodems, James D.; and Carner, Gary A., 4,856,617, Cl. 184-3.100.

Roden, Ralph V., Jr. Security device for an outwardly swinging door. 4,856,831, Cl. 292-259.00R.

Rodgers, John M.: *See*—
Shearer, Dwayne M.; Beetham, Richard C.; Beall, Frank C.; and Rodgers, John M., 4,856,334, Cl. 73-588.000.

Rodriguez, Hector L. Socket assembly for multiple size wrenching surfaces. 4,856,386, Cl. 81-90.200.

Roemmich, Bruce D.: *See*—
Cannon, Thomas G.; Roemmich, Bruce D.; and Precht, Terry A., 4,858,047, Cl. 360-106.000.

Roese, Horst; Bertke, Heinrich; Bruggemann, Reinhard; and Hampel, Peter, to G. Kromschroder Aktiengesellschaft. Bellows-type gas meter. 4,856,331, Cl. 73-268.000.

Rogers Tool Works, Inc.: *See*—
Wolfe, John R., Jr., 4,856,974, Cl. 425-67.000.

Rogozinski, Joseph; and Cohen, Ilan. Precise positioning apparatus. 4,857,816, Cl. 318-632.000.

Rohm and Haas Company: *See*—
McNulty, James T., 4,857,202, Cl. 210-662.000
Musco, Vincent A.; Kelley, Donald E.; and Hansen, Carl O., 4,857,101, Cl. 71-94.000.

Roland, James: *See*—
Najar, Mitri S.; and Roland, James, 4,857,229, Cl. 252-373.000.

Roll, Kenneth A.; Davenport, John M.; and von Herrmann, Pieter J., to General Electric Company. Current interruption operating circuit for a gaseous discharge lamp. 4,857,810, Cl. 315-194.000.

Roller, Joachim. Cosmetic composition, particularly for decorative applications. 4,857,306, Cl. 424-63.000.

Rolls-Royce plc: *See*—
Cox, Michael J., 4,856,274, Cl. 60-39.330.

Rolt, Richard C. Transmission of rotary power, particularly in printing machines. 4,856,690, Cl. 226-24.000

Romagnoli, Andrea, to Cestind - Centro Studi Industriali - S.R.L. Apparatus with rotary wheel having pickup means for applying labels and thread to a flattened tube carrying serially arranged dual-use filter sachets in machines for continuously producing said filter sachets. 4,856,257, Cl. 53-134.000.

Romano, Antonio, to Campagnolo S.P.A. Device to anchor a cyclist's shoe to the pedal of a sports or competition bicycle. 4,856,365, Cl. 74-594.600.

Romano, Antonio, to Campagnolo S.p.A. Rear derailing device for bicycle gears. 4,857,036, Cl. 474-80.000.

Romeas, Rene , to Societe Anonyme Dite: Alcatel Thomson Gigadisc. Preformatted information medium and optical reader device. 4,858,221, Cl. 369-275.000.

Romer GmbH: *See*—
Haberle, Hermann, 4,856,119, Cl. 2-417.000.

Romig, Byron A., Jr. Overspeed brake. 4,856,623, Cl. 188-180.000.

Rondini, Joseph: *See*—
Hurtel, Patrice; Laurent, Denis; and Rondini, Joseph, 4,857,239, Cl. 562-896.000.

Ronen, Daniel: *See*—
Margaritz, Mordeckai; Ronen, Daniel; and Levy, Itzhak, 4,857,473, Cl. 436-177.000

Rook, Cornelis; and Klein, Willem, to Gebroeders Rook Beheer B.V. Device for manufacturing stones. 4,856,976, Cl. 425-320.000.

Roppelt, Gunter: *See*—
Ziegler, Herbert; Clever, Carl W.; and Roppelt, Gunter, 4,858,153, Cl. 364-550.000

Rorer Pharmaceutical Corporation: *See*—
Mehta, Gunvant N.; Wertan, Dennis J.; and Grim, Wayne M., 4,856,909, Cl. 366-208.000.
Youssefyeh, Raymond; Klein, Scott I.; Campbell, Henry F.; and Kuhla, Donald E., 4,857,517, Cl. 514-161.000.

Rorick, Donald E.; Hayes, Frank M.; and Aspy, Robert O., to Phelps Dodge Industries, Inc. Traverse assembly for use on tapered flange spools. 4,856,731, Cl. 242-158.00R.

Rosati, Louis: *See*—
Casey, Donald J.; Rosati, Louis; Jarrett, Peter K.; and Lehmann, Leonard T., 4,857,602, Cl. 525-408.000.

Rosciszewski, Paul M.: *See*—
Boliver, Vincent J.; Rosciszewski, Paul M.; Sankey, Edward L.; and DeMeyer, Roy W., 4,857,021, Cl. 439-801.000.

Rose, Gary D.: *See*—
Fleming, Thomas W.; and Rose, Gary D., 4,856,493, Cl. 126-299.00R

Rose, William J., to Coleco Industries, Inc. Conversing dolls. 4,857,030, Cl. 446-303.000.

Rosebrock, Henning; Jung, Johann; Rademacher, Wilhelm; Luib, Max; Fischer, Volker; Hagen, Helmut; Kohler, Rolf-Dieter; Markert, Juergen; and Watanabe, Akihide, to BASF Aktiengesellschaft. Influencing the development of crops with 7-chloroquinoline-8-carboxylic acids. 4,857,103, Cl. 71-94.000.

Rosen, Harold A.; and Thompson, James D., to Hughes Aircraft Company. Filter interconnection matrix. 4,858,229, Cl. 370-75.000.

Rosen, Stanley D., to Ford Motor Company. Coast clutch control for multiple speed automatic transmission. 4,856,383, Cl. 74-869.000.

Rosenberg, Leonard S.; Black, Cheryl; Speicher, Earl R.; and Wagenknecht, Dietmar, to Du Pont de Nemours, E. I., and Company. Stable pharmaceutical composition. 4,857,552, Cl. 514-538.000.

Rosenberg, Michael E. Protective device for hypodermic needle. 4,857,060, Cl. 604-192.000.

Rosenberg, Saul H.; Dellaria, Joseph; Fung, Anthony K, L.; Kempf, Dale J.; Luly, Jay R.; and Plattner, Jacob J., to Abbott Laboratories. Angiotensinogen analogs. 4,857,507, Cl. 514-18.000.

Rosenquist, Niles R., to General Electric Company. Amino phenol end capped aromatic polycarbonate reacted with sulfonate. 4,857,627, Cl. 528-199.000

Rosetta, Richard: *See*—
Alexoff, Carl; Rosetta, Richard; Dennis, Michael; and Coll, Thomas E., 4,858,123, Cl. 364-412.000.

Roskell, Derek: *See*—
Simpson, Richard D.; and Roskell, Derek, 4,858,167, Cl. 364-787.000.

Ross, Richard E.; and Harvey, Donald R. Self-storing, retractable automobile cover. 4,856,842, Cl. 296-136.000.

Rossey, Guy: *See*—
Manoury, Philippe; Rossey, Guy; Binet, Jean; DeFosse, Gerard; and Jabri, Najib, 4,857,536, Cl. 514-322.000.

Roth, Bernard M.; Neveu, Daniel R. M.; and Delikat, Catherine, to Bertin & Cie. Method and devices for measuring the temperature of a running filiform element. 4,856,911, Cl. 374-135.000.

Roth, William H.; and Dull, Dennis C., to General Motors Corporation. Clutch damper with friction lag. 4,856,638, Cl. 192-106.100.

Rotola, Louis A., Jr.: *See*—
Matthews, James A.; and Rotola, Louis A., Jr., 4,856,139, Cl. 15-350.000.

Roufs, John G.: *See*—
Jackson, Glenn M.; and Roufs, John G., 4,857,353, Cl. 426-554.000.

Rousset, Jacky: *See*—
Bousquet, Hubert; Ravet, Georges; and Rousset, Jacky, 4,857,622, Cl. 526-317.100.

Rowcliffe, David J.: *See*—
Allam, Ibrahim M.; and Rowcliffe, David J., 4,857,116, Cl. 148-279.000.

Rowden, David L.: *See*—
Ashe, Philip R.; Carey, James R.; Champagne, Patrick J.; and Rowden, David L., 4,858,050, Cl. 360-133.000.

Rubin, Richard H.: *See*—
Hillman, Gary; Rubin, Richard H.; and Paulfus, Bernard H., 4,856,456, Cl. 118-500.000.

Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; and Lechner, Robert, to Siemens Aktiengesellschaft. Method for the operation of an interface circuit between a central portion and local portions of a subscriber termination module of a digital time multiplex telecommunications network. 4,858,226, Cl. 370-58.000.

Rueping, John E., to Eastman Kodak Company. Molded article with exposed, confined leads, and process for making. 4,857,940, Cl. 346-75.000.

Rukavina, Thomas G.: *See*—
Coleman, Charles R.; and Rukavina, Thomas G., 4,857,407, Cl. 428-412.000.

Rule, Mark; Fagerburg, David R.; and Watkins, Joseph J., to Eastman Kodak Company. Process for the preparation of copoly(arylene sulfide). 4,857,629, Cl. 528-217.000.

Rump, Jerome R., to Jero Incorporated. Method of forming stub ends. 4,857,693, Cl. 219-76.120.

Ruppert, Kurt A.: *See*—
Hinrichs, Walter; Hovestadt, Herbert; Lange, Ludwig; Ruppert, Kurt A.; and Splett, Erich, 4,857,665, Cl. 568-851.000.

Rush, Robert W., Jr.; and Huizenga, Michael K., to Aircap Industries Corp. Dead man-type electrical control device for power tools. 4,857,681, Cl. 200-61.850.

Rushing, Jim; and Rushing, Linda. Multi-use handbag. 4,856,570, Cl. 150-107.000.

Rushing, Linda: *See*—
Rushing, Jim; and Rushing, Linda, 4,856,570, Cl. 150-107.000.

Russell, Michael A., to Medical Parameters, Inc. Catheter introducer valve. 4,857,062, Cl. 604-256.000.

Russell, Ronald R., to General Electric Company. Molded case circuit breaker actuator-accessory module. 4,858,056, Cl. 361-93.000.

Russo, Raimondo: *See*—
Gandolfi, Carmelo A.; Spinelli, Silvano; Tofanetti, Odoardo; Russo, Raimondo; and Tognella, Sergio, 4,857,643, Cl. 544-121.000.

Rust-Oleum Corporation: *See*—
Hall, Robert M., 4,857,578, Cl. 524-488.000.

Rusterholz, John T.; and Hamstra, James R., to Unisys Corporation. Loop control mechanism for scientific processor. 4,858,115, Cl. 364-200.000.

Ruttimann, Theresa: *See*—
Khanna, Satish C.; and Ruttimann, Theresa, 4,857,336, Cl. 424-473.000.

Ryan, Barry F. Submersible bearing and hub assembly. 4,856,915, Cl. 384-473.000.

Ryan, Patrick M.: *See*—
Doyle, Thomas E.; and Ryan, Patrick M., 4,857,694, Cl. 219-76.120.

Rydell, Mark A., to Schneider (USA) Inc., A Pfizer Company. Atherectomy catheter. 4,857,045, Cl. 604-22.000.

Ryobi Motor Products Corp.: *See*—
Matthews, James A.; and Rotola, Louis A., Jr., 4,856,139, Cl. 15-350.000.

S R I International: *See*—
Allam, Ibrahim M.; and Rowcliffe, David J., 4,857,116, Cl. 148-279.000.

S. Smith & Son Pty. Ltd.: *See*—
Whitford, Darryl R., 4,856,421, Cl. 99-276.000.

Sabroff, Alvin M.; and Douglas, James R., to Eaton Corporation. Method for producing near net ring gear forgings. 4,856,167, Cl. 29-159.200.

Saccardi, Raymond J., to United States of America, National Security Agency. Reconfigurable pipelined processor. 4,858,113, Cl. 364-200.000.

Saeli, John: *See*—
Rabinowitz, Dan; and Saeli, John, 4,856,514, Cl. 128-303.140.

Safi, Toufic: *See*—
Drage, Davod J.; and Safi, Toufic, 4,857,138, Cl. 156-643.000.

Sagae, Takashi; and Kato, Takayuki, to Aichi Steel Works Ltd. Water-soluble oil property detection device. 4,857,829, Cl. 324-61.00R.

Sagara, Kazuhiko: *See*—
Homma, Noriyuki; Nakamura, Tohru; Nakazato, Kazuo; Matsumoto, Motoaki; Hayashida, Tetsuya; Kubo, Masaharu; and Sagara, Kazuhiko, 4,858,184, Cl. 365-174.000.

Sagenmuller, Alfons: *See*—
Knauf, Werner; Walteradorfer, Anna; Sagenmuller, Alfons; Stier, Hubert; and Lourens, Jan, 4,857,510, Cl. 514-30.000.

Sahara, Masayoshi: *See*—
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,857,953, Cl. 354-475.000.

Saijo, Munetoshi: *See*—
Terano, Takashi; Jinno, Masayuki; and Saijo, Munetoshi, 4,857,889, Cl. 340-461.000.

Saika, Toshihiro: *See*—
Hatanaka, Katsunori; Saika, Toshihiro; Ishii, Takayuki; and Yamada, Katsuhiko, 4,857,751, Cl. 250-578.000.

St-Arnaud, Jean-Marie: *See*—
Bose, Tapan K.; Chahine, Richard; Marchildon, Louis; and St-Arnaud, Jean-Marie, 4,856,320, Cl. 73-30.000.

St. Aubin, Donald L.: *See*—
Laugal, James A.; Martin, Glenn E.; St. Aubin, Donald L.; and Wold, Gerald G., 4,857,567, Cl. 523-415.000.

St. Clair, Martha H.: *See*—
Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Phillip A., 4,857,511, Cl. 514-50.000.

Saint, David: *See*—
Kohus, Louis M.; Mariol, John V.; and Saint, David, 4,856,809, Cl. 280-644.000.

Saito, Akihisa: *See*—
Yokota, Kazuto; and Saito, Akihisa, 4,857,741, Cl. 250-486.100.

Saito, Junichi: *See*—
Yamada, Yasuo; Saito, Junichi; Tamura, Tatsuo; and Sakawa, Shinji, 4,857,556, Cl. 514-585.000.

Saito, Katsushi: *See*—
Shindo, Yoshio; Yamazaki, Fumio; Wada, Kouichi; Tomio, Hidehiro; and Saito, Katsushi, 4,857,154, Cl. 204-27.000.

Saito, Masayuki; Niitsuma, Akira; Ohdaira, Hirosi; Tanuma, Chiaki; and Mori, Miki, to Kabushiki Kaisha Toshiba. Method of forming bump electrode and electronic circuit device. 4,857,482, Cl. a37-209.000.

Saito, Satoshi: *See*—
Horiuchi, Ryo; Saito, Satoshi; Suzuki, Koichi; and Higashino, Kazuyuki, 4,856,163, Cl. 29-157.00C.
Ishida, Kunio; Saito, Satoshi; Habuto, Akinaka; Murata, Tadahiko; Oiso, Hisayoshi; Joyama, Norio; and Fujimoto, Kazuhiro, 4,857,354, Cl. 426-558.000.
Sato, Akira; Sekizuka, Yasuo; and Saito, Satoshi, 4,857,346, Cl. 426-321.000.

Saito, Shuichi: *See*—
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,857,965, Cl. 355-45.000.
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,857,966, Cl. 355-45.000.

Saito, Tsunenari: *See*—
Suehiro, Tsutomu; Uchiyama, Hitoshi; Inukai, Takahito; and Saito, Tsunenari, 4,858,016, Cl. 358-246.000.

Saitoh, Kouichi: *See*—
Nihei, Hideki; Miyashita, Kunio; Saitoh, Kouichi; and Yamashita, Seizi, 4,857,786, Cl. 310-156.000.

Saiwai, Kazuhiko: *See*—
Tomita, Osamu; Saiwai, Kazuhiko; and Kimura, Akira, 4,856,325, Cl. 73-150.00A.

Sakaguchi, Akira; Uchibe, Hisashi; and Tange, Toshiyuki, to Kawasaki Jukogyo Kabushiki Kaisha. Apparatus for assembling a structural panel in order to prevent the sag thereof. 4,856,700, Cl. 228-5.100.

Sakai, Hiroyoshi: *See*—
Takaya, Takao; Takasugi, Hisashi; Esumi, Kimio; Kuno, Atsushi; Sakai, Hiroyoshi; Maeda, Kazuhiro; and Sakamoto, Yoshie, 4,857,527, Cl. 514-237.200.

Sakai, Shinji: *See*—
Fukushima, Nobuo; Okino, Tadashi; and Sakai, Shinji, 4,857,952, Cl. 354-452.000.

Sakai, Takeshi: *See*—
Maki, Yoshihiro; Matsuyama, Akira; Tanizaki, Katsuji; Okabe, Noboru; Kishida, Katsuhiro; Sakai, Takeshi; Ohgaki, Toshinaga; and Fujita, Masahito, 4,857,267, Cl. 419-31.000.

Sakai, Yasushi: *See*—
Tanaka, Koji; Takemoto, Katsuo; and Sakai, Yasushi, 4,857,617, Cl. 526-237.000.

Sakamaki, Hisashi: *See*—
Hosaka, Masao; Shimada, Kazutoshi; and Sakamaki, Hisashi, 4,857,960, Cl. 355-208.000.

Sakamoto, Hidenobu, to Mitsubishi Denki Kabushiki Kaisha. High frequency magnetic field generator for nuclear magnetic resonance. 4,857,849, Cl. 324-318.000.

Sakamoto, Hideshi: *See*—
Daimon, Takashi; Sakamoto, Hideshi; and Adachi, Tatsuya, 4,857,377, Cl. 428-90.000.

Sakamoto, Yoshie: *See*—
Takaya, Takao; Takasugi, Hisashi; Esumi, Kimio; Kuno, Atsushi; Sakai, Hiroyoshi; Maeda, Kazuhiro; and Sakamoto, Yoshie, 4,857,527, Cl. 514-237.200.

Sakata, Hajime; Watanabe, Yasuyuki; Yamanobe, Masato; Ohkubo, Yukitoshi; and Nagano, Akihiro, to Canon Kabushiki Kaisha. Display element and observation apparatus having the same. 4,856,869, Cl. 350-162.180.

Sakata, Kei; Hashiguchi, Koichi; and Okano, Shinobu, to Kawasaki Steel Corporation. Method of manufacturing a cold-rolled steel sheet having a good deep drawability. 4,857,117, Cl. 148-12.00C.

Sakata, Yasuo: *See*—
Yamaguchi, Morie; Horita, Chiezo; Suzuki, Shigeo; and Sakata, Yasuo, 4,857,411, Cl. 428-546.000.

Sakatani, Ikunori: *See*—
Inoue, Gentei; Sakatani, Ikunori; and Tanaka, Katsuhiko, 4,856,918, Cl. 384-610.000.

Sakawa, Shinji: *See*—
Yamada, Yasuo; Saito, Junichi; Tamura, Tatsuo; and Sakawa, Shinji, 4,857,556, Cl. 514-585.000.

Sako, Takeshi; Yokochi, Toshihiro; Sato, Masahito; Suzuki, Osamu; Hakuta, Toshikatsu; Sugeta, Tsutomu; and Nakazawa, Noriaki, to

Agency of Industrial Science & Technology. Process for extracting lipids from mortierella genus fungi. 4,857,329, Cl. 424-195.100.

Sakorafos, Kenneth G.: *See—*
Glenning, John J.; Johnson, Caryn J.; Pawlowski, Walter P.; and Sakorafos, Kenneth G., 4,857,143, Cl. 156-668.000.

Sakurai, Hiroko: *See—*
Nishi, Hiroyoshi; Watanabe, Toshiaki; Yuki, Satoshi; Morinaka, Yasuhiro; Iseki, Katsuhiko; and Sakurai, Hiroko, 4,857,542, Cl. 514-404.000.

Sakurai, Masaaki: *See—*
Wakimoto, Kazumasa; Shibata, Motohiro; Ishii, Takaharu; and Sakurai, Masaaki, 4,857,106, Cl. 75-41.000.

Sakurai, Takayasu; and Iizuka, Tetsuya, to Kabushiki Kaisha Toshiba. MOS semiconductor integrated circuit in which the production of hot carriers near the drain of a short n channel conductivity type MOS transistor is decreased. 4,857,763, Cl. 307-443.000.

Salerni, John V.: *See—*
Donovan, Joseph F.; Spatz, Edward C.; Salerni, John V.; Peterson, Elmer R.; and Weirich, John B., 4,856,591, Cl. 166-278.000.

Saller, Helmut: *See—*
Hoffmann, Thomas; Mayr, Ernst; and Saller, Helmut, 4,857,242, Cl. 264-1.400.

Salomon S.A.: *See—*
Arduin, Joel, 4,856,806, Cl. 280-605.000
Dunand, Josiane; Arnule, Paul; and Gasquet, Denis, 4,856,807, Cl. 280-615.000.

Salter, Richard J., Jr.; and Long, George S., III, to Asinc, Inc. Real-time flight and destination display for aircraft passengers. 4,857,924, Cl. 340-973.000.

Salvagnini, Guido, to SZ s.r.l. Machine tool for turning, milling, boring, drilling, and washing with independent means for clamping the part to be machined. 4,856,178, Cl. 29-568.000.

Salvagnini, Guido, to Salvagnini Transferica S.p.A. Bending machine for the production of rectangular sheet metal panels starting from flat metal sheets. 4,856,315, Cl. 72-306.000.

Salvagnini Transferica S.p.A.: *See—*
Salvagnini, Guido, 4,856,315, Cl. 72-306.000.

Salzman, Catherine A.; and Muszak, Martin F., to Eastman Kodak Company. Analyzer with wash station separate from incubator. 4,857,471, Cl. 436-43.000.

Sampsell, Jeffrey B.; and McDonald, Terrance G., to Texas Instruments Incorporated. Optical fiber interconnection network including spatial light modulator. 4,856,863, Cl. 350-96.160.

Samsonite Corporation: *See—*
Scelba, Stephen S.; and Feinberg, Martin R., 4,856,306, Cl. 70-68.000.

Samuelson, Douglas A., to International Telesystems Corp. System for regulating arrivals of customers to servers. 4,858,120, Cl. 364-401.000.

Sanagi, Kenichiro, to Olympus Optical Co., Ltd. Endoscope treatment device. 4,857,057, Cl. 604-164.000.

Sanbayashi, Takeshi: *See—*
Abuyama, Yasuo; Ide, Fumito; Hamanaka, Osamu; and Sanbayashi, Takeshi, 4,857,954, Cl. 355-245.000.

Sanchez, George, to Clyde Industries Limited. Low profile gear driven rotary scrub brush. 4,856,133, Cl. 15-29.000.

Sanders, Evan: *See—*
Hogan, Paul J.; Sanders, Evan; and DiGirolamo, Robert, 4,856,318, Cl. 73-12.000.

Sanders, Horst: *See—*
Becker-Ross, Helmut; Florek, Stefan; Kerstan, Felix; Moebius, Guenther; and Sanders, Horst, 4,856,898, Cl. 356-328.000.

Sanders, Royden C., Jr. Dot matrix printing and scanning. 4,856,920, Cl. 400-124.000.

Sandman, Leonardo: *See—*
Schatzberger, Yeshayahu; Mor, Yeshayahu; and Sandman, Leonardo, 4,858,166, Cl. 364-748.000.

Sandvig, Timothy C.: *See—*
Ersfeld, Dean A.; Hansen, Paul E.; Scholz, Matthew T.; Bartizal, Dennis C.; Reed, Katherine E.; Larson, Wayne K.; Sandvig, Timothy C.; and Buckanin, Richard S., 4,856,502, Cl. 128-90.000.

Sandvik AB: *See—*
Brandt, Nils G. L.; and Byhlin, Ake B., 4,857,108, Cl. 75-238.000.

Sangregory, Jude: *See—*
Wirt, Michael L.; Sangregory, Jude; and Bridges, Mark E., 4,858,003, Cl. 358-102.000.

Sankey, Edward L.: *See—*
Boliver, Vincent J.; Roscizewski, Paul M.; Sankey, Edward L.; and DeMeyer, Roy W., 4,857,021, Cl. 439-801.000.

Sano, Shin-ichi: *See—*
Kawai, Taiyo; Nakagawa, Norihisa; and Sano, Shin-ichi, 4,856,473, Cl. 123-308.000.

Sanshin Kagaku Kogyo Co., Ltd.: *See—*
Kouge, Katsushige, 4,857,656, Cl. 558-271.000.

Sanshin Kogyo Kabushiki Kaisha: *See—*
Takashima, Kazutoshi, 4,857,023, Cl. 440-88.000.

Santa Barbara Research Center: *See—*
Goodnough, Mark A.; Stineman, John A., Jr.; and Hoffman, Alan W., 4,857,725, Cl. 250-214.00A.

Santoro, Gennaro. Heat exchanger unit formed of a plurality of modular units including connection couplers. 4,856,581, Cl. 165-130.000.

Sanwa Kagaku Kenkyusho Co., Ltd.: *See—*
Kurono, Masayasu; Baba, Yutaka; Mitani, Takahiko; Onishi, Masao; Kondo, Yasuaki; and Sawai, Kiichi, 4,857,521, Cl. 514-206.000.

Sanyo Electric Co., Ltd.: *See—*
Iwamoto, Masayuki; Minami, Kouji; and Watanabe, Kaneo, 4,857,115, Cl. 136-249.000.

Saotome, Shigeru; and Nakajima, Nobuyoshi, to Fuji Photo Film Co., Ltd. Radiation image read-out method and apparatus, and radiation image read-out and reproducing method and apparatus. 4,857,733, Cl. 250-327.200.

Sapiejewski, Roman, to Bose Corporation. Headphone cushioning. 4,856,118, Cl. 2-209.000.

Sarcem S.A.: *See—*
Bonello, Philippe; and Noirot, Jacques, 4,856,721, Cl. 242-7.140.

Sardo, Alberto, to Xeda International. Compositions for the treatment of fruit and vegetables by thermal fogging and processing method using said composition. 4,857,345, Cl. 426-310.000.

Sartain, Stephen C.; and Chamberlain, Richard W., to Caterpillar Inc. Auxiliary actuation mechanism for a brake assembly. 4,856,622, Cl. 188-170.000.

Sartomer Company, Inc.: *See—*
Reiter, Ralph H.; and Ekwall, C. Raymond, 4,857,571, Cl. 524-248.000.

Sartorius GmbH: *See—*
Cornelius, Klaus; and Exner, Rainer, 4,856,605, Cl. 177-210.00R.

Sasaki, Tatsuo; Fujimaki, Hideo; Uemura, Tadahiro; and Kurihara, Masaru, to Toray Industries, Inc. Process for preparation of semipermeable composite membrane. 4,857,363, Cl. 427-245.000.

Sashou, Hidehiko; and Kizu, Soujiro, to Sony Corporation. Video tape recorder edit control system for performing color frame editing. 4,858,027, Cl. 358-311.000.

Sassenberg, Gero, to Karl Lautenschlager GmbH & Co. KG. Cabinet hinge with cover in the form of an elongated bellows. 4,856,141, Cl. 16-250.000.

Satani, Masuo: *See—*
Manabe, Sei-ichi; and Satani, Masuo, 4,857,196, Cl. 210-500.300.

Sato, Akira; Sekizuka, Yasuo; and Saito, Satoshi, to Meiji Seika Kaisha Ltd. Process for preventing staling of starch-containing composition. 4,857,346, Cl. 426-321.000.

Sato, Akira: *See—*
Fuyama, Moriaki; Tamura, Katsumi; Taguchi, Kazuo; Onisawa, Kenichi; Sato, Akira; Hashimoto, Kenichi; Nakayama, Takahiro; and Abe, Yoshio, 4,857,802, Cl. 313-506.000.

Sato, Hironobu: *See—*
Furusawa, Tadao; Mitsuyuki, Hiroshi; Sato, Hironobu; Tatsuno, Yujiro; and Matsuoka, Shigeru, 4,858,171, Cl. 364-900.000.

Sato, Hiroshi: *See—*
Honda, Hideyuki; Kawasaki, Koichi; and Sato, Hiroshi, 4,856,330, Cl. 73-204.250.

Sato, Kazuo, to Alps Electric Co., Ltd. Remote control apparatus providing leader pulse followed by data pulses. 4,857,917, Cl. 340-825.570.

Sato, Kazuyuki, to Kabushiki Kaisha Toshiba. Monolithic semi-custom IC having standard LSI sections and coupling gate array sections. 4,858,175, Cl. 364-900.000.

Sato, Masahito: *See—*
Sako, Takeshi; Yokochi, Toshihiro; Sato, Masahito; Suzuki, Osamu; Hakuta, Toshikatsu; Sugeta, Tsutomu; and Nakazawa, Noriaki, 4,857,329, Cl. 424-195.100.

Sato, Ryuichi; Taniguchi, Tsutomu; and Ohba, Masatoshi, to Omron Tateisi Electronics Co. Drive circuit for a two layer laminated electrostriction element. 4,857,757, Cl. 307-113.000.

Sato, Shiro: *See—*
Fujii, Katsuhiko; Sato, Shiro; Miyanaga, Yasuhiro; Asami, Heizo; Takekoshi, Susumu; and Kasai, Yasuo, 4,856,849, Cl. 301-63.00R.

Sato, Shoichi: *See—*
Murakoso, Toshiyuki; Sato, Shoichi; and Yagi, Motoi, 4,856,603, Cl. 177-210.00C.

Sato, Tomoaki: *See—*
Tohjoh, Yoshikazu; Hasegawa, Akira; and Sato, Tomoaki, 4,856,495, Cl. 128-6.000.

Sato, Yoichi: *See—*
Nishikawa, Masao; Aoki, Takashi; Sato, Yoichi; and Fukuda, Yukihiro, 4,856,382, Cl. 74-867.000.

Sato, Yoshinori: *See—*
Otonari, Satoshi; Sato, Yoshinori; Masuda, Narihiro; and Kotani, Tomoyuki, 4,857,396, Cl. 428-315.500.

Satoh, Tetsuo: *See—*
Itoh, Hiroyuki; Ishii, Takafumi; and Satoh, Tetsuo, 4,857,427, Cl. 430-19.000.

Satoh, Yokichi: *See—*
Terada, Haruyoshi; Ono, Youji; Satoh, Yokichi; and Kaneko, Hideaki, 4,857,225, Cl. 252-100.000.

Satoh, Yutaka: *See—*
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,857,965, Cl. 355-45.000.
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,857,966, Cl. 355-45.000.

Satou, Hiroyuki, to Fuji Photo Film Co., Ltd. Masking device for use in photographic printing. 4,857,962, Cl. 355-29.000.

Satou, Kazuo: *See—*
Okazaki, Ken; Satou, Kazuo; and Yamamoto, Junichi, 4,856,469, Cl. 123-90.510.

Satzinger, Gerhard; Hermann, Manfred; Fritschi, Edgar; and Weiershausen, Ute, to Godecke Aktiengesellschaft. N-phenylbenzamide derivatives. 4,857,662, Cl. 564-168.000.

Sauer, Gerhard: *See—*
Wachtel, Helmut; Schneider, Herbert H.; Loschmann, Peter-Andreas; Dorow, Rainer; Horowski, Reinhard; Acksteiner, Bernard; Schulze, Paul-Eberhard; and Sauer, Gerhard, 4,857,298, Cl. 424-1.100.

Saunders, Grady F.; and Mars, Wendy M., to University of Texas System, The Board of Regents of the. Probe for detection of specific human leukemias. 4,857,466, Cl. 435-252.330.

Saunders, James: *See—*
Stephens, Donald L.; and Saunders, James, 4,856,812, Cl. 280-678.000.

Sauron, Jean: *See—*
Bazinet, Marc; and Sauron, Jean, 4,856,168, Cl. 29-272.000.

Savale, Yves. System for assembling panels in various angular positions and panels suitable for the use of this system. 4,856,928, Cl. 403-217.000.

Savio, S.p.A.: *See—*
Colli, Luigi, 4,856,268, Cl. 57-58.520.

Sawa, Ikuo: *See—*
Kutsuki, Hidetoshi; Sawa, Ikuo; Mori, Natsuki; Hasegawa, Junzo; and Watanabe, Kiyoshi, 4,857,468, Cl. 435-280.000.

Sawai, Kiichi: *See—*
Kurono, Masayasu; Baba, Yutaka; Mitani, Takahiko; Onishi, Masao; Kondo, Yasuaki; and Sawai, Kiichi, 4,857,521, Cl. 514-206.000.

Sazonov, Jury I.: *See—*
Falkevich, Sergei A.; Naumov, Mikhail V.; Shkarlet, Jury M.; Sukhorukov, Dmitry V.; Fedotov, Viktor N.; and Sazonov, Jury I., 4,856,336, Cl. 73-598.000.

Scapa Inc.: *See—*
Westhead, William T., 4,857,391, Cl. 428-222.000.

Scaringe, Robert P.; Buckman, Jay A.; and Grzyll, Lawrence R., to Mainstream Engineering Corporation. Micro-climate control vest. 4,856,294, Cl. 62-259.300.

Scarpellino, Richard: *See—*
Parliment, Thomas H.; Cipriano, Joseph J.; and Scarpellino, Richard, 4,857,340, Cl. 426-96.000.

Scelba, Stephen S.; and Feinberg, Martin R., to Presto Lock, Inc.; and Samsonite Corporation. Zipper locking apparatus for luggage cases. 4,856,306, Cl. 70-68.000.

Schaap, Arthur P., to Board of Governors of Wayne State University. Chemiluminescent 1,2-dioxetane compounds. 4,857,652, Cl. 549-510.000.

Schabel, Karl-Heinz: *See—*
Musch, Rudiger; Muller, Eberhard; Hohmann, Gerhard; and Schabel, Karl-Heinz, 4,857,616, Cl. 526-204.000.

Schadler, Walter: *See—*
Landau, Richard F.; Millikin Jr., William E.; Puchacz, Jerzy P.; Reyes, Manolito Q.; and Schadler, Walter, 4,857,160, Cl. 204-192.120.

Schaefer, Willi, to Siemens Aktiengesellschaft. Adjustable patient support table for an x-ray diagnostics installation. 4,856,741, Cl. 248-122.000.

Scharrer, Carl J.; and Vogt, Debbie S., to Texas Instruments Incorporated. Fast recovery PNP loaded bipolar static RAM memory cell with an independent current path. 4,858,181, Cl. 365-155.000.

Scharrer, Carl J.; and Pang, Roland H., to Texas Instruments Incorporated. ECL high speed semiconductor memory and method of accessing stored information therein. 4,858,183, Cl. 365-174.000.

Schasteen, Thomas: *See—*
Smith, Lonnie E.; and Schasteen, Thomas, 4,856,582, Cl. 166-98.000.

Schatzberger, Yeshayahu; Mor, Yeshayahu; and Sandman, Leonardo, to Performance Semiconductor Corporation. Method and structure for performing floating point comparison. 4,858,166, Cl. 364-748.000.

Scheer, David I.: *See—*
Lippa, Arnold S.; and Scheer, David I., 4,857,514, Cl. 514-78.000.

Scheffel, Gary W.: *See—*
Gausman, Theodore J.; and Scheffel, Gary W., 4,856,555, Cl. 137-543.170.

Schelhas, Klaus-Dieter, to Orthoplant Endoprothetik GmbH. Device for cutting a thread in a cup-shaped bone. 4,856,503, Cl. 128-92.0VJ.

Schemmann, Heinrich: *See—*
Sieben, Ulrich; and Schemmann, Heinrich, 4,858,008, Cl. 358-148.000.

Schenk & Co.: *See—*
Iten, Thomas, 4,857,887, Cl. 341-34.000.

Schering Aktiengesellschaft: *See—*
Wachtel, Helmut; Schneider, Herbert H.; Loschmann, Peter-Andreas; Dorow, Rainer; Horowski, Reinhard; Acksteiner, Bernard; Schulze, Paul-Eberhard; and Sauer, Gerhard, 4,857,298, Cl. 424-1.100.

Schering Corporation: *See—*
Czarniecki, Michael F.; and Bauer, Barr E., 4,857,301, Cl. 424-40.000.
Narducy, Kenneth W.; Jahnke, Richard L.; and Loshack, Samuel, 4,857,072, Cl. 8-507.000.

Schiessl, Gerhard: *See—*
Reuchlein, Gunter; and Schiessl, Gerhard, 4,856,165, Cl. 29-157.30A.

Schild, Geoffrey C.: *See—*
Minor, Philip D.; Evans, David M. A.; Schild, Geoffrey C.; Almond, Jeffrey W.; and Ferguson, Morag, 4,857,634, Cl. 530-324.000.

Schildhorn, Alan W., to United Technologies Corporation. Complex arithmetic processing. 4,858,164, Cl. 364-736.000.

Schilplin, Frederick C. Dropout assembly. 4,856,802, Cl. 280-288.000.

Schipper, John F.: *See—*
Myers, David W.; Ozarski, Robert G.; Perera, Thiloma I.; Schipper, John F.; Tan, Raul V.; and Watts, Michael P. C., 4,857,738, Cl. 250-372.000.

Schisler, Robert C.: *See—*
Candle, Richard D.; and Schisler, Robert C., 4,857,253, Cl. 264-130.000.

Schlegel Corporation: *See—*
Buonanno, Samuel S., 4,857,668, Cl. 174-35.0GC.

Schleifstein, Robert A., to Ethyl Corporation. Thermoplastic formulations. 4,857,597, Cl. 525-151.000.

Schlumberger Technology Corporation: *See—*
Davies, Dylan H.; and Takeda, Jiro, 4,857,831, Cl. 324-65.0CR.
Hunt, Andrew, 4,856,344, Cl. 73-861.040.
Kleinberg, Robert L.; Clark, Brian; Chew, Weng C.; and Mariani, David, 4,857,852, Cl. 324-339.000.
Upchurch, James M., 4,856,595, Cl. 166-374.000.

Schmid Laboratories, Inc.: *See—*
Laurita, Joseph N., 4,856,980, Cl. 425-572.000.

Schmidt, Dieter: *See—*
Speil, Walter; Schmidt, Dieter; and Zipprath, Michael, 4,856,468, Cl. 123-90.470.

Schmidt, Elke: *See—*
Reinl, Hubert; and Schmidt, Elke, 4,857,356, Cl. 426-620.000.

Schmidt-Kastner, Gunter: *See—*
Egerer, Peter; Crueger, Wulf; and Schmidt-Kastner, Gunter, 4,857,461, Cl. 435-94.000.

Schmidt, Manfred; Sommerfeld, Claus-Dieter; Prolingheuer, Christoph; and Klan, Walter, to Bayer Aktiengesellschaft. Reaction products useful as catalysts in the production of isocyanate-based plastics. 4,857,560, Cl. 521-103.000.

Schmidt, Timothy J.; and Jacob, Valentim, Jr., to General Safety Corporation. Passive seat belt retractor assembly. 4,856,728, Cl. 242-107.700.

Schmidt, Utz H.; and Asfour, Richard E., to TRW Vehicle Safety Systems Inc. Retractor with cinch. 4,856,727, Cl. 242-107.40B.

Schmitt, Martin: *See—*
Widmann, Karlheinz; Kreth, Norbert; Schmitt, Martin; and Stellwagen, Armin, 4,856,278, Cl. 60-423.000.

Schmitte, Franz-Josef: *See—*
Groth, Rolf; and Schmitte, Franz-Josef, 4,857,094, Cl. 65-60.200.

Schmittner, Walter: *See—*
Groher, Manfred; Heit, Werner; Schmittner, Walter; and Warzawa, Wolfgang, 4,857,359, Cl. 427-6.000.

Schmitz, Heinz: *See—*
Divisek, Jiri; and Schmitz, Heinz, 4,857,153, Cl. 204-16.000.

Schneider, Claus: *See—*
Weber, Karl-Heinz; Schneider, Claus; Walther, Gerhard; Hinzen, Dieter; Kuhn, Franz J.; Lehr, Erich; Ensinger, Helmut; and Troger, Wolfgang, 4,857,528, Cl. 514-252.000.

Schneider, Hans: *See—*
Hollenberg, Detlef; Schneider, Hans; and Weihrauch, Georg, 4,856,542, Cl. 132-265.000

Schneider, Herbert H.: *See—*
Wachtel, Helmut; Schneider, Herbert H.; Loschmann, Peter-Andreas; Dorow, Rainer; Horowski, Reinhard; Acksteiner, Bernard; Schulze, Paul-Eberhard; and Sauer, Gerhard, 4,857,298, Cl. 424-1.100.

Schneider, James G., to Sherwood Medical Company. Body fluid collection device. 4,857,042, Cl. 604-4.000.

Schneider, Thomas C.; and Diver, James J., to Advanced Pulver Systems, Inc. System for loading patterns of articles into containers. 4,856,263, Cl. 53-543.000.

Schneider (USA) Inc., A Pfizer Company: *See—*
Rydell, Mark A., 4,857,045, Cl. 604-22.000

Schnitzler, Wilfred H.: *See—*
Obrero, Faustino P.; and Schnitzler, Wilfred H., 4,857,344, Cl. 426-308.000.

Schoch, Karl F., Jr.: *See—*
Bartko, John; Schoch, Karl F., Jr.; Congedo, Thomas V.; and Anderson, Stanwood L., Jr., 4,857,259, Cl. 376-154.000.

Schoeffl, Manfred; and Lex, Erich, to Bauer-Kompressoren GmbH. Protective enclosure device for filling tanks with compressed gas. 4,856,565, Cl. 141-97.000.

Schoenberger, Jack O.: *See—*
Branam, Timothy R.; Roberts, Jeffrey J.; and Schoenberger, Jack O., 4,856,327, Cl. 73-168.000.

Schoenig, Frederick C., Jr.; Walker, Edward S.; Cueman, Michael K.; Haughton, Robert A.; and Zuloaga, Jaime A., Jr., to General Electric Company. Apparatus for assembling and welding end plugs to nuclear fuel cladding tubes and inspecting the end plug welds on an automated basis. 4,857,260, Cl. 376-245.000.

Scholkens, Bernward: *See—*
Urbach, Hansjorg; Henning, Rainer; Scholkens, Bernward; and Becker, Reinhard, 4,857,520, Cl. 514-183.000.

Scholz, Matthew T.: *See—*
Ersfeld, Dean A.; Hansen, Paul E.; Scholz, Matthew T.; Bartizal, Dennis C.; Reed, Katherine E.; Larson, Wayne K.; Sandvig, Timothy C.; and Buckanin, Richard S., 4,856,502, Cl. 128-90.000.

Schoon, David J., to Printware, Inc. Combination of transition-encoded font information for generation of superimposed font images. 4,857,904, Cl. 340-730.000.

Schreck, Hans. Heated channel for plastic injection machines. 4,856,979, Cl. 425-547.000.

Schreck, John F., to Texas Instruments Incorporated. Programming implementation circuit. 4,858,187, Cl. 365-185.000.

Schricker, Brian R., to Pitman-Moore, Inc. Composition and method for increasing milk fat production in ruminants. 4,857,332, Cl. 424-442.000

Schroder, Horst; Kispert, Klaus; Stolz, Robert; and Jacob, Werner, to SKF GmbH. Device for the synchronous guidance of a roller bearing cage for a roller bearing executing swivel motion. 4,856,917, Cl. 384-550.000.

Schroer, Wolf-Dieter: *See—*
Bachem, Henning; Muszik, Janos; Schroer, Wolf-Dieter; and Suling, Carlhans, 4,857,586, Cl. 524-845.000.

Schuetz, James A., to Honeywell Inc. Resistive overlayer for magnetic films. 4,857,418, Cl. 428-693.000

Schult, Guenter: *See—*
Worschech, Kurt; Wedl, Peter; Kachel, Helmut; and Schult, Guenter, 4,857,216, Cl. 252-39.000.

Schulze, Paul-Eberhard: *See—*
Wachtel, Helmut; Schneider, Herbert H.; Loschmann, Peter-Andreas; Dorow, Rainer; Horowski, Reinhard; Acksteiner, Bernard; Schulze, Paul-Eberhard; and Sauer, Gerhard, 4,857,298, Cl. 424-1.100

Schumacher, Gerald E., to Minnesota Mining and Manufacturing Company. Method for obtaining adhesion of urethane sealant to a painted or glass surface. 4,857,366, Cl. 427-302.000.

Schumacher, Klaus: *See—*
Bottenbruch, Ludwig; Traenckner, Hans-Joachim; Hampe, Andreas; and Schumacher, Klaus, 4,856,342, Cl. 73-827.000.

Schuneman, Harold E.: *See—*
Karst, David A.; Pawlowski, Felix R.; Potrafke, William A.; and Schuneman, Harold E., 4,857,119, Cl. 148-318.000.

Schussler, Claus; Wojcik, Janusz; and Hemminger, Rolf, to Witzenmann GmbH Metallschlauch-Fabrik Pforzheim. Solar heating installation with failure-protected heating medium hose. 4,856,494, Cl 126-424.000

Schutte, Gerhard: *See—*
Ybema, Jan; and Schutte, Gerhard, 4,857,338, Cl. 426-2.000.

Schwab, Gerhart; and Brandon, Richard L., to Mead Corporation, The. Microcapsules with polysalt capsule walls and their formation 4,857,406, Cl. 428-402.220.

Schwab, Thomas H.: *See—*
Clendinning, Robert A.; Maresca, Louis M.; Matzner, Markus; and Schwab, Thomas H., 4,857,625, Cl. 528-171.000.

Schwaiger, Ernst; and Mitteregger, Erich, to IFW-Manfred Otte Gesellschaft m.b.H. & Co. KG. Die mold for the production of injection molded products and having improved closure member for closing a ring-receiving recess. 4,856,753, Cl. 249-94.000.

Schwartz, Abraham, to Flow Cytometry Standards Corporation. Method of compensating and calibrating a flow cytometer, and microbead standards kit therefor. 4,857,451, Cl. 435-7.000

Schwartz, Barry: *See—*
Dick, Chris C.; Schwartz, Barry; McMunn, Bert D.; and Zeh, Peter H., 4,857,287, Cl. 423-315.000.

Schweer, Reiner; Juenke, Manfred; and Sieben, Ulrich K., to Deutsche ITT Industries GmbH. Digital data slicer circuit for digital teletext signals. 4,858,007, Cl. 358-147.000.

Schweitzer, Martin: *See—*
Ochel, Klaus-Peter; Krupp, Joachim; Heger, Josef; and Schweitzer, Martin, 4,856,985, Cl. 431-202.000

Schweppe, Fred C.: *See—*
Hart, George W.; Kern, Edward C., Jr.; and Schweppe, Fred C., 4,858,141, Cl. 364-483.000.

Schwerdt, Friedrich W.: *See—*
Greschner, Johann; Schwerdt, Friedrich W.; and Trumpp, Hans J., 4,857,383, Cl. 428-156.000

Schwinn, Georg, to M.U.W. Verpackungen. Portable packing bag made of plastic film, and method of producing the same. 4,857,037, Cl. 493-195.000

SCI Systems, Inc.: *See—*
Faes, Steven M., 4,857,945, Cl. 346-160.100.

Sciaky S.A.: *See—*
Marianne, Jean J.; and Jablonski, Pierre, 4,856,698, Cl. 228-4.100.

Scot, Incorporated: *See—*
Evans, Griffith S., 4,856,433, Cl. 102-530.000.
Nordhaus, John P., 4,858,244, Cl. 372-77.000.

Scott, Harold C.; and Martin, Carl O. Self propelled carrier. 4,856,839, Cl. 296-24.200.

Scripps Clinic and Research Foundation: *See—*
Zimmerman, Theodore S.; and Fulcher, Carol A., 4,857,635, Cl. 530-383.000

Seagate Technology, Inc.: *See—*
Crapo, Alan D., 4,858,044, Cl. 360-99.080.

Seal, Michael J., to Bonar Carelle Limited. Absorbent products. 4,857,065, Cl. 604-368.000.

Sears Manufacturing Company: *See—*
Brodersen, Cole T.; and Foster, Danny S., 4,856,763, Cl. 267-131.000.

Sebag, Henri: *See—*
Philippe, Michel; Sebag, Henri; Leger, Didier S.; and Leveque, Jean L., 4,857,525, Cl. 514-227.500.

Seevinck, Evert; De Jager, Willem; and Buitendijk, to U. S. Philips Corporation. Amplifier arrangement with improved quiescent current control. 4,857,861, Cl. 330-255.000.

Segal, Jerome, to Cardiometrics, Inc. Ultrasonic pulmonary artery catheter and method. 4,856,529, Cl. 128-661.080

Segawa, Masao; and Arakawa, Masayuki, to Kabushiki Kaisha Toshiba. Thick-film high frequency signal circuit apparatus with feedthrough capacitor. 4,858,064, Cl. 361-302.000.

Seidel, Winfried; and Tappe, Horst. 2,4-Diaminophenyl tetrahydrofurfuryl ethers, processes for their preparation and tinting compositions, which contain them for keratinic fibres. 4,857,070, Cl. 8-408.000.

Seidensticker, Jens, to Rheinmetall GmbH. Device for arming and disarming a directional mine. 4,856,431, Cl. 102-427.000.

Seidner, David S., to Conoco Inc. Method for monitoring and controlling scale formation in a well. 4,856,584, Cl. 166-250.000.

Seikosha Co., Ltd.: *See—*
Sugino, Kouichi, 4,856,924, Cl. 400-283.000.

Seim, William J.: *See—*
Rebers, Kenneth D.; Seim, William J.; and Krenz, Dean C., 4,857,672, Cl. 174-93.000.

Seima Italiana SpA: *See—*
Hasuike, Makio, 4,856,855, Cl. 312-111.000.

Seitz, Edwin: *See—*
Polzer, Herwig W.; and Seitz, Edwin, 4,856,886, Cl. 350-635.000.

Seki, Kameharu; and Kubo, Isamu, to Nippon CMK Corporation. Apparatus for filler taping screen frame and apparatus for applying filling liquid to screen frame. 4,856,424, Cl. 101-128.400.

Seki, Yoshinobu: *See—*
Kirihara, Tomoo; Nakagawa, Ippei; Seki, Yoshinobu; and Honda, Yutaka, 4,857,155, Cl. 204-61.000

Sekida, Minoru: *See—*
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,857,953, Cl. 354-475.000

Sekiguchi, Takeshi: *See—*
Fukami, Kiyoshi; Sekiguchi, Takeshi; and Ohshima, Shigeru, 4,857,997, Cl. 358-55.000

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Anraku, Hideo; and Shoji, Yoshikata, 4,856,533, Cl. 128-763.000.

Sekizuka, Yasuo: *See—*
Sato, Akira; Sekizuka, Yasuo; and Saito, Satoshi, 4,857,346, Cl. 426-321.000.

Sekur S.p.A.: *See—*
Moscatelli, Romano, 4,856,113, Cl. 2-84.000.

Seld, Sigurd V., to Joh. Friedrich Behrens AG. Pneumatically operated driving tool for fasteners. 4,856,696, Cl. 227-130.000

Selwyn-Smith, Clive, to Locwyn Limited. Document suspension apparatus. 4,856,660, Cl. 211-46.000

Selzer, Gunther. Fire retardant gas spring assembly for a passenger seat control. 4,856,762, Cl. 267-64.120.

Semiconductor Energy Laboratory Co., Ltd.: *See—*
Tashiro, Mamoru; Urata, Kazuo; and Yamazaki, Shunpei, 4,857,139, Cl. 156-643.000.
Yamazaki, Shunpei; and Hamatani, Toshiji, 4,856,458, Cl. 118-722.000.

Separation Dynamics, Inc.: *See—*
Taylor, John A., 4,857,081, Cl. 55-16.000.

Serizawa, Haruo: *See—*
Hashimoto, Yasuaki; and Serizawa, Haruo, 4,857,413, Cl. 428-592.000.
Hitachi, Yuzo; and Serizawa, Haruo, 4,857,500, Cl. 502-439.000.

Serv-Tech, Inc.: *See—*
Krajicek, Richard W.; and Cradeur, Robert R., 4,856,545, Cl. 134-166.00C

Seto, Toru; Mitsuoka, Shigeaki; Morii, Atsushi; and Kobayashi, Norihisa, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for treating exhaust gas. 4,857,276, Cl. 422-171.000

Sevastopoulos, Nello G., to Linear Technology Corporation. Clock-sweepable low-pass filter having DC gain accuracy and reduced DC offset. 4,857,860, Cl. 330-107.000

Severance, Marcus W.; and Kirby, Aaron A. Fishing float. 4,856,219, Cl. 43-17.500.

Sew Simple Systems, Inc.: *See—*
Brocklehurst, Charles E., 4,856,442, Cl. 112-147.000.
Brocklehurst, Charles E., 4,856,444, Cl. 112-262.300.

Sezeur, Alain: *See—*
Rey, Pierre; Leandri, Jacqueline; Abbou, Clement; and Sezeur, Alain, 4,857,059, Cl. 604-185.000.

SFT AG Spontanfordertechnik: *See—*
Reist, Walter, 4,856,644, Cl. 198-716.000

SGS-Thomson Microelectronics S.A.: *See—*
Steffen, Francis; and Labelle, Jean, 4,857,483, Cl. 437-209.000.

Shaffer, David E.; and Della Corte, Michael P. Apparatus for relieving pain and discomfort of a bunion. 4,856,505, Cl. 128-81.00R.

Shamsuddin, Abulkalam M.; Elsayed, Alaaeldeen M.; and Jockle, Glenn A. Screening test for large intestinal cancer. 4,857,457, Cl. 435-7.000.

Sharp Kabushiki Kaisha: *See—*
Fukunaga, Takahiro, 4,856,142, Cl. 16-298.000.
Haneda, Isamu, 4,857,756, Cl. 307-66.000.
Hirata, Kengo; and Ishifuro, Katsumi, 4,857,686, Cl. 219-10.55B.
Honda, Iwakazu, 4,857,956, Cl. 355-234.000.
Katsoka, Shoei; Yoshida, Masaru; and Nakajima, Shigeo, 4,857,920, Cl. 340-907.000.
Kozaki, Shyuichi; Ichimura, Yukiko; and Narutako, Yozo, 4,856,875, Cl. 350-341.000.
Minami, Katsuji; Murata, Shinichi; Tsujimoto, Susumu; Matuzaki, Yukinori; Yukawa, Shogo; and Osaka, Susumu, 4,856,574, Cl. 160-168.100
Takahashi, Akira; Murakami, Yoshiteru; Mieda, Michinobu; Miyake, Tomoyuki; and Ohta, Kenji, 4,858,212, Cl. 369-13.000.
Uehira, Shigeyuki, 4,857,375, Cl. 428-75.000.
Washizuka, Isamu; Tsugei, Shinji; and Inoue, Tomohiro, 4,858,125, Cl. 364-413.010.

Yano, Seiki; Kudo, Hiroaki; Takiguchi, Haruhisa; Hijikata, Toshiki; and Kaneiwa, Shinji, 4,858,215, Cl. 369-45.000.

Shaw, James J.; and Bunick, Frank J., to Warner-Lambert Company. Sugarless pectin delivery system. 4,857,331, Cl. 424-440.000.

Shaw, Roland J., to Titan Mining & Engineering PTY. LTD. Deformed bar for adhesion and applying tension. 4,856,952, Cl. 411-413.000.

Shearer, Dwayne M.; Beetham, Richard C.; Beall, Frank C.; and Rodgers, John M., to Weyerhaeuser Company. Bond strength measurement of composite panel products. 4,856,334, Cl. 73-588.000.

Shebini, Nader O., to Babcock & Wilcox Company, The. Automated design of structures using a finite element database. 4,858,146, Cl. 364-512.000.

Sheinberg, Haskell; Meek, Thomas T.; and Blake, Rodger D., to United States of America, Energy. Dispersion strengthened copper. 4,857,266, Cl. 419-22.000.

Shell, Melvin E. Large capacity wing loader and unloader apparatus for cargo ships. 4,856,961, Cl. 414-749.000.

Shell Oil Company: *See—*
Borchardt, John K., 4,856,588, Cl. 166-273.000.
Coleman-Kammula, Seetha, 4,857,588, Cl. 525-54.200.
Danforth, R. L.; Gergen, W. P.; and Neate, J. A., 4,857,147, Cl. 162-156.000.
Dejaifve, Pierre E.; Darnanville, Jean-Paul; Dufour, Jacques J. J.; and Garin, Roland A. C., 4,857,498, Cl. 502-304.000.
De Jong, Krijn P.; Glezer, Johannes H. E.; and Post, Martin F. M., 4,857,497, Cl. 502-242.000.
Hoek, Arend; Huizinga, Tom; and Maxwell, Ian E., 4,857,170, Cl. 208-111.000.
Hoek, Arend; Huizinga, Tom; and Maxwell, Ian E., 4,857,171, Cl. 208-111.000.
Kuhlman, Myron I.; Borchardt, John K.; and Falls, Andrew H., 4,856,589, Cl. 166-273.000.
Long, Thomas E., 4,857,736, Cl. 250-358.100.
Lutz, Robert G., 4,857,605, Cl. 525-445.000.
Potter, Michael W., 4,857,077, Cl. 48-197.00R.
Smutny, Edgar J., 4,857,570, Cl. 524-112.000.
Vinegar, Harold J.; Wellington, Scott L.; and de Waal, Jannetje A., 4,856,341, Cl. 73-798.000.

Shelly, William A.: *See—*
Wilhite, John E.; and Shelly, William A., 4,858,176, Cl. 364-900.000.

Sheng, Zhengzhi: *See—*
Hermann, Allen M.; and Sheng, Zhengzhi, 4,857,504, Cl. 505-1.000.

Shepherd, Benjamin G.: *See—*
Marvin, Jack C.; and Shepherd, Benjamin G., 4,856,662, Cl. 212-176.000.

Sheppard, Ronald K.: *See—*
Heath, Allen W.; Hernandez, Raymond; Hoffman, Virginia M.; Sheppard, Ronald K.; and Stratton, Susan D., 4,858,114, Cl. 364-200.000.

Sheridan, James E.: *See—*
Benscoter, Richard D.; Domigan, Charles; Flachbarth, Charles T.; and Sheridan, James E., 4,857,016, Cl. 439-680.000.

Sherman, Fred P.; and Atkinson, David C., to Baker Cummins Pharmaceuticals, Inc. Method of treatment for autoimmune diseases. 4,857,533, Cl. 514-282.000.

Sherwood Medical Company: *See—*
Schneider, James G., 4,857,042, Cl. 604-4.000.
Talonn, Daniel A., 4,857,056, Cl. 604-135.000.

Sheryll, Richard. Illuminated coaster for a drinking vessel. 4,858,084, Cl. 362-101.000.

Shibata, George: *See—*
Okawa, Dobson; Pang, Wing S.; Ngo, Dang; and Shibata, George, 4,858,155, Cl. 364-557.000.

Shibata, Jiro: *See—*
Ohashi, Ryota; Kawamura, Masahisa; and Shibata, Jiro, 4,856,277, Cl. 60-422.000.

Shibata, Kazuo: *See—*
Ushio, Hideaki; Hayashi, Tadayoshi; Shibata, Kazuo; Hata, Tsunehisa; and Fujisawa, Yoshikazu, 4,856,462, Cl. 123-41.840.

Shibata, Motohiro: *See—*
Wakimoto, Kazumasa; Shibata, Motohiro; Ishii, Takaharu; and Sakurai, Masaaki, 4,857,106, Cl. 75-41.000.

Shibata, Takeshi: *See—*
Aono, Toshiaki; Shibata, Takeshi; and Takeno, Kazuma, 4,857,443, Cl. 430-496.000.

Shibuya, Ichiro: *See—*
Takagi, Masamichi; Yano, Keiji; Shibuya, Ichiro; and Morikawa, Minoru, 4,857,460, Cl. 435-91.000.

Shigematsu, Kazutoshi: *See—*
Fujii, Shigemi; Kumazaki, Eisuke; and Shigematsu, Kazutoshi, 4,857,256, Cl. 264-310.000.

Shih, Lei-Chen. Paper shifting apparatus for toilet seats. 4,856,694, Cl. 226-134.000.

Shih, Liang, to Eastman Kodak Company. High-speed non-contact linear motor with magnetic levitation. 4,857,781, Cl. 310-12.000.

Shikiya, Hajime: *See—*
Teraoka, Akira; and Shikiya, Hajime, 4,856,611, Cl. 180-233.000.

Shimada, Hiromi: *See—*
Oshima, Shinji; and Shimada, Hiromi, 4,857,245, Cl. 264-25.000.

Shimada, Kazutoshi: *See—*
Hosaka, Masao; Shimada, Kazutoshi; and Sakamaki, Hisashi, 4,857,960, Cl. 355-208.000.

Shimada, Masaru: *See—*
Torii, Yasuhiro; Matsuo, Seitaro; Watanabe, Iwao; and Shimada, Masaru, 4,857,809, Cl. 315-111.310.

Shimada, Toshiaki. Rotative tool for repairing electrodes for spot welding. 4,856,949, Cl. 409-140.000.

Shimadzu Corporation: *See—*
Kumazawa, Yoshihiko; and Matsuyama, Tsunekazu, 4,857,722, Cl. 250-207.000.

Shimasaki, Shigetaka, to Nihon Kenkou K.K. Tile assembly. 4,856,246, Cl. 52-386.000.

Shimazaki, Tetsuo, to Alliance Research Corporation. Mobile communications antenna. 4,857,939, Cl. 343-715.000.

Shimbo, Kazuyuki; and Nishimura, Katsuhiko, to Asahi Kogaku kogyo K.K. Method and apparatus of charging for transfer in electrophotograph device. 4,857,959, Cl. 355-276.000.

Shimizu, Hiroyuki: *See—*
Hirose, Tomiyuki; and Shimizu, Hiroyuki, 4,856,777, Cl. 273-1.0GA.

Shimizu, Shumpei, to Moses Lake Industries, Inc. Process for producing silica of high purity. 4,857,290, Cl. 423-339.000.

Shimizu, Takako: *See—*
Fukasawa, Junichi; Kato, Haruya; Iwaya, Katsumasa; Shimizu, Takako; and Kawano, Atsushi, 4,857,308, Cl. 424-63.000.

Shimomura, Akihiro: *See—*
Usami, Toshimasa; Shimomura, Akihiro; Tatsuta, Sumitaka; and Hatakeyama, Seiji, 4,857,501, Cl. 503-200.000.

Shimomura, Setsuhiro; and Nishimura, Yukinobu, to Mitsubishi Denki Kabushiki Kaisha. Rotational frequency control apparatus of internal combustion engine. 4,856,475, Cl. 123-339.000.

Shimomura, Yasuo: *See—*
Takeuchi, Kunihiko; Hayashi, Kiyoshi; and Shimomura, Yasuo, 4,858,103, Cl. 364-174.000.

Shimura, Kazuo; and Ishida, Masamitsu, to Fuji Photo Film Co., Ltd. Radiation image recording and read-out apparatus. 4,857,732, Cl. 250-327.200.

Shin, Masaaki; Fujiwara, Akio; and Taniwaki, Hiroshi, to Mitsui Toatsu Chemicals, Incorporated. Electrophotographic toner for high speed electrophotography. 4,857,433, Cl. 430-120.000.

Shindo, Yoshio; Yamazaki, Fumio; Wada, Kouichi; Tomio, Hidehiro; and Saito, Katsushi, to Nippon Steel Corporation. Method for producing a Zn-series electroplated steel sheet. 4,857,154, Cl. 204-27.000.

Shinguryo, Satoshi: *See—*
Kogure, Masaaki; Mitekura, Yoshihiro; Matsuyama, Naoki; and Shinguryo, Satoshi, 4,857,908, Cl. 340-785.000.

Shinmoto, Toshiharu, to Mazda Motor Corporation. Reverse synchronizer with a smaller synchronization capacity then the forward gear synchronizers. 4,856,361, Cl. 74-339.000.

Shinohara, Hiroichi; Suzuki, Hideo; and Ogihara, Satoru, to Hitachi, Ltd. Condenser-containing, ceramic multi-layer circuit board and semiconductor module and computer having the circuit board. 4,858,077, Cl. 361-414.000.

Shintani, Yooichi: *See—*
Kuriyama, Kazunori; Shintani, Yooichi; Yamaoka, Akira; Shonai, Tohru; Kamada, Eiki; and Inoue, Kiyoshi, 4,858,105, Cl. 364-200.000.

Shionogi & Co., Ltd.: *See—*
Makoto, Adachi; Matsumura, Hiromu; and Sugasawa, Tsutomu, 4,857,645, Cl. 544-349.000.

Shirai, Hikaru, to Daisyo Seiki Kabushiki Kaisha. Workpiece carrier means for surface grinding machine. 4,856,232, Cl. 51-215.0AR.

Shiraishi, Akihiko, to Canon Kabushiki Kaisha. Photographic lens of long back focal length. 4,856,881, Cl. 350-463.000.

Shirakawa, Hiroyuki, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for controlling throttle valve. 4,856,476, Cl. 123-342.000.

Shirata, Akihiro: *See—*
Yoshimura, Hiroshi; Shirata, Akihiro; and Kuroyanagi, Junzo, 4,856,360, Cl. 74-335.000.

Shirley, Arthur R., Jr., to Pursell Industries. Sulfur-coated fertilizer granules and process of making same. 4,857,098, Cl. 71-28.000.

Shiseido Company Ltd.: *See—*
Ishiwatari, Masaaki; Tsutsumi, Yuji; Ogusu, Yoshiyuki; and Kimura, Yoshihiro, 4,857,304, Cl. 424-59.000.

Shishido, Hideomi; Doi, Shigeo; Sumida, Hideki; and Tanaka, Masayuki, to Molten Corporation. Game ball. 4,856,781, Cl. 273-65.00E.

Shizukawa, Kenjiro: *See—*
Ito, Masamichi; Ohkoshi, Akio; Shizukawa, Kenjiro; Hayata, Terunobu; Furuya, Tomiaki; Yamanaka, Susumu; and Koezuka, Junji, 4,857,499, Cl. 502-326.000.

Shkarlet, Jury M.: *See—*
Falkevich, Sergei A.; Naumov, Mikhail V.; Shkarlet, Jury M.; Sukhorukov, Dmitry V.: Fedotov, Viktor N.; and Sazonov, Jury I., 4,856,336, Cl. 73-598.000.

Shobert, James P.; and Fish, Elson B., to Plas/Steel Products, Inc. Fiber-reinforced plastic strut connecting link. 4,857,124, Cl. 156-149.000.

Shockling, Larry A.: *See—*
Veronesi, Luciano; and Shockling, Larry A., 4,857,264, Cl. 376-353.000.

Shoji, Yoshikata: *See—*
Anraku, Hideo; and Shoji, Yoshikata, 4,856,533, Cl. 128-763.000.

Sholder, Jason A.; Mann, Brian M.; and Florio, Joseph J., to Siemens-Pacesetter, Inc. Rate-responsive pacemaker with automatic mode switching and/or variable hysteresis rate. 4,856,523, Cl. 128-419.0PG.

Sholes, Bessie M. Perspiration shield. 4,856,111, Cl. 2-56.000.

Shonai, Tohru: *See—*
Kuriyama, Kazunori; Shintani, Yooichi; Yamaoka, Akira; Shonai, Tohru; Kamada, Eiki; and Inoue, Kiyoshi, 4,858,105, Cl 364-200.000.

Shopsky, Harvey J., to Robertshaw Controls Company. Method of making a valve construction. 4,856,164, Cl. 29-157.10R.

Shore, Dennis. Article carrier. 4,856,689, Cl. 224-218.000

Shoshan, Itamar, to Elop Electrooptics Industries Ltd. Laser system 4,858,239, Cl. 372-9.000.

Shoshana RAM: *See—*
Gal, Shmuel, 4,856,597, Cl. 172-33.000

Shouldice, David R.; Treu, Dennis M.; Powell, Daniel A.; and Cernich, Thomas, to Cobe Laboratories, Inc. Control of cleaning of dialysate preparation apparatus. 4,857,181, Cl. 210-87.000

Showa Sangyo Co., Ltd.: *See—*
Kawamata, Yoshio; and Iwai, Kiyoshi, 4,857,279, Cl. 422-268.000

Shu, Chi-Yao, to Tai, Matthias; Hu, Shing-Bun; Yeh, Gwo-Guer; and Guo, Mow-Ho. Closed variable-volume container coolable to rapidly solidify water therein. 4,856,296, Cl. 62-430.000.

Shuert, Lyle H. Container with sleeve interlocking latch. 4,856,657, Cl. 206-600.000.

Shufflebarger, Charles: *See—*
Hein, Bruce; and Shufflebarger, Charles, 4,857,788, Cl. 310-214.000

Shulman, Cindy B.: *See—*
Hazelton, Donald R.; and Shulman, Cindy B., 4,857,409, Cl. 428-494.000.

Shultz, Preston D.; and Owen, William, to Wyle Laboratories. Field repairable cable connector. 4,857,011, Cl. 439-469.000

Sibalis, Dan, to Drug Delivery Systems Inc. Method for making disposable and/or replenishable transdermal drug applicators. 4,856,188, Cl. 29-877.000

Sicim SpA: *See—*
Cosmai, Pietro, 4,856,567, Cl. 141-302.000

Siddens, Jack K.: *See—*
Brown, Dale G.; Siddens, Jack K.; Diehl, Robert E.; and Wright, Donald P., Jr., 4,857,651, Cl. 549-443.000

Sieben, Ulrich; and Schemmann, Heinrich, to Deutsche ITT Industries GmbH. Apparatus for the digital generation of vertical synchronizing and field identification signals. 4,858,008, Cl. 358-148.000

Sieben, Ulrich K.: *See—*
Schweer, Reiner; Juenke, Manfred; and Sieben, Ulrich K., 4,858,007, Cl. 358-147.000.

Siebert, Edward: *See—*
Dunavan, David S.; Abreu, Rene; Messelt, Stephen; and Siebert, Edward, 4,857,721, Cl. 250-203.00R

Siebert, Lester D., to Uly-Pak, Inc. Preheater for heat-sealing system for plastic containers. 4,856,989, Cl. 432-225.000.

Sieberth, Ralf; and Sollinger, Hans-Peter, to J.M. Voith GmbH. Applicator mechanism for coating running webs. 4,856,454, Cl. 118-126.000

Siemens Aktiengesellschaft: *See—*
Baumgartner, Werner; and Fellinger, Johannes, 4,856,185, Cl. 29-840.000
Gaebel, Lutz, 4,857,762, Cl. 307-441.000
Hein, Gerd, 4,858,196, Cl. 365-229.000
Hoffmann, Thomas; Mayr, Ernst; and Saller, Helmut, 4,857,242, Cl 264-1.400
Jacopich, Werner; Winter, Kurt; and Mayr, Siegfried, 4,857,761, Cl. 307-350.000.
Kuhlmann, Werner; Spaeth, Werner; Waitl, Guenter; and Klann, Joerg, 4,857,746, Cl. 250-551.000
Maier, Reinhard; and Goth, Kurt, 4,858,057, Cl. 361-94.000
Reinfelder, Hans-Erich, 4,857,734, Cl. 250-327.200.
Rudolf, Hans-Werner; Stader, Harald; Wingerath, Norbert; and Lechner, Robert, 4,858,226, Cl. 370-58.000
Schaefer, Willi, 4,856,741, Cl. 248-122.000
Soelkner, Gerald, 4,857,836, Cl. 324-96.000
Weimert, Guenter; and Narjes, Ferdinand, 4,858,222, Cl. 370-13.000
Zojer, Bernhard, 4,857,932, Cl. 341-159.000

Siemens-Pacesetter, Inc.: *See—*
Sholder, Jason A.; Mann, Brian M.; and Florio, Joseph J., 4,856,523, Cl. 128-419.0PG

Sieverding, David L. Decorative foils and decals. 4,857,401, Cl. 428-336.000.

Sigg, Hans, to Maag Gear-Wheel & Machine Company Limited. Thrust bearing arrangement. 4,856,914, Cl. 384-223.000

Silas, Letha. Teaching aids. 4,856,998, Cl. 434-210.000

Silberberg, Yaron; and Smith, Peter W., to Bell Communications Research, Inc. Integrated all-optical switching devices. 4,856,860, Cl 350-96.120.

Silkbell Limited: *See—*
Hiemstra, Lourens A. V., 4,856,552, Cl. 137-497.000.

Silver, Spencer F.; Bronn, William R.; and Joseph, Eugene G., to Minnesota Mining and Manufacturing Company. Condensed phase polymers. 4,857,618, Cl. 526-240.000

Silver, Spencer F.: *See—*
Bronn, William R.; Silver, Spencer F.; and Joseph, Eugene G., 4,857,615, Cl. 526-173.000.

Silverman, Ronald H.: *See—*
Lizzi, Frederic L.; Yaremko, Mykola M.; Silverman, Ronald H.; and Coleman, D. Jackson, 4,858,124, Cl. 364-413.010.

Simada, Yuji: *See—*
Takechi, Moriaki; and Simada, Yuji, 4,857,848, Cl. 324-318.000.

Simcoe, Michael D.: *See—*
Cahill, Michael J.; Simcoe, Michael D.; Stanton, John D.; and Warner, Brian H., 4,856,536, Cl. 131-28.000

Simens Aktiengesellschaft: *See—*
Pichler, Alfred; Hertrampf, Joachim; and Pachonik, Horst, 4,856,181, Cl. 29-603.000

Simon, Jean-Pierre, to Kis Photo Industrie. Device for analyzing a liquid sample. 4,857,274, Cl. 422-72.000.

Simon, Wilhelm; and Oesch, Urs, to Willi Moller, Firma. Plastic material containing a tetracarboxylic acid tetraester-plasticizer. 4,857,573, Cl. 524-291.000

Simonet, Guy: *See—*
Wijnendaele, Frans V.; Gilles, Daniel; and Simonet, Guy, 4,857,317, Cl. 424-89.000

Simons, Michael J., to Eastman Kodak Company. Photographic silver halide element and process. 4,857,448, Cl. 430-544.000.

Simons, Tad D.; Stawitcke, Frederick A.; Reed, William M.; and Tessier, Paul A., to Hewlett-Packard Company. IV pump and disposable flow chamber with flow control. 4,857,048, Cl. 604-50.000.

Simpson, Richard D.; and Roskell, Derek, to Texas Instruments Incorporated. Parallel binary adder having grouped stages including dynamic logic to increase carry propagation speed. 4,858,167, Cl 364-787.000

Sinta, Roger F.: *See—*
Adams, Timothy G.; and Sinta, Roger F., 4,857,227, Cl. 252-299.650

Sisson, Robert W.; and Connell, Richard A., to Pitney Bowes Inc. Apparatus and method of determining the authenticity of weight obtained from a vibrating tray scale. 4,856,604, Cl. 177-210.0FP.

Sitek, Franciszek: *See—*
Riediker, Martin; Steiner, Eginhard; Beyeler, Harry; Rembold, Manfred; and Sitek, Franciszek, 4,857,654, Cl. 556-53.000

Sitton, Robert E. Method and apparatus for dispensing beverages. 4,856,680, Cl. 222-152.000.

Sivertsen, Olav N.: *See—*
Adkins, Gordon V.; McDonald, John R.; and Sivertsen, Olav N., 4,856,736, Cl. 244-45.00R

Sjostrand, Uno, to Aktiebolaget Profor. Conveyor assemblies. 4,856,646, Cl. 198-836.000

SKF GmbH: *See—*
Schroder, Horst; Kispert, Klaus; Stolz, Robert; and Jacob, Werner, 4,856,917, Cl. 384-550.000

Skinner, Gordon R. B.; and Buchan, Alexander, to Medical Research International Ltd. Method of preparing intracellular parasites for storage. 4,857,463, Cl. 435-235.000

Skinner, Willie C., Sr.: *See—*
Greenlee, Donald R.; and Skinner, Willie C., Sr., 4,856,583, Cl. 166-127.000.

Skis Rossignol: *See—*
Delery, Marc, 4,856,210, Cl. 36-117.000

Skytta , Osmo, to Valmet Oy. Spreader roll or equivalent for fabric in paper machine and method for the manufacture thereof. 4,856,159, Cl. 29-116.100

Skywardens Limited: *See—*
Adkins, Gordon V.; McDonald, John R.; and Sivertsen, Olav N., 4,856,736, Cl. 244-45.00R.

Slasinski, Arthur L., to Weldex, Inc. Apparatus for forming joints. 4,856,316, Cl. 72-451.000.

Slavens, Clyde M., to CRC-Evans Pipeline International, Inc. Internal welding head assembly. 4,857,701, Cl. 219-125.120.

Sloan Valve Company: *See—*
Pilolla, Joseph J., 4,856,122, Cl. 4-192.000.

Slocomb Industries: *See—*
Slocomb, Leon, 4,856,230, Cl. 49-504.000

Slocomb, Leon, to Slocomb Industries. Ultra sound welded window frames. 4,856,230, Cl. 49-504.000.

Slomczewski, Allen J.: *See—*
Baran, Mich S.; Beihoff, Bruce C.; Damiano, Michael A.; Hansen, James E.; Hastings, Jerome K.; Slomczewski, Allen J.; and Tennes, Charles J., 4,857,837, Cl. 324-117.00R.

Slonim, David M. Amphibious vessel. 4,857,022, Cl. 440-48.000.

Sluyterman, Albertus A. S.: *See—*
Bosch, Gerrit; Pasma, Tjebbe R., Sluyterman, Albertus A. S.; Doomernik, Fransiscus M. P. P.; and Wielink, Steven M., 4,857,805, Cl. 315-8.000.

Smahlik, Aloys J.; Smahlik, Michael A.; and Phipps, Richard D., to Steccone Products Co. Interior clamping device for tubular poles. 4,856,929, Cl. 403-297.000.

Smahlik, Michael A.: *See—*
Smahlik, Aloys J.; Smahlik, Michael A.; and Phipps, Richard D., 4,856,929, Cl. 403-297.000.

Smalling, Jack W.; Braswell, Leonard D.; and Lynnworth, Lawrence C., to Panametrics, Inc. Apparatus and methods for measuring fluid flow parameters. 4,856,321, Cl. 73-40.50A.

Smelcer, Jimmy C., to Lennox Industries Inc. Condensate trap on a condensing gas-fired furnace. 4,856,550, Cl. 137-192.000.

Smith, Alan M.: *See—*
McMillan, Thomas A.; Brooks, Carl A.; and Smith, Alan M., 4,858,099, Cl. 363-97.000

Smith, Bobby J., to North American Philips Consumer Electronics Corp. Data compression technique for reconfigurable remote control apparatus. 4,857,898, Cl. 341-22.000.

Smith, David: *See—*
Bennett, Brian S.; and Smith, David, 4,857,679, Cl. 200-61.620.

Smith, Donald S.: *See—*
Nelson, Carl W.; Smith, Donald S.; and Turner, Frank P., 4,856,943, Cl. 408-1.00R.

Smith, Frank A. F.; and Ludlow, Trevor A., to Redland Roof Tiles Limited. Cutting mechanisms. 4,856,395, Cl. 83-158.000.

Smith, Gene A. Smitty table. 4,856,434, Cl. 108-53.100.

Smith, Gordon H.: *See—*
Music, John; Smith, Gordon H.; and Thomas, James L., 4,857,991, Cl. 358-13.000.
Music, John; Smith, Gordon H.; and Thomas, James L., 4,857,993, Cl. 358-13.000.

Smith, Gordon N. Self-actuating collapsible transport cart. 4,856,810, Cl. 280-639.000.

Smith, Harry D., Jr., to Halliburton Logging Services Inc. Method and apparatus for reducing radioactive hazards in well boreholes. 4,857,728, Cl. 250-260.000.

Smith, Harry D., Jr.: *See—*
Gadeken, Larry L.; and Smith, Harry D., Jr., 4,857,729, Cl. 250-260.000.

Smith, Harry F. Minimal connectivity parallel data processing system. 4,858,177, Cl. 364-900.000.

Smith Kline-RIT, s.a.: *See—*
Morais Cravador, Alfredo J.; Jacobs, Paul; Bollen, Alex J.; Van Elsen, Ary; and Herzog, Albert A. M., 4,857,470, Cl. 435-320.000.

Smith, Lloyd B., to United Company, The. Method and apparatus for prevention of blinding of centrifuge filter screens. 4,857,210, Cl. 210-781.000.

Smith, Lonnie E.; and Schasteen, Thomas, to Atlantic Richfield Company. Motorized wellbore fishing tool. 4,856,582, Cl. 166-98.000.

Smith, Mark: *See—*
Langrick, David J.; and Smith, Mark, 4,856,322, Cl. 73-56.000.

Smith, Michael D.: *See—*
Little, Wendell L.; and Smith, Michael D., 4,857,767, Cl. 307-448.000.

Smith, Michael P.; and Haines, Frank C., Jr., to Amoco Corporation. Sample chamber and system for analyzing fluid inclusions. 4,856,351, Cl. 73-863.210.

Smith, Peter W.: *See—*
Silberberg, Yaron; and Smith, Peter W., 4,856,860, Cl. 350-96.120.

Smith, Phil N., to Dataproducts Corporation. Ribbon shield. 4,856,923, Cl. 400-247.000.

Smith, Robert J.; and Wilmore, Douglas W., to Brigham & Women's Hospital. Method of treating catabolic dysfunction. 4,857,555, Cl. 514-563.000.

Smith, Ronald L.: *See—*
Ingermann, Donald E.; Caffrey, Stephen F.; DeVoe, Alan R.; Smith, Ronald L.; and Sullivan, Ronald G., 4,856,138, Cl. 15-320.000.

Smith, Terrance P.: *See—*
Jongewaard, Susan K.; Smith, Terrance P.; and Zaklika, Krzysztof A., 4,857,503, Cl. 503-227.000.

Smith, Trevor S., to Lucas Industries. Fluid powered servo system. 4,856,275, Cl. 60-39.281.

Smith, William L.: *See—*
Ward, John W.; and Smith, William L., 4,857,553, Cl. 514-557.000.

SmithKline Beckman Corporation: *See—*
Hill, David T.; Johnson, Randall K.; and Mirabelli, Christopher K., 4,857,549, Cl. 514-495.000.
Kaiser, Carl; and Kruse, Lawrence I., 4,857,540, Cl. 514-387.000.

SmithKline Biologicals: *See—*
Wijnendaele, Frans V.; Gilles, Daniel; and Simonet, Guy, 4,857,317, Cl. 424-89.000.

Smolucha, Walter E.: *See—*
Lantz, Kenneth F.; Smolucha, Walter E.; and Struck, Leslie G., 4,856,785, Cl. 273-148.00B.

Smutny, Edgar J., to Shell Oil Company. Stabilized polymers. 4,857,570, Cl. 524-112.000.

Snelgrove, R. Vernon: *See—*
McCullough, Francis P., Jr.; Snelgrove, R. Vernon; and Goswami, Bhuvenesh C., 4,857,394, Cl. 428-303.000.

Snoeren, Rudolph M., to U.S. Philips Corp. Picture pick-up and display system and picture pick-up device suitable for said system. 4,857,724, Cl. 250-213.0VT.

Societa Chimica Larderello S.p.A.: *See—*
Mazzinghi, Paolo, 4,857,286, Cl. 423-282.000.

Societa' Industriale Costruzioni Microelettriche S.I.C.M.E. S.p.A.: *See—*
Macocco, Dino; and Ricco, Michele, 4,856,986, Cl. 432-72.000.

Societe Anonyme Dite: Alcatel Thomson Gigadisc: *See—*
Romeas, Rene , 4,858,221, Cl. 369-275.000.

Societe Anonyme: SPONTEX: *See—*
Wertz, Jean-Luc; and Baudonnel, Jacques, 4,856,134, Cl. 15-104.930.

Societe Fontaine: *See—*
Lewiner, Jacques; Hennion, Claude; and Leonard, Didier, 4,857,913, Cl. 340-825.310.

Societe Joseph Sauron Material Industriel: *See—*
Bazinet, Marc; and Sauron, Jean, 4,856,168, Cl. 29-272.000.

Societe Nationale Elf Aquitaine (Production): *See—*
Arens, Georges; Delvaux, Jacques; and Gros, Pierre, 4,856,614, Cl. 181-104.000.

Societe Orega Electronique et Mecanique: *See—*
Vincent, Joel, 4,858,098, Cl. 363-45.000.

Societe Pour la Transformation des Matieres Plastiques Stamp: *See—*
Massonnet, Henry, 4,856,845, Cl. 297-286.000.

Sodra Skogsagarna AB: *See—*
Soremark, Christer; and Olsson, Ingemar, 4,857,126, Cl. 156-205.000.

Soelkner, Gerald, to Siemens Aktiengesellschaft. Mechanical probe for optical measurement of electrical signals. 4,857,836, Cl. 324-96.000.

Soga, Yoshinobu: *See—*
Kouno, Katsumi; Okawa, Susumu; Sugaya, Masami; and Soga, Yoshinobu, 4,857,034, Cl. 474-28.000.

Solaroli, Alberto. Pressure relief valve. 4,856,547, Cl. 137-73.000.

Solberg, Mark A., to Morton Thiokol, Inc. Variable mass flow rate solid propellant grain. 4,856,276, Cl. 60-250.000.

Solco Basel AG: *See—*
Chia, Han-Lie; Popescu, Horia; and Boehmer, Gabrielle, 4,857,299, Cl. 424-1.100.

Solid State Systems, Inc.: *See—*
Ratcliff, Reginald, 4,858,227, Cl. 370-59.000.

Sollinger, Hans-Peter: *See—*
Sieberth, Ralf; and Sollinger, Hans-Peter, 4,856,454, Cl. 118-126.000.

Solow, Joseph E., to Wolo Manufacturing Co. Safety rear license plate frame. 4,857,890, Cl. 340-479.000.

SOLVAY & Cie (Societe Anonyme): *See—*
Brahm, Jacques; Cornu, Pierre; Garnier, Pierre; Verlaeten, Jean; and Van Diest, Jacques, 4,857,292, Cl. 423-473.000.

Sommer, Hans D., to Steyr-Daimler-Puch AG. Motor vehicle. 4,856,630, Cl. 192-13.00R.

Sommerfeld, Claus-Dieter: *See—*
Schmidt, Manfred; Sommerfeld, Claus-Dieter; Prolingheuer, Christoph; and Klan, Walter, 4,857,560, Cl. 521-103.000.

Soneda, Mitsuo, to Sony Corporation. Bit line charge sensing apparatus having CMOS threshold voltage compensation. 4,858,195, Cl. 365-205.000.

Song, Suk-zu; Rashidbaigi, Zahra A.; Nesbitt, Russell U.; and Fawzi, Mahdi B., to Warner-Lambert Company. Transdermal drug delivery device comprising copolymers of N-morpholinoethyl methacrylate and 2-hydroxylmethacrylate. 4,857,313, Cl. 424-81.000.

Sonoda, Atsuroh: *See—*
Morimoto, Kiyoshi; Iwamoto, Akikazu; Moriyama, Masuo; and Sonoda, Atsuroh, 4,856,941, Cl. 406-85.000.

Sonoda, Toshinari: *See—*
Mori, Seiji; Sonoda, Toshinari; and Kinoshita, Yusuke, 4,856,486, Cl. 123-572.000.

Sony Corporation: *See—*
Amano, Yasunobu; and Sudo, Masayuki, 4,857,796, Cl. 313-428.000.
Fujiie, Kazuhiko; Yoshida, Tadao; and Ando, Ryo, 4,858,217, Cl. 369-59.000.
Hayakawa, Kiyonori; and Mishima, Akio, 4,858,048, Cl. 360-121.000.
Makita, Toshio; and Tago, Koichi, 4,857,027, Cl. 445-37.000.
Ohkoshi, Akio; Nakagawa, Hideaki; Tsuruta, Koji; Sugii, Yasuyoshi; and Wada, Haruaki, 4,857,800, Cl. 313-495.000.
Sashou, Hidehiko; and Kizu, Soujiro, 4,858,027, Cl. 358-311.000.
Soneda, Mitsuo, 4,858,195, Cl. 365-205.000.
Shiro, Tsutomu; Uchiyama, Hitoshi; Inukai, Takahito; and Saito, Tsunenari, 4,858,016, Cl. 358-246.000.
Suzuki, Masakazu; Suematsu, Masayuki; and Komiya, Yoshinori, 4,858,006, Cl. 358-139.000.
Takeuchi, Hiroshi; Kohga, Daiju; and Yukita, Yasuo, 4,856,919, Cl. 400-18.000.

Soref, Richard A.: *See—*
Yang, Andrew C.; Lorenzo, Joseph P.; and Soref, Richard A., 4,857,973, Cl. 357-15.000.

Soremark, Christer; and Olsson, Ingemar, to Sodra Skogsagarna AB. Process for treatment of paper surfaces. 4,857,126, Cl. 156-205.000.

Sorensen, Erling: *See—*
Oehlenschlaeger, Ulla; Pedersen, Jan R.; and Sorensen, Erling, 4,857,369, Cl. 428-35.700.

Sorio, Aldo A.: *See—*
Gale, George M.; and Sorio, Aldo A., 4,857,250, Cl. 264-83.000.

Sorkin, Larry: *See—*
Sorkin, Reubin; and Sorkin, Larry, 4,856,534, Cl. 128-844.000.

Sorkin, Reubin; and Sorkin, Larry. Condom. 4,856,534, Cl. 128-844.000.

Sosa, Jose M.; and Morris, Jeffrey, to Fina Technology, Inc. Continuous process including recycle stream treatment for the production of high impact polystyrene. 4,857,587, Cl. 525-53.000.

Soudronic AG: *See—*
Martin, Michael S., 4,858,156, Cl. 364-560.000.

Souka, Abbas F.: *See—*
Bayoumi, Salah E. A., 4,856,853, Cl. 305-35.0EB.

Soulard, Charles. Striking appliance for a game of golf, playing area including the use of said appliance, and a game assembly comprising the appliance and the area. 4,856,783, Cl. 273-87.200.

Spademan, Richard G. Cuff device. 4,856,500, Cl. 128-80.00C.

Spaeth, Werner: *See—*
Kuhlmann, Werner; Spaeth, Werner; Waitl, Guenter; and Klann, Joerg, 4,857,746, Cl. 250-551.000.

Spain, Ian L.: *See—*
Goldberg, Harris A.; Kalnin, Ilmar L.; Williams, Clyde C.; and Spain, Ian L., 4,856,179, Cl. 29-592.100.

Spanjer, Tjerk G.: *See—*
Vrijssen, Gerardus A. H. M.; and Spanjer, Tjerk G., 4,857,797, Cl. 313-450.000.

Spatz, Edward C.: *See—*
Donovan, Joseph F.; Spatz, Edward C.; Salerni, John V.; Peterson, Elmer R.; and Weirich, John B., 4,856,591, Cl. 166-278.000.

Specht, Victor J. Wheel hub assembly. 4,856,633, Cl. 192-67.00R.

Spector, Ilan: *See—*
Kashman, Yoel; Spector, Ilan; Carmely, Shmuel; and Blasberger, Dina, 4,857,538, Cl. 514-369.000.
Speicher, Earl R.: *See—*
Rosenberg, Leonard S.; Black, Cheryl; Speicher, Earl R.; and Wagenknecht, Dietmar, 4,857,552, Cl. 514-538.000.
Speil, Walter; Schmidt, Dieter; and Zipprath, Michael, to INA Walzlager Schaeffler KG. Ball-and-socket joint. 4,856,468, Cl. 123-90.470.
Spencer, Lynne: *See—*
Brookes, Gerald F.; and Spencer, Lynne, 4,857,221, Cl. 252-61.000.
Spencer, Steven A.: *See—*
Hammonds, R. Glenn; Leung, David W.; Martin, David W., Jr.; Spencer, Steven A.; and Wood, William I., 4,857,637, Cl. 530-403.000.
Spilker, Harry, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. System for singularizing fuel rods in a fuel element. 4,857,262, Cl. 376-261.000.
Spindt, Charles A.; and Holland, Christopher E., to SRI International. Matrix-addressed flat panel display. 4,857,799, Cl. 313-495.000.
Spinelli, Silvano: *See—*
Gandolfi, Carmelo A.; Spinelli, Silvano; Tofanetti, Odoardo; Russo, Raimondo; and Tognella, Sergio, 4,857,643, Cl. 544-121.000.
Spinney, Mark A.: *See—*
Tapolczay, David J.; and Spinney, Mark A., 4,857,551, Cl. 514-532.000.
Spinnler, Ralph F., to Teleco Oilfield Services Inc. Centrifugal debris catcher. 4,857,175, Cl. 209-235.000.
Spirol International Corporation: *See—*
Duffee, Malcolm T., 4,856,697, Cl. 227-149.000.
Spitznas, M.; Veit, Wolfgang; and Kirchhuebel, Rainer, to Oculus Optikgeraete GmbH. Attachment for microscopes. 4,856,872, Cl. 350-255.000.
Splett, Erich: *See—*
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Spratt, Ray S.: *See—*
Fitch, Thomas J.; Goins, Neal R.; and Spratt, Ray S., 4,858,202, Cl. 367-75.000.
Goins, Neal R.; and Spratt, Ray S., 4,858,201, Cl. 367-75.000.
Springer, Albert R.: *See—*
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Square D Company: *See—*
Brooks, Stanley J., 4,857,896, Cl. 340-639.000.
Profio, Mark V., 4,858,053, Cl. 361-23.000.
Sreekrishna, Kotikanyadan; and Fuke, Motohiro, to Phillips Petroleum Company. Carbon and energy source markers for transformation of strains of the genes Pichia. 4,857,467, Cl. 435-255.000.
SRI International: *See—*
Cotts, David B.; and Brodrecht, Louisa, 4,857,569, Cl. 524-104.000.
Spindt, Charles A.; and Holland, Christopher E., 4,857,799, Cl. 313-495.000.
Stader, Harald: *See—*
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Stahlbush, James R.: *See—*
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Staiger, Rolf: *See—*
Hars, Ulrich; Staiger, Rolf; and Westphal, Karl, 4,857,207, Cl. 210-725.000.
Stamicarbon B.V.: *See—*
Beekman, Arie W., 4,856,833, Cl. 293-120.000.
Stammen, Joseph L. Ground-working tool for attachment to the foot of a wearer. 4,856,599, Cl. 172-370.000.
Standard Oil Company, The: *See—*
Ball, Lawrence E., 4,857,621, Cl. 526-265.000.
Benton, Kenneth C.; Pierman, David A.; and Fox, Joseph R., 4,857,395, Cl. 428-306.600.
Davis, James C.; McGuiggan, Michael F.; Cuellar, Edward A.; and Haas, Frederick W., 4,857,159, Cl. 204-149.000.
Standex International Corporation: *See—*
Westphal, Donald J., 4,856,497, Cl. 128-70.000.
Stanek, Jaroslav: *See—*
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Stanfill, Ted M.; and Dugger, Joe K., to Dugger, Joe K. Beverage dispenser with ice water precooler. 4,856,678, Cl. 222-108.000.
Stanford University: *See—*
Macovski, Albert, 4,857,843, Cl. 324-307.000.
Stanley, Jack H.: *See—*
Diaz, Felix V.; and Stanley, Jack H., 4,858,232, Cl. 370-86.000.
Stanton, John D.: *See—*
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State Chemical Mfg. Co., The: *See—*
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State of Israel, Ministry of Agriculture, Water Commission: *See—*
Margaritz, Mordeckai; Ronen, Daniel; and Levy, Itzhak, 4,857,473, Cl. 436-177.000.
Staupendahl, Gisbert: *See—*
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Stawitcke, Frederick A.: *See—*
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Steccone Products Co.: *See—*
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Steelcase Inc.: *See—*
Baloga, Mark A.; Trimborn, Edmond; and Fussler, Philippe, 4,856,242, Cl. 52-239.000.
Steffen, Francis; and Labelle, Jean, to SGS-Thomson Microelectronics S.A. Method for the encapsulation of integrated circuits. 4,857,483, Cl. 437-209.000.
Steiner, Eginhard: *See—*
Riediker, Martin; Steiner, Eginhard; Beyeler, Harry; Rembold, Manfred; and Sitek, Franciszek, 4,857,654, Cl. 556-53.000.
Steiner, Gerd: *See—*
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Steinman, Sheldon: *See—*
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Stellwagen, Armin: *See—*
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Stemm, Howard W.: *See—*
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Stephens, James B.: *See—*
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Stephens, Sally I.; Hamel, Lawrence G.; Barclay, Glen E.; and Wong, Patrick S. L., to Alza Corporation. Chlorpheniramine therapy. 4,857,330, Cl. 424-424.000.
Stephenson, Leslie: *See—*
Borthwick, David A.; Kirk, Barrie E.; Evans, Derek N.; Biggadike, Keith; and Stephenson, Leslie, 4,857,531, Cl. 514-262.000.
Steps, Steven C., to Hewlett-Packard Company. Write-back cache system using concurrent address transfers to setup requested address in main memory before dirty miss signal from cache. 4,858,111, Cl. 364-200.000.
Steri-Oss, Inc.: *See—*
Krueger, Kenneth K., 4,856,648, Cl. 206-63.500.
Sterling Drug Inc.: *See—*
Diana, Guy D.; and Carabateas, Philip M., 4,857,539, Cl. 514-378.000.
Thompson, Joseph, 4,856,673, Cl. 220-94.00R.
Stern, Howard, to Robotic Vision Systems. Sealant flow control for robotic applications. 4,858,172, Cl. 364-160.000.
Stevens, Robert C.; and Braun, Robert R., to Cordis Corporation. Drive catheter having helical pump drive shaft. 4,857,046, Cl. 604-22.000.
Stewart, Daniel L.; Immormino, Fredrick R.; Galdun, Daniel J.; and Rischar, Charles M., to Allen-Bradley Company, Inc. Programmable controller with parallel processors. 4,858,101, Cl. 364-131.000.
Stewart, Jon K., to AusTek, Inc. Masonry tool. 4,856,135, Cl. 15-105.500.
Stewart, Parks C.: *See—*
O'Neal, Darrell D.; and Stewart, Parks C., 4,856,439, Cl. 112-10.000.
Stewart, Robert E.; Natusch, Paul J.; Yu, Eugene L.; and Keller, James B., to Digital Equipment Corporation. Apparatus and method for responding to an aborted signal exchange between subsystems in a data processing system. 4,858,173, Cl. 364-900.000.
Stewart, William J., to Plessey Overseas Limited. Biosensors. 4,857,273, Cl. 422-68.000.
Steyr-Daimler-Puch AG: *See—*
Sommer, Hans D., 4,856,630, Cl. 192-13.00R.
Stidworthy, Frederick M. Variable phase couplings. 4,856,370, Cl. 74-675.000.
Stieger, Othmar, to Elpatronic AG. Safety clutch for rotating drives. 4,856,632, Cl. 192-56.00F.
Stier, Hubert: *See—*
Knauf, Werner; Waltersdorfer, Anna; Sagenmuller, Alfons; Stier, Hubert; and Lourens, Jan, 4,857,510, Cl. 514-30.000.
Still, Donald O.; Hovance, Hubert T.; and Burley, George J., to Firestone Tire & Rubber Company, The. Method for ply application. 4,857,123, Cl. 156-133.000.
Stineman, John A., Jr.: *See—*
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Stirling Technology, Inc.: *See—*
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Stirm, Michael: *See—*
Grossmann, Horst; and Stirm, Michael, 4,856,195, Cl. 30-369.000.
Stitt, Paul A. Stable nutritive and therapeutic flax seed compositions, methods of preparing the same, and therapeutic methods employing the same. 4,857,326, Cl. 424-195.100.
Stocchiero, Olimpio. Lid for accumulator batteries with an incorporated handle. 4,857,422, Cl. 429-175.000.

Stock, Alvin L., to Westinghouse Electric Corp. Method and apparatus for balancing a turbine rotor. 4,856,964, Cl. 415-201.000.
Stockton, Thomas R., to Ford Motor Company. Continually variable transmission having torque regeneration operating mode. 4,856,369, Cl. 74-665.0GE.
Stoltze, Leon: *See—*
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Stolz, Robert: *See—*
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Storz Instrument Company: *See—*
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Stratton, Susan D.: *See—*
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Straw, Alan; and Ellis, Roger D., to Colgate-Palmolive Company. Apparatus for making post-foaming gels and method. 4,857,241, Cl. 261-152.000.
Strejcek, Jan: *See—*
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Strid, Eric W.; and Jones, Keith E., to Cascade Microtech, Inc. System for setting reference reactance for vector corrected measurements. 4,858,160, Cl. 364-571.010.
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Strong, Bobby D.: *See—*
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Stuebing, Carlton, to Tektronix, Inc. Bipolar glitch detector circuit. 4,857,760, Cl. 307-234.000.
Sturgeon, Clayton L., to Qualitron, Inc. Integrated magnetic power converter. 4,858,093, Cl. 363-20.000.
Sturman, Oded E.; Grill, Benjamin; and Harrison, Lynn, to Kineret Engineering. Temperature compensated hall effect position sensor. 4,857,842, Cl. 324-225.000.
Su, Kai C.; and Molock, Frank F., to Ciga-Geigy Corporation. Wettable, flexible, oxygen permeable, substantially non-swellable contact lens containing polyoxyalkylene backbone units, and use thereof. 4,857,606, Cl. 525-455.000.
Suciu, George D.; Khonsari, Ali M.; and Chen, Jamin, to Lummus Company, The. Phenol purification. 4,857,151, Cl. 203-82.000.
Sudo, Masayuki: *See—*
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Suehiro, Tsutomu; Uchiyama, Hitoshi; Inukai, Takahito; and Saito, Tsunenari, to Sony Corporation. Cathode ray tube having an improved implosion proof structure. 4,858,016, Cl. 358-246.000.
Suematsu, Masayuki: *See—*
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Sueshige, Hirotaka; and Hayashi, Masayuki, to Tokai TRW & Co., Ltd. Apparatus for automatically setting steering center for use in power steering apparatus. 4,856,607, Cl. 180-142.000.
Sugasawa, Tsutomu: *See—*
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Sugimoto, Keiji; Hayashi, Takeo; and Fujimoto, Masahiro, to Idemitsu Petrochemical Co., Ltd. Multi-layer film and package. 4,856,656, Cl. 206-523.000.
Sugimura, Toshiya; Kasai, Hitoshi; and Yoshimura, Hiroshi, to Fujitsu Limited. Clutch target position control system. 4,858,131, Cl. 364-424.100.
Sugino, Kouichi, to Seikosha Co., Ltd. Printer. 4,856,924, Cl. 400-283.000.
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Sugiura, Yuzuru: *See—*
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Sugiyama, Shogo: *See—*
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Suimon, Yoshio, to Kabushiki Kaisha Hanzawa Corporation. Rotary-type electromagnetic actuator for toys. 4,857,789, Cl. 310-233.000
Sukemura, Takao, to Fujitsu Limited. Semiconductor integrated circuit. 4,857,834, Cl. 324-73.00R.
Sukhorukov, Dmitry V.: *See—*
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Sulfstede, Louis E.; Helt, Robert W.; and Jensen, Thomas E., to American Standard Inc. Refrigeration compressor driven by a DC motor. 4,856,286, Cl. 62-89.000.
Suling, Carlhans: *See—*
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Sullivan, John. Condensation pan/converter tray for a fan coil unit. 4,856,672, Cl. 220-82.000.
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Sullivan, Ronald G.: *See—*
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Sulmont, Benoit; and Paternoga, Alain, to Aluminium Pechiney. Process and apparatus for controlling solid electrolyte additions to electrolytic cells for aluminum production. 4,857,157, Cl. 204-67.000.
Sulzer-Escher Wyss AG: *See—*
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Sumida, Hideki: *See—*
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Sundell, Hans E.; Egeland, Terje; Johnson, Sten E.; and Friman, Erik B., to Telefonaktiebolaget L M. Ericsson. Method and apparatus for determining in a computer which of a number of programs are allowed to utilize a rapid access memory. 4,858,118, Cl. 364-243.400.
Sundstrand Data Control, Inc.: *See—*
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Sung, Rodney L.; and Kaufman, Benjamin J., to Texaco Inc. Bicyclic keto-acids preparation. 4,857,661, Cl. 562-502.000.
Sunstein, Drew E.; and Caseley, Clifford D., to Circuits and Systems, Inc. Enhanced system for transmission loss comparison. 4,856,906, Cl. 356-435.000.
Sunstone Inc.: *See—*
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Suntec Industries Incorporated: *See—*
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Sunyich, Steven L. Credit card storage system. 4,857,714, Cl. 235-382.000.
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Suss, Harold; and Ner, Virginia F., to Plough, Inc. Alcohol free-liquid makeup composition. 4,857,307, Cl. 424-63.000.
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Suzuki, Hirosuke, to Junkosha Co., Ltd. Reinforced dielectric sheet. 4,857,381, Cl. 428-120.000.
Suzuki Jidosha Kogyo Kabushiki Kaisha: *See—*
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Murano, Katsuaki; Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 4,856,380, Cl. 74-866.000.

Suzuki, Katsumi: *See*—
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Suzuki, Kazuhiko: *See*—
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Suzuki, Koichi: *See*—
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Suzuki, Kouhei, to Kabushiki Kaisha Toshiba. Contact-type linear image sensor. 4,858,022, Cl. 358-471.000.
Suzuki, Makoto: *See*—
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Suzuki, Masakazu; Suematsu, Masayuki; and Komiya, Yoshinori, to Sony Corp. Method and apparatus for establishing a servicing mode of an electronic apparatus. 4,858,006, Cl. 358-139.000.
Suzuki, Nobuo; Morinaga, Motoyasu; Furuyama, Hideto; Hirayama, Yuzo; Okuda, Hajime; Nakamura, Masaru; and Motegi, Nawoto, to Kabushiki Kaisha Toshiba. Semiconductor laser device. 4,858,241, Cl. 372-46.000.
Suzuki, Osamu: *See*—
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Suzuki, Shigeo: *See*—
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Suzuki, Tetsuo: *See*—
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Suzuki, Yukio: *See*—
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Swanson, Arthur P. Hose coupling. 4,856,821, Cl. 285-24.000.
Swapp, Mavin C., to Motorola, Inc. Apparatus and method for testing semiconductor devices. 4,858,208, Cl. 368-118.000.
Swarts, Richard E.: *See*—
Lopicolo, Mario T.; and Swarts, Richard E., 4,856,332, Cl. 73-505.000.
SWE Auto-Electric GmbH: *See*—
Erdelitsch, Herbert; Machalitzky, Otto; and Prang, Josef-Elmar, 4,857,815, Cl. 318-443.000.
Sweeney, John E. Container holder. 4,856,743, Cl. 248-149.000.
Swensen, Eugene L.; and Ray, George F., III, to USG Interiors, Inc. Method of manufacturing elevated floor panels. 4,856,175, Cl. 29-460.000.
Swered, Paul: *See*—
Lyons, Larry A.; Davis, Dwight P.; and Swered, Paul, 4,857,209, Cl. 210-755.000.
Swink, Billy J.: *See*—
Phillips, Pettice M.; and Swink, Billy J., 4,857,162, Cl. 204-257.000.
Swiss Aluminum Ltd.: *See*—
Mizrah, Tiberiu; Maurer, Albert; and Gauckler, Ludwig, 4,857,088, Cl. 55-523.000.
Symes, Peter D.: *See*—
Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; Frasier, Richard A.; Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; and Olmstead, Neil R., 4,858,011, Cl. 358-181.000.
Synofzik, Reinhard, to Rheinmetall GmbH. Spin stabilized carrier projectile including at least two submunition projectiles. 4,856,432, Cl. 102-489.000.
Syntex (U.S.A.) Inc.: *See*—
Eppstein, Deborah A., 4,857,316, Cl. 424-85.600.
Khanna, Pyare L.; Chang, Chiu C.; and Ullman, Edwin F., 4,857,455, Cl. 435-7.000.
Lee, Simon W., 4,857,318, Cl. 424-92.000.
Ullman, Edwin F.; Khanna, Pyare; and Peries, Rohan, 4,857,453, Cl. 435-7.000.
Synthelabo: *See*—
Manoury, Philippe; Rossey, Guy; Binet, Jean; DeFosse, Gerard; and Jabri, Najib, 4,857,536, Cl. 514-322.000.
Syrowatka, Rupert: *See*—
Clements, Brice P.; Kurihara, Tatsuo; Marshall, Sammy D.; and Syrowatka, Rupert, 4,857,193, Cl. 210-396.000.
Syverson, Daniel J., to FSI International, Inc. Method and apparatus for controlling simultaneous etching of front and back sides of wafers. 4,857,142, Cl. 156-646.000.
SZ s.r.l.: *See*—
Salvagnini, Guido, 4,856,178, Cl. 29-568.000.
Tabak, Samuel A.: *See*—
Huang, Tracy J.; LaPierre, Rene B.; and Tabak, Samuel A., 4,857,664, Cl. 568-695.000.
Tabayashi, Toshikazu, to Osaka Taiyu Co., Ltd. Carrier for cylindrical containers. 4,856,959, Cl. 414-451.000.
Tabei, Masatoshi, to Fuji Photo Film Co., Ltd. Electronic still camera. 4,858,025, Cl. 358-310.000.
Tabisz, Wojciech A.; and Lee, Fred C., to Virginia Tech Intellectual Properties, Inc. Zero-voltage-switched multi-resonant converters including the buck and forward type. 4,857,822, Cl. 323-282.000.
Tacchini, Franco, to Comarme Marchetti FASpA. Machine for forming cardboard boxes from blanks folded flat. 4,857,038, Cl. 493-316.000.
Tachi-S Co., Ltd.: *See*—
Kanai, Shigeru, 4,856,847, Cl. 297-341.000.
Tachi, Shinichi; Okudaira, Sadayuki; Tsujimoto, Kazunori; and Mukai, Kiichiro, to Hitachi, Ltd. Process for surface treatment. 4,857,137, Cl. 156-640.000.
Tachikawa Spring Co., Ltd.: *See*—
Isono, Hiroyuki, 4,856,844, Cl. 297-284.000.
Tada, Kaoru, to Minolta Camera Kabushiki Kaisha. Image read apparatus. 4,858,023, Cl. 358-471.000.
Tadlock, John W.: *See*—
Thomsen, Jack W.; Regunathan, Perialwar; and Tadlock, John W., 4,857,189, Cl. 210-232.000.
Taeusch, David R.; and Wohlmuth, Clinton J., to Raycon Textron Inc. Laser/EDM drilling manufacturing cell. 4,857,696, Cl. 219-121.700.
Taga Electric Co., Ltd.: *See*—
Mishiro, Shoji, 4,856,391, Cl. 82-137.000.
Tagata, Shojiro, to JEOL Ltd. Instrument for analyzing specimen. 4,857,731, Cl. 250-310.000.
Tago, Koichi: *See*—
Makita, Toshio; and Tago, Koichi, 4,857,027, Cl. 445-37.000.
Taguchi, Kazuo: *See*—
Fuyama, Moriaki; Tamura, Katsumi; Taguchi, Kazuo; Onisawa, Kenichi; Sato, Akira; Hashimoto, Kenichi; Nakayama, Takahiro; and Abe, Yoshio, 4,857,802, Cl. 313-506.000.
Taguchi, Riyozo: *See*—
Ishizaki, Hidetsurumaro; and Taguchi, Riyozo, 4,856,174, Cl. 29-455.100.
Tahara, Masato, to NEC Corporation. Digital demodulation system having independently operating cross-polarization cancellers. 4,857,858, Cl. 329-50.000.
Tahara, Shigehiko: *See*—
Takeuchi, Satoshi; Danjo, Koutaro; Tahara, Shigehiko; Yui, Yoshiharu; and Ikeda, Satoshi, 4,856,857, Cl. 350-3.600.
Tahara, Yoshiyuki; Koyama, Hiroyasu; Komatsu, Yasuhiro; Kubota, Reiko; and Takahashi, Toshihiro, to Nisshin Flour Milling Co., Ltd Interferon inducing, anti-vaccinia, and/or anti-influenza compositions. 4,857,529, Cl. 514-255.000.
Tai, Matthias: *See*—
Shu, Chi-Yao, 4,856,296, Cl. 62-430.000.
Taji, Ryoichi; and Imori, Hideo, to Mitsubishi Denki Kabushiki Kaisha. Armature of a.c. generator for a car and method of manufacturing the same. 4,857,787, Cl. 310-180.000.
Takabayashi, Osamu, to Yamaha Corporation. Dither circuit having dither level changing function. 4,857,927, Cl. 341-131.000.
Takada, Masao: *See*—
Tsuchiya, Hiromu; Nabekawa, Shukichi; and Takada, Masao, 4,857,238, Cl. 562-820.000.
Takada, Yutaka; Doi, Koichi; Yamazaki, Tsutomu; and Obata, Yutaka, to Nissan Motor Company, Limited. Dual air conditioner for a vehicle. 4,856,710, Cl. 236-13.000.
Takagi, Akihiro; and Kimoto, Kiyoshi, to Nikon Corporation. Optical recording medium and reproducing apparatus. 4,858,218, Cl. 369-109.000.
Takagi, Makoto: *See*—
Araki, Masatada; Kuroyama, Yutaka; Takeuchi, Yukihisa; Takagi, Makoto; Kawamura, Yoshihito; and Imura, Toru, 4,857,414, Cl. 428-612.000.
Takagi, Masamichi; Yano, Keiji; Shibuya, Ichiro; and Morikawa, Minoru, to Nikka Whisky Distilling Co., Ltd. Cycloheximide resistant gene. 4,857,460, Cl. 435-91.000.
Takagi, Mitsuhiro: *See*—
Kitamura, Masuo; Takagi, Mitsuhiro; and Nakamura, Masaaki, 4,857,669, Cl. 174-53.000.
Takahara, Kyoji: *See*—
Aizawa, Tamio; and Takahara, Kyoji, 4,858,150, Cl. 364-522.000.
Takahashi, Akira; Murakami, Yoshiteru; Mieda, Michinobu; Miyake, Tomoyuki; and Ohta, Kenji, to Sharp Kabushiki Kaisha. Recording method on magnetooptical disc with laser magnetic field. 4,858,212, Cl. 369-13.000.
Takahashi, Hiroki: *See*—
Mirura, Ryozo; Okamoto, Yoshio; Takahashi, Hiroki; and Inada, Souichi, 4,856,313, Cl. 72-234.000.
Takahashi, Junichi: *See*—
Itoh, Yuji; and Takahashi, Junichi, 4,856,890, Cl. 351-206.000.
Takahashi, Kouji: *See*—
Takei, Masahiro; Masui, Toshiyuki; Kashida, Motokazu; and Takahashi, Kouji, 4,858,037, Cl. 360-60.000.
Takahashi, Osamu: *See*—
Ogawa, Tadashi; and Takahashi, Osamu, 4,857,449, Cl. 430-546.000.
Takahashi, Tadahiro, to Diesel Kiki Co., Ltd. Air conditioning system for automotive vehicles. 4,856,291, Cl. 62-217.000.
Takahashi, Tadahiro, to Diesel Kiki Co., Ltd. Air-conditioning control system for automotive vehicles. 4,856,293, Cl. 62-228.300.
Takahashi, Toshihiro: *See*—
Tahara, Yoshiyuki; Koyama, Hiroyasu; Komatsu, Yasuhiro; Kubota, Reiko; and Takahashi, Toshihiro, 4,857,529, Cl. 514-255.000.
Takami, Akio: *See*—
Furusaki, Keizo; Nasu, Mineji; Matsuura, Toshitaka; Takami, Akio; and Okawa, Teppei, 4,857,275, Cl. 422-98.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; Negishi, Ichiro; and Osada, Masaru, to Victor Company of Japan, Ltd. Color imaging apparatus including control system for stabilizing phase and frequency of a video signal carrier frequency. 4,857,995, Cl. 358-47.000.
Takano, Hirohiko: *See*—
Mochizuki, Wataru; Ogino, Seiichi; and Takano, Hirohiko, 4,857,812, Cl. 318-15.000.
Takase, Haruo; Uenaka, Kazushige; Abe, Akira; and Fujita, Yoshihiro, to Fuji Photo Film Co., Ltd. Wash water reservoiring method and apparatus therefore. 4,857,950, Cl. 354-324.000.
Takase, Haruo: *See*—
Abe, Akira; Nakajima, Junya; Takase, Haruo; Uenaka, Kazushige; and Otomo, Ruyzi, 4,857,441, Cl. 430-393.000.
Takashima, Kazutoshi, to Sanshin Kogyo Kabushiki Kaisha. Cooling water drainage system for marine propulsion engine. 4,857,023, Cl. 440-88.000.
Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Esumi, Kimio; Kuno, Atsushi; Sakai, Hiroyoshi; Maeda, Kazuhiro; and Sakamoto, Yoshie, 4,857,527, Cl. 514-237.200.
Takata, Akira; and Fujii, Koichi, to Ricoh Co., Ltd. Programming logic device with test-signal enabled output. 4,857,773, Cl. 307-465.000.
Takata, Akira: *See*—
Obata, Takeo; Takata, Akira; and Fujioka, Takuro, 4,857,775, Cl. 307-468.000.
Takaya, Takao; Takasugi, Hisashi; Esumi, Kimio; Kuno, Atsushi; Sakai, Hiroyoshi; Maeda, Kazuhiro; and Sakamoto, Yoshie, to Fujisawa Pharmaceutical Co., Ltd. Morpholine containing pyridine compounds, compositions and use. 4,857,527, Cl. 514-237.200.
Takechi, Moriaki; and Simada, Yuji, to Mitsubishi Denki Kabushiki Kaisha. Nuclear magnetic resonance imaging apparatus. 4,857,848, Cl. 324-318.000.
Takeda Chemical Industries, Ltd.: *See*—
Terao, Shinji; and Maki, Yoshitaka, 4,857,516, Cl. 514-100.000.
Takeda, Jiro: *See*—
Davies, Dylan H.; and Takeda, Jiro, 4,857,831, Cl. 324-65.0CR.
Takeda, Kimiharu: *See*—
Hirano, Takahisa; Hagimoto, Kiyoshi; and Takeda, Kimiharu, 4,856,973, Cl. 418-55.000.
Takeda, Masatoshi, to Mitsubishi Denki Kabushiki Kaisha. Reactive power compensation system. 4,857,821, Cl. 323-210.000.
Takeda, Osamu: *See*—
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Aburaya, Toshio, 4,856,798, Cl. 280-6.110.
Takehana, Tatsuo; and Matsuda, Fumio, to Tsudakoma Corp. Yarn guide device. 4,856,691, Cl. 226-91.000.
Takei, Masahiro; Masui, Toshiyuki; Kashida, Motokazu; and Takahashi, Kouji, to Canon Kabushiki Kaisha. Information signal recording and/or reproducing apparatus 4,858,037, Cl. 360-60.000.
Takekoshi, Susumu: *See*—
Fujii, Katsuhiko; Sato, Shiro; Miyanaga, Yasuhiro; Asami, Heizo; Takekoshi, Susumu; and Kasai, Yasuo, 4,856,849, Cl. 301-63.00R.
Takemiya, Satoshi: *See*—
Morimoto, Takeshi; Endoh, Eiji; and Takemiya, Satoshi, 4,858,078, Cl. 361-527.000.
Takemoto, Katsuo: *See*—
Tanaka, Koji; Takemoto, Katsuo; and Sakai, Yasushi, 4,857,617, Cl. 526-237.000.
Takemura, Makoto: *See*—
Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, 4,857,943, Cl. 346-136.000.
Takenaga, Hideyuki: *See*—
Hayashi, Kimiaki; Ozaki, Yasuhiko; Yamada, Kenji; Takenaga, Hideyuki; and Inoue, Ichizo, 4,857,543, Cl. 314-444.000.
Takeno, Kazuma: *See*—
Aono, Toshiaki; Shibata, Takeshi; and Takeno, Kazuma, 4,857,443, Cl. 430-496.000.
Takenouchi, Masanori: *See*—
Hayakawa, Naoji; Takenouchi, Masanori; Nakamura, Kenji; Kan, Fumitaka; Kozato, Yasuo; and Hakamada, Isao, 4,858,062, Cl. 361-225.000.
Takeuchi, Hiroshi; Kohga, Daiju; and Yukita, Yasuo, to Sony Corporation. Pen printer. 4,856,919, Cl. 400-18.000.
Takeuchi, Kunihiko; Oba, Masao; and Horinouchi, Shinichi, to Tokyo Keiki Company Ltd. Automatic tool changer with electromagnetically readable tool holder having an electromagnetically coupling stopper for numerical control. 4,856,177, Cl. 29-568.000.
Takeuchi, Kunihiko; Hayashi, Kiyoshi; and Shimomura, Yasuo, to Tokyo Keiki Company, Ltd. Fluid valve control system for controlling fluid pressure or flow. 4,858,103, Cl. 364-174.000.
Takeuchi, Kunihiko; Ikeda, Hajime; and Horinouchi, Shinichi, to Tokyo Keiki Company Ltd. Drive management system. 4,858,133, Cl. 364-424.040.
Takeuchi, Satoshi; Danjo, Koutaro; Tahara, Shigehiko; Yui, Yoshiharu; and Ikeda, Satoshi, to Dai Nippon Insatsu Kabushiki Kaisha. Transparent reflection-type. 4,856,857, Cl. 350-3.600.
Takeuchi, Shiro: *See*—
Eto, Kunihiko; Takeuchi, Shiro; Mori, Yutaka; Tanooka, Shigeo; Kodama, Kazumasa; and Matsumoto, Tsutomu, 4,858,134, Cl. 364-424.050.
Takeuchi, Yukihisa: *See*—
Araki, Masatada; Kuroyama, Yutaka; Takeuchi, Yukihisa; Takagi, Makoto; Kawamura, Yoshihito; and Imura, Toru, 4,857,414, Cl. 428-612.000.
Takiguchi, Haruhisa: *See*—
Yano, Seiki; Kudo, Hiroaki; Takiguchi, Haruhisa; Hijikata, Toshiki; and Kaneiwa, Shinji, 4,858,215, Cl. 369-45.000.
Takiguchi, Yoshihiro, to Hamamatsu Photonics Kabushiki Kaisha. Apparatus for optically measuring the three-dimensional surface shape and inner structure of an object. 4,857,748, Cl. 250-560.000.
Takikawa, Kazunori, to Usui Kokusai Sangyo Kaisha Ltd. Elongated member fixing device by use of clamp. 4,856,739, Cl. 248-74.200.
Takizawa, Shozo: *See*—
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,813, Cl. 280-703.000.
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,815, Cl. 280-707.000.
Talik, Mieczyslaw: *See*—
Melchior, Wayne R.; and Talik, Mieczyslaw, 4,857,252, Cl. 264-118.000.
Talmadge, Paul C., to Pitney Bowes, Inc. Secure vault having electronic indicia for a value printing system. 4,858,138, Cl. 364-464.020.
Talonn, Daniel A., to Sherwood Medical Company. Auto-flush syringe pump. 4,857,056, Cl. 604-135.000.
Tam, Gordon; and Granick, Lisa R., to Motorola, Inc. Method of fabricating airbridge metal interconnects. 4,857,481, Cl. 437-182.000.
Tamai, Yasuo: *See*—
Ogawa, Hiroshi; and Tamai, Yasuo, 4,857,388, Cl. 428-212.000.
Tamari, Nobuyuki: *See*—
Ebata, Yoshihiro; Kouyama, Masanori; Tamari, Nobuyuki; and Kawamoto, Takamichi, 4,857,486, Cl. 501-21.000.
Tamoto, Koji; and Ono, Mitsunori, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material containing a coupler having a dye moiety. 4,857,447, Cl. 430-544.000.
Tamura, Katsumi: *See*—
Fuyama, Moriaki; Tamura, Katsumi; Taguchi, Kazuo; Onisawa, Kenichi; Sato, Akira; Hashimoto, Kenichi; Nakayama, Takahiro; and Abe, Yoshio, 4,857,802, Cl. 313-506.000.
Tamura, Susan Y.; and Asato, Goro, to American Cyanamid Company. 27-Halo derivatives of LL-F28249 compounds. 4,857,544, Cl. 514-450.000.
Tamura, Tatsuo: *See*—
Yamada, Yasuo; Saito, Junichi; Tamura, Tatsuo; and Sakawa, Shinji, 4,857,556, Cl. 514-585.000.
Tan, Raul V.: *See*—
Myers, David W.; Ozarski, Robert G.; Perera, Thiloma I.; Schipper, John F.; Tan, Raul V.; and Watts, Michael P. C., 4,857,738, Cl. 250-372.000.
Tanabe, Daijiro: *See*—
Yokota, Takayoshi; Horiya, Shigekazu; Uno, Sadao; Katayama, Kozo; and Tanabe, Daijiro, 4,856,754, Cl. 249-113.000.
Tanabe Seiyaku Co., Ltd.: *See*—
Hayashi, Kimiaki; Ozaki, Yasuhiko; Yamada, Kenji; Takenaga, Hideyuki; and Inoue, Ichizo, 4,857,543, Cl. 314-444.000.
Tanaka, Akira: *See*—
Nakajima, Toyohei; Mieno, Toshiyuki; Tanaka, Akira; Nagao, Akira; and Suzaki, Yukihiko, 4,856,480, Cl. 123-425.000.
Tanaka, Hiroshi, to Fuji Xerox Co., Ltd. Image processing apparatus. 4,858,018, Cl. 358-456.000.
Tanaka, Hirotoshi: *See*—
Kotera, Nobuo; Yamashita, Kiichi; Kinoshita, Taizo; Tanaka, Hirotoshi; Tanaka, Satoshi; and Nagata, Minoru, 4,857,769, Cl. 307-450.000.
Tanaka, Katsuhiko: *See*—
Inoue, Gentei; Sakatani, Ikunori; and Tanaka, Katsuhiko, 4,856,918, Cl. 384-610.000.
Tanaka, Koji; Takemoto, Katsuo; and Sakai, Yasushi, to Tosoh Corporation. Process for producing a high softening point hydrocarbon resin. 4,857,617, Cl. 526-237.000.
Tanaka, Masayuki: *See*—
Shishido, Hideomi; Doi, Shigeo; Sumida, Hideki; and Tanaka, Masayuki, 4,856,781, Cl. 273-65.00E.
Tanaka, Satoshi: *See*—
Kotera, Nobuo; Yamashita, Kiichi; Kinoshita, Taizo; Tanaka, Hirotoshi; Tanaka, Satoshi; and Nagata, Minoru, 4,857,769, Cl. 307-450.000.
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Vehicle suspension apparatus. 4,856,813, Cl. 280-703.000.
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, to Mitsubishi Jidoshia Kogyo Kabushiki Kaisha; and Mitsubhishi Denki Kabushiki Kaisha. Vehicle suspension apparatus. 4,856,815, Cl. 280-707.000.
Tanaka, Tatsuo; and Yoshida, Yoshihiro, to Kabushiki Kaisha Toshiba. Current mirror circuit. 4,857,864, Cl. 330-288.000.
Tanaka, Tomeo; and Oda, Toshikazu, to Anritsu Corporation. Dial device. 4,857,677, Cl. 200-5.00R.
Tanaka, Yoko: *See*—
DeLuca, Hector F.; Ikekawa, Nobuo; and Tanaka, Yoko, 4,857,518, Cl. 514-167.000.
Tanaka, Yoshiyuki; Ii, Akira; Meguro, Taiichi; and Hayashi, Kenji, to Toyota Jidosha Kabushiki Kaisha. Method of and apparatus for controlling fuel injection quantity for internal combustion engine. 4,858,136, Cl. 364-431.070.
Tandem Computers Incorporated: *See*—
Khan, Aurangzeb K., 4,857,776, Cl. 307-475.000.

Tange, Toshiyuki: *See*—
Sakaguchi, Akira; Uchibe, Hisashi; and Tange, Toshiyuki, 4,856,700, Cl. 228-5.100.

Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, to Minolta Camera Kabushiki Kaisha. Camera system. 4,857,953, Cl. 354-475.000.

Taniguchi, Tsutomu: *See*—
Sato, Ryuichi; Taniguchi, Tsutomu; and Ohba, Masatoshi, 4,857,757, Cl. 307-113.000.

Taniguchi, Yasutaka: *See*—
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,813, Cl. 280-703.000.
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Tanikawa, Hirohide; Nakahara, Toshiaki; and Nozawa, Keita, to Canon Kabushiki Kaisha. Toner for developing electrostatic charge image. 4,857,432, Cl. 430-106.000.

Taniwaki, Hiroshi: *See*—
Shin, Masaaki; Fujiwara, Akio; and Taniwaki, Hiroshi, 4,857,433, Cl. 430-120.000.

Tanizaki, Katsuji: *See*—
Maki, Yoshihiro; Matsuyama, Akira; Tanizaki, Katsuji; Okabe, Noboru; Kishida, Katsuhiro; Sakai, Takeshi; Ohgaki, Toshinaga; and Fujita, Masahito, 4,857,267, Cl. 419-31.000.

Tanooka, Shigeo: *See*—
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Tanuma, Chiaki: *See*—
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Tanuma, Jiro: *See*—
Kikuchi, Hiroshi; Tanuma, Jiro; Ishimizu, Hideaki; Uchida, Takao; and Asaka, Toshiyuki, 4,857,005, Cl. 439-140.000.

Tapolczay, David J.; and Spinney, Mark A., to Imperial Chemical Industries PLC. Insecticides. 4,857,551, Cl. 514-532.000.

Tappe, Horst: *See*—
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Tashiro, Mamoru; Urata, Kazuo; and Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Method and apparatus for forming a layer. 4,857,139, Cl. 156-643.000.

Tatara, Shinji, to Kabushiki Kaisha Toshiba. Electric power converter. 4,858,100, Cl. 363-161.000.

Tateishi, Hisao, to NEC Corporation. Phase-locked loop having elongated time for charge and discharge. 4,857,866, Cl. 331-1.00A.

Tatemoto, Minoru: *See*—
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,813, Cl. 280-703.000.
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Tatsumi, Takumi: *See*—
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Tatsumi, Yuuichi; Minagawa, Hidenobu; Iwahashi, Hiroshi; Asano, Masamichi; and Imai, Mizuho, to Kabushiki Kaisha Toshiba. Semiconductor memory device with redundancy circuit. 4,858,192, Cl. 365-200.000.

Tatsuno, Yujiro: *See*—
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Usami, Toshimasa; Shimomura, Akihiro; Tatsuta, Sumitaka; and Hatakeyama, Seiji, 4,857,501, Cl. 503-200.000.

Tayebi, Amad, to New England Thermoplastics, Inc. Face mask. 4,856,508, Cl. 128-206.120.

Taylor, Adoyal, to Oldacre, A. Q. Vacuum insect eradication device. 4,856,226, Cl. 43-113.000.

Taylor, John A., to Separation Dynamics, Inc. Separation of water from hydrocarbons and halogenated hydrocarbons. 4,857,081, Cl. 55-16.000.

Taylor, Roy M., Jr.: *See*—
Brumbaugh, Ernest; and Taylor, Roy M., Jr., 4,857,114, Cl. 134-42.000.

Taylor, William P. Solar power plant and still. 4,856,281, Cl. 60-641.900.

Tazuke, Hisashi: *See*—
Yamaguchi, Shogo; Araki, Kazunori; Tazuke, Hisashi; Murasaki, Masayuki; and Ito, Hirofumi, 4,856,563, Cl. 141-1.000.

Technicon Instruments Corporation: *See*—
Raczkowski, Jan, 4,857,247, Cl. 264-40.700.

Technion Research & Development Foundation Ltd.: *See*—
Zeevi, Yehoshua; and Hilsenrath, Oliver, 4,858,014, Cl. 358-217.000.

Tecma Laboratories, Inc.: *See*—
Trenzeluk, Theodore, 4,857,328, Cl. 424-195.100.

Tecumseh Products Company: *See*—
Kronich, Peter G., 4,856,467, Cl. 123-90.430.

Tee, Sim A., to Sun Industrial Coatings Private Ltd. Apparatus for holding electrical or electronic components during the application of solder. 4,856,455, Cl. 118-500.000.

Teegen, Walter: *See*—
Linder, Ernst; Rembold, Helmut; and Teegen, Walter, 4,856,482, Cl. 123-506.000.

Tegal Corporation: *See*—
Drage, Davod J.; and Safi, Toufic, 4,857,138, Cl. 156-643.000.

Teichmann, Robert J.; Walther, James F.; and Mulhall Robert C., to Potters Industries, Inc. Nickel particle plating system. 4,857,233, Cl. 252-513.000.

Teijin Limited: *See*—
Kadokura, Sadao; Kamei, Kazuhiro; and Honjyo, Kazuhiko, 4,858,047, Cl. 360-99.010.

Tekscan, Inc.: *See*—
Maness, William L.; Golden, Robert F.; Benjamin, Michael H.; and Podoloff, Robert M., 4,856,993, Cl. 433-68.000.

Tektronix, Inc.: *See*—
Conner, Arlie R., 4,857,906, Cl. 340-784.000.
Doeling, Wallace D., 4,856,184, Cl. 29-852.000.
Jenq, Yih-Chyun; and Crosby, Philip S., 4,858,142, Cl. 364-487.000.
Stuebing, Carlton, 4,857,760, Cl. 307-234.000.
VanDomelen, Joseph D., 4,857,000, Cl. 439-64.000.

Teleco Oilfield Services Inc.: *See*—
Spinnler, Ralph F., 4,857,175, Cl. 209-235.000.

Telectronics N.V.: *See*—
Hansen, James C., 4,856,522, Cl. 128-419.0PG.

Teledyne Industries, Inc.: *See*—
Peterson, John R., 4,856,576, Cl. 164-495.000.

Telefind Corp.: *See*—
Andros, Andrew A.; and Campana, Thomas J., 4,857,915, Cl. 340-825.440.

Telefonaktiebolaget L M. Ericsson: *See*—
Sundell, Hans E.; Egeland, Terje; Johnson, Sten E.; and Friman, Erik B., 4,858,118, Cl. 364-243.400.

Temple, Victor A. K., to General Electric Comapny. Lateral metal-oxide-semiconductor controlled triacs. 4,857,977, Cl. 357-23.400.

Tendick, Clyde C.: *See*—
Osborn, Paul V.; and Tendick, Clyde C., 4,857,039, Cl. 493-416.000.

Tennies, Charles J.: *See*—
Baran, Mich S.; Bethoff, Bruce C.; Damiano, Michael A.; Hansen, James E.; Hastings, Jerome K.; Slomczewski, Allen J.; and Tennies, Charles J., 4,857,837, Cl. 324-117.00R.

Terada, Haruyoshi; Ono, Youji; Satoh, Yokichi; and Kaneko, Hideaki, to Nihon Parkerizing Co., Ltd. Cleaning chemical for aluminium surface. 4,857,225, Cl. 252-100.000.

Terada, Tetsuya: *See*—
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,813, Cl. 280-703.000.
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,815, Cl. 280-707.000.

Terada, Yasushi; Nakayama, Takeshi; and Kobayashi, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Nonvolatile semiconductor memory device using source of a single supply voltage. 4,858,194, Cl. 365-203.000.

Teradyne, Inc.: *See*—
Gonzalez, Roberto; and Apfelbaum, Lawrence S., 4,857,833, Cl. 324-73.00R.

Terakawa, Takashige; Akaba, Noriyuki; and Hattori, Sadayoshi, to Tokyo Keiki Co., Ltd. High frequency push-pull transformer. 4,857,869, Cl. 333-26.000.

Terano, Takashi; Jinno, Masayuki; and Saijo, Munetoshi, to Mazda Motor Corporation. Liquid-crystal indicator control system. 4,857,889, Cl. 340-461.000.

Terao, Shinji; and Maki, Yoshitaka, to Takeda Chemical Industries, Ltd. Coumaran derivatives and their pharmaceutical use. 4,857,516, Cl. 514-100.000.

Teraoka, Akira; and Shikiya, Hajime, to Kubota, Ltd. Propelling transmission system of tractor. 4,856,611, Cl. 180-233.000.

Terpa Poultry B.V.: *See*—
de Greef, Willem M., 4,856,144, Cl. 17-24.000.

Tessier, Paul A.: *See*—
Simons, Tad D.; Stawitcke, Frederick A.; Reed, William M.; and Tessier, Paul A., 4,857,048, Cl. 604-50.000.

Tettex AG: *See*—
Zoltan, Istvan, 4,857,827, Cl. 324-55.000.

Teves, Leonides Y. Sound generating pacifier. 4,856,519, Cl. 128-360.000.

Tew, Sydney K., to Cadillac Gage Textron Inc. Movable core position transducer. 4,857,824, Cl. 323-347.000.

Texaco Inc.: *See*—
Najjar, Mitri S.; and Roland, James, 4,857,229, Cl. 252-373.000.
Sung, Rodney L.; and Kaufman, Benjamin J., 4,857,661, Cl. 562-502.000.

Texacone Company: *See*—
Wheeler, John H., 4,857,389, Cl. 428-217.000.

Texas Instrument Incorporated: *See*—
Kuwano, Hiromichi, 4,857,780, Cl. 307-574.000.

Texas Instruments Incorporated: *See*—
Breuninger, Robert K., 4,858,178, Cl. 364-900.000.
Fisher, Wayne G., 4,857,132, Cl. 156-345.000.
Loewenstein, Lee M., 4,857,140, Cl. 156-643.000.

Millis, Edwin G.; and Wood, Samuel J., Jr., 4,857,430, Cl. 430-30.000.
Millis, Edwin G.; and Wood, Samuel J., Jr., 4,857,750, Cl. 250-573.000.
Ovens, Kevin M.; and Strong, Bobby D., 4,857,771, Cl. 307-455.000.
Pang, Roland H.; and Chiu, Edison H., 4,858,182, Cl. 365-156.000.
Sampsell, Jeffrey B.; and McDonald, Terrance G., 4,856,863, Cl. 350-96.160.
Scharrer, Carl J.; and Vogt, Debbie S., 4,858,181, Cl. 365-155.000.
Scharrer, Carl J.; and Pang, Roland H., 4,858,183, Cl. 365-174.000.
Schreck, John F., 4,858,187, Cl. 365-185.000.
Simpson, Richard D.; and Roskell, Derek, 4,858,167, Cl. 364-787.000.
Whetsel, Lee D., Jr., 4,857,835, Cl. 324-73.00R.

Texas Medical Instruments, Inc.: *See*—
Modisette, J. Everett, 4,857,723, Cl. 250-213.00R.

Textilmaschinenfabrik Dr. Ernst Fehrer Aktiengesellschaft: *See*—
Kis, Ludwig, 4,856,152, Cl. 28-114.000.

Theeuwes, Felix, to Alza Corporation. Intravenous system for delivering a beneficial agent. 4,857,052, Cl. 604-85.000.

Thermacore, Inc.: *See*—
Ernst, Donald M., 4,857,421, Cl. 429-104.000.

Thiel, Rudolf; Klimt, Ulrich; and Kast, Helmut, to Alfred Teves GmbH. Spot-type disc brake. 4,856,620, Cl. 188-72.400.

Thomas, Gerald A.: *See*—
Radesky, Joseph A.; Brandt, Carl B.; Thomas, Gerald A.; and Aksins, William E., 4,856,225, Cl. 43-81.000.

Thomas, James L.: *See*—
Music, John; Smith, Gordon H.; and Thomas, James L., 4,857,991, Cl. 358-13.000.
Music, John; Smith, Gordon H.; and Thomas, James L., 4,857,993, Cl. 358-13.000.

Thomas, William C. Skin ointment. 4,857,321, Cl. 424-95.000.

Thomassen & Drijver-Verblifa N.V.: *See*—
Uithoven, Pieter G., 4,856,262, Cl. 53-499.000.

Thompson, David M. Fishing rod holder. 4,856,221, Cl. 43-21.200.

Thompson, Gregory J.: *See*—
Barger, Paul T.; Thompson, Gregory J.; Herber, Raymond R.; and Imai, Tamotsu, 4,857,666, Cl. 585-323.000.

Thompson, James D.: *See*—
Rosen, Harold A.; and Thompson, James D., 4,858,229, Cl. 370-75.000.

Thompson, Joseph, to Sterling Drug Inc. Container convertible to a child's pail. 4,856,673, Cl. 220-94.00R.

Thompson, Mortimer S., to Tri-Tech Systems International Inc. Container and cap. 4,856,667, Cl. 215-318.000.

Thomsen, Jack W.; Regunathan, Perialwar; and Tadlock, John W., to Everpure, Inc. Filter cartridge with a lugged concentric closure portion. 4,857,189, Cl. 210-232.000.

Thomson Consumer Electronics, Inc.: *See*—
Furrey, John H., 4,858,015, Cl. 358-242.000.

Thomson-CSF: *See*—
Drabowitch, Serge; and Bouko, Jean, 4,857,936, Cl. 342-368.000.
Gautier, Herve ; and Lardat, Claude, 4,857,870, Cl. 333-195.000.

Thorn, Brent A.; and Hill, William. Method of and apparatus for spraying. 4,857,367, Cl. 427-348.000.

Thorn, Mary F.: *See*—
Marshall, James R.; and Thorn, Mary F., 4,857,261, Cl. 376-248.000.

Thrower, Keith R. Access-control apparatus. 4,857,914, Cl. 340-825.310.

Thyes, Marco; and Steiner, Gerd, to BASF Aktiengesellschaft. Preparation of (Z)-2-(2-arylethenyl)arylcarboxylic acids. 4,857,658, Cl. 562-495.000.

Tiedeman, George T.; and Gess, Jerome M., to Weyerhaeuser Company. Method and products for sizing paper and similar materials. 4,857,149, Cl. 162-158.000.

Tiep, Brian L. Slide sorters. 4,856,215, Cl. 40-361.000.

Tilotta, David C.: *See*—
Fateley, William G.; and Tilotta, David C., 4,856,897, Cl. 356-301.000.

Timtner, Karlheinz: *See*—
Maurer, Ruprecht; and Timtner, Karlheinz, 4,856,411, Cl. 91-1.000.

Ting, Loi-Lou; Chui, Granger K.; and King, Edward T., to Ford Motor Company. Lubricant retaining finger-follower rocker arm. 4,856,466, Cl. 123-90.330.

Tisch, Siegfried, to INA Walzlager Schaeffler KG. Valve control device. 4,856,474, Cl. 123-323.000.

Tisma Machine Corporation: *See*—
Tisma, Steven, 4,856,566, Cl. 141-142.000.

Tisma, Steven, to Tisma Machine Corporation. Fast acting loading system for automatic packaging machine. 4,856,566, Cl. 141-142.000.

Titan Mining & Engineering PTY. LTD.: *See*—
Shaw, Roland J., 4,856,952, Cl. 411-413.000.

Tjernlund Products, Inc.: *See*—
Olson, Kenneth A., 4,856,982, Cl. 431-20.000.

TMC Corp.: *See*—
Choo, Tat Y., 4,857,206, Cl. 210-709.000.

TOA Nenryo Kogyo K.K.: *See*—
Kimura, Yoshiharu, 4,857,079, Cl. 55-16.000.

Toda, Masaaki; Ohuchida, Shuichi; and Ohno, Hiroyuki, to Ono Pharmaceutical Co., Ltd. Novel thiazolidine derivatives. 4,857,537, Cl. 514-365.000.

Todo, Eishiro: *See*—
Oku, Teruo; Todo, Eishiro; Kasahara, Chiyoshi; Nakamura, Katsuya; Kayakiri, Hiroshi; and Hashimoto, Masashi, 4,857,513, Cl. 514-76.000.

Tofanetti, Odoardo: *See*—
Gandolfi, Carmelo A.; Spinelli, Silvano; Tofanetti, Odoardo; Russo, Raimondo; and Tognella, Sergio, 4,857,643, Cl. 544-121.000.

Togashi, Kazuya: *See*—
Maruya, Shinji; Yatsurugi, Yoshifumi; and Togashi, Kazuya, 4,857,270, Cl. 420-578.000.

Tognella, Sergio: *See*—
Gandolfi, Carmelo A.; Spinelli, Silvano; Tofanetti, Odoardo; Russo, Raimondo; and Tognella, Sergio, 4,857,643, Cl. 544-121.000.

Tohjoh, Yoshikazu; Hasegawa, Akira; and Sato, Tomoaki, to Olympus Optical Co., Ltd. Endoscope apparatus. 4,856,495, Cl. 128-6.000.

Tohonen, Mauno: *See*—
Lindroos, Kaj; and Tohonen, Mauno, 4,856,158, Cl. 29-116.100.

Tokai Rubber Industries, Ltd.: *See*—
Kanda, Ryouji, 4,856,764, Cl. 267-140.100.

Tokai TRW & Co., Ltd.: *See*—
Sueshige, Hirotaka; and Hayashi, Masayuki, 4,856,607, Cl. 180-142.000.

Tokaichi, Tetsuro: *See*—
Nakano, Kenichi; Umezawa, Yoshihiro; Tokaichi, Tetsuro; Ichimura, Yoshiaki; and Kawabe, Natsuki, 4,857,001, Cl. 439-68.000.

Tokico Ltd: *See*—
Kawai, Masaki, 4,857,086, Cl. 55-162.000.

Tokio, Uetsuhara; and Hiroji, Iwasaki, to Mitsubishi Mining & Cement Co. Ltd.; and Iwasaki Electronics Co. Ltd. Step motor. 4,857,782, Cl. 310-12.000.

Tokuzo, Kobayashi, to O M Kiki Co., Ltd. Free access floor panel. 4,856,256, Cl. 52-805.000.

Tokyo Denshi Yakin Co., Ltd.: *See*—
Honda, Hideyuki; Kawasaki, Koichi; and Sato, Hiroshi, 4,856,330, Cl. 73-204.250.

Tokyo Electric, Co., Ltd.: *See*—
Murakoso, Toshiyuki; Sato, Shoichi; and Yagi, Motoi, 4,856,603, Cl. 177-210.00C.

Tokyo Electric Power Company: *See*—
Ito, Masamichi; Ohkoshi, Akio; Shizukawa, Kenjiro; Hayata, Terunobu; Furuya, Tomiaki; Yamanaka, Susumu; and Koezuka, Junji, 4,857,499, Cl. 502-326.000.
Okabe, Yoshimi; and Kikuchi, Katsumi, 4,856,353, Cl. 73-865.800.

Tokyo Electric Power Co. Inc., The: *See*—
Katsuie, Masahiro; Abe, Michiyuki; Kawahara, Katsuyuki; and Nakamura, Taizo, 4,856,965, Cl. 417-19.000.

Tokyo Keiki Company Ltd.: *See*—
Takeuchi, Kunihiko; Oba, Masao; and Horinouchi, Shinichi, 4,856,177, Cl. 29-568.000.
Takeuchi, Kunihiko; Hayashi, Kiyoshi; and Shimomura, Yasuo, 4,858,103, Cl. 364-174.000.
Takeuchi, Kunihiko; Ikeda, Hajime; and Horinouchi, Shinichi, 4,858,133, Cl. 364-424.040.
Terakawa, Takashige; Akaba, Noriyuki; and Hattori, Sadayoshi, 4,857,869, Cl. 333-26.000.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Murai, Shunji; Ohtomo, Fumio; and Ohtani, Hitoshi, 4,858,157, Cl. 364-560.000.

Tolson, Sidney S.; and Brumberg, Charles S., to Ossid Corporation. Machine packaging tray. 4,856,704, Cl. 229-2.50R.

Tomalia, Donald A.; and Stahlbush, James R., to Dow Chemical Company, The. Modified dense star polymers. 4,857,599, Cl. 525-259.000.

Tominaga, Shinji; Yamamoto, Kouji; and Yamanaka, Akira, to Minolta Camera Kabushiki Kaisha. Film winding-up system for photographic camera. 4,857,946, Cl. 354-173.100.

Tomio, Hidehiro: *See*—
Shindo, Yoshio; Yamazaki, Fumio; Wada, Kouichi; Tomio, Hidehiro; and Saito, Katsushi, 4,857,154, Cl. 204-27.000.

Tomita, Osamu; Saiwai, Kazuhiko; and Kimura, Akira, to Kanzaki Paper Manufacturing Co., Ltd. Apparatus for measuring adhesion. 4,856,325, Cl. 73-150.00A.

Tomita, Toshio: *See*—
Kimura, Kiyoshi; Kise, Masahiro; Morita, Iwao; Tomita, Toshio; and Tsuda, Masami, 4,857,515, Cl. 514-89.000.

Tomita, Yoshifumi: *See*—
Hayashi, Nobuaki; Uchino, Shoichi; Tomita, Yoshifumi; Nonogaki, Saburo; and Nishizawa, Masahiro, 4,857,429, Cl. 430-28.000.

Tomlinson, John C.: *See*—
McBride, William B.; Wilson, William R., Jr.; Tomlinson, John C.; McCarthy, John A.; Kochanowsky, Eugene W.; Hendricks, Jefferson D.; and Houle, Arthur J., 4,857,921, Cl. 340-912.000.

Tomlinson, Roger R.: *See*—
Ahmed, Nazeer; and Tomlinson, Roger R., 4,856,172, Cl. 29-434.000.

Tompkins, John C.; and Cook, Charles E. Cordless battery charger. 4,857,820, Cl. 320-2.000.

Tomy Kogyo Co., Inc.: *See*—
Hirose, Tomiyuki; and Shimizu, Hiroyuki, 4,856,777, Cl. 273-1.0GA.
Ohashi, Michiya, 4,858,079, Cl. 362-35.000.

Tone, Shoichi, to Murata Kikai Kabushiki Kaisha. Method and apparatus for changing bobbins in lot for an automatic winder. 4,856,723, Cl. 242-35.50R.

Tonen Sekiyukagaku K.K. *See—*
Matsumura, Tooru, 4,857,230, Cl. 252-400.240.
Toppan Printing Co., Ltd.: *See—*
Kato, Takeo; Yamamoto, Hideki; and Miyazaki, Naoki, 4,857,393, Cl. 428-289.000.
Toray Industries, Inc.: *See—*
Sasaki, Tatsuo; Fujimaki, Hideo; Uemura, Tadahiro; and Kurihara, Masaru, 4,857,363, Cl. 427-245.000
Toray Silicone Co., Ltd.: *See—*
Ona, Isao; and Ozaki, Masaru, 4,857,212, Cl. 252-8.600
Torbey, Habib H., to Columbia University in the City of New York, The Trustees of. System and method for hierarchal image encoding and decoding. 4,858,017, Cl. 358-426.000.
Torii, Nobutoshi: *See—*
Toyoda, Kenichi; Mizuno, Tohru; Torii, Nobutoshi; Kanda, Yuichi; and Morikawa, Shigehiro, 4,857,700, Cl. 219-124.340
Torii, Yasuhiro; Matsuo, Seitaro; Watanabe, Iwao; and Shimada, Masaru, to Nippon Telegraph and Telephone Corporation. Microwave ion source. 4,857,809, Cl. 315-111.310.
Tornberg, Neal E., to Expert System Technologies, Inc., The. Method of establishing standard composite material properties. 4,856,335, Cl. 73-597.000
Torres, Enrique R. Automotive alarm. 4,857,888, Cl. 340-426.000.
Torrington Company, The: *See—*
Cusati, Ward R., 4,856,927, Cl. 403-104.000
Toshiba Ceramics Co., Ltd.: *See—*
Aiba, Yoshiro; Arakawa, Kazumi; Watanabe, Takashi; and Kawai, Kazuhide, 4,857,488, Cl. 501-89.000.
Tosoh Corporation: *See—*
Tanaka, Koji; Takemoto, Katsuo; and Sakai, Yasushi, 4,857,617, Cl. 526-237.000
Tower, William A.: *See—*
Kreiling, William H.; and Tower, William A., 4,857,416, Cl. 428-64.000
Toyo Communication Equipment Co., Ltd.: *See—*
Matsuno, Tatsuji, 4,857,830, Cl. 324-62.000
Matsuno, Tatsuji, 4,857,855, Cl. 324-521.000.
Toyo Jozo Co., Ltd.: *See—*
Ishimura, Fumihiro; Ishikawa, Satoru; and Akiyama, Seiji, 4,857,469, Cl. 435-280.000
Toyoda Gosei Co., Ltd.: *See—*
Hara, Noboru; and Sugiyama, Shogo, 4,856,908, Cl. 366-182.000.
Toyoda, Kenichi; Mizuno, Tohru; Torii, Nobutoshi; Kanda, Yuichi; and Morikawa, Shigehiro, to Fanuc Ltd. Control apparatus for automatic arc welding machine. 4,857,700, Cl. 219-124.340.
Toyoda Koki Kabushiki Kaisha: *See—*
Eto, Kunihiko; Takeuchi, Shiro; Mori, Yutaka; Tanooka, Shigeo; Kodama, Kazumasa; and Matsumoto, Tsutomu, 4,858,134, Cl. 364-424.050.
Toyota Jidosha Kabushiki Kaisha: *See—*
Aiki, Shigetaka; Kobayashi, Kiyonori; and Kato, Satoshi, 4,857,032, Cl. 464-68.000
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Aburaya, Toshio, 4,856,798, Cl. 280-6.110.
Funahashi, Makoto; Kubo, Seitoku; and Nakamura, Shinya, 4,856,381, Cl. 74-867.000
Kawai, Taiyo; Nakagawa, Norihisa; and Sano, Shin-ichi, 4,856,473, Cl. 123-308.000.
Kouno, Katsumi; Okawa, Susumu; Sugaya, Masami; and Soga, Yoshinobu, 4,857,034, Cl. 474-28.000
Monden, Yukio; and Manabe, Akira, 4,857,695, Cl. 219-85.220
Tanaka, Yoshiyuki; Ii, Akira; Meguro, Taiichi; and Hayashi, Kenji, 4,858,136, Cl. 364-431.070
Toyota, Takehito, to Mitsubishi Denki Kabushiki Kaisha. Electronic blackboard capable of providing hardcopy. 4,858,021, Cl. 358-494.000
Tractiontec Corporation: *See—*
Kemper, Yves J., 4,856,371, Cl. 74-690.000.
Traenckner, Hans-Joachim: *See—*
Bottenbruch, Ludwig; Traenckner, Hans-Joachim; Hampe, Andreas; and Schumacher, Klaus, 4,856,342, Cl. 73-827.000
Tran, Duc H.: *See—*
Murphy, Patrick; and Tran, Duc H., 4,857,942, Cl. 346-76.0PH.
Tran, Kha M.; and Einerson, Mark A., to Nestec S.A. Protein-free coffee whitener and method of making same. 4,857,341, Cl. 426-98.000.
Traylor, Paul L. Air gap faucet. 4,856,121, Cl. 4-191.000.
Trenzeluk, Theodore, to Tecma Laboratories, Inc. Skin therapeutic mixture containing aloe vera extract. 4,857,328, Cl. 424-195.100.
Treshlen Limited: *See—*
Zaccaro, Carlo, 4,856,208, Cl. 36-29.000.
Treu, Dennis M.: *See—*
Shouldice, David R.; Treu, Dennis M.; Powell, Daniel A.; and Cernich, Thomas, 4,857,181, Cl. 210-87.000.
Tri-Tech Systems International Inc.: *See—*
Thompson, Mortimer S., 4,856,667, Cl. 215-318.000.
Tridem Manufactured Products Inc.: *See—*
Crosby, Nobel W., 4,857,020, Cl. 439-783.000.
Trimborn, Edmond: *See—*
Baloga, Mark A.; Trimborn, Edmond; and Fussler, Philippe, 4,856,242, Cl. 52-239.000.
Triolo, Victoria M.: *See—*
Hartwell, David W.; Bloom, Elbert; and Triolo, Victoria M., 4,858,234, Cl. 371-14.000.
Troger, Wolfgang: *See—*
Weber, Karl-Heinz; Schneider, Claus; Walther, Gerhard; Hinzen, Dieter; Kuhn, Franz J.; Lehr, Erich; Ensinger, Helmut; and Troger, Wolfgang, 4,857,528, Cl. 514-252.000.
Truckseas, A. William. Security enclosure for transaction machine. 4,856,437, Cl. 109-24.100.
Trumpp, Hans J.: *See—*
Greschner, Johann; Schwerdt, Friedrich W.; and Trumpp, Hans J., 4,857,383, Cl. 428-156.000.
Trush, David M.: *See—*
LaRocca, William J.; and Trush, David M., 4,856,363, Cl. 74-535.000.
TRW Cam Gears Limited: *See—*
Adams, Frederick J., 4,856,608, Cl. 180-148.000.
TRW Inc.: *See—*
Brown, Louis R., 4,856,606, Cl. 180-140.000
TRW Vehicle Safety Systems Inc.: *See—*
Schmidt, Utz H.; and Asfour, Richard E., 4,856,727, Cl. 242-107.40B
Tsai, Ming T. Converter. 4,858,076, Cl. 361-417.000.
Tserng, Ray L., to Chuan Erh Industrial Co., Ltd. Window grille latch device. 4,856,229, Cl. 49-56.000.
Tsubakimoto Chain Co.: *See—*
Yaguchi, Akio; and Kondo, Takayuki, 4,856,955, Cl. 414-278.000.
Tsuchiya, Hiromu; Nabekawa, Shukichi; and Takada, Masao, to Nippon Chemical Industrial Co., Ltd. Manufacturing method for alkyldihalogenophosphines. 4,857,238, Cl. 562-820.000.
Tsuda, Masami: *See—*
Kimura, Kiyoshi; Kise, Masahiro; Morita, Iwao; Tomita, Toshio; and Tsuda, Masami, 4,857,515, Cl. 514-89.000.
Tsudakoma Corp.: *See—*
Takehana, Tatsuo; and Matsuda, Fumio, 4,856,691, Cl. 226-91.000.
Tsugei, Shinji: *See—*
Washizuka, Isamu; Tsugei, Shinji; and Inoue, Tomohiro, 4,858,125, Cl. 364-413.010.
Tsuji, Nobuo: *See—*
Nishikawa, Yasuo; Miyazuka, Hajime; and Tsuji, Nobuo, 4,857,402, Cl. 428-336.000
Tsujihara, Susumu; and Kataoka, Teruo, to Matsushita Electric Industrial Co., Ltd. Automatic primary color convergence alignment system for projection television. 4,857,998, Cl. 358-60.000.
Tsujimoto, Kazunori: *See—*
Tachi, Shinichi; Okudaira, Sadayuki; Tsujimoto, Kazunori; and Mukai, Kiichiro, 4,857,137, Cl. 156-640.000.
Tsujimoto, Susumu: *See—*
Minami, Katsuji; Murata, Shinichi; Tsujimoto, Susumu; Matuzaki, Yukinori; Yukawa, Shogo; and Osaka, Susumu, 4,856,574, Cl. 160-168.100.
Tsukada, Shuichi: *See—*
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Tsukahara, Daiki: *See—*
Wakabayashi, Hiroshi; Kazami, Kazuyuki; Nakamura, Toshiyuki; Miyamoto, Hidenori; Tsukahara, Daiki; Machida, Kiyosada; and Katano, Yuji, 4,857,947, Cl. 354-195.100.
Tsukamoto, Katsuya; Fujii, Yasuhiro; and Abiko, Toshio, to Matsushita Electric Works, Ltd. Planar antenna. 4,857,938, Cl. 343-700.0MS
Tsukamoto, Yuji, to NEC Corporation. Apparatus for measuring an adhesion force of a thin film. 4,856,326, Cl. 73-150.00A.
Tsukazaki, Hisanobu: *See—*
Oku, Masuo; Kudo, Yoshimichi; Kuroyanagi, Tomomitsu; Kondo, Kazuo; Tsukazaki, Hisanobu; Ikeda, Tetsuya; Nakashima, Akio; and Kimura, Takashi, 4,858,030, Cl. 358-342.000.
Tsumori, Yukihisa: *See—*
Ito, Hideji; Kametaka, Koji; and Tsumori, Yukihisa, 4,856,916, Cl. 384-477.000
Tsuruta, Koji: *See—*
Ohkoshi, Akio; Nakagawa, Hideaki; Tsuruta, Koji; Sugii, Yasuyoshi; and Wada, Haruaki, 4,857,800, Cl. 313-495.000.
Tsutsumi, Yuji: *See—*
Ishiwatari, Masaaki; Tsutsumi, Yuji; Ogusu, Yoshiyuki; and Kimura, Yoshihiro, 4,857,304, Cl. 424-59.000.
Tu, Jan-I: *See—*
DiPietro, Richard A.; Tu, Jan-I; and Turabi, Noor Z., 4,857,522, Cl. 514-212.000
Tubbs, Arthur E., Jr. High energy return seawall. 4,856,933, Cl. 405-30.000
Tuboscope Inc.: *See—*
Kessler, Newlin W.; and Willis, Ray D., 4,856,828, Cl. 285-334.100.
Tuider, Wolfgang: *See—*
Fischer, Karl; Kock, Werner; and Tuider, Wolfgang, 4,858,051, Cl. 360-137.000
Turabi, Noor Z.: *See—*
DiPietro, Richard A.; Tu, Jan-I; and Turabi, Noor Z., 4,857,522, Cl. 514-212.000.
Turk, Gijsbertus W.: *See—*
Van Mens, Reinoud; and Turk, Gijsbertus W., 4,857,118, Cl. 148-103.000
Turk, Gunter: *See—*
Nauroth, Peter; Kuhlmann, Robert; Turk, Gunter; and Becker, Adam, 4,857,289, Cl. 423-339.000.
Turk, Hayrettin: *See—*
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Turner, Frank P.: *See—*
Nelson, Carl W.; Smith, Donald S.; and Turner, Frank P., 4,856,943, Cl. 408-1.00R.
Turner, Robert C.; and Holman, Rury R. Automatic lancet. 4,856,515, Cl. 128-315.000.
Turner, Ronald F., to Lucas Industries Public Limited Company. Fuel injection nozzles. 4,856,714, Cl. 239-533.900.
Turney, William J.: *See—*
Gailus, Paul H.; Turney, William J.; and Yester, Francis R., Jr., 4,857,928, Cl. 341-143.000.
Tusting, Robert F., to Harbor Oceanographic Institution, Inc. Safety devices for submarine lasers. 4,856,874, Cl. 350-267.000.
Tustison, Randal W.; and Varitimos, Thomas, to Raytheon Company. Method of producing single crystalline magnetic film having bi-axial anisotropy. 4,857,415, Cl. 428-620.000.
Twedt, Dean E.: *See—*
Anderson, Frank C.; and Twedt, Dean E., 4,858,154, Cl. 364-554.000.
Tyle, Praveen, to American Cyanamid Company. Sustained release growth hormone compositions for parenteral administration and their use. 4,857,506, Cl. 514-12.000.
Uchibe, Hisashi: *See—*
Sakaguchi, Akira; Uchibe, Hisashi; and Tange, Toshiyuki, 4,856,700, Cl. 228-5.100.
Uchida, Hideaki: *See—*
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Uchida, Takao: *See—*
Kikuchi, Hiroshi; Tanuma, Jiro; Ishimizu, Hideaki; Uchida, Takao; and Asaka, Toshiyuki, 4,857,005, Cl. 439-140.000.
Uchino, Kenji; and Ohnishi, Kazumasa, to Nissan Motor CO., Ltd.; and Alps Electric Co., Ltd. Linear motor. 4,857,791, Cl. 310-321.000.
Uchino, Shoichi: *See—*
Hayashi, Nobuaki; Uchino, Shoichi; Tomita, Yoshifumi; Nonogaki, Saburo; and Nishizawa, Masahiro, 4,857,429, Cl. 430-28.000.
Uchiyama, Hitoshi: *See—*
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Ucosan B.V.: *See—*
Dijkhuizen, Okko K., 4,856,125, Cl. 4-543.000.
Ueda, Hiroyuki, to Canon Kabushiki Kaisha. Output control system. 4,858,148, Cl. 364-518.000.
Ueda, Takashi; Maruta, Keiichi; and Yaguchi, Hiroshi, to Ricoh Company, Ltd. Thermosensitive recording material. 4,857,502, Cl. 503-217.000.
Uehira, Shigeyuki, to Sharp Kabushiki Kaisha. Shielding of semiconductor module. 4,857,375, Cl. 428-75.000.
Uemura, Tadahiro: *See—*
Sasaki, Tatsuo; Fujimaki, Hideo; Uemura, Tadahiro; and Kurihara, Masaru, 4,857,363, Cl. 427-245.000.
Uenaka, Kazushige: *See—*
Abe, Akira; Nakajima, Junya; Takase, Haruo; Uenaka, Kazushige; and Otomo, Ruyzi, 4,857,441, Cl. 430-393.000.
Takase, Haruo; Uenaka, Kazushige; Abe, Akira; and Fujita, Yoshihiro, 4,857,950, Cl. 354-324.000.
Ueno, Katsumi, to Diesel Kiki Co., Ltd. Shuttle valve device. 4,856,549, Cl. 137-112.000.
Ueno, Kazuhiro: *See—*
Kashihara, Hidechiyo; Nemoto, Shin-ichi; and Ueno, Kazuhiro, 4,857,040, Cl. 494-22.000.
Uhlmann, Klaus P. Method for drawing seamless metal tubing particularly copper tubing under inclusion of a floating mandrel and a diameter reducing die. 4,856,703, Cl. 228-156.000.
Uithoven, Pieter G., to Thomassen & Drijver-Verblifa N.V. Apparatus for disposing packing in predetermined relative positions. 4,856,262, Cl. 53-499.000.
Ullman, Edwin F.; Khanna, Pyare; and Peries, Rohan, to Syntex (U.S.A.) Inc. Immunoassay device. 4,857,453, Cl. 435-7.000.
Ullman, Edwin F.: *See—*
Khanna, Pyare L.; Chang, Chiu C.; and Ullman, Edwin F., 4,857,455, Cl. 435-7.000.
Uly-Pak, Inc.: *See—*
Siebert, Lester D., 4,856,989, Cl. 432-225.000.
Umemaru, Hisato: *See—*
Morishita, Mitsuharu; Kohge, Shinichi; Hara, Tadayuki; Hata, Yasuaki; and Umemaru, Hisato, 4,856,323, Cl. 73-118.100.
Umerez, Ignacio Z., to Celaya, Emparanza y Galdos, S.A. (Cegasa). Battery couplings to portable signals with long periods out of service. 4,857,885, Cl. 340-321.000.
Umeyama, Hideaki: *See—*
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,857,650, Cl. 548-336.000.
Umezawa, Yoshihiro: *See—*
Nakano, Kenichi; Umezawa, Yoshihiro; Tokaichi, Tetsuro; Ichimura, Yoshiaki; and Kawabe, Natsuki, 4,857,001, Cl. 439-68.000.
Undersea Industries, Inc.: *See—*
Hart, Dennis, 4,856,120, Cl. 2-428.000.
Unionrm Anstalt: *See—*
Bassino, Walter, 4,857,872, Cl. 335-80.000.
Union Carbide Corporation: *See—*
Acharya, Arun; Marchese, Michael A.; and Nowobilski, Jeffert J., 4,856,285, Cl. 62-63.000.
Austin, Paul E.; Farris, David D.; Reedy, James D.; Blevins, Charles; and Ramdatt, Philbert E., 4,857,583, Cl. 524-761.000.
Burns, Norman M., Jr., 4,857,232, Cl. 252-511.000.
Domeier, Linda A., 4,857,579, Cl. 524-507.000.
Gale, George M.; and Sorio, Aldo A., 4,857,250, Cl. 264-83.000.
Gross, Laurence H.; and Bartlett, Thorne M., 4,857,600, Cl. 525-285.000.
Larson, Nils E.; Leturno, David B.; and Cherne, Lawrence W., 4,857,692, Cl. 219-74.000.
Leung, Pak S.; Goddard, Errol D.; and Ancker, Fred H., 4,857,593, Cl. 525-92.000.
Meschke, Debra J.; and Hoy, Kenneth L., 4,857,218, Cl. 252-49.300.
Rival, Steven E.; and Prince, William D., 4,857,150, Cl. 203-41.000.
Union Oil Company of California: *See—*
Abdo, Suheil F., 4,857,169, Cl. 208-59.000.
Uniroyal Chemical Company, Inc.: *See—*
Lai, Hoi K.; Davis, Robert A.; and Blem, Allen R., 4,857,649, Cl. 548-262.000.
Uniroyal Chemical LTD/LTEE: *See—*
Lai, Hoi K.; Davis, Robert A.; and Blem, Allen R., 4,857,649, Cl. 548-262.000.
Unisys Corporation: *See—*
Conwell, Peter R., 4,858,147, Cl. 364-513.000.
Rusterholz, John T.; and Hamstra, James R., 4,858,115, Cl. 364-200.000.
United Company, The: *See—*
Smith, Lloyd B., 4,857,210, Cl. 210-781.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Knight, Richard B. D., 4,857,933, Cl. 341-168.000.
United Pharmaceuticals: *See—*
Davis, William M., 4,857,535, Cl. 514-317.000.
United States of America
Agriculture: *See—*
Columbus, Eugene P., 4,856,148, Cl. 19-55.00R.
Air Force: *See—*
Cardimona, David A., 4,858,238, Cl. 372-3.000.
Fender, Janet S.; and Avizonis, Petras V., 4,856,884, Cl. 350-557.000.
Yang, Andrew C.; Lorenzo, Joseph P.; and Soref, Richard A., 4,857,973, Cl. 357-15.000.
Army: *See—*
Phillippi, R. Michael; and Manion, Francis M., 4,856,338, Cl. 73-701.000.
Energy: *See—*
Atac, Muzaffer, 4,857,740, Cl. 250-374.000.
Phelps, James E., 4,857,739, Cl. 250-388.000.
Sheinberg, Haskell; Meek, Thomas T.; and Blake, Rodger D., 4,857,266, Cl. 419-22.000.
Health and Human Services: *See—*
Ito, Yoichiro, 4,857,187, Cl. 210-198.200.
National Security Agency: *See—*
Saccardi, Raymond J., 4,858,113, Cl. 364-200.000.
Navy: *See—*
Dahl, Ernest A., 4,857,894, Cl. 340-619.000.
Everett, Hobart R., Jr.; and Gilbreath, Gary A., 4,857,912, Cl. 340-825.300.
U.S. Philips Corporation: *See—*
Bates, Robert N., 4,857,935, Cl. 342-128.000.
Bosch, Gerrit; Pasma, Tjebbe R.; Sluyterman, Albertus A. S.; Doomernik, Fransiscus M. P. P.; and Wielink, Steven M., 4,857,805, Cl. 315-8.000.
Dadds, Alan F., 4,857,937, Cl. 342-377.000.
Dethienne, Henri-Pierre Y., 4,857,877, Cl. 336-170.000.
Field, Anthony J., 4,858,010, Cl. 358-160.000.
Fischer, Karl; Kock, Werner; and Tuider, Wolfgang, 4,858,051, Cl. 360-137.000.
Geittner, Peter E. E.; Lydtin, Hans-Jurgen; and Wilson, Howard J. C., 4,857,091, Cl. 65-3.120.
Harlos, Hartmut; and Kelting, Peter, 4,857,779, Cl. 307-542.000.
Hoeberechts, Arthur M. E., 4,857,980, Cl. 357-30.000.
Janssen, Eduard J. P.; and Notelteirs, Victor R., 4,857,709, Cl. 219-464.000.
Koropp, Norbert, 4,856,413, Cl. 91-454.000.
Meerman, Wilhelmus C. P. M., 4,857,092, Cl. 65-18.400.
Patillon, Jean-Noel; Gabillard, Bertrand; and Martin, Gerard M., 4,857,974, Cl. 357-22.000.
Richards, Norman D., 4,857,992, Cl. 358-13.000.
Richards, Norman D., 4,858,026, Cl. 358-310.000.
Seevinck, Evert; De Jager, Willem; and Buitendijk, 4,857,861, Cl. 330-255.000.
Snoeren, Rudolph M., 4,857,724, Cl. 250-213.0VT.
Van Mens, Reinoud; and Turk, Gijsbertus W., 4,857,118, Cl. 148-103.000.
Van Vaals, Johannes J., 4,857,844, Cl. 324-307.000.
Vigano, Liliana; Kokkeler, Franciscus; and Fioroli, Mario, 4,857,685, Cl. 219-10.55F.
Vos, Gerardus J. J.; and Van Mal, Louis J., 4,858,009, Cl. 358-148.000.
Vrijssen, Gerardus A. H. M.; and Spanjer, Tjerk G., 4,857,797, Cl. 313-450.000.
United Technologies Corporation: *See—*
Brennan, John J.; Layden, George K.; and Prewo, Karl M., 4,857,485, Cl. 501-7.000.
Graff, John M.; Nutter, Harry A., Jr.; and Stoltze, Leon, 4,856,162, Cl. 29-156.80B.

Klapproth, Kenneth H.; Blimmel, William C.; and Dinse, Merle L., 4,856,963, Cl. 415-190.000.
Lopicolo, Mario T.; and Swarts, Richard E., 4,856,332, Cl. 73-505.000.
McDow, Robert W., 4,856,962, Cl. 415-115.000.
Nelson, Carl W.; Smith, Donald S.; and Turner, Frank P., 4,856,943, Cl. 408-1.00R.
Prewo, Karl M.; and Minford, Eric, 4,857,093, Cl. 65-36.000.
Putman, Robert L.; and Hovan, Edward J., 4,856,272, Cl. 60-39.020.
Schildhorn, Alan W., 4,858,164, Cl. 364-736.000.

Universal Video Communications Corp.: *See—*
Music, John; Smith, Gordon H.; and Thomas, James L., 4,857,991, Cl. 358-13.000.
Music, John; Smith, Gordon H.; and Thomas, James L., 4,857,993, Cl. 358-13.000

Universite du Quebec a Trois-Rivieres, Societe Quebecoise d'Initiatives Petrolieres and Gaz Metropolitain Inc.: *See—*
Bose, Tapan K.; Chahine, Richard; Marchildon, Louis; and St-Arnaud, Jean-Marie, 4,856,320, Cl. 73-30.000.

University of Arkansas: *See—*
Hermann, Allen M.; and Sheng, Zhengzhi, 4,857,504, Cl. 505-1.000.

University of California, The Regents of the: *See—*
Carlson, Joseph W., 4,857,846, Cl. 324-309.000.
Crowe, John H.; and Crowe, Lois M., 4,857,319, Cl. 424-94.100.
Urist, Marshall R., 4,857,456, Cl. 435-7.000.

University of Florida: *See—*
Koehler, Philip G.; Kramer, Richard; and Patterson, Richard S., 4,857,532, Cl. 514-262.000
Moudgil, Brij M.; and Ince, Dursun, 4,857,174, Cl. 209-3.000.

University of Southern California: *See—*
Forrest, Stephen R., 4,857,982, Cl. 357-30.000.

University of Texas System, The Board of Regents of the: *See—*
Saunders, Grady F.; and Mars, Wendy M., 4,857,466, Cl. 435-252.330.

Uno, Sadao: *See—*
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UOP: *See—*
Barger, Paul T.; Thompson, Gregory J.; Herber, Raymond R.; and Imai, Tamotsu, 4,857,666, Cl. 585-323.000.
Gortsema, Frank P.; Pellet, Regis J.; Springer, Albert R.; Rabo, Jule A.; and Long, Gary N., 4,857,495, Cl. 502-214.000.
Kulprathipanja, Santi, 4,857,642, Cl. 536-127.000.
Marcus, Bonita K.; and Lok, Brent M., 4,857,288, Cl. 423-328.000.

Upchurch, James M., to Schlumberger Technology Corporation. Well tool control system and method. 4,856,595, Cl. 166-374.000

Upravlenie po Montazhu, Demontazhu i Remontu Gornoshakhtnogo Oborudovania "Spetsshakhtomontazh" Karagandinskogo Proizvodstvennogo Obiedinenie po Dobyche Uglya "Karagandaugol" : *See—*
Churkin, Vladimir G.; Negrutsky, Sergei B.; Klimov, Sergei B.; and Negrutsky, Boris F., 4,856,414, Cl. 92-83.000.

Urata, Kazuo: *See—*
Tashiro, Mamoru; Urata, Kazuo; and Yamazaki, Shunpei, 4,857,139, Cl. 156-643.000.

Urbach, Hansjorg; Henning, Rainer; Scholkens, Bernward; and Becker, Reinhard, to Hoechst Aktiengesellschaft. Fused azepinone and azocinone derivatives, processes for their preparation, agents containing them and their use, and intermediates in their preparation. 4,857,520, Cl. 514-183.000.

Urist, Marshall R., to University of California, The Regents of the. Assay of Bone morphogenetic protein (BMP) and anti-BMP antibody for the diagnosis of bone disorders. 4,857,456, Cl. 435-7.000.

USA Medical: *See—*
Glenn, Luke H., 4,857,063, Cl. 604-317.000.

Usami, Jun: *See—*
Kodachi, Toru; and Usami, Jun, 4,857,164, Cl. 204-406.000.

Usami, Toshimasa; Shimomura, Akihiro; Tatsuta, Sumitaka; and Hatakeyama, Seiji, to Fuji Photo Film Co., Ltd. Manufacturing method of a heat sensitive recording material. 4,857,501, Cl. 503-200.000.

USG Interiors, Inc.: *See—*
Swensen, Eugene L.; and Ray, George F., III, 4,856,175, Cl. 29-460.000.

Ushio, Hideaki; Hayashi, Tadayoshi; Shibata, Kazuo; Hata, Tsunehisa; and Fujisawa, Yoshikazu, to Honda Giken Kogyo Kabushiki Kaisha. Cylinder block made of fiber-reinforced light alloy for internal combustion engine. 4,856,462, Cl. 123-41.840.

Usui, Hiroaki: *See—*
Hirao, Shozo; Usui, Hiroaki; Ohta, Yoshihiro; Nakai, Takashi; Ishikawa, Hiroyuki; and Konishi, Satoru, 4,857,365, Cl. 427-297.000.

Usui Kokusai Sangyo Kabushiki Kaisha: *See—*
Hashimoto, Yasuaki; and Serizawa, Haruo, 4,857,413, Cl. 428-592.000.
Hitachi, Yuzo; and Serizawa, Haruo, 4,857,500, Cl. 502-439.000.

Usui Kokusai Sangyo Kaisha Ltd.: *See—*
Takikawa, Kazunori, 4,856,739, Cl. 248-74.200
Usui, Masayoshi, 4,856,624, Cl. 188-273.000.

Usui, Masayoshi, to Usui Kokusai Sangyo Kaisha Ltd. Slide type exhaust brake system. 4,856,624, Cl. 188-273.000.

Valenti, Andrew; Perez, Antonio; and Ben-Zvi, Seymour, to Research Foundation of State University of New York, The. Electrode catheter testing device. 4,857,857, Cl. 324-555.000.

Valentine, Donald, Jr., to American Cyanamid Company. Process for making alkyl arsine compounds. 4,857,655, Cl. 556-70.000.

Valentine, Joseph M.: *See—*
DiChiara, Joseph G.; Brown, Harry W.; and Valentine, Joseph M., 4,858,117, Cl. 364-200.000.

Valmet Oy: *See—*
Hindstrom, Rolf, 4,856,204, Cl. 34-95.000.
Lindroos, Kaj; and Tohonen, Mauno, 4,856,158, Cl. 29-116.100.
Miihkinen, Veijo, 4,856,161, Cl. 29-129.500.
Nikulainen, Osmo; and Kainu, Vesa, 4,856,154, Cl. 29-113.100.
Niskanen, Juhani; and Pullinen, Martti, 4,856,155, Cl. 29-113.200.
Skytta , Osmo, 4,856,159, Cl. 29-116.100.

Valmont Industries, Inc.: *See—*
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Valois, Societe Anonyme: *See—*
Brunet, Michel; and Jouillat, Claude, 4,856,677, Cl. 222-94.000.

Van Benschoten, Peter; and Burkett, David, to Fisher Scientific Co. Dual roller peristaltic pump. 4,856,972, Cl. 417-477.000.

Van Bilderbeek, Bernard H.; and Milne, Ian F., to Plexus Ocean Systems Limited. Annulus cementing and washout systems for wells. 4,856,592, Cl. 166-285.000.

Van Buskirk, Michael A.: *See—*
Partovi, Hamid; and Van Buskirk, Michael A., 4,857,770, Cl. 307-451.000.

van de Gaer, Daniel: *See—*
Drapier, Julien; Gallant, Chantal; and van de Gaer, Daniel, 4,857,226, Cl. 252-174.250.

van den Honert, Christopher, to Minnesota Mining and Manufacturing Company. Multichannel electrical stimulator with improved channel isolation. 4,856,525, Cl. 128-421.000.

van der Meer, Roelof F.; and Avakian, Roger W., to General Electric Company. Stabilized polyphenylene ether-polyamide compositions. 4,857,575, Cl. 524-398.000.

Vandermeersch, Jean; and Durand, Guy, to Ceca, S.A. Two-component polyurethanes. 4,857,584, Cl. 524-791.000.

Van Der Straten, Berend G., to Zedek, B.V. Packing device. 4,856,706, Cl. 229-110.000

Vandervelden, Cornelius K., to Becton, Dickinson and Company. Catheter identifier and method. 4,856,530, Cl. 128-692.000.

van der Wolk, Jacob A.: *See—*
Kopp, Heinz-Peter J.; Lammers, Jannes G.; van der Wolk, Jacob A.; and De Groot, Willibrordus T., 4,857,237, Cl. 260-409.000.

Vande Sande, Lee: *See—*
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Van Diest, Jacques: *See—*
Brahm, Jacques; Cornu, Pierre; Garnier, Pierre; Verlaeten, Jean; and Van Diest, Jacques, 4,857,292, Cl. 423-473.000.

VanDomelen, Joseph D., to Tektronix, Inc. Circuit board ejector/-guide. 4,857,000, Cl. 439-64.000.

Van Elsen, Ary: *See—*
Morais Cravador, Alfredo J.; Jacobs, Paul; Bollen, Alex J.; Van Elsen, Ary; and Herzog, Albert A. M., 4,857,470, Cl. 435-320.000.

Van Gemert, Barry: *See—*
Lavanish, Jerome M.; and Van Gemert, Barry, 4,857,099, Cl. 71-92.000

Vanino, H. L. I. M., heir: *See—*
Lotz, Michael, deceased; Vanino, Rudiger, deceased; Kuhl, Peter; Welte, Dieter; and Zimmer, Herbert, 4,856,735, Cl. 244-35.00R.

Vanino, Rudiger, deceased: *See—*
Lotz, Michael, deceased; Vanino, Rudiger, deceased; Kuhl, Peter; Welte, Dieter; and Zimmer, Herbert, 4,856,735, Cl. 244-35.00R.

Van Mal, Louis J.: *See—*
Vos, Gerardus J. J.; and Van Mal, Louis J., 4,858,009, Cl. 358-148.000

Van Mens, Reinoud; and Turk, Gijsbertus W., to U.S. Philips Corporation. Method of manufacturing a permanent magnet. 4,857,118, Cl. 148-103.000

Van Sant, Glen J., to General Electric Company. Replaceable laser and lens assembly. 4,856,871, Cl. 350-253.000.

Vansant, Jan L. M. F. G.: *See—*
Overbergh, Noel M. M.; and Vansant, Jan L. M. F. G., 4,857,370, Cl. 422-34.900.

Van Vaals, Johannes J., to U.S. Philips Corporation. Method of and device for automatic phase correction of complex NMR spectra. 4,857,844, Cl. 324-307.000.

Varitimos, Thomas: *See—*
Tustison, Randal W.; and Varitimos, Thomas, 4,857,415, Cl. 428-620.000.

Vataru, Marcel; and Filowitz, Mark S., to Wynn Oil Company. Diesel fuel additive. 4,857,073, Cl. 44-57.000.

VEB Elektromat Dresden: *See—*
Wolfgang, Kraib; and Joachim, Gerard, 4,856,699, Cl. 228-4.500.

VEB Kombinat Feinmechanische Werke Halle: *See—*
Pohler, Manfred; Staupendahl, Gisbert; and Wittig, Richard, 4,858,240, Cl. 372-10.000.

Veeder-Root Limited: *See—*
Clish, Frank; and Franklin, John B., 4,858,135, Cl. 364-426.040.

Veit, Wolfgang: *See—*
Spitznas, M.; Veit, Wolfgang; and Kirchhuebel, Rainer, 4,856,872, Cl. 350-255.000.

Velasquez, Jose R.: *See—*
Martinez, Nelson P.; Galiasso, Roberto E.; Velasquez, Jose R.; Lujano, Juan; and Zerpa, Carlos, 4,857,494, Cl. 502-210.000.

Verbatim Corp.: *See—*
Ashe, Philip R.; Carey, James R.; Champagne, Patrick J.; and Rowden, David L., 4,858,050, Cl. 360-133.000.

Verhoeven, Thomas R.: *See—*
Frenette, Richard; Gauthier, Jacques-Yves; Young, Robert N.; Zamboni, Robert; Kakushima, Masatoshi; and Verhoeven, Thomas R., 4,857,659, Cl. 562-426.000.

Verlaeten, Jean: *See—*
Brahm, Jacques; Cornu, Pierre; Garnier, Pierre; Verlaeten, Jean; and Van Diest, Jacques, 4,857,292, Cl. 423-473.000.

Vermont Castings, Inc.: *See—*
Ferguson, Robert W.; and Andors, Derik K., 4,856,491, Cl. 126-77.000.

Veronesi, Luciano; and Shockling, Larry A., to Westinghouse Electric Corp. Frictionally loaded top end supports for cantilever-mounted rod guides of a pressurized water reactor. 4,857,264, Cl. 376-353.000.

Verrico, Marsha K., to Nabisco Brands, Inc. Method and apparatus for spraying snow-like frosting onto food stuff particles. 4,856,453, Cl. 118-24.000.

Verseidag Industrietextilien GmbH: *See—*
Plontges, Margret; and Cox, Herbert, 4,857,379, Cl. 428-102.000.

Versteegen, Clemens: *See—*
Hentschel, Volker; Versteegen, Clemens; Gloyer, Jens; and Babendererde, Siegmund, 4,856,936, Cl. 405-145.000.

Vestovich, Robert P.: *See—*
Metala, Michael J.; Clark, William G., Jr.; Junker, Warren R.; Burtner, Lee W.; Arzenti, Thomas E.; Johnson, Harold P.; Vestovich, Robert P.; and Bevilacqua, Bruce W., 4,856,337, Cl. 73-601.000.

Vetco Gray Inc.: *See—*
Jennings, Charles E., 4,856,594, Cl. 166-338.000.

Vianova Kunstharz, A.G.: *See—*
Paar, Willibald; and Arzt, Anton, 4,857,581, Cl. 524-591.000.

Vicik, Stephen J., to Viskase Corporation. Shrink film. 4,857,399, Cl. 428-332.000.

Vicik, Stephen J., to Viskase Corporation. Meat adherable cook-in shrink film. 4,857,408, Cl. 428-474.400.

Victor Company of Japan, Ltd.: *See—*
Hikawa, Kazuo, 4,858,035, Cl. 360-51.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; Negishi, Ichiro; and Osada, Masaru, 4,857,995, Cl. 358-47.000.

Victorovich, Grigori S.; and O'Neill, Charles E., to Inco Limited. Process for reduction smelting of materials containing base metals. 4,857,104, Cl. 75-21.000.

Vigano, Liliana; Kokkeler, Franciscus; and Fioroli, Mario, to U.S. Philips Corporation. Microwave oven with improved humidity sensing means. 4,857,685, Cl. 219-10.55F.

Villavicencio, Eduardo J., to Process Evaluation and Development Corporation. Process for making a pulp from bamboo. 4,857,145, Cl. 162-19.000.

Villax, Ivan: *See—*
Heggie, William; Page, Philip R.; Villax, Ivan; Ghatak, Indira; and Hursthouse, Michael, 4,857,235, Cl. 260-351.500

Vilter Manufacturing Company: *See—*
Nikolaus, John G., 4,856,366, Cl. 74-605.000.

Vincent, Joel, to Societe Orega Electronique et Mecanique. Split-diode high-voltage transformer. 4,858,098, Cl. 363-45.000.

Vinegar, Harold J.; Wellington, Scott L.; and de Waal, Jannetje A., to Shell Oil Company. Apparatus for analysis of failure of material. 4,856,341, Cl. 73-798.000.

Virdalm, Carl A. Method for suppressing states of illness in the digestive system. 4,857,327, Cl. 424-195.100.

Virginia Tech Intellectual Properties, Inc.: *See—*
Tabisz, Wojciech A.; and Lee, Fred C., 4,857,822, Cl. 323-282.000.

Visco, Frank; and Balzano, Alfiero. Sanitary handle cover. 4,856,140, Cl. 16-114.00R.

Viskase Corporation: *See—*
Vicik, Stephen J., 4,857,399, Cl. 428-332.000.
Vicik, Stephen J., 4,857,408, Cl. 428-474.400.

Vital Force, Inc.: *See—*
Conaway, Robert M., 4,856,311, Cl. 72-56.000.

Vitaphore Corp.: *See—*
Yamamoto, Ronald; Conston, Stanley R.; and Pesotchinsky, Sophia, 4,856,504, Cl. 128-92.0ZW.

Vlamakis, Maria S., to Borg-Warner Automotive, Inc. Starting clutch for a continuously variable transmission. 4,856,635, Cl. 192-70.120.

VLSI Technology, Inc.: *See—*
Wagner, Lawrence F.; Burleson, Wayne P.; and Guadagna, John P., 4,857,882, Cl. 340-146.200.

Vogt, Debbie S.: *See—*
Scharrer, Carl J.; and Vogt, Debbie S., 4,858,181, Cl. 365-155.000.

Voith, J. M. GmbH: *See—*
Meyer, Richard; Muller, Wolfgang; and Heinzmann, Helmut, 4,856,205, Cl. 34-117.000.

Voles, Roger, to Electrical & Musical Industries Limited. Target detectors. 4,857,934, Cl. 342-90.000.

Von Blucher, Hasso: *See—*
Von Blucher, Hubert; Von Blucher, Hasso; and De Ruiter, Ernest, 4,857,243, Cl. 264-13.000.

Von Blucher, Hubert; Von Blucher, Hasso; and De Ruiter, Ernest. Process of making microspherules of activated carbon. 4,857,243, Cl. 264-13.000.

von Bonin, Wulf, to Bayer Aktiengesellschaft. Intumescent compositions and the use thereof. 4,857,364, Cl. 427-255.000.

von Herrmann, Pieter J.: *See—*
Roll, Kenneth A.; Davenport, John M.; and von Herrmann, Pieter J., 4,857,810, Cl. 315-194.000.

Von Holdt, John W. Two stage mold centering system. 4,856,977, Cl. 425-468.000.

Von Kohorn, Henry. Illuminating system. 4,858,085, Cl. 362-122.000.

von Loh, Knut: *See—*
Larson, Nils, F., deceased; Larson, heir & representative, Catherine J.; and von Loh, Knut, 4,856,248, Cl. 52-405.000.

Von Reis, Wolf; Derner, Paul; Quenett, Rudolf; and Armbruster, Guenter, to Flachglas Aktiengesellschaft. Motor vehicle glass pane. 4,857,376, Cl. 428-83.000.

Vos, Gerardus J. J.; and Van Mal, Louis J., to U.S. Philips Corporation. Television signal memory write circuit. 4,858,009, Cl. 358-148.000.

Voss, Hermann; and Mank, Manfred, to Hermann Berstorff Machinenbau GmbH. Apparatus for conveying preforms. 4,856,978, Cl 425-526.000.

Vrijssen, Gerardus A. H. M.; and Spanjer, Tjerk G., to U.S. Philips Corporation. Cathode ray tube having a tubular electron gun structure. 4,857,797, Cl. 313-450.000.

Vulkor Incorporated: *See—*
Wilkus, Edward V.; Fridland, Ida; and Betts, Joseph E., 4,857,673, Cl. 174-110.0PM.

W. H. Brady Co.: *See—*
Gratke, Norman G., 4,857,684, Cl. 200-600.000
Maser, Thomas L., 4,857,683, Cl. 200-5.00A.

W. R. Grace & Co.: *See—*
Klinger, Lori J., 4,857,434, Cl. 430-286.000.

Wachs, Marvin R.: *See—*
Berman, Arnold L.; Hahn, Carl J., III; and Wachs, Marvin R., 4,857,865, Cl. 330-304.000.

Wachtel, Helmut; Schneider, Herbert H.; Loschmann, Peter-Andreas; Dorow, Rainer; Horowski, Reinhard; Acksteiner, Bernard; Schulze, Paul-Eberhard; and Sauer, Gerhard, to Schering Aktiengesellschaft. I°-diagnostics for monoamine receptors using ergolines. 4,857,298, Cl. 424-1.100.

Wacker-Chemie GmbH: *See—*
Herzig, Christian; Deubzer, Bernward; Frey, Volker; and Esterbauer Josef, 4,857,608, Cl. 525-476.000
Wolfgruber, Matthias; Deubzer, Bernward; and Frey, Volker, 4,857,582, Cl. 524-730.000.

Wacker, Thomas P.; and Zabinski, Raymond J., to General Electric Company. UV curable epoxy resin compositions with delayed cure. 4,857,562, Cl. 522-31.000.

Wada, Haruaki: *See—*
Ohkoshi, Akio; Nakagawa, Hideaki; Tsuruta, Koji; Sugii, Yasuyoshi; and Wada, Haruaki, 4,857,800, Cl. 313-495.000.

Wada, Kouichi: *See—*
Shindo, Yoshio; Yamazaki, Fumio; Wada, Kouichi; Tomio, Hidehiro; and Saito, Katsushi, 4,857,154, Cl. 204-27.000.

Wada, Shohachi; and Kulhlemann, Bruce, to Miles Laboratories, Inc. Container for fine separation of blood and blood components 4,857,190, Cl. 210-232.000

Wada, Shunichi: *See—*
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,813, Cl. 280-703.000
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Takizawa, Shozo; Tatemoto, Minoru; Terada, Tetsuya; Wada, Shunichi; Ohtagaki, Shigeki; and Mitsuhata, Kouji, 4,856,815, Cl. 280-707.000.

Wadkin plc: *See—*
Robson, Thomas, 4,856,569, Cl. 144-91.000.

Wagenknecht, Dietmar: *See—*
Rosenberg, Leonard S.; Black, Cheryl; Speicher, Earl R.; and Wagenknecht, Dietmar, 4,857,552, Cl. 514-538.000.

Wagner, Eugene. Multiple reservoir nursing bottle, valve assembly and method. 4,856,995, Cl. 433-215.000.

Wagner, Eugene R.; Matthews, Donald P.; and Barney, Charlotte L., to Merrell Dow Pharmaceuticals Inc. Hypoglycemic N-(2-substituted-3-dialkylamino-2-propenylidene)-N-alkylalkanaminium salts. 4,857,663, Cl. 564-279.000.

Wagner, Hildebert; Zenk, Meinhart H.; and Ott, Holger, to Lomapharm, Rudolf Lohmann GmbH KG, Pharmazeutische Fabrik. Immunostimulating polysaccharides, method for using such, and pharmaceutical preparations containing them. 4,857,512, Cl. 514-54.000

Wagner, Lawrence F.; Burleson, Wayne P.; and Guadagna, John P., to VLSI Technology, Inc. Comparator array logic. 4,857,882, Cl. 340-146.200.

Wahl Clipper Corporation: *See—*
Wahl, John F., 4,856,888, Cl. 350-639.000.

Wahl, John F., to Wahl Clipper Corporation. Adjustable telescoping mirrors. 4,856,888, Cl. 350-639.000.

Waitl, Guenter: *See—*
Kuhlmann, Werner; Spaeth, Werner; Waitl, Guenter; and Klann, Joerg, 4,857,746, Cl. 250-551.000.

Wakabayashi, Hiroshi; Kazami, Kazuyuki; Nakamura, Toshiyuki; Miyamoto, Hidenori; Tsukahara, Daiki; Machida, Kiyosada; and Katano, Yuji, to Nikon Corporation. Position controlling device in a lens driving apparatus for camera. 4,857,947, Cl. 354-195.100

Wakasa, Akinori; Machida, Minoru; Miyakawa, Yasuhiro; and Asami, Seiichi, to NGK Insulators, Ltd. Cylinder head with ceramic precombustion chamber. 4,856,472, Cl. 123-270.000.

Wakimoto, Kazumasa; Shibata, Motohiro; Ishii, Takaharu; and Sakurai, Masaaki, to Nippon Kokan Kabushiki Kaisha. Method for controlling operation of a blast furnace. 4,857,106, Cl. 75-41.000.

Wakimoto, Yasuo. Color changeable photo-decorative pencil torch. 4,858,083, Cl. 362-101.000.

Wakita, Shoichi; and Hirasawa, Shigemi, to Hitachi, Ltd.; and Hitachi Device Eng. Co. Ltd. Internal magnetic shield support apparatus for color picture tube. 4,857,795, Cl. 313-402.000

Wakley, William D.: *See—*
Young, Grant A.; Lister, Roy D.; Wakley, William D.; and Andrews, Steven L., 4,857,197, Cl. 210-512.100.

Wakugawa, Jason M.; Gresko, Lawrence S.; and Brown, Kenneth M., to Hughes Aircraft Company. Lightweight silicon carbide mirror. 4,856,887, Cl. 350-641.000.

Walker, Douglas J.: *See—*
Hood, Richard D., Jr.; Mueller, Dale E.; and Walker, Douglas J., 4,856,303, Cl. 68-133.000.

Walker, Edward S.: *See—*
Schoenig, Frederick C., Jr.; Walker, Edward S.; Cueman, Michael K.; Haughton, Robert A.; and Zuloaga, Jaime A., Jr., 4,857,260, Cl. 376-245.000.

Walker, John G. Wingsail stalling. 4,856,449, Cl. 114-103.000

Wallendal, Craig D. Ground anchor for home plate and pitcher's plate and method of installation. 4,856,779, Cl. 273-25.000

Walsh, John P.: *See—*
DeBlasi, Douglas S.; and Walsh, John P., 4,857,624, Cl. 528-129.000

Waltersdorfer, Anna: *See—*
Knauf, Werner; Waltersdorfer, Anna; Sagenmuller, Alfons; Stier, Hubert; and Lourens, Jan, 4,857,510, Cl. 514-30.000

Walther, Gerhard: *See—*
Weber, Karl-Heinz; Schneider, Claus; Walther, Gerhard; Hinzen, Dieter; Kuhn, Franz J.; Lehr, Erich; Ensinger, Helmut; and Troger, Wolfgang, 4,857,528, Cl. 514-252.000.

Walther, James F.: *See—*
Teichmann, Robert J.; Walther, James F.; and Mulhall Robert C., 4,857,233, Cl. 252-513.000.

Walus, Richard L.: *See—*
Lombardo, Igino; and Walus, Richard L., 4,856,512, Cl. 128-303.100.

Wan, Wan-Kei: *See—*
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Wandler, Richard A.: *See—*
Fisher, Lynn E.; Wandler, Richard A.; and Frank, James P., 4,856,182, Cl. 29-622.000.

Wang, Kathy K.; Gustavson, Larry J.; and Dumbleton, John H., to Pfizer Hospital Products Group Inc. High strength, low modulus, ductile, biopcompatible titanium alloy. 4,857,269, Cl. 420-417.000.

Wang, Paul Y. Compression device enabling flexible solution containers to produce constant delivery rate. 4,857,055, Cl. 604-133.000.

Wang, Wei-Min: *See—*
Pidorenko, John; Hoffman, Alan R.; Hodge, Robert F.; and Wang, Wei-Min, 4,856,317, Cl. 73-4.00R.

Wanninger, Lester A.: *See—*
Koch, Vernon F.; Fahnlander, John G.; and Wanninger, Lester A., 4,857,715, Cl. 235-456.000.

Ward Engineering, Inc.: *See—*
Blakely, J. Ward, 4,856,825, Cl. 285-175.000.

Ward, John W.; and Smith, William L., to A. H. Robins Company, Incorporated. Method of treating nausea and vomiting with certain substituted-phenylalkylamino (and aminoacid) derivatives and other serotonin depleting agents. 4,857,553, Cl. 514-557.000.

Warner, Brian H.: *See—*
Cahill, Michael J.; Simcoe, Michael D.; Stanton, John D.; and Warner, Brian H., 4,856,536, Cl. 131-28.000.

Warner-Lambert Company: *See—*
Berman, Ellen M.; Werbel, Leslie M.; and McNamara, Dennis J., 4,857,530, Cl. 514-259.000.
Ecga, Anthony B. J., 4,857,224, Cl. 252-99.000.
Shaw, James J.; and Bunick, Frank J., 4,857,331, Cl. 424-440.000.
Song, Suk-zu; Rashidbaugi, Zahra A.; Nesbitt, Russell U.; and Fawzi, Mahdi B., 4,857,313, Cl. 424-81.000.

Warren, John A.: *See—*
Frost, Peter L. J.; Freeman, Robert A.; Warren, John A.; and Keeble, Peter J., 4,856,760, Cl. 254-134.400.

Warunek, Stephen P.: *See—*
Breada, Peter R.; Abbatte, Gerard P.; and Warunek, Stephen P., 4,856,991, Cl. 433-6.000.

Warzawa, Wolfgang: *See—*
Groher, Manfred; Heit, Werner; Schmittner, Walter; and Warzawa, Wolfgang, 4,857,359, Cl. 427-6.000.

Warzecha, Wolfgang: *See—*
Alf, Reinhard; and Warzecha, Wolfgang, 4,857,014, Cl. 439-578.000.

Washizawa, Yoshikazu, to Honda Giken Kogyo Kabushiki Kaisha. Axle assembly. 4,856,373, Cl. 74-710.500.

Washizuka, Isamu; Tsugei, Shinji; and Inoue, Tomohiro, to Sharp Kabushiki Kaisha. Electronic cone with environmental and human body condition sensors and alarm for indicating existence of undesirable conditions. 4,858,125, Cl. 364-413.010.

Watanabe, Akihide: *See—*
Rosebrock, Henning; Jung, Johann; Rademacher, Wilhelm; Luib, Max; Fischer, Volker; Hagen, Helmut; Kohler, Rolf-Dieter; Markert, Juergen; and Watanabe, Akihide, 4,857,103, Cl. 71-94.000.

Watanabe, Hajime: *See—*
Hiroki, Hisayuki; Ariga, Yoshio; and Watanabe, Hajime, 4,856,768, Cl. 271-186.000.

Watanabe, Hideo: *See—*
Ohara, Yuji; and Watanabe, Hideo, 4,858,019, Cl. 358-474.000.

Watanabe, Iwao: *See—*
Torii, Yasuhiro; Matsuo, Seitaro; Watanabe, Iwao; and Shimada, Masaru, 4,857,809, Cl. 315-111.310.

Watanabe, Kaneo: *See—*
Iwamoto, Masayuki; Minami, Kouji; and Watanabe, Kaneo, 4,857,115, Cl. 136-249.000.

Watanabe, Kiyoshi: *See—*
Kutsuki, Hidetoshi; Sawa, Ikuo; Mori, Natsuki; Hasegawa, Junzo; and Watanabe, Kiyoshi, 4,857,468, Cl. 435-280.000.

Watanabe, Osamu; Kawai, mituo; and Kawaguchi, Kanzi, to Kabushiki Kaisha Toshiba. Heat-resisting steel turbine part. 4,857,120 Cl. 148-325.000.

Watanabe, Saburo, to Koito Seisakusho Co., Ltd. Single-filament headlamp unit capable of throwing both upper and lower beams. 4,857,794, Cl. 313-113.000.

Watanabe, Sadahiro: *See—*
Aso, Toshiyuki; Kita, Yuuki; and Watanabe, Sadahiro, 4,857,688, Cl. 219-69.140.

Watanabe, Takashi: *See—*
Aiba, Yoshiro; Arakawa, Kazumi; Watanabe, Takashi; and Kawai, Kazuhide, 4,857,488, Cl. 501-89.000.

Watanabe, Toshiaki: *See—*
Nishi, Hiroyoshi; Watanabe, Toshiaki; Yuki, Satoshi; Morinaka, Yasuhiro; Iseki, Katsuhiko; and Sakurai, Hiroko, 4,857,542, Cl. 514-404.000

Watanabe, Yasuyuki: *See—*
Sakata, Hajime; Watanabe, Yasuyuki; Yamanobe, Masato; Ohkubo, Yukitoshi; and Nagano, Akihiro, 4,856,869, Cl. 350-162.180.

Waterbury, John B.; Watson, Stanley W.; Glazer, Alexander N.; and Ong, Linda J., to Research Corporation. Phycoerythrins useful in fluorescent conjugates. 4,857,474, Cl. 436-501.000.

Waters, Richard N.: *See—*
Ansell, John W.; Chopping, Geoffrey; and Waters, Richard N., 4,858,223, Cl. 370-14.000

Watkins, Joseph J.: *See—*
Rule, Mark; Fagerburg, David R.; and Watkins, Joseph J., 4,857,629, Cl. 528-217.000.

Watler, K.: *See—*
Watler, Kenneth G., 4,857,078, Cl. 55-16.000.

Watler, Kenneth G., to Membrane Technology & Research, Inc.; and Watler, K. Process for separating higher hydrocarbons from natural or produced gas streams. 4,857,078, Cl. 55-16.000.

Watson, Richard R., to Gilmore Valve Company. Sliding metal seal valve mechanism. 4,856,557, Cl. 137-625.250

Watson, Stanley W.: *See—*
Waterbury, John B.; Watson, Stanley W.; Glazer, Alexander N.; and Ong, Linda J., 4,857,474, Cl. 436-501.000.

Watts, Leslie M., to Illinois Tool Works Inc. Positive temperature coefficient heater. 4,857,711, Cl. 219-548.000.

Watts, Michael P. C.: *See—*
Myers, David W.; Ozarski, Robert G.; Perera, Thiloma I.; Schipper, John F.; Tan, Raul V.; and Watts, Michael P. C., 4,857,738, Cl. 250-372.000

Waugh, Gerald; Myers, Charley; Davis, John; and Sullivan, John, to Frymaster Corporation, The. Intelligent cooking appliance. 4,858,119, Cl. 364-400.000.

Weathers, Pamela; and Giles, Kenneth, to Bio-Rational Technologies, Inc. Mist cultivation of cells. 4,857,464, Cl. 435-240.230.

Weatherup, Clifford R.: *See—*
Maitland, Arthur; and Weatherup, Clifford R., 4,858,237, Cl. 372-2.000.

Webb, Wells A. Method of dehydrating and puffing food particles. 4,857,347, Cl. 426-438.000.

Webber, Robert C., to AG Communication Systems Corporation. Program code fetch from data memory arrangement. 4,858,109, Cl. 364-200.000

Webcraft Games, Inc.: *See—*
Alexoff, Carl; Rosetta, Richard; Dennis, Michael; and Coll, Thomas E., 4,858,123, Cl. 364-412.000.

Weber, Andreas. Cutter and guide for wall coverings and floor coverings. 4,856,191, Cl. 30-123.000.

Weber, James H.; and Cornish, Rodney H. Vacuum control valve. 4,856,478, Cl. 123-407.000.

Weber, Karl-Heinz, to Weber-Schraubautomaten GmbH & Co., K.G. Device for setting fastener elements and pins. 4,856,389, Cl. 81-429.000.

Weber, Karl-Heinz; Schneider, Claus; Walther, Gerhard; Hinzen, Dieter; Kuhn, Franz J.; Lehr, Erich; Ensinger, Helmut; and Troger, Wolfgang, to Boehringer Ingelheim KG. Substituted pyrrolidinones, pharmaceutical compositions and use. 4,857,528, Cl. 514-252.000

Weber, Robert C. Refrigerant alert and automatic recharging device. 4,856,288, Cl. 62-129.000

Weber-Schraubautomaten GmbH & Co., K.G.: *See—*
Weber, Karl-Heinz, 4,856,389, Cl. 81-429.000

Wechner, Edward, to Joy Technologies Inc. Roof bolt drill pot drive. 4,856,384, Cl. 81-57.110.

Wedl, Peter: *See—*
Worschech, Kurt; Wedl, Peter; Kachel, Helmut; and Schult, Guenter, 4,857,216, Cl. 252-39.000.

Wehrli, Samuel: *See—*
Briner, Emil; and Wehrli, Samuel, 4,856,269, Cl. 57-263.000.

Weiershausen, Ute: *See—*
Satzinger, Gerhard; Hermann, Manfred; Fritschi, Edgar; and Weiershausen, Ute, 4,857,662, Cl. 564-168.000.

Weihrauch, Georg: *See—*
Hollenberg, Detlef; Schneider, Hans; and Weihrauch, Georg, 4,856,542, Cl. 132-265.000.

Weimert, Guenter; and Narjes, Ferdinand, to Siemens Aktiengesellschaft. Circuit arrangement for serial data transmission. 4,858,222, Cl. 370-13.000.

Weirich, John B.: *See—*
Donovan, Joseph F.; Spatz, Edward C.; Salerni, John V.; Peterson, Elmer R.; and Weirich, John B., 4,856,591, Cl. 166-278.000.

Weise, Lutz: *See—*
Ocvirk, Norbert; and Weise, Lutz, 4,856,852, Cl. 303-114.000.

Weissman, David, to Mobil Oil Corporation. Determination of formation permeability from an acoustic log. 4,858,198, Cl. 367-31.000.

Weitzner, Mark A.: *See—*
Ferriss, Lincoln S.; and Weitzner, Mark A., 4,856,901, Cl. 356-350.000.

Weldex, Inc.: *See—*
Slasinski, Arthur L., 4,856,316, Cl. 72-451.000.

Wellington, Scott L.: *See—*
Vinegar, Harold J.; Wellington, Scott L.; and de Waal, Jannetje A., 4,856,341, Cl. 73-798.000.

Wells, David F. Window assembly for segmented structure. 4,856,575, Cl. 160-353.000.

Welsh, Robert C. Conversion bracket for portable microscopes. 4,856,742, Cl. 248-124.000.

Welsh, Russell J., to PEAC Media Research, Inc. Video monitoring system. 4,857,999, Cl. 358-84.000.

Welte, Dieter: *See—*
Lotz, Michael, deceased; Vanino, Rudiger, deceased; Kuhl, Peter; Welte, Dieter; and Zimmer, Herbert, 4,856,735, Cl. 244-35.00R.

Wenmaekers, Paul. High-precision melting and metering assembly for meltable or liquid material. 4,856,988, Cl. 432-210.000.

Wennerstrom, Joel: *See—*
Kearnes, Thom; Wennerstrom, Joel; and Glover, William, 4,857,240, Cl. 261-26.000.

Wennerstrum, Scott, to Fitzpatrick Company, The. Microwave vacuum dryer. 4,856,203, Cl. 34-68.000.

Wenoka Seastyle: *See—*
Collins, Walter W., 4,856,192, Cl. 30-151.000.

Werbel, Leslie M.: *See—*
Berman, Ellen M.; Werbel, Leslie M.; and McNamara, Dennis J., 4,857,530, Cl. 514-259.000.

Wertan, Dennis J.: *See—*
Mehta, Gunvant N.; Wertan, Dennis J.; and Grim, Wayne M., 4,856,909, Cl. 366-208.000.

Wertz, Jean-Luc; and Baudonnel, Jacques, to Societe Anonyme: SPONTEX. Abrasive pad, which can substitute for a steel wool pad, and/or scouring pad and process for producing same. 4,856,134, Cl. 15-104.930.

West Company, The: *See—*
Beswick, Frank; and Winship, Robert W., 4,856,640, Cl. 198-311.000.

Western Atlas International, Inc.: *See—*
Linyeav, Eugene J.; and Chang, Chi-Huang M., 4,857,006, Cl. 439-271.000.

Western Profiles Limited: *See—*
Elsasser, Glenn R., 4,856,239, Cl. 52-98.000.

Westhead, William T., to Scapa Inc. Non-woven paper machine dryer fabric without slack edges. 4,857,391, Cl. 428-222.000.

Westinghouse Electric Corp.: *See—*
Bartko, John; Schoch, Karl F., Jr.; Congedo, Thomas V.; and Anderson, Stanwood L., Jr., 4,857,259, Cl. 376-154.000.
Boatwright, David A., 4,857,691, Cl. 219-60.00R.
Cargnel, Louis A., 4,857,219, Cl. 252-52.00R.
Machado, Octavio J.; Moore, Jay T.; and Cooney, Barry F., 4,857,263, Cl. 376-272.000.
Marshall, James R.; and Thorn, Mary F., 4,857,261, Cl. 376-248.000.
Metala, Michael J.; Clark, William G., Jr.; Junker, Warren R.; Burtner, Lee W.; Arzenti, Thomas E.; Johnson, Harold P.; Vestovich, Robert P.; and Bevilacqua, Bruce W., 4,856,337, Cl. 73-601.000.
Stock, Alvin L., 4,856,964, Cl. 415-201.000.
Veronesi, Luciano; and Shockling, Larry A., 4,857,264, Cl. 376-353.000.

Westphal, Donald J., to Standex International Corporation. Portable collapsible treatment table with drop sections. 4,856,497, Cl. 128-70.000.

Westphal, Karl: *See—*
Hars, Ulrich; Staiger, Rolf; and Westphal, Karl, 4,857,207, Cl. 210-725.000.

Weyerhaeuser Company: *See—*
Allison, Kathleen S., 4,857,066, Cl. 604-385.100.
Shearer, Dwayne M.; Beetham, Richard C.; Beall, Frank C.; and Rodgers, John M., 4,856,334, Cl. 73-588.000.
Tiedeman, George T.; and Gess, Jerome M., 4,857,149, Cl. 162-158.000.

Whaley, Edward L.: *See—*
Neilson, Diane H. R.; Work, Sara L. R.; Whaley, Edward L.; Kirkpatrick, Steven J.; and McCarthy, James P., 4,857,351, Cl. 426-533.000.

Whatley, Roger A.: *See—*
Ganger, Jeffrey D.; and Whatley, Roger A., 4,857,863, Cl. 330-264.000.

Wheeler, John H., to Texacone Company. Composition and method of making polymer seals. 4,857,389, Cl. 428-217.000.

Wheeler, Roger R.; and Martin, John R., to Martin Automatic, Inc. Improved machine for lifting and loading web rolls. 4,856,960, Cl. 414-684.000.

Wheelwright, Lynn M.; Hansen, Vicky A.; and Heerema, Mark D., to Hewlett-Packard Company. Frequency-tuneable filter calibration. 4,858,159, Cl. 364-571.010.

Whetsel, Lee D., Jr., to Texas Instruments Incorporated. Global event qualification system. 4,857,835, Cl. 324-73.00R.

Whirlpool Corporation: *See—*
Hood, Richard D., Jr.; Mueller, Dale E.; and Walker, Douglas J., 4,856,303, Cl. 68-133.000.

Whirpool Corporation: *See—*
Dall, Larry N., 4,857,707, Cl. 219-375.000.

White, Arnold J.: *See—*
Abraham, Thomas E.; Malfait, Jacque L.; and White, Arnold J., 4,857,348, Cl. 426-462.000.

White, Kevin M.; and Beck, Harold K., to Halliburton Company. Tubing conveyed sampler. 4,856,585, Cl. 166-250.000.

White, William P.: *See—*
Pearson, Stanley R.; Merrick, Douglas D.; White, William P.; and Lipp, Charles W., 4,857,076, Cl. 48-86.00R.

Whitekettle, Wilson K.: *See—*
Donofrio, Deborah K.; and Whitekettle, Wilson K., 4,857,557, Cl. 514-711.000.

Whitford, Darryl R., to S. Smith & Son Pty. Ltd. Computer-controlled fermentation means for wines. 4,856,421, Cl. 99-276.000.

Wichmann, Werner: *See—*
Fischer, Horst; Wichmann, Werner; Wilhelms, Gernot; and Wiltmann, Guenter, 4,856,947, Cl. 409-119.000.

Wickes Manufacturing Company: *See—*
LaRocca, William J.; and Trush, David M., 4,856,363, Cl. 74-535.000.

Widholm, Jack M.: *See—*
Barwale, Usha B.; and Widholm, Jack M., 4,857,465, Cl. 435-240.490.

Widmann, Karlheinz; Kreth, Norbert; Schmitt, Martin; and Stellwagen, Armin, to Mannesmann Rexroth GmbH. Control arrangement for at least two hydraulic consumers fed by at least one pump. 4,856,278, Cl. 60-423.000.

Widrow, Bernard, to Leland Stanford Junior University, The Board of Trustees of the. Estimation of hydraulic fracture geometry from pumping pressure measurements. 4,858,130, Cl. 364-421.000.

Wied, Edwin; and Glezerman, Josef, to Inter Power Technologie. Fluidized bed combustion. 4,856,460, Cl. 122-4.00D.

Wiedemann, Rudolf A., to Lasersense, Inc. Imaging and inspection apparatus and method. 4,856,902, Cl. 356-375.000.

Wiedman, Francis W.: *See—*
Pricer, Wilbur D.; and Wiedman, Francis W., 4,857,766, Cl. 307-446.000.

Wielink, Steven M.: *See—*
Bosch, Gerrit; Pasma, Tjebbe R.; Sluyterman, Albertus A. S.; Doomernik, Fransiscus M. P. P.; and Wielink, Steven M., 4,857,805, Cl. 315-8.000.

Wigle, Frank T. Multifunction roof edger. 4,856,237, Cl. 52-12.000.

Wijmans, Johannes G.: *See—*
Baker, Richard W.; Louie, Jenny; Pfromm, Peter H.; and Wijmans, Johannes G., 4,857,080, Cl. 55-16.000.

Wijnendaele, Frans V.; Gilles, Daniel; and Simonet, Guy, to Smith-Kline Biologicals. Process for the extraction and purification of proteins from culture media producing them. 4,857,317, Cl. 424-89.000.

Wilhelms, Gernot: *See—*
Fischer, Horst; Wichmann, Werner; Wilhelms, Gernot; and Wiltmann, Guenter, 4,856,947, Cl. 409-119.000.

Wilhite, John E.; and Shelly, William A., to Honeywell Bull Inc. Distributor of machine words between units of a central processor. 4,858,176, Cl. 364-900.000.

Wilkening, Steven R.: *See—*
Boyers, Douglas B.; and Wilkening, Steven R., 4,856,794, Cl. 277-37.000.

Wilkins, Peter R., to Black & Decker Inc. Steam generator. 4,857,703, Cl. 219-271.000.

Wilkus, Edward V.; Fridland, Ida; and Betts, Joseph E., to Vulkor Incorporated. Polyolefin compounds having improved thermal stability and electrical conductors coated therewith. 4,857,673, Cl. 174-110.0PM.

Willberg, Hans-Heinrich. Apparatus for testing electronic components, in particular IC's. 4,857,838, Cl. 324-158.00F.

Willett International Limited: *See—*
Langrick, David J.; and Smith, Mark, 4,856,322, Cl. 73-56.000.

Willi Moller, Firma: *See—*
Simon, Wilhelm; and Oesch, Urs, 4,857,573, Cl. 524-291.000.

William R. Warner & Co. Limited: *See—*
Harper, Christopher T., 4,856,692, Cl. 226-119.000.

Williams, Clyde C.: *See—*
Goldberg, Harris A.; Kalnin, Ilmar L.; Williams, Clyde C.; and Spain, Ian L., 4,856,179, Cl. 29-592.100.

Williams, David R., to Centaur Sciences, Inc. Medical infusion pump with sensors. 4,856,339, Cl. 73-714.000.

Williams, Douglas D.: *See*—
Gillett, Richard B., Jr.; and Williams, Douglas D., 4,858,116, Cl. 364-200.000.
Williams Electronics, Inc.: *See*—
Lantz, Kenneth F.; Smolucha, Walter E.; and Struck, Leslie G., 4,856,785, Cl. 273-148.00B.
Williams, Perry M.: *See*—
Milbank, Miles C.; and Williams, Perry M., 4,858,001, Cl. 358-98.000.
Williams, Roger W., Jr., to R. E. Phelon Company, Inc. Time-delay for automatic reset of furnace. 4,856,984, Cl. 431-30.000.
Williamson, Archie O., to Williamson Patent Holding Company. Four wheel axle differential. 4,856,372, Cl. 74-710.000.
Williamson Patent Holding Company: *See*—
Williamson, Archie O., 4,856,372, Cl. 74-710.000.
Willis, Ray D.: *See*—
Kessler, Newlin W.; and Willis, Ray D., 4,856,828, Cl. 285-334.100.
Wilmore, Douglas W.: *See*—
Smith, Robert J.; and Wilmore, Douglas W., 4,857,555, Cl. 514-563.000.
Wilson, Donald K.; and Heiney, Allan. Magnetic configuration for Faraday rotators. 4,856,878, Cl. 350-375.000.
Wilson, Howard J. C.: *See*—
Geittner, Peter E. E.; Lydtin, Hans-Jurgen; and Wilson, Howard J. C., 4,857,091, Cl. 65-3.120
Wilson, Larry: *See*—
Lentz, David; Wilson, Larry; and Deckert, Curt, 4,857,050, Cl. 604-67.000.
Wilson, Robert S.; and Lynch, William M. Liquified petroleum gas fuelled two stroke engine. 4,856,484, Cl. 134-525.000.
Wilson, William G.: *See*—
Kay, D. Alan R.; and Wilson, William G., 4,857,280, Cl. 423-21.100.
Wilson, William R., Jr.: *See*—
McBride, William B.; Wilson, William R., Jr.; Tomlinson, John C.; McCarthy, John A.; Kochanowsky, Eugene W.; Hendricks, Jefferson D.; and Houle, Arthur J., 4,857,921, Cl. 340-912.000.
Wiltmann, Guenter: *See*—
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Wiltron Company: *See*—
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Windmoller & Holscher: *See*—
Brinkmeier, Friedhelm; and Eckelt, Ulrich, 4,856,396, Cl. 83-300.000
Windrem, Kevin D.: *See*—
Jackson, Richard A.; Symes, Peter D.; Bannister, Richard S.; Grancey, Thomas A.; Frasier, Richard A.; Abt, John; Barnett, Ronnie D.; Blecksmith, James E.; Windrem, Kevin D.; and Olmstead, Neil R., 4,858,011, Cl. 358-181.000.
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Winig, Gary: *See*—
Bressler, Peter W.; Byar, Peter D.; Beck, Benjamin J.; Fluke, G. Gordon, Jr.; Magill, Brad; Winig, Gary; and Magill, Tracy H., 4,856,811, Cl. 280-652.000.
Winner, James: *See*—
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Winstone, Violet M., 4,856,856, Cl. 312-231.000.
Winstone, Violet M., to Winston, Rebecca Drusilla. Portable artist's supply box and easel. 4,856,856, Cl. 312-231.000.
Winter, Kurt: *See*—
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Wirt, Michael L.; Sangregory, Jude; and Bridges, Mark E., to Eastman Kodak Company. Mechanism for handling slides and film strips. 4,858,003, Cl. 358-102.000.
Wirtz, Robert, to Reifenhauser GmbH & Co. Maschinenfabrik. Process and extrusion apparatus for extruding a plastic web. 4,858,139, Cl. 364-473.000.
Wirz, Arno, to Heidelberger Druckmaschinen AG. Sheet-fed rotary printing machine with printing units arranged in tandem. 4,856,426, Cl. 101-217.000.
Wisconsin Alumni Research Foundation: *See*—
DeLuca, Hector F.; Ikekawa, Nobuo; and Tanaka, Yoko, 4,857,518, Cl. 514-167.000
Wiseman, Leland G.; and Hertema, Daryl J., to Ritchie Industries, Inc. Heater and thermostat arrangement for animal waterers. 4,856,459, Cl. 119-73.000.
Witt, Harro: *See*—
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Wittig, Richard: *See*—
Pohler, Manfred; Staupendahl, Gisbert; and Wittig, Richard, 4,858,240, Cl. 372-10.000.
Wittwer, Arthur J., to Monsanto Company. Method of enhancing the solubility of tissue plasminogen activator. 4,857,320, Cl. 424-94.630.
Witzenmann GmbH Metallschlauch-Fabrik Pforzheim: *See*—
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Wohlmuth, Clinton J.: *See*—
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Wojcik, Janusz: *See*—
Schussler, Claus; Wojcik, Janusz; and Hemminger, Rolf, 4,856,494, Cl. 126-424.000.
Wold, Gerald G.: *See*—
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Wolf, Joachim. Filter device. 4,857,191, Cl. 210-286.000.
Wolf, Pierre, to Etesia. Cutting head with synchronized counter-rotary blades. 4,856,265, Cl. 56-320.200.
Wolfbeis, Otto S., to AVL AG. Method for continuous quantitative detection of sulphur dioxide and an arrangement for implementing this method. 4,857,472, Cl. 436-122.000
Wolfe, John J. Hot and cold frostop for food and salad bar. 4,856,579, Cl. 165-48.100.
Wolfe, John R., Jr., to Rogers Tool Works, Inc. Internally insulated extrusion die. 4,856,974, Cl. 425-67.000.
Wolfgang, Kraib; and Joachim, Gerard, to VEB Elektromat Dresden. Driving mechanism for a high-speed wire contacting device. 4,856,699, Cl. 228-4.500.
Wolfgruber, Matthias; Deubzer, Bernward; and Frey, Volker, to Wacker-Chemie GmbH. Process for preparing colloidal suspensions of organopolysiloxanes. 4,857,582, Cl. 524-730.000.
Wolo Manufacturing Co.: *See*—
Solow, Joseph E., 4,857,890, Cl. 340-479.000
Wong, Chun S., to Du Pont Canada Inc. Method for grafting monomers onto molten hydrocarbon polymer. 4,857,254, Cl. 264-211.240.
Wong, John L. Semi-fluid lubricant for extreme climates. 4,857,215, Cl. 252-32.500
Wong, Patrick S. L.: *See*—
Stephens, Sally I.; Hamel, Lawrence G.; Barclay, Glen E.; and Wong, Patrick S. L., 4,857,330, Cl. 424-424.000.
Woo, Lecon; and Ling, Michael T. K., to Baxter International Inc. Appratus for sealing and severing a web of film. 4,856,259, Cl. 53-373.000
Woo, Lecon; and Ling, Michael T. K., to Baxter International Inc. Apparatus for sealing a web of film in a packaging. 4,856,260, Cl. 53-373.000
Wood, John M.: *See*—
Wood, Kenneth R., 4,856,767, Cl. 269-46.000.
Wood, Kenneth R., to Wood, John M., a part interest. Radiator lifting and holding apparatus. 4,856,767, Cl. 269-46.000.
Wood, Leigh E.; and Zoia, Anthony J., to Minnesota Mining and Manufacturing Company. Disposable diaper having shirred ears. 4,857,067, Cl. 604-389.000.
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Millis, Edwin G.; and Wood, Samuel J., Jr., 4,857,750, Cl. 250-573.000
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Workentine, Larry, to Hike-A-Bike Incorporated. Cargo carrier. 4,856,686, Cl. 224-42.070.
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Worschech, Kurt; Wedl, Peter; Kachel, Helmut; and Schult, Guenter, to Neynaber Chemie GmbH. Lubricant system for the processing of polyvinyl chloride. 4,857,216, Cl. 252-39.000.
Woven Electronics Corporation: *See*—
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Wray, Donald L.: *See*—
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Wright, Donald P., Jr.: *See*—
Brown, Dale G.; Siddens, Jack K.; Diehl, Robert E.; and Wright, Donald P., Jr., 4,857,651, Cl. 549-443.000.
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Kasprzak, Paul L.; and Moy, Michael E., 4,856,820, Cl. 283-81.000.
Wright State University: *See*—
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Wrobel, Keith A.; and Mechelke, Joel D., to LSI Corporation of America, Inc. Interchangeable shelf support bracket. 4,856,746, Cl. 248-250.000.

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Ota, Yoshio; Goto, Norifumi; Motoyama, Iwao; Iwashita, Tetsushi; and Nomura, Kunio, 4,857,291, Cl. 423-430.000.
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Yaguchi, Akio; and Kondo, Takayuki, to Tsubakimoto Chaim Co. Lithographic plate transfer system. 4,856,955, Cl. 414-278.000.
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Yamada, Yasuo; Saito, Junichi; Tamura, Tatsuo; and Sakawa, Shinji, to Nihon Tokushu Noyaku Seizo K.K. Substituted benzylcycloalkenylurea derivatives. 4,857,556, Cl. 514-585.000.
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Yamamoto, Masayasu: *See*—
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Inoue, Shinichi; and Yamanaka, Masami, 4,858,145, Cl. 364-506.000.
Yamazaki, Fumio: *See*—
Shindo, Yoshio; Yamazaki, Fumio; Wada, Kouichi; Tomio, Hidehiro; and Saito, Katsushi, 4,857,154, Cl. 204-27.000.
Yamazaki, Kouichi: *See*—
Ogura, Setsuo; Kamegaki, Kazuyuki; Yamazaki, Kouichi; Miyazaki, Hideo; Kitamura, Yukinori; and Mayuzumi, Shirou, 4,857,987, Cl. 357-45.000.
Yamazaki, Shunpei; and Hamatani, Toshiji, to Semiconductor Energy Laboratory Co., Ltd. Photo CVD apparatus having no ultraviolet light window. 4,856,458, Cl. 118-722.000.
Yamazaki, Shunpei: *See*—
Tashiro, Mamoru; Urata, Kazuo; and Yamazaki, Shunpei, 4,857,139, Cl. 156-643.000.
Yamazaki, Tsutomu: *See*—
Takada, Yutaka; Doi, Koichi; Yamazaki, Tsutomu; and Obata, Yutaka, 4,856,710, Cl. 236-13.000.
Yang, Andrew C.; Lorenzo, Joseph P.; and Soref, Richard A., to United States of America, Air Force. Silicon waveguide with monolithically integrated Schottky barrier photodetector. 4,857,973, Cl. 357-15.000.
Yang, Nai-Chuen; and Leichner, Peter K., to John Hopkins University. Tumor volume determination. 4,856,528, Cl. 128-653.000.
Yano, Keiji: *See*—
Takagi, Masamichi; Yano, Keiji; Shibuya, Ichiro; and Morikawa, Minoru, 4,857,460, Cl. 435-91.000.
Yano, Seiki; Kudo, Hiroaki; Takiguchi, Haruhisa; Hijikata, Toshiki; and Kaneiwa, Shinji, to Sharp Kabushiki Kaisha. Integrated optical disc pickup that allows variations in the wavelength of the laser beam. 4,858,215, Cl. 369-45.000.
Yard, Kenneth G. Multipurpose boot for round-to-flat electrical cable. 4,857,012, Cl. 439-471.000.
Yaremko, Mykola M.: *See*—
Lizzi, Frederic L.; Yaremko, Mykola M.; Silverman, Ronald H.; and Coleman, D. Jackson, 4,858,124, Cl. 364-413.010.
Yassate, Mohamad H.: *See*—
Dyson, Clive M.; King-Smith, Anthony D.; and Yassate, Mohamad H., 4,858,233, Cl. 371-9.000.
Yasuda, Keiji; Nakasako, Kazuo; and Miyahara, Kazuhiro, to NGK Insulators, Ltd. Tunnel kiln for ceramic firing. 4,856,987, Cl. 432-128.000.
Yasue, Takao, to Mitsubishi Denki Kabushiki Kaisha. Transfer vessel device and method of transfer using the device. 4,856,297, Cl. 62-51.100.
Yasumoto, Hidetoshi: *See*—
Naruse, Kazuhiko; and Yasumoto, Hidetoshi, 4,857,967, Cl. 355-69.000.
Yatsurugi, Yoshifumi: *See*—
Maruya, Shinji; Yatsurugi, Yoshifumi; and Togashi, Kazuya, 4,857,270, Cl. 420-578.000.
Yazaki Corporation: *See*—
Oikawa, Takahiro, 4,858,080, Cl. 362-61.000.

Yhema, Jan; and Schutte, Gerhard, to Coop Weiproduktenfabriek "Borculo" W.A. Method of promoting the health and the growth of pigleta. 4,857,338, Cl. 426-2.000.
Yeda Research and Development Company, Ltd.: *See*—
Lippa, Arnold S.; and Scheer, David I., 4,857,514, Cl. 514-78.000.
Margaritz, Mordeckai; Ronen, Daniel; and Levy, Itzhak, 4,857,473, Cl. 436-177.000.
Yeh, Gwo-Guer: *See*—
Shu, Chi-Yao, 4,856,296, Cl. 62-430.000
Yeomans, Michael A., to AMP Incorporated. Apparatus and method for determination of crimp height. 4,856,186, Cl. 29-863.000.
Yester, Francis R., Jr.: *See*—
Gailus, Paul H.; Turney, William J.; and Yester, Francis R., Jr., 4,857,928, Cl. 341-143.000.
Yoder, Herbert G. Heavy duty actuating means in combination with surge or inertia type trailer brake system for use with "low boy", "gooseneck" or fifth wheel trailers and the like. 4,856,621, Cl. 188-112.00R.
Yokochi, Toshihiro: *See*—
Sako, Takeshi; Yokochi, Toshihiro; Sato, Masahito; Suzuki, Osamu; Hakuta, Toshikatsu; Sugeta, Tsutomu; and Nakazawa, Noriaki, 4,857,329, Cl. 424-195.100.
Yokogawa Electric Corporation: *See*—
Iwaoka, Hideto; Ohte, Akira; and Akiyama, Koji, 4,856,899, Cl. 356-346.000.
Yokohama Rubber Co., Ltd., The: *See*—
Morikawa, Tuneo; Kabe, Kazuyuki; and Tsukada, Shuichi, 4,856,573, Cl. 152-556.000
Yokota, Kazuto; and Saito, Akihisa, to Kabushiki Kaisha Toshiba. X-ray intensifying screen. 4,857,741, Cl. 250-486.100.
Yokota, Takayoshi; Horiya, Shigekazu; Uno, Sadao; Katayama, Kozo; and Tanabe, Daijiro, to Kabushiki Kaisha Kumagaigumi. Concrete form shuttering having double woven fabric covering. 4,856,754, Cl. 249-113.000.
Yoneda, Kazuhiko: *See*—
Kitano, Seiichi; Fukatani, Yasunobu; Asada, Masaaki; and Yoneda, Kazuhiko, 4,856,634, Cl. 192-70.300.
Yonezawa, Seiji: *See*—
Kataoka, Keiji; Kurosaki, Toshiei; Yonezawa, Seiji; and Katagiri, Soichi, 4,857,744, Cl. 250-548.000.
Yoshida, Akirahiko: *See*—
Yamaguchi, Yasunori; Yoshida, Akirahiko; Nei, Masami; Ishihara, Masamichi; and Yamamoto, Yukio, 4,858,190, Cl. 365-189.050.
Yoshida Kogyo K. K.: *See*—
Yunoki, Akio, 4,856,695, Cl. 226-154.000.
Yoshida, Masaru: *See*—
Kataoka, Shoei; Yoshida, Masaru; and Nakajima, Shigeo, 4,857,920, Cl. 340-907.000.
Yoshida, Tadao: *See*—
Fujiie, Kazuhiko; Yoshida, Tadao; and Ando, Ryo, 4,858,217, Cl. 369-59.000.
Yoshida, Tetsuo; and Heki, Tatsuo, to Fuji Photo Film Co., Ltd. Direct positive photo-sensitive materials. 4,857,445, Cl. 430-509.000.
Yoshida, Toyohiko: *See*—
Matsuo, Masahito; and Yoshida, Toyohiko, 4,858,104, Cl. 364-200.000.
Yoshida, Yoshihiro: *See*—
Tanaka, Tatsuo; and Yoshida, Yoshihiro, 4,857,864, Cl. 330-288.000.
Yoshikawa, Shozi, to Olympus Optical Company Limited. Optical information recording reproducing memory system with both power control and optical irradiation inhibiting circuit. 4,858,219, Cl. 369-116.000.
Yoshimoto, Tadashi: *See*—
Furukawa, Sunao; Yoshimoto, Tadashi; Ajisawa, Yukiyoshi; Ikeguchi, Seiichi; and Kinoshita, Yukihiko, 4,857,524, Cl. 514-227.500.
Yoshimura, Hiroshi; Shirata, Akihiro; and Kuroyanagi, Junzo, to Isuzu Motor Limited. Transmission control apparatus. 4,856,360, Cl. 74-335.000.
Yoshimura, Hiroshi: *See*—
Sugimura, Toshiya; Kasai, Hitoshi; and Yoshimura, Hiroshi, 4,858,131, Cl. 364-424.100
Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, to Canon Kabushiki Kaisha. Image forming apparatus having edge-guiding member for guiding a recording medium. 4,857,943, Cl. 346-136.000.
Yoshinaka, Hideo: *See*—
Onda, Kenichi; Matsuda, Yasuo; Abe, Kojin; Iwafuji, Yasunori; Aoyama, Hiroyuki; and Yoshinaka, Hideo, 4,858,096, Cl. 363-22.000.
Yoshino, Thunekazu: *See*—
Nakano, Hirotaka; and Yoshino, Thunekazu, 4,857,671, Cl. 174-68.500.
Young, Grant A.; Lister, Roy D.; Wakley, William D.; and Andrews, Steven L., to Amoco Corporation. Liquid separator with tangential drive fluid introduction. 4,857,197, Cl. 210-512.100.
Young, Robert N.: *See*—
Frenette, Richard; Gauthier, Jacques-Yves; Young, Robert N.; Zamboni, Robert; Kakushima, Masatoshi; and Verhoeven, Thomas R., 4,857,659, Cl. 562-426.000.
Young, Steven A.: *See*—
Cordova, David S.; Coffin, David R.; Lazarus, Stanley D.; and Young, Steven A., 4,857,405, Cl. 428-378.000.
Young, William R., to Harris Corporation. Current compensated precharged bus. 4,857,764, Cl. 307-443.000.
Youssefyeh, Raymond; Klein, Scott I.; Campbell, Henry F.; and Kuhla, Donald E., to Rorer Pharmaceutical Corporation. Quinuclidyl benzoxepins as 5-HT$_3$antagonists. 4,857,517, Cl. 514-161.000.
Yu, Eugene L.: *See*—
Stewart, Robert E.; Natusch, Paul J.; Yu, Eugene L.; and Keller, James B., 4,858,173, Cl. 364-900.000.
Yui, Yoshiharu: *See*—
Takeuchi, Satoshi; Danjo, Koutaro; Tahara, Shigehiko; Yui, Yoshiharu; and Ikeda, Satoshi, 4,856,857, Cl. 350-3.600.
Yuill, Grenville K.: *See*—
Henderson, D. Grant; Yuill, Grenville K.; and Kroeker, David, 4,856,123, Cl. 4-480.000.
Yukawa, Shogo: *See*—
Minami, Katsuji; Murata, Shinichi; Tsujimoto, Susumu; Matuzaki, Yukinori; Yukawa, Shogo; and Osaka, Susumu, 4,856,574, Cl. 160-168.100.
Yuki, Satoshi: *See*—
Nishi, Hiroyoshi; Watanabe, Toshiaki; Yuki, Satoshi; Morinaka, Yasuhiro; Iseki, Katsuhiko; and Sakurai, Hiroko, 4,857,542, Cl. 514-404.000
Yukita, Yasuo: *See*—
Takeuchi, Hiroshi; Kohga, Daiju; and Yukita, Yasuo, 4,856,919, Cl. 400-18.000.
Yunoki, Akio, to Yoshida Kogyo K. K. Method of and apparatus for feeding slide fastener chain with fly strips. 4,856,695, Cl. 226-154.000.
Yuri Itkis: *See*—
Itkis, Boris, 4,856,787, Cl. 273-237.000.
Yusa, Haruhiko: *See*—
Hoshino, Mitsuru; Yusa, Haruhiko; and Suzuki, Katsumi, 4,857,592, Cl. 525-82.000.
Zabinski, Raymond J.: *See*—
Wacker, Thomas P.; and Zabinski, Raymond J., 4,857,562, Cl. 522-31.000
Zaccaro, Carlo, to Treshlen Limited. Shoe with sole that includes inflatable passages to provide cushioning and stability. 4,856,208, Cl. 36-29.000
Zacharin, Alexey T. Spinning RAM air decelerator. 4,856,737, Cl. 244-113.000
Zajac, John. Reactor monitoring system and method. 4,857,136, Cl. 156-626.000
Zaklika, Krzysztof A.: *See*—
Jongewaard, Susan K.; Smith, Terrance P.; and Zaklika, Krzysztof A., 4,857,503, Cl. 503-227.000
Zalenski, Thomas, to Summagraphics Corporation. Electro-optical mouse with improved resolution for compensation of optical distortion. 4,857,903, Cl. 340-710.000.
Zamboni, Robert: *See*—
Frenette, Richard; Gauthier, Jacques-Yves; Young, Robert N.; Zamboni, Robert; Kakushima, Masatoshi; and Verhoeven, Thomas R., 4,857,659, Cl. 562-426.000.
Zedek, B.V.: *See*—
Van Der Straten, Berend G., 4,856,706, Cl. 229-110.000.
Zeevi, Yehoshua; and Hilsenrath, Oliver, to Technion Research & Development Foundation Ltd. Random scan system. 4,858,014, Cl. 358-217.000.
Zeh, Peter H.: *See*—
Dick, Chris C.; Schwartz, Barry; McMunn, Bert D.; and Zeh, Peter H., 4,857,287, Cl. 423-315.000
Zenk, Meinhart H.: *See*—
Wagner, Hildebert; Zenk, Meinhart H.; and Ott, Holger, 4,857,512, Cl. 514-54.000.
Zerpa, Carlos: *See*—
Martinez, Nelson P.; Galiasso, Roberto E.; Velasquez, Jose R.; Lujano, Juan; and Zerpa, Carlos, 4,857,494, Cl. 502-210.000.
Zhou, Xia-Ying: *See*—
Kostic, Nenad M.; and Zhou, Xia-Ying, 4,857,231, Cl. 252-408.100.
Zicaro, Joseph P., to Hydro Conduit Corporation. Seal construction for bell and spigot pipe. 4,856,561, Cl. 138-109.000.
Ziegler, Herbert; Clever, Carl W.; and Roppelt, Gunter, to Brown, Boveri & Cie AG. Methcd and apparatus for fixing an instantaneous measured value. 4,858,153, Cl. 364-550.000.
Zimmer, Herbert: *See*—
Lotz, Michael, deceased; Vanino, Rudiger, deceased; Kuhl, Peter; Welte, Dieter; and Zimmer, Herbert, 4,856,735, Cl. 244-35.00R.
Zimmerman, Theodore S.; and Fulcher, Carol A., to Scripps Clinic and Research Foundation. Factor VIII coagulant polypeptides and monoclonal antibodies tof them. 4,857,635, Cl. 530-383.000
Zimpro/Passavant Inc.: *See*—
Meidl, John A., 4,857,198, Cl. 210-603.000.
Zipprath, Michael: *See*—
Speil, Walter; Schmidt, Dieter; and Zipprath, Michael, 4,856,468, Cl. 123-90.470
Zobel, Jurgen, to Richard Wolf GmbH. Wide-angle objective for endoscopes. 4,858,002, Cl. 358-98.000.
Zoia, Anthony J.: *See*—
Wood, Leigh E.; and Zoia, Anthony J., 4,857,067, Cl. 604-389.000.
Zojer, Bernhard, to Siemens Aktiengesellschaft. Fast analog/digital converter having equal propagation times for the clock and the analog signal. 4,857,932, Cl. 341-159.000.
Zojirushi Vacuum Bottle Co., Ltd.: *See*—
Ishizaki, Hidetsurumaro; and Taguchi, Riyozo, 4,856,174, Cl. 29-455.100.
Zolk, Ralf; Kerth, Juergen; and Hemmerich, Rainer, to BASF Akteingesellschaft. Preparation of homopolymers and copolymers of propene using a Ziegler-Natta catalyst system. 4,857,613, Cl. 526-128.000.

Zoltan, Istvan, to Tettex AG. Electronic load for testing transformers. 4,857,827, Cl. 324-55.000.
Zook, Ronald E.: *See*—
Gombrich, Peter P.; Zook, Ronald E.; and Hendrickson, Max S., 4,857,716, Cl. 235-462.000.
Zucker, Joseph: *See*—
Campbell, Bruce D.; and Zucker, Joseph, 4,856,864, Cl. 350-96.160.
Zuloaga, Jaime A., Jr.: *See*—
Schoenig, Frederick C., Jr.; Walker, Edward S.; Cueman, Michael K.; Haughton, Robert A.; and Zuloaga, Jaime A., Jr., 4,857,260, Cl. 376-245.000.
Zur, Joseph G., to Supac Systems, Inc. Container extraction and transfer mechanism for an automated storage and retrieval system. 4,856,956, Cl. 414-280.000.
Zurru, Sergio; and Alberti, Romano, to Innse Innocenti Santeustacchio S.p.A. Die exchange device for horizontal axis extruding presses. 4,856,314, Cl. 72-263.000.
Zweifel, Terry: *See*—
Miller, Harry; and Zweifel, Terry, 4,857,922, Cl. 340-968.000.
501 Sharp Kabushiki Kaisha: *See*—
Koden, Mitsuhiro, 4,857,907, Cl. 340-784.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF AUGUST, 1989

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Acock, George W., Jr.: *See—*
Rhodes, James A.; Wren, Michael; Lantz, Paul W.; and Acock, George W., Jr., Re. 33,019, Cl. 52-2.000.

Consolidated Foods: *See—*
Ostrander, Charles, Re. 33,018, Cl. 36-102.000.

Critikon, Inc.: *See—*
Danby, Hal C., Re. 33,021, Cl. 604-80.000.

Danby, Hal C., to Critikon, Inc. Dual source parenteral infusion apparatus. Re. 33,021, Cl. 604-80.000.

Hiers, John J., to Lydall, Inc. Integral textile composite fabric. Re. 33,023, Cl. 428-285.000.

Hitachi, Ltd.: *See—*
Takayama, Shinji; Tsukuda, Yasuo; Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; Ogata, Yasunobu; and Sawada, Yoshizo, Re. 33,022, Cl. 148-304.000.

Hitachi Metals, Ltd.: *See—*
Takayama, Shinji; Tsukuda, Yasuo; Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; Ogata, Yasunobu; and Sawada, Yoshizo, Re. 33,022, Cl. 148-304.000.

Ikezawa, Katsuo: *See—*
Iwakuma, Takeo; Tsunashima, Akira; Ikezawa, Katsuo; and Takaiti, Osasi, Re. 33,024, Cl. 514-312.000.

Iwakuma, Takeo; Tsunashima, Akira; Ikezawa, Katsuo; and Takaiti, Osasi, to Tanabe Seiyaku Co. Ltd. Bronchodilating 8-hydroxy-5-(1R)-1-hydroxy-2-(N-((1R)-2-(p-methoxyphenyl)-1-methylethyl)-amino)ethyl) carbostyril and intermediates thereof. Re. 33,024, Cl. 514-312.000.

Kudo, Mitsuhiro: *See—*
Takayama, Shinji; Tsukuda, Yasuo; Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; Ogata, Yasunobu; and Sawada, Yoshizo, Re. 33,022, Cl. 148-304.000.

Kuno, Akira: *See—*
Matsumoto, Maneaki; Kuno, Akira; and Numata, Koji, Re. 33,025, Cl. 364-444.000.

Lantz, Paul W.: *See—*
Rhodes, James A.; Wren, Michael; Lantz, Paul W.; and Acock, George W., Jr., Re. 33,019, Cl. 52-2.000.

Lydall, Inc.: *See—*
Hiers, John J., Re. 33,023, Cl. 428-285.000.

Matsumoto, Maneaki; Kuno, Akira; and Numata, Koji, to Nippon Soken, Inc. Method and apparatus for display of distance and direction to destination. Re. 33,025, Cl. 364-444.000.

Nippon Soken, Inc.: *See—*
Matsumoto, Maneaki; Kuno, Akira; and Numata, Koji, Re. 33,025, Cl. 364-444.000.

NSK-Warner K.K.: *See—*
Yokote, Yoshihiro; and Yamamoto, Kazuo, Re. 33,020, Cl. 280-804.000.

Numata, Koji: *See—*
Matsumoto, Maneaki; Kuno, Akira; and Numata, Koji, Re. 33,025, Cl. 364-444.000.

Ogata, Yasunobu: *See—*
Takayama, Shinji; Tsukuda, Yasuo; Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; Ogata, Yasunobu; and Sawada, Yoshizo, Re. 33,022, Cl. 148-304.000.

Ostrander, Charles, to Consolidated Foods. Slipper. Re. 33,018, Cl. 36-102.000.

Otomo, Shigekazu: *See—*
Takayama, Shinji; Tsukuda, Yasuo; Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; Ogata, Yasunobu; and Sawada, Yoshizo, Re. 33,022, Cl. 148-304.000.

Research Development Corp. of Japan: *See—*
Takayama, Shinji; Tsukuda, Yasuo; Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; Ogata, Yasunobu; and Sawada, Yoshizo, Re. 33,022, Cl. 148-304.000.

Rhodes, James A.; Wren, Michael; Lantz, Paul W.; and Acock, George W., Jr. Environmentally controlled building. Re. 33,019, Cl. 52-2.000.

Sawada, Yoshizo: *See—*
Takayama, Shinji; Tsukuda, Yasuo; Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; Ogata, Yasunobu; and Sawada, Yoshizo, Re. 33,022, Cl. 148-304.000.

Shiiki, Kazuo: *See—*
Takayama, Shinji; Tsukuda, Yasuo; Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; Ogata, Yasunobu; and Sawada, Yoshizo, Re. 33,022, Cl. 148-304.000.

Takaiti, Osasi: *See—*
Iwakuma, Takeo; Tsunashima, Akira; Ikezawa, Katsuo; and Takaiti, Osasi, Re. 33,024, Cl. 514-312.000.

Takayama, Shinji; Tsukuda, Yasuo; Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; Ogata, Yasunobu; and Sawada, Yoshizo, to Hitachi, Ltd.; Hitachi Metals, Ltd.; and Research Development Corp. of Japan. Ferromagnetic amorphous alloy. Re. 33,022, Cl. 148-304.000.

Tanabe Seiyaku Co. Ltd.: *See—*
Iwakuma, Takeo; Tsunashima, Akira; Ikezawa, Katsuo; and Takaiti, Osasi, Re. 33,024, Cl. 514-312.000.

Tsukuda, Yasuo: *See—*
Takayama, Shinji; Tsukuda, Yasuo; Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; Ogata, Yasunobu; and Sawada, Yoshizo, Re. 33,022, Cl. 148-304.000.

Tsunashima, Akira: *See—*
Iwakuma, Takeo; Tsunashima, Akira; Ikezawa, Katsuo; and Takaiti, Osasi, Re. 33,024, Cl. 514-312.000.

Wren, Michael: *See—*
Rhodes, James A.; Wren, Michael; Lantz, Paul W.; and Acock, George W., Jr., Re. 33,019, Cl. 52-2.000.

Yamamoto, Kazuo: *See—*
Yokote, Yoshihiro; and Yamamoto, Kazuo, Re. 33,020, Cl. 280-804.000.

Yokote, Yoshihiro; and Yamamoto, Kazuo, to NSK-Warner K.K. Automatic seat belt driving device. Re. 33,020, Cl. 280-804.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Becht, Carl T., to Ethicon, Inc. Surgical stapling instrument. B1 4,109,844, 8-15-89, Cl. 227-120.000.

Bogan, Richard T.; and Kuo, Chung-Ming, to Eastman Kodak Company. Carboxylated cellulose ester and manufacture thereof. B1 4,590,265, 8-15-89, Cl. 536-63.000.

Eastman Kodak Company: *See—*
Bogan, Richard T.; and Kuo, Chung-Ming, B1 4,590,265, Cl. 536-63.000.
Jenkins, Waylon L.; Hawkins, James M.; and Sand, Daniel, B1 4,605,721, Cl. 527-312.000.

Ethicon, Inc.: *See—*
Becht, Carl T., B1 4,109,844, Cl. 227-120.000.

Hawkins, James M.: *See—*
Jenkins, Waylon L.; Hawkins, James M.; and Sand, Daniel, B1 4,605,721, Cl. 527-312.000.

Jenkins, Waylon L.; Hawkins, James M.; and Sand, Daniel, to Eastman Kodak Company. Novel graft copolymers and process for the preparation thereof. B1 4,605,721, 8-15-89, Cl. 527-312.000.

Koenig, Larry E. Pallet auger. B1 4,253,615, 8-15-89, Cl. 241-36.000.

Kuo, Chung-Ming: *See—*
Bogan, Richard T.; and Kuo, Chung-Ming, B1 4,590,265, Cl. 536-63.000.

Sand, Daniel: *See—*
Jenkins, Waylon L.; Hawkins, James M.; and Sand, Daniel, B1 4,605,721, Cl. 527-312.000.

LIST OF DESIGN PATENTEES

AB Bahco Verktyg: *See—*
Himbert, Hans; and Jansson, Erik C., 302,780, Cl. D8-47.000.

Ackerfeldt, Bo I. Golf cart. 302,887, 8-15-89, Cl. D34-15.000.

Akazaki, Michiko, to Playtex Apparel, Inc. Brassiere. 302,761, 8-15-89, Cl. D2-24.000.

Allbritton, Michael, to Skeeter Products, Inc. Console for boat. 302,807, 8-15-89, Cl. D12-317.000.

Aloys F. Dornbracht GmbH & Co. KG: *See—*
Lathrop, Bethany, 302,850, Cl. D23-254.000.

Anema, Willem, to U.S. Philips Corporation. Lamp base. 302,860, 8-15-89, Cl. D26-2.000.

Apple Marketing, Inc.: *See—*
Sinoff, Brad J.; and Sinoff, L. David, 302,775, Cl. D7-76.000.

Artemide S.p.A.: *See—*
De Lucchi, Michele, 302,866, Cl. D26-65.000.

Asakura, Osamu: *See—*
Nezu, Shigeru; and Asakura, Osamu, 302,829, Cl. D18-12.000.

Automated Shipping Machines, Inc.: *See—*
Wolff, William F., Jr., 302,798, Cl. D10-91.000.

Avery International: *See—*
Popat, Ghanshyam H.; Chen, Tien-Tsung; Binkley, Christopher H.; and Tsai, K. Fou, 302,830, Cl. D19-26.000.

Azzolina, Albert. Armoire. 302,770, 8-15-89, Cl. D6-446.000.

Baba, Tooru, to Kioritz Corporation. Cord cutter head for a vegetation trimmer. 302,779, 8-15-89, Cl. D8-8.000.

Bakic, Karena, to Cosmede Anstalt. Cosmetic case. 302,872, 8-15-89, Cl. D28-78.000.

Baldacci, Lapo, to Bimak S.r.l. Iron. 302,883, 8-15-89, Cl. D32-70.000.

Barbee, Jeffrey P. Trash bag support. 302,885, 8-15-89, Cl. D34-6.000.

Bareiss, Raymond E. Canopy. 302,856, 8-15-89, Cl. 25-56.000.

Bass, Saul, to Standard Oil Company. Combined fuel pump and canopy structure for a service station. 302,820, 8-15-89, Cl. D15-9.200.

Baume & Mercier S.A.: *See—*
Glauser, Jean-Francois, 302,797, Cl. D10-32.000.

Benit, Brad J.: *See—*
Rumbaugh, James T.; and Benit, Brad J., 302,845, Cl. D22-142.000.
Rumbaugh, James T.; and Benit, Brad J., 302,846, Cl. D22-142.000.
Rumbaugh, James T.; and Benit, Brad J., 302,847, Cl. D22-142.000.

Berkley, Inc.: *See—*
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Beuchat, Roland, to Synertrade and Finance S.A. Safety razor. 302,869, 8-15-89, Cl. D28-46.000.

Bimak S.r.l.: *See—*
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Bird Chef Co., Inc., The: *See—*
Earl, Norman M., 302,875, Cl. D30-124.000.

Black & Decker Inc.: *See—*
Cunningham, Lawrence T. A., 302,785, Cl. D8-64.000.

Blum, Dietmar, to Julius Blum Gesellschaft m.b.H. Combined drilling and insertion machine for furniture fittings. 302,821, 8-15-89, Cl. D15-132.000.

Bobrick Washroom Equipment, Inc.: *See—*
Keck, Henry C.; and Fujitaki, Roy K., 302,871, Cl. D28-54.100.

Boss, Karen. Oil candle. 302,862, 8-15-89, Cl. D26-11.000.

Bossart, Douglas W. Emergency inflatable belt. 302,874, 8-15-89, Cl. D29-6.000.

Boucher, Guy, to La Telemecanique Electrique. Housing for a programming terminal. 302,809, 8-15-89, Cl. D13-12.000.

Bratasevec, Vid, to Iskra-Delta. Data processor housing with adjustable support for display monitor. 302,811, 8-15-89, Cl. D14-100.000.

Cal-Comp Electronics Inc.: *See—*
Kao, George; and Chen, Feng-Chih, 302,813, Cl. D14-113.000.

Callahan, Sharron H. Wheeled hand truck for transporting a cooler or the like. 302,892, 8-15-89, Cl. D34-23.000.

Calvin Klein Cosmetics Corporation: *See—*
Dinand, Pierre, 302,792, Cl. D9-377.000.

Camens, Murray I. C., to U.S. Philips Corporation. Loudspeaker grille. 302,818, 8-15-89, Cl. D14-219.000.

Canon Kabushiki Kaisha: *See—*
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Nezu, Shigeru; and Asakura, Osamu, 302,829, Cl. D18-12.000

Capitol Products Corporation: *See—*
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Dunnick, Julian S., 302,858, Cl. D25-119.000.

Chen, Feng-Chih: *See—*
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Choi, Lung W., to Goodway Electrical Company Limited. Iron. 302,882, 8-15-89, Cl. D32-70.000.

Cochran, Eula G. Tub attachment for a clothes washer or dryer. 302,851, 8-15-89, Cl. D23-284.000.

Compagnie Plastic Omnium: *See—*
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Cosmede Anstalt: *See—*
Bakic, Karena, 302,872, Cl. D28-78.000.

Costar Corporation: *See—*
Lyman, George F., 302,855, Cl. D24-55.000.

Crain, Jack W. Life support system knife. 302,839, 8-15-89, Cl. D22-118.000.

Cunningham, Lawrence T. A., to Black & Decker Inc. Power padsaw. 302,785, 8-15-89, Cl. D8-64.000.

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De Lucchi, Michele, to Artemide S.p.A. Adjustable table lamp. 302,866, 8-15-89, Cl. D26-65.000.

den Braber, A. A., to Denka International B.V. Insect electrocution trap. 302,840, 8-15-89, Cl. D22-123.000.

Denka International B.V.: *See—*
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Dennis, Warren E.; and Plambeck, Eric D., to Venture Research. Decorative plasma arc display. 302,867, 8-15-89, Cl. D26-110.000.

Dinand, Pierre, to Calvin Klein Cosmetics Corporation. Bottle. 302,792, 8-15-89, Cl. D9-377.000.

Duke, Nora A. Garment protector. 302,762, 8-15-89, Cl. D2-225.000

Dunnick, Julian S., to Capitol Products Corporation. Frame member for a window jamb for a bow window or the like. 302,857, 8-15-89, Cl. D25-119.000.

Dunnick, Julian S., to Capitol Products Corporation. Frame member for a window jamb for a bow window or the like. 302,858, 8-15-89, Cl. D25-119.000.

Duran, Rosalie V. Lottery scraper. 302,879, 8-15-89, Cl. D32-46.000.

Earl, Norman M., to Bird Chef Co., Inc., The. Combined holder and dispenser for bird feed container. 302,875, 8-15-89, Cl. D30-124.000.

Ebihara, Yoshiyuki, to Etona Company, Limited. Stapler. 302,781, 8-15-89, Cl. D8-50.000.

Ebihara, Yoshiyuki, to Etona Company, Limited. Stapler. 302,782, 8-15-89, Cl. D8-50.000.

Ekco Housewares, Inc.: *See—*
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Hiscott, William D.; Witlin, Ina; Hasler, Theodore J.; and Jastrzebski, Andrew T., 302,777, Cl. D7-104.000.

Elements by Grapevine, Inc.: *See—*
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Endo, Aiko; and Ohba, Yasuo, to Canon Kabushiki Kaisha. Ink ribbon cassette for electronic typewriter. 302,828, 8-15-89, Cl. D18-12.000.

Esser, Jack, to Knapp Shoes, Inc. Outsole for a shoe. 302,765, 8-15-89, Cl. D2-320.000.

Etona Company, Limited: *See—*
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Ebihara, Yoshiyuki, 302,782, Cl. D8-50.000.

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Fiam S.r.l.: *See—*
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Fleximark AB: *See—*
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Friedman, Frank A., to Herman Miller, Inc. Combined wall-mounted panel and folding shelf. 302,772, 8-15-89, Cl. D6-555.000.

Fujii, Masao: *See—*
Takahashi, Nobuyoshi; Yamamoto, Yoshihiko; Fujii, Masao; and Seshimo, Yu, 302,853, Cl. D23-386.000

Fujita, Takayuki, to Kabushiki Kaisha Toshiba. Ink ribbon cartridge. 302,827, 8-15-89, Cl. D18-12.000.

Fujitaki, Roy K.: *See—*
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Fushiya, Fusao; and Kaneko, Tetsuhisa, to Makita Electric Works, Ltd. Electric screw driver. 302,786, 8-15-89, Cl. D8-68.000

GEC Plessey Telecommunications Ltd.: *See—*
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General Foods Corp. & Williams Industries: *See—*
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Glauser, Jean-Francois, to Baume & Mercier S.A. Wrist watch. 302,797, 8-15-89, Cl. D10-32.000.

Goatman, Michael C., to Philips Electronics & Associated Indus. Ltd. Telephone set. 302,815, 8-15-89, Cl. D14-51.000.

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Goodwin, Jeffrey M. Food serving cart. 302,889, 8-15-89, Cl. D34-21.000.

Goolsby, Michael D. Sports clock. 302,796, 8-15-89, Cl. D10-8.000

Graviano, John. Game board. 302,834, 8-15-89, Cl. D21-31.000.

Grosfillex, Raymond. Foldable chaise lounge. 302,768, 8-15-89, Cl. D6-361.000.

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Herman Miller, Inc.: *See—*
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Himbert, Hans; and Jansson, Erik C., to AB Bahco Verktyg. Combined wood chisel and edge cover therefor. 302,780, 8-15-89, Cl. D8-47.000.
Hiroki, Shin-ichi, to Kabushiki Kaisha Toshiba. Image scanner for electronic computers. 302,812, 8-15-89, Cl. D14-107.000.
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Holzman, Robert P., to Poulsen-Cascade Corporation. Buoyant spinner. 302,842, 8-15-89, Cl. D22-129.000.
Hoyt, Andrea. Bicycle rack. 302,805, 8-15-89, Cl. D12-115.000.
Huber, Lothar, to Luk Lamellen und Kupplungsbau GmbH. Cover side of a friction clutch. 302,822, 8-15-89, Cl. D15-148.000.
Huber, Lothar, to Luk Lamellen und Kupplungsbau GmbH. Cover side of a friction clutch. 302,823, 8-15-89, Cl. D15-148.000.
Hugill, Kelli. Ice blade fishing lure. 302,841, 8-15-89, Cl. D22-129.000.
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Kao, Aqee, to Hung Mei Brush Co., Ltd. Water injecting gun or similar article. 302,848, 8-15-89, Cl. D23-226.000.
Kao, George; and Chen, Feng-Chih, to Cal-Comp Electronics Inc. Monitor or similar article. 302,813, 8-15-89, Cl. D14-113.000.
Kato, Shuzo; and Nemoto, Asami, to NCR Corporation. Cash register or similar article. 302,826, 8-15-89, Cl. D18-4.000.
Katsuhiko, Nakakuma, to Plus Corporation. Scissors. 302,783, 8-15-89, Cl. D8-57.000.
Kawana, Yusuke, to Sugiyasu Industries Co., Ltd. Hand-operated lift truck. 302,895, 8-15-89, Cl. D34-31.000.
Kawana, Yusuke, to Sugiyasu Industries Co., Ltd. Hand-operated lift truck. 302,896, 8-15-89, Cl. D34-31.000.
Keck, Henry C.; and Fujitaki, Roy K., to Bobrick Washroom Equipment, Inc. Wall mounted recessed dryer. 302,871, 8-15-89, Cl. D28-54.100.
Kero, Ernst, to Plannja AB. Roofing element or the like. 302,859, 8-15-89, Cl. D25-141.000.
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Kimura, Shigetaka; Hasegawa, Kohichi; Sunagawa, Masao; Ishii, Yoshitaro; and Jyoraku, Fumio, to Hitachi, Ltd. Electric vacuum cleaner. 302,878, 8-15-89, Cl. D32-24.000.
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Lathrop, Bethany, to Aloys F. Dornbracht GmbH & Co. KG. Combined water control handles and escutcheon. 302,850, 8-15-89, Cl. D23-254.000.
Lau, Po C. Heart-shaped plastic paper clip. 302,831, 8-15-89, Cl. D19-65.000.
Levine, David. Corner pad. 302,789, 8-15-89, Cl. D8-403.000.
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Macaulay, Richard K., 302,817, Cl. D14-210.000.
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Macaulay, Richard K., to Macaulay Acoustics, Inc. Loudspeaker. 302,817, 8-15-89, Cl. D14-210.000.
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Myojo, Seiji, to Shimano Industrial Company Limited. Fishing reel. 302,843, 8-15-89, Cl. D22-140.000.
Myojo, Seiji, to Shimano Industrial Company Limited. Fishing reel. 302,844, 8-15-89, Cl. D22-140.000.
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Robert, Jean, to Swatch (SA). Ornamental design for a watch dial. 302,800, 8-15-89, Cl. D10-126.000.
Roe, Keith A. Container. 302,790, 8-15-89, Cl. D9-307.000.
Rose, Martin S., to GEC Plessey Telecommunications Ltd. Cash call public pay telephone stand without coin box. 302,814, 8-15-89, Cl. D14-142.000.
Roy, Joseph C. Play house. 302,836, 8-15-89, Cl. D21-114.000.
Rubbermaid Incorporated: *See—*
Murphy, Kent W., 302,774, Cl. D7-76.000.
Rumbaugh, James T.; and Benit, Brad J., to Berkley, Inc. Spinning rod handle. 302,845, 8-15-89, Cl. D22-142.000.
Rumbaugh, James T.; and Benit, Brad J., to Berkley, Inc. Bait casting rod handle. 302,846, 8-15-89, Cl. D22-142.000.
Rumbaugh, James T.; and Benit, Brad J., to Berkley, Inc. Spin casting rod handle. 302,847, 8-15-89, Cl. D22-142.000.
Safetech Pty. Ltd.: *See—*
Wakefield, Lindsay, 302,893, Cl. D34-31.000.
Sayn Wittgenstein, Marie C., to Parfums Christian Dior. Lipstick tube. 302,873, 8-15-89, Cl. D28-85.000.
Schieferstein, Hermann, to Union Sils. Cycle pedal. 302,806, 8-15-89, Cl. D12-125.000.
Schnapp, Aharon: *See—*
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Sharp Corporation: *See—*
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Moritani, Hiroshi, 302,852, Cl. D23-353.000.
Shchamorov, Shlomo; and Schnapp, Aharon, to Mercaz Haargazim Ltd. Collapsible plastic container. 302,897, 8-15-89, Cl. D34-40.000.
Sherrard, Steven T., to Tunturi, Inc. Exercise treadmill. 302,837, 8-15-89, Cl. D21-192.000.
Shimano Industrial Company Limited: *See—*
Myojo, Seiji, 302,843, Cl. D22-140.000.
Myojo, Seiji, 302,844, Cl. D22-140.000.
Shultz, Margaret B., to Playtex Apparel, Inc. Brassiere. 302,760, 8-15-89, Cl. D2-24.000.
Simester, Peter, to Present Games Ltd. Board for playing a game. 302,835, 8-15-89, Cl. D21-35.000.
Sinoff, Brad J.; and Sinoff, L. David, to Apple Marketing, Inc. Beverage tote bag. 302,775, 8-15-89, Cl. D7-76.000.
Sinoff, L. David: *See—*
Sinoff, Brad J.; and Sinoff, L. David, 302,775, Cl. D7-76.000.
Skeeter Products, Inc.: *See—*
Allbritton, Michael, 302,807, Cl. D12-317.000.
Skuza, Voyteck T.; and Williams, Edward L., to Stanley Works, The. Battery charger. 302,808, 8-15-89, Cl. D13-5.000.
S.A. Celatose: *See—*
Minot, Jean, 302,854, Cl. D24-50.000.
Standard Oil Company: *See—*
Bass, Saul, 302,820, Cl. D15-9.200.
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Steelcase Inc.: *See—*
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Riley, Robert B.; and Stefanski, Robert E., 302,825, Cl. D17-14.000.
Stubbs, David W.: *See—*
Vickers, Michael W.; and Stubbs, David W., 302,810, Cl. D14-191.000.
Sugiyasu Industries Co., Ltd.: *See—*
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Kawana, Yusuke, 302,896, Cl. D34-31.000.
Sugiyasu Iron Works Inc.: *See—*
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Sunagawa, Masao: *See—*
Kimura, Shigetaka; Hasegawa, Kohichi; Sunagawa, Masao; Ishii, Yoshitaro; and Jyoraku, Fumio, 302,878, Cl. D32-24.000.
Suzuki, Yoshinori, to Sugiyasu Iron Works Inc. Hand-operated lift truck. 302,894, 8-15-89, Cl. D34-31.000.
Swatch (SA): *See—*
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Takahashi, Nobuyoshi; Yamamoto, Yoshihiko; Fujii, Masao; and Seshimo, Yu, to Mitsubishi Denki Kabushiki Kaisha. Finned heat exchanger for electronic equipment. 302,853, 8-15-89, Cl. D23-386.000
Tan, Kheng L.: *See—*
Ng, Michael C. M.; and Tan, Kheng L., 302,890, Cl. D34-21.000.
Tayama, Shuichi, to Kabushiki Kaisha Toshiba. Fluorescent lamp. 302,861, 8-15-89, Cl. D26-3.000.
Terry, John H. Lottery ticket scraper or the like. 302,880, 8-15-89, Cl. D32-46.000.
Toa Tokushu Denki Kabushiki Kaisha: *See—*
Kubota, Hiroshi, 302,819, Cl. D14-228.000.
Trico Mfg. Corp.: *See—*
Jung, Donald R., 302,888, Cl. D34-20.000.
Tsai, Douglas G. Barbeque grill. 302,778, 8-15-89, Cl. D7-335.000
Tsai, Jih-Tu. Hair dryer. 302,868, 8-15-89, Cl. D28-13.000.
Tsai, K. Fou: *See—*
Popat, Ghanshyam H.; Chen, Tien-Tsung; Binkley, Christopher H.; and Tsai, K. Fou, 302,830, Cl. D19-26.000.
Tunturi, Inc.: *See—*
Sherrard, Steven T., 302,837, Cl. D21-192.000.
Turner, Donald R.; Kramer, Karl C.; and Wasserman, Gerald S., to General Foods Corp. & Williams Industries. Aper*ured lid or the like. 302,794, 8-15-89, Cl. D9-447.000.
Turner, Ronald R.: *See—*
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Union Sils: *See—*
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U.S. Philips Corporation: *See—*
Anema, Willem, 302,860, Cl. D26-2.000.
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Krol, Leonardus A. C., 302,863, Cl. D26-26.000.
Van Asten, Jan F.; and Van Surksum, Gerrit-Jan, 302,877, Cl. D32-21.000.
Van Asten, Jan F.; and Van Surksum, Gerrit-Jan, to U.S. Philips Corporation. Vacuum cleaner. 302,877, 8-15-89, Cl. D32-21.000.
Van Surksum, Gerrit-Jan: *See—*
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Venture Research: *See—*
Dennis, Warren E.; and Plambeck, Eric D., 302,867, Cl. D26-110.000.
Vickers, Michael W.; and Stubbs, David W., to Maxcom Electronics, Inc. Pager. 302,810, 8-15-89, Cl. D14-191.000.
Villanueva, Xavier R. Bicycle stand. 302,803, 8-15-89, Cl. D12-115.000.
von Klier, Hans. Adjustable table lamp. 302,865, 8-15-89, Cl. D26-63.000.
Wakefield, Lindsay, to Safetech Pty. Ltd. Load elevating table. 302,893, 8-15-89, Cl. D34-31.000.
Wasserman, Gerald S.: *See—*
Turner, Donald R.; Kramer, Karl C.; and Wasserman, Gerald S., 302,794, Cl. D9-447.000.
Wendt, Joel K. Combined roller skate footplate and fastening therefor. 302,838, 8-15-89, Cl. D21-226.000.
Williams, Edward L.: *See—*
Skuza, Voyteck T.; and Williams, Edward L., 302,808, Cl. D13-5.000.

Williams Industries, Inc.: *See*—
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Wilson, Edward E.: *See*—
Wilson, Erbin C.; and Wilson, Edward E., 302,787, Cl. D8-107.000.
Wilson, Erbin C.; and Wilson, Edward E. Gunsmith tool set. 302,787, 8-15-89, Cl. D8-107.000.
Witlin, Ina: *See*—
Hiscott, William D.; Witlin, Ina; Hasler, Theodore J.; and Jastrzebski, Andrew T., 302,776, Cl. D7-102.000
Hiscott, William D.; Witlin, Ina; Hasler, Theodore J.; and Jastrzebski, Andrew T., 302,777, Cl. D7-104.000.
Wolff, William F., Jr., to Automated Shipping Machines, Inc. Shipping center kiosk. 302,798, 8-15-89, Cl. D10-91.000.
World Dryer Division of Specialty Equipment Companies, Inc.: *See*—
Mango, Joseph R., 302,870, Cl. D28-54.100.
Yamaguchi, Kiyoshi. Combined container closure and spoon. 302,793, 8-15-89, Cl. D9-436.000.
Yamamoto, Yoshihiko: *See*—
Takahashi, Nobuyoshi; Yamamoto, Yoshihiko; Fujii, Masao; and Seshimo, Yu, 302,853, Cl. D23-386.000.

LIST OF PLANT PATENTEES

Arthur Ross Foundation, Inc.: *See*—
Karnosky, David F., 6,983, Cl. 51.000.
Bradford, Norman G. Nectarine tree (Sparkling June). 6,981, 8-15-89, Cl. 41.000.
Bradford, Norman G. Dwarf Nectarine Tree (Red Sunset). 6,982, 8-15-89, Cl. 41.000.
Central Park Conservatory: *See*—
Karnosky, David F., 6,983, Cl. 51.000.
Fuess, Janet S. Chrysanthemum plant named Bordeaux. 6,987, 8-15-89, Cl. 76.000.
Herrera, Camilo, to Whitefield Corporation. Chrysanthemum plant named Dark Red Simona. 6,989, 8-15-89, Cl. 82.000.
Hetherington, Ernest, to Stewart Orchids. Orchid Yamadara Midnight Magenta 'Fine Wine' AM/AOS. 6,984, 8-15-89, Cl. 68.000.
Holtkamp, Reinhold, Sr. African violet plant named Jennie. 6,985, 8-15-89, Cl. 69.000.
Holtkamp, Sr. Reinhold. African violet plant named Little Apatite. 6,986, 8-15-89, Cl. 69.000.
Karnosky, David F., to Central Park Conservatory; and Arthur Ross Foundation, Inc. Chinese elm cultivar named "ARoss/Central Park". 6,983, 8-15-89, Cl. 51.000.
Stewart Orchids: *See*—
Hetherington, Ernest, 6,984, Cl. 68.000.
VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Tolima. 6,988, 8-15-89, Cl. 77.000.
Whitefield Corporation: *See*—
Herrera, Camilo, 6,989, Cl. 82.000.
Yoder Brothers, Inc.: *See*—
VandenBerg, Cornelis P., 6,988, Cl. 77.000

CLASSIFICATION OF PATENTS

ISSUED AUGUST 15, 1989

NOTE.—First number, class; second number, subclass; third number, patent number

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181	4,856,116
195	4,856,117
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250.31	4,856,137
320	4,856,138
350	4,856,139

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116.1	4,856,158
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116.2	4,856,157
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159.2	4,856,166
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417	4,856,171
434	4,856,172
445	4,856,173
455.1	4,856,174
460	4,856,175
511	4,856,176
568	4,856,177
	4,856,178
592.1	4,856,179
596	4,856,180
603	4,856,181
622	4,856,182
753	4,856,183
840	4,856,185
852	4,856,184
863	4,856,186
867	4,856,187
877	4,856,188
882	4,856,189

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369	4,856,195

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264	4,856,200

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95	4,856,204
117	4,856,205
151	4,856,206

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117	4,856,210
131	4,856,211

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316	4,856,214
361	4,856,215
559	4,856,216

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	4,856,221
26.1	4,856,222
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81	4,856,225
113	4,856,226

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540	4,857,074

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29	4,856,228

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	4,857,076
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11	4,856,236
12	4,856,237
[illegible]	4,856,238
[illegible]	4,856,239
169.14	4,856,240
217	4,856,241
239	4,856,242
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309.7	4,856,244
386	4,856,245
	4,856,246
[illegible]	4,856,247
[illegible]	4,856,248
	4,856,249
[illegible]	4,856,250
553	4,856,251
702	4,856,252
717.1	4,856,253
741	4,856,254
769	4,856,255
805	4,856,256

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	4,856,260
469	4,856,261
499	4,856,262
543	4,856,263

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	4,857,079
	4,857,080
	4,857,081
	4,857,082
26	4,857,083
58	4,857,084
83	4,857,085
162	4,857,086
385.6	4,857,087
523	4,857,088
	4,857,089

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10.9	4,856,264
320.2	4,856,265

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263	4,856,269
281	4,856,270

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39.281	4,856,275
39.33	4,856,274
250	4,856,276
422	4,856,277
423	4,856,278
[illegible]	4,856,279
522	4,856,280
[illegible]	4,856,282
641.9	4,856,281

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6	4,856,283
51.1	4,856,297
55	4,856,284
63	4,856,285
89	4,856,286
91	4,857,090
126	4,856,287
129	4,856,288
149	4,856,289
	4,856,290
217	4,856,291
	4,856,292
228.3	4,856,293
259.3	4,856,294
263	4,856,295
[illegible]	4,856,296

CLASS 65

3.12	4,857,091
18.4	4,857,092
[illegible]	4,857,093
60.2	4,857,094
60.3	4,857,095
60.51	4,857,096
60.52	4,857,097

CLASS 66

40	4,856,298
[illegible]	4,856,299
221	4,856,300

CLASS 68

12 R	4,856,301
27	4,856,302
133	4,856,303

CLASS 70

14	4,856,304
[illegible]	4,856,305
[illegible]	4,856,306
165	4,856,307
209	4,856,308
359	4,856,309
379 R	4,856,310

CLASS 71

[illegible]	4,857,098
92	4,857,099
93	4,857,100
[illegible]	4,857,101
	4,857,102
	4,857,103

CLASS 72

56	4,856,311
133	4,856,312
234	4,856,313
263	4,856,314
306	4,856,315
451	4,856,316

CLASS 73

4 R	4,856,317
12	4,856,318
23.1	4,856,319
30	4,856,320
40.5 A	4,856,321
56	4,856,322
118.1	4,856,323
146	4,856,324
150 A	4,856,325
	4,856,326
168	4,856,327
202	4,856,328
204.22	4,856,329
204.25	4,856,330
[illegible]	4,856,331
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517 B	4,856,333
[illegible]	4,856,334
597	4,856,335
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601	4,856,337
701	4,856,338
714	4,856,339
715	4,856,340
[illegible]	4,856,341
827	4,856,342
861	4,856,343
861.04	4,856,344
861.17	4,856,345
861.38	4,856,346
861.72	4,856,347
861.78	4,856,348
862.54	4,856,349
862.59	4,856,350
863.21	4,856,351
863.25	4,856,352
[illegible]	4,856,353
866.5	4,856,354

CLASS 74

11	4,856,355
25	4,856,356
63	4,856,357
84 R	4,856,358
110	4,856,359
335	4,856,360
339	4,856,361
477	4,856,362
535	4,856,363
551.8	4,856,364
594.6	4,856,365
[illegible]	4,856,366
606 R	4,856,367
	4,856,368
665 GE	4,856,369
675	4,856,370
690	4,856,371
710	4,856,372
710.5	4,856,373
740	4,856,374
745	4,856,375
750 B	4,856,376
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804	4,856,378
805	4,856,379
866	4,856,380
867	4,856,381
	4,856,382
869	4,856,383

CLASS 75

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238	4,857,108
249	4,857,109

CLASS 81

57.11	4,856,384
57.39	4,856,385
90.2	4,856,386
124.4	4,856,387
177.2	4,856,388
429	4,856,389

CLASS 82

137	4,856,391
172	4,856,390

CLASS 83

40	4,856,392
50	4,856,393
56	4,856,394
158	4,856,395
300	4,856,396
322	4,856,397
425.2	4,856,398
685	4,856,399
885	4,856,400

CLASS 84

1.11	4,856,401
239	4,856,402
291	4,856,403
297 R	4,856,404
383 A	4,856,405
419	4,856,406
439	4,856,407

CLASS 86

29	4,856,408

CLASS 89

1.819	4,856,409
161	4,856,410

CLASS 91

1	4,856,411
369.2	4,856,412
454	4,856,413

CLASS 92

83	4,856,414
88	4,856,415
169.1	4,856,416
233	4,856,417

CLASS 98

2.13	4,856,418
115.1	4,856,419
115.3	4,856,420

CLASS 99

276	4,856,421
330	4,856,422
421 H	4,856,423

CLASS [illegible]

209	4,857,482

CLASS 101

128.4	4,856,424
212	4,856,425
217	4,856,426
366	4,856,427
475	4,856,428
486	4,856,429

CLASS 102

307	4,856,430
427	4,856,431
489	4,856,432
530	4,856,433

CLASS [illegible]

211	4,857,110
310	4,856,593
504	4,857,111

CLASS [illegible]

53.1	4,856,434
134	4,856,435

CLASS [illegible]

1 R	4,856,436
24.1	4,856,437

CLASS 110

233	4,856,438

CLASS 112

10	4,856,439
27	4,856,440
80.73	4,856,441
147	4,856,442
241	4,856,443
262.3	4,856,444

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39.1	4,856,445
61	4,856,446
103	4,856,447
	4,856,448
	4,856,449
293	4,856,450
301	4,856,451
364	4,856,452

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24	4,856,453
126	4,856,454
500	4,856,455
	4,856,456
666	4,856,457
722	4,856,458

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CLASS 122

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52 M	4,856,464
90.17	4,856,465
90.33	4,856,466
90.43	4,856,467
90.47	4,856,468
90.51	4,856,469
195 C	4,856,470
198 DC	4,856,471
270	4,856,472
308	4,856,473
323	4,856,474
339	4,856,475
342	4,856,476
399	4,856,477
407	4,856,478
425	4,856,479
	4,856,480
	4,856,481
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516	4,856,483
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643	4,856,489

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634 4,856,527
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692 4,856,530
719 4,856,531
720 4,856,532
763 4,856,533
4,856,534
857 4,856,535

CLASS 131

28 4,856,536
240 1 4,856,537
282 4,856,538
290 4,856,539
339 4,856,540

CLASS 132

110 4,856,541
265 4,856,542

CLASS 134

22 12 4,857,112
32 4,857,113
42 4,857,114
57 R 4,856,543
95 4,856,544
166 C 4,856,545
525 4,856,484

[redacted]

20 R 4,856,546

CLASS 136

249 4,857,115

CLASS 137

73 4,856,547
102 4,856,548
112 4,856,549
192 4,856,550
312 4,856,551
497 4,856,552
509 4,856,553
514 4,856,554
543 17 4,856,555
625 25 4,856,557
625 33 4,856,558
625 4 4,856,556
[redacted] 4,856,559
884 4,856,560

[redacted]

109 4,856,561

[redacted]

383 A 4,856,562

CLASS 141

1 4,856,563
95 4,856,564
97 4,856,565
142 4,856,566
302 4,856,567
337 4,856,568

CLASS 144

91 4,856,569

CLASS 148

12 C 4,857,117
103 4,857,118
279 4,857,116
304 Re 33,022
318 4,857,119
325 4,857,120

CLASS 150

107 4,856,570

CLASS 152

209 R 4,856,571
454 4,856,572
556 4,856,573

CLASS 156

[redacted] 4,857,121
125 4,857,122
133 4,857,123
149 4,857,124
169 4,857,125
[redacted] 4,857,126
242 4,857,127
244 12 4,857,128
273 7 4,857,129
292 4,857,130
331 4 4,857,131
345 4,857,132
378 4,857,133
385 4,857,134
[redacted] 4,857,135
626 4,857,136
[redacted] 4,857,137
643 4,857,138
4,857,139
[redacted] 4,857,140
[redacted] 4,857,141
[redacted] 4,857,142
668 4,857,143

CLASS 159

13 2 4,857,144

CLASS 160

168 1 4,856,574
353 4,856,575

CLASS 162

19 4,857,145
31 4,857,146
156 4,857,147
157 2 4,857,148
158 4,857,149

CLASS 164

495 4,856,576

CLASS 165

8 4,856,577
29 4,856,578
48 1 4,856,579
87 4,856,580
130 4,856,581

CLASS 166

98 4,856,582
127 4,856,583
250 4,856,584
4,856,585
270 4,856,586
272 4,856,587
273 4,856,588
4,856,589
278 4,856,590
4,856,591
285 4,856,592
338 4,856,594
374 4,856,595

CLASS 169

74 4,856,596

CLASS 172

33 4,856,597
54 5 4,856,598
370 4,856,599

CLASS 174

15 4 4,857,675
35 GC 4,857,668
53 4,857,669
68 3 4,857,670
68 5 4,857,671
93 4,857,672
110 PM 4,857,673
135 4,857,674

CLASS 175

26 4,856,600
393 4,856,601

CLASS 177

210 C 4,856,603
210 FP 4,856,602
4,856,604
210 R 4,856,605

CLASS 178

45 4,857,676

CLASS 180

140 4,856,606
142 4,856,607
148 4,856,608
179 4,856,609
197 4,856,610
233 4,856,611
273 4,856,612
282 4,856,613

CLASS 181

104 4,856,614

[redacted]

82 4,856,615
113 4,856,616

[redacted]

3 1 4,856,617

CLASS 187

8 5 4,856,618

[redacted]

18 A 4,856,619
72 4 4,856,620
112 R 4,856,621
4,856,622
[redacted] 4,856,623
273 4,856,624
282 4,856,625
371 4,856,626

[redacted]

11 4,856,627

CLASS 192

3 58 4,856,628
[redacted] 4,856,629
13 R 4,856,630
21 5 4,856,631
56 F 4,856,632
67 R 4,856,633
70 12 4,856,635
70 17 4,856,636
70 3 4,856,634
105 C 4,856,637
106 1 4,856,638
106 2 4,856,639

[redacted]

311 4,856,640
346 2 4,856,641
365 4,856,642
627 4,856,643
716 4,856,644
750 4,856,645
836 4,856,646

[redacted]

5 A 4,857,683
5 R 4,857,677
16 R 4,857,678
61 45 R 4,857,680
61 62 4,857,679
61 85 4,857,681
4,857,682
600 4,857,684

CLASS 203

41 4,857,150
82 4,857,151

CLASS 204

1 T 4,857,152
16 4,857,153
27 4,857,154
[redacted] 4,857,155
64 R 4,857,156
67 4,857,157
92 4,857,158
149 4,857,159
192 12 4,857,160
192 26 4,857,161
257 4,857,162
299 R 4,857,163
[redacted] 4,857,164
424 4,857,165
435 4,857,166
4,857,167

[redacted]

5 1 4,856,647
63 5 4,856,648
4,856,649
4,856,650
219 4,856,651
223 4,856,652
387 4,856,653
449 4,856,654
523 4,856,656
524 4,856,655
600 4,856,657

[redacted]

58 4,857,168
59 4,857,169
111 4,857,170
4,857,171

CLASS 209

1 4,857,172
2 4,857,173
3 4,857,174
143 4,857,178
166 4,857,179
235 4,857,175
392 4,857,176
[redacted] 4,857,177
[redacted] 4,857,180

[redacted]

87 4,857,181
127 4,857,183
128 4,857,184
150 4,857,185
198 2 4,857,187
222 4,857,188
232 4,857,189
4,857,190
286 4,857,191
321 84 4,857,192
[redacted] 4,857,193
[redacted] 4,857,194
443 4,857,195
500 3 4,857,196
512 1 4,857,197
603 4,857,198
[redacted] 4,857,199
651 4,857,200
655 4,857,201
662 4,857,202
[redacted] 4,857,203
695 4,857,204
700 4,857,205
[redacted] 4,857,206
725 4,857,207
745 4,857,208
755 4,857,209
781 4,857,210
797 4,857,211

CLASS 211

13 4,856,658
24 4,856,659
[redacted] 4,856,660
100 4,856,661

CLASS 212

176 4,856,662

CLASS 215

11 1 4,856,663
31 4,856,664
252 4,856,665
272 4,856,666
318 4,856,667
329 4,856,668

CLASS 219

10 55 B 4,857,686
10 55 F 4,857,685
10 57 4,857,687
10 71 4,857,689
60 A 4,857,690
60 R 4,857,691
69 14 4,857,688
74 4,857,692
76 12 4,857,693
4,857,694
85 22 4,857,695
121 63 4,857,697
121 7 4,857,696
121 71 4,857,698
121 85 4,857,699
124 34 4,857,700
125 12 4,857,701
225 4,857,702
271 4,857,703
354 4,857,704
370 4,857,705
373 4,857,706
375 4,857,707
385 4,857,708
[redacted] 4,857,709
548 4,857,711

CLASS 220

1 T 4,856,669
2 1 A 4,856,670
4 F 4,856,671
82 4,856,672
94 R 4,856,673
258 4,856,674
[redacted] 4,856,675

CLASS 222

[redacted] 4,856,676
94 4,856,677
108 4,856,678
136 4,856,679
152 4,856,680
158 4,856,681
238 4,856,682
318 4,856,683
402 23 4,856,684
454 4,856,685

CLASS 224

42 07 4,856,686
169 4,856,687
217 4,856,688
218 4,856,689

CLASS 226

24 4,856,690
91 4,856,691
119 4,856,692
127 4,856,693
134 4,856,694
154 4,856,695

CLASS 227

120 B1 4,109,844
130 4,856,696
149 4,856,697

CLASS 228

4 1 4,856,698
4 5 4,856,699
5 1 4,856,700
6 1 4,856,701
123 4,856,702
156 4,856,703

CLASS 229

2 5 R 4,856,704
109 4,856,705
110 4,856,706
114 4,856,707
125 17 4,856,708
125 34 4,856,709

CLASS 235

58 P 4,857,712
375 4,857,713
382 4,857,714
456 4,857,715
462 4,857,716

CLASS 236

13 4,856,710
34 5 4,856,711

CLASS 239

106 4,856,712
113 4,856,713
533 9 4,856,714

CLASS 241

5 4,856,715
30 4,856,716
36 B1 4,253,615
65 4,856,717
93 4,856,718
200 4,856,719

CLASS 242

7 02 4,856,720
7 14 4,856,721
18 A 4,856,722
35 5 R 4,856,723
55 3 4,856,724
66 4,856,725
84 8 4,856,726
107 4 B 4,856,727
107 7 4,856,728
118 4 4,856,730
129 4,856,729
158 R 4,856,731

CLASS 244

2 4,856,732
3 15 4,856,733
3 22 4,856,734
35 R 4,856,735
45 R 4,856,736
113 4,856,737
122 R 4,856,738

CLASS 248

74 2 4,856,739
97 4,856,740
122 4,856,741
124 4,856,742
149 4,856,743
215 4,856,744
237 4,856,745
250 4,856,746
354 7 4,856,747
[redacted] 4,856,749
562 4,856,750
638 4,856,751
678 4,856,752
688 4,856,748

CLASS 249

94 4,856,753
113 4,856,754

CLASS 250

201 4,857,717
4,857,718
4,857,719
4,857,720
203 R 4,857,721
207 4,857,722
213 R 4,857,723
213 VT 4,857,724
214 A 4,857,725
226 4,857,726
227 4,857,727
260 4,857,728
4,857,729
305 4,857,730
310 4,857,731
327 2 4,857,732
4,857,733
4,857,734
339 4,857,735
358 1 4,857,736
370 09 4,857,737
372 4,857,738
374 4,857,740
388 4,857,739
486 1 4,857,741
491 1 4,857,742
505 1 4,857,743
548 4,857,744
4,857,745
551 4,857,746
559 4,857,747
560 4,857,748
571 4,857,749
573 4,857,750
578 4,857,751
4,857,752

CLASS 251

6 4,856,755
297 4,856,756
335 2 4,856,757
368 4,856,758

CLASS 252

8 6 4,857,212
8 75 4,857,213
32 5 4,857,214
32 500 4,857,215
39 4,857,216
47 4,857,217
49 3 4,857,218
52 R 4,857,219
56 R 4,857,220
61 4,857,221
69 4,857,222
91 4,857,223
99 4,857,224
100 4,857,225
174 25 4,857,226
299 65 4,857,227
301 4 S 4,857,228
373 4,857,229
400 24 4,857,230
408 1 4,857,231
511 4,857,232
513 4,857,233
[redacted] 4,857,234

CLASS 254

132 4,856,759
134 4 4,856,760

CLASS 256

59 4,856,761

[redacted]

351 5 4,857,235
403 4,857,236
409 4,857,237

CLASS 261

26 4,857,240
152 4,857,241

CLASS 264

1 4 4,857,242
13 4,857,243
24 4,857,244
25 4,857,245
29 2 4,857,246
40 7 4,857,247
46 4 4,857,248
67 4,857,249
83 4,857,250
103 4,857,251
116 4,857,252
130 4,857,253
211 24 4,857,254
216 4,857,255
310 4,857,256
4,857,257
515 4,857,258

CLASS 267

64 12 4,856,762
131 4,856,763
140 1 4,856,764
166 4,856,765

CLASS 269

21 4,856,766
46 4,856,767

CLASS 270

104 4,857,182

CLASS 271

186 4,856,768

193 4,856,769
274 4,856,770

CLASS 272

18 4,856,771
67 4,856,772
118 4,856,773
123 4,856,774
134 4,856,775
142 4,856,776

CLASS 273

1 ES 4,856,778
1 GA 4,856,777
25 4,856,779
65 E 4,856,781
80 B 4,856,782
87 2 4,856,783
147 4,856,784
148 B 4,856,785
153 S 4,856,786
237 4,856,787
244 4,856,780
256 4,856,788
261 4,856,789
317 4,856,790
410 4,856,791
416 4,856,792
426 4,856,793

CLASS 277

37 4,856,794
212 FB 4,856,795
235 B 4,856,796

CLASS 279

41 R 4,856,797

CLASS 280

6 11 4,856,798
24 4,856,799
281 1 4,856,800
284 4,856,801
288 4,856,802
293 4,856,803
430 4,856,804
491 4 4,856,805
605 4,856,806
615 4,856,807
617 4,856,808
639 4,856,810
644 4,856,809
652 4,856,811
678 4,856,812
703 4,856,813
704 4,856,814
707 4,856,815
804 Re.33,020
851 4,856,816

CLASS 281

29 4,856,817

CLASS 283

34 4,856,818
79 4,856,819
81 4,856,820

CLASS 285

24 4,856,821
62 4,856,822
81 4,856,823
137 1 4,856,824
175 4,856,825
181 4,856,826
268 4,856,827
334 1 4,856,828

CLASS 290

55 4,857,753

CLASS 292

216 4,856,829
254 4,856,830
259 R 4,856,831
341 19 4,856,832

CLASS 293

120 4,856,833

CLASS 294

15 4,856,834
61 4,856,835
74 4,856,836
4,856,837

CLASS 296

14 4,856,838
24 2 4,856,839
26 4,856,840
100 4,856,841
136 4,856,842
181 4,856,843

CLASS 297

284 4,856,844
286 4,856,845
300 4,856,846
341 4,856,847
391 4,856,848

CLASS 301

63 R 4,856,849

CLASS 303

20 4,856,850
[redacted] 4,856,851
114 4,856,852

CLASS 305

35 EB 4,856,853

CLASS 307

10 8 4,857,754
47 4,857,755
[redacted] 4,857,756
113 4,857,757
140 4,857,758
141 4,857,759
234 4,857,760
350 4,857,761
441 4,857,762
443 4,857,763
4,857,764
4,857,765
4,857,768
[redacted] 4,857,766
448 4,857,767
450 4,857,769
451 4,857,770
455 4,857,771
463 4,857,772
465 4,857,773
4,857,774
[redacted] 4,857,775
475 4,857,776
511 4,857,777
521 4,857,778
542 4,857,779
574 4,857,780

CLASS 310

12 4,857,781
4,857,782
[redacted] 4,857,783
4,857,784
78 4,857,785
156 4,857,786
180 4,857,787
214 4,857,788
233 4,857,789
234 4,857,790
321 4,857,791
323 4,857,792
328 4,857,793

CLASS 312

38 4,856,854
111 4,856,855
231 4,856,856

CLASS 313

113 4,857,794
402 4,857,795
428 4,857,796
450 4,857,797
487 4,857,798
495 4,857,799
4,857,800
500 4,857,801
506 4,857,802
509 4,857,803
557 4,857,804

CLASS 314

444 4,857,543

CLASS 315

8 4,857,805
72 4,857,806
77 4,857,807
100 4,857,808
111 31 4,857,809
194 4,857,810

CLASS 318

3 4,857,811
15 4,857,812
54 4,857,813
281 4,857,814
443 4,857,815
632 4,857,816
696 4,857,817
762 4,857,818
778 4,857,819

CLASS 320

2 4,857,820

CLASS 323

210 4,857,821
282 4,857,822
314 4,857,823
347 4,857,824
353 4,857,825

CLASS 324

55 4,857,827
61 R 4,857,828
4,857,829
62 4,857,830
65 CR 4,857,831
72 4,857,832
73 R 4,857,833
4,857,834
[redacted] 4,857,835
[redacted] 4,857,836
117 R 4,857,837
158 F 4,857,838
158 R 4,857,839
207 4,857,840
[redacted] 4,857,841
225 4,857,842
307 4,857,843
4,857,844
309 4,857,845
4,857,846
311 4,857,847
318 4,857,848
4,857,849
4,857,850
326 4,857,851
339 4,857,852
456 4,857,853
508 4,857,826
512 4,857,854
521 4,857,855
547 4,857,856
555 4,857,857

CLASS 329

50 4,857,858
104 4,857,859

CLASS 330

107 4,857,860
255 4,857,861
261 4,857,862
264 4,857,863
288 4,857,864
304 4,857,865

CLASS 331

1 A 4,857,866
10 4,857,867
135 4,857,868

CLASS 333

26 4,857,869
195 4,857,870
202 4,857,871

CLASS 335

80 4,857,872
285 4,857,873
296 4,857,874
297 4,857,875

CLASS 336

165 4,857,876
170 4,857,877
192 4,857,878

CLASS 337

173 4,857,879

CLASS 338

22 R 4,857,880
128 4,857,881

CLASS 340

146 2 4,857,882
311 1 4,857,883
4,857,884
321 4,857,885
323 R 4,857,886
426 4,857,888
461 4,857,889
479 4,857,890
551 4,857,891
568 4,857,892
572 4,857,893
619 4,857,894
630 4,857,895
639 4,857,896
692 4,857,897
701 4,857,899
703 4,857,900
4,857,901
709 4,857,902
710 4,857,903
730 4,857,904
748 4,857,905
784 4,857,906
4,857,907
785 4,857,908
793 4,857,909
799 4,857,910
825 3 4,857,912
825 31 4,857,914
825 310 4,857,913
825 340 4,857,916
825 44 4,857,911
825 440 4,857,915
825 570 4,857,917
870 01 4,857,918
870 36 4,857,919
907 4,857,920
912 4,857,921
[redacted] 4,857,922
970 4,857,923
973 4,857,924
[redacted] 4,857,925

CLASS 341

22 4,857,898
34 4,857,887
116 4,857,926
131 4,857,927
143 4,857,928
148 4,857,929
150 4,857,930
156 4,857,931
159 4,857,932
168 4,857,933

CLASS 342

90 4,857,934
128 4,857,935
368 4,857,936
377 4,857,937

CLASS 343

700 MS 4,857,938
715 4,857,939

CLASS 346

75 4,857,940
76 PH 4,857,941
4,857,942
136 4,857,943
154 4,857,944
160 1 4,857,945

CLASS 350

3 6 4,856,857
6 6 4,856,858
96 12 4,856,859
4,856,860
96 14 4,856,861
96 15 4,856,862
96 16 4,856,863
4,856,864
96 21 4,856,865
4,856,866
96 23 4,856,867
4,856,868
162 18 4,856,869
252 4,856,870
253 4,856,871
255 4,856,872
267 4,856,874
341 4,856,875
350 F 4,856,876
356 4,856,877
375 4,856,878
407 4,856,879
418 4,856,880
463 4,856,881
500 4,856,882
502 4,856,873
538 4,856,883
557 4,856,884
633 4,856,885
635 4,856,886
639 4,856,888
641 4,856,887

CLASS 351

159 4,856,889
206 4,856,890
210 4,856,891
218 4,856,892

CLASS 354

173 1 4,857,946
195 1 4,857,947
288 4,857,948
322 4,857,949
324 4,857,950
400 4,857,951
452 4,857,952
475 4,857,953

CLASS 355

27 4,857,961
29 4,857,962
[redacted] 4,857,964
45 4,857,965
4,857,966
[redacted] 4,857,967
72 4,857,968
4,857,969
113 4,857,970
208 4,857,960
218 4,857,958
234 4,857,956
245 4,857,954
276 4,857,959
314 4,857,957
321 4,857,963
328 4,857,955

CLASS 356

5 4,856,893
15 4,856,894
28 4,856,895
153 4,856,896
301 4,856,897
328 4,856,898
346 4,856,899
350 4,856,900
4,856,901
375 4,856,902
400 4,856,903
4,856,904
401 4,856,905
435 4,856,906

CLASS 357

4 4,857,971
4,857,972
15 4,857,973
22 4,857,974
4,857,975
23 1 4,857,976
23 4 4,857,977
24 4,857,978
4,857,979
30 4,857,980
4,857,981
4,857,982
38 4,857,983
41 4,857,984
42 4,857,985
4,857,986
45 4,857,987
74 4,857,988
80 4,857,989

CLASS 358

13 4,857,990
4,857,991
4,857,992
22 4,857,993
4,857,994
47 4,857,995
48 4,857,996
55 4,857,997
60 4,857,998
84 4,857,999
4,858,000
98 4,858,001
4,858,002
102 4,858,003
133 4,858,004
135 4,858,005
139 4,858,006
147 4,858,007
148 4,858,008
4,858,009
160 4,858,010
181 4,858,011
210 4,858,012
213 17 4,858,013
217 4,858,014
242 4,858,015
246 4,858,016
287 4,858,020
310 4,858,024
4,858,025
4,858,026
311 4,858,027
340 4,858,029
342 4,858,030
4,858,031
426 4,858,017
456 4,858,018
471 4,858,022
4,858,023
474 4,858,019
494 4,858,021

CLASS 360

14 2 4,858,033
51 4,858,034
4,858,035
60 4,858,036
4,858,037
69 4,858,038
72 2 4,858,039
78 05 4,858,040
78 09 4,858,041
91 4,858,032
96 5 4,858,042
99 01 4,858,043
99 08 4,858,044
99 12 4,858,045
106 4,858,046
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137 4,858,051

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23 4,858,053
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93 4,858,056
[redacted] 4,858,057
96 4,858,058
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331 4,858,067
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395 4,858,075
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22 4,858,096
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401 4,858,120
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412 4,858,123
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496 4,858,144
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571.03 4,858,161
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240 23 4,857,464
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397 4,857,630
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487 4,857,632
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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4,856,946	4,856,523	4,857,080	4,857,902	4,858,082	4,856,228
4,857,098	4,856,529	4,857,085	4,857,910	09 : 4,856,132	4,856,234
4,857,945	4,856,561	4,857,130	4,857,912	4,856,162	4,856,272
04 : 4,856,112	4,856,570	4,857,133	4,857,924	4,856,220	4,856,288
4,856,841	4,856,575	4,857,135	4,857,929	4,856,332	4,856,294
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4,858,208	4,856,749	4,857,341	4,858,039	4,857,030	4,856,835
05 : 4,856,117	4,856,759	4,857,347	4,858,040	4,857,071	4,856,838
4,856,364	4,856,787	4,857,380	4,858,041	4,857,093	4,856,874
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4,857,399	4,857,398	4,857,715	4,858,102	4,856,435	4,857,421
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4,857,558	4,857,474	4,858,115	4,856,295	4,856,619	4,857,619
4,857,578	4,857,475	4,858,162	4,856,358	4,856,621	4,857,620
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4,857,971	4,857,901	4,857,320	4,856,705	4,857,099	4,856,442
4,858,169	4,857,931	4,857,489	4,856,708	4,857,121	4,856,444
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4,857,362	4,858,234	4,857,990	4,857,054	4,857,397	4,856,579
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4,857,678	4,856,235	4,856,170	4,857,176	4,857,621	4,857,026
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19 : 4,856,211	4,856,317	4,856,346	4,857,269	4,857,810	4,857,629
4,856,405	4,856,324	4,856,437	4,857,271	4,857,839	4,857,713
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20 : 4,856,348	4,856,402	4,856,615	4,857,439	40 : 4,856,129	48 : 4,856,115
4,856,683	4,856,416	4,856,670	4,857,440	4,856,252	4,856,202
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21 : 4,856,642	4,856,652	4,856,860	4,857,523	4,856,756	4,856,321
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4,856,724	4,857,587	4,858,181	51 : 4,856,518	4,857,639	4,857,670
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4,856,793	4,857,633	4,858,183	4,857,208	4,857,878	4,857,684
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Chemical (4,859,206)	2465
Electrical (4,859,804)	2639
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1101 O.G. 56 on Apr. 25, 1989.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	550.00
—Corresponding prior U.S. national application filed:	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority.	400.00
—Additional examination fee, per additional invention	130.00
—Searching Authority not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee:	436.00
Basic Supplemental fee (for each page over 30):	9.00
Designation fee per country or region for the first 10 national or regional offices:	106.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	134.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	165.00	330.00
USPTO was ISA but no IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

May 3, 1989.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on August 19, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,606,077 through 4,607,395
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on August 17, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,344,189 through 4,345,334
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

" (e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JUNE 4, 1989
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,520,509	06/467,914	06/04/85
4,520,517	06/391,689	06/04/85
4,520,522	06/533,226	06/04/85
4,520,532	06/536,653	06/04/85
4,520,538	06/500,444	06/04/85
4,520,546	06/524,551	06/04/85
4,520,548	06/445,524	06/04/85
4,520,550	06/498,731	06/04/85
4,520,555	06/424,073	06/04/85
4,520,563	06/588,338	06/04/85
4,520,564	06/548,922	06/04/85
4,520,565	06/545,891	06/04/85
4,520,566	06/582,893	06/04/85
4,520,569	06/579,011	06/04/85
4,520,573	06/460,485	06/04/85
4,520,577	06/482,088	06/04/85
4,520,579	06/504,885	06/04/85
4,520,581	06/335,645	06/04/85
4,520,584	06/495,612	06/04/85
4,520,585	06/567,064	06/04/85
4,520,586	06/580,734	06/04/85
4,520,587	06/477,118	06/04/85
4,520,597	06/439,874	06/04/85
4,520,601	06/539,230	06/04/85
4,520,622	06/501,637	06/04/85
4,520,625	06/471,341	06/04/85
4,520,637	06/456,764	06/04/85
4,520,649	06/519,231	06/04/85
4,520,654	06/475,340	06/04/85
4,520,655	06/331,994	06/04/85
4,520,660	06/541,041	06/04/85
4,520,667	06/530,055	06/04/85
4,520,668	06/469,336	06/04/85
4,520,677	06/316,697	06/04/85
4,520,682	06/316,084	06/04/85
4,520,686	06/472,744	06/04/85
4,520,690	06/495,393	06/04/85
4,520,691	06/599,430	06/04/85
4,520,692	06/422,605	06/04/85
4,520,700	06/445,536	06/04/85
4,520,701	06/453,781	06/04/85
4,520,703	06/495,767	06/04/85
4,520,706	06/569,579	06/04/85
4,520,707	06/565,130	06/04/85
4,520,711	06/448,997	06/04/85
4,520,716	06/590,604	06/04/85
4,520,727	06/588,501	06/04/85
4,520,728	06/620,539	06/04/85
4,520,732	06/507,898	06/04/85
4,520,733	06/392,755	06/04/85
4,520,735	06/408,722	06/04/85
4,520,751	06/556,451	06/04/85
4,520,753	06/605,373	06/04/85
4,520,756	06/627,716	06/04/85
4,520,769	06/635,405	06/04/85
4,520,785	06/575,776	06/04/85
4,520,794	06/354,930	06/04/85
4,520,795	06/559,051	06/04/85
4,520,799	06/648,610	06/04/85
4,520,800	06/493,145	06/04/85
4,520,802	06/537,795	06/04/85
4,520,805	06/460,592	06/04/85
4,520,807	06/487,999	06/04/85
4,520,808	06/474,098	06/04/85
4,520,809	06/457,258	06/04/85
4,520,815	06/506,427	06/04/85
4,520,834	06/549,990	06/04/85
4,520,844	06/477,752	06/04/85
4,520,848	06/586,829	06/04/85
4,520,860	06/470,269	06/04/85
4,520,863	06/436,937	06/04/85
4,520,869	06/537,096	06/04/85
4,520,870	06/566,109	06/04/85
4,520,871	06/439,546	06/04/85
4,520,872	06/527,491	06/04/85
4,520,873	06/503,292	06/04/85
4,520,876	06/526,681	06/04/85
4,520,877	06/470,298	06/04/85
4,520,890	06/518,958	06/04/85
4,520,893	06/434,907	06/04/85
4,520,895	06/534,307	06/04/85
4,520,897	06/579,685	06/04/85

Patent Number	Serial Number	Issue Date
4,520,898	06/577,485	06/04/85
4,520,902	06/486,310	06/04/85
4,520,908	06/550/564	06/04/85
4,520,911	06/410,731	06/04/85
4,520,916	06/396,615	06/04/85
4,520,917	06/354,298	06/04/85
4,520,921	06/592,887	06/04/85
4,520,922	06/623,936	06/04/85
4,520,931	06/524,413	06/04/85
4,520,933	06/366,143	06/04/85
4,520,934	06/590,624	06/04/85
4,520,940	06/626,288	06/04/85
4,520,943	06/634,537	06/04/85
4,520,948	06/328,799	06/04/85
4,520,961	06/515,480	06/04/85
4,520,972	06/386,072	06/04/85
4,520,983	06/317,835	06/04/85
4,521,009	06/408,168	06/04/85
4,521,010	06/523,278	06/04/85
4,521,015	06/563,134	06/04/85
4,521,019	06/400,791	06/04/85
4,521,023	06/554,889	06/04/85
4,521,024	06/574,418	06/04/85
4,521,026	06/534,386	06/04/85
4,521,032	06/458,910	06/04/85
4,521,035	06/313,237	06/04/85
4,521,036	06/342,823	06/04/85
4,521,044	06/477,323	06/04/85
4,521,045	06/529,095	06/04/85
4,521,046	06/461,815	06/04/85
4,521,057	06/466,857	06/04/85
4,521,059	06/473,493	06/04/85
4,521,066	06/595,687	06/04/85
4,521,067	06/463,281	06/04/85
4,521,070	06/361,416	06/04/85
4,521,072	06/392,685	06/04/85
4,521,079	06/416,059	06/04/85
4,521,085	06/631,738	06/04/85
4,521,086	06/509,798	06/04/85
4,521,091	06/421,854	06/04/85
4,521,092	06/496,110	06/04/85
4,521,104	06/555,973	06/04/85
4,521,110	06/449,011	06/04/85
4,521,120	06/532,411	06/04/85
4,521,125	06/573,370	06/04/85
4,521,127	06/445,429	06/04/85
4,521,139	06/399,989	06/04/85
4,521,141	06/459,122	06/04/85
4,521,142	06/412,549	06/04/85
4,521,145	06/533,791	06/04/85
4,521,148	06/492,274	06/04/85
4,521,149	06/432,907	06/04/85
4,521,151	06/545,106	06/04/85
4,521,158	06/528,225	06/04/85
4,521,163	06/506,903	06/04/85
4,521,164	06/573,285	06/04/85
4,521,168	06/413,072	06/04/85
4,521,171	06/594,322	06/04/85
4,521,176	06/656,076	06/04/85
4,521,180	06/619,771	06/04/85
4,521,181	06/603,924	06/04/85
4,521,182	06/341,490	06/04/85
4,521,185	06/525,446	06/04/85
4,521,186	06/495,555	06/04/85
4,521,188	06/542,175	06/04/85
4,521,191	06/567,557	06/04/85
4,521,193	06/297,468	06/04/85
4,521,195	06/574,029	06/04/85
4,521,200	06/538,028	06/04/85
4,521,205	06/615,380	06/04/85
4,521,208	06/400,087	06/04/85
4,521,209	06/487,569	06/04/85
4,521,215	06/489,041	06/04/85
4,521,230	06/634,598	06/04/85
4,521,241	06/533,773	06/04/85
4,521,242	06/404,780	06/04/85
4,521,254	06/346,013	06/04/85
4,521,255	06/517,252	06/04/85
4,521,281	06/538,299	06/04/85
4,521,286	06/587,123	06/04/85
4,521,291	06/596,562	06/04/85
4,521,297	06/350,943	06/04/85
4,521,303	06/607,409	06/04/85
4,521,310	06/527,745	06/04/85
4,521,321	06/531,042	06/04/85
4,521,322	06/543,963	06/04/85
4,521,337	06/475,247	06/04/85
4,521,341	06/590,133	06/04/85
4,521,355	06/533,882	06/04/85
4,521,356	06/379,006	06/04/85
4,521,368	06/510,253	06/04/85
4,521,371	06/331,419	06/04/85
4,521,377	06/352,213	06/04/85
4,521,412	06/490,899	06/04/85
4,521,420	06/518,867	06/04/85
4,521,429	06/342,933	06/04/85
4,521,433	06/540,994	06/04/85
4,521,434	06/423,601	06/04/85
4,521,436	06/517,862	06/04/85
4,521,441	06/562,679	06/04/85
4,521,452	06/238,489	06/04/85
4,521,463	06/409,072	06/04/85
4,521,469	06/615,606	06/04/85
4,521,473	06/544,413	06/04/85
4,521,495	06/624,051	06/04/85
4,521,526	06/516,435	06/04/85
4,521,529	06/646,858	06/04/85
4,521,542	06/619,612	06/04/85
4,521,554	06/582,645	06/04/85
4,521,555	06/570,307	06/04/85
4,521,592	06/419,314	06/04/85
4,521,595	06/399,195	06/04/85
4,521,603	06/462,845	06/04/85
4,521,607	06/365,038	06/04/85
4,521,613	06/589,575	06/04/85
4,521,619	06/552,901	06/04/85
4,521,634	06/574,150	06/04/85
4,521,642	06/270,197	06/04/85
4,521,646	06/326,472	06/04/85
4,521,652	06/547,938	06/04/85
4,521,667	06/568,479	06/04/85
4,521,673	06/497,659	06/04/85
4,521,678	06/570,677	06/04/85
4,521,684	06/350,687	06/04/85
4,521,690	06/269,815	06/04/85
4,521,693	06/439,358	06/04/85
4,521,694	06/509/952	06/04/85
4,521,702	06/434,085	06/04/85
4,521,715	06/412,901	06/04/85
4,521,719	06/412,172	06/04/85
4,521,723	06/596,276	06/04/85
4,521,728	06/410,856	06/04/85
4,521,729	06/489,672	06/04/85
4,521,740	06/467,637	06/04/85
4,521,746	06/527,953	06/04/85
4,521,748	06/509,951	06/04/85
4,521,761	06/581,152	06/04/85
4,521,768	06/366,558	06/04/85
4,521,771	06/352,033	06/04/85
4,521,801	06/422,143	06/04/85
4,521,808	06/280,611	06/04/85
4,521,820	06/431,630	06/04/85
4,521,824	06/579,627	06/04/85
4,521,825	06/542,858	06/04/85
4,521,831	06/571,786	06/04/85
4,521,839	06/578,775	06/04/85
4,521,857	06/378,615	06/04/85
4,521,864	06/429,254	06/04/85
4,521,865	06/383,147	06/04/85
4,521,903	06/473,483	06/04/85
4,521,911	06/568,894	06/04/85
4,521,916	06/556,356	06/04/85
4,521,919	06/527,782	06/04/85

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,433,001	06/355,687	2/21/84	3/08/82	7/18/89
4,459,333	06/315,291	7/10/84	10/27/81	7/24/89

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,205,621, Re. S. N. 378,276, Filed July 11, 1989, Cl. 188/622, SYSTEM FOR UNSIDE POWER STRIPING OF WELDED FOOD CANS, Robert D. Payne, Owner of Record: *The Continental Group, New York, N. Y.*, Attorney or Agent: Herbert C. Brinkman, Ex. Gp.: 135

4,427,878, Re. S. N. 376,100, Filed July 6, 1989, Cl. 250/203R, OPTICAL SCANNING APPARATUS INCORPORATING COUNTER-ROTATION OF ELEMENTS ABOUT A COMMON AXIS BY A COMMON DRIVING SOURCE, Michael E. Buchtel, et al., Owner of Record: *Ford Aerospace and Communication Corp., Detroit, Mich.*, Attorney or Agent: William H. Mandir, Ex. Gp.: 255

4,590,003, Re. S. N. 376,224, Filed June 29, 1989, Cl. 530, PLATELET RELATED GROWTH REGULATOR, Daniel R. Twardzik, et al., Owner of Record: *Oncdgen, Seattle, Wash.*, Attorney or Agent: Bertram I. Rowland, Ex. Gp.: 186

4,627,193, Re. S. N. 282,108, Filed Dec. 9, 1989, Cl. 49/42, REVOLVING DOOR CONTROL SYSTEM, Milan Schwarz, Owner of Record: *Inventor(s)*, Attorney or Agent: Russell R. Palmer, Jr., Ex. Gp.: 357

4,632,265, Re. S. N. 368,251, Filed June 19, 1989, Cl. 215/232, PRESS-ON CAP AND SEAL, Benjamin A. Cochrane, Owner of Record: *Inventor(s)*, Attorney or Agent: Robert E. Strauss, Ex. Gp.: 241

4,638,310, Re. S. N. 374,935, Filed June 30, 1989, Cl. 340/805, METHOD OF ADDRESSING LIQUID CRYSTAL DISPLAYS, Peter J. Ayliffe, Owner of Record: *International Standard Electric Corp., New York, N.Y.*, Attorney or Agent: William M. Lee, Jr., Ex. Gp.: 266

4,647,296, Re. S. N. 317,622, Filed Feb. 28, 1989, Cl. 055/002, SPACER FOR STRAIGHTENING WARPED PRECIPITATOR CURTAINS, Morris B. Tuck, Owner of Record: *Mississippi Power Co., Gulppo, Miss.*, Attorney or Agent: Donald A. Peterson, Ex. Gp.: 135

4,663,903, Re. S. N. 362,083, Filed June 5, 1989, Cl. 52/181, FLOOR COVERING STRUCTURE, Chester W. Ellingson, Owner of Record: *Reese Enterprises, Inc., Minneapolis, Minn.*, Attorney or Agent: Leo Gregory, Ex. Gp.: 354

4,677,980, Re. S. N. 376,868, Filed July 7, 1989, Cl. 128/655, ANGIOGRAPHIC INJECTOR AND ANGIOGRAPHIC SYRINGE FOR USE THEREWITH, David M. Reilly, et al., Owner of Record: *Medrad, Inc., Pittsburgh, Pa.*, Attorney or Agent: Ronald D. Cohn, Ex. Gp.: 335

4,680,265, Re. S. N. 376,344, Filed July 6, 1989, Cl. 435/172.3, METHOD OF SELECTING RECOMBINANT DNA-CONTAINING STREPTOMYCES, Virginia A. Brimingham, Owner of Record: *Eli Lilly and Co., Indianapolis, Ind.*, Attorney or Agent: Ron K. Levy, Ex. Gp.: 185

4,691,326, Re. S. N. 376,394, Filed July 6, 1989, Cl. 375/1, SPREAD-SPECTRUM COMMUNICATION SYSTEM, Masahiro Tsuchiya, Owner of Record: *Clarion Co., Ltd., Tokyo, Japan*, Attorney or Agent: Stephen R. Arnold, Ex. Gp.: 263

4,728,185, Re. S. N. 375,432, Filed July 3, 1989, Cl. 353/122, IMAGING SYSTEM, David A. Thomas, Owner of Record: *Texas Instrument Inc., Dallas, Tex.*, Attorney or Agent: Carlton H. Hoel, Ex. Gp.: 246

4,829,453, Re. S. N. 377,122, Filed July 10, 1989, Cl. 364/521, APPARATUS FOR CATALOGING AND RETRIEVING IMAGE DATA, Yuji Katsuta, et al., Owner of Record: *Sharp Kabushiki Kaisha, Osaka, Japan*, Attorney or Agent: Keichi Nishimura, Ex. Gp.: 231

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be, constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,459,526, Reexam. No. 90/001,805, Requested June 30, 1989, Cl. 318/576, MULTI APERTURED LENS SHOCK WAVE, Elmer L. Griebeler, Owner of Record: *Cleveland Controls Inc., Valleyview, Ohio*, Attorney or Agent: Body, Vickers and Daniels, Ex. Gp.: 210, Requester: Ultra Sonic Arrays Inc.

4,729,706, Reexam. No. 90/001,803, Requested June 28, 1989, Cl. 411/175, FASTENER CLIP, Francis C. Peterson, et al., Owner of Record: *Buell Industries Inc., Waterbury, Conn.*, Attorney or Agent: St. Onge, Steward and Reens, Ex. Gp.: 350, Requester: Owner

REGISTRATION TO PRACTICE

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished the Director, Office of Enrollment and Discipline on or before September 20, 1989:

Burkhart, Patrick N., 3821 Raymond Ave., Brookfield, Ill. 60513
Costantino, Mario A., 618 S. Payne St., Alexandria, Va. 22314
Creber, Anthony G., 15 Brinton Ave., Nepean, Ont., Canada K2H 6W6
Folkerts, Michael D., 105 Walden Fram Cir., Union, Ohio 45322
Goldberg, Elliot A., 5 Wild Olive Ct., Potomac, Md. 20854
King, Elizabeth A., 7101 Berkshire Dr., Temple Hills, Md. 20748
Meyer, Charles B., 2925 Wellesley Dr., Columbus, Ohio 43221
Parsons, Isabella J., R.R. 1, Mount Albert Ont., Canada L0G 1M0
Peters, Leo J., 604 Roberts Dr., N.W., Vienna, Va. 22180
Rae, Patricia A., 50 Quebec Ave., #1202, Toronto, Ont., Canada M6P 4B4
Rendos, Thomas A., 5455 Smetana Dr., #1310, Minnetonka, Minn. 55343
Rubinson, Gene Z., 1202 Princeton Pl., Rockville, Md. 20850
Tegtmeyer, Rene D., 1332 Timberly La., McLean, Va. 22102
Ward, Robert S. Jr., 4221 Shannon Hill Rd., Alexandria, Va. 22310
Wolffe, Susan A., 900 Banks Pl., Alexandria, Va. 22312

July 25, 1989 CAMERON WEIFFENBACH,
Director of Enrollment and Discipline

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

User Technology Services, Inc., Valley Cottage, N.Y., Reg. No. 1,271,013, for the mark "USERTECH", Canc. No. 17,444

Futura Footwear Corp., New York, N.Y., Reg. No. 944,096, for the mark "ULTIMA", Canc. No. 17,547

N.L.L. Trading Corp., New York, N.Y., Reg. No. 1,255,500, for the mark "HOLLAND CULTURE CARD" and design, Canc. No. 17,548

Osceola Fruit Distributors, Kissimmee, Fla., Reg. No. 881,000, for the mark "BREAKFAST GOLD", Canc. No. 17,549

The Cycle Factory, Inc., Cambridge, Mass., Reg. No. 1,256,016, for the mark "BELLA", Canc. No. 17,633

Worldly Goods, Ltd., New York, N.Y., Reg. No. 909,886, for the mark "WORLDLY GOODS BY PAUL L.", Canc. No. 17,943

Performance Dynamics Inc., Roseland, N.J., Reg. No. 1,135,109, for the mark "PEROFRMANCE DYNAMICS", Canc. No. 17,866

Firebaugh Produce Company, Firebaugh, Calif., Reg. No. 1,455,643, for the mark "GOLD RUSH" and design Canc. No. 17,882

ERMA S. BROWN
Administrator, Trademark Trial and Appeal Board
For JEFFERY M. SAMUELS
Assistant Commissioner for Trademarks

PATENT NOTICES

Certificates of Correction For Week of August 22, 1989

B1 4,588,580	4,777,940	4,792,492	4,806,420
D. 297,616	4,778,061	4,792,696	4,806,917
D. 300,548	4,778,162	4,792,976	4,807,411
4,066,268	4,778,461	4,793,163	4,807,601
4,484,856	4,778,603	4,793,426	4,807,856
4,589,980	4,780,046	4,793,692	4,808,026
4,618,635	4,781,609	4,794,518	4,808,287
4,653,056	4,782,582	4,794,540	4,808,416
4,669,664	4,782,846	4,794,764	4,808,424
4,670,651	4,783,197	4,794,895	4,808,487
4,711,019	4,783,236	4,795,860	4,808,742
4,727,276	4,783,474	4,796,240	4,808,748
4,729,668	4,783,478	4,796,297	4,808,814
4,736,600	4,783,668	4,797,120	4,808,854
4,740,594	4,784,141	4,797,508	4,808,859
4,740,704	4,784,353	4,797,892	4,809,033
4,742,050	4,784,432	4,798,073	4,809,469
4,742,542	4,784,725	4,798,583	4,809,525
4,744,927	4,785,390	4,798,653	4,509,812
4,747,638	4,786,022	4,798,818	4,809,896
4,747,851	4,786,024	4,795,171	4,809,911
4,750,643	4,786,040	4,799,270	4,809,912
4,754,549	4,786,322	4,799,451	4,810,051
4,758,153	4,786,501	4,799,643	4,810,342
4,759,446	4,786,705	4,799,674	4,810,761
4,761,525	4,786,717	4,800,015	4,811,001
4,762,738	4,786,970	4,800,198	4,811,049
4,763,463	4,786,998	4,800,247	4,811,173
4,764,052	4,788,589	4,800,258	4,811,696
4,764,428	4,788,688	4,802,748	4,811,930
4,767,509	4,788,965	4,803,089	4,812,024
4,771,832	4,789,820	4,804,054	4,812,754
4,773,027	4,789,969	4,805,511	4,813,159
4,776,353	4,790,185	4,805,614	4,813,617
4,776,788	4,792,196	4,806,322	4,824,893
4,776,886	4,792,275	4,806,349	4,826,629

Disclaimers

4,674,618.—*David Eglise*, Windsor; *Adrain Lewis*, Lymington, both of England. TOKENS AND TOKEN HANDLING DEVICES. Patent dated June 23, 1987. Disclaimer filed May 19, 1989, by the assignee, Mars Incorporated.

Hereby enters this disclaimer to claims 1-4, 34-36, 41, 42 and 44 of said patent.

4,762,185.—*Brian K. Simpson*, Congresbury, Great Britain. OFF-SHORE DRILLING. Patent dated Aug. 9, 1988. Disclaimer filed June 16, 1989, by the assignee, DRG (UK) Limited.

Hereby enters this disclaimer to claims 11 and 12 of said patent.

Disclaimers and Dedications

4,635,057.—*Maurice E. Schaefer*, Tremont, Ill. REMOTE SENSOR WITH COMPENSATION FOR LEAD RESISTANCE. Patent dated Jan. 6, 1987. Disclaimer and dedication filed June 30, 1989, by the assignee, Caterpillar Inc.

Hereby disclaims and dedicates to the Public claims 1 through 3 of said patent.

4,812,175.—*Gary A. Reghi*, Sterling Heights, Mich. PASSIVATION PROCESS AND COMPOSITION FOR ZINC-ALUMINUM ALLOYS. Patent dated Mar. 14, 1989. Disclaimer and Dedication filed June 26, 1989, by the assignee, Henkel Corporation.

Hereby disclaims and dedicates to the Public claims 1 through 3 of said patent.

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	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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	Houston: The Fondren Library, Rice University	(713) 572-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
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	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF July 15, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	7-15-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	12-23-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. SHAW, Acting Director	5-12-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-27-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-17-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-2-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—D. G. KELLY, Director	1-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	4-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-24-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-1-88

Expiration of patents: The patents within the range of numbers indicated below expire during July 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,673,609 to 3,680,148 inclusive
Plant Patents ..... 3,224 to 3,244 inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,026

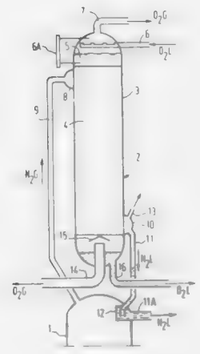
PROCESS AND DEVICE FOR VAPORIZING A LIQUID BY HEAT EXCHANGE WITH A SECOND FLUID AND THEIR APPLICATION IN AN AIR DISTILLATION INSTALLATION

Pierre Petit, Chatenay Malabry; Maurice Grenier, Paris, and Jean-Francois Deschamps, Bures-sur-Yvette, all of France, assignors to L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation Des Procedes Georges Claude

Original No. 4,599,097, dated Jul. 8, 1986, Ser. No. 620,078, Jun. 12, 1984. Application for reissue Aug. 23, 1988, Ser. No. ~~136,006~~ 236,006

Int. Cl.[4] F25J *3/00*

U.S. Cl. 62—36 24 Claims



1. A process comprising vaporizing a liquid by heat exchange with a second fluid by means of a heat exchanger designed to maintain no more than a small temperature difference between said liquid and said second fluid, including a parallelepipedal body formed by an assembly of parallel vertical plates defining therebetween a multitude of flat passages having generally vertical corrugated fins therein, by sending said liquid into a first group of said passages and sensing the second fluid into a second group of passages constituting the remaining passages of said passages defined between said plates, distributing the liquid in two stages at an upper end of the passages of said first group of passages throughout the horizontal length of said first group of passages, said two stages comprising a rough predistribution of the liquid *through openings* throughout the length of passages of said first group of passages, and then a fine distribution of the thus predistributed liquid *through a packing* throughout the length of said passages, the two stages being performed above an upper end of said generally vertical corrugated fins.

Re. 33,027

ENGINE IDLING SPEED CONTROLLING SYSTEM

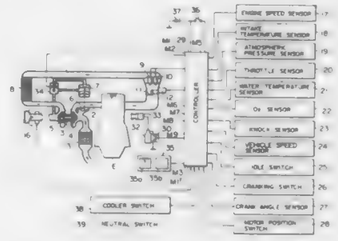
Yoshiaki Danno; Akira Takahashi; Kazumasa Iida; Toru Hashimoto; Yasukuki Okamoto, and Kenzo Nakao, all of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Original No. 4,580,535, dated Apr. 8, 1986, Ser. No. 740,226, Jun. 3, 1985. Application for reissue Apr. 7, 1988, Ser. No. 178,903

Claims priority, application Japan, Jun. 8, 1984, 59-117498; Apr. 1, 1985, 60-68677

Int. Cl.[4] F02B *41/16*

U.S. Cl. 123—339 14 Claims



1. An engine idling speed controlling system including:

a stopper member for restricting a stop position on a closing side of a throttle valve mounted in an intake passage of an engine;

an actuator for actuating said stopper member to change said closing side stop position to thereby control the opening of the throttle valve;

a throttle position sensor for detecting an opening of the throttle valve;

an engine speed sensor for detecting the number of revolutions of the engine;

a first idling speed control means for comparing a detected signal from said engine speed sensor with a target idling speed of the engine when the throttle valve is under control by said actuator and providing to the actuator a first idling control signal obtained from the result of said comparison;

a second idling speed control means for comparing a detected signal from said throttle position sensor with a target idle opening of the throttle valve when the throttle valve is under control by said actuator and providing to the actuator a second idling control signal obtained from the result of said comparison;

an operation control means for controlling the operation of said first idling speed control means and that of said second speed control means; and

a correction value learning means for learning a correction value for said second idling control signal on the basis of a detected signal from said throttle position sensor during operation of said first idling speed control means,

said correction value learning means being constructed so as to determine as said correction value both a long-time correction value based on a cumulative evaluation of detected signals from said throttle position sensor during operation of said first idling speed control means and a just-previous correction value based on the newest detected signal from said throttle position sensor during operation of said first idling speed control means, and said second idling speed control means being constructed so as to receive the long-time correction value and just-previous correction value

determined by said correction value learning means and obtain said second idling control signal in order to reflect the learning results of said correction value learning means in said second idling control signal.

Re. 33,028

ELECTROPNEUMATIC TRANSDUCER SYSTEM

Donald C. Simpson, Norton, Mass., assignor to Dresser Industries, Inc., Dallas, Tex.

Original No. 4,527,583, dated Jul. 9, 1985, Ser. No. 513,162, Jul. 12, 1983. Application for reissue Jul. 8, 1987, Ser. No. 70,957

Int. Cl.[4] F15B *5/00*; G05D *23/00*

U.S. Cl. 137—82 **55 Claims**



19. In a pneumatic system having a chamber which is in fluid communication with a source of pressurized gas, an outlet orifice, and an outlet conduit whose internal pressure is a function of the flow of fluid through said outlet orifice, a control system, comprising:

comparison means having two inputs and one output;

signal supplying means, connected to one input of said comparison means, for supplying a first electrical signal characteristic of the pressure to be maintained within said outlet conduit;

amplifier means having at least one input, and an output which is connected to the other input of said comparison means;

electro-pneumatic means, defining a bridge of piezo-resistors whose resistance varies in response to the pressure within said outlet conduit, for supplying a second electrical signal which is a characteristic of the actual pressure within said outlet conduit, said electro-pneumatic means being coupled to the input of said amplifier means;

voltage sensitive nozzle flapper means responsive to the output of said comparison means and mounted adjacent the outlet orifice for regulating the flow of fluid out of the outlet conduit;

an isolation circuit connected between the output of said comparison means and said voltage sensitive flapper means to provide galvanic isolation for said voltage sensitive flapper means;

voltage supply means for supplying voltage to said electro-pneumatic means; and

means coupled to the output of said amplifier means for supplying a voltage signal to a corner of said bridge of piezo-resistors.

Re. 33,029

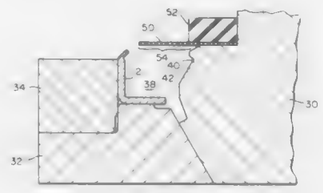
MOLDED LIP SEAL WITH POLYTETRAFLUOROETHYLENE LINER AND METHOD FOR MAKING SAME

Dean R. Bainard, Clover, S.C., and Dennis N. Denton, Besemer, N.C., assignors to Garlock, Inc., Longview, Tex.

Original No. 4,239,243, dated Dec. 16, 1980, Ser. No. 27,003, Apr. 4, 1979. Continuation of Ser. No. 571,154, Jan. 18, 1984, abandoned, which is a continuation of Ser. No. 345,735, Feb. 4, 1982, abandoned. Application for reissue May 15, 1985, Ser. No. 734,255

Int. Cl.[4] F16J *15/32*

U.S. Cl. 277—153 **22 Claims**



1. A shaft seal *of the molded lip type* comprising an annular elastomeric body having a molded *sealing* lip, and said molded *sealing* lip having bonded thereto a hydraulically formed liner of uniform thickness of sintered polytetrafluoroethylene, *said liner having been shaped by deformation of a portion thereof into a lip-shaped groove or recess.*

Re. 33,030

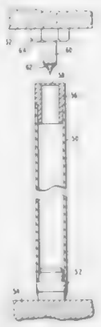
SELF RUPTURING GAS MODERATOR ROD FOR A NUCLEAR REACTOR

George R. Marlatt, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Original No. 4,371,495, dated Feb. 1, 1983, Ser. No. 228,007, Jan. 23, 1981. Continuation of Ser. No. 568,458, Jan. 5, 1984, abandoned. Application for reissue Feb. 5, 1986, Ser. No. 827,172

Int. Cl.[4] G21C *7/26*

U.S. Cl. 376—209 **5 Claims**



5. A nuclear reactor comprising:

a plurality of fuel assemblies, each of said assemblies having top and bottom nozzles with fuel rods and control rod guide tubes interposed between, said top nozzles having lower adaptor plates, and said bottom nozzles having upper surfaces;

at least one gas-filled tube in a portion of said assemblies, said gas-filled tube having a bottom end and a top end, said gas-filled tube extending substantially the full length of said assembly and having said bottom end resting on said upper surface of said bottom nozzle, and said gas-filled tube comprising material which will axially expand during reactor operation;

a pointed piercing device immovably mounted in said lower adaptor plate of said top nozzle and having its point directed downwardly toward said top end of said gas-filled tube, the point on said piercing device and said top end of said gas-filled tube being spaced a distance equal to the amount said gas-filled tube will expand during operation in a reactor, minus a distance sufficient for said piercing device to pierce said top end of said gas-filled tube and permit the gas therein to be displaced by water coolant circulating through the reactor.

Re. 33,031

METHOD FOR SIMULTANEOUSLY SCRUBBING CEMENT KILN EXHAUST GAS AND PRODUCING USEFUL BY-PRODUCTS THEREFROM

Garrett L. Morrison, Unity, Me., assignor to Passamaquoddy Tribe, A Sovereign Indian tribe recognized by the Government of The United States of America, Perry and Princeton, Me.

Original No. 4,716,027, dated Dec. 29, 1987, Ser. No. 904,719, Sep. 5, 1986. Continuation-in-part of Ser. No. 890,991, Jul. 25, 1986, which is a continuation-in-part of Ser. No. 796,075, Nov. 7, 1985, abandoned. Application for reissue Mar. 4, 1988, Ser. No. 164,771

Int. Cl.[4] C01B *17/16, 21/00, 17/00*

U.S. Cl. 423—225 **26 Claims**

12. A method of simultaneously scrubbing acidic oxides of sulfur, nitrogen and carbon from the hot exhaust stream from a cement kiln or boiler and utilizing acids derived therefrom to produce useful products from cement kiln dust containing as solids carbonates and oxides of alkali and alkaline earth metals along with insoluble silicates, aluminates and iron compounds, which comprises

(a) mixing said dust with water to form a slurry comprising the undissolved components and a solution of the soluble components in said dust, and

(b) reacting said gas stream with said slurry whereby

said acidic oxides contained in said stream will react with water to produce acids,

the latter will react with said carbonates and oxides of alkali and alkaline earth metals to yield a solution of alkali and alkaline earth metal salts comprising principally the cationic components, calcium, potassium, magnesium and sodium, and anionic components, carbonate, sulfate and nitrate, and a precipitate of alkali and alkaline earth metal salts with insoluble silicates, aluminates and iron compounds,

the gas of said gas stream after contact with said slurry emerging as scrubbed exhaust.

Re. 33,032

POLYCARBONATE FILMS OF LOW FLAMMABILITY AND IMPROVED STRESS CRACK RESISTANCE

Rudolf Binsack, Krefeld; Joachim Wank, and Eckart Reese, both of Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Original No. 4,214,062, dated Jul. 22, 1980, Ser. No. 875,014, Feb. 3, 1978. Application for reissue Nov. 16, 1987, Ser. No. 121,207

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1977, 2706126

Int. Cl.[4] C08K *5/42*

U.S. Cl. 524—165 **18 Claims**

1. [Polycarbonate films,] *A glass fiber-free polycarbonate film having a thickness of about 0.01 mm to 1 mm comprising an aromatic linear polycarbonate resin* characterized in that [they contain] *it contains* about 0.01% by weight to 2% by weight of a NH_4 salt, alkali metal salt or alkaline earth metal salt of a perhalogenoalkanesulphonic acid.

Re. 33,033

PROCESS FOR THE PREPARATION OF HMG-COA REDUCTASE INHIBITORS INTERMEDIATES

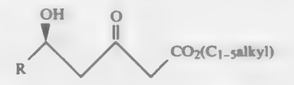
Joseph E. Lynch, Plainfield; Ichiro Shinkai, Westfield, and Ralph P. Volante, East Windsor, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Original No. 4,611,081, dated Sep. 9, 1986, Ser. No. 752,323, Jul. 5, 1985. Application for reissue Sep. 18, 1987, Ser. No. 98,171

Int. Cl.[4] C07C *69/74*

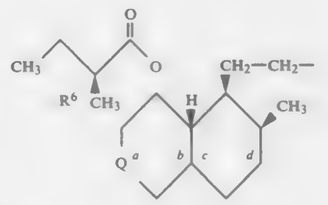
U.S. Cl. 560—53 **6 Claims**

1. A process for the preparation of a compound represented by the following general formula (I):



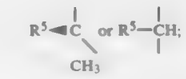
(I)

wherein R is:



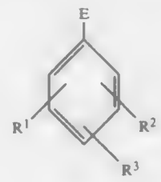
(A)

wherein Q is



R^5 is H or OH;

R^6 is hydrogen or methyl; and a, b, c, and d represent optional double bonds, especially where b and d represent double bonds or a, b, c and d are all single bonds; or



(B)

wherein

E is —C═CH— or —CH_2CH_2—; and

R^1, R^2 and R^3 are each selected from halo such as chloro, bromo or fluoro,

C_{1-4}alkyl,

C_{1-4}haloalkyl,

phenyl

phenyl with one or more substituents independently selected from halo,

C_{1-4}alkyl, and

C_{1-4}alkoxy, or

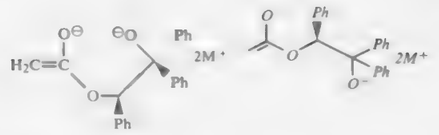
R^4O in which R^4 is phenyl, halophenyl, or substituted phenyl-C_{1-3}alkyl wherein the substituents are selected from halo and C_{1-4}haloalkyl;

which comprises:

(1) reacting a compound of the formula (II)

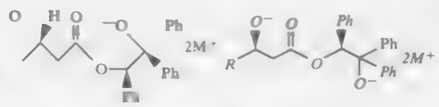
RCHO (II)

wherein R is defined above, with the enolate of [(R)-2-acetoxy-1,2,2-triphenylethanol] *(S)-2-acetyloxy-1,1,2-triphenylethanol* of the formula (III)



(III)

wherein M^+ is a cation derived from sodium, potassium, lithium, magnesium, or zinc, to afford a compound of the formula (IV)



(IV)

wherein R and M^+ are defined above; and

(2) reacting the compound of the formula (IV) with the enolate of a C_{1-5}alkylacetate, followed by mild acid hydrolysis to obtain the compounds of the formula (I).

PLANT PATENTS

GRANTED AUGUST 22, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,991
PLUM TREE, "DEL REY SUN"

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to Metzler Investments and Metropolitan Life Insurance Company, both of Del Rey, Calif.

Filed Aug. 22, 1988, Ser. No. 234,890

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree substantially as illustrated and described and which is characterized principally as to novelty by bearing fruit which are uniformly shaped and have an attractive black skin color and which further ripen for harvesting and shipment approximately June 15 through June 20 in the San Joaquin Valley of Central Calif., the subject variety maturing in that period of the season approximately midway between the Black Beaut Plum (U.S. Plant Pat. No. 3,617) and the earliest harvesting date of the Santa Rosa Plum Tree (unpatented) at Del Rey, Calif., and which further has a tough skin and a firm yellow flesh, the fruit of the new variety of plum tree having an excellent flavor and exceptional handling and shipping characteristics.

6,992
PEACH TREE "MAY SUN"

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to Metzler Investments and Metropolitan Life Insurance Company, both of Del Rey, Calif.

Filed Aug. 22, 1988, Ser. No. 234,618

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described and which is somewhat similar to the June Lady Peach Tree (U.S. Plant Pat. No. 3,022), from which it was derived as a chance seedling but from which it is distinguished therefrom and characterized as to novelty by bearing fruit which are ripe for commercial harvesting and shipment approximately May 20 through May 25 at Del Rey, Calif., and which further displays the desirable trait of being responsive to the cultural practice of girdling and produces fruit having desirable handling and shipping characteristics.

6,993
RED MAPLE NAMED WANDELL

Willet N. Wandell, Rte. #1, Box 286, Oquawka, Ill. 61469

Filed Feb. 19, 1988, Ser. No. 157,944

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct variety *Acer rubrum* named 'Wandell' as described and illustrated herein that differs from all other varieties by the unique combination of (1) brilliant scarlet fall color; (2) leaves all turning color at the same time in the fall; (3) leaves turning color earlier in the fall than other red maples, not affected by early fall frosts; (4) leaves that are smaller than the species; (5) abundant leaf population within the canopy; (6) petioles that are stout, holding the leaves flat and upright so that the visual impact of fall color is enhanced, even in windy conditions; (7) branches and twigs ascending at first, then arching downward, forming a graceful appearance and fully displaying the leaves; (8) a pyramidal growth habit; (9) later leaf emergence in the spring than other red maples, not affected by late spring frosts; and (10) the limbs of young trees are able to grow into and fill in gaps in the crown so that more branches and higher leaf populations are accommodated.

6,994
GERANIUM PLANT NAMED KLEFISALL

Siegfried Klemm, Stuttgart, Fed. Rep. of Germany, assignor to Klemm & Sohn, Stuttgart, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,398

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new geranium cultivar, substantially as herein shown and described, characterized by its abundant production of umbel-formed clusters of large florets and the red coloration of the flowers.

6,995
GERANIUM PLANT NAMED KLEFICE

Siegfried Klemm, Stuttgart, Fed. Rep. of Germany, assignor to Klemm & Sohn, Stuttgart, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,399

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinctive cultivar of geranium, substantially as herein shown and described, particularly characterized by the Tyrian purple coloration of the flower mass of each cluster and the large size of the individual florets, each of which has a bright, shiny eye.

6,996
GERANIUM PLANT NAMED MANEPI

Siegfried Klemm, Stuttgart, Fed. Rep. of Germany, assignor to Klemm & Sohn, Stuttgart, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,404

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinctive geranium cultivar, substantially as herein shown and described, distinguished by the very large size of its red florets, closely grouped to provide brilliant umbel-formed clusters.

6,997
GERANIUM PLANT NAMED MARELI

Siegfried Klemm, Stuttgart, Fed. Rep. of Germany, assignor to Klomm & Sohn, Stuttgart, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,402

Int. Cl.[4] A01H *5/02*

U.S. Cl. Plt.—68 **1 Claim**

1. The new variety of geranium plant, substantially as herein shown and described and particularly distinguished by the very large size of its flower clusters and the light pink coloration of the individual florets.

6,998
AFRICAN VIOLET PLANT NAMED NANCY

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 251,260

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of african violet named Nancy, as described and illustrated, and particularly characterized by its single, large pink flowers with wavy edges and darker center radiating into the 2 small petals; strong, upright flower stems that curve slightly toward the center to form a compact bouquet above the leaves, dark green slightly serrated leaves, profuse flowering, vigorous growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

6,999

CHRYSANTHEMUM PLANT NAME HEKLA

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Sep. 22, 1988, Ser. No. 247,658
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct chrysanthemum plant named Hekla, as described and illustrated.

7,000

CHRYSANTHEMUM PLANT NAMED CORAL CHARM

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Sep. 22, 1988, Ser. No. 247,523
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—80 1 Claim

1. A new and distinct chrysanthemum plant named Coral Charm, as described and illustrated.

PATENTS

GRANTED AUG. 22, 1989

ERRATA

For CLASS	See PATENT NO.
119-019	4,858,552
562-074	4,859,372
562-119	4,859,373
562-102	4,859,374
250-231	4,860,051

PATENTS

GRANTED AUGUST 22, 1989

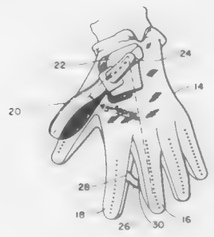
GENERAL AND MECHANICAL

4,858,245
ARMORED GLOVE FINGERS
Thomas M. Sullivan, 3953 Oregon St., San Diego, Calif. 92104, and Edward A. Coppage, Jr., 3031 Borge St., Unit 109, Oakton, Va. 22124
Filed May 19, 1988, Ser. No. 195,863
Int. Cl.[4] A41D *19/00, 19/02*
U.S. Cl. 2—21 22 Claims



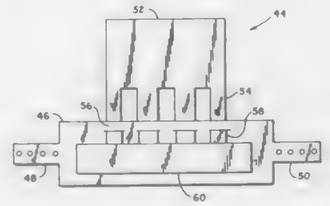
14. An armored glove finger comprising a tubular, seamless fabric element having an open end and an end closed with a seam, said tubular, seamless fabric element being adapted to receive a human finger therein through said open end with the tip of said finger substantially abutting said closed end and said seam disposed over the fingernail of said finger, said tubular, seamless fabric element comprising a first fiber of about 100 to about 650 denier, said first fiber comprising at least one yarn having a tensile strength in excess of about 120,000 psi; and a fabric reinforcement patch disposed proximate said closed end of said tubular, seamless fabric element on the interior of said tubular, seamless fabric element and fixed thereto so as to substantially cover at least the fingertip of a finger received within said tubular, seamless fabric element, said fabric reinforcement patch comprising a yarn having a tensile strength in excess of about 120,000 psi and of 650 denier; said tubular, seamless fabric element having said first fiber disposed in interlocked loops in two substantially perpendicular directions; said fabric reinforcement patch having said yarn of 650 denier being disposed in two interwoven substantially perpendicular directions; said two substantially perpendicular directions of said first fiber being disposed at an angle to said two substantially perpendicular directions said yarn of 650 denier.

4,858,246
GOLF GLOVES FOR IMPROVED GRIPPING
Charles W. Wiggins, 5008 N. Lake Hill Rd., Delaware, Ohio 43015
Filed May 29, 1987, Ser. No. 55,470
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—161 A 6 Claims



1. An improved golf glove which binds the golfer's hands together in order that the gloved accuracy hand and the opposing power hand work as one unit, comprising:
a binding means forming a loop attached to the dorsal portion of the glove at the wrist band being approximately two centimeters in width and of substantially sufficient size to permit the thumb of the opposing power hand to pass thru said loop while gripping the golf club,
said binding means being attached at an angle of approximately forty-five degrees from the middle finger of the glove with said angle being toward the thumb of said glove so as to hold the base of the thumb of the opposing power hand securely in place during the golf swing while also exerting pressure on the inner surface of the thumb of the opposing power hand forcing the wrist of the opposing power hand to roll in unison with the wrist of the gloved accuracy hand during the golf swing,
said binding means being substantially adjustable by way of an adjustment means,
said adjustment means allowing for enlargement or diminution of the size of said loop so as to permit varying thumb positions to be utilized while gripping the handle of the golf club, and
a second binding means being approximately one centimeter in width forming a loop attached approximately midway between the dorsal inner surface of the first finger of the glove and the adjacent palmar inner surface of the second finger of said glove for use by golfers who use the interlocking grip method, being of substantially sufficient size to permit the fourth finger of the opposing power hand to pass thru said second binding means and be secured to the gloved accuracy hand while permitting varying positions of the fourth finger of the opposing power hand, whereby a golfer can grip and swing the golf club with more consistency.

4,858,247
CAP SHAPE SUPPORTS
Donald L. Hooser, 1599-½ Hillcrest Rd., Fairmont, W. Va. 26554
Filed Jan. 19, 1988, Ser. No. 145,548
Int. Cl.[4] A42B *1/02*
U.S. Cl. 2—185 B 1 Claim



1. A cap shaped retaining structure comprising:
first support means selectively and adjustably formable into a closed loop within an interior peripheral portion of a cap;
first attachment means for holding said first support means in said closed loop, thereby to retain said cap in a conforming shape;
and
second support means attached to said first support means, said second support means extending upwardly from said first support means when said first support means is positioned within said interior peripheral portion of said cap,

said second support means serving to support a forward portion of said cap in said conforming shape,

and

wherein said second support means is removably attached to said first support means,

and

further including second attachment means, said second attachment means being utilized to attach said second support means to said first support means,

and

wherein said second support means includes a plurality of downwardly extending arms integrally attached thereto, said second attachment means forming a part of said downwardly extending arms,

and

wherein said downwardly extending arms are positionable through a plurality of loops formed on said first support means,

and

wherein said second attachment means comprises hook and loop fastening means,

and

further including sweat band means removably attachable around an inner peripheral portion of said first support means, said sweat band means also functioning as a part of said second attachment means.

4,858,248

COMBINED HAT AND EARPHONES DEVICE

Steven E. Goldsmith, 1344 Taft Rd., Teaneck, N.J. 07666, and Joseph M. Santi, 217 E. 33rd St., New York, N.Y. 10016

Filed Feb. 5, 1988, Ser. No. 152,758
Int. Cl.[4] A42B *1/04, 1/20, 1/24*
U.S. Cl. 2—209.1 7 Claims



6. A combined hat and earphones device, comprising:

a flexible hat positionable over the head and ears of a person;

and

a pair of earphones integrally and inconspicuously connected to lower portions of the hat such that the earphones will be held adjacent to the person's ears when the hat is being worn,

said hat comprises a knitted member having a substantially tubular shape with a lower end of the tube folded over to define a cuff and an upper end closed by stitching; and

said earphones being held in position within opposing sides of portions of the cuff by a retaining means so that the earphones are substantially hidden from view.

4,858,249

SHOULDER STRAP FASTENING DEVICE

Deborah L. Stewart, 14 Elm St., Acton, Mass. 01720

Filed Oct. 6, 1988, Ser. No. 254,250
Int. Cl.[4] A41F *19/00*; A44B *18/00*
U.S. Cl. 2—305 5 Claims

1. A shoulder strap organizer for use on garment shoulder straps comprising:

a single elongated strip having a length slightly longer than twice the outside edge separation of garment shoulder straps with which said organizer is intended to be used;

a first length of hook and pile release-fastening material of one fastening type bolded to a first side of said strip in a central region thereof;

second and third lengths of release-fastening material of a type mating with said one fastening type and bonded to said first side of said strip at opposing ends thereof and separated from said first length by a distance sufficient to permit 180 degree flexing of said strip between said first length and said second and third lengths respectively;



said first, second, and third lengths adapted for attaching said single strip to said first and second straps in such a manner that first and second loops are formed by mating said first length to said second and third lengths respectively, each loop encompassing a respective one of said first and second shoulder straps;

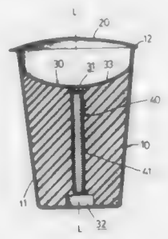
said first, second and third lengths being further adapted for tightening shoulder straps by adjusting said strip without movement of said strip up or down.

4,858,250

DISPOSABLE SANITARY SPITTOON

Chin C. Lee, No. 10, Nan-I Lane, Changshow Rd., Feng Yuean City, Taiwan

Filed Nov. 15, 1988, Ser. No. 271,287
Int. Cl.[4] A61J *19/00*
U.S. Cl. 4—258 1 Claim



1. A disposable sanitary spittoon comprising:

a spittoon container having an open upper end:

a cover removably mounted on said container to close said open upper end;

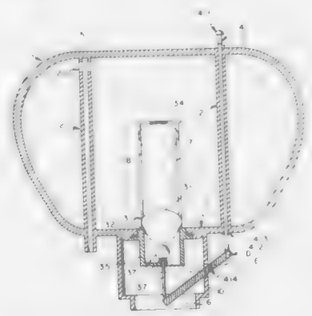
a molded block disposed within said container, said molded block having a concave upper surface and being made of high molecular hydrophilic polymer for absorbing liquid, said block being formed with at least one through hole for receiving at least one respective tube therein and at least ione recess at a bottom thereof communicating with said at least one respective tube; said tube being made of plastic or paper and being provided with cilia on an interior surface thereof, respective lengths of said cilia gradually increasing with respect to the downward direction of said tube.

4,858,251

PRESSURIZED WATER CISTERN WITH FLOATING VALVE

Alfredo de Belaunde, Avenida Pardo 975, Depto. 502, Miraflores, Lima 18, Peru

Filed Nov. 17, 1987, Ser. No. 121,559
Int. Cl.[4] E03D *3/10, 1/35*
U.S. Cl. 4—358 4 Claims



1. A pressurized flushing cistern for a water closet comprising a container with a bottom discharge opening, a liquid inlet conduit for admitting liquid into the container, the inlet conduit having an outlet disposed within the container at an upper portion of the container, an opening having an outlet valve seat connecting a lower portion of the container to the discharge opening, a flushing valve for closing said valve seat, said flushing valve comprising a floating valve member disposed in a chamber, said floating valve member having a concentration of weight at the bottom end thereof, said chamber connected to the bottom discharge opening, said chamber comprising an elongate tripod guide having a cover on the top thereof and a manually operable activating means for unseating said flushing valve, said activating means for raising the floating valve member within said chamber, the activating means comprising an elongate stem including a knob on the top end thereof, the stem being disposed in a channel in the container so as to isolate the stem from the liquid, the knob being disposed on the outside of the upper end of the container, a pivoted lever arm that contacts the bottom end of the stem and is movable by the stem and an elongate lifter arm which on the bottom end thereof contacts the lever arm and is movable by the lever arm, the top end of the lifter arm contacting the floating valve member, said lifter arm having a spherical resetting weight on the top end thereof which contacts the floating valve member, wherein the elongate stem has a retainer ring at the bottom end thereof, said ring disposed between the outside bottom end of the container and the lever arm, said ring acting as a stop.

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TRIM ASSEMBLY

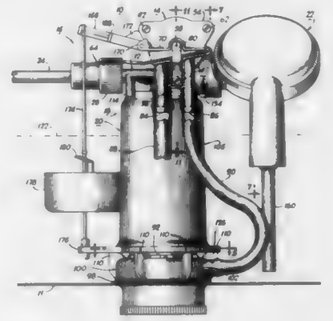
Dwight N. Johnson, Vista, Calif., assignor to Masco Corporation of Indiana, Taylor, Mich.

Filed Oct. 2, 1985, Ser. No. 783,079
Int. Cl.[4] E03D *1/06*
U.S. Cl. 4—368 24 Claims

7. A trim assembly for a water closet wherein said water closet includes a bowl, a water tank, a passage between said bowl and said tank, a trap in said bowl, and rim wash ports in said bowl, said trim assembly comprising:

a flush valve mounted in said tank,

said flush valve including a standpipe secured in said passage, a bell mounted over said standpipe, said bell and said standpipe define an inner annular flow path and an outer annular flow path, said inner annular flow path in communication with said passage, a jet ring secured to said standpipe, said jet ring including a plurality of jets in communication with said outer annular path, and means for directing high pressure fluid to said jet ring.

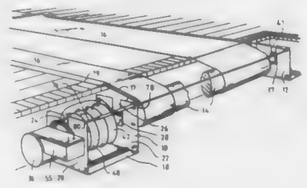


4,858,253

MECHANISM FOR EXTENDING AND RETRACTING SWIMMING POOL COVERS

Joe H. Lamb, 3500 Hillside La., Salt Lake City, Utah 84109

Continuation-in-part of Ser. No. 642,347, Aug. 20, 1984, abandoned. This application Feb. 4, 1986, Ser. No. 825,988
The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.
Int. Cl.[4] E04H *3/19*
U.S. Cl. 4—502 17 Claims



1. An apparatus for extending and retracting a cover comprising:

a support member, a rotatable drive shaft carried on said support member, a first and second tubular sleeve each circumscribing said drive shaft and being independently

freely rotatable, a cover-collecting drum, a means for fixing said cover-collecting drum to one end of said second tubular sleeve, a pair of cord-collecting reels circumscribing and being free wheeling about said first tubular sleeve, a means for selectively linking said pair of cord-collecting reels to said first tubular sleeve, and means fixed to said drive shaft for permitting rotation of said first tubular sleeve when said drive shaft is rotated in one direction and for permitting rotation of said second tubular sleeve when said drive shaft is rotated in other direction.

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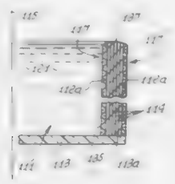
TUB APPARATUS

John M. Popovich, Los Angeles, and Roc V. Fleishman, Venice, both of Calif., assignors to Softub, Inc., Pacoima, Calif.

Continuation-in-part of Ser. No. 891,232, Jul. 30, 1986. This application Jan. 19, 1988, Ser. No. 145,233

Int. Cl.[4] A61H *33/02*

U.S. Cl. 4—542 **11 Claims**



1. A spa tube comprising,

(a) a multi-layered, upstanding insulative annular side wall having an inner and an outer surface, said side wall being formed from an outer-most sheet layer of foamed plastic sheet material followed by successive sheet layers of foamed plastic material, each successive foamed plastic sheet layer being applied to said outer sheet layer by winding in a spiral fashion about an axis passing through the center of the space enclosed by said side wall, successive foamed plastic sheet layers being fused together to form a unitary member,

(b) a reinforcing tensile liner defined by pre-stretched interwoven strips of plastic material, said liner extending about said axis and bonded to said foamed plastic sheet layers forming said group and at the innermost side thereof,

(c) a bottom wall made up of parallel sheets of foamed plastic fused together, the bottom wall being fused to the bottom of said side wall with said axis passing through said parallel sheets,

(d) a water impermeable plastic jacket covering said inner surface of said reinforcing line and overlying said bottom wall,

(e) and including ports extending through said side wall, liner and jacket, and water circulating means connected with said ports and including a pump for circulating water from and toward the interior of said tub.

4,858,255

HYDROTHERAPY APPARATUS HAVING PREHEATED AIR AGITATION FEATURE

William H. Haisman, Los Angeles, Calif., assignor to Premier Pump & Pool Products, Inc., Los Angeles, Calif.

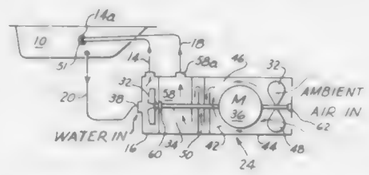
Continuation of Ser. No. 866,889, May 23, 1986, abandoned, which is a continuation of Ser. No. 685,310, Dec. 24, 1984, abandoned. This application Oct. 23, 1987, Ser. No. 113,174

Int. Cl.[4] A61H *33/02*

U.S. Cl. 4—544 **21 Claims**

1. In a hydrotherapy apparatus having a tub for containing a supply of heated water, a water pump for recirculating the heated water supply to and from the tub, a water pump motor for operating said water pump, and means for mixing ambient air into the heating water for air agitation thereof, the mixing means including a confined passage having a terminus in said means including a confined passage having a temperature tending to cool the heated water, the improvement comprising

said water pump motor including a fan coupled to be driven by said water pump motor when it operates said water pump, said fan including an outlet adapted to be connected to said means for mixing ambient air with water from said water pump,



said fan having as its inlet for ambient air a confined passage in thermal transfer relationship with said water pump motor whereby the heat generated by said water pump motor is introduced into the air moved by said fan past said water pump motor prior to mixing with water from said water pump.

4,858,256

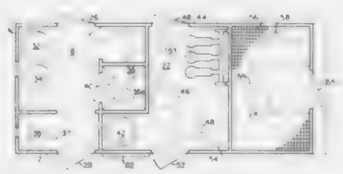
CHEMICAL EQUIPMENT DECONTAMINATION TRUCK

Jay Shankman, 48 Castle La., Holtsville,, N.Y. 11742

Filed Jul. 24, 1987, Ser. No. 77,243

Int. Cl.[4] A47K *3/22*

U.S. Cl. 4—597 **8 Claims**



8. A self-contained chemical and radiation decontamination and wash down highway transportable vehicle comprising first compartment means for receiving contaminated clothing of personnel, for showering said personnel to remove surface contaminants, and for blow drying said personnel prior to leaving said vehicle, second compartment means for housing the apparatus for the detergent ejection, water deluge and drying of said personnel in said first compartment means, third compartment means for conducting chemical and radiation decontamination of equipment carried by said personnel including means for subjecting said equipment to detergent ejection, water deluge and drying, said second compartment means separating said first compartment means from said third compartment means, means for filtering all waste liquids utilized in said first and third compartment means for removal of all detergents and chemical contaminants and returning the cleansed waste water for storage or removal of said water, means for bypassing said filtering means for discharging waste liquids contaminated by radiation, said third compartment means located at the rear of said vehicle, with access through the rear of said vehicle including a shelf of grating material shaped in the form of a U open to said rear access for convenient access to said equipment on said shelf, and nozzles both in the ceiling and the floor of said third compartment means for directing detergent and water deluge sprays at said equipment.

4,858,257

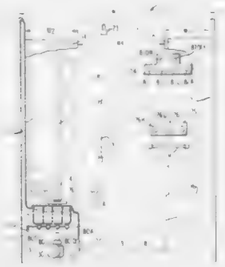
BODY BRUSH AND SHOWER STALL SYSTEM

David J. Bivens, 304 Clover La., Danville, Va. 24541

Filed Mar. 10, 1988, Ser. No. 166,348

Int. Cl.[4] A47K *7/04, 7/02*

U.S. Cl. 4—606 **17 Claims**



1. Body brush apparatus comprising, in combination,

a vertical drive shaft having upper and lower ends and a single bearing rotatably supporting said vertical drive shaft near its lower end in a substantially upwardly vertical position and a substantially horizontal wall surface supporting said single bearing,

an electrical drive motor, means which electrically insulatingly couple said electrical drive motor to said vertical drive shaft, means controlling the operation of said electrical drive motor so that said vertical drive shaft rotates at a predetermined speed in the speed range of greater than about 90 rpm to below about 120 rpm,

a single elongated body brush removably mounted coaxially over said upper end of said vertical drive shaft and having long soft flexible bristles which hang and droop downwardly at speeds below 90 rpm and which extend substantially horizontally when rotated at speeds above said about 90 rpm, and tend to shape their ends to conform to human body concavities and convexities,

vertical spray bar means for spraying a liquid on said elongated body brush at spaced points along the length thereof.

4,858,258

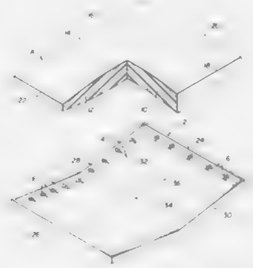
MATTRESS AND SUPPORTING STRUCTURE THEREFOR

Ned W. Mizelle, P.O. Box 5985, High Point, N.C. 27262

Continuation-in-part of Ser. No. 623,263, Jun. 21, 1984, abandoned. This application Apr. 22, 1987, Ser. No. 42,581

Int. Cl.[4] A47C *19/12, 17/04, 27/00*

U.S. Cl. 5—12 R **6 Claims**



1. A sleeping unit, comprising, a flexible deck for supporting a mattress, said deck having a perimeter comprising two sides, a head and a foot, said deck having an upper mattress supporting surface which in transverse planes is convex and in longitudinal planes is concave, said longitudinal concavity being greatest at the sides of the mattress supporting surface and decreasing progressively toward the center of the mattress supporting surface, said transverse convexity being greatest in a midportion of the deck and decreasing progressively toward the head and foot of the deck, said mattress supporting surface having a longitudinal centerline which is concave,

a foldable frame which surrounds the perimeter of said deck, said frame having a horizontal head rail, a horizontal foot rail and two side rails; connecting means of the frame for subjecting the flexible deck to substantially horizontal tensile forces in longitudinal and transverse directions to give the mattress supporting surface its said concavity and convexity when there is no vertical load on the deck, said substantially horizontal tensile forces in transverse directions being disposed along lines which are concave and lie in vertical longitudinal planes on opposite sides of the deck,

a mattress having a perimeter comprising a pair of longitudinal edges and a pair of transverse edges, said mattress having an upper surface which is generally smooth in the respect that it has no localized depressions and no localized protrusions for accommodating the anatomy of a person sleeping thereon, said mattress having an area of maximum thickness at a location which is spaced inwardly from said transverse edges and is positioned over said longitudinal centerline to provide an enhanced cushioning effect, said perimeter including an area of minimum thickness of the mattress, said mattress having a taper which extends from said area of maximum thickness to said area of minimum thickness, said mattress having a lower surface which is supported on and conforms to the mattress supporting surface of the deck.

4,858,259

THERAPY PILLOW WITH REMOVABLE THERAPEUTIC GEL PACK

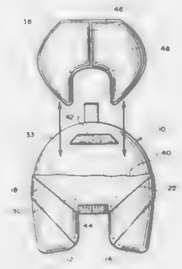
Ethel D. Simmons, #301, 811 S. Bedford St., Los Angeles, Calif. 90035, and Lee Kudrow, 16542 Ventura Blvd., Encino, Calif. 91436

Continuation of Ser. No. 2,052, Jan. 12, 1987, Pat. No. 4,783,866. This application Jun. 24, 1988, Ser. No. 211,028

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.[4] A47G *9/00;* **A61F** *7/00*

U.S. Cl. 5—441 **5 Claims**



1. A therapy pillow for treating headaches comprising;

a cushioned pillow filled with a soft resilient material having a pair of extensions forming a substantially U-shape;

a pair of extensions constructed to fit around the back and a portion of the sides of a human neck;

a pocket formed on at least one side of said pillow covering a substantial portion of said pillow and extending to near

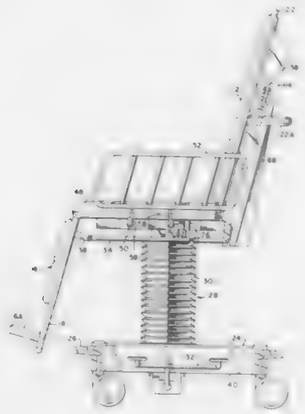
the end and in-seams to cover a substantial portion of said extensions;
said pocket constructed to provide intimate contact over nearly the entire occipital region of a human head resting on said cushioned pillow when said extensions are around the neck;
flexible plastic container means shaped to fit said pocket, said plastic container means being filled with a solution formulated to retain hot or cold temperatures for a substantial period of time;
said flexible plastic container means being constructed to provide an even distribution of solution to the occipital region on both sides of a human head;
said pocket having an opening accessible from one side for insertion of said flexible plastic container means with the heated or chilled solution, said opening being covered by a flap on said pocket;
closure means for closing and securing said pocket flap after insertion of said flexible plastic container means;
whereby said pillow can be used to effectively treat headaches by providing intimate cushioned contact over nearly the entire occipital region of a human head resting on said pillow.

4,858,260

PATIENT TRANSPORT APPARATUS INCLUDING TRENDELENBURG MECHANISM AND GUARD RAIL

Raymond A. Failor, Seville; Eugene Hayton, Medina, and Mark Reuter, Chippewa, all of Ohio, assignors to Hausted, Inc., Medina, Ohio

Filed Mar. 11, 1988, Ser. No. 166,675
Int. Cl.[4] A61G *7/00*
U.S. Cl. 5—67 13 Claims



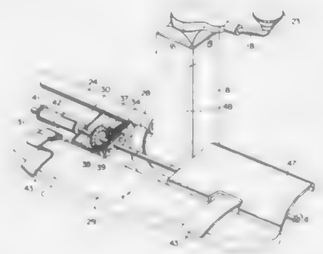
1. An apparatus for supporting a person comprising:
a seat assembly;
a backrest assembly;
means for pivotably mounting said backrest assembly adjacent to said seat assembly;
a support member secured to said backrest assembly, said support member being extensible or contractible depending upon the direction of rotation of said backrest assembly with respect to said seat assembly;
means for locking said support member at a selected length;
first stop means for preventing said backrest assembly from rotating beyond a recline position wherein an upper surface thereof is substantially coplanar with respect to an upper surface of said seat assembly;
actuating means for unlocking said support member, thereby allowing said support member to expand or contract, said actuating means including means for moving said first stop means to a first or a second position as it unlocks said support member, said first stop means preventing rotation of said backrest assembly beyond said recline position when in said first position, but not prevening such rotation when in said second position.

4,858,261

MOVABLE BED VEHICLE

Tadashi Iura, Ehime, Japan, assignor to Hoxan Corporation, Chuo-ku Sapporo, Japan

Continuation of Ser. No. 590,745, Mar. 19, 1984, abandoned.
This application Sep. 30, 1987, Ser. No. 102,607
The portion of the term of this patent subsequent to Jul. 22, 2004, has been disclaimed.
Int. Cl.[4] A61G *7/08*
U.S. Cl. 5—81 B 2 Claims



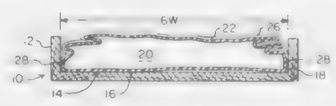
1. A movable bed vehicle comprising a truck having rolling wheels with low centroid, a post erected at the longitudinal intermediate position at one side of lateral direction of said vehicle, an elevator provided adjustably at said post in such an elevationally movable manner, a bed frame having a longitudinal length at said elevator and a bed mattress and mounted directly above said truck, a normally and reversely rotatably rotational shaft provided along longitudinal direction of the bed frame and rotating by a handle in a space at the elevator side of said bed frame, a plurality of strips provided at a plurality of longitudinal positions of the shaft for towing a movable sheet on said mattress to said elevator side by normally taking up said strips, and another strips for towing the movable sheet until said elevator is extended to the opposite side from said mattress by the reverse rotation.

4,858,262

CONFINED LIQUID FLOTATION MATTRESS

Stanley K. Anderson, 3000 Broadway, #9, Boulder, Colo. 80302

Filed Oct. 10, 1986, Ser. No. 917,792
Int. Cl.[4] A47C *27/08*
U.S. Cl. 5—451 19 Claims



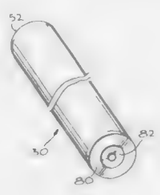
1. A confined liquid mattress for providing a reclining adult user with a substantially true, total body flotation experience with substantially unrestricted movement, said mattress having a bottom wall having an effective length and an effective width dimension, and effective sidewalls for providing an effective depth dimension and a top wall having an effective length dimension and an effective width dimension, said mattress being designed and adapted to be contained within a generally rectangular support structure having a substantially planar bottom and adapted to be usable in an isolating enclosure, wherein the improvement comprises:
said mattress having a generally rectangular shape when contained within a generally rectangular support structure having a substantially planar bottom, said mattress not requiring a connection to such a support structure in order to provide an adult user with a true flotation experience;
said effective length dimension of said top wall of said mattress being substantially greater than the effective length dimension of said bottom wall, and said effective width dimension of said top wall being substantially greater than the effective width dimension of said bottom wall, said combined length and width dimensions of said top wall being sufficient to provide a total top wall area which can completely yield beneath and completely conform to a reclining adult user's entire body without said top wall itself providing any support to any portion of such a reclining adult user's body to thereby provide an adult user with a true flotation experience; whereby when said mattress is contained within a generally rectilinear support structure having a substantially planar bottom and is filled with confined liquid to its effective depth, and an adult user reclines on said top wall, a sufficient amount of said top wall is displaced by such an adult user's body to in turn displace a volume of liquid within said mattress which will be equal to such an adult user's weight so that such an adult user will experience a true, body flotation experience without said top wall of the mattress or any portion of a support structure for the mattress providing any support to any portion of such an adult user's body, and wherein further an adult user's movement, will not be restricted by said mattress and will not be restricted by any portion of such a support structure.

4,858,263

CELLULAR WATERBED COMPONENT AND BED CONTAINING SAME

Angel M. Echevarria, 5416 La Crescenta Ave., and Michael A. Echevarria, 3550 Altura Ave., both of La Crescenta, Calif. 91214

Continuation of Ser. No. 426,956, Sep. 29, 1982, Pat. No. 4,619,007. This application Mar. 31, 1986, Ser. No. 846,221
The portion of the term of this patent subsequent to Oct. 28, 2003, has been disclaimed.
Int. Cl.[4] A47C *27/08;* B65B *7/00*
U.S. Cl. 5—451 16 Claims



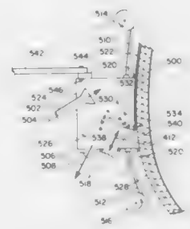
1. In a fluid flotation sleeping surface construction having an interior cavity and wherein a plurality of separate liquid containers are adapted to be disposed within the cavity, the improvement comprising a plurality of liquid containers disposed therein, each liquid container comprising an elongated tubular member closed at both ends, each end having an end piece affixed thereto in sealing relationship, the elongated tubular member being seamless between its ends, each end of the tubular member being formed to establish a smooth, wrinkle-free surface to which the end piece is attached by resort to a disassembleable thin annular backing member constructed of at least two pieces which is positioned within the container, one of said end pieces defining a fill opening which is substantially smaller than the lateral extent of the annular backing member when it is assembled but through which the individual pieces of the backing member, when disassembled, may be removed.

4,858,264

ULTRASONIC ASSISTED PROTECTIVE COATING REMOVAL

Theodore J. Reinhart, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 902,554, Sep. 2, 1986, abandoned. This application Oct. 5, 1988, Ser. No. 253,994
Int. Cl.[4] A47L *13/08*
U.S. Cl. 15—93 R 20 Claims



1. Vibratory mechanical energy apparatus for removing hardened tenacious polymeric resin coatings from the exterior of an aircraft with minimal damage to the smooth and fragile flight surfaces of the aircraft comprising the combination of:
a coating engagement tool member having a shaped working edge portion engageable in large kinetic energy transferring compression, impacting, scraping, and shearing relationships with a work area region of said aircraft polymeric coating and in low energy transferring sliding relationship with said smooth and fragile underlying aircraft flight surfaces;
a source of vibratory motion mechanical energy fixedly connected with said tool member and connected with an exciting source therefor, said vibratory motion mechanical energy source having an ultrasonic vibration frequency of at least twenty kilohertz and imparting movement at said frequency to said tool member along an axis having predetermined alignment with respect to said working edge portion thereof;
coating layer presence sensing means for sensing the absence of a coating immediately adjacent said working edge portion; and
means responsive to for urging said tool member working edge into moving continuing travel contact with a receding removed coating edge of said polymeric coating as removal progresses.

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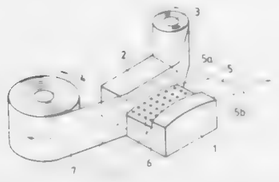
CLEANING APPARATUS FOR MAGNETIC TAPE

Akihiro Suzuki, and Akira Takagi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 21, 1988, Ser. No. 247,209
Claims priority, application Japan, Sep. 21, 1987, 62-234952
Int. Cl.[4] G11B *3/58;* B08B *11/00*
U.S. Cl. 15—100 6 Claims

1. A cleaning apparatus for magnetic tape, comprising:
(a) air bearing guide means for floating a magnetic tape transported thereon;
(b) strip-like cleaning means positioned at a side of said guide and making contact with at least one edge of said magnetic tape;

(c) magnet means for urging said edge of said tape into close contact with said strip-like cleaning means; and



(d) driving means for transporting said strip-like cleaning means with a predetermined speed.

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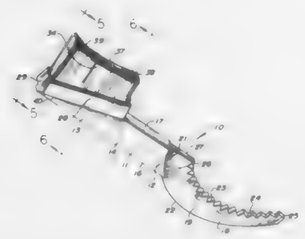
BICYCLE TOOL

Arthur B. Engstrom, Maplewood, Minn., assignor to Bicycle Tools, Incorporated, St. Paul, Minn.

Filed May 31, 1988, Ser. No. 200,545

Int. Cl.[4] A47L *13/06*

U.S. Cl. 15—111 **8 Claims**



1. A bicycle cleaning tool for cleaning a bicycle and the components thereof, the bicycle being susceptible to the collection of extraneous material such as dirt and grit, comprising

an elongate bar having a prong end and a brush end,

a prong integrally connected to said prong end of said bar and having a pair of convex and concave opposing edges, said concave edge including a plurality of projecting teeth having sharp points for biting into and digging out dirt and grit from a bicycle, said prong being curved and tapering away from said prong end of said bar so that said prong and teeth conform to curved bicycle components for penetrating into and prying dirt from generally inaccessible areas of a bicycle, and

a brush removably affixed to said brush end of said bar, said brush being disposed obliquely in relation to said bar, said brush brushing dirt and grit from a bicycle, whereby after said prong digs out dirt and grit from a bicycle component, said brush brushes the dirt and grit from the bicycle component.

4,858,267

APPARATUS FOR WET CLEANING IN PARTICULAR WINDOW PANES

Henry M. Unger, 24, Sunset Dr., Weston, Conn. 06880

Filed Mar. 18, 1988, Ser. No. 169,909

Claims priority, application Fed. Rep. of Germany, May 25, 1987, 3717573

Int. Cl.[4] A47L *1/08*

U.S. Cl. 15—220 R **15 Claims**

1. Apparatus for wet cleaning window panes comprising:

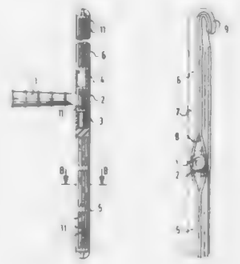
(a) an elongated handle;

(b) an elongated, rigid holder at one end of said handle, said handle joining said holder intermediate opposite ends of said holder such that said holder is transverse to said handle;

(c) two linear, elongated, rigid arms, a plurality of recesses being located in the surface of each of said elongated arms for retaining cleaning water after said tubular cleaning member surrounding said arms has been immersed in water;

(d) cooperating means, at opposite ends of said holder and one end of each of said arms, respectively, for detachably securing said one end of each of said arms to one of said opposite ends, respectively, of said holder such that said arms extend from opposite ends, respectively, of said holder transversely to said handle; and

(e) a flexible, elongated, water-permeable, tubular cleaning member entirely closed except for a longitudinally extending slit therein intermediate the opposite ends thereof, said slit in said tubular cleaning member being only of sufficient length to permit one end of said holder, with said cooperating securing means at said one end thereof, to be inserted into said cleaning member through said slit adjacent one end of said slit while the opposite end of said holder, with said cooperating securing means at said opposite end thereof, is in said cleaning member and a portion of said handle extending through said slit is in contact with said opposite end of said slit;



(f) whereby said cleaning member is retained in place surrounding said holder and two elongated arms secured thereto when said arms are secured in place at opposite ends, respectively, of said holder after said holder and arms are inserted in said cleaning member through said slit.

4,858,268

WINDSHIELD WIPER DEVICE FOR USE IN VEHICLES

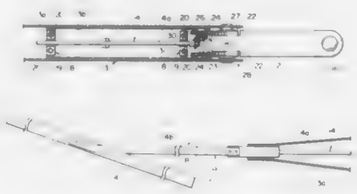
Masayoshi Shirato, Kiryu, Japan, assignor to Mitsuba Electric Mfg. Co., Ltd., Gumma, Japan

Filed Jun. 14, 1988, Ser. No. 206,582

Claims priority, application Japan, Jun. 15, 1987, 62-91722[U]

Int. Cl.[4] B60S *1/34*

U.S. Cl. 15—250.21 **10 Claims**



1. A windshield wiper device adapted to be mounted on the wiper shaft of an automotive vehicle to wipe the window glass of the vehicle, the windshield wiper comprising:

an arm head adapted to be fixed to the wiper shaft of the vehicle so as to be oscillated about an axis of oscillation;

a retainer member pivotally connected to the arm head for movement about a pivot axis extending in a direction perpendicular to the axis of oscillation;

an arm spring, interposed between the arm head and the retainer member, for urging the retainer member toward the window glass upon the fixation of the arm head to the wiper shaft;

an arm piece disposed perpendicularly to the pivot axis and rotatably connected to the retainer member for movement about the longitudinal axis of the arm piece;

a wiper blade connected to the arm piece so as to be pressed against the window glass by the arm spring upon the fixation of the arm head to the wiper shaft, the wiper blade squeegeeing the window glass upon the oscillation of the arm head; and

means, interposed between the arm head and the arm piece, for converting the pivotal movement of the retainer into the rotational movement of the arm piece so that, when the retainer is pivoted about the pivot axis, the wiper blade is turned about the longitudinal axis of the arm piece.

4,858,269

WET/DRY VAC

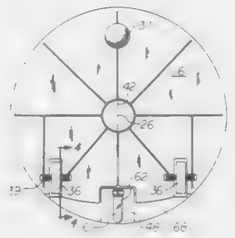
Richard J. Ostroski, Aurora; James E. Bigley, Warren; John L. Falk, Aurora, and E. Charles Sallee, Berea, all of Ohio, assignors to The Scott Fetzer Company, Cleveland, Ohio

Division of Ser. No. 35,624, Apr. 3, 1987, Pat. No. 4,800,615.

This application Jan. 25, 1989, Ser. No. 276,671

Int. Cl.[4] A47L *5/36*

U.S. Cl. 15—327 F **6 Claims**



1. A wet/dry vacuum cleaner including a tank having an upper edge forming an open top, a lid removably mounted on the tank for closing its open top, a vacuum motor unit carried on the lid, an air inlet and an air outlet on the lid for admitting and exhausting air respectively to and from the tank during operation of the vacuum motor unit, the tank being a plastic body having a liquid-tight bottom wall and sidewall construction capable of collecting liquids drawn in the tank by operation of the vacuum motor unit, a three-point suspension depending from the bottom wall of the tank formed by a pair of wheels and a skid plate, the wheels being co-axial with one another and spaced from one another on opposite sides of an imaginary vertical plane of general symmetry of the tank, the skid plate being spaced from the axis of the wheels and generally centered on said imaginary vertical plane, the vacuum motor unit being generally symmetrically disposed about said imaginary vertical plane above the upper edge of the tank and overlying a point between the axis of the wheels and the skid plate, the vacuum motor unit including an electric motor having a depending shaft and a fan mounted on the shaft, the inlet comprising a friction tapered circular coupling, the coupling lying above the upper edge of the tank and having a generally horizontal axis and opening in a direction away from the vertical axis of the vacuum motor unit, and being in substantial super-position with said skid plate.

4,858,270

PAVEMENT-CLEANING VEHICLE

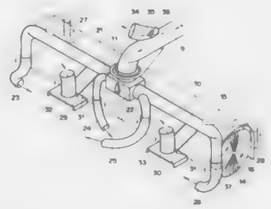
Marcel Boschung, Schmitten, Switzerland, assignor to Reberle reg. Treuunternehmen Schaan, Schaan, Liechtenstein

Filed Apr. 14, 1989, Ser. No. 181,450

Claims priority, application Switzerland, Apr. 23, 1987, 1557/87

Int. Cl.[4] E01H *1/08*

U.S. Cl. 15—328 **6 Claims**



1. A vehicle for cleaning ground surfaces provided with a rigid pavement, of the type having a chassis frame adapted for movement in a direction of travel along said pavement, and, mounted on the chassis frame, a traction engine, at least one working engine, and a fan having a suction-side intake and a blowing-side outlet and drivable by said working engine, the vehicle further having a sweeping-brush roller having a longitudinal axis transverse to said direction of travel and pivotable about a substantially vertical axis to vary the angle between said longitudinal axis and the direction of travel, drive means including said working engine for rotating the sweeping-brush roller about its longitudinal axis, a main blown-air duct connectible to the outlet of the fan, blowing nozzles connected to the main blown-air duct, and a cover disposed in front of the sweeping-brush roller in the direction of travel to form a blow duct running substantially parallel to the longitudinal axis of the sweeping-brush roller, wherein the improvement comprises:

at least one suction port disposed for vertical adjustment within said blow duct at a location between the opposite ends of said brush, the upper limit of said adjustment being suited for snow clearing, and the lower limit being suited for vacuum-sweeping,

means for connecting said suction port to said intake of said fan,

a blowing nozzle at each of the opposite ends of said brush having an airflow path directed toward said suction port,

a deflector device for leading airflow produced by said fan to either one or to both of said blowing nozzles, and

means to raise said suction port to one position out of the airflow path of said blowing nozzles, and to lower said suction port to a second position adjacent the rigid pavement within the airflow paths from said blowing nozzles.

4,858,271

WHEEL TYPE VACUUM CLEANER

Robert C. Berfield, Jersey Shore, and Ronald F. Meland, Muncy, both of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.

Filed Jul. 12, 1988, Ser. No. 218,100

Int. Cl.[4] A47L *4/20*

U.S. Cl. 15—339 **21 Claims**

1. A vacuum cleaner including:

a base;

a nozzle having an elongated inlet disposed below said base;

a suction producing fan means on said base comprising a

motor, an impeller rotated by said motor, a chamber wherein said impeller rotates, said chamber having an inlet communicating with said nozzle and an outlet through which air is expelled from said chamber;
load bearing wheel means on said base to support said vacuum cleaner while it is moved along a floor;
an extension projecting upward and rearward from said base;
a handle on said extension at its upper end;
an electrical connector first section connected to said motor;



a line cord having electrical connector second and third sections at opposite ends thereof, said first and second sections being separably connected to each other;
strain relief means on said extension in the vicinity of said handle;
said strain relief means including a guide opening through which a double section of said line cord extends from a first side of said extension to a second side thereof opposite said first side, and an anchor around which a portion of said line cord disposed on the second side of said extension, said double section extends after being reversely bent, on the second side of said extension.

4,858,272

DOOR CLOSING DEVICE

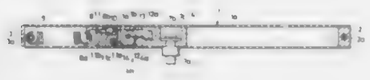
Kazuaki Ogawa, and Miyoshi Shiramasa, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Feb. 25, 1988, Ser. No. 160,383

Claims priority, application Japan, Jun. 1, 1987, 62-85978[U]; Jul. 27, 1987, 62-11546[U]

Int. Cl.⁴ E05F *1/08*

U.S. Cl. 16—80 **6 Claims**



1. An improved door closing device for reinforcing a door closing or latching force before a door is completely closed, which comprises:
(a) a door closer main body for restricting a swinging motion of said door when said door is opened and for exerting a closing force on said door when said door is closed;
(b) a guide rail fixed on said door;
(c) a slider slidably disposed within said guide rail;
(d) an arm pivotably connected at one end to said main body and at another end to said slider;
(e) a tension spring provided in said guide rail and connected to said slider for additionally exerting a closing force on said door; and
(f) a releasably connecting means for releasably connecting said tension spring with said slider when said door is swung to a certain angular position near a position where said door is completely closed.

4,858,273

DOOR STOP HAVING MULTIPLE MOUNTING POSITIONS

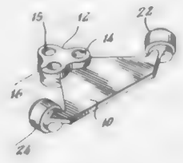
Gennaro Civitelli, 336 Mountain Rd., Hamden, Conn. 06514

Continuation of Ser. No. 532,601, Sep. 15, 1983, Pat. No. 4,527,303. This application Apr. 18, 1985, Ser. No. 724,615

The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.

Int. Cl.⁴ E05D *3/06, 11/06*

U.S. Cl. 16—86 A **6 Claims**



1. A door stop for mounting on a hinge pin of a hinged door, the door stop comprising:
a body including at one end portion thereof at least two apertures for receiving said hinge pin, each aperture having an axis;
two bumpers secured with respect to said body, each bumper being spaced from the other bumper and the axis of each said aperture to define one angle between one said axis and said bumpers and another angle between another said axis and said bumpers to provide for multiple mounting positions of said door stop on said hinge pin.

4,858,274

LIFT-OFF HINGE ASSEMBLY

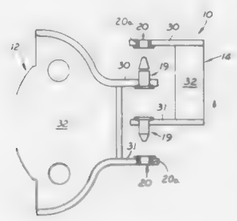
Neil Harrison, Sutton Coldfield; Cliff R. R. Aitken, Hampton Magna, and Ian Holloway, Stratford-upon-Avon, all of England, assignors to I. H. W. Engineering Ltd., United Kingdom

Continuation-in-part of Ser. No. 897,136, Aug. 15, 1986, abandoned. This application Oct. 21, 1987, Ser. No. 111,750

Int. Cl.⁴ E05D *7/10*

U.S. Cl. 16—265 **10 Claims**

1. A vehicle door lift-off hinge assembly comprising:
a first hinge leaf connected to a second hinge leaf for pivotal motion about a pivot axis;
each hinge leaf including a body portion from which extends a pair of oppposed arms spaced apart along the pivot axis;
each arm on one hinge leaf being connected by a hinge formation to a respective arm on the other hinge leaf;
each hinge formation including a separate hinge pin mounted on one arm and projecting therefrom to be received in a journal formed in the other arm;
the hinge pin passing through and being secured in a bore formed in said one arm and the journal being defined by a bush extending through a continuously walled aperture formed in said other arm; and
the hinge pins of all hinge formations being located to cooperate with their respective journal to enable the hinge pins



to be simultaneously withdrawn from their respective journals by moving the hinge leaves apart along the pivot axis.

4,858,275

OPENING ROLLER CONSTRUCTION FOR OPEN END SPINNING MACHINE AND THE LIKE

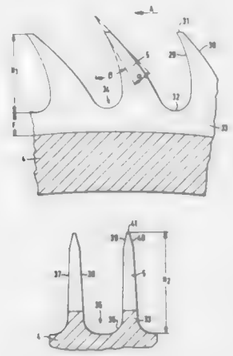
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, and Gerd Stahlecker, Eislingen/Fils, both of Fed. Rep. of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,760

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1987, 3730295

Int. Cl.⁴ D01E *15/14;* D01H *7/895*

U.S. Cl. 19—97 **13 Claims**



1. A mounting for an opening roller having a plurality of teeth, each tooth having a tooth throat, a tooth face, a tooth back, and lateral profiles between the tooth face and the tooth back, wherein the tooth face and tooth back define an angle of no more than 30° between one another, wherein the tooth face defines an angle of at least 15° with an axial plane extending from a roller rotational axis when in an operating position, and wherein outer radial tips of the teeth are chamfered and form cutting edges which extend essentially in the travel direction (A) of the teeth.

4,858,276

UNIVERSAL TEXTILE MACHINE FOR OPTIONALLY MANUFACTURING LONGITUDINALLY AND/OR RANDOMLY ORIENTED FIBER FLEECE

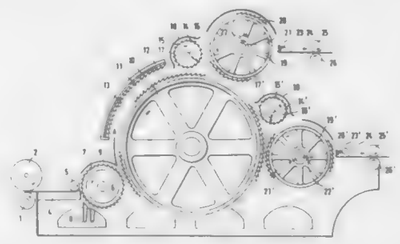
Werner Froech, Schwanewede, and Wolfram Dudek, Dülmen, both of Fed. Rep. of Germany, assignors to Hollingsworth GmbH, Neubulach, Fed. Rep. of Germany

Filed Mar. 12, 1987, Ser. No. 25,245

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632483

Int. Cl.⁴ D01G *15/26*

U.S. Cl. 19—98 **11 Claims**



1. A universal textile machine for selectively producing longitudinally oriented fiber fleece and/or tangled fiber fleece, comprising a main cylinder and carding elements cooperating therewith, a fiber drawing-in device and a first doffer roller, whose card clothings adjoin the circumferential area of the main cylinder, a first intermediate roller provided with a card clothing and the shaft of which is adapted to be positioned into a first or a second position by an adjusting device for adjusting the distance between the first doffer roller and the main cylinder, wherein said positions are selected such that when the first doffer roller is put into its operating position relative to the main cylinder, the card clothing of the first intermediate roller is out of operational engagement relative to the card clothings of both the main cylinder and the first doffer roller, and that in said second position, when the first doffer roller is operationally separated from the main cylinder, the card clothing of the first intermediate roller is in its operating position both relative to the card clothing of the main cylinder and of the first doffer roller, wherein the main cylinder and the first intermediate roller have the same direction of rotation, further comprising a second doffer roller, which is located downstream of the first doffer roller along the direction of the fiber flow around the main cylinder, and a second intermediate roller coordinated to said second doffer roller, said second rollers being similar in construction, arrangement and adjustability to said first intermediate roller and doffer roller and a device for combining the individual fleeces leaving each of said doffer rollers, wherein at least one of said intermediate rollers is adjustable to a speed of rotation such that its circumferential speed is lower than the circumferential speed of the coordinated doffer roller.

4,858,277

PROCESS AND APPARATUS FOR CLEANING AND OPENING LOOSE FIBER STOCK, E.G. COTTON

Akiva Pinto, Duesseldorf; Guenter Lacausen, Haltern, and Heinz Dirkes, Telgte, all of Fed. Rep. of Germany, assignors to Hergeth Hollingsworth GmbH, Duelmen, Fed. Rep. of Germany

Filed Sep. 19, 1988, Ser. No. 246,466

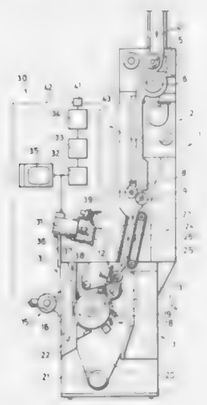
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1987, 3734145

Int. Cl.⁴ D01B *3/00, 1/00*

U.S. Cl. 19—200 **20 Claims**

1. A process for cleaning and opening loose fiber material of the type which includes feeding said fiber material through a feeder to a cleaning operation, and conveying said fiber mate-

rial away from said cleaning operation for further fiber material processing, wherein said process comprises continuously scanning the degree of contamination of said fiber material, while said fiber material is fed to the cleaning operation, generating a signal representing a measured degree of contamination of said scanned fiber material, and controlling said cleaning operation in response to said signal representing said measured degree of contamination.



4,858,278

APPARATUS FOR CLEANING AND OPENING TEXTILE FIBER MATERIAL

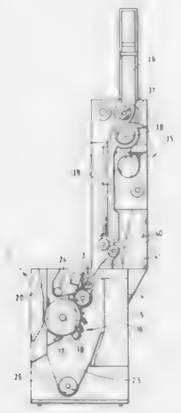
Akiva Pinto, Duesseldorf; Guenter Lucasse, Halters; Rolf R. Jung, and Bernhard Bocht, both of Neubulach, all of Fed. Rep. of Germany, assignors to Hergeth Hollingsworth GmbH, Duelmen, Fed. Rep. of Germany

Filed Apr. 1, 1988, Ser. No. 176,531

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 3711640

Int. Cl.[4] D01G *9/12*

U.S. Cl. 19—200 21 Claims



1. Textile apparatus for cleaning and opening flocks of fiber material in which the fiber material is first passed to an intake means cooperating with a trough, and subsequently to an opening roller having an associated cleaning device to be finally discharged to a processing machine, characterized in that between the intake means and the opening roller there is disposed at least one intermediate roller having a relatively smaller diameter and higher rotating speed than said opening roller.

4,858,279

HOSE CLAMP

Yoshinori Kato; Mitsuaki Nakanishi; Yasushi Fujita, and Nobuo Takagi, all of Aichi, Japan, assignors to Kabushiki Kaisha Togo Seisakusho, Aichi, Japan

Filed Aug. 9, 1988, Ser. No. 230,183

Claims priority, application Japan, Aug. 12, 1987, 62-123582[U]

Int. Cl.[4] B65D *63/02*

U.S. Cl. 24—20 R 8 Claims



1. A hose clamp comprising:

a spring steel band formed into a generally cylindrical configuration with the respective ends arranged in opposed relation;

a support piece extending radially outwardly from one end of said band and having an opening formed in the central lower portion thereof;

a bridging abutment projecting across said support piece opening;

a slot formed in said one end adjacent said support piece, said slot extending a predetermined length in a circumferential direction of said band and communicating with said support piece opening;

a projecting piece formed at the other end of said band and fittig in circumferential relationship in said slot opening; and

an upstanding tab formed at the distal end of said projecting piece and extending radially outwardly of said band;

whereby when said band is deflected to its expanded position, said tab is retained against said bridging abutment so as to lock said band in its open or expanded position, and when said support piece is moved radially outwardly said tab is released from said bridging abutment.

4,858,280

HINGE-PIN FOR COUPLING THE ENDS OF A CONVEYOR BELT OR THE LIKE

Jean-Francois Schick, Paris, France, assignor to Goro S.A., Chelles, France

Filed Nov. 30, 1988, Ser. No. 277,849

Claims priority, application France, Dec. 17, 1987, 87 17618

Int. Cl.[4] F16G *3/02*

U.S. Cl. 24—33 B 4 Claims

1. A hinge-pin for coupling two rows of fasteners fitted on a conveyor belt or the like at the ends to be joined together, said hinge-pin being constituted by a series of metallic elements mounted one after another around a flexible axial core, wherein:

each element aforesaid assumes the shape of a semi-cylindrical rod adapted to carry at each end two lugs forming projections with respect to the diametral plane which delimits the corresponding element, a cavity formed next to said lugs being intended to serve as a housing for the projecting lugs of an identical element placed on the element considered,

said elements are placed on each side of the flexible core in two inverted rows and in staggered relation from one row to the other so that each element of a predetermined row is placed partly opposite to one-half of one element of the other rows and partly opposite to one-half of another element which is adjacent to said other row,



the projecting lugs of each end of each element are engaged within the corresponding cavities of the opposite elements of the other row, with the result that the different elements placed in succession are interengaged in the transverse direction with a possibility of limited relative displacement of said elements in the other directions, thus permitting the requisite flexibility of the coupling hinge-pin.

4,858,281

ORNAMENTAL BUTTON

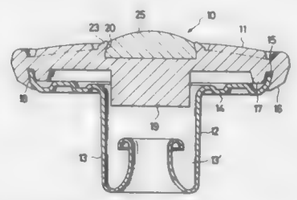
Hirokazu Watanabe, Kurobe, and Masamichi Shinmi, Tokyo, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 14, 1988, Ser. No. 181,394

Claims priority, application Japan, Apr. 14, 1987, 62-56597[U]

Int. Cl.[4] A44B *1/18*

U.S. Cl. 24—113 MP 5 Claims



1. A button device comprising:

(a) a decorative head member having a cavity in its top surface and a ridge on said top surface, said ridge extending around said cavity and defining at least an upper part of said cavity, said head member further having a groove in its top surface, said groove extending around said ridge and being partly defined by said ridge;

(b) an insert member of a rigid material retained in said cavity and having an upwardly tapered peripheral wall firmly embraced with said ridge, said insert member having a generally dome-like shape including an arcuate upper surface contiguous to said peripheral wall, said ridge having a marginal edge lying in registry with the borderline between said upper surface and said peripheral wall.

4,858,282

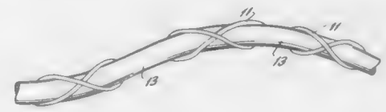
BRAIDED METAL-PLASTIC SHOE LACE

Charles E. DuPont, Jr., 312 N. Sierra Ave., Solana Beach, Calif. 92075

Filed Jul. 5, 1988, Ser. No. 215,318

Int. Cl.[4] A43C *9/00*

U.S. Cl. 24—143 R 8 Claims



1. As a new article of manufacture, a shoe lace made of nylon threads braided with vacuum metalized and resin-coated polyester film, wherein said nylon threads are interwoven with said vacuum metalized and resin-coated polyester film so as to form a repeated crisscross generally x-shaped, twisted patterns along the length of said polyester film.

4,858,283

STRAP BUCKLE STRUCTURE

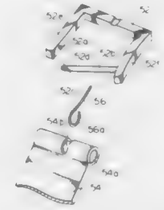
Fumio Takeuchi, Sayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 28,487, Mar. 20, 1987. This application Jul. 29, 1988, Ser. No. 227,425

Claims priority, application Japan, Mar. 25, 1986, 66831

Int. Cl.[4] A44B *11/20*

U.S. Cl. 24—178 4 Claims



1. In a strap buckle structure including a strap having a hollow portion provided at its end portion and a slit provided at the middle of said hollow portion, a tongue having a mounting portion, a buckle body consisting of a synthetic resin material and having a generally C-shaped configuration and first and second leg portions provided in parallel and having resilient force, the improvement comprising:

a mounting pin integrally provided on said second leg portion and extending to said first leg portion, said mounting pin having a length more than a distance between inner opposite surfaces of said first and second leg portions, a small-diameter portion provided at its tip and a large-diameter portion provided at the tip of said small-diameter portion, said large-diameter portion having an outer peripheral side surface which tapers off to its tip and a circular surface facing said small-diameter portion and substantially formed into a flat surface; and

a mounting hole provided at the end portion of said first leg portion and including a small-diameter hole facing said mounting pin and having a diameter larger than said small-diameter portion of said mounting pin and smaller than said large-diameter portion of said mounting pin, a large-diameter hole connected with said small-diameter hole and having a diameter larger than said large-diameter portion of said mounting pin and a circular surface formed at a periphery of an inside opening of said small-diameter hole and substantially formed into a flat surface; and

239-262 O - 89 - 2

wherein said mounting pin is laid between said first and second leg portions with spreading said first and second leg portions and is temporarily fitted by being pressed in the direction of said mounting hole by the resilient force of said first and second leg portions after said hollow portion of said strap is slipped over said mounting pin and said tongue is mounted to said mounting pin at said slit of said strap, wherein said large-diameter portion of said mounting pin reaches said large-diameter hole through said small-diameter hole by pressing said first and second leg portions, and wherein said mounting pin is fitted into said mounting hole with said circular surface of said large-diameter portion of said mounting pin engaging said circular surface of said mounting hole.

4,858,284

SEPARABLE BOTTOM END STOP FOR SLIDE FASTENER

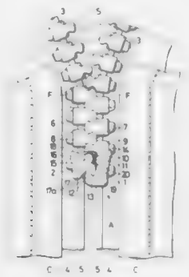
Elichi Yoshimura, Mattersburg, Austria, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 15, 1988, Ser. No. 182,174

Claims priority, application Japan, Apr. 20, 1987, 62-59363[U]

Int. Cl.[4] A44B *19/36*

U.S. Cl. 24—433 5 Claims



1. A slide fastener including a pair of stringer tapes, a pair of rows of coupling elements mounted respectively on said stringer tapes along their inner longitudinal edges, a slider slidably mounted on said rows of coupling elements and having opposed flanges, and a separable bottom end stop mounted on said slide fastener at an end thereof, said separable bottom end stop comprising:

a first end stop member mounted on one side of said stringer tapes at an end of a corresponding one of said rows of coupling elements adjacent to an endmost coupling element of said one coupling element row, said first end stop member having a recess opening toward the other stringer tape, a first finger disposed at an end of said first end stop member remote from said endmost coupling element and projecting in an outwardly direction therefrom and in an upwardly direction toward said endmost coupling element and further defining a part of said recess, and a tooth disposed between said endmost coupling element and said first finger and projecting into said recess in said outwardly direction toward said other stringer tape; and

a second end stop member mounted on said other stringer tape at an end of the other row of coupling elements, said second end stop member having a portion receivable in said recess in said first end stop member, said portion having a second finger on an end thereof for interfitting engagement with said first finger and an elastic wall remote from said second finger, said elastic wall confronting said tooth and being positioned for being elastically deformable by pressed engagement with said tooth, said elastic wall being a means for said first and second end stop members having a combined width when joined together normally greater than the smallest distance between said opposed flanges of said slider and said combined width being reducible to an extent smaller than said smallest distance when said elastic wall is elastically deformed by pressed engagement with said tooth.

4,858,285

TOWEL CLIP

Martin L. Dala, 16742 Bayview Dr., Sunset Beach, Calif. 90742, and William H. Baxter, 818 Hermosa Dr., San Gabriel, Calif. 91700

Filed Feb. 23, 1988, Ser. No. 159,172

Int. Cl.[4] B42F *1/08;* A44B *21/00*

U.S. Cl. 24—555 9 Claims



1. A towel clip for use in holding a towel in place on a chair back having a relatively wide-diameter top support member and a relatively tin backing extending downwardly away from the top support member to provide a back support for a person resting on the chair, the towel clip comprising:

a narrow, generally C-shaped semirigid clip member with a pair of free ends normally positioned close to one another, the C having an internal diameter sufficient to fit around the top support member of the chair back and around a towel draped over the chair back;

a pair of side-by-side first clamping members affixed to one free end of the C-shaped clip member and each having a generally spherically curved outer surface; and

at least one second clamping member with a generally spherically shaped outer surface affixed to the other free end of the C-shaped clip member and fictionally engaged under tension and positioned to normally interlock within at least a portion of a recessed region between the pair of first clamping members;

the C-shaped clip member having a recovery force when the ends thereof are spread apart so as to normally move the first and second clamping members toward each other and toward said interlocking position to produce a frictional restraint on a portion of the towel between the clamping members, with the cooperating end surfaces of the clamping members allowing such slippage of the towel between the clamping members to prevent pinching of the towel by the clamping members.

4,858,286

PLASTIC INTERLOCKING FASTENER STRIPS

Karl-Heinz Siegel, Nuremberg, Fed. Rep. of Germany, assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed May 23, 1988, Ser. No. 197,427

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 3729519; Oct. 15, 1987, 3734993

Int. Cl.[4] A65D *33/16*

U.S. Cl. 24—587 10 Claims

1. An interlocking flexible fastener comprising in combination:

confronting first and second fastener members each having web portions and each having releasably interlocking profile portions extending continuously therealong at the edge of the web portion, a first profile portion having a female inner groove and a female outer groove outwardly of the inner groove relative to the web, a second profile portion having a male inner rib and a male outer rib outwardly of the web portion, said ribs being complementary shaped to the grooves to interlock therein with the outer rib properly lockable in the inner groove and the inner rib properly lockable in the outer groove, each of said ribs being of the same size and shape and each of said grooves



being of the same size and shape as each other and as the ribs;

and a blocking element on one of said ribs preventing said outer rib from entering said outer groove so that proper interlocking is effected only by the outer rib locking in the inner groove and the inner rib locking in the outer groove.

4,858,287

METHOD FOR THE CONTINUOUS SIZING AND STRETCHING OF SYNTHETIC FILAMENT YARNS

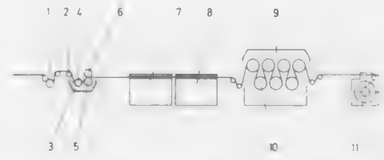
Peter Maurer, Waldkirch; Jörg Pfister, Freiburg, and Wolfgang Sauter, Gundelfingen, all of Fed. Rep. of Germany, assignors to Rhodia Aktiengesellschaft, Im Breisgau, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,527

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724751

Int. Cl.[4] D02H *5/02*

U.S. Cl. 28—172 3 Claims



1. A method for the production of warps wound on beams of synthetic filament yarns which are selected from the group consisting of polyesters, polyamides, polyolefin filament yarns, mixtures thereof and copolymers thereof which are essentially completely and uniformly stretched and sized, of sufficient cohesion for further processing and of a high density, which consists essentially of:

(A) preparing a group of essentially parallel synthetic filament yarns;

(B) guiding said group through a sizing zone whereby said group of yarns is sized;

(C) guiding said sized group of yarns through a heated predrying zone of a plurality of predryers whereby said group of yarns is predried and said predrying zone is at least 10 meters long;

(D) guiding said predried group of sized yarns through a heated final drying zone whereby said group of yarns is finally dried and

(E) then winding said dried group of yarns on beams wherein the filaments of the filament yarns of the group of the filament yarns in step (A) are not completely stretched and these filaments are stretched jointly and simultaneously in the prdrying zone by a roll system assigned to the sizing zone and a roll system assigned to the final drying zone and wherein these roll systems rotate at different circumferential speeds and the roll system assigned to the final drying zone rotates at a speed at least 33% higher than the speed of the roll system assigned to the sizing zone.

4,858,288

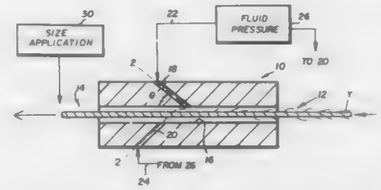
METHOD VORTEX ACTION YARN HAIRINESS REDUCTION

John B. Hodgin, Pleasant Garden; John H. Sumner, and Kenneth Y. Wang, both of Greensboro, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Apr. 2, 1985, Ser. No. 719,129

Int. Cl.[4] D02H *5/02;* D02J *1/16*

U.S. Cl. 28—178 12 Claims



1. A method of reducing hairiness in preexisting spun yarn having a Z-twist comprising the steps of:

(a) passing the yarn, in substantially dry condition, in a generally linear path; and

(b) while said substantially dry preexisting spun yarn having a Z-twist is passing in said generally linear path, directing a plurality of streams of fluid under approximately 5 psig pressure and with a flow rate of approximately 5–10 cubic feet per hour towards the path so as to establish a Z-vortex action acting on said yarn which twists and lays down protruding hairs causing the undesired yarn hairiness, so that undesired yarn hairiness is substantially eliminated.

7. A method of reducing hairiness in preexisting spun yarn having an S-twist comprising the steps of:

(a) passing the yarn, in substantially dry condition, in a generally linear path; and

(b) while said substantially dry preexisting spun yarn having an S-twist is passing in said generally linear path, directing a plurality of streams of fluid under approximately 5 psiq pressure and with a flow rate of approximately 5–10 cubic feet per hour towards the path so as to establish a S-vortex action acting on said yarn which twists and lays down protruding hairs causing the undesired yarn hairiness, so that undesired yarn hairiness is substantially eliminated.

4,858,289

DIMPLING AND RIVETING APPARATUS

Thomas H. Speller, Sr., Buffalo, N.Y., assignor to Gemcor Engineering Corp., Buffalo, N.Y.

Filed May 6, 1983, Ser. No. 492,041

Int. Cl.[4] B21J *15/12*

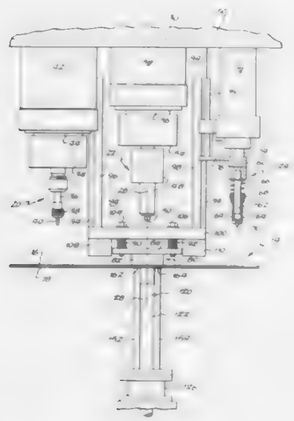
U.S. Cl. 29—34 B 7 Claims

1. Apparatus for dimpling, drilling and riveting a workpiece having one side and an opposite side comprising:

(a) a frame;

(b) dimpling means carried by said frame for forming a dimpled recess having a wall in said workpiece and comprising a first dimpling tool movable toward and away from said one side of said workpiece, said first dimpling tool having a solid end in the form of a die for contacting the workpiece and havig a shape of a truncated cone having a central substantially circular base defining a minor diameter disposed in a plane substantially perpendicular to the direction of movement of said tool and an annular outwardly diversing side wall and a second dimpling tool movable toward and away from said opposite side of said workpiece, said second dimpling tool having a solid end in the form of a die for contacting said work-

piece and having a shape complementary to the end of said first dimpling tool;
(c) drilling means carried by said frame and adapted to be moved toward and away from said workpiece for drilling a rivet-receiving hole in the dimpled recess, said drilling means including a drill bit having a given diameter;
(d) riveting means for inserting a rivet in the rivet receiving hole and upsetting the rivet; and



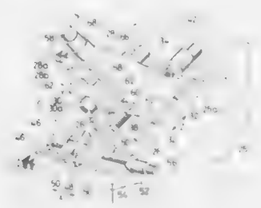
(e) the minor diameter of the truncated cone on said end of said first dimpling tool being slightly greater than the diameter of said drill bit so that after said drilling means provides said rivet-receiving hole an annular extension results between the rivet receiving hole and said wall of the dimpled recess and said riveting means during upsetting of the rivet provides a radial compresssion of said workpiece material in said extension to provide a fluid tight seal between said workpiece and the rivet.

4,858,290

MACHINE TOOL INDEXING APPARATUS

Noboru Hirose, Nagoya, and Akira Hirose, Konan, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 18, 1987, Ser. No. 98,222
Claims priority, application Japan, Oct. 23, 1986, 61-252519; Oct. 23, 1986, 61-162430[U]
Int. Cl.[4] B23B *29/30*
U.S. Cl. 29—35.5 **5 Claims**



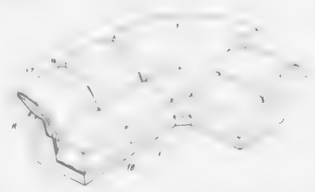
1. An indexing apparatus comprising: a base frame;
an indexing table for mounting thereon a workpiece, said indexing table being positioned above said base frame;
an indexing shaft disposed to said indexing table and having one end fixed to said indexing table, said indexing shaft having an axis, an axial end face, and being rotatable about said axis and movable in the direction of said axis with respect to said base frame;
a single drive source;
a rotatable drive means connected to said single drive source and driven by said single drive source, said single drive source being connected only to drive said drive means;
a follower member connected to said indexing shaft and engageable with said drive means for rotating said indexing shaft about said axis by a predetermined angle to provide angular rotation of said indexing table;
coupling means disposed between said indexing table and said base frame; and
shifting means operably provided for moving said indexing shaft in the direction of said axis in response to said drive means, said axial movement of said indexing shaft providing engagement with and disengagement from said coupling means, said shifting means including a rotatable cam member fixed to said drive means and being rotatable therewith and an arm member having a first end portion provided with an abutting member for abutting an axial end face of said cam member and a second end portion selectively abuttable on said axial end face of said indexing shaft.

4,858,291

METHOD OF MAKING A PIECE OF FURNITURE

Gérard Preti, Larny, Pollionnay (Rhone), France

Filed Aug. 28, 1987, Ser. No. 90,957
Claims priority, application France, Aug. 29, 1986, 86 12577
Int. Cl.[4] B68G *7/00*
U.S. Cl. 29—91.1 **2 Claims**



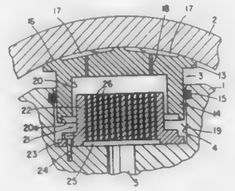
1. A method of making a piece of furniture having an upstanding back or arm rest, the method comprising the steps of sequentially:
(a) temporarily securing wire mesh to a frame;
(b) plastically deforming and shaping the mesh on the frame to form the upstanding rest with a three-dimensional shape;
(c) applying to the shaped mesh a layer of glass-fiber web, soaking same with a hardenable resin, and curing the resin-soaked web until it hardens;
(d) fixing at least one anchor to the cured resin-soaked web and applying at least one further layer of glass-fiber web to the cured web, soaking it with resin, and hardening the second resin-soaked web until it is hard and the anchors are securely fixed therein to form a free-form shell;
(e) stripping the wire mesh from the shell;
(f) trimming and finishing the shell;
(g) padding the trimmed and finished shell;
(h) covering the padded shell;
(i) securing the covered shell to a rigid base by means of the anchors.

4,858,292

CONTROLLED DEFLECTION ROLL

Eugen T. Bühlmann, Gossau, Switzerland; Mario Biondetti, Venice, Italy, and Wolf-Gunter Stotz, Ravensburg, Fed. Rep. of Germany, assignors to Sulzer-Escher Wyss AG, Zurich, Switzerland

Filed Mar. 7, 1988, Ser. No. 164,699
Claims priority, application Switzerland, Mar. 10, 1987, 00879/87
Int. Cl.[4] B21B *27/00*
U.S. Cl. 29—116.2 **24 Claims**



1. A controlled deflection roll comprising:
a stationary support member;
said stationary support member possessing a lengthwise axis;
a substantially tubular roll shell rotatable about said stationary support member;
a plurality of hydrostatic pressure elements arranged between said stationary support member and said substantially tubular roll shell;
each hydrostatic pressure element possessing a bearing surface and at least one bore flow communicating with said bearing surface;
said plurality of hydrostatic pressure elements serving to support said substantially tubular roll shell by means of said bearing surfaces;
guide means provided at said stationary support member;
said plurality of hydrostatic pressure elements being sealing movably guided by said guide means transversely with respect to said lengthwise axis of said stationary support member;
said plurality of hydrostatic pressure elements together with said guide means defining hydraulic pressure chambers;
feed channel means provided in said stationary support member for delivering a hydraulic pressure medium to said hydraulic pressure chambers;
each of said hydraulic pressure chambers being in flow communication by means of said at least one bore of an associated hydrostatic pressure element located in such hydraulic pressure chamber with said bearing surface of the associated hydrostatic pressure element and each being in flow connection with said feed channel means; and
means defining at least one oscillation damping throttle location provided in a flow path of said hydraulic pressure medium between said feed channel means and at least one predeterminate one of said hydraulic pressure chambers.

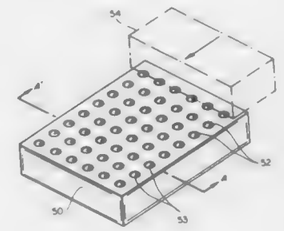
4,858,293

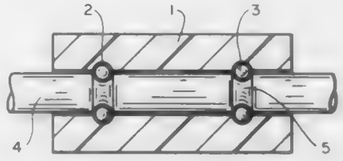
METHOD OF FORMING A BEARING BY DIMENSIONAL RECOVERY OF A RACE OR ROLLING ELEMENT

Nachum Rosenzweig, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 12, 1986, Ser. No. 929,947
Int. Cl.[4] B21D *53/12*
U.S. Cl. 29—148.4 A **20 Claims**

1. A method of making a bearing, which comprises:
(a) providing a race and a rolling or sliding element, said race being dimensionally-recoverable and comprising a cross-linked polymeric material;
(b) placing the rolling or sliding element adjacent the race; and
(c) heating the race to cause dimensional recovery thereof,





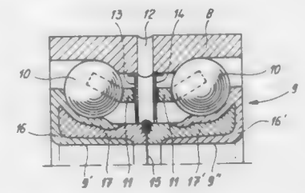
thereby trapping the rolling or sliding element with respect to the race, said recovery being in itself sufficient to cause the race and the rolling or sliding element to assume their finished dimensions with respect to each other.

4,858,294

METHOD OF PRODUCING AN OBJECT, IN PARTICULAR A ROLLING BEARING, CONSISTING OF AT LEAST TWO MOVING PARTS LOCKED INTO EACH OTHER

Graham E. Hollox, Sheffield, England, assignor to SKF Industrial Trading and Development Co. B.V., Nieuwegein, Netherlands

Filed May 13, 1988, Ser. No. 193,888
Claims priority, application Netherlands, May 15, 1987, 8701177
Int. Cl.[4] B21D *53/10*
U.S. Cl. 29—149.5 R **1 Claim**



1. Method of producing an object of at least two parts movable relative to each other, one of which parts or a portion thereof is essentially locked inside the other part, and in particular a rolling bearing is disposed between the two parts, in the form of races, at least one row of rolling elements is enclosed therein, one of said parts consisting of at least two separate pieces of steel subjected to a hardening operation, wherein these pieces are placed against each other in a proper position relative to the other part to form a parting seam, and wherein the rolling elements are inserted and the two parts are held together in said proper position, and wherein a high-energy radiation welding means such as a laser or electron beam is

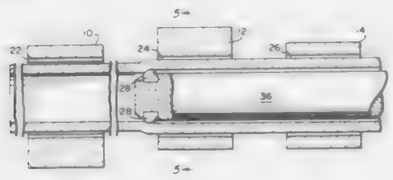
passed over the parting seam between the two parts and activated, while a rotary motion of the energy beam and the two parts held together relative to each other is brought about to weld the two pieces together, characterized in that the steel pieces are subjected to a surface hardening with the regions of said pieces bordering upon the parting seam shielded from the hardening process, so that these regions are not hardened.

4,858,295

METHOD OF MAKING A CAMSHAFT FOR RECIPROCATING PISTON ENGINES

Michael J. Hartnett, Woodbury; Robert Lugosi, Canton; James Rollins, Winsted; John P. Cook, Simsbury, and Jeffrey A. Clark, Riverton, all of Conn., assignors to The Torrington Company, Torrington, Conn.

Division of Ser. No. 819,837, Jan. 17, 1986, Pat. No. 4,781,076.
This application Mar. 14, 1988, Ser. No. 167,759
Int. Cl.[4] B23P *15/00, 11/02;* B21D *39/00*
U.S. Cl. 29—156.4 R 1 Claim



1. A method of making a camshaft having cams and bearing rings on a rotatable tube comprising the steps of: axially spacing and placing the cams and bearing rings about the rotatable tube, each cam and each bearing ring having a cylindrical inside surface with circumferentially spaced apart axially extending grooves on said inside surfaces; axially aligning said grooves in said cam and said bearing rings on said tube; and expanding circumferentially spaced apart portions of the wall of the tube away from the tube axis and into the grooves on the inside surfaces of the cams and bearing rings by axially inserting an expander tool having circumferentially separated hard material protrusions constructed to expand portions of the wall of said tube away from the tube axis, into the tube, each of said protrusions being positioned in axial alignment with each of said grooves so that as the protrusions move within the tube past the cams and bearing rings the hard material protrusions expand said portions of the wall into the grooves on the inside surfaces of the cams and bearing rings.

4,858,296

METHOD FOR TENSION EXPANDING TUBES

Kenneth P. Gray, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 944,487, Dec. 22, 1986, Pat. No. 4,766,667.
This application May 2, 1988, Ser. No. 188,982
The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.
Int. Cl.[4] B21D *53/02*
U.S. Cl. 29—157.3 C 2 Claims



1. A method of providing uniform dimensional integral belled portions in the ends of plate fin heat exchangers having a plurality of apertured plate fins parallelly spaced between two apertured tube sheets and a plurality of hairpin tubes extending through the apertures in which the open ends of the tubes are positioned for a manufacturing operation comprising the steps of:

locating the plate fin heat exchanger in a belling station so that the tube sheet nearest the open ends of the hairpin tubes is adjacent to a clamping means for providing a clamping force to hold the tube at a desired distance from the open ends and clamping the tubes therewith;

forming radially expanded bells in the ends of the tubes up to the desired distance from the open ends of the tubes and then releasing the clamping force;

positioning the belled plate fin heat exchanger in an expanding station so that the bell is adjacent the tube sheet nearest the bell;

clamping the ends of the plate fin heat exchanger in a retainer means to prevent the hairpin tubes from moving; and

expanding the tube radially outward into contact with the nearest tube sheet, then the plate fins, then the other tube sheet in tension expansion.

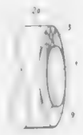
4,858,297

MANUFACTURING METHOD FOR A NON-INFLATABLE DEFORMABLE WHEEL

Guy Le Feron de Longcamp, 9 Zue Massenet, 75016 Paris, France

Filed Oct. 5, 1987, Ser. No. 104,790
Int. Cl.[4] B21D *53/26*
U.S. Cl. 29—159 R 10 Claims





1. A method for manufacturing a non-inflatable deformable wheel of the type comprising a rigid hub, a radially deformable tread of substantially constant peripheral length, and cable directly connecting said hub to said tread, said method comprising the steps of:

(a) fabricating a structural part constituted essentially of: (1) said cable and (2) a radially flexible inside band for a part of the tread, said cable being assembled to said flexible band;

(b) separately fabricating a one-piece outside band for another part of the tread;

(c) assembling said structural part with said outside band to form a subassembly; and

(d) coupling said cable nonresiliently directly to said hub.

9. The method of producing a noninflatable deformable wheel including a hub, a radially deformable, constant peripheral length tread surrounding the hub and coupling means including cable connecting said hub and tread comprising the steps of:

fabricating a first peripheral band including a plurality of peripherally successive bars parallel to the wheel axis and linked to each other by imbedment in rubber and coupling cable extending inwardly from said band and having outer ends anchored to the outer parts of at least some of said bars;

fabricating a second band encircling and overlying the first band and defining therewith a radially deformable tread of substantially constant length and forming with said cable coupling and first band a subassembly unit;

fabricating a hub with peripherally spaced coupling means; and

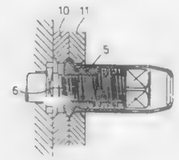
assembling said hub with said subassembly unit with the inner ends of said coupling cable being anchored to said hub coupling means.

4,858,298

ARRANGEMENT FOR MOUNTING DISK WHEELS ON MOTOR VEHICLES

Robert Fleischanderl, 4 Anschreithstrasse, A-3340 Waidhofen an der Ybbs, Austria

Filed Mar. 23, 1988, Ser. No. 171,959
Claims priority, application Austria, Mar. 23, 1987, 683/87
Int. Cl.[4] B25B *27/14*
U.S. Cl. 29—273 13 Claims



1. An arrangement for mounting disk wheels on a hub comprising:

(a) at least one substantially cylindrical sleeve, open at both ends, configured, dimensioned and proportioned to fit over a wheel bolt;

(b) a detachable sleeve insert having an outer diameter allowing insertion into said sleeve and an inner diameter sufficient to allow said sleeve insert to fit over said wheel bolt;

(c) a mounting lever pivotally attachable to an open end of said sleeve by means of a constant diameter cam;

(d) a locking means on said cam for preventing disengagement of the mounting lever from the sleeve in any inclined end position of said mounting lever;

(e) an inner nut with interior and exterior threads, said interior threads configured, dimensioned and proportioned to matingly engage with said wheel bolt and said exterior threads of substantially the said outer diameter of said sleeve insert, said inner nut capable of holding an inner wheel in position and allowing said wheel bolt to extend through said inner nut;

(f) a securing nut with an interior thread configured, dimensioned and proportioned to matingly engage the exterior threads of said inner nut and capable of holding an outer wheel in position.

4,858,299

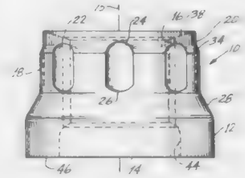
PROCESS FOR MAKING A JOINT WITH A TORQUE-LIMITED COLLAR

George S. Wing, 531 Esplanade, Apt. 515, Redondo Beach, Calif. 90277

Division of Ser. No. 122,493, Nov. 16, 1987, Pat. No. 4,784,549, which is a continuation of Ser. No. 702,811, Feb. 15, 1985, abandoned. This application Jul. 14, 1988, Ser. No. 219,077
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—446 4 Claims

1. A process for making a joint to obtain a predetermined pre-load, the joint having at least one sheet, a threaded pin through the sheet, and an internally-threaded collar on the pin, the collar having a plurality of axially extending external troughs for receiving driving elements of a driver, the troughs being spaced apart by bark of the collar that can fail in circumferential compression in response to the driving elements at the predetermined pre-load, the process comprising the steps of:

(a) engaging the axially extending troughs with the driving elements, and threading and tightening the thread of the collar onto the thread of the pin by rotating the driving elements; and



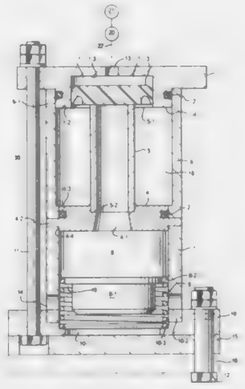
(b) failing that part of the bark of the collar in a path of the driving elements with the driving elements in circumferential compression by developing circumferential furrows in the bark between the troughs in the path of the driving elements by such elements plowing through the bark, the bark failing at the predetermined pre-load on the joint.

4,858,300

METHOD OF CONSTRUCTING A SHOCK APPLICATION DEVICE

Mitsuo Onodera, Soka, Japan, assignor to Hayashi Manufacturing Company, Ltd., Tokyo, Japan

Division of Ser. No. 6,371, Jan. 23, 1987. This application Jul. 21, 1988, Ser. No. 222,154
Claims priority, application Japan, Jan. 31, 1986, 61-11769
Int. Cl.[4] B21D *39/00*
U.S. Cl. 29—463 10 Claims



1. A method of constructing a shock application device for applying a shock to a housing comprising the steps of:

a. attaching a cylinder to said housing,

b. slidably mounting a piston in said cylinder,

c. integrally forming a hammer portion with said piston for providing an impact to said housing,

d. providing an accumulator chamber in said cylinder for storing fluid pressure received from an external fluid pressure source,

e. providing conduit means for selectively coupling pressurized fluid from said accumulator to said piston to move said piston towards said housing,

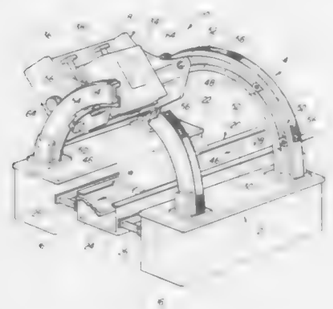
f. coupling a valve chamber in fluid transfer relationship with said accumulator and said conduit,
g. forming only one orifice in said valve chamber, said one orifice receiving pressurized fluid from said external fluid pressure source, and
h. mounting a valve in said valve chamber for movement to a first position by fluid received at said one orifice for enabling pressurization of said accumulator with fluid received at said one orifice and for movement to a second position by said pressure in said accumulator to enable said pressurized accumulator fluid to be coupled to said piston through said conduit to cause said piston and hammer portion to move toward and strike said housing to create a shock.

4,858,301

WORK STATION

Lawrence A. Galarowic, Dearborn, Mich., assignor to Visi-Trol Engineering Co., Detroit, Mich.

Filed Sep. 6, 1988, Ser. No. 240,919
Int. Cl.[4] B23Q *7/00, 1/12;* B23C *1/12*
U.S. Cl. 29—563 **5 Claims**



1. A work station comprising, in combination: a pair of spaced apart and parallel arcuate arch frame members, said frame members having a predetermined radius and a predetermined axis;
a work processing slide circumferentially movably mounted to and extending between said arch frame members;
means for circumferentially moving said slide along said frame members;
a work carrier located axially under said arch frame members for successively moving work pieces under said work processing slide and axially with respect to said arch frame members;
a tool located on said work processing slide;
means for moving said tool radially towards and away from said work carrier.

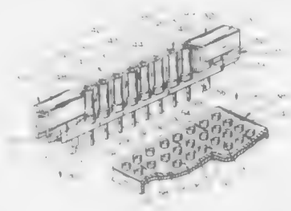
4,858,302

TOOL DEPLOYMENT APPARATUS

John J. Stribiak, Homewood, Ill., assignor to Precision Carbide Tool Co., Inc., Nile, Ill.

Filed Oct. 17, 1988, Ser. No. 259,186
Int. Cl.[4] B23Q *3/157;* B25M *3/04*
U.S. Cl. 29—568 **20 Claims**

1. A tool deployment apparatus for inserting, removing and otherwise deploying, one or more rotary cutting tools of the type having retaining collars, shank portions, and cutting edge portions, as well as for housing and shielding the cutting edge portions of said one or more rotary cutting tools during storage and handling of same, said tool deployment apparatus facilitating the insertion and removal of said one or more rotary cutting tools, respectively, into and from tool retention pallet means through cooperation therebetween, said tool retention pallet means being of the type having one or more operably spaced pallet elements, said pallet elements being capable of accepting and releasably retaining at least a portion of the shank portion of said one or more rotary cutting tools from their respective positions within said tool deployment apparatus, said tool deployment apparatus comprising:
tool housing means for retaining, orienting and aligning the position of each of said one or more rotary cutting tools relative to a respective one of said one or more pallet elements within said tool retention pallet means,
said tool housing means having a top region and a bottom region opposite to said top region and further including one or more tool housing apertures positioned proximate to the tool housing means, for exposing at least a portion of said shank portions of said one or more rotary cutting tools, respectively,
said tool housing means additionally including tool isolation means for isolating the cutting edge portions of at least one rotary cutting tool from inadvertent contact with



adjacently positioned rotary cutting tools and other objects,
said one or more tool housing apertures being configured in corresponding relationship to, and alignment with respective ones of said one or more pallet elements in said tool retention pallet means, for enabling aligned reciprocating deployment of said portion of exposed shank portion and, in turn, said respective rotary cutting tools, respectively, from and back into said tool housing means; and
tool channeling means operably positioned proximate to said tool housing apertures for, alternatively, obstructing the release of said one or more rotary cutting tools from said tool housing means, through said tool housing apertures, and releasing said one or more rotary cutting tools through said tool housing apertures, so as to enable transmission of said aligned ones of said one or more rotary cutting tools from within said tool housing means, to and into said respective pallet elements of said tool retention pallet means.

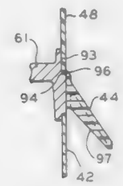
4,858,303

METHOD OF ASSEMBLING A DYNAMOELECTRIC MACHINE

Lynn E. Fisher, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 134,312, Dec. 17, 1987, Pat. No. 4,788,763, which is a division of Ser. No. 864,048, May 16, 1986, Pat. No. 4,716,326, which is a division of Ser. No. 522,620, Aug. 12, 1983, Pat. No. 4,593,163. This application Jul. 15, 1988, Ser. No. 195,852
Int. Cl.[4] H02K *15/14*
U.S. Cl. 29—596 **6 Claims**

1. A method of assembling a dynamoelectric machine having a shell, at least one end frame secured to the shell, a plurality of resilient seals, a synthetic material rain shroud, a synthetic material cover, and a plurality of fasteners, the at least one end frame including a generally circumferential rabbet surface, a plurality of notches intersecting the rabbet surface, and a plurality of threaded apertures spaced adjacent the rabbet surface, the rain shroud including a ring portion, a circumferential flange depending in angular relation from the ring portion generally radially outwardly thereof, and a plurality of tabs on the ring portion extending generally radially inwardly thereof, the fasteners each including a head, and a threaded end generally opposite the head, the cover including an end wall, a generally annular sidewall depending from the end wall and having a free end portion, a plurality of bosses integral with the end wall and the sidewall, respectively, and each boss having an abutment end spaced from the end wall, and a plurality of openings extending through the bosses intersecting the abutment ends thereof and the end wall, respectively, the method comprising the steps of:
placing the ring portion of the rain shroud generally in engagement with the rabbet surface on the at least one end frame and extending the flange on the rain shroud at least in part generally circumferentially about a part of the shell so as to extend generally radially outwardly thereof adjacent the at least one end frame;
receiving the tabs on the ring portion in interfitting relation within at least some of the notches in the at least one end frame, respectively, during the placing step and locating thereby the rain shroud in an assembly position on the at least one end frame;
disposing the cover in an assembly position on the at least one end frame and defining thereby a compartment means between the cover and the at least one end frame for accommodating dynamoelectric machine components;



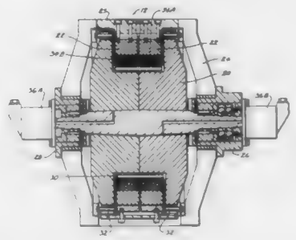
seating the free end portion on the sidewall of the cover in engagement with the rabbet surface on the at least one end frame and engaging the abutment ends on the bosses of the cover with the at least one end frame generally about the threaded apertures therein, respectively, during the disposing step;
overlaying parts of the free end portion with the tabs when the tabs are received in the interfitting relation with the at least some notches, respectively, and retaining thereby the rain shroud against displacement from its assembly position;
extending the fasteners in part through the openings in the bosses of the cover with the seals being disposed about the fasteners between the heads thereof and exterior parts of the end wall of the cover about the openings;
threadedly engaging the threaded ends of the fasteners with the threaded apertures, respectively;
bottoming the threaded ends in the threaded apertures during the threadedly engaging step and retaining thereby the cover against displacement from its assembly position; and
compressing the seals in sealing relation between the heads and the exterior parts of the end wall about the openings and limiting thereby the compressive forces applied onto the end wall by the fasteners at least upon the bottoming of the threaded ends in the threaded apertures, respectively.

4,858,304

METHOD OF CONSTRUCTING A ROTOR ASSEMBLY FOR HOMOPOLAR GENERATOR

William F. Weldon; John H. Gully, and Mark A. Pichot, all of Austin, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Division of Ser. No. 751,459, Jul. 2, 1985, Pat. No. 4,800,311, which is a continuation of Ser. No. 381,928, May 26, 1982, abandoned. This application Oct. 14, 1988, Ser. No. 247,046
Int. Cl.[4] H02K *15/02*
U.S. Cl. 29—598 **4 Claims**



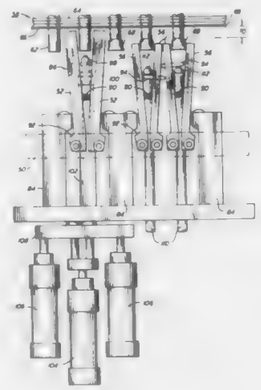
1. A method of constructing a rotor assembly for a homopolar generator, comprising the steps of:
providing first and second rotor halves, each having a bore therein;
providing a shaft;
thermally shrink-fitting the first rotor half onto the shaft; and
hydraulically expansion-fitting the second rotor half onto the shaft.

4,858,305

SINGLE STATION TENSION HAIRPIN TUBE EXPANDER

Kenneth P. Gray, Syracuse; Michael L. McDonough, Jamesville; Bruce J. Poplawski, Mattydale; Daniel P. Gaffaney, Chittenango, and Ross A. Moyer, LaFayette, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 6, 1988, Ser. No. 202,892
Int. Cl.[4] B23P *15/26*
U.S. Cl. 29—727 **6 Claims**



1. Apparatus for expanding tubes into a plate-fin heat exchanger unit in which there are a plurality of hairpin tubes passing through aligned opening in a fin pack that is formed of a stack of fin plates sandwiched between two tube sheets, each

said hairpin tube comprising a U-bend joining a pair of parallel legs with open ends of the legs extending beyond one of the tube sheet and lying in rows, said one of the tube sheets having a forward-facing flange that extends over said open ends, the apparatus comprising:

a frame;

means supporting said fin pack with the open ends of the tubes facing said frame;

at least one pair of elongated belling jaw fingers swingably mounted on said frame to reach beneath said forward-facing flange and clamp and clamp over an associated end of said hairpin tubes, the belling jaw fingers having a profile surface permitting expansion of said tube end to a bell shape;

means for urging said belling jaw fingers closed over said tube end during a belling operation;

means for urging said belling jaw fingers open after the belling operation has been carried out;

belling means carried on said frame and insertable into the associated tube end between said belling jaw fingers when the latter are closed for urging the tube outward into said profile to bell the end thereof;

a plurality of pairs of elongated expander jaw fingers swingably mounted on said frame to reach beneath said forward-facing flange and clamp over the belled ends of adjacent legs of the hairpin tubes in at least two rows;

means for closing said expander jaw fingers over the associated belled tube ends to grip the same during an expansion operation at a predetermined standoff in advance of said tube sheet;

means for urging said expander jaw fingers open after said expansion operation;

a plurality of expander rods, each associated with one of said pairs of expander jaw fingers, carried on said frame and drivable between the associated expander jaw fingers into the associated tube legs to urge the tube legs radially outward into contact against the fin plate and tube sheets; and

means for stepping said frame and said belling and expander jaw fingers laterally to a work position corresponding to positions of next adjacent tube ends with respect to said fin pack for belling an adjacent tube end and expanding at least one other pair of belled tube legs while at said work position.

4,858,306

APPARATUS FOR PULLING A PLURALITY OF FUEL RODS FROM A FUEL ELEMENT

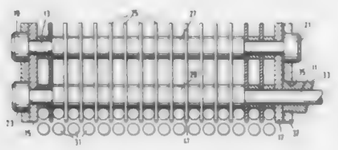
Helfrid Lahr, Wedemark, and Gerhard Betz, Alzenau, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Mar. 18, 1988, Ser. No. 169,625

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1987, 3711844

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—723 **7 Claims**



1. An apparatus for withdrawing a plurality of fuel rods out of a fuel element in which the fuel rods are supported, the fuel rods each having a predetermined diameter, the apparatus comprising:

a plurality of mutually parallel clamping plates arranged one next to the other;

an upper guide rod extending transversely through said plates;

a lower tension rod parallel to said guide rod and likewise extending transversely through said plates;

a first plurality of spacers mounted on said upper guide rod between corresponding ones of each two mutually adjacent ones of said clamping plates;

a second plurality of spacers mounted o said lower tension rod likewise between corresponding ones of each two mutually adjacent ones of said clamping plates;

each of said second plurality of spacers having a width slightly less than the predetermined diameter of one of the fuel rods;

tensioning means for developing a force to press said plates together; and,

structure means for holding said apparatus during the application of said force to said plates.

4,858,307

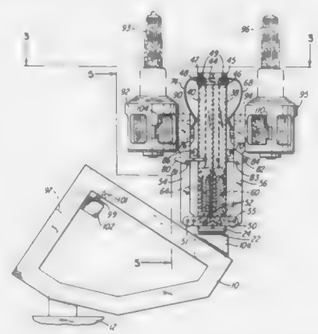
HOIST MECHANISM FOR ASSISTING IN MANUAL MOVEMENT OF A STATOR COIL INSERTION TOOL ASSEMBLY

Robert C. Appenzeller, Washington Township, Montgomery County, and Curtis R. Bailey, Dayton, both of Ohio, assignors to Machine Products Corporation, Dayton, Ohio

Filed Feb. 9, 1989, Ser. No. 307,947

Int. Cl.[4] H02K *15/06*

U.S. Cl. 29—736 **24 Claims**



1. Hoist mechanism for assisting in manual movement of a coil insertion tool assembly with respect to support structure which is provided with a support portion which supports a coil insertion tool assembly in an operational position, comprising a base, means attaching the base to the support structure, an arm, means pivotally attaching the arm to the base, means for attaching a coil insertion tool assembly to the arm, the arm being pivotally movable to move a coil insertion tool assembly which is attached thereto to the support portion of the support structure for support of the coil insertion tool assembly by the support portion of the support structure, the arm being pivotally movable to move a coil insertion tool assembly from the support portion of the support structure, a resilient member, means attaching the resilient member to the base, a cable, means attaching the cable to the arm, means attaching the cable to the resilient member, whereby the resilient member assists in pivotal movement of the arm as the arm is pivotally moved to move a coil insertion tool assembly to the support portion of the support structure for support of the coil insertion tool assembly by the support structure and whereby the resilient member assists in pivotal movement of the arm for removal of the coil insertion tool assembly from the support portion of the support structure.

4,858,308

PARTS MOUNTING APPARATUS

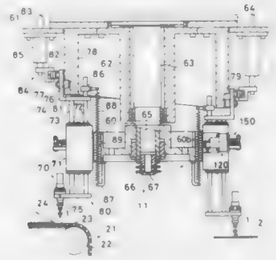
Ken-ichi Komori, Kasai, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed May 20, 1988, Ser. No. 196,437

Claims priority, application Japan, May 28, 1987, 62-132304

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—740 **22 Claims**



2. A parts mounting apparatus in which a series of work stations constitute a closed loop, comprising:

part supply means arranged at a parts supply station;

printed circuit board support means arranged at a parts mounting station;

suction means to which a suction piece is detachably attached, a part supplied by said part supply means being picked and placed onto a printed circuit board supported on said printed circuit board support means with said suction piece;

moving means for intermittently moving said suction means so that said suction means is temporarily stopped at respective work stations; and

suction piece exchanging means holding a plurality of suction pieces and arranged between said parts mounting station and said parts supply station to cross a path of said suction means for exchanging suction pieces with said suction means, and further arranged across two work stations, a first work station being a suction piece detaching station and a second work station being a suction piece attaching station.

4,858,309

EXTRACTION TOOL

Iosif Korsunsky, Harrisburg; Steven P. Bateman, Hummelstown, and Richard C. Schroepfer, Thompsontown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 28, 1988, Ser. No. 212,828

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—764 **13 Claims**

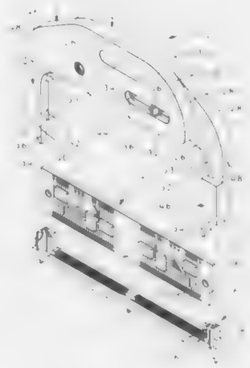
1. An apparatus for removing a printed circuit board from a connector, the connector having latching means provided thereon, the latching means cooperate with latching areas of the printed circuit board to maintain the printed circuit board in position during operation of the connector, the apparatus comprising:

a body portion having a first major surface and a second major surface, edge surfaces extend between the first major surface and the second major surface;

leg portions extending from a respective edge surface of the body portion, the leg portions having first and second surfaces, the first surfaces of the leg portions being essentially parallel to the first major surface of the body portion, and the second surfaces of the leg portions being essentially parallel to the second major surface of the body portion;

printed circuit board receiving channels provided proximate the leg portions, each receiving channel having an end wall and an open end, the receiving channels being dimensioned such that as the apparatus is inserted onto a printed circuit board, the end walls of the receiving channels frictionally engage edges of the printed circuit board;

camming means provided on the leg portions, the camming means engage the latching means as the apparatus is inserted onto the printed circuit board, so that the camming means causes the latching means to move away from the printed circuit board as the apparatus is inserted onto the printed circuit board, thereby allowing the printed circuit board to be removed from the connector.



4,858,310

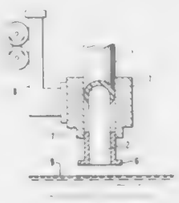
METHOD FOR SOLDERING A METAL FERRULE TO A FLEXIBLE COAXIAL ELECTRICAL CABLE

Mark S. Sanders, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Apr. 12, 1988, Ser. No. 180,505

Int. Cl.[4] H01B *13/00*

U.S. Cl. 29—828 **7 Claims**



1. A method for soldering an electrically and thermally conductive metal ferrule to a coaxial electrical cable having a protective polymeric jacket, an electrically conductive metal braided shield, a metal foil shield, a layer of dielectric material and an electrically conductive signal-carrying center core, said method comprising the steps of:

(a) stripping and trimming said polymeric jacket, said braided shield, said foil shield, said dielectric material, and said center core to a specified length;

(b) positioning said ferrule on the end of said cable;

(c) masking surfaces of said ferrule intended to be solder-free;

(d) placing in contact said ferrule and said cable end with a bath of solder such that a desired amount of solder is deposited between said ferrule and said cable;

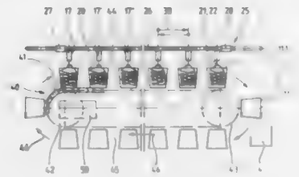
(e) removing said ferrule and said cable from said bath; and
(f) cooling said ferrule and said cable.

4,858,311

TRANSPORT SYSTEM FOR ELECTRICAL CABLES

Max Koch, Meggen, Switzerland, assignor to Komax AG, Dierikon, Switzerland

Filed Dec. 16, 1987, Ser. No. 133,634
Claims priority, application Switzerland, Dec. 23, 1986, 5155/86; Sep. 23, 1987, 3683/87
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—857 **23 Claims**



1. A transport device for electrical cables in a production station for processing of electrical cables of a certain length comprising

a frame;

a cable supply station associated with the frame and furnishing a cable having an end to be picked up;

a forward shifting device movably supported by the frame which forward shifting device is stepwise movable in horizontal direction perpendicular to the direction of the cable ends;

a forward and backward movable transfer carrier movably supported on the frame;

a joint transfer module attached to the forward and backward movable transfer carrier, which transfer module is rotatable at least around an axis running perpendicular to the axis of the cable ends and perpendicular to the direction of motion of the forward shifting device;

movable grippers attached to the forward shifting device, which grippers can be opened and closed and which are provided to support the cable ends and for gripping the two cable ends;

a cable depository dump at one end of the forward shifting device;

a frame;

a drive device attached to the frame;

a stationary gripper module attached to the frame;

stationary grippers attached to the stationary gripper module;

a receiver device movably supported by the frame and adapted for receiving cables of different lengths and which receiver device is step-wise movable in a circulation path by the drive device, wherein a bulk length of the cable can be inserted into the receiver device and can, at least in the region of the cable dump, be removed again from the receiver device, where the cable ends are supported before and after a cycle stroke motion by the stationary grippers of the stationary gripper module.

4,858,312

TORQUE CONTROL FOR AUTOMATIC CONNECTOR ASSEMBLY TOOL

Robert Van Naarden, Hinckley, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Filed Apr. 18, 1988, Ser. No. 182,391
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—861 **1 Claim**

1. A method of controlling torque in an electric motor driven connector tool in which the tool applies a desired torque to a wire connector and a plurality of wire ends positioned therein including the steps of:

(1) setting a desired level of torque to be applied,

(2) monitoring electric motor torque from start-up until there is no further change in motor torque indicating the motor has reached a steady state no-load torque.

(3) adding, when the motor has reached a steady state no-load condition, a voltage representative of the no-load torque to a voltage representative of the desired level of tightening torque,



(4) monitoring the torque applied by the connector tool electric motor as it turns a wire connector with wire ends positioned therein by comparing electric motor torque voltage with the voltage representative of the sum of the desired level of torque and the no-load torque.

(5) stopping the electric motor when the desired level of torque has been reached, and

(6) releasing the connector.

4,858,313

METHOD OF FORMING A CONNECTOR

Robert F. Bowlin, Downers Grove, Ill., assignor to Labinal Components and Systems, Inc., Elk Grove Village, Ill.

Division of Ser. No. 44,968, May 1, 1987. This application Jun. 10, 1988, Ser. No. 205,211
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—883 **10 Claims**



1. A method of forming a connector member for a multiple-pin electrical member comprising forming an insulating body with opposed ends, a side and a plurality of holes extending between the ends, one of the ends having spaced grooves, the grooves extending laterally from the holes to the side of the body, an a slot directed to intersect the grooves thereby to divide each groove into two sections, plating the insulating body, removing plating material from the slot, removing plating material from a selected area of at least one end, solder plating the plated layer, and removing selected plating material and solder plating material from at least one end.

4,858,314

DISPENSING CAP FOR SHAVING LUBRICANT

William J. Cunningham, Allamuchy Township, Warren County, N.J., assignor to Topaz Development Corp., Flemington, N.J.

Filed May 27, 1988, Ser. No. 199,436
Int. Cl.[4] B26B *21/40*
U.S. Cl. 30—90 **16 Claims**



1. A dispensing cap for shaving lubricant, which comprises:

(a) a neck having attachment means adapted for connection to the open end of a tube of shaving lubricant, said neck also having a channel through which shaving lubricant may pass from said tube to a receiving head on said cap; and,

(b) a receiving head on said cap opposite said neck, said receiving head having:

i. an inside hollow area connected to the channel of said neck and adapted to receive a supply of shaving lubricant;

ii. an outside, recessed tray having a width greater than the width of a razor adapted receive at least the blade end of a razor; and,

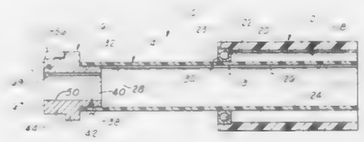
iii. a lubricant distribution means adapted to distribute lubricant from a supply of lubricant of the inside hollow area, including a manifold located at the blade end receiving portion of said recessed tray.

4,858,315

SHIELD STRIPPING APPARATUS FOR ELECTRICAL CABLE

John G. Tanner, Oklahoma City, Okla., assignor to N. J. Wheeler, Oklahoma City, Okla.

Filed May 9, 1988, Ser. No. 191,358
Int. Cl.[4] H02G *1/12*
U.S. Cl. 30—90.4 **20 Claims**



1. A stripper for removing a shield from a cable, said stripper comprising:

cable guiding means for receiving and guiding said cable;

cutting means movable between a retracted position and a cutting position and being pivotally affixed on said guiding means for cutting said shield in a substantially longitudinal direction as said cable is moved along said cable guiding means when said cutting means is in a cutting position; surface means on said cutting means responsive to insertion of said cable for moving said cutting means to said retracted position, and

stop means for holding said cutting means in said cutting position as said cable is moved.

4,858,316

TUBING CUTTER

Thomas W. Dubey, 2601 Lower Roswell Rd., Marietta, Ga. 30062

Continuation-in-part of Ser. No. 77,456, Jan. 24, 1987, abandoned. This application Nov. 22, 1988, Ser. No. 274,915
Int. Cl.[4] B23D *21/08*; B26D *27/00*
U.S. Cl. 30—102 **4 Claims**



1. A tubing cutter for cutting tubes having a diameter between a first diameter and a second diameter, said tubing cutter including a pair of opposed jaws, each jaw of said pair of jaws mounting at least one cutter and at least one jaw of said pair of jaws mounting a plurality of cutters, all of said cutters being aligned with one another to engage a single circumferential line on a tube, pivot means for pivoting said jaws with respect to each other, and a pair of handles, each handle of said pair of handles being fixed to one of said jaws, said handles and said jaws being on opposite sides of said pivot means, the arrangement being such that said handles can be separated to cause said jaws to separate for receiving a tube therebetween, said plurality of cutters on said at least one jaw being arranged such that a straight line drawn through all their axes is parallel to a centerline of said tubing cutter extending between said pair of jaws, through said pivot means and between said handles, said at least one cutter comprising two cutters and said plurality of cutters comprising two cutters, so that each jaw of said pair of jaws mounts two cutters, said cutters being circular in configuration and including an axle for rotatably mounting said cutter, said cutters being so arranged that said axles of said cutters are at the corners of a reference square when said jaws are at their closed position, each jaw of said pair of jaws including an axle housing for each of said cutters, each axle housing defining an opening therethrough for receiving an axle for said cutters, said jaw further defining a slot therein for receiving said cutter, said axle housing having a slot coextensive with said slot in said jaw, said cutter having a thickness to be snugly received in said slot and rotatable on said axle.

4,858,317

STOMA FLANGE CUTTER

George E. Seib, and Bradley D. Seib, both of Calgary, Canada, assignors to Geepard Industries, Inc., Calgary, Canada

Filed May 26, 1988, Ser. No. 199,177
Int. Cl.[4] B26B *27/00*
U.S. Cl. 30—115 **9 Claims**

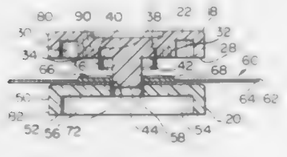
1. Apparatus for cutting a stoma flange comprising:

a first section and a second section;

said first section having a first surface portion with an annular cutter element extending perpendicularly therefrom, a post extending from said surface within said cutter element and concentric therewith, said cutter element and post each extending in an axial direction a predetermined distance from said first surface portion;

said second section having first and second spaced surface portions and a through bore between said surface portions, said bore being adapted for cooperative association with said post;

means cooperating between said first surface portions of said sections to protect said cutter, when said respective first surfaces are in confronting orientation and said post and bore are cooperatively associated;



said sections being separable and movable whereby said first surface of said first section and said second surface of said second section are in a confronting orientation with said post and bore in cooperative association whereby said cutter is exposed and adapted to cut a stoma flange in cooperation with said second surface.

4,858,318

CONVERSION CHAIN SAW

Harvey G. Anderson, Muskegon, Mich., assignor to Pro Power Corporation, Kalamazoo, Mich.

Filed Oct. 11, 1988, Ser. No. 255,780
Int. Cl.[4] B27B *17/00*
U.S. Cl. 30—122 **8 Claims**



1. A conversion chain saw comprising:

a power supply unit having a driven shaft;

a housing member mounted on said power supply unit with said driven shaft projecting axially therefrom;

chain-saw drive-sprocket means mounted on said shaft for rotation therewith;

said drive-sprocket means comprising juxtaposed concentric sprocket means keyed to said shaft and adapted to drive different kinds of chain saws;

a chain-saw support-bar mounting base whereon a chain-saw support bar for a particular type of chain saw can be mounted in alinement with a complementary said concentric sprocket means;

tension-adjusting means adapted to adjust the effective length of whatever support bar is mounted on said mounting base; and,

oil-delivery means adapted to discharge oil to the support bar which is mounted on said mounting base.

4,858,319

APPARATUS FOR ENSURING THAT A KNIFE IS OPENED IN A DESIRED ORIENTATION

James Castelluzzo, New York, N.Y., assignor to Unique Knife Manufacturing Corp., Roselle, N.J.

Filed Nov. 9, 1987, Ser. No. 118,627
Int. Cl.[4] B25F *3/00*
U.S. Cl. 30—125 **4 Claims**



1. A knife comprising a longitudinally extended elongated knife body including a first longitudinally extending surface and a second longitudinally extending surface opposite from said first longitudinally extending surface, a blade reservoir in said knife body for receiving at least one blade and including an opening on said first longitudinally extending surface of said knife body through which said at least one blade may be inserted,

sleeve means slidably disposed on said knife body, whereby said sleeve means may be slidably displaced over said knife body into a predetermined location on said knife body covering said opening so as to prevent said at least one blade from being removed therefrom, and

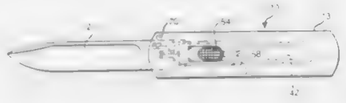
latch means projecting from said first longitudinally extending surface of said knife body, said latch means being movable between a first normal operating position and a second position whereby when said latch means is in said first normal operating position with said sleeve means located at said predetermined location, said latch means prevents removal of said sleeve means from said knife body, and when said latch means is in said second position, said sleeve means is slidably displaceable from said predetermined location and can be removed from said knife body, whereby operation of said latch means with said first longitudinally extending surface of said knife body facing upwardly causes said opening to face upwardly thereby preventing said at least one blade from falling from said reservoir upon removal of said sleeve means.

4,858,320

WEDGE LOCK FOR POCKET KNIFE BLADE

Denis J. Lemaire, 534, de la Verendrye, Boucherville, Quebec, Canada J4B 2Y1

Filed Apr. 4, 1988, Ser. No. 148,918
Int. Cl.[4] B26B *1/08*
U.S. Cl. 30—162 **8 Claims**



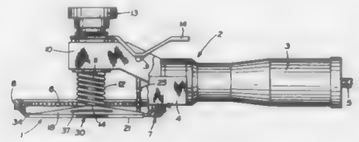
1. A lock for barring and unbarring a cutting blade of a pocket knife, the said blade having a cutting edge portion and a tang in a flat plane, the said lock comprising a substantially flat leaf spring extending in a plane substantially parallel to said blade, said leaf spring having one end slightly bent away from said parallel plane so as to abut against the tang of said blade for maintaining the cutting blade in its forwardly projected direction, wedge means for retracting the said one end of the leaf spring into said parallel plane so as to bring said one end of said leaf spring away from the flat plane of said tang and allow freedom of movement of said blade.

4,858,321

SLOTTED DEPTH GAUGE PLATE

Timothy J. McCullough, 833 Aurora Rd., Vermilion, Ohio 44089

Filed Mar. 4, 1988, Ser. No. 164,015
Int. Cl.[4] B26B *29/00*
U.S. Cl. 30—276 **19 Claims**



19. A plate for mounting within the periphery of a ring shaped cutting blade of a power driven trimming knife for severing strips of material from a larger body of resilient material, said plate being formed of a generally rigid material and having a bottom surface and a peripheral edge, and a radially inwardly extending slot formed in said bottom surface and edge providing a predetermined cross-sectional configuration to the slot so that as the knife is moved manually across the body of material, the material is compressed by the bottom surface of the plate except for the area of the slot whereby the material extends into said slot and is severed by the cutting blade and assumes a shape similar to the cross-sectional shape of said slot.

4,858,322

CIRCLE CUTTER EMPLOYING BASE, SWIVEL HANDLE, AND PIVOT BAR WITH ADJUSTABLE KNIFE

Benjamin Kluga, 26295 Wilson St., Los Molinos, Calif. 96055

Filed Feb. 9, 1988, Ser. No. 154,980
Int. Cl.[4] B26B *3/00*
U.S. Cl. 30—310 **5 Claims**



1. A circle cutter for making a circular cut of a selectable diameter in a rug or other soft, cuttable material, comprising:

a body portion having a bottom surface with a plurality of spaced prongs extending downward therefrom, said bottom surface and prongs adapted for non-slidingly resting on a selected portion of said material, and having a top surface with a shaft extending upwardly therefrom, said shaft being fixed to said body portion and having a stepped configuration including a lower cylindrical portion having a larger diameter, an upper cylindrical portion having a smaller diameter and an upwardly facing shoulder therebetween, said top surface, said bottom surface and said prongs being symmetrically oriented with respect to the axis of said shaft,

a manually-graspable handle pivotably positioned at the top of said shaft for rotation about said shaft with the lower face of said handle in bearing relationship to said upwardly facing shoulder, said handle being swivelable with respect to said shaft about an axis which is symmetrically oriented with respect to said base and said prongs,

a horizontal radius arm pivotably and slideably positioned on said lower portion of said shaft and having a free end at one end thereof and a pivot portion at the other end thereof, said pivot portion being positioned on said shaft so that said pivot portion engages said top surface of said body portion when the arm is slid to its lowest position and engages said lower face of said handle when the arm is slid to its highest position, said pivot portion being arranged to allow said arm to swing in a circular horizontal arc about said shaft,

a knife holder mounted on said arm, said knife holder including means for fixing said knife holder at any position on said arm between said pivot portion and said free end of said arm,

a knife having a blade having a sharpened, straight forward edge with a point at one end of said edge,

said knife holder also including means for holding said knife so that said straight, sharpened edge thereof will be inclined at an angle to flat surface on which said body portion is positioned, said knife holder including knife adjustment means for adjusting the position of said knife with respect to said flat surface so that, when said arm is slid to its lowest position and said pivot portion engages said top surface of said body portion, said knife can make cuts in said flat surface of a fixed depth and, when said arm is slid to higher positions, said knife can make cuts in said flat surface of a range of lesser depths without changing the angle of said straight, sharpened edge thereof with respect to said flat surface,

whereby when said arm is moved in said arc, said knife will be able to cut material of a wide range of thicknesses under said cutter smoothly and without buckling, and

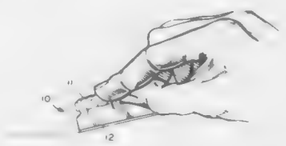
whereby the user of said circle cutter can support the user's body weight by placing the palm of one hand on said rotatable manually-graspable handle and then continuously grip its, without shifting the grip, as the user swivels about the said circle cutter and manipulates the said knife with the other hand.

4,858,323

INTEGRALLY BACKED SINGLE-EDGE RAZOR BLADE

Clemens A. Iten, Fisherville, Va., assignor to American Safety Razor Company, Verona, Va.

Filed Oct. 15, 1987, Ser. No. 108,628
Int. Cl.[4] B26B *21/54*
U.S. Cl. 30—346.6 **12 Claims**



1. An integral one-piece single-edge razor blade, comprising:

a thin elongated blade body having substantially uniform thickness and lying in a plane, said body having opposite, generally parallel, edges, one of said edges being sharpened to form a cutting edge; and

a marginal portion of said blade body adjacent the opposite edge having a plurality of projections integral with and formed in and by said body and which project from said body out of said plane at least to one side of said body to reinforce said marginal portion, said projections being spaced one from the other longitudinally along said blade body, said marginal portion extending from said opposite

blade edge toward said cutting edge a distance less than one-half the width of said blade, the remaining portion of said blade having smooth surfaces and lying in said plane, said projections being formed along said opposite edge of said blade body for facilitating manual purchase of said blade along said opposite edge.

4,858,324

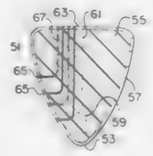
KNIFE BLADES AND METHOD OF MAKING SAID KNIFE BLADES

Raymond E. Wiech, Jr., San Diego, Calif., assignor to Edge Engineering, Inc., San Diego, Calif.

Continuation of Ser. No. 569,960, Jan. 11, 1984, abandoned. This application Dec. 3, 1986, Ser. No. 937,480

Int. Cl.[4] B26B *9/02*

U.S. Cl. 30—357 **20 Claims**



1. A method of forming a cutting edge comprising the steps of:

(a) providing a settable moldable material;

(b) providing a mold;

(c) molding said moldable material in said mold in the shape of a pair of surface meeting along a line to form a cutting edge along said line;

(d) allowing the molded material to set;

(e) providing a material which is hard relative to said set material; and

(f) replicating the shape of said cutting edge with a continuous coating of said material of step (e) disposed over said cutting edge.

4,858,325

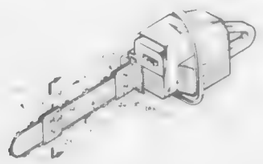
CHAIN SAW AND GUIDE

Edward A. Miller, P.O. Box 617, Woodstock, Ga. 30188

Filed Jul. 2, 1987, Ser. No. 69,171

Int. Cl.[4] B27B *17/02*

U.S. Cl. 30—373 **8 Claims**



1. A portable chain saw including a motor, a chain bar extending from said motor and a continuous saw chain extending about said chain bar in driven relationship with respect to said motor so that the motor moves the saw chain along a cutting path about said chain bar, the improvement therein of at least one pair of guide plates mounted to said chain bar with each guide plate of the pair of guide plates mounted on opposite sides of and in planes parallel to said chain bar, each guide plate including an edge portion protruding in overlying straddling relationship beyond the path of the saw chain and each of said edge portions having a curved guide surface extending parallel to the cutting path of the saw chain and spaced a predetermined constant radius (X) from the path of the saw chain whereby with the chain saw oriented in various attitudes and the curved guide surface of at least one of said guide paltes engaging a fixture guide surface the saw chain cuts the work product at a distance (X) displaced from the fixture guide surface.

4,858,326

GEOMETRIC INSTRUMENT AND METHOD OF MAKING SAME

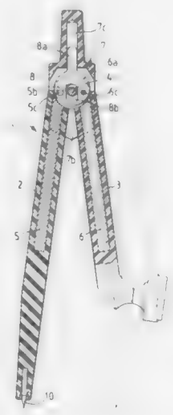
Clive W. Warwicker, Bookely, Nr. Kidderminster, England, assignor to Helix Group PLC., Stourbridge, England

Filed May 18, 1987, Ser. No. 51,670

Claims priority, application United Kingdom, May 23, 1986, 8612656

Int. Cl.[4] B43L *9/02*

U.S. Cl. 33—27.02 **10 Claims**



1. In a geometric instrument having a pair of elongated limbs articulatingly connected at their upper ends, the improvement wherein said limbs comprise an elongated moulded plastic lower leg portion and an elongated upper rigid metal leg portion embedded within and reinforcing said lower leg portion and having a rigid part projecting outwardly from the upper end of said lower leg portion free of said moulded plastic of said lower leg portion, said outwardly projecting parts being provided with cooperating overlapping members and means for rotatably interconnecting said overlapping members to permit articulation of same limbs, said metal upper leg portion is provided with laterally extending pips about which the mouldable plastic of said lower leg portion flows when said upper leg portion is embedded therein to prevent axial separation of said upper and lower leg portions and to act as centralizing means effective to stabilize said upper leg portion within the moulded plastic lower leg portion.

4,858,327

APPARATUS FOR DETERMINING AN EDGE PROFILE OF A METALLIC WORKPIECE

Robert H. Johns, Natrona Heights, Pa., assignor to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Nov. 23, 1987, Ser. No. 123,637

Int. Cl.[4] B43L *13/02*

U.S. Cl. 33—42 **10 Claims**

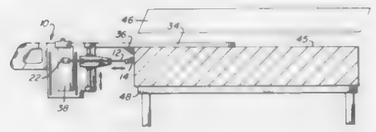
1. A portable apparatus for determining the surface profile of a vertical side of a large rectilinear shaped metallic slab while in an unconnected relationship therewith, the apparatus including:

means for stationarily supporting the slab in a horizontal position and at an elevational position easily approachable by a single work person handling the apparatus during the determining operation,

the portable characteristic of the apparatus being obtained by a positioning bar means arranged on the end of the apparatus most adjacent to the slab when in its operating position, said bar means adapted to be positioned in an overhanging supporting relation with respect to the surface of the upper side of the slab, the lower portion of said positioning bar means being established by a positioning bar projection therefrom to engage with the vertical side of the slab,

said bar means having a said overhanging length, a strength and a rigidity so as to give stability to the opposite free end of the apparatus when in its operative position, and allowing a substantial reduction in the remaining required supporting weight for the apparatus when said bar means is in its operative position supported by the slab,

said portable characteristic also being a result of a gripping



part formed and positioned to be easily gripped by the work person, the apparatus further including a frame means having a part for carrying said gripping part, said frame means arranged generally between said bar means and said gripping part and wherein said frame means is constructed to operatively carry the following:

a. surface engaging means for engaging with the vertical side of the slab and carried indirectly by said frame means so as to be moveable relative to said bar means,

b. vertical translating means operatively connected to said surface engaging means for allowing translation of the surface engaging means across the vertical side of the slab,

c. means being a part of said surface engaging means for allowing the work person to manually move said surface engaging means to effect said translation movement, and

d. recording means operatively connected to said surface engaging means for recording deflection of said surface engaging means as the surface engaging means is translated across the vertical side of the slab, thereby recording the surface profile of the vertical side of the slab.

4,858,328

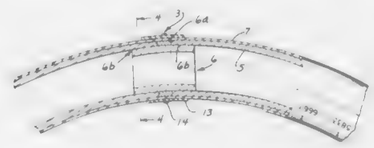
MANUALLY MANIPULATED DISTANCE MEASURING TOOL

Dennis Heinen, N5744 Hwy. 57, Belgium, Wis. 53004

Filed Oct. 13, 1988, Ser. No. 257,201

Int. Cl.[4] G01B *3/12*

U.S. Cl. 33—722 **6 Claims**



1. A measuring tool for manual rolling over a support area, comprising an unobstructed ring having a diameter of at least three feet, said ring being formed with a hollow metal tube with adjacent tube ends, a connecting element for joining the ends of said metal tube, a protective cover secured to said tube and connecting element, and length marks circumferentially spaced on said cover.

4,858,329

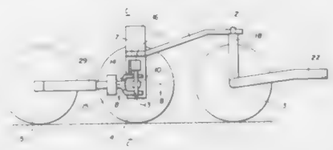
A SURVEYING AND MAPPING APPARATUS FOR INDICATING THE LEVEL DIFFERENCES OF THE GROUND TRAVELLED IN RELATION TO THE DISTANCE TRAVELLED

Gedalyahu Manor, Haifa, Israel, assignor to Technion Research & Development Foundation Ltd., Haifa, Israel

Filed Jan. 12, 1988, Ser. No. 143,066

Int. Cl.[4] G01B *7/00*

U.S. Cl. 33—775 **5 Claims**



1. A surveying and mapping apparatus adapted to indicate the level differences of the ground over which the apparatus is made to travel, in relation to the distance travelled from a given reference point, the apparatus having a front end and a rear end and includes:

a first carriage consisting of a longitudinal frame supported at a front end thereof by at least one wheel and at a rear end thereof by at least two spaced-apart coaxial wheels, said front wheels and said rear wheels having their axes distanced from each other by a first distance "A";

a second carriage consisting of a longitudinal frame attached at a front end thereof to said first carriage at a point substantially coexistent with the axis of said rear wheels, by a link permitting vertical and horizontal inclination as well as a twisting movement of said frame of said second carriage in relation to the frame of said first carriage, said second carriage being supported at its rear end by at least two spaced-apart coaxial wheels at a second distance "B" from said link;

a device attached to at least one of said wheels of said implement for measuring the distance traveled by said wheel, and to emit a first signal defining said distance;

a device attached to said two frames for measuring the angle of vertical inclination of said second carriage in relation to said first carriage and for emitting a second signal defining said angle;

a device attached to said two frames for measuring the angle of horizontal inclination of said second carriage in relation to said first carriage and for emitting a third signal defining said angle;

a device attached to said two frames for measuring the angle of twist of a second carriage in relation to said first carriage and for emitting a fourth signal defining said angle;

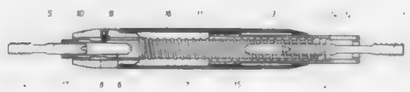
a computing device adapted to receive the said four signals and to compute the distance traveled and the level and slope of each point along the route traveled by said apparatus in relation to the level of said given reference starting point.

4,858,330

THREAD MEASURING TOOL

Leif G. Larsen, Sibbevej 10, Graested, Denmark 3230

PCT No. PCT/DK87/00157, § 371 Date Jul. 26, 1988, § 102(e) Date Jul. 26, 1988, PCT Pub. No. WO88/04763, PCT Pub. Date Jun. 30, 1988
PCT Filed Dec. 14, 1987, Ser. No. 225,752
Claims priority, application Denmark, Dec. 17, 1986, 6101/86
Int. Cl.[4] G01B *3/48*
U.S. Cl. 33—199 R 10 Claims



1. A thread measuring tool comprising:
an elongated hollow housing having first and second ends;
a tubular gauge member axially movable within said housing and having one end for projecting from said first housing end,
a spindle having one end extending within said gauge member and being axially movable relative to the gauge member;
a plug gauge at said one spindle end for projecting beyond said one end of said gauge member,
means for detachably connecting the other end of the spindle to said housing second end comprising mating threaded means on said spindle other end and housing second end to permit axial initial positioning of said gauge member relative to said housing and detachment of the spindle from the housing second end for removal of the spindle through said housing first end,
means acting between said housing and said gauge member for biasing said gauge member one end outwardly of said housing first end and over said plug gauge,
movement of said plug gauge into the hole of a piece with said gauge member one end engaging said piece causing said gauge member to move axially of said housing by an amount corresponding to the movement of the plug gauge into the hole.

4,858,331

METHOD AND APPARATUS FOR MEASUREMENT OF CASTER, KING-PIN-INCLINATION, AND CAMBER ON MOTOR VEHICLES

Otfrid Maus, Darmstadt, Fed. Rep. of Germany, assignor to Schenck-Auto-Service-Gerate GmbH, Fed. Rep. of Germany

Filed Aug. 31, 1987, Ser. No. 91,422
Claims priority, application European Pat. Off., Sep. 11, 1986, [illegible]
Int. Cl.[4] G01B *7/315*
U.S. Cl. 33—203.18 2 Claims



1. In a process for the measurement of caster, camber and king-pin-inclination of a freely positioned motor vehicle comprising the steps of measuring the geometric values of caster, camber and king-pin-inclination while the vehicle is freely positioned, utilizing an inclinometer to measure a shift angle while the vehicle is freely positioned, and correcting the measured geometric values obtained while the vehicle was freely positioned with the measured shift angle, the improvement comprising utilizing at least one additional inclinometer along the longitudinal or traverse axis of the vehicle to measure the inclination of the vehicle relative to a horizontal plane along the axis where the additional inclinometer is positioned, and correcting the measured geometric values in accordance with the measured inclination along the axis where the additional inclinometer is positioned.

4,858,332

LOFT-LIE TESTER FOR GOLF CLUBS

Frank Thomas, Chester, N.J., assignor to United States Golf Association, Far Hills, N.J.

Filed Sep. 19, 1988, Ser. No. 246,266
Int. Cl.[4] G01B *5/00*
U.S. Cl. 33—508 25 Claims



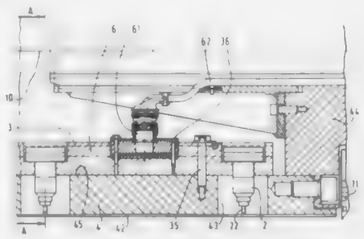
1. A loft-lie tester for golf clubs comprising
an elongated frame;
means for holding a shaft of a golf club on said frame with an axis of the shaft disposed along a fixed axis;
a first assembly slidably mounted on said frame for measuring the "lie" of a head of a golf club held on said frame; and
a second assembly mounted on said first assembly for measuring the "loft" of the head of the golf club held on said frame.

4,858,333

CONTINUOUS MONITORING ROLLER FOR THE PROFILE OF A STRIP

Michel Morel, Chelles, France, assignor to Clecim, Cedex, France

Filed Nov. 20, 1987, Ser. No. 123,464
Claims priority, application France, Nov. 20, 1986, 86-16178
Int. Cl.[4] G01B *7/28*
U.S. Cl. 33—552 8 Claims



1. A roller for continuous monitoring of the profile of a strip, said roller comprising a tubular wall (4) mounted for rotation about an axis of rotation (10), said strip moving in a direction perpendicular to said axis of rotation, said roller having a length and a circumference, a plurality of pick-ups (2) arranged on said circumference of said roller in at least one series (21) comprising a plurality of pick-ups distributed over said length of said roller in a direction (30) generally parallel to said axis of rotation (10), said pick-ups (2) being located in housings (43) in said tubular wall (4) and opening at least on an interior face of said tubular wall for the detachable fitting of said pick-ups (2), wherein said pick-ups (2) are fitted on a straight support bar (3) centered on said direction (30), said bar (3) being applied against said interior face (45) of said tubular wall (4) and maintained in position by detachable fixing means.

4,858,334

METHOD AND APPARATUS FOR LOCATING THE WEB CENTER OF A BEAM

George D. L. Heitzman, III, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 30, 1988, Ser. No. 175,415
Int. Cl.[4] B23D *49/02*
U.S. Cl. 33—673 7 Claims



1. An apparatus for locating a center of a blind web having a predetermined thickness and being formed perpendicularly to a substantially planar upper surface of a beam cap having a predetermined width, said apparatus comprising:
an upper portion defining a substantially planar surface that can be brought into substantially parallel relationship with said planar upper surface, said upper portion having a predetermined point thereon for locating said center; and
a pair of arms fixedly depending from said upper portions at locations spaced apart from each other by at least the width of said beam cap so that said arms can straddle said beam cap, said arms having respective ends extending inwardly toward each other, said ends being symmetrically displaced from each other with respect to an axis passing through said predetermined point perpendicularly to said planar surface, the displacement of said ends being less than said width of said beam cap and greater than said thickness of said blind web, said axis passing through the center of the blind web when the apparatus is turned about said axis until said arms both contact the blind web.

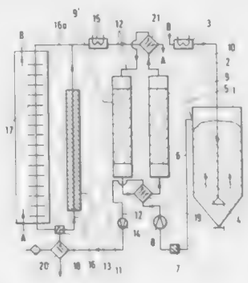
4,858,335

PROCESS FOR REGENERATING A MOISTURE LADEN DRYING CARTRIDGE AND APPARATUS FOR CARRYING OUT SUCH A PROCESS

Paul Roth, Isny/Allgaeu, Fed. Rep. of Germany, assignor to Motan Gesellschaft mit beschraenkter Haftung, Isny/Allgaeu, Fed. Rep. of Germany

Filed Nov. 4, 1987, Ser. No. 116,761
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1986, 3637700
Int. Cl.[4] F26B *21/06*
U.S. Cl. 34—32 3 Claims

1. A drying apparatus including means for regenerating a moisture laden drying cartridge comprising a drying circuit including a drying chamber for material to be dried, means for circulating a flow of drying air through said drying chamber, and at least one drying cartridge connected to said air circulating means for removing moisture from a stream of air withdrawn from said drying chamber, a closed regeneration circuit through which a stream of regeneration air can be circulated to remove moisture from a moisture laden drying cartridge, and means for switching a drying cartridge from said drying circuit to said regeneration circuit, wherein said switching means comprises at least one air flow regulating device arranged between a return line of the drying circuit and a regeneration line of the regeneration circuit for switching the flow of drying



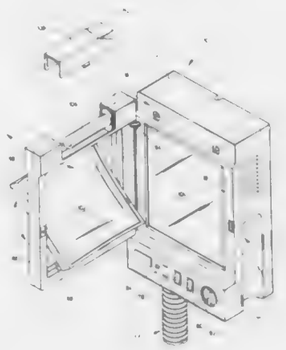
air in the drying circuit and the flow of regeneration air in the regeneration circuit between drying cartridges.

4,858,336

HAIR DRYER

Shivendra Varma, 2 McFadden Drive, Brampton, Ontario, Canada L6Z 3H4

Filed Feb. 25, 1988, Ser. No. 160,287
Int. Cl.[4] F26B *19/00*
U.S. Cl. 34—90 26 Claims



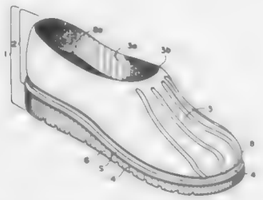
1. A hair dryer comprising:
a housing having a forward surface;
air flow producing means mounted in the housing for producing at least a heated air flow;
a nozzle;
conduit means for directing the heated air flow to the nozzle, the conduit means joining the nozzle to the housing and being flexible to permit movement of the nozzle relative to the housing;
a frame hinged to the housing such that the frame moves between a closed orientation in which the frame is positioned against the forward housing surface and an open orientation in which the frame is separated from and angled relative to the forward housing surface;
a mirror assembly including an opposing pair of parallel mirrored surfaces; and,
means mounting the mirror assembly to the support frame for pivoting movement relative to the frame.

4,858,337

VULCANIZED RUBBER FOOTWEAR PRODUCT

Tarachand S. Barma, La Crosse, Wis., assignor to La Crosse Footwear, Inc., La Crosse, Wis.

Division of Ser. No. 784,309, Oct. 4, 1985, Pat. No. 4,703,533.
This application Oct. 30, 1987, Ser. No. 114,604
Int. Cl.[4] A43B *1/12, 1/10, 13/12*
U.S. Cl. 36—4 17 Claims



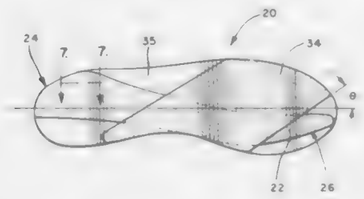
1. A footwear assembly, comprising:
an uncured rubber upper;
an uncured rubber insole mounted on said upper;
a midsole mounted on said insole, said midsole including a midsole base and means for securing said base to said insole, said base consisting essentially of a prefabricated material which is substantially non-crosslinkable and which retains its structural integrity during vulcanization of said upper and said insole, and which has an exposed outer face disposed to receive an outsole thereon.

4,858,338

KINETIC ENERGY RETURNING SHOE

Rainer K. Schmid, Eugene, Oreg., assignor to Orthopedic Design, Eugene, Oreg.

Filed May 18, 1988, Ser. No. 195,699
Int. Cl.[4] A43B *13/18, 13/38*
U.S. Cl. 36—44 24 Claims



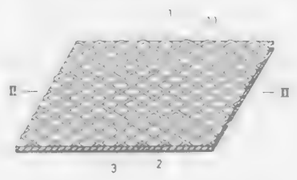
1. A sole for a shoe used by a wearer comprising:
an upper sole portion;
an outer sole portion; and
an inner sole disposed between said upper sole portion in said outer sole portion, said inner sole portion including a first strip of an elastic material extending from the outer heel portion to the large toe area of said outer sole portion, said first strip forming a rocker bottom adapted to cradle the first metatarsal head of the foot of said wearer, the roll point of said rocker bottom being disposed in a range of from the toe break of said wearer to approximately 2.5 cm. behind the toe break of said wearer.

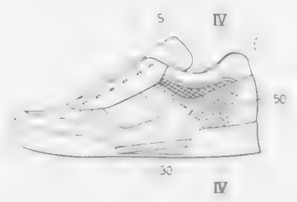
4,858,339

COMPOSITE RUBBER SHEET MATERIAL AND SPORTS SHOE EMPLOYING THE SAME

Hideki Hayafuchi, Kurume; Yoshiharu Moronaga, Saga, and Kiyotaka Nakano, Kurume, all of Japan, assignors to Nippon Rubber Co., Ltd., Tokyo, Japan

Filed Jan. 7, 1988, Ser. No. 141,524
Claims priority, application Japan, Jan. 10, 1987, 57-2061[U]; Feb. 24, 1987, 57-27067[U]
Int. Cl.[4] A43B *23/60, 5/00, 23/16*
U.S. Cl. 36—45 29 Claims





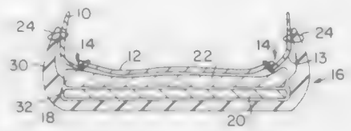
1. A composite rubber sheet material comprising:
a sponge rubber sheet; and
a mesh cloth having a percentage of voids in the range of 15 to 75%;
said mesh cloth being inset in one side surface of the sponge rubber sheet to a depth ranging from 5 to 75% of the thickness of the mesh cloth to limit the tension modulus and creep characteristics of the mesh cloth and the sponge rubber sheet and for absorbing tensile pressure and impact pressure for enhancing the stability, durability, bendability and flexibility of the composite rubber sheet material.

4,858,340

SHOE WITH FORM FITTING SOLE

Stephen M. Pasternak, Englewood, Fla., assignor to Prince Manufacturing, Inc., Princeton, N.J.

Filed Feb. 16, 1988, Ser. No. 156,282
Int. Cl.[4] A43B *7/14, 13/28*
U.S. Cl. 36—88 6 Claims



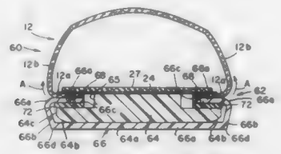
1. A shoe comprising an upper and a sole affixed thereto to define a foot-receiving space, wherein the sole comprises: a first sole element of a resilient material, a second sole element in the form of an elastic sock liner forming the uppermost layer of the sole, and a third sole element of a deformable material having a high hysteresis, wherein the third element is disposed between the first and second elements and said elements are bonded together.

4,858,341

ADJUSTABLE GIRTH SHOE CONSTRUCTIONS

Henri E. Rosen, 229 Coolidge Ave., Watertown, Mass. 02172

Filed Jul. 29, 1988, Ser. No. 226,403
Int. Cl.[4] A43B *3/26*
U.S. Cl. 36—97 30 Claims



1. A shoe capable of accommodating and fitting different foot widths, said shoe comprising
a shoe upper having deformable side members;
a foot support surface extending at least between the lower edge margins of the upper side members for supporting a foot inserted in the shoe;
a sole assembly having a heel portion, a toe portion and a midportion between said heel and toe portions and comprising an insole assembly having a platform member and a sole member having two side margins, said sole member covering at least a portion of said insole member;
said upper side member being fixedly and non-elastically attached to the respective opposite side margins of the sole member, at least one side member of said sole member being disposed in such a manner so as to permit slidable movement relative to the platform member, and
being laterally deformable at least at the midportion to permit vertical movement of the corresponding one of said shoe upper side members relative to said foot support surface so as to allow adjustment of the girth of the shoe to accommodate the girth of a foot supported on said support surface.

4,858,342

THERMOPLASTIC-RUBBER WADER AND METHOD OF MANUFACTURE

Joh E. Nicholson, La Crescent, Minn., and Tarachand S. Barma, La Crosse, Wis., assignors to La Crosse Footwear, Inc., La Crosse, Wis.

Filed May 27, 1988, Ser. No. 199,470
Int. Cl.[4] A43B *23/06, 1/10*
U.S. Cl. 36—109 12 Claims

1. A method for the manufacture of a thermoplastic rubber wader footwear product comprised of a rubber vulcanizate bottom, at least one circumscribing thermoplastic strip and a thermoplastic upper, the bottom, strip and upper being securely bonded in a water-tight relationship, said method comprising:
(a) treating an upper outer circumferential area of a rubber vulcanizate bottom with a chemical reagent so as to render said treated area compatible with an adhesive composition;
(b) applying an adhesive composition onto said treated area;
(c) adhesively bonding a circumscribing thermoplastic strip onto said adhesive composition;
(d) placing a thermoplastic upper having a lower portion sized so as to circumferentially seat onto said thermoplastic strip, and;
(e) applying sufficient pressure and heat to the lower portion of said upper to bond said applied adhesive composition, said thermoplastic strip and said lower portion together to provide a wader product wherein said thermoplastic upper is securely bonded onto said rubber vulcanizate bottom in a water-tight relationship.



4,858,343

SOLE FOR ATHLETIC SHOES, PARTICULARLY FOR SOCCER SHOES

Udo Flemming, Erlangen, Fed. Rep. of Germany, assignor to Puma AG Rudolf Dassler Sport, Herzogenaurach, Fed. Rep. of Germany

Filed Feb. 22, 1988, Ser. No. 158,644
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, 3706071
Int. Cl.[4] A43B *5/00;* A34C *15/00*
U.S. Cl. 36—128 24 Claims



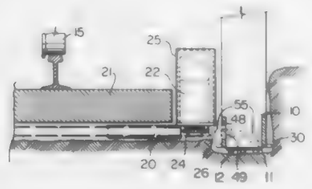
1. Sole for athletic shoes, particularly soccer shoes, made of a thin lightweight plastic construction with a reinforcing web provided between the ball and heel regions of the sole for the attachment of gripping elements, wherein a portion of the reinforcing web that is free of gripping elements runs over the sole diagonally from a lateral side of the ball region to a medial side of the heel region as a means for producing an anti-torsion effect.

4,858,344

UNDERCUTTER WITH ROTARY TRENCHER

Stephen G. Cotsford, Lexington, S.C., assignor to Tamper Corp., Columbia, S.C.

Filed May 5, 1988, Ser. No. 190,651
Int. Cl.[4] E01B 27/04
U.S. Cl. 37—104 5 Claims



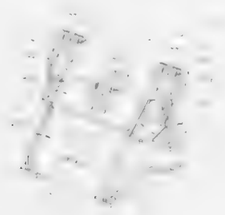
1. An apparatus for removing ballast from beneath a railroad track with a horizontally disposed undercutter and depositing the ballast directly into buckets in a vertical bucket carrying trenching wheel, the improvement comprising an inwardly facing open side on said buckets and a delivery end of said undercutter adjacent to and spaced inwardly of said trenching wheel, substantially in line with said open side of said buckets, whereby ballast removed from said track by said undercutter may be projected directly into said buckets through their open sides.

4,858,345

FRONT FRAMES OF WHEEL MOUNTED TYPE LOADERS

Tsutomu Abe, Hidaka, and Hiromichi Miyashita, Kawagoe, both of Japan, assignors to Kabushiki Kaisha Komatsu Siesakusho, Tokyo, Japan

PCT No. PCT/JP88/00095, § 371 Date Sep. 30, 1988, § 102(e) Date Sep. 30, 1988, PCT Pub. No. WO88/05845, PCT Pub. Date Aug. 11, 1988
PCT Filed Feb. 2, 1988, Ser. No. 261,960
Claims priority, application Japan, Feb. 4, 1987, 62-14293
Int. Cl.[4] E02F 3/00
U.S. Cl. 37—118 R 3 Claims



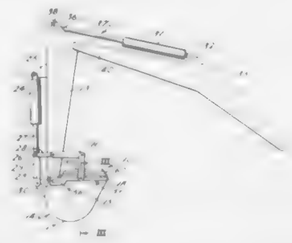
1. A front frame for a wheel mounted type loader comprising a lower frame for supporting a front wheel and a upper frame secured to said lower frame and formed with a bucket cylinder pivot, a boom pivot and a boom cylinder pivot, characterized in that said upper frame comprises a single plate formed with said bucket cylinder pivot and said boom pivot, and a pair of boom cylinder pivot members formed with said boom cylinder pivot.

4,858,346

BUCKET COVER FOR EXCAVATING IMPLEMENTS

Frank Schulte, P.O. Box 26, Mayo, Fla. 32066

Filed Aug. 27, 1987, Ser. No. 89,775
Int. Cl.[4] B66C 3/02; E02F 3/00, 3/40
U.S. Cl. 37—184 14 Claims



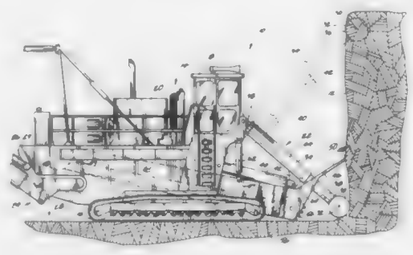
7. An excavating implement comprising a clam-shell bucket, said clam-shell bucket having first and second opposing sections, each of said first and second sections having substantially closed opposing side walls which are connected by an arcuate outer wall, each of said side walls and said outer walls having an uppermost edge portion defining openings into said first and second sections of said clam-shell bucket, means for pivotally joining said first and second sections of said clam-shell bucket, at least one cover means, said cover means having a substantially imperforate central body portion and a continuous outer edge portion, said central body portion of said cover means being formed of a flexible material so as to be expandable outwardly with respect to said openings defined by said uppermost edge portions of said side and outer wall portions of said first and second sections, said outer edge portion being configured to cooperatively seat with said uppermost edge portions of said side walls and said outer walls of said first and second sections, said central portion of said cover means closing the openings defined by said uppermost edge portions of said side walls and said outer wall of said first and second sections.

4,858,347

CONTINUOUS EXCAVATING APPARATUS AND METHODS

R. A. Hanson, and Jerry Mortoa, both of Spokane, Wash., assignors to R. A. Hanson Company, Inc., Spokane, Wash.

Filed Apr. 25, 1988, Ser. No. 185,983
Int. Cl.[4] E02F 3/18; E21C 37/00
U.S. Cl. 37—190 27 Claims



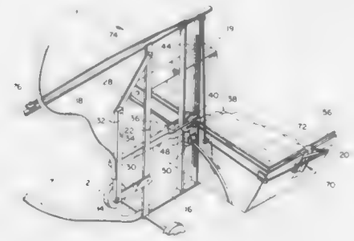
1. An excavating apparatus for breaking and removing material away from an upright face of material comprising:
a vehicle having first and second longitudinal ends;
means supporting the vehicle for movement in a generally longitudinal direction;
rotary cutter means for engaging and dislodging material from an upright face located outwardly from the first longitudinal end of the vehicle, the cutter means being mounted adjacent the vehicle first longitudinal end for rotation about a transverse axis, the cutter means being mounted for elevational movement relative to the vehicle;
power drive means for rotating the cutter means about its transverse axis;
power driven conveyor means on the vehicle for transporting material away from the first longitudinal end of the vehicle;
a collector pan extending transversely across the first longitudinal end of the vehicle, the collector pan having a front transverse edge and upwardly facing surfaces that incline to the conveyor means;
positioning means for moving the cutter means elevationally relative to the vehicle and collector pan; and
combination grading and collecting means mounted to the vehicle at an elevational position below the front transverse edge of the collector pan for, (a) gathering material dislodged by the cutter means from an upright face and transporting such material to the conveyor means, and (b) forming a surface over which the vehicle is adapted to travel by removing material from such surface and transporting such material to the conveyor means.

4,858,348

AUTOMATIC EJECTION SNOW PLOW

John Landy, 3522 Creighton Rd., S.W., Atlanta, Ga. 30331

Filed Jun. 2, 1988, Ser. No. 203,320
Int. Cl.[4] E01H 5/02
U.S. Cl. 37—265 10 Claims



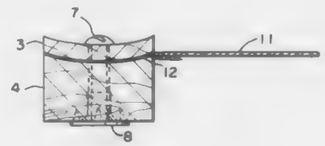
1. A snow plow, comprising:
a frame;
a scoop for receiving and containing a load of snow therein said scoop rotatably connected to said frame;
means for ejecting snow out of said scoop, said means for ejecting operably connected to said scoop and comprising
a power mechanism connected to said scoop for forcibly rotating said scoop in order to eject snow from said scoop;
means for manually activating said power mechanism;
means for rotating said scoop into a desired position adjacent the ground surface to receive a load of snow therefrom; and
a latch engaging said scoop to retain said scoop in the desired position adjacent the ground surface; and
running gear connected to said frame, said running gear enabling said scoop to be moved over a ground surface, said means for moving comprising;
a yoke;
a wheel having an axle mounted within said yoke;
a set of tracks mounted on said frame, said wheel engaging said set of tracks for generally vertical movement of said wheel along said set of tracks;
a handle rigidly connected to said yoke for moving said wheel along said set of tracks;
means for movably connecting said handle to said frame;
a stabilizer connected to the axle of said wheel, said stabilizer having runners slidably engaging said set of tracks to ensure said wheel moves generally only in a plane defined by said set of tracks;
a roller rotably mounted on said stabilizer; and
a scoop lever rigidly connected to said scoop, said scoop lever movably engaging said roller so that movement of said wheel down rotates said lever down to rotate said scoop down into the desired position adjacent the ground surface.

4,858,349

ANCHORING MEMBER FOR A FABRIC STRETCHER

Brendan R. Walsh, and Marietta T. Dantonio, both of 34 Carpenter Rd., Wilmington, Del. 19810

Filed Jun. 2, 1988, Ser. No. 202,095
Int. Cl.[4] D06C 3/08
U.S. Cl. 38—102.91 18 Claims



1. A stretcher frame in combination with a fabric anchoring member, said anchoring member comprising:
(a) a rigid first section having at least one concave surface;
(b) a second section of planer flexible material resiliently compressible against the concave surface of said first section; and
(c) means for applying a force in a direction substantially perpendicular to the concave surface for drawing the first and second sections compressibly together to anchor the fabric therebetween whereby the planer material is distorted to generally conform to the shape of the concave surface.

4,858,350

MEAL AND MARKET CALENDAR

Heidi M. Malarchik, 51 Birchwood Dr., Cranston, R.I. 02920

Filed Aug. 29, 1988, Ser. No. 237,810
Int. Cl.[4] G09D 3/04
U.S. Cl. 40—119 7 Claims



1. A meal and market calendar comprising a plurality of transparent calendar pages each having indicia thereon defining a plurality of discrete spaces, one for each day of the month, each page and the spaces thereon being viewable from the front and the back, each space having date indicia on the front and back side thereof, a plurality of labels adapted to be releaseably adhered to one side of said pages, each label fitting within one of said spaces without obliterating the date indicia for said space, each said label having a meal menu printed on one side thereof and the necessary main ingredients for said meal menu printed on the other side thereof, whereby daily

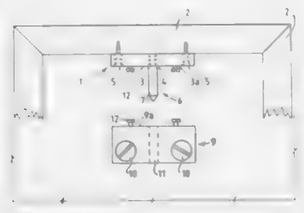
meals and the marketing requirements therefor may be planned in advance by adhering selected labels to selected date spaces, the selected meal menu for any given date then being visible by looking at one side of the page, and the necessary ingredients for said selected meal menu being visible by looking at the opposite side of said page.

4,858,351

WALL SECUREMENT SYSTEM

Charles P. B. Sewell; Michael J. B. Sewell, and Margaret I. Sewell, all of 82 Cliff View Drive, Green Bay, Auckland, New Zealand

Filed Jul. 22, 1986, Ser. No. 888,526
Claims priority, application New Zealand, Jul. 23, 1985, 212540
Int. Cl.[4] G09F *1/12*
U.S. Cl. 40—152.1 9 Claims



1. A securing arrangement including an engagement plate and at least one mounting plate; said engagement plate being provided with means to secure the same to an article, having a primary bore extending therethrough, and including an engagement pin; wherein a first end of said engagement pin is engaged within a first end of said primary bore, a second end of said primary bore being left open; said mounting plate being provided with means to secure the same to a wall or surface to which said article is to be secured, and having a secondary bore extending therethrough; in use said engagement plate being secured to a predetermined portion of said article, such that said article covers said second open end of said primary bore and said mounting plate being secured to a predetermined portion of said wall or surface, such that said engagement pin is located within said secondary bore; subsequent movement of said article away from said wall or surface requiring a hole or opening to be made in said article at or adjacent said second open end of said primary bore, at a predetermined point on said article in order that said engagement pin may be moved through said primary bore, so as to become disengaged with said plate.

4,858,352

MEANS FOR IDENTIFYING THE PARENTAGE AND PERFORMANCE CHARACTERISTICS OF SEED

Gerald L. Andersen; Ronald D. Howes, both of Cedar Rapids, and Richard D. Meyocks, Fairfax, all of Iowa, assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Oct. 26, 1987, Ser. No. 112,530
Int. Cl.[4] G09F *3/100*
U.S. Cl. 40—299 24 Claims

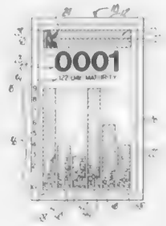
15. A means for identifying the performance characteristics of seed comprising,

a rectangular tag member having a top, bottom and opposite sides,

longitudinally disposed indicia means on said tag member with numeric indicia of progressively increasing magnitude,

a plurality of separate bars on said tag member extending longitudinally adjacent said indicia means,

each of said bars representing a different growing characteristic of the seed being identified,



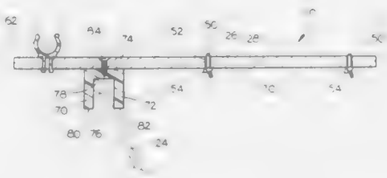
the length of each of said bars coinciding with a number or fractional number of said indicia means corresponding to a predetermined performance rating of the specific characteristics of said seed represented by each of said bars.

4,858,353

GROCERY SHOPPER ORGANIZER

Arthur D. Krebs, 835 So. 49th Ave., and Martin C. Guenette, 1507 So. 50th St., both of Omaha, Nebr. 68106

Filed Nov. 2, 1987, Ser. No. 115,201
Int. Cl.[4] G09F *3/00*
U.S. Cl. 40—308 20 Claims



1. A grocery shopper organizer adapted for support on the upper edge of any generally upright wall of a shopping cart, said organizer comprising,

a generally flat board having top and bottom surfaces and front and rear edges and transversely spaced apart opposite side edges,

means for detachably supporting a plurality of coupons on the top surface of said board

mounting means comprising at least one transversely extended open bottomed channel strip secured to the bottom of said board at a position offset toward the front edge thereof,

said channel strip including a pair of front and rear depending flanges spaced sufficiently apart for receiving the upper edge of any generally upright wall of a shopping cart therebetween,

said front flange being inclined relative to said bottom surface so as to partially define a transversely extended corner adapted for positive seating of the upper edge of said shopping cart wall at its limit position of upward travel in engagement with said front flange, and

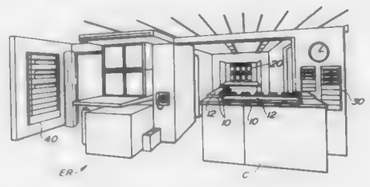
said rear flange having a lower edge which is operative to engage the shopping cart wall to limit downward pivotal movement of the rear edge of said board about the upper edge of said shopping cart wall.

4,858,354

ORGANIZATION SYSTEM

Lawrence H. Gettler, 8 Gilbert St., San Rafael, Calif. 94901

Filed Mar. 9, 1987, Ser. No. 23,483
Int. Cl.[4] G09F *3/00*
U.S. Cl. 40—324 8 Claims



1. An organization system for tracking the state of completion of an activity applicable to more than one subject, said activity having at least two states of completion, said system comprising:

a number of tray members equal to the number of subjects, said tray members arranged in side-by-side fashion upon a counter, said tray members including a top surface providing a working surface above said counter, and including a mounting device engageable to a tray connection device on said counter, and further including means for containing information relating to said subject; and

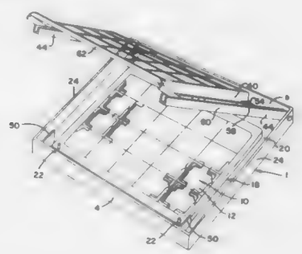
a display mechanism for selectively revealing a symbol indicating the state of completion of said activity activities to be tracked.

4,858,355

METHOD AND APPARATUS FOR SIMULTANEOUSLY INSERTING LAMINAR MATERIALS INTO A FILE SHEET

Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Japan

Filed May 14, 1987, Ser. No. 50,187
Claims priority, application Japan, Jul. 31, 1986, 61-181148
Int. Cl.[4] G02B *27/02*
U.S. Cl. 40—366 3 Claims



2. An apparatus for simultaneously inserting a plurality of laminar materials having a rigid frame into a file sheet, comprising:

a file sheet comprising a base sheet having a plurality of rectangular recessed pockets aligned both in rows and in columns, each of said pockets having a pair of retaining tabs on its opposed sides for retaining opposite side grasp portions of one of the laminar materials against the base sheet in each pocket;

a file sheet mounting plate for removably securing said file sheet in place thereon;

a slide structure having a plurality of both longitudinally and transversely aligned compartments which are, when positioned in parallel with the plane of said mounting late, in alignment with the corresponding pockets of the file sheet, and having depending pawl members provided in the lower portions of the respective compartments, said pawl members being engageable with the rear ends of the opposite sides grasp portions of the corresponding laminar materials to force the laminar materials into the respective pockets beneath the retaining tabs;

slide means for reciprocally moving said slide structure longitudinally through a predetermined stroke; and

means for moving the slide structure vertically relative to the plane of said mounting plate.

4,858,356

SLIDE SORTER AND VIEWER

George W. Brewer, 65 Gray Cliff Rd., Newton Centre, Mass. 02159

Continuation of Ser. No. 942,357, Dec. 16, 1986, abandoned. This application Jul. 5, 1988, Ser. No. 218,499
Int. Cl.[4] G02B *27/02*
U.S. Cl. 40—366 11 Claims



1. A device for simultaneous viewing and sorting of a plurality of photographic transparencies, each transparency housed in a mount having an aperture through which the transparency may be viewed and having a thickness, a width, a length, the device comprising:

first means for providing support for a plurality of mounts in a linear and generally horizontal shingled configuration, such means having a width not substantially exceeding the width of a mount and having a width not substantially exceeding the width of a mount and having a support surface with an axis hereinafter called the swipe axis, such surface being contacted by a portion of each of the mounts when they are in shingled configuration; and

the first means further having a plurality of periodically spaced ridges in the slide support surface, the height of each ridge not substantially exceeding the thickness of the mount, and the distance between two adjacent ridges being less than the length of the mount, such that in may (i) grasp a stack of transparencies housed in mounts to be viewed and sorted, between two fingers, and in a single motion parallel to the swipe axis, while the two finger span the first means, engage each successive mount against a different ridge and thereby cause the mounts to become arranged in a shingled configuration without a handler box and (ii) regather the mounts so arranged into a single stack by hand without a handler box.

4,858,357

REUSABLE DISPLAY SIGN OR CARD HAVING ALPHANUMERIC INFORMATION

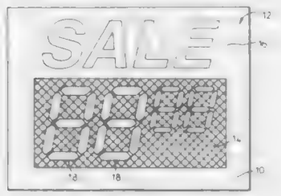
George T. Thorn, Etobicoke, Canada, assignor to Octagon Industries Inc., Mississauga, Canada

Continuation of Ser. No. 857,650, Apr. 30, 1986, abandoned. This application Jun. 30, 1987, Ser. No. 67,866
Int. Cl.[4] G09F *3/04*
U.S. Cl. 40—450 9 Claims

1. In a card for exhibiting and displaying alphanumeric information, which information may be changed form time to time, where the card has a face of which at least a portion thereof has permanently placed thereon a background field of a first, dark colour; where there are a plurality of multi-segmented alphanumeric presentation display digits on said background filed; where each display digit comprises at least seven bar segments which are so arranged as to form the digit "8",

having at least a top, a middle and bottom bar segment each of which is substantially horizontally directed; and further having two pairs of side bar segments, one pair extending form near each end of the top bar segment to near each end of the middle bar segment, and the other pair extending from near each end of the middle bar segment to near each end of the bottom bar segment; and where each bar segment of each display digit is of a second contrasting, lighter colour than said first colour;

the improvement wherein said face is substantially planar and smooth, and is adapted for receiving removable pigmentation applied thereto substantially on the plane of the



face and in an evaporable liquid base, to effectively obscure selected bar segment portions of selected ones of said digits, said pigmentation being selectively removable therefrom by wiping with a suitable solvent to restore said digits;

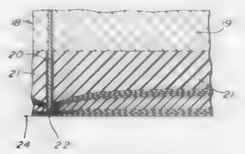
whereby specific alphanumeric data may be displayed in readable manner by changing the colour of none or some of the bar segments of each display digit form said second colour to said first colour, in order that only the unchanged bar segments are readily visible and distinguished from the background field.

4,858,358

BADGE AND METHOD OF MAKING SAME

Raymond Gagnon, 105, Bellefeuille, St-Calixte (Qué), Canada H3P 1P1

Continuation of Ser. No. 596,503, Apr. 3, 1984, abandoned. This application Aug. 10, 1987, Ser. No. 85,309
Int. Cl.[4] B32B *31/18*
U.S. Cl. 40—616 3 Claims



1. A method of making a badge having the appearance of metal badges with tapered contours for wearing on a person's clothing comprising the steps of:

making a laminate consisting of a body layer (8) of synthetic foam material (9) having a front face and a back face, an image-bearing layer (11) adhering to said front face, a protecting transparent film (12) covering said image-bearing layer (11), a layer of pressure adhesive (13) carried by said back face and, a peelable protective film (14) covering said layer of pressure adhesive;

providing a cutting and pressuring die (18) including a rigid backing block (19), a cutting blade (20) fixed to and protruding from one face of said backing block, said blade being a cutting edge (22) forming a closed figure and being longitudinally shaped in accordance with the desired contour of the finished badge;

positioning said laminate (8, 11, 13, 14) on a flat support surface (24) with said image-bearing layer (11) topmost, and pressuring said die (18) against said laminate towards said flat support surface (24);

simultaneously compressing the laminate with said blade and cutting the badge from said laminate, characterized in that:

the foam material used to make the laminate is of the type having no memory when compressed; and

a layer of compressible material (21) of uniform thickness is adhered to the one face of the block (19) of the die (18) and completely covers said one face of the block which is proximate to within and outside the same said closed figure, said compressible layer (21), when in non-compressed condition, protruding from said cutting edge (22) of said blade, said blade being free in a slot (23) formed through said layer;

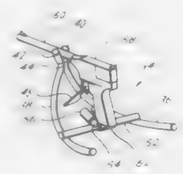
whereby said blade while it cuts the laminate to form said badge (1) simultaneously compresses the area (5) of said laminate adjacent said blade on each side of the same, to thereby obtain the finished badge with said foam exposed at the outer edge (6) of said badge and the marginal portion (5) of said badge tapering toward said edge (6) at the front face (2) of said badge (1).

4,858,359

WEAPON HOLDER

J. Roger Danz, Johnson City, Tex., assignor to Danz Research & Mfg., Inc., Johnson City, Tex.

Filed Aug. 3, 1987, Ser. No. 81,309
Int. Cl.[4] F41C *29/00*
U.S. Cl. 42—94 4 Claims



1. A pistol holder comprising:

a curved wishbone-shaped load-bearing stand formed of a pair of support members joined at a first end;

a first rest for retaining the muzzle of a pistol on the joined end of the support members;

a cross member spaced along the support members from the first rest which also interengages the support members;

a second rest for retaining the grip of the pistol on the cross member; and

an adjustable elevation lock on one of the support members for adjusting the elevation of the load-bearing stand, the elevation lock comprising a body member defining a hole which receives one of the support members in slidable relation along the support member.

4,858,360

RAM-ROD CLEANING ROD DEVICE FOR BLACK POWDER FIREARMS

Grant W. Hardin, Rt. 2, Box 960, Elizabethton, Tenn. 37643

Filed Aug. 29, 1988, Ser. No. 237,749
Int. Cl.[4] F41C *31/00*
U.S. Cl. 42—95 2 Claims

1. A ram-rod/cleaning rod device for the barrel portion of a black powder firearm comprising an essentially straight hollow rod of a length at least about equal to the length of said barrel portion, said device having a threaded section at one end thereof of a length sufficient to secure an accessory component having a mating threaded section thereof, and means for receiving a liquid component through the hollow portion of said

rod at the opposite end thereof, wherein a hollow cleaning tip having two ends with threaded sections at each end of the hollow portion thereof, having one end threadedly engaged with the threaded end of said device, said cleaning tip having a plurality of openings therein, each opening originating at the hollow portion of said tip and terminating at the surface



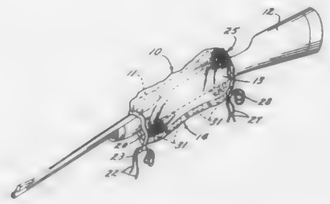
thereof to allow passage of said liquid component therethrough, wherein the threaded hollow end of the cleaning tip opposite to the hollow end thereof that is threadedly connected to the hollow rod has a plurality of slots in the threaded portion thereof to allow passage of said liquid component therethrough.

4,858,361

DETACHABLE PROTECTIVE COVER FOR A FIREARM

Grover W. White, 2641 Robinwood Rd., Gastonia, N.C. 28054

Filed Sep. 30, 1988, Ser. No. 251,891
Int. Cl.[4] B65D *65/10*
U.S. Cl. 42—96 6 Claims



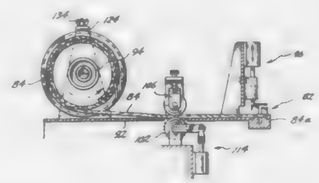
1. A detachable cover for protecting a firearm comprising a pliant elongate body having a first and second longitudinal edge portions adapted to be arranged in overlapping substantially aligned relation to each other so that said body is of tubular configuration, said body having opposed terminal end portions and being dimensioned and adapted for being placed in surrounding relation to the telescopic sight and bolt mechanism of a firearm, and spaced-apart magnetic means positioned along said longitudinal edge portions for providing forces attracting edge portions toward each other and for releasably holding the edge portions in overlapping engagement with each other so as to maintain the tubular configuration of the body.

4,858,362

ARTIFICIAL BAIT FEEDING APPARATUS

Harold T. Cook, Jr., Bainbridge Island, Wash., assignor to Marco Seattle, Inc., Seattle, Wash.

Division of Ser. No. 71,119, Jul. 8, 1987, Pat. No. 4,787,165.
This application Jul. 27, 1988, Ser. No. 224,934
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—4 4 Claims



1. An apparatus for feeding artificial bait to a baiting station comprising:

means for holding an elongated continuous strip of bait;

means for drawing said strip from said means for holding and for feeding incremental portions of said strip to a baiting station, said means for feeding being separated from and located downstream from said means for holding; and,

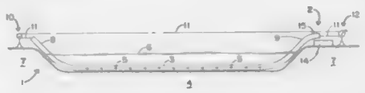
means for severing incremental portions from said strip.

4,858,363

CRAYFISH HARVESTER

John S. Smith, P.O. Box 8, Jennings, La. 70546

Filed Dec. 19, 1988, Ser. No. 286,276
Int. Cl.[4] A01K *80/00*
U.S. Cl. 43—6.5 11 Claims



1. An apparatus for harvesting crayfish or similar crustaceans from a body of water which comprises:

(a) a hollow tube positioned adjacent to the bottom of said body of water, said tube having a series of openings in its exterior wall surface connecting to the hollow passageway of said tube, said openings having a shape and positioned to permit crayfish to pass through said openings and into said passageway,

(b) a plug means positioned in said passageway, said plug means having an outer perimeter area shaped to be adjacent to the inner wall surface of said tube, and

(c) a second means attached to said plug means to move said plug means through said passageway.

4,858,364

BODY HARNESS FOR SUPPORTING A FISHING ROD

Brian B. Butts, R.R. 7, Box 109, Rome, N.Y. 13440

Filed Aug. 11, 1988, Ser. No. 230,895
Int. Cl.[4] A01K *97/10*
U.S. Cl. 43—21.2 4 Claims

1. A body harness for supporting the butt end of a fishing rod comprising a rigid, unitary body engaging member having a substantially flat central portion adapted to engage and extend across the front of the fisherman's thighs and a pair of curved side portions respectively projecting from the opposite sides of the central portion at substantially right angles thereto so as to extend alongside the fisherman's thighs, the side portions

merging smoothly with the opposite sides of the central portion, the central portion being formed with a socket for receiving the butt end of the fishing rod, and releasable means for holding the body harness in position on the fisherman.



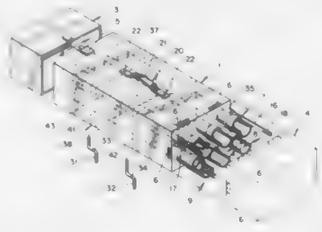
4,858,365
FISHING ROD HANDGRIPS
Bernard J. Strantz, 1002 Woodbridge St., St. Paul, Minn. 55117
Filed Mar. 13, 1989, Ser. No. 322,505
Int. Cl.[4] A01K *87/00*
U.S. Cl. 43—23 15 Claims



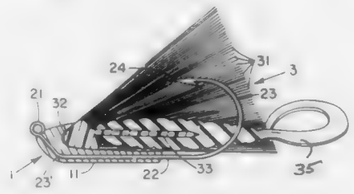
1. A fishing rod handgrip that the user can remove from a fishing rod and use as knife for filleting fish comprising:
a handle having an upper section with a first end and a second end, said upper section having a cylindrical section for the user to comfortably grasp with the user's hand from at least two directions, a lower section forming an opening between said upper section and said lower section so that the user's hand can be inserted around said cylindrical section, said cylindrical section including a knife blade pivotable mounted in said handle to permit the user to fold said knife blade out from said handle to permit the user to use said fishing rod handgrip as a knife by grasping either said upper section or said lower section and to permit the user to fold said knife blade into said handle to use said fishing rod handgrip as a handle for a fishing rod.

4,858,366
FISHING ROD HOLDER AND CARRIER
Richard T. Rushton, 57 Fairfax Village, Northport, Ala. 35476
Filed Dec. 21, 1988, Ser. No. 287,058
Int. Cl.[4] A01K *97/08*
U.S. Cl. 43—26 11 Claims

1. An apparatus for holding, carrying and storing a plurality of fishing rod and reel combinations comprising, a body of buoyant material, a plurality of parallel, elongate, smooth bore, tubular conduits disposed within and extending through said body, cover means attachable to each end of said body over the ends of said conduits, means for mounting said body on a boat, and means for retaining a fishing rod within at least one of said conduits.



4,858,367
WEEDLESS ROLL-OVER LURE APPARATUS AND METHOD
Phillip A. Rabideau, 3605 Fawn Creek Path, Austin, Tex. 78746
Filed Mar. 2, 1988, Ser. No. 163,303
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.25 16 Claims



1. A weedless roll-over lure comprising:
A. A weighted lure body means with a top and a flat bottom so that said weighted lure body means, upon coming to rest, provides the weighting for said weighted lure body means to roll over onto said flat bottom;
B. a hook means attached to said weighted lure body means;
C. a fish attracting, protective and roll-over surface means attached to said weighted lure body that enables said lure body to roll over onto said flat bottom and that protects said hook means and lure enhancements;
D. a socket undercutting said top into which said fish attracting, protective and roll-over surface means is inserted for attachment;
E. slanted sides that slant outwardly and upwardly from said flat bottom; and
F. a rounded top surface, of said top, connected to said slanted sides so that when said weighted lure body means comes to rest with said rounded top surfaces below said flat bottom, the combination of said weighted lure body means, said rounded top surface, said slanted sides, and said fish attracting, protective and roll-over surface means cause said weighted lure body to roll over onto said flat bottom.

4,858,368
FISHING LURE
Raymond C. Tolner, and Betty J. Tolner, both of P.O. Box 425, Wayland, N.Y. 14572
Filed Nov. 10, 1988, Ser. No. 269,446
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.36 10 Claims

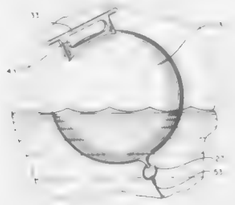
1. A fishing lure comprising:
(A) an elongated flexible tubular body which includes

(i) an inner body of semi-rigid translucent material having a longitudinally extending bore for accommodating a fishing line therethrough, and
(ii) an outer body of Woven material covering said inner body, said outer body having a tail end and a head end with said tail end being unwoven and expanded outwardly of the remainder of said outer body;



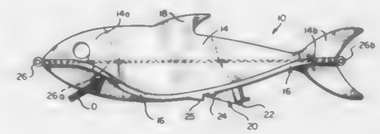
(B) a head fixedly attached to said head end of said outer body and including eye simulating means thereon; and
(C) a hackle means attached to said head to extend outwardly of said outer body on diametric opposite sides of said outer body.

4,858,369
FISHING FLOAT
Burk Collins, P.O. Box 23, Collegville, Tex. 76034
Filed Sep. 30, 1988, Ser. No. 251,308
Int. Cl.[4] A01K *93/00, 91/00*
U.S. Cl. 43—43.1 6 Claims



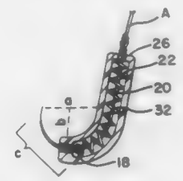
1. A fishing float for use in running a trot line, the float comprising:
a spherical body molded from a lightweight plastic material, said spherical body having a hollow interior and an exterior;
a line-engaging downward projection extending from one point on the exterior of said body for receiving a trot line;
a combination handle and line wrapping extension located opposite said line-engaging downward projection on the exterior of said body; and
wherein the plastic material of said spherical body has incorporated therein a visibility enhancing material.

4,858,370
FISHING LURE FOR SIMULATED FEEDING
Francis E. Ryder, Arab, Ala., assignor to Ryder International Corporation, Arab, Ala.
Filed Jul. 12, 1988, Ser. No. 218,091
Int. Cl.[4] A01K *95/00*
U.S. Cl. 43—43.13 8 Claims



1. A fishing lure for trolling through water and simulating the motion of a feeding fish comprising: an elongate central body having a vertically planar configuration in order to promote elevating propulsion of the lure; a pair of pectoral fin members extending laterally from respective opposite sides of said body and having a curved contour which is entirely perpendicular to said vertically planar body for causing deflection of water during trolling advancement of the lure through the water to produce said elevating propulsion of the lure in relation to the direction of said advancement; and a pivotal rudder member mounted below said body and located underneath said body during said trolling, and pivoting with respect thereto for deflecting water in order to cause lateral random motion of the lure in relation to said direction of advancement.

4,858,371
RETRACTABLE BARBLESS FISHHOOK
Herbert W. Preiser, 510 Oak Knoll, Barrington, Ill. 60010
Continuation of Ser. No. 143,001, Jan. 12, 1988, Pat. No. 4,768,304. This application Aug. 17, 1988, Ser. No. 234,576
The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.
Int. Cl.[4] A01K *83/00*
U.S. Cl. 43—43.16 8 Claims



1. A terminal tackle sport fishing device for releasing a hooked fish without handling the fish, the device being used in combination with a fishing rod having at least one guide at a terminal end thereof, the rod carrying a retrievable fishing line, the one guide of the rod having an inner dimension to permit passage of at least the fishing line, the device comprising in combination:
a body portion having outer dimensions generally larger than the inner dimension of the one guide of the fishing rod, the body portion also having an internal channel extending from one open end of the body portion to an other open end of the body portion;
a barbless bend segment, one end of the bend segment having a sharpened terminal point, the bend segment being generally retractable into the channel of the body portion through the one open end of the body portion;
a shank, one end of the shank acting upon the bend segment, an other end of the shank having means for connecting to the fishing line, the shank slidably movable within the

channel of the body portion, the shank having a length such that the means for connecting to the fishing line extends outside of and from the other open end of the body portion; and

a biasing element surrounding the shank so as to bias the slidable movement of the shank against the bend segment;

wherein upon by hooking and landing a fish with said device the fish is retrieved until means for connecting to the fishing line shank passes through the guide and the body portion abuts against the guide, further retrieval of the fishing line causes the shank to substantially retract the bend segment into the body portion thereby withdrawing the point of the bend segment from the fish effecting a release of the fish.

4,858,372

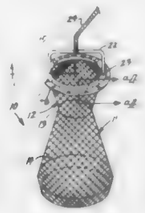
FISH BASKET

Lawrence J. Ray, 1207 Madison St., Darlington, Wis. 53530

Filed Jan. 9, 1989, Ser. No. 295,137

Int. Cl.[4] A01K *97/00*

U.S. Cl. 43—55 **8 Claims**



1. A fish basket apparatus, comprising,

a net member including an elongate net formed with a lower chamber and an upper chamber axially aligned with the lower chamber, and

an opening between said upper and lower chamber including an upper horizontal ring member defining said opening, and

a lower horizontal ring member spaced parallel to and below said upper horizontal ring member to maintain the configuration of said lower chamber, and

a flotation ring secured to an upper terminal circumferential end of the upper chamber;

said flotation ring including a circumferential flange extending outwardly of said upper chamber with fish attracting means directed outwardly from within said flotation ring for attracting fish to said apparatus, and wherein said fish attracting means includes a plurality of illumination devices.

4,858,373

SMALL ANIMAL TRAP

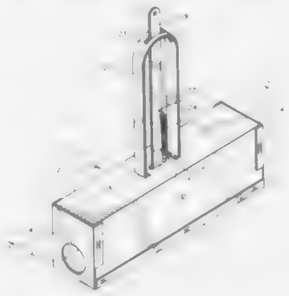
Linsey L. Combs, Rte. 4, Box 185, Holdenville, Okla. 74848

Filed Oct. 24, 1988, Ser. No. 261,691

Int. Cl.[4] A01M *23/02, 23/36*

U.S. Cl. 43—61 **6 Claims**

1. A small animal trap comprising an elongated enclosure, having a top, endwalls, bottom, sidewalls and a plunger having a flat portion in said enclosure parallel to the bottom thereof and movable between an unloaded position near the bottom thereof and a loaded position above the unloaded position, resilient means connected between said plunger and said enclosure in a manner to urge said plunger toward said unloaded position, a relatively small central opening in the top of said enclosure, an elongated arm extending from the top surface of said plunger outwardly through said opening, one sidewall of said enclosure having a lower opening adjacent its bottom edge and an upper opening adjacent its top edge said openings being at about the longitudinal center of said enclosure, a trigger inside said enclosure near its center, a trigger arm extending from said trigger to terminate outside the enclosure, a first pivotal connection means pivotally connecting said trigger arm intermediate its ends to the enclosure to enable said trigger to pivot between a set position and a released position, said trigger arm terminating in a first free end outside said enclosure, an upper lever arm second pivotal connection means pivotally connecting said upper lever arm to said enclosure adjacent the top thereof and functionally dividing said lever into a short lever and a long lever, said short lever being



formed to extend from said second pivotal connection to terminate in a free end inside said enclosure at a location beneath said plunger when the latter is in said loaded position, said long lever being formed to extend from said second pivotal connection to terminate outside said enclosure in a second free end adjacent the bottom of said enclosure and near said first free end, said first and second free ends having complemental releasable latching means for holding said free ends together only when said trigger is in the set position and said free end of said short lever is beneath said plunger.

4,858,374

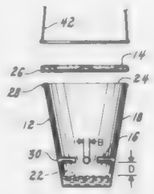
BEE TRAP

Carl W. Clemons, 4180 Sunset Crt., Ann Arbor, Mich. 48103

Filed Aug. 8, 1988, Ser. No. 229,239

Int. Cl.[4] A01M *1/10*

U.S. Cl. 43—122 **8 Claims**



1. A trap for bees comprising:

a housing having a side portion with an open top and an enclosed bottom providing a reservoir for holding bee attracting substance,

a lid removably attached to said open top, and

at least one bee entrance tube having a first end attached to said side surface and extending horizontally into the interior of said housing with a second end within said housing, said housing side portion defining an entrance port communicating with the inside surface of said tube, thereby enabling bees to enter said trap through said entrance port while preventing their escape, said tube having a length of at least 9 millimeters, an inside diameter of between 6 and 13 millimeters, and wherein said second end is positioned at least 9 millimeters from a portion of said housing side portion opposite said port.

4,858,375

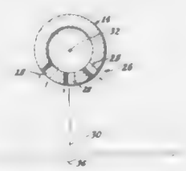
TERMITE CONTROL APPARATUS

George Mountain, P.O. Box 251, Morresville, Ind. 46158

Filed Apr. 3, 1989, Ser. No. 332,536

Int. Cl.[4] A01M *7/00*

U.S. Cl. 43—124 **5 Claims**



1. Applicator apparatus for applying termite control liquid to sites adjacent a structure whose periphery is to be treated, the apparatus comprising:

an applicator pipe, pointed at its lower end for ease of penetration into the ground, and hollow throughout its span from its lower end to a supply fitting adjacent its upper end;

a reservoir of termite control liquid, and pump means for supplying the applicator pipe with control liquid under pressure;

in such an apparatus, the improvement comprising, in combination:

the provision of a plurality of holes in the wall of the applicator pipe at a location closely adjacent its lower end;

the holes being located along about 90 degrees of the circumference of the pipe, providing, if the pipe is inserted into the ground adjacent a planar wall of a structure, and with the plurality of holes directed generally toward the said wall, the holes will aim control liquid being dispensed through the holes up to about 45 degrees from a line perpendicular to the wall and passing through the center of the pipe.

4,858,376

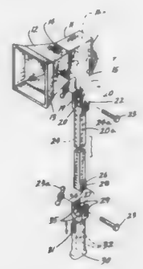
INSECT TRAP APPARATUS

Barry J. Reed, 4162 124th S. E. #301, Bellevue, Wash. 98006

Filed Jan. 9, 1989, Ser. No. 295,134

Int. Cl.[4] A01M *5/02*

U.S. Cl. 43—139 **7 Claims**



1. An insect trap apparatus comprising,

a housing enclosing a reversible motorized fan, and

a conduit member operatively associated with said motorized fan and rigidly connected to said housing, and

a shank integrally secured to said housing extending downwardly therefrom and including a first aperture, and

first contacts overlying opposed faces of said shank containing said first aperture and electrically associated with said motorized fan, and

a handle including an upwardly extending bifurcated portion including upwardly extending legs for complementarily and selectively accepting said shank between said legs, and

further contacts overlying handle apertures formed in said legs for electrically associating said further contacts with said motorized fan, and

a switch member for electrically reversing said motorized fan and battery means electrically associated with said switch and further contacts for electrically supplying electrical energy to said motorized fan, and

at least one fastening means for securing said shank to said handle.

4,858,377

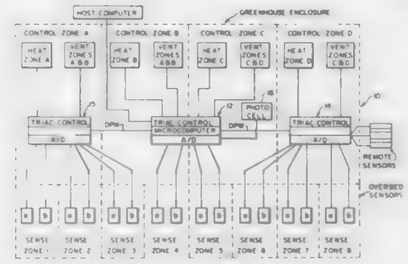
PLANT ORIENTED CONTROL SYSTEM BASED UPON VAPOR PRESSURE DEFICIT DATA

James R. Oglevee, and Kirk A. Oglevee, both of Connellsville, Pa., assignors to OCS, Inc., Connellsville, Pa.

Filed Oct. 16, 1986, Ser. No. 919,702

Int. Cl.[4] B01F *3/02;* **A01G** *9/00*

U.S. Cl. 47—17 **10 Claims**



1. A plant oriented method of automatically supplying water to a crop bed in a greenhouse comprising the steps for:

(a) continuously gathering vapor pressure deficit data over the crop bed at spaced time intervals and integrating said data;

(b) measuring a time parameter indicative of physiological crop age and leaf area;

(c) establishing an interval between supply of water based upon the data gathered in steps (a) and (b) by integrating said vapor pressure deficit data until a function thereof reaches a threshold at which time a water supply event takes place, said function and/or threshold being adjusted with increase in the parameter indicative of physiological crop age and leaf area to increase the frequency at which the threshold is reached for a given value of integrated vapor pressure deficit data; and

(d) controllably watering said crop bed based upon the interval established in step (c).

4,858,378

LANDSCAPING SYSTEM

Ibrahim F. Helmy, 6800 Park Ten Blvd., Suite 222 N., San Antonio, Tex. 78213

Filed Feb. 1, 1988, Ser. No. 151,014

Int. Cl.[4] H01G *1/00*

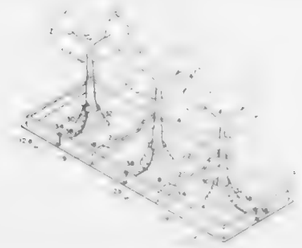
U.S. Cl. 47—33 **19 Claims**

1. A modular landscaping system for masking ground surface adjacent to plants to prevent unwanted grass and weed growth, for permitting watering of said plants from a single location within said system, and for containing decorative ground covering materials within a precisely delineated

boundary defined by said system thereby enhancing the aesthetic characteristics of the area near said plants comprising:

a first plate of unitary construction having a planar first floor section with a substantially round first plant hole in the approximate center thereof, a first retaining wall and a first interlocking ridge, each rising substantially perpendicular from said first floor section and collectively circumventing said first floor section at its periphery, a generally conical first collar surrounding said first plant hole and rising from said first floor section with its smallest circumference farthermost from said first floor section, said first floor section further having a plurality of first watering holes formed therethrough for permitting liquid placed in a first volume defined by said first floor, said first retaining wall, and said first interlocking ridge to pass from said first volume to a first area underlying said first plate;

a second plate of unitary construction having a planar second floor section with a substantially round second plant hole in the approximate center thereof, a second retaining wall and a second interlocking ridge, each rising substantially perpendicular from said second floor section and collectively circumventing said second floor section at its periphery, a generally conical second collar surrounding said second plant hole and rising from said second floor section with its smallest circumference farthermost from said second floor section, said second floor section further having a plurality of second watering holes formed therethrough for permitting liquid placed in a second volume defined by said second floor, said second retaining wall, and said second interlocking ridge to pass from said second volume to a second area underlying said second plate;



said first and second interlocking ridges capable of coupling said first and second plates through a mating arrangement, said first and second interlocking ridges each respectively having a first and second spillway formed therethrough to permit a liquid placed in said first volume to pass to said second volume and vice versa without requiring said plates to be filled with said liquid sufficiently to overflow said first and second retaining walls;

said first and second retaining walls and said first and second collars rising respectively from said first and second floor sections in like directions relative to said first and second floor sections with said first and second retaining walls and said first and second interlocking ridges peripheral to said spillways rising approximately three inches above said first and second floor sections;

said first interlocking ridge having affixed thereto means for sealing said first interlocking ridge with said second interlocking ridge whereby said first and second plates may be securely affixed to each other and whereby an effluence of said liquid over said first and second spillways from said first plate passes substantially only into said second plate and vice versa;

said first collar and second collars each terminating at their said smallest circumferences approximately twelve inches from their respective said floor sections and each having a plurality of collar tear lines permitting portions of said collars successively closer to said floors to be removed by tearing the material forming said collars along said collar tear lines thereby enlarging said plant holes to accommodate larger plants, said collar tear lines closest to respective said floor sections of said first and second plates each being no less than approximately three inches from said floor;

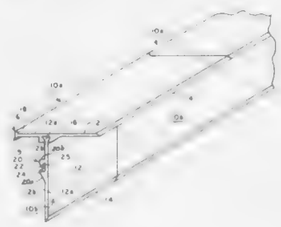
said first and second watering holes being no more than approximately 0.050 inches in diameter.

4,858,379

LANDSCAPE EDGING

David W. West, 215 Robin Hill Dr., Naperville, Ill. 60540

Filed Feb. 12, 1988, Ser. No. 155,562
Int. Cl.[4] A01G *1/08*
U.S. Cl. 47—33 7 Claims



1. An edging member comprising

a generally elongate, rectangular plate-like flexible section having mutually parallel longitudinally extending side edges, and mutually parallel end edges,

said member having first and second planar faces on opposite sides thereof,

first and second elongate beads extending respectively from said faces at one of said side edges in opposite directions and providing a first elongate interlocking section,

said beads extending continuously from one to the other of said ends,

an elongate portion protruding laterally from said first planar face intermediate said side edges and which extends from one to the other of said ends in parallel relationship to said side edges,

said elongate portion being provided with a groove extending from one to the other of said ends and which is complementary in cross-section to said first interlocking section thereby to provide a second interlocking section,

whereby two of said edging members may be connected together to form a T by positioning said first interlocking section of one member in said second interlocking section of the other member.

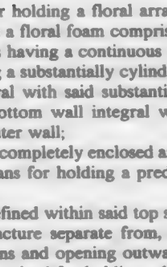
4,858,380

GUARD STRUCTURE FOR TOMATO PLANTS

Edwin O. Gayle, 2810 Creswell St., Shreveport, La. 71104

Filed Mar. 15, 1988, Ser. No. 168,230
Int. Cl.[4] A01G *17/06, 13/00, 13/10*
U.S. Cl. 47—45 5 Claims

1. A guard structure for enclosing and protecting at least one tomato plant, comprising a plurality of leg means disposed in spaced relationship, with one end of each of said leg means engaging the ground; a first ring having a first selected diameter attached to said leg means in substantially horizontal relationship; a second ring having a second selected diameter attached to said leg means in substantially horizontal relationship and spaced from said first ring; a first quantity of mesh extending around the circumference of said first ring and said second ring for connecting said first ring to said second ring; a generally cylindrically-shaped enclosure frame carried by said leg means above said second ring, said enclosure frame having diameter greater than the diameter of said first ring and said second ring, respectively; substantially horizontally-oriented bottom supports fixedly carried by said leg means in substantially perpendicular relationship, said bottom support supporting said bottom of said enclosure frame; a second quantity of mesh substantially covering the sides and bottom of said enclosure frame and a bottom opening provided in said mesh, said bottom opening provide substantially coextensive with said second ring, and said enclosure frame op at the top thereof; and lid means carried by said enclosure frame and selectively covering said top, for providing access to the tomato plant located inside said guard structure.

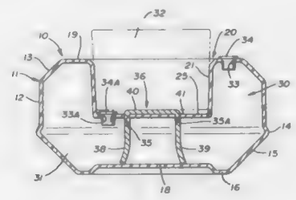


4,858,381

FLORAL CONTAINER AND WATER RESERVOIR

Charles F. Walton; Robert J. Sucheski, both of Hudson; James F. Bridenbaugh, Columbus, and James J. Chapman, Ravenna, all of Ohio, assignors to Smithers-Oasis Company, Kent, Ohio

Filed Jan. 19, 1988, Ser. No. 145,214
Int. Cl.[4] A01G *27/00*
U.S. Cl. 47—79 9 Claims



3. Apparatus for holding a floral arrangement of fresh cut flowers secured in a floral foam comprising:

container means having a continuous peripheral wall structure including a substantially cylindrical outer wall, a top surface integral with said substantially cylindrical outer wall and a bottom wall integral with said substantially cylindrical outer wall;

chamber means completely enclosed and defined within said container means for holding a predetermined volume of liquid;

cavity means defined within said top surface of said peripheral wall structure separate from, but adjacent to, said chamber means and opening outward from said top surface and being sized for holding a block of floral foam;

slot means formed in said container means for communicating between said chamber means and said cavity means;

wicking means having end portions extending through said slot means in snug engagement therewith into said chamber means and having a portion thereof disposed within said cavity means;

port means for filling said chamber means with liquid to a predetermined level above at least a portion of the end portions of said wicking means; and,

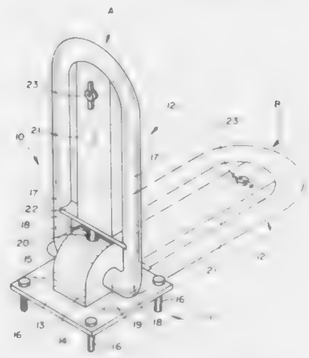
said wicking means being effective to transport liquid from said chamber means by capillary action to said cavity means while otherwise sealing said slot means.

4,858,382

ARTICULATABLE BARRIER FOR RESTRICTING ACCESS TO PARKING SPACES, ROADWAYS, PASSAGEWAYS AND THE LIKE

Gerard Ellgass, Bussigny-Lausanne, Switzerland, assignor to Samuel Blair, Territet, Switzerland, a part interest

Filed Nov. 17, 1988, Ser. No. 272,314
Int. Cl.[4] E05B *65/00;* E01F *13/00*
U.S. Cl. 49—35 20 Claims



1. A barrier for selectively restricting access to a parking space, roadway, passageway or the like, comprised of:

a heavy-duty base having an aperture formed therein;

a heavy-duty pivotal barrier frame journaled through the base below the aperture for pivotal movement of the barrier frame between a first obstructing position, wherein ingress and egress to the parking space, roadway, passageway or the like is prevented, and a second nonobstructing position, wherein ingress and egress to the parking space, roadway, passageway or the like is permitted;

a center bolt having a longitudinal axis, the center bolt being carried by the barrier frame for longitudinal movement of the center bolt between a first lowered position, wherein the center bolt is received through the aperture and into the base for securing and supporting the barrier frame in the first obstructing position and a second raised position, wherein the center bolt is spaced from the base for permitting the barrier frame to pivotally move between the first obstructing and second nonobstructing positions; and

key lock means for withdrawing the bolt from the base, so that movement of the lock means in a first direction permits the bolt to move into the first lowered position when the frame is in the first obstructing position supporting the frame in the first obstructing position, and further so that movement of the lock means in a second direction moves the bolt into the second raised position permitting the frame to be selectively pivotally moved between the first obstructing and second nonobstructing positions.

4,858,383

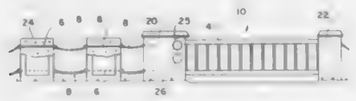
SECURITY ENCLOSURE AND GATE SYSTEM

Albert R. Kendig, Rte. 1, Box 291, King George, Va. 22485

Filed Jul. 11, 1988, Ser. No. 217,334
Int. Cl.[4] E05F *11/00*
U.S. Cl. 49—360 25 Claims

1. A security enclosure comprising an access gate and

remotely-actuated power means for opening and closing same, comprising at least one rigid barrier, a latch post to receive and support said barrier at one end and a support and drive structure supporting the driven end of said barrier, comprising upper drive means which provide positive drive connections to an upper surface of said barrier through downward pressure on at least two laterally-separated points and corresponding



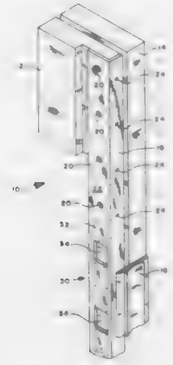
lower drive means which provide positive drive connections to a lower surface of said barrier and support said barrier on at least two laterally-separated points, said upper drive means and said lower drive means being driven by a common power source and connecting drive means to open and close said gate, further comprising remote switching means to operate said drive means to open and close said gate.

4,858,384

DOOR JAMB REINFORCEMENT PLATE

James E. Blankenship, Fayetteville, N.C., assignor to Carolina Masters, Inc., Fayetteville, N.C.

Filed May 13, 1988, Ser. No. 194,428
Int. Cl.[4] E06B *1/04*
U.S. Cl. 49—460 10 Claims



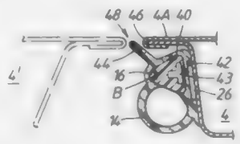
1. A door jamb reinforcement plate comprising:
an elongate support plate comprising an L-shaped cross section adapted to have a first side thereof overlap at least a portion of the door jamb defining the inside of a door frame and a second side thereof overlap at least a portion of the door jamb defining the front of a door frame; and
a plurality of vertically arrayed punch-out tabs located along and provided integrally within a length of said first side of said support plate so that said support plate is universally mountable on a door jamb with one of said punch-out tabs in alignment with a striker of each of one or more door latches on a door;
whereby said aligned tab can be punched out and said support plate then suitably mounted to a door jamb for reinforcement thereof.

4,858,385

SEALS

Robert G. Bright, Viersen, Fed. Rep. of Germany, assignor to Draftex Industries Limited, Edinburgh, Scotland

Filed Dec. 2, 1987, Ser. No. 127,478
Claims priority, application United Kingdom, Jan. 23, 1987, 8701477
Int. Cl.[4] E06B *7/16*
U.S. Cl. 49—488 15 Claims



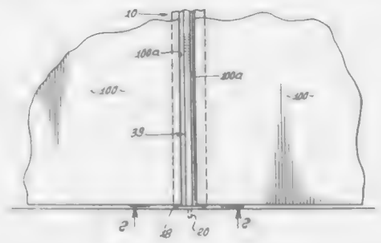
1. A seal for acting between the closure member of a framed opening and the frame of the opening, comprising
a longitudinally extending support part having a generally flat base surface and being mounted with this surface secured to a generally flat peripheral surface of the closure member, the support part having secured thereto a relatively soft hollow sealing part which is at least partially compressible between the closure member and the frame of the opening, and
a relatively rigid support member embedded within the support part so as to be positioned adjacent to the sealing part and thereby providing sufficient support for supporting the latter during its partial compression.

4,858,386

ACCURATELY AND EASILY ADJUSTABLE MULLION

Billie G. Nail, Glendale, Calif., assignor to Adams Rite Manufacturing Company, City of Industry, Calif.

Continuation-in-part of Ser. No. 161,960, Feb. 29, 1988. This application Dec. 27, 1988, Ser. No. 290,525
Int. Cl.[4] E06B *1/04*
U.S. Cl. 49—505 13 Claims



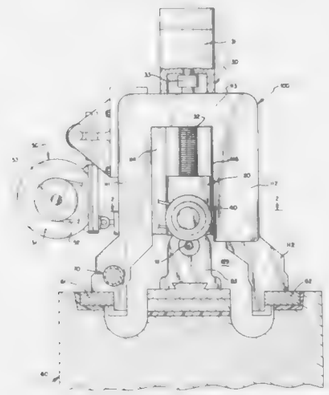
1. In a mullion assembly for door means, and attachable to support structure via a connector part, the combination comprising:
(a) an elongated upright mullion member having T-shape in horizontal cross section,
(b) a foot bracket at an end of the mullion member and having associated adjustable means for connecting the bracket to support structure so that the bracket can be shifted horizontally relative to said connector part fixed to the support structure, and then attached to that part,
(c) the foot bracket having T-shape in horizontal cross section to interfit the T-shape of the mullion for blocking sideward motion of the mullion relative to the bracket.

4,858,387

APPARATUS FOR GRINDING A WORKPIECE

Arthur H. Clough, Old Coldbrook Rd., Barre, Mass. 01005, and Edwin L. Knight, Airport Rd., Ware, Mass. 01082

Filed Oct. 30, 1986, Ser. No. 925,715
Int. Cl.[4] B24B *5/04*
U.S. Cl. 51—34 E 25 Claims



1. An apparatus for use in grinding a workpiece (W), said apparatus comprising a base (60), means (80) for supporting the workpiece (W) for rotation relative to said base (60), first and second spaced apart ways (61, 62) on said base (60) and extending parallel to and disposed on opposite sides of the axis (B) of rotation of the workpiece (W), a carriage (100) movable along said first and second ways (61, 62), said carriage having a first leg (111) extending perpendicular to and movable along said first way (61), a second leg (112) extending perpendicular to and movable along said second way (62) and a connector section (113) extending between said first and second legs, a wheel slide (20) mounted on said carriage (100) and movable relative to said carriage along a path disposed between and extending parallel to said first and second legs (111, 112), a rotatable grinding wheel (40) mounted on said wheel slide (20), wheel slide drive means (30) connected with said connector section (113) of said carriage (100) and said wheel slide (20) for moving said wheel slide (20) and grinding wheel (40) relative to said carriage and toward and away from the axis (B) of rotation of the workpiece along the path between said first and second legs (111, 112), and grinding wheel drive means (50) for rotating said grinding wheel (40), said apparatus being characterized by said grinding wheel drive means (50) including a motor (51) mounted on said carriage (100) at a location offset to one side of the path of movement of said wheel slide (20) to thereby tend to minimize the mass which is moved by said wheel slide drive means.

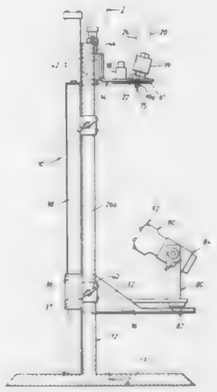
4,858,388

RESTORATION OR DRILL BUTTONS

Keith C. Bice, Lot 2 Silvan Road, Hurstbridge, 3099, Victoria, Australia

Filed Jul. 20, 1987, Ser. No. 75,667
Claims priority, application Australia, Jul. 25, 1986, PH07142
Int. Cl.[4] B24B *11/00*
U.S. Cl. 51—55 16 Claims

1. Apparatus for restoring drill buttons or the like objects, comprising:
a support body;
structure for positioning a drive shaft rotatable about a first axis being the axis of the shaft;
bearing means to secure said structure to said support body for rotation about a second predetermined axis at an angle to said first axis; and
means for transmitting rotational drive to said structure whereby said first axis revolves about the second axis;
wherein said structure includes an asymmetrical annular component which is rotatably co-operable with said bearing means and has annular means normal to said first axis to position said drive shaft through said annular component along said first axis;



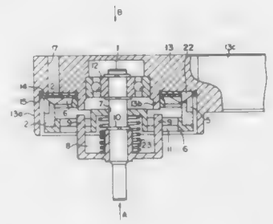
whereby said first and second axes intersect at the location in use of a grinding burr mounted to said shaft for restoring a button in engagement therewith, and
said apparatus further comprising a platform underlying said structure and a carriage for a drill bit with buttons to be restored, which carriage includes means for securely holding the drill bit, and wheel means whereby the carriage is able to freely roll over said platform.

4,858,389

APPARATUS FOR GRINDING TWIST DRILLS

Raimund Wurscher, Kramer-Glocknerstr. 12, A-1130 Wien, Austria

Filed Jul. 6, 1987, Ser. No. 69,827
Claims priority, application Austria, Jul. 7, 1986, 1828/86
Int. Cl.[4] B24B *7/00, 9/00*
U.S. Cl. 51—102 2 Claims



1. An apparatus for grinding a twist drill having two clearance surfaces and two helical flutes associated with respective ones of said clearance surfaces, which comprises
(a) a rotatable drive shaft,
(b) a grinding wheel having an annular grinding surface a concentrically surrounding the drive shaft and comprised of a continuous inner area and an adjoining outer area, only the outer grinding surface area having peripherally

spaced interruptions, the grinding wheel being axially movably and tiltably mounted on, and coupled to, said drive shaft for rotation thereby,

(c) a drill guiding structure axially spaced from said grinding surface, the drill guiding structure defining

(1) a plurality of peripherally spaced guiding passages of different diameters for respectively receiving twist drills of smaller and larger diameters, each one of the grinding passages having one open end spaced from, and facing, said grinding surface and an opposite end adapted to receive a respective one of the twist drills in a position in which one of said clearance surfaces of said twist drill of a smaller diameter contacts only said inner grinding surface area while one of said clearance surfaces of said twist drill of a larger diameter contacts the inner and outer grinding surface areas, and the drill guiding structure comprising

(2) at least one guiding projection in axial alignment with each one of said guiding passages near said one end thereof, the guiding projection being adpated to extend into one of said flutes of said twist drill received in said guiding passage and holding said twist drill against rotation,

(3) drill stop means having stop surface portions axially aligned with, and facing, respective ones of said guiding passages, the stop suface portions being engageable by the other clearance surface of said twist drill received in said guiding passage to limit the advance of said twist drill towards said grinding surface, and

(4) a plurality of peripherally spaced abutments having an abutment surface of a material having a greater hardness than the grinding surface, and

(d) spring means urging said grinding wheel towards said drill guiding structure,

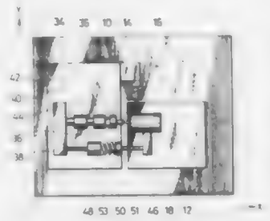
(1) each abutment surface being engageable by the grinding surface and arranged to limit the spring-urged movement of the grinding surface in an end position in which said grinding surface is closer to the guide projection than to the drill stop means.

4,858,391

SIZING APPARATUS FOR AN INTERNAL GRINDER

Tetsuya Nagata, and Hideki Ohmori, both of Narashino, Japan, assignors to Seiko Seiki Kabushiki Kaisha, Japan

Filed Apr. 14, 1988, Ser. No. 181,546
Claims priority, application Japan, Apr. 15, 1987, 62-92489
Int. Cl.[4] B24B *49/00*
U.S. Cl. 51—165.93 8 Claims



1. A sizing apparatus for an internal grinder comprising:

a work table for supporting a workpiece to be machined;

a wheel spindle table mounting thereon a spindle motor with a grinding wheel and movable in an axial direction of a bore in said workpiece;

an oscillation motor for oscillating said grinding wheel for machining an inner peripheral surface of said workpiece including motion converting means for converting rotation of said oscillation motor into oscillation of said wheel spindle table;

a sizing device to generate sizing signals for measuring the bore of said workpiece;

a measuring probe connected to said sizing device and mounted to undergo movement into and out of the bore of said workpiece;

an interlocking mechanism connected to said sizing device and said wheel spindle table to interlock said wheel spindle table relative to the oscillation of said wheel spindle table for inserting or removing said measuring probe of said sizing device into or out of said workpiece;

probe position sensing means having a rotation angle detection sensor and connected to a drive shaft of said oscillation motor for sensing positions of said measuring probe of said sizing device in an axial direction of the bore of said workpiece with reference to a rotation angle of a drive shaft of said oscillation motor; and

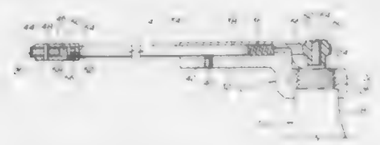
sizing signal sampling means for sampling sizing signals when the position of said measuring probe sensed by said probe position sensing means is inside the bore of said workpiece.

4,858,394

BELT GRINDER ATTACHMENT FOR POWERED ROTARY TOOLS

Nisan Kenig, 12415 Grove Meadow, Stafford, Tex. 77477

Continuation of Ser. No. 58,136, Jun. 4, 1987, abandoned. This application Jan. 5, 1989, Ser. No. 294,928
Int. Cl.[4] B24B *21/00*
U.S. Cl. 51—135 R 19 Claims



1. A belt grinder attachment in combination with a hand held rotary powered tool, said attachment comprising:

a body member having a first axial through bore adapted to receive one end of said tool therein, and a second blind bore in said body member extending normal to the axis of said first bore;

a straight unitary arm having one end received in said second blind bore to extend substantially normal to an elongated axis of the tool;

spring means in said second blind bore biasing said arm outwardly from said body member;

a driven pulley assemby mounted on the opposite free end of said arm and within a plane defined by said arm, said plaane lying normal to the axis of said first axial through bore, said assembly including a driven pulley mounted for rotation about its own axis which is normal to the plane of said arm;

a drive pulley adapted to be mounted on one end of and driven by the tool, said drive pulley being positioned in said plane and aligned with said driven pulley; and

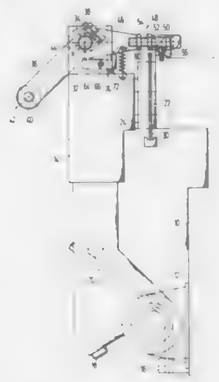
an endless grinding belt mounted on and passing around said drive and driven pulleys to follow a path along said plane with the width of said belt extending normal to said plane.

4,858,392

DEVICE FOR CLAMPING A SAW BLADE TO A SAW WORKING MACHINE

Ernst Beck, Maselheim; Fritz Richlein, and Peter Lenard, both of Biberach an der Riss, all of Fed. Rep. of Germany, assignors to Vollmer Werke Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed Apr. 20, 1988, Ser. No. 183,913
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1987, 3713407
Int. Cl.[4] B24B *19/00*
U.S. Cl. 51—218 R 10 Claims



1. In a device for clamping a saw blade to a saw working machine having a flap which is mounted on a machine frame to be movable to and fro between an open position and a closure position, a first clamping jaw which is supported on said machine frame, a second clamping jaw supported on said flap and disposed for confrontingly clamping in the closure position of said flap, a saw blade between said second clamping jaw and said first clamping jaw, releasable locking means including a locking member for securing said flap in said closure position and movable to and fro between a disengaged position permitting the opening of said flap and an engaged position securing said flap in said closure position, and grip means operatively coupled to said locking means for moving said locking member between said engaged and disengaged positions, the improvement wherein:

said locking member is mounted on said flap and is configured to engage with a support body disposed on the machine frame; and

said grip means is mounted on said flap so that movement of said grip means with respect to said frame urges said flap between said open and closure flap positions and is mounted for movement with respect to said flap to and fro between a rest position moving said locking member to said engaged position and an actuating position operating said locking member to said disengaged position.

4,858,393

METHOD OF DYNAMICALLY BALANCING CYLINDRICAL ROTORS, AND DEVICE FOR CARRYING OUT THE METHOD

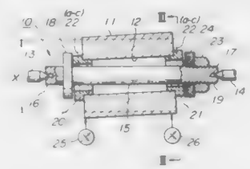
Tsutomu Yamada, Nagoya, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

Filed Feb. 12, 1988, Ser. No. 155,486
Claims priority, application Japan, Feb. 24, 1987, 62-42349
Int. Cl.[4] B24B *41/06*
U.S. Cl. 51—237 4 Claims

1. A device for correcting dynamic unbalance of a cylindrical rotor comprising a ceramic material with an axially extending center bore defined by inner peripheries of said cylindrical rotor, said device being adapted to be used in combination with a grinding machine which includes a pair of work holders for rotatably holding a workpiece to be ground, and also with a sintered rotor body, said device comprising:

a support shaft with a pair of centering portions arranged on both axial ends thereof and adapted to be rotatably held by said work holders of the grinding machine; and

a pair of substantially cylindrical clamp members adapted to be arranged around the support shaft and supported by said shaft at respective axial locations spaced from each



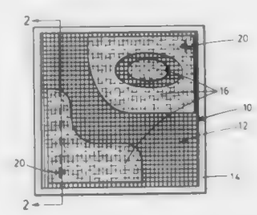
other by a predetermined axial distance corresponding to an axial length of the rotor body, said clamp members being engageable with said inner peripheries of the center bore of the rotor body, and having means for radially adjusting the position of each clamp member with respect to the support shaft, said means for radially adjusting the position of each clamp member comprising at least three adjusting bolts extending radially through each clamp member in an equiangularly spaced manner.

4,858,394

FREE STANDING PHOTORESIST MASK AND THE METHOD OF USING THE SAME FOR ABRASIVE ENGRAVING

Robert J. Lalumiere, and Jay M. Boucher, both of Enfield Center, N.H., assignors to Dynamat, Inc., Concord, N.H.

Filed Mar. 18, 1987, Ser. No. 27,474
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—312 1 Claim



1. "Method of making a photo resist free standing mask of woven cloth for use in abrasive engraving comprising the steps of:

stretching a sheet of said woven cloth on a frame,

impregnating said woven cloth with a photoresist emulsion having a thickness range of 0.002 inch and 0.125 inch,

exposing said photoresist emulsion to light,

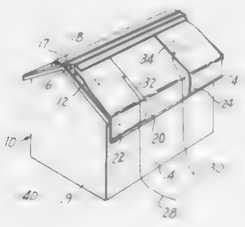
and washing away said unexposed emulsion with water at a pressure of at least 125 psi."

4,858,395

FIRE PROTECTION FOR STRUCTURES

Kyle McQuirk, 313 High St., San Luis Obispo, Calif. 93401

Filed Aug. 5, 1988, Ser. No. 229,143
Int. Cl.[4] E04B *1/34*
U.S. Cl. 52—3 5 Claims



1. In a structure having adjacent supporting walls at angles to each other and a roof, a fire protection device comprising:
at least two fire resistant sheet materials, each tailored to fit a specific portion of the roof and specific portions of at least two adjacent supporting walls of the building structure;
each sheet material being folded to define at least one folded portion and an unfolded portion with each folded portion having dimensions adapted to fit the specific portion of one of the at least two adjacent supporting wall for its sheet material, and the unfolded portion having dimensions adapted to fit the specific portion of the roof and another supporting wall for its sheet material;
a means for deployably compacting each folded sheet material;
a means for deploying each folded sheet material to fit over its specific portions of the roof and at least two adjacent walls; and
a means for interconnecting the sheet materials to substantially encompass the building with the sheet materials.

4,858,396

GUTTER

Thomas M. Rose, 6 Hillbrook Rd., Taylors, S.C. 29687, and Carlas F. Dixon, 212 Overbrook Rd., Greenville, S.C. 29607

Continuation of Ser. No. 762,702, Aug. 5, 1985, abandoned. This application Oct. 13, 1987, Ser. No. 207,470
Int. Cl.[4] E04D *13/04*
U.S. Cl. 52—11 1 Claim



1. A gutter for use beneath the eaves of a roof adjacent a facia board comprising:
a substantially flat extension member extending beneath the eaves of the roof;
an extruded tube constructed of synthetic polymeric material;
said extruded tube including an apex portion defined by opposed inwardly extending upper surfaces, and
a narrow slot between said opposed inwardly extending upper surfaces;
said extension member sloping downwardly and extending outwardly from the eaves to the extruded tube;
a free edge on one side of said slot for water to pass over into the extruded tube while separating leaves which pass over the upper surface on the other side of said slot;
said tube and said extension member forming an assembly;
means positioning said tube adjacent said facia board;
said flat extension member and said tube being extruded integrally;
said slot having a center line positioned on one side of a vertical center of said tube remote from said extension member; and
said inwardly extending surface opposite said extension member being arcuate and presenting a free end terminating at least about ½ inch below a line constituting a continuation of said extension member and said first mentioned free edge.

4,858,397

AIR-INFLATED HYPERBOLIC PARABOLOIDAL ROOF

Paul W. Lantz, Columbus, Ohio, assignor to James A. Rhodes, Columbus, Ohio

Filed Dec. 28, 1987, Ser. No. 138,732
Int. Cl.[4] E04B *1/32*
U.S. Cl. 52—80 10 Claims



1. A cable network for an air inflated fabric roof comprising:
a substantially rigid ring member having a geometric plan lying within and tangent to a non-square parallelogram;
a first set of cables extending across said ring member in parallel in a first or X direction with both ends of each cable of said first set of cables connected to said ring member;
a second set of cables extending across said ring member in parallel in a second or Y direction substantially perpendicular to the X direction, with both ends of each cable of said second set of cables connected to said ring member, each cable of said second set of cables intersecting each cable of said first set of cables, with the resulting intersections and said ring member defining a single saddle portion of a hyperbolic paraboloidal surface satisfying the equation

$$Z = \frac{X^2}{a^2} - \frac{Y^2}{b^2},$$

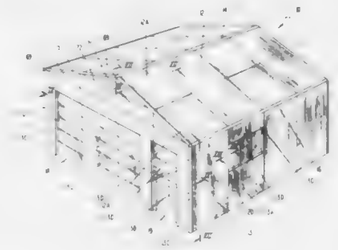
where X is the distance in the X direction from an origin point, Y is the distance in the Y direction from the origin point and Z is the distance from the origin point in the Z direction, perpendicular to both the X direction and the Y direction;
a pair of tie cables, extending diagonally with respect to said first and second sets of cables and lying in the Z=O plane, with the cable ends of said tie cables connected to said ring member.

4,858,398

PREFABRICATED BUILDING CONSTRUCTION

John A. Ricchini, Lincoln, Nebr., assignor to Universal Simplex Building System, Lincoln, Nebr.

Filed Nov. 23, 1981, Ser. No. 324,239
Int. Cl.[4] E04D *3/36*
U.S. Cl. 52—90 9 Claims



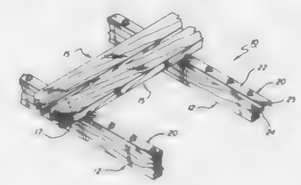
1. A prefabricated, modular building construction system comprising:
(a) a plurality of prefinished panels including rectangular roof panels and wall panels and right-triangular gable panels having first, second and hypotenuse sides, said panels to be secured together at adjacent edges to define walls and a roof,
(b) each of the panels having a unitary structure defined by a rigid frame extending around the edges thereof, and a rigid insulating core and protective skin disposed at each side of the core and frame,
(c) the hypotenuse side being disposed at a predetermined angle with respect to the other two sides of the gable panels to determine the roof pitch of the building to be constructed,
(d) the length of the roof panels being equal to a whole integer multiple of the length of the hypotenuse side,
(e) the panel frames comprises channel shaped member having legs extending over the marginal edges of the insulating core and webs defining the outer peripheral edge of the panels,
(f) a plurality of spaced, slotted openings in the frames of said panels,
(g) the slotted openings being formed in both the legs and web of the frames,
(h) the spaced distances between openings (1) in the two perpendicular sides of the gable panels, (2) in the ends and sides of the wall panels and (3) in the ends of the roof panels are equal to one another,
(i) the openings along the sides of the roof panels being spaced at a distance equal to a spaced distance between the openings along the hypotenuse of the gable panels,
(j) the length and width of the wall panels and the width of the roof panels are whole integer multiples of the length dimensions of the first and second sides of the gable panels, and
(k) fasteners including an enlarged blade at least at one end thereof and having a structural configuration effective for insertion through aligned slotted openings in adjacent panel edges,
(l) said fasteners being turnable to lock said at least one blade behind the frame to secure the panels together,
(m) the frame members at the ends of the walls and roof panels have diagonal members extending between the legs thereof,
(n) the webs include cut-out areas at the ends of the wall and roof panels to provide access to the diagonal members which have a slotted opening in the center of the cut-out areas for receiving a fastener,
(o) the secured prefinished panel defining a completed building structure.

4,858,399

PROTECTIVE COVERING AND SPACER STRIP FOR A DECK

Peter A. Salato, Jr., 236 Genesee St., Cayuga, N.Y. 13034

Filed Aug. 22, 1988, Ser. No. 234,514
Int. Cl.[4] E04D *13/00*; E04B *1/64, 1/66*
U.S. Cl. 52—97 16 Claims



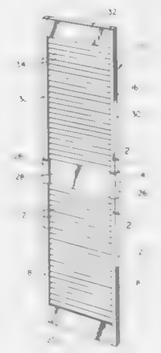
1. A combination protective cover and spacer strip for mounting upon a wooden rectangular beam which supports horizontal planks that include a channel molded of a resilient material, said channel having a top wall and a pair of dependent opposed side walls, the inside width of said channel between the sidewalls being equal to the width of a beam to permit the strip to be press-fitted over the top of the beam, a series of resilient deformable ribs projecting from and equally spaced along the top wall of said channel, said ribs being transversely aligned with the side wall edges of the channel with the longitudinal distance between adjacent ribs being equal to the width of planks supported upon said beam whereby said planks seated between said ribs are equally spaced to provide a uniform gap between adjacent planks.

4,858,400

ADJUSTABLE SHUTTER

Douglas C. Foyt, 1412 W. Main, Blytheville, Ark. 72315

Filed May 25, 1988, Ser. No. 198,556
Int. Cl.[4] E06B *7/08*
U.S. Cl. 52—98 8 Claims



1. An adjustable length shutter assembly including at least first and second vertically spaced shutter sections, one of said sections including a first pair of opposite side, elongated and generally parallel upright stiles permanently interconnected at one pair of corresponding ends by a first mullion extending and connected therebetween, said one section also including a plurality of elongated, transverse and vertically laterally spaced slats integrally formed with and extending between said stiles and spaced therealong from said first mullion toward the

other pair of corresponding ends of said stiles, the other of said sections including a second pair of opposite side, elongated and generally parallel vertical stiles permanently interconnected at one pair of corresponding ends by a second mullion extending and connected therebetween, the other pair of corresponding ends of said second pair of stiles and said other pair of ends of said first pair of stiles being relatively overlap engaged with each other with each pair of stiles forming a lengthwise continuation of the other pair of stiles and said second mullion laterally adjacent the slat furthest from said first mullion, at least the slats adjacent said other pair of ends of said first pair of stiles being joined, at their opposite ends, to the corresponding stiles along visually ascertainable reduced material thickness zones extending transversely of the last mentioned slats and along which zones the last mentioned ends may be readily manually individually severed from said first pair of stiles and said other pair of corresponding ends of said first pair of stiles being severable form the remaining portions of said first pair of stiles to compensate for the number of slats severed at their opposite ends from said first pair of stiles.

4,858,401

CABLE DUCTING SYSTEM

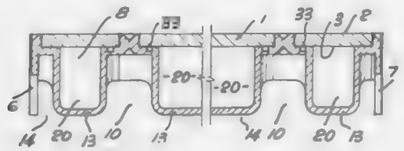
Graham M. Thorp, 45 Wentworth Road, Vaucluse, New South Wales, Australia (2030); James F. C. Allchin, 52 Bay Street,, Mosman, New South Wales, Australia 2088; Geoffrey F. Marquis, C/- Union Club, Bent Street, Sydney, New South Wales, Australia 2000; Dino Burattini, 42 Chamberlain Avenue, Rose Bay, New South Wales, Australia 2029, and Peter J. Watt, 32 Tryon Road,, Lindfield, New South Wales, Australia 2070

Continuation of Ser. No. 852,662, Mar. 27, 1986. This application Jan. 15, 1988, Ser. No. 144,732

Claims priority, application Australia, Jul. 8, 1984, PG6443

Int. Cl.[4] E04B *5/48*

U.S. Cl. 52—100 **20 Claims**



1. A module for use in supporting a floor load above a base, comprising:

a formation defining a first set of upwardly-closed parallel cable ducts, each segregated from the other,

each of the said ducts having spaced-apart hollow upstanding projections having a weakened portion forming a frangible closure for providing access to the interior of said duct, and

a floor sheet supported on said upstanding projections and adapted to cooperate therewith to support a floor load.

4,858,402

BUILDING BOARD, PARTICULARLY GYPSUM PLASTERBOARD

Helmar Putz, A-4822 Bad Goisern 517, Austria

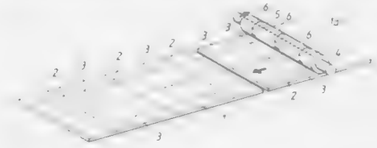
Filed Dec. 9, 1985, Ser. No. 806,698

Claims priority, application Austria, Jan. 24, 1985, A 175/85

Int. Cl.[4] E04B *2/00*

U.S. Cl. 52—105 **4 Claims**

1. A prefabricated rectangular building board for use in constructing a wall, the board having two parallel longitudinal edges, two parallel transverse edges extending perpendicularly to the longitudinal edges and a removable surface marking facilitating cutting, placing and fastening of the board to construct the wall, the surface marking consisting of a wide-mesh grid constituted by three longitudinal scales extending parallel to the longitudinal edges along lines regularly spaced apart in a transverse direction, the longitudinal scales including a center scale extending along a center line between the longitudinal edges and two scales extending on opposite sides of the center line adjacent respective ones of the longitudinal edges, and



three transverse scales extending parallel to the transverse edges along lines regularly spaced apart in a longitudinal direction, the transverse scales including a center scale extending along a center line between the transverse edges and two scales extending on opposite sides of the center line adjacent respective ones of the transverse edges.

4,858,403

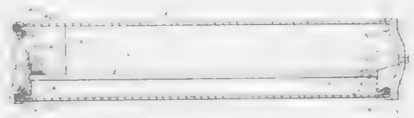
FASTENING BAR ASSEMBLY FOR FRAMELESS INSULATING PANELS

Cleo M. Lingle, #3 Palisades, Longview, Tex. 75601

Filed Jun. 1, 1988, Ser. No. 200,708

Int. Cl.[4] E04B *2/82*

U.S. Cl. 52—127.12 **8 Claims**



1. In a fastening bar assembly for connecting together adjacent insulated panels of an insulated enclosure, in which the panels have an insulating foam core and a skin on at least an outer face thereof, said skin having a peripheral flange, and wherein the fastening bar assembly is adapted to be encapsulated in the foam core and has connecting means on opposite ends thereof for securing together adjacent ends of fastening bar assemblies in adjacent panels, the improvement comprising:

an elongate bar body having opposite ends and adapted for encapsulation in the foam core of an insulated panel, said opposite ends bent at an angle to the body for extending within the foam core and into proximity with a peripheral flange on the skin of a panel and to be secured to the flange on the skin, whereby in a completed panel the fastening bar serves to strengthen the skin and prevent its delamination from the foam core, and said fastening bar is also accurately positioned in the panel.

4,858,404

CLEAT FOR FINISHING OFF THE CERAMIC TILES ON A STEP

Werner Schluter, AM Schierloh 6, 5860 Iserlohn, Fed. Rep. of Germany

Continuation of Ser. No. 141,049, Jan. 5, 1988, abandoned. This application Mar. 13, 1989, Ser. No. 323,204

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1987, 3701415

Int. Cl.[4] E04F *19/02, 13/08*

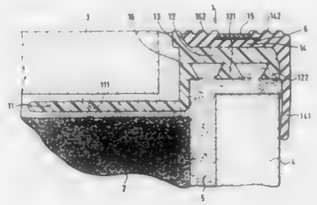
U.S. Cl. 52—179 **4 Claims**

1. A stair cleat formed in a single unit of plastic material and having a Z-shaped cross section for use in the nose of a stair

wherein the stair riser and the stair tread are formed of ceramic tiles having relatively thin layers of adhesive adhering the tiles to the unfinished step and adhesive filling the gaps between the stair cleat and the stair riser and between the stair cleat and the stair tread, the stair cleat comprising:

a thin fastening leg having breakthroughs therein and adapted to underlie the ceramic tile of the stair tread;

a closing off leg perpendicular to said fastening leg extending in front of the stair tread tile;



a step-on leg perpendicular to said closing off leg extending at the nose of the step;

a slip inhibiting cover strip provided on the top side of said step-on leg and formed of a soft elastic plastic material molded onto said stair cleat and covering the same; and

a lip formed together with said slip inhibiting cover strip projecting beyond said step-on leg to press against the ceramic tile of the stair riser and cover the adhesive gap between the stair riser and the stair cleat.

4,858,405

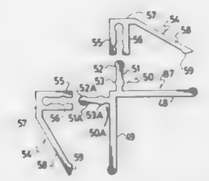
BUILDING SYSTEM FOR WINDOWS, ENCLOSURES, BUILDINGS AND THE LIKE

Dawson A. Christie, 629 Beecher Avenue, Winnipeg, Manitoba, Canada R2P 0G5

Filed Jul. 10, 1987, Ser. No. 71,782

Int. Cl.[4] E04C *2/38;* **E06B** *2/26, 3/44*

U.S. Cl. 52—208 **24 Claims**



1. A building system for jamb or flat mounting within a supporting frame and comprising in combination a base extrusion, at least one intermediate extrusion, a sealing extrusion and a snap-fitting means connecting sections of the extrusions onto framing strips extending along each side of the supporting frame, the base extrusion including a substantially planar flange, a lip projecting from an outer side of the flange, along a free first edge thereof; the intermediate extrusion including a substantially planar flange, a sealing bead along a free first edge of the flange and projecting to opposite inner and outer sides thereof; the sealing extrusion including a substantially planar flange, a lip along a free first edge of the flange and projecting to an inner side thereof; and the snap-fitting means extending along opposite second edges of the base, intermediate and sealing extrusions, and connecting the intermediate extrusions between the outer side of the base extrusion and the inner side of the sealing extrusion, with the planar flanges of the extrusions converging towards their free first edges;

the base extrusion, the intermediate extrusion and the sealing extrusion being connected solely by the snap-fitting means whereby the free first edges of the extrusions are unconnected for receiving a first window pane between the planar flanges of the base extrusion and the intermediate extrusion, with the lip of the base extrusion and the bead of the intermediate extrusion engaging opposite sides of the first window pane, and for receiving a second window pane between the planar flanges of the intermediate extrusion and the sealing extrusion with the bead of the intermediate extrusion and the lip of sealing extrusion in engagement with opposite sides of the second window pane.

4,858,406

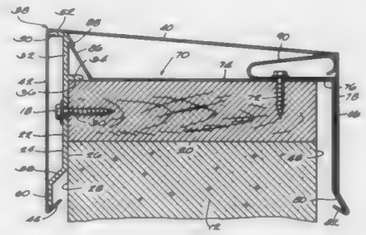
COPING STRUCTURE INCLUDING RIGID ANCHOR BAR

Bennie L. Lane, Eagle, and William T. Taylor, Whitefish Bay, both of Wis., assignors to Metal Era, Inc., Waukesha, Wis.

Filed Jul. 12, 1988, Ser. No. 217,969

Int. Cl.[4] E04F *19/02*

U.S. Cl. 52—300 **9 Claims**



1. A coping assembly for covering the top of a wall adjacent to a roof, the wall including a top surface, a forward face and a rear face, the coping assembly comprising:

an anchor bar adapted to be secured to the forward face of the wall, the anchor bar being an elongated plate adapted to extend along substantially the entire length of the forward face of the wall, and the anchor bar including an elongated upper edge and an elongated lower edge;

a coping having an inverted channel configuration and including a top portion adapted to cover the top surface of the wall, a forward face extending downwardly from the top portion, and a rearward face extending downwardly from the top portion, the forward face of the coping including a lower edge portion engaging the elongated lower edge of the anchor bar, and a forward portion of the top of the coping being supported by the elongated upper edge of the anchor bar.

4,858,407

LATERAL STABILIZER FOR WALL

Robert A. Smolik, 670 W. Seventh St., St. Paul, Minn. 55102

Filed May 1, 1987, Ser. No. 144,983

Int. Cl.[4] E04B *2/60*

U.S. Cl. 52—481 **19 Claims**

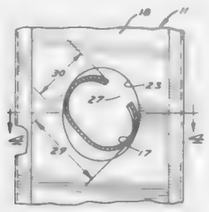
1. Wall construction comprising:

a plurality of elongate wall studs assembled in parallel relationship with flat facing side members having linearly aligned parallel openings, each opening having a width dimension and a length dimension greater than the width dimension;

an elongate linear stabilizing bar passing through the openings of the wall studs, said bar having a cross-sectional profile with a width dimension and a length dimension greater than the width dimension, the width and length dimensions being less that the width and length dimensions of the openings in the wall studs respectively, whereby the stabilizing bar is inserted through the openings in the wall studs;

the length dimension of the stabilizing bar being greater than the width dimension of the wall stud openings;

said stabilizing bar having gradually curved portions between extremities of said length and width dimensions and said openings having a profile with a gradually curving



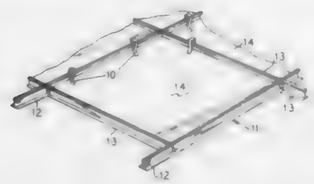
portion so that said stabilizing bar is relatively fixed with respect to the wall stud openings by being axially rotated in the wall stud openings to a point of jamming relationship between the stabilizing bar and the wall studs to hold the wall studs relatively rigid with respect to one another.

4,858,408

HOLD DOWN CLIP

James J. Duan, St. Charles, Ill., assignor to Chicago Metallic Corporation, Chicago, Ill.

Filed Jan. 20, 1988, Ser. No. 146,094
Int. Cl.[4] E04B *5/52*
U.S. Cl. 52—489 19 Claims



1. A hold-down clip having an inverted U-shape with a bight portion interconnecting two leg portions, each of the leg portions adjacent a free end being provided with an outwardly extending foot portion, each of the leg portions, along at least one side, having an inwardly extending flange facing a flange on the other leg portion, each of said flanges terminating inward of the foot portion and outward of the bight portion to leave the bight portion free of the flange, and each of said flanges being provided with inwardly-extending teeth, which coact to grip a member on which the clip is inserted.

4,858,409

CEILING PANEL ASSEMBLY

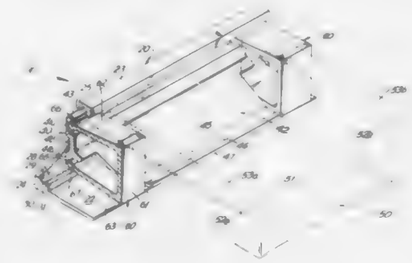
John M. Handley, Ridgewood, and Ramzi A. Khalifa, Rutherford, both of N.J., assignors to Industrial Acoustics Company, Inc., Bronx, N.Y.

Filed Apr. 22, 1988, Ser. No. 184,862
Int. Cl.[4] E04F *13/00, 19/02*
U.S. Cl. 52—489 5 Claims

1. An assembly for affixing a rigid ceiling panel to a wall member comprising:

a support member having a substantially flat panel support portion for supporting the ceiling panel such that the panel may lie flush against the panel support portion and extend away from the wall member and a wall fixation member for affixing the support member to the wall member;

a retaining member for retaining the ceiling panel in the assembly, the retaining member including an attachment member engageable with the support member and a clamping portion extending from the attachment member for restraining the ceiling panel in the assembly and against the panel support portion when the attachment member is fully engaged with the support member; and



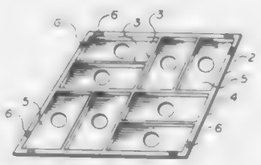
a closure member disposable on the panel support portion and against to the ceiling panel, the closure member being engageable with said support member and said retaining member so as to close the assembly and lock the clamping portion of the retaining member against the ceiling panel.

4,858,410

MODULAR BRICKWORK FORM

Robert I. Goldman, 6658 Cibola Rd., San Diego, Calif. 92120

Filed Mar. 17, 1989, Ser. No. 324,691
Int. Cl.[4] E04F *13/08*
U.S. Cl. 52—592 9 Claims



1. A plurality of forms for laying a pattern of blocks comprising:

at least two symmetrical planar bases each commensurate with a plurality of said blocks arranged in said pattern and having edges corresponding to a portion of the perimeters of said blocks;

a plurality of raised dividers on each of said bases, said dividers shaped and dimensioned to retain and space apart said blocks at specific locations on said bases;

a first raised ledge along a first edge of each of said bases;

a second raised ledge along a edge of each of said bases, said second edge being opposite to said first edge across each of said bases;

protruding means for locating adjoining forms attached to said first ledge; and

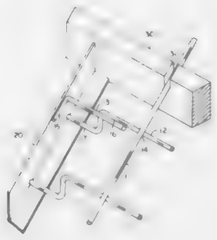
receiving means for locating adjoining forms attached to said second ledge, wherein said protruding means is shaped and dimensioned to engage said receiving means, wherein both of said means for locating are generally commensurate and comprise at least one notch located on said first ledge having one convex surface, and at least one matching notch located on said second edge having one concave surface

4,858,411

SECTIONAL SWIMMING POOL CONSTRUCTION

C. A. Graham, 725 Colonial Dr., Panama City, Fla. 32404

Continuation of Ser. No. 112,457, Oct. 26, 1987, abandoned.
This application Feb. 3, 1989, Ser. No. 307,216
Int. Cl.[4] E04C *2/06;* E04G *21/14*
U.S. Cl. 52—601 9 Claims



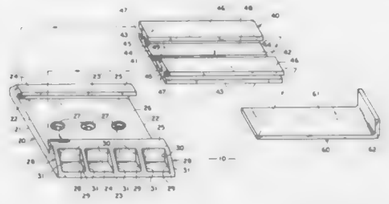
1. A sectional panel used for the construction of swimming pools, said panel being generally rectangular in shape and comprised of concrete, reinforcing members, end braces and exposed metal end pieces having a right-angle configuration, such that the panel has two major sides and two lateral ends; where each lateral end is comprised of one side of one of the metal end pieces and the other side of the metal end piece is parallel with one of the sides of the sectional panel; where one or more of the reinforcing members is attached at an end thereof to each metal end piece on the side of the metal end piece parallel to the side of the sectional panel; and end braces are attached to one or more of the reinforcing members and to each of the metal end pieces on the side forming the lateral ends.

4,858,412

NON-PENETRATING ELASTOMERIC MEMBRANE ANCHORING SYSTEM

Gary M. Kassem, Margret and McKee Sts., McKees Rocks, Pa. 15136

Filed Mar. 28, 1988, Ser. No. 172,762
Int. Cl.[4] E04D *5/14*
U.S. Cl. 52—713 10 Claims



1. An anchoring system for fastening an elastomeric membrane to the upper surface of a roof without puncturing the membrane, comprising:

(a) a rigid anchoring plate having a top planar surface having outside edges and a pair of spaced-apart raised sidewalls having a top outside edge on said top planar surface over which an elastomeric membrane may be laid, said sidewalls each having a retaining lip extending inwardly from said sidewalls over, and substantially parallel to, said top planar surface for aiding in the retention of a spacing insert, and a plurality of apertures disposed within said top planar surface for facilitating the securing of said anchoring plate to said upper surface of a roof;

(b) a hinged spacing insert having a planar top and bottom surface with outer edges arranged to be inserted within said anchoring plate; a pair of spaced-apart, raised flanges having interior and exterior faces disposed parallel to each other and positioned on said top surface, near, but not at, the outer edges of the top surface of said spacing insert, said flanges on said top surface thereby dividing said top surface into three regions, an interior region between said flanges, and two exterior regions outside of each of said flanges; said flanges each having a retaining lip extending over and substantially parallel to said top surface, both inwardly and outwardly from said flanges, the inwardly extending portions of said lips, along with said interior faces of said flanges and said interior region of said top surface of said spacing insert, thereby defining a substantially rectangular shaped cavity into which an insert wedge may be slid to aid in securely interlocking said anchoring system; the outwardly extending portions of said lips, along with said exterior faces of said flanges and said exterior regions of said top surface of said spacing insert thereby defining a pair of C-shaped notches for snappingly engaging the retaining lips of said anchoring plate after said elastomeric membrane has been laid over said anchoring plate; and, hinging means disposed within said top and bottom planar surfaces of said spacing insert parallel to, and equidistant from, said flanges, said hinging means thereby forming a line of flexure along which said insert is thereby divided into two mirror-symmetrical halves;

(c) an insert wedge having a planar top and bottom surface and a raised lip disposed along one edge of said wedge perpendicular to said top and bottom surfaces for grasping and thereby facilitating the insertion of said wedge within said substantially rectangular shaped cavity within said hinged spacing insert; and,

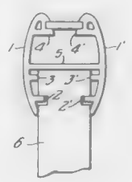
(d) fastening means for securely attaching said anchoring plate to said upper surface of a roof.

4,858,413

PROFILE FOR FURNITURE

Dov Grushka, P.O. B. 3069, Hod Hasharon, 45247, Israel

Filed Jan. 15, 1988, Ser. No. 144,036
Int. Cl.[4] E04C *2/38, 2/44*
U.S. Cl. 52—823 2 Claims



1. An edge forming means for the reception of planar parts of furniture comprising an elongated molding of flexible material, said molding including first and second longitudinally extending walls having outer rounded edges, and inner and outer surfaces; rigid teeth extending from said inner surface of each of said walls toward each other; a flexible plate interconnecting said inner surfaces of each of said walls; each of said walls defining a longitudinally extending recess disposed outwardly of said flexible plate; and a rigid plate having longitudinal edges engaging said recess to urge said teeth toward each other.

4,858,414

PACKING CASE, PARTICULARLY FOR SHEET MATERIAL

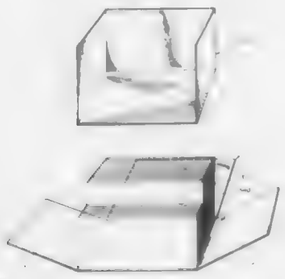
Luciano Meschi, Livorno, Italy, assignor to Wully, S.A., Panama City, Panama

Continuation of Ser. No. 581,216, Feb. 22, 1984, abandoned, which is a continuation of Ser. No. 342,747, Jan. 26, 1982, abandoned. This application Feb. 22, 1988, Ser. No. 137,064

Claims priority, application Italy, Jan. 26, 1981, 20590/81[U]

Int. Cl.[4] **B65B** *5/06, 63/04*

U.S. Cl. 53—429 **1 Claim**



1. A process of making and using a packaging article which when opened provides complete accessibility to the while contents of the package, and which when closed is usable as a storage and shipping container, said packaging article comprising an open top container including a bottom and solely three lateral panels, each of said three lateral panels being joined only to said bottom and being pivotal along an edge thereof, and being foldable relative thereto from two orthogonal directions, said panels forming solely three angularly related sidewalls for said container when in an upstanding position to provide a box-type packing having an open top and an open side to form solely an open top and an open side container providing an open front, said angularly related sidewalls when in the upstanding position not completely closing the container and forming open portions thereof, one of the open portions being the open top and the other of the open portions being the open front, the three pivotally joined panels each individually being pivotal relative to said bottom to open themselves as a fold; and a parallelepipedal closure member having a top and depending sidewalls fitting over said three lateral panels of said container and covering the open side to close the open portions thereof and maintain said sidewalls thereof in an upright position, said sidewalls of said closure member being of sufficient height to fit substantially entirely over said panels and base of each of the sidewalls extending to said bottom to enclose said three sidewalls, the open top and the open front, the method of making the packaging article comprising:

placing a plurality of individual sheets joined to each other to form a single connected into the open top container having solely the three lateral panels;

folding the plurality of individual sheets in overlapping relationship to form a package of sheets;

placing the three lateral panels in an upstanding position against the package of sheets in said open top container; and

placing the closure member over the open top container with the package of sheets therein to hold said three lateral panels against the package of sheets for shipment and/or storage of the sheets in the open top container so as to impart rigidity to the lateral panels and with a sidewall of said closure member covering the open front to prevent access to the sheets in the open top container through either the open top or the open front;

and the method of using the packaging article to dispense the sheets contained therein comprising:

removing the cover to expose the three lateral panels and the open front and releasing the three panels from their vertical position;

pulling down the three lateral panels until they are substantially coplanar with the bottom to provide complete accessibility to the sheets; and

withdrawing the connected sheets from the package.

4,858,415

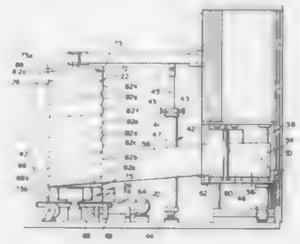
METHOD AND APPARATUS FOR UNITIZING TIRES

Leroy Hake, Louisville, Ky., assignor to Lantech, Inc., Louisville, Ky.

Filed Oct. 5, 1988, Ser. No. 253,583

Int. Cl.[4] **B65B** *11/30, 13/20, 27/06, 63/02*

U.S. Cl. 53—438 **20 Claims**



1. A method of unitizing a load of tires stacked in a longitudinal direction comprising:

compressing the stack of tires in the longitudinal direction between platens located adjacent the ends of the stack of tires;

dispensing a web;

stretching the web along the direction in which it is dispensed;

positioning mandrels adjacent the ends of the stack of tires;

rotating the stack of tires relative to the web dispenser about an axis in the longitudinal direction, wrapping the stretched web around and onto the compressed stack of tires and the mandrels, forming a tube from the web which extends in the longitudinal direction beyond the stack of tires and on the mandrels; and

separating the mandrels from the web and stack of tires and collapsing the web form the mandrels onto the ends of the stack of tires covering the sidewalls of the tires at the ends of the stack.

4,858,416

TENSIONLESS SEAL APPARATUS AND METHOD

Alfred C. Monaghan, Simpsonville, S.C., assignor to Siempelkamp Corporation, Greenville, S.C.

Filed Aug. 4, 1987, Ser. No. 81,697

Int. Cl.[4] **B65B** *63/02*

U.S. Cl. 53—439 **48 Claims**

1. An apparatus for packaging articles in relatively tensionless plastic films, comprising:

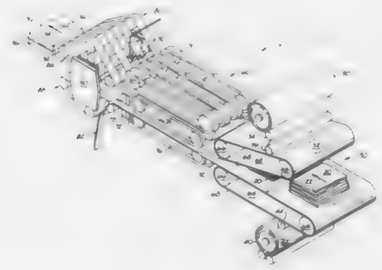
first conveyor means for advancing longitudinally spaced-apart articles, to be separately packaged, in a defined forward direction at a predetermined speed;

upper and lower plastic film supply means for feeding film respectively above and below such articles so that as they are advanced the articles become sandwiched between such films;

article detection means, disposed relative to said first conveyor means, for outputting a detection signal responsive to the passage of articles thereby;

carriage means, disposed downstream of said first conveyor means and having second conveyor means generally for continuing advancement of said articles in said forward direction,

sealing means responsive to said detection signal for laterally sealing said upper and lower films between adjacent articles being separately packaged; and



film tension reducing means, responsive to said detection signal for urging articles within said carriage means relatively against said forward direction of said articles back towards said sealing means during its operation, thereby removing tension on said upper and lower films as same are sealed about such articles.

4,858,417

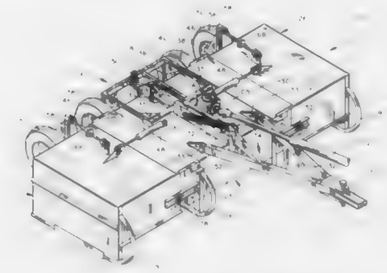
MOWER WITH ADJUSTABLE EXTENSION WINGS

Marvin J. Priefert, and William D. Prifert, both of Mt. Pleasant, Tex., assignors to Priefert Mfg. Co., Inc., Mt. Pleasant, Tex.

Filed Nov. 14, 1988, Ser. No. 270,834

Int. Cl.[4] **A01D** *75/30, 34/05*

U.S. Cl. 56—6 **11 Claims**



1. In a tractor drawn mower having a horizontal main frame with generally transversely disposed horizontally rotatable cutting units, a system for vertically adjusting said cutting units to a mowing position and for exposing said cutting units for maintenance accessibility, comprising:

(a) a ground wheel carrying frame for said main frame having a generally horizontal section with a front portion overlying a rear portion of the main frame and a downwardly extended upright section arranged rearwardly of said rear portion;

(b) a pair of ground wheels supported on said rear section;

(c) means pivotally supporting said wheel carrying frame on said main frame for up and down movement of said main frame relative to said rear section;

(d) a tongue structure having a front end attachable to a tractor and a rear end pivotally supported on said main frame;

(e) means on said main frame movable to a first position to releasably lock said main frame and tongue structure against relative pivotal movement, and to a second position to releasably lock said wheel carrying frame and main frame against relative pivotal movement; and

(f) power means for pivotally moving said main frame relative to said wheel carrying frame when the releasable locking means is in said first position therefor to vertically adjust said cutting units relative to the ground surface, and for pivotally moving said main frame and wheel carrying frame as a unit relative to said tongue structure, when the releasable locking means is in the second position therefor, to an upright position to expose said cutting units.

4,858,418

MOWING MACHINE

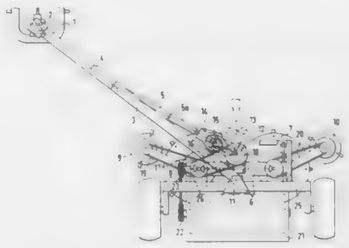
Wilhelm von Allwoerden, Gallingen, Fed. Rep. of Germany, assignor to Greenland GmbH & Co. KG, Gottmadingen, Fed. Rep. of Germany

Filed Jan. 26, 1988, Ser. No. 148,500

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1987, 3702221

Int. Cl.[4] **A01D** *34/66, 34/76*

U.S. Cl. 56—15.5 **15 Claims**



1. A mowing machine adapted for laterally displaced attachment to a tractor and having an undercarriage frame, a cross beam having a draft connection to said undercarriage frame, a plurality of rotary cutting tools connected for operation on vertical axes of rotation with cutting blades at their lower ends, a tractor hitch having a rear end pivotally connected to said undercarriage frame and drive means for rotating said cutting tools including a drive shaft interconnecting a power take-off shaft of the tractor with a gear box (12) on the mowing machine, characterized by the fact that said gear box (12) is pivotally mounted on a vertical drive axis to a substantially midpoint location on said cross beam (6) and said drive shaft (5, 5*a*) is connected to said gear box (12) by a forked support joint (14) having front and rear forked parts pivotally connected to one another on a horizontal pivot axis.

4,858,419

SWATH TREATING ATTACHMENT FOR A SWATHER

Paul Bernier, Box 414, Fisher Branch Manitoba, Canada R0C 1Z0

Filed Sep. 28, 1988, Ser. No. 250,070

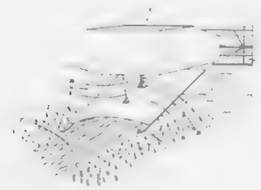
Claims priority, application United Kingdom, Sep. 30, 1987, 8722941

Int. Cl.[4] **A01D** *75/00*

U.S. Cl. 56—189 **5 Claims**

1. A swather comprising a swather frame, a header mounted on the frame for cutting a standing crop and for forming the cut crop into a swath discharged from a rear discharge opening of the swather frame and a swath treating attachment comprising a panel member having a front edge, a pair of sides and a rear edge, hinge means on the panel member adjacent said front edge mounting a forward portion of the panel member on the swather frame for movement of the panel member with the

swather frame and for pivotal movement of the panel member relative to the swather frame about a substantially horizontal axis transverse to the direction of movement of the swather, a pair of ground engaging members on said panel member each at a respective side thereof, biasing means on said panel member arranged to apply a force downwardly on the panel member tending to move the panel member downwardly about the horizontal axis to hold said ground engaging members in contact with the ground while allowing the panel member to



floatingly pivot upwardly about the axis as ground level changes relative to the swather frame, the panel member having a substantially rigid undersurface thereof arranged to engage the swath formed by the swather as it lies on the stubble to compress the swath into the stubble, a rear edge of the panel member being bowed such that a center portion thereof is raised above said sides thereof, and means for lifting the panel member against the force of the biasing means away from the ground.

4,858,420

PNEUMATIC FALSE-TWIST SPINNING PROCESS AND APPARATUS

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany

Filed Sep. 16, 1987, Ser. No. 97,658

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1986, 3631400

Int. Cl.⁴ D01H *5/28, 1/00;* **D02G** *1/04, 1/16*

U.S. Cl. 57—328 **33 Claims**



1. A process for pneumatic false-twist spinning having one pneumatic false-twisting nozzle means including at least one pneumatic false-twist nozzle arranged between a sliver drafting device and a withdrawal device, said process comprising:

at least partially reducing propogation of the false twist applied to the sliver by the false-twisting nozzle means in the direction of the drafting device to form an area having reduced twist, and

spreading away fiber ends from the sliver in at least the area having reduced twist utilizing spreading means disposed separate from and downstream of the most upstream portion of the area having reduced twist.

6. An arrangement for false twist spinning comprising:

drafting means for drafting sliver to be spun,

at least one pneumatic false-twisting nozzle for applying a false-twist to the sliver supplied from the drafting means,

withdrawal means for withdrawing the sliver form the false-twisting nozzle,

twist propogation reducing means disposed between the drafting means and the false-twisting nozzle and being operative to at least partially reduce propogation of the effective false-twist applied to the sliver by the false-twisting nozzle toward the drafting means to form an area having reduced twist, and

fiber end spreading means for spreading away fiber ends from the silver at least in the area having reduced twist, said spreading means including means disposed separate from and downstream of the upstream most portion of the propogation reducing means.

4,858,421

ARRANGEMENT FOR PNEUMATIC FALSE-TWIST SPINNING

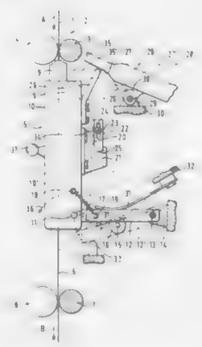
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Ueberkingen, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Feb. 10, 1989, Ser. No. 308,461

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1988, 3810846

Int. Cl.⁴ D01H *5/28, 11/00, 15/02, 1/00*

U.S. Cl. 57—328 **8 Claims**



1. An arrangement for pneumatic false-twist spinning comprising:

a drafting unit including a pair of delivery rollers,

air nozzle means including a movably held air nozzle, which follows the drafting unit in the travel direction of the yarn,

a withdrawal device,

nozzle transfer means for transferring the movably held air nozzle from an operating position behind the pair of delivery rollers of the drafting unit into a piecing position, which is offset with respect to the pair of delivery rollers, and

a movably held suction tube which can be brought into a piecing position by means of suction tube adjusting means when the air nozzle is moved out of the operating position, in which piecing position the suction tube is applied to the area of a clamping gap of the pair of delivery rollers of the drafting unit,

wherein the suction tube is in a cleaning position when the air nozzle is in the operating position, said suction tube being disposed at a distance from the clamping gap and being aimed at the circumference of one roller of the pair of delivery rollers of the drafting unit when in said cleaning position.

4,858,422

SUCTION ROLLER ARRANGEMENT FOR AN OPEN END FRICTION SPINNING MACHINE

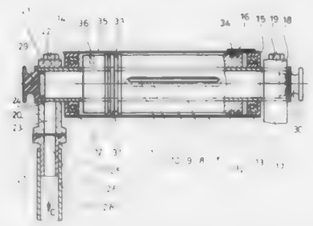
Fritz Stahlecker, Bad Üeberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Fed. Rep. of Germany

Continuation of Ser. No. 607,275, May 4, 1984, abandoned. This application Jan. 27, 1987, Ser. No. 9,089

Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3316656

Int. Cl.⁴ D01H *7/882, 7/892*

U.S. Cl. 57—401 **33 Claims**



1. Suction insert assembly arrangement for a suction roller of an open-end spinning unit of the type having a pair of rotatably driven friction rollers disposed adjacent one another to form a yarn forming wedge-shaped gap therebetween, with at least one of the friction rollers being formed as a suction roller with a perforated shell means and a suction insert assembly disposed therein for directing suction air flow in the region of the wedge-shaped gap, said suction insert assembly comprising:

pipe means connectible to a vacuum source, said pipe means being non-rotatably supported by spinning unit support means, said pipe means including a pipe slot means communicating the outer surface of the pipe means with the vacuum source, said pipe slot means being circumferentially located approximately in the area of said wedge-shaped gap; and

intermediate piece means interposed between the outer surface of the pipe means and the perforated shell means, said intermediate piece means including intermediate slot means for communicating the pipe slot means to the inside surface of the perforated shell means, said intermediate piece means being adjustably mounted at the pipe means to accommodate relative movement of the intermediate piece means with respect to the pipe means in at least one of the circumferential and axial directions to adjust at least one of either the direction or magnitude of the suction air flow occurring during a yarn forming operation.

4,858,423

FIBER FEEDING ARRANGEMENT FOR OPEN-END ROTOR SPINNING

Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,332

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1987, 3730706

Int. Cl.⁴ D01H *7/898, 7/892*

U.S. Cl. 57—413 **19 Claims**

1. A fiber feeding arrangement for an open-end rotor spinning unit of the type having

a spinning rotor which has a fiber sliding surface expanding conically into a fiber collecting groove,

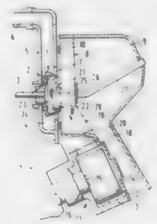
a rotor housing encasing the rotor, said rotor housing being connecting to an airflow inducing means,

a cover for closing off a side of the rotor housing facing an open end of the rotor,

and fiber opening means for opening fiber to be supplied to the rotor,

said fiber feeding arrangement including fiber feeding duct means extending from the fiber opening means through at least a portion of the cover to a fiber feeding end area of the fiber feeding duct means which opens to supply fibers to the fiber sliding surface of the rotor, said fiber feeding duct means exhibiting a tapered internal cross-section which diminishes in size in the direction toward the fiber feeding end area,

wherein the fiber feeding duct means is provided with a



lateral slot at the fiber feeding end area which is configured such that the cross-section of the fiber feeding duct means operable to accommodate fiber conveying airflow is disposed in an area of the fiber feeding duct means with a larger diameter than the diameter of the fiber feeding end area closest to the fiber sliding surface of the rotor,

and wherein the fiber feeding end area of the fiber feeding duct means is shaped as a groove with a groove base having a radius of no more than 2.5 millimeters (mm).

4,858,424

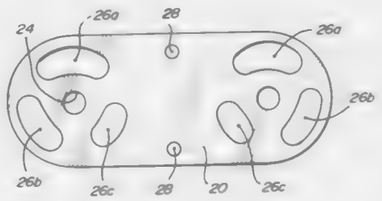
VARIABLE RADIUS CABLE CARRIER

David C. Loding, Sandusky, and James D. Ernst, Peck, both of Mich., assignors to Magnetek Controls, Clawson, Mich.

Filed Aug. 15, 1988, Ser. No. 232,163

Int. Cl.⁴ F16G *13/16*

U.S. Cl. 59—78.1 **3 Claims**





1. A plate-link chain comprising:

first and second links pivotally connected by pivots in a contiguous overlapping relationship forming a chain;

a plurality of arcuate slots on said first link arranged concentrically about the pivots, said slots being of different lengths; and

a slug pin fixed to said second link and extending through a particular arcuate slot,
whereby the pin limits the maximum angular travel between the links.

4,858,425
REFLECTING ORNAMENT STRING
Lorne Cheredaryk, and Wilfred Cheredaryk, both of 6065 Pitton Road, Niagara Falls, Ontario, Canada L2H 1S2
Filed Dec. 21, 1987, Ser. No. 135,677
Int. Cl.[4] F16G *13/00*
U.S. Cl. 59—80 **8 Claims**

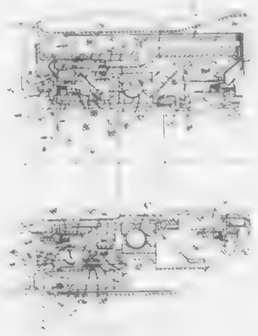




1. An ornament comprising a flexible cord and a plurality of reflecting members connected each to the other by said flexible cord to form an approximate linear chain, which connection permits said reflecting members to freely assume various and changing relative angular positions to each other when the ornament is suspended from one end, and wherein said reflecting members are paired elements bonded together back to back, and therebetween is securely disposed said flexible cord.

4,858,426
SECONDARY OIL SYSTEM FOR GAS TURBINE ENGINE
Warren N. Holcomb, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Jul. 21, 1988, Ser. No. 222,994
Int. Cl.[4] F02C *7/06*
U.S. Cl. 60—39.08 **2 Claims**

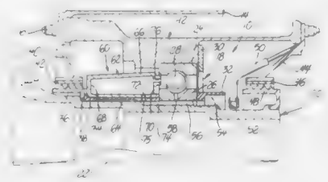
1. In a gas turbine engine for flight propulsion in a selected one of a horizontal flight mode and a vertical flight mode, said gas turbine engine having
a rotor shaft on an axis of said engine oriented horizontally in said horizontal flight mode and vertically in said vertical flight mode,
a generally annular housing of said engine surrounding said rotor shaft,
seal means at opposite longitudinal ends of said housing engaging said rotor shaft and defining therebetween an annular sump around said rotor shaft,
a bearing in said sump including an inner race on said rotor shaft and an outer race on said housing and a plurality of anti-friction elements between said inner and said outer races,
a primary oil system including a pipe conducting a primary oil flow at a primary oil flow rate to a plurality of nozzles in said sump wherein said primary oil flow cools and lubricates said bearing, and an annular reservoir tank disposed in said sump and attached to said housing,
the improvement comprising:
a vent and overflow disposed at the top of said reservoir tank in each of said horizontal and said vertical flight modes of



said engine and connected to said sump whereby the pressure in said reservoir tank is always equal to the pressure in said sump,
means defining an inlet orifice between said pipe and said reservoir tank at the top of said reservoir tank in each of said horizontal and said vertical flight modes of said engine whereby a part of said primary oil flow is conducted into said reservoir tank,
means defining a discharge orifice in said reservoir tank at the bottom thereof in each of said horizontal and said vertical flight modes of said engine whereby gravity induces a continuous secondary oil flow from said reservoir tank at a secondary flow rate substantially less than said primary oil flow rate in each of said horizontal and said vertical flight modes of said engine, and
means defining a passage between said discharge orifice and said sump conducting said gravity induced secondary oil flow from said reservoir tank to said bearing.

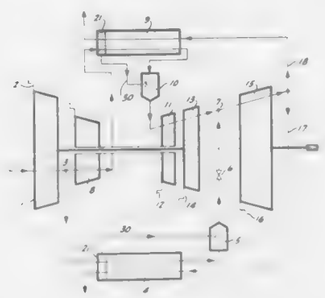
4,858,427
SECONDARY OIL SYSTEM FOR GAS TURBINE ENGINE
Nicholas J. Provenzano, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 8, 1988, Ser. No. 229,401
Int. Cl.[4] F02C *7/06*
U.S. Cl. 60—39.08 **3 Claims**

1. In a gas turbine engine having
a rotor shaft supported on a case of said engine by a bearing for rotation about an axis of said engine, and
a primary oil system directing a primary oil flow to said bearing at a primary oil flow rate,
a secondary oil system comprising: an oil reservoir rotatable as a unit with said rotor shaft about said axis,
means on said engine connected to said primary oil system operative to conduct a portion of said primary oil flow to said reservoir concurrently with said primary oil flow to said bearing,
discharge orifice means on said reservoir having a predetermined flow area limiting centrifugal force induced discharge of oil from said reservoir to a secondary oil flow rate substantially less than said primary oil flow rate to



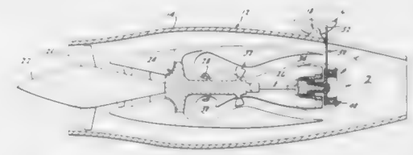
said bearing so that said centrifugal force induced oil discharge from said reservoir persists for a predetermined duration after said primary oil flow to said bearing stops, and
means on said engine for directing said centrifugal force induced oil discharge from said reservoir to said bearing.

4,858,428
ADVANCED INTEGRATED PROPULSION SYSTEM WITH TOTAL OPTIMIZED CYCLE FOR GAS TURBINES
Marius A. Paul, 969 La Paz, Placential, Calif. 92690
Filed Apr. 24, 1986, Ser. No. 855,847
Int. Cl.[4] F02C *1/06*
U.S. Cl. 60—39.17 **14 Claims**



1. A gas turbine assembly with integrated high and low pressure circuits comprising:
a low pressure air compressor and a high pressure air compressor staged with the low pressure air compressor;
a first high pressure combustion chamber and associated two-stage, high pressure turbine communicating with the high pressure combustion chamber, the two-stage high pressure turbine having a first stage coupled to the high pressure air compressor and a second stage coupled to the low pressure air compressor;
a second low pressure combustion chamber and associated low pressure, power turbine being staged with the high pressure turbine to receive combustion gases expended from the high pressure turbine;
diverting means between the low pressure compressor and the high pressure compressor for diverting compressed air from the low pressure compressor to the low pressure combustion chamber;
a converging chamber between the low pressure combustion chamber and the low pressure, power turbine constructed to receive and combine combustion gases from the low pressure combustion chamber and exhaust gases from the high pressure turbine;
a junction valve between the low pressure combustion chamber and the covering chamber, the valve being regulatable according to power and efficiency requirements of the turbine assembly to vary the flow of compressed air from the low pressure compressor to the low pressure combustion chamber;
transmission means for extracting mechanical output power, wherein the transmission means for extracting mechanical power is connected to the low pressure power turbine and the high pressure turbine drives the compressors; and,
fuel supply means for supplying fuel to said first and second combustion chambers wherein a fuel and compressed air mixture is combusted and passed through said turbines.

4,858,429
CABLE STARTER FOR AIR LAUNCH MISSILE
Gerald J. Herman, Farmington Hills, Mich., assignor to Williams International Corporation, Walled Lake, Mich.
Filed Apr. 27, 1988, Ser. No. 186,801
Int. Cl.[4] F02C *7/275*
U.S. Cl. 60—39.141 **1 Claim**



1. In a gas turbine engine adapted to be launched from a platform, said engine comprising a compressor and turbine mechanically connected to one another by a shaft, an improved cable start system for said engine comprising,
a cable drum drivably connected to said engine shaft, and
a cable wound about said drum in a plurality of coils, said cable having one end fixed to said launch platform and an opposite end freely disposed about said drum and underlying said coils whereby relative movement between said engine and said launch platform effects tensioning of said cable and rotation of said drum and engine shaft independently of air flow through said engine.

4,858,430
THRUST REVERSER FOR A TURBOFAN ENGINE
Lionel A. Belbouche, Harfleur, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA), Paris, France
Filed Jul. 21, 1988, Ser. No. 222,555
Claims priority, application France, Jul. 29, 1987, 87 10730
Int. Cl.[4] F02C *1/70*
U.S. Cl. 60—226.2 **4 Claims**



1. In a turbojet engine of the turbofan type having a primary duct for exhausting hot gases in a downstream direction and a secondary annular duct concentrically arranged about the primary duct as to define an annular space therebetween for exhausting cold air in a downstream direction, the secondary duct having an inner air flow surface, an outer air flow surface,

and defining at least one laterally extending opening, the improved thrust reverser comprising:

(a) at least one thrust reversing door attached to the secondary duct, the door having an upstream edge, a downstream edge, an outer air flow surface and a generally concave inner surface;

(b) actuating means connected between the door and the secondary duct to move the door between a retracted position in which the door extends over the lateral opening such that the air flow through the secondary duct is unimpeded and the outer air flow surface of the door is substantially flush with the outer air flow surface of the secondary duct, and an extended position in which the door redirects the air passing through the annular space through the lateral opening in a direction having an upstream acting component; and,

(c) a deflector attached to the upstream edge of the door, the deflector having (i) a first portion extending generally perpendicular to the direction of air flow when the door is in its retracted position, and (ii) a second portion extending from the first portion in a dowstream direction so as to direct air flowing through the secondary away from the generally concave inner surface of the door.

4,858,431

APPARATUS FOR REMOVING SOLID PARTICLES, ESPECIALLY SOOT PARTICLES, FROM THE EXHAUST GAS OF AN INTERNAL COMBUSTION ENGINE

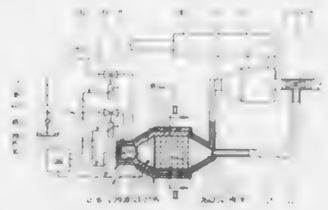
Rolf Leonhard, Schwieberdingen, and Ulrich Projahn, Ditzingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 7, 1988, Ser. No. 254,898

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1987, 3734197

Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—297 **23 Claims**



1. An apparatus device for removing solid particles, especially soot particles, from an exhaust gas flow of an internal combustion engine, in particular a Diesel engine, having a separator for dividing the flow of exhaust gas into a largely particle-free primary flow and a particle-enriched secondary flow, said separator including a first outlet for said particle-enriched secondary flow and a second outlet for said largely particle-free primary flow, a particle disposal device, said particle disposal device including a combustion chamber, said combustion chamber including an inlet opening connected to said first outlet for the secondary flow of exhaust gas, a pilot burner (**16**) connected to said combustion chamber for producing a burnoff flame that burns off any solid particles in said combustion chamber, said particle disposal device including an outlet opening for removing any gaseous product of said burnoff flame, a filter (**42**; **142**; **242**; **342**) disposed in said combustion chamber (**15**; **115**; **215**; **315**) between said inlet opening and said outlet opening, said filter divides said combustion chamber (**15**; **115**; **215**; **315**) into a filter pre-chamber (**18**; **118**; **218**; **218**) and a filter after-chamber (**19**; **119**; **219**; **319**), wherein said burnoff flame burns in said filter pre-chamber (**18**; **118**; **218**; **318**), and the outlet opening (**20**; **120**; **220**; **320**) joins said filter after-chamber (**19**; **119**; **219**; **319**).

4,858,432

PILOT BURNER FOR AN APPARATUS FOR BURNING OFF SOLID PARTICLES IN THE EXHAUST GAS OF INTERNAL COMBUSTION ENGINES

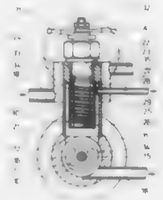
Alfred Kaaner, Stuttgart, and Ulrich Projahn, Ditzingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 26, 1988, Ser. No. 236,972

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1987, 3732491

Int. Cl.[4] F01N *3/26*

U.S. Cl. 60—303 **17 Claims**



1. A pilot burner for a device for burning off solid particles, in the exhaust gas of internal combustion engines, comprising a hollow-cylindrical mixture preparation chamber, a glow element therein, said preparation chamber being closed at one face end and at the other provided with a mixture outlet opening, a hollow-cylindrical receiving chamber, adapted to receive a glow plug, arranged to extend transversely to and communicate with the mixture preparation chamber, a fuel inflow line arranged to discharge into the receiving chamber, a tangentially disposed air inflow supply line associated with said mixture preparation chamber, said glow plug (**22**) being surrounded coaxially, in a radially spaced apart manner, in the vicinity of an incandescent coil (**25**) by a thin-walled protective sleeve (**26**), and further that the fuel inflow line (**28**) includes an orifice fitting (**27**) which protrudes radially into the receiving chamber (**11**), said orifice fitting having an orifice opening (**29**) which terminates in close proximity to the protective sleeve (**26**).

4,858,433

PILOT BURNER FOR AN APPARATUS FOR BURNING OFF SOLID PARTICLES IN THE EXHAUST GAS OF INTERNAL COMBUSTION ENGINES

Alfred Knauer, Stuttgart; Rolf Leonhard, Schwieberdingen; Ulrich Projahn, Ditzingen, and Wolfgang Stolper, Fellbach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 26, 1988, Ser. No. 236,973

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1987, 3732492

Int. Cl.[4] F01N *3/26*

U.S. Cl. 60—303 **18 Claims**

1. A pilot burner for a device for burning off soot particles, in the exhaust gas of internal combustion engines, comprising

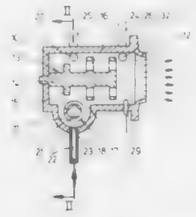
a hollow-cylindrical mixture preparation chamber that coaxially receives a glow element and is closed on one face end and on the other face end has a mixture outlet opening,

a hollow-cylindrical receiving chamber extending transversely of and eccentrically to the mixture preparation chamber arranged to receive a glow plug, said receiving chamber being closed on both face ends and adapted to communicate with the mixture preparation chamber via an opening formed by piercing the chamber walls of both chambers,

a fuel inflow line discharging into the receiving chamber,

an air supply line arranged to discharge into the mixture preparation chamber, the air supply line having at least one inflow opening disposed near the mixture outlet opening and having a tangential inflow direction,

said air supply line (**24**, **25**; **124**, **125**) having at least one second inflow opening (**27**; **127**), which is disposed in the region of the wall of the mixture preparation chamber (**10**; **110**) opposite the opening (**17**; **117**) which adjoins the mixture preparation chamber (**10**; **110**) and the receiving chamber (**11**; **111**) and said air inflow having a tangential inflow direction in the same direction as the first inflow opening (**26**; **126**).



4,858,434

WAVE-ACTIVATED POWER GENERATOR

Takahiko Masuda, Yokosuka, Japan, assignor to Kohichi Nishikawa, Japan

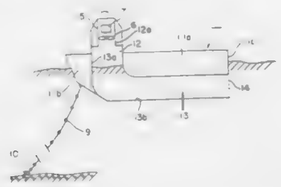
PCT No. PCT/JP83/00359, § 371 Date Jun. 14, 1984, § 102(e) Date Jun. 14, 1984, PCT Pub. No. WO84/01603, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 15, 1983, Ser. No. 619,632

Claims priority, application Japan, Oct. 15, 1982, 57-179990

Int. Cl.[4] F03B *13/12*

U.S. Cl. 60—398 **4 Claims**



1. A wave-activated power generator comprising: an elongated main body having a first end and a second end opposite to said first end and floatable on a water surface; an air chamber formed in said main body at said first end thereof; power generating means in communication with one end of said air chamber and driven by an air flow flowing between said air chamber and atmosphere; a continuous open passage formed in said main body with one end of said passage in communication with an other end of said air chamber and the other end of said passage being submersible under the water surface and being formed as an open end at said second end of said main body in operation opened sideways, said continuous open passage including a vertical passage portion extending downward from said air chamber to a bottom end and a horizontal passage portion extending from the bottom end of said vertical passage portion to said open end, said continuous open passage open end arranged to receive a water column from a water wave, said water column being movable within said continuous open passage to obtain said air flow; and mooring means connected to said first end of said main body for mooring said main body in the water surface such that said open end is oriented toward the downstream direction with respect to the advancing direction of waves.

4,858,435

FLUID PRESSURE CONTROL CIRCUIT FOR WORKING VEHICLE HAVING TRANSMISSION OPERABLE BY FLUID PRESSURE

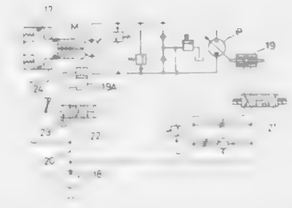
Kenji Ikeda, Sakai, Japan, assignor to Kubota Ltd., Osaka, Japan

Filed Jan. 12, 1988, Ser. No. 142,960

Claims priority, application Japan, May 9, 1987, 62-69543[U]; May 11, 1987, 62-70346[U]

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—441 **4 Claims**



1. A fluid pressure control circuit for a working vehicle having transmission means operable by a fluid pressure, comprising:

fluid pressure actuator means for controlling said transmission means said actuator means including a first cylinder acting to control a main change speed operation of said transmission means and a second cylinder acting to control an auxiliary change speed operation of said transmission means, said second cylinder being movable to a first end position to place said transmission means in a low sped position and to a second end position to place said transmission means in a high speed position,

a fluid supply line for supplying pressure fluid to said first and second cylinders of said fluid pressure actuator means,

fluid pressure parking brake means connected to said fluid supply line, said fluid pressure parking brake means being a negative-type brake operable by fluid pressure to release parking brakes, and

control valve means mounted on said fluid supply line and having a first position to release the pressure fluid from said fluid supply line and thereby from said fluid pressure parking brake means and a second position to supply the pressure fluid to said fluid pressure parking brake means, and to control the supply of the pressure fluid from said fluid supply line to said fluid pressure actuator means in order to set said second cylinder selectively to said first end position and said second end position.

4,858,436

VEHICLE POWER BRAKE SYSTEM

Enzo Brussasco, Turin, Italy, assignor to Roltra S.p.A., Turin, Italy

Filed Feb. 17, 1987, Ser. No. 15,073

Claims priority, application Italy, Feb. 21, 1986, 53013/86[U]

Int. Cl.[4] F15B *7/00*

U.S. Cl. 60—545 **6 Claims**

1. A power brake system for a vehicle, comprising:

(a) a control pedal having a free first end and a second end pivotally connected with a portion of the vehicle;

(b) hydraulic means for fluid activating a braking member;

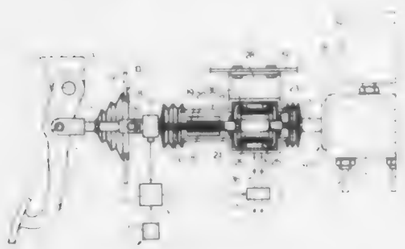
(c) said hydraulic means comprising a hydraulic cylinder with a piston member extending therefrom;

(d) a rod having a first end operatively connected with said pedal and a second end operatively connected with said piston;

(e) power drive means cooperating with said rod;

(f) said power drive means comprising a motor and a hollow shaft;

(g) a reversible screw-nut screw coupling comprising a screw-nut integral with said hollow shaft and a screw shaft formed of a portion of said rod;

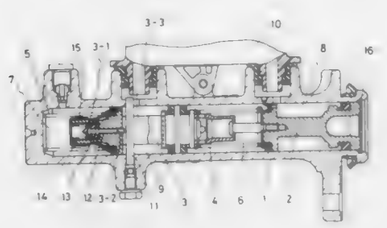


(h) said screw shaft extending through said hollow shaft;
(i) control means for selectively activating said motor in response to a pressure exerted on said control pedal.

4,858,437
MASTER CYLINDER

Chiaki Ochiai, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 23, 1988, Ser. No. 197,422
Claims priority, application Japan, May 29, 1987, 62-[illegible][U]
Int. Cl.[4] B60T *11/28*
U.S. Cl. 60—562 12 Claims

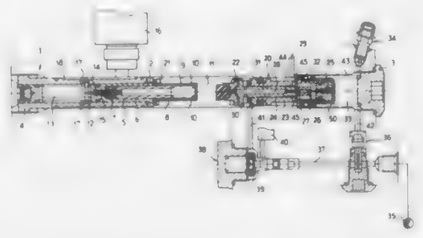


1. A master cylinder comprising; a piston liquid-tightly and slidably fitted in an internal bore of a cylinder body for defining in said internal bore a supply chamber normally communicating with a reservoir tank and a pressure chamber normally communicating with a hydraulic line; a valve rod assembled into a stepped hole formed at the end of said piston on the side near said pressure chamber to communicate said pressure chamber and said supply chamber with each other, said valve rod being movable in the direction of sliding of said piston; a valve body attached to said valve rod to be abutted against and departed from a valve seat formed in the stepped hole of said piston for intermittently controlling communication between said supply chamber and said pressure chamber; a valve spring disposed in the stepped hole of said piston for urging said valve body toward said valve seat; a stopper member fixedly provided in the internal bore of said cylinder body for causing said valve body to be departed from said valve seat against said valve spring when the end of said valve rod abuts against said stopper member; a return spring stretched in said pressure chamber for urging said piston toward said supply chamber, said master cylinder further comprising support means for elastically supporting the end face of said piston facing said supply chamber, so that said valve body is seated on said valve seat with a predetermined gap left between the end of said valve rod and said stop member during an inoperative state of said master cylinder.

4,858,438
HYDRAULIC BOOSTER DEVICE FOR BRAKING CIRCUIT

Christian Douillet, Puteaux, and Joël Vasselet, Chelles, both of France, assignors to Bendix France, Drancy, France

Filed Mar. 18, 1988, Ser. No. 170,481
Claims priority, application France, Mar. 31, 1987, 87 04471
Int. Cl.[4] B60T *17/00, 11/32*
U.S. Cl. 60—566 11 Claims



1. A hydraulic booster device for a braking circuit, comprising a body having a bore in which slides coaxially a plunger controlled by a brake pedal and piston means located between first and second chambers containing brake fluid, the first chamber having a spring which maintains the plunger and the piston means separated one from the other, the first and second chambers being connected respectively to sources of low pressure and high pressure fluid by first and second valve means, respectively, third and fourth valve means being interposed between the first and second chambers, and a braking circuit, characterized in that the high pressure fluid source controls the opening of the first and second valve means which close in the event of failure of the high pressure fluid source in order to isolate the first chamber from the low pressure fluid source and the second chamber from the high pressure fluid source, the second chamber then emptying, in the event of braking, into the braking circuit due to action of the piston means which is displaced by the spring and a translation of the plunger, and in that the third valve means opens once the second chamber is empty to permit transmission into the braking circuit of a volume of brake fluid expelled from the first chamber by a continuation of movement of the plunger due to action of the brake pedal.

4,858,439
DEVICE FOR VARYING A STROKE

Daisaku Sawada, Gotenba, and Takeshi Takahashi, Mishima, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Feb. 17, 1988, Ser. No. 156,576
Claims priority, application Japan, Mar. 3, 1987, 62-046834
Int. Cl.[4] F15B *15/00*
U.S. Cl. 60—583 20 Claims

1. A device for varying a stroke, comprising:
a cylinder housing having therein a large diameter cylinder and a small diameter cylinder which are interconnected to each other;
a large diameter piston slidably inserted into said large diameter cylinder and having a projecting end portion which projects from said cylinder housing;
a small diameter piston slidably inserted into said small diameter cylinder and having a projecting end portion which projects from said cylinder housing, said large diameter piston and said small diameter piston defining a cylinder chamber therebetween;
a first flexible annular seal member fixed to the projecting end portion of said large diameter piston in a fluid tight manner at one end thereof and fixed to an outer wall of said cylinder housing in a fluid tight manner at the other end thereof to define a first hermetically sealed chamber therein;
a second flexible annular seal member fixed to the projecting end portion of said small diameter piston in a fluid tight manner at one end thereof and fixed to the outer wall of said cylinder housing in a fluid tight manner at the other end thereof to define a second hermetically sealed chamber therein; and
an incompressible fluid filling said cylinder chamber, said first hermetically sealed chamber and said second hermetically sealed chamber.

4,858,440
TURBO-COMPOUND ENGINE

Masaki Okada, Kawasaki, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,552
Claims priority, application Japan, May 30, 1987, 62-136477
Int. Cl.[4] F02G *5/00*
U.S. Cl. 60—614 9 Claims

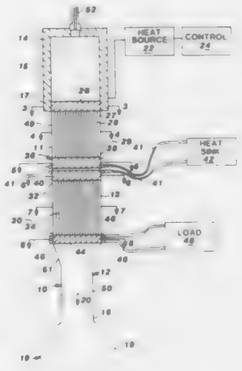


1. A turbo compound engine for use in a vehicle, comprising:
an exhaust brake system which includes a vehicle being driven by an engine through a crankshaft, said vehicle having an accelerator and a clutch, said engine having an exhaust gas passage;
an engine neutrality sensing switch for sensing if said accelerator is free;
a clutch engagement sensing switch for sensing if said clutch is engaged;
an exhaust brake valve disposed in said exhaust gas passage of said engine;
an exhaust brake switch for activating said exhaust brake valve to throttle said exhaust gas passage;
a power turbine disposed in said exhaust gas passage downstream of said exhaust brake valve;
two sets of gears for independently connecting said power turbine with said crankshaft, a first set being selected when said engine neutrality sensing switch, said clutch engagement sensing switch and said exhaust brake switch are all turned on, said first set causing said crankshaft to transmit rotational energy to said power turbine and a second set being selected at all other times causing said power turbine to transmit rotational energy to said crankshaft;
speed change means associated with said first set for adjusting the transmission speed that said crankshaft drives said power turbine at; and
control means for detecting an engine revolution speed and for controlling said speed-change means in a manner such that said power turbine does not rotate at a revolution speed higher than a desired value, said desired value being a predetermined value retained in said control means.

4,858,441
HEAT-DRIVEN ACOUSTIC COOLING ENGINE HAVING NO MOVING PARTS

John C. Wheatley, Los Alamos; Gregory W. Swift; Albert Migliori, both of Santa Fe, and Thomas J. Hofler, Los Alamos, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 942,139, Mar. 2, 1987, abandoned, which is a continuation of Ser. No. 829,345, Feb. 13, 1986, abandoned. This application Jan. 21, 1988, Ser. No. 147,126
Int. Cl.[4] F25B *9/00*; F03G *7/00*
U.S. Cl. 62—6 24 Claims



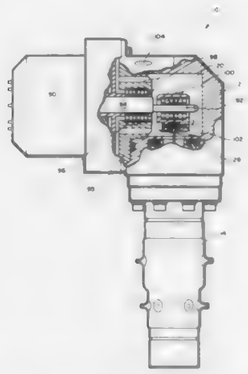
1. An acoustic cooling engine driven by a heat source comprising:
container means for containing a compressible fluid which is capable of supporting an acoustic standing wave, said container means having a first end and a second end;
first means for receiving heat from the heat source, said first means being located in said container means and effective to transfer heat to said fluid;
a first thermodynamic element located in said container means adjacent said first means for receiving heat from the compressible fluid and for converting some of the received heat into acoustic power in the form of said acoustic standing wave;
a second thermodynamic element located in said container means and spaced apart from said first thermodynamic element, said second thermodynamic element having a first portion and a second portion functionally related to said first thermodynamic element to cool said second portion by the acoustic wave generated by said first thermodynamic element; and
second means located between said first and said second thermodynamic elements for receiving heat rejected from said first and said second thermodynamic elements to said fluid.

4,858,442

MINIATURE INTEGRAL STIRLING CRYOCOOLER

Norman B. Stetson, Lexington, Mass., assignor to Inframetrics, Incorporated, Bedford, Mass.

Filed Apr. 29, 1988, Ser. No. 188,287
Int. Cl.[4] F25B *9/00*
U.S. Cl. 62—6 **27 Claims**



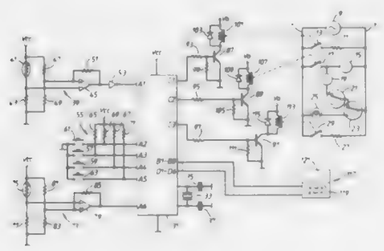
1. An integral cryocooler comprising:
a compressor piston arranged to reciprocate inside a compression cylinder;
a regenerator arranged to reciprocate inside an expansion cylinder, the expansion cylinder disposed at right angles to the compression cylinder;
a coupling connecting the compressor piston and the regenerator at right angles to one another, the coupling having a bearing disposed in a central portion; and
a motor having an offset shaft, the offset shaft mated to the coupling at the bearing, and the offset shaft perpendicularly positioned with respect o both the center axis of the compression cylinder and the center axis of the expansion cylinder.

4,858,443

REFRIGERATION WITH QUICK COOLING SYSTEM

Kazuo Deapou, Osaka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 6, 1988, Ser. No. 178,372
Claims priority, application Japan, Apr. 11, 1987, 62-89272
Int. Cl.[4] F25B *49/00*; G05D *23/32*
U.S. Cl. 62—126 **21 Claims**



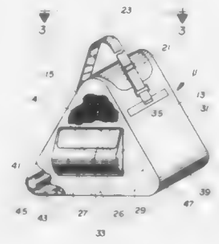
1. A refrigerator comprising:
a refrigerator compartment;
refrigerating cycle means for cooling said compartment;
quick cooling means for operating the refrigerating cycle means regardless of a temperature in the compartment for a predetermined time period;
means for setting a set time when the operation by the quick cooling means is to be completed; and
control means for activating the quick cooling means at a start time corresponding to the predetermined time period earlier than the set time, thereby cooling food within said refrigerator compartment by said set time.

4,858,444

PORTABLE COOLER

Jeff Scott, 11531 NW. 23rd St., Pembroke Pines, Fla. 33026

Filed Nov. 18, 1988, Ser. No. 272,920
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—372 **12 Claims**



1. An improved portable cooler designed to transport, chill, and permit easy access to sealed beverages, said improved portable cooler comprising:
a receptacle for receiving sealed containers and coolant,
said receptacle having a closed end and a sealable open end,
said receptacle having a diminishing cross-sectional length from said closed end to said open end and a substantially constant cross-sectional width, said diminishing cross-sectional length being sized to support stacked layers of diminishing numbers of containers in relatively stable, side-wise parallel relation, said substantially constant cross-sectional width being sized and proportioned to accommodate a given length of container plus coolant alongside top and bottom of the containers,
said receptacle comprising a soft, expandable, insulated material suitable for insulating sealed beverages and substantially containing icy liquid coolant;
a lid, said lid being sized and disposed for mateable engagement with said sealable open end; and,
an insert, said insert being sized and disposed for insertion through said sealable open end and for mateable engagement with said closed end, said insert including upwardly extending lip portions and being further sized and disposed to accommodate a first row of a pre-designated number of containers in parallel, said upwardly extending lip portions maintaining said pre-designated number of containers in parallel relation.

4,858,445

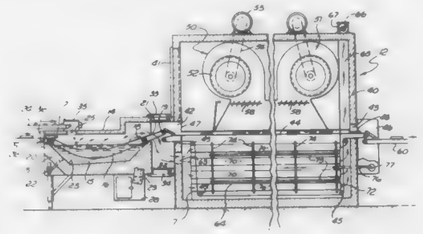
COMBINATION CRYOGENIC AND MECHANICAL FREEZING SYSTEM

Ivan Rasovich, 8950 Glenoaks Blvd., Sun Valley, Calif. 91352

Filed Sep. 26, 1988, Ser. No. 248,965
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—374 **12 Claims**

1. In a freezing system, the combination of:
a cryogenic freezer having a first product inlet and a first product outlet,
first conveyor belt means for moving product from said first product inlet to said first product outlet,
a source of cryogenic material, and
a first cryogenic vapor outlet; and

a mechanical refrigeration freezer having a second product inlet and a second product outlet,
second conveyor belt means for moving product from said second product inlet to said second product outlet,
a refrigeration evaporator coil,
a blower,
a first cryogenic vapor inlet and a second cryogenic outlet,



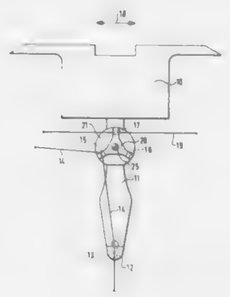
first flow means defining a cryogenic vapor path from said first cryogenic vapor outlet through said first cryogenic vapor inlet to said second cryogenic vapor outlet, and
second flow means defining an air flow path from said blower through said refrigeration evaporator coil, said first flow means and said second belt means.

4,858,446

THREAD-GUIDE ARM

Ernst Goller; Dieter Wurst, both of Reutlingen; Guenther Kazmaier, St. Johann-Ohnastetten, and Jochen Frei, Moessingen, all of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,203
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3732879
Int. Cl.[4] D04B *15/52*
U.S. Cl. 77—126 R **8 Claims**



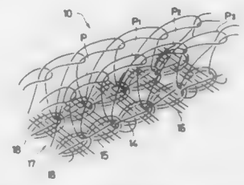
1. A thread-guide arm having thread-guide members arranged on said arm above a thread-guide pulley, said thread-guide members being formed as webs attached to and arranged immediately in front of a thread-restraining plate and having bores defined in said webs, the outer edges of said plate being free of acute angles.

4,858,447

WARP-KNIT TAPE FOR HOOK-AND-LOOP FASTENERS

Yoshio Matsuda, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Continuation of Ser. No. 105,673, Oct. 8, 1987, abandoned. This application Mar. 23, 1988, Ser. No. 173,027
Claims priority, application Japan, Oct. 8, 1986, 61-154573[U]; Oct. 8, 1986, 61-154574[U]
Int. Cl.[4] D04B *7/12*
U.S. Cl. 66—191 **9 Claims**



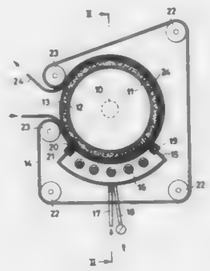
1. A warp-knit tape for hook-and-loop fasteners, comprising a pile portion constructed with pile threads, foundation threads and laid-in weft threads, said pile threads being knitted into a continuous chain of pile loops each having a rise portion and a horizontally extending flat portion and linking in interlaced relation with adjacent loops.

4,858,448

APPARATUS FOR THE CONTINUOUS DECATING OF A FABRIC

Gino D. Vecchia, Santorso, Italy, assignor to Sperotto Rimar S.P.A., Thiene, Italy

Filed May 6, 1988, Ser. No. 190,994
Claims priority, application Italy, May 26, 1987, 20677 A/87
Int. Cl.[4] D06B *5/08*
U.S. Cl. 68—5 E **13 Claims**



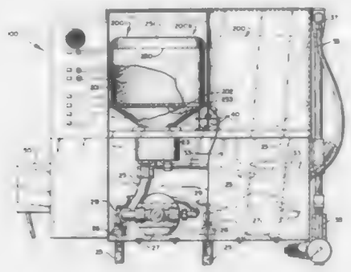
1. Equipment for the continuous decating of a fabric comprising a cylindrical drum having an outer surface constituted by an elastic, deformable material, a first, inner back gray of a textile material at least partially covering said outer surface of said drum, the fabric to be decated being continuously fed on said first back gray, a second, outer back gray of a textile material of continuous, closed loop form at least partially surrounding said first back gray and the fabric fed thereon, drive means for said second back gray, a pressurized steam chamber in correspondence with at least one portion of the second back gray which surrounds the first back gray and said cylindrical drum, said chamber extending transversely over at least the entire width of the fabric, and pressure-tight sealing means on said chamber in peripheral contact with said second back gray at said at least one portion thereof.

4,858,449

CHEMICAL SOLUTION DISPENSER APPARATUS AND METHOD OF USING

Chris F. Lehn, Minneapolis, Minn., assignor to Ecolab Inc., St. Paul, Minn.

Filed Jan. 9, 1986, Ser. No. 817,350
Int. Cl.[4] D06F *39/02*
U.S. Cl. 68—12 R 25 Claims



17. An improved chemical dispenser for dispensing a predetermined quantity of a chemical solution of unknown or variable concentration into a washing machine, which comprises:

(a) a means for forming a homogeneous aqueous chemical solution comprising:

(i) a container having an upper storage portion for retaining a mass of a laundry chemical and a collector portion integral with and extending continuously downward from the upper storage portion and terminating at a lower outlet port from the container;

(ii) means for mounting the container to a vertical surface;

(iii) a spray forming nozzle operatively engaged to the container for directing the spray of water into the upper storage portion of the container, dissolving that laundry chemical carried immediately adjacent to the spray forming nozzle which passes in solution to the collector portion and is immediately directed by the collector portion through the outlet port;

(iv) a solution conduit connecting the outlet port with the washing machine for directing concentrated laundry chemical solution from the collector portion of the container into the washing machine;

(v) a water supply line connecting the spray forming nozzle with a pressurized source of water;

(vi) pressure regulating means cooperatively connected to the water supply line for maintaining a constant flow rate of water into the container;

(vii) spray control means cooperatively connected to the water supply line for selectively controlling the flow of water through the supply line to the nozzle and being operative in response to receipt of a control signal to open and close the water supply line to water flow;

(viii) a conductivity sensing means cooperatively connected to the solution conduit for sensing the conductivity of the laundry chemical solution flowing through the conduit and emitting a conductivity signal; and

(ix) temperature sensing means cooperatively connected to the conduit for sensing the temperature of the laundry chemical solution and emitting a temperature signal; and

(b) an electronic control mechanism cooperatively connected to the washing machine, the conductivity sensing means, the temperature sensing means, and the spray control means for:

(i) receiving an initiating control signal emitted by the washing machine to begin dispensing laundry chemical solution into the washing machine;

(ii) emitting a control signal to the spray control means to open the water supply line to water flow therethrough;

(iii) receiving the conductivity signal emitted by the conductivity sensing means;

(iv) receiving the temperature signal emitted by the temperature sensing means;

(v) calculating the periodic amount of laundry chemical dispensed into the washing machine based upon the constant water flow rate, the length of the period, the temperature of the laundry chemical solution and the conductivity of the laundry chemical solution;

(vi) calculating the total amount of laundry chemical dispensed into the washing machine by summing the periodic amounts;

(vii) repeating functions (iii) through (vi) until a predetermined amount of laundry chemical has been dispensed into the washing machine; and

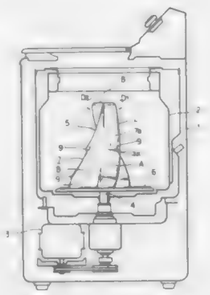
(viii) emitting a control signal to the spray control means to close the water supply line to water flow therethrough.

4,858,450

STIRRING DEVICE FOR AUTOMATIC WASHER

Yang H. Noh, Pusan, Rep. of Korea, assignor to Gold Star Col, Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 844,124, Mar. 26, 1986, abandoned. This application Feb. 18, 1988, Ser. No. 159,456
Claims priority, application Rep. of Korea, Mar. 27, 1985, 85-2044[U]; Mar. 27, 1985, 85-3252[U]
Int. Cl.[4] D06F *17/10*
U.S. Cl. 68—134 1 Claim



1. A stirring device for an automatic washer which comprises:

a circular base plate,

a stirring blade member having length and width, said stirring blade member extending vertically from the center of one surface of said circular base plate, said stirring blade member including three helical blades, said three helical blades being undulated to extend from the center of said circular base plate upward in three directions, joined together at inner edges thereof to form an integral part, provided at respective outer edges thereof with helically curved tip lines, and concentrated together at top ends thereof to form a rod member substantially shaped into a triangle,

rib members uniformly disposed on and extending vertically from said one surface of said circular base plate, and

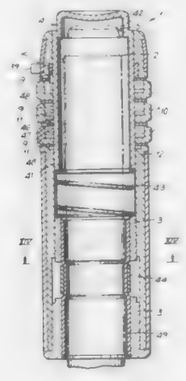
at least one protrusion member extending in a direction along the width of and across the top surface of each blade, and intersecting the tip line of the blade with an angle between the tip line and each protrusion being less than about 90° whereby said stirring blade member imparts to the material being washed an impactive drying action while suppressing the upward movement of said material.

4,858,451

LOCK FOR HAND BRAKE LEVER OF MOTOR VEHICLE

István Balins; József Kókai; Lajos Boró , and Lajos Torba, all of Budapest, Hungary, assignors to "Spiral" Autojavito Vallalat, Hungary

Continuation of Ser. No. 904,871, Sep. 8, 1986, abandoned. This application Sep. 2, 1988, Ser. No. 243,187
Claims priority, application Austria, Jan. 24, 1986, 170/86
Int. Cl.[4] F16H *57/00*
U.S. Cl. 70—202 19 Claims



1. A lock for a hand brake lever of a motor vehicle with a sleeve mounted on the hand brake lever, a release member movable with respect thereto to contact a pushbutton of the hand brake lever, and a locking device capable of preventing movement of the release member in a locked condition, characterized in that the release member (4) is associated with a mechanism which arrests an unlocked condition of the locking device (8) after release of the hand brake and prevents shifting from this condition.

4,858,452

NON-COMMUTATED LINEAR MOTOR

Faik K. Ibrahim, Columbus, Miss., assignor to United Technologies Electro Systems, Inc., Columbus, Miss.

Filed Dec. 22, 1986, Ser. No. 945,441
Int. Cl.[4] E05B *51/00*
U.S. Cl. 70—275 24 Claims

9. An automobile power door lock mechanism which comprises:

a latch and lock mechanism for latchably securing the door in a closed position and for locking the latch when in the closed position, said latch and lock mechanism receiving a series of mechanical inputs;

a power drive mechanism connected to provide an input to the latch and lock mechanism to either lock or unlock said mechanism, said power drive mechanism including a linear motor having an armature including a shaft which is connected to the latch and lock mechanism, said shaft being driven by the linear motor between the locked and unlocked positions of the mechanism; and

said linear motor further comprising a plurality of windings electrically connected in series, a stack formed from a plurality of winding portions positioned to secure the windings of the linear motor, each portion defining a winding receiving segment in which one of said windings may be positioned, a central opening through which the armature may reciprocate, means mounted to each end of the stack of winding portions for securing the armature for sliding motion relative to the stack, said sliding motion relative to said stack being caused by energization of the linear motor windings effecting displacement of the armature in a direction controlled by the polarity of the current flowing through the windings, said armature being connected to the latch and lock mechanism to either lock or unlock said mechanism.

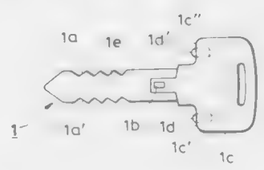


4,858,453

CAR ANTI-THEFT DEVICE

Hirotoshi Namazue, Fujisawa, Japan, assignor to Kokusan Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 939,803, Dec. 9, 1986, abandoned. This application Aug. 5, 1988, Ser. No. 228,879
Int. Cl.[4] E05B *49/00*
U.S. Cl. 70—278 1 Claim



1. Anti-theft device for automotive vehicles, comprising:

a key unit having a body including identical opposite side edge serrations,

a pair of electrical contacts mounted opposite to each other on two side surfaces of said body and insulated from said body,

an illuminator control circuit mounted on said body for delivery of a signal corresponding to a specifically preset code signal upon energization of either of said electrical contacts, said illuminator control circuit including a polarity converter electrically connected to said electrical contacts for preventing a supply of a reverse polarity current, a control circuit electrically connected to said polarity converter and a memory connected to said control circuit for a correct polarity energization of said control circuit to transmit said preset code signal stored in said memory,

a pair of illuminator elements arranged on said key unit in a laterally opposite position to each other and electrically connected to said illuminator control circuit for transmission of said preset code signal, and

a cylinder lock unit mechanically movable by engagement with said edge serrations when said side edge serrations are arranged in a predetermined pattern, said cylinder lock unit having

a key-reception slot,

an opposite pair of terminals projecting partially into said

slot and each establishing an electrical contact with either of said electrical contacts, respectively, when said key unit has been inserted into said slot and energizing said illuminator control circuit when said cylinder lock unit has been moved to an ON-position by said key unit,

a light-reception element mounted on said lock unit for reception of light from either of said illuminator elements,

comparator means for adjudging a coincidence between a signal received by said light-reception elements from one of said illuminator elements and a predetermined signal,

first means energized by a coincidence of signals by said comparator means for making a vehicle controller operate,

second means energized by a lack of coincidence of said signals by said comparator means for activing an alarm.

4,858,454

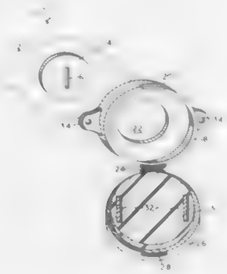
DOOR LOCK PROTECTING DEVICE

Frederick J. McAnulty, III, 114 Furbush Rd., West Roxbury, Mass. 02132

Continuation-in-part of Ser. No. 851,802, Apr. 14, 1986, abandoned, which is a continuation of Ser. No. 576,210, Feb. 2, 1984, abandoned. This application Jan. 21, 1988, Ser. No. 147,111

Int. Cl.[4] E05B *17/18*

U.S. Cl. 70—455 **10 Claims**



1. A lock protecting system to prevent the exposure of a lock to moisture and foreign material, which lock protecting system comprises in combination:

(a) a lock secured to a surface, the lock having a lock entrance opening subject to exposure to moisture and foreign matter; and

(b) a lock protecting apparatus which comprises:

(i) a base characterized by an opening therein to fit about said lock;

(ii) means to secure the base to said surface so that the lock opening is located within the said opening of the base;

(iii) a cover;

(iv) means to secure the cover to the base so to permit the cover to move between a closed position where the lock and the lock opening are protected, and an open position where the lock may be used;

(v) a resilient, compressible, moisture-resistant material, which compressible material is placed in a compressive sealing relationship against the exterior surface of the said lock and over the said lock opening when the cover is in a closed position to protect the lock from moisture and foreign matter; and

(vi) a permanent magnet means positioned within the resilient material to maintain by magnetic force the resilient material in said compressive sealing relationship, when the cover is in a closed position.

4,858,455

LOCK CORE

Wen Tai Kuo, Tainan, Taiwan, assignor to Ming Tay Hardware Ind. Co., Ltd., Taiwan

Filed Feb. 11, 1988, Ser. No. 159,406

Int. Cl.[4] E05B *27/08*

U.S. Cl. 70—491 **4 Claims**



1. A lock comprising:

a cylindrical casing having a key hole opening and plural internal steps at one end thereof of progressively larger diameter than the key hole opening in a direction away from the key hole, and a recess at said opening;

a spindle having an upper plug followers stand at a top third portion thereof, said stand formed with through bores and a plug chamber and an outer ring surface at an upper end thereof;

a lower plug followers stand having plural blind bores;

plural upper plug followers of different length respectively received in said through bores of said upper plug followers stand;

plural lower plug followers of the same length respectively received in said blind bores of said lower plug followers stand;

plural helical compression springs respectively received in said blind bores of said lower plug followers stand to urge portions of said upper plug followers into said plug chamber, said upper plug followers and outer ring surface and lower plug followers stand received against said integral steps, respectively; and

a pair of protuberances integrally formed on an upper end of said outer ring of said spindle, wherein when a valid key is inserted into the key hole, a tenon of said key engages between said protuberances and by rotating the key, the tenon will abut a protuberance and the spindle will rotate simultaneously in an unlocking direction.

4,858,456

RESETTABLE AXIAL TUMBLER LOCK

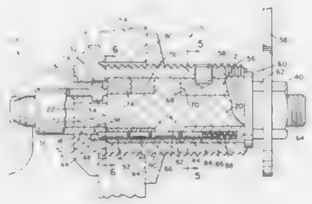
Rodney M. McGee, Sr., Rte. 4, Box 703, Lincolnton, N.C. 28092

Filed Apr. 6, 1988, Ser. No. 178,428

Int. Cl.[4] B05B *27/08*

U.S. Cl. 70—491 **13 Claims**

1. In an axial pin tumbler lock having a housing including an annular key opening at one end and a locking member at the other end, a cylindrical inner member rotatably carried within the housing and having a plurality of axially extending tumbler bores each having a plurality of cylindrical tumbler pins therein, the pins having respective axial lengths so that upon insertion into the key opening of a tubular operating key, respective tumblers are axially shifted within the tumbler bores so that interfaces between one pair of tumbler pins in each bore lie ina single plane transverse to the housing axis to permit the cylindrical inner member to be rotated relative to the housing and permit the locking member to be moved from a locking position to an unlocking position, the improvement comprising: first and second annular sleeves carried on and rotatable relative to the cylindrical inner member and rotatable relative to each other, each annular sleeve including a plurality of axially aligned tumbler bores equal in number to the number of tumbler bores in the cylindrical inner member and having their



axes disposed in a circular array coaxial with the housing axis, the bores of each of the annular sleeves being axially aligned with corresponding tumbler bores in the inner cylindrical member, wherein the sleeves are in end-to-end contact to define a first tumbler reset plane and wherein one sleeve is in abutting contact with the inner cylindrical member to define a second tumbler reset plane.

4,858,457

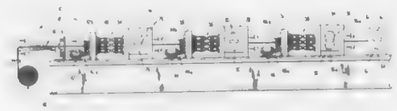
MACHINE AND METHOD FOR MAKING CONCRETE REINFORCING BARS

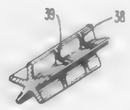
Frank R. Potucek, 612 48th St. Court W., Palmetto, Fla. 34221

Filed May 12, 1988, Ser. No. 192,990

Int. Cl.[4] B21H *8/02*

U.S. Cl. 72—187 **43 Claims**





1. A machine for making rebars, comprising:

a supply of wire stock having a substantially round cross section;

a preform roller station including a plurality of preform roller members having annular edges;

means for feeding a continuous length of said wire stock from said supply to said preform roller station;

said plurality of preform roller members being equidistantly and circumferentially spaced relative to a path of travel of said wire stock;

said plurality of preform roller members imparting a generally polygonal cross section to said wire stock;

a first form roller station longitudinally spaced apart from said preform roller station;

said first form roller station including a first plurality of form roller members having convex annular edges;

said first plurality of form roller members being equidistantly and circumferentially spaced relative to a path of travel of said wire stock;

said first plurality of form roller members forming said wire stock into a wire stock having a central core and a plurality of equidistantly spaced, tapered fin members radiating therefrom;

each of said fin members having a rounded terminus, and said fin members having a common dimension and configuration;

the diameter of said central core being about one-third the diameter of an imaginary circle coincident with radially outermost edges of said fin members;

a plurality of elongate, circumferentially spaced bight regions formed along the extent of said wire stock, there being as many bight regions as there are form rollers in said first plurality of form roller members;

a second form roller station longitudinally spaced apart from said first form roller station;

said second form roller station including a second plurality of form roller members having convex annular edges;

said second plurality of form roller members being equidistantly and circumferentially spaced relative to a path of travel of said wire stock;

said second plurality of form roller members further forming said wire stock by further reducing the diameter of said central core, further reducing the amount of taper of said fin members, and further lengthening the radial dimension of said fin members relative to the core diameter, taper, and fin length imparted to said wire stock by said first plurality of form roller members;

a plurality of transversely disposed notch members formed on the convex annular edges of each of said second plurality of roller members;

said notch members being equidistantly and circumferentially spaced about the respective annular edges of said second plurality of form roller members; and

a plurality of transversely disposed, longitudinally spaced, raised shoulder members being formed along the extent of said wire stock by said notch members;

each of said raised shoulder members extending across its associated bight region.

4,858,458

DRIVE FOR A PILGER COLD-ROLLING MILL WITH BALANCING OF MASSES AND MOMENTS

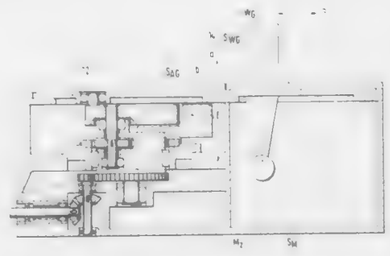
Josef Gerretz, Viersen, and Antonio Hurtado, Duisburg, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 23, 1988, Ser. No. 159,191

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1987, 3706129

Int. Cl.[4] B21B *21/00*

U.S. Cl. 72—214 **20 Claims**



1. A drive for a pilger cold-rolling mill with a mass and a torque balancing comprising

a driven crank rotating around a vertical axis;

a guide;

a roller frame guided horizontally in the guide;

a coupler connecting the driven crank with the roller frame where the coupler assumes, with its full mass, the balanc-

ing of momentum and where the crank assumes, with its full mass, the balancing of the masses;

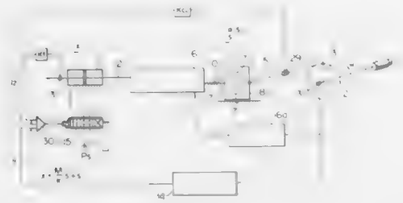
an additional mass having a center of mass (S_M) and subject-able to a reciprocating motion synchronous and parallel to the roller frame and where the center of mass (S_M) of the additional mass is disposed lower than a virtual engagement point (S_{AG}) of the centrifugal force of the crank balancing mass (MA), where a product of the force of inertia for accelerating the additional mass (M_z) and a vertical distance (b) between the center of mass (S_M) of the additional mass (M_z) and the virtual engagement point (S_{AG}) of the centrifugal force of the mass (MA) corresponds to the mass moment to be balanced and is about equal to the product of the force of inertia engaging at a roller frame center of gravity (S_{AG}) and the vertical distance (a) of the roller frame center to the engagement point (S_{AG}) of the centrifugal force of the mass (MA), wherein the additional mass (M_z) is provided immediately below the roller frame (W_G) and where the roller frame (W_G) is disposed on a slider extended in the direction of motion.

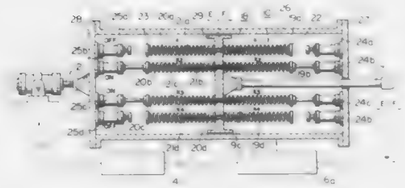
4,858,459

INERTIA FORCE BALANCING APPARATUS

Munehara Takahashi, Nihama, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Jul. 29, 1987, Ser. No. 78,937
Claims priority, application Japan, Apr. 10, 1986, 61-81077
Int. Cl.[4] B21B *21/00*
U.S. Cl. 72—214 **3 Claims**





1. An inertia force balancing apparatus for a machine having a heavy object supported for horizontal reciprocating movement and a drive device for imparting reciprocating movement to said heavy object by converting rotational motion provided by a prime mover into reciprocating motion, said apparatus comprising:

spring means comprising a plurality of coil springs arranged in parallel and supported on a common member, said spring means including means for setting each of said coil springs in an operative condition,

means connecting said common support to said heavy object to enable said spring means to balance the inertia force of the reciprocating movement of said heavy object,

means for detecting the rotational speed of said drive device and for emitting a signal indicative of said rotational speed,

a control device for controlling said means for setting each of said coil springs in an operative condition in response to said signal indicative of said rotational speed, and

means for altering the position of said spring means relative to said heavy object including a hydraulic cylinder and a piston connected to said spring means and a servo valve responsive to said rotational speed of said drive device for supplying fluid pressure to said hydraulic cylinder to position said spring means relative to said heavy object, whereby said control device is operative to change the combination of said coil springs set in operation and thereby alter the spring constant of said spring means in response to the rotational speed of said drive device and said means for altering the position of said spring means is operative to control the position of said spring means relative to said heavy object in response to the rotational speed of said drive device.

4,858,460

AIR DETECTOR FOR LIQUID-FILLED SENSING LINES

Gerald A. Schohl, Knoxville, and Svein Vigander, Norris, both of Tenn., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed Mar. 18, 1988, Ser. No. 169,917
Int. Cl.[4] G01N *7/00*
U.S. Cl. 73—19 **14 Claims**



1. A passive comparative standing wave frequency system eminently suitable for measuring and comparing the characteristics of a fluid static in or flowing through containment means, said containment means including first conduit means, and said measuring of characteristics including detecting inhomogeneities comprising air pockets, gas bubbles or both in said fluid within said first conduit means, said system comprising:

(a) void detection attachment means, said void detection attachment means comprising:

(1) second conduit means for containing a relatively small portion of fluid, said second conduit means operatively associated with said first conduit means;

(2) pressure response detecting means operatively associated with said second conduit means; and

(b) pressure response analyzer means coupled to receive the output from said pressure response detecting means, said pressure response analyzer means comprising:

(1) power spectrum indicative means for providing, over a predetermined frequency range, the distribution of the pressure fluctuations sensed by said pressure response detecting means, said pressure fluctuations effected in situ in said first conduit means by virtue of the background flow noise therein;

(2) storage means for the resulting distribution of said pressure fluctuations;

(3) retrieval means operatively associated with said storage means and with later mentioned standing wave frequency comparator means; and

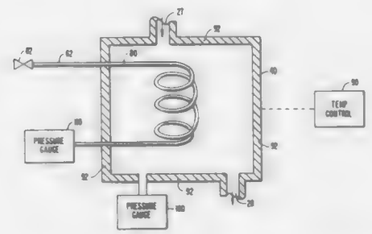
(4) standing wave frequency comparator means for effecting a comparison between the frequency distribution of said pressure fluctuations with previously stored frequency distributions, said previously stored frequency distributions subsequently retrieved from said storage means by said retrieval means, and said standing wave frequency comparator means thereby operable to detect a change in the quantitative value of inhomogeneities in said fluid within said first conduit means.

4,858,461

PERMEATION CELL GAS DETECTOR

Shelton Steinle, Richmond, Calif.; John P. Sturtz, Hudson, Ohio; Yogeshwar Dayal, and Lealon C. Wimpee, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Sep. 29, 1987, Ser. No. 102,441
Int. Cl.[4] G01N *31/00*
U.S. Cl. 73—23 **9 Claims**



1. Apparatus for receiving a sample gas and measuring the percentages of various known number (N) and kind of gas species present within said sampling comprising:

a plurality of chambers, each chamber configured to receive and confine sample gas;

each chamber further including a discrete permeation cell having an internal volume isolated from the chamber by a permeable membrane;

each chamber including a pressure sensor for measuring the pressure within the permeation cell resulting from gases permeating through the permeable membrane;

a sensor for measuring the pressure of the gas sample surrounding the permeation cell;

means for evacuating the permeation cells; and means for measuring the pressure buildup within said cells; said apparatus including a plurality of said chambers including at least (N-1) chambers;

means for maintaining each chamber at a discrete temperature, said temperature for each chamber different than the temperature of all other chambers.

4,858,462

ACOUSTIC EMISSION LEAK SOURCE LOCATION

John E. Coulter; Robert S. Evans, both of Lynchburg, and Michael O. Robertson, Hurt, all of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

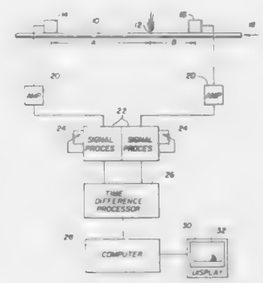
Filed Jan. 20, 1989, Ser. No. 300,408
Int. Cl.[4] G01M *3/24*
U.S. Cl. 73—40.5 A **5 Claims**

1. A method of locating a leak which produces a continuous acoustic emission having background noise and spikes, comprising:

continuously monitoring acoustic emissions from at least two spaced locations using detectors at the spaced locations to form at least two continuous signals having background noise and spikes corresponding to the background noise and spikes of the acoustic emission, the spikes in the signals of the detectors being offset from each other in time by an amount corresponding to the difference in travel time for an acoustic emission to each of the spaced locations;

adjusting a detection threshold value for each detector to remove the background noise from the spikes in each signal, the detection threshold value being adjusted in a floating manner so as to correspond to an average level for the signals; and

measuring the offset in time between the spikes of the signals, in real time, to determine the relative position of the acoustic emissions with respect to the spaced locations.



4,858,463

PROCESS AND APPARATUS FOR DETECTING LEAKS IN SEALED PACKAGES

Meinrad Rossé, la Tour-de-Peilz, and Marc-Henri Rossier, Epalinges, both of Switzerland, assignors to Nestec S. A., Vevey, Switzerland

Continuation of Ser. No. 20,541, Mar. 3, 1987, abandoned. This application Sep. 26, 1988, Ser. No. 249,239
Claims priority, application European Pat. Off., Mar. 22, 1986, 86103958.4
Int. Cl.[4] G01M *3/26*
U.S. Cl. 73—49.3 **8 Claims**



1. A process for detecting leaks in sealed packages in a leak detection system comprising:

establishing a predetermined pressure in a first system section which includes two first system section pressure reservoirs of differing volumes connected in parallel to a first conduit in common with each reservoir and which includes a first system section pressure measuring cell for measuring a pressure of the first system section;

isolating the pressure of the smaller reservoir from the pressure of the larger reservoir;

placing the pressure of the smaller reservoir in communication, via the first conduit, with a second system section, which includes a sealed measuring chamber for containing a sealed package to be detected for leaks, for establishing

a pressure for a combination of the smaller reservoir and measuring chamber;

isolating the pressure of the measuring chamber from the pressure of the smaller reservoir and then placing the pressure of the smaller reservoir in communication with the pressure of the larger reservoir for establishing a pressure in a combination of the smaller and larger reservoirs;

measuring for a time sufficient, by means of a differential pressure cell positioned in a second conduit which is connected in parallel to the first conduit and being in communication with the measuring chamber and with the combination of the smaller and larger reservoirs, pressure in the measuring chamber relative to the pressure of the combination of reservoirs for detecting changes in pressure in the measuring chamber; and

relating, via a control unit, changes in pressure measured by the differential pressure cell with a reference pressure and predetermined values for detecting leaks in a sealed package in the measuring chamber.

4,858,464

PORTABLE PIPE TESTING APPARATUS

James J. Miller, and Robert C. Valentine, both of 25334 Oakhurst Dr., Spring, Tex. 77386

Filed Aug. 30, 1988, Ser. No. 238,570
Int. Cl.[4] G01M *3/08*
U.S. Cl. 73—49.5 20 Claims



1. A joint testing apparatus comprising:

(a) joint hydrostatic pressure testing means sealing at the two ends of a joint to be tested wherein the joint is filled with an incompressible liquid for pressure testing;

(b) an elongate frame for supporting said joint testing means and the joint being tested thereon;

(c) means for dividing said frame into relatively movable portions wherein the portions are joined to form the full length of the frame and are selectively moved for assembly in a shorter structure;

(d) wheels for supporting said shorter structure to enable said structure to be rolled over a surface; and

(e) means for connecting said shorter structure to a towing vehicle wherein the vehicle pulls said structure on said wheels, and wherein said frame has a pipe joint length side loading slot therein for receiving a joint to be tested.

4,858,465

WATER WASHABLE CONTAMINANT DETECTION AND LABELING COMPOSITIONS AND METHOD FOR UTILIZING SAME

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 21, 1988, Ser. No. 209,387
Int. Cl.[4] G01N *21/91*
U.S. Cl. 73—104 15 Claims

1. A method for detecting and visually locating surface contaminants on an object which comprises:

(1) applying to the surface of an object having a contaminant thereon, an aqueous contaminant locating composition which detects and indicates the presence of a contaminant on the surface of an object;

(2) removing excess contaminant locating composition from the surface of the object;

(3) applying an aqueous contaminant-identifier fluorescent developer onto the surface at the indicated contaminant;

(4) transferring by migration dye molecules to and associating same with the contaminant causing the contaminant to fluoresce;

(5) removing excess developer from the surface of the object; and

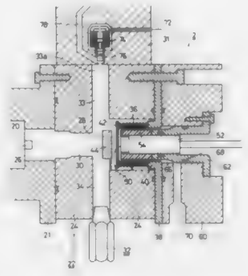
(6) viewing the surface of the object under lighting conditions to visually locate said surface contaminant.

4,858,466

MEASURING APPARATUS OF VOLUME OF AN INJECTED FLUID

Takeshi Takahashi, Mishima; Naoyuki Tsuzuki, Susono; Yukimitsu Omori, Kawasaki, and Akio Takamura, Yokohama, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Ono Sokki Co., Ltd., Tokyo, both of, Japan

Filed May 13, 1988, Ser. No. 193,531
Claims priority, application Japan, May 15, 1987, 62-119197
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—119 A 12 Claims



1. Apparatus for measuring the volume of a fluid injected by an injection valve being tested comprising:

an injection chamber which is filled with fluid the same as that to be injected therein by an injection valve, said filling fluid having a predetermined pressure and the valve being mountable to inject the fluid to be measured into said chamber;

a back pressure chamber which is filled with a gas having the same predetermined pressure as that of said filling fluid;

a movable member partitioning said chambers one from the other and which member moves a distance corresponding to an increment of volume of said injection chamber due to an injection of fluid thereinto from the injection valve;

means of a non-contact type for measuring the displacement of said member due to an injection; and

means for discharging a volume of fluid from said injection chamber and for controlling the volume of the discharge to maintain said member in a predetermined zone during injection and non-injection by the injection valve.

4,858,467

GAUGER FOR CARS

Hsi K. Weng, NO. 35, Sec. 4, Lu Kang, Chang Huah, Taiwan

Filed Jul. 29, 1988, Ser. No. 225,919
Int. Cl.[4] B60C *23/02*; G01L *7/16*
U.S. Cl. 73—146.8 5 Claims

1. A gauger for a car comprising:

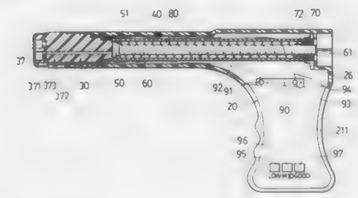
a housing having a tubular receiving room having a first opening and a second opposite opening;

a gauge head secured to said first opening and having an air inlet and an axial projection capable of being urged against an air valve of said car for guiding an air pressure from said air valve to pass into said inlet;

a pressure-measuring plunger slidably received in said receiving room and having a first end and a second opposite end capable of protruding beyond said second opening;

a piston engaging with said first end and capable of being forced by said air pressure to protrude said second end beyond said second opening;

an elastic member mounted between said piston and said second opening and capable of returning said piston to rest against said gauge head when said projection is removed from said air valve;



two conductive members respectively mounted on said gauge head; and

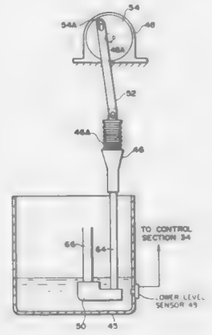
a circuit device electrically connected to said conductive members and capable of showing an electric power state of a battery of said car when said conductive members are respectively electrically connected to two electrodes of said battery.

4,858,468

METHOD OF DETECTING REMAINING QUANTITY OF REPLENISHING SOLUTION

Toshiro Tahara, and Mikio Takahashi, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 13, 1988, Ser. No. 205,699
Claims priority, application Japan, Jun. 17, 1987, 62-150402; Jun. 17, 1987, 62-150399
Int. Cl.[4] G01F *23/00*
U.S. Cl. 73—149 17 Claims



1. A method of detecting the quantity of replenishing solution remaining in a replenishing-solution tank in an automatic developing machine, which tank is adapted to supply a quantity of replenishing solution to a processing tank for processing a light sensitive material, wherein said quantity of replenishing solution supplied to said processing tank is calculated on the basis of the quantity of said light sensitive material processed, comprising the steps of:

(a) subtracting the quantity of replenishing solution supplied to said processing tank from a storage quantity representing the amount of replenishing solution stored in said replenishing-solution tank; and

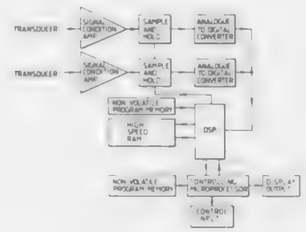
(b) detecting the value of said subtraction as the quantity of replenishing solution remaining in said replenishingsolution tank.

4,858,469

METHOD AND APPARATUS FOR TESTING TIMBERS FOR DISCONFORMITY OR DECAY

Henry Hosgood; Leslie Banks, both of Dorset, and William Beauford, Somerset, all of England, assignors to Bio-Kil Chemicals Limited, London, England

Filed Sep. 15, 1987, Ser. No. 97,219
Claims priority, application United Kingdom, Sep. 20, 1986, 8622731
Int. Cl.[4] G01H *13/00*; G01N *29/00, 29/04*
U.S. Cl. 73—579 7 Claims



1. A method for testing timber for disconformity or decay, which comprises:

inducing vibrations in the timber;

detecting by separate transducers and as to amplitude in the time domain at least the first half cycle of the surface vibrations and of the shear vibrations in the timer;

amplifying the transducer outputs;

processing the amplified outputs by a microprocessor connected to an indicator, said microprocessor being adapted to compare at least the portions of the amplified outputs corresponding to the said first half cycle and the indicator being adapted to indicate when a disconformity is detected between the compared outputs.

4,858,479

VIBRATION TRANSDUCER MOUNTING

Harry R. Kincaid, Johnstown, and Walter S. Riggs, Heath, both of Ohio, assignors to IRD Mechanalysis, Inc., Columbus, Ohio

Filed Mar. 23, 1988, Ser. No. 172,139
Int. Cl.[4] G01H *11/08*
U.S. Cl. 73—654 18 Claims



1. A vibration transducer asembly for mountable and demountable attachment with a vibratory surface comprising:

a mounting base having a contact surface for intimate engagement with said vibratory surface, a base peripheral wall, a vibration transfer surface spaced from said contact surface, and a base biasing connector component integrally formed at said base peripheral wall;

means for securing said mounting base contact surface into said intimate engagement with said vibratory surface;

a transducer base having an engaging surface configure for intimate contact in vibration transfer relationship with said mounting base vibration transfer surface, a peripheral transducer wall extending from said engaging surface, and a transducer biasing connector component integrally formed at said peripheral transducer wall;

transducer sensing means supported by said transducer base and having a signal communications cable extending therefrom;

biasing ring means having an external surface and inwardly disposed first and second engaging components respectively engageable with said transducer biasing connector component and said base biasing connector component, and constrictable to effect movement of said transducer engaging surface into compressive engagement against said mounting base vibration transfer surface; and

constricting means for effecting said constriction of said biasing ring means.

4,858,471

PRESSURE TRANSDUCER

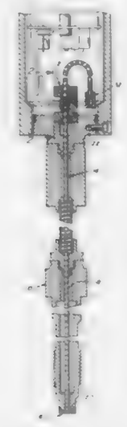
William Wareham, Marion, Mass., assignor to Dynisco, Inc., Norwood, Mass.

Continuation-in-part of Ser. No. 54,747, May 27, 1987, Pat. No. 4,819,487, which is a continuation-in-part of Ser. No. 54,936, May 27, 1987, Pat. No. 4,829,827, which is a continuation-in-part of Ser. No. 798,169, Nov. 14, 1985, Pat. No. 4,679,438, which is a continuation-in-part of Ser. No. 689,385, Jan. 7, 1985, Pat. No. 4,680,922. This application Apr. 25, 1988, Ser. No. 185,856

The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.

Int. Cl.[4] G01L *7/08, 9/04*

U.S. Cl. 73—706 **23 Claims**



1. A pressure transducer comprising;

an elongated frame having an elongated passage therethrough,

a capillary tube extending through the frame passage and terminating at one end adjacent one end of the frame,

a coupler at said one end of the frame and defining with the frame a chamber in communication with the capillary tube,

a sensing member disposed about the capillary tube at the other end of the frame and including means defining an annular sensing chamber in fluid communication with the capillary tube, and means defining a recess in the sensing member forming a relatively thin wall adjacent said annular sensing chamber,

a filler means disposed in said sensing chamber, said filler means comprising a single filler rod, and means for sensing pressure at said wall.

4,858,472

STRAIN MONITORING SYSTEM

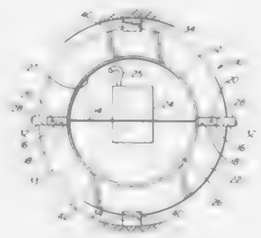
Gerhard H. Herget, 85 Country Lane, Kanata, Ontario, Canada K2L 1J4, and Franz Kapeller, 927 Weston Drive, Ottawa, Ontario, Canada K1G 1X1

Filed Aug. 25, 1988, Ser. No. 236,164

Claims priority, application Canada, Aug. 25, 1987, 545258

Int. Cl.[4] G01B *7/16*

U.S. Cl. 73—784 **10 Claims**



1. A vibrating wire sensing unit for a strain monitoring system, comprising:

a cylindrical proving ring having an axially extending bore;

a taut wire extending across the bore and being secured at its two ends to the proving ring;

means for mounting the proving ring within a bore hole, the mounting means comprising a pair of wedges having a predetermined taper angle and a pair of diametrically opposed complementary grooves for respectively receiving the wedges, the grooves extending along an outer surface of the proving ring parallel to the bore axis from one end of the proving ring to the other, the grooves each becoming progressively deeper from one end of the proving ring to the other end at a slope angle substantially identical to that of the wedges; and

electromagnetic transducer means contained in the bore, the transducer means being arranged to cause the wire to vibrate and to detect the frequency of vibration, which frequency is dependent upon movement transmitted to the proving ring via the wedges.

4,858,473

MINIATURE CLOSED-LOOP DYNAMIC UNIVERSAL MECHANICAL TESTING MACHINE

Robert A. Latour, Jr., Narberth, and Jonathan Black, King of Prussia, both of Pa., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Jun. 17, 1988, Ser. No. 208,747

Int. Cl.[4] G01N *3/00*

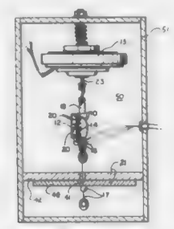
U.S. Cl. 73—805 **23 Claims**

1. An apparatus for mechanically testing a sample under relatively light loads comprising:

(a) solenoid actuator means for exerting an applied load force of up to about 200 grams upon said sample;

(b) load transducer means for converting said applied load force into a voltage feedback signal, said load transducer means being attachable to said sample; and

(c) closed-loop control means for regulating said applied load force by controlling said solenoid actuator means;



said regulating being, at least in part, responsive to said voltage feedback signal.

4,858,474

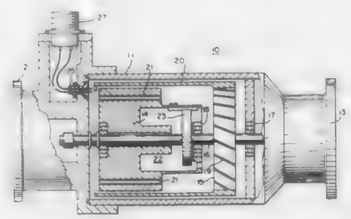
ANGULAR MOMENTUM MASS FLOWMETER WITH OPTICAL PICKOFF

William M. Glasheen, Derry, and Christopher R. Mayer, Windham, both of N.H., assignors to General Electric Co., Schenectady, N.Y.

Filed Dec. 30, 1987, Ser. No. 141,179

Int. Cl.[4] G01F *1/82*

U.S. Cl. 73—861.35 **4 Claims**



1. A mass rate flowmeter comprising in combination:

(a) a flowmeter housing for receiving a stream of fluid whose mass flow rate is to be measured;

(b) angularly restrained rotating turbine and impeller elements coaxially mounted within said housing, said turbine and impeller elements being subject to angular displacement in response to the mass rate of flow of the fluid through said housing;

(c) optical means fixedly located within said housing at a pickoff position for measuring said angular displacement between said turbine and impeller elements, said optical means including

(1) an input optic fiber for directing an incident beam of radiant energy at a surface of one of said turbine and impeller elements, and

(2) an output optic fiber for receiving radiant energy reflected from said element surface; and

(d) radiant energy beam interrupting means including

(1) a single first reference point carried by said element surface for momentarily deflecting the reflected radiant energy from said output optic fiber during movement past said pickoff position with each revolution of said element surface, and

(2) a single second reference point carried by the other of said impeller and turbine elements for momentarily blocking said incident radiant energy beam during movement past said pickoff position with each revolution of said other element,

(3) whereby the time interval between the moments of movements of said first reference point and said second reference point past said pickoff position during each revolution of said impeller and turbine elements indicates said angular displacement.

4,858,475

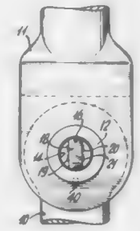
APPARATUS AND METHOD FOR MEASURING STRAIN

Walter E. Jacobson, Meriden; Donald J. Summers, Northford; Kenneth Vining, Branford, and Frederick E. Jackson, Wethersfield, all of Conn., assignors to Revere Corporation of America, Wallingford, Conn.

Filed May 26, 1987, Ser. No. 54,021

Int. Cl.[4] G01L *1/22, 5/13*

U.S. Cl. 73—862.54 **11 Claims**



2. Apparatus for measuring strain in a structure, including, in combination,

(a) a pin adapted to constitute an element of the structure and to be subjected to the strain to be measured, said pin having a generally cylindrical axial bore opening through one end of the pin;

(b) at least two strain gage elements; and

(c) a plug for mounting said strain gage elements within the bore, said plug being inserted endwise into the bore with an interference fit and having two opposed parallel flat side surfaces, on which said strain gage elements are mounted, each of said flat side surfaces having at least one of said strain gage elements mounted thereon, and both of said flat side surfaces being shaped and disposed to enable said strain gage elements to enter the bore with clearance when the plug is introduced into the bore, said plug having opposed longitudinally grooved cylindrical end portions dimensioned for interference fit with said bore and a central portion of rectangular cross section extending between said end portions.

4,858,476

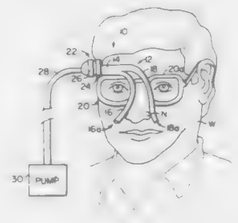
BREATHING ZONE AIR SAMPLER

John Tobin, Bethel Park, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 25, 1988, Ser. No. 147,823

Int. Cl.[4] G01N *1/24, 1/26*

U.S. Cl. 73—863.23 **2 Claims**



1. A sampling apparatus comprising sampling means for

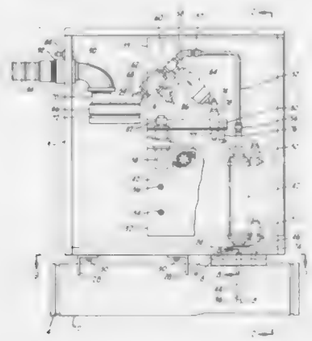
sampling air in the breathing zone of a wearer of the apparatus and support means for said sampling means comprising a pair of eyeglasses including a frame; said sampling means comprising a sampling tube supported on the frame of said eyeglasses and including a main body portion and a pair of sample transport tubes connected to said main portion and suspended, in use, therefrom centrally of said frame so as to be disposed on opposite sides of the nose of the wearer in close proximity but spaced therefrom so that a representative sample of air breathed by the wearer can be taken without obstructing the flow of air into the nostrils of the wearer, said transport tubes each including an inlet therein which, in use, is disposed adjacent to a respective nostil of the nose of the wearer; a filter holder connected to said main body portion of said sample tube; a filter removably mounted in said filter holder for filtering out particulate material in the air sampled by the apparatus; and means for connecting the sampling apparatus to a pump for drawing air into the apparatus through said inlets so that the air passes through said filter.

4,858,477

DRY MATERIALS SAMPLE COLLECTOR IMPROVEMENTS

Dennis A. Wienck, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 24, 1988, Ser. No. 211,315
Int. Cl.[4] G01N *1/20*
U.S. Cl. 73—863.54 **22 Claims**



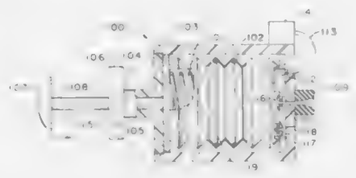
1. An apparatus for sampling bulk material flowing through a conduit, comprising:
sampler means for receiving a sample of said bulk material;
holding means for storing said material sample;
drive cylinder means for inserting and retracting said sampler means into and out of a flow path of said bulk material,
said drive cylinder means including a hollow piston rod directly connectable to said sampler means, the hollowed out portion of the piston rod thereby providing a flow passageway for said material sample; and
control means for varying a frequency at which said sampler means is inserted into the flow path of said bulk material.

4,858,478

BELLOWS TYPE HAND-OPERATED AIR SAMPLING PUMP

Robert S. Kush, Turtle Creek, and Clayton J. Bossart, Monroeville, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Aug. 16, 1988, Ser. No. 232,659
Int. Cl.[4] G01N *1/14*
U.S. Cl. 73—864.35 **3 Claims**



1. A sampling pump comprising:
a. a bellows having a flexible airtight sleeve that encompasses a return spring and a plurality of rigid concentric stabilization rings and having a first and second opening at a first end;
b. a rigid frame positioned around the outer perimeter of said bellows, having a hollow sleeve at one end adapted to receive and position a plunger rod while permitting movement of said rod therethrough, a handgrip means extending from said sleeve to enable the pump to be held and said plunger rod to be moved with one hand;
c. a compression plate attached to a second end of said bellows that is rigidly attached to said plunger rod at the center of said plate;
d. a retaining means suitable for receiving and retaining a colorimetric detector tube positioned at said first bellows opening;
e. a check valve positioned to permit air flow into said bellows through said first opening of said bellows while preventing air flow out of said bellows; and,
f. a second check valve positioned to permit air flow out of said second opening of said bellows while preventing air flow into said bellows.

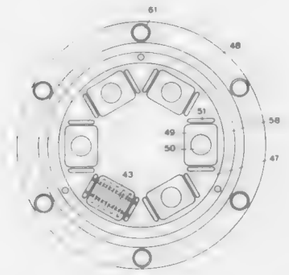
4,858,479

METHODS AND MEANS FOR USE IN EXAMINING THE QUALITY OF PLATED-THROUGH HOLES IN CIRCUIT BOARDS

Jørgen T. Voss, Charlottenlund, and Asger P. Christensen, Herlev, both of Denmark, assignors to Struers A/S, Rødovre, Denmark

Filed Dec. 21, 1987, Ser. No. 135,455
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—865.9 **8 Claims**

1. A method for use in examining the quality of plated-through holes in circuit boards, comprising the steps of
(a) providing a plurality of coupons, each including a row of holes to be examined and which define a common diametrical plane, and two reference holes which define a common diametrical plane, the common diametrical plane of the reference holes being located at a predetermined accurate distance from the common diametrical plane of the row of holes to be examined,
(b) mounting said coupons in a spaced side-by-side array on two hardened steel pins by pressing said pins through the reference holes of said coupons with a tight fit in such a manner that end portions of said pins extend beyond the outer surfaces of the outermost ones of the coupons of said array,
(c) molding said mounted array of coupons into a block of a curable plastic molding material in such a manner that the rows of holes to be examined are located on one side of said pins, that the array of coupons is embedded in the molding material, and an integrated shank portion is formed by the molding material on the other side of said pins, and that at least the peripheral surface areas of the extending end portions of the pins remote from the rows of holes to be examined are kept free from molding material,
(d) mounting said block, together with other similar blocks, in a sample holder having a front face in such a manner that the shank portions are received in pockets of said sample holder and said peripheral surface areas of said extending end portions of said pins are urged against hardened surface portions provided on the front face of said sample holder, and
(e) subjecting the ends of said blocks protruding from the front face of said sample holder and comprising said array of coupons to abrasive means so as to remove material up to a distance from said hardened surface portions provided on the front face of said sample holder exactly equal to the radius of said pins plus the originally provided distance between the diametrical planes of the holes to be examined and the reference holes, respectively.

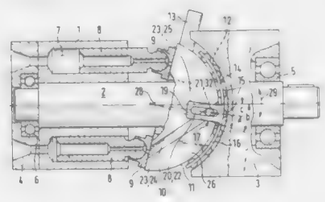


4,858,480

SWASH PLATE SWIVEL BEARING FOR A HYDRAULIC AXIAL PISTON MACHINE

Rolf Rohde, Elchingen, and Gunter Ritter, Nersingen, both of Fed. Rep. of Germany, assignors to Hydromatic GmbH, Elchingen, Fed. Rep. of Germany

Filed Nov. 4, 1985, Ser. No. 794,747
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1984, 3442391
Int. Cl.[4] F16H *23/00*; F04B *1/26*
U.S. Cl. 74—60 **15 Claims**



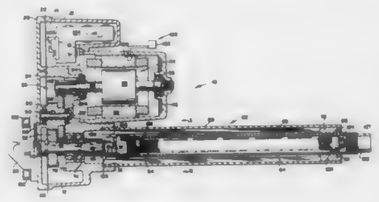
1. An axial piston machine, comprising:
a housing;
a drum supported by the housing for rotation about a rotary axis, and defining a plurality of cylinder bores;
a plurality of pistons extending into the cylinder bores, and supported for rotary movement with the drum and reciprocating movement within the cylinder bores;
a shaft extending into the housing to rotate with the drum;
a swash plate connected to the pistons to transmit selectively rotary movement of the drum into reciprocating movement of the pistons, and reciprocating movement of the pistons into rotary movement of the drum, the swash plate defining a curved bearing surface and being supported by the housing for pivotal movement about a pivot axis;
the housing further including means defining a curved bearing surface located opposite the bearing surface of the swash plate to support the swash plate in the housing;
a plurality of bearing means located between the bearing surfaces of the swash plate and the housing to facilitate relative movement therebetween;
a cage holding the bearing means between said bearing surfaces;
the swash plate formed with a first groove extending away from the bearing surface thereof;
the housing formed with a second groove crossing past the first groove, the first and second grooves forming a recess spaced from the bearing surfaces and moving toward and away from the bearing surfaces as the swash plate pivots about the pivot axis;
a carrier connected to the cage and extending therefrom and between the first and second grooves; and
a guide ball closely held in the recess, against both the swash plate and the housing, and moving with the recess as the swash plate pivots, the guide ball engaging the carrier and moving the carrier, the cage and the bearing means as the swash plate pivots about the pivot axis.

4,858,481

POSITION CONTROLLED LINEAR ACTUATOR

William F. Abraham, Lancaster, N.Y., assignor to Brunswick Valve & Control, Inc., Houston, Tex.

Continuation of Ser. No. 69,534, Jul. 1, 1987, abandoned, which is a continuation of Ser. No. 733,633, May 13, 1985, Pat. No. 4,712,441. This application May 9, 1988, Ser. No. 192,032
Int. Cl.[4] F16H *25/20*; F16D *71/04*
U.S. Cl. 74—89.15 **20 Claims**



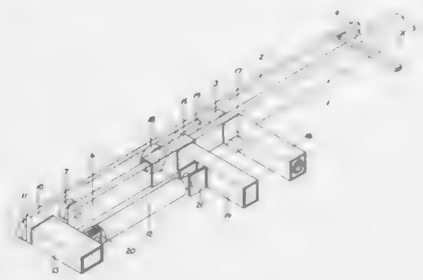
1. A linear actuator comprising:
a housing;
a drive screw rotatably supported within said housing;
a drive nut in threaded engagement with said drive screw;
a body tube assembly connected to said housing and positioned above said drive screw, said body tube assembly containing reaction surfaces for preventing rotation of said drive nut;
an extendable member having a load connecting member on its free end and having the opposite end thereof connected to said drive nut, said extendable member adapted for axial movement so as to extend out of said body tube;
drive means including an electric drive motor containing windings for rotating said drive screw; and
a limit switch assembly attached to said housing and adapted for operation by movement of said drive means, said switch assembly controlling operation of electrical power switches for disengaging said electric drive motor when said extendable member reaches predetermined positions, and said limit switch assembly containing a position indicating means, operated by said drive means through limit switch gear means rotated by said drive screw, and adapted for generating an electrical signal proportional to the position of said extendable member.

4,858,482

SCISSOR MECHANISM IN PARTICULAR FOR LIFT TABLES

Erik Knudsen, Hovedgaden 79, Brovst, Denmark (DK-9460)

Filed Mar. 11, 1988, Ser. No. 167,293
Int. Cl.[4] F16H *21/44;* B66F *3/22*
U.S. Cl. 74—110 4 Claims



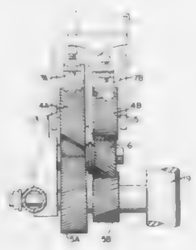
1. In a scissor mechanism for lift tables having two scissor arms which are pivotably journalled in a common bearing and having a driving member which is coupled between an engagement element on one of said scissor arms and an engagement element on the other of said scissor arms, said engagement elements being offset from the common bearing such that the angle between the scissor arms may be changed, as long as the scissor arms are not parallel to one another, by changing the length of the driving member, and wherein the engagement element on a first one of the scissor arms may be displaced along the arm and is connected to a two segment wedge mechanism located between the scissor arms, said wedge mechanism comprising a pressure wedge and a pressure roller, and wherein one of the segments of the wedge mechanism is connected to the displaceable engagement element and the other segment of the wedge mechanism is fixedly mounted on the other scissor arm such that the scissor arms, when parallel to one another, may be swung out of a parallel relationship by means of wedging action in the wedge mechanism created by displacing the displaceable engagement element, the improvement comprising the displaceable engagement element comprising a displaceable sleeve which surrounds the first scissor arm and is connected with the driving member by a pivotable link.

4,858,483

LEVER ACTION WHEELCHAIR

John Blakemore, 1143 S. Taylor St., Oak Park, Ill. 60304

Filed Jan. 26, 1989, Ser. No. 301,855
Int. Cl.[4] F16H *27/02, 31/00*
U.S. Cl. 74—143 4 Claims



1. An improved torque convertor comprising:

(a) frame means having first shaft means rotatably carrying first and second spaced helical gears and second shaft means rotatably carrying first and second carrier cage means; said first and second shaft means being substantially parallel to one another;

(b) said first carrier cage means carrying a first rotatable worm gear engageable with said first helical gear in different orientations thereof and said second carrier cage means carrying a second rotatable worm gear engageable with said second helical gear in different orientations thereof;

(c) cam means mounted on said frame means for rotation in a direction substantially normal to the direction of rotation of said first and second carrier cage means, said cam means having cam surfaces engageable with said first and second carrier cage means, said cam means having a first neutral position wherein said cam surfaces maintain said first and second carrier cage means in alignment with one another, a second position wherein said cam surfaces engage said first and second carrier cage means moving said first carrier cage means in a clockwise direction and said second carrier cage means in a counterclockwise direction, and a third position wherein said cam surfaces engage the first and second carrier cage means moving said first carrier cage means in a counterclockwise direction and said second carrier cage means in a clockwise direction;

(d) handle means connected to said cam means for controlling rotations thereof as well as pivoting of said frame means;

(e) a first driven gear enmeshed with said first helical gear and fixed to a driven shaft; and

(f) a second driver gear drivingly connected to said second helical gear via an idler gear, said second driver gear being fixed to said driven shaft;

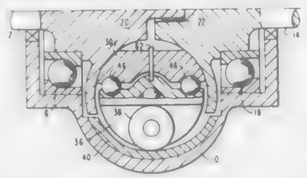
(g) whereby pivoting of said frame consecutively in first and second directions with said cam means in said second position rotates said driven shaft in a first direction, and pivoting of said frame consecutively in said first and second directions with said cam means in said third position rotates said driven shaft in a second opposite direction.

4,858,484

INFINITELY VARIABLE TRACTION ROLLER TRANSMISSION

Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Oct. 26, 1987, Ser. No. 112,392
Int. Cl.[4] F16H *15/08*
U.S. Cl. 74—200 9 Claims



1. An infinitely variable traction roller transmission comprising: a housing; coaxial input and output shafts rotatably supported in said housing; two toric traction discs supported opposite one another, one by said input and the other by said output shaft, said toric discs having opposite toric traction surfaces defining therebetween a toric cavity of circular cross-section; at least two motion transmitting traction rollers arranged in said toric cavity in radial symmetry and in engagement with said toric discs for the transmission of motion therebetween, each of said traction rollers being rotatably supported in said housing by a pivot trunnion adapted to pivot about an axis which is tangential to a center circle of said toric cavity,

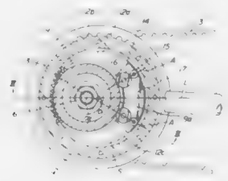
each of said pivot trunnions having a pair of axially spaced support rollers rotatably mounted thereon one each at opposite sides of the traction roller on each trunnion and said housing having partial circular tracks arranged adjacent said pivot trunnions and supporting said support rollers so as to force the traction rollers on said pivot trunnions into force transmitting engagement with said toric discs.

4,858,485

INSCRIBED TRANSMISSION DEVICE

Kunitoshi Kozakae, and Toru Takeda, both of Ageo, Japan, assignors to Bridgestone Cycle Co., Ltd., Tokyo, Japan

Filed Aug. 1, 1988, Ser. No. 226,870
Claims priority, application Japan, Aug. 27, 1987, 62-211366
Int. Cl.[4] F16H *1/48*
U.S. Cl. 74—399 6 Claims



1. An inscribed transmission device including a substantially crescent-shaped space between an internal gear and an external gear circumscribingly in mesh with each other, comprising a rolling space holder having two sets of two rollers whose centers are situated on radial axes in the crescent-shaped space on both sides of a straight line connecting centers of the internal and external gears, said rollers rolling on roller rolling portions provided on said internal and external gears.

4,858,486

ROTARY ACTUATOR WITH BACKLASH ELIMINATION

Paul P. Weyer, 1462 Blake St., Enumclaw, Wash. 98022

Division of Ser. No. 692,293, Jan. 7, 1985, Pat. No. 4,683,767, Continuation-in-part of Ser. No. 575,228, Jan. 30, 1984, Pat. No. 4,590,816, and a continuation-in-part of Ser. No. 662,256, Oct. 17, 1984, Pat. No. 4,667,528. This application Jun. 15, 1987, Ser. No. 62,504
The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.
Int. Cl.[4] F16H *55/18;* F01B *3/00*
U.S. Cl. 74—409 53 Claims

1. A fluid-powered actuator, comprising:

a body;

a first member reciprocally mounted within said body;

a second member reciprocally mounted within said body coaxial with said first member, said first and second members being independently and adjustably rotatable or axially movable within at least a limited range relative to the other without producing axial or rotational movement, respectively, in an amount proportional thereto through at least a portion of said limited range prior to preloading of said first and second members for fluid-powered operation;

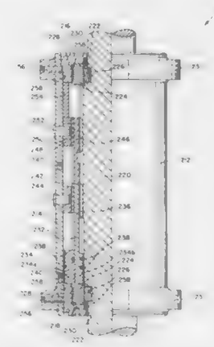
at least one piston reciprocally mounted within said body for application of fluid pressure to one or the other opposing sides thereof to produce axial movement of said piston, said piston operatively engaging at least one or the other of said first and second members to axially move said members in response to axial movement of said piston;

first torque-transmitting means for transmitting torque between said first member and said body;

second torque-transmitting means for transmitting torque between said first member and said rotatable member;

third torque-transmitting means for transmitting torque between said second member and said rotatable member;

fourth torque-transmitting means for transmitting torque between said second member and said body, at least said first and fourth torque-transmitting means or said second and third torque-transmitting means producing relative rotational movement between said body and said rotatable member in response to axial movement of said piston, and said first, second, third and fourth torque-transmitting means producing movement of said first and second members in unison and in the same axial direction with substantially equal axial travel in response to axial movement of said piston during fluid-powered operation; and



adjustment means for selectively and adjustably moving said first member in one or the other of a rotational or axial direction relative to said second member within said limited range by an amount sufficient to axially preload said first and second members equally with respect to said first, second, third and fourth torque-transmitting means with a desired force, and for maintaining axial preloading of said first and second members during fluid-powered operation once so adjusted for equalized preloading to substantially eliminate backlash in said first, second, third and fourth torque-transmitting means as said piston moves from one axial direction to the other to produce relative rotational movement between said body and said rotatable member in response to selective application of fluid pressure to said piston.

4,858,487

DEVICE FOR TRANSMISSION OF MOVEMENT BY AN OUTSIDE GEARING

Jacques Mercier, Paris, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jan. 20, 1988, Ser. No. 146,194
Claims priority, application France, Jan. 20, 1987, 8700558
Int. Cl.[4] F16H *1/08*
U.S. Cl. 74—424.7 7 Claims

1. A device for the transmission of movement between a pair of identical pinions, one of said pinions being mounted on each of two parallel rotational axes, each of said pinions having outside gearing, said outside gearing of said pinions being

mutually meshing and each comprising identical helixes, whereby the pinions rotate at the same velocity and in the same



direction, wherein the shape of said teeth in a plane perpendicular to axes of said pinion is an involute to a base circle.

4,858,488

LINK ARM SUSPENSION

Gary Butts, Huntington Beach, Calif., assignor to Ling Electronics, Inc., Anaheim, Calif.

Continuation of Ser. No. 859,609, May 5, 1986, abandoned. This application Oct. 26, 1987, Ser. No. 115,648
Int. Cl.[4] G05G *1/04*
U.S. Cl. 74—519 **11 Claims**



6. An apparatus Comprising two relatively reciprocating members and means to control the movement thereof along an axis of reciprocation, said means comprising:

a plurality of link arm means coupling said relatively reciprocating members and being arranged so that at least one of said plurality of link arm means is disposed in other than a diametrically opposed relationship with at least another one of said plurality of link arm means such that a lateral direction of said at least one of said plurality of link arm means is disposed in other than parallel relation with a lateral direction of said at least another one of said plurality of link arm means, each link arm means including,

a first support body having a first cylindrical bore disposed therein said lateral direction and a first opening to expose a portion of said first bore, said first support body also having means fixedly coupling it to one of said relatively reciprocating members; such that a lateral direction of said at least one of said plurality of link arm means is disposed in other than parallel relation with a lateral direction of said at least another one of said plurality of link arm means.

a second support body having a second cylindrical bore and a third cylindrical bore disposed therein in said lateral direction, such that all three of said bores are axially parallel in said lateral direction;

said second support body having a second opening to expose a portion of said second bore, said second opening facing in a direction opposite to that of said first opening;

said second support body having a third opening to expose a portion of said third bore, said third opening facing in a perpendicular direction to that of said first and second openings;

a first interconnecting member having an elongated intermediate straight section, having first and second ends wherein said first end is disposed within said first bore through said first opening and said second end is disposed within said second bore through said second opening, such that said first support body is rotatable about said first end;

a second interconnecting member having a proximate and a distal end, said proximate end disposed within said third bore through said third opening and said distal end fixedly coupled to the other relatively reciprocating member;

fastening means for coupling said first, second and proximate ends to their respective support body yet permitting said support bodies to pivot about said ends;

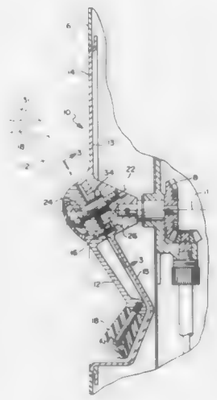
whereby said relatively reciprocating members are prohibited from moving along other than the axis of reciprocation.

4,858,489

VEHICLE WINDOW REGULATOR RETRACTABLE WINDER APPARATUS AND METHOD

Dennis Baynes, Longford, Great Britain, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 18, 1986, Ser. No. 897,499
Int. Cl.[4] G05G *1/00*
U.S. Cl. 74—547 **8 Claims**



1. A vehicle opening device regulator winder for use in a vehicle, said winder comprising:

a mounting for rotatively mounted to a vehicle along a first rotational axis;

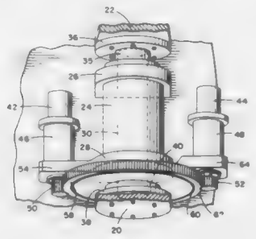
a handle rotatably mounted to said mounting plate along a second rotational inclined axis at an intersecting angle with said first rotational axis and relatively rotatable with respect to said mounting plate between first and second predetermined angular positions along said second rotational axis whereby rotation of said handle along said second rotational axis past said first or second predetermined angular position causes rotation of said handle along said first rotational axis.

4,858,490

TWO MOTOR REDUNDANT DRIVE MECHANISM

Richard W. Grant, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 13, 1987, Ser. No. 107,314
Int. Cl.[4] F16H *37/06*; F01B *21/04*
U.S. Cl. 74—661 **18 Claims**



1. A redundant drive mechanism comprising:

a platform;

a shaft rotatably mounted with respect to said platform for rotation about a first axis with respect to said platform;

a first motor stationarily mounted with respect to said platform, a first pinion, said first motor being connected to drive said first pinion for rotation about a second axis which is substantially parallel to said first axis of said shaft;

a ring gear carrier mounted on said shaft and rotationally fixed to said shaft;

a rigid ring gear rotatably mounted on said ring gear carrier for rotation about said first axis of rotation of said shaft, said first pinion being in gear-tooth engagement with said rigid ring gear;

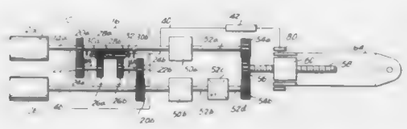
a second motor, said second motor being mounted on said ring gear carrier, a second pinion, said second pinion being rotatably mounted on said ring gear carrier for planetary motion around said shaft and said first axis, said second pinion being connected to be driven by said second motor and being rotatable on an axis parallel to said axis of rotation of said shaft, said second rigid pinion also being in gear-tooth engagement with said rigid ring gear so that energization of either said first or second motor causes rotation of said shaft with respect to said platform.

4,858,491

FAIL-FREE ACTUATOR ASSEMBLY

Eugene E. Shube, Elmont, N.Y., assignor to Plessey Incorporated, White Plains, N.Y.

Continuation of Ser. No. 146,301, Jan. 21, 1988, abandoned. This application Apr. 20, 1988, Ser. No. 183,928
Int. Cl.[4] F16H *37/08*
U.S. Cl. 74—665 B **29 Claims**



1. An actuator assembly for selectively moving a load, said actuator assembly comprising:

first means for normally producing a first kinetic energy output;

second means for normally producing a second kinetic energy output concurrently with said first kinetic energy output;

third means responsive to said first and second kinetic energy outputs for normally producing a third kinetic energy output which is the sum of said first and second kinetic energy outputs;

fourth means for normally applying said third kinetic energy output to said load to cause said load to move;

first force limiting coupling means operatively connected between said first means and said third means for preventing force in excess of a first predetermined force threshold from being transmitted from said first means to said third means via said first kinetic energy output;

fifth means for monitoring said first and second kinetic energy outputs and for producing an output indication in the event that the relationship between said first and second kinetic energy outputs deviates from a predetermined relationship; and

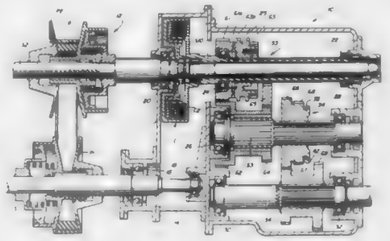
sixth means responsive to said output indication for causing said fourth means to disconnect said load from said third kinetic energy output.

4,858,492

POWER TRANSMISSION SYSTEM

Hiroshi Takano, Miki, and Mu Matsuo, Shizuoka, both of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Division of Ser. No. 24,688, Mar. 11, 1987, Pat. No. 4,779,488. This application May 23, 1988, Ser. No. 197,643
Claims priority, application Japan, Mar. 11, 1986, 54000
Int. Cl.[4] F16H *9/04, 11/06*
U.S. Cl. 74—745 **6 Claims**



1. An adjustable speed automobile transmission comprising:

a variable speed input drive mechanism having a driven shaft defining an axis of rotation;

an intermediate shaft having an end portion;

means defining a space surrounding said driven shaft radially thereof;

a selectively engageable clutch including an input portion rotatably coupled to an intermediate portion of said driven shaft, and an output portion coupled to said end portion of the intermediate shaft, said intermediate shaft being concentric and rotatable with respect to said driven shaft;

a multiple speed gear drive output mechanism; and

a reversible gear means driven by said intermediate shaft and coupled with said output mechanism for selectively driving said multiple speed gear drive output mechanism

(a) directly from said variable speed input drive mechanism so that output speed from said multiple gear drive output mechanism varies over two non-overlapping speed ranges, and

(b) reversely therefrom,

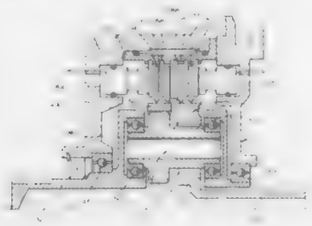
said clutch, output mechanism and reversible gear means being disposed within said space radially of said driven shaft and said intermediate shaft.

4,858,493

MULTI-RANGE, DISSIPATIVE, INFINITELY VARIABLE RATIO TRANSMISSION

Michael A. Cordner, Manchester, Mo., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 4, 1987, Ser. No. 45,319
Int. Cl.[4] F16H *57/10*
U.S. Cl. 74—768 **5 Claims**



1. A multi-range, dissipative, infinitely variable ratio transmission comprising:

a gearset having at least four rotatably associated gears including an input gear, an output gear and a pair of independently rotatable gears;

a first hydroviscous brake connected to one of said rotatable gears and operable to vary speed of the output gear within a first range;

a second hydroviscous brake connected to the other of said rotatable gears and operable to vary speed of the output gear within a second range,

said first and second ranges being at least partially overlapping; and

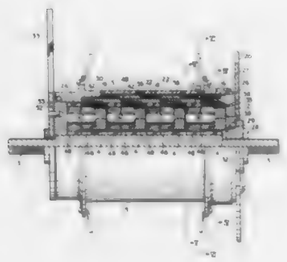
means for selecting which of said brakes is operable and controlling the amount of slip of the operating brake.

4,858,494

TORQUE RESPONSIVE AUTOMATIC SHIFTING HUB

Donald B. Healy, 618 San Roque Rd., Santa Barbara, Calif.

Filed May 2, 1988, Ser. No. 189,336
Int. Cl.[4] F16H *3/44, 57/10*; F16D *23/00, 11/06*
U.S. Cl. 74—781 B **13 Claims**



1. A torque responsive automatic shifting bicycle hub comprising:

a. an outer hub shell to which wheel structure may be attached;

b. a plurality of co-axial rotatable cylinders disposed in lineal array within the hub shell;

c. a plurality of outer helical wrapped springs having one end connected to the hub shell and disposed inside the hub and disposed over the cylinders for a sliding engagement with the cylinders when the cylinders are rotating slower than the hub and gripping the cylinders when the cylinders attempt to rotate faster than the hub;

d. a torque applying sprocket secured to one of said cylinders at one end of the lineal array;

e. a torque drive plate secured to each cylinder and having compression spring recesses;

f. a rotatable torque receiving plate for each cylinder and having recesses in registry with the recesses of the torque drive plate;

g. compression springs disposed in the registered recesses and engaged by both plates and subject to compression and expansion upon the application of torque to the sprocket and the reduction of torque;

h. a round plate for each cylinder;

i. gearing inter-connecting each round plate and the adjoining cylinder;

j. an inner helical wrapped spring disposed about each round plate and having one end connected to the torque receiving plate and the other end connected to the cylinder with a sliding movement connection,

whereby applying torque to the sprocket will compress the compression springs which act through the torque receiving plate to uncouple the inner helical springs from their round plates and whereby reducing torque allows the springs to expand and act through the torque receiving plates to wrap the inner helical springs.

4,858,495

MULTI-SPEED POWERSHIFT TRANSMISSION

Joachim Horsch, Lombard, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Jun. 8, 1988, Ser. No. 204,167
Int. Cl.[4] F16H *3/02*
U.S. Cl. 74—745 **14 Claims**

1. A multi-speed powershift transmission for connection to a driven power shaft, said transmission comprising:

a speed transmission assembly including a speed input section connectable to said power shaft for selectively producing either of at least two forward input speed ratios having a relatively small speed ratio differential therebetween; a speed output section for selectively producing any one of at least three equally different forward output speed ratios and at least one reverse speed ratio; said input section comprising a pair of clutch operated drive gears mounted on a speed input shaft and hydralically actuated in an alternative manner; said output section comprising a plurality of driven gears including a reverse gear mounted on a common speed output shaft, each driven gear having a hydraulically actuated clutch for connecting a selected driven gear to said speed output shaft; and a cluster gear assembly interconnecting said input and output sections, said cluster gear assembly being selectively driven by either of said clutch operated drive gears; and

a range transmission assembly for selectively producing any one of a least three equally different forward speed ranges, said range transmission assembly including a range input shaft which is operably coupled to the speed output shaft of said speed transmission assembly, a transmission output shaft, and a plurality of hydraulic clutch actuated gears interposed between said range input shaft and said transmissions output shaft and

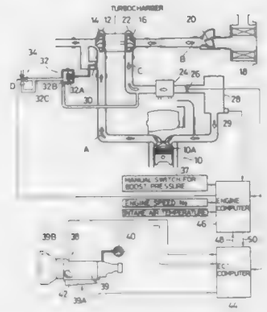
a master clutch assembly selectively interconnecting said speed and range transmission assemblies.

4,858,496

DEVICE FOR INTEGRALLY CONTROLLING A SUPERCHARGED ENGINE AND AUTOMATIC TRANSMISSION IN VEHICLE

Kunihiro Iwatsuki, and Yoshio Shindo, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Nov. 25, 1986, Ser. No. 934,791
Claims priority, application Japan, Nov. 26, 1985, 60-265929
Int. Cl.[4] B60K *41/00*
U.S. Cl. 74—863 **15 Claims**



1. A device for integrally controlling an engine and an automatic transmission in a vehicle, comprising:

supercharging means for selectively continuously or gradually introducing boost pressure to said engine;

means for detecting intake air temperature; and

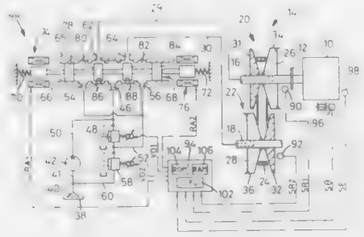
means for increasing or decreasing oil pressure in a hydraulic control device of said automatic transmission in association with at least the values of said intake air temperature and said boost pressure selectively introduced by said supercharging means.

4,858,497

HYDRAULIC CONTROL SYSTEM FOR CONTINUOUSLY VARIABLE TRANSMISSION FOR AUTOMOTIVE VEHICLE

Katsumi Kouno, 375-1, Imazato, Susono-shi, Shizuoka-ken, Japan

Filed Jul. 20, 1987, Ser. No. 75,724
Claims priority, application Japan, Jul. 22, 1986, 61-172566
Int. Cl.[4] B60K *41/12*
U.S. Cl. 74—866 **7 Claims**



1. A hydraulic control system for a continuously variable transmission of a belt-and-pulley type for an automotive vehicle, the transmission having a first and a second shaft, a first and a second variable-diameter pulley provided on the first and second shafts, respectively, a transmission belt connecting the first and second pulleys to transmit power from one of the pulleys to the other, and a first and a second hydraulic cylinder for changing effective diameters of the first and second pulleys, said hydraulic control system comprising:

a hydraulic pressure source for pressurizing a working fluid;

a first pressure regulating valve for regulating a pressure of said fluid from said hydraulic pressure source, and thereby establishing a first line pressure in a first pressure line;

a shift-control valve receiving said first line pressure of said first pressure line, and applying said first line pressure to one of said first and second hydraulic cylinders, while simultaneously permitting a flow of the fluid from the other hydraulic cylinder, thereby changing the effective diameters of said first and second pulleys to control a speed ratio of said transmission;

a second pressure regulating valve for establishing a second line pressure in a second pressure line connected to said shift-control valve, by regulating a pressure of the fluid flowing from said other hydraulic cylinder through said shift-control valve, said second line pressure being lower than said first line pressure; and

control means for controlling said shift-control valve so that an actual speed ratio of said transmission coincides with a target speed ratio determined depending upon a running condition of the vehicle,

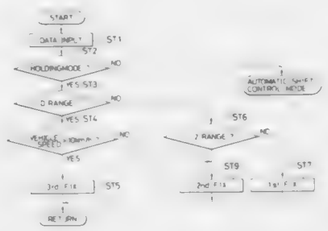
said control means being operable for effecting a feedback control of said first pressure regulating valve, to regulate said first line pressure so that a control error between said actual speed ratio and said target speed ratio of the transmission coincides with a predetermined constant target value.

4,858,498

AUTOMATIC TRANSMISSION SYSTEM FOR A VEHICLE

Keiji Bouda, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 30, 1986, Ser. No. 925,245
Claims priority, application Japan, Oct. 31, 1985, 60-244837
Int. Cl.[4] B60K *41/10*
U.S. Cl. 74—866 **7 Claims**



1. An automatic transmission system for a vehicle which includes a multiple stage transmission gear mechanism having a plurality of gear stages with respectively different gear ratios,

range selecting means for manually selecting one of a plurality of transmission gear mechanism operating ranges of gear stages in which at least one of said gear stages is selected by said transmission gear mechanism, each operating range including at least a highest and a lowest gear stage, the highest gear stage of one of said operating ranges being higher than those of the other operating ranges,

a control circuit and switching means for shifting the gear mechanism between the respective stages in a selected operating range,

drive condition detecting means for providing signals representative of a driving condition to said control circuit,

mode selecting means for selectively placing the system in an automatic mode and a holding mode, said control circuit including control means for determining which mode has been selected, the switching means controlled

by said control means in the automatic mode automatically to change gears in accordance with a first shift map using predetermined variable parameters derived from detected driving conditions, and the switching means controlled by said control means in the holding mode to retain the transmission in a gear stage which is lower than the highest gear stage in each of said plurality of operating ranges and different in each of said operating ranges, and to automatically downshift the transmission to a lower stage only when the holding mode is selected, the vehicle speed is less than a predetermined value, and the operating range having the highest of said plurality of gear stages is selected by said range selecting means, downshift from said lower stage being prohibited, said lower stage being higher than at least one other gear stage.

4,858,499

AUTOMATIC TRANSMISSION WITH LOCK-UP CLUTCH

Yasunobu Ito, and Kenji Suzuki, both of Anjo, Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

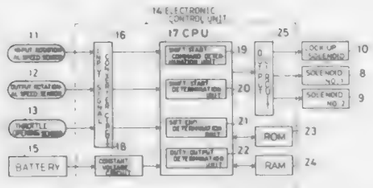
PCT No. PCT/JP87/00441, § 371 Date Feb. 22, 1988, § 102(e) Date Feb. 22, 1988, PCT Pub. No. WO88/00307, PCT Pub. Date Jan. 14, 1988

PCT Filed Jun. 30, 1987, Ser. No. 179,950

Claims priority, application Japan, Jun. 30, 1986, 61-154332

Int. Cl.[4] B60K *41/06*

U.S. Cl. 74—866 **2 Claims**



1. An automatic transmission equipped with a lock-up clutch capable of transmitting engine power to the automatic transmission directly or via a torque converter, characterized by comprising: detecting means for detecting an input rotational speed and an output rotational speed of the transmission, shift start determination means for judging start of a shift by comparing a ratio of the input rotational speed to the output rotational speed with a gear ratio prevailing prior to a shift, shift end determination means for judging end of a shift by comparing the ratio of the input rotational speed to the output rotational speed with a gear ratio prevailing after a shift, and a lock-up solenoid responsive to output signals from said shift start determination means and said shift end determination means for releasing the lock-up clutch during a shift.

4,858,500

APPARATUS FOR CONTROLLING LOCK-UP CLUTCH IN AUTOMATIC TRANSMISSION SYSTEM HAVING MAIN TRANSMISSION AND SUB-TRANSMISSION

Yoshiharu Harada, Toyota; Yutaka Taga, Aichi; Kagenori Fukumura, Toyota; Yoichi Hayakawa, Toyoake, and Masao Kawai, Chiryu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisin-Warner Kabushiki Kaisha, both of Aichi, Japan

Filed Jan. 21, 1986, Ser. No. 820,153

Claims priority, application Japan, Jan. 19, 1985, 60-7766

Int. Cl.[4] B60K *41/18;* **F16H** *37/00, 47/00*

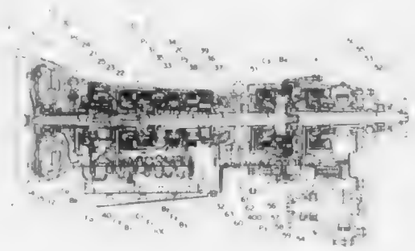
U.S. Cl. 74—866 **10 Claims**

1. A transmission control device for controlling the operation of a transmission system, comprising:

a main transmission having a torque converting device provided with a direct clutch for effecting engagement and disengagement of the input member with output member of a fluid transmission portion;

a sub-transmission having a speed change mechanism;

a drive mode detecting means for detecting the drive mode of the speed change mechanism of the sub-transmission; and



a controller means for controlling the lock-up characteristics of the direct clutch by means of the output of the drive mode detecting means, and wherein the controller means prevents a lock-up when the sub-transmission is in a low speed stage.

4,858,501

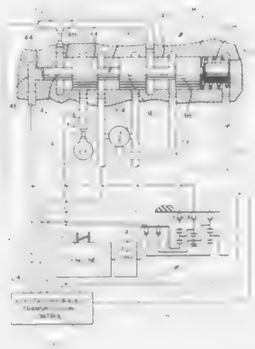
SHIFT INHIBIT VALVE FOR A TRANSMISSION CONTROL

Michael F. King, Brownsburg, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 11, 1988, Ser. No. 230,938

Int. Cl.[4] B60K *41/06*

U.S. Cl. 74—868 **2 Claims**



1. A shift inhibit valve in a hydraulic control system of a transmission having a plurality of speed ratios established by the actuation of friction devices, said control system having -a source of hydraulic fluid pressure and control valve means; said shift inhibit valve comprising: a stepped diameter valve bore having at least a large diameter portion and a small diameter portion; a valve spool movable in said valve bore to an inhibit position and a noninhibit position and having a plurality of land means disposed in sliding valve relation with said valve bore and including a small diameter land disposed in said small diameter portion and cooperating therewith to form a first control chamber, a first large diameter land disposed in said large diameter portion and cooperating with said large diameter portion and said small diameter land to form a second control chamber, second and third large diameter lands slidingly disposed in the large diameter portion and reduced diameter means separating said first and second large diameter lands, and said second and third large diameter lands, said third large diameter land cooperating with said valve bore to form a spring and control chamber; spring means in said spring and control chamber for urging said valve spool to said noninhibit position to reduce the volume of the first and second control chambers and to increase the volume of said spring and control chamber; first control passage means for cooperating in controlling the engagement of a friction device for establishing a third highest speed ratio in a transmission and being in fluid communication with said first control chamber; second control passage means for cooperating in controlling the engagement of a friction device for establishing a highest speed ratio in the transmission and being in fluid communication with said second chamber and with the reduced diameter means separating said second and third large diameter lands; third passage means for cooperating in controlling the engagement of a friction device for cooperating in controlling a second highest speed ratio and being in fluid communication with the control and spring chamber for supplying fluid pressure thereto to force said valve spool to said noninhibit position; fourth passage means for cooperating in controlling the engagement of a friction device for cooperating in the establishment of the third highest speed ratio and being in fluid communication with said valve bore to be closed when the valve spool is in the inhibit position and open between the first and second large diameter lands when the valve spool is in the noninhibit position; and fifth passage means for selectively distributing fluid to said valve bore to be distributed by said valve spool to said second passage means when said valve spool is in said inhibit position and to said fourth passage when said valve spool is in said noninhibit position, whereby a ratio change from said highest speed ratio to said third highest speed ratio cannot occur without a ratio change from said highest speed ratio to said second highest speed ratio.

4,858,502

CLOSED CONTAINER OPENER

Richard J. Warburg, 43 Spruce Dr., Westwood, Mass. 02090

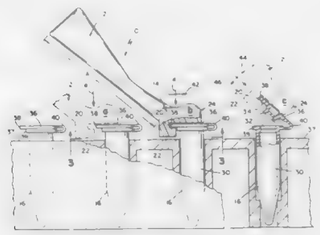
PCT No. PCT/US87/02927, § 371 Date Aug. 29, 1988, § 102(e) Date Aug. 29, 1988, PCT Pub. No. WO88/03908, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 9, 1987, Ser. No. 261,731

The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.

Int. Cl.[4] B67B *7/00*

U.S. Cl. 81—3.57 **6 Claims**



1. A microcentrifuge tube opener adapted to open any microcentrifuge tube comprising a container with an opening, and a lid for the container, the lid having a lip projection extending past the outer perimeter of the opening in essentially one direction, when the lid is placed above the opening, the lip projection extending along a first axis located centrally in the lid and passing from the lid to the lip projection, and a downwardly extending annular portion shaped to sealing fit inside the opening, the opener comprising

a base, having a recess shaped to accept the lip projection, and an opening sized to allow access of the lip projection to said recess, the base comprising:

a lower projection below and adjacent the recess, and an upper projection above and adjacent the recess,

wherein the lower projection is positioned to engage the lip during use to open said microcentrifuge tube, and the upper projection is positioned to engage the lid during said use,

wherein said recess is defined by a perimeter wall, and wherein a second axis is defined by a centrally located line passing from said wall to said opening, said wall being positioned to abut said lip projection and thereby prevent said annular portion from contacting said base when said lip projection is positioned in said recess, with a portion of said lip projection furthest from said lid abuting said wall, and with said first axis aligned parallel with said second axis;

wherein the lid can be moved from the container by positioning the lip in the recess and causing the lower projection to apply pressure to the lip away from the container and, at the same time causing the upper projection to apply pressure to the lid at a position distant from the lip in a direction towards the container; wherein the base does not touch the annular portion of the lid of any said microcentrifuge tube when the lid is removed from the container, and the lip is positioned in the recess with said first and second axes aligned parallel to each other.

4,858,503

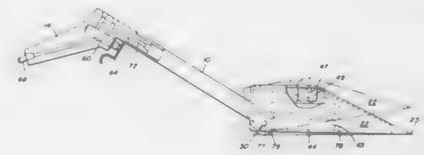
SHINGLE REMOVING APPARATUS

John H. Dike, Jr., Stoneham, Mass., assignor to Dike Equipment Company, Stoneham, Mass.

Continuation of Ser. No. 76,130, Jul. 21, 1987, Pat. No. 4,763,547. This application Jul. 6, 1988, Ser. No. 215,567

Int. Cl.[4] B25B *33/00*

U.S. Cl. 81—45 **10 Claims**



1. Apparatus for stripping fastened shingles comprising:

a frame member;

a power head attached to one end of said frame member;

a hand grip on the frame member distal to said power head;

said power head comprising:

(a) a lift plate mounted for articulating movement about an axis on a pivot connected to said frame member;

(b) a support structure connected to said frame member and disposed below said lift plate;

(c) drive means disposed beneath said lift plate, mounted between said lift plate and said support structure, and comprising a piston having a drive shaft

operative to be powered substantially normal to said support structure to push said lift plate about said axis away from said support structure to a shingle lift position and

operative to return toward said support structure to permit said lift plate to pivot about said axis back toward said support structure to an insertion position;

(d) means for receiving remotely generated power deliverable to said drive means for powering said drive shaft; and

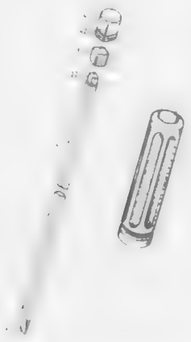
(e) switch means for actuating delivery of and for releasing power delivered to said drive means.

4,858,504

SCREWDRIVER WITH INSULATED SHAFT AND POLYGONAL DRIVING HEAD

Jame Tsai, No. 331, Ren Shin Rd., Wu Lin Tsuen, Ren Wu Shiang, Kaohsiung, Taiwan

Filed Aug. 1, 1988, Ser. No. 227,086
Int. Cl.[4] B25B *15/00*
U.S. Cl. 81—436 1 Claim



1. A screwdriver with insulated shaft and polygonal driving head comprising:

a shaft with a blade end and a polygonal end;

an insulated block having a polygonal recess which receives said polygonal end of said shaft;

a polygonal head having a polygonal recess which receives said insulated block and a slot on the perimeter of said polygonal head; and

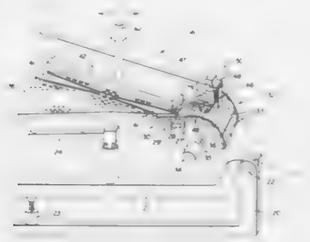
a handle having a centrally axial essentially cylindrical opening to receive said shaft, insulated block and polygonal head and a flange to engage with said slot of said polygonal head; an upper portion of said polygonal head and a lower portion of said shaft, respectively, extending from said opening of said handle.

4,858,505

PIVOTABLE KNIFE

Donald O. Still, Akron; Hubert T. Hovance, Ravenna, and George J. Burley, Clinton, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 9, 1983, Ser. No. 493,087
Int. Cl.[4] B26D *5/08, 7/10*
U.S. Cl. 83—49 11 Claims



1. An apparatus for severing a planar material comprised of:

a. rail means disposed proximate to at least a portion of said planar material;

b. transport means operatively associated with said rail means and adapted to be moved along said rail means;

c. pivot means affixed to said transport means and pivotable in a plane parallel to the plane of said planar material;

d. knife means associated with said pivot means in order to pivotally affix said knife means to said transport means; and

e. means for measuring the angular displacement of said pivot means.

8. A method for cutting a planar material having reinforcing members therein utilizing a pivotable knife means adapted to be displaced relative to said planar material in a plane parallel to the plane of said planar material, whereby a rail means is used in conjunction with a carriage means to transport said knife, and includes linkage means for mounting said knife on said carriage means wherein said linkage means includes at least four links, comprising the steps of:

a. plunging said knife means into said planar material between two or more reinforcing members;

b. displacing said knife means relative to said planar material;

c. pivoting said knife means in order to facilitate the displacement of said knife means between said reinforcing means; and

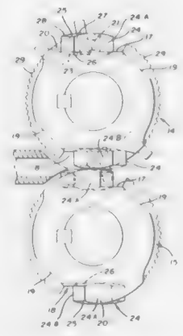
d. determining the angle of cut made by said knife means.

4,858,506

DUAL ARBOR SCRAP CHOPPER

John R. Buta, 140 Penn Ave., Salem, Ohio 44460

Filed Feb. 17, 1987, Ser. No. 15,425
Int. Cl.[4] B23D *25/12*
U.S. Cl. 83—342 4 Claims



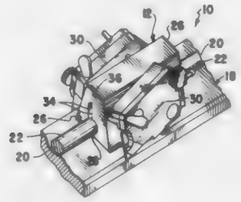
1. A dual arbor scrap chopper comprising: a support housing, a pair of oppositely disposed arbors rotatably positioned within said housing, drive means interconnecting and controlling relative rotational speed of said arbors, at least one blade on each arbor, each blade having spaced parallel side surfaces and being secured angularly and transversely of said arbors, said at least one blade on each arbor being oppositely disposed in relation to one another, means for mounting said at least one blade on said arbors in angularly transverse relation said means for mounting including oppositely disposed concave transverse recesses, said means for mounting further including an angularly upstanding edge mount against which said at least one blade is positioned, each of said blades being substantially the same length, height and width, said blades each having outwardly curved transversely flat oppositely disposed upper and lower surfaces at right angles to said side surfaces, cutting edges formed at the intersection of each of said side surfaces and said upper and lower surfaces, the oppositely disposed blades on said arbors being disposed to coact upon matched rotation of said arbors to align their outwardly curved surfaces and associated cutting edges into progressive shearing relationship whereby scrap metal material may be cut at high speeds.

4,858,507

MAT BOARD CUTTER WITH ADJUSTABLE CUTTER-CARRYING BODY

Louis B. Evans, Afton Twp., Washington County, Minn., and Daniel D. Smith, Castelwoods, Miss., assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Apr. 20, 1983, Ser. No. 486,896
Int. Cl.[4] B26D *3/02, 7/02*
U.S. Cl. 83—455 1 Claim



1. In a mat board cutter having a base with means for positioning a mat board thereon, a clamp bar for clamping the mat board on said base, a guide rail on said clamp bar having a peripheral guide surface, a cutter-carrying body having spaced ends and a bearing surface defining a through opening between said ends receiving said guide rail in close-fitting relationship so that said bearing surface can slide along and be guided by said peripheral guide surface, and at least one cutter device including a knife and being pivotaly mounted on said cutter-carrying body for movement between a disengaged position with the knife spaced from the mat board and an engaged position with the knife engaged with the mate board, the improvement wherein:

said cutter carrying body is of one-piece construction, has spaced opposed surfaces defining a slot extending between said ends and communicating along one edge with said through opening, and has a portion bridging the edge of said slot opposite said through opening that is sufficiently flexible to afford adjusting the spacing between said opposed surfaces; and said cutter includes means for adjusting the spacing between said opposed surfaces to position said bearing and guide surfaces in close-fitting slideable relationship comprising two spaced screws threadably engaged with said body and extending across said slot between said opposed surfaces.

4,858,508

ELECTRONIC MUSICAL INSTRUMENT WITH TONE-SUSTAINING CONTROLLER

Takeo Shibukawa, Shizuoka, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jan. 28, 1988, Ser. No. 149,685
Claims priority, application Japan, Jan. 29, 1987, 62-19081
Int. Cl.[4] G10H *1/00, 1/02, 3/00*
U.S. Cl. 84—1.01 5 Claims

1. An electronic musical instrument for electronically producing sounds, comprising:

(a) a keyboard having a plurality of keys each movable between an undepressed state and a depressed state, said keyboard being operative to produce a note information representative of a note of a depressed state key;

(b) first memory means provided with a plurality of first channels each capable of storing said note information;

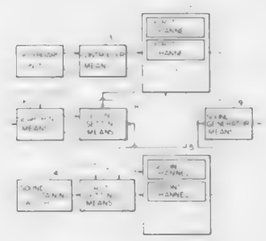
(c) control means operative to assign said note information to one of said first channels;

(d) a sound-sustaining switch operated by an operator and producing a switch state information alternatively representing an activated state and an inactivated state;

(e) second memory means provided with a plurality of second channels each paired with each of said first channels for storing a sound-sustaining information alternatively representing a first state and a second state, said first state being representative of a request for imparting a tone-sustaining effect to one of said sounds, said second state being representative of the absence of said request;

(f) searching means operative to search, when a key is depressed, said first memory means for a first channel which has already stored a note information identical with the note information of said depressed key;

(g) first setting means operative to set to said first state said sound-sustaining information stored in one of said second channels paired with said first channel supplied with said note information when said switch state information is in said activated state, said first setting means further being operative to set to said second state said sound-sustaining



information stored in said one of said second channels when said switch state information is in said inactivated state;

(h) second setting means responsive to said searching means so as to set said sound-sustaining information stored in said one of said second channels to the same state as said sound-sustaining information stored in a second channel paired with said first channel which has already stored said note information; and

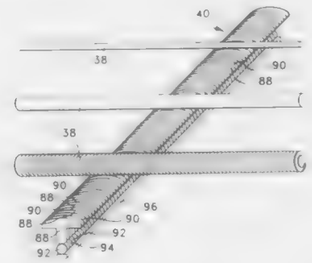
(i) sound generator means operative to produce one of said sounds having the note specified by said note information, said sound generator means further operative to impart said tone-sustaining effect to said one of said sounds when said tone-sustaining information stored in said one of said second channels is in the first state.

4,858,509

ELECTRIC MUSICAL STRING INSTRUMENTS

Steven C. Marshall, 5 Ice Pond Ct., Baltimore, Md. 21208

Division of Ser. No. 903,266, Sep. 3, 1986, Pat. No. 4,748,887.
This application May 31, 1988, Ser. No. 200,696
The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.
Int. Cl.[4] G10H *1/18, 1/34*
U.S. Cl. 84—1.16 17 Claims



1. An electric guitar, comprising:

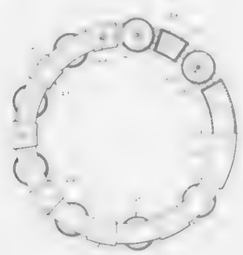
a body structure carrying fret assemblies and strings extending lengthwise over the fret assemblies;
each fret assembly including means, comprising at least one resistive element forming part of that fret assembly and being associated with a string contact surface of that fret assembly, for enabling the effective resistance of said element to change in dependence upon transverse deflection of a string when in contact with said surface for enabling note bending to be achieved; and
each said fret assembly having a lengthwise direction extending transversely to said strings, and said resistive element extending the length of its respective fret assembly in the lengthwise direction of that fret assembly.

4,858,510

RESONANT MUSICAL INSTRUMENTS

Isao Shimoda; Mitsugu Yaguchi, and Junji Fujii, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

Filed Jun. 2, 1988, Ser. No. 202,118
Claims priority, application Japan, Jun. 5, 1987, 62-141868; Aug. 26, 1987, 62-211803; Nov. 2, 1987, 62-168811[U]; Nov. 30, 1987, 62-303888
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—402 **5 Claims**



1. A musical instrument which comprises idiophones or membranophones comprising,
a body,
at least one tone generator coupled to said body, and
a plurality of slide openable resonant chambers arranged in the vicinity of said tone generator, said resonant chambers each having an inner space communicating with the outside air via at least one opening.

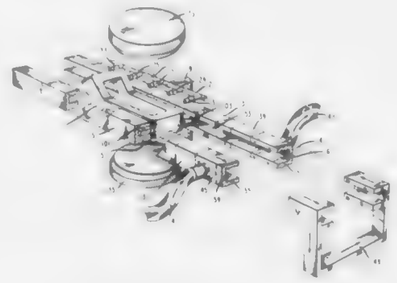
4,858,511

SUPERCONDUCTIVE LEVITATED ARMATURES FOR ELECTROMAGNETIC LAUNCHERS

Louis J. Jasper, Jr., Ocean, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 14, 1988, Ser. No. 167,653
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 **4 Claims**

1. An electromagnetic weapon comprising:
an armature having first and second parallel arms, a third arm connecting said first and second arms, said first, second and third arms defining a first plane, fourth and fifth arms connected to said first and second arms respectively, said fourth and fifth arms defining a second plane which is oblique to said first plane, a sixth arm connected between said fourth and fifth arms; first and second stabilizing fins attached to said first and second arms respectively;
first and second parallel rails spaced apart to receive said first and second arms of said armature;
means for producing a magnetic field perpendicular to said first plane;
means for cooling said armature;



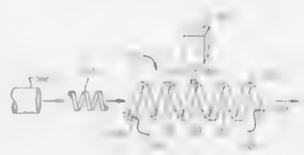
means for applying a voltage to said first and second rails whereby said armature accelerates between said rails and is ejected towards a chosen target.

4,858,512

ELECTROMAGNETIC LAUNCHER WITH CRYOGENIC COOLED SUPERCONDUCTING RAILS

Louis J. Jasper, Jr., Ocean, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 68,389, Jun. 12, 1987, Pat. No. 4,813,332. This application Sep. 29, 1988, Ser. No. 251,143
Int. Cl.[4] F41F *1/02*
U.S. Cl 89—8 **11 Claims**



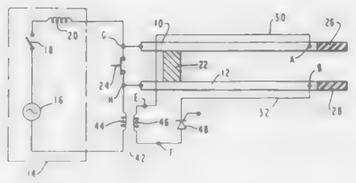
1. An electromagnetic railgun for accelerating a projectile comprising a first helical coil having a plurality of turns electrically separated from each other, said helical coil being comprised of superconducting material and having one or more holes therein, cryorefrigerator means serving to generate temperatures at or below the superconductivity temperature of said material, one or more thermally conductive arms or shafts extending from said cryorefrigerator means into said one or more holes, each arm having a cap or sleeve on the end thereof that extends into a hole, each cap being thermally conductive and electrically insulating, said projectile comprising a second helical coil wound in a direction opposite that of the first helical coil and dimensioned to pass freely in an axial direction through the first helical coil, means for connecting a voltage source to the ends of said first helical coil, and means for injecting said second helical coil into said first helical coil so that said second helical coil is accelerated in said axial direction inside said first helical coil.

4,858,513

ELECTROMAGNETIC LAUNCHER WITH IMPROVED RAIL ENERGY RECOVERY OR DISSIPATION

George A. Kemeny, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 21, 1983, Ser. No. 564,050
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 **14 Claims**



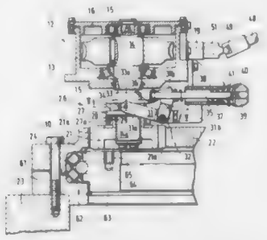
1. An electromagnetic projectile launcher comprising:
a pair of conductive rails each having a breech end and a muzzle end;
a source of current connected to the breech ends of said rails;
means for conducting current between said rails and for propelling a projectile along said rails; and
a muzzle shunt circuit including a pair of conductors connected to said muzzle end of said rails and located adjacent to and parallel to said rails such that a muzzle shunt circuit commutating voltage is induced during the time that said means for conducting current travels in a portion of said rails which is paralleled by said conductors and wherein the induced voltage continues until said means for conducting current exits at the muzzle ends of said rails.

4,858,514

MOUNTING ASSEMBLY FOR A SADDLE FRAME STRUCTURE HAVING A CRADLE FOR A GUN BARREL

Gideon Argon, Tel-Aviv, Israel, assignor to Salgad International Ltd., Cayman Insel (Jamaika), Cayman Islands

Filed Apr. 1, 1987, Ser. No. 33,579
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1986, 3612018; Sep. 13, 1986, 3631206
Int. Cl.[4] F41F *21/02*
U.S. Cl. 89—37.05 **11 Claims**



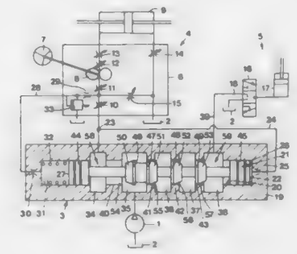
1. A mounting assembly for a saddle frame structure having cradle means for a gun barrel, said assembly comprising:
(a) bottom plate means pivotally mounted to stationary base plate means and carrying the saddle frame structure,
(b) drivable gear means for pivotally rotating the bottom plate means with respect to the base plate means, and
(c) coupling means including means for engaging the drivable gear means to the stationary base plate means,
(d) said coupling means including adjusting means for moving the engaging means between a disengaged position and an engaged position in which drivable gear means is effective to rotate the bottom plate means,
(e) the drivable gear means including a rotatably mounted gear shaft having a first gear member fixedly secured to one end thereof and a second gear member loosely mounted at the other end thereof to rotate loosely about the gear shaft,
(f) said coupling engaging means including a coupling sleeve member axially displaceable on the gear shaft between the engaged and disengaged positions,
(g) said adjusting means being connected to the coupling sleeve member to effect said axial displacement of the sleeve member,
(h) the adjusting means including a pivotally mounted angle lever means having one end cooperating with the coupling sleeve member and the other end thereof connected to lever displacement means for pivotally moving the angle lever means,
(i) the lever displacement means including a draw-bar member movably displaceable against spring action,
(j) the draw-bar member is elongate, has a longitudinal axis and is mounted for movement along its
(k) one end of the draw-bar member is connected to said other end of the angle lever means and an opposite end of the draw-bar member is connected to manually operable, draw-bar displacing means,
(l) the draw-bar displacing means includes abutment means and a hand lever member,
(m) said hand lever having a camming surface eccentrically mounted to said opposite end of the draw-bar member,
(n) the camming surface being in sliding contact with the abutment means to effect movement of the elongate draw-bar member along its longitudinal axis when the draw-bar displacing means is operated.

4,858,515

PRIORITY VALVE FOR HYDRAULIC INSTALLATIONS

Niels G. Karlberg, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 543,865, Oct. 20, 1983, abandoned. This application Nov. 18, 1985, Ser. No. 798,990
Int. Cl.[4] G05D *11/03*
U.S. Cl. 91—516 **1 Claim**



1. A hydraulic system comprising a priority valve having a casing with an inlet port and first and second outlet ports, said casing having a bore having fluid communication with said ports and defining main and auxiliary circuit passages respectively between said inlet port and said first and second outlet ports, a pump connected to said inlet port for supplying pressurized fluid to said circuits, a slide in said bore having throttle elements cooperable with said bore to form throttles, said slide being movable in opposite directions to form main and auxiliary throttling paths between said inlet port and said first and second outlet ports respectively, said throttle elements forming only one throttle in said main throttling path and at least two throttles in series in said auxiliary throttling path to minimize cavitation in said auxiliary throttling path, fluid return tank

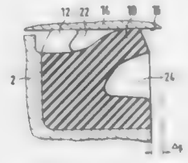
means, a closed center type steering control device connected to said first valve outlet port and having internal throttle means between said first valve outlet port and said fluid return tank means, and an open center type auxiliary device connected to said second outlet port having an inoperative mode wherein said second valve outlet port is connected directly to said fluid return tank means.

4,858,516

BRAKE CYLINDER-PISTON SLAVE UNIT SEAL HAVING RADIAL ROLL-BACK PROTRUSION FOR PISTON SPRING BACK RETRACT

Hans-Christof Klein, Hattersheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt, Fed. Rep. of Ger-[redacted]

Filed Jun. 22, 1984, Ser. No. 623,836
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1983, 3323361; Feb. 13, 1984, 3405028
Int. Cl.[4] F16D *65/20, 65/24;* **F16J** *15/32, 15/34*
U.S. Cl. 92—240 **23 Claims**



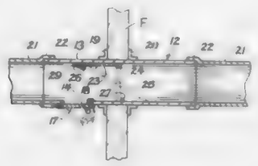
1. A piston-cylinder assembly for a wheel brake unit of a hydraulic brake system of an automotive vehicle comprising:
- a ceramic piston received in a cylinder of said wheel brake unit with radial clearance between said cylinder and said piston, said piston movable between a brake released position and a braked position in response to hydraulic pressure on said piston;
- a seal on said piston at an end thereof exposed to said hydraulic pressure in said cylinder including a sealing lip extending at an acute angle outwardly from said piston into sliding sealing engagement with said cylinder, said seal further including roll-back means engaging said cylinder for substantially returning said piston to said brake released position upon reduction of said hydraulic pressure.

4,858,517

FIRE DAMPER KIT

Rick Coker, 326 Clara Ln., Belen, N. Mex. 87002

Filed Jun. 8, 1988, Ser. No. 204,007
Int. Cl.[4] F24F *11/02;* **F16K** *17/40*
U.S. Cl. 98—1 **1 Claim**



1. A flue damper kit positioned in alignment with duct work and secured through a fire wall to halt air flow through said duct work upon sensing of fire therethrough, said damper kit comprising,
- an elongate damper box defining first and second ends of securement to duct work, and
- a damper assembly including a damper door pivotally mounted within said damper box orthogonally positioned relative to said first and second ends, and
- fusable link means underlying said damper door to maintain said damper door in a first open position, and
- spring means to bias a damper door to a second closed position orthogonal to said first position upon destruction of said fusable line, and
- wherein said fusable link is a thermally sensitive fusable link, and
- wherein said flue damper kit further includes a first fixed "L" shaped securement bracket secured to an exterior surface of said damper box, and a second slidable "L" shaped securement bracket slidable over said damper box for securing and sandwiching said fire wall between said first and second "L" shaped securement brackets, and
- wherein a first and second "L" shaped groove is formed integrally onto opposite sides of said damper box for slidingly securing said fusable link means therethrough, and
- wherein the first and second "L" shaped grooves are positioned adjacent an upper interior surface of said fire box, and
- wherein said damper door is pivotally mounted at a first end of said damper door adjacent an upper interior surface of said damper door box, and
- wherein an access door is pivotally mounted to a bottom wall of said damper box overlying an opening to enable access to said damper assembly.

4,858,518

CONTROL APPARATUS FOR AUTOMOBILE AIR CONDITIONING SYSTEMS

Hideo Yamaguchi, Higashihiroshima, and Tsutomu Fujiki, Hiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 12, 1988, Ser. No. 231,862
Claims priority, application Japan, Aug. 12, 1987, 62-202570
Int. Cl.[4] B60H *1/32*
U.S. Cl. 98—2.08 **19 Claims**



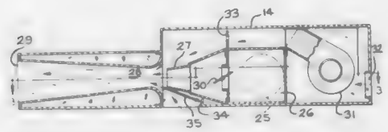
1. An air conditioning control apparatus of an automobile air conditioning system in which different airflow modes including at least one dual airflow mode in which two of said different airflow modes are simultaneously made effective are selectively created by opening and closing airflow control doors disposed in air ducts and operatively coupled to a power driven mechanism, said air conditioning control apparatus comprising:
- airflow mode selecting switches provided one individually to each of said different airflow modes and arranged in a line on a dash panel in a driver's compartment of a car for selectively creating a desired airflow mode, a dual airflow mode selecting switch for said dual airflow mode being disposed between said airflow mode selecting switches for said two different airflow modes made simultaneously effective by said dual airflow mode selecting switch;
- a controller actuated by any one of said airflow selecting switches for controlling said power driven mechanism to selectively open and close said control doors according to said desired airflow mode; and
- regulating means for causing said controller to regulate openings of said airflow control doors so as to thereby regulate a quantity of outlet air in at least one of said different airflow modes; said regulating means including a manually operative member disposed near said airflow mode selecting switch associated with said dual airflow mode and slidably moved back and forth in the direction in which said airflow mode selecting switches are arranged for causing an increase in the quantity of outlet air in the one of said two different airflow modes effective in said dual airflow mode associated with the one of said airflow selecting switches toward which said manually operative member of said regulating means is slidably moved.

4,858,519

MIXING BOX

Gershon Meckler, 1703 Channel Tower Dr., Monmouth Beach, N.J. 07750

Continuation of Ser. No. 314,872, Oct. 26, 1981, Pat. No. 4,657,178, which is a continuation-in-part of Ser. No. 184,282, Sep. 5, 1980, abandoned. This application Feb. 26, 1987, Ser. No. 19,149
Int. Cl.[4] F24F *13/04*
U.S. Cl. 98—384 **9 Claims**



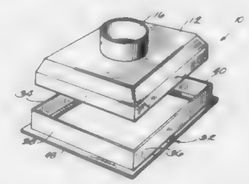
9. A method for operating a mixing box having an inlet end, an outlet end, an induction nozzle intermediate the inlet and outlet ends of the box, a substantially closed first passage and a primary air inlet, wherein primary air flows into the primary air inlet, and then through the induction nozzle and the outlet end of the box, the induction nozzle being operable, when primary air flows through the passage, to induce a flow of air through a first opening for mixture with primary air and delivery therewith through the outlet end of the mixing box, means for controlling the rate of flow of primary air through the passage, a fan operable to induce a flow of air through a second opening and a closed second passage to the suction side of the fan and to deliver such air through the outlet end of the mixing box, a control operable to energize and de-energize the fan, and first and second heat transfer devices positioned for heat transfer with air which is induced to flow through the second opening before that air is delivered through the outlet end of the mixing box, said method comprising varying the rate at which primary air is delivered to the mixing box between a maximum rate and a minimum rate, as a direct function of load, as that load varies between a given load and a minimum load, when the air conditioning load is less than the minimum load, continuing to deliver primary air at the minimum rate while operating the second heat transfer device to transfer heat to air which flows in heat transfer relationship therewith, and, when the air conditioning load is more than the given load, continuing to deliver primary air at the maximum rate, while operating the first heat transfer device to transfer heat from air which flows in heat transfer relationship therewith, and operating the fan whenever the flow of primary air and air induced thereby is insufficient to provide adequate circulation and when the air conditioning load is more than the given load.

4,858,520

AUXILIARY FRAME FOR CEILING MOUNTED AIR DIFFUSERS AND THE LIKE

Kenneth E. Prochnow, and Richard C. Burke, both of Madison, Wis., assignors to Carnes Company, Inc., Verona, Wis.

Filed Feb. 10, 1988, Ser. No. 154,851
Int. Cl.[4] F24F *13/06*
U.S. Cl. 98—40.05 **14 Claims**



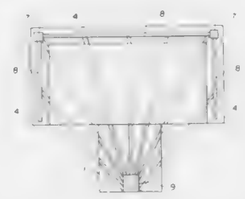
1. An air distribution device system for providing a flush-mounted air distribution device in a ceiling of the type having two or more substantially parallel framing members, said air distribution device system comprising:
- a substantially rectangular closed-looped structure dimensioned to fit within a cut-out in the ceiling between the substantially parallel framing members and having a pair of substantially parallel side members and a pair of substantially parallel end members, said side and end members being connected to each other and each being substantially T-shaped in cross-section;
- each of said first and second side and end members including a horizontal lower flange portion having an outwardly extending portion dimensioned to overlie the adjacent edge of the ceiling when said rectangular structure is positioned within the cut-out in the ceiling and having an inwardly extending portion on which an air distribution device rests when said rectangular structure supports said air distribution device;
- means for mounting said rectangular closed-looped structure between the substantially parallel framing members with said lower flange portions of said first and second side and end members substantially coplanar with the ceiling;
- means extending upwardly from said horizontal lower flange portions for connection with said framing members; and
- an air distribution device of substantially rectangular configuration dimensioned to fit within and rest upon the horizontal portions of said side and end members of said substantially rectangular closed-looped structure.

4,858,521

RADON GAS HOME/BUILDING MITIGATION APPARATUS AND METHOD

Robert W. Heh, 830 Mifflin Rd., Pittsburgh, Pa. 15207

Filed Jul. 21, 1988, Ser. No. 222,497
Int. Cl.[4] F24F *11/00*
U.S. Cl. 98—42.05 **4 Claims**



1. In a building supported on a rectangular foundation slab surrounded by trenches extending below and beyond a longitudinal side and two ends of said slab and beyond a portion of the

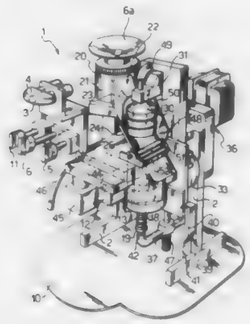
other longitudinal side of said slab, a plurality of perforated pipes extending underneath said slab in fanned out relationship from a focal point in said trench portion of the other longitudinal side of said slab, a series of pipe junctions in a U-shape extending in said first mentioned trenches beyond a longitudinal side and two ends of said slab, which pipe junctions are connected to the extremities of said fanned out perforated pipes, an above-ground header connected to said pipe junctions at said focal point, and an exhaust fan connected to said pipes to force ventilation air through the pipes and cause a vacuum therein to enable removal of radon gas otherwise penetrating said building.

4,858,511

AUTOMATIC ESPRESSO COFFEE MAKING MACHINE FOR HOUSEHOLD USE

Giovanni Castelli, Milan, Italy, assignor to Simac S.r.l., Italy

Filed Oct. 20, 1988, Ser. No. 260,062
Claims priority, application Italy, Oct. 23, 1987, 22402 A/87
Int. Cl.[4] A47J *31/42*
U.S. Cl. 99—280 **2 Claims**



1. An automatic "espresso" coffee making machine for household use of a type which comprises a coffee grinder and an electric motor therefor, a percolation chamber, a chute between said coffee grinder and said percolation chamber for loading said chamber with a metered amount of ground coffee, a heated water storage boiler, and a pump having its delivery side in communication with said percolation chamber and its suction side in communication with said boiler, characterized in that it further comprises an electronic control device operatively linked to and driven by a timer in said device, a selector to selectively dispense one or more doses of espresso coffee, and a control knob for controlling the amount of coffee percolate to be dispensed, said electric motor and pump being in turn linked operatively to respective outputs of said device to be operated for predetermined time periods clocked by said timer.

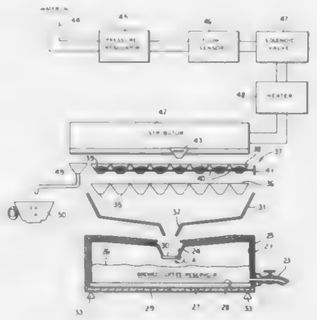
4,858,523

AUTOMATIC INFUSION-BEVERAGE APPARATUS

Edward Heibling, 1 Janet La., Commack, N.Y. 11725

Filed Jul. 12, 1988, Ser. No. 218,107
Int. Cl.[4] A47J *31/34*
U.S. Cl. 99—280 **20 Claims**

1. An automatic infusion apparatus for brewing infusion beverages, comprising:
- a housing;
- means in said housing for supporting a unit comprised of a plurality of filters each receiving a predetermined quantity of a comminuted substance to be infused with hot water to generate a beverage;
- a distributor in said housing communicating selectively with said filters for delivering heated water thereto;
- a source of heated water connected to said distributor;
- a collector for receiving beverage from at least some of said filters and dispensing the received beverage; and
- a microprocessor controller connected to said source for supplying water to said distributor upon an instruction to said source from said microprocessor controller for generation of a beverage at a selected one of said filters, and connected to said distributor for connecting said distributor to said selected one of said filter to deliver the heated water thereto upon an instruction to said distributor from said microprocessor controller.

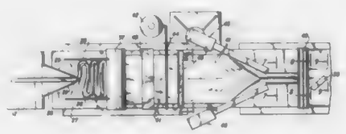


4,858,524

APPARATUS FOR PRODUCING LAMINATED PRODUCTS

William J. Simelunas, Glen Rock, and Nicholas R. Polifroni, Cliffside Park, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation of Ser. No. 001,692, Jan. 9, 1987, Pat. No. 4,778,685, which is a division of Ser. No. 611,671, May 8, 1984, Pat. No. 4,679,496. This application Jul. 28, 1988, Ser. No. 225,253
The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.
Int. Cl.[4] A23G *3/00*
U.S. Cl. 99—450.2 **13 Claims**



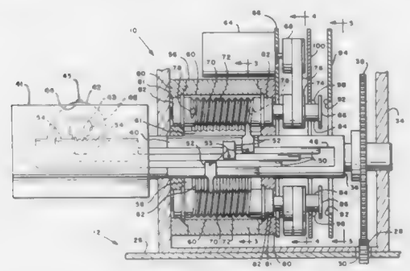
1. An apparatus for producing a laminated sheet product having thin layers of a semifluid first material interleaved with thin layers of a semifluid second material, which apparatus comprises:
- longitudinally extending conveyor means;
- means for continuously forming a sheet of said first material on said conveyor means;
- means for continuously depositing said second material on said sheet to form a layered sheet of said first and second materials;
- first means for continuously rolling said sheet from the edges thereof inwardly to form a first double roll extending longitudinally along said conveyor means;
- first means for flattening said first double roll into a sheet product;
- second means for continuously rolling the sheet product from the edges thereof inwardly to form a second double roll; and
- second means for flattening the second double roll into the laminated sheet product.

4,858,525

POSTAGE METER HAVING A WORM GEAR DRIVE AND GUIDING SLEEVE

David W. Hubbard, Stamford, and Glen J. Randmer, Norwalk, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 7, 1987, Ser. No. 130,041
Int. Cl.[4] B41J *1/20, 1/34*
U.S. Cl. 101—91 **6 Claims**



1. A postage meter comprising:
- a housing,
- a sleeve supported within said housing, said sleeve having a central opening, a plurality of peripheral grooves disposed about said central opening and a plurality of openings peripheral to and confluent with said central opening,
- a rotatable shaft received within said central opening,
- a print drum having an opening therein and secured to one end of said shaft for rotation therewith,
- a plurality of print wheels rotatably supported within said print drum, each of said print wheels having a portion extending through said print drum opening,
- each of said print wheels having a gear coaxially secured thereto,
- a plurality of racks received within said central opening and slidably supported within said shaft and individually engageable with one of said gears whereby upon linear movement of said rack said print wheels are rotated,
- a follower secured to each of said racks and extending from said central opening to one of said peripheral openings to be received within a respective groove of said sleeve upon rotation of said shaft,
- a plurality of worm gears each having a helical thread and being rotatably received within said peripheral openings of said sleeve, one of said followers being received within the helical thread of one of said worm gears,
- means for rotating said worm gears, and
- means for rotating said shaft within said central opening, and relative to said worm gears, whereby said followers will travel within their respective grooves upon rotation of said shaft to be guided by said grooves to return to their original position.

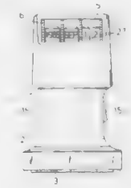
4,858,526

HAND STAMP

Lars Bengtsson, 512 00 Svenljunga, 13, Lysjövägen, Sweden

Filed Mar. 9, 1988, Ser. No. 166,019
Int. Cl.[4] B41J *1/60*
U.S. Cl. 101—111 **8 Claims**

1. A hand stamp, comprising:
- a hollow casing having a print support portion and a handle portion with an aperture therein;
- first printing means for printing an invariable text fixedly mounted in the print support portion and defining a first print surface;
- resilient supports for normally supporting the defined first print surface a first predetermined distance out of printing engagement with a printable face;
- second printing means for printing a variable text, including a frame slidably mounted in the casing along an axis substantially perpendicular to the defined first print surface, a plurality of endless belts laterally spaced along and rotatable on a pair of spaced axes substantially parallel to the defined first print surface, the belts supporting a plurality of spaced printing blocks, a plurality of adjusting wheels rotatably mounted on one of said axes for moving a respective endless belt to position a selected printing block in registry with the defined first print surface;
- limiting means for limiting the axial movement of the frame in one direction toward the handle portion to a setting position and in the opposite direction toward the defined first print surface to a printing position, said limiting means and said printing blocks being dimensional to define a second print surface in registry with the defined first print surface at times when the frame is in the printing position;
- spring means mounted in the casing for urging the frame to the printing position; and
- locking means for releasably locking the frame in the setting position against the urging of the spring means;
- said adjusting wheels having a peripheral surface more accessible from said aperture when the frame is in the setting position, and less accessible from said aperture when the frame is in the printing position;
- said handstamp operative against the urging of the resilient supports to apply the defined second print surface to the printable face against the urging of the spring means, and to apply the defined first print surface against the printable face in registry with said defined second print surface.

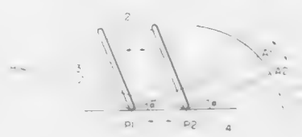


4,858,527

SCREEN PRINTER WITH SCREEN LENGTH AND SNAP-OFF ANGLE CONTROL

Oozeki Masanao, 47-301 Sakuradai 3-chome, Nerima-ku, Tokyo, Japan 176

Filed Jul. 22, 1987, Ser. No. 76,300
Int. Cl.[4] B41F *15/42*
U.S. Cl. 101—123 **6 Claims**



1. An improved screen printing machine comprising:
- a screen held over a surface to be printed, said screen having a first fixed end and a second end,
- a squeegee having an inking edge at a lower end thereof and in contact with said screen for transferring ink to said screen, and

drive means for moving said second end of said screen in unison with said squeegee on said screen along a locus substantially of a hyperbola so that:

(a) the length of said screen is maintained substantially constant throughout said movement, and

(b) a snap-off angle formed between the screen and the surface, on one side of the squeegee at a position opposite to the inking edge of the squeegee, is maintained substantially constant throughout the entire movement of said squeegee for ink transfer.

4,858,528

PRINTING PRESS AND CONTROL METHOD OF PLATE FEEDING OPERATION

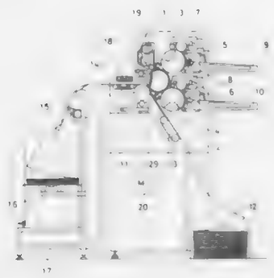
Yoshinori Inouye, Ohtsu; Yoshihiko Osawa, and Minoru Ueda, both of Koga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 28, 1986, Ser. No. 902,423

Claims priority, application Japan, Sep. 13, 1985, 60-203611

Int. Cl.[4] B41F *7/08, 27/06*

U.S. Cl. 101—175 **13 Claims**



1. A printing press for automatically feeding a printing plate having a lead edge portion provided with a plurality of register holes, and at least two sides extending from the lead edge portion, comprising:

a printing press body;

a plate cylinder mounted to said printing press body:

a plurality of register pins provided at said plate cylinder and adapted to engage said register holes;

a first driving motor for driving said plate cylinder;

a plate feeding unit installed in said printing press body;

a plate feeding tray having a positioning part means for guiding to set said at least two sides of the printing plate on a predetermined position of the plate feeding tray, said plate feeding tray being installed in said plate feeding unit;

a plate forwarding mechanism including at least one plate-feeding driving roller provided at said plate feeding unit to advance the printing plate positioned on said plate feeding unit;

a second driving motor for driving said plate-feeding driving roller;

means for imparting a driving command signal to said first driving motor;

means for generating a plate-feeding command signal;

means for outputting a rotation phase detecting signal in relation to a rotation phase of said plate cylinder;

means for imparting a plate-feeding start-up command signal for driving said plate-feeding driving roller with said second driving motor in response to said plate-feeding command signal when a rotation phase of said plate cylinder detected by said rotation phase detecting signal reaches a predetermined rotation phase; and

means for controlling a rotating speed of said plate-feeding driving roller on the basis of said rotation phase detecting signal so that said register pins engage with said register holes after commencement of plate-feeding by said plate-feeding driving roller.

4,858,529

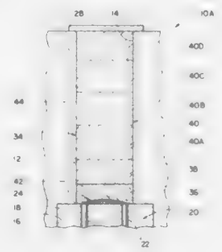
SPARK-SAFE LOW-VOLTAGE DETONATOR

Morton L. Lieberman, Albuquerque, N. Mex., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jul. 1, 1988, Ser. No. 214,370

Int. Cl.[4] F42C *19/12*; F42B *3/12*

U.S. Cl. 102—202.5 **15 Claims**



1. In a detonator having a housing with an bore therein and a header supported by said housing and mounting an electrical ignition device in communication with and adjacent to an end of said housing bore, a column of explosive comprising:

(a) a first layer of an organic secondary explosive charge disposed in said housing bore in an ignition region of said explosive column adjacent to said ignition device;

(b) a second layer of an explosive charge of CP disposed in said housing bore in said ignition region of said explosive column and on a side of said first layer opposite from said ignition device, said second layer being loaded under sufficient pressure adjacent to and in physical contact with said first layer to provide mechanical confinement of said first layer and physical coupling thereof with said ignition device in a manner sufficient to prevent decoupling of said first layer from said ignition device; and

(c) a third layer of an explosive charge of CP disposed in said housing bore in a transition region of said explosive column and on a side of said second layer opposite from said first layer, said third layer being loaded under sufficient pressure adjacent to and in physical contact with said second layer to allow occurrence of deflagration-to-detonation transition (DDT).

4,858,530

POWER RELAY/SAFING DEVICE FOR A FUZE SYSTEM

Robert E. Edminister, Scottsdale, and Raul V. Cavazos, Jr., Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1988, Ser. No. 189,552

Int. Cl.[4] F42C *15/12, 15/40*

U.S. Cl. 102—208 **34 Claims**

1. A power relay/safing device for a fuze in a free-fall munition comprising:

electronic circuit means coupled to the fuze;

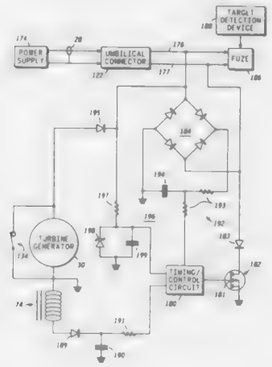
power connector means having a first end connected to said electronic circuit means and a second end;

said power connector means for feeding a first electric current from an external power source to said electronic circuit means;

turbine generator means for generating a second electric current;

said turbine generator means having a first output coupled to an electrical ground and a second output coupled to said electronic circuit means; and

said electronic circuit means for receiving said first electric current, for receiving said second electric current, for determining if said first electric current was fed through



said power connector means, for relaying said first electric current to the fuze, and for feeding said second electric current to the fuze when said first electric current is not received by said electronic circuit means.

4,858,531

WARHEAD WITH METAL COATING FOR CONTROLLED FRAGMENTATION

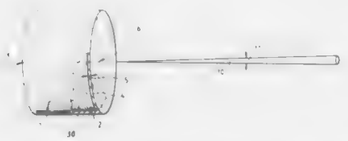
Klaus Lindstadt, Schwaig, and Karl Rudolf, Schrobenhausen, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jun. 29, 1987, Ser. No. 81,246

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 3625965

Int. Cl.[4] F42B *1/02*

U.S. Cl. 102—307 **9 Claims**



1. In a warhead for a horizontal fragmentation mine including a housing; an explosive charge arranged within said housing, and a concave or planar coating covering the front side of said explosive charge; the improvement comprising in that at least the major portion of said coating is constituted of a brittle heavy-metal or hard metal having a static breaking expansion of 15 to 25%, said coating being decomposed upon detonation of said warhead into a large number of natural generally equally-sized and discrete fragments of a certain weight and quantity which spread out within a defined fragment cone or fragment wedge, and wherein the ratio of the weight of coating relative to the explosive is in the range of about 1:0.4 to 1:0.6.

4,858,532

SUBMUNITIONS

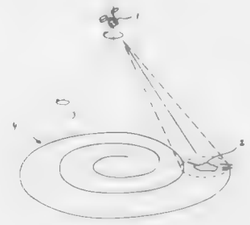
Per-Olof Persson; Kjell Albrektsson, both of Karlskoga; Jan Axinger, Storfors; Jan-Olof Fixell, Karlskoga, all of Sweden, and Jari Hyvärinen, Stavanger, Norway, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Mar. 23, 1987, Ser. No. 28,949

Claims priority, application Sweden, Mar. 27, 1986, 8601423

Int. Cl.[4] F42B *1/02, 13/00*

U.S. Cl. 102—387 **5 Claims**



1. A submunition arranged to be separated from an aeronautical body over a target area, the submunition comprising:

a warhead,

a target detector being pivotally mounted on a mounting shaft disposed on said warhead parallel with an axis of symmetry of the warhead to activate said target detector outwardly between a retracted position in which an optical axis of the target detector coincides with the axis of symmetry of the warhead to an extended position in which the axis of symmetry of the warhead permits free vision of the target detector beyond the warhead; and

a carrier surface member for imparting a controlled rotation and fall speed to the submunition for scanning of the target area in a helical pattern during the fall of the submunition towards the target area, said carrier surface member being pivotally mounted on said warhead between a retracted position and an outwardly extended position, said carrier surface member in said retracted position having its axis of symmetry aligned with the axis of symmetry of said warhead and in said outwardly extended position extends beyond the warhead.

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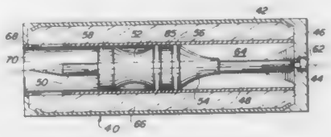
CASED TELESCOPED AMMUNITION ROUND FOR A FIN STABILIZED PROJECTILE

J. Bruce Warren, Wayzata, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 6, 1988, Ser. No. 190,908

Int. Cl.[4] F42B *5/02*

U.S. Cl. 102—434 **15 Claims**



1. A cased telescoped ammunition round 40 comprising;

a casing 42, having a front end and a rear end;

a rear seal 46 closing the rear end of the casing 42;

a front seal 68 mounted on the front end of the casing 42;

a core tube 48 positioned within the casing 42 in contact with the rear seal 46 and the front seal 68;

a fin stabilized penetrator 50 having fins 60;

a sabot 52 mounted on the penetrator 50, said sabot and

penetrator **50** being positioned completely within the core tube **48** with the fins **60** of the penetrator substantially in contact with the rear seal **46**;

a main propellant charge **66** positioned around core tube **48** within casing **42** and between the front and rear seals **68**, **46**;

a booster propellant charge **64** positioned in the space defined by the core tube **48**, the rear seal **46**, the sabot **52** and the penetrator **50**;

primer means **62** mounted in the rear seal **46** for igniting the booster propellant charge **64** when initiated; and

means **70** for providing an ignition path for the ignited booster propellant charge **64** to ignite the main propellant charge **66** when the sabot **52** has moved a predetermined distance with respect to the core tube **48**.

4,858,534

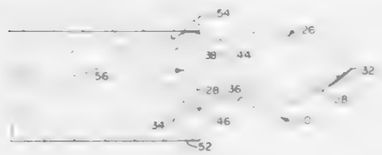
BALLISTIC LUBRICATING AND PROCESS

William G. Wallace, Aurora, Ill., assignor to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 855,128, Apr. 23, 1986, Pat. No. 4,735,146. This application Feb. 10, 1988, Ser. No. 154,654

Int. Cl.[4] F42B *11/20, 31/02*

U.S. Cl. 102—511 **2 Claims**



1. A ballistic lubricating process for extending the life of a barrel of a weapon, comprising the steps of:

shooting a projectile from a shell through a barrel of a weapon with a propellant by igniting and exploding said propellant;

said propellant emitting corrosive gases during said shooting;

expelling a borated lubricating grease from said projectile during said shooting;

borating said barrel of said weapon by substantially coating said barrel with said borated lubricating grease before a substantial amount of said corrosive gases can contact said barrel; wherein

said borated lubricating grease comprises from about 60% to about 85% by weight base oil, from about 3% to about 20% by weight thickener, and from about 1% to about 20% by weight borate.

4,858,535

INTERCIRCULATION TUNNEL BETWEEN VEHICLES

Jean-Pierre Bechu, Courbevoie, and Jacques J. Champleboux, Clermont-Ferrand, both of France, assignors to Caoutchouc Manufacture et Plastiques, Bezons, France

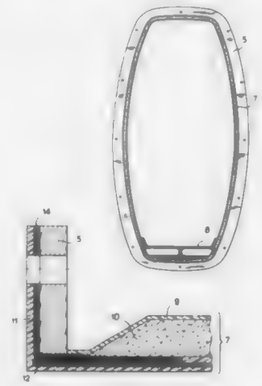
Filed Jun. 16, 1986, Ser. No. 874,717

Claims priority, application France, Jun. 14, 1985, 85 09011

Int. Cl.[4] B60D *5/00;* **B61D** *17/22*

U.S. Cl. 105—15 **10 Claims**

1. An intercirculation tunnel between successive railroad cars or highway vehicles providing protection against bad weather and atmospheric agents as well as noise and heat insulation which comprises a unitized structure having a substantially oval cross section and formed of a self-supporting composite multi-layer wall which is elastically deformable; said wall comprising an outer layer made of a compact elastic polymer material for providing said protection against bad weather and atmospheric agents, an intermediate layer made of elastic cellular material for providing noise and heat insulation coextensive with the outer wall and an inner layer made of elastic polymer material covering said intermediate layer; said intermediate layer being intimately linked to adjacent layers,



ensuring noise insulation and essentially constant spacing of layers throughout the extent of said layers and said inner layer, made of a compact elastomer completing the noise insulation and protection of pasengers within said tunnel.

4,858,536

ASH PAN ASSEMBLY FOR WOOD BURNING STOVE

John H. Guest, Norwich, and Lewis E. Crain, Randolph, both of Vt., assignors to Vermont Castings, Inc., Randolph, Vt.

Filed Apr. 9, 1986, Ser. No. 849,683

Int. Cl.[4] F23J *1/00*

U.S. Cl. 110—166 **8 Claims**



1. A heating apparatus for burning solid fuels comprising:

a frame assembly defining a combustion chamber; and

an ash pan assembly positioned below said combustion chamber for receiving ashes therefrom, said ash pan assembly including

an ash pan door hinged to a front wall of said frame assembly for pivoting about a vertical axis to and between an ash collection position and an open position,

an ash pan generally in the form of an open-topped box including means for attachment to an ash pan cover,

means for mounting said ash pan to said ash pan door so as to be easily removable therefrom, said mounting means comprising support bracket means extending rearwardly from said door or opposite sides of said ash pan, said ash pan including outwardly overhanging ribs for resting on said support bracket means, and

an ash pan cover engagable with said ash pan and having a handle for lifting said ash pan from said ash pan door when said ash pan door is in said open position.

4,858,537

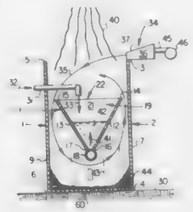
COMBUSTION METHOD AND APPARATUS

William F. Priebe, Midland; Brad R. Milliken, Coahoma, and Dennis A. Braaten, Midland, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 234,765, Aug. 22, 1988. This application Jan. 5, 1989, Ser. No. 294,080

Int. Cl.[4] F23G *5/00*

U.S. Cl. 110—243 **5 Claims**



1. In apparatus for the combustion of a hydro-carbonaceous material to reduce visible emissions and remove at least some particulate solids, the improvement comprising a pair of spaced apart upstanding elongate wall means having upper and lower longitudinally extending edge means joined by upstanding end edges, said spaced apart wall means being adapted to contain and direct an oxygen containing gas curtain in the space between same, an elongate combustion trough means carried in said space between said spaced apart wall means, said trough means being spaced above said lower edge and below said upper edge of said spaced apart wall means and extending for a substantial portion of the length of said spaced apart wall means, said trough means comprising upwardly diverging side means which extend for a substantial portion of the length of said spaced apart wall means, said side means terminating at their top edge so that said top edge is spaced inwardly from said spaced apart wall means to provide a gap between said top edge and said spaced apart wall means through which said gas curtain can pass, said side means terminating near their bottom edges on at least one conduit means, each said conduit means extending essentially the length of said trough means and having a plurality of aperatures along the length thereof for admitting at least one fluid to the interior of said trough means between said side means, said side means being joined at both ends of said trough means by end means which define a closed interior for said trough means, means for feeding combustible material to said closed interior of said trough means, and means for establishing said oxygen containing gas curtain around said trough means and between said spaced apart wall means.

4,858,538

PARTIAL COMBUSTION BURNER

Willem F. Kuypers, and Hendrikus J. A. Hasenack, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 16, 1988, Ser. No. 207,471

Int. Cl.[4] F23D *1/02*

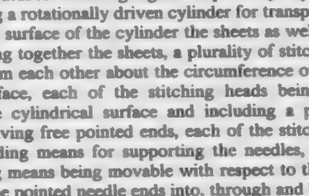
U.S. Cl. 110—264 **5 Claims**

1. A burner for the partial combustion of finely divided solid carbonaceous fuel with a an oxygen-containing gas in a combustion zone, said burner having a supply end and a discharge end and comprising:

a central channel disposed along a longitudinal axis of the burner and having an outlet at the discharge end of the burner for supplying fuel to the combustion zone;

a substantially annular channel disposed coaxially with said central channel and having an outlet forming the throat of the burner with a diameter D, at the discharge end of the burner and configured to supply oxygen-containing gas flow to intersect the fuel from said central channel;

a hollow wall member disposed at the discharge end of said burner and coaxially with said substantially annular channel, said hollow wall member having a construction defining an internal passage for fluid coolant, said passage having a first end adjacent to said substantially annular channel and another end adjacent to the lateral periphery of the burner at said discharge end said hollow wall member having a curvilinear outer surface including an arcuate shape substantially normal to the longitudinal axis of the burner extending from the outlet of said substantially annular channel to the lateral dimension of the burner, said curvilinear outer surface extending in the downstream direction of said throat a distance from about 0.2 to



about 1 D, said hollow wall member at the lateral periphery of the burner extending from said discharge end of the burner toward the supply end of the burner for a distance of at least one-half D, said hollow wall member internal passage being of substantially uniform cross-sectional area in a radial direction; said hollow wall member being operatively connected to: (a) a supply conduit disposed adjacent to said substantially annular channel to supply fluid coolant to a proximate first end of said hollow wall member and (b) a return conduit disposed to pass fluid coolant proximately from the other end of said hollow wall member whereby fluid coolant flows outwardly and substantially radially through said hollow wall member from said supply conduit; said hollow wall member being dimensioned for substantially constant momentum of coolant flow therethrough.

4,858,539

ROTATIONAL SWITCHING APPARATUS WITH SEPARATELY DRIVEN STITCHING HEAD

Frank Schumann, Machern, German Democratic Rep., assignor to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, Fed. Rep. of Germany

Filed Mar. 1, 1988, Ser. No. 162,433

Claims priority, application German Democratic Rep., May 4, 1987, 302355

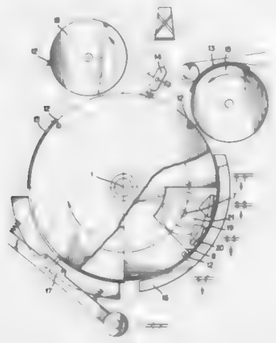
Int. Cl.[4] D05B *3/00, 69/02;* **B42B** *1/02*

U.S. Cl. 112—21 **4 Claims**

1. Apparatus for stitching together a plurality of paper sheets comprising a rotationally driven cylinder for transporting on a cylindrical surface of the cylinder the sheets as well as thread for stitching together the sheets, a plurality of stitching heads spaced from each other about the circumference of the cylindrical surface, each of the stitching heads being recessed within the cylindrical surface and including a plurality of needles having free pointed ends, each of the stitching heads also including means for supporting the needles, the needle supporting means being movable with respect to the cylinder to drive the pointed needle ends into, through and back out of said sheets on the cylindrical surfaces of the cylinder thereby to stitch said sheets together by means of said thread, each of the stitching heads also including a cam shaft and a cam fixed on the cam shaft and connected to the needle supporting means for effecting said movement of said needle supporting means, a

drive shaft for the cylinder, the cylinder being fixed on the drive shaft coaxially therewith, a sun gear rotationally mounted on the drive shaft, a respective planetary gear fixed on each of the cam shafts, the sun gear being in engagement with the planetary gears for driving the cam shafts, and a gear train connecting the drive shaft directly to the planetary gear for driving of the planetary gear by the drive shaft, gear ratios of the gears being predetermined so that each of the cam shafts makes an integral number of revolutions of at least one for each revolution of the drive shaft.

4. Apparatus for stitching together a plurality of paper sheets comprising a rotationally driven cylinder for transporting on a cylindrical surface of the cylinder the sheets as well as thread for stitching together the sheets, the cylinder being split in a radial plane into two cylinder halves, a plurality of stitching stations spaced from each other about the circumference of the cylindrical surface, an axle for the cylinder, the cylinder being



rotatably mounted on the axle, each of the stitching stations including a shaft axially parallel to the axle and interconnecting and rotatably supported by the cylinder halves, a respective gear fixed on each said shaft, a respective pulley fixed on each said shaft, a pulley fixed on the axle and located between the cylinder halves, a belt drivingly engaging the pulley on the shaft and the pulley on the axle, each of said stitching stations including a pin axially parallel to the axle and the shaft and fixed to one of said cylinder halves and extending into a space between the cylinder halves, each of said stitching stations including a respective stitching head slidably mounted on each said pin, and the stitching head including a gear in engagement with the gear on the shaft, the gear on the shaft being of greater axial dimension than the gear of the stitching head so that the position of the stitching head may be adjusted by sliding the stitching head on the pin while the gear of the stitching head remains in engagement with the gear on the shaft.

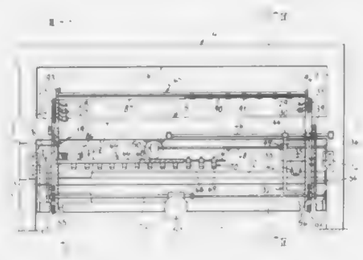
4,858,540

QUILTING MACHINE WITH ADJUSTABLE-LENGTH CLOTH-HOLDER CYLINDER

Rodolfo Resta; Mario Resta, and Roberto Resta, all of Faenza, Italy, assignors to Resta Commerciale S.r.l., Faenza, Italy

Filed Jan. 7, 1988, Ser. No. 142,113
Int. Cl.[4] D05B *11/00*
U.S. Cl. 112—117 **6 Claims**

1. Quilting machine comprising a main frame including vertical columns, an upper horizontal beam, an intermediate horizontal beam and a lower horizontal beam, said beams connecting said vertical columns, said upper and intermediate beams defining an upper and a lower opening and said lower beam extending through said lower opening, a cloth-holder cylinder rotatably supported on said main frame and surrounding said intermediate and lower beam, said cylinder having a rotation axis parallel to said beam, means provided on said cylinder for fastening a cloth thereof according to a cylindrical surface, a C-shaped slider slidingly mounted on said upper and intermediate beams and having two parallel portions externally and internally extending with respect to said cylindrical surface, on said external portion being mounted a sewing head and on said internal portion being mounted a "crochet" device



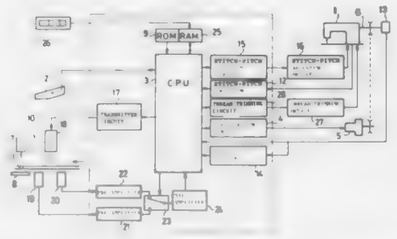
cooperating with said sewing head, meand being further provided for moving said slider along said upper and intermediate beams and for rotating said cylinder to cause said sewing head to follow a predetermined sewing line.

4,858,541

APPARATUS FOR TERMINATING THE LAST STITCH AT A PREDETERMINED POINT

Masato Ozawa, Hino, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,195
Claims priority, application Japan, Feb. 25, 1987, 62-42232
Int. Cl.[4] D05B *19/00, 27/22*
U.S. Cl. 112—121.11 **2 Claims**



1. In a sewing machine, an apparatus for terminating the last stitch at a predetermined point on a workpiece, comprising:

speed setting means for setting either high speed or medium speed operation of the sewing machine,

a first detector located behind a needle entry in the workpiece feed direction for detecting an end of the workpiece and generating a first signal in response thereto,

a second detector located at a predetermined distance behind said first detector in the workpiece feed direction for detecting the end of said workpiece and generating a second signal in response thereto, said predetermined distance being sufficient to reduce from high speed to medium speed operation,

first stitching means for stitching at high speed operation when the sewing machine starts,

calculating means for calculating a number of stitches by subtracting the number of stitches required to reduce from high speed to medium speed operation from the number of stitches to be conducted at medium speed operation over said predetermined distance and generating a third signal indicative thereof in response to said second signal,

second stitching means responsive to said third signal for successively stitching at high speed operation to stitch a length corresponding to said calculated number of stitches and then stitching at medium speed operation, and

means for terminating the stitching in association with said first signal.

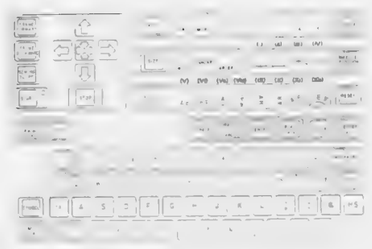
4,858,542

INITIAL OPERATION CONTROLLING SYSTEM FOR A COMPUTER CONTROLLED EMBROIDERING MACHINE

Kenji Kato, and Koji Okutani, both of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Feb. 12, 1988, Ser. No. 155,320
Claims priority, application Japan, Feb. 13, 1987, 62-29515
Int. Cl.[4] D05B *21/00*
U.S. Cl. 112—121.12 **2 Claims**





1. In a computer operated embroidering machine having stitch forming instrumentalities including a vertically reciprocating needle, an embroidering frame for holding a work to be embroidered, drive means for changing the relative positions between the needle and the embroidering frame, memory means for storing pattern data groups, pattern selecting means, means for setting parameters for the size of selected patterns, for the space between the selected patterns to be embroidered and/or for the direction in which the selected patterns are arranged, control means for controlling the stitch forming instrumentalities and the drive means, and means for moving the embroidering frame relative to the needle at a first starting operation while the needle is kept standstill by tracing with the frame an outer configuration of the selected patterns group so as to confirm an embroidering scope of the selected patterns to be embroidered prior to subsequent starting of an embroidering stitching operation of the selected patterns, an improvement comprising an initial control system including means for memorizing the embroidering scope of the selected patterns confirmed by the embroidering frame moving means, and means for designating the omission of the embroidering scope confirming operation in the repeated embroidery stitching operations of the selected patterns.

4,858,543

PLASTIC BOBBIN BASKET WITH NEEDLE GUARD PLATE

Paul Badillo, Lakewood, Colo., assignor to Bakron Corp., Morton Grove, Ill.

Filed Mar. 7, 1988, Ser. No. 165,260
Int. Cl.[4] D05B *57/26*
U.S. Cl. 112—231 **11 Claims**



1. A horizontal lock-stitch bobbin basket comprising a cylindrical side wall, a laterally extending flange on the top of said side wall, a rotation restraining notch formed in the top face of said flange, and a needle-receiving opening or bore in said side wall adjacent said restraining notch to provide for needle clearance, characterized in that said bobbin basket including said side wall is integrally formed of plastic and there is provided needle guarding means in the form of a plate positioned adjacent said bore and secured to said basket side wall for protecting said basket side wall from impact in that the needle of a sewing machine incorporating said bobbin basket does not penetrate into said opening but is directed toward the area of said bobbin basket side wall adjacent to said bore,

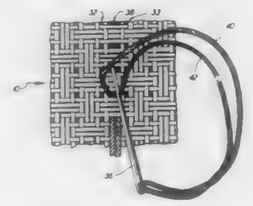
whereby said needle guarding means will protect said area of said bobbin basket sidewall adjacent to said bore from being damaged by said needle and will guide said needle into said bore.

4,858,544

METHOD OF HAND-FORMING NEEDLEWORK PATTERNS

Corinne M. Bridge, 4480 E. Patricia Dr., Clarence, N.Y. 14031

Continuation of Ser. No. 74,982, Jul. 17, 1987, abandoned. This application Mar. 24, 1989, Ser. No. 328,806
Int. Cl.[4] D05B *93/00*; D05C *1/08*
U.S. Cl. 112—266.1 **10 Claims**



1. A method of hand-forming needlework patterns conforming to a predetermined design on an even-weave base fabric of the type having orthogonal warp and weft threads arranged in

thread groups, each of said groups being of uniform height and width and spaced from adjacent thread groups by equal distances whereby the common spaces at the corners of said thread groups form columns and rows of spaced, original openings extending in orthogonal directions in said base fabric, each of said thread groups including at least one warp and one weft float thread, all of said float threads passing over and under all threads of successive thread groups, all of said float threads being accessible from both sides of said base fabric and each of said thread groups including at least one outer thread on both sides of said float threads, said method comprising the steps of:

(a) removing from said base fabric at least those portions of said float threads lying within the peripheral limits of said predetermined design from each of a predetermined plurality of said thread groups in only one of said orthogonal directions, leaving intact all threads in said one orthogonal direction other than said float threads, and leaving in place of the removed float threads columns and rows of spaced, additional openings in said predetermined plurality of thread groups;

(b) threading a needle with a pattern thread;

(c) passing said needle and drawing said pattern thread alternately in upward and downward directions through predetermined ones of said original and/or said additional openings according to said predetermined design along a first row of said openings in said only one of said orthogonal directions between initial and terminal openings in said first row, forming therein a predetermined succession of stitches; and

(d) thereafter passing said needle and drawing said pattern thread alternately in upward and downward directions through predetermined ones of said original and/or said additional openings according to said predetermined design along other rows of said openings, all of said other rows being parallel to said one row, between initial and terminal openings in each of said other rows.

4,858,545

SEWING MACHINE HAVING MEANS FOR TERMINATING SEAMS AT A PREDETERMINED PLACE

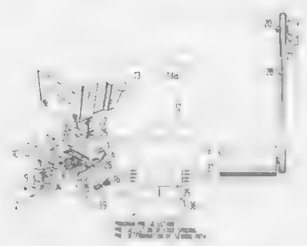
Siegmund Balke, Spenge, and Günter Lütkemeyer, Bielefeld, both of Fed. Rep. of Germany, assignors to Durkoppwerke GmbH, Fed. Rep. of Germany

Filed May 21, 1987, Ser. No. 52,717

Claims priority, application Fed. Rep. of Germany, May 22, 1986, 3617204

Int. Cl.⁴ D05B *69/22*

U.S. Cl. 112—275 **28 Claims**



1. A sewing machine adapted for moving a workpiece in a downstream direction for sewing a seam therein, and for automatically terminating said seam at a predetermined point a selected distance from a trailing edge of said workpiece, the sewing machine comprising:

base means;

arm means mounted on the base means;

drive means, for driving a sewing needle, said sewing needle being movably mounted on the arm means to make stitches at a sewing point on the base means, said drive means also driving a feed dog on the base means adjacent the sewing point which engages the workpiece and performs repetitive strokes, thereby moving the workpiece past said sewing point in said downstream direction;

edge sensing means on the base means, located a predetermined distance upstream of said sewing point for sensing the downstream passage of such trailing edge, and generating edge sensing signals in response thereto;

stroke sensing means on the base means for sensing the length of said strokes of the feed dog and generating stroke length signals which are indicative of said stroke length and of the length of said stitches;

stopping means on the base means for being actuated to engage the workpiece to stop its movement when the sewing needle is at the predetermined point for terminating the seam; and

control means for receiving the edge sensing signals and the stroke length signals, determining therefrom a time when the sewing needle will be at said predetermined point, and generating a stopping signal for actuating the stopping means at said time;

wherein said stroke sensing means is located in the immediate vicinity of the feed dog for directly sensing its strokes;

wherein said feed dog is driven by said drive means via linkage means and said stroke sensing means is located at least partially on one of said feed dog and said linkage means; and

wherein said stroke sensing means comprises a magnet secured to one of said feed dog and said linkage means, and a Hall effect sensor secured to said base means immediately near said magnet for sensing motion of said feed dog.

4,858,546

HEMMER SEAMER ASSEMBLY

Maximilian Adamski, Palatine; Robert L. Kosrow, Hoffman Estates, and Stephen Ruderman, Oak Park, all of Ill., assignors to Union Special Corporation, Chicago, Ill.

Division of Ser. No. 162,919, Mar. 2, 1988, Pat. No. 4,800,830.

This application Oct. 11, 1988, Ser. No. 256,334

Int. Cl.⁴ D05B *65/06*

U.S. Cl. 112—286 **20 Claims**

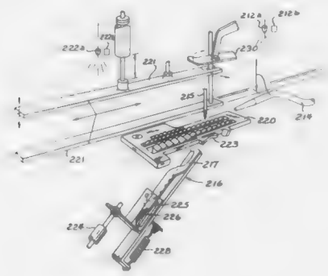
1. A device for sewing a fabric, comprising:

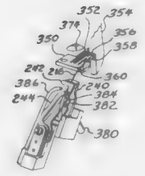
a sewing machine having a needle for forming a chain of stitches onto a sewn fabric;

a support plate for the fabric;

means for transporting a fabric into position for sewing by the sewing machine above the support plate;

means for initiating sewing of the transported fabric;





means for sensing a trailing edge of the sewn fabric; and

means responsive to the sensing means for positioning the chain forwardly of the needle.

4,858,547

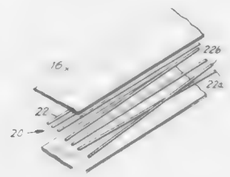
FABRIC HAVING SANDWICH STRUCTURE

Herschel Sternlieb, Brunswick, Me., assignor to W. S. Libbey Co., Lewiston, Me.

Filed Jan. 27, 1987, Ser. No. 6,800

Int. Cl.⁴ B32B *7/08*

U.S. Cl. 112—420 **16 Claims**



1. A fabric having a lengthwise direction, said fabric comprising:

a first substrate layer extending in said lengthwise direction;

a second substrate layer extending in said lengthwise direction;

said first and second substrate layers being at least translucent;

a layer of filling material sandwiched between said first and second substrate layers, said layer of filling material including a plurality of substantially parallel, adjacent and spaced apart strands of yarn running in said lengthwise direction of said fabric between said first and second substrate layers; and

a stitching yarn extending in a direction which is substantially transverse to said lengthwise direction, for securing together said first substrate layer, said second substrate layer and said layer of filling material.

4,858,548

NEEDLE BAR AND FEED DRIVES FOR A ZIG-ZAG SEWING MACHINE

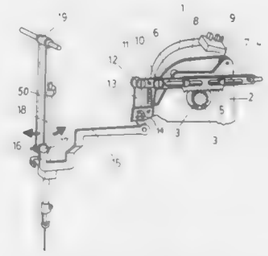
Fernando C. Echeverria, Eibar (Guipuzcoa), Spain, assignor to Maquinas de Coser Alfa, S.A., Eibar (Guipuzcoa), Spain

Filed Jan. 9, 1987, Ser. No. 1,900

Claims priority, application Spain, Feb. 3, 1986, 551,582

Int. Cl.⁴ D05B *3/02, 3/04, 55/14*

U.S. Cl. 112—443 **8 Claims**



1. In a sewing machine using a needle, a means for driving a zig-zag mechanism and a feed carriage mechanism, wherein said zig-zag mechanism includes a needle bar and a needle bar support connected to said needle bar and having an upper end, said needle bar support being pivotally connected at said upper end to the sewing machine, and the means for driving comprising:

a rack;

a stepper motor connected to said rack to move said rack in a to and fro motion;

lever means connected to said rack for imparting to the needle a to and fro rocking motion so as to achieve a zig-zag motion of the needle, said lever means including an elongated cambered double-shaped lever with a curved end;

said double shaped lever being connected at said curved end to said needle bar support,

whereby said lever means imparts to the needle a to and fro rocking motion so as to achieve a zig-zag motion of the needle.

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FAST BOAT

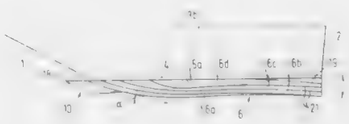
Wilhelm Boden, Kappeln, Fed. Rep. of Germany, assignor to Dealermain Ltd., London, England

Filed Oct. 7, 1986, Ser. No. 916,195

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1985, 3536408

Int. Cl.⁴ B63B *1/18*

U.S. Cl. 114—56 **14 Claims**



1. In a fast boat including a boat hull having a longitudinal centre line with a front stem, a stern, two side walls and a bottom plate having a bottom surface facing the water, in which on each side of said longitudinal centre line on said

bottom surface respectively is a sliding skid provided with outward ascending, stepped sliding steps which are graded with respect to each other, and a keel skid in a midships plane is provided with outward ascending, stepped keel steps which are graded with respect to each other and arranged on both sides thereof, wherein said bottom surface disposed between said sliding skids provides a bottom wall for at least one aeration channel, and said boat hull is equipped with a bow fin, an improvement comprising:

means to provide lifting forces for acting upon said boat hull at substantialy all speeds to maintain the boat in a predetermined statical and/or dynamic floatation position in the water relative to a water line (26) of the boat to obtain optimal driving navigational qualities, wherein the weight of the boat in combination with the lifting forces, which work against an underwater part of the boat hull up to the water line (26), are distributed such that at least partial areas of front approach inclinations of the keel skid (10) and the sliding skids (6) are positioned above the water line (26) and then are submerged into the water below the water line (26) in an area between a leading edge of the bottom plate (4) and longitudinal middle of the bottom plate (4);

a forward-lying portion of the bottom surface (5) in said floatation position being above the water line (26) from the leading edge of the bottom plate (4) to about the longitudinal middle of the bottom plate (4) to form with the water line (26) a wedge-shaped space narrowingly extending to the longitudinal middle of the bottom plate (4);

said means including a first inclination (19) provided in said bottom surface (5) between the sliding skids (6), said first inclination (19) extending rearwardly from the bottom wall of the aeration channel (20) so that the lifting forces generated by the aeration channel (20) act against said first inclination (19) to lift up said boat hull;

said first inclination (19) being positioned between a longitudinal centre of the boat and the stern;

said first inclination (19) declining in a downwardly direction from said longitudinal centre towards the stern relative to the sliding skid (6); and

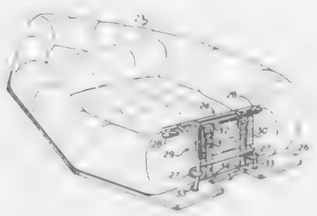
a second inclination (21) being arranged in a stern area of at least one of the sliding steps (*6a, 6b, 6c, 6d*) to coact with said first inclination (19) for lifting up said boat hull.

4,858,550

DETACHABLE INFLATABLE BOAT BOTTOM

Paul A. Bellia, P.O. Box 60612, San Diego, Calif. 92106

Filed Jan. 25, 1988, Ser. No. 148,089
Int. Cl.[4] B63B *39/03*
U.S. Cl. 114—345 **3 Claims**



1. In combination with an inflatable boat having a bow and bottom surface spanning a hull, said hull made of at least one inflatable generally cylindrical bladder defining said bow and starboard and port sides, a detachable bottom assembly which comprises:

a plurality of rigid selectively attachable and detachable bottom segments;

means for removably joining edges of said segments to form said bottom assembly comprising interlocking each side of said segments;

said segments when joined along their edges being generally shaped and dimensioned to conform to said bow and bottom surface, providing both longitudinal and transverse rigidity between said segments and forming a bow which is capable of providing hydrodynamic lift to said inflatable boat when propelled through water; and

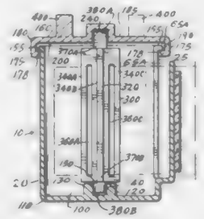
means for removably attaching said bottom assembly to said hull, said means for removably attaching said bottom assembly comprises a ring secured to the front edge of said bottom assembly and at least one strap engaging said ring and a part of said hull.

4,858,551

PORTABLE AND REUSABLE SAFETY MARKER FOR DISABLED VEHICLES

William H. Peters, Rural Route 3, Bryan, Ohio 43506

Filed Mar. 3, 1988, Ser. No. 163,785
Int. Cl.[4] B60Q *7/00*
U.S. Cl. 116—30 **2 Claims**



1. A safety-marking device for a disabled vehicle comprising:

(a) a housing member having a hollow interior chamber, said housing member having a longitudinal central axis, and said housing member having an upper covering and a lower covering, and said housing member having a vertical extending enclosure extending from said upper covering to said lower covering, and wherein said vertical enclosure has a longitudianlly extending slot therein communicating from the inside to the outside and wherein said slot is generally parallel to the longitudinal central axis of said housing member, and wherein said housing member has a circumferential lip over over the upper edge thereof, and wherein said slot has an L-shaped covering over a portion thereof to cover a portion of said slot in a vertically longitudinal manner;

(b) longitudinally extending spool means disposed in a longitudinal manner parallel to the longitudinal central axis of said housing member and wherein said spool member is mounted in the housing for rotatable movement within said housing, said spool member being comprised of two intersecting planar members disposed about a central axial member, with each planar member having a longitudinal opening therein;

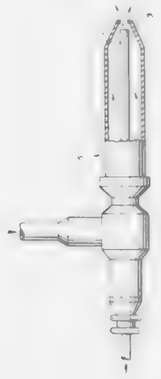
(c) marker tape means rotatably mounted in spiral fashion on said spool means, said marker tape means having a first end and a second end, said first end being affixed to the pool means and said second end being adapted to be drawn from the slot in the housing member, said marker tape having magnetic means on the first end thereof.

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APPARATUS PELLETIZING PARTICLES

Werner Glatt, and Reinhard Nowak, both of Binzen, Fed. Rep. of Germany, assignors to Glatt GmbH, Binzen, Fed. Rep. of Germany

Filed Mar. 18, 1987, Ser. No. 27,431
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1986, 3609133
Int. Cl.[4] A23G *3/26*
U.S. Cl. 118—19 **39 Claims**



1. An apparatus for pelletizing a fluidizable material comprising:

a fluid bed chamber for receiving said material and for permitting passage of an upwardly flowing stream of gas therethrough, wherein said material becomes entrained in said gas stream, said chamber including base means, other sidewalls extending upwardly from said base means and an upper end having an open portion wherein said upper end is opposite said base means, said base means including a plurality of perforations therein for permitting entry of said gas stream into said chamber;

means disposed in said chamber for spraying a fluid onto said entrained material, thereby inducing a portion of said entrained material to agglomerate and to form relatively plastic particles, and for coating said particles;

rotatable means, disposed in said upper end of said chamber within said gas stream, including a guide surface against which said particles impinge, for shaping said particles into pellets and for deflecting said particles outwardly toward said sidewalls of said chamber; and

wherein the vertical position of said rotatable means is adjustable.

4,858,553

SHORT-DWELL COATER

Sivert Westergard, and Pekka Koivukunnas, both of Järvenpää, Finland, assignors to Valmet Paper Machinery Inc., Helsinki, Finland

Filed Jul. 24, 1987, Ser. No. 77,250
Claims priority, application Finland, Jul. 25, 1986, 863048
Int. Cl.[4] B05C *11/04*
U.S. Cl. 118—126 **5 Claims**

1. A short-dwell coater comprising:

a backing roll for guiding paper web, said backing roll having a shaft;

a nozzle apparatus consisting of an upper lip and a lower lip, with which the coating mix can be applied to the web backed by the surface of the backing roll;

a member for doctoring excess mix applied with the nozzle apparatus;

a mounting fixture to which the doctoring member is attached;

a supporting structure by which the mounting fixture is supported; and

actuator means to which the nozzle apparatus is fitted for moving said nozzle apparatus in relation to the doctoring member, said actuator means comprising a backing roll support lever for pivotably mounting said nozzle apparatus to the shaft of the backing roll and comprising an actuator member for pivotably moving the nozzle apparatus relative to the backing roll and to the doctoring member for adjusting dwell length between the doctoring member and the nozzle apparatus.

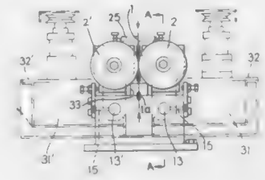


4,858,554

SOLDER COATING APPARATUS

Tomio Tsuchiya, Shizuoka, Japan, assignor to Fuji-Seiki Machine Works, Ltd., Shizuoka, Japan

Filed Aug. 31, 1988, Ser. No. 238,923
Claims priority, application Japan, Sep. 2, 1987, 62-217956
Int. Cl.[4] B05C *1/02, 1/08*
U.S. Cl. 118—224 **9 Claims**



1. In a solder machine for simultaneously applying thin solder coatings to opposite sides of leads associated with a plurality of I.C. devices as mounted in longitudinally spaced relationship on an elongate lead frame, comprising:

frame means;

tank means including first and second sidewardly spaced chambers containing a molten liquid solder bath therein and disposed on opposite sides of a narrow vertically extending passage for permitting a lead to pass vertically therethrough, the level of the molten solder bath in said chambers being substantially the same and at an elevation slightly below the elevation of the upper end of the passage;

first and second movable supports pivotally mounted on said frame means for pivoting movement about respective first and second pivot axes, said first and second pivot axes extending generally horizontally and being disposed in generally spaced but parallel relationship;

first and second drive shafts respectively rotatably sup-

ported on said first and second movable supports, said first and second drive shafts respectively defining first and second rotational axes which extend generally horizontally in sidewardly spaced and parallel relationship with one another, said first and second rotational axes being disposed generally parallel with and spaced radially a substantial distance from the respective first and second pivot axes, and each of said first and second drive shafts including an elongated cantilever shaft portion which projects outwardly from said frame means so as to be disposed directly above said chambers;

first and second solder coating rolls respectively nonrotatably secured to the cantilever shaft portions of said first and second drive shafts adjacent the free ends thereof, said first and second rolls being disposed sidewardly closely adjacent but slightly spaced from one another to define a narrow nip therebetween which is vertically aligned above said passage, said first and second rolls being vertically disposed relative to the chambers so that only the lower portions of said rolls dip into the molten solder bath, said rolls defining therein a radially inwardly directed recess which extends angularly around the periphery thereof for loosely accommodating the resin package associated with the I.C. devices therein to prevent application of hot molten solder to the resin package;

control means for effecting simultaneous swinging movement of said first and second supports inwardly toward one another for maintaining said supports in an innermost position to maintain a minimum predetermined width at said nip; and

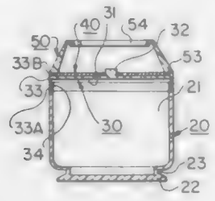
drive means drivingly connected to said first and second drive shafts for causing simultaneous and synchronized rotation of said drive shafts and of said rolls in opposite rotational directions.

4,858,555

FINGER MOISTENER FOR HANDLING MONEY

Dennis J. Arsene, 5711 Highfield Drive, Burnaby, B.C., Canada V5B 1E4, and Darren J. Lee, 7310 Montecinir Street, Burnaby, B.C., Canada V5A 3J1

Filed Jul. 29, 1988, Ser. No. 225,794
Int. Cl.[4] B05C *1/00*
U.S. Cl. 118—270 **7 Claims**



1. A moistening device comprising:

a. a container having a liquid holding compartment and at least one aperture in a top wall thereof;

b. a plate like member, movably mounted on said top wall selectively to cover and uncover said aperture(s);

c. an annular wall, extending upwardly beyond said top wall; and

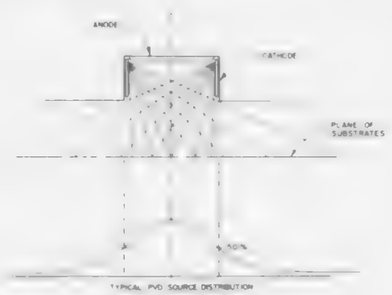
d. a body of absorbent material surrounded by said annular wall and retained thereby on said container.

4,858,556

METHOD AND APPARATUS FOR PHYSICAL VAPOR DEPOSITION OF THIN FILMS

Jerome F. Siebert, 5991 S. Vale Rd., Boulder, Colo. 80303

Filed Sep. 15, 1986, Ser. No. 907,274
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—664 **47 Claims**



1. A physical vapor deposition system comprising:

at least one substrate;

at least one source for processing a thin film on the surface of said substrate;

a source-operating means for operating said source at different sets of values of operating parameters during said thin film processing;

a motion-and-positioning means for moving said substrate into different positions relative to said source during said thin film processing;

a calibration means for measuring and predicting the hypothetical processing profiles of said thin film processing, where a said hypothetical processing profile is the amplitude and shape of the result of said thin film processing per unit processing time obtained at any one of said processing positions while using any one of said sets of values of source operating parameters;

a modeling means for predicting the final processing profile of said thin film on said substrate that results from any specified weighted superposition of said hypothetical processing profiles; and

a control means for said source-operating means and said motion-and-positioning means for implementing any desired source-operating scenario and motion-and-positioning scenario during said thin film processing in order to effect any said weighted superposition;

to this predict and achieve a desired range of said final processing profiles of said thin film on said substrate, where said range is limited only by the diversity in shapes of said hypothetical processing profiles.

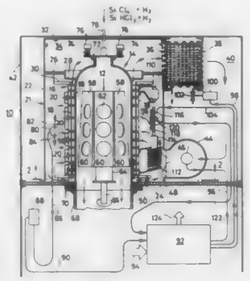
4,858,557

EPITAXIAL REACTORS

Vittorio Pozzetti, Brugherio; Piergiovanni Poggi, and Franco Preti, both of Milan, all of Italy, assignors to L.P.E. Spa, Milan, Italy

Continuation-in-part of Ser. No. 756,084, Jul. 17, 1985, abandoned. This application Jul. 15, 1987, Ser. No. 73,483
Claims priority, application Italy, Jul. 19, 1984, 21960 A/84; Apr. 24, 1987, 20255 A/87
Int. Cl.[4] C23C *16/46, 16/52*
U.S. Cl. 118—725 **27 Claims**

1. A reactor for the deposition of epitaxial layers from a vapor phase on crystalline substrates comprising a susceptor rotatable about its axis and heated by means of electrical currents induced by turns of a coil, said susceptor being housed in a bell jar of insulating and optically transparent material, such as quartz, said bell jar being surrounded by a reflector for reflecting to said susceptor the heat irradiated therefrom during operation, said reflector being formed by optically finished internal sides of the turns of the coil, said turns being hollow conductors through which a cooling liquid flows, said turns being spaced apart from each other so as to have minimal



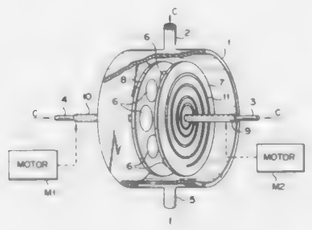
discontinuities of the reflector and being fixed in a mechanically steady configuration, and means for controlling local variations in the magnetic field inside the coil, necessitated by required local power variations in said susceptor, said means subtracting or adding reactive currents from or to turns of the coil corresponding to susceptor regions in which said power variations are required.

4,858,558

FILM FORMING APPARATUS

Masanori Ohmura; Hiroshi Sakama, and Kenji Araki, all of Tokyo, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1988, Ser. No. 146,712
Int. Cl.[4] C23C *16/46, 16/52*
U.S. Cl. 118—725 **11 Claims**



1. A film forming apparatus comprising:

a reaction furnace having a reaction chamber therein;

means coupled to said reaction furnace for introducing a reactive fluid, into said reaction chamber;

means coupled to said reaction furnace for discharging a reactive fluid from said reaction chamber;

at least two susceptors located in a generally vertical position in said reaction chamber and having respective sides facing each other;

means for holding on each of said facing sides of the respective susceptors a plurality of objects to be subjected to a film formation process; and

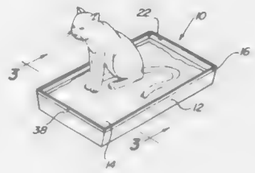
rotating means for rotating at least one of said susceptors, around an axis substantially perpendicular thereto, relative to another of said at least two susceptors.

4,858,559

DISPOSABLE PET TOILET UNIT

Pamela J. Allen, 1449 Roods Lake Rd., Lapeer, Mich. 48446

Filed Oct. 13, 1987, Ser. No. 108,245
Int. Cl.[4] A01K *67/00*
U.S. Cl. 119—1 **3 Claims**



1. A disposable pet toilet unit for use by household pets to defecate and urinate in, whereby odors may be absorbed, comprising:

a body portion of a moisture-proof material having a bottom and a plurality of sides extending upwardly therefrom to form an opening to a central chamber defined by the sides and the bottom, eachh side having an inner face and an outer face, said inner face of each side facing inward towards said opening, said body portion having an outer edge around the perimeter of the opening on the outer faces of said sides;

a deodorizing, absorbent, granular material contained within the chamber of the body portion and extending upwardly along the inner faces of said sides to a predetermined level of absorbing moisture and odors from defecation and urination;

a moisture-proof film permanently attached to said body portion and gatherable about the opening thereof;

said film being permanently attached to said body portion about said outer edge of said opening and folded over the top of said sides and onto the inner faces of said sides for ease of gathering, said film being folded onto itself on the inner faces of said sides at a location substantially above said predetermined level of granular material such that said folded film only extends a relatively small distance into said opening;

closure means associated with said moisture-proof film for gathering said film together about said opening by unfolding said film to substantially seal said body portion when said deodorizing, absorbent, granular materail becomes sufficiently soiled so as to no longer adequately deodorize and absorb odor and moisture, and said film remaining attached to said body portion before, during and after said gathering;

wherein said closure means is adapted to include a drawstring, and an outer end of said film is folded and fastened to itself to form a facing having a pathway therethrough into which said drawstring is contained, whereby when the drawstring is pulled, the outer end of said film is drawn together, unfolding said film from said body portion to close the opening;

whereby said body portion and film are transported and discarded as a one-piece disposable unit without spillage or leakage of the soiled deodorizing, absorbing, granular material.

4,858,560

METHOD OF BREEDING POULTRY FOR FOOD

Kunioki Hayashi, Kagoshima; Hironori Tanaka, Yokohama; Tsutomu Sasagawa, Shizuoka; Isao Uemura, Kasukabe, and Akira Aizawa, Ohamishirasato, all of Japan, assignors to Toyo Jozo Co., Ltd., Shizuoka and Ise Chemical Industries Co., Ltd., Tokyo, both of, Japan

Filed Dec. 24, 1987, Ser. No. 137,809
Int. Cl.[4] A61K *33/18*
U.S. Cl. 119—1 3 Claims

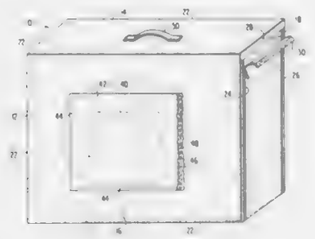
1. Method of breeding poultry for food characterized by feeding feedstuff that contains iodide-and-iodate-containing protein or a reaction product of iodine with a protein to the poultry for food at the age of from 10 to 60 days.

4,858,561

PET LITTER ENCLOSURE

H. Thomas Springer, 169 Portsmouth St., Suite 111, Concord, N.H. 03301

Filed Sep. 6, 1988, Ser. No. 240,328
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 5 Claims



1. An enclosure for accommodating a supply of pet litter comprising:

frame means, flexible cover means supported by said frame means to define a substantially sealed enclosure;

said cover means including a plurality of interconnected panels;

fastener means for at least partially detachably securing one of said panels to adjacent panels to define an opening for the insertion and removal of said frame means and a litter container;

another of said panels having a aperture therein for the passage of an animal;

a cover flap overlying said aperture and partially secured along the periphery thereof to said another of said panels with a portion of the periphery remaining unsecured; and

elastic means secured to said cover flap along the unsecured portion of the periphery to draw the unsecured portion of the periphery of said flap toward said another of said panels to provide a substantially sealed enclosure for the aperture.

4,858,562

REHEAT TYPE WASTE HEAT RECOVERY BOILER AND POWER GENERATION PLANT

Tadao Arakawa; Tsuguo Hashimoto, and Akihiro Kawauchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

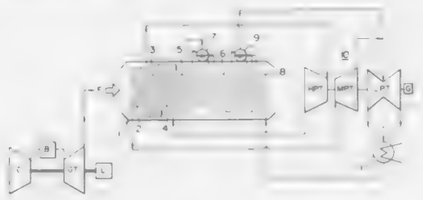
Filed Apr. 26, 1988, Ser. No. 189,406
Claims priority, application Japan, May 6, 1987, 62-109040
Int. Cl.[4] F22D *1/00*
U.S. Cl. 122—7 R 14 Claims

1. A waste heat recovery boiler comprising:

separate high temperature heat exchanger means in which vapor is heat-exchanged with exhaust gas to produce high temperature vapor;

first passage means for supplying said high temperature vapor from said high temperature heat exchanger means to a first turbine means;

low temperature heat exchanger means in which feed water is heat-exchanged with said exhaust gas to produce low temperature vapor, a portion of said low temperature heat



exchange means being disposed in a flow of exhaust gas between said separate high temperature heat exchanger means; and

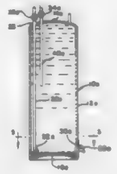
second passage means for supplying said low temperature vapor from said low temperature heat exchanger means to a second turbine means.

4,858,563

WATER HEATER CLEANING APPARATUS

Richard C. Perry, 905 Linden Ct., Western Springs, Ill. 60558

Filed Jun. 23, 1988, Ser. No. 210,410
The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.
Int. Cl.[4] F22B *37/50, 37/52*
U.S. Cl. 122—382 2 Claims



1. An apparatus for cleaning a residential or commercial water heater having a top and a bottom without draining and refilling said heater, comprising a water supply source, a single fixed, water-discharging means for permitting a flow of water from said water supply source onto the bottom and within said water heater, said single fixed, water-discharging means being disposed substantially adjacent the bottom of said water heater and providing a stream of water in a generally horizontal pattern across said bottom to dislodge scale and other foreign matter, and further including single tank drain means diametrically opposed to said water-discharging means, said single tank drain means being open while said scale is being dislodged by said stream of water for removing said dislodged scale and foreign matter from said tank while said water is flowing through said water-discharging means.

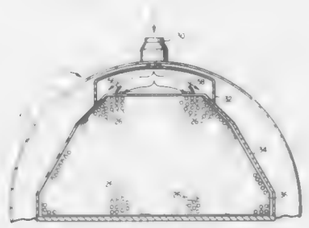
4,858,564

FEEDWATER HEATER WITH IMPROVED STEAM DISTRIBUTION

Charles V. Maffei, Elizabeth, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed May 16, 1988, Ser. No. 194,243
Int. Cl.[4] F22D *1/28, 1/32, 1/40*
U.S. Cl. 122—441 1 Claim

1. A feedwater heater comprising a vessel having an inlet for receiving steam and directing said steam in a flow path through said vessel, a shroud disposed in said vessel for receiving said steam and defining a desuperheater zone in said vessel, a plurality of tubes disposed in said shroud and in said flow path, means for introducing feedwater into said tubes for passing in a heat exchange relation with said steam to condense at least a portion of said steam and to add heat to said feedwater, an impingement plate disposed on the top wall of said shroud and



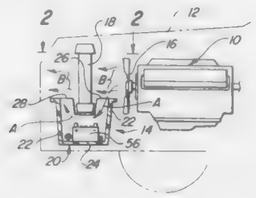
immediately below said inlet for deflecting said steam in a direction transverse to the direction of flow of said steam in said flow path, and two vanes disposed on said top wall of said shroud adjacent the respective opposite sides of said impingement plate and in the path of said deflected steam for distributing steam throughout said tubes.

4,858,565

ENGINE COMPONENT HEATING AND COOLING ASSEMBLY

James A. King, Schofield, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Jul. 11, 1988, Ser. No. 217,194
Int. Cl.[4] F22B *27/00*
U.S. Cl. 123—41.31 3 Claims



1. An internal combustion engine mounted within a compartment, said engine having a fan assembly, and a radiator mounted within said compartment in proximity with said fan assembly, wherein the improvement comprising:

an air flow directing assembly, said air flow assembly including an enclosure located adjacent said radiator, said enclosure having side walls and a bottom wall for supporting an engine component, said enclosure including first and second openings which are formed on opposite sides of said radiator, and said fan assembly directing air flow through said radiator and across said openings such that air flows through said enclosure for heating or cooling said engine component.

4,858,566

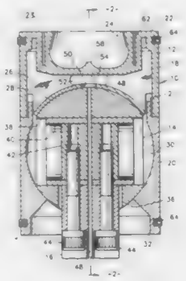
AXIALLY SYMMETRICAL PISTON FOR RECIPROCAL ENGINES

Marius A. Paul, and Ana Paul, both of 969 La Paz, Placentia, Calif. 92670

Filed Mar. 16, 1988, Ser. No. 168,981
Int. Cl.[4] F01P *1/04*
U.S. Cl. 123—41.35 12 Claims

1. A piston assembly for an internal combustion, reciprocal engine in which the piston assembly reciprocates with a compression stroke and an expansion stroke, the assembly comprising:

a cylindrical piston unit having a piston head with a top surface having a central, recessed combustion chamber therein and having a deep, open, circular groove arranged concentrically around the recessed combustion chamber,



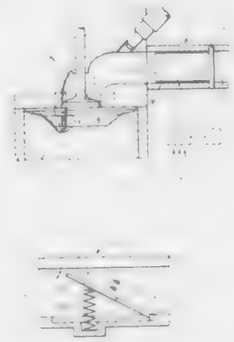
the recessed combustion chamber and the groove being of substantially the same depth for thermally isolating and cooling the combustion chamber and relieving the piston head of thermal expansions said groove being open to its full depth to the top surface of the piston head and constructed and adapted to receive compressed air on the compression stroke and release the compressed air during the expansion stroke.

4,858,567

INTERNAL COMBUSTION ENGINE

Heinrich Knapp, Leonberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 877,939, Jun. 24, 1986, abandoned.
This application Nov. 24, 1987, Ser. No. 129,380
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1985, 3522991
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—52 M 20 Claims



1. An internal combustion engine comprising more than one cylinder (1), a piston (2) operative in each of said cylinders, a cylinder head (3) secured to each of said cylinders, a separate inlet channel (7) extending in said cylinder head to each of said cylinders, a separate fuel injection means for each of said cylinders inserted into said cylinder head having an outlet directed into said inlet channel for each of said cylinders for injecting fuel into said inlet channel, a separate adjoining section (12) upstream of said fuel injection means connected to

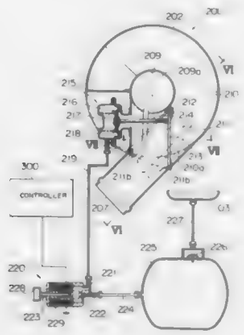
each separate inlet channel (7) for each of said cylinders, each said separate adjoining section (12) for each said separate inlet channel provided with a wall (15) and having a flow area arranged to lead to said inlet channel, an inlet valve (5) for each separate cylinder for introducing a fuel-air mixture to said cylinder, a rectangular flap means (13) pivotably disposed in said flow area of each of said separate adjoining sections (12), pivot means (14) on said wall for said flap means, said flap means further provided with a terminal portion (16), and a spring (20) positioned within each respective adjoining section between said flap means (13) and said wall (15) which applies a closing force on said flap means within said separate adjoining section (12) which, dependent upon suction flow, said flap moves relative to said wall of said inlet channel.

4,858,568

INTAKE APPARATUS FOR INTERNAL COMBUSTION ENGINE

Hideki Obayashi, Okazaki; Yoshitaka Nishio, Nagoya; Tokio Kohama, Nishio, and Hiroyuki Goto, Aajo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 13, 1988, Ser. No. 218,244
Claims priority, application Japan, Jul. 17, 1987, 62-179416
Int. Cl.[4] F02B *27/02*
U.S. Cl. 123—52 M **6 Claims**



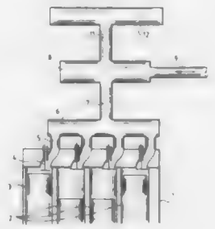
1. An intake apparatus for an internal combustion engine, comprising:
- an air cleaner device including an outer casing, for introducing clean air into a combustion chamber of said internal combustion engine;
- first intake passage means, entirely disposed within said air cleaner device at a substantially central portion of an interior of said air cleaner device, and communicating with said combustion chamber of said internal combustion engine;
- second intake passage means, entirely disposed within said casing of said air cleaner device to helically surround an outer periphery of said first intake passage means, and which selectively communicates with said combustion chamber of said internal combustion engine and has a length which is greater than a length of said first intake passage means;
- valve means, disposed at a position on an outlet side of said first and second intake passage means at which the outlet side of said first intake passage means is prevented from interfering with the outlet side of said second intake passage means when said first intake passage means is closed by said valve means and said second intake passage means is opened, for selectively changing over between a communication state and a shutting off state between said combustion chamber of said internal combustion engine and each of said first and second intake passage means;
- drive means for driving said valve means to cause said valve means to effect said changing-over operation; and
- a controller for controlling said drive means in correspondence with an operating state of said internal combustion engine to allow said valve means to effect said changing-over operation.

4,858,569

RECIPROCATING PISTON-TYPE INTERNAL COMBUSTION ENGINE WITH RESONANCE CHARGING

Gyula Caer, Budapest; Antal Csikos, Érdliget, and Péter Timár, Budapest, all of Hungary, assignors to Autóipari Kutató és Fejlesztö Vállalat, Budapest, Hungary

Filed Feb. 10, 1988, Ser. No. 154,392
Claims priority, application Hungary, Feb. 12, 1987, 546/87; Jul. 23, 1987, 546/87
Int. Cl.[4] F02M *35/10*
U.S. Cl. 123—52 MB **14 Claims**



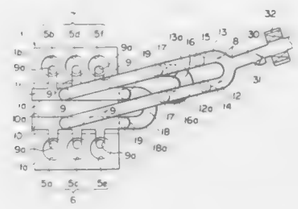
1. In a reciprocating piston-type internal combustion engine including
- a plurality of cylinders each having an intake port;
- an intake gas conduit assembly in which intake gas resonance oscillations are generated for increasing the charging efficiency of the cylinders; said intake gas conduit assembly having
- a feed resonance system including a feed resonator vessel connected with the intake ports of a group of cylinders whose suction strokes do not significantly overlap; and a feed resonance pipe communicating with said feed resonator vessel;
- an auxiliary resonance system including a closed auxiliary resonator vessel and an auxiliary resonance pipe opening into said auxiliary resonator vessel;
- an intermediate vessel coupled with said auxiliary resonance pipe and said feed resonance pipe;
- an intake gas inlet pipe coupled with said intermediate vessel;
- the feed resonance system and the auxiliary resonance system are tuned to one another by a dimensional selection such that at a predetermined first resonance rpm of the engine the intake gas oscillations generated in the feed resonance pipe and the auxiliary resonance pipe by intermittent suction strokes of the cylinders forming said group are in phase effecting an increase in the charging efficiency;
- the improvement wherein said intermediate vessel is an intermediate resonator vessel dimensioned such that at a predetermined second resonance rpm in an operational rpm range of the engine the intake gas oscillations in said feed resonance pipe and said auxiliary resonance pipe are of opposite phase, effecting an increase in the charging efficiency.

4,858,570

V-TYPE ENGINE

Hiroyouki Matsumoto; Kazumi Okamura; Hideo Nakayama, and Yasuhiro Okasako, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 18, 1988, Ser. No. 259,253
Claims priority, application Japan, Oct. 19, 1987, 62-263357
Int. Cl.[4] F02B *75/18*
U.S. Cl. 123—52 M V **8 Claims**



1. An intake system for a V-type engine having a plurality of cylinders formed in first and second cylinder banks, the firing order being set so that the cylinders in each cylinder bank do not fire one after another, in which said intake system comprises a first communicating passage which communicates the cylinders in the first cylinder bank with each other, a second communicating passage which communicates the cylinders in the second cylinder bank with each other, and a first and second intake air supply passage which are respectively connected to the first and second communicating passages characterized in that
- the downstream end of each of the first and second intake air supply passages is connected to the corresponding communicating passage at a position near one end of the communicating passages and each of the first and second intake air supply passages extends toward the other end of the corresponding communicating passage.

4,858,571

LIQUID PUMP DRIVEN BY A TWO-CYCLE, DUAL PISTON INTERNAL COMBUSTION ENGINE

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Division of Ser. No. 791,461, Oct. 25, 1985, Pat. No. 4,745,886.
This application Feb. 29, 1988, Ser. No. 162,210
The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.
Int. Cl.[4] F02B *33/10*
U.S. Cl. 123—71 R **1 Claim**



1. A liquid pump, comprising:
- a liquid pump assembly and a two-cycle internal combustion engine for driving said liquid pump assembly;
- said liquid pump assembly including:
- a liquid input pipe;
- an engine block including cylinder walls and an upper piston serving as a pumping piston, said cylinder walls and a top portion of said pumping piston defining a liquid pumping chamber, said liquid pumping chamber connected to said liquid input pipe, said cylinder walls and a bottom portion of said pumping piston defining a fuel/air mixture pressurization chamber of said two-cycle internal combustion engine, said liquid pumping chamber separated from said pressurization chamber by said pumping piston, said liquid pumping chamber and said pressurization chamber defining an upper chamber, said pressurization chamber connected to a source of fuel/air mixture through a one-way valve permitting fuel/air mixture to flow from the fuel/air source to said pressurization chamber;
- a one-way valve means located between said liquid input pipe and said liquid pumping chamber for permitting liquid to enter said pumping chamber from said input pipe;
- a liquid output pipe connected to said liquid pumping chamber;
- a one-way valve means located between said liquid pumping chamber and said liquid output pipe for permitting liquid to exit from said pumping chamber to said output pipe,
- wherein, in said two-cycle internal combustion engine driving said pumping piston, said engine block further includes,
- an inter-chamber passageway for permitting flow of fuel/air mixture from said pressurization chamber directly to a combustion chamber, said inter-chamber passageway located near the top of said combustion chamber;
- a lower cylindrical gas chamber which serves as a combustion chamber, said lower gas chamber including an automatically controlled valved fuel/air mixture intake means for admitting fuel/air mixture directly from said pressurization chamber to said compression chamber through said inter-chamber passageway; wherein the fuel/air mixture from the fuel/air mixture source passes in sequence through said one-way pressurization chamber intake means, said pressurization chamber, said inter-chamber passageway, and said automatically operated lower chamber intake valve means prior to entry into said lower gas chamber; and
- a piston assembly comprised of said upper pumping piston located in said upper chamber and a lower piston located in said lower gas chamber, and a shaft connecting said upper and lower pistons for moving both upper and lower pistons in phase with one another;
- sealing means for permitting reciprocating movement of said connecting shaft within said upper and lower chambers and for providing a seal between said upper and lower chambers;
- cooling means jacketing said sealing means for cooling said sealing means,
- lower chamber exit means for permitting the contents of said lower gas chamber to be discharged from said chamber, said lower chamber exit means located near the bottom of said lower chamber and controlled by travel of said lower piston thereby facilitating exhaustion of the combustion products of the fuel/gas mixture from said lower gas chamber when a fresh fuel/air mixture enters said lower gas chamber from said automatically controlled lower chamber intake valve means directly from said inter-chamber passageway;
- ignition means for igniting the gaseous contents of said lower chamber, said ignition means automatically periodically being energized and unenergized in coordination with the automatic operation of said automatically controlled lower chamber intake valve means.

4,858,572

DEVICE FOR ADJUSTING AN ANGULAR PHASE DIFFERENCE BETWEEN TWO ELEMENTS

Eiji Shirai, Okazaki; Yoshio Okabe, Chiryu, and Yukimori Kobayashi, Gamagohri, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 30, 1988, Ser. No. 252,054
Claims priority, application Japan, Sep. 30, 1987, 62-246880
Int. Cl.[4] F01L *1/34, 9/02*
U.S. Cl. 123—90.12 **9 Claims**

1. A device for adjusting an angular phase difference be-

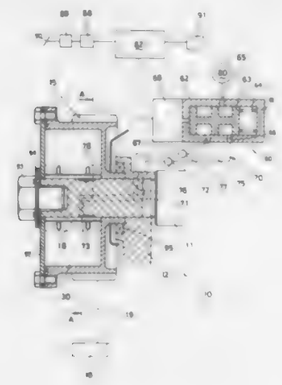
tween a cam shaft rotatably supported on an engine and having a cam member which acts on a tappet, and a drive member rotatably mounted on said cam shaft and driven by the rotational torque from a crank shaft, comprising:

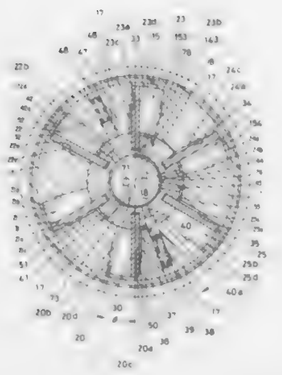
a hub fixedly mounted on said cam shaft and enclosed by said drive member;

a chamber defined between said drive member and said hub and having a pair of circumferentially opposed walls;

a vane fixedly mounted to said hub and extended outwardly therefrom in the radial direction into said chamber so as to divide said chamber into a first section and a second section which are fluid-tightly separated from each other;

a fluid supplying means for supplying fluid under pressure to a selected one of said first section and said second section via respective first and second passage means;





means for preventing counter flow of said fluid under pressure from said first and second sections;

a first connecting means for mechanically connecting said hub and said drive member when said vane is in abutment with one of said circumferentially opposed walls of said chamber and for releasing the mechanical connection between said hub and said drive member when the pressure of fluid in said first passage means exceeds a set value; and

a second connecting means for mechanically connecting said hub and said drive member when said vane is brought into abutment with an other of said circumferentially opposed walls of said chamber after a rotary movement of said hub through a set angle and for releasing the mechanical connection between said hub and said drive member when the fluid pressure in said second passage means exceeds a set value.

4,858,573

INTERNAL COMBUSTION ENGINES

Peter W. Bothwell, "Meoncote" 114 Shipston Road, Stratford upon Avon, Warwickshire, United Kingdom

Continuation-in-part of Ser. No. 569,316, Jan. 9, 1984, abandoned. This application Nov. 13, 1985, Ser. No. 797,478

Claims priority, application United Kingdom, Nov. 13, 1984, 8428611

Int. Cl.[4] F01L *1/00*

U.S. Cl. 123—90.15 **13 Claims**



1. An internal combustion reciprocating piston engine comprising a cylinder head defining at least six valve ports which communicate with a combustion chamber defined between the cylinder head and a piston, a plurality of poppet valves, one for each port, and an overhead camshaft for operating the valves, wherein said valves have respective stems with longitudinal centrelines which substantially intersect an axis of rotation of the camshaft at first to sixth intersection positions respectively, wherein said intersection positions are spaced apart from each other along the camshaft axis, wherein respective stems of the valves are mutually inclined, the inclination of the stem of a first of the valves to the stem of a second of the valves, as viewed in a direction along the camshft, differing from the inclination of the stem of the first valve to the stem of a third of the valves, also as viewed along the camshaft.

4,858,574

HYDRAULIC CIRCUIT FOR A VALVE OPERATING TIMING CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Koichi Fukuo; Mitsuhiro Shibata; Toshiaki Hiro, and Masahiko Matsumoto, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 138,080

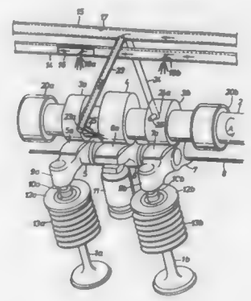
Claims priority, application Japan, Dec. 26, 1986, 61-314801; Dec. 26, 1986, 61-314803

Int. Cl.[4] F01L *1/34;* **F01M** *1/08, 9/10*

U.S. Cl. 123—90.34 **17 Claims**

1. A hydraulic circuit for a valve operation timing control device for an internal combustion engine, wherein oil pressure is applied from one end of an oil passage defined in a rocker shaft on which a rocker arm is pivotally supported, said oil passage extending to an actuator disposed in said rocker arm for opening an intake valve or an exhaust valve which is angularly movable by a cam on a camshaft rotatable in synchronism with a crankshaft and normally urged in a valve closing direc-

tion, an improvement comprising, said oil passage having a second end remote from said one end, and said second end



communicating with an open end through an orifice to discharge oil for engine lubrication purposes.

4,858,575

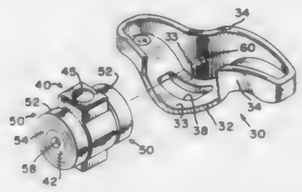
ROCKER ARM BEARING ASSEMBLY

David Fittro, 3 Daniel La., West Simsbury, Conn. 06092, and Arnold E. Fredericksen, R.F.D. 2, Littlebrook Rd., Winsted, Conn. 06098

Filed Mar. 1, 1988, Ser. No. 162,448

Int. Cl.[4] F01L *1/18*

U.S. Cl. 123—90.41 **3 Claims**



1. A rocker arm bearing assembly comprising:

an immovable support stud;

a bearing support member immovably affixed to said stud, said member being configured so as to support and retain two coaxial bearings;

a rocker arm having a generally cup-shaped configuration, said arm having a lower portion with an arcuate shape, said arm also having at least two side walls upwardly-extending from said lower portion, and said lower portion having an elongate aperture formed therethrough so as to accommodate said stud and said support member; and

means for supporting said support member within said rocker arm so as to provide for oscillating movement of said rocker arm on said two bearings, wherein said means comprises two horizontally-extending arms integrally attached to said support member, each of said arms having an end surface; and a convex protuberance projecting outwardly from each of said end surfaces of said support member arms.

4,858,576

GLOW PLUG ALTERNATOR CONTROL

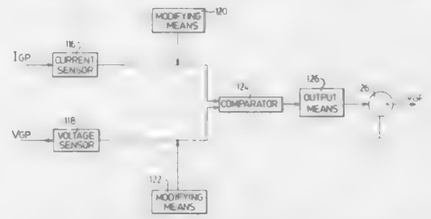
James R. Jeffries, East Peoria, and Michael R. Verheyen, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

PCT No. PCT/US87/02878, § 371 Date Nov. 27, 1987, § 102(e) Date Nov. 27, 1987, PCT Pub. No. WO88/03991, PCT Pub. Date Jun. 2, 1988

Continuation-in-part of Ser. No. 935,897, Nov. 28, 1986, Pat. No. 4,726,333. This PCT application Nov. 4, 1987, Ser. No. 231,422

Int. Cl.[4] F02P *19/02*

U.S. Cl. 123—145 A **8 Claims**



1. An apparatus (20) for controlling the resistance of a glow plug (28) over various operating temperature ranges of an internal combustion engine (24), said apparatus comprising:

means (116) for sensing current through said glow plug (28) and delivering a signal relative to the magnitude of said sensed current;

means (118) for sensing voltage across said glow plug (28) and delivering a signal relative to the magnitude of said sensed voltage;

means (120,122) for modifying said sensed current and voltage signals to include a preselected resistance;

means (124) for comparing said modified current signal to said modified voltage signal to produce a resistance error signal in response to a difference between said compared signals;

means (126) for delivering a voltage signal to said glow plug (28) to control said glow plug's resistance relative to said preselected resistance in response to receiving the resistance error signal.

4,858,577

ROTARY VALVE DEVICE FOR INTERNAL COMBUSTION ENGINES

Masaaki Matsuura; Mitsuru Ishikawa, both of Tokyo; Masaharu Nakamori, and Masahiro Kuroki, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 913,524, Sep. 30, 1986, abandoned. This application Jun. 14, 1988, Ser. No. 207,030

Claims priority, application Japan, Sep. 30, 1985, 60-216388; Sep. 30, 1985, 60-216389; Sep. 30, 1985, 60-216390

Int. Cl.[4] F01L *7/10*

U.S. Cl. 123—190 A **19 Claims**

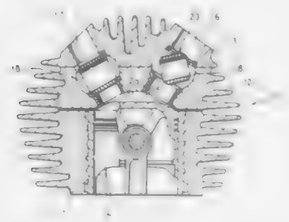
3. For an internal combustion engine having a cylinder, an intake gas flow passage and an exhaust gas flow passage communicating therewith, a rotary valve device for disposition in either one of said gas flow passages for controlling the flow of gas therethrough, said rotary valve device comprising:

wall means in said flow passage defining a valve cavity intermediate the length thereof having oppositely spaced, substantially coaxially aligned passage openings defined therein;

oppositely facing annular seats about said passage openings;

a valve body mounted for angular movement in said valve cavity, said valve body being movable into and out of engagement with said valve seats whereby, in engagement with said valve seats, said valve body prevents the flow of gas between said passage openings and out of engagement

with said valve seats, the gas flows around said valve body between said passage openings; and



drive means for imparting pivotal movement to said valve body about an axis substantially normal to said passage axis.

4,858,574

FUEL INJECTION NOZZLE ARRANGEMENT

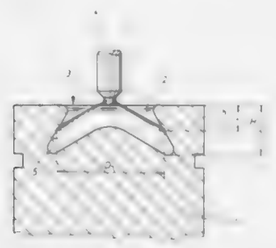
Friedrich Scherer, Untereisingen; Kurt Schmied, Denkendorf, and Henning Osterwald, Feilbach, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 16, 1984, Ser. No. 631,067

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 3325586

Int. Cl.⁴ F02F *3/26*

U.S. Cl. 123—276 **3 Claims**



1. A method of manufacturing a fuel injection nozzle used in a combustion chamber arrangement of an air-compression internal combustion engine having a piston and a combustion trough adjacent an end of said piston, wherein fuel is injected against a boundary wall of said combustion trough through said nozzle holes, wherein the method comprises the steps of:

(a) determining the diameter D of said combustion trough in the region of fuel contact with said boundary wall of said combustion trough,

(b) determining the depth H of said combustion trough,

(c) determining the value of a dimensionless constant K which is equivalent to a qualitative value of the spin number of the spin of the combustion air entering said combustion trough, said value being equal to or less than 1.5 for combustion air entering said trough with said spin and equal to 1.0 for combustion air entering said trough without spin,

(d) multiplying the value of D with the value of π and dividing the above by the product of the value for H and K, whereby the resulting value represents the optimum number of holes for said fuel injection nozzle,

(e) making a fuel nozzle with said determined optimum number of holes.

4,858,579

FUEL-INJECTION FOR DIRECT-INJECTION DIESEL ENGINE

Ludwig Elsbett; Günter Elsbett, and Klaus Elsbett, all of Industriestrasse 14, D-8543 Hilpoltstein, Fed. Rep. of Germany

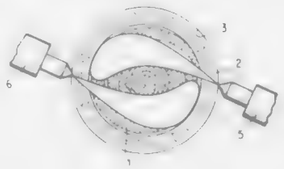
PCT No. PCT/DE87/00390, § 371 Date Apr. 28, 1988, § 102(e) Date Apr. 28, 1988, PCT Pub. No. WO88/01683, PCT Pub. Date Mar. 10, 1988

PCT Filed Aug. 31, 1987, Ser. No. 214,728

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629437

Int. Cl.⁴ F02B *3/12;* **F02M** *61/14, 63/02*

U.S. Cl. 123—299 **16 Claims**



1. A method of operating a combustion engine, particularly a direct-injection diesel engine, having a combustion chamber, comprising the steps of admitting air into said chamber; admitting fuel into said chamber, mixing said fuel with at least part of said air to form a combustible mixture; compressing said air in said chamber; combusting said mixture to generate power, the pressure in said chamber increasing during the combusting step; rotating a crankshaft with the power generated during the combusting step; and maintaining the pressure increase per degree of crankshaft rotation during the combusting step at least approximately equal to the maximum pressure increase during the compressing step.

4,858,580

KNOCKING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

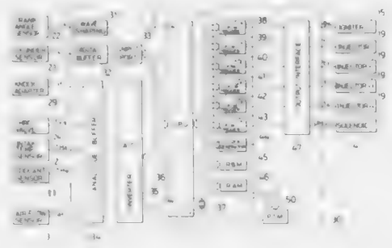
Katsuya Kamise, and Shigeru Yamamoto, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed May 25, 1988, Ser. No. 198,745

Claims priority, application Japan, May 28, 1987, 62-129912

Int. Cl.⁴ F02P *5/15, 11/00*

U.S. Cl. 123—425 **11 Claims**



1. A knocking control system for an internal combustion engine comprising knocking detecting means for detecting an occurrence of a knocking, first control means for controlling a combustion in an engine combustion chamber based on signals from the knocking detecting means, first knocking suppressing means for determining a first control gain to control the first control means and thereby suppressing a knocking, second control means for controlling the combustion in the combustion chamber, second knocking suppressing means for determining a second control gain and for controlling the second control means when the first control gain for the first control means is more than a predetermined value, and gain changing means for changing the first control gain to a smaller value as the second control gain is increased.

4,858,581

AIR-FUEL RATIO FEEDBACK CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

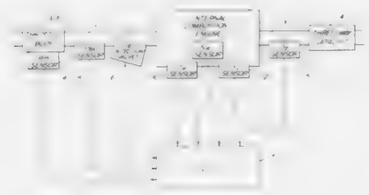
Shuichi Hosoi, and Sachito Fujimoto, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Mar. 7, 1988, Ser. No. 164,796

Claims priority, application Japan, Mar. 31, 1987, 62-78337

Int. Cl.⁴ F02M *51/00*

U.S. Cl. 123—489 **6 Claims**



1. A method of controlling the air-fuel ratio of a mixture being supplied to an internal combustion engine having an exhaust system, in a feedback manner responsive to output from sensing means arranged in said exhaust system for sensing the concentration of a component in exhaust gases from said engine to produce as said output a normally fluctuating output signal indicative of the concentration of said component, the method including:

comparing the value of said output signal with a predetermined reference value; and

controlling the air-fuel ratio of said mixture to a desired value by means of at least one of proportional control applying a first correction value to correct the air-fuel ratio when said output signal changes from a rich side to a lean side or vice versa with respect to said predetermined reference value, and integral control applying a second correction value to correct the air-fuel ratio whenever a predetermined period of time elapses so long as said output signal remains on the lean side or on the rich side with respect to said predetermined reference value,

the method comprising the steps of:

(a) sensing load on said engine;

(b) setting at least one of said first correction value and said second correction value to a smaller first value as the sensed load on said engine is higher, and applying the set at least one correction value to correction of the air-fuel ratio of said mixture in a direction of enriching said mixture; and

(c) setting said at least one correction value to a second value larger than said first value when said engine is operating in a steady condition where the sensed load on said engine is higher than a predetermined value, and applying the at least one correction value set to said second value to correction of the air-fuel ratio of said mixture in said direction of enriching said mixture.

4,858,582

CARBURETOR FUEL PRECONDITIONER

Paul M. Brown, 10492 Summerwind, Boise, Id. 83704

Filed Jul. 11, 1988, Ser. No. 216,960

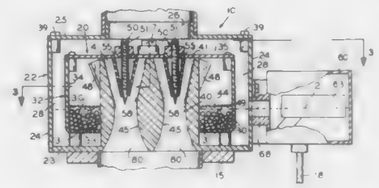
Int. Cl.⁴ F02M *17/26*

U.S. Cl. 123—523 **12 Claims**

1. A carburetor and fuel preconditioner for internal combustion engines comprising:

a bubble chamber operable to hold liquid fuel at a selected level therein, said bubble chamber provided with one or more air ports located below said fuel level for bubbling air through the fuel and said bubble chamber defining an air-fuel vapor chamber above said fuel level;

a multiplicity of catalytic beads located within said bubble chamber in contact with the fuel and with air drawn through said ports; and



at least one air-fuel vapor mixing conduit in fluid communication between the vapor chamber of said bubble chamber and an intake manifold of the engine, said conduit provided with a mixing valve for controlling air-fuel ratio provided to the engine.

4,858,583

ARRANGEMENT FOR THE METERING OF FUEL AND METERING DEVICE THEREFOR

Bruno Soantag, Horstmar, Fed. Rep. of Germany, assignor to Hi-Tec-Gas International GmbH, Fed. Rep. of Germany

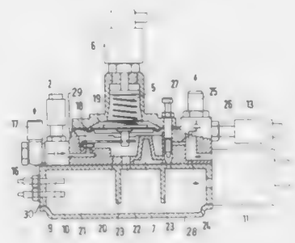
PCT No. PCT/EP87/00201, § 371 Date Dec. 14, 1987, § 102(e) Date Dec. 14, 1987, PCT Pub. No. WO87/06302, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 15, 1987, Ser. No. 150,666

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1986, 3612994

Int. Cl.⁴ F02B *43/00*

U.S. Cl. 123—527 **19 Claims**



1. An arrangement for the metering of fuel, in particular liquid gas, to a variable-output power apparatus comprising:

a metering device with a reduction valve (4), a metering valve (11), a chamber (20, 21) arranged therebetween,

means for open-loop control of the metering valve as a function of a power requirement signal,

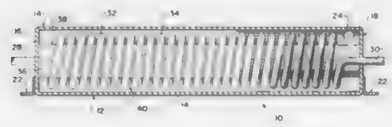
means for closed-loop regulation of the reduction valve (4), wherein the chamber (20, 21) between the two valves is designed as a buffer volume for the equalization of pressure fluctuations, and the volume of the chamber in cubic centimeters is at least half as great as the output of the power apparatus in kilowatts.

4,858,584

HEAT EXCHANGER

Gordon Bridgeman, 230 Gibbs Road, East, Kelowna, British Columbia, Canada V1X 2V9

Filed Sep. 27, 1988, Ser. No. 249,675
Int. Cl.[4] F02M *31/10*
U.S. Cl. 123—557 5 Claims



1. A fuel pre-heater comprising:
a container with a cylindrical outer wall and closed ends;
an inner cylindrical wall extending from end to end of the container, concentrically therein to provide an annular chamber within the container;
a tube formed into a helical coil located between the inner and outer walls, with ends of the tube extending through the container to the exterior thereof, adjacent opposite ends of the container; and
inlet and outlet fittings connected to the cylindrical outer wall, to open in opposite tangential directions into the annular chamber adjacent opposite ends thereof.

4,858,585

ELECTRONICALLY ASSISTED ENGINE STARTING MEANS

Gregry M. Remmers, Ingleside, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 12,336, Feb. 9, 1987, abandoned. This application Dec. 11, 1987, Ser. No. 131,457
Int. Cl.[4] F02P *3/00*
U.S. Cl. 123—602 44 Claims



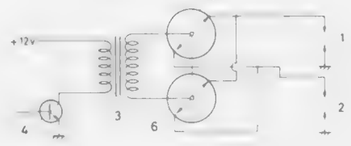
1. An ignition system for an internal combustion engine of the type which has an ignition capacitor means, a means to charge said ignition capacitor means and an ignition capacitor discharge means connected to discharge said ignition capacitor means in response to receiving a trigger pulse applied thereto, the system comprising:
trigger pulse generating means for producing trigger pulses in synchronism with the engine speed, said trigger pulse generating means being adapted to provide a first timing characteristic for discharging said ignition capacitor means and a second timing characteristic that is advanced a predetermined time with respect to said first timing characteristic said trigger pulse generating mean providing said second timing characteristic in response to an advance signal being applied thereto;
means for selectively generating an advance signal for application to said trigger pulse generating means, said advance signal generating means producing said advance signal responsive to an enabling signal being received, but being precluded from producing said advance signal responsive to an inhibiting signal being received;
means for producing an enabling signal for application to said advance signal generating means to generate said advance signal for a predetermined time period after startup of the engine, and also for producing said enabling signal in response to a first engine temperature signal being received, said first engine temperature signal being produced in response to the engine temperature not exceeding a first predetermined sensed level;
means for producing an engine operating speed signal indicative of the speed of the engine;
means for generating an inhibit signal in response to an engine speed signal indicative of an engine operating speed exceeding a first predetermined speed being received;
means for disabling the ignition capacitor charging means in response to an ignition capacitor disabling signal being received;
means for producing an ignition capacitor disabling signal in response to a second engine temperature signal being produced in response to the engine temperature exceeding a second predetermined sensed level and in response to an engine speed signal indicating an operating speed exceeding a second predetermined level being produced.

4,858,586

METHOD AND DEVICE FOR IGNITING ENGINES

Seizo Kanno, Tokyo, Japan, assignor to Hiroyuki Hoshino, Kanagawa, Japan

Continuation of Ser. No. 108,995, Oct. 16, 1987, abandoned. This application Jan. 30, 1989, Ser. No. 304,003
Claims priority, application Japan, Oct. 17, 1986, 61-246859; Dec. 5, 1986, 61-289944; Dec. 26, 1986, 61-312830
Int. Cl.[4] F02F *1/00*
U.S. Cl. 123—620 24 Claims



1. An ignition method for an engine having at least one cylinder with a spark plug, said cylinder operating according to a cycle having a compression stroke portion and an exhaust stroke portion, comprising the steps of:
firing the spark plug of said cylinder during its compression stroke using a voltage of one polarity; and
firing the spark plug of said cylinder during its exhaust stroke using a voltage of another polarity.

4,858,587

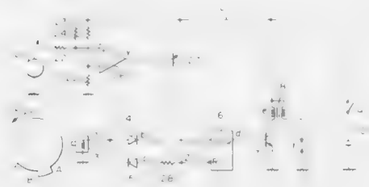
IGNITION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Atsushi Hashizume, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1988, Ser. No. 197,317
Claims priority, application Japan, May 27, 1987, 62-82678[U]
Int. Cl.[4] F02P *11/00*
U.S. Cl. 123—631 3 Claims

1. An ignition device for an internal combustion engine comprising:
a sensor for producing a first and a second angular signal corresponding to a first and a second crank angle, respectively,

a flip-flop circuit which is set or reset by the first angular signal of the sensor and is reset or set by the second angular signal,
ignition control means for controlling the primary current of an ignition coil based on the output of the flip-flop circuit and carrying out the ignition operation based on the second angular signal,



means for producing a voltage when the internal combustion engine reverses, and
means for comparing the voltage produced by the voltage producing means with a predetermined voltage, and causing the second angular signal to be ignored depending on the results of comparison so as to prevent the flip-flop circuit from being reset or set.

4,858,588

ARCHERY DEVICE WITH SEPARATE BENDING AND LAUCHING BOWSTRINGS AND FRONT END ARROW LAUNCH

John W. Bozek, 6093 Waterfront Dr., Waterford, Mich. 48167

Continuation-in-part of Ser. No. 109,736, Oct. 19, 1987, abandoned, which is a continuation-in-part of Ser. No. 871,793, Jun. 9, 1986, Pat. No. 4,757,799. This application Aug. 22, 1988, Ser. No. 234,473
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—23 R 11 Claims



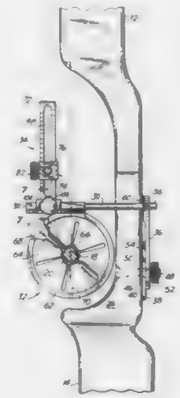
1. An archery device comprising:
an elongated bow member having a limb at either end, each terminating in a limb tip;
a launching bowstring fixed at either end to one of said limb tips;
a bending bowstring extending parallel to said launching bowstring;
a bending mechanism carried by each respective end of said bow member, drivingly engaging an end of said bending bowstring with a respective one of said limb tips;
each bending mechanism including means for bending a respective limb upon drawing movement of said bending bowstring while causing a mechanical advantage to be exerted by said bending bowstring in bending said limbs;
said bending mechanisms each further including a first windlass reel and a first cable wound thereon and fixed to an associated limb tip, and also including drive means rotating said first windlass reel upon drawing of said bending bow so as to wind said first cable onto said first windlass reel and thereby shorten said first cable and thereby bending an associated limb.

4,858,589

ARCHERY ARROW SIGHTING APPARATUS

Steven Chang, Bardonia, N.Y., assignor to C & M Sports Enterprises Inc., West Nyack, N.Y.

Filed Jul. 11, 1988, Ser. No. 217,191
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—24 R 3 Claims



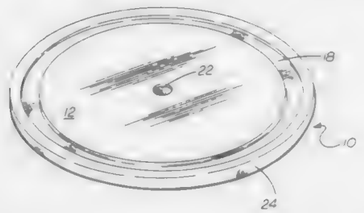
1. A combination arrow sight and support device adapted to be mounted to an archery bow with a drawstring and a hand-grip portion, comprising a horizontal bar projecting outwardly from said bow across the plane defined by drawstring action and in front of the undrawn position of the drawstring; arrow support means mounted to said bar and depending therefrom in the plane of drawstring action; a peep-sight mounted for adjustable travel along said bar and projecting upwardly therefrom; a mounting plate adapted to be secured to the bow in the area of the hand-grip portion thereof and a bar-support arm having first and second ends pivotally mounted to said mounting plate about a horizontal axis at said first end and pivotally mounted to said horizontal bar at said second end; said arrow-support means comprising a generally circular frame supporting a plurality of adjacent, inwardly-directed, elastomeric support elements converging about and defining a central arrow-support aperture, said circular frame having an entrance slot therein aligned with the interface between an adjacent pair of said support elements, and an arrow rest member mounted to said circular frame and having an arrow shaft supporting portion extending forwardly thereof aligned with the axis of said arrow-support aperture.

4,858,590

FLEXIBLE HEAT TRANSFER PAD

Samuel Bailey, 5550 Williamsburg Way, Fairfield, Ohio 45014

Filed Mar. 10, 1988, Ser. No. 166,541
Int. Cl.[4] F24C *3/00*; F24H *7/00*; A05B *3/68*
U.S. Cl. 126—39 H 6 Claims



1. A flexible heat transfer pad for optimizing heat transfer from an electrical heating element on an electric stove comprising:

upper and lower metallic plates, said plates being sealed together and being thermally conductive; and

conducting means retained within said upper and lower places, said conducting means being a metallic alloy which liquefies at relatively low cooking temperatures said conducting means further changing from a solid state to a liquid state with substantially no appreciable expansion or contraction;

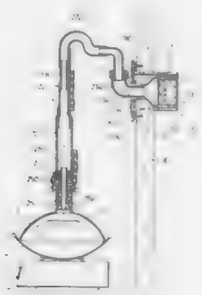
whereby said heat transfer apparatus substantially conforms to the contours of said electrical heating element during cooking, optimizing heat transfer.

4,858,591

KITCHEN SMOKE EXHAUST DEVICE

Chuen-Fong Fu, No. 13, Lane 685, Fong Lin Rd. Sec. 3, Lin Yuan Hsiang, Kaohsiung, Taiwan

Filed Sep. 12, 1988, Ser. No. 243,459
Int. Cl.[4] F24C *15/20*
U.S. Cl. 126—299 D 6 Claims



1. A kitchen exhaust device comprising:

a fan unit to be mounted on a wall, having a fan casing with a suction side and a discharging side, and a guide conduit provided at said suction side,

a cover means to lie above a cooking unit, having a top opening and a top tube extending from said top opening;

a connecting tube means having a first end communicated with said top tube of said cover means and a second end communicated with said guide conduit, said tube means having a bent section connected to said guide conduit, a telescopic section extending downward from said bent section and connected to said cover for adjusting the level of said cover above the cooking unit, and a locking means for locking the telescopic section after adjustment; and

means for collecting oily substances removably placed in said top tube of said cover, said means including an oil collecting tube means inserted into said top tube and having an annulus-shaped cavity for receiving oily substances.

4,858,592

BURNER SYSTEM

George W. Hayek, Seattle; Amos J. Brown, Bothell; John R. Hamblin, Seattle, and Donald M. Robinson, Snohomish, all of Wash., assignors to Belshaw Bros., Inc., Seattle, Wash.

Filed Feb. 20, 1987, Ser. No. 16,761
Int. Cl.[4] A47J *27/00*
U.S. Cl. 126—373 11 Claims





1. A burner system for a doughnut fryer having a tank, at least one heat pipe having an inner wall and an outer wall and located in the bottom of the tank, a stack connected to a discharge end of the heat pipe, a burner connected to the inlet end of the heat pipe and a gas pipe connected to the burner, comprising:

said burner being held within the heat pipe and having an outside surface spaced from the inner wall of the heat pipe, forming a gap therewith, the burner having a discharge end and inner and outer walls, a nozzle insert located within the burner and spaced from the inner wall of the burner, a primary atmospheric air opening located at the upstream end of the burner in the direction of airflow upstream of the nozzle insert, a gas inlet separate from the primary atmospheric air opening located at the upstream end of the burner upstream of the nozzle insert, the nozzle insert forming a restricted orifice for preventing burning of the gas and air upstream of the nozzle insert, and a closure ring closing the gap between the heat pipe inner wall and the burner outer wall, said closure ring provided with a secondary air opening located solely radially outward of the burner outer wall in close proximity to the burner outer wall, and downstream from the nozzle insert for admitting a limited amount of secondary air into the heat pipe and into the flame at the discharge end of the burner.

5. A burner system for a doughnut fryer having a tank, a least one heat pipe having an inner wall having upper and lower internal surfaces and located in the bottom of the tank, a stack connected to a discharge end of the heat pipe, and a burner connected to an inlet end of the heat pipe, the improvement comprising:

an elongated baffle lying lengthwise in the heat pipe between the burner and the stack, said baffle including at least two upwardly opening, continuously V-shaped deflectors for directing the heat primarily upwardly to heat the upper internal surface of the heat pipe more than the lower internal surface of the heat pipe,

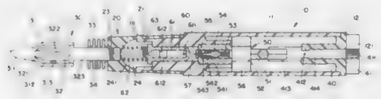
said first deflector having a wider angle than said second deflector, said second deflector starting lengthwise further downstream in said heat pipe than said first deflector.

4,858,593

SOLDERING TOOL

David Hsu, 801 Cheng Fong Bldg. No. 125, Sec. 3, Roosevelt Road, Taipei, Taiwan

Filed Jul. 18, 1988, Ser. No. 220,516
Int. Cl.[4] B23K *3/02*
U.S. Cl. 126—414 4 Claims



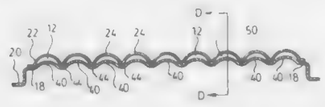
1. A gas powered soldering tool comprising a housing serving as a handle, said housing having a front end (20) and a rear end (10), a tip assembly (30) connected to the front end of said housing, said tip assembly having a front end and a rear end, a heating element (52) inserted in the front end of said tip assembly, a dome-shaped air-gas mixing chamber (24) located in said front end of said housing, a gas tank (40) located in the rear end of said housing, said gas tank having a duct (57) at the front end thereof, said duct retaining a dual flow controlling assembly, said dual flow controlling assembly including a needle valve (50) and a nozzle assembly (60), the gas flowing from said gas tank through said needle assembly and said nozzle assembly to said air-gas mixing chamber, an air inlet (22) in the rear of said front housing for supplying air to the mixing chamber, a catalytic combustion element (313)being wrapped around said heating element.

4,858,594

SOLAR HEATING PANEL WITH CURVILINEAR PASSAGEWAY

Ronald E. McCurdy, Rexdale, Canada, assignor to K-S-H Canada Inc., Mississauga, Canada

Filed Mar. 28, 1988, Ser. No. 172,767
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—444 8 Claims



1. A solar heating panel having a flow channel through which a fluid flows to be heated by solar energy comprising:

a dark opaque bottom sheet,

a transparent top sheet overlying the bottom sheet,

sealing glue means between the top sheet and bottom sheet sealably securing the top sheet and bottom sheet together,

each of the top sheet and the bottom sheet formed to have a regular corrugated configuration with alternating upwardly-protruding, upwardly convex portions and downwardly-protruding upwardly concave portions,

the convex and concave portions of the top sheet having curvatures of a lesser radii than curvatures of the convex and concave portions of the bottom sheet,

the sealing glue means comprising elongate glue strip means centered longitudinally within the concave portions of the bottom sheet,

each concave portion of the top sheet centered above and nested within a corresponding concave portion of the bottom sheet secured and sealed centrally therein by one of said glue strip means,

each convex portion of the top sheet centered above and overlying a corresponding convex portion of the bottom sheet defining therebetween a hollow space of an upwardly convex crescent shape,

said hollow spaces interconnected and defining said flow channel.

4,858,595

MEDIASTINOSCOPE

Gerhard Buess, Berliner Strasse 1, 6501, Niederolm; Manfred Boebel, Allmandstrasse 18, 7136, Oetisheim, and Siegfried Hiltebrandt, August-Lämmle-Strasse 16, 7134, Knittlingen, all of Fed. Rep. of Germany

Filed Oct. 6, 1988, Ser. No. 254,109
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3743042
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—6 7 Claims



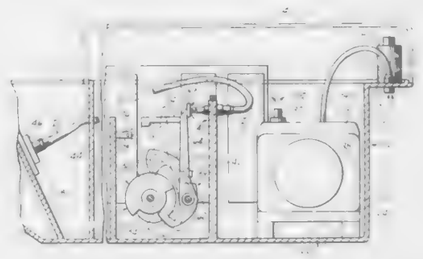
1. A mediastinoscope having a shaft which is traversed by a photoconductor and an observation optical system, said shaft having a distal end provided with an atraumatically shaped cap having a greatest diameter which is greater than that of the shaft and defining a cavity with a distal aperture, into which said cavity there open channels and the end of the optical system, said shaft defining a shaft channel through which auxiliary instruments extending therethrough can be guided distalwards as far as a treatment location.

4,858,596

PORTABLE SEQUENTIAL COMPRESSION DEVICE

Mark Kolstedt, Algonquin, and John F. Dye, Elgin, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Feb. 18, 1988, Ser. No. 157,689
Int. Cl.[4] A61H *9/00*
U.S. Cl. 128—24 R 11 Claims



1. A sequential compression device for delivering sequentially pressurized air for medical purposes to an inflatable multi-compartment sleeve, comprising:

an accumulator having walls to define a containment hous-

ing for containing pressurized air therein, said accumulator housing also containing:
- a pump to generate pressurized air into said accumulator housing;
- a plurality of conduits each having a proximal open end within said accumulator housing and a distal end disposed through a wall of said accumulator housing; and
- a plurality of valves to control the flow of pressurized air into said conduits;

said conduits, said pump and said valves being disposed within said accumulator housing, to compress said air therewithin, and to selectively discharge said pressurized air through said conduits in said accumulator housing for discharge to an inflatable sleeve.

4,858,597

PIEZOELECTRIC TRANSDUCER FOR THE DESTRUCTION OF CONCRETIONS WITHIN AN ANIMAL BODY

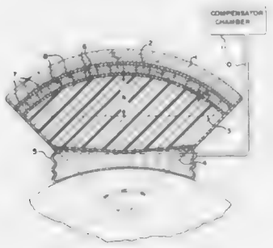
Günther Kurtze, Winheim, and Rainer Riedlinger, Karlsruhe, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Continuation of Ser. No. 614,145, May 25, 1984, abandoned. This application Oct. 3, 1988, Ser. No. 253,884

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1983, 3319871

Int. Cl.[4] A61B *17/22*

U.S. Cl. 128—24 A 21 Claims



1. A piezoelectric transducer for the destruction of hard concretions within an animal body, said piezoelectric transducer being in the form of a spheroidal cap with a rise and comprising a mosaic of separate piezoceramic elements each having a height of about 3 to about 10 mm and a lateral extension which does not substantially exceed the height, said piezoceramic elements having gaps therebetween, said gaps being filled with an electrically insulating elastic material having a modulus of elasticity which is smaller by at least one order of magnitude than that of the piezoceramic material, and the rise of the spheroidal cap being at least 5 cms and the apex angle of the corresponding spherical sector of the cap being at least 60°.

4,858,598

ANTIOSTEOPOROSIS DEVICE HAVING DROP PLATFORM WITH POWERED DROP

Alan A. Halpern, 1400 Low Rd., Kalamazoo, Mich. 49008

Continuation-in-part of Ser. No. 921,256, Oct. 17, 1986, abandoned. This application Sep. 22, 1987, Ser. No. 99,541

Int. Cl.[4] A61H *1/00*

U.S. Cl. 128—33 30 Claims

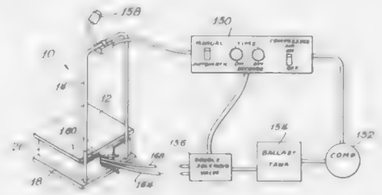
1. Apparatus for use in the prevention or alleviation of a condition of osteoporosis in a patient subject thereto by imparting force to bones of said patient, comprising the following elements:

(1) platform means upon which said patient may stand,

(2) support means for supporting said platform in an essentially horizontal position,

(3) elevating means for raising said platform from a first position to a second position which is elevated with respect to said first position,

(4) means for powering said platform to drop from said second position to said first position, and



(5) means for repeating the steps of raising said platform and dropping said platform,

wherein the distance from said second position to said first position is between one quarter inch (¼") and two inches (2"), and

wherein said means for powering is sufficient to cause said platform descent at a rate greater than the rate provided by the force of gravity alone.

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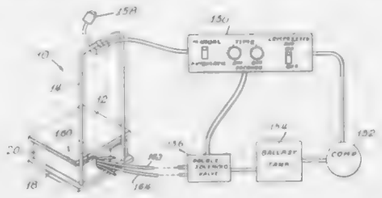
ANTIOSTEOPOROSIS DEVICE AND METHOD

Alan A. Halpern, 1400 Low Rd., Kalamazoo, Mich. 49008

Division of Ser. No. 99,541, Sep. 22, 1988, which is a continuation-in-part of Ser. No. 921,256, Oct. 17, 1986, abandoned. This application Jun. 14, 1988, Ser. No. 206,602

Int. Cl.[4] A61H *1/00*

U.S. Cl. 128—33 14 Claims



1. A method for the prevention or alleviation of a condition of osteoporosis in a patient subject thereto, but having an intact weight-bearing bone structure, comprising the following steps:

(1) locating said patient in a standing position upon an essentially horizontal platform,

(2) locating said platform at a first level,

(3) raising said platform to a second level which is elevated with respect to said first level,

(4) powering said platform downwardly from said second level to said first level, so as to descend at a rate greater than the rate provided by the force of gravity alone, the distance from said second level to said first level being between about one-quarter inch and about two inches, thereby imparting a peak force greater than gravitational to bones of said subject upon said platform at the bottom of said descent to said first level, and

(5) repeating said steps of raising and downwardly powering said platform.

4,858,600

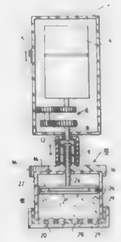
MASSAGING APPLIANCE

Joseph Gross, Moshav Mazor; David Lowenstein, Natanya; Menachem Tilman, Hofit, and Etan Rosenberg, Kiryat Ono, all of Israel, assignors to General Ideas & Products Ltd., Tel Aviv, Israel

Continuation-in-part of Ser. No. 76,346, Jul. 22, 1987, abandoned. This application Oct. 28, 1987, Ser. No. 113,305

Int. Cl.[4] A61H *9/00*

U.S. Cl. 128—65 17 Claims



1. A massaging appliance for massaging a body part while applying a massaging substance thereto, comprising:

a rotary drive including a rotary drive shaft;

a rotatable housing containing a chamber for a supply of the massaging substance, and an outer end wall, derining the outer end of said chamber and carrying a plurality of rotatably mounted balls for massaging the body part while applying massaging substance thereto;

said rotatable housing including a displaceable member defining one end, constituting the inner end of said chamber, said displaceable member being disposed parallel to, and being displaceable towards and away from, said outer end wall for contracting or expanding the size of the chamber according to the quantity of the massaging substance therein;

said rotary drive being external to said rotatable housing;

and coupling means coupling said rotatable housing to said rotary drive shaft.

4,858,601

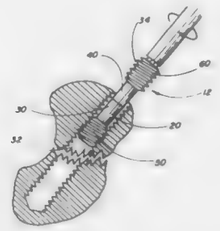
ADJUSTABLE COMPRESSION BONE SCREW

Richard R. Glisson, 311 S. LaSalle St. #34K, Durham, N.C. 27705

Filed May 27, 1988, Ser. No. 200,054

Int. Cl.[4] A61F *5/04; F16B 35/00*

U.S. Cl. 128—92 R 9 Claims



1. A bone screw for connecting first and second bone fragments together, comprising:

(a) a shaft having a first section and a second section rotatable independently of each other;

(b) a first external screw thread on said first section;

(c) a second external screw thread on said second section;

(d) means associated with said second section adapted to receive a first driving tool for driving the screw as a unit and further adapted to receive a second driving tool for rotating the second section independently of the first section whereby upon rotation of the shaft by the first driving tool, the screw is advanced as a unit through the first and second bone fragments with the first and second sections being received in the respective first and second bone fragment and when the second section is rotated in a direction opposite to the direction of rotation for driving the screw as a unit into the first and second bone fragments, the second bone fragment is drawn towards and closely adjacent to the first bone fragment.

4,858,602

BONE NAIL FOR THE TREATMENT OF UPPER ARM FRACTURES

Hartmut R. A. Seidel, Hamburg; Hans E. Harder, Probsteierhagen, and Klaus F. A. Behrens, Rickling, all of Fed. Rep. of Germany, assignors to Howmedica GmbH Werk Schönkirchen, Schönkirchen, Fed. Rep. of Germany

Filed Nov. 28, 1986, Ser. No. 936,042

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1985, 8534358

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 YY 17 Claims



1. A bone nail for the treatment of upper arm fractures comprising an elongated hollow shank adapted to be introduced proximally into the medullary canal, the shank having proximal and distal ends and being slotted at the distal end with a plurality of paraxial slots, the transverse cross sectional profile of the shank being provided at least in the slotted region with alternating elevations and depressions on the inner surface of the wall of the hollow shank, and with an inner thread being formed on the inner wall of the hollow shank outside and adjacent to the slotted region; and an expansion screw comprising a head and a shank capable of cooperating with said inner thread, with said expansion screw being adapted to be advanced into the distal end of the shank by rotation of the screw so that the screw head radially expands the slotted distal shank end.

4,858,603

BONE PIN

Alastair J. T. Clemow, Princeton, and Scott H. Jaeger, Cherry Hill, both of N.J., assignors to Johnson & Johnson Orthopaedics, Inc., New Brunswick, N.J.

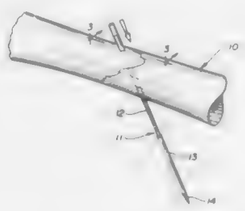
Filed Jun. 6, 1988, Ser. No. 202,602

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 ZW 5 Claims

1. A bone pin comprising a tapered cylindrical portion made

of a polymeric material and a separate drill portion affixed to one end of the cylindrical polymeric portion, the cylindrical polymeric portion of the pin having a taper such that the



diameter is reduced by from 0.005 to 0.05 millimeters per millimeter of length of the polymeric portion of the pin, the diameter of the drill portion being between the smallest diameter and the largest diameter of the polymeric portion.

4,858,604

ADHESIVE BANDAGE

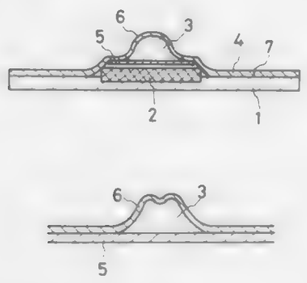
Ryusaku Konishi, Takarazuka, Japan, assignor to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 447,640, Dec. 7, 1982, abandoned. This application Sep. 13, 1985, Ser. No. 775,836

Claims priority, application Japan, Dec. 9, 1981, 56-198879; Dec. 14, 1981, 56-186996

Int. Cl.[4] A61L *15/00*

U.S. Cl. 128—156 17 Claims



1. An adhesive bandage comprising:

a. adhesive tape;

b. an absorbent pad carried by the tape which is smaller in its length and width than the tape; and

c. a release sheet releasably attached to the tape on the side of the adhesive overlaying the whole pad; said release sheet having:

d. a blister having an open side facing the pad;

e. medicine in the blister; and

f. a medicine covering film for sealing the medicine in the blister responsive to pressure for causing the medicine in the blister to impregnate the pad;

wherein the medicine is sealingly stored in the blister portion by means of a medicine covering film interposed between the medicine and the adhesive tape;

wherein the top of the blister is provided with a V-letter shaped or U-letter shaped recessed portion whereby the medicine covering film is ruptured by the bottom of the recessed portion when pressure is applied to the blister.

4,858,605

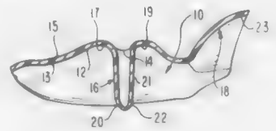
ORAL ARTIFICIAL VENTILATION APPARATUS

Raymond H. Levy, Bridgewater, N.J., assignor to Jay Danziger and George Blank, both of New Brunswick, N.J.

Continuation of Ser. No. 856,609, Apr. 25, 1986, abandoned, which is a continuation-in-part of Ser. No. 615,361, May 30, 1984, abandoned. This application Mar. 14, 1988, Ser. No. 170,709

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—203.11 17 Claims



1. Apparatus for use by an individual in administering face-to-face oral artificial ventilation to a subject, said apparatus comprising:

(a) an air and liquid impervious elongate member formed by a single, molded plastic sheet sized and contoured to overlie the mouth and adjacent areas of the face of the subject, said sheet having opposing sides forming two opposite surfaces, thereof, one of said surfaces being molded and configured complementary to the subject's face to overlie and contact the mouth and face of the subject, said sheet having a substantially central opening formed therein, said central opening being shaped and positioned for disposal over the mouth of the subject;

(b) one way normally closed valve means integrally formed with said sheet leaving from said central opening into the mouth of the subject for opening in response to air flow from the individual to permit only the passage of air to the mouth of the subject through said central opening and prevent escape of substances from the mouth of the subject through said central opening; and

(c) air deflector means formed by the upper edge portion of said molded sheet which is adapted to extend to and cover the tip of the nose of the subject but not block the nostrils of the subject, and said edge portion flaring in shape in a direction away from said central opening such that it is adapted to diverge about the nostrils of the subject so as to deflect air expelled from the nostrils of the subject away from the face of the individual when said elongate member is contacting the face of the subject.

4,858,606

LOW PRESSURE BREATHING REGULATORS AND BREATHING GAS SYSTEMS INCORPORATING THE SAME

Humphrey A. S. Hamlin, Montacute, England, assignor to Normalair-Garrett (Holding) Systems

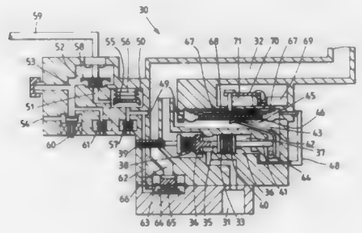
Filed Oct. 6, 1987, Ser. No. 104,888

Claims priority, application United Kingdom, Oct. 9, 1986, 8624250

Int. Cl.[4] A62B *7/14, 21/00*

U.S. Cl. 128—204.29 5 Claims

5. A breathing regulator for controlling delivery of breathing air in accordance with breathing demands of an aircrew member, comprising a regulator body having an inlet for receiving a flow of breathing air and an outlet for delivering breathing air to a face mask worn by an aircraft aircrew member, a demand valve for controlling flow of the breathing air through the regulator from the inlet to the outlet, a demand-pressure sensing chamber having communication with the outlet, a breathing-pressure control chamber having communication with aircraft cabin atmosphere ambient of the regulator, a diaphragm dividing the demand-pressure sensing chamber from the breathing-pressure control chamber, means connecting the diaphragm with the demand valve for opening movement of the demand valve in response to breathing demand sensed in the demand pressure sensing chamber, means for supplying a bleed of breathing air to the breathing-pressure control chamber, valve means for restricting flow of breathing air from the breathing-pressure control chamber to ambient in response to signals received from a G sensitive valve mounted in the aircraft in which the regulator is installed whereby pressure in the breathing-pressure control chamber is increased



to provide a delivery pressure at the regulator outlet appropriate to positive pressure breathing during periods of high or rapidly changing G load, and means comprising a passageway for by-passing the valve means so that a metered flow of pressurized air from the G sensitive valve may flow to the breathing-pressure control chamber to maintain control pressure therein, said last-named means including a non-return valve in said passageway, whereby pressure in the breathing-pressure control chamber may be rebuilt at a required rate to maintain satisfactory operation of the regulator following extreme excursions of the diaphragm.

4,858,607

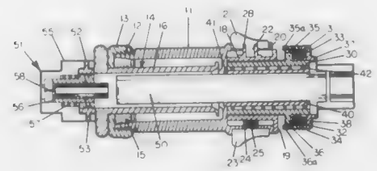
PLASTIC DEVICE FOR INJECTION AND OBTAINING BLOOD SAMPLES

Pavel Jordan; Janet Muff, both of So. Pasadeana, and Bernard Strong, Tarzana, all of Calif., assignors to Pavel Jordan & Associates, Garden Grove, Calif.

Filed Oct. 16, 1987, Ser. No. 108,950

Int. Cl.[4] A61B *17/34*

U.S. Cl. 128—314 2 Claims



1. A plastic injection device comprising:

a. an elongate, exterior hollow barrel;

b. a hollow, cylindrically-shaped depth gage means having a rearward end slidably received within the forward end of the exterior barrel such that the forward end of the depth gage means protrudes from the barrel;

c. a cylindrically-shaped spring loaded firing barrel, including first spring loading means positioned at the rearward end of the exterior barrel for projecting the firing barrel forward, the spring loading means of the firing barrel being axially disposed between the firing barrel and the exterior barrel;

d. an inwardly biased, spring loaded sleeve, including second spring loading means, said sleeve being mounted rearwardly and within the exterior barrel, the forward end of the firing barrel when cocked, resting on the said sleeve;

e. an inwardly moveable firing button mounted on the exterior barrel for biasing the spring loaded sleeve outwardly against the force of the second spring loading means, the firing button being positioned opposed to the second spring loading means of the said sleeve;

f. striker holder means mounted at the rearward end of the firing barrel for removeable attachment with a lancet striker means;

g. spring loading means to maintain a lancet striker under tension on the striker holder means; and,

h. a lancet module removably mounted at the forward end of the depth gage, the module comprising a rearwardly biased lancet holder, including a spring biasing means adapted to support a removeable lancet mounting and attached lancet; whereby:

i. when the firing barrel is retracted against the force of the first spring loading means, it rests in a cocked position, on the spring loaded sleeve;

ii. when the firing button is depressed inwardly, it outwardly biases the spring loaded sleeve and dislodges the firing barrel and thereby projects the lancet striker through the exterior barrel and depth gage to impact the lancet module against the force of the lancet spring biasing means, and thereby projects the lancet module forwardly and punctures a user's skin with the lancet;

iii. the depth gage aligns the striker as it passes therethrough and adjusts the puncture depth of the lancet needle.

4,858,608

APPLICATOR

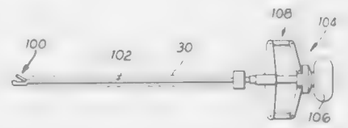
Peter H. McQuilkin, Kimberley, United Kingdom, assignor to Femcare Limited, Nottingham, United Kingdom

Filed Aug. 21, 1987, Ser. No. 88,699

Claims priority, application United Kingdom, Aug. 23, 1986, 8620560

Int. Cl.[4] A61B *17/12*

U.S. Cl. 128—325 7 Claims



1. An applicator for a sterilization clip comprising a first portion and a second portion, the first portion including an operational handle and the second portion including an elongate tube for passage completely through a laparoscope and including means for engageably connecting the first and second portions at the handle end of the laparoscope, means for looking the alignment of said operational head and handle, the second portion also including an operational head, said operational head including jaw means for holding a sterilization clip, the operational handle being operative to close said jaw means via operating rod means guided within said elongate tube, said operational handle including mechanical advantage leverage means for imposing forces on said operating rod means to close said jaw means to effect closure of a sterilization clip when the latter is fitted within the jaw means, said applicator further comprising stop means operatively connected within the operational handle and comprising means for restricting movement of the operational handle, the stop means being operative after partial closure of the jaw means by the operational handle to prevent opening of the jaw means past a specified partially closed position to thereby retain within the jaw means a partially closed sterilization clip and to retain the jaw means in a

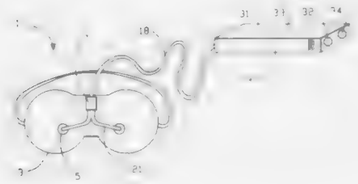
partially closed position to allow the applicator to be fed through a cannula into the interior of a patient.

4,855,690

BRIGHT LIGHT MASK

Roger J. Cole, 12981 Via Esperia, Del Mar, Calif. 92014

Filed Dec. 4, 1987, Ser. No. 128,634
Int. Cl.[4] A61N *5/06*
U.S. Cl. 128—395 14 Claims



1. A bright light mask for shining a high intensity light into a subject's eyes to modify biological rhythms, the bright light mask comprising:

a mask adapted to be worn by the subject for covering the subject's eyes regardless of body position, the mask having at least one light admitting aperture that is transparent to visible light energy;

lighting means coupled to the mask for generating bright light and delivering cool light at selected intensity and frequencies sufficient to modify biological rhythms, the light means including a light means for generating bright light; and

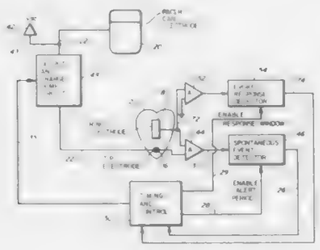
control means for regulating the delivery of light to the subject's eyes, the control means including timer means for turning the light source on and off at variable preselected times, and dimmer means for varying the intensity of the light delivered to the subject's eyes, wherein said dimmer means is arranged such that each time the timer means turns the light source on, the dimmer means gradually increases the intensity of the light delivered to the subject's eyes.

4,858,610

DETECTION OF CARDIAC EVOKED POTENTIALS

Frank J. Callaghan, Miami, and Edward A. Schroeppel, Miramar, both of Fla., assignors to Telectronics, N.V., Antilles, Netherlands

Continuation of Ser. No. 807,547, Dec. 11, 1985, abandoned.
This application Feb. 8, 1988, Ser. No. 157,084
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG 40 Claims



1. The method of cardiac pacing and sensing which comprises the steps of:

providing a cardiac pacing lead having a first electrode carried on the distal end of said lead and a second electrode carried by the lead and spaced from said first electrode and free of electrical connection thereto;

positioning said lead in a heart chamber;

periodically emitting an electrical stimulus, pulse in a unipolar mode, from said first electrode to stimulate cardiac muscular contraction; and

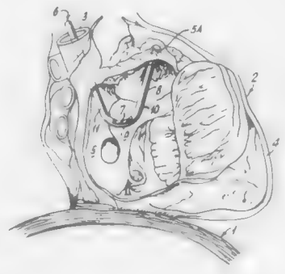
detecting in a unipolar mode, an electric potential response evoked by said pulse, by said second electrode, whereby signal interference caused by residual polarization of said first electrode is suppressed.

4,858,611

SENSING SYSTEM AND METHOD FOR SENSING MINUTE VENTILATION

Clyde D. Elliott, Mountain Brook, Ala., assignor to Dimed, Inc., Birmingham, Ala.

Filed Jun. 3, 1987, Ser. No. 57,492
Int. Cl.[4] A61N *1/00;* H05G *00/00*
U.S. Cl. 128—419 P 22 Claims



1. A sensing system for detecting the frequency and amplitude of motion of a patient's diaphragm comprising:

a transducer means for detecting vertical movements of the patient's pericardial sac, transvenously implantable in a patient's cardiovascular system;

a lead means coupled to the transducer means, transvenously implantable in a patient's cardiovascular system, and

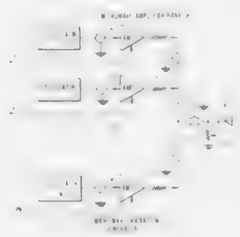
a sensing instrument means for correlating transducer movement detection with the frequency and amplitude of diaphragm motion coupled to the lead means and the transducer means.

4,858,612

HEARING DEVICE

Philip L. Stocklin, P.O. Box 2111, Satellite Beach, Fla. 32937

Filed Dec. 19, 1983, Ser. No. 562,742
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—422 29 Claims



1. A sound perception device for providing induced percep-

tion of sound into a mammalian brain comprising in combination:

means for generating microwave radiation which is representative of a sound to be perceived, said means for generating including means for generating a simultaneous plurality of microwave radiation frequencies and means for adjusting the amplitude of said microwave radiation frequencies in accordance with the sound to be perceived; and

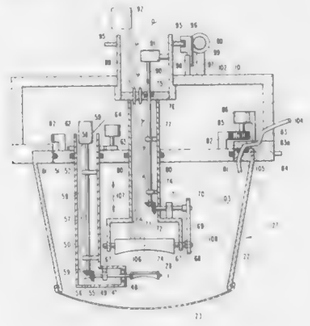
antenna means located in the region of the auditory cortex of said mammalian brain for transmitting said microwave energy into the auditory cortex region of said brain.

4,858,613

LOCALIZATION AND THERAPY SYSTEM FOR TREATMENT OF SPATIALLY ORIENTED FOCAL DISEASE

Francis J. Fry, and Narendra T. Sanghvi, both of Indianapolis, Ind., assignors to Laboratory Equipment, Corp., Mooresville, Ind.

Filed Mar. 2, 1988, Ser. No. 163,259
Int. Cl.[4] A61B *8/00*
U.S. Cl. 128—660.03 15 Claims



1. An ultrasound imaging and treatment device for use in the treatment of a patient by means of ultrasound energy, said device comprising:

an enclosed transducer housing designed and arranged to be positionable onto the patient;

a visualization transducer disposed within said housing and movable relative to said housing;

a treatment transducer disposed within said housing and movable relative to said housing;

first drive means for imparting linear motion to said treatment transducer relative to said housing;

second drive means for imparting rotary motion to said treatment transducer relative to said housing; and

third drive means for imparting rotary sector motion to said visualization transducer relative to said housing.

4,858,614

METHODS OF AND APPARATUS FOR POSITIONING AND AIMING AN ULTRASONIC PROBE

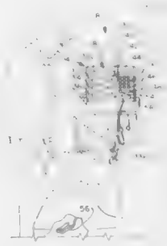
Jerry D. Stevens; Donald R. Steele, and Donald A. Gorney, Jr., all c/o Lawrence Medical Systems, 1100 Avenida Acaso, Camarillo, Calif. 93010

Filed Apr. 29, 1986, Ser. No. 188,356
Int. Cl.[4] A61B *8/00*
U.S. Cl. 128—661.07 30 Claims

1. A method of accurately aiming a transducer with an ultrasonic transmitter and a receiver for reflected ultrasonic energy toward the center of a blood vessel of a patient, said method including the steps of:

a. converting the output from the transducer receiver to an electrical signal representing the frequency shift between the ultrasonic energy emitted from the transmitter and the energy reflected to the receiver;

b. amplifying said electrical signal to a constant level by



adjusting the gain of the circuit means employed to amplify said signal; and

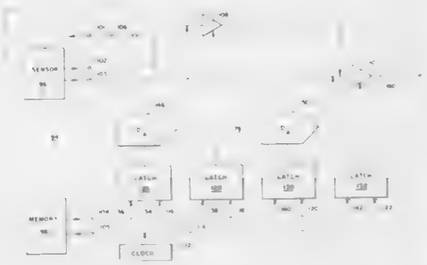
c. adjusting the position of the probe until the gain of the circuit means reaches a minimum.

4,858,615

CATHETER SENSOR AND MEMORY UNIT

Ate. J. Meinema, Roden, Netherlands, assignor to Sentron v.o.f., Roden, Netherlands

Continuation of Ser. No. 830,900, Feb. 18, 1986, abandoned, which is a continuation of Ser. No. 439,517, Nov. 5, 1982, abandoned. This application Jul. 29, 1988, Ser. No. 227,435
Claims priority, application Netherlands, Nov. 10, 1981, 8105084
Int. Cl.[4] A61B *5/00;* G01K *15/00;* G01L *27/00*
U.S. Cl. 128—668 2 Claims



1. A living body parameter sensing system including:

a catheter sensor and memory unit; and,

information and signal processing circuitry;

said catheter sensor and memory unit including:

a catheter,

a non-ideal sensor mounted in said catheter,

a connector assembly including a connector housing,

said catheter being connected to said connector housing,

connectors mounted in said connector housing,

conductors in said catheter connected between said sensor and said connectors mounted in said connector housing, and

memory means for storing departure information data including offset and amplification data relative to the departure of non-ideal sensor output signals from ideal sensor output signals,

said memory means being mounted in said connector housing and being connected to said connectors such that said sensor and said memory means are permanently joined together by being mounted together in

said catheter sensor and memory unit and by being connected to said connectors; said information and signal processing circuitry including:

means coupled to said memory means via said connector for retrieving the departure information data including offset data and amplification data relative to first sensor output signals from said memory means,

means coupled to said sensor via said connectors for retrieving first sensor output signals from said sensor relative to a first living body parameter,

means for offsetting said first sensor output signals retrieved from said sensor relative to the offset data for said first sensor output signals retrieved from said memory means,

means for amplifying said retrieved first sensor output signals,

means for adjusting the gain of said amplifying means relative to said amplification data for said first sensor output signals retrieved from said memory means, and

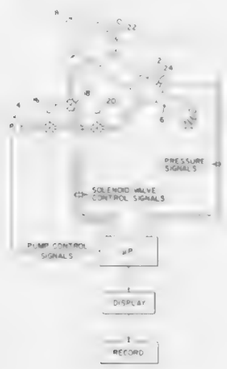
means coupled to said amplifying means for providing a first sensor output signal standardized for amplitude and offset.

4,858,616

BLOOD PRESSURE MEASUREMENT SYSTEM FOR FILTERING LOW-FREQUENCY, HIGH-AMPLITUDE NOISE

George M. Samaras, Columbia, Md., and Steven M. Falk, Washington, D.C., assignors to GMS Engineering Corporation, Columbia, Md.

Filed Mar. 17, 1988, Ser. No. 169,587
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—680 12 Claims



1. A blood pressure measurement system comprising:

an occlusion bladder attachable to an upper portion of a limb;

a sensing bladder attachable to a lower portion of the limb;

a means for monitoring a first pressure in the occlusion bladder and producing an occlusion pressure signal related to the first pressure and for monitoring a second pressure in the sensing bladder and producing a sensing pressure signal related to the second pressure;

a means for filtering out blood pulse signals from the sensing pressure signal and producing a static pressure signal;

a means for recognizing and storing a plurality of relative minimums of the static pressure signal; and

a means for relating the smallest of the relative minimums of the static pressure signal with a corresponding occlusion pressure value to derive systolic pressure.

4,858,617

CARDIAC PROBE ENABLING USE OF PERSONAL COMPUTER FOR MONITORING HEART ACTIVITY OR THE LIKE

William J. Sanders, Palo Alto, Calif., assignor to ITH, Inc., San Jose, Calif.

Filed Sep. 10, 1987, Ser. No. 95,314
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—696 8 Claims



1. A unitary probe for producing and transmitting computer compatible serial form digital signals indicative of heart activity of a subject to a spaced apart digital computer of the general purpose type at which software may be changed by the operator to run any of a variety of different computer programs and which has a serial data input port, comprising:

a probe housing having a configuration adapted for disposition at the thoraic region of said subject and having signal output means for transmitting said digital signals to said serial data input port of said computer,

first, second and third electrodes secured to said housing and extending outward from a surface thereof, said electrodes being mutually spaced apart,

first circuit means for producing a first analog signal which varies in accordance with variations of the electrical potential at said first electrode relative to the electrical potential at said third electrode.

second circuit means for producing a second analog signal which varies in accordance with variations of the electrical potential at said second electrode relative to the electrical potential at said third electrode.

third circuit means for producing a third analog signal which varies in accordance with variations of the difference between said first and second analog signals,

signal conversion circuit means for converting said third analog signal to sequences of serial form digital signal bits,

each of said circuit means being within said probe housing,

an electrical power supply disposed within said probe housing and being coupled to each of said circuit means to supply operating current thereto, and

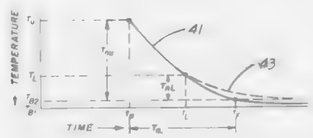
isolating means for transmitting said sequences of signal bits to said serial data input port of said computer through said output means of said probe housing and which converts said signal bits to non-electrical form and then back into electrical form to electrically isolate said subject from said computer.

4,858,618

THERMODILUTION METHOD AND APPARATUS FOR DETERMINING RIGHT VENTRICULAR EJECTION FRACTION

Mark A. Konno, Costa Mesa, and John A. Ripley, Newport Beach, both of Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 23, 1986, Ser. No. 866,772
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—7.3 21 Claims



1. An apparatus for determining right heart ejection fraction comprising:

means for injecting a cold indicator into the right ventricle or locations in the heart upstream thereof during an injection period and allowing the indicator to be diluted with blood and flow to the pulmonary artery whereby the temperature of the fluid in the pulmonary artery falls and then rises;

means for measuring the temperature of the blood in the heart to provide a prebolus temperature of the blood prior to the time that the cold indicator reaches the pulmonary artery and to provide measured temperatures of the fluid in the pulmonary artery during the time that the temperature in the pulmonary artery is rising;

means responsive to at least some of the measured temperatures for establishing a post bolus baseline temperature which is lower than said prebolus baseline temperature;

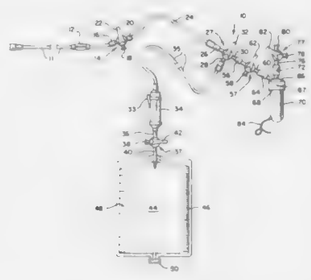
means responsive to differentials between at least some of the temperatures measured during the time that the temperature of the fluid in the pulmonary artery is rising and the post bolus baseline temperature for determining right heart ejection fraction.

4,858,619

INTRACRANIAL PRESSURE MONITORING SYSTEM

Marie A. Toth, 1462 Village Green Dr., Clairton, Pa. 15025

Filed Jun. 29, 1987, Ser. No. 67,984
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—748 9 Claims



1. A system for monitoring intracranial pressure and draining intracranial fluid comprising:

a drainage collection means;

first valve means having an input port and first and second output ports, said first output port being connected to said drainage collection means;

tubing for connecting said input port of said first valve means to a patient, said tubing having a length sufficient to reduce the risk of infection;

second valve means having an input port connected to said second output port of said first valve means, and an output port;

a pressure transducer; and

a dome member having a first opening connected to said output port of said second valve means, a second opening connected to said pressure transducer, and a third opening through which the system can be balanced;

the system defining a fluid communication path between the patient and said pressure transducer wherein said pressure transducer and said dome member are in a downstream position along said path relative to said drainage collection means.

4,858,620

WARNING SYSTEM FOR EXCESSIVE ORTHOPEDIC PRESSURES

Edward D. Sugarman, Fayetteville; Nicholas F. D'Antonio, and Nicholas J. D'Antonio, both of Liverpool, all of N.Y., assignors to Walgen Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 834,609, Feb. 28, 1986, abandoned. This application Sep. 15, 1987, Ser. No. 96,667
Int. Cl.[4] A61B *5/10*
U.S. Cl. 128—774 20 Claims



1. An apparatus for monitoring pressure beneath an orthopedic restraining member that has been applied to a person's body, said apparatus comprising:

sensing means for sensing a pressure level at a plurality of compartments beneath a restraining member, said sensing means includes a plurality of electrical pressure sensors, whereby at least one of said sensors can be situated at each of the compartments,

means, coupled to the plurality of electrical pressure sensors of said sensing means, for generating an electrical output signal that is proportional to the algebraic sum of said pressure levels sensed at a plurality of compartments, and

warning means, coupled to said generating means and responsive to the output signal, for warning when said output signal reaches a predetermined danger level.

4,858,621

FOOT PRESSURE MEASUREMENT SYSTEM

Christopher I. Franks, Hatharage, England, assignor to Biokinetics, Inc., Bethesda, Md.

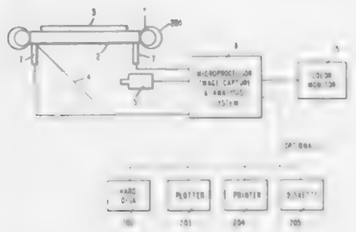
Filed Mar. 16, 1988, Ser. No. 168,953
Int. Cl.[4] A61B *5/10*
U.S. Cl. 128—779 14 Claims

1. A foot pressure measurement system comprising:

(a) a glass plate,

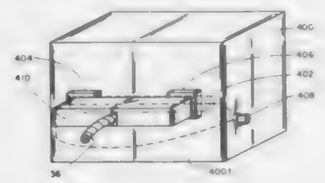
(b) a reflective material comprising photographic paper positioned above said glass plate for receiving foot pressure,

(c) a light source for generating light within said glass plate,
(d) a mirror positioned below said glass plate for reflecting light emitted through said glass plate,



(e) a television camera for receiving light reflected from said mirror, and
(f) means for processing and displaying data indicative of said foot pressure.

4,858,622
FALL ALERT SYSTEM WITH MAGNETICALLY OPERABLE SWITCH
Josef Osterweil, Rockville, Md., assignor to J.D. Monitoring, Incorporated, Rockville, Md.
Filed Apr. 1, 1987, Ser. No. 32,675
Int. Cl.[4] A61B *5/10*
U.S. Cl. 128—782 **9 Claims**



1. A human monitoring device for alerting monitoring personnel located at a remote location that a monitored person may have fallen, said device comprising:
(a) an enclosure, said enclosure being manufactured from a non-ferromagnetic material and having an opening in one wall;
(b) a source of magnetic field secured inside said enclosure proximate a first side of said opening in said enclosure;
(c) a magnetically operable switch secured inside said enclosure proximate a second side of said opening in said enclosure, said magnetically operable switch being positioned so that it is substantially parallel to said source of magnetic field, the output of said magnetically operable switch changing from a first state to a second state in the presence of said magnetic field;
(d) shunting means selectively positioned between said source of magnetic field and said magnetically operable switch, said shunting means operating to divert said source of magnetic field away from said magnetically operable switch;
(e) a harness having two ends, one end of said harness being attached to said shunting means, the remaining end of said harness being secured to said monitored person in a manner whereby said shunting means is withdrawn from said opening in said enclosure if said monitored person exceeds a predetermined range of movement with respect to said monitoring device, said movement causing said magnetically operable switch to change to said second state; and,
(f) alerting means for sending a signal to said remote location when said magnetically operable switch changes from said first state to said second state to alert said monitoring personnel that said monitored person may have fallen.

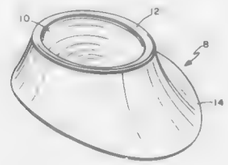
4,858,623
ACTIVE FIXATION MECHANISM FOR LEAD ASSEMBLY OF AN IMPLANTABLE CARDIAC STIMULATOR
James I. Bradshaw, Surfside, and Ross G. Baker, Jr., Houston, both of Tex., assignors to Intermedics, Inc., Angleton, Tex.
Filed Jul. 13, 1987, Ser. No. 72,746
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—785 **10 Claims**

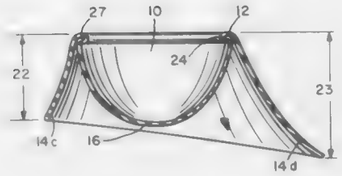


1. An active fixation mechanism adapted to secure a stimulating electrode to tissue to be stimulated, said electrode being fixed to the distal end of an endocardial lead, said fixation mechanism comprising:
a generally cylindrical housing extending axially of said lead beyond said electrode;
a rigid hook having a first end pivotally coupled to the housing and a second end adapted to move between a first concealed position within said housing and a second exposed position encompassing at least a portion of said housing and spaced therefrom wherein axial rotation of said lead causes said hook to engage cardiac tissue in the vicinity of the electrode;
spring means biasing the hook to said first position; and
means for selectively overcoming the bias of the spring means for moving the hook into said tissue-engaging second position.

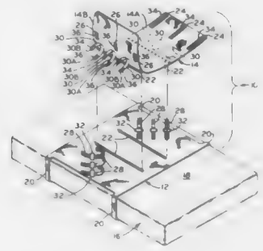
4,858,624
DEVICE AND METHOD FOR INTRAVAGINAL, BARRIER-TYPE PREVENTION OF CONCEPTION AND INFECTION
Alfred A. Shihata, Bonita, Calif., assignor to Vance Products Incorporated d/b/a/ Cook Urological Incorporated and Cook OB/GYN, Spencer, Ind.
Filed Feb. 24, 1988, Ser. No. 159,846
Int. Cl.[4] A61F *5/46*
U.S. Cl. 128—834 **4 Claims**

1. A barrier-type device for preventing conception and infection by sexually-transmitted diseases, comprising:
a cervical dome fabricated from a flexible, physiologically non-reactive material, said dome having an opening and a curved surface extending from said opening to a dome top;
a continuous fornical rim on said dome, said rim defining said opening; and
a continuous, annular vaginal brim circumscribing said cervical dome,
said vaginal brim being folded at said rim outwardly and downwardly with respect to said opening; and wherein the vertical dimension between the rim and the outside edge of the brim increases with circumferential symmetry from an anterior vaginal location on said brim to a posterior vaginal location on said brim which is opposite said anterior vaginal location.



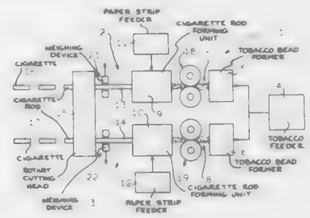


4,858,625
SECURITY RESTRAINING BLANKET
Judith C. Cramer, 12128 Aboite Rd., Roanoke, Ind. 46783
Filed Nov. 25, 1987, Ser. No. 125,465
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—872 **14 Claims**



1. A security restraining blanket, comprising:
(a) a sheet-like main pad composed of flexible material and adapted to be applied to a support structure so as to extend across a surface of said structure, said main pad including a plurality of straps for attaching said pad to said support structure;
(b) a sheet-like restraining section composed of flexible material and adapted to encircle only the torso of a person for restraining the person's torso in a desired position on said main pad, said restraining section adapted not to encircle the person's neck and arms, said restraining section releasably secured to said main pad by releasable fastening means whereby a person may be moved from said main pad without removing said person from said restraining section;
(c) arm restraining means on said main pad and adapted to be applied about at least one of the arms of the person for restraining the person's arms in a desired position on said main pad; and
(d) releasable fastening straps and segments attached on opposite end portions of said restraining section for securement of the opposite end portions of said restraining section together after said section is applied about the person's torso.

4,858,626
METHOD OF OPTIMIZING THE STANDARD WEIGHT VARIATION OF CIGARETTES ON A DUAL-ROD CIGARETTE MANUFACTURING MACHINE
Armando Neri, Bologna, Italy, assignor to G.D. Societa' Per Azioni, Bologna, Italy
Filed Dec. 17, 1987, Ser. No. 134,238
Claims priority, application Italy, Dec. 17, 1986, 3613 A/86
Int. Cl.[4] A24C *5/14*
U.S. Cl. 131—84.4 **3 Claims**



1. A method of optimizing the standard weight deviation of cigarettes on a cigarette manufacturing machine having at least two manufacturing lines for producing respective continuous cigarette rods, each said line having shaving means for adjusting the amount of tobacco in the respective rod characterized by stages comprising:
assigning each line (2, 3) a device for weighing each individual cigarette (16, 17);
simultaneously determining for each line (2, 3), the standard weight deviation and mean weight values of a given number of cigarettes (16, 17);
comparing the said standard weight deviations against each other to determine the measurement presenting the greatest standard weight deviation; and
controlling the shaving means (18, 19) on the lines (2, 3) so that the mean weight value of each measurement equals a given value identical for all the measurements and is selected as a function of the measurement presenting the highest standard weight deviation.

4,858,627
SMOKER'S HAT
Walter C. Netschert, 5821 Beach Blvd., Buena Park, Calif. 90621
Filed May 25, 1988, Ser. No. 198,335
Int. Cl.[4] A24D *3/04*; A24F *47/00*
U.S. Cl. 131—329 **23 Claims**

1. A portable hat system for enabling the smoking of tobacco-type products without affecting the environment comprising:
hat means for covering the head of a smoker;
means for intaking ambient air into the hat means, the intake

ambient air flowing in front of the smoker's face when the hat is worn by the smoker;



separate filter means for removing combustion products released by the smoker into the intake ambient air to produce filtered air; and

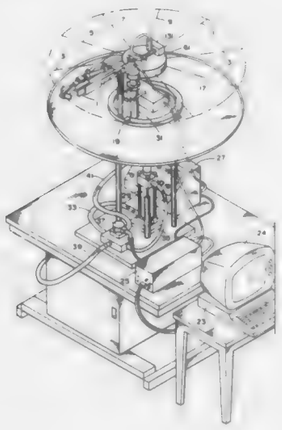
means for exhausting the filtered air from the hat means.

4,858,628

SMOKING MACHINE

Alan B. Norman, Clemmons; David W. Griffith, Jr., Winston-Salem; Dewey L. Holt, Winston-Salem; John H. Reynolds, IV, Winston-Salem, and Stephen B. Sears, Winston-Salem, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Nov. 16, 1987, Ser. No. 121,304
Int. Cl.[4] A24C *5/60*
U.S. Cl. 131—329 **16 Claims**



1. A multi-port automatic smoking machine comprising:

a plurality of suction means for simultaneously drawing smoke through a plurality of smoking articles; and

actuation means for simultaneous operation of each of said suction means comprising a hydraulic ram operatively connected to each of said plurality of suction means.

4,858,629

INCREASED VOLUME SYNTHETIC FIBRES, PROCEDURE FOR PRODUCING THEM AND THEIR USE, IN PARTICULAR FOR FILTERS

Francesco Candari, Brindisi, Italy, assignor to S.P.T. S.r.l., Lecce, Italy

Filed Jul. 23, 1986, Ser. No. 889,321
Claims priority, application Italy, May 9, 1986, 20386 A/86
Int. Cl.[4] D01D *5/247, 5/253;* **D01F** *6/06;* **B29C** *67/22*
U.S. Cl. 131—332 **24 Claims**



4. A process for making a high-bulk fiber, comprising the steps of:

(a) cold mixing a fiber-forming synthetic polymer with a blowing agent to form a spinnable filament-producing mixture;

(b) heating said mixture to form a melt and melt-spinning said mixture through X-section or Y-section orifices to produce fibers therefrom and generate by a swelling and fringing action of heat and said blowing agent the formation of ramified structure consisting essentially of a porous central core and porous lateral filaments branching from said core and shorter than said core, said lateral filaments being distributed over substantially the entire length of each spun fiber;

(c) drawing the spun fibers of said ramified structure of step (b); and

(d) fixing the drawn spun fibers of step (c).

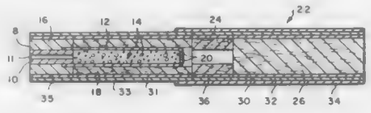
19. Cigarette filter characterized in that it comprises a tow of fibers of porous polypropylene made by the process of claim 4; each of said polypropylene fibers consist of a large number of porous lateral filaments integral with the core so as to form a ramified structure; the ramified structure of each fiber interpenetrates the ramified structure of the surrounding structures so as to form a filter that is rigid and which possesses high absorbent capacity.

4,858,630

SMOKING ARTICLE WITH IMPROVED AEROSOL FORMING SUBSTRATE

Chandra K. Banerjee, Pfafftown, and Gary R. Shelar, Greensboro, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Dec. 8, 1986, Ser. No. 939,203
Int. Cl.[4] A24B *15/16;* **A24D** *1/18*
U.S. Cl. 131—364 **72 Claims**



1. A method of preparing an aerosol producing substrate material for use with smoking articles, said method comprising the steps of:

(a) forming a slurry of a tobacco flavor material and a non-aqueous, non-tobacco aerosol forming material; and

(b) applying the slurry to a porous non-tobacco carrier, the slurry being substantially absorbed within the carrier.

4,858,631

SIMULATED EYEBROW APPLICATOR

William J. Chuang, 1230 Miramonte Ave., Los Altos, Calif. 94022

Filed Apr. 7, 1988, Ser. No. 178,538
Int. Cl.[4] A45D *40/26*
U.S. Cl. 132—218 **4 Claims**



1. A simulated eyebrow applicator, comprising:

a sheet of thin material of a width at least equal to two eyebrows of a human being;

a pair of simulated eyebrows having an inner end and an outer end and symmetrically and transversely formed on the sheet of thin material, with a space left between the inner end of the said eyebrows;

a plurality of foldings formed on the sheet of thin material at the space left between the inner ends of the said eyebrows so as to form a corrugated part; and

a plurality of adhesive areas formed on the sheet of thin material on the same face having the simulated eyebrows formed thereon and at the places between the inner ends of the said eyebrows and the corrugated part, and at the places near the outer ends of the said simulated eyebrows;

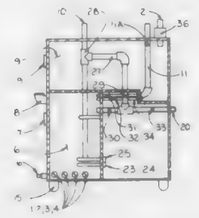
whereby the simulated eyebrow applicator can be brought near the eyebrows or the original position of eyebrows of a user by two hands of the user, the distance between the pair of the said simulated eyebrows can be adjusted by extending or collapsing the corrugated part, the applicator can be adhered to the face of the user with the plurality of adhesive areas stuck to the face of the user; and the said simulated eyebrows can be transferred from the sheet of thin material to the face of the user.

4,858,632

PNEUMATIC DEEDIMENTATION MACHINE

Jerry L. Jay, Jr., Rte. #3, Box 239, and Ben Cottrell, Rte. 190 3, Box 313, both of Newbern, Tenn. 38059

Filed Mar. 25, 1988, Ser. No. 173,060
Int. Cl.[4] B08B *9/02*
U.S. Cl. 134—57 R **3 Claims**



1. A device for the removal of deposits from the inside of machinery or equipment comprised of two tanks, one being a process or pressure tank for holding process solution, the other being a return tank for temporarily holding used process solution, that are interconnected by two pipes, one of which is for returning the used process solution from the return tank to the process tank, the other being for venting entrapped air from the process tank to the atmosphere and the flow through both pipes being controlled by solenoid operated valves so that they can be closed to allow the process tank, which is further supplied with an air supply line, the flow through which is also controlled by a solenoid operated valve, and is supplied with air pressure from an external source, that is still further supplied with a pressure regulator, to be pressurized, in a controlled manner, when the solenoid valve that controls the air flow through the air supply line is opened forcing the solution in the process tank through and out of a provided to process line and, by means of user supplied plumbing, through any remote machinery or equipment being cleaned and then into the return tank until the level of solution in the process tank goes below the level of the furthermost extension of the to process line within the process tank and the level of a lower level control probe within the process tank, at which time controls are signaled to open the solenoid valve for venting entrapped air from the process tank to the atmosphere and returning the solution from the return tank to the process tank and close the solenoid valve for controlling the supplied air pressure so that the solution can be transferred back to the process tank until the level of the solution in the process tank exceeds the level of an upper level control probe within said process tank which signals controls to close the solenoids for venting entrapped air from the process tank to the atmosphere and for returning the solution from the return tank to the process tank and open the solenoid for supplied air pressure which will allow for the process tank to repressurize and recirculate the solution and by automatically controlling the open/closed condition of these valves, the solution can be recirculated through the machinery or equipment being cleaned an infinite number of times until the deposits are removed or the solution is neutralized to allow for the maximum efficiency of the solution being used.

4,858,633

STABLE TELESCOPIC CENTERPOST OF MULTIPLE-FOLD UMBRELLA

Chi-Kuo Yang, P.O. Box 10160, Taipei, Taiwan

Filed Apr. 14, 1989, Ser. No. 338,041
Int. Cl.[4] A45B *19/00*
U.S. Cl. 135—25 R **6 Claims**



1. A Telescopic centerpost of a multiple-fold umbrella comprising:

a plurality of hollow tubes telescopically retracted or extended with one another having a slider of spokes and canopy extendibly retained on an upper portion of the centerpost and a handle tube formed on a lower portion of the centerpost;

an upper retainer generally formed as an arcuate spring plate held in a first hollow tube of the hollow tubes having an upper catch protruding leftwardly from an upper slot of the first tube for supporting a left portion of the slider and having a lower catch protruding leftwardly through a lower slot formed on a lower portion of said first tube and through an upper slot formed on an upper portion of a

seconed tube extendibly connected under said first tube thereby coupling said first tube and said second tube;

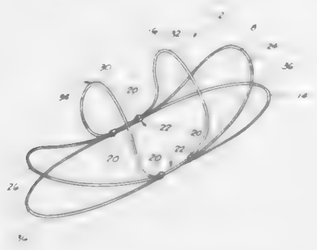
the improvement which comprises: said upper retainer having a rear extension formed on a rear portion of said upper catch retractably engageable with a right notch formed in an upper portion of said first tube, said upper catch with said rear extension operatively protruding leftwardly for supporting a left portion of said slider; and a slider straightener formed as an U-shaped spring plate having a protrusion secured on one end of said spring plate protruding rightwardly through a protrusion notch formed in an upper portion of said first tube to resiliently retain a cylindrical bore portion inside said slider to stabilize said slider vertically by the aid of said upper catch of said upper retainer.

4,858,634

SELF ERECTING STRUCTURE

Eddie S. McLeese, 7912 Wrenwood Blvd., Ste. C., Baton Rouge, La. 70809

Filed Jul. 18, 1988, Ser. No. 223,889
Int. Cl.[4] E04H *15/40*
U.S. Cl. 135—104 **11 Claims**



1. A self-erecting tent structure, comprising:

(a) a first continuous resilient substantially closed planar loop base support member contacting the surface upon which the tent is resting when erected:

(b) at least a second continuous resilient closed loop support member, secured to the closed loop base support member at at least two points, with portions of the second closed loop support member positioned apart from and above portions of base support member; and

(c) a fabric membrane extending around and enclosing the base and second continuous support members, and including an entry port, for defining an enclosure within the fabric positioned around the first and second support members.

4,858,635

TENT

Lawrence C. Eppenbach, 900 First Ave. South, Seattle, Wash. 98134

Filed Feb. 22, 1988, Ser. No. 158,591
Int. Cl.[4] A45F *1/16*
U.S. Cl. 135—104 **18 Claims**

1. A tent comprising;

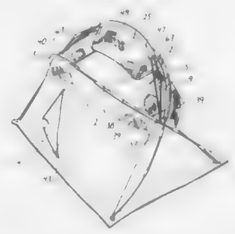
a frame including crossed frame members;

sheet material supported by the frame and formed into an enclosure having a peripheral wall and an elongated sloped ceiling with an opening in the ceiling, said opening extending longitudinally for substantially less than the full longitudinal length of the ceiling;

an elongated, bowed pivot member having opposite ends, said pivot member extending over the ceiling generally in the direction of elongation of the ceiling;

means for mounting the pivot member for pivotal movement over the opening;

a flexible flap for opening and at least partially closing the opening, a first region of said flap being coupled to the sheet material; and



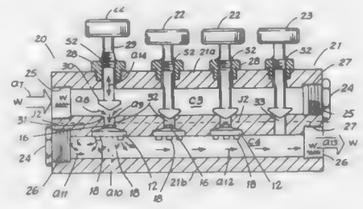
means for attaching a second region of the flap to the pivot member whereby the pivot member can pivot to move the flap transversely to the direction of elongation of the ceiling to open and at least partially close the opening.

4,858,636

PRESET MICROSCOPIC FLOW VALVE APPARATUS AND METHOD

Donald E. Adkins, P.O. Box 217, San Simon, Ariz. 85632

Filed May 11, 1988, Ser. No. 193,113
Int. Cl.[4] G05D *7/01*
U.S. Cl. 137—8 **7 Claims**



4. A preset flow rate valve apparatus having water pressure compensating means for maintaining a constant water volume flow rate during periods of variable inlet pressures, for use in moisture maintenance systems, said valve apparatus comprising:

(a) valve housing means for coupling to a water source and delivering microscopic volumes of water, said valve housing means having a first housing member and a second housing member, said first housing member forming an inlet chamber and said second housing member forming an outlet chamber, said first housing member having at least one valve inlet port adapted for connecting to said water source and said second housing member having at least one valve outlet port adapted for connecting to an irrigating system;

(b) a flushing port located between said inlet chamber and said outlet chamber;

(c) a shut-off means for opening and closing water flow to said flushing port;

(d) at least one emitter means, said emitter means being fixedly positioned and sealed between said inlet and outlet chambers, said emitter means having a housing with an inlet port and a plurality of outlet ports designed to deliver microscopic volumes of water at a rate ranging from one quart per hour to fifty gallons per hour, each outlet port being designed to provide a fractional preset flow rate, said plurality of outlet ports including unused outlet ports having closed orifices and useable outlet ports having opened orifices that are selectively opened prior to said

emitter means being fixedly positioned between said inlet and outlet chambers; and

(e) shut-off means for opening and closing the flow of water into said inlet port of said at least one emitter means.

4,858,637

GAS CONSUMPTION MEASURING SYSTEM

Garry L. Rempel, Waterloo, and Navroz A. Mohammadi, Sarnia, both of Canada, assignors to University of Waterloo, Waterloo, Canada

Filed Dec. 23, 1987, Ser. No. 137,053
Claims priority, application United Kingdom, Dec. 23, 1986, 8630794
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—12 **12 Claims**



1. A method of maintaining the pressure of a gas in a reaction zone substantially constant during chemical consumption of said gas in said reaction zone, which comprises:

establishing a chemical reaction in said reaction zone wherein gas is consumed,

continuously monitoring the gas pressure in said reaction zone during said chemical reaction by pressure transducer means connected to said reaction zone and comparing the pressure in said reaction zone to a reference pressure, said pressure transducer means being capable of generating an electrical signal of magnitude corresponding to a detected drop in pressure in said reaction zone, said electrical signal being an analog signal and being converted to a digital signal for processing an an algorithm resident in a microcomputer to generate a valve control signal,

controlling the flow rate of said gas to said reaction zone through a pressure-actuated control valve through which said reaction zone is connected to a reservoir of said gas by said valve control signal to compensate for said gas consumption and to maintain a substantially constant pressure of said gas in said reaction zone during said chemical reaction.

detecting a decrease in gas pressure in said reservoir by a second pressure transducer comparing the reservoir pressure to a second reference pressure.

4,858,638

FAST-ACTING QUICK RELEASE VALVE

Zoltan Caeri, Northbrook, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

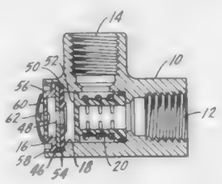
Filed Nov. 10, 1987, Ser. No. 269,297
Int. Cl.[4] G05D *11/00*
U.S. Cl. 137—115 **12 Claims**

1. A quick release valve for a pneumatic air system includes:

a housing, a chamber in said housing, an air inlet opening into said chamber, an air outlet opening into said chamber, an exhaust opening communicating with said chamber and a seal positioned to close said exhaust opening,

a shuttle movable within said housing chamber and having a shuttle chamber and an air inlet connecting said housing air inlet and said shuttle chamber, shuttle air outlets positioned circumferentially about said shuttle and communicable between said shuttle chamber and housing air outlets, and an elastomeric valve member positioned about said shuttle and masking said shuttle air outlets to control the opening thereof,

said shuttle having a first position wherein housing air inlet pressure is less than housing air outlet pressure in which said elastomeric valve member closes said shuttle air outlets and said housing air outlet is in communication with said housing exhaust opening, said shuttle having a second



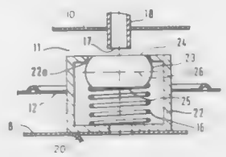
position wherein housing air inlet pressure is greater than housing air outlet pressure in which said shuttle and seal close said exhaust opening and the housing inlet/outlet pressure differential causes said elastomeric valve member to permit air to flow from said housing air inlet, through said shuttle air inlet, shuttle chamber and shuttle air outlets to said housing air outlet.

4,858,639

CURRENT-PRESSURE TRANSDUCER, PARTICULARLY FOR A VACUUM CONTROL IN AUTOMOTIVE VEHICLES

Stephan Wietschorke-Muhsold, Usingen, and Wolfgang Göcking, Neu-Anspach, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 836,289, Mar. 5, 1986, Pat. No. 4,793,373. This application Oct. 14, 1988, Ser. No. 258,224
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1985, 3508481
Int. Cl.[4] G05D *16/06*
U.S. Cl. 137—116.5 **1 Claim**



1. A current-pressure transducer, in particular for a vacuum control in automotive vehicles, having a chamber which is provided with a connection for supply vacuum and with a connection for removal of control pressure, the transducer including an air inlet for admitting outside pressure to the chamber and a member serving as a wall of the chamber; the transducer further comprising

a plunger-type armature of an plunger-type armature electromagnet, a double valve and a valve block developed substantially as hollow cylinder and located on the membrane as part of the double valve, the valve block being a displaceable with the membrane, which is displaceable by the plunger type armature; the transducer including

a supply valve seat and a valve member and an annular atmospheric valve seat positioned for pressing against the valve member; and wherein the double valve and the valve block, in combination with the valve member and the atmospheric valve seat form an atmospheric valve

between the chamber and the outer pressure, the valve member forming together with the supply valve seat a vacuum valve at the connection for supply vacuum and wherein

said valve member is pressed from the inside of the chamber against said valve block said valve member being developed approximately as a spherical shell having two flattenings of approximately the same size and arranged substantially parallel to each other on opposite sides of a control plane of the valve member in such a manner that one of the flattenings together with the supply valve seat at the connection for supply vacuum forms a vacuum valve, a curved surface of the spherical shell forming, together with the annular atmospheric valve seat the atmospheric valve.

4,858,640

PROCESS FOR FEEDING GAS STORED IN A CAVERN STORAGE FACILITY INTO A CONSUMER NETWORK, AND A LAYOUT FOR IMPLEMENTING SUCH A PROCESS

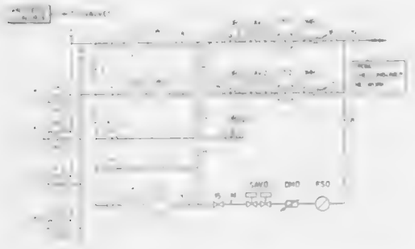
Klaus-Dieter Kaufmann, Morassistrasse 21, 8000 Munich 5, Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 114,849

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637370

Int. Cl.[4] F17D *1/04*

U.S. Cl. 137—236.1 11 Claims



1. A process for feeding gas stored under high pressure in a multiple cavern storage facility into a consumer network operating at a lower pressure by use if an interposable compressor station comprising:

a first stage wherein gas is removed exclusively from a first individual cavern and fed directly into the consumer network to be supplied;

at least one subsequent stage occurring when the gas in said first individual cavern reaches a pressure of approximately that of the consumer network wherein said subsequent stage includes connecting said first individual cavern to the suction side of said compressor station, and further connecting a second individual cavern to the consumer network together with the pressure side of said compressor station to provide gas to said consumer network from both said first and second caverns simultaneously;

said first and subsequent stages are repeated until each of said caverns have been fully evacuated into the consumer network.

4,858,641

SHUT-OFF VALVE

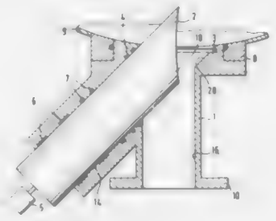
Hans-Joachim Titus, Le Donatello, 13, Av. de Papalines, M.C. 98000, Monaco, Monaco

Filed May 20, 1988, Ser. No. 197,117

Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717239

Int. Cl.[4] F16K *13/00*

U.S. Cl. 137—244 4 Claims



1. A shut-off valve for closing the lower end of a container the shut-off valve comprising:

a valve housing having upper and lower flanges, a housing passage between upper and lower end flanges, a cylindrical guide channel intersecting the housing passage at an acute angle and terminating at the upper end of the housing passage in an elliptical opening;

an elliptical seal in the cylindrical guide channel adjacent the upper flange;

a rotatable cylindrical valve body concentric with the cylindrical guide channel and rotatable between a closed position and an open position, a face of the rotatable cylindrical valve body exhibiting a generally elliptical contour and capable of closing off one end of the housing passage, a portion of the body adjacent the face engaging the elliptical seal when the rotatable cylindrical valve body is disposed within its closed position; and

actuating means for rotating the valve body between open and closed positions in such a manner that the elliptical seal is shaved or scraped off during rotation of the valve body.

4,858,642

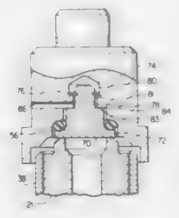
IMPACT RESISTANT PRESSURE RELIEF VALVE

John E. Fain, Jr., Pineville, La., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 25, 1988, Ser. No. 147,790

Int. Cl.[4] F16K *17/04*

U.S. Cl. 137—474 16 Claims



1. In a pressure operated relief valve, the combination comprising:

(a) a valve body having an exhaust port therein;

(b) a nozzle assembly in said valve body having a flow passage therein and terminating in an opening in an annular valve seat around said flow passage, said valve seat

comprising a surface having a width of less than 0.8 millimeter which is cooperative with and adapted to be contacted by the hereinafter recited planar disc facing surface;

(c) a disc holder slidably disposed in said valve body between a closed position adjacent said valve seat to close communication between said flow passage and said exhaust port and a second position in which said exhaust port is in fluid communication with said nozzle passage;

(d) a valve disc secured to said disc holder and having a planar facing surface;

(e) compressible shock absorber means interposed between said disc and said disc holder; and

(f) a means for biasing said disc holder in the direction of said valve seat to normally hold said valve disc facing surface against and in contact with the cooperative surface of said valve seat in the closed position.

4,858,643

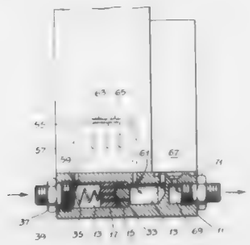
FLUID FLOW STABILIZING APPARATUS

Randall J. Vavra, Orange, and Michael Doyle, Tustin, both of Calif., assignors to Unit Instruments, Inc., Orange, Calif.

Filed Mar. 14, 1988, Ser. No. 167,572

Int. Cl.[4] G05D *7/00*

U.S. Cl. 137—486 8 Claims



1. Fluid flow stabilizing apparatus comprising:

primary means defining a primary fluid flow path;

first and second stabilizer units located adjacent one another in the primary flow path and including, respectively, a plurality of parallel, axially extending first tubules, and a plurality of parallel, axially extending second tubules parallel to the first tubules, the stabilizer units being movable into different relative positions in which certain ones of the first and second tubules are located in alignment and in fluid communication, and the others of the first and second tubules are out of alignment and thereby out of fluid communication

index means for fixing the stabilizer units in a selected one of the different relative positions thereby to select a desired number of aligned first and second tubules having a length-to-EHR ratio high enough to assure laminar flow of a fluid therethrough.

4,858,644

FLUID FLOW REGULATOR

Kenneth L. Decker, Garland, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed May 31, 1988, Ser. No. 200,138

Int. Cl.[4] F16K *15/14*

U.S. Cl. 137—504 11 Claims

1. A fluid flow regulator device, comprising:

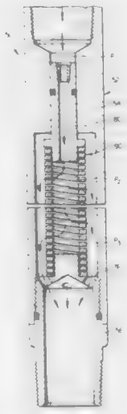
(a) housing means having a flow course therethrough;

(b) a coil spring in said flow course of said housing;

(c) means in said housing supporting said spring and closing the downstream end thereof;

(d) a piston slidable in said housing means and closing the upstream end of said spring, said piston having an orifice therethrough and an external flange thereabout for limiting movement of said piston means relative to said housing and relative to said coil spring;

(e) whereby an increase in the flow rate of fluids flowing through said piston orifice and into said spring will displace said piston and cause it to compress said spring to



bring the coils thereof closer together to restrict and reduce the rate of flow to thus allow said piston to move in the opposite direction and allow said spring to relax and its coils to move farther apart so that the flow rate of the flowing fluids will be maintained substantially constant.

4,858,645

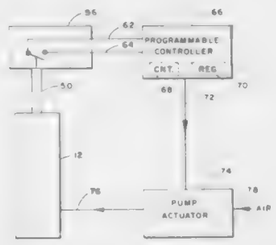
LUBRICANT DELIVERY SYSTEM INCLUDING FLOW MEASURING

Gordon P. Reeves, Grandville, Mich., assignor to G. P. Reeves In., Grand Rapids, Mich.

Filed Oct. 24, 1988, Ser. No. 261,776

Int. Cl.[4] F16N *13/16;* F04B *49/00*

U.S. Cl. 137—551 12 Claims



1. A lubrication system for delivering metered volumetric quantity of lubricant separately to distinct portions of a machine comprising:

a plurality of positive displacement pumps, each of said pumps having a lubricant inlet configured for connection to a supply of a lubricant, a lubricant outlet adapted to delivering lubricant to a portion of a machine, a positive displacement pumping member reciprocally movable through a metering passage means cooperative therewith for positively volumetrically displacing a quantity of lubricant in response to reciprocation of said member, actuating means for reciprocating said member, and check valve means including a valve body movable from a seat for allowing lubricant flow from said passage to said

outlet and movable toward said seat for preventing lubricant flow from said outlet to said passage; and

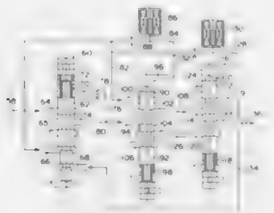
lubricant flow measuring means for measuring the flow of lubricant from the fluid outlet of each of said pumps, said flow measuring means including monitoring means for monitoring the occurrence of each said check valve body moving away from and toward the associated said seat to indicate each reciprocal movement of a pumping member and the resulting delivery of a predetermined volume of fluid to a portion of a machine.

4,858,686

HYDRAULIC PRESSURE CONTROL DEVICE FOR CLUTCH FOR CONTROLLING DRIVE TORQUE DISTRIBUTION IN FOUR WHEEL DRIVE DEVICE

Nobuyuki Kato, Toyota; Koujiro Karamochi, Okazaki; Shinya Nakamura, Owariasahi, and Yasuo Houjo, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 7, 1988, Ser. No. 280,824
Claims priority, application Japan, Jan. 28, 1988, 63-18424
Int. Cl.[4] F15B *13/043*
U.S. Cl. 137—596.16 5 Claims



1. A hydraulic pressure control device for a clutch for controlling drive torque distribution in a four wheel drive device, said clutch varying torque transmission capacity thereof according to a hydraulic pressure supplied thereto so as thereby to vary the drive torque distribution in the four wheel drive device, comprising:

a pressure regulation valve having at least one boost pressure port and producing a modulated hydraulic pressure from a line hydraulic pressure supplied thereto, said modulated hydraulic pressure substantially differing according as a hydraulic pressure is supplied or not supplied to said boost pressure port; and

a combination of two switchover valves having a delivery port for delivering the hydraulic pressure supplied to said clutch, said two switchover valves being adapted to be individually switched over to operate in combination so as to switch over a supply of hydraulic pressure to said delivery port between the line hydraulic pressure and the modulated hydraulic pressure or to drain said delivery port, and to switch over a supply of hydraulic pressure to said boost pressure port of said pressure regulation valve between the line hydraulic pressure and the modulated hydraulic pressure or to drain said boost pressure port.

4,858,647

ATTITUDE-INSENSITIVE, BY-PASS SENSOR

Craig S. Custer, Pompano Beach, Fla., assignor to Chem Tech Equipment Corp., Deerfield Beach, Fla.

Filed Apr. 13, 1987, Ser. No. 37,813
Int. Cl.[4] G01F *5/00*; H01H *35/40*
U.S. Cl. 137—599.1 1 Claim

1. An attitude-insensitive, flow rate sensing device for monitoring flow conditions, the sensor comprising:

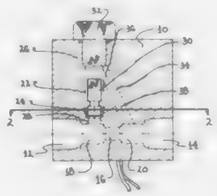
(a) a body having an inlet channel, an outlet channel in fluid communication with said inlet channel, and a flow-monitoring region situated medially between said inlet and outlet channels, said flow-monitoring region thus having an inlet side and an outlet side;

(b) in said body, a secondary channel having a first end and a second end, said first end in fluid communication with said inlet side of said flow-monitoring region and said second end extending to the outside of said body, said secondary channel having at its first end an area of constriction relative to its diameter;

(c) a piston slideably moveable within an annulus of the secondary channel, said piston having a diameter greater than the diameter of said constriction of said secondary channel, said piston further defining a pole magnet having a magnetic axis co-linear with the axis of said secondary channel;

(d) a plug secured within said second end of said secondary channel, said plug defining a pole magnet having an axis co-linear with the axis of said secondary channel, said magnetic axis of said plug oriented oppositely to the polarity of the magnetic axis of said piston, thereby effecting a magnetic repulsion between said plug and said piston in the direction of said first end of said secondary channel; and

(e) in said body, a by-pass channel having an upper end and a lower end, said upper end in fluid communication with



said secondary channel at an area medially between said piston and said plug, said lower end of said by-pass channel in fluid communication with said outlet side of said flow-monitoring region, in which said plug secured within second end of said secondary channel comprises: said plug secured within said second end to thereby permit the selective advancement of said plug relative to said second end and thereby to be advanced for withdrawal of said plug relative to the location of said piston, selectively adjusting the degree of magnetic repulsion between said plug and said piston thusly calibrating the flow condition actuation point of said piston, whereby an excess flow condition within said flow-monitoring region will generate an enhanced fluid pressure against said constriction of said secondary channel and against the end of said piston in abutment therewith, sufficient to partially overcome the magnetic repulsion between said piston and said plug thereby causing the resultant displacement of said piston toward said plug, thereby permitting an increased level of fluid from said inlet channel to flow through said constriction and across said annulus between the surface of said piston and the inside diameter of said secondary channel and, therefrom, into said by-pass channel and to the outlet side of said flow-monitoring region and therefrom, out of the present attitude-insensitive sensor.

4,858,648

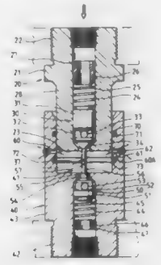
SELF-FLUSHING HYDRAULIC COUPLING

Robert E. Smith, III, and Virgil E. Mosley, Both of P.O. Drawer FF, Stafford, Tex. 77477

Filed Aug. 28, 1987, Ser. No. 90,678
Int. Cl.[4] F16L *37/28*
U.S. Cl. 137—614.04 11 Claims

1. A self-flushing hydraulic coupling comprising:

a pair of interconnectable male and female members, each of said members connected to a hydraulic line, each of said members having a body, a bore extending through said body, and valve means movable between a seated and an unseated position in said bore to control fluid flow between said members, said female member having a sealed receiving chamber for slidably receiving said male member; the receiving chamber having an outer annular seal and an inner annular seal;



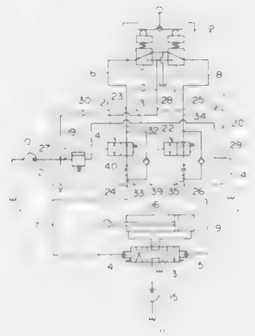
a flushing port in the wall of the receiving chamber for flushing the hydraulic line connected to one of said members while said male member has slidably withdrawn from the inner annular seal in said receiving chamber, said flushing port communicating between said receiving chamber and the outer surface of said female member body.

4,858,649

VALVE APPARATUS

Shinichi Satoh, Ibaraki; Toichi Hirata, Ushiku; Genroku Sugiyama, and Hideaki Tanaka, both of Ibaraki, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP87/00662, § 371 Date Apr. 29, 1988, § 102(e) Date Apr. 29, 1988, PCT Pub. No. WO88/02071, PCT Pub. Date Mar. 24, 1988
PCT Filed Sep. 7, 1987, Ser. No. 221,509
Claims priority, application Japan, Sep. 9, 1986, 61-137360[U]; Sep. 10, 1986, 61-137949[U]
Int. Cl.[4] F15B *13/042*
U.S. Cl. 137—625.6 4 Claims



1. A valve apparatus in which at least one flow control valve is incorporated in a body block and the flow control valve is connected in pilot lines which connect a pilot valve supplied with a pilot hydraulic fluid of a predetermined pressure set by a relief valve and a pilot operated directional control valve actuated in response to operation of the pilot valve, to premit free flow of pilot hydraulic fluid from the pilot valve to the directional control valve but to restrict flow of the pilot hydraulic fluid from the directional control valve to the pilot valve, wherein

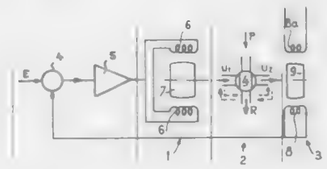
said body block is formed therein with a first passage connected to a return line for discharging the pilot hydraulic fluid vented by said relief valve whereby said at least one flow control valve is heated by the pilot hydraulic fluid generated by said relief valve in said first passage.

4,858,650

ELECTROHYDRAULIC SERVOVALVE FOR THE CONTROL OF A HYDRAULIC ACTUATOR, IN PARTICULAR IN SERVOMECHANISMS CONTROLLING THE FLIGHT OF AIRCRAFT

Gérard Devaud, Paris, and Arnaud Libault De La Chevasnerie, Sevres, both of France, assignors to S.A.M.M. - Societe D'Applications Des Machines Motrices, Bievres, France

Continuation-in-part of Ser. No. 146,869, Jan. 22, 1988, abandoned. This application Apr. 29, 1988, Ser. No. 188,573
Claims priority, application France, Jan. 22, 1987, 87 00740
Int. Cl.[4] F15B *13/044*; F16K *11/06*
U.S. Cl. 137—625.22 10 Claims



1. An electrohydraulic servovalve for a feed-back control of a hydraulic device, in particular a jack (37) or a motor, said servovalve comprising in combination:

(a) a rotary torque motor (1) having a limited angular movement;

(b) a hydraulic distributor (2) comprising a rotary shaft (10) coaxially connected to the torque motor (1) and means for enabling said distributor to supply hydraulic fluid to said device (37);

(c) a detector (3,3*b*) of the angular position of the shaft (10) of the distributor (2), mounted coaxially with and fixed to said shaft, so that the torque motor, the hydraulic distributor (2) and the detector have rotating parts (7, 10, 9, 3*a*) which are coaxial and connected to rotate together;

(d) an adder (4) having a first input, a second input and an output, an electronic amplifier (5) combined with the adder and connecting the torque motor to the output of the adder, and means for supplying a given command voltage (E) to the first input of the adder, the detector (3, 3*b*) having an output connected to the second input of the adder so that an output voltage of the detector reaches the second input of the adder (4), this servovalve further comprising a hollow body (11) in which the torque motor and the rotary distributor are disposed, the angular position detector being fixed to an end of said body, magnets (7) fixed to the shaft (10) of the distributor, the torque motor comprising a coil (6) for exciting said magnets, a stationary sleeve (17) mounted in the body (11) in coaxial relation to said shaft and surrounding said shaft and a hydraulic circuit for controlling said device comprising orifices and conduits in said sleeve and in said body,

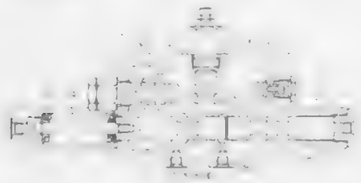
(e) and said orifices and hydraulic conduits (19, 7, 31, 42; 26, 28, 32, 43; 19, 55, 56, 48, 49 . . . 26, 28 . . . FIG. 4), respectively formed within the body and the sleeve pass through a same common radial plane.

4,858,651

CONTROL VALVE FOR CONSTRUCTION EQUIPMENT

Hideshi Koiwai, and Keiji Sekikawa, both of Saitama, Japan, assignors to Kayaba Industry Co. Ltd., Japan

Filed Oct. 12, 1988, Ser. No. 256,646
Claims priority, application Japan, Oct. 14, 1987, 62-157277[9]
Int. Cl.[4] F15B *13/02*
U.S. Cl. 137—869 1 Claim



1. A control valve for a construction equipment adapted to operate a control mechanism in which a central by-pass passage is provided with a pilot pressure generating mechanism and which is adapted to generate a pilot pressure due to pressure loss of fluid passed through said pilot pressure generating mechanism when a valve connected to said central by-pass passage is set at an open position, the resulting pilot pressure acting to control a discharge rate of a variable discharge pump, comprising:

a valve body;

a first spool and a second spool arranged in series in said valve body in such manner that inner ends of said first and second spools are opposite to each other;

a centering spring arranged in a manner to act on an outer end of said first spool;

first and second pilot chambers formed in said valve body;

said second spool having an outer end arranged so as to face said second pilot chamber;

said centering spring generating elastic force acting on said first and second spools;

said first pilot chamber being arranged so that said inner ends of said first and second spools abutted against each other are positioned in said first pilot chamber when said first and second spools are at their normal position;

said first spool closing said central by-pass passage when it is moved against said centering spring due to a pressure in said first pilot chamber; and

a parallel passage formed in said valve body;

said first and second spools closing said central by-pass passage and opening said parallel passage when they are moved due to pressure in said second pilot chamber.

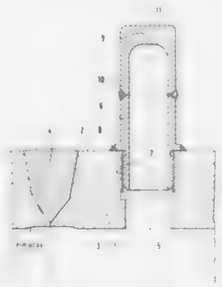
4,858,652

PLUG FOR AN OPENING PROVIDING AN INSPECTION X-RAY SOURCE WITH ACCESS TO PIPEWORK OR TO AN APPARATUS

Jacques Bobichon, Verrieres le Buisson; Lucien Hervouin, Guyancourt, and Gilbert Vigneron, Boulogne sur Seine, all of France, assignors to Societe Anonyme dite: Stein Industrie, Vezizy Villacoublay, France

Continuation of Ser. No. 49,177, May 13, 1987, abandoned. This application Aug. 23, 1988, Ser. No. 237,612
Claims priority, application France, May 13, 1986, 86 06850
Int. Cl.[4] F16L *55/10*
U.S. Cl. 138—92 1 Claim

1. In combination, a pipework (1) made of high strength steel alloy which is susceptible to cracking after heat treatment such as welding and which includes a wall, an opening (5) extending through said wall proximate a weld joint (4) of the pipework for providing an X-ray source with access to said pipework for the periodic inspection of said weld joint, said opening being threaded over at least a portion of its length from the outside of the pipework, and a plug for said opening, said plug comprising an open ended, first cylindrical component (6) having a central bore extending therethrough and having an outer threaded surface screwed into side wall opening and being welded (8) to an outer surface (2) of the wall, and projecting outwardly therefrom, said first cylindrical component being made of the same steel as the pipework, and a second cylindrical component (9) having a closed outer end (11) for closing the bore through the first component, an inner end of said second cylindrical component being butt welded (10) to an



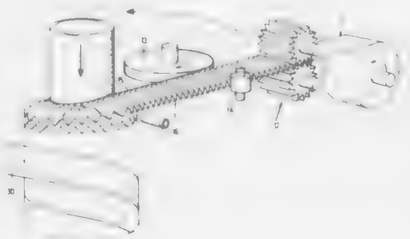
outer end of the first cylindrical component and disposed in axial alignment therewith, means allowing periodic weld joint inspections that are implemented by destroying the butt weld to enable the removal of the second cylindrical component, where thereafter the second cylindrical component is capable of being butt welded back onto the first cylindrical component, said allowing means comprising making said second cylindrical component of a steel having a lower susceptibility to cracking than that of the first component.

4,858,653

STRUCTURE FORMED FROM A STRAIGHT STRIP BENT OR CORRUGATED AND THE METHOD OF MANUFACTURING SAME

Michel Huvey, Bougival; Anh T. Do, La Celle Saint Cloud; Jean-Michel Gerez, Le Vesinet, and Lucien Le Gallais, Orgeval, all of France, assignors to Institut Francais du Petrole et Coflexip, Rueil-Malmaison, France

Filed Dec. 30, 1986, Ser. No. 947,750
Claims priority, application France, Dec. 30, 1985, 85 19429
Int. Cl.[4] F16L *9/14*
U.S. Cl. 138—144 9 Claims



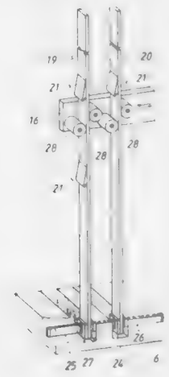
1. A tubular structure comprising an internal tube having a first radius, an external tube having a second radius, the radius of the internal tube being smaller than that of the external tube and the external tube being spaced outwardly from the internal tube and a corrugated strip formed of a straight strip folded or undulated, the width of the strip being disposed substantially radially to said internal tube, said strip being arranged on and around the internal tube space with an outer edge of the strip contacting an inner wall of the external tube to provide a reinforcement structure extending along the internal tube via spaces between said internal tube and said external tube; the space between said internal tube and said external tube being partially filled with an insulating material.

4,858,654

PULLEY-BLOCK DRIVE OPEN SHED JACQUARD MACHINE

Carlos Deruddre, Kortrijk-Heule, Belgium, assignor to N. V. Michel Van De Wiele, Belgium

Filed Feb. 8, 1988, Ser. No. 153,098
Claims priority, application Belgium, Feb. 13, 1987, 8700128
Int. Cl.[4] D03C *13/00, 3/00, 3/06*
U.S. Cl. 139—59 13 Claims



1. Jacquard loom machine apparatus comprising movable suspension apparatus and moving means for moving the suspension apparatus by knife grids of the jacquard machine apparatus, the moving means comprising hook means and connecting means for connecting the hook means to the movable suspension apparatus, hook-shaped projection means on the hook means and lateral moving means for moving the hook means laterally for selectively engaging and disengaging the hook-shaped projections with the knife grids;

wherein the hook means comprise flat strips aligned next to each other and wherein the hook-shaped projections are provided on flat sides of the flat strips;

wherein further the lateral moving means comprise needle means having their first and second opposite rollers contacting opposite flat faces of each strip, the rollers being connected to the needle means for moving horizontally with the needle means, whereby portions of the strips are moved laterally with the needle means and the rollers for selectively engaging and disengaging the hook-shaped projections with the knife grids.

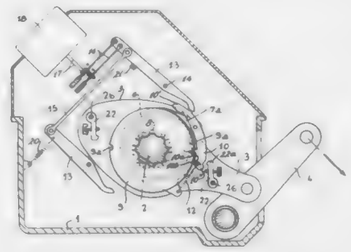
4,858,655

ROTATING DOBBY FOR WEAVING LOOMS

Joseph Palau, Saint Jorioz, and Jean-Paul Fromest, Faverges, both of France, assignors to S.A. Des Etablissements Staubli (France), Faverges, France

Filed Mar. 3, 1987, Ser. No. 21,222
Claims priority, application France, Mar. 26, 1986, 86 04635
Int. Cl.[4] D03C *1/00*
U.S. Cl. 139—76 2 Claims

1. In a dobby of the rotating type for weaving looms which includes an oscillating rod for controlling the movement of the heddle frames, the oscillating rod being mounted on an eccentric which is freely rotatably mounted on a drive shaft, an engagement hook pivotally mounted on an extension of the eccentric and including a coupling arm having a nose portion extending therefrom, a drive disk mounted for rotation with the drive shaft, the drive shaft having opposed notches therein, a pair of pivotally mounted selection arms mounted in opposing relationship on either side of the drive disk, resilient means for normally urging the nose portion of the engagement hook toward the drive disk so that the nose portion is engageable with one of the notches in the drive disk so as to couple the oscillating rod to the drive disk through the engagement hook and eccentric, controls for selectively pivoting the selection arms relative to the drive disk to thereby urge the nose portion



of the engagement hook from engagement with a notch of the drive disk in order to operatively disconnect the eccentric and oscillating rod from driven engagement with the drive disk, the improvement comprising:

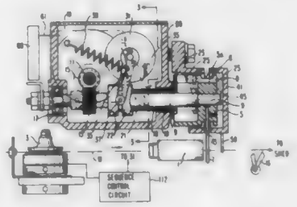
said coupling arm of said engagement hook having a hook means disposed oppositely of said nose portion, a catch member mounted in facing relationship to said hook means, said catch member being engageable with said hook means when said nose portion thereof is urged from within a notch of the drive disk to thereby immobilize the engagement hook and prevent further motion of the eccentric and the oscillating rod.

4,858,684

APPARATUS FOR REMOVING A FAULTY WEFT ON A JET LOOM

Mitsuru Suwa, Ishikawa, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 934,730, Nov. 25, 1986, abandoned. This application Jul. 21, 1988, Ser. No. 222,129
Claims priority, application Japan, Jan. 27, 1986, 61-16166
Int. Cl.[4] D03D *47/28;* D03J *1/00*
U.S. Cl. 139—116 9 Claims



1. An apparatus for removing a faulty weft from a cloth-fell in the operation of a jet loom comprising a rotary take-up drum arranged above and in front of a main jet nozzle adapted for insertion of a weft into said cloth-fell, said take-up drum having a hook pin which radially extends outwardly, and positioning means for positioning, by rotation of said take-up drum, said hook pin at a first location out of moving ambit of a weft during normal running of said jet loom and at a second location

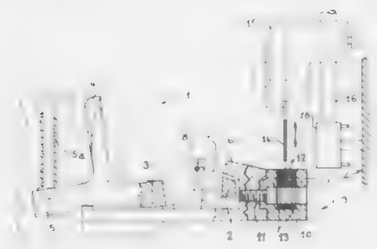
to capture that portion of a faulty weft adjacent said main jet nozzle and to wind said faulty weft on said take-up drum upon rotation thereof, thereby removing said faulty weft from said cloth-fell.

4,858,657

YARN CUTTING DEVICE OF THE GRIPPER SHUTTLE TYPE

AiméLa Pomatière Fabre, Brangues, France

Filed Mar. 2, 1988, Ser. No. 162,961
Claims priority, application France, Mar. 13, 1987, 87 03701
Int. Cl.[4] D03D *47/24*
U.S. Cl. 139—438 **8 Claims**



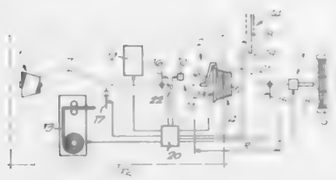
1. A yarn cutting device in a weaving loom having a movable shuttle for carrying yarn comprising at least one cutting member and at least one guide member, reciprocating means for mounting one of said cutting member or said guide member to the loom so as to be selectively brought into general alignment with the shuttle, the other of said cutting member or said guide member being mounted to the shuttle so as to be carried thereby, said guide member including two plates which are normally urged into contact with one another by resilient means, said cutting member being aligned between said two plates, said plates being separable against said resilient means by said cutting member whereby the yarn is cut as said plates and said cutting member pass relative to one another.

4,858,658

METHOD AND APPARATUS FOR REPAIRING A BROKEN WEFT THREAD IN A LOOM

Henry Shaw, Vleteren, Belgium, assignor to Picanol N.V., Belgium

Filed May 13, 1988, Ser. No. 193,751
Claims priority, application Belgium, May 20, 1987, 00566
Int. Cl.[4] D03D *47/34*
U.S. Cl. 139—452 **12 Claims**



1. A method for repairing a break in a weft thread occurring between a yarn package and a weft accumulator to form first and second broken thread sections, said weft thread being connected before the breaks to the yarn package and threaded along a first path to the accumulator for insertion into a weaving machine shed, with the first section remaining connected to the yarn package and the second section including a thread reserve portion present in the accumulator, wherein the method comprises the steps of:

a. releasing the thread reserve portion present in the accumulator and then leading the second section of thread in a direction opposite the direction of threading along a second path to a predetermined location between said yarn package and said accumulator, said second path including portions of said first path, and

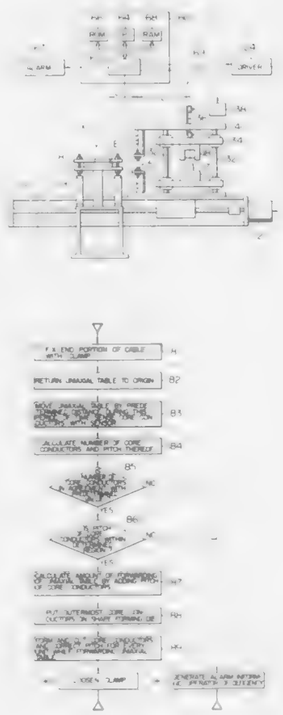
b. joining said first and second thread sections at said predetermined location.

4,858,659

METHOD FOR FORMING AND CUTTING A FLAT TYPE MULTI-CORE CABLE AND APPARATUS FOR REALIZING SAME

Satoru Ezaki; Kiyofumi Tanaka, both of Hadano; Tsukasa Kasahara; Tetsuya Hirose, both of Hitachi, and Tetsuro Nakagawa, Takahagi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Cable, Ltd., both of Tokyo, Japan

Filed Jul. 6, 1988, Ser. No. 215,534
Claims priority, application Japan, Jul. 6, 1987, 62-167108
Int. Cl.[4] B21F *1/00*
U.S. Cl. 140—105 **13 Claims**



6. A method for forming and cutting a flat type multi-core cable using; clamping means for clamping a flat type multi-core cable, whose core conductors are previously exposed by exfoliating a part of a jacket therefor; shape forming sharp edged dies capable of holding and cutting exfoliated core conductors, which are divided into a plurality of units, in said flat type multi-core cable for every unit of core conductors; and detecting means, which is located in a predetermined fixed positional relation with respect to said shape forming sharp edged dies, scanning said exfoliated core conductors and outputting a detection signal; comprising:

a first step of scanning all the core conductors by said detecting means by varying the relative relation between said cable and said detecting means;

a second step of calculating the relative distances between each of said units of core conductors and said shape forming sharp edged dies on the basis of the detection signal thus obtained by the scanning;

a third step of positioning each of said units of core conductors, using the relative distance thus calculated corresponding thereto for the relative distance from the shape forming sharp edged dies thereto;

a fourth step of holding the unit of core conductors thus positioned to cut it;

a fifth step of locating said unit of core conductors so that the relative distance between said unit of core conductors and the shape forming sharp edged dies and the standard relative distance corresponding thereto; and

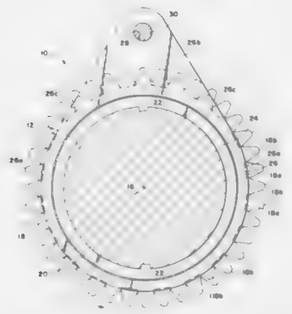
a sixth step of removing the clamp of said unit of core conductors by said shape forming sharp edged dies, said third to sixth steps being repeated for all the units of core conductors.

4,858,660

SELF CLEANING WOOD INCISOR

Lloyd H. Toberg, 11120 SW. Industrial Way, Tualatin, Oreg. 97062

Filed Dec. 28, 1988, Ser. No. 291,260
Int. Cl.[4] B27M *1/02*
U.S. Cl. 144—2 J **20 Claims**



1. A wood incisor for forming a plurality of spaced perforations in the outer surface of a piece of wood preparatory to the preservative treatment of the wood comprising:

(a) a mounting platform;

(b) a drum, having an axis of rotation, rotatably journaled on said mounting platform;

(c) a plurality of annular incisor rings mounted on said drum for rotation therewith, said incisor rings being interspaced along said axis of said drum;

(d) a plurality of cleaning elements mounted to said platform so as to be irrotatable with respect to said drum, each of said cleaning elements projecting into a respective space between said incisor rings.

4,858,661

PLATE JOINER WITH A HANDLE HAVING A SUPERIOR ORIENTATION

Donald R. Bosten, Jackson, and Randy G. Cooper, Milan, both of Tenn., assignors to Porter-Cable Corporation, Jackson, Tenn.

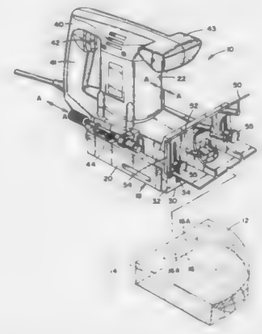
Filed Jun. 3, 1988, Ser. No. 202,227
Int. Cl.[4] B27C *5/10*
U.S. Cl. 144—134 D **15 Claims**

1. A plate joiner with a handle having a superior orientation comprising:

(a) a base having a first end portion comprising a guide surface with a cutter slot;

(b) a cutter normally housed in the base, the cutter having a drive shaft with an axis oriented substantially parallel to the guide surface and substantially perpendicular to the cutter slot;

(c) handle means attached to a second end portion of the base substantially opposite the first end portion for orienting the guide surface to the joint surface of the workpiece, and for causing the cutter to protrude from the base through the cutter slot and to make a plunge cut into a joint surface of a workpiece when the guide surface of the base is pressed against the joint surface, the handle means having a substantially vertical gripping portion with an axis oriented substantially parallel to the axis of the cutter drive shaft.

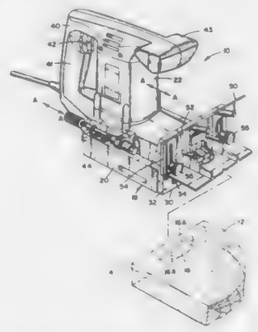


4,858,662

PLATE JOINER HAVING A SUPERIOR MITER GUIDE FOR MITERED CARCASE JOINTS

Donald R. Bosten, Jackson, and Randy G. Cooper, Milan, both of Tenn., assignors to Porter-Cable Corporation, Jackson, Tenn.

Filed Jun. 3, 1988, Ser. No. 202,052
Int. Cl.[4] B27M *1/00*; B23C *1/20*
U.S. Cl. 144—136 C **15 Claims**



1. A plate joiner having a superior miter guide for mitered carcase joints, comprising:

(a) a base having a first end portion comprising a guide surface with a cutter slot;

(b) a cutter normally housed in the base;

(c) handle means located at a second end portion of the base substantially opposite the first end portion for orienting

the guide surface to the joint surface of the workpiece, and for causing the cutter to protrude from the base through the cutter slot and to make a plunge cut into a joint surface of a workpiece when the guide surface of the base is pressed against the joint surface; and

(d) miter guide means adjustably attached to the guide surface for locating a plunge cut into a mitered carcase joint surface at a predetermined distance from an outside surface of the workpiece independent of workpiece thickness, the miter guide means comprising a miter guide plate having a surface for contacting the outside surface of the workpiece, and for referencing the angle of the plunge cut from the outside surface of the workpiece, the miter guide plate being oriented at a predetermined angle to the guide surface and a projection of the miter guide plate intersecting the guide surface along a line substantially parallel to the cutter

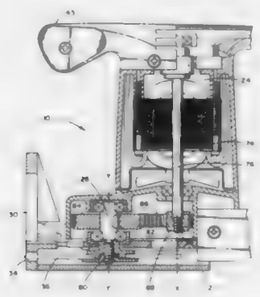
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4,858,663

PLATE JOINER HAVING A QUIET DRIVE

Donald R. Bosten, Jackson, and Randy G. Cooper, Milan, both of Tenn., assignors to Porter-Cable Corporation, Jackson, Tenn.

Filed Jun. 3, 1988, Ser. No. 202,102
Int. Cl.[4] B27M *1/00*
U.S. Cl. 144—136 C 3 Claims



3. A plate joiner having a quiet, comprising:

(a) a base having a guide surface with a cutter slot;

(b) a cutter normally housed in the base, the cutter having a drive shaft with an axis oriented substantially parallel to the guide surface and substantially perpendicular to the cutter slot;

(c) a motor for driving the cutter, the motor having an output shaft, the output shaft of the motor having an axis oriented substantially parallel to the guide surface and substantially perpendicular to the cutter slot;

(d) means for causing the cutter to protrude from the base through the cutter slot and to make a plunge cut into a joint surface of a workpiece when the guide surface of the base is pressed against the joint surface;

(e) pulley means located on the drive shaft of the cutter for accepting a belt drive to power the drive shaft;

(f) pulley means located on the output shaft of the motor for accepting a belt drive to provide power to the drive shaft; and

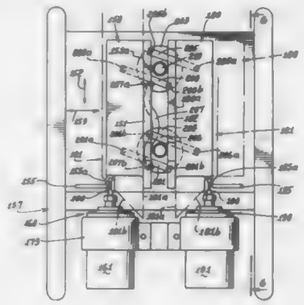
(g) belt means for coupling the pulley means together so that the motor drives the cutter more quietly than a drive mechanism which uses interlocking gears to transfer power.

4,858,664

MOULDING ROUTING APPARATUS

M. Bosley Wright, 2501 Greenspring Valley Rd., Owings Mills, Md. 21117

Continuation of Ser. No. 944,180, Dec. 22, 1986, Pat. No. 4,715,415. This application Dec. 14, 1987, Ser. No. 132,361
The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.
Int. Cl.[4] B27C *5/00*
U.S. Cl. 144—136 R 9 Claims



1. In apparatus for cutting insert grooves in longitudinally elongated mouldings each having a backside and mitred end, the combination comprising:

(a) a first base, and a first guide surface on the base to engage the back side of one moulding thereby to position the moulding directionally laterally, and to extend directionally longitudinally, a second base, and a second guide surface on the second base to engage the backside of a second moulding thereby to position the latter directionally laterally, and to extend directionally longitudinally,

(b) a first stop to engage and position the mitred end of the first moulding, thereby to position the first moulding longitudinally, and a second stop to engage and position the mitred end of the second moulding, thereby to position the second moulding longitudinally,

(c) means to engage the positioned mouldings and retain each moulding on its base,

(d) a first router and a rotary drive therefor, the router projecting into lapping relation with said mitred end of the first moulding, and a second router and a rotary drive therefor, the second router projecting into lapping relation into said mitred end of the second moulding,

(e) and means to guide relative lateral displacement of each rotating router and its associated base to cause the router to directionally engage and penetrate the mitred end of its associated moulding, thereby to produce said grooves, the routers thereafter being removable from said grooves,

(f) and the routers projecting longitudinally, parallel to said first and second bases.

4,858,665

HOCKEY STICK BLADE BENDER

Thomas R. Miller, 16001 Kangaroo St. NW.; John W. Green, 16011 Kangaroo St. NW., and Mark Motz, 8261 159th La., all of Ramsey, Minn. 55303

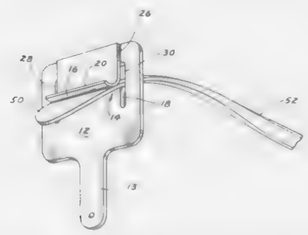
Filed Dec. 2, 1988, Ser. No. 278,711
Int. Cl.[4] B27M *1/00*; B27H *1/00*
U.S. Cl. 144—380 4 Claims

1. Hockey stick blade bender comprising:

a. paddle member with an integral handle;

b. a horizontal slot in a midportion of said paddle member; and,

c. two opposing curved forming members extending outwardly from said paddle member and diametrically opposed with respect to each other, whereby said hockey stick blade is positioned through said slot and manipulated



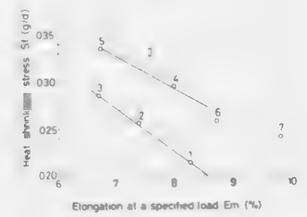
between said curved forming members, thereby imparting a degree of curvature along the longitudinal axis of said hockey stick blade.

4,858,666

RADIAL TIRE

Yukio Komai, Shiga, and Keijiro Oda, Hyogo, both of Japan, assignors to Toyo Tire & Rubber Company Limited, Osaka, Japan

Filed Apr. 30, 1986, Ser. No. 857,637
Claims priority, application Japan, Apr. 30, 1985, 60-94211
Int. Cl.[4] B60C *9/08*
U.S. Cl. 152—556 2 Claims



1. A radial tire comprising a carcass ply of nylon cord substantially composed of polytetramethylene-adipamide impregnated with an adhesive and heat set at 240°–260° C. in a drawn state, and which has a characteristic of

$$Md > 20$$

$$Em \cdot Sf < 2.2$$

where: Md is the modulus (g/d) obtained from a force necessary for stretching in an amount of 2% at 100° C., Em is the elongation percentage (%) under a load of 2.7 g/d at room temperature, and Sf is the heat shrinkage stress (g/d) at 150° C.

4,858,667

METHOD FOR COUPLING TUBED TIRE WITH WHEEL

Naoto Igari, Fujisawa; Noriyuki Yamamoto, Hatano, and Tetshin Sakata, Tokyo, all of Japan, assignors to Nissan Motor co., Ltd., Yokohama, Japan

Filed Jan. 14, 1988, Ser. No. 143,890
Claims priority, application Japan, Jan. 22, 1987, 62-13090
Int. Cl.[4] B60C *25/00*
U.S. Cl. 157—1.1 4 Claims

1. A method for coupling a tubed tire with a wheel, the tube in the tire proper having an inflation valve projected therefrom and said wheel having a valve aperture formed in a rim of the same, said method comprising, in steps:

(a) subjecting said wheel to a uniformity test to find out and mark a first certain portion of the wheel where the radial run-out value is the minimum;

(b) defining the position of the first certain portion by using a first central angle which is defined between a line passing through said first certain portion and a center of said wheel and another line passing through said valve aperture and the wheel center;

(c) subjecting only the tire proper to a uniformity test to find out and mark a second certain portion of the tire proper where the radial force variation value is the maximum;

(d) disposing the tube in the tire proper;



(e) defining the position of the second certain portion by using a second central angle which is defined between a line passing through said second certain portion and a center of the tire and another line passing through said inflation valve and the tire center;

(f) sliding the tube in the tire proper to a position where the second central angle of the tubed tire is equal to the first central angle of the wheel; and

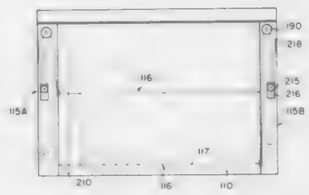
(g) coupling the tubed tire with the wheel having the inflation valve passed through the valve aperture.

4,858,668

VERTICAL WINDOW COVERING SYSTEMS

Andrew J. Toti, 311 W. River Rd., Modesto, Calif. 95351

Continuation-in-part of Ser. No. 888,462, Jul. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 788,460, Oct. 17, 1985, abandoned. This application Oct. 17, 1986, Ser. No. 920,704
Int. Cl.[4] E06B *3/94*
U.S. Cl. 160—84.1 32 Claims



2. In a vertical window covering system, a window covering material portion having a plurality of sections disposed in a generally vertical orientation, said portion being adaptable to being traversed between open and closed conditions and having an inherent distortion characteristic causing non-vertical hanging of left and right edge portions thereof in an open or partially open condition, a traverse track adapted to be mounted in a horizontal orientation; a plurality of track mounting means for mounting a plurality of sections of said window covering material intermediate said left and right edge portions thereof for bidirectional traverse relative to said traverse track; first and second edge carrier means mounted to said traverse track with at least one of said carrier means adapted for bidirectional traverse on said track; and edge stabilizer means mounted on each of said carrier means for holding said edge portions of said window covering material in a substantially straight vertical orientation when said material is traversed toward an open condition, including a stabilizer rod means

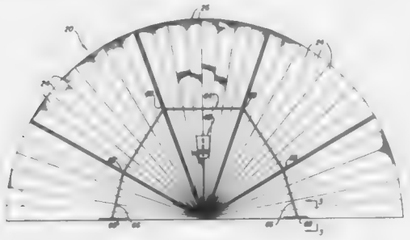
mounted to said carrier means in an accurate vertical orientation and with a degree of rigidity sufficient to overcome said inherent distortion characteristic, said stabilizer rod means extending at least substantially the entire length of an associated one of said edge portions of said window covering material and being secured thereto at least at a plurality of locations throughout said length; wherein said window covering material portion includes a plurality of vertical material portions which move together as said material is traversed toward a closed condition and has the further inherent distortion characteristic operating during traversing toward said closed condition tending to cause said vertical material portions to become misaligned in a direction perpendicular to the general plane of traverse, and further comprising traverse alignment means for maintaining the alignment of said vertical material portions during said traverse toward said closed condition, said traverse alignment means including guide apertures formed in said vertical material portions at a prearranged position near a bottom edge thereof, guide cord means extending through said guide apertures and being fastened to one of said stabilizer rod means, and tensioning means operatively mounted to the other of said stabilizer rod means for maintaining said guide cord in substantial tension throughout the traverse of said material portion between said open and closed conditions.

4,858,669

DECORATIVE FAN ASSEMBLY

Charles S. Vinson, Empty Walls; 2723 McKinney Ave., Dallas, Tex. 75204

Filed Jan. 25, 1988, Ser. No. 147,896
Int. Cl.[4] A45B *27/00;* E06B *3/94*
U.S. Cl. 160—134 24 Claims



1. A decorative fan assembly including
(a) a sheet member of stiff foldable material;
(b) said sheet member being folded at intervals to provide a plurality of pleated segments which are gathered at one end to assume a fan shape;
(c) an elongated base of flat rigid material in supporting engagement with the end segments of the pleated sheet member;
(d) a first means engaging said sheet member with said elongated base, and
(e) a second means fixedly connecting an intermediate portion of said fan shaped sheet member to said elongated base for holding the latter upright on the base.

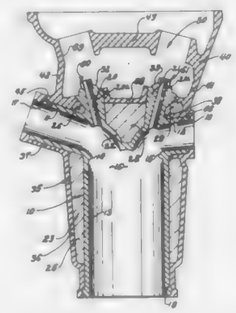
4,858,670

METHOD OF MAKING AND APPARATUS FOR MONOBLOCK ENGINE CONSTRUCTION

Nathaniel L. Field, Northville, and Michael A. Pulick, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1987, Ser. No. 137,771
Int. Cl.[4] B22D *19/16*
U.S. Cl. 164—11 5 Claims

1. A method of making a cast dual-metal unitary head and block, comprising the steps of:
(a) casting a unitary iron-based insert having continuous walls defining one or more chambers of passages for each of at least combustion, piston reciprocation, and gaseous exhaust;
(b) forming a sand core wrapping directly about said insert, said wrapping covering said insert except for the remote extremities of the walls defining said passages for gaseous



exhaust and the remote extremity of the chamber for piston reciprocation, said extremities being remote from the walls defining the combustion chamber; and
(c) casting alumiunum-based metal about the assembly of said insert and core wrapping to complete said dual-metal unitary block and head.

4,858,671

METHOD AND APPARATUS FOR ACCELERATING METAL SOLIDIFICATION

William G. Hesterberg, Rosendale, and Terrance M. Cleary, Allenton, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Apr. 19, 1988, Ser. No. 183,622
Int. Cl.[4] B22C *9/04;* B22D *27/04*
U.S. Cl. 164—34 15 Claims



1. An apparatus for casting an article, comprising a mold defining a receiving zone, a non-metallic medium disposed within said mold and surrounding said zone, a basin for introducing molten material into said zone to form a cast article, heat transfer-means disposed to be moved into contact with said molten material in said basin for removing heat from said material and reducing the cooling time for said cast article, and

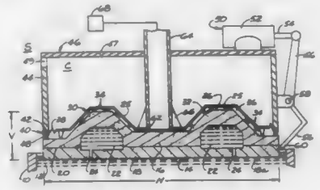
means for flowing a cooling fluid through the heat transfer means.

4,858,672

COUNTERGRAVITY CASTING APPARATUS AND METHOD

George D. Chandley, Amherst, N.H., assignor to General Motors Corporation, Detroit, Mich.

Filed May 25, 1988, Ser. No. 198,229
Int. Cl.[4] B22D *18/06*
U.S. Cl. 164—63 53 Claims



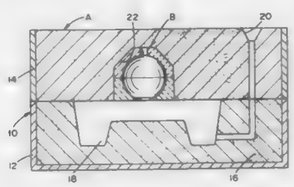
38. In vacuum countergravity casting molten metal into a mold having a gas permeable upper mold member and a lower mold member engaged together, the steps of:
(a) overlaying a gas impermeable member on the upper mold member including contacting the gas impermeable member and upper surface of the upper mold member at a plurality of spaced apart contact regions distributed across the upper surface and peripherally sealing the gas impermeable member substantially about the upper mold member, and
(b) applying a reduced pressure between the gas impermeable member and the upper mold member to fill a mold cavity at least in part defined therein with molten metal from an underlying molten metal pool and transmitting through said contact regions atmospheric pressure above the gas impermeable member to the upper mold member in opposition to atmospheric pressure transmitted to the lower mold member.

4,858,673

RISER CONSTRUCTION

Patsie C. Campana, and David L. Campana, both of Lorain, Ohio, assignors to Caldo Internationa, Inc., Lorain, Ohio

Continuation-in-part of Ser. No. 112,383, Oct. 22, 1987. This application Aug. 16, 1988, Ser. No. 232,936
Int. Cl.[4] B22C *9/08*
U.S. Cl. 164—359 13 Claims



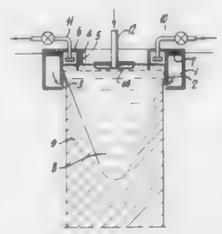
1. A riser for molds, comprising:
a riser body formed of an exothermic material which is capable of igniting when contacted with molten metal;
a cavity located in said riser body and adapted to contain an associated molten metal;
a first opening in said riser body for communicating said riser body cavity with an associated mold; and,
wherein said riser body exothermic material consists essentially of a reactive mixture which includes in weight percent from about 25% to 65% silica, from about 5% to 18% sodium nitrate, from about 1% to 8% sodium hexafluorosilicate, from about 15% to 40% aluminum, and from about 2% to 20% iron oxide.

4,858,674

CASTING ALUMINIUM ALLOYS

Philip G. Enright, Oxfordshire, England, assignor to Alcan International Limited, Montreal, Canada

Continuation of Ser. No. 838,428, Mar. 10, 1986, abandoned, which is a continuation of Ser. No. 540,202, Oct. 7, 1983, abandoned. This application Jul. 28, 1987, Ser. No. 83,941
Claims priority, application United Kingdom, Oct. 15, 1982, 8229602
Int. Cl.[4] B22D *11/00*
U.S. Cl. 164—475 7 Claims



1. A method of casting an aluminium alloy which includes at least one readily oxidisable constituent and has a wide freezing range, which alloy is an aluminium-lithium alloy, which comprises casting the metal in an open-ended mould, maintaining the metal at a relatively uniform level in said mould during the casting operation, enclosing a space over the molten metal adjacent the mould wall by means of a baffle which dips into the molten metal at a position spaced away from the mould wall, maintaining said enclosed space full of an inert gas, establishing a body of an oxide-dissolving halide flux on the molten metal surface in the enclosed region, and maintaining the molten metal surface in the enclosed space at a level very close to the molten metal level in a central region within the baffle.

4,858,675

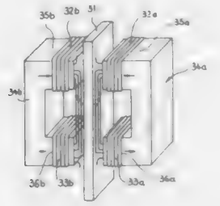
PROCESS AND APPARATUS FOR PREPARING ESPECIALLY METALLIC AND SEMI-METALLIC BANDS OF SMALL THICKNESS

Claude Senillou, Voreppe; Rémy de Framond, Grenoble; Marcel Garnier, Uriage; Ali R. Yavari, Grenoble, and Jean-Charles Joud, Meylan, all of France, assignors to Union Siderurgique Du Nord Et De L'Est De La France (USINOR), Puteaux, France

Division of Ser. No. 925,470, Oct. 30, 1986, Pat. No. 4,762,653, which is a continuation of Ser. No. 692,185, Jan. 17, 1985, abandoned. This application May 3, 1988, Ser. No. 189,952
Claims priority, application France, Jan. 18, 1984, 84 00747
Int. Cl.[4] B22D *27/02*
U.S. Cl. 164—503 10 Claims

1. An apparatus for preparing a strip from an electrically conductive molten liquid, the apparatus comprising a tank for the molten liquid, a nozzle having a substantially rectangular discharge opening for producing a liquid stream of substantially rectangular cross-section strip, electromagnetic means for producing an alternating magnetic field for stabilization of the strip before solidification by inducing a stabilizing effect, said electromagnetic means having core means and including first and second poles to produce an incident magnetic field on at least one face of the strip with said field originating from said first pole of said electromagnetic device which has a first polarity which extends along a direction that is initially perpendicular and then parallel to the adjacent surface of the strip

towards said second pole of said electromagnetic device, said second pole having a polarity opposed to said first polarity of said first pole and then extends perpendicular again to the strip



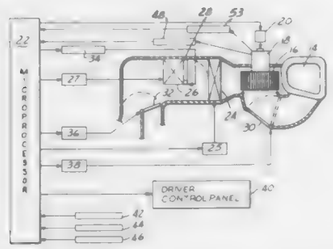
and then through the core means to said first pole to form a loop path, solidification means located downstream of said electromagnetic means.

4,858,676

AIRCONDITIONING SYSTEM FOR A VEHICLE

Lawrence J. Bolfik, and Calvin G. Smith, both of Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1988, Ser. No. 253,518
Int. Cl.[4] F25B *29/00*
U.S. Cl. 165—2 **17 Claims**



15. A method for controlling the output temperature of a vehicular airconditioning system having a blower, an air heating device, an air chilling device and a temperature governing means operatively associated with said air chilling and air heating devices, comprising the steps of:

sensing nonprogrammed changes in the speed and power consumption of said blower;

iteratively determining adjusted operating points for the speed of said blower and said temperature governing means so as to compensate for any nonprogrammed speed and power consumption changes; and

directing said blower and said temperature governing means to assume said adjusted operating points.

4,858,677

AUTOMOBILE AIR-CONDITIONING APPARATUS WITH AIR BLOWER CONTROL

Shigetoshi Doi; Yoshiaki Nagayama, both of Hiroshima; Katsumi Iida, and Yoshihiko Sakurai, both of Saitama, all of Japan, assignors to Mazda Motor Corporation and Diesel Kiki Co., Ltd., both of, Japan

Filed Jun. 12, 1987, Ser. No. 61,268
Claims priority, application Japan, Jun. 18, 1986, 61-140185
Int. Cl.[4] F25B *29/00*
U.S. Cl. 165—12 **3 Claims**

1. An air conditioning apparatus for a motor vehicle having a passenger compartment, said air conditioning apparatus comprising:

a duct means extending from a position in the compartment and opening back into the compartment at another position and having a first passage opening into said duct means from outside the apparatus;

an intake damper in said duct means at said first passage and movable for controlling the amount of ambient air introduced into said duct means and the amount of air circulating from the compartment through said duct means;

an air blower disposed in said duct means between said intake damper and the compartment for drawing air from the position of said intake damper and supplying such air into the compartment, and drive means connected to said air blower for adjusting the operation of said air blower for adjusting an amount of air fed by said air blower into the compartment;

a cooling system including an evaporator disposed in said duct means between said air blower and the compartment;

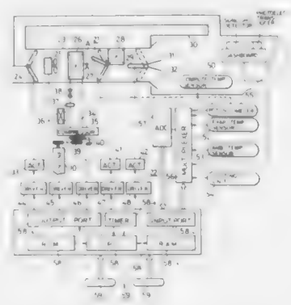
a heater core disposed in said duct means between said evaporator and the compartment for heating air that has passed through said evaporator;

an air mixing damper means disposed in said duct means between said evaporator and said heater core and movable for controlling the amount of air that has passed through said evaporator and is to be fed to said heater core;

a temperature setting unit;

a compartment temperature detector in the compartment;

means for recognizing the first time at which the cooling cycle of said cooling system is started after the air conditioning apparatus has started to operate;



a sunlight detector for detecting an amount of sunlight applied to the motor vehicle; and

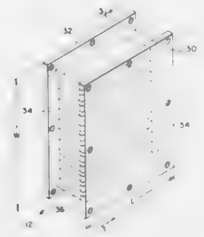
a control system to which said temperature setting unit, said compartment temperature sensor, said recognizing means and said sunlight detector are connected and connected to said air blower driving means, said air mixing damper, and said evaporator for controlling an amount of air fed from said air blower, controlling said cooling system and said air mixing damper in response to any difference between a temperature preset by said temperature setting unit and the temperature of the air in the compartment to automatically adjust the temperature of air in the compartment in an automatic adjusting mode which is controlled dependent on the difference between the temperature preset by said temperature setting unit and the temperature of air in the compartment, and further controlling said air blower driving means in a first gradient mode the first time the cooling cycle is started to maintain a prescribed low amount of air fed into the compartment for a first prescribed period of time and then to progressively increase the amount of air from said air blower at a first prescribed gradient with respect to time from the prescribed low amount of air up to an amount of air which is the same as the amount of air from the blower when said apparatus is operating in said automatic adjusting mode, said further controlling of said air blower being when the amount of sunlight is at least equal to a first prescribed value or the temperature of air in the compartment is at least equal to a second prescribed value, and the air temperature at the outlet of said evaporator is at least equal to third prescribed value, still further controlling said air blower driving means in a second gradient mode the first time the cooling cycle is started to progressively increase the amount of air from said air blower from the prescribed low amount of air up to an amount of air which the same as the amount of air from the blower when the apparatus is operating in said automatic adjusting mode, said still further controlling of the blower being when the amount of sunlight is at least equal to the first prescribed value or the temperature of the air in the compartment is at least equal to the second prescribed value, and the air temperature at the outlet of said evaporator is lower than a third prescribed value, and yet further controlling said air blower driving means in a third gradient mode the first time the cooling cycle is started to maintain a prescribed low amount of air fed into the compartment for a second prescribed period of time and then to progressively increase the amount of air from said air blower at a third prescribed gradient with respect to time from the prescribed low amount of air up to an amount of air which is the same as the amount of air from the blower when said apparatus is operating in said automatic adjusting mode, said lastmentioned controlling of said air blower being when the amount of sunlight is lower than said first prescribed value and the temperature of the air in the compartment is lower than said second prescribed value.

4,858,678

VARIABLE HEAT CONDUCTANCE HEAT EXCHANGER

Michael M. Ladd, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 2, 1988, Ser. No. 201,774
Int. Cl.[4] F28F *27/00*; F28D *15/00*
U.S. Cl. 165—32 **28 Claims**



1. A heat transfer apparatus comprising:

a heat generating system including a heat transport fluid and a heat source;

a cooling system including a cryogen cooling fluid having heat transport properties that vary significantly as the cryogen cooling fluid circulates; and

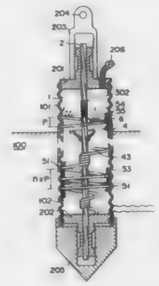
a heat exchanger assembly thermally isolating said heat generating system from said cooling system, said heat exchanger assembly including a high-temperature wall adjacent said heat generating system and a low-temperature wall thermally coupled to said cryogen cooling fluid of said cooling system and an interior volume, said heat exchanger assembly further including a plurality of fins extending from said low-temperature wall and a heat transfer medium circulating within said volume; a first set of said plurality of fins extending for a first length from said low-temperature wall; a second set of said plurality of fins extending for a second length longer than said first length from said low-temperature wall to provide a sharp increase in the thermal conductivity of said heat exchanger assembly when sufficient of said heat transfer medium changes from solid to liquid that said first set of fins which were previously surrounded by solid heat transfer medium are surrounded in part by circulating liquid heat transfer medium.

4,858,679

CORRUGATED HEAT PIPE

Masuji Sakaya, Narashino; Tsuneaki Motai, Yachiyo; Masataka Mochizuki, Nagareyama, and Kouichi Mashiko, Tokyo, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Division of Ser. No. 164,560, Mar. 7, 1988. This application Jan. 26, 1989, Ser. No. 302,404
Claims priority, application Japan, Mar. 11, 1987, 62-53975; Apr. 10, 1987, 62-86989; May 15, 1987, 62-117168
Int. Cl.[4] F28D *15/02*
U.S. Cl. 165—46 **11 Claims**



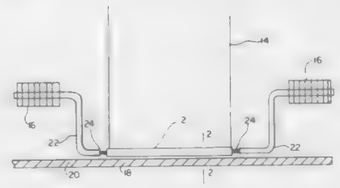
1. A corrugated heat pipe sealed at both ends, having a longitudinally corrugated peripheral wall, containing operating liquid therein, and having a rope-like tension member extending therethrough in its longitudinal direction and secured at both ends, said corrugated heat pipe comprising a supporting member disposed between a portion of said rope-like tension member and a recessed inner wall portion thereof, to let weight of the corrugated heat pipe be supported between said rope-like tension member portion and recessed inner wall portion.

4,858,680

DOOR SADDLE FOR BASEBOARD HEATING

Charles Byrne, 53 Riverside Ave., Massapequa, N.Y. 11758

Continuation of Ser. No. 249,997, Mar. 30, 1981, abandoned. This application May 17, 1983, Ser. No. 494,683
Int. Cl.[4] F24D *19/00*
U.S. Cl. 165—55 **4 Claims**



1. A threshold saddle for connecting fluid circulating heating systems across an upper surface of a floor of a doorway comprising;

an elongated member adapted to span the doorway along the floor and having:

a generally flat lower surface for contacting the upper surface of the floor;

a means defining a fluid circulating heat channel disposed

within the elongated member, said channel extending the length of said member;

a generally convex upper surface shielding the fluid circulating heat channel and substantially free from abrupt changes in grade to diminish the possibility of stumbling on the device; and connecting means at each end of said channel means for coupling to said fluid circulating health system across the upper surface of the floor of a doorway.

4,854,381

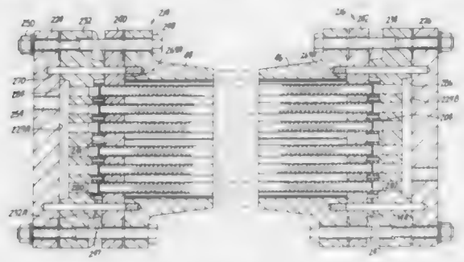
SHELL AND TUBE HEAT EXCHANGER

Kevin J. Sulzberger, Orange, Calif., assignor to TUI Industries, Anaheim, Calif.

Continuation of Ser. No. 795,240, Nov. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 582,975, Feb. 23, 1984, abandoned, which is a continuation-in-part of Ser. No. 479,234, Mar. 28, 1983, abandoned. This application Nov. 16, 1988, Ser. No. 273,105

Int. Cl.[4] F28F *9/22, 11/00*

U.S. Cl. 165—70 21 Claims



1. A heat exchanger comprising:

(a) a generally tubular shell extending between axially opposed ends and having first inlet means and first outlet means for respectively permitting the ingress and egress of a first heat exchange fluid;

(b) a pair of end members coupled to the axially-opposed ends of the shell to define an internal chamber therein having an intermediate region disposed between two opposite nonintermediate end regions of the chamber, the end members having second inlet means and second outlet means for respectively permitting the ingress and egress of a second heat exchange fluid;

(c) a plurality of groups of tube members extending within the internal chamber to adjacent the end members at each end, the tube members each including an inner tube having a wall of uniform thickness and a spiral groove formed therein and an outer tube disposed concentrically about the inner tube and having a uniformly thick wall with a spiral groove formed therein which mates with the spiral groove of the inner tube that an inner surface of the outer tube wall engages an outer surface of the inner tube wall along the mating grooves of the inner and outer tubes, the inner and outer tubes defining a spirally extending cavity therebetween and between adjacent spiral groove contact areas forming a path for leaking fluids, the spiral grooves in the inner and outer tubes having a width of substantially ½ inch, a depth of substantially 3/32 inch and a pitch of substantially 9/16 inch and the inner tube having a nominal ½ inch outside diameter;

(d) means for coupling the second heat exchange fluid into at least one group of the tube members;

(e) axially extending baffle means within the internal chamber for partitioning an intermediate region of the chamber into a plurality of axially extending subchambers, each respectively occupied by a different group of the tube members;

(f) first means for sealing the intermediate partitioned region of the chamber from the nonintermediate end regions of the chamber while permitting the nonintermediate end regions to communicate via the tube members;

(g) means including the baffle means for establishing a multipass flow path of the first fluid through the intermediate partitioned region of the chamber via successive ones of the subchambers;

(h) end baffle means cooperative with the end members for forming a plurality of fluid flow continuums between groups of the tube members to provide a multipass flow of second fluid flow through the chamber between the nonintermediate end regions with all of the tubes in each subgroup passing through the same subchamber, each subchamber having a subgroup of tubes passing therethrough;

(i) venting means within the tubular shell in communication with the flow path for leaking fluids;

with a flow of the second fluid in each given group of the tube members being in opposition to a flow of the first fluid through the partitioned chamber occupied by the given group to provide a full counterflow.

4,858,681

CYLINDER FOR HEAT EXCHANGERS

Carl T. Odelstam, Sandviken, Sweden, assignor to Sandvik AB, Sandviken, Sweden

Filed Nov. 13, 1987, Ser. No. 120,536

Claims priority, application Sweden, Nov. 17, 1986, 8604906

Int. Cl.[4] F28D *11/06*

U.S. Cl. 165—84 18 Claims



1. Cylinder tube for use in a scraped surface heat exchange where fluid, half fluid or viscous products are pressed through said tube from one end to the other while being chilled or heated by means of a cooling or heating medium applied towards the exterior surface of said cylindrical tube, characterized in the following, in combination,

(a) the cylinder tube is made of a duplex ferrite-austenite steel alloy comprising in weight-% max 0.03% C, 18–30% Cr, 4–8% Ni, 0–6% Mo, 0.5–2% Mn, 0.5–2% Si, 0.05–0.30% N and the remainder being Fe and usual impurities, whereby the amounts of these constituents are selected such that the ferrite content is 35–65%, and

(b) the cylinder is in the shape of a tube with an even interior surface, the exterior surface of which is provided with a plurality of spaced grooves with a profile the bottom of which is smoothly rounded at a radius (R) whereby the profile depth (A) of each said groove is essentially larger than said radius (R).

4,858,663

STAMPED DISCHARGE GRILLE INCLUDING TWO LOUVRED SECTIONS

Richard F. Beehler, Franklin, Tenn., assignor to Heil-Quaker Corporation, Lavergne, Tenn.

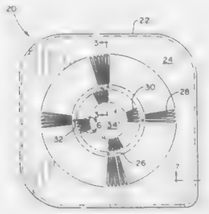
Filed Apr. 4, 1988, Ser. No. 176,868

Int. Cl.[4] F24B *1/06*

U.S. Cl. 165—125 18 Claims

1. A cover for a heat exchanger cabinet, said cabinet including a plurality of generally upstanding sides and having a heat

exchanger coil, fan, and motor for driving said fan disposed therein, said cover comprising a peripheral generally planar portion, a generally planar central portion, and a generally unbroken planar ring portion located intermediate said peripheral portion and said central portion, said central, peripheral, and ring portions being substantially coplanar;



a plurality of length wise radially oriented first louvres connecting said peripheral portion with said ring portion;

a plurality of lengthwise radially oriented second louvres connecting said ring portion with said central portion.

4,858,685

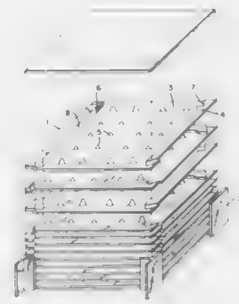
PLATE-TYPE HEAT EXCHANGER

László Szücs, and András Harmatha, both of Budapest, Hungary, assignors to Energigazdalkodasi Intezet, Budapest, Hungary

Continuation of Ser. No. 446,972, Dec. 6, 1982, abandoned. This application May 31, 1988, Ser. No. 201,366

Int. Cl.[4] F28F *3/08*

U.S. Cl. 165—166 12 Claims



1. A heat exchanger in the form of a stack of plates, comprising:

a plurality of diagonally symmetrical like parallel plates, alternate plates being disposed at 90 degrees with respect to adjoining plates,

each of the plates having a base portion substantially on and defining a base plane;

each of the plates having a pair of generally parallel opposite first outer edges and two generally parallel second outer edges bridging and generally perpendicular to the respective first outer edges;

respective lips bend upward from the base plane along said first outer edges and forming and lying on a connection plane substantially parallel to the base plane;

each lip having a first end formation defining a portion of said base plane spaced in from said first outer edge and adjacent one of said second outer edges, and having an opposite second end formation defining a portion of said base plane adjacent both said first outer edge and the other of said second outer edges, said end formations being arranged in directions opposite each other whereby each of said outer edges has a portion lying in said base plane and a portion lying in said connection plane;

whereby when said plates are stacked 90 degrees with respect to one another, said connection plane of one plate underlies said base plane of an adjacent plate such that the first outer edges of said one plate underlie the second outer edges of said adjacent plate and the connection plane of said one plate is in full contact with an edge portion of the base plane of said adjacent plate, said second end formations of said one plate underlying said first end formations of said adjacent plate;

means for securing the plates together in a stack to form respective sets of flow passages sealed from each other, and parallel to the planes,

the sets of flow passages being disposed generally perpendicularly to each other.

4,858,684

HEAT EXCHANGER, ESPECIALLY FOR COOLING CRACKED GAS

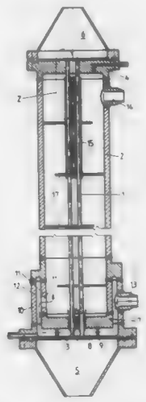
Peter Brücher, and Helmut Lachmann, both of Berlin, Fed. Rep. of Germany, assignors to Borsig GmbH, Berlin, Fed. Rep. of Germany

Filed May 11, 1988, Ser. No. 193,116

Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715713

Int. Cl.[4] F28F *13/00*

U.S. Cl. 165—134.1 5 Claims



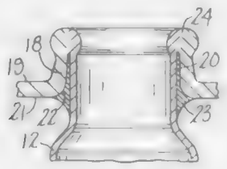
1. A heat exchanger for cooling cracked gases by boiling water, comprising: pipes having an inner wall of conducting gas to be cooled; a cooling jacket surrounding said pipes; cooling medium for flowing through said jacket; sleeve means, each of said pipes having a gas outlet end surrounded by said sleeve means; said cooling medium flowing through said sleeve means; said sleeve means comprising a sleeve pipe open at both ends and out of contact with said gas conducting pipes; said sleeve pipe having a wall with perforations.

4,855,686

HEAT EXCHANGER

Gerald C. Callesen, Madison, Conn., assignor to The Allen Group, Inc., New Haven, Conn.

Division of Ser. No. 867,402, May 13, 1986, Pat. No. 4,744,505, which is a continuation of Ser. No. 543,324, Oct. 19, 1983, abandoned. This application Mar. 7, 1988, Ser. No. 164,506
Int. Cl.[4] F28F 9/16; F28D 1/04
U.S. Cl. 165—173 11 Claims



6. A heat exchanger comprising:

at least one header defined by walls having an inner, liquid-facing side and an outer, air-facing side, at least one of said walls having therein a plurality of collared openings of substantially circular cross section;

a plurality of tubes of non-circular cross section having end portions of substantially circular cross section, said tube end portions primarily having a diameter slightly smaller than and being received within respective collared openings to mount said tubes into communication with said header, the outermost end portion of said circular tube ends being expanded to create a tight fit with the end of said collared opening while leaving an annular region between the body of the collared opening and the unexpanded remainder of the circular tube end within the collared opening;

a weld bonding the expanded end portion of said tube to the end of said collared opening; and

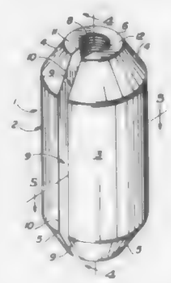
a columnar bond of bonding material in said annular region.

4,858,668

SUCKER ROD GUIDE

Billy J. Edwards, 1917 Cambridge, Bossier City, La. 71112, and Jimmy A. Starks, 1105 James, Bossier City, La. 71111

Filed Jun. 27, 1988, Ser. No. 211,567
Int. Cl.[4] E21B 17/10
U.S. Cl. 166—241 4 Claims



1. A sucker rod guide for mounting on a sucker rod and spacing the sucker rod from the tubing in an oil well, comprising a generally cylindrically-shaped, extruded, ultra-high density polyethylene body having a substantially smooth outside surface; a longitudinal bore provided centrally of said body, said bore having a smaller diameter than the diameter of the sucker rod; a plurality of grooves provided in circumferential relationship in said bore; and a tapered slot extending longitudinally through said body from said outside surface to said bore, said tapered slot further comprising a slot mouth located at said outside surface and a slot throat spaced from said slot mouth, said slot throat lying adjacent to said sucker rod bore and wherein said slot throat is wider than said slot mouth for mounting said sucker rod guide on the sucker rod.

4,858,687

NON-ROTATING PLUG SET

Brock W. Watson, and T. Austin Freeman, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Nov. 2, 1988, Ser. No. 266,413
Int. Cl.[4] E21B 33/16
U.S. Cl. 166—153 11 Claims



1. In combination an anti-rotation plug set and piece of floating equipment for use therewith,

wherein the anti-rotation plug set comprises: an upper plug including:

a body member having a cavity in the bottom thereof;

an elastomeric wiper covering disposed about a portion of the body member and retained thereon; and

an anti-rotation insert retained within the cavity in the bottom of the body member, the insert having a plurality of downwardly facing teeth thereon; and

a bottom plug including:

a body member having a bore therethrough;

an elastomeric wiper covering disposed about a portion of the body member and retained thereon;

an upper anti-rotation insert retained within the upper portion of the bore through the body member, the upper anti-rotation insert having a plurality of upwardly facing teeth thereon adapted to engage the downwardly facing teeth on the anti-rotation insert retained within the upper plug;

a diaphragm sealing the bore through the body member, the diaphragm located below the upper anti-rotation insert in the body member; and

a lower anti-rotation insert retained within the lower portion of the bore through the body member, the lower anti-rotation insert having a plurality of downwardly facing teeth thereon; and

wherein the piece of floating equipment comprises:

an annular housing;

a float valve assembly;

cementitious material retaining the float valve assembly within the annular housing; and

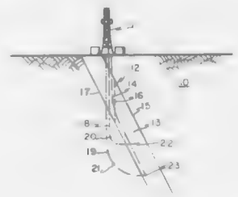
an anti-rotation insert secured within the annular housing, the anti-rotation insert having a plurality of upwardly facing teeth thereon adapted to engage the downwardly facing teeth on the lower anti-rotation insert of the lower plug of the plug set.

4,858,689

COAL GASIFICATION WELL DRILLING PROCESS

Terry L. Logan, Grand Junction, Colo., assignor to Resource Enterprises, Inc., Salt Lake City, Utah

Filed Apr. 11, 1988, Ser. No. 179,663
Int. Cl.[4] E21B 43/243
U.S. Cl. 166—256 12 Claims



1. A process for in-situ gasification of a section of a formation containing at least one below surface dipping coal seam comprising the steps of, dimensionally identifying a section of each coal seam of the formation that is an area of the coal seam between head and foot ends with opposite sides and a roof and floor as a burn module; for each coal seam positioning a drilling platform on a ground surface location that is axially offset over said coal seam roof from a vertical line extending upwardly from the head end of said burn module to the ground surface; directionally drilling a production wellbore vertically from each drilling platform through said coal seam roof to intersect the coal seam and curve into the designated burn module at the head end thereof, said production well bore extending longitudinally the length of said burn module; from one drilling platform that is used for drilling a production wellbore, directionally drilling at least one pair of injection wellbores through said coal seam roof and floor into that burn module at approximately a right angle to and spaced apart a distance from said production wellbore; during drilling of said production and injection wellbores, tracking the subsurface location of the drilling bit; introducing a burn material or enhancer through at least one of the injection wellbores that is then ignited to burn the coal seam burn module; and withdrawing the products of that combustion through the production wellbore for further processing.

4,858,690

UPWARD MOVEMENT ONLY ACTUATED GRAVEL PACK SYSTEM

Wade A. Rebardi, Carencro, and David L. Farley, Lafayette, both of La., assignors to Completion Services, Inc., Lafayette, La.

Filed Jul. 27, 1988, Ser. No. 224,974
Int. Cl.[4] E21B 34/14, 43/04
U.S. Cl. 166—278 38 Claims

1. A gravel pack system for gravel packing a formation, which comprises:

a screen assembly;

a crossover assembly within said screen assembly, said screen assembly and crossover assembly forming interference collar and indicator collet means for positioning said crossover assembly within said screen assembly;

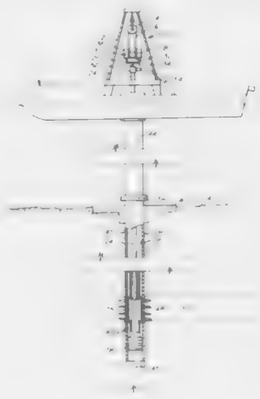
said screen assembly comprising:

a packer for setting and sealing said screen assembly within said well, a ported extension below said packer, a portion of said interference collar and indicator collet means disposed below said ported extension, and a production screen below said portion of said interference collar and indicator collet means;

said crossover assembly comprising:

a crossover means having an extension tube and outer cylinder for passing fluid downwardly through said extension tube to a lower port and outside said crossover assembly and for passing fluid upwardly through said outer cylinder to an upper port, a wash pipe section, another portion of said interference collar and indicator collet means disposed on said section, and a circulating valve, said circulating valve positioned between said outer cylinder and said wash pipe section for controlling passage of fluid from said wash pipe upwardly to said outer cylinder and upper port;

said crossover assembly having a plurality of positions within said screen assembly including a lower circulating position for passing a gravel slurry through said extension tube and lower port and into the formation and returning fluid through said wash pipe section, outer cylinder and upper port, an upper squeeze position for passing a gravel slurry through said extension tube and lower port and forcing the gravel slurry into the formation by closing said circulation valve, and an upper circulating position for passing a gravel slurry through said extension tube and lower port and into the formation and returning fluid through said wash pipe section, outer cylinder and upper port;



said interference collar and collet means positioning said crossover assembly within said screen assembly for each of said lower circulating, upper squeeze and upper circulating positions.

12. A method for gravel packing a formation in a well which comprises:

running a screen assembly having a packer, crossover tool, and production screen into the wall and setting the packer above the formation to form an annulus adjacent the formation;

sequentially raising the crossover tool to perform the steps of

lower squeeze opening the flow of gravel to the annulus and formation and closing the production screen and the flow of returns to the surface;

lower circulation opening the flow of gravel to the annulus and formation, maintaining the production screen closed, and opening the flow of returns to the surface;

upper squeeze opening the flow of gravel to the annulus and

formation and through the production screen and closing the flow of returns to the surface;

upper circulation opening the flow of gravel to the annulus and formation and opening the production screen for flow of the returns to the surface; and

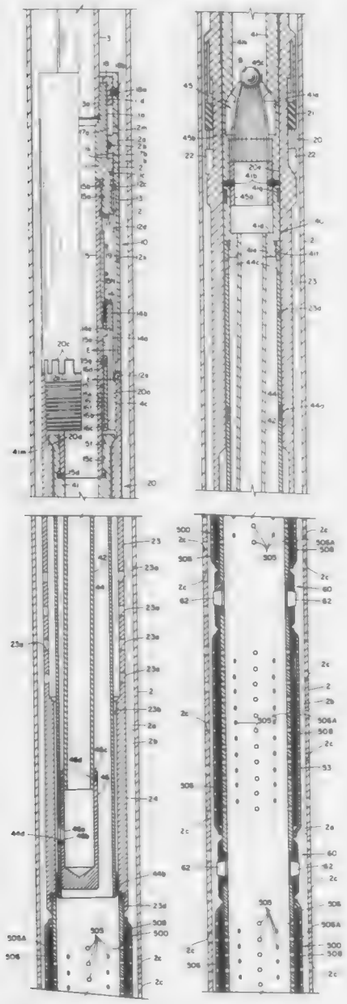
reverse circulation closing the annulus and opening the crossover tool for the reverse flow of fluid to the surface.

4,858,691

GRAVEL PACKING APPARATUS AND METHOD

William T. Ilfrey, Spring; Edward C. Spatz, Houston; Elmer R. Peterson, The Woodlands, all of Tex., and William Moran, Broussard, La., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Jun. 13, 1988, Ser. No. 206,209
Int. Cl.[4] E21B *43/04, 43/08*
U.S. Cl. 166—278 31 Claims



1. An apparatus for use on a subterranean well gravel packing conduit, comprising:

a cylindrically shaped inner tubular member having an interior wall and an exterior wall;

a fluid flow passageway defined within the interior wall of said tubular member;

fluid flow passage means extending from the interior of said tubular member through the exterior wall of said tubular member and in communication with said fluid flow passageway;

a fluid-porous particulate-restricting means carried around the exterior wall of said tubular member and having its interior facing the tubular member;

wire mesh means disposed between the exterior wall of said tubular member and the interior of said particulate-restricting means and passing across said fluid flow passage means, and having fluid flow openings therethrough, said wire mesh means having inner and outer wrapping means interwoven between one another, at least one of said inner tubular members and said particulate restricting means being secured at at least one of its ends to the subterranean well gravel packing conduit, whereby fluid passing through said particulate restricting means and said wire mesh means is filtered to prevent solids of a predeterminable size from passing into said fluid flow passage means and into said fluid flow passageway through the subterranean well gravel packing conduit.

4. A method of gravel packing subterranean oil or gas well comprising the steps of:

(1) introducing into said well a subterranean well conduit having disposed thereon at least one well packer apparatus and at least one gravel packing apparatus, said gravel packing apparatus comprising:

a cylindrically shaped inner tubular member having an interior wall and an exterior wall;

a fluid flow passageway defined within the interior wall of said tubular member;

fluid flow passage means extending from the interior of said tubular member through the exterior wall of said tubular member and in communication with said fluid flow passageway;

a fluid-porous particulate-restricting means carried around the exterior wall of said tubular member and having its interior facing the tubular member;

wire mesh means disposed between in the exterior wall of said tubular member and the interior of said particulate-restricting means and passing across said fluid flow passage means, and having fluid flow openings therethrough, said wire mesh means having inner and outer wrapping members interwoven between one another, at least one of said inner tubular members and said particulate restricting means being secured at at least one of its ends to the subterranean well gravel packing conduit, whereby fluid passing through said particulate restricting means and said wire mesh means is filtered to prevent solids of a predeterminable size from passing into said fluid flow passage means and into said fluid flow passageway through the subterranean well gravel packing conduit;

(2) placing said gravel packing apparatus adjacent a production zone in said well;

(3) setting said well packer ; and

(4) introducing a carrier fluid containing a particulate matter into said well conduit for placement of said particulate matter exterior of said well conduit and adjacent said production formation.

4,858,692

CEMENTING APPARATUS AND METHOD FOR EXECUTION OF CEMENTING OPERATION

Magne P. Nilsen, Hafrsfjord, Norway, assignor to Den norske stats oljeselskap a.s, Norway

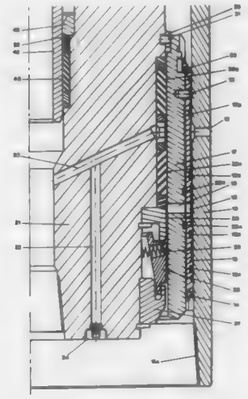
Filed Mar. 16, 1988, Ser. No. 168,983
Claims priority, application Norway, Mar. 19, 1987, 871125
Int. Cl.[4] E21B *33/13*
U.S. Cl. 166—285 10 Claims

1. Cementing apparatus to be used for well cementing operations, characterized by comprising

an intermediate casing (10) that features one or several cementing ports (12),

a main tool (21) with one or several cementing channels (22) located with their outlets aligned with the cementing ports (12),

a main sealing sleeve (13) and an auxiliary sleeve (17) that feature one or several port openings (15, 19),



the main sealing and auxiliary sleeves (13, 17) as a unit in an initial lower position closing a communication therebetween the cementing channels (22) and the cementing ports (12), and in a second vertically shifted position forming said communication through the port openings (15, 19).

4,858,693

COMPOSITIONS AND METHODS FOR REDUCING THE PERMEABILITY OF UNDERGROUND STRATA

Martin Navratil, West Hill; Mark S. Mitchell, London, and Mojmir Sovak, Toronto, all of Canada, assignors to The Borden Company Limited, West Hill, Canada

Division of Ser. No. 703,201, Feb. 19, 1985, Pat. No. 4,663,367.
This application Apr. 15, 1987, Ser. No. 38,602
Claims priority, application Canada, Aug. 30, 1984, 462127
Int. Cl.[4] E21B *43/22;* E02B *3/12*
U.S. Cl. 166—295 24 Claims



1. A method for decreasing the fluid permeability of a segment of a formation containing an oil-bearing stratum, said segment having greater fluid permeability than the surrounding segments of said formation, which method comprises:

injecting into said formation via a well penetrating said formation an aqueous gelable solution having a pH of at least about 4, said solution consisting essentially of a sulfonate derivative of a tannin extract and an aldehyde component selected from the group consisting of furfural, urea-formaldehyde concentrate, hexamethylenetetramine, paraformaldehyde, formaldehyde in aqueous solution and a phenol-formaldehyde resole resin, the weight of said sulfonate derivative to said aldehyde component is from about 1.5:1 to about 7.5:1 based on the aldehyde in said sulfonate derivative, the total weight of said sulfonate derivative and aldehyde component being from about 1 to about 30 percent by weight of said solution; the viscosity of said solution is between 1 and 30 mPa-s. when first formed; the gelling time of said solution and the rate of injection thereof being such that said solution passes down said well by which it is injected and achieves substantial penetration into said higher fluid permeability segment before substantial gelling of said solution occurs; and

allowing said solution to gel within said higher fluid permeability segment and thereby reduce the fluid permeability of said segment.

4,858,694

HEAVE COMPENSATED STABBING AND LANDING TOOL

Dale V. Johnson, Metairie; Joseph A. Burkhardt, New Orleans, both of La., and Thomas W. Childers, Hosle, Norway, assignors to Exxon Production Research Company, Houston, Tex.

Filed Feb. 16, 1988, Ser. No. 156,053
Int. Cl.[4] E21B *19/00*
U.S. Cl. 166—355 9 Claims



1. A heave compensated stabbing and landing tool for use on a vessel including a drill string compensator and a tubing string connected to the drill string compensator, comprising:

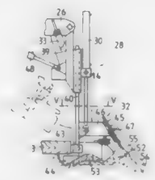
an upper tubing grip having a first engaged position in which it grips the tubing string and a second disengaged position;
a lower tubing grip having a first engaged position in which it grips the tubing string and a second disengaged position;
means connected to the upper and lower tubing grips for selectively adjusting the vertical distance therebetween to allow controlled vertical placement of the lower end of the tubing string; and
a separater anchor line having a first end connected to the lower tubing grip and a second end adapted to be anchored to the seabed, wherein the anchor line is adapted to anchor the tool to the seabed independently of the drill string.

4,858,696

MOBILE BALLAST CLEANING MACHINE

Josef Theurer, Vienna, and Manfred Brunninger, Altenberg, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellsichaft m.b.H., Vienna, Austria

Filed Feb. 22, 1988, Ser. No. 158,793
Claims priority, application Austria, Mar. 31, 1987, 784/87
Int. Cl.[4] E01B *27/00*
U.S. Cl. 171—16 5 Claims



1. A machine for cleaning ballast along the shoulders of a railroad track mounted on the track for mobility in an operating direction, the track consisting of two rails fastened to ties having transversely opposite ends at the track shoulders, which comprises
(a) a machine frame having transversely opposite sides adjacent the track shoulders,
(b) a respective endless ballast excavating and conveying chain vertically adjustably mounted at a respective one of the machine frame sides,
(c) a ballast screening installation arranged to receive the excavated ballast conveyed by the endless chains, and
(d) a respective ballast loosening and excavating device preceding each endless ballast excavating and conveying chain in the operating direction and vertically adjustably mounted on the machine frame, each device including
(1) a vertically extending ballast loosening and excavating tool arranged to project full into the ballast below a respective one of the tie ends in a vertically adjusted operating position for loosening and excavating a layer of the ballast below the one tie end, and
(2) ballast guide plate means comprising a ballast guide plate adjoining the ballast loosening and excavating tool for receiving the loosened and excavated ballast therefrom and guiding it transversely outwardly from the tie end whereby a ballast heap spaced from the tie end in longitudinal alignment with the respective chain is produced for excavation and conveyance by said chain, and
(e) a ballast plow pivoted to each ballast loosening and excavating device and spaced from the ballast guide plate, the plow having a forward end arranged to dig a furrow into the ballast at a distance from the tie end.

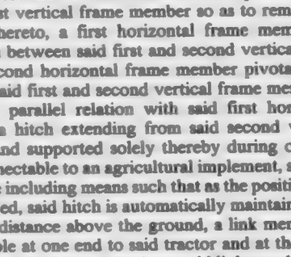
4,858,697

LAWN AERATOR

Paul A. Sherblom, 15 Iowa St., Worcester, Mass. 01602

Filed Mar. 4, 1988, Ser. No. 164,449
Int. Cl.[4] A01B *45/02*
U.S. Cl. 172—21 12 Claims

1. An attachment for a lawn roller having an outer cylindrical surface, said attachment comprising:
(a) an elongated sheet of flexible material which is capable of covering the outer cylindrical surface of a lawn roller, said sheet having a first end edge, a second end edge, an inner generally flat surface for bearing against said cylindrical surface, and an outer generally flat surface which faces away from said inner face surface,
(b) a plurality of rigid pins which are attached to said sheet and which project from said outer face surface at a right angle to said outer face surface, and
(c) means for removably attaching said first end edge to said second end edge for removably mounting said sheet on



said roller so that said pins, extend outwardly from said roller.

4,858,698

WEIGHT TRANSFER LINKAGE ARRANGEMENT

Gerald E. Williamson, Davenport, Wash., and Donald R. Hartwig, Rock Island, Ill., assignors to Yetter Manufacturing Company, Colchester, Ill.

Filed Jun. 10, 1988, Ser. No. 207,137
Int. Cl.[4] A01B *63/11, 59/00*
U.S. Cl. 172—448 6 Claims

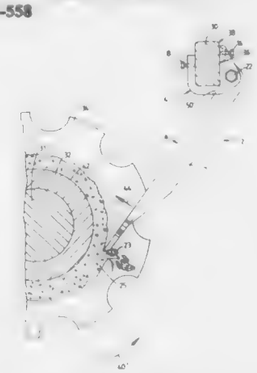
1. A weight transfer linkage arrangement adapted to be connected to a three-point hitch of a tractor and to a vertically adjustable tool bar, said linkage arrangement including a first parallel linkage including a first vertical frame member connectable to said tool bar in a position generally perpendicular thereto, a second vertical frame member pivotally connected to said first vertical frame member so as to remain in parallel relation thereto, a first horizontal frame member pivotally connected between said first and second vertical frame members, a second horizontal frame member pivotally connected between said first and second vertical frame members so as to remain in parallel relation with said first horizontal frame member, a hitch extending from said second vertical frame member and supported solely thereby during operation, said hitch connectable to an agricultural implement, said first parallel linkage including means such that as the position of said tool bar is varied, said hitch is automatically maintained at a predetermined distance above the ground, a link member pivotally connectable at one end to said tractor and at the other end to said first vertical frame members, said link member disposed in parallel relation to a pair of lower three-point hitch links associated with said tractor, wherein said hitch links are pivotally connectable at one end to said tractor and at the other end to said tool bar, said link member and said hitch links cooperatively forming a second parallel linkage whereby said second parallel linkage is adaptable to raise or lower said tool bar and said first vertical frame member of said first parallel linkage, and a force applying means connected between said second horizontal frame member and said link member, said force applying means operative to exert a down pressure force on said tool bar.

4,858,699

SCRAPER DEVICE FOR AN AGRICULTURAL IMPLEMENT

Bruce A. Poltrock, Swan Hill, Australia, assignor to Grizzly Engineering Pty. Ltd., Victoria, Australia

Filed Jan. 21, 1987, Ser. No. 6,524
Claims priority, application Australia, Jan. 21, 1986, PH04294/86
Int. Cl.[4] A01B *15/16*
U.S. Cl. 172—558 11 Claims



1. An implement including a framework, a plurality of ground working discs with spacer elements therebetween, the discs and elements being rotatably mounted on the framework, clearing means for each spacer element, said clearing means each comprising an arm having blade means thereon operable to remove earth or other material accumulated on the spacer elements and arm mounting means arranged such that the arm can swing relative to the framework about an axis which is generally parallel to the axis of rotation of the spacer element between a first position in which the blade means is spaced from the spacer element by a first predetermined distance and a second position in which the blade means engages or is spaced from the spacer element by a second predetermined distance which is less than said first predetermined distance, the arrangement being such that in use earth or other material forms a layer accumulated on the said spacer element, which layer, on engagement with the blade means, will cause the blade means to penetrate the layer and swing towards said second predetermined position, thereby removing at least a part of said layer.

4,858,700

ARTICULATED APPARATUS FOR POSITIONING ROCK DRILLS

James P. Shafer, 22 Maple La., Elkview, W. Va. 25071

Filed Jun. 26, 1987, Ser. No. 66,432
Int. Cl.[4] E21B *7/02*
U.S. Cl. 173—22 14 Claims

1. An articulated apparatus for positioning a rock drill comprising:
a vehicle having a chassis supported by ground engaging means, a carriage means mounted on said chassis, and rotary means for power actuated rotation of said carriage means relative to said chassis about an upright first axis;
a boom means mounted with one end at said carriage means for power actuated pivoting thereon about a second axis perpendicular to said upright first axis;
an arm means carried by another end of said boom means for power actuated pivoting thereon about a third axis paral-

lel with said second axis, said power actuated pivoting of said boom means and said arm means defining a plane of boom articulation;

an elongated feedshell means for guiding and reciprocating a rock drill means toward and away from a drill point entry location adjacent to one end of said feedshell means; and,

a feedshell pivot means for mounting said feedshell means on a distal end portion of said arm means for power actuated pivoting of said feedshell means about a fourth axis parallel with said second and third axis, said feedshell pivot means comprising body means pivotally connected to said



distal end portion for rotation about said fourth axis and offset means providing an offset connection between said body means and said elongated feedshell means, said offset connection being located at an intermediate position between the ends of said elongated feedshell means and offset to one side of said distal end portion of said arm means to allow said pivoting of said feedshell means in a plane parallel to said plane of boom articulation, the amount of said offset being sufficient for the other end of said elongated feedshell means to swing back and forth past said arm means without interference.

4,858,701

FLUID-POWERED IMPACT DEVICE AND TOOL THEREFOR

Paul P. Weyer, 48811 - 284th Ave. SE., Enumclaw, Wash. 98022

Continuation-in-part of Ser. No. 126,837, Nov. 30, 1987. This application Jan. 25, 1988, Ser. No. 147,990

Int. Cl.[4] E21C *3/04*; B25D *9/04*

U.S. Cl. 173—50 **48 Claims**



25. A device for breaking apart or forming cuts or holes in a stationary work piece, such as a rock, cement or other hard material, the device being usable with a percussion hammer having a striker movable with reciprocating motion to provide repeated impact, comprising:

a tool having a working head at a forward end portion, an impact member at a rearward end portion, and a shank extending therebetween;

an outer body having a forward end and a rearward end, and having ports for introducing pressurized fluid within said body;

a drive member extending within said body and supported for rotation relative to said body within a limited rotational range, said drive member having an interior bore extending fully and generally coaxially through said drive member from a forward drive member end to a rearward drive member end, said drive member bore being sized to receive said tool shank therewithin in generally coaxial arrangement with said drive member, said drive member bore having drive means for transmitting selective rotational drive force from said drive member to said tool as said drive member is selectively rotated within said limited rotational range by the application of fluid within said body through said ports, said drive means permitting substantially unrestricted axial movement of said tool relative to said drive member within a limited longitudinal range, said drive member holding said tool working head positioned at said forward body end exterior of said body to engage the work piece and said tool rearward end portion positioned at said body rearward end, said drive member end for locking said tool against forward removal from said drive member bore while permitting substantially unrestricted reciprocal axial movement of said tool within said limited longitudinal range, said tool being movable axially within said limited longitudinal range to a position whereat said tool rearward end portion is axially endwise impacted by the striker to drive said tool forward when said tool working head is moved into engagement with the work piece; and

transmission means, disposed within said body and surrounding said drive member, for converting the selected application of pressurized fluid within said body through said ports into selected clockwise and counterclockwise rotational drive force to said drive member to move said drive member relative to said body within said limited rotational range by a limited first amount in a clockwise direction and a limited second amount in a counterclockwise direction.

4,858,702

HYDRAULIC DISTRIBUTOR FOR PERCUSSION APPARATUS DRIVEN BY AN INCOMPRESSIBLE FLUID UNDER PRESSURE

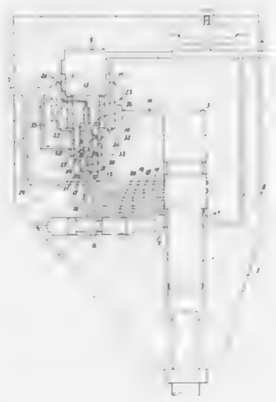
Bernard Piras, Charly, France, assignor to Etablissements Montabert, Saint-Priest, France

Filed Jul. 18, 1988, Ser. No. 220,548

Claims priority, application France, Jul. 17, 1987, 87 10501

Int. Cl.[4] B23B *45/16*

U.S. Cl. 173—134 **16 Claims**



1. A hydraulic percussion apparatus, comprising:

a percussion piston hydraulically reciprocatable toward and away from a tool and adapted to strike said tool to impart percussion thereto;

means defining a main cylinder receiving said percussion piston and forming with said percussion piston a driving chamber pressurizable to drive said percussion piston toward said tool;

a high-pressure source of a hydraulic medium;

a low-pressure source of said hydraulic medium; and

a hydraulic distributor between said sources and said driving chamber for alternately connecting said high-pressure source and said low-pressure source to said driving chamber in dependence upon position of said percussion piston to respectively accelerate descent of said percussion piston and permit upward return travel of said percussion piston, said distributor comprising:

means defining a working cylinder of said distributor communicating with said sources,

a distributor body slidable in said working cylinder and defining in said cylinder a distributor control chamber connectable by said body successively with said high-pressure source and said low-pressure source, and a bore communicating with said distributor control chamber,

a valve shiftable in said bore and defining a valve control chamber in said bore and in continuous communication with said distributor control chamber by a channel, said valve being shiftable in said body in opposite directions in dependence upon the source to which said valve control chamber is connected, and

a hydraulic circuit formed in said valve and having one end continuously communicating with said valve control chamber and another end selectively connectable to said high-pressure source upon communication of said control chambers with said high-pressure source in dependence upon the position of said percussion piston and to said low-pressure source upon communication of said control chambers with said low-pressure source in dependence upon the position of said percussion piston.

4,858,703

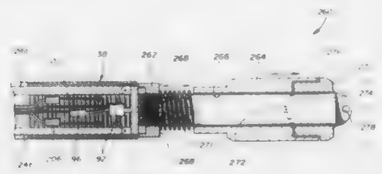
SELF-PROPELLED SUBSOIL PENETRATING TOOL SYSTEM

Frank R. Kinnan, Camas Valley, Oreg., assignor to Underground Technologies, Inc., Byron, Calif.

Division of Ser. No. 115,987, Nov. 2, 1987. This application Jun. 2, 1988, Ser. No. 201,199

Int. Cl.[4] E21B *11/02*

U.S. Cl. 175—19 **3 Claims**



1. A back reamer for enlarging the bore created by a self-propelled subsoil penetrating tool having a valve means to selectively apply a viscous fluid to a nozzle means through fluid feed tube means, said valve means being coupled to a source of viscous fluid and a source of high-pressure fluid and to control means for periodically applying said high-pressure fluid to said valve means to force said viscous fluid along said fluid feed tube means to said nozzle means with great force; said back reamer comprising;

tube means;

collar means fixedly mounted at one end of said tube means;

anvil means fixedly mounted at the other end of said tube means;

reamer means mounted upon said tube means for movement therealong and thereon between said collar means and said anvil means; said fluid feed tube means extending into and partially through said tube means and expansion ducts between said collar means and said reamer means to receive the viscous fluid forced through said fluid feed tube means and propel said reamer means away from said collar means to strike the walls defining said bore and enlarge same;

the viscous fluid being permitted to escape from the expansion ducts prior to the application of high-pressure fluid to fill the bore to lubricate the back reamer and provide a binder for mixing with the soil disturbed, distributed and compacted to help support the enlarged bore walls.

4,858,704

GUIDED EARTH BORING TOOL

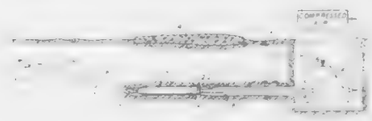
William J. McDonald; Gerard T. Pittard; William C. Maurer; Michael R. Wasson, and William C. Herben, all of Houston, Tex., assignors to Gas Research Institute, Chicago, Ill.

Continuation of Ser. No. 863,957, May 16, 1986, Pat. No. 4,694,913. This application Sep. 9, 1987, Ser. No. 94,937

The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.

Int. Cl.[4] E21B *4/14, 4/20, 7/08*

U.S. Cl. 175—61 **9 Claims**



1. A controllable tool for drilling holes in soft earth comprising

an elongated rigid supporting drill rod or pipe,

means supporting said drill rod or pipe for earth boring or piercing movement, including

means for moving said drill rod or pipe longitudinally for penetrating the earth,

means for rotating said drill rod or pipe while penetrating the earth, and

means for controlling the direction of movement of said drill rod or pipe along a straight or curved path,

said drill rod or pipe moving and rotating means being constructed to permit addition and removal of supporting drill rod or pipe during earth penetrating operation,

an earth piercing member of substantially cylindrical shape,

said tool being operable to penetrate the earth upon longitudinal movement of said drill rod or pipe by said longitudinal rod or pipe moving means, and

said direction controlling means comprising means causing drill rod or pipe movement in a curved path through the earth when said rod or pipe is not rotated and causing drill rod or pipe straight line movement when said rod or pipe is rotated.

4,858,705

ASSEMBLY FOR MAKING ORIENTED BORE-HOLES

Jean Thiery, Le Pecq, France, assignor to Institut Francais Du Petrole, Cedex, France

Continuation of Ser. No. 860,472, May 7, 1986, abandoned. This application Apr. 1, 1988, Ser. No. 176,452

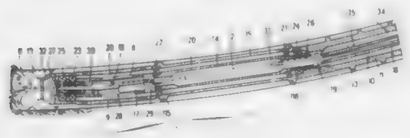
Claims priority, application France, May 7, 1985, 85 07069

Int. Cl.[4] E21B *7/08, 47/024*

U.S. Cl. 175—73 **17 Claims**

1. An assembly for driving a drilling tool in rotation about an axis of said drilling tool from a drive column rotating at its lower end about a second axis, said axes being substantially convergent at the same point and forming therebetween an angle alpha, the assembly comprises in combination a remote-controlled deflector means for creating a deflection of the angle alpha, means for controlling a value of said angle alpha, guide means for allowing rotation of said tool and said drive

column at a lower end about said axes relative to said deflector means, and means for controlling a polar position of said de-



flector means relative to the second axis whereby a rotation of said drive column effects rotation of said tool.

4,858,708

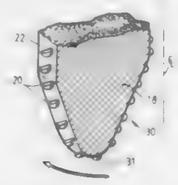
DIAMOND DRILL BIT WITH HEMISPHERICALLY SHAPED DIAMOND INSERTS

Maurice P. Lebourgh, 5592 Longmont, Houston, Tex. 77056

Continuation-in-part of Ser. No. 96,895, Sep. 15, 1987, abandoned. This application Jan. 17, 1988, Ser. No. 208,407

Int. Cl.[4] E21B *10/48*

U.S. Cl. 175—329 16 Claims



1. A rotary drill bit for drilling a hole in subterranean formations comprising:

a body portion including a matrix forming a face of said bit;

means to define fluid passageways across said matrix, said means dividing said matrix into a plurality of fins; and

a plurality of hemispherically shaped diamond cutting elements embedded in each of said fins, each element having a cleaved, planar face, a portion of the planar face of each of said cutting elements which is not embedded in each fin being disposed to define a cutting surface to successively drill the formation upon rotation of the bit.

4,858,707

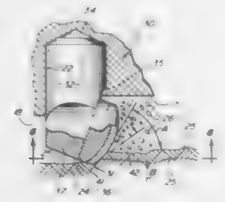
CONVEX SHAPED DIAMOND CUTTING ELEMENTS

Kenneth W. Jones, Kingwood, and George Fyfe, Spring, both of Tex., assignors to Smith International, Inc., Houston, Tex.

Filed Jul. 19, 1988, Ser. No. 221,410

Int. Cl.[4] E21B *10/46*

U.S. Cl. 175—329 5 Claims



1. A polycrystalline diamond insert comprising:

a cylindrical shaped hardmetal insert stud body forming a first base end and a second cutter end,

said second cutter end comprising a cutter element formed in a convex shaped layer of polycrystalline diamond, said convex cutter element further comprises a substantially constant thickness, convex layer of polycrystalline diamond material bonded to a substantially cylindrical hardmetal backup portion, said backup portion forming a first convex surface bonded to said layer of diamond and a second base end, said second base end being metallurgically bonded to said second cutter end of said insert stud, said convex layer of diamond is oriented relative to a centerline of said cylindrical stud with a negative rake angle from 0° to about 45°, inclusive, said convex cutter element forces detritus from a working surface of a material away from the center of the convex surface thereby continuously clearing said convex cutter surface of detritus to enhance cooling said cutter surface during a cutting operation of said insert.

4,858,711

COMBINATORIAL WEIGHING APPARATUS

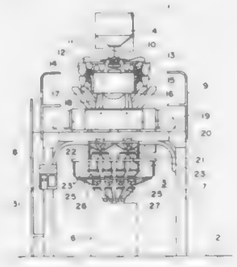
Masami Kohno, Kyoto, Japan, assignor to Ishida Scales Mfg. Co. Ltd., Kyoto, Japan

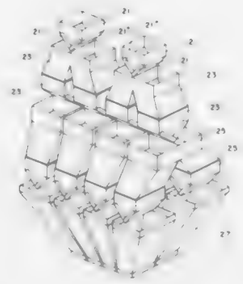
Filed Sep. 12, 1988, Ser. No. 243,277

Claims priority, application Japan, Sep. 11, 1987, 62-226681

Int. Cl.[4] G01G *13/00, 13/16;* B65G *11/00*

U.S. Cl. 177—25.18 6 Claims





1. A combinatorial weighing apparatus having chutes for distributing articles selected and discharged by combinatorial weighing operation to prescribed discharge positions, said combinatorial weighing apparatus comprising:

at least one distribution chute coupled to said chutes and having means for distributing articles discharged from weighing hoppers in a plurality of directions;

a plurality of timing hoppers capable of temporarily storing the articles distributed by said distribution chute;

article receiving means disposed downstream of said timing hoppers for receiving the articles discharged from said timing hoppers; and

control means for controlling a sequence in which the articles are distributed by said distribution chute.

4,858,709

DIGITAL SCALE

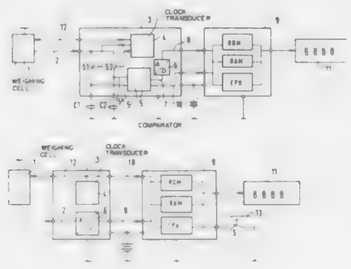
Albrecht Stahl, Sulzbach, Fed. Rep. of Germany, assignor to Soehnle-Waagen GmbH & Co., Murrhardt, Fed. Rep. of Germany

Filed Oct. 14, 1988, Ser. No. 257,814

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1987, 3735036

Int. Cl.[4] G01G *23/14, 23/10*

U.S. Cl. 177—164 10 Claims



1. A digital scale, comprising:

a weighing cell which generates an analog output signal;

an adaptation circuit including a clock transducer connected to the weighing cell, memory means connected to the clock transducer and to the weighing cell, a comparator connected to said memory means, and a analog/digital converter connected to said comparator;

said clock transducer causing the weighing cell to be energized at regular time intervals generating thereby corresponding analog signals applied to said memory means, wherein said analog signals are stored in alternation and in subsequent time intervals, the stored signals being compared to each other and to a predetermined threshold value and an output signal generated when the predetermined threshold value is exceeded, said output signal being applied to said analog/digital converter;

an evaluation circuit connected to said adaptation circuit for receiving the output signal converted by said analog/digital converter, said evaluation circuit ascertaining the decimal value to be assigned to the output signal converted by said analog/digital converter; and

a display device connected to the evaluation circuit for displaying the decimal value.

4,858,710

LOAD CELL

Matthias R. Krause, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

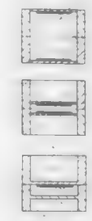
Filed Aug. 29, 1988, Ser. No. 237,484

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1987, 3730702

Int. Cl.[4] G01G *3/14;* G01L *1/22*

U.S. Cl. 177—211 7 Claims

1. A load cell, in particular for weighing systems, comprising a deformable member which has an aperture extending transversely of the direction of the force, which is closed by at least one disc-shaped wall which corresponds to the cross-section of the aperture and extends transversely of the axis of the aperture and serves to receive the strain gauges which are deposited by means of a film technique, characterized in that the deformable member (1) is formed from two welded-together sub-members (3, 4; 20, 21) which extend in a plane transversely of the axis of the aperture and in that a wall (6, 7; 13, 14; 23, 26) which completely closes the aperture (2; 24, 27, 28) is provided in the



aperture of each sub-member, at least one wall being provided with strain gauges (8, 9; 15, 16; 25) at its interior side.

4,858,711

ELECTRONIC BALANCE

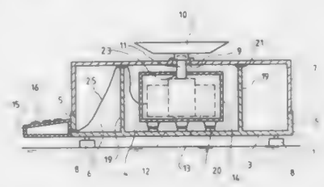
Peter Kunz, Gossau, Switzerland, assignor to Mettler Instrumente AG, Switzerland

Filed Dec. 16, 1988, Ser. No. 285,772

Claims priority, application Switzerland, Feb. 15, 1988, 552/00

Int. Cl.[4] G01G *7/00, 21/28*

U.S. Cl. 177—212 5 Claims



1. In an electronic balance including a balance housing having walls, a base and a cover, a measuring cell for electromagnetic load compensation placed in the balance housing, and electronic analyzing and indicating means including electric circuits, partition means for separating the measuring cell from the circuits of the electronic analyzing and indicating means, the balance further including a load receiving member with a receiving cone for a weighing dish, the receiving cone extending through an opening in the balance housing, and control elements for operating the balance, wherein the improvement comprises that the partition means comprises an inner housing, the measuring cell for electromagnetic load compensation and the load receiving means being arranged in the inner housing, the inner housing being closed to all sides and having an opening for the receiving cone, the inner housing being placed in the balance housing so as to be spaced on all sides from the walls, the base and the cover of the balance housing, and a circumferentially extending partition wall tightly sealingly attached to the bottom and the cover of the balance housing, the partition wall being mounted between the inner housing and the walls of the balance housing.

4,858,712

SPEED RESPONSIVE POWER STEERING SYSTEM

Charles E. Neff, Ferndale, Mich., assignor to TRW Inc., Lundhurst, Ohio

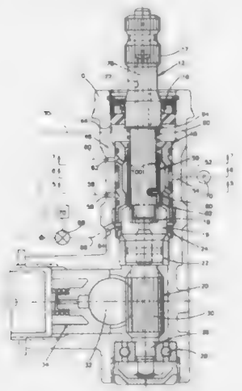
Filed Aug. 29, 1988, Ser. No. 237,041

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—143 14 Claims

11. A power assisted steering system for a vehicle, comprising:

a housing;
an input shaft projecting into said housing;
an output shaft;
an inner valve sleeve disposed in said housing coaxially about said input shaft;
said input shaft having a locator pin extending radially therefrom, said inner valve sleeve having an axially extending slot receiving said locator pin therein to secure said inner valve sleeve from rotation relative to said input shaft while providing for axial movement of said inner valve sleeve along said input shaft;
an outer valve sleeve axially fixed in said housing and disposed coaxially about said inner valve sleeve and being rotatable relative to said inner valve sleeve, said outer valve sleeve having an inner surface in facing engagement with an outer surface of said inner valve sleeve;
said inner surface of said outer valve sleeve having a first set of axially extending grooves separated by lands;



said outer surface of said inner valve sleeve having a second set of axially extending grooves and lands lying opposite to said first set of grooves and lands;
means for conducting hydraulic fluid under pressure into and out of said grooves, relative rotation between said inner and outer valve sleeves acting to vary the relative location of adjacent edges of opposing grooves and lands to control the flow of hydraulic fluid within said system;
portions of at least some of said grooves being progressively masked and unmasked by relative axial movement between said first and second sets of grooves and lands;
means defining a fluid return chamber the pressure in which is exposed to an axial end surface of said inner valve sleeve; and
means for selectively varying the fluid pressure in said fluid return chamber to move said inner valve sleeve axially to mask and unmask said portions of at least some of said grooves.

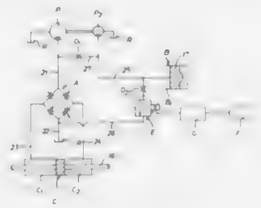
4,858,713

POWER-ASSISTED STEERING SYSTEM

Hiroshi Kawakami; Harunori Shiratori; Koichi Sugihara; Atsushi Watanabe, and Fumio Kishida, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Division of Ser. No. 19,419, Feb. 26, 1987, Pat. No. 4,765,428.
This application Mar. 3, 1988, Ser. No. 163,947
Claims priority, application Japan, Feb. 26, 1986, 40647
Int. Cl.[4] B62D *5/09*
U.S. Cl. 180—143 **5 Claims**

1. A power-assisted steering system in an automotive vehicle, comprising:
a primary hydraulic pump driven by a prime mover of the vehicle for supply of fluid under pressure;
an auxiliary hydraulic pump driven by the prime mover for supply of a predetermined small quantity of fluid under pressure;
a hydraulic power cylinder operatively connected to the dirigible road wheels of the vehicle;
a changeover valve unit including an input member arranged to be moved by the driver's steering effort applied thereto, an output member operatively connected to said power cylinder, and valve means for controlling the supply of fluid under pressure from said primary hydraulic pump to said power cylinder in response to relative movement between said input and output members;
a hydraulic reaction mechanism associated with said changeover valve unit to apply a reaction force to said input member in accordance with a hydraulic reaction pressure



applied thereto, said reaction mechanism including a reaction fluid chamber connected to said auxiliary hydraulic pump to be supplied with the predetermined small quantity of fluid under pressure;
a first throttle disposed within a bypass circuit connecting a first fluid circuit between said primary hydraulic pump and said valve means of said changeover valve unit to a second fluid circuit between said auxiliary hydraulic pump and said reaction fluid chamber;
a second throttle disposed within a third fluid circuit connecting said second fluid circuit to a fluid reservoir; and
flow control valve means disposed within said third fluid circuit downstream of said second throttle to decrease the quantity of fluid discharged therethrough into said fluid reservoir in accordance with an increase of travel speed of the vehicle thereby increase the hydraulic pressure in said reaction fluid chamber.

4,858,714

HYDROSTATIC STEERING DEVICE

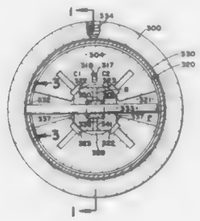
Hollis N. White, Jr., 243 Pyle La., Hopkinsville, Ky. 42240

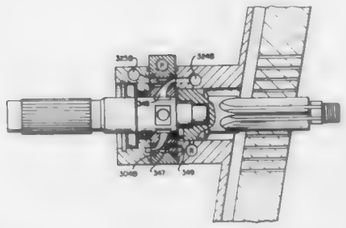
Continuation of Ser. No. 812,443, Dec. 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 763,001, Aug. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 567,429, Dec. 30, 1983, Pat. No. 4,552,519, which is a continuation-in-part of Ser. No. 439,058, Nov. 4, 1982, Pat. No. 4,494,916, which is a continuation-in-part of Ser. No. 381,946, May 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 317,501, Nov. 2, 1981, Pat. No. 4,494,915, which is a continuation-in-part of Ser. No. 51,508, Jun. 25, 1979, abandoned, said Ser. No. 763,001, is a continuation-in-part of Ser. No. 603,994, Apr. 26, 1984, abandoned, which is a continuation of Ser. No. 390,328, Jun. 21, 1982, abandoned, which is a continuation-in-part of Ser. No. 360,832, Mar. 23, 1982, Pat. No. 4,454,744, which is a continuation-in-part of Ser. No. 113,400, Jan. 18, 1980, Pat. No. 4,357,133, which is a continuation of Ser. No. 910,075, May 26, 1978, abandoned. This application Mar. 17, 1988, Ser. No. 170,675
Int. Cl.[4] B62D *5/083;* **F15B** *9/08;* **F16K** *39/00*
U.S. Cl. 180—148 **19 Claims**

1. In a hydrostatic steering device having a valve member rotatably circumferentially surrounding a shaft connected

valve seat to form a valve for the device, the valve extending for a certain axial length of the device, fluid passageways in the device leading to the valve, the valve member having an outer surface, and the device also having a resilient connection between the rotary valve member and valve seat, the improvement of the resilient connection being located within the certain axial length of the valve of the device, and one fluid passageway surrounding and extending by itself through and about the outer surface of the valve member with the other fluid passageways leading otherwise to the valve.

16. In a hydrostatic steering device having a valve with two





axially spaced sides and a high pressure fluid connection to one axial side of the valve pressure imbalancing the valve, the improvement of the addition of equalization means on the other axial side of the valve to equalize the high pressure connection on the one axial side of the valve and pressure balance the valve, said equalization means including a seal means, said seal means located in the valve adjacent to the other axial side of the valve, said seal means having an axially inner side, and means to pressurize said inner side of said seal means to move said seal means axially outward in respect to the valve to equalize the high pressure connection on the one axial side of the valve.

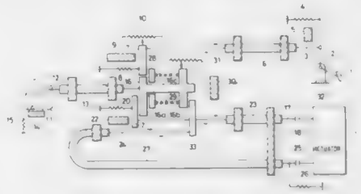
4,858,715

THROTTLE CONTROL DEVICE

Tsutomu Tominaga, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1988, Ser. No. 172,093
Claims priority, application Japan, Mar. 27, 1987, 62-46356[U]
Int. Cl.[4] B60K *31/00;* **F02D** *11/04*
U.S. Cl. 180—170 **7 Claims**

1. A throttle control device, comprising: an acceleration pedal (1), an acceleration wire (3) connected at one end, through an acceleration link (2), to said acceleration pedal, an acceleration return spring (4) operatively connected to said acceleration pedal for biasing said acceleration pedal towards an initial, idle position thereof, an acceleration movable element (7) connected to another end of said acceleration wire, an acceleration movable element return spring (8) operatively connected to said acceleration movable element in a direction towards an initial position thereof, an acceleration sensor (10) provided on said acceleration movable element, a throttle movable element (16), a throttle wire (12) connected at one end to said throttle movable element and connected at another end, through a throttle link (11), a to a throttle valve, a throttle movable element return spring (15) operatively connected to said throttle link for biasing said throttle valve towards a closed state, a constant speed running clutch (18) coupled to an actuator (19), a constant speed running wire (17) connected between said clutch and a constant speed running movable element (21), a constant speed running return spring (20) operatively connected to said constant speed running movable element for biasing said constant speed running movable element towards an initial position, a traction wire (24) connected between a traction clutch (25) coupled to said actuator and a traction



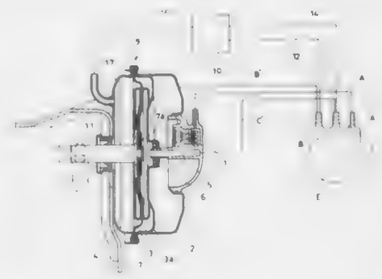
movable element (33), a traction return spring (26) operatively connected to said traction wire for biasing said traction wire in a direction toward said traction clutch, a throttle sensor (31) provided on said throttle movable element, an intermediate disc member (28) provided between opposite flanges (16*a*, 16*b*) of said throttle movable element, and an intermediate spring (29) provided between said intermediate disc member and a rear one of said flanges of said throttle movable element, said acceleration movable element (7) being disposed to operatively engage said throttle movable element (16) via said disc member (28) and said intermediate spring (29), and said constant speed running movable element (21) and said traction movable element (33) being disposed to operatively engage said throttle movable element directly.

4,858,716

TWO WHEEL/FOUR WHEEL DRIVE CHANGE OVER APPARATUS FOR FOUR-WHEEL DRIVE VEHICLES

Junichi Kano, Kariya, and Kongo Aoki, Toyota, both of Japan, assignors to Aisin Seiki-Kabushiki Kaisha, Kariya, Japan

Filed Sep. 30, 1987, Ser. No. 102,843
Claims priority, application Japan, Sep. 30, 1986, 61-231559
Int. Cl.[4] B60K *23/08*
U.S. Cl. 180—233 **3 Claims**



1. In a four wheel drive vehicle having an internal combustion engine and a change-over apparatus for changing between two wheel and four wheel drive, the improvement wherein said change-over apparatus comprises:

an actuator including vacuum chamber means for receiving vacuum, said vacuum chamber means having a movable diaphragm wall,

vacuum conducting passage means opening into said vacuum chamber means and being positioned opposite to said diaphragm wall,

a tank formed integrally with said actuator,

first conduit means including a one-way check valve, communicating said tank with an engine vacuum, whereby a vacuum is stored in said tank,

second conduit means communicating said tank with said vacuum conducting passage means for introducing a vacuum in said vacuum chamber means to move said diaphragm wall and change-over means for effecting a change-over between two wheel drive and four wheel drive, and

said check valve being formed in a housing integral with said tank, said vacuum chamber means comprising two vacuum chambers, a first of said vacuum chambers defined by said diaphragm wall and a first rigid wall which separates said first vacuum chamber from the interior of said tank, a second of said vacuum chambers defined by said diaphragm wall and a second rigid wall of said actuator, said vacuum passage means comprising a first vacuum passage extending through said first rigid wall, and a second vacuum passage extending through said second rigid wall, said first and second rigid walls arranged in opposing relation to said diaphragm wall.

4,858,717

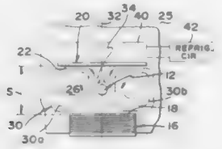
ACOUSTIC CONVECTIVE SYSTEM

Eugene H. Trinh, Los Angeles, Calif., and Judith L. Robey, Arlington, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 23, 1988, Ser. No. 172,100

Int. Cl.[4] G10K *11/00*

U.S. Cl. 181—0.5 **12 Claims**



1. Apparatus for cooling an electronic circuit component by producing a convective flow of fluid past the component while it lies in an environment of said fluid comprising:

a sound transducer spaced from said circuit component and having a transducer surface generally facing in a predetermined direction toward said component;

means forming a sonic reflecting surface spaced generally in said predetermined direction from said transducer, at least as far as said component;

means for driving said transducer at a frequency which produces an acoustic standing wave pattern in the space between said surfaces.

4,858,718

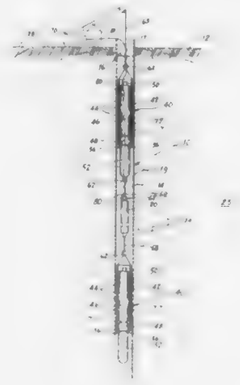
TUBE-WAVE ATTENUATION METHOD, SYSTEM AND APPARATUS FOR USE WITH AN INPULSIVE SEISMIC ENERGY SOURCE IN LIQUID-CONTAINING WELLS

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Technology Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 23,208, Mar. 9, 1987. This application Apr. 14, 1987, Ser. No. 38,327

Int. Cl.[4] G01V *1/40*

U.S. Cl. 181—106 **31 Claims**



1. A method for attenuating unwanted tube waves generated in a liquid column extending lengthwise in a well in the earth as a result of operating an impulsive seismic energy source in the liquid column in the well comprising the steps of:

lowering a gas inflatable resilient attenuator down into a liquid column in a well,

said gas inflatable resilient attenuator being elongated in an axial direction and said axial direction being aligned with the lengthwise direction of said liquid column,

supplying pressurized gas to said gas inflatable resilient attenuator,

regulating the pressurized gas supplied to said gas inflatable resilient attenuator to at least be equal to the ambient pressure in said liquid column adjacent to said attenuator,

arranging said elongated resilient attenuator to have an external diameter less than the inside diameter of the well for providing an axially elongated annular clearance between the attenuator and a wall of the well,

lowering an impulsive seismic energy source down into said liquid column in said well to an elevation in the well different from the elevation of said gas inflatable resilient attenuator,

and firing said impulsive seismic energy source,

whereby tube waves traveling along said liquid column in the lengthwise direction thereof from said impulsive energy source to said elongated gas inflatable resilient attenuator are attenuated by said elongated resilient attenuator absorbing and dissipating said tube waves therein and in said axially elongated annular clearance between the elongated resilient attenuator and the well wall prior to reaching an end of the liquid column in said well.

4,858,719

PRESSURE GRADIENT PICKUP

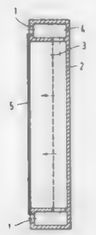
Werner Fidi, Baden, and Heinz Reuner, Kaltenleutgeben, both of Austria, assignors to AKG Akustische u. Kino-Gerate Gesellschaft m.b.H., Vienna, Austria

Filed Jan. 13, 1987, Ser. No. 2,870

Claims priority, application Austria, Jan. 16, 1986, 89/86; Apr. 17, 1986, 1015/86

Int. Cl.[4] G10K *13/00*

U.S. Cl. 181—158 **11 Claims**



1. A pressure gradient pickup, comprising a housing, a diaphragm mounted in the housing, the housing defining at least two openings for sound entry, means for conducting the sound entering the sound entry openings to a rear side of the diaphragm, wherein phase-shifting sections which act acoustically are in connection to the sound entry openings, wherein the improvement comprises that the sound entry openings are located adjacent the diaphragm edge and at least approximately in the same plane as the diaphragm, the sound entry openings being arranged individually and spaced apart from one another, wherein at least one of the sound entry openings has an acoustical damping which is greater than that of the remaining openings.

4,858,720

NOISE REDUCING APPARATUS

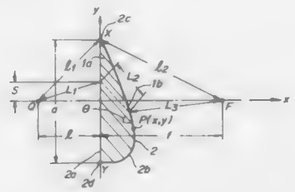
Masanori Murase, Tokyo; Naotaka Tomita, Sayama; Keiichiro Mizuno, Ohta, and Kazuyoshi Iida, Yokohama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Nov. 13, 1987, Ser. No. 120,437

Claims priority, application Japan, Nov. 15, 1986, 61-270921

Int. Cl.[4] G10K *11/06*

U.S. Cl. 181—176 **1 Claim**



1. A noise reducing apparatus comprising; a lens-type hollow body consisting of a plurality of inclined hollow tubular passages, and having an incident surface and an emission surface at opposite sides thereof, respectively, one of the surfaces being formed of a plane surface and the other thereof being formed of a curved surface, wherein a length L_2 of any hollow tubular passage of the lens-type hollow body is represented by the following formula (1)

$$L_2 = \frac{(L - L_1)^2 - f^2 - S^2}{2\{(L - L_1) - f\cos\theta - S \cdot \sin\theta\}} \quad (1)$$

where, p1 L_1: a distance from a spot sound source to an opening of any hollow tubular passage,

$L = (l^2 + a^2/4)0.5 + (f^2 + a^2/4)0.5$

S: a distance from a center of the incident surface of the lens-type hollow body to an opening of any hollow tubular passage,

F: a distance from the incident surface to a focus,

l: a distance from a spot sound source to the incident surface,

a: a height of the lens-type hollow body, and

θ: an inclined angle of the hollow tubular passage,

and a tolerance of the length L_2 is +15%,

whereby noise passing through said hollow tubular passages is converged and focused at a focus point of the lens-type hollow body to be absorbed at the focus point.

4,858,721

ACOUSTIC PANEL FOR SOUND INSULATING LININGS OF GAS DUCTS

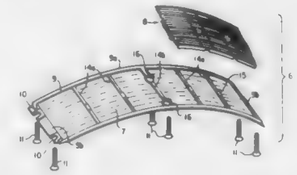
Pascal J. M. Autie, Paris; Philippe P. Avignon, Combs-la-Ville; Dominique P. Camusso, Evry; Alexandre Forestier, Melun, and Gilles Ulryck, Ballancourt, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, 03, Pa.RIS, FRX

Filed Apr. 4, 1988, Ser. No. 177,130

Claims priority, application France, Apr. 8, 1987, 87 04908

Int. Cl.[4] B64D *33/00*; E04B *1/82*

U.S. Cl. 181—213 **6 Claims**



1. An acoustic panel for a sound insulating lining to be applied to a wall of a gas flow path, said panel comprising

an inner skin provided with a multiplicity of perforations,

an elongate stiffening frame bonded to said inner skin, said frame being arcuately curved in a longitudinal direction thereof and including transverse struts across a width portion of said frame, said struts having thinned portions at predetermined positions thereon,

and a cellular structure mounted on said inner skin to define a plurality of resonant acoustic cavities for which said perforations of said inner skin form acoustic vents,

said cellular structure comprising a ribbed skin wherein the ribs thereof extend in said longitudinal direction and are arcuately curved with a natural radius of curvature different from that of said inner skin,

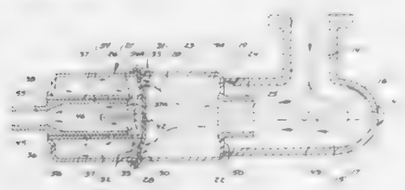
said ribbed skin having at least one pair of resilient tongues which slip under said thinned portions of said transverse struts of said frame to attach said ribbed skin to said inner skin whereby said ribs engage said inner skin to form said resonant cavities.

4,858,722

SELF-CONTAINED MUFFLER ATTACHMENT AND CONVERSION KIT FOR SMALL TWO-CYCLE ENGINES

David C. Abbe, 1780 E. Chase Ave., El Cajon, Calif. 92020, and John M. Tatone, 62 Bellhaven, Daly City, Calif. 94015

Filed Sep. 22, 1988, Ser. No. 247,735
Int. Cl.[4] F01N *7/18*
U.S. Cl. 181—243 6 Claims



1. A muffler kit for attachment to an existing muffler of a model engine of small size comprising:

a kit muffler of commercial/design having an inlet and an outlet, and having a transverse baffle wall across the muffler between the inlet and outlet;

the baffle wall having a central axial opening therein;

a mounting bolt for passing through said central axial opening and for clamping the kit muffler in position by supporting the kit muffler through the central axial opening in the baffle, surfaces of the kit muffler being positioned to be sealed against an existing muffler to define a flow path through the kit muffler; and

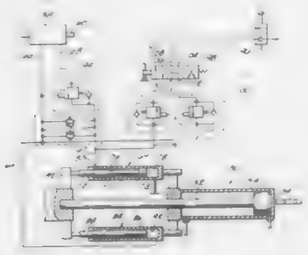
a stinger pipe insertable into the outlet opening of said kit muffler or providing a controlled outlet from the kit muffler.

4,858,723

BUCKET LEVELING SYSTEM

William K. Holmes, Delafield, and John J. Mlaker, Milwaukee, both of Wis., assignors to Hi-Ranger, Inc., Waukesha, Wis.

Filed Jul. 29, 1988, Ser. No. 226,144
Int. Cl.[4] B66F *11/04*
U.S. Cl. 182—2 34 Claims



1. In an aerial lift having a tower assembly and a passenger platform supported by the tower assembly, a platform leveling system comprising:

a hydraulically actuated motor supported by the tower assembly and operable to pivot the passenger platform around a substantially horizontal axis, the hydraulically actuated motor including a cylinder having a central longitudinal axis colinear with said horizontal axis and a piston housed in the cylinder and shiftable in the direction of the longitudinal axis of the cylinder, the cylinder including hydraulic fluid chambers at its opposite ends, the hydraulic fluid chambers being separated by the piston, and means for causing rotation of the piston in response to shiftable movement of the piston in the direction of the longitudinal axis, one of the piston and cylinder being fixed to the tower assembly and the other of the piston and cylinder supporting the passenger platform; and

means responsive to raising of the tower assembly for hydraulically actuating said motor to maintain the passenger platform in a substantially constant predetermined orientation relative to vertical as the tower assembly is raised and lowered.

4,858,724

SAFETY FENCE FOR SCAFFOLDS

Jean St-Germain, 1350, rang Saint-Georges Saint-Simon, Canada J0H 1Y0

Filed Sep. 2, 1988, Ser. No. 245,461
Int. Cl.[4] E04G *1/26*
U.S. Cl. 182—113 6 Claims



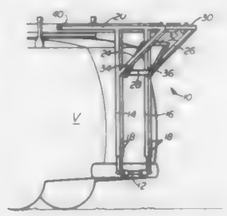
1. A safety fence for a scaffold, said scaffold having at least one flat outer end portion, said fence comprising a rigid framework, a screen provided at at least at the lower portion of the framework, a scaffold attachment means provided at the bottom of said framework; rigid connection means projecting longitudinally of said attachment means on each side thereof, each said side having a free end, and a framework anchoring means connected to said free ends of said connection means.

4,858,725

LADDER BRACE

Lamar H. Griffin, Lineal Enterprises, Inc., 3737 Northview Ln., Dallas, Tex. 75229

Filed Oct. 11, 1988, Ser. No. 255,345
Int. Cl.[4] E06C *5/24, 5/04*
U.S. Cl. 182—127 7 Claims



1. A ladder brace for transporting, for deploying and for supporting a standard, mobile extension ladder which ladder brace is pivotally attachable to the lower, rear portion of a vehicle, said ladder brace comprising:

two substantially T-shaped mobile extension ladder supporting members comprising a first main brace and a second main brace, each one of said T-shaped members bearing a secondary supporting brace fixedly secured thereto and positioned at an oblique angle both to said first main brace and to said second main brace wherein each combination of one of said T-shaped members and one of said secondary supporting braces defines substantially a geometric plane, said T-shaped structural members being fixedly joined one to the other by at least two cross members, with two of said cross members positioning said two T-shaped supporting members substantially in parallel planar relationship;

a first pivot means joined between each of said first main braces, for attaching said braces to said lower, rear portion of said vehicle;

a second pivot means joined between each of said second main braces, for pivotally securing said mobile extension ladder to said ladder brace; and

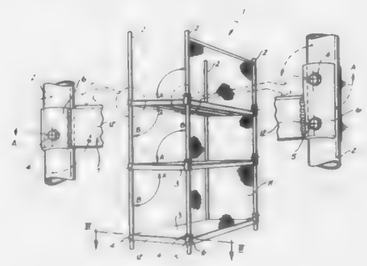
a safety stop means pivotally joined between each of said obliquely positioned secondary support braces, for initially securing said mobile extension ladder against pivotal movement about said second pivot means after deployment of said ladder brace and during final deployment of said mobile extension ladder.

4,858,726

SCAFFOLDING MODULE AND METHOD ERECTING SAME

John C. Preston, 12 Wentworth Rd., Eastwood, N.S.W., Australia 2122

Continuation of Ser. No. 879,228, May 9, 1986, Pat. No. 4,773,506. This application Sep. 26, 1988, Ser. No. 237,923
Int. Cl.[4] E04G *1/34*
U.S. Cl. 182—152 1 Claim



1. A vertically stackable scaffolding module having four elongated vertical generally rigid support members which are generally parallel and coextensive and support the module on a generally horizontal support surface or the next adjacently below module;

at least two work platforms supported by the support members at vertically spaced locations, said platforms being supported by the support members at vertically spaced locations, of generally rectangular configuration and parallel to each other, means pivotally attaching each platform to the support members so that each support member is located adjacent a respective one of the corners of each platform and permitting relative pivoting movement between each platform and the support members about two parallel axes extending generally parallel to longer sides of the platforms and being spaced vertically from each other and one being spaced vertically from its associated platform; and

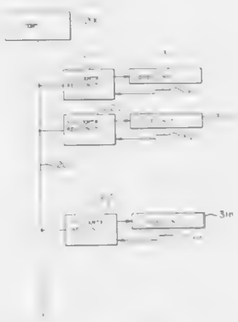
releasable securing means for preventing pivoting of the platforms relative to the support members so that the module is foldable between an erect configuration with the platforms normal to the support members when the securing means is engaged and a folded configuration with the support members pivoted relative to the platforms so the support members are located adjacent each other when the securing means is released to thereby reduce the overall space occupied by the module to facilitate storage and transportation of the module.

4,858,727

APPARATUS AND METHOD FOR TRANSMITTING SIGNAL FOR ELEVATOR

Junichi Tanino, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 6, 1988, Ser. No. 216,209
Claims priority, application Japan, Jul. 6, 1987, 62-168138
Int. Cl.[4] B66B *3/00*
U.S. Cl. 187—121 10 Claims



1. An apparatus for transmitting a signal for an elevator having a controller for controlling the registration of hall callings in a plurality of halls and the ON of registration lamps thereof, signal transmitter/receiver units provided in the respective halls and connected to said controller by way of a signal wiring, said signal transmitter/receiver units connected to a plurality of hall buttons for generating calling signals and said calling registration lamps operated by the lamp ON signal from said controller to transmit or receive signals from said controller to said signal transmitter/receiver units through said signal wiring comprising:

instruction means provided in said controller for outputting a first instruction for detecting whether said hall calling is generated in zones set in a predetermined number as divided by sets from said hall buttons by way of said signal wiring and outputting a second instruction for detecting the floor having said calling signal in the zone by way of said signal wiring when zone data generated in response to said first instruction and indicating the presence or absence of the hall calling in the zone, and

responding means provided in said signal transmitter/-receiver units for generating the zone data indicating whether there is a floor where said calling signal is generated in the zone or not to output it by way of said signal wiring when said first instruction is inputted thereto and generating hall data indicating the floor where said calling signal is generated to output it by way of said signal wiring when said second instruction is inputted thereto.

4,858,728

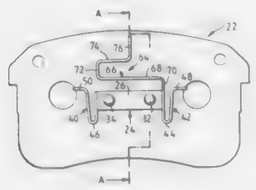
BRAKE PAD RETENTION SPRING, IN PARTICULAR FOR SPOT-TYPE DISC BRAKES FOR AUTOMOTIVE VEHICLES

Rudolf Thiel, Frankfurt am Main; Ulrich Klimt, Muehltal, both of Fed. Rep. of Germany, and Dalibor Zaviska, Frankfurt am Main, Czechoslovakia, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 9,469, Feb. 2, 1987, abandoned. This application Aug. 5, 1988, Ser. No. 230,708
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1985, 3532373
Int. Cl.[4] F16D *65/06, 69/04, 55/224*
U.S. Cl. 188—73.31 7 Claims

1. A brake pad retention spring for a spot-type disc brake for automotive vehicles, said disc brake including a brake piston

acting upon a pad backing plate, said spring comprising a fastening section for securing said spring to said pad backing plate, a plurality of spring arms for engagement into a brake member, wherein two of said spring arms extend substantially in a circumferential direction in relation to a brake disc and a third of said spring arms extends substantially in a radial direction in relation to said brake disc, said two spring arms each having a nose protruding from the end of a circumferentially



extending end section of each of the spring arms of the spring arms, said noses each extending into an annular groove means extending circumferentially along an inner surface of said brake piston, each of said two spring arms extending in the circumferential direction include a generally U-shaped bent section, wherein said arms are each arranged at the pad backing plate such that a free end of the end section abuts on said brake piston above a center line of said piston.

4,858,729

BRAKE SUPPORT ASSEMBLY

Gary E. Crewson, Niagara Falls, Canada, and David J. Pulliam, Birmingham, Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jun. 26, 1985, Ser. No. 748,897
Int. Cl.[4] F16D *51/22*
U.S. Cl. 188—205 R 4 Claims



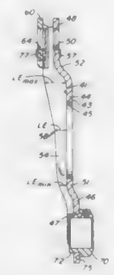
1. A brake spider for mounting on a vehicle axle and supporting a pair of brake shoes and an actuator comprising:
a spider having a mounting portion and diametrically opposed first and second support portions,
a pair of laterally spaced bores through said second support portion and mounting a pair of anchor pins, and
spacing means comprising a plurality of bosses projecting from oppositely disposed surfaces of said second support portion of said spider with at least one boss on each said surface adjacent to and spaced from each of said bores.

4,858,730

VEHICLE BRAKE SUPPORT

Robert J. Baroni, West Bloomfield, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jun. 26, 1985, Ser. No. 749,046
Int. Cl.[4] F16D *51/22*
U.S. Cl. 188—205 R 8 Claims



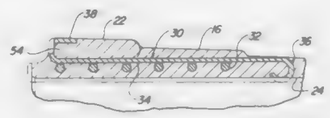
1. A stamped metal plate for supporting a brake assembly on a vehicle axle comprising:
a substantially planar and circular mounting portion,
diametrically opposed, planar first and second support portions substantially parallel to and off-set in opposite directions from said mounting portion,
first and second transition sections respectively joining said first and second support portions to said mounting portion,
a pair of reinforcing ribs with each rib extending continuously along opposite edges of said plate from said first support portion across said mounting portion and substantially across said second support portion and projecting from said plate in the direction that said second support portion is off-set from said mounting portion.

4,858,731

COMPOSITE BRAKE DRUM

John W. Bush, Livonia, Mich., assignor to The Budd Company, Troy, Mich.

Filed Jul. 14, 1988, Ser. No. 218,867
Int. Cl.[4] F16D *65/10*
U.S. Cl. 188—218 R 11 Claims



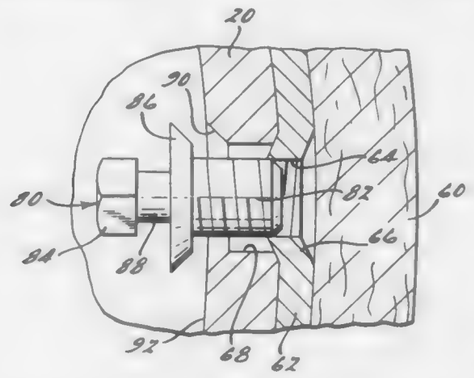
1. A composite brake drum for a motor vehicle comprising:
a mounting plate portion for mounting said drum to a motor vehicle axle structure for rotation about an axis of rotation, and
a cylinder side portion joining said mounting plate portion defining an open and closed end of said drum and forming an inside cylindrical braking friction surface, said cylindrical portion having a reinforcing member substantially embedded within iron and formed of bands wrapping more than one turn around said drum about said axis of rotation and wherein adjacent turns of said bands are axially separated along said axis of rotation and are connected together by two or more axially extending locator wires and wherein said locator wires have at least one end extending axially beyond said bands for positioning said reinforcing member in a casting mold.

4,858,732

BRAKE SHOE

James L. Taylor, Jr., 1611 S. Renaud, Grosse Pointe Woods, Mich. 48236

Continuation of Ser. No. 678,257, Dec. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 430,323, Sep. 30, 1982, abandoned. This application Dec. 23, 1986, Ser. No. 946,116
Int. Cl.[4] F16D *69/04*
U.S. Cl. 188—250 G 11 Claims



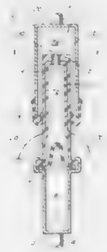
1. In a drum brake assembly comprising a brake drum, a brake shoe and means for engaging and disengaging said brake shoe with said brake drum, a brake shoe comprising:
a brake pad subassembly including at least one arcuate liner having a plurality of threaded liner holes therein at various locations through said arcuate liner and a friction pad element fixed to said liner and continuously covering one surface of said liner;
means for positioning said brake pad subassembly relative to said brake drum comprising a table having surfaces on opposed sides thereof, web means fixedly secured to said table on one of said opposed surfaces of said table, and a plurality of table holes extending through said table from said one opposed surface to said other opposed surface, said table holes corresponding in position to the position of said liner holes when said brake pad subassembly is operably associated with said positioning means;
means for securing said brake pad subassembly to said positioning means comprising a plurality of bolts extending through at least some of said table holes into engagement with corresponding liner holes in said liner of said brake pad subassembly without traversing any portion of said friction pad element, said table holes having a size larger than said bolt diameter such that peripheral gaps are between said bolts and said table holes to enable alignment of said bolts with said threaded liner holes, said bolts having a retainer positioned around said bolts for limiting the insertion of said bolt into said liner holes, said bolts including torque limiting means for limiting the maximum amount of torque to which said bolts can be subjected without said bolts traversing any portion of said friction pad element when said liner-and-pad subassembly is secured to said brake shoe table; and
means for aligning said brake pad subassembly with said positioning means comprising raised portion of said liner generally surrounding said liner holes and extending away from said friction pad element, said raised portions being insertable into said table holes in a seating relationship therewith to align and rotationally interconnect said brake pad subassembly with said positioning means for securing said brake subassembly to said positioning means.

4,858,733

ELECTROVISCOUS LIQUID-FILLED SUSPENSION DEVICE AND CONTROL DAMPING DEVICE THEREFOR

Takeshi Noguchi; Takashi Kikuchi, both of Yokohama, and Kazuya Takano, Kamakura, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,114
Claims priority, application Japan, Dec. 29, 1986, 61-313069; Apr. 18, 1987, 62-94290
Int. Cl.[4] F16F *15/03, 9/08, 5/00*
U.S. Cl. 188—267 4 Claims



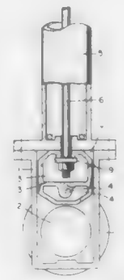
1. A liquid-filled suspension device comprising; an inner cylinder having an insulative body portion, an outer cylinder telescopically arranged with said inner cylinder an elastomeric rolling lobe member connecting the cylinders to each other, a connecting member arranged on each of the said cylinders, a closed liquid chamber formed inside at least one of the inner and outer cylinders and communicating with the other inside of the remaining cylinder, a restricted passage formed in the middle portion of the closed liquid chamber, a flexible membrane member defining at least a part of the closed liquid chamber, an electroviscous liquid filled in the closed liquid chamber, two electrode plates arranged in said restricted passage which is formed on said insulative body portion separate form each other at opposite positions and being in contact with the electroviscous liquid and electrode lead wires embedded in said insulative body portion.

4,858,734

SLIDE TYPE EXHAUST BRAKE SYSTEM

Ryoichi Suzuki, Mishima, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Sunto, Japan

Filed Nov. 23, 1988, Ser. No. 276,208
Claims priority, application Japan, Nov. 25, 1987, 62-297166
Int. Cl.[4] F02D *9/06*
U.S. Cl. 188—273 5 Claims



1. A slide type exhaust brake system comprising:
an exhaust brake body having a connecting wall defining an

exhaust passageway and having an operation passageway extending into the exhaust passageway;

a cylinder unit mounted proximate to said exhaust brake body, said cylinder unit including a cylinder and a piston rod having an end, said piston rod being reciprocally movable in the operation passageway into and out of the cylinder, and a block intermediate the end of the piston rod and the cylinder; and

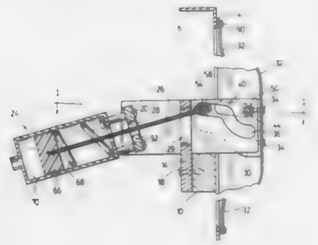
a tabular valve member slidably mounted in said exhaust brake body and slidably mounted to said piston rod such that a portion of the tabular valve member is intermediate the block and the cylinder, said tabular valve member having an intermediate wall transverse to the piston rod, an exhaust pressure adjusting hole extending through the tabular valve member and communicating with an engagement port in said intermediate wall and axially aligned with the end of the piston rod, said engagement port being dimensioned to be substantially closed by the end of the piston rod, the movement of the piston rod out of the cylinder moving the end of the piston rod into the intermediate wall to substantially block the exhaust pressure adjusting hole and to urge the tabular valve member into the exhaust passageway, the movement of the piston rod into the cylinder moving the end of the piston rod out of the engagement port and urging the block into the tabular valve member for moving the tabular valve member out of the exhaust passageway.

4,858,735

STATIONARY PIVOT MECHANISM FOR USE WITH A DAMPER

Richard W. Heddle, 1364 Highway #8, and Herbert R. Ruzicka, 339 Winona Road, both of Winona, Canada L0R 2L0

Filed Jun. 16, 1986, Ser. No. 874,647
Claims priority, application Canada, Jun. 18, 1985, 484310
Int. Cl.[4] F16K *31/12*
U.S. Cl. 188—299 **9 Claims**



1. In a damping assembly having a circular opening in a planar surface of a frame and a circular disk having a diameter greater than that of the opening to regulate flow of gas through the opening,

the circular disk assuming a first closed position in which the disk lies in the plane of the opening on a first forward side of the opening with the periphery of the disk in sealing engagement with the planar surface of the frame surrounding the opening,

the disk movable forwardly away from the opening to an intermediate position in which it may be rotated substantially about a diameter of the disk toward a fully open position with the plane of the disk substantially normal to the plane of the opening and with a portion of the disk extending rearwardly through the opening,

an improved camming assembly to move the disk between its open and closed positions, the camming assembly comprising:

support means comprising two substantially identical parallel support plates fixed to the frame and extending normal to the plane of the opening rearwardly from approximately the center of the rear of the disk when fully closed,

carriage means comprising two substantially identical parallel carriage plates fixedly coupled to the center of the rear of the disk and extending rearwardly normal to the plane of the opening when the disk is fully closed,

a side surface of each carriage plate in close sliding juxtaposition with a side surface of one of the support plates to guide the carriage plates on movement rearward and forwardly and maintain the same parallel with the support plates,

each support plate having therethrough a first camming slot and a first bore,

each carriage plate having therethrough a second camming slot and a second bore,

a first axle member received in the first bores and extending between the support plates normal thereto and through the second slots of the carriage plates,

a pair of first cam wheels journalled for rotation about the first axle member with one first wheel received in rolling camming engagement in each of the second slots,

a second axle member received in the second bores and extending between the carriage plates normal thereto and through the first slots of the support plates,

a pair of second cam wheels journalled for rotation about the second axle member with one second wheel received in rolling camming engagement in each of the first slots,

the second slots located forward of the second bores,

each second slot being substantially straight and extending forwardly from a rear end to a forward end,

the first bores located proximate the forward end of the support plates,

each first slot having a rear end rearward of the first bore, the first slot extending forwardly from its rear end as a first substantially straight slot portion having a length and configuration similar to that of the second slots,

the first slot portion merging at its forward extent into a second substantially arcuate slot portion the center of which describes an arc of a circle centered on the axis of the first bore and having a radius equal to the distance between the center of the rear end of the second slot and the axis of the second bore,

the second slot portion extending from the forward extent of the first slot portion forwardly and to one side of the first bore to terminate near the forward end substantially as far forward as the first bore,

actuating means providing reciprocal forward extension and rearward retraction of a piston rod and coupled to the support means rearward of the first slot for pivoting about an axis parallel to the first and second axle members and normal to the direction the piston rod is extendable and retractable,

the piston rod extending between the support plates and coupled at a free forward end to the second axle

wherein:

a. with the piston rod fully rearwardly retracted the disk is in a fully closed position with the carriage means drawn as far rearwardly as possible with the second wheels proximate the rear ends of the first slots and with the first wheels proximate the front ends of the second slots, and

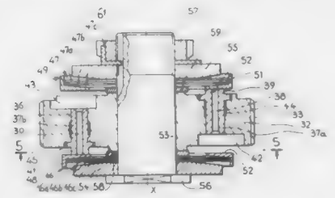
b. upon forward extension of the piston rod from a fully closed position, the piston rod moves the carriage means forwardly substantially in a direction normal to the plane of the opening with the carriage means being guided by the first wheels rolling in the second slots to the rear end thereof at the same time as the second wheels roll in the first slot portions to the forward extent thereof, and upon further forward extension of the piston rod with the first wheels received in rear end of the second slots, the second wheels roll in the second arcuate slot portions to the forward end thereof thereby pivoting the carriage means about the first axle member so as to pivot the disk to a plane substantially normal to the plane of the opening.

4,858,736

SHOCK ABSORBER FOR A HYDROPNEUMATIC VEHICLE SUSPENSION ELEMENT

Alain Arnaud, Chatenay Malabry; Jean-Michel Perrochat, Montrouge, and Joseph Philippe, Carpentras, all of France, assignors to S.A.M.M. - Societe D'Applications Des Machines Motrices, Bievres, France

Filed Dec. 22, 1987, Ser. No. 136,885
Claims priority, application France, Dec. 26, 1986, 86 18208
Int. Cl.[4] F16F *9/34, 9/28;* **F16K** *17/18*
U.S. Cl. 188—322.14 **4 Claims**



1. Shock absorber (**31**) for a hydropneumatic suspension element (**1, 12**) of a vehicle, especially a heavy vehicle, comprising a disk (**32**) fastened in an outer casing (**34**) having ports (**30, 38**) for the passage of hydraulic fluid on either side of the disk, means (**48, 49, 37***a, 37b*) allowing this passage in only one direction for some ports (**30**) and in the opposite direction for the other ports (**38**), and elements (**53, 54, 55**) for fastening said means to the disk, characterized in that the abovementioned means comprise, mounted on the two opposite faces of the disk (**32**), stacks (**46, 47**) of elastically flexible metal washers (**46***a–46c; 47a–47c*) retained in rigid annular deflectors (**48, 49**) located opposite the hydraulic-fluid passage ports (**30, 38**); and in that each port (**38, 30**) is delimited by a tubular insert (**37***a, 37b*) fastened in a bore (**36**) passing right through the disk (**32**), some (**37***a*) of the inserts being equipped with end collars (**39**) projecting on one face of the disk, whilst the other inserts (**37***b*) are equipped with end collars (**41**) projecting on the opposite face of the disk, and the dimensions of these projecting collars (**39, 41**) are such that the deflectors (**48, 49**) are held elastically up against said collars (**41, 39**), thereby shutting off the corresponding inserts (**37***b, 37a*), as long as the hydraulic pressure is insufficient to move the deflectors away from the associated collars.

4,858,737

HYDRAULIC BRAKING DEVICE FOR AUTOMOBILE VEHICLE

Roger Tourneur, Pontault Combault, and Joël Vasselet, Chelles, both of France, assignors to Bendix France, Drancy, France

Filed Apr. 26, 1988, Ser. No. 186,505
Claims priority, application France, Apr. 28, 1987, 87 05974
Int. Cl.[4] B60T *13/12, 15/36, 17/18*
U.S. Cl. 188—358 **8 Claims**

1. A two-state braking device comprising:

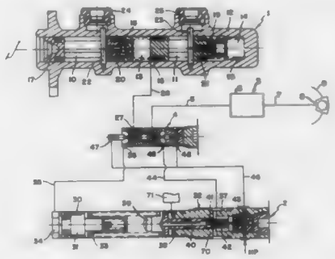
a master cylinder controlled by a pedal;

a braking circuit supplying at least one brake motor;

a high pressure fluid circuit;

a high pressure fluid distributor having an inlet orifice connected to said high pressure fluid circuit, an outlet orifice and a control chamber; and

valve means controlled by said high pressure fluid circuit to change from a first state corresponding to normal operation to a second state in case of failure of said high pressure fluid circuit, said valve means comprising a first valve which in the first state connects said master cylinder to said control chamber in order to connect said inlet and outlet orifices when said pedal is actuated and to isolate said master cylinder from said braking circuit, and, in a second state, connects said master cylinder to said braking circuit and isolates said control chamber from said master cylinder, and a second valve which in the first state connects said outlet orifice to said braking circuit and, in the second state, isolates said outlet orifice from said braking circuit.



4,858,738

SYSTEM OF AUXILIARY MASS DAMPERS TO RESTRAIN THE RESPONSE OF SLENDER ELASTIC STRUCTURES TO VIBRATIONS SUCH AS FROM EARTHQUAKES

Fernando Novoa, Santa Rosa 76, Santiago, Chile

Continuation of Ser. No. 606,131, May 2, 1984, abandoned, which is a continuation of Ser. No. 936,051, Aug. 23, 1978, abandoned. This application Feb. 20, 1985, Ser. No. 704,132
Claims priority, application Chile, Jul. 26, 1978, 470/78
Int. Cl.[4] F16F *7/10*
U.S. Cl. 188—378 **2 Claims**



1. A method for damping vibration of a slender, elastic structural element which, on account of being fixed by at least one end to a base subjected to earthquake, is subject to a high oscillatory response, owing to its inherent functional design, said method comprising:

providing at least one receptacle constructed and arranged for moving together with a respective point of maximum displacement response to said element in a principal oscillatory mode thereof;

filling into each said receptacle a quantity of ballast in the form of a loose mass of material, so that the ballast is contained by the receptacle but is able to move freely therein so that the total mass of all of such ballast is 10–20 percent of the principal mass of said element, thereby constituting at least one auxiliary mass damper;

rigidly attaching each said auxiliary mass damper to said element at a respective point close to a respective said point of maximum displacement response so that, as said element is subjected to earthquake:

(a) the apparent frequency of movement of the respective said ballast within each respective said receptacle is somewhat different than the natural frequency of oscillation of said element alone, but within 20 percent of that value,

(b) the freedom of movement of the respective said ballast

within each respective said receptacle allows for an oscillatory displacement of the center of gravity of each respective said receptacle with respect to the center of gravity of the respective said ballast that is at least several times greater than the maximal oscillatory response of said element at the respective said point of attachment of said receptacle, and

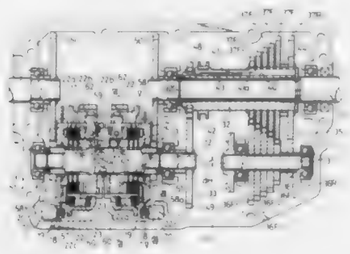
(c) the damping of the oscillatory movement of the ballast by friction is equivalent to 10–20 percent of the critical ratio of such movement, so that, in respect of said principal mode of oscillation of said element, the oscillatory energy of said element is first dynamically converted into higher-displacement oscillations of the mass of said ballast and finally dissipated by the inherent friction of the oscillating ballast so as to counteract the tendency of said structural element to vibrate during an earthquake.

4,858,739

CLUTCH AND BRAKE ASSEMBLY FOR WORKING VEHICLES

Shusuke Nemoto, Midorigaoka, Japan, assignor to Kanzaki Kokyukoki Mfg. Co., Ltd., Japan

Filed Jul. 28, 1988, Ser. No. 225,363
Claims priority, application Japan, Sep. 30, 1987, 62-149477
Int. Cl.[4] F16D *13/22*
U.S. Cl. 192—18 R 4 Claims



1. In a vehicle having a transmission casing and left and right wheel axles extending sidewards from said transmission casing, a clutch and brake assembly comprising:

an output shaft (12) journalled in said transmission casing (10);

axially spaced left and right side clutch gears (13) mounted rotatably on said output shaft for transmitting power from said output shaft to said left and right wheel axles;

left and right clutch housings (14) fixedly secured to boss portions of said left and right side clutch gears and extending towards each other;

left and right side clutches (15) disposed within said left and right clutch housings, each of said side clutches having a first frictional element 16 which is slidably but non-rotatably supported by said output shaft and a second frictional element slidably but non-rotatably supported by said clutch housing;

left and right side brakes (18) disposed within spaces around said left and right clutch housings, each of said side brakes having a third frictional element 19 which is slidably but non-rotatably supported by said transmission casing and a fourth frictional element slidably but non-rotatably supported by said clutch housing;

left and right clutch control arms (21) extending through peripheral walls of said left and right clutch housing, each of said clutch control arms being supported pivotally by each said clutch housing for engaging and disengaging each said side clutch;

left and right shifter sleeves (22) slidably disposed on the outer circumferences of said left and right clutch housings, each of said shifter sleeves including axially spaced first and second pushing portions (22*a*, 22*b*), said first pushing portion (22*a*) of said left sleeve being adapted to actuate said left brake by a movement of said left shifter sleeve in a first direction towards the left side brake, said second pushing portion (22*b*) of said left sleeve being adapted to rotate said left clutch control arm so as to engage said left side clutch by a movement of said left shifter sleeve in a second, opposite direction, said first pushing portion of said right sleeve being adapted to actuate the right side brake by a movement of said right shifter sleeve in the second direction towards the right side brake, and said second pushing portion of said right sleeve being adapted to rotate said right clutch control arm so as to engage said right side clutch by a movement of said right shifter sleeve in the first direction; and

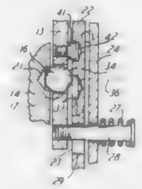
left and right clutch spring means (23) disposed on the outer circumferences of said left and right clutch housings, each of said clutch spring means being adapted to bias said left and right shifter sleeve to move away from said left and right brake, respectively.

4,858,740

OVERLOAD RELEASE CLUTCH

Quinten A. Hansen, P.O. Box 882, Racine, Wis. 53403

Filed Mar. 10, 1988, Ser. No. 166,476
Int. Cl.[4] F16D *7/00, 43/20*
U.S. Cl. 192—56 R 1 Claim



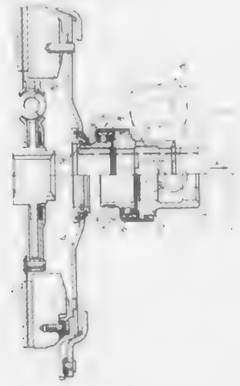
1. In an overload release clutch having a body rotatable about an axis and having a series of circumferentially spaced holes extending in an axial direction, a rotor rotatably mounted about said axis and adjacent said body and having a plurality of detents, one detent for each of said holes in said body, said detents being circumferentially alignable on a common axis with the holes in said body when said clutch is engaged, a ball in each of said holes and engagable in said detents in clutch engaged position and forming torque transmitting means between said body and rotor, a spring plate, mounting means for shiftably mounting said spring plate to said body, spring means acting between said mounting means and said spring plate for resiliently urging said spring plate towards said body, a pressure plate shiftably mounted on said mounting means, one of said body and said pressure plate having a transverse surface said pressure plate extending between said transverse surface and said spring plate, pins extending between said body and said pressure plate, said spring means bearing against said spring plate and acting to urge said pressure plate against said torque transunitting balls for causing clutch engagement, whereby when excessive torque loads are imposed upon said clutch said rotor and body rotate relative to one another thereby causing axial movement of said balls from said detents and consequent clutch disengagement, said transverse surface having pin holes extending therethrough for receiving portions of said pins, and with said pin holes and said pins being spaced from said body holes and said balls, said axial movement of said balls causing axial movement of said pins out from their respective said pin holes and causing said pins to bear against said transverse surface, thereby permitting said pressure plate to rotate slightly relative to said body to cause disengagement of said clutch, the improvement comprising said transverse surface is on said pressure plate and has circular openings disposed around said pressure plate with said circular openings disposed axially offset from said common axis of said detents and said body holes and with the circular edge which defines each of said circular openings to the side of said openings which is in the direction of rotation of said pressure plate during clutch release being in contact with said balls when said clutch is engaged, said circular openings being located and arranged to receive portions of said balls upon clutch disengagement.

4,858,741

FRICTION CLUTCH FOR A VEHICLE

Ian C. Maycock, Leamington Spa; Robert J. Ball, Bishops Itchington, and Denzil J. W. Symonds, Warwick, all of England, assignors to Automotive Products PLC, Leamington Spa, United Kingdom

Filed May 7, 1987, Ser. No. 46,712
Claims priority, application United Kingdom, May 8, 1986, [illegible]
Int. Cl.[4] F16D *23/14*
U.S. Cl. 192—98 16 Claims



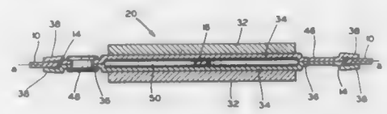
1. A friction clutch for a vehicle which includes a clutch release mechanism comprising a first member, a second member, a detent arranged to locate the first member relative to the second member on assembly by moving the first member in one direction relative to the second member whereby a clutch release force subsequently applied to said first member in an opposite direction will be transmitted to said second member to release the clutch, and detent release means having a peripheral surface for engagement with the detent, said detent release means enabling the detent to be released by urging said first member further in said one direction relative to said second member so that the detent release means engages the detent, thereby enabling said first and second members to be separated, said detent being carried by one of said members and the detent release means being carried by the other of said members whereby on separation of the members following release of the detent said detent and detent release means disengage and remain on their respective members, the detent release means having a radial deformation on its peripheral surface which engages the detent during movement of the first member further in said one direction whereby during separation of the members following release of the detent relative movement will take place between the detent release means and said other member.

4,858,742

CLUTCH DISK WITH CUSHIONED FRICTION ELEMENT ASSEMBLY

Mickey G. Cameron, Auburn, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed May 13, 1988, Ser. No. 193,853
Int. Cl.[4] F16D *13/69*
U.S. Cl. 192—107 C 12 Claims



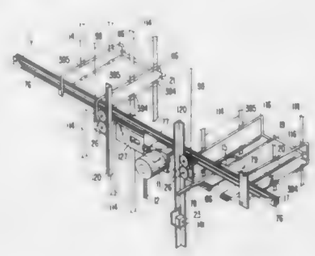
12. A friction element laminate comprising a backing plate and a friction member secured to the backing plate, the backing plate defining a pair of joinder sections spaced apart on opposed sides of said friction member, said laminate further defining a pair of elbows and a pair of wedge supports, each wedge support depending from one elbow, said pair of wedge supports defining opposing ends of said laminate outwardly of said joinder sections, said joinder sections being laterally offset by said elbows from said wedge supports, said wedge supports being angularly oriented in a range of one to five degrees with respect to said joinder sections, each of said joinder sections being positioned intermediately of said friction member and one of said wedge supports.

4,858,743

VENDING MACHINE AND METHOD FOR AUTOMATIC VENDING AND RETURNING OF MERCHANDISE, PARTICULARLY VIDEO CASSETTE TAPES

T. G. Paraskevakos, Melbourne, Fla., and J. P. Paris, Baltimore, Md., assignors to DataVend, Inc., Baltimore, Md.

Filed Jul. 31, 1987, Ser. No. 80,571
Int. Cl.[4] G07F *7/10, 11/16*
U.S. Cl. 194—205 56 Claims



47. A vending machine for vending merchandise to a patron, comprising:

controller means for controlling operation of said vending machine;

display means for displaying information to said patron;

input means for inputting information from said patron to said controller means;

shelf means for storing merchandise in a plurality of columns;

at least one service platform for carrying said merchandise;

fork means for partially surrounding a selected one of said merchandise and transferring said selected merchandise between said shelf means and said at least one service platform;

drive means responsive to said controller means for moving said service platform vertically adjacent at least one column of said shelf means and for moving said fork means vertically and horizontally only in a plane in which said

service platform is moved, wherein said fork means is movable horizontally relative to said service platform between at least two positions, a first of said at least two positions being aligned with said shelf means and a second of said at least two positions being aligned with said service platform adjacent said at least one column; and

switch means responsive to said controller means for causing said service platform to dispense said selected merchandise to said patron.

4,858,744

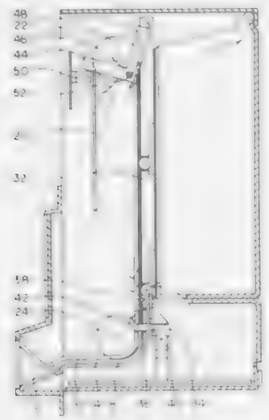
CURRENCY VALIDATOR

Anthony H. Doleja, Bedford Heights; Henry M. Stopar, and Patrick Swetel, both of Eastlake, all of Ohio, assignors to Ardac, Inc., Eastlake, Ohio

Filed Feb. 16, 1988, Ser. No. 156,038

Int. Cl.[4] G07F 7/04; G07D 7/00

U.S. Cl. 194—206 **9 Claims**



6. A currency validator, comprising:

a note path having a horizontal portion leading to a vertical portion;

first sensing means at an end of said vertical portion for sensing the presence of a bill at said end; and

a magnetic sensor positioned adjacent said note path at an intersection of said horizontal and vertical portions, said magnetic sensor being received within a flexible member, and wherein said note path comprises first and second plates, said flexible member bridging an opening in said first plate.

4,858,745

ESCALATOR STEPS HAVING LATERAL SAFETY DEVICES

Max Haas, Lopperstr. 8, CH-6010 Kriens, and Joris Schroder, Schadrutihalde 2, CH-6006 Luzern, both of Switzerland

Filed Jun. 30, 1988, Ser. No. 212,896

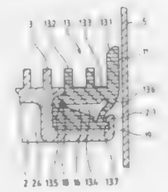
Claims priority, application Switzerland, Jul. 1, 1987, [redacted]

Int. Cl.[4] B66B 23/12

U.S. Cl. 198—333 **16 Claims**

1. In an escalator having a movable step in a longitudinal direction of travel guided between two handrail bases, the steps including safety devices at each lateral side thereof, where the safety devices are formed of elastic synthetic material and exhibit in the direction of travel ribs and grooves, the safety devices forming a visible termination at lateral edge zones of the steps and each safety device having one of the ribs formed as a safety rib spaced from the adjacent base to form an air gap, each of the safety ribs being movably supported under load to close the air gap between the step and the adjacent base, the improvement comprising:

a wedge-shaped recess formed in the body of each safety device which extends beneath the ribs including the safety



rib and is closed adjacent to the adjacent handrail base, and means for retaining the safety device in position forming the air gap, a portion of the safety device being movable by stepping on or loading into a safety position closing the air gap between the step and the adjacent base.

4,858,746

METHOD AND APPARATUS FOR TRANSPORTING ARTICLES

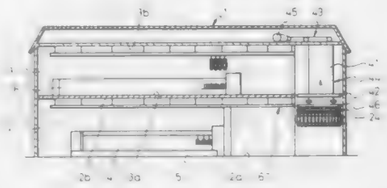
Shunji Ito, Nagoya; Kanchiro Ito, Aichi; Takashi Kogiso, Mizunami, and Yoshio Kurachi, Aichi, all of Japan, assignors to Howa Machinery, Ltd., Aichi, Japan

Filed Dec. 23, 1987, Ser. No. 137,253

Claims priority, application Japan, Dec. 27, 1986, 61-311180; Jan. 17, 1987, 62-8613

Int. Cl.[4] B65G 37/00

U.S. Cl. 198—465.4 **33 Claims**



1. A method for transporting articles in a system for transferring said articles between different machines provided on different floors of a building respectively, wherein the method comprises, taking a predetermined number of articles from a machine provided on a floor, hanging said articles in a series of rows on a carrying means having a predetermined length and moving along a guide rail provided in the proximity of said machine, taking said articles to a lifting means by moving said carrying means along said guide rail, storing said articles in the lifting means in such a way that at least one portion of the carrying means is arranged with at least one other portion of the carrying means in a side by side configuration while said articles are still hanging on the carrying means, transferring the articles to another floor by a lifting means, withdrawing the articles from the lifting means in a series of rows while said articles are still hanging on the carrying means, onto a guide rail, and supplying said articles to another machine by moving the carrying means along the guide rail.

4,858,747

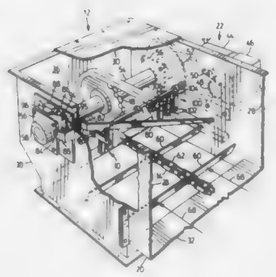
DRIVE MOTOR CONTROLLING DEVICE FOR A MATERIAL TRANSPORTING CONVEYOR

Charles S. Eunson, Winnipeg, Canada, assignor to Strong Equipment Corporation, Downsview, Canada

Filed Mar. 15, 1988, Ser. No. 168,364

Int. Cl.[4] B65G 43/06; F16D 7/00

U.S. Cl. 198—718 **9 Claims**



8. A drive motor controlling device for a material transporting conveyor, the conveyor having an endless material transporting member running between an idler sprocket at one end, and a drive sprocket at the other end, a support frame for supporting said sprockets, and a drive motor for driving said drive sprocket, the drive motor controlling device comprising:

a pivotally mounted slack sensing lever having a first rest position closely spaced apart beneath an upper flight of said endless material transporting member;

a means for urging said slack sensing lever into said first rest position;

a means for sensing displacement of said slack sensing lever from said first rest position;

a control switch actuated by said displacement sensing means for stopping said motor upon a predetermined amount of displacement of said slack sensing lever from said first rest position; and

a pivotally mounted foreign object sensing flap having a second rest position spaced apart above a lower flight of said endless material transporting member, and a means for linking said foreign object sensing flap to said displacement sensing means for actuation of said control switch upon a predetermined amount of displacement of said foreign object sensing flap from said second rest position;

and wherein said idler sprocket is slideably housed within said support frame, and is permitted a limited amount of movement, said idler sprocket being biased in a direction to maintain a predetermined amount of tension in said endless material transporting member, and upon said predetermined amount of tension being exceeded, said idler sprocket moving towards said drive sprocket, causing a downward deflection of said upper flight of said material transporting member onto said slack sensing lever, causing pivotal displacement of said slack sensing lever from said first rest position.

4,858,748

BEARING SYSTEM FOR RECIPROCATING FLOOR CONVEYOR

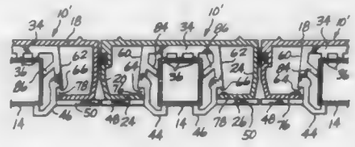
Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Division of Ser. No. 059,376, Jun. 4, 1987, Pat. No. 4,785,929, and a continuation-in-part of Ser. No. 680,069, Dec. 10, 1984, Pat. No. 4,679,686, which is a continuation-in-part of Ser. No. 346,865, Jan. 8, 1985, Pat. No. 4,492,303. This application Apr. 25, 1988, Ser. No. 185,840

The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.

Int. Cl.[4] B65G 25/00

U.S. Cl. 198—750 **5 Claims**



1. For use with a reciprocating floor conveyor of a type comprising a plurality of elongated floor members, each of which is of channel form and comprises a top panel, a pair of opposite side panels extending downwardly from the top panel, and a pair of bottom flanges projecting inwardly from the side panels and defining a space between them, and each of which is supported on and guided by an elongated guide beam means, and a plurality of spaced apart plastic slide bearings on the guide beam means, an improved plastic slide bearing, comprising:

a top which in use is positioned above the guide beam means, a side part of each side of the bearing depending from said top, said side parts in use occupying positions outwardly adjacent sides of the guide beam means, and a bottom lock flange projecting inwardly from each side part, each said lock flange in use extending below and engaging lower portions of the guide beam means, for holding the plastic slide bearing on said guide beam means;

said bearing top being of a width smaller than the space between the bottom lock flanges of the floor member;

each side part of the bearing including an inner portion which is contiguous an adjoining side of the guide beam means and a sloping outer portion which slopes downwardly and outwardly to a lower edge, with a flex space being defined laterally inwardly of each sloping outer portion;

said bearing having a width at the level of the lower edges of said sloping outer portions which is wider than the width of the space between the bottom lock flanges of the floor member; and

each said sloping outer portion being flexibly connected to the bearing and being bendable inwardly relative to the inner portion and relatively into the flex space, such that the floor member can be set down on top of a bearing which has been installed onto a beam means, with the top of the bearing positioned between the bottom lock flanges of the floor member, and the floor member can then be pushed downwardly, and as the floor member moves downwardly a force is applied by the flanges of the floor member onto said sloping outer portions of the bearing, causing such sloping outer portions to bend relative to the inner portions, and each to swing relatively into the flex space that is inwardly of it, an amount sufficient to allow the floor member to move downwardly until its bottom flanges are below the lower edges of the sloping outer portions, at which time the sloping outer portions will swing back outwardly into positions placing their lower edges above the bottom flanges of the floor member.

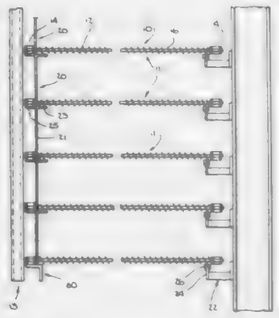
239-262 0 - 89 - 7

4,858,749
MASS FLOW SPIRAL WITH ABSORBER DRIVE
Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.
Filed Feb. 4, 1988, Ser. No. 152,047
Int. Cl.[4] B65G *27/02*
U.S. Cl. 198—756 16 Claims



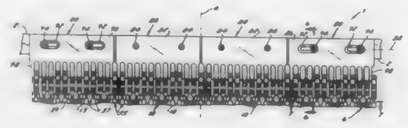
10. A vibratory material conveying apparatus comprising:
spiral means to be vibrated for conveying material vertically;
a platform;
cushioning means resiliently supporting the platform above a support surface for said apparatus;
means for resiliently attaching the spiral conveying means to the platform so that said spiral means is spaced above said support surface and suspended from said platform; and
means for imparting vibration to said platform and thereby to said spiral means to effect vertical conveyance of material.

4,858,750
CONVEYORS
Keith Cawley, Coltishall, England, assignor to Lineal Thermotech Limited, Norwich, United Kingdom
Filed Apr. 25, 1988, Ser. No. 185,774
Claims priority, application United Kingdom, May 9, 1987, 8711022; May 9, 1987, 8711023
Int. Cl.[4] B65G *21/18*
U.S. Cl. 198—778 7 Claims



1. An endless conveyor having a conveyor belt, a portion of the length of which is caused to follow a helical conveying path comprising a plurality of tiers stacked on top of one another, including a fixed helical guide supporting the outside edge of the conveyor belt on the helical conveying path, and the inside edge of the conveyor belt being supported one on top of one another by an arrangement which includes articulated links, at least some of which are equipped with spacers in the form of upstanding plates, the tops of which, at any one tier, engage the underside of the links or plates associated with the next tier above, whereby the tiers are supported one on the other, and means whereby the inside edge of the conveyor is driven from an internal drum or capstan.

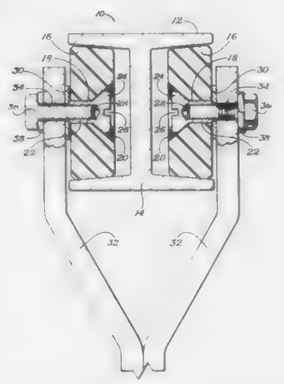
4,858,751
WIDE CHAIN CONVEYOR ASSEMBLY
Wasyly G. Hodlewsky, Greendale, Wis., assignor to Rexnord Corporation, Milwaukee, Wis.
Filed Mar. 14, 1988, Ser. No. 167,648
Int. Cl.[4] B65G *23/06, 15/08, 21/10*
U.S. Cl. 198—834 10 Claims



1. A conveyor assembly comprising
a frame having a longitudinal axis,
a drive shaft rotatably supported by said frame and extending generally perpendicular to said axis,
a plurality of drive sprockets mounted on said drive shaft for rotation therewith, all of said sprockets being axially movable relative to said drive shaft in response to expansion and contraction of the width of a conveyor belt driven by said sprockets,
said conveyor belt driven in the direction of said axis by said sprockets, said conveyor belt having a width measured along a line extending generally perpendicular to said axis, and said conveyor belt including an upper surface including a plurality of spaced apart slots extending in the direction of said axis, and
means independent of said sprockets for aligning said conveyor belt with said axis and for permitting variation of the width of said belt, said means for aligning including a fingered transfer plate including at least one projection fixed to the frame to prevent lateral movement of said projection with respect to the frame, a portion of the projection extending into one of the slots.

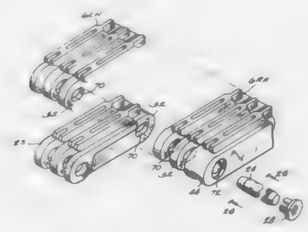
4,858,752
WHEEL ASSEMBLY FOR CONVEYER SYSTEM
Joe B. Ballard, Jr., De Soto, Tex., assignor to Dynamic Conveyor Products, Fort Worth, Tex.
Filed Feb. 4, 1988, Ser. No. 152,408
Int. Cl.[4] B65G *39/20*
U.S. Cl. 198—845 12 Claims

1. A conveyor system wheel assembly comprising:
a generally cylindrical axle member having an internally threaded aperture at one end and an enlarged head at a second end;
a wheel adapted to rotate about said axle member, constructed from a self-lubricating thermoplastic material and including a central opening having a diameter slightly larger than the diameter of the said generally cylindrical axle member for receiving said axle member so that said wheel will rotate on said axle member without binding said central opening having at one end an enlarged portion for generally mating with said enlarged head of said axle member; and



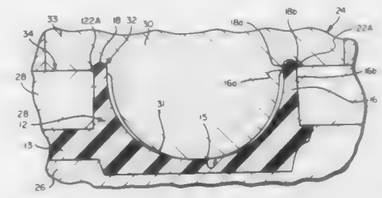
a bolt adapted to be threaded into said internally threaded aperture of said axle member.

4,858,753
CONVEYOR CHAIN ASSEMBLY
William G. Hodlewsky, Greendale, Wis., assignor to Rexnord Corporation, Milwaukee, Wis.
Continuation-in-part of Ser. No. 38,845, Apr. 15, 1987. This application Jun. 14, 1988, Ser. No. 206,591
Int. Cl.[4] B65G *17/06*
U.S. Cl. 198—853 2 Claims



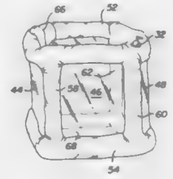
1. A chain module for use in forming a conveyor chain assembly and the chain module comprising a body portion including opposite lateral ends, a plurality of link ends projecting forwardly and rearwardly from the module body portion with respect to the direction of movement of the conveyor chain, the plurality of link ends being adapted to intermesh with link ends of an adjacent module, at least a plurality of link ends including substantially coaxially aligned holes adapted to house a hinge pin for pivotally joining together adjacent modules, said coaxially aligned holes in said plurality of link ends being slots having a length extending in the direction of movement of the conveyor chain, each of said slots including opposite ends, one of said ends of each slot being adjacent the module body portion and the other end of each slot being spaced from the module body portion, and one of said link ends projecting from the module body portion adjacent one of the lateral ends of the body portion having a generally circular aperture and being adapted to permit insertion of a hinge pin through the link ends to join together a pair of modules, said generally circular aperture being aligned with said one of said ends of said slot.

4,858,754
MOLDING APPARATUS AND CONSTRUCTION OF CONTACT LENS CASE
David Wright, Guntersville, and Richard Rabenau, Arab, both of Ala., assignors to Ryder International Corporation, Arab, Ala.
Filed Jun. 7, 1988, Ser. No. 203,275
Int. Cl.[4] A45C *13/10*
U.S. Cl. 206—5.1 2 Claims



1. A molded receptacle for containment of a contact lens or the like, comprising: an open mouth, cup-shaped body having a generally annular, upstanding body wall and a curved rim formed on an upper end of said body wall to define said open mouth, and wherein the radially outer surface of said body wall includes a remnant flash material formation which is located below said rim.

4,858,755
INFLATABLE DISPLAY CONTAINER
Lawrence J. Kuivanen, 17A Pine Needle Dr., Stratford, Conn. 06497
Filed Jan. 22, 1988, Ser. No. 147,253
Int. Cl.[4] B65D *25/00*
U.S. Cl. 206—45.31 4 Claims



1. An inflatable container having an upper open end, said container comprising:
at least four flexible side panels;
an inflatable, tubular, flexible framework surrounding said panels, said framework including an upper and a lower tubular rim and at least four upstanding tubular columns;
said inflatable, tubular framework and said side panels being formed from a single sheet of flexible film material folded upon itself along a longitudinal fold line into two overlapping, substantially rectangular sections each of which has its opposite lateral edges aligned with the opposite lateral edges of the other section, said overlapping rectangular sections being sealed together by a longitudinal seam extending between the opposite lateral edges of each section at a point spaced from said longitudinal fold line and by at least four continuous seams enclosing at least four separate areas within the space between said longitudinal fold line and said longitudinal seam, each of said overlapping rectangular sections having one of its opposite lateral edges sealed to the other of its opposite lateral edges by a lateral seam extending between said longitudinal fold line and said longitudinal seam, the arrangement being such that each one of said continuous seams defines one of said side panels while the remaining portions of said overlapping rectangular sections form said tubular framework with said longitudinal seam extending along the

surface of said lower tubular rim and with said lateral seam extending along the surface of one of said upstanding tubular columns;

said upper tubular rim surrounding said upper open end of said container and being seamless except for a portion of said lateral seam extending along the surface of said one upstanding tubular column;

said upper and lower tubular rims communicating with each other through at least one of said upstanding tubular columns;

a flexible bottom panel joined to said lower tubular rim and covering the bottom end of said container; and

a valve mounted in one portion of said framework for inflating the entire framework through said communicating upstanding tubular column.

4,858,756

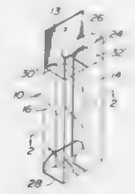
CONTAINER

Melvin B. Herrin, Meadowbrook, and Richard Mazurek, Rockledge, both of Pa., assignors to Klearfold, Inc., Warrington, Pa.

Continuation of Ser. No. 271,359, Jun. 15, 1981, abandoned, which is a continuation-in-part of Ser. No. 175,404, Aug. 5, 1980, abandoned. This application Aug. 24, 1983, Ser. No. 526,028

Int. Cl.[4] B65D *25/00*

U.S. Cl. 206—45.34 **20 Claims**



1. A container made of a first sheet of transparent or translucent plastic substantially rigid, self-supporting material, a second sheet of substantially rigid, self-supporting material, joining means comprising at least two flange portions connecting said first and second sheets together at least along said two flange portions to form a unitary composite container, discrete fold lines in said container including at least a pair of discrete fold lines formed in said first sheet of material, said discrete fold lines being disposed and constructed to cooperate to form a walled enclosure when a container is in its setup condition, to form a substantially flat configuration when the container is in its fully collapsed condition, and so that said walled enclosure is movable between its setup condition and its fully collapsed condition by movement of the walls of said walled enclosure relative to each other, said second sheet of material including a portion extending beyond said walled enclosure to provide an extended portion, and at least one of said two flange portions is disposed adjacent to and connected to a first side of said second sheet so that said walled enclosure is disposed adjacent to and one said first side of said second sheet.

4,858,757

COMBINED PACKAGE AND DISH FOR A SOAP BAR PRODUCT

James R. Liggett, P.O. Box 768, Bedford, N.Y. 10506

Filed Jun. 17, 1988, Ser. No. 208,158

Int. Cl.[4] B65D *65/16;* **A47K** *5/03*

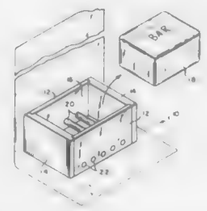
U.S. Cl. 206—77.1 **5 Claims**

1. A combined package and dish structure for a soap bar product comprising:

four side walls connected to form a box open at the top and bottom, said box being dimensioned to permit the soap bar product to fit therein; and

a plurality of dowels extending between two opposed side walls of the box slightly spaced from the bottom thereof, a small portion of each of said pour side walls extending below said dowels;

the soap bar product being positioned in the box resting on



the dowels to form a package, and said box being invertable so that the soap bar product can rest on the said dowels within said four side walls and outside said box when used as a soap dish.

4,858,758

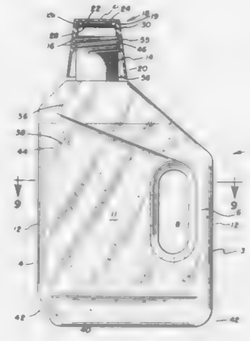
OXIDANT BLEACH, CONTAINER AND FRAGRANCING MEANS THEREFOR

Frances E. Mitchell; G. Edward Campbell, both of Pleasanton, and Dale S. Steichen, Livermore, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation of Ser. No. 893,524, Aug. 4, 1986, abandoned. This application Dec. 12, 1988, Ser. No. 284,783

Int. Cl.[4] B65D *81/24, 51/16, 23/00;* **C01B** *15/00*

U.S. Cl. 206—205 **30 Claims**



1. A transparent, durable container comprising a plastic bottle and a closure therefor and a granular peracid bleach disposed within said bottle, said bleach containing residual amounts of moisture, said bottle being constructed from a heteropolymer having a water vapor transmission rate of at least about 2 g/day/100 in.^{2}/mil. thickness.

4,858,759

CONTAINER ARRANGEMENT FOR CARTRIDGE DISPENSING TWO-COMPONENT MASS

Peter Mauthe, Kleinberghofen; Gabriele Grundmann, Munich, and Monika Moench, Neuried, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 944,747, Dec. 22, 1986, abandoned. This application May 20, 1988, Ser. No. 196,868

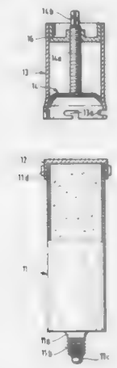
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545614

Int. Cl.[4] B65D *25/08*

U.S. Cl. 206—221 **1 Claim**

1. Cartridge for a two-component mass comprises a first

axially extending container holding one component of the mass and a second axially extending container holding the other component of the mass, said first and second containers each having a first end and a second end and being connectable together at the first ends thereof in axial alignment, wherein the improvement comprises that each of said first and second containers has a connecting region at the first ends thereof where said containers are connectable together, each connecting region has a removable partition forming a sealed closure before said containers are connected together, so that upon removal of the partitions from the connecting region, the contents of the first and second containers can be intermixed, one of said removable partitions is a mechanically detachable



sealing cap, the other said removable partition is an axially displaceable piston displaceable within and in the axial direction of the container in which it is positioned away from the other container, whereby the components of the mass can be intermixed, said container in which said piston is located has an inside surface, said displaceable piston is a cup-shaped sealing disc with an annular deformable sealing lip projecting from said sealing disc toward the first end of the container in which the piston is located and disposed in contact with the inside surface of said container so that as said piston is displaced in the direction toward the second end of said container in which it is positioned, said lip deflects whereby the component within the container can flow around said piston into the component in the other said container.

4,858,760

COMPOUND CAP FOR USE WITH A BOTTLE

Paolo Di Sturco, Viale Nuova Florida 41, Ardea- Roma, Italy

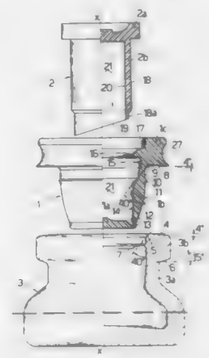
Filed Jun. 30, 1988, Ser. No. 213,903

Claims priority, application Italy, Jul. 2, 1987, 35888/87[U]

Int. Cl.[4] B65D *25/08*

U.S. Cl. 206—222 **4 Claims**

1. A compound cap for use with a bottle (3) having a neck (3*a*) with an inner surface, and annular protrusion (7) on the inner surface, and a mouth having a countersink (5) above the annular protrusion, the bottle having a widened head (3*b*) with an upper truncated cone-like surface (4) around the mouth, the compound cap comprising: first and second coaxial elements (1,2) each made of elastically deformable plastic material and each comprising one body defined by revolution surfaces around a common axis (x-x); the first element (1) being hollow and having a lower wall (1*a*) provided with a periphery having an annular area of lesser resistance defining a breaking line (13), the first element including a side wall (1*b*) with an upper annular head (1*c*), the side wall having an outer surface which is shaped for fitting into the neck of the bottle; the second element (2) comprising a cylindrical body (2*b*) having an outer diameter which is substantially equal to a minimum inner diameter of the hollow first element (1), the second element including a head (2*a*) at the top of and extending outwardly from the cylindrical body, the cylindrical body having a lower flute shaped mouthpiece (19); the side wall (1*b*) of the first element having an outer surface in the area of the head (1*c*) of the first element which carries a truncated cone-like surface (9) which is shaped to match the countersink (5) of the bottle, the head (1*c*) of the first element having a lower surface (8) extending outwardly around the side wall (1*b*) and having a truncated cone-like shape which matches the shape of the truncated cone-like surface (4) of the bottle, the outer surface of the side



wall (1*b*) including a cylindrical part (10) extending downwardly of the truncated cone-like surface (9) of the outer surface, the outer surface of the side wall including an annular protrusion (11) which is spaced from the lower surface (8) of the head (1*c*) of the first element, by a distance so that when the lower surface (8) of the head (1*c*) of the first element is in contact with the truncated cone-like surface (4) of the bottle, the annular protrusion (11) of the first element is positioned immediately below the annular protrusion (7) of the bottle.

4,858,761

BAG, PARTICULARLY A GOLF BAG, OF VARIABLE CONFIGURATION

Enrico Fumia, Turin, Italy, assignor to Pininfarina Extra S.r.l., Turin, Italy

Filed Jun. 15, 1988, Ser. No. 206,773

Claims priority, application Italy, Jun. 15, 1987, 53423/87[U]

Int. Cl.[4] A63B *55/00*

U.S. Cl. 206—315.3 **13 Claims**



1. A golf bag of variable configuration comprising a tubular pillar, two compartments disposed parallel to said pillar; hinge means connecting said compartments to the pillar, the compartments being open at one end and being movable angularly between an open position in which they are spaced from each other and define with the tubular pillar a longitudinal seat which is open outwardly along one side of the bag, and a

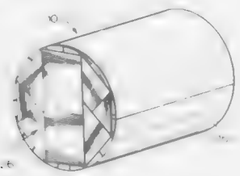
closed position in which they are side by side, and an auxiliary container which has a shape substantially complementary to that of the longitudinal seat and can be fitted removably into the seat when the two compartments are in the open condition, wherein the longitudinal seat defined in the open position of the two compartments has a V-shaped section, and the auxiliary container has a substantially triangular cross-sectional profile.

4,858,762

PACKAGING FOR PAPER ROLLS (UNIFORM WRAP SYSTEM)

Daniel D. Kewin, 16 Dogwood Drive, Brantford, Ontario, Canada N3R 1R3

Filed Feb. 21, 1989, Ser. No. 312,550
Int. Cl.[4] B65D *85/67*
U.S. Cl. 206—414 **6 Claims**



1. A packaged roll of paper or other sheet material comprising:

a roll of paper or other sheet material,

a protective sheet of material wrapped around the circumference of the roll and having overlapping longitudinally-extending edge portions secured together, said protective sheet extending beyond the roll at opposite ends thereof to provide projecting protective sheet portions,

the projecting portion of the protective sheet at each end being crimped radially inwardly over the outer annular portion of the end of the roll, and

at least one header assembly at each end of the roll located externally and/or internally of the crimped over projecting protective sheet portion, at least one header assembly comprising a series of generally rectangular strips of material superposed one on top of the other in a star-like manner with central portions overlapping and secured together and shorter edges outermost and adjacent but within the periphery of the roll,

said overlapping central portions of the header assembly strips being located within the outer annular portion of the end of the roll over which the crimped over projecting protective sheet portion extends.

4,858,763

FLUORESCENT LIGHT HOLSTER

Ronnie E. Scott, 2001 S. 22nd St., McClennan County, Waco, Tex. 76706

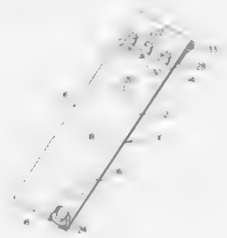
Filed Apr. 11, 1988, Ser. No. 180,238
Int. Cl.[4] B65D *85/42*
U.S. Cl. 206—419 **10 Claims**

1. An apparatus for holding elongated light bulbs comprising:

first and second layers of a flexible material attached together to define an enclosure therebetween;

means for defining a plurality of pockets within said enclosure, each pocket having an open end for receiving the light bulbs;

said second layer having an extended portion operable to fold about a support structure; and



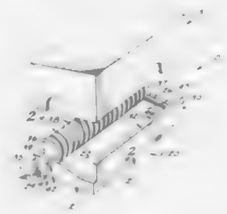
fastening means to secure said extended portion to said second layer, such that said pockets may be pivotally attached to said support structure.

4,858,764

ADJUSTABLE CARRIER DEVICE FOR CERAMIC SUBSTRATES AND THE LIKE

Julius Domokos, Fountain Valley, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 20, 1988, Ser. No. 208,443
Int. Cl.[4] B65D *85/30*; H05K *7/16*
U.S. Cl. 206—449 **17 Claims**



1. A carrier device for handling panel-like parts in predetermined part locations, which is adjustable over a continuous size range to accommodate parts of various sizes, said device comprising:

an elongated side member having a plurality of aligned slots formed therein, the width of each slot being sufficient to receive an edge of a part within the slot;

an elongated adjustment member having a curved outer peripheral surface and first and second pivot pin members extending from each end thereof;

a bottom member and first and second end members which are joined with said elongated side members to comprise a box like structure, said end members having a pivot opening defined therein for receiving a corresponding one of said pivot pins for mounting said adjustment member for rotation about a pivot axis;

said curved outer peripheral surface of said elongated adjustment member being adapted so that as said member is rotated about said axis, said surface is disposed progressively nearer to or further from said side member so as to adjust the spacing between said adjustment member and said side member.

6. A carrier device for carrying parts in predetermined part locations, which is adjustable over a continuous size range to parts of different sizes, said device comprising:

an elongated side plate member having a plurality of aligned slots formed therein, the width of each slot being sufficient to receive an edge of a part within the slot;

a semi-cylindrical adjustment member having a plurality of

aligned circumferential slots defined therein, and further comprising first and second aligned pivot-pin members extending from the ends of the adjustment member and which are offset from the center axis of said adjustment member; and

means for mounting said adjustment member for rotation about said pivot-pin members so as to provide an eccentric pivot of said adjustment member, and wherein each circumferential slot in said adjustment member is aligned with a respective one of said slots in said side plate member to form one of said part locations, and wherein as said adjustment member is pivoted on said eccentric pivot, the distance between said respective circumferential slot and said side plate slot is varied to adjust for parts of different sizes.

14. A carrier device for carrying thin panel-shaped parts in predetermined rack locations, the size of the rack locations being adjustable over a continuous size range to adjust to parts of different sizes, said device comprising:

an elongated side plate member having a plurality of aligned slots formed therein, the width of each slot being sufficient to receive an edge of a part;

a bottom plate member and first and second end structural members which are joined with said side member to comprise a boxlike structure;

a semi-cylindrical adjustment member having a plurality of aligned circumferential slots formed in the curved external peripheral surface thereof, and further comprising first and second pivot pins extending from respective ends of said elongated members and which are offset from the center axis of said adjustment member; and

means for mounting said adjustment member for rotation about said pivot pin members so as to provide an eccentric pivot of said adjustment member, and wherein each circumferential slot in said adjustment member is aligned with a respective one of said rack locations, and wherein as said adjustment member is pivoted on said eccentric pivot, the distance between said respective circumferential slot and said side member slot is varied to adjust the width therebetween.

4,858,765

PORTABLE HOLDER FOR STICK-TYPE COSMETIC CASE

Toshiko Nakamura, and Tomio Tahara, both of Tokyo, Japan, assignors to Kanaya Kagaku Kogyo Co., Ltd., Taito, Japan

Filed May 31, 1988, Ser. No. 200,622
Claims priority, application Japan, Jan. 25, 1988, 63-7781[U]
Int. Cl.[4] A45G *11/00*
U.S. Cl. 206—581 **9 Claims**



1. A portable holder for containing a stick-type cosmetic case having an end portion and the other portion, the end portion being of a transverse outer size smaller than the transverse outer size of the other portion, the portable holder comprising:

a holder body including a bottom wall and a peripheral wall, the bottom wall having an upper face, the peripheral wall being formed along the periphery of the upper face of the bottom wall, the bottom and peripheral walls defining a hollow for receiving the stick-type cosmetic case in the holder body, the peripheral wall including front and rear portions, the front portion having first engaging means and outer and inner faces, the rear portion having an inner face confronting the inner face of the front portion;

a cover member, pivotally connected to the rear portion of the peripheral wall, for opening and closing the hollow of the holder body, the cover member having a lower face and second engaging means, the lower face confronting the bottom wall when the cover member is in its closed position, the second engaging means being resiliently and releasably engageable with the first engaging means of the holder body so that the cover member is releasably fastened to the front portion of the holder body when the cover member is in its closed position;

means for allowing the end portion of the cosmetic case to project outward from the outer face of the front portion when the cosmetic case is received in the hollow of the holder body; and

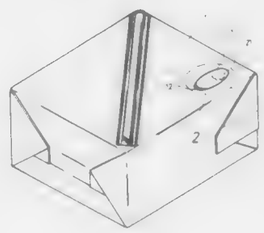
a slanting surface extending between the upper face of the bottom wall and the inner face of the rear portion of the peripheral wall, the slanting surface having front and rear edges and inclining to the upper face of the bottom wall so that the rear edge is positioned at a higher level than the front edge, the distance between the front edge of the slanting surface and the front portion of the peripheral wall being less than the length of the cosmetic case and not less than the length of the other portion of the cosmetic case, the distance between the rear edge of the slanting surface and the lower face of the cover member being less than the transverse outer size of the other portion of the cosmetic case when the cover member is in its closed position.

4,858,766

SUCKING HOLE STRUCTURE FOR AN ALUMINIUM FOIL BEVERAGE CONTAINER

Wen Tsai, 25, Lane 200, Wen-Hwa West Rd., Fon San City, Kaohsiung Hsien, Taiwan 800

Filed Dec. 14, 1988, Ser. No. 284,339
Int. Cl.[4] B65D *5/74*
U.S. Cl. 206—628 **2 Claims**



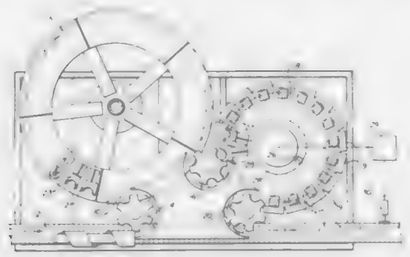
1. A sucking hole structure for an aluminium foil beverage container made of three layers, i.e. a coated paper layer as the outermost, a simile paper layer as the middle and an aluminium foil layer as the innermost, having the sucking hole made at a corner of a side face of the container, said sucking hole covered and surrounded by an oval peeling line punched on the coated paper layer, said sucking hole punched with a round peeling line on the simile paper layer and compressed to become less thick than the rest part and adhered with the part enclosed by the oval peeling line, and the part enclosed by the round peeling line with part enclosed by the oval peeling line possible to be peeled off to become said sucking hole.

4,858,767

PLASTIC CONTAINER INSPECTION PROCESS

Michael J. Myers, Lawrenceville, Ga., and Warren J. Harwick, Milwaukee, Wis., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Sep. 2, 1987, Ser. No. 92,003
Int. Cl.[4] B07C 5/34; G01N 21/90, 35/04
U.S. Cl. 209—3.1 7 Claims



1. A continuous process for detecting organic contaminants present on or absorbed into the walls of plastic containers comprising:

placing said containers on a first rotary disc,

injecting a substantially inert gas into said containers as the containers are rotating around said first rotary disc,

transferring said containers from said first rotary disc to a second rotary disc having (a) multiple vacuum means for drawing samples of newly formed vapors from within said containers and (b) multiple ionization means for analyzing said samples,

drawing said samples from said containers, analyzing said samples for total ionizables present as said containers are rotating around said second rotary disc,

removing said containers from said second rotary disc, and

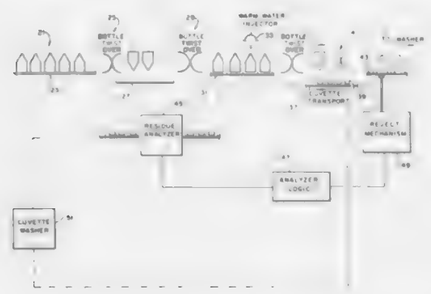
rejecting said containers in which said total ionizables present are above or below a predetermined value.

4,858,768

METHOD FOR DISCRIMINATION BETWEEN CONTAMINATED AND UNCONTAMINATED CONTAINERS

George Piester, Essen, Fed. Rep. of Germany, assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Aug. 4, 1986, Ser. No. 892,983
Int. Cl.[4] B07C 5/00, 5/32
U.S. Cl. 209—3.1 19 Claims



1. A method for discriminating between a contaminated container and an uncontaminated container from a population of containers which were once filled with product to be consumed, each of said containers having a residue therein comprising the steps of:

generating a signal representative of at least one physical response generated by a sample of product residue;

generating at least one physical response from a sample residue in each container;

comparing the physical response of the sample residue with the signal representative of the physical response of a product residue; and

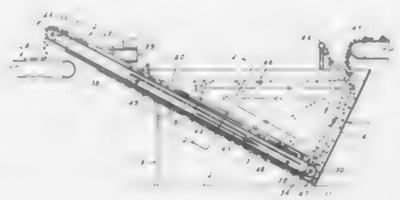
rejecting the container when the physical response of the sample residue does not correlate to the physical response of the product residue; whereby complex analytical systems for detecting a large number of unknown contaminants is avoided by reducing the analytical problem to the detection of known and relatively few product residues whose presence is used to indicate that the container was not contaminated.

4,858,769

FLOTATION SEPARATOR

Jeffrey S. DeVries, 13530 Tyler St., Holland, Mich. 49424

Filed May 19, 1986, Ser. No. 864,338
Int. Cl.[4] B07C 5/02
U.S. Cl. 209—3.1 10 Claims



1. A liquid flotation tank for sorting objects by flotation on a liquid comprising:

an elongated tank having a triangular cross sectional configuration, with an inclined bottom extending downwardly and inwardly from one side of the tank and an end extending downwardly from the opposite side of the tank, the end and the bottom meeting at an apex at the lowest point of the tank, the sides of the tank being enclosed by sidewalls, the end and bottom extending upwardly above the liquid level in the tank, the upper portion of the end serving as an entry point for objects in the tank, the upper portion of the bottom serving as an exit point for heavier sorted objects;

a conveyor having an endless loop conveyor belt mounted inside the tank and extending generally parallel to the bottom from a lower end adjacent the apex of the tank to an upper end extending to a discharge point above the liquid level in the tank, the conveyor having an upwardly moving upper course, and a downwardly moving lower course, both positioned in the tank above the bottom; and

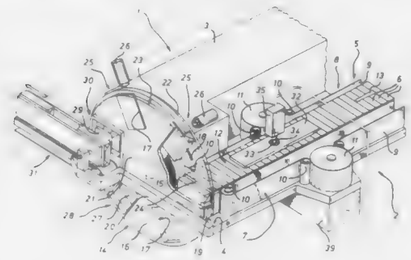
shroud means positioned between the upper and lower courses of the conveyor for isolating the upper course from the lower course as they move through the liquid, such isolation enhancing the settling of objects on the upper course for conveyance out of the tank.

4,858,770

EXIT STAGE DEVICE FOR A PACKAGING LINE

Antonio Gamberini, Bologna, Italy, assignor to G.D. Società per Azioni, Bologna, Italy

Filed May 27, 1987, Ser. No. 54,770
Claims priority, application Italy, May 27, 1986, 3428 A/86
Int. Cl.[4] B07C 5/00
U.S. Cl. 209—535 8 Claims



1. An exit stage device for a packaging line, in particular a line for the manufacture of packs of cigarettes, comprising:

a conveyor in receipt of a file of packs which it indexes forward along a predetermined path, sandwiched side by side substantially in mutual contact one with the next;

transfer means located at the exit end of the conveyor, designed to remove the packs from the conveyor singly and in regular succession, shifting them in a direction transverse to that of the path established by the conveyor, and consisting in a transfer wheel that exhibits a plurality of peripheral pockets, each one of which designed to accommodate a respective pack, and is rotatable about an axis lying substantially parallel with the path established by the conveyor in such a way that the peripheral pockets can be indexed successively into alignment with the exit end of the path established by the conveyor;

drive means for operation of the conveyor and the transfer means;

means for detection of the exact position occupied by each pack in relation to the transfer wheel on arrival at a reference point situated along the path established by the conveyor;

a differential, installed between the conveyor and the drive means and having a first input and a second input, the first connected to the drive means, the second connected to a motor which is operated by the detection means through the agency of a control circuit.

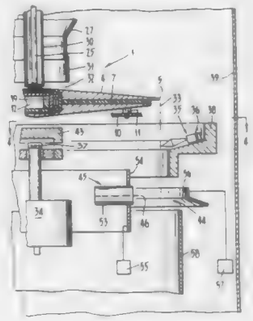
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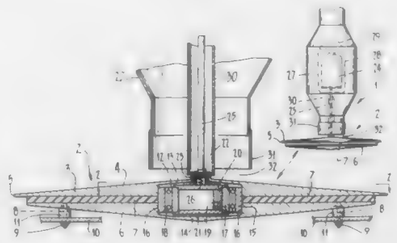
PARTICLE DISTRIBUTING AND SORTING METHOD AND APPARATUS

Albert P. Hawkins; Alan Boyle, and Alan M. Stone, all of Melbourne, Australia, assignors to Argyle Diamond Mines Pty. Limited, West Perth, Australia

Filed Aug. 3, 1983, Ser. No. 520,125
Claims priority, application Australia, Aug. 4, 1982, PF5199
Int. Cl.[4] B07C 5/36
U.S. Cl. 209—552 11 Claims

1. Sorting apparatus comprising particle feed means capable of feeding particles to be sorted in paths which radiate out from a central zone of the apparatus and free-fall substantially vertically downwardly in an array curved about the central zone, said feed means comprising a rotationally fixed substantially horizontally extending distributor plate and vibrating means adapted to vibrate the plate in a horizontal plane, and means beneath the particle feed means to separate the particles into fractions according to the degree to which they possess a particular characteristic as they fall in said substantially vertical curved array of paths around the central zone.



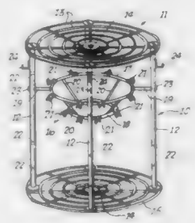


4,858,772

CAROUSEL ACCESSORY UNIT

Theodore Phillipson, 5209 Paleo Pines, Fort Pierce, Fla. 33451

Filed Nov. 17, 1987, Ser. No. 121,903
Int. Cl.[4] A47F 7/08
U.S. Cl. 211—36 16 Claims



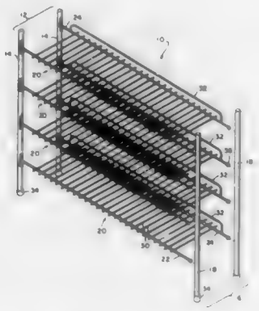
1. A shoe and accessory support unit comprising an upper circular shelf means, base means including a second circular shelf, a plurality of spaced vertical leg members fixedly positioned between said upper shelf means and said base means, attachment means provided on said spaced vertical leg members, a two position shoe hanger assembly supported by said attachment means and selectively positioned in one of said two positions below said upper circular shelf means, and accessory hook means supported by said attachment means on the upper end of each of said spaced vertical leg members whereby shoes can be suspended from said shoe hanger assembly and accessories such as ties, belts and scarves can be suspended from said accessory hook means.

4,858,773

COOLING/BAKING RACK

Karen M. Zimmerman, 1949 Woodhaven Dr., Fort Wayne, Ind. 46819-1053

Filed Jul. 26, 1988, Ser. No. 225,024
Int. Cl.[4] A47F *5/13*
U.S. Cl. 211—149 11 Claims



1. A foldable cooling/baking rack, comprising:
a first end frame and a second end frame, each end frame including a pair of laterally spaced posts;
a plurality of generally rectangular shelving elements, disposed horizontally and connected to said end frames;
wherein said shelving elements are relatively fixedly and pivotably connected to said first end frame and detachably and non-pivotably connected to said second end frame to allow said elements to be detached from said second end frame and pivoted relative to said first end frame;
wherein said shelving elements and said end frames are movable between an upright, operable position and a folded, inoperable position; and
wherein said shelving elements are disposed generally perpendicularly to said end frames when the rack is in the upright, operable position, and are disposed generally non-perpendicularly to said end frames when the rack is in the folded, inoperable position.

4,858,774

SHELVING SYSTEM

Russell K. Winter, Crownsville; Thomas D. Harvey, Rockville; Richard S. Kain, Woodbine, and Nedin Savas, Bethesda, all of Md., assignors to Russel William Ltd., Odenton, Md.

Filed Mar. 29, 1988, Ser. No. 174,853
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—184 12 Claims



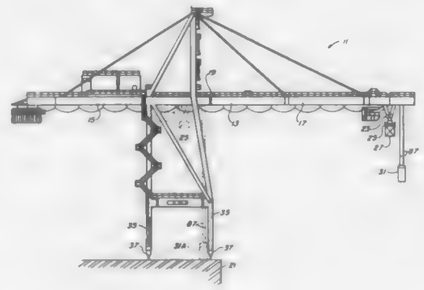
1. shelving system for displaying articles within partitioned areas; comprising:
a. shelf means for supporting said articles; said self means having at least one substantially vertical wall flexibly mounted to a substantially horizontal bottom wall; and,
b. divider means for defining said partitioned areas, said divider means includes a plate member having (1) on a first end an integrally formed tab having an upwardly directed hook-shaped contour for pivotal insert into a slotted through opening formed in said substantially vertical wall, and (2) on a second end substantailly orthogonal said first end a second and third tab member integrally formed thereon for insert into a pair of corresponding through openings formed in said bottom wall; said second tab member being angularly directed in a direction extending away from both said first and second ends of said plate member for preventing insert or withdrawal of said plate member prior to said bottom and substantially vertical walls being flexibly displaced by a camming surface formed on said second tab member from a first position to a second position each from the other, and said plate member being subsequently lockingly engaged when said bottom and substantially vertical walls are releasably displaced to said first position.

4,858,775

PERSONNEL TROLLEY AND ELEVATOR PLATFORM FOR A CARGO CONTAINER HANDLING GANTRY CRANE

John H. Crouch, Long Beach, Miss., assignor to Paceco Corp., San Mateo, Calif.

Filed Feb. 12, 1988, Ser. No. 156,304
Int. Cl.[4] B66C *19/00*
U.S. Cl. 212—205 4 Claims



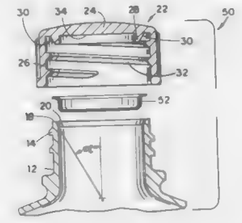
1. In a personnel trolley and elevator platform for a cargo container handling gantry crane having a lifting spreader trolley mounted for movement on lifting spreader trolley rails mounted on the gantry thereof, controlled from an elevated cab, said gantry including a boom having an outboard end, the invention comprising
an independent self-powered personnel trolley mounted on said rails and having a personnel elevator platform reeved thereto and suspended thereunder, said personnel trolley being disposed or position on the gantry between said lifting spreader trolley and the outboard end of said boom and,
wire rope drums for lifting and lowering said elevator platform,
lift and lower and horizontal movement controls for said personnel trolley and elevator located in said elevator platform, and
means for guiding the wire rope reeving of the crane relative to the personnel trolley when the reeving or the personnel trolley more relative to each other.

4,858,776

BOTTLE CLOSURE ASSEMBLY

Ravinder C. Mehra, Fairport, N.Y., assignor to Nalge Company, Rochester, N.Y.

Filed Nov. 3, 1988, Ser. No. 266,527
Int. Cl.[4] B65D *53/04*
U.S. Cl. 215—270 7 Claims



1. A bottle closure assembly comprising:
a plastic bottle having a neck portion that includes an externally thread portion and an outer rim which defines an outlet of the bottle, the inside surface of the rim having an annular planar mating surface disposed at a first angle with respect to the longitudinal axis of the bottle;
a thin flexible sealing plug comprising an annular outer lip for engagement with the top surface of the rim, an annular mating section adjacent the inner side of said lip, and a generally cylindrical shape well portion for replacement adjacent the inside surface of said neck, said annular mating section having an inner and outer mating surfaces, said inner and outer surfaces being substantially parallel to each other and disposed at second angle with respect to the longitudinal axis of said bottle, said second angle of said annular mating surface of said plug being greater than said first angle of said sealing surface of said rim;
a closure for placement over said sealing plug and for engagement with the neck portion of said bottle, said closure comprising a top wall, a circular outer side wall extending downward from said top wall and an annular sealing rib on its lower surface and spaced radially from said side wall, said rib having a generally arcuate mating surface for engagement with said outer surface of said annular mating section of said flexible plug so as to cause the inner mating surface of said annular mating section of said sealing plug to engage said annular sealing surface of said bottle.

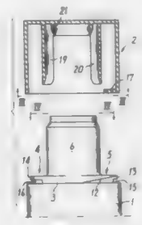
4,858,777

CONTAINER WITH A REMOVABLE CAP HAVING SIDE GENERATING LINES IN ALIGNMENT WITH THOSE OF THE CONTAINER

Simone Morel, 15 rue du Faubourg de Paris, 51210 Montmirail, Marne, France

Filed Sep. 6, 1988, Ser. No. 240,829
Claims priority, application France, Sep. 15, 1987, 87 12761
Int. Cl.[4] B65D *41/06*
U.S. Cl. 215—295 6 Claims

1. A container with a removable cap having aligned cap inner and container outer surfaces wherein the container has a to part formed with at least one boss having a first side spaced apart from said aligned surfaces of the container by a measure corresponding to a wall thickness of the cap and an other side which defines a ramp, an extreme edge of the boss being in turn spaced apart from side generating lines of the container by a measure which is equal to the wall thickness of the cap and



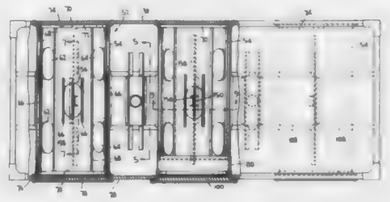
defining a groove corresponding to a rib formed from an inner wall of the cap.

4,858,778

FUEL TANK

Harvey O. Patrick, Columbia, Md., assignor to PATS, Inc., Columbia, Md.

Filed Feb. 18, 1988, Ser. No. 156,964
Int. Cl.[4] B65D *90/22*
U.S. Cl. 220—5 A 20 Claims



1. A fuel tank comprising a housing including top and bottom walls and side walls, and combined internal support and baffle means within said housing in part extending between said top and bottom walls and in part extending between said side walls, said combined internal support and baffle means including tubular members extending between said side walls, openings in at least one of said side walls in alignement with said tubular members for providing access to the interiors of said tubular members, and replaceable closure plates secured to said side wall for sealing said side wall openings.

10. A fuel tank comprising a housing including top and bottom walls and side walls, and combined internal support and baffle means within said housing in part extending between said top and bottom walls and in part extending between said side walls, said combined internal support and baffle means including tubular members extending between said side walls, openings in at least one of said side walls in alignment with said tubular members for providing access to the interiors of said tubular members, and replaceable closure plates secured to said side wall for sealing said side wall openings; said tubular members each including a tubular wall, and said tubular wall having openings therethrough providing access to the interior of said housing surrounding said tubular members; said tubular wall openings of each of said tubular members including generally vertically aligned openings, and said combined internal support and baffle means further including upstanding supports extending through said aligned openings and secured to said top and bottom walls.

13. A fuel tank comprising a housing including top and bottom walls and side walls, and combined internal support and baffle means within said housing in part extending between said top and bottom walls and in part extending between said side walls, said combined internal support and baffle means

including tubular members extending between said side walls, openings in at least one of said side walls in alignment with said tubular members for providing access to the interiors of said tubular members, and replaceable closure plates secured to said side wall for sealing said side wall openings; one end of one of said tubular members being closed in spaced relation from a respective one of said side walls to form a sealed compartment opening through said one side wall, said compartment forming space for control means.

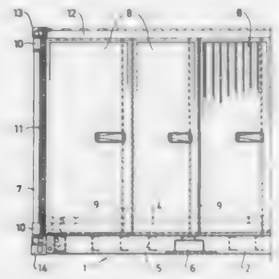
14. A fuel tank comprising a housing including top and bottom walls and side walls, and combined internal support and baffle means within said housing in part extending between said top and bottom walls and in part extending between said side walls, said combined internal support and baffle means including supports extending between two opposite ones of said walls and secured to said walls by anchoring members, said housing walls being of a double wall construction including a central core, at least certain of said anchoring members including a mounting flange, said core being absent in alignment with said mounting flange and defining an internal recess in a respective one of said opposite walls, and said mounting flange being seated in said recess and secured to said double wall.

4,858,779

CONTAINER

Hans Zimmerlund, Skelleftea, Sweden, assignor to Scandinavian Transshipment AB, Skelleftea, Sweden

Continuation of Ser. No. 865,195, May 14, 1986, abandoned. This application Dec. 9, 1988, Ser. No. 283,017
Claims priority, application Sweden, Sep. 14, 1984, 8404627
Int. Cl.[4] B65D *19/00*
U.S. Cl. 220—6 **6 Claims**



1. A collapsible container comprising:

a bottom unit defining four corners, two longitudinal edges and two transverse end edges;

an angle post at each of said four corners, each having a base portion, each of said base portions having an associated joint which connects the base portion to said bottom unit, each of said posts being foldable by its joint along one of said longitudinal edges, each of said joints being arranged inwardly relative to its post along said longitudinal direction;

two end walls, each extending transversely along one of said end edges and connected to two of said posts;

two longitudinal side walls, each including a plurality of side doors, said side doors of each side wall being arranged beside each other and being pivotally connected to at least one adjacent side door, wherein, for each side wall, the side door adjacent to an angle post is pivotally connected thereto, the dimensions of the respective side doors and the pivot arragements being such that the respective side walls are foldable against each other to form a package having a maximum width not greater than one half the distance between the angle posts of the respective end wall, and such that the package of side doors is pivotable into abutment relationship with the respective end wall;

an upper unit being supported by said end walls;

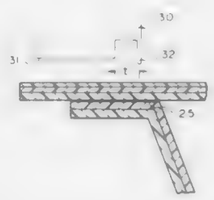
said container being collapsible by folding said angle posts along said longitudinal edges and against said bottom unit, said base portions moving upwardly and inwardly with respect to their positions prior to the folding of said angle posts, and the distance between the base portions of two angle posts when folded along the same longitudinal edge being less than the distance between said end walls before folding so that a collapsed container fits within a non-collapsed container.

4,858,780

HERMETICALLY SEALED PACKAGE AND METHOD OF PRODUCING THE SAME

Hiroshi Odaka, Himeji, and Tsuyoshi Kishida, Tokyo, both of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,127
Claims priority, application Japan, Sep. 9, 1987, 62-226158
Int. Cl.[4] B65D *41/00*
U.S. Cl. 220—359 **6 Claims**



1. A hermetically sealed package comprising:

(a) a multilayer container comprising at least an innermost layer and a layer adjacent to the innermost layer, the innermost layer and the layer adjacent to the innermost layer being joined by a pressure sensitive adhesive, the multilayer container including

(1) a recessed portion;

(2) a flat flange portion adjoining integrally the rim of the recessed portion; and

(3) a notch surrounding the boundary between the recessed portion and the flat flange portion, the notch being provided on the flat flange portion in the innermost layer of the multilayer container; and

(b) a top film including

(1) a lid portion of sealing the multilayer container, the lid portion being adhered strongly to the flat flange portion of the multilayer container at the outside of the notch; and

(2) a tab portion for picking the top film, the tab portion extending from the rim of the lid portion, being integral with the lid portion, and being not adhered to the flat flange portion;

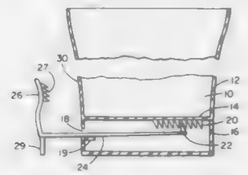
the coefficient of adhesion between the multilayer container and the top film being larger than the coefficient of adhesion between the innermost layer of the multilayer container and the layer adjacent to the inner most layer of the multilayer container generated by the pressure sensitive adhesive, whereby upon progressive separation of the top film from the tab portion, the innermost layer is progressively peeled from the layer adjacent to the innermost layer, with the innermost layer inside the notch remaining unpeeled; and the pressure sensitive adhesive enabling to reseal the hermetically sealed package after opening.

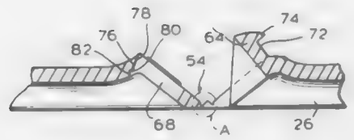
4,858,781

WASTE CONTAINER AND ADJUSTABLE BAG LINER PACKAGE HOLDER COMBINATION

Richard Kane, Rochester; Carl Meyerhoefer, Dix Hills, both of N.Y.; David C. Miller, New Canaan, and Thomas J. Pendleton, Danbury, both of Conn., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 10, Jan. 2, 1987, Pat. No. 4,763,809. This application Aug. 12, 1988, Ser. No. 231,513
Int. Cl.[4] B65D *21/02, 67/02*
U.S. Cl. 220—407 **9 Claims**





1. The combination comprising a rigid container having a bottom planar surface and a wall member, at least one ratchet bar fixed in association with said planar surface, at least one pawl including a pawl escapement tooth and a pawl arm in association therewith; said container having a peripherally depending rigid skirt for offsetting the bottom of said container from a support surface, at least one orifice in said skirt functioning as a fulcrum for said pawl arm located so as to permit said pawl tooth to move into and out of engagement with the teeth of said ratchet bar; an upright member fixed at the end of said pawl arm opposite to said pawl tooth, said pawl tooth and arm being slideable in relation to said ratchet bar, fulcrum and wall member, and a hinge pivotally joining the upright member to the pawl arm such that the upright member may be pivoted with respect to the pawl arm and positioned so as to extend in the same direction as said pawl tooth; said combination being adapted to receive a package, which is decreasible in size, between said upright member and said wall member, said upright member being structured so as to exert a spring-force against said package when said pawl escapement tooth is in locked engagement with said ratchet bar.

4,858,782

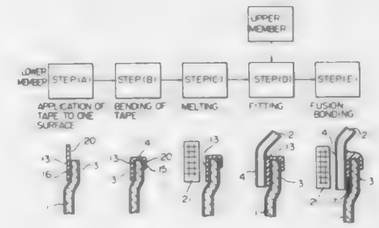
METAL VESSEL HAVING CIRCUMFERENTIAL SIDE SEAM AND PROCESS FOR PRODUCTION THEREOF

Hisakazu Yasumuro; Michio Watanabe, both of Yokohama; Kazuo Taira, Tokyo; Tsuneo Imatani, and Hideo Kurashima, both of Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 416,378, Sep. 9, 1982, abandoned. This application Apr. 25, 1985, Ser. No. 727,186
Claims priority, application Japan, Sep. 17, 1981, 56-145514
Int. Cl.[4] B65D *8/22;* B23P *11/02;* B32B *31/06, 31/28*
U.S. Cl. 220—458 **14 Claims**

1. In a metal vessel having upper and lower members, each of which is in the form of a seamless molded metal cup having a protective resin cover layer over each of the inner and outer facing surfaces thereof with exposed metal end edges, the upper member having a pouring mouth, the upper and lower members having straight end portions fitted in a telescopic relation, the end portions of the upper and lower members being lap-bonded to each other through a thermoplastic resin adhesive forming a circumferential side seam, including inner and outer circumferential laps, the improvement comprising:

a layer of a thermoplastic layer adhesive tape in the lap-bonded circumferential seam filling the space between and adjoining in heat-bonded relation the inner and outer laps, fully wrapping therein the exposed metal end edge of the



inner lap, and uniformly covering, along the entire circumference thereof, a portion of the inner face of the inner lap, said adhesive layer in the lap-bonded seam being compressed between the inner and outer circumferential laps to such an extent that a portion of the adhesive resin filling the space between the inner and outer laps is forced to flow out of the lap portion to form a protruded portion of adhesive resin and such that the adhesive layer present in the lap-bonded seam satisfies the following requirement:

$$0.95 \geqq \frac{Sl}{l_o \times lo} \geqq 0.05$$

wherein Sl stands for the sectional area (mm^2) of the adhesive layer present in the lap-bonded portion,

l_o stands for the width (mm) of the lap-bonded portion, and

t_o stands for the thickness (mm) of the adhesive tape present on the inner side of the inner open end portion.

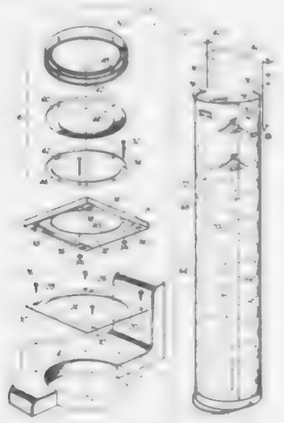
10. In a process for the production of metal vessels having a circumferential side seam by lap-bonding to each other the open ends of lower and upper protective resin covered seamless molded metal cup members through an adhesive to form a circumferential side seam, the improvement comprising applying a thermoplastic resin adhesive tape to the outer side face of the open end portion of the molded cup to be located on the inner side of the resulting circumferential side seam such that a part of the adhesive tape protrudes from said open end portion, bending the protruding portion of the adhesive tape inwardly to wrap the end edge and adjoining inner face of said open end portion in the bent protruding portion of the adhesive tape, fusion-bonding the bent adhesive tape to said open end portion, telescopically fitting the other molded cup over the fusion-bonded adhesive tape-applied molded cup, thereby placing the fusion-bonded adhesive layer between the open end portions of both the molded cups under compression, and fusing the compressed adhesive layer so as to bond both the open end portions to each other and so that the difference between the outer diameter of the inner open end portion and the inner diameter of the outer open end portion is 0.1 to 1.9 times the thickness of the adhesive tape, and a portion of the adhesive resin between the open end portions forming the circumferential side seam is forced to flow out from between the open end portions to form a protruded portion of adhesive resin thereby further increasing the strength and barrier properties of the circumferential side seam.

4,858,783

DISPENSERS

John T. Mayfield, III, Clarkston, Ga., assignor to Modular Engineering Corporation, Stone Mountain, Ga.

Filed Mar. 1, 1988, Ser. No. 162,657
Int. Cl.[4] B65H *1/08*
U.S. Cl. 221—59 9 Claims



1. A dispenser which extends through an opening in a mounting surface, comprising:
(a) a mounting template having an opening corresponding to the opening in the mounting surface;
(b) a plurality of mounting fasteners which fasten the mounting template to the mounting surface;
(c) a face plate having an opening corresponding to the opening in the mounting surface and keyed holes to capture the mounting fasteners so that the face plate is removably attached to the mounting template;
(d) a trim assembly attached to the face plate comprising:
(i) a trim rim body, a lip for connecting the trim assembly to a container assembly, and a retainer fastened together by a plurality of trim assembly fasteners; and
(ii) a trim rim slidably fitted on the trim rim body;
(e) a plurality of face plate fasteners which fasten the trim assembly to the face plate; and
(f) a container assembly attached to the trim assembly so that the container assembly and the trim assembly are removable as a unit with the face plate, comprising:
(i) a container body;
(ii) a plurality of container fasteners for fastening the container body to the retainer of the trim assembly;
(iii) a follower which slides inside the container body;
(iv) a spring for forcing the follower and thus items in the dispenser toward the trim assembly; and
(v) a stabilizer member attached to the container body and the follower for stabilizing the follower.

4,858,784

GOLF TEE DISPENSER

Robert P. Moody, 6251 Timberlake Dr., E-4, Sarasota, Fla. 34243

Filed Apr. 28, 1988, Ser. No. 187,307
Int. Cl.[4] G07F *11/16*
U.S. Cl. 221—155 8 Claims

1. A golf tee dispenser for receiving, holding and dispensing a plurality of golf tees comprising:
an elongated rigid generally straight cylindrical tube having open ends and having an inside wall with an interior diameter sized to receive the enlarged head of a conventional golf tee for free sliding movement therein without permitting the shank of one tee from passing the head of a tee below it;
two diametrically opposed apertures in wall portions of said tube adjacent one of its open ends;
a relatively thin, elongated elastic member disposed in tension through and between said apertures permitting the shank of a tee to pass on either side thereof;
said elastic member tensioned sufficiently to retain golf tees within said tube unless manually removed and extendible sufficiently to be displaced to said inside wall of said tube as a tee is manually removed.

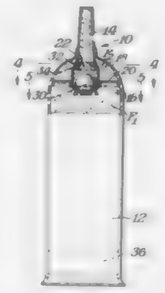


4,858,785

MULTIPLE FLUID DISPENSER

William T. Wilkinson, Kemblesville, Pa., assignor to Package Research Corporation, Cleveland, Ohio

Filed Apr. 4, 1988, Ser. No. 164,454
Int. Cl.[4] B65D *35/22*
U.S. Cl. 222—145 10 Claims



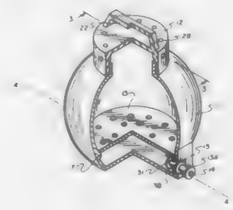
1. A dispenser for dispensing two distinct fluids from a common outlet comprising a container open at its bottom and closed at its top, a dispensing spout at said top of said container in communication with the interior of said container, a first chamber in said container extending from the lower end of said container to the upper end of said container, a first fluid in said first chamber, a second chamber in said container at said upper end, a second fluid in said second chamber, an axially disposed mixing chamber communicating with said spout and with said first chamber and with said second chamber, said second chamber being a sleeve around said mixing chamber, said mixing chamber being an extension of said spout at the lower end of said pout, said mixing chamber being open at its lower end and in axial communication with said first chamber, mixing ports around the periphery of said mixing chamber communicating with said second chamber whereby said second fluid may flow through said ports and mix with said first fluid in said mixing chamber, a plunger in the bottom of said first chamber and mounted for movement only in the upward direction to form the bottom of said first chamber and control the volume of said first chamber to maintain said first chamber filled with said first fluid, said spout being tiltable to force said first fluid and said second fluid to mix in said mixing chamber and be jointly discharged from said spout, and ridges on the inner surface of said mixing chamber associated with said mixing ports to prevent said ball valve from closing said mixing ports from preventing the mixed fluids to flow through said spout.

4,858,786

BEVERAGE CONTAINER POSSESSING AN IMPROVED SUPPORT PLATE TO EFFECT MORE RAPID CARBONATION

Lee J. Eagar, P.O. Box 622, La Verkin, Utah 84745

Filed Mar. 4, 1988, Ser. No. 164,328
Int. Cl.[4] B67D *5/38*
U.S. Cl. 222—158 5 Claims



1. A beverage container comprising in combination an outer housing shell having an opening at the top, a water level mark on the side near the top of the housing and a fluid-flow release valve extending through an opening near the bottom side of the said housing, a removable support plate resting near but above the bottom of the said housing and possessing a tongue hinged onto said plate with the tongue extending over the interior end of the fluid flow valve and being bent down and around said fluid-flow valve, and said support plate being adapted for holding solid cooling means to be added to the container, a lid for the container having a side flange and a top wall integral therewith, the interior side of the flange being adapted to being removably engaged with the top of the housing, and vent means in said lid to permit removal of any vapors formed inside the housing.

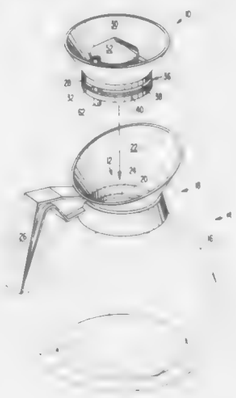
4,858,787

TOP ASSEMBLY FOR COFFEE POTS INCORPORATING ECCENTRIC LIQUID TRAP AND RETAINER THEREFOR

Wayne B. Stone, Birch Tree, Mo., assignor to Wood Manufacturing Co., Inc., North Flippin, Ark.

Continuation-in-part of Ser. No. 896,712, Aug. 15, 1986, which is a continuation-in-part of Ser. No. 532,980, Sep. 16, 1983, abandoned, and a continuation of Ser. No. 921,881, Oct. 22, 1986. This application Apr. 22, 1988, Ser. No. 184,815
Int. Cl.[4] A47G *19/14*
U.S. Cl. 222—188 5 Claims

1. In combination, an open mouth coffee port and a top assembly for said coffee pot;
said coffee pot having a restricted coffee pot neck portion, an outwardly flaring coffee pot pour lip extendingly upwardly from said neck portion, and an outwardly flaring shoulder extending downwardly from said neck portion;
said top assembly, including a liquid trap, interfitted with said open mouth, said top assembly having a top assembly neck portion closely interfitting, and surrounded by, said coffee pot neck portion,
an outwardly flaring top assembly pour lip extending upwardly from said top assembly neck portion and overlying and engaging the coffee pot pour lip, and an extension member extending downwardly from said top assembly neck portion, said extension member having a circumferential groove immediately below said top assembly neck portion;



a retainer ring seated in said circumferential groove formed in said top assembly, said retainer ring having a contracted diameter less than the diameter of said coffee pot neck portion whereby the contracted retainer ring can pass through said restricted neck portion, said retainer ring having an uncontracted diameter greater than the diameter of said neck portion, said uncontracted retainer ring engaging said outwardly flaring shoulder on said coffee pot thereby biasing said top assembly pour lip into seating engagement with said coffee pot pour lip.

4,858,788

DISPENSING DEVICE FOR DISPERSING LIQUID FROM A CONTAINER

Fritz Meckenstock, Wuppertal, Fed. Rep. of Germany, assignor to Mega Plast product- u. Verpackungsentwicklung Marketing Gesellschaft mit Beschränkter Haftung & Co., Nuremburg, Fed. Rep. of Germany

Filed Sep. 23, 1987, Ser. No. 101,120
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633173; Jul. 8, 1987, 3722553
Int. Cl.[4] B65D *37/00*
U.S. Cl. 222—207 24 Claims

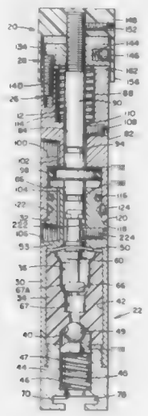
1. A dispensing device for the dispensing of liquid from a container, comprising
a manually actuatable liquid dispensing device operatively connectable to the container,
an elastically expandable storage chamber,
the liquid dispensing device is connected to said storage chamber so as to feed liquid in the container into the storage chamber,
means comprising an outlet for the stored liquid communicating with said storage chamber,
a spring having snap action with residual restoring force,
a control valve on an outlet side of said storage chamber is moved into an open position in a snapped-over position of the spring,
the spring is formed with a central opening,

a wall of said storage chamber in a basic position is opposite a convex side of the spring,



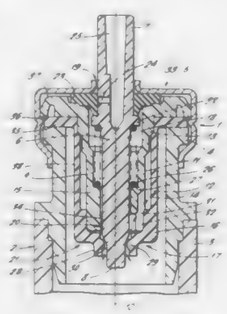
a ram passes through said central opening,
said ram has a free end engageable with the control valve.

4,858,789
SEALLESS MODULAR POSITIVE DISPLACEMENT DISPENSER
John P. Breault, New Britain, and Ewald F. Dickau, Glastonbury, both of Conn., assignors to Loctite Corporation, Newington, Conn.
Filed Apr. 4, 1988, Ser. No. 176,875
Int. Cl.[4] G01F *11/06, 11/30*
U.S. Cl. 222—309 32 Claims



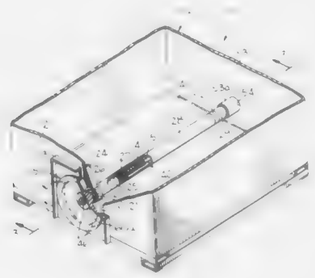
1. Positive displacement pump apparatus for dispensing precise quantities of a fluid product comprising:
a housing defining a fluid product reservoir and having an inlet for delivery of pressurized fluid product to said reservoir and including a closure surface defining an outlet for dispensing the fluid product from said reservoir;
a chamber intermediate said reservoir and said closure surface for receiving fluid product from said reservoir and for dispensing fluid product through the outlet in said closure surface closure means normally biased to a closed position in engagement with said closure surface;
actuator means including an operation mechanism and an actuator shaft member extending away from said operative mechanism a stem member coaxially with and mounted on said actuator shaft member;
a product piston mounted to an extremity of said stem member, distant from said operative mechanism, and movable between an inactive position within said reservoir withdrawn from said chamber and an active position sealingly, slidably received within said chamber to move said closure means, by means of the fluid product within said chamber, to an open position and thereby dispense the fluid product from said chamber; and
sealless sealing means fixed to said housing and to said stem member and extending therebetween for isolating said reservoir from said operative mechanism, said sealing means being deformable to permit movement of said product piston between said inactive and active positions.

4,858,790
COLLAPSIBLE CHAMBER METERING VALVE
David J. Howlett, Norfolk, United Kingdom, assignor to Bespak PLC, King's Lynn, England
Filed Aug. 25, 1988, Ser. No. 236,398
Claims priority, application United Kingdom, Sep. 7, 1987, [illegible]
Int. Cl.[4] B65D *83/14*
U.S. Cl. 222—402.2 4 Claims



1. A collapsible chamber metering valve for use in a pressurised dispensing container comprising a generally cylindrical body, an elastomeric sleeve coaxially overlaying the body and defining a collapsible chamber therebetween, the body defining an internal chamber, channel means providing a fluid flow-path between the internal chamber, and the collapsible chamber, an axially slidable valve actuating stem extending coaxially through the internal chamber, outlet valve means operable between the stem and the body at the outer end of the internal chamber so as to dispense fluid therefrom in an open condition of outlet valve means and inlet valve means operable between the sleeve and the stem at the inner end of the collapsible chamber to admit fluid thereto in a closed condition of outlet valve means wherein the inlet valve means comprises an annular, seal portion of the sleeve co-operating with an inner end portion of the stem extending therethrough and, wherein the sleeve further comprises an annular shoulder portion nestably receiving the inner end of the body, the shoulder portion and the seal portion being integrally formed of relatively thick and thin material respectively whereby the shoulder portion and seal portion are relatively rigid and flexible respectively so as to positively locate the sleeve upon the valve body whilst permitting deformation of the seal portion.

4,858,791
BULK MATERIAL CONTAINER WITH A DOOR MOVABLE OVER A RECTILINEAR PATH
Clarence B. Coleman, Oakland, Calif., assignor to Fabricated Metals, Inc., San Leandro, Calif.
Filed Mar. 29, 1984, Ser. No. 594,840
Int. Cl.[4] B65D *47/00*
U.S. Cl. 222—510 4 Claims



1. A bulk material container comprising:
(a) a bulk material container shell having an exterior wall with an opening formed therein;
(b) a door having a wall disposed in confronting parallel relation with the wall of said shell, said door being arranged to open and close said opening, said door having fixed thereto a door aligner projecting toward the interior of said container shell;
(c) a screw actuating means for imparting movement to said door along a rectilinear path for the opening and closing of said opening and for moving said confronting parallel wall of said door toward and away from said wall of said shell;
(d) a gasket disposed exteriorly of said shell between said confronting parallel walls of said door and said shell, said gasket being arranged to surround said opening exteriorly of said shell and arranged to be compressed between said confronting parallel walls of said door and said shell to form a seal while said door closes said opening; and
(e) aligner guide means fixedly disposed within said container shell for guiding said door aligner to select the orientation of said door upon closure with said opening,
(f) said screw actuated means comprising internally threaded tubular means fixedly positioned within said shell, a threaded shaft disposed in threaded engagement with said threaded tubular means, and means on said threaded shaft engaging said door to move said door along a rectilinear path in response to the rotation of said threaded shaft to open said opening and to close said opening,
said opening being formed in said wall of said shell and another opening being formed in an opposite wall of said shell, said screw actuating means further comprising means at each end portion of said threaded shaft for rotating said threaded shaft at either end thereof, one of said means being accessible in the vicinity of said first mentioned opening and other of said means being accessible in the vicinity of said other opening formed in said opposite wall.

4,858,792
STORAGE AND DISPENSING DEVICE
Vincent de Laforcade, Vincennes, France, assignor to L'Oreal, Paris, France
Filed Dec. 24, 1987, Ser. No. 137,728
Claims priority, application France, Dec. 30, 1986, 86 18344
Int. Cl.[4] B67D *3/00*
U.S. Cl. 222—533 10 Claims

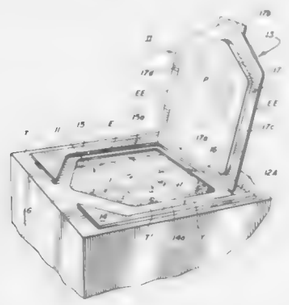


1. A unit for storing and dispensing a liquid product, the unit comprising:
a container for the product to be dispensed, said container having a discharge means including an outlet conduit,
a dispensing head including a first part mounted on said container and a second part which includes a push button, said push button comprising internally a first duct and a second duct in communication with said first duct, said second duct communicating with an outlet duct of an elongate applicator which constitutes one piece with said push button, said second part being movable relative to said first part around a hinge to allow displacement of said second part between a storage position and a dispensing position in which dispensing position, said outlet conduit of said container is in communication with said first duct of said push button and the applicator is oriented substantially perpendicular to the container so that when a user acts on said push button, the product will be dispensed from said outlet conduit through said push button and applicator, and in said storage position, said push button is displaced out of communication with said outlet conduit and said applicator is oriented substantially parallel to and alongside the container.

4,858,793
POUR SPOUT CLOSURE
James L. Stone, Grand Rapids, Mich., assignor to Packaging Corporation of America, Evanston, Ill.
Filed Aug. 22, 1988, Ser. No. 235,426
Int. Cl.[4] B65D *39/04*
U.S. Cl. 222—541 10 Claims

1. A pour spout closure of unitary construction for fixedly mounting proximate an opening formed in a surface of a container, comprising a base section adapted to be affixed to the container surface circumjacent the opening, said base section including marginal portions forming a dispensing aperture in substantial registry with the container opening and foldable flap means disposed in folded fixed relation with predetermined marginal portions, said folded flap means having a peripheral segment projecting into an area defined by a perimeter of the dispensing aperture; and a cover section hingedly connected to said base section and selectively movable relative thereto between open and reclose positions, said dispensing aperture being exposed when said cover section is in an open position, said cover section including a protuberance sized to enter the container opening when the cover section is in a

reclose position, and a laterally extending rim in substantially encompassing relation with an exposed surface of said protuberance, said cover section having a predetermined portion



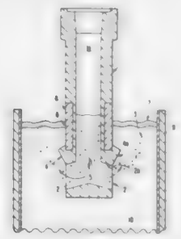
thereof in frictional engagement with said flap means peripheral segments whereby said cover section is retained in reclose position.

4,858,794

SUBMERGED NOZZLE FOR STEEL CASTING

Sadanobu Sugiura, Anjo; Kunishige Tokunaga, and Teruhisa Kawashima, both of Kariya, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,789
Claims priority, application Japan, Jun. 5, 1987, 62-139670
Int. Cl.[4] B22D *35/00*
U.S. Cl. 222—606 **11 Claims**



1. A nozzle which is submersible into molten metal during steel casting, comprising:

(a) a nozzle body having a lower end portion for submersion into molten metal and an upper end portion,

(b) a nozzle passage provided through said nozzle body such that a molten metal and gas stream can be introduced into said nozzle body at said upper end portion, and

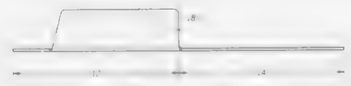
(c) at least one downwardly-directed discharge port which is inclined downwardly away from said lower end portion, wherein said discharge port (i) is bordered at the upper portion thereof by a part projecting from said nozzle body that presents a surface upwardly inclined away from the longitudinal axis of said nozzle body and (ii) lacks downwardly directed surfaces against which gas bubbles exiting through said discharge port would collide.

4,858,795

DEVICE FOR AIDING IN THE PUTTING ON OF STOCKINGS OR THE LIKE

George J. Selinko, 2021 N.E. 31st Ct., Lighthouse Point, Fla. 33064

Filed Apr. 27, 1988, Ser. No. 186,592
Int. Cl.[4] A47G *25/90*
U.S. Cl. 223—111 **12 Claims**



1. A device for aiding the putting on of a stocking comprising:

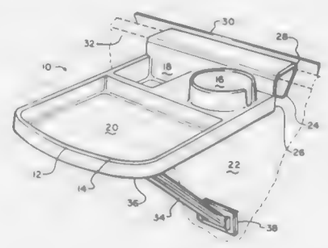
a member having a slidable surface and including a U-shaped portion on a front end extending into a flat base portion on the back end, said member further having an outwardly extending protrusion on the front end, said U-shaped portion having a flat bottom base connected to opposed side walls extending upwardly from said flat bottom base of said U-shaped portion, said flat base portion lying within the same plane as the flat bottom base to form a continuously smooth unitary-bottom surface, said sidewalls and said flat bottom base having substantially smooth-exterior surfaces to permit a stocking to easily slide over the surfaces, wherein a bunched up stocking is easily slidable over the outwardly extending protrusion on said front end over said side walls forming a cavity for inserting a first foot, and further wherein said U-shaped portion remains stationary due to pressure exerted by the second foot on said flat base portion to permit the first foot to slide over the bottom base and into the stocking cavity, said substantially smooth-exterior surfaces permitting the stocking to easily slide off the U-shaped portion onto the first foot to aid the individual in putting on the stocking.

4,858,796

VEHICLE TRAY

Charles S. Roth, 31505-5 Lindero Canyon Rd., Westlake Village, Calif. 91361

Filed Apr. 7, 1988, Ser. No. 178,543
Int. Cl.[4] B60R *7/00;* **B60N** *3/10*
U.S. Cl. 224—42.44 **4 Claims**



1. A vehicle tray comprising:

a horizontal member having an outer end, an inner end, a top, and a bottom;

a hook means coupled to said outer end for hooking either into the space between a window and an inner door panel of a vehicle or onto a partially raised window;

arm mounting means on said bottom;

an arm having a tray end and a door end, said tray end rotatably mounted in said arm mounting means; and

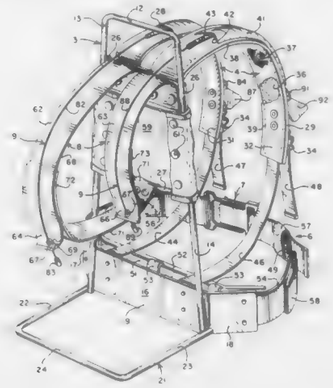
a fastener means having a first fastener portion on said door end and a second fastener portion for permanently attaching to said inner door panel, said fastener means removably retaining said door end of said arm on said inner door panel.

4,858,797

FIRE HOSE BACKPACK FRAME

William G. Rabaka, 502 Kinglet Ct., Suisun City, Calif. 94585

Filed Feb. 1, 1988, Ser. No. 150,826
Int. Cl.[4] B65H *75/40;* **B65D** *83/04*
U.S. Cl. 224—162 **16 Claims**



1. A backpack for carrying on the back of a wearer at least one hose spirally coiled as an integral unit about an axis perpendicular to the plane of the spirally coiled hose unit and having a central aperture formed about said axis, said spirally coiled hose unit being normally releasably bound as a unit to said backpack with said axis perpendicular to the back of said wearer, whereby said spirally coiled hose unit may be selectively quickly and easily unbound from said backpack and deployed by the wearer of the backpack while still wearing the backpack by the natural body movement of lowering the shoulder corresponding to the direction in which it is desired to deploy the unitary spirally coiled hose for extension and use after deployment, comprising:

(a) a backpack frame assembly on which said at least one spirally coiled hose unit is adapted to be releasably supported and including a rigid frame portion having a first section oriented parallel to the back of a wearer when the backpack is donned and a second section on which said at least one spirally coiled hose unit is adapted to be supported;

(b) a shoulder strap assembly mounted on the rigid frame portion for suspending said rigid frame portion on the shoulders and parallel to the back of a wearer;

(c) a spirally coiled hose unit retention assembly means mounted on said first section of said rigid frame portion and extending around and through the central aperture of said spirally coiled hose for releasably retaining said at least one spirally coiled hose on said rigid frame portion with the axis of said coil perpendicular to the back of a wearer; and

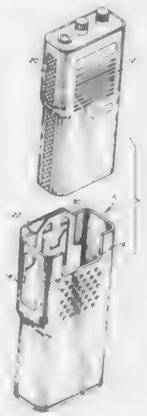
(d) a spirally coiled hose unit release assembly means cooperatively associated with said hose unit retention assembly means and selectively manipulable by a wearer while the backpack is still donned to release from said first section of said rigid frame portion said at least one spirally coiled hose unit, whereby said spirally coiled hose unit may be deployed as a unit from said rigid frame portion by lowering the shoulder corresponding to the direction in which the spirally coiled hose unit is to be deployed from said second section.

4,858,798

CARRY CASE WITH QUICK RELEASE AND SELF LOCATING RETAINER APPARATUS

Craig F. Siddoway, Ft. Lauderdale; Julio C. Castaneda, Miami, and Peter D. Iezzi, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 29, 1988, Ser. No. 161,824
Int. Cl.[4] B65D *25/10*
U.S. Cl. 224—242 **7 Claims**



1. A carry case for a portable hand held appliance wherein said appliance is provided with a feature thereon for affixing a mounting clip thereto, including in combination:

on enclosed carry case being open at a top end for housing the portable appliance,

a retainer bracket of semirigid material attached to the interior back wall of the case,

said retainer bracket having self-locating means for centering the portable appliance clip mounting feature and latching means for retaining the portable appliance within said carry case,

said retainer bracket having a top portion thereof extending upwardly from the carry case and moveable by a user's hand to force said latch means from engagement with said clip mounting feature and thereby serve as an automatic quick-release to permit removal of the appliance from the case; and

flap means secured to the exterior of said case for supporting said case on the belt of the user.

4,858,799

THREE WAY LOCKING SYSTEM FOR A HAND GUN IN A HOLSTER

Duane E. Young, 3224 E. Greenway La., Phoenix, Ariz. 85032

Filed Oct. 28, 1988, Ser. No. 264,068
Int. Cl.[4] F41C *33/04*
U.S. Cl. 224—243 **7 Claims**

1. Apparatus for releasably retaining a hand gun in a holster, the hand gun having at least a barrel, said apparatus comprising:

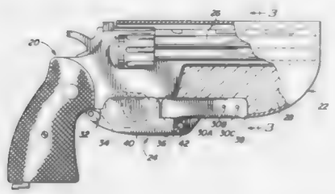
means for aligning the barrel of the hand gun in the holster about a longitudinal axis of the barrel and for essentially restricting movement of the barrel to a direction along said longitudinal axis;

means for releasably retaining the hand gun in the holster, said means for releasably retaining the hand gun in the holster having an engaged position and a disengaged position, said engaged position providing for retention of the hand gun in the holster and said disengaged position providing for release of the hand gun from the holster,

said means for releasably retaining the hand gun further comprising:

means for fastening said means for releasably retaining the hand gun to the holster;

means for locking said means for releasably retaining the



hand gun in the holster for preventing removal of the hand gun from the holster;

means for adjusting a releasing force required to remove the hand gun from the holster when said means for locking is released, said locking means and said adjusting means being operable from a single control.

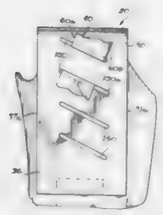
4,858,800

HOLSTER WITH ADJUSTABLE RETAINING STRAP

James O. Holtzclaw, Jr., Broomfield, and Marvin A. Novotny, Denver, both of Colo., assignors to The Hunter Company Inc., Westminster, Colo.

Continuation of Ser. No. 948,105, Dec. 31, 1986, abandoned. This application Mar. 8, 1988, Ser. No. 169,155
Int. Cl.[4] F41C *33/02*
U.S. Cl. 224—243 2 Claims





1. A handgun holster for receiving a handgun comprising:

a pocket member including front and back walls each having upper and lower ends, the front and back walls joined together to define a handgun-retaining pocket with an upper end defining a handgun-receiving opening;

an elongated loop-forming portion having a longitudinal axis, and a free end, and extending from the back wall upper end and bent so that the loop-forming portion free end is downwardly extending, said loop-forming portion further having a plurality of slot-forming edges forming a series of generally parallel, spaced apart, elongated strap-receiving slots, each having a longitudinal axis extending at an acute angle to the longitudinal axis of said loop-forming portion;

means for joining the free end of said loop-forming portion to said back wall;

a double-ended elongated retaining strap for retaining a handgun in said pocket, said strap having a cross section dimensioned for insertion through said strap-receiving slots, an enlarged free end with outwardly extending ears for engaging said loop-forming portion adjacent a slot-forming edge thereof to prevent unintentional withdrawal of said free end through said slots and said retaining strap further including a second free end overlying at least a portion of said front wall; and

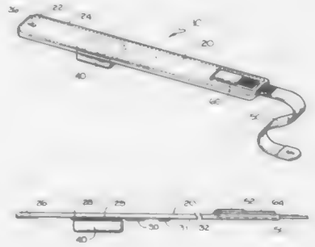
means for releasably securing the second free end of said retaining strap to said front wall.

4,858,801

GUITAR STRAP

Manuel Sameniego, 1026 Darwin Place, San Diego, Calif. 92154

Filed Mar. 14, 1988, Ser. No. 167,501
Int. Cl.[4] G10D *3/00*
U.S. Cl. 224—264 12 Claims



1. A guitar strap comprising:

a narrow band of flexible material having a top side and bottom side, said bottom side having a bottom anchor member located thereon;

cushion means having a cushion coupling member connected thereto for detachably affixing said cushion means to said anchor on the bottom side of said band;

so that said cushion member is readily detachable from said band and capable of being affixed onto said anchor member at differing desired positions laterally along said bottom side of said band; and

an end belt having a belt coupling member connected to one side thereof;

said band further having an end portion defining a tunnel for slidably receiving said end belt, said end portion having an outer surface, and an end anchor member located on said outer surface of said end portion for detachably affixing said end belt to said end anchor member after sliding said end belt through said tunnel, and wherein said end portion includes a reinforcing member connected thereto so that said reinforcing member counteracts the force exerted by said end belt when said strap is in use.

4,858,802

WATER SKI STORAGE RACK FOR BOATS

Rodney L. Hamby, Rte. E, Box 707A; Ronald L. Hamby, both of Rte. E, both of, Caulfield, Mo. 65626, and Grant Q. Haden, P.O. Box 698, Ava, Mo. 65608

Filed Jul. 10, 1987, Ser. No. 71,775
Int. Cl.[4] B60R *9/12;* F16M *13/02*
U.S. Cl. 224—273 17 Claims



1. A rack for storing water skis and the like on a boat, the rack comprising at least two laterally spaced generally parallel rack members, each rack member comprising:

two generally perpendicular arms, each arm being sloped with respect to vertical and horizontal to form a generally upwardly-facing V-shaped support for receiving the skis;

a base adapted to mount the V-shaped support on the boat outside of the cockpit, the base and the V-shaped support being separate; and

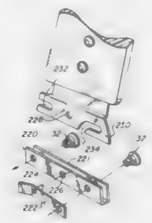
means for resiliently connecting the base and the support to allow the support to resiliently deflect relative to the base in response to applied pressure.

4,858,803

INVISIBLE MOUNT ROOF RACK

Gary A. Gerber, Weston, Conn., assignor to Gerber Group, Ltd., Bridgeport, Conn.

Filed Jul. 16, 1987, Ser. No. 74,521
Int. Cl.[4] B60R *9/04*
U.S. Cl. 22.4—329 22 Claims



1. A roof rack section for motor vehicles, said motor vehicles having a roof return on each side of the vehicle roof, said roof return having outwardly extending support pins, comprising:

a hollow transverse channel beam;

leg sections for joining to said transverse channel beam, at least one such leg section and said transverse beam being movable in relation to each other;

foot plates having lower and upper ends, said lower ends having lower edges and side edges, said upper ends being shaped for joining to said leg sections, each said foot plate having a curved slot extending from the lower edge of said foot plate, and each said foot plate having a straight slot extending from one side edge of said foot plate, said slots being shaped to fit into said support pins extending outwardly from said roof returns and to trap said pins, and each said foot plate having an opening for a locking pin therein; and

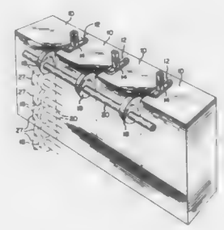
means for drawing together said transverse beam and said movable leg section.

4,858,804

METHOD AND APPARATUS FOR SEPARATING INTERCONNECTED STACKS

Kenneth J. Sharp, Jr., 2725 SW. 216th, Aloha, Oreg. 97006

Filed Jan. 5, 1988, Ser. No. 141,295
Int. Cl.[4] B26F *3/02*
U.S. Cl. 225—2 13 Claims



1. A method for separating a pack of multiple stacks of paper sheets that are interconnecting in side edge-to-side edge relation, the junctures interconnecting the stacks being scored to enhance separation, which comprises;

(a) confining the pack in a rack including impacting means aligned with the junctures,

(b) impacting the juncture of the pack by a lifting and twisting action applied to the junctures by the impacting means, said impacting being applied to discrete segments of the pack height and progressively encompassing the entire pack height to establish a partial separation of the stacks of the pack, and

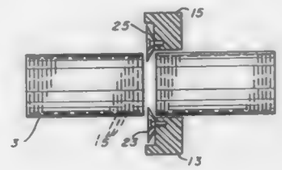
(c) forcing a pivotal spreading of the adjacent stacks to complete the separation thereof.

4,859,805

METHOD FOR OPENING A WRAPPED ROLL OF COINS

Stanley Hochfeld, Howard Beach, N.Y., assignor to Leonard Holtz, Oceanside, N.Y.

Division of Ser. No. 933,756, Nov. 21, 1986, abandoned. This application May 16, 1988, Ser. No. 194,409
Int. Cl.[4] B26F *3/02*
U.S. Cl. 225—2 14 Claims



1. A method for opening a wrapped roll of coins, comprising:

placing a wrapped roll of coins in an opening between inner facing portions of said first and second elements, each

element having opposite end portions, said first and second elements being joined together at only end portion thereof and being spaced apart from each other along the length thereof to form said opening therebetween, said first and second elements being relatively movable about said joined end portions, said first and second elements extending transversely relative to the longitudinal axis of said wrapped roll of coins and each of said first and second elements having an outer gripping surface which is grippable by a hand of a user;

relatively moving said first and second elements toward each other with said wrapped roll of coins received in said opening therebetween for engaging said wrapped roll of coins between at least one cuter means which is fixedly mounted on at least one of said first and second elements and support means on the other of said first and second elements, said cutter means being immovable relative to said at least one of said first and second elements to which it is mounted, and said cutter means being positioned in the vicintiy of said opening and facing said wrapped roll of coins and having at least one edge extending toward said wrapped roll of coins which is selectively engageable against said wrapped roll of coins received in said opening, said at least one edge of said cutter means extending in a direction substantially transverse to said longitudinal axis of said wrapped roll of coins;

manually applying a squeezing force to said outer gripping surfaces of said first and second elements by a hand of a user to cause said first and second elements to relatively move toward each other and to forcedly move said cutter means against said wrapper of said wrapped roll of coins to at least weaken said wrapper, in a direction transverse to said longitudinal axis of said wrapped roll of coins, where said cutter means is forced thereagainst; and then

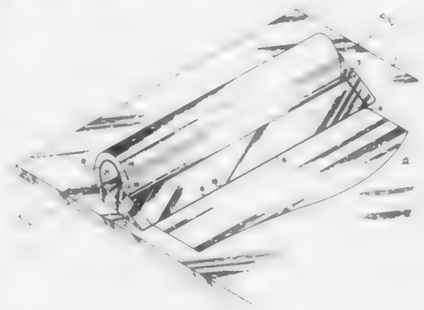
breaking said wrapper of said wrapped roll of coins at said at least weakened portion thereof and removing said coins from the broken wrapper.

4,858,807

TRACE CUTTER FOR ROLL MATERIAL

Sava Cvek, 142 Pearl St., Cambridge, Mass. 02139

Filed Jul. 22, 1986, Ser. No. 888,708
Int. Cl.[4] B65D *85/672*
U.S. Cl. 225—58 **21 Claims**



1. Apparatus for cutting sheet material wound about an open-ended roll, such roll having the form of a cylindrical shell of length L with a roll axis, wherein the apparatus comprises:

a blade member of length L lying generally within a tapered profile and having a cutting edge extending from a first end to a second end of the blade member;

opposing first and second arms affixed to the blade member at respective first and second ends thereof;

positioning means affixed to each arm at an end thereof distal to the blade member for moving under the influence of gravity within the cylindrical shell when the roll is hand held so as to position the blade member parallel to the roll axis,

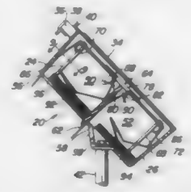
wherein the arms hold the blade member such that the blade pendulously assumes said parallel position with its cutting edge oriented away from said roll, said cutting edge being radiused so as to define, when urged against a work table, a line of contact at said cutting edge for cutting said sheet material.

4,858,808

TICKET DISPLAY AND DISPENSER

Christopher E. Schafer, R.R. 2, Adair, Iowa 50002

Filed Feb. 1, 1988, Ser. No. 150,956
Int. Cl.[4] B26F *3/02*; B65H *35/10*
U.S. Cl. 225—32 **17 Claims**



1. A ticket display and dispenser comprising a box having opposite side walls, top and bottom ends, a back wall and an open front delineated by coplanar front edge portions of the side walls and top and bottom ends and providing a compartment for containing a ticket series made up of a plurality of series-connected tickets, said back wall having a ticket exit slot extending transversely between the side walls; ticket display means carried by the box and including upper and lower transverse guide elements spanning the side walls in close proximity to the front edge portions of the side walls, the upper guide element being generally at the level of the ticket exit slot and the lower guide element being spaced above the bottom of the box to provide a transverse ticket entry slot through which a ticket series is fed forwardly for upward travel over the lower guide element to and rearwardly over the upper guide element for exit through the ticket exit slot.

4,858,809

TAPE HANDLING APPARATUS

Barrett P. Bingaman, Glendale; Richard G. Krum, Thousand Oaks, and James R. Williams, Sun Valley, all of Calif., assignors to Cetec Corporation, El Monte, Calif.

Filed May 27, 1987, Ser. No. 54,745
Int. Cl.[4] B65H *20/14, 20/12, 20/28*
U.S. Cl. 226—95 **27 Claims**

1. In a tape handling apparatus for storing an endless loop of tape in a bin and moving the tape from a bin exit past a reproduce head assembly to a bin entrance, the improvement including in combination:

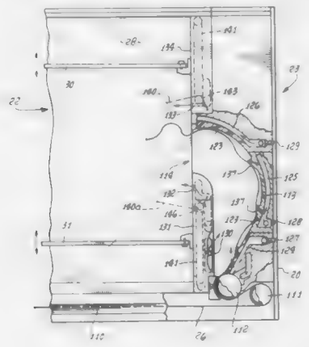
a tape injection assembly positioned at said bin entrance for injecting tape into said bin, and including

tape injection drive means for moving said tape at a first forward speed, and

an entrance guide wall defining a curved tape path between said tape injection drive means and said bin entrance, which curved tape path is concave when viewed from the bin,

said entrance guide wall including separating means for separating the tape from said guide wall as the tape moves therealong, and with said guide wall spaced from the remainder of the tape handling apparatus providing an open space for said tape separation, and

with said tape injection drive means positioned to move the tape toward and along said entrance guide wall producing



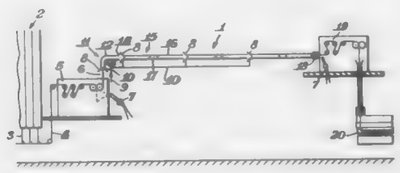
a curved tape path and a serpentine tape shape reducing the tape forward speed prior to entering said bin.

4,858,809

CONVEYING OF FILAMENT BUNDLES OVER LONG CONVEYING SECTIONS

Dieter Paulini, Dormagen; Peter Schmitz-Bastian, Erftstadt/Liblar; Wolfram Wagner, and Günter Bieber, both of Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 10,461, Feb. 3, 1987, abandoned. This application May 17, 1988, Ser. No. 194,885
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1986, 3604819
Int. Cl.[4] B65H *20/10*
U.S. Cl. 226—97 **2 Claims**



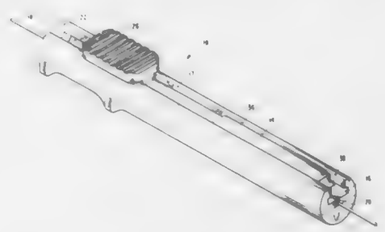
1. A process for conveying continuous fiber filaments from a first operational stage to a distant operational stage comprising the steps of initially introducing the fiber filaments into a first air injector at the front of a conveyor channel, pneumatically moving the fiber filaments through the first air injector and the conveyor channel by creating and maintaining an air flow stream through the channel, allowing the air flow stream to escape at spaced apart locations along the conveyor channel while injecting air into the channel at those locations in order to continue pneumatic movement of the filaments through the channel, mechanically guiding the fiber filaments within the conveyor channel, continuing to pneumatically convey and mechanically guide the fiber filaments through the conveyor channel until the filaments reach the distant operational stage, terminating the air flow stream when the filaments reach the distant operational stage, and pulling the filaments from the first operation stage to the distant operational stage through the coneyor channel, while continuing to mechanically guide the fiber filaments within the conveyor channel.

4,858,810

QUICK ACTING PIN VISE FOR USE WITH ANGIOGRAPHIC GUIDEWIRES

Michael J. Intlekofer, Bellevue, and Michael W. Slota, Bothell, both of Wash., assignors to Heart Technology, Inc., Redmond, Wash.

Filed Apr. 30, 1987, Ser. No. 44,172
Int. Cl.[4] A61B *17/00*; B65H *20/00*
U.S. Cl. 226—127 **7 Claims**



1. A pin vise which may be attached to a medical guidewire comprising:

an elongated, cylindrical body portion having a slot which runs substantially parallel to the axis of said cylindrical body portion whose cross-section is shaped to receive a guidewire and a means for holding said guidewire, said slot comprising a first slot portion which opens to ambient atmosphere through an elongated side of said body portion; a slot portion transverse to said first slot portion and a groove in communication with said first and transverse slot portions, said groove having a much narrower cross-section than either said first or transverse slot portion and being adapted to receive said guidewire; and

a plastic slider portion adapted to be received within said slot and slidable back and forth therein, between a remote position and a lock position, said slider portion including:

means for moving said slider portion;

means for holding said guidewire further comprising a narrow blade extending into said groove for frictional engagement with said guidewire as said slider portion is moved toward said lock position; and

means for retaining said slider portion within said body portion when said holding means is not engaging a guidewire.

4,858,811

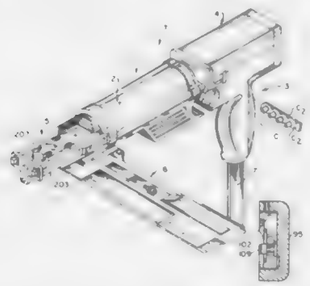
POWER ACTUATED TOOL WITH MAGAZINE FEED

James R. Brosius, and Ralph C. Brosius, both of St. Louis County, Mo., assignors to Eldorado Cartridge Corporation, Boulder City, Nev.

Continuation-in-part of Ser. No. 800,610, Nov. 21, 1985. This application Aug. 6, 1987, Ser. No. 82,385
The portion of the term of this patent subsequent to Aug. 8, 2004, has been disclaimed.
Int. Cl.[4] D25C *1/14*
U.S. Cl. 227—10 **44 Claims**

1. A fastener driving tool for use for driving a nail or other anchor into a hardened surface such as of concrete, metal, or the like, said tool useful for feeding a cartridge strip of explosive cartridges through the tool for repeated subsequent driving sequentially of a plurality of magazine fed fasteners into such a surface, said tool including a handle means, a tubular cylinder provided extending forwardly from said handle means, a cartridge chamber provided at the rear of said tubular cylinder means for contiguous reception of a cartridge therein in preparation for a firing, a piston means having a cartridge chamber operatively associated with its back end provided within the tubular cylinder means and provided for reciprocal movement therein between a set position arranged approxi-

mate the back segment of said tubular cylinder means and at its front segment as after a firing and for driving of a fastener in place, said tubular cylinder and piston means capable of being reset in preparation for a firing, a feed housing means operatively associated with said handle means and tubular cylinder, and providing an indexing of the cartridge strip through the feed housing means upon the handle means for selective positioning of a next cartridge aligned with the cartridge chamber in preparation for a next firing, a fastener housing operatively associated with the forward end of the tubular cylinder, and provided for reception singly of fastener means in preparation for a next firing, and a magazine means connecting with the fastener housing, and provided for delivery of a series of held fasteners sequentially into the fastener housing during repeat usage of the driving tool.



4,858,812

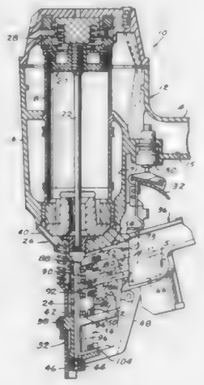
NAIL DRIVING DEVICE WITH IMPROVED NAIL FEEDING MECHANISM

William S. Fealey, Jamestown, R.I., assignor to Stanley-Bostitch, Inc., East Greenwich, R.I.

Filed Jun. 28, 1988, Ser. No. 212,484

Int. Cl.[4] B25L *1/04*

U.S. Cl. 227—116 **15 Claims**



1. In a nail driving device of the type including a portable housing having a nosepiece assembly defining a naildrive track terminating in a downwardly discharge facing end and a nail feed track extending downwardly and forwardly into lateral communication with said drive track above the discharge end thereof, a nail driving element mounted within said drive track for movement through repetitive cycles each including a drive stroke and a return stroke, power operated means for effecting the drive stroke of said nail driving element, and means for feeding successive nails from a package of such nails along said feed track into said drive track to be driven from the discharge end thereof into a workpiece during the drive stroke of said nail driving element, the improvement which comprises

the discharge end of said drive track being formed by a separate annular member formed of wear resistant material fixedly secured to a fixed portion of said nosepiece assembly,

said annular member having a bore extending therethrough defining the discharge end of said bore and presenting a forwardly facing surface portion for resisting abrasion when ring or screw shanked nails are being driven from the drive track and into a workpiece which in the normal operation of the device tend to be displaced rearwardly within the drive track with respect to the device.

3. A fastener driving device including a fastener driving element movable through repetitive cycles of operation each of which includes a drive stroke and a return stroke,

a mechanism for feeding successive fasteners from a fastener package into a position to be driven by said fastener driving element during the drive stroke thereof, the fastener package being in the form of a coil of circular headed nails interconnected in series with their shanks in spaced parallel relation selected from a number of different coils wherein the nails of the coils vary in shank length from 1½" to 4",

said mechanism comprising

a nosepiece assembly having means defining an elongated drive track receiving said fastener driving element therein during the operating cycle thereof and a nail feed track communicating laterally with said drive track,

an actuating rod having a longitudinal axis, said actuating rod being mounted on said nosepiece assembly with its axis extending in the direction of extent of said feed track for (1) pivotal movement about its axis and (2) axial reciprocating movement from a retracted position in a direction toward said drive track through a feed stroke into an extended position and from said extended position in a direction away from said drive track through a return stroke into said retracted position,

a nail feeding member mounted on said actuating rod for pivotal and axial reciprocating movements with said actuating rod and for pivotal movement relative to said actuating rod about an axis parallel with the extent of said drive track in opposite directions,

first spring means for biasing said nail feeding member to pivotally move with respect to said actuating member in one direction into a nail engaging position and for resiliently resisting pivotal movement in the opposite direction into a nail clearing position,

second spring means for effecting axial movement of said actuating rod through its feed stroke and for resiliently resisting axial movement in a direction away from said drive track,

power operated means for effecting axial movement of said actuating rod through its return stroke and for enabling said second spring means to effect the feed stroke thereof and to resiliently resist axial movement thereof in the direction away from said drive track when said actuating rod is in said extended position,

a nail holding member mounted for pivotal movement about an axis parallel with the extent of said drive track in opposite directions, and

third spring means for biasing said nail holding member to pivotally move in one direction into a nail holding position and for resiliently resisting movement in the opposite direction into a nail clearing position,

said drive track defining means including a tubular discharge end and operatively fixed surfaces leading thereto for preventing substantial lateral movement of the shank of a nail being driven in said drive track except in the position of and direction of communication of said feed track therewith,

said feed track defining means including operatively fixed laterally spaced first and second head controlling surfaces means facing inwardly with respect to said drive track in a direction away from the discharge end thereof for engaging the nail heads and supporting the nails in said feed track,

said feed track defining means further including operatively fixed laterally spaced first and second shank controlling surface means facing toward one another and disposed with respect to said first and second head controlling surface means to control nail shank movement in a direction laterally of the direction of extent of said feed track,

said nail feeding member having a leading series of teeth aligned and spaced apart in the direction of extent of said drive track and a second series of teeth aligned and spaced apart in the direction of extent of said drive track spaced apart from said leading series of teeth in the direction of extent of said feed track,

said second series of teeth having feed surface means facing toward said drive track for engaging a nail shank in said feed track and moving the leading nail in said feed track into said drive track during the feed stroke of said actuating rod when said nail feeding member is in said nail engaging position,

said nail holding member having cam surface means operable during the feed stroke of said actuating rod to be engaged by a moving nail shank to initially effect a pivotal movement of said nail holding member in said opposite direction against the resilient resistance of said third spring means into said nail clearing position and thereafter to allow a pivotal movement of said nail holding member in said one direction under the bias of said third spring means into said nail holding position,

said nail holding member having nail holding surface means facing in a direction toward said drive track for engaging a nail shank when said nail holding member is in said nail holding position,

said teeth having cam surface means operable during the return stroke of said actuating rod to initially effect pivotal movement of said nail feeding member by engagement with a nail shank in said opposite direction into said nail clearing position and to thereafter allow said first spring means to effect pivotal movement of said nail feeding member in said one direction into said nail engaging position,

said leading series of teeth including drive track closing surface means facing in a direction toward said drive track operable when said actuating rod is in said extended position and said nail feeding member is in said nail engaging position to close a substantial extent of the area of communication of said feed track with said drive track and to prevent substantial lateral shank movement within the drive track in the direction of feed track communication,

said leading series of teeth including an outermost tooth having laterally facing surface means disposed closely adjacent said second shank controlling surface means when said actuating rod is in said extended position and said nail feeding member is in said nail engaging position, so as to insure that a drive track closing surface of said outermost tooth elongated in the direction of extent of said drive track closes an area of communication of said feed track with said drive track adjacent the discharge end thereof and normally prevents canting of relatively short length nails and buckling of relatively long thin shanked nails in said drive track into said feed track except under the resilient resistance of said second spring means,

said nail feeding member having abutment surface means for engaging an operatively fixed portion of said nosepiece assembly when said nail feeding member is in said nail engaging position and said actuating rod is in said extended position to positively prevent pivotal movement of said nail feeding member and said actuating rod about the axis of the latter in a direction tending to move said laterally facing surface means of outermost tooth away from closely adjacent relation with said second shank controlling surface means.

4,858,813

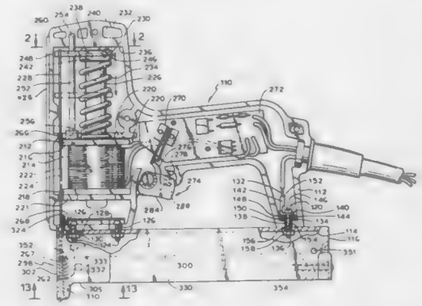
STAPLE DRIVING TOOL

Rudolf Wingert, West Milford, N.J., assignor to Arrow Fastener Company, Inc., N.J.

Division of Ser. No. 76,327, Jul. 22, 1987, which is a division of Ser. No. 794,305, Nov. 1, 1985, Pat. No. 4,700,876. This application Jan. 6, 1988, Ser. No. 203,485

Int. Cl.[4] B25C *5/15*

U.S. Cl. 227—131 **5 Claims**



1. An electrically-powered, hand-held staple driving tool comprising:

(a) a housing;

(b) a mainframe channel having a wall;

(c) a device for electrically connecting said mainframe channel to a grounding wire, said grounding and mounting device comprising:

(i) a screw with one enlarged end, on threaded end, and a throat between them;

(ii) a flat ended electrical lug having a first end adapted to receive the threaded end of said screw therethrough and a second end adapted to receive and secure said grounding wire;

(iii) a mounting plate having an opening adapted to freely receive the threaded end of said screw and to forcibly receive the throat of said screw, said screw being passed through said opening in said first end of said grounding lug and forcibly pressed with an interference fit into said opening in said mounting plate so that said grounding lug is pressed firmly between the enlarged end of said screw and the opposing surface of the mounting plate, the threaded end of said screw further passing through a hole in said housing and then through a hole in said wall of said mainframe channel; and

(iv) a nut on the threaded end of said screw so that when tightened in the normal manner, the first end of said grounding lug, the mounting plate, the wall of said housing and the wall of said mainframe channel are, respectively, sandwiched between said enlarged end of said screw and said nut.

4,858,814

AUTOMATIC NAILER SYSTEM

Terry E. Francis, Poplar Court, Cae-Hopkin, Abercave, Powys, South Wales SA9 1TP, United Kingdom

Filed Feb. 29, 1988, Ser. No. 162,054

Claims priority, application United Kingdom, Mar. 5, 1987, 8705130

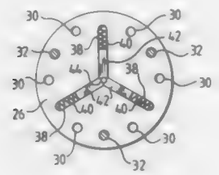
Int. Cl.[4] B25C *7/00*

U.S. Cl. 227—149 **18 Claims**

1. An automatic nailer system, for securing nailed ferrules to a substrate, comprising:

a body defining a generally cylindrical channel for receiving a nailed ferrule with the nail and the channel being approximately coaxial;

a hammer rod having a free end reciprocable within the channel between a retracted position and an extended position;
means for feeding a nailed ferrule into the channel when the hammer rod is in its retracted position; and
a collet mechanism comprising a plurality of collet pieces which are biased to move radially to abut one another and define a passage;
the passage having a tapered section which at its opening and wider end has a cross-sectional size and shape generally the same as those of the channel and leading at its other end into a generally cylindrical section for receiving coaxially and snugly the nail of a nailed ferrule,
the collet mechanism being located on the end of the body remote from the hammer rod such that the channel and the passage are coaxial and the wider end of the tapered section is adjacent the channel, and
the free end of the hammer rod in its extended position extending at least as far as the wider end of the tapered section of the passage.



4,858,815

FRICTION WELDER MECHANISM

Derek A. Roberts, and John W. Daines, both of Bristol, England, assignors to Rolls Royce plc, London, England

Filed Jul. 21, 1988, Ser. No. 222,415
Claims priority, application United Kingdom, Aug. 1, 1987, 8718260
Int. Cl.[4] B23K *20/12*
U.S. Cl. 228—2 7 Claims



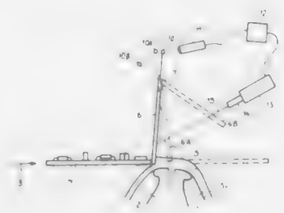
1. A friction welder mechanism for joining first and second components to be welded together by means of linear friction welding, comprising:
a drive shaft mounted in bearings for rotation about a first longitudinal axis;
an eccentric formed on said drive shaft, said eccentric being circular about a second longitudinal axis parallel with the first longitudinal axis but displaced therefrom by a predetermined eccentric distance;
an eccentric cam member rotatably mounted on said eccentric for rotation relative to the drive shaft about the second longitudinal axis, said eccentric cam member being formed with a peripheral surface which is circular about a third longitudinal axis laterally offset from the second longitudinal axis by the predetermined eccentric distance;
a connecting-rod located by a big-end bearing on the circular peripheral surface of the cam member and which is thereby made to reciprocate with an amplitude of movement corresponding to at most twice the predetermined eccentric distance upon rotation of the cam member and drive shaft, said connectingrod being provided with a component holding fixture for holding the first of the components to be welded and for urging it into frictional contact with the second component;
an annular gear interposed between the cam member and the eccentric on the drive shaft, and including first and second splines formed on said gear for meshing with corresponding first and second splines formed on the cam member and the eccentric, respectively, to couple them together for rotation, one of the first and second splines being formed with straight teeth and the other of the first and second splines being formed with inclined teeth so that axial movement of the gear along the first longitudinal axis causes rotation of the cam member relative to the eccentric on the drive shaft to vary and cancel the combined eccentric distances so that during operation of the mechanism the amplitude of movement of the component holding fixture on the connecting rod may be varied and reduced to zero by the axial movement of the said annular gear.

4,858,816

TIN-SOLDERING MACHINE WITH AUTOMATIC WAVE BARRIER FOR PRINTED CIRCUIT BOARDS

Bruno Gontier, Amgeon, France, assignor to Societe Electronique de la Region Pays de Loire, Paris, France

Filed Feb. 29, 1988, Ser. No. 162,125
Claims priority, application France, Mar. 3, 1987, 87 02836
Int. Cl.[4] H05K *3/34*
U.S. Cl. 228—34 8 Claims



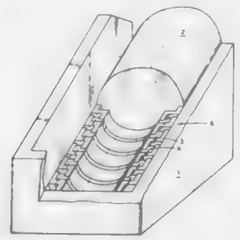
1. A tin-soldering machine with a wave barrier for printed circuit boards comprising:
a wave barrier device which moves in front of the circuit board as a function of the boards movement with respect to the machine and wherein said wave barrier is rigidly joined to the machine; and
means for pushing the tin by creating a moving dip in the tin and wherein said dip proceeds the printed circuit board through the machine and which prevents said printed circuit board from being submerged.

4,858,817

GRAPHIT-CERAMIC RF FARADAY-THERMAL SHIELD AND PLASMA LIMITER

David L. Hwang, Princeton Junction, and Joel C. Hosea, Princeton, both of N.J., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed May 5, 1983, Ser. No. 491,639
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—122 8 Claims



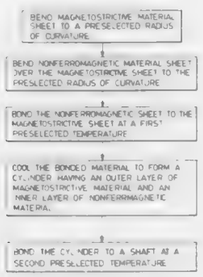
1. A process for brazing a graphite material to a ceramic or glass material comprising:
a. locating said ceramic or glass substrate material and graphite substrate material on a support surface at an angle of about 45 degrees with respect to the vertical and positioning a brazing alloy comprising Cu, Ti, and Ag between said materials forming a layered product;
b. applying pressure to said product in an amount sufficient to maintain substantially said materials in their relative position in the support surface and insufficient to prevent movement of said materials as a result of the thermal expansion and contraction which occurs during the subsequent heating and cooling steps;
c. heating said product in a vacuum to a temperature sufficient for brazing and maintaining said product at this temperature until brazing occurs whereby said materials expand as a result of thermal expansion during heating;
d. cooling said brazed material to room temperature whereby said brazed product contracts upon cooling;
e. recovering said brazed product.

4,858,818

METHOD OF BONDING A MAGNETOSTRICTIVE SHEET TO A SHAFT

Lawrence D. Knox, Milford, Mass., and Izrail Tsals, Princeton Junction, N.J., assignors to Caterpillar Inc., Peoria, Ill.

Filed Aug. 4, 1988, Ser. No. 228,132
Int. Cl.[4] G01L *3/10*; B23K *1/12, 1/20, 31/02*
U.S. Cl. 228—164 6 Claims



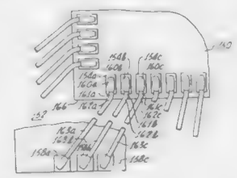
1. A method for bonding a magnetostrictive material sheet to a shaft while minimizing stress of the magnetostrictive sheet, comprising the steps of:
conforming a magnetostrictive material sheet to a mandrel having a preselected radius of curvature;
conforming a nonferromagnetic material sheet to said magnetostrictive material sheet on said mandrel;
bonding said nonferromagnetic material sheet to said magnetostrictive material sheet at a first preselected temperature to form a bonded material sheet;
cooling said bonded material sheet to form, upon cooling, a cylinder having an outer layer of magnetostrictive material and an inner layer of nonferromagnetic material; and
bonding said cylinder to a cylindrical shaft at a second predetermined temperature.

4,858,819

ORTHOGONAL BONDING METHOD AND EQUIPMENT

William H. Hill, and Dale W. Cawelti, both of Carlsbad, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 29, 1988, Ser. No. 174,566
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—179 4 Claims



1. A method of electrically connecting areas of a semiconductor ship to a plurality of outer bond points, said method comprising the steps of:
providing a plurality of closely adjacent elongated bond pads on said ship along an edge of the chip with relatively longer dimensions of said pads oriented substantially parallel to one another,
orienting a first end of a wire to be bonded in a first direction relative to the chip edge,
bonding said wire end to a pad on the chip along a bond line extending in said first direction,
bending the wire adjacent the chip edge to extend in a second direction,
extending the wire in said second direction to an outer bond point displaced from said chip, and
bonding a portion of said wire to said outer bond point.

4,858,820

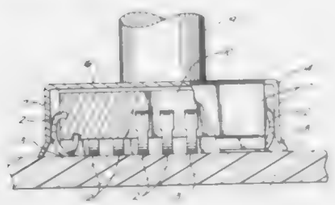
DESOLDERING AID AND METHOD

George M. Kent, Sierra Madre, Calif., assignor to Plato Products, Inc., Glendora, Calif.

Filed Feb. 18, 1987, Ser. No. 15,881
Int. Cl.[4] B23K *29/00*
U.S. Cl. 228—264 8 Claims

1. A desoldering aid for a standard size rectangular electronic circuit component having electrical leads protruding along sides of the component and soldered to a circuit board beneath the component comprising:
a box of high thermal conductivity metal having a rectangular top, four rectangular sides approximately normal to the top and integral therewith, and no bottom;
the inside width between opposite sides of the box being no greater than the outside width between electrical leads on opposite sides of the component so that the sides of the box contact the leads with at least sufficient force to support the weight of the component;
the depth of the inside of the box being greater than the height of the top of the component above the circuit board

so that there is no contact between the top of the box and the top of the component when the sides are against the circuit board; and



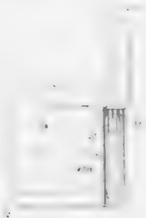
a heat shield having a rectangular hole through which the sides of the box fit.

4,858,821

PACKAGE AND LID WITH CONTROLLED TEARING MEANS

Roger G. Bickelhaupt, Modjeska Canyon, Calif., assignor to Baxter International Inc., Deerfield, Ill.

Filed Nov. 14, 1988, Ser. No. 270,320
Int. Cl.[4] B65D *77/38*
U.S. Cl. 229—123.1 13 Claims



2. A package having a peelable lid, comprising:

(a) a bottom tray having an inner surface defining a receptacle for an object to be packaged and a continuous rim extending around the periphery of the tray and projecting into the interior of the tray at least once at a given point on the periphery to define at least two compartments in the tray joined by a channel;

(b) a lid extending over the bottom tray and having a peripheral edge portion continuously overlying the peripheral rim of the bottom tray and having a predetermined tear line overlying said inward projecting portion of the rim;

(c) a heat seal coating applied to the interior surface of the lid in contact with the continuous rim of the bottom tray for heat sealing the lid to the bottom tray; and

(d) controlled tearing means on the lid for guiding the tear line across one compartment of the tray so that the other compartment of the tray is not exposed when the lid is selectively torn open along the predetermined tear line.

4,858,822

PREFABRICATED GIFT BOX

Larry B. Johnson, Colleyville; Thomas K. Curtis, Jr., Dallas, and Gary A. Allred, Grand Prairie, all of Tex., assignors to Carousel Investment Corporation, Irving, Tex.

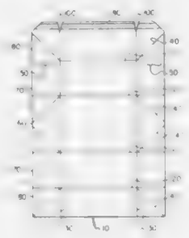
Filed Aug. 29, 1988, Ser. No. 237,052
Int. Cl.[4] B65D *5/06*
U.S. Cl. 229—137 6 Claims

1. A collapsible box, comprising;

a substantially rectangular blank of a suitable material having a central top wall flexibly connected to sidewall panels along lateral score lines, said sidewall panels flexibly connected to responsive bottom wall panels along lateral score lines, the lateral edges of said bottom wall panels partially overlapping each other with said overlapped portions being fastened together, thereby forming an open-ended rectangular body;

end enclosure means integrally formed with said open-ended rectangular body by means of a longitudinal score line formed on each end of said panels forming said body parallel to and equally distant from the ends of said body;

a V-shaped notch cut in each end of the overlapped interior bottom wall panel such that said notch is bisected by a respective longitudinal score line; said V-shaped notches being cut to the depth of the overlap of said bottom wall panels, the outer corners of said interior bottom wall panel being trimmed off commencing at the depth of the overlap of said bottom wall panels and extending inwardly to said lateral interior edge;



diagonal score lines formed in the top and bottom wall panels, said diagonal score lines bisecting the angles formed by the intersections of the longitudinal and lateral score lines and extending outwardly to the end of said rectangular body; and

said lateral score lines being perforated from the intersection of the lateral and longitudinal score lines outwardly to the end of said rectangular body, said perforated sections of said lateral score lines cooperating with said longitudinal score lines, diagonal score lines and V-shaped notches to allow the rectangular portions of said sidewalls defined by the longitudinal score lines and the perforated section of the lateral score lines to be folded inwardly while simultaneously folding the rectangular portions of the top and bottom walls defined by the longitudinal score lines and the perforated sections of the lateral score lines into flaps; said flaps being folded over said rectangular sidewall sections to form end walls.

4,858,823

DAMAGE-RESISTANT MAILBOX

Glenn N. Fischer, 7595 E. Singer Rd., Dayton, Ohio 45424

Filed Aug. 16, 1985, Ser. No. 766,380
Int. Cl.[4] A47Q *29/12*
U.S. Cl. 232—34 5 Claims

1. A flag mounting arrangement for a mailbox for receiving delivered mail, said mailbox including a box-like housing defining a front and a rear, having at least one wall, and defining an opening in said housing at said front adjacent said wall, a door for closing said opening, means for pivotally connecting said door to said housing to open and close said opening, and means for mounting said housing in a fixed location, said flag mounting arrangement comprising:

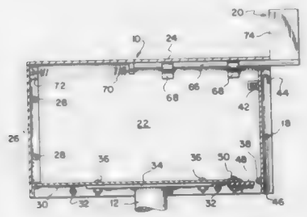
an elongated shaft having an axis;

means for securing said shaft to an inner surface of said wall to extend from said rear to said front of said housing, thereby defining a rearward and a forward end for said shaft, said securing, means being constructed to permit rotation of said shaft about said axis and sliding movement of said shaft along said axis;

spring means connecting said rearward end of said shaft with said rear of said housing;

target means carried on said shaft at said forward end of said shaft; and

means for engaging said target means outside said housing but adjacent said front thereof, whereby said target means



is displayed by sliding said shaft from said housing to move said target means out of said housing, and by rotating said shaft for engagement of said target means with said engaging means;

said target means being returned to said housing by rotation of said target means on said shaft such that said spring draws said shaft into said housing.

4,858,824

AIR CONDITIONER

Kenji Matsuda, Shizuoka; Sakuo Sugawara; Masanori Hara, both of Kanagawa; Hiroyuki Umemura, Shizuoka; Hidenori Ishioka, Shizuoka, and Katsuyuki Aoki, Shizuoka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1987, Ser. No. 53,351
Claims priority, application Japan, May 23, 1986, 61-118610; May 28, 1986, 61-122811
Int. Cl.[4] G05D *23/00*
U.S. Cl. 236—94 2 Claims



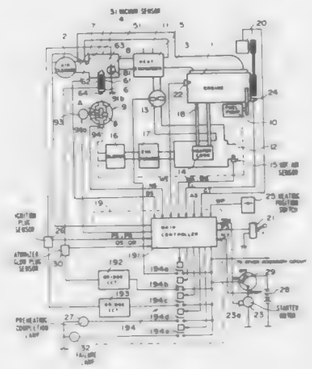
1. an air conditioner provided with a temperature detector for detecting room temperature, a switch input part having a first input means mannually operable for indicating in a thermal sense when a user feels "hot" and a second input means for indicating in a thermal sense and transmitting a corresponding signal into a signal detection means when a user feels "cold", a signal detecting means comprising set temperature decision means in signal detecting association with both said input means and said temperature detector for deciding and establishing a set temperature according to inputs of said temperature detector and said switch input part, which is characterized in that said set temperature decision means adjusts a first set temperature previously established thereby to a second set temperature lower by a predetermined value with reference to a then room temperature, and thereafter raises said second set temperature somewhat after reaching said second set temperature when said first input means is operated, but adjusts said first set temperature to a third set temperature higher by a predetermined value with reference to a then room temperature and thereafter lowers said third set temperature somewhat after reching said third set temperature, -when said second input means is operated.

4,858,825

CONTROL SYSTEM FOR QUICK HEATER

Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Aug. 20, 1986, Ser. No. 898,189
Claims priority, application Japan, Aug. 23, 1985, 60-185594
Int. Cl.[4] G05D *23/00*
U.S. Cl. 237—2 A 10 Claims



1. A motor vehicle heater, mounted in a motor vehicle having an engine, for heating the passenger compartment of the motor vehicle, comprising:

means for supplying fuel;

a quick heating burner including:

an atomizer plug for atomizing the fuel, said atomizer plug being heated by electric power;

means for mixing air with the atomized fuel; and

an ignition plug for igniting the mixture of air and atomized fuel so that the mixture is burned, said ignition plug being heated by electric power;

means for transferring heat from the ignited mixture to the passenger compartment of the motor vehicle;

operation detecting means for detecting operation of said quick heating burner and said means for transferring heat, and for generating detection signals, said operation detection means including:

means for detecting whether said ignition plug has failed based on the electrical resistance of said ignition plug, and for generating a first ignition plug detection signal; and

means for detecting whether said atomizer plug has failed based on the electrical resistance of said atomizer plug, and for generating a first atomizer plug detection signal; amil

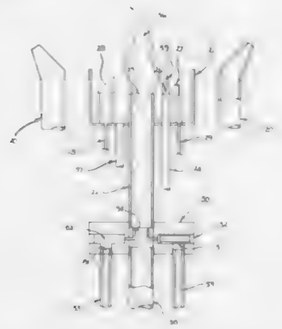
means for stopping the operation of said quick heating burner in dependence upon the detection signals generated by said operation detecting means.

4,858,826

COLORED FLAME WATER FOUNTAIN ILLUMINATION SYSTEM

Alan S. Robinson, El Monte, and Mark W. Fuller, Studio City, both of Calif., assignors to Wet Enterprises, Inc., Universal City, Calif.

Continuation of Ser. No. 48,566, May 11, 1987, abandoned. This application Dec. 28, 1988, Ser. No. 291,414
Int. Cl.[4] F21P *7/00*
U.S. Cl. 239—18 11 Claims



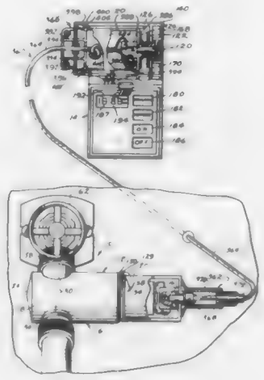
10. An improved apparatus for illuminating a water fountain, said water fountain comprising at least one water nozzle capable of emitting a stream of water, said apparatus comprising:
- a main burner disposed adjacent to said water nozzle and disposed partially beneath a surface of water in said fountain;
- a flame sensor disposed to adjacent to said main and pilot burner nozzles and connected by a flame sensor control line to said control means, said flame sensor sending a signal to control means when ever said main burner flame is lit;
- a control means for regulating the flow of said fuel to said main burner, the flow of said control to said main burner flame, and for controlling the operation of said ignition [redacted]
- said control means controlling said fuel flow such that fuel is emitted from said main burner nozzle only when said flame sensor senses that said ignition means is operating;
- said control means controlling said colorant flow control means such that colorant is emitted from said colorant nozzle means only when said flame sensor senses that said main burner flame is lit;
- whereby a colored flame is created for the improved illumination of a water fountain.

4,858,817

ELECTRONIC WATER SPRINKLER TIMER

Douglas C. Fletcher, Peoria, and Kenneth J. Braninga, Mapleton, both of Ill., assignors to L. R. Nelson Corporation, Peoria, Ill.

Continuation of Ser. No. 838,613, Mar. 11, 1986, Pat. No. 4,722,478, and a continuation-in-part of Ser. No. 575,012, Jan. 30, 1984, Pat. No. 4,592,505. This application Jul. 13, 1987, Ser. No. 72,667
Int. Cl.[4] A01G *27/00*
U.S. Cl. 239—69 2 Claims



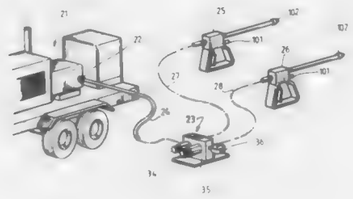
1. Apparatus for connection with a sill cock for communicating water under pressure from the sill cock with a hose having a lawn sprinkler communicating therewith comprising
- a female coupler for connection with the sill cock,
- a male coupler for connection with the hose,
- valve means between said couplers movable into opened and closed position with respect thereto so as to permit and prevent respectively communication of the water under pressure from the sill cock with the hose when said female coupler is connected with the sill cock and said male coupler is connected with the hose,
- battery means for providing a source of electrical current,
- battery operated valve moving means operable in response to the connection of the electric current from said battery means therewith for effecting movement of said valve means from its closed position into its opened position,
- battery operated programming means for selecting a sprinkling time in the future when it is desired to water with the sprinkler,
- battery operated display means for displaying the sprinkling time selected by said programming means,
- a first water control unit containing said male coupler, said valve means, said battery operated valve moving means and said female coupler so as to render said first unit operable to be fixed to the sill cock in supported relation thereby when said female coupler is connected therewith,
- a second manually portable programming unit containing said battery operated programming means, said battery operated display means, and said battery means operatively connected with said battery operated programming means and said battery operated display means,
- mounting means operatively associated with both of said units for interengagement to mount said portable second unit in supported relation on said fixed first unit in an operative position and for disengagement to enable the portable second unit to be disposed in a remote position with respect to said fixed first unit such that a user can operate said programming means remote from said fixed first unit allowing for observation of said display means at close eye-level proximity, and
- means operable either when said portable second unit is mounted on said fixed first unit in said operative position or when said portable second unit is disposed in a remote position with respect to said fixed first unit to connect an electrical current from said battery means contained in said portable unit with said battery operated valve moving means contained in said fixed first unit when the sprinkler time selected on said programming means arrives causing said valve means to be moved into its opened position and water under pressure from the sill cock connected with said female coupler to flow into the hose connected with said male coupler.

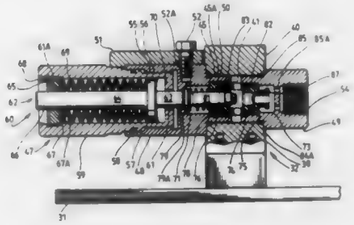
4,858,[redacted]

MULTI-GUN CONTROL VALVE

J. Edward Stachowiak, 12628 Broken Bough, Houston, Tex. 77014

Filed Sep. 15, 1986, Ser. No. 907,502
Int. Cl.[4] B05B *15/00*
U.S. Cl. 239—76 9 Claims





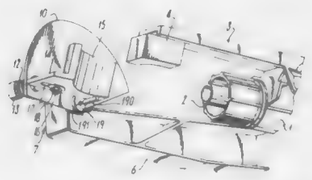
1. In a hydraulic blast system including a source of high pressure liquid and a blast gun operative in a first condition to discharge liquid at relatively high pressure through a blast nozzle and in a second condition to dump liquid at a relatively low pressure through a dump port, a control valve comprising:
- a valve housing having a passageway including an inlet adapted to receive high pressure liquid from said source and an outlet adapted to deliver liquid to said blast gun;
- a valve seat in said passageway;
- a valve closure member movably mounted in said valve housing to move between a first limiting position approaching said valve seat to provide a pressure drop across said valve seat, and a second limiting position clear of said valve seat; and
- adjustment means attached to the valve housing to adjust he first limiting position of the valve closure member.

4,858,829

UNIVERSAL ADVANCEMENT DEFLECTOR FOR IMPACT IRRIGATORS

Arno Drechsel, 39, Via Weggenstein - I-39100, Bolzano, Italy

Filed Feb. 23, 1984, Ser. No. 582,763
Claims priority, application Italy, Mar. 18, 1983, 46825A/83
Int. Cl.[4] B05B *3/02, 3/14*
U.S. Cl. 239—230 5 Claims



1. A universal advancement deflector for an impact irrigator having a rocker arm (6) disposed on a propelling tube (1) with an outlet nosepiece (2) providing a jet, said universal advancement deflector comprising
- a member having a barycenter and having a cylindrical surface (15) which substends a substantially right angle, said cylindrical surface terminates in edges and is formed around a longitudinal axis,
- a pin (11) mounted on said rocker arm, said member being pivoted about said pin at a location spaced from said barycenter,
- adjustable repositioning means (12) for opposing the movement of said member being caused by said cylindrical surface being arranged to penetrate into said jet such that one of said edges and said longitudinal axis are respectively tangential and orthogonal to said jet so that under the action of said jet said surface inclines in order to provide a reaction component which causes said surface to emerge from the jet,
- adjustment means (19,190) (20,200) for selecting the rocking range of said cylindrical surface,
- means (17, 18) for adjusting the distance of said cylindrical surface from said outlet nosepiece, and
- said cylindrical surface (15) comprises an outer end ledge (14) fixed to said pin (11) and said pin is pivoted in a plate (10) disposed on said rocker arm (6).

4,858,830

SPRAYING DEVICE HAVING AN ADDITIVE FLUID DISPENSER AT AN EXIT END

Rudy R. Proctor, Costa Mesa, and Fred M. Reinstein, Encino, both of Calif., assignors to Turbo Tek Enterprises, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 45,562, May 4, 1987, abandoned, which is a continuation of Ser. No. 713,824, Mar. 20, 1985, Pat. No. 4,682,734. This application Jul. 27, 1987, Ser. No. 77,836
Int. Cl.[4] B05B *7/26*
U.S. Cl. 239—313 41 Claims



1. A spraying device comprising:
- a spray tube having a fluid entrance end and a fluid exit end;
- coupling means for attaching the fluid entrance end of the spray tube to a primary fluid source;
- an additive fluid dispenser having a fluid entrance end and a fluid dispensing end, and having a chamber for holding additive fluid;
- cooperable means at the fluid exit end of the spray tube and the fluid entrance end of the additive fluid dispenser for removably coupling the fluid entrance end of the additive fluid dispenser to the fluid exit end of the spray tube in coaxial alignment with the direction of flow of primary fluid through the spray tube;
- releasable fluid sealing means in the additive fluid dispenser

for retaining the additive fluid in the chamber of the additive fluid dispenser; and

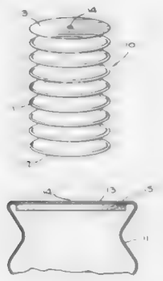
means in the additive fluid dispenser for releasing the releasable fluid sealing means to permit the additive fluid to flow from the chamber and the fluid dispensing end of the additive fluid dispenser, the releasable means including a member movable in the additive fluid dispenser to a releasing position in response to the coupling of the fluid entrance end of the additive fluid dispenser to the fluid exit end of the spray tube.

4,858,811

HAND-ACTUATED FRAGRANCE EMITTING UNIT

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Feb. 22, 1988, Ser. No. 158,835
Int. Cl.[4] B05B *11/04*
U.S. Cl. 239—326 8 Claims



1. A hand actuated fragrance emitting unit comprising:

(A) an air-filled container free of liquid which is sealed except for a small jet opening, said container having a flexible wall which when manually depressed repeatedly by a user subjects air in the interior of the container to pressure to cause pulses of air to be expelled from the opening; and

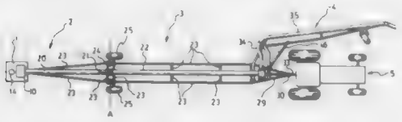
(B) an air-permeable, porous, disc-shaped member interposed between the jet opening and the interior of the container, the entire inner surface of the member being exposed to the air in the container, said member being impregnated with a volatile liquid fragrance whereby when the wall is depressed, a pulse of pressurized air is forced through the member to extract liquid fragrance therefrom to produce a fragrance pulse that is discharged as a mist through the opening, the wall when released resuming its normal shape and in doing so creating a vacuum in the container causing air to be drawn into the jet opening and through the member so that the container air is now laden with fragrance.

4,858,813

AGRICULTURAL WATER CANNON

David R. Hundeby, Saskatoon, Canada, assignor to Flexi-Coil Limited, Saskatoon, Canada

Filed Jul. 28, 1988, Ser. No. 225,301
Int. Cl.[4] B05B *1/14, 3/18*
U.S. Cl. 239—723 7 Claims



1. An agricultural water cannon comprising:

A. a suction pod having

(1) a flat horizontal base plate

(2) a horizontal main plate attached to and vertically positioned over the base plate and spaced therefrom by apertures to permit ingress of water therebetween,

(3) a valve attached to the main plate and covering an aperture in said main plate to permit unidirectional flow of water through said aperture from below to above the main plate,

(4) a suction chamber sealingly fastened on top of the main plate around the valve and in open communication with the inlet end of an elongated rigid tail boom tube,

(5) an immersible centrifugal pump, mounted outside said suction chamber and on top of the main plate with its inlet connected to a second aperture in said main plate and its discharge outlet connected to said suction chamber, and

(6) power means to drive said immersible centrifugal pump,

B. a tail boom assembly comprising:

(1) said elongated rigid tail boom tube,

(2) a flexible suction tube connecting the distal end of said tail boom tube to the inlet end of an elongated rigid suction boom tube aligned with said tail boom tube,

(3) a hinged connection, hinging on a substantially horizontal axis transverse to said tail boom tube, supporting the distal end of said rigid tail boom tube at the inlet end of said rigid suction boom tube, and

(4) power means to pivot said tail boom tube on the axis of said hinged connection,

C. a suction boom assembly comprising:

(1) said elongated rigid suction boom tube,

(2) a pair of wheels mounted under the inlet end of said rigid suction boom tube to support said end and the tail boom assembly on the ground for transport purposes,

(3) a framework to support the distal end of said suction boom tube and attachable to the drawbar hitch of a motive power source,

(4) a high pressure, high volume, centrifugal pump mounted on said framework with its inlet connected to the distal end of said suction boom tube,

(5) transmission means mounted on said framework to transmit rotary power from a power takeoff of said motive power source to the drive shaft of said centrifugal pump, and

(6) a substantially horizontal rigid frame piece pivotally attached to said framework on a horizontal axis aligned substantially parallel to the longitudinal axis of said suction boom tube and substantially directly thereunder, said frame piece protruding horizontally to the side of said suction boom tube and supporting, at a location thereon distal to said hinge axis, a universal hinge having a vertical axis of rotation and a horizontal axis of rotation, and

D. a pressure boom assembly comprising:

(1) a rigid pressure boom framework, attached by said universal hinge to said rigid frame piece,

(2) an elongated rigid pressure boom tube having its inlet end proximate said universal hinge and its distal end connected to a water dispersing nozzle,

(3) at least one castor mounted wheel under and supporting on the ground said pressure boom framework and said pressure boom tube, and

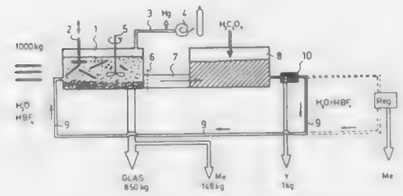
(4) a flexible pressure tube connecting the discharge of said high pressure centrifugal pump to the inlet of said pressure boom tube.

4,858,833

PROCESS FOR RECYCLING FLUORESCENT AND TELEVISION TUBES

Jozef Hanulik, Zurich, Switzerland, assignor to Recytec S.A., Switzerland

Filed Jun. 27, 1988, Ser. No. 211,982
Claims priority, application Switzerland, Jun. 29, 1987, 2437/87
Int. Cl.[4] B02C *19/14*
U.S. Cl. 241—24 5 Claims



1. A process for recycling fluorescent and television tubes containing yttrium, which are first crushed, after which the metallic constituents are separated off, and the broken glass produced is washed and fed to the glass recycling process, wherein the tubes are introduced into a container which can be sealed in a gas-tight manner and are crushed under water, the ascending gases released being drawn off by suction and placed in a compressed state, feeding the gases in a compressed state to a reuse process, and an acid which dissolves or strips off the pollutants being added to the broken glass which is coated with pollutants,

the dissolved and stripped-off pollutants are flushed out of the broken glass to form a liquid phase containing yttrium and the metallic constituents are removed therefrom, and then the broken glass is passed to a further utilization process,

a precipitating agent is added to the liquid phase and the latter is then filtered to form a filtrate and a yttrium containing filter cake, supplying the yttrium-containing filter cake to a lanthanide process,

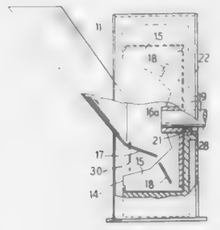
after which the filtrate is fed back to the container in which the tubes are crushed.

4,858,834

CHIP SLICER IMPROVEMENT

Bryan Lanham, Gresham, Oreg., assignor to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 142,623, Jan. 11, 1988, abandoned. This application Feb. 3, 1989, Ser. No. 307,217
Int. Cl.[4] B02C *19/12*
U.S. Cl. 241—85 8 Claims



1. An apparatus for slicing wood chips for reducing the thickness dimension thereof, said device comprising:

a substantially cylindrical housing having a plurality of knives circumferentially disposed around and within the housing, said knives having cutting edges exposed to chips passed along the inner surface of said housing;

said housing having an axial dimension between a first end of said housing and a second end of said housing;

a rotary anvil means for carrying wood chips against said cutting edges, said rotary anvil means having a rotary anvil axial width and being rotational about an axis of said rotary anvil means;

said rotary anvil means having a base disposed substantially at said first end of said cylindrical housing and having a plurality of vanes for carrying wood chips radially toward and circumferentially against said cutting edges, said vanes extending radially from near said axis of said rotary anvil means and housing and extending axially and radially from said base toward said second end of said housing;

said base and said vanes thereby defining a generally frustoconically shaped chip receiving area of greater diameter near second end of said housing than near said first end of said housing, and substantially closed at said first end by said base;

an infeed chute means for supplying wood chips to said rotary anvil means, said infeed chute means having a delivery end disposed within the rotary anvil axial width so that chips leaving said delivery end are deposited in said chip receiving area of said rotary anvil means near the center of the rotary anvil axial width and near said axis about which said rotary anvil means is rotational; and

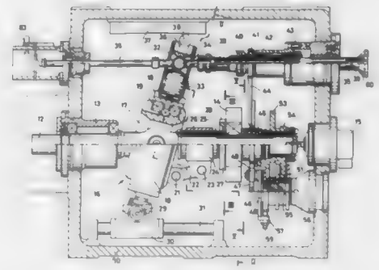
said vanes thereby receiving chips from said infeed chute means and distributing the chips radially and axially to evenly distribute the load against said cutting edges as the chips are brought into cutting inter-engagement with said knife means.

4,858,835

EQUIPMENT FOR THE ACTUATION OF NEEDLES FOR THE REALIZATION OF ELECTRIC MOTORS FIELD WINDINGS

Sabatino Luciani, Florence, and Antonio Lunini, Serto Fiorentino, both of Italy, assignors to Axis S.p.A., Florence, Italy

Continuation-in-part of Ser. No. 88,020, Aug. 18, 1987, Pat. No. 4,762,283, which is a continuation of Ser. No. 785,918, Oct. 10, 1985, abandoned. This application Mar. 4, 1988, Ser. No. 164,772
Claims priority, application Italy, Nov. 26, 1987, 68009 A/87
Int. Cl.[4] H02K *15/085*
U.S. Cl. 242—1.1 A 25 Claims



1. Machine for the actuation of needles for the realization of electric motor field windings characterized in that it is made of a case internally supporting a main shaft in revolving mode which is set in rotation by motor means; on the main shaft means that perform an up and down oscillating motion at each complete rotation of the said shaft are pivoted, in oscillating mode around an axis which is perpendicular to the axis of the shaft; at one end of such means a winding shaft is pivoted, into

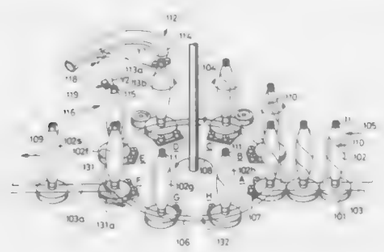
which are through cables that realize the winding on the slots of a stator, the winding shaft performs a reciprocating traverse motion driven by the said oscillating means; on the winding shaft a tube supporting the winding needles is concentrically inserted in oscillating mode and is set in reciprocating rotatory motion by kinematic motion means connected to the main shaft which accomplish an oscillation of the tube for each stroke end of the winding shaft; means for adjusting the stroke of the winding shaft and the oscillation amplitude of the tube concentric to it are also being foreseen; and means on the free ends of the tube and of the shaft concentric to them for mounting the winding needles so that said needles perform a reciprocating traverse and oscillating motion; wherein the oscillating means on the main shaft are made of a disk axially pivoted on the shaft and revolving into a frame; the disk being connected through a connecting rod to a sleeve which is assembled on the shaft in revolving mode with it; on one end of the frame a cursor is held, sliding into the frame thrusted by elastic means, and pivoted on the winding shaft around a perpendicular axis to the axis of the same winding shaft.

4,858,836

YARN END FINDING DEVICE

Shoichi Tone, and Norio Kubota, both of Kyoto, Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 7, 1987, Ser. No. 129,539
Claims priority, application Japan, Dec. 12, 1986, 61-191467; Feb. 9, 1987, 62-27872
Int. Cl.[4] B65H 54/00
U.S. Cl. 242—18 R 13 Claims



1. A device for finding an end of a yarn wound about a bobbin having a layer of yarn wound thereon, a center hole and a bunch winding location, the device comprising:

first yarn end finding means for finding a yarn end wound about the bunch winding location of the bobbin;

second yarn end finding means for finding a yarn end, suspended on the layer of yarn, the second yarn end finding means having an air flow controlling plate located near an outer periphery of a layer of a yarn on a spinning bobbin at a yarn end finding position and extending in a direction of an axis of the spinning bobbin, and a compressed air injection nozzle located in a gap between said air flow controlling plate and the yarn layer on the spinning bobbin; and

inserting means or inserting the found yarn end in the center hole of the bobbin.

8. A method of detecting an end of yarn found on a spinning bobbin, the method comprising the steps of:

inserting an end of yarn connecting to a layer of a yarn on a bobbin into a center hole of the bobbin, and

detecting the yarn end as it enters the center hole of the bobbin.

4,858,837

DEVICE AND METHOD FOR INTERMITTENTLY STORING AND RETURNING YARN DURING THE WINDING OF CONICAL BOBBINS FED WITH YARN AT CONSTANT SPEED

Sergio Montali; Francesco Ferro, and Luigi Colli, all of Pordenone, Italy, assignors to Savio, S.p.A., Pordenone, Italy

Filed Mar. 17, 1988, Ser. No. 169,495
Claims priority, application Italy, Mar. 19, 1987, 19756 A/87
Int. Cl.[4] B65H 54/06, 54/10
U.S. Cl. 242—18 R 4 Claims



1. A yarn storage and return device for yarn being wound on a conical bobbin driven at a constant speed comprising:

(a) a lever system including a shaft, an elastic element, and a pair of arms, which are connected to and move with each other, through which said shaft passes, and which can swing around the axis defined by said shaft, one of said arms having a deflecting roller and acting concurrently as a yarn storage and return means and a tension compensator and a regulator for the wound yarn, and the other of said arms connected to said elastic element, for generating a balancing counterforce to the tension of said wound yarn;

(b) a sensor for measuring the tension of yarn to be wound on the bobbin for generating electrical signals proportional to said tension of said yarn for indicating the tension thereof;

(c) an electronic comparator for comparing said electrical signals from said sensor with one or more reference signals which define a predetermined range of desired tension, and for generating a control signal when the tension is outside the predetermined range;

(d) an electronic control processor unit for converting said control signal from said electronic comparator into an activating signal; and

(e) a drive source for adjusting the loading on said elastic element according to said activating signal from said electronic control processor unit for varying the tension of said storage and return arm to restore the winding tension to within the preset tension range.

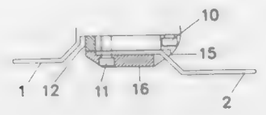
4,858,838

WINDER FLY WASTE MANAGEMENT SYSTEM

Paul S. Harris, Chester, and Larry E. Stevens, Chesterfield, both of Va., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation of Ser. No. 924,387, Oct. 29, 1986, abandoned.
This application Mar. 24, 1988, Ser. No. 175,654
Int. Cl.[4] B65H 54/28
U.S. Cl. 242—43 A 3 Claims

1. In a yarn traversing apparatus of the rotary blade type comprising, in combination: at least two yarn traversing groups arranged in succession along an effective yarn traversing width at a position upstream of a package on which said yarn is to be wound; each said yarn traversing group comprising a pair of coaxially disposed rotary blades each mounted on a separate rotatable shaft; said pair comprising an inner blade and an outer blade; and actuating means for effective rotation of said blades of said respective yarn traversing groups to effect traverse of said yarn in one direction by the cooperative action of one blade of each yarn traversing group and traverse of said yarn in an opposite direction by the cooperative action of the other blade of each yarn traversing group; whereby said yarn is transferred from a rotary blade of one of said yarn traversing groups to a rotary blade of a neighboring yarn traversing group at a boundary between said two yarn traversing groups; the improvement wherein each said rotary blade connected to said rotatable shaft comprises means to provide a smooth contoured outline serving to reduce substantially protrusions and crevices associated with said rotary blades and said rotatable shafts, and means to direct air across said yarn traversing groups, in an amount sufficient to remove fly waste yarn from and to prevent entry of fly waste yarn to said rotary blades and said rotatable shafts, wherein said means to provide a smooth contoured outline comprises an outer spacer ring mounted to each outer blade of each pair of coaxially disposed rotary blades, and an inner spacer ring mounted to each inner blade of each pair of coaxially disposed rotary blades, said outer spacer ring and said inner spacer ring cooperatively shaped to provide said smooth contoured outline.

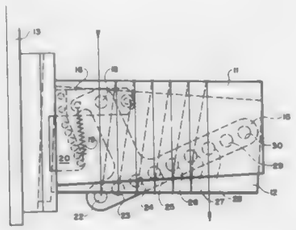


4,858,839

YARN TENSION CONTROL APPARATUS AND METHOD

Kurt W. Niederer, 3021 Mountainbrook Rd., Charlotte, N.C. 28210

Filed Apr. 11, 1988, Ser. No. 180,172
The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.
Int. Cl.[4] B65H 51/26, 51/30
U.S. Cl. 242—47.09 10 Claims



1. A yarn tension control apparatus, comprising:

(a) a first feed roll having a substantially conically tapered yarn engaging roll surface;

(b) a second feed roll having a substantially conically tapered yarn engaging roll surface, said second feed roll positioned in spaced-apart relation with said first feed roll for receiving a yarn wrapped successively around a circumference defined collectively by opposed surface of said first and second rolls from a yarn infeed position to a yarn exit position, and including means for driving at least one of said first feed roll and said second feed roll;

(c) said first and second feed rolls being aligned relative to each other so that the collectively defined circumstances at any point on the yarn engaging surfaces of said first and second rolls is greater than the collectively defined circumference in one direction along the axis of rotation of the rolls, and less than the collectively defined circumference in the other direction along the axis of rotation of the rolls; and

(d) closed loop tension feedback control means for varying the rate of feed of the yarn as a function of the tension on the yarn as it exits the yarn tension control apparatus, said feedback control means comprising:

(i) An elongate tension arm positioned between and along the length of said first and second rolls;

(ii) a plurality of yarn guides positioned in said tension arm along the length thereof for receiving successive wraps of yarn; and

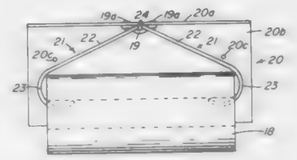
(iii) mounting means for mounting said tension arm for movement of said yarn guides along the length of the rolls in response to changes in tension of the yarn to a yarn infeed position of decreased roll diameter in response to an increase in tension on the yarn and to a position of increased roll diameter in response to a decrease in tension on the yarn.

4,858,840

DISPENSING HANGER FOR ROLLS OF SERIALLY CONNECTED SHEETS

L. La Vere Kidman, 1050 E. 800 North, No. 16, Spanish Fork, Utah 84660

Filed Apr. 8, 1988, Ser. No. 179,224
Int. Cl.[4] B65H 19/00
U.S. Cl. 242—55.2 11 Claims



1. A dispensing hanger for utility rolls of serially connected, tear-off sheets of paper or the like, comprising a pair of arms, each of which includes an elongate shank member having its lower end formed as a widely open and substantially correspondingly widely based hook member for fitting into the open end of the roll to be received and dispensed, with the radial upper portion of an end of such roll received within the cradle of said hook, the upper end of said shank being formed as an eye member; and suspension means having eye means pivotally attached to the eye members of said arms, said suspension means being located inwardly of the ends of the roll to be received so that the upper ends of said shank members are attached to the suspension means inwardly of the ends of the roll to be received a sufficient distance so that said shank members extend at an angle outwardly from their respective points of attachment toward the respective ends of the roll to be received whereby gravity acting on the respective arms will maintain the hook member in the ends of the roll to be received during use.

4,858,841

APPARATUS FOR LOADING TAPE INTO A CASSETTE

George M. Woodley, Shrewsbury; Richard A. McGrail, Worcester; Stephen J. Powers, Webster, and William W. Ross, Framingham, all of Mass., assignors to King Instrument Corporation, Westboro, Mass.

Filed Nov. 2, 1987, Ser. No. 116,665
Int. Cl.[4] B31F 5/06; B65H 21/00
U.S. Cl. 242—56 R 47 Claims



1. An improved shift block assembly for use in splicing tape to leaders comprising:
- means defining an axis of rotation;
- a shift block support means mounted for rotational and axial movement on said axis;
- a first shift block carried by said shift block support means;
- a second shift block mounted for rotational and axial movement on said axis;
- a third shift block mounted for rotational movement on said axis;
- first fluid-powered shift means for shifting said shift block support means on said axis between a first position adjacent said third block and a second position spaced axially from said third block, said first fluid-powered shift means comprising portions of said shift block support means;
- second fluid-powered shift means for shifting said second shift block on said axis between a first shift block position adjacent said third block and a second position spaced axially from said third block, said second fluid-powered shift means comprising portions of said second shift block; and
- first, second and third selectively operable tape holding means for holding a tape in position on each of said first, second and third shift blocks respectively.

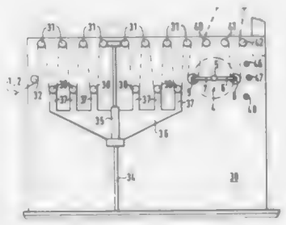
4,858,842

APPARATUS FOR WINDING WEBS TO FORM SUPPLY ROLLS

Friedhelm Mundus, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 114,920
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637417; Oct. 6, 1987, 3733780
Int. Cl.[4] B65H 23/198, 20/24
U.S. Cl. 242—56.9 4 Claims

1. Apparatus for winding webs to form supply rolls under a substantially constant web tension comprising
- a machine frame,
- a first winding shaft rotatably mounted in said machine frame,
- an electric motor connected to drive said shaft,
- dancer rollers,
- a rocker pivoted to the machine frame and having mutually opposite, freely protruding arms equal in length and at their ends carrying said dancer rollers freely rotatably mounted,
- means for detecting a deflection of the rocker resulting in a displacement of said dancer rollers from a normal position, in which they are horizontally aligned,
- a differential having first and second inputs and an output, said first winding shaft being coupled to said first input to said differential,
- a second winding shaft, power-transmitting means coupling the output of said differential to said second winding shaft,
- the dancer rollers disposed between the arms of the rocker being axially spaced apart by a distance from each other



which equals the lateral distance between the two webs to be wound up,
- two guiding rollers rotatably mounted in the machine frame and disposed on opposite sides of each dancer roller for training a web around said dancer roller and said two guiding rollers,
- a servomotor coupled to said second input of said differential, and
- controlling means responsive to the means for detecting a deflection of the rocker for controlling said servomotor to apply an additional torque to the second input member of the differential to increase or decrease the speed of the second winding shaft in dependence on the deflection of the rocker.

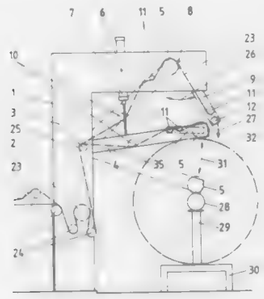
4,858,843

FABRIC WEB DELIVERY APPARATUS

Franz J. Gierse, Siegen; Manfred Pabst, Cologne; Heinz Hermanns, Korschenbroich; Karl Ippers, Willich; Stephan Krenn, Monchen-Gladbach; Friedrich Huppe, Aachen; Carl H. Opgenoorth, and Conrad Wolters, both of Monchen-Gladbach, all of Fed. Rep. of Germany, assignors to A. Monforts GmbH & Co., Fed. Rep. of Germany

Filed Aug. 22, 1988, Ser. No. 235,003
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1987, 3727888
Int. Cl.[4] B65H 17/08
U.S. Cl. 242—65 6 Claims

1. Apparatus for delivering a traveling fabric web to a web-handling location for winding or folding of the web, said apparatus comprising a frame, a delivery arm pivotably mounted on said frame, a driven delivery roller rotatably supported on said delivery arm at a spacing from its pivoted mounting, and a cuttle arm mounted to said frame for reciprocable cuttle motion independently of said delivery arm, said delivery arm being selectively pivotable to a first position for peripheral driving contact with a fabric winding roll of a surface-driven fabric winder for driving said fabric winding roll while applying the traveling fabric web peripherally thereto to wind the



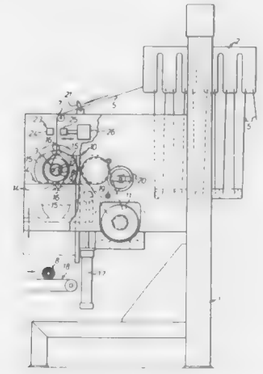
fabric web thereabout and a second position feeding the traveling fabric web to said cuttle arm for folding the web in pleats.

4,858,844

METHOD AND MACHINE FOR MANUFACTURING ROLLS OF BAGS

Jan N. Stenqvist, Kvidinge, Sweden, assignor to Fas Converting Machinery Aktiebolag, Ystad, Sweden

Filed Nov. 3, 1987, Ser. No. 116,193
Claims priority, application Sweden, Nov. 5, 1986, 8604755-2
Int. Cl.[4] B65H 18/08
U.S. Cl. 242—67.1 R 11 Claims



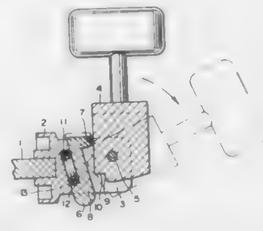
1. A method of manufacturing rolls of bags from an elongate web having transverse lines of perforation, said method comprising the steps of:
- winding the web by means of a winding device having two opposed pairs of spaced-apart fingers;
- introducing a leading end of the web between said two opposed pairs of fingers;
- setting said two opposed pairs of fingers in motion for winding the web into a roll of bags;
- severing the roll of bags from the web, after winding a predetermined length of the web, by clamping the web by means of a clamping device located upstream of said winding device relative to the direction of travel of the web, and tearing the web along a line of perforation at the end of the ready-wound roll of bags;
- gripping a leading end of the web, after allowing a predetermined time delay for completion of said winding step, by means of a gripping device located upstream of said winding device relative to the direction of travel of the web;
- subjecting said two opposed pairs of fingers to a braking action and resetting said fingers to a starting position for a new winding cycle;
- conducting the leading end of the web between said two opposed pairs of fingers by moving said gripping device in the direction of travel of the web past said winding device, such that the leading end of the web is seized by said winding device; and
- commencing said new winding cycle.

4,858,845

APPARATUS FOR FOLDING FISHING REEL HANDLE

Kyoichi Kaneko, Tokyo, Japan, assignor to Daiwa Seiko Inc., Higashikurume, Japan

Filed Sep. 15, 1988, Ser. No. 244,686
Claims priority, application Japan, Oct. 9, 1987, 62-254942; Oct. 9, 1987, 62-254943
Int. Cl.[4] A01K 89/00
U.S. Cl. 242—285 7 Claims



1. A handle folding apparatus for fishing spinning reels comprising:
- a handle seat provided at the outer end of the handle shaft;
- a fork consisting of two plates projecting outwardly from the handle seat;
- a handle arm having its bent front end rotatably supported between the forked plates and spaced from the bottom of the fork;
- a handle stopper slidably mounted between the front end of the handle arm and the bottom of the fork, the handle stopper having an operating portion at one end and an engagement projection at the other end projecting toward the handle arm;
- a recessed engagement surface formed at one side of the front end of the handle arm, the recessed engagement surface being adapted to come into contact with the engagement projection of the handle stopper to provide a wedge effect; and
- a spring compressed and installed between a recess formed at the bottom of the fork and a recess formed in the handle stopper on the handle shaft side near the operating portion to urge the operating portion of the handle stopper to project from the fork of the handle seat.

4,858,846

WIRING HARNESS

Rodney L. McDonald, Box A-5 Kansal Rd., Homer City, Pa. 15748

Filed Apr. 13, 1988, Ser. No. 181,172
Int. Cl.[4] B65H 75/34
U.S. Cl. 242—85.1 5 Claims

1. A wiring harness for the storage of a plurality of individual electrical transmission cables comprising,
- an open container including a floor, a first side, a second side, a first end, and a second end;
- and

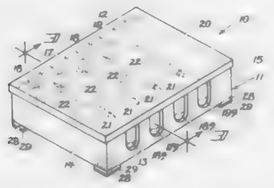
a plurality of apertures formed in said first side in alignment with like plurality of companion apertures formed in a second side,

and

a lid means for frictional engagement with said first and second side and said first and second end;

and

a plurality of guide means positioned in alignment with opposed pairs of said apertures and companion apertures



wherein said guide means are secured to said floor medially between said apertures and companion apertures for windingly accepting said cables thereabout and for directing terminal ends of said cables through each respective aligned aperture and companion aperture, and

wherein said guide means comprises a cylindrical guide member including an axis aligned with each aperture and companion aperture and orthogonally and integrally secured to a support post wherein said support post is secured to said floor.

4,858,847

SENSING AND LOCKING DEVICE FOR A SAFETY BELT SYSTEM

Gottfried Ogris, Unterschleissheim, Fed. Rep. of Germany, assignor to Britax-Kolb GmbH & Co., Dachau, Fed. Rep. of Germany

Continuation of Ser. No. 114,653, Oct. 28, 1987, abandoned. This application Dec. 15, 1988, Ser. No. 290,829

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1986, 3636847

Int. Cl.[4] B60R *22/38, 22/40*

U.S. Cl. 242—107.4 B **8 Claims**

1. Sensing and locking device for a safety belt system which comprises:

(a) a frame possessing an opening, said opening possessing an internally toothed periphery;

(b) a rotatable shaft for winding the safety belt, one end of the shaft traversing the opening in the frame;

(c) a crown possessing an externally toothed periphery, said crown being supported upon the shaft and positioned proximate to said end thereof such that when the shaft is in a first, or non-locking, position, the shaft rotates freely and when the shaft has been displaced from said first position to a second, or locking, position, the externally toothed periphery of said crown achieves locking engagement with the internally toothed periphery of the opening in the frame;

(d) a control wheel supported upon said end of the shaft and possessing an externally toothed periphery;

(e) a control disc pivotally mounted at its periphery to the frame and possessing an opening traversed by the shaft, said opening possessing an internally toothed periphery, pivotal movement of said control disc causing the displacement of the shaft from the first position to the second position;

(f) an inertia disc supported upon the shaft and possessing a peripheral stepped cam control surface, said inertia disc being capable of rotational movement relative to the control wheel upon a sensed withdrawal of the safety belt from the shaft, said inertia disc being positioned on the shaft between the control wheel and the control disc; and,

(g) a safety belt withdrawal-sensing first pawl pivotally mounted upon the control wheel proximate the periphery thereof, said first pawl being biased into engagement with the peripheral stepped cam control surface of the inertia disc and away from engagement with the internally toothed periphery of the opening in the control disc when the shaft is in the first position, and engaging the internally toothed periphery of the opening in the control disc when





the shaft has been displaced from the first to the second position by movement of the inertia disc relative to the control wheel, said peripheral stepped cam control surface sloping away from a predetermined interface contact point between the first pawl and said control surface thereby defining the closest possible on-engagement position between the first pawl and the internal toothed region of the opening in the control disc.

4,858,848

MAGNETIC TAPE CASSETTE

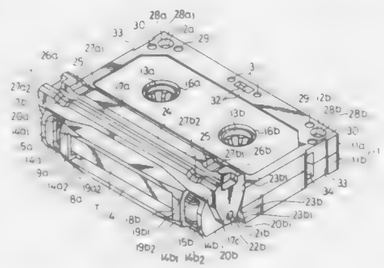
Takashi Katoku, and Masato Tanaka, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 6, 1988, Ser. No. 202,484

Claims priority, application Japan, Jun. 18, 1987, 62-94030[U]

Int. Cl.[4] G11B *23/04, 23/113*

U.S. Cl. 242—198 **9 Claims**



1. A magnetic tape cassette comprising:

(a) a cassette housing having a front opening portion;

(b) a front lid formed of a lid main section and supporting arm portions attached perpendicularly to said lid main section at both its end portions, said front lid being pivotally mounted on the front portion of said cassette housing by said supporting arm portions so as to selectively open and close said front opening portion of said cassette housing;

(c) tape guide rollers respectively provided in said cassette housing at both side end positions of the front opening portion of said cassette housing; and

d) grooves respectively formed on both side end portions of said lid main section at positions opposite to said guide rollers in a direction perpendicular to the longitudinal direction.

4,858,849

TAPE CASSETTE HOUSING

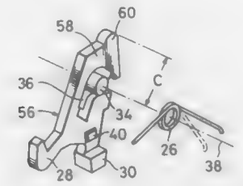
Masatoshi Okamura, Saku; Haruo Shiba, Komoro; Kenji Hashizume, and Yoshiya Sakata, both of Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 274,709

Claims priority, application Japan, May 2, 1985, 60-65894

Int. Cl.[4] G03B *1/04;* **G11B** *23/04;* **B65D** *43/14*

U.S. Cl. 242—199 **1 Claim**



1. A tape cassette comprising a housing consisting of an upper half and a lower half, a lid which protects the tape at the front of the housing, a space defined by a pair of side walls in said housing, and a lid locking member inserted in said space and provided with a pivot received in a bearing at a mating portion of the halves, said locking member having two leg levers, and a head extending upwardly into said upper half along a rear wall provided in said upper half, one of said leg levers being adapted to lock the lid when the latter closes the front opening of a housing and the other leg lever being adapted to release the lid when the same is turned open, said other leg lever being provided with a stop projected therefrom, said housing being provided with a stop on one of said side walls facing the stop on the locking member, the distance between the axis of a pivot of said lid locking member and the upper end of the head thereof being longer than the distance between the axis of said bearing and the rear wall of a space provided in said upper half, said two stops being at such positions that when they are engaged with each other said head is spaced from the said rear wall.

4,858,850

AIRCRAFT OPEN VIEWING PORT CONFIGURATION

Curtis E. McNay, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 9, 1987, Ser. No. 71,631

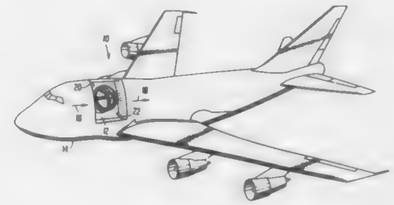
Int. Cl.[4] B64D *47/00*

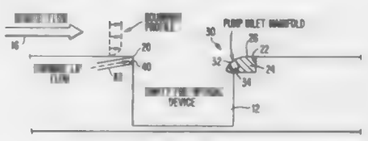
U.S. Cl. 244—1 R **12 Claims**

1. Apparatus for reducing drag from, and improving optical observation through, an open aircraft port during flight, the open port having an upstream edge and a downstream edge relative to an airstream following past the port, the airstream detaching from the vicinity of the upstream edge and flowing across the open port in a free shear layer, the apparatus comprising:

a ramp position at the downstream edge and having a ramp surface facing the port; and

means associated with said ramp for inducing reattachment of the free shear layer at a preselected location on said





ramp surface, wherein said reattachment means includes means for extracting air from the vicinity of said preselected ramp surface location, whereby flow disturbances over and aft of the port are reduced and density variations in the free shear layer across the port are reduced.

4,858,851

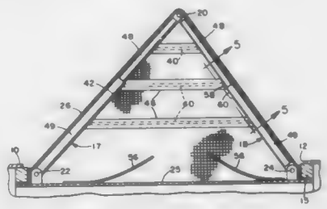
FOLDING WING STRUCTURE FOR MISSILE

Steven A. Mancini, Claremont, and Joseph D. Kutschka, Alta Loma, both of Calif., assignors to General Dynamics Pomona Division, Pomona, Calif.

Filed Jun. 7, 1988, Ser. No. 203,200

Int. Cl.[4] F42B *13/32*

U.S. Cl. 244—327 **8 Claims**



1. A folding erectable wing structure for an airframe, comprising:

a wing supporting strut assembly including a leading strut and a trailing strut pivotally connected together at adjacent ends, and spaced pivot means for pivotally mounting the opposite ends of the struts at spaced leading and trailing locations relative to an airframe, said struts being moveable between a collapsed, storage position in which they are substantially colinear and an expanded, erect position projecting out of said airframe;

biassing means for urging said struts towards said erect position;

a wing member of flexible fabric material in the form of a double walled pocket conforming in shape substantially to the extended position of said struts nd moveable with said struts, the wing member enclosing said strut assembly; and

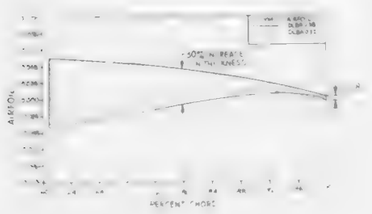
a series of spaced, parallel reinforcing ribs secured to each wall of said wing member and extending chordwise across the respective wall between the struts in the erect position of said struts.

4,858,852

DIVERGENT TRAILING-EDGE AIRFOIL

Preston A. Heane, Irvine, and Robert D. Gregg, III, Anaheim, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 1, 1987, Ser. No. 56,250
Int. Cl.[4] B64C 3/14
U.S. Cl. 244—35 R 5 Claims



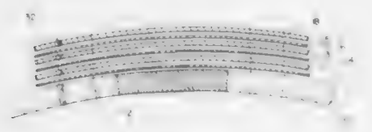
1. An improved transonic airfoil, having a chord, comprising:
a blunt trailing-edge base;
a high pressure surface connected to said blunt trailing-edge base by an immediate region of high local concentrated concave curvature;
a low pressure surface, opposite said high pressure surface, and connected to said blunt trailing-edge base;
the trailing portions of said high pressure and low pressure surfaces having slopes forming an included trailing-edge angle which diverges; and
a leading edge connecting said high pressure and low pressure surfaces opposite said blunt trailing-edge base.

4,858,853

BOLTED REPAIR FOR CURVED SURFACES

Everett A. Westerman, Auburn, and Mark S. Cohodas, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 17, 1988, Ser. No. 157,279
Int. Cl.[4] B23P 7/04
U.S. Cl. 244—119 18 Claims



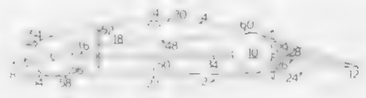
1. A method of repairing a damaged airframe structure, comprising:
preparing a plurality of relatively thin plates having a shape configured to at least overlap the damaged area of said structure;
bending said plates against said structure, either individually or in groups, so that said plates progressively conform to the surface of said structure;
applying a layer of adhesive between adjacent plates to form a stack of bonded plates; and
securing said stack of plates to said structure by inserting permanent fasteners through respective attachment holes in said stack of plates and said structure, said stack of plates providing structural support to said airframe structure.

4,858,854

INFLATABLE AERODYNAMIC WING STRUCTURE

Barry J. Jacobson, 30 Queen Street, Shepshed, Loughborough, Leicestershire, LE12 9RZ, England

Filed Mar. 16, 1988, Ser. No. 169,032
Claims priority, application United Kingdom, Mar. 16, 1987, 8706134
Int. Cl.[4] B64C 3/30
U.S. Cl. 244—123 5 Claims



1. An inflatable aerodynamic wing structure comprising an aerodynamic skin, a first inflatable member positioned inside the skin such that it extends longitudinally of the wing structure adjacent a leading edge portion of the wing structure, a second inflatable member positioned inside the skin such that it extends longitudinally of the wing structure adjacent a trailing edge portion of the wing structure, and an inflatable chamber which is positioned between the first and the second inflatable members and which is larger than the first and the second inflatable members, the wing structure being such that the first and the second inflatable members are adapted to be inflated to a higher pressure than the inflatable chamber so that, in use of the wing structure, the first and the second inflatable members provide longitudinal rigidity and the inflatable chamber forms the skin into an aerodynamic shape required by the wing structure, and the inflatable chamber being such that it is inflatable at least primarily by dynamic pressure via an air flap which is provided in a forward and underneath part of the inflatable chamber and which is such that it is opened by oncoming ambient air during use of the wing structure and is closed by air pressure in the inflatable chamber when sufficient air has been admitted to the inflatable chamber.

4,858,855

AUTONOMOUS ONBOARD LOADING DEVICE FOR A CARGO-AIRCRAFT

Jacques M. Dalbera, Colomiers, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed May 24, 1988, Ser. No. 198,134
Claims priority, application France, Jun. 4, 1987, 87 07801
Int. Cl.[4] B64C 1/22; B64D 9/00
U.S. Cl. 244—137.1 22 Claims



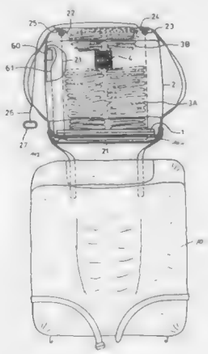
1. Autonomous onboard loading device for a cargo-aircraft which has a fuselage having a longitudinal axis, a floor in the fuselage, a lateral opening and a lateral door for the opening, said device comprising hoisting means movable between the exterior and interior of the fuselage of the aircraft, carrier and guide means for the hoisting means, for the movement of the hoisting means between the interior and exterior of the fuselage, comprising a first part extending transversely inside the fuselage in the region of the lateral door and fixed in an upper part of the fuselage, and a second part movable between an extended position in which it is in the extension of the first part outside the fuselage and projects transversely beyond the fuselage through an upper part of said opening uncovered by the lateral door and a retracted position in which the second part is withdrawn into the fuselage, support means for the second part of the carrier and guide means in the extended position of the second part, actuating means for the hoisting means, means for shifting the hoisting means along the carrier and guide means, and means for extending and retracting the second part of the carrier and guide means, the second part of the carrier and guide means comprising two arms each articulated at an end of the arm inside the fuselage in the vicinity of a corresponding upper corner of said lateral opening of the fuselage, said arms extending in a direction substantially parallel to each other in said extended position.

4,858,856

PRESSURE DEPENDENT RELEASE DEVICE FOR A PARACHUTE

Helmut Cloth, 4790 Paderborn, Riemekester 97a, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 164,152
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 3707294
Int. Cl.[4] B64D 17/56
U.S. Cl. 244—149 9 Claims



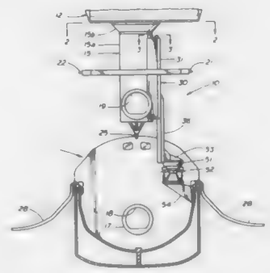
1. A releasing device for a parachute which is in the state ready for use, folded and disposed in a receptacle and held together by securing string against the force of an unholding preloaded spring, said releasing device having means for disconnecting said securing string comprising a breaking device for said securing string and control means for actuating said disconnecting means at predetermined conditions, wherein said control means has means actuating said breaking device by an electric control signal being derived after an initialisation operation and depending on a barometric pressure present and further depending on the presence of a given pressure change rate, said breaking device comprises energy storing means which is releasable by said electric control signal for disconnecting said securing string, wherein said breaking device is disposed within a casing, said casing having passage holes for said securing string and which passage holes are closed by a cutting means after cutting the securing string when actuating by the release of the energy storing means.

4,858,857

DOCKING MECHANISM FOR SPACECRAFT

Gregory A. Lange; John P. McManamen, and John A. Schliesing, all of Houston, Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 30, 1988, Ser. No. 292,123
Int. Cl.[4] B64G 1/64
U.S. Cl. 244—161 9 Claims



1. A docking mechanism for the docking of a space vehicle having a payload bay with a space station having an egress hatch, said docking mechanism comprising:
a space station docking structure mounted on said space station, said docking structure comprising an elongated tunnel structure attached at one of its ends in sealing relation with the space station about the egress hatch thereof;
a first docking ring;
means for mounting said first docking ring to the tunnel structure whereby said first docking ring is selectively movable between a retracted position closely adjacent the tunnel structure and a deployed position wherein said first docking ring is extended from the tunnel structure to a position appropriate for coupling engagement with a space vehicle;
a space vehicle docking structure mounted on said space vehicle, said space vehicle docking structure comprising a second docking ring;
a rigid support ring mounted on a wall of the payload bay in a location which is offset from the centerline of the space vehicle;
a plurality of linearly expansible attenuator actuator devices interconnecting said second docking ring and rigid support ring and movably supporting said second docking ring on the rigid support ring in an exposed position when the payload bay is in opened condition;
coupling means responsive to substantially coaxial engagement of said first and second docking rings by an aligned approach of the space vehicle to the space station for coupling said first and second docking rings;
impact attenuation means comprising said plurality of linearly expansible attenuator actuator devices for attenuating and absorbing the docking impact of the space vehicle and space station; and
means responsive to retraction of the active docking ring after coupling engagement of said docking rings for establishing a structural tie between said space vehicle and space station and sealing connection of said tunnel structure with said space vehicle for establishing a passageway for the passage of personnel and equipment between the space vehicle and space station.

4,858,858

PROCESSS FOR THE REACQUISITION OF THE PITCH ATTITUDE OF AN EARTH SATELLITE

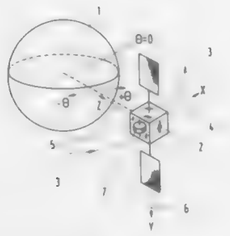
Ernst Bruederle, Ottobrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Ottobrunn bei Muenchen, Fed. Rep. of Germany

Filed Sep. 6, 1988, Ser. No. 240,921

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 3729389

Int. Cl.[4] B64G *1/28*

U.S. Cl. 244—165 6 Claims



1. A process for the reacquisition of the pitch attitude of an earth satellite which is equipped with an earth sensor having a visual field for viewing the earth, and a flywheel having a rotational axis oriented in the direction of a pitch axis (Y) of a coordinate system (X, Y, Z) which is fixed with respect to the satellite, the satellite being normally oriented in orbit with a yaw axis (Z) pointing toward the earth'S center and with a roll axis (X) pointing in the orbit direction, the flywheel rotating at an angular velocity ω which is maintained between a lower value ω_L and an upper value ω_U in normal operation, the process being used in the event the angular velocity falls below the lower value ω_L due to an insufficient energy supply and the earth orientation of the yaw axis is consequently lost, whereafter the energy supply is restored, and the earth (1) is no longer in the visual field of the earth sensor and where the angular velocity has fallen below the lower value ω_L by more than a preselected amount $\Delta\omega$, the process comprising:

(a) increasing the angular velocity of the flywheel toward a new value $\omega_C=\omega_L-\Delta\omega$ until the earth sensor determines a zero passage of a pitch deviation ($\theta=0$);

(b) then, further increasing the angular velocity toward a new value $\omega_C=\omega_U$ which guarantees a reversal of rotational direction of the satellite;

(c) then, during every additional zero passage of the pitch deviation as determined by the earth sensor, applying a new angular velocity to the flywheel which alternately decreases and increases the angular velocity of the flywheel and is distinguished from a respective preceding angular velocity by an amount qH_S/I_W wherein H_S is the actual or estimated angular momentum of the satellite during the zero passage, I_W is the moment of inertia of the flywheel, and $1<q<2$; and

(d) repeating step (c) until the angular momentum of the satellite during the zero passage has fallen below a preselected value H_{SO}.

4,858,859

CONTROL SYSTEMS FOR CONTROLLING THE PASSAGE OF VEHICLES

Joseph Apperson, Mickleover, England, assignor to British Railways Board, London, England

Filed Nov. 2, 1987, Ser. No. 116,013

Claims priority, application United Kingdom, Nov. 4, 1986, 8626354

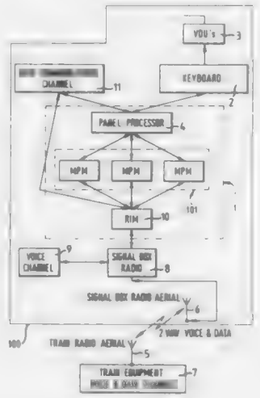
Int. Cl.[4] B61L *21/00*

U.S. Cl. 246—20 6 Claims

1. A control system for providing authority for a vehicle to travel along a defined section of track by passing electronic tokens between a signal box and the vehicle, said system comprising:

(a) a first data communications channel for passing vital information and which is security interlocked by solid state interlocking in said first data communications channel;

(b) a vital safety system within said solid state interlocking including a communications processor for processing said vital information;



(c) a keyboard in the signal box;

(d) a panel processor forming part of said solid stae interlocking and through which information is passed from the keyboard to the communications processor; and

(e) a second data communications channel interfacing with said panel processor through which information is passed from said second data communications channel to said communications processor.

4,858,860

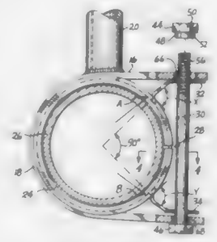
SIDE-LOAD TYPE PIPE HANGER WITH SINGLE BOLT CLOSURE AND LINER PROTECTING INSERT

Peter S. Richards, Issaquah, Wash., assignor to Progressive Fastening, Inc., Seattle, Wash.

Continuation of Ser. No. 047,182, May 6, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 273,603

Int. Cl.[4] F16L *3/10*

U.S. Cl. 248—62 6 Claims



1. A pipe hanger, comprising:

a generally C-shaped saddle comprising a pair of spaced apart arm portions and an interconnecting semi-circular bight portion, and a support leg member connected to said saddle wherein a pipe is side loaded into said saddle by moving it sideways into said saddle through an entry opening defined by and between the arm portions; and

an improved system for securing a pipe section within the C-shaped saddle, comprising;

a first bolt receiving opening in one of said arm portions;

a second bolt receiving opening in the second arm portion;

a clamping bolt comprising a rod body, an enlarged head at a first end of said rod body and a threaded end portion at a second end of said rod body;

a nut including a central opening that is threaded with threads which complement the threads on the bolt;

said openings in said arm portions being sized so that the bolt has a substantially fixed position relative to the saddle when the bolt and nut are threaded together and tightened;

a generally circular liner for a section of pipe of a length to extend around said section of pipe;

a liner bracing insert for said saddle comprising

a circular central portion having an arc length that is greater than ninety degrees 90°) and being shaped and positioned to contact the generally circular liner on the side of the pipe section opposite the bight portion of the saddle, and spaced apart end portions connected to the central portion and extending therefrom into positions inwardly adjacent the arm portions of the saddle, each said end portion of the insert having an inner part which extends outwardly from the central portion of the insert at an angle between it and the central portion less than ninety degrees 90°) relative to a tangent where the end portion connects to the central portion, each said end portion of the insert also including an outer part which extends contiguous an arm portion of the saddle and makes an angle with the inner part which is greater than ninety degrees 90°), said outer parts including generally circular bolt receiving openings aligned with the bolt receiving openings in the arm portions of the saddle; and

said bolt receiving openings in said end portions of said insert having border portions which contact the bolt when the bolt is tightened so as to anchor the end portions of the insert in position relative to the bolt;

whereby in use a pipe section is placed within said saddle, with the generally circular liner surrounding it, and with a semi-circular portion of the liner in contact with the semi-circular bight portion of the saddle, and the insert is placed within the saddle with its circular central portion against the generally circular liner on the side of the pipe section opposite the bight portion of the saddle, and the bolt is inserted through first the bolt receiving opening in a first arm portion of the saddle, then through the generally circular opening in a first end portion of the insert, then through the generally circular opening in the second end portion of the insert, then through the bolt receiving opening in the second arm portion of the saddle, and then the nut is applied to the bolt and tightened and such tightening fixes the bolt in position and squeezes the end portions of the insert together and in response to such squeezing and said contact between the bolt and the end portions of the bolt receiving openings in the end portions of the insert the central portion of the insert is displaced sideways towards the generally circular liner for exerting a clamping force on the liner and the pipe section.

4,858,862

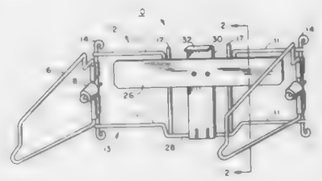
APPARATUS FOR SUSPENDING BAG PACKS OF DIFFERENT GEOMETRY

Randolph D. Prader, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 18, 1985, Ser. No. 810,454

Int. Cl.[4] B65B *67/04*

U.S. Cl. 248—99 6 Claims



1. An apparatus for the support of loop handle bag packs of different geometry and for the loading of individual bags from said packs comprising in combination:

(a) a frame having a front and a rear comprising at least one pair of spaced horizontal members interconnected with spaced vertical members;

(b) the horizontal members include a central length which is spaced from the end lengths of the horizontal member by a pair of spacing lengths interconnecting the central and end lengths, said spacing lengths functioning to accommodate the thicknesses of bag packs suspended by said apparatus;

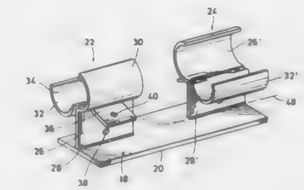
(c) a first support means carried by said central length, said support means being for a first pack of bags of a first general geometry which includes a stack of bags, each bag of which has a front and rear panel closed at the sides and bottom, a bag mouth opening, loop handles as integral extensions of said front and rear panels at the opposite ends of said bag mouth opening and a cross-member at or near the hand-gripping region of said handles intercon-

engagement with the horizontal planar surface of the pipe rack;

a first clamp member including a sheet-like spacer portion secured at its lower end to the base member, a first clamp portion having a C-shaped transverse cross-sectional configuration secured to an upper end of the spacer portion, and a through slot;

a second clamp member including a second clamp portion having a C-shaped transverse cross-sectional configuration, and a plate projecting from an edge of the second clamp portion for fitting within the through slot in the first clamp member, such that the second clamp member is pivotally movable with respect to the first clamp member from an open position to a closed position; and

a securing member for maintaining the plate adjacent the sheet-like spacer portion of the first clamp member when the second clamp member is in its closed position, such that the first and second clamp portions grip the process piping.



4,858,861

CLAMP-TYPE PIPE SHOE AND METHOD

Joseph Wilkinson, III, Rte. 6, Box 6142, Brazoria, Tex. 77422

Filed Sep. 22, 1988, Ser. No. 247,949

Int. Cl.[4] F16L *3/08*

U.S. Cl. 248—74.1 20 Claims

1. A pipe shoe for permanently supporting a length of process pipe above a pipe rack having a generally horizontal planar surface, the pipe shoe comprising:

a base member having a lower planar surface for sliding

necting the same; said first support means comprising two or more spaced vertical posts carried by said central length and extending above the uppermost horizontal member a sufficient distance to permit the cross-member of said pack of first general geometry to be positioned in back of said posts permitting support of said pack of first general geometry;

(d) a second support means carried by said central length and located between said vertical posts and extending above the uppermost horizontal member, said second support means being for a second pack of bags for a second general geometry, said second general geometry includes a stack of bags, each bag of which has a front and rear panel closed at the bottom and sides, a bag mouth opening, loop handles as integral extensions of said front and rear panels at opposite ends of said bag mouth opening and tab extensions from the front and rear panels at the center region of said bag mouth opening, said tab extensions having second orifice means therein; said second support means comprising means adapted to fit within said orifice means to support said second pack of bags therefrom, said second support means being adapted to support said second pack of bags from at or above the same plane as said first support means;

(e) a horizontal handle holder member affixed to said second support means said holder being adapted to support the handles of the bags of a second geometry; and

(f) loop handle arms extending from, and attached to said frame extending forwardly of said frame said arms being adapted to extend and separate the individual loop handles of each bag from one another.

4,858,863

CHOPSTICK SEAT

Kuen-Ming Lin, No. 141, Po-Ai St., Chunan Chen, Miaoli Hsien, Taiwan

Filed Feb. 9, 1989, Ser. No. 308,831
Int. Cl.[4] A47G *21/14;* A45D *19/04*
U.S. Cl. 248—174 2 Claims



1. A chopstick seat comprising:

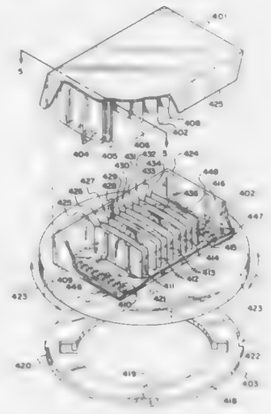
a one piece foldable member folded to form a seat body including a portion folded to form a V-shaped concave top portion which has two longitudinal top edge folds and a longitudinal bottom edge fold, two diverging side walls extending downward from said longitudinal top edge folds and having two longitudinal bottom edge folds, and two horizontal base portions respectively extending from said bottom edges folds of said side walls and overlapping one another, and two spaced apart cut lines which are transverse to said longitudinal top edge folds provided in said top wall and which extend downward into said side walls, said cut lines terminating in each of said side walls at two points higher than the level of said base portions in each of said side walls and dividing said top wall and said side walls into two spaced apart first portions and a second portion between said first portions, said second portion being further provided with two longitudinal folding lines each extending between said terminating points in each of said side walls and being folded therealong until said top edge folds of said side walls approach one another and until said V-shaped concave top portion is collapsed and extends downward, said folded second portion forming an indented seat face between said first portions.

4,856,864

TILT AND SWIVEL MECHANISM

Dennis C. Thompson, Roseville, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 30, 1987, Ser. No. 8,804
Int. Cl.[4] F16M *11/04*
U.S. Cl. 248—178 1 Claim



1. A tilt and swivel apparatus which provides for the tilting and swiveling of an object, the apparatus comprising:

a base;

support means for supporting the object;

rocking means, coupled to the base and to the support means, for allowing the supporting means to move in a rocking motion with respect to the base;

antisliding means for preventing the support means from moving in a sliding motion with respect to the base, the anti-sliding means includes a first gear rack coupled to the base and a first gear coupled to the support means and wherein the first gear rack and the first gear intermesh, a tab slot within the base; and, a tab coupled to the support means, wherein the tab is placed in the tab slot; and,

friction means coupled to the base and to the support means for preventing the support means from rocking freely on the base, the friction means includes

a plurality of slot walls each slot wall mounted on the base and extending up from the base, the slot walls arranged to form a plurality of slots,

a plurality of insert walls coupled to the support means, wherein the plurality of insert walls is placed within the plurality of slots, and

a friction spring attached to two slot walls of the plurality of slot walls to increase the pressure of the two slot walls upon an insert wall from the plurality of insert walls.

4,858,865

WEDGE LEVELING MOUNTING DEVICE

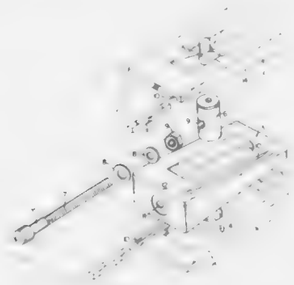
Rudolf Schrepfer, Kuesnacht, Switzerland, assignor to Air-Loc Schrepfer AG, Kuesnacht, Switzerland

Filed Oct. 20, 1987, Ser. No. 110,337
Int. Cl.[4] F16M *11/24*
U.S. Cl. 248—188.2 8 Claims

1. A levelling mount for machines and the like having a footplate with an upper inclined surface, a headplate with a lower inclined surface, a wedge interposed between said headplate and said footplate, said wedge having opposed inclined

surfaces in sliding engagement respectivly with said upper inclined surface and said lower inclined surface, a vertical pin passing through an opening in said wedge and plates and vertically aligning said plates for sliding vertical motion on said pin as said wedge moves horizontally therebetween,

sliding key and slot means between said inclined surfaces for maintaining said plates and wedges in transverse alignment as said wedge moves, a threaded adjusting screw



rotatably fixed in an end of said wedge and in threaded engagement with said vertical pin for horizontal adjustment of the position of said wedge between said plates upon rotation of said screw; and

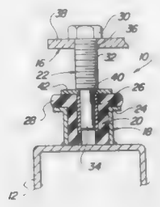
spring means for urging said wedge and plates into horizontal and vertical sliding engagement, said spring means, said vertical pin and said threaded screw acting to retain the parts in assembled operative relation.

4,858,866

RADIATOR RESTRAINING ASSEMBLY

Ronald H. Werner, Edgar, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 25, 1988, Ser. No. 185,589
Int. Cl.[4] B60K *11/04*
U.S. Cl. 248—213.3 1 Claim



1. A radiator restraining assembly for holding a radiator in a desired position relative to a support member, said radiator having an end surface and said support member spaced from said end surface, said assembly comprising holder means attached directly to said radiator end surface, resilient bushing means mounted within said holder means, and connection means extending between said support member and said bushing means, and said connection means moveable for compressing said bushing means to retain said radiator in said desired position while allowing limited flexing of said radiator relative to said connection means;

said holder means comprises a cylindrical ring, said bushing means being generally cylindrical and having a hollow center portion with a generally cylindrical sleeve fitted therein, said sleeve having a length less than the length of the bushing means, said connection means includes a head portion which engages said support member and a threaded portion adjustably mounted within an opening in said support member and a smooth generally cylindrical portion engaging the interior of said bushing sleeve, said smooth portion having a width that is less than the width of said threaded portion, and a bearing surface formed between said portions of said connection means, and means positioned between said bearing surface and said bushing means for compressing said bushing means in response to movement of said threaded portion relative to said support member; and

said generally cylindrical holder ring includes a peripheral lip at one end and said bushing means also includes a peripheral lip which is located between said compressing means and the peripheral lip of said holder ring.

4,858,867

GARMENT BAG SUPPORT HOOK

William L. King, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.

Continuation of Ser. No. 108,836, Oct. 15, 1987, abandoned.
This application May 18, 1988, Ser. No. 196,886
Int. Cl.[4] E04G *5/06*
U.S. Cl. 248—214 17 Claims



1. In a garment bag, hook means for hanging the garment bag from a support, comprising:

a first leg;

a second leg spaced a substantial distance from the first leg;

support surface means connecting the legs;

the first and second legs being adapted to contact opposite sides of a door near the top thereof when the hook means is used to support the garment bag from the door;

means for connecting the hook means to the garment bag to permit the garment bag to rotate relative to the hook means when the garment bag is supported by the hook means; wherein said means for connecting the hook means to the garment bag comprises a normally vertically oriented, closed loop attached to the first leg and a strap passing through said loop and connecting the top panel of the garment bag to said loop.

4,858,868

MOUNTING UNIT WITH ADJUSTABLE LOCKABLE PIVOT ARM

Volkwin Hoffelner, Sackgasse 10a, Wördern, Austria A-3425

Filed May 20, 1988, Ser. No. 197,003
Claims priority, application Austria, May 22, 1987, 1324/87
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—291 15 Claims

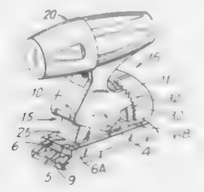
1. A mounting unit for mounting a game warning siren to a mounting surface comprising:

a base plate attachable to said mounting surface;

a pivot arm for attachment to said siren; and

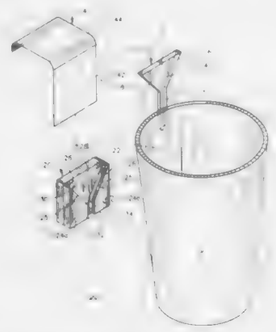
a bipartite slide block having a pivot arm retaining means for retaining said pivot arm and a locking means for prevent-

ing rotation of said pivot arm, said pivot arm being pivotably mounted to said pivot arm retaining means;
wherein said locking means is elastically swingable with respect to said pivot arm retaining means and wherein



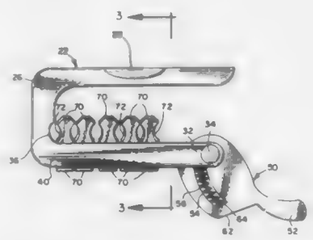
slidable insertion of said slide block into said base plate fixes the position of said pivot arm retaining means with respect to said locking means and prevents rotation of said pivot arm.

4,858,869
CUP ATTACHMENT SYSTEM
Michael A. Stang, 26 Stockmill Rd. - Apt. F, Pikesville, Md. 21208
Filed Sep. 20, 1988, Ser. No. 246,781
Int. Cl.[4] A47K *1/08*
U.S. Cl. 248—311.2 **19 Claims**



1. A releasable attachment system for releasably capturing a cup, comprising:
receptacle means for releasably mounting said cup to a base surface, said receptacle means including a housing having a discontinuous cross-sectional wall contour defining an axially extended open cavity having a substantially constant depth throughout said axial extension; and
insertion means coupled to an external surface of said cup for releasable coupling to said receptacle means within said open cavity, said insertion means including a tab member having a substantially rectangular first portion extending from a first end of said tab member to an angular second portion extending from said first portion to a second end of said tab member, said tab member first end being coupled to said external surface of said cup.

4,858,870
HANGER CLAMP FOR GARMENT BAGS, WITH MOVABLE HANGER RETAINING ELEMENTS
Rino Mazzanti, Bologna, Italy, assignor to Lenox Incorporated, Lawrenceville, N.J.
Filed Jan. 25, 1989, Ser. No. 301,800
Int. Cl.[4] A47F *5/00*
U.S. Cl. 248—316.1 **19 Claims**



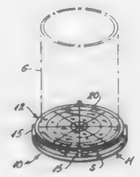
1. A clamp for retaining hangers, comprising:
a frame member having an at least partly horizontal support bar and means for mounting the support bar below an overhead surface, an insertion space being defined between the support bar and the overhead surface, the support bar defining a longitudinal axis and being dimensioned to carry hangers for clothing and the like;
a plurality of hanger retaining elements slidably carried on the support bar, each of the hanger retaining elements having at least one contoured face disposed towards another of the hanger retaining elements along the longitudinal axis of the support bar, the contoured face being dimensioned to partly enclose one of said hangers, facing pairs of the hanger retaining elements being separable to permit removal of the hanger from the support bar; and,
resilient means urging the hanger retaining elements on the support bar together, the resilient means being lockable to fix the hanger retaining elements against one another.

4,858,871
CLIP FOR FASTENING AN OBJECT TO A SUPPORT BY MEANS OF A HOOK AND DEVICE FOR FITTING SUCH A CLIP
Robert Romano, 47 avenue du Marechal Joffre, 94170 Le Perreux, France
Filed Jan. 13, 1988, Ser. No. 143,476
Claims priority, application France, Jan. 13, 1987, 87 00252
Int. Cl.[4] B42F *13/00*
U.S. Cl. 248—339 **7 Claims**



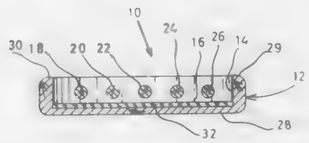
1. A clip for hooking an object to a support comprising:
a metal plate, said plate including
a first section having first and second sides and having a hanging means for hanging the object,
a second section having first and second sides, said first side forming an obtuse angle with said first side of said first section, and
a third section which is folded back along the second side of the second section so that said third section does not lie inside said obtuse angle formed between said first sides of said first and second sections, said third section includes a penetrating means for penetrating the object which is to be hung.

4,858,872
COASTERS
Russell Witt, P.O. Box 924044, Houston, Tex. 77292
Filed Nov. 1, 1988, Ser. No. 265,522
Int. Cl.[4] A47B *91/00*
U.S. Cl. 248—346.1 **12 Claims**



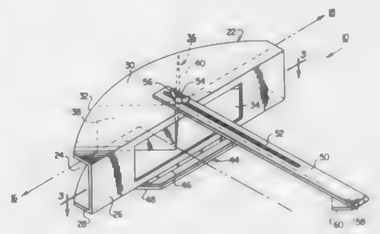
1. A coaster for supporting containers relative to a surface comprising a base portion and a container supporting tray element, at least one vertically extending post means for supporting said tray element in vertically spaced relationship with respect to said base portion so as to define an air space therebetween through which ambient air is free to pass, said tray element having upper and lower surfaces, at least one opening through said tray element and between said upper and lower surfaces, and at least one absorbent wick means mounted proximate to said opening adjacent said lower surface of said tray element, said absorbent wick means being spaced from said upper surface of said tray element, and said base portion including a receptacle portion, said receptacle portion being oriented in vertically spaced relationship below said at least one absorbent wick means, whereby any moisture passing through said opening from said upper surface of said tray element to said lower surface thereof will be absorbed by said wick means and be exposed to evaporation in the air space created between said base portion and said tray element.

4,858,873
NON-STICK DRINK COASTER
Charles C. Wilmoth, and Rhonda A. Wilmoth, both of Rte. 2, Box 27A, Whitleyville, Tenn. 38588
Filed Sep. 19, 1988, Ser. No. 246,277
Int. Cl.[4] A47B *43/04*
U.S. Cl. 248—346.1 **13 Claims**



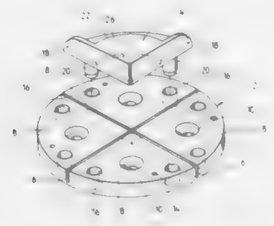
1. A coaster for supporting a drinking glass or the like that is subject to forming condensed moisture on the exterior thereof, which comprises:
a base member having substantially planar top and bottom surfaces defined by edge surfaces, said base member provided with a recess in said top surface, said recess defining side walls of said base, and a rim at a junction of said recess with said top surface, said recess having a substantially flat bottom wall;
a layer of absorbent material positioned within said recess and supported upon said bottom wall of said recess; and
a plurality of substantially parallel support rods spanning said recess, said rods each defining a top surface and a bottom surface, said top surface positioned below said rim, said bottom surface spaced above and separated from said absorbent material, said support rods having cross-sectional configuration whereby said top surface presents a minimum contact surface area to said drinking glass when said glass is supported thereon said support rods penetrating said side walls of said base to said edge surfaces.

4,858,874
REAR MOUNTED MIRROR APPARATUS FOR VEHICLES
John Wright, 801 British, Grand Prairie, Tex. 75050-2334
Continuation of Ser. No. 54,573, May 27, 1987, abandoned. This application Oct. 14, 1988, Ser. No. 258,070
Int. Cl.[4] A47G *1/16*
U.S. Cl. 248—467 **6 Claims**



1. A mirror apparatus for mounting onto a variably angled rear window of an on-road vehicle having a rear view mirror at the driver's station comprising in combination:
a frame defining a central cavity and providing apertures for optical transmission to and from said cavity;
mirror means consisting of a substantially intersecting dual mirror surface for cooperating with the rear view mirror at the driver's station to simultaneously transmit visual images from at least two optically obscure areas behind the vehicle to said driver's station mirror;
said mirror means being mounted in said central cavity in an angular orientation to at least a pair of said apertures for effecting reflective image transmission from a first to a second of said apertures; and
mounting means for attaching said frame to the variably angled rear window surface of a vehicle on which the mirror apparatus is to be utilized; said mounting means including a pair of support means each secured to opposed first and second surfaces of said frame for attaching said frame to the window surface and including presettable means operably displaceable in the longitudinal direction of the vehicle for adjustably securing said frame and mirror means relative to the angled plane of the window surface and to thereby effect a secured optical alignment through said apertures to the rear view mirror at the driver's station.

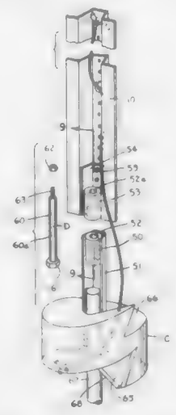
4,858,875
CORNER HOLDERS FOR MIRRORS OR SIMILAR ELEMENTS
Poul E. Nielsen, Højbjerg, Denmark, assignor to Mogens Daugaard, Brabrand, Denmark
Continuation of Ser. No. 816,104, Dec. 12, 1985, abandoned. This application May 13, 1988, Ser. No. 193,689
Claims priority, application Denmark, Apr. 16, 1984, 1233/84
Int. Cl.[4] A47F 7/14
U.S. Cl. 248—488 6 Claims



5. A corner holder for a mirror or similar element, the corner holder comprising a base element for fixation to a wall surface, said base element is provided with locking means, and a holding member provided with locking members for reception in the locking means of the base element and holding means for securing a corner of the mirror, characterized in that the base element is provided with a plurality of spaced mounting hole means and is divided into sections by recess means in the base element, so that the base element can be divided into one of a number of base element pieces or sections, the corner holder further comprises a plurality of holding members, which in shape and number correspond to the sections or base element pieces of the base element, said locking members are arranged on said holding members so as to enable said locking members to be received in the locking means of the base element by an insertion movement substantially perpendicular to a plane of the wall surface, and in that each of the holding members is provided on an arched side edge with an open pocket for accommodating a right-angled mirror corner, a height of the open pocket being adapted to a given mirror thickness.

4,858,876
POST SUPPORT
Albert M. Moreno, One Moren Pl., East Flat Rock, N.C. 28726
Continuation-in-part of Ser. No. 43,037, Apr. 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 859,655, May 5, 1986, abandoned. This application Apr. 28, 1988, Ser. No. 187,439
Int. Cl.[4] F16M 13/00
U.S. Cl. 248—545 16 Claims

1. A shear pin for use in a breakaway connection between a lower post section fixed on one end and an upper post section, said breakaway connection having opposed abutments receiving a shearing force therebetween carried at adjacent opposed ends of said section with axially aligned pin receiving openings therein conforming to an intermediate portion of said pin resisting forces tending to twist said upper post section upon said lower post section comprising:
- a plurality of longitudinally aligned flat surfaces extending circumferentially about an intermediate portion of said pin;
- fastening means at each end of said pin for securing a bearing member thereto;
- at least one of said fastening means at one end of said pin having threads to receive a bearing member thereon;
- a circumferential groove in said intermediate portion of said pin;
- said groove extending into said flat surfaces forming an arcuate connecting portion of reduced cross section separating said pin into upper and lower sections;



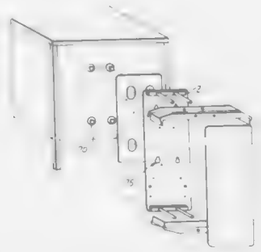
whereby said groove permits a substantially uniform shearing action at said connecting portion regardless of where a shearing force may be applied about said pin.

4,858,877
PLASTIC STANDARD FOR SUPPORTING A LIGHT FIXTURE ADJACENT TO THE GROUND
E. Ray Carter, 2515 N. 7th St., Phoenix, Ariz. 85006
Filed Feb. 29, 1988, Ser. No. 161,493
Int. Cl.[4] F21V 7/00
U.S. Cl. 248—545 18 Claims



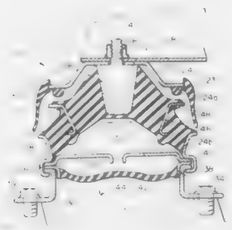
1. Light standard apparatus for supporting electrical elements and for receiving electrical conductors and their associated connectors, comprising, in combination:
- non-conductive cylinder means, including an open bottom portion, for receiving electrical conductor elements, including at least an active pair of electrical conductors and a ground conductor and electrical conductor connectors for connecting the electrical conductors together;
- cap means removably secured to the cylinder means for closing the cylinder means and for receiving and supporting electrical elements; and
- grounding means secured to the cap means and to the electrical elements for grounding the electrical elements and including a ground element for connecting the ground conductor.

4,858,878
MOUNT FOR SECURING PROTECTED ARTICLES
Mark M. Gassaway, 2201 Stern La., Oxnard, Calif. 93035
Filed Oct. 21, 1987, Ser. No. 111,459
Int. Cl.[4] A47F 5/00
U.S. Cl. 248—551 8 Claims



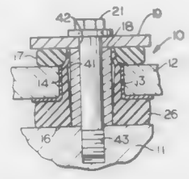
1. A security mounting for releasably holding a protected article to a substrate body, comprising:
- a base plate and a second plate, each having a substantial planar area;
- a plurality of posts connected to said plates holding said plates parallel to and spaced from one another with a spacing between them to receive the protected article;
- lock means releasably holding one of said plates to said posts;
- an adhesive pad having a substantial area adhered to said base plate and being adherent to said substrate body; and
- a rigid saddle-like bracket restrained to the connected plates and posts, said bracket having a pair of arms partially overhanging the spacing between the plates to prevent in-plane removal of a protected article from the said spacing past the arms.

4,858,879
MOUNT
Yasuo Miyamoto; Katsuyoshi Arai, and Keiichi Uchiyama, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 6, 1988, Ser. No. 215,660
Claims priority, application Japan, Jul. 7, 1987, 62-103328; Dec. 1, 1987, 62-184185
Int. Cl.[4] F16F 13/00
U.S. Cl. 248—562 6 Claims



1. A mount comprising:
- a rigid boss adapted to be connected to a moving component;
- an annular flange adapted to be connected to a stationary support;
- a resilient element connected between said boss and said annular flange to resiliently support said moving component relative to said stationary support, said resilient element having a frustoconical shape;
- a deformable element cooperating with said resilient element to define a chamber, said chamber being filled with fluid;
- a rigid partition connected to said flange and adapted to divide said chamber into a working chamber and a compensation chamber, said partition including at least one orifice which said two chambers are communicated with each other; and
- pressing means including a rigid spacer connected to said boss and having an annular projection spaced above the intermediate portion of the resilient element, and a rigid ring inserted into the intermediate portion of said resilient element and having an outwardly extending annular flange opposing said annular projection said projection engaging the intermediate portion at said annular flange, when said boss moves downwards, thereby pressing said resilient element towards said partition.

4,858,880
RESILIENT LOAD SUPPORTING AND MOTION ACCOMMODATING MOUNTING APPARATUS
James C. Durand, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.
Filed May 29, 1987, Ser. No. 55,825
Int. Cl.[4] F16M 5/00
U.S. Cl. 248—635 13 Claims



7. A resilient load supporting and motion accommodating mounting apparatus for interconnecting supporting and supported members, at least one of said members having an opening therein, comprising:
- a rigid support having a tubular portion extending through the opening in the one member and a flange projecting radially outwardly from one end of the tubular portion and being in engagement with the one member;
- a resilient primary support having a circular head portion disposed between the flange and the other member and integrally bonded to the flange, a tubular portion extending through and integrally bonded to the tubular portion of the rigid support, and a central passage extending axially therethrough, said tubular portion of the primary support having a skirt extending beyond the tubular portion of the rigid support;
- a resilient annular rebound pad having opposite ends and a central passage extending therethrough, one of said ends normally being in contact with the one member; said skirt extending into the central passage of the rebound pad and being in sealing engagement with the rebound pad;
- a rigid spacer sleeve extending through the central passages and cooperating with the resilient primary support to define an annular space therebetween;
- a snubbing washer normally engaging the other of said ends of the rebound pad; and
- threaded fastener extending through the snubbing washer and the rigid spacer sleeve and threaded into the other of said members;
- said rebound pad normally being compressed between the one member and the snubbing washer in the assembled condition and having a free state shape wherein said one end has an inner chamfer, intersecting the central passage of the rebound pad and an outer chamfer intersecting the

outer peripheral surface of the rebound pad, said inner and outer chamfers forming an axially projecting annular ridge in sealing contact with the supported member in the assembled condition; and

wherein said central passage in the rebound pad has a frusto-conical shape and said skirt has a frusto-conical outer surface similar to the frusto-conical shape of the rebound pad.

4,858,881

TIRE REPAIR PLATE

James W. Alloway, Rte. 2, Box 15-A, College Grove, Tenn. 37046

Filed Apr. 13, 1988, Ser. No. 181,109
Int. Cl.[4] B29C 67/10
U.S. Cl. 249—135 3 Claims



1. A repair plate for use in mending a surface of a plastic article, comprising:

(a) a plate body having a front face surface conforming with the surface of said plastic article to be mended, a rear surface, a circumferential margin, and a substantially uniform thickness,

(b) said plate body being made of a homogeneous epoxy casting resin material stable under high temperatures of at least 220 deg. F.,

(c) a metallic base plate of high thermal conductivity having a front surface and a rear surface, a plurality of spaced perforations extending through said base plate from said front surface to said rear surface, and a thickness less than the thickness of said plate body,

(d) said base plate being embedded in said plate body, said rear surface of said base plate lying substantially coplanar with said rear surface of said plate body, and said front surface of said base plate being spaced from and behind said front face surface of said plate body, and

(e) said resin material filling said perforations in said base plate.

4,858,882

BLOWOUT PREVENTER WITH RADIAL FORCE LIMITER

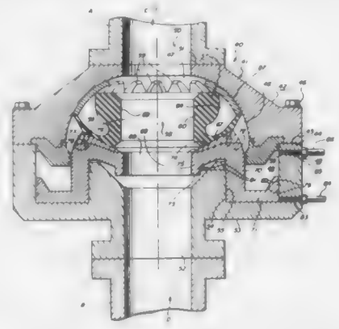
Joseph O. Beard, 1025 N. Lincoln Ave., Fullerton, Calif. 92631; Stanley W. Granger, 23800 Gold Nugget, Diamond Bar, Calif. 91765, and Frode Sveen, 12697 Orgren Ave., Chino, Calif. 91710

Continuation of Ser. No. 54,932, May 27, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 273,738
Int. Cl.[4] E21B 33/06
U.S. Cl. 251—1.2 31 Claims

1. An oil well blowout preventer comprising:

a. a housing having an entrance bore, a coaxially aligned lower exit bore, and a generally circularly symmetric curved hollow upper interior cavity coaxial with and communicating with said entrance and exit bores, said housing being adapted to receiver drill string components coaxially through said bores,

b. a sealing member moveable longitudinally and radially within the interior of said housing, said sealing member being a composite structure having a plurality of incompressible elements imbedded in a resilient matrix of generally circularly symmetric shape, the dimensions of said matrix being of such relationship to the inner wall dimensions of said cavity of said housing as to form a space between said matrix and said cavity walls for any longitudinal position of said sealing member in said cavity



thereby permitting movement of a portion of said resilient matrix into said space, and thereby limiting the force with which said sealing member may impact said drill string components within said housing, and

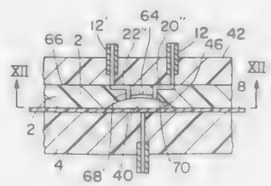
c. actuating means for effecting longitudinal and radial movement of said sealing member.

4,858,883

VALVE WITH FLEXIBLE SHEET MEMBER

Milo E. Webster, Braintree, Mass., assignor to Integrated Fluidics, Inc., Plainville, Conn.

Division of Ser. No. 131,751, Dec. 11, 1987. This application Dec. 8, 1988, Ser. No. 281,544
Int. Cl.[4] F16K 7/12
U.S. Cl. 251—61.1 11 Claims



1. A valve comprising:

a valve body member having a firm and stable surface,

a flexible valve sheet member having a surface for conforming and mating engagement with said valve body surface,

first and second fluid passageways intersecting the surface of the valve body member at spaced locations with a land portion located between the passageways,

a groove formed in the surface of the land portion, which is depressed relative to the surface of the land portion and which extends between the spaced locations where the first and second fluid passageways intersect the surface of the valve body member,

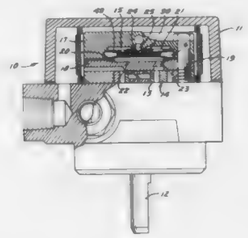
and means for flexing the said sheet member between a first position in which the valve sheet surface is in mating and sealing engagement with the valve body surface and the depressions to sealingly block flow between the first and second passageways, and a second position in which said sheet surface is spaced away from said first position to allow flow between said first and second passageways across the land portion by way of the depressed portion.

4,858,884

DIAPHRAGM-ACTUATED VALVE FOR A GEAR PUMP

Frank L. Harwath, Rockford, Ill., assignor to Suntex Industries Incorporated, Rockford, Ill.

Filed Sep. 22, 1988, Ser. No. 247,668
Int. Cl.[4] F16K 31/126, 43/00
U.S. Cl. 251—61.4 4 Claims



3. A valve assembly comprising a valve seat having a port therein, a valve member movable between open and closed positions with respect to said port, a Belleville spring engageable with one side of said valve member and operable to urge said valve member toward said open position, and a flexible and pressure responsive diaphragm engageable with the other side of said valve member and operable to urge said valve member toward said closed position when subjected to pressurized fluid, said valve assembly being characterized in that said valve member includes a generally cup-shaped housing of circular cross-section, said housing comprising a substantially planar wall having a hole formed therethrough in alignment with said port, an annular skirt formed integrally with the outer periphery of said wall and extending axially away from said port, an annular flange formed integrally with and projecting radially outwardly from said skirt and engaging said spring, said flange having a face spaced axially from and disposed substantially parallel to said wall and engaging said diaphragm, a disc of elastomeric material telescoped into said housing and having one side located in abutting relation with said wall so as to seal against said port when said valve member is in said closed position, a retainer for holding said disc in said housing, said retainer comprising a generally circular plate formed of sheet metal and telescoped into said housing in abutting relation with the other side of said disc, said plate having one face disposed in substantially the same plane as said face of said flange and engaging said diaphragm, and a plurality of angularly spaced and radially outwardly projecting tabs formed integrally with the outer periphery of said plate and engaging the inner side of said skirt with tight fit thereby to hold said retainer in assembled relation with said housing, each of said tabs including a face disposed in non-abutting relation with said disc and disposed in a plane located between said disc and the plane occupied by said one face of said flange and said one face of said plate thereby to prevent any burrs on said tabs from projecting into and piercing said diaphragm.

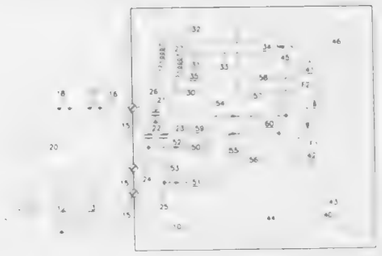
4,858,885

ANTI-BOUNCE LOGIC FOR CRITICAL LOADS

Kenneth B. Kidder, Coon Rapids; William R. Landis, Bloomington, and Paul B. Patton, Rockford, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 15, 1988, Ser. No. 206,777
Int. Cl.[4] F23N 5/24
U.S. Cl. 251—129.01 14 Claims

1. An anti-bounce system adapted to be connected to one or more critical loads to control and monitor the state of said loads, including: a control system adapted to control operating power to at least one critical load through load control means; said control system further including at least two subsystems for monitoring and controlling said critical load; a first of said subsystems for normal control of said critical load with said first subsystem having a normal signal processing time of such a length as to create a potential problem upon momentary failures of said operating power to said critical load which results in momentary change in state of said load; load control monitoring means having connection means connected to said load and said first subsystems to provide said first subsystem



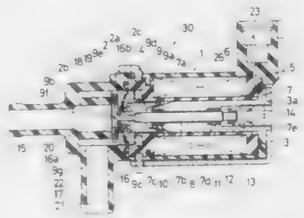
with feedback signal means to allow said first subsystem to monitor said load; a second of said subsystems for rapid control of said critical load with said second subsystem having a rapid signal processing time of such a length as to be able to rapidly control said load in the event of said momentary change in state of said load; and said load control monitoring means having further connection means connected to said second subsystem to allow said second subsystem to rapidly and safely control said critical load by operation of said load control means upon said momentary failure of said operating power to said critical load.

4,858,886

ELECTROMAGNETIC VALVE

Junichi Tatara, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 31, 1988, Ser. No. 176,156
Claims priority, application Japan, Mar. 31, 1987, 62-49597[U]; May 29, 1987, 62-85280[U]
Int. Cl.[4] F16K 31/06
U.S. Cl. 251—129.07 2 Claims



1. An electromagnetic valve comprising:

a valve housing including an inlet port, an exhaust port and a valve seat portion;

a motor housing fixed to said valve housing;

an electromagnetic mechanism in said motor housing and including a solenoid coil, a magnetic yoke connecting ends of said solenoid coil, and fixed and movable cores within said solenoid coil;

a valve member movably mounted on said movable core at a position for closing said valve seat portion;

an elastomeric diaphragm member having an outer periphery air tightly secured between said valve and motor housings to define a back pressure chamber and having an inner periphery air tightly secured to said movable core at a position where the material of said inner periphery of said diaphragm member elastically presses on said valve member, wherein the elastic pressure of said inner periphery of said diaphragm member comprises means for permitting said valve member to move relative to said movable core and pivot so as to airtightly seal said valve seat portion; and

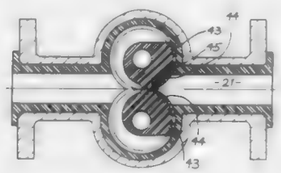
passage means in said movable core for communicating said back pressure chamber with a pressure at said inlet port.

4,858,857

VALVE AND VALVE ROLLER SEALING

Christopher G. Kelsey, Sydney, and Ian R. McKenzie, Flinders Park, both of Australia, assignors to Geoflow International Pty. Limited, Australia

Filed Sep. 27, 1988, Ser. No. 249,678
Claims priority, application Australia, Oct. 23, 1987, PI5029
Int. Cl.[4] F16K *13/02*
U.S. Cl. 251—212 **5 Claims**



1. A fluid valve in which flow is controlled by a pair of cylinders in peripheral contact and rotatable about parallel axes between a closed position and an open position of the valve, the cylinders being mounted within a valve chamber defined by upper, lower and cylindrical wall portions, at least one of the cylinders having a tapered circumferential groove in its peripheral face, characterised in that the peripheral face of each cylinder is provided with at least one pair of oppositely inclined teeth sealingly engageable with said cylindrical wall portion, the peripheral face being further provided with a resilient sealing projection engageable with the corresponding projection of the other cylinder when the cylinders are rotated to the closed position of the valve.

4,858,886

PLATFORM LIFTING MECHANISM

Ouelio Cruz, and Neal Cruz, both of 3294 NW. 69th St., Miami, Fla. 33147

Filed Jul. 11, 1988, Ser. No. 217,693
Int. Cl.[4] B66F *3/22*
U.S. Cl. 254—122 **3 Claims**

1. A lifting mechanism, comprising:

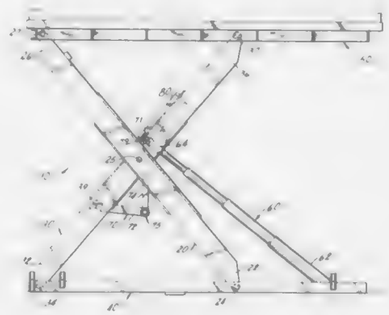
A. a chassis member;

B. scissor-action means including two pairs of elongated structural members in pivotal criss-cross arrangement with respect to each other, each elongated structure member having upper and lower ends, wherein said upper ends of said first two elongated structural members include third roller means for supporting said platform member and first two of said elongated structural members in opposite location being pivotally mounted to said chassis member at their lower ends and the second two elongated structural members including first roller means at their lowest ends for travelling within said chassis member;

C. platform means pivotally supported by said second two elongated structural members and slidably supported by the upper ends of said first two elongated structural members;

D. hydraulic means for lifting said platform including at least one distensible piston rod having second roller means at its end and one cylinder that is pivotally mounted to said chassis;

E. linkage means for pivotally securing said piston rod to said first two elongated members and said linkage means



including first and second hingedly connected arm members at one of the ends and the other ends of said arm members being pivotally mounted to said first two elongated structural members and the second arm member being pivotally mounted to said first roller means;

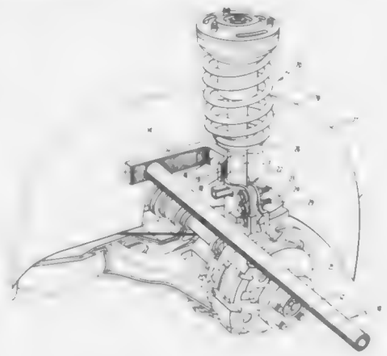
F. a bearing plate member rigidly mounted to and between said first two elongated structural members and said bearing plate member positioned for cooperatively receiving said second roller means.

4,858,889

CAMBER ADJUSTING TOOL FOR FRONT-WHEEL DRIVE VEHICLES

Richard L. Dixon, 715 E. Geer St., Durham, N.C. 27701

Filed Dec. 15, 1988, Ser. No. 284,694
Int. Cl.[4] B66F *1/00*
U.S. Cl. 254—131 **17 Claims**



1. A hand tool for adjusting the camber of a wheel assembly on a front-end drive vehicle including a vertically disposed spring-loaded strut portion located between a partition means and a front wheel, said tool comprising:

(a) a structural configuration including an elongated handle section, a fulcrum section, and a wheel assembly contacting section,

(b) said wheel assembly contacting section including a strut portion bearing surface transversely disposed at an outer end of bearing surface support means projecting outwardly from a first side and at one end of the fulcrum section,

(c) said elongated handle section being connected to the fulcrum section at a location laterally spaced from the bearing surface support means and projecting outwardly from said first side of the fulcrum section with the handle, fulcrum and wheel assembly contacting sections being substantially disposed in a common plane,

(d) the fulcrum section including a fulcrum bearing surface on a second side of the fulcrum section opposite said first side thereof,

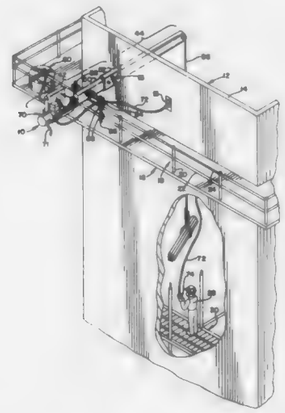
(e) said fulcrum bearing surface being substantially flat along said second side and being effective to abut said partition means of the front-end drive vehicle.

4,858,890

METHOD AND APPARATUS FOR LIFTING OBJECTS INSIDE A LIMITED ACCESS VESSEL

Ronald E. Fowler, Long Grove; Jeffrey L. Voss, Elgin, both of Ill., and Stephen D. Cain, Canton, Ga., assignors to Brand Scaffold Services, Ltd., Park Ridge, Ill.

Filed Feb. 26, 1988, Ser. No. 160,530
Int. Cl.[4] B66C *23/30;* **B66D** *1/12, 3/20*
U.S. Cl. 254—335 **2 Claims**



1. A hoist for lifting objects inside a vessel having a wall defining a port and having a platform adjacent the exterior of said wall, said hoist comprising:

a frame, said frame including a support portion for extending outwardly from said port adjacent said platform and including a cantilevered portion for extending through, and inwardly from, said port when said hoist is operatively disposed to lift said objects inside said vessel, said

frame extending in a generally horizontal plane when the hoist is operatively disposed to lift said objects inside said vessel, said support portion including a round bar fixed to, and laterally extending on each side of, said frame parallel to said horizontal plane for being attached to said platform;

attaching means for attaching said frame support portion round bar to said platform;

a cable extending along said frame from said support portion to said cantilevered portion;

means for guiding said cable through a change in direction on said cantilevered portion to accommodate the hanging of an end of said cable from said cantilevered portion; and

a winch operatively engaged with said cable and mounted to said frame support portion for feeding out and for retracting said cable whereby the end of said cable may be raised and lowered inside said vessel.

4,858,891

FIBERGLASS FENCE POST OR COLUMN STRUCTURE

Roger T. Boes, 3713 Bixler St., Metairie, La. 70001

Filed Sep. 30, 1988, Ser. No. 251,914
Int. Cl.[4] E04H *17/14*
U.S. Cl. 256—19 **2 Claims**



1. A fence of column structure, comprising:

an internal support, said support including

steel tubing or the like positioned longitudinally through the center of said structure,

an upper extension having a diameter less than that of said tubing, the length of said extension being at least two inches, and

a steel mounting member affixed to said support juxtaposed between said upper extension and said tubing; and

an exterior of fiberglass compound moldingly affixed around said support, said compound including

fiberglass resin, and

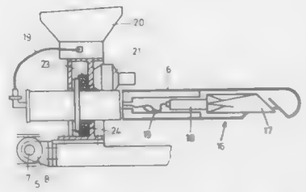
bits of fiberglass roving.

4,858,892

DEVICE FOR DETERMINING THE CHARGE PROFILE IN A SHAFT FURNACE

Hans-Otto Kreuz, Fortunastrasse 9 D-5901, Wilnsdorf, Fed. Rep. of Germany, and Hans Jochen Grisse, Eisernfalstrasse 451, D-5900, Siegen, Fed. Rep. of Germany

Filed Apr. 22, 1988, Ser. No. 184,877
Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715762
Int. Cl.[4] C21B *7/24*
U.S. Cl. 266—99 **4 Claims**



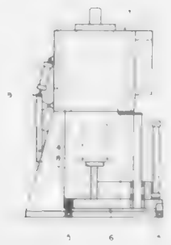
1. Device for determining the charge profile in a shaft furnace with a measuring unit which is introduced radially into the furnace by way of a tubular lance and scans the surface of the charge material in a noncontact fashion, comprising a radar unit (**16**) at the front end of the tubular lance (**6**), means for pivoting the beam direction (**27**) of this radar unit about the longitudinal axis of the tubular lance (**6**) bilaterally over an angle (alpha), and means for pivoting said beam direction (**27**) as well about a transverse axis extending perpendicularly thereto in the forward direction over an angle (beta) during projection of the beam.

4,858,853

BELL FURNANCE AND HARDENING VAT ARRANGEMENT

Pierre Beuret, and Pascal Beuret, both of Porreatruy, Switzerland, assignors to Pierre Beuret, Porreatruy, Switzerland

Filed May 31, 1988, Ser. No. 200,727
Claims priority, application Switzerland, Jun. 5, 1987, 2145/87
Int. Cl.[4] C21D *9/00*
U.S. Cl. 266—249 12 Claims



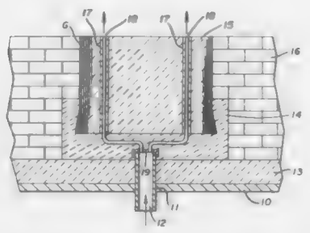
1. A bell furnace and hardening vat arrangement, said furnace and said vat being placed at different levels, at least one of these elements being movable horizontally relative to the other, the arrangement including supporting means for supporting a charge composed of parts cntained in a cage, these means being integral with the bell and projecting from the sidewall and on the inside of the latter, the arrangement further comprising a lift capable of entering the bell, characterized in that vertical movement means are provided for subjecting the bell to a relative vertical movement in relation to the furnace, the furnace remaining fixed, while the vat is under the furnace, so that the bottom rim of the bell is brought against the top peripheral portion of the vat, the bell and the vat then forming a tight enclosure.

4,858,854

STIRRING BLOCK WITH UNIDIRECTIONAL GRAIN STRUCTURE HAVING IMPROVED EROSION RESISTANCE

Micheal D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Jun. 30, 1988, Ser. No. 213,938
Int. Cl.[4] C21C *5/48*
U.S. Cl. 266—265 3 Claims



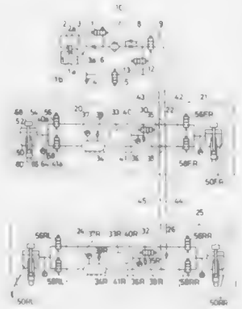
1. In a device for introducing stirring gas into a mass of molten metal in a vessel having a refractory lining and a stirring block having upper and lower surfaces positioned in said lining, the improvement comprising forming said stirring block of a refractory having a dense, unidirectional grain structure extending between said upper and lower surfaces, said upper surface positioned for engagement with said molten metal, apertures in said stirring block extending between said upper and lower surfaces, shaped tubes positioned in said apertures and a gas supply pipe positioned in an opening in said vessel and said lining and communicating with said shaped tubes.

4,858,895

VEHICLE FLUID SUSPENSION CIRCUIT WITH EQUALIZED SUPPLY AND DISCHARGE SPEEDS

Shuuichi Buma; Nobutaka Ohwa, both of Toyota; Osamu Takeda, Susono, and Hajime Kamimae, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 31, 1988, Ser. No. 200,432
Claims priority, application Japan, Jun. 9, 1987, 62-88765[U]; Jun. 9, 1987, 62-88766[U]
Int. Cl.[4] B60G *17/00, 11/26*
U.S. Cl. 267—64.16 8 Claims



1. A vehicle fluid suspension circuit comprising:
a fluid suspension of a vehicle;
fluid supply/exhaust means for supplying and exhausting fluid to and from said fluid suspension;
a supply line connecting said fluid suspension at a first position with said fluid supply/exhaust means;
an exhaust line connecting said fluid suspension at a second position with said fluid supply/exhaust means;
high pressure reserve means provided at said supply line for maintaining a high pressurized fluid therein;
a first valve provided at a supply portion of said supply line for supplying said high pressurized fluid from said high pressure reserve means to said fluid suspension through said supply portion when said first valve is opened;
low pressure reserve means provided at said exhaust line for maintaining a low pressurized fluid therein; and
a second valve provided at a discharging portion of said exhaust line for allowing fluid to discharge from said fluid suspension to said low pressure reserve means through said discharging portion when said first valve is opened;
wherein an effective area of a supply portion of said supply line is smaller than that of a discharging portion of said exhaust line so that a fluid supply speed is equalized to a fluid discharge speed.

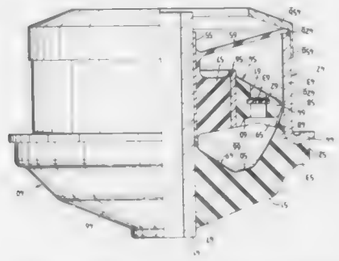
4,858,896

ELASTOMERIC MOUNTING

Terence H. Colford, Queniborough, England, assignor to Dunlop Limited a British Company, London, England

Filed Sep. 16, 1987, Ser. No. 97,148
Claims priority, application United Kingdom, Sep. 19, 1986, 8622638
Int. Cl.[4] F16F *9/08*
U.S. Cl. 267—140.1 15 Claims

1. An elastomeric mounting comprising a pair of rigid members arranged to define an annular space therebetween,
an annular first element of elastomeric material located in said annular space and arranged to extend between and serve to interconnect said rigid members,
a second element of elastomeric material also arranged to extend between and be sealed to each of said rigid members to form therebetween a flexible annular diaphragm seal,
said annular first element of elastomeric material being of a shape which deforms by both shear and bending movements in the event of relative longitudinal movement of the rigid members and only said first of said first and second elements of elastomeric material being shaped to deform from an initially unstressed condition in response to applied load in said direction of relative longitudinal movement by a combination of buckling and shear movements to exhibit a regressive stiffness characteristic,
said first and second elements of elastomeric material being spaced apart by said rigid members in said direction of relative longitudinal movement of the rigid members to cooperate with said rigid members to define therebetween an annular fluid chamber,



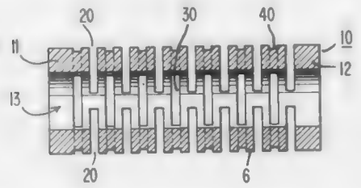
a substantially incompressible fluid contained in said annular fluid chamber,
an annular elastomeric buffer means contained in said annular fluid chamber and secured to one of the confronting surfaces of the inner and outer rigid members for restricting relative radial movement of the rigid members, said annular elastomeric buffer means incorporating an annular reinforcement layer of substantially inextensible material and being arranged to slide in fluid sealing engagement over the other of said confronting surfaces of the inner and outer rigid members, and
a fluid restrictor arranged to permit a restricted flow of fluid within the fluid chamber between opposite sides of the buffer means during relative longitudinal movement of the rigid members thereby to provide a damping effect additional to that provided by said first element of elastomeric material during relative longitudinal movement of the rigid members.

4,858,897

SPRING

Hideki Irifune, 225-3, Nakatsu, Kakogawa-cho, Kakogawa-shi, Hyogo-Prefecture, Japan

Filed Nov. 16, 1987, Ser. No. 120,841
Int. Cl.[4] F16F *1/02*
U.S. Cl. 267—181 4 Claims



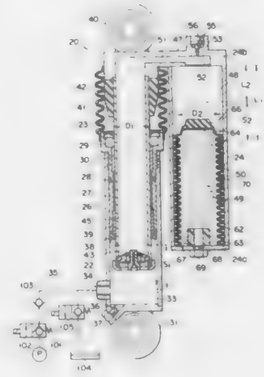
1. A spring comprising a hollow cylinder having a wall defining a bore extending therethrough coaxially therewith, a plurality of shallow annular lead grooves arranged axially of said cylinder at a first predetermined spacing and extending perpendicular to the axis of said cylinder, said plurality of shallow annular lead grooves being in the outer peripheral surface of said cylinder and extending into said wall of said hollow cylinder less than the thickness of said wall, said cylinder having a plurality of groups of slits arranged axially of the cylinder at a second predetermined spacing, said second predetermined spacing being a multiple of and coincident with said first predetermined spacing, said plurality of groups of slits extending perpendicular to the axis of said cylinder and through said wall for communicating with said bore, said slits in each group of slits being disposed around the cylinder axis and equidistantly spaced apart circumferentially of the cylinder, each said slit group including a pair of slits opposed to each other diametrically of the cylinder, each two axially adjacent slits being displaced from each other by 90 degrees about the cylinder axis, and the width of each said slit being equal to or less than the width of each said shallow groove.

4,858,898

ACCUMULATOR

Yoshiharu Niikura, Fujisawa; Takeo Fukumura, and Chiharu Umetsu, both of Yokohama, all of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Dec. 30, 1988, Ser. No. 292,377
Claims priority, application Japan, Jan. 19, 1988, 63-8924
Int. Cl.[4] F16F *9/43;* B60G *17/04*
U.S. Cl. 267—218 9 Claims



1. An accumulator comprising:
a first hollow cylinder whose inner surface defines a first liquid chamber which is filled with a liquid;
connecting means arranged in said first cylinder, a liquid path communicating with said first liquid chamber being formed in said connecting means;
a second hollow cylinder connected to said first cylinder by means of said connecting means and having first and second end walls opposing each other;
a bellows housed in said second cylinder, said bellows including a bellows body and an end plate for sealing one end of said bellows body, the other end of said bellows body being fixed to said first end wall of said second cylinder, said bellows body freely expanding and contracting in an axial direction of said second cylinder with a stroke, a gas chamber being defined by an inner surface of said bellows body, a compressed gas being sealed in said gas chamber, a second liquid chamber being defined by an outer surface of said bellows and an inner surface of said second cylinder, and said second liquid chamber commu-

nicating with said first liquid chamber via the liquid path of said connecting means;

a gas supply port formed in said second cylinder, said gas supply port being opened when a gas is supplied into said gas chamber, and being sealed upon completion of supply of the gas;

a hydraulic circuit, connected to said first or second liquid chamber, for charging/discharging a liquid into/from said chambers;

an annular valve seat formed on said second end wall of said second cylinder, said valve seat being arranged at an opening of the liquid path so as to oppose said second liquid chamber; and

a valve body which opposes said valve seat, in such a manner that when said bellows moves within a range of the stroke, said valve body does not reach said valve seat, and when said bellows expands farther than the stroke, said valve body is brought into contact with said valve seat so as to close the liquid path of said connecting means, and the liquid is entrapped in a gap between the inner surface of said second cylinder and an outer surface of said bellows body.

4,858,899

BUSHING TYPE VIBRATION INSULATOR

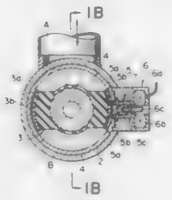
Masaru Sootome, Iseharu; Takao Ushijima, Chigasaki; Takeshi Noguchi, Ichikawa; Naomi Sato, and Tsutomu Nakao, both of Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd. and Bridgestone Corporation, both of, Japan

Filed Oct. 27, 1986, Ser. No. 923,483

Claims priority, application Japan, Oct. 28, 1985, 60-239513; Oct. 28, 1985, 60-239514

Int. Cl.[4] F16M *7/00, 13/00;* B62D *21/11*

U.S. Cl. 267—219 26 Claims



1. A bushing type vibration insulator which insulates vibrations in an automotive vehicle, comprising:

an outer cylindrical member;

an inner cylindrical member disposed inside and spaced from said outer cylindrical member;

said inner and outer cylindrical members sharing a common central longitudinal axis;

an elastic member disposed between said outer and inner cylindrical members to connect said outer and inner cylindrical members;

means defining at least two fluid chambers filled with a fluid, said fluid chambers being located between said outer and inner cylindrical members and separate from each other in peripheral direction of said outer and inner cylindrical members, said fluid chambers defining means including a part of said elastic member;

means defining a first communication passage for providing fluid communication between said fluid chambers;

an electrically operated actuator constructed and arranged to close said first communication passage to block fluid communication between said fluid chambers under a predetermined condition, said actuator being fixedly secured directly to said outer cylindrical member.

4,858,900

MOUNTING SUPPORT ARRANGEMENT FOR AN ENGINE AND DRIVING ASSEMBLY OF A MOTOR VEHICLE WHICH OPERATES AT A LIMITED FREQUENCY RANGE

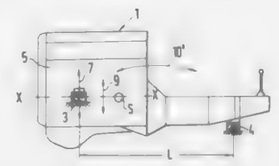
Ulrich von Broock, Weissach, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 19, 1988, Ser. No. 157,984

Claims priority, application European Pat. Off., Feb. 21, 1987, [illegible]

Int. Cl.[4] B60G *15/04;* F16M *13/00;* B62D *21/00*

U.S. Cl. 267—219 2 Claims



1. A mounting support arrangement for an engine and drive assembly of a motor vehicle having hydro-mounting-supports that are arranged at both sides of the engine and that elastically support the engine and the drive assembly with respect to the vehicle body, wherein the hydro-mounting-supports on the engine sides are vertically aligned and arranged at a level of the center of gravity (S) of the engine and drive assembly and at a distance (a) with respect to the engine such that essentially excited rigid-body vibrations of the engine and drive assembly extend substantially in the same direction as the vertical longitudinal axes of the hydro-mounting-support, each compression movement of the mounting-support resulting from a bouncing and pitching and/or rolling movement of the engine and drive assembly can be led to it separately and can be damped jointly in the vertical direction of the hydro-mounting-support, and wherein the ratio of the spring stiffnesses of the mounting-supports in an axial vertical direction and in a transverse and horizontal direction is 1:0.7.

4,858,901

END HOLDER FOR BAND-LIKE MATERIAL

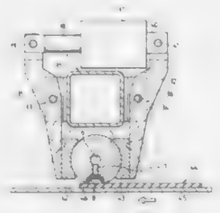
Kouji Okuyama, and Hiroki Touya, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 2, 1988, Ser. No. 201,142

Claims priority, application Japan, Jun. 4, 1987, 62-140406

Int. Cl.[4] B66C *1/02*

U.S. Cl. 269—21 6 Claims



1. A device for holding an end portion of a band-like material comprising:

a frame;

a suctional attraction roller rotatively supported by said frame and having a suctional attraction part at the periphery of said roller; and

a pincher supported by said frame and movable toward and away from the peripheral surface of said roller;

said end portion of said material attached by said roller through suction, means to rotate said roller so that said end portion is wound upward, and means to move said pincher toward said roller so that said end portion is held by said pincher and said roller.

4,858,902

WORKBENCH VISES

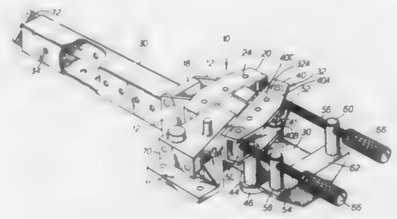
Ronald P. Hickman, Trinity, United Kingdom, assignor to Tekron Licensing BV, De Leersum, Netherlands

Filed Jun. 19, 1982, Ser. No. 389,289

Claims priority, application United Kingdom, Jun. 18, 1981, [illegible]

Int. Cl.[4] B25B *1/02*

U.S. Cl. 269—88 15 Claims



1. A workbench vise, comprising:

a stationary structure;

means for attaching the stationary structure to a workbench;

a rear clamping jaw carried by the stationary structure;

an elongate member;

means defining a guide way in the stationary structure for slidably receiving said elongate member;

means for supporting a front clamping jaw on said elongate member adjacent the front end thereof and for permitting movement of said front clamping jaw relative to said elongate member;

screw operating means acting between said front clamping jaw and said elongate member for providing clamping movement of said front clamping jaw with respect to said rear clamping jaw;

cooperative locating means carried by said elongate member and said guide way defining means for releasably securing said elongate member in any one of a series of coarsely variable operative positions relative to said stationary structure in each of at least two different rotational orientations of said elongate member and said front clamping jaw relative to said guide way; and

means providing for the complete withdrawal of said elongate member, and the front clamping jaw and screw operating means carried thereby, from said guide way and for the reinsertion thereof into said guide way in a different one of said at least two rotational orientations of said elongate member and said front clamping jaw relative to said guide way.

4,858,903

HAND SURGERY OPERATING TABLE

Gabor Tari, and Laszlo Hari, both of Szentes, Hungary, assignors to Metripond Merleggyar, Hungary

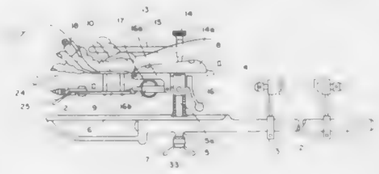
Continuation-in-part of Ser. No. 579,296, Feb. 15, 1984, abandoned, which is a continuation-in-part of Ser. No. 308,804, abandoned. This application Oct. 4, 1985, Ser. No. 786,957

Claims priority, application Hungary, Nov. 28, 1980, 2836/80

Int. Cl.[4] A61G *13/00*

U.S. Cl. 269—328 20 Claims

1. An adjustable hand surgery table for immobilizing a hand to be operated upon into a desired position, comprising fore-arm support connected to a hand support, means for coupling said forearm and hand supports and enabling respective axial and angular adjustment therebetween; a plurality of flexible arms for adjustably securing the fingers in a predetermined space during operation, a base plate, means for coupling each of said plurality of flexible arms to said base plate, a thimble fixed at the end of each of said flexible arms for securely coupling the fingers when placed on the respective fingers to said flexible arms during operation, wherein each flexible arm consists of alternately arranged sleeve joint means and ball joint means, wherein said ball joint means and said sleeve joint means are provided with a bore, a wire being passed through



said bore in said sleeve joint means and said ball joint means, one end of said wire is fixed in the flexible arm proximate said thimble means, while the other end is secured to said coupling means, and said ball joint means comprising external spherical surfaces for engaging internally conical surfaces formed at the end portions of adjacent sleeve joint means when assembled for enabling relative sliding movement between said spherical and conical surfaces in the untensioned state of said flexible arm, means operatively connected to said coupling means for selectively adjusting and securing in the adjusted position said coupling means, wherein the adjusting and securing means comprises a tensioning device for the flexible arms.

4,858,904

DEVICE FOR COMBINING PARTIAL PILES OF BOOK PAGES

Kurt L. Lindblom, Trollhattan, Sweden, assignor to Miller-Johannisberg Druckmaschinen GmbH, Weisbaden-Biebrich, Fed. Rep. of Germany

Filed Apr. 11, 1988, Ser. No. 180,292

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712387

Int. Cl.[4] B65H *39/02*

U.S. Cl. 270—58 11 Claims

1. In a device for combining two partial piles of book pages by laying one pile on the other, which partial piles are brought up alternately along a guide channel by a conveying chain (32) having carriers, the combination comprising:

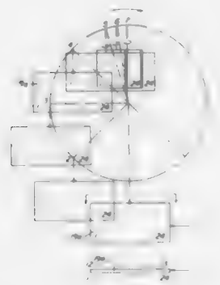
a rearranging apparatus (20) which is rotatable about a horizontal central axis (15) that extends generally transversely to the direction of movement of the conveying chain (32), the rotational speed of said rearranging apparatus being synchronized to the running speed of the conveying chain (32);

said rearranging apparatus including a plurality of gripping systems (21) evenly distributed over an outer circumference thereof;

each said gripping system (21) being adapted to pick up one partial pile (19*a*) and to carry the same through a 360 degree revolution of said rearrangement apparatus (20) about said central axis (15) and to deposit the same beside a succeeding partial pile (19*b*) and release it; and

each of said gripping systems (21) being rotatable during revolution of said rearrangement apparatus by a transmission unit (14, 16, 17) with a drive ratio of 1:1 about an axis (28) which extends parallel to the central axis (15) of said

rearrangement apparatus (20) such that pincer-like grippers (27a, 27b) of said gripping systems (21) always remain





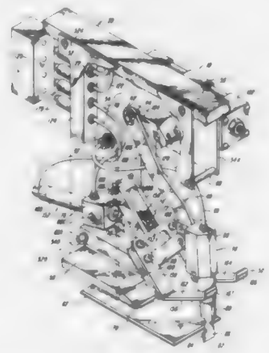
projecting downwards at the lowest part (A) of the respective gripping systems (21).

4,858,906

METHOD AND APPARATUS FOR MANIPULATING AND TRANSPORTING LIMP MATERIAL

Donald C. Fyler, Cambridge, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Mar. 21, 1988, Ser. No. 171,265
Int. Cl.[4] B65H *3/08, 3/32, 5/12*
U.S. Cl. 271—19 9 Claims



1. A manipulator system for selectively manipulating the top segment of a stack of one or more limp material segments said system comprising at least one picker assembly, each picker assembly including:

A. a body having a base plate said body being movable with respect to said stack of limp material segments;

B. picker having an end effector for selectively grasping and releasing an adjacent surface of a limp material segment in response to an applied grasp/release signal;

C. picker positioning means for Positioning said picker with respect to said body, said picker positioning means including:

i. a linkage pivotally connected between said body and said picker and constraining motion of said end effector to a path between a segment pick-up position and a segment release position, said segment pick-up position being laterally displaced from said base plate and adjacent to the top segment of said stack, and said segment release position being adjacent to a clamp surface of said base plate, and

ii. first actuator means responsive to an applied pick-up control signal for selectively driving said linkage to move said end effector between said segment pick-up position, and a segment release position; and

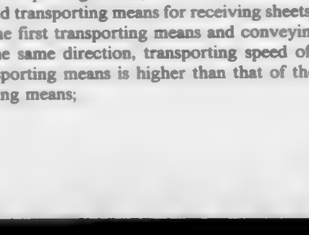
D. clamp means responsive to an applied clamp/release signal for receiving a segment from said picker at said segment release position, and for clamping said received segment to said base plate.

4,858,907

SYSTEM FOR FEEDING ENVELOPES FOR SIMULTANEOUS PRINTING OF ADDRESSES AND BAR CODES

Lawrence F. Eisner, Cheshire, and Bruce E. Hurd, Monroe, both of Conn., assignors to Bryce Office Systems, Inc., Oxford, Conn.

Continuation-in-part of Ser. No. 918,122, Oct. 14, 1986, abandoned. This application Aug. 19, 1988, Ser. No. 234,205
Int. Cl.[4] B65H *3/06*
U.S. Cl. 271—124 17 Claims



1. An envelope feed control system for feeding envelopes longitudinally into a printer, said system including

an envelope feed bin, said bin including a bottom surface sloping downwardly in the direction of desired feed and an end wall extending vertically above the lower end of said bottom surface,

said bottom surface including an opening therein proximate to said lower end, a feed roller positioned in said opening,

a non-rotatable, unitary, rounded control surface below said end wall and above said feed roller, said control surface and said feed roller defining an envelope gate, said gate being dimensioned to permit passage of one envelope at a time, and

said control surface having a low friction area in the vicinity of said gate and having an area of greater friction thereabove on the portion thereof facing said bin, said low friction area having lesser friction than that of said feed roll,

whereby envelopes may be fed singly through said gate and the envelope above the one being fed will be prevented from moving by the frictional engagement of its leading edge with said area of greater friction.

4,858,908

SHEET TRANSPORTING SPEED CONTROL APPARATUS

Hirokazu Yamada, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 26, 1988, Ser. No. 236,940
Claims priority, application Japan, Aug. 28, 1987, 62-216113
Int. Cl.[4] B65H *43/08*
U.S. Cl. 271—176 9 Claims

1. A sheet transporting apparatus, comprising:

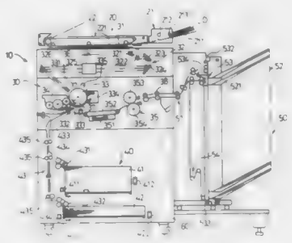
a first transporting means;

a second transporting means for receiving sheets transported by the first transporting means and conveying the sheets to the same direction, transporting speed of the second transporting means is higher than that of the first transporting means;

a first detecting means for detecting the transporting speed of the second transporting means;

a first control means for controlling the second transporting means in according to said first detecting means;

memory means for storing the contents of control by the first control means;



a second control means for controlling the second transporting means basing on the contents stored in the memory means;

a second detecting means for detecting the position of sheet being transported; and

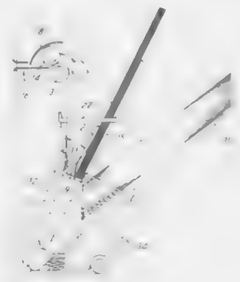
a third control means for selecting either one of the first control means or the second control means according to said second detecting means.

4,858,909

SHEET TRANSPORTING APPARATUS

Denis J. Stemmle, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1988, Ser. No. 176,121
Int. Cl.[4] B65H *29/00*
U.S. Cl. 271—184 16 Claims



1. Sheet transporting apparatus including:

a pair of rollers forming a sheet transporting nip, and adapted, when in an initial position, to engage the leading edge of a sheet delivered thereto, and

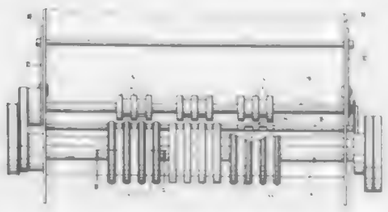
means arranged to produce an orbital motion of the rollers one about the other in an orbiting mode so as to progressively change the direction of motion of the sheet while the sheet is advancing through the nip, said rollers being adapted for additionally transporting sheets in a mode in which the axes of the two rollers are in line within a vertical plane therethrough, and wherein the sheet transporting apparatus operates only in the mode in which the axes of the two rollers are within a vertical plane for sheets of less than a predetermined length, and then operate in the orbiting mode for sheets at least equal to the predetermined length.

[illegible]

DISPENSING DEVICE FOR SHEET MATERIAL

Peter Weigel, Borchen-Dörenhagen, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Mar. 1, 1988, Ser. No. 162,715
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1987, 3706834
Int. Cl.[4] B65H *5/00*
U.S. Cl. 271—10 4 Claims



1. A device for dispensing sheet material comprising:

a sheet storage container having a stack of sheets;

a driver draw-off roller mounted on an axis perpendicular to said stack;

bias means maintaining said stack in contact with said draw-off roller, such that rotation of said draw-off roller removing sheet from said stack;

a second roller assembly, said draw-off roller sending the removed sheets to said second roller assembly;

said second roller assembly comprising a conveyor roll portion and a mating roll portion mounted adjacent to each other, both mounted on axes parallel to said axis of said draw-off roller and the mounting of said conveyor roll portion and said mating roll portion being such that a small gap exists between their radially outer peripheries;

said draw-off roller sending the removed sheets into said [illegible]

said conveyor roll comprising at least three separate sections spaced axially along said conveyor roll mounting axis, there being at least one central section and two outer sections, said central section being formed of a plastic material and said two outer portions being formed of a metal; and

said two outer sections each have a circumferential groove formed at their periphery and a ring shaped strip of elastically deformable material is embedded therein, the axial extent of said groove being less than the axial extent of said outer sections.

4,858,910

CONVEYOR FOR A SHEET-FED ROTARY PRESS

Herbert Rebel, Rodgau, and Marco Bergmann, Offenbach-/Main, both of Fed. Rep. of Germany, assignors to M.A.N. Roland Druckmaschinen, Fed. Rep. of Germany

Filed Jan. 22, 1987, Ser. No. 146,966
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1987, 3701767
Int. Cl.[4] B65H *29/04*
U.S. Cl. 271—204 17 Claims



1. A conveyor for a sheet-fed rotary printing press for transferring sheets away from an impression cylinder comprising a delivery cylinder disposed adjacent said impression cylinder,

a chain conveyor having a plurality of sheet grippers adapted for moving said grippers about said delivery cylinder for successively engaging sheets on said impression cylinder,

said delivery cylinder having a gap in the outer periphery thereof for receiving successive of said sheet grippers during transfer of a sheet from said impression cylinder to said sheet grippers,

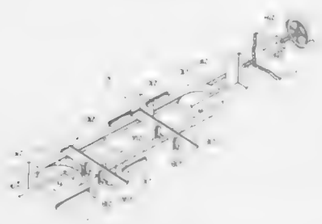
said sheet grippers each including a support and a pivotable gripper fringer for engaging the leading edge of a sheet against said support during a sheet transfer operation, and displacer means disposed on each gripper support for bridging the gap in said delivery cylinder within which the gripper is disposed during a sheet transfer operation.

4,858,911

APPARATUS FOR CONVEYING BASE

Takao Matsuo, Hyogo, and Shigeo Sumi, Saitama, both of Japan, assignors to Somar Corporation, Tokyo, Japan

Continuation of Ser. No. 921,513, Oct. 22, 1986, abandoned. This application Mar. 20, 1989, Ser. No. 325,113
Claims priority, application Japan, Oct. 22, 1985, 60-236860; Oct. 22, 1985, 60-236861
Int. Cl.[4] B65H *9/06*; B32B *31/00*
U.S. Cl. 271—240 9 Claims



1. An apparatus for conveying a base from an input position to a holding position, comprising:

conveying means comprising a plurality of pairs of conveying and pressing rollers for transporting said base toward said holding position;

a crosswise base guide disposed in a path of said base along said conveying means between said input position and said holding position for aligning a centerline of said base with a centerline of said apparatus as said base is being transported by said conveying means, said base guide comprising a threaded rod extending generally perpendicular to a conveying direction of said base and lying in a plane generally parallel to a plane of said base, first and second pulley support members threadedly engaged with said threaded rod to move together in the same direction perpendicular to said conveying direction when said rod is rotated, a pulley rotatably mounted on each of said pulley support members, an endless belt entrained between said pulleys, a support rod mounted generally parallel to said threaded rod, a pair of guide member supports slidably mounted on said support rod and connected on opposite sides to said endless belt so that said guide member supports move toward or away from one another as said endless belt is moved, a pair of guide members mounted on respective ones of said guide member supports and disposed in a said path of said base, and means connected to one of said guide members for moving both said guide members through said endless belt;

base position detecting means for detecting a presence of a base and instructing said moving means to start moving said guide members; and

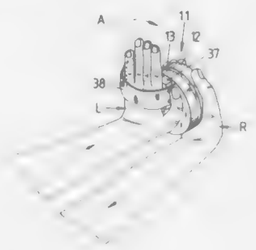
base breadth detecting means for detecting a breadth of said base and stopping said moving means when said guide members are positioned apart from one another by a distance corresponding to a breadth of said base.

4,858,912

ARM EXERCISING APPARATUS

Billy E. Boyd, 2910 E. Hargrove Rd., Tuscaloosa, Ala. 35401

Filed Aug. 22, 1988, Ser. No. 234,616
Int. Cl.[4] A63B *21/22*
U.S. Cl. 272—67 10 Claims



1. Muscle toning apparatus for the arms, comprising:

(a) a pair of hand-held disc-like members coaxially mounted for relative rotation in parallel planes;

(b) means operatively connected to said discs for varying the resistance of said disc-like members to relative rotation;

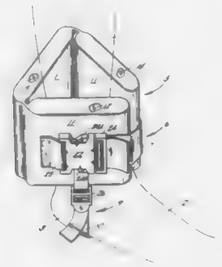
(c) handle means mounted eccentrically to one of said disc-like members such that the palms of the user's hands are constrained to remain parallel during relative rotation of said disc-like members said handle means being rotatable about its axis and independent from said resistance means.

4,858,913

AQUATIC EXERCISING AID

Craig J. Stuart, 4105 Fox Hollow Rd., Eugene, Oreg. 97405

Continuation-in-part of Ser. No. 22,080, Mar. 5, 1987, abandoned. This application Apr. 29, 1988, Ser. No. 187,852
Int. Cl.[4] A63B *69/00*
U.S. Cl. 272—71 4 Claims



1. An aquatic exercise aid for attachment to the human body, said aid comprising,

a main body of a buoyant nature including rigid multiple buoyant block members of foamed material, at least some of said block members defining receptacles, buoyant inserts for selective installation into said receptacles to vary the buoyancy of the main body, an enclosure of a permeable nature for placement about the ankle and including compartments offset from one another, each compartment receiving one of said buoyant block members, said enclosure having a flat surface, a closure in place on said flat surface and permitting access to said compartments,

retention means carried by said enclosure for holding same in substantially closed configuration to define a central open area within which a portion of the human body is received, and

adjustable restraint means on said enclosure also for engagement with the human body to restrain the aid against buoyant displacement relative the human body.

4,858,914

BALANCE ENHANCING EXERCISE AND AMUSEMENT APPARATUS

Jimmy D. Hix, 4309 Action St., Bay No. 5, Garland, Tex. 75042

Filed Jul. 13, 1988, Ser. No. 218,627
Int. Cl.[4] A63B *25/08*
U.S. Cl. 272—114 11 Claims

1. Balance developing exercise apparatus comprising:

support means for supporting an exerciser, said support means having spaced apart front and rear portions;

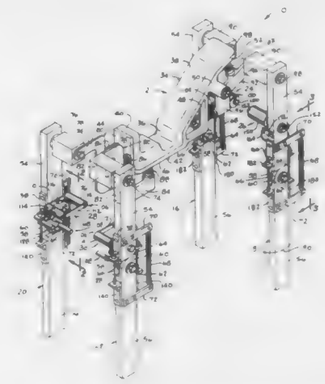
front leg means, pivotally connected to said front portion of said support means, for engaging a support surface and supporting said front portion in an elevated position relative thereto;

rear leg means, pivotally connected to said rear portion of said support means, for engaging the support surface and supporting said rear portion in an elevated position relative thereto,

said front and rear leg means being operatively pivotable relative to said support means to cause said apparatus to walk across the support surface with the exerciser balanced on said support means, said front and rear leg means additionally being bendable, about generally central portions thereof, between straightened and rearwardly flexed positions; and

control means carried by said front and rear leg means and forcibly movable by the hands and feet of the exerciser to operatively pivot said front and rear leg means, said control means being further operative to flex and straighten said front and rear leg means

whereby, by forcibly moving said control means, the arms and legs of the exerciser are exercised and strengthened, and the exerciser's balance ability is developed during walking movement of said apparatus along the support surface.

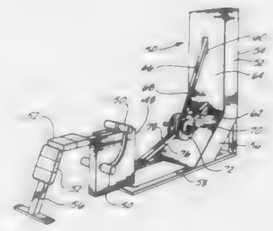


4,858,915

WEIGHT-BIASED FITNESS MACHINE

William J. Szabo, 10126 Langmuir Ave., Sunland, Calif. 91040

Filed Jul. 2, 1986, Ser. No. 882,165
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—117 44 Claims



1. Weight biased exercise apparatus for exercising various muscle groups in the body of an apparatus user placed in a selected exercise position adjacent the apparatus, the apparatus comprising:

a foundation frame,

an elongate main lever pivotally connected at one end thereof to the frame and connectable at an opposite end thereof to selected devices via which a user can apply force to the lever to move the lever between spaced ends of a range of lever motion,

a weight carriage on the lever moveable along a selected portion of the elongate extent of the lever for receiving and carrying a weight of selected magnitude, the carriage and the lever being cooperatively defined so that the carriage is biased by gravity to move in one direction along the lever throughout motion of the lever within said range, and

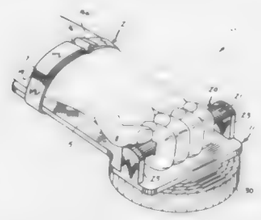
a user-controllable mechanism operable at the will of a user for moving the carriage along the lever.

4,858,916

WEIGHTED EXERCISE APPARATUS

Jeff Beaumont, 1411 Niles Cortland Rd., Cortland, Ohio 44410

Filed May 3, 1988, Ser. No. 189,793
Int. Cl.[4] A63B *21/12*
U.S. Cl. 272—119 7 Claims



1. A weight exercise apparatus for securement to a forearm and graspable by a hand of an individual comprising,

a platform means including an upper surface and a lower surface, and

a strap means extending with first and second terminal ends for overlying said upper surface for selective securement to said forearm wherein said strap means is captured in a sleeve integrally secured to said lower surface adjacent a rear end of said platform means, and

a grasp bar means integrally secured to said upper surface proximate a forward end of said platform means and extending parallel to said sleeve, and

a weight means for providing weighted resistance to said apparatus, and

a weight support means aligned with said grasp bar means for selective securement of a weight means thereto in an aligned relationship to said grasp bar means, and

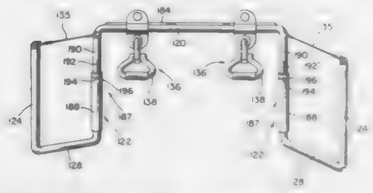
wherein said weight means comprises a cylindrical boss integrally and orthogonally formed and extending outwardly of said lower surface orthogonal to said lower surface and said grasp bar means wherein said weight support means is further medially positioned relative to said grasp bar means.

4,858,917

SAFETY WEIGHT BAR ASSEMBLY

Calvin Montgomery, 7 Baynard Cove Rd., Hilton Head, S.C. 29928

Continuation-in-part of Ser. No. 56,780, Jun. 2, 1987, Pat. No. 4,749,188. This application Jun. 1, 1988, Ser. No. 200,968
The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 10 Claims



1. A weight bar assembly comprising:

a main bar having a pair of ends;

a weight supporting element located at each end of said main bar, said weight supporting elements supporting a variable amount of weight having a center of gravity laterally displaced to one side of said main bar when said weight is mounted on said weight supporting elements, said weight supporting elements including spacing means extending from said main bar and supporting said main bar at a distance vertically above ground; and

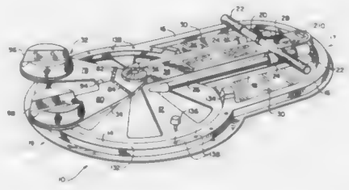
handle means mounted on said main bar and disposed centrally of said weight supporting elements for gripping of the weight bar assembly to lift the weight bar assembly, said handle means including a gripping portion laterally displaced to said one side of said main bar, a shaft interconnecting said main bar and said gripping portion and mounting means slidably mounted on said main bar for mounting said shaft on said main bar, said shaft being movable to allow said gripping portion to be oriented in a first position located above said main bar and a second position below said main bar.

4,858,918

DEVICE FOR PROVIDING ENHANCED MOVEMENT OF A PERSON'S TRUNCAL MUSCLES AND SPINE

John F. Iams, Poway; Robson L. Splane, Jr., Granada Hills, and John A. Drusch, III, Escondido, all of Calif., assignors to Superspine, Inc., Poway, Calif.

Filed Mar. 25, 1986, Ser. No. 843,558
Int. Cl.[4] A63B *23/00*
U.S. Cl. 272—127 23 Claims



1. A device for providing enhanced movement of a person's truncal muscles and spinal joints in the lower spinal region, which comprises:

a generally horizontal base for supporting said person in an all fours kneeling posture in which there is minimal gravity-induced axial loading of said person's spine, said base having incorporated therein a circular track having a centrally located pivot point;

a stationary rest means, fixed to the base, for engaging and supporting said person's two hands or two knees;

a support arm attached to the pivot point for pivoting in a circular arc while riding on the circular track for support and spaced apart from the stationary rest means sufficiently so that the person may assume said kneeling posture with a region of the support arm that is opposite the pivot point engaging and supporting the remaining two of said person's hands and knees for permitting their moving in a circular arc;

therein permitting said person to cause relative motion in the frontal, or coronal, plane between the thoracic and pelvic portions of said person's trunk while said person remains in said kneeling posture;

wherein upon such times as the pivoted support arm is supporting both said person's knees then said moving of both knees in a circular arc will cause said person's pelvis to move off the axial line of the thorax causing relative motion in said person's frontal plane and also said person's rotational plane;

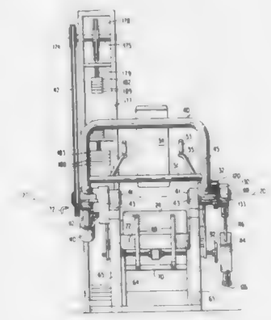
wherein said relative motion between axial portions of said person's trunk occurs in at least two of said person's bodily planes simultaneously.

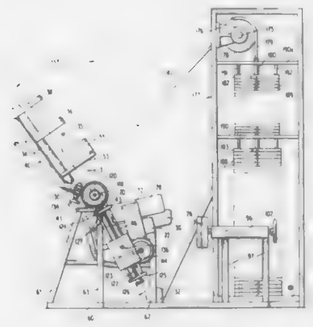
4,858,919

APPARATUS FOR TESTING OR EXERCISING MUSCLES OF THE LOWER TRUNK OF THE HUMAN BODY

Arthur Jones, 1155 NE. 77th St., Ocala, Fla. 32670

Division of Ser. No. 60,679, Jun. 11, 1987. This application Nov. 3, 1988, Ser. No. 266,983
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 6 Claims





1. Apparatus for exercising the muscles of the lower trunk of a human body, the apparatus comprising in combination, a seat for receiving a person in sitting position, means associated with the seat for restraining against movement the pelvis of a person seated on said seat, a movement arm extending above the seat and being mounted for pivotal movement relative to the seat about a generally horizontal axis, said movement arm having an upper portion engageable by an upper trunk portion of the body for applying with the muscles of said lower trunk a force to the movement arm to pivot the movement arm about said axis, and resistance means connected to the movement arm to create resistance to movement, and counterweight means connected to said movement arm for counterbalancing the movement arm as well as the trunk of the body about said axis, said counterweight means including a first counterweight imposing a moment about said axis and means for adjusting the position of the first counterweight relative to said axis for changing the moment imposed by the counterweight to counterbalance the mass of a particular body being exercised, and wherein said means for adjusting the position of said first counterweight includes means for adjusting the counterweight about and towards or away from said axis, and wherein said counterweight is mounted for rotative movement relative to the movement arm about said axis to adjust the angular position of the counterweight.

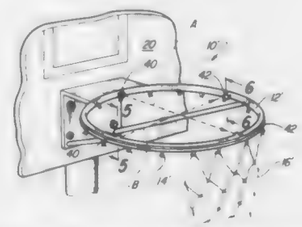
2. Apparatus for exercising the muscles of the lower trunk of a human body, the apparatus comprising in combination, a seat for receiving a person in sitting position, means associated with the seat for restraining against movement the pelvis of a person seated on said seat, a movement arm extending about the seat and being mounted for pivotal movement relative to the seat about a generally horizontal axis, said movement arm having an upper portion engageable by an upper trunk portion of the body for applying with the muscles of said lower trunk a force to the movement arm to pivot the movement arm about said axis, and resistance means connected to the movement arm to create resistance to movement, and counterweight means below said axis and connected to said movement arm for counterbalancing the movement arm as well as the trunk of the body about said axis, said counterweight means including a first counterweight imposing a moment about said axis and means for adjusting the position of the first counterweight relative to said axis for changing the moment imposed by the counterweight to counterbalance the mass of a particular body being exercised, said counterweight means further including a second counterweight located below said axis and fixed to the movement arm for counterbalancing the movement arm about said axis, and wherein said means for adjusting the position of said first counterweight includes means for adjusting the counterweight about and towards or away from said axis.

4,858,920

SCORE-SENSITIVE BASKETBALL HOOP

Jerry L. Best, 1706 Spoon Bill Dr., Nokomis, Fla. 34275

Filed Aug. 12, 1988, Ser. No. 231,265
Int. Cl.[4] A63B *63/08*
U.S. Cl. 273—1.5 R 4 Claims



1. A score-sensitive basketball hoop apparatus comprising:

a hoop portion including a rim and a base;

means for sensing the by-passage of a ball through said hoop portion;

means for signalling said sensed by-passage of said ball;

means for counting the number of times said ball by-passes said hoop;

means for relaying said sensed by-passage of said ball to said counting means;

said means for counting comprising a counter, said counter being interconnected with a scoreboard;

said means for signalling including means for visually signalling said by-passage through said hoop by said ball; and

said means for visually signalling comprising lighting units fixed in said rim.

4,858,921

BALL SUSPENDING APPARATUS AND METHOD

Harold L. Eustice, 8422 E. Desert Steppes, Tucson, Ariz. 85710, and William T. Foster, 4576 E. Fifth St., Tucson, Ariz. 85711

Continuation-in-part of Ser. No. 77,396, Jul. 24, 1984, abandoned. This application Aug. 5, 1988, Ser. No. 230,728
Int. Cl.[4] A63B *69/40*
U.S. Cl. 273—26 R 34 Claims

1. An improved ball suspending apparatus for suspending and spinning a sport ball in one position comprising:

blower means operably connected to a power source for creating a stream of forced air;

tubular means having a straight portion and a bent end portion coupled to said blower means for directing said stream of forced air onto said sport ball to both suspend

and rotate said sport ball in one position at an angle different than the vertical and in general axial alignment with said end portion; and



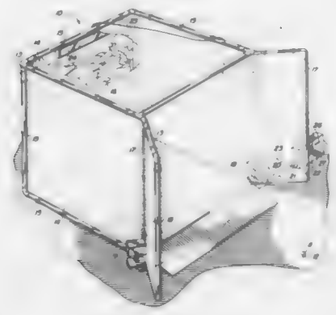
a plurality of interchangeable tubular means, each of said plurality of interchangeable tubular means having said uppermost portion held at a different angle from the remaining plurality of tubular means.

4,858,921

METHOD AND APPARATUS FOR DETERMINING THE VELOCITY AND PATH OF TRAVEL OF A BALL

Jerome Santavaci, Reno, Nev., assignor to Intermark Amusements, Inc., Scottsdale, Ariz.

Filed Jul. 12, 1988, Ser. No. 217,956
Int. Cl.[4] A63B *69/00*
U.S. Cl. 273—26 R **8 Claims**



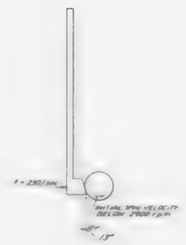
1. Ball velocity measuring apparatus comprising first and second velocity sensing devices, each of said sensing devices being adapted for transmitting a directional electromagnetic field therefrom and for sensing electromagnetic energy reflected from a ball traveling through its field, said devices being positioned on opposite sides of the proposed path of movement of the ball with their transmitted electromagnetic fields directed across the proposed path of the ball at acute angles thereto, each of said sensing devices generating signals reflecting the velocity at which the ball appears to be moving in the direction of its respective electromagnetic field, means for averaging the velocity signals generated by the sensing devices and for generating an average velocity signal, means for generating a velocity message corresponding to said average velocity signal, and means for displaying said message.

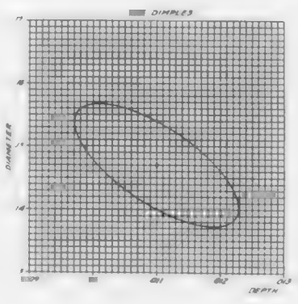
4,858,923

LOW TRAJECTORY LONG DISTANCE GOLF BALL

William Gobush, North Dartmouth, Mass.; Raymond A. Berard, Portsmouth, R.I.; Robert A. Brown, Mattapoisett, and John W. Jepson, Marion, both of Mass., assignors to Acushnet Company, New Bedford, Mass.

Continuation of Ser. No. 18,840, Feb. 24, 1987, abandoned, which is a continuation of Ser. No. 544,780, Oct. 24, 1983, abandoned. This application Jun. 14, 1988, Ser. No. 207,017
Int. Cl.[4] A63B *37/12, 37/02*
U.S. Cl. 273—62 **12 Claims**





12. A golf ball having a core and a cover, said golf ball being characterized by:

(a) the materials of said core and said cover being selected so that said golf ball has a spin velocity below 2900 rpm when hit at 230 feet per second by an implement having a face angle of 13° with respect to the vertical;

(b) 384 dimples±3% substantially evenly spaced over the surface of the golf ball, the dimple depth, diameter and number being interrelated according to the following formula:

$$[554.3(d-x)-37(D-y)]^2+[138.6(-D-y)+926(d-x)]^2=S$$

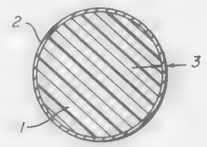
wherein:
d=average dimple depth
D=average dimple diameter
x=0.275–0.0041667N
y=0.2790–0.033N
N=the exact number of dimples divided by 100
S≧0≦1.

4,858,924

SOLID GOLF BALL

Tasuku Saito, Tokorozawa, and Shinichi Kakiuchi, Kodaira, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 858,215, May 1, 1986, abandoned. This application Mar. 11, 1988, Ser. No. 167,259
Claims priority, application Japan, May 1, 1985, 60-94186
Int. Cl.[4] A63B *37/00*
U.S. Cl. 273—62 **1 Claim**



1. In a solid golf ball comprising a solid core and a cover, the improvement wherein said solid core is formed from a composition comprising a polybutadiene containing at least 40% of a cis-1,4-bond and an unsaturated carboxylic acid and/or a metal salt thereof for causing crosslinking of said polybutadiene and having a deformation of 1.5 to 3.5 mm under a constant load of 100 kg, and the difference in hardness between the center and the periphery of said solid core is less than 10%; and

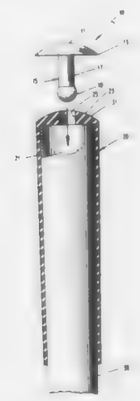
said cover is formed from a thermoplastic resin composition comprising 97 to 65% by weight of an ionomer resin and 3 to 35% by weight of a flexible resin selected from the group consisting of polyester elastomers, polyamide elastomers, thermoplastic urethane elastomers, propylene-butadiene copolymers, 1,2-polybutadienes, polybutene-1 and styrene-butadiene block copolymers and mixtures thereof and having a resilience of at least 35%, and having a flexural modulus of 1,500 to 4,500 kg/cm^2 and a thickness of 0.3 to 1.8 mm.

4,858,925

GOLF CLUB COMBINED WITH BALL POSITION MARKER

Peter DeStefano, Jr., 545 Main St., Follansbee, W. Va. 26037

Filed Jan. 29, 1987, Ser. No. 8,379
Int. Cl.[4] A63B *53/00*
U.S. Cl. 273—162 D **2 Claims**



1. In a golf club having a handle with a resilient grip placed over its proximal end, said grip being elongated and having a proximal end with a convex surface and an opening extending through said proximal end, the improvement comprising a golf ball marker including:

(a) a head including a convex upper surface connected to a concave undersurface engageable with said convex surface of said grip proximal end in complimentary fashion;

(b) a stem having a proximal end and a distal end, said stem merging into said concave undersurface at its proximal end and having an enlarged protuberance on its distal end;

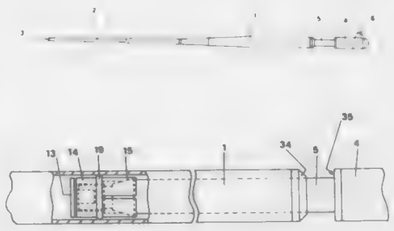
(c) said stem and protuberance being insertable through said opening to install said marker on said grip with said concave undersurface engageable on said grip proximal end convex surface, the outer diameter of said protuberance being greater than the diameter of said opening whereby the resiliency of said grip allows said protuberance to be forced through said opening whereupon the resiliency of said grip aids in maintaining said golf ball marker in mounted position on said grip.

4,858,926

STICK FOR THE BILLIARD GAME

Walter Cabianca, Via IV Novembre 2, Cornedo Vicentio (Vicenza), Italy

Filed Mar. 31, 1988, Ser. No. 175,903
Claims priority, application Italy, Apr. 8, 1987, 85533 A/87
Int. Cl.[4] A63D *15/08*
U.S. Cl. 273—68 **6 Claims**



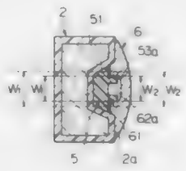
1. A billiard stick which comprises a central body (1), said central body having a forward end and a rear end, a cue tip (2) having a forward end and a rear end, said cue tip (2) connected to said central body at the forward end thereof, said cue tip (2) having a head (3) at the forward end thereof, said central body being telescopically adjustable in length, a hand grip (4) at the rear end of said central body, means for adjusting the length of said central body comprising a staff (5) having a forward end and a rear end, said staff (5) connected to said hand grip (4), said staff having an externally threaded portion (11) at the forward end thereof, said staff (5) being blocked within said central body (1) by means of a threaded sleeve (14), said sleeve being internally threaded to engage with the externally threaded portion (11) of said staff and having longitudinal grooves (16), in the rear portion thereof, said longitudinal grooves dividing said sleeve into sectors, said staff (5) having an inner trunco-conical portion (17) in the forward end thereof, said sleeve having an inner trunco-conical section (15), a rubber ring means (19) located around said sleeve, said ring means preventing the rotation of said sleeve when said staff is inserted in said central body, said staff (5) has a threaded orifice (12) in the forward end thereof, and a nut (13) for engagement with said threaded orifice, said staff being fixed in a set position when said hand grip is rotated of about 90°, said inner trunco-conical surface (15) of said sleeve rests against said trunco-conical section (17) of said staff and said nut engages with said threaded orifice.

4,858,927
DARTS HAVING AN ANTI-DEFLECTION APPARATUS
Daniel M. Simmons, 427 Seaman Ave., Akron, Ohio 44305
Filed Feb. 23, 1988, Ser. No. 159,322
Int. Cl.[4] A63B *65/02*
U.S. Cl. 273—416 14 Claims



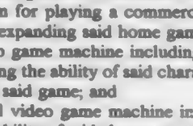
1. A game dart comprising anti-deflection means having as separable portions;
an elongated main body portion having a point coupled thereto, and protruding from said body portion;
a shaft portion including a section for retaining a flight;
a subassembly coupling said body portion to said shaft portion;
said subassembly including a housing having a longitudinal bore therein said bore having a reduced opening at one end;
a force applying means disposed within said bore;
a centering means acted on by said force applying means having an enlarged portion of a size greater than said reduced opening and a portion extending through said reduced opening coupled to said shaft portion.

4,858,928
RACKET FRAME
Kunimasa Murai; Yoshinari Inagaki, and Tetsuyuki Awano, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan
Filed May 28, 1987, Ser. No. 55,000
Claims priority, application Japan, Jun. 10, 1986, 61-88390[U]; Jul. 9, 1986, 61-105240[U]; Nov. 20, 1986, 61-178491[U]
Int. Cl.[4] A63B *49/04*
U.S. Cl. 273—73 D 1 Claims



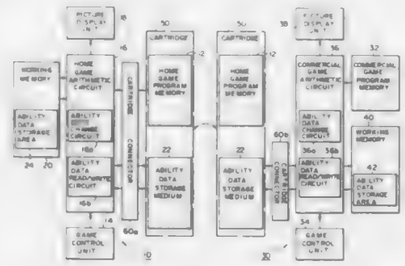
1. A racket frame comprising a grip,
a head coupled to one end of said grip, said head including a peripheral surface, a plurality of string holes extending through said peripheral surface, and a circumferential groove extending along said peripheral surface,
at least one string protector extending within said circumferential groove between adjacent ones of said plurality of string holes, said string protector including an outer peripheral surface and an integral locker rail projecting from said outer peripheral surface, said locker rail including transversely extending locker arm means, said transversely extending locker arm means including a first portion and a second portion, said first and second portions extending transversely first and second distances, said first and second distances differing from each other, and
at least one longitudinally extending weight adjusting element including an inner surface and an outer surface, said inner surface of said at least one weight adjusting element including elongated recess means formed therein and transversely extending arm members tightly engageable with said transversely extending locker arm means on said string protector whereby said at least one weight adjusting element can be removably coupled to said outer peripheral surface of said string protector.

4,858,929
GOLF IRONS
D. Clayton Long, Albany, Ga., assignor to MacGregor Golf Company, Albany, Ga.
Division of Ser. No. 66,077, Jun. 24, 1987, Pat. No. 4,802,672.
This application May 13, 1988, Ser. No. 197,662
Int. Cl.[4] A63B *53/00, 53/04*
U.S. Cl. 273—77 A 9 Claims



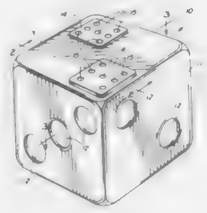
7. In a golf iron head including a planar face with a pattern of horizontal grooves thereon, the improvement comprising the configuration of the grooves each of which in cross section has an opening in the planar face, two sides, top junctions between the sides and planar face, a bottom, and bottom junctions between the sides and bottom, wherein each side is defined by a segment of a parabola.

4,858,930
GAME SYSTEM
Seiichi Sato, Tokyo, Japan, assignor to Namco, Ltd., Tokyo, Japan
Filed Jun. 7, 1988, Ser. No. 203,134
Int. Cl.[4] A63F *9/22*
U.S. Cl. 273—85 G 14 Claims



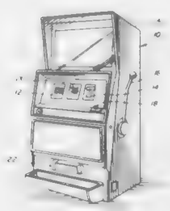
1. A game system comprising:
a home video game machine in which a game is played and the ability of a character which appears in said game is calculated and set with the progress of said game in accordance with a predetermined home game program; and
a commercial video game machine in which a game is played in a commercial game space of a higher grade than that of the home game space and the ability of a character which appears in said game is calculated and set with the progress of said game in accordance with a commercial game program for playing a commercial game which is produced by expanding said home game;
said home video game machine including means for externally outputting the ability of said character at the time of suspension of said game; and
said commercial video game machine including means for inputting the ability of said character at the time of suspension of said game which has been output from said home video game machine as the initial ability data of said character which appears in said commercial video game.

4,858,931
ELECTRONIC DICE
Ian C. McKechnie, 8524 N. 50th Pl., Scottsdale, Ariz. 85253
Continuation of Ser. No. 289,726, Aug. 3, 1981, abandoned. This application Nov. 27, 1984, Ser. No. 676,201
Int. Cl.[4] A63B *71/00*
U.S. Cl. 273—138 A 1 Claim



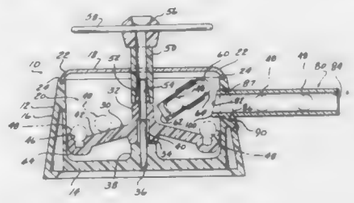
1. A cubic enclosure comprising:
a battery,
an electronic circuit comprising a pair of counter means each having an input,
a pair of single pole, single throw inertia switches, one of each interposed between the input of each of said counter means and said battery,
said counter means being actuated by pulses generated in a random manner by a series of intermittent contacts occurring between the poles in said inertia switches when erratic movement is manually imparted to said enclosure, and
two display surfaces on the top of said enclosure,
said display surfaces each comprising exposable displays of dots positioned to represent the dots on a die,
said counter means each causing a random number on each display of form one through six to be illuminated when the erratic movement ceases.

4,858,932
NONUNIFORM PROBABILITY REEL STOP MECHANISM FOR GAMING MACHINES
Martin A. Keane, Arlington Heights, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.
Filed Apr. 21, 1988, Ser. No. 184,240
Int. Cl.[4] A63F *5/04*
U.S. Cl. 273—143 R 11 Claims



2. A gaming apparatus having a symbol bearing reel mounted for rotation about an axis with the reel having a predetermined number of reel stops comprising
initiation means responsive to a player input for generating an initiate signal;
a digital memory containing a table of upper and lower subinterval limits wherein each of pairs of said upper and lower subinterval limits defines a subinterval and wherein each subinterval corresponds to a stop index and wherein the range between the lower limit and the upper limit of each subinterval represents a predetermined probability factor;
processor means responsive to said initiation signal for initiating rotation of the reel;
generator means for generating a value; means utilizing said table for determining which of said subintervals contains said value and identifying the corresponding stop index;
stop means responsive to said identified stop index for stopping said reel at a predetermined location corresponding to said identified stop index.

4,858,933
GAME ARTICLE SELECTION APPARATUS
George Mink, 38296 Horseshoe Dr., Mt. Clemens, Mich. 48043
Filed May 27, 1988, Ser. No. 199,720
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—144 A 12 Claims



1. An article selection apparatus comprising:
a housing having a hollow cavity for receiving a plurality of loose articles;
a base rotatably mounted in the cavity in the housing, the base having an annular, peripheral groove formed therein for receiving articles in single file;
means for rotating the base;
an inclined chute mounted in the cavity in the housing and having first and second open ends, the first end being positioned proximate the groove in the base to receive articles therefrom, the chute inclining upward from the first end to the second end; and
a discharge sleeve mounted in the housing and having first and second ends, the first end being open and disposed within the cavity in the housing and spaced from the second end of the chute to only receive articles discharged from the chute having a predetermined amount of momentum imparted thereto by being centrifugally spun by rotation of the base and the momentum of succeeding articles in the groove and chute sufficient to traverse the space between the second end of the chute and the first end of the sleeve, the second end of the sleeve being disposed exteriorly of the housing.

4,858,934
GOLF PRACTICE APPARATUS
Robert B. Ladick, New Westminster, and Bryan E. Ladick, West Vancouver, both of Canada, assignors to Syntronix Systems Limited, Burnaby, Canada
Filed Apr. 27, 1988, Ser. No. 186,915
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—186 A 23 Claims

1. Apparatus for the practising of golf swings, comprising:
an elongate member to be swung by a user in simulation of the swinging of a golf club;
said elongate member comprising a simulated golf club handgrip, a source of radiation and means for forming radiation from said radiation source into a beam extending from one end of said elongate member in the longitudinal direction of said elongate member;
a plurality of sensor means responsive to said radiation and disposed in a predetermined array for producing sensor

signals in response to the passage of said beam over said array during the swinging of said elongate member;

means for processing said sensor signals to produce output signals corresponding to the speed and orientation of said elongate member; and



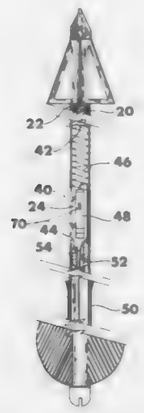
visual display means responsive to said output signals for providing a visual representation corresponding to said output signals.

4,858,935

HUNTING ARROW WITH SIGNAL GENERATING MEANS

Ronnie R. Capson, Blackfoot, Id., assignor to Michael D. Ferguson, Rexburg, Id.

Filed Jun. 13, 1988, Ser. No. 205,478
Int. Cl.[4] F41B 5/02
U.S. Cl. 273—416 11 Claims



5. A hunting arrow having an arrowhead, a hollow shaft and a nock, said arrow comprising:

a. a chamber containing a signal generating means therein;

b. said chamber having a rigid forward wall and an outwardly sloping rearward wall;

c. said signal generating means being spring loaded within said chamber and bearing against the rigid forward wall;

d. a retaining member slidably affixed to the shaft to retain the signal generating means within the chamber; and

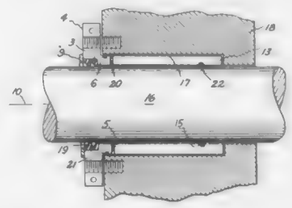
e. the signal generating means having a plurality of gripping means thereon.

4,858,936

SPLIT GLAND SEAL ASSEMBLY

David G. Adams, Box 131 Vly Summit Rd., Greenwich, N.Y. 12834

Continuation of Ser. No. 924,208, Oct. 29, 1986, abandoned. This application Feb. 8, 1988, Ser. No. 154,426
Int. Cl.[4] F16J 15/24, 15/16, 15/54; B21D 39/00
U.S. Cl. 277—1 6 Claims



1. A split seal assembly for preventing the transfer of liquid or other material along a rotatable shaft extending from within a machine to the outside thereof through said assembly, said machine including a hollow stuffing box surrounding a portion of said shaft;

said assembly comprising:

a split spool located in said stuffing box and coaxially surrounding said shaft, said spool including a pair of separable spool sections disposed to mate in a plane through the axis of said shaft and further including a spool groove in the interior spool surface coaxially surrounding said shaft;

a split seal gland positioned axially outward of said machine and comprising a pair of separable gland sections disposed to coaxially surround said shaft, said gland defining an annular space coaxial with and adjacent to said shaft open in an axially outward direction, said gland including an annular extension protruding axially into said stuffing box, said extension including an extension groove open in a radially outward direction and coaxially surrounding said shaft;

a first seal positioned in said annular space in contact with said shaft;

a second seal positioned between said extension and said spool;

a third seal positioned in said extension groove in contact with said groove and a surface of said machine;

a retaining ring detachably mounted on an axially outward facing surface of said gland, said retaining ring at least partly overlapping the opening of said annular space to retain said first seal within said space; and

a baffle seal disposed coaxially on said shaft so as to rotate therewith, said baffle seal extending into said spool groove out of contact with said spool;

whereby said gland, said spool and said seals may be removed jointly without displacement of said shaft.

6. A method of retrofitting a seal assembly surrounding a rotatable shaft, said shaft extending from within a machine to the outside thereof through said seal assembly, said machine including a hollow stuffing box surrounding a portion of said shaft;

said method comprising the steps of:

placing a baffle seal coaxially on said shaft so as to rotate therewith;

fitting a split spool into said stuffing box coaxially surrounding said shaft, said spool including a pair of separable sections disposed to mate in a plane through the axis of said shaft, said spool including a spool groove in the interior spool surface coaxially surrounding said shaft, said spool being positioned such that said baffle seal extends into said spool groove without contacting said spool, said spool further including an axially outward facing surface;

positioning a gasket seal in contact with said axially outward facing spool surface;

said seal assembly including a split seal gland comprising a pair of separable gland sections configured to coaxially surround said shaft and defining an annular space coaxial with and adjacent to said shaft open in an axially outward direction, said gland further including an annular axial extension having an extension groove open in a radially outward direction;

positioning an O-ring seal within said extension groove;

positioning said split seal gland around said shaft with said extension protruding into said stuffing box in contact with said gasket seal;

positioning a lip seal within said annular space in contact with said shaft and said gland; and

detachably mounting a retaining ring on an axially outward facing surface of said gland, said retaining ring at least partly overlapping the opening of said annular space to retain said lip seal within said space.

4,858,937

PRESSURE CONTROLLER FOR A BUFFER FLUID SEAL

Anthony C. Fairlie-Clarke, 1 Abercorn Drive, Edinburgh, EH8 7JR, Scotland, and Charles O. Etheridge, 3730 Cypress Hill Dr., Spring, Tex. 77388

PCT No. PCT/GB86/00488, § 371 Date Jun. 8, 1987, § 102(e) Date Jun. 8, 1987, PCT Pub. No. WO87/01171, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 15, 1986, Ser. No. 40,775
Claims priority, application United Kingdom, Aug. 15, 1985, 8520376
Int. Cl.[4] F16J 15/40; F16K 31/122, 37/00
U.S. Cl. 277—2 15 Claims

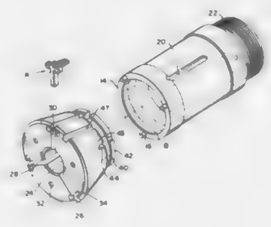
1. Apparatus for automatically maintaining a buffer fluid at a pressure above that of a sealed fluid comprising a piston moveable within a cylinder; a first chamber on one side of the piston for continuous communication with the sealed fluid; a second chamber on the other side of said piston for continuous communication with the buffer fluid; and recharging means associated with said second chamber for automatically modifying said buffer fluid pressure in relation to variation in the sealed fluid pressure in order to maintain the pressure of the buffer fluid at a pressure greater than that of the sealed fluid, said recharging means including a third chamber having buffer fluid at a pressure greater than that in said second chamber, said third chamber being coupled to said second chamber via valve means which includes a valve responsive to movement of said piston so that in the event of a reduction in pressure of said buffer fluid upward movement of said piston causes said valve to open whereby higher pressure fluid from said third chamber transfers to said second chamber to force said piston down and to close said valve to maintain said buffer fluid pressure above said sealed fluid pressure.

4,858,938

TWO PIECE COLLET WITH INTERLOCKING COLLET SEGMENTS

Donald N. Terwilliger, Millerton, Pa., and Richard C. Knox, Horseheads, N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Apr. 8, 1988, Ser. No. 179,637
Int. Cl.[4] B23B 31/20
U.S. Cl. 279—57 12 Claims



6. A two piece collet, comprising:

(a) a collet head;

(b) said collet head including a plurality of segments arranged in a circular configuration forming spaced slots between said segments;

(c) each of said segments having a front face, a rear face, an inside work gripping surface, an outer cam surface and left and right side faces;

(d) said segments being arranged so that the left side face of each one of said segments lies adjacent to the right side face of its corresponding adjacent segment;

(e) each of said segments having on its left and right side faces a lock recess extending from said front face rearwardly towards said rear face;

(f) said lock recesses opening into the respective side faces of the respective segments;

(g) said left and said right lock recesses of adjacent segments forming cooperating pairs of lock recesses;

(h) said collet head including a plurality of removable sealing resilient spring means having lateral lock ears;

(i) each one of said resilient sealing spring means inserted from said front face into each of said spaced slots with said lock ears projecting into each of said cooperating pair of lock ears projecting into each of said cooperating pair of lock recesses, thereby locking said segments together to form said collet head;

(j) a tubular collet body having a longitudinal axis and a front face;

(k) said collet head having means for securing said collet head to said collet body; and

(l) said collet body including means cooperating with said means on said collet head for securing said collet head to said collet body.

4,858,939

BIT RETENTION AND RELEASE MECHANISM

James J. Riggs, Bryan, Ohio, assignor to The Aro Corporation, Bryan, Ohio

Continuation of Ser. No. 12,257, Feb. 9, 1987, abandoned. This application Jul. 26, 1988, Ser. No. 225,614
Int. Cl.[4] B23B 31/06
U.S. Cl. 279—75 9 Claims

1. A mechanism for selectively releasing or retaining, in a rotary tool, a bit with a shaft having a groove on the shaft, comprising, in combination:

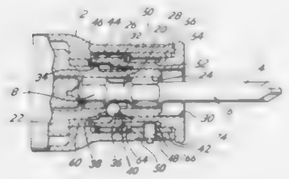
a tool housing having an axis and an interior bore aligned with the axis;

a spindle mateable with a bit and aligned with the axis, the spindle being rotatably mounted within the tool housing

bore and adapted to rotate the bit when the bit is inserted into the housing bore;

a tubular release sleeve mounted within the tool housing bore and slidable between a retention position and a release position, said sleeve having an outside surface;

a generally annular, removable bushing having an interior and an exterior surface, said bushing positioned within the bore between the sleeve and the housing with at least a part of the exterior, circumferential surface thereof contacting the inside surface of the bore, and at least a part of the interior circumferential surface slidably contacting the outside of said sleeve, said bushing being adapted to prevent complete removal of the sleeve from the housing bore without removing the bushing;



a retention key mounted within the spindle and adpated to cooperate with the release sleeve to extend into the groove of the bit and retain the bit in the spindle when the sleeve is in the retention position, and move out of the groove in the bit, allowing the bit's release from the spindle, when the sleeve is in the release position;

means for biasing the release sleeve in the retention position said means for biasing positioned on the outside surface of the release sleeve intermediate the bushing and sleeve; and

a removable retention pin mounted on the tool housing and adapted to project through housing to removably retain the bushing within the housing, whereby the bushing removably retains the sleeve and may limit, at least in part, the travel of the sleeve in the bore.

4,858,940

STAIRWAY ACCESSIBLE CARRY CART WITH FOLDAWAY WHEELS

Chiun J. Cheng, No. 8, Alley 2, Lane 161, Sec. 2, Cheng Kung Rd., Yung Ho City, Taipei Hsien, Taiwan

Filed Mar. 17, 1988, Ser. No. 169,343
Int. Cl.[4] B62B *5/02*
U.S. Cl. 280—5.2 **1 Claim**



1. A carry cart or the like comprising a main frame with a handle portion at an upper end thereof and a support frame (13) at a lower end thereof, primary wheels (12, 11) being fixed to said lower end of said main frame, the improvement comprising:

foldaway auxiliary wheels (21) which in extended state project rearwardly from said lower portion of said main frame; each of said foldaway auxiliary wheels (21) being rotatably supported by a respective wheel support (3);

support blocks (5) being fixed in vertical alignment at lower positions of said main frame, each of said support blocks (5) having a safety hook (51) protruding therefrom;

said foldaway auxiliary wheels (21) being foldable about two-way hinges (6); each of said two-way hinges including upper plates (61, 62) which are complementary to each other, said upper plates (61, 62) further comprising an upper left plate (62) and an upper right plate (61), lower plates (63, 64), said lower plates (63, 64) further comprising a lower left plate (63) and a lower right plate (64), four rods (71, 72, 73, and 74), and four springs (81, 82, 83, and 84); one of said respective upper plates (61, 62) being fixed to a lateral side of said support block (5); said upper plate (62, 61) being fixed to said wheel supports (3); and

auxiliary wheels (21, 22) which are each fixed on and pivotable about said upper plate (62, 61) of said two-way hinges (6), a pin (41) extending from said wheel support (3) so that said safety hook (51) is latchable thereto to prevent said auxiliary wheel (21, 22) from slipping out of place when in use.

4,858,941

TIRE SPRAY CONTROL DEVICE

John H. Becker, 528 Retreat Dr., Bldg. 1-202, Naples, Fla. 33963

Filed Jul. 23, 1987, Ser. No. 76,699
Int. Cl.[4] B62B *9/16*
U.S. Cl. 280—851 **21 Claims**



1. A device for the control of the liquid particulate spray cast from a rotating wheel of a vehicle which comprises:

(a) a leading plate adapted to be spaced apart from the leading surface of the wheel, said plate comprising parallel sides and a plurality of openings defined by blades joined to the sides through which an airstream passes, the openings shaped and spaced such that the airstream directs the spray inwardly and rearwardly;

(b) a trailing plate comprising a back sheet, a plurality of vanes secured to the sheet in spaced apart relationship from the sheet and from one another, the vanes shaped and spaced to direct the spray to the back sheet and inwardly and downwardly; and

(c) means to secure the plates to the vehicle.

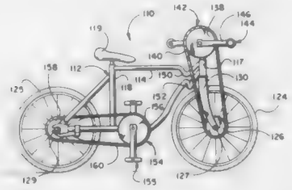
4,858,942

MANUALLY DRIVEN BICYCLE

Otto Rodriguez, 8465 Timberlake Dr., Riverdale, Ga. 30296

Filed Aug. 12, 1988, Ser. No. 231,486
Int. Cl.[4] B62K *19/00;* **B62M** *1/12*
U.S. Cl. 280—233 **5 Claims**

1. A self propelled vehicle comprising: at least one front wheel having an axle; at least one rear wheel having an axle; a front fork rotatably connected to said front wheel axle so that said front wheel can rotate relative to said front fork; a drive mechanism operably connected to said front wheel for rotating said front wheel; a frame connected at a rear portion thereof to said axle of said rear wheel so that said rear wheel can rotate relative to said frame, said frame being rotatably connected to said front fork so that said front fork can rotate relative to said frame in generally horizontal direction in order to provide steering capability to the vehicle, said frame being supported by said front wheel and said rear wheel, said frame having a portion which is bent to provide clearance between said frame and said chain drive mechanism to accommodate a desired degree of generally horizontal rotation of said chain drive mechanism upon generally horizontal rotation of said front



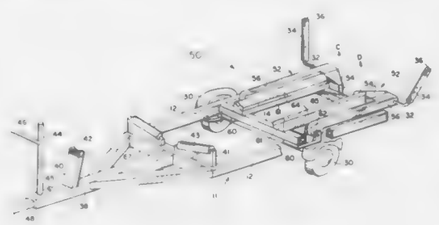
fork during steering movement of the vehicle to provide a desired degree of steering capability to the vehicle; a manual operating means connected to said drive mechanism to enable the vehicle to be manually driven, wherein said frame is bent generally vertically to allow said frame to accommodate movement of said manual operating means relative thereto during generally horizontal rotation of said front fork relative to said frame during steering movement.

4,858,943

BOAT TRAILER

Warren E. Cote, 92 Longpond Dr., Tyngsboro, Mass. 01879

Filed Jul. 25, 1988, Ser. No. 223,654
Int. Cl.[4] B63P *3/10*
U.S. Cl. 280—414.1 **7 Claims**



1. A boat trailer having a frame, said frame having a forward extending tongue, and a pair of parallel bolsters longitudinally disposed at a rear portion of said frame, the improvement comprising; p1 a pair of float arms independently longitudinally with respect to said frame in which each one of said pair is outboard of and adjacent to one of said pair of bolsters, a forward end of each of said float arms pivoted transversely to said frame wherein each of said arms is independently rotatable about its pivot;

a pair of outwardly and upwardly extending guide arms, one of said guide arms attached to the distal end of each of said float arms; and

a pair of floats, one of said floats attached to the distal end of each of said float arms wherein said floats cause said pair of guide arms to extend above the surface of a body of water during launching and recovery of a boat.

4,858,944

SKI WITH DISSYMMETRICAL LATERAL SURFACES

Jean-Luc Diard, Annecy, and Roger Pascal, Annecy Le Vieux, both of France, assignors to Salomon S.A., Annecy Cedex, France

Division of Ser. No. 49,931, May 15, 1987, Pat. No. 4,795,184. This application Sep. 16, 1988, Ser. No. 245,273
Claims priority, application France, May 23, 1986, 86 07852
The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.
Int. Cl.[4] A63C *5/04*
U.S. Cl. 280—609 **19 Claims**



1. A ski for sliding on ice or snow, said ski having a central zone and two ends and comprising:

(a) an upper surface comprising a first edge, second edge, and a median vertical plane;

(b) a lower sliding surface comprising a first edge portion, a second edge portion, and a median vertical plane; and

(c) a plurality of lateral surfaces, whereby a first one of said lateral surfaces connects said first edge of said upper surface with said first edge portion of said lower surface, and a second one of said lateral surfaces connects said second edge of said upper surface with said second edge portion of said lower surface, wherein said vertical planes are distinct from each other;

wherein each of said first lateral surface and said second lateral surface is inclined relative to said lower surface along at least said two ends thereby forming a first angle of inclination and a second angle of inclination, respectively, said ends defining the useful length of the ski, wherein at least one of said lateral surfaces, along at least a portion of said central zone, is substantially vertical.

4,858,945

SNOW SKI AND METHOD OF MAKING THE SAME

Bryan A. Kashiwa, 1896 Camino Manzana, Los Alamos, N. Mex. 97544

Continuation-in-part of Ser. No. 720,878, Apr. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 675,011, Nov. 26, 1984, abandoned, which is a continuation of Ser. No. 412,024, Aug. 26, 1982, abandoned. This application Dec. 8, 1986, Ser. No. 939,186
Int. Cl.[4] A63C *5/00*
U.S. Cl. 280—610 **21 Claims**

1. A ski particularly adapted for effective travel over a snow surface, said ski comprising: a front end, a rear end, a middle portion, a major longitudinal axis extending along a lengthwise dimension of said ski, a minor transverse axis perpendicular to said longitudinal axis, and a vertical thickness axis, said ski having two side surfaces, each of which curves moderately

inwardly in a generally concave curve from the front and rear ends toward the middle portion, said ski further comprising:

a. a core structure;

b. an outer steel box means, comprising:

1. an upper steel sheet having two edge portions;
2. a lower steel sheet have two edge portions;
3. two steel side wall sheets defining side walls positioned on opposite sides of said upper and lower sheets which with said upper and lower sheets and said core structure complete a box structure, with upper edge portions of each of said side wall sheets being rigidly connected to related side edge portions of the upper sheet, said box means being arranged in a manner that said upper sheet is positioned at a level at least as high as the upper edge portions of the side wall sheets, and said side wall sheets being substantially planar with lower edge portions thereof extending substantially vertically downwardly;
4. said upper, lower and side wall sheets having substantially constant material thickness dimensions from the front end to the rear end;

c. said core structure being positioned between, and adhesively bonded to said upper and lower sheets and having substantially planar upper and lower contact surfaces which extend along and are bonded to said upper and lower sheets, respectively, throughout a major portion of



the longitudinal axis and along substantial bonded surfaces areas thereof;

d. a running surface member adhesively bonded to a lower surface of said lower sheet;

e. a pair of metal edge members formed separately from said upper, lower and side sheets, said edge members rigidly connected to opposite lower edge portions of said box structure, wherein said box structure comprises the upper and lower sheets in combination with the side walls and the core to determine the torsional and flexural characteristics of the ski;

f. said upper and side wall sheets having material thickness dimensions between two-hundredths to one and one-half hundredths of an inch, said lower sheet having a material thickness dimension between about one and one-half hundredths to one-hundredths of an inch;

g. said ski having a vertical thickness dimension measured from a top surface of said upper sheet to a lower surface of said lower sheet, said vertical thickness dimension being at a maximum at the middle portion of the ski and diminishing toward the front and rear ends of the ski, said vertical thickness dimension at the middle portion of the ski being dependent on a half length dimension of the ski measured from a center location of the ski equidistant between front and rear contact points to one of said rear front and rear contact points, in accordance with values as follows:

half length dimension in inches	vertical thickness dimension at center of ski in inches
36	0.43–0.64
30	0.33–0.54
24	0.24–0.38
18	0.18–0.28

with the vertical thickness dimension at the center of the ski relative to other half length dimensions of the ski lying within a range defined by two curves passing through said thickness dimension upper and lower limits relative to the half length dimensions of 36 inches, 30 inches, 24 inches, and 18 inches.

4,858,946

NON-SOLE DEPENDENT SKI BINDING

Karl Stritzl; Heary Freisinger, both of Vienna, and Franz Luschnig, Traiskirchen, all of Austria, assignors to TMC Corporation, Baar, Switzerland

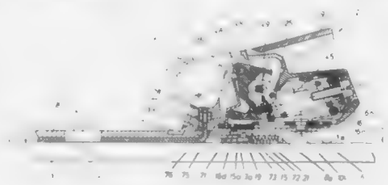
PCT No. PCT/EP87/00080, § 371 Date Nov. 30, 1987, § 102(e) Date Nov. 30, 1987, PCT Pub. No. WO87/04939, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 14, 1987, Ser. No. 116,730

Claims priority, application Austria, Feb. 17, 1986, 408/86

Int. Cl.⁴ A63C *9/081, 9/20*

U.S. Cl. 280—618 **7 Claims**



1. A ski binding comprising:

elongated base plate means having a first longitudinal axis, said base plate means including a substantially flat upper surface, and a first pivot axle extending from said upper surface along a second axis substantially orthogonal to said first axis;

elongated sole plate means for supporting the sole of a ski boot, said sole plate means pivotally mounted on said base plate for pivotal movement about said first pivot axle;

heel holder means for retaining a shoe heel in said binding, said heel holder means mounted on said sole plate means for pivotal movement about a third axis substantially parallel to said second axis, said heel holder means further including a locking portion extending in a direction towards said base plate means;

first cam means for limiting pivotal movement of said sole plate means about said first pivot axle, said first cam means, including a first cam surface and a first cam roller, and disposed between said base plate means and said heel holder means; and

second cam means for limiting pivotal movement of said heel holder means about said third axis, said second cam means including a second cam surface, a second cam roller, and locking pin means, said second cam roller and said second cam surface disposed between said base plate means and said sole plate means to move said locking pin means into and out of contact with said locking portion of said heel holder means thereby permitting said pivotal movement of said heel holder means about said third axis.

4,858,947

FOLDING TANDEM SEAT BABY CARRIAGE

David T. Yee, Hacidena Heights, and Eric Lin, Alhamra, both of Calif., assignors to A B Oriental Trading Co., Inc., Los Angeles, Calif.

Filed Oct. 26, 1987, Ser. No. 113,260

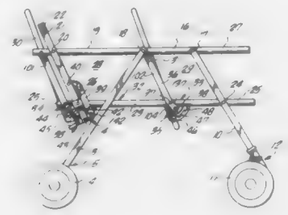
Int. Cl.⁴ B62B *7/08*

U.S. Cl. 280—643 **22 Claims**

1. A foldable tandem baby carriage comprising a pair of front legs having wheels mounted at the lower ends, a pair of rear legs having wheels mounted at the lower ends, a first pair of parallel bars extending between each respective front leg and rear leg and pivotally mounted near the upper ends of the respective front leg and rear leg, a second pair of parallel bars extending between each respective front leg and rear leg and

pivotally mounted between the top and the bottom of the front leg, the second pair of parallel bars being substantially parallel with the first pair of bars and in an operational position below the first pair, a substantially U-shaped push handle, said push handle having free ends, the free ends of said handle being pivotally connected near the ends of the second pair of bars remote from the front legs, a transverse bar extending between the rear legs and interengaging a lock between the rear legs and the push handle, the transverse bar being operable for disengaging the lock thereby to permit folding, a plurality of tandem seats and backrests extending completely between the pairs of bars, the backrests being connected to the second pair of longitudinal parallel bars so as to be pivotally collapsible relative to the seats about a transverse pivot, wherein in an extended operational position, the first and second parallel bars are substantially horizontal, and in a folded position the legs fold towards each other, the first and second pairs of parallel bars fold together, and the backrests fold downwardly towards the respective seats between the folded parallel bars.

21. A foldable tandem baby carriage comprising a pair of front legs having wheels mounted at the lower ends, a pair of rear legs having wheels at the lower ends, a first pair of parallel bars extending between each respective front leg and rear leg and pivotally mounted near the upper ends of the respective



front leg and rear leg, a second pair of parallel bars extending between each respective front leg and rear leg and pivotally mounted between the top and the bottom of the front leg, the second pair of parallel bars being substantially parallel with the first pair of parallel bars, and in an operational position below the first pair, a substantially U-shaped push handle having free ends, the free ends of the handle being pivotally connected near the ends of the second pair of bars remote from the front legs, a plurality of tandem seats and backrests extending completely between the pairs of bars, the backrests being connected to the second pair of longitudinal parallel bars so as to be pivotally collapsible relative to the seats about a transverse pivot, wherein in an extended operational position, the first and second parallel bars are substantially horizontal, and in a folded position, the legs fold towards each other, the first and second pair of parallel bars fold together, and the backrests fold downwardly towards the respective seats between the folded parallel bars, struts extending between a respective bar of the first pair of parallel bars, and the respective bar of the second pair of parallel bars, the struts being pivotally mounted relative to the parallel bars wherein in the extended operative position the struts are forwardly extended and in the folded position the struts are adjacent the rear legs and the struts cooperate with at least one of the backrests to cause the backrest to fold downwardly when in the folded position.

4,858,948

SUSPENSION ASSEMBLY

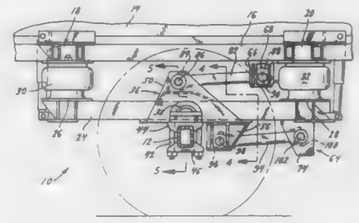
John E. Raidel, Rte. 1, Box 400-M, Springfield, Mo. 65804

Filed Feb. 22, 1988, Ser. No. 158,629

Int. Cl.⁴ B60G *11/26*

U.S. Cl. 280—711 **20 Claims**

1. A suspension assembly for a vehicle having an axle and a chassis including a longitudinal frame member comprising a transverse extender projecting outwardly from the frame member, a longitudinal bolster beam spaced outboard of the frame member, means for connecting the bolster beam to the axle, the bolster beam having a spring mounted section below the transverse extender, an air spring mounted between the transverse extender and the spring mounted section, an upper torque rod, a lower radius rod, the torque rods having first and second ends and being of substantially equal length, first means for pivotally connecting the first end of the upper torque rod to the bolster beam at a point generally above the axle, second means for pivotally connecting the first end of the lower



torque rod to the bolster beam at a point between the axle and the spring and spaced below and inboard of the first connecting means, third means for pivotally connecting the second end of the upper torque rod to the chassis at a point spaced longitudinally and inboard from the first connecting means, fourth means for connecting the second end of the lower torque rod to the chassis at a point spaced below and inboard of the third connecting means, the torque rods being parallel to one another.

4,858,9[illegible]

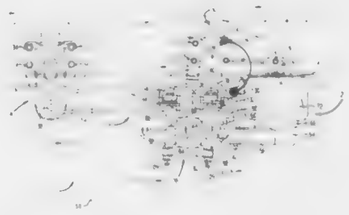
LIGHTWEIGHT TRAILING ARM SUSPENSION

Donovan B. Wallace, and William C. Pierce, both of Muskegon, Mich., assignors to Lear Siegler Neway Corp., Muskegon, Mich.

Filed Nov. 20, 1987, Ser. No. 123,582

Int. Cl.⁴ B60G *9/02*

U.S. Cl. 280—713 **32 Claims**



1. In a trailing arm suspension adapted to support a vehicle on ground-engaging wheels, the vehicle having a longitudally-extending frame, the trailing arm suspension comprising:

a frame bracket adapted to mount to a vehicle frame;

a rigid trailing arm pivotably mounted to the frame bracket at one end for vertical swinging movement with respect thereto;

an air spring assembly mounted to another end of said trailing arm and adapted to mount to the vehicle frame to cushion the swinging movement of the trailing arm about the one end thereof; and

means for mounting an axle to said trailing arm,

the improvement which comprises:

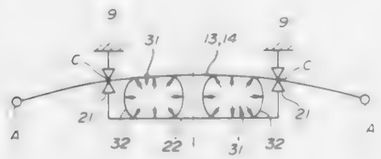
said air spring assembly having a cup forming a bottom portion thereof and a reservoir for said air spring, said cup being secured to a terminal end of said trailing arm in lateral juxtaposition thereto so as to form an extension thereof to reduce the length of said trailing arm and to increase the volume of said air spring without increasing the height between said frame and said axle.

4,858,950

VEHICLE HEIGHT ADJUSTING DEVICE

Hajime Kajiwara; Masami Ogura, both of Saitama, and Shoichi Sano, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1988, Ser. No. 167,589
Claims priority, application Japan, Mar. 12, 1987, 62-57823; Mar. 12, 1987, 62-57824; Mar. 13, 1987, 62-58574
Int. Cl.[4] B60G *11/08*
U.S. Cl. 280—719 **15 Claims**



1. Vehicle height adjusting apparatus, comprising:
an elongate resilient member extending transversely of a vehicle body and having opposite ends coupled respectively to two laterally spaced wheel support members, said resilient member having a vertically resilient characteristic and serving as a suspension component;
retaining means supporting an intermediate portion of said resilient member slidably and swingably on said vehicle body at at least two spaced points on said intermediate portion;
load means for applying a vertical bending stress to said resilient member to displace the resilient member for thereby varying the height of the vehicle body; and
said load means including means for applying different concentrated loads to a plurality of points in a range between said two spaced points on said elongate resilient member supported by said retaining means.

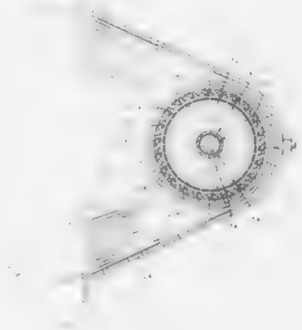
4,858,951

IGNITER FOR GAS GENERATING MATERIAL

Reiner Lenzen, Almont, Mich., assignor to TRW Vehicle Safety Systems, Inc., Lyndhurst, Ohio

Filed May 4, 1988, Ser. No. 190,479
Int. Cl.[4] B60R *21/10*
U.S. Cl. 280—741 **19 Claims**

1. An apparatus for igniting gas generating material, said apparatus comprising:
a container; and
an ignitable material located in said container for igniting the gas generating material upon ignition of said ignitable material, said ignitable material igniting when heated to a predetermined temperature,
said ignitable material comprising a homogeneous mixture of auto-ignition material which ignites when heated to said predetermined temperature and booster material which



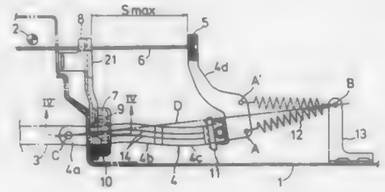
ignites at a temperature greater than the temperature at which said auto-ignition material ignites.

4,858,952

DOOR CHECKER FOR SEAT BELT REACHER SYSTEM

Kiichi Sasaki, Saitama; Tadanori Honda, Tochigi; Hidetoshi Saruwatari, Tochigi, and Kazuo Higuchi, Tochigi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1985, Ser. No. 766,092
Claims priority, application Japan, Aug. 23, 1984, 59-175695; Aug. 23, 1984, 59-175696; Aug. 23, 1984, 59-127996[U]
Int. Cl.[4] B60R *21/02*
U.S. Cl. 280—802 **10 Claims**



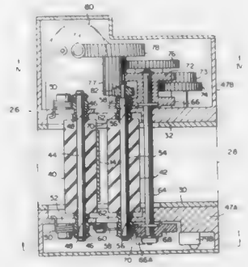
1. For use with a door hingedly mounted to a vehicle body, a door checker operable as an operating source for automotive equipment, comprising:
a generally L-shaped member on said door having a first end portion projecting from a hinge end of said door and being pivotally connected to a bracket fixed to said vehicle body,
a cam portion provided at least on a side surface of said first end portion proximate to the exterior of said door,
gripping means secured to said door adjacent said hinged end thereof cooperable with said cam portion,
a second end portion laterally offset from said first end portion toward said door exterior and connected to said first end portion by a corner portion,
a control cable having one end extending exteriorly of said door operably connecting the equipment to be operated,
the other end of said cable extending interiorly of said hinge end of said door and connecting said second end portion of said member, and
a tension spring connected between said corner portion of said member and the door so as to biased said member relative to the door in a direction to close the door, wherein the point of engagement between the tension spring and said member is located on a side opposite to the point of engagement of the control cable with said member with respect to a line extending between the pivotal connection of the bracket and the first end portion of said member with the point of connection of the tension spring with the door.

4,858,953

APPARATUS FOR DRIVING AN INTERMEDIATE PORTION OF WEBBING

Yuji Nishimura; Takashi Kawaharazaki; Keiichi Tamura; Kenji Matsui; Yasutaka Watanabe, and Noritada Yoshitsugu, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Mar. 10, 1987, Ser. No. 24,125
Claims priority, application Japan, Mar. 11, 1986, 61-53260
Int. Cl.[4] B60R *22/34*
U.S. Cl. 280—807 **29 Claims**



1. An apparatus for driving an intermediate portion of a webbing, comprising:
driving means interposed between a webbing accommodating section and a portion of application of the webbing onto an occupant and adapted to drive the webbing in the direction of application of the webbing around the occupant; and
a driving source for imparting a webbing-driving force to said driving means.

4,858,954

DEVICE FOR ADJUSTING THE POSITION OF A STRAP RETURN ELEMENT OF IN PARTICULAR AN AUTOMOBILE VEHICLE SAFETY BELT

Gérard Escaravage, Valentigney, France, assignor to ECIA - Equipements et Composants Pour L'Industrie Automobile, Audincourt, France

Filed Jun. 20, 1988, Ser. No. 208,536
Claims priority, application France, Jun. 19, 1987, 8708634
Int. Cl.[4] B60R *22/20*
U.S. Cl. 280—808 **7 Claims**

1. Device for adjusting the position of a strap return element, of in particular an automobile vehicle safety belt, between two end positions, said device comprising:
a relatively flat hollow guide rail for fixing to a post of the vehicle and having a front wall including an opening in the form of a rectilinear slot;
a fixing pin longitudinally movable in said slot, and having an outer end for said strap return element and an inner end with a base located in said rail and having a dimension larger than the width of said slot;
an element constituting a lock having the form of a platen located between said base and said wall parallel to the latter and defining a generally C-shaped opening having two branches and an intermediate part, said C-shaped opening having a width less than the dimension of said base;
said platen being movably mounted in its plane between a first locking position, in which said two branches are in facing relation to said slot so as to define two apertures for selectively positively capturing and locking said pin in two positions corresponding to said end positions, and a



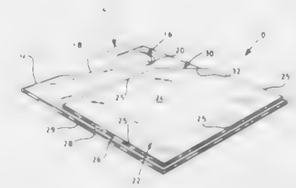
second releasing position in which said intermediate part is facing said slot to permit the shifting of said pin and strap return element;
resilient means for biasing said platen to its first position; and
control means acting on said platen and manually operable from the outside of said rail for shifting said platen from its first position to its second position against the bias of said resilient means.

4,858,955

PALETTE WITH DISPOSABLE MIXING SURFACE FOR MIXING BLENDABLE MATERIALS

George G. Holt, P.O. Box 3244, Morristown, Tenn. 37814

Continuation-in-part of Ser. No. 939,814, Dec. 9, 1986, Pat. No. 4,740,014. This application Apr. 22, 1988, Ser. No. 185,142
Int. Cl.[4] B42D *5/00, 17/00*; G09B *11/10*; B44D *3/00*
U.S. Cl. 281—44 **5 Claims**



1. A palette for providing a surface upon which a user can mix blendable material with a mixing instrument, said palette comprising:
a substantially rigid planar base defining a perimeter;
a stabilizing means for allowing said palette to be steadily held during use, said stabilizing means including a cut-out defined in a portion of said perimeter of said base for steadying said palette against said user's body, and said base defining at least one thumb hole;
a mixing surface means for receiving said materials to be blended, said mixing surface means including pad secured to said base to prevent movement during mixing, said pad defining a perimeter and including a plurality of disposable mixing sheets, each of said sheets being releasably bonded to said other sheets along substantially all of said perimeter of said pad provided, however, a selected portion of said perimeter is unbonded; and
sheet separation means at said selected unbonded perimeter portion whereby said user can grasp and remove at least one said sheet from said pad, said sheet separation means comprising a truncated corner of said pad, said sheets

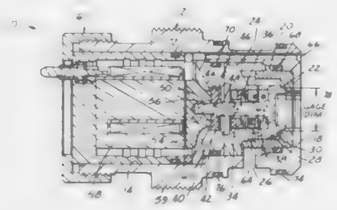
being unbonded at said truncated corner and said base defining a finger hole proximate and at least partially overlaid by said truncated corner thereby facilitating the grasping and removing of the last few of said sheets in said pad.

4,856,956

HIGH PRESSURE, FAST RESPONSE, PRESSURE BALANCED, SOLENOID CONTROL VALVE

Morse N. Taxon, Hampton, Va., assignor to Siemens-Bendix Automotive Electronics L.P., Troy, Mich.

Filed Sep. 22, 1988, Ser. No. 247,999
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.07 8 Claims



1. A high pressure, fast response, pressure balanced, solenoid control valve comprising:

a housing with an open end and an axially extending tubular passageway from said open end and terminating in an outlet at the other end;

a solenoid means located in said housing;

a valve seat member having a conical valve seat located in the passageway adjacent to said outlet;

a spherical valve member axially in line with said valve seat member, said valve member seats along a contact line in said valve seat;

said spherical valve member having an axially extending post axially extending in a direction away from said conical valve seat;

a guide bearing means positioned in said tubular passageway and axially aligned with said valve seat;

a pressure balancing bearing mounted around said post and located in said guide bearing means, the diameter of said contact line and the diameter of said bearing being equal;

a valve cavity extending between said bearing and said conical valve seat;

an armature cavity extending between said solenoid means and said bearing;

armature means spaced in said armature cavity and mounted to the end of said post, said armature means magnetically coupled to said solenoid means, said armature means and said valve member forming an unitary member having reciprocal movement and with said valve cavity therebetween;

inlet means in fluid communication with said valve cavity for receiving fluid at a first pressure; and

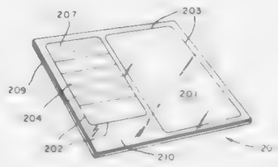
an outlet pressure passageway axially extending from a position near said outlet to said armature cavity for transmitting fluid at a second pressure, said unitary member being in pressure balance with said second pressure on each end and said first pressure in said valve cavity.

4,858,957

IDENTIFICATION TAG

Carl A. Capozzola, 21515 Hawthorne Blvd., Suite 1140, Torrance, Calif. 90503

Continuation-in-part of Ser. No. 103,654, Oct. 2, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 277,351
Int. Cl.[4] B42D *15/00*; B44C *5/00, 3/00, 3/02*
U.S. Cl. 283—81 3 Claims



1. An identification tag arrangement comprising, in combination:

a sheet of clear transparent material;

a transparent adhesive layer applied to one side of said clear sheet material;

a backing sheet having at least one smooth side adhesively removable from said adhesive layer;

a notational strip perforation of said clear sheet material outlining a notational strip;

an overlay perforation of said clear sheet material forming an overlay larger than said notational strip;

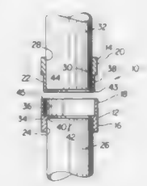
under the condition of removal of said notational strip from said backing sheet and removal of said overlay from said backing sheet, the user may place the notational strip in a preselected location with said adhesive layer down and may place said overlay on top of said notational strip with said adhesive layer in contact with said notational strip.

4,858,958

SLIP-JOINT COUPLING

Gerold J. Harbeke, 2807 S. Military Trail, West Palm Beach, Fla. 33415

Filed Mar. 14, 1988, Ser. No. 168,020
Int. Cl.[4] A16L *21/00*
U.S. Cl. 285—31 6 Claims



1. A two-piece slip-joint coupling for a pipe comprising:

a cylindrically-shaped first coupling piece having a first pipe-mounting portion at one end and a first coupling mating portion at the other end, said first pipe-mounting portion having a coupling inner diameter of a size for snugly fitting an outer surface of a first standard plumbing pipe as an inner diameter and a coupling outer surface diameter which is substantially greater than said coupling inner diameter as an outer diameter;

a separate cylindrically shaped second coupling piece having a second pipe-mounting portion at one end and a second coupling mating portion at the other end, said second pipe-mounting portion having said coupling inner diameter as an inner diameter for snugly fitting an outer surface of a second standard plumbing pipe of the same size as said first pipe and said coupling outer diameter as an outer diameter;

one of said first and second coupling mating portions having said coupling inner diameter as an inner diameter and an intermediate diameter as an outer diameter, said intermediate diameter having a size between said coupling inner and outer diameters, the other of said first and second coupling mating portions having approximately said intermediate diameter as an inner diameter and approximately said coupling outer diameter as an outer diameter;

said first coupling piece having an internally protruding shoulder between said first coupling mating portion and said first pipe-mounting portion to contact a coupling end edge of said first pipe on which said first coupling piece is mounted and thereby prevent said first coupling piece from sliding onto said first pipe beyond said internally-protruding shoulder, said second coupling piece not having an internally protruding shoulder for contacting a coupling end edge of said second pipe whereby said second coupling piece can slide onto the second pipe beyond its end;

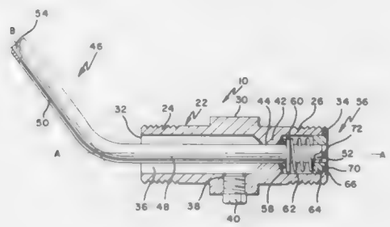
whereby said first pipe-mounting portion of said first coupling piece can be mounted on an end portion of said first pipe with said first coupling mating portion directed in the same direction as said coupling end edge of said first pipe and said shoulder abutting on said end edge of said first pipe, said second pipe-mounting portion of said second coupling can be mounted on an end portion of said second pipe with said second coupling mating portion directed in the same direction as said coupling end edge of said second pipe, and said second coupling piece can be slid onto said second pipe beyond the end edge thereof, and then slid toward the first pipe so that said coupling mating portion with said intermediate outer diameter telescopes into said coupling mating portion with said intermediate inner diameter so as to form a composite coupling joint for coupling said first and second pipes together having an outer diameter which is essentially uniform along the entire length of the composite coupling, and means for attaching said first coupling to said first pipe, said second coupling to said second pipe and said first coupling to said second coupling.

4,858,959

FUEL LINE ADAPTOR

R. Alan Parrow, 53 Montana Dr., Holden, Mass. 01520

Filed Sep. 1, 1988, Ser. No. 239,434
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—39 11 Claims



1. A fuel line adaptor for a fuel line having a standard pipe fixture and a fuel tank having an outlet opening, said adaptor comprising:

(a) a housing having a first fixture for operative connection to said outlet opening, a second fixture for operative connection to said standard pipe fixture, a first opening at said first fixture, a second opening at said second fixture, a drain opening, and a bore which extends from said first opening to said drain opening,

(b) a drain fixture at said drain opening for selectively opening and closing said drain opening,

(c) a feed tube which has an outer portion which extends into said bore from said first opening to said second fixture, said outer portion having an outlet opening which is operatively connected to said second opening, said feed tube having an inner portion which extends from said first opening into said fuel tank, said inner portion having an inlet opening which is substantially above the outlet opening of the tank, and

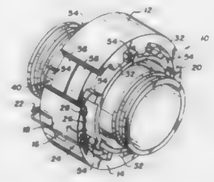
sealing means for forming a seal between said feed tube and said housing at said second fixture for preventing fuel from said fuel tank from flowing from said bore to said second opening and allowing fuel from said fuel to said second opening.

4,858,960

HOSE COUPLING LOCK

Michael Pharaon, 7182 Gibson Street, Burnaby, B.C., Canada V5A 1P3

Filed Nov. 10, 1988, Ser. No. 269,462
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—91 10 Claims



1. A locking device for securing together two coupled components of a firehose coupling, said locking device comprising first and second generally semicylindrically shaped members for embracing the coupling;

said semi-cylindrically shaped members each having first projections extending inwardly of said device for retainingly engaging second projections on each of the coupled components of said firehose coupling; to prevent relative rotation of the fire hose coupling and said locking device, in a locking condition of the first and second members; and

means for releasably securing said first and second members around said firehose coupling in said locking condition.

4,858,961

ROTARY JOINT

Yoshiaki Nunogaki, Nagaokakyo, Japan, assignor to Sanki Engineering Ltd., Kyoto, Japan

Filed Aug. 14, 1987, Ser. No. 85,860
Claims priority, application Japan, Aug. 15, 1986, 61-191824
Int. Cl.[4] F16L *17/00*
U.S. Cl. 285—98 2 Claims

1. A rotary joint comprising:

a first joint portion including a first sliding member having a first sliding face perpendicular to a central axis thereof, a first flow passage along the central axis thereof and through said first sliding face, a first external flow passage, and means for communicating said first flow passage with said first external flow passage, and a second flow passage through said first sliding face and separate from said first flow passage, a second external flow passage, and means for communicating said second flow passage with said second external flow passage;

a second joint portion including a third flow passage and a fourth flow passage, a third and a fourth external flow passage, means for communicating said third and fourth flow passages with said third and fourth external flow

passages, and said second joint portion being freely relatively rotatable with said first joint portion;

a third joint portion rotatably mounted between said first and second joint portions, and including a second sliding member and a third sliding member, said second and third sliding members defining jointly a second sliding face perpendicular to the central axis, said second sliding face being slidable relative to said first sliding face of said first joint portion, said third joint portion having a fifth flow passage along the central axis thereof and through said second sliding face of said third sliding member, means for communicating said fifth flow passage with said first and third flow passages, said third joint portion having a sixth flow passage separate from said fifth flow passage and through said second sliding face of said second sliding member, and means for communicating said sixth flow passage with said second and fourth flow passages;

means for holding together said first, second, and third joint portions; and

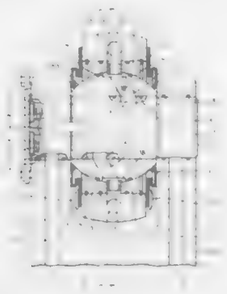
a biasing means for urging said third joint portion in a direction away from said second joint portion for contacting said second sliding face of said third joint portion with said first sliding face of said first joint portion for providing fluid sealing and for maintaining fluid communication between said fifth and first flow passages and between said sixth and second flow passages.

4,858,962

ARTICULATED JOINT

Fritz C. Bölling, Witzenhausen, and Josef Sellner, Espenau, both of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Mar. 12, 1987, Ser. No. 25,228
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1986, 3608782
Int. Cl.[4] F16L *27/06;* F16C *11/06*
U.S. Cl. 285—136 8 Claims



1. Articulated joint for the joining of a first and a second joint body (1,5) comprising:

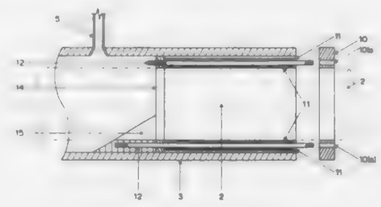
a first bearing body (3) fixedly disposed in a bore of the first joint body (1), said first bearing body being provided internally with a first spherical bearing surface (4), and having an axis and being divided into segments along a plane parallel to said axis; a second bearing body (6) fixedly disposed on a pin (8), said pin having an axis and being fixed to the second joint body (5), said second bearing body having a second, spherical, outer bearing surface, (6a) in contact with the first bearing surface, said bearing surfaces permitting relative motion between said first and second joint bodies about three axes of rotation, namely a first axis which is the axis of said pin, a second axis perpendicular to the first axis, and a third axis perpendicular to both said first and said second axis: first and second fluid pathways (12–14, 16–20 and 12'–14', 16'–20') independent of each other, each fluid pathway leading from a respective channel (20, 20') in the first joint body (1) through the bearing bodies and through the pin to a respective channel in the second joint body (5) for transporting at least one fluid through the joint and the joint bodies, and each fluid pathway having a first passage (17, 17') formed in one (6) of said first and second bearing bodies and having a first end opening into a pocket-like recess (18, 18') also formed in said one bearing body and bounding its bearing surface, and a second passage (19, 19') formed in the other (3) of said first and second bearing bodies and having a first end bounding the bearing surface of said other bearing body, said first end of said second passage having a smaller cross-section than said pocket-like recess, sealing means (23–26, 24'–26', 28) for sealing said fluid pathways, said sealing means containing each a gasket means (24, 24') surrounding an associated recess (18, 18'), said gasket means being inserted into a groove which is formed in one of said bearing surfaces; and stop means for establishing a permissible range of motion between the two joint bodies about said three axes of rotation such that said first end of each second passage opens into its associated recess in all possible positions of the joint bodies within said permissible range of motion between the two joint bodies.

4,858,963

SEALING APPARATUS FOR CONCENTRIC CONDUITS

Earl P. Kimbrough, 204 Windsor Rd., Starkville, Miss. 39579

Filed Jul. 15, 1988, Ser. No. 220,452
Int. Cl.[4] F16L *21/04*
U.S. Cl. 285—138 4 Claims



1. An apparatus for sealing the ends of a casing pipe located around a carrying pipe which comprises, in combination, a plurality of seals positioned within said casing pipe so that said seals are not exposed to the earth surrounding said casing pipe, said seals each having a back plate with a passageway for slidably accepting said carrying pipe, the outer diameter of said back plate being less than the inner diameter of said casing pipe; a face plate having a passageway for accepting said carrying pipe, the outer diameter of said face plate being equal to the outer diameter of said casing pipe; a compressible material having a passageway therethrough for acceptance of said carrying pipe whereby said compressible material is assembled between said plate plate and said face plate; and means for supporting said carrying pipe within said casing pipe; and, a tightening means for drawing said back plate toward said face plate so as to compress said compressible material so that said compressible material seals the space between the outer surface of said carrying pipe and the inner surface of said casing pipe.

4,858,964

T-JOINT FOR CONNECTING BRANCH PIPE

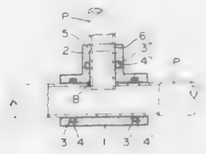
Masayoshi Usui, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Sunto, Japan

Filed Mar. 22, 1988, Ser. No. 171,669
Int. Cl.[4] F16L *41/00*
U.S. Cl. 285—156 5 Claims

1. A T-joint for connecting an end of a branch pipe to a main pipe having a peripheral opening such that the end of the branch pipe is retained in the peripheral opening of the main pipe, said branch pipe comprising an inwardly formed annular locking groove at a location thereon spaced from the end thereof, said T-joint comprising:

a linear main piping wall with opposed longitudinal ends and a through hole extending therebetween, said through hole being penetrated and fitted with the main pipe, the through hole in the main pipe wall being characterized by annular grooves spaced inwardly from the respective opposed longitudinal ends thereof, with elastic O-rings being engaged in said grooves; and

a branch piping wall integral with said main piping wall for receiving the branch pipe, said branch piping wall being arranged perpendicularly to said main piping wall and communicating with the through hole of said main piping



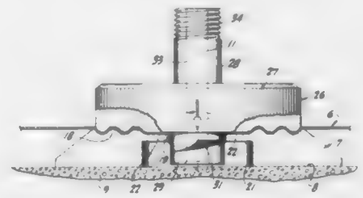
wall, such that the end of said branch pipe received in the branch piping wall can be inserted into the peripheral opening in said main pipe fitted in the through hole of said main piping wall, said branch piping wall comprising an inwardly protruding engaging wall at a location thereon spaced from said main piping wall for engaging the annular groove formed in said branch pipe, said branch piping wall further being characterized by an interiorly disposed annular groove intermediate the main piping wall and the inwardly protruding engaging wall, with an elastic O-ring being retained in said annular groove of said branch piping wall, whereby said branch pipe is securely retained in communication with the main pipe by the interengagement of the inwardly protruding engaging wall of said branch piping wall with the annular groove formed in said branch pipe.

4,858,965

INTRODUCTORY PORTION

Peter R. Ciriscioli, Stanford, Calif., and Michael W. Cook, Sandy, Utah, assignors to L.C.P., Inc., Reno, Nev.

Filed Feb. 12, 1988, Ser. No. 155,569
Int. Cl.[4] F16L *41/00*
U.S. Cl. 285—200 1 Claim



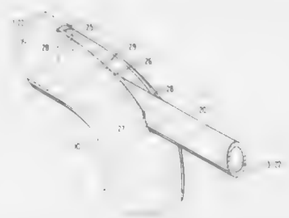
1. A fitting for filling or evacuating a bag having a flexible wall with an inner face and an outer face and having means defining a hole in said wall comprising an inner block symmetrical about an axis and adapted to abut said inner face and having a transversely elongated recess in said inner block extending only partway through said inner block to leave side flanges, said inner block having an upper surface extending substantially normal to said axis with coaxial annular corrugations therein; an outer block symmetrical about said axis and having a lower surface substantially normal to said axis with coaxial annular corrugations thereon positioned to intersperse with said annular corrugations of said inner block; a stem on and extending axially above and below said outer block; means defining an axial passage through said stem adapted to connect with a pressure source and to connect with said recess in said block; crescent flanges on said inner block extending into said axial passage; means on said stem projecting radially therefrom and adapted to rotate with said stem about said axis between one rotated position in which said projecting means engage said adjacent flanges and preclude relative axial movement of said inner block and said outer block and another rotated position in which said projections are axially movable between said crescent flanges; and an air permeable supporting block underlying and disposed against said lower surface of said inner block and spanning said recess out of contact with said stem.

4,858,965

CONCENTRIC INJECTION FLOW PIPE JUNCTION

Harold A. Fuller, and Michael L. Shepard, both of Covington, Va., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 149,483, Jan. 28, 1988, Pat. No. 4,807,340.
This application Oct. 31, 1988, Ser. No. 253,492
Int. Cl.[4] F16L *5/02*
U.S. Cl. 285—189 7 Claims



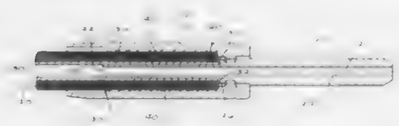
1. A pipe junction wherein the wall of a main fluid carrier conduit is penetrated by an injection fluid carrier conduit for positionment of an injection fluid discharge end substantially parallel and coaxial with a main fluid flow channel and direction, said main fluid carrier conduit and injection fluid carrier conduit having outer wall surfaces, said junction comprising fairing plates of compatible material secured with a bonded, fluid-tight seam to outer wall surfaces of said injection fluid carrier continuously around a zone of main fluid flow disruption caused by said injection fluid carrier penetration, said fairing plates extending from the outer wall surface of said injection fluid carrier to the outer wall surface of said main fluid carrier as fluid tight fairing walls against a main fluid flow stagnation volume within said zone of main fluid flow disruption, said fairing plates being secured to said main fluid carrier outer wall surface with a bonded, fluid-tight seam around a continuous, closed perimeter which includes a portion of said injection fluid carrier outer wall surface.

4,858,967

HIGH PRESSURE HOSE FITTING AND METHOD FOR SEALING HIGH PRESSURE HOSES TO FITTINGS

Olivier L. Tremoulet, Jr., Edmonds, and Chidambaram Raghavan, Renton, both of Wash., assignors to Flow Systems, Inc., Kent, Wash.

Filed Apr. 12, 1988, Ser. No. 180,546
Int. Cl.[4] F16L *33/00*
U.S. Cl. 285—256 15 Claims



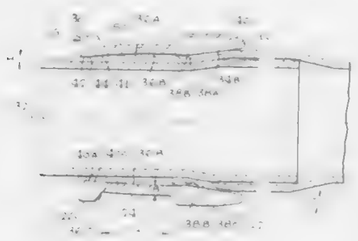
1. A hose end unit comprising:
an axially extending hose having an inner axially extending passageway, an axially extending liner of generally annular cross-section generally circumventing said passageway, and an axially extending reinforcement layer generally circumventing the liner,
the hose having an end portion,
the liner extending axially beyond the reinforcing layer to terminate in a protruding end region adjacent said end portion;
a generally tubular end fitting having a leading end portion inserted within the end region of the liner, said leading portion including means for enveloping at least a portion of the protruding end region of the liner; and
a sleeve circumventing the end portion of the hose and swaged radially inwardly to clamp the leading portion of the tubular end fitting to the liner, the liner being thereafter expanded by fluid pressure within the hose to seal against the enveloping means.

4,858,968

LOCKRING TUBE JOINT

Peter Moebius, 38 Oceanaire Dr., Rancho Palos Verdes, Calif. 90274

Filed Mar. 17, 1988, Ser. No. 169,388
Int. Cl.[4] F16L *13/14*
U.S. Cl. 285—382.2 12 Claims



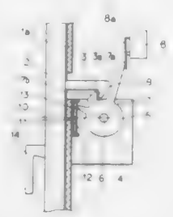
1. Apparatus for joining the ends of a pair of interfitting tubes wherein the end portion of a first tube lies closely within the end portion of said second tube, and wherein said second tube end portion has a first predetermined outside diameter, comprising:
a lockring having front, center and rear sections, said front section having an internal surface which is tapered in a forward radially-outward direction and which has a predetermined minimum diameter which is less than said first diameter, said center section having a cylindrical internal surface of said predetermined minimum diameter, and said rear section forming a rearwardly-facing push surface;
said center section being so constructed and arranged in the relationship of the length to the thickness thereof so it elastically bows outwardly far enough to avoid high frictional contact with said second tube when said ring is pushed over a tube by a force applied to said push surface while said front section squeezes said tube end portions to reduce their diameters.

4,858,969

DOOR LATCH ASSEMBLY

Kwan H. Lee, Changwon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Aug. 28, 1987, Ser. No. 90,330
Int. Cl.[4] E05C *3/22*
U.S. Cl. 292—78 10 Claims



1. In a door latch assembly for use in a microwave oven having a door, the door latch assembly comprising a latch pawl fastened inside the door, a support member secured to a front face of the oven at one end thereof, a revolving plate pivotally mounted on the support member and having a hook-shaped portion and a projected bar for use in actuating a switch, the improvement comprising:
a spring support member secured to said front face of said microwave oven;
a panel spring secured to said spring support member for pivotally urging said revolving plate;
said revolving plate having a push projection acted on by the panel spring for urging the revolving plate in a first direction such that the hook-shaped portion thereof engages said latch pawl in a closed condition of said door; and
said hook-shaped projection of said revolving plate having a stop surface acted on by said panel spring for limiting movement of said revolving plate in a second direction opposite said first direction in an open condition of said door.

4,858,970

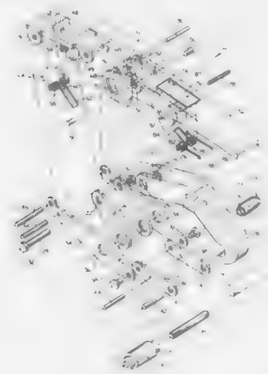
LOW PROFILE LATCH

Albert D. Tedesco, Anaheim; John C. Stammreich, Rancho Palos Verdes; Raymond E. Harmon, Orange, and William R. Rourne, Jr., Redondo Beach, all of Calif., assignors to Rexnord Holdings Inc., Torrance, Calif.

Filed Dec. 18, 1987, Ser. No. 134,728
Int. Cl.[4] E05C *5/02*
U.S. Cl. 292—113 16 Claims

1. A low profile aircraft latch for joining one aircraft member to a second aircraft member, one of said members mounting a keeper, comprising:
a hook for engaging said keeper;
a mounting bushing;
a single pair of compression links connecting said mounting bushing to said hook at a pivot point;
a handle means joined to said hook at said pivot point;
a pair of side plates pivoted about said mounting bushing having first and second opposing ends extending to either side of said mounting bushing;

a pair of control links connecting said first opposing end of said side plates to said hook; and



said handle means connected to said second opposing ends of said side plates, whereby an arcuate movement of said handle means causes a controlled movement of said hook.

4,858,971

ELECTRONIC VEHICLE DOOR LOCK/UNLATCH CONTROL

Ronald H. Haag, East Detroit; Mark Manuel, Warren, and Lloyd W. Rogers, Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 7, 1988, Ser. No. 164,903
Int. Cl.[4] E05C *9/00*
U.S. Cl. 292—201 2 Claims



1. An electronic door lock/unlatch control for a motor vehicle having an electric power source, an ignition switch connected to the electric power source and at least one front door and one rear door, each of the front and rear doors having a mechanical latch mechanism adapted to latch the door automatically upon door closure and having a mechanical unlatch mechanism driven by an electric motor, when activated, to unlatch and partially open the door, the control comprising, in combination:
a front door unlatch switch;
a first transistor connected in series with the front door unlatch switch and electric motor of the front unlatch mechanism across the electric power source, the first transistor having a control electrode;
a first bistable device having an output connected to the control electrode of the first transistor and being characterised by a first state effective to enable conduction of the first transistor upon closure of the front door unlatch switch and a second state in which conduction of the first transistor is prevented;
a front door unlatch switch;
a rear door unlatch switch;
a second transistor connected in series with the rear door unlatch switch and the electric motor of the rear unlatch mechanism across the electric power source, the second transistor having a control electrode;
a second bistable device having an output connected to the control electrode of the second transistor and being characterised by a first state effective to enable conduction of the second transistor upon closure of the rear door unlatch switch and a second state in which conduction of the second transistor is prevented;
a front lock switch connected to the electric power source and the first and second bistable devices and effective, when closed, to put the first and second bistable devices in their second states to disable unlatching of the front and rear doors;
a front unlock switch connected to the electric power source and the first and second bistable devices and effective, when closed, to put the first and second bistable devices in their first states to enable unlatching of the front and rear doors;
a rear lock switch connected to the electric power source and the second bistable device and effective, when closed, to put the second bistable device in its second state to disable unlatching of the rear door;
a rear unlock switch connected to the electric power source and the second bistable device and effective, when closed, to put the second bistable device in its first state to enable unlatching of the rear door;
a rear unlatch disable switch connected in series with the second transistor, rear door unlatch switch and the electric motor of the rear unlatch mechanism across the electric power source, the rear unlatch disable switch being located within reach of a vehicle operator but out of reach of a passenger using the rear door and effective, when open, to prevent unlatching of the rear door;
front lock and unlock indicating lights associated with the front door;
rear lock and unlock indicating lights associated with the rear door;
an indicating light drive circuit for each of the front lock, front unlock, rear lock and rear unlock indicating lights responsive to an enabling input and the output of the bistable device controlling enablement of the unlatching mechanism of the associated door to indicate the lock/unlock status thereof;
a timing circuit effective to supply the enabling signal to the indicating light drive circuits while provided with an activating voltage input and for a predetermined time after removal of the activating voltage input;
a door jamb switch connected to the electric power source and activated while the front door is open to provide the activating voltage to the timing circuit; and
circuit means connected to the electric power source through the ignition switch to provide the activating voltage to the timing circuit, whereby the lock/unlock status of the locks is displayed while the ignition switch is closed, while the front door is open and for at least the predetermined time thereafter.

4,858,972

DOOR OPENING LIMITING BAR

Sidney C. Salyer, 1826 Dixon La., Concord, Calif. 94521

Continuation of Ser. No. 98,936, Sep. 21, 1987, abandoned. This application Aug. 15, 1988, Ser. No. 233,894
Int. Cl.[4] E05C *17/30*
U.S. Cl. 292—338 13 Claims

1. A door opening limiting bar, comprising
an elongated rigid member,
a first bracket formed for attachment to the inner face of a hinged door a spaced distance above the bottom thereof,
a second bracket formed for attachment to a wall confront-

ing said inner face of said door at approximately the same height as said first bracket,

attachment means on the opposite ends of said elongated rigid member formed for selectively securing said ends to said first and second brackets whereby said elongated rigid member prevents opening of said door beyond a desired point,

adjustment means on said elongated rigid member formed for selectively increasing and shortening the distance between said opposite ends of said elongated rigid member so as to control the position of said door between a closed position and a desired partially open position,

said elongated rigid member being longitudinally expansible and contractable by desired amounts for accomplishing said selective increasing and shortening of the distance between said opposite ends of said elongated rigid member,

said adjustment means being operable for selectively increasing and decreasing the distance between said opposite ends of said elongated rigid member without disengaging said ends from said first and second brackets whereby the opening of said door is limited at all times while adjustment of the length of said elongated rigid member is being accomplished,

said elongated rigid member providing telescoping sections threadably joined together for relative axial movement upon relative rotation so as to provide said adjustment means,

said elongated rigid member comprising

an elongated tube having closed ends provided with axial threaded bores,

tubular end sections telescopingly engaged over said closed ends of said elongated tube,

a wall closing off each of the outer ends of said end sections,

and a threaded rod secured to each of said walls and extending axially inwardly and being threadably engaged in said threaded bores in said closed end of said elongated tube corresponding to the end section in which said threaded rod is secured whereby rotation of said elongated tube relative to said threaded rods in one direction causes said tubular end sections to move relatively apart and rotation of said elongated tube relative to said threaded rods in the opposite direction causes said tubular end sections to move relatively together.

4,858,973

INSIDE DOOR HANDLE ASSEMBLY WITH MEANS TO PREVENT INADVERTENT SEPARATION OF DOOR HANDLE

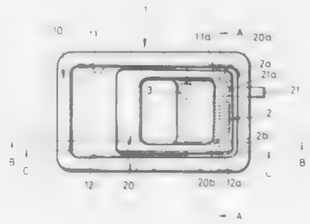
Shinji Ogasawara, Hekinan; Yukio Isomura, Chiryu, and Souichiro Okudaira, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed May 24, 1988, Ser. No. 197,920

Claims priority, application Japan, May 27, 1987, 62-80405[U]

Int. Cl.⁴ E05B *3/00*

U.S. Cl. 292—347 **3 Claims**



1. An inside door handle assembly, comprising:

a bezel fixedly secured to a door and having two opposing side walls;

a rotatable handle retained by the opposing side walls of said bezel;

an arm formed as an integral part of said handle adjacent one of the two opposing side walls of said bezel;

a spring arranged on said handle and having a first end engaged with said bezel and a second end engaged with said handle, said spring biasing said handle at all times in a door closing direction;

a stop provided adjacent said one of the two side walls of said bezel, said stop coming into abutting contact with said arm when said handle is turned in the door opening direction; and

an engagement portion provided as part of said handle adjacent the other of the two opposing side walls of said bezel, said engagement portion coming into abutting contact with said spring when said handle is turned in a direction which opens the door.

4,858,974

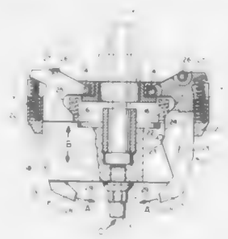
ROBOTIC GRIPPER HEAD

Karl H. Stannek, 20122 Kline Dr., Santa Ana Heights, Calif. 92707

Filed May 2, 1988, Ser. No. 189,031

Int. Cl.⁴ B25J *15/06*; B66G *47/91*; H05K *13/02*

U.S. Cl. 294—2 **1 Claim**



1. In a robotic gripper head for selectively abstracting a flat part from a stack of a plurality of such parts at a supply station,

transferring the abstracted part from the supply station to a work station, and

positioning the transferred part in a preselected location at said work station,

said gripper head, carried by a robotic arm to move said head between said supply and work stations, including

vacuum means including a part-contacting suction tube for selectively abstracting the selected part from the stack thereof to a part-gripping location spaced from said stack, and

a plurality of mechanically-actuated gripping fingers, pivotally attached at their upper ends to said head,

and having free lower ends which are spaced away from said part during the part-abstracting operation and which are pivoted arcuately inwardly at said spaced location, to grip said abstracted part on opposed edges thereof,

to retain said part during movement thereof from said spaced location to said work location,

the improvement for handling parts have variable transverse dimensions, comprising:

(a) at least a pair of said gripping fingers, pivotally attached at their upper ends to said gripper head for pivotal movement in vertical planes, and

(b) means defining opposed arcuate gripping surfaces formed in opposed lower ends of said fingers, said surfaces being concave in said vertical planes.

4,858,975

VACUUM CHUCK APPARATUS FOR WET PROCESSING WAFERS

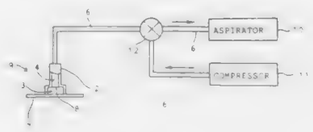
Tsutomu Ogawa, Machida, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 17, 1988, Ser. No. 258,512

Claims priority, application Japan, Oct. 22, 1987, 62-267119

Int. Cl.⁴ A47B *97/00*

U.S. Cl. 294—64.1 **13 Claims**



13. A method of handling objects with a vacuum chuck having an inlet formed by a cavity and a liquid-gas separating membrane disposed within the cavity wherein the membrane prevents passage of liquid, the method comprising:

immersing the vacuum chuck into a liquid in proximity to an object to be handled;

purging the liquid from the inlet with compressed gas supplied to the vacuum chuck from a compressed gas source, and after purging;

aspirating the vacuum chuck with an aspirator thereby vacuuming the object against the inlet.

4,858,976

DEVICE FOR HANDLING WORKPIECES

Kurt Stoll, Lenzhalde 72, 1300 Esslingen, Fed. Rep. of Germany

Filed Apr. 28, 1988, Ser. No. 187,221

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714388

Int. Cl.⁴ B25J *15/06*; B66C *1/02*

U.S. Cl. 294—64.1 **17 Claims**

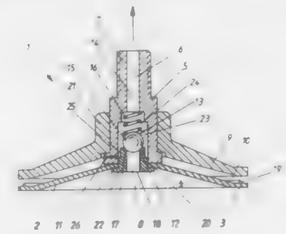
1. A suction holder for handling workpieces comprising:

a suction plate of flexible material to be placed in engagement with a workpiece so as to delimit a suction chamber between said suction plate and the workpiece;

a connector being connectable to a vacuum line, said connector extending from a center part of said suction plate away from the workpiece, said connector having a duct therein opening into the suction chamber providing a connection between said suction chamber and the vacuum line;

a cover plate being arranged on said connector between said suction plate and the vacuum line, said cover plate and said suction plate being disposed to provide a clearance therebetween defining a circumferential annular gap being open radially to the outside, said suction plate being deformed when the suction holder is placed on the workpiece thereby closing said circumferential annular gap;

a normally closed check valve arranged in said connector duct preventing flow toward said suction chamber and



permitting flow out of said suction chamber, an orifice part extending between said check valve and said suction chamber;

said circumferential annular gap and said connector duct being connected by a first connecting duct, said suction chamber and said connector duct being connected by a second connecting duct, each of said first and said second connecting ducts having a connecting duct cross section, said orifice part having an orifice part cross section, each of said connecting duct cross sections being smaller than said orifice part cross section so that when one of said suction chamber and said annular gap are not sealed to prevent communication with outside air, air is drawn in via one of said first and said second connecting ducts, and when said suction chamber and said annular gap are sealed off from the outside air said check valve opens to cause the suction holder to be drawn against the workpiece.

4,858,977

SELF-ATTACHING LINKING DEVICE

Glen E. Mitchell, 6925-B South 151 W. Ave., Sapulpa, Okla. 74066

Filed Jan. 21, 1988, Ser. No. 146,410

Int. Cl.⁴ F16G *15/04*; B66C *1/34*

U.S. Cl. 294—82.1 **26 Claims**

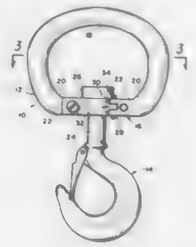
1. A self-attaching linking device, comprising:

a loop member having a first end and a second end, the loop member being oriented in a first plane,

a base member having a first end and a second end, each end joining an end of the loop member,

the base member having a central opening adapted to receive and hold rotatably a cooperating securing device,

the central opening axially aligned and disposed parallel to the first plane, and



the base member including means operable in a second plane for closing the linking device securably and easily releasably.

4,858,978

COUPLING ARRANGEMENT FOR CHANGING COMPONENTS ON THE BLOCK OF A HOIST

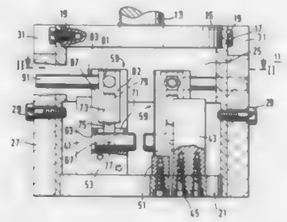
Günter Schröder, Minden, and Günther Dudek, Visselhövede, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Feb. 10, 1988, Ser. No. 154,636

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1987, 3703994

Int. Cl.[4] B66C *1/00*

U.S. Cl. 294—82.35 19 Claims



1. A coupling arrangement for exchanging components on a block of a hoist movable in the vertical direction, the coupling arrangement comprising:

an upper part defining a longitudinal axis extending in said vertical direction and being connected to the block so as to be rotatable about and movable along said axis;

said upper part including an annular body having a base wall disposed in a plane transverse to said axis, said annular body and said base wall conjointly defining a housing having an enclosed space;

a lower part including: a head mounted on said component and defining a longitudinal axis; two supporting pins extending from said head in a plane transverse to said longitudinal axis of said head;

said base wall having slot means formed therein which is dimensioned to permit said head and said pins to pass therethrough and into said enclosed space of said housing when said upper part is lowered over said head; and,

latching means disposed in said housing at a predetermined angular spacing from said slot means for receiving and latching said supporting pins when said upper part is rotated about said longitudinal axis of said upper part after the latter has been lowered over said head in the direction of said longitudinal axis of said upper part.

4,858,979

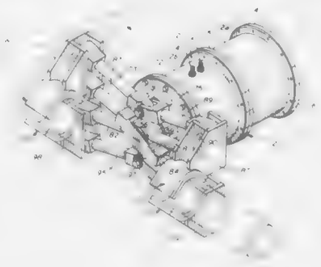
GRIPPING DEVICE

George F. Parma, Stanford, Calif., assignor to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 19, 1988, Ser. No. 221,388

Int. Cl.[4] B25J *15/00*

U.S. Cl. 294—106 19 Claims



11. A gripping device having relatively large moment-carrying capability which is particularly adapted for use as an end effector of a robotic arm, said gripping device comprising:

two spaced pairs of parallel jaw type gripping members, each said gripping member being provided with a gripping surface;

means for controlling movement of the gripping members of each said pair between a fully open position and a closed position, said controlling means comprising a pair of coaxially arranged inner and outer output drive shafts, each of which is provided with a pair of arms extending in opposed generally radial directions of its drive shaft axis with each said arm having a different one of said gripping members attached thereto with said gripping members being equidistant from the common axis of said output drive shafts, and a drive means for simultaneously and controllably driving said output drive shafts in counter-rotating directions; and

means for maintaining the gripping surfaces of the gripping members in parallel orientation and in equidistant relationship from an axis of symmetry extending between the gripping members of each said pair throughout their range of movement, said gripping device being provided with large moment-carrying capability for grasping elongate workpieces at relatively widely spaced regions of contact.

4,858,980

ARTICLE GRIPPER

Robert C. Dreisig, West Chester, and David I. McDonald, Cincinnati, both of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Aug. 23, 1988, Ser. No. 235,255

Int. Cl.[4] B25B *5/08*

U.S. Cl. 294—99.1 27 Claims

1. An article gripper, comprising:

a body, including means for mounting said body to a gripper carrier;

first and second jaws on said body, oppositely disposed about a reference axis, said first jaw being deflectable from said axis;

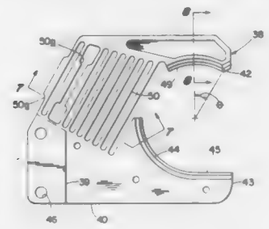
reed spring means for mounting said first jaw to said body, including a plurality of parallel reed springs joined for common action, said reed springs having a relatively low spring constant and being shiftable in a lateral direction, while having a relatively high spring constant in a longitudinal direction, parallel to said reed springs;

an opening between said jaws for insertion and removal of an article as said jaws and article are relatively moved along said axis;

first cam means on the first jaw for contacting an article being inserted into said gripper;

second cam means on the first jaw for contacting an article being removed from said gripper;

a first line of action defined through the first cam means in a direction transverse to said reed springs, said first line of action receiving an insertion force component as an insertion force is applied to an article along said reference axis;



a second line of action defined through the second cam means in a direction approximately parallel to said reed springs, said second line of action receiving a removal force component as a removal force is applied to an article along said reference axis;

whereby said insertion force component and said removal force component will deflect said first jaw from said reference axis and wherein the ratio of the removal force to the insertion force is greater than one.

4,858,981

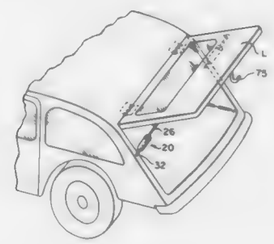
VEHICLE LOADING ATTACHMENT

Herman D. Post, 7 Chester Dr., Great Neck, N.Y. 11021

Filed Jun. 20, 1988, Ser. No. 208,765

Int. Cl.[4] B62D *25/10*

U.S. Cl. 296—76 19 Claims



1. A vehicle loading attachment for vehicles having a hinged closure lid overlying an opening of a storage area in the vehicle, said attachment comprising a piston-cylinder assembly having opposed ends and a piston rod extensible from one end; a pivot connection at each end of said piston-cylinder assembly, one pivot connection couplable to the vehicle body adjacent the opening to the storage area, the other pivot connection couplable to the closure lid; distending means for extending the piston rod of said piston-cylinder assembly from the cylinder of said piston-cylinder assembly; load engaging means secured to the closure lid; and control means for selectively actuating said distending means to control piston rod extension to selectively raise said lid, whereby a load engaged by said load engaging means may be selectively lifted by the closure lid.

4,858,982

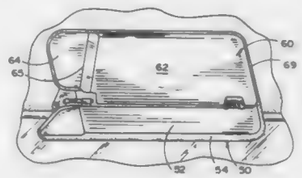
VISOR

Ronald A. Dykstra, and William J. Fluharty, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Filed Feb. 25, 1988, Ser. No. 160,133

Int. Cl.[4] B60J *3/02*

U.S. Cl. 296—97.5 28 Claims



1. A visor for use in a vehicle comprising:

a body defined by a plurality of generally planer nested sections which are movable with respect to one another for movement between adjacent nested positions to define a single visor and spaced-apart positions to define multiple visor panels wherein at least one of said panels has a concave surface facing a second one of said panels such that said one and second panels nest together; and

means for mounting said visor to a vehicle for movement of said visor and sections thereof.

4,858,983

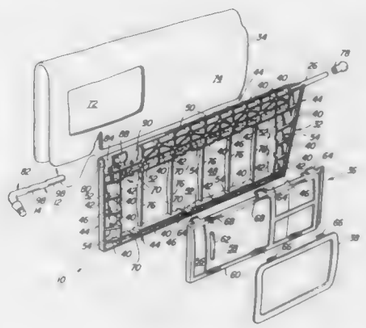
SUN VISOR FRAME AND MOUNTING STRUCTURE

Jay E. White, 2937 Strawberry, and Jay R. White, 4388 Lehigh Dr., both of Troy, Mich. 48098

Filed Apr. 4, 1988, Ser. No. 177,055

Int. Cl.[4] B60J *3/00*

U.S. Cl. 296—97.13 23 Claims



1. A frame and mounting structure for a motor vehicle sun visor comprising:

a molded plastic frame having longitudinally and transversely extending interconnected ribs defining a reinforced lattice work frame;

a fixed mounting post extending from one corner of said frame parallel to the longitudinal ribs;

a mounting socket in a second corner of said frame in line with said mounting post, said mounting socket being formed by integrally molding with the frame at least two spaced apart fingers having generally semicircular contact portions facing in the same direction and at least one intermediate finger positioned between said two spaced apart fingers having a semicircular contact portion facing in an opposite direction, said semicircular portions having flattened first detent portions;

an L-shaped swing and pivot rod with a longer leg extending into said socket and having cooperating first detent means which engage said flattened first detent portions of said fingers to hold said frame in a storage position on said rod, and said longer leg having a round portion which engages said first detent portions of said fingers when said frame is in a use position permitting the frame to be swung from said storage position to said use position on said rod; and

a vehicle mounting bracket receiving a shorter leg of said swing and pivot rod, said mounting bracket and said shorter leg of said rod having second detent means to confine said rod for pivoting rotation relative to said bracket between windshield and side window use positions but preventing removal of said rod from said bracket without removal of said bracket from the vehicle.

4,858,984

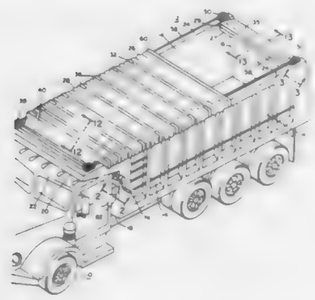
SLIDABLE TRUCK COVER ASSEMBLY

Robert C. Weaver, Port Matilda, Pa., assignor to Robert C. Weaver, Port Matilda; Robert Semlon, State College; John H. Imbt, State College and Marlin K. Gingrich, State College, all of, Pa.

Continuation-in-part of Ser. No. 888,001, Jul. 22, 1986, Pat. No. 4,725,090. This application Dec. 30, 1987, Ser. No. 139,444

Int. Cl.[4] B60P *7/04*

U.S. Cl. 296—100 **12 Claims**



1. A slidable truck cover assembly for covering the open bed of a truck having side, front and rear walls, comprising

front pulleys mounted to the front portion of the truck bed,

an axle connecting the front pulleys,

rear pulleys mounted to the rear portion of the truck bed,

cables extending between the front pulleys and the rear pulleys in looping relationship,

a plurality of slats extending between said cables and attached thereto in a slipping relationship,

cable connecting means for connecting the cables to a slat,

a tarpaulin attached to the slats,

the tarpaulin having side portions that extend over the side walls of the truck,

side holding means for holding the tarpaulin side portions close to the side walls of the truck and for minimizing the space between the tarpaulin side portions and the side walls of the truck to limit the passage of air into or from the truck bed via the space between the tarpaulin side portions and the side walls of the truck while permitting the tarpaulin to be extended and retracted freely over the truck bed,

the side holding means including a lateral tarpaulin support mounted on the end of each slat over the tarpaulin and extending downwardly over and adjacent to the side walls of the truck for holding the side portions of the tarpaulin close to the side walls of the truck,

front enclosure means for enclosing the front of the truck bed,

rear enclosure means for enclosing the rear of the truck bed, and

bi-directional rotating means for rotating the axle.

4,858,985

VEHICLE COVER PROTECTOR—"VCP"

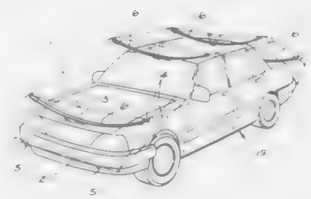
Leszek Wojcik, 9/20 Crown Street, Granville, New South Wales, Australia

Filed Apr. 8, 1988, Ser. No. 179,500

Claims priority, application Australia, Apr. 8, 1987, PI1325

Int. Cl.[4] B60J *11/00*

U.S. Cl. 296—136 **10 Claims**



1. A vehicle cover protector comprising: a cover adapted to be positioned over a vehicle; retractable roller means including a roller connected to said cover for storing said cover, said retractable roller means being connected to at least one end of the vehicle, with said cover being wound about said roller; and, cover supporting means with at least one supporting member adapted to support said cover when said cover is positioned above the surface of the vehicle, at least two retaining portions attached to said cover and spaced apart from each other a distance smaller than the length of said supporting member, said supporting member having ends insertable into said retaining portions so as to urge said supporting member into an arcuate shape, said vehicle engagement portion being positionable between said supporting member ends.

4,858,986

AUTOMOBILE-MOUNTED CAMPER

William N. Whitley, 19315 Shaker Blvd., and James M. Whitley, 2963 Morley, both of Shaker Heights, Ohio 44122

Continuation of Ser. No. 898,816, Aug. 18, 1986, abandoned, which is a continuation of Ser. No. 629,077, Jul. 9, 1984, abandoned. This application Feb. 17, 1987, Ser. No. 16,523

Int. Cl.[4] B60P *3/34*

U.S. Cl. 296—165 **10 Claims**



1. A camper adapted to be supported atop an automobile and capable of being collapsed from an extended configuration to a thin, compact configuration for travel or storage, comprising:

a generally planar floor;

means for connecting the floor to the automobile;

an enclosure connected to and supported atop the floor, the enclosure including:

rectangular first, second, and top wall portions which, together with the floor, define a quadrilateral when viewed from the side;

the side wall portions including a plurality of panels, three of the panels being hingedly connected to an adjacent panel and to an adjacent one of the first, second, and top wall portions;

a releasable, diagonal connection between adjacent side wall panels, the connection extending from one corner of the quaidrilateral to a diametrically opposite corner of the quadrilateral, the releasable connection, when released, permitting the panels to fold inwardly and the first, second, and top wall portions to be folded with respect to each other into a collapsed position;

first and second sections from which the enclosure is assembled, even section being of unitary construction, the first section including the first wall portion, the top wall portion, and front and upper side wall sections, and the second section including the second wall portion and rear and lower side wall sections; and

a canopy pivotally connected to the enclosure at a location adjacent the intersection of the first wall portion and the top wall portion, the canopy being disposed on an outer side of the first wall, the canopy including depending flanges which enclose the remainder of the enclosure when the enclosure is in a collapsed position.

4,858,987

VEHICLE STRUCTURE INCLUDING A BRACKET STRUCTURE ASSEMBLY FOR MOUNTING A LOOSE UPPER DECK PANEL ONTO A VEHICLE BODY

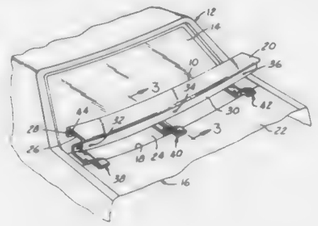
Edward J. Gorski, Warren, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed May 9, 1988, Ser. No. 192,071

The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.

Int. Cl.[4] B62D *25/08, 27/00*

U.S. Cl. 296—195 **5 Claims**



1. Vehicle structure including a bracket assembly for mounting a loose upper deck panel onto a vehicle body, the vehicle body including a rear window and a deck lid spaced rearwardly therefrom, the loose upper deck panel being mounted between the rear window and the forward edge of the deck lid, the vehicle including a support shelf positioned between the rear window and the forward edge of the deck lid, the loose upper deck panel being generally U-shaped and including an upper wall for extending transversely of the vehicle with forward and rearward walls extending downwardly therefrom, the loose upper deck panel being mounted on the vehicle with the upper surface of the upper wall thereof being in alignment with the upper surface of the deck lid, the bracket being generally U-shaped and including a bottom wall for extending longitudinally on said support shelf of the vehicle with forward and rearward bracket walls extending upwardly therefrom, the forward bracket wall having a protuberance on the rearward surface thereof, the forward wall of the loose upper deck panel having opening means therein, said protuberance extending through said opening means to secure said forward wall in the desired vertical location, the rearward bracket wall having opening means therein, the rearward wall of the loose upper deck panel having opening means therein mating with the last mentioned opening means, fastening means extending through said mating opening means to secure the rearward wall of the loose upper deck panel to the rearward bracket wall in the desired vertical location, a spacer element extending rearwardly from the upper end of the rearward bracket wall, the spacer element having a generally vertical location surface for contact with the forward edge of the deck lid to locate the bracket a predetermined distance forwardly of the forward edge of the deck lid, the spacer element having a generally horizontal locator surface for contact with the upper surface of the deck lid to locate the bracket at a predetermined vertical orientation with respect to the upper surface of the deck lid, shim structure for postionment between the bracket bottom wall and the support shelf to maintain said vertical orientation, and fastening means securing the bracket bottom wall to the support shelf, the spacer element being joined to the rearward bracket wall by a frangible joint whereby the spacer element may be easily broken away from the rearward bracket wall after the bracket has been located and fastened in place on the support shelf.

4,858,988

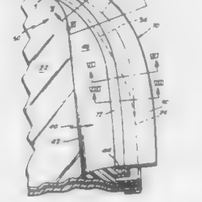
VEHICULAR WINDOW ASSEMBLY

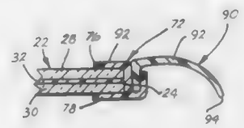
Cleon C. Morgan, and Keith A. Nieboer, both of Holland, Mich., assignors to Donnelly Corporation, Holland, Mich.

Filed Apr. 19, 1988, Ser. No. 183,696

Int. Cl.[4] B60J *1/02*

U.S. Cl. 296—201 **37 Claims**





1. A vehicular window assembly for installation in a vehicle comprising:

a sheet-like window panel having a peripheral edge;

a casing, including an outer surface, molded from resinous plastic material on a first portion of said peripheral edge of said window panel; and

trim means for covering and finishing at least portions of the periphery of the assembly including a second portion of said peripheral edge of said window panel;

said casing including mounting means for mounting said trim means therealong;

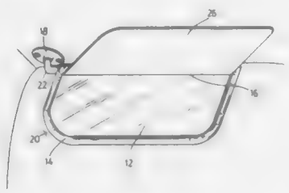
said casing and trim means including transition means for extending said trim means in one piece without interruption from said second portion of said peripheral window panel edge where said trim means encapsulates said window panel edge to said mounting means on said casing where said trim means is spaced from said window panel, said casing and trim means adapted to fill spaces between said window panel and the body of the vehicle in which said window assembly is mounted thereby wind noise is reduced when the vehicle is in motion and weather sealing is improved.

4,858,989

REPLACEMENT SUN VISORS FOR AUTOMOBILES

Henry Bruckstein, Toronto, Canada, assignor to Dopler Industries Inc., Toronto, Canada

Filed Aug. 1, 1988, Ser. No. 226,833
Int. Cl.[4] B60J *3/00*
U.S. Cl. 296—97.2 **4 Claims**



1. A vehicle sun visor comprising an open frame of a general size and shape of a vehicle sun visor, a transparent sheet of anti-glare material mounted in the open frame, the frame being pivotable into a variety of operative positions;

an opaque flap hingably connected on a rear surface of said frame and co-extensive with said transparent sheet to be movable between a closed position covering said sheet and an open position allowing view through said sheet; and

means to releasably hold said flap in said open position.

4,858,990

SUN VISOR FOR INFANT CAR SEATS

Kimberly Combe-Rose, and Carl Rose, both of Rt. #5, Box 523, Berea, Ky. 40403

Filed Jun. 24, 1988, Ser. No. 210,800
Int. Cl.[4] A47C *7/62*
U.S. Cl. 297—184 **9 Claims**

1. A new and improved sun visor for attachment to an infant car seat, comprising:

hood means;

mounting arm means;

connecting means securing said mounting arm means to said hood means;

clamp means for securing said mounting arm means to an infant car seat;

said clamp means including two semicylindrical clamp body portions;

a recessed cylindrical socket formed in one of said clamp body portions;

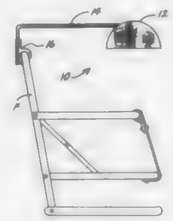
a hexagonal recess formed coaxially within said cylindrical socket;

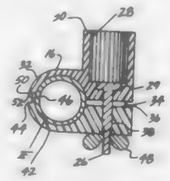
a cylindrical bore extending through each of said clamp body portions in axial alignment;

a hexagonal headed threaded fastener extending between said clamp body portions through said cylindrical bores;

wing nut in threaded engagement with said fastener for securing said clamp body portions around a frame of an infant car seat;

a pair of spaced tabs formed on an upper surface of one of said clamp body portions;





an elongated undercut groove formed in a bottom surface of the other clamp body portion.

4,858,991

CHAIR FOR INFANTS

Eyvind Boyesen, R.D. #2, P.O. Box 246-A, Kempton, Pa. 19529

Continuation of Ser. No. 895,165, Aug. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 761,563, Aug. 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 487,077, Apr. 21, 1983, abandoned. This application Nov. 23, 1987, Ser. No. 129,373
Int. Cl.[4] A47C *3/23*
U.S. Cl. 297—195 **5 Claims**



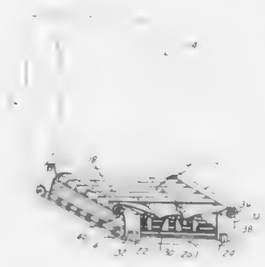
1. A chair for infants, comprising a chair body having a generally upright forwardly inclined rigid post, the chair body having an infant support in the form of a seat connected with said upright post and extended rearwardly from a lower part of said post to engage the crotch of an infant occupant of the chair and provide for seating of the infant under the action of gravity, means for positioning the body of an infant seated on said seat, including first and second pairs of vertically spaced supports, each pair being rigidly connected with said generally upright post in front of the infant occupant and the supports of said pairs being positioned to form rearwardly open cradles located to receive vertically spaced portions of the front of an infant occupant, and each cradle being presented at an angle inclined upwardly and rearwardly from said generally upright post of the chair body and thereby provide for gravitational support of vertically spaced portions of an infant occupant in a forwardly inclined position, the first pair of supports being the uppermost one of said cradles, first connecting means for connecting the first of said cradles with said rigid post at an elevation below the level of the junction of the head and neck of an infant occupant and further having mounting means providing freedom for adjustment of its upward inclination through a range including positions in which the uppermost one of the cradles will engage the region of junction of the head and neck of infant occupants of different sizes, second connecting means for connecting the second of said cradles to the said rigid post at a position spaced lower on the post than the first cradle and further means for positioning the body of an infant seated on said seat further including a pair of positioning parts at an elevation intermediate said first and said second pairs of vertically spaced supports, third connecting means for connecting said positioning parts to the rigid post at a level intermediate the first and second connecting means and encircling the upper portion of the body of an infant occupant in position on the seat of the chair and in a forward inclination independently of the action of gravity.

4,858,992

CONFORMABLE SEAT

Larry LaSota, 15745 North Park, East Detroit, Mich. 48021

Continuation-in-part of Ser. No. 785,202, Oct. 7, 1985. This application Feb. 16, 1988, Ser. No. 156,328
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—284 **24 Claims**



1. A conformable member comprising:

a frame;

first and second tubular members mounted on opposite sides of the frame, the first tubular member being rotatably mounted on the frame;

a plurality of belts disposed retractably mounted on the frame and extending over the upper ends of the first and second tubular members;

means for adjusting the shape of each belt individually to conform the shape of the belt to the shape and position of the body of the user on the conformable member; and

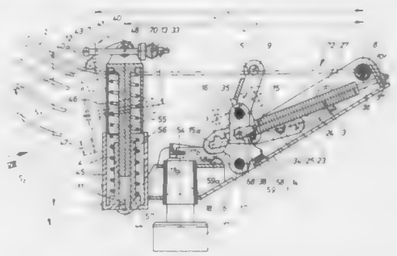
means for sensing the shape and position of the user along successive portions on the conformable member.

4,858,993

WORK CHAIR COMPRISING A SWIVELLING SEAT SHELL

Joachim Steinmann, Meersburg, Fed. Rep. of Germany, assignor to Klober GmbH & Co., Fed. Rep. of Germany

Filed Aug. 22, 1988, Ser. No. 234,595
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1987, 3727784
Int. Cl.[4] A47C *10/32*
U.S. Cl. 297—302 **14 Claims**



1. In a work chair comprising a seat shell having a front edge and a back portion adjacent a back rest, means for pivotably connecting the shell to a height adjustable seat carrier adjacent the front edge to pivot on a swivel axis, first means positioned between the carrier and the seat shell to oppose pivoting of the seat shell on the swivel axis in one direction in response to a person sitting on the seat shell, and means for fixing the seat shell in different angular positions which includes an arrangement of blocking elements, the improvements comprising the first means for opposing the pivotable movement including a toggle arrangement having a first spring element, and a separate second spring element, said toggle arrangement including a first toggle lever pivotably connected at one end to the seat carrier and pivotably connected to a second toggle lever at a point spaced inward of the ends of the second toggle lever, said second toggle lever having one end pivotably connected to a support structure of the seat shell, said first spring element acting between the first toggle lever and the seat carrier to oppose pivoting of the first toggle lever during pivoting of the seat shell in said one direction, said second spring element supporting a base load and being positioned at the end of the seat carrier to act between a portion of the seat shell adjacent the back portion and said carrier, the spring characteristics for the second spring element and the first spring element being selected to form a compound spring motion providing an initially stiff force against pivoting followed by a soft suspension so that initial pivoting from an upper position towards a lower tilted position requires an initially large increase in the amount of force which is followed by a rather small increase in the amount of force.

4,858,994

ADJUSTABLE HEADREST FOR AUTOMOTIVE SEAT

Takashi Yamashita, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Jun. 3, 1988, Ser. No. 201,892
Claims priority, application Japan, Sep. 30, 1987, 62-148096[U]
Int. Cl.[4] A47C *7/36*
U.S. Cl. 297—391 **18 Claims**

1. An adjustable headrest comprising:

a core case in which a tilting mechanism is installed, said core case having a slot formed through its bottom wall;

a stay extending from said tilting mechanism and projecting outwardly through said slot;

a boot structure constructed of an elastomeric material and including a substantially flat base portion and a tubular

portion which is integrally mounted on said base portion, said base portion being attached to said bottom wall of said core case whereby said slot is sealingly covered with said substantially flat base portion, said outwardly projecting part of said stay passing through said tubular portion of said boot structure;



a pad material molded around said core case with the base portion of said boot structure interposed therebetween; and

an outer skin member substantially covering said pad material.

4,858,995

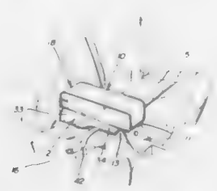
ARM REST FOR MOTOR VEHICLE CONSOLE

Douglas D. Young, 110 N. Sunset Cir., Hopkinsville, Ky. 42240

Filed May 27, 1988, Ser. No. 200,059

Int. Cl.[4] A47C *7/54*

U.S. Cl. 297—411 **2 Claims**



1. In a motor vehicle having a center console including an elongated top surface extending front-to-rear and depending side surfaces between a pair of seats, an arm rest comprising:

(a) an elongated arm rest member comprising a cushion material, an elongated top rest surface, opposed sides, and an elongated bottom support surface having substantially the same contour as the top surface of said center console for seating on and straddling said console,

(b) a pair of elongated wing flap members, each having front and rear portions, top and bottom edge portions, and a widthwise dimension between said top and bottom edge portions,

(c) means securing said top edge portions to corresponding opposite sides of said arm rest members so that said wing flap members freely depend from said corresponding opposite sides when said arm rest member is seated in an operative position upon said center console,

(d) each of said rear portions of said wing flap members having a width greater than the width of each of said front portions, said rear portions depending farther down than said front portions on opposite sides of said arm rest member when said arm rest member is in said operative position on said center console,

(e) each of said rear portions and said front portions in both said wing flap members having a separate independent weight compartment, and

(f) weight means within each of said compartments, said weight means having a front-to-rear weight distribution for holding said arm rest member in said operative position on said center console.

4,858,996

MODULAR SEATING

Leif Blodee, 293 S. Lakeshore Dr., Holland, Mich. 49423

Filed Jun. 9, 1987, Ser. No. 61,102

Int. Cl.[4] A47C *1/12*

U.S. Cl. 297—446 **2 Claims**



1. A laminated furniture construction wherein intersecting first and second members are joined together at a joint by overlapping laminations, the first, member being formed of at least two different alternating lamination layers, one lamination layer extending over the joint in the direction of the first member and the second lamination layer leaving an open space at the joint in the direction of the second member, the second member having mating lamination layers, a first layer that leaves an open space at the joint in the direction of the first member and a second layer that extends through the joint in the direction of the second member, the laminations being glued together to form a rigid interlocking joint with the laminations of both members extending all the way through the joint.

4,858,997

CHILD SAFETY CAR SEAT

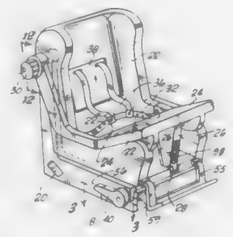
Steven A. Shubin, 5699 Kanan Rd., Agoura Hills, Calif. 91301

Continuation-in-part of Ser. No. 948,327, Dec. 31, 1986, Pat. No. 4,770,468. This application Jul. 22, 1988, Ser. No. 222,807

The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.

Int. Cl.[4] A47D *15/00;* **B60R** *21/00*

U.S. Cl. 297—487 **20 Claims**



1. A child safety car seat assembly comprising:

a child's car seat;

means for securing said seat to the seat of an automobile;

lap belt means for engaging the lap of a child seated in said child's car seat, and for restraining said child in said child's car seat;

shoulder strap means, extending from the back of said child's car seat and secured to said lap belt means, for engaging the shoulders and body of a child;

means for adjusting the height of the point where said shoulder strap means extend from the back of said seat,

whereby the height may be adjusted through a continuous range of heights, said height adjusting means includes a movable panel at the rear of said seat through which said shoulder strap means extend;

means for vertically adjusting said panel and for locking said panel in a vertically adjusted position;

a rack on the back of said panel;

a gear attached to a shaft, said gear meshing with said rack;

handle means for adjusting height of said panel, said shaft being splined to said handle means; and

said handle means having a locking position and an adjusting means for biasing said handle to said locking position.

4,858,998

WHEEL SUPPORTING ASSEMBLY

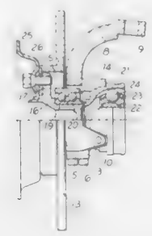
Hans-Heinrich Welschof, Rodenbach, and Rudolf Beier, Offenbach, both of Fed. Rep. of Germany, assignors to Lohr & Bromkamp GmbH, Offenbach/Main, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 142,506

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1987, 3700564

Int. Cl.[4] B60B *27/02*

U.S. Cl. 301—124 R **21 Claims**



1. A wheel supporting assembly, comprising a wheel carrier member having bearing receiving means and means for attachment to at least one suspension component;

and a non-non-disassembleable unit secured thereto comprising a wheel hub member, connected for torque transmission to a universal joint member and provided with a flange for wheel attachment, and bearing means supporting the hub member and universal joint relative to a bearing housing for rotation about an axis, the bearing being arranged on the wheel hub member axially between the universal joint member and the wheel flange, wherein said unit is received in said bearing receiving means in the wheel carrier member so as to be open in a direction transversely of said axis, said bearing receiving means being of non-undercut configuration, the bearing housing being held to the wheel carrier member by fixing elements spaced from one another by a maximum radial distance greater than an outer diameter of the bearing means, the outer diameter of the bearing means being smaller than that of an outer part of the universal joint member.

4,858,999

PRESSURE CONTROL UNIT WITH LOCKING DEVICE FOR DUAL CIRCUIT BRAKE SYSTEMS

Juergen Schonlau, Walluf; Peter Volz, Darmstadt, and Ralf Harth, Oberursel, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

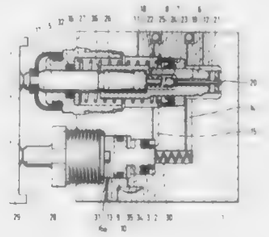
Filed Apr. 8, 1987, Ser. No. 36,448

Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614797

Int. Cl.[4] B60T *13/00, 8/18*

U.S. Cl. 303—9.63 **1 Claim**

1. A pressure control unit for use with dual-circuit brake systems, said unit comprising a housing including a first bore having a first inlet and an outlet for connecting the unit to a first brake circuit, a regulating device in said first bore for maintaining a predetermined pressure relationship between the first inlet and the outlet, a by-pass allowing fluid to flow from said first inlet to said outlet and bypassing said regulatory device, a second bore parallel to the first bore and having a second inlet for connecting the unit to a second brake circuit, said second bore being of stepped design, a locking piston in said second bore, said locking piston being moveable in response to fluid pressure sensed at said second inlet for closing said by-pass, said locking piston being moveable in response to fluid presure sensed at said first inlet to open said by-pass, and spring means for opening said by-pass if there is no pressure in said second inlet, said locking piston being also of stepped design with two faces, a first face which is larger than a second face, said first face being in contact with fluid pressure from said second inlet and said second face being in contact with fluid pressure from said first inlet.



4,859,000

ADAPTIVE AIR BRAKE CONTROL SYSTEM

Milton C. Deno, Satellite Beach; Eugene A. Smith, Jr., Palm Bay, and Dale H. Delaruelle, Melbourne, all of Fla., assignors to Harris Corp., Melbourne, Fla.

Filed Aug. 15, 1988, Ser. No. 232,466

Int. Cl.[4] B60T *15/22*

U.S. Cl. 303—33 **24 Claims**



1. For use with the brake system of a railway train having a locomotive which contains an equalizing reservoir and a brake pipe coupled in fluid communication therewith through a brake pipe control valve, said brake pipe control valve being coupled to a source of braking control fluid through which said brake pipe is controllably charged, and one or more cars each of which contains a brake pressure reference reservoir and a train fluid line coupled in fluid communication therewith through a brake mechanism control valve, said fluid line and said brake pipe being in fluid communication with one another, so that said fluid line may be controllably charged through said brake pipe control valve, in accordance with the control of the fluid pressure within said equalizing reservoir, a method of

controlling the pressure in said equalizing reservoir, and thereby the pressure in said fluid line through which said brake control mechanism is controlled, in response to a request for a reduction in the pressure in said equalizing reservoir, comprising the steps of:

(a) monitoring a change in pressure in said brake pipe;

(b) in response to the pressure within said brake pipe undergoing a change less than a preselected value, storing the value of the pressure within said equalizing reservoir; and

(c) causing the pressure in said equalizing reservoir to be changed by an amount corresponding to said requested reduction modified by the difference between a preestablished equalizing reservoir pressure and said stored equalizing reservoir pressure, whereby the pressure in said fluid line is caused to be reduced by an amount corresponding to said requested reduction.

4,859,001

ISOLATION VALVE BYPASS FOR MASTER CYLINDER BRAKE FLUID IN WHEEL LOCK CONTROL SYSTEM

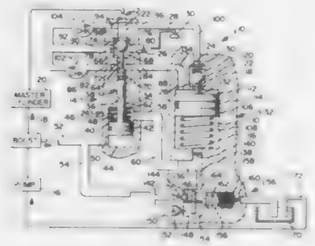
Donald L. Parker, Middletown; David F. Reuter, Beavercreek, both of Ohio, and Patrick Roussel, Blanc Mesnil, France, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 28, 1987, Ser. No. 138,168

The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.

Int. Cl.[4] B60T *8/88, 8/42*

U.S. Cl. 303—92 **3 Claims**



1. In a vehicle wheel braking system comprising a service braking section and a wheel lock control section, said system having a wheel brake operable in a service braking mode by brake actuating pressure from a master cylinder and operable in a wheel lock control mode by a controlled pressure so as to prevent excessive wheel slip and wheel lock, and an isolation valve actuatable to isolate the wheel brake from the master cylinder when the system is operating in the wheel lock control mode, the improvement comprising:

means sensing premature check-off, in which the isolation valve has been actuated to block master cylinder brake actuating pressure from the wheel brake but cannot be de-actuated to re-establish connection of the master cylinder brake actuating pressure to the wheel brake, because of air trapped in a portion of the wheel lock control section of the system;

and means including a passageway connecting the brake actuating pressure from the master cylinder through the actuated isolation valve, said passageway having a normally closed check valve therein normally preventing said connection;

and check valve opening means responsive to said premature check-off sensing means so that, when premature check-off is sensed thereby, said check valve is opened and master cylinder brake actuating pressure which had been isolated from said wheel brake is then delivered to the wheel brake and the wheel brake is actuated by that pressure independently of the operational mode of the wheel lock control section of the system.

4,859,002

ANTISKID BRAKE CONTROL DEVICE

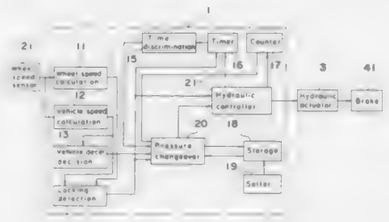
Masato Yoshino, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 6, 1988, Ser. No. 216,182

Claims priority, application Japan, Jul. 9, 1987, 62-173489

Int. Cl.[4] B60T *8/60*

U.S. Cl. 303—103 **4 Claims**



1. An antiskid brake control device for use in a motor vehicle or the like, which reduces a hydraulic braking pressure when wheels of the motor vehicle are in a state towards locking and increases the hydraulic braking pressure when the wheels have recovered from locking, comprising:

a hydraulic control means which repeatedly performs changeover from increase of the hydraulic braking pressure to holding of the hydraulic braking pressure during the increase of the hydraulic braking pressure by interrupting the increase of the hydraulic braking pressure temporarily;

a timer means which measures time periods for maintaining states of reducing, increasing and holding the hydraulic braking pressure, respectively;

a counter means which is reset upon completion of reduction of the hydraulic braking pressure and counts the number of changeover from the increase of the hydraulic braking pressure to the holding of the hydraulic braking pressure and the number of changeover from the holding of the hydraulic braking pressure to the increase of the hydraulic braking pressure;

a calculating means for calculating a speed of a vehicle body of the motor vehicle;

a decision means which discriminates an average deceleration of the vehicle body into finite steps;

the average deceleration being obtained as a change of the speed of the vehicle body, which change is observed during a sufficiently long time after start of antiskid operation;

a discrimination means which discriminates into finite steps, the time period for maintaining the state of reducing the hydraulic braking pressure, with the time period being measured by said timer means;

a storage means in which the time periods for maintaining the states of increasing and holding the hydraulic braking pressure are set and stored so as to correspond to each of combinations of finite outputs of said discrimination means and finite outputs of said decision means, respectively; and

a changeover means which, at the time when the wheels have recovered from locking, performs changeover between the increase of the hydraulic braking pressure and the holding of the hydraulic braking pressure in accordance with the time periods for maintaining the states of increasing and holding the hydraulic braking pressure, which time periods are stored in said storage means and correspond to a combination of outputs yielded at said time by said discrimination means and said decision means, respectively.

4,859,003

METHOD AND DEVICE FOR THE CONTROL OF THE BRAKING EFFECT OF A BRAKE-SLIP-CONTROLLED BRAKE SYSTEM

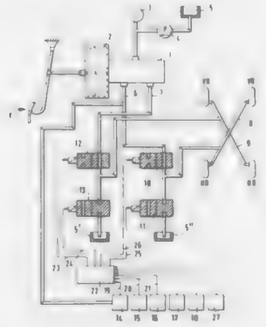
Fritz Ostwald, Dreieich, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 7, 1984, Ser. No. 638,384

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330482

Int. Cl.[4] B60T *8/64, 8/74*

U.S. Cl. 303—111 **4 Claims**



1. A brake-slip-controlled brake system for an automotive vehicle having front and rear wheels each having wheel brake cylinders, said system comprising, in combination:

a petal-actuated master cylinder;

an auxiliary energy source connected to said master cylinder for increasing the pressure in said master cylinder in response to brake actuation;

a first brake pressure fluid circuit connecting said master cylinder to one front wheel brake cylinder and to one rear wheel brake cylinder;

a second brake pressure fluid circuit connecting said master cylinder to the other front wheel brake cylinder and to the other rear wheel brake cylinder;

first and second normally open control valves respectively connected in said first and second brake pressure circuits and said control valves being responsive to control signals to close said control valves;

first and second normally closed control valves respectively connected between a fluid supply reservoir and said first and second brake pressure circuits, said normally closed control valves being responsive to control signals to open said normally closed control valves;

a first sensor coupled to said master cylinder for providing electrical signals indicative of braking pressure;

a second sensor coupled to said vehicle for providing electrical signals indicative of translational deceleration of said vehicle;

a third sensor coupled to at least one vehicle axle for providing electrical signals indicative of axle load;

means coupled to said sensors and said normally open and normally closed control valves for providing output control signals when said electrical signals indicate an imminent wheel locked condition to periodically open and close said valves in accordance with a predetermined pulse repetition frequency when said electrical signals indicate an imminent wheel locked condition.

4,859,004

HYDRAULIC BRAKING SYSTEM FOR AN AUTOMOTIVE VEHICLE

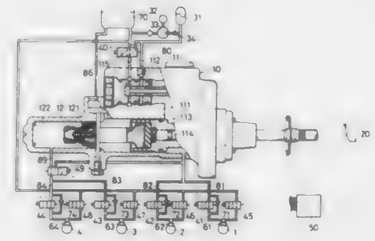
Michiharu Nishii, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 29, 1988, Ser. No. 174,859

Claims priority, application Japan, Mar. 31, 1987, 62-80179

Int. Cl.[4] B60F *8/02*

U.S. Cl. 303—119 **8 Claims**



1. A hydraulic braking system for an automotive vehicle comprising:

a power source for producing a hydraulic power pressure;

a reservoir for storing an amount of hydraulic fluid;

a hydraulic braking pressure generator having a housing defining therein a power chamber communicated with said power source through a power passage and communicated with said reservoir through a drain passage, said hydraulic braking pressure generator being arranged to control the communication of said power chamber with said power source and said reservoir in response to depression of a brake pedal to generate a hydraulic pressure in said power chamber, said power chamber normally communicating with said reservoir through said drain passage when said brake pedal is in an initial position thereof, said hydraulic braking pressure generator includes a regulator valve disposed within said power chamber and connected to said power passage and said drain passage, said regulator valve being arranged to control the communication of said power chamber with said power passage and said drain passage in response to depression of said brake pedal to regulate said hydraulic power pressure supplied from said power source and generate a regulated hydraulic pressure in said power chamber, said power chamber normally communicating with said drain passage when said brake pedal is an initial position thereof, said hydraulic braking pressure generator further including a master piston defining a fluid chamber in said housing and a power piston associated with said master piston, said power piston being applied with the hydraulic pressure in said power chamber, and said wheel brake cylinders are divided into a first group of wheel brake cylinders communicated with said fluid chamber and a second group of wheel brake cylinders communicated with said power chamber;

a changeover valve selectively placed in one of a first operating position for communicating said power chamber with said reservoir through said drain passage, and a second operating position for communicating said power chamber with said power source through said drain passage and blocking the communication between said power chamber and said reservoir;

a plurality of wheel brake cylinders for braking respective road wheels, said wheel brake cylinders being connected to said hydraulic braking pressure generator to be applied with a hydraulic pressure corresponding to the hydraulic pressure generated in said power chamber and said wheel brake cylinders being connected to said reservoir;

an auxiliary changeover valve is positioned in a fluid passage

connecting said fluid chamber and said first group of wheel brake cylinders, said auxiliary changeover valve normally communicates said fluid chamber with said first group of wheel brake cylinders, and said auxiliary changeover valve blocks the communication therebetween and communicates said power chamber with said first group of wheel brake cylinders when said auxiliary changeover valve is operated, wherein said auxiliary changeover valve further includes a three port-two position solenoid operated directional control valve having a first auxiliary port connected to said fluid chamber, a second auxiliary port connected to said first group of wheel brake cylinders and a third auxiliary port connected to said power chamber, said first auxiliary port and said second auxiliary port are normally communicated therebetween and said third auxiliary port is normally closed, said second auxiliary port and said third auxiliary port are communicated therebetween and said first auxiliary port is closed when said auxiliary changeover valve is energized; and

valve means for controlling the communication between said hydraulic braking pressure generator and said wheel brake cylinders, and the communication between said reservoir and said wheel brake cylinders.

4,859,006

THREE-PORT FLUID VALVE

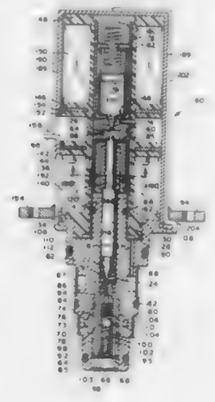
Pierre J. Rey, Saint Laurent du Var, and Maurice DeRaco, Grasse, both of, assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 72,321, Jul. 13, 1987, abandoned. This application Jul. 15, 1988, Ser. No. 219,945

Claims priority, application United Kingdom, Jul. 26, 1986, 8618361

Int. Cl.[4] B60T *8/36, 13/68, 15/02*

U.S. Cl. 303—119 17 Claims



1. A valve assembly for use in a vehicle anti-lock braking system (ABS) comprising:

(a) a valve body having aligned portions of differing cross-sections adapted for connecting in a multi-ported common recess in a receptacle and having,

(i) a first cross-section having an inlet port formed therein in a direction transverse to the direction of insertion into said recess,

(ii) a second cross-section having a dump port provided therein in a direction transverse to the direction of insertion into said recess, said dump port being spaced from said inlet port,

(iii) a sigal or service port disposed in said portions in a direction common with said direction of insertion;

(b) means defining a fluid pressure tight valving chamber;

(c) a first normally open electrically actuated valve means disposed for controlling flow between said inlet port and said valving chamber and operative upon electrical actuation to isolate said chamber from said inlet port;

(d) a second normally closed electrically actuated valve means disposed for controlling flow between said valving chamber and said dump port and operative upon electrical actuation to enable fluid flow from said chamber to said dump port; and,

(e) means defining a continuously open passage between said valving chamber and said service port.

4,859,006

HYDROPNEUMATIC JACK

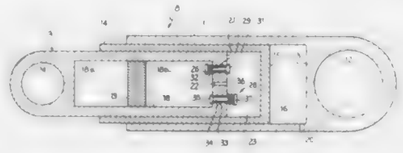
Joseph Philippe, Carpentras, and Jean-Michel Perrochat, Montrouge, both of France, assignors to S.A.M.M. - Societe d'Applications des Machines Motrices, Bievres, France

Filed Jun. 30, 1988, Ser. No. 213,563

Claims priority, application France, Jul. 3, 1987, 87 09497

Int. Cl.[4] B62D *55/30*

U.S. Cl. 305—10 5 Claims



1. A hydropneumatic jack for articulated tracked vehicles, said device comprising a tubular body having a closed transverse end and an open end opposite the closed end, a hollow rod which is slidably mounted in the body in a sealed manner and defines a first chamber containing a freely slidable piston which divides the chamber into two compartments which are sealed off from each other, the hollow rod having a transverse end wall, a second chamber being defined between the transverse end wall of the hollow rod and the closed transverse end of the body, said transverse end wall being provided with a nozzle which puts the second chamber in communication with a neighbouring compartment of said two compartments of the hollow rod, a hydraulic liquid under pressure filling said neighbouring compartment and said second chamber, and a pressurized gas filling a second compartment of said two compartments, said jack further comprising a tubular case having a closed end wall and being pen at an opposite end of the case, the body being slidable in the case in a sealed manner, a third chamber being defined between the closed end wall of the case and the transverse end of the body, and grease filling the third chamber.

4,859,007

INTERLOCKING DISK STORAGE WITH SLIDING-DISPERSED ACCESS

Richard L. Schapker, 134 Farnum St., North Andover, Mass. 01845

Continuation-in-part of Ser. No. 752,925, Jul. 8, 1985, abandoned. This application Jul. 31, 1986, Ser. No. 891,161

Int. Cl.[4] A47B *81/06*

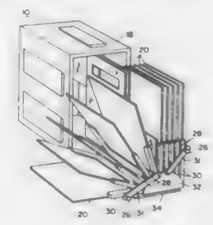
U.S. Cl. 312—12 29 Claims

1. Storage apparatus for flat disk-like objects wherein the disk-like objects may all be dispersed simultaneously for viewing and open selection, and wherein the storage apparatus comprises:

a narrow upright box structure open on one long upright side of the box structure;

slidably positioned within the box structure, a slidable member which supports a number of envelope-like holders, wherein the slidable member slides into and out of the box structure while slidably attached to the box structure thereby moving the envelope-like holders completely out of the box structure;

movably attached to the slidable member by attaching means a number of envelope-like holders for disk-like objects positioned side by side, wherein each envelope-like holder may contain a disk-like object; and



a means for simultaneous dispersement positioned between each adjacent pair of envelope-like holders for dispersing the disk-like objects all simultaneously in a spaced separated array for viewing and equal access to each disk-like object;

and wherein the means for simultaneous dispersement comprises interconnecting tabular means between adjacent envelope-like holders.

4,859,008

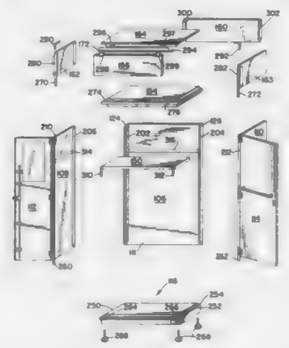
KNOCK-DOWN WARDROBE CABINET

Clarence W. Eyre, Rte. 1, Box 374, Dry Prong, La. 71423, and William E. Stevens, 8409, Fairway, Pineville, La. 71360

Continuation-in-part of Ser. No. 916,723, Oct. 8, 1986, abandoned, which is a continuation-in-part of Ser. No. 817,160, Jan. 8, 1986, abandoned, which is a continuation-in-part of Ser. No. 618,950, Jun. 8, 1984, abandoned. This application Sep. 3, 1987, Ser. No. 92,593

Int. Cl.[4] A47B *43/00*

U.S. Cl. 312—257.1 4 Claims



1. A knock-down wardrobe cabinet comprising:

a back panel;

two side panels;

a base member;

a top member;

a shelf member;

a first front frame member and a second front frame member;

a first back frame member and a second back frame member;

said base having a channel along the back edge thereof which is dimensioned to receive the lower portion of said back panel and a channel along each side thereof, each side channel of said base receiving the lower edge portion of one of the said side panels;

said top member having two side channels, and a back channel, each of said side channels receiving the upper edge portion of one of the side panels, and said back channel receiving the, upper edge portion of said back panel;

wherein each back frame member has two substantially orthogonal channels, one of the orthogonal channels being dimensioned to receive a side edge portion of said back panel and the other orthogonal channel being dimensioned to receive a back edge portion of one of said side panels; and

wherein each front frame member has a channel dimensioned to receive a front edge of one of said side panels;

one side panel extending between and being received within channels of the first front frame member and the first back frame member, and the other side panel extending between and being received within channels of the second front frame member and the second back frame member when the cabinet is assembled;

said back panel extending between and being received within channels of the first back frame member and the second back frame member when the cabinet is assembled;

a plurality of tab members having at least two holes therein;

wherein a first of said tab members is coupled to and extends downward below one of said front frame members; and

a second tab member is coupled to and extends downward below the other of said front frame members; and

two slots and four holes in said base, each slot being positioned to receive a respective one of the two metal tabs;

wherein corresponding holes in said base align with said holes in said tabs when said tabs extend into said slots;

wherein removable fasteners are inserted through aligned holes to maintain rigid axial alignment of said holes and spatial positioning of said base, said back and said two side panels, further comprising:

a reverse curve bend on each back frame member;

a plurality of side panel metal strips, each said side panel metal strip being fixedly fastened to the back portion of each said side panel;

wherein each said side panel metal strip has a reverse curve bend that engages the said reverse curve bend in a corresponding said back frame member for rapid assembly of said cabinet;

third and fourth tab members extending from the front edge of said shelf and rigidly coupling said shelf to said front frame members;

a lip extending around the periphery of said shelf;

a first coupling member extending continuously along said first side panel, across said back panel and along said second side panel a constant distance between said bottom panel and said top panel;

wherein said coupling member is configured for receipt of said shelf lip;

wherein upon engagement of said shelf lip with said coupling member and coupling of said third and fourth tabs with said front frame member, said shelf provides rigid reinforcement for said box structure formed by said top, bottom, side and back panel members.

4,859,009

TABLE-CHEST

William Tulenko, 2734 Mount Troy Rd., Pittsburgh, Pa. 15212

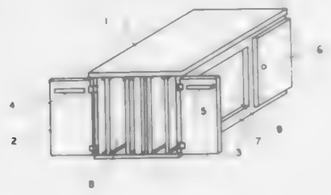
Filed Jun. 27, 1988, Ser. No. 211,565

Int. Cl.[4] A47B *83/00*

U.S. Cl. 312—277 3 Claims

1. A rectangular table-chest together with individual smaller collapsible rectangular tables slidably stored therein with means for supporting tops of collapsed tables in vertical, parallel relationship, a pair of pivotally opened doors at one end of said table-chest, each of which carries, on its inner surface, an L-shaped extension in parallel relationship with and close to a

top end thereof, each of said smaller tables having an L-shaped extension underneath one side thereof and a groove underneath, an opposite side thereof whereby when the L-shaped



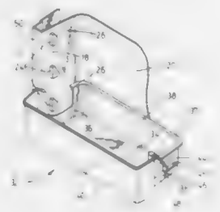
extension on one of said doors engages a groove underneath one of said smaller tables and, whereby when the legs of the smaller table are extended to the open position, an increased table top surface is provided adjacent said one of said doors.

4,859,010

REFRIGERATOR DOOR TRAY ASSEMBLY

Les A. Jeziorowski, Ancaster, Canada, assignor to CAMCO Inc., Mississauga, Canada

Filed Jan. 24, 1989, Ser. No. 300,886
Claims priority, application Canada, Mar. 10, 1988, 561118
Int. Cl.[4] A47B *51/00*
U.S. Cl. 312—312 9 Claims



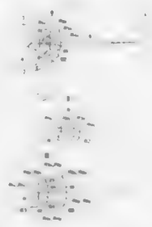
1. A refrigerator door tray assembly including:
(a) a refrigerator door having an inner liner cavity defined by a rear wall and tow forwardly projecting side walls, at least one pair of opposing tray support means projecting from said side walls,
(b) each of said tray support means having a shoulder comprising an upper portion defining an upwardly facing ledge that slopes downwardly toward said inner liner rear wall at a predetermined angle and a lower portion defining a vertical edge in downward extension from said slope,
(c) a tray positionable within the cavity of the refrigerator door, said tray including a bottom wall and two upstanding side walls positionable adjacent the side walls of the inner liner cavity,
(d) each of the upstanding side walls of the tray having an outwardly projecting support arm including
(i) a rib member having a bottom surface that slopes downwardly at said predetermined angle such that said bottom surface lies flush on the upwardly facing ledge of the shoulder of said tray support means when the tray is positioned within the cavity,
(ii) a securing arm portion extending vertically from the lower edge of said rib member for cooperating with the vertical edge of the lower portion of said shoulder of the tray support means to detachably secure said tray in said cavity, and
(iii) a leading arm portion extending horizontally and rearwardly from the securing arm portion,
(e) said tray further including positioning means for engaging the inner liner of said door to limit movement of said tray into the cavity, said positioning means cooperating with the downwardly facing surface of said rib member and the vertical edge of the support means to positively locate said tray in the cavity.

4,859,011

LIGHT SCANNING DEVICE

Kenichi Takanashi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 16, 1988, Ser. No. 207,719
Claims priority, application Japan, Jun. 17, 1987, 62-150983; Jun. 7, 1988, 63-140044
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.8 7 Claims



1. A light scanning device comprising:
a light source unit;
a first focusing optical system for focusing a light beam from said light source unit as a linear image in a position;
a rotating polygon having a reflecting surface near said position for deflecting the light beam at a constant angular velocity;
a second focusing optical system for focusing the light beam deflected by said rotating polygon as a spot on a surface being scanned;
said second focusing optical system including a lens having a toric surface and coupling the reflecting surface and the scanned surface in substantially conjugate relationship with respect to an auxiliary scanning direction; and
the axis of the deflected light beam and the optical axis of the second focusing optical system deviating by Δ from each other in a light deflecting plane, where the deflected light beam is parallel to the optical axis of the second focusing optical system, with the second focusing optical system having a focal length fM in the light deflecting plane, the amount of deviation Δ being in the range:

$$0.0066fM < \Delta < 0.0076fM.$$

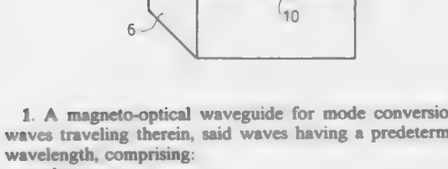
4,859,012

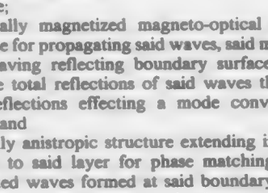
OPTICAL INTERCONNECTION NETWORKS

Robert W. Cohn, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 14, 1987, Ser. No. 85,993
Int. Cl.[4] G02B *6/04, 6/28*
U.S. Cl. 350—96.24 9 Claims

1. A reconfigurable optical interconnection network, comprising:
(a) an array of N inputs, each of said inputs emitting a light beam;
(b) a deformable mirror device with N rows and K columns of pixels;
(c) a first set of lenses directing each of said light beams onto one of said rows of pixels;
(d) an array of K outputs;
(e) a second set of lenses directing that portion of each of said light beams reflecting off of undeflected ones of said pixels in one of said columns onto one of said outputs, and directing that portion of each of said light beams reflecting off of deflected ones of said pixels away from said outputs; and
(f) a controller determining the deflections of said pixels.
5. A bundle of optical fibers, comprising:
(a) a plurality of optical fibers, each of said fibers with a core





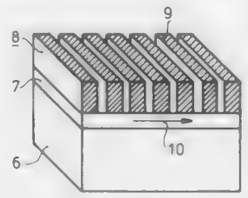
of diameter d and cladding about said core to form a total diameter of D;
(b) said fibers arranged as a stack of staggered rows of n fibers in each row, the stagger of each row such that the centers of the cores of adjacent fibers in a row are displaced by a distance D/n in the direction of the stack.

4,859,013

MAGNETO-OPTICAL WAVEGUIDE DEVICE WITH ARTIFICIAL OPTICAL ANISOTROPY

Hans J. Schmitt; Günter L. Schmitz, both of Aachen, and Hans Dammann, Tangstedt, all of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 671,148, Nov. 13, 1984, abandoned.
This application Oct. 2, 1987, Ser. No. 104,586
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341482
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.12 14 Claims



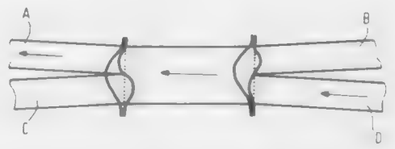
1. A magneto-optical waveguide for mode conversion of waves traveling therein, said waves having a predetermined wavelength, comprising:
a substrate;
an externally magnetized magneto-optical layer on said substrate for propagating said waves, said magneto-optical layer having reflecting boundary surfaces which form multiple total reflections of said waves therefrom, such total reflections effecting a mode conversion of said waves; and
an optically anistropic structure extending in the direction parallel to said layer for phase matching of the mode converted waves formed at said boundary surfaces, said optically anisotropic structure having an artificially manufactured phase structure with successive regions which have alternately different indices of refraction in the direction of propagation of said waves, and wherein the lengths of said regions and the distances therebetween in the direction of propagation of said waves are less than the wavelength of said waves.

4,859,014

NON-RECIPROCAL OPTICAL WAVEGUIDE DEVICE, PARTICULARLY FOR USE AS AN ISOLATOR OR CIRCULATOR

Hans-Jürgen Schmitt, Aachen, and Hans O. B. Dammann, Tangstedt, both of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jan. 20, 1988, Ser. No. 209,445
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1987, 3720929
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.13 8 Claims



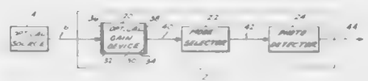
1. A non-reciprocal optical element, particularly for use as an isolator or circulator, and for connection to at least two monomode optical waveguides and which has a magneto-optical waveguide structure intended to be subjected to a transverse magnetic field directed perpendicularly to the direction of propagation of the optical wave, comprising:
the magneto-optical waveguide structure being formed as a multimode waveguide which can propagate at least one fundamental mode and the first-order mode,
the optical waveguides are located off-center with respect to the waveguide structure,
at least one of the dimensions and the cross-sectional distribution of the refractive index of the optical waveguide structure is chosen to be such that the two modes have a reciprocal phase difference of $\pi/2+2n\pi$ and
at least one of the magnetic field strength and the structure of the magneto-optical waveguide structure is chosen to be such that the two modes have non-reciprocal phase difference of $\pi/2+2m\pi$and in which n and m may be integers including 0.

4,859,015

OPTICAL RECEIVER HAVING OPTICAL GAIN MEDIUM AND MODE SELECTOR

Jeffrey A. Krinsky, and Robert A. Falk, both of Renton, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 17, 1988, Ser. No. 233,334
Int. Cl.[4] G02B *6/26;* H01S *3/098;* G02F *1/00;* H01L *27/14*
U.S. Cl. 350—96.15 5 Claims



1. A receiver for receiving and detecting an optical input signal, the receiver comprising:
an optical gain device for amplifying the input signal to produce an amplified input signal, the optical gain device comprising an optical gain medium, an optical input port through which the input signal may be received into the optical gain medium, and an optical output port through which an optical output signal may leave the optical gain medium, the output signal including the amplified input

signal and any noise generated within the optical gain device, the optical gain device further comprising antireflection means associated with the input and output ports to minimize reflections at such ports;
a photodetector for receiving an optical signal and producing a corresponding electrical signal; and
a mode selector connected to receive the output signal from the optical gain device, the mode selector including means for preferentially transmitting one or more preselected spatial modes of the output signal to the photodetector.

4,859,016

FIBER OPTIC AMPLIFIER

Herbert J. Shaw, Stanford, and Michel J. F. Digonnet, Palo Alto, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Division of Ser. No. 930,136, Nov. 12, 1986, Pat. No. 4,723,824, which is a division of Ser. No. 554,888, Nov. 25, 1983, Pat. No. 4,674,830. This application Dec. 22, 1987, Ser. No. 137,870
The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.
Int. Cl.[4] G02B *6/26*; H01S *3/07*
U.S. Cl. 350—96.15 **15 Claims**





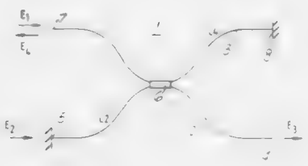
1. A fiber optic amplifier, comprising:
an optical fiber comprised of a material which will emit light in response to pumping;
a source of signals comprising light at a frequency of said emitted light;
a source of light for pumping said material; and
means for coupling both said signals and said light for pumping into an end of said optical fiber.

4,859,017

DIELECTRIC OPTICAL FABRY-PEROT WAVEGUIDE DEVICE AND METHOD FOR MAKING AND USING SAME

Michael C. Brierley; Stephen R. Mallinson, both of Ipswich; Colin A. Millar, Felixstowe, and William P. Urquhart, Ipswich, all of England, assignors to British Telecommunications plc, London, England

PCT No. PCT/GB86/00430, § 371 Date Mar. 19, 1987, § 102(e) Date Mar. 19, 1987, PCT Pub. No. WO87/00699, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 21, 1986, Ser. No. 26,444
Claims priority, application United Kingdom, Jul. 24, 1985, 8518739; Sep. 24, 1985, 8523532; Dec. 20, 1985, 8531422
Int. Cl.[4] G02B *6/26*; G01B *9/02*; H04B *9/00*
U.S. Cl. 350—96.15 **13 Claims**



1. A dielectric optical waveguide device (1) comprising a first waveguide (2) transversely coupled to a second waveguide (3) at a coupling region (6), wherein the first and second waveguides (2, 3) have substantially identical propagation constants at all wavelengths, and one end (5, 8) of each waveguide (2, 3) selected at opposite respective ends of said coupling region (6) is provided with a reflection means, thereby to form a Fabry-Perot cavity.

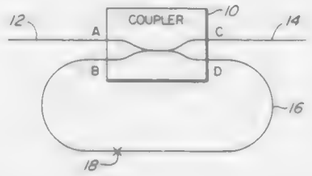
11. A method of wavelength selection of optical signals using a dielectric optical waveguide device (1) comprising a first waveguide (2) transversely coupled to a second waveguide (3) at a coupling region (6), wherein the first and second waveguide (2, 3) have substantially identical propagation constants at all wavelengths, and one end (5, 8) of each waveguide (2, 3) selected at opposite respective ends of said coupling region (6) is provided with a reflection means, thereby to form a Fabry-Perot cavity, said method of wavelength selection comprising the step of: inputting optical signals (E1, E2) into a or each waveguide (2, 3), whereby selected optical signals (E_3, E_4) are output from the device from output ports (4, 7).

4,859,018

OPTICAL FIBER BANDWIDTH LIMITING

Maurice S. O'Sullivan, Ottawa; Hyung B. Kim, Kanata; Vincent C. So, and Paul J. Vella, both of Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 15, 1987, Ser. No. 61,625
Int. Cl.[4] G02B *6/28*
U.S. Cl. 350—96.16 **4 Claims**



1. A method of limiting bandwidth on an optical fiber transmission path carrying an optical signal, comprising the steps of:
supplying the optical signal to a first input, and deriving a bandwidth-limited optical signal from a first output, of an optical signal coupler; and
coupling a second output of the coupler to a second input thereof via an optical fiber providing a predetermined propagation delay and a predetermined attenuation;
wherein the coupler has a coupling coefficient α from the first input to the second output and a transfer coefficient β from the first and second inputs to the first and second outputs, the optical fiber provides a transfer coefficient β' from the second output to the second input of the coupler whereby the predetermined attenuation is $1-\beta'$, and α is substantially equal to $(1+\beta\beta')/(1+2\beta\beta')$.

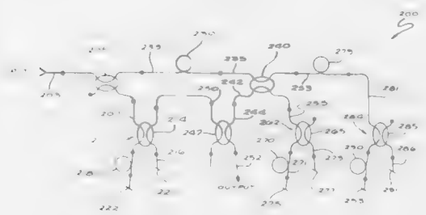
4,859,019

FIBER OPTIC TELEMETRY SYSTEM

Dennis P. Bevan, Alhambra, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Mar. 14, 1988, Ser. No. 167,513
Int. Cl.[4] G02B *6/28*; H04B *9/00*
U.S. Cl. 350—96.16 **8 Claims**

1. A fiber optic telemetry system an arrangement having input and output terminals comprising, in combination:
(a) a first optical coupler having at least one input and two output terminals, said input terminal being connected to the input terminal of said telemetry system;
(b) a second optical coupler having two input terminals and at least one output terminal, said output terminal being connected to the output terminal of said telemetry system;
(c) a first sensor having one input terminal and one output terminal, said input terminal being connected to said output terminal of said first coupler and said output terminal being connected to a first one of said input terminals of said second coupler;
(d) a third optical coupler having two input terminals and two output terminals, one of said input terminals being interconnected between said output terminal of said first coupler and said second input terminal of said third coupler being connected to said second input of said second coupler;
(e) a second sensor having one input/output terminal, said input/output terminal being connected to a third terminal of said third coupler;
(f) a third sensor having one input/output terminal, said input/output terminal being connected to a fourth terminal of said third coupler.

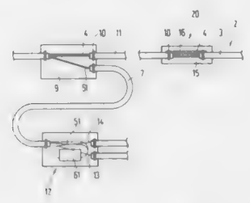


4,859,020

BRANCHING CIRCUIT FOR AN OPTICAL CABLE COMPRISING A PLURALITY OF OPTICAL WAVEGUIDES AND A METHOD OF PRODUCING SAME

Peter G. Deusser, Cologne; Detlef M. Boehm, Neunkirchen-Seelscheid; Karl W. Eiden, Bergisch-Gladbach, and Johann A. Becker, Overath, all of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 17, 1987, Ser. No. 94,223
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1986, 3630659
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **19 Claims**



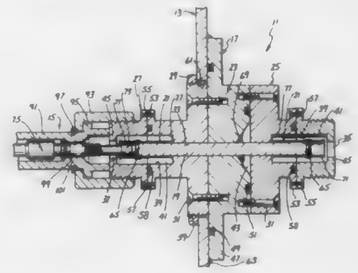
1. A branching circuit for an optical cable comprising a plurality of optical waveguides in a cable sheath, characterized in wherein a longitudinal section from which the cable sheath has been removed is fixed in the stretched condition in a branching box which extends in both directions beyond the ends of the cable sheath and an end of at least one severed optical waveguide or a branch-optical waveguide connected thereto is passed through a branching sleeve fitted to the branching box.

4,859,021

HERMETIC FEEDTHROUGH CONNECTOR FOR FIBER OPTIC TRANSMISSION

Stephen W. Wall, Costa Mesa, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 20, 1988, Ser. No. 247,010
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **10 Claims**



1. A feedthrough connector comprising:
a connector body including first and second body sections, a central body section between the first and second body sections, first means for releasably attaching the first body section to the central body section and second means for releasably attaching the second body section to the central body section, said body sections having a passage extending therethrough with a portion of said passage being in each of said body sections;
a graded index rod in said passage and having first and second ends in the portions of the passage which are in the first and second body sections, respectively; and
a first alignment sleeve in the portion of the passage which is in the first body section, said first alignment sleeve receiving a portion of said graded index rod and having means extending beyond said first end of said graded index rod for receiving an end portion of a fiber optic terminus.

4,859,022

MOVING "S" FIBER OPTICAL SWITCH

Barry J. Opdahl; Douglas H. Hooren, both of Williamsport, Pa., and Lauren F. Calaby, Huntington Beach, Calif., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jul. 11, 1988, Ser. No. 217,527
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **15 Claims**

9. A fully-reversing 2×2 electromechanical optical switch apparatus in which input optical signals carried on input optical fibers **500** and **600** can be selectively transmitted to output optical fibers **51** and **601** or to said output optical fibers **601** and **501**, respectively, comprising
a base having a planar surface with a first V-groove formed therein, said surface having a first pair of non-parallel V-grooves formed therein at one side of said first V-groove and converging thereat, and said surface having a second pair of non-parallel V-grooves formed therein at the other side of said first V-groove and converging thereat, said non-parallel V-grooves chimerically intersecting at said first V-groove, said non-parallel V-grooves having a fixed depth less than that of said first V-groove, whereby said first V-groove interrupts said pairs of non-parallel V-grooves, and said non-parallel V-grooves intersect said first V-groove at both sides thereof;
a first pair of optical fibers **500**, **600** residing within said first pair of non-parallel V-grooves wholly at one side of said first V-groove, said first pair of optical fibers **500**, **600** having fiber end faces lying in a first common plane;

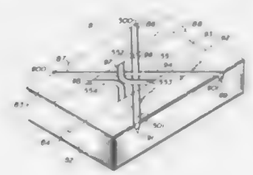
a second pair of optical fibers **601, 501** residing within said second pair of non-parallel V-grooves wholly at the other side of said first V-groove, said second pair of optical fibers **601, 501** having fiber end faces lying in a second common plane;

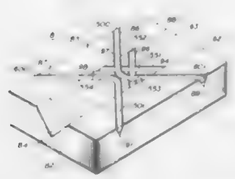
a V-block adapted for reciprocating movement from one position to another linearly within said first V-groove, said V-block having opposing sides, and said V-block having

a straight V-groove formed therein from one of said opposing sides continuously to an opposite one of said opposing sides so aligned, when said V-block is in one position, with one of said first pair of non-parallel V-grooves and one of said second pair of non-parallel V-grooves,

a first discontinuous V-groove formed therein having a pair of ends terminating at said opposing sides, said discontinuous V-groove at said pair of ends having a depth equal to said fixed depth, said discontinuous V-groove encroaching said continuous V-groove of said V-block but being discontinuous thereat, said discontinuous V-groove being so aligned, when said V-block is in said one position, with the other of said first pair of non-parallel V-grooves and the other of said second pair of non-parallel V-grooves,

a curved discontinuous V-groove formed therein having a





pair of ends terminating at said opposing sides, said curved discontinuous V-groove at said pair of ends having a depth equal to said fixed depth, said curved discontinuous V-groove being discontinuous between said pair of ends thereof,

a curved continuous V-groove formed therein having a pair of ends terminating at said opposing sides, said curved continuous V-groove having a depth equal to said fixed depth, said curved continuous V-groove being oriented, when said V-block is in a switched position, with said one of said V-grooves of said first pair and said other of said V-grooves of said second pair,

said curved discontinuous V-groove being oriented, when said V-block is in said switched position, with said other of said V-grooves of said first pair and said one of said V-grooves of said second pair;

a first fiber segment residing in said straight continuous V-groove of said V-block having a first end at said one of said opposing sides and having a second end at said other of said opposing sides;

a second fiber segment coupled to said first discontinuous V-groove of said V-block having a first end thereof at said one of said opposing sides, having a second end thereof at said other of said opposing sides, and having a mid-portion thereof overlapping said first fiber segment;

a third fiber segment coupled to said curved discontinuous V-groove having a first end thereof at said one of said opposing sides, having a second end thereof at said other of said opposing sides, and a mid-portion thereof overlapping both said first fiber segment and said second fiber segment; and

a fourth fiber segment residing in said curved continuous V-groove of said V-block having a first end at said one of said opposing sides and having a second end at said other of said opposing sides.

said fiber segments at their said first ends having fiber end faces lying in a third common plane, said third common plane being in close proximity to and parallel with said first common plane, and

said fiber segments at their said second ends having fiber end faces lying in a fourth common plane, said fourth common plane being in close proximity to and parallel with said second common plane.

4,859,023

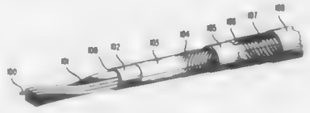
SHEATHED OPTICAL FIBER CABLE

Bernard R. Eichenbaum, Lilburn, and Manuel R. Santana, Doraville, both of Ga., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 21, 1981, Ser. No. 304,203

Int. Cl.[4] G02B *6/44*

U.S. Cl. 350—96.23 **12 Claims**



10. An optical fiber cable comprising an inner sheath of polymeric material surrounding one or more optical fibers and having a coefficient of coupling to at least one of said fibers of at least 0.01, characterized in that said polymeric material is chosen to have a sufficiently high creep compliance so that said sheath, in the absence of longitudinal compressive reinforcing elements within, or embedded in, said sheath, transmits to said fibers a longitudinal compressive stress small enough to result in substantially zero buckling of said fibers.

4,859,024

OPTICAL FIBER CABLE WITH TAMPERING DETECTING MEANS

Mujib Rahman, Columbia, S.C., assignor to Pirelli Cable Corporation, Florham Park, N.J.

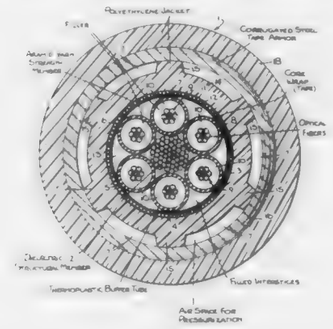
Filed Mar. 10, 1988, Ser. No. 166,255

Int. Cl.[4] G02B *6/44*; H01J *5/16*; H01B *7/02*; G08B *13/20*

U.S. Cl. 350—96.23 **16 Claims**

1. An optical fiber cable comprising at least one optical fiber extending lengthwise of said cable, a first substantially gas impermeable layer encircling said optical fiber and a second substantially gas impermeable layer encircling said first substantially gas impermeable layer, a viscous filler filling any otherwise empty spaces within said first layer and said second

layer having at least a portion of its inner surface spaced from the outer surface of said first layer to provide at least one gas



receiving duct intermediate said first layer and said second layer which extends lengthwise of said cable.

4,859,025

OPTICAL FIBRE CABLE

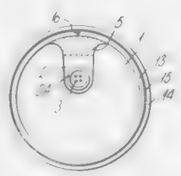
Ian Houghton, Newport, England, assignor to STC PLC, London, England

Continuation of Ser. No. 906,301, Sep. 11, 1986, abandoned. This application Nov. 3, 1988, Ser. No. 267,643

Claims priority, application United Kingdom, Sep. 14, 1985, 8522796; May 8, 1986, 8611177

Int. Cl.[4] G02B *6/44*

U.S. Cl. 350—96.23 **16 Claims**



1. An aerial optical fiber cable suitable for long spans comprising an elongate core member having a central longitudinal axis and defining a surfacial slot extending parallel to said axis, said member being the main tensile strength member of the cable and wholly consisting of high tensile strength material, at least one optical fiber located in said slot, and means closing the slot, said core member also being the main crush-resistant armouring around the optical fiber, there being an excess length of fiber in the slot.

4,859,026

OPTICAL ASSEMBLY FOR AIRCRAFT TRAILING GROUND LINES

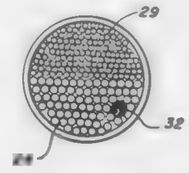
Donald N. Arents, Newport News, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 585,689, Mar. 2, 1984, abandoned, which is a continuation of Ser. No. 312,219, Oct. 19, 1981, abandoned. This application Feb. 18, 1988, Ser. No. 157,006

Int. Cl.[4] G02B *6/06*

U.S. Cl. 350—96.25 **6 Claims**

1. In an aircraft having a trailing ground line suspended therefrom for use in rescue missions, refueling and cargo handling, wherein, since a pilot cannot see the trailing ground line beneath the aircraft to align its working end with rescue platforms, windows, fuel tanks and cargo load rings, a person at the site must signal the pilot, the combination of the trailing line with an optical assembly enabling the pilot to see the precise location of the working end, the optical assembly including a fiber optic image reception lens unit, said lens unit being adapted to produce a portion of an image which is magnified and a portion of an image which is visible in a wide field of view, means for mounting the lens unit on the working end of the trailing ground line, a fiber optic magnifying viewer capable of displaying fiber optically transmitted images, means for mounting the viewer in the aircraft with other aircraft instruments, a flexible fiber optic light guide capable of transmitting coherent light of ultraviolet through infrared wave-



lengths, and adapted to be interposed between the image reception lens unit and the magnifying viewer, adapter means fiber optically connecting one end of the light guide to the magnifying viewer, the adapter means fiber optically connecting the other end of the light guide to the lens unit so that the light guide transmits images from the lens until on the trailing ground wire working end to the magnifying viewer in the aircraft, and so that the lens unit provides the pilot an enlarged forward field of view enabling him to judge the position of the trailing ground line, and a wide field of view enabling him to judge the approach of the trailing ground line to the object.

4,859,027

LENTICULAR LENS SCREEN

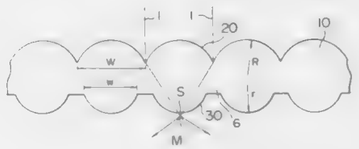
Hideo Kishida, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1988, Ser. No. 159,733

Claims priority, application Japan, Feb. 28, 1987, 62-46533

Int. Cl.[4] G03B *21/60*

U.S. Cl. 350—128 **17 Claims**



1. A lenticular lens screen comprising:

a substantially planar screen body;

a first lenticular lens array formed on a first side of said screen body upon which light beams are incident, said first array comprising a plurality of lenticles, said lenticles each having a cross sectional shape, in a plane perpendicular to a plane of said screen body, which corresponds to an entire or arcuate portion of a semicircle; and

a second lenticular lens array formed on a second side of said screen body, opposite said first side, from which said light beams are transmitted, said second array comprising a plurality of lenticles, said lenticles each having a cross sectional shape, in a plane perpendicular to a plane of said screen body, which corresponds to an entire or arcuate portion of a semicircle;

wherein a radius of the lenticles in the first array is greater

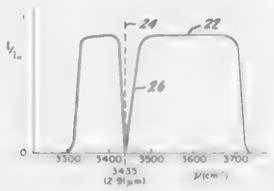
than a radius of the lenticles in the second array, and an apex of the lenticles in the second array is inwardly spaced, in a plane parallel to a plane of said screen body, from an intersecting point of light beams projected through the lenticles in the first array, in both end portions of said lenticles, in a direction parallel to an optical axis of said lenticles.

4,859,028

NARROW-BAND OPTICAL ABSORPTION FILTER

James Moore; Michael Kale, both of Ridgefield, and George Csanak, Stamford, all of Conn., assignors to Barnes Engineering Company, Shelton, Conn.

Filed Apr. 9, 1981, Ser. No. 252,449
Int. Cl.[4] G02B *5/22*
U.S. Cl. 350—1.1 24 Claims



1. A method of making a narrow-band absorption filter for absorbing optical radiation at a desired frequency and for passing optical radiation at other frequencies within a selected frequency band which includes said desired frequency, comprising the steps of:

selecting an impurity material having narrowband absorption properties in crystals at a frequency near said desired frequency;

selecting a first crystal material having matrix isolation absorption characteristics for said impurity with narrow-band absorption above said desired frequency; and having substantial transmission properties over said selected frequency band;

selecting a second crystal material having matrix isolation absorption characteristics for said impurity with narrow-band absorption below said desired frequency, having substantial transmission properties over said selected frequency band and having crystal forming compatibility with said first selected crystal material;

selecting a ratio of said first crystal and said second crystal to adjust said narrow-band absorption to said desired frequency;

and forming a filter comprising a mixed crystal of said first and second crystal materials with said selected ratios and a selected amount of said impurity.

4,859,029

VARIABLE RATIO BEAM SPLITTER AND BEAM LAUNCHER

William E. Durell, 41310 N. Westlake, Antioch, Ill. 60002

Continuation-in-part of Ser. No. 881,933, Jul. 3, 1986, Pat. No. 4,787,710. This application Jul. 11, 1988, Ser. No. 217,433
Int. Cl.[4] G02B *27/10, 27/14, 6/26, 6/32*
U.S. Cl. 350—173 40 Claims

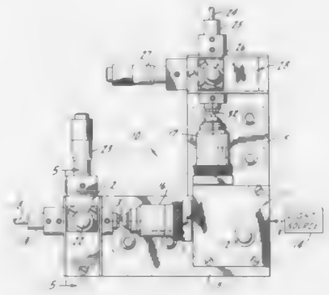
1. A continuously variable ratio beam splitter and beam launcher for splitting an input light beam into first and second output light beams and launching those output beams through first and second light transmission elements, comprising:

a frame;

an optical support, adjustably mounted on the frame;

beam splitting optical array means, mounted on the optical support and interposed in the path of an input light beam, for splitting the input beam into first and second output beams launched along first and second output paths, respectively, each output path having a fixed position and alignment relative to the frame regardless of adjustments of the optical support within a given limited adjustment range.

intensity ration adjustment means, connected to the base and to the optical support, for adjusting the alignment of the



support relative to the input beam path, within said limited adjustment range, to vary the intensity ratio between the output beams;

and first and second transmission element positioners, each affixed to the frame, for accurately positioning a pickup portion of each of first and second transmission elements in the first and second output paths, respectively.

4,859,030

HELMET MOUNTED DISPLAY WITH IMPROVED BRIGHTNESS

Donald J. Rotier, St. Paul, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Jul. 29, 1987, Ser. No. 78,947
Int. Cl.[4] G02B *27/14*
U.S. Cl. 350—174 14 Claims



1. In a helmet mounted display which includes an optical system for directing rays of light to one eye of an observer so as to produce an image superimposed upon a remote scene being observed, the improvement comprising:

a first surface positioned to reflect rays of light received from the optical system at angles of incidence which vary with the positions on the first surface that the rays are received;

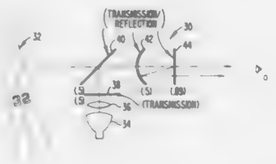
a second surface positioned to receive the rays reflected from the first surface and to reflect them back to the first surface for transmission to the eye of the observer, the first surface being coated with a thin dielectric optical film which is has varying depth over the first surface in accordance with the angle of incidence at the positions so that rays received from the optical system are predominantly reflected and rays received from the second surface are predominantly transmitted.

4,859,031

OPTICAL COLLIMATING APPARATUS

Arthur L. Berman, Milpitas, and James E. Melzer, San Jose, both of Calif., assignors to Kaiser Electronics, San Jose, Calif.

Filed Aug. 3, 1987, Ser. No. 80,739
Int. Cl.[4] G02B *27/14, 5/30;* G02F *1/13*
U.S. Cl. 350—174 8 Claims



1. An optical collimating apparatus for focussing an image at or closer than at an infinite distance from an observer, comprising the elements of:

a circular polarizing filter;

a semi-reflective concave mirror; and

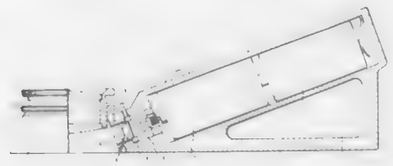
a cholesteric liquid crystal element.

4,859,032

HAND-HELD MAGNIFIER APPARATUS

Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., Ronkonkoma, N.Y.

Filed Apr. 15, 1988, Ser. No. 182,212
Int. Cl.[4] G02B *27/02*
U.S. Cl. 350—235 12 Claims



1. A magnifying apparatus, comprising:

a first housing section having a top portion for containing at least one magnifying lens assembly with a top opening to enable a person to view via said lens, said housing having a bottom opening surrounded by a peripheral wall,

a second housing section coupled to said peripheral wall at an angle thereto and containing a source of illumination adapted to transmit a beam of light, and

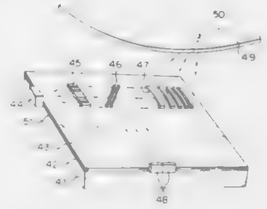
means located in said second housing section for shaping said beam so that a circular pattern of light is provided about said bottom opening of said first housing section when said first housing section is placed on a flat surface to completely cover said bottom opening.

4,859,033

METHOD OF PRODUCING OPTICAL HEAD ASSEMBLY

Keizo Kono; Mitsuhige Kondou, both of Kyoto; Natsuro Tsubouchi; Shiro Hine, both of Hyogo; Hiroshi Nishihara, and Toshiaki Suhara, both of Osaka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 855,110, Apr. 23, 1986, Pat. No. 4,779,259. This application Apr. 29, 1988, Ser. No. 188,210
Claims priority, application Japan, Apr. 25, 1985, 60-89590; Jun. 24, 1985, 60-137531
Int. Cl.[4] G02B *27/00;* G11B *5/09*
U.S. Cl. 350—320 5 Claims



1. A method of producing an optical head assembly having an efficient light source coupling surface comprising the steps

A. forming a substrate from material which can be readily cleaved along a plane in at least one direction;

B. forming a light-guiding layer having an axis along which light propagates on the substrate, the light-guiding layer being aligned on the substrate with the light propagation axis substantially perpendicular to the substrate cleavage plane; and

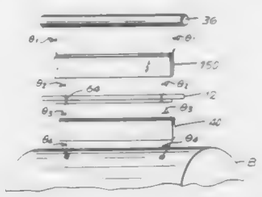
C. cleaving the substrate along the cleavage plane, the light-guiding layer fracturing along the cleavage plane during the cleaving operation to form a smooth light source coupling surface substantially parallel to the cleavage plane.

4,859,034

LIQUID CRYSTAL OPTICAL PRINTING APPARATUS

Yoshiaki Shiraishi, Shiojiri, and Kenji Aoki, Suwa, both of Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 452,370, Dec. 23, 1982, Pat. No. 4,589,732. This application May 9, 1986, Ser. No. 861,688
Claims priority, application Japan, Dec. 28, 1981, 56-213263
The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.
Int. Cl.[4] G02F *1/13;* G03B *27/00;* G01D *9/42*
U.S. Cl. 350—331 R 15 Claims



1. A liquid crystal optical printing apparatus comprising:

a light source in the form of a fluorescent lamp;

a liquid crystal panel subject to being irradiated with light from the source, the liquid crystal panel comprising a plurality of light valves arranged in a linear array;

a light guide plate positioned between the light source and the liquid crystal panel for directing light from the light

source onto the array of light valves, the light guide plate being disposed substantially parallel to the linear array of the light valves and in line of travel of light from the light source through the light valves with opposed narrow edge surfaces facing the light source and the liquid crystal panel;

driver means for selectively opening and closing the light valves;

means for receiving images of the light valves for reproduction; and

lens means comprising a plurality of self-focusing fiber lenses for focusing incident light from the liquid crystal panel on the means for receiving images, each lens producing an image of at least one light valve on the receiving means.

4,859,035

FERROELECTRIC LIQUID CRYSTAL LIGHT SHUTTER DEVICE AND METHOD OF CONTROLLING THE DRIVING OF THE SAME

Hideo Ichinose, and Shohei Naemura, both of Tokyo, Japan, assignors to NEC Corporation, Japan

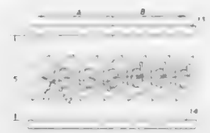
Filed May 26, 1987, Ser. No. 54,386

Claims priority, application Japan, May 26, 1986, 61-121576; May 30, 1986, 61-126582

Int. Cl.[4] G02F *1/13*; G09G *3/00, 3/20*

U.S. Cl. 350—332 **5 Claims**





1. A ferroelectric liquid crystal light shutter device, comprising:

an array of light shutter elements which are lightmodulated by multiplex-driving the elements in groups in accordance with a predetermined duty ratio, said array comprising:

(i) a plurality of scanning electrodes respectively associated with respective elements of said array, said scanning electrodes being addressed in a predetermined order in accordance with said predetermined duty ratio,

(ii) a plurality of signal electrodes each facing a plurality of said scanning electrodes and to which a respective selecting or non-selecting signal is applied in accordance with image data signals read out of an image memory,

(iii) a pair of glass substrates on the respective inner surfaces of which said scanning and signal electrodes are provided,

(iv) a pair of alignment layers covering said scanning and signal electrodes,

(v) a pair of polarizers provided on the respective outer surfaces of said pair of glass substrates, and

(vi) a layer of ferroelectric liquid crystal exhibiting a chiral smectic phase contained between said pair of said layers, and

means interconnected with said scanning and signal electrodes for controlling said array of said shutter elements to be turned on and off in said predetermined order in accordance with said image data signals,

wherein said means for controlling said array of said light shutter elements erases the respective formerly memorized states of light shutter elements to be addressed in the next scanning sequence of said light shutter elements, turns said light shutter elements from which said formerly memorized states have been erased into an "ON-state" and "OFF-state" through application to the respective scanning and signal electrodes for each element of respective voltage signals selected in accordance with said image data signals in the next scanning sequence, and maintains the formerly memorized states of the remaining light shutter elements.

4,859,036

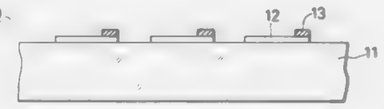
DEVICE PLATE HAVING CONDUCTIVE FILMS SELECTED TO PREVENT PIN-HOLES

Fumie Yamanaka, Segamihara; Takashi Enomoto, and Toshifumi Yoshioka, both of Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1988, Ser. No. 193,060

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—336 **19 Claims**



1. A device plate comprising a transparent conductive film comprised of indium oxide, and a metallic conductive film laminated thereon comprised of at least one metal selected from the group consisting of molybdenum, titanium, chromium, tantalum, tungsten and nickel.

4,859,037

LIQUID CRYSTAL ELECTRICALLY-CONTROLLED BIREFRINGENCE DISPLAY DEVICES WITH IMPROVED CONTRAST

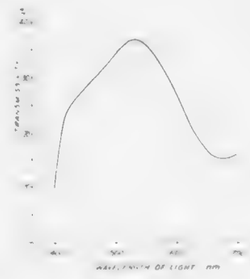
Yukihiro Iwashita, and Masashi Mochizuki, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Nov. 5, 1987, Ser. No. 116,945

Claims priority, application Japan, Feb. 18, 1986, 61-33577; Feb. 18, 1986, 61-33576; PCT Int'l Appl., Feb. 18, 1987, PCT/JP87/00104

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—339 F **11 Claims**



1. A liquid crystal display device of the positive display type wherein dark characters are displayed on a light background, comprising:

a liquid crystal cell including a pair of cooperating spaced apart electrode substrates and a liquid crystal material sandwiched between said two electrode substrates with the liquid crystal material having an orientation direction along the interior surfaces of the electrode substrates;

a pair of polarizers disposed on both sides of said liquid crystal cell each polarizer having an axis of polarization;

the angle between the polarizing axis and the molecular direction of orientation of the liquid crystal molecule adjacent to said electrode substrate between 20° to 70°; and

one of the polarizers being a colored polarizer of a color substantially the same as the complimentary color of the display background observed when monochrome polarizers are used in the display device.

4,859,038

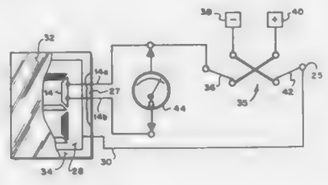
NON-VOLATILE MEMORY DISPLAY CELL

Ronald P. Sansone, Weston, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 24, 1984, Ser. No. 685,812

Int. Cl.[4] G02F *1/17*

U.S. Cl. 350—357 **8 Claims**



1. An electrolytic display cell of the type comprising two plates whereof one is covered by a semitransparent electrode having a first terminal, an electrolyte solution containing platable marking particles disposed between said plates, the electrode being plated by connecting the first terminal of said electrode to a source of potential of a first polarity and the erasing by connecting said first terminal of the electrode to a source of potential of a second polarity, the improvement comprising: said electrode having a second terminal connected to a means for measuring an electrical characteristic whereby the presence of plating upon the electrode can be determined.

4,859,039

LIGHT-POLARIZING FILM

Takuzo Okumura, Tokyo; Toyokazu Okada, and Hitoshi Kikui, both of Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 12, 1985, Ser. No. 797,024

Claims priority, application Japan, Nov. 16, 1984, 59-243084; Aug. 6, 1985, 60-173916

Int. Cl.[4] G02B *5/30*; B05D *5/06*; D06N *7/06*

U.S. Cl. 350—398 **7 Claims**

1. A highly durable, dye light-polarizing film having neutral gray as well as a high polarizing coefficient, which comprises a polymer film made from polyvinyl alcohol or derivatives thereof having at least three dichroism dyes adsorbed and oriented therein, which is treated with an aqueous boric acid solution under the conditions wherein the concentration of boric acid is 5–10%, and the temperature is 50°–80° C.,

said light-polarizing-film having, over a visible light region of 400–700 nm, a minumum polarizing coefficient of at least 70%, the difference between the minimum and a maximum polarizing coefficient is at most 20%, a minimum light transmittance of at least 20%, and the difference between the minimum and a maximum light transmittance is at most 20%;

wherein the dichroism dyes are selected from the following respective classes of:

(A) a yellow dichroism dye having a major absorption wavelength region in the range of 400–500 nm,

(B) a black dichroism dye having a major absorption wavelength region in the range of 450–650 nm,

(C) a blue dichroism dye having a major absorption wavelength region in the range of 570–700 nm,

(D) an arange or red dichroism dye having a major absorption wavelength region in the range of 450–570 nm; and

(E) a green dichroism dye having a major absorption wavelength region in the range of 600–700 nm or 400–450 nm.

4,859,040

OPTICAL SYSTEM HAVING GRADIENT-INDEX LENS AND METHOD FOR CORRECTING ABERRATIONS

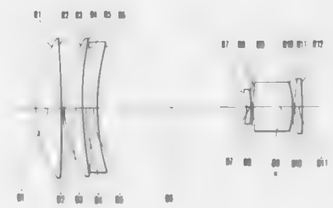
Nozomu Kitagishi, Tokyo, and Jun Hattori, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

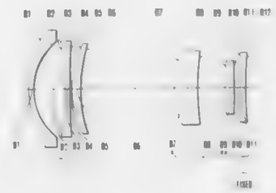
Filed Dec. 19, 1986, Ser. No. 944,664

Claims priority, application Japan, Dec. 27, 1985, 60-297214

Int. Cl.[4] G02B *3/00, 15/177, 9/60, 9/62*

U.S. Cl. 350—413 **5 Claims**





1. An optical system comprising a plurality of lens components, the improvement being that at least one of said lens components is a gradient-index negative lens whose axial thickness is thicker than the marginal thickness and which has a gradient of refractive index with the refractive index increasing in a direction perpendicular to the optical axis as the height from the optical axis increases, so that the lens has a negative power.

4,859,041

VARIABLE FOCUS OPTICAL DEVICE

Shigeyuki Suda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 137,338

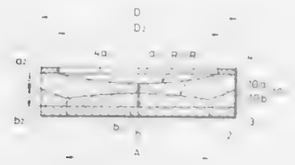
Claims priority, application Japan, Dec. 26, 1986, 61-308727

Int. Cl.[4] G02B *15/00, 3/14*

U.S. Cl. 350—423 **9 Claims**

1. A variable focus optical device having an optical axis, comprising at least first and second elastic bodies laminated in the optical axis direction, and a driving member having an opening, with an inner side of said driving member being in contact with one of said elastic bodies and being capable of deforming surfaces of said elastic bodies by applying a force thereto, said first elastic body being disposed adjacent to said driving member and having a modulus greater than that of said

second elastic body disposed adjacent to said first elastic body and opposite from said driving member, and said first elastic body having a first portion with a thickness that continuously decreases toward the optical axis.



4,859,042

ZOOM LENS

Kazuo Tanaka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1987, Ser. No. 26,004
Claims priority, application Japan, Mar. 17, 1986, 61-058540
Int. Cl.[4] G02B *9/64, 15/14*
U.S. Cl. 350—423 6 Claims



1. A zoom lens comprising, from front to rear, a first lens group of positive refractive power, a second lens group of negative refractive power, a third lens group of positive refractive power and a fourth lens group of positive refractive power, wherein said first and said third lens groups are made fixed, said second lens group is made to move in one direction to perform variation of magnification, said fourth lens group is made to move so as to compensate for the shift of an image plane the variation of magnification accompanies, and focusing is performed by moving the entire fourth lens group.

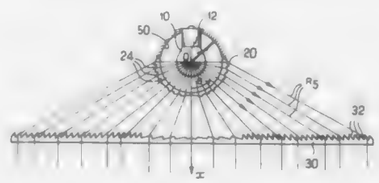
4,859,043

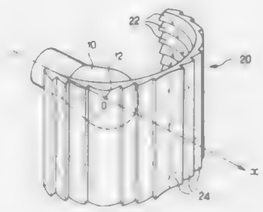
HIGH EFFICIENCY SIGNAL LIGHT, IN PARTICULAR FOR A MOTOR VEHICLE

Pierre Carel, Clamart, and Eric Blusseau, Les Pavillons Sous Bois, both of France, assignors to Cibie Projecteurs, Bobigny Cedex, France

Filed Apr. 28, 1988, Ser. No. 187,220
Claims priority, application France, May 7, 1987, 87 06497; Jan. 12, 1988, 87 00260
Int. Cl.[4] G02B *3/08, 13/18*
U.S. Cl. 350—452 9 Claims

1. A motor vehicle signal light, of the type comprising a light source and deflector means for causing the rays emitted by the source to propagate in a direction which is essentially parallel to a given general emission direction, the deflector means comprising a first lens which is generally arcuate and disposed around and close to the source, and a second lens which is generally in the form of a plate disposed in front of the source and in front of the first lens and which extends transversely to a generally horizontal emission direction, said second lens having substantially greater width than the first lens at least in a horizontal direction, wherein the first lens comprises first arcuately oriented horizontally disposed deflector elements for causing the light rays it receives from the source to be deflected substantially vertically towards said second lens, and the second lens includes second deflector elements for deflecting the light rays it receives from the first lens substantially horizontally to a direction which is substantially parallel to said general emission direction, and wherein the first lens also includes third deflector elements forming light flux distributors





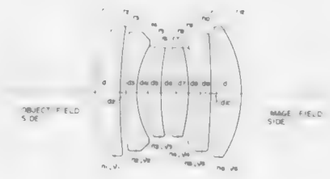
at least in the horizontal direction, for converting the uniform angular distribution of the light received from the source into a substantially uniform linear distribution of the light impinging on the second lens along the horizontal direction thereof, whereby the light flux received per unit surface of said second lens is substantially constant in said horizontal direction.

4,859,044

LARGE APERTURE LENS SYSTEM FOR USE IN A COPIER

Taira Kouchiwa, Kamakura, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 28, 1988, Ser. No. 149,587
Claims priority, application Japan, Jan. 29, 1987, 62-17221
Int. Cl.[4] G02B *9/62*
U.S. Cl. 350—464 3 Claims



1. A lens system comprising in combination as arranged in the order mentioned from an object field side:
- a first positive lens having a convex surface directed to the object field side;
- a second negative lens having a convex surface directed to the object field side;
- a third positive lens having a convex surface directed to the object field side;
- a stop;
- a fourth positive lens having a concave surface directed to the object field side and substantially identical to said third lens;

- a fifth negative lens having a concave surface directed to the object field side and substantially identical to said second lens; and
- a sixth positive lens having a concave surface directed to the object field side and substantially identical to said first lens, each of said first through sixth lenses being a meniscus lens, whereby said lens system is structured to satisfy the following conditions:

$$0.28 < \frac{d_1 + d_2 + d_3}{z} < 0.34$$

$$0.7 < \frac{r_2}{r_3} < 1.2$$

$$-17 < \frac{f_{12}}{f} < -4.5$$

$$1.7 < n_1 < 1.8$$
$$\nu_2 < 35$$
$$1.68 < n_3 < 1.73$$
$$50 < \nu_3$$

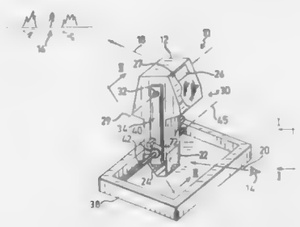
where,
- f: combined focal distance of the entire system;
- f_{12}: combined focal distance of the first (=sixth) and the second (=fifth) lenses;
- r_2: radius of curvature of a second surface (=eleventh surface) from the object field side;
- r_3: radius of curvature of a third surface (=tenth surface) from the object field side;
- $d_1+d_2+d_3$: sum of the center lens thicknesses of the first lens (=sixth lens) and the second lens (=fifth lens) and the center air gap between the first (=sixth) and second (=fifth) lenses;
- z: total sum of the center lens thicknesses of the entire system;
- n_1: refractive index of the first (=sixth) lens;
- ν_2: Abbe number of the second (=fifth) lens;
- n_3: refractive index of the third (=fourth) lens:
- ν_3: Abbe number of the third (=fourth) lens.

4,859,045

VIEWFINDER SYSTEM FOR A PERISCOPE

Jacob Dagan, Gilon, and Shlomo Nezer, Carmiel; both of Israel, assignors to State of Israel-Ministry of Defence, Armament Development Authority Rafael, Haifa, Israel

Filed Nov. 27, 1987, Ser. No. 126,124
Claims priority, application Israel, Dec. 2, 1986, 80830
Int. Cl.[4] G02B *23/08, 27/64, 23/16, 23/14*
U.S. Cl. 350—623 18 Claims



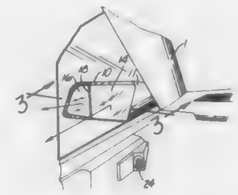
1. An improved viewfinder for viewing a landscape along a selected line of sight, said viewfinder comprising:
- a window periscope comprising a body housing, reflective means mounted on a rotation axis within an end portion of said body housing and being operable to adjust the elevation angle of the line of sight, and optical means fixedly mounted in another end portion of said housing for relaying the line of sight to a viewer in relation to said adjustment;
- means for supporting said body housing and defining a tilt axis about which said body housing may be selectably rotated; and
- a transmission means operatively associated with said supporting means and said reflective means for rotating said reflective means in response to tilting of said body housing about said tilt axis and thereby providing said elevation angle adjustment in relation to said rotation.

4,859,046

LANE VIEWER MIRROR APPARATUS FOR VEHICLES

Rodney P. Traynor, 620 Dexter, Denver, Colo. 80220, and Albert F. Zeedick, 6279 S. Johnson Ct., Littleton, Colo. 80123

Filed May 20, 1988, Ser. No. 196,569
Int. Cl.[4] B60R *1/06, 1/08*
U.S. Cl. 350—627 4 Claims



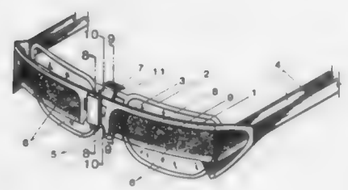
1. A rear view mirror for a vehicle, said rear view mirror apparatus comprising:
- a housing rigidly attached to one side of a vehicle, said housing having a cavity formed therein;
- a mirror assembly disposed in the cavity of said housing and adjustably attached to said housing, said mirror assembly comprising:
- a first planar mirror section means having an outside edge away from the vehicle and having a reflective surface thereon for visually reflecting to the driver of the vehicle what is in the lane adjacent to the lane the vehicle is in at a point several car lengths behind said vehicle;
- a second planar mirror section means having an inside edge toward the vehicle and having a reflective surface thereon for visually reflecting to the driver of the vehicle what is in the lane directly beside said vehicle, said second planar mirror section being disposed at an angle of more than one degree and less than four degrees with respect to said first planar mirror section means;
- means for holding said second planar mirror section fixed with respect to said first mirror section, whereby movement of one mirror section means results in a corresponding movement of the other mirror section means, said holding means comprising an aluminum backing plate with both of said first and second planar mirror section means bonded thereto, said backing plate having a groove therein; and
- a black opaque spacer means disposed between the reflective surfaces of said first and second planar mirror section means for defining a clear line of demarcation to the vehicle operator between what is being shown in the first planar mirror section means that represents what is in the adjacent lane at a point several vehicle lengths back from said vehicle, and what is being shown in the second planar mirror section that represents that is in said adjacent lane directly beside said vehicle, said opaque spacer means also extending in front of and in back of said first and second planar mirror section means, a portion of a back part of said opaque spacer means being disposed in the groove of said backing plate.

4,859,047

GLARE REDUCING NIGHT DRIVING GLASSES

Charles J. Badewitz, 1583 Calle De Andluca, La Jolla, Calif. 92037

Continuation-in-part of Ser. No. 31,574, Mar. 30, 1987, abandoned. This application Mar. 17, 1988, Ser. No. 170,167
Int. Cl.[4] G02C 9/00, 7/10
U.S. Cl. 351—47 4 Claims



1. A set of night driving glasses or screens for reducing the glare experienced during night driving, comprising:

(a) a frame with integral, adjustable nose pads, and temple pieces;

(b) a lens set having a plurality of regions of different configurations and different light transmissivities;

(c) a mechanical coupler to modify the glasses into an attachment for a set of eyeglasses, and;

(d) said lenses are joined to the frames wherein said regions of different transmissivity are configured and located such that one region comprises a narrow horizontal strip positioned in front of the pupils of a wearers eyes by means of the mechanical coupler, and thence extend horizontally around to the sides of the wearers eyes; and wherein said narrow region varies linearily in transmissivity in a vertical direction from 100% at the lower edge to a significantly lower transmissivity at an upper edge; whilst, a region of the lens immediately above the narrow region is integral and of uniform transmissivity of the same value as the upper edge of the narrow region; and, a region of the lens immediately below the lower edge of the narrow region is void of all lens material and hence of 100% transmissivity; and,

(e) said mechanical coupler comprises a thin strip of easily formable metal, approximately ¼ inch wide, and wherein one end comprises an array of apertures which function to attach the coupler to the driving glasses via attachment means for tightening at one of a plurality of vertical positions on eyeglass nose bridges by appropriate choice of aperture; and, for which the other end of the metal strip is formed into a small approximately 90 degree hook to freely rest on said eyeglasses nose bridge such that the driving glasses are gravitationally coupled and constrained to the eyeglasses; and, comprises means for adjustments of the vertical location and horizontal leveling of the narrow linear transmissivity region while wearing the glasses; in order to,

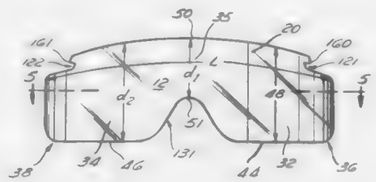
(f) enable the wearer to selectively view oncoming vehicles and headlights through either the narrow linear transivity region, the uniform transmissivity region, or the clear region; and to change from one region to another by a head nod of several degrees accomplished in the time approximating the blink of an eye.

4,859,048

CYLINDRICAL LENS FOR SUNGLASSES

James H. Jannard, Laguna Niguel, Calif., assignor to Oakley, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 690,642, Jan. 11, 1985, Pat. No. 4,674,851, and Ser. No. 893,091, Aug. 4, 1986, abandoned. This application Jun. 23, 1987, Ser. No. 65,345
The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.
Int. Cl.[4] G02C 7/02
U.S. Cl. 351—159 16 Claims



1. An arcuately molded lens for eyeglasses, said lens being mounted on the wearer by means of an eyeglass frame having a lens-receiving portion and a pair of ear stems, and suitable for participation in active sports, such as biking, skiing, and the like, said lens comprising:

a unitary lens having an upper edge and a lower edge, said lower edge having a nosepiece opening formed therein for mounting said lens on the nose of the wearer, thereby mounting said lens, in cooperation with said eyeglass frame, on the head of the wearer, said upper edge of said lens having a generally upwardly arcuate configuration to maximize the surface area of said lens above the eye level of said wearer in order to intercept light rays incident from above,

said lens having a bright portion over said nosepiece opening, the distance separating the lower edge of the bridge portion and the top of the lens being defined as d_1, and the distance separating the bottom edge of the lens and the top of the lens being defined as d_2, wherein d_1 is in the range between about ¾ inch and ½ inches, and d_2 is in the range from about 1¾ inches to 2¾ inches, said dimensions providing optimum interception of light rays while allowing sufficient ventilation around the face of the wearer while participating in active sports,

said lens having in its as-molded condition an arcuate cross-sectional configuration wherein the arc length (L) of said lens is in the range of about 5½ to about 7 inches, and wherein the plane of said lens substantially defines a portion of the wall of a cylinder,

said lens having an inner concave surface and an outer convex surface, and a thickness therebetween, wherein the radius (R_1) from the axis of said cylinder to an arc defining said inner concave surface is a substantially constant radius in the range of about 2½ inches to about 4½ inches; and

means for mounting said lens on said lens-receiving portion of said frame.

4,859,049

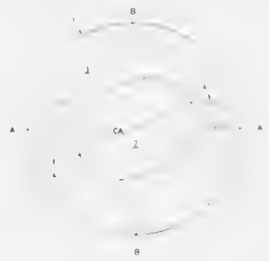
CONTACT LENS FOR ORIENTED OPTICAL CORRECTIONS

Gérard Muller, Route de Blonay 28, 1800 Vevey, Switzerland, assignor to Gerard Muller, Vevey, Switzerland

Continuation of Ser. No. 268,135, May 29, 1981, abandoned. This application Aug. 28, 1987, Ser. No. 90,468
Claims priority, application European Pat. Off., Jun. 12, 1980, [illegible]
Int. Cl.[4] G02C 7/04, 7/06
U.S. Cl. 351—161 10 Claims

1. A contact lens for oriented optical correction having a

horizontal axis of stabilization, a central optical zone and a peripheral zone, wherein said lens comprises in its peripheral zone means adapted for cooperative engagement with at least one eyelid of a wearer for orientation of said lens about said



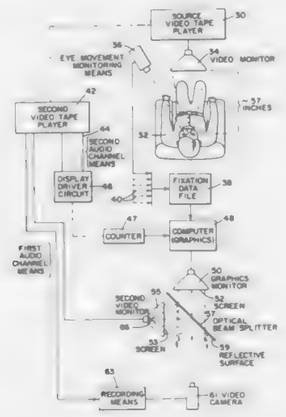
horizontal axis of stabilization, said means including at least two stabilizing bosses protruding from said lens surface, said bosses being disposed on or symmetrically to said horizontal axis of stabilization.

4,859,050

METHOD AND SYSTEM FOR GENERATING A SYNCHRONOUS DISPLAY OF A VISUAL PRESENTATION AND THE LOOKING RESPONSE OF MANY VIEWERS

Joshua D. Borah, Mansfield; James C. Merriam, West Newton, and Jose Velez, Brookline, all of Mass., assignors to Applied Science Group, Inc., Waltham, Mass.

Division of Ser. No. 931,234, Nov. 17, 1986, Pat. No. 4,755,045, which is a continuation-in-part of Ser. No. 848,154, Apr. 4, 1986, abandoned. This application Feb. 8, 1988, Ser. No. 153,438
The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.
Int. Cl.[4] A61B 3/14
U.S. Cl. 351—210 7 Claims



1. A method of generating and displaying visual fixation data obtained from individuals viewing a visual presentation wherein said visual fixation data is superimposed, in real time synchrony, upon said visual presentation, said method comprising the steps of:

(a) providing a visually neutral viewing room with a video monitor positioned therewithin for displaying said visual presentation to one or more individuals;

(b) displaying said visual presentation to said one or more individuals in said room by way of said video monitor;

(c) directing a dimly visible beam of collimated near-infrared light into the pupil of an eye of one of said individuals;

(d) positioning a video camera so as to record the pupil center and corneal reflection of the eye upon which the same beam of collimated near-infrared light is directed;

(e) providing a control unit operatively connected to said video camera and adapted to determine and provide raw eye position measurements of the point of gaze of said individual by monitoring the vector between the pupil center and the point at which said beam of collimated near-infrared light rays reflects from the cornea of said eye of said individual;

(f) providing a computer adapted to extract from the said raw eye position measurements of a series of eye fixation variables, each such fixation being defined by its starting time, duration and X and Y coordinates as spacially related to said video presentation and further, to reformat such eye fixation data to facilitate their storage in retrievable form; and to expedite the formation of dynamic plots of said series of eye fixations so obtained;

(g) providing a means for optically or electronically combining, in real time synchrony, said dynamic plot of said visual fixation points with said visual presentation to provide a real time synchronized composite display; and,

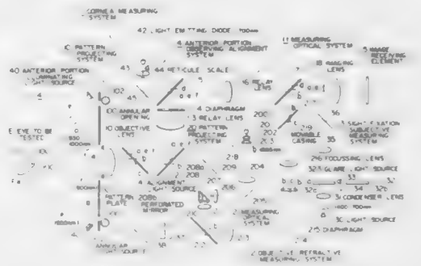
(h) containing and partially concealing the source of said beam of near-infrared red light and said camera within a common housing positioned within said visually neutral viewing room.

4,859,051

EYE TESTING APPARATUS

Yasufumi Fukuma; Ikuo Kitao, and Yasuo Kato, all of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,718
Claims priority, application Japan, Dec. 25, 1986, 61-310009
Int. Cl.[4] A61B 3/10
U.S. Cl. 351—211 17 Claims



1. An eye testing apparatus, in which a corneal reflecting image and a retinal reflecting image formed by projecting a target mark image onto a cornea and a retina of an eye to be tested are projected to a light receiving portion through a measuring optical system, and in which a corneal configuration and a refractive power of the eye to be tested are measured according to a signal detected by the light receiving portion comprising:

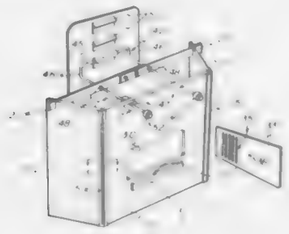
a two-dimensional light receiving element in said light receiving portion, and wherein said measuring optical system includes a means for simultaneously projecting said corneal reflecting image and said retinal reflecting image in separate optical paths to different areas of said two-dimensional light receiving element for simultaneously reception.

4,859,052

PORTABLE SCREEN ASSEMBLY FOR VISUAL ACUITY TESTING

Diana R. McFarland; Robert P. Ginsburg, and Arthur P. Ginsburg, all of Dayton, Ohio, assignors to Vistech Consultants, Inc., Beavercreek, Ohio

Continuation of Ser. No. 207,464, Jun. 16, 1988, abandoned.
This application Nov. 4, 1988, Ser. No. 268,629
Int. Cl.[4] A61B 3/02
U.S. Cl. 351—239 10 Claims



1. A portable screen assembly for use in combination with a visual acuity testing card to test the visual acuity of a person located in a predetermined testing position, comprising:
(a) a main panel having front and back sides and having an opening therethrough,
(b) a pair of sides panels hingedly connected to the opposite side edges of said main panel whereby each said side panel is movable to a position defining a predetermined obtuse angle with the front side of said main panel so that said three panels constitute a free standing screen facing said testing position,
(c) a brace member,
(d) means for movably connecting the opposite ends of said brace member to the upper free corners of said side panels to hold said side panels in said fixed angular relation with said main panel, and
(e) means on said back side of said main panel for supporting a visual acuity test card for viewing from the opposite side of said screen through said opening.

4,859,053

PROJECTING APPARATUS WITH SPHERICAL SCREEN, MORE PARTICULARLY FOR ADVERTISING PURPOSES

Pierre Nicolas, 38 rue Chef de Ville, 92140 Clamart, France

Filed Oct. 16, 1986, Ser. No. 919,440
Claims priority, application France, Oct. 10, 1985, 85 15032
Int. Cl.[4] G03B 21/10
U.S. Cl. 353—74 4 Claims



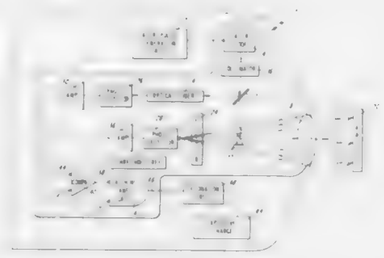
1. A projecting apparatus comprising a spherical screen having a front half-sphere incorporting a translucent screen and a rear half-sphere, the rear half-sphere being opaque except in a central region in order to permit a projection of images arriving from an optic means of an image projector positioned behind the screen, support means being provided for mounting the projecting apparatus, the image projector having a front face, the front face of the image projector comprising a platen mounted in front of the optic means of the image projector, the platen carrying a rotary polarization filter rotated by a first motor, said polarization filter being occultable by a rotary flap rotated by a second motor whereby the various points of the rotary flap will describe circles of equal radius, the rotary flap being mounted on respective spindles placed on a same vertical plane and rotating in synchronism under action of the second motor.

4,859,054

PROXIMITY FUZE

Thomas R. Harrison, Stockton, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 10, 1987, Ser. No. 71,952
Int. Cl.[4] G01C 3/08; F42C 13/02
U.S. Cl. 356—5 7 Claims



1. Optical ranging apparatus comprising:
laser light pulse means for generating a series of target ranging light pulses and optical reference light pulses;
means for directing the target ranging light pulses toward a target;
means for collecting light pulses reflected from the target;
optical delay means for delaying the optical reference pulses a time corresponding to a predetermined distance of the apparatus from the target;
converter means for providing electrical signals corresponding to the light pulses reflected from the target, and signals corresponding to the light pulses from the optical delay means; and
circuitry means for providing an output signal only when the signals corresponding to light pulses reflected from the target coincide with the signals corresponding to light pulses from the optical delay means, said output signal occurring only when the distance from the target is equal to the predetermined distance from the target.

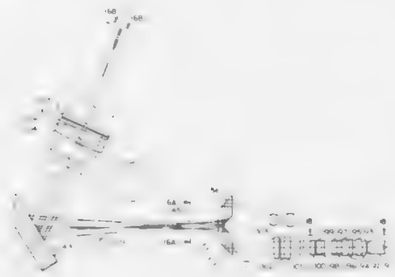
4,859,055

LASER VELOCIMETER

George Gal, Palo Alto, and Howard E. Morrow, San Jose, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed May 17, 1988, Ser. No. 194,781
Int. Cl.[4] G01P 3/36, 5/22; G02B 9/00
U.S. Cl. 356—28 41 Claims

1. A method for determining velocity of an object relative to particles in a gaseous mass surrounding said object, said method comprising the steps of:
(a) projecting a plurality of pairs of beams of optical radiation from said object to a measurement volume that is spaced apart from said object, each pair of said plurality of pairs of beams consisting of two beams that are generally ribbon-shaped and substantially parallel to each other and that are separated from each other by a predetermined distance at the measurement volume, the two beams of each pair of said plurality of pairs of beams being nonparallel to the beams of every other pair of said plurality of pairs of beams at the measurement volume, the particles in said gaseous mass at the measurement volume scattering optical radiation from the two beams of each pair of said plurality of pairs of beams;
(b) gathering a portion of the optical radiation scattered by said particles in said gaseous mass surrounding said object from the two beams of each pair of said plurality of pairs of beams at the measurement volume;
(c) discriminating the gathered optical radiation scattered from each of the two beams of each pair of said plurality



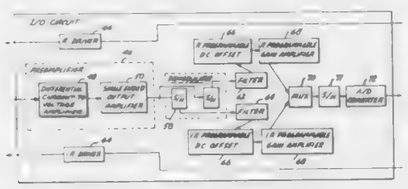
of pairs of beams at the measurement volume from the gathered optical radiation scattered from every other beam of said plurality of pairs of beams at the measurement volume;
(d) generating a plurality of pairs of electrical signals, each electrical signal being related to the scattering of optical radiation from a corresponding beams of said plurality of pairs of beams at the measurement volume;
(e) processing said plurality of pairs of electrical signals to measure time intervals required for said particles to traverse the predetermined distance between the two beams of each pair of said plurality of pairs of beams at the measurement volume, and to calculate components of velocity of said particles relative to said object; and
(f) determining a velocity vector for said object relative to said particles from said calculated components of velocity.

4,859,056

MULTIPLE-PULSE METHOD AND APPARATUS FOR USE IN OXIMETRY

Stephen J. Prosser, Lynnwood, and Robert E. Smith, Edmonds, both of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Filed Aug. 18, 1986, Ser. No. 897,661
Int. Cl.[4] G01N 33/48
U.S. Cl. 356—41 29 Claims



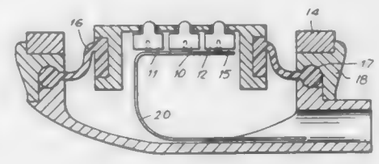
1. An apparatus for determining the oxygen saturation of arterial blood flowing in tissue that is illuminated with light at two wavelengths, the light being received upon emergence from the tissue by detection means that produces signals that are proportional to the intensity of the light received at each of the wavelengths, the intensity of light received being a function of at least one time-dependent absorption coefficient, said apparatus comprising:
sampling means for determining the magnitude of said signals at a plurality of sample times spaced over an interval greater than the period of one pulse as exhibited by said arterial blood flowing in said tissue; and
processing means for producing a single indication of said oxygen saturation that is corrected for any time-dependent variation in said absorption coefficient from said sample times and the magnitudes of said signals at said sample times.

4,859,057

OXIMETER APPARATUS

Steve Taylor; Dale Nelson, both of Camarillo, and Don Gorney, Simi Valley, all of Calif., assignors to Lawrence Medical Systems, Inc., Camarillo, Calif.

Filed Oct. 13, 1987, Ser. No. 108,164
Int. Cl.[4] A61B 5/00; G01N 33/16
U.S. Cl. 356—41 8 Claims



1. In a reflectance oximeter comprising a s ens or having a red light source, an infrared light source, and a photodetector for receiving light from said sources reflected from tissue, the improvement wherein said sensor comprises a housing having an aperture, a sensor carrier, said light sources and photodetector being mounted to have active light emitting and light receiving surfaces respectively at one side of said carrier, an electrical connection arrangement for said sources and photodetector within said housing, and resilient means for mounting said carrier in said aperture, whereby said carrier floats with respect to said housing.

4,859,058

IMPROVED ADJUSTMENT MEANS FOR SIGHTING INSTRUMENT

Per-Olof S. Ekstrand, 2820 SE. 7th Ave., Ocala, Fla. 32671

Filed Jul. 9, 1987, Ser. No. 71,731
Int. Cl.[4] G02B 23/10
U.S. Cl. 356—251 14 Claims



1. An optical sighting instrument, comprising:
a tubular lens housing having front and rear apertures;

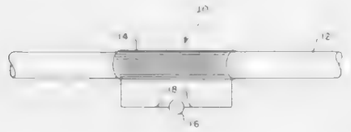
a lens mounted within said lens housing and having a concave light reflecting surface facing said rear aperture;
a light source located within said lens housing and relative to said concave surface so as to generate a light point image viewable as a sighting mark at a point ahead of said surface by an observer looking through the sighting device from said rear to said front aperture;
means for fixedly mounting said lens housing to a firearm;
a tubular circuitry housing;
means connecting a power source received within said circuitry housing to said light source in said lens housing;
bracing means supporting said circuitry housing at a fixed position spaced from said lens housing; and
means for rotating said circuitry housing relative to said mounting means, while maintaining its fixed position relative to said lens housing, from a first position in which the circuitry housing is located to the left of said lens housing, as seen from the rear aperture, to a second position in which the circuitry housing is located to the right of said lens housing.

4,859,059

THERMAL MODULATION OF LIGHT BEAMS

Lloyd C. Bobb, Warminster; Barbara J. White, Hatboro, and Jon P. Davis, Willow Grove, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 13, 1988, Ser. No. 145,020
Int. Cl.[4] G01D *9/02*
U.S. Cl. 356—345 **6 Claims**



1. In a modulator of the type which controls the phase of a light beam passing through an optical fiber waveguide, the improvement comprising:
an electrically resistive element disposed about a longitudinal portion of the optical fiber to establish a cylindrical thermal interface therebetween, said resistive element generating heat when a predetermined level of current is passed therethrough to cause thermal expansion in the optical fiber which varies the refractive index thereof in accordance with the desired phase modulation.

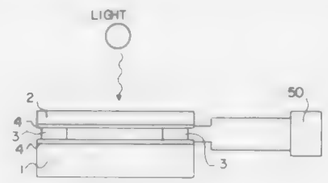
4,859,060

VARIABLE INTERFEROMETRIC DEVICE AND A PROCESS FOR THE PRODUCTION OF THE SAME

Masayuki Katagiri; Masanori Watanabe, both of Nara; Kazutaka Uda, Tenri; Masaya Hijikigawa, Yamatokoriyama; Shuhei Tsuchimoto, and Yasuhiko Inami, both of Nara, all of Japan, assignors to 501 Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 25, 1986, Ser. No. 934,843
Claims priority, application Japan, Nov. 26, 1985, 60-266680; Dec. 18, 1985, 60-285959; Apr. 30, 1986, 61-102989; May 13, 1986, 61-110290
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—352 **18 Claims**

1. A variable interferometric device comprising a Fabry-Pérot interferometer including a pair of reflecting substances facing each other with a space therebetween formed by spacers, wherein one of said reflecting substances is replaced by a substrate on which a photodetector is formed, resulting in a



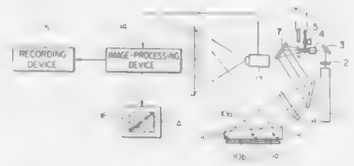
single body structure incorporating said Fabry-Pérot interferometer and said photodetector into a single body.

4,859,061

FLATNESS EXAMINING DEVICE

Katsuyo Inoue, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 715,535, Mar. 25, 1985. This application Nov. 12, 1987, Ser. No. 122,536
Claims priority, application Japan, Mar. 31, 1984, 59-64550
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—359 **7 Claims**



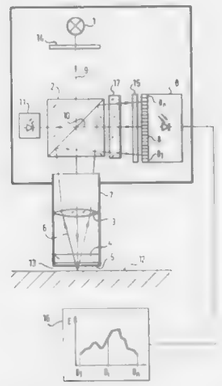
1. A flatness examining device comprising
a radiation beam generating means,
an objective lens for enlarging a radiation beam,
a converting means for converting said enlarge radiation beam into a parallel beam,
an optical means having a reference plane, in which a test plane to be measured is placed opposite said reference plane and said optical means introduces said parallel beam at an incident angel onto both said reference plane and said test plane produce at least one interference fringe, and
a pattern recognizing member capable of transmitting said enlarged radiation beam therethrough in a radiation beam path between said objective lens and said converting means, said pattern recognizing member adapted to be inserted into and removed from said path and capable of changing its inclination by a predetermined angle to the radiation beam path so that said pattern recognizing member can shift the enlarged radiation beam, thereby changing the incident angle of said parallel beam onto said reference plane, whereby whether the test surface is convex or concave is recognized.

4,859,062

OPTOELECTRICAL MEASURING SYSTEM AND APPARATUS

Gerhard Thurn, Otto-Suhr-Allee 143, 1000 Berlin 10, and Theodor Gast, Bergstr. 1, D-1000 Berlin 39, both of Fed. Rep. of Germany

Continuation of Ser. No. 301,969, Sep. 14, 1981. This application Jan. 22, 1985, Ser. No. 932,234
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1980, 3037622
Int. Cl.[4] G01B *11/30;* **G01N** *21/55*
U.S. Cl. 356—371 **21 Claims**



1. Apparatus for determining the roughness and structure, respectively, of a surface area of workpieces, said apparatus comprising a source of light having a beam, the rays of which are substantially parallel and directed substantially perpendicularly onto the surface area to be examined; a plurality of detectors arranged in an array so that each said detector senses the light scattered from said surface area within a given solid angle to measure the light intensity at a scattering angle in the distribution different from that measured by the other detectors, and an analyzing circuit means responsive to the outputs of said detectors to determine an integral characteristic value from the values of intensity measured by said detectors and from the scattering angles to thereby analyze and determine the surface roughness and structure, respectively, in the following manner:
(a) at first determining standardized light intensity values p_i according to the equation

$$p_i = \frac{D_i \cdot g_i}{\sum_{i=1}^{n} D_i \cdot g_i}$$

wherein D_i is the light intensity of the scattered light measured by the respective detector i, n is the number of detectors, and g_i is a correction factor for the respective light intensity value D_i;
(b) then determining an average angle $\bar{w}$ of the scattered light by the detectors i from the values p_i and the scattering angles according to the equation:

$$w = \sum_{i=1}^{n} w_i \cdot p_i$$

wherein w_i is the scattering angle at which the respective detector i measures the intensity of the scattered light; and
(c) at last determining an integral characteristic value S_x from from the value $\bar{w}$ and the values p_i and w_i according to the equation:

$$S_x = \sum_{i=1}^{n} |w_i - w|^x \cdot p_i$$

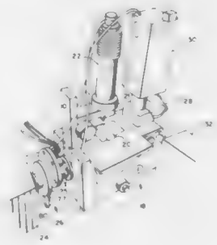
where x=1 or 2.

4,859,063

IMAGING MICROSPECTROFLUORIMETER

Fredric S. Fay; Kevin E. Fogarty, both of Worcester, and Cyril Rodgers, Paxton, all of Mass., assignors to University of Massachusetts Medical Center, Worcester, Mass.

Continuation of Ser. No. 34,777, Apr. 3, 1987, abandoned, which is a continuation-in-part of Ser. No. 900,407, Aug. 26, 1986, Pat. No. 4,744,667, which is a continuation-in-part of Ser. No. 828,766, Feb. 11, 1986, abandoned. This application May 31, 1988, Ser. No. 204,931
Int. Cl.[4] G01N *21/64*
U.S. Cl. 356—418 **15 Claims**



1. A microscope comprising:
means for locating a sample;
a source of radiation for illuminating the sample;
a detector for detecting radiation from a microscopic portion of the sample;
a filter assembly in an optical path between the source and the detector, the filter assembly comprising a plurality of removable bandpass filters having different pass bands mounted to a filter carrier and
circumferentially spaced about a filter axis offset from said optical path and filter drive means for rotating the filter carrier about the filter axis to selectively move selected ones of the plurality of filters into said optical path to change the wavelengths of radiation passed through the filter assembly;
means for sensing the position of the filter carrier as each filter is positioned in the optical path; and
electronic processor means for controlling imaging of the sample, the processor automatically controlling the filter drive means to sequentially position predetermined one of the filters in the optical path and sequentially adjusting the image plane of the detector to obtain plural images at different image planes with each of plural filters.

4,859,064

DIFFUSE REFLECTANCE SPECTROSCOPY SYSTEM AND METHOD

Robert G. Messerschmidt, Westport, and Donald W. Sting, New Canaan, both of Conn., assignors to Spectra-Tech, Inc., Stamford, Conn.

Filed May 9, 1988, Ser. No. 191,980
Int. Cl.[4] G01N *21/47*
U.S. Cl. 356—446 **15 Claims**

1. A diffuse reflectance spectroscopy system comprising:
a source of energy;
a sample at a sample plane;
means to direct the energy from the source of energy to a focus at a field stop plane;
a filter at the field stop plane operative to reflect the energy

from the source of energy toward the sample in spatially separated energy bands; and

means to direct the energy bands onto the sample at the sample plane in focus to form an image of the filter at the sample plane and to return energy reflected from the sample to the filter;



the filter being operative to direct specularly reflected focused energy from the sample out of the system and to direct diffusely reflected unfocused energy from the sample to a detector.

4,859,065

TEMPERATURE MEASUREMENT

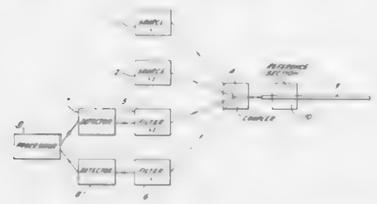
Geoffrey W. Bibby, Leatherhead, England, assignor to Central Electricity Generating Board, London, England

Filed Oct. 7, 1986, Ser. No. 916,142

Claims priority, application United Kingdom, Oct. 18, 1985, 8525714

Int. Cl.[4] G01J *5/60*

U.S. Cl. 356—45 **10 Claims**



1. A method of measuring temperature sensed by a temperature sensing element comprising the steps of:

consecutively launching into said temperature sensing element input pulses of light at two different wavelengths, λ_1 and λ_2, to obtain from said temperature sensing element Raman scattered light driving from the input pulses, at wavelengths λ_2 and λ_1 respectively;

applying the Raman scattered light to an intensity detector or detectors;

obtaining from said detector or detectors output signals indicative of the intensity of the Raman scattered light at the wavelengths λ_2 and λ_1 deriving from the input pulses at wavelengths λ_1 and λ_2 respectively; and

processing the output signals to provide a temperature measurement;

the wavelengths λ_1 and λ_2 being chosen such that

$$1/\lambda_1 - 1/\lambda_2 = \nu$$

where ν is the Stokes shift in wavenumber units of the Raman scattered light at wavelength λ_2 arising from input light at wavelength λ_1.

4,859,066

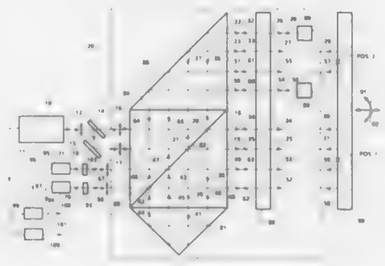
LINEAR AND ANGULAR DISPLACEMENT MEASURING INTERFEROMETER

Gary E. Sommargren, Santa Cruz, Calif., assignor to Zygo Corporation, Middlefield, Conn.

Filed Jul. 8, 1988, Ser. No. 216,844

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—349 **74 Claims**



1. An interferometer system capable of simultaneously measuring linear displacement and angular displacement of a movable plane mirror comprising a source of a frequency stabilized input beam with two linear orthogonally polarized components; means disposed for dividing said input beam into two parallel, spatially displaced beams each having a pair of orthogonally polarized components; means disposed for reflecting one of said two polarization components of the first of said two parallel beams twice from said movable plane mirror to produce a first output beam and for reflecting the other of said polarization components of the first of said two parallel beams twice from a stationary plane mirror to produce a second output beam; means disposed for recombining said first and second output beams into a third output beam having two orthogonally polarized components in which a phase difference between said two orthogonally polarized components of said third output beam is related to the linear displacement of said movable plane mirror; means for mixing said orthogonal components of said third output beam; means for producing a first electrical measurement signal; means associated with said first electrical measurement signal for indicating a first measured phase, said first measured phase being related to the linear displacement of said movable plane mirror; means for reflecting one polarization component of the second of said two parallel beams twice from a first position on said movable plane mirror to produce a fourth output beam and for reflecting the other polarization component of said second of said two parallel beams twice from a second position on said movable plane mirror to produce a fifth output beam, said two positions being spatially separated from each other; means for recombining said fourth and fifth output beams into a sixth output beam having a pair of orthogonally polarized components; means for mixing said orthogonal components of said sixth output beam having two orthogonally polarized components in which a phase difference between said two components of said sixth output beam is related to the angular displacement of said movable plane mirror; means for producing a second electrical measurement signal; and means associated with said second electrical measurement signal for indicating a second measured phase, said second measured phase being related to the angular displacement of said movable plane mirror; whereby said linear and angular displacement of said movable plane mirror may be simultaneously accurately measured in a single interferometer system.

4,859,067

BULK MATERIAL MIXER

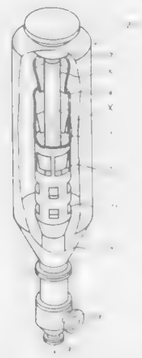
Hans Hoppe, Vogt, Fed. Rep. of Germany; Theodor Breucker, Montreal, Canada; Reinhard Ernst, and Robert Storf, both of Weingarten, Fed. Rep. of Germany, assignors to Waeschle Maschinenfabrik GmbH, Ravensburg, Fed. Rep. of Germany

Filed Mar. 12, 1987, Ser. No. 25,125

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1986, 3608650

Int. Cl.[4] B01F *13/00*

U.S. Cl. 366—341 **9 Claims**



1. A mixing device in particular for bulk material, comprising:

a container defining an axis; and

means for withdrawing substreams of material at various levels during the flow of the bulk material and including a tube defining an interior space and extending in direction of said axis within said container, said tube including a plurality of inlet openings at various levels thereof for allowing substreams of material to enter said tube, said inlet openings having a cross section from inlet opening to inlet opening increasing with ascending level from bottom to top in such a manner that substreams withdrawn from various levels are at least approximately the same per unit of time.

4,859,068

SCREW TYPE EXTRUDER WITH FLOW CHAMBERS EXTERNALLY AND INTERNALLY OF SCREW

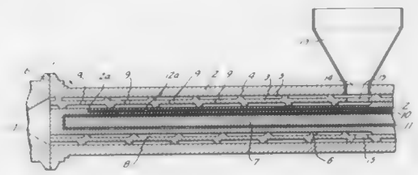
Giovanni Sironi, Osnago, Italy, assignor to Societa' Cavi Pirelli S.p.A., Milan, Italy

Filed Jun. 20, 1988, Ser. No. 209,229

Claims priority, application Italy, Jun. 30, 1987, 21106 A/87

Int. Cl.[4] B29C *47/04*

U.S. Cl. 366—76 **14 Claims**



1. An extruder or polymeric materials, said extruder comprising:

an outer elongated stationary body having a cylindrical bore defined by an inner wall;

an elongated hollow and rotatable screw with an exterior surface and an inner wall, said screw being disposed within said bore and extending from a first portion of said cylindrical bore to a second portion of said cylindrical bore, said screw having first threads of a first sense extending radially outwardly from the exterior surface thereof, said wall of said cylindrical bore and said exterior surface of said screw defining an external material flow chamber, and said screw having a passageway internally thereof defined by said inner wall of said screw and extending from a first portion of said cylindrical bore to a second portion of said cylindrical bore, said screw having second threads extending radially inwardly from said inner wall of said screw and said second threads having the same sense as said first threads;

an inner stationary cylindrical body disposed within said passageway and having an exterior surface adjacent said second threads to define an internal material flow chamber between said inner wall of said screw and the exterior surface of said cylindrical body extending from said first portion to said second portion of said cylindrical bore; and

means for supplying a polymeric material to said first portion of said cylindrical bore;

whereby said rotatable screw with said first threads and said second threads acting respectively in conjunction with said inner wall of said outer stationary elongated body and in conjunction with said exterior surface of said inner stationary cylindrical body provides a high flow rate of polymeric material supplied to said first portion of said cylindrical bore to said second portion of said cylindrical bore without increasing the temperature of the polymeric material to a value which causes deterioration of the polymeric material.

4,859,069

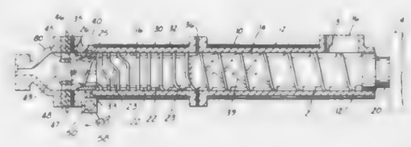
EXTRUSION APPARATUS

Paul Geyer, 15660 Tacoma, Detroit, Mich. 48025

Filed May 12, 1988, Ser. No. 193,007

Int. Cl.[4] B29B *1/06*

U.S. Cl. 366—77 **7 Claims**



1. An apparatus for the straining and processing of plastic and rubber like materials, said apparatus having a rotor rotatably mounted in the bore of a cylindrical barrel and operable to move process material, from one end of said bore to the other, to progressively heat, develop pressure, transport and separate the fine and fluent from the oversize and less fluent process material and to discharge the separated material from different ports:

first means, structurally integral with said rotor and barrel bore, for operably developing heat, pressure and transporting said process material with minimum twining of the process material flow lines;

second means, structurally integral with said rotor and barrel bore, for continuously leading off the fine and fluent process material, from each side of multiple circumferential rotor extrusion grooves into restrictive actuated circumferential openings, as formed between the said barrel bore and tooth tops of the circumferential rotor extrusion grooves, longitudinally from the openings, along the tooth tops to a centrally located tooth top extrusion groove, which intercepts all of the fine and fluent process material and conveys it to ports communicating, from the tooth top extruder groove to the internal bore of said rotor;

third means, structurally integral with said rotor, for leading off the fine and fluent process material as entered into the bore

of said rotor, a stationary helical groove rotor, which due to relative rotational movement, rotor to rotor, extrudes the fine and fluent process material out of the end of the rotor and the extruder, in a smooth and even flow pattern, not subject to the "blips" as caused by the end flights of a rotating extruder screw;

fourth means, structurally integral with said rotor and barrel, continuous, abruptly interconnected circumferential rotor extrusion grooves, which transport the oversize and less fluent process material, rejected by the circumferential restrictive openings, to the downstream end of the straining section, where the material is transferred to a barrel circumferential groove which communicates with ports; and

fifth means, structurally integral with said barrel, and communicating with said last mentioned ports, a metering device arranged to exit the oversize and less fluent process material at a preset rate to atmosphere, without releasing upstream extrusion pressure.

4,859,070

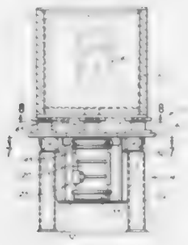
OMNIAXIS APPARATUS FOR PROCESSING PARTICULATES AND THE LIKE

Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Continuation-in-part of Ser. No. 855,130, Apr. 23, 1986, abandoned. This application Apr. 6, 1987, Ser. No. 34,753

Int. Cl.⁴ B01F *11/00;* **B22C** *15/10*

U.S. Cl. 366—114 **19 Claims**



1. Apparatus for processing particulates, comprising:

a vibratory bed including a horizontally disposed bed plate, a support carried by the bed plate, a vertically disposed shaft carried by the support and at least two eccentric weights vertically spaced apart on the shaft, said weights being radially adjustable relative to the shaft and circumferentially adjustable relative to each other, wherein rotation of the shaft imparts vibrational gyratory motion to the bed plate; and

a vessel for the particulates carried atop the bed plate, means between the vessel and the bed plate for permitting unrestrained vertical motion between the vessel and the bed plate and for limiting relative horizontal motion between the vessel and the bed plate, wherein the vessel is movable relative to the bed plate such that vibrational gyratory motion of the bed plate impacts the vessel to cause the vessel to vibrate at multiple frequencies for fluidizing or compacting the particulates in the vessel.

4,859,071

HOMOGENIZING DEVICE FOR A FLUID CARRIED IN A PIPE

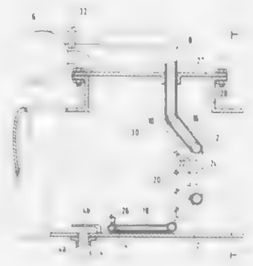
Jacques Woilles, Grenoble, and Pierre Hayward, Saint Cloud, both of France, assignors to Societe Anonyme dite: Alsthom, Paris Cedex, France

Continuation of Ser. No. 829,034, Feb. 13, 1986, abandoned. This application Feb. 22, 1988, Ser. No. 161,389

Claims priority, application France, Feb. 14, 1985, 85 02104

Int. Cl.⁴ B01F *5/04*

U.S. Cl. 366—136 **11 Claims**



1. In a homogenzing device for a liquid forming an axial flow stream in a carrier pipe said liquid comprising two non miscible phases, one of which is continuous and the other of which is discontinuous and forms spurts in said continuous phase, said device comprising:

a tapping opening (**4***a*) in said carrier pipe,

means including a (a) tapping conduit (**4**) coupled to said tapping opening (**4***a*) in said carrier pipe (**2**) and comprising a circulating pump (**6**) to suck off and pressurize a fraction of the flow of said liquid to be homogenized, whereby some of said spurts of said discontinuous phase can be sucked off by said tapping means and some others can constitute remaining spurts in the remaining fraction of said liquid,

an injection nozzles (**20, 22, 24, 26**) for receiving said sucked off and pressurized fraction and forming respective strong cross jets which create swirls in said carrier pipe to homogenize said liquid to be homogenized, whereby said cross jets loose their strength progressively from the said respective injection nozzles, the improvement comprising:

at least some of said injection nozzles being spray nozzles disposed in said carrier pipe such that limited lengths of said respective cross jets from said spray nozzles constitute respective spray jets in a jet grid like pattern which extends over a whole cross section of said carrier pipe and which does not leave any place in said cross section for any one of said remaining spurts to pass at a distance greater than a limited distance from at least one of said spray jets, said limited lengths being substantially less than the diameter of said carrier pipe and said limited distance being less than one-quarter of the diameter of said carrier pipe, such that said any one remaining spurt is then broken into droplets due to the strength and the proximity of said one spray jet.

4,859,072

DEVICE FOR THE CONTINUOUS PRODUCTION OF A LIQUID MIXTURE OF SOLIDS AND LIQUIDS

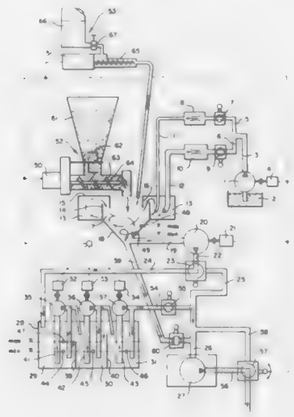
Hans Fey, Hasselroth, and Manfred Czapiewski, Offenbach, both of Fed. Rep. of Germany, assignors to Matra-Werke GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 30, 1988, Ser. No. 237,957

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 3729527

Int. Cl.⁴ B01F *15/02*

U.S. Cl. 366—165 **11 Claims**



1. A device for the continuous production of a liquid mixture of solids and liquids comprising:

(a) a container having an annular rotation-symmetric space therein with an at least approximately vertical rotation axis, in which a rotational flow is created, said annular space (**13**) having an overflow edge (**14**) on an inside wall portion thereof (**17**), said container having at least one feed line (**11,12**) therein from which a liquid flow under pressure may be provided tangentially into the annular space (**13**);

(b) a funnel-shaped collecting basin (**18**) located below the overflow edge (**14**);

(c) dosing devices (**52, 53**) for the solid and liquid components having discharge openings therein located above the overflow edge (**14**); and

(d) a pump (**20**) having a suction line (**19**) connected to an outlet provided in the funnel-shaped collecting basin (**18**), said pump (**20**) having a delivery line (**22**) thereof in which a multi-way valve (**23**) is provided that connects the pump to a mixing vessel (**28**) in one switching position and connects the delivery line (**22**) of the pump (**20**) with a suction line (**26**) of a discharge pump (**27**) in another switching position.

4,859,073

FLUID AGITATOR AND PUMP ASSEMBLY

William E. Howseman, Jr., 150 E. Los Angeles Ave., #205, Moorpark, Calif. 93021, and Harold J. Engel, 18932 Olympia St., Northridge, Calif. 91326

Filed Aug. 5, 1988, Ser. No. 228,454

Int. Cl.⁴ B01F *15/02*

U.S. Cl. 366—195 **12 Claims**

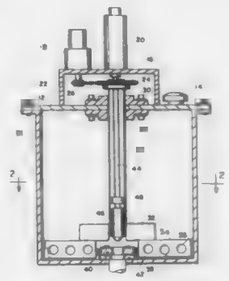
1. A fluid agitator and pump assembly comprising:

a mixing chamber having a top, side walls, and a substantially circular floor with a centrally located fluid exit opening therein;

a tubular shaft within said chamber said shaft being aligned with said fluid exit opening;

at least one mixing blade attached to said tubular shaft, said blade having a bottom edge and outer edges respectively spaced from and adjacent to the interior floor and walls of said chamber;

first means at the top of said chamber for rotating said tubular shaft; and



second means at the top of said chamber and coupled to a drive shaft extending through said tubular shaft for driving a mixture pump at the bottom of said chamber.

4,859,074

CLOSED MIXING MACHINE

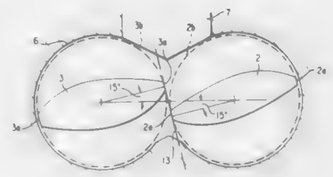
Toshihiro Asai, and Katsunobu Hagiwara, both of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation-in-part of Ser. No. 896,962, Aug. 15, 1986, Pat. No. 4,718,771. This application Aug. 6, 1987, Ser. No. 82,218

Claims priority, application Japan, Aug. 22, 1985, 60-184506

Int. Cl.⁴ B29B *1/06;* **B28C** *1/16*

U.S. Cl. 366—97 **3 Claims**



1. A closed mixing machine, comprising:

a casing defining therein a pair of chambers provided with end frames closing said chambers at end portions thereof; and

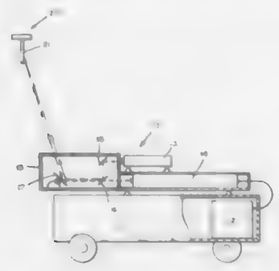
a pair of non-intermeshed rotors mounted on parallel axes disposed within the chambers and adapted to rotate in opposite directions; each said rotor having tips which extend along the length of said rotor and on substantially opposite sides of said rotor, said rotors having a differential rotation ratio of 1.0, said rotor tips being set in position so that a differential phase angle of the rotor tips at an axially central portion thereof of 0±up to 45 degrees is obtained.

4,859,078

LASER THERMAL TESTING METHOD AND SYSTEM FOR USE WITH A FIRE ALARM SYSTEM

Leroy V. Sutter, Jr., Irvine, Calif., and Robert E. Mofley, Eagle River, Ak., assignors to Directed Energy, Inc., Calif. and Atlantic Richfield Company, Del.

Filed Mar. 14, 1988, Ser. No. 167,651
Int. Cl.[4] G01K *15/00*
U.S. Cl. 374—2 1 Claim



1. A laser thermal testing method for use in testing a fire alarm system having a plurality of heat sensors each of which is remotely distributed, utilizing a laser thermal testing system comprising:

a. a first laser which generates an aiming beam of coherent electromagnetic radiation in the visible spectrum;

b. reflecting means for reflecting said aiming beam, said reflecting means being optically coupled to said first laser so that said reflecting means first may be moved to align said aiming beam in a aligned position in order for said aiming beam to be reflected onto one of the heat sensors and then may be fixedly secured in said aligned position;

c. a second laser which generates a heating beam of coherent electromagnetic radiation in the infrared spectrum and which is optically coupled to said reflecting means whereby when said reflecting means is fixedly secured in said aligned position said second laser may be turned on so that said heating beam is reflected onto said one of the heat sensors thereby triggering the fire alarm system during a testing sequence; and

d. transporting means for transporting said first and second lasers and said reflecting means from a first position to a second position,

said laser thermal testing method comprising:

generating an aiming beam of coherent electromagnetic radiation in the visible spectrum with said first laser,

reflecting said aiming beam with said reflecting means onto one of the fire alarm system heat sensors,

generating a heating beam of coherent electromagnetic radiation in the infrared spectrum,

said heating beam being reflected by said reflecting means onto said one of the fire alarm heat sensors thereby triggering the fire alarm system, and transporting said first and second lasers and said reflecting means from a first position to a second position.

4,859,076

DIFFERENTIAL TEMPERATURE SENSORS

Michael Twerdochlib, Oviedo, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

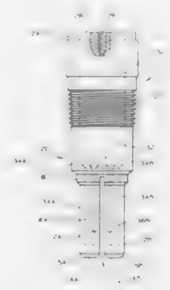
Continuation-in-part of Ser. No. 58,956, Jun. 5, 1987, abandoned. This application May 20, 1988, Ser. No. 196,706
Int. Cl.[4] G01 *01/14;* G01N *25/00*
U.S. Cl. 374—10 26 Claims

1. A differential temperature sensor housing, adapted to be mounted to the sidewall of a pressure vessel and to communicate through a penetration in the sidewall with the fluid state in the pressure vessel, comprising:

a generally cylindrical shank defining a central axis and having a first, free end and a second end;

at least two substantially identical probes each having first and second ends, the first ends thereof forming an integral juncture with the second end of the shank and the probes extending therefrom in laterally spaced relationship relative to the central axis, the probes together defining an outer circumference of reduced diameter relative to the diameter of the shank;

a generally cylindrical chamber extending coaxially within the shank from the free end thereof and defining a base



wall transverse to the central axis adjacent the integral juncture;

the probes having corresponding, symmetrically disposed bores therein, extending in parallel axial relationship relative to the central axis from the base wall and toward the second end of the probe, for receiving associated heater and temperature sensing elements therein; and

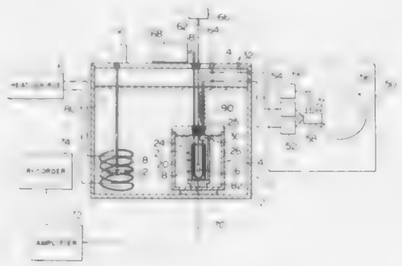
each pair of two probes being related as a differential temperature sensor, selective energization of the heater element of one of the related probes establishing that probe as the heated probe and the other probe of the pair as the reference probe.

4,859,077

PRECISION CALORIMETER

Shoziro Ito, Setagaya; Akihiro Ito, Tama, and Hiroyasu Ito, Niihari, all of Japan, assignors to Shoziro Ito, Japan

PCT No. PCT/JP86/00657, § 371 Date Jul. 2, 1987, § 102(e) Date Jul. 2, 1987, PCT Pub. No. WO87/03964, PCT Pub. Date Jul. 2, 1987
PCT Filed Dec. 26, 1986, Ser. No. 87,254
Claims priority, application Japan, Dec. 26, 1985, 60-294803
Int. Cl.[4] G01K *17/00;* G01N *25/48*
U.S. Cl. 374—33 2 Claims



1. A precision calorimeter comprising:

a temperature-controlled bath container having a heater and an agitator;

a detection bach container disposed in said temperature-controlled bath container, said detection bath container having a detection unit;

said temperature-controlled bath container being filled with a liquid having a specific gravity less than the specific gravity of perfluorocarbon, and said detection bath container being filled with perfluorocarbon; and

said detection unit including a detection element and pipe means for carrying a sample, said pipe means having a mixer and a reference heater, said mixer and said reference heater being positioned between metallic pieces.

4,859,075

APPARATUS FOR THE NON-INVASIVE MEASUREMENT OF THERMAL PROPERTIES AND PERFUSION RATES OF BIOMATERIALS

Harry F. Bowman, Needham, and James C. Weaver, Sudbury, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 828,001, Feb. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 701,434, Feb. 11, 1985, abandoned, which is a continuation of Ser. No. 421,533, Sep. 22, 1982, abandoned. This application May 18, 1988, Ser. No. 195,336
Int. Cl.[4] G01N *25/18;* G01K *17/08;* A61B *5/02*
U.S. Cl. 374—44 15 Claims



1. Apparatus for measuring thermal conductivity, thermal diffusivity and/or fluid perfusion within a biomaterial in a nonsteady state non-invasively comprising:

a. a non-invasive first heat transfer and temperature sensing means positioned in direct thermal communication with said biomaterial,

b. a non-invasive second heat transfer and temperature sensing means positioned in thermal communication with said first heat transfer and temperature sensing means,

c. non-invasive means for changing the temperature of said first heat transfer and temperature sensing means.

d. non-invasive means for changing the temperature of said second heat transfer and temperature sensing means so as to substantially prevent net heat flow between said first heat transfer and temperature sensing means and said second heat transfer and temperature sensing means

e. non-invasive means for quantifying the heat flow between said first heat transfer and temperature sensing means to a surface of said biomaterial, and

f. means for determining thermal conductivity, thermal diffusivity and/or perfusion as a function of time dependent heat dissipation during a period of fixed temperature elevation or measured rate of change of temperature of said first heat transfer and temperature sensing means, by determining a rate of heat transfer between said first heat trasnfer and temperature sensing means and said biomaterial in a coupled fashion in conjunction with boundary and initial conditions,

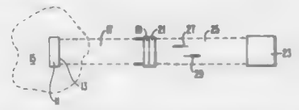
said apparatus having a size and thermal conductivity such that the thermal responsive time of said apparatus between a time of measuring temperature of said first heat transfer and temperature sensing means and a time power is supplied to said first heat transfer and temperature sensing means being less than five seconds.

4,859,079

OPTICAL SYSTEM USING A LUMINESCENT MATERIAL SENSOR FOR MEASURING VERY HIGH TEMPERATURES

Kenneth A. Wickersheim, Menlo Park, and Mei H. Sun, Los Altos, both of Calif., assignors to Luxtron Corporation, Mountain View, Calif.

Filed Aug. 4, 1988, Ser. No. 228,958
Int. Cl.[4] G01J *5/08;* G01K *11/20*
U.S. Cl. 374—131 14 Claims



1. A method of measuring the temperature of an environment or object in excess of 450 degrees centigrade, comprising the steps of:

positioning in thermal communication with said environment or object a quantity of material that is characterized by emitting radiation in the infrared region of the electromagnetic spectrum with an energy level that is proportional to the temperature of said material,

heating an optical temperature sensor by an amount proportional to a fraction of the temperature of said material by positioning said sensor in the path of said infrared radiation a distance from said environment or object, said optical temperature sensor being characterized by modifying incident optical radiation in the visible or near visible region of the electromagnetic spectrum by an amount that varies as a known function of its temperature, thereby to develop a visible or near visible optical signal proportional to the temperature of said sensor,

directing said incident visible or near visible optical radiation toward said sensor, thereby to develop said temperature proportional optical signal,

detecting said temperature proportional optical signal, and

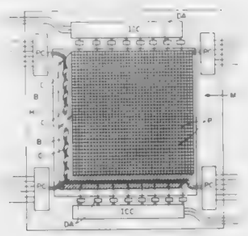
determining from said temperature proportional optical signal the temperature of said material, whereby the temperature of the environment or object is determined.

4,859,080

DYNAMIC THERMAL DISPLAY SIMULATOR

Joseph S. Titus, Sudbury; Dexter Wang, Concord, and Harold A. Graham, Acton, all of Mass., assignors to SSG, Inc., Waltham, Mass.

Filed Jul. 22, 1988, Ser. No. 223,448
Int. Cl.[4] G01K *1/16;* G09G *3/22*
U.S. Cl. 374—134 19 Claims



1. A dynamic thermal display simulator for testing thermal sensors comprising:

a matrix of individually programmable resistive elements,

a plurality of elements being arranged in a linear array on one exposed edge of a narrow board comprising a low thermal conductive, electrically insulating substrate,

a plurality of narrow boards being arranged side-by-side in rows to create the matrix, and a plurality of integrated circuit chips secured to each narrow board.

4,859,081

SURFACE TEMPERATURE SENSOR

Seishiro Kabayashi, Tokyo, Japan, assignor to Anritsu Meter Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1988, Ser. No. 151,668
Claims priority, application Japan, Aug. 4, 1987, 62-193684
Int. Cl.[4] G01K 7/04
U.S. Cl. 374—179 6 Claims



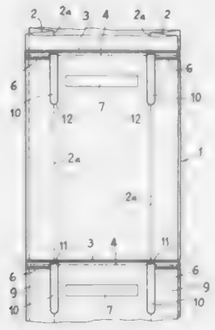
1. A surface temperature sensor comprising a sensor body and a contact member formed of a resilient material and generally in the shape of the latter "C" or "Ω", said contact member including a contact surface at a central portion thereof, support portions formed adjacent the ends of said contact member so that free end sections of said support portions are opposed to each other within the width of said contact surface, and support members on which said support portions are pivotably supported on said sensor body.

4,859,082

CONTINUOUS BAG STRIP

Rafael G. Llorens, and Juan V. Sole, both of Barcelona, Spain, assignors to Esselte Meto, Barcelona, Spain

Continuation of Ser. No. 766,357, Aug. 16, 1985. This application Mar. 10, 1988, Ser. No. 169,167
Claims priority, application Spain, Aug. 29, 1984, 281395
Int. Cl.[4] B65D 33/06
U.S. Cl. 383—8 6 Claims



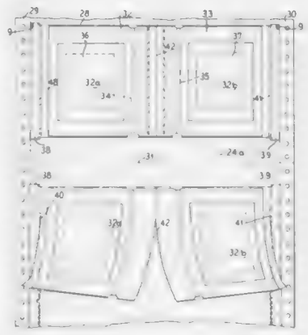
1. A continuous bag strip separable into a plurality of bags comprising a flat, continuous tubular strip of flexible plastic material having opposite sides and longitudinal edges each of which edges has an inward longitudinal fold made along a fold line, said strip having a plurality of longitudinally spaced apart transverse weld lines extending from one longitudinal edge of said strip to the other and a plurality of transverse perforation lines each located close to a respective weld line and extending from one longitudinal edge of said strip to the other such that said strip may be separated at said perforation lines into bags each having a bottom formed by one of said weld lines, each side of said strip having a plurality of longitudinally elongated die-cut openings at the location of each of said fold lines, each opening having two longitudinal edges and two transverse edges; one transverse edge of each opening lying on a perforation line or between that perforation line and the corresponding adjacent weld line and the other transverse edge of each opening being semi-circular in shape where each said bag has a pair of said openings extending in substantially parallel relationship from the perforation line associated with each bag so that each bag has a pair of lobes respectively in the sides thereof, each lobe continuously extending from the perforation line to said semi-circular transverse edges of the openings and being unattached to one another; and a plurality of second transverse weld lines each of which extends from one longitudinal edge of said strip to an adjacent longitudinal edge of one of said openings.

4,859,083

BAG CHAIN ATTACHED TO COMPUTER PAPER

Robert S. Nocek, Stamford, Conn., and Steven Ausnit, New York, N.Y., assignors to Minigrip, Inc., Orangeburg, N.Y.

Filed Apr. 24, 1987, Ser. No. 41,988
Int. Cl.[4] B65D 30/00
U.S. Cl. 383—37 16 Claims



1. A chain-fed multiple bag construction, comprising in combination:
- a continuous web of computer paper having sprocket holes at each side;
- a plurality of sets of double bags on the surface of the web having printable areas thereon so that the areas can be placed in registry with a printer;
- the tops of said bags being in alignment down the center of the web and said adjacent bags attached to each other by lines of weakened tear resistance;
- the bottoms of said bags joined by a continuous bag support strip with a line of weakened tear resistance connecting each bag to the strip;
- and means securing the strip to the surface of the web laterally inwardly of the sprocket holes so that individual bags can be torn from said strip and be removed from the web after printing is added to the bags.

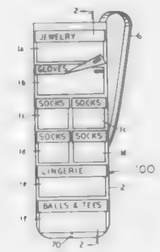
4,859,084

HANGABLE COMPARTMENTED BAG

Jean M. Kaumeyer, 4784 Eddy Dr. E., Lewiston, N.Y. 14092

Filed Aug. 23, 1988, Ser. No. 235,177
Int. Cl.[4] A45C 11/24, 3/12
U.S. Cl. 383—39 17 Claims

1. A bag for holding a plurality of items and being capable of suspension from the inside of a locker door, said bag comprising a substantially two-dimensional backing having a front face, a rear face, an upper edge and a lower edge; suspension means secured to said rear face adjacent to and spaced below said upper edge; said suspension means extending toward said upper edge and away from said rear face, and being confined within the area of said backing; a plurality of pockets secured to and extending forwardly from said front face; said pockets



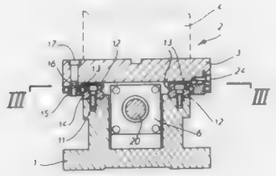
each including two side walls formed as expandable gussets and a front wall; said pockets being arrnged in horizontal rows.

4,859,085

TRAVEL DEVICE FOR A MACHINE TOOL OR A TRANSFER MACHINE

Pierre Buessinger, Colmar-Wintzenheim; Pierre Colin, Wittenheim, and Rene Rudolf, Morschwiller Le Bas, all of France, assignors to Somex S.A., France

Filed Oct. 5, 1988, Ser. No. 253,763
Int. Cl.[4] F16C 29/06
U.S. Cl. 384—45 8 Claims



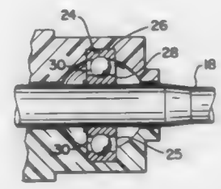
1. Travel device for a machine tool or a transfer machine, comprising:
- a frame provided with two parallel longitudinal components located on each side of a central passage and each provided with at least one longitudinal groove made in a lateral face located on the side opposite the other component,
- a slide mobile in travel, placed above said longitudinal components of the frame and provided with at least one pair of runners guided by balls and disposed opposite one another, each runner comprising a circuit of balls having a section along which the balls emerge laterally from the runner and are engaged in one of said grooves for guiding the slide,
- and means for displacing and positioning the slide along the frame, characterised in that the said longitudinal components of the frame comprise two separate rails (12), detachably fixed on the frame (1), and in that the slide (2) comprises control means for ensuring a prestressing of each runner guided by balls (15) in the groove (13) of the corresponding rail, towards the opposite runner.

4,859,086

APPARATUS WITH NOVEL HOUSING HAVING UNIVERSAL BEARING SUPPORT STRUCTURE

David A. Viecusi, Carlisle, Pa., assignor to General Signal Corporation, Stamford, Conn.

Filed Mar. 28, 1988, Ser. No. 173,971
Int. Cl.[4] F16C 21/00
U.S. Cl. 384—126 6 Claims



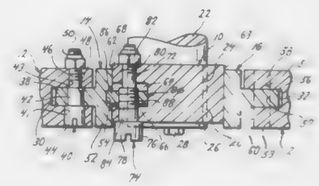
1. A mounting for a bearing which comprises ;
a body having a cavity which includes a first portion which is a spherical section and a second portion thereof which is adjacent to said first portion and which is a cylindrical section, said spherical section being dimensioned and configured for holding a spherical bearing and said cylindrical section being dimensioned and configured for holding a generally cylindrical shaped bearing, whereby from a group consisting of a spherical bearing and a cylindrical bearing can be installed in said body.

4,859,087

ROTARY DIE LATERAL ADJUSTMENT BEARING BLOCK ASSEMBLY

Larry J. Greer, Chesterfield, Mo., assignor to Allied Gear and Machine Co., Inc., St. Louis, Mo.

Filed Oct. 24, 1988, Ser. No. 262,433
Int. Cl.[4] F16C 23/00
U.S. Cl. 384—255 11 Claims



1. An adjustable journal bearing block assembly for a rotary die comprising:
- (a) support means including a slot having opposed sides, at least one of said sides including an elongate groove;
- (b) a bearing block having a journal-receiving opening, said block having opposed sides, at least one of said sides including a groove disposed adjacent to the elongate groove of said support means, said bearing block groove having laterally adjacent sides having a lateral bore passing therethrough,
- (c) key means having a first portion received within said bearing block groove and a second portion extending outwardly of said bearing block groove and received within said slot side elongate groove, said first portion being narrower than said journal block groove for lateral movement therewithin and said second portion being substantially the same thickness as said elongate groove for sliding movement therewithin substantially without lateral movement, and said key means first portion including a threaded opening, and

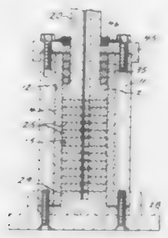
(d) adjustable fastener means received by the bore through the bearing block said fastener means having a threaded portion received within the threaded opening of said key means first portion, whereby rotation of said fastener means moves said journal block laterally with respect to said support means.

4,859,088

THRUST BEARING

Richard A. Fer, 8449 - 7th St., Downey, Calif. 90241

Filed Dec. 16, 1988, Ser. No. 285,751
Int. Cl.[4] F16C *17/08*
U.S. Cl. 384—371 5 Claims



1. A thrust bearing assembly for supporting a rotary workpiece, comprising

a tubular mount provided with a base for the support thereof in a vertical alignment;

a cylindrical shaft conformed for attachment to said workpiece and adapted for insertion into the interior of said tubular mount, said shaft including a cylindrical shank having an upper end proximate said workpiece and a lower end insertable in said tubular mount, said lower end being formed as a circular enlargement receivable in said tubular mount;

a plurality of rings stacked on the exterior of said shank and conformed for sliding receipt in the interior of said mount; and

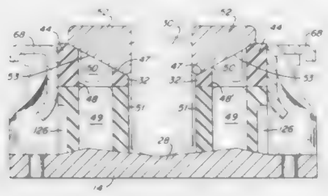
a plurality of discs receivable in a stack in said mount subjacent said enlargement, each said disc having arcuate grooves formed in the faces thereof.

4,859,089

RAILWAY TRUCK SIDE BEARING

James F. Wright, Washington, Pa., assignor to A. Stucki Company, Pittsburgh, Pa.

Continuation of Ser. No. 851,350, Apr. 14, 1986, abandoned.
This application Jan. 12, 1988, Ser. No. 144,667
Int. Cl.[4] F16C *17/04*
U.S. Cl. 384—423 16 Claims



1. In a railway vehicle side bearing having a rigid elongated channel member which is adapted to be affixed to the bolster of a railway vehicle truck to extend in a generally horizontal orientation with upwardly projecting side walls and longitudinally spaced end walls of the channel member having respective uppermost edges to define an upwardly open elongated cavity that is adapted to retain a bearing assembly therein for engagement with a wear plate carried by a railway car body, said bearing assembly comprising:

elastomeric bearing means adapted to be captively received in an upstanding orientation within such a cavity and including at least a pair of elastomeric elements located adjacent the respective end walls of the cavity and providing respective upper end portions;

rigid metallic friction means including a bearing surface portion adapted for frictional engagement with such a wear plate;

said friction means and the respective said end portions including interengageable portions which are mutually cooperable to support said friction means with respect to the channel member in a manner that a portion of each of said elastomeric elements, when deformed by essentially vertical compressive loading upon vertical movement of said friction means with respect to the channel member, is positioned with respect to the respective adjacent end wall such that, upon application to said elastomeric elements of loads directed horizontally of such a channel at least one of the respective said elastomeric elements deforms in horizontal shear; and

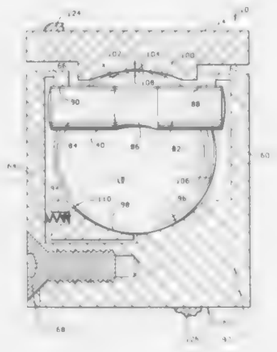
means cooperate with the channel member for limiting vertical movement of said friction means in the direction which produces such essentially vertical compressive loading.

4,859,090

ROTATING CONDUCTIVE HEAT TRANSFER DEVICE

Dennis W. Smith, Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 25, 1988, Ser. No. 236,474
Int. Cl.[4] F16C *33/32, 33/60*
U.S. Cl. 384—463 10 Claims



1. A heat transfer device comprising:

an outer race having an axis;

an inner race coaxial with the outer race;

a plurality of bearing balls disposed in a radial direction between the inner race and the outer race;

a plurality of separators disposed alternately in a peripheral direction between the bearing balls;

a first track and a second track for supporting the separators;

said inner race having a first inner ring portion with a first bearing surface and having a second inner ring portion with a second bearing surface;

said outer race having a third bearing surface disposed in a radial direction opposite to the first bearing surface;

said outer race having a fourth bearing surface disposed in a radial direction opposite to the second bearing surface;

said first and second and third and fourth bearing surfaces being in contact with each bearing ball; and

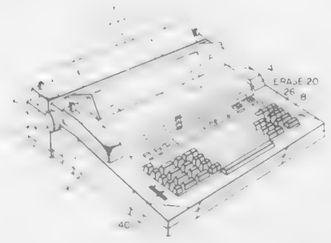
spring means urging the second inner ring portion in an axial direction toward the first inner ring portion for applying first and second and third and fourth forces normal to the respective first and second and third and fourth bearing surfaces.

4,859,091

WORD PROCESSOR INCLUDING SPELLING VERIFIER AND CORRECTOR

Hiroyuki Ueda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1987, Ser. No. 61,971
Claims priority, application Japan, Jun. 20, 1986, 61-145622
Int. Cl.[4] B41J *5/30*
U.S. Cl. 400—63 15 Claims



1. A word processor having a spelling verification and word correction function, comprising:

display means for displaying at least a part of one line of words;

generating means for generating a plurality of candidate correct words for one of the words, in that part of the line displayed by said display means, that is possibly misspelled; and

display control means for controlling said display means to display one of the plurality of candidate correct words together with other words displayed by said display means by replacing the possibly misspelled word with the one candidate correct word.

4,859,092

PORTABLE APPARATUS WITH A MECHANISM FOR HOLDING A DISPLAY ABOVE A PRINTER WHILE THE PRINTER IS PRINTING DATA

Sadao Makita, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 18, 1987, Ser. No. 122,147
Claims priority, application Japan, Nov. 18, 1986, 61-176011[U]
Int. Cl.[4] B41J *3/46*
U.S. Cl. 400—83 18 Claims

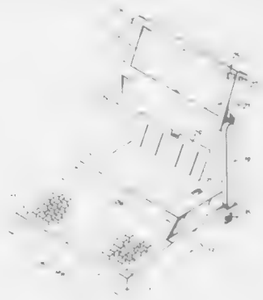
1. A portable apparatus comprising:

a main body having a keyboard toward a front of said main body and a printer toward a rear of said main body;

a display housing for containing a display, adapted to mate with said front of said main body to form a cover for said keyboard;

first mounting means for mounting said display housing to rotate about a first axis; and

second mounting means for mounting said first mounting means to rotate about a second axis, said first mounting means being rotatable between a first position adjacent to said keyboard and a second position which exposes said printer, said display housing being rotatable to mate with said main body and cover said keyboard in one position and to face said display to be visible to an operator in another position when said first mounting means is in said first position.

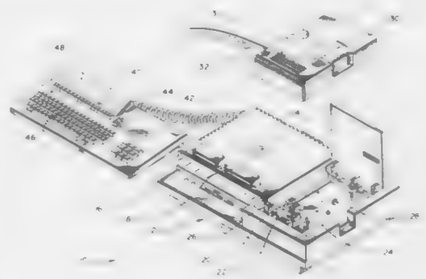


4,859,093

PIXEL PREHEAT SYSTEM FOR AN AUTOMATED THERMAL TRANSFER DEVICE

Michael A. Plotnick, Southampton, Pa., assignor to Kroy Inc., Scottsdale, Ariz.

Filed Mar. 21, 1988, Ser. No. 170,756
Int. Cl.[4] B41J *3/02;* G01D *15/10*
U.S. Cl. 400—120 13 Claims



1. A pixel preheat system for an automated thermal transfer device having an image transfer station comprising a thermal printhead in operative association with a color carrying ribbon and an image carrying tape for transferring a selected image comprised of a set of columns of pixel data from said ribbon to said tape, said thermal printhead having at least one column of pixel heating elements, comprising:

latch means for storing a first column of the pixel data and for shifting out the pixel data after it has been printed by said thermal printhead;

driver means operably connected to said latch means for applying a specified heating voltage to said pixel heating elements in response to the respective pixel data stored in said latch means;

gating means operably connected to said latch means for receiving the pixel data as it is shifted out of said latch means and for combining the shifted out pixel data with a second column of pixel data to generate a column of pixel preheat data associated with the second column of pixel data; and

processing means operably connected to said gating means, said latch means, said driver means and said thermal printhead for transferring the first column of pixel data to said latch means, supplying a strobe signal to said driver means

to cause the respective pixel data stored in said latch means to be printed, enabling said gating means to shift out the first column of pixel data and combine the first column of pixel data with the second column of pixel data to generate the column of pixel preheat data, transferring the column of pixel preheat data to said latch means and supplying a strobe signal to said driver means to cause the preheating of said pixel heating elements for the second column of pixel data,

whereby the temperature of said pixel heating elements is maintained just below a threshold transfer temperature of said ribbon.

4,859,094

BRAILLE PRINTING PLATE

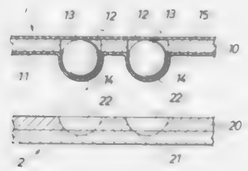
Chozo Okada, 23-20, Yagiyamahoncho 1-chome, Sendai-shi, Miyagi-ken, Japan

Filed Dec. 3, 1987, Ser. No. 128,380

Claims priority, application Japan, Jun. 3, 1986, 61-129961

Int. Cl.⁴ B41J *3/32;* **B41M** *3/16*

U.S. Cl. 400—122 **6 Claims**



1. A braille printing plate, comprising:

a male part including a first board having dot holes selectively formed therein only at locations defining data to be printed in the form of braille characters, a deformable plastic film fixed to said first board and covering one side of said first board, and balls in all of said dot holes projecting outwardly so as to deform said film outwardly therewith, said film thereby having an exterior surface having projecting portions corresponding to the locations of said balls defining raised braille characters; and

a female part including a second board having dot hole receptables in one-to-one correspondence with said projecting portions directly opposing and shaped to respective ones of said projecting portions, whereby a sheet placed between said male part and said female part will have the raised braille characters printed thereon by pressing said female part and said male part together such that said projecting portions are received in the opposing dot hole receptacles.

4,859,095

PRINTING HEAD WITH CURRENT PASSING THROUGH THE PRINT WIRE

Kazuo Watanabe; Yutaka Takahashi, and Masaaki Takimoto, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Aug. 18, 1987, Ser. No. 86,430

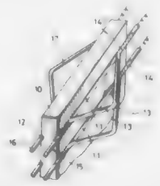
Claims priority, application Japan, Aug. 20, 1986, 61-194837; Aug. 20, 1986, 61-194838

Int. Cl.⁴ B41J *3/12*

U.S. Cl. 400—124 **9 Claims**

1. In a printing head for use a wire-dot printer wherein an actuator pin having one end fixed to a part of said printing head is positioned within a magnetic field and extends generally in a longitudinal direction from said one end to a tip thereof, and current is caused to flow in the actuator pin to generate electromagnetic force by which the actuator pin is deformed to extend said tip in said longitudinal direction to thereby record a dot, the improvement comprising:

said actuator pin being bent at least three longitudinally spaced points in a zig-zag fashion to form at least two V-shaped portions spaced successively in said longitudinal



direction, each V-shaped portion of the pin having an apex and a pair of straight angularly related legs extending therefrom, with the straight angularly related legs of each V-shaped portion being not linearly aligned with the straight angularly related legs of an adjacent V-shaped portion.

4,859,096

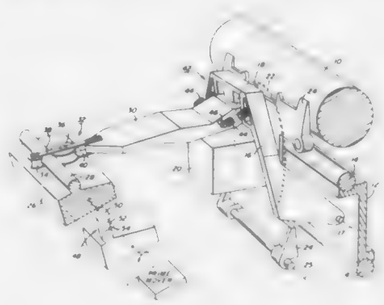
IMPACT MECHANISM FOR IMPACT PRINTER

Helmut K. Waibel, Fremont, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 14, 1988, Ser. No. 206,556

Int. Cl.⁴ B41J *9/133*

U.S. Cl. 400—157.2 **13 Claims**



5. An impact mechanism in an impact printer, for delivering a printing force to drive a character element against a platen by means of a print tip normally spaced from the surface of said platen by a throat distance and movable toward and away from said platen, said character element and said print tip being supported upon a carriage mounted upon said printer for reciprocating movement in a path substantially parallel to the axis of said platen, including

a rockable bail bar having an axis of rotation substantially parallel to the axis of said platen, and constrained to limited angular movement toward and away from said platen, a prime mover connected to said bail bar for imparting the rocking movement thereto,

a push rod for interconnecting said print tip and said bail bar so as to close said throat distance for delivering impact forces to said platen as said bail bar is moved toward said platen,

means for movably coupling said push rod and said bail bar,

rail means on said bail bar for receiving said means for movably coupling, for delivering impact forces from said prime mover to said push rod, and

repositioning means having a receiving portion in alignment

with said rail means so as to accept said means for movably coupling from said rail means, and a remaining portion for maintaining the coupling between said repositioning means and said push rod as said means for movably coupling is moved away from said platen by said push rod and the distance between said print tip and said platen is increased in order to allow said character element to be removed wherein said repositioning means comprises a movable section of rail coextensive with said rail means, and further includes means for mounting said movable section of rail for movement toward and away from said platen, biasing means for urging said section of rail toward said platen, and locating means for aligning said receiving portion with said rail means.

4,859,097

RIBBON CARTRIDGE FOR TYPEWRITERS OR SIMILAR OFFICE MACHINES

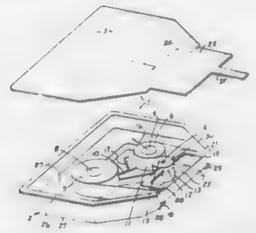
Klaus-Dieter Frericha, Schortens, Fed. Rep. of Germany, assignor to Olympia Werke AG, Fed. Rep. of Germany

Continuation of Ser. No. 731,506, May 7, 1985, abandoned. This application Mar. 25, 1987, Ser. No. 30,734

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418545

Int. Cl.⁴ B41J *32/00*

U.S. Cl. 400—208 **9 Claims**



1. A ribbon cartridge for typewriters or similar office machines having a cartridge-holding device, said cartridge enclosing a ribbon and including a first wall and a side wall having exit and entrance openings through which the ribbon runs outside the cartridge, said cartridge further comprising:

a drive wheel rotatably mounted within the cartridge, said drive wheel being adapted to be coupled through an opening in the cartridge to a drive element of said cartridge-holding device,

said first wall overlying said side wall and enclosing said drive wheel and the portion of said ribbon disposed within said cartridge,

and a sealing member formed integral with said cartridge and being connected to said first wall along a parting line,

said sealing number extending from said first wall to a position overlapping said side wall and overlying and enclosing said exit and entrance openings and the portion of said ribbon outside said cartridge, said sealing member hermetically sealing said cartridge and being removable prior to insertion of said cartridge in said cartridge holder.

4,859,098

PAPER FEEDER FOR A PRINTER

Norio Kawashima, 17-17 Hirado 2 chome, Totsuka-ku, Yokohama-shi, Kanagawa-ken, and Hidemi Haga, Mori-so, 19-9 Nakahama-cho, Isogo-ku, Yokohama-shi, Kanagawa-ken, both of Japan

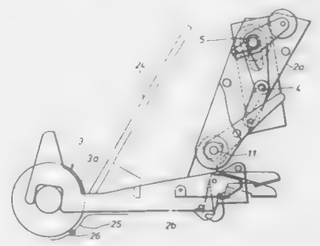
Continuation of Ser. No. 915,154, Oct. 2, 1986, abandoned. This application Mar. 17, 1988, Ser. No. 170,686

Claims priority, application Japan, Oct. 3, 1985, 60-220967

Int. Cl.⁴ B41J *11/26, 13/16*

U.S. Cl. 400—616 **2 Claims**

1. A paper feeder for a printer, said paper feeder comprising a rotatable platen, a roller defining a nip between said platen and roller, a tractor feeder, a first frame supporting the tractor feeder, a second frame attached to said platen, and a detachable paper guide member for feeding cut paper to the platen and including a planar member supported on said second frame, said planar member defining an acute angle between a first surface of said planar member and a horizontal plane, said planar member oriented tangentially to said platen, whereby



said detachable paper guide member guides cut sheet paper directly into said nip;

said second frame rotatably supporting a first end of the first frame whereby the first frame and tractor feeder are rotatable from a first operative position wherein said tractor feeds continuous paper around the platen to a second inoperative position and thereby permitting the paper guide member to be supported by the printer.

4,859,099

AUTOMATIC PAPER LOADING APPARATUS FOR PRINTER HAVING PAPER BAIL ACTUATING DEVICE

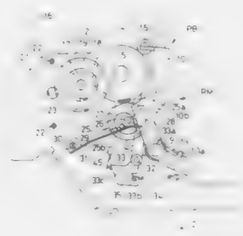
Seiichi Kanemoto, Nagoya, and Mutsuo Fukuoka, Yokkaichi, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Oct. 18, 1988, Ser. No. 259,210

Claims priority, application Japan, Oct. 22, 1987, 62-267530; Mar. 14, 1988, 63-61337

Int. Cl.⁴ B41J *13/36, 13/20*

U.S. Cl. 400—636.1 **12 Claims**



1. An apparatus for automatically loading a printer with a recording medium, comprising:

a support member supported by a frame of the printer, for supporting the recording medium;

a medium feeding mechanism having a medium feeding motor, for feeding the recording medium;

a carriage having a print head mounted thereon and movable in a longitudinal direction of said support member, said carriage having a medium loading standby position;

a medium guide member having a presser portion and pivotally supported by said frame such that said medium guide member is movable between a first position in which said presser portion urges the recording medium against said support member, and a second position in which said presser portion is spaced apart from said support member;

holding means for holding said medium guide member in said first position;

a release member actuated by said medium feeding motor, for pivoting said medium guide member to said second position;

a clutch operable between an operated position for transmitting a motion of said medium feeding motor to said release member, a non-operated position in which said motion is not transmitted to said release member, and an intermediate position between said non-operated and operated positions;

a switching device operable by a movement of said carriage to said medium loading standby position, for operating said clutch from said non-operated position to said intermediate position in which a movement of said carriage away from said medium loading standby position toward a printing area of the printer permits said clutch to return to said non-operated position unless said medium feeding motor is activated; and

a control device for controlling an operation to load the printer with the recording medium, by moving said carriage to said medium loading standby position, and activating said medium feeding motor so as to operate said clutch from said intermediate position to said operated position.

4,859,100

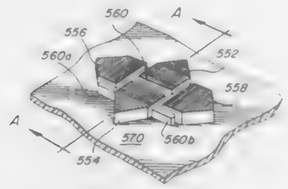
KEYBOARD TO PREVENT ERRONEOUS SIMULTANEOUS ACTIVATION OF KEYS

Vincent Carlson, Lexington; Michael N. Fenlon, Newton; Robert P. Mansur, Chelmsford, and Ronald H. Kadomiya, Cambridge, all of Mass., assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 628,733, Jul. 9, 1984, Pat. No. 4,742,485. This application Jan. 4, 1988, Ser. No. 140,775

Int. Cl.⁴ B41J *5/10;* **G06F** *3/02, 3/14*

U.S. Cl. 400—715 **11 Claims**



1. A keyboard comprising;

a plurality of keys each of which is able to be depressed from an upper resting position to a lower operational position for executing a selected operation, and

a partition extending between adjacent ones of at least some of keys for preventing two or more of said adjacent keys from being simultaneously and inadvertently depressed to their respective operational positions, said partition being dimensioned so that the top of each said adjacent key is positioned above the top of said partition when each said adjacent key is not depressed from its respective resting position and below the top of said partition when each said adjacent key is depressed to its respective operational position.

4,859,101

DEVICE FOR COOLING A CARRIAGE MOTOR AND PRINTHEAD IN A SERIAL PRINTER

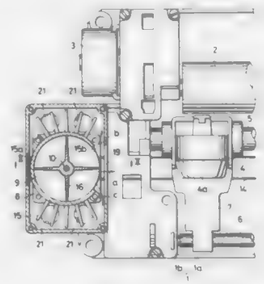
Hiroyuki Sato, and Akio Tajima, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan

Filed Sep. 17, 1986, Ser. No. 908,344

Claims priority, application Japan, Sep. 19, 1985, 60-207104; Sep. 19, 1985, 60-207105

Int. Cl.⁴ B41J *29/00*

U.S. Cl. 400—719 **14 Claims**



1. In a printer having a print head, first heat-dissipating means disposed on the print head for dissipating heat produced by the print head, a reciprocable carriage carrying thereon the print head and mounted to undergo reciprocation within a defined space, and a motor for reciprocatingly driving the carriage: second heat-dissipating means disposed on the motor for dissipating heat produced by the motor; air-flow forming means driven by the motor for forming an air flow; and means defining an enclosure enclosing the air-flow forming means, the motor and the second heat-dissipating means, the enclosure having at least one air-intake port and a plurality of air-exhaust ports, at least one of the air-exhaust ports being positioned in opposed facing relation to the print head, and the enclosure coacting with the air-flow forming means to direct a portion of the air flow onto and over the second heat-dissipating means to thereby effect air cooling of the motor and to direct another portion of the air flow through the air-exhaust port which faces the print head into the defined space and onto and over the first heat-dissipating means to thereby effect air cooling of the print head.

4,859,102

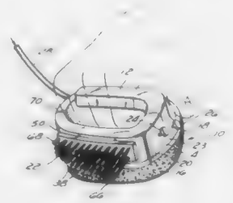
CONTOURED CLEANING DEVICE

Naji Chamieh, 13206 Summertime La., Culver City, Calif. 90230

Filed Mar. 7, 1988, Ser. No. 165,238

Int. Cl.⁴ A46B *11/06*

U.S. Cl. 401—17 **12 Claims**



1. A cleaning apparatus comprising:

an ergonomically shaped body part, having:

a handle joining said body part said ergonomically shaped body part and handle being molded as one piece, said body part defining a recess around said handle adapted to receive the knuckles and fingers of a hand for gripping said handle, and whereby the thumb of said hand extends outwardly of said body part;

a first cleaning device attached to said body part;

a second cleaning device attached to said body part;

a means for providing flowing water to said body part;

a first valve controlling water flowing between said means for providing flowing water to said body part and said first cleaning device;

a second valve controlling water flowing between said means for providing flowing water to said body part and said second cleaning device; and

thumb-operable means controlling said first valve and said second valve.

4,859,103

SELF-SEALING RETRACTABLE WRITING IMPLEMENT

Gotz U. Wittek, Giselastr.3, Munich 40, Fed. Rep. of Germany (D-8000)

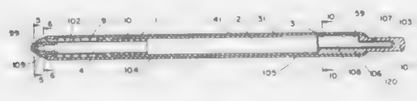
PCT No. PCT/EP86/00306, § 371 Date Mar. 16, 1987, § 102(e) Date Mar. 16, 1987, PCT Pub. No. WO86/07014, PCT Pub. Date Dec. 4, 1986

PCT Filed May 20, 1986, Ser. No. 10,164

Claims priority, application Fed. Rep. of Germany, May 20, 1985, 3518069

Int. Cl.⁴ B43K *24/16, 24/08*

U.S. Cl. 401—108 **5 Claims**



1. Writing implement comprising:

(a) a sleeve-shaped housing comprising an inner sleeve which is disposed substantially within an outer sleeve, said inner sleeve mounted to be relatively displaceable with respect to said outer sleeve in the axial direction to a limited extent, a plurality of segments mounted on the inner sleeve, said segments being, in a writing readiness position, radially spread apart, and in a storage position bearing on each other to form a closure portion of said housing, said segments projecting radially outwardly under biasing and lying partially outside the outer sleeve where said segments have a greater external diameter than the internal diameter of the closure portion end of the outer sleeve, the inner sleeve being biased via a first spring bearing on the outer sleeve in a direction towards the storage position;

(b) a writing element disposed within said housing, said writing element being displaceable between the writing readiness position freeing the tip portion of the writing element, and the storage position wherein said writing element is retracted protecting said tip within said closure portion;

(c) a second spring, bearing against said inner sleeve and said writing element, said second spring requiring a smaller return force than said first spring; and

(d) an actuating element comprising a shift mechanism in engagement with the outer sleeve and two actuating members , said actuating members being axially displaceable with respect to each other and of which a first actuating member acts on the inner sleeve and the second actuating member acts on the writing element, said writing element being biased against said second actuating member by said second spring, said second actuating member also carr ying said shift mechanism and being actuated by said first element.

4,859,104

APPLICATOR DEVICE AND CAP

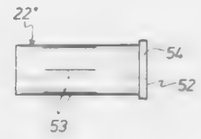
Georg Roeder, Schwabach, and Gerhard Moeck, Kirchenehrenbach, both of Fed. Rep. of Germany, assignors to Schwan-Stabilo Schwanhausser GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Nov. 16, 1987, Ser. No. 121,160

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1986, 3641389

Int. Cl.⁴ B43K *9/00;* **B05C** *1/02;* **A46B** *11/00*

U.S. Cl. 401—202 **2 Claims**



1. In a device comprising:

(a) applicator means having a coating member at an end;

(b) a closing cap having an open end defining an entry orifice and a closed end, said cap sealingly covering said end of said applicator means and thereby also covering the coating member of the applicator means, said closing cap defining a reservoir space in said closed end;

(c) moistened reservoir means in said reservoir space of said closing cap for keeping the coating member moist;

(d) a closing element in the closing cap movable between first and second positions, an open area within the closing element which surrounds the coating member when the closing element is in said second position, wherein when said closing element is in said first position it closes off the reservoir space from the open area and when said closing element is in the second position it opens the reservoir space to the open area; and

(e) a means for moving the closing element into the first position when the closing cap is pulled off the applicator means whereby insertion of the applicator into the cap moves the closing element to the second position;

the improvement wherein:

(f) the closing cap has an inner collar near its entry orifice and a stop located opposite said entry orifice;

(g) the closing element is a longitudinally elastic cap which, in said second position, surrounds the coating member, is shortened and is matched to the shape of the closing cap while remaining spaced from the inner wall of the closing cap;

(h) said closing element has at the closing cap entry orifice an edge pressed axially by the applicator means during the attachment of the closing cap onto the applicator means and interacting with the collar, this edge being movable axially of the closing cap by means of the applicator means in such a way that the edge rests against the collar to substantially seal the reservoir space in the first position of the longitudinally elastic closing element, and is separated from the collar in the other position of the closing element;

(i) the closing element has as end located opposite to the closing cap entry orifice, wherein the closing element end rests against the stop of the closing cap at the end located opposite said closing cap entry orifice for the coating member;

(j) in the relaxed state of the closing element, the distance between the end of the closing element and said edge is no less than the distance between the stop of the closing cap and the collar of the closing cap; and

(k) between said edge and said end of the closing element resting against the stop are means defining slits which open during the shortening of the closing element when the closing cap is attached onto the applicator means.

4,859,105

APPLICATOR BOTTLE

Richard E. Davis, 1010 W. 56th St., Kansas City, Mo. 64113, and Kathryn J. Fuchs, 5625 W. 97th St., Overland Park, Kans. 66207

Continuation of Ser. No. 944,000, Dec. 22, 1986, abandoned. This application Jun. 10, 1988, Ser. No. 205,605
Int. Cl.[4] A46B *11/00*
U.S. Cl. 401—286 1 Claim



1. A device for applying hair treating solution or the like comprising a container having a reduced neck defining a mouth at one end and a bottom wall at the other end, a cap adapted to close said mouth and having an opening through the top wall thereof and brush means secured thereto on opposite sides of said opening, a hair spreader secured to said bottom wall of said container opposite from said neck and extending longitudinally of the container, and a hollow stand open at the top and having a length greater than the length of said hair spreader, said stand having a transverse dimension at said top that is smaller than the transverse dimension of said bottom wall of said container whereby the container will rest on the top of said stand with the hair spreader suspended in said stand and having a transverse dimension at the end opposite from said top sufficient to provide a base for resting said stand on a supporting surface while supporting said container, said stand having a neck at said stop with an outside dimension smaller than the internal dimension of the mouth of said container whereby said neck of said stand is adapted to be inserted into said mouth when the stand is inverted and to function as a funnel for filling said container.

4,859,106

DEVICE FOR CONNECTING TWO COAXIAL COMPONENTS FIXEDLY IN TERMS OF ROTATION

Ernst Elsner, Herbrechtingen; Hans Lindenthal, Heidenheim, both of Fed. Rep. of Germany, and Stewart D. Jelfs, Worcester, England, assignors to J.M. Voith GmbH, Fed. Rep. of Germany

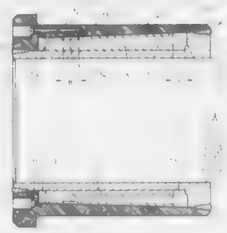
Filed Dec. 2, 1987, Ser. No. 127,414
Int. Cl.[4] F16B *2/04*
U.S. Cl. 403—5 19 Claims

1. A device for fixedly connecting two coaxial objects for rotation together, wherein one object is radially outward and the other object is radially inward, the device comprising:

an inner component around the inner object and an outer component at the outer object; the inner component being coaxially disposed inside the outer component, the outer component having an inner surface and the inner component having an outer surface and the surfaces being respectively shaped for defining between them and enclosing a tapered annular space, and means at the outer and inner components for making the annular space pressure tight relative to the outside;

a tapered shape annular piston located in the annular space, the piston having respective outward and inward annular surfaces adapted for resting sealingly against the inner surface of the outer component and outer surface of the inner component; the piston being axially displaceable in one direction in the annular space selectively for bringing the annular surfaces of the piston to sealingly rest against the annular surfaces of the outer and inner components for pressing the components outward against the objects for causing the objects to rotate together and being axially displaceable in the opposite direction to discontinue the sealing resting;

the device having axially opposite, front and rear end faces, with the front end face being toward the radially narrow end of the tapered annular space and the rear end face being toward the radially wider end of the annular space; a front annular pressure chamber being formed between the front end face of the device and the piston and between the inner and outer components; a rear annular pressure chamber being defined between the rear end face of the device and the rear of the annular piston and between the inner and outer components;



a pressure medium feed duct for supplying pressure medium to each of the pressure chambers; the feed duct including a first duct leading to the front pressure chamber and including a second duct leading to the rear pressure chamber, the second duct extending within a wall of the outer component surrounding the annular space and opening into the annular space;

the annular space having a front region more toward the front chamber than toward the rear chamber; the second duct opening into the front region of the annular space, sufficiently rearward in the annular space that even as the piston shifts axially through the annular space, the axial position of the opening of the second duct is covered by the annular piston;

grooves extending axially along the annular space and connected respectively to the front pressure chamber and to the rear pressure chamber; at least one of the grooves defines a connection for a pressure medium between the opening of the second duct into the annular space and the rear pressure chamber; and

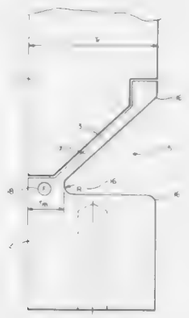
the grooves connecting to the front pressure chamber extend rearwardly from the front pressure chamber and stop short of the region where the second duct opens into the annular space.

4,859,107

STRUCTURES SUBJECT TO BENDING AND FATIGUE LOADING

Robert L. Box, Grange-over-Sands, and Peter R. Cottrell, Barrow-in-Furness, both of United Kingdom, assignors to Vickers Shipbuilding & Engineering Limited, Cumbria, United Kingdom

Filed Dec. 2, 1987, Ser. No. 127,870
Int. Cl.[4] F16T *15/00*
U.S. Cl. 403—24 10 Claims



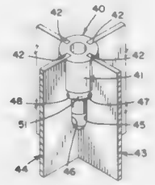
1. A structure comprising first and second components having higher and lower modulii of elasticity, respectively, and secured together at a transistion joint wherein the cross-sectional area and form of a portion of the first of said components in said transistion joint is such that the product of the second moment of area of said portion and the modulus of elasticity for the first component is approximately equal to or less than the product of the second moment of area and the modulus of elasticity for the second component, whereby stress concentrations are reduced when one or both of said components and/or the transition joint between them are subject to bending.

4,859,108

BLIND FASTENER

Charles G. Maddox, Kent, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed Mar. 17, 1988, Ser. No. 169,553
Int. Cl.[4] B25G *3/28*
U.S. Cl. 403—277 11 Claims



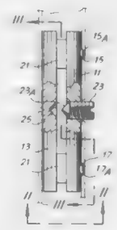
1. A narrow flat structural member with at least one fastener insert therein; said narrow flat member having one edge and an oppositely disposed other edge along with a body portion, at least one fastening hole extending through said one edge and into the body portion, said fastening hole defining oppositely disposed side portions in said body portion, said fastening hole having a notch extending into both side portions and communicating with said hole, a fastener having a head and a sleeve that is received by said fastening hole, said head having a pair of narrow slots that frictionally engage said side portions of said body portion, said fastener having a central bore, said central bore of said fastener having at least a portion thereof threaded, said fastener sleeve having a bulged portion engaging said notches to locate said fastener in said narrow flat member.

4,859,109

EXPANSION TYPE CLAMP FOR CONNECTING COINCIDING ENDS OF TUBULAR COMPONENTS FOR RETICULAR STRUCTURES AND THE LIKE

Giampaolo Targetti, Via Barbacane No. 29, 50133 Firenze, Italy

Filed Aug. 3, 1987, Ser. No. 81,119
Claims priority, application Italy, Aug. 5, 1986, 11774/86[U]
Int. Cl.[4] F16B *7/04*
U.S. Cl. 403—297 1 Claim



1. A clamp for interconnecting the ends of hollow tubular components having inner walls of cylindrical shape, said clamp including:

two stiff elements in opposed cooperable relationship whose external shape is substantially cylindrical and conforms substantially to the cylindrical inner wall shape of each of said tubular components to be connected in end-to-end abutting relationship,

the ends of said elements being chamfered to facilitate insertion of said clamp into the tubular components to be connected,

resilient elastomeric means in the form of a pair of shims interposed between said stiff elements and adhesively bonded thereto to enable resilient lateral movement of one element relative to the other when inserted into opposed ends of said tubular components,

each of said shims being located adjacent each end of said opposed stiff elements,

connecting means located on the surface of at least one of said elements adjacent each end thereof for engaging corresponding connecting means located in the wall of each of said tubular components to secure the tubular components in abutting relationship and against axial separation,

said connecting means on the surface of said element being formed of a truncated cylindrical peg with its upper surface inclined toward the adjacent end of said element to facilitate insertion of said clamp into each end of said tubular components while maintaining resistance of said abuttng tubular components against axial movement,

means for effecting rigid arrangement of substantially maximum separation between said resiliently connected elements after insertion thereof into the ends of said tubular components,

said means including a threaded hole passing through the wall of one of said stiff elements at substantially the abutting positions of said tubular components and a screw with a conical head for said threaded hole,

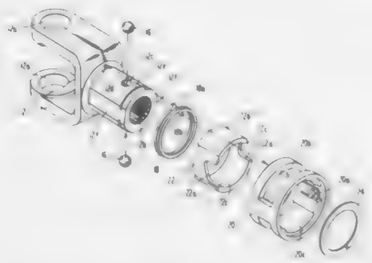
and a conically shaped seat in the wall of the other of said opposed resiliently connected stiff elements for receiving the conical head of said screw to thereby urge said resiliently connected stiff elements apart within the abutting tubular components and thus maintain the clamp capability of resisting axial separation of said abutting tubular components.

4,859,110

AUTOMATIC COUPLING DEVICE

Philip J. Dommel, Doylestown, Pa., assignor to Neapco, Inc., Pottstown, Pa.

Filed Sep. 21, 1988, Ser. No. 247,167
Int. Cl.[4] F16B *21/00*; F16D *1/00*
U.S. Cl. 403—325 **12 Claims**



12. A coupling device including a member having an internally splined opening being adapted to receive an externally splined shaft having a recess therein, locking structure selectively locking the shaft into the opening in the member, said locking structure being biased to a locked position and selectively movable to an unlocked position, said locking structure including means for automatically locking the shaft within the member upon insertion of the shaft into the internally splined opening of the member and structure for allowing unlocking of the shaft from the internally splined member, said locking structure including at least one bore radially disposed in said member, a locking element slidably disposed in said bore and being radially movable from an inner locking position, wherein the element is engageable within the recess in the shaft to prevent relative axial movement of the member with respect to the shaft, and an outer unlocked position, whereby the element permits relative axial movement of the member and the shaft, and rotatable means for maintaining the locking element in the unlocked position with respect to the recess in the shaft while the shaft is being withdrawn or inserted into the opening in the member, said means for maintaining said locking element in the unlocked position being automatically actuated and rotated to the locked position, upon insertion or withdrawal of the shaft from said opening in said internally splined member said locking structure further comprises cam means positioned on the outside of said internally splined member and fixed within a collar having a plurality of openings in the sides thereof into which flexible tabs are adapted to extend.

said cam means and said collar being disposed on the outer surface of said internally splined member for rotation relative thereto.

4,859,111

UNISEX CONNECTOR

Willy Borner, Cupertino, and Kenneth A. McQueeney, Los Gatos, both of Calif., assignors to Balco, Inc., San Jose, Calif.

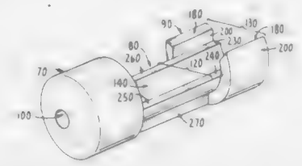
Filed Oct. 6, 1988, Ser. No. 255,123
Int. Cl.[4] F16B *2/04*
U.S. Cl. 403—340 **15 Claims**

1. A connector assembly for connecting first and second flexible lines in precise axial alignment, including:

a first connector having a first axis and a first section for receiving the first flexible line in axial alignment with said first axis, a second section affixed to said first section and having a first outer diameter, a third section affixed to said second section and having a second outer diameter larger than said first outer diameter and a first inner diameter;

a second connector having a second axis and a fourth section for receiving the second flexible line in axial alignment with the second axis, a fifth section affixed to said fourth section and having a third outer diameter, a sixth section affixed to said fifth section and having a fourth outer diameter larger than said third outer diameter and a second inner diameter;

wherein said first inner diameter is substantially equal to said third outer, diameter, and said second inner diameter is substantially equal to said first outer diameter, and



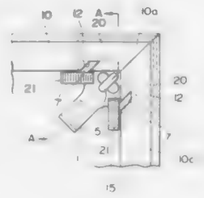
wherein said third section and sixth section include, respectively, first and second clipping means for reversibly engaging said third and first sections, respectively, for clipping said first and second connectors together with coincident alignment of said first and second axes, wherein forces imparted by the first and second lines on the first and second connectors are resisted by engagement of said third section with said sixth section.

4,859,112

DEVICE FOR JOINING FRAME MEMBERS FOR PICTURE FRAME

Toshiaki Nakayama, No. 2-13, 1-chome, Komagata, Taito-ku, Tokyo, Japan

Filed Mar. 3, 1988, Ser. No. 163,581
Int. Cl.[4] A47G *1/06*; F16B *2/00*
U.S. Cl. 403—402 **1 Claim**



1. A joint fixture of unitary construction for joining frame members of a picture frame comprising:

a handle;

a base plate, partially separated by substantially perpendicular elongated grooves from said handle and integrally formed with said handle;

end engaging walls, integrally formed with and substantially perpendicular to said base plate and to each other;

a thickened wall portion formed at an inner side of each engaging wall;

outwardly extending flanges extending from opposite sides of each thickened wall portion;

stoppers, each having a triangular cross sectional configuration, projecting from said handle, said elongated grooves being cut through said base plate substantially parallel to said engaging walls; and

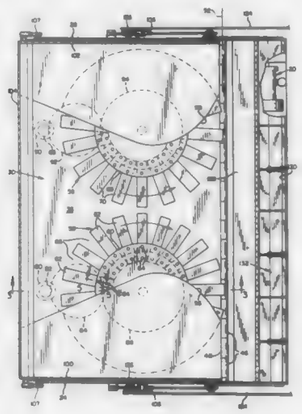
elongated push-down grips joined to said handle adjacent said elongated grooves and extending from said handle, said stoppers interposed between said push-down grips and said elongated grooves, said outwardly extending flanges engaging grooves defined inside the frame members, said stoppers being received in notches formed at ends of adjacent frame members when said frame members are joined, said stoppers being manually removable from said notches by pressure applied to said push-down grips to permit separation of said frame members from one another.

4,859,113

PAVER WITH DISCONTINUOUS DISCS MOVING AGGREGATE CONTAINED IN THE PAVER

Jack D. Layton, 4468 Medina La., SE., Salem, Oreg. 97301

Filed Jul. 18, 1988, Ser. No. 220,156
Int. Cl.[4] E01C *19/48*
U.S. Cl. 404—101 **8 Claims**



1. In a paver having a collecting hopper for collecting aggregate dumped thereinto from a supply, a screed extending transversely of the paver and spaced longitudinally from the collecting hopper, and an elongate opening defined in the paver which is substantially parallel to and spaced from the screen for feeding aggregate from the hopper to a region in advance of the screed,

a subfloor in the hopper and a rotary disc overlying the subfloor, the disc forming a portion of the floor in said collecting hopper and the disc being rotatable about a substantially upright axis, said disc having voids extending through the disc and said voids exposing the subfloor in the hopper, said disc being operable on rotation to move aggregate located in the hopper above the disc toward said opening, and said voids catching aggregate to promote motion of the aggregate lying over the disc.

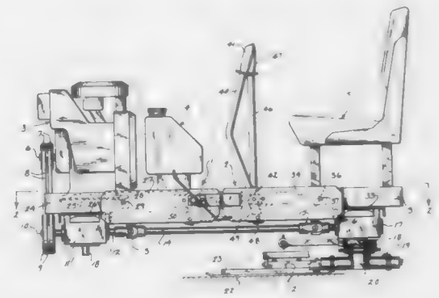
4,859,114

DIRECTIONAL CONTROL SYSTEM FOR A RIDING-TYPE SURFACE WORKING MACHINE

Thomas G. Artzberger, Menomonee Falls, Wis., assignor to M-B-W Inc., Slinger, Wis.

Filed Mar. 24, 1988, Ser. No. 173,171
Int. Cl.[4] E01C *19/22*
U.S. Cl. 404—112 **18 Claims**

1. A riding-type surface working machine, comprising a pair of frame means disposed in fore and aft relation, a rotor carried by each frame means with each rotor including a plurality of rotatable surface working members, each rotor being mounted in non-tiltable relation to the respective frame means, drive means operably connected to each rotor for rotating the rotors in opposite directions, first mounting means for mounting each frame means for relative tilting movement in a fore and aft direction with respect to the other frame means, second mounting means for mounting each frame means for relative tilting movement in a lateral direction with respect to the other frame means, first operating means for effecting relative tilting movement of said frame means in said fore and aft direction, and second operating means for effecting relative tilting movement of said frame means in said lateral direction, selectively relative tilting of said frame means in said fore and aft and



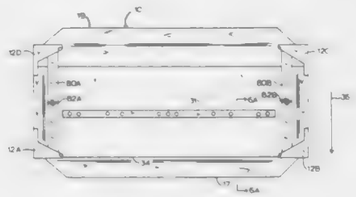
lateral direction causing directional movement of said machine on a working surface.

4,859,115

BLADE MOUNTING APPARATUS, AND BLADE COMPRISING SAME

Donald R. Morrison, 6228 Eagle Peak Dr., Charlotte, N.C. 28214

Filed Feb. 2, 1988, Ser. No. 151,456
Int. Cl.[4] E01C *19/22*
U.S. Cl. 404—112 **4 Claims**



1. A blade assembly adapted to be removably mounted on a generally rectangular trowel finishing blade, the assembly comprising:

(a) a generally rectangular plate member having a leading edge, a trailing edge and a pair of end edges; and

(b) a tab secured to an upper surface of the plate member at each of the four corners thereof, each tab comprising:

(i) a laterally extending side wall generally parallelly aligned with the plate member leading and trailing edges;

(ii) an end wall generally parallelly aligned with the plate member and edges; and

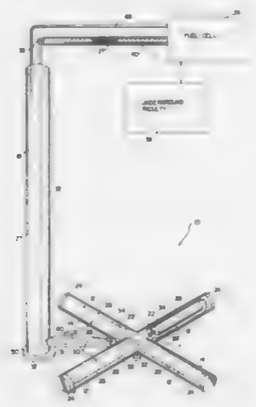
(iii) a cover plate generally parallelly aligned with the plate member and secured to upper surfaces of the side wall and the end wall to form a cavity bounded by the side wall, end wall, plate member and cover plate, wherein the maximum width of the cover plate is less than the length of the end wall.

4,859,116

LEAK CONTAINMENT STORAGE FACILITY

William G. Harris, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 12, 1986, Ser. No. 828,921
Int. Cl.[4] B65G *5/00*
U.S. Cl. 405—52 37 Claims



1. A leak containment storage facility comprising:
(a) a containment vessel including an inner tank and an outer tank that surrounds said inner tank;
(b) pressurizing means connected to the outer tank for increasing the pressure within said outer tank;
(c) means associated with with vessel for detecting a leak from said inner tank to said outer tank and for activating said pressurizing means in response to detecting the leak;
(d) a jacketed feed line, including inner and outer conduits, connected to the inner tank for withdrawing fluid from the inner tank; and
(e) neutralizing means within the outer conduit of the jacketed feed line for neutralizing fluid that leaks from the inner conduit to the outer conduit.

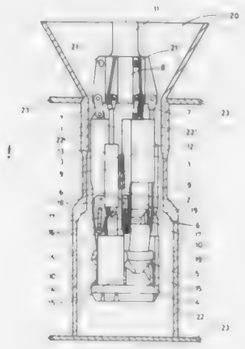
4,859,117

REVERSIBLE MECHANICAL COUPLING, PARTICULARLY FOR TENSIONAL ANCHORAGES

Roberto Brandi, Padua, and Apollonio De Meio, Belluno, both of Italy, assignors to AGIP, S.p.A., Milan, Italy

Filed Feb. 7, 1989, Ser. No. 307,007
Claims priority, application Italy, Feb. 12, 1988, 19387 A/88
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—224 4 Claims

1. A reversible mechanical coupling to be clamped within a suitable seat provided in particular in a foundation base for anchoring to said base one of the tensioned tubular anchorages of a tension leg marine platform, said coupling consisting substantially of a tubular body provided upperly with vertical guides for a series of wedges pivoted to a guide sleeve slidably driven along said body by hydraulic cylinders hinged between said body and said sleeve, and provided lowerly with a terminal widened portion arranged to cause radial expansion of an analogous series of clamping levers kept in contact with said body by mechanical means, characterised in that said clamping levers are pivoted respectively to arms rigid with said wedges, each by two lateral pivots which are inserted through corresponding vertical slots in said arms to slide therein and are retained at the lower end of said slots by the narrow but forcible mouth of two springs of tuning-fork shape mounted in correspondence with said slots, said mechanical means for maintaining contact between the clamping levers and said tubular body consisting of two pegs projecting laterally from each clamping lever and compelled to slide along guides of



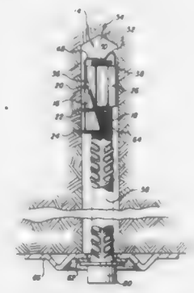
suitable shape provided in protection casings interposed between said clamping levers and fixed to the tubular body.

4,859,118

MINE ROOF SUPPORT ANCHOR AND PROCESS FOR INSTALLING THE SAME

Charles W. Schaeffer, Lebanon, Pa., assignor to Birmingham Bolt Company, Inc., Birmingham, Ala.

Filed Jun. 21, 1988, Ser. No. 209,378
Int. Cl.[4] E02D *20/00*; F16B *13/04*
U.S. Cl. 405—259 19 Claims



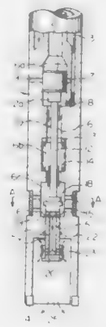
1. A process for installing an expansion shell in a mine roof opening, the shell being of the type comprising a pair of interconnected wedge members having tapered, interengaging surfaces to effect expansion thereof upon sliding engagement of one tapered surface over the other, comprising the steps of
(a) arranging the interconnected wedge members in interconnected spaced, longitudinally offset, relationship;
(b) threading a roof bolt through one of the interconnected wedge members, and
(c) substantially contemporaneously effecting upward movement of the other wedge member, and downward movement of the one wedge member, thereby producing sliding movement of the tapered surface of one wedge member over the tapered surface of the other wedge member, whereby the expansion shell is expanded into gripping engagement with the mine roof.

4,859,119

LIQUID CHEMICAL GROUTING APPARATUS AND VALVE SWITCHING ARRANGEMENT IN CONDUIT SYSTEM FOR SUPPLYING LIQUID CHEMICALS TO THE APPARATUS

Shouhei Chida, No.5-10, Matsuba 3-chome, Ryugasaki-shi, Ibaragi-ken; Naoki Yamaoto, Tokyo; Yasuo Miyazaki, and Yasunori Sato, both of Osaka, all of Japan, assignors to Nittoc Constructions Co., Ltd., Tokyo; Osaka Bousui Constructions Co., Ltd.; Kashiyama Kogyo Co. Ltd., both of Osaka and Shouhei Chida, Ibaragi, all of, Japan

Filed Mar. 2, 1988, Ser. No. 162,873
Claims priority, application Japan, Apr. 10, 1987, 62-87949
Int. Cl.[4] E02D *3/12*
U.S. Cl. 405—269 9 Claims



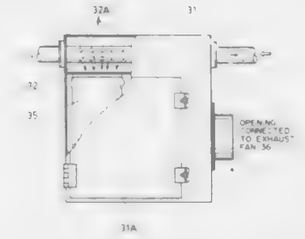
1. A liquid chemical grouting apparatus comprising:
a grouting rod having, at its lower end, a boring cutter;
a first longitudinal channel formed in said grouting rod and having an opened upper end;
a second longitudinal channel formed in said grouting rod to surround said first longitudinal channel and having an opened upper end;
a third longitudinal channel formed in a lower major portion of said grouting rod, said third longitudinal channel being normally in communication with said first channel and having an outlet near the lower end of said grouting rod;
upper lateral communication holes, lower lateral communication holes and upper discharge holes which are formed in the upper peripheral wall of said third channel, said upper and lower lateral communication holes being vertically spaced apart from each other and through which said second channel communicates with said third channel, said upper discharge holes being flush with said upper communication holes;
a piston valve vertically movably received in an upper portion of said third channel and having a piston upwardly of said lower communication holes, said piston valve being urged to be normally raised by means of a spring,
whereby when said piston valve is raised, said upper communication holes and upper discharge holes are closed by said piston and concurrently said second channel is permitted to communicate with a lower portion of said third channel through said lower communication holes and when said piston valve is lowered, said upper communication holes and upper discharge holes are opened and concurrently said second channel is prevented from communicating with said lower portion of said third channel through said lower communication holes.

4,859,120

PNEUMATIC CONVEYING SYSTEM

Yukihiro Tsubata, and Masaru Shiino, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 15, 1988, Ser. No. 144,145
Claims priority, application Japan, Jan. 16, 1987, 62-7517; Jan. 19, 1987, 62-9427
Int. Cl.[4] B65G *51/20*
U.S. Cl. 406—84 3 Claims



1. A pneumatic conveying system for pneumatically conveying articles to be conveyed, which are successively discharged from an assembling machine, to a plurality of conveying positions, comprising:
a distributing conveyor provided along said plurality of conveying positions;
scrapers for causing said articles to be conveyed on said distributing conveyor to be selectively dropped to any of said plurality of conveying positions;
a transporting piping provided on the inlet side thereof with a receiving opening for receiving said articles to be conveyed, and provided on the outlet side thereof with a shooter for causing said articles to be conveyed to be dropped down to the front of said distributing conveyor;
an ejector disposed at a position close to the outlet side of said transporting piping, for sending out a conveying power wind for pneumatically conveying said articles to be conveyed toward the outlet side of said transporting piping; and
a stall device interposed between said ejector and the outlet side of said transporting piping, said transporting piping having an air ventilation hole formed therein, said stall device including means for inhaling from said air ventilation hole a greater quantity of air than that of said conveying power wind, for stalling the speed of said articles to be conveyed by providing a counter-flow wind from the outlet side of said transporting piping, said outlet side of said transporting piping extending sufficiently far from said air ventilation hole to provide said counter-flow wind,
wherein said articles to be conveyed are roll film magazines, said roll film magazines being conveyed one at a time.

4,859,121

METHOD AND DEVICE FOR THE DISPERSION OF ULTRA-FINE POWDERS

Jean-Yves Deysson, Paris; Jacques Karian, Dampierre; Philippe Malgrat, Vaucresson, and Michel Blondeau, Plaisir, all of France, assignors to Bertin & Cie, Plaisir Cedex, France

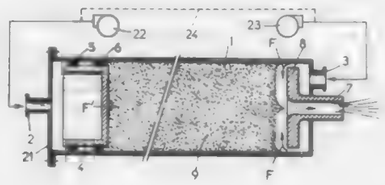
Continuation of Ser. No. 932,512, Nov. 4, 1986, abandoned. This application Oct. 11, 1988, Ser. No. 256,191
Claims priority, application France, Mar. 5, 1985, 85 03196
Int. Cl.[4] B65G *53/40*
U.S. Cl. 406—114 5 Claims

1. A process for suspending an ultrafine powder in a gas comprising the steps of:
enclosing a mass of powder to be dispersed in a container having first and second ends, said mass being placed be-

tween an axially movable piston and an axially fixed member enclosed in said container adjacent to the first and second ends thereof respectively,

said fixed member defining an inner counteracting surface facing said powder, having peripheral passage means adjacent to a wall of said container and axial passage means extending out of said container,

connecting a first source of pressurized gas to said first end of said container and applying to said movable piston a permanent pressure of the gas from said source, this pressure being such as to move said piston towards said fixed member for any orientation of the container and whatever the acceleration to which it is submitted, thereby pressing said powder against said counteracting surface of said member,



injecting a flow of a second gas produced by a second source of pressurized gas, which is independent from said first source of pressurized gas into said second end of said container whereby said gas flows through said peripheral passage means for eroding said powder adjacent to said counteracting surface and driving said eroded powder through said axial passage means out from said container,

controlling said flow of second gas to obtain a predetermined velocity of the powder-charged gas, measured at said axial passage means, and a predetermined powder flow, and

independently controlling the pressure provided by said first source of pressurized gas to maintain an approximately constant distance from a free surface of the mass of powder to the counteracting surface.

4,859,122

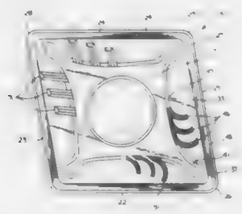
POLYGONAL CUTTING INSERT

John H. Patterson, Hazel Park; Tony M. Lowe, Royal Oak; Thomas J. Bernadic, Madison Hights; Yefim Val; Karl A. Katbi, both of Troy, and Charles E. Zimmerman, Southfield, all of Mich., assignors to GTE Valenite Corporation, Troy, Mich.

Continuation of Ser. No. 85,839, Aug. 17, 1987, abandoned. This application Jun. 6, 1988, Ser. No. 205,048

Int. Cl.[4] B26D *1/00*

U.S. Cl. 407—114 **1 Claim**



1. A polygonal indexable cutting insert comprising a pair of substantially parallel faces and peripheral side surfaces normal to said parallel faces,

said faces and said side surfaces being joined to form corners,

at a pair of cutting edges extending away from each corner substantially within the plane of a respective one of said faces,

a floor surface being substantially parallel to a respective face and spaced downwardly therefrom,

a ramp surface extending downwardly from a respective cutting edge to said floor surface whereby said insert has a positive rake,

a backwall surface extending between a respective floor surface and respective face surface, and

said backwall having a main portion extending in a curved path from each corner to an adjacent corner, said backwall surface extending from a position closely adjacent a corner inwardly toward the center of the insert and outwardly toward an adjacent corner, a plurality of straight projecting lands extending outwardly from the main portion toward the cutting edge in a manner tending to deflect chips inwardly toward the center of said insert, each projecting land having a substantially uniform width and height with each land being longer than the next adjacent projecting land when progressing from a corner to the center of the insert in a direction parallel to the cutting edge.

4,859,123

INSERT BORING TOOL

Yuzo Koesashi; Yasuhiko Kawade, and Yoshikazu Iwata, all of Gifu, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1987, Ser. No. 107,431

Claims priority, application Japan, Apr. 25, 1987, 62-63315[U]; Oct. 8, 1987, 62-154518[U]

Int. Cl.[4] B23B *51/00*

U.S. Cl. 408—233 **10 Claims**



1. An insert boring tool comprising:

a tool body having an axis of rotation therethrough;

a radially outward cutting insert in the form of a polygon as viewed in plan, said radially outward insert being mounted on a forward end of said tool body and located adjacent an outer periphery of said forward end, said radially outward insert having at least one end cutting edge; and

a radially inward cutting insert in the form of a polygon as viewed in plan, said radially inward insert being mounted on said forward end of said tool body and located adjacent said axis of said tool body, said radially inward insert having at least one end cutting edge,

each of said radially outward and inward inserts being generally in the form of a regular triangle and each having substantially identical dimensions.

wherein said radially outward and inward inserts are arranged such that said end cutting edge of said radially outward insert is intersected at a point of intersection with said end cutting edge of said radially inward insert, in loci of rotation of the respective radially outward and inward inserts in a plane containing the axis of said tool body, and

wherein said radially outward and inward inserts are positioned such that, assuming that a radial distance between

said point of intersection and a radially outermost end of said end cutting edge of said radially outward insert is A, and a radial distance between said point of intersection and a radially innermost end of said end cutting edge of said radially inward insert is B, a ratio of A/B takes a value of from 2/8 to 45/55.

4,859,124

METHOD OF CUTTING USING A TITANIUM DIBORIDE BODY

David Moskowitz, Southfield, and Charles W. Phillips, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 124,383, Nov. 20, 1987. This application Jul. 15, 1988, Ser. No. 220,126

Int. Cl.[4] B23C *1/00*

U.S. Cl. 409—64 **4 Claims**

1. A method of cutting an aluminum based material with a titanium diboride based sintered material, comprising relatively moving said titanium diboride based material shaped as a cutting tool against an aluminum based material, said titanium diboride based cutting tool being the heat fused product of compacting a powder mixture of 5–20% by weight of iron metal group binder and the remainder being essentially titanium diboride except for up to 1.0% oxygen and up to 2% graphite.

4,859,125

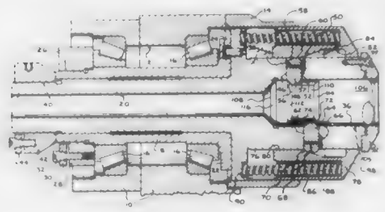
HELICAL BROACH PULLER

Arthur F. Lubiarz, Troy, Mich., assignor to Crankshaft Machine Company, Jackson, Mich.

Filed Oct. 31, 1988, Ser. No. 264,777

Int. Cl.[4] B23D *41/04*

U.S. Cl. 409—287 **10 Claims**



1. Broach pulling apparatus for an elongated broach having an axis and a retaining end region, a blade region and a retaining end, an axially extending recess located within the retaining end region axially defined by a first surface oblique to the broach axis located toward the retaining end and a second surface oblique to the broach axis located toward the blade region, an axially displaceable spindle having a socket defined therein substantially coaxial with the spindle axis selectively receiving the broach retaining end region, an axially fixed radially displaceable first set of jaws located within the spindle each movable between an extended inner position engaging the recess first surface and a retracted outer position removing the jaws from the recess, and first jaw operating means located adjacent the spindle for radially displacing the first jaws between the extended and retracted positions, the improvement comprising, a second set of axially fixed radially displaceable jaws located within the spindle axially spaced from the first set of jaws and each movable between an extended inner position engaging the recess second surface and a retracted outer position removing the jaws from the recess, and second jaw operating means located adjacent the spindle for radially displacing said second jaws between the extended and retracted positions, simultaneous engagement of the first set of jaws and said second set of jaws with the first and second recess surfaces, respectively, locking a broach within the spindle socket against relative axial displacement with respect to the spindle.

4,859,126

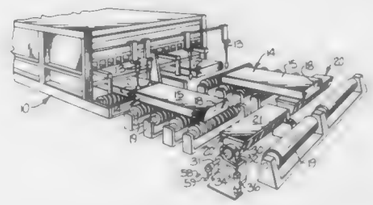
APPARATUS AND METHOD FOR REMOVING DROSS RIDGES FROM A METAL WORKPIECE

Matthew A. Mancuso, New Kensington, Pa., assignor to Keibler-Thompson Corp., Kensington, Pa.

Continuation-in-part of Ser. No. 847,421, Apr. 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 834,834, Feb. 21, 1986, abandoned. This application Feb. 10, 1987, Ser. No. 13,134

Int. Cl.[4] B23D *1/22;* **B23K** *7/02*

U.S. Cl. 409—293 **19 Claims**



1. An apparatus for removing a dross ridge along the edge of a metal workpiece of the type resulting from a torch cutting operation or the like, and comprising

a cutting blade having an outer surface and a pair of longitudinally extending opposite sides, and with said sides each defining a longitudinally extending cutting edge at the junction of the side and said outer surface, and with said cutting edges being parallel to each other,

means mounting said cutting blade for pivotal movement about a fixed longitudinal axis which is equally spaced from each of said cutting edges, and with the separation between said parallel cutting edges being at least substantially as great as the radial distance between said axis and each of said cutting edges, and such that the blade is adapted to be mounted immediately adjacent the path of travel of a metal workpiece supported by a conveyor system and with the longitudinal direction of said blade extending across the workpiece path of travel, and

means for selectively pivoting said cutting blade about said longitudinal axis and so that either one of said cutting edges may be held in contact with the adjacent surface of a workpiece moving along said path of travel, and such that each of said cutting edges is adapted to engage and remove a dross ridge formed on the adjacent work-piece surface when the workpiece is moved along said path of travel with the dross ridge disposed substantially perpendicular to the path of travel and opposing said cutting edge.

14. A method of removing the dross ridges formed on the lower surface along each end of a flat metal workpiece during a torch cutting operation or the like, and which includes the use of a cutting blade having a generally flat outer surface and a pair of opposite sides extending in a longitudinal direction along the length of said blade, and with each side defining a longitudinally extending cutting edge at a junction of the side and said outer surface, and comprising the steps of

(a) advancing the workpiece across said outer surface of said blade in an initial direction which is substantially transverse to the longitudinal direction of said blade, with said lower surface facing said cutting blade and with the dross ridges disposed substantially perpendicular to the direction of advance, and such that one of said dross ridges passes the blade without contact,

(b) tilting the blade so that the one of said cutting edges

which faces said one dross ridge engages the adjacent surface of the workpiece, and

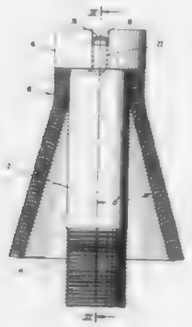
(c) advancing the workpiece in the opposite direction so that said one dross ridge moves in a direction opposing said one cutting edge of the tilted blade and such that said one cutting edge engages and removes said one dross ridge.

4,859,127

SPRING WIRE FASTENER AND METHOD OF USING SAME

Frank J. Koch, Ogdensburg, N.Y., assignor to Linda Koch Beamish, Ontario, Canada

Filed Jun. 3, 1988, Ser. No. 201,832
Int. Cl.[4] F16B *13/04*
U.S. Cl. 411—16 **29 Claims**



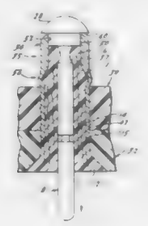
1. A spring wire fastener, comprising a single length of wire formed into a means for engaging the head of a bolt at one end thereof and a tapered coiled portion at the other end thereof, said tapered coiled portion tapering inwardly in a direction toward the engaging means, said spring wire being arcuate in cross section such that adjacent layers of the spring wire may nest together when the spring wire fastener is compressed.

4,859,128

SHEATHED COMPOSITE BLIND RIVET

Imre Brecz, Rancho Santa Margarita; Dennis Schultz, Fullerton, and Dennis L. Hinton, Yorba Linda, all of Calif., assignors to Microdot Inc., Darien, Conn.

Continuation-in-part of Ser. No. 940,414, Dec. 11, 1986, abandoned, which is a continuation of Ser. No. 727,781, Apr. 26, 1985, abandoned. This application Nov. 9, 1987, Ser. No. 118,547
Int. Cl.[4] F16B *13/04*
U.S. Cl. 411—43 **8 Claims**



1. In a composite blind rivet comprising

a tubular composite body comprising reinforcement fibers encapsulated in a heat deformable resin matrix, said tubular body having a preformed head portion, a shear portion, and a portion thereof deformable to form a blind head thereon, and

a mandrel extending centrally of said tubular body and having a stem portion at one end and an anvil at the other end overlying the blind head forming portion of said tubular body, said mandrel being movable axially relative to the shear and preformed head portions of said tubular body to form a blind head thereon;

the improvement comprising

a metallic sheath encompassing the head forming portion of said tubular body and a part of the shear portion thereof:

an end of said sheath abutting an axially-disposed surface on said tubular body: and

the other end of said sheath radially engaging with a radial shoulder of the anvil of said mandrel to form a closed pressure chamber encapsulating the head forming portion and said part of the shear portion of said tubular body, said other end of said sheath being axially engageable with an axially-disposed surface of the anvil of said mandrel during rivet head formation subsequent to initial axial movement of said mandrel:

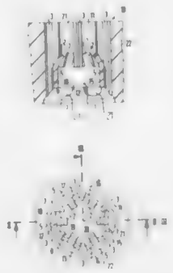
whereby axial displacement of the anvil of said mandrel initially axially compresses said tubular body within said pressure chamber, said compressed tubular body hydrostatically uniformly radially expanding the thin-walled section of said sheath; whereafter said sheath is mechanically axially compressed between the axially-disposed surface of the anvil of said mandrel and said axially-disposed surface of said tubular body portion; and whereupon said sheath is further controllably buckled along the thin-walled section thereof during the formation of the blind head on said rivet.

4,859,129

PLASTIC HOLDING DEVICE

Willibald Kraus, Grunstadt, Fed. Rep. of Germany, assignor to TRW United Carr GmbH, Enkenbach Alsenborn, Fed. Rep. of Germany

Filed Dec. 17, 1987, Ser. No. 134,378
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644334
Int. Cl.[4] F16B *21/07*
U.S. Cl. 411—512 **5 Claims**



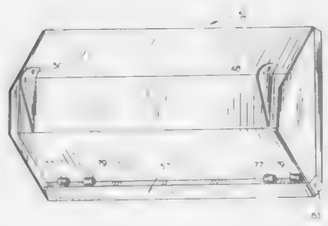
1. A holding device for connection to a threaded bolt comprising: a relatively rigid body having an inner wall defining an opening extending inwardly of the body from an outer aperture, a plurality of guide ribs extending generally radially inwardly from the wall at circumferentially spaced locations, a profiled guide zone comprising a shell axially aligned with the opening and extending circumferentially about the interior of the opening spaced radially inwardly of said inner wall at a location axially between the outer aperture and the guide ribs, and resilient spring elements carried between the guide zone and the guide ribs, said spring elements comprising a plurality of resilient fingers extending radially and axially inwardly of said opening.

4,859,130

MATERIAL HANDLING ATTACHMENT FOR A TRACTOR HAVING A MULTIPLE-POINT HITCH ASSEMBLY

Joseph W. Langenfeld, and Neal W. Westendorf, both of Onawa, Iowa, assignors to Westendorf Manufacturing Co., Inc., Onawa, Iowa

Continuation-in-part of Ser. No. 814,043, Dec. 27, 1985. This application Apr. 27, 1987, Ser. No. 43,194
Int. Cl.[4] E02F *3/43*
U.S. Cl. 414—703 **5 Claims**



4. In combination,

a wheeled vehicle having a vertically movable hitch assembly mounted thereon which is movable between a lower position and an upper position,

a materials handling bucket pivotally secured to hitch assembly for vertical movement therewith, said bucket being movable between a lower position and an upper position,

said bucket including a bottom which is substantially horizontally disposed when said bucket is in its said lower position and which is substantially vertically disposed when in its said upper position.

said bucket including a bottom wall having top and bottom surfaces, spaced-apart side walls, and a back wall having rearward and forward surfaces, said top surface of said bottom wall and said rearward surface of said back wall being projection free,

means for raising and lowering said hitch assembly,

mechanical linkage means interconnecting said bucket and said hitch assembly which maintains said bottom of said bucket in its substantially horizontally disposed position as said hitch assembly raises said bucket from its said lower position towards its said upper position for substantially the entire distance therebetween,

said mechanical linkage means pivoting said bucket so that said bottom is moved to its said substantially vertically disposed position as said bucket reaches its said upper position,

an elongated blade means being secured to the rearward end of said bottom wall and extending between said side walls,

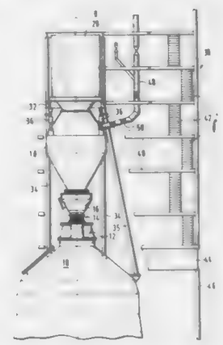
said mechanical linkage means including a pair of horizontally spaced support arms having rearward and forward end which are pivotally secured at their rearward ends to the forward end of said blade means whereby forced applied to said pair of horizontally spaced support arms will be transmitted directly to said blade means through said arms without applying force to said bottom wall.

4,859,131

SUPPORTING FRAMEWORK FOR A LOADING INSTALLATION OF A SHAFT FURNACE

Emile Lonardi, L-Bascharage, and Pierre Mailliet, L-Howard, both of Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed Mar. 16, 1988, Ser. No. 168,893
Claims priority, application Luxembourg, Mar. 24, 1987, 86820
Int. Cl.[4] B65B *1/28*
U.S. Cl. 414—200 **5 Claims**



1. Supporting framework for a loading installation of a shaft furnace having a central vertical axis comprising:

a charging device for introducing and distributing charge material into the head of the furnace, said charging device being in alignment with said central axis of the furnace, said charging device being surmounted in ascending order by a compensator having a valve housing, a lock chamber having a weighing system and a stand-by hopper;

a horizontal supporting beam;

a plurality of balances on said horizontal support beam; said valve housing being suspended on said horizontal supporting beam by said balances;

said stand-by hopper being supported on said horizontal supporting beam independent of said balances; and

a plurality of vertical pillars, said horizontal supporting beam being carried by said vertical pillars, said vertical pillars being carried by the head of the furnace.

4,859,132

PROCESS AND DEVICE FOR OPENING BY THE MEDIAN ZONE OF THEIR BODIES, EMPTYING AND FLATTENING HERMETICALLY CLOSED METAL OR COMPOSITE CONTAINERS

Yves Chasseray, 56 Boulevard de Dezerseul, 35510 Cesson Sevigne, France

PCT No. PCT/FR86/00271, § 371 Date Apr. 14, 1987, § 102(e) Date Apr. 14, 1987, PCT Pub. No. WO87/01094, PCT Pub. Date Feb. 26, 1987
PCT Filed Jul. 31, 1986, Ser. No. 50,127
Claims priority, application France, Aug. 14, 1985, 85 12397
Int. Cl.[4] B30B *9/00*
U.S. Cl. 414—412 **7 Claims**

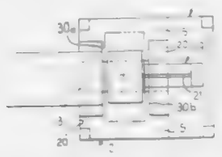
1. A device for successively opening, emptying and flattening, in a single operation, hermetically closed metal or composite filled containers, characterized in that it comprises, mounted in a fixed support frame (1):

(a) a hopper (2) provided at its base with an opening (3) and passageways (4) defining convergent inclined walls (5) and vertical walls and opening into this opening (3);

(b) means (6) for feeding the hopper (2) with filled containers (7) through a lock (8), so that each container (7) can bear

successively by its ends against the walls (5) of the hopper (2) and above said opening (3); and

(c) a tool (9) provided with a cutter (11) for cutting the container, mounted in the frame (1) in such manner as to be displaceable against successive containers (7) and equipped with driving means (16, 17), the cutter (11) having a contour adapted to the shape of the containers and being positioned in such manner as to partly sever the latter transversely in their median zone;



said tool (9) also comprising means for flattening the severed containers (7), after their cutting by the cutter (11), upon said convergent inclined walls (5), while causing their emptying into a receptacle (13) placed under the hopper (2); and in that

the cutter (11) is fixed under a ram (9) having a shape complementary to the shape of the inclined walls (5), so as to be capable of flattening the container (7) against the latter, at the same time as the two halves of said container are opened and emptied.

4,859,133

FORK LIFT TRUCK AND VEHICLE FOR THE TRANSPORT THEREOF

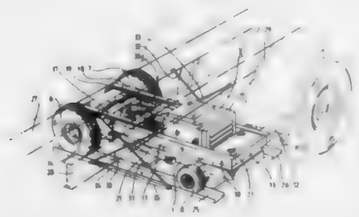
Jozef G. Maris, Langstraat 74, 5801 AE Venray, Netherlands

Filed May 27, 1987, Ser. No. 54,548

Claims priority, application Netherlands, May 28, 1986, [redacted]

Int. Cl.[4] B60P *3/06;* B66F *9/08*

U.S. Cl. 414—462 14 Claims



1. Fork lift truck comprising a chassis, a front and a rear axle supported by the chassis and having wheels at their outer ends, a portal which is pivotally connected to the front of the chassis, a fork on which a load can be placed, being movable along said portal, an engine which is provided on the chassis for driving wheels of the fork lift truck, said truck being intended for being transported under the loading floor of a vehicle intended for goods carriage, characterized in that a counterweight (23) is provided outside the wheelbase at the end of the chassis (1) located opposite the portal (10) and the portal is pivotally connected to the chassis in such a manner that the portal can be folded down so as embrace the engine (2) and the counterweight (23), against the upper side of the chassis.

4,859,134

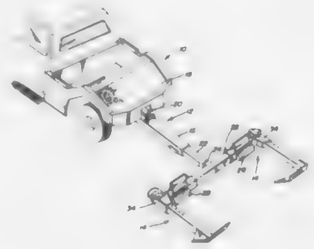
FOLDABLE RAMP EXTENSION FOR WHEEL LIFT APPARATUS

Walter G. Lock, Signal Mountain, Tenn., assignor to Holmes International Inc., Chattanooga, Tenn.

Filed Apr. 19, 1988, Ser. No. 183,044

Int. Cl.[4] B60P *3/12*

U.S. Cl. 414—563 18 Claims



15. Apparatus for use with wheel lift towing apparatus for supporting a pair of transversely spaced tires of a vehicle lifted and towed thereby, said apparatus comprising a transversely elongated tow bar adapted to be positioned beneath the vehicle, a pair of tire support cradles, each of said cradles having front support means including mounting means carried by a respective end portion of said tow bar for supporting a front surface portion a first of said tires and rear support means for supporting a rear surface portion of said first tire, said front support means comprising a fixed ramp secured to said mounting means, and a foldable plate juxtaposed relative to said fixed ramp and pivotably mounted for moving relatively to said fixed ramp from an operative position providing an extension of said fixed ramp to an inoperative position.

4,859,135

REFUSE DISPOSAL METHOD AND APPARATUS

Jacob J. Neufeldt, P.O. Box 597, Lethbridge, Alberta, Canada T1J 3Z4

Continuation-in-part of Ser. No. 45,668, Jun. 5, 1979, Pat. No. 4,280,780. This application Feb. 25, 1981, Ser. No. 237,933

Int. Cl.[4] B65G *67/04;* B65F *3/00*

U.S. Cl. 414—572 29 Claims

1. A refuse container assembly for storing refuse material at a refuse transfer station, comprising:

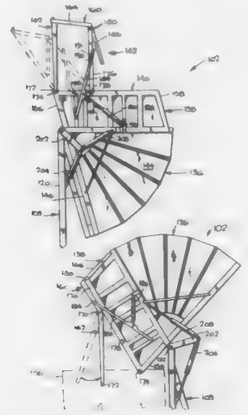
a support frame;

a receptacle having a rearwardly inclined planar rear wall, a front wall, a pair of side walls and a bottom defining a refuse material storage chamber and an open top defining a refuse material intake and discharge opening, first arm means rigidly attached to the receptacle and extending rearwardly from the upper end of said rear wall and secured to said support frame for pivotal movement of said receptacle about a receptacle pivot axis extending transversely of said receptacle and parallel to said rear wall between a lower, upright position on one side of said pivot axis whereat said receptacle is disposed to receive through said opening refuse material discharged from refuse collection vehicles and an elevated at least partially inverted position on the other side of said axis whereat said receptacle is disposed for discharging the contents of said chamber through said opening into refuse transportation vehicles;

Means for pivoting said receptacle between said lower and elevated positions, said pivoting means including:

second arm means having one end secured to said support for pivotal movement about said receptacle pivot axis and extending forwardly thereof;

first hydraulic cylinder means, including extendable and retractable piston rod means, having one end connected to said support frame and the other end connected to said second arm means remote from said pivot axis; and



second hydraulic cylinder means, including extendable and retractable piston rod means, having one end connected to said receptacle and the other end secured to said second arm means remote from said pivot axis.

4,859,136

REINFORCEMENT MEANS FOR TINES AND METHOD OF MANUFACTURE

Thomas I. Burenga, Litchfield, Ill., assignor to Worksaver, Inc., Litchfield, Ill.

Filed Jun. 3, 1985, Ser. No. 740,392

Int. Cl.[4] B66F *9/12*

U.S. Cl. 414—607 2 Claims



1. Reinforcing means for agricultural or other equipment tines of the type used for loading materials or the like, said tines being of the type attaching with structural means that provides for maneuverability of the tines during application, each tine comprising a hollow rod like member being opened at least at one end for attachment with the structured means of the equipment, and incorporating means at its other end to facilitate its usage in transferring a load of material, said reinforcing means comprising a metallic bar being bent back upon itself to form a pair of approximately adjacent legs, said metallic bar being of rectangular cross section, the bent portion and legs of the reinforcing means inserting within the hollow rod like member at its structured means attaching end to structurally reinforce said tine during usage for conveying of a heavy load, and the height of the bent bar being vertically disposed within the reinforced tine.

4,859,137

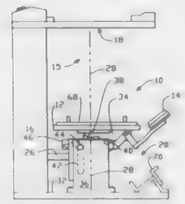
APPARATUS FOR TRANSPORTING A HOLDER BETWEEN A PORT OPENING OF A STANDARDIZED MECHANICAL INTERFACE SYSTEM AND A LOADING AND UNLOADING STATION

Anthony C. Bonora, Menlo Park, and Fred T. Rosenquist, Redwood City, both of Calif., assignors to Asyst Technologies, Milpitas, Calif.

Filed Oct. 21, 1987, Ser. No. 111,040

Int. Cl.[4] B65G *65/02*

U.S. Cl. 414—648 7 Claims



1. For use in a standardized mechanical interface system, an apparatus for transporting a holder for holding articles between a port opening providing access to the system and a loading and unloading station, the apparatus comprising:

first means for supporting the holder in the course of transport of the holder between the port opening and the station;

second means for moving said first means between the port opening and the station;

third means for moving said first means between a first position in which said first means is oriented substantially perpendicular to a vertical axis and a second position in which said first means is inclined relative to the vertical axis wherein said third means includes a first cam and a first cam follower;

wherein said third means moves said first means between the first and second positions while said second means is in the course of moving said first means between the port opening and the the station;

fourth means for supporting the holder in the course of transport of the holder between the port opening and the station; and

fifth means for moving said fourth means between a third position substantially spaced apart from said first means and a fourth position substantially adjacent to said first means, wherein said fifth means includes a second cam and a second cam follower.

4,859,138

BOOM FOR A VEHICLE INCLUDING FOLDING LINKAGE BETWEEN BOOM PARTS

Norman Brocklebank, New Walk, and Alan Cooper, Common Lane, both of United Kingdom, assignors to J.C. Bamford Excavators Limited, Rocester, United Kingdom

PCT No. PCT/GB87/00676, § 371 Date May 23, 1988, § 102(e) Date May 23, 1988, PCT Pub. No. WO88/02420, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 24, 1987, Ser. No. 197,502

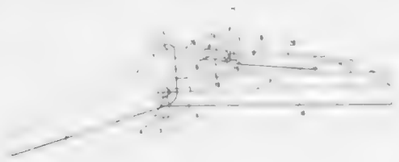
Claims priority, application United Kingdom, Sep. 27, 1986, [redacted]

Int. Cl.[4] E02F *3/38*

U.S. Cl. 414—694 22 Claims

1. A boom for a vehicle, the boom comprising first and second parts,the first part carrying means for mounting an earth working implement and the second part having means for mounting the boom on a body of the vehicle, the first and second parts being connected together by pivot means which permit relative pivotal movement between the first boom part

and the second boom part about a generally horizontal axis, an elongate actuating means mounted between the first and second boom parts and being operable to effect the relative pivotal movement between the boom parts in one sense of rotation only to increase an included angle between the first and second boom parts, auxiliary means being provided to effect relative movement between the boom parts to reduce the included angle between the boom parts, the elongate actuating means comprising two relatively movable fluid operated members which operate in tension and an extension linkage pivotally connected to one of said fluid operated members to form an elongate extension therefrom, said elongate actuating means



being mounted solely at or adjacent its ends to said boom parts, one said end mounting of said elongate actuating means being pivotally connected via one of said fluid operated members to one said boom part and the other said end mounting of said elongate actuating means being pivotally connected via an end portion of said extension linkage to the other said boom part, said extension linkage being movable to fold upon a support structure at least in part carried by the other said boom part when said included angle is at a minimum, said pivot connection of said extension linkage to said one of said fluid operated members being free to move towards and away from the pivot means between said first and second boom parts. movable to fold upon.

4,859,139

ARM STRUCTURE FOR AN INDUSTRIAL ROBOT

Nobutoshi Torii, Hachioji; Ryo Nihei, Musashino, and Akihiro Terada, Hino, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

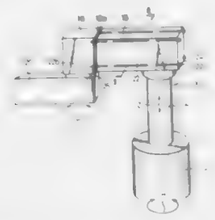
PCT No. PCT/JP87/00352, § 371 Date Feb. 1, 1988, § 102(e) Date Feb. 1, 1988, PCT Pub. No. WO87/07554, PCT Pub. Date Dec. 17, 1987

PCT Filed Jun. 3, 1987, Ser. No. 162,387

Claims priority, application Japan, Jun. 3, 1986, 61-127215

Int. Cl.[4] B25J *18/00*

U.S. Cl. 414—744.5 6 Claims



1. An industrial robot comprising: a vertical robot shaft; a first robot arm secured to an upper end of said vertical robot shaft; transmission-reduction gear means secured to a free end of said first robot arm and contained in a case; a second robot arm pivotally joined through said transmission-reduction gear means to the free end of said first robot arm; a plurality of coupling bolts, each bolt extending through the interior of said first robot arm and having one end securing said case containing said transmission-reduction gear means to said first robot arm and the other end projecting from and fastened to a rear end of said first robot arm; and a fastening nut engaging at least one end of each of said coupling bolts, wherein said nuts are tightened on said bolts to couple said transmission-reduction gear means to said first robot arm and compress said first arm.

4,859,140

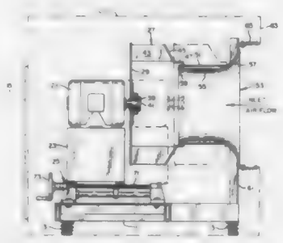
CENTRIFUGAL FAN

Albert M. Passadore, Boring, Oreg., assignor to Brod & McClung - Pace Co., Portland, Oreg.

Continuation-in-part of Ser. No. 695,175, Jan. 25, 1985, abandoned. This application Jun. 13, 1986, Ser. No. 874,801

Int. Cl.[4] F04D *29/56*

U.S. Cl. 415—48 13 Claims



3. A centrifugal fan comprising:
a rotary bladed wheel, disposed in a bodily stationary position;
inlet cone means for directing air into said wheel, said cone means having an inlet and outlet end, said inlet cone means being bodily stationary;
sleeve means slidably interposed between the outlet end of said inlet cone and interior of said wheel for reducing the effective area of the interior of said wheel; and
means for moving the sleeve means axially to disposed it in a desired masking position at the interior of the wheel so as to controllably starve the wheel for air.

4,859,141

METALLIC HOLLOW COMPONENT WITH A METALLIC INSERT, ESPECIALLY TURBINE BLADE WITH COOLING INSERT

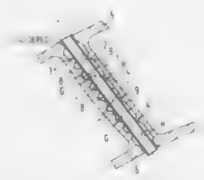
Helmut Maisch, Groebenzell, and Dieter Fedran, Zorneding, both of Fed. Rep. of Germany, assignors to MTU-Motoren- und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 3, 1987, Ser. No. 92,666

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1986, 3629910

Int. Cl.[4] F01D *5/18*

U.S. Cl. 415—115 19 Claims



1. A metallic hollow turbine blade whose inner geometry is matched to at least one completely pre-profiled metallic cooling insert means supported thereon, the cooling insert means being secured at the hollow structural turbine blade under predetermined heat influence, and wherein said insert means is made of a memory material that abuts substantially free of play at the inner geometry after exceeding a predetermined temperature threshold value.

4,859,142

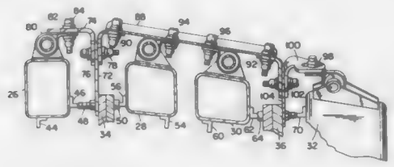
TURBINE CLEARANCE CONTROL DUCT ARRANGEMENT

William F. Burke, Marlborough, and Daniel E. Kane, Tolland, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 1, 1988, Ser. No. 150,866

Int. Cl.[4] F02C *25/12*

U.S. Cl. 415—116 3 Claims



1. A clearance control cooling air duct arrangement for a gas turbine comprising:
a turbine casing;
a plurality of circumferential flange structures joining sections of said turbine casing;
a plurality of cooling air ducts circumferentially surrounding said casing adjacent to said flange structures;
supply means for supplying cooling air to said ducts;
multiplicity of holes in each of said ducts directing impingement cooling air against a flange and against the casing adjacent to the flange;
a plurality of radial spacer members secured to each duct extending radially toward said casing;
a plurality of axial spacer members secured to each duct extending axially toward a flange;
a plurality of support brackets secured to each flange; and
support means for adjustably securing said ducts to said brackets, with said spacer members in contact with said casing and one of said flange structures.

4,859,143

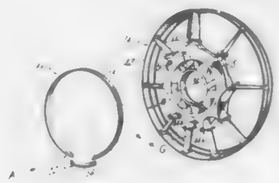
STIFFENING RING FOR A STATOR ASSEMBLY OF AN AXIAL FLOW ROTARY MACHINE

John R. Larrabee, Portland; Arthur W. Lucas, West Hartford, and Peter A. Faucher, Brooklyn, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 8, 1987, Ser. No. 71,000

Int. Cl.[4] F01D *9/04*

U.S. Cl. 415—142 14 Claims



1. A stator assembly for a rotary machine which comprises a circumferentially extending structure, a plurality of struts extending radially from the structure and a self-supporting ring which engages each strut at a point intermediate of the length of the strut and which is tensioned at installation and under all normal operative conditions to stiffen the stator assembly.

4,859,144

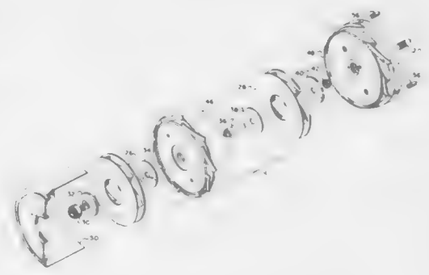
FAN STAGE CONFIGURATION

William S. Houston, Uniontown, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Mar. 7, 1988, Ser. No. 164,980

Int. Cl.[4] F04D *29/44*

U.S. Cl. 415—210 3 Claims



1. A stator for a fan system extending in an axial direction and producing a flow of air including;
(a) a spiralling, extending fixed blade section centered on a center of said stator,
(b) a blade tip attached to and forming a continuation of said spiralling, extending blade section,
(c) said blade tip angled relative to the axial direction of said fan system,
(d) the tangent of said angle of said blade tip being expressed by the average air axial velocity of said flow of air divided by the average air tangential velocity of said flow of air.

4,859,145

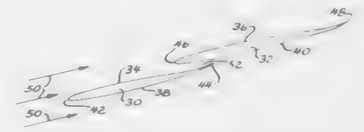
COMPRESSOR WITH SUPERCRITICAL DIFFUSER

Fred Sidransky, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 19, 1987, Ser. No. 109,324

Int. Cl.[4] F04D *29/44*

U.S. Cl. 415—211.1 6 Claims



1. A radial discharge compressor comprising:
an impeller rotatable about an axis and including blades extending from a radially inward position to a radially outward position to terminate in radially outermost discharge ends;
an annular collector surrounding said impeller in radially spaced relation including at least one compressed gas discharge port; and
an annular diffuser interposed between said discharge ends and said collector, said diffuser having a radially inner first stage made up of a plurality of radially inner diffuser vanes and a radially outer second stage made up of a plurality of radially outer diffuser vanes, each aligned with a corresponding one of said inner vanes;

each of said vanes having a leading edge and a trailing edge with each trailing edge being radially outward of the leading edge of the associated vane and displaced circumferentially from the leading edge of the associated vane in the direction of rotation of said impeller;

at least the vanes of said first stage having cross sections configured as supercritical airfoils.

4,859,146

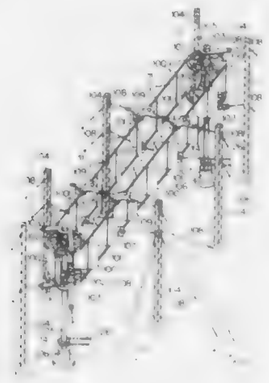
UNITED SAIL WINDMILL

Gandencio A. Labrador, 1312 Leaf Terr., San Diego, Calif. 92114

Continuation-in-part of Ser. No. 631,321, Jul. 19, 1984, Pat. No. 4,756,666. This application Apr. 5, 1988, Ser. No. 177,599

Int. Cl.[4] F03D 5/02

U.S. Cl. 416—8 12 Claims



1. A United Sail Windmill that converts wind energy into consumable energy in the form of compressed air, electricity, hydrogen gas fuel, and elevated water, and/or to serve as direct prime driving machine, comprising:

A plurality of large square-faced wind sails, made of light thin metal sheets or strong light cloth/fabrics fastened together to a light strong square frame, put together in great quantities, arranged in a single file procession closed to each one after the other with a clearance to allow each sail to flip to the right or to flip to the left and moving along a long straight line in one direction and along another long straight line parallel to the first line but moving to the opposit direction—transverse to the general direction of the wind;

A vertical mast for each sail, made of light strong materials such as bamboo poles or reinforced aluminum pipes, that holds the sail in place at vertical posture and at the same time serves as frame member to which the said fabric is attached to, the top end of which is reinforced by steel pipe or bar that is securely attached to the upper Power Cable Chain to serve as drive teeth of said Power Cable Chain, the bottom end of which is also reinforced by steel pipe or bar that is securely attached to the lower Power Cable Chain to serve as drive teeth of said Power Cable Chain;

A pair of Power Cable made of strong rope, one at the upper level and one at the lower level as mentioned above, which are tugged by each of said large sails moving in equal pace, which form an endless drive chain having two end loops that are quite apart from each other (may be ½ mile or more apart), to which the upper end and the lower end of each sail-mast are securely attached respectively, which are provided with drive teeth by clamping to same three or more vertical short bars in between the spacing of each sail-mast that are strong enough to drive the terminal gear wheels;

A set of three Terminal Gear Wheels arranged in a half-hexagonal formation to hold and stretch out each of the end loops of the said upper level and the lower level Power Cable, which are driven by said Power Cable thru its drive teeth that fit into the notches on the circumferencial edges of the said Gear Wheels;

Said three Terminal Gear Wheels are quite far apart from each other such that the half-hexagonal formation has a radius of 100 feet or more in order to sparate the two long parallel lines of sails away from each other for better wind contact;

An Aerial-Cable Railway parallel and 1 to 3 inches close to each and every level and every line of said Power Cable, which is a high tension steel or nylon rope, suspended or held in place by tall posts or steel towers separate from the support posts for the said terminal gear wheels, which will carry the whole weight of each and every sail including the weight of the Power Cable plus the weights of the deep-grooved carrier Roller Wheels, which will hold the sails from swaying sideward due to the horizontal forces of the wind, and which will relieve the Power Cable from vertical loads at the same time prevents overloading of the Terminal Gear Wheels;

A deep-grooved carrier Roller Wheel securely attached to the top end and to the bottom end of each and every sail-mast at the point where the Power Cable is also connected to each mast, which rolls on said Aerial Cable Railway carrying the sail as being pushed by the wind, the deep groove of which being at least 5 times the diameter of the Aerial Cable Railway so that it will not be de-railed during violent weather or when it is working with high speed winds;

An Intermediary Suspension Support in the form of catenary wires or ropes strung in various strategic poinsts along the span length of said Aerial Railway, transverse to and connected to various strategic points of the upper level said Aerial Railway by means of an erect "T" connectors with the tip of its bottom hook being the one clamped to the said railway to lift it from below giving clear passage of the carrier roller wheels, and connected to various trategic points of the said lower level Aerial Railway by means of an inverted "T" connectors with the tip of its tail being the one clamped to said railway to lift it up from below giving clear passage of the carrier roller wheels running on the lower level Aerial Railway, the purposes of which are to provide rigid support (vertically and horizontally) to the Aerial Cable Railway to prevent sag and to provide the opportunity to build longer lines of aerial railways;

A Cable-Rail Switch as illustrated by 135/136 named in the summary as "Labrador Cable-Rail Switch", made of laminated steel plate or hardwood plate (depending upon the kind of Aerial Railway) with a deep groove to house said cable railway and provided with clipping accessories such as "U"-Bolts and clipping block, and further provided with a horizontal arc-tang to guide the deep-groove carrier roller wheel, which is clipped to the Aerial Cable Railway at the location of every Terminal Gear Wheel at the exact point where the sail-mast is forced to make a turn by the Power Cable, in order to effect smoth transfer of the sails from one Aerial Railway to the next Aerial Railway of different direction;

A Terminal Power Station as per 102, 126, 124, 127 constructed at each end loop of the Power Cable (the right end and the left end of the windmill) which is an assembly comprising (a) the aforementioned set of three Terminal Gear Wheels in a Half-Hexagonal formation, (b) a vertical Gear Shaft holding each and driven by each of the said Terminal Gear Wheels, (c) a Power Gear held and driven by each of the said vertical Gear Shafts, (d) a Power Support Chain which interlocks the upper level set of three Terminal Gear Wheels and another Power Support Chain interlocking the lower level set of three Terminal Gear Wheels to remove concentration of force upon the said first Terminal Gear Wheel being exerted by the said Power Cable, and to serve as energy collection agent;

A vertical Power Shaft, being a part of said Terminal Power Station, which holds and being driven by an upper level Power Gear and by a lower level Power Gear;

A Power Chain, being a component of said Terminal Power Station, which interlocks the Power Gear attached to the Gear Shaft of the said upper level first Terminal gear Wheels with the Power Gear attached to the upper end of the said Power Shaft, and another Power Chain (the same kind and length as the first) interlocking the Power Gear attached to the Gear Shaft of the said lower level first Terminal Gear Wheel with the Power Gear attached to the lower end of the said Power Shaft, by which the said vertical Power Shaft is driven by the Terminal Gear Wheels, and by which the forward pace of the upper level Power Cable is controlled to become equal to the forward pace of the Power Cable at the lower level, so that the sail-mast will stay vertical at all times—not being affected by the small differences in circumference among the Terminal Gear Wheels it being that they have equal number of circumferencial notches or teeth;

A Power Take-off Gear Wheel securely attached to the bottom tip of the said vertical Power Shaft;

A Diagonal Brace String tautly tied to the bottom-outer corner of of the sail frame and connected to the top-inner corner of said frame to make the sail stay square against its own weight;

A control string tied to the outer-top corner and another string tied to the outer-bottom corner of each sail that hold the sail stay rigid against the wind by tying its opposit end to the upper end of the succeeding sail-mast and the opposit end of the lower control string tied to the bottom end of the said succeeding sail-mast, holding the sail 45 degrees with the Power Cable;

Said control string is provided with a Short-Hook String that is calibrated to snap-off to release the sail automatically during violent weather or when the wind speed becomes beyond the working limit, making the sail neutral to the wind to save the whole windmill from destruction;

A Horizontal Arm Structure for each and every Terminal Gear Wheel, long enough to hold one said wheel away from the support post to provide clear passage of the large sails when they flip towards the said support post due to the wind direction, and strong enough to hold the said Terminal Gear Wheel in correct position against the high tension Power Cable pulling it outward;

A Support-Post Structure for every pair of Horizontal Arm Structure (upper and lower level) to hold same high above the ground for a better wind contact, which can be in the form of wood poles or in the form of steel towers;

A support post structure for every end of the Aerial Cable Railway and for every end of said Intermediary Suspension Support, each support post structure carry two levels of Aerial Cable Railway or two levels of Intermediary Suspension Support;

Guy Wires to hold and keep erect all Support-Post Structures;

A Transmission Gear, stick-shift, 5 or more speeds, driven by said Power Take-off Gear Wheel, to increase or decrease driving speeds depending upon the wind speeds and/or power output of the windmill;

An air compressor, driven thru said Transmission Gear, to produce compressed air and store same in large tunnel reservoirs;

An electric generator driven by an air turbine;

An electrolizer to produce oxygen and hydrogen gas fuel out of the electricity generated by electolysis of water;

A water pump driven thru said Transmission Gear to store energy in the form of elevated water;

A long-toothed lock gear functionally connected to the mast as illus-by part 134 using the mast as its axil freely rotating but vertically immovable to be sweeping the lower lips of the carrier wheel 133 to prevent same from being derailed by the violent weather;

A switch for the cable rail, part 135, and also a rail Support 137, having windows 136 that allows free passage of the long-toothed lock gear when the sail moves forward.

4,859,147

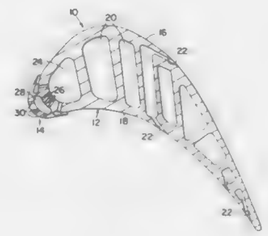
COOLED GAS TURBINE BLADE

Kenneth B. Hall, Jupiter, and Kenneth K. Landis, Tequesta, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 25, 1988, Ser. No. 147,465

Int. Cl.[4] F01D 5/18

U.S. Cl. 416—97 R 5 Claims



1. An air cooled turbine blade comprising:

an airfoil shaped body having a leading edge portion having an outer surface and a main body having an outer surface;

two longitudinally extending struts supporting said leading edge portion in spaced relationship from said main body forming a central plenum between said struts and two outer plenums;

means for conducting cooling air to each of said outer plenums;

means for conducting cooling air to said central plenum;

said leading edge portion having a tail overlapping the surface of said main body forming a longitudinally extending slot therebetween in fluid communication with each of said outer plenums;

the outer surface of said main body being continuous surface extending past each of said slots; and

a plurality of openings extending through said leading edge portion from said central plenum.

4,859,148

PRELOADED TUNABLE ELASTOMERIC FLAPPING HINGE BEARING AND METHOD OF PRELOADING

Edward S. Hibyan, Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.

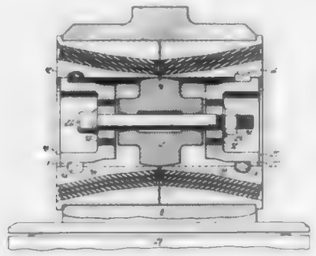
Filed Feb. 26, 1988, Ser. No. 161,562

Int. Cl.[4] B64C 11/12; F01B 5/26; F16C 27/06

U.S. Cl. 416—134 A 8 Claims

1. An elastomeric bearing for the flapping hinge of a helicopter articulated rotor head, said bearing having an inner race and an outer race with elastomeric means between said races, said inner and said outer races consisting of two elements, each element having an inner face in close proximity to the inner face of said other element and located near the middle of the bearing, and each element having an outer face located adjacent the outer edge of said bearing, each inner race element having an inner periphery toward said inner face having a first slope angle and an outer periphery toward said outer face

having a slope angle greater than the slope angle of said inner periphery, and said outer race having an inner periphery with



surfaces opposite and essentially parallel to those of its opposite inner race element.

4,859,149

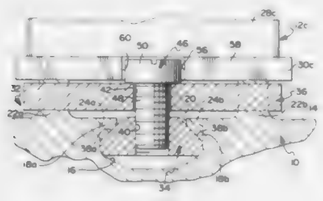
BLADE LOCKING SYSTEM

John C. McClain, Plainfield, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 10, 1989, Ser. No. 321,822

Int. Cl.[4] F01D *5/32*

U.S. Cl. 416—215 **3 Claims**



1. In a rotor assembly including

means on said rotor defining an outside cylindrical surface,

a dovetail groove extending circumferentially around said rotor having a pair of converging shoulders which define therebetween a slot in said outside cylindrical surface,

a pair of circumferentially extending steady rest flanges on said outside cylindrical surface on opposite sides of said slot,

a plurality of rotor blades each having an airfoil and a root and a platform between said airfoil and said root, and

a pair of aligned notches in said converging shoulders defining a loading slot for insertion of said blade roots into said dovetail groove,

a blade lock comprising:

an inner lock member slidably disposed in said dovetail groove and spanning said slot between said converging shoulders so that said inner lock member is radially captured in said dovetail groove,

means defining a pair of aligned notches in said steady rest flanges on opposite sides of said slot in said outside cylindrical surface,

an outer lock member disposed between said outside cylindrical surface and said platforms of a pair of adjacent ones of said rotor blades and captured in said aligned slots so that said outer lock member is immobilized with respect to circumferential bodily shiftable movement relative to said rotor,

means on each of said platforms of said adjacent ones of said rotor blades cooperating in defining a clearance aperture through said platforms, and

connecting means between said inner and said outer lock members accessible through said clearance aperture and operable to clamp each of said inner and said outer lock members against said rotor.

4,859,150

BLADES FOR LOW SPEED PROPELLER FAN

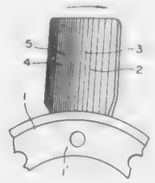
Kazunori Takigawa, Numazu, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 134,517, Dec. 17, 1987, abandoned, which is a continuation of Ser. No. 27,900, Mar. 19, 1987, abandoned. This application Jul. 15, 1988, Ser. No. 219,452

Claims priority, application Japan, May 19, 1986, 61-75107[U]; May 19, 1986, 61-75108[U]

Int. Cl.[4] B65H *1/26*

U.S. Cl. 416—223 R **7 Claims**



1. In a low speed propeller fan which includes a member connected to a rotating body and a plurality of blades extending radially outwardly from the outer peripheral surface of said member, each of said blades characterized by having a coarsened surface defined by a plurality of grooves on at least part of its suction side, the coarseness of the surface gradually increasing from the front edge of said blade, which is its leading edge when the fan is rotated, to its rear edge, said grooves extending generally parallel to the rear edge.

4,859,151

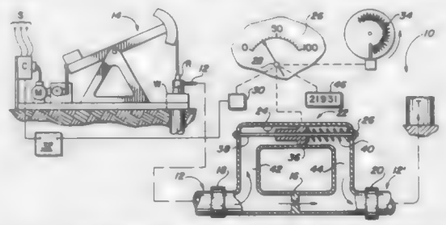
PUMP-OFF CONTROL FOR A PUMPJACK UNIT

John H. Reed, P.O. Box 837, Kermit, Tex. 79745

Filed Jan. 19, 1988, Ser. No. 145,385

Int. Cl.[4] F04B *49/02, 49/08*

U.S. Cl. 417—12 **12 Claims**



1. In a downhole pump that is reciprocated by a pumpjack unit to provide a flow of fluid through a flow line each upstroke of the pump, a prime mover for said pumpjack unit, a controller for starting and stopping said prime mover, a method of controlling the operation of said pumpjack unit comprising the steps of:

placing an orifice in said flow line and connecting a bypass around said orifice, sizing said orifice so that when said pump upstrokes and establishes a flow of fluid, the fluid flow is divided with part of the fluid flowing through said orifice while simultaneously the other part of the fluid flows through said bypass;

placing a movable member within said bypass and biasing the member in an upstream direction; said member being responsive to rate of flow; and, using the magnitude of the flow through the bypass for reciprocating said movable member an amount which is proportional to the quantity of fluid produced by one pumping stroke of said downhole pump;

connecting circuitry to said controller to energize said prime mover for a first time interval and to thereafter deenergize said primer mover for a second time interval; and, then to energize said primer mover for another said first time interval;

selecting the relative size of the member, bypass, the biasing force, and orifice to displace said member downstream against the biasing force when flow occurs through said bypass each full barrel stroke of the downhole pump, connecting said member to produce a signal in response to each movement of the member which is of a selected magnitude;

connecting said signal to reset said first time interval each time said movable member is moved a predetermined amount in response to flow through said bypass; so that said first time interval is never exceeded so long as said movable member continues to reset said first time interval; whereby; said controller continues to supply current to the prime mover;

starting said prime mover and running said pumpjack unit so long as the flow each upstroke of the pump moves the movable member said predetermined amount;

shutting in the pump for said second time interval whenever the movable member is displaced less than said predetermined amount for a period of time equal to said first time interval, said pump is shut-in for said second time interval; whereby:

said pumpjack unit, when started, runs a plurality of strokes and then discontinues the operation of the pumpjack unit unless said first time interval is reset during said pluarlity of strokes.

4,859,152

ELECTROMAGNETIC AIR PUMP

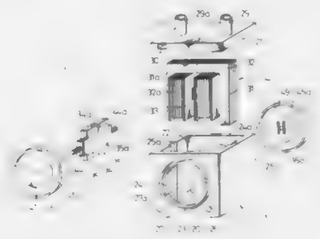
Rokusaburo Kimura, Kobe; Yoshie Watari, Osaka, and Satoshi Makayama, Nara, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Nov. 19, 1987, Ser. No. 122,464

Claims priority, application Japan, Nov. 26, 1986, 61-281433

Int. Cl.[4] F04B *39/12, 45/04*

U.S. Cl. 417—63 **10 Claims**



1. An electromagnetic air pump comprising:

a housing including a box-shaped body having upstanding side walls and a fully open top side for providing physical and visual access to an interior of said box to accommodate the assemblage of parts therewithin and visual inspection of the assembled parts,

said parts including:

an electromagnetic core block mounted within said body interior and including an iron core and electric coils wound on said core to form an air gap which is centrally disposed in said interior and visible through said open top side, and

an actuator including permanent magnet means, said actuator disposed in said air gap for being shiftable when electromagnetically excited by said core block,

a cover member mounted over said open top side for covering said top side, with said parts assembled in said interior,

two flexible diaphragm means mounted in respective ones of two of said side walls opposed to one another in the direction of shifting of said actuator, each of said diaphragm means being coupled to said actuator to be flexed thereby in response to shifting of said actuator, and

means, including said diaphragm means, defining variable volume chambers within said housing and including suction and discharge valve means which are selectively opened and closed in response to volume variation of said chambers produced by flexing of said diaphragm means in order to create an air flow.

4,859,153

PRESSURE WAVE CHARGER

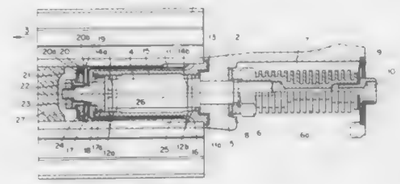
Andreas Mayer, Niederrohrdorf, Switzerland, assignor to ASEA Brown Boveri Ltd., Baden, Switzerland

Filed Oct. 3, 1988, Ser. No. 252,549

Claims priority, application Switzerland, Oct. 2, 1987, 3861/87

Int. Cl.[4] F02B *33/42;* **F04F** *11/00*

U.S. Cl. 417—64 **7 Claims**



1. A pressure wave charger for the supercharging of an internal combustion engine, comprising:

a cell rotor which is driven by the force of gases of the internal combustion engine and is comprised of a ceramic material having an air housing closing off one side of the cell rotor and a gas housing closing off the other side of the cell rotor;

an axle anchored in the air housing;

a rotor shaft bearingly supported on the axle and projecting from the air housing, upon which rotor shaft said cell rotor is mounted;

said rotor shaft including a stop shoulder at the side by the air housing and which shoulder is raised relative to a centering surface of the rotor shaft;

means for pressing the cell rotor against the stop shoulder; and

a thermal protective device for shielding the rotor shaft.

4,859,154

VARIABLE-DELIVERY VANE-TYPE ROTARY COMPRESSOR

Toshinori Aihara, and Yukio Sudo, both of Atsugi, Japan, assignors to Atsugi Motor Parts Co., Ltd., Kanagawa, Japan

Filed Aug. 5, 1987, Ser. No. 83,267

Claims priority, application Japan, Aug. 7, 1986, 61-186555

Int. Cl.[4] F04B *49/00, 49/02*

U.S. Cl. 417—295 **3 Claims**

1. A variable capacity rotary compressor comprising:

(a) a compressor housing defining therein an internal space which includes a low-pressure chamber connected to a low-pressure fluid source and a high-pressure chamber connected to a load;

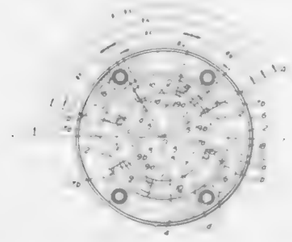
(b) introducing means for introducing a low-pressure fluid into said low-pressure chamber;

(c) compression means for compressing said low-pressure fluid to a predetermined higher pressure, said compression

means including a compression chamber into which said low-pressure fluid is introduced for compression, said compression means including a rotor assembly carrying a plurality of vanes which are provided radially for radial movement toward and away with respect to said rotor assembly for defining a plurality of arcuately arranged compression chambers, said rotor being driven to rotate for repeating operation cycles including introduction stroke for introducing said low-pressure fluid, compression stroke for the introduced low-pressure fluid and discharge stroke for compressed high pressure fluid to said high-pressure chamber;

(d) first inlet communicating the low pressure chamber and compression chamber, said first inlet acting solely as an inlet port during all operations of the variable capacity rotary compressor;

(e) passage means for defining a by-pass passage located between the low-pressure chamber and compression chamber for establishing communication between said low-pressure chamber and said compression chamber, said by-pass passage extending substantially the entire arcuate length of the compression chamber so as to establish com-



munication between said low-pressure chamber and said compression chamber;

(f) rotary closure member defining an opening having an arcuate extent with loading and trailing edges wherein the leading edge defines the beginning of the compression point of the variable capacity compressor, said rotary closure member being selectively positioned between a first position wherein said opening serves only as an inlet for communicating low-pressure fluid from the low-pressure chamber to the compression chamber when said compressor operates at maximum capacity and a second position wherein said opening serves as a by-pass from the compression chamber through said by-pass passage to the low-pressure chamber when said compressor operates at a reduced capacity; and

(g) actuating means for actuating said rotary closure member for movement between said first position and said second position for adjusting the amount of low-pressure fluid by-passed through said by-pass passage wherein the pressure on both sides of the vanes prior to the beginning of the pressure point is substantially equal whereby power losses resulting from pressure drops across the vanes is substantially reduced.

4,859,155

BYPASS VALVE FOR A DISPLACEMENT PUMP

Fred L. Laqua, Wichita, Kans., assignor to Great Plains Industries, Inc., Wichita, Kans.

Filed Oct. 21, 1987, Ser. No. 112,536
Int. Cl.[4] F04B *49/02*; F16K *17/04, 17/10*
U.S. Cl. 417—307 **6 Claims**

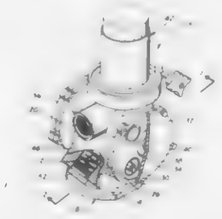
1. A bypass valve for a displacement pump having a housing wherein a pump inlet and pump outlet are formed, the bypass valve comprising:

a bore formed through portions of the housing between the pump inlet and the pump outlet, the bore extending from a first end thereof opening to the pump outlet to a closed second end thereof;

a valve seat formed in the housing about portions of the bore adjacent the first end thereof;

a duct formed through the housing between the closed end of the bore and the pump inlet;

a piston having opposite first and second ends, the piston disposed in the bore for sliding movement therein from a closed position of the valve to an open position of the valve, in the closed position of the valve the first end of the piston being disposed adjacent the valve seat, in the open position the first end of the piston being displaced from the valve seat, the piston having a cylindrical expansion chamber and an opening through the first end of the piston to communicate fluid pressure in the pump outlet to the expansion chamber;



means for forming a seal between the first end of the piston and the valve seat when the valve is in the closed position;

a piston spring disposed in portions of the bore between the second end thereof and the second end of the piston for urging the piston against the valve seat; and

means for varying the volume of the expansion chamber in relation to fluid pressure in the pump outlet, comprising:

a modulator disc disposed in the expansion chamber for sliding movement toward and away from the opening in the expansion chamber; and

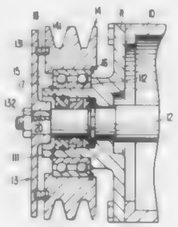
a modulator spring disposed in the expansion chamber between the second end of the piston and the modulator disc for urging the modulator disc toward the first end of the piston, the modulator spring having a spring constant lower than the spring constant of the piston spring.

4,859,156

COUPLING MECHANISM FOR A COMPRESSOR

Kazuto Kikuchi, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Jul. 23, 1987, Ser. No. 76,852
Claims priority, application Japan, Jul. 23, 1986, 61-111995[U]
Int. Cl.[4] F04B *35/00*
U.S. Cl. 417—319 **7 Claims**



2. A coupling mechanism for a compressor, said compressor

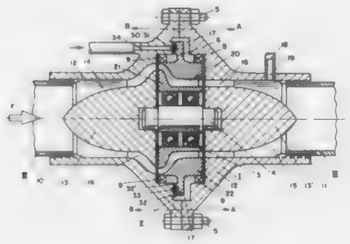
comprising a compressor housing having an open end surface, a front end plate attached to said open end surface of said compressor housing, a drive shaft rotatably disposed within said compressor housing, said drive shaft having an outer end portion terminating exterior of said compressor housing, and a tubular extension extending outwardly from said front end plate in a direction parallel to the rotational axis of said drive shaft; and said coupling mechanism comprising a pulley rotatably supported on a peripheral outer surface of said tubular extension, a plate-like element connected to and rotatable with said outer end portion of said drive shaft, and a plurality of cylindrical members disposed between an inner side surface of said rotatable plate-like element and an outer side surface of said pulley, said cylindrical members made of materials which are easily broken by a large torque to disconnect said pulley from said plate-like element.

4,859,157

DEVICE FOR INJECTING FERTILIZER OR OTHER CHEMICALS INTO A PIPELINE

Dan Adler, 56 Haag Street, Haifa, Israel

Filed Nov. 10, 1988, Ser. No. 269,677
Claims priority, application Israel, Dec. 31, 1987, 84994
Int. Cl.[4] F04D *13/04*
U.S. Cl. 417—348 **12 Claims**



1. An injection device adapted to be energized by the water flow in a pipe line III and to carry liquid fertilizer or other chemicals from a supply into said pipe line at a given rate and comprising a housing I adapted for positioning in said pipe line and containing an impeller II freely rotatable in axial alignment therewith,

said device being characterized by a central turbine portion consisting of a number of turbine vanes (**20**) integral with said impeller and water guiding means (**16**) integral with said housing, and by a peripheral pump portion in the form of a side-channel turbine pump consisting of a plurality of spaced-apart, substantially radial vanes (**30**) provided on an annular portion on at least one side of an outstanding rim (**6**) extending from said turbine portion, and at least one stationary channel (**33**) recessed in said housing and facing said vanes in proximate relationship, said channel extending between a suction port (**34**) and a discharge port (**35**) provided in said housing.

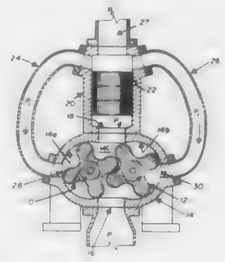
4,859,158

HIGH RATIO RECIRCULATING GAS COMPRESSOR

John F. Weinbrecht, 601 Oakwood Pl., NE., Albuquerque, N. Mex. 87123

Filed Nov. 16, 1987, Ser. No. 121,663
Int. Cl.[4] F04C *18/18, 23/00, 29/04*
U.S. Cl. 418—9 **5 Claims**

1. A positive displacement recirculating rotary compressor comprising a housing having two mutually opposing cylindrically curved interior side walls, said housing including a gas inlet port at one end located between said mutually opposing cylindrically curved side walls, and a gas discharge port located at the opposite end of said housing from said inlet port and also located between said mutually opposing cylindrically curved interior side walls, said housing further including first and second gas recirculation ports formed respectively in said cylindrically curved side walls between said inlet port and said discharge port, first and second involutely lobed impellers journalled for rotation in opposite directions within said housing, each of said impellers having at least four lobes, said impellers being intermeshed so as to form a high-impedance seal when said impellers are rotated in opposite directions, said discharge port being connected in fluid communication with a discharge conduit, heat exchange means located in said discharge conduit operable to cool gas discharged from said discharge port of said housing, and first and second recirculation conduit means connected in fluid communication with



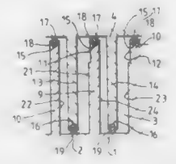
said discharge conduit and connecting said discharge conduit respectively to said first and second recirculation ports, said inlet port and said discharge port being approximately equal in size to one another, and said first and second recirculation ports being approximately equal in size to one another, and said discharge port being approximately twice the size of each of said recirculation ports, and said inlet, discharge and recirculation ports further being as large as possible within the constraints of the foregoing relationships, whereby gas discharged from said housing is cooled by said heat exchange means and returns to said housing through said recirculation ports so as to reduce heating of said impellers, and with the sizing of said inlet, discharge and recirculation ports resulting in minimal flow losses.

4,859,159

SPIRAL COMPRESSOR WITH SETBACK PORTION ON RADIALLY OUTER PERIPHERAL WALL

Helmut Leptien, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,729
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 3702059
Int. Cl.[4] F04C *18/04*
U.S. Cl. 418—55 **4 Claims**



1. A displacement machine for compressible media comprising a stationary housing formed with at least one displacement chamber having a generally spiral shape and having radially inner and outer peripheral walls with upper edges and at least one displacement body having a generally spiral shape associated with the displacement chamber and positioned therein,

the displacement body being positioned essentially perpendicularly on a disc-shaped rotor which is mounted for eccentric motion relative to the housing, wherein a portion of the upper edge of the radially outer peripheral wall of a displacement chamber is set back over at least a part of its peripheral region extending from its radially outer end to form a recess therein extending in the angular direction, the height of the set-back portion being no more than about one-quarter of the wall height and the radial depth of the set-back portion being no more than about 0.15 mm, said recess being configured to avoid contact or butting relation with the adjacent displacement body while providing a minimum chamber volume for maximum efficiency and minimum leakage.

4,859,160

CUTAWAY ROTOR GEROTOR DEVICE

Hollis N. White, Jr., 243 Pyle La., Hopkinsville, Ky. 42240

Filed Sep. 18, 1987, Ser. No. 98,362
Int. Cl.[4] F01C *1/10, 21/08*
U.S. Cl. 418—61.3 **14 Claims**



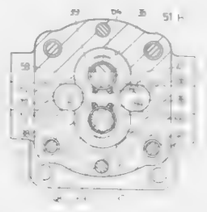
1. In a gerotor device having a rotor with a depth and generated lobe shape and with main lines of action to surrounding stator rolls, the main lines of action defining the edges between expanding and contracting sections of gerotor cells, the improvement of the lobes of the rotor being cut away between the main lines of action for the full depth of the rotor.

4,859,161

GEAR PUMP

Hideo Teruyama, Saitama, and Masaru Yano, Chiba, both of Japan, assignors to Kayaba Industry Co. Ltd., Japan

Filed Apr. 28, 1988, Ser. No. 187,088
Claims priority, application Japan, May 7, 1987, 62-110968
Int. Cl.[4] F04C *29/02*
U.S. Cl. 418—102 **3 Claims**



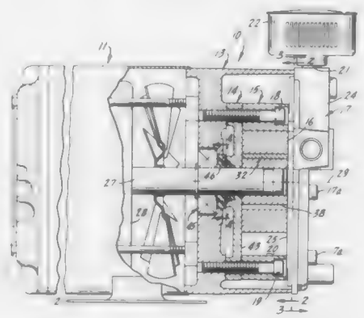
1. A gear pump comprising:
a pump body formed with a gear hole and bushing insertion holes;
gears arranged in said gear hole;
bearing bushings pressedly inserted in said bushing insertion holes, said bearing bushings each being formed on an inside thereof with a lubricating oil introduction passage and on an outside thereof with a lubricating oil return passage;
gear shafts rotatably supported in said bearing bushings;
at least one side plate arranged on at least one side of said gears; and
a suction chamber defined in said pump body so as to circulate a part of hydraulic fluid in said suction chamber through said lubricating oil introduction passages and said lubricating oil return passages;
said lubricating oil return passages having outlets positioned in a manner to be laterally symmetric on the basis of a vertical line defined by connecting centers of said gear shafts together and vertically symmetric on the basis of a horizontal line extending through a center of said vertical line and perpendicular to said vertical line and inlets;
said at least one side plate being formed with a through-hole which is positioned on one side of said vertical line so as to be communicated to said outlets of said lubricating return passage vertically symmetric on the basis of said horizontal line and a cutout for communicating said inlet of said lubricating oil introduction passage to said suction chamber.

4,859,162

ROTARY VANE COMPRESSOR

Robert J. Cox, Sheboygan, Wis., assignor to Thomas Industries, Inc., Sheboygan, Wis.

Continuation of Ser. No. 943,960, Dec. 22, 1986, abandoned.
This application Aug. 29, 1988, Ser. No. 240,371
Int. Cl.[4] F04C *18/00, 29/00*
U.S. Cl. 418—152 **5 Claims**



1. In a rotary vane compressor,
a rotor housing which forms, with closure means, a rotor chamber,
rotor chamber outlet means and inlet means,
a rotor in the rotor chamber carried by a shaft which is mounted for rotation about a fixed axis,
a plurality of slots in the rotor which extend from end to end of the rotor,
a vane adapted for reciprocating movement in each slot,
said rotor being oriented with respect to the fixed wall of the rotor chamber and the inlet means and outlet means as to draw fluids through the inlet means and into an expanding and contracting pump space formed by the rotor chamber, the rotor, the closure means and the adjacent vanes, thereafter compressing the fluid and subsequently discharging the compressed fluid from the pumping space to the outlet means under pressure,
said rotor housing being formed from cast iron,
said rotor being formed from a material selected from the group consisting of cast iron and power metallurgy composition,
at least that portion of said closure means which is located

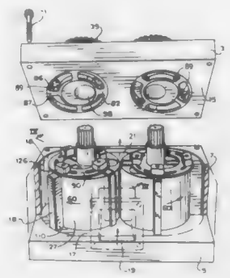
adjacent the rotor and vanes being coated with a material having the characteristics of plastic with respect to friction and abrasion resistance,
said coating having a substantial thickness,
said rotor shaft being journaled in a bearing which is located between the rotor and a power source,
and further including
means, located adjacent to and upstream of the bearing, for reducing the quantity of deleterious particles and hot air passing toward and through the bearing during normal operation,
said means including a baffle surrounding the rotor shaft and located between the bearing and the rotor,
said baffle having radial ribs for discharging a portion of said particles and hot air out of the fluid flow path which passes through the bearing.

4,859,163

ROTARY PUMP HAVING VANES GUIDED BY BEARING BLOCKS

Steven C. Schuller, Markham, Canada, assignor to Steven Schuller Performance Inc., Markham, Canada

Filed Jun. 25, 1987, Ser. No. 66,162
Int. Cl.[4] F04C *18/344*
U.S. Cl. 418—192 **17 Claims**



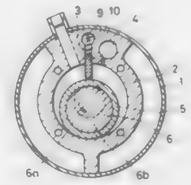
1. A rotary pump comprising:
a housing defining a chamber, the chamber having two end surfaces, first and second sealing surface sections extending between the end surfaces, having respective first and second axes, and inlet and outlet ports disposed opposite one another and between the sealing surfaces;
one first, circular track and one second, circular track on one end surface of the chamber, and another first, circular track and another second, circular track on the other end surface of the chamber, each of the first and second tracks being continuous, the first tracks extending around the first axis and the second tracks extending around the second axis;
a first rotor rotatably mounted within the chamber for rotation about the first axis, and including a plurality of first slots and a plurality of first fluid transfer ports providing communication between the first slots;
a second rotor rotatably mounted within the chamber for rotation about the second axis, and including a plurality of second slots and a plurality of second fluid transfer ports providing communication between the second slots;
the first and second rotors sealingly contacting one another at a contact line therebetween and between the first and second axes;
a plurality of first vanes, each vane having a stub shaft at either end and a sealing edge and being slidably received in a slot of the first rotor and rotatable therewith about the first axis with the sealing edges of the first vanes projecting outwardly;
a plurality of second vanes, each vane having a stub shaft at either end and a sealing edge and being slidably received in a second slot of the second rotor and rotatable therewith about the second axis with the sealing edges of the second vanes projecting outwardly;
a first track following means which comprises one first annular carrier rotatably mounted in said one first track, another first annular carrier rotatably mounted in said one other first track, each of the first annular carriers including an annular recess having at least one first arcuate bearing surface, and a plurality of first bearing blocks each of which includes inner and outer arcuate bearing surfaces for sliding movement along a respective annular recess and a bore, and which are mounted in the recesses of the first annular carriers for rotation therewith and for relative motion along the first arcuate bearing surfaces, with each first vane being pivotally mounted by one stub shaft to one first bearing block on said one first annular carrier and by the other stub shaft thereof to one first bearing block on said other first annular carrier;
a second track following means which comprises one second annular carrier rotatably mounted in said one second track, another second annular carrier rotatably mounted in said another second track, each of the second annular carriers including an annular recess having at least one second annular bearing surface, and a plurality of second bearing blocks each of which includes inner and outer arcuate bearing surfaces for sliding movement along a respective annular recess and a bore, and which are mounted in the recesses of the second annular carriers for rotation therewith and for relative motion along the second arcuate bearing surfaces, with each second vane being pivotally mounted by one stub shaft to one second bearing block mounted on said one second annular carrier and by the other stub shaft thereof to one second bearing block mounted on said other second annular carrier;
for each annular carrier, a respective cover plate secured thereto and covering each corresponding arcuate recess, the cover plate including a plurality of arcuate holes, corresponding to the arcuate recesses, with a respective stub shaft extending through each arcuate hole;
means for rotating the first and second rotors in opposite directions;
whereby, in use, with the rotors rotated such that the vanes contacting the sealing surfaces move from the inlet port to the outlet port, those vanes pump fluid from the inlet port to the outlet port.

4,859,164

FERROUS SINTERED ALLOY VANE AND ROTARY COMPRESSOR

Soichi Shimomura, Yono, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,324
Claims priority, application Japan, Dec. 6, 1986, 61-291364
Int. Cl.[4] F03C *2/00*
U.S. Cl. 418—179 **5 Claims**



1. A vane for use in a rotary compressor employing a cooling medium, said vane comprising a ferrous sintered alloy product produced by the steps of:
preparing metal powder mixture primarily containing iron;

compacting said powder mixture to obtain a powder compact;
sintering said powder compact to obtain a sintered body;
subjecting sub-zero treatment to said sintered body;
tempering said sub-zero treated sintered body; and
machining said sintered body, whereby said cooling medium is maintained without deterioration of its property upon operation of said rotary compressor.

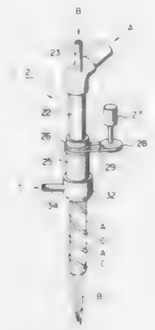
3. A rotary compressor comprising:
a casing;
a rotor housing disposed in said casing and formed with a groove;
a rotor eccentrically rotatable in said rotor housing;
a vane disposed slidable relative to said groove and in sliding contact with said rotor, said vane being formed of a ferrous sintered alloy which is subjected to sub-zero treatment after sintering and prior to tempering.

4,859,165

EXTRUDER FOR FOOD

Chikako Hoashi, Musashinoshi, Japan, assignor to Yugenkaisha Matsubei, Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 290,459
Int. Cl.[4] B29C *47/24*
U.S. Cl. 425—133.1 8 Claims



1. An extruder for food, comprising:
a rotary cylinder fitted to a tip of an extrusion nozzle for extruding a food material;
at least one feed opening formed in the outer periphery of said rotary cylinder, from which a different food material is fed;
a stationary cylinder so fitted as to cover said feed opening in slidable contact with the outer periphery of said rotary cylinder, and having a circular space formed around the corresponding outer periphery of said rotary cylinder; and
a feed pipe from which said different food material is fed into said circular space of said stationary cylinder.

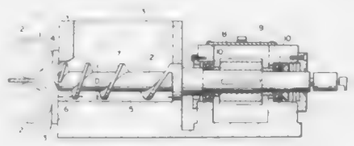
4,859,166

SCREW EXTRUDING MACHINE

Yoshihiro Hamada; Kazuhiko Nakagawa; Katunobu Hagiwara; Takeoki Noda, and Mitunori Asada, all of Hyogo, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Aug. 5, 1988, Ser. No. 228,466
Claims priority, application Japan, Aug. 6, 1987, 62-196991; May 9, 1988, 63-113055
Int. Cl.[4] B29C *47/38*
U.S. Cl. 425—204 4 Claims

1. A screw extruding machine, comprising:
a casing having a screw base portion;
a pair of screws horizontally and rotatably supported on said casing; a top-open hopper provided on a side of said screw base portion of said casing; an outlet opened in an axial direction of the screw on the side of a screw front end of said casing; and a roller die located in proximity of said outlet, said screw having a feed portion which corresponds to a portion facing the hopper and a compression portion defined between said feed portion and said outlet, such that material to be extruded supplied from the hopper is extruded into a sheet-like form by said roller die



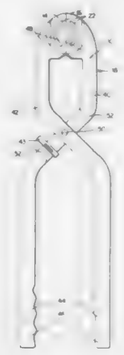
from the outlet via said feed portion and said compression portion by the rotating screws, wherein said screws comprise a pair of screws parallel with each other in the same plane, and said hopper is positioned over said feed portion of each screw, and the length L of the compression portion to the diameter D of each of said screws has the relationship of L/D=0.3 to 0.6.

4,859,167

SNOWBALL MAKER

Ralph R. Maerz, and Judy A. Maerz, both of P.O. Box 466, Entwistle, Alberta, Canada T0E 0S0

Filed May 4, 1988, Ser. No. 190,133
Int. Cl.[4] B29C *33/26, 43/04*
U.S. Cl. 425—276 4 Claims



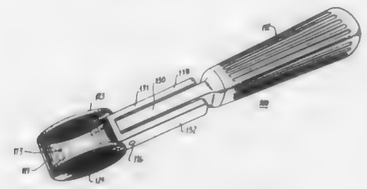
1. A snowball maker, comprising:
a. a pair of semi-spherical cups, said cups having bevelled peripheral edges;
b. a guide adapted to permit rapid movement of said cups between a first position wherein said edges of said cups are in spaced relation and a second position wherein said edges are engaged, said guide having stop means which define said first position and thereby control the volume of snow compressed between said cups;
c. at least one of said cups defining slots for permitting exit of excess show;
d. edges defining said slot being bevelled.

4,859,168

FOOD SCOOP MOLD WITH EJECTOR

Daniel N. Calder, 442 Willard Rd., Huntingdon Valley, Pa. 19006

Continuation-in-part of Ser. No. 882,074, Jul. 3, 1986, abandoned. This application Oct. 19, 1987, Ser. No. 111,090
Int. Cl.[4] A47G *21/00*
U.S. Cl. 425—284 3 Claims



1. An apparatus for dispensing food, the apparatus comprising:
first and second planar side walls having a substantially circular configuration for defining a predetermined space therebetween;
coupling means arranged in said predetermined space and substantially transverse with respect to said first and second side walls for coupling said first and second side walls to each other in substantially parallel spaced relationship and defining a substantially cylindrical receptacle region therebetween for receiving the food;
a handle means extending from said coupling means; and food displacement means having:
a food engagement portion arranged in said receptacle region forming a substantially continuously curved back wall dimensioned to extend for substantially the entire distance between said first and second side walls for closing a portion of said receptacle region, whereby the food entering into said receptacle region is formed into a cylindrical shape, and
an actuation portion formed substantially integral with said food engagement portion and having two actuation arms substantially parallel to each other and disposed on opposite sides of said handle means, said two actuation arms being parallel with said handle means when said food engagement portion is positioned to close a portion of said substantially cylindrical receptacle region, said food engagement portion being pivotally movable in a direction parallel with said first and second side walls in response to manual actuation of either actuation arm, whereby the food is displaced along an arcuate path which is parallel with, and substantially along, said first and second side walls.

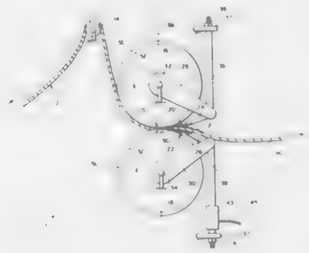
4,859,169

WEB PROCESSING BY LONGITUDINAL COMPRESSION USING MATCHED DRIVE DISKS AND RETARDING FINGERS

Richard R. Walton, Ten W. Hill Pl., Boston, Mass. 02114, and George E. Munchbach, Roslindale, Mass., assignors to Richard R. Walton, Boston, Mass.

Continuation-in-part of Ser. No. 933,087, Nov. 20, 1986, abandoned. This application Dec. 23, 1987, Ser. No. 137,074
Int. Cl.[4] B29C *53/28;* B31F *1/12*
U.S. Cl. 425—336 32 Claims

1. An apparatus for longitudinally compressing a web under the influence of driving forces provided at a nip line defined by spaced-apart pairs of matched rotating disks and under the influence of retarding forces provided by sets of retarding fingers inserted in the spaces between the disks, wherein the retarding fingers of at least one set are associated with a yieldable support enabling movement of the fingers to positions respectively further apart and closer together dependently with increase and decrease in force applied to the fingers by the web, the fingers being constructed and arranged so that over the range of said positions of said fingers, in the downstream region close to the nip line, web-contacting surfaces of the sets of fingers diverge in the direction of travel of the web whereby, regardless of the position of said fingers, the longitudinally copressed web is always subjected to tightest constraint of its thickness at a point longitudinally close to the nip line, and downstream therefrom, while still confined, said corresponding sections of web are released from tightest constraint, said diverging surfaces promoting uniform movement of the corresponding oncoming sections of compressed web while enabling relatively steady retarding forces to be transmitted laterally through the web to retard the adjacent sections of the web that are in line with said disks, whereby the longitudinal compressive treatment of both the sections of the web in line with said fingers and the sections in line with said disks can be substantially regular.

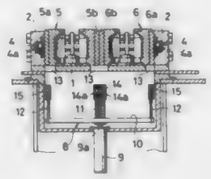


4,859,170

CLAMPING DEVICE FOR A BLOW MOLD

Katashi Aoki, c/o Room No. 208, Yotsuya Attorneys at Law Building, 13, Samoncho, Shinjuku-ku, Tokyo, Japan

Filed Oct. 27, 1988, Ser. No. 263,541
Claims priority, application Japan, Oct. 27, 1987, 62-271274
Int. Cl.[4] B29C *49/56*
U.S. Cl. 425—450.1 2 Claims



1. In a clamping device in which two sets of clamping plates, one set of which comprises a pair, are provided between a pair of fixed plates on a base plate connected by tie bars passing through said tie bars, blow molds in the form of a split mold are mounted on each set of clamping plates and two sets of blow molds are arranged between the fixed plates so that the blow molds may be opened and closed, and a plurality of external clamping cylinders are provided in a position in both the fixed plates, said clamping device for said blow molds comprising a supporting device with a central plate and two side plates provided on a seat plate and characterized in that said central plate extends through said base plate and is interposed between two sets of the clamping plates and both the side plates are interposed between the fixed plate and the clamping plate, the clamping device further comprising said supporting device being movable in a vertical direction on the underside of the base plate, a plurality of internal clamping cylinders provided on opposite sides of the central plate of the supporting device

corresponding to said external clamping cylinder, a plurality of relay rams provided extending through both the side plates of the supporting device and corresponding to said external clamping cylinder, and an opening and closing cylinder is provided over each set of clamping plates.

4,859,171

METHOD AND APPARATUS OF OPERATING PRE-MIXED BURNERS

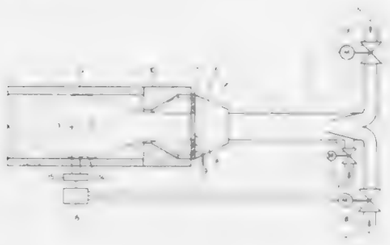
Detlef Altemark, Dorsten, and Robert Hess, Essen, both of Fed. Rep. of Germany, assignors to Ruhrgas Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Aug. 31, 1987, Ser. No. 91,197

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1986, 3630177

Int. Cl.[4] F23N *1/02*

U.S. Cl. 431—12 15 Claims



1. A method of operating a pre-mixed burner at a pressure equal to at least atmospheric pressure, said method comprising the steps of:

blending a fluid fuel, combustion air, and cooling fluid to produce a fuel lean combustible mixture;

combusting said fuel lean combustible mixture in a downstream combustion chamber, thereby forming at least one flame, said flame having a limit of flame stability at an air/fuel ratio greater than one;

measuring a flame property that is characteristic of the proximity of the flame to said limit of flame stability;

deriving a control signal from said measured flame property; and

controlling the rate of flow of at least one of the fluids contained in said combustible mixture in response to said control signal, whereby said rate of flow is controlled such that the combustion is performed near said limit of flame stability.

4,859,172

PIEZOELECTRIC LIGHTER EQUIPPED WITH A SAFETY LOCK

Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan

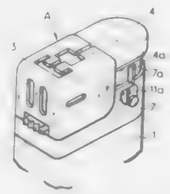
Filed May 17, 1988, Ser. No. 196,171

Claims priority, application Japan, May 20, 1987, 62-74371[U]

Int. Cl.[4] F23D *11/36*

U.S. Cl. 431—153 3 Claims

1. A piezoelectric lighter comprising: a casing; a gas ejection nozzle appearing from a ceiling of the casing; a windshield fixed to the ceiling of the casing and encircling the gas ejection nozzle; a piezoelectric unit fitted in the casing; a thumb-operated push cap operatively connected both to the gas ejection nozzle and to the piezoelectric unit for striking spark in response to a push to the push cap; and a liquefied gas cell defined in the casing and communicating with the gas ejection nozzle, characterized in that the thumb-operated push cap has a slot made on its outer surface and that it further comprises a rotatable hook-shaped safety lock, which is composed of a shank, a finger catch fixed to one end of the shank, a pivot fixed to the other end of the shank, a catch plate fixed to the pivot at the side opposite to the shank and extending substantially perpendicular to the shank, the catch plate having a longitudinal size larger than the width of the slot of the push cap and a lateral size smaller than the width of the slot of the push cap, the safety lock being rotatably fixed to a top raised side of the



casing at such a position that the catch plate may prevent the push cap from descending when the safety lock is put in its locking position in which the shank is vertical with the catch plate laid horizontal and at such a position that the catch plate may allow the push cap to descend when the safety lock is put in its unlocking position in which the shank is horizontal with the catch plate laid vertical.

4,859,173

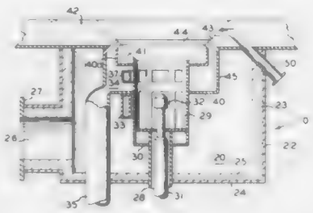
LOW BTU GAS STAGED AIR BURNER FOR FORCED-DRAFT SERVICE

Lester W. Davis, Jr., Randolph; John P. Geosits, Long Valley; Dennis L. Juedes, Randolph, and Edward F. Kiczek, Long Valley, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Sep. 28, 1987, Ser. No. 101,677

Int. Cl.[4] F23C *5/28*

U.S. Cl. 431—175 8 Claims



1. A staged-air vortex burner for use in burning low Btu fuel and under forced-draft service comprising a flame zone; a swirl chamber for creating a swirling flow path for primary combustion air and primary low heating value gas; means for discharge into said flame zone; and, means adjacent to each other for introducing secondary air and secondary low heating value gas so as to intersect the flame zone at a point such that the secondary air and secondary low heating value gas have minimal effect on the aerodynamics of the flame.

4,859,174

DEVICE FOR IGNITING COMBUSTIBLE MATERIALS

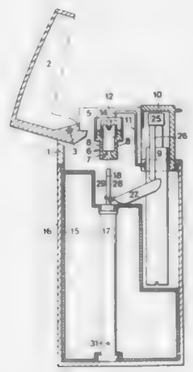
Conrad Zellweger, Chene-Bougeries, Switzerland, and Yves Gendey, Esery-Reignier, France, assignors to LN Industries S.A., Geneva, Switzerland

Filed Jun. 20, 1988, Ser. No. 208,495

Claims priority, application Switzerland, Jul. 10, 1987, 2633/87

Int. Cl.[4] F23Q *7/12*

U.S. Cl. 431—255 4 Claims



1. A device for igniting combustible materials, said device comprising

a body,

burner means comprising an air-gas mixing chamber, a combustion chamber at an upper end of said air-gas mixing chamber, means for igniting gas delivered to said combustion chamber, said air-gas mixing chamber including in a lower end thereof a gas inlet conduit opening into said chamber to permit delivery of gas to said air-gas mixing chamber, the diameter of said air-gas mixing chamber being greater than the diameter of the portion of said gas inlet conduit opening into said air-gas mixing chamber,

a removable reservoir for liquefied gas, said reservoir being provided with valve means which controls the flow of gas from said reservoir,

said valve means of said removable reservoir including tubular injector means having a bore of a diameter less than 0.1 mm, said tubular injector means adapted to deliver gas to said air-gas mixing chamber through said gas inlet conduit upon movement of said tubular injection means to a deliver position whereby a delivery end of said tubular injector means is axially displaced into a receiving end of said gas inlet conduit, an annular space being formed between said delivery end of said tubular injector means and the interior of the receiving end of said gas inlet conduit upon displacement of said tubular injector means to said delivery position, said annular space permitting air to be drawn into said gas inlet conduit together with said gas during delivery of same; and

said valve means including means to compensate for the effect of temperature on the flow of said gas from said reservoir.

4,859,175

APPARATUS AND PROCESS FOR OPTIMIZING COMBUSTION IN CHAMBER-TYPE FURNACES FOR BAKING CARBONACEOUS BLOCKS

Christian Dreyer, Saint Jean de Maurienne; Jean-Claude Thomas, Saint Germain en Laye, and Claude Vauvoren, Saint Jean de Maurienne, all of France, assignors to Aluminium Pechiney, Paris, France

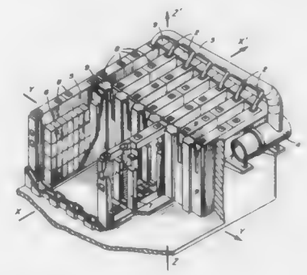
PCT No. PCT/FR87/00213, § 371 Date Jan. 15, 1988, § 102(e) Date Jan. 15, 1988, PCT Pub. No. WO87/07938, PCT Pub. Date Dec. 30, 1987

PCT Filed Jun. 12, 1987, Ser. No. 156,913

Claims priority, application France, Jun. 17, 1986, 86 08987; Apr. 14, 1987, 87 05466

Int. Cl.[4] F27D *7/00*

U.S. Cl. 432—4 12 Claims



1. Apparatus for optimizing combustion in a chamber or ring furnace for baking carbonaceous blocks, said furnace comprising a plurality of preheating, baking and cooling chambers aligned in series, each chamber being formed by an alternating juxtaposition of hollow heating partitions **1** in which combustion gases circulate and compartments **5** in which the carbonaceous blocks to be baked are stacked, a suction pipe **3** for extracting combustion gases from the furnace, a plurality of delivery tubes **2** connecting said suction pipe to the partitions of the first, preheating, chamber in said series, and a blowing pipe **25** connected to said furnace for injection, via a fan **26**, of combustion air,

said apparatus comprising:

a movable closure flap **11** associated with each said delivery tube **2**, a motor means **12** for controlling each said closure flap **11**, means for measuring the temperature and reduction in pressure in each partition to which a delivery tube is connected, means **19**, **20**, **21** for measuring the opacity, by reflection, of gases in each said partition of said first chamber, and means for controlling the position of each said closure flap **11**, and thereby combustion gas flow rate in each said partition of said first chamber in dependence on opacity, temperature and reduction in pressure.

5. Process for optimizing combustion in a chamber or ring furnace for baking carbonaceous blocks, said furnace comprising a plurality of preheating, baking and cooling chambers aligned in series, each chamber being formed by an alternating juxtaposition of hollow heating partitions **1** in which combustion gases circulate and compartments **5** in which the carbonaceous blocks to be baked are stacked, a suction pipe **3** for extracting combustion gases from the furnace, a plurality of delivery tubes **2** connecting said suction pipe to the partitions of the first, preheating, chamber in said series, a movable closure flap **11** associated with each said delivery tube **2**, and a blowing pipe **25** connected to said furnace for injection, via a fan **26**, of combustion air,

said process comprising the steps of:

(a) regulating said closure flap **11** so as to set a reduction in pressure in each partition **1** of said first chamber at a predetermined value between 0 to 250 Pa, and measuring,

by reflection after stabilization, the opacity value, of combustion gases in each partition of said first chamber;

(b) adjusting the reduction in pressure to values throughout the range between 0 to 250 Pa, measuring by reflection, after a stabilization period of at least 30 seconds the opacity value of the combustion gases at each said pressure value, and determining the minimum reduction in pressure necessary to achieve a minimum opacity value;

(c) regulating the position of each flap 11 to maintain the reduction of pressure at approximately said minimum, to maintain opacity at approximately said minimum value; and

(d) in parallel with steps (b) and (c), measuring the rise in termperature of the gases in said first chamber, comparing said rise to a reference curve of the desired baking temperature, and regulating said minimum reduction in pressure so as to maintain the temperature in a range around the reference curve and opacity at approximately said minimum value;

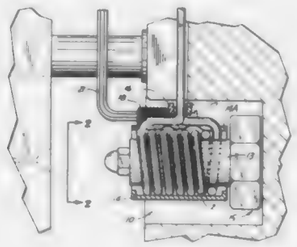
whereby the reduction in pressure in said chambers is maintained at a minimum value compatible with optimum combustion conditions, and the temperature in said first chamber is maintained as close as possible to the reference curve.

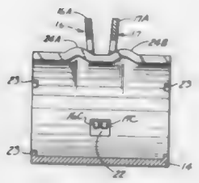
4,859,176

HEATER CLAMP FOR INJECTION MOLDING

Stephen R. Meyer, Savage, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Sep. 27, 1988, Ser. No. 249,663
Int. Cl.[4] F24J *3/00*
U.S. Cl. 432—225 17 Claims





17. A heater assembly for an injector barrel, comprising:

a heater element disposed around the injector barrel for heating the injector barrel;

a tube disposed about the heater element having a slit extending along the tube's length and forming slit edges extending between ends of the tube;

a clip extending about the tube having a central clip portion slidably engaging the tube by the slit edges joined to a pair of clip pivots defining a pivotal axis substantially normal to the slit edges and extending through the tube at a location spaced away from the slit edges; and

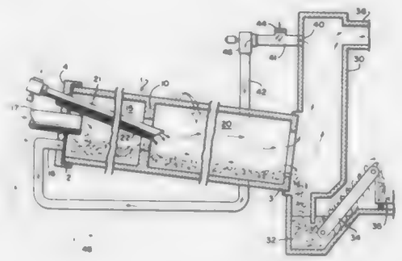
means for pivoting the clip with respect to the tube such that the central clip portion slides along the length of the tube to compress the tube around the heater element.

4,859,177

APPARATUS FOR INCINERATING COMBUSTIBLE MATERIAL

Alan J. Kreisberg, Bethlehem, Pa., and Millard E. Prowler, North Hills, N.Y., assignors to Fuller Company, Bethlehem, Pa.

Continuation of Ser. No. 156,135, Feb. 16, 1988, abandoned.
This application Jan. 3, 1989, Ser. No. 293,546
Int. Cl.[4] F27D *7/00*
U.S. Cl. 432—14 8 Claims



8. A method for incinerating combustible material comprising the steps of providing an elongated vessel mounted on an incline and having an upper inlet end and a lower outlet end; dividing the vessel into a drying zone and a combustion zone by providing a dam inside the vessel; rotating the vessel about its own axis; supplying material to be incinerated to the drying zone through the upper inlet end of the vessel; supplying hot drying gases to the drying zone for drying the material to be incinerated; discharging the material from the drying zone by displacement over the dam into the combustion zone; supplying air for combustion directly to the combustion zone by-passing the drying zone through a conduit which extends through the drying zone for incinerating the dried material in the combustion zone; discharging through the lower outlet end of the vessel ash from the incineration of the material and discharging spent drying and combustion gases from the lower outlet end of the vessel whereby the flow of gases through the vessel is co-current to the flow of material from the inlet of the vessel to the outlet of the vessel.

4,859,178

INGOT PUSHER FURNACE WITH MEANS FOR REDUCING HEAT LOSS

Robert H. Ross, Meadville, Pa., assignor to Seco/Warwick Corporation, Meadville, Pa.

Filed Aug. 15, 1988, Ser. No. 232,271
Int. Cl.[4] F27D *1/12*
U.S. Cl. 432—237 7 Claims

1. An ingot pusher furnace comprising:

an insulated furnace enclosure including a bottom wall, a front wall, a rear wall and a top wall, said enclosure receiving a plurality of ingots to be heated;

means for heating said enclosure by heating a gaseous medium therein;

means for moving said gaseous medium within said enclosure;

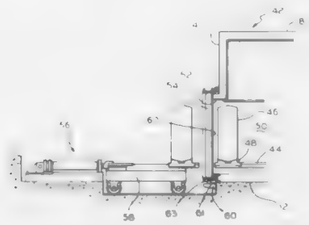
support rails being disposed in association with said bottom wall for facilitating support and movement of the ingots within said enclosure;

a charging door located adjacent said front wall and being adapted to close and opening formed in said front wall;

said support rails extending between said front wall and said rear wall and terminating inside of said charging door;

said charging door extending below said support rails in its closed position so as to provide a positive seal;

a stop member disposed adjacent said front wall and below said support rails; and



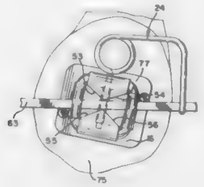
said charging door including a seal formed on its bottom surface for contacting a top surface of said stop member when said charging door is in the closed position.

4,859,179

EDGEWISE BRACKET WITH SVED SHAPED SLOT AND CONTROL MEANS

Peter C. Kesling, LaPorte, Ind., assignor to TP Orthodontics, Inc., Westville, Ind.

Filed Nov. 26, 1986, Ser. No. 935,586
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—8 12 Claims



1. An edgewise bracket adapted to be mounted on the crown of a tooth such that the vertical axis of the bracket substantially aligns with the long axis of the crown, said bracket having a body with a horizontally opening close-fitting archwire slot for receiving an archwire and a single tie wing having gingival and occlusal tips, said slot having a Sved shape such that it defines directly opposed wire pivot edges, said edges being spaced apart a distance substantially equal to the occlusogingival dimension of the archwire to be received by the slot, opposed mesiodistally extending surfaces diverging from opposite sides of said pivot edges a substantially equal amount, said surfaces being inclined from the horizontal beyond any desired tipped or uprighted positioned, whereby said bracket has a mesiodistal pivotal relation with said archwire, and stop means coacting with said bracket and said archwire in said slot for limiting the tipping or uprighting movement range to a desired value short of said inclined surfaces, said stop means including a base on which the bracket is mounted and at least one archwire stop pin extending from said base for limiting the tipping and/or uprighting movement of said bracket.

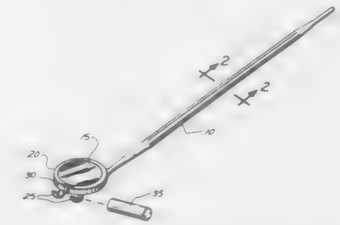
4,859,180

SELF-DRYING CHEEK RETRACTING MIRROR

Roderick J. Smith, 2900 Moss St., Lafayette, La. 70501, and Leopold A. Castille, Rte. 7, Box 17 E15, Opelousas, La. 70570

Filed Jun. 30, 1988, Ser. No. 214,124
Int. Cl.[4] A61C *1/00, 3/00*
U.S. Cl. 433—31 18 Claims

1. A dental mirror comprising an elongate handle, a mirror angularly disposed from one end of said handle, and means adapted to detachably secure an absorbent roll in a substantially linear and tangential position relative to the periphery of



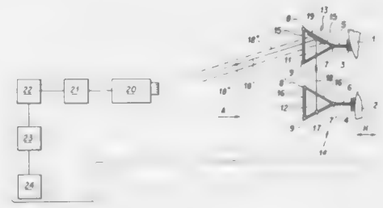
the mirror such that said roll retracts the cheek when said mirror is disposed in a viewing position in proximity to the outer side of a gumline.

4,859,181

METHOD AND APPARATUS FOR MEASURING RELATIVE JAW MOVEMENT

Stefan Neumeyer, Leminger Str. 10, 8491 Eschlkam, Fed. Rep. of Germany

Filed Sep. 11, 1987, Ser. No. 95,082
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1986, 3630945; Oct. 28, 1986, 3636671
Int. Cl.[4] A61C *19/04*
U.S. Cl. 433—69 12 Claims



1. A process for three-dimensional determination of the relative movement between the jaws, said process comprising steps of

affixing at least one reference element to the teeth of the lower jaw and at least one reference element to the teeth of the upper jaw, with one of said reference elements comprising at least four spatially staggered reference marks arranged in three dimensions and with the other of said reference elements comprsing at least three spatially staggered reference marks;

optically detecting the position of each reference mark in relation to each of the other reference marks along at least two viewing axes, and

determining the relative movement of the jaws from the change in the mutual position of the reference marks.

4,859,182

DENTAL SYRINGE SAFETY SHEATH APPARATUS

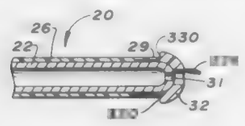
Robert Nerli, 15 El quanito Way., Burlingame, Calif. 94010

Filed Nov. 9, 1987, Ser. No. 118,170
Int. Cl.[4] A61C *17/02*
U.S. Cl. 433—80 7 Claims

1. In a dental syringe of the type having a beak for dispensing fluids into an oral cavity;

the improvement comprising a sheath means, said sheath means being a form fitted, generally elongated tube or

cylinder adapted to substantially fit over and cover said beak, said sheath means being removably attached to said beak, said sheath means providing a substantially sterile outer-covering for said beak, said sheath means having an open end and a terminal end having an aperture to allow a fluid to be dispensed from said beak and said sheath means, said aperture being located near a discharge orifice of said beak through which said fluid is dispensed, and



a tip, said tip being located at said terminal end of said sheath, said tip and said sheath means providing a substantially sterile outer-covering for said beak and said discharge orifice, said tip having a valve means coincident with said discharge orifice, said valve means allowing said fluid to be dispensed from said beak and said tip, said valve means substantially preventing contaminants from entering or being drawn into said beak through said discharge orifice.

4,859,183

ROOT CANAL INSTRUMENT HANDLE

Howard Martin, 909 Pershing Dr., Silver Spring, Md. 20910

Filed Jul. 21, 1988, Ser. No. 222,020
Int. Cl.[4] A61C *1/14*
U.S. Cl. 433—102 **3 Claims**



1. A root canal handle for use with a root canal instrument having a file positioned in said handle, comprising, a substantially elongated member formed in the shape of a handle for use with a root canal file, said handle having oppositely spaced substantially cylindrical portions running in the longitudinal direction thereof, said substantially cylindrical portions having spaced grooves located between said oppositely spaced cylindrical portions and arranged substantially transversely to the longitudinal direction of said handle, said handle having substantially spaced flat opposite sides positioned between said oppositely spaced cylindrical portions and spaced from each other, with said substantially spaced flat sides having grooves formed therein and arranged substantially transversely to the longitudinal direction of said handle.

4,859,184

FACE SHIELD DEVICE

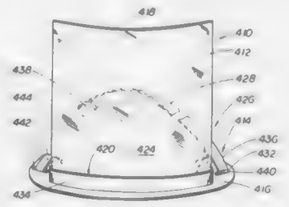
James T. Hazard, 311 Fairmeade Rd., Louisville, Ky. 40207

Continuation-in-part of Ser. No. 842,824, Mar. 3, 1986, Pat. No. 4,701,129. This application Sep. 21, 1987, Ser. No. 98,808
The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.
Int. Cl.[4] A61C *5/14*
U.S. Cl. 433—136 **5 Claims**

1. A face shield device comprising:

An arcuate substantially completely transparent face shielding panel concavely oriented toward the wearer's face, the face shielding bracket having an arcuate bottom edge, an arcuate top edge, and generally parallel lateral side edges;

a shield support bracket having a bottom side for resting against the wearer's chest, and connected at a top side to the bottom edge of the shielding panel for holding the shielding panel at and extending outwardly from the wearer's chest at an acute angle to the vertical such that



only when the wearer's head is titled forwardly does the face shielding panel extend across the wearer's face; and,

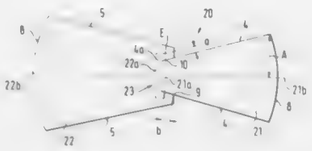
a flexible band connected at each of its ends to the shield support bracket, at least one of said ends being detachably connected.

4,859,185

DENTAL CAP FOR USE IN MAKING JACKET CROWNS

Anita Wunderle, geb. Rudigier, Lorenz-Wenk-Weg 22, 7880 Bad Säckinghen 11; Michael Frank, and Dieter Schöesow, both of Basler Str. 8, 7889 Grenzach-Whylen, all of Fed. Rep. of Germany

Filed Apr. 29, 1988, Ser. No. 188,529
Claims priority, application Fed. Rep. of Germany, May 6, 1987, 3715096
Int. Cl.[4] A61C *5/08*
U.S. Cl. 433—222.1 **20 Claims**



1. A noble metal sheet for forming a dental cap comprising at least one first flap and at least one second flap connected at one end of each of said flaps, each flap having at least two sides, the width of said first flap being substantially larger than that of said second flap, at least said first flap being adapted to provide a quadrilateral region substantially identical to a quadrilateral occlusal face of a model of a tooth stump to be crowned at said one end thereof, each of said two sides of said second flap intersecting with each of said two sides of said first flap and further extending toward said quadrilateral region in order to form a first cut, wherein said noble metal sheet is placed upon said tooth stump model, then said both sides of said first flap are folded in a manner such that said both sides of said first flap overlap covering said both sides of said second flap.

4,859,186

PULPOTOMY AGENT AND METHOD OF USE

Don M. Ranly, San Antonio, Tex., assignor to Biomedical Development Corporation, San Antonio, Tex.

Filed Feb. 8, 1988, Ser. No. 153,137
Int. Cl.[4] A61C *5/00*; A61K *6/06*
U.S. Cl. 433—228.1 **2 Claims**

1. A method of treating infected teeth prior to dental restoration comprising:

mixing a solution (A) including between 2 and 5% glutaraldehyde, the anti-oxidants sodium nitrite and glycerol in sufficient quantities to maintain the fixative properties of the glutaraldehyde by preventing the oxidation thereof, and a buffer for maintaining the pH of the solution at near-physiological levels, with a solution (B) which consists of eugenol, wherein the proportions of solutions (A) and (B) are approximately equal;

adding sufficient zinc oxide to achieve a cement of proper clinical consistency; and

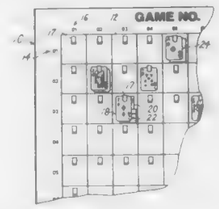
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4,859,187

DATABASE MANAGEMENT ENHANCEMENT DEVICE

Richard E. Peterson, 537 Valley St., San Francisco, Calif. 94131

Continuation-in-part of Ser. No. 672,473, Nov. 19, 1984, abandoned. This application Jul. 11, 1986, Ser. No. 884,482
Int. Cl.[4] G06F *3/14*
U.S. Cl. 434—118 **17 Claims**



1. A database management enhancement device comprising:

a format layout having an ordered array of discrete visual display cells,

a database having discrete records with the records having an associative interrelationship and with each record having a discrete record identifying key,

a set of mnemonic icons wherein the set of icons comprises representations of a deck of conventional, individually unique playing cards having a hierarchical order and intrinsic associative value,

wherein discrete card representations are associated with select record keys according to an intrinsic association between the card representation and the record identified by the selected record key wherein a mnemonic association is formed between the card representation and the record, and

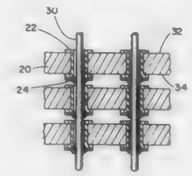
wherein the associated card representations ar positioned and displayed the format layout according to an interrelationship of the records wherein a mnemonic composite of discrete card representations is formed that is suggestive of the associative interrelationship among selected records of the database.

4,859,188

WIRE/DISK BOARD-TO-BOARD INTERCONNECT DEVICE

Eugene F. Neumann, Chippewa Falls, Wis., assignor to Cray Research, Inc., Minneapolis, Minn.

Continuation of Ser. No. 104,848, Oct. 5, 1987, abandoned. This application Feb. 3, 1989, Ser. No. 306,229
Int. Cl.[4] H01R *29/00*
U.S. Cl. 439—45 **4 Claims**



1. A device for detachably interconnecting stacked printed circuit boards so that an electrical current may be established between trace connectors on the boards, comprising:

a plurality of separate hole pad members each adapted to be received in a hole formed in a printed circuit board, each of said hole pad members having means defining a bore therein, said hole pad members further including flange portions which are adapted to extend axially beyond a surface of the printed circuit board;

a plurality of thin, substantially flat separate disks each having slits meeting at a common point in a central portion thereof, each of said disks substantially conforming to the outside dimensions of and bonded to one of said flange portions of said hole pad members so said central portions of said disk is substantially aligned with said bore, said disks being adapted for electrical connection to trace connectors on the printed circuit boards; and

a plurality of conducting rod means for insertion between said slits and into said bores, whereby an electrical connection may be made between the printed circuit board and another circuit board in a compact, high density arrangement.

4,859,189

MULTIPURPOSE SOCKET

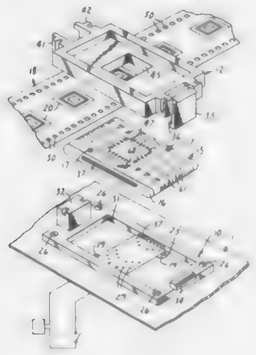
Kurt H. Petersen, and Christopher A. Schmolze, both of Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 101,203, Sep. 25, 1987, abandoned. This application Jul. 8, 1988, Ser. No. 217,212
Int. Cl.[4] H05K *1/00*
U.S. Cl. 439—66 **9 Claims**

1. A socket connector for use in test and burn-in of integrated circuit devices having contact points, said connector comprising:

a conductive metal layer beam tape having a central portion and end portions, said central portion of said beam tape defining a contact area having contact portions to contact the contact points of the integrated circuit device and a connector area at said end portions having spaced connector portions for connection to correspondingly spaced contacts on a circuit board, said beam tape having registration holes selectively positioned in relationship to said contact portions and said connector portions, and said beam tape being folded between said contact area and said connector area, a compliant elastomeric pad disposed between said contact area and said connector area for supporting said contact area and said connector area, frame means for supporting said pad and locating said connector area with said spaced connector portions positioned opposite to the contacts of a said printed circuit

board and for locating an integrated circuit device to place the contact points on the contact portions of said contact area, said frame means including registration pins extending through said registraton holes, and



means for pressing said integrated circuit device onto said contact area with the contact points engaging said contact portions against the resilient support of said elastomeric pad.

4,859,190

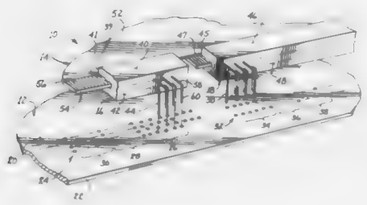
DUAL CONNECTOR PRINTED CIRCUIT BOARD ASSEMBLY AND METHOD

Russell Y. Anderson, Mesa, Ariz., assignor to Solid State Devices, Tempe, Ariz.

Filed Feb. 29, 1988, Ser. No. 161,494

Int. Cl.[4] H05K *3/30*

U.S. Cl. 439—78 **14 Claims**



1. A printed circuit board assembly for mounting connectors having different pin spacing and enabling electronic coupling to a plurality of commoning conductors, said assembly comprising:

a first main board having a group of at least four rows of holes, said group of at least four rows of holes being arranged in an alternating set of different hole spacing patterns, including a first row of holes and a third row of holes, with the first row of holes and the third row of holes having the same first lengthwise spacing of holes, and including a second row of holes and fourth row of holes, with the second row of holes and fourth row of holes having the same second lengthwise spacing of holes, the second lengthwise spacing of holes being different from the first lengthwise spacing of holes, said first row of holes respectively having a first set of outer conductors and a first set of inner conductors, each inner conductor of said first set of inner conductors connecting to a nearest hole on the second row of holes, said third row of holes respectively having a second set of inner conductors, each inner conductor of said second set of inner conductors connecting to a nearest hole in the fourth row of holes, and said fourth row of holes respectively have a second set of outer conductors; and

a connector having a group of at least two rows of input and output pins, including a first row of pins and a second row of pins, with the first row of pins and the second row of pins having a same third lengthwise spacing of pins, the third lengthwise spacing of pins being the same spacing as one of the first lengthwise spacing of holes or the second lengthwise spacing of holes.

4,859,191

MULTI-PIECE CONNECTOR ASSEMBLY

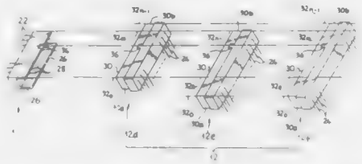
Takashi Tonooka, and Toshimitsu Katsumata, both of Shizuoka, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 22, 1987, Ser. No. 53,977

Claims priority, application Japan, May 30, 1986, 61-125453

Int. Cl.[4] H01R *9/09*

U.S. Cl. 439—79 **1 Claim**



1. A multi-piece connector assembly comprising

(a) a first interconnect member of an electrical insulator, the first interconnect member having a plurality of contact pins, and

(b) a second interconnect member of an electrical insulator, the second interconnect member having a plurality of apertures,

(c) the first and second interconnect members being matingly engageable with each other for allowing desired ones of said contact pins to be fitted into desired ones of said apertures, the mating engagement between the first and second interconnect members being achieved without involving deformation of each of the interconnect members and removal of any of said contact pins from said first interconnect member, and

(d) in which each of said first and second interconnect members is elongated and in which said contact pins are arranged in at least one row longitudinally of said first interconnect member and said apertures are arranged in at least one row longitudinally of said second interconnect member, wherein at least one of said first and second interconnect members has a receptacle portion which is open in at least one of the opposite longitudinal ends of the interconnect member and the other interconnect member has a base portion to fit partly within said receptacle portion so that one of the first and second interconnect members is allowed to longitudinally extend beyond the open end of the receptacle portion of the other.

4,859,192

EASILY REMOVABLE HIGH VOLTAGE GROUND STUD INSULATOR

John DeLeo, 107 Sun Valley Dr., Southington, Conn. 06489

Division of Ser. No. 104,800, Oct. 2, 1987, Pat. No. 4,822,289.

This application Feb. 6, 1989, Ser. No. 306,994

Int. Cl.[4] H01R *4/66*

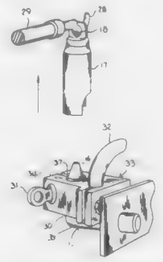
U.S. Cl. 439—92 **3 Claims**

1. A ground cable connector comprising:

a metal bar having a first bifurcated end with a cylindrical opening through said metal bar inboard said first bifurcated end for capturing an end of a ground stud;

a first bolt threadingly engaging said metal bar transverse said first bifurcated end to secure said ground stud end to said metal bar;

a second bifurcated end for receiving an end of a flexible ground cable; and



a second bolt threadingly engaging said metal bar transverse said second bifurcated end to secure said ground cable end to said metal bar.

4,859,193

BUS BAR JOINT

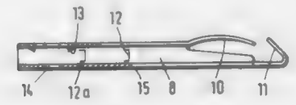
Heinz Pfaankuche, Bochum, and Uwe Schulte, Wetter, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 593,557

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311791

Int. Cl.[4] H01R *25/02*

U.S. Cl. 439—115 **20 Claims**



1. Joint for connecting the facing ends of two electric current bus bars facing each other with one end each, comprising:

a first and a second, similarly constructed plug element, respectively inserted in each end of said bars, but each having a particular portion projecting from the respective bar; and

a connecting element laterally reaching around both plug elements and clampingly embracing and engaging said projecting portions of the plug elements for interconnecting.

4,859,194

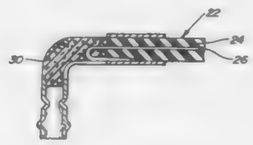
SPARK PLUG CONNECTOR

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Filed Apr. 6, 1988, Ser. No. 178,273

Int. Cl.[4] H01R *11/28*

U.S. Cl. 439—125 **23 Claims**



1. A spark plug connector comprising a boot assembly, and a rigid lock sleeve connected to the boot assembly, said boot assembly including a contact having a pair of conductor receiving portions integral with one another and disposed within a body of elastomeric material, said portions being separated from one another by a space, one and the other said portion being adapted to terminate to a spark plug electrode and to the center conductor of a wire extending from the body, respectively, and dielectric means extending between said portions and filing said space for inhibiting arcing between the electrode and center conductor, said lock sleeve including means for transmitting forces to the body in a direction substantially aligned with the axis of the electrode.

4,859,195

CONNECTING CLAMP FOR WARP STOP MOTION

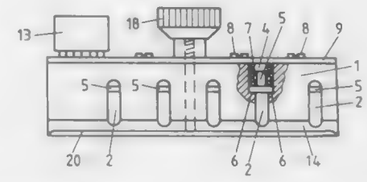
Ernst Steiner, Richterswil, Switzerland, assignor to Grob & Co., Aktiengesellschaft, Horgen, Switzerland

Filed Jul. 29, 1988, Ser. No. 225,772

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1987, 3728071

Int. Cl.[4] H01R *9/09*; **C03D** *51/28*

U.S. Cl. 439—55 **7 Claims**



1. A connecting clamp for use in an electrical warp stop motion device of a textile machine and operative for conducting electrical current to a plurality of contact bars, said clamp comprising a casing consisting of an insulating material and provided with a plurality of slots in adjacent parallel relationship and with resiliently supported contact pins in the bottom of each of the slots, which are adapted to receive contact bars of the stop motion device, each contact bar consisting of mutually insulated conductor bars, said casing being provided with a releasably mounted casing part for pressing said contact bars against said contact pins, wherein all contact pins are supported via springs against a circuit board mounted on said casing, said circuit board is provided with contact disks, each of which is in electrical contact with one spring of a contact pin, and is provided with conductors which electrically connect each of the contact disks with each one pin of a multiple contact plug located at the outer side of the casing for a connection to indicating devices, of which each is allocated individually to one of said contact bars.

4,859,196

UNDERWATER ELECTRIC CONNECTOR

Pierre Durando, Paris, and Alain LaFaille, Vaucresson, both of France, assignors to Total Compagnie Fracaise des Petroles, Paris and Institut Francais du Petrole, Rueil Malmaison, both of, France

Filed Jul. 22, 1988, Ser. No. 223,046

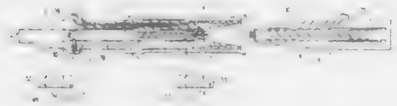
Claims priority, application France, Jul. 23, 1987, 87 10452

Int. Cl.[4] H01R *13/523*

U.S. Cl. 439—197 **3 Claims**

1. Electric connector comprising two elements (1, 9) having elongated housings capable of being coupled end to end one to the other by means of a coupling end-piece on each said element, and each said element being equipped with a longitudinal cylindrical cavity and a set of contact pieces within said cavity, a first (1) of said elements being equipped with a device inject-

ing an insulating fluid under pressure into said first element, said device being mounted at the coupling end of said first element, characterized by the fact that the housing (8) of the second element (9) has, at the coupling end of said second element, a conically-shaped pointed end-piece (10) and that the housing (2) of the first element (1) has, at the coupling end of said first element, a conically-shaped wide-mouthed end-piece (11) designed to fit over said pointed end-piece (10), a clamping device (14, 15) between said two end-pieces (10, 11) ensuring maintenance of said end-pieces in a mated position, each said set of contact pieces (17, 20) of said elements being stationary on the element (1, 9) to which it is secured, and being arranged around the cylindrical cavity (16, 19) of said element, and a cylindrical connection pin (22) capable of sliding within said



cavities (16, 19) and having two groups (24, 25) of contact pieces which are electrically interconnected and arranged so that the two groups (24, 25) may simultaneously electrically interconnect the two sets (17, 20) of contact pieces of the coupled said elements (1, 9), said pin being equipped with a sealing and gripping head (26, 23) which seals the cylindrical cavity (19) of the second element (9) when said pin (22), in a resting position, is totally inserted in said second element (9), gripping (27) and displacement (28) devices being provided in the first element in order to grip said head (23) and draw said pin (22) into a working position in which, partially inserted in each of the two coupled elements (1, 9), said pin positions contact pieces from its two groups of contact pieces (24, 25) opposite the contact pieces of the two sets of contact pieces (17, 20) of the two coupled elements (1, 9).

4,859,197

PIN PLUG CONNECTOR

Hisao Toramoto, Nara, and Tadashi Yagi, Higashiosaka, both of Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed May 3, 1988, Ser. No. 189,917

Claims priority, application Japan, Jul. 7, 1987, 62-104697[U]

Int. Cl.[4] H01R *17/04*

U.S. Cl. 439—675 **4 Claims**



1. A pin plug connector for an electric cable having a core line, a shield line, and a cover portion for covering said lines, comprising:

a cylindrical pin having a press connector at one end thereof for connecting said core line thereto;

a terminal for connecting said shield line, said terminal having a clamping end at one end thereof for clamping said cover portion, a slidably detachable first engagement element at the other end thereof and a press connector between said clamping end and said first engagement element;

a substantially cylindrical unitary insulating body provided with a through hole along a central axis thereof and a circumferential surface, said through hole having an inner diameter substantially equivalent to an outer diameter of said cylindrical pin; and

a cylindrical conductive unitary cover slidably and detachably covering said insulating body, said cylindrical conductive unitary cover having a length longer than that of said unitary insulating body and having a slidably detachable second engagement element at one end thereof for receiving said first detachable engagement elements of said terminal.

4,859,198

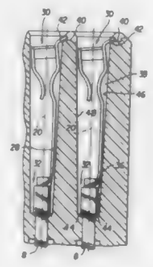
CONTACT ASSEMBLY

Alex F. Owen, Spring Creek, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Aug. 25, 1988, Ser. No. 236,486

Int. Cl.[4] H01R *13/11*

U.S. Cl. 439—252 **15 Claims**



1. A contact assembly for electrically conductively engaging at least one first pin at one end of said contact assembly and at least one second pin at an opposite end of said contact assembly, comprising:

a housing having at least one elongated cavity therein for receiving said at least one first pin at a first entrance to said cavity and said at least one second pin at an opposite second entrance to said cavity, said cavity extending along a longitudinal axis;

an elongated contact extending within said at least one elongated cavity along said longitudinal axis for electrically conductively engaging said at least one first pin at one end of said at least one elongated contact and said at least one second pin at an opposite end of said at least one elongated contact, said at least one elongated contact comprising:

a bridging member;

first means extending from a first end of said bridging member and forming said one end for electrically conductively engaging said at least one first pin so that when said at least one first pin is fully engaged by said one end said first means is substantially concentric relative to said longitudinal axis and said first pin, and when said first pin is not fully engaged by said one end said first means extends at an angle relative to said longitudinal axis; and,

second means extending from a second end of said bridging member and forming said opposite end for electrically conductively engaging said second pin.

4,859,199

CONNECTOR

Yasuhiro Komatsu, Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

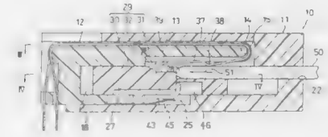
PCT No. PCT/JP87/00403, § 371 Date Feb. 9, 1988, § 102(e) Date Feb. 9, 1988, PCT Pub. No. WO88/00401, PCT Pub. Date Jan. 14, 1988

PCT Filed Jun. 18, 1987, Ser. No. 157,503

Claims priority, application Japan, Jun. 24, 1986, 61-96321

Int. Cl.[4] H01R *13/62*

U.S. Cl. 439—267 **7 Claims**



1. A connector for connecting with contact-loaded cards, comprising:

a plurality of conductor strips each having a middle portion;

a body defining an interior and an insertion port at one end for the insertion of a contact-loaded card into said interior, said body having a support portion for engagement with the conductor strips at their middle portion;

a movable member situated within said interior for reciprocal movement toward and away from the insertion port;

spring means for biasing the movable member toward the insertion port; and

lock mechanisms for locking the movable member at a retreated position and at an advanced position, wherein:

said conductor strips each further have a contactor portion positioned forwardly of its middle portion in engagement with said support portion and disposed in the direction of said reciprocal movement, each contactor portion having a front end and at the middle portion a contact to be engaged by and disengaged from a contact of the card;

said movable member having a stepped portion for abutment with a front end of the card when the card is inserted through the insertion port, and a cam face which raises the respective front ends of the contactor portions against their elastic force so as to enable the contacts of the contactor portions to move away from contact with the card when the movable member is at its advanced position and which allows the front ends of the contactor portions to be reset under the elastic force thereof so as to enable the contacts of the contact portions to contact the contact of the card when the movable member is at its retreated position; and

said lock mechanisms are alternately switchable to a locked state in which said movable member is held at the retreated position and an unlocked state in which said movable member slides from the retreated position to the advanced position, as a result of repetitive movement of a card brought into abutment with said stepped portion.

4,859,200

DOWNHOLE ELECTRICAL CONNECTOR FOR SUBMERSIBLE PUMP

Ronald M. McIntosh, Wagoner; Richard T. Rentzel, Claremore; Robert W. Stewart, Disney, and Daniel L. Daugherty, Tulsa, all of Okla., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Dec. 5, 1988, Ser. No. 280,067

Int. Cl.[4] H01R *13/52*

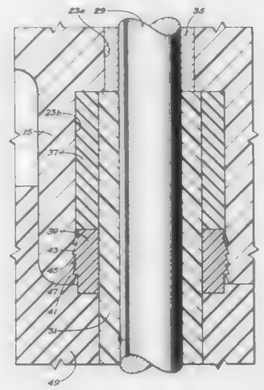
U.S. Cl. 439—275 **3 Claims**

1. A device for attaching an end of an electric cable to the head of a motor, the electric cable having at least one conductor with a terminal on its end, the device comprising in combination:

a rigid shell;

an insert secured in one end of the shell, the insert having one end located in the shell and another end protruding from the shell for insertion into an opening in the head of the motor;

at least one passageway in the insert through which the conductor extends with the terminal protruding from the insert;



an elastomeric compression sleeve located in the passageway and encircling the conductor;

a locking ring secured in the passageway and bearing against the compression sleeve to cause the compression sleeve to seal around the conductor; and

the interior of the shell being filled with an elastomeric material.

4,859,201

DATA COMMUNICATIONS OUTLET

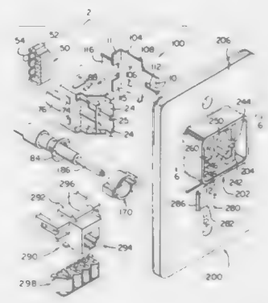
Edward K. Marsh, Kernersville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 945,401, Dec. 22, 1986, abandoned. This application Jan. 21, 1988, Ser. No. 147,110

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

Int. Cl.[4] H01R *13/631*

U.S. Cl. 439—290 **10 Claims**



1. An electrical wall mountable outlet including a front face plate, the outlet performing as a local area network interface which receives a matable hermaphroditic data connector from the front thereof, the data connector having a latching profile including a T-bar and a T-slot, and a plurality of hermaphro-

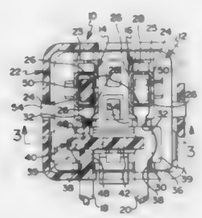
ditic electrical terminals therein including resilient contact portions, and for receiving from the rear, a shielded subassembly which is latchable to the outlet and includes a like plurality of terminals, the outlet comprising a one piece molded body including retention means to retain the shielded subassembly, and latching means for the hermaphroditic data connector including an integrally molded T-bar and T-slot interconnectable with respective T-slot and T-bar of the data connector, the molded body being profiled to position the electrical terminals of the shielded subassembly in an overlapping and mating relationship when the T-bar of the outlet is in a latched configuration with the T-slot of the data connector, and when the T-slot of the outlet is in a latched configuration with the T-bar of the data connector.

4,859,202

ELECTRICAL CONNECTOR HAVING STRAIN RELIEF

Charles R. Nestor, Niles, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 28, 1988, Ser. No. 187,132
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—397 6 Claims



1. An electrical connector comprising:

a connector body which houses an insulation displacement terminal attached to an electrical lead and a strain relief cover,

said connector body having a terminal cavity which houses the insulation displacement terminal and an exit chamber which communicates with the terminal cavity through a slot which extends through a separating wall of the connector body which separates the exit chamber from the terminal cavity,

said exit chamber having a second wall opposite the separating wall which has a slot which is aligned with the slot of the separating wall,

said electrical lead passing through the slot of the separating wall, the exit chamber and the slot of the second wall,

one of the slots having a width which is less than the diameter of the electrical lead so that the insulation of the electrical lead is pinched and tightly gripped when the electrical lead is pushed down into the one slot,

said strain relief cover having a depending blade which projects into the exit chamber when the strain relief cover is attached to the connector body,

said depending blade having a side wall which partially blocks a straight line path from the slot in the separating wall to the slot in the opposite wall thereby creating a labyrinthian passage for the electrical lead when the blade is inserted into the exit chamber,

said side wall engaging and kinking the electrical lead laterally to pass through the labyrinthian path which is created when the depending blade is inserted into the exit chamber, and

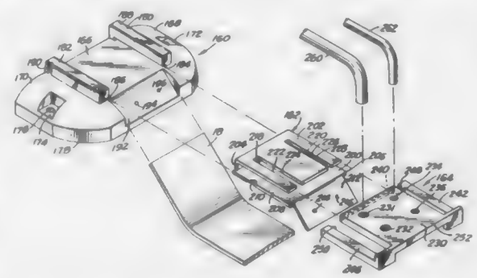
means for retaining the strain relief cover on the connector body.

4,859,203

ELECTRICAL WIRE CONNECTORS

Ira Eckhaus, 1006 Neilson St., Far Rockaway, N.Y.

Continuation-in-part of Ser. No. 864,435, May 16, 1986, Pat. No. 4,695,113, which is a continuation-in-part of Ser. No. 656,860, Oct. 2, 1984, abandoned. This application Sep. 21, 1987, Ser. No. 99,351
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—404 3 Claims



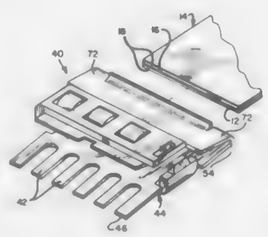
1. An electrical terminal block, comprising a base portion having a receiving platform for receiving a layer of metal foil material at least along a portion thereof, at least one wire receiving trough formed thereacross, and a channel formed into said base portion transverse to said trough, a metal retaining member having one wall section for engaging foil material placed on the platform and another wall section, at least one elongated notch formed into said another wall section from a free end thereof, defining an opposing pair of cutting edges, said another wall section aligned with said channel, whereupon insertion of an insulated electrical wire into said trough, and with the placement of said metal retaining member onto said base portion, whereupon said another wall section enters the channel, said wire and said elongated notch are forced into engagement to slice the insulation and contact the wire core to electrically interconnect the wire core to a foil material, and further comprising clip means between said metal retaining members and said base portion for retaining the metal retaining member secured on to said base portion.

4,859,204

METHOD OF STAKING A WAVE CRIMP FOR FLAT POWER CABLE TERMINATION

John K. Daly, Scottsdale, and Earl R. Kreinberg, Phoenix, both of Ariz., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 13, 1988, Ser. No. 193,852
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—424 13 Claims



1. A method for providing an assured electrical connection between a transition adapter member and flat power cable of the type having a flat conductor with a thin insulative covering thereover, terminating the conductor and electrically interconnecting the conductor to another electrical article having

contact means matable with contact means of the adapter for the transmission of power, where the transition adapter is of the type having a body member having plate sections to be disposed along major surfaces of the cable after termination, each plate section having a terminating region adapted upon the plate sections being pressed toward each other and against the cable therebetween to penetrate the cable insulative covering and shear strips of the cable conductor and deflect the sheared strips out of the plane of the cable exposing sheared conductor edges for electrical connection, the adapter further having insert members along cable-remote surfaces of the plate sections, each insert member including relief apertures to receive the sheared conductor strips deflected thereinto during termination so that sheared conductor edges are disposed laterally adjacent side surfaces of the relief apertures, the method comprising the steps of:

pressing the plate sections of the adapter together thereby shearing conductor strips and deflecting the sheared conductor strips into the relief apertures of the insert members;

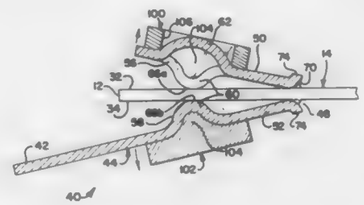
staking each insert member at each location between the relief apertures thereof, from a cable-remote surface thereof, to deform portions thereof laterally toward and against adjacent ones of the sheared and deflected conductor edges within the relief apertures, creating gas-tight electrical connections between the sheared conductor edges and the side surfaces of the insert member relief apertures.

4,859,205

STRAIN RELIEF FOR FLAT CABLE TERMINATION

William B. Fritz, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 13, 1988, Ser. No. 194,063
Int. Cl.[4] H01R *9/07*
U.S. Cl. 439—492 6 Claims



1. A strain relief system for a terminal applied to end portions of flat electrical cable, the terminal being of the type having opposed plate sections affixed to major surface of the flat cable and including means for mechanical and electrical connections therewith, the strain relief system comprising:

an integral hinge means at a cable-receiving end of an electrical terminal joining opposed plate sections thereof, said hinge means comprising a pair of hinge sections spaced transversely apart, said terminal including a cable-receiving slot therebetween through which an end of a flat cable is insertable to be disposed between the plate sections of the terminal; and

said terminal includes a pair of opposed flanges along said cable-receiving slot extending outwardly away from said major cable surfaces after termination, whereby the hinge sections and opposed flanges prevent torque applied on said terminal by said cable from tending to move said opposed sections apart and the mechanical and electrical connections of the termination are protected.

4,859,206

HAIR DYE PREPARATIONS CONTAINING NITRODIPHENYLAMINE DERIVATIVE

David Rose, Hilden; Edgar Lieske, Duesseldorf; Horst Hoeffkes, Duesseldorf-Hellerhof, and Norbert Maak, Neuss, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 26, 1988, Ser. No. 160,964

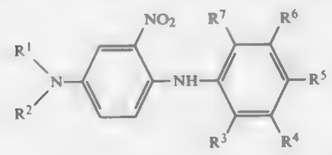
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706225

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

Int. Cl.[4] A61K *7/13*; C07C *87/54*

U.S. Cl. 8—429 34 Claims

1. In a hair dye aqueous preparation comprising a hair dye effective amount of a first substantive hair dye in a suitable cosmetic carrier including an amount of an anionic, nonionic or ampholytic surfactant effective as a wetting agent and emulsifier, the improvement wherein said first substantive hair dye comprises one or more compounds of the formula:



(I)

wherein:

R^1 and R^2 independently are hydrogen, C_{1-4} alkyl, or C_{2-4} hydroxyalkyl;

one of R^3 to R^7 is $—SO_3H$ or —COOH; and

the remaining of R^3 to R^7 independently are hydrogen, chlorine, C_{1-4} alkyl, C_{1-4} alkoxy, or $—NR^8R^9$, where R^8 and R^9 independently are hydrogen, C_{1-4} alkyl, C_{2-4} alkoxy, or where $—NR^8R^9$ is piperidine, morpholine, piperazine, or pyrrolidone;

or a water soluble salt thereof.

4,859,207

PROCESS FOR DYEING TEXTILE PLANAR FABRICS MADE FROM POLYAMIDES: WITH MELAMINE COMPOUND AS RESIST AGENT

Thys Bouwknegt, and Heinz Abel, both of Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 19, 1988, Ser. No. 221,401

Claims priority, application Switzerland, Jul. 27, 1987, 2961/87

Int. Cl.[4] D06P *5/12*; C09B *67/00*

U.S. Cl. 8—455 10 Claims

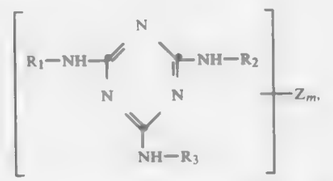
1. A process for dyeing textile planar fabrics made from natural or synthetic polyamides with anionic dyes by

(a) locally applying a resist agent by itself or in conjunction with an anionic dye or fluorescent whitening agent,

(b) subjecting the textiles to a heat treatment, and

(c) carrying out ground dyeing with a dye liquor that contains a further anionic dye,

which process comprises using, as resist agent, a melamine compound of formula



(I)

wherein R_1, R_2 and R_3 are each independently phenyl or naphthyl, each of which is unsubstituted or substituted by halogen, hydroxy, C_1–C_3alkyl or C_1–C_3alkoxy, Z is an acid water-solubilising group, and m is 1 to 6.

4,859,208

CALCIUM CONTROL SYSTEM: HYDROCOLLOID AND ALGINATE FOR DYE PRINTING

Kenneth Clare, San Diego, Calif., and William Gibson, Horsham, England, assignors to Kelco International Limited, London, England

Continuation of Ser. No. 42,067, Apr. 24, 1987, abandoned, which is a continuation of Ser. No. 770,114, Aug. 27, 1985, Pat. No. 4,693,728. This application Jun. 10, 1988, Ser. No. 205,415

Claims priority, application United Kingdom, Aug. 30, 1984, 8421987

Int. Cl.[4] A23L *1/04*; C08L *5/04*; D06P *1/48*; C09D *11/14*

U.S. Cl. 8—557 7 Claims

1. A mixture of (A) a blend of (1) hydrocolloid selected from the group consisting of guar, oxidized guar, carboxymethyl guar, hydroxyalkyl guar, polyvinyl alcohol, carboxymethyl cellulose, xanthan gum, cold water soluble locust bean gum, cold water soluble starch, hydroxyethylated starch, and hydroxypropylated starch and (2) calcium citrate salt wherein the ratio of salt to hydrocolloid ranges from 10:1 to 0.05:1 and (B) the amount of calcium citrate is that necessary to replace 16–60% of the alginate cation with calcium.

4,859,209

STABLE BROWN-COAL/OIL SUSPENSIONS AND A PROCESS FOR PREPARING SAME

Katalin Szabó née Mogyorossi; István Kalocsai; Istyán Gyóni, all of Tatabánya; Károly Reményi, Budapest; György Pláveczky, Százhalombatta; László Kovács, Budapest; Dezsö Gál, Budapest; István Nemes, Budapest; László Botár, Budapest; Ákos Bencsura, Kecskemét; Galina Móger née Jeremejeva, Budapest; Károly Héberger, Budapest, and András Németh, Budapest, all of Hungary, assignors to MTA Kozponti Kemiai Kutato Intezet, Budapest, Hungary

Filed Jan. 22, 1987, Ser. No. 5,952

Claims priority, application Hungary, Jan. 22, 1986, 297/86

Int. Cl.[4] C10L *1/32*

U.S. Cl. 44—51 3 Claims

1. A process for the preparation of a stable brown coal/oil suspension, consisting essentially of mechanically admixing:

(a) 25 to 70% by mass of an agglomerate comprising 65 to 80% by mass brown coal powder, 10 to 18% by mass of a fuel oil or heating oil with a solidification point above 20° C. and 10 to 17% by mass of water, and

(b) 30 to 75% by mass of fuel oil, at a temperature of 65°–75° C.

4,859,210

MOTOR FUEL OR LUBRICANT COMPOSITION CONTAINING POLYBUTYL OR POLYISOBUTYL DERIVATIVES

Dieter Franz, Ludwigshafen; Rudolf Kummer, Frankenthal; Helmut Mach, Heidelberg, and Hans P. Rath, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 5, 1988, Ser. No. 141,111

Int. Cl.[4] C10L *1/02, 1/22*

U.S. Cl. 44—53 9 Claims

1. A motor fuel composition which contains 0.005 to 0.5% by weight of one or more polybutyl or polyisobutyl alcohols of the formula (I)

$$R—CH_2—OH \qquad (I)$$

where R is a polybutyl or polyisobutyl radical derived from isobutene and up to 20% by weight of n-butene and having a molecular weight $\overline{M}_N$ of from 324 to 3,000, or a corresponding (poly)alkoxylate or a corresponding carboxylate of the polybu-

tyl or polyisobutyl alcohol, wherein said polybutyl or polyisobutyl alcohol is prepared by hydroformylating the corresponding polybutene or polyisobutene using a rhodium or cobalt catalyst at from 80° to 200° C. under a CO/H_2 pressure of up to 600 bar.

4,859,211

WASTE RECLAMATION SYSTEM FOR PELLETIZING FUEL PELLETS

Richard S. Moore, North Yorkshire, England, assignor to Materials Recycling Management Ltd., Harrogate, United Kingdom

Filed Aug. 18, 1987, Ser. No. 86,540

Claims priority, application United Kingdom, Feb. 17, 1987, 8703589

Int. Cl.[4] C10L *5/40, 5/46*

U.S. Cl. 44—589 **9 Claims**

1. A method for the reclamation of wastes comprising

(a) assembling at a waste reclamation center dry secondary organic wastes that have been separated into
generally uncontaminated waste,
waste contaminated with lesser amounts of extraneous matter, and
waste contaminated with greater amounts of extraneous matter,

(b) transferring said generally uncontaminated waste in a first processing line to a packing zone within the center, and packaging same for primary reuse,

(c) transferring said lesser contaminated waste in a second processing line to a pelletizing zone within the center and pelletizing the same for reuse as a fuel, and

(d) in a third processing line separating from the waste contaminated with greater amounts of extraneous matter
(1) components suitable for use in step (b), and
(2) components suitable for use in step (c), and

(e) transferring said components (1) and (2) to said first and second processing lines respectively.

4,859,212

CHEMICAL CLEANING OF COAL BY MOLTEN CAUSTIC LEACHING AFTER PRETREATMENT BY LOW-TEMPERATURE DEVOLATILIZATION

Colin D. Chriswell, Slater, Iowa; Surender M. Kaushik, Socorro, N. Mex.; Navin D. Shah, Houston, Tex., and Richard Markuszewski, Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Sep. 15, 1988, Ser. No. 244,991

Int. Cl.[4] C10L *5/00*

U.S. Cl. 44—622 **21 Claims**

1. In the molten caustic leaching process for removal of sulfur and ash from coal, the improvement comprising:

preheating the coal at a temperature of from about 400° C. to about 450° C. for a time sufficient to remove oxygen-containing compounds from the coal and thereby minimize carbonate formation in molten caustic leaching process.

4,859,213

INTERCHANGEABLE QUENCH GAS INJECTION RING

Clifford C. Segerstrom, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 20, 1988, Ser. No. 208,533

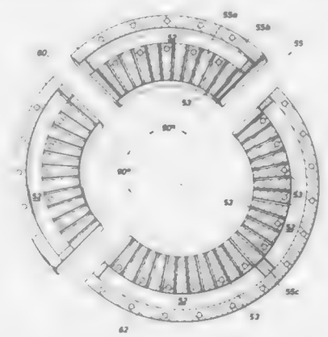
Int. Cl.[4] C10J *3/72, 3/82*

U.S. Cl. 48—87 **3 Claims**

1. An apparatus for injecting quench gas in a gasification reactor comprising:

an injection ring formed by least two arcuate sections, each of said sections having an outer arcuate portion and an inner arcuate portion spaced inwardly of and concentric with said outer portion thereby forming an arcuate space between said inner and said outer portions, and a plurality of bores defining passageways in said inner portion and extending radially therethrough;

a base plate and a top plate matingly secured to said sections



and defining with said arcuate space a plenum chamber, said top plate having a fluid port therein in fluid communication with said plenum chamber; and

means for injecting a quench gas into said fluid pot.

4,859,214

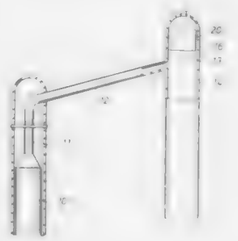
PROCESS FOR TREATING SYNGAS USING A GAS REVERSING CHAMBER

Clifford C. Segerstrom, Houston, Tex.; Jacob H. Stil; Adrianus J. Ooms, both of The Hague, Netherlands; Bernardus H. Mink, Degstgeest, Netherlands; Ulrich Premel, Gummersbach, and Leszek Gawloski, Reichshof-Wollseifen, both of Fed. Rep. of Germany, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 30, 1988, Ser. No. 213,419

Int. Cl.[4] C10J *3/46, 3/84*

U.S. Cl. 48—197 R **8 Claims**



1. A method for reversing the flow of a synthesis gas containing solids that tend to cause fouling of heat transfer surfaces, comprising:

passing said synthesis gas from a solid carbanaceous fuel gasification reactor into a gas-reversal space within a chamber;

removing said synthesis gas from said gas-reversal space within said chamber in a different direction from the direction of synthesis gas entering said chamber;

stopping the flow of synthesis gas to said gas-reversal space;

adjusting the volume of the gas-reversal space within the chamber; and

resuming the flow of synthesis gas from said gasification reactor.

4,859,215

POLYMERIC MEMBRANE FOR GAS SEPARATION

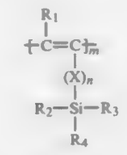
Michael Langsam, Allentown; Pushpinder S. Puri, Macungie; Madhu Anand, Allentown, and Daniel V. Laciak, Fogelsville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 2, 1988, Ser. No. 144,295

Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—16 **19 Claims**

1. A polymeric membrane having improved selectivity for use in separating a feed gas mixture containing at least two gaseous components, said membrane comprising a polymer having the general structural formula:



wherein R_1 is a linear or branched C_1–C_4 alkyl group; R_2 and R_3 are independently linear or branched C_1–C_4 alkyl groups; R_4 is a linear or branched C_1–C_{12} alkyl group or aryl group; X is a C_1–C_3 alkyl group or phenyl; m is at least 100 and n is 0 or 1, to which has been added between about 5 and 50 wt. % of an additive which is miscible with said polymer, has a boiling point > 300° C. at atmospheric pressure, is soluble in a common solvent for the polymer, and increases the selectivity ratio for O_2/N_2 by at least 15% over the polymer without said additive, and wherein said additive is selected from the group consisting of: silicon oils, non-ionic surfactants, hydrocarbon oils, flame retardant additives, epoxides, natural oils, liquid poly(vinyl chloride) stabilizers, aromatic compounds containing nitrogen groups, aromatic compounds containing sulfur groups, and mixtures thereof.

16. A process for separating components of a gas mixture containing at least two components, said process comprising bringing said gas mixture into contact with the polymeric membrane of claim 1 such that one component of said gas mixture permeates through the polymeric membrane at a faster rate than at least one other component to selectively separate the components of said gas mixture which are recovered as a permeate stream enriched in the more permeable component and as a reject stream enriched in the less permeable component.

4,859,216

PROCESS AND EQUIPMENT FOR THE TREATMENT AND RECOVERY OF SOLVENT VAPORS BY RECYCLING ON ACTIVE CHARCOAL

Georges Fritsch, Paris, France, assignor to Ameg France, Paris and Ceca S.A., Courbevoie, both of, France

Filed Mar. 25, 1988, Ser. No. 173,634

Claims priority, application France, Mar. 27, 1987, 87 04337

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—28 **12 Claims**

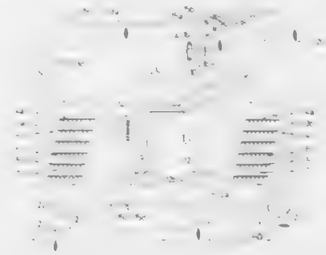
1. A process for the treatment and recovery of solvent vapors contained in air or in another gaseous fluid, wherein the air or the gaseous fluid containing the solvent vapors is treated in an equipment comprising:

(A) one or more adsorption-desorption assemblies or casings (3) containing active charcoal in fiber form in the form of a bed (5) made up of superposed layers of active charcoal fibers, said bed being arranged between two metal grids held by a metal frame, forming a support-frame (4*a*) containing said active charcoal fibers, one or more of said support-frame(s) being arranged in a square or rectangular drawer (4) formed by a frame-work supporting the support-frames containing said bed of layers of active charcoal fibers, said support-frames being provided with removable electrical resistors (6) the ends of which are fastened onto one of the sides of the framework; and

(B) a system for recovering the solvents comprising:
(a) means for converting the adsorbed solvents into vapor form;
(b) means for condensing the solvent vapors and, if present, water vapor;
(c) means for separating the condensed solvents from the water originating from the water vapor present in the gaseous discharge to be treated; and
(d) means comprising conduits, air shutters and valves so as to permit circulation of the fluid in a closed circuit through assembly (A) and system (B),

said process comprising three stages,

(1) in a first adsorption stage, passing air or the gaseous fluid containing the solvent vapors at ambient temperature through the adsorber (3) containing superposed layers of active charcoal fibers (5) forming a bed, in a support-frame (4*a*) arranged in a removable drawer (4) above



removable electrical resistors (6); adsorbing said solvent vapors onto said active charcoal fibers and discharging the air or the gaseous fluid freed of solvent;

(2) in a second desorption stage recycling the gaseous regeneration fluid by means of a turbine (8) in a closed circuit, through the layers of solvent-impregnated active charcoal fibers (5), the said active charcoal fibers being heated by heating elements (6) placed below the layers of active charcoal fibers, said regeneration fluid being heated by a heater (14), the solvent adsorbed onto the active charcoal fibers being vaporized by heat and then being liquefied in a cryocondensation device cooled by a refrigeration unit (9), while any water vapor present in the regeneration fluid is separated off in the form of ice crystals; and

(3) in a third purging stage, switching off the heating of resistors (6) and heater (14) and cooling the active charcoal (5) by purging with air or with the fresh neutral gas which follows the same path as during the desorption stage.

4,859,217

PROCESS FOR SEPARATING NITROGEN FROM MIXTURES THEREOF WITH LESS POLAR SUBSTANCES

Chien C. Chao, Millwood, N.Y., assignor to UOP

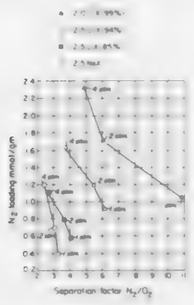
Filed Jun. 30, 1987, Ser. No. 67,820

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—68 **7 Claims**

1. Process for selectively adsorbing nitrogen from a gas mixture thereof with less polar substances which comprises

contacting said gas mixture with a crystalline zeolite X adsorbent having a framework SiO_2/Al_2O_3 molar ratio of not



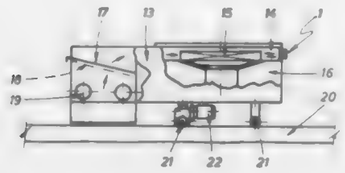
greater than 3.0 and having at least 88 percent of its AlO_2 tetrahedral units associated with lithium cations.

4,859,218

DEVICE FOR CONTROLLING REFUSE DISCHARGE IN TEXTILE CLEANERS

Jose R. Trias, Fontcuberta, 24-Urbanizacion "La Coromina", Manlleu, Spain

Filed Jun. 12, 1987, Ser. No. 62,469
Claims priority, application Spain, Jun. 20, 1986, 294958
Int. Cl.[4] B01D *29/04, 46/10*
U.S. Cl. 55—213 **7 Claims**



1. A textile cleaner in combination with a control device for controlling refuse discharge in the textile cleaner, the textile cleaner comprising a pressure chamber and an underpressure chamber, a turbine in said pressure chamber, and a filter located upstream of said turbine so that said turbine suctions air through said filter into said chambers and thereby refuse accumulated on said filter disturbs operation of said turbine, the control device comprising:

a housing with an open face and at least one hole;

a deflectable membrane closing said open face, said membrane being in contact with one of said chambers;

spring means for biasing said membrane, said spring means being in said housing and being formed to exert a biasing force, said membrane being formed to deflect in response to pressure forces acting against said membrane in opposition to said biasing force when said pressure forces are greater than said biasing force;

electrical contact means including a first contact member fixed on said membrane and a second contact member extending into said housing, said first contact member being movable by said membrane into contact with said second contact member against said biasing force in response to said membrane deflecting; and

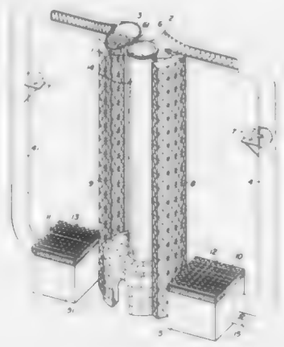
means for adjusting a position of one of said contact members relative to the other of said contact members to initially adjust a gap between said contact members so as to limit an accumulation of the refuse on the filter prior to said contact becoming effected between said contact members.

4,859,219

APPARATUS FOR PRECIPITATING EXHAUSTED SMOKE FROM A CHIMNEY

Chien-Feng Huang, No. 8 Alley 49, Lane 36, Sec. 2 Li-Hsing Road, Sanchung City, Taipei Hsien, Taiwan

Filed Dec. 2, 1987, Ser. No. 128,020
Int. Cl.[4] B01D *53/14*
U.S. Cl. 55—223 **5 Claims**



1. An apparatus for precipitating smoke from a chimney having an exhaust outlet, said apparatus comprising:

a funnel-shaped smoke collecting means provided adjacent to but not encompassing the exhaust outlet of the chimney;

a vapour injection nozzle provided opposite said funnel-shaped smoke collecting means for spraying a high speed water vapour over the exhaust outlet of the chimney;

a water tank having a conduit connected to said smoke collecting means for receiving the smoke and precipitating the same therein; and

a suction means provided in said conduit for accelerating said vapour and smoke into said water tank;

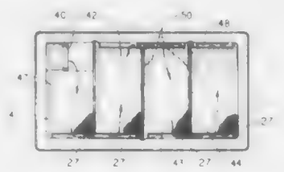
said water vapour from said nozzle precipitating the smoke exhausted from the chimney and bringing the same into said water tank for further precipitation of the smoke by the water in the water tank.

4,859,220

CABINET CONTROLLER

Leland C. Leber, Fort Collins, and Charles L. Hunter, Loveland, both of Colo., assignors to Teledyne Industries, Inc., Fort Collins, Colo. and Westvaco Corporation, New York, N.Y.

Division of Ser. No. 902,864, Sep. 2, 1986, abandoned. This application Feb. 16, 1988, Ser. No. 155,826
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—350 **8 Claims**



1. For use in an air filter system having a housing within

which is received a removable filter canister which canister comprises:

a generally cup-shaped canister;

means defining a plurality of separate compartments within the interior of said canister and individually having respective different spaced entrances and exits and peripheral upper edge surfaces;

means defining an inlet opening in a location through one wall of said canister as to be into one of said entrances;

means defining a plenum disposed at the final one of said exits with said entrances and exits being disposed and interconnected in series to define with said compartments a maze through which air may flow;

a cover sealingly affixed atop the upper edge surfaces around each of said compartments and having an opening so located on said cover as to be aligned in communication with said plenum;

a particulate air filtration material filling each of said compartments;

a shell sealingly affixed to said canister over said cover and having an outlet;

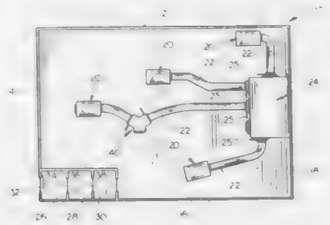
and a sheet of air filter material sandwiched between said cover and said shell.

4,859,221

METHOD AND MEANS FOR REPLACING A MALFUNCTIONING AIR FILTRATION UNIT

Steven C. Griffis, 2929 Avenue D, Council Bluffs, Iowa 51501

Filed Feb. 10, 1989, Ser. No. 308,749
Int. Cl.[4] B01D *46/00*
U.S. Cl. 55—419 **1 Claim**



1. The method of replacing a malfunctioning air filtration unit which is being used in a contaminated area and which has its exhaust connected to an air conduit which extends to a selectively closable air exhaust means, comprising the steps of:

(1) closing the air exhaust means;

(2) disconnecting the exhaust of the malfunctioning air filtration unit from said air conduit;

(3) providing a Y-shaped, air diverter box means having first, second and third closable openings formed therein;

(4) connecting the first closable opening of said air diverter box means to the end of said air conduit while maintaining said first, second and third closable openings in a closed condition;

(5) providing a functioning air filtration unit having an air intake and an air exhaust;

(6) providing a second air conduit;

(7) connecting one end of said second air conduit to said second closable opening;

(8) connecting the other end of said second air conduit to the air intake of said functioning unit;

(9) connecting one end of a third air conduit to said third closable opening;

(10) opening said selectively closable air exhaust means;

(11) opening said first and second closable openings and closing said third closable opening;

(12) energizing said air filtration unit for a predetermined length of time whereby said first and second air conduits and the interior of said air diverter box means will be purged and cleaned;

(13) connecting the other end of said third air conduit to the exhaust of said functioning air filtration unit, while opening said third closable opening, closing said first closable opening, and closing said selectively closable air exhaust means while operating said functioning air filtration unit to purge and clean said third air conduit, the interior of said diverter box means and said second air conduit;

(14) disconnecting said second air conduit from said second closable opening and the intake of said functioning air filtration unit;

(15) opening said first closable opening and said closable air exhaust means and closing said second closable opening; and

(16) operating said functioning air filtration unit.

4,859,222

METHOD FOR THE MANUFACTURE OF A LIGHT WAVE GUIDE

Hartmut Bauch, Liederbach; Peter Krause; Ulrike Jost, both of Mainz; Ralf Kersten, Bremthal; Volker Paquet, Mainz, and Wolfgang Siefert, Freiburg, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Oct. 7, 1988, Ser. No. 255,106
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3733880
Int. Cl.[4] C03B *37/023*
U.S. Cl. 65—3.12 **8 Claims**



1. Method for the manufacture of a light wave guide, providing a cladding and a light-conducting core, from a glass tube showing a material on or below its inner surface which forms the core of the finished light wave guide, comprising at least one substance which is selectively diffused out of this material forming the core subsequently, into the interior space of the glass tube at a suitable temperature, characterized in that

during the diffusing-out process the partial pressure of the diffusing-out substance in the interior space of the glass tube is maintained as small as possible whereby a premature collapsing of the glass tube during the diffusion process is prevented by adjusting an overpressure in the glass tube,

the glass tube, after the diffusing-out process, is largely collapsed while rinsing with a rinsing gas and in a last collapsing step is completely collapsed to a rod (preform) without rinsing with a rinsing gas and

that the rod is subsequently drawn out to a fiber.

4,859,223

METHOD OF MANUFACTURING POLARIZATION-MAINTAINING OPTICAL FIBERS

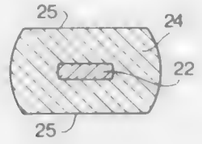
Hiroshi Kajioka; Kondo Yamada; Yusetsu Takuma, and Tatsuo Tenaka, all of Hitachi, Japan, assignors to Hitachi Cable Limited, Tokyo, Japan

Filed Jan. 5, 1988, Ser. No. 141,364

Claims priority, application Japan, Jun. 15, 1987, 62-148282; Dec. 7, 1987, 62-307735

Int. Cl.[4] C03B *37/027, 37/018*

U.S. Cl. 65—3.12 4 Claims



1. A method of manufacturing a polarization-maintaining optical fiber, comprising the steps of:

(A) fabricating a core rod having a longitudinal axis by vapor phase axial deposition and sintering;

(B) removing portions of the core rod by machining said core rod at two opposite surface positions thereof so that the core rod possesses opposite flat surfaces which extend along the longitudinal direction thereof;

(C) depositing cladding soot around the core portion and vitrifying the cladding soot to form cladding surrounding the core rod, the core portion and cladding defining a core rod having a circular cross-section;

(D) grinding two opposite surfaces of the cladding along the longitudinal direction of the core rod, such that the sectional configuration of the cladding and the core portion are large and small scale analogs of each other in shape; and

(E) wire-drawing the core rod fabricated in step (D) into said polarization-maintaining optical fiber

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4,859,224

METHOD OF MANUFACTURING GLASS OR CERAMIC BODIES

Rolf Claasen, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 15,773, Feb. 17, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 229,781

Claims priority, application Netherlands, Jun. 10, 1986, 8619510

Int. Cl.[4] C03B *37/014*

U.S. Cl. 65—17 15 Claims

1. A method of manufacturing glass or ceramic bodies, in which an open-pore green body is formed from the starting material and is subjected to a purification process in which a heated purification gas is reacted with impurities present in the green body, in such a manner that the green body to be purified, is rinsed with flowing purification gas, is then sealed and subsequently evacuated until the gases present in the open-pore green body are removed in the form of purification gas and gaseous reaction products, after which the purified green body is sintered, wherein metallic impurities in the form of elements of the groups Ib, Va, VIa, VIIa and/or VIII of the Periodic Table of Elements are converted into volatile complex compounds at a temperature in the range from 200° to 500° C. by means of a purification gas consisting of a carrier gas saturated with a sulphur-oxygen-halogen compound.

4,859,225

METHOD AND DEVICE FOR CURVING SHEETS OF GLASS

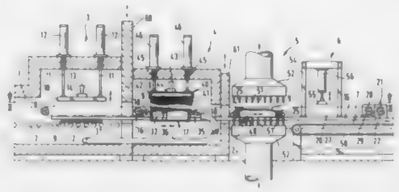
Hans-Werner Kuster, Aachen, Fed. Rep. of Germany; Herbert Radermacher, Raeren, and Luc Vanaschen, Eupen, both of Belgium, assignors to Saint-Gobain Vitrage, Paris, France

Filed May 9, 1988, Ser. No. 191,326

Claims priority, application Fed. Rep. of Germany, May 7, 1987, 3715151

Int. Cl.[4] C03B *23/035*

U.S. Cl. 65—104 24 Claims



1. A method for curving sheets of glass, comprising heating sheets of glass to their curving temperature in a horizontal position in a continuous furnace, pressing said sheets is a curving station adjacent to the continuous furnace by applying said sheets against an annular frame in a sealing manner and pressing same against a solid surface curving form which together with said frame defines a curving form having upper and lower components, transferring said sheets to a cooling station on a support frame, wherein the sheets of glass in the curving station, during the pressing between the annular frame and the solid surface form, are pressed in the area located inside the annular frame, against the solid surface curving form, by producing static pressure in a pressure chamber whose end surface is defined by the annular frame and which is closed by the sheet of glass.

11. An installation for curving glass sheets, comprising a continuous furnace with rollers, a curving station and a cooling station downstream of the curving station, wherein the curving station comprises an upper curving form with a solid surface, which can be moved upward and downward together with means for effecting said movement, and a lower annular curving frame, wherein said lower annular curving frame is formed by the upper edge of the wall of a pressure chamber which can be placed under pressure by supplying a hot gas thereto, and means for supplying said hot gas.

4,859,226

UNIVERSAL LOWER STEM MOLD FOR MANUFACTURING A MOLDED GLASS STEM

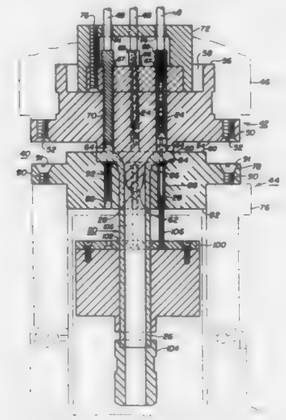
John R. Hale, Lancaster, Pa., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Aug. 11, 1988, Ser. No. 231,340

Int. Cl.[4] C03B *11/14;* C03C *29/00*

U.S. Cl. 65—139 3 Claims

1. In an apparatus for manufacturing a glass stem for an electron tube, said stem having a plurality of lead-in conductors and a greater plurality of fillets, said lead-in conductors extending through selected ones of said fillets, there being at least one dummy fillet without a lead-in conductor therethrough, said apparatus comprising a first mold assembly and a second mold assembly for forming said stem therebetween, said first mold assembly including fillet-forming means therein, the improvement wherein said second mold assembly comprises a universal second stem mold having a plurality of lead-in conductor receiving openings formed therethrough, and at least one removable stem mold plug disposed and retained within one of said opening.



said pressurized water to said tube when said shear mechanism is not operating.

4,859,227

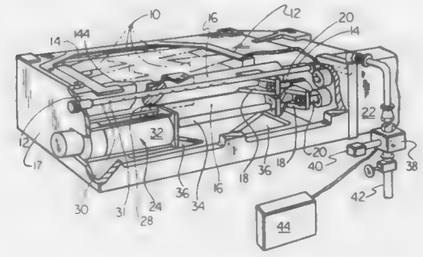
STRAIGHT LINE SHEAR MECHANISM

Douglas W. Wright, Tarriffville, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jan. 27, 1989, Ser. No. 303,780

Int. Cl.[4] C03B *7/10*

U.S. Cl. 65—334 2 Claims



1. A straight line shear mechanism for cutting discrete gobs from a runner of molten glass which is to be formed into a glass container comprising a housing,

a pair of opposed shear blade assemblies mounted for simultaneous displacement from retracted positions to advanced shear positions,

means for displacing said shear blade assemblies including an air cylinder means having a cylindrical housing and an outwardly extending rod, movable between retracted and fully advanced positions;

means for cooling said air cylinder means including

an elongated tube extending parallel to said air cylinder means,

a plurality of holes defined in said tube, said holes selectively located to direct fluid discharged from said tube towards said cylindrical housing and said rod when said rod is at said fully advanced positions,

a source of pressurized ambient air,

a source of pressurized water,

means for supplying said pressurized ambient air to said tube when said shear mechanism is operating and for supplying

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4,859,228

NOVEL 5-AMINOMETHYLENE-2,4-IMIDAZOLIDINEDIONES AND 5-AMINOMETHYLENE-2-THIONOIMIDAZOLIDINE-4-ONES

Michael P. Prisbylla, Richmond, Calif., assignor to ICI Americas Inc, Wilmington, Del.

Filed Jul. 16, 1987, Ser. No. 74,216

Int. Cl.[4] C07D *233/96;* A01N *43/50*

U.S. Cl. 71—92 122 Claims

89. An herbicidal composition according to claim 88 wherein R_2 is hydrogen.

4,859,229

3-ARYLURACILS HAVING AN ETHER (THIO) CARBOMYLOXY OR SULPHOMYLOXY SUBSTITUENT ON THE AROMATIC MOIETY

Jean Wenger, Uster, and Paul Winternitz, Greifensee, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

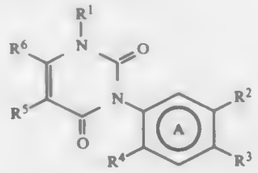
Filed Jul. 21, 1987, Ser. No. 76,415

Claims priority, application Switzerland, Jul. 31, 1986, 3090/86; Jun. 12, 1987, 2207/87

Int. Cl.[4] A01N *43/54;* C07D *239/55*

U.S. Cl. 71—92 86 Claims

1. A compound of the formula



I

wherein

R^1 is C_{1-4}-alkyl, C_{1-4}-haloalkyl, formyl or C_{2-6}-alkanoyl,

R^2 is an ether group or a group containing a (thio)carbonyloxy or sulphonyloxy, whereby this group is directly attached to the benzene nucleus A via the oxygen atom,

R^3 is halogen or cyano,

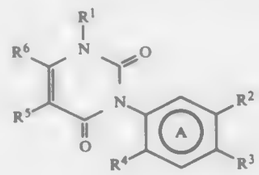
R^4 is hydrogen or halogen,

R^5 is hydrogen, halogen or C_{1-4} alkyl,

R^6 is C_{1-4}-alkyl or C_{1-4}-haloalkyl, or

R^5 and R^6 are tetramethylene.

23. A weed control composition, which contains an effective amount of at least one compound of the formula



I

wherein

R^1 is C_{1-4}-alkyl, C_{1-4}-haloalkyl, formyl or C_{2-6}-alkanoyl,

R^2 is an ether group or a group containing a (thio)carbonyloxy or sulphonyloxy, whereby this group is directly attached to the benzene nucleus A via the oxygen atom,

R^3 is halogen or cyano,

R^4 is hydrogen or halogen,

R^5 is hydrogen, halogen or C_{1-4}-alkyl,

R^6 is C_{1-4}-alkyl or C_{1-4}-haloalkyl, or

R^5 and R^6 together are tri- or tetramethylene, as well as formulation adjuvants.

31. A method for the control of weeds, which method comprises treating the locus to be protected against weeds and/or the weeds with an effective amount of a composition in accordance with claim 23.

4,859,230

HALOGENCYCLOPROPYL COMPOUNDS, AND USE AS HERBICIDAL AGENTS

Friedhelm Blume; Wilfried Franke; Friedrich Arndt, and Richard Rees, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany

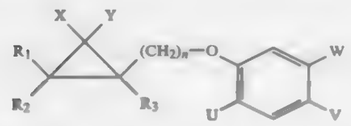
Filed Oct. 14, 1987, Ser. No. 108,380

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1986, 3635309

Int. Cl.[4] A01N *43/707, 43/56, 43/54, 43/653*

U.S. Cl. 71—93 20 Claims

1. Halocyclopropyl compound of the formula I



(I)

in which

R_1, R_2 and R_3, independently of each other, are hydrogen or C_{1-4}-alkyl,

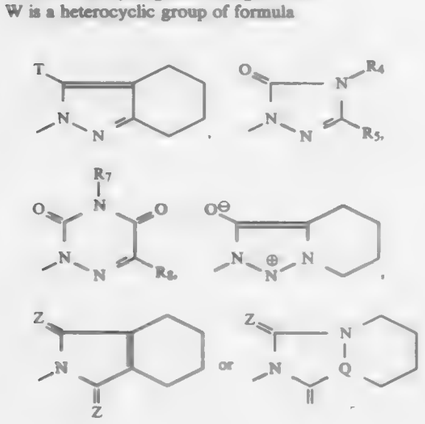
X is hydrogen or halogen,

Y is halogen,

n is 0, 1, 2 or 3,

U and V are hydrogen or halogen, and

W is a heterocyclic group of formula



in which

T is halogen, C_{1-4}-alkyl, C_{1-4}-haloalkyl, CN or OR_9

Q is CH or N,

Z is O or S,

R_4, R_5, R_7 and R_8 are each a straight, branched or cyclic C_{1-7}-alkyl group optionally substituted by up to six halogen atoms, or

R_4 and R_5, can also together form a 4 to 7 membered ring that is saturated or unsaturated and can optionally be substituted by one to three methyl groups and one to six halogen atoms, and

R_9 is hydrogen, C_{1-4}-alkyl or C_{1-4}-haloalkyl.

3. A method of combating weeds which comprises applying to the weed or its locus a herbicidally effective amount of a compound claimed in claim 1.

4,859,231

(6,7-)DIHYDRO-(1,2,4) TRIAZOLO (1,5-A) (1,3,5) TRIAZINE-2-SULPHONAMIDES, AND THEIR USE AS HERBICIDES AND PLANT GROWTH REGULATORS

Jürgen Westermann; Martin Krüger; Friedrich Arndt; Richard Rees, and Clemens Kötter, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany

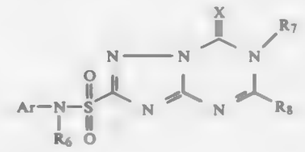
Filed Dec. 18, 1987, Ser. No. 135,142

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3644343

Int. Cl.[4] C07D *487/04;* A01N *43/66*

U.S. Cl. 71—93 20 Claims

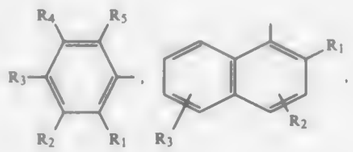
1. 6,7-Dihydro-[1,2,4]triazolo[1,5-a][1,3,5]triazine-2-sulphonamide of formula I

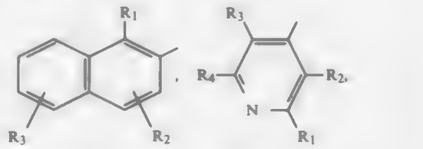


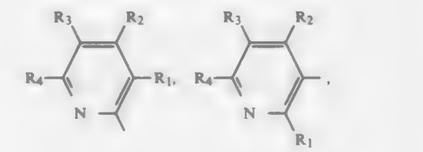
(I)

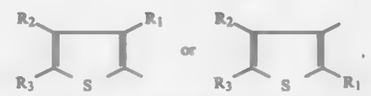
in which

Ar is a phenyl, naphthyl, pyridyl or thienyl group of formula

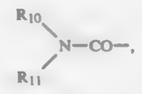








R_1, R_2, R_3, R_4 and R_5 are the same or different and are hydrogen, a C_1–C_6-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl group, each of which is optionally substituted by one or more of the same or different halo, hydroxy, halo-C_1–C_4-alkyl, C_1–C_4-alkoxy, halo-C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl, halogen, C_1–C_4-alkoxy, a group R_9—O—CO, a carbamoyl group

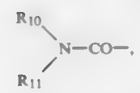


an amino group



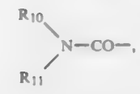
cyano, nitro, a sulphur containing group R_9—$S(O)_n$—, an acyl group R_9—CO, a group R_9—O—CO—$(CH_2)_n$, or phenyl or phenoxy, both of which are optionally substituted by one or more of C_1–C_4-alkyl, halo or nitro,

R_6 is hydrogen, an acyl group R_9—CO, a group R_9—O—CO—, C_1–C_6-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl, phenyl-C_1–C_4-alkyl, a carbamoyl group



an alkali metal atom, a single metal equivalent of an alkaline earth or other metals or ammonium group, optionally substituted by C_1–C_6-alkyl,

R_7 and R_8 are the same or different and are hydrogen, a C_1–C_6-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl group, each of which is optionally substituted by halo and/or C_1–C_4-alkoxy, a phenyl-C_1–C_6-alkyl, phenyl-C_2–C_6-alkenyl or phenyl-C_2–C_6-alkynyl group, each of which is optionally substituted by halo, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkoxy-C_1–C_4-alkyl or halo-C_1–C_4-alkyl, phenyl, substituted by R_1, R_2, R_3, R_4 and R_5, an acyl group R_9—CO, a group R_9—O—CO, a group R_9—O—CO—$(CH_2)_n$, a carbamoyl group



or a sulphonyl group R_9—SO_2,

R_9 is hydrogen, a C_1–C_6-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl or phenyl-C_1–C_4-alkyl group, each of which is optionally substituted by one or more of the same or different halo, hydroxy or C_1–C_4-alkoxy, or phenyl, optionally substituted by halo, nitro or C_1–C_4-alkyl,

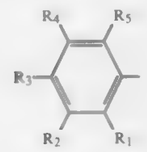
R_{10} and R_{11} are the same or different and are hydrogen, a C_1–C_6-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl group, each of which is optionally substituted by one or more of the same or different halo, hydroxy or C_1–C_4-alkoxy, or

R_{10} and R_{11} together with the adjacent nitrogen form a pyrrolidinyl, piperidino or morpholino ring,

X is oxygen or sulphur, and

n is 0, 1, or 2.

5. 6,7-Dihydro-[1,2,4]triazolo[1,5-a][1,3,5]triazine-2-sulphonamide according to claim 1, in which Ar is a phenyl group of formula



R_1 and R_5 are the same or different and are halogen, methyl, trifluoromethyl, nitro, methoxy or methoxycarbonyl,

R_2, R_3 and R_4 are the same or different and are hydrogen, halogen, trifluoromethyl or a C_1–C_4-alkyl group,

R_6 is hydrogen, a single equivalent of a metal or a C_1–C_4-acyl group, and

R_7 and R_8 are the same or different and are hydrogen, C_1–C_4-acyl, C_1–C_6-alkyl, C_2–C_4-alkenyl or phenyl.

4,859,232

SUBSTITUTED-ARYL CYCLOPROPANECARBONITRILES AND DERIVATIVES THEREOF AS HERBICIDE ANTIDOTES

Rajendra K. Singh, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 5, 1986, Ser. No. 938,497

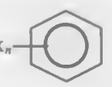
Int. Cl.[4] A01N *37/00*

U.S. Cl. 71—100 31 Claims

1. A method for reducing herbicide injury to a crop plant due to application of a herbicidally-effective amount of a herbicide compound selected from thiocarbamates, triazines and acetamides which method comprises applying to the plant locus a safening-effective amount of at least one antidote compound of the structural formula



wherein A is selected from phenyl, naphthyl, and



wherein each of X_n is independently selected from halo, alkyl, haloalkyl, alkoxy, alkoxycarbonyl, carboxylic acid, nitro, cyano, cyanocycloalkyl, and phenoxy, with "n" being an integer from one through five; wherein R is selected from cyano, carboxylic acid, carboxamide, and N-hydroxycarboximidamide.

4,859,233

2,3,6-TRICHLOROBENZOHYDROXAMIC ACID DERIVATIVES

John W. Williams, Lake Bluff, Ill., assignor to Sandoz Ltd., Basel, Switzerland

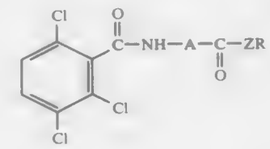
Continuation-in-part of Ser. No. 95,787, Sep. 11, 1987, abandoned, which is a continuation of Ser. No. 907,348, Sep. 12, 1986, abandoned. This application Jan. 25, 1988, Ser. No. 147,409

Claims priority, application European Pat. Off., Jul. 24, 1987, 87810441.4

Int. Cl.[4] A01N *37/44;* C07C *153/11*

U.S. Cl. 71—100 21 Claims

1. A compound of the formula:



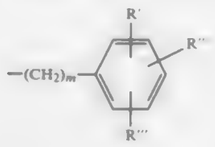
wherein

A is O-alkylene of 1 to 5 carbon atoms, O-alkenylene of 3 to 6 carbon atoms in which the unsaturation is non-adjacent the oxygen atom thereof or NH-alkylene in which the alkylene is of 1 to 5 carbon atoms, the O— and NH— thereof being attached to the NH which is adjacent to A,

Z is oxygen or sulfur,

R is H, C_1–C_{12}alkyl, C_3–C_8alkenyl, C_3–C_8alkynyl, C_2–C_{10}haloalkyl containing 1 to 6 halogens selected from the

group consisting of fluoro, chloro and bromo, C_2–C_{10} alkoxyalkyl, cycloalkyl or cycloalkenyl of 3 to 8 ring carbon atoms optionally mono- or di-substituted by fluoro, chloro, bromo or C_1–C_2alkyl, cycloalkylalkyl or cycloalkenylalkyl of 4 to 10 carbon atoms in which the alkyl portion is of 1 to 3 carbon atoms and the cycloalkyl or cycloalkenyl ring is of 3 to 8 carbon atoms and is optionally mono- or di-ring substituted by fluoro, chloro, bromo or C_1–C_2alkyl or



m is 0 to 3,

R′ and R″ are independently H, C_1–C_4alkoxy, C_1–C_4alkylthio, CF_3, fluoro, chloro, bromo or NO_2,

R is H, C_1–C_3alkyl, fluoro, chloro or bromo, or

two of R′, R″ and R‴ together form C_1–C_2alkylenedioxy with the other being H,

or a salt form thereof.

4,859,234

HERBICIDAL COMPOSITIONS OF ACYLATED 1,3-DICARBONYL HERBICIDES AND PHENOXYALKANOIC ACIDS, SALTS, AMIDES AND ESTERS THEROF AS ANTIDOTES

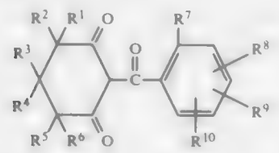
Marcelo K. Alterman, Wilton, Conn., and Luis F. do Amaral, Campinas, Brazil, assignors to ICI Americas Inc., Wilmington, Del.

Filed Sep. 14, 1987, Ser. No. 95,788

Int. Cl.[4] A01N *41/10*

U.S. Cl. 71—103 **6 Claims**

3. The method of reducing injury to sugarcane caused by an acylated 1,3-dicarbonyl containing herbicidal compound having the formula



(II)

in which

R^1, R^2, R^3, R^4, R^5 and R^6 are independently hydrogen or C_1–C_4 alkyl or

R^1 or R^3 is



in which

R_a is C_1–C_4 alkyl; phenyl, optionally substituted by from 2 to 5 methyl groups;

or in which R^1 and R^2, or R^3 and R^4, taken together are C_2–C_5 alkylene (such compounds have a spiro structure);

R^7 is halogen (chlorine, bromine, iodine or fluorine); cyano; C_1–C_4 alkyl; C_1–C_4 haloalkyl; R_kSO_n in which R_k is C_1–C_4 alkyl and n=0, 1 or 2; C_1–C_4 alkoxy; or nitro;

R^8, R^9 and R^{10} independently are hydrogen or substituents including halogen; C_1–C_4 alkyl; C_1–C_4 alkoxy, trifluoromethoxy; cyano; nitro; C_1–C_4 haloalkyl; C_1–C_4 alkylthio; phenoxy; or substituted phenoxy in which the substituent is halogen or halomethyl or both;

$R_bS(O)_n$ in which n is 0, 1 or 2; and R_b is C_1–C_4 alkyl, C_1–C_4 haloalkyl, phenyl or benzyl,



in which R_c is C_1–C_4 alkyl,

$—NR_dR_e$ in which R_d and R_e independently are hydrogen or C_1–C_4 alkyl;

$R_fC(O)—$ in which R_f is hydrogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl or C_1–C_4 alkoxy;

$SO_2NR_gR_h$ in which R_g and R_h independently are hydrogen or C_1–C_4 alkyl; and

which comprises applying to the soil, crop or crop seed as an antidote compound therefor, a nonphytoxic antidotally effective amount of 2,4-dichlorphenoxyacetic acid or salt, amide or ester thereof wherein said phenoxyacetic acid compound is antidotally active with said herbicide and wherein the weight ratio of herbicide to antidote compound is from about 0.1:1 to about 30:1.

4,859,235

FESTICIDAL α-METHYLSULPHONYL-BENZALDOXIMES AND CARBAMATES THEREOF

Christa Fest, Wuppertal; Gerd Hänssler, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

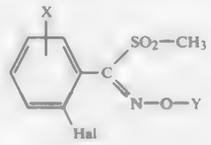
Filed Apr. 8, 1988, Ser. No. 179,094

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1987, 3712632

Int. Cl.[4] A01N *37/52*

U.S. Cl. 71—103 **13 Claims**

1. A compound of the formula



in which

Y represents H or —CO—NH—R,

R represents alkyl having 1 to 6 carbon atoms, halogenoalkyl having 1 to 8 carbon atoms and 1 to 5 halogen atoms, cyanoalkyl having 1 to 6 carbon atoms in the alkyl part, tosyl, benzyl, cycloalkyl having 5 to 7 carbon atoms which is optionally monosubstituted to pentasubstituted by alkyl having 1 to 4 carbon atoms, or phenyl which is optionally monosubstituted to pentasubstituted by alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 4 carbon atoms, halogenoalkyl or halogenoalkoxy in each case having 1 to 4 carbon atoms and 1 to 5 halogen atoms, and halogen, these substituents being identical or different,

Hal represents halogen, and

X represents hydrogen or halogen.

11. A pesticidal composition comprising a pesticidally effective amount of a compound according to claim 1 and a diluent.

4,859,236

PROCESS FOR PRODUCING MOLYBDENUM-RUTHENIUM METAL POWDER

Thomas J. Patrician, Monroeton; Joseph E. Ritsko, Towanda, and Harry D. Martin, III, Troy, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 25, 1988, Ser. No. 185,644

Int. Cl.[4] B22F *9/20*

U.S. Cl. 75—0.5 AB **5 Claims**

1. A process for producing molybdenum-ruthenium metal powder, said process comprising:

(a) forming an ammonium molybdate solution;

(b) heating said ammonium molybdate solution to drive off excess ammonia;

(c) adding ruthenium dioxide to the resulting heated ammonium molybdate solution to form a slurry of said ruthenium dioxide in said heated ammonium molybdate solution;

(d) crystallizing molybdenum trioxide and ruthenium dioxide from said slurry;

(e) heating said oxide mixture at a temperature of from about 300° C. to about 800° C. for a sufficient time in a reducing atmosphere to reduce said molybdenum trioxide and said ruthenium dioxide to molybdenum metal and ruthenium metal respectively and form a uniform mixture of said metals;

(f) heating said mixture of said metals at a temperature of from about 800° C. to about 1200° C. for a sufficient time in a reducing atmosphere to stabilize said mixture at a particle size of −325 mesh; and

(g) cooling said heated metal mixture in a non-reacting atmosphere.

4,859,237

HYDROMETALLURGICAL PROCESS FOR PRODUCING SPHERICAL MARAGING STEEL POWDERS WITH READILY OXIDIZABLE ALLOYING ELEMENTS

Walter A. Johnson, Towanda; Nelson E. Kopatz, Sayre, and Joseph E. Ritsko, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 4, 1988, Ser. No. 140,701

The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.

Int. Cl.[4] B22F *9/24*

U.S. Cl. 75—0.5 AA **15 Claims**

1. A process comprising:

(a) forming an aqueous solution containing the metal values of iron, cobalt, nickel and molybdenum, said metals being present in a predetermined ration to form a maraging steel alloy,

(b) forming from said solution a reducible solid material selected from the group consisting of salts of said metals, oxides of said metals, hydroxides of said metals and mixtures thereof,

(c) heating said solid in a reducing atmosphere at a temperature above the reduction temperature but below the melting point of the metals in the solids thereby reducing said solid material to form metallic powder particles,

(d) entraining at least a portion of said powder particles in a carrier gas,

(e) feeding said entrained particles and said carrier gas into a high temperature zones and maintaining said particles in said zone for a sufficient time to melt at least about 50% by weight of said particles, and to form droplets therefrom, and

(f) cooling said droplets to form essentially spherical shaped alloy particles and

(g) combining said spherical shaped particles with a predetermined amount of at least one readily oxidizable metal selected from the group consisting of aluminium, titanium and vanadium to form a relatively uniform blend of the spherical shaped particles and the readily oxidizable metal, said metals in said blend being a suitable ratio for producing a maraging steel alloy containing a readily oxidizable metal.

4,859,238

SILVER-IRON MATERIAL FOR ELECTRICAL CONTACTS

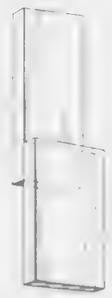
Wolfgang Weise, Frankfurt; Roger Wolmer, Hanau, and Peter Braumann, Alzenau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 201,726

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 3719052

Int. Cl.[4] C22C *29/12*

U.S. Cl. 75—233 **10 Claims**



1. A material suitable for the formation of electrical contacts comprising 3 to 30 weight percent iron, and one or more of the additives manganese, copper, zinc, antimony, bismuth oxide, molybdenum oxide, tungsten oxide, chromium nitride in a total amount of 0.05 to 5 weight percent and the balance being silver.

4,859,239

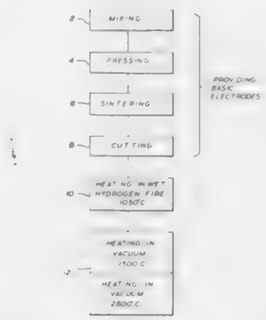
TUNGSTEN ELECTRODE AND METHOD OF PRODUCING SAME

Edmund M. Passmore, Gloucester, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Dec. 20, 1988, Ser. No. 287,183

Int. Cl.[4] C22C *29/12*

U.S. Cl. 75—235 **13 Claims**



1. The method of making a tungsten electrode comprising the steps of:

providing a basic electrode comprising tungsten;

then heating said basic electrode in wet hydrogen at about 1050° C. for about 5 to 10 minutes;

then further heating said basic electrode at about 1500° C. for about three hours in a vacuum; and
then further heating said basic electrode at about 2800° C. for about 5 minutes in a vacuum.

4,859,240
DENTAL AMALGAM ALLOY
Graham J. Parker, Malvern, Australia, assignor to Jeffery James Cheetham, Bayswater, Australia
Division of Ser. No. 626,722, Jul. 2, 1984, Pat. No. 4,686,082. This application Jun. 5, 1987, Ser. No. 58,831
Claims priority, application Australia, Jul. 8, 1983, PG0209; Aug. 1, 1983, PG0594
The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—251 5 Claims

1. A particulate dental amalgam alloy consisting of spherical particles formed of a dental amalgam alloy consisting essentially of, as alloying ingredients substantially uniformly distributed through each particle, from about 40 to 50% by weight silver, from about 20 to 30% by weight tin, from about 15 to 30% by weight copper, from 0 to about 1% by weight zinc and from about 0.03 to 0.5% by weight platinum, said particles having a particle size in the range from 1 to 55 microns with a majority of the particles being less than 35 microns in particle size.

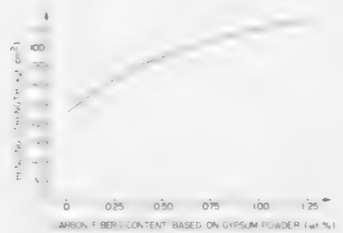
4,859,241
METAL FLAKE AND USE THEREOF
James Grundy, San Diego, Calif., assignor to Johnson Matthey Inc., Valley Forge, Pa.
Filed Apr. 16, 1986, Ser. No. 852,846
Int. Cl.[4] B05B *7/00*
U.S. Cl. 106—1.14 7 Claims

1. Silver flake having an organo-silver surfactant thereon, said surfacxtant being insoluble in 2,2,4-trimethyl-1,3-pentane diol-monoisobutyrate.

4,859,242
WATER SOLUBLE COLORING COMPOSITIONS CONTAINING SPARKLE COMPONENTS
Cleveland L. Hughes, Grand Terrace; Timothy N. Williams, Canoga Park, and Paul M. Mandel, Jr., Orange, all of Calif., assignors to Color Quest Inc., Anaheim, Calif.
Filed Mar. 16, 1987, Ser. No. 26,477
Int. Cl.[4] C09D *11/00*
U.S. Cl. 106—19 3 Claims

1. A water soluble, solid coloring paint having an approximate range of ingredients, by percentage weight, consisting of: Water: 45%–55%; Polymeric thickener selected from the group consisting of polyacrylic acid, silica, nitrile latexes, styrene-butadiene latexes, polyisobutylene, acrylic latexes, rosin gum, food thickeners including flours and starches, and cellulose ethers: 0.05%–0.5%; Water soluble microcrystalline wax: 1%–5%; Glycerin, cetyl alcohol or sorbitol, and mixtures thereof: 1%–10%; An activator to cure the polymeric thickener: 0%–0.5%; Adhesive thickener selected from the class consisting of gum arabic, accacia gum, tragacinth gum and plant mucilages: 8%–25%; Hardener: 0%–0.5%; Colorant: 3%–5%; Sparkle or glitter: 21%–30%; and Preservative: 0%–1%; the mixture being portable at about 90° F.–130° F.

4,859,243
CARBON FIBER-REINFORCING GYPSUM MODELS AND FORMING MOLDS, GYPSUM POWDER MATERIALS FOR MAKING SUCH MODELS AND MOLDS, AND A METHOD FOR PRODUCING THEM
Yoshiaki Hattori, Yokkaichi, and Makoto Ishihara, Ama, all of Japan, assignors to Noritake Co., Ltd., Nagoya, Japan
Continuation-in-part of Ser. No. 808,242, Dec. 12, 1985, abandoned, which is a division of Ser. No. 714,900, Mar. 22, 1985, abandoned, which is a division of Ser. No. 601,851, Apr. 19, 1984, Pat. No. 4,552,329. This application Nov. 12, 1987, Ser. No. 122,483
Claims priority, application Japan, Apr. 19, 1983, 58-68954; Apr. 23, 1983, 58-71963
Int. Cl.[4] C04B *11/00, 24/00*
U.S. Cl. 106—110 2 Claims



1. A carbon fiber containing hemihydrate gypsum $CaSO_4 \cdot \frac{1}{2}H_2O$ powder for a carbon fiber-reinforced gypsum precision model, which powder is produced by (a) cutting carbon fibers having a sizing agent deposited thereon to a length of from 30 to 200 mm, heating them to decompose the sizing agent, separating the resultant fibers into substantially single fibers by stirring said cut fibers with a stirring blade in water to which ultrasonic vibration is applied simultaneously and then drying and dehydrating the single fibers and (b) thereafter mixing and uniformly dispersing the resulting single fibers into hemihydrate gypsum powder in the amount of 0.01 to 2.4 parts by weight of the former to 100 parts by weight of the latter.

4,859,244
PAPER SIZING
Jerome M. Floyd, Mobile, Ala., assignor to International Paper Company, Tuxedo, N.Y.
Filed Jul. 6, 1988, Ser. No. 216,152
Int. Cl.[4] C08L *91/00;* D21D *3/00*
U.S. Cl. 106—243 3 Claims

1. A paper-sizing composition for application to paper to provide to the sized paper an improved resistance to liquid penetration and an improved resistance to leakage when the sized paper is subjected to vibratory abuse, the composition comprising a mixtue of a paper-sizing fatty acid anhydride and a paper-sizing alkyl ketene dimer, the weight ratio of the fatty acid anhydride to the alkyl ketene dimer being greater than about 1.5 to 1.0 and not exceeding 4.0 to 1.0.

4,859,245
VISCOSIFIERS FOR ASPHALT EMULSIONS
Peter Schilling, and Hans G. Schreuders, both of Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 891,593, Aug. 1, 1986, abandoned. This application Feb. 8, 1988, Ser. No. 153,220
Int. Cl.[4] C08L *95/00*
U.S. Cl. 106—277 16 Claims

1. In a process for preparing a bituminous emulsion of a predetermined viscosity based on a specified bitumen content comprising bitumen and emulsifier in water, the improvement of producing an emulsion of reduced bitumen content characterized by a viscosity equivalent to or higher than the predetermined viscosity by adding to the bitumen material prior to emulsification with an anionic or a cationic emulsifier from 0.5 to 10% of a water-insoluble viscosifier comprising the reaction product of a first reactant selected from the group consisting of tall oil fatty acids, rosin, tall oil pitch, petroleum derived acids or esters, vegetable oils, animal oils, tallow fatty acids, and a distillation residue which contains carboxylic acid groups and a second reactant selected from the group consisting of ammonia, amine, polyalkylene amine, alkanolamine, and trialkanolamine in a ratio of from 5:1 to 10:1, respectively, and at a temperature of from 180° to 250° C.

4,859,246
USE OF HIGH MOLECULAR WEIGHT SULFONATE AS AUXILIARY DISPERSANTS FOR STRUCTURED KAOLINS
Paul Sennett, Colonia, N.J., assignor to Engelhard Corporation, Menlo Park, N.J.
Continuation of Ser. No. 40,918, Apr. 21, 1987, abandoned. This application Sep. 12, 1988, Ser. No. 244,535
The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.
Int. Cl.[4] C08J *7/12;* C09C *3/06;* C09J *3/06;* C04B *33/04*
U.S. Cl. 106—487 10 Claims

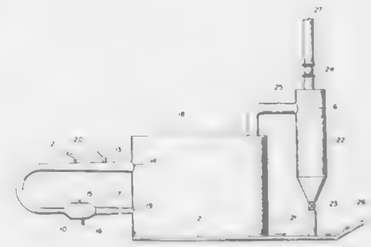
1. A heat stabilized fluid aqueous slurry comprising chemically bulked hydrous kaolin clay pigment particles obtained by adding a cationic organic polymeric material to hydrous kaolin clay in the presence of water to flocculate said clay and a dispersant effective amount of a combination of dispersants consisting essentially of a polyacrylate salt and a water soluble anionic sulfonate, said slurry having greater heat stability than it would have using said polyacrylate salt as the sole dispersant.

4,859,247
LOW VISCOSITY, HIGHLY CONCENTRATED PIGMENT DISPERSIONS AND METHOD OF MAKING SAME
Thomas E. Foye, and Joseph P. Baillargeon, both of Holland, Mich., assignors to BASF Corporation, Parsippany, N.J.
Filed Nov. 2, 1987, Ser. No. 115,963
Int. Cl.[4] C08J *3/02*
U.S. Cl. 106—505 20 Claims

1. An oil-based pigment dispersion comprising:
(a) at least 20 percent pigment by weight of dispersion; and
(b) at least 35 percent carrier by weight of dispersion, wherein the carrier is a hydrophobic organic vehicle; and
(c) at least 1.0 percent oil-soluble additive by weight of pigment, wherein the oil-soluble additive is a reaction product of an oil-soluble, long chain aliphatic amine having a molecular weight between 80 and 340 and a polybasic organic acid having a molecular weight between 50 and 250.

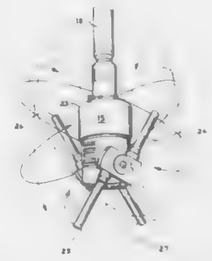
4,859,248
PULSE COMBUSTION PROCESS FOR THE PREPARATION OF PREGELATINIZED STARCHES
Martin D. Thaler, and Roger W. Rubens, both of Somerville, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.
Division of Ser. No. 753,516, Jul. 10, 1985, Pat. No. 4,667,654. This application May 1, 1987, Ser. No. 44,686
Int. Cl.[4] C08B *30/12, 30/14, 31/00*
U.S. Cl. 127—32 7 Claims

1. A pregelatinized substantially granular waxy maize starch powder prepared by the steps of:
(a) preparing a moist starch cake comprising about 60–70% by weight of a granular unmodified or modified waxy maize starch and water;
(b) feeding the starch cake into an exhaust pipe containing a hot exhaust gas stream from a sonic pulse jet combustion engine to atomize the starch cake;
(c) maintaining the resulting mixture of atomized starch, water, and hot gas in the exhaust pipe for a time sufficient to pregelatinize and substantially dry the atomized starch; and



(d) recovering the pregelatinized starch powder by exhausting the mixture containing the atomized, pregelatinized and substantially dry starch powder into a collection chamber supplied with a flow of air.

4,859,249
PROCESS FOR CLEANING ENCLOSED VESSELS
Jose E. Valentini, Hendersonville, N.C., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.
Filed Mar. 14, 1988, Ser. No. 167,867
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—22.18 14 Claims



1. A cleaning process for removing material coated on the inner surfaces of an enclosed vessel comprising
A. forming a substantially continuous high pressure stream of cleaning liquid,
B. supplying said stream of cleaning liquid at a pressure in the range of 4000 to 8000 psi to a nozzle head which continuously rotates and is positioned at at least one fixed point in the vessel, the nozzle head, which continuously rotates, comprising a nozzle head housing having rotatably attached thereto two sets of diametrically opposed nozzles,
C. dividing the high pressure stream inside said nozzle head into at least two opposed paths, and
D. directing the cleaning liquid emitting from the two sets of continuously rotating diametrically opposed nozzles onto said surfaces in a 360° solid angle using the fixed point as the vertex of the solid angle.

4,859,250

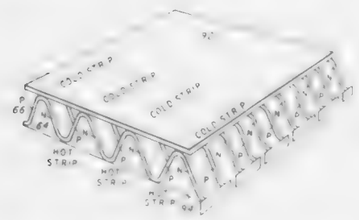
THERMOELECTRIC PILLOW AND BLANKET

Richard J. Buist, 1802 Clover Trail, Richardson, Tex. 75081

Continuation of Ser. No. 784,189, Oct. 4, 1985, abandoned. This application Aug. 31, 1987, Ser. No. 91,323

Int. Cl.[4] H01L *35/28;* **A47C** *21/04;* **H05B** *1/00;* **F25B** *21/02*

U.S. Cl. 136—225 **2 Claims**



1. A thermoelectric device pillow comprising:

(a) a substrate of corrugated material;

(b) a plurality of n-type and p-type conductivity material elements formed in alternative columns beginning with a column of either n-type or p-type conductivity material elements and ending with a column of elements of opposite conductivity to that of the beginning column of elements and serially connected together to form p-n junctions, said columns being formed on opposing loops of the corrugated substrate;

(c) conductive leads connected to the beginning column of elements and to the ending column of elements for connecting a dc source of power thereto for producing selectively opposing hot and cold sides of the corrugated substrate; and

(d) a bag of thermal conductive material enclosing the corrugated substrate assembly for providing a pillow having a hot side and a cold side.

4,859,251

FURNACE FOR FORMATION OF BLACK OXIDE FILM ON THE SURFACE OF THIN METAL SHEET AND METHOD FOR FORMATION OF BLACK OXIDE FILM ON THE SURFACE OF SHADOW MASK MATERIAL BY USE OF SAID FURNACE

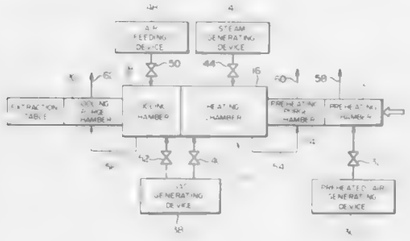
Toshitomo Hayami, Himeji; Humio Shibata, Hyogo; Katsumi Iguchi, Ttsuno; Hisao Inoue, Nagoya; Takashi Ono, Okazaki, and Takashi Ishimoto, Aichi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 4, 1988, Ser. No. 164,484

Claims priority, application Japan, Mar. 7, 1987, 62-52359

Int. Cl.[4] C23C *8/18*

U.S. Cl. 148—286 **3 Claims**



1. A method for the formation of a black oxide film on the surface of a shadow mask material formed mainly of iron and nickel by the use of a furnace for the formation of a black oxide film on the surface of a thin metal sheet, comprising:

a heating step for heating said shadow mask material in the atmosphere of a mixed gas at a temperature in the range of 550° to 650° C., the gas containing carbon monoxide, carbon dioxide, steam, and substantially no oxygen, wherein the volumetric composition of the gas is such that the content of a carbon dioxide is in the range of 5 to 20 and the content of steam is in the range of 30 to 50, where the content of carbon monoxide is taken as 1; and

a cooling step for causing said shadow mask material heated in said heating step to be cooled in the atmosphere of a mixed gas at a temperature in the range of 200° to 300° C., the gas containing carbon monoxide, carbon dioxide, oxygen, and substantially no steam, wherein the volumetric composition of the gas is such that the content of a carbon dioxide is in the range of 5 to 10, where the content of carbon monoxide is taken as 1.

4,859,252

HIGH DAMPING CAPACITY ALLOY AND A PROCESS FOR PRODUCING THE SAME

Hakaru Masumoto; Showhachi Sawaya, and Masakatsu Hinai, all of Sendai, Japan, assignors to The Foundation: The Research Institute of Electric and Magnetic Alloys, Tokyo, Japan

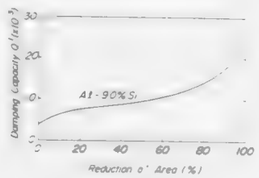
Continuation of Ser. No. 551,902, Nov. 15, 1983, Pat. No. 4,684,414, which is a continuation of Ser. No. 286,624, Jul. 24, 1981, abandoned, which is a continuation-in-part of Ser. No. 180,563, Aug. 25, 1980, abandoned. This application Mar. 25, 1987, Ser. No. 9,149

Claims priority, application Japan, Sep. 5, 1979, 54-112762

The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.

Int. Cl.[4] C22F *1/04*

U.S. Cl. 148—11.5 R **10 Claims**



2. A process for producing a damping alloy having a high damping alloy capacity, comprising:

heating an alloy consisting of 1–20% by weight of silicon, 0.1–15% by weight of iron, 0.1–50% by weight in total of at least one subingredient selected from the group consisting of less than 50% by weight of lead and antimony, less than 40% by weight of germanium and cerium, less than 20% by weight of nickel, less than 15% by weight of cobalt, niobium and zirconium, less than 10% by weight of calcium and less than 3% by weight of boron, and the remainder of aluminum, at a temperature higher than 250° C. and lower than its melting point for 5 minutes to 500 hours to achieve homogeneity of said alloy;

cooling at a cooling rate of less than 200° C./sec and more than 1° C./sec to maintain said homogeneity; and

subjecting to a cold working with a reduction of area of at least 20%, whereby said damping capacity is made not less than 6×10^{-3}.

4,859,253

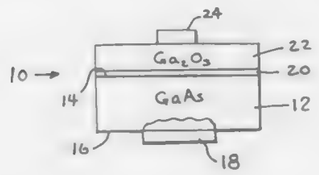
METHOD FOR PASSIVATING A COMPOUND SEMICONDUCTOR SURFACE AND DEVICE HAVING IMPROVED SEMICONDUCTOR-INSULATOR INTERFACE

Douglas A. Buchanan, Peekskill; Alessandro C. Callegari, Yorktown Heights, both of N.Y.; Peter D. Hoh, Wädenswil, Switzerland, and Dianne L. Lacey, Mahopac, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 20, 1988, Ser. No. 221,686

Int. Cl.[4] H01L *21/00, 21/02, 21/306, 29/56*

U.S. Cl. 148—33.3 **34 Claims**



1. A method for passivating the surface of a compound semiconductor comprising the step of:

forming an anionic nitride layer free of a detectable amount of a cationic nitride on the surface of a compound semiconductor substrate.

4,859,254

PERMANENT MAGNET

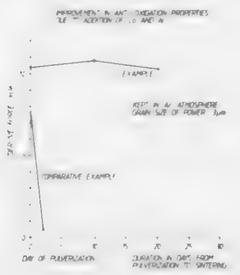
Tetsuhiko Mizoguchi; Isao Sakai, both of Yokohama; Hiromi Niu, Tokyo, and Koichiro Inomata, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 10, 1986, Ser. No. 905,397

Claims priority, application Japan, Sep. 10, 1985, 60-198530; Oct. 25, 1985, 60-237494; Mar. 7, 1986, 61-48657

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—302 **15 Claims**



1. A permanent magnet formed of a sintered alloy body comprising 9 to 23% by weight of cobalt, 0.1 to 1.25% by weight of boron, 0.1 to 5% by weight of aluminium, 10 to 40% by weight of material consisting of at least one element from the group consisting of rare earth elements and yttrium and the balance substantially of iron, wherein said sintered body is formed principally of a ferromagnetic Fe-rich phase of a tetragonal system and includes 2 to to 10% by volume of a nonmagnetic Laves phase.

4,859,255

PERMANENT MAGNETS

Setsuo Fujimura, Kyoto; Masato Sagawa, Nagaokakyo; Yutaka Matsuura, Ibaraki; Hitoshi Yamamoto, and Norio Togawa, both of Osaka, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Continuation of Ser. No. 532,472, Sep. 15, 1983, abandoned. This application Feb. 29, 1988, Ser. No. 165,371

Claims priority, application Japan, Aug. 4, 1983, 58-141850

The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—302 **28 Claims**



1. A magnetically anisotropic sintered permeanent magnet of the (Fe,Co)BR system in which R represents the sum of R_1 and R_2 wherein:

R_1 is at least one rare earth element selected from the group consisting of Dy, Tb, Gd and Ho, and

at least 80 at % of R_2 consists of Nd and/or Pr, the balance being at least one other element selected from the group consisting of La, Ce and Y,

said system consisting essentially of, by atomic percent, 0.2 to 5% of R_1, 12.5 to 20% of R, 5 to 11% of B, and at least 69% Fe in which Co is substituted for Fe in an amount greater than zero and not exceeding 25% of the system; and

said magnet having a tetragonal (Fe, Co)-B-R crystal structure phase of at least 50 vol % of the entire magnet, having a higher Curie temperture than a corresponding Fe-B-R base composition containing no Co, and having a maximum energy product of at least 25 MGOe and an intrinsic coercive force of at least 12 kOe.

4,859,256

HIGH PERMEABILITY AMORPHOUS MAGNETIC MATERIAL

Takao Sawa, Yokohama; Susumu Hashimoto, Oota, and Koichiro Inomata, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 30, 1987, Ser. No. 9,373

Claims priority, application Japan, Feb. 24, 1986, 61-37374; Sep. 17, 1986, 61-217110

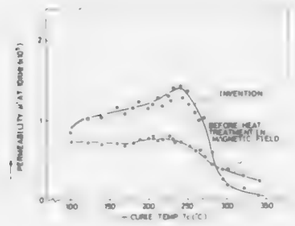
Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—304 **7 Claims**

1. A heat treated, high permeability magnetic material in the form of a ribbon having a thickness of 5 to 25 μm consisting essentially of a Co-based amorphous alloy with a Curie temperature Tc of 120° C.≦Tc≦270° C., wherein said material has been heat treated to increase the permeability of said material by heating at a temperature below the Curie temperature and within a magnetic field applied transverse to the axis of said ribbon, and wherein said Co-based amorphous alloy is expressed as

$(Co_{1-a}Fe_a)_{100-x-y}(Si_{1-y}B_y)_z$

$0.02 \leqq a \leqq 0.08$



$0.3 \leqq y \leqq 0.5$

$25 \leqq z \leqq 32$

where a, y and z are constants expressed by atomic ratio.

4,859,257

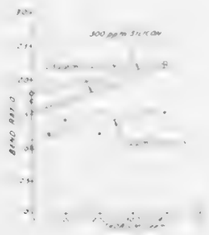
FINE GRAINED EMBRITTLEMENT RESISTANT TANTALUM WIRE

Victor T. Bates, Kenosha, Wis., and Charles Pokross, Gurnee, Ill., assignors to Fansteel Inc., North Chicago, Ill.

Continuation of Ser. No. 823,781, Jan. 29, 1986, abandoned. This application Oct. 4, 1988, Ser. No. 253,898

Int. Cl.[4] C22C *27/00*

U.S. Cl. 148—422 **18 Claims**



1. In a wrought tantalum-based product, the improvement which comprises inclusion of about 10 to about 1000 ppm silicon in combination with about 10 to about 1000 ppm total of one or more metals in oxide form having high free energies of formation as compared with tantalum and which possess an oxide melting temperature in excess of 2400° C.

4,859,258

METHOD OF MANUFACTURING A FLEXIBLE ELECTRIC CABLE INCLUDING A CONDUCTOR COMPRISING A PLURALITY OF FINE STRANDS OF ALUMINUM OR ALUMINUM ALLOY

Michel Maréchal, Combs La Ville; Alain Rageot, Draveil, and Michel Basly, Juvisy sur Orge, all of France, assignors to Societe Anonyme dite: Filotex, Draveil, France

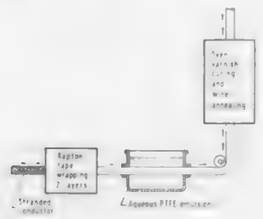
Filed Apr. 4, 1988, Ser. No. 177,264

Claims priority, application France, Apr. 3, 1987, 87 04691

Int. Cl.[4] H01B *13/06*

U.S. Cl. 156—51 **5 Claims**

1. A method of manufacturing a flexible electric cable comprising fine metal strands at least partially of aluminum having a diameter of less than 0.5 mm and being in the form of one of a polymer coated stranded conductor and a wrapped or braided electric screen of said fine metal strands surrounding an insulated conductor, surrounding said strands by at least one insulating layer of polymer material, and wherein the stranding to form the conductor or wrapping or braiding strands to surround said insulated conductor(s) to form the electric screen, is with fine strands which are at the most only partially annealed and, wherein after stranding together the fine metal



strands and applying insulation, the insulated conductor or the insulated electric screen is coated with a layer of varnish based on a polymer material, and the varnish coated insulated conductor or insulated electric screen is heat treated for simultaneously curing the varnish and annealing the fine metal strands.

4,859,259

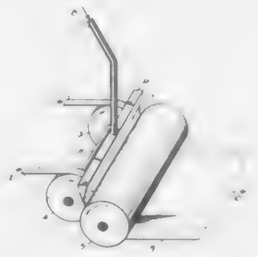
PROCESS AND APPARATUS FOR RECLOSABLE CONTAINER STOCK

Gerald H. Scheibner, Downers Grove, Ill., assignor to First Brands Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 361,191, Mar. 24, 1982, abandoned. This application Sep. 23, 1983, Ser. No. 535,350

Int. Cl.[4] B29C *47/92*

U.S. Cl. 156—66 **29 Claims**



1. An apparatus for producing plastic film with occludable closure strip portions fused thereto wherein said closure strip portions have profile portions and flange portions, said apparatus comprising feeding means for supplying said closure strip portions; a rotatable, circumferentially grooved lay-on roll adapted to receive the profile portions of said closure strip portions wherein said lay-on roll has circumferential grooves positioned near the opposite ends of said roll and a recessed area between said grooves; a rotatable casting cylinder positioned opposite said lay-on roll wherein the axis of said casting cylinder is parallel to the axis of said lay-on roll; means for advancing said closure strip portions to said lay-on roll; means to control the tension on said closure strip portions as said closure strip portions are fed to said lay-on roll from said feeding means; extruding means for casting a molten plastic film onto said casting cylinder so that said plastic film becomes fused to said flange portions of said closure strip portions; means adapted to control the lamination pressure exerted by said lay-on roll on said casting cylinder when said closure strip

portions are fused to said plastic film; and cooling means for the laminated composite of said plastic film and closure strip portions.

24. A method for producing plastic film fused to occludable closure strip portions having profile portions and flange portions, said method comprising the steps of advancing said closure strip portions to a rotatable, circumferentially grooved lay-on roll so the unoccluded profile portions of said closure strip portions extend into the grooves of said lay-on roll, said lay-on roll having a recessed area between said grooves, controlling the tension on said closure strip portions as said closure strip portions are fed to said lay-on roll, extruding a molten plastic film onto a rotatable casting cylinder positioned opposite said lay-on roll so that said plastic film fuses to said flange portions of said closure strip portions, controlling the lamination pressure exerted by said lay-on roll on said casting cylinder when said closure strip portions are being fused to said plastic film, and thereafter cooling the laminated composite of said plastic film and closure strip portions.

4,859,260

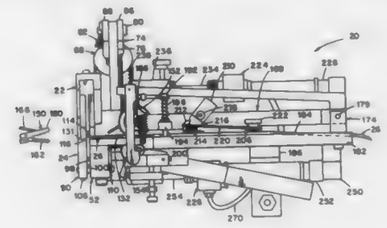
APPARATUS AND METHOD FOR CUTTING AND SEALING BELT LOOP ENDS AND BELT LOOP CONSTRUCTION

William A. Tice, Knoxville, Tenn., assignor to Tice Engineering & Sales Inc., Knoxville, Tenn.

Filed Nov. 10, 1967, Ser. No. 119,646

Int. Cl.[4] B32B *31/18, 31/20*

U.S. Cl. 156—88 **27 Claims**



1. An apparatus for producing individual belt loops from a ribbon of belt loop material having sealing material incorporated in the ribbon, comprising:

means for gripping a leading end of the ribbon of belt loop material and pulling the material in a longitudinal direction through a cutting space of a work station so that a predetermined length of the material corresponding to the desired cut length of the individual belt loops extends between the gripped, leading end of the ribbon, and the cutting space;

means located at the work station for cutting through the ribbon across its width in said cutting space to produce a belt loop of the predetermined cut length and to thereby define opposed cut ends comprising a trailing end of the belt loop and a new leading end of the ribbon of belt loop material; and

means for sealing the ribbon only in a predetermined region adjacent to the opposed cut ends.

4,859,261

METHOD OF MAKING MULTI-FOCUS OPHTHALMIC LENS

Ronald S. Ace, 6150 Springhill Ter., Greenbelt, Md. 20770

Filed May 11, 1988, Ser. No. 192,660

Int. Cl.[4] B32B *17/00*

U.S. Cl. 156—102 **18 Claims**

1. A method of producing a multifocal lens assembly having a near vision minor lens element secured to the surface of a major lens element, comprising

providing a major lens element having a front surface and an ocular surface, at least one of said surfaces being finished;

providing a set of completely finished minor lens elements, each minor lens in said set having a different one of a plurality of preselected add powers, each of said minor lens elements having first and second continuously curved surfaces, the relative curvatures of said first and second surfaces establishing a fixed power for that lens element, said lens element being optically clear, elastic, and highly flexible to permit mechanical deformation of said lens element without affecting the power thereof, said minor lens being sufficiently flexible to provide one surface there of with a minor lens base curve matched to the curvature of the finished surface of a major lens element substan-



tially without loss of the selected add power for the major lens element;

selecting one of said completely finished minor lens elements from said set in accordance with the add power required for said major lens element;

positioning said selected minor lens element with its said one surface adjacent a selected portion of a finished surface of said major lens element;

deforming said one completely finished minor lens element, while retaining its add power, to cause said one surface of said minor lens element to flex sufficiently to conform to the shape of the adjacent finished surface of the major lens; and

adhesively securing the deformed minor lens to the finished surface of the major lens thereby producing a finished multifocal lens assembly.

4,859,262

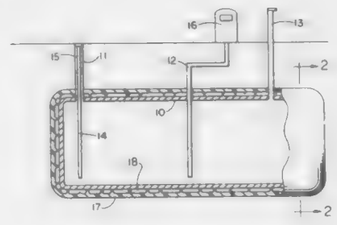
METHOD OF MAKING STORAGE TANKS WITH SECONDARY CONTAINMENT

Bruce R. Sharp, 4090 Rose Hill, Cincinnati, Ohio 45229

Continuation-in-part of Ser. No. 853,974, Apr. 21, 1986, which is a continuation-in-part of Ser. No. 824,680, Jan. 31, 1986, Pat. No. 4,653,312, which is a continuation-in-part of Ser. No. 745,540, Jun. 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 740,869, Jun. 3, 1985, Pat. No. 4,607,522, which is a continuation-in-part of Ser. No. 544,013, Oct. 21, 1983, Pat. No. 4,523,454, which is a continuation-in-part of Ser. No. 544,012, Oct. 21, 1983, abandoned. This application Mar. 7, 1988, Ser. No. 165,027

Int. Cl.[4] B32B *31/26;* G01M *3/32*

U.S. Cl. 156—155 **12 Claims**



1. A method of forming a storage tank system having sec-

ondary containment capability and sufficient integral structural strength to withstand external load forces, comprising the steps of:

(a) applying a layer of wax over a rigid inner storage tank in a manner such that the outside surface of the wax has an uneven surface with a random set of surface ridges;

(b) applying a fibrous reinforcing material and a resinous material onto said wax-covered rigid storage tank, so that when cured a jacket is formed which is capable of containing any leaked liquid from the inner tank, said jacket having an irregular underside with force transfer supports resulting from the resinous material occupying areas between the surface ridges;

(c) heating the jacketed rigid storage tank of step (b) to melt the wax; and

(d) removing a substantial amount of the wax thereby creating a continuous closed space between the rigid storage tank and the formed jacket, wherein the force transfer supports cause the jacket to contact the rigid storage tank in a random pattern such that external forces applied to the jacket are transferred through the supports to the rigid storage tank while maintaining the continuous closed space for detection of leakage through the storage tank or jacket.

4,859,263

PROCESS FOR THE MANUFACTURE OF PRINTED CIRCUITS

Heinz-Jürgen Dziuba, Leverkusen; Hans-Leo Weber, Rommerskirchen; Dieter Freitag, Krefeld, and Werner Waldenrath, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft AG, Fed. Rep. of Germany

Filed Mar. 17, 1988, Ser. No. 169,830

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711403

Int. Cl.[4] B32B *31/26*

U.S. Cl. 156—233 **11 Claims**



1. A method of manufacturing printed electrical circuits which comprise a substrate and copper foil applied thereto by hot embossing in a predetermined circuit pattern, said method comprising

(a) providing a laminate which comprises the sequence of a printed circuit substrate, a heat activatable adhesive layer, a copper foil and a carrier film which is electrically conductive,

(b) passing an electrical current between two electrodes and through the carrier film wherein one electrode has sufficiently large film contact area whereby substantially no resistance heating results from the current density and the other electrode serves as an embossing tool and is of no sufficiently small film contact area whereby sufficient resistance heating results from the current density to activate the adhesive layer to bond the copper foil to the substrate in the pattern of said other electrode, and

(c) removing from the laminate the carrier film and such copper foil overlying areas where the adhesive was not heat activated, thereby leaving a copper foil pattern bonded to the substrate.

4,859,264

METHOD AND INSTALLATION FOR PRODUCING HOSE FOR DRIP IRRIGATION

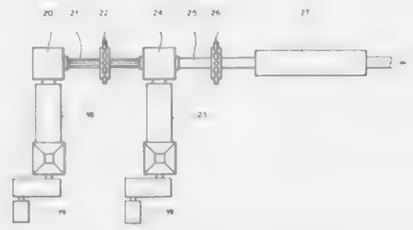
Bruno Buluschek, Echandens, Switzerland, assignor to Maillefer SA, Ecublens, Switzerland

Division of Ser. No. 35,359, Apr. 7, 1987, Pat. No. 4,756,339. This application Apr. 22, 1988, Ser. No. 185,162

Claims priority, application Switzerland, Apr. 11, 1986, 1454/86

Int. Cl.[4] B29C *47/06;* **B32B** *31/18*

U.S. Cl. 156—244.13 **3 Claims**



1. An installation for producing a drip irrigation hose, comprising:

a first extruder provided with a first extrusion head for extruding a first tube, said first tube being extruded with an outer configuration comprising longitudinal ribs and grooves distributed alternately around its periphery,

a second extruder provided with a second extrusion head for extruding a second tube around the first tube, an inner wall of said second tube contacting said ribs of the first tube to define secondary ducts between the first and second tubes,

means for guiding the first tube toward said second extrusion head,

means disposed between said first and second extrusion heads for perforating the first tube, and

means disposed downstream from said second extrusion head for perforating the second tube.

4,859,265

PROCESS FOR MANUFACTURING OF HEAT EXCHANGERS FROM POLYMERS

Jerry P. Shuster, Oakville, and Anthony Cesaroni, Agincourt, both of Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Filed Apr. 6, 1988, Ser. No. 178,386

Claims priority, application United Kingdom, Apr. 8, 1987, 8708387; Apr. 8, 1987, 8708388

Int. Cl.[4] B32B *31/12*

U.S. Cl. 156—292 **4 Claims**



1. A process for the manufacture of a heat exchanger from a thermoplastic polymer, said thermoplastic polymer being a polyamide, said heat exchanger comprising a first panel and a second panel, each of said panels having a thickness in the range of 0.12 to 0.7 mm, being generally planar and formed from said polymer, said panels being bonded together to define a labyrinth of fluid-flow passages extending between inlet and outlet header means, said labyrinth occupying a substantial proportion of the area of the panels,

said process comprising the steps of:

(a) coating the first panel with a first coating composition, said first coating composition comprising polyvinyl alcohol, in a pattern corresponding to the fluid passages of the labyrinth;

(b) coating the second panel with a second coating composition in at least those areas corresponding to the areas of the first and second panel that will be bonded together;

(c) contacting said first and second panels and applying heat and pressure thereto to effect bonding between said panels; and

(d) expanding the fluid passages to facilitate the flow of liquid therethrough;

(e) said second coating composition being such that the composition adheres to the polymer of the first panel but not to the first coating composition under the influence of the heat and pressure applied in step (c).

4,859,266

METHOD AND APPARATUS FOR ELECTROSTATIC POWDER SEWING OF FABRICS

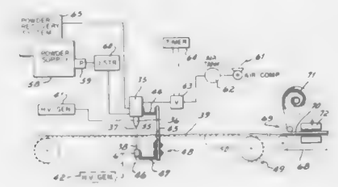
Toshiro Akasaki, Tokyo; Masafumi Matsunaga, Yokohama; Takashi Watanabe, Omiya, and Hironari Matsushima, Tokyo, all of Japan, assignors to Nordson Corporation, Westlake, Ohio

Continuation-in-part of Ser. No. 10,905, Feb. 4, 1987, abandoned. This application Aug. 4, 1988, Ser. No. 228,606

Claims priority, application Japan, Feb. 10, 1986, 61-028463

Int. Cl.[4] B32B *31/12;* **B05B** *5/02*

U.S. Cl. 156—273.1 **12 Claims**



10. A method of powder sewing one ply of electrically non-conductive fabric material to a second ply of flexible substrate, which method comprises

spraying powder from a powder spray gun located on one side of said fabric material as said material is moved past said spray gun,

applying an electrostatic charge of one polarity to said powder before it contacts said material,

locating a pin electrode of opposite polarity on the opposite side of said material from said one side whereby said powder is applied to said one side of said material in a long, narrow, well-defined band of no more than three millimeters in width,

positioning said second ply of substrate over said one side of said fabric and over said band of powder applied thereto, and

activating said band of powder so as to render said powder tacky so as to secure said plies together.

4,859,267

METHOD FOR CONSOLIDATING COMPOSITE MATERIALS

Frederick L. Knoll, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 813,645, Dec. 26, 1985, Pat. No. 4,715,923. This application Sep. 28, 1987, Ser. No. 101,851

Int. Cl.[4] B32B *31/20*

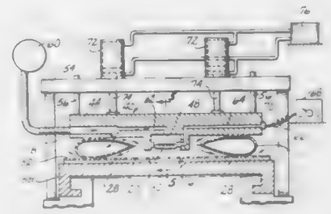
U.S. Cl. 156—273.7 **18 Claims**

1. A method for consolidating composite materials with a fluid bearing, said fluid bearing having an inflatable cushion that surrounds a cavity, said cavity cooperating with an opposing surface to form a pressurizeable plenum chamber when said inflatable cushion is inflated, said method comprising the steps of:

stacking at least two plies of composite material on a work surface;

inflating said fluid bearing and positioning said fluid bearing in opposed relation to said work surface to form said pressurizeable plenum chamber;

pressurizing said plenum chamber with fluid;



applying a load to said fluid bearing to develop a pressure in said plenum chamber; and

positioning said fluid bearing so that said inflatable cushion is spaced from said plies and so that said plenum chamber is in superposed relation to said plies and said work surface to apply the pressure in said plenum chamber to said plies without physical contact between said inflatable cushion and said plies.

4,859,268

METHOD OF USING ELECTRICALLY CONDUCTIVE COMPOSITION

Charles A. Joseph, Candor, and James R. Petrozello, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 832,195, Feb. 24, 1986, Pat. No. 4,780,371. This application May 27, 1988, Ser. No. 199,875

Int. Cl.[4] B32B *31/28*

U.S. Cl. 156—275.5 **13 Claims**

1. A method of bonding a semiconductor to a substrate which comprises:

(A) applying to at least one of said semiconductor and said substrate a composition containing:

(1) about 15% to 65% by weight of a photosensitive epoxy polymer component;

(2) about 1% to about 15% by weight of a plasticizer reactive with said epoxy polymer component; and

(3) about 25 to about 80% by weight of electrically conductive particles having electrically conductive outer surfaces selected from the group of platinum, palladium, gold or mixtures thereof, and being spherical in shape;

wherein the above amounts of (1), (2) and (3) are based upon the total weight of (1), (2) and (3) and wherein said composition provides electrical conductivity between said semiconductor and said substrate; exposing said composition to ultraviolet light bringing together said substrate and said conductor with the said composition interposed between said semiconductor and said substrate; and permitting said composition to harden to thereby form said bonding.

4,859,269

CHIP MOUNTING APPARATUS

Masanori Nishiguchi, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 29, 1988, Ser. No. 237,755

Claims priority, application Japan, Aug. 31, 1987, 62-217522

Int. Cl.[4] B32B *31/18*

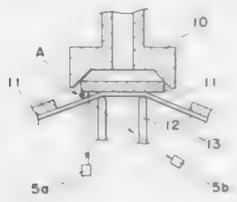
U.S. Cl. 156—361 **3 Claims**

1. A chip mounting apparatus for mounting a plurality of

chips bonded on an adhesive expand tape one by one, which comprises:

a vacuum pickup member movable in any desired direction for picking up each chip by drawing the vacuum therethrough;

a plurality of push members movable up and down for pushing up said chip from a lower surface of said tape towards said vacuum pickup member, said push members located below said vacuum pickup member when said chip is picked up by said vacuum pickup member;



a tape driving means for drawing said tape downwards from a peripheral portion of said chip; and

a separation detecting means for detecting whether or not said tape has been separated at least from the peripheral portion of said chip in a state in which said chip is being pushed upwards by said push members;

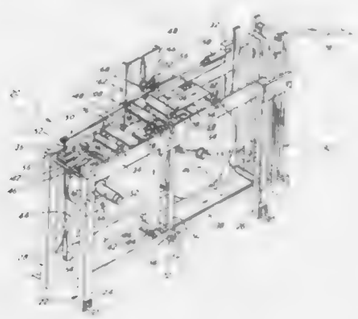
whereby said push members are so controlled as to move downwards by virtue of a signal outputted from said separation detecting means.

4,859,270

IN-REGISTER WEB SPLICER

John R. Martin, Rockford, and Donald E. Carlson, Cherry Valley, both of Ill., assignors to Martin Automatic, Inc., Rockford, Ill.

Filed Sep. 11, 1987, Ser. No. 95,554
Int. Cl.[4] B65H *19/18*
U.S. Cl. 156—361 9 Claims



1. An improved in-register web splicer adapted for forming a splice to join together: (a) a web from an expiring roll of material that has spaced, regularly repeating patterns, including a register mark, thereon and that is being run downstream from the expiring roll along a predetermined path of travel having a first section and then proceeding to a running web storage means and next to a web utilization apparatus; and (b) a web from a new roll of material that has a leading end portion and that has the identical spaced, regularly repeating patterns thereon, whereby the patterns on the joined new and expiring webs will be in-register, the improved web splicer comprising:

(1) means for mounting the expiring roll so that the expiring web may be run under tension and at a relatively high speed along the path of travel, with the expiring web passing about a first idler roll that is disposed adjacent to the path of travel of the expiring web and between the expiring roll and the first section of the path of travel;

(2) means for mounting the new roll so that the new web may be led to and into the first section of the path of travel in preparation for a splice and so that the new web, when joined with the expiring web, may then be run under tension and at the relatively high speed along the remainder of the path of travel, with the new web passing about a second idler roll that is disposed adjacent to the path of travel of the new web and between the new roll and the first section of the path of travel;

(3) means for preparing the leading end of the new web for a splice along the first section of the path of travel including holding a pattern on the leading end portion of the new web adjacent to a first pre-selected point so that a pattern on the leading end portion of the new web is aligned with the first preselected point;

(4) means for braking the expiring web during a splice so that a portion of the expiring web in the first section of the path of travel momentarily stops running, the braking means including: (a) first and second braking rolls that are disposed adjacent to and associated with the first and second idler rolls, respectively, and that are each selectively movable between a braking position and a non-braking position with respect to their associated idler roll, with each of the first and second braking rolls being in contact with the web as the web passes about their associated idler rolls, respectively, when the first and second braking rolls are in their braking positions, and with the rotational axis of each of the first and second braking rolls being substantially parallel with the rotational axis of its associated idler roll; (b) a movable elongated bar that is disposed adjacent to the first and second braking rolls and that is selectively movable between a first position wherein a side of the elongated bar may be selectively moved into contact with the first braking roll when the first braking roll is in its braking position and a second position wherein a side of the elongated bar may be selectively moved into contact with the second braking roll when the second braking roll is in its braking position; (c) means for moving a side of the elongated bar into contact with one of the first and second braking rolls such that when the elongated bar is moved into contact with a braking roll, that braking roll then clamps the web running between that braking roll and its associated idler roll so as to stop the running of the web; and (d) means for holding the side of the elongated bar in contact with one of the first and second braking rolls;

(5) means for sensing the passage of a pattern on the expiring web during a splice, with the sensing means being positioned at a second pre-selected point downstream from the first pre-selected point and adjacent to the path of travel;

(6) means for relatively slowly moving the stopped portion of the expiring web along the first section of the path of travel and past the sensing means upon the substantial stopping of the portion of the expiring web during a splice, with the web-moving means including means for slowly moving the elongated bar in a direction substantially parallel to its side, when the elongated bar is in its first and second positions, so that such movement of the elongated bar causes rotation of the braking roll, then in contact with the elongated bar, which, in turn, causes movement of the expiring web clamped between the braking roll and its associated idler roll;

(7) means for securing the leading end of the new web to an adjacent part of the portion of the expiring web after the next pattern on the expiring web has been moved past the sensing means by the web-moving means;

(8) means for cutting the portion of the expiring web immediately upstream from the secured part of the portion of the expiring web after the next pattern on the expiring web has been moved past the sensing means by the web-moving means and after part of the leading end of the new web has been secured to the part of the portion of the expiring web; and

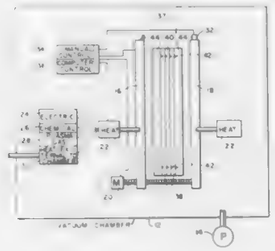
(9) means for permitting the joined new web to move along the path of travel at the relatively high speed, the permitting means including means for permitting the side of the elongated bar to move out of contact with the braking roll.

4,859,271

LAMINATION APPARATUS HAVING MULTIPLE BOOK PLATENS

Fazal A. Fazlin, and Ronald Corces, both of St. Petersburg, Fla., assignors to Advanced Plasma Systems, Inc., St. Petersburg, Fla.

Continuation-in-part of Ser. No. 723,607, Apr. 15, 1986, Pat. No. 4,681,649, and a continuation-in-part of Ser. No. 832,860, Feb. 24, 1986, Pat. No. 4,689,105. This application Feb. 24, 1987, Ser. No. 17,658
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—382 7 Claims



1. An apparatus for laminating the layers of a book composed of printed circuit layers and adhesive layers, comprising in combination:

a vacuum chamber including an opening;

door means affixed about said opening, said door means comprising means for forming an airtight seal about said opening;

a press having an upper and a lower bolster plate, said bolster plates being positioned within said vacuum chamber;

a first platen assembly including a bookshelf and a chamber platen; and

means for positioning said bookshelf apart from said chamber platen of said platen assembly between said bolster plates until actuation of said press whereupon said bookshelf and said chamber platen engage one another between said bolster plates.

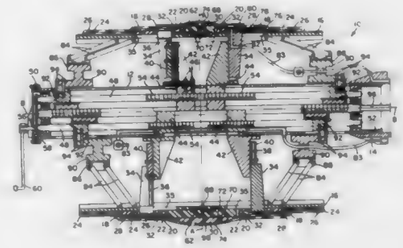
4,859,272

RADIAL TIRE BELT FOLDING DRUM

John A. Lovell, Munroe Falls; Gary E. Medved, Lyndhurst, and John R. White, Wadsworth, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 22, 1988, Ser. No. 210,391
Int. Cl.[4] B29D *30/22*
U.S. Cl. 156—415 14 Claims

1. A rotatable belt folding drum comprising a rotatable, cylindrical main shaft, a pair of central hub assemblies slidably mounted on said main shaft at opposite sides of a centerplane of said drum, a plurality of circumferentially spaced drum segments disposed in a generally cylindrical configuration around said central hub assemblies, each of said drum segments including slider members slidably mounted on said pair of central hub assemblies for radial movement of each of said drum segments relative to said central hub assemblies, a pair of annular turnup bladders positioned around said drum segments and each of said bladders having a cavity in communication with a source of fluid pressure, each of said drum segments including bladder support means slidably mounted on each of said drum segments and adjustably connected to said slider members for axial adjustment of said bladder support means at each end of said drum segments, said pair of turnup bladders being mounted on said bladder support means for axial adjusting movement with said bladder support means, spacing screw means in threaded engagement with said central hub assemblies, said screw means being rotatable for moving said central hub assemblies in opposite directions to lengthen and shorten



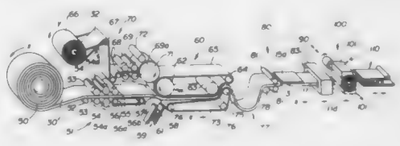
the distance between said bladders, a pair of drum expanding hub assemblies slidably mounted on said main shaft at positions spaced axially from said central hub assemblies and at opposite sides of said central hub assemblies from said centerplane, link means connecting each of said drum expanding hub assemblies with an opposite end of each of said segments, drum diameter screw means in threaded engagement with said drum expanding hub assemblies and said drum diameter screw means being rotatable for expanding and contracting said segments.

4,859,273

FEMININE HYGIENE TAMPON AND METHOD AND APPARATUS FOR MAKING SAME

Axel Friese, Wuppertal, Fed. Rep. of Germany, assignor to Johnson & Johnson GmbH, Duesseldorf, Fed. Rep. of Germany

Division of Ser. No. 109,961, Oct. 19, 1987, Pat. No. 4,816,100, which is a division of Ser. No. 768,098, Aug. 5, 1985, abandoned. This application Aug. 29, 1988, Ser. No. 238,016
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1983, 3347647
Int. Cl.[4] A61F *13/20*; B32B *31/00*
U.S. Cl. 156—446 20 Claims



1. An apparatus for the manufacture of a tampon as claimed comprising the following devices arranged in series in the direction of processing:

a stock roll (50) for a continuous nonwoven ribbon(30) of natural and/or synthetic fibres;

a weakening station (51) for the nonwoven ribbon (30);

a transport device (55, 60) for the nonwoven ribbon (30);

a nonwoven ribbon-severing device (80) for continuous severing of nonwoven ribbon sections (11);

a withdrawal cord-attaching and -knotting device (90);

a winding station (100) for rolling up the nonwoven ribbon section (11) to form a tampon blank (12), transport and severing tongs (110), which can be moved to and fro approximately in the transport plane of the nonwoven

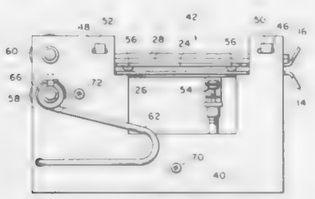
ribbon (30), for severing one nonwoven ribbon section (11) each time, and a device for transferring the tampon blank (12) to a press in which the tampon blank (12) can be pressed substantially radially to give the final form of the tampon (10), and a device for forming the introduction end (10*a*) of the tampon, wherein a stock roll (66) for a continuous strip (32) of nonwoven, liquid-permeable, thermoplastic material of width smaller than that of the nonwoven ribbon (30) is provided, which roll is followed by a cutting station (70) for largely severing the continuous strip (32) into sections (15) of defined length, after which a separation and transfer device (82) for the strip sections (15) is arranged, which is followed by a sealing station (60) for sealing the thermoplastic strip section (15) onto the outside of the nonwoven ribbon (30), downstream of which a device for continuously transporting the nonwoven ribbon (30) with the strip section (15) sealed thereto to a nonwoven ribbon severing device (80) is provided, and wherein the winding station (100) is associated with a heatable welding and smoothing device for pressing the end (15*a*), extending freely and unsealed beyond the rear end (11*a*) of the nonwoven ribbon section (11), of the strip section (15) against the strip section (15) sealed onto the nonwoven ribbon section (11).

4,859,274

PACKET-TYPE LAMINATOR

Fred D. Marvel, 1720 N. Sheridan, Tulsa, Okla. 74115

Continuation of Ser. No. 778,233, Sep. 20, 1985, abandoned. This application May 3, 1988, Ser. No. 191,755
Int. Cl.[4] B30B *15/04, 15/34*
U.S. Cl. 156—499 **1 Claim**



1. A packet-type laminating machine and packet comprising, in combination, a pair of vertical sidewall members adapted to ret on a lower edge during assembly wherein each of said vertical sidewall members contains a single recess along the top edge and a plurality of openings adapted to accept the following items from above and from the side during assembly and retain said items in the stated relationship to each other during the operation of said packet-type laminating machine and wherein said packet-type laminating machine and packet further consist of said items:

(a) a pair of horizontally flat heating platens lying one on top of the other at a fixed minimum displacement from each other with a flared opening at one end adapted to accept and heat a packet to be laminated wherein said platens are permanently spaced a fixed minimum distance apart during use such as to accept a packet having a thickness less than said fixed minimum distance such as to be laminated with minimum drag and allow virtually all compression to occur at the nip of rollers;

(b) a single pair of vertically stacked rollers positioned behind said platens such that a nip between said rollers is coplanar with and essentially adjacent to a plane between said platens and wherein at least one roller is equipped with and driven by a manual crank;

(c) at least one rigid member adapted to attach to said vertical sidewalls and hold said sidewalls essentially parallel during operation;

(d) a first spring means attached to said vertically stacked rollers such as to hold said pair of rollers under compression;

(e) a second spring means attached to said pair of horizontally flat heating platens such as to hold said pair of horizontally flat heating platens in said recesses; and

(f) a packet to be laminated, wherein said packet thickness is less than said fixed minimum distance said platens are permanently spaced apart during use.

4,859,275

REINFORCING PIECE PASTING APPARATUS FOR BINDING HOLE

Norio Sueda, Chiba, and Hiroyasu Hoshino, Tokyo, both of Japan, assignors to Elm Industry Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1988, Ser. No. 181,671
Claims priority, application Japan, May 7, 1987, 62-111081
Int. Cl.[4] B32B *35/00*
U.S. Cl. 156—541 **16 Claims**

1. A reinforcing piece pasting apparatus for binding holes, said apparatus comprising:

(a) a base having a base end part and a tip part;

(b) a frame having a base end part;

(c) a handle having a base end part and a tip part;

(d) wherein the base end parts of said base, said frame, and said handle are combined pivotally so as to be relatively turnable;

(e) a first spring provided between said base and said frame;

(f) a second spring provided between said frame and said handle;

(g) wherein said base and said handle are urged by said springs in a direction to separate their tip parts further away;

(h) wherein the urging torque of said first spring is smaller than the urging torque of said second spring;

(i) a pasting table provided on the tip portion of said base, said pasting table being equipped with a positioning projection having a connical apex portion for engaging with a binding hole in a document;

(j) a feeding mechanism providing on said frame for feeding reinforcing pieces coated with a pressure-sensitive adhesive agent one piece at a time, said feeding mechanism being interlocked with the relative rotation between said frame and said base;

(k) a supporting part provided on said frame for supporting a reinforcing piece that is fed at a position corresponding to the projection on said pasting table, said supporting part comprising:

(i) a pair of opposing placing pieces separated by a distance smaller than the outer diameter of the reinforcing pieces and greater than the diameters of the central holes in the reinforcing pieces and

(ii) a a stopper with which the tip of the reinforcing pieces is brought to a contact; and

(l) an annular presser provided on the tip portion of said handle for pushing out the reinforcing pieces on said supporting part to an engaging position with the projection on said pasting table and for pressing and pasting each reinforcing piece around a binding hole on a document that is set on said pasting table.

4,859,276

TUBE FLUSH ETCHING, RINSING, DRYING, INSPECTING AND PLUGGING SUBSYSTEM AND METHOD IN A TUBE MANUFACTURING SYSTEM

Clarence D. John, Jr., Penn Hills Twp, Allegheny County; Francis C. McNerney, Murrysville, and Thomas M. Sanders, Unity Twp., Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 3, 1987, Ser. No. 81,087
Int. Cl.[4] B08B *9/02;* **C23G** *3/04*
U.S. Cl. 156—626 **9 Claims**

1. In a fuel rod tube manufacturing system, a tube processing subsystem comprising:

(a) means for dispensing fuel rod tubes one at a time from a bundle thereof;

(b) means for receiving the dispensed tubes one at a time and arraying the tubes in a side-by-side relationship in a group thereof containing less tubes than the bundle thereof;

(c) means for receiving a group of arrayed tubes and flush etching and rinsing the same, said etching and rinsing means being operable (i) initially to seal the interiors of the tubes from the atmosphere, (ii) then without changing the positions of the tubes to, first, flush etch the interiors of the tubes in one direction from the same one ends toward the same opposite ends thereof, second, rinse the interiors of the tubes from the same one ends toward the same opposite ends thereof, third, flush etch the interiors of the tubes in the opposite direction from the same opposite ends toward the same one ends thereof, and, fourth, rinse the interiors of the tubes from the opposite ends toward the same one ends thereof, and (iii) finally to unseal the interiors of the tubes;

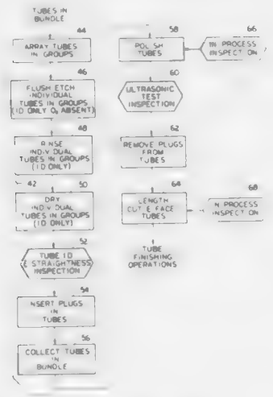
(d) means for receiving a group of flush etched and rinsed tubes and drying the same; and

(e) means for receiving a group of dried tubes to inspect the same to separate those tubes which are accepted from those which are rejected.

6. In a fuel rod manufacturing system, a tube processing method comprising the steps of:

(a) dispensing fuel rod tubes one at a time from a bundle thereof numbering in the hundreds of such tubes;

(b) receiving the dispensed tubes one at a time and arraying the tubes in a side? by? side relationship in a group thereof numbering in the fives of such tubes;



(c) receiving a group of arrayed tubes and flush etching and rinsing the same, said etching and rinsing including (i) initially sealing the interiors of the tubes from the atmosphere, (ii) then without changing the positions of the tubes, first, flush etching the interiors of the tubes in one direction from the same one ends toward the same opposite ends thereof, second, rinsing the interiors of the tubes from the same one ends toward the same opposite ends thereof, third, flush etching the interiors of the tubes in the opposite direction from the same opposite ends toward the same one ends thereof, and, fourth, rinsing the interiors of the tubes from the opposite ends toward the same one ends thereof, and (iii) finally unsealing the interiors of the tubes;

(d) receiving a group of etched and rinsed tubes and drying the same;

(e) receiving a group of dried tubes and inspecting the same;

(f) separating those of the inspected tubes which are accepted from those which are rejected; and

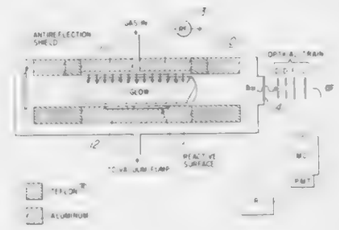
(g) receiving accepted inspected tubes one at a time and plugging the same to seal the interiors of the tubes.

4,859,277

METHOD FOR MEASURING PLASMA PROPERTIES IN SEMICONDUCTOR PROCESSING

Gabriel G. Barna, Richardson, and Demetre J. Economou, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 3, 1988, Ser. No. 189,572
Int. Cl.[4] B44C *1/22;* **B05D** *3/06;* **H01L** *21/306;* **C03C** *15/00*
U.S. Cl. 156—626 **32 Claims**



1. A method for determining the concentration profile of the active gas species in a plasma reactor so as to allow the adjustment thereof, comprising the steps of:

measuring the intensity of the emission of light from the plasma; and

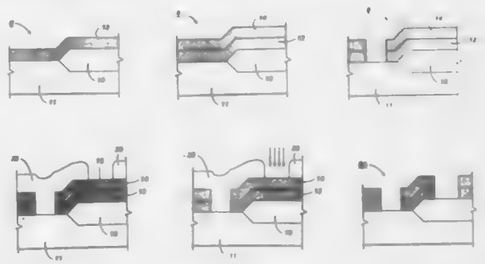
adjusting the concentration gradient of the active species dependent upon the measured intensity of the light emission of the plasma.

4,859,278

FABRICATION OF HIGH RESISTIVE LOADS UTILIZING A SINGLE LEVEL POLYCIDE PROCESS

Francis K. Choi, Rosemead, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 11, 1988, Ser. No. 231,404
Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C23F** *1/02;* **C03C** *15/00*
U.S. Cl. 156—643 **2 Claims**



1. A method of fabricating high resistive loads in a very large scale integrated circuit comprising

depositing an undoped layer of polysilicon over a predetermined area of said integrated circuit,

doping said layer of polysilicon to render it conductive,

depositing a layer of metallic silicide on said polysilicon layer to form a layer generally termed a polycide layer,

masking and etching said polycide layer to form the gates and interconnect links,

implanting said gate areas to form the source/drain areas of said integrated circuit,

masking and etching said polycide layer to expose an area of said polycide wherein said silicide layer is etched away at said exposed area down to the polysilicon layer, and

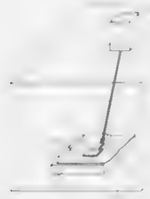
implanting said exposed area of polysilicon with a heavy dose of boron to fabricate said high resistive load element.

4,859,279

METHOD FOR PRESCRIBED, STRUCTURED DEPOSITION OF MICRO-STRUCTURES WITH LASER LIGHT

Dieter Baeuerle, Altenberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 31, 1988, Ser. No. 238,523
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730644
Int. Cl.[4] B44C *1/22*; C23F *1/02*; C03C *15/00, 25/06*
U.S. Cl. 156—656 16 Claims



1. A method for generating a structured surface on a substrate comprising the steps of:
covering at least a portion of said surface of said substrate with a metal film;
structuring said surface of said substrate at selected locations by laser-controlled vapor deposition with said film in place; and
removing portions of said film unaffected by said vapor deposition.

4,859,280

METHOD OF ETCHING SILICON BY ENHANCING SILICON ETCHING CAPABILITY OF ALKALI HYDROXIDE THROUGH THE ADDITION OF POSITIVE VALENCE IMPURITY IONS

Robert K. Lowry, Melbourne Beach, and Edward U. Adams, Melbourne, both of Fla., assignors to Harris Corporation

Division of Ser. No. 936,609, Dec. 1, 1986, Pat. No. 4,781,853.
This application Apr. 28, 1988, Ser. No. 187,268
Int. Cl.[4] B44C *1/22*; C09K *13/02*
U.S. Cl. 156—662 7 Claims

1. A method of etching silicon comprising the steps of:
providing an alcoholic solution of potassium hydroxide containing a dissolved metallic salt, the cation of which has a positive valence of at least +2, that readily dissociates in a strong base solution and thereby supplies an added quantity of positive valence ions therein, which dissolved salt effectively increases the electronegativity of the alcoholic solution of potassium hydroxide such that the ability of the solution to attract electrons from the atoms of silicon to be etched is enhanced;
bringing said etchant solution to an etching temperature; and
contacting silicon with said etchant solution.

4,859,281

ETCHING OF COPPER AND COPPER BEARING ALLOYS

Kurt Goltz, West Whiteland, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 4, 1987, Ser. No. 58,066
Int. Cl.[4] C23F *1/00, 1/18*
U.S. Cl. 156—666 27 Claims

1. In a method for etching copper which includes treating the copper with an aqueous etchant solution, said solution including a mixture of an acid selected from the group consisting of sulfuric acid, nitric acid, sulfamic acid, and phosphoric acid; hydrogen peroxide; and water; the improvement which comprises incorporating an accelerating effective amount of both tolyltriazole and either an aliphatic water soluble monoalcohol or a glycol monoether in the etchant solution to provide a faster etching rate.

4,859,282

ACID PURIFICATION OF PRODUCT FROM ALKALINE PEROXIDE PROCESSING OF NONWOODY LIGNOCELLULOSIC SUBSTRATES

Yu-Chin T. Chou, Wilmington, Del.; David F. Garrison, Mullica Hill, N.J., and William I. Lewis, Burlington, Canada, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 15, 1988, Ser. No. 181,771
Int. Cl.[4] D21C *9/16*
U.S. Cl. 162—78 5 Claims

1. A process for purifying the fibrous ingestible product from an alkaline peroxide process for treating and converting non-woody lignocellulosic substrates into fibrous products suitable for ingestion consisting essentially of the following steps:
(a) Upon completion of the alkaline peroxide treatment, separating the insoluble cellulosic fiber product from the aqueous alkaline peroxide phase,
(b) Adding enough non-toxic, aqueous mineral or organic acid to lower the pH of the product to less than 3.0,
(c) Holding the product at that pH with adequate mixing to assume full soaking of the product for a time sufficient to remove chemical residues and enhance product brightness,
(d) Following the hold time at the low pH, washing the product one or more times with a wash liquid to remove additional chemical residues and water-soluble compounds, and
(e) Separating the product from the wash liquid.

4,859,283

MAGNESIUM IONS IN A PROCESS FOR ALKALINE PEROXIDE TREATMENT OF NONWOODY LIGNOCELLULOSIC SUBSTRATES

Madhusudan D. Jayawant, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 15, 1988, Ser. No. 181,776
Int. Cl.[4] D21C *9/16*
U.S. Cl. 162—78 29 Claims

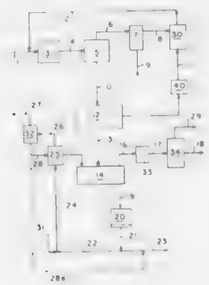
1. An improved process for converting nonwoody lignocellulosic substrates into products digestible by ruminants and ingestible by humans comprising the following steps:
(a) forming a slurry of the substrate with aqueous alkali in an amount at least sufficient to wet the substrate, the slurry having a pH in the range 10 to 13 and a temperature of about 25° to 100° C., the slurry being substantially free of peroxide;
(b) maintaining the slurry for a sufficient time under conditions of (a) for the alkali to wet the substrate;
(c) adding sufficient magnesium compound to provide about 00.5 to 1.0 percent magnesium ions based on the dry weight of the substrate;
(d) adding a water-soluble peroxide in an amount sufficient to bleach the substrate to the alkaline slurry after or with the addition of the magnesium ions;
(e) maintaining the substrate in contact with the alkaline peroxide solution at a sufficient temperature, pH and for a time sufficient to produce a substantially bleached, cellulosic fiber; and
(f) separating the bleached fiber from the alkaline liquid.

4,859,284

COMBINED PROCESS FOR THE SEPARATION AND CONTINUOUS COKING OF HIGH SOFTENING POINT ASPHALTENES

Roland Rammler, Konigstein; Hans-Jurgen Weiss, Frankfurt; Hans-Adolf Herbertz, Neu-Isenburg, all of Fed. Rep. of Germany; Rodolfo B. Solari, Los Teques, and Rafael Hidalgo, Caracas, both of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Sep. 15, 1986, Ser. No. 906,892
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1996, 3609963
Int. Cl.[4] C10B *55/06*; C10C *3/08*
U.S. Cl. 201—12 5 Claims



1. A process for the separation and the continuous coking of high softening point asphaltenes from heavy hydrocarbon material containing asphaltenes, that combines a deasphalting method to separate solid asphaltenes with a continuous coking process for said solid asphaltenes, comprising the following steps:
(a) admixing said heavy hydrocarbon material containing asphaltenes with an aliphatic C_5 to C_{12} hydrocarbon solvent in a mixing zone to precipitate the asphaltenes in the form of fine solid particles,
(b) mechanically separating the solid asphaltene particles from the mixture to obtain a highly concentrated asphaltene slurry and a liquid phase,
(c) drying the asphaltene slurry to obtain completely dried high softening point asphaltenes in the form of a fine powder wherein the asphaltene softening point is not lower than 170° C.,
(d) feeding the dried high softening point asphaltenes to a double screw coking mixer,
(e) mixing said asphaltenes in said double screw coking mixer with a heat carrier to obtain gaseous coker products and a petrol coke reaction product,
(f) feeding the petrol coke reaction product to a surge bin,
(g) partially burning the petrol coke, and
(h) thereafter recycling at least a portion of the hot petrol coke reaction product from said surge bin to said coking mixer together with said high softening point asphaltenes wherein the mixing ratio between said high softening point asphaltenes and said petrol coke reaction product is in the range of about 1:5 to 1:40 so as to form a substantially pure hydrocarbon feed to said coking mixer wherein said petrol coke reaction product acts as said heat carrier.

4,859,285

SEPARATION OF 2-PENTANONE FROM FORMIC ACID BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715; Rudolph J. Szabados, and Thomas H. Flower, both of Bozeman, Mont., assignors to Lloyd Berg, Bozeman, Mont.

Filed May 2, 1988, Ser. No. 189,054
The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.
Int. Cl.[4] B01D *3/40*; C07C *45/83, 51/44*
U.S. Cl. 203—51 10 Claims

1. A method for recovering 2-pentanone from mixtures of 2-pentanone and formic acid which comprises distilling a mixture of 2-pentanone and formic acid in a rectification column in the presence of about one part of an extractive agent per part of 2-pentanone-formic acid mixture, recovering 2-pentanone as overhead product and obtaining the formic acid and the extractive agent from the stillpot, wherein said extractive agent is a compound selected from the group consisting of cyclohexanone, diisobutylketne, ethyl butylketone, methyl isoamyl ketone, 2-heptanone and 2-octanone.

4,859,286

ISOLATION OF 1,3-BUTADIENE

Gerd Kaibel; Werner Hefner, both of Lampertheim, Fed. Rep. of Germany; Peter Keller, Kapellen, Belgium, and Werner Drewitz, Erpolzheim, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 18, 1988, Ser. No. 170,402
Int. Cl.[4] B01D *3/40*; C07C *7/04*
U.S. Cl. 203—75 4 Claims

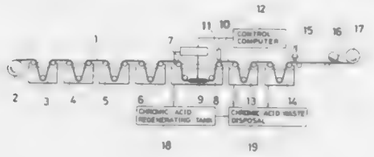
1. In a process for isolating 1,3-butadiene from a C_4-hydrocarbon mixture containing 1,3-butadiene by extractive distillation with a selective solvent, to form crude 1,3-butadiene which contains propyne and C_5-hydrocarbons, the improvement comprising:
(a) feeding the crude 1,3-butadiene in vapor form from the extractive distillation to a first distillation column;
(b) withdrawing an overhead product containing 1,3-butadiene and lower-boiling impurities in liquid form from the first distillation column and feeding the overhead product into the middle section of a second distillation column,
(c) withdrawing a liquid sidestream containing 1,3-butadiene and higher-boiling impurities in a stripping portion of the first distillation column and feeding the side-stream to the base of the second distillation column,
(d) withdrawing the higher-boiling impurities at the base of the first distillation column,
(e) withdrawing the lower-boiling impurities at the top of the second distillation column,
(f) withdrawing 1,3-butadiene in liquid form as the product in a stripping portion of the second distillation column, and
(g) withdrawing the bottom product of the second distillation column, containing 1,3-butadiene and higher-boiling impurities, in liquid form and returning the bottom product to the first distillation column in the section where the liquid side-stream was withdrawn.

4,859,287

METHOD FOR PRODUCING COLORED STAINLESS STEEL STOCK

Yuji Sone; Kayoko Wada; Hayao Kurahashi; Yoichi Nakai; Tetsu Narutani, and Shigeharu Suzuki, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

PCT No. PCT/JP85/00647, § 371 Date Jul. 11, 1986, § 102(e) Date Jul. 11, 1986, PCT Pub. No. WO86/03229, PCT Pub. Date Jun. 5, 1986
PCT Filed Nov. 22, 1985, Ser. No. 887,020
Claims priority, application Japan, Nov. 22, 1984, 59-247542; Dec. 10, 1984, 59-260497; Sep. 11, 1985, 60-200821; Sep. 11, 1985, 60-200822; Sep. 11, 1985, 60-200823; Sep. 11, 1985, 60-200824; Sep. 11, 1985, 60-200825; Oct. 31, 1985, 60-244783
Int. Cl.[4] C25D *9/04, 11/34, 11/38*
U.S. Cl. 204—1 T 22 Claims



1. A method for producing a colored stainless steel stock, characterized in that a stainless steel stock is subjected to alternating current electrolysis using an alternating current having a rectangular wave form in a coloring electrolyte solution containing ions comprising a metal having a plurality of valence numbers, thereby coloring the stock, said method further comprising the step of independently selecting the current density employed, the number of cycles of alternating current employed and electrolysis time employed during said electrolysis to achieve the desired coloring of the stainless steel stock.

12. A method for producing a colored stainless steel stock, comprising subjecting a stainless steel stock to alternating current electrolysis using an alternating current having a rectangular wave form in a coloring electrolyte solution containing ions comprising a metal having a plurality of valence numbers, thereby coloring the stock, said method further comprising the steps of sensing the color difference achieved during said coloring step by means of a color discriminating sensor and changing the current density employed, the number of cycles of alternating current employed and electrolysis time employed during said electrolysis responsive to said sensed color difference to achieve the desired coloring of the stainless steel stock.

4,859,288

POROUS ANODIC ALUMINUM OXIDE FILMS

Robin C. Furneaux, Sheningtoo, and William R. Rigby, Banbury, both of England, assignors to Alcan International Limited, Montreal, Canada

Continuation of Ser. No. 7,287, Jan. 27, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 273,113
Claims priority, application United Kingdom, Feb. 3, 1986, 8602582
Int. Cl.[4] C25D *11/00*
U.S. Cl. 204—11 18 Claims

1. A porous anodic aluminium oxide film having a major face with an area of at least 50 cm^2 and a thickness of at least 5 microns, the film material containing phosphorus derived from the anodizing electrolyte, said film being separate from the metal substrate on which it was formed.

4,859,289

PROCESS FOR PRODUCING A METAL WIRE USEFUL AS RUBBER PRODUCT REINFORCEMENT

Yoshifumi Nishimura, and Yoshio Yoshimura, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 26, 1987, Ser. No. 53,669
Claims priority, application Japan, May 26, 1986, 61-121676; Jun. 5, 1986, 61-132163; Aug. 26, 1986, 61-200687
Int. Cl.[4] C25D *5/26, 7/06*
U.S. Cl. 204—28 6 Claims



1. A process for producing a metal wire for use as a reinforcement of rubber products, comprising the steps of:
smoothing the surface of a steel wire by electropolishing to an average surface roughness of 1 μm or below;
forming on the smoothed surface of said steel wire a coating of any one metal selected from the group consisting of a copper-zinc binary alloy and a ternary alloy which is composed of copper, zinc and a third element selected from the group consisting of nickel, cobalt, tin and iron; and
drawing the thus prepared steel wire to have its cross-sectional area reduced by at least 80%.

4,859,290

PRINTING PLATE PRECURSORS

Philip J. Watkiss, Leeds, Great Britain, assignor to Vickers plc, London, Great Britain

Filed Feb. 9, 1988, Ser. No. 154,158
Claims priority, application United Kingdom, Feb. 13, 1987, 8703276
Int. Cl.[4] C25D *11/08;* C25F *3/00*
U.S. Cl. 204—33 9 Claims

1. A lithographic printing plate precursor comprising a grained and anodised aluminium substrate having coated thereon a sol containing nuclei for reducing a silver complex to metallic silver, the substrate having an anodic weight ($gm \cdot m^{-2}$) to surface roughness (microns) ratio greater than or equal to 6, such precursor having superior corrosion resistance.

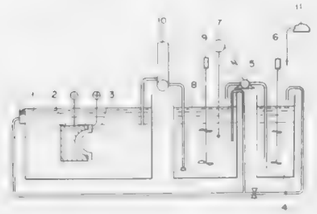
4,859,291

METHOD OF PERFORMING INDUSTRIAL LOW HYDROGEN EMBRITTLEMENT NICKEL PLATING BY USE OF AN INSOLUBLE ANODE

Koji Takada, Nagoya; Masaya Miyata, Isahaya, and Isojiro Tamura, Oyamacho, all of Japan, assignors to Katsukawa Micarome Industrial Co. Ltd., Japan

Continuation-in-part of Ser. No. 181,081, Apr. 13, 1988, abandoned. This application Jan. 25, 1989, Ser. No. 302,020
Claims priority, application Japan, Apr. 28, 1987, 62-103374
Int. Cl.[4] C25D *3/12*
U.S. Cl. 204—49 2 Claims

1. A method of industrial low hydrogen embrittlement nickel plating by using an insoluble anode, comprising the steps of:
preparing a plating bath composed of 200–350 g/l nickel sulfate, 30–50 g/l boric acid and 20–150 g/l sodium sulfate; and
performing plating in said plating bath while making electrolysis by using a lead anode as said insoluble anode and while supplying nickel carbonate slurry into said plating bath to thereby cause the nickel carbonate to dissolve in a plating solution in said plating bath under control of pH



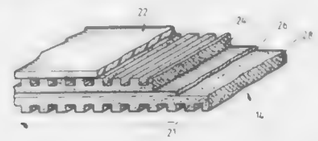
value of said plating solution within a range of from 2 to 5.

4,859,292

METHOD AND APPARATUS FOR H_2S ELECTROLYSIS

Anthony J. Appleby, Bryan, Tex., assignor to The Texas A & M University System, College Station, Tex.

Filed Mar. 28, 1988, Ser. No. 174,215
Int. Cl.[4] C25B *1/02;* C25C *3/00*
U.S. Cl. 204—60 30 Claims



28. A method of electrolyzing hydrogen sulfide to form hydrogen and sulfur, comprising:
saturating a porous matrix with a molten polysulfide electrolyte, where said electrolyte is elevated to a temperature in the range of 285°–400° C.;
contacting the molten electrolyte with a porous anode and a porous cathode to form an electrolytic cell;
passing hydrogen sulfide gas through the porous cathode into the electrolyte while applying an electrical potential across the anode and cathode to form hydrogen from the hydrogen ions at the cathode and to form sulfur from the sulfide ions at the anode; and
withdrawing hydrogen from the cathode and sulfur from the anode.

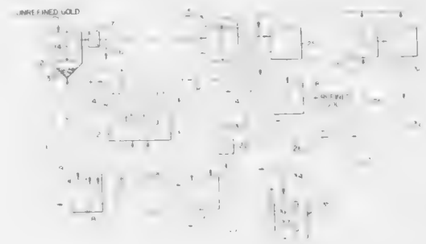
4,859,293

PROCESS FOR REFINING GOLD AND APPARATUS EMPLOYED THEREFOR

Mamoru Hirako, Yokohama, and Nobuyasu Ezawa, Tokyo, both of Japan, assignors to Tanaka Kikinzoku Kogyo K.K., Japan

Filed Jul. 15, 1987, Ser. No. 73,509
Claims priority, application Japan, Jul. 16, 1986, 61-167615; Jul. 16, 1986, 61-167616; Jul. 25, 1986, 61-174948; Aug. 21, 1986, 61-196350
Int. Cl.[4] C25B *1/24;* C25C *1/20, 7/00*
U.S. Cl. 204—94 17 Claims

1. A process of refining gold comprising:
(a) forming a solution containing an iodide compound of gold in the anode chamber of an electrolytic cell by dissolving unrefined gold by means of iodine and/or an iodide compound, and alkali hydroxide in the cathode chamber;
(b) converting soluble metal-containing impurities in the solution into the corresponding insoluble metal oxides and/or hydroxides;
(c) removing the oxides and/or hydroxides together with insoluble impurities already present in the solution, from the solution;
(d) reducing ions containing gold in the solution by making



the pH of the solution strongly basic which is not less than 12 by means of alkali hydroxide; and
(e) separating the precipitated gold from the solution after the reduction.

4,859,294

PROCESS FOR ELECTROCHEMICALLY OXIDIZING SULPHURIC ACID CHROMIUM-III-SOLUTIONS TO CHROMIUM-VI-SOLUTIONS

Richard Vytlacil, Donaustrasse 110/10, 2346 Maria Enzersdorf-/Südstadt, Austria

PCT No. PCT/AT86/00016, § 371 Date Jul. 24, 1987, § 102(e) Date Jul. 24, 1987, PCT Pub. No. WO86/05215, PCT Pub. Date Sep. 12, 1986
PCT Filed Feb. 27, 1986, Ser. No. 85,677
Claims priority, application Austria, Feb. 27, 1985, 577/85
Int. Cl.[4] C25B *1/00*
U.S. Cl. 204—97 5 Claims

1. Process for electrochemically oxidizing sulphuric acid chromium-III-solutions to chromium-VI-solutions in a cell which is subdivided by means of a diaphragm, and with the infeeding of air into the electrolyte which is present in the cathode space, characterized in that the electrolyte contains nitric acid, sulphuric acid and chromium-III and the nitric acid is used as a redox carrier for the oxygen electrode which is used as the cathode, and that the nitric acid is regenerated by infeeding oxygen or air.

4,859,295

METHOD FOR THE PRECIPITATION OF MERCURY BY ELECTROLYSIS

Wolfgang Dietz, Friedlandstr. 14, D-6454 Bruchköbel, and Freidel Kuhn, An der Berstr. 5, D-6000 Frankfurt am Main 56, both of Fed. Rep. of Germany

Filed Mar. 22, 1988, Ser. No. 171,625
Int. Cl.[4] C25C *1/16*
U.S. Cl. 204—105 R 4 Claims

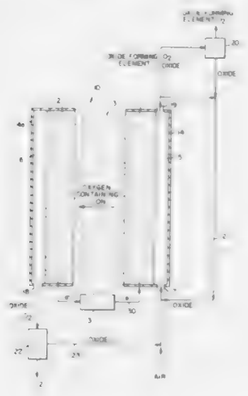
1. A method for the precipitation by electrolysis of metallic mercury from an electrolyte containing mercury-(I)-chloride, said method comprising:
(a) providing an electrolysis cell containing an anode, a cathode and an electrolyte containing mercury-(I)-chloride, and in which chlorine developed at the anode during the course of oxidation can migrate without impediment to the cathode area of the cell; and
(b) subjecting said electrolyte to electrolysis, whereby:
(1) chlorine is formed at the anode,
(2) said chlorine reacts in situ with mercury-(I)-chlorine to form mercury-(II)-chlorine, and
(3) mercury-(II)-chloride is reduced at the cathode to metallic mercury with the formation of chloride ions.

4,859,296

ELECTROCHEMICAL SEPARATION OF OXYGEN

Leonard G. Marianowski, South Holland, and Robert J. Remick, Bolingbrook, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 91,716, Sep. 1, 1987, Pat. No. 4,738,760. This application Feb. 25, 1988, Ser. No. 160,242
The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.
Int. Cl.[4] C25B *1/02*
U.S. Cl. 204—129 16 Claims



1. A process for electrochemical separation of oxygen from an oxygen containing gaseous mixture comprising: supplying a gaseous admixture comprising O_2 and a non-metallic oxide to a porous cathode catalytically active for promotion of a cathode reaction $ze^- + nO_2 + XO_m \rightarrow XO_{zn}^{z-} + m$, passing formed oxygen containing non-metallic ion through an oxygen containing molten inorganic salt electrolyte to a porous anode catalytically active for promotion of an anode reaction $XO_{zn} + {}_m^{z-} \rightarrow ze^- + nO_2 + XO_m$

wherein

z=1, 2, or 3;

n=½ or 1;

m=1, 2, or 3; and

X=a non-metallic oxide forming element capable of forming the oxide and oxygen containing ion for conduct of said electrochemical reactions, separating formed O_2 from formed said non-metallic oxide and removing separated O_2 from the process, passing released e^- through an external electrical circuit to said cathode, and supplying electric potential to said cathode sufficient to drive said electrochemical reactions.

4,859,297

PROCESS FOR DESCALING COLD-ROLLED AND ANNEALED STAINLESS STEEL STRIP

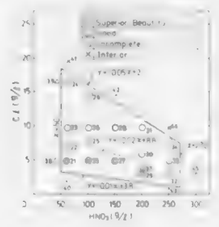
Kanji I; Tatsuo Kawasaki, and Eiko Yasuhara, all of Chiba, Japan, assignors to Kawasaki Steel Corp., Kobe, Japan

Filed Dec. 2, 1988, Ser. No. 279,416
Claims priority, application Japan, Dec. 3, 1987, 62-304556
Int. Cl.[4] C25F *1/06*
U.S. Cl. 204—145 R 2 Claims

1. A process for descaling a cold-rolled and annealed stainless steel strip comprising electrolizing the strip with an aqueous solution which has concentrations of nitric acid and chlorine within ranges fulfilling the following equations

$$x\ (g/l) = 50 \text{ to } 270 \quad (1)$$

$$y\ (g/l) = (-0.01x + 3.8) \text{ to } (-0.05x + 21) \quad (2)$$



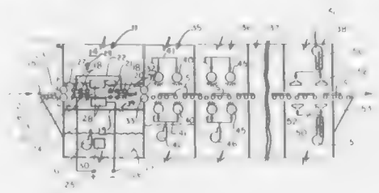
wherein x is the concentration of nitric acid and y is the concentration of chlorine.

4,859,298

PROCESS AND APPARATUS FOR ELECTROLYTICALLY REMOVING PROTECTIVE LAYERS FROM SHEET METAL SUBSTRATE

F. Gerhard Senge; Angus A. Watson, both of State College; Kenneth E. Sanner, Spring Mills, and Terry R. Corbin, Huntingdon, all of Pa., assignors to Chemcut Corporation, State College, Pa.

Filed Dec. 7, 1988, Ser. No. 280,987
Int. Cl.[4] C25F *5/00*
U.S. Cl. 204—146 30 Claims



1. A process for the removal of electrolytically removable protective coatings from metal sheets, comprising the steps of:

(a) providing the sheets with at least some flat exterior surfaces having surface portions with protective coatings;

(b) continuously and serially delivering the sheets along a predetermined generally horizontal path;

(c) immersing the sheets in and through an electrolyte bath as the sheets are continuously delivered along their generally horizontal path;

(d) providing at least one cathode in the bath;

(e) serially making anodic electrical contact with the sheets as they are delivered along their path through the bath; and

(f) maintaining an electric current flow between the anodic sheets and the cathode to electrolytically remove the protective coating from the sheets.

4,859,299

NOVEL PERFLUOROPOLYETHER AND PROCESS FOR PRODUCING THE SAME

Kazuo Kobayashi; Masashi Fukazawa, and Shinji Ishikawa, all of Kitaibaraki, Japan, assignors to Nippon Mektron, Ltd., Tokyo, Japan

Filed Nov. 2, 1987, Ser. No. 115,841
Claims priority, application Japan, Nov. 28, 1986, 86-283932
Int. Cl.[4] C07C *41/01*
U.S. Cl. 204—157.92 4 Claims

1. A process for producing a perfluoropolyether having a molecular weight of about 200 to about 25,000, whose main chain is composed of a combination of the following structural units arranged linearly at random and which contains 0.1 to 10% by weight of chlorine, bromine or iodine atoms as bonded in the molecule:

$$-CF_2CF_2O-_a-CF_2O-_b-O-_c$$

wherein

a+b=2–230,

b/a=0.1–10, and

c/(a+b)=0.01–1.0

which comprises reacting tetrafluoroethylene with oxygen in a fluorinated solvent or a chlorofluorinated solvent under ultraviolet irradiation and the addition of carbon tetrabromide or carbon tetraiodide.

4,859,300

PROCESS FOR TREATING PLASTICS WITH ALKALINE PERMANGANATE SOLUTIONS

Thomas E. Sullivan, Hamden, and Juan Hayda, Orange, both of Conn., assignors to Enthone, Incorporated, West Haven, Conn.

Continuation of Ser. No. 72,478, Jul. 13, 1987, abandoned. This application Jan. 9, 1989, Ser. No. 296,361
Int. Cl.[4] C25B *11/04*
U.S. Cl. 204—164 3 Claims

1. In a process for treating plastic articles to increase the adhesion of metal plating to the articles wherein the articles are immersed in an operating permanganate solution bath to etch the articles and then removed from the bath with the procedure being repeated for new articles until the solution is spend and/or in need of regeneration by adding fresh permanganate solution, the improvement comprising:

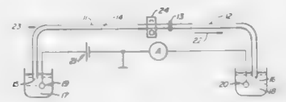
utilizing an anode electrode and cathode electrode in contact with the operating permanganate solution bath and passing current through the electrodes to effect a net oxidation of the operating bath during the treatment process.

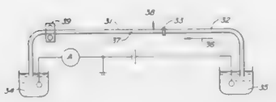
4,859,301

SEPARATION OF ZONE FORMATION FROM ELECTROOSMOTIC IMPULSE IN TUBULAR ELECTROPHORETIC SYSTEMS

Nathaniel Brenner, Irvine, and James C. Osborne, Jr., Sunnyvale, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Aug. 30, 1988, Ser. No. 238,676
Int. Cl.[4] G01N *27/28, 27/26*
U.S. Cl. 204—180.1 16 Claims





1. A method for detecting individual components in a sample, said method comprising:

(a) injecting said sample into a first length of tubing which is substantially nonadsorptive with respect to at least a portion of said components, said first length being joined in fluid communication manner to a second length of tubing which is susceptible to the formation of an electrokinetic potential; and

(b) applying an electric potential across said first and second lengths to effect electrophoretic separation of said components of said sample into zones in said first length and electroosmotic flow in said second length, said electroosmotic flow causing bulk flow in said first length driving said zones past a detector.

4,859,302

ELECTROELUTION OF MACROMOLECULES

Mark R. Alfenito, Cambridge, Mass., assignor to President and Fellows of Harvard College, Cambridge, Mass.

Filed Oct. 22, 1987, Ser. No. 112,349
Int. Cl.[4] G01N *27/28*
U.S. Cl. 204—182.8 8 Claims



1. A method for the electroelution of a macromolecular component from a matrix comprising the steps of:

placing a sample comprising said macromolecular component contained within said matrix in a first container;

forcing said sample toward the tip of said first container;

providing an opening at the first container tip large enough to pass said macromolecular component but not said matrix;

inserting said first container into a second container;

placing one electrode in said first container and placing a second electrode in said second container, together with enough electrolysis buffer to immerse each said electrode; and

applying a voltage across said electrodes for a time and under conditions sufficient to cause said macromolecular component to migrate through the opening in said first container tip and into said second container;

thereby separating said macromolecular component from said matrix.

4,859,303

METHOD AND APPARATUS FOR REMOVING COATING FROM SUBSTRATE

Alexander Kalnitsky, Ottawa; Joseph P. Ellul; Sing P. Tay, both of Nepean, and Jacques G. Poirier, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

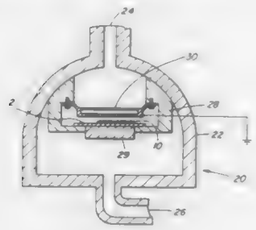
Filed Oct. 9, 1987, Ser. No. 106,213
Int. Cl.[4] C23F *1/02*
U.S. Cl. 204—192.36 8 Claims

1. A method for removing a layer of coating material from a substrate, comprising:

activating a gas;

inducing turbulence in the activated gas while discharging positive charged species in the activated gas by passing the activated gas through a diffuser comprising grounded electrically conducting walls defining a chamber, one of the walls having a plurality of inlet apertures for permit-

ting activated gas to flow into the chamber, and another of the walls having a plurality of outlet apertures for permitting activated gas to flow out of the chamber, the inlet apertures being offset from the outlet apertures to induce the turbulence, the induced turbulence enhancing contact



of the activated gas with the grounded walls to enhance discharge of positively charged species in the activated gas; and

impinging the discharged activated gas on a layer of coating material to break down the coating material and strip it from a substrate.

4,859,304

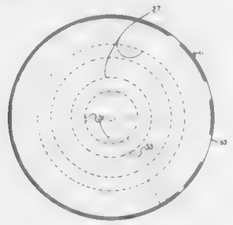
TEMPERATURE CONTROLLED ANODE FOR PLASMA DRY ETCHERS FOR ETCHING SEMICONDUCTOR

David A. Cathey; John C. Freeman; James Dale; William J. Crane; Eric A. Powell, and Jeffrey V. Musser, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jul. 18, 1988, Ser. No. 220,749

Int. Cl.[4] B01J *19/12*; C23C *14/50*

U.S. Cl. 204—298 **15 Claims**



1. A plasma dry etcher including an anode plate, wherein the anode plate is adapted to support a semiconductor wafer and the anode plate is mounted to the inside of an outer wall of an enclosure in a manner such that the semiconductor wafer faces the inside of the enclosure, comprising:

(a) a plasma dry etch chamber forming the enclosure;

(b) the anode plate having a body portion and a preferred wafer location; and

(c) a cooling passage within the anode plate which extends radially outwardly from a cooling core to an extent limited to, and corresponding to, the preferred wafer location so as to preferentially cool the anode plate at the preferred wafer location,

wherein the anode plate includes an outer perimeter section which, because the cooling passage extends to said preferred wafer location, has a reduced ability to thermally conduct heat from the outer perimeter, said reduced ability to thermally conduct resulting in the outer section having an elevated temperature as compared to the preferred wafer location, said construction reducing the effects of polymer deposition by minimizing hot spots on the semiconductor wafer when the outer section has said elevated temperature, said construction further permitting the wafer to be maintained at a higher average temperature.

and the outer perimeter of the anode plate includes means for reducing the effects of polymer deposition which occurs during etching of a said substrate

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4,859,305

ELECTROCHEMICAL CELL

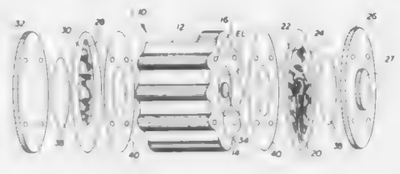
Alan A. Schneider, Reisterstown; David A. Stewart; Joseph D. Jolson, both of Baltimore; RaeAnn M. Auel, Westminster, and John F. Price, Owings Mill, all of Md., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Continuation of Ser. No. 760,144, Jul. 29, 1985, Pat. No. 4,707,242, which is a continuation-in-part of Ser. No. 646,316, Aug. 30, 1984, abandoned. This application Jun. 4, 1987, Ser. No. 58,029

The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—412 **20 Claims**



1. An electrochemical cell for quantitatively detecting a noxious gas comprising:

(a) a first end plate;

(b) a second end plate;

(c) a first working electrode comprising a gas diffusion membrane having bonded thereto a catalytic portion electrochemically reactive with the noxious gas;

(d) a second working electrode having electrochemical activity with oxidation/reduction products produced at the first working electrode;

(e) a counter electrode;

(f) a reference electrode;

(g) an electrolyte in contact with the catalytic portion of the first working electrode and in contact with the second working, counter and reference electrodes;

(h) means for containing said electrolyte and said first and second working electrodes, said counter electrode and said reference electrode, said means positioned between said first and second end plates;

(i) means for maintaining a fixed potential on said first working electrode relative to said reference electrode of from about 1.0 to 1.8 volts with respect to the potential of the reversible hydrogen couple in the electrolyte of the cell; and

(j) means for maintaining a fixed potential on said second working electrode relative to said reference electrode of from above 1.0 to about 2.2 volts with respect to the potential of the reversible hydrogen couple in the electrolyte of the cell, the fixed potential on said second working electrode being maintained at a voltage higher than the fixed potential being maintained on said first working electrode.

4,859,306

SELECTIVELY ION-PERMEABLE DRY ELECTRODES FOR ANALYZING SELECTED IONS IN AQUEOUS SOLUTION

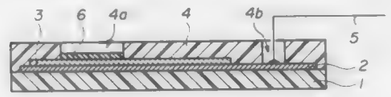
Iqbal Siddiqi, Geneva, and Hans-Rudolf Wuhrmann, Lampenberg, both of Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 942,110, Dec. 16, 1986, abandoned. This application May 31, 1988, Ser. No. 203,550

Claims priority, application Switzerland, Dec. 23, 1985, 5991/85

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—416 **4 Claims**



1. A multilaminar dry electrode for determining the concentration of a specific ion in an aqueous solution, such as biological fluid, comprising:

(a) an electrochemical reference cell at stable potential having a conductive base layer and a layer of Prussian blue adhered firmly to the conductive base layer; and

(b) an ion selective diaphragm which is selected for the specific ion to be detected said ion selective diaphragm being deposited as a film on at least a Portion of the layer of Prussian blue;

whereby, when a drop of aqueous solution containing the specific ion to be detected is placed on the ion selective diaphragm and an external electrode is electrically interconnected with the diaphragm by the aqueous solution a concentration of the ion to be detected in the drop of aqueous solution may be determined by measuring an electrical potential between the electrochemical reference cell and the external electrode without the multilaminar dry electrode requiring any pre-treatment.

4,859,307

ELECTROCHEMICAL GAS SENSOR, AND METHOD FOR MANUFACTURING THE SAME

Hitoshi Nishizawa, Iwakura, and Kazuyoshi Shibata, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

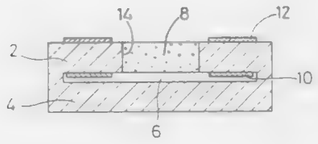
Filed Sep. 2, 1987, Ser. No. 92,206

Claims priority, application Japan, Sep. 5, 1986, 61-210432

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—425 **16 Claims**



1. A gas sensor for dealing with a measurement gas in an external space, comprising:

an electrochemical pumping cell including a first planar solid electrolyte body, and a first electrode and a second electrode which are disposed on opposite surfaces of said first planar solid electrolyte body;

a gas-tight ceramic body cooperating with said first planar solid electrolyte body, to define therebetween a thin flat space, such that said first electrode substantially communicates with said thin flat space, said thin flat space extending in a direction parallel to a plane of said first planar solid electrolyte body and having a first predetermined diffusion resistance to said measurement gas; and

a porous structure exposed to said thin flat space in a direction of thickness of said thin flat space, and juxtaposed with respect to said first electrode in said direction parallel to the plane of said first planar solid electrolyte body, said porous structure having a second predetermined diffusion resistance to said measurement gas, and maintaining said thin flat space in communication with said external space under said second predetermined diffusion resistance.

4,859,308

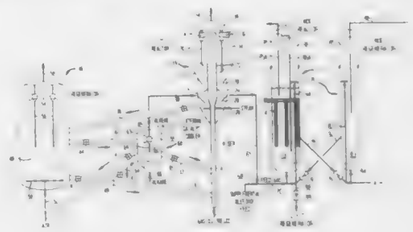
TWO-STAGE PROCESS FOR CONVERSION OF ALKANES TO GASOLINE

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 19, 1988, Ser. No. 144,991

Int. Cl.[4] C10G *57/00, 63/04*

U.S. Cl. 208—49 **9 Claims**



1. In a two-stage process for upgrading hydrocarbons in at least four reaction zones cooperating to produce gasoline range hydrocarbons from lower alkanes, said reaction zones comprising first reaction zone to crack gas oil range hydrocarbons utilizing a large pore cracking catalyst, a second reaction zone in which said large pore catalyst is oxidatively regenerated, a third reaction zone in which an external catalyst cooler autogeneously cools regenerated catalyst by dehydrogenation of said lower alkane stream to produce an olefinic effluent, and, a fourth reaction zone in which said olefinic effluent is oligomerized to said gasoline range hydrocarbons, the improvement comprising,

a first stage, comprising

(a) utilizing excess heat from said second reaction zone by transporting hot regenerated fluid catalytic cracking catalyst from said second reaction zone to said third reaction zone located externally relative to said second zone;

(b) contacting said hot fluid catalytic cracking catalyst, at substantially the same temperature as that in said second reaction zone, with C_3^+ alkanes in said third reaction zone at a pressure in the range from about 239 to 411 kPa (20 to 50 psig) and a temperature below that of said second reaction zone, at a weight hourly space velocity WHSV in the range from 0.01 to 5.0 hr^{-1} to provide conversion of the alkanes to olefins which leave said third reaction zone as said olefinic effluent separated from catalyst;

(c) returning a specified amount of separated fluid catalytic cracking catalyst from said third reaction zone directly to said first or second reaction zone at a temperature below the operating temperature of said first or second reaction zone; and,

a second state, comprising

(d) passing said olefinic effluent from said third reaction zone to a fourth reaction zone for oligomerizing olefins to gasoline range hydrocarbons,

(e) contacting said olefinic effluent with a medium pore zeolite catalyst effective to oligomerize the olefins to gasoline range hydrocarbons at superatmospheric pressure less than about 446 kPa (50 psig) and a temperature in the range of from about 315.5° C. to about 538° C. (600°–1000° F.), at a WHSV in the range from 0.01 to 20.0 hr^{-1}; and,

(f) recovering a gasoline range hydrocarbon stream from the effluent of said fourth reaction zone.

4,859,309

PROCESS FOR THE PREPARATION OF LIGHT HYDROCARBON DISTILLATES BY HYDROCRACKING AND CATALYTIC CRACKING

Auke F. de Vries, and Willem H. J. Stork, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 20, 1988, Ser. No. 213,732

Claims priority, application United Kingdom, Nov. 17, 1987, [illegible]

Int. Cl.[4] C10G *69/04*

U.S. Cl. 208—61 4 Claims

1. A process for the preparation of a gasoline range petroleum distillate from a vacuum heavy hydrocarbon oil distillate which comprises:

(a.) passing at least a portion of said vacuum heavy hydrocarbon oil distillate to a hydrocracking zone to hydrocrack said distillate at a temperature in the range of from 375° C. to 450° C., a pressure in the range of from 10 to 200 bar, a space velocity in the range of from 0.1 to 1.5 kg of vacuum heavy hydrocarbon oil distillate per liter of catalyst per hour and a hydrogen to vacuum heavy hydrocarbon oil distillate ratio in the range of from 100 to 2500 Nl per kg into a product stream comprising a hydrocracked distillate residue having an initial boiling point of at least 300° C.;

(b.) passing said hydrocracked distillate of step a. to a distillation separation zone to separate and recover said residue;

(c.) passing said residue to a catalytic cracking zone to catalytically crack said residue at a temperature in the range of 400° C. to 550° C., a pressure in the range of from 1 to 10 bar and at a severity (V_s) in the range of from 2.0 to 5.0, wherein (V_s) is defined as:

$$\frac{\text{weight of catalyst}}{\text{weight of feed}} \times t^{\alpha}$$

where t is the contact time in seconds, between the cracking catalyst and said residue, and α is equal to 0.30 to said gasoline range petroleum distillate;

(d.) passing at least a portion of said vacuum heavy oil distillate of step a. prior to hydrocracking to said catalytic cracking of step c. to catalytically crack said vacuum heavy oil distillate at a temperature in the range of 400° C. to 550° C., a pressure in the range of from 1 to 10 bar and at a severity (V_s) in the range of from 2.0 to 5.0, wherein (V_s) is defined as:

$$\frac{\text{weight of catalyst}}{\text{weight of feed}} \times t^{\alpha}$$

where t is the contact time in seconds, between the cracking catalyst and said vacuum, and α is equal to 0.30 to said gasoline range petroleum distillate in association with said catalytic cracking of said residue in step c. and

(e.) withdrawing said gasoline range petroleum distillate from said catalytic cracking zone.

4,859,310

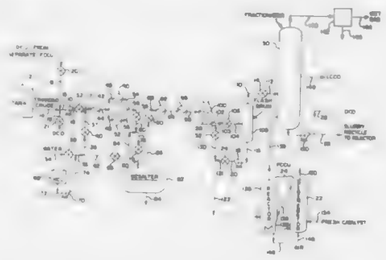
CATALYTIC CRACKING OF WHOLE CRUDE OIL

William D. Fitzharris, Houston; Scott J. Ringle, League City, both of Tex., and Kathy S. Nicholes, Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 25, 1988, Ser. No. 173,667

Int. Cl.[4] C10G *37/00*

U.S. Cl. 208—87 17 Claims



1. A catalyst cracking process, comprising the steps of:

substantially desalting petroleum comprising crude oil;

flashing and separating said desalted crude oil in a flash drum into a flashed overhead stream and a flashed bottom stream;

feeding said flashed bottom stream to a catalytic cracking unit comprising a regenerator and at least one catalytic cracking reactor selected from the group consisting of a riser reactor and a fluidized bed reactor, in the absence of previously fractionating said petroleum in a fractionator selected from the group consisting of a pipestill, crude unit, an atmospheric tower, and a vacuum tower;

substantially cracking said flashed bottom stream in said catalytic cracking reactor in the presence of a cracking catalyst to form a cracked effluent stream;

passing said cracked effluent stream from said catalytic cracking reactor and said flashed overhead stream from said flash drum in a fractionator;

fractionating said cracked effluent stream from said catalytic cracking reactor and said flashed overhead stream from said flash drum in said fractionator;

regenerating said catalyst in a regenerator; and recycling said regenerated catalyst to said catalytic cracking reactor.

4,859,311

CATALYTIC DEWAXING PROCESS USING A SILICOALUMINOPHOSPHATE MOLECULAR SIEVE

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 750,388, Jun. 28, 1985, abandoned. This application Jul. 6, 1987, Ser. No. 70,492

Int. Cl.[4] C10G *69/02*

U.S. Cl. 208—89 10 Claims

1. A process for dewaxing a hydrocarbon oil feedstock boiling above 350° F. and containing straight chain and slightly branched chain hydrocarbons comprising contacting said feedstock under mild cracking and isomerization conditions including a pressure of from about 15 psig to about 3000 psig with a catalyst comprising SAPO-11 and a Group VIII metal selected from the group consisting of platinum and palladium.

4,859,312

PROCESS FOR MAKING MIDDLE DISTILLATES USING A SILICOALUMINOPHOSPHATE MOLECULAR SIEVE

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 12, 1987, Ser. No. 2,087

Int. Cl.[4] C10G *47/02*; C07C *5/13*

U.S. Cl. 208—111 15 Claims

1. A process for selectively producing middle distillate hydrocarbons by hydrocracking and isomerizing a hydrocarbonaceous feed wherein at least 90% of said feed has a boiling point above about 600° F. comprising:

(a) contacting under hydrocracking conditions wherein the pressure is from about 200 psig to about 3000 psig and a conversion of greater than about 50%, said hydrocarbonaceous feed with a catalyst comprising a silicoaluminophosphate molecular sieve having a three-dimensional microporous crystal framework structure of tetrahedral units whose unit empirical formula on an anhydrous basis is:

$$mR:(Si_xAl_yP_z)O_2$$

wherein R represents at least one organic templating agent present in the intracrystalline pore system; "m" represents the moles of "R" present per mole of $(Si_xAl_yP_z)O_2$ and has a value from zero to about 0.3, "x", "y" and "z" represent respectively, the mole fractions of silicon, aluminum and phosphorus, said mole fractions being within the compositional area bounded by points A, B, C, D and E on the ternary diagram which is FIG. 1, said silicoaluminophosphate selected from the group consisting of SAPO-11 having an X-ray powder diffraction pattern as set forth in Table I and SAPO-41 having an X-ray powdered diffraction pattern as set forth in Table III and at least one hydrogenation component selected from the group consisting of platinum and palladium;

(b) recovering a hydrocarbonaceous effluent wherein more than about 40% by volume of said effluent boils above about 300° F. and below about 725° F. and has a pour point below 0° F.

4,859,313

METHOD FOR REDUCING THE TEMPERATURE IN A REGENERATION ZONE OF A FLUID CATALYTIC CRACKING PROCESS

Robert A. Lengemann, Arlington Heights; Gregory J. Thompson, Waukegan; Anthony G. Vickers, Arlington Heights, and Raymond W. Mott, Darien, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation of Ser. No. 703,625, Feb. 20, 1985, abandoned. This application Aug. 15, 1986, Ser. No. 896,569

Int. Cl.[4] C10G *11/00, 35/00*

U.S. Cl. 208—113 20 Claims

1. A method for operating a fluid catalytic cracking unit comprising a regeneration zone and a reaction zone with a relatively reduced temperature in said regeneration zone while processing a hydrocarbon feedstock with 50 volume percent of said feedstock having a boiling point temperature greater than about 500° F. which method comprises:

(a) contacting said feedstock in said reaction zone with a solids mixture of regenerated fluidizable cracking catalyst and fluidizable low coke make solid particles comprising alpha-alumina in a ratio of said low coke make solid particles to said cracking catalyst from about 1:100 to about 10:1, said low coke make solid particles having a surface area of less than 1 m^2/g, a pore volume of 0 cc/g and a coke making capability of less than about 0.05 weight percent coke on the spent low coke make solid particles in the ASTM standard method for testing cracking catalyst by microactivity test (MAT), said contacting occurring under cracking conditions sufficient to result in a feedstock conversion level ranging from about 60 to 90 volume percent;

(b) separating the resulting converted hydrocarbon products from the mixture of deactivated fluidizable cracking catalyst and fluidizable low coke make solid particles;

(c) recovering said resulting converted hydrocarbon products;

(d) passing said mixture of cracking catalyst and low coke make solid particles to said regeneration zone for regeneration by removal of coke; and

(e) passing the resulting regenerated mixture of cracking catalyst and low coke make solid particles from said regeneration zone to said reaction zone to contact said



feedstock as described in step (a) with the amount of low coke make solids present in said solids mixture being sufficient to maintain the temperature of said regenerated cracking catalyst below 1600° F. in said regeneration zone and to maintain the temperature in said regeneration zone between 10° to 250° F. less than would otherwise be expected when an equal amount of solids were present in said regeneration zone comprised of said cracking catalyst without the additional presence of said low coke make solids while simultaneously not affecting the operation of said reaction zone.

4,859,314

CATALYTIC CRACKING CATALYSTS AND CRACKING PROCESS USING NON-ZEOLITIC MOLECULAR SIEVES

Regis J. Pellet, Croton; Peter K. Coughlin, Yorktown Heights; Mark T. Staniulis, Peekskill; Gary N. Long, Putnam Valley, and Jule A. Rabo, Armonk, all of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation of Ser. No. 773,245, Sep. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 772,616, Sep. 4, 1985, which is a division of Ser. No. 675,285, Nov. 27, 1984, and a continuation-in-part of Ser. No. 490,952, May 2, 1983. This application Jun. 2, 1987, Ser. No. 56,762

Int. Cl.[4] C10G *11/02*

U.S. Cl. 208—114 35 Claims

1. A catalytic cracking process for cracking a hydrocarbon feedstock to produce lower boiling hydrocarbons, comprising contacting said hydrocarbon feedstock at catalytic cracking conditions effective for converting said hydrocarbon feedstock, with a conversion catalyst comprising an amount of at least one non-zeolitic molecular sieve (NZ-MS) effective to increase the gasoline octance number of the products without substantially increasing the loss in gasoline yield and feedstock conversion, said non-zeolitic molecular sieve being selected from the group consisting of SAPOs, ELAPSOs, MeAPOs, TiAPOs, FeAPOs and FCAPOs and being characterized in its calcined form by an adsorption of isobutane of at least 2 per-

cent by weight at a partial pressure of 500 torr and a temperature of 20° C.

4,859,315

LIQUID-SOLID SEPARATION PROCESS AND APPARATUS

David B. Bartholic, 75 Wetumpka La., Watchung, N.J. 07060

Filed Nov. 5, 1987, Ser. No. 116,886
Int. Cl.[4] C10G *35/10*
U.S. Cl. 208—153 17 Claims

1. A continuous fluidized process for upgrading a heavy liquid hydrocarbon charge containing solid or solid-forming contaminants, which process comprises:

(a) atomizing said charge to provide a stream of liquid particles, said liquid particles being of a pre-selected size;

(b) introducing said atomized charge substantially horizontally into a contacting zone;

(c) introducing a stream of hot fluidized vaporizing media containing heated solid particles solely derived from said contaminants in said feed substantially vertically into said contacting zone to intimately contact said atomized charge therein, the temperature of said fluidized vaporizing media and the contact time with said atomized charge being sufficient to vaporize hydrocarbons in said charge while not inducing substantial cracking thereof;

(d) vaporizing a substantial portion of said hydrocarbons to form a mixture of said solid particles entrained in the resulting vaporized hydrocarbons, said contaminants being deposited on said solid particles or forming new solid particles;

(e) passing said mixture rapidly into a separation zone having an inlet positioned substantially opposite the point of introduction of said atomized charge into said contacting zone and separating solid particles from said vaporized hydrocarbons therein;

(f) heating at least a portion of said separated solid particles to raise the temperature of said solid particles to a temperature higher than the temperature at which said vaporization occurs;

(g) recycling the heated solid particles to said contacting zone to transfer heat to the atomized feed; and

(h) condensing said vaporized hydrocarbons and recovering a hydrocarbon product having a substantially reduced content of said contaminants.

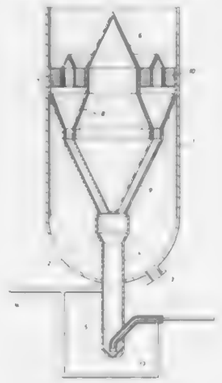
4,859,316

PROCESS AND APPARATUS FOR WITHDRAWING SOLIDS FROM A VESSEL

Hugo G. Polderman, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 27, 1987, Ser. No. 112,981
Claims priority, application United Kingdom, Dec. 1, 1986, 8628691
Int. Cl.[4] C10G *11/16*
U.S. Cl. 208—166 13 Claims

1. A process for withdrawing solids from a vessel utilizing an inserted nozzle comprising an outer tube and one or more inner tube(s) retracted inside the outer tube, which process comprises introducing an entrainment liquid into the vessel upstream from a pick-up area where the solids are withdrawn, introducing dilution transport liquid into the area for solids to be removed through the outer tube in such a way that it does not substantially influence the flow of the solids and the entrainment liquid introduced upstream from the pick-up area,



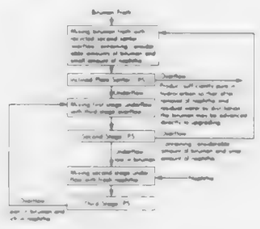
and withdrawing transport liquid and solids through the retracted inner tube(s).

4,859,317

PURIFICATION PROCESS FOR BITUMEN FROTH

William E. Sheifantook, #1, 11115-27 Avenue, Edmonton, Alberta, T6J 5H3; Alexander W. Hyndman, 168 Brosseau Crescent, Fort McMurray, Alberta, T9K 1T2, and Larry P. Hackman, 16, Flint Crescent, St. Albert, Alberta, T8N 1Y8, all of Canada

Filed Feb. 1, 1988, Ser. No. 151,011
Int. Cl.[4] C10C *3/00, 3/08, 3/10*
U.S. Cl. 208—391 1 Claim



1. A process for purifying bitumen froth from the hot water process for extracting bitumen from oil sand, said froth comprising bitumen, water and solids, said process being carried out in a circuit comprising first, second and third inclined plate settlers and first, second and third mixers, each settler having an inlet, an overflow outlet and an underflow outlet, each mixer having an inlet and outlet, each mixer being positioned before the corresponding settler, the outlet of each mixer being connected with the inlet of the immediately downstream settler, the inlet of the first mixer being connected with a source of bitumen froth, the inlet of the second mixer being connected with the underflow outlet of the first settler, the inlet of the third mixer being connected with the underflow outlet of the second settler, the overflow outlet of the first settler providing the diluted bitumen product from the circuit, the overflow outlet of the second settler being connected with the first mixer, the overflow outlet of the third settler being connected with the second mixer, the third mixer being connected with a source of light hydrocarbon diluent, said process comprising:

mixing the bitumen froth in the first mixer with a first recycled overflow stream from the second settler, said overflow stream being depleted in bitumen and enriched in diluent relative to the froth;

treating the mixture produced from the first mixer in the first settler to produce a first product overflow stream which is sufficiently enriched in bitumen relative to the froth to be of upgrading quality and a first underflow steam which is depleted in bitumen relative to the froth;

mixing the first underflow stream from the first settler in the second mixer with a second recycled overflow stream from the third settler, said second overflow stream being depleted in bitumen and enriched in diluent relative to the first overflow stream;

treating the mixture produced from the second mixer in the second settler to produce the first recycled overflow stream and a second underflow stream which is depleted in bitumen relative to the first underflow stream;

mixing the second underflow stream from the second settler in the third mixer with a stream of light hydrocarbon diluent from said source of light hydrocarbon diluent;

treating the mixture produced from the third mixer in the third settler to produce the second recycled overflow stream and a third underflow stream which is depleted in bitumen relative to the second underflow steam.

4,859,318

RECOVERING COAL FINES

Gerald F. Brookes, Cotgrave, and Lynne Spencer, Alvaston, both of England, assignors to Fospur Limited, Derbyshire, England

Filed Oct. 16, 1987, Ser. No. 109,036
Int. Cl.[4] B03D *1/02*
U.S. Cl. 209—166 13 Claims

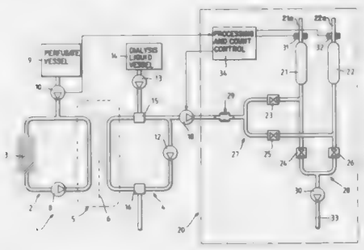
1. A method of recovering coal fines from an aqueous slurry also containing shale fines as suspended fine solids, the method comprising forming a resultant slurry by adding to the slurry a hydrophobic polyvinyl ether in a liquid organic carrier in an amount sufficient to selectively form flocs of coal fines, agitating the resultant slurry containing said flocs of coal fines, introducing gas into the agitated resultant slurry to form bubbles whereby said flocs of coal fines formed are caused to float and recovering the floated coal fines while discarding the underlying slurry containing shale fines.

4,859,319

DEVICE FOR MEASURING THE QUANTITY OF ULTRAFILTRATE ELIMINATED DURING A DIALYSIS TREATMENT

Gianni Borsari, Medolla Modena, Italy, assignor to Hospal AG, Basel, Switzerland

Filed Aug. 8, 1986, Ser. No. 894,846
Claims priority, application Italy, Aug. 9, 1985, 53695/85[U]
Int. Cl.[4] B01D *13/00, 37/04*
U.S. Cl. 210—86 11 Claims



1. A device for measuring the quantity of ultrafiltrate eliminated by means of an ultrafiltrate pump during a dialysis treatment, comprising:

an ultrafiltrate supply conduit for connecting to the output of said ultrafiltrate pump;

first and second vertically-arranged vessels for collecting said ultrafiltrate, each having an upper portion and a lower portion;

means defining an opening in said lower portion of each of said vessels in flow communication with said supply conduit;

ultrafiltrate discharge means in flow communication with each of said openings;

first valve means in said ultrafiltrate supply conduit between the output of said ultrafiltrate pump and each of said openings;

second valve means connected to said ultrafiltrate discharge means;

sensing means consisting essentially of two sensors each operatively connected to one of said vessels for detecting the presence of a predetermined quantity of ultrafiltrate collected in each of said vessels by detecting when the ultrafiltrate reaches a predetermined level in each vessel and for generating separate electrical signals when said predetermined quantity is attained in each of said vessels; and

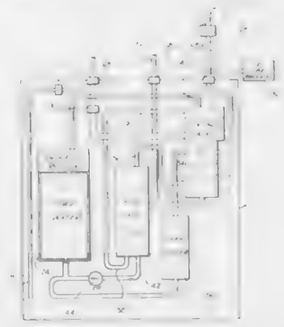
processing and count control means operatively connected to each of said first and second valve means and to said sensing means and responsive to said separate electrical signals for actuating said first and second valve means to alternately obtain a simultaneous connection of (1) said opening in said first vessel to the output of said ultrafiltrate pump and said opening in said second vessel to the said ultrafiltrate discharge means, and (2) said opening in said second vessel to the output of said ultrafiltrate pump and said opening in said first vessel to said ultrafiltrate discharge means, whereby the quantity of ultrafiltrate eliminated by said ultrafiltrate pump can be determined by accumulating a count of the number of times said vessels are filled.

4,859,320

LEAK-PROOF WATER PROCESSING UNIT

Richard W. Beall, Jr., 229 4th Pl., Manhatten Beach, Calif. 90266

Filed Sep. 8, 1987, Ser. No. 95,420
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—136 16 Claims



1. A leakproof water processing system comprising:

a water processing means having a plurality of fluid communication means coupled thereto to supply water thereto and remove water therefrom, said plurality of fluid communication means and said water processing means being sealed so as to be operative for processing water without water leakage therefrom;

a watertight enclosure means having an enclosure wall separating the inside and the outside of the enclosure means, said water processing means being disposed inside said watertight enclosure means, said plurality of fluid communication means passing through said enclosure wall and

being sealed with respect thereto, thereby providing access to said fluid communication means from outside said watertight enclosure means;

said inside of said watertight enclosure means being coupled to a drain line, whereby any leakage of water due to the failure of said water processing means to remain sealed will be confined by said watertight enclosure means and directed to said drain line.

4,859,321

AERATION TYPE WATER TREATING DEVICE

Katumi Iida, 2-2, Hamada-cho, Yokkaichi-shi, MIE, Japan

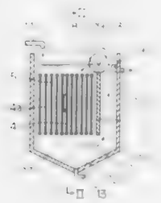
PCT No. PCT/JP87/00195, § 371 Date Nov. 30, 1987, § 102(e) Date Nov. 30, 1987, PCT Pub. No. WO87/05892, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 30, 1987, Ser. No. 137,860

Claims priority, application Japan, Apr. 1, 1986, 61-074521; Apr. 18, 1986, 61-089737; Jun. 9, 1986, 61-132951

Int. Cl.[4] C02F *3/06*

U.S. Cl. 210—150 **3 Claims**



1. An aeration type water treating device comprising:

a treating tank,

an immersion filter bed in said tank composed of a plurality of filter bed elements each including a flat net tube as a main element, and means for vertically positioning said bed elements in parallel,

a water wheel rotatably fixed on an upper side of said tank for performing surface aeration and having at least one water raking out member,

a circulation partitioning plate with lower side open installed from a position just below the at least one water raking out member of the water wheel across the whole width of said tank, and

means for adjusting the water level in the tank so that a part of the water raking out member is sunk in the water while circulation flow is produced from said circulation partitioning plate as the border by rotating the water wheel,

said immersion filter bed being arranged at least on one side of said circulation partitioning plate.

4,859,322

DEVICE FOR REMOVING MATERIAL SCREENED OR FILTERED OUT OF A LIQUID FLOWING IN A CHANNEL

Hans G. Huber, Zum Rachental 8, 8434 Berching, Fed. Rep. of Germany

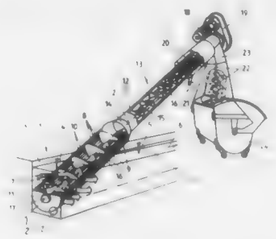
Filed Dec. 22, 1987, Ser. No. 136,835

Claims priority, application Fed. Rep. of Germany, May 16, 1987, 3716434

Int. Cl.[4] B01D *35/02*; E02B *5/08, 8/02*; E03F *5/14*

U.S. Cl. 210—162 **15 Claims**

1. An arrangement for removing material screened or filtered out of a liquid flowing in a channel, comprising: an unpowered cylindrical grating slanting downwardly to the bottom of said channel and being immersed partly in said liquid; said grating having a total length and grating bars extending over said total length, said grating bars having longitudinal interstices between them; screw conveyor means having a housing, a shaft, and a worm for conveying screened-out material to a deposition location, said grating merging into an upward-sloping section comprising said conveyor means; said worm picking up said screened-out material when scraping said bars of said grating and conveying said material upward thereby maintaining said grating clean; said grating bars having a predetermined cross-section with rounded-off edges, said worm having a circumference and positioned relative to said grating bars so that one side of said cross-section is oriented tangential to said circumference; said interstices having a narrowest location at a least possible radius at a predetermined point, said interstices having an open cross-section adjacent to



said point and expanding proportionately in a direction flowed by said liquid so that particles which pass through said narrowest location cannot be held by said grating bars for preventing clogging; and outside bracing bars connected to said grating bars, said grating bars defining said longitudinal interstices, said predetermined point being outside of contact with said circumference of said worm to prevent a cutting effect between said worm and said grating bars whereby cutting of long fibers which can pass through the interstices without being separated from said liquid is prevented; said bracing bars maintaining constant interstice widths between said grating bars.

4,859,323

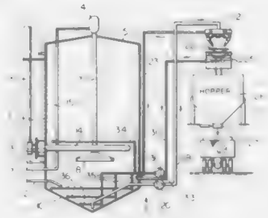
OIL SAND CLEANING APPARATUS

Theodore Rolfvondenbaumen, 5614 - 26th Street, Lloydminster, Alberta, Canada T9V 2C6

Filed May 16, 1988, Ser. No. 194,505

Int. Cl.[4] B01D *21/00*

U.S. Cl. 210—181 **6 Claims**



1. An apparatus for recovering sand from a tank and for separating sand from oil and water comprising:

first perforate pipe means in the bottom of the tank for introducing a liquid under pressure into the sand for maintaining the sand in a slurry and facilitating the separation of oil from the sand;

first pump means for discharging a sand slurry from the tank;

hydrocyclone separator means for receiving the slurry from said first pump means and for separting liquid from the slurry;

screen means for receiving sand from said separator means and receiving added water for further cleaning the sand;

means for returning the liquid separated from the sand by said hydrocyclone separator means to said tank and second pump means for returning the added water from said screen means to said first pipe means.

4,859,324

APPARATUS FOR FILTERING MACHINE LIQUID OF AN ELECTROEROSION MACHINE

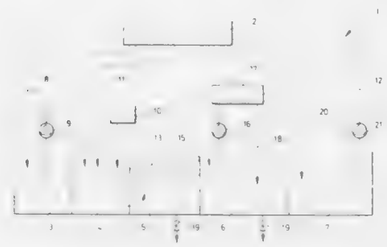
Gideon Levy, Losone; Josef Budin, Minusio, and Benjamin Moergeli, Rickenbach, all of Switzerland, assignors to AG Fur Industrielle Elektronik Agie, Losone Bei Locarno, Switzerland

Filed Dec. 20, 1988, Ser. No. 287,402

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743622

Int. Cl.[4] B01D *13/00, 17/038*

U.S. Cl. 210—195.2 **16 Claims**



1. Apparatus comprising: means for filtering a machining liquid or an electroerosion machine, including a pump, a filter connected to said pump and having a membrane, said pump supplying a concentrate to said filter, and means to remove a permeate from said filter, said pump being sized and said filter including means for minimizing clodding constructed in such a way that the concentrate passes substantially tangentially to a wall of said membrane in a circuit and so that a quantity of the concentrate per time unit carried in said circuit is greater than a quantity of the permeate removed per time unit from the filter.

4,859,325

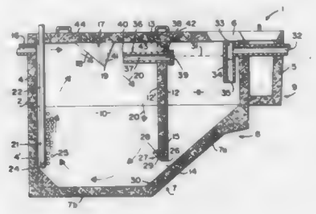
WASTE MATERIAL TREATMENT APPARATUS

Murphy Cormier, Rte. 14, Box 1935, Lake Charles, La. 70605

Filed Apr. 19, 1988, Ser. No. 183,228

Int. Cl.[4] B01D *21/00*

U.S. Cl. 210—195.3 **13 Claims**



1. A waste material treatment apparatus comprising:

floor, end, and side wall means defining a container for receiving, treating, and discharging said material;

internal wall means within said container dividing the same into substantially isolated aeration and clarifier chambers, said internal wall means terminating a short distance above said floor means to provide in cooperation with said floor means a material transfer port between said chambers;

diffuser means in said aeration chamber;

material inlet means in communication with said aeration chamber near the top thereof;

material outlet means in communication with said clarifier near the top thereof;

motion attenuating means mounted in said clarifier chamber intermediate said transfer port and said outlet means for reducing the motion of material in said clarifier chamber and enhancing thereby the settling of floc therefrom for return to said aeration chamber through said port means;

skimmer means having a conduit through said internal wall means having opposite open ends respectively in communication with said aeration and clarifier chambers;

removable closure means on said conduit, normally preventing passage of material through said conduit flow guide means, having a deflector member fixedly disposed within said aeration chamber, said member having a first downwardly slanted forward surface on its leading end obtusely angled and longitudinally aligned with and facing the path of material entering said aeration chamber through said inlet means, and having a second downwardly but oppositely slanted surface on its trailing end juxtaposed one end of said conduit whereby material entering said aeration chamber is deflected downwardly by said first surface to create a diminished pressure zone between said second surface and said one conduit such that upon removal of said closure means, float material in said clarifier chamber is sucked into said aeration chamber.

4,859,326

ELECTROLYTIC TUBULAR MIXER-SETTLER

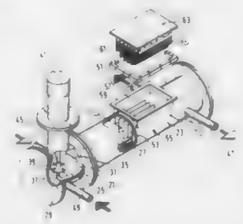
Heinz Evers, Busenberg, Fed. Rep. of Germany, assignor to Wiederaufarbeitungsanlage Karlsruhe Betriebsgesellschaft mbH, Eggenstein-Leopoldshafen, Fed. Rep. of Germany

Filed Aug. 17, 1988, Ser. No. 233,248

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1987, 3727481

Int. Cl.[4] B01D *11/04*

U.S. Cl. 210—197 **3 Claims**



1. A multi-stage tubular mixer-settler for liquid-liquid countercurrent extraction wherein two phases are mixed, the multistage tubular mixer comprising:

a plurality of mutually adjacent tubular extraction stages arranged in a horizontal plane;

each of said tubular extraction stages having first and second end walls and including first and second horizontal tubular sections connected together so as to be mutually adjacent and aligned with respect to each other;

said first tubular section including said first end wall and defining a mixing chamber, said first tubular section including a rotary agitator mounted thereon;

said second tubular section including said second end wall and defining a settling chamber;

each of said tubular extraction stages further including: first and second inputs communicating with the mixing chamber thereof for bringing in respective ones of the phases; and, a partition wall having an opening formed therein

and arranged between the mixing and settling chambers thereof for separating the latter from each other;
first conduit means and second conduit means for connecting the settling chamber of each extraction stage with the respective mixing chambers of corresponding ones of the next adjacent extraction stages for obtaining the countercurrent;
a housing formed in at least one of said tubular extraction stages and connected so as to define a cathode; and,
an anode assembly mounted in said housing in the region of the settling chamber of said one tubular extraction stage.

4,859,327

MEANS FOR WATER AND WASTEWATER TREATMENT

Raleigh L. Cox, 15582 Summerwood Dr., Baton Rouge, La. 70817, and Christopher E. Cox, 2657 Palmer Rd., Baton Rouge, La. 70816

Filed Dec. 18, 1987, Ser. No. 134,933
Int. Cl.[4] B01D *35/06*
U.S. Cl. 210—219 8 Claims



1. A treatment system for water or wastewater, comprising:
a. a tank, having a substantially circular continuous sidewall and a bottom;
b. a mixing means, for mixing and circumferentially circulating liquid within said tank, positioned within said tank; and
c. an intra-channel clarifier, positioned within said tank between the center of said tank and said sidewall such that said clarifier will be partially submerged when said tank contains liquid, said clarifier including a bow, a stern, a bottom, side walls, an entry opening in said stern, at least one discharge port in said bottom, and a clarified liquid discharge means, connected between said clarifier and a point exterior to said tank, for discharging clarified liquid from said clarifier, said clarifier having an elongated arcuate shape such that said side walls are generally parallel to said circular sidewall of said tank, said bow being oriented in an upstream direction.

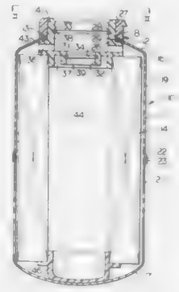
4,859,328

TWIST ON DISPOSABLE FILTER

John J. Groezinger, Dunlap, and Philip E. Moldenhauer, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed May 30, 1986, Ser. No. 868,481
Int. Cl.[4] B01D *27/08*
U.S. Cl. 210—232 8 Claims

1. A twist on disposable filter comprising:
a generally cylindrical housing opposite ends and an opening in one of the ends;
twist-lock connector means including a first member partially disposed within the housing and having an extension protruding outwardly through the opening in the housing and a generally radially outwardly extending annular shoulder disposed within the housing and being in abutment with an inside surface of the housing adjacent the opening, and a second member secured to the extension of the first member and being in abutment with an outside surface of the housing adjacent the opening;



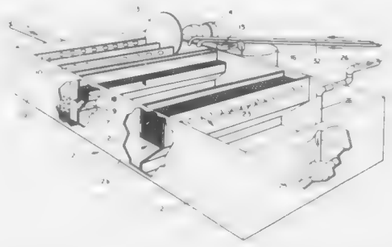
means for sealing between the twist-lock connector means and the housing; and
a filter element disposed between the first member of the twist-lock connector means and the other end of the housing.

4,859,329

ULTRASORB SYSTEM

Ronald G. Fink, 191 Commodore Dr., Jupiter, Fla. 33477

Filed Jan. 15, 1988, Ser. No. 144,412
Int. Cl.[4] C02F *9/00*
U.S. Cl. 210—257.1 5 Claims



1. A water decontamination system comprising a first phase cleansing station and a second phase cleansing station, said first phase cleansing station including a multi-compartment tank for receiving contaminated gravity fed water and producing semi-cleansed water, said multi-compartment tank, including baffle means, stabilizing means and absorption means, said first phase cleansing station delivering said semi-cleansed water to said second phase cleansing station through pressurizing means;
said second phase cleansing station including centrifugal separator and coalescing means, and additional absorption and filtering means, each of said means being fluidly interconnected.

4,859,330

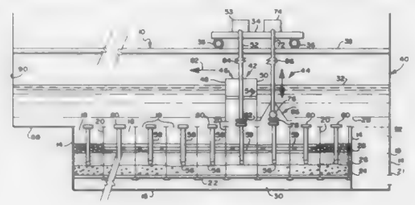
TRAVELING BRIDGE FILTER WITH AIR SCOUR

Julian R. Pauwels, Thomasville, Ga., assignor to Davis Water & Waste Industries, Inc., Thomasville, Ga.

Filed Oct. 11, 1988, Ser. No. 255,612
Int. Cl.[4] B01D *23/16, 23/24*
U.S. Cl. 210—264 25 Claims

1. In a traveling bridge filter cleaning system including a liquid filtration tank divided into a plurality of adjacent filter

cells, each of said cells containing filter media, a traveling bridge carriage located above said tank and movable along said tank, said carriage mounting air scour means comprising an air



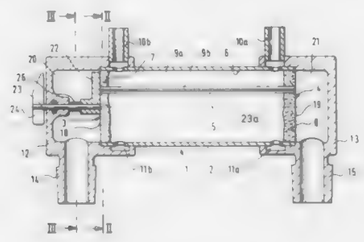
scour hood for sealingly engaging each of said cells, and backwash means comprising a backwash hood also for sealingly engaging each of said cells.

4,859,331

SYSTEM FOR EXCHANGING A SUBSTANCE BETWEEN FLUIDS

Jürgen Sachtler, Ratekau, and Wolf-Dieter Schmidt, Lübeck, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Division of Ser. No. 195,305, May 18, 1988, Pat. No. 4,801,385.
This application Oct. 17, 1988, Ser. No. 258,474
Int. Cl.[4] B01D *13/01*
U.S. Cl. 210—321.8 10 Claims



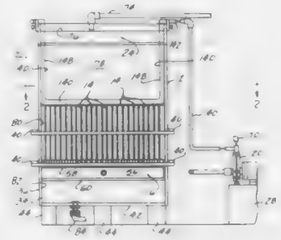
1. An exchange system for exchanging a substance between fluids, the exchange system comprising:
a housing;
a bundle of hollow fibers mounted in said housing;
said housing and the outer sides of said hollow fibers conjointly defining a first flow space for conducting a first fluid therethrough;
said hollow fibers having respective interiors conjointly defining a second flow space for conducting a second fluid therethrough;
a first set of said fibers defining a first exchange characteristic value and a second set of said fibers defining a second exchange characteristic value with the exchange of the substance between said flow spaces being dependent upon said exchange characteristic values; and,
means for selectively dividing the flow of said second fluid between said sets of fibers for adjusting the exchange of the substance between said fluids.

4,859,332

FILTER LEAF CLEANING JET APPARATUS

Willard L. Johnson, 12923 Lincoln Ave., Huntington Woods, Mich. 48070

Continuation-in-part of Ser. No. 24,383, Mar. 19, 1987, abandoned, which is a continuation-in-part of Ser. No. 932,010, Nov. 26, 1986. This application Nov. 19, 1987, Ser. No. 120,581
Int. Cl.[4] B01D *29/38*
U.S. Cl. 210—332 23 Claims



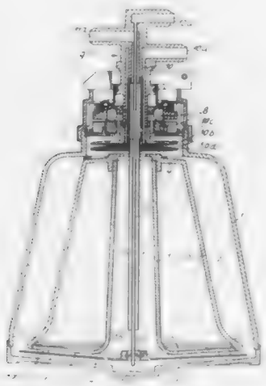
1. A suction-type filtration apparatus comprising:
a unitary chamber having a first open section, a second intermediate, removable filter-panel-retaining section, and a third solids collection section in free and open communication and connection with each other;
a set of first filter panels retained in the second intermediate section of the chamber for collecting, conducting and discharging liquid filtrate;
a first removable filtrate receiving manifold in fluid communication with the set of first filter panels and disposed below said first filter panels in said second intermediate section of said chamber;
a set of second filter panels retained in the second intermediate section of the chamber for collecting, conducting and discharging liquid filtrate, said set of second filter panels interposed in staggered, adjacent, abutting, lateral relationship with said set of first filter panels forming a narrow passageway between filtering membrane surfaces of adjacent first and second filter panels;
a second removable filtrate receiving manifold, separate and independent of said first manifold, in fluid communication with the set of second filter panels and disposed below said second filter panels in said second intermediate section of the chamber;
a set of first filter membranes releasably connected to said set jof first filter panels with a fluidtight seal between said first membranes and said first filter panels;
a set of second filter membranes releasably connected to said set of second filter panels with a fluidtight seal between said second membranes and said second filter panels;
a first filtrate pump in fluid communication with said removable first manifold for drawing filtrate from said set of first filter panels;
a second filtrate pump in fluid communication with said removable second manifold for drawing filtrate from said set of second filter panels;
a first filtrate header for receiving discharged filtrate from said first filtrate pump;
a second filtrate header for receiving discharged filtrate from said second filtrate pump; and
means for rehabilitating the first and second filter membranes.

4,859,333

CONTINOUS BLOOD CENTRIFUGATION CELL

Ivo Panzani, Mirandola, Italy, assignor to Dideco S.p.A., Mirandola, Italy

Filed Apr. 6, 1988, Ser. No. 177,722
Claims priority, application Italy, Apr. 7, 1987, 20038 A/87
Int. Cl.[4] B01D *21/26;* B04B *15/00*
U.S. Cl. 210—360.2 4 Claims



1. A centrifugation cell for blood and biological liquids, comprising:

an outer container rotatable about a central axis having an outer wall, an upper end and a generally circularly shaped enclosed bottom;

a volume displacement body having an upper end, a lower end, a generally cylindrical central longitudinal passage therein, and coaxially enclosed within said container;

a generally circularly shaped partition coaxially enclosed within and closely spaced from the bottom of said container and having a diameter adapted to be closely spaced from the wall of said container and having a central aperture therein;

said lower end of said body being closely spaced from said partition;

a stationary housing connected to and enclosing the upper end of said container through an annular rotatable seal and having a coaxial first conduit, a coaxial second conduit, and a coaxial third conduit;

a means providing a stationary passage within said housing near the upper end of said container and in communication with said third conduit and adapted for the removal of lighter fraction blood components;

said second conduit extending downwardly into the central passage of said body, with the lower end thereof closely spaced from said partition, and adapted for the inlet of blood into said container;

said first conduit extending downwardly through the central passage of said body and through the central aperture of said partition with the lower end thereof closely spaced from the bottom of said container, and adapted for the continuous removal of the red blood corpuscles, and

a means for substantially sealing the space between said first conduit and the aperture in said partition.

4,859,334

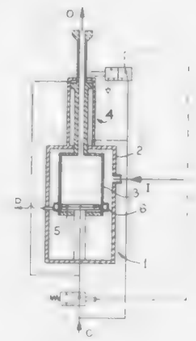
Patent Not Issued For This Number

4,859,335

FLUID FILTERING SYSTEMS

Jon F. R. Whyte, Cheltenham, United Kingdom, assignor to Dowty Mining Machinery Limited, Cheltenham, England

Filed Feb. 9, 1988, Ser. No. 154,016
Claims priority, application United Kingdom, Feb. 26, 1987, [illegible]
Int. Cl.[4] B01D *35/16, 46/04*
U.S. Cl. 210—393 13 Claims



1. A fluid filtering unit including a filter element through which the fluid being filtered must pass and means for cleaning the filter element in situ without interruption of the filtration process, which cleaning means comprises a cleaning head and a co-operating collection duct, one of said cleaning head and collection duct, on the one hand, and said filter element, on the other hand, being movable relative to the other of said cleaning head and collection duct, on the one hand, and said filter element, on the other hand, wherein cleaning fluid issues from the cleaning head at a pressure greater than that of the fluid being filtered so to cause localized cleaning of the filter element, and is collected in the co-operating collection duct and passed to waste.

4,859,336

FILTERING DEVICE FOR DISPENSING AND FILTERING FROM SAMPLES

Peter G. Savas, Concord, Mass., and Virginia S. Kiger, Old Bridge, N.J., assignors to Genex Corp., Gathersburg, Mass.

Filed Jun. 5, 1987, Ser. No. 58,390
Int. Cl.[4] B01D *35/02;* A61M *5/31*
U.S. Cl. 210—416.1 24 Claims

1. A filtering device for fluids comprising:

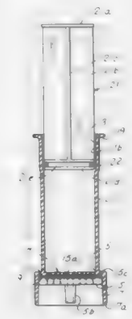
a barrel having an open end and a flow discharge end;

a plunger having an engaging end disposed in the barrel, said plunger being slidable through the open end toward the discharge end;

an exhaust nipple projecting from the discharge end and in communication with the interior of the barrel;

a filter disposed adjacent the barrel inwardly of and adjacent to the discharge nipple;

stop means disposed between said filter and said engaging



end of said plunger said stop means formed into the flow discharge end of said barrel; and

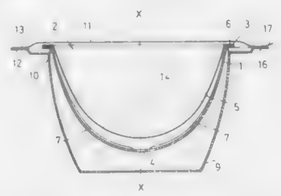
an annular, integral support stand disposed at the discharge end of the barrel and surrounding the nipple, said nipple terminating at a point spaced from a planar surface defined by the support stand which surface is normal to the axis of the barrel and the direction of movement of the plunger whereby the device will stand ono a surface with the exhaust nipple spaced from said surface.

4,859,337

FILTER FOR MAKING PORTIONS OF COFFEE OR TEA

Erich H. Woltermann, Ameisenweg 3, 4950 Minden, Fed. Rep. of Germany

Filed Jul. 10, 1987, Ser. No. 71,957
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1986, 3623952
Int. Cl.[4] B01D *23/28*
U.S. Cl. 210—474 16 Claims



1. A filter for making portions of coffee or tea from a ground material of coffee or tea comprising:

a supporting member provided with an upper pouring-in opening and a rim surrounding said upper pouring-in opening;

said supporting member being a cup-shaped, inherently stable supporting vessel having a chamber for filling with liquid adjacent to said upper pouring-in opening;

said supporting vessel being provided with a lower outlet opening;

a bag-shaped filter insert disposed in said chamber of said supporting vessel spaced above said lower outlet opening;

said filter insert being a filter mat having a shape adapted to the shape of said supporting vessel so that said filter mat extends downwardly within said supporting vessel approximately parallel to inner wall of said supporting vessel;

an upper periphery of said filter mat being disposed on and connected to said rim of said supporting vessel to support said filter mat in a position spaced above said lower outlet opening;

a filling of the ground material of coffee or tea being disposed within said filter mat;

said supporting vessel and said filter mat together with said filling being arranged within an individual pack in a gas-tight arrangement;

said individual pack including a receiving vessel, said receiving vessel receiving and surrounding said supporting vessel within an interior space of said receiving vessel;

said receiving vessel being provided with an upper opening and an annular collar surrounding said upper opening of said receiving vessel;

said rim of said supporting vessel resting on an inner region of said annular collar of said receiving vessel;

sealing means for sealing said upper opening of said receiving vessel in a gas-tight manner to maintain said supporting vessel and said filter mat within said receiving vessel;

said sealing means being a cover foil disposed across said rim and upper pour-in opening of said supporting vessel in a sealing area;

said cover foil being connected by sealing to an outer peripheral region of said annular collar of said receiving vessel; and

said rim of said supporting vessel being inwardly spaced from said sealing means at said outer peripheral region of said annular collar of said receiving vessel.

4,859,338

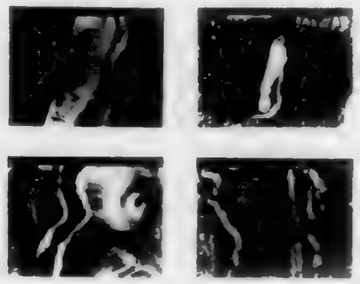
FILTER FOR SMALL PARTICLES

Friedrich Behr, Krefeld, Fed. Rep. of Germany, assignor to Thyssen Edelstahlwerke AG, Krefeld, Fed. Rep. of Germany

Filed Aug. 8, 1988, Ser. No. 229,524
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1988, 3726076
Int. Cl.[4] B01D *29/00*
U.S. Cl. 210—490 1 Claim

1. A filter body comprising means for filtering solid particles having diameters generally smaller than 5 μm from flowing fluids, said body having pores and columnar and/or platelet-

shaped oxides at least in and around the pores, said filter body including at least one steel foil (2) which is provided with an



oxidic covering layer (3) containing columnar and/or platelet-shaped oxides (4,6).

4,859,339

MICROPOROUS MEMBRANES OF SYNDIOTACTIC VINYLAROMATIC POLYMERS

Ritchie A. Wessling; Chieh-Chun Chau, and Alan F. Burmester, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 11, 1988, Ser. No. 154,777
Int. Cl.[4] B01D *13/00*; C08J *9/28*; B29D *55/12*
U.S. Cl. 210—500.34 12 Claims

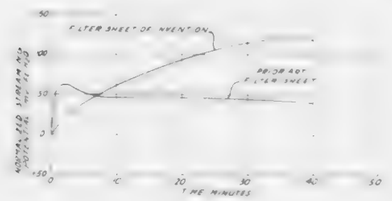
1. A microporous, asymmetric membrane comprising a syndiotactic vinylaromatic polymer.

4,859,340

FILTER SHEET

Kenneth C. Hou, Glastonbury, and Eugene A. Ostreicher, Farmington, both of Conn., assignors to Cuno, Incorporated, Meriden, Conn.

Continuation of Ser. No. 921,799, Oct. 17, 1986, abandoned, which is a continuation of Ser. No. 828,573, Feb. 10, 1986, abandoned, which is a continuation of Ser. No. 653,464, Sep. 20, 1984, abandoned, which is a continuation of Ser. No. 276,125, Jun. 22, 1981, abandoned, which is a division of Ser. No. 164,797, Jun. 30, 1980, abandoned, which is a division of Ser. No. 13,716, Feb. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 666,815, Mar. 15, 1976, abandoned. This application Apr. 21, 1988, Ser. No. 186,695
The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.
Int. Cl.[4] H01D *39/18*
U.S. Cl. 210—502.1 9 Claims



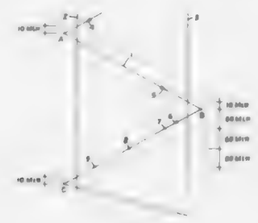
1. A filter medium sheet having enhanced capture potential for electronegative submicron particulate contaminants in a contaminated liquid passed therethrough, comprising at least about 50% by weight of siliceous particulate and a self bonding matrix of cellulose fiber, the surfaces of at least the particulate being modified with a sufficient amount of polyamido-polyamine epichlorhydrin cationic resin to impart a positive zeta potential to the surface of the filter media.

4,859,341

METHOD FOR CONTROLLING AERATING UNITS IN A WASTEWATER TREATMENT PROCESS

Berthold Schreiber, Langenhagen, Fed. Rep. of Germany, assignor to Schreiber Corporation, Inc., Trussville, Ala.

Filed Dec. 8, 1986, Ser. No. 939,092
Int. Cl.[4] C02F *3/20*
U.S. Cl. 210—614 4 Claims



1. A method for the treatment of wastewater by use of activated sludge generated in an aeration tank having a plurality of aerating units operable to be selectively activated and deactivated for introducing oxygen into said aeration tank, comprising the steps of:

(a) withdrawing a stream of activated sludge-wastewater mixture from the aeration tank;

(b) separating the activated sludge-wastewater mixture into clarified water and settled concentrated solids;

(c) monitoring the turbidity of the clarified water;

(d) monitoring the oxygen concentration in the aeration tank;

(e) selectively activating and deactivating said plurality of aerating units in response to both said turbidity and oxygen concentration by:

(i) activating at least one of said aerating units in response to a predetermined maximum turbidity limit being reached; and

(ii) inactivating at least one of said aerating units in response to an increase in the monitored oxygen concentration; and

(f) cyclically repeating the elements of step (e) above.

4,859,342

PROCESS FOR INDUSTRIALLY SEPARATING BIOPOLYMERS

Hosai Shirasawa, Ikeda; Hiroto Sugeno, Toshima; Shigeo Eto, Toshima, and Hiroshi Saito, Toshima, all of Japan, assignors to Suntory Limited, Osaka and Soken Kagaku Kabushiki Kaisha, Tokyo, both of, Japan

PCT No. PCT/JP87/00769, § 371 Date Jun. 14, 1988, § 102(e) Date Jun. 14, 1988
PCT Filed Oct. 14, 1987, Ser. No. 217,878
Claims priority, application Japan, Oct. 14, 1986, 61-243353
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—656 2 Claims

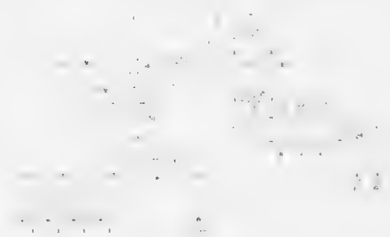
1. A process for controlling the industrial separation of a biopolymer by column chromatography, in which a large amount of a biopolymer-containing mixture sample is charged into the upper stream side of a column filled with a filler having ion-exchange capability; a mobile phase liquid the concentration and/or pH of which continuously vary/varies with the passage of time is prepared by continuously mixing at least 2 precursor liquids for the mobile phase while controlling the flow rate of each precursor liquid over a wide variable range of flow rate; the mobile phase liquid thus obtained is pumped through the column to develop the components of the mixture in the column; and the fractions eluted from the lower stream side of the column are collected to separate the components of the mixture from each other, said process comprising sequentially conducting the following steps:

(i) a step of pumping a buffer solution through a column in which a filler having ion-exchange capability has been charged to bufferize the column until it is confirmed that the observed value of the eluate from the column has been maintained within a predetermined range for a predetermined time after passage of a specific period of time from the pumping of the liquid;

(ii) a step of injecting a biopolymer-containing mixture sample into the column and finishing after passage of a specific period of time from the injection;

(iii) a step of pumping a washing liquid into the column until it is confirmed that the observed value of the eluate from the column measured by a detector has been maintained within a predetermined range for a predetermined time after passage of a specific period of time from the pumping of the liquid;

(iv) a step of preparing a mobile phase liquid the concentration and/or pH of which are/is continuously varied by



controlling the ratios of pumping flow rate of respective liquids for mobile phase according to a predetermined program, pumping the mobile phase liquid into the column to develop the components of the sample within the column and collecting the eluate from the lower stream side of the column in fractions so that components of the sample are separated from each other, in which fractionation is started after passage of a specific period of time from the start of the process or when the observed value exceeds the predetermined value;

(v) a step of pumping a washing-out liquid into the column to wash out unnecessary components from the column until it is confirmed that the observed value of the eluate from the column measured by a detector has been maintained within a predetermined range for a predetermined time after passage of a specific period of time from the pumping of the liquid;

(vi) a step of pumping regenerating liquids having different concentrations sequentially into the column until it is confirmed that the observed value of the eluate from the column measured by a detector has been maintained within a predetermined range for a predetermined time after passage of a specific period of time from the pumping of the liquid; and

(vii) a step of pumping a cleaning liquid into the column for a predetermined time.

4,859,343

SODIUM REMOVAL FROM BRINES

Teresita C. Frianeza-Kullberg, and Darrish W. Barnette, both of Gastonia, N.C., assignors to Lithium Corporation of America, Castonia, N.C.

Filed Dec. 2, 1987, Ser. No. 127,819
Int. Cl.[4] C02F *1/42*
U.S. Cl. 210—679 13 Claims

1. A method for removing at least 99% of the sodium ions from a natural or industrial brine containing dissolved salts of metals of Group 1A of the periodic chart wherein sodium ions are present but are not the predominant metal ions, comprising: contacting the brine at pH 11 to 12 with an ion exchanger selected from the group consisting of crystalline antimonic acid and polyantimonic acid for a period of time to permit ion exchange to occur, and separating of the ion exchanger from the brine with greater than 99% of the sodium ions removed.

4,859,344

METHOD FOR UNDERGROUND SUPPORT AND REMOVAL OF HAZARDOUS IONS IN GROUND WATERS

Lloyd B. Spangle, Claremore, and S. Ebow Coleman, Broken Arrow, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 861,027, May 8, 1986, Pat. No. 4,741,834. This application May 3, 1988, Ser. No. 189,571
The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.
Int. Cl.[4] C02F *1/28*
U.S. Cl. 210—683 20 Claims

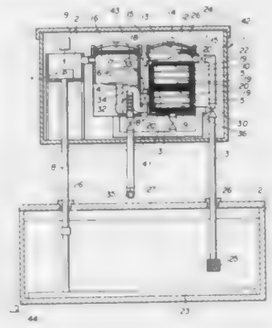
1. A method comprising (a) forming a pumpable slurry of Type C fly ash containing at least about 8 percent by weight CaO and at least about 5 percent by weight tricalcium aluminate and water; (b) pumping the slurry into ground water passages; (c) permitting the slurry in the passages to cure into a water permeable mass; and (d) contacting the mass with ground water to remove wastes from the ground water.

4,859,345

BATH WATER HEATER AND CIRCULATOR-PURIFIER APPARATUS

Jitsuo Inagaki, 71, Aza Kamiyashiki, Oaza Itsusiki, Itsusikicho, Hazugun, Aichi, Japan

Filed Aug. 26, 1988, Ser. No. 236,734
Int. Cl.[4] B01D *17/00*; C02F *1/68*
U.S. Cl. 210—764 4 Claims



4. A method or purifying bath water comprising pumping said bath water into a main body of a heater/circulator apparatus so as to filter and heat the bath water, adding an acid additive to said bath water, said additive being effective in separating and agglomerating organic substances as well as in sterilizing and deodorizing the bath water and in suppressing the generation of steam, said additive being prepared by dissolving

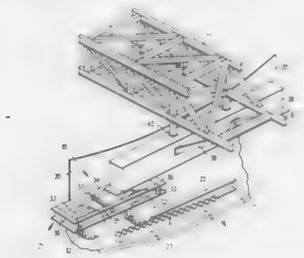
vermiculite weathered from mica materials in an aqueous acid inorganic solution, ejecting said filtered and heated water with air bubbles from the apparatus into the bath tub by way of an ejector nozzle which is connected with said main body of the heater/circulator apparatus, said air bubbles formed by suctioning ambient air by way of a suction pipe for purifying said bath water by circulating it through said suction pipe, said main body and the ejector nozzle.

4,859,346

GROUND MOUNTED TRACTION DRIVE AND METHOD FOR SEDIMENTATION DEVICE

Leonard J. A. Wood, Pennant Hills, Australia, assignor to Baker Hughes Inc., Houston, Tex.

Filed Jun. 17, 1988, Ser. No. 208,308
Int. Cl.[4] B01D *21/06*
U.S. Cl. 210—776 **12 Claims**



10. A method of driving a rotatable truss extending at least radially across a top of and extending laterally from an essentially above-ground circular tank having a cylindrical exterior tank wall and a circular tank bottom comprising:

providing a relatively-flat circular support base adjacently positioned at ground level exteriorly surrounding said tank wall adjacent the intersection of said tank wall and said tank bottom;

mounting a traction frame and traction wheel exteriorly of said tank wall to ride on said base;

mounting an end of said truss to said traction frame; and

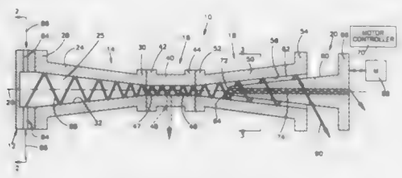
driving said traction frame and said traction wheel along said support base to rotate said truss.

4,859,347

CENTRIFUGAL SEPARATOR

Wayne E. Simon, P.O. Box 125, 28479 Douglas Park Rd., Evergreen, Colo. 80439; Willy Z. Sadeh, 2020 Brookwood Dr., Fort Collins, Colo. 80525; Edward R. Kerin, 2520 Romeldale Ct., Fort Collins, Colo. 80526, and Bernard W. Gamson, 11124 Hunt Club Dr., Potomac, Md. 20854

Filed Nov. 18, 1988, Ser. No. 273,407
Int. Cl.[4] B01D *17/038*
U.S. Cl. 210—788 **33 Claims**



1. An apparatus for separating component species of a mixture at least one of which species is a fluid, the mixture including at least one or more species of specific weight different from the fluid, said apparatus comprising:

vortex forming means;

feeding means for feeding the mixture into said vortex forming means to establish a vortex therein to induce radial separation of the species;

diffuser means communicating with the downstream end of said vortex forming means;

throttle means for controlling flow of the mixture, said throttle means including a throttle valve element which is disposed at least partially within said diffuser means and which cooperates with said diffuser means to control flow of the mixture including means for providing at least a first outlet and a second annular outlet of variable cross-sectional area; and

means for extracting at least one of said species through said throttle valve element.

31. A method of separating component species of a mixture at least one of which species is a fluid, the mixture including at least one or more species of specific weight different from that of the fluid, said method comprising the steps of:

feeding the mixture into a converging nozzle;

establishing flow of the mixture along a path within said converging nozzle to induce radial separation of the species within said converging nozzle;

providing a first annular outlet of variable cross-sectional area for controlling flow of the mixture with a throttle valve downstream of the converging nozzle, the throttle valve including a throttle valve element disposed at least partially within a diverging diffuser and cooperating with the diverging diffuser to control flow of the mixture; and

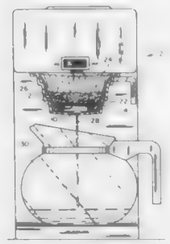
extracting at least one of the species through a second outlet in the throttle valve element.

4,859,348

METHOD AND DEVICE FOR FILTERING OILS FROM INFUSION BEVERAGES

Walter Jusaitis, Chesterfield, and William W. Matthews, Imperial, both of Mo., assignors to National Fluid Separators, Inc., St. Louis, Mo.

Continuation of Ser. No. 946,887, Dec. 29, 1986, abandoned. This application Jul. 6, 1988, Ser. No. 218,473
Int. Cl.[4] B01D *17/02, 23/28*
U.S. Cl. 210—799 **11 Claims**



11. The method of removing substantially all of the oils and undesirable oil-like hydrocarbons from brewed coffee or tea comprising the steps of passing liquid brewed coffee or tea from a source thereof onto and through a filter-like device positioned below said source, the filter-like device including a synthetic porous fabric filter-like member formed by adjacent strands of yarn and having opposite exposed surfaces, at least one of said opposite surfaces being napped by brushing and shearing the fibers which form said surface, the fabric which forms said one surface being an upper surface when said filter-like device is being used and being formed of relatively fine denier fiber yarns constructed so as to form intestitial openings between adjacent strands which openings have their largest dimension between 0.15 mm and 0.72 mm (0.006 to 0.028 inch) so as to coalesce and trap oils and oil-like hydrocarbons on said napped under surface and prevent said oils from passing therethrough while permitting the rest of the brewed coffee or tea unrestricted passage therethrough into a container therebelow.

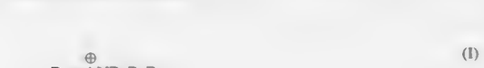
4,859,349

POLYSACCHARIDE/PERFLUOROALKYL COMPLEXES

Kirtland P. Clark, Bethal, Conn., and Robert A. Falk, New City, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 9, 1987, Ser. No. 107,434
Int. Cl.[4] A62D *1/00;* **A62C** *1/00, 3/00*
U.S. Cl. 252—3 **8 Claims**

1. A complex of an anionic polysaccharide and a perfluoroalkyl surfactant cation, wherein the perfluoroalkyl surfactant cation is of the formula



(I)

wherein

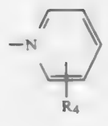
R_f represents a straight or branched chain perfluoroalkyl or perfluoroalkoxy-substituted perfluoroalkyl of 4 to 18 carbon atoms;

A represents a divalent covalent linking group;

R_1, R_2 and R_3 are independently hydrogen, aryl of 6 to 10 carbon atoms or an aliphatic or araliphatic group of up to 50 carbon atoms;

R_1 and R_2 taken together with the nitrogen to which they are attached represent piperidino, morpholino, or piperazino; or

wherein R_1, R_2 and R_3 taken together with the nitrogen to which they are attached represent pyridinium, or substituted pyridinium,



where R_4 is hydrogen or alkyl of up to 1 to 4 carbon atoms.

4,859,350

VISCOSITY REGULATORS FOR WATER-BASED SPIN FINISHES

Gunilla E. Gillberg-LaForce, Summit, and Helen A. Kravas, Chatham, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Continuation of Ser. No. 859,972, May 5, 1986, abandoned. This application Sep. 13, 1988, Ser. No. 244,650
Int. Cl.[4] D06M *13/18;* **C10M** *173/00*
U.S. Cl. 252—8.9 **19 Claims**

1. A method for lubricating filaments or yarns during textile processing comprising applying to said filaments or yarns a spin finish composition comprising:

(A) from about 70 to about 99.5% by weight of water; and

(B) 30 to 0.5% by weight of an oil-based component comprising:

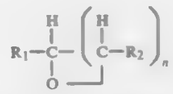
(i) a lubricating oil in an amount sufficient to achieve lubrication of a material contacted with the composition;

(ii) an emulsifier in an amount sufficient to emulsify the lubricating oil and the water; and

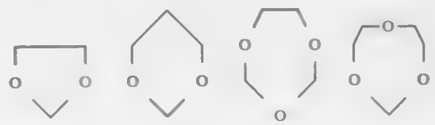
(iii) an associative thickener comprising:

(I) copolymers of 1,3 dioxolane and aliphatic 1,2 epoxides;

(II) a polymerized cyclic ether of the formula:



wherein R_1 and R_2 are each alkyl, cycloalkyl, aryl, alkoxy or aryloxy and n has the value of 1 to 4, or a polymerized cyclic acetal having one of the following formulae:



or a mixture of any of the cyclic ethers and/or acetals among themselves or with a cyclic acetal having the formula:



(III) a liquid straight-chain polyoxyalkylene heteric or block copolymer intermediate capped with an alpha-olefin oxide;

(IV) a compound of the formula:



wherein

z is 1 or 2

R is, for z=1, alkyl, aralkyl or alkylaryl of 8–22 carbon atoms in the alkyl chain or hydroxyalkyl of 2–22 carbon atoms, and, for z=2, (aryl)alkylene of 4–18 carbon atoms in the alkyl chain,

R′ and R″ each independently is hydrogen of C_1–C_{20}-alkyl wherein R′ and R″ are not simultaneously hydrogen and R′ alkyl wherein R′ and R″ are not simultaneously hydro-

gen and R′ and R″ together have a total of 8–20 carbon atoms,

x is 10–40 and

y is 1.2–5;

(V) copolymers of ethylene oxide and epoxy-n-alkane of 12 to 25 carbon atoms; or

(VI) cellulose ethers modified with long-chain hydrocarbon epoxides,

the associative thickener being present in an amount which does not substantially affect the initial viscosity of said spin finish composition, yet causes a substantial increase in the viscosity of the composition as the water contained therein decreases from its initial level and effects no substantial change in viscosity as the water content further decreases to below about 40%.

4,859,351

LUBRICANT AND SURFACE CONDITIONER FOR FORMED METAL SURFACES

Sami B. Awad, Drexel Hill, Pa., assignor to Henkel Corporation, Ambler, Pa.

Filed Jun. 1, 1987, Ser. No. 57,129

Int. Cl.[4] C10M *105/08, 105/18*

U.S. Cl. 252—32.5 **14 Claims**

1. A liquid lubricant and surface conditioner composition for application to aluminum cans consisting essentially of a water-soluble organic material selected from the group consisting of an ethoxylated fatty acid, an alcohol having at least about 4 carbon atoms and containing up to about 20 moles of ethylene oxide per mole of alcohol, and an ethoxylated alkyl alcohol phosphate ester, said composition having a pH of between about 1 and about 6.5.

4. A process of reducing the coefficient of static friction on the outside surface of a metal can and increasing the mobility of said can, comprising applying to said can a liquid lubricant and surface conditioner composition consisting essentially of a water-soluble organic material selected from the group consisting of an ethoxylated fatty acid, an alcohol having at least about 4 carbon atoms and containing up to about 20 moles of ethylene oxide per mole of alcohol, and an ethoxylated alkyl alcohol phosphate ester, said composition having a pH of between about 1 and about 6.5.

4,859,352

LOW TEMPERATURE HIGH PERFORMANCE GREASE

John A. Waynick, Bolingbrook, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Feb. 29, 1988, Ser. No. 162,044

Int. Cl.[4] C10M *111/02*

U.S. Cl. 252—41 **12 Claims**

1. A grease, comprising:

from about 65% to about 93% by weight of oil consisting of a synthetic base oil blend in the absence of mineral oil, said synthetic oil blend comprising from about 5% to about 75% polyalphaolefin based upon the total weight of said synthetic base oil blend and from about 25% to about 95% of an aliphatic diester of an aliphatic dicarboxylic acid based upon the total weight of said synthetic oil blend;

from about 5% to about 20% by weight of a lithium 12-hydroxystearate soap thickener; and

from about 2% to about 15% by weight of a low temperature compatible additive package comprising at least one member selected from the group consisting of a dithiocarbamate-containing compound, a phosphate-containing compound, a lithium hydroxide-containing compound, and a calcium hydroxide-containing compound.

4,859,353

SULPHUR-CONTAINING BORATE ESTERS

Terence Colclough, Abingdon, United Kingdom, assignor to Exxon Chemical Patents Inc., Linden, N.J.

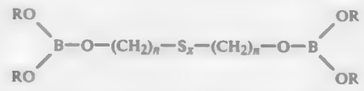
Filed Apr. 1, 1988, Ser. No. 176,444

Claims priority, application United Kingdom, Apr. 2, 1987, 8707833

Int. Cl.[4] C10M *139/00, 135/20*

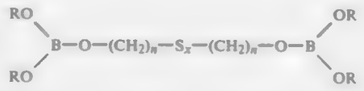
U.S. Cl. 252—46.3 **18 Claims**

1. A sulphur-containing borate ester of the formula:



wherein each R is a hydrocarbyl group opt substituted by one or more —XR″ group, or the two R attached to one boron represent a group $—(R'_2C)_m—$, from 1 to 4, each n is from 1 to 6, each m is from 2 t and each R′ is hydrogen, an —XR″ group, or a hydrocarb radical optionally substituted by one or more —XR″ group, X is O, S or NR″ or two groups R′ together form an alicyclic or heterocyclic ring and R″ is hydrogen, a hydrocarbyl radical or a hydrocarbylcarbonyl group.

9. A lubricating composition comprising a major amount of oil and at least one sulphur-containing borate ester of the formula:



wherein each R is a hydrocarbyl group optionally substituted by one or more —XR″ group, or the two R groups attached to one boron represent a group $—(R'_2C)_m—$, x is from 1 to 4, each n is from 1 to 6, each m is from 2 to 4 and each R′ is hydrogen, an —XR″ group, or a hydrocarbyl radical optionally substituted by one or more —XR″ group, X is O, S or NR″ or two groups R′ together form an alicyclic or heterocyclic ring and R″ is hydrogen, a hydrocarbyl radical or a hydrocarbylcarbonyl group.

4,859,354

NITROGEN-CONTAINING ADDITIVES FOR NON-AQUEOUS FUNCTIONAL FLUIDS

Emyr Phillips, Sale; Robert M. O'Neil, Boothstown, both of England, and Hermann O. Wirth, Bensheim, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 838,986, Mar. 12, 1986, Pat. No. 4,762,628.

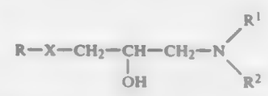
This application May 18, 1988, Ser. No. 195,553

Claims priority, application United Kingdom, Mar. 12, 1985, 8506251

Int. Cl.[4] C10M *129/06*

U.S. Cl. 252—47.5 **22 Claims**

1. A composition having corrosion inhibiting properties which comprises a non-aqueous functional liquid and an effective corrosion-inhibiting amount of at least one compound of formula



(I)

wherein X is —S—, —SO—, or $—SO_2—$, R^1 is unsubstituted C_1–C_4alkyl or C_2–C_5alkyl substituted by one to three hydroxyl groups, R^2 is hydrogen, unsubstituted C_1–C_4alkyl or C_2–C_5alkyl substituted by one to three hydroxyl groups, with the proviso that at least one of R^1 or R^2 is hydroxy-substituted, and

R is C_2–C_{20}-alkyl, $—CH_2—CH(OH)—CH_2—NR^1R^2$, in which R^1 and R^2 have their previous significance, or R is C_2–C_{18}alkenyl, C_2–C_3alkynyl or C_5–C_{12}cycloalkyl.

4,859,355

PHENOLIC-CONTAINING MANNICH BASE REACTION PRODUCTS AND LUBRICANT COMPOSITIONS CONTAINING SAME

Sheldon Chibnik, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 813,813, Dec. 27, 1985, Pat. No. 4,717,492, Division of Ser. No. 136,077, Dec. 21, 1987, Pat. No. 4,806,130.

This application Jan. 23, 1989, Ser. No. 299,288

Int. Cl.[4] C10M *129/10, 135/30*

U.S. Cl. 252—47.5 **9 Claims**

1. A composition comprising a major amount of an oil of lubricating viscosity or grease prepared therefrom normally susceptible to oxidation and a minor antioxidant amount of an additive product prepared by (a) reacting a preformed Mannich base derived from a phenol, a C_1–C_8 alkyl aldehyded and a suitable low boiling amine, and (b) a reactive thiol having at least one reactive hydrogen and having a higher boiling point than said low boiling amine.

4,859,356

N,N-DIORGANODITHIOCARBAMATE-ALKYLTHIOSULFINYL HALIDE REACTION PRODUCTS AND LUBRICANT COMPOSITIONS CONTAINING SAME

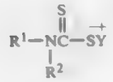
Abraham O. M. Okorodudu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 24, 1988, Ser. No. 236,405

Int. Cl.[4] C10M *135/18*

U.S. Cl. 252—47.5 **16 Claims**

1. A lubricating composition comprising a major amount of a lubricating oil and between about 0.01 and about 10 percent by weight of the reaction product obtained by reacting an amine or metal dithiocarbamate salt having the following structural formula:



where R^1 and R^2 are the same or different, each being a hydrocarbyl group containing from 1 to 36 carbon atoms and Y is an ammonium or metal radical with an alkyl thiosulfinyl halide having the structural formula:



where R^3 is an aryl, alkaryl, aralkyl, or a saturated or unsaturated alkyl group and X is halogen.

4,859,357

POLYFLUORINATED COMPOUNDS, THEIR PREPARATION AND THEIR USE AS LUBRICANT ADDITIVES

Laurent Germanaud, Irigny, and Marc Hermant, Cormeilles-en-Parisis, both of France, assignors to Societe Atochem, Puteaux, France

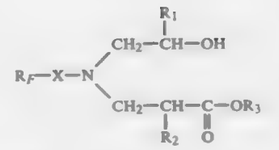
Filed Jun. 9, 1988, Ser. No. 204,602

Claims priority, application France, Jun. 19, 1987, 87 08663

Int. Cl.[4] C10L *133/04*

U.S. Cl. 252—51 **18 Claims**

1. Polyfluorinated compound, comprising the general formula:



(I)

in which:

R_F denotes a perfluorinated radical,

X denotes a divalent linkage $—(CH_2CF_2)_a(CH_2)_b—$, $—CF═CHCH_2—$ or $—CFHCH_2CH_2—$, a being an integer ranging from 0 to 10, and b an integer which can range from 1 to 4 but is equal to 2 when a is other than 0,

R_1 denotes a hydrogen atom or a linear or branched alkyl radical containing from 1 to 12 carbon atoms,

R_2 denotes a hydrogen atom or methyl radical, and

R_3 denotes a linear or branched alkyl radical containing from 1 to 24 carbon atoms.

4,859,358

LIQUID AUTOMATIC DISHWASHING COMPOSITIONS CONTAINING METAL SALTS OF HYDROXY FATTY ACIDS PROVIDING SILVER PROTECTION

Steven M. Gabriel, Cincinnati, and Brian J. Roselle, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 9, 1988, Ser. No. 204,444

Int. Cl.[4] C11D *3/02, 3/20, 17/08;* **C23F** *11/10*

U.S. Cl. 252—99 **27 Claims**

1. A liquid automatic dishwashing detergent composition comprising:

(a) from 0% to about 5% of bleach-stable surfactant;

(b) from about 5% to about 40% of detergency builder;

(c) hypochlorite bleach to yield available chlorine in an amount of from about 0.3% to about 2.5%;

(d) from about 0.25% to 20% of a thickening agent;

(e) from about 0.05% to about 0.3% of a metal salt of a long chain hydroxy fatty acid to inhibit tarnishing in silverware; and

(f) the balance being water and minor ingredients; said composition having a yield value of from about 50 to about 350 dynes/cm^2.

23. A method for inhibiting silver tarnishing of dishware in an automatic dishwashing process comprising contacting the silver with washwater containing the composition of claim 1.

4,859,359

HARD SURFACE CLEANING AND POLISHING COMPOSITIONS

John A. DeMatteo, and Gregory P. Pilant, both of Memphis, Tenn., assignors to Dyna-5, Inc., Memphis, Tenn.

Filed Mar. 25, 1988, Ser. No. 173,309

Int. Cl.[4] C11D *7/22;* **C09G** *1/04*

U.S. Cl. 252—174.15 **14 Claims**

1. A solvent-based liquid cleaning and polishing composition, suitable for use on hard surfaces, which comprises

a solvent mixture in which a major portion is constituted by a glycol ether and a minor portion is constituted by a combination of a lower aliphatic alcohol, a hydrocarbon solvent, and water;

an organic polysiloxane soluble in said solvent mixture, dissolved therein in an amount of about 0.1 to about 7 percent by weight of the composition, and having the repeating group wherein n is an integer having a value greater than 1, R^1 is an alkyl radical containing 1 to 7 carbon atoms, inclusive, R^2 is a member of the group consisting of hydrogen, an alkyl radical containing 1 to 7 carbon atoms, inclusive, and phenyl;

a silane having the formula

$R^3—Si(OR^4)_3$

wherein R^3 is selected from the group consisting of an alkyl radical containing 1 to 3 carbon atoms, inclusive, and phenyl, and R^4 is an alkyl radical containing 1 to 2 carbon atoms, inclusive, dissolved in said solvent mixture in an amount in the range of about 0.1 to about 5 percent by weight of the composition; and a polycarboxylic chelating acid having a first pK value in the range of about 1 to about 3.5 dissolved in said solvent mixture in an amount in the range of about 0.5 to about 5 percent by weight of the composition.

4,859,360

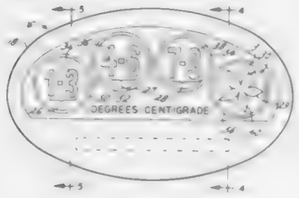
CHOLESTERIC LIQUID CRYSTAL FORMULATIONS AND TIME/TEMPERATURE MONITORING MEANS

Fred K. Suzuki, Arlington Heights; Sharon M. Mead, Streamwood; Noble H. Yoshida, and Robert H. Dobberstein, both of Arlington Heights, all of Ill., assignors to Biosynergy, Inc., Arlington Heights, Ill.

Continuation-in-part of Ser. No. 545,910, Oct. 27, 1983, abandoned. This application Mar. 21, 1986, Ser. No. 842,631

Int. Cl.[4] C09K *19/36;* **G01K** *11/12*

U.S. Cl. 252—299.7 **34 Claims**



1. Time/temperature-monitoring means comprising a cholesteric liquid crystal material having an irreversible phase wherein said material quenched from a first temperature at or above its color-play temperature range to a second temperature below its color-play temperature range while retaining a color characteristic of said material at said material at said first temperature, wherein said material has a pseudo-irreversible liquid crystal phase at a temperature below said color-play temperature range and at a temperature above said irreversible phase, said pseudo-irreversible phase being the only phase located between said color-play temperature range and said irreversible phase, said material having a defined time-dependent temperature-dependent limit said pseudo-irreversible liquid crystal phase, wherein when said limit is exceeded, said material exhibits a color change which is irreversible by cooling.

4,859,361

PROCESS FOR PRODUCING ELECTROLUMINESCENT PHOSPHORS OF IMPROVED BRIGHTNESS

Kenneth T. Reilly, and Richard G. W. Gingerich, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 194,646, May 13, 1988, abandoned. This application Jan. 17, 1989, Ser. No. 297,209

Int. Cl.[4] C09K *11/56*

U.S. Cl. 252—301.6 S **9 Claims**

1. A process for producing an electroluminescent phosphor comprising:

(a) blending a chloride flux, a copper source, and zinc sulfide to form a relatively uniform admixture;

(b) heating the resulting admixture at a temperature of from about 1000° C. to about 1300° C. for about 2 to about 8 hours to convert at least a portion of the admixture to a crystalline material containing zinc sulfide, at least some chloride ions, and copper ions,

(c) washing the resulting material with sufficient water to remove at least a major portion of the water soluble material from the crystalline material;

(d) drying the washed material to produce a relatively moisture-free material;

(e) subjecting said relatively moisture-free material to low intensity milling for a sufficient time to change the crystallographic structure of at least a portion of the moisture-free material from a hexagonal structure to a cubic structure;

(f) blending the resulting milled material with zinc sulfate and copper sulfate to form a second admixture;

(g) heating said second admixture at a temperature of from about 750° C. to about 850° C. for about 1.5 to about 3 hours to form an activated material;

(h) cooling said activated material by allowing it to stand at room temperature for a period of time of from about 10 minutes to about 20 minutes followed by immediately quenching said cooled material in water;

(i) removing said water from the resulting cooled and quenched activated material;

(j) washing said quenched activated material to remove residual fluxes and excess activator materials;

(k) drying the resulting washed material to form an electroluminescent phosphor.

4,859,362

SULFOMETHYLATED LIGNIN AMINES

Peter Schilling, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 762,215, Aug. 5, 1985, which is a continuation-in-part of Ser. No. 889,236, Jul. 25, 1986, abandoned. This application May 4, 1987, Ser. No. 45,894

Int. Cl.[4] B01J *13/00*

U.S. Cl. 252—312 **14 Claims**

1. A method for producing a surface active agent from a by-product of the papermaking process, comprising the steps of:

(a) reacting a by-product of papermaking selected from the group consisting of lignin, modified lignin, and mixtures thereof, with a polyamine having at least three amine group per molecule, to form an amine condensate; and

(b) reacting said amine condensate with a bisulfite formaldehyde in aqueous solution to form a surface active agent.

4,859,363

EMULSIONS OF PERFLUOROCARBONS IN AQUEOUS MEDIA

Stanley S. Davis, Nottingham, and David E. M. Wotton, Bristol, both of United Kingdom, assignors to I.S.C. Chemicals Limited, London, United Kingdom

Continuation of Ser. No. 833,017, Feb. 26, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 143,282

Claims priority, application United Kingdom, Feb. 26, 1985, 8504916

Int. Cl.[4] A61K *9/10, 31/25;* **B01J** *13/00*

U.S. Cl. 252—312 **6 Claims**

1. An oil-in-water emulsion of perfluorodecalin in an aqueous medium, wherein the emulsion is stabilized by the addition of a fluorinated compound of a higher boiling point than perfluorodecalin, wherein the fluorinated compound of higher boiling point is selected from the group consisting of:

perfluoroperhydrofluorene $C_{13}F_{22}$;

perfluoroperhydrophenanthrene $C_{14}F_{24}$; and

perfluoroperhydrofluoranthene $C_{16}F_{26}$;

and wherein said fluorinated compound of high boiling point is added in an amount of from 0.1% to 5% weight/volume of the emulsion.

4,859,364

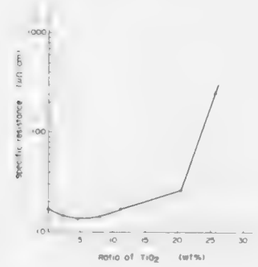
CONDUCTIVE PASTE COMPOSITION

Yasuo Yamamoto; Akira Inabe, and Takashi Kitagaki, all of Tokyo, Japan, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 25, 1988, Ser. No. 199,843

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—512 **7 Claims**



1. A conductive thick film paste consisting of (a) 60–90% by weight of an admixture of solids consisting of (1) 89–99% by weight, basis solids, of conductive metal particles having an average particle size of 0.3–1.0 μm, and (2) 11–1% by weight, basis solids, of metal oxide particles coated with a conductive metal, the coated particles having a particle size of no more than 1 μm, the admixture being dispersed in (b) 40–10% by weight of an organic medium.

4,859,365

FLAME RETARDANT AND SMOKE SUPPRESSANT COMPOSITION

Robert H. Peninger, Mineral Wells, Tex., assignor to Manufacturers Industrial Technology, Inc., Chicago, Ill.

Filed Feb. 10, 1987, Ser. No. 12,883

Int. Cl.[4] C09K *21/00;* **C09D** *5/16;* **C08L** *67/00, 67/06*

U.S. Cl. 252—601 **20 Claims**

1. A flame retardant and smoke suppressant composition comprising:

from about 20 to 60 weight percent of an unsaturated polyester resin;

from about 2.5 to about 10 weight percent of an unsaturated monomer compatible with the polyester resin;

from about 2.5 to about 18 weight percent antimony oxide;

from about 4 to about 15 weight percent iron oxide;

from about 30 to about 70 weight percent hydrated alumina; and

from about 1 to about 10 weight percent of trialkyl phosphate;

wherein said composition is curable at ambient temperatures upon admixture with a catalytic amount of methyl ethyl ketone peroxide prior to application of the composition to a surface.

4,859,366

LOW SMOKE MODIFIED POLYPROPYLENE INSULATION COMPOSITIONS

Lie K. Djiauw, Houston, Tex., and Ronald D. Icenogle, Spokane, Wash., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 802,797, Nov. 27, 1985, abandoned. This application Apr. 11, 1988, Ser. No. 177,801

Int. Cl.[4] H01B *7/00;* **C09K** *21/00;* **C09D** *5/16, 5/18*

U.S. Cl. 252—602 **6 Claims**

1. An electrically conductive wire coated with a flame retardant insulation composition consisting essentially of:

(a) 15–20 percent by weight of a hydrogenated monoalkylene (A)—conjugated diene (B) block copolymer containing at least two A blocks and at least one B block;

(b) 4–8 percent by weight of a plasticizer;

(c) 4–8 percent by weight of a maleic anhydride functionalized polypropylene; and

(d) 63–75 percent by weight of a hydrated inorganic filler which has been surface coated with a coupling agent.

4,859,367

WASTE SOLIDIFICATION AND DISPOSAL METHOD

Joseph Davidovits, 16 Rue Galilee, F-02100 Saint Quentin, France

Filed Oct. 2, 1987, Ser. No. 104,190

Int. Cl.[4] G21F *9/16, 9/12;* **C09D** *1/04, 1/02*

U.S. Cl. 252—628 **12 Claims**

1. A method for toxic mine tailings disposal, comprising:

(a) preparing a concrete mixture by adding to the toxic mine tailings a mineral binder selected from the class of alkali-activated silico-aluminate geopolymers, to form a geopolymeric matrix of the poly(sialate) (—Si—O—Al—O—) and/or poly(sialate-siloxo) (—Si—O—Al—O—Si—O—) types, providing zeolitic properties associated with long-term durability as exemplified by archaeological records;

(b) subjecting said concrete mixture to an engineering process involving casting or pressing, to form a raw tailing disposal product;

(c) hardening said raw tailing disposal product to form an environmentally safe disposal product associated with archaeological long-term durability.

4,859,368

PROCESS FOR THE CONTAINMENT OF MATERIALS IN A CERAMIC MATRIX THROUGH THE CHEMICAL PRECIPITATION OF A HYDROSOL OF THE MATRIX

Erich Zimmer, Kreuzau-Bilstein; Hans Langen, Julich, and Kurt Scharf, Erftstadt, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Fed. Rep. of Germany

Filed Oct. 2, 1987, Ser. No. 104,760

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1986, 3634111

Int. Cl.[4] G21F *9/16;* **C09K** *3/00;* **C03C** *3/00*

U.S. Cl. 252—629 **2 Claims**



1. A process for containing or imbedding radio-active waste materials in a ceramic matrix, through chemical precipitation of a hydrosol, comprising the steps of;

preparing a hydrosol through the reaction of a nitrate with ammonia or ammonium hydroxide in a hydrosol preparation unit;

passing said hydrosol through a dialysis unit to separate any ammonium nitrate formed during said hydrosol preparation step from said hydrosol;

introducing said waste materials into said hydrosol;

trickling said hydrosol in a pouring column into a precipita-

tion bath for gelatinizing hydrosol particles into gel particles;
subsequently removing said gel particles from said bath for washing and then drying; and
sintering said dried gel particles in a reducing atmosphere to form said ceramic matrix;
wherein said waste material is introduced into said hydrosol such that said hydrosol is substantially devoid of ammonium nitrate.

4,859,369

USE OF WATER-SOLUBLE POLYMERS IN AQUEOUS CHEMICAL LIGHT FORMULATIONS

Bruce H. Baretz, New Canaan, and William J. Trzaskos, Ridgefield, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 24, 1984, Ser. No. 653,405
Int. Cl.[4] C09K *11/06*
U.S. Cl. 252—700 12 Claims

1. A composition for generating chemiluminescence comprising, in aqueous solution,
(a) 10^{-3} to 5 molar concentration of a water-soluble reactant which generates light by reaction with hydrogen peroxide,
(b) 10^{-5} to 1 molar concentration of a water-soluble or water-dispersible organic fluorescer having spectral emission in the range about 300 to 1000 nanometers and
(c) from about 10^{-2} to about 50%, by weight, based on the total weight of the solution, of a water-soluble polymer.

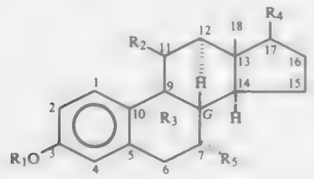
4,859,370

9 ALPHA, 11 BETA-SUBSTITUTED AND 11 BETA-SUBSTITUTED ESTRANES

David F. Crowe, Yreka; Masato Tanabe, Palo Alto, and Richard Peters, San Jose, all of Calif., assignors to SRI International, Menlo Park, Calif.

Division of Ser. No. 748,489, Jun. 25, 1985, Pat. No. 4,705,783.
This application Aug. 24, 1987, Ser. No. 88,802
Int. Cl.[4] C07J *1/00*
U.S. Cl. 260—397.45 15 Claims

1. A compound of the formula



wherein
R_1 is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl and lower acyl;
R_2 is a halo;
R_4 is selected from the group consisting of a carbonyl oxygen and a pair of substituents the α one of which being lower alkynyl, and the β one of which being hydroxyl and a pair of substituents the α one of which being hydrogen and the β one being lower alkyl; and
R_5 is selected from the group consisting of lower alkyl and hydrogen.

4,859,371

EXTRACTION OF PARTICULATE MATERIALS

Levente L. Diosady, Willowdale; Leon J. Rubin, Toronto, and Csaba G. Tar, Mississauga, all of Canada, assignors to The University of Toronto Innovations Foundation, Toronto, Canada

Filed Apr. 29, 1987, Ser. No. 43,868
Int. Cl.[4] C11B *1/10*
U.S. Cl. 260—412.4 20 Claims

1. A method of extracting components from solid particulate material comprising the steps of:
mixing said particulate material with a first extraction solvent to provide a slurry;
passing said slurry through an extraction zone;
passing a second extraction solvent countercurrently to said slurry through said extraction zone, said second solvent having a different density than said first solvent and being substantially immiscible in said first solvent;
wherein (i) said solid particulate material is an oil bearing seed selected from the group comprising rapeseed, canola, soy, sunflower, cottonseed, peanut and mustard seed; and (ii) one extraction solvent is non-polar and the other extraction solvent is polar.

4,859,372

PROCESS FOR THE SULPHONATION OF AROMATIC COMPOUNDS WITH SULPHUR TRIOXIDE

Horst Behre, Odenthal-Elkamp; Heinz U. Blnak, Odenthal; Wilfried Köhler, Cologne; Nikolaus Müller, Leverkusen, and Peter Schnegg, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 6, 1989, Ser. No. 296,396
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1983, 3330334
Int. Cl.[4] C07C *143/24*
U.S. Cl. 562—74 3 Claims

1. In a process for the preparation of an aromatic sulfonic acid by sulfonation of an aromatic compound wherein the sulfonating agent consists of sulfur trioxide and the sulphonation is carried out in an aliphatic halogenohydrocarbon, the improvement which comprises carrying out the sulphonation in the presence of 0.01 to 0.9 moles of hydrogen halide per mol of sulfur trioxide at temperatures from −40° to +20° C.

4,859,373

PROCESS FOR THE PRODUCTION OF ALKANESULPHONIC ACIDS

Jean Ollivier, Arudy; Christian H. Lagaude, Pau; Hubert Baptiste, Lescar, and Michèle Larrouy, Pau, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Jan. 27, 1988, Ser. No. 148,867
Claims priority, application France, Feb. 25, 1987, 87 02476
Int. Cl.[4] C07C *143/16*
U.S. Cl. 562—119 10 Claims

1. A process for the production of an alkanesulphonic acid comprising hydrolyzing, in the heated state, an alkanesulphonyl chloride, which process is continuous, characterized in that the hydrolysis reaction is initiated by prior use of required activation energy to the reaction medium wherein said activation is supplied in the form of latent heat of liquifaction of steam, by mixing a hot steam with said alkanesulphonyl chloride.

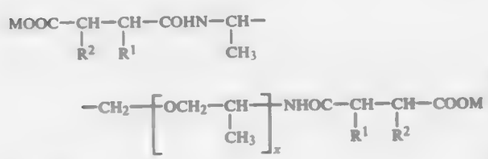
4,859,374

SULFOSUCCINAMIDO ACIDS OF POLYOXYPROPYLENEDIAMINES AND THEIR USE AS EMULSIFIERS

Udo-Winfried Hendricks, Odenthal, and Adolf Schmidt, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 24, 1988, Ser. No. 159,764
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1987, 3707439
Int. Cl.[4] C07C *143/02;* B01F *17/00*
U.S. Cl. 562—102 2 Claims

1. Sulfosuccinamido acid and salt thereof corresponding to the following general formula



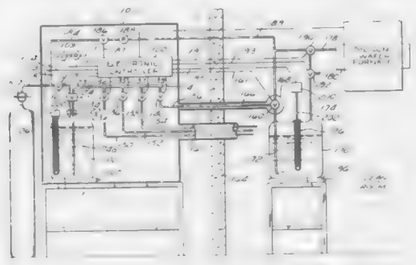
in which
x is a number of 5 to 60
M is hydrogen, an alkali metal, an ammonium, C_1–C_4 alkylammonium or C_2–C_3 hydroxyalkylammonium group, and, of the substituents R^1 and R^2, one is hydrogen and the other is $—SO_3M$.

4,859,375

CHEMICAL REFILL SYSTEM

Bruce A. Lipisko, Carlsbad; John C. Schumacher, Rancho Santa Fe; Richard E. Howard, Escondido; Peter T. Randtke, San Marcos; Adrian Sandu, La Mesa; Robert E. Fletcher, Vista, and Hans-Juergen Graf, Oceanside, all of Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 29, 1986, Ser. No. 946,828
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—20 18 Claims



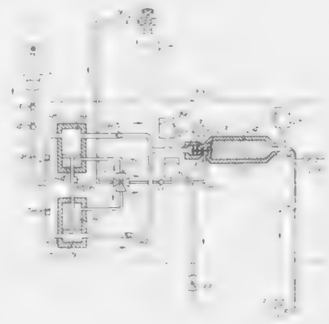
1. A system for providing chemically reactive vapor from a bubbler to silicon wafer treating furnaces and the like, comprising, in combination:
(a) a refill reservoir **102** for containing and dispensing ultra-high purity highly chemically reactive reagent;
(b) at least one bubbler **170** comprising a reagent reservoir, an inlet tube **172** for introducing inert gas into the reservoir below the surface of the reagent to cause said gas to bubble inwardly through the reagent, an outlet tube **174** for carrying inert gas at least partially saturated with reagent vapor from the bubbler;
(c) means **104–108, 120–168**) including a conduit system for periodically (i) transferring reagent from the refill reservoir through the conduit system into the bubbler and (ii) flushing reagent out of the conduit system and filling the conduit system with inert gas, substantial portions of the conduit system being formed of material which is inert to the reagent conducted therethrough, but permeable to moisture vapor or oxygen or both;
enclosure means substantially enclosing the reservoir and the conduit system, said enclosure means being formed of material which is reactive with the reagent but impermeable to moisture vapor and oxygen; and
means for maintaining an inert atmosphere in said enclosure.

4,859,376

GAS-DRIVEN CARBONATOR AND METHOD

Mark W. Hancock, and Marvin M. May, both of Los Angeles, Calif., assignors to Aquatec, Hollywood, Calif.

Filed Jun. 26, 1987, Ser. No. 67,803
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—35 10 Claims



1. Carbonator apparatus comprising:
fluid mixing means for combining liquid and gas therein including a conduit disposed to direct fluid flow therethrough between a liquid inlet and a fluid outlet and having a gas inlet coupled thereto at a location therealong intermediate the liquid inlet and fluid outlet;
pumping means for pumping liquid into the liquid inlet of the fluid mixing means in response to gas under pressure transferred through said pumping means
said pumping means includes a plurality of variable-volume chambers coupled to operate in synchronized movement for admitting liquid into at least one of the variable-volume chambers to be expelled by gas under pressure admitted into another of the variable-volume chambers;
valve means coupled to respond to said movement for selectively controlling the exhausting of gas under pressure transferred through a selected one of the variable-volume chambers;
first source means coupled to supply liquid to the pumping means;
second source means of gas under pressure coupled to supply gas to the pumping means for pumping liquid into said liquid inlet;
means coupling the exhausted gas transferred through the pumping means to the gas inlet of said fluid mixing means; and
dispensing valve means coupled to the fluid outlet of said fluid mixing means for selectively controlling the dispensing of liquid combined with gas from the fluid outlet of said fluid mixing means.

4,859,377

STARCH ENCAPSULATION OF ENTOMOPATHOGENS

Baruch S. Shasha, Peoria, and Richard L. Dunkle, Morton, both of Ill., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 10, 1987, Ser. No. 72,205
Int. Cl.[4] B01J *13/02*; C12N *11/10*
U.S. Cl. 264—4.1 10 Claims

1. A method for the encapsulation of an entomopathogenic biocontrol agent comprising the steps:

a. preparing an aqueous dispersion of a retrodegradable, amylase-digestible, pregelatinized starch having an amylose content of above about 5% and an effective amount of said biocontrol agent, wherein said biocontrol agent is a living pathogen of insects selected from the group consisting of bacteria, fungi, yeasts, viruses, microsporidians, protozoa, and phages, and wherein the relative amount of the starch with respect to the agent is sufficient to entrap the agent within a matrix of the starch;

b. subjecting the dispersion consisting essentially of said starch, said biocontrol agent and water to gelation conditions whereby the amylose components will reassociate with one another and thereby transform said dispersion into a continuous insolubilized matrix having entrapped therein uniformly dispersed, discontinuous domains of the agent; and

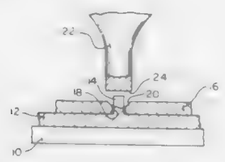
c. converting said matrix into discrete, free-flowing, nonagglomerating particles.

4,859,378

METHOD OF ULTRASONICALLY ASSEMBLING WORKPIECES

Jeffrey S. Wolcott, Sandy Hook, Conn., assignor to Branson Ultrasonics Corporation, Danbury, Conn.

Filed Oct. 28, 1988, Ser. No. 263,864
Int. Cl.[4] B29C *65/08*
U.S. Cl. 264—23 5 Claims



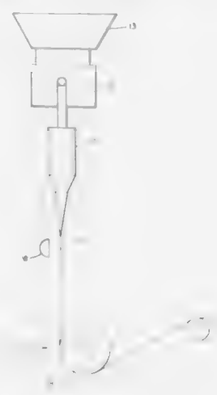
2. The method of providing an ultrasonically staked assembly of two workpieces comprising the steps of providing a first thermoplastic workpiece having an upstanding stud; providing an apertured second workpiece; disposing said second workpiece upon said first workpiece so that said stud extends through said aperture of said second workpiece and above the exposed surface of said second workpiece. deforming the upstanding end of said stud by bringing a horn adapted to be mechanically resonant at an ultrasonic frequency into forced contact with said upstanding end, whereby responsive to the application of ultrasonic vibrations to said stud and the dissipation of ultrasonic energy the thermoplastic material of said upstanding stud end is caused to soften and become displaced, the improvement comprising: rendering said horn while in contact with said stud resonant during first time periods which alternate with second time periods during which said horn is rendered substantially inactive.

4,859,379

PROCESS FOR REDUCING DRAW RESONANCE BY HEATING FILM AFTER EXTRUSION

Alan W. Chiang, North Vassalboro, Me., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1987, Ser. No. 139,414
Int. Cl.[4] B29C *47/88*
U.S. Cl. 264—25 18 Claims



1. A process for forming film from a melted polymer comprising:

(a) extruding the polymer through a slot-die under high Deborah number condition;

(b) heating the extruded film while it is in the molten state,

(c) cooling the film; and

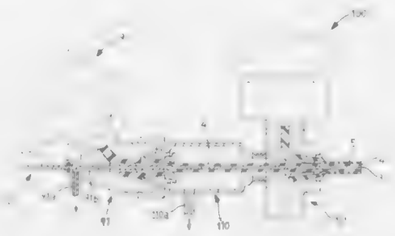
(d) drawing the film in the machine direction; said heating in step (b) being sufficient to obtain a film which is more uniform in thickness than a film prepared under the same conditions but without said heating step.

4,859,380

METHOD AND APPARATUS FOR PRODUCING FIBER-REINFORCED RUBBER HOSE

Kazuhiro Ogata, Komaki, Japan, assignor to Tokai Rubber Industries, Ltd., Japan

Filed Jan. 19, 1988, Ser. No. 145,412
Claims priority, application Japan, Jan. 23, 1987, 62-13782
Int. Cl.[4] B29C *47/28*
U.S. Cl. 264—25 12 Claims



1. A method of producing a fiber-reinforced rubber hose, comprising the steps of:

extruding an unvulcanized inner rubber tube on an outer surface of a mandrel made of a resin or rubber material;

forming a tubular reinforcing fiber layer having an interlaced structure on an outer surface of said inner rubber tube;

extruding an unvulcanized outer rubber tube on an outer surface of said reinforcing fiber layer, at one of opposite ends of an enclosed vacuum chamber under a reduced pressure;

continuously feeding an intermediate extruded product consisting of said mandrel, said unvulcanized inner and outer rubber tubes and said reinforcing fiber layer, through said enclosed vacuum chamber;

extruding a cover tube of a resin on an outer surface of said outer rubber tube of said intermediate extruded product, at the other end of said enclosed vacuum chamber;

cooling said cover tube to a temperature sufficiently low to harden said resin to an extent that substantially inhibits expansion of said outer rubber tube in the hardened cover tube;

microwave-heating said unvulcanized inner and outer rubber tubes to soften said rubber tubes, and cause a thermal shrinkage of said tubular reinforcing fiber layer, thereby causing a portion of said inner rubber tube to be forced through a network of said interlaced structure of said reinforcing fiber layer into said outer rubber tube;

vulcanizing said unvulcanized inner and outer rubber tubes while externally heating said rubber tubes; and

removing said cover tube to expose said outer rubber tube.

3. An apparatus for producing a fiber reinforced rubber hose, comprising:

first extruding means for extruding an unvulcanized inner rubber tube on an outer surface of a mandrel made of a resin or rubber material;

forming means for forming a tubular reinforcing fiber layer having an interlaced structure on an outer surface of said inner rubber tube;

second extruding means including an extruding head for extruding an unvulcanized outer rubber tube on an outer surface of said reinforcing fiber layer;

third extruding means including an extruding head for extruding a cover tube of a resin on an outer surface of said outer rubber tube;

means for defining an enclosed vacuum chamber which is connected to a vacuum source and which is disposed so as to connect said extruding heads of said second and third extruding means;

means for cooling said cover tube to a temperature sufficiently low to harden said resin to an extent that substantially inhibits expansion of said outer rubber tube in the hardened cover tube;

means for microwave-heating said unvulcanized inner and outer rubber tubes to soften said rubber tubes, and cause a thermal shrinkage of said tubular reinforcing fiber layer, thereby causing a portion of said inner rubber tube to be forced through a network of said interlaced structure of said reinforcing fiber layer into said outer rubber tube;

means for vulcanizing said unvulcanized inner and outer rubber tubes while externally heating said rubber tubes; and

means for removing said cover tube to expose said outer rubber tube.

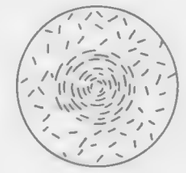
4,859,381

PROCESS FOR PREPARING PITCH-TYPE CARBON FIBERS

Hiroaki Morita, Osaka; Kazutoshi Haraguchi, Matsudo, and Eiji Tanigawa, Kawanishi, all of Japan, assignors to Osaka Gas Company Limited, Osaka and Dainippon Ink and Chemicals Inc., Tokyo, both of, Japan

PCT No. PCT/JP87/00041, § 371 Date Nov. 18, 1987, § 102(e) Date Nov. 18, 1987
PCT Filed Jan. 22, 1987, Ser. No. 105,428
Claims priority, application Japan, Jan. 22, 1986, 61-12848
Int. Cl.[4] D01F *9/00*
U.S. Cl. 264—29.2 10 Claims

1. A process for preparing pitch-type carbon fibers exhibiting a high tensile strength and substantially free of flaws by melt-spinning a pitch-type material into a fiber, rendering the fiber infusible and then carbonizing said fiber, comprising the steps of passing molten pitch, before reaching a final nozzle orifice, through a capillary portion having a circular, non-circular, or slit type sectional shape to thereby apply a shearing



stress of at least ½ as high as the level of shearing stress to be exerted during passage through the final nozzle orifice and then maintaining the molten pitch for a time in a state substantially free of shearing stress, and then passing the pitch through the final nozzle orifice to spin said pitch into a fiber.

4,859,382

PROCESS FOR PREPARING CARBON FIBERS ELLIPTICAL IN SECTION

Kazutoshi Haraguchi, Matsudo; Eiji Tanigawa, Kawanishi; Kenji Nukina, Kashiwa; Hiroaki Morita, Osaka, and Toyohiro Maeda, Tsurl, all of Japan, assignors to Osaka Gas Company Limited, Osaka and Dainippon Ink and Chemicals Inc., Tokyo, both of, Japan

PCT No. PCT/JP87/00040, § 371 Date Nov. 16, 1987, § 102(e) Date Nov. 16, 1987
PCT Filed Jan. 22, 1987, Ser. No. 105,427
Claims priority, application Japan, Jan. 22, 1986, 61-12847
Int. Cl.[4] D01F *9/00*
U.S. Cl. 264—29.2 8 Claims



1. A process for preparing a carbon fiber having an elliptical cross section and substantially free of microscopic flaws, comprising the steps of extruding spinnable pitch from a nozzle with an orifice being rectangular or non-circularly shaped in cross section and having a width/height ratio of more than 1, fully relaxing the molecules in the extruded pitch oriented by the nozzle on discharge from the nozzle, effecting continuous winding-up to obtain a pitch fiber elliptical in cross section, rendering the fiber infusible and then carbonizing said fiber.

4,859,383

PROCESS OF PRODUCING A COMPOSITE MACROSTRUCTURE OF ORGANIC AND INORGANIC MATERIALS

Mark E. Dillon, Watertown, Mass., assignor to Bio Med Sciences, Inc., Amherst, N.Y.

Division of Ser. No. 56,386, Jun. 1, 1987. This application Apr. 25, 1988, Ser. No. 185,424
Int. Cl.[4] B28C *3/00*; B29C *71/00*
U.S. Cl. 264—43 4 Claims

1. A process of producing a composite macrostructure comprising the steps of first (1) intimately blending a mixture of a major amount of unsintered and unfibrillated particulate polytetrafluoroethylene resin and minor amounts of (A) a hydrocarbon liquid and (B) an addition curable silicone composition containing a crosslinking catalyst, then (2) intimately blending with the product of step (1) both a particulate ceramic material selected from the group consisting of hydroxyapatite and

tricalcium phosphate and a particulate sodium chloride whose particle size is determined by a desired size of open pores in the macrostructure, then (3) introducing the product of step (2) into opposing streams of air within a mill so as to form a homogeneous particulate mixture, then (4) subjecting the product of step (3) to mechanical pressure within a die, then (5) hot pressing the product of step (4) at a temperature sufficient to sinter the polytetrafluoroethylene and to cure the silicone composition and then (6) solubilizing the particulate sodium chloride so as to create a network of open pores in the product of step (6) corresponding in size to the original sodium chloride particles.

4,859,384

NOVEL POLYAMIDE REVERSE OSMOSIS MEMBRANES

Richard F. Fibiger, Midland, Mich.; Ja-young Koo, Plymouth, Minn.; David J. Forgach, Midland, Mich.; Robert J. Petersen, Minnesota, Minn.; Donald L. Schmidt; Ritchie A. Wessling, both of Midland, Mich., and Thomas F. Stocker, St. Paul, Minn., assignors to Filmtec Corp., Minneapolis, Minn. and Dow Chemical Company, Midland, Mich.

Division of Ser. No. 122,307, Nov. 18, 1987, Pat. No. 4,769,148. This application Jun. 13, 1988, Ser. No. 205,576

Int. Cl.[4] B01D *13/04*

U.S. Cl. 264—45.1 18 Claims

1. In a process for making a composite reverse osmosis membrane having a crosslinked polyamide discriminating layer made by interfacial polymerization on a porous support of an essentially water-soluble reactive polyamine present in an aqueous solution and a relatively water-insoluble, polyfunctional acyl halide having an average acyl halide functionality of at least 2, said acyl halide being present in an organic solution, the improvement comprising conducting the interfacial polymerization in the presence of an effective amount of a polymeric wetting agent bearing a plurality of ionic moieties.

4,859,385

METHOD FOR MAKING A FURNACE COMPONENT

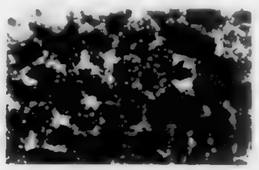
Takashi Tanaka, and Yoshiyuki Watanabe, both of Oguni, Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 877,946, Jun. 24, 1986, abandoned. This application Jun. 29, 1988, Ser. No. 213,459

Claims priority, application Japan, Jul. 9, 1985, 60-149345

Int. Cl.[4] B29C *71/00*; C04B *35/56, 35/64, 41/81*

U.S. Cl. 264—62 8 Claims



1. A method for making a component for a semi-conductor diffusion furnace, comprising the steps of:

(a) obtaining, as separate powders, (i) intermediate silicon carbide having an average particle size of 10–30 microns and (ii) coarse silicon carbide having an average particle size of 40–200 microns;

(b) blending about 10 parts by weight of the intermediate silicon carbide powder and about 10–25 parts by weight of the coarse silicon carbide powder to form a mixture;

(c) admixing an organic binder with the mixture;

(d) thereafter granulating the mixture thereby to produce pellets;

(e) preforming the pellets by a rubber press thereby to produce a formed body;

(f) presintering the formed body thereby to produce a presintered body;

(g) impregnating the presintered body with silicon; and

(h) sintering the presintered body, to produce a high quality component for a semi-conductor diffusion furnace having a homogeneous Si-SiC microstructure, and improved mechanical strength and physical characteristics.

4,859,386

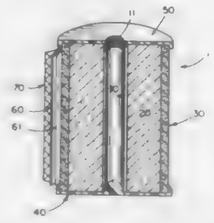
METHOD OF MAKING A WATER FILTER

Herbert J. VanderBilt, Lowell, and Timothy D. Modert, Grand Rapids, both of Mich., assignors to Amway Corporation, Ada, Mich.

Division of Ser. No. 849,167, Apr. 7, 1986, Pat. No. 4,753,728. This application Feb. 1, 1988, Ser. No. 150,828

Int. Cl.[4] B32B *1/10*

U.S. Cl. 264—113 32 Claims



1. A method of making a composite charcoal filter having inner and outer shells of two different types of charcoal particles comprising:

providing a mold defining the exterior configuration of said composite filter;

placing a separator in said composite mold at the desired juncture between said inner and outer shells;

mixing said inner shell carbon material with a binder and filling it into said mold to the inside of said separator;

mixing said outer shell carbon material with said binder and filling it into the space to the outside of said separator,

said binder comprising a low melt index polymeric material having a sufficiently low melt index that it will tackify at elevated temperatures without becoming sufficiently liquid to substantially wet the carbon particles in order that diminution of the effective caron surface is minimized; and

removing said separator and subjecting said two different carbon materials and their binders to heat and pressure to cause said carbon particles to bind to each other and to cause said inner shell of carbon material to bond to said outer shell of carbon material whereby an integral composite filter can be obtained, wherein said heat and pressure are applied such that said binder does not become sufficiently liquid to substantially wet the carbon particles in order that diminution of the effective carbon surface is minimized.

4,859,387

BEADER DRUM METHOD

James E. McGuffin, West Monroe, La., assignor to Columbian Chemicals Company, Atlanta, Ga.

Filed Jan. 26, 1988, Ser. No. 148,615

Int. Cl.[4] B29B *9/08*

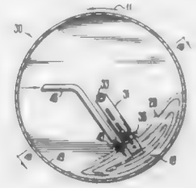
U.S. Cl. 264—117 1 Claim

1. The process of introducing a powdery material into a fluent bed of beaded material within a rotating beader drum, comprising the steps of:

placing a bed of fluent beaded material within the drum such that the beaded material tends to travel part-way up one side of the rotating drum, so that a surface layer of beads

in the bed flows by gravity down the bed as the drum rotates;

creating an open furrow in the surface layer at a location up the one side of the rotating drum; and



introducing the powdery material into the open furrow on the surface layer, and then covering the powdery material with the fluent beaded material of the surface layer as the beaded material flows to close the furrow while the drum rotates, thereby enclosing the powdery material before the powdery material can contact the drum.

4,859,388

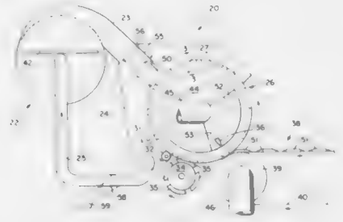
IMPROVED METHOD OF MAKING DISCRETE AIRLAID ABSORBENT FIBROUS ARTICLES

David A. Peterson, Cincinnati, Ohio, and Douglas H. Benson, West Harrison, Ind., assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 820,901, Jan. 16, 1986, abandoned, which is a continuation of Ser. No. 576,099, Feb. 1, 1984, abandoned. This application Nov. 3, 1987, Ser. No. 117,898

Int. Cl.[4] B27N *3/14*

U.S. Cl. 264—121 1 Claim



1. An improved method of making discrete absorbent fibrous articles by depositing air-entrained fibers in discrete closed-bottom deposition cavities, said improvement comprising the steps of:

rotating a drum having said cavities:

overfilling each of said cavities with said fibers;

continuously scarfing away the excess of said fibers to thereby form in each said cavity an uncompacted preform of a said article having the size and shape of said cavity, a thickness equal to the depth of said cavity, and an outwardly exposed top surface;

rotating a lugged cylinder in synchronous relation with said drum;

mechanically compacting each said preform to reduce its thickness by a predetermined amount while it is disposed in its respective said rotating cavity, said compacting being effected by mechanical rolling of a lug of said lugged cylinder against said top surface and thereby converting each said preform into a said article; and then discharging each said article from its respective deposition cavity.

4,859,389

PROCESS FOR PREPARING POLYAMIDE FIBERS HAVING IMPROVED PROPERTIES

Kazuo Kurita, Ohtsu, and Hideaki Ishihara, Uji, both of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

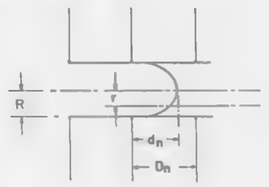
Division of Ser. No. 831,376, Feb. 20, 1986, Pat. No. 4,701,377. This application Jul. 29, 1987, Ser. No. 79,162

Claims priority, application Japan, Feb. 20, 1985, 60-32218

The portion of the term of this patent subsequent to Nov. 25, 2003, has been disclaimed.

Int. Cl.[4] D01D *5/12*

U.S. Cl. 264—130 9 Claims



1. A process for preparing a polyamide fiber excellent in strength, comprising the steps of:

spinning a polyamide having a relative viscosity of not less than 2.3 in a melt state through a spinning orifice to produce filaments;

introducing the filaments to a cooling zone for cooling;

sealing the atmosphere between the spinning orifice and the cooling zone with a heated inert gas;

taking up the filaments to make an index of birefringence of 13×10^{-3} or less;

drawing the filaments taken up by:

(a) transferring the filaments onto a first supply roller and then a second supply with application of a pre-draft of less than 20% between the first supply roller and the second supply roller;

(b) transferring the resultant pre-drafted filaments onto a first draw roller kept at a temperature of not lower than 100° C. while jetting super-heated steam of not lower than 200° C. from a jet nozzle, provided between the second supply roller and the first draw roller, onto the pre-drafted filaments so as to achieve a first drawing of not less than 50% of the total drawing capacity; and

(c) transferring the resulting drawn filaments onto a second draw roller kept at a temperature of not lower than 150° C., while passing the drawn filaments through a heating zone provided between the first draw roller and the second draw roller, with the temperature at the entrance to the heating zone being lower than the temperature at the exit from the heating zone, to achieve a second drawing; and

relaxing the resultant drawn filaments at a proportion of 3 to 15% by heating.

4,859,390

PROCESS FOR THE PRODUCTION OF POLYAMIDE MOULDINGS

Karl H. Fritsch, Bergisch Gladbach, and Peter Bier, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 765,457, Aug. 14, 1985, abandoned. This application Nov. 4, 1987, Ser. No. 117,517

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 3431271

Int. Cl.[4] B29C *47/88*; B29B *9/06*

U.S. Cl. 264—143 5 Claims

1. A process for the production of improved polyamide mouldings, wherein the polyamide of a relative viscosity of from 2.0 to 5.0 measured as a 1% by weight solution in m-

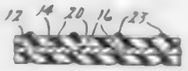
cresol at 25° C., is first melt extruded through nozzles of 1–8 mm to form solid strands, which at a temperature of from 25° C. below the respective polyamide softening point are stretched longitudinally in a ratio of from 1:1.5 to 1:8, the strand being passed on stretching through two heating zones with temperatures adjusted from 25° C. to 300° C., the heating zones lying between stretching roller pairs, the strands then being granulated, and the granulates are then injection moulded at temperatures not exceeding 280° C. to product polyamide having improved resistance to breaking and higher elongation at break.

4,859,391

METHOD OF MAKING A SMOOTH FLEXIBLE FLANGE COVER

Norman C. Jackson, Livonia, Mich., assignor to The Standard Products Company, Cleveland, Ohio

Filed May 3, 1988, Ser. No. 189,656
Int. Cl.[4] B29C *47/02*; B32B *31/12, 31/30*
U.S. Cl. 264—162 **7 Claims**



1. A method of making a flange cover for attachment to a vehicle, said method comprising the steps of:
- forming a core member having a plurality of longitudinally spaced clip members and a plurality of apertures between said clip members;
- extruding an outer layer of elastomeric material about the core member;
- bending the core member and outer layer and forming the core member and outer layer to a predetermined configuration, whereby the outer surface has ridges corresponding to said clip members and valleys corresponding to the apertures;
- grinding the ridges of at least a portion of the outer layer to a height less than their original height; and
- extruding a cover layer about the ground portion and forming a smooth continuous planar outer surface.

4,859,392

PROCESS AND DEVICE FOR THE PRODUCTION OF PLASTIC FILMS

Heinz Vetter, Rossdorf, Fed. Rep. of Germany, assignor to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed May 24, 1988, Ser. No. 198,051
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 3719242
Int. Cl.[4] B29C *59/04*
U.S. Cl. 264—166 **9 Claims**



1. A process for the production of plastic film, said process comprising the steps of:
- (a) extruding a web having a first surface and a second surface from a slot die; then
- (b) passing the web around at least a portion of the periphery of a cooling roll such that the first surface of the web is in contact with the cooling roll; and then
- (c) passing the web between the cooling roll and a pressure roll that is parallel to and spaced from the cooling roll such that, along the line at which the cooling roll is closest to the pressure roll:
  - (i) the first surface of an upstream portion of the web is in line contact with the cooling roll;
  - (ii) the second surface of the upstream portion of the web is in line contact with the first surface of a downstream portion of the web; and
  - (iii) the second surface of the downstream portion of the web is in line contact with the pressure roll.

4,859,393

METHOD OF PREPARING POLY (P-PHENYLENETEREPHTHALAMIDE) YARNS OF IMPROVED FATIGUE RESISTANCE

Hung H. Yang, and Minshon J. Chiou, both of Richmond, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 2, 1988, Ser. No. 162,967
Int. Cl.[4] D01D *5/06*; D01F *6/60*
U.S. Cl. 264—184 **3 Claims**

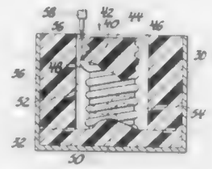
1. A method for preparing poly(p-phenylene terephthalamide) yarn of improved fatigue resistance comprising the steps of:
- (a) spinning a spin dope containing from 17 to 20% by wt. of said polymer in 98 to 102% sulfuric acid through an air gap into an aqueous coagulating bath to produce a coagulated yarn;
- (b) maintaining the coagulating bath at a temperature of at least about 20° C.;
- (c) washing and neutralizing the yarn while it is under a tension of from 0.2 to 0.4 grams per denier; and
- (d) drying the yarn at a temperature below 200° C. while it is maintained under a tension of 0.05 to 0.2 grams per denier.

4,859,394

METHOD OF MOLDING A ONE PIECE PLASTIC BALL NUT

Robert L. Benton, Bay City, and Joseph A. Rutkiewicz, Saginaw, both of Mich., assignors to Thomson Saginaw Ball Screw Co., Inc., Saginaw, Mich.

Continuation of Ser. No. 794,822, Nov. 4, 1985, abandoned, and a continuation-in-part of Ser. No. 541,550, Oct. 13, 1983, abandoned. This application May 26, 1987, Ser. No. 56,273
Int. Cl.[4] B29C *33/42, 39/02*; B29D *15/00*
U.S. Cl. 264—225 **2 Claims**



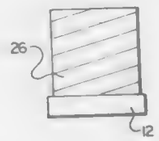
1. A method of pour molding a one-piece plastic ball nut for a ball nut and screw assembly, the ball nut have formed therein an internal helical ball groove and a ball return crossover channel, the method comprising the steps of:
- placing a master model ball nut within a container, the model ball nut having a cylindrical body with inner and outer cylindrical walls and an opening formed axially through the body, the inner cylindrical wall having an internal helical ball groove, with turns connected by an internal crossover channel, formed therein for carrying a train of balls, the master model ball nut cylindrical body being a metal body provided with a radial opening formed in its outer wall which intersects the longitudinal axis of the nut and two adjacent turns of the helical ball groove, and there being a plastic insert provided in the radial opening which has a crossover channel internally formed therein to provide a ball path which interconnects the two adjacent turns of the helical groove;
- adding a silicone rubber material to the container until the material covers the outer cylindrical wall of the master model ball nut and fills the axial opening thereof;
- curing said silicone rubber material;
- removing the master model ball nut from the cured silicone rubber material so that said silicone rubber material forms a unitized resilient and slippery imprint mold for said one-piece ball nut, the unitized imprint mold having a cylindrical wall and an upstanding cylindrical core integrally joined to the cylindrical wall, the wall and the core defining a cavity between them;
- filling the cavity of the unitized imprint mold with a plastic resin;
- allowing said resin to harden to form an all plastic ball nut with a helical ball groove and crossover channel formed therein; and
- removing the plastic ball nut from the imprint mold to clear said imprint mold so that another plastic ball nut can be molded therein.

4,859,395

METHOD FOR ENCAPSULATING HAZARDOUS WASTES USING A STAGED MOLD

Samuel L. Unger, Los Angeles; Rodney W. Telles, Alhambra, and Hyman R. Lubowitz, Rolling Hills Estates, all of Calif., assignors to Environmental Protection Polymers, Inc., Hawthorne, Calif.

Division of Ser. No. 792,336, Oct. 29, 1985, Pat. No. 4,756,681. This application Jul. 25, 1986, Ser. No. 889,213
Int. Cl.[4] B29C *43/20*
U.S. Cl. 264—254 **7 Claims**



1. A method for molding a first moldable material into an agglomerate having a top, sides, and a bottom and encapsulating the agglomerate with a second moldable material, comprising the steps of:
- combining a first mold base and a first mold body;
- loading the first mold base and a first mold body with the first moldable material;
- compressing the first moldable material with a first mold top;
- heating the first moldable material to form the agglomerate;
- removing the first mold top and body from the top and sides of the agglomerate;
- leaving the agglomerate sitting on the first mold base;
- combining the first mold base with the agglomerate sitting thereon and a second mold body;
- loading the first mold base and second mold body with the second moldable material to cover the agglomerate on the sides and top;
- compressing the second moldable material with a second mold base;
- heating the second moldable material to jacket the agglomerate on the sides and top;
- inverting the first mold base, second mold body, second mold base, and jacketed agglomerate;
- removing the first mold base to expose the bottom of the agglomerate;
- loading the second moldable material on the bottom of the agglomerate and the second moldable material jacketing the sides of the agglomerate adjacent the bottom;
- compressing the second moldable material on the top of the bottom of the first mold base;
- heating the second moldable material adjacent the first mold base to jacket the bottom of the agglomerate and fuse with the second moldable material jacketing the sides of the agglomerate; and
- removing the first mold base and the second mold body leaving the encapsulated agglomerate on the second mold base.

4,859,396

PROCESS OF PRODUCING TENSION-PROOF, IMPERMEABLE, FLEXIBLE BANDS, IN PARTICULAR FOR PRESSES TO DEWATER FIBER MATERIAL WEBS

Bernhard Krenkel, and Heinz Joos, both of Heidenheim, Fed. Rep. of Germany, assignors to F. Oberdorfer GmbH & Co. KG Industriegewebe-Technik, Heidenheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 823,138, Jan. 28, 1986, abandoned. This application Feb. 8, 1988, Ser. No. 153,152
Claims priority, application Fed. Rep. of Germany, May 25, 1983, 3318984
Int. Cl.[4] B28B *1/20*
U.S. Cl. 264—311 **4 Claims**

1. A process of producing a fluid impervious flexible coated fabric band including at least one reinforcing band under tension, said at least one reinforcing band being covered at least on one side by an impervious layer penetrating said at least one reinforcing band, comprising stretching the at least one reinforcing band onto a horizontally positioned cylinder, effecting rotation of said cylinder, pouring a flowing mixture of liquid polyurethane prepolymer and a cross linking agent onto said at least one reinforcing band in a stream at a temperature of approximately 20° C. to approximately 150° C. for impregnating said reinforcing band herewith whilst gradually shifting the pouring equipment for the said stream parallel to the longitudinal axis of said cylinder so that constant directional change of gravity relative to the at least one reinforcing band during rotation of said cylinder causes complete envelopment and penetration of the at least one reinforcing band, wherein the thickness of the raw coating being within the range of approximately 5 mm to approximately 7 mm.

4,859,397

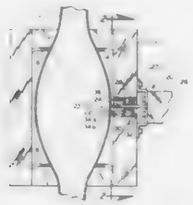
PREVENTING GAS LEAKAGE AROUND BLOW NEEDLE IN BLOW MOLDING METHOD

Donald L. Peters, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 158,440, Feb. 22, 1988, Pat. No. 4,799,876. This application Sep. 30, 1988, Ser. No. 252,297
Int. Cl.[4] B29C *49/18, 49/60*
U.S. Cl. 264—529 **7 Claims**

1. A method of blow molding an article from a parison comprising:
- (a) positioning the parison in a cavity defined between two mold halves;
- (b) puncturing the parison with a blow needle having an outlet end so as to extend the needle into the interior of the parison;
- (c) passing a gas from the outlet end of the blow needle so as to inflate the parison;
- (d) providing a sleeve around said blow needle, said sleeve having at least one projection extending therefrom which surrounds said blow needle;
- (e) positioning said sleeve with respect to said parison so that

said at least one projection extends into the cavity so as to contact the exterior surface of the parison, wherein step (b) is performed before said at least one projection contacts the parison and wherein said parison conforms to the shape of said at least one projection during inflation of



the parison so as to form sealing contact between the parison and said at least one projection, thereby effectively preventing loss of gas pressure within said parison due to leakage around said blow needle; and

(f) completing inflation of the parison so as to form the article.

4,859,398

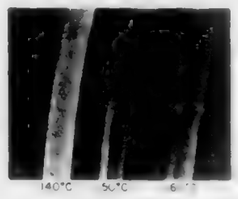
HIGH SHEAR EXTRUSION OF LINEAR LOW DENSITY POLYETHYLENE

Tien-Kuei Su, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 2, 1987, Ser. No. 69,543

Int. Cl.[4] B29C *47/86*

U.S. Cl. 264—564 **5 Claims**



1. A method for the reduction of melt fracture encountered during the high shear extrustion of polyethylene resins normally producing higher levels of melt fracture; comprising reducing the processing temperature of the polyethylene resin to a temperature of about 140° C. during extrustion of said polyethylene resin over the die lip of an extrusion apparatus, which temperature is only slightly higher than the melting temperature of the resin; and extensively increasing the shear rate of the resin to within the range of about 1,000 sec^{-1} to 1,500 sec^{-1} for extruding at an extremely high shear stress of above 2×10^5 dynes/inc.^{2}.

4,859,399

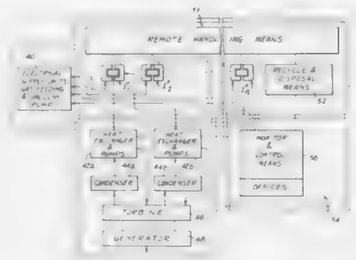
MODULAR FUSION POWER APPARATUS USING DISPOSABLE CORE

Robert W. Bussard, Arlington, Va., assignor to FDX Patents Holding Company, N.V., Curacao, Netherlands

Continuation of Ser. No. 738,906, May 29, 1985, abandoned, which is a continuation of Ser. No. 408,635, Aug. 16, 1982, abandoned, which is a division of Ser. No. 87,439, Oct. 22, 1979, Pat. No. 4,367,193, which is a continuation of Ser. No. 841,903, Oct. 13, 1977, abandoned. This application Oct. 27, 1987, Ser. No. 113,362

Int. Cl.[4] C21B *1/00*

U.S. Cl. 376—133 **20 Claims**



1. A modular installation for generating thermal energy from fusion reactions in an ionized plasma of fusible fuel comprising:

(a) a plurality of fusion core units each including as components thereof,

1. a vacuum plasma cavity for containing said fusible fuel said cavity in the form of a toroid surrounding a central region;
2. a plurality of toroidal field coils surrounding said plasma cavity for generating a toroidal magnetic field therein; and
3. ohmic heating means for inducing an ohmic heating current in the ionized plasma within the plasma cavity of each of said fusion core units for raising the temperature of said plasma, said ohmic heating means including a transformer means contained within said central region so that said toroidal plasma cavity surrounds said transformer means, and said ohmic heating current generating a poloidal magnetic field within said plasma, said components of each fusion core unit being so arranged and interconnected as to allow handling of said fusion core unit as a single entity;

(b) disconnectable means extending into each of said fusion core units for delivering said fusible fuel therein;

(c) a plurality of disconnectable means for transporting a cooling fluid to and through the toroidal field coils of each of said fusion core units;

(d) a power supply connected through disconnectable means to said toroidal field coils for generating a toroidal magnetic field for confining the ionized plasma within the plasma cavity of said fusion core units, said toroidal magnetic field having a strength of on the order of greater than 100 KG;

(e) said plurality of toroidal field coils comprising high-strength, non-superconducting conductors for sustaining said toroidal magnetic field and for withstanding said thermal energy;

(f) a plurality of blanket means, one corresponding to each of said fusion core units, each of said blanket means being positioned completely outside of and substantially surrounding said toroidal field coils, each of said blanket means comprising at least two modules;

(g) said toroidal field coils and said plasma cavity have no blanket means therebetween;

(h) means for connecting and disconnecting each of said disconnectable means, means for separating said at least two modules of each blanket means a distance sufficient to allow removal of the respective fusion core unit, means for removing and inserting a fusion core unit as a single entity between the separated modules of each blanket means;

(i) a plurality of blanket cooling fluid transport means connected to said plurality of blanket means for transporting a cooling fluid to and through each of said blanket means; and

(j) means, connected to at least one of the plurality of blanket cooling fluid transport means and the plurality of toroidal field cooling fluid transport means, for extracting thermal energy therefrom whereby the means for extracting thermal energy is operable to receive thermal energy from all of said plurality of fusion core units of said modular installation which are operating at a given time.

4,859,400

NUCLEAR REACTOR CORE RESTRAINT

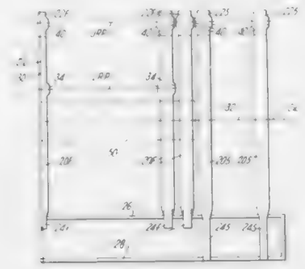
Andrew F. Curzon, Heaton Moor, United Kingdom, assignor to National Nuclear Corporation Ltd., Knutsford, United Kingdom

Filed Oct. 13, 1987, Ser. No. 106,590

Claims priority, application United Kingdom, Nov. 3, 1986, 8626138

Int. Cl.[4] G21C *1/00, 9/00*

U.S. Cl. 376—172 **8 Claims**



1. A nuclear reactor core assembly comprising an array of core sub-assemblies of which a first group forms a central core zone and a second group forms an annular outer core zone surrounding the central core zone, each subassembly of both groups comprising an elongate tubular wrapper provided at its lower end with a spike formation which engages in a support structure for supporting the sub-assemblies of both groups in upright parallel relationship and at its upper end with first abutment surfaces for contact with the corresponding first abutment surfaces of neighbouring sub-assemblies so as to form an upper restraint plane for the sub-assemblies of both groups, characterised in that:

at a level below the upper restraint plane, the wrappers of the first group of sub-assemblies, but not of the second group of sub-assemblies, are each provided with second abutment surfaces for contact with the corresponding second abutment surfaces of neighbouring sub-assemblies of the first group so as to form a lower restraint plane effective only for the sub-assemblies of the first group;

each of the sub-assemblies of the first group has a connection between the wrapper and the respective spike formation allowing tilting of the wrapper relative to the spike formation; and

each of the sub-assemblies of the second group has a connection between the wrapper and the respective spike formation which is stiffer than the connection aforesaid so that each second group sub-assembly, being subject by virtue of the stiffer connection to greater restraint against tilting of the wrapper relative to the spike formation, acts as a cantilever beam which, on take up of clearance between the first and second abutment surfaces, radially restrains the sub-assemblies inboard thereof, the radial restraint exerted by the second group sub-assemblies being effective for the first group subassemblies via the upper restraint plane.

4,859,401

NUCLEAR REACTOR

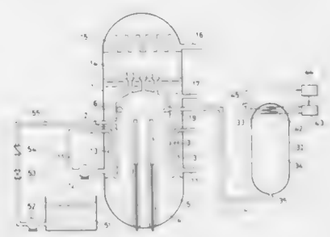
Michio Murase, Mito; Yoshiyuki Kataoka, Naka; Hisamichi Inoue, Takahagi; Masanori Naioh, and Toshihiko Sugisaki, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 14, 1986, Ser. No. 896,256

Claims priority, application Japan, Aug. 14, 1985, 60-177522

Int. Cl.[4] G21C *15/18*

U.S. Cl. 376—282 **8 Claims**



1. A nuclear reactor comprising:

a nuclear reactor pressure vessel containing nuclear fuel and cooling water;

a liquid storage container containing an emergency cooling liquid so as to separate it from said cooling water, and keeping the temperature of an upper part of said emergency cooling liquid higher than that of a lower part thereof, the lower part of said emergency cooling liquid being lower in temperature than the cooling water in said pressure vessel;

means, substantially free from any movable parts, for always communicating the lower temperature region of said liquid storage container and a reactor core region; and

wherein said liquid storage container is provided outside said pressure vessel, and a heater for heating the emergency cooling liquid is provided in an upper portion in said liquid storage container,

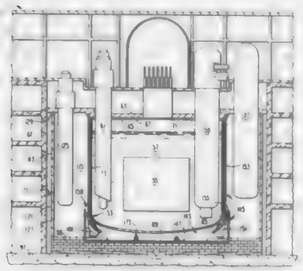
whereby when the cooling water in said pressure vessel flows out thereby to cause the pressure of said pressure vessel to decrease, the emergency cooling liquid in the high temperature region of said liquid storage container boils to generate vapor, the pressure of said vapor depresses the low temperature emergency cooling liquid in the lower part of said liquid storage container and supplies said emergency cooling liquid to said reactor core region of said pressure vessel through said communicating means.

4,859,402

BOTTOM SUPPORTED LIQUID METAL NUCLEAR REACTOR

Robert B. Tupper, Greensburg; James D. Mangus, Hempfield Township, Westmoreland County; John E. Sharbaugh, Bullskin Township, Fayette County; Gedney B. Brown, Wilkins Township, Allegheny County; Julie M. Livingston, North Huntingdon, and Asfandiar K. Dhalla, Latrobe, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 10, 1987, Ser. No. 95,989
Int. Cl.[4] G21C *13/00*
U.S. Cl. 376—285 26 Claims



1. A liquid metal nuclear reactor comprising:

a generally cylindrical closed bottom tank, for holding a pool of liquid metal coolant, having an open top, a closed arcuate bottom wall, and a cylindrical side wall extending upwardly therefrom;

a nuclear reactor core supported in said closed bottom tank within said pool of liquid metal coolant;

a guard tank, in which said closed bottom tank is disposed, having an arcuate closed bottom wall generally conforming to the arcuate bottom wall of said closed bottom tank, and a cylindrical shell extending upwardly therefrom;

support means within said guard tank, adjacent the arcuate bottom wall of said closed bottom wall, comprising an inwardly extending ledge adjacent the periphery of said arcuate wall of said closed bottom tank, fixed to the lower section of said guard tank, for supporting said arcuate bottom wall and cylindrical side wall in spaced relationship to said bottom wall and cylindrical shell of said guard tank when said closed bottom tank contains said pool of liquid metal;

a reactor cavity side wall surrounding the cylindrical shell of said guard tank;

a closure deck above the open top of said generally cylindrical closed bottom tank, with said closure deck supported by the reactor cavity side wall, and the cylindrical shell of said guard tank suspended from said closure deck;

a base mat having a refractory bed thereon upon which said guard tank is adapted to rest; and

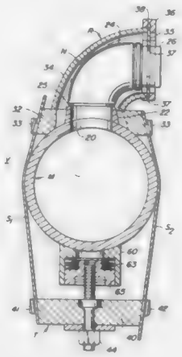
downwardly depending legs about the periphery of the bottom wall of said guard tank, with a predetermined gap provided between the said legs and said refractory bed when said closed bottom tank is empty of liquid metal, whereby when said closed bottom tank contains said pool of liquid metal under heated, operating conditions, axial expansion of said guard tank is effected and said legs rest on said refractory bed.

4,859,403

FEEDWATER SPARGER RESTRAINT

Robert C. Dixon, Morgan Hill, and Gerald A. Deaver, San Jose, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Sep. 29, 1987, Ser. No. 102,444
Int. Cl.[4] G21C *15/00*
U.S. Cl. 376—286 8 Claims



8. A restraint for a feedwater sparger nozzle in a reactor, said reactor having an arcuate sparger manifold with a plurality of sparger pipe elbows communicated to the interior of the sparger manifold at the lower end and extending upwardly and radially inward from the reactor vessel sidewalls to discharge feedwater radially and horizontally inward through said attached sparger nozzles away from the reactor vessel sidewalls at the upper end, said restraint comprising in combination a sparger restraint assembly; a sparger mounting assembly; said sparger restraint assembly including a restraint elbow for fitting over and encasing said sparger pipe elbow; a saddle mounted to said restraint elbow and shaped to fit on said sparger manifold in substantial water tight relation to confine water leaking from said sparger nozzle into the interstices of said restraint elbow;

a nozzle plate for mounting to the nozzle end of said restraint elbow, said nozzle plate defining an aperture for receiving said nozzle of said sparger;

a fitting for maintaining said nozzle plate over the end of said restraint elbow and permitting movement of said nozzle plate with respect to said restraint elbow;

mounting means including a seat for bearing on said manifold opposite said saddle;

first and second straps attached to said seat;

means on the upper end of said straps for engaging said saddle on opposite sides of said manifold whereby said restraint elbow is held by said mounting means to brace said feedwater sparger nozzle.

4,859,404

REACTOR VESSEL INTERNALS STORAGE AREA ARRANGEMENT

Joseph W. Richard, West Mifflin, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

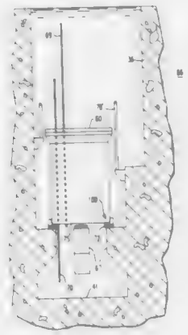
Filed Jun. 29, 1988, Ser. No. 213,209
Int. Cl.[4] G21C *19/00*
U.S. Cl. 376—293 20 Claims

10. In a nuclear reactor power plant which includes a nuclear reactor pressure vessel having an upper internals structure and a lower internals structure which are removed therefrom while performing maintenance procedures, the nuclear reactor pressure vessel being housed within a generally cylindrical concrete containment building having concrete floor and walls, the containment building defining a refueling cavity

comprised of a reactor cavity and a fuel transfer canal, the reactor pressure vessel being disposed within the reactor cavity and said upper and lower internals structures are stored within the fuel transfer canal during said maintenance procedures, the improvement comprising an internals storage means integrally formed within the fuel transfer canal, wherein;

(a) an upper internals storage area is defined by a plurality of concrete support ledges projecting radially inwardly from and integrally formed with said walls of the fuel transfer canal, said support ledges being disposed at an intermediate axial level in a first generally circular array and adapted to receive said upper internals thereon;

(b) a lower internals storage area is defined by a plurality of concrete support columns projecting upward from and





integrally formed with the floor of the fuel transfer canal, said support columns being disposed in a second generally circular array and adapted to recieve said lower internals thereon, and each of said support ledges and columns further including:

(i) an embedment plate at least partially embedded therein;

(ii) a top plate disposed above the embedment plate and having two bearing pads disposed thereon for receiving said respective internals, and two vertically disposed guide plates securely mounted on the top plate for positioning the respective internals thereon; and

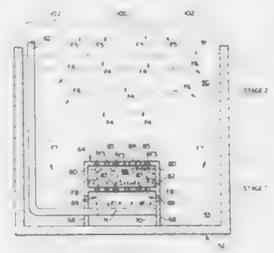
(iii) means for providing lateral adjustment of the top plate with respect to the embedment plate disposed between said embedment and top plates.

4,859,405

FILTERED VENTING AND DECAY HEAT REMOVING APPARATUS AND SYSTEM FOR CONTAINMENT STRUCTURES, AND METHOD OF OPERATION

David Squarer, Pittsburgh, Pa.; Andre Colin; Robert P. Prior, both of Brussels, Belgium; Frederick J. Mink, Rhoje-St-Genese, Belgium, and Nicholas J. Liparulo, North Huntingdon, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 10, 1987, Ser. No. 118,950
Int. Cl.[4] G21C *15/18, 9/00*
U.S. Cl. 376—299 23 Claims



15. A method for filtering and removing decay heat and entrained particulate matter from pressurized gases, upon being vented from a nuclear containment and prior to release to the atmosphere in a postulated accident scenario specifying the pressure, volumetric flow rate and temperature of the vented gases and the type and amount of contaminants therein including entrained particulate matter, and in accordance with required decontamination factor and temperature reduction and decay heat removal values as a time integral function over a predetermined passive operating interval, comprising:

providing an impervious enclosure having a base and at least vertical sidewalls defining therewithin predetermined values of cross-sectional area, height and corresponding volume, and comprising a first lower stage extending from the base to a first height and a second stage extending from the first stage to a second height and a head space thereabove, the second stage being of greater height and volume than the first stage;

disposing a filter within the enclosure, the filter having impervious vertical sidewalls and perforated top and bottom, horizontal closure plates secured to the sidewalls and defining therewithin predetermined values of horizontal cross-sectional area, sidewall height and corresponding volume, the filter being substantially filled with a porous filter media to define a porous filter bed and positioned centrally within the enclosure and displaced by a predetermined vertical space from the base thereof with the top plate at the first height and defining the first stage and the cross-sectional area of the porous filter bed defining a central region of substantially equal cross-sectional area in the first stage, the central region extending upwardly into the second stage, and a boundary region surrounding and extending between the central region and the interior of the enclosure, the perforated top and bottom closure plates providing generally vertical flow paths through the porous filter bed;

filling the enclosure with a volume of water to an initial water surface level substantially at the second height;

distributing hot pressurized gases and particulate matter within the predetermined vertical space and beneath the porous filter bed in a generally vertically upward direction and substantially uniform flow distribution toward the porous filter bed;

permitting water to flow from the boundary region portion of the volume thereof in the first stage, laterally inwardly

to within the predetermined vertical space between the porous filter bed and the base of the first enclosure for mixing with the gases and particulate matter therein distributed and producing a mixed two-phase flow in the generally vertical flow paths through the porous filter bed for first stage filtering thereby and upwardly through the volume of water in the central region of the second stage above the porous bed filter for second stage filtering by pool scrubbing and for removing decay thereby;

discharging gases separated and released from the mixed, two-phase flow at the surface of the volume of water; and

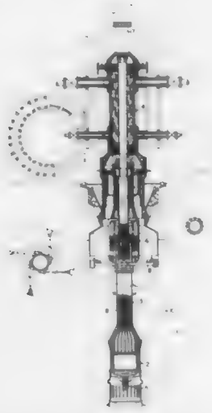
selecting the height of the second stage for accommodating a corresponding height of water to perform sufficient second stage pool scrubbing of the mixed, two-phase flow in combination with the first stage filtering thereof by the porous filter bed to achieve the required decontamination factor values and selecting the volume of the second stage and the corresponding volume of water therein for functioning as a heat sink sufficient to achieve the required temperature reduction and decay heat removal values, as time integral functions over the required passive operating interval.

4,859,406

REACTOR

Kåre Hannerz, Västerås, Sweden, assignor to AB Asea-Atom, Västerås, Sweden

Filed Dec. 3, 1987, Ser. No. 128,103
Claims priority, application Sweden, Dec. 17, 1986, 8605418
Int. Cl.[4] G21C *1/32*
U.S. Cl. 376—406 **6 Claims**



1. In a reactor with a reactor core enclosed in a water-filled core vessel, the core vessel being connected to an inlet and an outlet for cooling water, comprising:

at least one hydraulic connection between the outlet and at least one heat exchanger,

at least one hydraulic connection between the inlet and at least one heat exchanger,

a re-circulation pump for transporting the cooling water through said reactor core and said heat exchanger,

lower and upper density locks for said core vessel,

said core vessel and said reactor core being enclosed in a containment space which is filled and pressurized with a neutron absorbing aqueous solution,

the improvement wherein

the containment space is bottle-shaped and has a tapering upper opening, a steel dome arranged above the upper opening being sealed and detachably connected to the surroundings of the containment space, said steel dome substantially at the centre thereof supporting said recirculation pump, the water flowing straight up from the core through a riser to the pump and the pump then pressing down the process water to the core and by means of the detachably connected steel dome access is provided to the riser for refuelling through the riser to the reactor core.

4,859,407

NUCLEAR REACTOR FUEL ASSEMBLY

Olov Nylund, Västeras, Sweden, assignor to AB Asea-Atom, Västeras, Sweden

Filed Feb. 3, 1988, Ser. No. 151,903
Claims priority, application Sweden, Feb. 6, 1987, 8700462
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—446 **3 Claims**



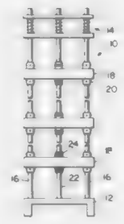
1. A fuel assembly for a nuclear reactor having a bundle of longitudinal fuel rods insertable into the fuel assembly, said fuel rods being held together by spacers (1), consisting of cells, arranged along the bundle, the wall (2) of the fuel assembly towards the fuel rod bundle being provided with a number of first locking members arranged in the longitudinal direction of the wall and the spacers (1) being provided with a second locking member, characterized in that said second locking member comprises at least two interconnected rods, one rod consisting of material having a low coefficient of linear expansion and the other rod consisting of material having a high coefficient of linear expansion, said rods being adapted, in dependence on the temperature in the reactor in operation, to bring said second locking member into engagement with said first locking members and to release the same when the reactor is shutdown.

4,859,408

METHOD AND APPARATUS FOR SECURING STRUCTURAL TUBES IN NUCLEAR REACTOR FUEL ASSEMBLIES

John S. Kerrey, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 3, 1984, Ser. No. 637,374
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—450 **11 Claims**



1. A nuclear fuel assembly having a skeletal structure comprising:

a bottom nozzle assembly;

a top nozzle assembly;

at least one control rod guide tube extending between said top and bottom nozzle assemblies;

at least one grid assembly, disposed in said fuel assembly between said top and bottom nozzle assemblies, said guide tube extending through and being fixed with respect to said at least one grid assembly;

an instrumentation structural tube extending at least partially between said top and bottom nozzle assemblies and through said at least one grid assembly; and

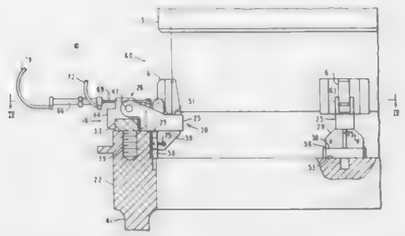
an inside diameter restrictor insert, coaxially disposed within said structural tube at a location where said structural tube passes through said at least one grid assembly, said restrictor insert having a central opening with a predetermined inside diameter for effectively reducing the inside diameter of said instrumentation structural tube to said predetermined inside diameter and circumferential lobe means for centering the restrictor insert in said structural tube and for locking said structural tube and said restrictor insert together and to said fuel assembly at said grid assembly location.

4,859,409

REACTOR VESSEL LOWER INTERNALS TEMPORARY SUPPORT

John M. Matusz, Plum Boro; Leonard R. Golick, Trafford, and Walter Matusz, North Braddock Boro, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 27, 1988, Ser. No. 199,416
Int. Cl.[4] G21C *19/00*
U.S. Cl. 376—463 **20 Claims**



1. In a nuclear reactor pressure vessel having a vessel flange on its upper portion, the vessel flange including a top surface, a plurality of circumferentially spaced threaded openings and a radially inwardly projecting internals support ledge, a lower internals assembly having a plurality of radially oriented keys on a lower end thereof, means for temporarily supporting the lower internals assembly above the reactor vessel comprising a plurality of support structures secured to the vessel flange, each of said support structures comprised of:

a support bracket secured to the top surface of the vessel flange;

an arm having a top and bottom surface, said arm pivotally secured near one end to the support bracket so as to project radially inward therefrom, the top surface of the arm adapted to engage said lower internals assembly near the lower end thereof;

means for pivotally rotating the arm with respect to the support bracket;

an arcuately shaped foot depending from the bottom surface of the arm near the end opposite the one end, said foot adapted to engage said internals support ledge; and

alignment means on the top surface of the arm adapted to engage said keys for aligning said lower internals assembly with respect to said support means.

4,859,410

DIE-UPSET MANUFACTURE TO PRODUCE HIGH VOLUME FRACTIONS OF RE-FE-B TYPE MAGNETICALLY ALIGNED MATERIAL

Earl G. Brewer, Warren, and Robert W. Lee, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 24, 1988, Ser. No. 172,666
Int. Cl.[4] G22F *1/00*
U.S. Cl. 419—10 **10 Claims**



1. In a method of processing magnetically isotropic alloy material based on rare earth elements, iron and boron to make magnetically anisotropic material and wherein the magnetically isotrpic alloy material includes fine grained crystalline material having grains of $RE_2TM_{14}B$ where RE is one or more rare earth elements at least sixty percent of which RE is neodymium and/or praseodymium, TM is iron or iron-cobalt combinations and B is the element boron the improvement comprising;

precompressing particles of magnetically isotropic material to form a fully dense preform;

shaping the preform to form a precursor having compression relief regions therein or defined therewith when said precursor is placed in a hot-working die;

and hot working the precursor to flow the material of the precursor to fill the compression relief regions while maintaining the precursor at an elevated temperature as the precursor is being conformed to a hot working tool thereby to align particles or cyrstallites along a common crystallaographically preferred magnetic axis to increase the high energy product fraction of the total volume of a precursor resultant.

4,859,411

CONTROL OF SELENIUM ALLOY FRACTIONATION

Gerald H. Sweatman, Harpenden; Roy Hodgson, Huntingdon, and Robert H. Haste, Stevenage, all of England, assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 8, 1988, Ser. No. 179,193
Int. Cl.[4] G22F *1/00*
U.S. Cl. 419—23 **11 Claims**

1. A process for crystallizing particles of an alloy of selenium comprising providing pellets of an alloy comprising amorphous selenium and an alloying component selected from the group consisting of tellurium, arsenic, and mixtures thereof, said pellets having an average weight between about 50 mg and about 1000 mg, exposing said pellets to an ambient temperature of between about 114° C. and about 190° C. until an exotherm occurs in said pellets at between about 104° C. and about 180° C., carrying said exotherm through to substantial completion, grinding said pellets into fresh powder having an average particle size of less than about 200 micrometers, and compressing said fresh powder into fresh pellets having an average weight between about 50 mg and about 1000 mg.

4,859,412

METHOD OF PRODUCING ALLOYED POWDERS FOR DENTAL AMALGAMS

Werner Groll, Gartenstrasse 5, 8755 Alzenau-Hörstein; Doris Hathaway, Lahnstrasse 20, 6450 Hanau 7, and Gernot Schlick, Bahnhofstrasse 56, 6454 Bruchköbel, all of Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,360

Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717048

Int. Cl.[4] B22F *1/00*

U.S. Cl. 419—23 **6 Claims**

1. A process for the production of alloy powders for dental amalgams from silver, copper, tin and, optionally, additions of indium, zinc, palladium, ceramic powder and/or glass powder by means of mechanical size reduction of a sintered compact, said process comprising mixing and compressing the elemental powders silver, copper, tin and, optionally, additions of indium, zinc, palladium, ceramic and/or glass powder, to form a compact and sintering the compact at a temperature between 150° C. and the solidus temperature of the alloy being produced until a homogeneous distribution of the tin has been achieved in the silver and copper particles.

4,859,413

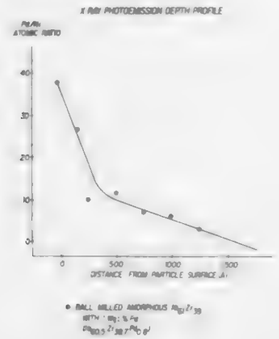
COMPOSITIONALLY GRADED AMORPHOUS METAL ALLOYS AND PROCESS FOR THE SYNTHESIS OF SAME

Jonathan H. Harris, Shaker Heights; Michael A. Tenhover, and Richard S. Henderson, both of Solon, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 4, 1987, Ser. No. 129,029

Int. Cl.[4] B22F *1/00*

U.S. Cl. 419—32 **16 Claims**



1. A process for the synthesis of a compositionally graded substantially amorphous metal alloy of the formula

AMM′

wherein M is at least one metal selected from the group consisting of Ni, Co, Fe, Cu, Mn, Pd, Ru, Si, Cr, Mo, W, Al, Sn, Zn, Cd and Ga;

M′ is at least one metal selected from the group consisting of Ti, Zr, V, Nb, Ca, Mg, Y, Hf, Ta and the rare earths; and

A is at least one metal selected from the group consisting of Pd, Pt, Ir and Rh; said process comprising:

(a) combining an M and M′-containing bulk hydrogen storage material with an A-containing material to obtain a mixture thereof;

(b) sealing said mixture in a mechanical milling device under an inert atmostphere; and

(c) milling said mixture.

4,859,414

ALLOY FOR DISK ROTOR

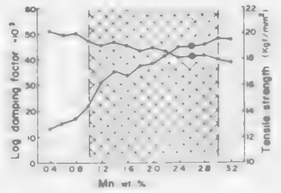
Masao Arai, Kumagaya, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Centre Ltd., Hanyu, both of, Japan

Filed Apr. 19, 1988, Ser. No. 183,222

Claims priority, application Japan, May 11, 1987, 62-112414

Int. Cl.[4] C22C *38/36*

U.S. Cl. 420—15 **6 Claims**



1. An alloy for a disk rotor utilized in a disk brake, which consists essentially of 2.3 to 3.0 wt.% of silicon, 2.2 to 3.0 wt.% of manganese, 0.2 to 1.0 wt.% of chromium, 3.7 to 4.2 wt.% of carbon, and up to 2.0 wt.% of copper with the remainder being iron and inevitable impurities.

4,859,415

METHOD OF IMPROVING THE RESISTANCE OF Ti-BASED ALLOYS TO CORROSION IN DEEP-WELL ENVIRONMENTS

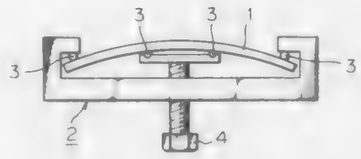
Yoshiaki Shida, Ikoma; Shiro Kitayama, Kobe, and Tomio Nishikawa, Takatsuki, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Oct. 29, 1987, Ser. No. 114,016

Claims priority, application Japan, Oct. 31, 1986, 61-260150

Int. Cl.[4] C22C *14/00*

U.S. Cl. 420—417 **21 Claims**



1. In a deep well environment wherein α-type or (β+β)-type Ti-based alloys parts are subjected to corrosive media containing carbon dioxide, chloride ions and wet hydrogen sulfide under high pressure at high temperature wherein corrosive resistance of said parts is improved by adding 0.02–0.2 weight % of at least one platinum group metal as an alloying agent therein.

4,859,416

SUPERALLOY COMPOSITIONS AND ARTICLES

Stuart Adelman, 135 Carl St., San Francisco, Calif. 94117

Continuation of Ser. No. 840,515, Mar. 17, 1986, abandoned. This application Mar. 17, 1985, Ser. No. 27,555

Int. Cl.[4] C22C *19/05*

U.S. Cl. 420—443 **7 Claims**

1. A superalloy composition consisting essentially of about 19.3 to 19.7% chromium, 0.5% carbon, 2 to 3% iron, and the balance essentially nickel, said composition being free of an amount of aluminum sufficient to form a substantial quantity of Ni-Al-Cr-C eutectic composite, said composition further comprising 0 to 1% erbium and 0.1 to 10 atomic percent of an element selected from the group consisting of rhenium, technetium and mixtures thereof, said superalloy composition having

improved mechanical properties independent of directional solidification thereof.

4,859,417

COPPER-BASED METAL ALLOY OF IMPROVED TYPE, PARTICULARLY FOR THE CONSTRUCTION OF ELECTRONIC COMPONENTS

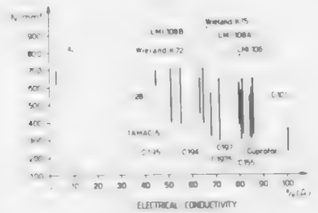
Stefano Innocenti, Gallicano, Italy, assignor to Europa Metalli-Lmi Societa Per Azioni, Fireazi, Italy

Continuation of Ser. No. 95,060, Sep. 9, 1987, abandoned. This application Nov. 30, 1988, Ser. No. 279,297

Claims priority, application Italy, Sep. 11, 1986, 48445 A/86

Int. Cl.[4] C22C *9/02, 9/00*

U.S. Cl. 420—493 **8 Claims**



1. A copped based metal alloy, particularly for the construction of electronic components, which comprised, in parts by weight, from 0.05 to 1% magnesium, from 0.03 to 0.9% phosphorus and from 0.002 to 0.04% calcium, the remainder being copper, the ratio by weight between magnesium and phosphorus contained in the alloy lying between 1 and 5 and, in combination, the ratio by weight between magnesium and calcium contained in the alloy lying between 5 and 50.

4,859,418

PROCESS AND COMPOSITIONS FOR CORROSION INHIBITION OF METALLIC MATERIALS

Dieter Ohlendorf, Liederbach; Werner Interthal, Rüsselsheim, and Friedrich Stoll, Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 26, 1986, Ser. No. 878,615

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1985, 3523088

Int. Cl.[4] C23F *11/04*

U.S. Cl. 422—16 **5 Claims**

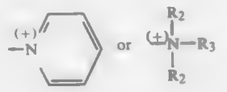
1. A process for inhibiting corrosion of metallic materials in the presence of an aqueous medium, which comprises adding to the aqueous medium a compound of the formula I or II



I II

in which

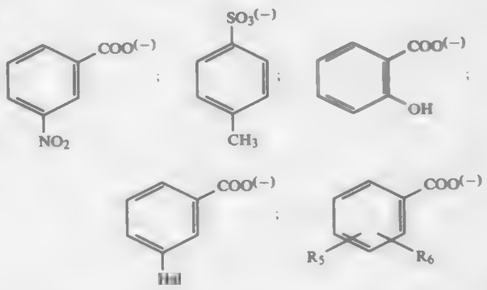
R_1 denotes C_{12}–C_{26}-alkyl or C_{12}–C_{26}-alkenyl; n denotes a number from 0 to 5; $Z^{\oplus}$ denotes a group of the formula



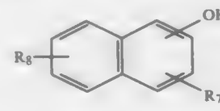
where R_2 is C_1–C_3-alkyl and R_3 is C_1–C_3-alkyl or a group of the formula $—C_2H_4O—_xH$, x being a number from 1 to 3; $A^{\ominus}$ denotes an anion of the following formulae:

$SCN^{\ominus}$ or

$R_4SO_3^{\ominus}$, where R_4 is C_6–C_9-alkyl or C_6–C_9-alkenyl, provided that the sum of the carbon atoms is R_1 and R_4 is at least 21; or $A^{\ominus}$ is



where Hal is fluorine, chlorine, bromine or iodine, R_5 is C_1–C_5-alkyl, C_2–C_5-alkenyl or C_1–C_5-alkoxy in the 3, 4, 5 and 6 positions and R_6 is hydrogen or hydroxy in the 2 and 3 positions to the carboxyl group or $A^{\ominus}$ is



where R_7 is COO^- or $SO_3(-)$ and R_8 is hydrogen or methyl, and in which: R_9 denotes a group of the formula R_{12}—$(OCH_2CH_2)y$—, C_8–C_{18}-alkylaryl or aryl-C_8–C_{18}-alkyl, R_{12} denotes C_{14}–C_{22}-alkyl or C_{14}–C_{22}-alkenyl, y denotes a number from 0 to 5 and the radicals R_{10} are identical and denote C_1–C_4-alkyl or C_1–C_4-hydroxyalkyl, said compound of formula I or II being in an amount effective to inhibit corrosion of a metallic material and inhibiting corrosion of said metallic material.

4,859,419

DIAGNOSTIC MANIFOLD APPARATUS

Martin E. Marks, Danville; William J. Littlehales, Point Richmond, and Chu-An Chang, El Cerrito, all of Calif., assignors to American Bionetics, Inc., Hayward, Calif.

Filed Feb. 27, 1987, Ser. No. 19,923

Int. Cl.[4] G01N *21/78, 33/52, 33/547*

U.S. Cl. 422—56 **28 Claims**



1. A test vessel for an assay apparatus comprising

an enclosed elongated body having an interior test chamber for receiving a test strip therein,

an inlet port at one end of the body in fluid communication

with said chamber with means to connect the port to an inlet manifold,
an outlet port at the end of the body in fluid communication with said chamber opposite said inlet port with means to connect the outlet port to an outlet manifold,
at least one injection port disposed between the inlet port and the outlet port in fluid communication with said chamber, and
means to limit the flow of fluid into the interior test chamber through the inlet port and the injection port and out of the interior test chamber through the outlet port.

4,859,420

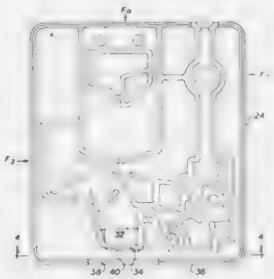
HEATING SYSTEM FOR ROTATING MEMBERS

Steven G. Schultz, Winthrop Harbor, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 606,787, May 3, 1984, Pat. No. 4,632,908. This application May 1, 1986, Ser. No. 858,330

Int. Cl.[4] G01N *31/22, 25/04*

U.S. Cl. 422—58 **3 Claims**



1. In a sample processor card for carrying out chemical tests under centrifugal force in the form of a substantially closed card having a plurality of chambers therein for measuring sample and reagent, inlet means for supplying a sample to the card and a cuvette chamber in which a reaction between sample and reagent can be measured, the improvement comprising a temperature sensing element affixed to the card in close proximity to the cuvette chamber to detect and indicate the temperature of the cuvette chamber as a function of reflected light.

4,859,421

DISPOSABLE ANTIGEN CONCENTRATOR AND DETECTOR

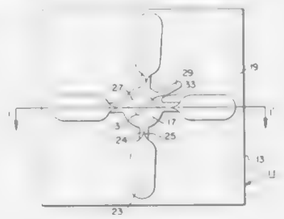
Michael A. Apicella, North Tonawanda, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.

Filed Jun. 23, 1987, Ser. No. 65,424

Int. Cl.[4] G01N *31/22*

U.S. Cl. 422—61 **5 Claims**

1. A disposable analytical test kit capable of being handheld comprised of:
(a) a base member,
(b) a reaction chamber, having a chemically inert surface, positioned in said base member, said reaction chamber having a removable cover for directly entering a sample to be tested into said reception chamber,
(c) at least one reagent chamber, having a chemically inert surface, positioned on said base member, each of said reagent chambers having separate, manually compressible top portions,
(d) each of said reagent chambers connected to said reaction chamber by a separate anti-back flow valve means, each of said valve means constructed to allow flow from a selected reagent chamber by the direct application of manual pressure on the top portion of said selected reagent chamber, into said reaction chamber and to prevent flow from said reaction chamber into said respective reagent chamber, and



(e) said reaction chamber having separate positive and negative control means in the base portion thereof, said control means visually indicating a positive and a negative test of reagents or reactions introduced or taking place in said reaction chamber.

4,859,422

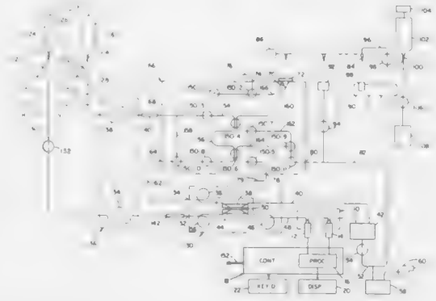
ANALYSIS SYSTEM

Humayun Qureshi, Wayland; Stanley M. Liffmann, Andover; Milo E. Webster, Braintree, and Theodore S. Geiselman, Groveland, all of Mass., assignors to Fisher Scientific Company, Pittsburgh, Pa.

Filed Jul. 17, 1987, Ser. No. 75,052

Int. Cl.[4] G01N *35/00*

U.S. Cl. 422—81 **18 Claims**



1. Apparatus for analyzing specimens of biological fluids and the like comprising,
structure defining a reduced pressure reservoir,
structure defining a sample region,
structure defining a reagent circuit that includes metering chamber structure in series in said regent circuit,
first transfer valve structure in said reagent circuit on one side of said metering chamber structure for coupling said sample region to said reagent circuit through a first path separate from said reagent circuit, said first transfer valve structure defining one boundary of said metering chamber structure,
second transfer valve structure in said reagent circuit on the side of said metering chamber structure opposite said one side for coupling said reagent circuit to said reduced pressure reservoir structure through a second path separate from said reagent circuit, said second transfer valve structure defining a second boundary of said metering chamber structure.
means for applying reduced pressure from said reservoir structure through said second transfer valve structure to reduce the pressure in said metering chamber structure for drawing reagent from said metering chamber structure out of said reagent circuit through said second transfer valve structure and said second path and concurrently drawing sample from said sample region through said first transfer valve structure into said metering chamber structure for replacing the guantity of regent drawn out of said metering chamber structure with a guantity of sample to be analyzed as a plug in a stream of reagent liquid in said reagent circuit; and
flow control means including means connecting said reagent circuit to a utilization device and means for flowing a reagent stream including an inserted plug of sample material. from said reagent circuit to said utilization device.

4,859,423

PLASTIC PIPETTE CANISTER

Daniel Perlman, Arlington, Mass., assignor to Brandeis University, Waltham, Mass.

Filed Dec. 9, 1987, Ser. No. 130,397

Int. Cl.[4] B65D *85/20, 85/30, 85/38, 85/40*

U.S. Cl. 422—102 **6 Claims**



1. A pipette canister comprising an elongated tube having a longitudinal axis along a length of said tube, said axis having an internal length greater than the length of a pipette, and having a diameter sufficient to allow storage of a plurality of pipettes, said tube having a closed base and an open top end wherein said canister is formed from a thermoplastic material consisting essentially of polyetherimide, said canister can withstand steam heat above 120° C., and dry heat above 160° C., said material is free from metal oxide residues, and wherein glass pipettes are protected from impact-breakage with said canister by the use of said thermoplastic material.

4,859,424

CONVERSION OF STACKED FCC UNIT

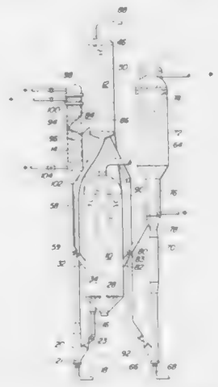
Carlos A. Cabrera, Northbrook, Ill., assignor to UOP, Des Plaines, Ill.

Filed Nov. 2, 1987, Ser. No. 115,737

Int. Cl.[4] B01J *8/18*

U.S. Cl. 422—144 **9 Claims**

1. A method of converting a stacked FCC reactor-regenerator arrangement into a two-stage regenerator, comprising providing a stacked FCC arrangement having a bottom regenerator vessel, a superadjacent reactor vessel, an external conduit for withdrawing catalyst from a lower portion of said regenerator vessel and transporting catalyst to said reactor vessel, means for injecting a hydrocarbon feed into said external conduit, means for adding spent catalyst to said hydrocarbon feed into said external conduit, means for adding spent catalyst to said regenerator vessel, means for recovering regeneration gas from an upper portion of said regenerator vessel, means for withdrawing hydrocarbon vapor from an upper portion of said reactor vessel, and a stripping vessel laterally offset from and in open communication with said reactor vessel, said method further comprising:
(a) modifying said reactor vessel to function as a second stage regeneration vessel by adding means for collecting catalyst to the lower portion of said reactor vessel, adding a catalyst withdrawal conduit that communicates with said catalyst collection means to a lower portion of said reactor vessel for withdrawing catalyst from said reactor vessel and replacing said means for withdrawing hydrocarbon vapor with means for withdrawing regeneration gas from the upper end of said reactor vessel;



(b) modifying said stripping vessel to function as an external removal zone by installing means for withdrawing heat from catalyst heat removal zone by installing means said stripping vessel and means for distributing fluidizing gas into said stripping vessel; and
(c) replacing said means for injecting a hydrocarbon feed with means for injecting lift gas into said external conduit.

4,859,425

SYSTEM FOR IMPROVE THE MIXING OF REACTED GASES AND QUENCH GASES IN HETEROGENEOUS SYNTHESIS REACTORS

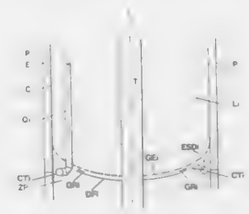
Umberto Zardi, Breganzona, Switzerland, assignor to Ammonia Casale S.A., Switzerland, a part interest

Continuation-in-part of Ser. No. 859,044, May 2, 1986, Pat. No. 4,755,362. This application May 27, 1987, Ser. No. 54,743

Claims priority, application Switzerland, Jun. 2, 1986, 02221/86

Int. Cl.[4] B01J *8/04;* **C01C** *1/04*

U.S. Cl. 422—148 **2 Claims**



1. A reactor for heterogeneous synthesis comprising
(a) an external pressure resistant shell;
(b) a cylindrical cartridge axially positioned in said shell and spaced apart from the walls of said shell;
(c) a plurality of vertically spaced apart catalyst beds disposed in said cartridge, at least the uppermost bed being adapted to permit the flow of synthesis gas downwardly therethrough;
(d) toroidal distributor means for introducing a plurality of quench gas streams into at least the outer periphery of the space between said uppermost bed and the bed next below

it, said distributor means being positioned along the periphery of said space; and

(e) means for directing the flow of gas exiting at least said uppermost bed towards the outer periphery of said space so that it impinges on said plurality of said quench gas streams at said outer periphery, said means (e) comprising an elliptical double bottom of said bed, said double bottom comprising an upper perforate bottom for retaining said bed and a solid bottom below said perforate bottom and spaced apart therefrom, the space between said perforate bottom and said solid bottom defining a channel for directing the gas exiting from said bed toward said periphery,

said toroidal quench gas distributor (d) having outlets in correspondence with the extrados of said elliptical bottom.

4,859,426

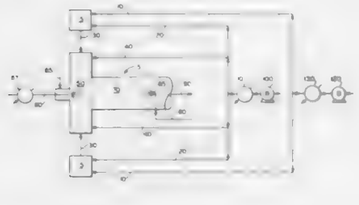
APPARATUS FOR PRODUCING CARBON BLACK

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 503,431, Jun. 13, 1983, abandoned, which is a division of Ser. No. 397,318, Jul. 12, 1982, Pat. No. 4,490,346. This application May 6, 1985, Ser. No. 731,173

Int. Cl.[4] C09C *1/48;* **B01J** *10/00*

U.S. Cl. 422—156 **2 Claims**



1. Apparatus for producing carbon black comprising:

(a) a mass of refractory defining

(i) a generally cylindrical precombustion zone having an upstream end and a downstream end and a generally cylindrical side wall connecting the upstream end with the downstream end,

(ii) a first end wall defining an upstream end of the precombustion zone,

(iii) a generally cylindrical reaction zone having a diameter less than that of the precombustion zone in axial alignment with and connected to the downstream end of the precombustion zone,

(iv) a first tunnel opening through the generally cylindrical side wall of the precombustion zone in a generally tangential direction for the introduction of an oxidant gas,

(v) a second tunnel opening through the generally cylindrical side wall of the precombustion zone in a generally tangential direction and corotationally with the first tunnel for the introduction of combustion gas,

(vi) a generally cylindrical combustion zone in axial alignment with and connected to the second tunnel, said generally cylindrical combustion zone having an upstream end and a downstream end,

(vii) a second end wall defining the upstream end of the combustion zone,

(b) a gas compressor connected to a source of combustible gas,

(c) a blower connected to a source of oxidant gas, said source containing said oxidant gas,

(d) a conduit means establishing a first flow path between the gas compressor and the combustion zone,

(e) a separate conduit means establishing a second flow path between the blower and the combustion zone and a third flow path between blower and the precombustion zone, wherein the third flow path consists of a conduit directly connected to the precombustion zone via the first tunnel for supply of the oxidant gas from the source directly to the precombustion zone and is further characterized by isolation from the source of combustible gas.

4,859,427

ACTIVE METAL BED

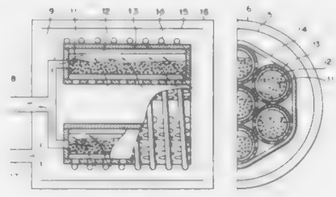
Satoshi Konishi; Takanori Nagasaki; Nobuhisa Yokogawa, all of Tokai, and Yuji Naruse, Mito, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,906

Claims priority, application Japan, Feb. 27, 1987, 62-042718

Int. Cl.[4] B01D *50/00*

U.S. Cl. 422—159 **3 Claims**



1. An active metal bed comprising:

(a) an outer receptacle;

(b) a plurality of filter tubes horizontally disposed in said outer receptacle;

(c) an active hydrogenization metal powder disposed in, but not filling, each one of said plurality of filter tubes, so that a gas flow volume is present in each one of said plurality of filter tubes above said active metal powder;

(d) a plurality of equithermal blocks, each one of said plurality of equithermal blocks:

(i) surrounding a corresponding one of said plurality of filter tubes;

(ii) being pervious to gas flow beneath the level of the surface of said active metal powder and impervious to gas flow above the level of the surface of said active metal powder; and

(iii) being in thermal contact with others of said plurality of equithermal blocks;

(e) a heater in thermal contact with at least some of said plurality of equithermal blocks;

(f) a gas discharge header in fluid communication with the interior of each one of said plurality of filter tubes;

(g) an introducing tube leading from outside said outer receptacle to a volume in said outer receptacle outside said plurality of filter tubes; and

(h) a discharging tube leading from said gas discharge header to the outside of said outer receptacle.

4,859,428

APPARATUS FOR THE CONTAINMENT OF MONOLITHIC CATALYSTS

Reinhold Brand, Moembris; Bernd Engler, Hanau; Peter Kleine-Moellhoff, and Edgar Koberstein, both of Alzenau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 28, 1987, Ser. No. 7,884

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1986, 8602600[U]

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.[4] B01J *8/02*

U.S. Cl. 422—179 **18 Claims**

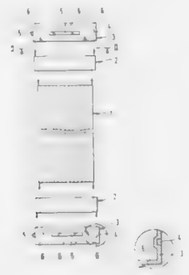
1. An apparatus for the containment of at least one monolithic catalyst element having a quadrilateral cross-section perimeter, comprising:

(a) at least one elastic buffer gasket (2) having a shape generally conforming to the outside shape of the catalyst element (1) to be contained by said apparatus and adaptable to a formfitting configuration with respect to the catalyst element to be contained by said apparatus;

(b) at least one metal frame (3) having a general configuration corresponding to the ouside shape of the catalyst element to be contained by said apparatus, the inside free cross-sectional area of said frame being greater than the front surface of the catalyst element to be contained by said apparatus and said buffer gasket,

(c) said frame and said buffer gasket having a depth dimension parallel to the longitudinal median axis of the catalyst to be contained by said apparatus, said depth dimension corresponding to at least 1/50 of the entire length of the catalyst element to be contained by said apparatus,

(d) said frame having a first exterior lateral surface parallel to said axis, said first exterior lateral surface having a recess (4) formed therein, said frame having a second exterior lateral surface opposite said first exterior lateral surface, said second exterior lateral surface having a projection (5) formed therein that is engageable in a form fitting manner into a recess of the form of the recess in the first exterior lateral surface of said frame.



18. A catalyst package, comprising:

at least one catalyst element having a first end and a second end and an external surface therebetween;

at least one gasket member having an internal and an external surface, said gasket member adapted to have its internal surface fit over at least one of said first and second ends such that the external surface of said catalyst is completely surrounded by said gasket;

at least one frame member having an internal and an external surface, said frame member adapted to have its internal surface fit over said at least one gasket so as to completely surround the external surface of said at least one gasket, said frame member having formed in its external surface at least one recess and said frame member having extending from its external surface at least one projection in a form which is engageable in a form fitting manner with any recess in the shape of the at least one recess formed in the external surface of said frame member.

4,859,429

OZONE GENERATING DEVICE

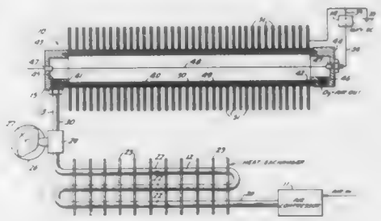
Jules Nisenson, Stamford, Conn., assignor to Technological Resources Corp., Stamford, Conn.

Filed Jun. 30, 1988, Ser. No. 213,676

Int. Cl.[4] C01B *13/11*

U.S. Cl. 422—186.13 **1 Claim**

1. An ozone generating device comprising: an air treatment element including a cylindrical tube having end caps forming air inlet and outlet means at opposed ends thereof, said tube having an electrically conductive inner surface forming a positive electrode, a plurality of fine wires supported between said end caps forming a negative electrode, power supply means interconnecting said negative and positive electrodes, compressor means supplying untreated air at above atmospheric pressure to said tube, cooling means receiving the output of said compressor means and communicating with said air inlet means, and cyclically operated valving means controlling the flow of air from said cooling means to said inlet means,



whereby air is introduced into said tube in a pulsed manner, frame means for mountng said fine wires eccentrically between said end caps with respect to the principal access of said tube, and means for the rotating said frame about the access of said tube; a plurality of baffles, mounted upon said frame and positioned between adjacent fine wires, whereby upon rotation of said frame about said access of said tube, said baffles create turbulence.

4,859,430

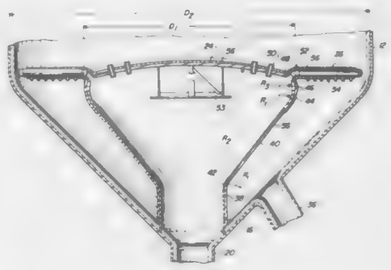
AIR DISTRIBUTION DEVICE

Scott C. Julian, Chicago, and Ismail B. Cetinkaya, Palatine, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Jun. 29, 1987, Ser. No. 67,659

Int. Cl.[4] F27B *15/10*

U.S. Cl. 422—310 **5 Claims**



1. In a gas distribution device for distributing gas over a fluidized bed of solid particles, the distributor being of a type having: a perforated central head for distributing gas over a central portion of said fluidized bed, a plurality of radially and horizontally extending perforated pipe branches for distributing gas over an annular region of said fluidized bed; and means for supporting said head and pipe branches and conveying said fluidizing gas to the interior portion of said head and pipe branches, said means for supporting said head comprising a toroidal knuckle for supporting said head, and being located between said head and said pipe branches, said toroidal knuckle surrounding the periphery of said head, the improvement comprising said toroidal knuckle having a plurality of pipe branch connections formed therein and regularly spaced about the major circumference of said toroidal knuckle, each of said pipe branch connections having an outlet in communication with the interior of said central head, each branch connection having a geometry consisting of continuous curves and

said pipe branches being attached to said knuckle through at least pipe elbows connected to said pipe branch connections.

4,859,431

RHENIUM GENERATOR SYSTEM AND ITS PREPARATION AND USE

Gary J. Ehrhardt, Columbia, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Continuation of Ser. No. 929,644, Nov. 10, 1986, abandoned. This application Jan. 25, 1988, Ser. No. 147,435

Int. Cl.[4] C01G *47/00, 41/00;* G21G *1/00;* A61K *43/00*

U.S. Cl. 423—2 8 Claims

1. A process for preparing a radionuclide generator useful for producing Re-188, comprising the steps:

(a) reacting a basic tungstate solution containing W-188 with an acidic solution containing zirconyl ion to form a zirconyl tungstate precipitate containing W-188; and,

(b) disposing said zirconyl tungstate precipitate in an elutable container.

4,859,432

NOVEL CERIC OXIDE PARTICULATES AND PROCESS OF MAKING

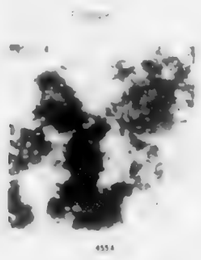
Claire David; Claude Magnier, both of Paris, and Bertrand Latourrette, Cernay, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Dec. 21, 1987, Ser. No. 135,380

Claims priority, application France, Dec. 19, 1986, 86 17805

Int. Cl.[4] C01F *1/00, 17/00*

U.S. Cl. 423—21.1 29 Claims



1. Ceric oxide particulates having a specific surface, after calcination at a temperature of from 350° to 450° C., of at least 100 m^2/g, a total pore volume of at least 0.3 cm^3/g, and the pores of which having a mean diameter larger than 50 Å.

11. A process for the preparation of the ceric oxide particulates as defined by claim 1, comprising either reacting a cerium salt with a strong base in the presence of carboxylate ions, or a cerium carboxylate with a strong base, separating a precipitate of true cerium hydroxide thus produced, and washing and heat-treating such precipitate.

4,859,433

PROCESS FOR TREATING AUTOMOTIVE EXHAUST GASES USING MONOLITH WASHCOAT HAVING OPTIMUM PORE STRUCTURE

Carmo J. Pereira; Joseph E. Kubsh, both of Silver Spring, and Louis Hegedus, Rockville, all of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Division of Ser. No. 52,103, May 18, 1987, Pat. No. 4,771,029. This application May 25, 1988, Ser. No. 198,810

Int. Cl.[4] B01D *53/36*

U.S. Cl. 423—212 2 Claims

1. A process for treating automotive exhaust gases with a washcoated ceramic or metal monolith automotive exhaust catalyst, wherein the washcoat on the catalyst has

a thickness in the range of 30–80 microns,

a total pore volume in the range of 0.60–1.80 cm^3/g washcoat,

a micropore volume in the range of 0.35–0.60 cm^3/g washcoat,

a micropore radium below 60 Angstrom units, and

a surface area between 125–250 m^2/g washcoat.

4,859,434

PRODUCTION OF ENDOTHERMIC GASES WITH METHANOL

George W. Roberts, Emmaus; Shivaji Sircar, Wescosville, and Paul Stepanoff, Quakertown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 10, 1988, Ser. No. 205,145

The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.

Int. Cl.[4] C01B *21/04, 23/00*

U.S. Cl. 423—219 11 Claims

1. A process for producing an endothermic gas comprising an inert gas, carbon monoxide, hydrogen, carbon dioxide and water by reacting an inert gas stream containing minor amounts of oxygen in the range of approximately 0.1 to 10 mole % with a stoichiometric excess amount of methanol at a feed gas temperature in the range of approximately 60° to 120° F. in the presence of a catalyst of approximately 0.05 to 1.0 wt % palladium in the metal form with a metal surface area of at least 0.4 m^2/g and a palladium dispersion of at least 30.0% to convert the oxygen and methanol to carbon monoxide, hydrogen, carbon dioxide and water without external heating of the reaction.

4,859,435

DEOXYGENATION OF INERT GAS STREAMS WITH METHANOL

George W. Roberts, Emmaus; Shivaji Sircar, Wescosville, and Paul Stepanoff, Quakertown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 10, 1988, Ser. No. 205,408

The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.

Int. Cl.[4] C01B *21/04, 23/00*

U.S. Cl. 423—219 14 Claims

1. A process for essentially complete removal of minor amounts of oxygen of approximately 0.1 to 10 mole% from inert gas streams comprising reacting a stoichiometric amount of methanol with said oxygen at a feed gas temperature in the range of approximately 60° to 120° F. in the presence of a catalyst containing approximately 0.05 to 1.0 wt% palladium in the metal form with a metal surface area of at least 0.4 m^2/g and a palladium dispersion of at least 30% to convert the oxygen and methanol to carbon dioxide and water without external heating of the reaction.

4,859,436

H_2S REMOVAL PROCESS AND COMPOSITION

Donald C. Olson, Houston, Tex., and John J. Miller, deceased, late of Houston, Tex. (by Wayne R. Miller, executor), assignors to Shell Oil Company, Houston, Tex.

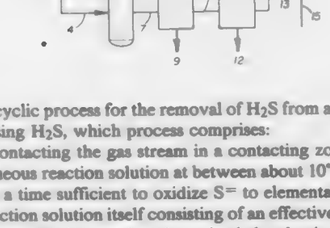
Continuation of Ser. No. 769,196, Aug. 23, 1985. This application Jul. 16, 1987, Ser. No. 75,195

Int. Cl.[4] C01B *17/16, 31/20, 17/02*

U.S. Cl. 423—221 29 Claims

1. A process for the removal of H_2S from an H_2S-containing gaseous stream comprising

contacting the H_2S-containing gaseous stream with aqueous reactant solution in a contacting zone, at a temperature below the melting point of sulfur, the reactant solution containing ammonium ferric nitrilotriacetate chelate and ammonium ferrous nitrilotriacetate chelate, the ratio of the ammonium ferric nitrilotriacetate chelate to ammonium ferrous nitrilotriacetate chelate in the reactant solution being from about 0.2 to about 6, at least about 0.1 percent, molar basis, with respect to said ammonium ferric and ammonium ferrous nitrilotriacetate chelates, of aqueous ammonia, a total iron content of from about 0.5 percent to about 7 percent by weight, based on the weight of the solution and iron, and a total concentration of sodium and potassium ions present in the reactant solution less



than that sufficient to precipitate sodium and potassium ferrous nitrilotriacetate chelate, and having a pH of from about 5 to about 8.5, under conditions to convert H_2S, producing a gaseous stream having reduced H_2S content and an aqueous admixture containing solid sulfur and additonal ammonium ferrous nitrilotriacetate chelate in solution.

4,859,437

PROCESS FOR THE REMOVAL OF H2S FROM FLUID STREAMS USING A WATER SOLUBLE POLYMERIC CHELATE OF AN OXIDIZING POLYVALENT METAL

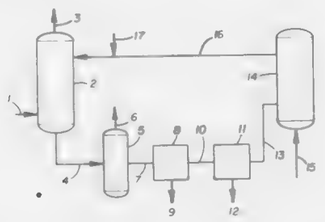
Robert R. Grinstead, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 10, 1986, Ser. No. 837,926

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

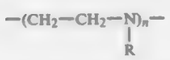
Int. Cl.[4] C01B *17/16, 31/20, 17/02*

U.S. Cl. 423—226 15 Claims



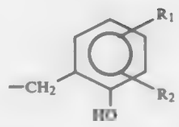
1. A cyclic process for the removal of H_2S from a gas stream comprising H_2S, which process comprises:

(A) contacting the gas stream in a contacting zone with an aqueous reaction solution at between about 10° and 90° C. for a time sufficient to oxidize $S^=$ to elemental sulfur the reaction solution itself consisting of an effective amount of water-soluble organic polymeric chelate having a molecular weight of between about 500 and 1,000,000 containing an oxidizing polyvalent metal, to remove the H_2S present, selected from organic polymeric chelates of the formula:

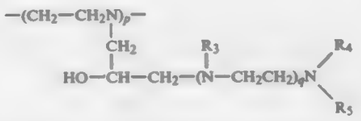


(i)

wherein R is $—CH_2COOH$, —H, $—CH_2—(=O)(OH)_2$, or

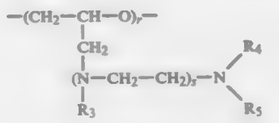


wherein R_1 and R_2 are independently $—CH_3$, $—SO_3H$, —Cl, —H, or —COOH and n is an integer between about 5 and 20,000;



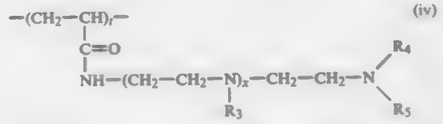
(ii)

wherein R_3, R_4 and R_5 are independently selected from R and R is as defined hereinabove, p is an integer between about 5 and 20,000; and q is an integer 0, 1, 2, 3 or 4;



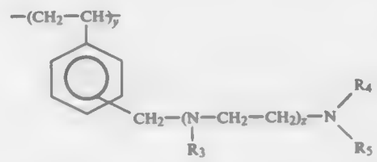
(iii)

wherein R_3, R_4 and R_5 are as defined hereinabove; r is an integer between about 10 and 20,000, and s is an integer between about 1 and 4;



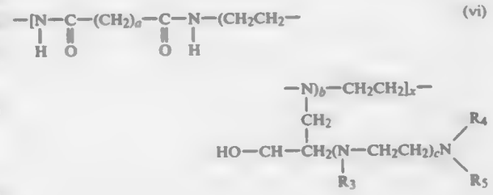
(iv)

wherein R_3, R_4 and R_5 are as defined hereinabove, t is an integer between about 10 and 20,000; and x is an integer between 1 and 4;



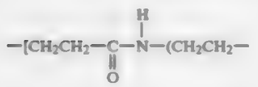
(v)

wherein R_3, R_4 and R_5 are as defined hereinabove; y is an integer between about 10 and 20,000, and z is an integer between about 1 and 4;

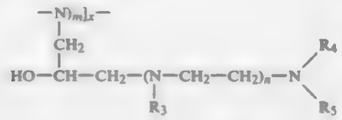


(vi)

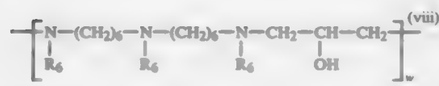
where x is between about 10 to 10,000, a is 6, b is 1 to 4, c is 1 to 4; and R_3, R_4 and R_5 are as defined hereinabove;



(vii)

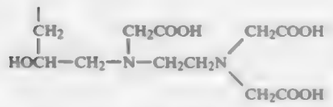


where m, z, n and R_3, R_4 and R_5 are as defined hereinabove; or



(viii)

wherein each R_6 is —H or



and, w is between about 10 and 10,000; or mixtures thereof;

(B) separating the gas stream and the resulting aqueous phase containing sulfur and polymeric chelated-metal complex produced in step (A);

(C) separating the sulfur by filtration from the aqueous phase separated in step membrane separation (B);

(D) treating the aqueous solution produced in step (C) by means effective to remove water and other low molecular weight materials having a molecular weight of less than 500 from the aqueous solution;

(E) contacting the concentrated aqueous solution produced in step (D) with an oxidizing agent under conditions effective to oxidize the polyvalent metal in chelate form; and

(F) recycling the concentrated aqueous solution from step (E) to the contacting zone of step (A).

4,859,438

METHOD FOR SEPARATION OF IMPURITIES FROM FLOWING GAS

Ralf Lindbauer, and Alfred Glasner, both of Graz, Austria, assignors to Waagner-Biro Aktiengesellschaft, Austria

Continuation-in-part of Ser. No. 803,587, Dec. 2, 1985, Pat. No. 4,767,605. This application Jan. 29, 1988, Ser. No. 215,716

Claims priority, application Austria, Nov. 30, 1984, 3800/84; Jan. 29, 1985, 233/85

The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.[4] B01J *8/00;* **C01B** *17/00*

U.S. Cl. 423—239 **26 Claims**

1. Method of separating SO_2 and NO_x wherein x is 1 or 2 from cooled flue gas having a relatively low SO_2 and NO_x content, comprising

contacting said gas at a temperature below 400° C. with a substantially dry particulate adsorbent including $NaHCO_3$ which, at said temperature, decomposes and forms an activated adsorbent including Na_2CO_3,

the thus-formed Na_2CO_3 reacting with said relatively low content of SO_2 and NO_x,

said substantially dry particulate adsorbent being present in an amount such that the formed activated adsorbent is formed in an amount to remove virtually the entire content of SO_2 and NO_x from said gas, and wherein said adsorbent additionally includes at least one of $Al(OH)_3$, Al_2O_3, $Ca(OH)_2$, $CaCl_2$, and NH_4HCO_3,

whereby said gas is substantially purified.

4,859,439

CATALYST AND A METHOD FOR DENITRIZING NITROGEN OXIDES CONTAINED IN WASTE GASES

Hiroaki Rikimaru; Tadao Nakatsuji; Toshikatsu Umabe; Kazuhiko Nagano; Kazuya Mishina, and Hiromitsu Shimizu, all of Osaka, Japan, assignors to Sakai Chemical Industry Co., Ltd., Sakai; Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo; Mitsubishi Petrochemical Co., Ltd., Tokyo; Mitsubishi Petrochemical Engineering Co., Ltd., Tokyo and Catalysts & Chemicals Industries Co., Ltd., Tokyo, all of, Japan

Filed Sep. 30, 1987, Ser. No. 102,639

Claims priority, application Japan, Sep. 30, 1986, 61-234031

Int. Cl.[4] B01J *8/00;* **C01B** *17/00*

U.S. Cl. 423—239 **6 Claims**

1. A method for denitrizing nitrogen oxides contained in waste gases which contain an amount of arsenic or arsenic compounds therein in amounts of not less than about 0.001 ppm, which comprises putting the waste gases into contact with a catalyst consisting essentially of, as active components:

(a) titanium dioxide and

(b) at least one base metal oxide selected from the group consisting of V_2O_5, WO_3 and MoO_3,

the catalyst containing titanium and the base metals in amounts of at least about 50% by weight in terms of oxides based on the catalyst, and titanium in amounts of about 80–99% by weight in terms of oxides and the base metals in amounts of about 20–1% by weight in terms of oxides, respectively, based on the total weight in terms of oxides of titanium and the base metals,

and the catalyst having micropores of about 50–75000 Å in radius in amounts of about 0.25–0.45 ml/g, and micropores of about 50–100 Å in radius in amounts of about 10–40% by volume and micropores of about 500–60000 Å in radius in amounts of not less than about 10% by volume, respectively, based on the total volume of the micropores of about 50–75000 Å in radius, in the presence of a reducing gas at elevated temperatures.

4,859,440

METHOD OF TREATING FLUE GASES AND COMBUSTION RESIDUES

Franz Zechner, Vienna, and Josef Stubenvoll, Poysdorf, both of Austria, assignors to Simmering-Graz-Pauker Aktiengesellschaft, Vienna, Austria

Filed Aug. 17, 1988, Ser. No. 233,039

Claims priority, application Austria, Aug. 18, 1987, 2079/87

Int. Cl.[4] C01B *7/00, 17/00*

U.S. Cl. 423—240 **2 Claims**

1. A method of treating flue gases and combustion residues from a combustion plant, comprising the steps of:

providing a flue gas scrubber comprising a tank containing a scrubbing liquor;

supplying at least one combustion residue selected from the group consisting of flue ash and slag to a washing zone;

supplying scrubbing liquor having a pH of from 3 to 8 from said tank of said flue gas scrubber to said washing zone;

washing the combustion residue with the scrubbing liquor in said washing zone to produce a washed mixture, whereby the acidity of the scrubbing liquor elutes alkaline constituents from the combustion residue;

separating the washed mixture into a solid portion and a liquid portion;

returning said liquid portion to said tank of said flue gas scrubber, said liquid portion having a pH of from 5 to 12; and

wet-scrubbing flue gas with said liquid portion in said flue gas scrubber, thereby eluting acidic constituents from the flue gas.

4,859,441

PROCESS FOR THE PREPARATION OF URANIUM TETRAFLUORIDE BY THE REDUCTION OF URANIUM HEXAFLUORIDE AND SULPHUR FLUORIDES PRODUCED BY THIS PROCESS

Jacques Lambard, L'hay Les Roses, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Apr. 1, 1988, Ser. No. 176,715

Claims priority, application France, Apr. 2, 1987, 87 04634

Int. Cl.[4] C01G *43/06;* **C01B** *17/45*

U.S. Cl. 423—259 **12 Claims**

1. A process for the preparation of uranium tetrafluoride comprising the steps of reducing gaseous uranium hexafluoride by reaction at a temperature of from 100° to 500° C. with a reducing agent to produce uranium tetrafluoride, said reducing agent comprising:

(a) sulphur vapor and at least one member of the group consisting of Cl_2, Br_2, S_2F_2, SCL_2, S_2Cl_2, and S_2Br_2; or

(b) at least one member of the group consisting of S_2F_2, SCl_2, S_2Cl_2, and S_2Br_2, and

regulating the quantities of reducing agent and uranium hexafluoride so that the ratio R is at least 0.6, where $R=(S)/(UF_6)$, (S) is the total number of gram-atoms of sulphur present during the reduction reaction and (UF_6) is the total number of gram-moles of UF_6.

4,859,442

ZEOLITE SSZ-23

Stacey I. Zones, San Francisco, and R. A. Innes, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 823,705, Jan. 29, 1986, abandoned. This application Feb. 17, 1987, Ser. No. 14,956

Int. Cl.[4] C01B *35/10, 33/20, 33/28;* **C01G** *15/00*

U.S. Cl. 423—277 **12 Claims**

1. A zeolite having a mole ratio of an oxide selected from silicon oxide, germanium oxide and mixtures thereof to an oxide selected from aluminum oxide, gallium oxide, iron oxide, boron oxide and mixtures thereof greater than about 50:1, and having the X-ray diffraction lines of Table 1.

4,859,443

PREPARATION OF SILICON NITRIDE POWDER

Laszlo Marosi, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 19, 1988, Ser. No. 195,817

Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717284

Int. Cl.[4] C01B *21/063, 33/06;* **B05D** *7/00*

U.S. Cl. 423—344 **5 Claims**

1. A process for the preparation of silicon nitride powder by reaction of silicon tetrachloride with ammonia at above 500° C. and separation of the resulting silicon nitride from the ammonium chloride simultaneously formed, wherein the reaction is carried out in a fluidized bed of silicon nitride particles, an amorphous silicon nitride having a specific surface area of >50 m^2/g being used at the beginning of the reaction.

4,859,444

METHOD OF PRODUCING ULTRAFINE PARTICLES OF GRAPHITE FLUORIDE

Yasushi Kita, and Shirou Moroi, both of Yamaguchi Prefecture, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Feb. 26, 1988, Ser. No. 160,775

Claims priority, application Japan, Feb. 27, 1987, 62-42738

Int. Cl.[4] C01B *31/00*

U.S. Cl. 423—439 **1 Claim**

1. A method of producing a graphite fluoride of the formula $(CF)_n$ in the form of submicron particles, the method comprising fluorinating acetylene black with a fluorinating gas consisting of not more than 30 vol % of fluorine gas and the balance of an inactive gas at a temperature in the range from 320° to 400° C.

4,859,445

PROCESS FOR PREPARING CHLORORHODIUMIC ACID

Akio Hirose, Tokyo, Japan, assignor to Tanaka Kikinzoku Kogyo K.K., Japan

Filed Sep. 8, 1988, Ser. No. 241,940

Int. Cl.[4] C01B *7/00, 11/00, 9/00*

U.S. Cl. 423—462 **4 Claims**

1. A process for preparing chlororhodiumic acid which comprises dissolving rhodium or a rhodium-containing mixture in hydrochloric acid having a concentration in the range of 6 to 12 normal by bubbling chlorine gas therein while heating at a temperature in the range of 60° C. to the boiling point of the hydrochloric acid and suspending the rhodium, to produce the chlororhodiumic acid.

4,859,446

PROCESS FOR PREPARING BASIC ALUMINUM COMPOUNDS HAVING INCREASED SWEAT RESISTANT ACTIVITY

Eric S. Abrutyn, Middletown, and Robert J. Sloan, Port Jervis, both of N.Y., assignors to Wickhen Products, Inc., Huguenot, N.Y.

Filed Dec. 18, 1986, Ser. No. 943,443

Int. Cl.[4] A61K *7/32, 7/38, 9/12;* **C01B** *7/00*

U.S. Cl. 423—462 **10 Claims**

1. An improved process for preparing an enhanced antiperspirant active aluminum compound having the empirical formula:

$$Al_2(OH)_{6-a}X_a \qquad (I)$$

wherein X is Cl, Br, F, I, SO_4 and NO_2, a is about 1.0 to about 4.0, which is further characterized by (a) a Size Exclusion Chromatograph Test Band corresponding to Band III of the Standard Basic Aluminum Chloride Solution Size Exclusion Chromatograph, and (b) a Band III percent aluminum value of at least 40 percent, which comprises reacting an aluminum compound of the formula: Al_nX_m, wherein X is an hereinbefore described, n is 1 or 2, and m is 1 or 3, with aluminum metal in an aqueous medium at a temperature between 50° C. and 195° C. until a ratio of aluminum to anion of 0.50–2.5:1 is obtained, and then recovering the resultant product without elevated temperature aging.

4,859,447

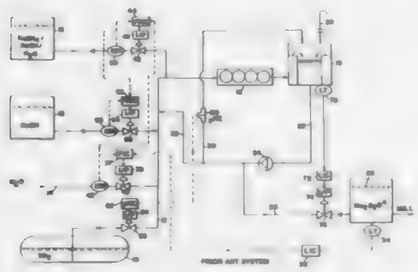
PROCESS FOR THE PRODUCTION OF SODIUM HYDROSULFITE

Philippe R. Sanglet, Gent, Belgium, assignor to Morton Thiokol, Inc., Chicago, Ill.

Division of Ser. No. 945,747, Dec. 22, 1986, Pat. No. 4,788,041. This application Feb. 18, 1988, Ser. No. 126,323

Int. Cl.[4] C01B *17/66*

U.S. Cl. 423—515 **15 Claims**



1. A process for producing sodium hydrosulfite, comprising:

a. establishing a first process flow stream comprising an aqueous mixture of at least sodium hydrosulfite and sodium bisulfite;

b. introducing sodium hydroxide solution into said first Process stream;

c. introducing water and sulfur dioxide into said first process stream at a location downstream from where said sodium hydroxide solution is introduced wherein sodium hydroxide and sulfur dioxide react to form an aqueous solution of sodium bisulfite;

d. introducing a mixture comprising sodium borohydride, sodium hydroxide, and water into said first process stream wherein said first process stream and said mixture are mixed and react to form a further process stream comprising an aqueous solution of sodium hydrosulfite;

e. removing hydrogen from said further process stream of an aqueous solution of sodium hydrosulfite so as to form a stream of degassed sodium hydrosulfite; and

f. dividing said degassed stream into two portions and then passing a portion of said degassed stream to a storage location and passing and recycling the other portion of said degassed stream into said first process stream at two locations, one location upstream from where said sodium hydroxide solution is introduced and one location between where said water and sulfur dioxide are introduced and where said mixture of sodium borohydride, sodium hydroxide, and water is introduced.

4,859,448

METHOD OF MANUFACTURING POWDERED BARIUM TITANATE

Mareike K. Klee, Hückelhofen/Brachelen, and Hans-Wolfgang Brand, Aachen, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 20, 1988, Ser. No. 209,450

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1987, 3739853

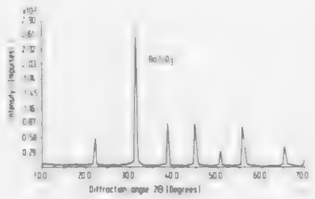
Int. Cl.[4] C01G *23/00*; G01F *11/02*

U.S. Cl. 423—598 **4 Claims**

1. A method of manufacturing powdered barium titanate powder, said method comprising the steps:

(a) refluxing at a temperature of between 70° C.–95° C. an aqueous suspension of an amorphous titanium dioxide power having a bound water content of ≈0.5 mol and barium hydroxide in excess while excluding CO_2 to thereby form barium titanate,

(b) removing barium titanate powder from the suspension,



(c) removing excess barium ions from the barium titanate power and,

(d) then drying the barium titanate powder.

4,859,449

MODIFIED ANTIBODIES FOR ENHANCED HEPATOCYTE CLEARANCE

Michael J. Mattes, Berkeley Heights, N.J., assignor to Center for Molecular Medicine and Immunology, Newark, N.J.

Filed Sep. 14, 1987, Ser. No. 96,615

Int. Cl.[4] A61K *49/00*

U.S. Cl. 424—9 **43 Claims**

1. In a method of treating a human patient having a tumor or infectious lesion, comprising parenterally, but non-systemically, injecting into said patient a therapeutically effective amount of an antibody or antibody fragment, conjugated to a radioisotope, toxin or drug, wherein said antibody or antibody fragment conjugate specifically binds to a marker produced by or associated with said tumor or infectious lesion,

the improvement wherein said antibody or antibody fragment conjugate is modified by being further conjugated to, or having exposed thereon, a plurality of terminal glycoside residues which bind to the human hepatocyte asialoglycoprotein receptor.

4,859,450

METHOD OF NMR IMAGING USING ANTIBODY TO CARDIAC MYOSIN

Mark Goldman, Weston, Mass., assignor to The General Hospital Corporation, Boston, Mass.

Continuation of Ser. No. 640,305, Aug. 13, 1984, abandoned. This application Dec. 8, 1986, Ser. No. 938,988

Int. Cl.[4] A61K *49/00*; A61B *5/05, 6/00*

U.S. Cl. 424—9 **7 Claims**

1. A method of enhancing the contrast between NMR spectra of infarct-damaged cardiac tissue and comparatively less damaged cardiac tissue in a human patient, said method comprising administering to said human patient an NMR contrast agent comprising an antibody to cardiac myosin complexed with a paramagnetic substance capable of reducing the spin lattice relaxation time of protons in the water of aqueous liquid in contact with said infarct-damaged cardiac tissue, and imaging said human patient.

4,859,451

PARAMAGNETIC CONTRAST AGENTS FOR MR IMAGING

Steven C. Quay, and Dilip M. Worah, both of Menlo Park, Calif., assignors to Salutar, Inc., Sunnyvale, Calif.

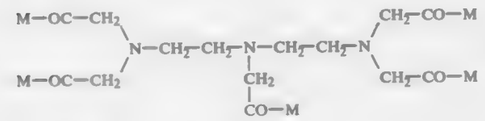
Continuation-in-part of Ser. No. 657,676, Oct. 4, 1984, Pat. No. 4,687,658, and a continuation-in-part of Ser. No. 671,106, Nov. 11, 1984, Pat. No. 4,687,659. This application Apr. 24, 1986, Ser. No. 855,223

The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.

Int. Cl.[4] A61K *49/00*; G01N *31/00*

U.S. Cl. 424—9 **17 Claims**

1. A complex of a paramagnetic polyvalent metal and a derivative of diethylenetriaminepentaacetic acid of the formula



in which

from 1 to 4 M's are OH and the balance independently are OR, NH_2, NHR or NRR, and

R is an alkyl radical of 1 to 18 carbon atoms.

10. In the NMR imaging of a subject comprising administering to such subject a composition containing an image-modifying effective amount of an image enhancer, permitting the enhancer to move through the subject, and after a time interval taking an NMR image of the subject, the improvement which comprises administering as said enhancer a complex according to claim 1.

4,859,452

METHODS FOR THE REDUCTION OF DIFLUOROMETHYLORNITHINE ASSOCIATED TOXICITY

Jaffer Ajani; Bruce Grossie, Jr.; Kenji Nishioka, and David M. Ota, all of Houston, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 820,517, Jan. 17, 1986. This application Jan. 13, 1987, Ser. No. 2,890

Int. Cl.[4] A61K *00/00*

U.S. Cl. 424—10 **9 Claims**

1. A method for reducing difluoromethylornithine associated toxicity in a patient comprising administering to a patient in need thereof a parenteral formulation comprising from about 0.05 about 2.0 grams per 100 ml. of at least one essential amino acid selected from the group consisting of leucine, isoleucine, valine, phenylalanine, lysine, histidine, threonine, and tryptophan; in combination with from about 50 to about 750 mg per 100 ml. of a polyamine precursor selected from the group consisting of methionine, arginine, and ornithine.

4,859,453

METHOD FOR PREVENTING MERCURY POISONING CAUSED BY DISSOLUTION OF MERCURY FROM AMALGAM FILLINGS

Sigvard Andheden, Sandskiddevägen 14, S-260 41 Nyhamnsläge, and Arthur Müller, Bärnstensgatan 19, S-253 68 Helsingborg, both of Sweden

PCT No. PCT/SE88/00003, § 371 Date Sep. 14, 1988, § 102(e) Date Sep. 14, 1988, PCT Pub. No. WO88/05295, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 13, 1988, Ser. No. 246,539

Claims priority, application Sweden, Jan. 16, 1987, 8700157-4

Int. Cl.[4] A61K *7/16*

U.S. Cl. 424—10 **4 Claims**

1. A method for preventing mercury poisoning caused by the dissolution of mercury in amalgam dental fillings, characterized in that the wearer forms a mercury selenide protective layer over the analgam surfaces by brushing a tooth surface with a toothpaste composition containing selenium iodide or components which are capable of forming selenium iodide when used in at least an effective quantity.

4,859,454

PAPER DISTRIBUTING AN ACTIVE COMPOUND ON BURNING, AND A PYROTECHNIC DISTRIBUTOR USING SUCH PAPER

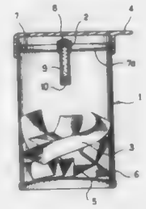
Patrick Barruet, Villeneuve Sur Lot; Alain Fauconnier, Vert Le Petit, and Pierre-Régis Carle, Cassis, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris Cedex, France

Division of Ser. No. 896,660, Aug. 14, 1986, Pat. No. 4,777,032. This application Apr. 26, 1988, Ser. No. 185,700

Claims priority, application France, Aug. 27, 1985, 85 12753

Int. Cl.[4] A01N *25/18*

U.S. Cl. 424—40 **6 Claims**



1. A pyrotechnic distributor comprising a can which is equipped with an igniting device and which contains a fuel ensuring the dissemination of an active compound contained in said can, wherein the can is provided with vents and contains a composition capable of disseminating an effective amount of an insecticide, an insect repellant or a lachrymatory agent, said composition consisting of (1) a combustible substrate and (2) said insecticide, insect repellant or lachrymatory agent; said combustible substrate is paper consisting essentially of a mixture of binding fibers and 50–75% nitrocellulose fibers, said paper having nitrogen content greater than 5%, said insecticide, insect repellant or lachrymatory agent having a decomposition temperature above 130° C., and a pyrotechnic ignition device.

4,859,455

HYDROCARBON TOLERANT HAIR FIXING COMPOSITIONS

Frank A. Nowak, Jr., Somerville; Albert L. Micchelli, Middletown, and William M. Rouse, Morristown, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 166,332, Mar. 10, 1989. This application Jan. 3, 1989, Ser. No. 293,154

Int. Cl.[4] A61K *7/11*

U.S. Cl. 424—47 **4 Claims**

1. An improved hair fixing composition having increased hydrocarbon tolerance, for use in aerosol formulations, comprising a 40–60% (by wt.) of a tetrapolymer of the following monomer units (1) C_3–C_{11} alkyl methacrylate, (2) 20–40% (by wt.) of a C_4–C_{10} N-substituted alkyl acrylamide, (3) 10–25% (by wt.) of acrylic acid or methacrylic acid, and (4) up to 20% (by wt.) of a comonomer selected from the group consisting of acrylic and methacrylic esters of C_1–C_{12} aliphatic alcohols, hydroxy alkyl esters of acrylic and methacrylic acids, C_1–C_4 alkyl/C_2–C_4 amino alkyl esters of acrylic and methacrylic acids, styrene and alkyl substituted styrene monomers, vinyl esters, C_1–C_8 dialkyl maleates, N-vinyl pyrrolidone, and N-

substituted alkyl (C_1–C_8) maleamic acid, wherein all percentages total 100% and the improvement comprises neutralizing at least 70% of the carboxylic acid functionalities with an alkaline neutralizing agent comprising at least one base selected from the group consisting of NaOH or KOH, such that the tolerance of the copolymer to hydrocarbons is enhanced.

4,859,456

HAIR RINSE CONDITIONERS WITH SUPERIOR DRY HAIR FEEL AND HIGH HAIR LUSTER

Frank W. Marschner, Whitehouse Station, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 812,229, Dec. 23, 1985, abandoned. This application Nov. 19, 1987, Ser. No. 122,616

Int. Cl.[4] A61K *7/06, 7/08, 9/12*

U.S. Cl. 424—47 **12 Claims**

1. A hair rinse conditioning composition which imparts superior dry feel and high luster properties to hair treated therewith and is readily removable from the hair by simply shampooing consisting essentially of by weight, a ternary mixture of 0.5% to 15% of a polyvinylpyrrolidone/vinyl acetate (PVP/VA) copolymer, in place of the fatty materials conventionally used, having a weight ratio of PVP/VA varying from 70:30 to 30:70; 0.1% to 10% of a hydrophilic cationic quaternary ammonium salt which corresponds to the following formula:



wherein R and R_1 each is an alkyl radical containing 1–3 carbon atoms; R_2 is a polyoxyalkylene radical represented by either $[CH_2CH(R_4)O]_nH$ or alkylene $O[CH_2CH(R_4)O]_nH$ where R_4 is an alkyl radical of 1–2 carbon atoms; n is 3 to 60, and alkylene contains not more than three carbon atoms; X is a lower alkyl or alkenyl radical containing 1 to 4 carbon atoms or is an alkaryl radical containing from 7 to 9 carbon atoms; and A is an anion selected from the group consisting of chlorine, bromine, hydroxy, sulfate, metho- or ethosulfate, nitrate, phosphate, acetate, formate and sulfonate; the weight ratio of said quaternary salt to said copolymer being in the range of 1:5 to 20:1; and 0.1% to 4% of a water soluble nonionic cellulose polymer in 71% to 99.3% of an aqueous medium, said composition having a pH in the range of 3 to 6.

4,859,457

HAIR RINSE COMPOSITION

Toshio Suzuki, Ichikawa, and Takeo Okumura, Funabashi, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jul. 5, 1984, Ser. No. 627,837

Claims priority, application Japan, Jul. 12, 1983, 58-126390

Int. Cl.[4] A61K *7/06, 7/08*

U.S. Cl. 424—70 **10 Claims**

1. A hair rinse composition which comprises (A) 0.05 to 0.5 wt % of a cationic surface active agent, and (B) a second component selected from the group consisting of a higher alcohol, a glycerine mono fatty acid ester having a melting point not lower than 45° C. and mixtures thereof, said second component being present in said hair rinse in an amount of 3 to 15 times by weight to ingredient (A), and wherein said composition is produced by first forming a highly concentrated emulsified product comprising 0.4 to 34 wt % of ingredients (A) and (B), and thereafter diluting said concentrated product with water in the amount of 1 to 20 times by weight of said concentrated product.

4,859,458

HAIR CONDITIONING POLYMERS CONTAINING ALKOXYLATED NITROGEN SALTS OF SULFONIC ACID

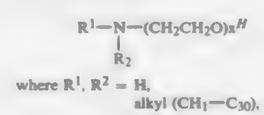
Aan B. Salamone, Marblehead, and Susan L. Snyder, Beverly, both of Mass., assignors to Morton Thiokol, Inc., Chicago, Ill.

Continuation of Ser. No. 302,329, Sep. 15, 1981, abandoned. This application Mar. 25, 1988, Ser. No. 173,519

Int. Cl.[4] A61K *7/06, 7/08, 7/11, 9/10*

U.S. Cl. 424—70 **46 Claims**

1. A polyanionic polymer for imparting good conditioning properties to hair made from an ethylenically unsaturated addition polymerizable monomer containing an alkyloxylated nitrogen salt of sulfonic acid, and at least one additional monomer selected from the group consisting of neutral monomers, anionic monomers, or cationic monomers; said addition polymerizable monomer being present in a mole fraction of about 0.03 to 1.0; said salt being derived from an ethoxylated amine having the following structure:



where R^1, R^2 = H, alkyl (CH_1—C_{30}), aryl, $(CH_2CH_2O)_xH$, or R^1—R^2 = cycloalkylene and x = 7.5 to 25;

4,859,459

METHOD OF SHAPING HUMAN HAIR USING DIPROPYLENE GLYCOL MONOMETHYL ETHER

Jousef Greiche, Darmstadt; Peter Hartmann, Darmstadt, and Joachim Köhler, Reinheim, all of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP87/00126, § 371 Date Oct. 13, 1987, § 102(e) Date Oct. 13, 1987, PCT Pub. No. WO87/05500, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 4, 1987, Ser. No. 128,827

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608151

Int. Cl.[4] A61K *7/09;* **A45D** *7/04*

U.S. Cl. 424—71 **31 Claims**

20. A cosmetic composition based on a keratin-softening active ingredient which comprises:

(a) a keratin-softening reducing agent in an amount effective to break disulfide bonds in hair keratin; and

(b) 2 to 25% by weight of dipropylene glycol monomethyl ether as a swelling agent and a penetrating material.

4,859,460

METHOD FOR REINFORCEMENT OR PERMANENT DEFORMATION OF HAIR

Claude Mahieu, Paris, and Christos Papantoniou, Montmorency, both of France, assignors to Société Anonyme dite L'Oreal, Paris, France

Filed Nov. 10, 1987, Ser. No. 119,336

Claims priority, application France, Nov. 21, 1986, 86 16252

Int. Cl.[4] A61K *7/09, 7/11;* **A45D** *7/04*

U.S. Cl. 424—72 **7 Claims**

1. A method for the reinforcement and/or permanent deformation of hair, comprising in a first step applying to hair a composition containing a reducing agent to form free thiol groups and in a second step applying to the hair a composition containing a modifying agent which promotes the formation of new chemical linkages with the thiol groups, the improvement comprising said modifying agent being a polyhaloacetylated polymer possessing halogen atoms which are capable of reacting with the free thiol groups.

4,859,461

COATABLE ION EXCHANGE RESINS

San-Laung Chow, and Yegnaswami Raghunathan, both of Perinton, N.Y., assignors to Fisons Corporation, Rochester, N.Y.

Continuation of Ser. No. 892,169, Jul. 30, 1986, abandoned. This application May 4, 1987, Ser. No. 46,378

Int. Cl.[4] A61K *31/74, 31/78, 31/79*

U.S. Cl. 424—79 **6 Claims**

1. A process for enhancing the coatability of sulfonic acid cationic exchange resin particles which comprises contacting said particles with an aqueous solution containing from at least about 3% to about 20% by weight of an impregnating agent, based on the combined weight of the impregnating agent and the particles, said agent being selected from the group consisting of hydroxypropylmethyl cellulose, hydroxypropyl cellulose, sorbitol, hydroxypropyl sorbitol, and polyvinylpyrrolidone, and thereafter individually coating said particles with a waterpermeable diffusion barrier.

4,859,462

POLYMER-TREATED ION EXCHANGE RESINS

San-Laung Chow, and Yegnaswami Raghunathan, both of Perinton, N.Y., assignors to Fisons Corporation, Rochester, N.Y.

Continuation of Ser. No. 892,168, Jul. 30, 1986, abandoned. This application May 4, 1987, Ser. No. 46,379

Int. Cl.[4] A61K *3/74, 3/78, 3/79*

U.S. Cl. 424—79 **4 Claims**

1. A process for enhancing the coatability of sulfonic acid cationic exchange resin particles which comprises contacting said particles with an aqueous solution containing from at least about 0.04% to about 1.1% by weight of a high molecular weight polymer, based on the combined weight of the polymer and the particles, said polymer being selected from the group consisting of carboxypolymethylene, xanthan gum, and propylene glycol alginate, and thereafter individually coating said particles with a water-permeable diffusion barrier.

4,859,463

USE OF METHYL-ISOEUGENOL, N-DODECANOL AND MIXTURES OF SAME AS INSECT ATTRACTANTS

Richard A. Wilson, Westfield, N.J.; Jerry F. Butler, Gainesville, Fla.; Donald Withycombe, Linerofft, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ira Katz, West Long Branch, N.J., and Kenneth R. Schrankel, Tinton Falls, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y. and The University of Florida, Gainesville, Fla.

Continuation of Ser. No. 930,418, Nov. 14, 1986, Pat. No. 4,801,446. This application Jun. 30, 1988, Ser. No. 213,682

The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.

Int. Cl.[4] A01N *25/00, 31/00;* **A61K** *31/74, 31/78*

U.S. Cl. 424—84 **8 Claims**

1. A method of attracting *Musca domestica L.* (Diptera Muscidae) to an insect trap comprising the step of exposing the environment surrounding said trap to an insect attractant containing polymer which consists of a mixture of a polymer which is compatible with said attractant and from about 1% up to about 45% by weight of said polymer of an attractant selected from the group consisting of:

(i) methyl isoeugenol;

(ii) n-Dodecanol; and

(iii) a mixture of methylisoeugenol and n-Dodecanol.

4,859,464

METHOD FOR THE PURIFICATION OF PARASITE ANTIGENIC FACTORS

Lawrence E. D'Antonio, 1000 Clifton Ave., Collingdale, Pa. 19023

Continuation of Ser. No. 349,616, Feb. 17, 1982, abandoned. This application Apr. 16, 1984, Ser. No. 600,596

Int. Cl.[4] C12P *21/00;* **A61K** *39/00, 37/00*

U.S. Cl. 424—88 **15 Claims**

1. A method for the solubilization and recovery of plasmodial parasite protective antigenic factors from associated starting plasmodial parasite material, starting material being selected from the group consisting of intact red blood cells containing the blood stage of the plasmodial parasite, intact plasmodial parasite cells or fragments of such cells released from red blood cells, merozoites which have released themselves from red blood cells, tissues having blood infected with the plasmodial parasite tissues having blood infected with the plasmodial parasite, and tissues having plasmodial parasite infected blood, and method comprising:

(a) forming an aqueous suspension of the starting parasite material and associated insoluble protective antigenic factors;

(b) adding the non-ionic detergent n-octyl-β-D-glucopyranoside to the suspension to solubilize the insoluble antigenic factors; and

(c) recovering the solublized plasmodial parasite protective antigenic factors.

4,859,465

VACCINE CAPABLE OF ELICITING MULTIVALENT ANTIBODIES

William J. Rutter, San Francisco, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 602,432, Apr. 20, 1984, abandoned, which is a continuation of Ser. No. 213,881, Dec. 8, 1980, abandoned. This application Dec. 21, 1987, Ser. No. 139,171

Int. Cl.[4] C07K *15/00, 9/00;* **C12N** *15/00;* **A61K** *39/12*

U.S. Cl. 424—89 **4 Claims**

1. A fusion protein for use in a multivalent hepatitis b vaccine comprising antigenic determinants derived from at least two proteins encoded by the hepatitis B genome,

wherein the encoded proteins are hepatitis B core antigen and hepatitis B surface antigen,

wherein said fusion protein is capable of eliciting the formation of antibodies which are immunoreactive with each of said proteins.

4,859,466

MICROBICIDES

Ludwig Maier, Ariesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

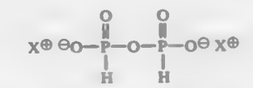
Filed Dec. 11, 1987, Ser. No. 131,710

Claims priority, application Switzerland, Dec. 23, 1986, 5202/86

Int. Cl.[4] A01C *1/06;* **A01N** *59/26*

U.S. Cl. 424—605 **2 Claims**

1. A method of controlling phytopathogenic fungi or of protecting plants from attack by said fungi, which compriaes applying to said plants or to the locus thereof a fungicidally effective amount of a salt of the pyrophosphorous acid of formula I



(I)

wherein $X^{\oplus}$ is a cation equivalent selected from the group consisting of sodium, potassium, lithium, beryllium, magnesium, aluminium, zinc, manganese, copper and NH_4.

4,859,467

SUSTAINED RELEASE FLUORIDE COMPOSITION

Marcus G. Grodberg, Newton, Mass., and David J. Baylink, Redlands, Calif., assignors to Colgate-Palmotive Company, New York, N.Y.

Filed Sep. 25, 1986, Ser. No. 911,608
Int. Cl.[4] A61K *9/22, 9/26, 33/16*
U.S. Cl. 424—606 2 Claims

1. A medication for providing fluoride ion for the treatment and prevention of bone loss disease including osteoporosis and alveolar bone loss, which comprises a solid, unitary dosage tablet, containing from about 20 to 100 milligrams of sodium monofluorophosphate and further containing a coherent network matrix of a hard dry compacted mass of water swellable gel-forming fibrous powder means for controlling the release of the monofluorophosphate at a slow rate over a period extending from at least 4 hours up to eight hours after swallowing, whereby the quantity of fluoride ions at any given time is below the threshold value at which gastric irritation will occur, further comprising from 5 to 10% by weight of sodium fluoride based on the combined weight of sodium monofluorophosphate and sodium fluoride.

4,859,468

COMPOSITIONS AND METHOD FOR DECOMPOSING ADIPOSE TISSUE

Michinori Kubo, Sakai, and Reiko Matsuda, Osaka, both of Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan

Filed Oct. 2, 1986, Ser. No. 914,681
Claims priority, application Japan, Oct. 3, 1985, 60-220934; Oct. 3, 1985, 60-220935
Int. Cl.[4] A61K *35/78*
U.S. Cl. 424—195.1 4 Claims

1. A method for controlling overweight comprising giving orally to an overweight human subject an effective overweight controlling amount of an extract of at least one plant selected from the group consisting of *Piper angustifolium* and *Boldea fragrans.*

4,859,469

NOVEL GALENIC FORMS OF VERAPAMIL, THEIR PREPARATION AND MEDICINES CONTAINING SAID NOVEL GALENIC FORMS

Philippe Baudier, Waterloo; Arthur De Boeck, Herne, and Jacques Fossion, Braine-L'Alleud, all of Belgium, assignors to Pharlyse Societe Anonyme, L-Luxembourg Ville, Luxembourg

Filed Sep. 18, 1986, Ser. No. 909,054
Claims priority, application Luxembourg, Sep. 18, 1985, 86077
Int. Cl.[4] A61K *9/58*
U.S. Cl. 424—462 17 Claims



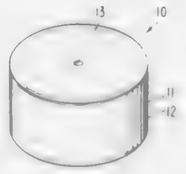
1. Galenic form of verapamil chlorhydrate with sustained release of said compounds, comprising a microgranules containing verapamil chlorhydrate and at least one wetting agent selected from the group consisting of sucrose, polyvinylpyrrolidone, C_{12} to C_{20} fatty acid esters of sucrose and xylose, sucrose glycerides, fatty acid esters of polyoxyethylene, fatty alcohol ethers of polyoxyethylene, sorbitan esters, polyoxyethylene sorbitan esters, polyglycides-glycerides, polyglycides-alcohols esters and lecithins, said microgranules being coated with a microporous membrane constituted of at least a synthetic polymerisate of acrylic acid ethylesters and methacrylic acid methylesters and at least a pharmacologically acceptable adjuvant selected from the group consisting of plastifying agents, pigments, fillers, wetting agents, lubricants and anti-foaming agents.

4,859,470

DOSAGE FORM FOR DELIVERING DILTIAZEM

George V. Guittard, Cupertino; Patrick S. L. Wong, Hayward; Felix Theeuwes, Los Altos, and Richard Cortese, Cupertino, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Jun. 2, 1988, Ser. No. 201,519
Int. Cl.[4] A61K *9/24*
U.S. Cl. 424—473 7 Claims



1. A device for delivering diltiazem, comprising:
(a) a wall that surrounds and forms;
(b) a compartment;
(c) a diltiazem composition in the compartment comprising from 70 wt % to 96 wt % of a member selected from the group consisting of diltiazem and its pharmaceutically acceptable salts, from 0.5 wt % to 15 wt % of a polyacrylic acid comprising a 2,500,000 to 4,000,000 molecular weight, from 0.5 wt % to 20 wt % of poly(ethylene oxide) comprising a 4,000,000 to 5,500,000 molecular weight and from 0.5 wt % to 20 wt % of a poly(vinylpyrrolidone) comprising a 35,000 to 40,000 molecular weight;
(d) a push composition in the compartment comprising 70 wt % to 95 wt % poly(ethylene oxide) comprising a 6,200,000 to 7,500,000 molecular weight, from 1 wt % to 15 wt % of a hydroxypropylmethylcellulose comprising a 9,000 to 16,000 molecular weight; and,
(e) at least one passageway in the wall for delivering diltiazem from the device.

4,859,471

PANCREATIC ENZYME PRODUCTS AND A PROCESS FOR THE PREPARATION THEREOF

Werner Fülberth, and Hans-Georg Freuer, both of Hoechst Aktiengesellschaft, P.O. Box 80 03 20, D-6230 Frankfurt am Main 80, Fed. Rep. of Germany

Continuation of Ser. No. 807,490, Dec. 10, 1985, abandoned. This application Mar. 14, 1988, Ser. No. 170,562
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1984, 3445301
Int. Cl.[4] A61K *9/22, 9/34, 37/62*
U.S. Cl. 424—480 7 Claims

1. A process for the preparation of a high-dosage pancreatic enzyme product in compressed form, which comprises application to the core, which contains the active compound, of a water-based insulating layer which is composed of a primary covering syrup and a primary covering powder, and then provision of a lacquer layer based on an organic solvent.

4,859,472

CLODRONATE-CONTAINING MEDICAMENTS AND A PROCESS FOR THE PREPARATION THEREOF

Fritz Demmer, Hirschberg-Leutershausen, and Berthold Stemmle, Hockenheim, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Dec. 17, 1987, Ser. No. 134,047
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1986, 3643758
Int. Cl.[4] A61K *9/14*
U.S. Cl. 424—489 21 Claims

1. Process comprising mixing together
(80–95%) by weight of methanedichlorodiphosphonic acid or a physiologically acceptable salt thereof
(2 to 10%) by weight of pharmaceutically acceptable filler
0 to 10% by weight of pharmaceutically acceptable disintegration agent
0 to 5% by weight of a first pharmaceutically acceptable lubricant,
to form a mixture, granulating and drying the first mixture, mixing 1 to 5% by weight of pharmaceutically acceptable second lubricant with the dried first mixture to form a second mixture containing 1 to 10% by weight of pharmaceutically acceptable lubricant, and forming the second mixture into a unit dose form having a rate of dissolving of greater than 90% after 30 minutes.

4,859,473

PROCESS FOR MAKING LOW SODIUM BAKED CRACKERS

Henry E. Arciszewski, Franklin Lakes; Linda A. Porzio, Kinnelon; Bin Y. Chiang, Cedar Knolls; Clyde E. Spotts, Jr., Ridgewood; Kevin McHugh, Oakland, and Joseph A. Szwerc, Mahwah, all of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation of Ser. No. 773,127, Sep. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 584,868, Feb. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 480,431, Mar. 30, 1983, abandoned. This application Oct. 6, 1987, Ser. No. 105,975
Int. Cl.[4] A21D *8/00, 8/04, 8/02*
U.S. Cl. 426—19 24 Claims

1. A process for producing a baked cracker, the process comprising forming a dough by mixing flour, water, fat or shortening, from about 40 to about 80 percent by weight of ammonium bicarbonate, from about 30 to about 10 percent by weight of potassium carbonate and from about 30 to about 10 percent by weight of an edible acidic component, the percentage being based upon the total weight of the ammonium bicarbonate, potassium carbonate and the acidic component and baking the dough, thereby causing the edible acidic compound to react to react with the potassium carbonate to form carbon dioxide and leaven the dough, laminating the dough and baking the laminated dough, thereby forming the baked cracker.

4,859,474

METHOD OF MAKING AN ENZYME SWEETENED CEREAL PRODUCT

Saul L. Neidleman, Oakland, Calif., and John A. Maselli, Winston-Salem, N.C., assignors to Nabisco/Cetus Food Biotechnology Research Partnership, Emeryville, Calif.

Filed Sep. 28, 1987, Ser. No. 101,564
Int. Cl.[4] A23L *1/10*
U.S. Cl. 426—28 25 Claims

1. A process for producing a sweetened cereal product comprising:
(a) moistening a cereal grain by adding an aqueous solution to a cereal grain containing cellulose and starch in an amount sufficient to support conversion by enzymes of the cellulose and starch to fructose;
(b) disrupting the moistened cereal produced in step (a) to an extent effective to promote the enzymatic conversion of the cellulose and starch to fructose;
(c) adding to the disrupted, moistened cereal produced in step (b) enzymes effective to convert cellulose and starch to glucose and the glucose to fructose to produce a moistened cereal and enzyme mixture;
(d) incubating said moistened cereal and enzyme mixture for a sufficient period of time and at a sufficient temperature to convert the cellulose and starch in said cereal to fructose while retaining a sufficient amount of starch for texture and formability in the resulting cereal product enriched in fructose; and
(e) collecting said cereal product enriched in fructose.

4,859,475

NUTRITIONAL ATHLETIC BAR

Jane Michnowski, Little Ferry, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Continuation of Ser. No. 724,552, Apr. 18, 1985, which is a continuation of Ser. No. 480,438, Mar. 30, 1983, Pat. No. 4,543,262. This application May 3, 1988, Ser. No. 189,846
Int. Cl.[4] A23G *3/00*
U.S. Cl. 426—72 18 Claims

1. A chewy nutritional snack consisting of a substantially homogenous mixture of:
(a) corn syrup,
(b) a confectioner's coating material which is normally solid at room temperature for providing shape integrity to the snack,
(c) a liquid wetting agent,
(d) added vitamins and minerals,
(e) at least one high protein content source, and,
(f) at least one high carbohydrate content source said snack being chewy in texture and having a caloric distribution of at least 10 percent from proteins, at least about 45 percent from carbohydrates, and from about 25 to about 35 percent from fats, said percentages adding up to 100 percent, the total water content of the snack being less than about 10 percent weight, said confectioner's coating material being substantially, uniformly distributed throughout said snack, said snack being shelf stable at room temperature during prolonged storage, said nutritional snack not having been heated or cooked at a temperature about 160° F.

4,859,476

BAKED WAFER OR CONE WITH PRINTED MATTER

Heinrich Herting, Herne, Fed. Rep. of Germany, assignor to Firma Karl Oexmann, Inh. Wolfmann Oexmann, Gelsenkirchen-Hessler, Fed. Rep. of Germany

Division of Ser. No. 882,267, Jul. 7, 1986. This application Mar. 18, 1988, Ser. No. 169,681
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524116; Apr. 19, 1986, 3613292
The portion of the term of this patent subsequent to Aug. 2, 2005, has been disclaimed.
Int. Cl.[4] A21D *13/00*; A23G *3/28*
U.S. Cl. 426—87 1 Claim

1. A baked cone of edible material formed directly with an imprint of an edible ink by application of a stamp carrying said

ink to a flat baked wafer of said edible material in a hot coilable and hardenable state so that said ink penetrates into the material which is coiled into the cone and is applied directly to a baked surface thereof.



4,859,477

PRESWEETENED COMESTIBLE COMPOSITION

Michael E. Augustine, Decatur, Ill., and Frank T. Orthoefer, Lafayette, La., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation of Ser. No. 887,678, Jul. 18, 1986, abandoned. This application Oct. 22, 1987, Ser. No. 113,383

Int. Cl.[4] A23L *1/10*

U.S. Cl. 426—103 1 Claim

1. A sweetened dry comestible comprising:

(a) a coating comprising from about 10% to about 60% of the total weight of the coated comestible, said coating comprising, on a coating only weight basis, from about 5% to about 50% of a cold-water-swelling granular starch and from about 50% to about 95% of a saccharide based sweetener, said sweetener having a fructose content of at least 85% by weight (dsb) of said sweetener; and

(b) a dry comestible comprising from about 40% to about 90% of the total weight of the coated comestible, said comestible comprising discrete particles of ready-to-eat cereal.

4,859,478

PROCESS FOR MANUFACTURING RECONSTITUTED SQUID

Jose M. I. Castro, Vigo, Spain, assignor to Pescanova S.A., Vigo, Spain

Continuation of Ser. No. 934,173, Nov. 20, 1986, abandoned. This application Jul. 7, 1988, Ser. No. 217,084

Claims priority, application Spain, Feb. 24, 1986, 552332

Int. Cl.[4] A33L *1/333*

U.S. Cl. 426—272 14 Claims

1. A process for the manufacture of reconstituted squid shaped into rings which consists essentially of:

a. washing eatable parts of a cephalopod

b. mincing the eatable parts into pieces at a temperature of −10° C. to −3° C.

4,859,479

METHOD FOR QUANTITATIVELY EXTRUDING FOOD MATERIAL

Torahiko Hayashi, and Yasunori Tashiro, both of Utsunomiya, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

Filed Jul. 22, 1988, Ser. No. 222,809

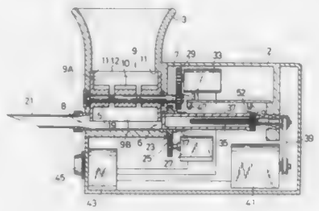
Claims priority, application Japan, Oct. 2, 1985, 60-219444

Int. Cl.[4] A23G *3/00*

U.S. Cl. 426—281 8 Claims

1. A method for quantitatively extruding food materials containing solids and possessing elasticity, comprising the steps of:

introducing the materials, by imparting a controlled force depending on the elasticity of the materials, into a cylinder through a longitudinal opening thereof, using at least one introducing means disposed in parallel with said opening;



closing said opening; and

extruding the materials from the cylinder into an edible article through a nozzle having a diameter substantially equal to that of the cylinder.

4,859,480

COMPOSITION AND METHOD FOR TREATING HAY AND SIMILAR MATTER

John O. Macfarlane, deceased, late of Overland Park, and John A. MacFarlane, personal representative, Fairbanks, Ak., assignors to Tillin, Inc., Shawnee, Kans.

Continuation of Ser. No. 903,211, Sep. 2, 1986. This application Sep. 28, 1987, Ser. No. 101,805

Int. Cl.[4] A23K *3/00*

U.S. Cl. 426—310 6 Claims

1. An oil-in-water emulsion for treating hay, milo, or silage, to coat same with a generally water-resistant coating, said composition consisting essentially of the following components in the following ratios by weight, later diluted with a sufficient amount of water to enable spreading over harvested material to be coated:

(a) about 16 to about 20 parts of soybean oil;

(b) about 16 to about 20 parts of an emulsifier containing acetylated monoglycerides;

(c) about 1 to 1.5 parts diethanolamine;

(d) about 1 to 1.5 parts of an emulsifier containing polyenthylene glycol-8-oleates;

(e) about 1 to 2 parts glyceryl triacetate;

(f) about 0.25 to about 1.0 parts of a polyacrylamide emulsifier; and

(g) about 0.5 to about 2.0 parts propionic acid.

4,859,481

METHOD FOR PRODUCING FRUIT CHIPS

Yasushi Matsumura; Takeshi Mizuguchi, both of Nara, and Fumio Matsui, Moriguchi, all of Japan, assignors to House Food Industrial Company Limited, Osaka, Japan

Filed Mar. 23, 1988, Ser. No. 172,088

Claims priority, application Japan, Mar. 24, 1987, 62-69769

Int. Cl.[4] A23B *7/02*

U.S. Cl. 426—445 4 Claims

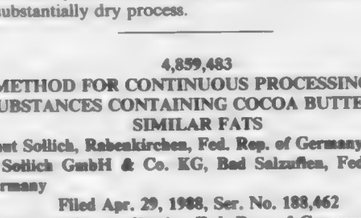
1. A method for producing fruit chips comprising the steps of:

(a) cutting bananas into small pieces;

(b) adjusting the temperature of the pieces of bananas to provide for a uniform temperature thereof from 5° to 20° C.;

(c) expanding the resulting pieces of bananas by quickly reducing the pressure from normal pressure to a reduced pressure ranging from 150 to 500 Pa within one minute; and

(d) heating the expanded pieces of bananas under a reduced pressure which is lower than the pressure in step (c) at a temperature of 60°–90° C.;



the time elapsed from the cutting step (a) to the completion of reduction of the pressure in the step (c) being not more than 20 minutes.

4,859,482

METHOD FOR PRODUCING A PRODUCT FROM OIL SEED

Michel Gavin, Wil; Urs Gruender, Oberuzwil, and Karl Ulmer, Wil, all of Switzerland, assignors to Gebruder Buhler AG, Uzwil, Switzerland

Continuation of Ser. No. 157,097, Feb. 9, 1988, abandoned, which is a continuation of Ser. No. 733,952, May 14, 1985, abandoned. This application Sep. 21, 1988, Ser. No. 246,264

Claims priority, application Switzerland, May 22, 1984, 2513/84

Int. Cl.[4] A23L *1/20*

U.S. Cl. 426—516 12 Claims

1. A method of refining oil seeds comprising protein-containing cells having outer cell walls; said method including the steps of:

(a) providing dry kernel material of said oil seeds;

(i) said dry kernel material comprising whole kernels, pieces of kernels, flakes of kernels, or mixtures thereof;

(ii) said dry kernel material having a moisture content of no greater than about 50% by weight;

(b) grinding said dry kernel material by passage between surfaces of adjacent rotating rollers of a friction roll refiner wherein rotation of adjacent rollers is maintained at different surface speeds and substantial pressure is simultaneously applied to said dry kernel material; and,

(c) continuing said grinding until said cell walls are substantially completely opened and disintegrated to release protein contained therein as a substantially dry powder;

(d) whereby oil seeds are refinable to a powder through a substantially dry process.

4,859,483

METHOD FOR CONTINUOUS PROCESSING OF SUBSTANCES CONTAINING COCOA BUTTER OR SIMILAR FATS

Helmut Sollich, Rabenkirchen, Fed. Rep. of Germany, assignor to Sollich GmbH & Co. KG, Bad Salzuflen, Fed. Rep. of Germany

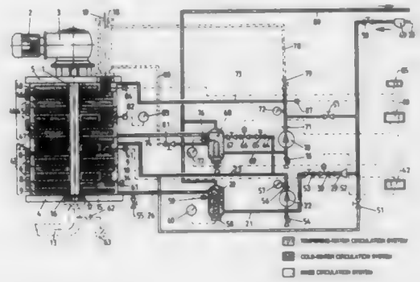
Filed Apr. 29, 1988, Ser. No. 188,462

Claims priority, application Fed. Rep. of Germany, May 2, 1987, 3714663

Int. Cl.[4] A23G *1/18*

U.S. Cl. 426—519 6 Claims

1. A method of continuously processing substances containing cocoa butter or similar fats including chocolate masses, in a tempering machine having mass chambers with several stages of cooling on cooling surfaces followed by stages of heating on heating surfaces, comprising the steps: supplying a mass of said substances to the mass chambers of said tempering machine; moving said mass from the mass chambers of said cooling stages to the mass chambers of said heating stages; flowing a cooling medium through cooling chambers adjacent to said cooling surfaces; flowing a heating medium through heating chambers adjacent to said heating surfaces; flowing sufficient cooling medium through said cooling chambers to generate turbulence; stirring said mass in said mass chambers with powered impellers sufficiently to blend it thoroughly during cooling and heating; removing said mass from said cooling and heating surfaces with a shearing gradient of 500 to 4000 sec^{-1} in a gap between said cooling and heating surfaces and said impellers.



4,859,484

PROCESSED STARCH-GUM BLENDS

Edward Bielskis, Wheaton, Ill.; Albert J. Leo, Ontario, Calif., and Jane K. Zeien, Geneva, Ill., assignors to Continental Colloids, Inc., West Chicago, Ill.

Filed Apr. 14, 1988, Ser. No. 181,383

Int. Cl.[4] A23L *1/195*

U.S. Cl. 426—573 16 Claims

1. A composition of matter comprising two components including a starch and a hydrocolloid gum, each of said components having been hydrated separately, said starch having been hydrated with greater than 0.7 parts of water, said hydrocolloid gum having been hydrated with greater than 0.2 parts of water, said components then having been intimately commingled, heated, cooled, dried, and pulverized to produce a finished product.

4,859,485

ANIMAL FEED SUPPLEMENT PREPARED FROM WET CORN BRAN AND CORN STEEP LIQUOR

John H. Linton, and Nick Hussar, both of London, Canada, assignors to John Labatt Limited, London, Canada

Continuation of Ser. No. 883,422, Jul. 14, 1986, abandoned, which is a continuation of Ser. No. 673,399, Nov. 20, 1984, abandoned, which is a continuation of Ser. No. 387,476, Jun. 11, 1982, Pat. No. 4,486,451, which is a continuation of Ser. No. 222,829, Jan. 2, 1981, abandoned. This application May 6, 1987, Ser. No. 47,496

Claims priority, application Canada, Dec. 31, 1981, 393458

Int. Cl.[4] A23K *1/00, 3/00;* A23C *9/00;* A23L *1/10*

U.S. Cl. 426—623 13 Claims

13. A product adapted to be fermented under substantially anaerobic conditions to produce a moist friable fermented gravitationally and microbiologically stable animal feed supplement having a pH of less than 4.25 and which is readily reduced to a non-agglomerating product, said product consisting essentially of an admixture of mechanically de-watered corn bran having a solids content of 30% to 50% by weight and a concentrated corn steep liquor having a solids content of 45% to 55% by weight in a ratio of de-watered corn bran to corn steep liquor of 3:1 to 1:1, whereby the resulting admixture readily compacts under its own weight to a bulk density of from 50 to 65 lbs./cubic foot and has a pH of less than about 4.5, a solids content of from 35% to 50% by weight and a protein content of at least 20% on a dry matter basis.

4,859,486

PREPARATION OF AN UNCOOKED SUNFLOWER SEED FOODSTUFF

John M. Douglass, 1526 N. Edgemont St., Los Angeles, Calif. 90027

Continuation-in-part of Ser. No. 846,469, Mar. 31, 1986, abandoned, which is a continuation of Ser. No. 486,713, Apr. 20, 1983, abandoned. This application Sep. 23, 1987, Ser. No. 100,117

Int. Cl.[4] A23L *1/36*; A23B *9/00*

U.S. Cl. 426—629 19 Claims

1. A method for making an uncooked sunflower seed foodstuff, the method comprising the steps of

(a) thoroughly soaking and rinsing raw, uncooked, hulled sunflower seeds to remove some of the outer membranes that are high in phosphorous on the seeds;

(b) sprouting, said seeds;

(c) grinding said seeds into a dough;

(d) forming said uncooked dough into a shape such that said dough can be readily dried; and

(e) drying, without cooking, said dough.

4,859,487

METHOD FOR PRODUCING FRUIT CHIPS

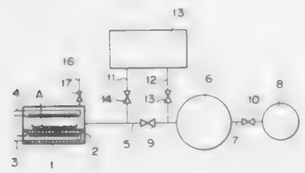
Yasushi Matsumura; Takeshi Mizuguchi, both of Nara, and Fumio Matsui, Moriguchi, all of Japan, assignors to House Food Industrial Company Limited, Higashi, Japan

Filed Mar. 23, 1988, Ser. No. 172,083

Claims priority, application Japan, Mar. 24, 1987, 62-69767

Int. Cl.[4] A23B *7/02*

U.S. Cl. 426—639 5 Claims



1. A method for producing fruit chips comprising the steps of:

(a) heating peaches or melons in syrup having a Brix degree ranging from 12 to 30 at a temperature ranging from 50 to 100° C. for 5 to 30 minutes;

(b) cutting the heated peaches or melons into small pieces;

(c) controlling the temperature of the pieces of peaches or melons to 10° to 35° C.;

(d) rapidly reducing the pressure surrounding the pieces of peaches or melon from atmospheric pressure to 150 to 500 Pa within one minute to expand the pieces; and

(e) heating the expanded pieces under a reduced pressure lower than that in the step (d).

4,859,488

LIQUID FOOD FOR CURING CONSTIPATION: POLYDEXTROSE AND OLIGOSACCHARIDE

Tatsuhiko Kan; Yoichi Kobayashi; Yoshiko Sonoike; Tsuneo Terashima, and Masahiko Mutai, all of Tokyo, Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

Filed Sep. 15, 1987, Ser. No. 96,483

Int. Cl.[4] A23L *1/30*; A61K *31/17*

U.S. Cl. 426—658 4 Claims

1. A liquid food, which is helpful in correcting constipation, comprising:

(a) a water soluble polysaccharide composed of glucose or maltose units having a molecular weight of 1,500 to 18,000 and

(b) an oligosaccharide of at least 3 saccharide units which is utilizable by intestinal bifidobacteria selected from the group consisting of:

(i) raffinose family oligosaccharide: Gal—$(Gal)_n$—Glc—Fru, n=0, 1;

(ii) galactose series oligosaccharide:
Gal—$(Gal)_m$—Glc, m=1, 2, 3, 4
or Gal—(β-1,6)—Glc—(β-1,4)—Gal;

(iii) fructooligosaccharide:
Fru—$(Fru)_m$—Glc, m=1, 2, 3, 4
or Fru—$(Fru)_n$—Glc—Fru, n=0, 1;

(iv) decomposition product of Konjak mannan which is an oligosaccharide comprised of glucose and mannose;

(v) levan (β-2,6-fructan):
Fru—(β-2,6)—(Fru—(β-2,6)$_p$=Fru; p=1–28;

(vi) partially hydrolyzed chitin:
Gal—$(GlcNAc)_m$—Glc, m=1, 2, 3, 4; and

(vii) lactosucrose: Gal—Glc—Fru,

where Gal=galactose moiety, Glc=glucose moiety, Fru=-fructose moiety, GlcNAc=N-acetylglucosamine moiety, and wherein (a) and (b) are admixed in a ratio of about 1:10 to about 20:1.

4,859,489

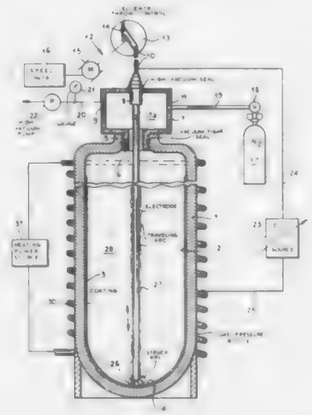
METHOD OF COATING A METAL GAS-PRESSURE BOTTLE OR TANK

Eduard Pinkhasov, Eastchester, N.Y., assignor to Vapor Technologies Inc., Mount Vernon, N.Y.

Filed Jul. 18, 1988, Ser. No. 220,591

Int. Cl.[4] B05D *3/06*; B05B *7/22*

U.S. Cl. 427—37 10 Claims



1. A method of coating the interior of a pressure tank adapted to contain a high-purity gas at an elevated pressure and wherein said tank is composed of metal, is closed at a lower end and has a narrow mouth at an upper end, said method comprising the steps of:

(a) plugging said mouth with a sealing closure to define a closed chamber within said tank;

(b) evacuating said chamber through said closure to a vacuum capable of sustaining an electric arc;

(c) repeatedly striking electric arcs between a wall of said tank and an electrode in said chamber by connecting an electric power source across said tank and said electrode and repeatedly approaching said electrode into contact with and withdrawing said electrode from contact with said wall of said tank, thereby generating a succession of said arcs; and

(d) controlling the vacuum drawn in said chamber, the electrical power supplied by said source and the repetition rate of the striking of said arcs so that the arcs upon being struck migrate along said electrode and evaporate material from said electrode to effect coating of said interior of said tank substantially over the height thereof at least in part with the material evaporated from said electrode.

4,859,490

METHOD FOR SYNTHESIZING DIAMOND

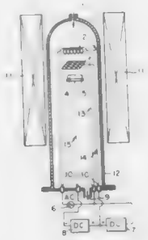
Akihiko Ikegaya, Itami, and Masaaki Tobioka, Kobe, both of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 20, 1987, Ser. No. 75,470

Claims priority, application Japan, Jul. 23, 1986, 61-173366; Mar. 27, 1987, 62-75282

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—38 6 Claims



1. A low pressure vapor phase method of synthesizing diamond from a carbon source ingredient selected from solid carbon, hydrocarbon, hydrocarbon additionally containing O and N in bonded radicals, and carbon tetrachloride, where said method causes raw material gas compound of a mixture of said carbon ingredient and hydrogen to be activated for eventually precipitating diamond on the surface of a substrate heated to a minimum of 600° C. through a maximum of 1,200° C., said method comprising;

(a) causing thermoelectron radiating material heated to a minimum of 1,600° C., to activate said raw material gas;

(b) generating an electrical potential by connecting said thermoelectron radiating material to a negative electrode and connecting a grid disposed between said thermoelectron radiating material and the substrate to be coated to a positive electrode and applying a DC power supply source to said negative and positive electrodes;

(c) extracting thermoelectrons from said thermoelectron radiating material by the electrical potential generated in step (b) to generate a plasma of positive ions between the thermoelectron radiating material and the grid;

(d) generating an electrical potential between the grid and the substrate by connecting the substrate to a negative electrode and applying a second DC power supply source for generating plasma between the grid and the substrate while maintaining the potential of said substrate negative relative to the grid to thereby draw positive plasma ions onto the surface of the substrate to form a coating on said surface of the substrate which is heated to a minimum of 600° C. through a maximum of 1,200° C.;

(e) jointly applying the effect of activation generated by the thermoelectron radiating material and another activation caused by generation of DC plasma; and

(f) maintaining the pressure inside the plasma-generating reactor to between 10 Torr and 400 Torr.

4,859,491

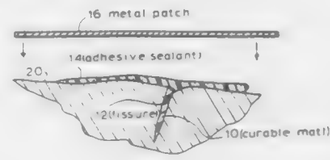
PROCESS FOR REPAIRING A CRYOGENIC HEAT EXCHANGER

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 13, 1987, Ser. No. 107,748

Int. Cl.[4] B32B *35/00*

U.S. Cl. 427—140 19 Claims



1. A method for repairing leakage-causing cracks and fissures in a cryogenic heat exchanger is provided which comprises:

(a) reducing the interior pressure of the heat exchanger to a level which does not exceed the external pressure upon the heat exchanger while maintaining the temperature of the heat exchanger at a low level relative to the ambient external temperature;

(b) applying a curable liquid filler composition to the surface of the heat exchanger proximal the leakage site for seepage into said cracks and fissures located at said leakage, said composition upon a relatively short period of cure at low temperature forming a solid material which fills said cracks and fissures;

(c) curing said filler composition; and,

(d) applying a sealant composition to the surface of said heat exchanger at the filled leakage site, said sealant composition having long-term sealing performance under cryogenic conditions.

4,859,492

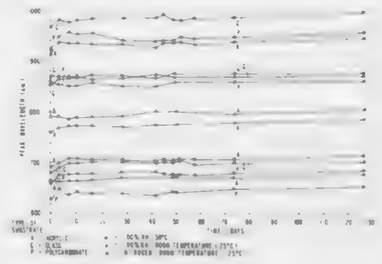
PROCESS FOR FORMING AN ENVIRONMENTALLY STABLE OPTICAL COATING THEREBY

Harvey N. Rogers, Jr., Los Angeles, and Ronald T. Smith, Redondo Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 831,896, Feb. 24, 1986, abandoned. This application Sep. 21, 1987, Ser. No. 99,697

Int. Cl.[4] B05D *3/06*, *5/06*

U.S. Cl. 427—42 7 Claims



1. A low temperature photochemical vapor disposition process for forming on the surface of a chosen substrate an environmentally stable optical coating comprising silicon dioxide and lead oxide, said process comprising the steps of:

(a) providing said substrate;

(b) providing a first selected vapor reactant containing silicon, and a chosen oxygen-containing precursor which are

capable of reacting upon inducement by radiation of a selected wavelength to form a stoichiometric silicon dioxide material;

(c) providing a second selected vapor phase reactant containing lead, which is capable of reacting with said chosen oxygen-containing precursor upon inducement by said radiation of said selected wavelength to form a stoichiometric lead oxide material which is resistant to the absorption of water vapor;

(d) exposing said substrate at a temperature within the range of 30° C. to 200° C. to said first and second vapor phase reactants in predetermined proportions and said oxygen-containing precursor in the presence of said radiation to deposit said coating on said substrate wherein said coating has a uniform composition and comprises silicon dioxide containing 25–80 mole percent of said lead oxide and said coating exhibits enhanced stability in optical properties upon sustained exposure to water vapor.

4,859,493

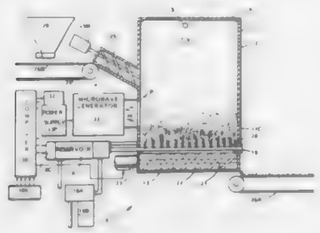
METHODS OF FORMING SYNTHETIC DIAMOND COATINGS ON PARTICLES USING MICROWAVES

Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540

Filed Mar. 31, 1987, Ser. No. 32,307

Int. Cl.⁴ B05D *3/02, 7/00, 3/12;* **B01J** *3/06*

U.S. Cl. 427—45.1 **9 Claims**



1. A method of coating particles with a hard surfacing material comprising:

(a) levitating a plurality of particles of hard solid material in a reaction zone of a reaction chamber by upwardly directing a plurality of streams of a fluid formed of gas molecules containing carbon atoms through said reaction chamber and, while said particles are so levitated,

(b) maintaining an above atmospheric gas pressure in said chamber and causing said particles to make contact with molecules of said fluid which molecules contain carbon atoms, and

(c) passing radiant energy through the molecules of said fluid and against said particles while they are levitated, which radiant energy is operable to react on both said fluid molecules and said particles in a manner to cause carbon atoms of said fluid to deposit as a hard synthetic diamond layer completely surrounding and coating said particles to define the entire outer surface of each of said particles composed of synthetic diamond.

5. A method for forming synthetic diamond coatings on particles which coatings define a hard surfacing wear resistant material comprising:

(a) admitting a plurality of solid hard particles to a reaction chamber containing a gas at an above atmospheric pressure and having molecules containing carbon atoms and causing said particles to be disposed freely in the gas of said chamber and apart from each other during at least part of the time they are disposed in said chamber while said gas is pressurized above the pressure of the atmosphere,

(b) causing said solid hard particles to make contact with molecules of said gas containing said carbon atoms, and

(c) passing microwave energy through the interior of said chamber to cause said microwave energy to intersect molecules of said pressuring gas and said particles, which microwave energy is generated at sufficient intensity and for a sufficient period of time to react on said gas in a manner to cause carbon atoms of said gas to deposit and form a hard synthetic diamond coating on said particles.

4,859,494

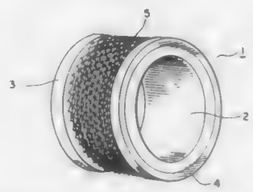
METHOD AND ARTICLE HAVING ELECTROLESS METAL PLATING

Thomas S. Lancsek, Morrisville, Pa. 19067, assignor to Surface Technology, Inc., Princeton, N.J.

Filed Aug. 22, 1988, Ser. No. 234,703

Int. Cl.⁴ B05D *3/14*

U.S. Cl. 427—47 **21 Claims**



1. A method of forming an electrolessly plated metal deposit on a ferromagnetic substrate comprising the step of demagnetizing the substrate prior to plating.

4,859,495

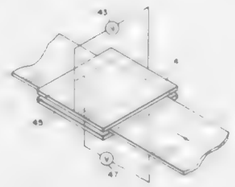
METHOD OF PREPARING PERPENDICULARLY ORIENTED MAGNETIC RECORDING MEDIA

James P. Peng, Rochester, N.Y., assignor to Eastman Kodak Co., Rochester, N.Y.

Filed Mar. 15, 1988, Ser. No. 168,210

Int. Cl.⁴ B05D *3/14*

U.S. Cl. 427—48 **5 Claims**



1. A method of making a magnetic recording film having the magnetic particles oriented in any given direction which comprises applying a magnetic paint to a substrate, subjecting the substrate containing the magnetic paint in an unfixed condition to a rotating magnetic field having magnetic components that lie only in a plane perpendicular to the given direction and fixing the magnetic paint.

4,859,496

METHOD OF PRODUCING AN ELECTRICALLY-CONDUCTIVE TRANSPARENT FILM

Yufuko Toyonaga, Hirakata; Suzushi Kimura, Toyonaka; Masaaki Ueda, Suita; Osamu Tabata, Ikeda, and Saburo Kimura, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 31, 1987, Ser. No. 91,971

Claims priority, application Japan, Sep. 2, 1986, 61-206356; Sep. 2, 1986, 61-206357; Dec. 18, 1986, 61-299899

Int. Cl.⁴ B05D *3/06, 5/12*

U.S. Cl. 427—53.1 **6 Claims**

1. A method of producing an electrically-conductive transparent film, comprising the steps of: projecting a laser beam to a surface of a substrate; moving said substrate in a two-dimensional fashion; and applying a beam of reactive gas comprising a tin compound, oxygen and an impurity material which enhances the conductivity of said film to the laser beam projected



portion on said substrate surface, said beam of reactive gas being finer than said laser beam, whereby said reactive gas is decomposed and deposits on said substrate surface thereby to form a fine line-shaped film.

4,859,497

PROCESS FOR IMPARTING STIR-IN CAPABILITIES TO A SILVER ACTIVATED ZINC SULFIDE PHOSPHOR

Robert W. Wolfe, Towanda, and James E. Morse, Milan, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 25, 1988, Ser. No. 185,591

Int. Cl.⁴ B05D *5/06*

U.S. Cl. 427—68 **5 Claims**

1. A process for pigmenting a silver activated zinc sulfide phosphor and imparting stir-in capabilities thereto, said process comprising:

(a) deagglomerating said phosphor;

(b) forming an aqueous slurry of the phosphor particles, pigment particles, and a binding agent selected from the group consisting of latex polymers and latex copolymers, said binding agent having a glass transition temperature of greater than about 20° C., and agitating said slurry;

(c) separating the solids from the resulting liquor;

(d) drying said solids at a temperature above the Minimum Film Formation Temperature of said latex to produce the phosphor particles wherein said pigment particles are bonded to said phosphor particles; and

(e) blending the resulting pigmented phosphor to insure uniformity in said phosphor.

4,859,498

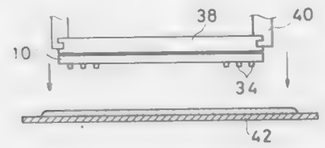
CHIP COMPONENT HOLDING PLATE

Masami Yamaguchi, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Nov. 18, 1987, Ser. No. 122,008

Int. Cl.⁴ B05D *5/12*

U.S. Cl. 427—96 **11 Claims**



9. A method for applying an electrode onto the chip electronics component by utilizing a holding plate for holding a plurality of chip components while simultaneously applying electrode material on one end of each of the chip components being held by the holding plate, said holding said comprising a sheet member composed of an elastic material, a number of through holes being formed in said sheet member, each of which being able to elastically hold chip components therein with one end of each said chip component projecting from one surface of said sheet member, and a magnet-attractable plate composed of a magnetically-attractable material and formed on at least one surface of said sheet member, a number of through holes being formed on said magnet-attractable plate at positions each of which corresponds to one of said through holes of said sheet member, said magnet-attractable plate being composed of a flexible material, said chip component holding plate thereby being flexible as a whole, said method comprising the steps of:

(a) press-inserting a chip electronics component into each through hole of said sheet member so that one end portion thereof is exposed;

(b) magnetically attracting said magnet-attractable plate by another substantially flat plate by a magnetic force acting therebetween to closely magnetically adhere said two plates together; and

(c) moving said plate to move said sheet member so that the respective end portions of the chip electronics components are pressed against an electrode paste.

4,859,499

METHOD FOR COATING A SUBSTRATE WITH AN ELECTRICALLY CONDUCTIVE LAYER

Vincent Sauvinet, Paris; Jean Bletry, Versailles; Micheline Bonnaud, Malakoff, and Maurice Trouve, Nemours, all of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Jan. 22, 1986, Ser. No. 821,365

Claims priority, application France, Jan. 22, 1985, 85 00854; Jul. 3, 1985, 85 10145

Int. Cl.⁴ B05D *5/12, 5/06*

U.S. Cl. 427—108 **26 Claims**

1. A method for coating a substrate with a pyrolyzed metal oxide coating which comprises depositing a predetermined amount of dry indium formate of the formula $In(HCOO)_3$ upon a surface of a heated substrate so as to pyrolyze said indium formate and form a coating of indium oxide upon the surface of the substrate.

4,859,500

METHOD FOR PREPARING A MAGNETIC RECORDING MEDIUM

Takeshi Kakuta, and Takahito Miyoshi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 16, 1987, Ser. No. 109,023

Claims priority, application Japan, Oct. 16, 1986, 61-244035

Int. Cl.⁴ H01F *10/02*

U.S. Cl. 427—128 **5 Claims**

1. A method for preparing a magnetic recording medium comprising the steps of pre-dispersing ferromagnetic particles and a binder in a solvent, mixing and dispersing with an additional binder, and coating the thus obtained magnetic coating composition on a support, wherein said ferromagnetic particles having a specific surface area S_{BET} of 40 m^2 or more and absorbed mosture content of less than 0.8 wt % are pre-dispersed in said solvent containing cyclohexanone in an amount of 80 wt % or more wherein from 5 to 50 parts by weight of said solvent containing cyclohexanone per 100 parts by weight of said ferromagnetic particles is used for the pre-dispersing.

4,859,501

METHOD FOR PROVIDING A PERPENDICULAR RECORDING MEDIUM FOR USE WITH A RING-SHAPED RECORDING AND REPRODUCING HEAD

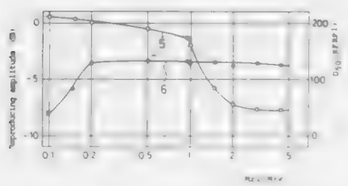
Ryuji Sugita; Kiyokazu Tohma, both of Hirakata; Kazuyoshi Honda, Takatsuki, and Taro Nanbu, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation-in-part of Ser. No. 843,628, Mar. 25, 1986, abandoned. This application Dec. 31, 1987, Ser. No. 140,278

Claims priority, application Japan, Mar. 26, 1985, 60-61136; May 24, 1985, 60-112421; Jul. 16, 1985, 60-156432

Int. Cl.[4] G11B *5/64*

U.S. Cl. 427—131 14 Claims



1. A perpendicular magnetic recording method, comprising:

(a) providing a perpendicular magnetic recording medium, by:

(i) providing a non-magnetic polymeric substrate;

(ii) in a vacuum deposition chamber maintained at a temperature of 100°-300° C. and at a pressure of 1×10^{-6}–3×10^{-4} torr., vacuum depositing on said substrate at a deposition rate in excess of 0.1 μm/sec., using an electron beam evaporating source, a perpendicular anisotropy film of cobalt-base metal alloy, containing 13–30 weight percent cobalt to thereby obtain a magnetic recording medium having:

a perpendicular remnant magnetization $Mr_{\perp}$ and a longitudinal remnant magnetization $Mr_{\parallel}$ having a ratio $Mr_{\perp}/Mr_{\parallel}$ which is less than 1 and not less than 0.2, and

a ratio of Ho/Ms of no more than 3.5π $Oe.cm^3/e.m.u.$, in which Ho is magnetic field intensity at an intersecting point of a first line and a second line in a perpendicular hysteresis loop, in which said first line passes through the origin and has a slope which is the same as that of said perpendicular hysteresis loop at zero magnetization, and said second line is parallel to an X-axis graduated with magnetic field intensity, and Ms is saturation magnetization; and

(b) magnetically recording on said recording medium using a ring-shaped head having a gap on the order of 0.2 micrometer.

4,859,502

METHOD AND APPARATUS USING BITUMINOUS SANDSTONE FOR PAVEMENT REPAIR

Myrle E. Astrope, 220 North 1300 E., and Norman P. Bushman, 1213 East 50 N., both of Pleasant Grove, Utah 84062

Filed Jan. 20, 1988, Ser. No. 146,296

Int. Cl.[4] B05D *5/10;* E01C *5/12*

U.S. Cl. 427—139 18 Claims

1. A method for filling or surfacing fissures, openings and cavities in a pavement surface, comprising the steps of:

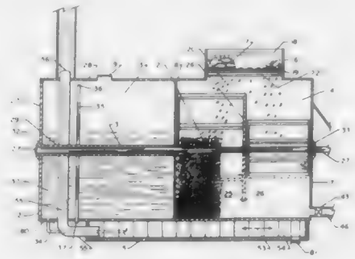
(a) placing a given volume of water within a container;

(b) heating the water to a temperature of at least 110 degrees F but no more than 210 F and maintaining that temperature throughout the remaining steps of this method;

(c) securing a needed quantity of bitumen sandstone;

(d) mixing the water and bitumen sandstone in a ratio within the range of 20 to 56% water by weight;

(e) continuously agitating the combination of water and bitumen sandstone sufficiently to develop a uniform slurry having a consistency and viscosity which enables the



slurry to substantially fill, conform and bond to the interior surface of the opening, yet which does not result in separaton of the bitumen and the water into separate phases;

(f) transporting the prepared slurry to the opening to be filled.

4,859,503

PROCESS FOR COATING CARBON FIBERS WITH A CARBIDE, AND CARBON FIBERS THUS COATED

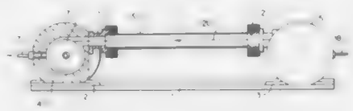
Jean Bouix, Lyon; Jean C. Viala, Villeurbanne; Henri Vincent; Christiane Vincent, both of Lyon; Jean L. Ponthenier, Champagne au Mont D'Or, and Jacques Dazord, Villeurbanne, all of France, assignors to Central National De La Recherche Scientifique (CNRS), France

Filed Dec. 2, 1987, Ser. No. 128,333

Claims priority, application France, Dec. 4, 1986, 86 17157

Int. Cl.[4] B32B *9/00;* D02G *3/00*

U.S. Cl. 427—249 3 Claims



1. A strand of carbon filaments that is arranged so that each filament is separate from the other filaments and the filaments being in parallel alignment along the length of the strand, each filament containing a homogeneous and uniform carbide coating along its length that has a thickness of between 0.01 and 0.1 microns so that the filaments combine to form a supply strand, said coating being formed by heating the carbon filaments at atmospheric pressure in the presence of a carbon free volatile compound capable of reacting with each filament to produce a thin protective coating which prevents carbon from diffusing therethrough whereby the reaction is self-regulating.

4,859,504

CONCRETE FINISHING PROCESS

Paul J. Rossiter, and Tina A. Rossiter, both of 527 San Jose St., Fort Myers, Fla. 33903

Filed May 25, 1988, Ser. No. 198,552

Int. Cl.[4] B05D *3/10, 3/12, 5/00*

U.S. Cl. 427—262 6 Claims

1. A method of transforming a cementitious slab into a simulated multi-stone slab, said method including (A) marking the upper surface of the cementitious slab with a plurality of generally straight intersecting lines to define intended grout lines between and extending about the multi-stones to be simulated, (B) cutting grooves of a predetermined width and depth in the surface of said cementitious slab along the lines marked on said upper surface, (C) applying an acid wash to said slab, including said upper surface and said grooves, to etch all exposed surfaces of said slab, (D) pressure washing said slab, including said upper surface and said grooves, at least once to effectively remove all residue of said acid wash, (E) allowing said slab, including said upper surface and grooves, to thoroughly dry, (F) applying a first light color stain to said upper surface and grooves, (G) allowing said first light color stain to dry, (H) unevenly applying a second darker color stain to said upper surface, only, exclusive of said grooves, and (I) allowing said second stain to dry.

4,859,505

PROCESS FOR METALLIZING GLASS SURFACE

Hajime Nakayama, Shimotsuma; Koichi Tsuyama, and Toshiro Okamura, both of Shimodate, all of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1987, Ser. No. 32,248

Claims priority, application Japan, Mar. 31, 1986, 61-73835; Aug. 25, 1986, 61-198379

Int. Cl.[4] C23C *18/24*

U.S. Cl. 427—305 7 Claims

1. A process for metallizing a crystallized glass surface comprising a crystalline phase and a non-crystalline phase which comprises

(a) a step of roughening the glass surface with a roughening solution having a larger dissolving rate for the non-crystalline phase as compared with the crystalline phase, said roughening solution being an aqueous solution of a fluoride salt having a pH of 5 to 10;

(b) a step of adsorbing a catalyst which can start an electroless plating reaction on the resulting roughened surface; and

(c) a step of carrying out electroless plating on the roughened surface containing the catalyst; the crystallized glass containing boron, silicon, magnesium and barium in the following proportions and percents by mole;

$15<B_2O_3<35$,

$10<SiO_2<30$, and

$40<MgO+CaO+BaO<65$.

4,859,506

DISPERSION FOR PROTECTIVE COATINGS AND METHOD FOR APPLYING SUCH COATINGS

Franz Puchinger, Niederscheyern, and Gerhard Wydra, Oberschleissheim, both of Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 137,176, Dec. 23, 1987. This application Jan. 28, 1988, Ser. No. 212,875

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644116

Int. Cl.[4] B05D *1/18*

U.S. Cl. 427—372.2 6 Claims

1. A method for protecting a substrate with a protective coating against erosion, comprising the following steps:

(a) mixing in water chromic acid (CrO_3) 10 to 20 percent by weight of the binder solution, phosphorous acid (H_3PO_3) 20 to 30 percent by weight, phosphoric acid (H_3PO_4) 20 to 30 percent by weight, aluminum phosphate ($AlPO_4$) 0 to 5 percent by weight, and the remainder being water, to form a binder solution,

(b) dispersing in said binder solution an about equal weight proportion, compared to said binder solution, of a metal powder to form a dispersion,

(c) applying said dispersion to said substrate, and

(d) heating the substrate with the dispersion applied thereto to a temperature within the range of about 150° C. to about 200° C. for bonding said dispersion onto said substrate thereby forming said protective coating.

4,859,507

HIGH SPEED PAPER COATERS

Wayne A. Damrau, Wisconsin Rapids, Wis., assignor to Consolidated Papers, Inc., Wisconsin Rapids, Wis.

Filed Dec. 2, 1987, Ser. No. 127,399

Int. Cl.[4] B05D *3/12*

U.S. Cl. 427—356 25 Claims



17. A method of metering and leveling an excess layer of coating liquid on a surface of a moving web of paper, comprising the steps of extending the tip of a doctor blade against and transversely across the surface of the web to doctor the coating on and remove excess coating from the surface; moving the web at a speed of travel sufficient to cause excess coating contacting and removed from the web surface by the blade to rebound off of and away from the blade and to flow in an upstream direction; directing the excess flow of bladed coating against the excess layer of coating on the web along an application contact line extending transversely of the web upstream of the doctor blade to rewet and smooth the excess coating layer on the web before it reaches the doctor blade, so that the excess layer of coating on the web doctored by the blade is very uniform, variations in impulse forces of the excess coating layer on the web against the blade are minimized, and the blade doctors the coating on the web very uniformly; and preventing the excess bladed coating liquid from completely filling an area adjacent to the web and intermediate the doctor blade and application contact line.

4,859,508

HEAT RESISTANT BINDERS

Ronald Pangrazi, Somerville, and James L. Walker, Whitehouse Station, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Sep. 26, 1986, Ser. No. 912,747

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—389.9 13 Claims

1. A process for preparing a heat resistant nonwoven mat comprising the steps of:

(a) impregnating the mat with an emulsion polymer having a glass transition temperature (Tg) of +10° to +50° C., said polymer comprising 100 parts by weight of C_1 to C_4 acrylate or styrene/C_2 to C_4 acrylate monomers, 3 to 6 parts of a blocked, N-methylol containing comonomer selected from the group consisting of N-(iso-butoxymethyl)acrylamide, N-(iso-(propoxymethyl)-acrylamide and N-(propoxymethyl)acrylamide; 0 to 3 parts of a water soluble non-blocked N-methylol containing comonomer; and 0 to 3 parts of a multifunctional comonomer:

(b) removing excess binder:

(c) drying and curing the mat.

4,859,509

TEXTILE WARP SIZE

Michael J. Hasuly, South Plainfield, and Peter T. Trzasko, Plainsboro, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 909,976, Sep. 22, 1986, Pat. No. 4,758,279, which is a continuation-in-part of Ser. No. 725,026, Apr. 19, 1985, abandoned. This application Mar. 28, 1988, Ser. No. 173,855

Int. Cl.[4] B65H *71/00*; C08L *3/00*; B05D *1/18*

U.S. Cl. 427—442 11 Claims

1. In an improved process for the warp sizing of textile yarns comprising passing the yarns through a sizing composition of the type containing water, a starch derivative, and a lubricant; wherein the improvement comprises (a) the presence, as the starch derivative, of a hydrophobic starch derivative containing an ether or simple ester substituent with a saturated or unsaturated hydrocarbon chain of at least 6 carbon atoms; and (b) the presence of about 3 to 50% of the lubricant, based on the weight of the hydrophobic starch derivative; the warp sizing composition being characterized by uniform lubricant dispersibility during sizing and efficient lubricant removability during desizing.

4,859,510

ARTIFICIAL VEGATATION OR PLANTS OR PARTS FOR THE SAME

Albert Rademacher, Am Glockenbach 11, D-8000 Munich 5, Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 114,851

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1986, 3640654

Int. Cl.[4] A41G *1/00*

U.S. Cl. 428—17 7 Claims



1. Artificial plants or parts of the same, comprising:
(A) a support structure designed to simulate the ground or bracnhes of a tree or bush;
(B) segments of a net-like fibrous material formed of predetermined sizes, said segments attached to said support structure in an irregular fashion over and throughout the depth of said support structure so as to appear as clusters of ground cover or natural extensions of the branches of a tree or bush;
(C) a plurality of particles of flat material of predetermined shapes of leaves, needles, snowflakes or ice crystals, said particles arranged throughout said segments of net-like fibrous material in an irregular density distribution; and
(D) adhesive means for attaching said particles to individual fibers of said segments of net-like material.

4,859,511

UNDERCOATED SILICONE RELEASE SHEET

Robert Patterson, Neenah, and Stephen M. Papez, Oshkosh, both of Wis., assignors to James River Corporation of Virginia, Norwalk, Conn.

Continuation-in-part of Ser. No. 67,830, Jun. 30, 1987, abandoned. This application Aug. 12, 1988, Ser. No. 231,270

Int. Cl.[4] B32B *7/02, 25/06, 27/16*

U.S. Cl. 428—40 9 Claims

1. A release sheet comprising (a) a substrate layer selected from the group consisting of paper, nonwoven fabric, polymeric film, and extrusion-coated paper, (b) an undercoating layer that has a polar component of surface energy of less than 4 dynes per centimeter and a modulus of elasticity of less than 3000 psi bonded to said substrate layer and selected from the group consisting of polybutadiene, polyisoprene, C_{14}–C_{16} alkyl ketene dimers, alkenyl succinic anhydride, block copolymers of styrene-butadiene-styrene, styrene-isoprene-styrene, styrene-ethylene-butylene-styrene, and styrene-ethylene-propylene, polybutadiene diacrylate, and blends of polybutadiene diacrylate with C_{14}–C_{15} diacrylates, and (c) a silicone release layer bonded to said undercoating layer.

4,859,512

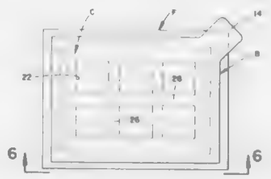
TRANSFER ADHESIVE SANDWICH FOR APPLYING ADHESIVE TO SUBSTRATES

Wallace R. Jones, Waite Hill Village; Robert A. Isaksen, Chardon, and Paul A. Krieger, North Ridgeville, all of Ohio, assignors to The Excello Specialty Company, Cleveland, Ohio

Continuation of Ser. No. 892,472, Aug. 1, 1986, Pat. No. 4,728,380. This application Feb. 29, 1988, Ser. No. 162,110

Int. Cl.[4] A61F *13/02*; E04F *15/16*; B32B *31/00*

U.S. Cl. 428—40 3 Claims



1. A pad of adhesive sandwiches stacked on top of one another and intended for applying adhesive to substrates having a plurality of spaced apart openings therein, each sandwich including a flexible carrier sheet having a pressure-sensitive adhesive layer releasably bonded to one surface thereof, said sheet having an opposite surface to which said adhesive layer is releasably bondable with a tenacity substantially less than the tenacity of the bond between said adhesive layer and said one surface, said sandwiches being stacked with said adhesive layer on one carrier sheet engaging said opposite surface of an adjacent carrier sheet, whereby said sandwiches are strippable from said pad one by one for engaging the adhesive layer with a substrate to which the adhesive layer is bondable with a tenacity substantially greater than the tenacity of the bond between the adhesive layer and carrier sheet so that the carrier sheet is strippable from the adhesive layer which remains on the substrate said adhesive layer having a predetermined discontinuous pattern with a plurality of spaced apart openings constituting areas of said carrier sheet to which adhesive has not been applied and corresponding in size and shape to the spaced apart openings in said substrate.

4,859,513

OXYGEN IMPERMEABLE LEAK FREE CONTAINER

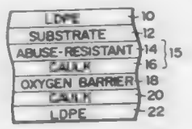
Charles E. Gibbons; Gerald A. Marano; James M. Kittrell; Allan A. Whillock; Robert L. Lanham, all of Mobile, and Donald Evans, South Mobile, all of Ala., assignors to International Paper Company, Purchase, N.Y.

Filed May 9, 1988, Ser. No. 191,337

Int. Cl.[4] B65D *5/02*

U.S. Cl. 428—34.2 27 Claims

1. An oxygen barrier laminate structure for producing an oxygen impermeable leak free container comprising:
(a) a mechanically stable structural substrate;
(b) an outer layer of a heat-sealable low density polyethylene polymer coated on said outer surface of said mechanically stable structural substrate;
(c) an inner coextruded layer of: a first low density polyethylene polymer, an abuse resistant polymer resin, a first adhesive tie layer, an oxygen barrier material layer, a second adhesive tie layer and a caulking polymer resin selected from the group consisting of zinc salts of ethylene/methacrylic acid copolymers, sodium salts of ethylene/methacrylic acid copolymers, ethylene/acrylic acid copolymers, ethylene/methacrylic acid copolymers, ethylene/vinyl acetate copolymers, and ethylene/methacrylate copolymers, all coextruded on said inner surface of said mechanically stable structural substrate; and



(d) a heat-sealable product contact layer of a low density polyethylene polymer extrusion coated on said outer surface of said coextruded layer, which is heat-sealable with the outer layer of low density polyethylene polymer on conventional equipment at temperatures ranging from 250° F. to 500° F.

4,859,514

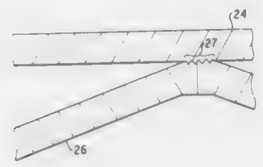
LAMINATE FOR AN EASILY OPENED PACKAGE

Steven G. Friedrich, Greer, and Kent A. Davis, Travelers Rest, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Jun. 12, 1987, Ser. No. 62,532

Int. Cl.[4] B29D *22/00*

U.S. Cl. 428—36.6 4 Claims



1. A package having a peel opening force of less than about 2.5 inch comprising:
(a) a first web including a sealant layer comprising a polymeric material selected from the group consisting of ionomer, and a blend of said ionomer and ethylene vinyl acetate copolymer;
(b) a second web including a sealant layer comprising a blend of
(i) ethylene vinyl acetate copolymer,
(ii) ethylene 1-butene copolymer, and
(iii) polypropylene; and
(c) the first and second webs heat-sealed to each other and enclosing an article.

4,859,515

DEVICE FOR DISPOSING OF SHARP INSTRUMENTS

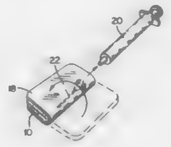
Nicholas L. Pothetes, 8496 S.W. Mohawk, Tualatin, Oreg. 97062

Continuation of Ser. No. 70,192, Jul. 6, 1987, abandoned, which is a continuation of Ser. No. 40,872, Apr. 20, 1987, abandoned. This application Sep. 14, 1988, Ser. No. 245,994

Int. Cl.[4] B32B *3/26*; B65D *85/24*

U.S. Cl. 428—40 2 Claims

1. A device for protecting personnel from sharp instruments that are to be discarded, consisting essentially of:
a substantially rectangular flexible body member having side and end edges and opposite surfaces,
said body member being constructed of a closed cell sponge for resisting penetration by a sharp instrument,
one of said surfaces having a pressure sensitive adhesive thereon capable of forming a secured, substantially permanent bond between overlapping areas of said surface when folded on itself,
a protective layer on said pressure sensitive adhesive surface arranged to be removed before said body member is folded on itself,
said body member being foldable upon itself with portions of said adhesive surface in engagement whereby upon placing a single sharp instrument to be discarded on said adhesive surface and folding the body member upon itself and said adhesive surface around the instrument, a casing is formed for the instrument to hold it securely between said fold portions and to protect personnel therefrom,



said body member being approximately 4×5 cm. in its dimensions and arranged to receive only a single instrument,
an auxiliary protective layer of high density, tough flexible material integral with said body member on the opposite surface from said adhesive surface preventing penetration by a sharp instrument,
each of said body member and auxiliary protective layer having a uniform uninterrupted thickness throughout its full length and width and being hingedly foldable along any portion of said body member and in any direction,
and a lateral tab on said body member projecting beyond one side edge of the body member,
said tab member also having a pressure sensitive adhesive thereon and covered by said removable protective layer.

4,859,516

MAT CONSISTING OF FILAMENT LOOP AGGREGATIONS AND METHOD AND APPARATUS FOR PRODUCING THE SAME

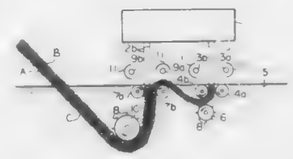
Minoru Yamanaka, Tokyo, and Tetsuo Amawa, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Risuron, Tokyo, Japan

Filed Apr. 12, 1988, Ser. No. 180,533

Claims priority, application Japan, Feb. 9, 1988, 63-26837

Int. Cl.[4] B32B *33/00*

U.S. Cl. 428—92 8 Claims



1. A mat consisting of filament loop aggregations wherein the filament loop aggregations in which irregular form loops are formed in the upright direction by respectively winding to be coil-like many filaments coarse in the arranging intervals and made of a thermoplastic synthetic resin and are fused in the intersecting parts are overlapped above and below an intermediate filament loop aggregation layer high in the filament

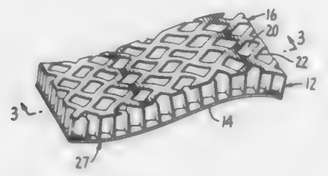
density and formed of coiled loops in the partly or all laterally fallen direction.

4,859,517

FORMABLE HONEYCOMB PANEL

H. Robert Hull, San Leandro, Calif., assignor to Hexcel Corporation, Dublin, Calif.

Filed Mar. 16, 1987, Ser. No. 25,980
Int. Cl.[4] B32B 3/12
U.S. Cl. 428—116 19 Claims



1. A formable honeycomb panel comprising:

a core layer having an open cellular structure with the open cells thereof extending transversely of the core layer, and

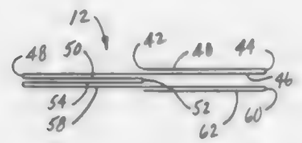
first and second skin panels of sheet material bonded flat to opposite sides of said core layer, wherein said first skin panel is composed of a sheet of material having a plurality of shaped openings extending through the thickness thereof so that said first skin panel has an effective stiffness that is substantially less than the stiffness of a solid sheet of material of the same overall thickness, wherein said skin panels are first bonded to said core layer to produce a flat honeycomb panel that is thereafter formed into a curved structure by bending said honeycomb panel, and wherein the stiffness of said first skin panel is low enough so that a bending load applied to the honeycomb panel sufficient to permanently deform the first skin panel is less than a bending load sufficient to collapse the core layer or to shear the bonds between the core layer and the skin panels.

4,859,518

FOLDED SHEET PRODUCT

Rudolph W. Schutz, Walnut Creek, Calif., assignor to James River Corporation, Richmond, Va.

Filed Sep. 22, 1988, Ser. No. 247,672
Int. Cl.[4] B32B 3/04
U.S. Cl. 428—126 5 Claims



1. A -folded sheet product constructed from a sheet and adapted for dispensing from a dispenser cabinet, said product comprising, in combination:

a first rectangular-shaped terminal portion defined by a first free edge and a first fold line spaced from said first free edge and substantially parallel thereto;

a first primary portion underlying said first terminal portion and extending from said first fold line to a second fold line substantially parallel to said first fold line;

a first intermediate portion underlying said first primary portion and extending from said second fold line to a third fold line, said third fold line being generally in registry with the first free edge;

a second intermediate portion underlying said first intermediate portion and extending from said third fold line to a fourth fold line, said fourth fold line being generally in registry with said second fold line, said first intermediate portion an said second intermediate portion being in substantially superposed relationship;

a second primary portion underlying said second intermediate portion and extending from said fourth fold line to a fifth fold line substantially parallel to said fourth fold line, said fifth fold line being generally in registry with said first fold line; and

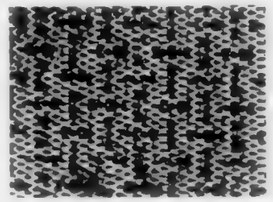
a rectangular-shaped second terminal portion defined by said fifth fold line and a second free edge, said first and second terminal portions being in substantially superposed relationship with the free edges thereof in general registry with each other and with said third fold line.

4,859,519

METHOD AND APPARATUS FOR PREPARING TEXTURED APERTURED FILM

Alex W. Cabe, Jr., 3 Muierfield Ln., Lebanon, N.J. 08833; Robert W. Saffel, 124 Dey St., Hightstown, N.J. 08520, and Arthur J. Sampson, R.D. 1 Blackwell Mills Rd., Belle Meade, N.J. 08502

Filed Sep. 3, 1987, Ser. No. 92,862
Int. Cl.[4] B32B 3/10; B29C 59/04
U.S. Cl. 428—131 34 Claims



1. A process for imparting surface texture and smoothness to an apertured polymeric film comprising:

a. macro embossing an apertured film having a unit thickness in the Z-direction at an elevated temperature and pressure to expand the film in the Z-direction and impart a pronounced pattern to said film, and

b. micro embossing said macro embossed film to reduce the thickness of the film in the Z-direction to substantially its original unit thickness while retaining the macro embossed pattern therein.

21. An apertured polymeric film produced by the process of claim 1.

4,859,520

MONOLITHIC SUBSTRATE FOR AN ELECTRONIC POWER COMPONENT AND PROCESS FOR THE PRODUCTION THEREOF

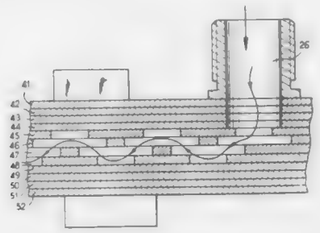
Jacques Dubuisson, Paris, and Rene Boutterin, Montlhery, both of France, assignors to Interconnexions Ceramiques, Courbevoie, France

Continuation of Ser. No. 52,207, May 19, 1987, abandoned, which is a continuation of Ser. No. 833,033, Feb. 26, 1986, abandoned. This application Mar. 9, 1988, Ser. No. 169,125
Claims priority, application France, Feb. 26, 1985, 85-02749
Int. Cl.[4] B32B 3/24; H05K 7/20
U.S. Cl. 428—137 7 Claims

1. The monolithic substrate in an electronic power component, comprising:

a sintered stack of layers of dielectric material having a network of integrated electrically conducting connections between said layers;

a closed system of cooling fluid ducts within said stack;



an inlet orifice extending between said duct system and an exterior surface of said stack; and

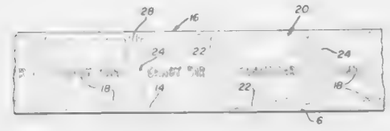
an outlet orifice extending between said duct system and an exterior surface of said stack.

4,859,521

COLD-SEAL ADHESIVES AND COMESTIBLE PACKAGES FORMED THEREWITH

Charles O. Pike, Reynoldsburg, and Tamela A. Viers, Columbus, both of Ohio, assignors to Century Adhesives Corp., Columbus, Ohio

Division of Ser. No. 74,861, Jul. 16, 1987, Pat. No. 4,810,745.
This application Dec. 12, 1988, Ser. No. 283,492
Int. Cl.[4] B32B 3/03
U.S. Cl. 428—195 5 Claims



1. A sheet material for packaging of comestibles comprising a continuous film of polyolefin resin that has been corona treated on one surface thereof, which surface has printed thereon in ink artwork and text and also a geometric pattern of cold-seal adhesive containing as an active ingredient between about 4–6% by weight of vinylpyrrolidone/styrene copolymer, rubber 25–45%, acrylic polymer 20–25%, tackifier 25–35%.

4,859,522

MULTI-COAT NONSKID SURFACING

Christian Cambon, Le Colombet Sanary, France, assignor to Etat Francais as represented by the Delegue general pour l'armement, Paris, France

Filed Jul. 23, 1986, Ser. No. 888,382
Claims priority, application France, Jul. 26, 1985, 85 11430
Int. Cl.[4] B32B 5/16; C09B 3/72
U.S. Cl. 428—215 17 Claims

1. A multi-coat nonskid surfacing for a substrate, comprising:

a priming coat applied directly to said substrate, said priming coat comprising a priming coat base component containing a hydroxylated vinyl terpolymer which is a copolymer of vinyl chloride, a vinyl ester and a hydroxylated ester with reactive hydroxy groups; and a priming coat hardener containing a polyisocyanate; and

a nonskid coat applied to said priming coat, said nonskid coat comprising a nonskid coat base component containing a hydroxylated vinyl terpolymer which is a copolymer of vinyl chloride, a vinyl ester and a hydroxylated ester with reactive hydroxy groups, and particles of a nonskid aggregate having particle sizes of from 0.1 to 1.5 mm; and a nonskid coat hardener containing a polyisocyanate;

wherein the hydroxylated vinyl terpolymer of the priming coat base component and the polyisocyanate of the priming coat hardener react at ambient temperatures; and

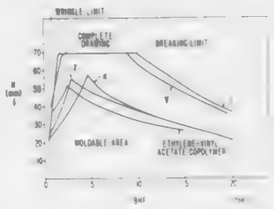
wherein the hydroxylated vinyl terpolymer of the nonskid coat base component and the polyisocyanate of the nonskid coat hardener react at ambient temperatures.

4,859,523

VISCOELASTIC RESIN FOR VIBRATION DAMPING MATERIAL

Hiroshi Endoh; Yoshimasa Zama; Nobuo Kadowaki, all of Sagamihara; Takeshi Yutaka, Ohtsu; Hiroshi Nagai, Ohtsu, and Yutaka Mizumura, Ohtsu, all of Japan, assignors to Nippon Steel Corporation, Tokyo and Toyo Boseki Kabushiki Kaisha, Osaka, both of, Japan

Filed Aug. 17, 1987, Ser. No. 85,718
Claims priority, application Japan, Aug. 15, 1986, 61-191219
Int. Cl.[4] B32B 7/02, 15/08
U.S. Cl. 428—215 11 Claims



1. A viscoelastic resin which comprises a reaction product of:

(A) a polyester diol having a molecular weight of 400 to 6,000, wherein at least 60 mol % of the polyester diol is a dicarboxylic acid component which is an aromatic dicarboxylic acid and at least 30 mol % of the polyester diol is a glycol component which is neopentyl glycol or its derivative;

(B) an aliphatic polyester diol having a molecular weight of 600 to 6,000;

(C) a diisocyanate compound; and

(D) a chain extender;

said (A), (B), (C) and (D) being reacted in a weight ratio (A):(B):(C):(D) of 100:0 to 150:10 to 100:0 to 30.

8. A viscoelastic resin according to claim 1, wherein the resin has a vibration damping peak temperature of 60° to 120° C. determined by sandwiching it between two steel plates each of which is 0.05 mm in thickness at 500 Hz.

4,859,524

REINFORCED COMPOSITE AND METHOD OF MANUFACTURE

Bang M. Kim, Schenectady, N.Y., and Harold F. Giles, Jr., Chesire, Mass., assignors to General Electric Company, Schenectady, N.Y.

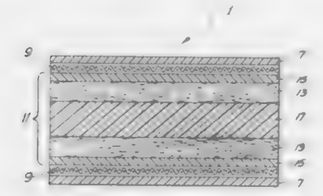
Filed Dec. 21, 1987, Ser. No. 135,762
Int. Cl.[4] B32B 3/26
U.S. Cl. 428—236 17 Claims

1. A composite blank comprising:

a fiber-free layer of thermoplastic resin; and

a bulk layer comprising fiber mat compounded with thermoplastic resin and radio frequency sensitive material, said radio frequency sensitive material being a member selected from the consisting of carbon powders, metal powders, metal oxides, mixed metal oxides, aluminosilicates,

and combinations thereof; said radio frequency sensitive material comprising between 0.5% to about 30% by



weight of said composites said fiber-free layer adhered to said bulk layer.

4,859,525

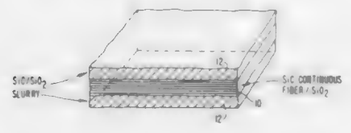
METHOD FOR LOW TEMPERATURE PROCESSING OF LIGHTWEIGHT SIC/SIO_2 COMPOSITES AND PRODUCTS

Larry L. Heach, and Bertrand I. Lee, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed Feb. 25, 1985, Ser. No. 704,937

Int. Cl.[4] B05D *7/00;* **B32B** *5/24, 13/04*

U.S. Cl. 428—260 **4 Claims**



1. A method for making a plural layer composite comprising forming a layer of SiC particulate containing SiO_2 gel and forming a contiguous layer of SiC in the form of a structure selected from the group consisting of fibers, whiskers, weaves and mats embedded in a matrix of SiC particulate containing SiO_2 gel.

3. A plural layer composite comprising a first layer composed of SiC containing SiO_2 gel and a second contiguous layer composed of a SiC structure selected from the group consisting of fibers, whiskers, weaves and mats embedded in a matrix of SiC particulate containing SiO_2 gel.

4,859,526

HIGH TEMPERATURE COMPRESSED NON-ASBESTOS SHEET

Agnes Potepan, Canandaigua, and Richard L. Dibble, Williamson, both of N.Y., assignors to Garlock Inc., Palmyra, N.Y.

Filed Feb. 3, 1988, Ser. No. 151,873

Int. Cl.[4] B32B *9/04;* **B65D** *53/00;* **F16J** *15/6, 15/10*

U.S. Cl. 428—283 **21 Claims**

1. A high temperature compressed non-asbestos sheet comprising a body which includes an elastomeric binder forming 10%–25% by weight of said body, a fiber base formed primarily of carbon fibers, said carbon fibers having a carbon content in excess of 90% and a modulus of elasticity less than 10,000,000 PSI and constituting at least 75% of said fiber base, and a filler forming 35%–80% by weight of said body.

4,859,527

CELLULOSIC NONWOVEN PRODUCTS OF ENHANCED WATER AND/OR SOLVENT RESISTANCE BY PRETREATMENT OF THE CELLULOSIC FIBERS

Frank V. DiStefano, Macungie, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 29, 1986, Ser. No. 868,141

Int. Cl.[4] B05D *3/00;* **B32B** *9/06, 27/04, 27/12*

U.S. Cl. 428—288 **20 Claims**

1. In a method for bonding a nonwoven web of cellulosic fibers by depositing a polymeric binder on the web, the improvement comprising

(1) pretreating the cellulosic fibers by depositing up to about 10 wt% of an adhesion-promoting compound which demonstrates adhesion to cellulose of at least 200 g as measured by the cellophane laminate test,

(2) forming the fibers into a nonwoven web if not already in such form and drying the web, and

(3) depositing on the dry nonwoven web of pretreated cellulosic fibers an amount of a binder polymer sufficient to provide a bonded self-sustaining web which binder polymer demonstrates wet tensile strength on Whatman #4 filter papers at 10% add-on (TAPPI Useful Method 656) of less than 3 pli and a swell value of less than 100% using the boiling water test, or a MEK tensile strength on Whatman #4 filter paper at 10% add-on (TAPPI Useful Method 656) of less than 4 pli and and MEK swell index of less than 5.

11. A nonwoven product comprising a nonwoven web of cellulosic fibers bonded together, the cellulosic fibers having as a first coat up to 10 wt% of an adhesion-promoting compound which demonstrates adhesion to cellulose of at least 200 g as measured by the cellophane laminate test and as an overcoat an amount of a binder polymer sufficient to form a bonded self-sustaining web which binder polymer demonstrates wet tensile strength on Whatman #4 filter paper at 10% add-on (TAPPI Useful Method 656) of less than 3 pli and a swell value of less than 100% using the boiling water test, or an MEK tensile strength on Whatman #4 filter paper at 10% add-on (TAPPI Useful Method 656) of less than 4 pli and an MEK swell index of less than 5.

4,859,528

COMPOSITE TOOLING

Frank W. Lee, San Ramon; Jon D. Neuner, Pittsburg, and Kenneth Baron, San Ramon, all of Calif., assignors to Hexcel Corporation, Dublin, Calif.

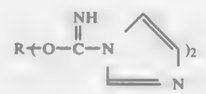
Continuation-in-part of Ser. No. 39,175, Apr. 17, 1987, Pat. No. 4,742,148. This application Dec. 3, 1987, Ser. No. 128,382

The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

Int. Cl.[4] C08G *59/68;* **C08L** *63/00*

U.S. Cl. 428—290 **15 Claims**

1. A composite tooling prepreg, comprised of an epoxy resin system and reinforcing material, said epoxy resin system comprising a catalyst of the formula



wherein R is aromatic or aralkyl, and wherein the 2, 4 and 5 positions of the imidazole of said formula are independently unsubstituted or substituted with C_{1-12} alkyl, aryl or aralkyl, and an epoxy resin, said tooling prepreg being in a form capable of being cured to form a tooling which can be used for repeated molding of composite parts.

4,859,529

FIBERS, FABRICS AND FLEXIBLE POROUS SUBSTRATES SIZED WITH A CURABLE HYDROPHILIC SILICONE POLYETHER POLYMER

William J. Raleigh, Rensselaer; James E. Doin, Hoosick Falls, and Frank J. Traver, Troy, all of N.Y., assignors to General Electric Co., Waterford, N.Y.

Division of Ser. No. 24,187, Mar. 10, 1987, Pat. No. 4,758,646. This application Jun. 20, 1988, Ser. No. 185,643

Int. Cl.[4] C08G *77/06;* **D02G** *3/00*

U.S. Cl. 428—290 **3 Claims**

1. A fiber, fabric or flexible porous substrate sized with a curable bis(alkoxysilyl)polyether of the general formula:

$$(R^2O)_b\text{—}SiR^3_a\text{—}R^1O\text{—}(\text{—}RO\text{—})_x\text{—}R^1\text{—}SiR^3_a(OR^2)_b$$

wherein R is a divalent substituted or unsubstituted hydrocarbon radical of from 2 to about 10 carbon atoms, R^1 is a divalent substituted or unsubstituted hydrocarbon radical of from 2 to about 20 carbon atoms, at least one R′ is a substituted alkylene group which is a derivative of 10-hendecenoic acid and forms an ester linkage to the polyether moiety R^2 is a monovalent substituted or unsubstituted hydrocarbon radical of from 1 to about 6 carbon atoms, R^3 is selected from the group consisting of hydrogen and R^2, b is 2 or 3, the sum of a+b is 3, and x is from 1 to 100.

4,859,530

HIGH TEMPERATURE ADHESIVE FOR POLYMIDE FILMS

David N. Roark, Baton Rouge, and Jules A. Lambert, Denham Springs, both of La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jul. 9, 1987, Ser. No. 71,368

Int. Cl.[4] B32B *27/00, 27/06*

U.S. Cl. 428—294 **24 Claims**

1. A method of bonding a metal to a substrate which comprises placing therebetween a prepreg composed of a fibrous substrate coated and impregnated with a tacky polyimide precursor of (a) a substantially equimolar mixture of (i) 2,2-bis[4-(4-(4aminophenoxy)phenyl]hexafluoropropane or 2,2-bis[4-(3-aminophenoxy)phenyl]hexafluoropropane, or both, and (ii) lower alkyl diester of benzophenone tetracarboxylic acid; (b) about 2 to 50 weight percent of polyamic acid polyamide producible from components (i) and (ii); and (c) about 10 to 50 weight percent of solvent; applying heat to cause the formation of the polyimide in situ while maintaining the metal and first-named substrate in intimate contact with the curing prepreg; and then cooling the resultant article.

4,859,531

METHOD FOR BONDING A CUBIC BORON NITRIDE SINTERED COMPACT

Kazuwo Tsuji; Hitoshi Sumiya; Yoshiaki Kumazawa; Nobuo Urakawa, and Keiichi Satoh, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 27, 1988, Ser. No. 224,930

Claims priority, application Japan, Jul. 29, 1987, 62-189649; Jul. 30, 1987, 62-191285; Nov. 6, 1987, 62-281762

Int. Cl.[4] B32B *31/06*

U.S. Cl. 428—333 **15 Claims**

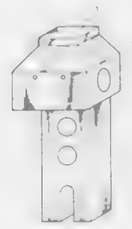
1. A method for bonding a cubic boron nitride sintered compact comprising the steps of:

preparing a pair of cubic boron nitride sintered compacts, each having a bonding surface;

forming a Ti layer of 0.01–1 μm in thickness on said bonding surface of each of said cubic boron nitride sintered compacts;

forming a Ni layer of 0.01–5 μm in thickness over said Ti layer;

holding said cubic boron nitride sintered compacts together, with a metal foil of 10–1,000 μm in thickness being interposed between said bonding surfaces of said sintered compacts, said metal foil being made of a material selected from the group consisting of aluminum and Al—Ni alloy; and



heating said sintered compacts to a temperature above the melting point of said metal foil and not exceeding 750° C. in an inert atmosphere or in a vacuum.

4,859,532

TRANSPARENT LAMINATED PRODUCT

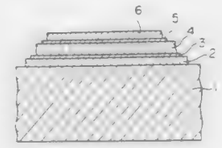
Takuji Oyama; Koichi Suzuki, and Mamoru Mizuhashi, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,236

Claims priority, application Japan, Nov. 27, 1986, 61-280644; Nov. 27, 1986, 61-280645; Nov. 27, 1986, 61-280646

Int. Cl.[4] B32B *15/04*

U.S. Cl. 428—336 **1 Claim**



1. A transparent laminated product comprising a transparent substrate and a 5-layered transparent coating composed of a first ZnO layer formed on the substrate, a second Ag layer formed on the first layer, a third ZnO layer formed on the second layer, a fourth Ag layer formed on the third layer and a fifth ZnO layer formed on the fourth layer, and having a visible ray transmission of at least 60%, wherein the thickness of each Ag layer is from 60 to 250 Å.

4,859,533

COMPOSITE MATERIALS OF REINFORCED FIBERS

Yuji Seiya, Otsu, and Hiroyuki Odawara, Moriyama, both of Japan, assignors to Toray Industries, Inc., Shiga, Japan

Filed Sep. 18, 1987, Ser. No. 98,148

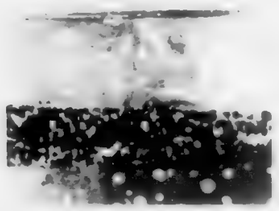
Claims priority, application Japan, Jan. 21, 1986, 61-10585; Aug. 1, 1986, 61-180043

Int. Cl.[4] D02G *3/00;* **B32B** *9/00;* **B05D** *3/12*

U.S. Cl. 428—366 **11 Claims**

1. A composite material, comprising an epoxy resin compo-

sition; reinforcing fibers; at least one hardener selected from the group consisting of dicyandiamide and urea derivatives;



and a polyvinyl formal of 5 microns or less in grain size finely dispersed in said epoxy resin composition.

4,859,534

METHOD AND APPARATUS FOR REPAIRING A CABLE

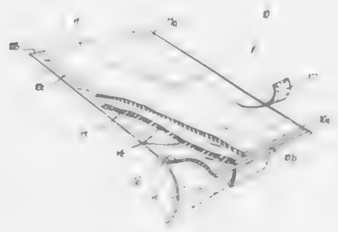
John R. Van Niekerk, Ferndale, South Africa, assignor to Chemical Vulcanising Systems (Proprietary) Limited, Roodepoort, South Africa

Continuation of Ser. No. 799,421, Nov. 19, 1985, abandoned. This application Mar. 16, 1988, Ser. No. 171,183

Claims priority, application South Africa, Nov. 19, 1984, [illegible]

Int. Cl.[4] C09Y *7/02*

U.S. Cl. 428—343 **4 Claims**



1. An electrical cable repair wrap for wrapping around a cable with the longitudinal sides of the wrap in overlapping relationship, the wrap comprising: an outer wear-resistant layer which is flexible at least in one direction, transverse to the axis of a cable in use, the one direction being transverse to an overlap zone along a longitudinal side of one surface of the outer wear-resistant layer and, laminated to the one surface thereof, an inner adhesive layer for adhering to the surface of the cable and the other, outer surface of the outer wear-resistant layer at the overlap zone, the overlap zone of the outer wear-resistant layer being an adhesive material.

4,859,535

POROUS HOLLOW-FIBER

Yasushi Shinomura; Masahiko Yamaguchi, and Koichiro Fukuzaki, all of Ichihara, Japan, assignors to Ube Industries, Ltd, Ube, Japan

Filed Jan. 21, 1988, Ser. No. 209,391

Claims priority, application Japan, Jan. 26, 1987, 62-159095

Int. Cl.[4] D01D *5/12*; D02G *3/00*

U.S. Cl. 428—398 **5 Claims**

1. A porous hollow-fiber formed of polyolefin, said fiber comprising:

a peripheral wall constituted by a plurality of relatively large rods of the polyolefin which extend in a direction substantially perpendicular to the longitudinal direction of the hollow-fiber and a plurality of fine fibrils which extend in the longitudinal direction of said hollow-fiber between adjacent rods and are connected thereto, said plurality of rods and plurality of fine fibrils connected thereto forming



rectangular fine pores in said wall; the wall thickness being 50–150 μm, the inside diameter of said fiber being 250–1000 μm, and the pore size measured by a bubble point method being 0.1–1.0 μm.

4,859,536

OPTICAL COATING

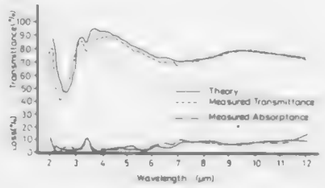
Ewan M. Waddell, Glasgow; James S. Orr, Falkirk, and Brian C. Monachan, Glasgow, all of Scotland, assignors to Barr & Stroud Limited, Glasgow, Scotland

Division of Ser. No. 862,078, May 12, 1986, Pat. No. 4,740,442. This application Jan. 13, 1988, Ser. No. 143,481

Claims priority, application United Kingdom, May 11, 1985, [illegible]

Int. Cl.[4] B32B *9/00*

U.S. Cl. 428—408 **7 Claims**



1. An optical component comprising a substrate and an optical coating comprising a multiplicity of layers including at least one first layer which is amorphous hydrogenated germanium carbide, at least one second layer which is amorphous hydrogenated germanium, and one third layer which is amorphous hydrogenated carbon, the layers of said multiplicity being arranged such that each second layer is bounded on both sides by a first layer, and the third layer is bounded on one side by a first layer, its other side forming the exposed surface of the coating.

4,859,537

THERMAL TRANSFER RECORDING MEDIUM

Shiro Kawahito, Utsunomiya, and Masanori Minato, Ichikaimachi, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 226,316

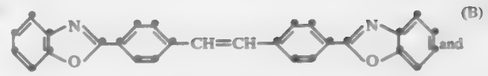
Claims priority, application Japan, Jul. 28, 1987, 62-187923

Int. Cl.[4] B41M *5/26*

U.S. Cl. 428—411.1 **2 Claims**

1. A thermal transfer recording medium which comprises a

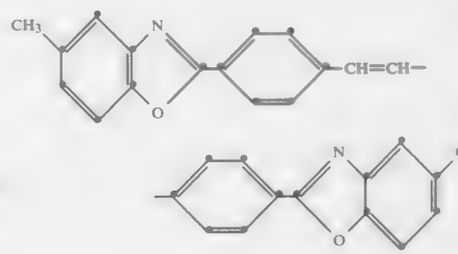
substrate and a layer of a hot-melting ink composition, coated on the substrate, comprising a hot-melting binder, a coloring



(B)

and

5–70% by weight based on the total weight of said mixture of



(C)

matter and 0.1 to 5 percent by weight, based on the composition as the solid content, of an alkaline earth metal phenate.

4,859,538

NOVEL LIPID-PROTEIN COMPOSITIONS AND ARTICLES AND METHODS FOR THEIR PREPARATION

Hans O. Ribi, 33 Emily La., Atherton, Calif. 94025

Filed Nov. 20, 1986, Ser. No. 933,034

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—474.4 **19 Claims**



1. An article comprising at least one polymerized ordered surfactant layer and an ordered protein layer specifically bound to said surfactant layer.

4,859,539

OPTICALLY BRIGHTENED POLYOLEFIN COATED PAPER SUPPORT

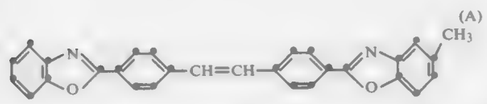
Donna L. Tomko, Penfield, and Kenneth G. Harbison, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 29,020, Mar. 23, 1987, Pat. No. 4,794,071. This application Sep. 19, 1988, Ser. No. 245,616

Int. Cl.[4] G03C *1/86*

U.S. Cl. 428—512 **7 Claims**

1. A photographic support comprising a paper base material having thereon at least one polyolefin coating containing at least one white pigment present in an amount of 3–35% by weight based on the total weight of said polyolefin coating and a mixture of optical brighteners, said mixture consisting of 15–90% by weight based on the total weight of said mixture of



(A)

5–70% weight based on the total weight of said mixture of

said mixture being present in an amount of 0.001 to 0.25 percent by weight based on the total weight of said polyolefin coating.

4,859,540

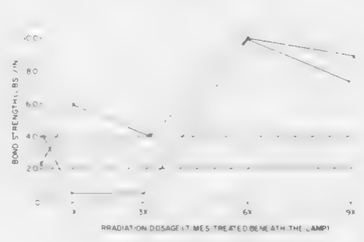
METHOD FOR BONDING ADHESIVES TO POLYOLEFIN SURFACES AND THE LAMINATE FORMED THEREBY

Robert A. Bragole, Danvers, Mass., assignor to Worthen Industries, Inc., Nashua, N.H.

Continuation-in-part of Ser. No. 6,368, Jan. 23, 1987, Pat. No. 4,778,724. This application Jan. 19, 1988, Ser. No. 141,025

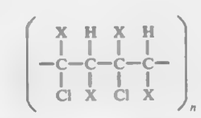
Int. Cl.[4] B32B *27/30*

U.S. Cl. 428—522 **5 Claims**



1. A method for bonding of a coating to a polyolefin surface which includes:

coating the surface with a halogenated polyolefin primer of the structure:



where X=selected from the group consisting of chloro, and bromo, fluoro; straight chained hydrocarbons, selected from the group consisting of Methyl, Ethyl, and Propyl Acid;

treating the primer to form free radical species; and

applying a coating to the primer to effect chemical bonding between the species and the coating.

4,859,541

SAFETY STRUCTURE

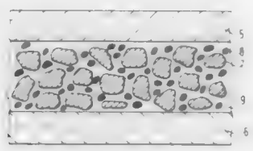
Heinz Maxeiner, Neu Isenburg; Gerhard Kruske, Oberursel, and Hartwig Reimann, Kelkheim-Liederbach, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main and Bode Panzer Aktiengesellschaft, Hanover, both of, Fed. Rep. of Germany

Filed Feb. 3, 1987, Ser. No. 20,528

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1986, 3630429

Int. Cl.[4] E04B *2/02;* **B22F** *7/00*

U.S. Cl. 428—545 **11 Claims**



1. A wall element for safety structure such as safes comprsing two parallel spaced steel plates;

a sheathing layer of hard granular material disposed between the plates;

a hard solder mass between the grains of granular material binding them together and to the inner surfaces of said steel plates;

characterized in that the sheathing layer is formed from 30–70% by volume of said hard granular material present in the amount of two to four parts by volume of a non-metallic substance taken from the group consisting of diamonds, boron carbide, silicon carbide, boron nitride, and ceramic oxides to one part of a hard metallic substance taken from the group consisting of cast iron, metallic carbides, nitrides, borides and silicides, the remainder being said hard solder mass.

4,859,542

GRADED STRUCTURE COMPOSITES

Alan R. Begg, Ascot; Colin W. Brown, Windsor, and Neil E. S. Charman, Bracknell, all of United Kingdom, assignors to The British Petroleum Company p.l.c., London, England

Filed Sep. 1, 1987, Ser. No. 19,788

Claims priority, application United Kingdom, Sep. 18, 1986, 8613464

Int. Cl.[4] B22F *7/04;* **B32B** *15/16*

U.S. Cl. 428—547 **7 Claims**

1. A non-porous graded structure composite comprising:

A. a surface layer

A1. comprising tungsten carbide and a binder phase selected from cobalt, nickel and alloys thereof, and

A2. having a thickness of 1–14% of the total thickness of the composite;

B. an interface layer comprising tungsten carbide and a binder phase as in A1 above but having a stepwise transition from the surface layer to and through the interface layer with respect to the binder content thereof such that the binder concentration in each succeeding transition step of the interface layer increases with respect to the immediately preceding transition step whereby

B1. the binder content of the final transition step is no more than 50% w/w of the total tungsten carbide-binder content of that step,

B2. the thickness of each transition step is from 0.5% v/v to 3% v/v of the total thickness of the composite,

B3. the total thickness of the interface layer is 5–14% v/v of the total thickness of the composite, and

B4. the thermal expansion coefficient of the interface layer is from $4–8\times10^{-6}$/°C. in the range of 800° C. to 250° C.; and

C. a final substrate layer comprising

C1. a high carbon steel layer immediately adjacent to the interface layer and which has

C1.1 a substantially similar affinity for carbon to that of the preceding interface layer and which is incapable of undergoing bainitic transformation to any substantial extent under normal atmospheric cooling conditions,

C1.2 a thermal expansion coefficient of $10–16\times10^{-6}$/°C. in the range of 800° C. to 250° C., and

C1.3 a thickness of 0.5–3% v/v of the total thickness of the composite; and

C2. a bainitic steel base layer which

C2.1 has a thermal expansion coefficient of $6–10\times10^{-6}$/°C. in the range of 800° C. to 250° C., and

C2.2 forms the remainder of the thickness of the composite.

4,859,543

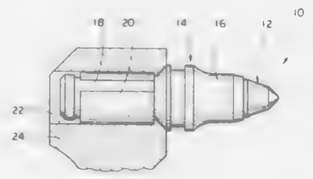
EARTH WORKING TOOL HAVING A WORKING ELEMENT FABRICATED FROM CEMENTED TUNGSTEN CARBIDE COMPOSITIONS WITH ENHANCED PROPERTIES

Mark S. Greenfield, Carey, N.C., and Edward V. Conley, Irwin, Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Apr. 28, 1987, Ser. No. 43,569

Int. Cl.[4] B22F *3/00*

U.S. Cl. 428—552 **12 Claims**



1. An earth working tool, comprising:

(a) an elongated/body; and

(b) a working element attached on a forward end of said body and being fabricated of a composition of essentially tungsten carbide of large grain size, said composition having 4.5±0.3 percent by weight of cobalt as a binder and a Rockwell A scale hardness of 88.2±0.3.

4,859,544

WELD FILTER MATERIAL FOR FUSION WELDING OF HIGH STRENGTH ALUMINUM ALLOYS

Pius Schwellinger, Tengen, Fed. Rep. of Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jul. 11, 1988, Ser. No. 217,680

Claims priority, application Switzerland, Jul. 23, 1987, 2807/87

Int. Cl.[4] B32B *15/00*

U.S. Cl. 428—654 **11 Claims**

11. A fusion welded assembly comprising alloys of the AlZnMgCu type and a filler material consisting essentially of 4.1–6.5% of zinc, 4.0–6.0% of magnesium, 0.3–0.6% of copper, 0.3–0.5% of manganese, at most 0.1% of titanium, at most 0.3% of chromium, at most 0.3% of zirconium, at most 0.1% of silicon and at most 0.3% of iron, balance essentially aluminum, said filler material characeterized by the tendency to suppress cracks in the region of the weld seam.

4,859,545

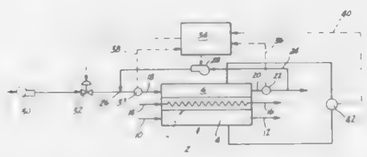
CATHODE FLOW CONTROL FOR FUEL CELL POWER PLANT

Glenn W. Scheffler, Tolland, and George Vartanian, Ellington, both of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed May 5, 1988, Ser. No. 190,431

Int. Cl.[4] H01M *8/04*

U.S. Cl. 429—17 **9 Claims**



1. A cathode air flow control system for use in a fuel cell power plant to minimize oxygen starvation of fuel cells in the power plant, said system comprising:

(a) means forming a fresh air inlet for admitting air into the cathodes of the fuel cells in the power plant;

(b) means in said fresh air inlet for varying the amount of fresh air admitted to said cathodes;

(c) means forming an exhaust outlet for exhausting oxygen-depleted gas from said cathodes;

(d) sensor means in said exhaust outlet for measuring the oxygen content of the oxygen-depleted gas therein;

(e) means forming a recirculating loop for recirculating oxygen-depleted gas from said exhaust outlet to said air inlet;

(f) monitoring means in said air inlet to measure the combined flow of incoming air and recirculated oxygen-depleted gas in said air inlet so as to effectively measure the total amount of flow conveying oxygen to the cathodes;

(g) means for continuously measuring the electrical current output of the power plant; and

(h) control means operably connected to said means for varying, to said sensor means, to said monitoring means, and to said means for continuously measuring, said control means being operable to calculate oxygen utilization in said cathodes and cause said means for varying to increase or decrease the amount of air in said air inlet in response to changes in the total measured oxygen utilization.

4,859,546

BATTERY EXPLOSION ATTENUATION MATERIAL AND METHOD

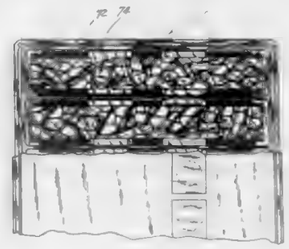
Richard R. Binder, Menomonee Falls; Paul E. Bantz, Colgate; William H. Tiedemann, Cedarburg; Guy D. McDonald, and William J. Wruck, both of Shorewood, all of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 87,774, Aug. 21, 1987, Pat. No. 4,751,154. This application Jun. 10, 1988, Ser. No. 205,411

Int. Cl.[4] H01M *2/12*

U.S. Cl. 429—53 **13 Claims**

1. An electric storage battery comprising a substantially closed container, electrode elements and an electrolyte disposed within said container, a head space within the container, means for venting from said container gases generated by electrochemical reactions within said container, and means for creating a bimodal pore distribution within said head space to attenuate pressure build-up within said container upon ignition of said generated gases, said bimodal pore distribution means including a plurality of pillows of bulked polypropylene each having at least one bonded segment, said pillows disposed within a surrounding netting, said bonded segments collectively creating a network of large pores sufficient to accommodate movement of said gases and electrolyte through said head space during operation of said battery, and the remaining portion of said pillows collectively forming a greater number



of small pores effective to limit the peak pressure within said container upon said ignition.

4,859,547

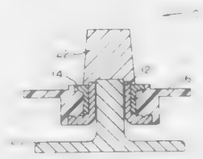
BATTERY TERMINAL AND METHOD

David W. Adams, Columbus, Ga.; Larry K. W. Ching, Jr., Littleton, and Neil Puester, Aurora, both of Colo., assignors to Gates Energy Products, Inc., Gainesville, Fla.

Filed Oct. 6, 1987, Ser. No. 106,700

Int. Cl.[4] H01M *2/26, 2/08*

U.S. Cl. 429—121 **31 Claims**



12. An electrolytic device comprising:

a. a container comprising a wall of resilient, electrolyte-resistant material, said wall having an opening therein;

b. a first outer substantially annular metallic bushing that is mounted interior of said wall opening;

c. a second inner substantially annular metallic bushing that is mounted interior of said first bushing, said first bushing and said second bushing being forced into intimate sealing contact with each other and said wall, the first bushing and the second bushing being work hardened by radial expansion to different degrees; and

d. a terminal post inserted through said second bushing.

4,859,548

METHOD FOR GENERATING A LATTICE STRUCTURE WITH A PHASE SHIFT ON THE SURFACE OF A SUBSTRATE

Gerhard Heise, Bert-Brecht-Allee 10, D8000 Munich 83; Ulrich Wolff, Geigenberger Str. 351, D8000 Munich 71, and Richard Matz, Maringerstr. 24a, D8152 Feldkirchen, all of Fed. Rep. of Germany

Filed Oct. 27, 1986, Ser. No. 923,439

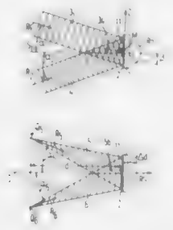
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1985, 3539092; Dec. 19, 1985, 3545102

Int. Cl.[4] G03H *1/28*

U.S. Cl. 430—1 **16 Claims**

1. In a method for generating a lattice structure on the surface of a substrate by providing a substrate with a photo-sensitive surface, holographically exposing the photo-sensitive surface by creating an optical interference field of light waves to expose the photo-sensitive surface and subsequently devel-

oping the exposed surface, the improvements comprising said step of holographically exposing including creating a first interference field of a spatial frequency, creating a second interference field of a different spatial frequency relative to the



spatial frequency of the first field and superimposing these first and second fields onto the photo-sensitive surface to expose the surface with both fields to create a lattice structure with a phase shift determined by said two fields.

4,859,549

METHOD OF FORMING A FLUORESCENT SCREEN FOR A COLOR CRT

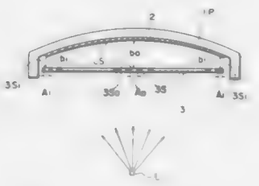
Masatake Hayashi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 9, 1988, Ser. No. 166,006

Claims priority, application Japan, Mar. 12, 1987, 62-57766; Mar. 13, 1987, 62-58211

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—23 **2 Claims**



1. A method of forming a fluorescent screen for a color CRT comprising the steps of exposing a photosensitive film formed over the inner surface of a curved panel for a color CRT simultaneously to form stripes respectively having different stripe widths by disposing a flat mask having slits opposite to the inner surface of the panel, said slits each having a width A which is a function of the distance b between the mask at the location of said slit and the inner surface of said panel, and a function of a constant factor F according to the expression:

$$F = A\sqrt{2/(b\lambda)}$$

where λ is the wavelength of light used for exposing the photosensitive film.

4,859,550

SMEAR RESISTANT MAGNETIC IMAGE CHARACTER RECOGNITION PROCESSES

Robert J. Gruber; Raphael F. Bov; Thomas D. Cometa, all of Pittsford; Paul W. Eakin; John S. Berkes, both of Webster, and Bernard Grushkin, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 2, 1988, Ser. No. 239,878

Int. Cl.[4] G03G *19/00*

U.S. Cl. 430—39 **45 Claims**

1. An electrophotographic process which comprises the generation of a latent image; developing the image with a toner composition comprised of resin particles, magnetite particles, and an additive component comprised of an aliphatic hydrocarbon or a polymeric alcohol of the formula

$$(CH_3(CH_2)_nCH_2OH$$

wherein n is a number of from about 30 to about 500; and subsequently providing the developed image with magnetic ink characters thereon to a reader/sorter device whereby toner offsetting and image smearing is minimized in said device.

4,859,551

PROCESS FOR PREPARING POSITIVE AND NEGATIVE IMAGES USING PHOTOHARDENABLE ELECTROSTATIC MASTER

Richard J. Kempf, Towanda, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 4, 1987, Ser. No. 116,656

Int. Cl.[4] G03F *7/20;* **G03G** *13/32*

U.S. Cl. 430—49 **50 Claims**

1. A process for producing a negative image from a photohardenable electrostatic master comprising

(A) imagewise exposing to visible radiation a photohardenable electrostatic master comprising (1) an electrically conductive substrate bearing (2) a photohardenable layer comprising

(a) a polymeric binder,

(b) a compound having at least one ethylenically unsaturated group,

(c) a photoinitiator,

(d) a photoinhibitor, and

(e) at least one visible light sensitizer;

(B) charging electrostatically the photohardenable electrostatic master to form a latent image of electrostatic charge on the imagewise exposed areas;

(C) developing the charged latent image by applying an electrostatic toner of opposite charge; and

(D) transferring the toned image to a receptor surface.

4,859,552

ELECTROPHOTOGRAPHIC PHOTORECEPTOR WITH SUPERLATTICE STRUCTURE

Shuji Yoshizawa, and Tatsuya Ikezue, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 16, 1988, Ser. No. 156,026

Claims priority, application Japan, Feb. 18, 1987, 62-34899; Feb. 18, 1987, 62-34901; Feb. 18, 1987, 62-34902; Feb. 19, 1987, 62-36734

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—57 **21 Claims**

1. An electrophotographic photoreceptor comprising a conductive substrate, and a photoconductive layer, provided on said conductive substrate, for generating photocarriers upon radiation of light, wherein said photoconductive layer has a charge-generating layer and a charge-retaining layer, said charge-generating layer comprises a semiconductor containing silicon as a major constituent, said charge-retaining layer comprises a multilayered body constituted by alternately stacking first amorphous semiconductor layers containing silicon as a major constituent and second amorphous semiconductor layers containing silicon as a major constituent and at least one element selected from the group consisting of carbon, oxygen, and nitrogen, and a concentration of said element is changed in a direction of thickness of said charge-retaining layer for each second amorphous semiconductor layer.

4,859,553

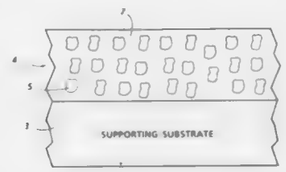
IMAGING MEMBERS WITH PLASMA DEPOSITED SILICON OXIDES

Frank Jansen, and Joseph Mort, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 4, 1987, Ser. No. 45,646

Int. Cl.[4] G03G *5/10*

U.S. Cl. 430—58 **31 Claims**



1. An electrographic imaging member consisting essentially of a supporting substrate; and in contact therewith a photogenerating transport layer comprised of regions of a photogenerating substance dispersed in a matrix of a charge transporting material comprised of plasma deposited silicon oxide with at least 50 atomic percent of oxygen.

4,859,554

MULTILAYER PHOTORECEPTOR

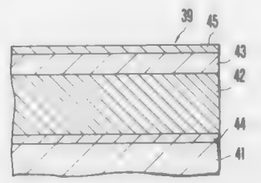
Toshinori Yamazaki; Eiichi Sakai; Tatsuo Nakanishi, and Hiroyuki Nomori, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 910,242, Sep. 18, 1986, abandoned, Continuation-in-part of Ser. No. 867,415, May 15, 1986, abandoned, which is a continuation of Ser. No. 716,190, Mar. 26, 1985, abandoned. This application Mar. 28, 1988, Ser. No. 175,583

Claims priority, application Japan, Mar. 28, 1984, 59-59728; Mar. 28, 1984, 59-59729; Mar. 28, 1984, 59-59730; Mar. 28, 1984, 59-59731

Int. Cl.[4] G03G *5/082, 5/14*

U.S. Cl. 430—58 **32 Claims**



1. A photoreceptor comprising a charge generation layer consisting essentially of at least one compound selected from the group consisting of amorphous hydrogenated silicon, amorphous fluorinated silicon and amorphous hydrofluorinated silicon; a charge transport layer formed on a lower surface of said charge generation layer and consisting essentially of at least one compound selected from the group consisting of amorphous hydrogenated silicon nitride, amorphous fluorinated silicon nitride, amorphous hydrofluorinated silicon nitride, amorphous hydrogenated silicon carbide, amorphous fluorinated silicon carbide and amorphous hydrofluorinated silicon carbide; a charge blocking layer; a surface modifying layer; and a substrate,

wherein said charge transport layer contains (i) from 50 atomic ppm to 5 atomic % oxygen and (ii) from 5 atomic % to 30 atomic % of at least one element selected from carbon and nitrogen based on the total atoms of silicon, nitrogen and carbon and wherein the charge transport layer further contains at least one element of IIIa group of the periodic table in an amount up to 50 atomic ppm based on the total amount of silicon, nitrogen and carbon.

4,859,555

ELECTROPHOTOGRAPHIC PRINTING PLATE COMPRISING DISAZO AND PERYNONE COMPOUNDS, HOLE TRANSPORT MATERIAL AND ALKALI SOLUBLE RESIN

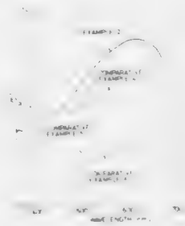
Yoshihiro Nishio; Masanobu Nakamura; Midori Fukawatase, all of Saitama, and Kenji Takahashi, Tokyo, all of Japan, assignors to Dainippon Ink & Chemical, Inc., Tokyo, Japan

Filed Oct. 13, 1987, Ser. No. 106,843

Claims priority, application Japan, Oct. 14, 1986, 61-243769

Int. Cl.[4] G03G *5/06, 5/14*

U.S. Cl. 430—72 **8 Claims**



1. An electrophotographic printing plate which comprises a substrate having formed thereon a photoconductive layer comprising (a) a disazo based compound, (b) a perynone based compound, (c) a hole transport material, and (d) an alkali-soluble resin.

4,859,556

ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR CONTAINING STILBENE COMPOUND

Masaomi Sasaki, Susono, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

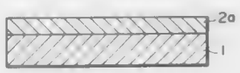
Continuation of Ser. No. 875,510, Jun. 18, 1986, abandoned, which is a continuation of Ser. No. 488,883, Apr. 26, 1983, abandoned. This application Aug. 9, 1988, Ser. No. 230,319

Claims priority, application Japan, Apr. 30, 1982, 57-73075; Apr. 30, 1982, 57-73076; May 14, 1982, 57-80115; May 14, 1982, 57-80116

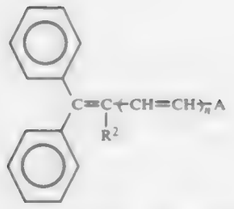
The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

Int. Cl.[4] C07C *15/12, 87/154;* **G03G** *15/62, 15/06*

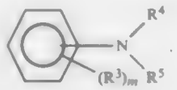
U.S. Cl. 430—73 **40 Claims**



1. An electrophotographic photoconductor comprising an electroconductive support material and a photosensitive layer formed thereon, said photosensitive layer comprising a charge transporting material and a charge generating material, said charge transporting material being an α-phenyl-stilbene derivative of the formula:



wherein n is 0 or 1, R^2 is hydrogen, alkyl, phenyl or substituted phenyl, and A is selected from the group consisting of



N-alkyl carbozolyl, and substituted N-alkyl carbazolyl, wherein R^3 is hydrogen, alkyl, alkoxy and halogen, and R^4, R^5 independently represent alkyl, aryl, substituted aryl, aralkyl or substituted aralkyl, and m is an integer of from 0 to 2, provided that when n is 0 and R^2 is hydrogen, R^3 is hydrogen or halogen.

4,859,557

DRY POWDER ELECTROPHOTOGRAPHIC TONER WITH PERMANENT MASTER IN ELECTROSTATIC TRANSFER

Robert H. Detig, Berkeley Heights, and David P. Bujese, Butler, both of N.J., assignors to Olin Hunt Specialty Products Inc., West Paterson, N.J.

Filed Feb. 25, 1988, Ser. No. 160,254
Int. Cl.[4] G03G *13/22*
U.S. Cl. 430—100 **18 Claims**



1. A method of fabricating a toned pattern on an electrically isolated receiving surface, comprising the steps of:

(a) coating a conductive substrate with a photopolymer material that will undergo an increase in resistivity upon exposure to a source of actinic radiation;

(b) forming a permanent latent image on the photopolymer material by exposing to an actinic radiation source to form electrostatically contrasted non-imaged areas and an exposed latent image;

(c) coating the photopolymer material with a low friction protective overcoated material;

(d) charging the protective overcoated material so that a charge is retained above the unexposed areas of the photopolymer material;

(e) developing the electrostatic latent image area by applying charged dry powder electrophotographic toner particles to the protective overcoated material, the charged dry powder electrophotographic toner particles being directed to the protective transparent overcoated material above the unexposed areas of the photopolymer material to form a developed image;

(f) establishing an electric field between the photopolymer material and the receiving surface;

(g) placing the receiving surface adjacent to the photopolymer material;

(h) transferring the developed image from the protective overcoated material at a point of contact transfer to the receiving surface to form non-imaged areas and a transferred toner particle image in an imaged area; and

(i) fusing the transferred toner particle image to the receiving surface.

4,859,558

COMPOSITION WITH FATTY ACID BISAMIDE POWDER DEVELOPER

Yasuo Matsumura; Takayoshi Aoki; Masayuki Takeda; Chiaki Suzuki, and Ikutaroh Nagatsuka, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1988, Ser. No. 143,881
Claims priority, application Japan, Jan. 14, 1987, 62-5005
Int. Cl.[4] G03G *9/10, 13/08*
U.S. Cl. 430—110 **5 Claims**

1. A developer composition for developing an electrostatically charged image formed on a photoreceptor having a surface layer comprising an organic substance, the developer composition comprises (i) carrier particles, (ii) toner particles, (iii) an inorganic fine powder as an external additive selected from the group consisting of silica, alumina, titania, zirconia and magnesia and (iv) a fatty acid bisamide compound as an external additive which is present in an amount of from 0.05 to 0.05% by weight based on said toner particle.

4,859,559

HYDROXYCARBOXYLIC ACIDS AS ADJUVANTS FOR NEGATIVE LIQUID ELECTROSTATIC DEVELOPERS

Torence J. Trout, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 18, 1987, Ser. No. 27,612
Int. Cl.[4] G03G *9/12*
U.S. Cl. 430—115 **48 Claims**

1. A negative, liquid electrostatic developer having improved charging characteristics consisting essentially of

(A) a nonpolar liquid having a Kauri-butanol value of less than 30, present in 85 to 99.9% by weight, based on the total weight of liquid developer,

(B) thermoplastic resin particles having dispersed therein 0.1 to 10% by weight based on the total weight of developer solids of a hydroxycarboxylic acid of the formula: HO—X—COOH wherein X is a divalent saturated or unsaturated aliphatic hydrocarbon containing at least 12 carbon atoms or aromatic hydrocarbon containing at least 6 carbon atoms, and in which there are at least 4 carbon atoms between the hydroxy and carboxylic acid groups, the resin particles having an average by area particle size of less than 10 μm, and

(C) a nonpolar liquid soluble ionic or zwitterionic charge director compound which imparts a negative charge to the thermoplastic resin particles present in an amount of 1 to 1000 μm/g developer solids, the total weight of developer solids is 0.1 to 15% by weight.

4,859,560

TONER FOR USE IN ELECTROPHOTOGRAPHY

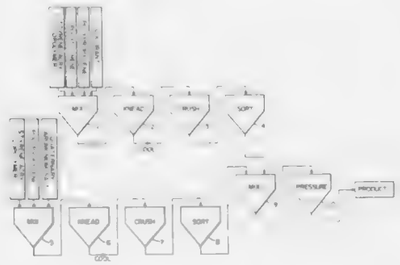
Tadashi Nakamura; Yasuo Kitabatake; Yoshiaki Takahashi, all of Nara, and Kazuya Maeda, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 9, 1987, Ser. No. 107,016
Claims priority, application Japan, Oct. 22, 1986, 61-252441
Int. Cl.[4] G03G *9/08*
U.S. Cl. 430—137 **8 Claims**

1. A method of producing toner particles for use in electrophotography with particles having a colored resin core containing resin and a colorant and a charge controlling layer on the outer surface of said colored resin core, said charge controlling layer containing a charge controlling agent but not containing any colorant, said method comprising the steps of

preparing toner core particles by mixing, kneading, crushing and sorting a first material including a resin material and a colorant,

preparing charge controlling particles with smaller diameters than said toner core particles by mixing, kneading, crushing and sorting a second material including a charge controlling agent, and



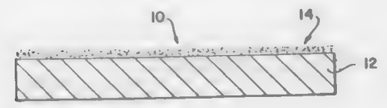
thereafter mixing said toner core particles with said charge controlling particles and causing a charge controlling layer to be formed around said toner core particles by applying a pressure to said mixed particles.

4,859,561

DEVELOPER SHEET USEFUL IN PROVIDING TRANSPARENCIES OR REPRODUCTIONS HAVING A CONTROLLED GLOSS FINISH

George D. Metz, Mayfield Heights; Carl McCrary, West Carrollton; Joseph G. O'Connor; Paul C. Adair, both of Springboro; D. Scott Proehl, Miamisburg; Edward J. Saccocio, Columbus, and James Dowler, Franklin, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 905,727, Sep. 9, 1986, abandoned. This application Jul. 14, 1987, Ser. No. 73,036
Int. Cl.[4] G03C *1/72*; B41M *5/16, 5/22*
U.S. Cl. 430—138 **27 Claims**



1. A process for forming images which comprises imagewise transferring a color precursor to the reactive surface of a developer sheet consisting essentially of a support and a layer of a finely divided thermoplastic developer material on the surface thereof, said developer material being capable of reacting with a color precursor to produce a visible image and being capable of coalescing into a thin film which imparts gloss to said image upon application of heat and/or pressure; and coalescing said developer material.

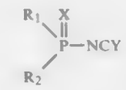
4,859,562

PHOTOSENSITIVE MIXTURE AND PHOTOSENSITIVE RECORDING MATERIAL PRODUCED THEREFROM WITH POLYMERIC COMPOUND WHICH IS REACTION PRODUCT OF UNSATURATED (THIO)PHOSPHINIC ACID ISO(THIO)CYANATE AND ACTIVE HYDROGEN CONTAINING COMPOUND

Georg Pawlowski, Wiesbaden; Hans-Jerg Kleiner, Kronberg, and Thomas Gerdau, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 8, 1987, Ser. No. 47,142
Claims priority, application Fed. Rep. of Germany, May 9, 1986, 3615612
Int. Cl.[4] G03C *1/60, 1/68, 1/71, 1/70*
U.S. Cl. 430—175 **11 Claims**

1. A photosensitive mixture comprising (a) a photosensitive compound, selected from the group consisting of photoinitiators and negative-working photosensitive substances, and present in sufficient amount to render said mixture sensitive to light, and (b) a polymeric compound having lateral olefinically unsaturated radicals, wherein said polymeric compound is present in an amount sufficient to affect alkali solubility of said photosensitive mixture, and is a product of reacting (i) an olefinically unsaturated compound represented by the formula


(I)

wherein

X and Y are the same or different and each is oxygen or sulfur,

R_1 is an olefinically unsaturated aliphatic radical containing 2 to 8 carbon atoms and

R_2 is a saturated aliphatic radical containing 1 to 8 carbon atoms or an aryl radical containing 6 to 10 carbon atoms, with (ii) a polymer containing active hydrogen, wherein said polymer contains hydroxyl or amino groups, and the active hydrogen is supplied by hydroxyl or amino groups.

4,859,563

POSITIVE PHOTORESIST COMPOSITION

Konoe Miura, Yokohama; Tameichi Ochiai, Sagamihara, and Yasuhiro Kameyama, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 825,902, Feb. 4, 1986, Pat. No. 4,719,167. This application Mar. 9, 1987, Ser. No. 23,689
Claims priority, application Japan, Feb. 13, 1985, 60-25660
The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.
Int. Cl.[4] G03C *1/54, 1/60*
U.S. Cl. 430—192 **4 Claims**

1. A positive photoresist composition consisting essentially of an admixture of (a) a photosensitizer of 1,2-naphthoquinone diazides photosensitive-material comprising an ester of 2,3,4,4'-tetrahydroxybenzophenone in which, on the average, not less than two hydroxyl groups of 2,3,4,4'-tetrahydroxybenzophenone have been esterified by 1,2-naphthoquinonediazide-5-sulfonic acid and (b) a novolak resin obtained by condensing a mixture of 10 to 80 mol % of m-cresol, 10 to 80 mol % of p-cresol and 10 to 80 mol % of 2,5-xylenol with formaldehyde, the weight ratio of said 1,2-naphthoquinone diazides photosensitive-material to said novolak resin being in the range of 15/100 to 60/100.

4,859,564

COLOR DIFFUSION TRANSFER PHOTOGRAPHIC ELEMENT WITH REDUCING SUGAR

Hideki Tomiyama, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 24, 1988, Ser. No. 159,985
Claims priority, application Japan, Feb. 24, 1987, 62-39300
Int. Cl.[4] G03C *5/54*
U.S. Cl. 430—216 **13 Claims**

1. A color diffusion transfer photographic element having at least one silver halide emulsion layer, a dye image forming material, a dye mordant image receiving layer and a neutralization system for lowering the pH value of an alkaline processing solution, wherein said neutralization system contains a reducing sugar in an amount of from 0.1 to 20 mmol/m^2.

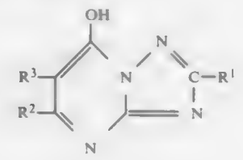
4,859,565

DIFFUSION TRANSFER REVERSAL PROCESS

René M. De Keyzer, Bornem; Robert J. Pollet, Vremde, and Leon L. Vermeulen, Herenthout, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Continuation of Ser. No. 872,881, Jun. 1, 1986, abandoned. This application Apr. 26, 1988, Ser. No. 186,757
Claims priority, application European Pat. Off., Jun. 11, 1985, [illegible]
Int. Cl.[4] G03C *5/54*
U.S. Cl. 430—231 **7 Claims**

2. Non-light-sensitive element for the formation therein of a transfer image according to the DTR-process comprising an image-receiving layer containing a development nuclei wherein the said image-receiving layer or a hydrophilic colloid lalyer in water-permeable relationship therewith comprises before the said transfer image formation a 7-hydroxy-s-triazolo-[1,5-a]-pyrimidine corresponding to the following general formula (I):



(I)

wherein:

each of R^1, R^2, and R^3, which may be the same or different, is one selected from the group consisting of:

(a) hydrogen,

(b) a C_1-C_8alkyl group, and

(c) an Alk_1—X—Alk_2—Y— group, wherein

Alk_1 represents a C_1-C_8alkyl group or a substituted C_1-C_8alkyl group,

X represents —O— or —S—,

Alk_2 represents a C_1-C_8alkylene group or a substituted C_1-C_8alkylene group, and

Y is one selected from the group consisting of a single bond, —O—, —S—, —CONH—, —SO_2NH—, and —NHCONH—,

or wherein:

each of R^1 and R^2 (the same or different) represents hydrogen or a said group (b) or (c) and R^3 represents a C_1-C_8alkylthio group or a C_1—C_8alkylthio group having a substituted C_1—C_8alkyl group,

at least one of R^1, R^2, and R^3, however, being other than hydrogen and other than C_1—C_8alkyl.

4,859,566

IMAGE-RECEIVING MATERIAL

René M. De Keyzer, St. Niklaas, Belgium, assignor to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Aug. 4, 1988, Ser. No. 228,180
Claims priority, application European Pat. Off., Sep. 8, 1987, [illegible]
Int. Cl.[4] G03C *5/54*
U.S. Cl. 430—232 **10 Claims**

1. An image receivng material suited for use in the silver complex diffusion transfer reversal process which material contains a water-impermeable support coated with (1) an image-receiving layer containing physical development nuclei dispersed in a waterpermeable binder and (2) a waterpermeable top layer free from development nuclei and containing a hydrophilic colloid. characterized in that:

(i) the total solids coverage of said two layers (1) and (2) is at most 2 g/m2,

(ii) in layer (1) the coverage of said nuclei is in the range of 0.1 mg/m2 to 10 mg/m2, and the coverage of binder is in the range of 0.4 to 1.3 g/m2, and

(iii) in said top layer (2) the coverage of hydrophilic colloid is in the range of 0.1 to 0.9 g/m2.

4,859,567

METHOD OF FORMING HIGH CONTRAST NEGATIVE IMAGES

Eiichi Okutsu, and Mitsunori Hirano, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 7, 1987, Ser. No. 129,632
Claims priority, application Japan, Dec. 5, 1986, 61-289918
Int. Cl.[4] G03C *1/06, 5/24*
U.S. Cl. 430—265 **10 Claims**

1. A method of forming a high contrast negative image, which comprises developing an imagewise exposed substantially surface latent image-type silver halide photographic material in the presence of a hydrazine derivative with a developer, said developer having a pH of 10.5 to 12.3 and containing

(1) a developing agent,

(2) not less than 0.25 mol/liter of a sulfite,

(3) a compound represented by formula (I):

$$Ar—(R_1)_n \quad \text{(I)},$$

wherein AR represents an aryl group, and R_1 represents an alkyl group or an alkoxy group and n is an integer of from 1 to 3, and

(4) a compound represented by formula (II);

$$R_2—SO_3M \quad \text{(II)},$$

or a compound represented by formula (III):

$$R_3—COOM \quad \text{(III)},$$

wherein M represents a hydrogen atom, Na, K or NH_4, and R_2 and R_3 each represents an alkyl group having at least 3 carbon atoms, a phenyl group, or a phenyl group substituted by an alkyl group or alkoxy group.

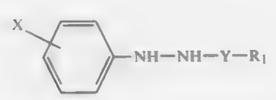
4,859,568

PHOTOGRAPHIC IMAGE RECORDING METHOD USING SILVER HALIDE AND VINYL MONOMER

Keiji Takeda, Kanagawa, and Yoshihide Hayakawa, Tokyo, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

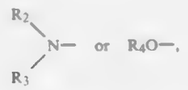
Continuation of Ser. No. 827,702, Feb. 10, 1986, abandoned. This application Apr. 27, 1987, Ser. No. 42,548
Claims priority, application Japan, Feb. 8, 1985, 60-22980; Feb. 18, 1985, 60-29894; Apr. 1, 1985, 60-68874
The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—269 **15 Claims**

1. A method for recording a photographic image on an image-recording material, wherein an image-recording material comprising a photographic silver halide emulsion containing silver halide in an amount of from 0.001 to 0.5 g per gram of polymerizable vinyl monomer, a polymerizable vinyl monomer, and from 0.1 to 20 moles per mole of the silver halide of a hydrazine derivative represented by formula (I)



(I)

wherein X represents a hydrogen atom, an alkyl group, or a group represented by



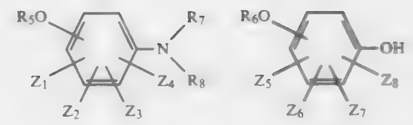
positioned in an ortho-, meta- or para-position on the benzene ring; Y represents



or —SO_2—; R_1, R_2, R_3 and R_4 each represents a hydrogen atom, an unsubstituted alkyl group, or a substituted alkyl group, provided that R_1 represents hydrogen atom only when Y represents



on a support is imagewise exposed to form a latent image in said photographic silver halide emulsion and then developed by heating for 1 to 300 seconds essentially in an absence of water at from 80° C. to 200° C. so as to polymerize said polymerizable vinyl monomer in the part having said latent image to form a polymer image therein, and wherein said image recording material contains a reducing agent represented by formula (IIa) or formula (IIb)



(IIa) (IIb)

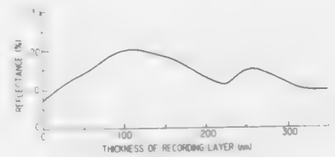
wherein R_5, R_6, R_7, and R_8 each represents a hydrogen atom, an unsubstituted alkyl group, a substituted alkyl group, or an aryl group; Z_1 through Z_8 each represents a hydrogen atom, an unsubstituted alkyl group, a substituted alkyl group, an alkoxy group, a halogen atom, or an aryl group; and the position of each of the R_5O-group and R_6O-group on the benzene ring may be any of ortho-, meta-, or para-position.

4,859,569

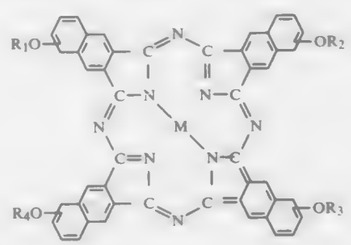
OPTICAL RECORDING MEDIUM

Sumio Hirose, Yokohama; Hiroshi Ozawa, Isehara; Kenji Abe; Yoichi Hosono, both of Yokohama; Shigeru Takahara, and Tadashi Koike, both of Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo and Yamamoto Chemicals, Inc., Yao, both of, Japan

Division of Ser. No. 898,021, Aug. 19, 1986, Pat. No. 4,719,613. This application Nov. 10, 1987, Ser. No. 119,388
Claims priority, application Japan, Aug. 27, 1985, 60-186659
Int. Cl.[4] G11B *7/24*; G01D *9/00*; G03C *1/72*; B41M *5/26*
U.S. Cl. 430—270 **7 Claims**



1. An optical recording medium permitting recording and reading-out of signals, comprising a transparent substrate and an optically reflective recording layer provided directly on said substrate, said recording layer having an amount of resinous binder therein of substantially 0 wt. % and containing a napthalocyanine dye having the formula (I):



(I)

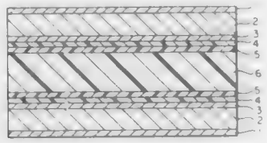
wherein M is a metal, metal oxide or metal halide, and —OR_1, —OR_2, —OR_3 and —OR_4 are the same or different and denote ether groups, respectively, having R^1, R^2, R^3 and R^4 each of which is a saturated or unsaturated hydrocarbon group having 4 to 12 carbon atoms.

4,859,570

PHOTOSENSITIVE ELEMENT HAVING IMPROVED ANTISTATIC LAYER

Conrad E. Miller, Hendersonville, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 75,454, Jul. 20, 1987, abandoned. This application Nov. 25, 1988, Ser. No. 275,956
Int. Cl.[4] B03C *1/82*
U.S. Cl. 430—271 21 Claims



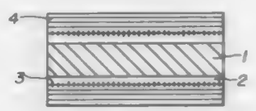
1. A photographic element comprising a polymeric film support having carboxyl groups attached to the surface thereof, a photosensitive layer on the support, and a permanent antistatic layer coated on at least one surface of the support, the antistatic layer consisting essentially of the reaction product of (1) a water-soluble, electrically conductive polymer having functionally attached carboxyl groups integral to the polymer, and (2) a polyfunctional substituted aziridine wherein at least one hydrogen atom on a carbon atom of the aziridine ring is substituted with an alkyl substituent wherein alkyl is of 1 to 6 carbon atoms, wherein the aziridine interlinks the water-soluble, electrically conductive polymer having functionally attached carboxyl groups integral to the polymer and the carboxyl groups on the surface of the support to form an antistatic layer having a coating weight based on the weight of conductive polymer (1) of less than 4.5 mg/dm^2.

4,859,571

EMBEDDED CATALYST RECEPTORS FOR METALLIZATION OF DIELECTRICS

Abraham B. Cohen, Springfield; Roxy Fan, E. Brunswick, and John A. Quinn, Morganville, all of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 30, 1986, Ser. No. 947,833
Int. Cl.[4] G03C *1/78, 1/94, 1/96*
U.S. Cl. 430—272 15 Claims



1. A laminate for the preparation of printed circuits by electroless plating of conductive metal thereon which comprises
   a. a substrate
   b. at least one surface of the substrate having an adherent layer of polymeric adhesive, having partially embedded therein finely divided microporus particles of adsorbent which protrude from the adhesive surface away from the substrate, the protrusive surfaces of which are adsorptive with respect to electroless plating catalysts or reductive precursors thereof, and
   c. a solid layer of photodielectric adherently overlying the layer of adhesive and adsorbent particles.

6. The laminate of claim 1 in which the substrate is a glass-filled network resin.

13. A method for making a laminate for the preparation of printed circuits by electroless plating of conductive metal thereon which comprises the sequential steps of

1. forming an adherent layer of crosslinkable polymeric adhesive on at least one surface of a substrate;
2. toning the layer with finely divided microporous, particles of adsorbent so that they become partially embedded within and protrude form the surface of the adhesive, the surfaces of the protruding part of the particles being adsorptive with respect to electroless plating catalysts or reductive precursors thereof;
3. crosslinking the polymer adhesive to harden the layer and firmly hold the embedded particle surfaces; and
4. applying a layer of photodielectric to the layer of crosslinked adhesive and protrusive adsorbent particles.

4,859,572

DYE SENSITIZED PHOTOGRAPHIC IMAGING SYSTEM

Samir Y. Farid, and Roger E. Moody, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 2, 1988, Ser. No. 189,002
Int. Cl.[4] G03C *1/68*
U.S. Cl. 430—281 15 Claims

1. A photographic imaging system comprised of
a hardenable organic component containing ethylenic unsaturation sites and
an initiator system for ethylenic addition comprised of an activator pair and a photosensitizer consisting of
a cationic onium electron acceptor activator chosen from the class of activators that liberate a free radical capable of initiating ethylenic addition by accepting an electron from a photosensitizer in its excited state,
an electron donor activator chosen from the class of activators that liberate a free radical capable of initiating ethylenic addition by donating an electron to a photosensitizer in its excited state, said electron donor activator including a borate anionic moiety that satisfies the formula:



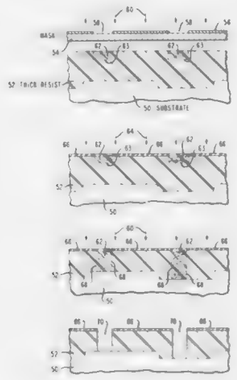
where
R^1, R^2, R^3, and R^4 are independently selected from the group consisting of alkyl of from 1 to 18 carbon atoms, aryl of from 6 to 18 carbon atoms, allyl, aralkyl in the aryl moiety contains from 6 to 18 carbon atoms and the alkyl moiety contains 1 to 5 carbon atoms, alkenyl of from 2 to 10 carbon atoms, alkynyl of from 2 to 18 carbon atoms, cycloalkyl of from 5 to 7 carbon atoms, and 5 and 6 membered heterocyclic rings having up to three heteroatoms selected from the group consisting of oxygen, nitrogen, and a middle chalcogen chosen from the group consisting of sulfur, selenium, and tellurium, and,
as a photosensitizer, a dye capable of absorbing imaging radiation to achieve an excited state, said dye having a reduction potential more cathodic, equal to, or up to 0.1 volt less cathodic than that of the electron acceptor activator and an oxidation potential more anodic, equal to, or up to 0.1 volt less anodic than that of the electron donor activator.

4,859,573

MULTIPLE PHOTORESIST LAYER PROCESS USING SELECTIVE HARDENING

George Maberas, Fort Collins; Hubert O. Hayworth, Loveland, both of Colo., and Michael R. Gulett, Freemont, Calif., assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 870,059, Jun. 3, 1986, abandoned, which is a continuation of Ser. No. 639,875, Aug. 13, 1984, abandoned. This application Aug. 21, 1987, Ser. No. 89,014
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—326 7 Claims



1. A process for creating a layer of patterned photoresist on a surface, said process comprising the steps of:
forming on said surface a first layer of polymeric photoresist material;
converting selected pattern regions adjacent to the surface of said first layer to monomeric form by selectively exposing such pattern regions to depolymerizing wavelength energy;
conditioning said first layer to render a relatively thin surface layer of the polymeric photoresist material substantially opaque to depolymerizing wavelength energy without materially changing the developing characteristics of the pattern regions of monomeric form;
further exposing first layer polymeric photoresist material to depolymerizing wavelength energy to extend the monomer form region pattern through the full thickness of said first layer using the relatively thin and opaque surface layer as a mask to depolymerizing wavelength energy; and
developing out the monomeric pattern regions of the photoresist.

4,859,574

PROCESS FOR STABILIZING PHOTOGRAPHIC ELEMENTS USING A SOLUTION COMPRISING A WATER-SOLUBLE N-METHYLOL COMPOUND AND A BUFFERING AGENT

Thomas M. Gormel, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 15, 1988, Ser. No. 169,249
Int. Cl.[4] G03C *7/40, 5/39*
U.S. Cl. 430—372 10 Claims

1. A process for stabilizing the magenta dye image in a photographic color element comprising a support having thereon at least one hydrophilic colloid layer containing a magenta dye image formed by coupling of oxidized developing agent with magenta-dye-forming coupler, said process comprising the steps of:
(1) contacting said element for a period of at least about 5 seconds at a temperature of at least about 20° C. with an aqueous stabilizing solution consisting essentially of a water-soluble N-methylol compound and a sufficient amount of an alkaline buffering agent to provide a pH of at least 9,



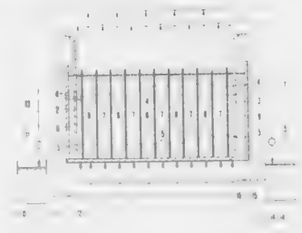
(2) subjecting said element to an aqueous wash to remove scum formed in step (1), and
(3) drying said element at an elevated temperature.

4,859,575

METHOD FOR PROCESSING OF SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL WITH DIALYSIS TREATMENT

Masayuki Kurematsu, and Shigeharu Koboshi, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 117,884, Oct. 23, 1987, abandoned, which is a continuation of Ser. No. 931,915, Nov. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 731,085, May 6, 1985, abandoned. This application Aug. 24, 1988, Ser. No. 236,321
Claims priority, application Japan, May 16, 1984, 59-96352
Int. Cl.[4] G03C *7/00, 5/24, 7/40*
U.S. Cl. 430—428 20 Claims



1. In a method for processing of a photographic material which comprises carrying out stabilizing processing of a photographic material which comprises carrying out stabilizing processing of a photographic material with a stabilizing solution in a stabilizing bath substantially without washing with water subsequent to the processing with exposure, development and processing having fixing ability, the improvement comprising removing iron (III) ions form said stabilizing solution by subjecting said stabilizing solution to electrodialysis treatment; and thereafter recycling said stabilizing solution for stabilizing processing of photographic material whereby the occurrence of yellow stain in the processed photographic material using the recycled stabilizing solution is inhibited.

4,859,576

SILVER HALIDE PHOTOGRAPHIC MATERIAL COMPRISING A PROTECTIVE LAYER CONTAINING A POLYOXYETHYLENE SURFACE ACTIVE AGENT

Nobuaki Miyasaka; Shigeki Yokoyama; Shuzo Suga; Takashi Naoi, and Masaki Satake, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 829,040, Feb. 13, 1986, abandoned. This application Mar. 29, 1988, Ser. No. 178,796

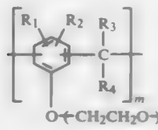
Claims priority, application Japan, Feb. 13, 1985, 60-24508; Feb. 13, 1985, 60-24509

Int. Cl.[4] G03C *1/76, 1/82*

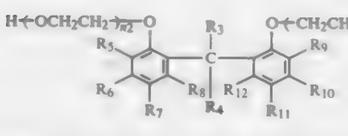
U.S. Cl. 430—523 **24 Claims**

1. A silver halide photographic material comprising at least one silver halide photographic emulsion layer disposed on at least one side of a support, wherein at least one of the silver halide photographic emulsion layer(s) contains a photosensitive silver halide emulsion containing silver iodide and an internally fogged silver halide emulsion, and at least one of the silver halide photographic emulsion layer(s) and an auxiliary layer(s) which is disposed on the same side of the support as that of the support having said emulsion containing silver iodide is a surface protective layer containing at least one polyoxyethylenic surface active agent selected from the group consisting of compounds represented by formula (I) and (II)

(I)



(II)



wherein R_1, R_2, R_6, R_8, R_{10}, and R_{12} each represents a hydrogen atom, a substituted or unsubstituted alkyl group, aryl group alkoxy group, or aryloxy group, a halogen atom, an acyl group, an amido group, a sulfonamido group, a carbamoyl group, or a sulfamoyl group; R_5, R_7, R_9 and R_{11} each represents a substituted or unsubstituted alkyl group, aryl group alkoxy group, or aryloxy group, a halogen atom, an acyl group, an amido group, a sulfonamido group, a carbamoyl group, or a sulfamoyl group; R_3 and R_4 each represents a hydrogen atom, a substituted or unsubstituted alkyl group, aryl group, or heterocyclic aromatic ring; or groups in at least one combination of R_3 and R_4, R_5 and R_6, R_7 and R_8, R_9 and R_{10}, and R_{11} and R_{12} are connected to each other to form a substituted or unsubstituted ring; n_1, n_2, and n_3 each represents the average polymerization degree of ethylene oxide within the range of from 5 to 50; and m represents an average polymerization degree of from 5 to 50.

4,859,577

PHOTOGRAPHIC SUPPORT

Shigehisa Tamagawa, and Tetsuro Fuchizawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 41,666, Apr. 20, 1987, abandoned, which is a continuation of Ser. No. 894,476, Aug. 5, 1986, abandoned, which is a continuation of Ser. No. 727,892, Apr. 26, 1985, abandoned, which is a continuation of Ser. No. 469,970, Feb. 25, 1983, abandoned. This application Mar. 16, 1988, Ser. No. 171,138

Claims priority, application Japan, Feb. 26, 1982, 57-30355

Int. Cl.[4] G03C *1/96*

U.S. Cl. 430—538 **4 Claims**

1. A photographic support comprising a photographic layer sensitive to light and a polyolefin-coated paper layer comprising a paper sheet which contains an alkylketene dimer mixture in an amount of 0.2–2.0% by weight of the absolutely dried pulp consisting the paper sheet and is coated with a polyolefin on both surfaces; wherein said alkylketene dimer mixture consists essentially alkyl chains having 14 carbon atoms or less than 14 carbon atoms in the chain, an alkyl chain having 16 carbon atoms in the chain, and at least one alkyl chain having 18 carbon atoms in the chain and alkyl chains of 20 carbon atoms or more than 20 carbon atoms in the chain under the condition satisfying the following equation

$$\frac{1/3[C_{16}] + [C_{18}] + 10[C_{20 \text{ and more}}]}{[C_{14 \text{ and less}}]} \geq 1$$

in which

$[C_{14 \text{ and less}}]$ means the amount of alkyl chains having carbon atoms of 14 and less;

$[C_{16}]$ means the amount of an alkyl chain having 16 carbon atoms;

$[C_{18}]$ means the amount of an alkyl chain having 18 carbon atoms; and

$[C_{20 \text{ and more}}]$ means the amount of alkyl chains having carbon atoms of 20 and more,

the alkyl chain amounts being represented by percent in number of the total alkyl chain amount of the alkylketene dimer composition mixture.

4,859,578

PHOTOGRAPHIC RECORDING MATERIAL PROVIDING IMPROVED GRANULARITY PROPERTIES

Drake M. Michno, Webster; Norma B. Platt, Ontario; David A. Steele, Webster, and David T. Southby, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 21, 1988, Ser. No. 209,611

Int. Cl.[4] G03C *7/30, 7/32*

U.S. Cl. 430—544 **29 Claims**

1. A photographic recording material comprising a support and a photosensitive silver halide emulsion layer which has, in reactive association therewith,

(a) a image dye-forming coupler compound

(b) a development inhibitor-releasing compound,

(c) a compound capable of imagewise release of a soluble mercaptan moiety, and

(d) a compound capable of imagewise release of a 1-aryl-3-pyrazolidinone electron transfer agent compound.

4,859,579

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Shigeo Hirano; Tetsuro Kojima; Mitsuru Yamamoto; Noriyuki Inoue, and Tatsuo Heki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 28, 1988, Ser. No. 149,271

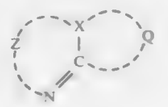
Claims priority, application Japan, Jan. 28, 1987, 62-17984

Int. Cl.[4] G03C *1/10, 1/485*

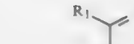
U.S. Cl. 430—598 **11 Claims**

1. A silver halide photographic material comprising a support having thereon at least one light-sensitive silver halide photographic emulsion layer, wherein at least one layer selected from said at least one emulsion layer and other hydrophilic colloid layers contains at least one alkynyl substituted heterocyclic quaternary ammonium salt nucleating compound represented by the following general formula (I):

(I)



wherein Z represents a non-metallic atomic group necessary to form a substituted or unsubstituted 5-membered or 6-membered heterocyclic ring to which an aromatic ring or a heterocyclic ring may further be condensed; R^1 represents a substituted or unsubstituted aliphatic group; X represents



Q represents a non-metallic atomic group necessary to form a substituted or unsubstituted 4-membered to 12-membered non-aromatic hydrocarbon ring or a substituted or unsubstituted non-aromatic heterocyclic ring; at least one of R^1, a substituent for Z and a substituent for Q includes an alkynyl group; Y represents a counter ion necessary for charge balance; and n represents a number necessary to balance the charge.

4,859,580

HEAT DEVELOPABLE PHOTOSENSITIVE MATERIAL

Toshiaki Aono, and Hiroshi Hara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 830,040, Feb. 18, 1986, abandoned. This application Mar. 29, 1988, Ser. No. 178,792

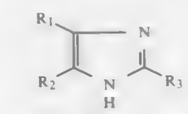
Claims priority, application Japan, Feb. 18, 1985, 60-29905

Int. Cl.[4] G03C *1/40, 5/54*

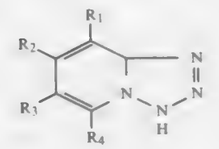
U.S. Cl. 430—617 **2 Claims**

1. A heat-developable photosensitive material having, on a support, a layer comprising a binder, a light-sensitive silver halide selected from the group consisting of silver chloride, silver bromide, silver chlorobromide, mixed crystals of silver iodide and silver chloroiodide, mixed crystals of silver iodide and silver iodobromide, and mixed crystals of silver iodide and silver chloroiodobromide, a reducing agent, and at least one compound selected from cyclic imino compounds and mercapto compounds, wherein said cyclic imino compounds are selected from those represented by the formulae (III) through (XI)

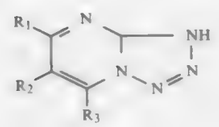
(III)



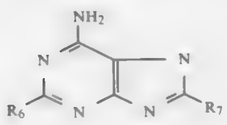
(IV)



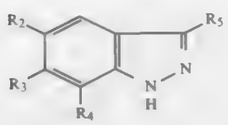
(V)



(VI)

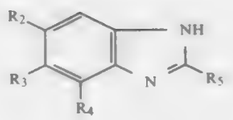


(VII)

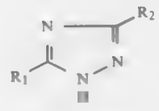


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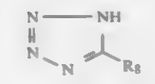
(VIII)



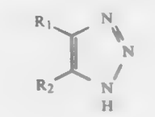
(IX)



(X)



(XI)



wherein

R_1, R_2, R_3, and R_4 each represents a hydrogen atom, an alkyl group, an aralkyl group, an alkenyl group, an alkoxy group, an aryl group, —NRR′, —COOR″, —CONRR′, —$NHSO_2$R, —SO_2NRR′, —NO_2, a halogen atom, —CN, or —OH (wherein R and R′ each represents a hydrogen atom, an alkyl group, an aryl group, or an aralkyl group, and R′ represents an alkyl group, an aryl group, or an aralkyl group), or R_1 and R_2 together form an aliphatic group carbocyclic ring, or in the case of formula (XI) form an aromatic carbocyclic ring,

R_5 represents a hydrogen atom, an alkyl group containing from 1 to 5 carbon atoms, or —S—R‴ (wherein R‴ represents a hydrogen atom, an alkyl group, an aryl group or an aralkyl group),

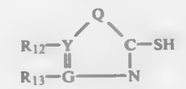
R_6 represents a hydrogen atom or an alkyl group,

R_7 represents a hydrogen atom, an alkyl group, or an aryl group, and

R_8 represents an alkyl group, an aryl group, a benzyl group, or a pyridyl group; and

the mercapto compounds are represented by formula (XII)

(XII)



(V)

wherein

Q represents an oxygen atom, a sulfur atom, or —NR⁗ (wherein R⁗ represents a hydrogen atom, an alkyl group, an unsaturated alkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted aralkyl group), Y and G each represents a carbon atom or a nitrogen atom, and R_{12} and R_{13} each represents a hydrogen atom, an alkyl group, an unsaturated alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted aralkyl group, —SR⁗′ or —NH_2 (wherein R⁗′ represents a hydrogen atom, an alkyl group, an aryl group, an aralkyl group, an alkylcarboxylic acid, or alkali-metal alkylcarboxylate group, or an alkylsulfonic acid or alkali-metal alkylsulfonate group), or R_{12} and R_{13} together form a substituted or unsubstituted aromatic carbocyclic ring, or a substituted or unsubstituted nitrogen-containing heterocyclic ring, except that when Q represents —NR⁗, R_{12} and R_{13} do not simultaneously represent a hydrogen atom,

wherein the total content of the cyclic imino compounds and mercapto compounds is from 0.05 to 10 mol% per mole of silver in the light-sensitive silver halide.

4,859,581

ENDOGLYCOSIDASE ASSAY

Garth L. Nicolson, Kingwood; Motowo Nakajima, Houston, and Tatsuro Irimura, Bellaire, all of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 839,890, Mar. 10, 1986. This application Feb. 20, 1987, Ser. No. 12,860

Int. Cl.[4] C12Q *1/00*

U.S. Cl. 435—4 **22 Claims**

1. A method of producing a liquid-phase substrate which, upon hydrolysis by a glycosaminoglycan endoglycosidase, yields labeled products, and using said substrate to assay human glycosaminoglycan endoglycosidase, the method comprising the steps of;

(a) labeling a glycosaminoglycan at one or more sites with a label yielding a detectable signal;

(b) tagging the labeled glycosaminoglycan with a tag at a site on the glycosaminoglycan that has not been labeled wherein said tag has a binding affinity for a specific protein;

(c) incubating the labeled and tagged glycosaminoglycan in a buffered aqueous solution with a human biological sample suspected of containing glycosaminoglycan endoglycosidase;

(d) separating, using the specific protein, any labeled untagged products resulting from glycosaminoglycan endoglycosidase-induced hydrolysis of the labeled and tagged glycosaminoglycan substrate from tagged products and unaltered labeled and tagged glycosaminoglycan substrate; and

(e) determining amounts of labeled untagged product, said amounts being proportional to glycosaminoglycan endoglycosidase levels in the human biological sample.

4,859,582

FLUORESCENT CONJUGATES FOR ANALYSIS OF MOLECULES AND CELLS

Lubert Stryer, Stanford; Alexander N. Glazer, Orinda, and Vernon T. Oi, Menlo Park, all of Calif., assignors to The Board of Trustees of the Leland Stanford Jr. University, Stanford, Calif.

Continuation-in-part of Ser. No. 454,768, Dec. 30, 1982, Pat. No. 4,520,110, which is a continuation-in-part of Ser. No. 309,169, Oct. 6, 1981, abandoned. This application Feb. 13, 1985, Ser. No. 701,324

The portion of the term of this patent subsequent to May 28, 2002, has been disclaimed.

Int. Cl.[4] C12Q *1/70;* **G01N** *33/566, 33/554, 33/53*

U.S. Cl. 435—5 **12 Claims**

1. A specific binding pair complex of a ligand and receptor, where one of said ligand and receptor is bound to a phycobiliprotein.

4,859,583

CHEMILUMINESCENT IMMUNOCHEMICAL TECHNIQUE FOR LOW MOLECULAR WEIGHT ANTIGENS

Michael J. Heller, Poway, Calif., and Larry E. Morrison, Lisle, Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Feb. 25, 1985, Ser. No. 705,493

Int. Cl.[4] G01N *33/53, 21/00*

U.S. Cl. 435—7 **37 Claims**

1. A sample device for assaying fluid samples potentially containing an analyte, wherein said analyte includes a member of a liquid-antiligand pair, comprising:

a containment vessel, adapted to receive a fluid sample, and containing a reagent, said vessel having a first chamber, a second chamber and cofactor blocking means, wherein said reagent includes a cofactor source and reagent members of a liquid-antiligand pair specific to the analyte of interest, one of said reagent members being restricted in said first chamber, the opposing reagent member having a label agent, said cofactor source providing cofactors which participate in a reaction with said label agent, which reaction is detectable, said first chamber being in fluid communication with said second chamber, said co-



factor blocking means interposed between said first and second chambers limiting the presence of said cofactor to said second chamber, allowing said label agent to be detected in said second chamber to the exclusion of said first chamber, said opposing reagent member having a label agent assuming a concentration in said second chamber in relation to the concentration of analyte.

4,859,584

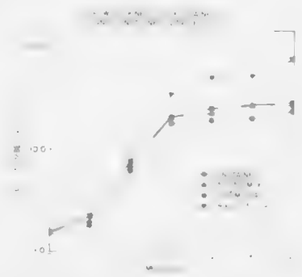
CELL GROWTH RATE DETERMINATION BY MEASUREMENT OF CHANGES IN CYANINE DYE LEVELS IN PLASMA MEMBRANES

Paul K. Horan, West Chester; Bruce D. Jensen, King of Prussia, and Sue E. Slezak, Downingtown, all of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Oct. 31, 1986, Ser. No. 925,429

Int. Cl.[4] C12Q *1/02, 1/18*

U.S. Cl. 435—29 **19 Claims**



1. A method for determining cell growth rate that comprises measuring changes in levels of cyanine dye in the plasma membranes of daughter cells derived from parent cells labelled with a cyanine dye wherein fluorescence is used to measure changes in levels of cyanine dye.

4,859,585

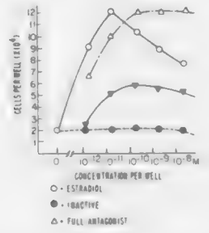
IN-VITRO METHODS FOR IDENTIFYING COMPOSITIONS WHICH ARE AGONISTS AND ANTAGONISTS OF ESTROGENS

Carlos Sonnenschein, and Ana M. Soto, both of Boston, Mass., assignors to Trustees of Tufts College, Medford, Mass.

Filed Apr. 17, 1986, Ser. No. 853,240

Int. Cl.[4] C12Q *1/02*

U.S. Cl. 435—29 **13 Claims**



1. An in-vitro method for identifying a substance of interest as an in-vivo estrogen agonist, said method comprising the steps of:

obtaining a plurality of cells cultured in-vitro, said cells being estrogen dependent for proliferation in-vivo;

maintaining a known quantity of said cultured cells in a medium without estrogens comprising a fluid and an inhibitor of cell proliferation endogenous to the serum of adult humans, said endogenous inhibitor being present in said maintaining medium at a concentration effective to prevent proliferation of said cells in-vitro in the absence of an estrogen;

adding the substance of interest to said cultured cells in said maintaining medium to form a reaction mixture;

incubating said reaction mixture for a preselected time period; and

determining the number of cultured cells in said incubated reaction mixture, a measurable increase in the number of cultured cells identifying the substance of interest as an estrogen agonist.

4,859,586

DEVICE FOR CULTIVATING BACTERIA

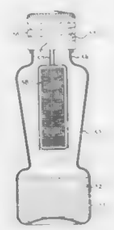
Eliahu Eisenberg, Remez Street 30, Tel Aviv; Reuven Padova, Kiryat Shmona Street, 11, Holon; Avner Shenfeld, Hess Street, 16; Tsvi Hirshfeld, Ben Yehuda Street, 19, both of Rehovot, and Jacob Stein, Omri Street, 18a, Tel Aviv, all of Israel

Filed Aug. 21, 1986, Ser. No. 898,654

Claims priority, application Israel, Aug. 26, 1985, 76189

Int. Cl.[4] C12Q *1/04, 1/24;* **C12M** *1/24, 1/18*

U.S. Cl. 435—34 **8 Claims**



1. An integral sterile closed device for simultaneous cultivation of microorganisms on a solid and on a liquid nutrient medium, comprising a transparent vessel with an elongated upper section with side walls and a lower part, a liquid nutrient medium within said lower section, the lower part being of a larger diameter than said upper section, said upper section is of a conical, downwardly and inwardly tapering shape so as to permit tilting of the vessel to rinse the side walls of the upper section with the liquid medium in the vessel and thereby remove droplets adhering to the upper section after cultivation, without contact of the solid medium by liquid medium in the vessel, and said upper section also being provided at its uppermost part iwth a closure cap and a hermetically sealing resilient septum in the upper part of said cap, a rod downwardly depending from said septum, an elongated downwardly extending support means having a solid nutrient medium on an exposed vertical outer surface thereof, said support means being attached to said rod and essentially parallel with a central axis of the vessel, a lower end of said support means terminating above an uppermost surface of said liquid nutrient medium when said vessel is upright, said cap having an opening where the sample may be introduced into said vessel by inserting a syringe needle through the septum.

4,859,587

RECOMBINANT HERPES SIMPLEX VIRUSES, VACCINES AND METHODS

Bernard Roizman, Chicago, Ill., assignor to Institut Merieux, Bains, France

Continuation-in-part of Ser. No. 616,930, Jun. 4, 1984. This application Apr. 25, 1986, Ser. No. 856,052

Int. Cl.[4] C12P *21/00;* **C12N** *15/00, 7/00;* **A61K** *39/00*

U.S. Cl. 435—68 **51 Claims**

1. A recombinant herpes simplex virus (HSV), the genome of which comprises a mutant of the genome of HSV-1 wherein the portion of said HSV-1 genome which is responsible for neurovirulence yet non-essential for growth and which is located at or near the internal inverted repeated sequences of said HSV-1 genome is deleted, and wherein a portion of the genome of HSV-2 which is responsible for coding one or more immunity inducing portions of glycoproteins of said HSV-2 is inserted in said mutant genome between the end points of said deletion.

4,859,588

PRODUCTION OF A SINGLE CELL PROTEIN

Kerry L. Sublette, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 849,646, Apr. 9, 1986. This application May 5, 1988, Ser. No. 190,624

Int. Cl.[4] C12P *21/00*

U.S. Cl. 435—68 **9 Claims**

1. A method for producing a single cell protein product comprising the steps of:

a. culturing *T. denitrificans* in the absence of H_2S in a maintenance medium containing thiosulfate to produce a desired population of *T. denitrificans,*

b. separating said population of *T. denitrificans* from any thiosulfate which may remain in said maintenance medium,

c. introducing said population of *T. denitrificans* into a reactor together with maintenance medium free of thiosulfate thus creating a slurry,

d. flowing gas streams containing hydrogen sulfide and oxygen through said slurry in said reactor whereby said *T. denitrificans* removes said hydrogen sulfide under aerobic conditions and produces sulfate whereby said population of *T. denitrificans* increases to produce excess *T. denitrificans,* the ratio of gas stream flow to the quantity of *T. denitrificans* being such that the average maximum loading of H_2S is no greater than 20 millimoles of H_2S per hour per gram dry weight of *T. denitrificans* and the quantity of O_2 is maintained at a level of at least 25 μM,

e. removing a portion of said slurry from said reactor, said slurry containing excess *T. denitrificans* and sulfate,

f. removing at least a portion of said *T. denitrificans* from said removed slurry as said single cell protein product and thereby leaving a remaining slurry, and

g. removing at least a portion of said sulfate from said remaining slurry and recycling the remaining slurry back to said reactor.

4,859,589

ENZYMATIC METHOD FOR PREPARATION OF EPOXY COMPOUNDS

Sven E. Godtfredsen, Vaerlose, Denmark, and Fredrik Bjorkling, Helsingborg, Sweden, assignors to Novo Industri A/S, Bagsvaerd, Denmark

Filed Nov. 17, 1987, Ser. No. 121,918

Claims priority, application Denmark, Nov. 18, 1986, 5498/86

Int. Cl.⁴ C07H *15/26;* C12P *19/58*

U.S. Cl. 435—73 **11 Claims**

1. Method for preparation of an epoxy substituted aldose or ketose sugar which comprises subjecting a reaction mixture of an aldose or ketose sugar or a glucosilated aldose or ketose sugar and a hydroxylated or thiolated epoxide having thereon a free hydroxyl group or thiol group to an enzymatic transfer reaction by presence in said reaction mixture of a glycosidase capable of splitting a sugar in the C-1 position (aldose) or C-2 position (ketose), forming thereby an epoxide substituted glucosilated aldose or ketose sugar and then recovering the epoxide substituted aldose or ketose sugar from the reaction mixture.

4,859,590

ENZYMATIC SYNTHESIS OF CYCLODEXTRINS USING α-GLUCOSYL FLUORIDE AS SUBSTRATE FOR CYCLODEXTRIN α(1→4)GLUCOSYLTRANSFERASE

Joachim Thiem; Wolfgang Treder, both of Münster; Reinhold Keller, Bad Soden am Taunus, and Merten Schlingmann, Königstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 31, 1987, Ser. No. 80,086

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 3626213

Int. Cl.⁴ C12P *19/18*

U.S. Cl. 435—97 **6 Claims**

1. A process for the preparation of α- and β-cyclodextrins, wherein α-glucopyranosyl fluoride is reacted with cyclodextrin α-(1→4)glucosyltransferase.

4,859,591

TRANSAMINATION PROCESS FOR PRODUCING AMINO ACIDS

James F. Walter, Ashton, and Martin B. Sherwin, Potomac, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation-in-part of Ser. No. 627,969, Jul. 5, 1984. This application Aug. 7, 1987, Ser. No. 83,603

Int. Cl.⁴ C12P *13/04, 13/22;* C12N *9/10*

U.S. Cl. 435—106 **4 Claims**

1. An improved process for providing metal ions to a transamination process in order to drive the transamination of an amino acid precursor to its corresponding L-amino acid by catalyzing decomposition of the oxalacetic acid transamination by-product, said transamination process comprising

(a) selecting aspartic acid as the amino donor,

(b) selecting the appropriate α-keto acid as the amino acid precursor,

(c) selecting a suitable intra- or extracellular transaminase,

(d) coupling the transamination reaction with the catalyzed decomposition of the oxalacetic acid transamination by-product, under conditions favorable for transaminase activity, said catalyzed decomposition effected by adding to the reaction system multivalent metal ions, and

(e) allowing the transamination to proceed,

the improvement comprising adding said multivalent metal ions to said transamination reaction system by providing solid particles or pieces comprising aluminum oxide, ferric oxide, lead oxide or zinc oxide to said system.

4,859,592

PRODUCTION OF PICOLINIC ACID AND PYRIDINE PRODUCTS VIA PSEUDOMONAS

Scott R. Hagedorn, Old Coach Rd., Summit, N.J. 07087; Anthony J. East, 63 Niles Ave., Madison, N.J. 07940, and Sol J. Barer, 271 White Oak Ridge Rd., Bridgewater, N.J. 08807

Filed Jul. 26, 1985, Ser. No. 759,038

Int. Cl.⁴ C12P *17/12;* C12N *1/20;* C12R *1/40*

U.S. Cl. 435—122 **6 Claims**

1. In the process of preparing picolinic acid and alkyl substituted picolinic acid derivatives in which an alkyl substituted aromatic hydrocarbon and molecular oxygen are converted to a 2-hydroxymuconic semialdehyde in a bioconversion medium containing a Pseudomouas microorganism exhibiting catechol 2,3-oxygenase activity and the resultant 2-hydroxymuconic semialdehyde is thereafter reacted with ammonia or a primary amine, the improvement which comprises adding ammonium or a primary amine to the bioconversion medium during the bioconversion in an amount in excess of the microorganism's nutritional needs and at a rate sufficient to react in situ with said 2-hydroxymuconic semialdehyde and prevent accumulative levels of said 2-hydroxymuconic semialdehyde above about 1 g/Liter of bioconversion medium.

4,859,593

NEW PHYSIOLOGICALLY ACTIVE SUBSTANCE, ARPHAMENINE AND PRODUCTION THEREOF

Hamao Umezawa, Tokyo; Takaaki Aoyagi, Fujisawa; Tomio Takeuchi, Tokyo; Masa Hamada, Tokyo, and Masaaki Ishizuka, Tokyo, all of Japan, assignors to Zaidin Hojin Biseibutsu Kagaku Kenky Kai, Tokyo, Japan

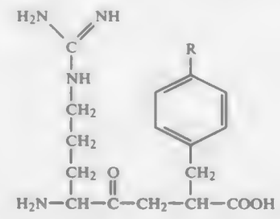
Continuation of Ser. No. 500,396, Jun. 2, 1983. This application Dec. 16, 1985, Ser. No. 809,215

Claims priority, application Japan, Jun. 7, 1982, 57-96276

Int. Cl.⁴ C12P *13/00*

U.S. Cl. 435—128 **2 Claims**

1. A process for the production of arphamenine A and arphameniine B of the formula



wherein R denotes a hydrogen atom for arophamenine A; and R denotes a hydroxyl group for arphamenine B, which comprises cultivating under aerobic conditions the microorganism Chromobacterium violaceum BMG361-CF4, a strain identified as FERM BP-286 and ATTC 39373, in a culture medium containing assimilable carbon and nitrogen sources for a sufficient time to produce and accumulate arphamenines A and B in the culture medium and recovering armphamenine A and B from said culture medium.

4,859,594

MICROORGANISMS FOR BIODEGRADING TOXIC CHEMICALS

Ralph J. Portier, Baton Rouge, La., assignor to Louisana State University Board of Supervisors, Louisana State University, Baton Rouge, La.

Filed Oct. 14, 1986, Ser. No. 918,840

Int. Cl.⁴ C12N *15/00, 11/00, 1/36, 1/20*

U.S. Cl. 435—172.1 **9 Claims**

1. A biologically pure culture of a microorganism selected from the group consisting of *Methylobacter rhodinum* ATCC 113-X and Methylobacter species ATCC 138-X.

4,859,595

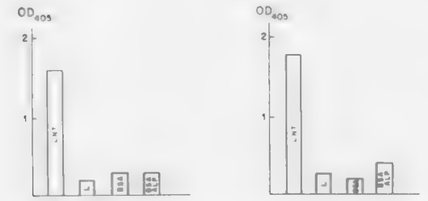
METHOD FOR PREPARING RABBIT MONOCLONAL ANTIBODIES, THE CELL LINES USED THEREIN AND THE ANTIBODIES PRODUCED THEREBY

Arthur D. Strosberg, 66 rue de Javel, 75105 Paris, France, and Jean-Gerard Guillet, 2 rue de Wattignies, 75012 Paris, France

Filed May 3, 1985, Ser. No. 730,346

Int. Cl.⁴ C12N *15/00, 5/00;* C12R *1/91*

U.S. Cl. 435—172.2 **11 Claims**



1. A continuous rabbit cell line, designated TP-3 and deposited with the ATCC as culture CRL 8761, wherein said cells are

hypoxyxanthine-guanine-phosphoribosyl transferase deficient;

hypoxyxanthine-aminopterine-thymidine sensitive;

fast growing;

non-antibody-secreting; and

capable of fusing with antibody-producing rabbit cells to produce hybrid cells capable of continuous growth and of secreting antibody;

and clones and subclones thereof.

4,859,596

CLONING SYSTEM FOR KLUYVEROMYCES SPECIES

Cornelis P. Hollenberg; Sunil Das, both of Dusseldorf, Fed. Rep. of Germany; Albert De Leeuw, Pijnacker, and Johannes A. van den Berg, Reeuwijk, both of Netherlands, assignors to Gist-Brocades N.V., MA Delft, Netherlands

Filed Jan. 19, 1984, Ser. No. 572,414

Claims priority, application Netherlands, May 19, 1982, 8202091; PCT Int'l Appl., May 19, 1983, PCT/EP83/00128

Int. Cl.⁴ C12N *15/00, 5/00;* C12P *21/00;* C07H *15/12*

U.S. Cl. 435—172.3 **30 Claims**

1. A transformed Kluyveromyces cell comprising a DNA sequence comprising a region encoding a polypeptide, heterologous to said cell, with said DNA sequence resulting from joining of at least two DNA molecules to provide a gene functional for expression in said Kluyveromyces cell, wherein said gene functional for expression comprises at least a promoter regulation region and a structural gene.

4,859,597

PRODUCTION OF PHAGE AND PHAGE-ASSOCIATED LYSIN

Huei-Hsiung Yang, Rockville; Stephen F. Hiu, and John L. Harris, both of Columbia, all of Md., assignors to Igene Biotechnology, Inc., Columbia, Md.

Filed Jul. 27, 1987, Ser. No. 77,874

Int. Cl.⁴ C12N *7/02*

U.S. Cl. 435—239 **16 Claims**

1. A method for producing a lysin-free phage inoculum, which comprises:

(a) inoculating a growing Streptococcal culture with phage,

(b) incubating the culture for a plurality of lytic cycles of phage until the cells are completely lysed to obtain a lysate, and

(c) removing cell debris and free lysin from the lysate to form a lysin-free phage suitable for use as an inoculum.

4. A method of producing lysin, which comprises:

producing a lysin-free phage inoculum according to the method of claim 1; and then

inoculating growing Streptococcal cells with the thus-produced Streptococcal lysin-free phage inoculum;

culturing the cells under conditions suitable for the production of lysin;

lysing the cells to release the lysin; and

recovering the lysin from the lysate.

4,859,598

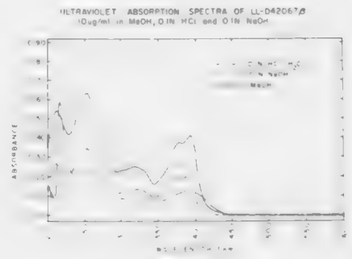
ANTIBIOTIC LL-D42067β

Guy T. Carter; Donald B. Borders, both of Suffern; Joseph J. Goodman, Spring Valley, all of N.Y., and David P. Labeda, Peoria, Ill., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 593,159, Mar. 26, 1984, Pat. No. 4,578,468. This application Jan. 21, 1986, Ser. No. 820,048

Int. Cl.⁴ C12R *1/04;* C12P *17/18, 1/06*

U.S. Cl. 435—252.1 **3 Claims**



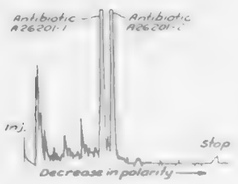
1. A biologically pure culture of the microorganism *Actinomadura madurae* subspecies *simaoensis*, NRRL 15734, said culture being capable of producing antibiotic LL-D42067β in recoverable quantities upon fermentation in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic anion and cation salts.

4,859,599

ANTIBIOTIC A26201-1 AND ANTIBIOTIC A26201-2 PRODUCED BY A NOVEL STRAIN OF ACTINOPLANES

Joseph W. Whalen; Gregory L. Swartz; Lisa J. Rheaume, and Karen M. McCoy, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 659,912, Oct. 11, 1984, Pat. No. 4,613,503.
This application Aug. 8, 1986, Ser. No. 877,581
Int. Cl.[4] C12N *1/22;* C12R *1/045*
U.S. Cl. 435—252.6 3 Claims



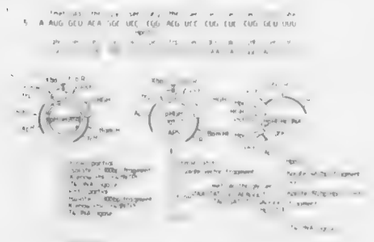
1. A biologically pure culture of the microoganism Actinoplanes species A26201 or a mutant thereof.

4,859,600

RECOMBINANT PROCARYOTIC CELL CONTAINING CORRECTLY PROCESSED HUMAN GROWTH HORMONE

Gregory L. Gray, San Francisco, and Herbert L. Heyneker, Burlingame, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 488,232, Apr. 25, 1983, Pat. No. 4,755,465.
This application Apr. 26, 1988, Ser. No. 186,493
Int. Cl.[4] C12N *1/16;* E12N *15/00;* C07K *13/00*
U.S. Cl. 435—252.33 1 Claim



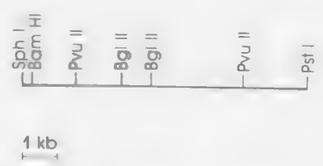
1. A recombinant prokaryotic host cell containing human growth hormone, the amino acid sequence of which consists of the amino acid sequence of naturally occuring human growth hormone, which is free of other proteins associated with its native environment and is free of mature human growth hormone having an extraneous N-terminal methionine, and which was produced by said recombinant prokaryotic host.

4,859,601

STREPTOMYCES BGL PROTEIN GENE PROMOTER

William V. Burnett, Jr., Manlius, N.Y.; Thomas G. Eckhardt, Collegeville, and Louis R. Fare, Lafayette Hill, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 585,496, Mar. 5, 1984. This application Jan. 21, 1986, Ser. No. 820,345
Int. Cl.[4] C12N *1/00, 15/00, 1/20;* C07H *15/12*
U.S. Cl. 435—253.5 7 Claims



Restriction endonuclease cleavage map of an 8 kb DNA fragment from Streptomyces lividans carrying the gene for excretable β-galactosidase

1. A DNA fragment consisting essentially of the Streptomyces Bgl protein gene promoter.

4,859,602

PROCESS FOR THE PREPARATION OF STEREOISOMERS OF 1-AMINOALKYLPHOSPHONIC AND PHOSPHINIC ACIDS

Gerd Zimmermann, Mannheim; Josef Maier, and Manfred Gloger, both of Weilheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 9, 1985, Ser. No. 774,140
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1984, 3435156
Int. Cl.[4] C12P *41/00*
U.S. Cl. 435—280 12 Claims

1. A process for the preparation of the stereoisomers substituted or unsubstituted of 1-aminoalkylphosphonic acids and of 1-aminoalkylphosphinic acids comprising resolving by enzymatically splitting of their racemic N-acyl derivatives with penicillin G amidase, subsequently deacylating the resolved derivatives, and recovering the stereoisomer.

4,859,603

PERSONAL DIAGNOSTIC KIT

Charles M. Dole, Purdys, N.Y., and Gary L. Webster, Fairfield, Conn., assignors to Dole Associates, Inc., Katonah, N.Y.

Continuation of Ser. No. 439, Jan. 5, 1987, Pat. No. 4,769,333.
This application May 20, 1988, Ser. No. 196,666
Int. Cl.[4] C12M *1/00;* B01L *11/00*
U.S. Cl. 435—287 6 Claims

1. A composite, hand held contamination free personal testing device comprising:

a support member carrying a plurality of receptacles arranged in arcuate array for containing liquid materials,

a cutting element operatively connected to said support member,

said support member and said cutting element being movable relative to one another in a generally horizontal mode whereby said cutting element is operable to slit said receptacles to release said liquid material to flow from said receptacles in a generally vertical direction when relative motion occurs.



4,859,604

COMPOSITION FOR STABILIZATION OF DIAGNOSTIC REAGENTS

Martin Gould, Gibbstown, and Sudhakar Vulimiri, West Deptford, both of N.J., assignors to Ampor, Inc., Bridgeport, N.J.

Filed Aug. 27, 1987, Ser. No. 89,840
Int. Cl.[4] G01N *31/00*
U.S. Cl. 436—15 11 Claims

1. A diagnostic device comprising a non-absorbent base carrying at least one deposition area in which is carried an evaporative residue of a mixture of combination of (a) a normally unstable at room temperature diagnostic reagent which functions to react with a specimen to determine the presence or absence of a biological condition, and (b) a stabilizing composition comprising abou 0.01 to 35 parts by weight of non-diagnostic protein selected from the group consisting of bovine serum albumin, human serum albumin, and egg albumin, and about 1 to 90 parts by weight of a material selected from the group consisting of corn syrup and dextrose.

4,859,605

PROCESS FOR PREPARATION OF SAMPLES FOR ANALYSIS

Andre Metzger, Le Verger, France; Peter Grimm, Frenkendork, Switzerland; Andre J. Nohl, Menlo Park, and Vance J. Nau, Cupertino, both of Calif., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 16, 1986, Ser. No. 942,353
Int. Cl.[4] G01N *1/10, 1/28*
U.S. Cl. 436—43 14 Claims

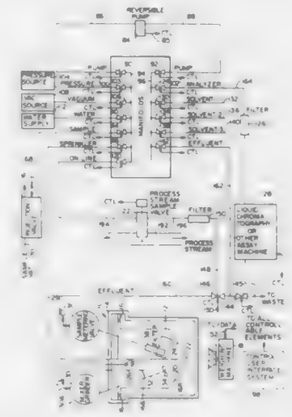
1. A process of preparing a sample of a substance for chemical assay comprising the steps of:

(a) automatically rendering the sample suitable for dilution in a solvent;

(b) pressurizing the sample by means of a pressure source to compress any gas bubbles in the sample and to produce a known volume of sample;

(c) diluting the known volume of sample to a predetermined sample concentration to form a diluted sample;

(d) homogenizing the diluted sample; and



(e) delivering the homogenized diluted sample to a chemical assay system.

4,859,606

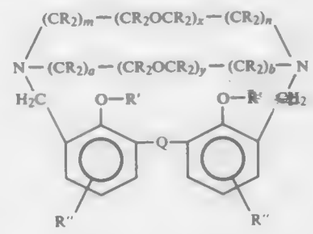
METHOD FOR DETECTING CATIONS IN A TEST SAMPLE UTILIZING CHROMOGENIC CRYPTAHEMISPHERANDS

Donald J. Cram, Los Angeles, Calif.; Eddy Chapoteau, Brooklyn, N.Y.; Bronislaw P. Czech, Peekskill, N.Y.; Carl R. Gebauer, Crompond, N.Y.; Roger C. Helgeson, Canoga Park, Calif.; Anand Kumar, Southfields, and Koon-Wah Leong, Ossining, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y. and The Regents of the University of California, Berkeley, Calif.

Filed Apr. 15, 1987, Ser. No. 38,681
Int. Cl.[4] C07D *498/18, 513/18, 273/00;* C07C *107/04*
U.S. Cl. 436—79 6 Claims

1. A method for selectively determining the presence of a test cation in a test sample, comprising the steps of:

(a) contacting said test sample with a compound which complexes selectively to the test cation and being of the formula:



wherein:

R, the same or different, is hydrogen, lower alkyl, lower alkylidene, lower alkenyl, allyl or aryl;

R′, the same or different, is lower alkyl, lower alkylidene, lower alkenyl, allyl or aryl;

R″, the same or different, is hydrogen, lower alkyl, lower alkylidene, lower alkenyl, allyl or unsubstituted aryl;

Q is a chromogenic moiety capable of providing a detectable response upon the complexation of said compound with said test cation;

a, b, m and n, the same or different, are 1 to 3;
x is 1 to 4; and
y is 1 to 4; and
y is 1 to 4; and
(b) measuring said detectable response.

6. A test device for determining the presence of a test cation in an aqueous test sample pursuant to the method of one of claims 1-4, said device comprising a solid carrier member, the compound of one of claims 1-4 incorporated into said solid carrier member and a buffer incorporated into said carrier member capable of providing a pH in the range of about 5-9.

4,859,607

COLORIMETRIC DETECTOR FOR OZONE AND METHOD OF PREPARATION

Jack L. Lambert, Manhattan; Yuan C. Chiang, Salina, and Joseph V. Paukstelis, Manhattan, all of Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Filed Jan. 17, 1989, Ser. No. 297,960
Int. Cl.[4] G01N *33/00*
U.S. Cl. 426—135 **12 Claims**

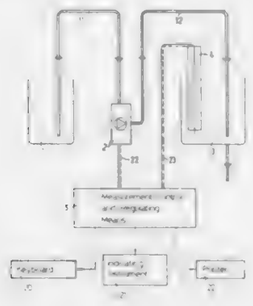
1. The method of preparing a colorimetric detector for ozone, comprising:
(a) forming a solution of a 3-methyl-2-benzothiazolinone (MBTH) ketone azine and a hydroxyphenyl compound in an inert organic solvent, said hydroxyphenyl compound containing at least one phenyl group with a hydroxy substituent which is unsubstituted in the ortho, or para, or both the ortho and para positions with reference to the hydroxy substituent;
(b) applying said solution to an inert solid support; and
(c) evaporating the solvent from the applied solution to form a solid phase mixture on said support of said MBTH ketone azine and said hydroxyphenyl compound for use as said colorimetric detector.

4,859,608

METHOD AND APPARATUS FOR TITRIMETRIC CONTENT DETERMINATION IN A CHEMICAL SOLUTION

Peter Frueh, Zurich, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Continuation of Ser. No. 804,838, Dec. 4, 1985, abandoned. This application Aug. 31, 1987, Ser. No. 90,895
Claims priority, application Switzerland, Jan. 18, 1985, 224/85
Int. Cl.[4] G01N *31/16, 31/22*
U.S. Cl. 436—163 **13 Claims**



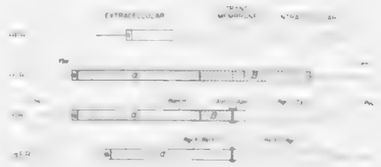
1. A method for the titrimetric determination of the content of at least one given component in the chemical solution capable of reacting with at least one reaction component comprising the steps of:
(a) successively providing in a chemical solution quantities of at least one reaction component, starting with one reaction component, starting with one initial preselected quantity of said at least one reaction component;
(b) measuring the change of a certain physico-chemical value which results from the reaction of each said reaction component quantity with said one given component;
(c) determining the next successively provided quantity of said reaction component as a function of said change of said physicochemical value resulting from an immediately preceding provided quantity of said reaction component;
(d) determining the total of the previously successively provided quantities of said reaction component including said immediate preceding quantity;
(e) determining said next reaction component quantity as a percentage relative to the total of the previously provided reaction component quantities; and
(f) providing in said solution the greater of:
(1) said determined next quantity of step (c), or
(2) an amount of not less than 0.1 per cent of the total of the previously provided quantities of the reaction component.

4,859,609

NOVEL RECEPTORS FOR EFFICIENT DETERMINATION OF LIGANDS AND THEIR ANTAGONISTS OR AGONISTS

Thomas J. Dull; Heimo Riedel, and Axel Ullrich, all of San Francisco, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Filed Apr. 30, 1986, Ser. No. 857,899
Int. Cl.[4] G01N *33/566, 33/542*
U.S. Cl. 436—501 **15 Claims**



1. A hybrid receptor for a ligand comprising (a) a ligand binding domain of a predetermined receptor fused at its C-terminus to the N-terminus of (b) a reporter polypeptide which is (1) heterologous to the receptor from which is obtained the ligand binding domain and which (2) undergoes a conformational change upon the binding of said ligand to the ligand binding domain.

4,859,610

IMMUNOASSAY INCUBATION DEVICE

Edward T. Maggio, San Diego, Calif., assignor to Synbiotics Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 741,369, Jun. 5, 1985, abandoned. This application Sep. 12, 1986, Ser. No. 906,663
Int. Cl.[4] G01N *33/483*
U.S. Cl. 436—518 **25 Claims**

1. An immunoassay incubation device for extracting a soluble analyte from a solid or semisolid sample into a liquid medium, for separating the soluble analyte from unextracted components of the solid or semisolid sample, and for assaying the soluble analyte, the device comprising:
a vessel for receiving and containing the solid or semisolid sample and the liquid medium,
a means for extracting the soluble analyte from the solid or semisolid sample into the liquid medium, said extraction means removably contained within said vessel,
an incubation chamber removably contained within said vessel,

said incubation chamber defining one or more apertures positively immersible within the liquid medium of said vessel, the apertures having a cross sectional area sufficiently large for passing detectable quantities of the soluble analyte and a cross sectional diameter sufficiently small for blocking passage of unextracted components between said vessel and said incubation chamber, and
a solid phase assay member coated with a binding immunological reagent inserted within said incubation chamber when assaying the soluble analyte therein,
the apertures of said incubation chamber effectively screening said solid phase assay member from contact with unextracted components from said vessel when said solid phase assay member is inserted into said incubation chamber.

22. A method for detecting a soluble analyte sequestered within a solid or semisolid sample, the method comprising the following steps:
Step (a): loading an immunoassay incubation device with a liquid medium,



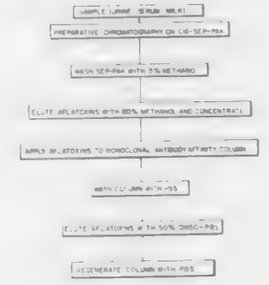
Step (b): introducing the solid or semisolid sample into the immunoassay incubation device, then
Step (c): extracting the soluble analyted from the solid or semisolid sample into the liquid medium within the immunoassay incubation device, then
Step (d): allowing the liquid medium and soluble analyte to pass into an incubation chamber housed within the immunoassay incubation device while blocking the passage of unextracted components into the incubation chamber, then
Step (e): contacting a solid phase assay member with the soluble analyte, the solid phase assay member inserted within the incubation chamber and partially submersed in liquid medium therein, the solid phase assay member coated with a binding immunological reagent for binding the soluble analyte, then
Step (f): removing the solid phase assay member from the incubation chamber, and then
Step (g): measuring the soluble analyte bound to the solid phase assay member.

4,859,611

AFFINITY COLUMN AND PROCESS FOR DETECTION OF LOW MOLECULAR WEIGHT TOXIC SUBSTANCES

John D. Groopman, Lyanfield; Gerald N. Wogan, Belmont; Frederick G. Bargoot, Wellesley, and Christopher Ferrari, Marlborough, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge and Boston University, Boston, both of, Mass.

Continuation-in-part of Ser. No. 706,984, Feb. 28, 1985, and a continuation-in-part of Ser. No. 706,983, Feb. 28, 1985. This application Jan. 21, 1986, Ser. No. 820,388
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[4] G01N *33/543, 33/577*
U.S. Cl. 436—518 **26 Claims**



1. A method for detecting toxins in a test sample, said method comprising:
preparing a sample believed to contain a toxin;
placing said sample on an affinity column comprised of a solid phase sorbant material and, immobilized thereon, a monoclonal antibody specific for said toxin;
eluting said column with a solvent to recover a first eluent, whereby said toxin is retained on said column by said monoclonal antibody and separated from all other ingredients of said sample;
eluting said column with a releasing agent to recover a second eluent, whereby said toxin is released from said antibody and recovered in said second eluent; and
subjecting said second eluent to fluorescence measurement by exposing said second eluent to UV light for detection of the presence of said toxin, with the proviso that said second eluent is not subjected to high pressure liquid chromatography or other purification subsequent to recovery from said column.

4,859,612

METAL SOL CAPTURE IMMUNOASSAY PROCEDURE, KIT FOR USE THEREWITH AND CAPTURED METAL CONTAINING COMPOSITE

Francis X. Cole, Stow; Gene Davis, Lexington, and Eric Sigillo, Meuthen, all of Mass., assignors to Hygeia Sciences, Inc., Newton, Mass.

Filed Oct. 7, 1987, Ser. No. 105,285
Int. Cl.[4] G01N *33/543, 33/553*
U.S. Cl. 436—523 **41 Claims**

1. In a process for the determination and detection of an immunologically reactive analyte in an aqueous sample, the steps of:
(a) providing a labelled component comprising the coupling product of a first immunologically reactive substance and a metal-containing particle of a size and character to facilitate the maintenance of a stable, monodispersed suspension of the labelled component;
(b) providing a solid phase component comprising the coupling product of a second immunologically reactive sub-

stance and a solid phase particle of a size and character to facilitate the maintenance of a stable suspension of the solid phase component and subsequent collection of a composite formed therefrom;

(c) forming a mixed aqueous suspension of said components and which contains a sample to be analyzed for the analyte, said first and second substances being different and capable of binding directly or indirectly as a function of the presence of said analyte to thereby form a collectible, solid phase, metal-containing composite;

(d) allowing the substances to bind to form said composite;

(e) collecting the composite; and

(f) determining or detecting the analyte in the sample by evaluating, through direct visual examination, the presence of metal in the collected solid phase composite.

4,859,613

IMMUNOASSAYS FOR GLUTATHIONE AND ANTIBODIES USEFUL THEREIN

David A. Lawrence, 38 Wellington Rd., Delmar, N.Y. 12054

Filed Nov. 12, 1986, Ser. No. 929,937

Int. Cl.[4] G01N *33/53*

U.S. Cl. 436—548 **27 Claims**

1. An immunoassay for measuring the amount of reduced glutathione in a biological sample comprising the steps of:

(a) contacting reduced glutathione that has been converted to a thiol-modified glutathione in said biological sample with at least one antibody specific for said thiol-modified glutathione to form a complex with said antibody and said thiol-modified glutathione, and

(b) measuring the amount of reduced glutathione in said biological sample by means of said complex.

4,859,614

METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE WITH LEADS ADHERED TO SUPPORTING INSULATOR SHEET

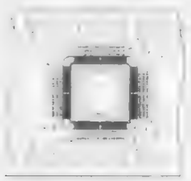
Takehisa Sugahara, Kawasaki; Toyokatu Nakagawa, Aizuwakamatsu, and Junichi Yano, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 773,781, Sep. 9, 1985, abandoned, which is a division of Ser. No. 437,127, Oct. 28, 1982, abandoned, which is a continuation of Ser. No. 120,092, Feb. 1, 1980, abandoned. This application Nov. 30, 1987, Ser. No. 126,514

Claims priority, application Japan, Feb. 19, 1979, 54-18115; Mar. 20, 1979, 54-33116; Apr. 16, 1979, 54-46450

Int. Cl.[4] H01L *23/48*

U.S. Cl. 437—8 **12 Claims**



1. A method for manufacturing a semiconductor device, comprising the steps of:

preparing a package containing a semiconductor chip and having one-piece lead frames made of a single type of electrically conductive material, each said lead frame comprising:

a supporting end portion; and

plural leads, each of said leads having two ends, one end of each lead coupled to said semiconductor chip and the other end of each lead coupled to each other via said supporting end portion for supporting said leads;

adhering said supporting end portion of each of said lead frames and a part of each of said leads to an insulating sheet; and

clipping off portions of said insulating sheet and said supporting end portion of each of said lead frames adhering thereto, leaving said leads supported by said parts thereof adhering to said insulating sheet.

4,859,615

SEMICONDUCTOR MEMORY CELL CAPACITOR AND METHOD FOR MAKING THE SAME

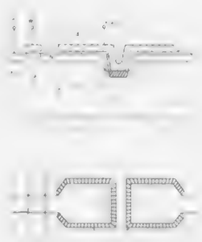
Katsuhiro Tsukamoto, and Takayuki Matsukawa, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 904,843, Sep. 5, 1986, abandoned. This application Nov. 9, 1987, Ser. No. 120,694

Claims priority, application Japan, Sep. 19, 1985, 60-209348

Int. Cl.[4] H01L *21/265, 29/96*

U.S. Cl. 437—38 **9 Claims**



1. A method of manufacturing a semiconductor memory device comprising memory cells arrayed on a common semiconductor substrate of a particular conductivity type, each cell having a capacitance region for storing an electric charge, comprising the steps of:

forming in the substrate a heavily doped region of the particular conductivity type;

etching into the substrate a circumferential trench that circumscribes a major portion of said capacitance region of said cell, with said heavily doped region underlying and surrounding said trench;

forming on the substrate a thin dielectric film;

forming on said dielectric film a conductive film to provide a capacitor having a planar portion on a planar region of said substrate and an edge portion on a sidewall of said trench, said planar portion of said capacitor extending outward from said trench and, together with said edge portion, establishing said capacitance region of one said cell; and

depositing an insulating layer within said trench, beneath said capacitor, to establish isolation from an adjacent cell.

4,859,616

METHOD OF MAKING SCHOTTKY CONTACTS ON SEMICONDUCTOR SURFACES

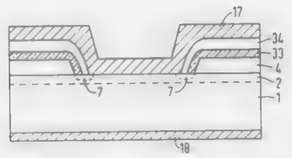
Reinhard Loschand, Munich, and Helmut Eger, Olching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 60,706, Jun. 10, 1987, abandoned, which is a division of Ser. No. 749,913, Jun. 28, 1985, abandoned. This application Mar. 3, 1988, Ser. No. 163,482

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1984, 3439315

Int. Cl.[4] H01L *21/265*

U.S. Cl. 437—39 **24 Claims**



1. A method for producing a Schottky contact on a semiconductor surface wherein the contact comprises a doped guard ring applied as self-aligning in a semiconductor edge region of the Schottky contact, and where portions of the semiconductor edge region are covered by at least two layers, a first layer and a second layer applied over the first layer, which layers comprise different, selectively etchable electrically insulating materials, the method is characterized by the following steps: depositing on at least portions of the semiconductor surface the first layer to provide a structured first layer; depositing the second layer on the first layer and on any exposed semiconductor surface; forming a window in the second layer in the region above the guard ring after the guard ring has been doped; etching through the window that section of the first layer lying directly below the window and then laterally to remove all of the structured first layer uncovered by the second layer; and applying the Schottky contact on the exposed semiconductor surface.

4,859,617

THIN-FILM TRANSISTOR FABRICATION PROCESS

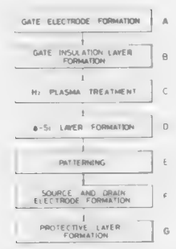
Tsutomu Nomoto; Mamoru Yosida; Mikio Mouri, and Tsukasa Watanabe, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 201,967

Claims priority, application Japan, Jun. 9, 1987, 62-142268

Int. Cl.[4] H01L *21/265*

U.S. Cl. 437—40 **10 Claims**



1. A thin-film transistor fabrication process comprising:

a first step for forming a gate electrode on a dielectric substrate;

a second step for forming a gate insulation layer over said gate electrode and said substrate;

a third step for treating the surface of said gate insulation layer with a $_2$ plasma consisting of H_2 gas created by glow discharge with an RF power density of from 0.005 w/cm^2 to 0.5 w/cm^2 and for the duration of from 1 minute to 60 minutes;

a fourth step for forming an amorphous silicon semiconductor layer over said gate insulating layer;

a fifth step for patterning said gate insulation layer and said amorphous silicon semiconductor layer to remove the parts outside the transistor element area; and

a sixth step for forming source and drain electrodes.

4,859,618

METHOD OF PRODUCING THE GATE ELECTRODE OF A FIELD EFFECT TRANSISTOR

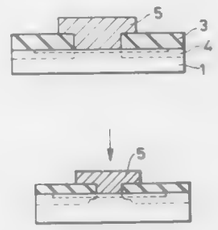
Shinichi Shikata, and Hideki Hayashi, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 19, 1987, Ser. No. 122,438

Claims priority, application Japan, Nov. 20, 1986, 61-277111; Nov. 20, 1986, 61-277112; Dec. 1, 1986, 61-286149

Int. Cl.[4] H01L *21/44*

U.S. Cl. 437—41 **16 Claims**



1. A method of forming a self-aligned gate electrode of a field effect transistor, consisting essentially of the steps of:

forming a resist pattern on a first portion of a semiconductor substrate by a lithography process;

forming an ion-implanted layer in a second portion of said substrate not covered with said resist pattern, by ion implantation into said substrate;

forming an insulating film on said substrate and said resist pattern by electron cyclotron resonance plasma chemical vapor deposition;

removing said resist pattern and a part of said insulating film on said resist pattern by lifting off to thereby leave an insulating pattern with an opening at said second portion;

annealing said substrate to activate said ion-implanted layer; and

forming a gate electrode on said opening by a spacer lift-off process.

10. A method of producing a self-aligned gate electrode of a field effect transistor, comprising the steps of:

forming a resist pattern on a semiconductor substrate at a first location, corresponding to a gate region;

forming a first insulating film on said substrate and on said resist pattern by electron cyclotron resonance plasma chemical vapor deposition;

forming a second insulating film on said first insulating film, and on exposed edges of said resist pattern;

removing said second insulating film except for said part of said second insulating film on said exposed edges of said resist patter;

forming a source region and a drain region for said field effect transistor by ion implantation into said substrate with said resist pattern and said first and second insulating films in place;

then removing said part of said second insulating film;
then applying a moderate dosage and energy level ion implantation to said substrate;
removing said resist pattern and said insulating film on said resist pattern by lifting-off to thereby form a pattern on said first insulating film having an opening; and
forming a self-aligned gate electrode on said opening by spacer lift-off.

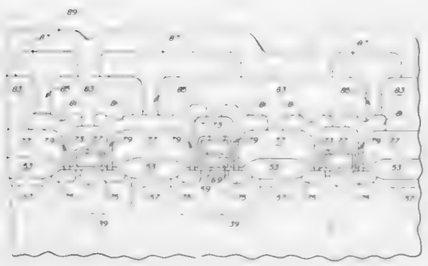
4,859,619

EPROM FABRICATION PROCESS FORMING TUB REGIONS FOR HIGH VOLTAGE DEVICES

Tsung-Ching Wu, San Jose; Geeng-Chuan Chern, Campbell, and James C. Hu, Saratoga, all of Calif., assignors to Atmel Corporation, San Jose, Calif.

Filed Jul. 15, 1988, Ser. No. 219,924
Int. Cl.[4] H01L *21/265, 29/96*
U.S. Cl. 437—43 **10 Claims**





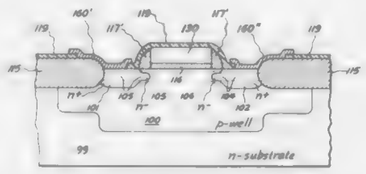
1. An EPROM fabrication process comprising,
forming P-type tub regions for memory cell and high voltage device areas on a P-type wafer substrate,
forming an isolation field around memory cell, high voltage and low voltage device areas in said substrate, said isolation field outside of P-type tub regions being characterized by a lower deep threshold voltage than said P-type tub regions,
forming at least one memory cell device in memory cell device areas of said substrate, said memory cell device having a floating gate, a second gate above said floating gate, a drain and a source associated therewith,
forming MOS devices in said high voltage and low voltage device areas of said substrate, said MOS devices having gates drains and sources associated therewith, and
forming a circuit pattern of electrically conductive lines connected to selected sources, drains and gates of said MOS and memory cell devices and separated by insulative material.

4,859,620

GRADED EXTENDED DRAIN CONCEPT FOR REDUCED HOT ELECTRON EFFECT

Ching-Yeu Wei, and Joseph M. Pimbley, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 31,717, Mar. 30, 1987, abandoned, which is a division of Ser. No. 722,640, Apr. 12, 1985, Pat. No. 4,680,603. This application May 20, 1988, Ser. No. 196,416
Int. Cl.[4] H01L *29/78, 29/36, 29/8*
U.S. Cl. 437—44 **6 Claims**



1. A method for the production of graded buried channels in MOSFET devices, said method comprising the steps of:
implanting a first light concentration of a first dopant, of a selected polarity, a fixed distance beneath the surface of a semiconductor body so that said first dopant is concentrated in a single buried region spaced apart from the surface of said semiconductor body to create an intermediate area between the buried region and the semiconductor body surface that is relatively devoid of the first dopant with respect to the buried region;
implanting a second light concentration of a second dopant of the same polarity as the first dopant in substantially the same single buried region as said first dopant, said intermediate area also being relatively devoid of the second dopant with respect to the buried region; and
selecting one of the dopants to have a higher diffusivity than the other dopant, to cause a completely buried protrusion of the higher diffusivity dopant, defining a diffused grading structure, to be formed within the semiconductor body and spaced below the semiconductor body surface to move high density current away from a silicon/silicon-oxide interface boundary of the MOSFET device to reduce hot electron effect.

4,859,621

METHOD FOR SETTING THE THRESHOLD VOLTAGE OF A VERTICAL POWER MOSFET

Willem G. Einthoven, Belle Meade, N.J., assignor to General Instrument Corp., New York, N.Y.

Filed Feb. 1, 1988, Ser. No. 150,755
Int. Cl.[4] H01L *21/22*
U.S. Cl. 437—45 **16 Claims**



1. A method for setting the threshold of a MOSFET formed

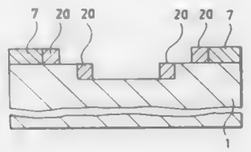
on a substrate with a <100> crystal orientation and a top layer of a first conductivity tape, a middle layer of a lightly doped second conductivity type and a bottom layer of a relatively heavily doped second conductivity type, the top and middle layers forming a junction at least a portion of which is substantially parallel to the substrate surface, comprising the steps of: forming a second conductivity type region proximate the substrate surface; anisotropically etching a groove with a substantially flat bottom through the surface region and into the top layer, the bottom of the groove initially being above the junction; exposing the substrate to a beam of ions of the second conductivity determining type so as to form an implanted region proximate the walls and bottom of the groove, said implanted region being substantially continuous and extending below said junction; and anisotropically etching the substrate a second time to remove the portion of the implanted region proximate the groove bottom such that the final level of the groove bottom is within the middle layer below the junction and said implanted region operably connects said surface region with said middle layer.

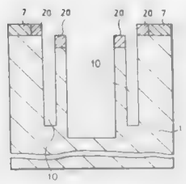
4,859,622

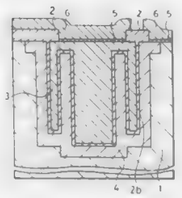
METHOD OF MAKING A TRENCH CAPACITOR FOR DRAM

Koji Eguchi, Hyogo, Japan, assignor to Matsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 119,893, Nov. 12, 1987. This application Aug. 2, 1988, Ser. No. 227,333
Claims priority, application Japan, Nov. 12, 1986, 61-269172
Int. Cl.[4] H01L *21/93*
U.S. Cl. 437—47 **17 Claims**







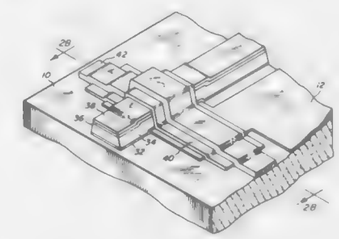
1. A method of manufacturing a semiconductor device comprising the steps of:
providing a semiconductor substrate having a major surface including a concavity of a first depth from said major surface,
forming a first insulating film on edge region of said major surface of said semiconductor substrate with said concavity and region of said major surface close to said concavity within a prescribed distance being exposed,
a first step portion being formed by a difference in level between a bottom of said concavity and said major surface of said semiconductor substrate, and a second step portion being formed by a difference in level between said major surface of said semiconductor substrate and an upper surface of said first insulating film,
forming a second insulating film on said semiconductor substrate including concavity and on said first insulating film,
anisotropically etching said second insulating film to leave said first insulating film and a portion of said second insulating film on side walls of said first and second step portions, and to expose regions of the bottom of said concavity and said major surface of said semiconductor substrate contiguous to the left portions of said second insulating film, and
anisotropically etching said exposed region of the bottom of said concavity and said exposed region of the major surface of said semiconductor substrate to a second depth larger than said first depth by using the left first insulating film and the left portion of said second insulating film as a mask, to form more than one trench, an upper wall interconnecting immediately adjacent ones of said trenches being spaced from said major surface of said semiconductor substrate by a prescribed distance.

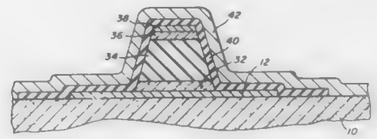
4,859,623

METHOD OF FORMING VERTICAL GATE THIN FILM TRANSISTORS IN LIQUID CRYSTAL ARRAY

Heinz H. Busta, Park Ridge, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Feb. 4, 1988, Ser. No. 152,349
Int. Cl.[4] H01L *27/02, 29/78*
U.S. Cl. 437—48 **25 Claims**





1. A method of producing an integrated array of liquid crystal pixels and vertical gate thin film transistors for charging said pixels and comprising the steps of:
providing an insulating substrate at least as large as the desired array;
forming on said substrate a first layer of a transparent conductive material and a second layer of a semiconducting material;

defining and etching said first and second layers to form one element of each said liquid crystal pixel with an overlay of semiconducting material, said pixel elements being arranged in a plurality of rows and columns;

forming over said substrate and said previously formed elements a third layer, a fourth layer of a semiconducting material, and a fifth layer of a conducting material;

defining and etching said second, third, fourth and fifth layers to provide on each said pixel element a first element for each said transistor formed from said second layer, and a first set of narrow lines from said third, fourth and fifth layers, each said narrow line traversing a column of said first transistor elements, each portion of said fifth layer subjacent one of said first transistor elements providing a second transistor element;

forming over said substrate and said previously formed elements a sixth layer of at least an insulating material;

defining and etching said sixth layer to form insulating areas, each area traversing one of said second transistor elements;

forming over said substrate and said previously formed elements a seventh layer of a conductive material insulated from said previously formed elements by said insulating area;

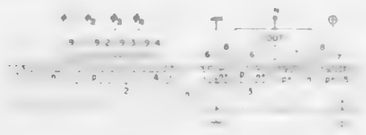
defining and etching said seventh layer to form a second set of narrow lines, each said line traversing a row of said second transistor elements, each portion of said second set of narrow lines adjacent the edges of a set of first and second transistor elements forming a third element of the respective transistor, and wherein each said pixel element has an extended portion and said transistor elements are positioned one the respective extended portions.

4,859,624

MANUFACTURING METHOD OF SEMICONDUCTOR DEVICE HAVING CCD AND PERIPHERAL CIRCUIT

Hiroshige Goto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 29, 1988, Ser. No. 226,032
Claims priority, application Japan, Jul. 31, 1987, 62-192069
Int. Cl.[4] H01L *29/96, 21/38*
U.S. Cl. 437—53 **4 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

forming a buried channel for a CCD in a semiconductor substrate; and

forming an impurity diffusion region in which a transistor for a peripheral circuit of the CCD having a conductivity type opposite to that of the buried channel is formed, the impurity diffusion region being of the same conductivity type as that of the buried channel; and

wherein said buried channel and said impurity diffusion region being formed at the same time by a single process.

4,859,625

METHOD FOR EPITAXIAL GROWTH OF COMPOUND SEMICONDUCTOR USING MOCVD WITH MOLECULAR LAYER EPITAXY

Fumio Matsumoto, Miyagi, Japan, assignor to Research Development Corporation of Japan, Junichi Nishizawa and Oki Electric Industry Co., Ltd., Japan

Filed Nov. 20, 1987, Ser. No. 123,497
Claims priority, application Japan, Nov. 22, 1986, 61-277829
Int. Cl.[4] H01L *21/205*
U.S. Cl. 437—81 **22 Claims**



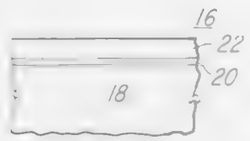
1. A method of epitaxial growth for forming on a substrate crystal a single crystalline thin film of a compound semiconductor $A_xB_{1-x}C$ containing three component elements A, B and C, two elements A and B being elements of the same group, comprising the steps of successively introducing a plurality of gaseous compounds, each containing one of said three elements A, B and C, into the crystal growth vessel, evacuating the crystal growth chamber between the successive introductions of two gaseous compounds so as to avoid mixing of the gaseous compounds together, and repeating a sequence of the above steps.

4,859,626

METHOD OF FORMING THIN EPITAXIAL LAYERS USING MULTISTEP GROWTH FOR AUTODOPING CONTROL

Rick L. Wise, Sherman, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 3, 1988, Ser. No. 202,731
Int. Cl.[4] H01L *21/20, 21/205*
U.S. Cl. 437—81 **10 Claims**



1. A method of forming a thin epitaxial layer, comprising the steps of:

providing a silicon substrate;

prebaking said substrate in the temperature range between approximately 1150° C. and 1190° C.;

reducing said temperature to the range between approximately 1100° C. and 1130° C.;

depositing a thin capping epitaxial layer up to approximately 0.1 micron by low pressure chemical vapor deposition with a silane;

reducing said temperature to the range between approximately 900° C. and 1050° C.; and

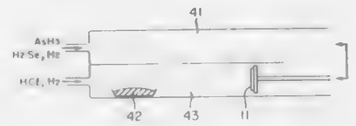
depositing a primary epitaxial layer to a desired thickness.

4,859,627

GROUP VI DOPING OF III-V SEMICONDUCTORS DURING ALE

Haruo Sunakawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 1, 1988, Ser. No. 214,241
Int. Cl.[4] H01L *21/205*
U.S. Cl. 437—81 **11 Claims**



1. Method of producing n-type III-V compound semiconductor comprising:

a first step of growing a plurality of monolayers of III-V compound semiconductor molecules on a III-V compound substrate;

a second step of growing a single layer of group VI element on said III-V monolayers so as to occupy lattice points for group V element by means of Atomic Layer Epitaxy process;

a third step of decreasing the number of said group VI element by exposing said single layer to the gas of group V element; and

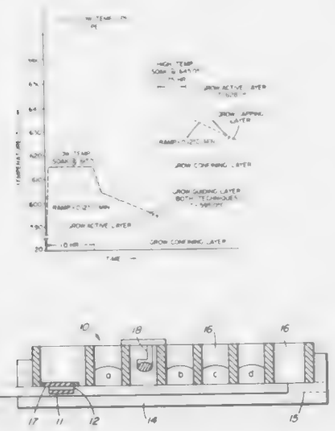
a fourth step of growing a plurality of monolayers of III-V compound semiconductor molecules on the group VI element-doped layer by means of said Atomic Layer Epitaxy process.

4,859,628

INTERRUPTED LIQUID PHASE EPITAXY PROCESS

Douglas G. Knight, Munster, and William Benyon, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 11, 1988, Ser. No. 179,834
Int. Cl.[4] H01L *21/208;* H01R *21/20*
U.S. Cl. 437—133 **12 Claims**



1. A liquid phase epitaxy process for growing epilayers over gratings on a first surface of an InP substrate, the substrate and epilayers together forming an InGaAsP/InP distributed feedback laser wafer, the process comprising the steps of:

(a) maintaining an As overpressure above the first surface while raising the temperature of the InP substrate and a first melt material to a first temperature, the InP substrate and the first melt material being maintained at the first temperature for a time sufficient to transform the first melt material to a liquid state;

(b) lowering the temperature of the InP substrate and first melt material to a second temperature;

(c) exposing the first surface to the first melt material at the second temperature, a guiding epilayer being thereby created on the first surface;

(d) terminating the exposure of the first surface to the first melt material;

(e) maintaining a P overpressure above the guiding epilayer while raising the temperature of the InP substrate and second and third melt materials to a third temperature approximately 30 degrees higher than the first temperature, the InP substrate and the second and third melt materials being maintained at the third temperature for a time sufficient to transform the second and third melt materials to a liquid state;

(f) lowering the temperature of the InP substrate and the second and third melt materials to a fourth temperature;

(g) exposing the guiding epilayer to the second melt material at the fourth temperature, an active epilayer being thereby created on the guiding epilayer;

(h) terminating the exposure of the guiding epilayer to the second melt material;

(i) exposing the active epilayer immediately to the third melt material, a confining epilayer being thereby created on the active epilayer; and,

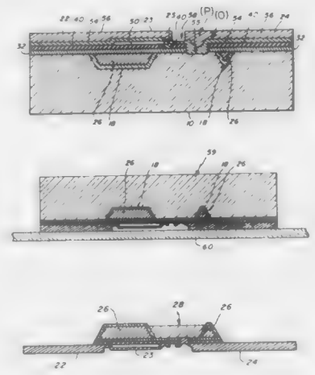
(j) terminating the exposure of the active epilayer to the third melt material.

4,859,629

METHOD OF FABRICATING A SEMICONDUCTOR BEAM LEAD DEVICE

Bruce A. Reardon, Brockton, and Joel L. Goodrich, Westford, both of Mass., assignors to M/A-Com, Inc., Burlington, Mass.

Division of Ser. No. 853,706, Apr. 18, 1986, Pat. No. 4,733,290.
This application Dec. 14, 1987, Ser. No. 132,811
Int. Cl.[4] H01L *27/12*
U.S. Cl. 437—203 **20 Claims**



1. A method of fabricating a semiconductor device comprising the steps of;

providing a semiconductor substrate,

defining a cavity in the substrate that extends in a multisided frame pattern,

depositing a layer of polysilicon in the cavity to substantially fill the cavity and provide structural support,

forming an epitaxy layer over the surface of the substrate,

forming a second insulating layer having windows defined therein for enabling ohmic contact with the epitaxy layer and substrate, respectively,
depositing metallization to form separate conductor leads to provide ohmic contact to the epitaxy layer and substrate,
and supporting the semiconductor device and removing the back side of the semiconductor substrate to within a predetermined distance of the frame.

18. A method of fabricating a semiconductor device comprising the steps of;
providing a semiconductor substrate,
defining a cavity in the substrate that extends in a multisided frame pattern,
depositing a layer of polysilicon in the cavity to substantially fill the cavity and provide structural support,
forming an epitaxy layer over the surface of the substrate,
forming a second insulating layer having windows defined therein for enabling ohmic contact with the epitaxy layer and substrate, respectively,
depositing metallization to form separate conductor leads to provide ohmic contact to the epitaxy layer and substrate,
depositing a silicon dioxide layer over the epitaxy layer, and defining windows through both the epitaxy layer and the silicon dioxide layer,
removing the silicon dioxide layer and redepositing the layer over the epitaxy layer,
a pair of windows through the silicon dioxide layer that forms the second insulating layer for enabling ohmic contact with the epitaxy layer and substrate, respectively.
applying a photoresist to a portion of the silicon dioxide layer for subsequent removal to define an air gap below one of the conductor leads.

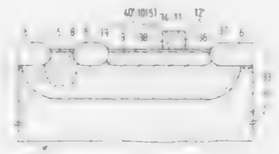
4,859,630

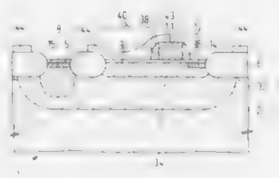
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

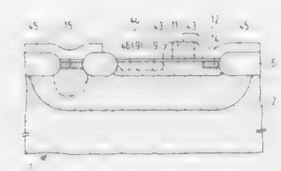
Wilhelmus J. M. J. Josquin, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1987, Ser. No. 25,554
Int. Cl.[4] H01L *29/78, 21/225*
U.S. Cl. 437—203 **6 Claims**

1. A method of manufacturing an integrated circuit including a semiconductor body having a surface with at least one field effect transistor at a first surface region and with at lest one further circuit element at a second surface region, said method comprising the steps of
providing a pattern of a first insulating layer on the semiconductor body;
forming at least one field effect transistor at the first surface region through said first insulating layer, said at least one field effect transistor including an insulated gate region, a source zone and a drain zone;
forming at least one semiconductor device at the second surface region through said first insulating layer, said at least one semiconductor device being formed by the steps comprising
providing a first semiconductor layer of a first conductivity type on said semiconductor body at said second surface region,
providing a second semiconductor layer of a second conductivity type on at least a part of said first semiconductor layer,
providing a second insulating layer on at least said second semiconductor layer,
providing a pattern of conductive material on said second insulating layer, said pattern of conductive material being provided simultaneously with said gate region at said first surface region, and said pattern of conductive material having at least a first edge separated from said first insulating layer,
forming a third semiconductor layer of said first conductivity type in said second semiconductor layer at a space located between said first edge and said first insulating layer by doping said second semiconductor layer at said space, said doping also simultaneously forming said source zone and said drain zone at said first surface region,
removing a part of said second insulating layer in said space located between said first edge and said first insulating layer,
providing a third layer of insulating material over said semiconductor body,







locally removing by anisotropic etching parts of said third layer of insulating material in said space to expose only a portion of said third semiconductor layer,
forming a conductive layer to contact the exposed portion of said third semiconductor layer; and
simultaneously forming conductive portions to said at least one field effect transistor in said first surface region and to said at least one semiconductor device in said second surface region.

4,859,631

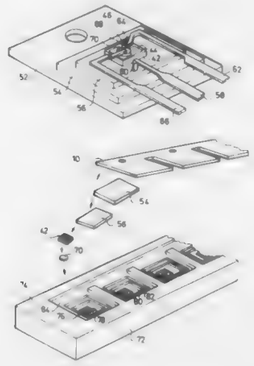
FITTING PROCESS FOR PACKAGING A SEMICONDUCTOR COMPONENT IN A PLASTIC BOX

Lucien Barre, Tours, France, assignor to Thomson-CSF, Paris, France

Division of Ser. No. 775,436, Sep. 12, 1985, abandoned. This application Feb. 25, 1988, Ser. No. 160,169
Int. Cl.[4] H01L *23/48*
U.S. Cl. 437—209 **16 Claims**

1. A process for fitting in a plastic box of a semiconductor component, involving the formation of a stack of elements welded to one another, including a metal plate forming a radiator, a ceramic plate, a metal counter-electrode of a semiconductor pellet having a metallized rear face and a front face having at least one metallized zone, the installation of the connecting pins establishing an electric contact with the rear face of the pellet via the counter-electrode and with the metallized zone of the front face of the pellet and finally coating said stack with a plastic material, wherein

(a) in a metal part forming a positioner, hollowed out in accordance with a configuration constituted by successive cups with lateral dimension decreasing from the outside to the inside of the parts, are successively placed the following elements, each having dimensions adapted to those of the cup in which they are placed;
the semiconductor pellet with its front face turned towards the inside of the positioner,
the counter-electrode,
the ceramic plate,
the plate forming the radiator, and between the adjacent elements is placed a welding material suitable for the welding of said adjacent elements to one another;



(b) the thus filled positioner is introduced into a welding furnace to obtain a rigid assembly;
(c) said assembly is extracted from the positioner;
(d) connecting pins are fixed to the assemblies so as to electrically connect them to the counter-electrode and to the metallized zones of the front face of the pellet.

12. A process for fabricating a plurality of semiconductor components, each of said semiconductor components being comprised of a stack of generally planar elements welded to one another and superposed with
(f) fixing first connecting pin to said counter-electrode and the at least one second connecting pin to said at least one metallized zone, in each of said plurality of welded stacks;
(g) severing the interconnected portions of said radiator plate from one another to separate said radiator from one another and thereby said semiconductor components.

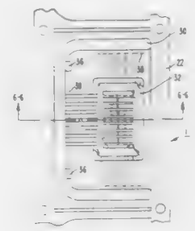
4,859,632

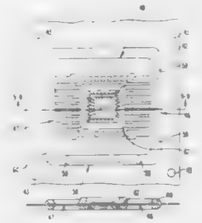
METHOD FOR MANUFACTURING THE SAME

Marvin Lumbard, Los Gatos, Calif., assignor to Siemens Corporate Research and Support, Inc., Iselin, N.J.

Filed Dec. 28, 1987, Ser. No. 138,887
Int. Cl.[4] H01L *21/60*
U.S. Cl. 437—209 **12 Claims**

1. A method for processing the lead frames of a lead frame strip, wherein the lead frames provide the leads for an integrated circuit, comprising:
providing a lead frame strip defining at least one lead frame, wherein the lead frame defines a support section and a plurality of leads attached to a positioning member, the positioning member being attached to the support section;
attaching the integrated circuit to the leads;
providing a first insulative member for connecting the leads to the support section;
providing a second insulative member for interconnecting the leads; and
removing the positioning member such that the insulative members, support section and leads cooperate so that the leads are supported by the support section while being





electrically insulated from the support section and electrically insulated from each other.

4,859,633

PROCESS FOR FABRICATING MONOLITHIC MICROWAVE DIODES

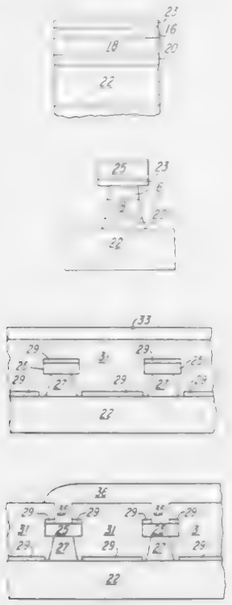
Burhan Bayraktaroglu, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 58,305, Jun. 5, 1987, abandoned, which is a division of Ser. No. 697,301, Jan. 31, 1985, Pat. No. 4,673,958. This application Dec. 29, 1988, Ser. No. 292,625
Int. Cl.[4] H01L *23/48, 39/02*
U.S. Cl. 437—211 **16 Claims**

1. A process for fabricating monolithic microwave devices, comprising the steps in following sequence:
i. providing a semiconductor substrate;
ii. epitaxially growing a semiconductor layer structure including an etch stop layer having a first side on said substrate;
iii. forming a metallic heat sink on the opposite side of said semiconductor layer structure;
iv. removing, using said etch step layer, said semiconductor substrate from said first side of said semiconductor layer;
v. etching the first side of said layer structure to defined therefrom separate active element portions all mounted on said metallic heat sink;
vi. coating a dielectric onto said active element portions;
vii. forming vias, bond pads, and metallization so that said metallization connects said active element portions to said bond pads.

2. A process for fabricating monolithic microwave devices, comprising the steps in the following sequence:
i. providing a semiconductor substrate;
ii. forming a semiconductor diode layer structure having a first side on said substrate;
iii. forming a metallic heat sink on the opposite side of diode layer structure;
iv. removing said semiconductor substrate;
v. etching said diode layer structure on said first side to separate it into separate diode portion all mounted on said metallic heat sink;

vi. coating a first layer of dielectric onto said diode portions;
vii. forming a first metallization on said first dielectric layer, and configure a predetermined first network of passive elements or connections;
viii. coating a second layer of dielectric onto said first metallization and first dielectric layer; and



ix. forming a second metallization on said second dielectric layer and configure a predetermined second network of passive elements or connections in electrical communication with said active device areas.

4,859,634

PROCESS FOR PRODUCTION OF VITREOUS CERAMICS AND PRODUCT THEREOF

Motoshige Iwamatsu, and Mitsugu Kaji, both of Kanazawa, Japan, assignors to Photon Ceramics Kabushiki Kaisha, Japan

Filed Sep. 11, 1987, Ser. No. 95,458

Claims priority, application Japan, Sep. 12, 1986, 61-214047; Jul. 30, 1987. 62-188856

Int. Cl.⁴ C03C *10/16, 6/06*

U.S. Cl. 501—3 **17 Claims**

1. A high yield method of producing a vitreous ceramic body of improved machinability and mechanical strength and substantially reduced cracks, comprising

mixing pottery stone, magnesium fluoride, a magnesium oxide precursor, a potassium oxide precursor, a boron oxide precursor and a complex oxide comprising zirconium dioxide and an oxide of at least one metal selected from the group consisting of alkali metals, alkaline earth metals, silicon and lead in amounts effective to obtain a composition of matter consisting essentially of 16 to 25 wt % silicon, 6 to 9 wt % aluminum, 5.5 to 12 wt % potassium, 4.7 to 15 wt % magnesium, 0.7 to 5.0 wt % zirconium, 0.7 to 3.2 wt % boron, 3.0 to 9.3 wt % fluorine and up to 7.0 wt % of other metals, the balance being oxygen, exclusive of the ignition loss;

heat-melting the composition;

gradually cooling the heat-melted composition from a temperature higher by at least 50° C. than the glass transition temperature thereof to a temperature lower by at least 70° C. than said transition temperature at a rate lower than 100° C./hour while forming a solid vitreous body; and

heating the vitreous body at a temperature of 1100° to 1260° C. in a covered vessel for a period of time effective to obtain said vitreous ceramic body.

4,859,635

OPTICAL FLUOROPHOSPHATE GLASS HAVING ANOMALOUS POSITIVE PARTIAL DISPERSION AND PROCESS FOR ITS PRODUCTION

Norbert Meinert; Werner Huber, both of Solms-Albshausen; Rainer Dreuth, Wetzlar-Niedergirmes, and Henning Franek, Braunfels-Tiefenbach, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Continuation of Ser. No. 59,925, Jun. 9, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 268,635

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1985, 3538491; Oct. 18, 1986, 3635445

Int. Cl.⁴ C03C *3/247, 4/00*

U.S. Cl. 501—44 **5 Claims**

1. Optical fluorophosphate glass based on metaphosphates and fluorides of alkaline earth metals and of aluminum and on alkaline earth metal oxides having refractive indices n_e between 1.515 and 1.546, Abbe values ν_e between 75.8 and 77.4 and positive anomalous partial dispersion values $+\Delta\nu_e$ between 14.85 and 15.15, characterized in that it consists essentially of the following composition (in weight-%):

Mg	2.4–2.7
Ca	4.5–4.9
Sr	15.9–17.6
Ba	20.2–22.3
Al	5.6–6.2
P	8.8–9.7
F	22.0–24.3
O	15.7–17.4.

4,859,636

CHEMICALLY STRENGTHENED GLASS ARTICLE FORMED OF FLOAT GLASS

Shinichi Aratani; Masaaki Katano, and Takeshi Mizoguchi, all of Mie, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Division of Ser. No. 837,131, Mar. 7, 1986, Pat. No. 4,671,814. This application Mar. 10, 1987, Ser. No. 24,033

Claims priority, application Japan, Mar. 8, 1985, 60-44926; Mar. 12, 1985, 60-47367; Oct. 29, 1985, 60-240430; Oct. 29, 1985, 60-240431

Int. Cl.⁴ C03C *3/078*

U.S. Cl. 501—72 **4 Claims**

1. A chemically strengthened glass article comprising a sheet glass produced by a float process wherein a first surface of said sheet glass was in contact with the surface of a molten metal bath, said sheet glass being a soda-limesilicate glass comprising, on a weight basis, 68–75% SiO_2, 10–20% Na_2O, 5–15% CaO, 0–5% MgO, 0–5% Al_2O_3 and 0–5% K_2O; said chemically strengthened glass article being produced by

(a) contacting at least said first surface of the sheet glass with an external source of Na ions, Na being the principal alkali metal in the glass composition of the sheet glass, and heating the sheet glass together with the external source of Na ions at a temperature of from 350° to 650° C. for a time of from 0.01 to 100 hours; and then

(b) strengthening the sheet glass by exchange of Na ions in surface layers of the sheet glass with ions of another alkali metal, which is larger in ionic radius than Na, supplied from another external source,

said chemically strengthened glass article being characterized by compressive stress values at the surfaces of the glass article of from 25 to 120 kg/mm² and values of fractional warp in the glass article of from −0.4 to +0.4 μm/cm.

4,859,637

LEAD-FREE U.V. ABSORBING GLASS

Gordon J. Roberts, Parma, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Dec. 17, 1987, Ser. No. 134,518

Int. Cl.⁴ C03C *4/08*

U.S. Cl. 501—79 **17 Claims**

1. An improved U.V. absorbing glass composition comprising from about 75 to about 98 parts by weight of a lead oxide free base glass containing in part by weight based on 100 parts by weight of the base glass form about 19 to about 45 parts SiO_2O, from about 20 to about 33 parts B_2O_3, from about 8 to about 15 parts alkali metal oxide, from about 0 to about 35 parts zinc oxide, from about 0 to about 10 parts zirconium dioxide, from about 0 to about 6 parts aluminum oxide, from about 0 to about 3 parts barium oxide, from about 0 to about 8 parts P_2O_5, from about 0 to about 6 parts La_2O_3, and from about 2 to about 10 parts of added fluorine and form about 2 to about 25 parts by weight of a U.V. additive selected from the group consisting of cerium oxide, manganese oxide, iron oxide, cobalt oxide, copper oxide, vanadium oxide, molybdenum oxide, and mixtures of two or more of said oxides.

4,859,638

MAGNETIC HEAD SLIDERS, MATERIALS THEREFOR, AND THE PROCESS FOR THE PRODUCTION THEREOF

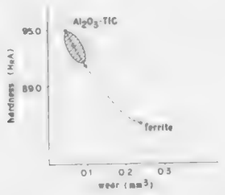
Toshiaki Wada, Takatsuki; Yoshiaki Katsuyama, Muro; Mitsuhiko Furukawa; Takashi Kitahira, both of Fukuoka; Michito Miyahara, Nakagawa; Kiyohito Misumi, Kurume, and Masaharu Shiroyama, Fukuoka, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka and Nippon Tungsten Co., Ltd., Tukuoka, both of, Japan

Continuation of Ser. No. 727,756, Apr. 26, 1985, abandoned. This application Feb. 16, 1988, Ser. No. 155,851

Claims priority, application Japan, Apr. 27, 1984, 59-83674

Int. Cl.⁴ C04B *35/50, 35/56*

U.S. Cl. 501—58 **12 Claims**



1. A sintered material for recording/reading head slider consisting essentially of:

0.5 to 6.0% by weight of at least one component selected from the component group A consisting of the following elements and compounds thereof,

5 to 15% by weight of erbium oxide, and

the balance being silicon carbide:

the elements for the component group A being Ti, V, Cr, Mn, Mg, Y, Zr, Nb, Mo, Ba, La, Ce, Gd, Hf, Ta, W, Th, and Cs.

4,859,639

PROCESS OF MAKING AMORPHOUS SILICON NITRIDE POWDER

Hans-Josef Sterzel, Dannstadt-Schauerabeim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 15, 1988, Ser. No. 206,753

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1987, 3720572

Int. Cl.⁴ C04B *35/58*

U.S. Cl. 501—97 **3 Claims**

1. A process for the preparation of an amorphous silicon nitride powder, from 0.5 to 40 mol % of the silicon being replaced by at least one modifying metal selected from the group consisting of boron, aluminum, yttrium, lanthanum, titanium, zirconium, tungsten and molybdenum, which comprises:

in a first step, passing ammonia into a solution of the halides of said modifying metals in an organic solvent in an amount of n-1 to n-2 equivalents of ammonia per metal equivalent, n denoting the valency of the modifying metal in said halide;

in a second step, adding an initial amount of silicon halide followed by further amounts to effect complete conversion of the halides to produce a reaction product;

in a third step, separating the reaction product from the solvent; and

in a fourth step, heating the reaction product into an amorphous modified silicon nitride powder a temperature of at from 800° to 1000° C.

4,859,640

METHOD OF MAKING CERAMIC COMPOSITE ARTICLES WITH SHAPE REPLICATED SURFACES

Marc S. Newkirk, Newark, Del., assignor to Lanxide Technology Company, LP, Newark, Del.

Filed Aug. 13, 1986, Ser. No. 896,157

Int. Cl.⁴ C04B *35/10*

U.S. Cl. 501—128 **27 Claims**

24. A method for producing a self-supporting ceramic composite body having a negative pattern inversely replicating a positive pattern of a parent metal body, said composite body comprising (1) a ceramic matrix obtained by oxidation of an aluminum parent metal to form a polycrystalline material comprising an aluminum oxidation reaction product of said parent metal with air; and (2) a filler embedded by said ceramic matrix, the method of comprising the steps of:

(a) providing an aluminum parent metal body having (1) a positive pattern section for inverse replication, and (2) a non-replicating section;

(b) emplacing at least said positive pattern section of said parent metal precursor in conforming engagement with a bed of conformable filler and using a means for promoting growth of said oxidation reaction product primarily from said positive pattern section into said filler material and a means for inhibiting oxidation reaction product growth from said non-replicating section, said conformable filler (i) being permeable to air to enable contact of the molten parent metal by air in step (c), and (ii) being permeable to infiltration by the growth of the oxidation reaction product through said conformable filler;

(c) heating the emplaced positive pattern to a temperature region of from about 850° C. to about 1450° C. to form a body of molten aluminum parent metal and, at said temperature,

(1) reacting the molten parent metal with said air to form said alumina oxidation reaction product,

(2) maintaining at least a portion of said alumina oxidation reaction product in contact with and between said body of molten metal and said air, to progressively draw molten metal from said body of molten metal through the alumina oxidation reaction product and into said bed of filler to concurrently from said negative pattern

in said bed of conformable filler as fresh alumina oxidation reaction product continues to form at an interface between said air and previously formed alumina oxidation reaction product, and

(3) continuing said reacting for a time to at least partially embed said bed of conformable filler within said alumina oxidation reaction product by growth of oxidation reaction product into said conformable filler to form said composite body with said composite body with said negative pattern; and

(d) separating the resulting self-supporting ceramic composite body from any excess filler and any unreacted parent metal.

4,859,641

NONREDUCIBLE DIELECTRIC CERAMIC COMPOSITION

Masaru Fujino, 8-1, Oryu, Shimokaiinji, Nagaokakyo-shi, Kyoto-fu; Goro Nishioka, 1-19-14, Tsudaminamicho, Hirakata-shi, Osaka-fu, and Yukio Sakabe, 1-6, Shinonome, Tahara, Hiyoshicho, Funai-gun, Kyoto-fu, all of Japan

Filed Mar. 9, 1988, Ser. No. 169,393

Claims priority, application Japan, Mar. 11, 1987, 62-56206; Mar. 11, 1987, 62-56207; Mar. 11, 1987, 62-56208

Int. Cl.[4] C04B *35/49*

U.S. Cl. 501—136 **8 Claims**

1. A nonreducible dielectric ceramic composition consisting essentially of a main component expressed by the formula:

$$(Sr_{1-x}Ca_x)_m(Ti_{1-y}Zr_y)O_3$$

wherein the subscripts x and y are molar fractions of the respective elements, and m is molar ratio of $(Sr_{1-x}Ca_x)$ to $(Ti_{1-y}Zr_y)$, and wherein x, y and m take values within the following respective ranges: $0.30 \leqq x \leqq 0.50$, $0.03 \leqq y \leqq 0.20$, $0.95 < m \leqq 1.08$, and secondary components composed of manganese oxides and SiO_2, the content of each secondary component per 100 parts by weight of the main component being 0.01 to 2.00 parts by weight for manganese oxides in terms of MnO_2, and 0.10 to 4.00 parts by weight for SiO_2.

4,859,642

FIXED-BED CATALYST STRUCTURE OBTAINED USING HONEYCOMB ELEMENTS

Wolfgang Hoelderich, Frankenthal; Michael Kroener, Mannheim; Peter Kroetzsch, Ketsch, and Werner Biffar, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 18, 1986, Ser. No. 875,571

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1985, 3521767

Int. Cl.[4] B01J *35/04*

U.S. Cl. 502—2 **4 Claims**

1. A fixed-bed catalyst reactor for use in highly endothermic and exothermic chemical reactions which comprises: a train of individual honeycomb catalyst elements and static mixing elements in contact with and between said honeycomb elements, said honeycomb elements containing multiple parallel channels through which liquid or gaseous reactants and reaction products flow; said mixing elements including channels which run obliquely with respect to the central axis of the mixing elements, whereby gases flowing along the wall of the honeycomb reactor element are directed into the interior of the downstream honeycomb element while gases flowing along the axis of the honeycomb reactor element are directed toward the reactor wall of the downstream honeycomb element, thus providing improved heat exchange between the gases flowing through the reactor and external heating or cooling means.

4,859,643

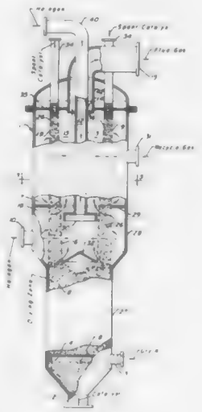
REGENERATION METHOD WITH REDUCED CATALYST HEAT EXPOSURE

Paul A. Sechrist, Arlington Heights, and William J. Koves, Hoffman Estates, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed May 11, 1988, Ser. No. 192,800

Int. Cl.[4] B01J *38/44, 38/24, 23/96;* **C10G** *35/12*

U.S. Cl. 502—37 **20 Claims**



1. A method of removing coke from the surface of solid catalyst particles in a regeneration zone through which the particles move in at least semi-continuous flow, aid method comprising:

(a) passing catalyst particles containing coke deposits into said regeneration zone;

(b) forming a vertically elongated bed of said particles in a combustion section of said regeneration zone;

(c) at least periodically moving said particles down said bed;

(d) introducing an oxygen-containing gas into said combustion section in an amount sufficient to provide breakthrough of said oxygen-containing gas, passing said gas into an inlet face of said bed in a direction generally transverse to the direction of catalyst flow so that the oxygen-containing gas passes through the upper portion of said combustion section at a superficial velocity that is greater than the superficial velocity of the gas passing through a lower portion of the combustion section, and initiating combustion of said coke deposits along a burn front that extends vertically through said combustion section, said front having a width less than the width of said bed, said burn front starting at the uppermost point of said inlet face and extending down said catalyst bed at an angle such that the distance from said inlet face to said burn increases with its distance from said uppermost point;

(e) collecting a flue gas, produced by combustion of said coke, from an outlet face of said bed, and removing said flue gas from said regeneration zone;

(f) decreasing the duration of travel of said flue gas in at least an upper portion of said combustion section after said flue gas exits said burn front; and

(g) withdrawing particles from the bottom of said bed below a point in said combustion section at which breakthrough of said oxygen-containing gas occurs, and adding catalyst particles to the top of said bed thereby causing said moving of said particles.

4,859,644

CATALYST COMPOSITIONS AND A PROCESS FOR POLYMERIZING CARBON MONOXIDE AND OLEFINS

Johannes A. M. Van Broekhoven, and Eit Drent, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 21,947, Mar. 5, 1987, Pat. No. 4,824,935. This application Jun. 23, 1988, Ser. No. 212,032

Claims priority, application Netherlands, Mar. 5, 1986, 8600561

Int. Cl.[4] B01J *31/12, 31/04*

U.S. Cl. 502—154 **30 Claims**

1. A catalyst composition which comprises

(a) a compound of a Group VIII metal selected from the group consisting of palladium, cobalt and nickel,

(b) at least one compound selected from the group consisting of metal salts having an anion of a non-hydrohalogenic acid with a pKa less than 6,

(c) a bidentate ligand of the general formula

$$R^1\text{—}M\text{—}R\text{—}M\text{—}R^4$$

(with R^2 and R^3 attached to the M atoms)

wherein M is selected from the group consisting of phosphorus, arsenic or antimony, R is a bivalent organic bridging group containing at least two carbon atoms in the bridge and R^1, R^2, R^3 and R^4 are alkyl substituted, alkoxy substituted or unsubstituted hydrocarbon groups, and

(d) an ether.

4,859,645

CATALYST COMPOSITIONS AND A PROCESS FOR POLYMERIZING CARBON MONOXIDE AND OLEFINS

Johannes A. M. Van Broekhoven, and Eit Drent, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 21,948, Mar. 5, 1987, Pat. No. 4,824,934. This application Jun. 23, 1988, Ser. No. 212,030

Claims priority, application Netherlands, Mar. 5, 1986, 8600564

Int. Cl.[4] B01J *3/12, 31/04*

U.S. Cl. 502—154 **29 Claims**

1. A catalyst composition which comprises

(a) a compound of a Group VIII metal selected from the group consisting of palladium, cobalt and nickel,

(b) at least one salt of a metal selected from the group of metals consisting of Group 2B–7B, iron, cobalt, copper, nickel, actinides, and lanthanides, having an anion of a non-hydrohalogenic acid with a pKa less than 6,

(c) a bidentate ligand of the general formula

$$R^1\text{—}M\text{—}R\text{—}M\text{—}R^4$$

(with R^2 and R^3 attached to the M atoms)

wherein M is selected from the group consisting of phosphorus, arsenic or antimony, R is a bivalent organic bridging group containing at least two carbon atoms in the bridge and R^1, R^2, R^3 and R^4 are alkyl substituted, alkoxy substituted or unsubstituted hydrocarbon groups, and

(d) a quinone.

4,859,646

PROCESS FOR THE DIMERIZATION OF OLEFINS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 156,674, Feb. 17, 1988, Pat. No. 4,806,647. This application Sep. 6, 1988, Ser. No. 240,301

Claims priority, application United Kingdom, Feb. 24, 1987, 8704338

Int. Cl.[4] B01J *31/02*

U.S. Cl. 502—165 **1 Claim**

1. A catalytic system which comprises:

(a) a palladium(II) compound,

(b) a chelate ligand comprising a compound containing as coordinating atoms at least two nitrogen atoms which are connected through a chain comprising two carbon atoms, wherein more than about 2.0 mol of said chelate ligand per gram-atom of palladium(II) is used,

(c) a protonic acid, with the exception of a hydrohalogenic acid, and

(d) a salt of a protonic acid selected from the group consisting of copper, iron, zinc, tin, manganese, vanadium, aluminum, a metal of Group VIB of the Periodic Table of the Elements and mixtures thereof, with the exception of a halide.

4,859,647

CATALYST COMPOSITIONS AND COMPOSITIONS CATALYZED THEREWITH

Peter O. Bentz, Waterloo, Belgium, assignor to Dow Corning, Ltd., Barry, Wales

Filed Mar. 3, 1987, Ser. No. 21,366

Claims priority, application United Kingdom, Mar. 18, 1986, 8606634

Int. Cl.[4] B01J *31/28*

U.S. Cl. 502—165 **22 Claims**

8. The composition according to claim 7 in which the R′ group has the general formula (iii)

$$R^3N(Q)R''NQ_2$$

in which R^3 represents an alkylene group having a chain of at least three carbon atoms linking silicon and nitrogen atoms, R″ represents an alkylene group having from 2 to 5 inclusive carbon atoms linking the nitrogen atoms and each Q is selected from the group consisting of a hydrogen atom and an alkyl group attached to a nitrogen atom.

4,859,648

LAYERED METAL CHALCOGENIDES CONTAINING INTERSPATHIC POLYMERIC CHALCOGENIDES

Michael E. Landis, Woodbury; Brent A. Aufdembrink, Voorhees; Pochen Chu, West Deptford; Ivy D. Johnson, Mt. Laurel; Garry W. Kirker, Washington Twp., Warren County, all of N.J.; Nancy M. Page, Yardley, and Mae K. Rubin, Bala Cynwyd, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 687,414, Dec. 28, 1984, abandoned. This application Jun. 27, 1986, Ser. No. 879,787

Int. Cl.[4] B01J *21/06, 21/02, 21/16*

U.S. Cl. 502—242 **103 Claims**

1. A method for preparing a layered material containing an interspathic polymeric chalcogenide of at least one element selected from Groups IB, IIB, IIIA, IIIB, IVA, IVB, VA, VB, VIA, VIIA, and VIIIA of the Periodic Table, which method comprises: treating a layered chalcogenide of at least one element having an atomic number of 4, 5, 12 to 15, 20 to 33, 38 to 51, 56 to 83 and greater than 90, inclusive, which contains ion exchange sites having interspathic cations associated therewith, with an organic compound which is a cationic species or capable of forming a cationic species to effect exchange with said interspathic cations; providing between the layers of said treated layered chalcogenide, an electrically neutral com-

pound capable of conversion to said interspathic polymeric chalcogenide; and converting said compound to the interspathic polymeric chalcogenide to form said layered material.

4,859,649

SEMI-FINISHED PRODUCTS OF FERRITIC STEEL AND CATALYTIC SUBSTRATE CONTAINING SAME

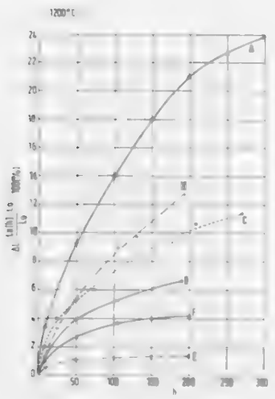
Kurt Böhnke, Wetter; Helmut Brandis, Krefeld; Hans-Heinrich Domalski, Wetter; Hans-Joachim Fleischer, Velbert, and Heinrich Frinken, Wetter, all of Fed. Rep. of Germany, assignors to Thyssen Edelstahlwerke AG, Krefeld, Fed. Rep. of Germany

Filed Feb. 26, 1988, Ser. No. 162,796

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1987, 3706415

Int. Cl.[4] B01J *32/00; C22C 38/02, 38/06, 38/18*

U.S. Cl. 502—439 **10 Claims**



1. A semi-finished product in form of a wire rod, a bar, a billet, a sheet or strip of a ferritic steel alloy consisting essentially of 0.008 to 0.10% carbon, up to 0.80% silicon, 0.10 to 1.00% manganese, up to 0.035% phosphorus, up to 0.020% sulphur, 12 to 30% chromium, 0.1 to 1.0% molybdenum, up to 1% nickel, 3.5 to 8.0% aluminum and additions of 0.010 to 1.0% zirconium, 0.003 to 0.3% titanium and 0.003 to 0.30% nitrogen, remainder iron including incidental impurities.

9. A catalyst comprising a catalytic substrate made from material according to any of claims 1 to 7.

4,859,650

PRESSURE-SENSITIVE RECORDING MATERIAL

Bodo Hilterhaus, Monchen-Gladbach, and Günther Hunger, Korschenbroich, both of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Fed. Rep. of Germany

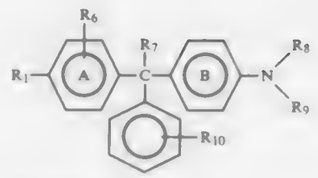
Filed Sep. 30, 1987, Ser. No. 103,115

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633116

Int. Cl.[4] B41M *5/16, 5/22*

U.S. Cl. 503—213 **10 Claims**

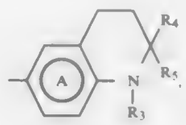
1. Pressure-sensitive recording material with microcapsules, comprising a color former, microscapsules and paper, wherein said color former is of the formula:



in which R_1 is alkoxy or the group



R_2 and R_3 are the same or different and are each alkyl or aryl, or R_2 forms with the ring A in o-position to the nitrogen, a ring of the formula



R_4 and R_5 are alkyl,

R_6 is hydrogen or alkoxy,

R_7 is hydrogen or alkoxy,

R_8 and R_9 are the same or different and are each alkyl, aryl or cyano-substituted aryl and

R_{10} is hydrogen or alkoxy, said color former is prepared from a triphenyl-methane leuco-dye and dissolved in a solvent composed at least 80% of plant, animal or paraffin oils,

said microcapsules are formed from a wall material which is water-soluble or water-dispersible before formation of said microcapsules,

said dissolved color former being contained in said microcapsules, and

said microcapsules being applied onto said paper.

4,859,651

THERMAL TRANSFER PRINTING

Peter Gregory, Bolton; Roy Bradbury, Farnworth, and Barry H. Meyrick, Flixton, all of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

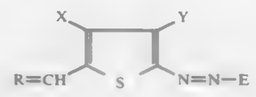
Filed Aug. 3, 1988, Ser. No. 227,990

Claims priority, application United Kingdom, Aug. 4, 1987, [illegible]

Int. Cl.[4] B41M *5/35, 5/26*

U.S. Cl. 503—227 **9 Claims**

1. A thermal transfer printing sheet comprising a substrate having a coating comprising a binder and a water-insoluble dye of the formula:



wherein

R represents the residue of an active methylene compound;

X represents hydrogen, halogen or an optionally substituted alkyl, aryl or heteroaryl radical;

Y represents cyano, nitro, alkanoyl, aroyl, alkylsulphonyl, arylsulphonyl or a group of the formula —$COOR^1$ or —$CONR^2R^3$ wherein R^1 represents a hydrocarbyl radical and each of R^2 and R^3, independently, represents hydrogen or a hydrocarbyl radical, and

E represents the residue of a coupling component.

4,859,652

METHOD FOR PREPARATION OF HIGH TEMPERATURE SUPERCONDUCTORS USING TRICHLOROACETATES

Jacob Block, Rockville, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Nov. 16, 1987, Ser. No. 121,018

Int. Cl.[4] C01F *11/18, 17/00;* **C04B** *35/50;* **H01L** *39/12*

U.S. Cl. 505—1 **7 Claims**

1. A composition consisting essentially of aqueous solution of L,M,A trichloracetates, substantially free from ions other than L,M,A, where L is at least one metal of the rare earth group, including scandium and yttrium; M is at least one metal of the group Ba, Ca, and Sr; and A is the proportions of L:M:A being such that the carbonate precipitate resulting on heating the solution is calcinable to yield a superconducting product.

3. Method of preparing a slurry of L,M,A mixed carbonates substantially free of ions other than L.M.A carbonate, chloride, and water-generated ions comprising:

(i) forming an aqueous solution of L,M,A tirchloroacetates by adding to an aqueous solution of trichloroacetic acid L,M and A as oxide, hydroxide, carbonate, or bicarbonate where L is at least one metal of the rate earth group, including scandium and yttrium; M is at least one metal of the group Ba, Ca, and Sr; and A is Cu,

(ii) heating the said solution to form mixed L,M,A carbonate precipitate with evolution of carbon dioxide and chloroform; and

(iii) recovering and drying the said precipitate, the proportions of L:M:A being such that the said precipitate is calcinable to yield a superconducting product.

4,859,653

USE OF COMPOSITIONS OF MATTER CONTAINING N-ACYLATES OF ALPHA AMINOACIDS FOR THE TREATMENT OF SKIN

Jean V. Morelle, and Eliane M. T. Lauzanne-Morelle, both of 170 Avenue Parmentier, 75010 Paris, France

Continuation of Ser. No. 748,777, Jun. 25, 1985, abandoned, which is a continuation of Ser. No. 567,767, Jan. 3, 1984, abandoned, which is a continuation of Ser. No. 358,848, Mar. 17, 1982, abandoned. This application Dec. 9, 1986, Ser. No. 940,184

Claims priority, application France, Apr. 2, 1981, 81 06592; Apr. 2, 1981, 81 06593; Apr. 2, 1981, 81 06594

Int. Cl.[4] A61K *37/00, 31/195*

U.S. Cl. 514—2 **7 Claims**

1. A method of treating wrinkles of the human skin, said method comprising the topical administration of a composition comprising as an active ingredient at least one N-acylate selected from the group consisting of butyrylglycine, butyryl phenylalanine, butyrylthreonine, butyrylaspartic acid, butyrylvaline, butyryl leucine, dibutyryl lysine, butyrylproline, mono and dibutyryl hydroxyproline, dibutyrylhydroxylysine, butyryl methionine, dibutyryl cystine, butyrylcysteine, butyrylcollagenic acid, butyrylkeratinic acid and butyrylcaseinic acid, said composition comprising a pharmaceutically acceptable carrier and an amount of said active ingredient effective to treat wrinkles.

4,859,654

HOMOCYCLOSTATINE AND CYCLOSTATINE CONTAINING POLYPEPTIDES AS ANTIHYPERTENSIVE AGENTS

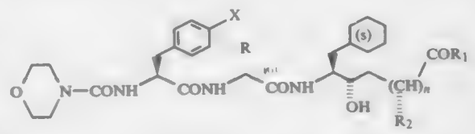
Dennis J. Hoover, Ledyard, and Robert L. Rosati, Stonington, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 68,992, Jul. 1, 1987. This application Jun. 1, 1988, Ser. No. 200,820

Int. Cl.[4] A61K *37/00;* **C07K** *5/06, 5/08*

U.S. Cl. 514—19 **12 Claims**

1. A compound of the formula



and a pharmaceutically acceptable salt thereof wherein X is hydrogen, methoxy or hydroxy; R is alkyl having one to six carbon atoms or methylthiomethyl; n is an integer of 1; R_1 is amino, alkylamino having from one to five carbon atoms, alkoxy having from one to three carbon atoms or 2-alkoxycarbonylpyrrolidin-1-yl said alkoxy having from one to three carbon atoms; and R_2 is alkyl having three to four carbon atoms —$CH_2CH(Cl)=CH_2$, —$CH_2CH=CH-CH_2N_3$, —$(CH_2)_4NH_2$, —$CH_2CH(Br)=CH_2$, —$CH_2CH=CHCl$, —$CH_2CH=C(CH_3)_2$, —$CH_2CH=CHCH_3$ or —$CH_2C=CH$.

4,859,655

URDAMYCIN G AND DERIVATIVES THEREOF, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Axel Zeeck; Thomas Ciesiolka; Jürgen Rohr, all of Göttingen; Hans Zähner, Tübingen, and Hannelore Drautz, Mössingen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

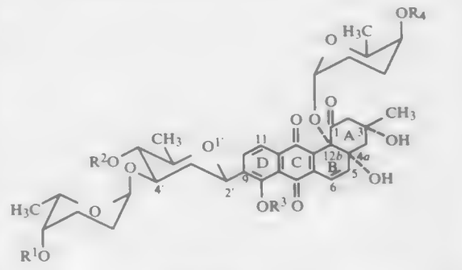
Filed Aug. 26, 1987, Ser. No. 89,434

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1986, 3629274

Int. Cl.[4] C07H *15/24;* **A61K** *31/71, 45/05;* **C12P** *19/56*

U.S. Cl. 514—34 **11 Claims**

1. A compound of the formula I



in which R^1 to R^4, independently of one another, denote hydrogen or a (C_1–C_{18})-acyl group.

4,859,656

METHOD OF DETACHING MICRO-FLORA AND COMPOSITIONS THEREFOR

Staffan Kjelleberg, Göteborg, and Peter Rönnow, Mölnlycke, both of Sweden, assignors to Chemical Dynamics Sweden AB, Skara, Sweden

PCT No. PCT/SE85/00515, § 371 Date Sep. 10, 1986, § 102(e) Date Sep. 10, 1986, PCT Pub. No. WO86/03937, PCT Pub. Date Jul. 17, 1986
PCT Filed Dec. 10, 1985, Ser. No. 908,019
Claims priority, application Sweden, Jan. 10, 1985, 8500102
Int. Cl.[4] A61K *31/715, 6/00, 31/725, 33/06*
U.S. Cl. 514—54 15 Claims

1. A method for increasing detachment of microflora adhered to surfaces and interfaces, comprising administering thereto a solution comprising;

(a) at least one water soluble organic or inorganic salt selected from the group consisting of lithium, magnesium, aluminum, ammonium, beryllium, and calcium salts, and

(b) at least two polymer groups selected from the group consisting of positively charged groups, negatively charged groups, amine groups and carboxyl groups.

14. A composition for increasing detachment of microorganisms adhered to surfaces and interfaces, comprising a solution comprising:

(a) at least one water soluble organic or inorganic salt selected from the group consisting of lithium, aluminum, ammonium, beryllium and calcium salts, the concentration of said at least one salt being at least about 0.5 molar, and

(b) at least two polymer groups selected from the group consisting of positively charged groups, negatively charged groups, amine groups and carboxyl groups.

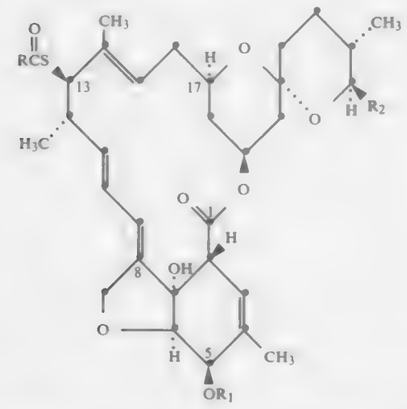
4,859,657

PESTICIDES

Anthony C. O'Sullivan, Basel, and Bruno Frei, Liestal, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 30, 1987, Ser. No. 68,692
Claims priority, application Switzerland, Jul. 2, 1986, 2668/86
Int. Cl.[4] A61K *31/35;* C07D *313/08, 309/10*
U.S. Cl. 514—63 15 Claims

1. A compound of formula I



(I)

in which R_1 is a hydrogen or a silyl or acyl group, R_2 is methyl, ethyl, isopropyl or sec.-butyl and R is hydrogen, unsubstituted or substituted, linear or branched-chain C_1–C_{18}-alkyl groups, unsubstituted or substituted cycloaliphatic groups having 3 to 10 carbon atoms, unsubstituted or substituted C_2–C_6-alkenyl groups, unsubstituted or substituted C_2–C_6-alkynyl groups, unsubstituted or substituted phenyl groups or unsubstituted or substituted benzyl groups, the substituents of said alkyl, cycloaliphatic, alkenyl and alkynyl R-groups being 1 to 7 halogen atoms or 1 to 6 C_1–C_6-alkoxy groups and the substituents of the phenyl and benzyl R-groups being 1 to 3 substituents selected from the group consisting of halogen atoms, C_1–C_6-alkyl, C_1–C_6-alkoxy, C_1–C_4-alkylthio, phenyl and nitro.

4,859,658

COMPOUND COMPOSITIONS WITH IMPROVED ANALGESIC ANTIPYRETIC AND ANTI-INFLAMMATORY ACTIVITY

Michele G. Di Schiena, Cisliano, Italy, and Zvi Paster, Givataim, Israel, assignors to Ricerfarma S.R.L., Milan, Italy and Life Science Research Israel Ltd, Ness Ziona, Israel

Filed Feb. 29, 1988, Ser. No. 162,127
Claims priority, application United Kingdom, Mar. 2, 1987, 8704839
Int. Cl.[4] A61K *31/40, 31/60, 31/02*
U.S. Cl. 514—159 13 Claims

1. A pharmaceutical or veterinary composition which comprises, as active ingredients, p-acetamido-phenyl thiophene-2-carboxylate and a non-steroidal anti-inflammatory drug selected from the group consisting of aspirin and indomethacin, wherein said composition contains p-acetamido-phenyl thiophene-2-carboxylate and aspirin in a weight ratio of from 1:0.2 to 1:3 or p-acetamido-phenyl thiophene-2-carboxylate and indomethacin in a weight ratio of from 1:0.002 to 1:0.02.

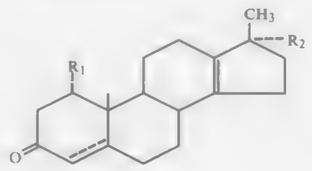
4,859,659

DERMATICS UTILIZING 17βMETHYL-18 NOR STEROIDS AND METHODS FOR THEIR USE

Dieter Bittler; Henry Laurent; Klaus Nickisch, and Petra Rach, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

PCT No. PCT/DE86/00156, § 371 Date Dec. 17, 1986, § 102(e) Date Dec. 17, 1986, PCT Pub. No. WO86/06078, PCT Pub. Date Oct. 23, 1986
PCT Filed Apr. 10, 1986, Ser. No. 12,910
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3514272
Int. Cl.[4] A61K *31/56;* C07J *1/00*
U.S. Cl. 514—177 25 Claims

1. Dermatics, in the form of a solution, ointment, cream, or lotion for topical, substantially nonsystemic administration, characterized by containing as the active compound an antiandrogenically effective concentration of a 17β-methyl-18-nor steroid of general Formula I



(I)

wherein

is a single bond or a double bond,

R_1 is a hydrogen atom or a methyl group, and

R_2 is an alkyl group of maximally 6 carbon atoms, optionally substituted by an alkanoyloxy group containing 2–6 carbon atoms,

and further comprising a dermatically acceptable excipient.

4,859,660

METHOD OF TREATING CIRRHOSIS

Raoul Poupon, Paris, France, assignor to Synthelabo, Paris, France

Filed Nov. 19, 1987, Ser. No. 122,867
Claims priority, application France, Nov. 20, 1986, 86 16139
Int. Cl.[4] A61K *31/56;* C07J *1/00*
U.S. Cl. 514—182 4 Claims

1. A method of treating primary biliary cirrhosis which comprises administering an effective amount of ursodeoxycholic acid to a patient suffering from primary biliary cirrhosis.

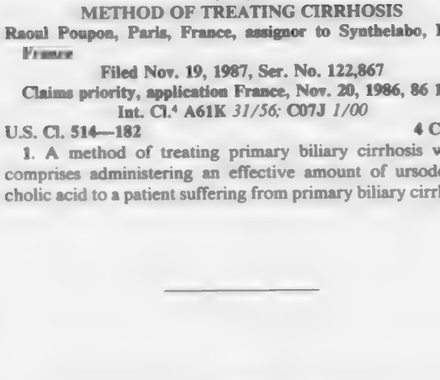
4,859,661

ALKYL-SUBSTITUTED BENZOXAZINORIFAMYCIN DERIVATIVE, PROCESS FOR PREPARING THE SAME AND ANTIBACTERIAL AGENT CONTAINING THE SAME

Fumihiko Kano, Takasago; Takehiko Yamane, Akashi; Katsuji Yamashita, Kobe; Kazunori Hosoe, Takasago, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

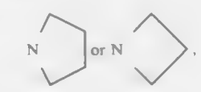
Filed Jul. 13, 1987, Ser. No. 75,021
Claims priority, application Japan, Jul. 14, 1986, 61-165121; Oct. 14, 1986, 61-243376; Feb. 10, 1987, 62-29436; Mar. 17, 1987, 62-62213
Int. Cl.[4] A61K *31/535;* C07D *498/18*
U.S. Cl. 514—183 4 Claims

1. A rifamycin derivative having the formula (I):



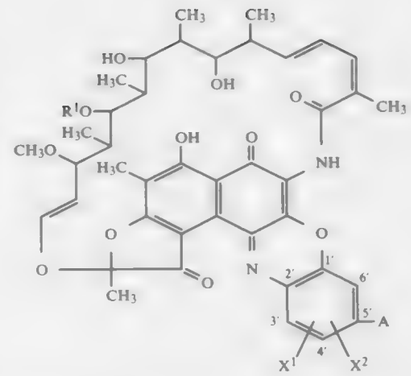
(I)

wherein X^1 is an alkyl group with 1 to 3 carbon atoms, X^2 is a hydrogen atom or an alkyl group with 1 to 3 carbon atoms, R^1 is a hydrogen atom or acetyl group, and A is a group represented by the formula:



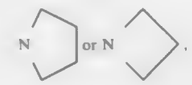
or a salt thereof.

4. An antibacterial composition comprising a pharmaceutical carrier and at least one antibacterial agent selected from the group consisting of a rifamycin derivative having the formula (1):



(I)

wherein X^1 is an alkyl group with 1 to 3 carbon atoms, X^2 is a hydrogen atom or an alkyl group with 1 to 3 carbon atoms, R^1 is a hydrogen atom or an acetyl group, and A is a group represented by the formula



or a salt thereof, and other antibacterial agents compatible with said rifamycin derivative of formula (I) or salt thereof, provided that said antibacterial composition comprises at least one rifamycin derivative of formula (I) or salt thereof, wherein the ratio of the rifamycin derivative (I) or salt thereof to the pharmaceutical carrier is 0.2 to 100% by weight.

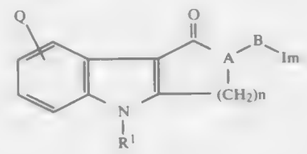
4,859,662

TETRAHYDRO-IMIDAZOLYLMETHYLCARBAZOLONES AND ANALOGS THEREOF FOR TREATING 5-HT FUNCTION DISTURBANCES

Ian H. Coates, Hertford; John Bradshaw; James A. Bell, both of Royston; David C. Humber, London; George B. Ewan, Gerrards Cross; William L. Mitchell, London, and Barry J. Price, Tewin Wood, all of England, assignors to Glaxo Group Limited, London, United Kingdom

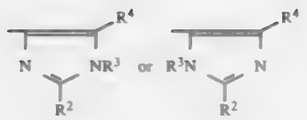
Division of Ser. No. 199,792, May 27, 1988, abandoned, which is a continuation-in-part of Ser. No. 126,202, Nov. 27, 1987, Pat. No. 4,822,881. This application Dec. 7, 1988, Ser. No. 281,031
Claims priority, application United Kingdom, Nov. 28, 1986, 8628473; Nov. 12, 1987, 8726537; May 20, 1988, 8812002
Int. Cl.[4] A61K *31/55, 31/415;* C07D *403/06*
U.S. Cl. 514—212 21 Claims

1. A compound of formula (I):



(I)

wherein Im represents an imidazolyl group of the formula:



R^1 represents a hydrogen atom or a group selected from C_{1-6}alkyl, C_{3-6}alkenyl, C_{3-10}alkynyl, C_{3-7}cycloalkyl, C_{3-7}cycloalkylC_{1-4}alkyl, phenyl, phenylC_{1-3}alkyl, $—CO_2R^5$, —COR^5, —$CONR^5R^6$ or —SO_2R^5;

R^5 and R^6, which may be the same or different, each represents a hydrogen atom, a C_{1-6}alkyl or C_{3-7}cycloalkyl group, or a phenyl or phenylC_{1-4}alkyl group, in which the phenyl group is unsubstituted or substituted by one or more C_{1-4} alkyl, C_{1-4}alkoxy or hydroxy groups or halogen atoms, with the proviso that R^5 does not represent a hydrogen atom when R^1 represents a group $—CO_2R^5$ or $—SO_2R^5$;

one of the groups represented by R^2, R^3 and R^4 is a hydrogen atom or a C_{1-6}alkyl, C_{3-7}cycloalkyl, C_{3-6}alkenyl, phenyl or phenylC_{1-3}alkyl group, and each of the other two groups, which may be the same or different, represents a hydrogen atom or a C_{1-6}alkyl group;

Q represents a hydrogen or a halogen atom, or a hydroxy, C_{1-4}alkoxy, phenylC_{1-3}alkoxy or C_{1-6}alkyl group or a group $—NR^7R^8$ or $—CONR^7R^8$;

R^7 and R^8, which may be the same or different, each represents a hydrogen atom or a C_{1-4}alkyl or C_{3-4}alkenyl group, or together with the nitrogen atom to which they are attached form a saturated 5 to 7 membered ring;

n represents 1, 2 or 3; and

A–B represents the groups CH—CH_2 or C═CH;

or a physiologically acceptable salt or solvate thereof.

4,859,663

MULTIPLY SUBSTITUTED PYRIDINE 1-OXIDE COMPOUNDS WHICH ARE USEFUL IN TREATING BRAIN DISORDERS

Wilfried Greve, Rödermark; Ulrich Elben, Wiesbaden; Karl Rudolph, Kelkheim, and Ursula Schindler, Mörfelden-Walldorf, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/EP86/00211, § 371 Date Dec. 16, 1986, § 102(e) Date Dec. 16, 1986, PCT Pub. No. WO86/06067, PCT Pub. Date Oct. 23, 1986

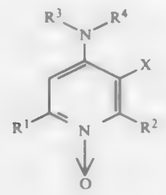
PCT Filed Apr. 10, 1986, Ser. No. 942,385

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1985, 3514073

Int. Cl.[4] A61K *31/55;* **C07D** *213/89*

U.S. Cl. 514—212 **13 Claims**

1. A multiply substituted pyridine 1-oxide of the formula I



(I)

in which

R^1 and R^2 are, in each case, identical or different and represent alkyl having 1 to 6 carbon atoms,

R^3 denotes hydrogen, and

R^4 denotes mercaptoalkyl having up to 4 carbon atoms, or

R^3 and R^4 form, together with the nitrogen atom in the 4-position, a from the group consisting of a thiomorpholine, morpholine, pyrrolidine, piperidine, hexamethyleneimine, piperazine and homopiperazine ring, whereby the sulfur in the thiomorpholine ring can carry up to tw oxygen atoms, and wherein the second nitrogen in the piperazine or homopiperazine ring is in the form of the NR^6 group, in which R^6 is hydrogen, alkyl having up to 2 carbon atoms, phenylalkyl having up to 2 carbon atoms in the alkyl moiety or phenyl, and the phenyl rings in the two latter radicals can carry up to two identical of different substituents from the group consisting of halogen and methoxy, and which heterocyclic ring at its carbon atoms is unsubstituted or carries up to wwo identical or different substituents from the group consisting of hydroxy and alkyl having up to 2 carbon atoms, and

X denotes the cyano or nitro group or the group —CO—R^5, in which R^5 represents the amino, hydroxyl or an alkoxy group having up to 4 carbon atoms, or a physiologically tolerated salt of this compound.

8. A method for the preparation of medicaments for the prevention and treatment of brain disorders caused by vascular and degnerative factors which comprises incorporating in said medicaments (a) multiply substituted pyridine 1-oxides of the formula I as claimed in claim **1**, or (b) their physiologically tolerated sales, or (c) a combination of (a) and (b).

4,859,664

DERIVATIVES OF 2,3,4,5,6,7-HEXAHYDRO-2,7-METHANO-1,5-BENZOXAZONINES AND -1,4-BENZOXAZONINES, PROCESSES FOR THEIR PRODUCTION AND THEIR USE AS PHARMACEUTICALS

Friedrich Eiden, Gräfeling; Peter Gmeiner, and Jürgen Schünemann, both of Munich, all of Fed. Rep. of Germany, assignors to Madaus GmbH & Company, Cologne, Fed. Rep. of Germany

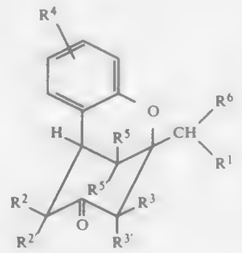
Filed Sep. 4, 1987, Ser. No. 93,553

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1986, 3630539

Int. Cl.[4] C07D *267/00;* **A61K** *31/33*

U.S. Cl. 514—217 **15 Claims**

13. A method for treating humans or animals which comprises administering thereto as an analgesic a pharmaceutically effective amount of a compound of the formula



wherein:

R_1 is hydrogen or C_1–C_4 alkyl;

one of R^2 and $R^{2'}$ is hydrogen and the other is hydrogen or C_1–C_4 alkyl;

one of R^3 and $R^{3'}$ is hydrogen and the other is hydrogen, C_1–C_4 alkyl or phenyl;

R^4 is in the ortho- or para-position to the oxygen atoms and is hydrogen, halogen, C_1 or C_2 alkoxy or C_1–C_4 alkyl;

each of R^5 and $R^{5'}$ is hydrogen or C_1–C_4 alkyl;

and R^6 is hydrogen or C_1–C_4 alkyl.

4,859,665

ANTIHYPERTENSIVE COMBINATION PRODUCTS CONTAINING A DIHYDROPYRIDINE AND A PYRIDAZODIAZEPINE

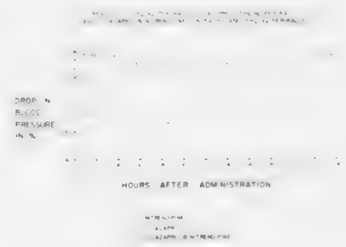
Bernward Garthoff, Hilden, Fed. Rep. of Germany; Marcel Gerold, Binningen; Fridolin Hefti, Allschwil, both of Switzerland; Stanislav Kazda, Wuppertal, and Andreas Knorr, Erkrath, both of Fed. Rep. of Germany, assignors to Hoffmann-LaRoche Inc., Nutley, N.J. and Bayer Akt., Leverkusen, Fed. Rep. of Germany

Filed Dec. 2, 1986, Ser. No. 937,867

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 3542794

Int. Cl.[4] A61K *31/33, 31/345, 31/44, 31/55*

U.S. Cl. 514—221 **10 Claims**



1. A composition for combating hypertension comprising an effective amount of a dihydropyridine of the formula 3-methyl-5-ethyl-2,6-dimethyl-4-(3-nitrophenyl)-1,4-dihydropyridine-3,5-dicarboxylate and a pyriazodiazepine of the formula 9(S)-[1(S)-ethoxycarbonyl- 3-phenyl-propylamino]octahydro-10-oxo-6H-pyridazo[1,2-a][1,2]diazepine-1(S)-carboxylic acid, wherein the weight ratio of the dihydropyridine to the pyridazodiazepine is from 10:1 to 1:10, and an inert carrier.

9. A method of reducing blood pressure in a host requiring such treatment which comprises administering to such a host an effective amount of a composition which comprises a pyridazodiazepine having the formula 9(S)-[1(S)-ethoxycarbonyl-3-phenylpropylamino]octahydro-10-oxo-6H-pyridazo[1,2-a][1,2]diazepine-1(S)-carboxylic acid and a dihydropyridine having the formula 3-methyl-5-ethyl 2,6-dimethyl-4-(3-nitrophenyl)-1,4-dihydropyridine-3,5-dicarboxylate, wherein the weight ratio of the dihydropyridine to the pyridazodiazepine is from 6:1 to 1:4, and an inert carrier.

4,859,666

THAZ DERIVATIVES FOR ENHANCEMENT OF CEREBRAL FUNCTION

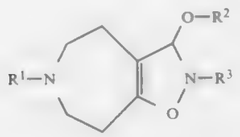
Michael S. Eison, Avon, Conn., and Povl Krogsgaard-Larsen, Allerod, Denmark, assignors to Bristol-Myers Company, New York, N.Y.

Filed Jul. 6, 1988, Ser. No. 215,836

Int. Cl.[4] A61K *31/395;* **C07D** *223/00*

U.S. Cl. 514—221 **15 Claims**

1. A compound of Formula I



I

and its pharmaceutically acceptable salts and solvates wherein

R^1 is hydrogen, lower(C_{1-6})alkyl, C_{3-6} cycloalkyl, cycloalkyl-lower alkyl, allyl and phenyl-lower alkyl;

R^2 and R^3 are independently selected from a non-bonding electron pair, lower alkyl, C_{3-6} cycloalkyl, cycloalkyl-lower alkyl, allyl and phenyl-lower alkyl, with the proviso that one of R^2 and R^3 is always a non-bonding electron pair; and

the solid and dotted line is either a single or double chemical bond.

15. A method for enhancing cerebral function in a mammal in need of such treatment comprising administering an amount of a compound of claim 1 effective in enhancing cerebral function.

4,859,667

PHARMACEUTICAL COMPOSITIONS OF PHENOTHIAZONE DERIVATIVES AND ANALOGS

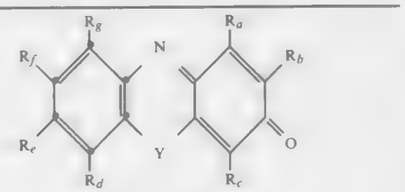
Cheuk K. Lau, Pierrefonds; Christiane Yoakim, Montreal; Joshua Rokach, Laval; Rejean Fortin, Montreal, and Yvan Guindon, Bizard, all of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Division of Ser. No. 786,257, Oct. 10, 1985, Pat. No. 4,667,032, and a continuation-in-part of Ser. No. 559,471, Dec. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 536,487, Sep. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 459,924, Jan. 22, 1983, abandoned. This application Jan. 14, 1987, Ser. No. 3,354

Int. Cl.[4] A61K *31/535, 31/54*

U.S. Cl. 514—224.5 **25 Claims**

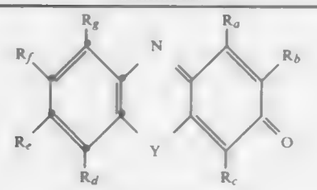
1. A pharmaceutical composition for inhibiting mammalian leukotriene biosynthesis or action containing a pharmaceutically acceptable carrier and an effective amount of a compound of the formula:



wherein the substituents are:

Y	R_a	R_b	R_c	R_d	R_e	R_f R_g
S	H	SCH_3	H	H	H	H H
S	H	H	SCF_3	H	H	H H
H	H	H	CHO	H	H	H H
S	H	H	$COCF_3$	H	H	H H
S	H	H	H	H	SCH_3	H H
S	H	H	H	H	CO_2CH_3	H H
S	H	H	H	H	CO_2H	H H
S	H	H	H	H	CHO	H H
H	H	H	H	H	$CONH_2$	H H
S	H	H	H	H	CH_2OH	H H
S	H	H	Cl	H	Co_2Me	H H
S	H	H	Cl	H	CO_2H	H H
S	H	H	Cl	H	CHO	H H
S	H	H	Cl	H	$COHN_2$	H H
S	H	H	Cl	H	CH_2OH	H H
S	H	O—benzyl	Cl	H	H	H H
S	H	OEt	Cl	H	F	H H
S	H	OEt	Cl	H	CH_3	H H
S	CH_3	H	Cl	H	CH_3	H H
S	H	CH_3	Cl	H	CH_3	H H
S	H	OMe	Br	H	OMe	H H
S	H	OMe	Cl	H	OMe	H H
S	H	OEt	Br	H	OEt	H H
S	H	OEt	Cl	H	OEt	H H
S	H	OMe	Cl	H	OEt	H H
S	H	OMe	H	H	SMe	H H
O	H	OMe	Br	H	OMe	H H
O	H	OMe	Cl	H	OMe	H H
S	H	OMe	Br	H	Me	H H
SO_2	H	H	OH	H	H	H H
SO_2	H	OMe	OH	H	OMe	H H
SO_2	OMe	OMe	Me	H	H	H H
SO_2	H	H	OMe	H	H	H H
SO_2	H	OMe	OMe	H	OMe	H H

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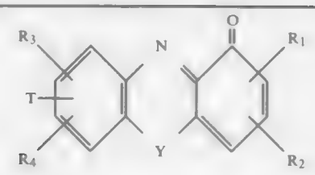


wherein the substituents are:

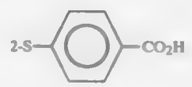
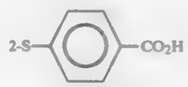
Y	R_a	R_b	R_c	R_d	R_e	R_f/R_g
S	OCH_3	OCH_3	Me	"	"	H H
S	"	"	$COCH_3$	"	"	H H
"	OCH_3	"	"	"	OCH_3	H H
S	OCH_3	Cl	Cl	"	OCH_3	H H
S	OCH_3	"	Cl	"	OCH_3	H H
"	"		H	"	OCH_3	H H
"	"		"	"	OCH_3	H H
SO_2	H	OCH_3	OH	H	OCH_3	H H
SO_2	NHPr	"	NHPr	"	H	H H
SO_2		"		"	"	H H
SO_2	H	OCH_3		"	OCH_3	H H
SO_2	H	OCH_3	Br	"	OCH_3	H H
S	NHPr	H	NHPr	H	H	H H
S	NHPr	H	NHPr	H	OCH_3	H H
"	"	NHPr	NHPr	"	"	H H
"	H	NHPr	NHPr	"	OCH_3	H H
S	H	OCH_3	NH_2	"	OCH_3	" H
S	"	OCH_3	NHPr	"	OCH_3	" "
SO_2	H	OCH_3	NHPr	"	OCH_3	H H
O	OCH_3	"	Cl	"	OCH_3	" H
O	OCH_3	"	"	H	OCH_3	H H
O	NHPr	"	NHPr	"	"	H H
SO_2	H	OCH_3	CN	"	OCH_3	H H
SO_2	"	OCH_3	$NHCH_2CO_2R$	"	OCH_3	H H
SO_2	H	OCH_3	S—n-Bu	"	OCH_3	H H
SO_2	"	OCH_3	CH_2CO_2R	"	OCH_3	H H
SO_2	H	OCH_3	SO_2CH_3	"	OCH_3	H H
"	H	S—n-Bu	"	"	"	H H
"	"	H	S—n-Bu	"	"	H H
S	"	CH_3	S—n-Bu	"	"	H H
"	H	OMe	Br	H	CF_3	H H
S	"	OMe	Br	"	F	H H
S	"	OMe	"	"	Cl	H H
"	H	OMe	Br	"	Br	H H
S	H	OMe	"	"	NMe_2	H H
S	H	OMe	"	"	SMe	H H
"	"	OMe	"	"	SO_2Me	" "
"	"	OMe	"	"	"	H H

and R is H or C_2 to C_6alkyl

23. A pharmaceutical composition for inhibiting mammalian luekotrine biosynthesis or action containing a pharmaceutically acceptable carrier and an effective amount of a compound of the formula:

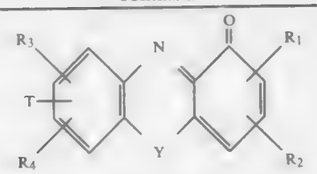


wherein the substituents are:

Y	R_1	R_2
S, SO, or SO_2	2-Cl	"
"	2-SCF_3	H
"		H
S	2-t-Bu	4-t-Bu
S, SO, or SO_2	2-CN	H
"	"	3-CO_2Et
"	H	3-Cl
"	H	H
"	H	H
"	2-Cl	H
S	H	H
S	2-Cl	3-Cl
S	2-Br	3-Br
S	H	H
S	2-Cl	H
S	2-F	H
S	2-Br	H
S	2-CF_3	H
S	2-SCF_3	H
S	2-SO_2CF_3	H
S	"	3-Cl
S	"	3-CO_2Et
S	H	3-CO_2H
S	H	3-CN
S	H	3-SCF_3
S	H	H
S	H	H
S	2-Br	H
S	2-Cl	H
S	2-Cl	H
S	2-Cl	H
S	2-Cl	H
S	2-Cl	H
S	H	3-$CONMe_2$
S	2-Cl	"
S		H
S	2-SO_2CH_3	H
S	2-$CH_2CH{=}CH_2$	H
S	"	3-$N(CH_3)_2$
S	"	"
S	2-CH_2CO_2H	H
S	2-Cl	H
S	2-$COCH_3$	H
S	"	H
S	"	H
S	2-$COCH_3$ *H*	
S	"	H
S	4-Cl	H
SO	"	H
SO_2	H	H
SO_2	4-Cl	H
S	2-t-Bu	9-t-Bu
S	2-t-Bu	7-t-Bu
S	2-t-Bu	7-t-Bu
S	2-t-Bu	7-t-Bu

R_3	R_4	T
H	H	H

-continued



wherein the substituents are:

"	"	H
H	H	H
H	H	H
H	H	H
H	H	H
H	H	H
4-Cl	H	H
4-SO_2CH_3	H	H
4-Cl	H	H
H	H	H
4-Cl	7-Cl	9-Cl
4-Br	7-Br	9-Br
H	7-SO_2CH_3	H
4-SO_2CH_3	H	H
4-Cl	H	H
H	H	H
H	H	H
H	H	H
H	H	H
H	H	H
H	H	H
H	H	H
H	H	H
4-Cl	H	H
4-SCF_3	H	H
4-Br	"	H
H	8-CN	H
H	8-CO_2Et	H
H	8-CO_2H	H
H	8-CF_3	H
H	7-SO_2CH_3	H
H	"	H
H	7-OCH_3	H
H	H	H
"	H	H
4-$CH_2CH{=}CH_2$	H	H
H	H	H
4-Cl	7-S—C_6H_5	H
H	H	H
4-SCH_2CO_2H	H	H
"	H	7-CF_3
4-CO—C_6H_5	H	7-CF_3
H	H	H
"	7-OCH_3	H
4-COC_6H_5	7-OCH_3	"
H	H	H
H	H	H
H	H	H
H	H	H
4-OMe	H	H
4-F	H	H
4-Me	H	H
4-SMe	"	H

4,859,668

METHOD OF INHIBITING THE GROWTH OF MELANIN-PIGMENTED CELLS

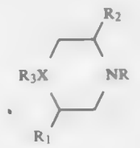
Edward J. Noga, and George T. Barthalmus, both of Raleigh, N.C., assignors to North Carolina State University, Raleigh, N.C.

Continuation-in-part of Ser. No. 845,701, Mar. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 678,229, Dec. 5, 1984, abandoned. This application Mar. 7, 1988, Ser. No. 164,928

Int. Cl.[4] A61K *31/535*

U.S. Cl. 514—231.2 **2 Claims**

1. A method of effecting cutaneous bleaching in a human or animal subject in need of such treatment, comprising topically administering to said subject, for a time and in an amount sufficient to selectively inhibit the growth of cutaneous pigmented cells of the subject without substantially affecting the nonpigmented cutaneous cells of the subject, a cyclic amine of the formula:



wherein

X is O;

R is H, C_{1-5} alkyl, hydroxy substituted C_{1-5} alkyl, or pyridyl;

R_1 and R_2 are either or both H or C_{1-3} alkyl; and

R_3 is absent.

4,859,669

ANTIINFLAMMATORY AND ANTI-HYPERPROLIFERATIVE NAPHTHYRIDIN-4-ONES

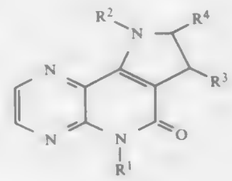
Timothy Duelfer, Morris Plains, and David J. Blythin, North Caldwell, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Dec. 23, 1987, Ser. No. 137,300

Int. Cl.[4] C07D *471/00, 401/00, 251/00;* **A61K** *31/495*

U.S. Cl. 514—250 **17 Claims**

1. A compound having the structural formula XI



XI

or a pharmaceutically acceptable salt or solvate thereof, wherein:

R^1 is selected from H, alkyl having from 1 to 10 carbon atoms, aryl having from 6 to 15 carbon atoms, alkenyl having from 3 to 10 carbon atoms, benzyl, substituted alkyl having from 1 to 10 carbon atoms, substituted aryl having from 6 to 15 carbon atoms, substituted benzyl, —O(CO)—R^8, D—NR^5R^6, —D—OR^7 or —D—(-CO)—OR^8 wherein D is alkanediyl having from 1 to 8 carbon atoms or a covalent bond;

R^3 and R^4 are the same or different and each is independently selected from H, alkyl having from 1 to 10 carbon atoms, aryl having from 6 to 15 carbon atoms or heteroaryl having from 2 to 14 carbon atoms;

R^5 and R^6 are the same or different and each is independently selected from H or alkyl having from 1 to 10 car-

bon atoms, or together represent alkanediyl having from 1 to 8 carbon atoms;

R^7 is selected from H, alkyl having from 1 to 10 carbon atoms or aryl having from 6 to 15 carbon atoms; and

R^8 is selected from alkyl having from 1 to 10 carbon atoms, aryl having from 6 to 15 carbon atoms, benzyl or substituted benzyl.

12. A method for treating inflammation in a mammal comprising administering to said mammal an anti-inflammatory effective amount of a compound as claimed in claim 1.

4,859,670

2-AZOLYLMETHYL-2-ARYL-1,3-DIOXOLANES AND THE SALTS THEREOF, AGENTS CONTAINING SAME, AND THE USE THEREOF

Klaus-Dieter Kampe, Bad Soden am Taunus; Wolfgang Raether, Dreieich; Walter Dittmar, Hofheim am Taunus, and Heinz Hänel, Bad Homburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

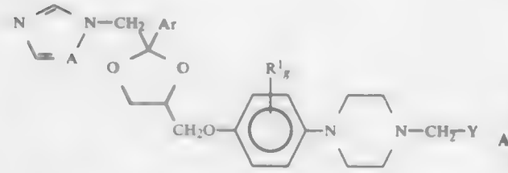
Filed Mar. 19, 1987, Ser. No. 28,193

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, [illegible]

Int. Cl.[4] A61K *31/505*; C07D *405/14*

U.S. Cl. 514—252 7 Claims

1. A compound of the formula I



in which

A denotes CH or N,

Ar denotes naphthyl, thienyl, halothienyl or a phenyl group which is unsubstituted or carries one to 3 substituents, where the substituents may be identical or different and denote F, Cl, Br, I, CF_3, OCH_3,OC_2H_5, CH_3, C_2H_5 or phenoxy,

R^1 denotes C_1–C_3-alkyl, F or Cl,

g denotes 0, 1 or 2 and

Y denotes one of the following heterocyclic radicals t,0781 in which

R^2 denotes H, C_1–C_8-alkyl, C_1–C_4-alkoxy, a phenyl group which is unsubstituted or carries 1 or 2 substituents, where the substituents may be identical or different and denote F, Cl, Br, I, CF_3, OCH_3, OC_2H_5, NO_2 or C_1–C_4-alkyl, or a phenyl-C_1–C_2-alkyl group which is unsubstituted or carries 1 or 2 substituents in the phenyl radical, where the substituents may be identical or different and denote F, Cl, Br, OCH_3 , OC_2H_5, CH_3 or C_2H_5, or, in the case of the radical a_1, additionally denotes C_1–C_4-alkylthio, or a benzylthio group which is unsubstituted or carries 1 or 2 substituents in the phenyl radical, where the substituents may be identical or different and denote F, Cl, OCH_3, OC_2H_5, CH_3 or C_2H_5,

R^3 denotes H, OH, Cl, C_1–C_4-alkoxy or a benzyloxy group which is unsubstituted or carries 1 or 2 substituents in the phenyl radical, where the substituents may be identical or different and denote note F, Cl, Br, OCH_3, OC_2H_5, CH_3 or C_2H_5, and, in the case of the heterocyclic radical a_1, additionally denotes C_1–C_4-alkyl or a phenyl group which is unsubstituted or substituted by one F, Cl, Br, OCH_3, OC_2H_5, CH_3 or C_2H_5 and, in the case of the heterocyclic radical b_1, additionally denotes C_1–C_4-alkyl or a phenyloxy group which is unsubstituted or carries 1 or 2 substituents, where the substituents may be identical or different and denote F, Cl, Br, OCH_3 , OC_2H_5, CH_3 or C_2H_5,

R^4 denotes H, Cl, Br, C_1–C_4-alkyl or CN,

R^5 denotes H, C_1–C_4-alkyl, prop-2-en-1-yl, prop-2-in-1-yl or benzyl,

P denotes 0 or 1, the phenylene radical in a_1, a_2 and c being bonded via the 2, 3 or 4 position,

R^6 denotes H, C_1–C_8-alkyl, (C_3–C_6-cycloalkyl)- C_1–C_3-alkyl, a phenyl group which is unsubstituted or carries 1 or 2 substituents, where the substituents may be identical or different and denote F, Cl, Br, I, OCH_3, OC_2H_5, 1,2——O—CH_2—O—, CF_3 or C_1–C_4-alkyl, a phenyl-C_1–C_2-alkyl group which is unsubstituted or substituted in the phenyl radical by OCH_3, OC_2H_5, 1,2—O—CH_2—O—, CF_3, F, Cl, or C_1–C_4-alkyl or CF_3,

R^7 and R^8 independently of one another, denote H, C_1–C_8-alkyl, C_1–C_4-alkoxy or a phenyl or benzyl group which is unsubstituted or carries 1 or 2 substituents in the phenyl radical, where the substituents may be identical or different and denote F, Cl, Br, OCH_3 or OC_2H_5, and where, in addition, R^7 may alternatively denote OH, and

R^9 denotes H, Cl, Br or CN,

and the physiologically acceptable acid-addition salts thereof.

7. A process for the treatment of mycosis which comprises administering to a host in need of such treatment an effective amount of at least one compound of the formula I as claimed in claim 1 or a phusiologically acceptable acid-addition salt thereof.

4,859,671

2-SUBSTITUTED 1,2-BENZISOTHIAZOL-3(2H)-ONE 1,1-DIOXIDE USEFUL AS AN ANXIOLYTIC AGENT

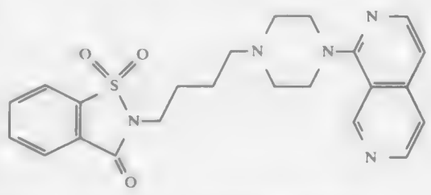
Amedeo A. Failli, Princeton Junction, N.J., assignor to American Home Products Corporation, New York, N.Y.

Filed Jul. 8, 1968, Ser. No. 216,922

Int. Cl.[4] A61K *31/495*; C07D *417/14*

U.S. Cl. 514—254 3 Claims

1. A compound having the formula



(I)

and the pharmaceutically acceptable salts thereof.

2. A method of treating anxiety which comprises administering to a patient suffering from anxiety an effective dosage of a piperazine having the formula (I) as defined in claim 1.

4,859,672

PYRIDO[2,3-D]PYRIMIDINONE AND IMIDAZO[4,5-B]PYRIMIDINONE

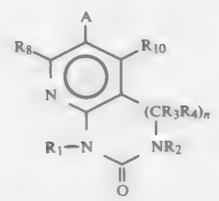
Alfred P. Spada, Ambler; Henry F. Campbell, Lansdale; Donald E. Kuhla, Doylestown; William L. Studt, Harleysville; William C. Faith, Ambler, and Bruce F. Molino, Hatfield, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Filed Oct. 29, 1986, Ser. No. 925,008

Int. Cl.[4] C07D *471/04*; A61K *31/55*

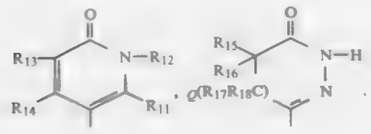
U.S. Cl. 514—254 17 Claims

1. A compound having the structure:



or a pharmaceutically acceptable salt thereof wherein:

A is



and R_1, R_2, R_3, R_4, R_8, R_{10}, R_{11}, R_{12}, R_{14}, R_{15}, R_{16}, R_{17}, R_{18}, R_{19}, R_{20}, R_{21}, R_{22}, R_{23} and R_{24} are H, lower alkyl of 1–4 carbon atoms or substituted phenyl lower alkyl of 1–4 carbon atoms;

wherein the substituted phenyl group is substituted by one or more of lower alkyl, lower alkoxy, amino, lower alkyl amino, lower alkyl mercapto, hydroxy, hydroxy lower alkyl, acetoxy, benzyloxy, phenoxy, lower alkyl sulfinyl or lower alkyl sulfonyl;

R_{13} is H, lower alkyl of 1–4 carbon atoms, alkoxy lower alkyl of 1–4 carbon atoms, hydroxy lower alkyl of 1–5 carbon atoms, amino, carbamoyl, cyano, lower allkyl carbamoyl of 1–4 carbon atoms, formyl, amino lower alkyl of 1–4 carbon atoms, carboxy, carbalkoxy, or tetrazolyl;

R_3 and R_4 together may form =0;

R_{16} and R_{17} together may form a carbon-carbon bond;

n is 0 or 1; and

Q is 0 or 1.

3. A pharmaceutical composition for increasing cardiac contractility in a human or other animal requiring such treatment comprising an effective inotropic amount of a compound according to claim 1 in admixture with a pharmaceutically acceptable carrier.

4,859,673

AMIDE DERIVATIVES AND ANTIALLERGIC AGENTS CONTAINING THE SAME

Makoto Takai, Hochioji; Kazuhiro Omori; Takahiro Kumonaka, both of Kawasaki; Shinji Ozawa, Tokyo, and Toshio Wakabayashi, Tama, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

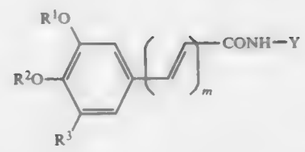
Filed Apr. 23, 1987, Ser. No. 41,441

Claims priority, application Japan, Apr. 28, 1986, 61-96638

Int. Cl.[4] C07D *405/00, 211/22, 211/56, 413/00*

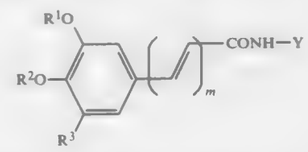
U.S. Cl. 514—255 5 Claims

1. A compound of the formula (I)



(I)

wherein R^1 and R^2 may be the same or different and each represents a lower alkyl group, a benzyl group, a tetrahydrofuranyl group, a lower alkoxy (lower)alkyl group or a lower alkoxycarbonyl group, R^3 represents a hydrogen atom or a lower alkoxy group, m represents an integer of 1 or 2 and Y represents a group of the formula (II), (III), or (IV).



(I)

wherein X^1 and X^2 may be the same or different and each represents a hydrogen atom a halogen atom or a lower alkoxy group, n, p and q each represents an integer of 1 to 4, provided that when R^1 and R^2 may be the same or different and each represents a lower alkyl group or a lower alkoxycarbonyl/-group, Y does not represent a group of the above formula (II) or (III).

5. A method for the therapy of allergic conditions having a passive cutaneous anaphylaxis reaction which comprises administering to animals an antiallergic effective dose of the compound of claim 1.

4,859,674

PYRAZINE IN PREVENTION AND TREATMENT OF STROKES

David Baskin, Houston, and Dominic M. K. Lam, The Woodlands, both of Tex., assignors to Houston Biotechnology Incorporated, The Woodlands, Tex.

Continuation of Ser. No. 62,109, Jun. 12, 1987, abandoned. This application Aug. 3, 1988, Ser. No. 228,827

Int. Cl.[4] A61K *31/495*

U.S. Cl. 514—255 6 Claims

1. A method for diminishing the ischemic deficits as a result of stroke and enhancing survival, said method comprising:

administering to a mammalian host as a single bolus an effective amount of a tetramethylpyrazine to enhance the blood flow to the brain of said host; and

continuing administration of said tetramethylpyrazine for at least one additional hour by continuous infusion or repetitive administration while maintaining the blood level at at least an effective amount of tetramethylpyrazine to maintain an enhanced blood flow to the brain.

4,859,675

1-[2-(PHENYLMETHYL) PHENYL]PIPERAZINES AS ANTIDEPRESSANTS

Rafael Foguet; Ernesto Forne; Aurelio Sacristan, and José A. Ortiz, all of Barcelona, Spain, assignors to Ferrer Internacional S.A., Barcelona, Spain

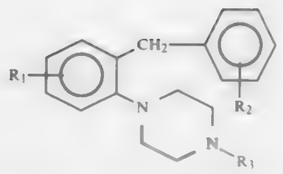
Filed Jun. 15, 1988, Ser. No. 207,375

Claims priority, application Spain, Jul. 29, 1987, 8702460

Int. Cl.[4] A61K *31/495*; C07D *295/02*

U.S. Cl. 514—255 5 Claims

1. An 1-[2-phenylmethyl)phenyl]piperazine of the formula (I):



(I)

or a pharmaceutically acceptable acid addition salt thereof, wherein R_1 is hydrogen, C_{1-4} alkylor halogen, R_2 is hydrogen, C_{1-4} alkyl, halogen or C_{1-4} alkoxy and R_3 is hydrogen or methyl.

5. A pharmaceutical composition comprising a compound of claim 1 in a therapeutically effective amount sufficient to act as an antidepressive with pharmaceuticallt acceptable additives.

4,859,676

2-OXO-1-SULFONYL PYRAZOLO(1,5-A) PYRIMIDINE-6-CARBOXYLIC ACID ESTERS

Karnail Atwal, Cranbury, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 19, 1988, Ser. No. 145,004

Int. Cl.[4] C07D *487/04*

U.S. Cl. 514—258 **5 Claims**

1. A compound having the formula

or a pharmaceutically acceptable salt thereof wherein

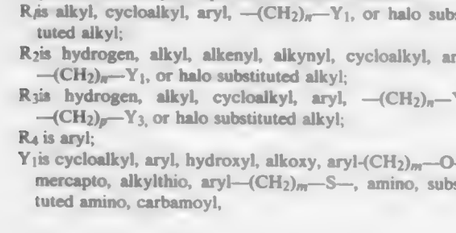
R_1 is alkyl, cycloalkyl, aryl, $-(CH_2)_n-Y_1$, or halo substituted alkyl;

R_2 is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, $-(CH_2)_n-Y_1$, or halo substituted alkyl;

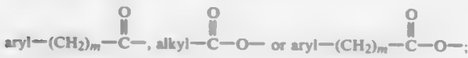
R_3 is hydrogen, alkyl, cycloalkyl, aryl, $-(CH_2)_n-Y_2$, $-(CH_2)_p-Y_3$, or halo substituted alkyl;

R_4 is aryl;

Y_1 is cycloalkyl, aryl, hydroxyl, alkoxy, aryl-$(CH_2)_m$—O—, mercapto, alkylthio, aryl—$(CH_2)_m$—S—, amino, substituted amino, carbamoyl,



(substituted amino)—C—, carboxyl, alkoxycarbonyl, alkyl—C—,



aryl—$(CH_2)_m$—C—, alkyl—C—O— or aryl—$(CH_2)_m$—C—O—;

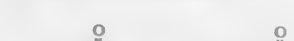
Y_2 is cycloalkyl, aryl, carbamoyl,

(substituted amino)—C—, carboxyl, alkoxycarbonyl,



alkyl—C—, or aryl—$(CH_2)_m$—C—;

Y_3 is hydroxyl, alkoxy, aryl—$(CH_2)_m$—O—, mercapto, alkylthio aryl—$(CH_2)_m$—S—,



alkyl—C—O—, aryl—$(CH_2)_m$—C—O—,

amino or substituted amino;

m is 0 or an integer of 1 to 6;

n is an integer of 1 to 6; and

p is an integer of 2 to 6;

wherein the terms "alkyl" and "alkoxy" refer to both straight and branched chain groups having 1 to 8 carbon atoms;

the term "halo substituted alkyl" refers to alkyl groups in which one or more hydrogens have been replaced by chloro, bromo or fluoro groups;

the term "aryl" refers to phenyl and substituted phenyl wherein the substituents are 1,2 or 3 groups independently selected from alkyl, alkoxy, allkylthio, halo, nitro cyano, trifluoromethyl, and difluoromethoxy;

the terms "alkenyl" and "alkynyl" refer to both straight and branched chain groups having 2 to 8 carbon atoms;

the term "cycloalkyl" refers to those groups having 3, 4, 5, 6 or 7 carbon atoms;

the term "halo" refers to chloro, bromo, fluoro and iodo;

the term "substituted amino" refers to a group of the formula $-NZ_1Z_2$ wherein Z_1 is hydrogen, alkyl, or aryl—$(CH_2)_m$—and Z_2 is alkyl or aryl—$(CH_2)_m$— or Z_1 and Z_2 taken together with the nitrogen atom to which they are attached are 1-pyrrolidinyl, 1-piperidinyl, 1-azepinyl, 4-morpholinyl, 4-thiamorpholinyl, 1-piperazinyl, 4-alkyl-1-piperazinyl, 4-arylalkyl-1-piperazinyl, 4-diarylalkyl-1-piperazinyl, or 1-pyrrolidinyl, 1-piperidinyl, or 1-azepinyl substituted with alkyl, alkoxy, alkylthio, halo, trifluoromethyl or hydroxy.

4,859,677

NUCLEOSIDE ANALOGUES HAVING ANTIVIRAL ACTIVITY

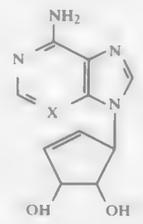
Ronald T. Borchardt, and David R. Borcherding, both of Lawrence, Kans., assignors to University of Kansas, Lawrence, Kans.

Filed Apr. 17, 1987, Ser. No. 39,511

Int. Cl.[4] A61K *31/52, 31/435;* **C07D** *473/34, 471/02*

U.S. Cl. 514—261 **16 Claims**

1. A compound of the formula (I)



(I)

wherein X is =N— or =CH— or a physiologically acceptable salt or solvate thereof.

5. An antiviral composition comprising an effective antiviral amount of the compound of claim 1, and a pharmaceutically effective carrier.

4,859,678

N-OXIDE ERGOLINES AS ANTIHYPERTENSIVE AGENTS

Sergio Mantegani, Milan; Enzo Brambilla, Mariano Comense; Aldemio Temperilli; Daniela Ruggieri, both of Milan, and Patricia Salvati, Arese, all of Italy, assignors to Farmitalia Carlo Erba, Milan, Italy

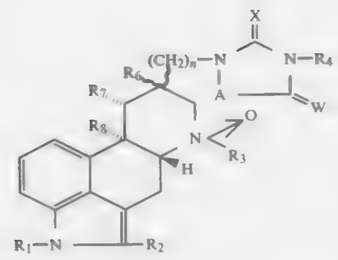
Filed Jun. 21, 1988, Ser. No. 210,420

Claims priority, application United Kingdom, Jun. 24, 1987, 8714767

Int. Cl.[4] A61K *31/505, 31/48;* **C07D** *403/14, 457/08*

U.S. Cl. 514—269 **7 Claims**

1. An ergoline compound of the formula I:



I

wherein R_1 represents hydrogen or a methyl group; R_2 represents hydrogen or a halogen atom, a methyl, cyano or phenyl group or an alkylthio group having from 1 to about 4 carbon atoms; R_3 represents a hydrocarbon group having from 1 to about 4 carbon atoms; R_4 represents hydrogen, a phenyl group or a hydrocarbon group having from 1 to about 4 carbon atoms; wherein either (a) each of R_6 and R_7 represents a hydrogen atom or, taken together R_6 and R_7 represent a valence bond and R_8 represents a hydrogen atom or a methoxy group, or (b) R_6 represents a hydrogen atom and R_7 and R_8 taken together represent a valence bond; W represents an oxygen atom or an imino group; A represents a group of the formula CHR_5, $CH{=}CR_5$ or CH_2CHR_5 wherein R_5 represents a hydrogen atom or an alkyl group having from 1 to about 4 carbon atoms; X represents an oxygen or sulphur atom or an imino group; and n is 0, 1 or 2; or a pharmaceutically acceptable salt thereof.

6. A method of treating hypertension in a mammal, which comprises administering to said mamman an effective amount of one or more of the compounds of claim 1.

4,859,679

ANTIULCER (ALKYLDITHIO) QUINOLINE DERIVATIVES

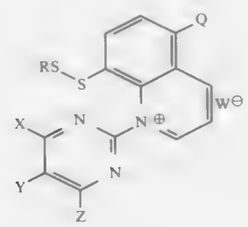
Conrad Santini, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jul. 19, 1988, Ser. No. 221,167

Int. Cl.[4] A61K *31/505;* **C07D** *239/34, 239/52, 239/42*

U.S. Cl. 514—273 **12 Claims**

1. A compound of the formula



(I)

wherein

$W^{\ominus}$ is a pharmaceutically-acceptable anion;

R is $(C_1–C_5)$alkyl or benzyl;

Q is H, F, Cl, NO_2, $(C_1–C_5)$alkyl, CF_3, $(C_1–C_5)$alkoxy or $(C_2–C_4)$alkanoylamino;

X is H, $(C_1–C_5)$alkyl or $(C_1–C_5)$alkoxy;

Y is H, F, Cl, Br, $(C_1–C_5)$alkyl or $(C_1–C_5)$alkoxy; and

Z is H, $(C_1–C_5)$alkyl, $(C_5–C_7)$cycloalkyl, $(C_1–C_5)$alkoxy, $(C_5–C_7)$cycloalkoxy, phenoxy or benzyloxy.

4,859,680

PYRIMIDINE DERIVATIVES AS ANTIVIRAL COMPOUNDS

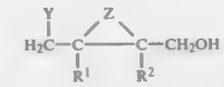
Wallace T. Ashton, Clark, N.J.; Edward Walton, Sun City West, Ariz., and Richard L. Tolman, Warren, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 889,014, Jul. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 598,612, Apr. 10, 1984, Pat. No. 4,617,304. This application Feb. 4, 1988, Ser. No. 157,076

Int. Cl.[4] A61K *31/505;* **C07D** *239/10*

U.S. Cl. 514—274 **8 Claims**

1. A compound of the formula



and the pharmaceutically acceptable salts thereof wherein Y is a member selected from the group consisting of uracil, cytosine, and thymine; R^1 is selected from hydrogen and alkyl of 1 to 4 carbon atoms; R^2 is selected from hydrogen, alkyl of 1 to 4 carbon atoms, and $—CH_2OH$; and Z is $>CH_2$ or $>O$.

6. A method of treating virus infections selected from the group consisting of the herpes family and RNA viruses consisting of influenza and retroviruses in mammals comprising administering to a mammal in need of such treatment an effective amount of a compound of claim 1.

4,859,681

17 α-ACYL-4-AZA-5A-ANDROST-1-EN-3-ONES AS 5 ALPHA-REDUCTASE INHIBITORS

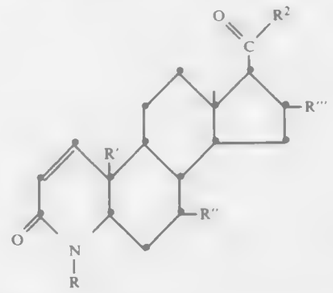
Gary H. Rasmusson, Watchung, and Glenn F. Reynolds, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 800,624, Nov. 21, 1985, abandoned, which is a continuation of Ser. No. 584,061, Feb. 27, 1984, abandoned. This application Dec. 3, 1987, Ser. No. 129,335

Int. Cl.[4] A61K *31/58;* **C07J** *73/00*

U.S. Cl. 514—284 **11 Claims**

1. A compound of the formula:



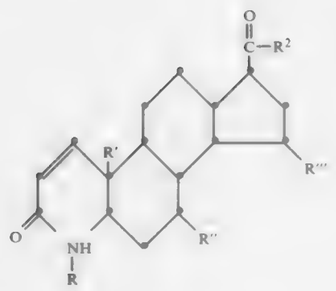
wherein

R is selected from hydrogen, methyl and ethyl and

R_2 is branched chain alkyl of from 3–12 carbons,

R', R'', R''' are each selected from hydrogen and methyl.

8. A method of inhibiting testosterone 5α-reductase in a patient in need of such inhibiting treatment, comprising administration to such a patient of a therapeutically effective amount of a compound of the formula:



wherein
R and R^2 are defined as in claim 1,
R′ is hydrogen or methyl,
R″ is hydrogen or β-methyl,
R‴ is hydrogen, α-methyl or β-methyl.

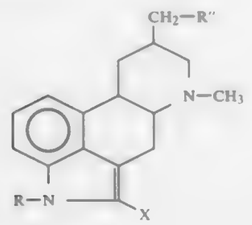
4,859,682

2-HALOGENATED-8- AND 1,8-SUBSTITUTED ERGOLENES

Tibor Keve; Gábor Megyeri; Stefkó Béla; Lajos Kovács, Jr.; Anna Kassai née Zieger, all of Budapest; Béla Kiss, Vecsés; István Laszlovszky, Budapest; Erzsébet Lapis, Budapest; Éva Pálosi, Budapest; Dóra Groó, Budapest, and László Szporny, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Apr. 21, 1987, Ser. No. 40,938
Claims priority, application Hungary, Apr. 25, 1986, 1719/86
The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.
Int. Cl.[4] A61K *31/44;* **C07D** *457/02*
U.S. Cl. 514—288 **6 Claims**

1. A compound of the Formula (I)



wherein
X is chloro, bromo or iodo;
R is C_1 to C_4 alkyl; and
R″ is hydroxyl; or
R and R′ are identical and are each C_1 to C_6 alkanoyl, benzoyl, naphthoyl, phenylacetyl, 3-phenylpropionyl, picoloyl, furoyl, nicotinoyl, isonicotinoyl, trimethoxybenzoyl, 4-chlorobenzoyl, 2-chlorobenzoyl, or pyroglutamyl; and
R″ is halogen or an —OR′ group; or
R is formyl;
R″ is is an —OR′ group; and
R′ is as defined above; and the dotted lines indicate a double bond between the 8–9 or 9–10 positions; or a pharmaceutically acceptable acid addition salt thereof.

6. A method of treating a patient with a psychiatric disease responsive to a dopaminergic antagonistic effect which comprises the step of administering to said patient a therapeutically effective amount of the compound of the Formula (I) as defined in claim 1 or a pharmaceutically acceptable acid addition salt thereof.

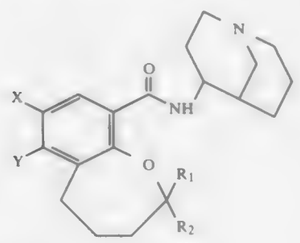
4,859,683

CERTAIN BENZOXEPINS AND THEIR PHARMACEUTICAL COMPOSITIONS AND METHODS

Raymond Youssefyeh, Princeton Junction, N.J.; Scott I. Klein, Audubon, Pa.; Henry F. Campbell, North Wales, Pa., and Donald E. Kuhla, Doylestown, Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Filed Feb. 4, 1988, Ser. No. 152,192
Int. Cl.[4] A61K *31/44;* **C07D** *471/08*
U.S. Cl. 514—299 **14 Claims**

1. A compound of the formula: where:



where
X is hydrogen or halo;
Y is hydrogen, amino or loweralkylamino;
R_1 and R_2 are independently hydrogen or loweralkyl; and pharmaceutically acceptable salts thereof.

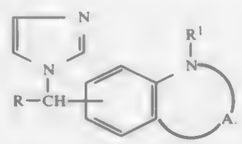
4,859,684

(1H-IMIDAZOL-1-YLMETHYL) SUBSTITUTED BENZIMIDAZOLE DERIVATIVES AND USE THEREOF IN TREATING ANDROGEN DEPENDENT DISORDERS

Alfons H. M. Raeymaekers, Beerse; Eddy J. E. Freyne, Rumst, both of Belgium, and Gerard C. Sanz, Garges les Gonesse, France, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 907,903, Sep. 15, 1986, abandoned. This application Jul. 27, 1987, Ser. No. 78,435
Int. Cl.[4] C07D *487/00, 417/00, 401/00, 215/12*
U.S. Cl. 514—314 **20 Claims**

1. A chemical compound having the formula



(I)

or pharmaceutically acceptable acid addition, metal or amine substitution salt or a stereochemically isomeric form thereof, wherein
R is hydrogen; C_{1-10}alkyl; C_{3-7}cycloalkyl; Ar^1 or Ar^1-C_{1-6}alkyl;
R^1 is hydrogen; C_{3-7}cycloalkyl; Ar^1; C_{1-10}alkyl; C_{1-6}alkyl substituted with Ar^1 or C_{3-7}cycloalkyl; hydroxy; C_{1-10}alkyloxy; C_{1-6}alkyloxy substituted with Ar^1 or C_{3-7}cycloalkyl; C_{3-6}alkenyloxy optionally substituted with Ar^2; C_{3-6}alkynyloxy optionally substituted with Ar^2; or Ar^1-oxy;
A is a bivalent radical having the formula

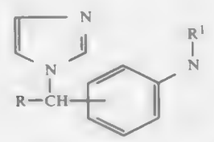
$-CR^2{=}N-$ or (a)



(b)

wherein the carbon atom in the bivalent radical (a) or (b) is connected to $-NR^1$;
said R^2 being hydrogen; halo; C_{1-4}alkyl substituted with up to 4 halo atoms; C_{3-7}cycloalkyl; Ar^1; quinolinyl; indolinyl; C_{1-10}alkyl; C_{1-6}alkyl substituted with Ar^1, C_{3-7}cycloalkyl, quinolinyl, indolinyl or hydroxy; C_{1-10}alkyloxy; C_{1-6}alkyloxy substituted with Ar^1 or C_{3-7}cycloalkyl; C_{3-6}alkenyl optionally substituted with Ar^1; Ar^2-oxy; C_{1-6}alkyloxycarbonyl; carboxyl; C_{1-6}alkylcarbonyl; Ar^1-carbonyl or Ar^1—(CHOH)—;
said X being O or S;
said R^3 being hydrogen, C_{1-6}alkyl or Ar^2-C_{1-6}alkyl;
Ar^1 is phenyl, substituted phenyl, pyridinyl, aminopyridinyl, imidazolyl, thienyl, halothienyl, furanyl, halofuranyl or thiazolyl;
Ar^2 is phenyl or substituted phenyl;
in Ar^1 and Ar^2 said substituted phenyl being phenyl substituted with 1 or 2 substituents each independently selected from halo, hydroxy, trifluoromethyl, C_{1-6}alkyl, C_{1-6}alkyloxy, cyano, amino, mono- and di(C_{1-6}alkyl)amino, nitro, carboxyl, formyl and C_{1-6}alkyloxycarbonyl.

13. A method of treating mammals suffering from androgen dependent disorders, said method comprising the systemic administration to said mammals of an amount effective to treat androgen dependent disorders of a compound having the formula



(I)

A.

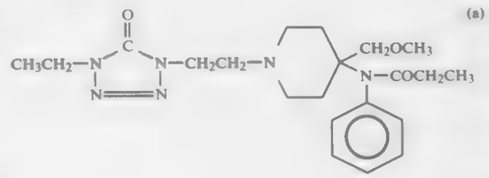
4,859,685

ANESTHETIC COMPOSITION AND METHOD OF USING THE SAME

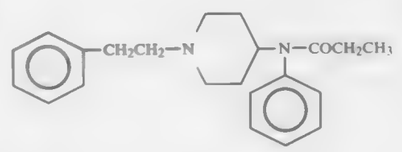
Thomas P. Jerussi, Berkeley Heights; John F. Capacchione, Westfield, and Mark J. Benvenga, West Orange, all of N.J., assignors to BOC, Inc., New Providence, N.J.

Filed Aug. 13, 1986, Ser. No. 896,039
Int. Cl.[4] A61K *31/445*
U.S. Cl. 514—329 **21 Claims**

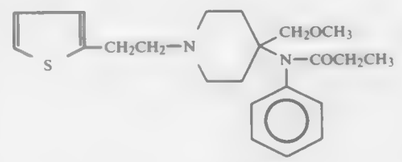
1. An injectable pharmaceutical composition for inducing and maintaining anesthesia without muscle rigidity comprising:
(A) an anesthetic effective amount of at least one substituted N-(4-piperidinyl)-N-amide selected from the group consisting of



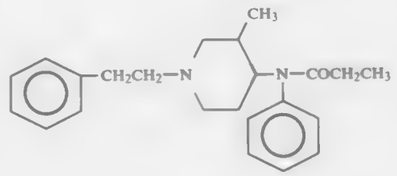
(a)



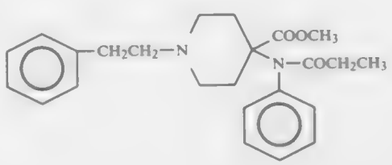
(b)



(c)

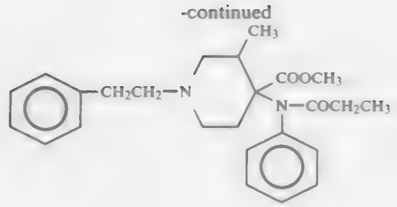


(d)

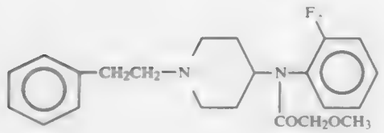


(e)

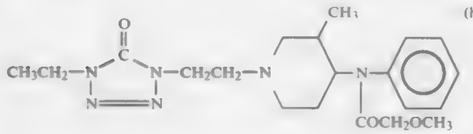
-continued



(f)



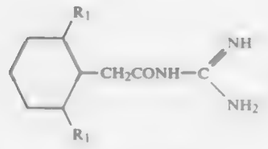
(g)



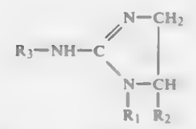
(h)

or pharmaceutically acceptable salts thereof.

(B) a muscle rigidity inhibiting effective amount of at least one alpha-2 adrenergic agonist selected from the group consisting of guanabenz alpha-methyl DOPA, compounds of the formula



wherein R_1 is chlorine or methyl, and substituted 2-(phenylamino)-1,3-diazacyclopentenes-(2) having the formula



wherein R_1 and R_2 are each independently selected from the group consisting of hydrogen, methyl and ethyl and R_3 is selected from the group consisting of trifluoromethyl-phenyl; 2,6-dichloro-phenyl; 2-chloro-6-methyl-phenyl; 2-methyl-4-chloro-phenyl; 2-chloro-4-methyl-phenyl; 2-chloro-4-ethyl-phenyl; 2-chloro-6-ethyl-phenyl; 2-chloro-4-tert. butyl-phenyl; 2,6-dichloro-4-methyl-phenyl; 2,4-dichloro-6-methyl-phenyl; 2-4-dimethyl-6-chlorophenyl; 2,6-dimethyl-4-chloro-phenyl; and pharmaceutically acceptable acid addition salts thereof; and

(C) a pharmaceutically acceptable carrier.

4,859,686

DIHYDROPYRIDINE ANTI-ALLERGIC AND ANTI-INFLAMMATORY AGENTS

Kelvin Cooper, Deal; John Steele, Sandwich, and Kenneth Richardson, Birchington, all of England, assignors to Pfizer Inc., New York, N.Y.

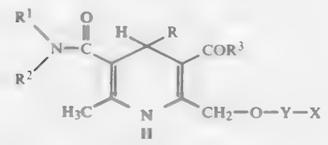
Filed Jan. 6, 1989, Ser. No. 294,322

Claims priority, application United Kingdom, Feb. 19, 1988, 8803963

Int. Cl.[4] C07D *401/14;* A61K *31/41*

U.S. Cl. 514—330 **7 Claims**

1. A compound having the formula:-



(I)

or a pharmaceutically acceptable salt thereof,

wherein R is chlorophenyl; R^1 is pyridyl or alkyl having one to six carbon atoms; R_2 is hydrogen; R_3 is alkoxy having one to three carbon atoms; Y is alkylene having two to four carbon atoms; and X is triazolo[2,3-a]pyrid-2-yl or 1,2,4-triazolyl optionally monosubstituted or disubstituted by a substituent selected from methyl or phenyl.

4,859,687

SUBSTITUTED 1,3-DIOXOLANE COMPOUNDS AND THEIR USE AS FUNGICIDES

Peter Riebli, Buckten, Switzerland, assignor to Ciba-Giegy Corporation, Ardsley, N.Y.

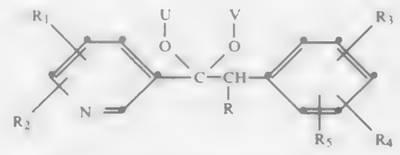
Continuation of Ser. No. 610,726, May 16, 1984, abandoned. This application Feb. 20, 1986, Ser. No. 833,503

Claims priority, application Switzerland, May 19, 1983, 2729/83

Int. Cl.[4] C07D *405/06;* A61K *31/44*

U.S. Cl. 514—336 **11 Claims**

1. A compound of the formula



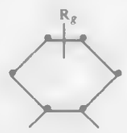
or an acid addition salts thereof, wherein

R is hydrogen, C_1–C_6-alkyl, C_3–C_6-cycloalkyl, phenyl, benzyl, phenyl substituted by C_1–C_4alkyl, halogen, C_1–C_4-alkoxy, NO_2 or CF_3, or benzyl substituted by C_1–C_4-alkyl, halogen, C_1–C_4-alkoxy, NO_2 and/or CF_3,

R_1 and R_2 independently of one another are each hydrogen, C_1–C_4-alkyl, halogen or C_1–C_4-alkoxy,

R_3, R_4 and R_5 independently of one another are each hydrogen, halogen, CF_3, NO_2, C_1–C_4-alkyl, C_1–C_4-alkoxy, phenyl, or phenyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, NO_2 or CF_3,

U and V together form the following alkylene bridge



in which R_g is hydrogen or C_1–C_4-alkyl.

4,859,688

METHOD FOR THE TREATMENT AND PREVENTION OF ARTERIOSCLEROSIS WITH NITROPHENYL SUBSTITUTED DIHYDROPYRIDINES

Isamu Yamaguchi, Ibaraki, and Jiro Hirosumi, Tokyo, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

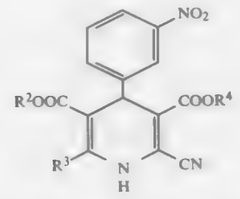
Continuation-in-part of Ser. No. 801,842, Nov. 26, 1985, abandoned. This application Mar. 30, 1987, Ser. No. 31,746

Claims priority, application United Kingdom, Dec. 10, 1984, [illegible]

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—344 **2 Claims**

1. A method for the treatment of arteriosclerosis in mammals, which comprises administering a dihydropyridine compound of the formula:



in which R^2, R^3 and R^4 are each C_1–C_4 alkyl, or a pharmaceutically acceptable salt thereof, to said mammal in need of treatment in an effective antiarteriosclerotic dosage of 0.01–20 mg/kg single dose to a level of 0.5–1000 mg daily dose.

4,859,689

SYNERGISTIC FUNGICIDAL COMPOSITION COMPRISE A BENZIMIDAZOLE COMPOUND, AN ALKYL PYRIDINIUM SALT, AND A CARRIER AND THE USE THEREOF TO COMBAT FUNGI

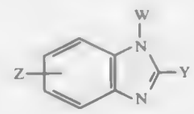
George S. Puritch, Brentwood Bay, and Edward S. Kondo, Orleans, both of Canada, assignors to Safer, Inc., Newton, Mass.

Filed Oct. 31, 1986, Ser. No. 925,180

Int. Cl.[4] A01N *43/40, 43/52, 47/30*

U.S. Cl. 514—358 **21 Claims**

1. A fungicidal composition comprising: A) a fungicidal amount of (i) a benzimidazole compound of the following formula:

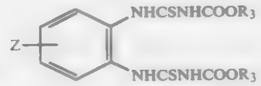


wherein

W represents a hydrogen or lower alkyl carbamoyl

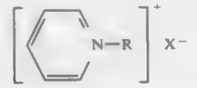
Y represents a thiazolyl, dihydrothiazolyl, tetrahydrothiazolyl or furyl group, and

Z represents hydrogen or halogen or a lower alkyl, or an acid addition salt of the benzimidazole compound or (ii) a benzimidazole-related compound of the formula:



wherein R_3 represents C_{1-2} aklyl, and

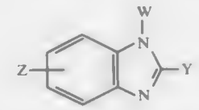
Z represents a hydrogen or halogen atom or a lower alkyl group, and B) an alkyl pyridinium salt of the formula:



wherein R represents alkyl containing 8 to 20 carbon atoms and X^- represents a monovalent anion in an amount sufficient to enhance the effectivenes of the fungicidal activity of said benzimidazole compound, and a carrier.

10. A method of combatting fungi, which comprises applying to fungi or habitats thereof,

(A) a fungicidally effective amount of (i) a benzimidazole compound of the formula

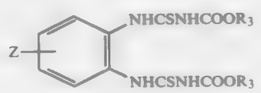


wherein

W represents a hydrogen or a lower alkyl carbamoyl,

Y represents a thiazolyl, dihydrothiazolyl, tetrahydrothiazolyl or furyl group, and

Z represents hydrogen or halogen or a lower alkyl radical, or an acid addition salt of the benzimidazole compound or (ii) a benzimidazole-related compound of the formula:

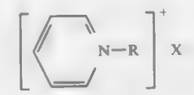


wherein

R_3 represents a C_{1-2} alkyl, and

Z represents hydrogen or halogen or a lower alkyl, and

(B) an alkyl pyridinium salt of the formula



wherein R represents alkyl containing 8 to 20 carbon atoms and X^- represents a monovalent anion in an amount sufficient to enhance the effectiveness of the fungicidal activity of said fungicidal component (A).

4,859,690

THERAPEUTIC VIRGINIAMYCIN M_1 ANALOGS

Yiu-kuen T. Lam, Plainsboro, N.J.; Raymond S. Chang, Lansdale, Pa.; Otto D. Hensens, Red Bank; Cheryl D. Schwartz, Westfield, both of N.J., and Deborah L. Zink, Manalapan, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 21, 1986, Ser. No. 934,212

Int. Cl.[4] A61K *31/42*

U.S. Cl. 514—375 **7 Claims**

1. A method of treating cholecystokinin and gastrin induced gastrointestinal disorders in mammals which comprises administering a pharmaceutically effective amount of virginiamycin M_1.

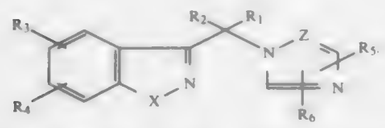
4,859,691

CERTAIN 1,2-BENZISOXAZOLE DERIVATIVES

Robert M. Bowman, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 8, 1987, Ser. No. 71,124
Int. Cl.[4] A61K *31/42*; C07D *413/06*
U.S. Cl. 514—379 24 Claims

1. A compoound of the formula



(I)

wherein X represents oxygen; Z represents carbon (CH) so as to complete the imidazol-1-yl ring radical or Z represents nitrogen (N) so as to complete the 1,2,4-triazol-1-yl ring radical; R_1 represents hydrogen, lower alkenyl, lower alkynyl, carbocyclic aryl-lower alkyl or lower alkyl; R_2 represents hydrogen, lower alkenyl, lower alkynyl, aryl-lower alkyl or lower alkyl; or R_1 and R_2 combined represent C_1–C_6-alkylene; or R_1 combined with R_5 located on the 2-carbon atom of the imidazolyl radical represents C_2C_4 alkylene; R_3 and R_4 independently represent hydrogen, lower alkyl, C_5–C_7-cycloalkyl, halogen, trifluoromethyl, cyano, nitro, amino, hydroxy, lower alkanoyloxy, carbocyclic aroyloxy, lower alkoxy or carbocyclic aryl; or R_3 and R_4, together when located on adjacent carbon atoms, represent lower alkylenedioxy; or R_3 and R_4, together when located on adjacent carbon atoms, represent 1,3-butadienylene or C_3–C_5-alkylene to form with the carbon atoms to which such is attached a benzo-fused or C_5–C_7-cycloalka-fused ring, respectively; R_5 located on carbon represents hydrogen, lower alkyl or hydroxy-lower alkyl; R_6 located on carbon represents hydrogen or lower alkyl; or when Z represents carbon, R_5 located on the Z-carbon atom combined with R_6 located on the adjacent carbon atom represents C_3–C_5-alkylene; carbocyclic aryl within the above definitions represents phenyl or phenyl substituted by lower alkyl, lower alkoxy, trifluoromethyl or halogen; carbocyclic aroyloxy represents benzoyloxy, benzoyloxy substituted on the phenyl ring by trifluoromethyl, lower alkyl, halogen or lower alkoxy, or a pharmaceutically acceptable salt thereof.

18. A method of treating convulsions in mammals comprising the administration to a mammal in need thereof of an anticonvulsant effective amount of a compound of claim 1 or of a pharmaceutical composition comprising a said compound.

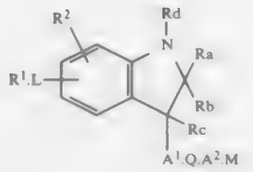
4,859,692

HETEROCYCLIC AMIDE DERIVATIVES AND PHARMACEUTICAL USE

Peter R. Bernstein, Wallingford, Pa.; Frederick J. Brown, Newark; Victor G. Matassa, Wilmington, both of Del., and Ying Kwong Yee, Kennett Square, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Filed Apr. 16, 1986, Ser. No. 852,798
Claims priority, application United Kingdom, Apr. 17, 1985, 85/09882; Oct. 17, 1985, 85/25658
Int. Cl.[4] A61K *31/40*; C07D *209.18*
U.S. Cl. 514—381 17 Claims

1. A compound of formula Ia



Ia

wherein

Ra is hydrogen or (1–4C)alkyl;

Rb and Rc are each hydrogen or, together with the existing carbon to carbon bond, form an unsaturated linkage;

Rd is hydrogen or (1–10C)alkyl optionally containing one or two double or triple bonds and in which a carbon atom may optionally be replaced by oxygen or sulphur, said (1–10C)alkyl additionally optionally bearing a substituent selected from a group consisting of (1–4C)alkoxy, cyano, carboxy, 1H-tetrazol-5-yl, carbamoyl, N-(1–4C)carbamoyl, N,N-dicarbamoyl, and (1–4C)alkoxycarbonyl, or Rd is selected from a group consisting of (3–8C)cycloalkyl, (3–8C)cycloalkyl-(1–4C)alkyl, (2–6C)alkanoyl and phenyl-(1–4C)alkyl, the phenyl moiety of which may optionally bear a substituent selected from a grou consisting of cyano, halogeno, (1–4C)alkyl, (1–4C)alkoxy and trifluoromethyl;

the group R^1.L— stands for amidic radicals of the formula: R^1.W.CO.— NH— or R^1.W.CS.NH—, in which R^1 is selected from a group consisting of (a) (2–10C)alkyl optionally containing 1 or more fluorine substituents: (b) phenyl-(1–6C)alkyl in which the (1–6C)alkyl moiety may optionally bear a fluoro or (1–4C)alkoxy substituent and in which the phenyl moiety may optionally bear a substituent selected from a group consisting of halogeno, (1–4C)alkyl, (1–4C) alkoxy and trifluoromethyl; and (c) (3–8C)cycloalkyl or (3–8C)cycloalkyl-(1–6C)alkyl, the cyclic moiety of any of which optionally may contain one unsaturated linkage and may optionally bear 1 or 2 (1–4C)alkyl substituents;

W is oxy, thio, imino or a direct link to R^1;

R^2 is hydrogen, halogeno, (1–4C)alkyl or (1–4C)alkoxy;

Q is a phenylene optionally bearing 1 or more substituents independently selected from a group consisting of halogeno, hydroxy, (1–4C)alkyl, (1–4C)alkoxy and trifluoromethyl;

A^1 is (1–2C)alkylene or vinylene;

A^2 is methylene, vinylene or a direct link to M; and

M is an acidic group selected from a group consisting of carboxy, 1H-tetrazol-5-yl and an acylsulphonamide residue of the formula —CO.NH.SO_mR[3] in which m is the integer 1 or 2 and R^3 is selected from a group consisting of (1–6C)alkyl, (3–8C)cycloalkyl, (6–12C)aryl, heteroaryl comprising 5–12 atoms at least one of which is carbon and at least one of which is selected from a group consisting of oxygen, sulfur and nitrogen, and (6–12C)aryl-(1–4C)alkyl, in any of which the aromatic or heteroaromatic moiety may bear 1 or 2 substituents selected from a group consisting of halogeno, (1–4C)alkyl, (1–4C)alkoxy, trifluoromethyl, nitro and amino;

or a pharmaceutically acceptable salt thereof.

14. A method for antagonizing one or more of the actions of leukotrienes in a living mammal comprising administering to said mammal an effective amount of a compound claimed in claim 1.

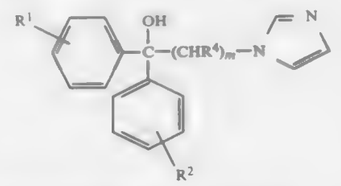
4,859,693

ANTIINFLAMMATORY CARBINOLOIMIDAZOLES

Douglas G. Batt, Wilmington, Del.; Richard S. Greenberg, Wayne, N.J., and Richard R. Harris, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 10, 1988, Ser. No. 230,448
Int. Cl.[4] A61K *00/00*
U.S. Cl. 514—397 10 Claims

1. A topical pharmaceutical composition consisting essentially of a suitable pharmaceutical carrier and an antiinflammatory amount of a compound of the formula:



(I)

or a pharmaceutically accetable salt thereof,

wherein R^1 and R^2 independently are H, F, Cl, Br, CH_3, CF_3 or $S(O)_nR^3$ where n is 0, 1 and 2 and R^3 is alkyl of 1–4 carbon atoms;

R^4 is H or alkyl or 1–4 carbon atoms with the proviso that R^4 is H when m is 2 or 3; and

m is 1 to 3.

4,859,694

METHOD FOR TREATING HOOF THRUSH AND HOOF ROT

Frederick M. Pavlich, 300 Crestview Dr., Fox River Grove, Ill. 60021

Filed Feb. 10, 1988, Ser. No. 154,787
Int. Cl.[4] A61K *31/415*
U.S. Cl. 514—398 13 Claims

1. A method of treating hoof thrush in a horse or hoof rot in a sheep, goat or cow comprising topically administering a therapeutically effective amount of metronidazole in a carrier directly on a thrush or hoof rot infected area for a treatment period effective to cure the thrush or hoof rot infection.

4,859,695

ANTIESTROGEN AGENTS HAVING ANABOLIC ACTIVITY IN ANIMALS

Gaylord E. McKissick, Bridgewater, and Roger M. Weppelman, Scotch Plains, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 10, 1986, Ser. No. 872,738
Int. Cl.[4] A23K *1/165*
U.S. Cl. 514—408 1 Claim

1. A method of enhancing growth and feed conversion in animals which comprises administering from 1 to 100 ppm in the animal's feed of an antiestrogen agent selected from nafoxidine hydrochloride (1-[2-[P-(3,4-dihydro-6-methoxy-2-phenyl-1-naphthyl)phenoxy]ethyl]pyrrolidine hydrochloride); nitromefene citrate 1-[2-[P-[α-P-methoxyphenyl)-β-nitrostyryl]-phenoxy]ethyl]pyrrolidine citrate); trioxefene mesylate (3,4-dihydro-2-(p-methoxyphenyl)-1-naphthyl p-[2-(1-pyrrolidinyl]phenyl ketone methanesulfonate).

4,859,696

PRECUTANEOUS ABSORPTION ACCELERATOR AND PREPARATION CONTAINING SAME

Tetsuro Kamiya; Takeshi Inoue; Hidenori Yoroza; Yasutera Eguchi, and Kaoru Tsujii, all of Tochigi, Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 47,513, May 6, 1987, abandoned, which is a continuation of Ser. No. 726,320, Apr. 23, 1985, abandoned. This application Aug. 3, 1988, Ser. No. 227,777
Claims priority, application Japan, Apr. 23, 1984, 59-82464
Int. Cl.[4] A61K *31/405*
U.S. Cl. 514—420 8 Claims

1. A percutaneous absorbent preparation for transdermal or transmucosal absorption of a pharmaceutically active substance, comprising:

an effective amount of indomethacin; and

an absorption accelerator selected from the group consisting of 1-O-n-decylglycerol, 1-O-n-octyl-3-O-2',3'-dihydroxypropylglycerol, 1-O-n-dodecyl-3-O-2',3'-dihydroxypropylglycerol, 1-O-n-tetradecyl-3-O-2',3'-dihydroxypropylglycerol, 1-O-n-hexadecyl-3-O-2',3'-dihydroxypropylglycerol, 1-O-n-octadecyl-3-O-2',3'-dihydroxypropylglycerol, 1-O-n-octadecenyl-3-O-2',3'-dihydroxypropylglycerol, 1-O-methyl-branched isostearyl-3-O-2',3'-dihydroxypropylglycerol, 1-O-n-octyl-2-O-methyl-3-O-2',3'-dihydroxypropylglycerol, 1-O-n-dodecyl-2-O-methyl-3-O-2',3'-dihydroxypropylglycerol, 1O-n-dodecyl-2-O-n-butyl-3-O-2',3'-dihydroxypropylglycerol, 1-O-n-dodecyl-2-O-n-octyl-3-O-2',3'-dihydroxypropylglycerol, 1-O-n-tetradecyl-2O-methyl-3O-2',3'-dihydroxypropylglycerol, 1-O-n-hexadecyl-2-O-methyl- 3-O-2',3'-dihydroxypropylglycerol, 1-O-n-octadecyl-2-O-methyl-3-O-2',3'-dihydroxypropylglycerol, 1-O-n-octadecenyl-2-O-methyl-3-O-2',3'-dihydroxypropylglycerol, 1-O-n-octadecenyl-2-O-n-butyl-3-O-2',3'-dihydroxypropylglycerol, 1-O-methyl-branched isostearyl-2-O-methyl-3-O-2',3'-dihydroxypropylglycerol, 1-O-methyl-branched isostearyl-2-O-n-octyl-3-O-2',3'-dihydroxypropylglycerol; 1O-n-octyl-3-O-methyl-2-O-2',3'-dihydroxypropylglycerol, 1-O-n-dodecyl-3-O-methyl-2-O-2',3'dihydroxypropylglycerol, 1-O-n-dodecyl-3-O-n-butyl-2-O-2',3'-dihydroxypropylglycerol, 1-O-n-dodecyl-3-O-n-octyl-2-O-2',3'-dihydroxypropylglycerol, 1-O-n-tetradecyl-3-O-methyl-2-O-2',3'-dihydroxypropylglycerol, 1-O-n-hexadecyl-3-O-methyl-2-O-2',3'-dihydroxypropylglycerol, 1-O-n-octadecyl-3-O-methyl-2-O-2',3'-dihydroxypropylglycerol, 1-O-n-octadecenyl-3-O-methyl-2-O-2',3'-dihydroxypropylglycerol, 1-O-n-octadecenyl-3-O-n-butyl-2-O-2',3'-dihydroxypropyl-glycerol, 1-O-methyl-branched isostearyl-3-O-methyl-2-O-2',3'-dihydroxypropylglycerol, 1-O-methyl-branched isostearyl-3-O-n-butyl-2-O-2',3'-dihydroxypropylglycerol, and 1-O-methyl-branched isostearyl-3-O-n-octyl-2-O-2',3'-dihydroxypropylglycerol.

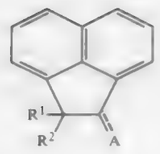
4,859,697

SUBSTITUTED ACENAPHTHENES AND THEIR USE AS INHIBITORS OF PHOSPHOLIPASE A2

William C. Ripka, Wilmington, Del., and William J. Sipio, Lindenwold, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 860,428, May 17, 1986, Pat. No. 4,806,671. This application Oct. 6, 1988, Ser. No. 254,182
Int. Cl.[4] A61K *31/12, 31/15, 31/18, 31/24, 31/38, 31/135, 31/165, 31/235, 31/275*
U.S. Cl. 514—438 20 Claims

1. A pharmaceutical composition, consisting essentially of: (i) a substituted acenaphthene phospholipase A_2 inhibitor having the formula:



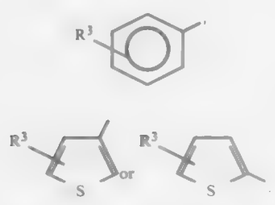
wherein

R^1 is H or C_1–C_3 alkyl;

R^2 is C_3–C_{10} alkyl, C_4–C_{10} cycloalkyl, or aryl$(CH_2)_n$—; and

R^1 and R^2, taken together, may be aryl—CH= where n=1–4, and

aryl is



R^3 is H, CN, NO_2, CO—phenyl, $S(O)_eR^5$, halogen, $NHCOR^4$, CO_2R^4, OR^4, $SO_2N(R^4)_2$, or NR^6R^7, wherein e=0, 1 or 2;

R^4 is H, C_1–C_6 alkyl, or phenyl;

R^5 is C_1–C_6 alkyl, phenyl;

R^6 and R^7, independently are H or C_1–C_4 alkyl;

and wherein

A is =O, =CHR[8],



=NOR[8]

R^8 is H, C_1–C_6 alkyl, or $(CH_2)_mW$;

R^9 is C_1–C_6 alkyl, $(CH_2)_mW$, or —$X(CH_2)_mW$;

where m=1–6, X is O, S,

W is —OR^{10}, —COR^{10}, —$OCOR^{10}$, —$OCOOR^{10}$, $NR^{11}R^{12}$, or $CONR^{11}R^{12}$;

R^{10} is C_1–C_6 alkyl;

R^{11}, R^{12}, independently are H, C_1–C_6 alkyl;

provided that:

1. When A=0 then R^1 and R^2 taken together are not 4—$(CH_3)_2NC_6H_4CH$=, 2—$MeOC_6H_4CH$=3—$MeOC_6H_4CH$=, 4—FC_6H_4CH=, or 4—$MeOC_6H_4CH$=;
2. When A is =NOR_8, R_8 is not H;
3. When R^8 is hydrogen, then R^2 is not C_3–C_{10} alkyl or C_4–C_{10} cycloalkyl;
4. When R^2 is 4—$FC_6H_4CH_2$—, 3—$CH_3CONHC_6H_4CH_2$—, or 4—$NO_2C_6H_4CH_2$—, then A is not =CH_2;
5. When A=0, then R^2 is not C_3–C_{10} alkyl or C_4–C_{10} cycloalkyl;
6. When A is $CH_2NR^{11}R^{12}$, then R^2 is not alkyl;

in an amount sufficient to provide anti-inflammatory and/or anti-allergic effects in a mammal suffering from a phospholipase A_2-mediated condition, and (ii) a pharmaceutically acceptable carrier.

4,859,698

NOVEL CLASS OF ACYL-DERIVATIVES OF CARNITINE, PROCESS FOR PREPARING SAME AND THERAPEUTIC USE THEREOF

Claudio Cavazza; Paolo De Witt, and Maria O. Tinti, all of Rome, Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

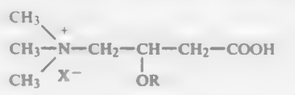
Division of Ser. No. 68,748, Jun. 30, 1987, Pat. No. 4,766,222, which is a continuation of Ser. No. 753,653, Jul. 10, 1985, abandoned, which is a continuation of Ser. No. 433,427, Oct. 8, 1982, abandoned, which is a continuation of Ser. No. 237,312, Feb. 23, 1981, abandoned. This application May 31, 1988, Ser. No. 200,641

Claims priority, application Italy, Mar. 6, 1980, 48099 A/80

Int. Cl.[4] C07D *333/22, 333/32*

U.S. Cl. 514—445 4 Claims

1. An acyl-derivative of carntine or pharmaceutically acceptable salt thereof, having the general formula



(I)

wherein x is an anion, and R is the radical of one of the following organic acids: dithiolane 3-pentanoic, or 2-thiophenecarboxylic or 2-thiopheneacetic acid.

4,859,699

SUBSTITUTED N-BENZOYL-N'-THIENYLUREAS

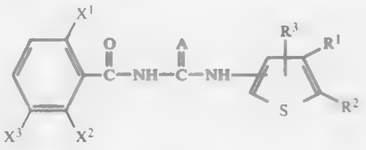
Robert L. Carney, Palo Alto; Alfred S. T. Lui, Redwood City, both of Calif.; Fred Kuhnen, Weil, Fed. Rep. of Germany, and John M. Gruber, Menlo Park, Calif., assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 211,515, Aug. 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 167,595, Mar. 4, 1988, abandoned, which is a continuation-in-part of Ser. No. 75,504, Jul. 20, 1987, abandoned. This application Feb. 23, 1989, Ser. No. 316,253

Int. Cl.[4] A01N *43/02;* C07D *333/36, 333/38, 333/42*

U.S. Cl. 514—447 20 Claims

1. A compound of the following formula (A):



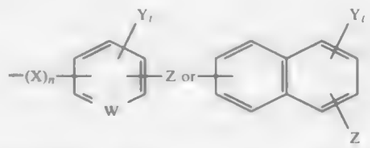
(A)

wherein,

A is oxygen or sulfur;

each of X^1, X^2 and X^3 is independently hydrogen, C_{1-8}alkyl or halogen;

each of R^1 and R^2 is independently hydrogen, halogen, cyano, unsubstituted or halogenated C_{1-8}alkyl, or the aryl group



provided that when one of R^1 or R^2 is an aryl group, the other of R^1 or R^2 is not an aryl group;

R^3 is hydrogen or halogen;

n is zero or one;

t is one, two, three or four;

W is nitrogen or CH;

X is oxygen, sulfur or methylene;

Y is hydrogen, halogen or unsubstituted or halogenated C_{1-8}alkyl; and

Z is halogen, or unsubstituted or halogenated C_{1-8}alkyl, unsubstituted or halogenated C_{1-8}alkoxy, or unsubstituted or halogenated phenoxy;

and the agriculturally acceptable salts or metal complexes thereof.

4,859,700

2-(2,3-DIHYDRO-2-OXO-3-BENZOFURANYL)ACETIC ACID COMPOUNDS HAVING ANTIHYPOXIC AND NOOTROPIC EFFECTS

Gilbert Lavielle, Saint-Cloud, and Jean Lepagnol, Chatou, both of France, assignors to ADIR Et Cie, Neuilly-sur-Seine, France

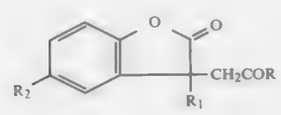
Filed Feb. 12, 1988, Ser. No. 155,352

Claims priority, application France, Feb. 27, 1987, 87 02630

Int. Cl.[4] A61K *31/34*

U.S. Cl. 514—470 8 Claims

1. Compounds of general formula I



(I)

in which:

R_1 denotes a hydrogen atom, a linear or branched alkyl radical having 1 to 4 carbon atoms or a phenyl radical optionally substituted with a halogen atom or with an alkoxy radical having 1 to 4 carbon atoms or an alkyl radical having 1 to 4 carbon atoms,

R_2 denotes a hydrogen or halogen atom, a hydroxyl radical, an alkyl radical having 1 to 4 carbon atoms or an alkoxy radical having 1 to 4 carbon atoms,

R denotes either a hydroxyl radical, a linear or branched alkoxy radical having 1 to 4 carbon atoms or a benzyloxy radical, or a radical of formula A



(A)

in which

X and Y, which may be identical or different, each denote a linear or branched alkyl radical having 1 to 5 carbon atoms,

a radical of formula A_1

—CHZ—COOH (A_1)

in which Z denotes a hydrogen atom, a linear or branched alkyl radical having 1 to 4 carbon atoms, a hydroxyalkyl radical having 1 to 4 carbon atoms, or a benzyl radical optionally substituted with an alkyl radical having 1 to 4 carbon atoms or with a hydroxyl radical,

a radical of formula A_2

—CH_2W (A_2)

in which W denotes a linear or branched dialkylaminomethylene radical having 3 to 9 carbon atoms, or a benzyl radical,

in racemic form or in the form of an optical isomer,

or an addition salt thereof with a pharmaceutically-acceptable inorganic or organic acid when it contains a salifiable basic group, or an addition salt thereof with a pharmaceutically-acceptable inorganic or organic base when it contains a salifiable acidic group.

7. A method of treating ischemic syndromes linked to hypoxemia or cerebral aging in a subject suffering therefrom comprising the step of administering to the said subject an amount of a compound of claim 1 which is effective for the alleviation of such disease.

4,859,701

AZULENE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Masabumi Yasunami; Kahei Takase, both of Sendai; Takashi Meguro, Zushi; Katsumi Suzuki, Kawasaki; Osamu Hiwatashi, Kawasaki; Masaru Okutsu, Kawasaki; Nobuo Kato, Kawasaki, and Toru Nakamura, Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

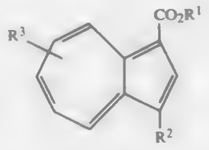
Filed Nov. 6, 1987, Ser. No. 117,539

Claims priority, application Japan, Nov. 7, 1986, 61-264933

Int. Cl.[4] A61K *31/215*

U.S. Cl. 514—510 6 Claims

1. A method for treating hyperlipidemia in a mammal in need thereof, which comprises administering to said mammal a hypolipidemic effective dose of an azulene derivative having the following general formula:



wherein R^1 stands for an alkyl group of 1 to 3 carbon atoms, R^2 stands for an alkyl group of 1 to 3 carbon atoms, and R^3 is at the 5- or 6-position and stands for an alkyl group of 1 to 6 carbon atoms, an aryl group of 6 to 9 carbon atoms or an aralkyl group of 7 to 10 carbon atoms.

4,859,702

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF 2-BROMO-2-NITROPROPANE-1,3-DIOL AND PARATOLYL SULFONYL ACRYLONITRILE

Wilson K. Whitekettle, Conroe, and Deborah K. Donofrio, The Woodlands, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Sep. 12, 1988, Ser. No. 242,840

Int. Cl.[4] A01N *33/18, 37/34*

U.S. Cl. 514—520 7 Claims

1. A bacterial inhibiting composition comprising a synergistic aqueous mixture of (a) 2-bromo-2-nitropropane-1,3-diol (BNPD) and (b) paratolyl sulfonyl acrylonitrile (PSA), wherein the weight ratio of said BNPD to said PSA is from about 32:1 to 1:4.

4,859,703

LIPID REGULATING COMPOSITIONS

Brian R. Krause, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 15, 1987, Ser. No. 61,641

Int. Cl.[4] A61K *31/235, 31/24, 31/195, 31/16*

U.S. Cl. 514—543 2 Claims

1. A pharmaceutical composition comprising a lipid regulating effective amount of 5-(2,5-dimethylphenoxy)-2,2-dimethylpentanoic acid or a lower alkyl ester or pharmaceutically acceptable acid addition salt thereof, together with an ACAT inhibitory effective amount of (Z)-N-(2,4,6-trimethoxyphenyl)-9-octadecenamide, together with a pharmaceutically acceptable carrier; wherein the lipid regulating compound and the

ACAT inhibitory compound are present in a weight ratio of 1:1.

4,859,704

WATER SOLUBLE IBUPROFEN COMPOSITIONS AND METHODS OF MAKING THEM

Ronald T. Haas, West Windsor Township, Mercer County, N.J., assignor to Oratech Pharmaceutical Development Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 110,184, Oct. 15, 1987. This application Mar. 25, 1988, Ser. No. 173,299
Int. Cl.[4] A61K *31/19*
U.S. Cl. 514—557 26 Claims

1. A solid crystalline composition of matter, comprising: an alkali metal salt of ibuprofen.

4,859,705

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF 2 BROMO-2-NITROPROPANE-1,-3 DIOL AND N,N-DIMETHYL-N-PHENYL-N-FLUORODICHLOROMETHYLTHIO)-SULPHAMIDE

Deborah K. Donofrio, The Woodlands, and Wilson K. Whitekettle, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Sep. 12, 1988, Ser. No. 242,846
Int. Cl.[4] A01N *33/18, 41/02*
U.S. Cl. 514—600 7 Claims

1. A bacterial inhibiting composition comprising a synergistic aqueous mixture of (a) 2-bromo-2-nitropropane-1, 3-diol (BNPD) and (b) N, N-dimethyl-N[1]-phenyl-N[1]-(fluorodichloromethylthio)-sulphamide (DPFS). wherein the weight ratio of said BNPD to said DPFS is from about 32:1 to 1:16.

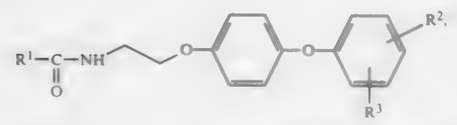
4,859,706

PESTICIDAL COMPOSITION AND PROCESS FOR COMBATING PESTS EMPLOYING CARBOXAMIDES

Rainer Buerstinghaus, Heidelberg; Peter Hofmeister, Neustadt, and Christoph Kuenast, Waldsee, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 6, 1987, Ser. No. 82,326
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1986, 3628082
Int. Cl.[4] C07C *103/19, 103/58, 103/34*
U.S. Cl. 514—624 7 Claims

1. A pesticidal composition which comprises: a carrier or diluent and an effective amount of a carboxamide of the formula I



(I)

where R^1 is C_1–C_6-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl, C_3–C_{10}-cycloalkyl, C_3–C_{10}-cycloalkenyl or C_4–C_{10}-cycloalkenylalkyl, and R^2 and R^3 are each hydrogen, halogen, C_1–C_3-alkyl, C_1–C_3-alkoxy, C_1–C_3-haloalkyl, C_1–C_3-haloalkoxy or methylthio.

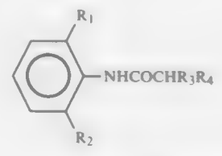
4,859,707

SULFUR-SUBSTITUTED PHENYLACETAMIDES

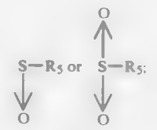
Thorsteinn Loftsson, Reykjavik, Iceland, and Nicholas Bodor, Gainesville, Fla., assignors to Key Pharmaceuticals, Inc., Miami, Fla.

Filed Aug. 23, 1983, Ser. No. 525,634
Int. Cl.[4] A61K *31/165;* C07C *103/12*
U.S. Cl. 514—625 9 Claims

1. Compounds of the formula

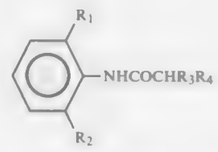


wherein R_1, R_2 and R_3 may be the same or different and are H or CH_3; R_4 is SR_5,

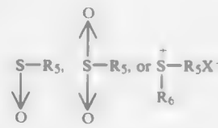


R_5 is lower alkyl containing 1–4 carbon atoms.

8. A method for the treatment of arrhythmia which comprises administering to a patient having an arrhythmia heart beat an antiarrythmically effective amount of a compound of the formula



wherein R_1, R_2 and R_3 may be the same or different and are H or CH_3; R_4 is SR_5,



R_5 and R_6 may be the same or different and are lower alkyl containing 1–4 carbon atoms and R_5 and R_6 may be taken together with S to form a 5–7 member ring; and X^- is a pharmaceutically acceptable anion.

4,859,708

BIOCIDAL COMPOSITIONS AND USE THEREOF CONTAINING A SYNERGISTIC MIXTURE OF 2-BROMO-2-NITROPROPANE-1,3-DIOL AND BETA-BROMO-BETA-NITROSTYRENE

Deborah K. Donofrio, The Woodlands, and Wilson K. Whitekettle, Conroe, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Sep. 12, 1988, Ser. No. 243,007
Int. Cl.[4] A01N *33/18, 33/24*
U.S. Cl. 514—727 7 Claims

1. A composition comprising a synergistic aqueous mixture of (a) 2-bromo-2-nitropropane-1,3 diol (BNPD) and (b) beta-bromo-beta-nitrostyrene (BNS), wherein the weight ratio of said BNPD to said BNS is from about 32:1 to 1:8.

4,859,709

PHARMACEUTICAL COMPOSITION

David A. Rawlins, Tewin, England, assignor to Beecham Group plc, Middlesex, England

Continuation-in-part of Ser. No. 736,337, May 21, 1985, Pat. No. 4,719,228. This application Oct. 26, 1987, Ser. No. 115,589
Claims priority, application United Kingdom, May 23, 1984, 8413191
Int. Cl.[4] A61K *47/00, 31/705, 31/56, 31/54*
U.S. Cl. 514—770 7 Claims

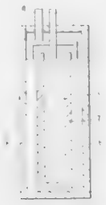
1. A pharmaceutical composition comprising a freely flowable powder, the powder comprising a porous, high absorption silica or silicate having a mean particle size of at least 10 μm in diameter and having absorbed therein at least 10% by volume of a liquid, pharmaceutically active composition, based on the weight of powder plus liquid, wherein said liquid pharmaceutically active composition comprises a pharmaceutically active ingredient selected from the group consisting of an anti-inflammatory agent, a tranquiliser, a cardiotonic agent, an antibacterial agent, an antidepressant, a corticosteroid, an anti-ulcer agent, an anti-allergy agent, an anti-obesity agent, an anti-hyperglycaemic agent, an anti-emetic agent and a gastric motility enhancing agent; and a liquid diluent or carrier.

4,859,710

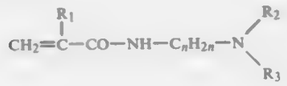
LEAD ACCUMULATOR

Tadayuki Ohmae; Tadashi Sakurai; Noboru Yamaguchi; Mitsuyuki Okada, and Kouichiro Asao, all of Chiba, Japan, assignors to Sumitomo Chemical Co., Limited, Osaka, Japan

Filed May 2, 1988, Ser. No. 188,995
Claims priority, application Japan, Jun. 26, 1987, 62-160246
Int. Cl.[4] C08J *9/40*
U.S. Cl. 521—55 10 Claims

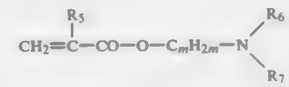


1. A lead accumulator using dilute sulfuric acid as an electrolyte liquor, in which the electrolyte liquor is fixed by absorption or impregnation into a porous or swellable ethylene copolymer resin or a molding thereof comprising from 40 to 90% by weight of an ethylene unit and from 10 to 60% by weight of at least one comonomer unit selected from (A) an acrylamide comonomer unit derived from a compound represented by formula (I):



(I)

wherein R_1 represents a hydrogen atom or a methyl group; R_2 and R_3 each represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms, or they are bonded to each other to form a heterocyclic ring together with the nitrogen atom; and n represents an integer of from 2 to 5 and (B) an ethylenically unsaturated comonomer unit having an ester group and an amino group in the molecule thereof and having an average molecular weight of from 5,000 to 50,000 wherein said comonomer unit having an ester group and an amino group in the molecule thereof is a comonomer unit derived from a compound represented by formula (II):



(II)

wherein R_5 represents a hydrogen atom or a methyl group; R_6 and R_7 each represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms, or they are bonded to each other to form a heterocyclic ring; and m represents an integer of from 2 to 5.

4,859,711

HOLLOW MICROSPHERES

Mukesh Jain, and Sadashiv Nadkarni, both of Jonquiere, Canada, assignors to Alcan International Limited, Montreal, Canada

Division of Ser. No. 100,090, Sep. 23, 1987, Pat. No. 4,782,097. This application Jul. 19, 1988, Ser. No. 221,135
Claims priority, application Canada, Oct. 1, 1986, 519529
Int. Cl.[4] C08J *9/32;* B01J *13/02*
U.S. Cl. 521—56 24 Claims



1. Microspheres having a diametric size in the range of ½–10 mm, produced by a process of forming hollow microspheres, which comprises:

forming a solution in a liquid solvent of a polymer having the following properties:

(a) a molecular chain weight of at least 10,000 and a long chain structure of at least 200 monomer units;

(b) an ability to be coagulated or precipitated from the solution upon contact of the solution with a non-solvent for the polymer;

(c) an ability to form a continuous stretchable film when coagulated or precipitated from solution;

(d) a chemical structure which is infusible or which is capable of being rendered infusible; and

(e) a high carbon yield of at least 30% by weight upon being carbonized in a non-reactive atmosphere;

incorporating into said solution an insoluble solid particulate blowing agent which is decomposable by heat to generate a gas;

dividing the solution into droplets and introducing the droplets into a liquid bath containing a non-solvent for the polymer, said non-solvent being such that the polymer is rapidly coagulated or precipitated from the solution, and said bath having a temperature high enough to cause decomposition of the blowing agent; and

removing the resulting hollow microspheres from the bath.

4,859,712

SILICONE FOAM AND METHOD FOR MAKING IT

James E. Cox, Oxnard, Calif., assignor to Cox-Uphoff International, Carpinteria, Calif.

Filed Oct. 12, 1988, Ser. No. 256,648
Int. Cl.[4] C08J 9/26
U.S. Cl. 521—62 2 Claims



1. The method of preparing a silicone foam comprising embedding in a layer of uncured silicone a layer of crystalline material, the crystalline material being closely packed and generally in crystal-to-crystal contact, and embraced by the liquid silicone, curing the silicone, and with a solvent which dissolves the crystals but does not dissolve the cured silicone dissolving out the crystals, the crystals being provided in a plurality of sizes or ranges of sizes to increase the packing ratio of the crystals as a group whereby to produce a structure of said cured silicone having a great number of tendrils and intercommunicating cavities.

4,859,713

PRODUCTION OF FLAME-RETARDANT POLYOLS

David H. Blount, 6728 Del Cerro Blvd., San Diego, Calif. 92120

Continuation-in-part of Ser. No. 60,492, Jun. 11, 1987, and a continuation-in-part of Ser. No. 64,502, Jun. 22, 1987. This application Dec. 4, 1987, Ser. No. 131,125
Int. Cl.[4] C08J 9/14
U.S. Cl. 521—106 16 Claims

1. The process for the production of flame-retardant polyurethane foam which consists of mixing and reacting the following components:

Component A: epoxy compound, in the amount of 100 parts by weight;

Component B: compound containing 1 or more reactive hydrogens, in the amount of up to 100 parts by weight;

Component C: acidic salt-forming compound that contains phosphorus, in the amount of 1 to 30 parts by weight;

Component D: basic salt-forming compound that will react with a phosphorus-containing compound, in the amount of up to 100 parts by weight;

Component E: compound containing at least two isocyanate radicals, in the amount of 25 to 200 parts by weight;

Component F: up to 50 percent by weight of a blowing agent consisting of an inert liquid, boiling in the range of −25° C. to 80° C. is included in the reactive mixture;

the said mixing carried out in such a way that Components A, B and C are reacted, thereby producing an inorganic-organic polyol with acidic phosphate radicals, then component D is added and reacted, thereby producing a salt of inorganic-organic polyol containing phosphorus and a salt-containing phosphorus, then Component E and and F are added.

4,859,714

PROCESS AND COMPOSITION FOR PROTECTING AND CUSHIONING

Ralph J. Locke, Boyne City, Mich., and David C. Netherton, Valparaiso, Ind., assignors to Plan B, Inc., Wauwatosa, Wis.

Division of Ser. No. 167,404, Mar. 14, 1988. This application Dec. 20, 1988, Ser. No. 287,129
Int. Cl.[4] C08J 9/12
U.S. Cl. 521—140 6 Claims

1. A foamed material consisting essentially of:

a polymeric substrate and a gaseous material encapsulated therein, the chemical substrate and gaseous material present in a ratio of about 1:1 to about 1:10 gaseous material to substrate gaseous material to substrate respectively; wherein the foamed material solidifies after contacting the product and the polymeric substrate consists essentially of:

(a) between about 40% and about 90% by weight of a polymer selected from the group consisting of polyethylene, ethylene vinyl acetate, and mixtures thereof;

(b) between about 10% and about 90% by weight of polyterpene; and

(c) between about 0.05% and abut 0.5% by weight of an anti-oxidant stabilizer.

4,859,715

MICROPOROUS POLY (ARYLETHER KETONE) ARTICLE

Robert S. Dubrow, Redwood City, and Michael F. Froix, Los Altos, both of CA, assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 858,484, Apr. 30, 1986, Pat. No. 4,721,732, which is a continuation-in-part of Ser. No. 611,665, May 18, 1984, abandoned. This application Nov. 10, 1987, Ser. No. 119,140
Int. Cl.[4] C08J 9/26
U.S. Cl. 521—180 3 Claims

1. A microproous article comprising a poly(aryl ether ketone), said article having an average pore size of about 0.005 to about 1 micron.

4,859,716

MICROFILLED DENTAL COMPOSITE AND METHOD FOR MAKING IT

Robert L. Ibsen, Santa Maria, and William R. Glace, Orcutt, both of Calif., assignors to Den-Mat Corporation

Filed Nov. 6, 1987, Ser. No. 118,154
Int. Cl.[4] C08J 3/28; C08K 3/36; A61K 6/08
U.S. Cl. 522—14 9 Claims

1. A microfilled dental composite containing from about 30% to about 60% filler, said filler being sub-micron hydrophobic silica particles of about 0.01–0.04 micrometers in diameter,

dispersed in ethoxylated bisphenol A dimethacrylate resin containing suitable aliphatic dimethacrylate diluents up to about 40% by weight and curing agents effecting curing.

4,859,717

CROSS-LINKED POLYVINYL ALCOHOLS AND OIL RESERVOIR PERMEABILITY CONTROL THEREWITH

Dennis H. Hoskin, Lawrenceville, and Paul Shu, Princeton Junction, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 4, 1987, Ser. No. 93,274
Int. Cl.[4] C09K 7/00
U.S. Cl. 523—130 12 Claims

1. A method for controlling the permeability of a subterranean formation under steam flooding conditions, which comprises injecting into the formation an aqueous polymer obtained by cross-linking polyvinyl alcohol with a cross-linking agent which is a mixture of a phenolic component and an aldehyde or a mixture of a naphtholic component and an aldehyde.

4,859,718

METHOD FOR SURFACE TREATING METAL CARBONATE

Camilla A. Rice, Sandersville, Ga., assignor to E.C.C. America Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 943,669, Dec. 17, 1986, Pat. No. 4,789,403, which is a continuation-in-part of Ser. No. 887,320, Jul. 22, 1986, abandoned. This application Mar. 31, 1988, Ser. No. 175,868
Int. Cl.[4] C08K 9/04, 3/26
U.S. Cl. 523—202 17 Claims

1. A method of surface modifying with an organic material a carbonate selected from the group consisting of calcium carbonate, magnesium carbonate and calcium-magnesium carbonate which during processing has become coated with processing chemicals, wherein the carbonate in substantially dry, particulate form is contacted with an organic monomer, comonomers or a prepolymer, in the presence of gaseous hydrogen and a calcined kaolin or TiO_2 as a polymerization catalyst.

11. A composition comprising a filled polymer system comprising a matrix polymer and a filler, said filler comprising particles of a carbonate selected from the group consisting of calcium carbonate, magnesium carbonate and calcium-magnesium carbonate, the surfaces of which have been modified by a polymer synthesized in situ in the presence of gaseous hydrogen or by reacting a prepolymer in situ on the carbonate in the presence of gaseous hydrogen, said modified surfaces containing a minor, catalytic amount of a calcined kaolin.

4,859,719

POLYMER BLENDS WITH HIGH WATER ABSORPTION

Ronald F. Ofstead, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 753,406, Jul. 10, 1985, Pat. No. 4,771,089, which is a continuation-in-part of Ser. No. 530,199, Sep. 8, 1983, abandoned. This application Jun. 13, 1988, Ser. No. 205,675
Int. Cl.[4] G02C 7/02, 7/04
U.S. Cl. 523—108 13 Claims

1. An ophthalmic device comprising a miscible blend of non-crosslinked polymers comprising from about 2 to 95 parts by weight of a water-insoluble, hydrophobic polymer and from about 98 to 5 parts by weight of a hydrophilic polymer, wherein said hydrophobic and hydrophilic polymers are not covalently bonded to each other, said blend being transparent and capable of absorbing a sufficient quantity of water to provide a hydrated material containing at least 50% by weight water.

4,859,720

PROCESS AND COMPOSITIONS FOR SIZING PAPER

Peter Flesher; John Langley; Norma Rosier, and David Farrar, all of West Yorkshire, England, assignors to Allied Colloids Ltd., England

Continuation-in-part of Ser. No. 857,115, Apr. 29, 1986, abandoned, and a continuation-in-part of Ser. No. 667,950, Nov. 5, 1984, abandoned. This application Feb. 4, 1987, Ser. No. 11,062
Claims priority, application United Kingdom, Nov. 7, 1983, 8329655; May 3, 1985, 8511379
Int. Cl.[4] C08J 3/00
U.S. Cl. 523—332 17 Claims

1. A concentrate composition suitable, upon dilution with water, for sizing cellulosic fibres and which comprises a substantially anhydrous dispersion of particles of water soluble cationic or anionic polyelectrolyte in a non-aqueous liquid comprising a reactive size and which contains water in an amount of 0 to 5% by weight of the total composition and which has been made by a process forming a dispersion in a water immiscible non-aqueous hydrophobic liquid of the polyelectrolyte particles while they are swollen by water, dehydrating the dispersion of polyelectrolyte particles swollen by water by azeotropic distillation until the dispersion is substantially anhydrous and dissolving the reactive size into the non-aqueous hydrophobic liquid of the resultant dehydrated dispersion, and in which the reactive size is selected from ketene dimer sizes and anhydride reactive sizes and the water soluble polyelectrolyte is selected from water soluble polymers of (a) cationic polymers formed from one or more ethylenically unsaturated monomers comprising a cationic ethylenically unsaturated monomer, (b) anionic polymers formed from one or more ethylenically unsaturated monomers comprising an ethylenically unsaturated carboxylic monomer or an ethylenically unsaturated sulphonic acid monomer, (c) polyamines, (d) dicyandiamide condensates and (e) polyimines.

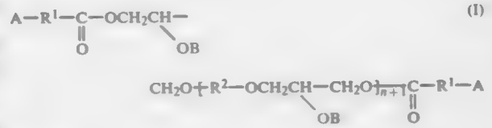
4,859,721

ADDUCTS OF CARBOXYLIC ACIDS AND ISOCYANATES WITH EPOXIDES, AQUEOUS DISPERSIONS CONTAINING THESE ADDUCTS, PROCESSES FOR THEIR PREPARATION AND THEIR USE IN THE AUTOPHORETIC COATING OF METALLIC SURFACES

Doris Oberkobusch, Duesseldorf; Roland Morlock, Bergheim; Karl-Heinz Stritzke, Langenfeld, and Ludwig Schieferstein, Ratingen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 17, 1988, Ser. No. 233,621
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1987, 3727382
Int. Cl.[4] C08L 75/04
U.S. Cl. 523—402 41 Claims

1. A polymer of the formula



(I)

in which

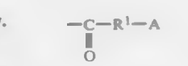
R^1 is a linear or branched, saturated or unsaturated, substituted or unsubstituted, C_2–C_{16} aliphatic radical, substituted or unsubstituted cycloalkylene radical, substituted or unsubstituted, 1,2-phenylene, substituted or unsubstituted 1,3-phenylene or substituted or unsubstituted 1,4-phenylene radical;

R^2 is a linear or branched C_1–C_8 aliphatic radical, phenalkylene or phenalkylphenylene radical each containing 1 to 4 carbon atoms in the alkylene radical;

n is a number of 0 to 6;

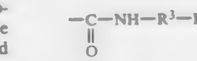
A is independently hydrogen or COOH;

B is independently hydrogen, a group of the formula



(II)

in which R^1 and A are as defined above, or a group of the formula



(III)

in which

R^3 is independently an alkylene radical containing 1 to 8 carbon atoms in the chain, and can contain linear or branched alkyl groups, alkyl-substituted cycloalkyl, alkyl substituted aryl groups, alkyl-substituted ureylene group, alkyl substituted carbamido groups, a cycloalkylene radical containing 5 to 8 carbon atoms in the ring, which can contain linear or branched alkyl groups, alkyl substituted cycloalkyl groups, aryl groups alkyl-substituted ureylene groups, carbamido groups, or an arylene radical containing 1 to 4 aromatic rings fused to one another, arylene groups, joined to one another by C_1–C_3 alkylene bridges, which can contain one or more alkyl or alkylene substituents, and

D is an NCO group masked by a protective group; the substituents B may have different meanings within one and the same molecule.

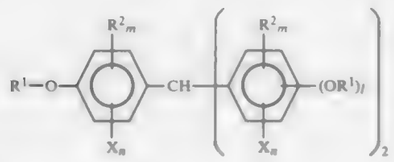
4,859,722

EPOXY RESIN COMPOSITION

Toshio Shiobara, and Kazutoshi Tomiyoshi, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

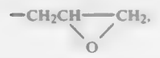
Filed Mar. 16, 1988, Ser. No. 168,943
Claims priority, application Japan, Mar. 16, 1987, 62-61631
Int. Cl.[4] C08L 63/00
U.S. Cl. 523—433 17 Claims

1. An epoxy resin composition which comprises a curable epoxy resin, a curing agent, and a block copolymer formed by the reaction of a compound represented by the formula (1) below or an oligomer thereof,



(1)

where R^1 denotes a hydrogen atom,



or a monovalent organic group; R^2 denotes a monovalent hydrocarbon group having 1 to 10 carbon atoms; X denotes a halogen atom; l denotes an integer of 1 or 2; m and n each denote an integer of 0 to 2; and $l+m+n \leqq 5$ with an organopolysiloxane represented by the formula (2) below,

$$R^3_aR^4_bSiO_{(4-[a+b])/2} \quad (2)$$

where R^3 denotes a hydrogen atom, haloen atom, hydroxyl group, alkoxyl group, or substituted monovalent hydrocarbon group; R^4 denotes monovalent organic group; $0.001 \leqq a \leqq 2$, $1 \leqq b < 3$, and $1.001 \leqq a+b \leqq 3$.

4,859,723

COATING FOR ROOF SURFACES

Stanley C. Kyminas; John C. Phillips, both of St. Petersburg, and Bernard J. Einhaus, Clearwater, all of Fla., assignors to The Celotex Corporation, Tampa, Fla.

Continuation of Ser. No. 851,769, Apr. 14, 1986, Pat. No. 4,749,731. This application May 5, 1988, Ser. No. 190,554
Int. Cl.[4] C08K 3/28, 7/20
U.S. Cl. 524—31 20 Claims

1. A process of forming a durable waterproof coating on the exterior surface of a substrate for protection against water ponding and long-term weathering comprising (a) applying to the surface of the substrate an aqueous dispersion comprising at least one synthetic film-forming polymer, pigment material including kaolin clay, the kaolin clay being present in an amount sufficient to improve the adhesion of the coating to the substrate and the pigment material having an average particle size less than 200 microns, and water, the pigment volume concentration of the dispersion being greater than 15%, and (b) allowing the dispersion to dry on the surface.

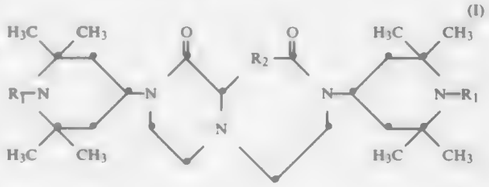
4,859,724

BICYCLIC PIPERIDINE COMPOUNDS FOR USE AS STABILIZERS FOR ORGANIC MATERIALS

Giuseppe Cantatore, Bitonto, and Valerio Borzatta, Bologna, both of Italy, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 25, 1988, Ser. No. 198,269
Claims priority, application Italy, Jun. 2, 1987, 20750 A/87
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—91 12 Claims

1. A compound of the formula (I)



(I)

in which R_1 is hydrogen, O·, OH, NO, CH_2CN, C_1–C_8-alkyl, allyl, benzyl, C_1–C_8-acyl, OH-monosubstitured C_2–C_4-alkyl, 2,3-epoxypropyl, C_1–C_{18}-alkyloxy, C_5–C_{12}-cycloalkyloxy or 2,3-dihydroxypropyl and R_2 is a direct bond or —CH_2—.

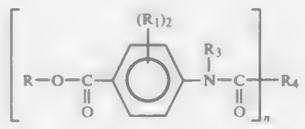
4,859,725

OXALAMIDE COMPOUNDS USEFUL AS UV ABSORBERS

Lajos Avar, Biel-Benken, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

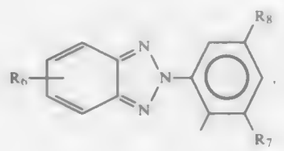
Continuation-in-part of Ser. No. 117,774, Nov. 5, 1987, abandoned. This application Aug. 23, 1988, Ser. No. 236,075
Claims priority, application United Kingdom, Nov. 7, 1986, 8626810
Int. Cl.[4] C08K 5/34, 5/20; C07C 103/46; C07D 249/20, 211/98
U.S. Cl. 524—91 20 Claims

1. A compound of formula I

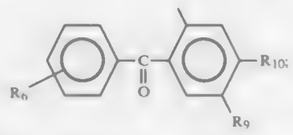


(I)

in which
n is 1 or 2;
R is a group of the formula IIa or IIIa



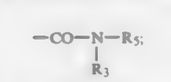
(IIa)



(IIIa)

each R_1, independently, is hydrogen, C_{1-8}alkyl, C_{1-8}alkoxy or halogen;
R_3 is hydrogen or C_{1-4}alkyl;

R_4, when n=2, is a direct bond and, when n=1, is



R_5 is unsubstituted or substituted phenyl, C_{1-22}alkyl, or a 4-(2,2,6,6-tetra-C_{1-4}alkyl piperidinyl) group;
$R_6$is hydrogen, C_{1-8}alkyl, C_{1-8} alkoxy, Chd 1-4alkyl monosubstituted by phenyl, or halogen;
R_7 is hydrogen;
R_8 is C_{1-22}alkyl or phenyl (C_{1-22}alkyl);
R_9 C_{1-22}alkyl or C_{1-22}alkoxy; and
R_{10} is hydrogen, C_{1-22}alkyl or C_{1-22}alkoxy.

12. A polymeric composition comprising a polymeric material and a light stabilizing-effective amount of a compound according to claim 1.

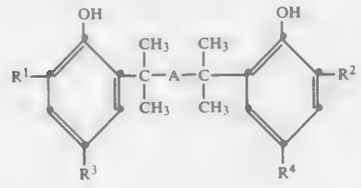
4,859,726

BIS-BENZOTRIAZOLYL COMPOUNDS AND POLYMERIC MATERIALS STABILIZED THEREWITH

Richard H. S. Wang, and Garry L. Myers, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 24, 1988, Ser. No. 261,524
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—91 16 Claims

1. A compound having the formula



wherein
R^1 and R^2 each is a 2-benzotriazolyl radical:
R^3 and R^4 each is hydrogen, alkyl, aralkyl, alkoxy, aryl, carboxy, alkoxycarbonyl or halogen; and
A is 1,3- or 1,4-phenylene.

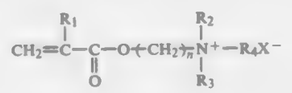
4,859,727

ANTISTATIC THERMOPLASTIC RESIN COMPOSITION

Isao Sasaki; Naoki Yamamoto, both of Saeki; Akira Yanagase, and Hiroki Hatakeyama, both of Otake, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Aug. 20, 1987, Ser. No. 87,524
Claims priority, application Japan, Aug. 22, 1986, 61-196857; Aug. 22, 1986, 61-196858; Sep. 4, 1986, 61-208494
Int. Cl.[4] C08K 5/51; C08L 33/14
U.S. Cl. 524—147 8 Claims

1. An antistatic thermoplastic resin composition which comprises (A) 100 parts by weight of methyl methacrylate polymer readily electrically charged by friction comprising at least 50% by weight of methyl methacrylate units and (B) 0.1 to 20 parts by weight of an antistatic property-imparting copolymer comprising at least 20% by weight of units of a monomer having a quaternary ammonium base, which is represented by the following general formula (I):



(I)

wherein R_1 represents a hydrogen atom or a methyl group, R_2 through R_4 represent a hydrogen atom or an alkyl group having 1 to 9 carbon atoms, which may have a substituent, n is a number of from 1 to 10, and X^- represents a monovalent inorganic or organic acid group or a corresponding equivalent of an inorganic or organic acid, at least 10% by weight of units of a copolymerizable monomer having a polyalkylene glycol component and 0 to 70% by weight of units of other copolymerizable vinyl monomer or vinylidene monomer, the weight ratio of units of the monomer having a quaternary ammonium base represented by the general formula (I), to units of the copolymerizable monomer having a polyalkylene glycol component being from ⅓ to 2/1, the units of the other copolymerizable vinyl monomer or vinylidene monomer being units of methyl methacrylate or units of a monomer which does not cause a diminution of transparency of the thermoplastic resin composition relative to a composition in which the other copolymerizable vinyl monomer or vinylidene monomer of (B) is methyl methacrylate.

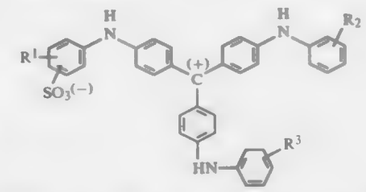
4,859,728

PASTY PIGMENT FORMULATIONS, PRODUCTION AND USE THEREOF

Manfred Schneider, Eppstein/Taunus; Ulrich Ott, Liederbach; Alexander Sieber, Frankfurt am Main, and Manfred Zimmermann, Offenbach/Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 3, 1988, Ser. No. 163,766
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1987, 3707020
Int. Cl.[4] C08K 5/41
U.S. Cl. 524—159 20 Claims

1. A pasty pigment formulation containing
(a) 5 to 50% by weight of one or more pigments of the general formula I



(I)

in which R^1, R^2 and R^3 independently of each other denote hydrogen, halogen, C_1–C_3-alkyl, C_1–C_3-alkoxy or nitro,
(b) a long oily alkyd resin, based on a polyester, having an oil content of 70-80% by weight, whose oil content originates from the modification of the polyester with a drying, semidrying or nondrying oil or a mixture of at least two of these oils or corresponding fatty acids or combinations thereof, the dicarboxylic acid component of the polyester being a mixture of isophthalic acid and orthophthalic acid, a small proportion of one or more α,β-unsaturated dicarboxylic acids or corresponding anhydrides or combinations thereof and the polyalcohol component being a mixture of glycerol and pentaerythritol,
(c) a hydrocarbon resin or mixture of hydrocarbon resins having an average molecular weight within the range from 600 to 1700, the amount of which is 1–1.5 times that of alkyd resin b,
(d) a phenolic resin modified colophony resin or a cyclized rubber resin or combinations of the two resins and also
(e) a mineral oil having a boiling range between 200°anc 530° C.

4,859,729

PLASTICIZED COMPOSITION AND METHOD OF PRODUCTION

Edgar J. Smutny, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 99,857, Sep. 22, 1987, Pat. No. 4,795,773. This application Sep. 6, 1988, Ser. No. 240,653

Int. Cl.[4] C08K *5/41*

U.S. Cl. 524—170 **9 Claims**

1. A process for the production of a plasticized composition which comprises intimately mixing

(a) a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon of from 2 to 20 carbon atoms inclusive, and

(b) organic sulfone of from 2 to 20 carbon atoms inclusive wherein the substituents of the $—SO_2—$ linkage of said sulfone are of 2 to 20 carbon atoms inclusive and are hydrocarbyl or substituted hydrocarbyl in which the substituents are non-reactive toward the components of the plasticized composition.

4,859,730

AQUEOUS SUSPENSION POLYMERIZATION PROCESS OF COMPOSITIONS CONTAINING STYRENE IN THE PRESENCE OF ROSIN ACID DERIVATIVES AND THEIR SALTS AND EXPANDABLE OR NON EXPANDABLE POLYSTYRENE OBTAINED

Didier Lozachmeur, Compiegne, France, assignor to Societe Chimique des Charbonnages Sa Tour Aurore, France

Division of Ser. No. 200,902, Jun. 1, 1988, Pat. No. 4,814,355, which is a division of Ser. No. 97,180, Sep. 16, 1987, Pat. No. 4,769,392. This application Jan. 11, 1989, Ser. No. 295,540

Claims priority, application France, Sep. 17, 1986, 86 13006

Int. Cl.[4] C08L *23/00*

U.S. Cl. 524—274 **16 Claims**

1. A non-expandable thermoplastic composition comprising: (i) particles of polymers containing styrene and (ii) 1 to 5000 ppm relative to the total weight of the thermoplastic composition of at least one substance selected from rosin acid derivatives and their salts of metals belonging to Group IIa of the Periodic Classification of Elements, said substance being incorporated into the polymer particles before the end of the polymerization of the styrene.

4,859,731

POLYMERIC DIHYDROXY COMPOUNDS AND THEIR USE AS STABILIZERS FOR POLYMERS

Herbert Eichenauer, Dormagen; Hartwig Höcker, Aachen, and Thomas Heitz, Alsdorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

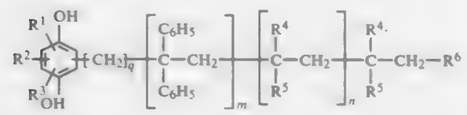
Filed Jul. 25, 1988, Ser. No. 223,541

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1987, 3725848

Int. Cl.[4] C07C *59/52, 39/19, 39/08;* **C08F** *8/02;* **C08K** *5/13*

U.S. Cl. 524—291 **6 Claims**

1. Polymeric dihydroxy compounds corresponding to the following formula



in which

R^1, R^2, R^3 = H or C_1–C_4 alkyl,

R^4 = H or C_1–C_4 alkyl,

R^5 = $—C_6H_5$, $—C_6H_4CH_3$, $—CH=CH_2$ or $—CO_2R^7$,

R^6 = C_1–C_4 alkyl, aryl or H,

R^7 = C_1–C_4 alkyl,

m = 0 or 1

n = 5 to 100,

q = 0 or 1.

3. Synthetic polymers according to claim 2 which additionally contain a sulfur-containing or phosphorus-containing co-stabilizer.

4,859,732

REINFORCED MOLDING COMPOSITION BASED ON POLY(1,4-CYCLOHEXYLENE DIMETHYLENE TEREPHTHALATE) HAVING IMPROVED CRYSTALLIZATION CHARACTERISTICS

Larry A. Minnick, Bluff City, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 22, 1988, Ser. No. 158,821

Int. Cl.[4] C08K *5/05*

U.S. Cl. 524—385 **13 Claims**

1. A glass fiber reinforced composition, comprising:

(a) a poly(1,4 cyclohexylene dimethylene terephthalate) resin having an I.V. of about 0.5–1.0,

(b) 10–50 wt % of glass reinforcing fibers, and

(c) a crystallization promoting amount of at least one linear alcohol having 30–50 carbon atoms.

4,859,733

POLYOLEFIN COMPOSITIONS CONTAINING TRIALKANOLAMINES

David J. Mitchell, and Vaclav G. Zboril, both of Kingston, Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Filed Aug. 4, 1988, Ser. No. 228,061

Claims priority, application United Kingdom, Aug. 11, 1987, [redacted]

Int. Cl.[4] C08F *2/42, 10/02, 4/64*

U.S. Cl. 524—432 **11 Claims**

1. A composition of a polyolefin selected from the group consisting of homopolymers of ethylene and copolymers of ethylene and at least one C_3–C_{10} hydrocarbon alpha-olefin, said polyolefin containing at least 20 ppm of at least one trialkanolamine of the formula $N(ROH)(R'OH)_2$, where R is isopropyl and R' is alkyl of 2–4 carbon atoms, and an agent selected from the group consisting of zinc oxide and a zeolite molecular sieve, and mixtures thereof, the amount of zinc oxide being 0.01 to 4 parts by weight and the amount of zeolite molecular sieve being 0.05 to 1 parts by weight, per 100 parts by weight of polyolefin.

6. A solution polymerization process for the preparation of high molecular weight polymers of alpha-olefins selected from the group consisting of homopolymers of ethylene and copolymers of ethylene and C_3–C_{12} hydrocarbon alpha-olefins, said process comprising feeding monomer selected from the group consisting of ethylene and mixtures of ethylene and at least one C_3–C_{12} hydrocarbon alpha-olefin, a coordination catalyst and inert hydrocarbon solvent to a reactor, said catalyst being a titanium-based and/or vanadium-based coordination catalyst, polymerizing said monomer at a temperature in the range of 105°–320° C. and a pressure of less than 25 MPa, deactivating the catalyst by admixing the solution so obtained with at least one trialkanolamine deactivating agent of the formula $N(ROH)(R'OH)_2$, where R is isopropyl and R' is alkyl of 2–4 carbon atoms, separating the hydrocarbon solvent and other volatile matter from the solution and recovering a composition of said high molecular weight polymer, the amount of deactivating agent being not more than 2.5 moles of deactivating agent per mole of halogen plus alkyl radicals in the coordination catalyst, in which process an agent is added to the polymer subsequent to the deactivation of the coordination catalyst and prior to the recovery of the polymer, said agent being selected from the group consisting of zinc oxide and a zeolite molecular sieve, and mixtures thereof, the amount of zinc oxide being 0.01 to 4 parts by weight and the amount of zeolite molecular sieve being 0.05 to 1 parts by weight, per 100 parts by weight of polyolefin.

4,859,734

COMPOSITION OF POLYARYLENE THIOETHER

Yukio Ichikawa, and Takayuki Katto, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1988, Ser. No. 176,155

Claims priority, application Japan, Mar. 31, 1987, 62-79187

Int. Cl.[4] C08K *3/34*

U.S. Cl. 524—447 **3 Claims**

1. A composition of polyarylene thioether having a high crystallization rate, which comprises 100 parts by weight of polyarylene thioether having a repeating unit of



as the main constituent and 0.001 to 10 parts by weight of kaoline having a mean particle diameter of 0.03 to 2 μm.

4,859,735

CASTOR OIL BASED POLYURETHANE FOR BRIDGE DECKINGS AND RELATED APPLICATIONS

Cung Vu, Columbia, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Sep. 16, 1988, Ser. No. 245,869

Int. Cl.[4] C08L *75/04*

U.S. Cl. 524—780 **40 Claims**

1. Composition consisting essentially of two separate components, A and B, wherein in parts by weight

Component A consists essentially of (i) about 90–140 parts ketone-formaldehyde modified castor oil and (ii) about 0–120 parts elastomer; and

Component B consists essentially of about 50–75 parts a mixture comprising diphenylmethane diisocyanate and the reaction product of diphenylmethane diisocyanate (MDI) with an alkylene oxide of 2–4 carbons.

4,859,736

SYNTHETIC POLYSTYRENE RESIN AND ITS USE IN SOLID PHASE PEPTIDE SYNTHESIS

Hans Rink, Richen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

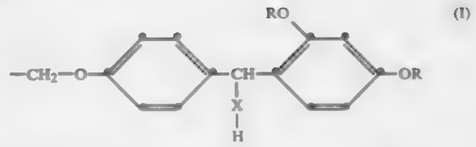
Filed Mar. 21, 1988, Ser. No. 171,049

Claims priority, application Switzerland, Mar. 30, 1987, 1214/87

Int. Cl.[4] C08L *89/00;* **C07C** *103/52*

U.S. Cl. 525—54.1 **6 Claims**

1. A synthetic resin based on a polystyrene that can be used as a support for solid phase peptide synthesis and that has been cross-linked with from 0 to 5 mol% of divinyl benzene, characterised in that it has been substituted at benzene rings of its skeletal structure by groups of the formula



in which X represents —O— or —NH— and R represents C_1–C_4-alkyl.

4,859,737

POLYMERIC COMPOSITION

Michael J. Modic, and Richard Gelles, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 24, 1987, Ser. No. 124,644

Int. Cl.[4] C08L *67/02*

U.S. Cl. 525—64 **11 Claims**

1. A thermoplastic polyster resin composition comprising from about 75 weight percent to about 85 weight percent of a polybutylene terephthalate, a carboxylated, hydrogenated or selectively hydrogenated conjugated diolefin polymer and an acidic transesterification catalyst, said diolefin polymer being hydrogenated to remove at least 95% of the original ethylenic unsaturation, the diolefin polymer and the transesterification catalyst being present in amounts effective to give ductile failure using ASTM D256.

4,859,738

ENVIRONMENTAL STRESS FAILURE RESISTANT POLYCARBONATE BLEND

Hani Farah, Sugarland; Chai J. Chou, Missouri City, and Don R. Roden, Jr., Hitchcock, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 7, 1988, Ser. No. 268,104

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 **16 Claims**

1. A thermoplastic molding composition, comprising:

A. an aromatic polycarbonate;

B. an aromatic polyester; and

C. a copolymer of ethylene and carbon monoxide.

4,859,739

COMPATIBILIZED POLYPHENYLENE ETHER-POLYAMIDE COMPOSITIONS AND METHOD OF PREPARATION

John B. Yates, III, Glenmont, and Dwain M. White, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 10, 1987, Ser. No. 119,004

Int. Cl.[4] C08L *53/02, 55/02, 71/04, 77/00*

U.S. Cl. 525—92 **19 Claims**

1. A method for preparing a resin composition which comprises melt blending (A) at least one polyamide, at least one polyphenylene ether comprising structural units containing a single carboxylic acid moiety attached directly to or separated by at most one carbon atom from an aromatic ring, and an impact modifying resin for polyphenylene ether-polyamide compositions.

4,859,740

PARTICULATE MULTIPHASE POLYMERS

Volker Damrath, Burscheid; Christian Lindner, Cologne, both of Fed. Rep. of Germany; Hans-Jürgen Kress, Pittsburgh, Pa., and Dieter Wittmann, Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 10, 1988, Ser. No. 154,956

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1987, 3704657

Int. Cl.[4] C08F *8/00;* C08L *83/04*

U.S. Cl. 525—100 4 Claims

1. Particulate, multiphase polymers which have a core (A) and an overlying shell (B) wherein the core (A) is an organic, rubbery polymer comprising polymerized olefinically unsaturated monomer units having softening point temperatures below 0° C. and wherein the shell (B) is an organopolysiloxane.

4,859,741

POLYESTER COMPOSITION

Katsuhiko Takahashi, Shizuoka; Tsuneyasu Nakashima, Kanagawa; Hiroshi Nakatsuji, and Hiroshi Okuda, both of Shizuoka, all of Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 850,206, Apr. 10, 1986, abandoned, and a continuation-in-part of Ser. No. 718,903, Apr. 2, 1985, abandoned. This application Mar. 16, 1987, Ser. No. 26,486

Claims priority, application Japan, Apr. 4, 1984, 59-67027; Apr. 10, 1985, 60-75945

Int. Cl.[4] C08L *67/02*

U.S. Cl. 525—123 3 Claims

1. A polyester composition consisting essentially of polybutylene terephthalate, (a) 1 to 50 percent by weight, based on said polybutylene terephthalate of a thermoplastic elastomer which is a copolymer of butadiene, styrene and methylmethacrylate, and (b) 0.1 to 10 percent by weight based on the weight of said polybutylene terephthalate of a low-temperature temperature impact strength and molten-state thermal stability improving component which is a polycarbodiimide.

4,859,742

RADIATION-CROSSLINKABLE THERMOPLASTIC SOLID COMPOSITION AND CURABLE PRODUCTS OBTAINED WITH THIS COMPOSITION

Jacky Pattein, Bergerac, and Patrice Le Roy, Itteville, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Dec. 17, 1987, Ser. No. 134,143

Claims priority, application France, Dec. 19, 1986, 86 17788

Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—131 16 Claims

1. A radiation-crosslinkable thermoplastic solid composition comprising at least one solid thermoplastic urethane polymer containing no unsaturation and having a molecular weight between 10,000 and 200,000, and a radiation-crosslinkable oligomer containing at least two ethylenic unsaturations selected from the group consisting of acrylic unsaturations, methacrylic unsaturations, vinylic unsaturations and allylic unsaturations, each of these unsaturations being situated either at the end of a chain or in a pendant position, wherein the weight ratio of the solid thermoplastic polymer to the radiation-crosslinkable oligomer is between 55/45 and 96/4.

4,859,743

URETHANE COMPONENT FOR HIGH SOLIDS COATING COMPOSITIONS

Ronald R. Ambrose, Allison Park; James B. O'Dwyer, Valencia; Byron K. Johnston, Arnold; David P. Zielinski, Gibsonia; Samuel Porter, Jr., Natrona Heights, and Wayne H. Tyger, New Kensington, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 22, 1988, Ser. No. 209,716

Int. Cl.[4] C08L *75/04*

U.S. Cl. 525—443 25 Claims

1. A high solids coating composition having a total solids content of at least 40 percent, comprising as a film former a urethane polyol having a hydroxyl value of at least about 50 and a number average molecular weight of no more than 4,000 which is prepared from reactants comprising a hydroxyl functional polyether or polyester or mixtures thereof of a number average molecular weight less than 1000 and average functionality not exceeding 3 and at least 10 weight percent of a polyisocyanate having isocyanate groups separated by one or more hydrophobic moieties, each moiety containing at least 12 consecutive carbon atoms in a continuous chain, the percentage based on the total weight of the hydroxyl functional polyether or polyester or mixtures thereof and polyisocyanate; and an aminoplast crosslinking agent.

4,859,744

PROCESS FOR THE PRODUCTION OF GRAFT POLYMERS OF HIGH RUBBER CONTENT

Christian Lindner, Cologne, and Karl-Heinz Ott, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 7, 1988, Ser. No. 164,806

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1987, 3708913

Int. Cl.[4] C08F *279/02, 279/04;* C08L *51/04*

U.S. Cl. 525—256 3 Claims

1. A process for the production of a graft polymer which comprises the emulsion graft polymerization of:

(a) from 40 to 90%, by weight, of an at least partly cross-linked diene rubber having an average particle diameter of from 0.1 to 0.6 μm; and

(b) from 60 to 10%, by weight, of one or more of styrene, acrylonitrile and methyl methacrylate; an initiator system comprising an organic hydroperoxide and ascorbic acid being used and a graft yield of greater than 60%, by weight, being obtained.

4,859,745

STRATIFIED FIBROUS FLUOROPOLYMER COMPOSITIONS AND PROCESS FOR FORMING SUCH FLUOROPOLYMERS

William P. Carl, Angleton; Emmett L. Tasset, Lake Jackson, and Robert E. Aikman, Jr., West Columbia, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 22, 1987, Ser. No. 136,690

Int. Cl.[4] C08F *259/08*

U.S. Cl. 525—276 21 Claims

1. A process for producing a modified polytetrafluoroethylene which comprises polymerizing tetrafluoroethylene in an aqueous medium containing a dispersing agent with a polymerization initiator source and then, copolymerizing tetrafluoroethylene and one or more fluorinated modifiers having an acid functional group or a functional group which is convertible to the acid group as a copolymerizable modifier in the presence of the resulting polytetrafluoroethylene to a polymerization point past the Kraft point to produce highly porous, fibrous, stratified fluoropolymers having cores made of homopolymer of polytetrafluoroethylene coated with sheath layers which are made of a copolymer of polytetrafluoroethylene and one or more modifiers.

4,859,746

AIR-DRYING LACQUER BINDER BASED ON POLYOCTENYLENE

Herbert Fischer, Duesseldorf; Bernd Wegemund, Hasn; Wolfgang Gress, Wuppertal-Elberfeld, and Manfred Gorzinski, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 16, 1987, Ser. No. 109,546

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3635285

Int. Cl.[4] C08F *8/14*

U.S. Cl. 525—293 10 Claims

1. The ring-opening reaction product of

(I) an epoxide of an unsaturated polymer containing from about 1 to about 12% by weight of epoxide oxygen, based on the weight of the polymer, wherein the unsaturated polymer is a polyoctenylene or a cyclo-octene-cycloene copolymer in which the cycloene component contains from 5 to 12 carbon atoms, and wherein the polymer before formation of the epoxide has a number average molecular weight of from about 600 to about 3,000, and

(II) at least one unsaturated monocarboxylic acid or derivative thereof which is one or more of

(a) an unsaturated monocarboxylic acid containing 6 to 22 carbon atoms.

(b) an alcohol containing from 2 to 6 hydroxy groups,

(c) an hydroxyalkyl amine containing at least one hydroxyalkyl group,

wherein the hydroxy groups of the alcohols and the hydroxyalkylamines are esterified with one or more unsaturated monocarboxylic acids containing from 6 to 22 carbon atoms to an OH number of less than about 25, and

wherein the ring-opening reaction product has a number average molecular weight of from about 1,500 to about 10,000 and an acid number of from about 0.1 to about 20.

4,859,747

PERFLUORINATION OF ETHERS IN THE PRESENCE OF HYDROGEN FLUORIDE SCAVENGERS

Thomas R. Bierschenk; Timothy J. Juhlke, both of Roundrock, and Richard J. Lagow, Georgetown, all of Tex., assignors to Exfluor Research Corporation, Austin, Tex.

Continuation-in-part of Ser. No. 924,198, Oct. 27, 1986, Pat. No. 4,755,567, which is a continuation-in-part of Ser. No. 796,623, Nov. 8, 1985, abandoned. This application May 24, 1988, Ser. No. 198,154

The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.

Int. Cl.[4] C08G *65/32;* C07C *41/22, 43/12*

U.S. Cl. 525—409 17 Claims

1. A method of fluorinating a hydrocarbon ether, comprising contacting the hydrocarbon ether, in the presence of a hydrogen fluoride scavenger, with fluorine gas under conditions sufficient for fluorination of ether, the amount of hydrogen fluoride scavenger being sufficient to react with hydrogen fluoride formed during the fluorination and to prevent charring or combustion of the ether during the fluorination.

4,859,748

PROCESS FOR ANIONIC POLYMERIZATION IN A CONTINUOUS STIRRED TANK REACTOR

Duane B. Priddy, and Michael Pirc, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 71,496, Jul. 9, 1987, abandoned, which is a division of Ser. No. 525,863, Aug. 24, 1983, Pat. No. 4,725,654, which is a continuation-in-part of Ser. No. 364,959, Apr. 2, 1982, abandoned. This application Oct. 11, 1988, Ser. No. 257,115

Int. Cl.[4] C08F *2/06, 4/46, 12/08*

U.S. Cl. 526—88 13 Claims

1. In an anionic polymerization process wherein a reaction mixture comprising an anionically polymerizable monomer selected from the group consisting of alkenyl aromatic monomers and mixtures thereof as the sole polymerizable monomer and an organometallic anionic polymerization initiator is subjected to polymerization conditions and the resulting polymeric product is thereafter recovered, the improvement comprising conducting the polymerization in a continuous stirred tank reactor wherein monomer and initiator are continuously added thereto, said reactor operating at a temperature between about 80° C. and about 140° C., a conversion of at least 99 weight percent, and a solids content from about 30 to about 80 weight percent.

4,859,749

PROCESS FOR THE PREPARATION OF A POLYOLEFIN WITH A WIDE MOLECULAR MASS DISTRIBUTION

Rainer Franke, Niedernhausen/Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 13, 1988, Ser. No. 218,655

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1987, 3723526

Int. Cl.[4] C08F *4/64, 10/02*

U.S. Cl. 526—124 4 Claims

1. A process for the preparation of a polyolefin by two-stage polymerization of ethylene with 0 to 10% by weight, based on the total amount of monomers, of a 1-olefin of the formula $R^6—CH=CH_2$, in which R^6 denotes a straight-chain or branched alkyl radical with 1 to 12 carbon atoms, in suspension or in the gas phase at a temperature of 20° to 120° C. under a pressure of 2 to 60 bar in the presence of a mixed catalyst consisting of a transition metal component (component (a)), which is the reaction product of a magnesium alcoholate with a titanium compound and an organoaluminum compound, and an organoaluminum compound, the average molecular mass being regulated by hydrogen, which comprises carrying out the polymerization in the presence of a mixed catalyst, component (a) of which has been prepared by reaction of a magnesium alcoholate, suspended in an inert dispersing agent, of the formula (I)

$$Mg(OR^1)(OR^2) \quad (I)$$

in which R^1 and R^2 are identical or different and denote an alkyl radical with 1 to 6 carbon atoms, with a titanium-IV compound of the formula (II)

$$Tix_m(OR^3)_{4-m} \quad (II)$$

in which R^3 denotes an alkyl radical with 1 to 6 carbon atoms, x denotes a halogen atom and m is a number from 2 to 4, and subsequent reaction with an organoaluminum compound of the formula III

$$ALR^4_n(OR^5)_pX_{3-n-p} \quad (III)$$

in which R^4 and R^5 are identical or different and denote an alkyl radical with 1 to 12 carbon atoms, X denotes a halogen atom, n is a number from 1 to 2 and p is a number from zero to 0.5, and is introduced only into the first polymerization stage, and component (b) of the mixed catalyst being an aluminumtrialkyl with 1 to 12 carbon atoms in the alkyl radicals or aluminumisoprenyl the molar ratio of component (a) to component (b), based on titanium and aluminum, being 1:1 to 1:500, the molar ratio of hydrogen to ethylene in the gas space being 1:0.01 to 1:0.5 in the one polymerization stage and 1:0.01 to 0.1:8 in the other polymerization stage, and the ratio of the amounts of polyolefins formed in the two polymerization stages being 30:70 to 70:30.

4,859,750

METHOD FOR THE PRODUCTION OF POLYMETHYL METHACRYLATE

Yasuyuki Kato; Masahiro Yuyama; Masahiko Moritani, all of Ehime, and Yukio Yasunori, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 21, 1986, Ser. No. 898,514

Claims priority, application Japan, Aug. 21, 1985, 60-183423

The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.

Int. Cl.[4] C08F *11/06, 120/18*

U.S. Cl. 526—135 8 Claims

1. A method for the production of a polymer having improved flexural strength and transparency which comprises polymerizing a mixture of 100 parts by weight of a monofunctional unsaturated monomer or methyl methacrylate and a monomer mixture comprising predominantly methyl methacrylate which may partially contain a polymer of said monomer and 0.5 to 25 parts by weight of a polyfunctional unsaturated monomer selected from the group consisting of an acrylic acid or methacrylic acid ester of ethylene glycol and oligomers thereof, an acrylic acid or methacrylic acid ester of dihydric alcohols, an acrylic acid or methacrylic acid ester of bisphenol A or bisphenol A alkeneoxide adducts, glycidyl acrylate or glycidyl methacrylate adducts of dihydric or polyhydric alcohols, and glycidyl acrylate or glycidyl methacrylate adducts of dibasic acids in the presence of (1) a radical polymerization initiator of from 0.1 to 5 parts by weight per 100 parts by weight of said monofunctional unsaturated monomer, (2) a reducing compound containing sulfur in the molecule thereof of from 0.1 to 5 parts by weight per 100 parts by weight of said monofunctional unsaturated monomer, (3) an amine hydrohalogenate or a quaternary ammonium halide of from 0.005 to 1 parts by weight based on 100 parts by weight of said monofunctional unsaturated monomer and (4) a copper-containing compound in an amount of from 0.005 to 10 parts per million based upon the weight of the monofunctional unsaturated monomers, said polymerization being carried out by bulk polymerization with a mold.

4,859,751

PROCESS FOR EMULSION POLYMERIZATION

Joachim Schulze; Klaus Adler; Manfred Selig, all of Burghausen; Peter Ball, Emmerting; Klaus Marquardt, Burghausen; Otmar Killermann, Kirchdorf/Inn, and Manfred Hannebaum, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Fed. Rep. of Germany

Filed Oct. 29, 1984, Ser. No. 665,787

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1983, 3344242

Int. Cl.[4] C08F *2/24, 2/20*

U.S. Cl. 526—200 8 Claims

1. A process for the preparation of a readily dispersible, pourable dispersion powder capable of forming stable redispersions in water comprising emulsion polymerizing in the presence of a free radical initiator a mixture consisting essentially of 1 to 50% by weight of ethylene and 99 to 50% by weight of an ethylenically unsaturated comonomer phase comprising at least one member of the group consisting of (a) 60 to 100% by weight of vinyl chloride, (b) 0 to 40% by weight of monoethylenically unsaturated, oil-soluble monomers, (c) 0 to 10% by weight of monoethylenically unsaturated water-soluble monomers having functional groups and (d) 0 to 5% by weight of oil-soluble monomers that are mono-ethylenically unsaturated and have functional groups or are multiple ethylenically unsaturated and optionally a protective colloid and free of emulsifier at an ethylene pressure of 10 to 150 bar to obtain an aqueous dispersion of a vinyl chloride-ethylene copolymer, optionally adding to the aqueous dispersion (e) 0 to 40% by weight, based on the VCE-polymer, of at least one water-soluble substance having a T_g 60° C., (f) 0 to 1% by weight, based on the VCE-polymer, of an antifoaming agent, and (g) 0 to 30% by weight, based on the total weight of polymer constituents, of a finely divided antiblocking agent and spray drying or freeze drying the aqueous dispersion to obtain the readily redispersible pourable powder of a vinyl chloride-ethylene copolymer.

4,859,752

ALKENE/EXCESS MALEIC ANHYDRIDE POLYMER MANUFACTURE

Thomas P. Bosanec; Kenneth R. Lukow, and Calvin J. Verbrugge, all of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Sep. 11, 1987, Ser. No. 96,106

Int. Cl.[4] C08F *2/00*

U.S. Cl. 526—209 16 Claims

1. A method for making a free radical addition polymer of maleic anhydride and at least one 1-alkene comprising the steps of

(A) mixing maleic anhydride with at least one 1-alkene selected from the group consisting of 1-alkenes having from 4 to 30+ carbon atoms in the presence of an effective amount of a thermally decomposable initiator to initiate the polymerization reaction at a temperature of from about 145° C. to about 200° C. to form a reaction mixture wherein a major portion of the maleic anhydride and 1-alkene is proportionally added over a period of time at a rate which is substantially equal to the rate of reaction of the maleic anhydride and 1-alkene to form said reaction mixture and the molar ratio of maleic anhydride to total 1-alkene present is maintained at a ratio of at least 55:45 up to about 95:5 during the course of the mixing and reaction; and

(B) thereafter maintaining the reaction mixture at a temperature of from about 145° C. to 200° C. until a polymer containing from 55 mole percent up to about 95 mole percent of maleic anhydride is obtained.

4,859,753

BRANCHED LIPOPEPTIDE POLYMERS FORMING THERMOTROPIC AND LYOTROPIC LIQUID CRYSTALS, THEIR APPLICATIONS AND CORRESPONDING MONOMERS

Bernard Gallot, and André Douy, both of Olivet, France, assignors to Centre Natioonal de la Recherche Scientifique (CNRS), Paris, France

Filed Jul. 11, 1986, Ser. No. 884,751

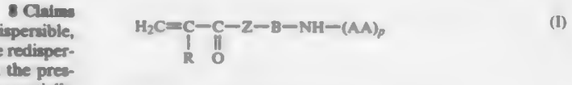
Claims priority, application France, Jul. 19, 1985, 85 11121

Int. Cl.[4] C08H *1/00*

U.S. Cl. 526—238.1 8 Claims

1. Polymers selected from the group consisting of:

A. homopolymers of monomers having the formula:



(I)

where:

R is H or a lower alkyl group of C_1 to C_3;

Z is O or NH;

B represents an alkyl chain of C_2 to C_{24}; and

$(AA)_p$ represents a peptide radical comprising p coupled aliphatic amino acids, and bound to B by the carboxyl group of the first amino acid, each amino acid comprising less than 15 carbon atoms and being unsubstituted or substituted at a carbon of the chain by an acid or carboxylic ester, amide or amine group, the terminal amine group being unsubstituted or acylated by a R'CO group, R' being an alkyl radical comprising 1 to 4 carbon atoms, or by a group stable under the condition of the synthesis; AA being derived from amino acids with a hydrophilic side chain; and

p is less than 30;

B. copolymers of the monomers of formula I with an alkyl acrylate of the formula:



or with an acrylamide of the formula:



where:

R_3 is H or a lower alkyl group of C_1 to C_3; and

R_4 represents alkyl or hydroxyalkyl groups of C_1 to C_{18}; and mixtures thereof.

4,859,754

WATER AND OIL REPELLANT HAVING DESOILING PROPERTIES

Takashige Maekawa; Kazuya Oharu, both of Yokohama, and Tomoko Sakaguchi, Fukuoka, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Oct. 20, 1988, Ser. No. 260,261

Claims priority, application Japan, Oct. 20, 1987, 62-262752

Int. Cl.[4] C08F *18/20*

U.S. Cl. 526—245 6 Claims

1. A water and oil repellant having desoiling properties composed of a polyfluorinated group-containing copolymer obtained by copolymerizing the following monomers a and b as essential constituting components:

a: a polyfluorinated group-containing monomer

b: an amphipathic monomer having a hydrophilic moiety and a lipophilic moiety.

4,859,755

CROSSLINKABLE, FLUORINE-CONTAINING COPOLYMERS AS BINDERS FOR HIGHLY WEATHER-RESISTANT SURFACE COATINGS

Michael Schlipf, Burgkirchen; Albrecht Manz, Wiesbaden, and Gernot Löhr, Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 6, 1988, Ser. No. 141,569

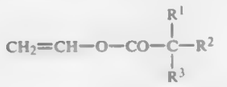
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1987, 3700548

Int. Cl.[4] C08F *14/18*

U.S. Cl. 526—255 10 Claims

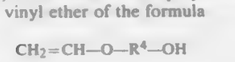
1. A crosslinkable, fluorine-containing copolymer, comprising:

(a) 15 to 70 mol % of copolymerized units of a vinyl ester of the formula



in which R^1, R^2 and R^3 are branched or straight-chain alkyl radicals or cycloalkyl radicals, at most one of these radicals is hydrogen and at least one of these radicals is a methyl group, and, furthermore, the entire acyl radical of the vinyl ester contains at least 9 and at most 28 carbon atoms,

(b) 5 to 50 mol % of copolymerized units of a hydroxyalkyl vinyl ether of the formula



in which R^4OH is a branched or straight-chain hydroxyalkyl group having 1 to 6 carbon atoms, and

(c) copolymerized units of tetrafluoroethylene in an amount which makes up the sum of components (a) plus (b) plus (c) to 100, but with the proviso that at least 10 mol % of copolymerized units of tetrafluoroethylene are present in the copolymer.

4,859,756

POLYMERS OF OXYALKYLATED UNSATURATED QUATERNARY AMMONIUM SALTS, THEIR PREPARATION AND THEIR USE

Hans-Helmut Goertz, Freinsheim; Alfred Oftring, Ludwigshafen, and Friedrich Vogel, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

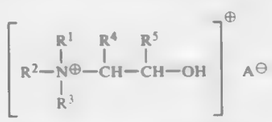
Filed Jul. 29, 1988, Ser. No. 226,198

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1987, 3725449; Jul. 31, 1987, 3725428

Int. Cl.[4] C08F *26/06*

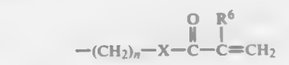
U.S. Cl. 526—263 5 Claims

1. A water-soluble cationic homopolymer obtained from a water-soluble monomer having a polymerizable olefinic double bond and a quaternary nitrogen atom, of the formula I



I

where R^1 is alkenyl of 2 to 4 carbon atoms or a radical of the formula II



II

where n is an integer from 1 to 18, X an NH group and R^6 is hydrogen or methyl, R^2 is alkyl of 1 to 18 carbon atoms or hydroxyalkyl of 2 to 18 carbon atoms, R^3 is alkenyl of 2 to 4 carbon atoms or alkyl of 1 to 18 carbon atoms or hydroxyalkyl of 2 to 18 carbon atoms, or the radicals R^1, R^2 and R^3 together with the quaternary nitrogen atom form a 5-membered or 6-membered heterocyclic ring which is substituted by a polymerizable olefinic double bond and may contain a further nitrogen atom and may contain one or two alkyl radicals of 1 to 4 carbon atoms as substituents, and R^4 and R^5 are each hydrogen or alkyl of 1 to 28 carbon atoms or are each methyl which is substituted by alkoxy where alkyl is of 1 to 10 carbon atoms, and $A\ominus$ is one equivalent of an anion, except for halide, by free radical polymerization.

4,859,757

NOVEL PROPYLENE POLYMERS

Brian J. Pellon; George C. Allen, and Michael P. Hughes, all of Odessa, Tex., assignors to Rexene Products Company, Odessa, Tex.

Continuation-in-part of Ser. No. 880,453, Jun. 30, 1986, abandoned. This application Apr. 21, 1988, Ser. No. 184,225

Int. Cl.[4] C08F *210/16*

U.S. Cl. 526—348 8 Claims

1. A substantially amorphous binary random copolymer consisting essentially of from about 10 to about 30 wt. % of ethylene and from about 70 to about 90 wt. % of propylene, said copolymer having a tacticity index m/r ranging between 3.0 and 4.0 and having a propylene inversion value of about 0.15 and below as determined by ^{13}C NMR Spectra.

4,859,758

ACID-FUNCTIONAL POLYMERS DERIVED FROM CELLULOSE ESTER-UNSATURATED ALCOHOL COPOLYMERS, WHICH ARE REACTED WITH CYCLIC ANHYDRIDES

Mohamad D. Shalati, Richton Park; James A. Marquart, Chicago Heights; John R. Babjak, Tinley Park, and Rodney M. Harris, Chicago, all of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Nov. 16, 1987, Ser. No. 121,265
Int. Cl.[4] C08F 251/02
U.S. Cl. 527—313 9 Claims

1. A carboxylic acid-functional polymer which comprises the reaction products obtained by reacting:

(a) a hydroxy-functional polymer having an average of at least two hydroxyl groups per molecule; and

(b) a monomeric aliphatic or aromatic cyclic anhydride having one anhydride group per molecule under reaction conditions to produce acid groups and ester groups; and

wherein the hydroxy-functional polymer is obtained by the copolymerization of:

(i) 1–95 weight percent of a cellulose ester; and

(ii) 5–99 weight percent of at least one ethylenically unsaturated alcohol copolymerizable with the cellulose ester; and

(iii) 0–94 weight percent of at least one other ethylenically unsaturated monomer copolymerizable with the cellulose ester and the ethylenically unsaturated alcohol.

4,859,759

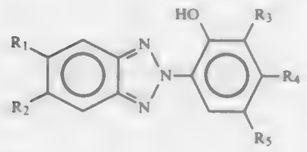
SILOXANE CONTAINING BENZOTRIAZOLYL/TETRAALKYLPIPERIDYL SUBSTITUENT

William E. Maycock, Marietta; Ronald S. Nohr, Roswell, and J. Gavin MacDonald, Decatur, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 14, 1988, Ser. No. 181,463
Int. Cl.[4] C08G 77/04
U.S. Cl. 528—27 72 Claims

1. A siloxane containing at least one benzotriazolyl/tetraalkylpiperidyl substituent and having the general formula, S-Z, in which S represents a siloxane moiety and Z represents a pendant benzotriazolyl/tetraalkylpiperidyl group attached by means of a divalent connecting group to a silicon atom, in which:

(A) the benzotriazolyl moiety is represented by the general formula,



in which

(1) R_1 is (a) a monovalent goup selected from the group consisting of hydrogen and chloro; (b) a tetraalkylpiperidyl group; or (c) a divalent connecting group;

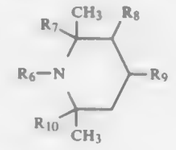
(2) R_2 is (a) a monovalent group selected from the group consisting of hydrogen, chloro, carboxy, sulfo, ethylsulfonyl, C_1–C_8 alkyl, C_1–C_4 alkoxy, vinylbenzyloxy, and alkoxycarbonyl in which the alkoxy moiety contains from 2 to 9 carbon atoms; (b) a tetraalkylpiperidyl group; or (c) a divalent connecting group;

(3) R_3 is (a) a monovalent group selected from the group consisting of hydrogen, chloro, carboxyethyl, C_1-C_{14} alkyl, C_1-C_8 alkoxy, cyclopentyl, cyclohexyl, phenyl, phenyl substituted with C_1-C_8 alkyl groups, C_7-C_9 phenylalkyl, and alkoxycarbonyl in which the alkoxy moiety contains from 2 to 9 carbon atoms; (b) a tetraalkylpiperidyl group; or (c) a divalent connecting group;

(4) R_4 is a monovalent goup selected from the group consisting of hydrogen, chloro, hydroxy, C_1–C_{14} alkyl, C_1–C_8 alkoxy, and vinylbenzyloxy; and

(5) R_5 is (a) a monovalent group selected from the group consisting of hydrogen, chloro, carboxyethyl, C_1–C_{14} alkyl, cyclopentyl, cyclohexyl, phenyl, and C_7–C_9 phenylalkyl; (b) a tetraalkylpiperidyl group; or (c) a divalent connecting group; and

(B) the tetraalkylpiperidyl moiety is represented by the general formula,



in which

(1) R_6 is (a) a monovalent group selected from the group consisting of hydrogen; hydroxy; C_1–C_{18} alkyl; C_2–C_4 hydroxyalkyl; C_8–C_{12} phenylhydroxyalkyl; C_3–C_8 alkenyl; C_7–C_{12} phenylalkyl; C_1–C_8 alkanoyl; C_3–C_5 alkenoyl; and -CO-$N(R_{11})(R_{12})$, in which each of R_{11} and R_{12} is a monovalent group independently selected from the group consisting of hydrogen, C_1–C_{18} alkyl, C_3–C_{12} alkoxyalkyl, C_2–C_8 hydroxyalkyl, C_3–C_{12} alkenyl, C_7–C_{14} phenyalkyl, C_6–C_{14} aryl, C_7–C_{14} alkaryl, C_3–C_7 cycloakyl, and 2,2,6,6,-tetramethyl-4-piperidyl; (b) a benzotriazolyl group; or (c) a divalent connecting group;

(2) R_7 is C_1–C_5 alkyl;

(3) R_8 is hydrogen or C_1–C_5 alkyl;

(4) R_9 is (a) a monovalent group selected from the group consisting of hydrogen; hydroxy; C_1–C_{12} alkoxy; C_3–C_{14} alkoxyalkoxy (oxaalkoxy); C_3–C_5 alkenoxy; poly(oxyethylene) having from 1 to 10 oxyethylene repeating units; carboxy; C_1–C_{18} alkoxycarbonyl; C_3–C_5 alkenoxycarbonyl; C_3–C_8 cycloalkoxycarbonyl; C_6–C_{10} aryloxycarbonyl; C_7–C_{12} alkylaryloxycarbonyl; C_7–C_{12} phenylalkoxycarbonyl; carboxymethyl; C_1–C_{18} alkoxycarbonylmethyl; C_3–C_5 alkenoxycarbonylmethyl; C_5–C_8 cycloalkoxycarbonylmethyl; C_6–C_{10} aryloxycarbonylmethyl; C_7–C_{12} alkylaryloxycarbonylmethyl; C_7–C_{12} phenylalkoxycarbonylmethyl; C_2–C_{20} alkanoyloxy (alkoxycarbonyloxy); cyano; cyanomethyl; 2-cyanoethoxy;

—$N(R_{13})(R_{14})$, in which each of R_{13} and R_{14} independently is a monovalent group selected from the group consisting of C_1–C_{18} alkyl, C_2–C_{14} alkoxyalkyl, C_3–C_5 alkenyl, C_5–C_8 cycloalkyl, C_7–C_{12} phenylalkyl, C_6–C_{10} aryl, C_2–C_5 hydroxyalkyl, and C_7–C_{10} cycloakylalkyl;

—$CH_2CH_2N(R_{13})(R_{14})$, in which R_{13} and R_{14} are as already defined;

—CO—$N(R_{15})(R_{16})$, in which each of R_{15} and R_{16} independently is hydrogen, a group as defined for R_{11} and R_{12}, or a monovalent group selected from the group consisting of C_3–C_{12} alkoxyalkyl, C_3–C_{12} alkenyl, C_2–C_8 hydroxyalkyl, C_7–C_{14} phenylalkyl, C_6–C_{14} aryl, and C_7–C_{14} alkaryl;

—$N(R_{17})$—CO—R_{18}, in which R_{17} is hydrogen or a group as defined for R_{13} and R_{14} and R_{18} is a monovalent group selected from the group consisting of C_1–C_{12} alkyl, C_3–C_{14} alkoxyalkyl, C_2–C_{14} alkyl which is substituted with carboxy or the C_1–C_4 alkyl ester thereof, C_2–C_5 alkenyl; C_5–C_8 cycloalkyl, C_7–C_{12} phenylalkyl, C_6–C_{10} aryl, and C_7–C_{12} alkaryl;

—O—CO—R_{19}, in which R_{19} is a monovalent group selected from the group consising of C_1–C_{18} alkyl, C_3–C_{14} alkoxyalkyl, C_2–C_{14} alkyl which is substituted by carboxy or the C_1–C_4 alkyl ester thereof, C_2–C_5 alkenyl, C_5–C_8cycloalkyl, C_7–C_{12} phenylalkyl, C_6–C_{10} aryl, C_7–C_{12} alkylaryl, and phenyl or C_7–C_{10} phenylalkyl which is substituted by hydroxy and 1–3 C_1–C_4 alkyl groups;

—$N(R_{17})$—CO—O—R_{20}, in which R_{17} is as already defined and R_{20} is a monovalent group selected from the group consisting of C_1–C_{12} alkyl, C_3–C_5 alkenyl, C_5–C_8 cycloalkyl, phenyl, and C_7–C_{12} phenylalkyl;

—O—CO—O—R_{20}, in which R_{20} is as already defined; and

—O—CO—$N(R_{21})(R_{22})$, in which each of R_{21} and R_{22} independently is hydrogen or a group as defined for R_{13} and R_{14}; (b) a benzotriazolyl group; or (c) a divalent connecting group; and

(5) R_{10} is C_1–C_5 alkyl;

with the selection of (A)(1)-(A)(5) and (B)(1)-(B)(5) such that Z contains at least one benzotriazolyl moiety and at least one tetraalkylpiperidyl moiety, one of which is covalently coupled to a silicon atom of the siloxane moiety, S, by means of a divalent connecting group.

4,859,760

POLYURETHANE POWDER COATING COMPOSITIONS

Fred W. Light, Jr.; James D. Hood, both of Charlotte, N.C., and Yeong-Ho Chang, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 7, 1987, Ser. No. 129,514
Int. Cl.[4] C08G 18/30
U.S. Cl. 528—45 13 Claims

1. Polyurethane powder coating composition in solid form comprising

(a) abou 10–80 weight % of at least one amorphous polyester containing free hydroxyl groups and having a Tg of greater than 40° C., a hydroxyl number of about 20–200, and an inherent viscosity of about 0.1–0.5.

(b) abou 10–80 weight % of at least one semi-crystalline polyester containing free hydroxyl groups and having a Tg of about −10 to about 50° C., a number average molecular weight of about 500–10,000, a heat of ofusion of greater than 5 calories per gram—° C., a hydroxyl number of about 20–200, an inherent viscosity of about 0.1–0.5, and

(c) about 5–30 weight % of a polyisocyanate crosslinking agent.

the sum of (a), (b) and (c) being 100%.

4,859,761

CYANOGUANIDINES AS HARDENERS FOR EPOXY RESINS

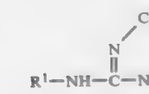
Peter Flury, Himmelried, and Alex Alder, Arisdorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 30, 1988, Ser. No. 238,638
Claims priority, application Switzerland, Sep. 2, 1987, 3359/87
Int. Cl.[4] C08G 59/40, 59/50
U.S. Cl. 528—123 13 Claims

1. A curable composition containing

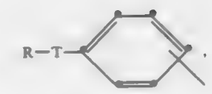
(a) an epoxy resin and

(b) as hardener for the epoxy resin, a cyanoguanidine of formula I



(I)

wherein R^1 and R^2 are each independently of the other C_1–C_{12}alkyl, C_2–C_{12}alkenyl, C_5–C_{10}cycloalkyl, C_6–C_{10}aryl or C_7–C_{12}aralkyl, or are a heterocyclic radical of 4 to 8 carbon atoms or a group of formula II



(II)

wherein R is phenyl or a heterocyclic radical of 4 to 5 carbon atoms, and T is methylene, isopropylidene, CO, O, S or SO_2, which radicals R^1 and R^2 are unsubstituted or substituted by C_1–C_4alkyl, C_1–C_4alkoxy, nitro, halogen, R^3OCO or R^3COO, where R^3 is phenyl or C_1–C_4alkyl.

4,859,762

PROCESS FOR THE PREPARATION OF COPOLY(ARYLENE SULFIDE)

Mark Rule; David R. Fagerburg, and Joseph J. Watkins, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 220,404, Jun. 28, 1988, abandoned. This application Feb. 13, 1989, Ser. No. 308,924
Int. Cl.[4] C08G 75/14
U.S. Cl. 528—215 15 Claims

1. A process for producing elemental iodine and a copoly-(arylene sulfide) corresponding to the structure:

$$[(—A—S—)_{1-x}(—A—S—S—)_x]_n$$

wherein A is a divalent substituted or unsubstituted aromatic racial, x is in the range of 0.5 to 0.001 and n is at least 200, comprising

(1) reacting at a temperature above about 175° C. a mixture consisting essentially of a diiodoaromatic compound and elemental sulfur and an organic amine-containing compound to produce the elemental iodine and the copoly(arylene sulfide), and

(2) recovering the elemental iodine.

4,859,763

PREPARATION PROCESS OF DL-LACTIC ACID-GLYCOLIC ACID-COPOLYMER

Hiroshi Takayanagi; Tadashi Kobayashi, both of Omuta; Takayoshi Mazuda, Tokai, and Hosei Shinoda, Nishikasugai, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 216,371
Claims priority, application Japan, Jul. 14, 1987, 62-173884; Jul. 1, 1988, 63-162396
Int. Cl.[4] C08G 63/10
U.S. Cl. 528—357 3 Claims

1. In a process for the copolymerization of a lactide and a glycolide to prepare a dl-lactic acid-glycolic acid-copolymer containing 50–60 mol % of a lactic acid unit and 40–50 mol % of a glycolic acid unit and having an inherent viscosity of 0.4–0.6 in chloroform, the improvement which comprises conducting the copolymerization in the presence of a polymerization regulator at a temperature of 200°–230° C. by using stannous octoate as a catalyst in an amount of 0.005–0.015 wt. % based on the sum of the lactide and the glycolide.

4,859,764

COPOLYMERIZATION OF CARBON MONOXIDE AND OLEFIN WITH NITROGEN CONTAINING PHOSPHINE LIGAND CATALYST

Eit Drent; Richard L. Wife, and Petrus W. N. M. Van Leeuwen, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 21, 1987, Ser. No. 88,169

Claims priority, application Netherlands, Aug. 22, 1986, [redacted]

Int. Cl.[4] C08G *67/02*

U.S. Cl. 528—392 9 Claims

1. In the process of producing polymers of carbon monoxide and at least one ethylenically unsaturated hydrocarbon under polymerization conditions in the presence of a catalyst composition formed from a palladium compound, anion of a non-hydrohalogenic acid having a pKa less than about 2 and a phosphine ligand, the improvement wherein the ligand is a nitrogen-containing ligand of the formula PA_3 wherein A independently is a phenyl substituent or a nitrogen-containing substituent of from 2 to 20 carbon atoms and from 1 to 3 nitrogen atoms, and wherein at least one A is the nitrogen-containing substituent, each nitrogen-containing substituent incorporates at least one nitrogen atom that is free from substitution with hydrogen, and from 2 to 4 carbon atoms separate each nitrogen atom from the phosphorus atom to which the nitrogen-containing substituent is attached.

4,859,765

SYNTHETIC PEPTIDE SEQUENCES USEFUL IN BIOLOGICAL AND PHARMACEUTICAL APPLICATIONS AND METHODS OF MANUFACTURE

John J. Nestor, Jr., San Jose; John G. Moffatt, Los Altos, and Hardy W. Chan, Belmont, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 542,633, Oct. 17, 1983, Pat. No. 4,493,795. This application Jul. 6, 1984, Ser. No. 628,678

Int. Cl.[4] C07K *1/00*

U.S. Cl. 530—333 5 Claims

1. A method of producing a synthetic antigenic polypeptide from a protein having a predetermined sequence of amino acids, said method comprising the steps of:

(1) determining a predicted β-turn polypeptide sequence consisting of four amino acid residues of the protein, said β-turn sequence having two ends; and

(2) synthesizing a polypeptide segment of the protein, wherein said segment comprises the β-turn sequence and from two to eight amino acid residues on each end of the β-turn sequence.

4,859,766

PURIFIED APPETITE-REGULATING SUBSTANCES OF BIOLOGICAL ORGIN, THEIR ANTIBODIES, IMMUNOCOMPLEXES OF THE APPETITE—REGULATING SUBSTANCES FORMED WITH THE ANTIBODIES AND PROCESSES FOR PREPARING SAME

József Knoll; Sándor Harmath, both of Budapest; János Nagy, Szentendre, and Berta Knoll, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti, Budapest, Hungary

Filed Dec. 17, 1987, Ser. No. 134,403

Claims priority, application Hungary, Dec. 17, 1986, 5254/86

Int. Cl.[4] C07K *15/14;* A61K *35/16, 37/02*

U.S. Cl. 530—380 4 Claims

1. A process for the preparation of a selective appetite-regulating substance of biological origin selected from the group consisting of Satietin and Satietin-D, in purified form, which comprises the steps of:

(a) providing Satietin or Satietin-D obtained from human or animal blood serum or plasma, in impure form;

(b) adding an adjuvant to the impure Satietin or Satietin-D and parenterally administering same to a mammalian subject to immunize said mammalian subject to form an anti-serum containing polyclonal monovalent antibodies against Satietin or Satietin-D, designated Antisatietin or Antisatietin-D respectively in the blood of the mammalian subject;

(c) removing the blood from the mammalian subject, centrifuging the blood to obtain the antiserum as a supernatent, and isolating from the antiserum Antisatietin or Antisatietin-D;

(d) preparing an activated and equilibrated gel chromatographic column;

(e) binding the Antisatietin or Antisatietin-D to the gel chromatographic column by layering same onto the gel bed of the gel chromatographic column;

(f) equilibrating the gel chromatographic column containing Antisatietin or Antisatietin-D by passing a buffer solution at a pH of 2.5 to 10 therethrough;

(g) ultrafiltering human or animal blood serum or plasma through a membrane filter permeable up to a molecular weight of 50,000 daltons to obtain a ultrafiltrate containing all native human or animal blood serum or plasma constituents with a molecular weight below 50,000 daltons;

(h) equilibrating the ultrafiltrate with the same buffer employed in step (f);

(i) introducing the equilibrated ultrafiltrate into the gel chromatographic column following the step (f) to selectively bind Satietin or Satietin-D contained in the ultrafiltrate to Antisatietin or Antisatietin-D bound to the gel chromatographic column to form an immunocomplex of Satietin-Antisatietin or Satietin-D-Antisatietin-D;

(j) eluting the native human or animal blood serum or plasma constituents other than Satietin or Satietin-D through the gel chromatographic column by passing the buffer solution previously employed during steps (f) and (h) therethrough;

(k) following step (j), passing an eluant having the ability to cleave the Satietin-Antisatietin or Satietin-D-Antisatietin-D complex bound to the gel chromatographic column to desorb selectively Satietin or Satietin-D thereby forming an eluate containing Satietin or Satietin-D; and

(l) recovering the eluate containing Satietin and Satietin-D.

4,859,767

GLUCOSYLMORANOLINE DERIVATIVES AND USE THEREOF FOR INHIBITING INCREASE IN BLOOD SUGAR LEVELS

Makoto Sugiyama, Kyoto; Yoji Ezure, Otsu; Yoshiaki Yoshikuni, Uji; Takayuki Ozaki, and Nobutoshi Ojima, both of Moriyama, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

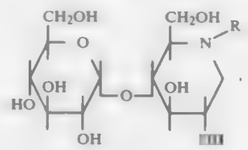
Filed Oct. 10, 1986, Ser. No. 917,739

Claims priority, application Japan, Oct. 12, 1985, 60-227601; May 14, 1986, 61-111618

Int. Cl.[4] C07H *15/00, 17/00;* A61K *31/70*

U.S. Cl. 536—17.4 15 Claims

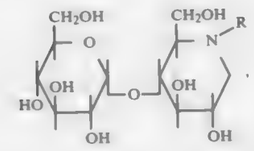
1. A compound of the formula I



[I]

or a pharmaceutically acceptable salt thereof wherein R is alkyl of 1 to 8 carbon atoms substituted by one or more hydroxyl groups.

11. A method for inhibiting an increase in blood sugar level in humans and animals which comprises administering to a human or animal in need thereof a therapeutically effective amount of a compound of the formula I



or a pharmaceutically acceptable salt thereof wherein R is alkyl of 1 to 8 carbon atoms substituted by one or more hydroxyl groups, in combination with a pharmaceutically acceptable carrier.

4,859,768

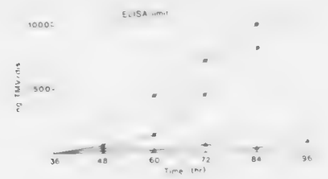
DERIVATIVES OF 2', 5'-OLIGOADENYLATE AND ANTIVIRAL USES THEREOF

Robert J. Suhadolnik, Roslyn, Pa., and Wolfgang Pfleiderer, Konstanz, Fed. Rep. of Germany, assignors to Temple University of the Commonwealth System of Higher Education, Philadelphia, Pa.

Continuation of Ser. No. 629,660, Jul. 11, 1984, abandoned. This application Jan. 11, 1988, Ser. No. 144,602

Int. Cl.[4] C07H *21/00*

U.S. Cl. 536—27 16 Claims



1. A compound selected from the group consisting of adenlylyl(2',5')3'-deoxyadenylyl(2',5')3'-deoxyadenosine and the 5' mono, di-, and triphosphate thereof.

4,859,769

ANTIVIRAL AGENTS

Karl-Anders Karlsson, Gothenburg; Erling Norrby, Lidingö , and Göran Wadell, Umeå, all of Sweden, assignors to Symbicom AB, Umea, Sweden

PCT No. PCT/DK86/00007, § 371 Date Nov. 5, 1986, § 102(e) Date Nov. 5, 1986, PCT Pub. No. WO86/03971, PCT Pub. Date Jul. 17, 1986

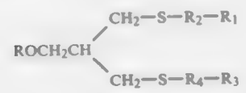
PCT Filed Jan. 13, 1986, Ser. No. 916,542

Claims priority, application Denmark, Jan. 14, 1985, 178/85

Int. Cl.[4] A61K *31/70, 37/22;* C07H *15/00;* G01N *33/53*

U.S. Cl. 536—53 13 Claims

1. A method of inhibiting the interaction between a cellular second-step viral binding receptor and a virus which comprises exposing the virus to a compound having the formula:



where R is a carbohydrate moity, R_1 and R_3 are selected independently from the group consisting of methyl, a reactive group, and a macromolecular carrier, and R_2 and R_4 are hydrocarbons with a chain length of at least five carbon atoms, and may be the same or different, and where said compound preferentially binds the viral recognition site for the binding epitope of a cellular second-step viral binding receptor, whereby the binding of the virus to the receptor is inhibited.

4,859,770

PROCESS FOR MAKING ALPHA-PHASE PHTHALOCYANINE BLUE PIGMENT COMPRISING SUBSTANTIALLY 100 PERCENT ISOMETRIC CRYSTALS

Thomas E. Donegan, Holland; Timothy G. Leary, Grand Haven, both of Mich., and Arvind S. Patil, Williamsburg, Va., assignors to BASF Corporation, Parsippany, N.J.

Filed Jan. 19, 1988, Ser. No. 145,400

Int. Cl.[4] C09B *47/04*

U.S. Cl. 540—136 20 Claims

1. A process for making a substantially 100 percent isometric, α-phase phthalocyanine blue pigment, comprising:

(a) activating a phthalocyanine blue pigment crude whereby an activated crude is formed,

(b) combining the activated crude with:

(1) an amount of water which is effective to produce a millable mixture,

(2) a surfactant which is effective to wet-out the activated crude, whereby a mixture is formed, and

(c) milling the mixture so that a pigment slurry is formed and so that the pigment within the slurry is comprised of substantially 100 percent isometric, α-phase phthalocyanine crystals.

4,859,771

PROCESS FOR RESOLUTION AND RACEMIZATION OF AMINES WITH ACIDIC α-HYDROGENS

Paul J. Reider, and Edward J. J. Grabowski, both of Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 178,872, Mar. 30, 1988, abandoned, which is a continuation of Ser. No. 885,047, Jul. 14, 1986, abandoned. This application Jan. 19, 1989, Ser. No. 300,737

Int. Cl.[4] C07B *55/00;* C07D *243/00*

U.S. Cl. 540—509 4 Claims

1. A process for the resolution-racemization of a 3 amino diazepin 2 one which comprises:

(a) addinq about 0.86 - 0.94 mole equivalent of a chiral sulfonic acid in an appropriate orqanic solvent and from about one to about 5 mole equivalent of water to a solution of a racemic mixture of a 3 amino diazepin-2-one to create a resolution mixture;

(b) seedinq the resolution mixture with a crystalline diastereomeric salt derived, from said 3 amino diazepin 2-one and said chiral sulfonic acid;

(c) addinq a catalytic amount of an aromatic aldehyde to the resolution mixture; and

(d) filterinq the resolution mixture to isolate the optically-pure diastereomeric salt of said 3-amino diazepin 2 one.

4,859,772

PROCESS FOR THE PREPARATION OF 3-ISOPROPYL-BENZO-2-THIA-1,3-DIAZINONE-(4)-2,2-DIOXIDE

Jenö Pelyva; K. István Vecsey, both of Füzfogyártelep; Zoltán Kolonics, Balatonalmádi; László Légrádi, Füzfogyártelep; Lajos Nagy, Füzfogyártelep; András Horváth, Füzfogyártelep; Ferenc Fodor, deceased, late of Füzfogyártelep (by Edit Tavasz Fodor née Ibolyka, heir); Csaba Soptei, Veszprém; Dezso Sebok, Veszprém; Elemér Tömördi, Veszprém; László Lendvai, Balatonfüzfo; Béla Karácsonyi, Budapest, and Erzsébet Diószegi, Veszprém, all of Hungary, assignors to Nitro Kémia Ipartelepek, Füzfogyártelep, Hungary

PCT No. PCT/HU86/00065, § 371 Date Jul. 15, 1987, § 102(e) Date Jul. 15, 1987, PCT Pub. No. WO87/03588, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 3, 1986, Ser. No. 105,230

Claims priority, application Hungary, Dec. 3, 1985, 4615/85

Int. Cl.⁴ C07D *285/16*

U.S. Cl. 544—11 **2 Claims**

1. In a process for the production of 3-isopropyl-benzo-2-thia-1,3-diazinone-(4)-2,2-dioxide, which comprises reacting isopropyl sulfamoyl chloride with anthranylic acid methyl ester, and subjecting the thus obtained N-isopropyl-N'-o-carbomethoxyphenyl-sulfamide to cyclization in the presence of sodium methylate, to obtain 3-isopropyl-benzo-2-thia-1,3-diazinone-(4)-2,2-dioxide, the improvement comprising preparing isopropyl sulfamoyl chloride in one step by reacting N,N'-diisopropyl urea with phosphorus trichloride and chlorine in the presence of oleum and sulfuric acid, whereby a 3-isopropylbenzo-2-thia-1,3-diazinone-(4)-2,2-dioxide of high purity is obtained.

4,859,773

PREPARATION OF 1,8-BRIDGED 4-QUINOLINE-3-CARBOXYLIC ACIDS

Klaus Grohe, Odenthal, and Michael Schriewer, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

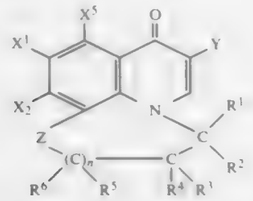
Division of Ser. No. 874,182, Jun. 3, 1986, Pat. No. 4,762,831. This application Mar. 24, 1988, Ser. No. 172,612

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1985, 3522406

Int. Cl.⁴ C07D *265/34*

U.S. Cl. 544—101 **7 Claims**

1. A process for the preparation of a 1,8-bridged 4-quinolone-3-carboxylic acid of the formula



(I)

in which

Y represents a carboxyl group, a nitrile group, an ester group —COOR⁷ or an acid amide group —CONR⁸R⁹, R⁷ representing C_1–C_4-alkyl,

R⁸ and R⁹ representing hydrogen or C_1–C_4-alkyl, and it additionally being possible for R⁹ to be optionally substituted phenyl,

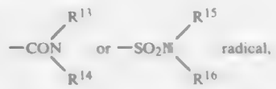
X¹ represents hydrogen, nitro, alkyl having 1–3 carbon atoms, or halogen,

X² denotes halogen, alkyl having 1–3 carbon atoms, an alkylsulphonyl group having up to 3 C atoms in the alkyl radical, and a phenylsulphonyl group which is optionally substituted in the aryl radical,

X⁵ is hydrogen, halogen or methyl,

Z represents oxygen, an amino radical NR¹⁰,

R¹⁰ denoting hydrogen, an alkyl radical having 1–6 carbon atoms which is optionally substituted by halogen, trifluoromethyl, nitro, cyano, hydroxyl, alkoxy or alkylmercapto each having 1–3 carbon atoms, aryloxy, arylthio or ester radical having 1–3 carbon atoms in the alcohol moiety, or a phenyl radical which is optionally substituted by halogen, a nitro group, an alkyl group having 1–3 carbon atoms, an akoxy or alkylmercapto group each having 1–3 carbon atoms, or furthermore represents an acyl radical R¹¹CO— or $R^{12}SO_2$—, R¹¹ and R¹² representing alkyl radicals having 1–6 carbon atoms or optionally substituted phenyl radicals, or is a

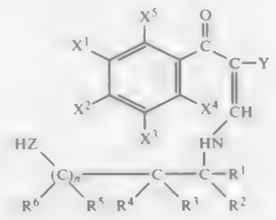


radical,

the radicals R¹³ to R¹⁶ representing hydrogen, alkyl having 1–6 carbon atoms or an optionally substituted phenyl radical,

R¹, R², R³, R⁴, R⁵ and R⁶ represent hydrogen, an alkyl group having 1–6 carbon atoms which is optionally substituted by halogen, nitro, cyano, hydroxyl, alkoxy or alkylmercapto each having 1–3 carbon atoms, aryloxy, arylthio or an ester group having 1–3 carbon atoms in the alcohol moiety, or a phenyl radical, naphthyl radical or heterocyclic radical which is optionally substituted by halogen, nitro, alkyl or alkoxy or alkylmercapto each having up to 3 carbon atoms, hydroxyl, aryloxy, arylthio, cyano or an ester radical having 1–3 carbon atoms in the alcohol moiety, and

R¹ and R², R³ and R⁴, R⁵ and R⁶ each can form, together with the carbon atom which connects them, a 3–7-membered ring which can optionally be substituted by optionally substituted alkyl radicals having 1–3 carbon atoms or optionally substituted aryl radicals, and furthermore R² with R³ and/or R⁴ with R⁵ each can form, together with the carbon atom to which they are bonded, a 3–7-membered ring which is optionally substituted by optionally substituted alkyl radicals having 1–3 carbon atoms or optionally substituted aryl radicals, and n denotes 0 or 1, and when n denotes 1, R³ and R⁴ denote halogen, hydroxyl, alkoxy or alkylmercapto each having 1–3 carbon atoms, or a dialkylamino group having 1–3 carbon atoms in the alkyl radicals, comprising in a first reaction step reacting an enamine of the formula

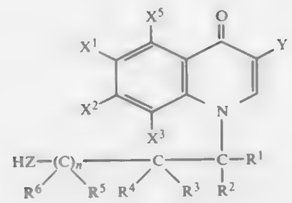


in which

X³ represents halogen, or a nitro group, and

X⁴ represents halogen, a nitro group, an alkoxy group having 1–3 carbon atoms in the alkyl moiety, an alkylmercapto or alkylsulphonyl group each having 1–3 carbon atoms in the alkyl radical, and an arylsulphonyl group,

in an anhydrous, aprotic solvent with one equivalent of a base, at a temperature from 80° C. to 180° C., to give a 4-quinolone-3-carboxylic acid derivative of the formula



and, in a second reaction step, reacting that with another equivalent of a base, to give the 1,8-bridged 4-quinolone-3-carboxylic acid derivative of the formula (I) and optionally converting the group Y into a carboxyl group or salt thereof.

4,859,774

FLOWABLE TRIETHYLENEDIAMINE

Akio Takahashi, Macungie; Robert G. Petrella, Allentown, and Joel Schwartz, Whitehall, all of Pa., assignors to Air Products and Chemicals Inc., Allentown, Pa.

Continuation of Ser. No. 747,621, Jun. 21, 1985, abandoned. This application Apr. 14, 1988, Ser. No. 181,615

Int. Cl.⁴ C07D *471/08*

U.S. Cl. 544—251 **2 Claims**

1. In a method for improving the flowability of triethylenediamine by admixing with a flow-promoting additive, the improvement which consists essentially of admixing sodium stearate with triethylenediamine at about 250 ppm.

4,859,775

PROCESS FOR PREPARING ACYLPYRAZINE ETHERS

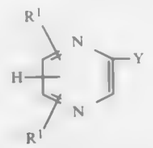
David L. Williams; Everett W. Southwick, and Yoram Houminer, all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 782,545, Oct. 1, 1985, Pat. No. 4,728,738. This application Mar. 18, 1987, Ser. No. 27,547

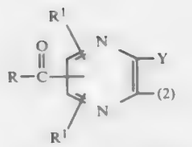
Int. Cl.⁴ C07D *241/16, 241/18, 405/12*

U.S. Cl. 544—405 **6 Claims**

1. A process for preparing halo-acylpyrazines which comprises the steps of (1) providing a heterogeneous reaction medium consisting of a water-immiscible organic phase and an acidic aqueous phase, wherein the organic phase comprises a mixture of a R-CHO aldehyde compound and a halopyrazine compound corresponding to the formula:



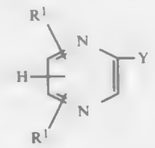
where Y is a halogen atom, and R¹ is a substituent selected from hydrogen and alkyl groups, having 1–6 carbon atoms, and R in the aldehyde compound is a substituent selected from aliphatic, alicyclic and aromatic hydrocarbyl groups having 2–12 carbon atoms; (2) maintaining efficient contact between the organic and aqueous phases for a period of time sufficient to achieve acylation of the halopyrazine compound in the presence of a free radical generating agent; and (3) recovering a halo-acylpyrazine product corresponding to the formula:



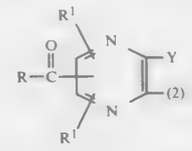
(2)

where Y is a halogen atom, R is a substituent selected from aliphatic, alicyclic and aromatic hydrocarbyl groups having 2–12 carbon atoms, and R¹ is a substituent selected from hydrogen and alkyl groups having 1–6 carbon atoms, with the proviso that the position-(2) substituent is not hydrogen.

6. A process for preparing acylpyrazine ethers which comprises the steps of (1) providing a heterogeneous reaction medium consisting of a water-immiscible organic phase and an acidic aqueous phase, wherein the organic phase comprises a mixture of a R-CHO aldehyde compound and a halopyrazine compound corresponding to the formula:

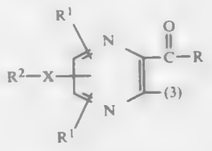


where Y is a halogen atom, and R¹ is a substituent selected from hydrogen and alkyl groups having 1–6 carbon atoms, and R in the aldehyde compound is a substituent selected from aliphatic, alicyclic and aromatic hydrocarbyl groups having 2–12 carbon atoms; (2) maintaining efficient contact between the organic and aqueous phases for a period of time sufficient to achieve acylation of the halopyrazine compound in the presence of a free radical generating agent; (3) recovering a halo-acylpyrazine intermediate corresponding to the formula:



(2)

where Y is a halogen atom, R is a substituent selected from aliphatic, alicyclic and aromatic hydrocarbyl groups having 2–12 carbon atoms, and R¹ is a substituent selected from hydrogen and alkyl groups having 1–6 carbon atoms, with the proviso that the position-(2) substituent is not hydrogen; and (4) reacting the halo-acylpyrazine intermediate with a R^2-X-M alcoholate, where M is an alkali metal atom, in a liquid medium under conditions that yield an acylpyrazine ether corresponding to the formula:

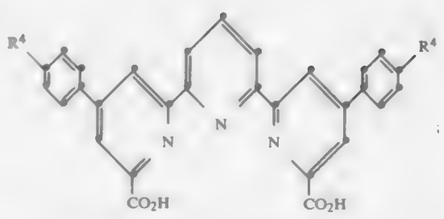


(3)

where R is a substituent selected from aliphatic, alicyclic and aromatic hydrocarbyl groups having 2–12 carbon atoms, R¹ is a substituent selected from hydrogen and alkyl groups having 1–6 carbon atoms, X is etheric oxygen or sulfur, and R² is a substituent selected from aliphatic, alicyclic and aromatic

hydrocarbyl groups having 1–12 carbon atoms, with the proviso that the position-3) substituent is not hydrogen.

(1)



wherein R^4 represents —H, —SCH_3, —OCH_3, —CN, —NO_2, —CO_2CH_3, —CH_3;

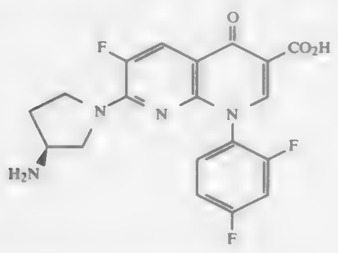
4,859,776

(S)-7-(3-AMINOPYRROLIDIN-1-YL)-1-(ORTHO, PARA-DIFLUOROPHENYL)-1,4-DIHYDRO-6-FLUORO-4-OXO-1,8-NAPHTHYRIDINE-3-CARBOXYLIC ACID AND METHOD FOR ITS PREPARATION

Daniel T. Chu, Vernon Hills, Ill., and Terry J. Rosen, East Lyme, Conn., assignors to Abbott Laboratories, Abbott Park, Ill.

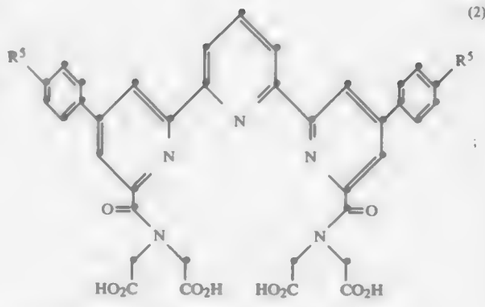
Filed Mar. 11, 1988, Ser. No. 167,058
Int. Cl.[4] C07D *471/04*
U.S. Cl. 546—123 **7 Claims**

7. The substantially pure (S) enantiomeric form of the compound of the formula:



or a pharmaceutically acceptable salt thereof.

(2)



wherein R^5 represents —CH_3, —NO_2, —OCH_3;

4,859,777

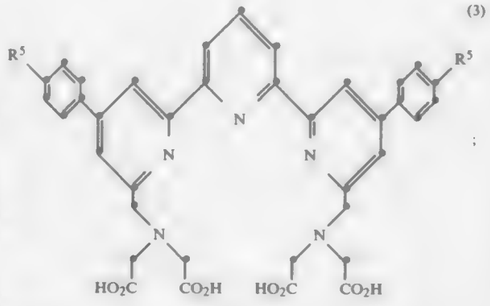
TERPYRIDINE CHELATING AGENTS

John L. Toner, Webster, assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 40,385, Apr. 20, 1987, which is a continuation-in-part of Ser. No. 7,024, Jan. 27, 1987, Pat. No. 4,801,722, which is a division of Ser. No. 825,693, Feb. 3, 1986, Pat. No. 4,637,988, which is a continuation of Ser. No. 279,398, Jul. 1, 1981, abandoned. This application Dec. 16, 1988, Ser. No. 285,163
Int. Cl.[4] C07D *401/14, 213/77, 213/79, 213/36*
U.S. Cl. 546—256 **1 Claim**

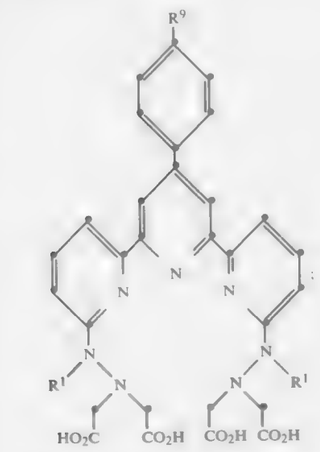
1. A compound selected from those having the following structures

(3)

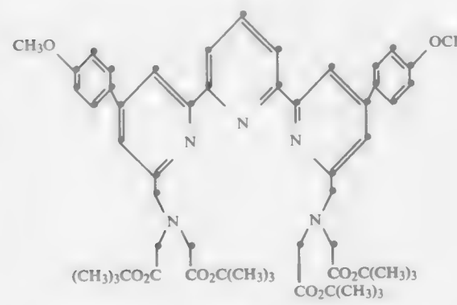


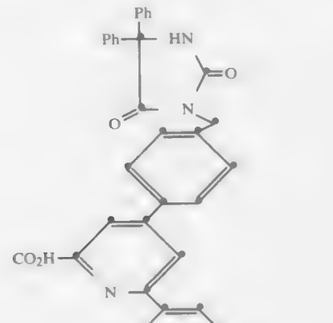
wherein R^5 represents —CH_3, —NO_2, or —OCH_3.

(4)



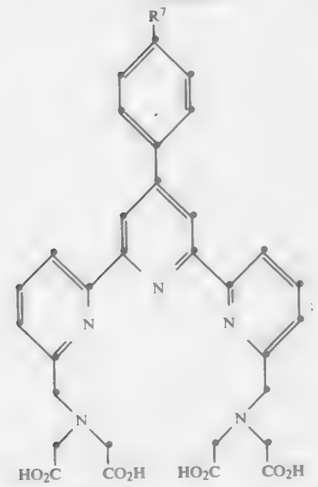
wherein R^9 represents —H, —OCH_3, —NO_2;





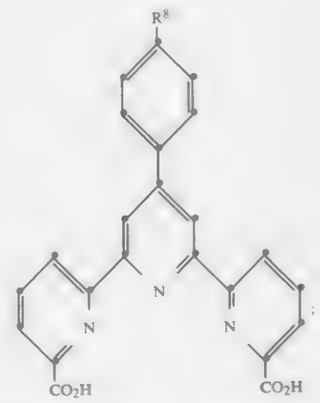
(5)

-continued



wherein R^7 represents —H, —OCH_3, —NO_2; and

(6)



wherein R^8 represents H, —OCH_3, —NO_2.

(7)

(8)

4,859,778

PROCESS FOR THE PREPARATION OF 2,2'-DITHIOBIS (BENZOTHIAZOLE)

Edward L. Graeber, Spring City, and Michael J. Lindstrom, Downington, both of Pa., assignors to Pennwalt Corporation, Philadephia, Pa.

Filed Mar. 17, 1988, Ser. No. 169,258
Int. Cl.[4] C07D *417/12*
U.S. Cl. 548—158 **9 Claims**

1. A process for preparing 2,2'-dithiobis (benzothiazole) which comprises contacting an aqueous solution of sodium mercaptobenzothiazole with a mixture of chlorine and air at a pH maintained in the range of 9.0 to 12.0 in the presence of a nonionic or cationic surfactant at a temperature between about 25° C. and about 75° C. and recovering precipitated 2,2'-dithiobis (benzothiazole) from said solution.

4,859,779

DOPAMINE-β-HYDROXYLASE INHIBITORS

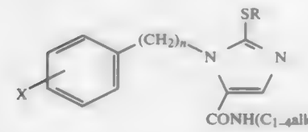
Joseph A. Finkelstein, Philadelphia, Pa.; Lawrence I. Kruse, Tewin, England, and Thomas B. Leonard, Haverford, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Division of Ser. No. 146,537, Jan. 21, 1988, which is a division of Ser. No. 29,512, Mar. 24, 1987, Pat. No. 4,862,850. This application Jan. 27, 1989, Ser. No. 302,640

Int. Cl.[4] C07D *233/90*

U.S. Cl. 538—321 3 Claims

1. A compound represented by the formula:



in which:

X is H, F, Cl, Br, I, C_{1-4} alkyl, CN, NO_2, SO_2NH_2, COOH, OH, CHO, C_{1-4} alkyl, CN,

CF_3, SO_2CH_3, SO_2CF_3, or $CO_2C_dH_{2d+1}$ wherein a is 1–5, or any accessible combination thereof of up to 5 substituents;

R is hydrogen or C_{1-4}alkyl; and

n is 0–5.

4,859,780

HYDROPHILIC MODIFIER MONOMERS

Frank Molock, Lawrenceville; J. Richard Robertson, Jr., and Kai C. Su, both of Alpharetta, all of Ga., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 26, 1988, Ser. No. 160,623

Int. Cl.[4] C07D *707/12, 211/40, 223/10*

U.S. Cl. 548—550 5 Claims

1. A compound of the formula

X-T-G

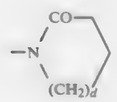
wherein

X is vinyl, 1-lower alkyl vinyl, 2-lower alkyl vinyl or 1,2-di-lower alkyl vinyl,

T is alkylene of 2 to 6 carbon atoms terminated on one side by carbonyloxy, the carbonyl group being bound to X, with T being interrupted once by —NHCOO—; or

T is a divalent aliphatic-arylene-aliphatic group wherein each aliphatic group is alkylene of 1 to 6 carbon atoms and is terminated on one side bound to the arylene by —NH-COO— the nitrogen of each being bound to the arylene, one aliphatic group being terminated on the other end by carbonyloxy with the carbonyl group being bound to X, and where the arylene is of 6 to 10 carbon atoms and may be substituted by alkyl of 1 to 4 carbon atoms; and

G is an amido group of the formula



which group G is unsubstituted or substituted by lower alkyl, and where d is 1–3.

4,859,781

RECOVERY OF N-METHYL-2-PYRROLIDONE

Fu M. Lee, and Joseph G. Ceurvorst, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 3, 1989, Ser. No. 319,015

Int. Cl.[4] C07D *201/16, 207/267*

U.S. Cl. 548—555 17 Claims

1. In a process for recovery N-methyl-2-pyrrolidone from a liquid aqueous medium comprising the step of liquid-liquid extraction with an organic extractant, the improvement which comprises employing a branched alkyl alcohol having 5–7 carbon atoms per molecule as extractant.

4,859,782

MISAKINOLIDE COMPOSITIONS AND THEIR DERIVATIVES

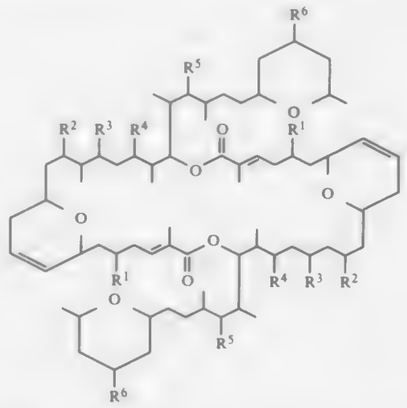
Tatsuo Higa, Naha, Japan; Ryuichi Sakai, Vero Beach, and May S. Lui, Sebastian, both of Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Ft. Pierce, Fla.

Continuation-in-part of Ser. No. 879,134, Jun. 26, 1986, abandoned. This application May 18, 1987, Ser. No. 51,127

Int. Cl.[4] C07D *323/00*

U.S. Cl. 549—267 10 Claims

4. A compound of the formula:



wherein

R^{1-6} are the same or different and are —H, —OH, —OR or —OCOR and

R is lower alkyl,

plus

hydrogenation derivatives thereof wherein at least one double bond in the compound is reduced and

derivatives thereof which have been oxidized, treated with an alkaline solution or treated with an acid solution.

4,859,783

2,2-DIFLUORO-4-AMINO-1,3-BENZODIOXOLE

Josef Ehrenfreund, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

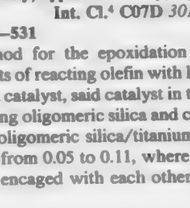
Division of Ser. No. 843,533, Mar. 25, 1986, Pat. No. 4,722,935. This application Oct. 9, 1987, Ser. No. 106,303

Claims priority, application Switzerland, Apr. 3, 1985, 1434/85

Int. Cl.[4] C07D *317/46*

U.S. Cl. 549—439 1 Claim

1. The compound of formula II



4,859,784

PROCESS FOR THE PRODUCTION OF OPTICALLY ACTIVE CYANOHYDRINS

Franz Effenberger; Thomas Ziegler, and Siegfried Foerster, all of Stuttgart, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 19, 1988, Ser. No. 145,158

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1987, 3701383

Int. Cl.[4] C07C *120/00, 207/327, 333/16, 317/54*

U.S. Cl. 549—491 7 Claims

1. A process for the production of an optically active cyanohydrin comprising reacting an aldehyde with hydrocyanic acid in the presence of D-oxynitrilase and an organic solvent which is immiscible with water, said solvent being saturated with water or being saturated with an aqueous buffer solution.

4,859,785

CATALYST ON THE BASIS OF SILICON AND TITANIUM HAVING HIGH MECHANICAL STRENGTH

Giuseppe Bellussi, Piacenza; Franco Buonomo, San Donato Milanese; Antonio Esposito, San Donato Milanese; Mario Clerici, San Donato Milanese; Ugo Romano, Vimercate, and Bruno Notari, San Donato Milanese, all of Italy, assignors to Enichem Sintesi S.p.A., Palermo, Italy

Division of Ser. No. 854,890, Apr. 23, 1986, Pat. No. 4,701,428. This application Jul. 20, 1987, Ser. No. 75,688

Claims priority, application Italy, Apr. 23, 1985, 20457 A/85

Int. Cl.[4] C07D *301/12*

U.S. Cl. 549—531 2 Claims

1. A method for the epoxidation of olefinic compounds which consists of reacting olefin with hydrogen peroxide in the presence of a catalyst, said catalyst in the form of microspheres and comprising oligomeric silica and crystals of titanium-silicalite with an oligomeric silica/titanium-silicalite molar ratio in the range of from 0.05 to 0.11, where said crystals of titanium silicalite are encaged with each other by means of Si—O—Si bridges.

4,859,786

OLEFIN OXIDATION CATALYST OF UNSUPPORTED SILVER CONTAINING LOW LEVELS OF MAGNESIUM

G. Edwin Vrieland, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 761,112, Jul. 31, 1985, abandoned. This application Mar. 18, 1987, Ser. No. 27,580

Int. Cl.[4] C07D *301/06*

U.S. Cl. 549—537 13 Claims

1. A process for converting an olefin to an epoxide which process comprises contacting an olefin with oxygen in the presence of an unsupported silver catalyst containing a amount of magnesium promoter, such that the weight ratio of magnesium to silver is less than about 0.001:1 but sufficient to increase the selectivity to the epoxide formed to at least about 34 percent while the conversion of olefin is at least about 0.6 percent; said olefin being selected from the group consisting of propylene, 1,2 butylene, 2,3-butylene, 1,2-pentene and 2,3-pentene.

4,859,787

PROCESS FOR THE PREPARATION OF DIALKYLDITHIOCARBAMATES OF MULTIVALENT METALS

Wolfram Spiess, and Rolf Himmelreich, both of Grünstadt, Fed. Rep. of Germany, assignors to C. F. Spiess & Sohn GmbH & Co., Kleinkarlbach, Fed. Rep. of Germany

Filed Apr. 22, 1988, Ser. No. 185,174

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714436

Int. Cl.[4] C07C *155/06*

U.S. Cl. 558—235 8 Claims

1. A process for the preparation of a multivalent metal salt of a dialkyl-dithiocarbamate comprising reacting the oxide of a multivalent metal selected from the group consisting of lead oxide, zinc oxide, copper(II)oxide, iron(III)oxide, nickel-(III)oxide, antimony(III)oxide and manganese dioxide, with a secondary amine of the formula



wherein R and R′ represent the same or different straight or branched-chained saturated or unsaturated hydrocarbon or cycloalkyl groups having from 1 to 13 carbon atoms and carbon disulfide and removing the formed water of reaction.

4,859,788

CURING COMPONENTS FOR SYNTHETIC RESINS AND THEIR USE

Gerhard Brindöpke, Frankfurt am Main; Claus Godau, Kiedrich, and Walter Weber, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany

Filed Apr. 7, 1988, Ser. No. 178,476

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 3711947

Int. Cl.[4] C07C *101/20*

U.S. Cl. 558—398 10 Claims

1. An amino group-containing curing component (A) for compounds (B) containing epoxy or 1,3-dioxolan-2-one groups, wherein the curing component (A) is a reaction product from (a_1) isocyanate adducts of active CH alkyl esters with (a_2) polyamines, and wherein the curing component (A) has an amine number of 60 to 800 mg KOH/g, hydrogen equivalent weight of 30 and 400, and a molecular weight $\overline{M}_w$ (weight average) of 200 to 3000.

2. A curing component as claimed in claim 1, wherein (a_2) contains at least two primary amino groups or a primary and a secondary amino group.

4,859,789

DIARYLNITRONES

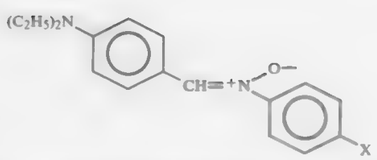
Bruce F. Griffing, Schenectady, and Paul R. West, Ballston Spa, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 675,918, Nov. 28, 1984, abandoned, which is a division of Ser. No. 536,923, Sep. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 438,194, Nov. 1, 1982, abandoned. This application Mar. 5, 1986, Ser. No. 836,287

Int. Cl.[4] C07C *101/44, 103/22, 121/52*

U.S. Cl. 560—35 2 Claims

1. Diarylnitrones of the formula,



where X is an electron withdrawing group in the para position selected from the class consisting of



—CN,
—CF_3,
halogen,

and R^7 is a $C_{(1-8)}$ alkyl radical.

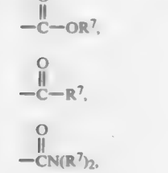
2. The compound α-(4-diethylaminophenyl-N-(4-ethoxycarbonylphenyl)nitrone.

4,859,790
ESTERS OF 3-TERT-BUTYL- AND 3-TERT-BUTYL-5-ALKYL-4-HYDROXYPHENYL (ALKANE) CARBOXYLIC ACIDS WITH OXETHYLATES OF POLYHYDROXYAROMATICS, PROCESS FOR THEIR PRODUCTION, AND THEIR USE AS STABILIZERS

Friedrich-Wilhelm Küpper, Marl; Heinz-Werner Voges, Dorsten; Werner Pätzold, Gladbeck, and Richard Schaaf, Haltern, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

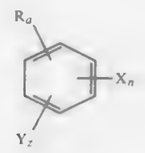
Filed Nov. 18, 1987, Ser. No. 122,722
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1986, 3639383
Int. Cl.⁴ C07C *69/88*
U.S. Cl. 560—75 **16 Claims**

1. An ester of a 3-tert-butyl- or 3-tert-butyl-5-alkyl-4-hydroxyphenyl(alkane) carboxylic acid of Formula I

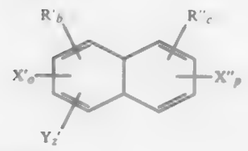


(I)

wherein
R_1=—$C(CH_3)_3$,
R_2=H, C_1- to C_4-alkyl, and
m=0 to 4,
with an oxethylate of a polyhydroxyaromatic group of 2–6 hydroxy groups of Formulae II or III, containing 1–6 oxethylate units,



(II)



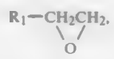
(III)

wherein
X=$(CH_2)_qOH$
X′=$(CH_2)_rOH$
X″=$(CH_2)_sOH$,
wherein q, r, s can be 0 or 1, R,R′,R″=H, C_{1-4}-alkyl or halogen,



n=2 to 6 for z or z′=0, and
n=1 to 5 for z or z′≠0,
o+p=n
$0 \leqq a,z \leqq a+z \leqq 6-n$ (in Formula II)
$0 \leqq b,c,z' \leqq 4 \leqq 8-n$ (in Formula III)

wherein the oxethylate group(s) are bonded t hydroxy groups of said groups of formulae II or III and are derived from alkylene oxide groups of the formula



wherein R_1 is H, C_{1-4}-alkyl or C_{6-10}-aryl.

4,859,791
HIGH SOLIDS POLYESTER POLYOLS

Neil H. Nodelman, Pittsburgh, and Robert G. Kelso, Wexford, both of Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Mar. 3, 1987, Ser. No. 21,106
Int. Cl.⁴ C07C *69/80, 69/75*
U.S. Cl. 560—91 **4 Claims**

1. A polyester polyol having a molecular weight between about 850 and 2000, a functionality of about 5 to 9 and an OH number of about 200 to 350, based on 100% solids, which is prepared by reacting a mixture comprising
(a) an active component based on at least one polyfunctional cycloaliphatic or aromatic carboxylic acid, anhydride or ester and optionally up to about 50% by weight of at least one acyclic, polyfunctional carboxylic acid and
(b) a hydroxyl component containing at least a portion of at least one polyol having a functionality of at least 3.

4,859,792
ACCELERATED PREPARATION OF ESTERS

Thomas M. Powanda, Middlesex; Robert H. Imes, Bridgewater, and George L. Collins, Maplewood, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Continuation of Ser. No. 891,991, Aug. 1, 1986, abandoned. This application Mar. 7, 1988, Ser. No. 168,564
Int. Cl.⁴ C07C *67/00*
U.S. Cl. 560—204 **18 Claims**

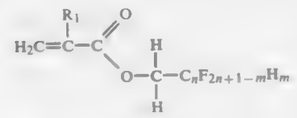
2. A process for the batch preparation of an acrylate ester by reacting an acrylic acid with an aliphatic hydroxyl containing compound in the presence of an esterification catalyst and a vinyl polymerization inhibitor which comprises:
adding the aliphatic hydroxyl containing compound to a reactor, heating the contents of the reactor to a temperature of from about 100° C. to about the boiling point of the acrylic acid, adding the acrylic acid to the reactor over at least about the time necessary to remove at least about 65 percent of the total water of reaction and heating the reaction mixture until the reaction is complete.

4,859,793
PROCESS FOR THE PRODUCTION OF FLUOROALKYL ACRYLATES

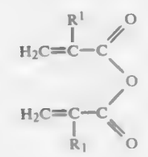
Patrice Hurtel, Saint Avold, France, assignor to Societe Chimique des Charbonnages S.A., Paris, France

Continuation-in-part of Ser. No. 875,826, Jun. 18, 1986. This application Dec. 11, 1987, Ser. No. 132,431
Claims priority, application France, Jun. 18, 1985, 85 09206
Int. Cl.⁴ C07C *69/52*
U.S. Cl. 560—223 **20 Claims**

1. A process for the preparation of fluoroalkyl (alk)acrylates, having the formula



where
R_1 is a hydrogen atom, or an alkyl group having up to 4 carbon atoms,
n is between 1 and 20, and
m is between 0 and n, in which an (alk) acrylic anhydride, of the formula



is reacted with a fluoroalcohol of the formula:



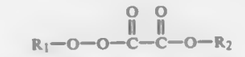
in the presence of at least one acid catalyst, at a temperature between 10° C. and 90° C. and during 3 to 120 minutes to obtain fluoroalkyl (alk)acrylates in a yield of at least 90%.

4,859,794
PERESTERS, THEIR PREPARATION AND USE AS POLYMERIZATION INITIATORS

Claes O. A. Lundin, Saltsjö-Boo; Erik M. Larsson, Stockholm, and Björn J. E. Akermark, Saltsjöbaden, all of Sweden, assignors to Berol Nobel Nacka AB, Stockholm, Sweden

Filed Dec. 3, 1987, Ser. No. 128,167
Claims priority, application Sweden, Dec. 8, 1986, 8605242
Int. Cl.⁴ C07C *179/18*
U.S. Cl. 560—302 **2 Claims**

1. Dialkyl esters of monoperoxyoxalic acid, characterized by the general formula



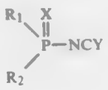
wherein R_1 is a tertiary alkyl group having 4 to 10 carbon atoms and R_2 is a primary, normal alkyl group having 18 to 28 carbon atoms.

4,859,795
ETHYLENICALLY UNSATURATED PHOSPHINIC ACID AND THIOPHOSPHINIC ACID ISOCYANATES AND ISOTHIOCYANATES, AND A PROCESS FOR THEIR PREPARATION

Thomas Gerdau, Eppstein; Hans-Jerg Kleiner, Kronberg, and Georg Pawlowski, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 8, 1987, Ser. No. 47,102
Claims priority, application Fed. Rep. of Germany, May 9, 1986, 3615614
Int. Cl.⁴ C07F *9/53*
U.S. Cl. 564—12 **10 Claims**

1. A compound represented by the formula



(I)

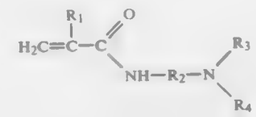
wherein
X and Y are the same or different, and each is oxygen or sulfur,
R_1 is an ethylenically unsaturated aliphatic radical containing from 2 to 6 carbon atoms, and
R_2 is a saturated aliphatic radical containing from 1 to 6 carbon atoms, or an aryl radical containing from 6 to 10 carbon atoms.

4,859,796
REACTING A (METH)ACRYLIC ANHYDRIDE WITH A DIAMINE TO FORM A N-DIALKYLAMINOALKYL(METH)ACRYLAMIDE

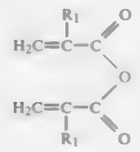
Patrice Hurtel, and Denis Laurent, both of Saint Avold, France, assignors to Norsolor, Paris, France

Filed Nov. 26, 1986, Ser. No. 935,352
Claims priority, application France, Nov. 27, 1985, 85 17506
Int. Cl.⁴ C07C *103/64, 102/00, 103/60;* C08F *20/60*
U.S. Cl. 564—204 **8 Claims**

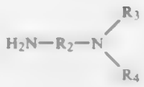
1. A process for the synthesis of a N-dialkylaminoalkyl(-meth)acrylamide of the formula:



in which:
R_1 is methyl or hydrogen,
R_2 is alkyl group containing at most 10 carbon atoms,
R_3 and R_4, being identical or different, each represent an: aliphatic alkyl group containing from 1 to 4 carbon atoms, or an alicyclic group containing from 5 to 6 carbon atoms; or R_3 or R_4, together with the nitrogen atom to which they are chemically linked, represent piperidino or pyrrolidino,
which process comprises reacting a (meth)acrylic anhydride of the formula:



with a diamine of the formula:



in the presence of at least one polymerization inhibitor at a temperature of between 70° and 100° C. and in the presence of oxygen, and separating resultant N-dialkylaminoalkyl(meth)acrylamide.

4,859,797
NOVEL NON IONIC FLUORINATED COMPOUNDS, THEIR PROCESS OF PREPARATION AND APPLICATIONS THEREOF AS SURFACTANTS
Jean-Pierre Lampin, deceased, late of Moulignon Ponthierry; Jeannine Robillart Lampin, heir, Saint Fargeau Pontthierry; Corinne Lampin, heir, Saint Fargeau Pontthierry; Sophie Lampin, heir, Saint Fargeau Pontthierry; Aimé Cambon, Nice, all of France; Francois Szonyi, Monaco, Monaco; Jean-Jacques Delpuech, Laxou, France; Guy Serratrice, Villers les Nancy, France; Gérard Thiollet, Ballancourt, France, and Louisette Lafosse, Vert le Petit, France, assignors to Institut National de Recherche Chimique Appliquee, Paris, France
Continuation of Ser. No. 738,701, May 29, 1985, abandoned. This application May 6, 1987, Ser. No. 48,540
Claims priority, application France, May 29, 1984, 84 08376
Int. Cl.[4] C07C *148/00*
U.S. Cl. 568—39 **3 Claims**

1. A process for preparing a surfactant having the formula:

$$R_FC_2H_4S(R)H$$

in which
R designates a chain exclusively consisting of at least 2 identical or different units of the formula C_2H_4X wherein X=O or X=S and R_F is a perfluorinated C_2–C_{12} alkyl group, comprising the steps of:
(a) reacting a compound having the formula $R_FC_2H_4S(R')H$ wherein R' is a sulfur-hydrogen bond or a chain exclusively consisting of one or more identical or different units of C_2H_4X wherein X=O or X=S and X when bound to H is S, R' having at least one less C_2H_4X unit than does R and R_F has the meaning given above, with ethylene or polyethylene glycol monochlorohydrin, in the presence of ethanol and sodium to obtain a first product having a terminal alcohol function; and
where said first product has less C_2H_4X units than in R:
(b) replacing the terminal alcohol function of the product of the previously performed step with a thiol function and reacting the thiol product resulting therefrom with ethylene or polyethylene glycol monochlorohydrin in the presence of ethanol and sodium; and
(c) repeating step (b) upon the product thereof until said surfactant is obtained.

4,859,798
OXIDATION OF ALKANES
James E. Lyons, Wallingford; Paul E. Ellis, Jr., Downingtown; Harry K. Myers, Jr., Cochranville; George Suld, Springfield, and Wayne A. Langdale, Milmont Park, all of Pa., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.
Division of Ser. No. 76,570, Jul. 20, 1987, Pat. No. 4,803,187. This application Jun. 24, 1988, Ser. No. 211,008
Int. Cl.[4] C07G *27/12*
U.S. Cl. 568—399 **10 Claims**

1. An alkane oxidation process comprising contacting an alkane in the liquid phase at a temperature of 50°–250° C. with air or oxygen and in the presence of a catalytically effective amount of a promoted heteropolyacid or polyoxoanion, said promoter being vanadium, niobium, titanium, rhenium, or azide.

4,859,799
PROCESS FOR THE PRODUCTION OF ALDEHYDE OR KETONE COMPOUNDS AND ALDEHYDES AND KETONES OBTAINED BY MEANS OF THIS PROCESS
Sandro Campestrini, Trent; Fulvio Di Furia, Padua; Giorgio Modena, Padua, and Lucia Pasquato, Padua, all of Italy, assignors to Interox (Société Anonyme), Brussels, Belgium
Continuation of Ser. No. 905,325, Sep. 9, 1986, abandoned. This application May 20, 1988, Ser. No. 196,826
Claims priority, application Italy, Sep. 9, 1985, 22092 A/85
Int. Cl.[4] C07C *45/27*
U.S. Cl. 568—430 **13 Claims**

1. Process for the selective production of organic aldehyde or ketone compounds from olefins comprising the steps of:
performing an oxidative cleavage of the double bond of the olefin by means of a peroxo compound of a metal of group 6b containing a coordinated ligand, said ligand selected from the group consisting of tertiary amides, phosphoramides, aliphatic amine oxides, aromatic amine oxides, phosphine oxides and aromatic amines, the molar ratio of olefin to active oxygen of the complex being between 0.1 and 0.5 to selectively produce said aldehyde or ketone compounds free from diols and acids; and
recovering said aldehyde or ketone compounds.

4,859,800
PHENOXYACETATE PERACID PRECURSORS
Alfred G. Zielske, Pleasanton, and Ronald A. Fong, Modesto, both of Calif., assignors to The Clorox Company, Oakland, Calif.
Continuation-in-part of Ser. No. 927,856, Nov. 6, 1986, abandoned. This application Apr. 30, 1987, Ser. No. 45,197
Int. Cl.[4] C07C *179/00, 143/525*
U.S. Cl. 568—566 **5 Claims**

1. A peroxyacid having the structure
where R is hydrogen or an alkyl of not more than 5 carbons.
2. A peroxyacid precursor having the structure
wherein R is hydrogen or an alkyl of not more than five carbons, and Y_2 is hydrogen, a sulfonate group or an alkaline salt of a sulfonate group.

4,859,801
SYNTHESIS OF MIXTURES OF BUTANEDIOLS
Richard E. Ernst, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed May 26, 1988, Ser. No. 199,192
Int. Cl.[4] C07C *29/36, 29/00, 41/01*
U.S. Cl. 568—617 **18 Claims**

1. A process for the preparation of 2-alkyl-1,4-butanediols,

which comprises bringing together, at an initial alkaline pH, and at a temperature and pressure effective for reaction, a mixture of:
(a) 2,3-dihydrofuran,
(b) hydrogen,
(c) an unsubstituted aliphatic aldehyde, and
(d) a hydrogenation catalyst.

4,859,802
PROCESS FOR REMOVING CONTAMINANTS FROM DIALKYL ETHERS OF POLYALKYLENE GLYCOLS
Eugene R. Thomas, and Robert E. Steele, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.
Filed Mar. 4, 1988, Ser. No. 163,929
Int. Cl.[4] C07C *37/72*
U.S. Cl. 568—621 **21 Claims**

1. A process for removing a glycol from a solution of said glycol and a dialkyl ether of a polyalkylene glycol which comprises the steps of contacting said solution with an aqueous base solution in the amount and having a pH above about 11 so that said dialkyl ether of a polyethylene glycol and said aqueous base solution are substantially immiscible with each other, and recovering said dialkyl ether of a polyalkylene glycol.

4,859,803
PREPARATION OF BISPHENOLS
Paul V. Shaw, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Filed May 16, 1988, Ser. No. 194,659
Int. Cl.[4] C07C *39/16*
U.S. Cl. 568—727 **9 Claims**

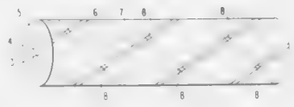
1. A process for the preparation of bisphenols which comprises treating an excess of a phenol with a ketone in the presence of an effective amount of a cation exchange resin catalyst and a mercaptan co-catalyst in a reactor or a series of reactors at about 50° C. to about 130° C. at about ambient pressure, wherein all of the phenol and a portion of the mercaptan is injected into the beginning of the reactor or the first reactor and the remaining mercaptan is injected along the reactor length or in the subsequent reactors whereby cyclic dimers formation is required.

4,859,804

ELECTRIC POWER SUPPLY CABLE USING INSULATING POLYOLEFIN LAMINATE PAPER

Ryosuke Hata; Shosuke Yamanouchi; Masayuki Hirose, all of Osaka; Hidemitsu Kuwabara, Shizuoka; Yasuharu Mizumoto, Shizuoka, and Yasuhiro Hagiuda, Shizuoka, all of Japan, assignors to Sumitomo Electric Industries, Osaka, Japan

Division of Ser. No. 927,984, Nov. 7, 1986, Pat. No. 4,762,965, which is a division of Ser. No. 649,004, Sep. 10, 1984, Pat. No. 4,673,607. This application May 20, 1988, Ser. No. 196,403
Claims priority, application Japan, Sep. 9, 1983, 58-167082
Int. Cl.[4] H01B *9/06*
U.S. Cl. 174—25 R **8 Claims**



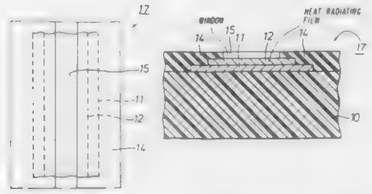
1. An oil-filled electric power supply cable comprising:
(1) a conductor,
(2) 3 to 10 plies of kraft paper wound around the conductor, and
(3) a plurality of insulating layers,
wherein at least one of said plurality of insulating layers consists of an insulating polyolefin laminated paper comprising first and second fiber paper layers having an impermeability of 20 to 4000 Gurley-seconds and a polyolefin film layer to which said first and second fiber paper layers are laminated, at least one of said fiber paper layers being mechanically deformed prior to lamination in such a manner that irregularities whose depth is 2 to 50% of the thickness of said fiber paper layer are formed thereon, and a water content of said fiber paper layers being controlled to 4% or less immediately before laminating to said polyolefin film layer, said fiber paper layers having a thickness of at least 30 microns.

4,859,805

PRINTED WIRING BOARD

Shin Kawakami; Satoshi Haruyama; Hirotaka Okonogi; Katutomo Nikaido, and Norito Mukai, all of Saitama, Japan, assignors to Nippon CMK Corp., Japan

Filed Mar. 29, 1988, Ser. No. 194,841
Claims priority, application Japan, Sep. 19, 1987, 62-235764; Sep. 19, 1987, 62-235763; Sep. 19, 1987, 62-235762
Int. Cl.[4] H05K *1/00*
U.S. Cl. 174—68.5 **19 Claims**



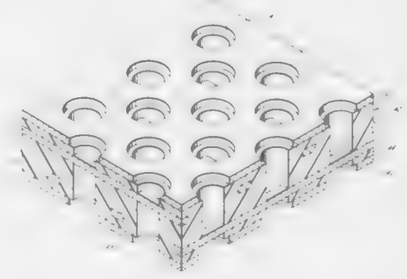
1. A printed circuit board comprising: a base plate having opposed major surfaces; a circuit conductor formed on at least one of the base plate surfaces; a heat-radiating film formed on at least a portion of the surface of the circuit conductor; an insulating film formed over the exposed surfaces of the heat-radiating film and the circuit conductor; and means defining at least one opening in the insulating film, the opening overlying the heat-radiating film thereby directly exposing the heat-radiating film to ambient atmosphere to promote dissipation of heat from the circuit conductor during use of the printed circuit board.

4,859,806

DISCRETIONARY INTERCONNECT

Robert T. Smith, Round Rock, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed May 17, 1988, Ser. No. 194,666
Int. Cl.[4] H05K *1/00*
U.S. Cl. 174—68.5 **12 Claims**



1. A discretionary interconnect, comprising:
a first set of essentially parallel, co-planar electrically conductive wires;
a second set of essentially parallel, co-planar electrically conductive wires, said first set of wires being orthogonal and non-planar to said second set of wires;
a first conductive plane positioned on the side of said first set of wires opposite said second set of wires;
a second conductive plane positioned on the side of said second set of wires opposite said first set of wires;
a first set of vias having diameters equal to or less than about 20 mils and extending from the top surface of the interconnect to said first set of wires; and
a second set of vias having diameters equal to or less than about 20 mils and extending from the top surface of the interconnect to said second set of wires.

10. A process for customizing an interconnect, comprising the steps of:
constructing an interconnect which includes a first conductive plane, a first set of essentially parallel, co-planar conductive wires, a second set of essentially parallel, co-planar conductive wires on the side of said first set of conductive wires opposite said first conductive plane, a second conductive plane positioned on the side of said second set of wires opposite said first set of wires, a first set of vias accessing said first set of wires, and a second set of vias accessing said second set of wires, said vias having diameters equal to or less than about 20 mils and extending from the top surface of the interconnect to said first and second sets of wires, respectively;
selectively removing sections of said wires at said vias; and
selectively interconnecting said wires at said vias.

4,859,807

WIRE SCRIBED CIRCUIT BOARDS AND METHOD OF MANUFACTURE

Brian E. Swiggett, Huntington; Ronald Morino, Sea Cliff; Raymond J. Keogh, Huntington, all of N.Y.; Jonathan C. Crowell, Lakeville, Mass.; George Szenczy, Northport, N.Y.; Andrew J. Schoenberg, Huntington, N.Y., and Marju L. Friedrich, Babylon, N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Division of Ser. No. 756,722, Jul. 19, 1985, Pat. No. 4,711,026. This application Oct. 1, 1987, Ser. No. 103,850

Int. Cl.[4] H05K *1/00*

U.S. Cl. 174—68.5 21 Claims



1. In an interconnection board comprising a substrate, a plurality of points spaced apart on a surface of the substrate each defining a terminal point, a plurality of thin, elongated, preformed conductors, at least one of the conductors having an insulating layer extending along its length, means adhering the conductors to the surface of the substrate and in fixed position relative to each other and to said terminal points, said adhering means adhering the at least one insulated conductor to the surface of the substrate, the improvement which comprises:

said adhering means which comprises an adhesive coating encapsulating the at least one insulated conductor, said adhesive coating prior to curing being non-tacky and non-blocking, being capable of being activated by application of energy and rapidly reverting to a solid non-tacky condition within about 0 to about 200 milliseconds after activation, said adhesive coating being bonded to the surface of the substrate at points of contact between the surface and the at least one conductor and in the vicinity of said points of contact.

18. An article of manufacture comprising an interconnection circuit board having an insulating base substrate having a plurality of points spaced apart on the substrate each defining a terminal point, said article produced by a process comprising:

a. providing at least one conductor having an adhesive coating, the adhesive coating being non-tacky, non-blocking and flexible prior to curing and which can be activated by heat, radiant or ultrasonic energy or by a combination thereof said adhesive coating rapidly reverting to a solid non-tacky condition within about 0 to about 200 milliseconds after activation;

b. activating a portion of the adhesive coating on the conductor prior to or simultaneously with scribing the activated portion to a surface of the substrate;

c. scribing the activated portion of the conductor onto the surface from a first terminal point along a predetermined, precise and reproducible pattern to a second terminal point, thereby adhering the conductor to the surface by means of the adhesive coating;

said rapid reversion of the coating permitting the scribing speed along a straight path to reach a potential speed of at least 120 inches per minute, simultaneously allowing the conductor pattern to retain dimensional stability.

20. An article of manufacture comprising an interconnection circuit board having at least one conductor on a surface of the interconnection board in a first predetermined pattern between two points spaced apart on the surface each defining a terminal point on the connection board, said board modified by a process comprising:

a. providing an elongated preformed conductor having an adhesive coating, the adhesive coating being non-tacky, non-blocking and flexible prior to curing and which can be activated by thermal, radiant or ultrasonic energy or a combination thereof, said adhesive coating capable of rapidly reverting to a solid non-tacky condition within about 0 to about 200 milliseconds after activation:

b. activating a portion of the adhesive coating the elongated preformed conductor prior to or simultaneously with scribing the activated portion to the surface; and

c. scribing the activated portion of the elongated preformed conductor onto the surface from a first terminal point along a second predetermined, precise and reproducible pattern to a second terminal point, thereby adhering the elongated preformed conductor to the surface by means of the adhesive coating;

said rapid reversion of the coating permitting the scribing speed along a straight path to reach a potential speed of at least 120 inches per minute, simultaneously along the second predetermined pattern to retain dimensional stability.

[illegible]

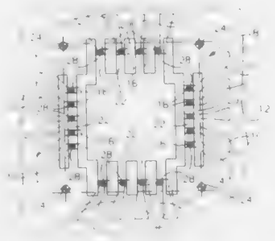
ELECTRICAL CONDUCTOR HAVING UNIQUE SOLDER DAM CONFIGURATION

Michael A. Jeter, Kokomo, Ind., and Joseph S. Capurso, Waltham, Mass., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Jun. 28, 1988, Ser. No. 212,446

Int. Cl.[4] H05K *3/34*

U.S. Cl. 174—68.5 7 Claims



1. An electrical interconnection lead pattern for electrically connecting an integrated circuit to an electrical circuit comprising:

a plurality of electrical conductors, each conductor having a contact region wherein said conductor is electrically connected to a predetermined region on the integrated circuit, each of said contact regions being substantially parallel with respect to each and every other contact region; and

a plurality of non-continuous dielectric regions, each of said dielectric regions comprising a material not amenable to soldering and being substantially parallel with respect to each and every other dielectric region so that the non-continuous regions between the dielectric regions are also substantially parallel;

each of said contact regions being substantially perpendicular with respect to each and every said dielectric regions, such that a portion of each of said contact regions contacts a portion of the non-continuous region between said dielectric regions and a portion of said dielectric region;

effective to provide an electrical conductor pattern suitable for electrically connecting an integrated circuit to an electrical circuit which provides high tolerance for misalignment between said components without detrimental effects.

4,859,809

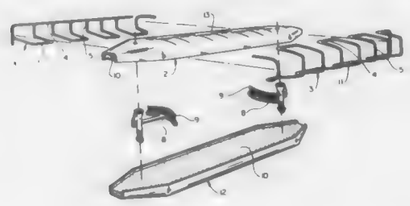
SPLICE CASE

James E. Jervis, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 27, 1988, Ser. No. 186,533

Int. Cl.[4] H02G *15/113*

U.S. Cl. 174—92 11 Claims



8. A splice case for encapsulating a conductor splice, which comprises:

a first hollow part;

a second part that can be positioned adjacent the first part, such that said first and second parts together define an enclosed space;

a conductor organizer positionable within the enclosed space, the organizer comprising a comb-like member having upstanding teeth substantially perpendicular to a base to separate conductor.

[illegible]

4,859,810

WATER-TREE STABLE ELECTRICAL INSULATING POLYMERIC COMPOSITIONS

Rudolphe C. Cloetens, Geneva, Switzerland, and Jeffrey D. Umpleby, Princeton, N.J., assignors to BP Chemicals Limited, London, England

PCT No. PCT/GB87/00479, § 371 Date Feb. 18, 1988, § 102(e) Date Feb. 18, 1988, PCT Pub. No. WO88/00602, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 9, 1987, Ser. No. 162,335

Claims priority, application United Kingdom, Jul. 11, 1986, 8617004

Int. Cl.[4] C08K *5/55;* H01B *3/18*

U.S. Cl. 174—110 PM 17 Claims

1. An electrical wire or cable comprising an electrical conductor and insulation comprising a polymeric component and a water tree retardant additive wherein the water tree retardant additive is selected from the group consisting of:

(A) an organo orthoborate or partial ester of boric acid having the general formula:

$$B(OR)(OR^1)(OR^2)$$

in which R is an alkyl, aryl, aralkyl, alkaryl or cycloalkyl group having from 4 to 24 carbon atoms and R^1 and R^2 are individually hydrogen or an alkyl, aryl, aralkyl, alkaryl or cycloalkyl group having from 4 to 24 carbon atoms and

(B) an organo orthoborate or partial ester of boric acid with a polyhydric hydrocarbyl alcohol.

4,859,811

ELECTRICAL CONDUCTOR

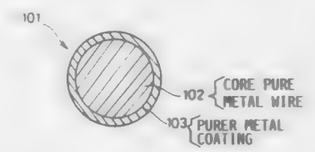
Kazuo Sawada; Masanobu Nishio, and Yoshihiro Nakai, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 25,607, Mar. 13, 1987. This application May 10, 1988, Ser. No. 192,397

Claims priority, application Japan, Mar. 18, 1986, 61-61898; Jun. 5, 1986, 61-131624; Jun. 6, 1986, 61-132434

Int. Cl.[4] H01B *5/02*

U.S. Cl. 174—126.2 10 Claims



1. A bonding wire for connecting semiconductor elements comprising a core metal conductor made of a metal having a purity of at least 99.99%, and a conductive metal coating on said core metal conductor, said conductive metal coating being made of the same metal as said core metal conductor, said conductive metal coating having a higher purity than said purity of said core metal conductor, wherein said core metal conductor is made of a metal selected from the group consisting of copper, aluminum and gold, wherein said higher purity of said metal coating is 99.999% or above, and wherein said conductive metal coating and said core metal conductor together have an outer diameter within the range of about 20 μm to about 127 μm.

4,859,812

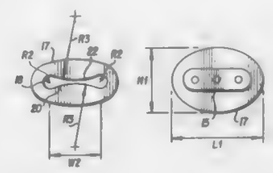
FLAT CABLE AND SEALING ELEMENT

John J. Klosin, and J. William Venezia, both of Ormond Beach, Fla., assignors to Homac Mfg. Company, Ormond Beach, Fla.

Filed Jan. 28, 1987, Ser. No. 7,681

Int. Cl.[4] H02G *15/013, 15/04;* H01B *17/58*

U.S. Cl. 174—135 9 Claims



1. A cable and sealing element comprising

a flat cable having opposed rounded minor surfaces and opposed substantially flat parallel major surfaces;

an elongated body of resilient material, said elongated body having a periphery greater than the periphery of said flat cable;

an orifice extending longitudinally within said body having a width greater than its height and a periphery smaller than the periphery of said flat cable;

opposed involute walls within said orifice extending substantially along said width of said orifice and extending the length of said orifice, and opposed arcuate end walls within said orifice interconnecting said opposed involute walls;

said flat cable being inserted in said orifice with said opposed involute walls within said orifice stretching and conforming to the substantially flat parallel major surfaces of said cable and with said opposed arcuate end walls within said

orifice stretching and conforming to the opposed rounded minor surfaces of said cable so as to provide a watertight interference fit entirely about said cable.

4,859,813

DIGITIZER TABLET HAVING ELECTRICAL INTERCONNECT COMPONENTS ON THE WRITING SUBSTRATE

Lynn H. Rockwell, Mesa, Ariz., assignor to CalComp Inc., Anaheim, Calif.

Filed Sep. 4, 1987, Ser. No. 93,483
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—18 11 Claims



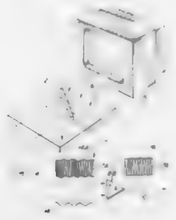
1. A digitizing tablet for use with a stylus and digitizing circuit generating signals representative of the position of the stylus on the digitizing tablet, the digitizing tablet comprising:
(a) a rigid substrate of dielectric material having a first, writing side over which the stylus is to be disposed, and a second, underside opposite said writing side;
(b) grid conductors disposed on said rigid substrate underside, said grid conductors including a first and second set of parallel, spaced apart conductors, said first and second sets of conductors disposed at any angle to each other said grid conductors formed of electrically conductive ink;
(c) a layer of dielectric ink applied on said rigid substrate at least between the points said first and second grid conductors intersect; and
(d) an electrical interconnect means on said rigid substrate integral with said grid conductors to provide a conductive path between said grid conductors and the digitizing circuit.

4,859,814

NOISE CANCELLATION IN DIGITIZING SYSTEM AND METHOD

James R. Sciacero, Scottsdale, and Charles A. Waterbury, Chandler, both of Ariz., assignors to Kurta Corporation, Phoenix, Ariz.

Filed Aug. 29, 1988, Ser. No. 238,040
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—19 14 Claims



1. A method of reducing effects of ambient electrical noise in a digitizing system, the method comprising the steps of:
(a) transmitting a carrier signal from a pointing device to a plurality of grid conductors in a tablet;
(b) inducing a portion of the transmitted carrier signal in a first grid conductor close to the pointing device and also inducing a portion of the ambient electrical noise in the first grid conductor;
(c) simultaneously with step (b), inducing a portion of the electrical noise in a noise reference conductor located away from the pointing device;
(d) differentially sensing the first conductor and the noise reference conductor to produce an output carrier signal representative of the closeness of the first conductor to the pointing device or a command from the pointing device without appreciable amplitude modulation of the output carrier signal due to the ambient electrical noise;
(e) conducting the output carrier signal to a tablet processing circuit which operates on the output carrier signal to determine a location of the pointing device relative to the tablet or discriminate a command represented by the frequency of the output carrier signal.

4,859,815

SERIAL LINK TRANSPARENT MODE DISPARITY CONTROL

John W. Irwin, Austin, and James D. Wagoner, Georgetown, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1988, Ser. No. 285,921
Int. Cl.[4] H04L *1/10, 25/49*
U.S. Cl. 178—69 D 13 Claims

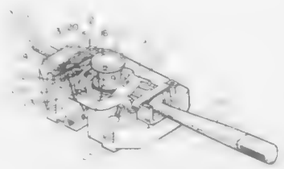
8. In a link transmitter system for sending a frame of link characters in a transparent mode, the improvement for disparity control comprising:
means for examining the disparity effect of a last link character in said frame when said last character is sent to a serializer; and
means for sending a first idle character thereafter encoded with an opposite disparity effect from said disparity effect of said last link character.

4,859,816

SELF CANCELLER FOR A TURN SIGNAL INDICATOR

Masao Tanaka, Tokyo, Japan, assignor to Metro Denso Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 22, 1988, Ser. No. 157,722
Int. Cl.[4] H01H *3/16*
U.S. Cl. 200—61.27 1 Claim



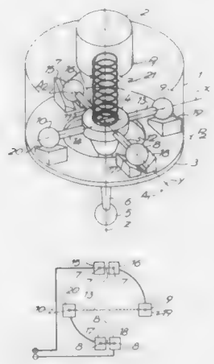
1. A self-canceller for a turn signal indicator comprising:
a main body;
a retaining element attached to said main body, said retaining element having three recesses, and said three recesses including left, neutral, and right recesses for retaining an engaging ball in a left, neutral, and right position;
a movable bracket rotatably mounted on said main body, said movable bracket including a left stopper, a center stopper, and a right stopper, and said center stopper having a left and a right pivot means;
a compression spring housing spaced from said center stopper and attached to said movable bracket;
a compression spring in said compression spring housing;
an engaging ball in said compression spring housing and between said retaining element and said compression spring, said compression spring biasing said engaging ball against said retaining element for retaining said engaging ball in one of said left, neutral, and right recesses;
a ratchet mount between said compression spring housing and said center stopper, said compression spring biasing said ratchet mount against said center stopper, and said ratchet mount including a left turn and a right turn cancel ratchet;
a control lever attached to said movable bracket for rotating said movable bracket relative to said main body for moving said compression spring housing relative to said retaining element for disengaging said engaging ball from one of said three retaining element recesses for moving said engaging ball into another one of said three recesses; and
a cancel cam rotatably attached to said main body, said cancel cam being attachable to a rotatable steering wheel for rotation therewith, said cancel cam first engaging said left turn cancel ratchet for pivoting said ratchet mount about said left pivot means of said center stopper for compressing said compression spring when said engaging ball is retained in said left recess of said retaining element and a steering wheel is first rotated to the left from a neutral position, said cancel cam disengaging from said left turn cancel ratchet for causing said ratchet mount to return to its initial position when a steering wheel is rotated still further to the left, and said left turn cancel ratchet engaging said ratchet mount for moving said ratchet mount against said right stopper for moving said right stopper for moving said movable bracket to its initial position for moving said engaging ball to said neutral recess when a steering wheel is then rotated back in the opposite direction to the right.

4,859,817

FEELER FOR OMNIDIRECTIONAL CONTACTOR SYSTEM

Alexandre Cassani, Lausanne, Switzerland, assignor to Tesa S.A., Renens, Switzerland

Filed Sep. 13, 1988, Ser. No. 244,073
Claims priority, application Switzerland, Sep. 15, 1987, 03556/87
Int. Cl.[4] H01H *3/00*; G01B *7/02*
U.S. Cl. 200—61.41 7 Claims



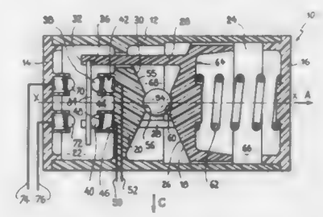
1. A sensor for an omnidirectional contactor system, said sensor comprising:
a stationary support;
a movable support having a tip, and being movable relative to the stationary support;
a positioning device intermediate the stationary and movable supports, said positioning device comprising first through fourth positioning pieces connected to a selected one of the movable and stationary supports and spaced about a central axis, the first and second positioning pieces being separated by 180° about the central axis and the third and fourth positioning pieces being separated by 180° about the central axis, said positioning device further comprising first through sixth resting pieces connected to the other of the mobable and stationary supports, the first and second resting pieces being disposed to contact the first positioning piece at two points of contact thereon defining first and second angularly aligned planes of tangency respectively, the third and fourth resting pieces being disposed to contact the second positioning piece at two points of contact defining third and fourth angularly aligned planes of tangency respectively, the fifth resting piece being disposed to contact the third positioning piece at a point of contact defining a fifth plane of tangency, and the sixth resting piece being disposed to contact the fourth positioning piece at a point of contact defining a sixth plane of tangency, said positioning pieces and said resting pieces being disposed and configured such that said movable and stationary supports are translatable and pivotable relative to one another in a first plane which passes symmetrically through said first and second positioning pieces and said central axis, while maintaining said first and second positioning pieces in contact with said first through fourth resting pieces respectively; and
spring means disposed intermediate the movable and stationary supports for urging the first through fourth positioning pieces into contact with the respective first through sixth resting pieces.

4,859,818

ELECTRIC INERTIA-ACTUATED CIRCUIT BREAKER

Jean Landais, Jouy-le-Moutier, France, assignor to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly/Seine, both of, France

Filed Sep. 16, 1988, Ser. No. 245,645
Claims priority, application France, Sep. 21, 1987, 87 13043
Int. Cl.[4] H01H *35/14*
U.S. Cl. 200—61.45 R 7 Claims



1. An inertia-actuated circuit breaker comprising a case defining an inner chamber having a longitudinal axis, a piston, an electrically conductive element fixed on the piston, an electric circuit having two contact studs carried by the case, the piston being axially slidably mounted in the case between a position of rest in which the conductive element bears against and interconnects the two contact studs and a circuit-breaking position in which said electric circuit is broken, a fixed concave seat carried by the case, a concave seat carried by the piston, a calibration spring bearing against and biasing the piston, and a ball which is maintained resiliently gripped, in said position of rest of the piston, by the calibration spring, between the fixed concave seat and the concave seat carried by the piston, the ball being maintained in position substantially at the centre of said chamber of the case into which chamber the ball radially escapes upon movement of the piston, to permit the piston to occupy said circuit-breaking position thereof, each of the contact studs being axially slidably mounted relative to the case to permit the piston to slide axially in opposi-

tion to the resiliently yieldable force exerted by the calibration spring, and resilient means for yieldably biasing the contact studs against the conductive element.

4,859,819

STAGED OPENING SWITCH

William F. Weldon, Austin; Ben M. Rech, Round Rock, and Raymond C. Zowarka, Jr., Austin, all of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Sep. 1, 1987, Ser. No. 91,656
Int. Cl.[4] H01H *33/04, 47/00;* H02H *5/04*
U.S. Cl. 200—146 R 7 Claims



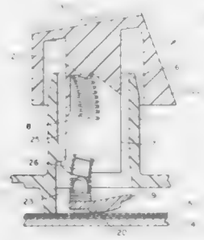
1. A two-stage switch arrangement, comprising:
a first-stage switch having a normally-closed primary contact and a normally-open secondary contact; and
a second-stage switch,
wherein the second-stage switch is connected in electrical series with the secondary contact of the first-stage switch, and the second-stage switch and secondary contact are connected in electrical parallel with the primary contact of the first-stage switch, and
wherein, upon operation of the first-stage switch, the secondary contacts close before the primary contacts open and the primary contacts reclose before the secondary contacts re-open.

4,859,820

QUIET KEY SWITCH

Casimer Gotfryd, Wauconda; Stephen L. Kay, Palatine; Hartland P. Klotz, Highland Park, and Robert M. Wentzel, Mundelein, all of Ill., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Mar. 31, 1988, Ser. No. 175,974
Int. Cl.[4] H01H *13/14*
U.S. Cl. 200—408 6 Claims



1. In a key switch acutating mechanism comprising:
a key top;
a housing having means for slidably receiving said key top for vertical motion thereof;
a pivoting rocker means located in said housing opposite said key top;
a buckling compression spring including coils forming a cylindrical opening, said spring mounted between said key top and said pivoting rocker means, the spring buckling and unbuckling in response to the downward and upward motion of the key top, respectively, the spring generating acoustical energy by the buckling and unbuckling action of the spring which energy manifests itself in at least two distinct types of sounds—metallic click and metallic ringing; and
means for damping acoustical energy generated by the spring which manifests itself by the sound of metallic ringing.

4,859,821

DEVICE FOR DRYING, BY MICRO-WAVES, THE SELVEDGE OF AN ADVANCING FLAT MATERIAL, PARTICULARLY TEXTILE

Bertrand Meyer, and Alexandre Pijew, both of Lyons, France, assignors to Institut Textile de France, Boulogne Billancourt Cedex, France

Filed May 11, 1988, Ser. No. 192,859
Claims priority, application France, May 11, 1987, 87 06574
Int. Cl.[4] F26B *3/28, 3/34*
U.S. Cl. 219—10.55 A 9 Claims



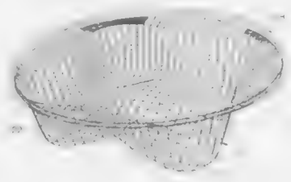
1. A device for drying a selvedge of a continuously advancing flat material (**10**), of the type employing micro-wave radiation coming from a generator (**2**) and composed of an elongated guide (**1**) for propagation of the micro-waves, provided with a slot, characterized in that the guide (**1**) comprises two lips (**5**) which are parallel to each other and to the plane of the material, away from the guide side all along the slot, and forming a quartz-wave trap.

4,859,822

MICROWAVEABLE CONTAINER

James J. Ragusa, and Gordon V. Sharps, Jr., both of Fairport, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 19, 1988, Ser. No. 195,916
Int. Cl.[4] H05B *6/64;* A23C *3/07*
U.S. Cl. 219—10.55 E 9 Claims



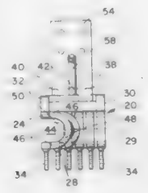
1. A container constituted of a microwave-transparent material for the heating or cooking of foods, said container including a bottom wall having a contoured wavilinear peripheral configuration and a raised center portion; a peripheral upstanding side wall structure having an undulating contour; a curvilinear transition wall surface joining said bottom wall structure with the lower end of said side wall structure, the container bottom wall and side wall configurations enabling the distribution of the foods within said container so as to enhance the degree of uniformity in the heating or cooking of said foods in said container by microwave energy; and a radially outwardly projecting peripheral flange extending from the upper edge of said peripheral side wall structure so as to impart stability to said container during storage and enhance the strength of said container during handling and lifting thereof, said flange including a raised flange portion extending about the opening of said container adapted to sealingly engage a complementary flange structure on a cover for said container.

4,859,823

ELECTRIC INDUCTION HEATER

Michael R. Faber, Warren, Ohio, assignor to Ajax Magnethermic Corporation, Warren, Ohio

Filed Sep. 16, 1988, Ser. No. 245,918
Int. Cl.[4] H05B *6/36*
U.S. Cl. 219—10.69 14 Claims



1. An induction coil for heating a bar-shaped workpiece in an induction furnace, wherein the workpiece has a longitudinal axis and is conveyed through the furnace in a conveying direction orthogonal to the longitudinal axis of the workpiece, the coil comprising a continuous conductor wound about a coil axis into a spiral having a plurality of turns and enclosing a heating zone, said coil axis being substantially parallel to the conveying direction, said coil including a first end and a second end downstream of said first end in the conveying direction, said coil having a workpiece exit portion having a plurality of coil turns at said second end thereof, said workpiece exit portion of said coil enclosing an exit section of said heating zone, at least one of said turns in said workpiece exit portion including a primary conductor member generating a varying magnetic field in said exit section of said heating zone when a varying electric current is conducted in said conductor to heat a workpiece in said exit section and including a return bend configured to permit removal of the workpiece from said exit section in a removal direction coincident with the longitudinal axis of the workpiece.

4,859,824

ELECTROSPARK MACHINE SYSTEM, ASSEMBLY FOR USE WITH SYSTEM, DEVICE FOR MOUNTING ELECTROSPARK MACHINING ELECTRODE, AND METHOD OF SHAPING A WORKPIECE

Shiroh Ukaji; Hisao Kimura; Kenji Urata, and Toshio Kaneda, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1987, Ser. No. 103,726
Claims priority, application Japan, Oct. 3, 1986, 61-235588; Oct. 3, 1986, 61-235589; Oct. 3, 1986, 61-235590; Feb. 19, 1987, 62-234454[U]
Int. Cl.[4] B23H *7/22*
U.S. Cl. 219—69.15 82 Claims

1. An electrospark machining system including:
(a) an electrode forming machine comprising means for machining an electrode blank in order to produce a shaped electrode having a predetermined profile;
(b) an electrospark machine to which said shaped electrode is adapted to be attached in order to machine a workpiece; and
(c) a reference block having a plurality of surfaces, said reference block being adapted to be directly attached to a surface of said electrode blank and having at least one



surface which serves as a common reference surface for said electrode forming machine and said electrospark machine.

4,859,825

SPOT WELDING ELECTRODE AND METHOD FOR MAKING IT

Maria Polvara, Via Ponte Nuovo, 42, 20128 Milan; Giovanni Crosti, Via Buonarotti, 41, 20149 Milan, and Sergio Lapo, Via Tolmezzo, 5, 33100 Udine, all of Italy

Filed Nov. 18, 1987, Ser. No. 122,288
Claims priority, application Italy, Nov. 26, 1986, 22465 A/86
Int. Cl.[4] B23K *35/00*
U.S. Cl. 219—119 2 Claims

1. A method for making a sintered material adapted to form an active portion of a spot welding electrode, said method consisting of:
(a) a step of dry mixing, under rolling and stirring, from 99 to 80% by weight of a silver powder, and from 1 to 20% by weight of crystalline graphite particles, said silver powder including silver particles having a particle size from 1 to 10 microns, said dry mixing step providing a mixture in which said crystalline graphite particles cover said silver particles;
(b) a step of pressing, at a pressure from 4000 to 6000 Kg/cm^2, said mixture;
(c) a step of sintering said mixture at a temperature from 800° to 920° C. and for substantially 30 minutes and
(d) a step of extruding the sintered mixture so as to provide said active portion of said spot welding electrode.

4,859,826

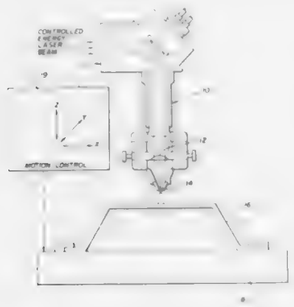
SIMULTANEOUSLY CUTTING AND WELDING SHEET METAL USING LASER ENERGY

Albert J. Hess, III, Westminster, Md., assignor to Laser Applications, Inc., Westminster, Md.

Division of Ser. No. 74,864, Jul. 17, 1987, Pat. No. 4,798,931.
This application Jun. 9, 1988, Ser. No. 204,274
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.63 7 Claims

1. Apparatus for simultaneously cutting and welding at least two sheets of metal overlaid on each other comprising means for producing a laser beam, motion control means for subjecting the areas of said overlaid sheets along a line of progress where they are to be cut and welded to the laser energy in said beam, means for providing a shield of inert gas around said laser beam; and means for selecting the operating parameters of at least said inert gas shield, said laser energy, and the speed of progress of said laser beam along said line of progress with respect to said sheets and with respect to at least the number, thicknesses and types of metals in said sheets so that the relatively narrow melt zone and cut is created along said line of progress of said laser beam on said sheets so that surface ten-

sion in said melt zone after breakthrough will cause said melt zone on both sides of said line of progress to form smooth beads on the cut edges of said sheets on both sides of said line of progress.

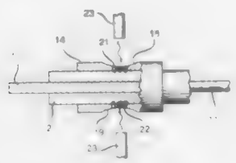


4,859,827

METHOD FOR WELDING RELATIVELY SMALL PARTS

Richard J. Coyle, Jr., Lawrenceville, and Jaroslav Mracek, Trenton, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Oct. 17, 1988, Ser. No. 259,024
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.64 10 Claims



1. A method for assembling optical apparatus comprising the steps of: mounting an optical fiber ferrule within a metal sleeve; orienting the ferrule within the sleeve to attain a desired orientation of the optical fiber with respect to the sleeve; and using a laser beam to weld permanently the ferrule to the sleeve, characterized in that:

prior to the mounting, a portion of the sleeve is made significantly thinner than the remainder of the sleeve; and the welding step comprises the step of directing the laser beam at the thinned portion of the sleeve.

4,859,828

PROCESS AND INSTALLATION FOR PRODUCING WORKPIECES

Ernst Zumstein, Kirchberg, Switzerland, assignor to Bystronic Laser AG, Industrestrasse, Niederonz, Switzerland

Filed Jan. 15, 1988, Ser. No. 144,226
Claims priority, application Switzerland, Jan. 16, 1987, 00139/87
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.67 15 Claims

1. A process for producing workpieces from a blank in the form of a plate, partly by stamping and partly by thermal cutting using a laser beam, characterized in that said blank is machined in a self-contained stamping station, in that said blank is positioned in a desired, determined location for each individual stamping operation and in that contours are cut in said blank in a cutting station by means of the laser beam, said blank lying in an unchanged position on a support in said cutting station.

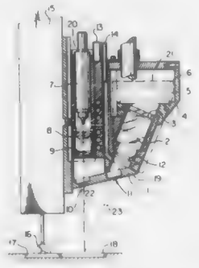


4,859,829

ADAPTIVE WELDING CONTROL VISION HEAD

L. Marc Dufour, Montreal, Canada, assignor to Canadian Patents & Development Ltd., Ottawa, Canada

Filed Jan. 15, 1988, Ser. No. 144,109
Claims priority, application Canada, Sep. 22, 1987, 546745
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—124.34 16 Claims



1. A vision head to supply the electrical signals required for visual control of an adaptive welding control system with a welding head, which produces a weld pool on a workpiece being welded, comprising:

(a) a metal enclosure for attachment to the welding head having a side facing the workpiece, the said side forming an angle with a plane tangent to the workpiece and passing through the weld pool, said side having a first and a second aperture, both apertures located in a same radial direction from the axis normal to the said workpiece at the said weld pool, the said side being slanted with respect to the said plane so that the said first aperture is nearer to the said axis and to the said plane than the said second aperture,

(b) projecting means mounted in said enclosure for projecting a structured light pattern onto the workpiece through one of the said two apertures,

(c) monitoring means mounted in said enclosure for monitoring scattered light of the said structured light pattern on the workpiece through the other of the said two apertures, and converting said scattered light into electrical signals required for visual control, and

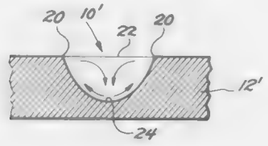
(d) cooling means for maintaining the temperature of the enclosure.

4,859,830

METHOD OF DETERMINING THE WELDABILITY OF A PART

Allen W. Case, Jr., Amsterdam; Robert D. Lillquist, Schenectady, and Robert E. Sundell, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 5, 1987, Ser. No. 104,609
Int. Cl.[4] B23K *9/23*
U.S. Cl. 219—130.01 18 Claims



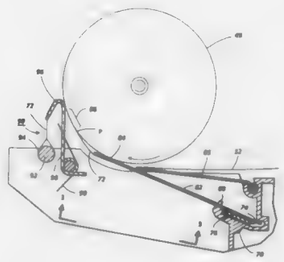
1. A method of determining the weldability of a workpiece prior to a welding process by relating weldability to the three-dimensional geometry of a molten weld pool, comprising initiating an arc between a stationary welding torch and the workpiece using a predetermined set of welding parameters to produce the molten weld pool in the workpiece; measuring a natural frequency of oscillation of the molten weld pool a predetermined time following initiation of the arc; and comparing the measured natural frequency of oscillation to empirically determined data for the workpiece material to determine the weldability of said workpiece.

4,859,831

FUSER SYSTEM

John L. Webb, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 15, 1988, Ser. No. 206,794
Int. Cl.[4] G03G *15/20*
U.S. Cl. 219—216 5 Claims



1. An improved fuser system for fixing toner images to a copy substrate, said apparatus comprising:

a fuser roll;

a pressure applying member in the form of a thin web having an elongated surface contacting said fuser roll to form a fusing nip therebetween,

a blade member positioned so as to be in biased tangential contact directly with the surface of said fuser roll upstream from said fusing nip to form an entrance nip therebetween, and

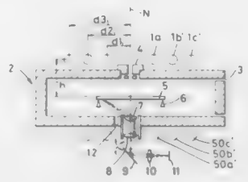
biasing means to provide a bias pressure to said web so as to produce a bias force to bias the web into engagement with the fuser roll along said fusing nip area.

4,859,832

LIGHT RADIATION APPARATUS

Makoto Uehara, Tokyo; Hajime Ichikawa, Yokohama; Masahiko Yomoto, Kawasaki, and Shigeru Kato, Hoya, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Sep. 2, 1987, Ser. No. 92,125
Claims priority, application Japan, Sep. 8, 1986, 61-211208; Dec. 9, 1986, 61-292887; Jan. 28, 1987, 62-17786; Jan. 30, 1987, 62-21383; Mar. 6, 1987, 62-51480; Mar. 16, 1987, 62-60659; Mar. 16, 1987, 62-60660; Mar. 30, 1987, 62-77033; Mar. 30, 1987, 62-77034; Mar. 31, 1987, 62-79495; Apr. 17, 1987, 62-94593; Apr. 27, 1987, 62-103989
Int. Cl.[4] H05B *3/62*
U.S. Cl. 219—411 16 Claims



1. An apparatus for annealing a substrate, including:

(a) a plurality of annular light source means concentric about a predetermined axis;

(b) placing means for placing the substrate such that the substrate receives radiation from said plurality of annular light source means and is substantially perpendicular to the predetermined axis; and

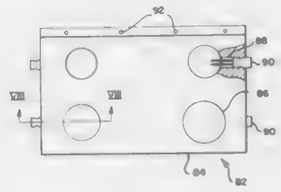
(c) measuring means having a measuring optical system with an optical axis substantially aligned with the predetermined axis, said measuring means being adapted to receive radiation through said measuring optical system from the substrate placed on said placing means and to detect a temperature distribution of the substrate, wherein said measuring means comprises scanning means for scanning the substrate placed on said placing means in a plurality of directions perpendicular to the predetermined axis.

4,859,833

COOKING APPARATUS

Leonard M. Petersen, 45, 30th Ave. Elsies River, Cape Province, South Africa

Continuation-in-part of Ser. No. 829,500, Feb. 14, 1986, abandoned. This application Oct. 2, 1987, Ser. No. 105,500
Int. Cl.[4] H05B *3/68*
U.S. Cl. 219—432 1 Claim



1. Cooking apparatus comprising, in combination, a waterless cooking pot and a base structure for supporting the cooking pot, the base structure having a top surface and a depression in the top surface thereof for receiving the pot, the depression having a side wall and there being a passage leading into said depression through the side wall thereof, there being in

said passage an electrical heating element which is free to move along the passage between a position in which it is clear of the depression and a position in which it protrudes into said depression, the cooking pot having a base which has a recess in it which recess is adapted to receive said heating element, the arrangement being such that, in use, the pot is placed in the depression with said recess aligned with the passage, and the heating element is then pushed along the passage and into the [illegible].

4,859,834

POWER CONTROLLER FOR HEAT TRACING CABLE WHICH RESPONDS TO AMBIENT TEMPERATURE

Jeffery P. Hausler, New Braunfels; Paul C. Baris, Austin; Alfred Majek, Meadows, and Jeffrey B. Moore, New Braunfels, all of Tex., assignors to Letco Management Company, Inc., New Braunfels, Tex.

Filed Jun. 15, 1988, Ser. No. 207,188
Int. Cl.[4] H05B *1/02, 3/00*
U.S. Cl. 219—497 **18 Claims**



1. A controller for powering electrical heating element, such as heating cable, comprising:
means for sensing ambient temperature;
means for setting the desired maintenance temperature and for setting the approximate temperature operating range below the desired maintenance temperature over which the controller is to supply power to the heating element;
signaling means connected to the temperature sensing means and to the setting means for providing a signal representative of the ratio of —
(i) the difference between the sensed ambient temperature and the desired maintenance temperature to
(ii) the approximate temperature operating range; and
means coupled to the signaling means for controlling the power supplied to the heating element in response to the ratio signal.

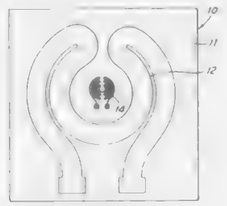
4,859,835

ELECTRICALLY RESISTIVE TRACKS

Simon Balderson, Reading, Great Britain, assignor to Thorn EMI plc, London, United Kingdom

Filed Feb. 24, 1988, Ser. No. 159,675
Claims priority, application United Kingdom, Feb. 25, 1987, #704467
Int. Cl.[4] H05B *3/16*
U.S. Cl. 219—543 **19 Claims**

1. A heating unit comprising an electrically insulative substrate and a heating element applied to said substrate, the heating element comprising an electrically resistive track, said track consisting of a thick film having in the temperature range of from 0° C. to 550° C. a temperature coefficient of resistance in excess of 0.006 per degree C, said thick film including a metal and a glass in such proportions as to provide a suitable resistivity and a thermal expansion coefficient to match that of



said substrate and to permit adhesion of said track to said substrate.

4,859,836

MELT-SHAPEABLE FLUOROPOLYMER COMPOSITIONS

Hans E. Lunk; Donald A. Reed, both of Menlo Park; Marguerite E. Deep, Los Altos; Charles Hill, Mountain View, and Andrew Au, Union City, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 720,119, Apr. 4, 1985, Pat. No. 4,624,990, which is a continuation-in-part of Ser. No. 539,871, Oct. 7, 1983, abandoned. This application Aug. 14, 1986, Ser. No. 896,549
Int. Cl.[4] H05B *3/10*
U.S. Cl. 219—548 **8 Claims**

1. An electrical device which comprises
(1) a melt-shaped conductive polymer element which comprises a polymeric component and, dispersed therein, a particulate conductive filler, said polymeric component comprising a mixture of
(A) a first fluoropolymer which has a crystallinity of less than 45% and which can be melt-shaped in the absence of other polymers, and
(B) a second crystalline fluoropolymer which is polytetrafluoroethylene and which has a crystallinity of at least 50%, and
(2) at least two electrodes which can be connected to a source of electrical power and which, when so connected, cause current to flow through the conductive polymer element.

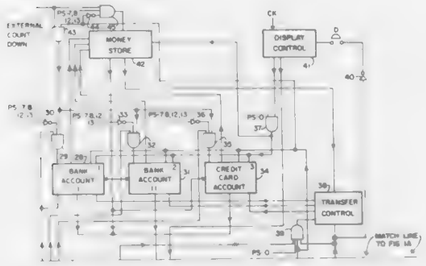
4,859,837

PORTABLE DATA CARRIER INCORPORATING MANUALLY PRESETTABLE PROCESSING MODES

John W. Halpern, 14 Belsize Park Gdns., London, N W 3, England

Continuation of Ser. No. 30,274, Mar. 23, 1987, abandoned, which is a continuation of Ser. No. 343,829, Jul. 6, 1982, abandoned. This application Sep. 15, 1988, Ser. No. 246,035
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 **19 Claims**

1. A portable data carrying and transfer device capable of communicating with an external data transfer device, comprising:
display means;
memory means for storing data having a plurality of memory stores;
processing means for processing data in said memory means and for shifting data from a first one of said memory stores to a second one of said memory stores;
transfer means for enabling bi-directional data exchange between said memory means memory stores and an external data transfer device;
manually actuatable memory accessing means for (a) selectively displaying on said display means the data in any one of said memory stores, for (b) enabling and defining data to be transferred by said transfer means, for (c) enabling receipt of account data from an external data transfer device via said transfer means, and for (d) enabling and defining data to be transferred by said processing means; and



a pocket-sized housing including said display means and providing support for said memory means, said processing means, said transfer means, and said manually actuatable accessing means.

4,859,838

POS TERMINAL DEVICE

Ryoichi Okiharu, Kawaguchi, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 16, 1987, Ser. No. 120,937
Claims priority, application Japan, Nov. 14, 1986, 61-272140
Int. Cl.[4] G06K *15/00*
U.S. Cl. 235—383 **7 Claims**



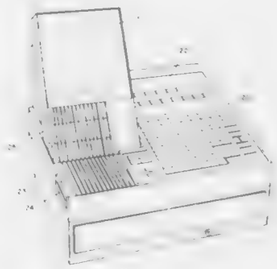
1. A point of sales terminal device comprising:
(a) a file for sorting commodity identification data and data related to commodities corresponding to the commodity identification data for each commodity;
(b) reading means for reading commodity identification data attached to commodities;
(c) registration processing means for registration processing sold commodities on the basis of data related to the commodities read from said file, whenever commodity identification data are read through said reading means;
(d) storing means for storing commodity identification data and data related to commodities corresponding to the commodity identification data;
(e) discriminating means for discriminating whether said file is abnormal or not whenever said reading means reads commodity identification data; and
(f) control means for allowing said storing means to store data related to read commodities and said registration processing means to implement registration processing, whenever said discriminating means discriminates that said file is normal; and for retrieving data related to the read commodities in said storing means on the basis of commodity identification data read by said reading means and allowing said registration processing means to implement registration processing on the basis of the data related to commodities and read from said storing means, when said discriminating means discriminates that said file is abnormal.

4,859,839

POINT-OF-SALE TERMINAL FOR LAUNDRY OR DRY CLEANING ESTABLISHMENTS

Bruce Tetelman, Fort Lee, N.J.; Yannis Milios, New York, N.Y.; Il-Pyung Park, Palisades Park, N.J., and Tom Recht, Forest Hills, N.Y., assignors to Counter Computer Corporation, Westbury, N.Y.

Filed Jul. 8, 1988, Ser. No 216,885
Int. Cl.[4] G06F *15/24*
U.S. Cl. 235—385 **5 Claims**



1. A point-of-sale terminal for use in laundry or dry cleaning establishments, comprising:
keyboard entry means for entering information relating items to be laundered or dry cleaned, characteristics of such items and services to be performed on such items;
memory means for storing the information entered by the keyboard means;
ticket transport means for moving a ticket in a forward or backward direction;
printer means positioned to print ticket information on a ticket being moved by the ticket transport means;
bar code reader means positioned to read a bar code on a ticket being moved by the ticket transport means; and
control means for deriving the ticket information from the information entered at the keyboard means and stored in the memory means and controlling the keyboard means, the ticket transport means, the printer means and the bar code reader means to appropriately move a ticket past the printer means for the printing of the ticket information on the ticket, and to appropriately move a ticket past the bar code reading means for the reading of a bar code on the ticket.

4,859,840

CODE READING APPARATUS

Kazuo Hasegawa; Junichi Ouchi; Hiroaki Sasaki; Koji Nakase, and Makoto Sasaki, all of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jun. 16, 1988, Ser. No. 208,182
Claims priority, application Japan, Oct. 30, 1987, 62-275037; Oct. 30, 1987, 62-275036; Nov. 30, 1987, 62-300114; Nov. 30, 1987, 62-300112; Feb. 5, 1988, 63-23928; Feb. 13, 1988, 63-30030; Feb. 13, 1988, 63-16999; Feb. 25, 1988, 63-40616
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—463 **17 Claims**

1. A code reading apparatus comprising detecting means for outputting a reading signal responsive to the code displayed on a medium, edge detecting means for detecting the edge of said

reading signal, counting means for starting counting each edge detected by said edge detecting means, and discriminating means for outputting a rest signal to decoding means for reading to decode the counted value when the counted value started for counting by said counting means is a product or more of the quotient produced by dividing the allowable maximum width of the code by the allowable minimum width and the counted value counted between the edges immediately before by said counting means, when the quotient produced by



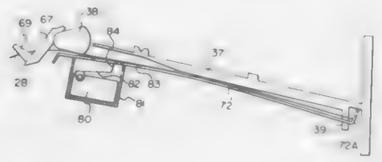
dividing the counted value started for counting by said counting means by the counted value counted between the edges immediately before is a quotient or more produced by dividing the allowable maximum width of the code by the allowable minimum width, or when the quotient produced by dividing the counted value started for counting by the quotient produced by dividing the allowable maximum width of the code by the allowable minimum width is the counted value or more counted between the edges immediately before.

4,859,841

DIGITAL DATA APPARATUS INCLUDING AN APPLICATION INSERT SENSOR

Marc Hershberger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,467
Int. Cl.[4] G06K *13/063, 13/067, 13/24*
U.S. Cl. 235—485 **3 Claims**



1. Digital data apparatus comprising:
- a housing having a reader for reading digital data contained in data strips on an application insert;
- a platen mounted within said housing for positioning an application insert relative to said reader, said platen having a free end which is movable between first and second positions;
- a microswitch which is mounted on said platen and which includes an actuator normally biased to engage an application insert positioned onto said platen;
- a door which is mounted in a wall of said housing adjacent to said end of said platen, said door being movable between open and closed positions; and

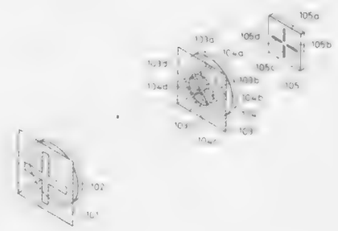
means, cooperatively associated with said door and said platen (1) for moving said end of said platen between said first and second positions when said door is moved between said closed and said open positions, so that an application insert may be placed onto said platen through said door for positioning relative to said reader; and (2) for moving said end of said platen between said second and first positions when said door is moved between said open and said closed positions, so that said application insert engages said actuator to actuate said microswitch.

4,859,842

MULTI-DIRECTIONAL FOCUS STATE DETECTION APPARATUS

Yasuo Suda, Yokohama; Ichiro Ohnuki, Tokyo; Akira Akashi; Akira Ishizaki, both of Yokohama; Keiji Ohtaka, and Takeshi Koyama, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 919,506, Oct. 16, 1986, abandoned.
This application Feb. 21, 1989, Ser. No. 313,343
Claims priority, application Japan, Oct. 22, 1985, 60-235822; Dec. 12, 1985, 60-280591; Jan. 27, 1986, 61-15278
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **34 Claims**



1. A focus detection apparatus for an objective lens, comprising:
- first optical means for forming energy distributions which vary along a first direction in accordance with a focusing state of said objective lens;
- second optical means for forming energy distributions which vary along a second direction transverse to the first direction in accordance with the focusing state of said objective lens;
- first sensing means, having a plurality of photosensors, for forming a signal associated with the focusing state of said objective lens in order to sense the energy distributions formed by said first optical means;
- second sensing means, having a plurality of photosensors, for forming a signal associated with the focusing state of said objective lens in order to sense the energy distributions formed by said second optical means; and
- a stop having a first aperture for regulating a detection field for said first sensing means and a second aperture for regulating a detection field for said second sensing means, said stop being arranged between said first and second optical means and said objective lens;

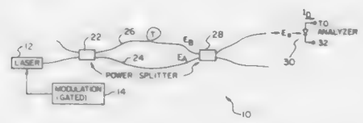
said first and second optical means being provided between a predetermined image plane of the objective lens and said first and second sensing means, each of said first and second optical means having a pair of light regulating members and a pair of image forming lenses.

4,859,843

METHOD AND APPARATUS FOR OPTICAL SIGNAL ANALYSIS USING A GATED MODULATION SOURCE AND AN OPTICAL DELAY CIRCUIT TO ACHIEVE A SELF-HOMODYNE RECEIVER

Douglas M. Baney, Santa Rosa, and Wayne V. Sorin, Mountain View, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 22, 1988, Ser. No. 146,915
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 **28 Claims**



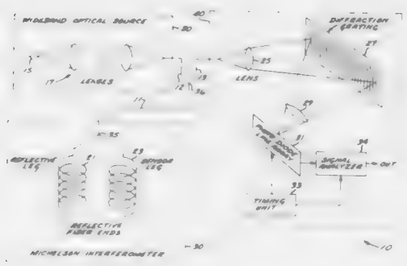
1. A method for directly measuring the optical field spectrum of an optical signal based on a local oscillator approach for mixing down the actual optical field spectrum to baseband, comprising the steps of:
- providing an optical source;
- providing a modulation source for selectively modulating the optical signal produced by the optical source so that the optical signal produced by the optical source alternates between (a) an unmodulated state and (b) a modulated state which carries the optical field spectrum of interest;
- routing the optical signal produced by the optical source to an optical circuit for providing delayed and undelayed states of the optical signal;
- recombining the states of the optical signal produced by the optical source together concurrently after being channeled through the optical circuit;
- the unmodulated state of the optical signal produced by the optical source serving as a local oscillator signal; and
- mixing the recombined states of the optical signal produced by the optical source;
- thereby providing self-homodyne mixing in response to the unmodulated and modulated states of the optical signal produced by the optical source.

4,859,844

COMB FILTER PRESSURE/TEMPERATURE SENSING SYSTEM

Elvin E. Herman, Pacific Palisades, and Bart E. Likes, Northridge, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 24, 1988, Ser. No. 159,816
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 P **16 Claims**



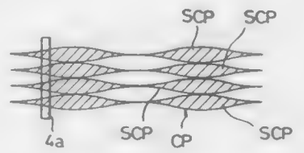
1. An sensing system comprising:
- means for providing optical illumination having a bandwidth of at least 25 nanometers;
- means for transmitting said optical illumination;
- transducer means responsive to said transmitted optical illumination for amplitude modulating said transmitted optical illumination as a function of a monitored physical parameter to provide an amplitude modulated optical illumination having generally sinusoidally varying nulls across the spectrum thereof, the frequency of said nulls varying across the spectrum of said modulated optical illumination and being a function of the monitored physical parameter;
- means for transmitting said modulated optical illumination;
- means for spectrally dispersing said transmitted modulated optical illumination to provide a spectrally dispersed optical signal indicative of the spectral content and amplitudes of said modulated optical illumination;
- means responsive to said spectrally dispersed optical signal for extracting the frequency variation of said periodic nulls to an electrical signal indicative of the substantially constant frequency of said periodic nulls across the spectrum of said modulated optical illumination;
- means for narrowband filtering said electrical signal to provide a filtered signal; and
- means responsive to said filtered signal for providing an output signal indicative to the substantially constant frequency of said periodic nulls.

4,859,845

OPTICAL ROTARY ENCODER WITH SUB-CODE PATTERNS

Tetsuro Sakano, Yamanashi, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP87/00240, § 371 Date Apr. 15, 1987, § 102(e) Date Apr. 15, 1987, PCT Pub. No. WO87/06338, PCT Pub. Date Oct. 22, 1987
PCT Filed Apr. 15, 1987, Ser. No. 141,306
Claims priority, application Japan, Apr. 15, 1986, 61-86658
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE **30 Claims**



1. An optical rotary encoder having a photoreceptor for receiving light beams from a photoemitter through a code pattern formed in a disk for detecting a value of a parameter associated with rotation of the disk, the optical rotary encoder comprising:
- an analog code pattern which is formed annularly in the disk in a direction circumferentially of the disk; p1 said analog code pattern including a plurality of sub-code patterns, said plurality of sub-code pattern being respectively formed coaxially with the disk and along circular centerlines having different radius to each other, and being arranged in phase with each other, said photoreceptor generating the sum of signals optically received through said plurality of code patterns,
- wherein a maximum width of each of said sub-code patterns is set to a value which is smaller than a region of a linear approximation of an intensity distribution of light projected from said photoemitter.

4,859,846

DUAL-MODE RESONANT SCANNING SYSTEM

Gordon J. Burrer, 5 Wayland Hills Rd., Wayland, Mass. 01778

Filed Jul. 21, 1988, Ser. No. 222,260
Int. Cl.[4] H01J 3/14
U.S. Cl. 250—234 6 Claims



1. A dual-mode resonant scanning system for use in a radiation imaging system, comprising:

high-Q dual-mode resonant mechanical scanning means for simultaneously oscillating at a predetermined fundamental frequency and near a third harmonic frequency of said predetermined fundamental frequency, said high-Q dual-mode resonant mechanical scanning means being designed and fabricated for self-resonance at said predetermined fundamental frequency and wherein said high-Q dual-mode resonant mechanical scanning means is mechanically tuned for self-resonant oscillation near the third harmonic frequency of said predetermined fundamental frequency; and

control means associated with said high-Q dual-mode resonant mechanical scanning means for controlling the simultaneous oscillation thereof, said control means including

means for generating an exact third harmonic frequency signal based upon a signal having said predetermined fundamental frequency, and

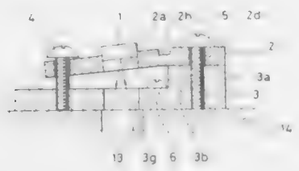
means for phase locking said exact third harmonic frequency signal with said predetermined fundamental frequency with an appropriate scan amplitude and phase angle therebetween to produce a triangular scan motion from said high-Q dual-mode resonant mechanical scanning means to provide near constant velocity scanning over a predetermined scan angle.

4,859,847

PHOTO DETECTOR ADJUSTMENT DEVICE

Takeshi Matsuno, and Kazuo Iwata, both of Ojimamachi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1988, Ser. No. 184,986
Claims priority, application Japan, Apr. 24, 1987, 62-101352
Int. Cl.[4] H01J 5/02
U.S. Cl. 250—239 8 Claims



1. A device mounted on an optical head base for the adjustment of a photo detector for adjusting the position of a photo detector in a direction of an optic axis of a light beam and in a plane perpendicular to said optic axis, comprising:

a movable plate able to move relative to said optical head base in a plane perpendicular to the optic axis of a light beam,

a base plate on which the photo detector is fixed, said base plate having a first end fixed to said movable plate, being able to bend to the direction of the optic axis, and being fixed to said movable plate, and

an adjusting screw extending through said base plate and threaded into said movable plate for bending the base plate toward said movable plate.

4,859,848

MASS SPECTROMETER APPARATUS

Ronald R. Bowman; Ingvar E. Sodal; Thomas A. Wilke, all of Boulder, Colo., and Frank Weller, Menlo Park, Calif., assignors to Masstron, Inc., Boulder, Colo.

Filed Oct. 9, 1987, Ser. No. 107,011
Int. Cl.[4] B01D 59/44
U.S. Cl. 250—296 28 Claims



1. A mass spectrometer apparatus, comprising:

first means for generating ions using a molecular fluid, said first means including a first means body portion;

second means for generating magnetic and electric fields, said second means communicating with said first means and said second means including a second means body portion, said first means body portion and said second means body portion being integral and contiguously adjacent to each other, with said first means body portion and said second means body portion being substantially formed of a first material, wherein portions of said first material are covered with a second material in which said first material has insulating properties and said second material has electrical conducting properties; and

third means operatively associated with said second means for use in determining components of the fluid.

4,859,849

RADIATION IMAGE RECORDING AND READ-OUT APPARATUS

Kazuo Shimura, and Masamitsu Ishida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 16, 1985, Ser. No. 787,846
Claims priority, application Japan, Oct. 16, 1984, 59-216910; Oct. 19, 1984, 59-220279
Int. Cl.[4] G01N 23/04
U.S. Cl. 250—327.2 10 Claims

1. A radiation image recording and read-out apparatus comprising:

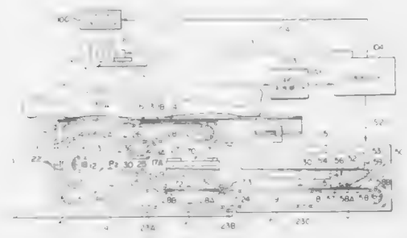
(i) a circulating and conveying means for conveying a plurality of stimulable phosphor sheets for recording radiation images thereof along a predetermined circulation path,

(ii) an image recording section positioned on said circulation path for recording the radiation image of an object on each of said stimulable phosphor sheets by exposing each stimulable phosphor sheet to a radiation passing through said object,

(iii) an image read-out section positioned on said circulation path and provided with a stimulating ray source for emitting stimulating rays for scanning said stimulable phosphor sheet carrying said radiation image stored therein at said image recording section, and a photoelectric read-out means for detecting light emitted by said stimulable phosphor sheet scanned by said stimulating rays to obtain an electric image signal,

(iv) an erasing section positioned on said circulation path for, prior to the next image recording on said stimulable phosphor sheet for which the image read-out has been conducted at said image read-out section, having said stimulable phosphor sheet release the radiation energy remaining in said stimulable phosphor sheet, and

(v) a radiation quality changing means for changing the quality of the radiation to be irradiated to the stimulable phosphor sheet to record radiation images of the object in the image recording section using different radiation qualities, a stimulable phosphor sheet changing means for



discharging one stimulable phosphor sheet, which has been recorded with a first radiation quality, from the recording position in the image recording section and positioning another stimulable phosphor sheet in the recording position of the image recording section for recording with a second, different radiation quality, and a synchronizing means which actuates the stimulable phosphor sheet changing means is synchronization with the radiation quality changing means, wherein said circulating and conveying means comprises means for positioning said one stimulable phosphor sheet for recording, and means for holding said another stimulable phosphor sheet during said recording, wherein said stimulable phosphor sheet changing means cooperates with said circulating and conveying means and said synchronizing means to discharge said one stimulable phosphor sheet after recording said radiation image at said first radiation quality and to insert said another stimulable phosphor sheet into said recording position to record said radiation image at said second radiation quality.

4,859,850

IRRADIATION FIELD RECOGNIZING METHOD, AND METHOD OF ADJUSTING IMAGE PROCESSING CONDITIONS USING THE SAME

Takeshi Funahashi, and Masamitsu Ishida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

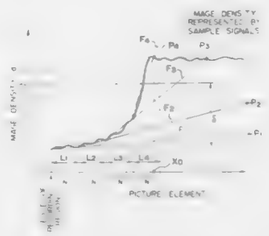
Filed Jan. 12, 1988, Ser. No. 143,100
Claims priority, application Japan, Jan. 12, 1987, 62-4552; Jan. 12, 1987, 62-4553; Jan. 12, 1987, 62-4554
Int. Cl.[4] G03C 5/16
U.S. Cl. 250—327.2 21 Claims

1. A method of recognizing an irradiation field wherein an irradiation field is recognized in a case where a radiation image is recorded on a recording medium by limitation of the irradiation field, the method of recognizing an irradiation field comprising the steps of:

(i) extracting sample image signals at an arbitrary picture element string, which extends from an edge of a recording region on said recording medium towards the center of said recording region, from image signals detected from said recording medium,

(ii) expressing changes among image density levels at a predetermined number of picture elements in the vicinity of said edge of said recording region, which image density levels are represented by said sample image signals, by an approximate equation substantially constituted by a simple equation,

(iii) calculating differences between imaginary image density



levels calculated by use of said approximate equation and actual image density levels represented by said sample image signals, and

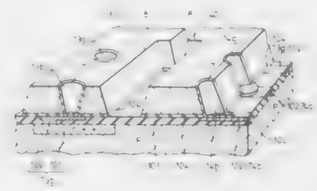
(iv) recognizing a region extending up to a picture element, at which said difference comes up to a predetermined value, from said edge of said recording region towards the center of said recording region as a region outside of the irradiation field, and recognizing a region inward from said picture element as viewed in the direction from said edge of said recording region towards the center of said recording region as the irradiation field.

4,859,851

THERMAL-RADIATION IMAGING DEVICES AND SYSTEMS, AND THE MANUFACTURE OF SUCH IMAGING DEVICES

John T. M. Wotherspoon, Southampton, United Kingdom, assignor to Philips Electronics and Associated Industries Limited, London, England

Filed Jul. 1, 1983, Ser. No. 512,440
Claims priority, application United Kingdom, Jul. 27, 1982, 8214643
Int. Cl.[4] G02B 26/10; H01L 27/14
U.S. Cl. 250—334 20 Claims



1. In a thermal-radiation imaging system comprising a thermal-radiation detector device having an ambipolar drift path for free charge-carriers which are generated by the thermal radiation, and scanning means for scanning a thermal-radiation image along said drift path in the same direction as the ambipolar drift and at a rate corresponding substantially to the ambipolar drift velocity, the device comprising:

at least one semiconductor body portion of elongated shape having a length which provides the ambipolar drift path and having a thickness which is smaller than its width, the body portion being of semiconductor material of one

conductivity type in which free charge carriers are generated along the drift path on absorption of the thermal radiation;

biasing electrode means spaced on the body portion for causing a bias current predominantly of majority charge carriers to flow along the length of the elongate body portion in one direction, said bias current being capable of supporting an ambipolar drift of radiation-generated minority charge carriers in the opposite direction to said flow of majority carriers;

read-out means at at least one area in the ambipolar drift path for providing a signal representative of the ambipolar drift at that area as sampled across the thickness of the body portion, said read-out means comprising metallization which extends through the thickness of the body portion at at least one hole located on the periphery of the body portion, said metallization being confined to substantially the whole side-wall of the hole without extending on the upper major surface of the semiconductor body portion or on the periphery of the body portion outside the side-wall of the hole; and

a support on which said at least one semiconductor body portion is present, said substrate having a conductor pattern which extends below said at least one hole in the ambipolar drift path and to which said metallization forms an electrical connection for the read-out means.

4,859,852

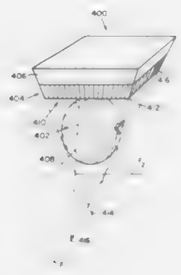
COLLIMATOR SYSTEM WITH IMPROVED IMAGING SENSITIVITY

Sebastian Genna, Belmont, and Andrew P. Smith, Medford, both of Mass., assignors to Digital Scintigraphics, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 876,811, Jun. 20, 1986, Pat. No. 4,782,233. This application Apr. 21, 1987, Ser. No. 40,941

Int. Cl.[4] G01T *1/164*

U.S. Cl. 250—363.1 **31 Claims**



1. A collimator system rotatable about an axis of rotation for use in a radionuclide emission tomography camera for imaging a region of an object, comprising a collimator having a plurality of collimator elements for restricting and collimating radionuclide emissions within a field of view of said collimator, said collimator elements being disposed with their axes intersecting at least one line, parallel to the axis of rotation and within said collimator field of view, at at least two different angles, and said collimator elements comprising means for establishing a selected variation in imaging sensitivity across the imaging region.

4,859,853

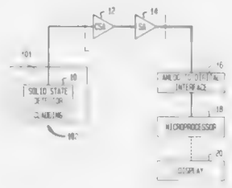
SOLID STATE GAMMA RAY DOSIMETER WHICH MEASURES RADIATION IN TERMS OF ABSORPTION IN A MATERIAL DIFFERENT FROM THE DETECTOR MATERIAL

Stanley Kronenberg, Skillman, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 4, 1988, Ser. No. 152,128

Int. Cl.[4] G01T *1/02, 1/24*

U.S. Cl. 250—370.07 **3 Claims**



1. A radiation dosimeter, comprising:

A solid state detector which produces an output pulse when radiation is absorbed;

an amplifier connected to said solid state detector which receives said output pulse and which produces an amplified pulse proportional to said output pulse;

an analog-to-digital interface connected to said amplifier which receives said amplified pulse and which converts said amplified pulse into a corresponding digital output;

a microprocessor connected to said analog-to-digital interface which receives said digital output and which associates said digital output with non-tissue dose translation data to produce a non-tissue dose measurement.

2. A radiation dosimeter, comprising:

A solid state detector which produces an output pulse when radiation is absorbed;

an amplifier connected to said solid state detector which receives said output pulse and which produces an amplified pulse proportional to said output pulse;

an analog-to-digital interface connected to said amplifier which receives said amplified pulse and which converts said amplified pulse into a corresponding digital output;

a microprocessor connected to said analog-to-digital interface which receives said digital output and which associates said digital output with dose translation data to produce a dose measurement;

wherein the solid state detector is substantially surrounded by a cladding material identical to the detector material;

wherein the thickness of said cladding material is greater than the maximum range of energetic electrons emitted upon absorption of gamma rays which constitute the radiation to which the dosimeter is exposed; and

wherein the dimensions of the solid state detector and said cladding material are less than the maximum range of the gamma rays which constitute the radiation to which the dosimeter is exposed.

4,859,854

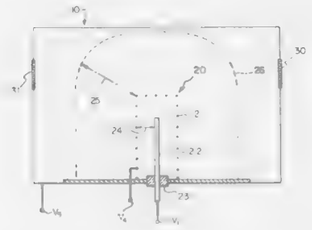
OPEN GRID PULSED ION CHAMBER OPERATING IN THE LINEAR ION COLLECTION REGION

Carl J. Kershner, Dayton, and Edward T. Burgess, Carlisle, both of Ohio, assignors to Femto-Tech, Inc., Carlisle, Ohio

Division of Ser. No. 39,392, Apr. 16, 1987. This application Aug. 15, 1988, Ser. No. 197,496

Int. Cl.[4] H01J *47/02*

U.S. Cl. 250—374 **12 Claims**



1. A device for detecting airborne alpha radiation in real time, said device including

an ion pulse collecting chamber comprising a probe, and an open grid surrounding said probe,

electrometer means connected between the probe and said grid, said electrometer means having a power gain of approximately 10^9 or more, and including pulse shaping means, and

counter means for counting the number of pulses detected by said ion pulse collecting chamber.

4,859,855

DOSIMETER FOR IONIZING RADIATION

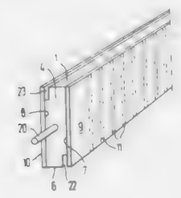
Hugo Vlasbloem, Maasland, Netherlands, assignor to B.V. Optisch Industrie 'De Oude Delft' , Delft, Netherlands

Filed Nov. 14, 1986, Ser. No. 931,539

Claims priority, application Netherlands, Nov. 15, 1985, 8503163

Int. Cl.[4] G21K *1/04;* **G01T** *1/185*

U.S. Cl. 250—385.1 **32 Claims**



1. A dosimeter for ionizing radiation comprising a casing defining a gas-filled measuring chamber in which there is provided electrode elements and wherein said casing is provided with at least one entry window for the ionizing radiation, characterized in that said casing is of an oblong shape defining an oblong measuring chamber said casing including at least two opposed side walls manufactured of a material transparent to ionizing radiation, one side wall is provided with a plate-like electrode substantially covering said inner surface and a guard electrode surrounding said plate-like electrode, an inner surface of another side wall is provided with a plurality of strip-like electrode elements extending essentially transversely to said oblong measuring chamber.

4,859,856

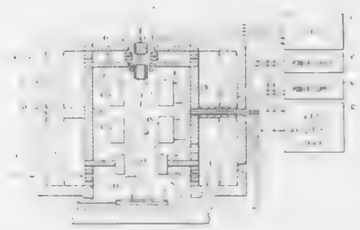
TELECENTRIC SUB-FIELD DEFLECTION WITH VAIL

Timothy R. Groves, Poughkeepsie, N.Y.; Hans C. Pfeiffer; Werner Stickel, both of Ridgefield, Conn., and Maris A. Sturans, Poughquag, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 11, 1988, Ser. No. 142,035

Int. Cl.[4] H01J *37/20*

U.S. Cl. 250—398 **7 Claims**



1. A two stage, vail electron beam projection system including

(a) a target,

(b) a source of an electron beam and means for projecting said electron beam towards said target with the upper surface thereof defining a target plane,

(c) a magnetic projection lens having a principal plane and a back focal plane located between said means for projecting and said target,

(d) said means for projecting providing an electron beam directed towards said target,

(e) lower stage means for providing deflection of said beam from area to area within a field,

(f) upper stage means for providing deflection of said beam within a said area within a said field, said upper stage means being located above said lower stage means, said upper stage means deflecting said beam in a first direction away from the geometrical axis of said system, and then reflecting said beam in a second direction towards said geometrical axis of said system, said lower stage means deflecting said beam in one direction, and then in another, direction substantially normal to said target plane,

(g) said beam crossing said back focal plane producing a telecentric condition of said beam in the image plane with said beam substantially normal to said target plane from said principal plane to said target plane,

(h) said magnetic projection lens including a magnetic compensation structure positioned within said projection lens, whereby said projection system projects on said target plane from said projection system as deflected by said upper and lower stages, at all times maintaining the telecentric condition at said target plane throughout the entire range of deflection of said beam, assuring minimum errors due to target height variations.

4,859,857

ION-PROJECTION APPARATUS AND METHOD OF OPERATING SAME

Gerhard Stengl, Villach; Hans Löschner, and Peter Wolf, both of Vienna, all of Austria, assignors to IMS Ionen Mikrofabrikations Systeme Gesellschaft, Wien, Austria

Filed Jan. 30, 1987, Ser. No. 9,414

Claims priority, application Austria, Jan. 31, 1986, A 237/86

Int. Cl.[4] H01J *37/08*

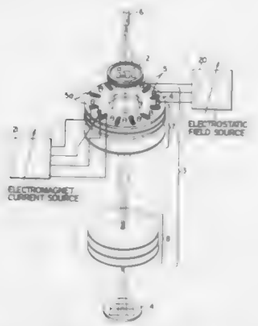
U.S. Cl. 250—492.3 **23 Claims**

1. In an image-forming projector for controllably varying the image of the structure of a mask upon a substrate relative to one actual structure of the mask wherein a beam of charged particles is directed along a path to flood and impinge upon a

mask defining a structure by an opening in said mask to be formed on a substrate, and then through an electromagnetic lens system before said beam impinges upon said substrate to form an image of the mask structure thereon, comprising:

a controllable corrective element independent of said lens system and located along the path of said beam formed with adjustable field-distribution means for generating static electromagnetic fields differing controllably at various locations around said beam and corresponding to more than two electromagnetic potentials affecting different ray portions of the beam passing through said opening in said mask for deforming said beam portions and

a control means for controlling said corrective element for affecting a directed modification of the image of the structure of the mask transferred to said substrate relative to the actual structure of the mask.

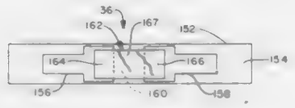


4,859,858

GAS ANALYZERS

Daniel W. Knodle, Seattle; Leslie E. Mace, Mercer Island, and Lawrence L. Labuda, Issaquah, all of Wash., assignors to Cascadia Technology Corporation, Redmond, Wash.

Continuation-in-part of Ser. No. 938,030, Dec. 4, 1986, abandoned. This application Mar. 11, 1987, Ser. No. 24,770
Int. Cl.[4] H05B *3/26*
U.S. Cl. 250—504 R 20 Claims



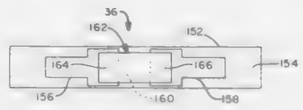
1. A device for emitting modulated infrared energy in a stable, repeatable manner, said device comprising: a non-metallic substrate fabricated of a material possessing low thermal conductivity; a layer of an emissive, electrically resistive material on said substrate; and means for applying pulses of electrical energy across said layer of emissive, electrically resistive material to periodically produce the wanted emission of infrared energy therfrom, the means for applying said pulses across said emissive layer comprising an operatioonal amplifier, electronic switch means for so applying a signal to one input of said operational amplifier as to cause a signal to appear at the output of said operational amplifier, means responsive to the appearance of said output signal to connect said emissive layer across two power sources of equal magnitude but opposite polarity, and a differential resistor network for precisely controlling the voltage thus applied across said emissive layer, said differential resistor network comprising one pair of resistors connected in series between one side of said emissive layer and ground and a second pair of resistors connected in series between the other side of said emissive layer and a lead routing the input signal to said operational amplifier, the resistors in one of said pairs being matched to the resistors in the other of said pairs.

4,859,859

GAS ANALYZERS

Daniel W. Knodle, Seattle, and William E. Crone, Redmond, both of Wash., assignors to Cascadia Technology Corporation, Redmond, Wash.

Continuation-in-part of Ser. No. 938,028, Dec. 4, 1986. This application Mar. 11, 1987, Ser. No. 24,769
Int. Cl.[4] H05B *3/26*
U.S. Cl. 250—504 R 20 Claims



8. A device for emitting modulated infrared energy in a stable, repeatable manner, said device comprising:

a. a non-metallic substrate fabricated of a material possessing a thermal conductivity which is approximately one order of magnitude less than the thermal conductivity of alumina; and

b. a layer of an emissive, electrically resistive material on said substrate;

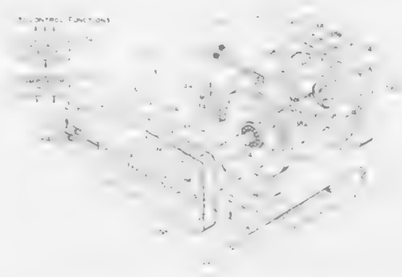
c. the thermal properties of said substrate and the thermal properties of said emissive, electrically resistive material being so related as to enable said device to efficiently emit pulses of electromagnetic radiation at a high energy level, at a frequency in the range of 40 to 100 Hz, with a high signal-to-noise ratio, and with a sharktooth waveform when electrical energy is applied to said emissive, electrically resistive material.

4,859,860

FEATHER LIGHT WEB EDGE SENSOR

Robert J. Poterala, 140 Rocky Point, Greenville, S.C. 29615

Filed May 6, 1988, Ser. No. 191,050
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—548 20 Claims



1. A web edge sensor having a feather light sensing action for sensing the edge of a travelling web without distorting the edge comprising:

a housing for mounting adjacent said web;

a trip disk rotatably carried by said housing;

a feeler carried by said trip disk for engaging said web edge and moving in a pendular motion in response to web movement;

a plurality of weighted balls carried by said trip disk;

coupling means for carrying said balls on said trip disk in said housing so that said weighted balls dampen rapid oscillations in the pendular motion of said feeler in response to the interactive engagement between said feeler and said web edge during high speed travel of said web; and

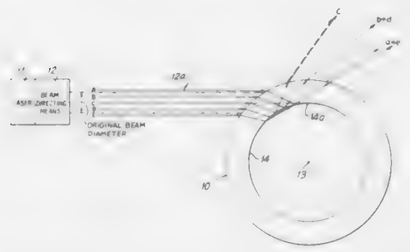
detector means actuated in response to the rotation of said trip disk as effected by said pendular motion of said feeler for generating a web position signal indicative of the position of the edge of said web for controlling and guiding said travelling web.

4,859,861

MEASURING CURVATURE OF TRANSPARENT OR TRANSLUCENT MATERIAL

Steve Mersch, Germantown, Ohio, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed May 16, 1988, Ser. No. 194,614
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—560 12 Claims



1. An apparatus to determine the diameter of the bore, the height of the inside wall, and/or the radius of curvature of the inside wall of a transparent or translucent tube comprising:

a laser which provides a light beam at a wavelength for which the material being measured is transparent or translucent;

directing means for said laser beam to aim said laser beam toward a tube location and normal to a longitudinal axis of the tube while moving the aimed beam to scan the tube transverse to the longitudinal axis;

light detection means positioned to receive laser light polarized normal to the axis of the tube from said laser beam which laser light has been reflected or refracted by the inside wall of the tube, said light detection means capable of generating signals responsive to the light received, and

signal processing means associated with said light detection means for processing signals to determine the position of the inside wall of the tube by means of analyzing when the signals from said reflected or refracted laser light change from being reflected by to being refracted through the inside wall of the tube.

4,859,862

APPARATUS FOR GENERATING DETECTING AND CHARACTERIZING A RASTER IMAGE OF AN OBJECT

Tore Planke, Nykirke; Andreas Nordbryhn, Oslo, and Steinar Solnördal, Åros, all of Norway, assignors to A/S Tomra Systems, Asker, Norway

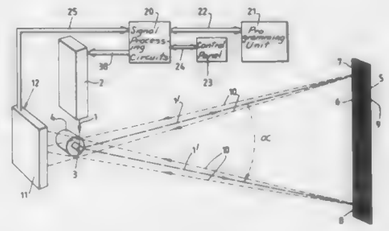
Filed Feb. 16, 1988, Ser. No. 157,047
Claims priority, application Norway, Feb. 20, 1987, 870681
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—560 46 Claims

1. An apparatus for obtaining a characteristic expression of an object, comprising:

means for sweeping a light beam repeatedly in a plane which intersects the object so as to provide a sweeping light beam;

retro-reflector means for reflecting the light beam back in said plane when the light beam is not screened by the object so as to provide a reflected light beam;

detector means for directly receiving the reflected light beam from the retro-reflector; and



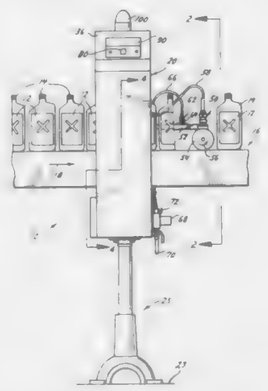
means for transforming the reflected light beam received by said detector means into a characteristic expression of the contour of the object, said detector means being behind said sweeping means as viewed in a direction of the reflected light beam.

4,859,863

LABEL INSPECTION APPARATUS SENSING REFLECTIVITY VALUES

Stephen A. Schrader, Bridgeton, and Douglas J. Goff, Kirkwood, both of Mo., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Jan. 11, 1988, Ser. No. 142,800
Int. Cl.[4] G06K *5/00*; H04N *7/18*
U.S. Cl. 250—556 22 Claims



1. A label inspection apparatus for inspecting labels on containers such as, for example, containers of generally rectangular horizontal cross-section in the label areas and where the labels are applied to generally flat or slightly convex as opposed to round side surfaces of the container, and further where the containers with the labels to be inspected are moving by a conveyor past the inspection apparatus in an upright position, said label inspection apparatus comprising:

means for sensing the reflectivity values of pixels located over substantially the entire label for each container in a sample having a predetermined number of containers, the pixel locations being the same for each label in the sample and each label to be inspected, the containers and labels in the sample being typical of those to be inspected,

means for establishing MEANS reflectivity values from the

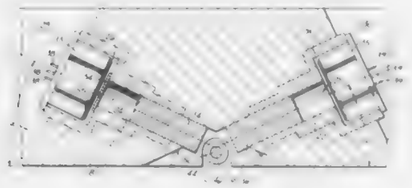
reflectivity values of each pixel location for the containers in the sample,
means for determining standard deviation values from the number of containers in the sample and the reflectivity values,
means for establishing limits by which containers to be inspected are to be judged as pass or fail, said limits established as a function of said MEANS values and standard deviation values,
means for inspecting labels on the containers to be inspected, including means for sensing the reflectivity value of each pixel in each label as with the containers in the sample,
means for comparing values which are a function of the sensed values with the established limits, and
means for passing or failing a label in response to said comparison.

4,859,864

SENSOR AND METHOD FOR DETECTING THE PRESENCE OF AIR BUBBLES IN LIQUID

Roger E. Smith, Bountiful, Utah, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed May 7, 1987, Ser. No. 46,957
Int. Cl.[4] G01N *15/06*
U.S. Cl. 250—577 **17 Claims**



1. An air bubble sensor device comprising:
a sensor block;
a recess in said block for receiving a hollow tube through which liquid flows, said tube having an interior surface and a rounded exterior surface;
a light source arranged in said block to enhance and direct light at the tube when placed in said recess so that light rays strike a localized spot on said interior surface at an angle with respect to the normal of said interior surface;
a light detector arranged in said block to receive light reflected at said itnerior surface when an air bubble is present in said tube, said light detector positioned to receive substantially no light refracted at said interior surface when liquid is present in the tube; and
means for taking the light received by said detector to produce a signal for indicating the presence of an air bubble in said tube.

4,859,865

TAMPER RESISTANT RADON DETECTOR SYSTEM

Herman H. Vandenburgh, 22 Chapin Rd., Barrington, R.I. [illegible]

Filed Jul. 20, 1987, Ser. No. 75,521
Int. Cl.[4] G01V *5/00*
U.S. Cl. 250—253 **5 Claims**

1. A radon detector system for accurately measuring the radon level within a finite test site of a structure over a period of time without direct supervision by the tester comprising,
a portable fully enclosed housing having a lockable access cover and means for attaching said housing to a fixed member of said structure within said test site,
said housing having a radon monitoring device in turn including an air accepting portion thereof disposed externally of said housing and both external and internal detection means for detecting various possible modes of tampering with said radon monitoring device and/or the test site in which such is disposed,
said external detection means including:
(a) motion detection means for detecting the presence of a moving object adjacent said housing, and
(b) test site air environment detection means for detecting a change in the air proximal to the housing,



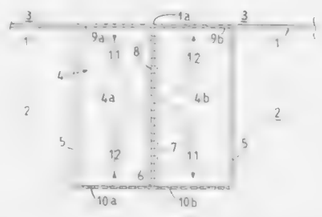
said internal detection means including:
(a) tamper switch means for detecting movement of the housing,
(b) means for detecting the interruption of electrical power to the housing, and
(c) means for detecting removal or dislodging of said air accepting portion of said monitoring device.

4,859,866

WATER TURBINE ARRANGEMENT FOR POWER GENERATION USING TIDAL ENERGY

Colin Horne, and Edward B. Morgan, both of 26 Horseshoe Park, Pangbourne, Reading, Berks, Great Britain RG8 7JW

Filed Aug. 1, 1988, Ser. No. 226,672
Claims priority, application United Kingdom, Aug. 5, 1987, 8718551; Jun. 9, 1988, 8813705
Int. Cl.[4] F03B *13/00*
U.S. Cl. 290—54 **5 Claims**



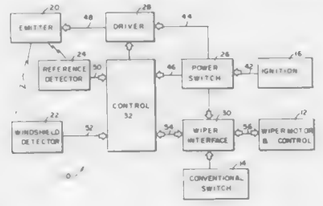
1. An arrangement for locating at least one water turbine in the path of a tidal water source for both ebb and flow power generation, characterised in that a turbine is used which is designed for uni-directional flow, in that the or each said turbine is mounted in a wall which divides an enclosed space into a first area which can be brought into communication with the tidal water source and a second area which can be brought into communication with a basin separated from said source, and in that adjustable sluices are associated with each area and arranged so that, irrespective of the tide direction, the sluices can be adjusted to cause water to flow only in said uni-direction through the turbine.

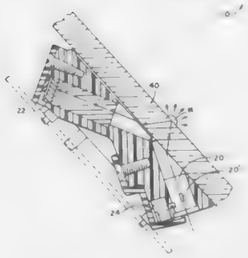
4,859,867

WINDSHIELD MOISTURE SENSING CONTROL CIRCUIT

Mark L. Larson, Grand Haven; Karl H. Hanft, and Desmond J. O'Farrell, both of Holland, all of Mich., assignors to Donnelly Corporation, Holland, Mich.

Filed Apr. 19, 1988, Ser. No. 183,693
Int. Cl.[4] H02J *1/00;* **H02P** *1/04*
U.S. Cl. 307—10.1 **17 Claims**





1. A vehicle windshield rain sensor comprising:
emitter means for periodically emitting light radiation;
first sensor means for detecting a portion of the radiation refracted and reflected by a windshield and producing a first signal indicative thereof;
second detector means for detecting a portion of the radiation from said emitter means and producing a second signal indicative thereof;
signal-processing means for processing the first signal, said signal-processing means including first amplifier means for amplifying the first signal, filter means for removing the noncyclical component from the amplified signal, and second amplifier means for amplifying the filtered signal, whereby the noncyclical portion of said signal due to ambient light impinging on said first sensor means is removed from the first signal and the cyclical portion is amplified; and
control means for processing the first amplified signal from said signal-processing means and the second signal to provide a decision signal indicative of the amount of moisture on the windshield.

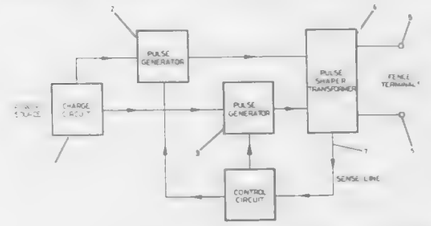
4,859,868

ELECTRIC FENCE ENERGIZER

Jeremy J. McKissack, Hamilton, New Zealand, assignor to Gallagher Electronics Limited, Hamilton, New Zealand

Continuation-in-part of Ser. No. 67,941, Jun. 29, 1987, abandoned. This application Sep. 9, 1988, Ser. No. 242,799
Claims priority, application New Zealand, Jul. 4, 1986, 216748; Mar. 6, 1987, 219542
Int. Cl.[4] H01H *47/00*
U.S. Cl. 307—106 **6 Claims**

1. An electric fence energizer, including:
a first energy generating circuit including a first transformer having a primary winding connected across an output of said first energy generating circuit and having a secondary winding for connection to a fence wire;
a second energy generating circuit including a second transformer having a primary winding connected across an output of said second energy generating circuit and having a secondary winding for connection to said fence wire:
a control circuit having a first output connected to said first energy generating circuit for controlling said first energy generating circuit, and having a second output connected to said second energy generating circuit for controlling said second energy generating circuit independently of said first energy generating circuit; and,
a control line connected to an input of said control circuit



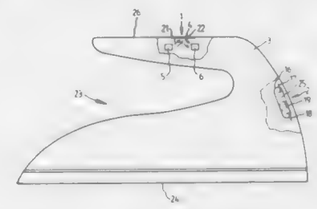
and also connected to a means of said first generating circuit responsive to a change in operating conditions occuring in said first energy generating circuit, said means being operative to trigger said control circuit and energize said second energy generating circuit on the occurence of a change in operating conditions of said first energy generating circuit.

4,859,869

SAFETY SWITCHING MEANS FOR CONTROLLING A CURRENT CONSUMER

Lothar Heuwinkel, Eppstein, and Herbert Hofinger, Oberursel, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed May 4, 1988, Ser. No. 190,106
Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3715497
Int. Cl.[4] H01H *36/00;* **H05B** *1/02;* **D06F** *75/26*
U.S. Cl. 307—117 **11 Claims**



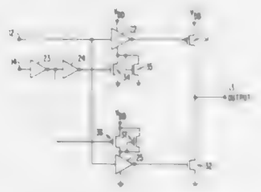
1. A hand-operated electrical appliance, in particular an iron, comprising a body portion that includes a handle portion, an electrical load in said body portion, an outlet opening in said handle portion,
safety switching means in said appliance, said safety switching means including a radiation source disposed in said handle portion for directing a beam of radiation along a predetermined path towards and through said outlet opening,
a radiation detector disposed in said handle portion adjacent said outlet opening such that said radiation detector is not exposed to radiation from said source along said predetermined path, said radiation detector being located such that when said outlet opening is covered by the hand of a user of said appliance, radiation from said predetermined path is reflected by the hand to said detector, and
evaluation circuitry responsive to radiation striking said detector for determining whether that radiation is outside light which entered through said outlet opening or whether that radiation is radiation from said radiation source and reflected by the hand of the user, said evaluation circuitry being adapted to cause electrical energy to be applied to said electric load only while said detector senses radiation from said radiation source that is reflected by the hand of the user.

4,859,870

TWO-MODE DRIVER CIRCUIT

Anthony Y. Wong, Cupertino; Daniel Wong, San Jose, and Steven S. Chan, Fremont, all of Calif., assignors to LSI Logic Incorporated, Milpitas, Calif.

Continuation of Ser. No. 108,333, Oct. 14, 1987, abandoned.
This application Jan. 9, 1989, Ser. No. 296,297
Int. Cl.[4] H03K *17/16, 17/687*
U.S. Cl. 307—263 20 Claims



1. For connection to an MOS inverter circuit having an input terminal, an output terminal, first and second power terminals for connection to first and second reference voltage supplies respectively, a circuit comprising:

a pair of MOS transistors connected in parallel between one of said first and second power terminals and one of said first and second reference voltage supplies, said first MOS transistor having its gate electrode connected to a third terminal, said second MOS transistor having its gate connected to its source or drain region for diode operation and having a channel width much smaller than channel width of said first MOS transistor;

whereby the output terminal voltage swing of said MOS inverter circuit operation is reduced when a signal on said third terminal turns off said first MOS transistor.

4,859,871

VOLTAGE LEVEL SETTING CIRCUIT

Osamu Kobayashi, Yokohama, and Kunihiko Gotch, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 9, 1988, Ser. No. 153,894
Claims priority, application Japan, Feb. 13, 1987, 62-31783; Feb. 20, 1987, 62-37613
Int. Cl.[4] H03K *5/01;* H04N *9/72, 5/16*
U.S. Cl. 307—264 19 Claims



1. A voltage level setting circuit for setting a D.C. voltage level of a predetermined portion of an input signal received through a coupling capacitor to a desired reference voltage level suited for a signal processing which is carried out in a signal processing circuit, said voltage level of the predetermined portion being used as a reference level of said input signal, said voltage level setting circuit, comprising:

a charge injecting circuit for injecting a quantity of charge to a node between said coupling capacitor and said signal processing circuit, wherein said node has a bias voltage during a predetermined time period, and wherein said voltage substantially corresponds to the predetermined portion of said input signal: and

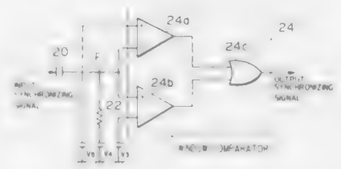
control means for controlling the injection of charge by said charge injecting circuit responsive to a signal from said signal processing circuit so that the D.C. voltage level of the predetermined portion at said node is set to said desired reference voltage level.

4,859,872

SYNCHRONIZING SIGNAL PROCESSING CIRCUIT

Junichi Hyakutake, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1988, Ser. No. 172,216
Claims priority, application Japan, Mar. 31, 1987, 62-80820; Apr. 28, 1987, 62-105585
Int. Cl.[4] H03K *5/13, 5/153, 5/22;* H04N *5/08*
U.S. Cl. 307—269 9 Claims



1. A synchronizing signal processing circuit comprising:

mean DC voltage setting means for setting mean DC voltge of an input synchronizing signal at a prescribed level including a coupling capacitor for receiving said input synchronizing signal at its one end, and a voltage source connected to the other end of said coupling capacitor; and

a window comparator having first reference voltage which is larger than said prescribed level and second reference voltage which is smaller than said prescribed level, for comparing the input synchronizing signal set by said main DC voltage setting means with said first reference voltage and said second reference voltage to output a signal of a first level when the input synchronizing signal set by said mean DC voltage setting means is in a level between said first reference voltage and said second reference voltage and a signal of a second level when it is in a level higher than said first reference voltage or lower than said second reference voltage, thereby an output synchronizing signal of constant polarity and amplitude is obtained.

4,859,873

CMOS SCHMITT TRIGGER WITH INDEPENDENTLY BIASED HIGH/LOW THRESHOLD CIRCUITS

Timothy G. O'Shaughnessy, Norco, and Richard W. Hull, Laguna Hills, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Jul. 17, 1987, Ser. No. 74,905
Int. Cl.[4] H03K *3/29, 5/153*
U.S. Cl. 307—290 18 Claims

1. A unidirectional threshold crossing detector comprising:

an input node;

a first intermediate node;

an output node;

a first threshold activated logic switch, coupled to the input node and the first intermediate node so as to drive the first intermediate node towards a first logic state when an input signal applied to the input node surpasses a first threshold level;

a second intermediate node;

a second threshold activated logic switch, coupled to the input node and the second intermediate node so as to drive the second intermediate node towards a second logic state when the input signal surpasses a second threshold level;

a first drive disabling switch, operatively coupled to the first threshold activated logic switch, for selectively disabling the first threshold activated logic switch from driving the first intermediate node towards the first logic state;

a logic control means, coupled to the first and second intermediate nodes and the first drive disabling switch, for selectively operating the first drive disabling switch to



disable the first threshold activated logic switch from driving the first intermediate node towards the first logic state and for producing a logical output signal, that is functionally related to the logic state of the first and second intermediate nodes, at the output node;

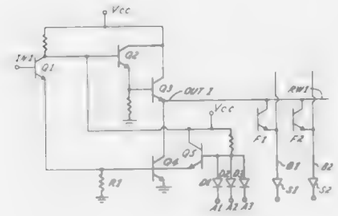
threshold determining means for setting the first and second threshold levels of the first and second threshold activated logic switches independently of one another.

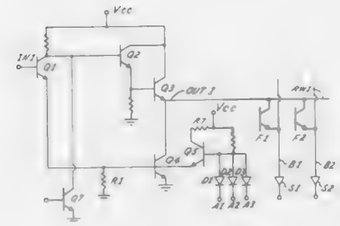
4,859,874

PLA DRIVER WITH RECONFIGURABLE DRIVE

Robert J. Bosnyak, Portland, Oreg., assignor to Fairchild Semiconductor Corp., Cupertino, Calif.

Filed Sep. 25, 1987, Ser. No. 101,210
Int. Cl.[4] H03K *17/08, 17/10, 17/687;* G11C *7/00*
U.S. Cl. 307—296.3 11 Claims





1. A row driver circuit comprising:

a row addressing input terminal for receiving an input signal;

a program enable means for providing a program enable signal;

an output terminal for providing a drive signal to a row in an array;

pull up means for providing a pull up voltage level to said output terminal in response to a first state of said input signal;

pull down means for providing a first pull down voltage level to said output terminal in response to a second state of said input signal, said pull down means comprising a first transistor having a first current carrying terminal connected to said output terminal, a second current carrying terminal connected to a pull down voltage source, and having a control terminal; and

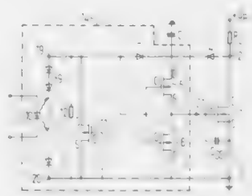
pull down control means for controlling said pull down means, causing said pull down means to provide a second pull down voltage level to said output terminal in response to said program enable signal, and wherein said pull down control means comprises a second transistor having a first current carrying terminal connected to a supply voltage, a second current carrying terminal connected to said control terminal of said first transistor, and a control terminal responsive to said program enable signal.

4,859,875

OPTOCOUPLER FOR POWER FET

Jenoe Tihanyi, and Roland Weber, both of Muenchen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 24, 1988, Ser. No. 236,076
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1987, 3728806
Int. Cl.[4] H03K *3/42;* G02B *27/00*
U.S. Cl. 307—311 4 Claims



1. An optocoupler having at least one LED and one single photodiode chain optically coupled with the LED and two series-connected FETs each having a first terminal and a second terminal and a gate terminal, the first terminals are connected to each other while the gate terminals are connected to each other to form a common terminal, a first terminal of the photodiode chain is connected to the common terminal, the optocoupler comprising:

(a) the first FET being of an enhancement type and of a first channel type,

(b) the second FET being of an enhancement type and of a second channel type,

(c) a first diode is connected from the first terminal of the photodiode chain and common terminal to the second terminal of the first FET,

(d) a second terminal of the photodiode chain is connected to the second terminal of the second FET,

(e) the first diode is poled so that upon illumination of the photodiode chain a photocurrent will flow through the first FET,

(f) the first terminals of the FETs are connected to the gate terminal of a power FET,

(g) the second terminal of the second FET is connected to the source terminal of the power FET,

(h) a capacitor is connected to the second terminal (D) of the first FET and a fixed voltage potential,

(i) a second diode is connected between the power FET and the capacitor, and

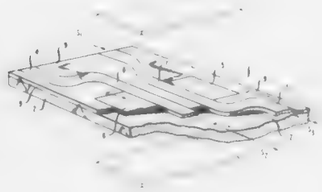
(j) the second diode is poled in such a way, that the capacitor is charged when the power FET is blocked.

4,859,876

NONLINEAR OPTICAL MATERIALS AND DEVICES

Carl W. Dirk, Piscataway; Howard E. Katz, Summit; Salvatore J. Lalama, Clifton, all of N.J.; Kenneth D. Singer, Abington Township, Montgomery County, Pa., and John E. Sohn, Voorhees, N.J., assignors to AT&T Bell Laboratories American Telephone and Telegraph Company, Murray Hill and AT&T Technologies, Inc., Berkeley Heights, both of, N.J.

Continuation-in-part of Ser. No. 776,336, Sep. 16, 1985, abandoned. This application Jun. 19, 1987, Ser. No. 69,733
Int. Cl.[4] G02F *1/00*
U.S. Cl. 307—425 40 Claims



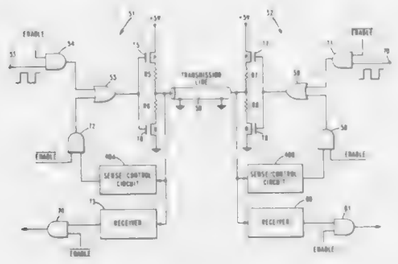
1. An optical device comprising a non-crystalline second order optically nonlinear element, means for providing an optical input to and an optical output from said element wherein said element comprises an organic compound having a second order optical susceptibility incorporated in a directionally oriented manner in an optically clear glassy polymer so as to impart a net second order optical susceptibility to said element.

4,859,877

BIDIRECTIONAL DIGITAL SIGNAL TRANSMISSION SYSTEM

Michael Cooperman, Framingham, and Richard W. Sieber, Attleboro, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 4, 1988, Ser. No. 140,378
Int. Cl.[4] H03K *5/09;* H03L *5/00*
U.S. Cl. 307—443 19 Claims



1. A transmission system for transmitting and receiving digital signals on a transmission line from a transmit connection to a termination connection thereof comprising

an input terminal for receiving digital signals of a first voltage level or of a second voltage level;

transmit driver means connected between a transmit source of operating potential and a transmit point of reference potential, said transmit driver means being coupled to said input terminal and to the transmit connection of the transmission line;

said transmit driver means being operable to change the potential at said transmit connection from the potential of the transmit point of reference potential to the potential of the transmit source of operating potential when the digital signal at the input terminal changes from the first voltage level to the second voltage level, and said transmit driver means being operable to change the potential at said transmit connection from the potential of the transmit source of operating potential to the potential of the transmit point of reference potential when the digital signal at the input terminal changes from the second voltage level to the first voltage level;

said transmit driver means includes a first transmit switching means and a first transmit resistance connected in series between said transmit source of operating potential and said transmit connection, and said transmit driver means includes a second transmit switching means and a second transmit resistance connected in series between said transmit connection and said transmit point to reference potential;

said first transmit switching means being switched to a closed condition and said second transmit switching means being switched to an open condition in response to said second voltage level at said input terminal, and said first transmit switching means being switched to an open condition and said second transmit switching means being switched to a closed condition in response to said first voltage level at said input terminal;

an output terminal connected to the termination connection of the transmission line;

termination driver means connected between a termination source of operating potential and a termination point of reference potential, said termination driver means being coupled to said termination connection and to said output terminal;

said termination driver means having an input connection and being operable to change the potential at said termination connection and at said output terminal from the potential of the termination point of reference potential to the potential of the termination source of operating potential when the signal at said input connection thereto changes from a first input condition to a second input condition, and said termination driver means being operable to change the potential at said termination connection and at said output terminal from the potential of the termination source of operating potential to the potential of the termination point of reference potential when the signal at said input connection thereto changes from said second input condition to said first input condition;

said termination driver means includes a first termination switching means and a first termination resistance connected in series between said termination source of operating potential and said termination connection, and said termination driver means includes a second termination switching means and a second resistance connected in series between said termination connection and said termination point of reference potential;

said first termination switching means being switched to a closed condition and said second termination switching means being switched to an open condition in response to said second input condition at said input connection, and said first termination switching means being switched to an open condition and said second termination switching means being switched to a closed condition in response to said first input condition at said input connection;

control means coupled to said termination connection and to the input connection to the termination driver means;

said control means being operable in response to the potential at the transmit connection changing from the potential of the transmit point of reference potential to the potential of the transmit source of operating potential to change the input condition at the input connection to the termination driver means from the first input condition to the second input condition whereby said termination driver means produces a potential at the output terminal equal to the potential of the termination source of operating potential;

said control means being operable in response to the potential at the transmit connection changing from the potential of the transmit source of operating potential to the potential of the transmit point of reference potential to change the input condition at the input connection to the termination driver means from the second input condition to the first input condition whereby said termination driver means produces a potential at the output terminal equal to the potential of the termination point of reference potential; and

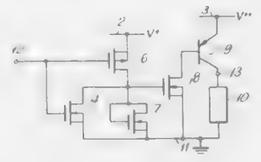
said control means being operable to change the voltage at the input to said termination driver means from the first input condition to the second input condition and from the second input condition to the first input condition in response to the potential at the termination connection of the transmission line being within a predetermined range.

4,859,878

BI-MOS LEVELSHIFT CIRCUIT CAPABLE OF CONTROLLING POWER CONSUMPTION

Yoichi Murayama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 17, 1987, Ser. No. 134,280
Claims priority, application Japan, Dec. 17, 1986, 61-302514
Int. Cl.[4] H03K *17/56*
U.S. Cl. 307—446 11 Claims



1. A Bi-MOS circuit comprising:

a MOS field effect transistor having a source connected to a first power potential in a low-voltage power source, a drain and a gate connected to an input terminal;

a first double-diffused field effect transistor having a source connected to a reference potential and a gate and a drain connected in common with said drain of said MOS field effect transistor;

a second double-diffused field effect transistor having a source connected to said reference potential, a drain and a gate connected to said gate and said drain of said first double-diffused field effect transistor;

a bipolar transistor having an emitter connected to a second power potential in a high-voltage power source, a base connected to said drain of said second double-diffused field effect transistor and a collector connected to an output terminal; and

a means for controlling a potential level, operatively connected to a junction of said gate of said first double-diffused field effect transistor and said gate of said second double-diffused field effect transistor.

4,859,879

SUPERCONDUCTING DIGITAL LOGIC AMPLIFIER

John X. Przybysz, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 16, 1988, Ser. No. 194,688
Int. Cl.[4] H03K *19/195, 17/92*
U.S. Cl. 307—476 4 Claims

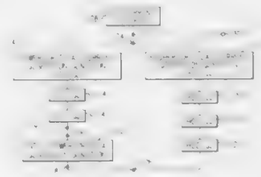
1. A superconducting digital logic amplifier for interfacing between a Josephson junction logic circuit having output current and a higher voltage semiconductor circuit input, said amplifier comprising:

a. an input terminal for connection to a

b. an output terminal for connection to a semiconductor circuit input;

c. an input, lower critical current, Josephson junction having first and second terminals;

d. a first series string of at least three lower critical current Josephson junctions, said first series string being connected to said first terminal of said input Josephson junction such that the first series string is in series with said input Josephson junction to provide a series combination, and said input terminal being connected to said first terminal of said input Josephson junction, and with said critical current of said lower critical current Josephson junctions





of said input Josephson junction and said first series stirng Josephson junctions being less than the output current of said low voltage Josephson junction circuit;

e. a second series string of at least four higher critical current Josephson junctions, said second string being connected in parallel with said series combination to provide parallel strings having an upper common connection and a lower common connection, said lower common connection being connected to said second terminal of said input Josephson junction and said upper common connection being connected to said output terminal; and

f. a pulsed DC current source connected to said parallel strings at said upper common connection, said DC current source having a current at least equal to the critical current of said higher critical current Josephson junctions.

4,859,880

HIGH SPEED CMOS DIFFERENTIAL DRIVER

Paul W. Chung, San Jose, and Niantsu N. Wang, Milpitas, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1988, Ser. No. 207,481
Int. Cl.[4] H03K 17/693
U.S. Cl. 307—494 8 Claims

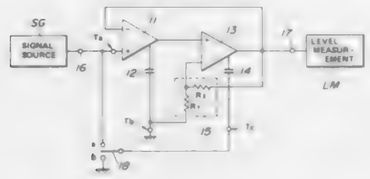
1. A CMOS differential driver comprising:
a differential amplifier having first and second input terminals;
a first transfer gate connecting high and low voltage input terminals to said first amplifier input terminal; and
a second transfer gate connecting said high and low voltage input terminals to said second amplifier input terminal, said transfer gates being complementary and controlled by identical logic input signals.

4,859,881

FILTER CIRCUIT

Yoshihiro Yamamoto, Tokyo; Tsutomu Kume, Ibaraki; Nobuo Yamazaki; Fumiharu Hashimoto, both of Tokyo, and Koichi Ohya, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 29, 1987, Ser. No. 138,865
Claims priority, application Japan, Dec. 29, 1986, 61-310125; Jan. 8, 1987, 62-001064
Int. Cl.[4] H03K 5/00, 17/56; H03B 1/04; H03F 3/04
U.S. Cl. 307—520 19 Claims



1. A filter circuit having an adjusting feature comprising:
a pair of integrators, each consisting of an amplifier having first and second input terminals and an output circuit, each said output circuit having an output terminal, each said integrator having an integration capacitance connected to said output circuit, the output terminal of said amplifier of a first one of said integrators being connected to the first input terminal of said amplifier of a second one of said integrators and the output terminal of said amplifier of said second integrator being connected to the first input terminal of said amplifier of said first integrator and to the second input terminal of said amplifier of said second integrator; and
switch means connected with one of the input terminals of said amplifier of one of said first and second integrators for commutating the characteristics of said filter circuit, and means responsive to a control signal for selectively operating said switch means so that said filter may be adjusted in a first position of said switch and operated in a second position of said switch, wherein said switch means is commutated so as to change the shape of the characteristic curve of said filter circuit to a curve having a prominent peak or valley at a predetermined frequency, whereby said predetermined frequency is emphasized more with one shape than with another shape.

14. A method of changing the characteristics of a filter circuit having a pair of integrators, said filter circuit having selectively operable switch means having first and second positions, comprising the steps of;
supplying a constant frequency input signal to said filter circuit,
supplying a control signal to operate said switch means to said first position for commutating the shape of the characteristic curve of said filter circuit to a shape having a prominent peak or valley at a predetermined frequency, whereby said predetermined frequency is emphasized more with one shape than with the normal shape,
obtaining an output signal from said filter circuit in response to said constant frequency input signal, to enable adjustment of said filter circuit, and
operating said switch to its second position to enable normal operation with said normal shape characteristic curve.

4,859,882

SENSE AMPLIFIER

Osamu Matsumoto, Yokohama; Isao Abe, Kawasaki, and Takeshi Nakashiro, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 7, 1988, Ser. No. 280,854
Claims priority, application Japan, Dec. 16, 1987, 62-317861
Int. Cl.[4] G11C 7/06, 9/00, 11/40, 17/04
U.S. Cl. 307—530 9 Claims



1. A sense amplifier, comprising:
a signal source to be detected;
a first MOS transistor, one end of a channel conductive path of which is connected to said signal source, and gate of which is grounded, for causing a current from a power source to flow toward said signal source when said signal source is turned on;
second MOS transistor, a gate and one end of a channel conductive path of which are connected to said signal source, for quickly increasing potential at a node between said signal source and said first MOS transistor to $V_{DD}-|Vthp|$ (V_{DD}: a power source voltage, Vthp: a threshold value of said second MOS transistor) after said signal source is switched from an ON state to an OFF state;
a ratio circuit constituted by a third MOS transistor having a constant ON resistance and a fourth MOS transistor having a ON resistance changed in accordance with a change in potential at the node, for changing an output in accordance with a change in ON resistance of said fourth MOS transistor; and
an inverter for inverting the output from said ratio circuit.

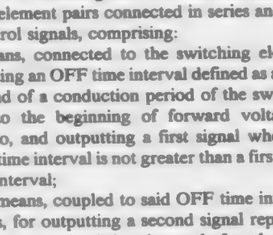
4,859,883

DIGITAL CIRCUIT ARRANGEMENT FOR QUANTIZATION-NOISE REDUCTION

Werner H. W. Bradinal, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 8, 1987, Ser. No. 130,367
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642168
Int. Cl.[4] H03K 5/00, 5/08; H03B 19/00, 1/00
U.S. Cl. 307—546 12 Claims

1. A digital circuit arrangement comprising an interpolation filter (1) for oversampling a digital input signal which appears as a sequence of discrete-amplitude samples with a specific sampling rate, and a noise shaper (2) comprising a quantizer, means responsive to the input and output of said quantizer for performing a quantization-error signal, an adder stage (3) whose output is coupled to the input of said quantizer (7),



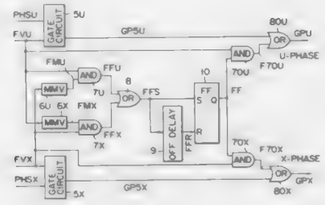
having a first input coupled to the output of said interpolation filter (1) and a second input, and a limiter (10) in cascade with each other coupled between the output of said quantization-error signal forming means and said second input of the adder stage for limiting and filtering the quantization-error signal.

4,859,884

GATE SIGNAL GENERATOR FOR THYRISTOR VALVE

Teruo Yoshino, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 8, 1988, Ser. No. 216,538
Claims priority, application Japan, Jul. 10, 1987, 62-172236
Int. Cl.[4] H03K 17/72, 17/08
U.S. Cl. 307—646 9 Claims



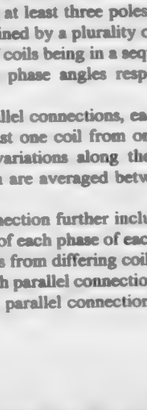
1. A gate signal generator apparatus for firing a switching element valve including one or more anti-parallel-connected switching element pairs connected in series and controlled by phase control signals, comprising:
first means, connected to the switching element pair, for detecting an OFF time interval defined as an interval from the end of a conduction period of the switching element pair to the beginning of forward voltage application thereto, and outputting a first signal when the detected OFF time interval is not greater than a first predetermined time interval;
second means, coupled to said OFF time interval detecting means, for outputting a second signal representing a second predetermined time interval after the first signal has been output;
third means, coupled to said first means and said second means, for outputting auxiliary gate pulses when the second signal is output and forward voltage signals are generated at the beginning of the forward voltage application to the switching element pair; and
fourth means, coupled to said third means, for inserting the auxiliary gate pulses into the phase control signals for firing the switching element valve.

4,859,885

WINDING FOR LINEAR PUMP

Gerald B. Kliman, Schenectady, N.Y.; Glen V. Brynsvold, San Jose, Calif., and Thomas M. Jahns, Schenectady, N.Y., assignors to General Electric Company, San Jose, Calif.

Filed Jun. 6, 1988, Ser. No. 202,989
Int. Cl.[4] H02K 44/04, 44/08
U.S. Cl. 310—11 6 Claims



1. In a linear pump for pumping liquid sodium, the pump having a cylindrical stator, a cylindrical central duct concentrically fastened to said stator, a central magnetic field conducting core fastened central to said cylindrical central duct, said central magnetic field conducting core having a diameter less than the diameter of said cylindrical central duct whereby said cylindrical central duct and said central magnetic field conducting core define together an interstitial cylindrical pumping volume having an inlet and an outlet, means for conducting a magnetic field disposed in said stator about said central duct; and powered coil means spatially distributed in said means for conducting a magnetic field in said stator; the improvement is said powered coil means including:
a power supply having at least two alternating phases;
a group of coils in side by side relation along said stator and disposed around said central duct for generating a magnetic field to said means for conducting a magnetic field;
said coils defining at least three poles;
each said pole defined by a plurality of coils for each phase, said plurality of coils being in a sequential order and each having varying phase angles responsive to said power supply; and,
a plurality of parallel connections, each parallel connection including at least one coil from one phase on each pole whereby flux variations along the central duct in said pumped sodium are averaged between said parallel connections; and,
each parallel connection further including a permuted sample of the coils of each phase of each pole whereby differing phase angles from differing coils in differing poles are averaged in each parallel connection to reduce circulating currents in said parallel connections.

4,859,886

PORTABLE ENGINE-OPERATED ELECTRIC GENERATOR

Yoshio Tanaka; Shigeru Fujii; Takao Nishida, and Yasushi Fujita, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1987, Ser. No. 20,370
Claims priority, application Japan, Feb. 28, 1986, 61-44767; Feb. 28, 1986, 61-44764; Mar. 14, 1986, 61-37051[U]; Mar. 18, 1986, 61-39344[U]
Int. Cl.[4] H02K *9/06, 5/20;* F02B *63/04*
U.S. Cl. 310—51 13 Claims



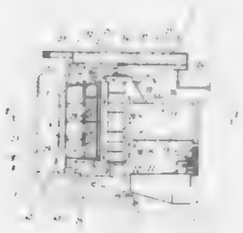
1. A portable engine-operated electric generator comprising:
a sound proof case having a plurality of air inlet openings at its front and a plurality of air outlet openings at its rear;
an engine supported within said case, said engine including a crankcase having a vertically extending output shaft and a cylinder block extending rearwardly and horizontally from said crankcase;
a generator unit disposed below said engine and having a vertically extending input shaft, said input shaft being coaxially connected to the output shaft of said engine; and
heated and unheated components all housed within said case, said unheated components being situated forwardly of a nominal vertical plane that extends transversely of the soundproof case and includes a longitudinal axis of said output shaft of the engine, and said heated components being situated rearwardly of said nominal vertical plane.

4,859,887

SYNCHRONOUS MACHINE

Tage Carlsson, and Jan Sandberg, both of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Continuation of Ser. No. 783,725, Oct. 3, 1985. This application Aug. 6, 1987, Ser. No. 82,920
Claims priority, application Sweden, Oct. 5, 1984, 8404989
Int. Cl.[4] H02K *9/00*
U.S. Cl. 310—59 5 Claims



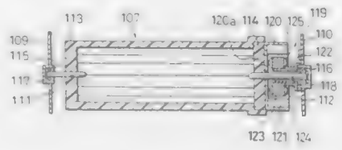
1. A synchronous machine comprising:
a stator with an annular stator core, said stator core being provided with a plurality of passageways for admission of a radially outwardly flowing cooling gas;
a rotor with a rotor shaft surrounded by said stator, and comprising a rotor hub, a rotor rim, a plurality of salient poles supported by said rotor rim, a plurality of arm plates arranged in mutually spaced relationship between said rotor rim and said rotor hub, and annular end plate members arranged transversely with respect to said rotor shaft between said rotor rim and said rotor shaft;
a plurality of inlet chambers being defined between said end plate members and said arm plates, at least one of said end plate members having inlet openings for the supply of cooling gas flow to said inlet chambers;
means for conducting cooling gas from said inlet chambers to a space between said rotor and said stator, said means for conducting cooling gas comprising first non-rotating shield means at both ends of the machine secured to said stator core for axially confining the radially outwardly directed cooling gas flow within said space for ensuring a flow of cooling gas through said stator core passageways;
means for making sealing contact between said first non-rotating shield means and said rotor;
a second non-rotating shield means provided at least at one end of the machine;
a gas space for admission of cooling gas flowing towards said inlet chambers, said gas space being at least partly defined by said second non-rotating shield means and an end plate member;
at least one opening for admission of cooling gas into said gas space; and,
a plurality of guide vanes disposed in said opening, said guide vanes being arranged to deflect the flow of cooling gas into said gas space in the direction of rotation of said rotor.

4,859,888

CROSS FLOW TYPE COOLING FAN DEVICE

Yoshiaki Ohbayashi, Nara; Kunio Hashimoto, Higashiosaka; Katsumi Sakurai, and Hiroyuki Noma, both of Yao, all of Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan

PCT No. PCT/JP86/00503, § 371 Date May 13, 1987, § 102(e) Date May 13, 1987, PCT Pub. No. WO87/03149, PCT Pub. Date May 21, 1987
PCT Filed Oct. 1, 1986, Ser. No. 57,894
Claims priority, application Japan, Nov. 11, 1985, 60-173697
Int. Cl.[4] H02K *29/08*
U.S. Cl. 310—68 R 10 Claims



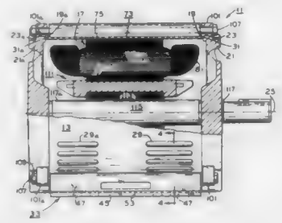
1. A cross flow type cooling fan device, comprising:
a pair of spaced apart stationary supporting frames;
a plurality of aligned cylindrical bodies, each having a greater length than diameter and each defining a hollow central area and air blowing slits in its lengthwise direction around the hollow central area, each cylindrical body thereby serving as an impeller, and the blowing slits of the respective respective cylindrical bodies are arranged to be staggered relative to each other;
means for rotatably supporting each end of the aligned cylindrical bodies to a respective supporting frame; and
a magnet and a winding confronting the magnet which together serve as a motor for rotatably driving the impellers, said magnet and winding being separately mounted to the device.

4,859,889

DYNAMOELECTRIC MACHINE

Loren E. Andrews, Gallatin, Tenn., and Robert L. Sieber, Ft. Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Filed Jun. 28, 1988, Ser. No. 212,604
Int. Cl.[4] H02K *5/00*
U.S. Cl. 310—89 15 Claims



1. A dynamoelectric machine adapted for energization comprising:
a housing having a horizontal centerline axis with an imaginary plane passing therethrough to define a vertical axis of the dynamoelectric machine, said housing including generally axially extending radially spaced apart first inner and outer circumferential surfaces generally coaxial with the horizontal centerline axis, at least one end face extending generally radially between said first inner and outer circumferential surfaces, and at least one circumferential external rabbet in said first outer circumferential surface having a generally annular first base wall intersecting said at least one end face and a generally annular first sidewall intersecting said first base wall and said first outer circumferential surface;
a stator assembly disposed within said first inner circumferential surface and axially spaced from said at least one end face, said stator assembly including winding means for excitation upon the energization of the dynamoelectric machine;
rotatable means extending generally coaxially through said stator assembly for magnetic coupling relation with said winding means upon the excitation thereof;
at least one end frame means disposed in a preselected assembly position on said housing for rotatably supporting a part of said rotatable means, said at least one end frame means including generally axially extending radially spaced apart second inner and outer circumferential surfaces, another end face extending generally radially between said second inner and outer circumferential surfaces, a circumferential internal rabbet in said second inner circumferential surface having a generally annular second base wall intersecting said another end face and a generally annular second sidewall intersecting said second base wall and said second inner circumferential surface, said second base wall being received in engagement about said first base wall, said another end face being disposed in facing relation at least adjacent said first sidewall and said second sidewall being disposed in facing relation at least adjacent said at least one end face when said at least one end frame means is in its preselected assembly position on said housing, four flanges integral with said second outer circumferential surface and extending generally radially therefrom, and each flanges having an aperture therein with a centerline axis radially spaced about the horizontal centerline axis generally about thirty seven and one half degrees (37° 30') from the vertical axis when said at least one end frame is in the preselected assembly position thereof;
said housing further including another four flanges integral with said first outer circumferential surface, said another four flanges each having a threaded aperture coaxial with another centerline axis and each another centerline axis being radially spaced about the horizontal centerline axis generally about thirty seven and one half degrees (37° 30') from the vertical axis so as to generally axially align with a respective one of said first named apertures when said at least one end frame means is in its preselected assembly position; a pair of mounting pads integrally formed with two adjacent ones of said another four flanges and extending therefrom generally in oppositely spaced relation with the vertical axis, respectively, each mounting pad including a part blended in shape with one of said two adjacent ones of said another four flanges, a free end part, and at least one opening spaced between said blended part and said free end part with said at least one opening having a third centerline axis arranged generally in predetermined spaced parallel relation with the vertical axis so as to intersect with said first outer circumferential surface; and
a set of means extending at least in part through said first named and threaded apertures for threaded interconnection with said threaded apertures, respectively, to releasably maintain said at least one end frame against displacement from its preselected assembly position.

4,859,890

FLAT WINDINGS AND COIL FORMS

Richard D. Sedgewick, 100 Horne St., Dover, N.H. 03820

Filed Jan. 7, 1988, Ser. No. 141,704
Int. Cl.[4] H02K *3/04;* H01Q *1/16;* B21F *45/00*
U.S. Cl. 310—208 18 Claims



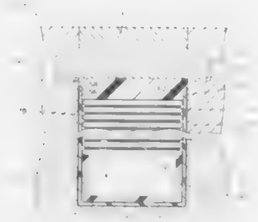
1. A coil form or bobbin for winding coil winding wire to form a flat winding comprising:
a flat disk formed with a plurality of peripheral radial slots comprising at least one set of n slots spaced around the periphery of the flat disk dividing the bobbin into a respective set of n segments, said slots extending from the outside perimeter radially part way into the flat annular disk, said slots having a width greater than one diameter and not substantially greater than two diameters of the coil winding wire, said n slots and n segments all lying in a single common plane;
said n number of slots being selected in number so that turns of coil winding wire form well defined apexes at the slots of the set of n slots with well defined angles, said turns of coil winding wire forming conducting paths on either side of the apexes having components of radial direction in the direction of radii of the bobbin for conducting radial components of current flow on either side of the apexes.

4,859,891

SUBSLOT LINER FOR ROTOR OF DYNAMOELECTRIC MACHINE

Thomas B. Jenkins, Schenectady; Dennis R. Ulery, Ballston Spa; Blake W. Wilson, Scotia; Steven C. Walko, Clifton Park, all of N.Y.; Lester H. Lee, Leominster, Mass.; Robert P. Salerno, Everett, Mass.; Robert W. Nason, Beverly, Mass., and John P. Courtney, Lynnfield, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 8, 1988, Ser. No. 179,156
Int. Cl.[4] H02K *3/34*
U.S. Cl. 310—215 11 Claims



1. A rotor for a dynamoelectric machine, comprising:
said rotor including a plurality of longitudinal slots therein extending radially into said rotor;
a plurality of conductors in each of said slots;
a subslot liner below said plurality of conductors;
said subslot liner including first and second arms extending radially outward toward said plurality of conductors;
said subslot liner, together with a lower one of said plurality of conductors defining a coolant opening below said plurality of conductors;
said first and second arms supporting said plurality of conductors at least during assembly of said rotor;
a slot armor extending radially along first and second sides of said slot between said slot and said plurality of conductors;
first means for retaining a radially inner portion of said slot armor against outward urging by centrifugal acceleration; and
second means for retaining said plurality of conductors in said slot against outward urging by centrifugal acceleration

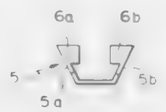
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4,859,892

APPARATUS FOR SECURING MAGNETIC POLES OF MAGNET-TYPE ROTATING MACHINES

Shigeru Shiroyama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 159,281
Claims priority, application Japan, Feb. 23, 1987, 62-25750
Int. Cl.[4] H02K *1/18*
U.S. Cl. 310—218 7 Claims



1. An apparatus for securing magnetic poles of magnet-type rotating machines of the type having a cylindrical fixed frame, a plurality of permanent magnets attached to the inner side of said fixed frame at a predetermined distance in the circumferential direction, and a positioning member defined by an elastic member having a substantially U-shaped cross section, said positioning member being disposed in the space between adjacent permanent magnets in such a manner as to abut against the opposing end faces of adjacent permanent magnets to thereby effect positioning of said permanent magnets in the circumferential direction, wherein the improvement comprises, said positioning member having a bottom portion adapted for positioning at the inner side of said fixed frame and a pair of side walls extending along said bottom portion from opposite sides thereof and directed inwardly away from said fixed frame, each of said side walls having a pair of bent portions at the end edges thereof, said bent portions extending inwardly of said positioning member and spaced inwardly from said fixed frame, the bent portion at the end edge of each side wall being in substantially opposed position to the bent portion of the other sidewall.

4,859,893

COMMUTATOR WITH RESILIENTLY CLAMPED RESISTOR RING

Patrick S. Wang, Repulse Bay, Hong Kong, assignor to Johnson Electric Industrial Manufactory Limited, Chaiwan, Hong Kong

Filed Mar. 21, 1988, Ser. No. 171,273
Claims priority, application United Kingdom, Mar. 23, 1987, 8706544
Int. Cl.[4] H02K *13/06, 13/04*
U.S. Cl. 310—234 7 Claims



1. An armature for an electric motor, comprising an armature winding, a commutator which has a plurality of commutator segments each provided with an integral terminal connected to a portion of the armature winding, a resistor ring, and a clip-on clamping member havig resilient means urging the resistor ring into contact with the terminals of the commutator, wherein the clamping member comprises a part, which is provided with said resilient means and which bears against the resistor ring, and a plurality of legs, which extend in a direction substantially parallel to an axis of the armature and which engage with the armature on that side of the resistor ring distal from the commutator segments.

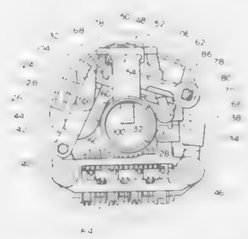
4,859,894

ALTERNATING CURRENT GENERATOR FOR USE IN A VEHICLE

Shigeru Akutsu, Gumma, and Kiyoshi Tsuchiya, Kiryu, both of Japan, assignors to Mitsuba Electric Mfg. Co., Ltd., Japan

Filed Aug. 28, 1987, Ser. No. 90,691
Claims priority, application Japan, Sep. 1, 1986, 61-132720[U]; Sep. 1, 1986, 61-203794
Int. Cl.[4] H02K *13/00*
U.S. Cl. 310—239 5 Claims

1. In an alternating current generator adapted to be used in a vehicle, the generator including: a frame; a rotation shaft supported by the frame for rotation about an axis thereof and having a rotor fixedly fitting around it, the rotor including a rotor coil; a slip ring attached to the rotation shaft and electrically connected to the rotor coil; a brush urged against the slip ring so as to be electrically connected to the slip ring; and a brush holder secured to the frame and retaining the brush in its proper position on the slip ring, the improvement wherein the brush holder comprises:
a cover portion enclosing that portion of the rotation shaft where the slip ring is attached so that the slip ring is protected from outside dust and splash, the cover portion being substantially hollow and generally cylindrical,
a brush-guiding portion projecting radially outward from the cover portion and having an outer end face, a hollow slidably receiving substantially the entire brush for movement in a radial direction with respect to the rotation shaft, the hollow having an opening at the outer end face of the brush-guiding portion so that the brush is able to be



removed from and inserted into the hollow through the opening,
the cover portion being integrally formed with the brush-guiding portion in such a manner that neither a clearance nor a mating surface is produced between the cover portion and the brush-guiding portion, and
a lid detachably attached to the brush-guiding portion for opening and closing the opening at the outer end face of the brush-guiding portion, the lid having outer and inner faces, a terminal member projecting from both the outer and inner faces thereof, and the brush being connected to the inner face of the lid through a spring member urging the brush radially inward, the brush being electrically connected to the terminal member.

4,859,895

ARMATURE COIL SLOTS HAVING GROOVES FORMED IN ITS THROAT

Akira Morishita; Keiichi Konishi, and Toshinori Tanaka, all of Himeji, Japan, assignors to Mitsubishi Denka Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,043
Claims priority, application Japan, Jan. 28, 1987, 62-11660
Int. Cl.[4] H02K *1/22*
U.S. Cl. 310—261 5 Claims

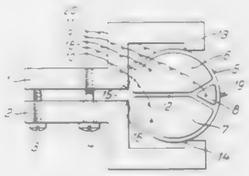
1. An armature for a d.c. motor comprising a shaft, a commutator, a coil and an armature core haivng a plurality of slots at its circumference to receive said coil wherein the opening portion of said slots is made smaller than the diameter of a wire constituting said coil, and a groove and a coil constraining portion are formed in a throat portion between said opening portion and a coil receiving portion formed in said slot, said throat portion having a constant width and extending along the axial direction of the armature core in which said groove is formed in each inner side wall of said throat portion in an opposing relation, so as to have an increased magnetic resistance compared to an armature without said groove.

4,859,896

PIEZOELECTRIC PRECISION POSITIONING DEVICE

Michael Anders, Giessen, and Christoph Heiden, Linden, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

PCT No. PCT/DE87/00296, § 371 Date Mar. 4, 1988, § 102(e) Date Mar. 4, 1988, PCT Pub. No. WO88/00399, PCT Pub. Date Jan. 14, 1988
PCT Filed Jul. 2, 1987, Ser. No. 183,187
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1986, 3622557
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—328 12 Claims



1. A piezoelectric fine positioning device for moving an object in three coordinate directions, comprising:
a piezoelectric disk cut in a plane parallel manner;
a layout of four flat electrodes arranged on the faces of the disk;
electrical connections for applying a potential to each said electrode, thereby providing three independently adjustable electric fields in said disk;
a fork-shaped clamping device for holding said disk at contact points symmetrically arranged around the circumference of said disk, one said electrode positioned so as to lie outside of the area determined by the contact points of said clamping device, said clamping device being electrically insulated from said electrodes; and
an object mounted on said disk, said object positioned within the electrical field region of said electrode lying outside of the area determined by the contact points of said clamping device.

4,859,897

DIRECTIONAL WATERPROOF ULTRASONIC TRANSDUCER FOR OPERATING IN AIR

Frank Massa, 280 Lincoln St., Hingham, Mass. 02043-1796, assignor to Frank Massa; Donald P. Massa and Gitta M. Kurlat, all of Cohasset, Mass.

Filed Apr. 7, 1988, Ser. No. 178,692
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—334 8 Claims



1. An ultrasonic transducer capable of operating out-of-doors during adverse weather conditions including rain, snow or fog, comprising a cylindrical tube of electromechanical transduction material which is capable of vibrating in the

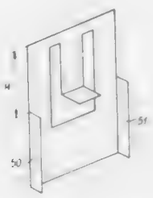
circumferential vibratory mode when excited by an electrical oscillating signal, the diameter of said cylindrical tube is selected to resonate within the approximate frequent range 20 kHz to 40 kHz electrical terminal means associated with said cylindrical tube for supplying electrical power to excite said cylindrical tube, a layer of low mechanical impedance sound insulating material applied as a covering to a portion of the outer surface of said cylindrical tube, said covered portion of said outer surface comprising the full length of said tube and at least 180° of the circumferential outer surface of said cylinder, a waterproof encapsulating outer covering completely enclosing said tubular assembly, said encapsulating outer covering characterized in that it makes intimate contact with the uncovered surface area portion of said tubular element, and further characterized in that a portion of said electrical terminal means is positioned to remain external to said waterproof encapsulating outer covering.

4,859,898

SUSPENSION SPRINGS FOR A VIBRATING PIEZOELECTRIC PLATE

Jean-Pierre Aubry; Marc Fragneau, both of Asnieres; Jean-Charles Craveur, Chatillon; Denis Janiaud, Les Ulis, and Serge Muller, Meudon La Foret, all of France, assignors to Compagnie D'Electronique Et De Piezo-Electricitie C.E.P.E, Argenteuil and Office Nationale D'Etudes Recherches Aerospatiales Onera, Chatillon, both of, France

Filed Mar. 3, 1988, Ser. No. 163,946
Claims priority, application France, Mar. 6, 1987, 87 03074
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—353 10 Claims



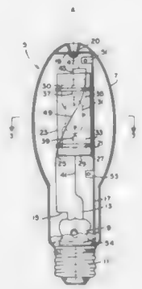
1. A suspension spring for a piezoelectric vibrating plate, which comprises:
a first portion having a first end fixed on a base and having a second end;
a second portion for supporting the vibrating plate wherein said second portion comprises a support member having a first end and a second end, the second end of the support member supporting the vibrating plate, said spring being formed of a strip bent a plurality of times, the first end of said support member being connected to said first portion by an intermediate portion, the support member and the first portion being positioned in planes substantially parallel to each other, wherein the distance separating the support member from said first portion is less than or equal to three times a thickness dimension of said strip, and a length dimension of said support member represents approximately half a length diameter of said first portion.

4,859,899

METAL-HALIDE LAMP HAVING HEAT REDISTRIBUTION MEANS

William M. Keeffe, Rockport; Zeya Krasko, Beverly, both of Mass.; Robert Karlotski, Weare, N.H., and James C. Morris, Wakefield, Mass., assignors to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 47,226, May 7, 1987. This application Apr. 25, 1988, Ser. No. 185,755
The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.
Int. Cl.[4] H01J *61/34*
U.S. Cl. 313—25 11 Claims



1. In a metal-halide arc discharge lamp having:
(a) a hermetically sealed outer envelope having a longitudinal axis;
(b) an arc tube mounted within said outer envelope, said arc tube having a substantially cylindrical body about said longitudinal axis and at least one end, said body enclosing an interior containing a gaseous fill and a metal-halide additive, said body having an outer radius, r;
(c) a substantially cylindrical light-transmissive enclosure mounted within said outer envelope about said longitudinal axis and surrounding said arc tube, said enclosure having an inner radius, R;
(d) a vacuum within said outer envelope; and
(e) means for mounting said arc tube and said enclosure;
the improvement comprising in combination:
(f) the ratio r/R being greater than approximately 0.54 and less than approximately 0.68.

4,859,900

IGNITION PLUG FOR IMPROVING FUEL ECONOMY OF AN INTERNAL COMBUSTION ENGINE AND DECREASING THE AMOUNT OF TOXICANTS EXPELLED TO THE ENVIRONMENT

Kotoo Kasai, 9, Yodogawa-cho 1-chome, Fujinomiya-shi, Shizuoka, Japan

Filed May 6, 1988, Ser. No. 191,051
Int. Cl.[4] H01T *13/02*
U.S. Cl. 313—120 4 Claims

1. An ignition plug adapted to be attached to a cylinder of an internal combustion engine comprising:
a plug main body made of insulating ceramic material and having a continuous groove formed along the outer circumferential surface of an upper portion of said plug main body;
a central electrode embedded axially through the inside of said plug main body and having a tubular structure that defines therein an air introduction channel for introducing atmospheric air from the outside of the plug into the cylinder of the engine;
a ring member made of insulating material coaxially disposed air tightly over the grooved surface of said plug main body to define therebetween a non-linear air path,
means defining an air intake port formed radially through a wall of said ring member in communication with an end of said groove, and means defining an air inlet formed radially through a wall of said plug main body and a wall of said central electrode at a position different from that for said air intake port in view of circumferential position and/or axial position; and



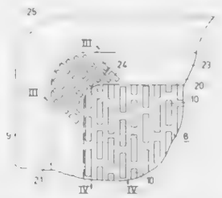
a valve means for closing and opening said air introduction channel depending on the difference between gas pressure in said cylinder and atmospheric pressure, said valve means including a main check valve of gravity actuation type adapted to open said air introducing channel gravitationally only when the atmospheric pressure overcomes the gas pressure in said cylinder and an auxiliary check valve of resiliently biased type adapted to open said air introduction channel only when the atmospheric pressure overcomes biasing resiliency.

4,859,901

COLOR CRT SHADOW MASK WITH WRINKLE-FREE CORNERS

Kathryn C. Thompson-Russell, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 688,279, Jan. 3, 1985, abandoned, which is a continuation of Ser. No. 437,087, Oct. 27, 1982, abandoned. This application Oct. 3, 1985, Ser. No. 785,085
Claims priority, application Netherlands, Oct. 29, 1981, [illegible]
Int. Cl.[4] H01J *29/06*
U.S. Cl. 313—403 13 Claims



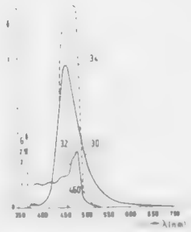
1. A color cathode ray display tube, comprising a glass envelope having a substantially rectangular display window, and a pattern of phosphors capable of luminescing in different colors, arranged to be visible through said window,
a system of electron guns for generating a plurality of electron beams directed onto said pattern, and
a substantially rectangular shadow mask including a mask sheet having an upright edge, an area containing a pattern of apertures, and a blind edge between said area and said upright edge, said blind edge comprising weakened portions,
characterized in that said pattern of apertures is formed by rows of elongate apertures, and
said weakened portions are provided substantially in each corner only of the mask sheet, said portions being arranged with respect to a respective diagonal defined by the rectangular shadow mask such that said portions are weaker in a direction transverse to the respective diagonal than in a direction parallel to said diagonal.

4,859,902

METHOD OF CHANGING THE CHROMATICITY OF A CATHODOLUMINESCENT PHOSPHOR, COLOUR CATHODE RAY TUBE INCORPORATING THE PHOSPHOR, AND PROJECTION TELEVISION USING SAME

Dagobert M. De Leeuw; Dirk B. M. Klaassen, and Cornelis A. H. A. Mutsaers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 30, 1987, Ser. No. 102,988
Claims priority, application United Kingdom, Oct. 3, 1986, [illegible]
Int. Cl.[4] H01J *29/89*
U.S. Cl. 313—474 8 Claims



3. A cathode ray tube comprising an envelope including an optically transparent faceplate, a cathodoluminescent phosphor carried by the faceplate having a broadband emission spectrum around a wavelength of maximum emission, said emission spectrum having a chromaticity outside an acceptable range for color television, and an interference filter mounted in the lightpath from the phosphor, the gain of said interference filter being larger than unity over a narrow band around a wavelength of maximum gain, of order unity for wavelengths smaller than the narrow band and decreasing to zero for wavelengths larger than the narrow band, said narrow band being positioned so that the filtered broad band emission has a chromaticity acceptable for color television.

4,859,903

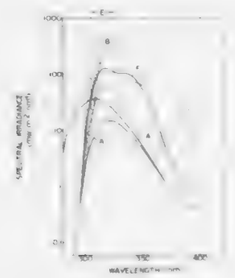
ULTRAVIOLET FLUORESCENT LAMP FOR ACCELERATED EXPOSURE TEST ON POLYMER

Yoiti Minematu, Tokyo; Toshio Tajima, Hiratsuka, and Shigeharu Nakajima, Tokyo, all of Japan, assignors to Yoiti Minematu, Tokyo; Sankyo Denki Co., Ltd., Kanagawa and Nichia Kagaku Kogyo K. K., Tokushima, all of, Japan

Filed Mar. 2, 1988, Ser. No. 163,298
Claims priority, application Japan, Mar. 4, 1987, 62-49831
Int. Cl.[4] H01J *61/30, 61/44*
U.S. Cl. 313—487 9 Claims

1. An ultraviolet fluorescent lamp for accelerated artificial test on polymer, comprising a bulb having an ultraviolet-ray-transmitting glass with an absorbance of 1 to 3 with respect to ultraviolet rays having a wavelength of 280 nm, the inner

surface of said bulb being provided with a phosphor having a characteristic that causes radiant energy transmitted through said bulb to increase by 5 to 17 times for every wavelength



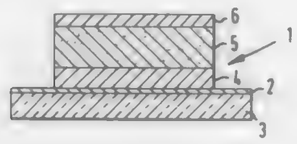
increase of 5 nm in a wavelength range of 295 to 310 nm, and that it has a radiant energy peak in a wavelength range of 305 to 325 nm.

4,859,904

HIGH CONTRAST ELECTROLUMINESCENT DISPLAYS

Malcolm H. Higton, Poole, and Arun Vecht, London, both of United Kingdom, assignors to Phosphor Products Company Limited, Upton, United Kingdom

Continuation of Ser. No. 741,119, Jun. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 689,719, Jan. 8, 1985, abandoned. This application May 24, 1988, Ser. No. 198,687
Int. Cl.[4] H05B *33/22*
U.S. Cl. 313—506 13 Claims



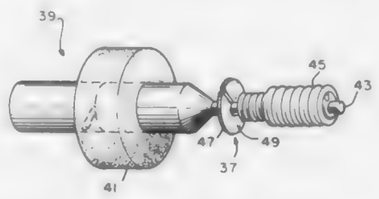
1. An electroluminescent phosphor panel suitable for unidirectional voltage operation, comprising in serial order, a transparent electrically insulating substrate, a transparent first electrode film, a first layer in the form of a thin film of substantially insulating phosphor and a second layer which is a control layer of powder material,
the improvement consisting in that:
(A) the said thin film first layer is the sole light-emitting layer; and
(B) the said powder material is:
(i) inherently dark-colored,
(ii) one of electrically conducting and semi-conducting,
(iii) not a phosphor, and
(iv) free of activator doping; and
(C) the particles of said powder material are free of metallic coating.

4,859,905

UNSATURATED VAPOR HIGH PRESSURE SODIUM LAMP GETTER MOUNTING

Philip J. White, Monroe, Conn.; John A. Scholz, Danvers, and Robert S. White, Beverly, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 473,897, Mar. 10, 1983, abandoned. This application Nov. 21, 1988, Ser. No. 274,658
Int. Cl.[4] H01J *61/26*
U.S. Cl. 313—558 10 Claims



1. In a high pressure sodium lamp of the unsaturated vapor type, an arc tube comprising:
a tubular ceramic envelope;
a dosing of sodium, mercury and a rare gas within said ceramic envelope;
an electrode sealed into each end of said ceramic envelope; and
an oxygen-absorbing getter located within said ceramic envelope and in contact with said dosing and contiguous to at least one of said electrodes.

4,859,906

DEEP UV LAMP BULB WITH IMPROVED FILL

Michael G. Ury, Bethesda, and Charles H. Wood, Rockville, both of Md., assignors to Fusion Systems Corportion, Rockville, Md.

Filed Oct. 6, 1982, Ser. No. 433,069
Int. Cl.[4] H01J *11/02, 7/10, 65/04, 61/20*
U.S. Cl. 313—639 8 Claims



1. An electrodeless lamp bulb for producing a relatively high output in the deep UV part of the spectrum, comprising:
a quartz envelope which does not contain electrodes therein, and
a fill inside said envelope consisting essentially of mercury in a ratio of form 0.5–0.9 μl per ml of envelope volume at room temperature.

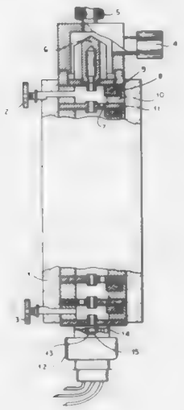
4. A relatively bright electrodeless lamp for producing a relatively high output in the deep UV part of the spectrum, comprising,
means for generating microwave energy,
a lamp bulb comprising a quartz envelope and a fill inside said envelope consisting essentially of mercury in a ratio of from 0.5–0.9 μl per ml of envelope volume at room temperature, and
means for coupling said generated microwave energy to said lamp bulb.

4,859,907

TRAVELING-WAVE TUBE WITH DAMPING OF UNDESIRED FREQUENCIES

Guido Busacca; Vincenzo Meli, and Mario Spalla, all of Palermo, Italy, assignors to Selenia Industrie Elettroniche Associate, Rome, Italy

PCT No. PCT/IT86/00047, § 371 Date Mar. 17, 1988, § 102(e) Date Mar. 17, 1988, PCT Pub. No. WO87/00680, PCT Pub. Date Jan. 29, 1987
PCT Filed Jun. 27, 1986, Ser. No. 28,536
Int. Cl.[4] H01J *25/34*
U.S. Cl. 315—3.5 7 Claims



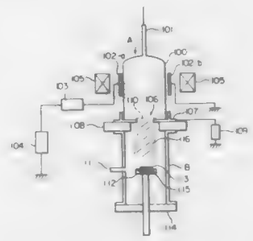
1. A traveling-wave tube, comprising:
a elongated tube structure having a pair of opposite ends;
an electron gun injecting a beam of electrons into the interior of said structure at one of said ends;
a collector at the other of said ends for collecting electrons traversing the interior of said structure;
a plurality of traveling wave apertured irises spaced periodically along said interior of said structure and defining between them respective cavity cells coupled in succession through said irises, said irises being separated by respective spacers enclosing the respective cells;
means for injecting a radiofrequency signal into said interior of said structure at said one of said ends;
means for extracting an amplified radiofrequency signal from the interior of said structure at said other of said ends;
a magnetic focussing system along said structure;
at least one radially extending dielectric waveguide in each of said spacers respectively coupled to each of said cells and transparent to all frequencies above a prefixed frequency; and
a respective lossy load at an outer end of each of said dielectric waveguides and in contact therewith to dissipate energy of all frequencies passed by the respective dielectric waveguide to the respective lossy load.

4,859,908

PLASMA PROCESSING APPARATUS FOR LARGE AREA ION IRRADIATION

Akihisa Yoshida, Neyagawa; Kentaro Setsune, Sakai, and Takashi Hirao, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 23, 1987, Ser. No. 100,148
Claims priority, application Japan, Sep. 24, 1986, 61-225266; Dec. 19, 1986, 61-304185; Dec. 19, 1986, 61-304186; Dec. 19, 1986, 61-304196; Mar. 2, 1987, 62-47109
Int. Cl.[4] H01J *27/02*
U.S. Cl. 315—111.81 19 Claims



1. An ion irradiation processing apparatus comprising:
a discharge chamber including
a first vacuum chamber having an outer surface formed of an insulating material,
RF electrodes disposed outside said first vacuum chamber and along said outer surface thereof, said RF electrodes being supplied with RF power, and
a magnetic field source disposed at a predetermined position outside said first vacuum chamber, said RF electrodes and said magnetic field source comprising means for generating a ion plasma within said first vacuum chamber
a substrate chamber including
a second vacuum chamber in communication with said discharge chamber, and
a substrate stand mounted within said second vacuum chamber; and
biasing means for causing ions from said plasma to uniformly irradiate said substrate stand in said substrate chamber, said biasing means including
a first electrode, having an aperture, interposed between said substrate chamber and said discharge chamber, said first electrode being electrically insulated from said substrate chamber and said discharge chamber, and
a second electrode disposed in said discharge chamber opposite to and spaced apart from said first electrode, said first and said second electrodes being connected across a voltage source.

4,859,909

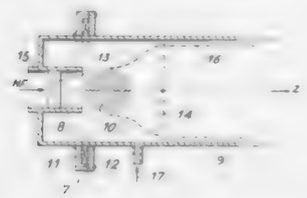
PROCESS AND APPARATUS FOR IGNITING AN ULTRA-HIGH FREQUENCY ION SOURCE

René Gaslandris, Aix en Provence; Paul Ladwig, Grenoble; Jean-Claude Rocco, Claix, and Francois Zadworny, Corenc, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Continuation of Ser. No. 793,915, Nov. 1, 1985. This application Dec. 7, 1987, Ser. No. 129,853
Claims priority, application France, Nov. 6, 1984, 84 16884
Int. Cl.[4] H05H *13/00*
U.S. Cl. 315—111.81 7 Claims

1. An ignition device of an ultra-high frequency ion source using a resonant cavity having a random shape, supplied by a gas or a vapor of a material intended to form a plasma filling the cavity, a system having a waveguide for injecting ultra-high frequency power into the cavity and a system for extract-

ing ions from the plasma outside the cavity, wherein: each of the three dimensions of the plasma cavity, namely length, width and height or diameter and length exceeds the small side or diameter of the waveguide of the system for injecting ultra-high frequency power into the cavity; means are provided for injecting into the cavity gas or vapor of the material to be ionized upstream of the ion extraction system and at a relatively small distance from the latter compared with the length of the cavity in order to establish a pressure gradient in the source, said pressure rising from the ultra-high frequency power injection zone to the ion extraction zone; means are



provided for producing within the medium to be ionized in a region of the cavity preferably located at a few centimeters downstream of the junction zone between the ultra-high frequency power injection system and the cavity, electron nuclei bringing about the ignition of the plasma having a random shape, the dimensions of the enclosure and the rising pressure of the injection system towards the extraction point then enabling the plasma to function under multimode operating conditions, i.e. without a privileged mode, and to self-maintain with the aid of the ultra-high frequency power alone, without having recourse to a permanent cyclotron resonance of the electrons of said plasma.

4,859,910

PLASMA DISPLAY APPARATUS

Tsunekiyo Iwakawa; Hiroshi Hada, and Tadashi Nakamura, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jul. 22, 1987, Ser. No. 76,368
Claims priority, application Japan, Jul. 22, 1986, 61-173104
Int. Cl.[4] G09G *3/10*
U.S. Cl. 315—169.1 **6 Claims**



1. A plasma display apparatus comprising a first electrode group and a second electrode group disposed in an opposed relation relative to each other, the space intermediate the opposed electrode groups being filled with a discharge gas to form cells therebetween, the plasma display comprising:

first means for applying a first pulse train of a first voltage to said first electrode group for a first period at a predetermined interval and in a time division mode,

second means for applying a second pulse train of second voltage to at least one selected electrode in said second electrode group for a second period which is shorter than said first period, said second pulse train being applied in synchronism and in combination with said first pulse train so as to produce a first pulsing potential difference between the electrodes associated with a selected cell, said first pulsing potential difference being larger than a firing voltage of said cell,

third means for applying to non-selected electrodes in said second electrode group and during said second period a third pulse train of third voltage pulses in synchronism with said first pulses train so as to produce a second pulsing potential difference between the electrodes associated with non-selected cells in combination with said first pulses trains, said second pulsing potential difference being less than the firing voltage of said cell,

fourth means for applying a first direct-current voltage component in combination with said first pulse train to said at least one selected electrode in said second electrode group during a third period which is shorter than said first period, said third period being after the application of said second voltage pulses so as to produce a third pulsing potential difference between the electrodes associated with said selected cell, said third pulsing potential difference being smaller than the firing voltage of said cell, but also being enough larger to continue the discharge of said selected cell due to a previously discharging state of said selected cell, and

fifth means for applying a second direct-current voltage component in combination with said first pulse train to said non-selected electrodes in said second electrode group for said third period after the application of said third pulse train so as to produce a fourth pulsing potential difference between the electrodes associated with said non-selected cell, said fourth pulsing potential difference being less than the firing voltage of said cell, the period of applying said fourth pulsing potential difference being smaller than the period required to cause a discharge of said non-selected cell.

4,859,911

POWER SUPPLY FOR ELECTROLUMINESCENT PANEL

J. R. Kinnard, and Dennis N. Oliver, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 14,894, Feb. 13, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 273,115
Int. Cl.[4] G09G *3/10*
U.S. Cl. 315—169.3 **11 Claims**



1. A circuit for powering an electroluminescent panel of a display device, wherein said circuit receives a low DC voltage and said panel requires at least an order of magnitude higher AC voltage, comprising:

means for increasing said low DC voltage to a higher DC voltage; and

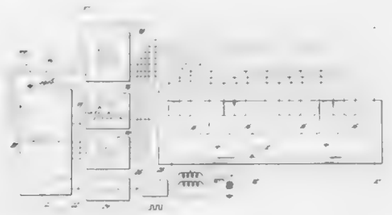
self commutating power oscillator means including said panel and an inductor in a series resonant circuit for receiving said higher DC voltage and directly generating and providing said AC voltage to said panel without any transformer.

4,859,912

STABLE BRIGHTNESS VACUUM FLUORESCENT DISPLAY

Raymond Lippmann, Ann Arbor, and James E. Nelson, Union Lake, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 26, 1985, Ser. No. 769,395
Int. Cl.[4] G09G *3/10*
U.S. Cl. 315—169.3 **6 Claims**



1. A brightness control circuit for a vacuum fluorescent display having control electrode means selected from anode, grid, and filament electrodes,

means for supplying alternating current to the filament electrodes whereby the filament-to-anode voltage and the emitted light intensity varies with time and varies across the display,

enabling means for aperiodically generating control pulses for enabling display illumination,

pulse width modulation means for controlling the duty cycle of the control pulses thereby controlling display brightness, and

means for coordinating the enabling means with the filament current to initiate successive control pulses or groups of control pulses at opposite phases of the filament current at sufficiently high rates to obtain uniform perceived display brightness.

4,859,913

VACUUM FLUORESCENT PRINTING DEVICE

Frank C. Genovese, Fairport, and James W. Lannom, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

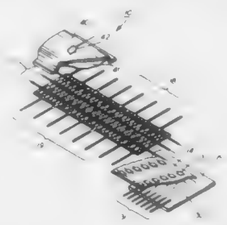
Filed May 1, 1984, Ser. No. 605,728
Int. Cl.[4] H01J *13/56*
U.S. Cl. 315—169.4 **4 Claims**

1. A printing system, compising in combination:

a light sensitive recording media;

an optical coupling means; and

a compact vacuum fluorescent active light bar enclosed in a hermetically sealed housing having a glass cover plate with a transparent conductive coating inside the cover plate and adapted for communication with said light sensitive recording media through said optical coupling means in order to create images from electronically generated data on said light sensitive recording media, said light bar having a plurality of cathode filaments, a control structure, and a matrix of addressable fluorescent substance coated anode elements mounted on a support substrate such that as said elements are excited by electrons from said cathode filaments through said control grid structure a high resolution array of precisely defined light is generated and directed toward said light sensitive recording media, and wherein said fluorescent substance coated anode elements are arranged in a skewed matrix so that they are displaced a proper amount when imaged on said recording media.



4,859,914

HIGH FREQUENCY ENERGY SAVING BALLAST

Frank A. Summa, 22 Starbuck St., Staten Island, N.Y. 10304

Continuation of Ser. No. 758,779, Jul. 25, 1985, abandoned. This application Mar. 2, 1988, Ser. No. 166,744
Int. Cl.[4] H05B *41/00*
U.S. Cl. 315—354 **8 Claims**



1. In a luminescent gas discharge device power supply system having an oscillator for converting alternating current from an alternating current source to direct current for operating a luminescent gas discharge device, said oscillator comprising a transformer having a primary winding and a secondary winding, a transistor connected to said primary winding for generating a predetermined high frequency signal in said primary winding, an oscillatory circuit including said transitor and said primary winding and a feedback circuit, and means connecting said secondary winding to said luminescent gas discharge device, the improvement comprising:

a biasing circuit connected to said transistor for preventing said transistor from ramping thereby preventing hard turn-on of said transistor to prolong component and discharge device life, said biasing circuit including rectifier means for converting said alternating current to said direct current and a capacitor connected to the emitter side of said transistor for providing a delayed charge to smoothly deliver initial turn-on current to said luminescent gas discharge device;

said feedback circuit including a tertiary winding of said transformer, said tertiary winding including a start winding and an end winding, said start winding of said tertiary winding being connected to the base of said transistor

through a parallel time constant circuit and a biasing resistor;

waveshaping means for supplying shaped wave current to said transformer and including a Darlington connected transistor pair connected to the base of said transistor to control current thereto;

said luminescent gas discharge device including heated filaments and said transformer including filament winding means for providing current to said filaments; and

a sensing circuit comprising,

sensing means connected in circuit with said filaments for sensing failure and/or removal of said luminescent gas discharge device from said system,

means for producing a signal in response to said failure and/or removal of said luminescent gas discharge device from said system, and

switch means connected between said alternating current source and said rectifier means for responding to said control signal to halt flow of said alternating current to said rectifier and thus from said oscillator.

4,859,915

LINE DEFLECTION CIRCUIT WITH DYNAMIC S CORRECTION

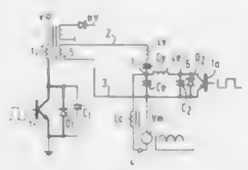
Alain Decraemer, Garches, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 89,096, Aug. 25, 1987, abandoned. This application May 6, 1988, Ser. No. 191,300

Claims priority, application France, Sep. 2, 1986, 86 12319

Int. Cl.[4] H01J *29/56*

U.S. Cl. 315—371 **3 Claims**



1. A line deflection circuit for an image display tube with magnetic beam deflection, comprising a series arrangement includes a deflection inductance, a first and a second S capacitor, switching means conducting during part of the line period called the trace time for applying to the series arrangement a substantially constant voltage and being cut off during the rest of the period called the retrace time during which the said series arrangement forms with a retrace capacitance a resonant circuit, the circuit comprising modulating means for charging the second S capacitor at a voltage whose mean value is modulated at field frequency, characterized in that the first and second S capacitors have a common terminal that is connected via an auxiliary inductance to switching means conductive during the trace time, and that the series arrangement of the deflection inductance and the first and second S capacitors is permanently connected across a d.c. supply source.

4,859,916

H-DRIVER

John M. McCambridge, Northville, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed May 31, 1988, Ser. No. 200,106

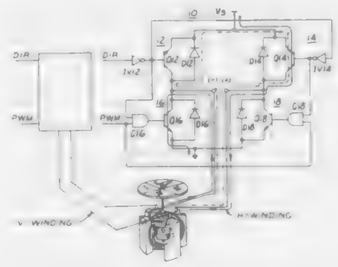
Int. Cl.[4] H02P *3/08, 1/22*

U.S. Cl. 318—293 **3 Claims**

1. A half-bridge driver circuit for recirculating decaying currents in an inductance type indicating gauge when a source voltage supply to said gauge is switched off, wherein said gauge includes a rotor with a magnetic sensitive region disposed perpendicular to an indicating dial shaft with a dial needle attached at one end and a pair of stator windings, fixedly arranged at right angles about said shaft, wherein said rotor rotates said needle in response to magnetic fields generated when current passes through said pair of stator windings, said circuit includes:

(a) means for applying voltage from the supply to said half-bridge drive circuit so as to generate the magnetic fields in said pair of stator windings;

(b) means for sinking a direct current to a ground potential of the supply in response to ON times of a modulated pulse signal applied to said drive circuit for maintaining the generated magnetic fields in the stator windings;



(c) means for recirculating a decaying current in said stator windings for a desirable period when said means for sinking the direct current is cut off during OFF times of the pulse signal;

said decaying current recirculating means including (1) means for maintaining the capability to apply voltage to said pair of stator windings after the secession of the applied voltage in a manner providing low resistance current paths which opposes dissipation of the decaying currents; and (2) means for preventing a dominant magnetic field of one stator winding from inhibiting a recessive magnetic field of an other stator winding from influencing movement of said rotor.

4,859,917

SPEED CONTROL DEVICE FOR AN ELECTRIC SEWING MACHINE

Michio Hisatake, Kanagawa, and Satoru Ishikawa, Tokyo, both of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Jul. 8, 1987, Ser. No. 73,692

Claims priority, application Japan, Jul. 10, 1986, 61-105015[U]

Int. Cl.[4] H02P *5/00*

U.S. Cl. 388—815 **11 Claims**



1. A speed control device of an electric sewing machine that has an upper shaft and a motor for rotating the upper shaft, the device comprising:

means for variably designating a speed of rotation of the motor to output a designated speed of rotation;

speed setting memory means for storing speed setting data and having speed setting data currently addressed therein;

detecting means for detecting a speed of the motor;

drive circuit means responsive to said speed setting memory means and said detecting means for controlling an ignition voltage with respect to the motor; and

calculation circuit means for addressing said speed setting memory means with updated speed setting data in dependence upon the designated speed of rotation, said calculation circuit means including comparator means comparing the speed setting data currently addressed in the speed setting memory means with the designated speed of rotation, said calculation circuit means being formed to operate in synchronism with an electric source synchronous signal to produce incremented speed setting data which is an incrementation of the speed setting data currently addressed in the speed setting memory means in response to said comparator means and to assign the updated speed setting data with the incremented speed setting data when the designated speed of rotation is greater than the speed setting data currently addressed in the speed setting memory means, said calculating circuit being responsive to said comparator means to assign the updated speed setting data with the designated speed of rotation when the designated speed of rotation is at most equal to the speed setting data currently addressed in the speed setting memory means.

4,859,918

METHOD AND APPARATUS FOR PRODUCING A SPEED CONTROL VOLTAGE FOR DIRECT CURRENT MOTORS IN TYPEWRITERS OR SIMILAR OFFICE MACHINES

Ernst Kloppenburg, Grossefehn, Fed. Rep. of Germany, assignor to AEG Olympia AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Jul. 27, 1987, Ser. No. 78,190

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1986, 3625345

Int. Cl.[4] H02P *5/00*

U.S. Cl. 388—815 **5 Claims**



1. In a method for controlling a direct current motor having a tachometer connected to the motor to derive a speed signal, the steps comprising:

forming two signals A and B phase shifted 90° from each other;

forming from the two phase shifted signals A and B four coding signals comprising respectively the two phase shifted signals A and B and their respective inverse signals $\overline{A}$ and $\overline{B}$;

selecting and combining the four coding signals to form a triangular signal C;

differentiating said triangular signal C to produce a signal D;

inverting the signal D to provide the signal D and its inverse $\overline{D}$; and

generating from the signals D and its inverse D a speed value.

4,859,919

WINDOW WIPER CONTROL FOR VEHICLE

Steven L. Tracht, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 29, 1988, Ser. No. 237,464

Int. Cl.[4] B60S *1/08*

U.S. Cl. 318—444 **4 Claims**



1. A window wiper control for a motor vehicle having a window and a wiper mechanism including an electric motor effective, when activated, to drive a wiper across the window in repeating cycles of a wiper pattern with a pause in a park position between successive cycles, the window wiper control comprising, in combination:

a source of electric power;

a pulse switch;

a park switch responsive to the wiper mechanism to close a first circuit path when the wiper is in its park position and alternatively close a second circuit path throughout the rest of the wipe pattern;

a relay having an armature connected in series with the motor, source of electric power and pulse switch through a normally closed contact and further connected in series with the motor, the first circuit path of the park switch and source of electric power through a normally open contact, the relay further having an activating coil effective, when activated, to move the armature out of contact with the normally closed contact into contact with the normally open contact, the relay armature being further connected in series with the motor and the second circuit path of the park switch for dynamic braking of the motor when the relay armature is in contact with the normally open contact and the second circuit path of the park switch is closed;

an electrically controlled switch connected in series with the relay coil and electric power source and having a control terminal;

a capacitor connected in series with the park switch and electric power source so as to be charged to a high voltage when the park switch is closed, the capacitor being further connected to the control terminal of the electrically controlled switch so as to close the switch with the high voltage;

a resistance comprising a discharge current path for the capacitor effective to slowly discharge the capacitor to a low voltage when the park switch is open, the low voltage being applied to the control terminal and effective thereby to open the electrically controlled switch, whereby closure of the pulse switch initiates an immediate cycle of the wipe pattern and a new such cycle after each pause through the normally closed contact of the relay with the remainder of each such cycle being activated through the normally open contact of the relay, the relay armature being held in contact with the normally open contact as the capacitor discharges with the park switch open to create the paused between successive cycles of the wipe pattern.

4,859,920

INTERFACE SYSTEM FOR SERVO CONTROLLER

Mitsuo Kurakake, Hino; Keiji Sakamoto, and Yukio Toyosawa, both of Hachioji, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP86/00009, § 371 Date Jul. 14, 1986, § 102(e) Date Jul. 14, 1986, PCT Pub. No. WO86/04159, PCT Pub. Date Jul. 17, 1986

PCT Filed Jan. 11, 1986, Ser. No. 890,856

Claims priority, application Japan, Jan. 12, 1985, 60-003701

Int. Cl.[4] H02P *7/68;* G05B *19/18*

U.S. Cl. 318—567 6 Claims



1. An interface system for a servo controller, having components both in a numerical control apparatus and outside the numerical control apparatus, for processing position command signals from a microprocessor of the numerical control apparatus and position, speed and current data fed back from a plurality of servomotors for controlling the servomotors, said interface system comprising:

a control circuit in the numerical control apparatus for generating control signals for each of the servomotors based on the position command signals from the microprocessor and the position, speed and current data fed back from each of the servomotors; and

a plurality of driver circuits, one corresponding to each of the servomotors, situated outside the numerical control apparatus and connected to the numerical control apparatus by a local bus, each of said driver circuits having a plurality of switching circuits, said driver circuits being controlled by the control signals from said control circuit.

4,859,921

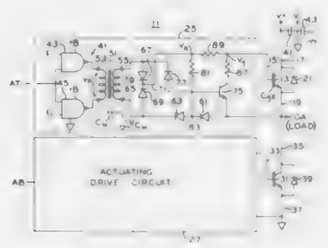
ELECTRONIC CONTROL CIRCUITS, ELECTRONICALLY COMMUTATED MOTOR SYSTEMS, SWITCHING REGULATOR POWER SUPPLIES, AND METHODS

William R. Archer, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Mar. 10, 1988, Ser. No. 167,574

Int. Cl.[4] H02P *5/17*

U.S. Cl. 318—599 67 Claims



1. For use with electrical load powering apparatus having a load connection, a high voltage supply connection and a common, and with electronic means for switching the high voltage supply connection to the load connection, the electronic means having an input and being responsive to a voltage difference between the input and the load connection, the load connection being subject to high voltage excursions relative to the common due to the switching, an electronic control circuit comprising:

a transformer having a primary winding and a secondary winding for providing at least one pulse output from said secondary winding, said transformer having an inherent interwinding capacitance between said primary winding and said secondary winding;

means connected to said secondary winding for coupling the pulse output from said secondary winding between the input of the electronic means and the load connection when the pulse output is present, a high voltage excursion on the load connection charging the inherent interwinding capacitance to a high voltage level when the pulse output is present; and

means for bypassing the high voltage level on the inherent interwinding capacitance of said transformer to the load connection when the pulse output and each high voltage excursion cease, including active control means having an input and first and second control leads and means for providing a resistive path substantially free of inductance between the input of said active control means and the input of the electronic means, said active control means thereby bypassing current from the input of the electronic means to the load connection through the first and second control leads and the high voltage level being prevented from actuating the electronic means when each high voltage excursion ceases.

62. A switching regulator power supply for use with electrical load powering apparatus having a high voltage supply connection and a common, the switching regulator power supply comprising:

a power transformer having a first winding and an output winding;

a solid state power switching device having a high impedance input and control terminals connected between the high voltage supply connection and said first winding of said power transformer, said high impedance input having an inherent input capacitance, said first winding being subject to high voltage excursions relative to the common due to the switching;

a signal transformer having a primary winding and a secondary winding for providing at least one pulse output from said secondary winding, said signal transformer having an inherent interwinding capacitance between said primary winding and said secondary winding;

means connected to said secondary winding for coupling the pulse output from said secondary winding between said high impedance input of said solid state power switching device and said first winding of said power transformer when the pulse output is present, a high voltage excursion on said first winding charging said inherent interwinding capacitance to a high voltage level when the pulse output is present; and

means for bypassing the high voltage level on the inherent interwinding capacitance of said signal transformer to said first winding of said power transformer when the pulse output and each high voltage excursion cease, including active control means having an input and first and second control leads and means for providing a resistive path substantially free of inductance between said input of said active control means and said high impedance input of said solid state power switching device, said active control means thereby bypassing current from said high impedance input of said solid state power switching device to said first winding through said first and second control leads and the high voltage level being prevented from actuating said solid state power switching device when each high voltage excursion ceases;

means connected to said output winding of said power transformer for deriving an output voltage of the switching regulator power supply;

means for detecting a difference between the output voltage and a predetermined value to which the output voltage is to be regulated; and

means for generating a pulse width modulated series of pulses for energizing the primary winding of said signal transformer as a function of the difference so detected to reduce the difference detected.

65. A control method for use in electrical load powering apparatus having a load connection, a high voltage supply connection and a common, and including electronic means for switching the high voltage supply connection to the load connection, the electronic means having an input and being responsive to a voltage difference between the input and the load connection, the load connection being subject to high voltage excursions relative to the common due to the switching, the control method comprising the steps of:

producing at least one pulse output from a secondary winding of a transformer having a primary winding and a secondary winding and an inherent interwinding capacitance between the primary winding and the secondary winding;

coupling the pulse output from the secondary winding between the input of the electronic means and the load connection when the pulse output is present, a high voltage excursion on the load connection charging the inherent interwinding capacitance to a high voltage level when the pulse output is present; and

providing an electrical signal substantially free of inductive delay from the input of the electronic means to an active control means so that the active control means bypasses current from the input of the electronic means to the load connection and the high voltage level is prevented from actuating the electronic means when each high voltage excursion ceases.

4,859,922

SYSTEM FOR CONTROLLING THE OPERATING MODE OF A CONTROLLED APPARATUS

Harald Tauchenitz, Mainz-Kostheim, and Horst Schupp, Griesheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 17, 1987, Ser. No. 15,290

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1986, 3605088

Int. Cl.[4] G05B *11/01*

U.S. Cl. 318—628 20 Claims

1. Control system for controlling the operating mode of an apparatus (M) having

a movable operator controllable knob (1, 50), said knob being deflectable from a reference position by being rotatable and axially shiftable, for controlling operating modes of the controlled apparatus (M, 28) by rotation and axial shifting of the knob, including

means (23, 24, 36) for scanning deflection of the knob from the reference position and providing

knob movement signals representative of said deflection,

said knob movement signals including

a first electrical control signal representative of the angular deflection of the knob and a second electrical control signal representative of the speed of angular deflection, and of the direction from the reference position of the knob,

said system comprising

a toroidal coil (7, 64) positioned concentrically with the axis of rotation (5) of the operator controllable knob (1, 50);

a brake disk (2, 63) magnetically coupled to the toroidal coil and further mechanically coupled to the knob for effecting braking at a predetermined angular deflection of the knob;

and control means receiving said knob movement signals coupled to and selectively energizing said toroidal coil.

4,859,923

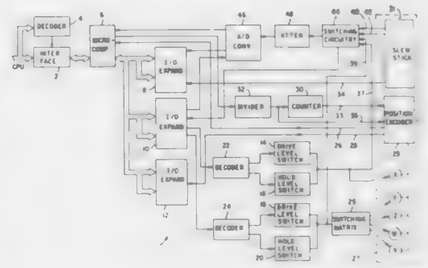
MICROPROCESSOR CONTROLLED DUAL CHANNEL CLOSED LOOP CONTROLLER FOR STEPPER MOTORS USED IN SERVO SYSTEMS

Jacob H. Malka, Fair Lawn, and Joseph T. Goodman, Hackensack, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jul. 14, 1988, Ser. No. 218,767

Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—685 10 Claims



1. Apparatus of the type including a servo system and stepper motors used in the servo system, said apparatus comprising:

a first channel including a first control line connected to a single stepper motor, and first drive means connected to the first control line and dedicated to driving said single motor;

a second channel including a second control line, second drive means connected to the second control line and time sharing means connected to the second drive means and connected to a plurality of stepper motors, whereby said second drive means drives one of the plurality of motors in a time sharing arrangement with the other motors of the plurality of motors;

processing means;

interface means connected to the processing means; and

controlling means connected to the interface means and to the first and second drive means, and communicating with the processing means for controlling the first and second drive means whereby the first drive means drives the single motor concurrently with the second drive means driving the one of the plurality of motors.

4,859,924

INVERTER

Katsuhiko Chonan, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 928,409, Nov. 10, 1986, abandoned.

This application Jun. 22, 1988, Ser. No. 211,161

Claims priority, application Japan, Dec. 27, 1985, 60-296055; Dec. 27, 1985, 60-296056

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—808 5 Claims

1. A driver circuit for a variable frequency inverter-controlled by D.C. frequency command and voltage command signals to operate an A.C. motor, the driver circuit comprising

a frequency setting device for producing a reference voltage which indicates a desired frequency for the inverter,

a frequency command circuit connected to the frequency setting device for converting the reference voltage from the frequency setting device into the frequency command signal,

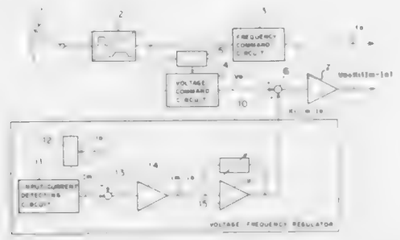
a voltage command circuit connected to the frequency setting device for converting the reference voltage from the

frequency setting device into a command voltage which is linearly proportional to the desired frequency,

motor current detecting means for detecting a current to the motor,

auto torque boost means connected to the motor current detecting means and responsive to a current detected by the motor current detecting means exceeding a predetermined high torque current for producing an auto torque boost correction voltage,

adding means connected to the voltage command circuit and the auto boost means for adding the auto boost correction signal to the command voltage to produce the voltage command signal, and



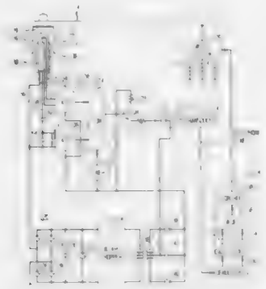
manual torque boost means connected to the voltage command circuit for selectively correcting the command voltage from the voltage command circuit by increasing the command voltage as the desired frequency becomes lower so that, when selected, the command voltage from the voltage command circuit is increased at low frequencies to produce motor currents, under high motor torque conditions, which exceed the predetermined high torque current whereby the auto torque boost means is selectively enabled at low frequencies when winding resistance of the motor limits motor current to less than the predetermined high torque current in the absence of the selective correction of the command voltage.

4,859,925

POWER TRANSMISSION SYSTEMS AND MEANS FOR CONTROL THEREOF

Thomas E. Beling, Saxonville, Mass., assignor to Sigma Instruments, Inc., Weymouth, Mass.

Continuation-in-part of Ser. No. 776,910, Sep. 17, 1985, Pat. No. 4,700,123. This application Dec. 19, 1986, Ser. No. 944,709
Int. Cl.[4] G05F *1/70*
U.S. Cl. 323—210 **37 Claims**



1. A power transmission system, comprising:

a power transmission line;

a sensor coupled to said line for sensing operating conditions of said line;

said sensor including voltage forming means capacitively coupled to said line;

an optical fiber system responsive to said sensor for transmitting optical signals representing the operating conditions of said line;

control means responsive to said optical fiber system and coupled to said line for controlling the operating conditions of said line;

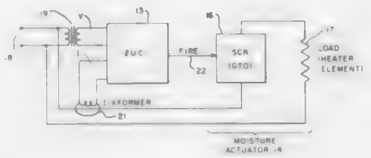
signal actuating means responsive to said voltage forming means for accumulating energy over a period of time and actuating said optical fiber system to transmit the optical signals for a length of time less than the period of time during which energy is accumulated.

4,859,926

POWER CONTROLLER FOR HEATER LOAD

David A. Wolze, San Jose, Calif., assignor to Impact Systems, Inc., San Jose, Calif.

Filed Jan. 19, 1988, Ser. No. 145,526
Int. Cl.[4] G05F *1/455*
U.S. Cl. 323—241 **9 Claims**



1. A power controller for a load where the amount of power applied to the load is controlled by a controlled rectifier (CR) whose firing angle is controlled by an external power command signal, said CP being in series with said load and the series combination being connected across an AC line having a nominal voltage, the improvement comprising:

means for sensing the zero crossings of said line voltage to provide a timing reference for control of said firing angle of said CR, including switching means for commutating said line voltage with an inverter to synchronously demodulate said line voltage to provide a full wave rectified line voltage;

means for digitizing said rectified line voltage;

said switching means including digital processing truth means for sensing whether or not said digitized voltage is greater or less than zero at the time of said commutation, and including delay means for routing the answer to said truth means through delay paths, either slightly less or greater than one-half cycle of said line voltage in accordance with the answer to whether or not the digitized voltage is greater than zero to drive said commutating to occur substantially at a zero crossing, whereby said switching means provides for said full wave rectification and at the same time a zero crossing indication of said AC line voltage at the time of commutation.

4,859,927

POWER SUPPLY WITH IMPROVED SWITCHING REGULATOR

Robert S. Meijer, San Diego, Calif., assignor to Fisher Scientific Company, Pittsburgh, Pa.

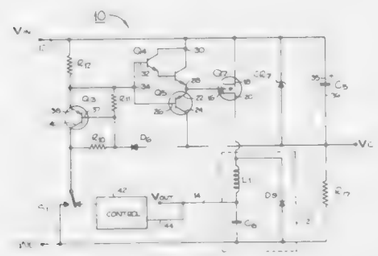
Filed Oct. 28, 1988, Ser. No. 264,259
Int. Cl.[4] G05F *1/565*
U.S. Cl. 323—284 **20 Claims**

1. A switching regulator for a field effect transistor employed in a regulated power supply as the switching element for an unregulated power source, said switching regulator comprising:

(a) a first control transistor having an emitter, a collector, and a base, said emitter being coupled to the gate of the field effect transistor, whereby the field effect transistor is rendered conductive to pass current from the unregulated power source to a load when said first control transistor is conductive;

(b) a charging capacitor coupled to the unregulated power source so as to develop therefrom a store of charge, said charging capacitor being connected to said collector of said first control transistor, whereby the gate of the field effect transistor is coupled to said charging capacitor and said store of charge thereon drives the field effect transistor when said first control transistor is conductive;

(c) a second control transistor complementary to said first control transistor and having a base, an emitter, and a



collector, said first and said second control transistors being conductive in the alternative, said emitter of said second control transistor being coupled to said gate of said field effect transistor, and said collector of said second control transistor being coupled to said unregulated power supply, whereby when said second control transistor is rendered conductive, the charge on the gate of the field effect transistor is shunted therefrom through said second control transistor to said unregulated power supply rendering said field effect transistor non-conductive; and

(d) driver means coupled to said base of said first control transistor and to said base of said second control transistor for alternately and selectively causing one of said first and second control transistors to conduct.

4,859,928

CMOS COMPARATOR BIAS VOLTAGE GENERATOR

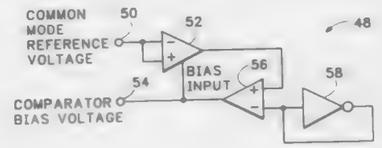
Eric P. Etheridge, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

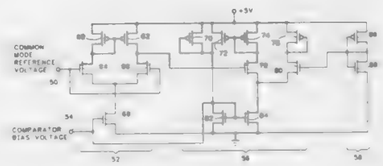
Filed Dec. 20, 1988, Ser. No. 287,825
Int. Cl.[4] G05F *3/24*
U.S. Cl. 323—311 **4 Claims**

1. An apparatus for generating a CMOS comparator bias voltage comprising:

(a) a dummy comparator having a negative input and a positive input coupled together to receive a common mode reference voltage, a bias input, and an output; and

(b) a bias amplifier having a positive input coupled to the output of said dummy comparator, a negative input for receiving a threshold reference voltage, and an output to form the CMOS comparator bias voltage, the output also





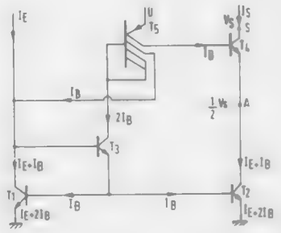
being coupled to the bias input of said dummy comparator.

4,859,929

CURRENT MIRROR HAVING A HIGH OUTPUT VOLTAGE

Philippe Raguet, Cormelles Le Royal, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1988, Ser. No. 192,624
Claims priority, application France, May 22, 1987, 8707217
Int. Cl.[4] G05F *3/26*
U.S. Cl. 323—316 **17 Claims**



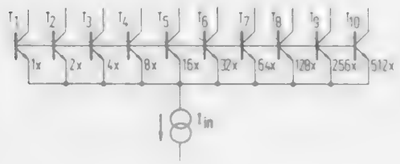
1. A current mirror comprising a first branch for receiving an input current to be reproduced, which first branch comprises a main current path of a first transistor of a first conductivity type, and a second branch for supplying an output current which is a replica of the input current, which second branch comprises a main current path of a second transistor of the first conductivity type, bases of the first and the second transistor being interconnected, a third transistor of the first conductivity type having its base and emitter connected respectively to a collector and a base of the first transistor, characterized in that the second branch comprises a main current path of a fourth transistor of the first conductivity type in series with the main current path of the second transistor and in that it comprises an auxiliary current mirror for injecting into the base of the fourth transistor a first injection current equal to half the current flowing in the collector of the third transistor.

4,859,930

CURRENT SOURCE ARRANGEMENT

Hendrikus J. Schouwenaars; Else C. Dijkmans, and Dirk W. J. Groeneveld, all of Groenewoudseweg 1, Eindhoven, Netherlands

Filed May 12, 1988, Ser. No. 193,376
Claims priority, application Netherlands, Feb. 16, 1988, 8800371
Int. Cl.[4] G05F 3/16
U.S. Cl. 323—317 3 Claims



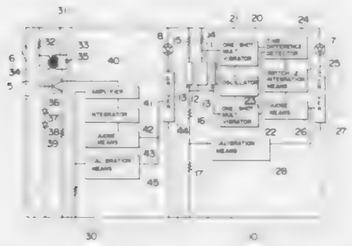
1. A current source arrangement comprising N ($N \geq 1$) current sources I_p ($P=1, \ldots, N$) for generating N binary-weighted currents, said current sources comprising 2^N-1 substantially equal current source transistors which are arranged in a matrix comprising R rows and K columns of matrix elements each comprising M current source transistors such that $R \times K \times M = 2^N$, each current source I_p comprising a number of 2^{p-1} current source transistors, characterized in that for each current source I_p for which $R \leq 2^{p-1}/M$ and $K \leq 2^{p-1}/M$, each row comprises substantially $2^{p-1}/R.M$ matrix elements and each column comprises substantially $2^{p-1}/K.M$ matrix elements of said current source, and wherein said matrix elements are arranged to provide a substantially maximum possible distance between the matrix elements associated with a given current source.

4,859,931

ELECTRONIC DETECTOR WITH CAPACITOR SENSOR AND MAGNETIC FIELD SENSOR FOR LOCATING AN OBJECT BEHIND A WALL SURFACE

Mikihiro Yamashita, and Kaoru Furukawa, both of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Dec. 9, 1987, Ser. No. 130,614
Claims priority, application Japan, Dec. 23, 1986, 61-306845
Int. Cl.[4] G01R 33/00, 27/26; G01V 3/11
U.S. Cl. 324—67 8 Claims



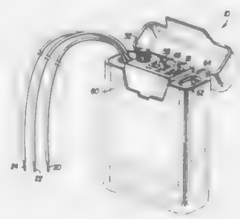
1. A detector for locating an object behind a wall surface and for determining whether said object is electrically conductive or non-conductive, said detector comprising:
- a capacitor sensor comprising means for sensing any change in the capacitance of the wall to provide a first electric signal indicative of that change;
- a first control circuit, connected to said capacitor sensor, for receiving and analyzing the first electric signal from the capacitor sensor to produce a first control output when the level of the first electric signal reaches a first reference level;
- a magnetic filed sensor comprising means for creating a magnetic field around said wall and in turn for detecting any change in the magnetic field to provide a second electric signal indicative of that change;
- a second control circuit, connected to said magnetic field sensor, for receiving and analyzing the second electric signal from the magnetic field sensor to produce a second control output when the level of the second electric signal reaches a second reference level;
- a display circuit, connected to said first control circuit and said second control circuit, comprising indication means for enabling simultaneous determination of whether said first control output has been output by said first control circuit and said second control output has been output by said second control circuit, said indication means comprising a first indicator producing a first indication responsive to the first control output from the first control circuit and a second indicator disposed adjacent said first indicator and producing a second indication responsive to the second control output from the second control circuit; and
- a common battery energizing the above mentioned elements so that said first and second control circuits are simultaneously operative to provide the first and second indications when there is a metallic object behind the wall surface causing the changes both in the magnetic field and in the capacitance sensed and to provide only the first indication when there is a non-metallic object behind the wall surface causing the changes only in the capacitance sensed.

4,859,932

MULTI-FUNCTION TESTER

William E. Whitley, 312 York St., Suffolk, Va. 23434

Filed Nov. 21, 1988, Ser. No. 273,548
Int. Cl.[4] G01R 31/02
U.S. Cl. 324—72.5 11 Claims



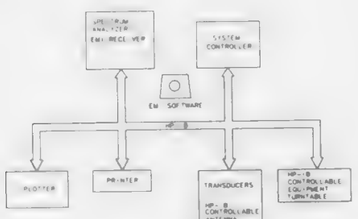
1. A multi-function tester for testing for electrical continuity and the presence of various types of voltages comprising:
- a DC voltage source for providing electrical DC-voltage;
- a bistable flip flop circuit having a set input terminal, a reset input terminal, and an output terminal, said output terminal being switchable between a first output voltage-level state and a second output voltage-level state by application of respective voltage changes at said set and reset input terminals, said bistable flip flop circuit being coupled to said DC voltage source and powered thereby, said set input terminal also being coupled to a set voltage divider circuit extending between said DC voltage source and a common terminal, said set voltage divider circuit having a set fixed resistor therein;
- an indicator means coupled between said output terminal and said common terminal for producing a detectable output when said first output voltage level appears at said output terminal;
- a voltage steerable switch means coupled in said set voltage divider circuit for selectively immediately decreasing a switch impedance in response to a steering voltage of a first magnitude being applied to a switching terminal thereof and immediately increasing said switch impedance in response to a steering voltage of a second magnitude being applied to said switching terminal thereof to thereby change the voltage appearing at said set input terminal to move said flip flop between said first and second output voltage level state;
- a voltage probe coupled to said voltage source;
- a common probe coupled to said common terminal;
- a switching probe coupled to said switching terminal;
- wherein each of said voltage, common and switching probe can be selectively brought into contact with each other and can be brought into contact with electrical circuits to be tested;
- whereby voltage signals from both said DC voltage source and from outside sources can be placed on said switching terminal with said voltage, common and switching probes, both directly and through other circuits, for immediately changing the voltage at said flip flop circuit set input terminal in a sense for causing said first level voltage to appear at said output terminal to thereby cause said indicator means to produce a detectable output and voltage signals can be removed from said switching terminal for immediately changing the voltage at said flip-flop circuit set input terminal in a sense for causing said second level voltage to appear at said output terminal to thereby extinguish said indicator means.

4,859,933

NARROWBAND SIGNAL RECOGNITION FOR EMI MEASUREMENT

John B. Taylor, Santa Rosa, and Michael K. Ellis, Rohnert Park, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 24, 1988, Ser. No. 211,517
Int. Cl.[4] G01R 23/00
U.S. Cl. 324—77 B 9 Claims



1. A method for discriminating two frequency domain signals, which are measured at different times, to determine whether or not they are the same signal, comprising the steps of:
- measuring the frequency of a first signal by means of a measuring receiver at a first time, the measuring receiver having a selectable frequency span and a digital display for displaying a predetermined number of measured points;
- measuring the frequency of a second signal by means of the measuring receiver at a second time, the second time being later than the first time;
- comparing the frequencies of the first and second signals; and
- determining that the first signal is distinct from the second signal if the frequencies of the first and second signals differ by at least a frequency E defined as:

$$E = 2(\text{frequency span}/N)$$

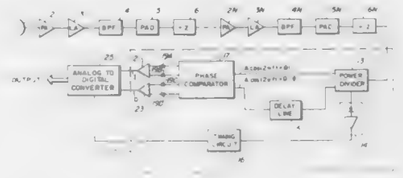
where:
E=possible frequency error of a signal;
frequency span=frequency range swept by the measuring receiver; and
N=number of points measured;
thereby recognizing narrowband signals.

4,859,934

APPARATUS FOR MEASURING THE FREQUENCY OF MICROWAVE SIGNALS

P. Michael Gale, Kanata; Myles McMillan, Wakefield, and Andre Gagnon, Hull, all of Canada, assignors to Telemus Electronic Systems, Inc., Ontario, Canada

Filed Oct. 15, 1987, Ser. No. 108,627
Claims priority, application Canada, Oct. 15, 1986, 520571
Int. Cl.[4] G01R 23/10
U.S. Cl. 324—78 D 21 Claims



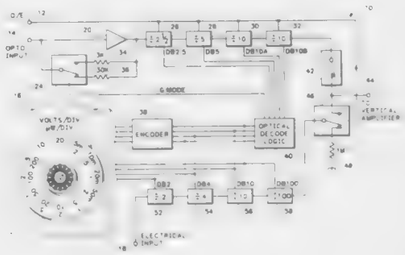
1. Apparatus for measuring the frequency of microwave signals, comprised of one or a plurality of cascaded analog frequency dividers for receiving an incoming microwave signal having a frequency in a predetermined microwave bandwidth, and down-converting said received signal to a lower frequency within a predetermined compressed bandwidth, a combined frequency discriminator and quantizer processor operable on signals in said predetermined compressed bandwidth, for receiving said down-converted signal and generating a digital output signal representative of the frequency of said incoming signal, in response thereto.

4,859,935

METHOD AND APPARATUS FOR COMBINING AN OPTICAL AND ELECTRICAL CHANNEL IN AN OSCILLOSCOPE

Kevin K. Smith, West Linn, Oreg., and Bryan E. Allsop, Watton-Atstone, England, assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 27, 1988, Ser. No. 263,147
Int. Cl.[4] G01R 35/00; H03H 7/24
U.S. Cl. 324—121 R 8 Claims



1. An apparatus for combining an electrical and an optical channel in an oscilloscope comprising:
- (a) first means for attenuating a first analog input signal having a selectable attenuation factor to produce a first analog output signal;
- (b) second means for attenuating a second analog input signal to produce a second analog output signal;

(c) means for converting a photocurrent to the second analog input signal;
(d) means for encoding the selectable attenuation factor into a first digital signal;
(e) means for decoding the first digital signal to produce a second digital signal for selecting an attenuation factor for the second attenuating means; and
(f) means for selectively coupling to an output terminal the first analog output signal and the second analog output signal.

4,859,936

METHOD OF AND APPARATUS FOR DETERMINING AC CALIBRATION ERRORS AND APPARATUS USING DEVICE WITH AC CALIBRATION ERRORS

Larry E. Eccleston, Edmonds, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Continuation-in-part of Ser. No. 8,234, Jan. 29, 1987. This application May 19, 1987, Ser. No. 51,318
Int. Cl.[4] G01R *35/00, 1/02*
U.S. Cl. 324—130 **6 Claims**



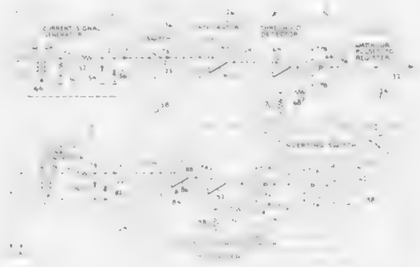
1. A method of determining the magnitude of errors introduced as a function of frequency by a circuit used in a device to derive a calibration AC output signal or a device for measuring the amplitude of an AC signal with a precise sensor for deriving a DC output having an amplitude commensurate with the amplitude of an AC input thereof, the precise sensor having a known input signal-output calibrating error, comprising the steps of applying different known DC levels to an input of the circuit while the sensor is connected to be responsive to an output of the circuit, controlling the values of the DC levels and of variable elements in the circuit so the circuits supplied the sensor with a first gamut of DC signals, the DC signals in the first gamut resulting in the sensor deriving DC in a second gamut of DC signals, the known DC levels and the values of the variable elements being arranged so each signal in the second gamut is supposed to have a predetermined value, comparing actual values of the signals in the second gamut with the value each signal in the second gamut is supposed to have to derive a numerical indication of the DC calibration error for each of the values of the DC levels and of the variable elements, applying a constant amplitude AC voltage to the input of the circuit at plural frequencies in a gamut of frequencies while the sensor is connected to be responsive to the output of the circuit, the AC voltage and DC levels being applied to the input of the circuit at mutually exclusive times, one of said frequencies being a frequency at which reactive components in the circuit have negligible effect on the amplitude of the output of the circuit, comparing the amplitude of the output of the sensor for frequencies in the gamut with the output of the sensor at said one frequency to derive a numerical indication of the AC calibration error for said constant amplitude at said frequencies in said gamut of frequencies, and combining the calibration error of the precise sensor with the DC calibration errors and the AC calibration errors to derive a calibration error of the circuit for each of several amplitude positions at each of several frequency positions.

4,859,937

PULSE WIDTH MODULATOR IN AN ELECTRONIC WATT-HOUR METER WITH UP AND DOWN INTEGRATION FOR ERROR CORRECTION

Miran Milkovic, Schenectady, N.Y., assignor to General Electric Company, Somersworth, N.H.

Filed Jul. 7, 1987, Ser. No. 70,794
Int. Cl.[4] G08C *19/22;* **G01R** *21/127*
U.S. Cl. 324—142 **1 Claim**



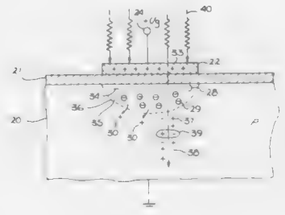
1. Apparatus for producing a pulse-width-modulated signal in response to a current signal related to a current or a voltage in an electric system comprising:
a signal generator;
said signal generator including means for producing a signal voltage proportional to said current or voltage;
a series resistor in series with said signal voltage effective for converting said signal voltage into a first current signal;
an integrator;
said integrator including an operational amplifier with an integrating capacitor connected between an output and a first input/thereof, whereby a gain in said operational amplifier is effective to produce a virtual ground at an input of said integrator;
said series resistor being connected to said virtual ground;
a second operational amplifier having a first input receiving an output of said integrator;
a first bi-polarity trigger receiving said output of said second operational amplifier;
a resistive voltage divider on an output of said first bi-polarity trigger;
a junction of said resistive voltage divider being connected to a second input of said second operational amplifier, whereby a positive and a negative voltage at said junction provides first and second threshold voltages for said second operational amplifier;
a second inverting bi-polarity trigger receiving said output of said first bi-polarity trigger;
a resistor receiving an output voltage from said second inverting bi-polarity trigger and effective to convert said output voltage to a second current signal; and
means for connecting said second current signal to said virtual ground, whereby an integration rate in said integrator is increased or decreased in proportion to an amplitude of said first current signal and a pulse-width-modulated signal is produced.

4,859,938

NOVEL TECHNIQUE TO DETECT OXYDONOR GENERATION IN IC FABRICATION

Sang U. Kim, Tempe, Ariz., and Mohammad K. Khan, Iselin, N.J., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 859,619, May 5, 1986, abandoned. This application Jul. 27, 1987, Ser. No. 78,094
Int. Cl.[4] G01R *27/26, 31/00*
U.S. Cl. 324—158 D **5 Claims**



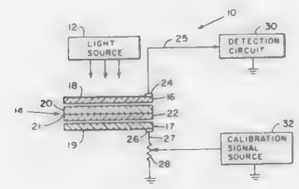
1. A method for nondestructive detection of oxydonor generation in a semiconductor diode device which includes a gate, a P-type silicon substrate having a N+ region disposed therein, such that said N+ region is disposed between a P-region of said substrate and said gate to form a P-N+ diode, and wherein presence of oxydonors causes a further P-N junction to be formed in said substrate, comprising the steps of:
placing a forward biased voltage potential across said diode device;
measuring a forward current value of said diode device;
subjecting said device to an external source of energy;
measuring again said forward current of said diode device;
comparing measurement of said forward current without said external source energy to measurement of said forward current with said external source of energy;
wherein oxydonor generation is detected to be present in said substrate, if said forward current values are substantially different with and without said external source of energy.

4,859,939

NON-DESTRUCTIVE TESTING OF SOS WAFERS USING SURFACE PHOTOVOLTAGE MEASUREMENTS

Jonathan I. Gittleman, Lawrenceville, and Stanley Bozowski, Trenton, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 21, 1987, Ser. No. 135,968
Int. Cl.[4] G01R *31/26, 31/00*
U.S. Cl. 324—158 R **4 Claims**



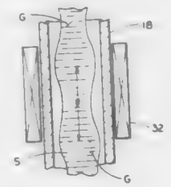
2. A device for measuring photovoltage for use in a preselection process in the non-destructive testing of a silicon-on-sapphire wafer, said device comprising:
(i) a light source for emitting a predetermined wavelength of incident light which is capable of being absorbed by the silicon layer within about 100A of the silicon-sapphire interface;
(ii) a first thin irridescent coated glass positioned with the coated surface facing said light source, said coated surface being transparent to said predetermined wavelength and said coated surface being conductive;
(iii) detection circuitry for measuring voltage indicative of optically stimulated current flow in said wafer, said first thin irridescent coated glass being coupled to said detection circuitry;
(iv) a second thin irridescent coated glass and being spaced apart a predetermined distance from said first thin irridescent coated glass positioned with the coated surface of said second thin iridescent glass facing outward with respect to said first thin irridescent coated glass, said spaced apart predetermined distance being able to accommodating a tested silicon-on-sapphire wafer between said thin irridescent coated glasses; and,
(v) calibration circuitry for calibrating said device, said second thin irridescent coated glass being coupled to said calibration circuitry.

4,859,940

APPARATUS FOR DETECTING ONSET OF SLAG ENTRAINMENT IN A MOLTEN METAL STREAM

George T. Hummert, Oakmont; Robert M. Slepian, Pittsburgh, both of Pa., and Lawrence R. Westrick, Grosse Ile, Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 9, 1987, Ser. No. 94,983
Int. Cl.[4] G01N *27/74;* **G01R** *33/12*
U.S. Cl. 324—204 **6 Claims**



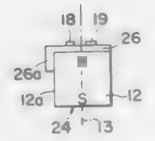
1. A slag detector apparatus for detecting the onset of slag entrainment in a stream of molten metal having a fluctuating cross-sectional dimension and being composed of a continuous succession of recurring cyclical globules of molten metal, each globule cycle being of approximately length "l", said apparatus comprising:
(a) an AC detector coil located adjacent the stream;
(b) means for applying an a.c. excitation to said detector coil for electromagnetically coupling said detector coil to the stream of molten metal such that changes in electrical conductivity of the molten metal in the stream thereof due to slag entrainment are reflected as a corresponding change in terminal impedance of said detector coil; and
(c) means for detecting the change in terminal impedance of said detector coil;
(d) said detector coil having an axial length at least equal to the length "l" of one cycle of the globules composing the stream of molten metal for nullifying any change in terminal impedance of said detector coil due to the presence of the fluctuating cross-sectional dimension of the molten metal stream.

4,859,941

PROXIMITY SELECTRO WITH INTEGRAL MAGNET, POLE-PIECE PLATE AND PAIR OF MAGNETIC TRANSDUCER

Jacob K. Higgs, Salisbury, N.H., and Barbara L. Gibson, Dorchester, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Mar. 18, 1987, Ser. No. 27,363
Int. Cl.[4] G01B *7/30*
U.S. Cl. 324—208 4 Claims



1. A proximity detector for detecting a ferromagnetic article passing by a side of said detector comprising:

a magnet having north and south pole ends, said magnet being oriented with one of said pole ends at said detector side;

a ferromagnetic pole piece consisting of a plate portion with one of the two major plate surfaces mounted adjacent to said one pole end and one extending portion;

a single silicon integrated circuit comprising a pair of side-by-side Hall elements mounted to the outer and opposite major plate surface so that the difference in electrical output signals of the two transducers respectively is a function of the nearness of approach of the passing ferromagnetic article, a differential amplifier means connected to the outputs of said Hall elements for amplifying the Hall elements'difference signal, and a Schmitt-trigger circuit having an input connected to the output of said amplifier means;

said magnet having one corner formed by said one pole end and an adjacent side, said one extending portion being adjacent to said one side of said magnet, said one magnet corner being about orthogonal to a line passing through the centers of said side-by-side Hall elements.

4,859,942

CIRCUIT ARRANGEMENT FOR SENSING THE DISPLACEMENT OF A MOVABLE IRON CORE RELATIVE TO A MAGNETIC COIL BY MEASURING THE DECAY TIME OF A CONSTANT CURRENT FLOWING THROUGH THE MAGNETIC COIL

René Charton, Garbsen, and Berend Kleen, Hanover, both of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Apr. 27, 1988, Ser. No. 186,851
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1987, 3714282; Mar. 4, 1988, 3807015
Int. Cl.[4] G01R *11/52, 27/26;* G01B *7/14;* G01N *27/72*
U.S. Cl. 324—208 9 Claims

1. A circuit arrangement for measuring an inductance and, in particular, the inductance of an inductive displacement sensor, comprising:

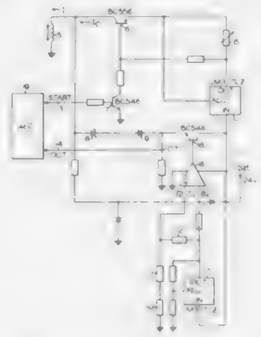
(a) means for supplying the inductance with a constant controlled current;

(b) means for cutting off the constant controlled current and for limiting the cut-off voltage induced in the inductance to a given value;

(c) means for measuring the decay time of the current flowing through the inductance;

(d) the constant controlled current supply is connected to the inductance by means of a switch;

(e) the means for limiting the cut-off voltage of the inductance is connected parallel to the inductance; and



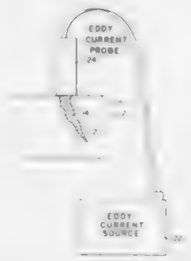
(f) detection means for measuring the cut-off voltage of the inductance.

4,859,943

INSPECTION METHOD USING MAGNETIC PARTICLES IN A LIQUID CARRIER IN COMBINATION WITH ELECTRICAL DETECTION MEANS

Robert S. Evans; Wayne M. Latham; Thomas Powers, all of Lynchburg, and Michael O. Robertson, Hurt, all of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 28, 1987, Ser. No. 138,888
Int. Cl.[4] G01N *27/84, 27/90;* G01R *33/12*
U.S. Cl. 324—216 10 Claims



1. A method for inspecting the surface of a workpiece for the presence of of flaws, comprising:

applying a ferrofluid to the surface of the workpiece;

scanning the surface of the workpiece with electrical detection means placed adjacent to the surface of the workpiece for producing responses indicative of the presence of flaws in the surface of the workpiece; and

applying a magnetic field to the workpiece to induce the ferrofluid to withdraw from the flaws, after the inspection has been completed, to clean the workpiece.

10. A method for inspecting the surface of a workpiece for the presence of flaws, comprising:

applying a ferrofluid to the surface of the workpiece;

applying a magnetic field to the workpiece to induce the ferrofluid to penetrate into any flaws; and

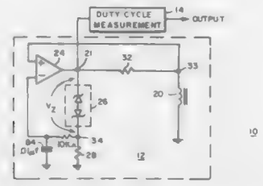
scanning the surface of the workpiece with electrical detection means placed adjacent to the surface of the workpiece for producing responses indicative of the presence of flaws in the surface of the workpiece9

4,859,944

SINGLE-WINDING MAGNETOMETER WITH OSCILLATOR DUTY CYCLE MEASUREMENT

Spencer L. Webb, Belmont, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Aug. 25, 1987, Ser. No. 89,148
Int. Cl.[4] G01R *33/04;* G01C *17/28*
U.S. Cl. 324—253 10 Claims



1. An instrument for measuring a magnetic field, comprising:

a. an oscillator employing a saturable core inductor as the principal element thereof for storage of potential energy and having a voltage source whose output switches between a first voltage for driving the core to saturation in a first direction and a second voltage for driving the core to saturation in a second direction, the first and second voltages being of equal magnitude and opposite polarity;

b. the oscillator further comprising means, coupled to the voltage source and responsive to the saturation of the core, for causing the output of the voltage source to switch

(i) from the first voltage to the second voltage when the inductor core saturates in the first direction and

(ii) from the second voltage to the first voltage when the inductor core saturates in the second direction; and

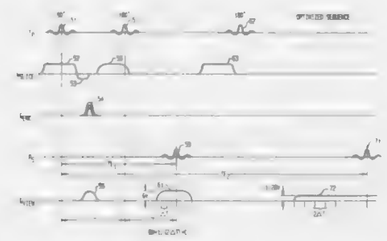
c. means coupled to the output of the voltage source, for measuring the average DC current in the inductor, said current representing the component of the magnetic field impinging upon the inductor along the axis of its core.

4,859,945

OPTIMIZED SIGNAL TO NOISE RATIO

Saul Stokar, Raanana, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed May 3, 1988, Ser. No. 189,712
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 13 Claims



1. A method of optimizing the signal-to-noise ratio (SNR) of magnetic resonance images (MRI) in echo acquisition scan sequences providing echoes at times (TE) after application of a first radio frequency (RF) pulse, said method comprising the steps of:

using said echo acquisition sequence to generate echo signals,

detecting a first echo signal during the application of an initial view gradient,

sampling the detected echo signal at a sampling rate determining a sampling time,

filtering the sampled signal through a receiving filter having a variable bandwidth,

providing a subsequent view gradient of decreased amplitude compared to said initial view gradient during the detection of subsequent echo signals, and

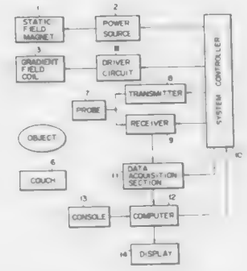
decreasing the bandwidth of the receiving filter responsive to the reduction of the subsequent view gradient amplitude to improve the SNR.

4,859,946

MAGNETIC RESONANCE IMAGING SYSTEM

Shigehide Kuhara, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 29, 1988, Ser. No. 251,099
Claims priority, application Japan, Sep. 30, 1987, 62-244356
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 13 Claims



1. A magnetic resonance imaging system comprising:

magnetic resonance exciting means having an imaging mode and echo position detection mode, the imaging mode being executed such that a slicing gradient field and a high-frequency magnetic field are applied as pulsed fields to an object placed in a uniform static field to excite a predetermined slice of the object, a read gradient field which is repeatedly switched is applied to the object, and a phase-encoding gradient field is applied to the object in a direction orthogonal to the read gradient field, thereby generating a series of magnetic resonance echo signals, and the echo position detection mode being executed such that the slicing gradient field and the high-frequency magnetic field are applied as the pulsed fields to the object placed in the uniform static field to excite the predetermined slice of the object in the same manner as in the imaging mode except that the phase-encoding gradient field is not applied to the object, and the read gradient field which is repeatedly switched is applied to the object to cause the slice to generate a series of phase-nonencoded magnetic resonance echo signals;

data acquiring means for sampling and acquiring the echo signals generated by said magnetic resonance exciting means;

peak position detecting means for detecting peak positions of the series of phase-nonencoded echo signals acquired by said data acquiring means on the basis of an operation in the echo position detection mode of said magnetic resonance exciting means;

memory means for storing the peak positions detected by said peak position detecting means; and

image forming means for performing image reconstruction using a predetermined number of sampling data of the sampling data obtained by said data acquiring means with respect to the peak positions as centers stored in said memory means on the basis of the imaging mode of said

magnetic resonance exciting means, and for generating a magnetic resonance image of the slice.

4,859,947

MAGNETIC RESONANCE IMAGING APPARATUS COMPRISING A STACKED SURFACE COIL SYSTEM

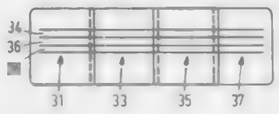
Eddy B. Boskamp, Eindohoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 4, 1987, Ser. No. 117,003

Claims priority, application Netherlands, Nov. 27, 1986, [illegible]

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 11 Claims



1. A magnetic resonance imaging apparatus, comprising magnet systems for generating a steady magnetic field and gradient magnetic fields, an rf transmitter coil, and an rf surface coil system for placement along a surface of an object for detecting magnetic resonance signals to be generated in said object, wherein said rf surface coil system comprises a cascade of individually operatively selectable successive, substantially identical surface coils, corresponding parts of each successive coil in said cascade being offset along said object surface from those of the preceding surface coil in said cascade.

4,859,948

DEVICE FOR POSITIONING A SAMPLE CARRIER IN AN NMR SPECTROMETER

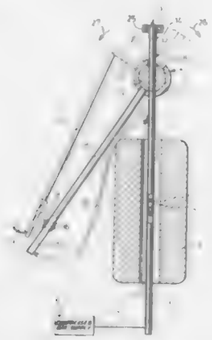
Anton Kuster, Greifensee, Switzerland, assignor to Spectrospin AG, Zurich, Switzerland

Filed Aug. 29, 1988, Ser. No. 238,043

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729819

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 8 Claims



1. Device for positioning a sample carrier in an NMR spectrometer comprising an intense-field cryomagnet with vertically arranged axis producing a homogeneous static magnetic field in a predetermined measuring area, and a vertical guide tube passing through the said measuring area and carrying at its upper end a sample-changing device for transporting and removing a sample carrier to or from the guide tube, and comprising further and arrangement for supplying pressurized gas to the lower end of the guide tube by means of which the gas quantity supplied to the guide tube can be measured in such a manner that a sample carrier, having been transferred to the guide tube, can be selectively lowered from the upper end of the guide tube to the measuring area of the cryomagnet, for performing a measurement, and raised subsequently to the upper end of the guide tube for removing the sample carrier, characterized in that

the said sample-changing device comprises an inclined tube leading from a point neighboring the upper end of the guide tube to an easily accessible point outside the said magnet arrangement where it is provided with an opening with a closure for inserting and removing the said sample carrier, and further a direction switch comprising a tube section that can be brought into alignment selectively with the said guide tube or with the said inclined tube, and that the device for supplying the pressurized gas is connected also to the closed lower end of the said inclined tube and can be controlled in such a manner that the said sample carrier, after having been raised in the said guide tube into the area of the direction switch in the condition where the tube section is aligned with the guide tube, can be lowered for removing the sample, after changing-over the position of the direction switch in the inclined tube, and vice versa.

4,859,949

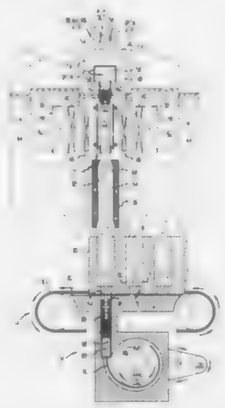
MAGNETIC RESONANCE SPECTROSCOPY APPARATUS

Gilbert W. McKenna, Revere, Mass., assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 26, 1988, Ser. No. 148,713

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—321 34 Claims



1. A magnetic resonance spectroscopy apparatus for testing a sample contained within an elongated container having opposing ends, the apparatus comprising:

magnetic resonance excitation and detection means having a vertically oriented central bore including a container receiving portion therein for receiving the sample to be tested; and

means for engaging the container by the opposing ends thereof when it is positioned within said bore, and for spinning the container.

4,859,950

BALUN CIRCUIT FOR RADIO FREQUENCY COILS IN MAGNETIC RESONANCE SYSTEMS

Hanan Keren, Kfar Saba, Israel, assignor to Elscint Ltd, Haifa, Israel

Filed May 17, 1988, Ser. No. 194,975

Claims priority, application Israel, May 26, 1987, 82658

Int. Cl.[4] G01V *3/00;* H01P *5/10*

U.S. Cl. 324—322 7 Claims



1. A balun circuit arrangement for coupling radio frequency coil means in a magnetic resonance system to the RF transmitter-receiver, said RF coil means comprising:

an inductor coil;

tuning capacitor means coupled to said inductor coil means for tuning said inductor coil to a desired resonant frequency for use in systems; and

matching capacitor means coupled to said tuning capacitor for matching the characteristic impedance of the RF coil to the characteristic impedance of the MR system,

said balun circuit arrangement comprising:

(a) a two conductor first cable means for coupling said RF coil means to said RF transmitter-receiver;

(b) coupling means for coupling said first cable means across said matching capacitor and said tuning capacitor;

(c) said coupling means including balun means for connecting one conductor of said two conductor cable means to said inductor coil at the point of coupling of said tuning capacitor means and said inductor coil to short skin currents in said first cable means and to simultaneously prevent said currents from reaching said RF coil means, and

(d) said balun means being a second cable means that is substantially one quarter wavelength in length at the tuned resonance frequency of said RF coil means.

4,859,951

DETECTING FAULTS IN TRANSMISSION LINES EMPLOYING AN ECHO CANCELLATION SIGNAL

Nigel G. Cole, Saxmundham, and Peter F. Adams, Ipswich, both of England, assignors to British Telecommunications, London, England

Filed Oct. 21, 1987, Ser. No. 111,049

Claims priority, application United Kingdom, Oct. 22, 1986, [illegible]

Int. Cl.[4] G01R *31/11*

U.S. Cl. 324—534 9 Claims

1. Fault detection apparatus for detecting faults in transmission lines comprising:

transmitter means for supplying a sequence of output pulses to a wire,

receiver means for receiving echoes of said pulses from said wire using a sample clock rate of 1/T and an adaptive cancellation processor arranged to produce a cancellation signal in response to each output pulse,

said apparatus further including a fault detection processor,

said fault detection processor being arranged to receive N sets of cancellation coefficients from said cancellation processor, each of said sets of cancellation coefficients being derived by adjusting the sample clock phase of the receiver means and hence of the cancellation signal by T/N,

said fault detection processor interleaving said N sets of



coefficients to derive an overall coefficient set representing line characteristics at N times sample rate 1/T,

said overall set of coefficients being compared with a stored reference set to determine whether a fault has occurred on the line.

4,859,952

APPARATUS AND METHOD FOR TESTING IMPEDANCES OF INTERCONNECT DEVICES

Daniel Wissell, Westford, Mass., assignor to Digital Equipment Corp., Maynard, Mass.

Filed Dec. 28, 1987, Ser. No. 137,928

Int. Cl.[4] G01R *31/04*

U.S. Cl. 324—538 23 Claims



1. Apparatus for testing long term and intermittent impedance changes in an interconnect device used to couple data processing system components, said apparatus comprising:

a bridge circuit means for receiving a radio frequency input signal, an interconnect device being coupled in one arm of said bridge circuit by means of a cable, said interconnect device having a coupled impedance coupled thereto, said coupled impedance and said interconnect device impedance being generally equal to a characteristic impedance of said cable coupling said interconnect device to said bridge circuit means, said bridge circuit means providing an output signal in response to said radio frequency input signal when a value of said interconnect device impedance in said bridge circuit means changes;

first signal processing means responsive to said output signal for providing a DC signal proportional to slow changes in said interconnect device impedance; and

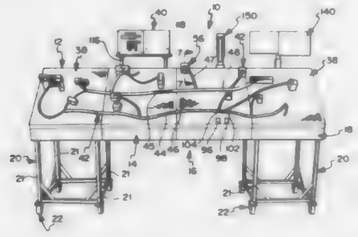
second signal processing means responsive to said output signal for providing a count signal in response to intermittent changes in said interconnect device impedance.

4,859,953

MODULAR TEST ASSEMBLY FOR WIRING HARNESSES

Douglas A. Young, Cortland, and Jay F. Gilson, Warren, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 8, 1988, Ser. No. 216,904
Int. Cl.[4] G01R 31/02
U.S. Cl. 324—539 9 Claims



1. In a test assembly for checking the operative characteristics, presence of harness mounting features and electrical terminals for coupling a preassembled wiring harness in operative position in an environment by use of interface circuit boards and a harness tester for selectively connecting individual ones of the circuit boards to the preassembled wiring harness in accordance with a desired testing sequence the improvement comprising:

a plurality of modular units including frame means adapted to be jointed end to end to accommodate different length preassembled wiring harnesses of varying form, fit and function;

each of said modular units including a faceplate with an inner and outer surface and having slot means therein extending across the full planar extent of the outer surface thereof;

a plurality of standardized brackets;

said slot means comprising a plurality of elongated slots which are formed in ranks which alternately overlap to provide openings for mounting and locating said standardized brackets in a spaced array corresponding to the form, fit and function of a preassembled wiring harness;

fastener means cooperating with said slot means for adjustably securing said brackets with respect to each of said faceplates so as to permit spatial adjustment thereof with respect to a preselected preassembled wiring harness; and

coupling means on said brackets for providing either an electrical connection to a wiring harness or for detecting the presence of mounting means thereon when the wiring harness is in a desired attitude corresponding to the assembled position of the wiring harness.

4,859,954

CLOCK PHASE ADJUSTING SYSTEM

Tatsuro Yoshimura, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 55,740, May 4, 1987, abandoned. This application Oct. 7, 1988, Ser. No. 256,171
Claims priority, application Japan, Sep. 4, 1985, 60-195171
Int. Cl.[4] H03K 5/13, 5/159, 5/00; H03L 7/00
U.S. Cl. 328—155 4 Claims

1. A clock phase adjusting system, comprising:

means, connected to receive an input clock signal, for delaying the input clock signal by a selected time in accordance with a given delay time selection signal and for outputting a delayed clock signal, said delay means including:

first delay means for coarse adjustment, said first delay means selectively outputting the input clock signal in accordance with an (n) bit selection, wherein n is an integer greater than or equal to one, as delay clock signals having a maximum of $m=2^n$ steps, wherein m is an integer greater than or equal to one;

second delay means for fine adjustment, said first and second delay means connected in cascade, said second delay means selectively outputting the input clock signal in accordance with a (p) bit selection signal, wherein p is an integer greater than or equal to one, as delay clock signals having a minimum of $\frac{1}{2}^p$ steps having a minimum step width of said first delay means;



scan in/out latch circuits, connected to said means for delaying an input clock signal, for providing said delay time selection signal to said delay means; and

means, connected to said scan in/out latch circuit, for applying a setting signal and for setting selection data corresponding to said delay time selection signal to said scan in/out latch circuits during a scan-in operation, said delaying means outputting the delay clock signal having a selected delay time.

4,859,955

APPARATUS FOR SMOOTHING AN ABRUPT CHANGE IN SIGNAL LEVEL

Paul M. Trethewey, Penn Valley, Calif., assignor to The Grass Valley Group, Inc., Grass Valley, Calif.

Filed Nov. 6, 1985, Ser. No. 795,676
Int. Cl.[4] H03B 1/00; H03K 5/00
U.S. Cl. 328—169 4 Claims



1. Apparatus for receiving a step-form input signal and providing a limited slew rate output signal in response thereto, comprising:

amplifier means having a signal input terminal for receiving the step-form input signal, an output terminal and a slope-control terminal, the amplifier means being operative to provide at said output terminal a current that is variable linearly between a maximum value of one polarity and a maximum value of the opposite polarity when the potential of the input terminal relative to the output terminal varies within a predetermined range, the magnitudes of said maximum values being dependent on the magnitude of a control signal applied to said slope-control terminal, a resistive circuit element and a capacitive circuit element connected in series between the output terminal and a reference potential level, with the resistive circuit element being connected to the output terminal and the capacitive circuit element being connected to the reference potential level, the limited slew rate output signal being taken from a node between the resistive and capacitive circuit elements, and

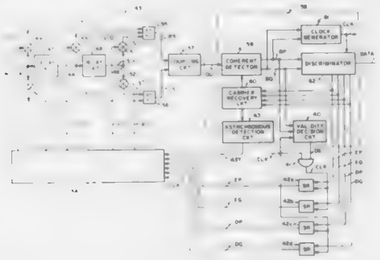
means for maintaining the current provided by the amplifier means at a minimal value for a predetermined interval following a change in the magnitude of the step-form signal by delaying the control signal for the predetermined interval.

4,859,956

VALIDITY DECISION CIRCUIT CAPABLE OF CORRECTLY DECIDING VALIDITY OF AN ERROR SIGNAL IN A MULTILEVEL QUADRATURE AMPLITUDE DEMODULATOR

Shoichi Mizoguchi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 28, 1988, Ser. No. 264,150
Claims priority, application Japan, Oct. 30, 1987, 62-274938; Dec. 30, 1987, 62-336101; Oct. 7, 1988, 63-253343
Int. Cl.[4] H03D 3/18
U.S. Cl. 329—50 5 Claims



1. A validity decision circuit for use in a demodulator used as a counterpart of a modulator for modulating a modulator input signal into a multilevel quadrature amplitude modulated signal specified by a plurality of signal points on a phase plane having an origin and real and imaginary axes crossing at said origin, said modulator rearranging a square arrangement of said signal points into an approximately octangular arrangement in which said signal points are arranged on an approximately octangular region having a specific region inwardly of an octangle, said demodulator being for demodulating said multilevel quadrature amplitude modulated signal into an in-phase baseband signal and a quadrature baseband signal and for converting said in-phase and said quadrature baseband signals into a demodulator output signal and an error signal, said in-phase baseband signal having an in-phase signal level, said quadrature baseband signal having a quadrature signal level, each of said in-phase and said quadrature signal levels being related to one of said signal points at a time, wherein the improvement comprises:

adder means for adding said in-phase baseband signal and said quadrature baseband signal to produce a sum signal having a sum level representing a sum of said in-phase signal level and said quadrature signal level, said sum level being orthogonal to a sum axis which passes through said origin and forms an angle of forty-five degrees with both of said real and said imaginary axes;

subtracter means for subtracting said in-phase signal level and said quadrature signal level to produce a difference signal having a difference level representing a difference level, said difference level being orthogonal to a difference axis which passes through said origin and orthogonally crosses said sum axis;

first discriminating means responsive to said in-phase baseband signal for discriminating said in-phase signal level to produce a first binary discrimination signal;

second discriminating means responsive to said quadrature baseband signal for discriminating said quadrature signal level to produce a second binary discrimination signal;

third discriminating means coupled to said adder means and responsive to said sum signal for discriminating said sum level to produce a third binary discrimination signal;

fourth discriminating means coupled to said subtracter means for discriminating said difference level to produce a fourth binary discrimination signal; and

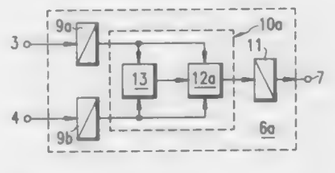
OR gate means responsive to said first through said fourth binary discrimination signals for producing at least one of said first through said fourth discrimination signals as a decision signal representing the fact that said error signal is valid.

4,859,957

METHOD FOR DEMODULATING AN FM SIGNAL

Walter Braun, Wettingen, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Oct. 7, 1988, Ser. No. 254,697
Claims priority, application Switzerland, Oct. 8, 1987, [illegible]
Int. Cl.[4] H03D 3/00
U.S. Cl. 329—50 10 Claims



1. A method for demodulating an FM signal (FM=Frequency Modulation), in which

(a) the FM signal is directly mixed down into an in-phase and a quadrature component of a complex frequency baseband signal, and

(b) a modulation signal is determined from a phase relationship of the complex frequency baseband signal, wherein

(c) the phase relationship is determined from a curve length of the complex frequency baseband signal.

4,859,958

MULTIPLE REUSE OF AN FM BAND

Glen A. Myers, 842 Fairmont Cir., Salinas, Calif. 93901

Filed Aug. 16, 1988, Ser. No. 232,691
Int. Cl.[4] H03D 3/00
U.S. Cl. 329—112 6 Claims

1. Signal receiving system for receiving an input signal having a plurality of modulated carrier signals included therein, said system comprising:

first demodulator means for receiving the input signal for producing a signal representing the demodulated message of the most dominant carrier signal of said input signal, and for producing a replica signal of said dominant carrier signal;

delay means coupled to the demodulator means for receiving the input signal, and for producing a first signal identical to said input signal except that said first signal is selectively delayed with respect to said input signal;

output means, coupled to the delay means and to the demodulator means, for receiving and combining said first signal

produced by said delay means and said replica signal produced by said demodulator means, and for producing an output signal representing the input signal with the most dominant carrier suppressed; and

second demodulator means coupled to said outputs means for receiving the output signal produced thereby, for producing a signal representing the demodulated message of the second most dominant carrier of said input signal, and for producing a replica signal of said second most dominant carrier signal.

4,859,959

DATA DEMODULATOR CARRIER PHASE ERROR DETECTOR

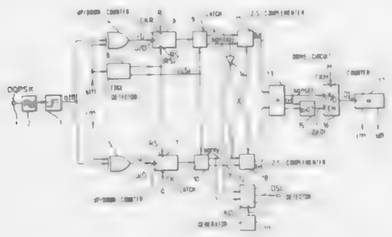
Robin Sharpe, Morden, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 5, 1988, Ser. No. 280,615

Claims priority, application United Kingdom, Dec. 11, 1987, 8729016

Int. Cl.[4] H03D 3/18; H03K 9/04

U.S. Cl. 329—124 6 Claims



1. An arrangement for producing a phase error signal representative of the phase error between a received phase-modulated shift keyed signal of a given frequency and a locally generated carrier signal of notionally the same frequency, which arrangement is characterised by comprising two exclusive-OR gates connected to receive in common at respective first inputs a square wave version of the received signal and at respective second inputs respective quadrature phase versions of square wave form of said locally generated carrier signal, two up/down counters, the up/down operation mode of each of which is controlled by the output signal from a respective one of said two exclusive-OR gates, each of said counters being connected to receive counting pulses from a count clock pulse source and each being reset by a reset signal on the occurrence of each edge of one of the two locally generated carrier signals, the count present on each counter immediately before being reset each time representing the difference in the durations of the two levels of the relevant channel signal and the direction of the count representing the sign of said difference, the arrangement further comprising logic means responsive to the count produced by both counters to produce said phase error signal.

4,859,960

DIGITAL SIGNAL DEMODULATION

Richard T. A. Standford, Bracknell, and Roger Biggs, Leatherhead, both of England, assignors to British Aerospace Public Limited Company, London, England

Filed Jun. 27, 1988, Ser. No. 212,246

Int. Cl.[4] H03D 3/00

U.S. Cl. 329—126 9 Claims

1. In a method of demodulating a modulated high frequency carrier signal, wherein a parameter of said modulated high frequency carrier signal is modulated by a low frequency modulating signal, said method comprising the steps of:

initially translating said high frequency carrier signal to a low intermediate frequency which is such that a ratio between said low intermediate frequency and said frequency of said modulating signal is less than 500:1,

sampling said intermediate frequency signal at a low sampling rate corresponding to said low intermediate frequency and thereby producing terms of a digital time series to thereby digitize said signal,



applying said terms to non-linear processor means, and

using said non-linear processor means to produce an output representative of an instantaneous value of said modulated parameter.

4,859,961

WIDE BANDWIDTH PUSH-PULL PARALLEL AMPLIFIER

William H. Davenport, Hillsboro, Oreg., assignor to TriQuint Semiconductor, Inc., Beaverton, Oreg.

Filed Dec. 19, 1988, Ser. No. 285,993

Int. Cl.[4] H03F 3/45

U.S. Cl. 330—253 4 Claims



1. A wide bandwidth push-pull parallel amplifier comprising,

a main differential amplifier stage that includes a first pair of field effect transistors having their source electrodes coupled to a ground reference terminal via a first constant current source and their drain electrodes individually coupled via first and second load impedances to a supply voltage source,

a parallel amplifier stage comprising

a differential amplifier that includes a second pair of field-effect transistors having their source electrodes coupled to the ground reference terminal via a second constant current source, and

a source follower that includes a third pair of field effect transistors, each having its source electrode coupled to the drain electrode of a corresponding one of the second pair of field-effect transistors, and its gate electrode connected to the drain of a corresponding one of the first pair of field-effect transistors, the drain electrodes of said third pair of transistors being connected to said supply voltage source,

a pair of input terminals, each connected to the gate electrodes of a different one of the first pair and the second pair of field effect electrodes, and

a pair of output electrodes, each connected to the drain electrode of a different one of the second pair of field-effect transistors.

4,859,962

VIDEOAMPLIFIER

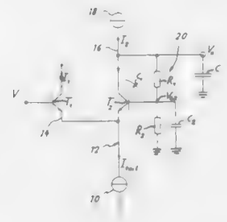
Johannes M. M. Simons, Venlo, and Caspar P. M. Michels, Vearay, both of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

Filed Mar. 23, 1988, Ser. No. 172,011

Claims priority, application European Pat. Off., Mar. 25, 1987, 87200538.4

Int. Cl.[4] H03F 3/45

U.S. Cl. 330—260 15 Claims



1. An amplifier for generating an output signal from an input signal comprising:

a first current source connected to a branched circuit;

a first transistor means provided in a first branch of the branched circuit, the first transistor means being responsive to the input signal to control a current flowing in the first branch;

a second current source provided in a second branch of the branched circuit;

a second transistor means provided in the second branch between the first current source and the second current source to generate the output signal; and

a feedback circuit connected to the second current source and the second transistor means for deriving a control signal for the second transistor means from the output signal.

4,859,963

HIGH SPEED LOW GAIN STABLE AMPLIFIER

Gregory L. Schaffer, Sunnyvale, Calif., assignor to Maxim Integrated Products, Sunnyvale, Calif.

Filed May 24, 1988, Ser. No. 198,048

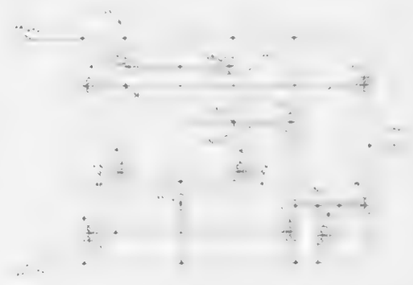
Int. Cl.[4] H03F 3/45

U.S. Cl. 330—253 11 Claims

1. A low gain amplifier circuit for amplifying the voltage difference between differential input signals, and providing an output signal to a predetermined load, said amplifier circuit comprising:

a differential amplifier stage, coupled to said input signals, for amplifying said difference between the differential input signals, said differential amplifier stage having no frequency compensation components;

a push pull transconductance stage, coupled to said differential amplifer stage and to said predetermined load, the transconductance of said push pull transconductance stage being approximately equal to the reciprocal of the impedance of said load, said push pull transconductance stage having approximately a unity gain to provide amplification of wide bandwidth signals with minimal phase shift, said push pull transconductance stage having a first driver transistor, coupled to said differential amplifier stage, for driving said output signal and having a second driver transistor, coupled to said first driver transistor, for



driving said output signal said push-pull transconductance stage having no frequency compensation components.

4,859,964

METHOD AND CIRCUIT FOR AUTOMATIC GAIN CONTROL OF A SIGNAL

Poul R. Jorgensen, LaRomantica 8, Almunocar, Apt. 217, Malaga, Spain

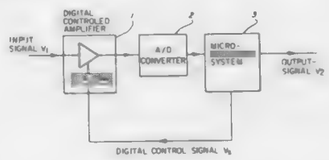
PCT No. PCT/DK87/00010, § 371 Date Oct. 9, 1987, § 102(e) Date Oct. 9, 1987, PCT Pub. No. WO87/04877, PCT Pub. Date Aug. 13, 1987

PCT Filed Feb. 3, 1987, Ser. No. 111,023

Claims priority, application Denmark, Feb. 11, 1986, 651/86

Int. Cl.[4] H03G 3/20

U.S. Cl. 330—279 8 Claims



1. A method of processing an input analog signal having varying values and of automatically, incrementally adjusting the gain of an amplifier system comprising:

amplifying the analog signal by a predetermined gain value;

digitizing amplified values of the analog signal;

storing the digitized values of the analog signal;

determining if the digitized values are increasing or decreasing;

comparing the digitized values to an upper, predetermined threshold if those values are increasing and subsequently, incrementally decrease the gain value if a selected maximum digital value exceeds that upper threshold;

comparing the digitized values to a lower, predetermined threshold if those values are decreasing; and

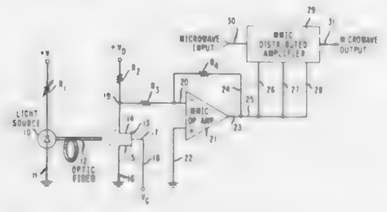
subsequently, incrementally increasing the gain value if a selected maximum digitized value falls below that lower threshold.

4,859,965

OPTICAL GAIN CONTROL OF GAAS MICROWAVE MONOLITHIC INTEGRATED CIRCUIT DISTRIBUTED AMPLIFIER(U)

Arthur Paolella, Howell, N.J., and Peter R. Herczfeld, Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 27, 1989, Ser. No. 316,358
Int. Cl.[4] H03G *3/30*
U.S. Cl. 330—285 6 Claims



1. An optical gain control circuit for controlling the gain of a GaAs MMIC distributed amplifier comprising

a GaAs MMIC distributed amplifier having a dc bias control for controlling the gain of the amplifier;

a light source for emitting light at a wavelength in the region of 0.5 micrometers to 1 micrometer;

control means coupled to said light source for controlling the intensity of the light emitted from said source;

a fixed resistance;

a GaAs multi-finger FET having parallel connected sources, parallel connected drains and parallel connected gate fingers;

circuit means for connecting the sources and drains of said FET in series circuit with said fixed resistance across a source of positive dc voltage;

gate biasing means coupled to the gates of said FET for biasing said FET to a point near pinch-off to maximize the light sensitivity of the FET;

dc amplifier means having an input coupled to the circuit junction of said fixed resistance and said FET and an output coupled to said dc bias control of said GaAs MMIC distributed amplifier; and

means optically coupled to said light source and said FET for focussing light from said light source on the surface of said FET between the sources and the drains of the FET and covering substantially all of the gate fingers of the FET, whereby changes in the intensity of light from said light source change the voltage drop across said FET and the input applied to said dc amplifier means to thereby change the gain of said MMIC distributed amplifier.

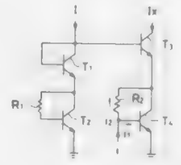
4,859,966

CURRENT AMPLIFIER CIRCUIT AND A CURRENT AMPLIFYING TYPE DIFFERENTIAL CURRENT CONVERTER CIRCUIT

Akira Yamakoshi; Toyohiko Fujita; Kunihiko Tsukakoshi, and Shinji Anraku, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1987, Ser. No. 94,374
Claims priority, application Japan, Sep. 11, 1986, 61-214335; Sep. 11, 1986, 61-214336
Int. Cl.[4] H03F *3/04*
U.S. Cl. 330—288 18 Claims

1. An electric current amplifier circuit comprising: a first, a second, a third and a fourth transistor each having the same polarity, wherein the first transistor has an electrically connected collector and base and is connected in series with the second transistor having an electrically connected collector and base, wherein the collector of the first transistor is connected to a base of the third transistor, wherein the fourth transistor has an emitter with a resistance R_E and a collector and base connected through a resistor having a resistance R and the fourth transistor is connected in series with the third transistor, wherein the first transistor is receptive of a bias



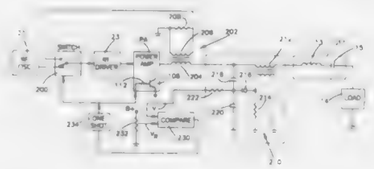
current I flowing therethrough, and wherein the base of the fourth transistor is receptive of an input signal current i supplied thereto to produce an amplified output signal current approximately $I+R\cdot i/2R_E$ flowing through the third transistor.

4,859,967

RF POWER AMPLIFIER PROTECTION

Hilmer I. Swanson, Quincy, Ill., assignor to Harris Corporation, Melbourne, Fla.

Filed Nov. 9, 1988, Ser. No. 269,191
Int. Cl.[4] H02H *7/20*
U.S. Cl. 330—298 11 Claims



6. An RF power amplifier system having amplifier protection, comprising:

an RF source for providing an RF input signal;

an actuatable RF power amplifier having an on condition and an off condition for, when on, normally receiving and amplifying said input RF signal to provide an amplified output RF signal;

an output circuit for receiving said output RF signal and including an impedance matching output network and a load connected together in series;

means coupled to said output circuit for providing a first signal representative of the level of any reflected power in said output circuit;

means for comparing said first signal with a reference level and providing a control signal when said first signal exceeds that of said reference level;

means responsive to said control signal for providing a turn off signal for actuating said RF amplifier to its off condition;

means coupled to sad output circuit for providing a frequency signal having a frequency corresponding with that of any current flowing in said output circuit; and

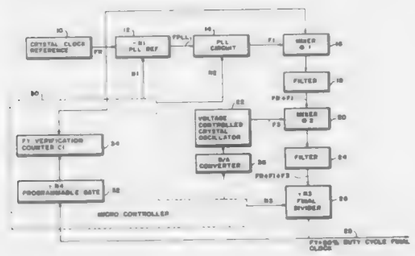
actuatable switching means having a normal first condition for supplying said RF signal to said power amplifier and a second condition in response to said turn off signal for disconnecting said RF input signal and instead supplying said frequency signal to said power amplifier.

4,859,968

FREQUENCY GENERATOR

Ezra Gershon, East Meadow, N.Y., assignor to Integrated Technologies Solutions, Inc., East Meadow, N.Y.

Filed Aug. 16, 1988, Ser. No. 232,705
Int. Cl.[4] H03B *21/02*; H03L *7/18*
U.S. Cl. 331—38 24 Claims



1. A method for generating a clock signal having an adjustable, accurate and stable frequency, said method comprising the steps of:

(a) generating a clock signal with a first reference frequency (FR):

(b) dividing said first reference frequency by a selectable first number (N2/N1) to produce a clock signal with a first intermediate frequency (F1), said first intermediate frequency thereby being coarsely adjustable in steps over a prescribed range;

(c) mixing said clock signals having said first reference frequency and said first intermediate frequency to produce a clock signal having a second intermediate frequency (FR±F1);

(d) generating a clock signal with a second reference frequency (F3), said second reference frequency being finely adjustable over a range in the order of magnitude of the frequency difference between two successive steps of said first intermediate frequency;

(e) mixing said clock signals having said second intermediate frequency (FR±F1) and said second reference frequency (F3) to produce a clock signal having a third intermediate frequency (FR±F1±F3).

4,859,969

SINGLE TRANSISTOR DUAL MODE CRYSTAL OSCILLATOR(U)

Gregory J. Malinowski, Oakhurst, and Stanley S. Schodowski, Wayside, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 13, 1983, Ser. No. 509,269
Int. Cl.[4] H03B *21/00, 5/36*
U.S. Cl. 331—43 8 Claims

1. A dual mode oscillator circuit comprising:

a resonator device;

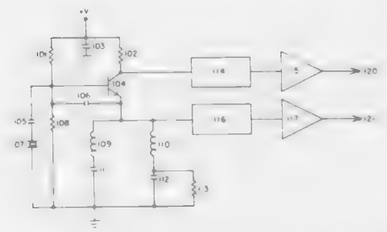
a single transistor having a base, an emitter and a collector, said transistor being coupled in a base input-emitter to ground configuration;

means for coupling said resonator device between ground and the base input of said transistor;

means coupled to said transistor base for biasing said transistor for operation in its linear region;

feedback means coupled between said emitter and said base; and

circuit means in the emitter to ground path of said transistor, said circuit means comprising a parallel arrangement of at least two series L-C circuits, the L and C values of said



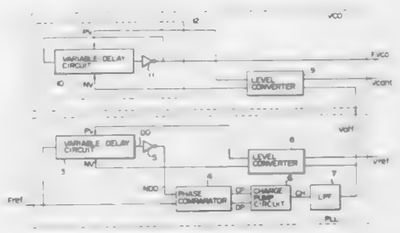
L-C circuits being chosen so as to excite in said resonator, at least two distinct frequencies simultaneously.

4,859,970

VOLTAGE CONTROLLED OSCILLATOR

Kenji Matsuo, and Ikuo Tsuchiya, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 29, 1988, Ser. No. 277,108
Claims priority, application Japan, Nov. 30, 1987, 62-302700; Jun. 29, 1988, 63-161345
Int. Cl.[4] H03B *1/00*
U.S. Cl. 331—57 10 Claims



1. A voltage controlled oscillator comprising:

a phase locked loop section coupled with an input signal at a reference frequency and a reference potential, said phase locked loop section performing a signal feedback control so as to obtain a constant delay time of a first variable delay circuit contained in said phase locked loop section; and

a voltage controlled oscillator section for controlling a delay time of a second variable delay circuit in a ring oscillator by a control input voltage and an output voltage of a low-pass filter contained in said phase locked loop section, and producing a signal oscillating at a frequency as determined by the delay time.

4,859,971

R-SEGMENT TRANSMISSION LINE DIRECTIONAL COUPLER

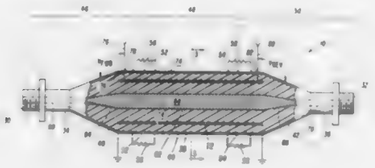
Richard C. Edwards, and Burton L. Martin, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 15, 1987, Ser. No. 39,570
Int. Cl.[4] H01P *5/18*
U.S. Cl. 333—109 20 Claims

1. A broadband directional coupler for use in a circuit including a signal source and a signal load each having an equivalent resistance of value R_O, comprising:

a first transmission line segment comprising first and second conductors connected to the signal source and load;

a second transmission line segment adjacent said first transmission line segment, comprising third and fourth conductors connected in parallel to the first transmission line segment, said second conductor in said first transmission line segment being coupled to said third conductor in said second transmission line segment to form a common conductor;



resistive means of value R connected to said fourth conductor;

means connected to said common conductor for sampling an aspect of a signal therein;

said first transmission line segment having characteristic impedance which is a function of R_O and R; and

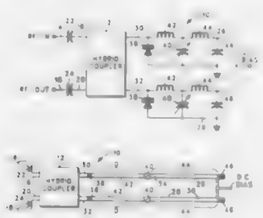
said second transmission line segment having characteristic impedance which is a function of R.

4,859,972

CONTINUOUS PHASE SHIFTER FOR A PHASED ARRAY HYPERTHERMIA SYSTEM

Steven J. Franke, Champaign; Ronald D. Boesch, Rockford, and Richard L. Magin, Urbana, all of Ill., assignors to The Board of Trustees of the University of Illinois, Urbana, Ill.

Filed Nov. 1, 1988, Ser. No. 265,499
Int. Cl.[4] H01P *1/185*
U.S. Cl. 333—164 **6 Claims**



1. A continuous microwave phase shifter comprising:

a quadrature hybrid coupler having a pair of reflective ports; and

a pair of reactive loads coupled respectively to said reflective ports, each of said reactive loads comprising:

a distributed inductance coupled to said reflective port; and

a varactor connected in parallel with said distributed inductance adjacent said reflective port.

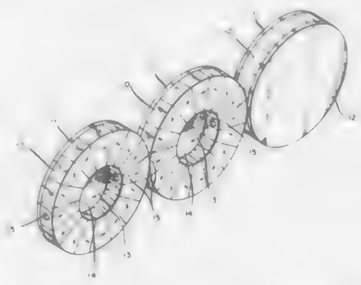
4,859,973

SUPERCONDUCTING SHIELDED PYX PPM STACKS

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 23, 1989, Ser. No. 327,931
Int. Cl.[4] H01F *7/22*
U.S. Cl. 335—216 **7 Claims**

1. A periodic permanent magnet structure comprising a plurality of segments of sliced hollow cylindrical flux sources each of which produces a uniform high-field in its central cavity, each flux source having an axial tunnel through the magnetic poles of the flux source, the flux sources arranged linearly with adjacent flux sources in peripheral edge contact so that the magnetic fields are in alignment, a continuous channel being formed through the plurality of axially aligned flux sources, and further comprising a pair of superconducting sheets covering the end faces of each of the sliced flux sources.

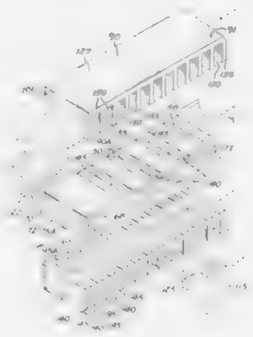


4,859,974

ELECTROMAGNETIC MOTOR/ACTUATOR

Gerald B. Kliman, Schenectady, and Donald W. Jones, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 11, 1988, Ser. No. 255,216
Int. Cl.[4] H01F *7/08*
U.S. Cl. 335—229 **13 Claims**



1. An electromagnetic machine comprising:

a stationary member having a plurality of slots for receiving multiple electrical windings for generating controllable electromagnetic poles along a surface of said stationary member upon energization of said windings with controlled electric current;

a movable member of magnetic material positioned adjacent said surface of said stationary member, said movable member having a pluraltiy of slots angularly oriented with respect to said surface; and

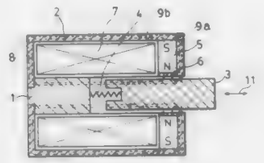
a plurality of magnets, each of said magnets being dimensioned to snugly fit within a corresponding one of said plurality of slots, respectively, said magnets being oriented such that facing poles of said magnets are of the same polarity so as to concentrate magnetic flux between said magnets to generate a sequence of alternating magnetic poles along a surface of said movable member adjacent said surface of said stationary member.

4,859,975

ELECTROMAGNETIC ACTUATOR

Tokio Uetsuhara, Urawa, Japan, assignor to Mitsubishi Mining & Cement Co., Tokyo and Iwasaki Electronics Co., Ltd., Kyoto, both of, Japan

PCT No. PCT/JP86/00663, § 371 Date Dec. 2, 1987, § 102(e) Date Dec. 2, 1987, PCT Pub. No. WO88/05207, PCT Pub. Date Jul. 14, 1988
PCT Filed Dec. 26, 1986, Ser. No. 139,251
Int. Cl.[4] H01F *7/08*
U.S. Cl. 335—230 **4 Claims**



1. An electromagnetic actuator which is composed of a yoke, a stationary core fixed to the yoke, a movable core capable of reciprocally moving with respect to the stationary core, a coil wound around the movable core for applying the first magnetic flux thereto when the coil is energized, and a permanent magnet fixed to the yoke so as to apply the second magnetic flux which dividingly flows to the first magnetic flux in parallel thereto; wherein the improvement is characterized that this electromagnetic actuator satisfies the condition (a);

$$(a)\ 0.5 > R_1/R_o > 0$$

wherein,

R_1 represents the magnetic reluctance of the magnetic pass of one divided magnetic flux generated by the permanent magnet, including the magnetic reluctance of the gap d_1 between one pole face of the movable core and one pole face of the yoke;

R_2 represents the magnetic reluctance of the magnetic pass of the other divided magnetic flux generated by the permanent magnet, including the magnetic reluctance of the gap d_2 between the other pole face of the movable core and one pole face of the stationary core; and

$$R_o = R_1 + R_2.$$

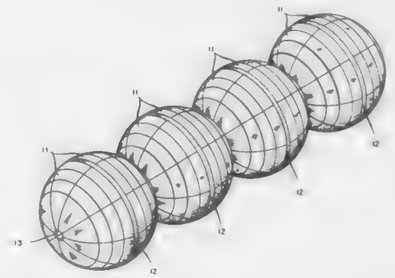
4,859,976

PERIODIC PERMANENT MAGNET STRUCTURES

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of The Army, Washington, D.C.

Filed Mar. 17, 1989, Ser. No. 326,715
Int. Cl.[4] H01F *7/02*
U.S. Cl. 335—306 **7 Claims**

1. A periodic permanent magnet structure comprising a plurality of aligned juxtaposed hollow hemispherical flux sources each of which produces a uniform high-field in its hemispherical central cavity, the magnetic field orientations in the central cavities being axially directed and successively alternating in direction from hemispherical source to hemispherical source, and an axial bore hole through the magnetic poles of the stack of hemispheric flux sources so as to form



with said cavities a continuous channel through the stack through which a beam of charged particles can travel.

4,859,977

INSULATOR DEVICE FOR POWER TRANSFORMER

Kazuto Mochizaki, Yokohama, and Katsushi Kawahara, Tokyo, both of Japan, assignors to Akai Electric Company, Limited, Tokyo, Japan

Filed Oct. 26, 1988, Ser. No. 262,986
Claims priority, application Japan, Oct. 27, 1987, 62-163923[U]
Int. Cl.[4] H01F *15/02*
U.S. Cl. 336—65 **4 Claims**

1. An insulator device and a power transformer, said transformer being mounted on a conductive chassis by at least one screw, comprising:

a spacer between said transformer and said chassis, and having at least one hole receiving said at least one screw to mount said transformer to said conductive chassis;

at least one insulation washer being monolithically formed with said, spacer and being folded to lie above said hole; and

a cylindrical portion monolithically formed with said insulation washer and being inserted into said at least one hole to surround said screw;

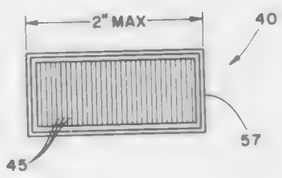
wherein said transformer is electrically insulated from said chassis.

4,859,978

HIGH-VOLTAGE WINDINGS FOR SHELL-FORM POWER TRANSFORMERS

Landis E. Feather, Hermitage; Ramsis S. Girgis, Mars; Leach S. McCormick, and Andreas M. Sletten, both of Pittsburgh, all of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 29, 1988, Ser. No. 188,239
Int. Cl.[4] H01F *27/28*
U.S. Cl. 336—186 **11 Claims**



1. A winding for an electrical induction device comprising:

an elongated conductor bundle having opposing outer and inner longitudinal surfaces defining the thickness of the bundle and a pair of opposing side surfaces defining the width of the bundle, the conductor bundle being formed from a multiplicity of insulated elongated conductor strands arranged in side by side relation, each said conductor strand having a substantially rectangular cross section with a pair of substantially parallel contact longitudinal side surfaces which serve as contact surfaces and which define the width of the strand and a pair of inner and outer longitudinal surfaces defining the thickness of the strand along a major axis, the minor axis being substantially perpendicular to the major axis, the width of the conductor strands along their minor axes being less than approximately 40 mils and substantially less than the height along their major axes, said conductor strands being mounted side by side such that their respective contact surfaces abut;

a support member, wrapped about the elongated conductor bundle to provide mechanical support; and

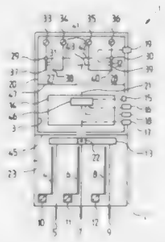
wherein said conductor bundle is spirally wound in a multiplicity of winding turns to form a coil, the conductor bundle being wound such that said inner surfaces of the bundle and strands face the center of the coil.

4,859,979

THERMAL RELAY

Bruno Jacquet, Saint Germain en Laye, France, assignor to La Telemecanique Electrique, France

Filed Jul. 8, 1988, Ser. No. 216,479
Claims priority, application France, Aug. 7, 1987, 87 09676
Int. Cl.[4] H01H *37/00, 71/16, 61/00*
U.S. Cl. 337—3 **4 Claims**



1. An overload thermal relay comprising:

i. a case having a first partition wall defining first and second cavities, the second cavity having a further partition wall at right angles to the first partition wall.

ii. a plurality of bi-metallic inductive strips housed in said first cavity,

iii. a first break switch having a first movable contact support member which has a first pivoting point and a first actuating point, and a first pair of terminals, said break switch having a first operating mode with automatic reset and a second operating mode with manual reset,

iv. a second make switch having a second movable contact support member which has a second pivoting point and a second actuating point and a second pair of terminals,

v. a movable strip linked to said first and second actuating points and forming with said first and second contact support members and a line which joins said first and second pivoting points a deformable parallellogram,

vi. first and second toggle springs respectively connecting said first and second actuating points at a first end thereof, said first and said toggle springs having respective second ends which are fixedly anchored with respect to the case,

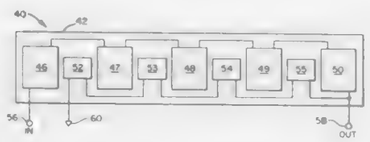
vii. snap-acting tripping means connecting said bi-metallic strips to said movable strip, and selection means selecting the operating mode of the first switch, said first and second switches are arranged in said second cavity on one side of said further partition wall, while said movable strip, said snap-acting tripping means and said selector means are arranged in said second cavity on the other side of said further partition wall.

4,859,980

APPARATUS AND METHOD FOR PROVIDING IMPROVED RESISTIVE RATIO STABILITY OF A RESISTIVE DIVIDER NETWORK

Robert W. Hammond, Edmonds, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Continuation of Ser. No. 26,156, Mar. 16, 1987, Pat. No. 4,792,782. This application Jun. 13, 1988, Ser. No. 205,965
Int. Cl.[4] H01C *1/012*
U.S. Cl. 338—308 **9 Claims**



1. A symmetric arrangement for providing substantially uniform temperature coefficient of resistance to a plurality of film resistors in a network formed on a substrate, comprising:

a substrate;

a resistive material on said substrate; and

a plurality of separate portions of said resistive material forming each of said resistors, wherein

said plurality of resistive portions are symmetrically arranged with respect to one another relative to an axis of symmetry along said substrate,

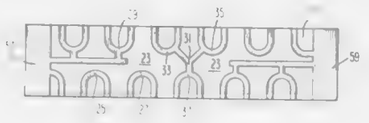
thereby providing said substantially uniform temperature coefficient of resistance to said plurality of film resistors in said network.

4,859,981

ELECTRICAL RESISTOR DEVICE

Hans P. Peschl, Hart/Graz, Austria, assignor to EBG Elektronische Bauelement Gesellschaft m.b.H., Kirchbach, Austria

Filed May 18, 1988, Ser. No. 195,194
Int. Cl.[4] H01C *1/012*
U.S. Cl. 338—308 **8 Claims**



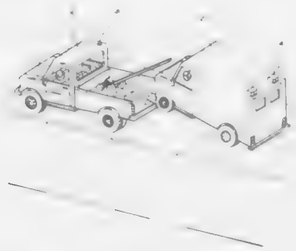
1. An electrical resistor means comprising in combination: cylindrical substrate means having a circumferential surface and formed of electrically non-conductive material; electrical resistance material secured around a major portion of said circumferential surface of said cylindrical substrate and formed in a meandering sinusoidal path having a plurality of full wave patterns each with a first half wave apex and an associated second half wave apex and further with each first half-wave apex being separated from its associated second half-wave apex by a separation area of said cylindrical substrate surface; at least one interconnecting pattern of said electrical resistance material having at least first and second connecting legs and secured to said separation area with said first leg being connected to the first half-wave apex of a selected full wave pattern and said second leg being connected to the associated second half wave apex whereby a parallel electrical conducting path is formed between said first half-wave apex and said second half-wave apex.

4,859,982

WIRELESS TAILLIGHT SYSTEM

Stephen L. Seaburg, 4021 Cedar Run Rd., Traverse City, Mich. [illegible]

Filed Jan. 7, 1988, Ser. No. 141,563
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 340—475 **11 Claims**



1. A wireless taillight system comprising:

(A) a transmitting module adapted to be disposed in operative association with the taillight energizing circuitry of a vehicle, said module including:

input means operatively connected to said taillight energizing circuitry and adapted to receive taillight energizing signals therefrom;

a signal generator adapted to generate a first group of radio frequency control signals at a first frequency in response to the energizing signals from the right-side taillights of the vehicle and a second group of radio frequency control signals at a second frequency in response to the energizing signals from the left-side taillights of the vehicle; and

an antenna adapted to broadcast the radio frequency control signals;

(B) a first taillight module configured to be removably mounted on a vehicle at a location remote from the transmitting module and including:

a radio receiver-decoder adapted to receive the first group of radio frequency control signals broadcast by the antenna and generate lamp control signals corresponding thereto; and

signaling means including a signal lamp and a lamp controller, said controller adapted to receive the lamp control signals and energize the lamp in accordance with the energization of the right-side taillights; and,

(C) a second taillight module configured to be removably mounted on a vehicle at a location remote from the transmitting module and including:

a radio receiver-decoder adapted to receive the second group of radio frequency control signals broadcast by the antenna and generate lamp control signals corresponding thereto; and,

signaling means including a signal lamp and a lamp controller, said controller adapted to receive the lamp control signals and energize the lamp in accordance with the energization of the left-side taillights.

4,859,983

PLASTIC BARRICADE

Jack H. Kulp, San Juan Capistrano, and Carl L. Erwin, Brea, both of Calif., assignors to Signal, Inc., LaMirada, Calif.

Continuation of Ser. No. 790,885, Oct. 24, 1985, abandoned. This application Jun. 15, 1988, Ser. No. 208,865
Int. Cl.[4] E01F *9/04*
U.S. Cl. 340—908.1 **19 Claims**



1. A traffic barricade of the A-frame type comprising first and second barricade planar members constructed and defined for forming an A-frame barricade when the members are pivotably secured together, each of the barricade members being similarly constructed of a lightweight material that will yield when impacted by a motor vehicle so as to minimize any damage to the motor vehicle and barricade, each of the first and second barricade members including an integral hinge member adjacent opposite sides of each barricade member and extending a pre-selected distance from a pre-selected end of the barricade member for pivotable co-action with the corresponding hinge member of the other barricade member when the barricade members are pivotably securfed at said hinge members, hinge means for each of the hinge members for pivotally securing the corresponding hinge members of each of the barricade members to thereby permit the barricade members to be moved to a closed position in a side-by-side relationship and in open position with the remaining ends of the barricade members being spaced apart in an A-frame configuration, each of said integral hinge members having means substantially minimizing any closing pivoting action or gradual closing pivoting action of the barricade members when they are arranged in a A-frame configuration in response to closing forces impacting the barricade members and wherein each of the hinge members extend outwardly of one of the planar sides of the barricade members, the opposite side of the one planar side having a concave element for receiving and holding the extending hinge members for permitting a plurality of barricade members to be stacked in a planar relationship.

4,859,984

DEVICE FOR DISPLAYING THE GEAR PARAMETERS OF A BICYCLE OR THE LIKE

Antonio Romano, Padova, Italy, assignor to Campagnolo S.p.A., Vicenza, Italy

Filed Sep. 29, 1987, Ser. No. 105,075
Claims priority, application Italy, Sep. 30, 1986, 53895/86 [U]
Int. Cl.[4] B62J *6/00*
U.S. Cl. 340—432 **3 Claims**

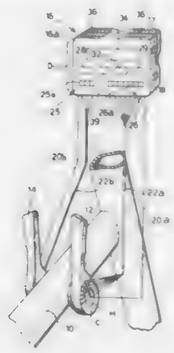
1. A device for displaying gear parameters of a bicycle, including a driving chain engageable selectively with a series of sprockets connected to the hub of the wheel in order to obtain different gear ratios and a member for controlling the lateral movement of the chain from one sprocket to another, said device further comprisng:

(a) sensor means for detecting the position of the control member;

(b) display means connected to the sensor means and able to supply a signal indicative of the ratio engaged;

(c) said display means displaying the number of teeth of a

particular sprocket of said series of sprockets with which the chain is engaged; and



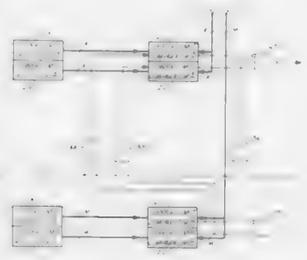
(d) wherein said display means supplies the value of the distance covered by each push on a pedal.

4,859,985

RECONFIGURABLE PARAMETER FILTER HAVING FILTER SECTIONS SELECTIVELY OPERATING INDEPENDENTLY ON RESPECTIVE LOW PRECISION BINARY NUMBERS OR TOGETHER ON A HIGHER PRECISION BINARY NUMBER

Robert J. Inkol, Gloucester, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Oct. 20, 1987, Ser. No. 110,272
Claims priority, application Canada, Dec. 23, 1986, 526132
Int. Cl.[4] G06F 7/02
U.S. Cl. 340—146.2 3 Claims



1. A reconfigurable parameter filter comprising:

first and second filter sections respectively supplied with first and second binary numbers, each filter section comprising:

an upper limit storage register for storing an upper limit binary number;

a lower limit storage register for storing a lower limit binary number;

an upper limit comparator having one input for receiving an upper limit binary number stored in said upper limit storage register and another input for receiving one of said first and second binary numbers;

a lower limit comparator having one input for receiving a lower limit binary number stored in said lower limit storage register and another input for receiving the same one of said first and second binary numbers, which is received by the upper limit comparator; and,

an output AND gate having inputs for respectively receiving comparison outputs of said upper and lower limit comparators, one of said comparison outputs being inverted, said output AND gate providing an output signal if the one of said first and second binary numbers supplied to said upper and lower limit comparators is within a comparison window set by the binary numbers stored by said upper and lower limit storage registers;

the upper and lower limit comparators of said first filter section receiving said first binary number and the upper and lower limit comparators of said second filter section receiving said second binary number; and,

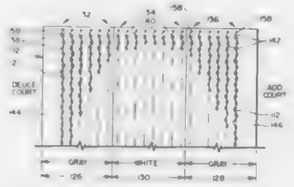
means for selectively interconnecting said first and second filter sections in response to a mode control signal by coupling the respective comparison outputs of the upper and lower limit comparators of one filter section to respective expansion inputs of the upper and lower limit comparators of the other filter section so that, when interconnected, said first and second binary numbers are processed by said first and second filter sections as portions of a single high precision binary number and, when not interconnected, said first and second binary numbers are separately processed as independent binary numbers by said first and second filter sections.

4,859,986

OBJECT TOUCHDOWN AND NET CONTACT DETECTION SYSTEMS AND GAME APPARATUS EMPLOYING SAME

John A. Van Auken, 16 LaGorce Cir., Miami Beach, Fla. 33141, and M. Gene Kaufman, 6771 Southwest 76th Ter., South Miami, Fla. 33143

Filed Sep. 24, 1987, Ser. No. 100,712
Int. Cl.[4] G08B 23/00; A63B 61/00
U.S. Cl. 340—323 R 20 Claims



19. A component which can be applied to a playing surface to provide a network of parallel, spaced apart conductors on said surface, said component comprising an open mesh substrate having electrically nonconductive warp and woof filaments bonded together at the intersections of the filaments and conductors lying parallel to said warp filaments, each of said conductors being trained over and under successive woof filaments to thereby secure the conductor to the mesh and said conductors being wires fabricated from an electrically conductive metal.

4,859,987

APPARATUS AND METHOD FOR MONITORING LIQUID LEVELS

James A. Markus, Stamford, Conn., assignor to Casco Products Corporation, Bridgeport, Conn.

Filed Dec. 11, 1987, Ser. No. 131,907
Int. Cl.[4] B60Q 9/00
U.S. Cl. 340—450 14 Claims

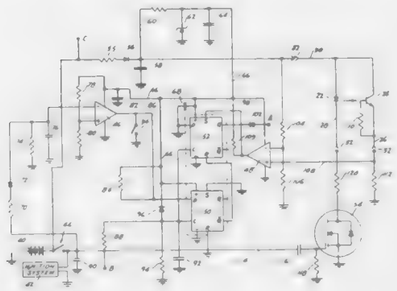
1. Apparatus for indicating the level of liquid in a liquid-containing vessel of an internal combustion engine of a vehicle, comprising in combination:

(a) an electro-responsive device which when excited emits a beam of radiant energy, said device being adapted for disposition in the liquid contained in said vessel,

(b) a transducer coupled with said electro-responsive device and responsive to said beam of radiant energy,

(c) a source of electricity for said electro-responsive device,

(d) means for producing a pulse to excite said electro-responsive device from said source of electricity, said pulse having a magnitude in excess of the steady-state current rating of said electro-responsive device but being of a duration which is insufficient to damage said device, and



(e) a switch and electrical circuitry, said switch being actuated in conjunction with operation of said engine, said switch being connected to effect energization of said means for producing said pulse from said source of electricity during the time that it is actuated,

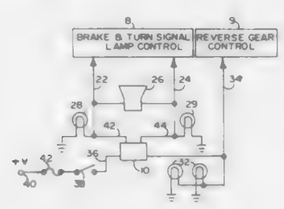
(f) said pulse-producing means comprising an RC network and a solid state switching device, said RC network being connected between said switch and said solid state switching device, and said solid state switching device being connected with said electro-responsive device.

4,859,988

AUTOMOTIVE VEHICLE EXTERIOR LIGHT FLASHING CIRCUIT

Douglas C. Holtvluwer, Jenison, Mich., assignor to Emergency Technology, Inc., Jenison, Mich.

Filed May 19, 1988, Ser. No. 196,485
Int. Cl.[4] B60Q 1/52
U.S. Cl. 340—471 13 Claims



1. A vehicle lighting system comprising:

a first pair of lamps located at laterally spaced apart positions on a rearwardly facing portion of said vehicle, said lamps projecting visible light in a yellow spectrum, a red spectrum or both a red and a yellow spectrum when said lamps are energized;

a second lamp means located on a rearwardly facing portion of said vehicle for projecting visible light in a white spectrum when said second lamp means is energized;

a third lamp positioned laterally between said first pair of lamps on a rearwardly facing portion of said vehicle and projecting visible light in a red spectrum when said third lamp is energized;

first control means selectively operable for energizing said first pair of lamps together and including means for energizing said third lamp;

second control means selectively operable for energizing said second lamp means;

flashing means selectively operable for energizing said first pair of lamps and said third lamp alternatingly with said second lamp means whereby, a hazard warning signal is produced that alternates between red or yellow or both to indicate danger and white to provide superior visibility; and

wherein said third lamp is positioned vertically between said first pair of lamps, forming a triangle with said first pair of lamps.

4,859,989

SECURITY SYSTEM AND SIGNAL CARRYING MEMBER THEREOF

Hugh McPherson, Milnathort, Scotland, assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Dec. 1, 1987, Ser. No. 126,670
Int. Cl.[4] G08B 29/00; H01B 7/00
U.S. Cl. 340—510 11 Claims

1. A signal-carrying member for a security system comprising a core surrounded by means capable of transmitting an electrical signal, an electrically-insulating layer surrounding the core and said means capable of transmitting a signal, and a semi-conductive layer surrounding the insulating layer, the semi-conductive layer incorporating throughout semi-conductive fibres which protrude from the layer when the layer is pierced, the thickness of the insulating layer being substantially less than the length of such protruding fibres whereby piercing of the semi-conductive layer and the insulating layer by an object entering from outside and moving towards the core will cause semi-conductive fibres from the semi-conductive layer to form an electrical conductive path between the semi-conductive layer and said means capable of transmitting a signal.

4,859,990

ELECTRICALLY PROGRAMMABLE TRANSCEIVER SECURITY SYSTEM AND INTEGRATED CIRCUIT

Marvin Isaacman, Los Angeles, Calif., assignor to Linear Corporation, Carlsbad, Calif.

Filed Apr. 15, 1987, Ser. No. 39,577
Int. Cl.[4] G08B 1/08; H04Q 7/00
U.S. Cl. 340—539 20 Claims



1. An electrically programmable security system comprising:

(a) a receiver responsive to particular radio frequency signals which include a predetermined digital code encoded on the radio frequency signal, said receiver having an antenna for receiving said particular radio frequency signals and said receiver generating a control signal upon detecting the presence of the encoded radio frequency signal, said receiver including means for digitally communicating said predetermined digital code on a coaxial wire communication link, the coaxial wire having a shield which also serves as said antenna; and

(b) a transmitter including means for storing a digital code, said transmitter including means for generating a radio

frequency signal at a radio frequency to which said receiver is responsive, the radio frequency signal generated by said transmitter being encoded with the digital code stored in said means for storing, said transmitter further including means for coupling with said coaxial wire communication link and means for inputting the predetermined digital code from said receiver unit communicated on said coaxial wire communication link into said means for storing when said communication link is coupled to said coupling means.

4,859,991

ELECTRONIC ARTICLE SURVEILLANCE SYSTEM EMPLOYING TIME DOMAIN AND/OR FREQUENCY DOMAIN ANALYSIS AND COMPUTERIZED OPERATION

Harry E. Watkins, Boca Raton; Brent F. Balch, Ft. Lauderdale; Jeffery T. Oakes, Deerfield Beach; Richard L. Copeland; Hubert A. Patterson, both of Boca Raton, and Mart Martinson, Deerfield Beach, all of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Aug. 28, 1987, Ser. No. 91,052
Int. Cl.[4] G08B *13/24*
U.S. Cl. 340—572 **38 Claims**



1. A surveillance system for detecting the presence of articles containing magnetic markers in an interrogation zone comprising: transmitting means for establishing a magnetic field at a preselected frequency in the interrogation zone; receiving means for sensing perturbations to the magnetic field in the zone and developing a signal indicative thereof, said receiving means including means for developing a signal content profile indicative of the energy levels in each of a plurality of frequency bands of said signal; and means responsive to said signal content profile for comparing the energy levels indicated by said signal content profile for use in evaluating whether an article is present in said zone.

4,859,992

ELECTROSTATIC SYSTEM MONITOR AND METHOD THEREFOR

Jan C. Hoigaard, 5940 Flintridge Dr., Colorado Springs, Colo. 80918

Continuation of Ser. No. 568,604, Jan. 6, 1984, Pat. No. 4,649,374. This application Dec. 11, 1986, Ser. No. 940,266
The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—649 **8 Claims**

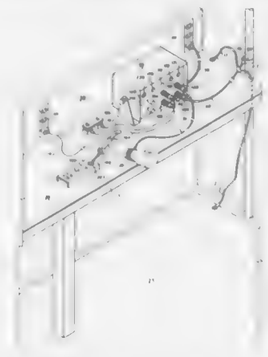
1. An electrostatic ground impedance monitoring system for monitoring the operation of static control equipment located at a user's workstation, said system comprising:

means for providing an earth ground,

said static control equipment being connected only to said earth ground providing means for removing electrostatic voltage on said static control equipment to said earth ground,

means for providing a separate electrical power ground,

means connected to said earth ground providing means and



to said electrical power ground providing means for continuously sensing the low impedance continuity between said earth ground and said electrical power ground, said sensing means being capable of issuing a loss-of-continuity signal in the event said low impedance exceeds a predetermined resistance value, and

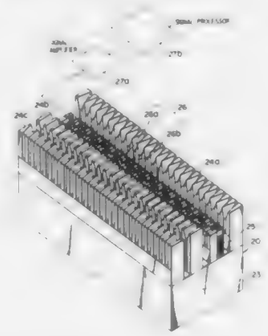
means receptive of said loss-of-continuity signal from said sensing means for indicating when said loss-of-continuity has occurred between said earth ground providing means and said electrical power ground providing means.

4,859,993

WAFER ACCOUNTING AND PROCESSING SYSTEM

Toshihiko Kagami, Kofu; Kazuyoshi Kobayashi, Yamanashi; Eiji Asakawa, Yamanashi; Atushi Osada, Yamanashi; Kozo Hara, Yamanashi, and Yasuji Abe, Yamanashi, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed Feb. 12, 1988, Ser. No. 155,518
Claims priority, application Japan, Feb. 13, 1987, 62-31048
Int. Cl.[4] G08C *21/00*; G01B *11/14*
U.S. Cl. 340—674 **13 Claims**



1. A wafer accounting and processing system, comprising:

plural wafer guides spaced apart from each other formed within a cassette to engage with edges of wafers each aligned at a predetermined pitch;

plural detecting element pairs, each detecting element pair consisting of a light-emitting element and a light-receiving element also formed within said cassette in cooperation with said plural wafer guides such that an optical path is shielded when said wafer is engaged with a corresponding wafer guide; and

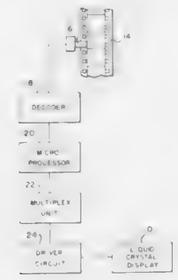
a signal processor electrically connected to said detecting element pair, said signal processor being adapted to detect the presence or absence of a wafer.

4,859,994

CLOSED-CAPTIONED MOVIE SUBTITLE SYSTEM

Malcolm Zola; Marcia Zola, and Daniel Zola, all of 56 Woodland Rd., Roslyn, N.Y. 11576

Filed Oct. 26, 1987, Ser. No. 112,665
Int. Cl.[4] G02B *27/02*
U.S. Cl. 340—705 **10 Claims**



1. An apparatus for displaying movie subtitles in closed caption from independently of the screen displaying the visual images comprising:

a liquid crystal capable of forming alphanumeric images in plane polarized light on a cross-polarized background;

decoding means capable of reading and transmitting coded dialogue information on standard movie films;

a microprocessor coupled to said decoding means and capable of producing a dialogue output based on input information provided by said decoder;

a means for driving said liquid crystal display in response to said output of said microprocessor to thereby display appropriate subtitles formed by said liquid crystal display; and,

a polarizing material provided to selected viewers to enable said viewers to distinguish said alphanumeric subtitles from said liquid crystal display background, said polarizing material to be placed over the eye and is generally cross-polarized with respect to one of said plane polarized alpha-numeric images or said cross-polarized background.

4,859,995

MOUSE POINTER WITH SWITCHABLE EMULATION MODE

Ronald D. Hansen, Fremont; Clayton W. Mock, Mountain View, and Abdo G. Kadifa, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 30, 1987, Ser. No. 68,604
Int. Cl.[4] G09G *3/02*
U.S. Cl. 340—710 **22 Claims**

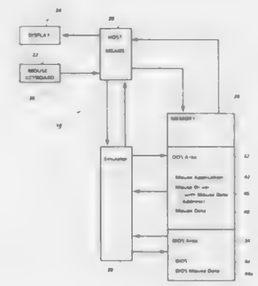
1. A system comprising:

first means for providing a first image for display, the

first means being operable to perform pointer control within the first image;

second means for providing a second image for display, the second means being operable to perform pointer control within the second image; the second means being responsive to the first means to include the first image as a part of the second image; and

input means for receiving signals from a user, the signals from the user including a switch request signal, the input means providing the switch request signal to the second means;



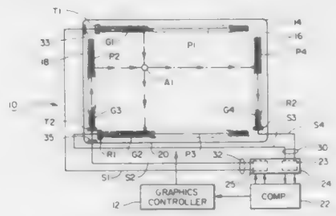
the second means further being for switching in response to the switch request signal between a first mode in which the first means performs pointer control and a second mode in which the second means performs pointer control.

4,859,996

TOUCH CONTROL ARRANGEMENT FOR GRAPHICS DISPLAY APPARATUS

Robert Adler, Northfield; Mark Fogelson, Wilmette, both of Ill., and Sam Kaplan, Deerfield Beach, Fla., assignors to Zenith Electronics Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 698,306, Feb. 5, 1985, Pat. No. 4,700,176. This application Jan. 20, 1987, Ser. No. 4,740
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—712 **6 Claims**



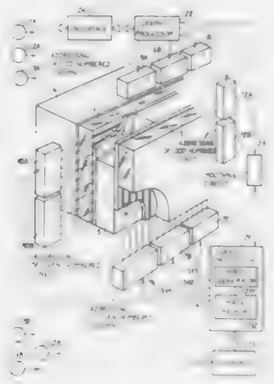
2. A display device comprising an image viewing surface and at least one raised SAW-reflecting element formed of a frit composition and secured to said surface.

4,859,997

DISPLAY SYSTEM FOR DISPLAYING ESSENTIAL DATA BY SEPARATELY HANDLING DIFFERENT PARTS OF THE IMAGE TO MAXIMIZE RELIABILITY

Jean P. Bouron, Ville d'Avray; Daniel Giroux, Saint Germain les Corbeil, and Pierre Rousseau, Bordeaux, all of France, assignors to Thomson-CSF, Paris, France

Filed Dec. 14, 1987, Ser. No. 132,563
Claims priority, application France, Dec. 16, 1986, 8617575
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—752 8 Claims



1. A display system for data presentation on a matrix type flat panel comprising:

a display device of a matrix type flat panel and having matrix addressing means to obtain an image resulting from even parts of the image and odd parts of the image interlaced with each other, said matrix addressing means comprising four groups of circuits which respectively address even-numbered lines and even-numbered columns forming said even parts of the image and odd-numbered lines and odd-numbered columns forming said odd parts of the image;

graphic processor means for preparing video signals for display by addressing columns and applying scanning signals to the lines, wherein the graphic processor means are divided into two sub-groups, a first sub-group pertaining to preparation of said even parts of the image and a second sub-group pertaining to preparation of said odd parts of the image.

4,859,998

APPARATUS AND METHOD FOR DRIVING SIGNAL ELECTRODES FOR LIQUID CRYSTAL DISPLAY DEVICES

Masao Kawamura, 205 Daiichi-Kitajima-So, 4993 Yabo, Kunitachi-shi, Tokyo, and Minoru Usui, 201 Satsuki-Corpo, 2-2-4, Asahi-cho, Akishima-shi, Tokyo, both of Japan

Continuation of Ser. No. 907,679, Sep. 15, 1986, abandoned. This application Jun. 14, 1988, Ser. No. 207,020
Claims priority, application Japan, Sep. 27, 1985, 60-213746
Int. Cl.[4] G09G *3/36*
U.S. Cl. 340—784 3 Claims

1. An image display device including a signal electrode drive apparatus, comprising:

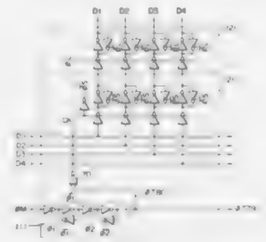
(a) A/D converter means for sampling a video signal m times in accordance with a sampling clock within a period of an effective horizontal display and converting said video signal to n-bit digital data, where m is an integer;

(b) latch circuit means including m stages of shift registers and m buffer registers;

(c) one shift register in each stage for successively shifting a latch pulse in synchronism with reference clocks, to generate m latch clocks with different phases, and each of said buffer register being adapted for latching in parallel fashion said digital n-bit video data in synchronism with said latch clocks output from said shift registers, the buffer registers of each stage being coupled to receive said digital n-bit video data;

(d) intensity modulation pulse generating circuit means for generating n kinds of intensity modulation pulses;

(e) m-stage logic circuit means arranged to receive said n kinds of intensity modulation pulses from said pulse generating circuit and said n-bit digital data from said buffer circuit, said logic circuit means producing gradation signals having 2^n kinds of pulse widths corresponding to said digital data;



(f) voltage selecting circuit means for decoding said gradation signals from said logic circuit means and for producing an output signal that varies with said gradation signals; and

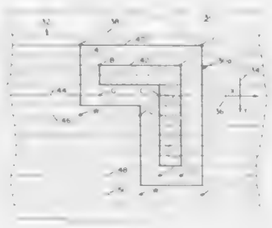
(g) dot matrix liquid crystal display panel means of the twist nematic type and including a signal electrode arranged to be driven in response to an output signal from said voltage selecting circuit.

4,859,999

PATTERN-BOUNDARY IMAGE GENERATION SYSTEM AND METHOD

Dusan A. Koso, Cambridge, Mass., assignor to Gerber Scientific Instrument Company, Inc., South Windsor, Conn.

Filed Jul. 21, 1986, Ser. No. 887,652
Int. Cl.[4] G01B *11/24*
U.S. Cl. 340—799 20 Claims



1. A system for rapidly generating an image of a pattern in successive lines, each line being formed of a plurality of pixels, in which each pixel is represented by a pixel value, said system comprising:

means for storing the pixel values of a previously generated line;

means for producing one or more replacement pixel values;

output means for providing successively generated lines of the image;

control means for selectively delivering output of said means for storing and said means for producing to said output means in accordance with commands defining the boundaries of the pattern to generate the successive lines of the image; and

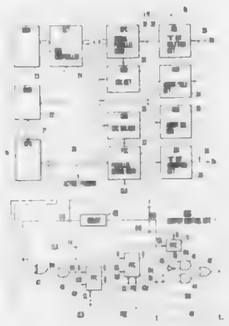
means for updating said means for storing with the replacement pixel values from said means for producing.

4,860,000

DATA TRANSMISSION SYSTEM USING SENDING RIGHT REQUEST SIGNAL TRANSFERRED THROUGH LOOP TRANSMISSION PATH

Koji Kobayashi, Kanagawa, Japan, assignor to Yamatake-Honewell Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 922,281, Oct. 23, 1986, abandoned. This application Nov. 4, 1988, Ser. No. 270,457
Claims priority, application Japan, Oct. 25, 1985, 60-237606; Jun. 10, 1986, 61-132625; Jun. 10, 1986, 61-132626; Jun. 10, 1986, 61-132627; Jun. 10, 1986, 61-132628
Int. Cl.[4] H04Q *9/00*; G06F *13/00*; H04J *3/06*
U.S. Cl. 340—825.5 15 Claims



1. In a data transmission system comprising a unidirectional loop transmission path to which a plurality of communication equipments are coupled, each communication equipment operating to relay and send a signal including a data signal received from other communication equipment located upstream to those located downstream via said transmission path, an arbitrary communication equipment which operates to request a sending right via a sending right request signal and adds a code indicating a priority level of said sending right to the sending right request signal and sends said sending right request signal to which said priority level code has been added;

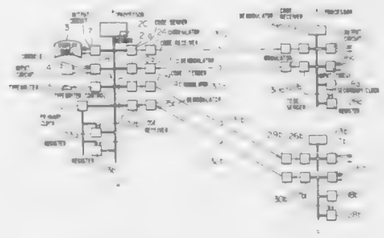
the improvement wherein each communication equipment includes circuit means which receives the sending right request signal and starts resending said sending right request signal before the reception of the last bit of said sending right request signal is completed, and wherein each arbitrary communication equipment requesting said sending right activates its said circuit means and said circuit means operates to compare the received priority level code with the priority level code of said arbitrary communication equipment itself to send said sending right request signal, including said priority level code of said arbitrary communication equipment itself, instead of said sending right request signal including said received priority level code, when the priority level of said code of said communication equipment itself is higher than that of the code of said received signal.

4,860,001

REMOTE MONITORING AND CONTROLLING SYSTEM

Torao Yamanaka, and Takeshi Kawahara, both of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 14, 1987, Ser. No. 108,079
Claims priority, application Japan, Mar. 2, 1987, 62-45267
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.200 3 Claims



1. In a remote monitoring and controlling system having a master station including a primary clock and a plurality of slave stations each having a respective secondary clock, the master and slave stations exchanging coded time information in information frames of fixed duration, in which the respective slave stations monitor the status of various conditions and report to the master station changes in status, and the times of status changes, of the monitored conditions, and the reported changes in status from the various slave stations are placed in time sequence by the master station, a method for determining a time correction for each of said secondary clocks relative to said primary clock comprising:

sending a clock time inquiry command from said master station to each of said slave stations;

receiving from each respective slave station coded time information including (i) a time reading of said secondary clock of the respective slave station, and (ii) a time interval that elapses between the reading of said secondary clock time and the sending of said coded time information by the respective slave station;

storing in said master station a transmission delay time that elapses between the sending of the coded time information from the respective slave station and the reception of the coded time information at said master station, the duration of one of the frames of information, the time reading of said primary clock when reception of said coded time information from the respective slave station by the master station is completed, and said coded time information; and

calculating, from the stored transmission delay time, the time readings of said primary and respective secondary clocks, and the time interval, a time correction for each respective secondary clock relative to said primary clock whereby the reported changes in status can be placed in an accurate time sequence by said master station.

4,860,007

LOCK SYSTEM FOR OPENING COVER MEMBER OF VEHICLE

Tomoaki Imaizumi, Aichi; Taneichi Kawai; Kouji Nishida, both of Anjo, and Yuuichi Murakami, Tokyo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 27,476, Mar. 18, 1987, abandoned. This application Dec. 8, 1988, Ser. No. 281,601
Claims priority, application Japan, Mar. 18, 1986, 61-60068; Mar. 18, 1986, 61-60069
Int. Cl.[4] G06F *7/04*
U.S. Cl. 340—825.310 22 Claims

1. A lock system for a cover member that covers an opening in a vehicle, comprising:

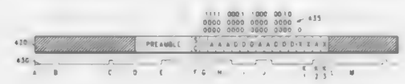
a lock mechanism capable of locking the cover member;
a driver means which, when energized, causes the lock mechanism to unlock the cover member;
an electrical driver for energizing the driver means;
a manually operated handle for opening the cover member;
a detector means for detecting the operation of the handle;
a key code-generating means for producing a signal containing information on a certain key code;
a key code-detecting means which is installed on the vehicle, receives the signal containing the information on the key code, and detects the key code;
a storage means in which a key code is stored;
a comparator means for comparing the key code detected by the detector means with the key code stored in the storage [illegible]
a timer means; and
a control means which, when the comparator means indicates the coincidence between the two key codes, starts the timer means and which actuates the driver means when the detector means detects the operation of the handle before the timer means generates a timeout signal.

4,860,003

COMMUNICATION SYSTEM HAVING A PACKET STRUCTURE FIELD

Joan S. DeLuca; Michael J. DeLuca, both of Boca Raton, and George B. Shea, Lake Worth, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 27, 1988, Ser. No. 199,732
Int. Cl.[4] H04Q *7/00*
U.S. Cl. 340—825.440 **39 Claims**



1. A method for sending an information packet having at least one portion, a packet structure field and an at least one message having an address and information associated with the address, the packet structure field having an identifying means for identifying the occurrence of the at least one address within the information packet, said method comprising the steps of:
(a) accumulating at least one message for selective call receivers and locating the message accumulation within the portion of the information packet;
(b) positioning the packet structure field within the portion of the information packet;
(c) determining the location of addresses within the portion of information packet;
(d) generating the identifying means in correspondence to the determination of step (c)
(e) incorporating the identifying means within the positioning of the packet structure field; and
(f) transmitting the portion of the information packet.

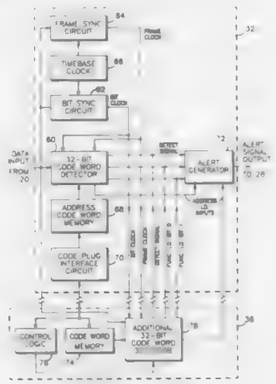
4,860,004

DIGITAL SELECTIVE CALLING RECEIVER HAVING A SELECTIVELY ATTACHABLE DEVICE FOR MULTIPLE INDEPENDENT ADDRESS DECODING CAPABILITY

Walter L. Davis, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 4, 1988, Ser. No. 140,455
Int. Cl.[4] H04Q *7/00;* **G08B** *5/22*
U.S. Cl. 340—825.440 **8 Claims**

1. In a digital selective call receiver including a receiver circuit for receiving transmitted signals, and a decoder for decoding said received signals, said decoder comprising: a memory containing a digital sequence corresponding to one address of the receiver; means for generating bit and frame synchronization signals; a comparator coupled to the receiver circuit and memory and governed by the bit and frame synchronization signals to determine correspondence between the receiver signals and the digital sequence stored in said memory; and annunciator responsive to the comparator for alerting the user of such correspondence which is indicative of the reception of a selective call message, a selectively attachable additional independent address decoding device comprising:
additional memory means containing at least one additional independent digital sequence address; and
additional decoder means operative in parallel with said decoder for independently decoding received signals including



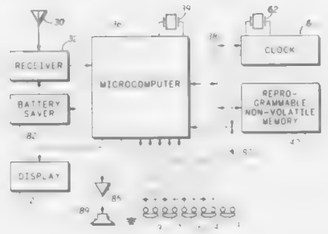
additional comparator means coupled between the receiver circuit and said additional memory means, and governed by the bit and frame synchronization signals of the decoder to determine correspondence between the received signals and the additional independent digital sequence address, and for providing a separate signal to the annunciator for alerting the user of such correspondence which is indicative of the reception of a selective call message corresponding to the at least one additional independent digital sequence address.

4,860,005

COMMUNICATION RECEIVER WITH AUTOMATIC TURN ON/OFF

Joan S. DeLuca, and Randi L. Dulaney, both of Boca Raton, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 7, 1988, Ser. No. 141,458
Int. Cl.[4] H04Q *7/02;* **H04B** *1/16*
U.S. Cl. 340—825.440 **26 Claims**



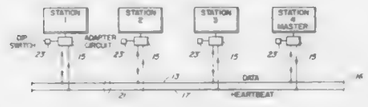
1. A multistate selective call receiver capable of receiving and processing modulated information in a high power consumption state of power on or in an alternative, inhibiting the receiving and processing of the modulated information, thereby operating in a lower power consumption state of power off, the power on and power off consumption state selection being dependent upon time of day, said receiver comprising;
timekeeping means for generating a time signal including time of may information;
memory means for storing at least one power on time and at least one power off time, both including time of day information;
comparison means coupled to said timekeeping means and the memory means for generating a power on request signal, wherein the power on request signal is generated when the time signal equals any of the power on times and the power on request signal is terminated only when the time signal equals any of the power off times;
power control means for providing operating power solely in response to the presence of the power on request signal; [illegible]
receiving means responsive to the operating power and coupled to the power control means for receiving and processing modulated information.

4,860,006

HEARTBEAT COLLISION AVOIDANCE METHOD AND CIRCUIT

Michael Barall, 896 Middle Ave., Apt. #4, Menlo Park, Calif. [illegible]

Continuation of Ser. No. 871,460, Jun. 5, 1986, abandoned. This application Nov. 21, 1988, Ser. No. 274,655
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.500 **24 Claims**



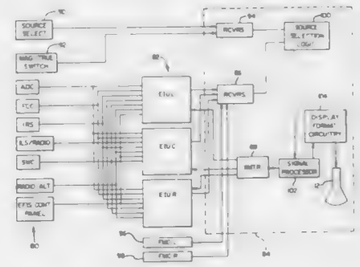
12. An adapter circuit for regulating access of a host station to a network of stations interconnected by two communication paths defined as a data communications path for conducting network data signals and heartbeat communications path for conducting a heartbeat signal and wherein each station of said network is given a unique preassigned station address, and wherein the end of the data signal transmission of said network stations is a random event independent of said heartbeat signal, said adapter circuit comprising
means for detecting the end of a data signal transmission on said data communications path,
means for detecting a heartbeat signal on said heartbeat communications path,
means for allocating transmission slot times for said host station in reference to both said network heartbeat signal and the station address of said host station, and
means for enabling said host station to begin transmitting data on said data communications path only at slot times allocated to said station provided the following data signal collision avoidance condition exists; there is no data signal transmission on said data communication path by other stations of said network and there has been a minimum time interval defined as the interframe spacing time between a given slot time and the end of a previous at a transmission on said data communications path.

4,860,007

INTEGRATED PRIMARY FLIGHT DISPLAY

Michael L. Konicke, Everett; James E. Veiteagruber, Bellevue, and James G. Loesch, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 15, 1988, Ser. No. 144,512
Int. Cl.[4] G01C *23/00*
U.S. Cl. 340—173 **12 Claims**



1. A primary flight display for an aircraft, comprising:
means defining a display field including a central attitude director indicator,
a vertically disposed, movable altitude scale on a first side of said central attitude director indicator, including a relatively fixed pointer provided with a window for digital display, and means responsive to the altitude of said aircraft for moving said scale relative to said pointer and generating said digital display indicating the altitude of said aircraft, wherein said scale is adjacent said central attitude director indicator and said pointer points toward said scale and said attitude director indicator,
a vertically disposed, movable air speed scale on a second side of said central attitude display indicator opposite said first side, including a second relatively fixed pointer provided with a second window for digital display, and means responsive to the air speed of said aircraft for moving said air speed scale relative to said second pointer and generating said digital display for said second window indicating the air speed of said aircraft, wherein said air speed scale is adjacent said central attitude director indicator and said second pointer points toward said air speed scale and said attitude director indicator,
a movable, arcuate heading scale adjacent and below said attitude director indicator, including a third relatively fixed pointer provided with a third window for digital display, and means responsive to the heading of said aircraft for moving said heading scale relative to said third pointer and generating said digital display for said third window indicating the heading of said aircraft, wherein said heading scale is adjacent said central attitude director indicator and said third pointer points toward said heading scale and said attitude director indicator, and
a relatively fixed vertical speed scale on said first side of said central attitude display indicator adjacent said altitude scale and on the remote side of said altitude scale from said central attitude director indicator, including a fourth relatively movable pointer directed radially toward both said vertical speed scale and said altitude scale from an apparent origin on the remote side of said vertical speed scale from said altitude scale such that said fourth pointer changes radial direction as it moves along said vertical speed scale, and means responsive to the vertical speed of said aircraft for moving said fourth pointer along said vertical speed scale, wherein graduations along said vertical speed scale and said altitude scale are such that said fourth pointer simultaneously points toward a selected altitude and the vertical speed appropriate for attaining the selected altitude.

4,860,008

RADIATION INTERRUPTION KEYBOARD

Claude Battarel, 26120 Chabeuil, France

Filed Apr. 20, 1987, Ser. No. 39,948
Claims priority, application France, Apr. 22, 1986, 86 05774
Int. Cl.[4] G08C *21/00*
U.S. Cl. 341—31 11 Claims



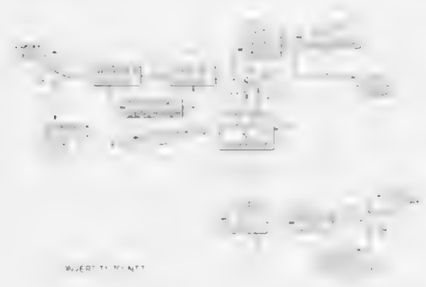
1. A keyboard comprising:
a plurality of keys arranged in columns and rows of keys;
a respective radiation emitter for each column of keys; each said emitter being arranged in a respective hollow longitudinally extending channel corresponding to a column of keys;
a respective radiation receiver for each row of keys;
a plurality of deflection surfaces, each being disposed at an intersection of a column and a row for deflecting radiation from the corresponding emitter of the column to the corresponding receiver of the row;
means associated with and controlled by each key for interrupting radiation from a corresponding emitter, each said interrupting means being in a direct unreflected light propagation path from a respective emitter thorough a respective longitudinally extending hollow channel, each deflecting surface also being disposed in said direct unreflected light propagation path and being located downstream of an associated interrupting means, and
means for operating said emitters to generate radiation therefrom sequentially and cyclically.

4,860,009

BIDIRECTIONAL MULTIFRAME CONVERTER FOR DATA COMMUNICATIONS SYSTEMS

Dorian LaRowe, St. Petersburg, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Feb. 12, 1988, Ser. No. 155,226
Int. Cl.[4] H03M *5/00*
U.S. Cl. 341—73 6 Claims



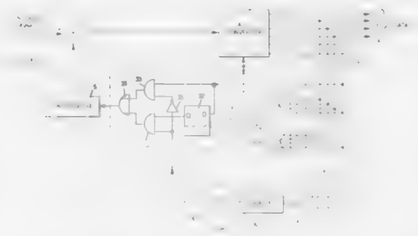
1. A converter for converting AMI encoded data signals of a first interface into CMI encoded data signals of a second interface, said converter comprising:
a receiver logic circuit for converting signals from a device operating under said first interface to said CMI encoded signals of said second interface;
means for converting said AMI encoded signals of said first interface to standard bilevel digital signals;
means for adding sync bits to said standard bilevel digital signals;
means for converting said standard bilevel digital signals to said CMI encoded signals of said second interface; and
driver logic for converting said CMI encoded signals of said second interface into signals to be transmitted on a network operating under said second interface.

4,860,010

AUTOMATIC DRIFT CONTROL CIRCUIT

Takanori Iwamatsu, Otawara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 29, 1987, Ser. No. 66,960
Claims priority, application Japan, Jun. 27, 1986, 61-149616
Int. Cl.[4] H03K *13/02;* H03M *1/06*
U.S. Cl. 341—118 9 Claims



1. An automatic drift control circuit for automatically correcting a received multi-level demodulated input signal in accordance with a drift control feedback signal, said control circuit comprising:
an adding circuit adding the drift control feedback signal to the received multi-level input signal to provide an added multi-level signal;
an A/D converter operatively connected to said adding circuit, providing said added multi-level signal as parallel digital output data corresponding to decision levels having ranges;
a monitoring circuit operatively connected to said A/D converter, detecting a decision level condition based on said digital output data and providing a corresponding decision condition signal;
an error signal selecting circuit operatively connected to said A/D converter and said monitoring circuit, selecting and providing an error signal when said added multi-level signal is greater than a highest range of the decision levels and when said added multi-level signal is less than a lowest range of the decision levels, in accordance with said decision level condition signal; and
a first integrator operatively connected to said error signal selecting circuit and said adding circuit, integrating said error signal and providing an integrated error signal as the drift control feedback signal to said adding circuit.

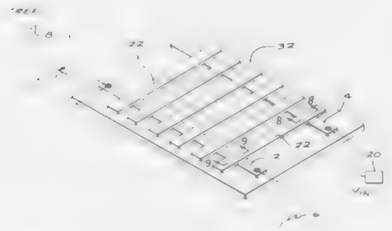
4,860,011

FLASH ANALOG-TO-DIGITAL CONVERTER

Joseph H. Colles, Oceanside, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Oct. 27, 1986, Ser. No. 923,632
Int. Cl.[4] H03M *1/36*
U.S. Cl. 341—133 21 Claims

1. In combination in a flash converter,
an integrated circuit chip,
a first ion-implanted line disposed on the integrated circuit chip and constructed to provide a substantially constant voltage at every position on the line,
means for introducing an input voltage to the first line,
a second ion-implanted line disposed on the integrated circuit chip and constructed to provide progressive voltages at progressive positions on the line,
means for introducing first and second reference voltages to opposite ends of the second line to produce a reference voltage of progressive values at progressive positions on the line,
a plurality of ion-implanted bridging layers each disposed between the first and second lines at a progressively spaced position along the lines relative to the disposition of the other bridging layers along the lines, each of he bridging layers being constructed to provide a substantially constant voltage at every position on the bridging layer,
means for introducing an energizing voltage to the bridging layers,
each of the bridging layers being disposed in insulating relationship to the first and second lines, and
means responsive to the energizing voltage on each bridging layer for comparing the input voltage on the first line with the reference voltage on the second line at the position of the bridging layer to determine the bridging layer at which the voltages on the first and second lines are substantially equal.

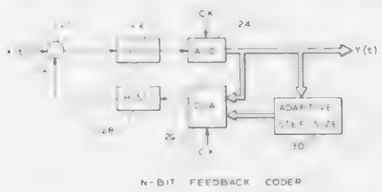


4,860,012

INTEGRATED ANALOG-TO-DIGITAL CONVERTER

David Rich, Woodmere, and Peter Staley, Kings Park, both of N.Y., assignors to Microchip Technology Incorporated, Chandler, Ariz.

Division of Ser. No. 829,624, Feb. 14, 1986. This application Jun. 22, 1987, Ser. No. 65,263
Int. Cl.[4] H03M *3/02*
U.S. Cl. 341—143 33 Claims



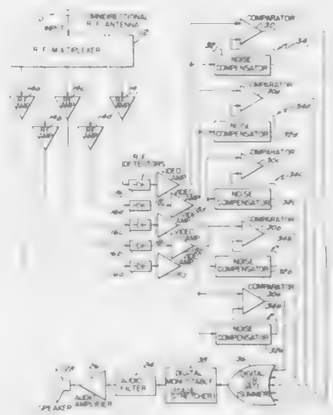
1. A feedback coder comprising summation means having first and second inputs and an output, said first input of said summation means receiving an analog signal to be coded, first filter means having an input operably connected to said output of said summation means, analog-to-digital conversion means having an input operably connected to said first filter means and an output, second filter means operably connected between said output of said analog-to-digital conversion means and said second input of said summation means, digital-to-analog conversion means operably connected between said output of said analog-to-digital conversion means and said second filter means, the output of said analog-to-digital conversion means forming the coder output, each of said filter means comprising CMOS push/pull amplification means.

4,860,013

AUTOMATIC THRESHOLDING MULTICHANNEL DIGITAL RADAR EARLY WARNING SYSTEM

William P. Huntley, Old Lyme, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 4, 1988, Ser. No. 176,958
Int. Cl.[4] G01S *7/40*
U.S. Cl. 342—20 5 Claims



1. An automatic thresholding multichannel digital radar early warning system comprising:
an antenna system for receiving signals over a range of frequencies;
RF multiplexer and processing means connected to said antenna system for receiving said signals over said range of frequencies and for providing a plurality of output signals over separate paths, with each output signal having a discrete frequency band within said range of frequencies;
a plurality of noise riding threshold means with each of said noise riding threshold means connected for receiving said output signals respectively over said separate paths from said RF multiplexer and processing means, each of said noise riding threshold circuit means having generating means for providing a DC voltage proportional to the noise within said received signal, and each of said noise riding threshold means for providing an output signal when the received signal from said RF multiplexer and processing means exceeds said DC voltage;
an OR gate having separate input lines connected to receive respective outputs from said noise riding threshold circuits for providing an output signal upon receipt of a signal from any of said noise riding threshold circuits that indicate the noise riding threshold circuit received a signal containing radar emission pulses; and
indication means connected to the output of said OR gate for providing a signal when said OR gate indicates one of said noise riding threshold circuits received a signal containing pulses other than noise.

4,860,014

DOPPLER RADAR WITH MULTIPHASE MODULATION OF TRANSMITTED AND REFLECTED SIGNAL

Paul W. Shores, Houston; John W. Griffin, Pearland, and Herbert S. Kobayashi, Webster, all of Tex., assignors to The United State of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 25, 1987, Ser. No. 125,677
Int. Cl.[4] G01S *13/58*
U.S. Cl. 342—105 **20 Claims**



1. A doppler radar system for measuring range rate and sense, comprising:

first oscillator means for generating a microwave signal;

circulator means having an input port for receiving said microwave signal, an input-output port for outputting a first portion of said microwave signal and for receiving a phase modulated return microwave signal, and an output port for outputting an unmodulated second portion of said microwave signal and said phase modulated return microwave signal;

antenna means for transmitting a transmitted microwave signal and receiving a return microwave signal;

phase shifting means for receiving said first portion of said microwave signal, phase modulating said first portion of said signal with a first plurality of phase shifts characterized by a phase shift rate, and outputting said phase modulated first portion of said signal to said antenna means as said transmitted signal, and also for receiving said return signal, further phase modulating said return signal with a second plurality of phase shifts also characterized by a phase shift rate to generate said phase modulated return signal, and outputting said phase modulated return signal to said input-output port of said circulator;

mixer means for mixing said unmodulated second portion of said signal and said phase modulated return signal to form an i.f. signal functionally related to said range rate and [illegible]

amplifier means for providing an amplified output of said i.f. signal;

filter means for filtering said amplified i.f. signal to generate a filtered i.f. output signal; and

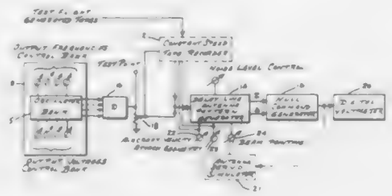
second oscillator means generating an oscillator output for controlling said first and said second phase shift rates, whereby said first and said second phase shift rates are related to the range rate and thus to the frequency of the i.f. signal, and whereby the relative frequency of said second oscillator means with respect to said frequency of said i.f. signal is controllable.

4,860,015

DELAY LINE NULL COMMAND GENERATOR TEST SET FOR SARCALM

Eddy Hose, Fullerton, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 29, 1972, Ser. No. 283,128
Int. Cl.[4] G01S *7/40, 13/89*
U.S. Cl. 342—168 **3 Claims**



1. A delay line null command generator test set apparatus for testing a null command generator comprising in combination:

a signal generator having a range of output frequencies, said output frequencies being centered around the center frequency of said null command generator, said output frequencies being tunable in frequency and output voltage, said output frequencies being summed to provide a composite output signal,

a tape recorder having a constant speed, said tape recorder receiving said composite output signal, said tape recorder having the capability of providing pre-recorded flight tapes, said tape recorder being utilized to synthesize a composite test signal,

a delay line antenna pattern generator receiving said composite output signal, said delay line antenna pattern generator utilizes said composite output signal to synthesize the monopulse sum and monopulse difference patterns of the Sarcalm antenna, said delay line antenna pattern generator contaminates said monopulse sum with white noise to provide a first output signal, said delay line antenna pattern generator contaminates said monopulse difference with white noise to provide a second output signal,

a unit under test comprising a null command generator, said null command generator receiving said first and second outputs, said null command generator providing an error signal, and

a digital voltmeter receiving said error signal from said null command generator, said digital voltmeter providing a measurement of the accuracy of said null command generator.

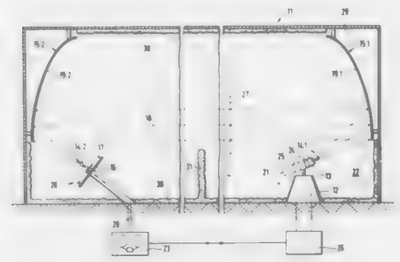
4,860,016

TEST FACILITY, ESPECIALLY FOR THE SEARCH HEAD OF INTELLIGENT GUIDED AMMUNITION

Robert Westphal, Altdorf, and Karl Herrmann, Eckental, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Oct. 14, 1987, Ser. No. 108,780
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637006
Int. Cl.[4] G01S *7/40*; G09B *9/00*
U.S. Cl. 342—169 **8 Claims**

1. A test facility for search heads of intelligent guided ammunition, comprising a target simulator; a turntable with a flight simulator; a search head supported on said turntable, said target simulator including at least one antenna element for radiating a target signature to said search head; and a quasi-opical imaging system including two mutually facing concave reflectors each with an eccentrically located focal point, a coupling being formed between said focal points through parallel beams; said target simulator and said search head each



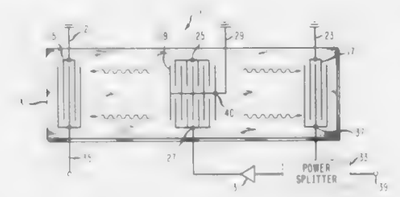
being in at least close proximity with a respective one of said focal points.

4,860,017

SAW CIRCUIT FOR GENERATING CONTINUOUS TIME-COHERENT RF CARRIERS

Thomas W. Grudkowski, Glastonbury, Conn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 5, 1988, Ser. No. 215,138
Int. Cl.[4] H01L *41/08*
U.S. Cl. 342—201 **3 Claims**



1. A device comprising:

a piezoelectric substrate;

first, second and third interdigital transducers, said first and third interdigital transducers each having two sets of parallel interdigitated fingers, said second transducer having four sets of parallel interdigitated fingers, two of said sets of fingers of said second transducer being connected to a common conductive strip;

a power splitter connected to said third interdigital transducer; and

an amplifier connected between said power splitter and said second interdigital transducer whereby an input signal applied to said second interdigital transducer produces first input signal at said first interdigital transducer and a second output signal at said power splitter.

4,860,018

CONTINUOUS WAVE INTERFERENCE REJECTION FOR RECONSTRUCTED CARRIER RECEIVERS

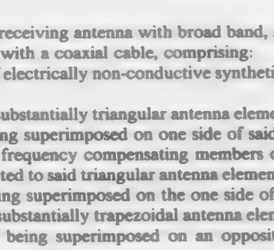
Charles C. Counselman, III, Belmont, Mass., assignor to Western Atlas International, Inc., Houston, Tex.

Continuation of Ser. No. 353,331, Mar. 1, 1982, Pat. No. 4,667,203. This application Aug. 11, 1986, Ser. No. 895,151
Int. Cl.[4] G01S *5/08*; H04B *7/185*
U.S. Cl. 342—357 **80 Claims**

1. A system for deriving position related data from signals modulated by mutually orthogonal, spectrum spreading codes, comprising:

antenna means for receiving a composite of signals including spread spectrum signals and potentially interfering continuous wave components;

filter means for rejecting the continuous wave components related to a selected frequency from the composite;



means for reconstructing at least one continuous wave component related to the selected frequency from the filtered spread spectrum components; and

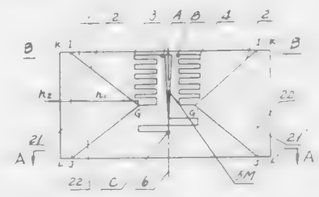
means for deriving said position related data from the reconstructed component.

4,860,019

PLANAR TV RECEIVING ANTENNA WITH BROAD BAND

Ke-zheng Jiang; Deng-ke Ren; Zu-yuan Chen, and Lian-zhen You, all of Shanghai, China, assignors to Shanghai Dong Hai Military Technology Engineering Co., Shanghai, China

Filed Nov. 1, 1988, Ser. No. 265,482
Claims priority, application China, Nov. 16, 1987, CN87211386
Int. Cl.[4] H01Q *1/38, 9/16*
U.S. Cl. 343—795 **10 Claims**



1. A TV receiving antenna with broad band, and capable of connecting with a coaxial cable, comprising:

a sheet of electrically non-conductive synthetic plastic material;

a pair of substantially triangular antenna elements of metallic foil being superimposed on one side of said sheet;

a pair of frequency compensating members of metallic foil connected to said triangular antenna elements respectively and being superimposed on the one side of said sheet;

a pair of substantially trapezoidal antenna elements of metallic foil being superimposed on an opposite side of said sheet;

a pair of frequency compensating members of metallic foil connected to said trapezoidal antenna elements respectively and being superimposed on the opposite side of said sheet;

a first impedance transformer of metallic foil superimposed on the one side of said sheet and being connected to one of the frequency compensating members on the one side of said sheet and to a corresponding frequency compensating member on the opposite side of said sheet; and

a second impedance transformer of metallic foil superimposed on the opposite side of said sheet and being connected to one of the frequency compensating members on

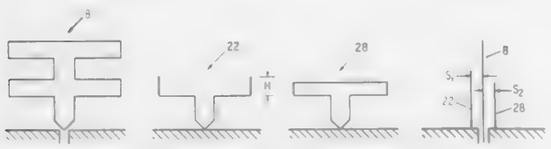
the opposite side of said sheet and to a corresponding frequency compensating member on the one side of said sheet.

4,860,020

COMPACT, WIDEBAND ANTENNA SYSTEM

Jimmy L. Y. Wong, Redondo Beach, and Howard E. King, Gardena, both of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.

Filed Apr. 30, 1987, Ser. No. 44,381
Int. Cl.[4] H01Q *9/30*
U.S. Cl. 343—828 4 Claims



1. A compact, broadband monopole antenna system designed to operate in a particular frequency bandwidth comprising:

(a) a driven element configured from two symmetrical meander wires having a plurality of alternating vertical sections V and horizontal sections L, having an overall height not exceeding ¼ of a wavelength at the lowest frequency in said bandwidth;

(b) a first parasitic sleeve having alternating vertical sections H and horizontal sections W, and having an overall height not exceeding the height of said driven element and located within 1/20 of a wavelength at the highest frequency in said bandwidth away from the driven element; and

(c) a means for connecting the driven element to a feed line.

4,860,021

PARABOLIC ANTENNA

Hiroshi Kurosawa, and Izumi Ochiai, both of Tochigi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 23, 1986, Ser. No. 877,206
Claims priority, application Japan, Jun. 28, 1985, 60-140304; Sep. 20, 1985, 60-206460
Int. Cl.[4] H01Q *3/02, 15/16*
U.S. Cl. 343—840 12 Claims

1. A parabolic antenna comprising:

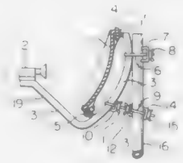
a parabolic reflector having a concave reflecting surface with a focal point;

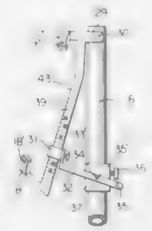
antenna fitting means mounted at a convex back surface of the parabolic reflector, said antenna fitting means including a first fitting means rigidly fixed to an upper portion of the parabolic reflector, a second fitting means rigidly fixed to a lower portion of the parabolic reflector, and a rigid member with a convex back surface fixed between the first and second fitting means so as to extend along a central axis of the parabolic reflector sush that said first and second fitting means, said rigid member and said parabolic reflector form a unitary structure;

mount arm means fixedy associated with said antenna fitting means for mounting a converter at the focal point of the parabolic reflector;

a support member for supporting said antenna fitting means with the convex back surface of the rigid member contiguous with the support member; and

means for setting elevation coordinates of the parabolic reflector, including clamping means for permitting relative adjustment between the rigid member and the support





member and for clamping the rigid member to the support member at a desired elevational position.

4,860,022

SATELLITE DISH ANTENNA SUPPORT RIB APPARATUS

Eugene H. Dobroski, Burlington, Iowa, assignor to Winegard Company, Burlington, Iowa

Filed May 3, 1985, Ser. No. 730,683
Int. Cl.[4] H01Q *15/16, 1/22*
U.S. Cl. 343—840 1 Claim





1. In a satellite dish antenna having a parabolic reflector petal and a support rib for holding the side of said reflector petal when said antenna is assembled; an improvement to said support rib wherein said support rib has an upper reflective surface in the same parabolic plane as said, petal and is capable of engaging, under said upper reflective surface, the side of said petal aligned continuously along the substantial longitudinal length of said support rib, said improved support rib comprising:

a flat reflective surface portion connected to the upper end of said rib, and

means connected to one of the aforesaid reflective surface portion for continuously engaging said side reflective petal, said engaging means comprising:

(a) a lower channel connected to said engaging means, said channel comprising a formed upwardly open channel having a lower horizontal portion with upwardly and outwardly directed sides to be receptive of said reflective petal;

(b) an upper member connected to said engaging means, said upper member comprising a downwardly extending ridge angularly positioned over said lower channel; and

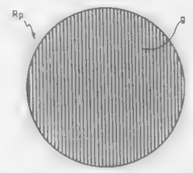
(c) upper member connecting means for one-time flexing of said upper member downward to firmly hold the aforesaid reflective petal side in said channel by having said ridge engaging and firmly holding said side when said upper member is forced downwardly so that the surface of said upper member is in said parabolic plane, said upper member connecting means further comprising a formed slot at said connection between said upper member and said lower member, wherein said slot compresses under said force.

4,860,023

PARABOLIC REFLECTOR ANTENNAS AND METHOD OF MAKING SAME

Rudolf Haim, Rijnsburg, Netherlands, assignor to European Space Agency/Agence Spatiale Europeenne, Paris, France

Filed May 5, 1987, Ser. No. 46,216
Claims priority, application France, May 6, 1986, 86 06521
Int. Cl.[4] H01Q *19/12*
U.S. Cl. 343—912 3 Claims



1. A method of manufacturing gridded parabolic reflector antennas of the type having a polarization (PSS) or frequency (FSS) sensitive surface and supported by an insulating material, this surface being defined by a metal grid consisting of elements pertaining to either a PSS or FSS type reflector, which method includes in combination the following steps:

levelling the irregularities of the surface of said support by applying a levelling means, such as a lacquer or a polymer film,

metallizing substantially the entire levelled surface by metal deposition under a vacuum,

forming a mask having orifices corresponding to the elements of the desired grid,

interpositioning the mask between a laser source and a focusing lens,

focusing the laser beam emitted by this source on the metallized surface of the reflector, while following the contours of the orifices formed in the mask,

scanning the surface of the reflector by means of the laser beam for cutting out said grid therein, and

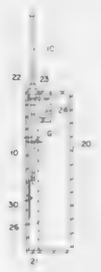
maintaining the distances between each of the laser source, the focusing lens, the mask and the surface of the parabolic reflector substantially constant during scanning of the surface.

4,860,024

ANTENNA FOR A PORTABLE RADIOTELEPHONE

Yoshimi Egashira, Kanagawa, Japan, assignaor to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 242,328
Claims priority, application Japan, Dec. 28, 1988, 62-201546[U]
Int. Cl.[4] H01Q *1/24*
U.S. Cl. 343—702 3 Claims



1. An antenna system for a portable radiotelephone comprising:

a transmitting and receiving main antenna element freely insertable into and withdrawable from a case for said radiotelephone;

an antenna retaining mechanism which holds said main antenna element so that said main antenna element is free to slide, said antenna retaining mechanism further being equipped with a conductive part which is in sliding contact with and electrically coupled to said main antenna element both when said main antenna element is extended outside of said case and when said main antenna element is retracted inside said case;

a matching device installed inside said case with one end thereof connected to said conductive part of said antenna retaining mechanism;

a means for connecting the other end of said matching device to a transmitter-receiver set of said radiotelephone; and

an auxiliary antenna element provided in said case which engages with and is electrically coupled to a retracted end of said main antenna element when said main antenna element is retracted inside of said case so that said auxiliary antenna element acts as a unit integral with said main antenna element.

4,860,025

THERMAL TRANSFER PRINTING PROCESS

William Berson, Westport; Julius Gluck, Norwalk; Patrick Murphy, Stamford, and Duc H. Tran, Bridgeport, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 28, 1987, Ser. No. 138,428
Int. Cl.[4] G01D *9/00*
U.S. Cl. 346—1.1 21 Claims

21. In printing apparatus of the type which includes a ribbon having a backing layer and an ink donor layer supported on the backing layer, wherein the apparatus includes a first thermal printhead for transfer printing a first ink pattern from the ink donor layer to the backing layer at a first printing station, a second thermal printhead for transfer printing a second ink pattern from the ink donor layer to a workpiece at a second printing station, a process comprising the steps of:

a. sensing a letter being fed to the second printing station;

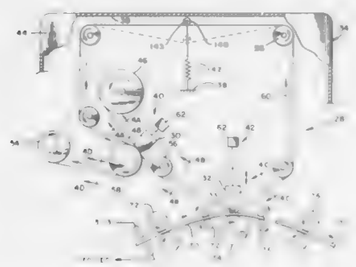
b. starting feeding the ribbon;

c. starting printing at the first printing station;

d. moving the second printhead from a non-printing position to a printing position;

e. starting printing at a second printing station;

f. stopping printing at the first and second printing stations;
g. stopping feeding the ribbon;
h. moving the second printhead from the printing position to the on-printing position over a distance sufficient to accommodate stepped and other irregularly-shaped letter



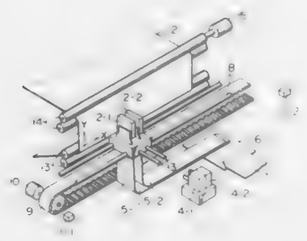
mail between the second printhead and a backing element which cooperates with the second printhead in the second printing station;
i. maintaining the tension in the ribbon in the printing and non-printing positions of the second printhead.

4,860,026

HALFTONE IMAGE RECORDING METHOD USING RECORDING DATA HAVING A PLURALITY OF CONCENTRATIONS FOR ONE COLOR

Kentaro Matsumoto, Sagamihara; Makoto Takaoka, Atsugi; Masami Fukumoto, Sagamihara; Toyokazu Uda, and Susumu Sugiura, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 210,869
Claims priority, application Japan, Jun. 25, 1987, 62-156567; Jul. 6, 1987, 62-166976
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—1.1 **17 Claims**



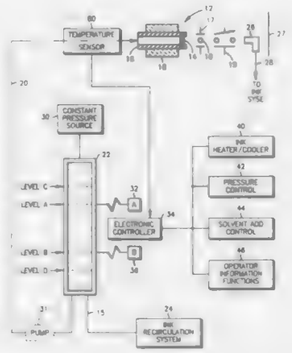
1. A halftone image recording method for recording an image by forming dots in unit areas on a recording medium, the method comprising the steps of:
forming an image using, for one color, at least two kinds of dots respectively having different concentrations, one of said kinds being thin-concentration dots and the other of said kinds being thick-concentration dots; and
setting a size of unit area for the thin-concentration dots larger than a size of unit area for the thick-concentration dots for the one color.

4,860,027

INK DROP CONTROL SYSTEM WITH TEMPERATURE COMPENSATION

Joseph P. Ozelis, Chicago, and Robert I. Keur, Niles, both of Ill., assignors to A. B. Dick Company, Chicago, Ill.

Filed Mar. 18, 1988, Ser. No. 169,627
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—1.1 **10 Claims**



1. In an ink composition controller for a drop marking system having an ink supply reservoir, a nozzle to form a stream of ink drops, means to force the ink to the nozzle from the reservoir, means for measuring the time interval required for an established volume of ink to flow through the nozzle, controller means responsive to said measuring means for comparing said time interval against a reference value, SP to identify deviations from the latter and means responsive to the controller means for selectively altering the ink flow rate, the improvement comprising:
(a) means for sensing the temperature of the ink;
(b) said controller means including recalculating means responsive to said temperature sensing means for periodically determining a temperature change and recalculating said reference value, SP, to compensate for such temperature change in the ink;
whereby temperature induced changes in flow time and viscosity are accounted for.

4,860,028

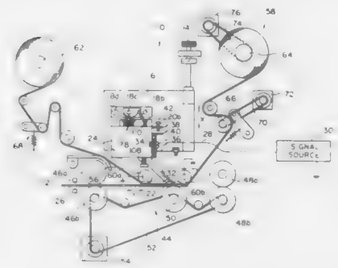
PRINT HEAD ASSEMBLY

Yoshihisa Ogawa, Nagakakyo, Japan, assignor to Data Card Corporation, Minneapolis, Minn.

Filed Dec. 3, 1986, Ser. No. 937,602
Int. Cl.[4] G01D *15/10;* **B41J** *3/20*
U.S. Cl. 346—76 PH **8 Claims**

1. A printer head comprising:
a platen roller provided to be freely rotatable about a fixed shaft;
a drive frame provided to move in a back-and-forth direction with respect to said platen roller;
a support block provided on said drive frame to be movable in said back-and-forth direction;
a printing head element secured to said support block in a state movable in said back-and-forth direction and provided to be capable of opposing said platen roller;
a pair of guide rollers, which are freely rotatable about respective shafts, mounted on said support block in such a manner that said printing head element is interposed therebetween;
conveying means for conveying a sheet-like member, which is to be printed on, between said printing head element and said platen roller;
an ink ribbon driven in accordance with a printing operation

to travel in a state where it is in contact with said pair of guide rollers and said printing head, said ribbon being arranged between said sheet-like member, which is in a printing state, and said printing head element;
a signal source for applying a print signal to said printing head element, in response to which signal said printing head element transfers ink from said ink ribbon to said sheet-like member;
a position adjusting screw provided on said support block to be movable back and forth, a forward position of said printing head element relative to said platen roller being adjusted by bringing a distal end of said position adjusting screw into abutting contact with a fixed portion of said drive frame; and
printing pressure adjusting means operative in the printing state for pressing said printing head element against said sheet-like member through the intermediary of said ink ribbon at a predetermined printing pressure and for adjusting the printing pressure, said printing pressure adjusting means including:
a screw rod provided to be movable back and forth, on a face of said support block opposite that on which said printing head element is provided;
an urging plate loosely penetrated by said screw rod and provided to be movable in said back-and-forth direction without slipping off said screw rod;
an urging member provided between said urging plate and said support block for urging said urging plate and said support block away from each other; and
printing pressure means operative in the printing state for pressing said urging plate against an urging force from said urging member in such a manner that said urging plate approaches said support block, whereby said printing head element is resiliently brought into contact with said sheet-like member through the intermediary of said ink ribbon at the predetermined printing pressure.



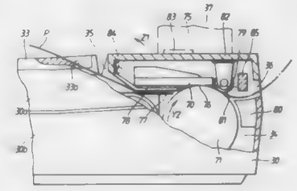
4,860,029

IMAGE INFORMATION APPARATUS

Ken Iseda, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed May 29, 1987, Ser. No. 55,519
Claims priority, application Japan, May 30, 1986, 61-124929
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **13 Claims**

1. An apparatus for forming an image on an image-receiving means, comprising:
(a) inlet means for guiding an image-receiving means inserted in said inlet means along a transport path for transporting said image-receiving means;
(b) supporting means for supporting said image-receiving means, inserted from said inlet means;
(c) printing means, opposed to said supporting means, for printing an image on said image-receiving means, said printing means being movable between an operative position where the printing operation is achieved and an inoperative position where said image-receiving means passes smoothly through said path; and
(d) adjusting means, including a plate to stop a leading edge



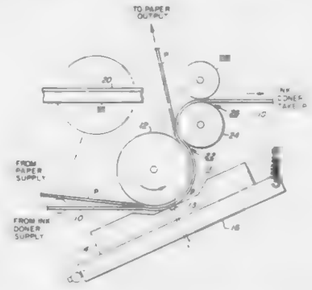
of said image-receiving means, for adjusting said image-receiving means inserted in said inlet means where said printing means is moved to said inoperative position and for guiding said image-receiving means when said printing means is moved to said operative position.

4,860,030

RESISTIVE PRINTHEAD ARRAYS FOR THERMAL TRANSFER PRINTING

Stephen F. Pond, Pittsford; Gary A. Knoezel; Robert V. Lorenze, both of Webster; Michael P. O'Horo; Martin S. Maltz, both of Rochester, all of N.Y., and Richard Kellerman, Media, Pa., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 14, 1987, Ser. No. 133,590
Int. Cl.[4] G01D *15/10;* **H05B** *1/00*
U.S. Cl. 346—76 PH **8 Claims**



8. A thermal printhead for imagewise application of heat to a surface comprising:
a heat sink layer comprising a conductive metallic support layer;
an insulating substrate layer deposited on said support layer;
an array of resistors, supported on said insulating substrate, each resistor selectively controllable to apply a melting temperature to the surface;
each resistor in said array electrically connected through a common current bus to the conductive metallic support layer.

4,860,031

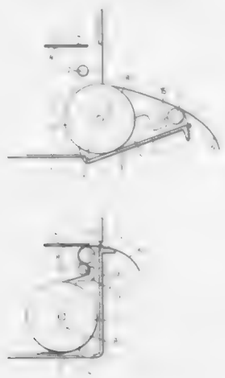
REGISTER TAPE TRANSPORT DEVICE

Franz Lejcek, Vienna, Austria, assignor to Goerz Electro Gesellschaft m.b.H., Vienna, Austria

Filed Sep. 24, 1984, Ser. No. 654,098
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1983, 3334217
Int. Cl.[4] G01D *15/24, 15/00*
U.S. Cl. 346—136 **1 Claim**

1. Transport device for a register tape of an electric register mechanism having a housing containing a supply load unit

which is a supply roller service for unwinding the register tape is insertable; and a transport roller which, together with a contact pressure roller, grips a register tape running between both the transport roller and the contact pressure roller and passes it from the supply roller unit to and beyond a register element of the register mechanism for preforming a recording on the register tape; the supply load unit being at least partly removable from the housing for inserting the supply roller therein; the supply roller and the contact pressure roller being spatially separated from one another during the removal of the supply load unit; the transport device further comprising means defining a contact pressure surface, the register element



being at said contact pressure surface; the transport roller, in operating position thereof, being located between the contact pressure roller and said contact pressure surface; said transport roller being shifted out of said operating position thereof when the supply load unit is removed at least partly from the housing, and the register tape pressed between the contact pressure roller and the contact pressure surface being freed therefrom; the supply load unit being a plug-in unit slidable with the supply roller and the transport roller into and at least partly out of the housing, and the contact pressure roller being carried on free arms of a U-shaped swivel bracket so that said swivel bracket swings the contact pressure roller into the operating position thereof when said plug-in unit is slid into the housing.

4,860,032

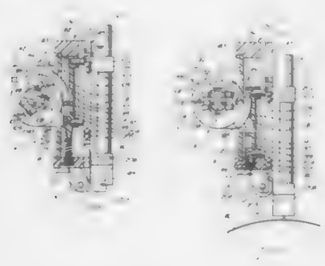
AUTOMATIC PEN CAPPING MECHANISM

Robert H. Niemeyer, III, Beaverton, Oreg., assignor to AM International Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 75,533, Jul. 20, 1987, Pat. No. 4,763,140. This application Jun. 24, 1988, Ser. No. 210,992

Int. Cl.[4] G01D *9/30, 9/00;* G06K *15/00*

U.S. Cl. 346—139 R 12 Claims



7. For use in a graphic recorder having a pen carriage supporting a plurality of pen shuttles each supporting a recording pen having a pen point, said pen shuttles being moveable between raised and lowered positions, automatic pen capping means comprising:

a plurality of pen capping doors, each defining a pen recess;

support means pivotally supporting each of said pen capping doors proximate to a respective one of said pen shuttles;

gear means coupling each of said pen capping doors to the proximate one of said pen shuttles causing rotation of said pen capping doors to a closed position in which the pen point of the pen within its proximate pen shuttle is received within its pen recess when said proximate pen shuttle is raised and to an open position in which the pen point of the pen within its proximate pen shuttle is exposed when said proximate pen shuttle is moved to its lowered position.

4,860,033

BASE PLATE HAVING AN OXIDATION FILM AND AN INSULATING FILM FOR INK JET RECORDING HEAD AND INK JET RECORDING HEAD USING SAID BASE PLATE

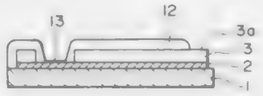
Atsushi Shiozaki, Isehara; Hirokazu Komuro; Koichi Sato, both of Hiratsuka, and Kazuaki Masuda, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1988, Ser. No. 151,299

Claims priority, application Japan, Feb. 4, 1987, 62-23995; Feb. 4, 1987, 62-23996; Feb. 4, 1987, 62-23997

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R 39 Claims



1. A base plate for an ink jet recording head provided with an electricity-heat convertor comprising:

a substrate;

a heat-generating resistor provided on said substrate;

a pair of electrodes electrically connected to said heat-generating resistor;

an oxidized film provided by local anodic oxidation of a surface of said heat-generating resistor between said electrodes; and

an organic insulating film provided on a region including at least a part of each of said electrodes, said insulating film being in the vicinity of said oxidized film and forming an exposed region of said oxidized film and a bonding region bonding to said oxidized film.

4,860,034

INK JET RECORDING APPARATUS WITH AMBIENT TEMPERATURE DETECTING MEANS FOR PROVIDING A SIGNAL TO DRIVE CONTROL MEANS RESPONSIVE TO A RECORDING-DENSITY DATA SIGNAL

Yoshitaka Watanabe, Tokyo; Nobuaki Sakurada; Makoto Aoki, both of Yokohama, and Eiichi Sato, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 849,398, Apr. 8, 1986, abandoned. This application Mar. 30, 1988, Ser. No. 177,881

Claims priority, application Japan, Apr. 15, 1985, 60-079597; Apr. 15, 1985, 60-079598; May 15, 1985, 60-103173; May 15, 1985, 60-103174

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R 3 Claims

1. An ink jet recording apparatus comprising:

ink jet recording means for recording at a recording density

determined by discharging an amount of ink corresponding to the magnitude of a driving signal supplied thereto;

detecting means for detecting ambient temperature and generating a signal in accordance with the detected temperature; and

drive control means for accepting an input signal having a magnitude in accordance with a desired recording density and outputting a driving signal, said drive control means including a plurality of limiters for setting a stepwise plurality of driving signal ranges, wherein one of said



limiters is selected in accordance with the signal from said detecting means so as to provide a driving signal range in which said ink jet recording means will perform stable discharge and said selected limiter accepts the input signal and supplies a driving signal to said ink jet recording means in accordance with the input signal when the input signal is within the driving signal range of said selected limiter and supplies a driving signal in the vicinity of a limit of the driving signal range of said selected limiter when the input signal is outside the driving signal range of said selected limiter.

4,860,035

PRINTING DEVICE HAVING A ROTATABLE IMAGE-RECEIVING SUPPORT

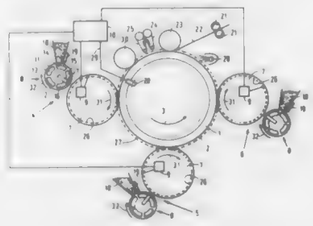
Peter Klein Meuleman, Venlo, and Peter G. La Vos, Baarlo, both of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

Filed Jun. 9, 1988, Ser. No. 205,389

Claims priority, application Netherlands, Jun. 12, 1987, #701366

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—157 11 Claims



1. In a printing device having an image-receiving support in the form of a rotatable cylinder and having a number of image-forming stations disposed along the rotational path of the image-receiving support, wherein a separation image of a required image is generated and transferred to the image-receiving support at an image-transfer zone, each image-forming station comprising a rotatable cylindrical image-registration element and an imaging means for forming the separation image on the image-registration element, the improvement comprising: the imaging means being disposed with respect to the image-registration element each such that there is an equal distance in each image-forming station, along the circumference of the image-registration element in the direction of its movement, between the place where the separation image is formed on the image-registration element and the center of the image-transfer zone between the image-registration element and the image-receiving support; and a control means for deriving the start time of image formation in each image-forming station from the position of the image-receiving support with respect to that image-forming station to ensure proper registration.

4,860,036

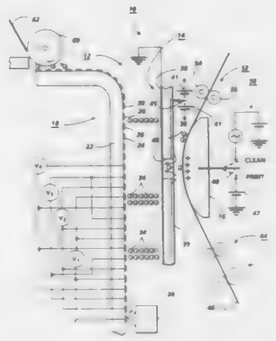
DIRECT ELECTROSTATIC PRINTER (DEP) AND PRINTHEAD STRUCTURE THEREFOR

Fred W. Schmidlin, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 29, 1988, Ser. No. 226,178

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—159 9 Claims



1. Direct electrostatic printing apparatus for forming toner images on an image receiving member, said apparatus comprising:

An apertured printhead structure for depositing spots of toner on an imaging surface;

means for causing said printhead structure to deposit spots of toner on an imaging surface in image configuration;

said apertured printhead structure including a plurality of equally spaced rows of equally spaced apertures, said plurality of rows being spatially arranged and equal to a number sufficient to insure printing of images without voids between spots of toner, said number being equal to at least three.

4,860,037

FILM CASSETTE WITH MAGNETIC FILM LEADER

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 12, 1988, Ser. No. 242,567

Int. Cl.[4] G03B *7/00*

U.S. Cl. 354—21 4 Claims



3. An improved film cassette wherein a film spool is rotatable in an unwinding direction to propel a filmstrip including an integral film leader out of said cassette and is rotatable in a winding direction to wind said filmstrip including its film leader back into the cassette, and wherein the improvement comprises:

said film leader having a magnetic area containing film frame related data which indicates that said filmstrip is only partially exposed but which can be magnetically altered to indicate that the filmstrip is completely exposed, whereby

when said film leader is wound into said cassette said data will be protected and when the film leader is propelled from the cassette the data will be made accessible to determine whether said filmstrip is partially or completely exposed.

4,860,038

UNDERWATER BUBBLE CAMERA

Herbert vH. Thatcher, Encinitas; Richard C. Mursiana, San Diego, and Richard E. Tackabery, Carlsbad, all of Calif., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 913,053, Sep. 29, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 188,716
Int. Cl.[4] G03B *17/56;* H04N *5/26*
U.S. Cl. 354—64 11 Claims



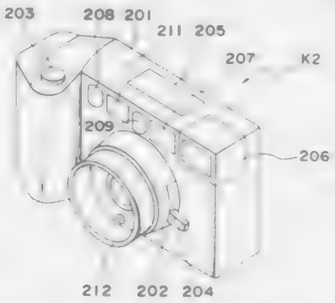
1. An underwater camera assembly, comprising:
a transparent solid member, impermeable to water;
a support member, impermeable to water and configured to combine with said transparent solid member to form a spherical or substantially spherical enclosure, and wherein said transparent member spans a solid angle of at least 90° as measured from the approximate center of said spherical or substantially spherical enclosure;
means for connecting said transparent solid member and said support member;
means for sealing said enclosure against water;
a camera having a lens;
means for rotating said camera about a first axis in response to a first electrical rotate signal;
means for rotating said camera about a second axis in response to a second electrical rotate signal;
means for adjusting the focal distance of said lens in response to an electrical focus signal;
means for providing a plurality of voltage level outputs in response to electrical energy supplied thereto, wherein selected of said voltage level outputs are applied to said camera, to said means for rotating said camera about a first axis, to said means for rotating said camera about a second axis and to said means for adjusting the focal distance; and
wherein said camera, said means for rotating said camera about said first axis, said means for rotating said camera about said second axis, said means for adjusting the focal distance of said lens and said means for providing a plurality of voltage level outputs, are all secured within said enclosure.

4,860,039

PHOTOGRAPHIC CAMERA SYSTEM AND USING THEREOF

Yoshiaki Hata; Nobuyuki Taniguchi, both of Nishinomiya; Takeo Hoda, Kawachinagano; Manabu Inoue, Kobe; Yoshinobu Kudo, Sakai, and Hiroshi Ueda, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 29, 1986, Ser. No. 924,425
Claims priority, application Japan, Oct. 31, 1985, 60-242736; Oct. 31, 1985, 60-242738; Nov. 11, 1985, 60-252472; Nov. 27, 1985, 60-265008; Nov. 27, 1985, 60-265009
Int. Cl.[4] G03B *11/04, 17/02, 17/18, 17/24*
U.S. Cl. 354—106 6 Claims

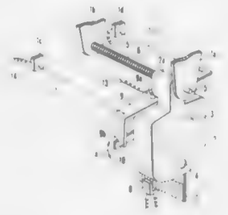


1. A photographic camera system comprising:
a mode setting means for selectively setting said photographic camera system to a real focal length photographing mode for printing an ordinary photographic zone and pseudo focal length photographing mode for printing a zone narrower than the ordinary photographic zone;
a recording means for recording a signal corresponding to the pseudo focal length photographing mode when the pseudo focal length photographing mode is selected; and
a control means including a movable means for changing an external appearance of a camera body of said photographic camera system by controlling position of said movable means in accordance with the set one of the real focal length photographing mode and the pseudo focal length photographing mode so as to enlarge the external appearance of said camera body when said photographic camera system has been set to the pseudo focal length photographing mode.

4,860,040
CAMERA

Hideo Tamamura, and Masakazu Taku, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1988, Ser. No. 207,503
Claims priority, application Japan, Jun. 19, 1987, 62-152908; Jun. 24, 1987, 62-157223; Jun. 30, 1987, 62-163160
Int. Cl.[4] G03B *3/00, 17/38*
U.S. Cl. 354—170 20 Claims



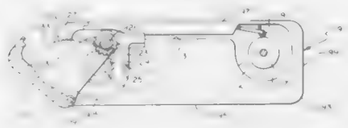
1. A camera comprising:

(A) motion means, rotatable in first and second directions, for effecting a sliding movement different from rotation when receiving rotative drive forces in said first and said second directions at the same time;
(B) first shape-memory material for applying to said motion means the rotative drive force in said first direction;
(C) a second shape-memory material for applying to said motion means the rotative drive force in said second direction;
(D) first operating means, responsive to the rotation of said motion means by the drive force of said first or said second shape-memory material, for carrying out a first operation of the camera; and
(E) second operating means, responsive to the sliding movement of said motion means by the drive forces of said first and said second shape-memory materials, for carrying out a second operation of the camera.

4,860,041
CAMERA APPARATUS FOR ADVANCING A FILM LEADER FROM A FILM CASSETTE

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 6, 1988, Ser. No. 215,841
Int. Cl.[4] G03B *1/00*
U.S. Cl. 354—212 9 Claims

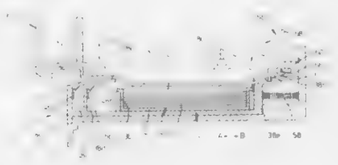


1. An improved photographic camera wherein a cover door is supported for opening and closing movements to uncover and recover a film cassette-receiving chamber, and wherein the improvement comprises:
said chamber being configured to receive a film cassette having a film spool engageable for rotation in an unwinding direction to propel a film leader from inside the cassette to outside the cassette;
a drive member rotatable in engagement with the film spool in a predetermined direction to rotate the film spool in the unwinding direction; and
motion responsive means responsive to closing movement of said cover door for rotating said drive member in the predetermined direction, whereby the film leader will automatically be propelled from the film cassette.

4,860,042
FILM PACKAGE AND DEVICE FOR LOADING FILMS

Kenji Tajima; Hiroshi Kushima, and Sadami Yamada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 26, 1987, Ser. No. 54,175
Claims priority, application Japan, May 23, 1986, 61-119975; Jul. 15, 1986, 61-167364; Nov. 29, 1986, 61-284479
Int. Cl.[4] G03B *17/26*
U.S. Cl. 354—277 35 Claims

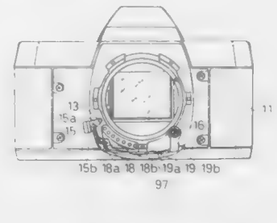


1. A device for loading a film package having a removable cover and storing a stack of sheet films therein, comprising a main body; a holder for placing said film package therein, said holder being partially, slidably removable from said main body such that said holder is partially retained in said main body to facilitate the loading of said film package in the holder; and roller means operable with said holder for shielding said film package from light when said cover is removed therefrom, the arrangement being such that said cover is able to be removed from said film package while said film package is disposed in said main body and said holder is retained in said main body, said holder being drawn substantially outwardly from said main body.

4,860,043
APPARATUS FOR KINEMATIC LINKAGE IN INTERCHANGEABLE LENS TYPE OF CAMERA

Hiroshi Kurei; Akihiro Arai, and Takumi Kobayashi, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

PCT No. PCT/JP87/00067, § 371 Date Nov. 12, 1987, § 102(e) Date Nov. 12, 1987, PCT Pub. No. WO87/04807, PCT Pub. Date Aug. 13, 1987
Continuation of Ser. No. 113,285, Nov. 12, 1987, abandoned. This PCT application Feb. 2, 1987, Ser. No. 207,939
Claims priority, application Japan, Feb. 5, 1986, 61-14483; Oct. 20, 1986, 61-160327
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—286 39 Claims



1. An interchangeable lens type camera comprising a body to which an interchangeable lens is adapted to be connected, said camera including a driving motor positioned in said camera body for driving said interchangeable lens when said lens is connected to said body, said camera body having a body mounting surface including a mounting ring and comprising first, second, third and fourth quadrants, and a mount locking member located on said body mounting surface, said mount locking member comprising means for locking said interchangeable lens on said camera body, a driving shaft positioned adjacent to said body mounting ring, said driving shaft comprising means for transmitting rotation of said driving motor to a driven member in said interchangeable lens, biasing means for biasing said driving shaft and said mount locking member in a direction in which said shaft and said mount locking member both project from said mounting surface, a mount lock releasing member comprising means for retracting said driving shaft and said mount locking member from the body mounting surface against said biasing means, said mounting surface having a lower mounting surface portion in which said third and fourth quadrants are located, said camera further comprising means for kinematically linking said driving shaft and said mount lock releasing member, said kinematically linking means being located adjacent to said lower mounting surface portion, said mount locking member and said mount lock releasing member being positioned in said third quadrant of said mounting surface, as viewed from the front of said camera body, said driving shaft being located in said fourth quadrant of said mounting surface, said locking member being integrally attached to said mount lock releasing member.

4,860,044

PHOTOGRAPHIC MATERIAL PROCESSING UNIT

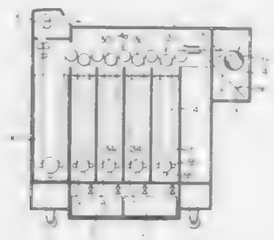
Kunio Kanai, and Toshiyuki Yamamoto, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1986, Ser. No. 910,391

Claims priority, application Japan, Sep. 30, 1985, 60-216940; Oct. 3, 1985, 60-220855; Oct. 4, 1985, 60-221258; Oct. 4, 1985, 60-221260; Oct. 4, 1985, 60-221262; Oct. 4, 1985, 60-221263; Dec. 18, 1985, 60-285306

Int. Cl.[4] G03D *3/08*

U.S. Cl. 354—321 18 Claims



1. A unit for processing photographic material comprising at least one tank adapted to contain a processing solution;

a conveying means for conveying said material in a direction along a path into contact with said solution, said conveying means having a carrier member adapted to convey a roll film and a disk film along said path;

a supply means for supplying said material to said conveying means; and

a delivery means for deliverying said material after processing;

wherein said carrier member comprises a flexible sheet member and a fitting member, said sheet member adapted to convey said disk film and said roll film thereon and said fitting member adapted to fit said disk film and said roll film on the sheet member.

4,860,045

AUTOMATIC FOCUSING DEVICE

Masataka Hamada, Osaka, and Tokuji Ishida, Daito, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 936,103, Nov. 28, 1986, abandoned. This application Aug. 10, 1987, Ser. No. 83,819

Claims priority, application Japan, Nov. 27, 1985, 60-268015; Dec. 13, 1985, 60-280788; Dec. 13, 1985, 60-280789

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—402 4 Claims

1. An automatic focusing device for a camera having an objective lens for forming an image of an object, comprising:

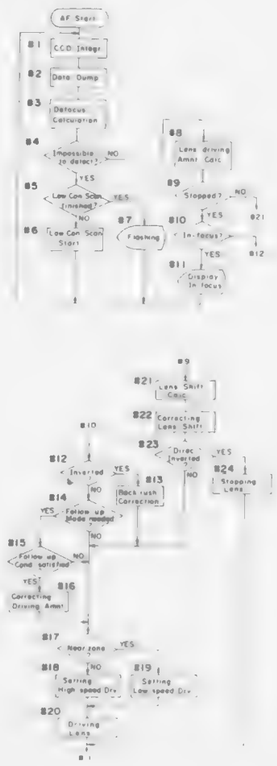
focus detection means for repeatedly detecting a defocus amount of the image formed by an optical lens to generate a defocus signal corresponding to the detected defocus amount upon each detecting operation;

object movement detection means for detecting movement of the object based on the defocus signals generated by the focus detection means to generate a movement signal corresponding to the movement of the object;

drive means for driving the objective lens for focus adjustment;

corrected defocus signal generating means for generating a corrected defocus signal based on the movement signal;

drive control means for causing the drive means to drive the objective lens in accordance with the corrected defocus signal; and



inhibition means for inhibiting the generation of the corrected defocus signal by the corrected defocus signal generating means under a predetermined condition.

4,860,046

CAMERA SYSTEM

Nobuyuki Taniguchi, Tondabayashi; Masatake Niwa, Sakai; Akira Fujii, Sennan; Takeo Hoda, Sakai; Masaaki Nakai, Nara; Minoru Sekida, Sakai, and Masayoshi Sahara, Sennan, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 43,758, Apr. 29, 1987, Pat. No. 4,763,144, which is a division of Ser. No. 888,600, Jul. 23, 1986, Pat. No. 4,712,904, which is a division of Ser. No. 634,474, Jul. 25, 1984, Pat. No. 4,621,914. This application Jul. 15, 1988, Ser. No. 130,068

Claims priority, application Japan, Jul. 27, 1983, 58-138129; Jul. 29, 1983, 58-139600; Aug. 8, 1983, 58-144547; Aug. 8, 1983, 58-144549; Aug. 17, 1983, 150572; Jun. 22, 1984, 58-129572; Jun. 25, 1984, 58-131452; Jun. 25, 1984, 58-131453

Int. Cl.[4] G03B *17/18*

U.S. Cl. 354—475 2 Claims

1. A camera adapted to function with film speed data, comprising:

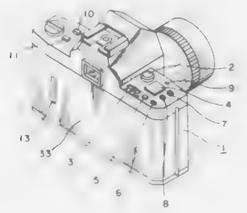
first means for storing film speed data;

second means for storing exposure time data;

third means for storing aperture value data;

fourth means for storing override data;

first means for normally indicating the stored exposure time data and also capable of indicating the stored film speed data in place of the exposure time data; and



second means for normally indicating the stored aperture value data and also capable of indicating the stored override data in place of the aperture value data.

4,860,047

FUSER SYSTEM UTILIZING A PRESSURE WEB

Robert G. Pirwitz, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 2, 1988, Ser. No. 188,890

Int. Cl.[4] G03G *15/0;* H05B *1/00*

U.S. Cl. 355—290 1 Claim

1. A heat and pressure apparatus for fixing toner images to copy substrates, said apparatus comprising:

a fuser roll;

a pressure applying member in the form of a thin web having an elongated surface contacting said fuser roll to form a nip therebetween through which copy substrates pass with the toner images carried thereon contacting said fuser roll, one end of said thin web being anchored in a frame member and an area of said web adjacent the other end thereof being frictionally biased into engagement with said fuser roll; and a biasing assembly to bias an area of the thin web into contact with said fuser roll to form a nip entrance for receiving the lead edge of said copy substrates, said biasing assembly comprising a first rectangular flat spring, and a second profiled leaf spring mounted beneath said rectangular flat spring, and a feed roller positioned between said biasing assembly and said fuser roll, said feed roller rotating in a direction opposite said fuser roll to form the entrance nip and said profiled leaf spring providing a varied pressure along the entrance nip consistent with its profile.

4,860,048

IMAGE FORMING APPARATUS

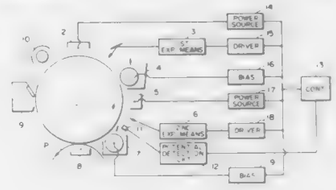
Masahiro Itoh, Yokohama; Yoshihiro Murasawa, Kawasaki; Atsushi Takeda; Hiroaki Tsuchiya, both of Yokohama, and Kimio Nakahata, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1988, Ser. No. 199,278

Claims priority, application Japan, May 28, 1987, 62-132914

Int. Cl.[4] G03G *15/01*

U.S. Cl. 355—208 31 Claims



1. An image forming apparatus, comprising:

movable image bearing means;

first charging means for charging said image bearing means;

first electrostatic latent image forming means for forming a first electrostatic latent image in accordance with image information on said image bearing means charged by said first charging means;

first developing means for developing the first electrostatic latent image;

second charging means for re-charging said image bearing means;

second electrostatic latent image forming means for forming a second electrostatic latent image in accordance with image information on said image bearing means recharged by said second charging means;

second developing means for developing the second electrostatic latent image;

detecting means for detecting a surface potential of said image bearing means, said detecting means detecting at least the surface potential at that portion of the latent image formed on said image bearing means by said first latent image forming means which is to be developed, after the portion is charged by said second charging means; and

control means for controlling said second charging means to provide a target potential of said portion and for controlling a developing bias voltage of said second developing means in accordance with the potential of said portion.

4,860,049

IMAGE FORMING APPARATUS

Kenshi Toshimitsu, and Takashi Mizuma, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Apr. 22, 1988, Ser. No. 184,977

Claims priority, application Japan, Apr. 30, 1987, 62-106829; May 30, 1987, 62-136320

Int. Cl.[4] G03G *15/00, 15/01*

U.S. Cl. 355—218 10 Claims

1. An image forming apparatus, comprising:

rotatable image carrier means for carrying electrostatic latent images thereon;

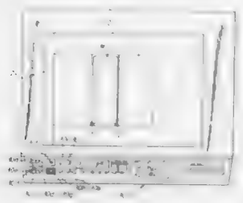
scanning means having a prescribed scanning direction for exposing the image carrier means to form the electrostatic latent images corresponding to the pattern of an original document on the image carrier means;

means for designating first and second rectangular areas of the original document to be copied;

developing means having first and second developing units for converting the electrostatic latent images correspond-

ing to the first and second areas, respectively, into first and second different color toner images on the image carrier means;

means for selectively actuating the first and second developing units; and



means for transferring the first and second color toner images from the image carrier means onto a sheet having a defined length and width corresponding to the length and width of the original document in a single rotation of the image carrier means when the widths of both of the first and second areas correspond to the width of the sheet.

4,860,050

DEVELOPING REPLENISHER MATERIAL FOR USE IN IMAGE FORMING DEVICE

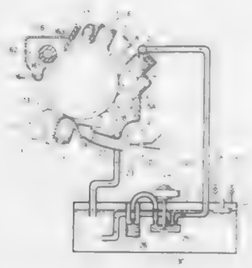
Tsuneo Kurotori, Tokyo; Manabu Mochizuki; Keazo Ariyama, both of Yokohama; Shinichi Kuramoto, Numazu; Yoshihiro Sugiyama, Mishima; Hajime Takanashi, Numazu; Takashi Ishizuka, Matsudo; Yoshio Kudo, and Yoshio Sato, both of Shibata, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 28, 1987, Ser. No. 78,670

Claims priority, application Japan, Jul. 28, 1986, 61-177073; Jul. 28, 1986, 61-177074; Sep. 29, 1986, 232722; Oct. 27, 1986, 255354; Oct. 27, 1986, 255355; Oct. 27, 1986, 255356

Int. Cl.[4] G03G *15/10*

U.S. Cl. 355—256 **52 Claims**



1. An electrostatic copying machine, equipped with a developer tank for use with a developing replenisher material capable of being supplied to said developer tank,

said replenisher material comprising 100 parts by weight of a carrier liquid composed mainly of an aliphatic hydrocarbon, and 200 to 1200 parts by weight of toner particles composed mainly of a binder resin and a pigment;

wherein said developer tank comprises a container for storing a liquid developer, and has dispersing means for dispersing said developing replenisher material in said liquid developer, said developer tank being connected to a liquid developer supply through a liquid developer supply means and a liquid developer retrieval means, said liquid developer supply means being disposed around a rotatable latent image carrier for applying the liquid developer to said latent image carrier;

wherein said dispersing means comprises a pump disposed in said developer tank and having inlet and outlet ports opening in said developer tank, said liquid developer supply means comprising said pump disposed in said developer tank and a liquid developer supply pipe connecting an outlet port of said pipe to said liquid developer supply, said inlet port of said pump communicating through a pipe with a replenisher tank for containing the developing replenisher material;

wherein said outlet port of said pump and said pipe are interconnected with a mesh screen disposed therebetween across a passage extending between said outlet port of said pump and said pipe.

4,860,051

COPYING PROCESS TIMING CONTROL SYSTEM FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

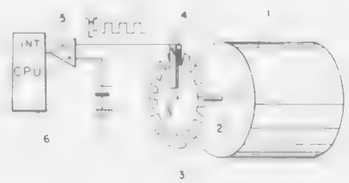
Akihiko Taniguchi, Nara, and Yasushi Nakanishi, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 3, 1985, Ser. No. 771,804

Claims priority, application Japan, Sep. 4, 1984, 59-187071

Int. Cl.[4] G03G *15/00*

U.S. Cl. 250—231 SE **2 Claims**



1. A system for detecting the rotation angle of a photoreceptor drum in an electrophotographic copying machine, comprising:

means for generating a pulse signal in response to the rotation of said photoreceptor drum, wherein said pulse signal includes a pulse rising edge and a pulse falling edge;

counter means, responsive to generation of said pulse signal, for counting both said pulse rising edge and said pulse falling edge,

control means for enabling said counter means to count both of said pulse rising edge and said pulse falling edge, said control means including a central processing unit having an interruption mask register, said interruption mask register storing a selecting bit, said central processing unit setting said selecting bit to zero to enable said counter means to count said pulse falling edge and setting said selecting bit to one to enable said counter means to count said pulse rising edge.

4,860,052

COPYING APPARATUS WITH USE FREQUENCY CANCELLATION CONTROL

Masazumi Ito, Toyohashi; Kadotaro Nishimori, Toyokawa, and Masaaki Oyabu, Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 11, 1987, Ser. No. 95,475

Claims priority, application Japan, Sep. 13, 1986, 61-216189; Sep. 13, 1986, 61-216190; Dec. 20, 1986, 61-305106

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—209 **8 Claims**

1. In a copying apparatus which includes one or more components to be replaced with new components at predetermined intervals, the apparatus including:

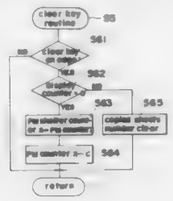
first counting means for counting a number of copies reproduced;

second counting means for counting use frequencies of said various components which are not counted by said first counting means;

memory means for saving the counted use frequency of said second counting means;

clearing means which clears the counted use frequency of the second counting means;

clear indicator means indicates clearing of the counted use frequency of the second counting means;



cancellation display means which displays the cancelled clearing of the counted use frequency of the second counting means; and clearing control means which restores the saved use frequency to the second counting means following the cancellation of the clearing operation which is indicated by the cancellation display means after the clearing display indicates the clearing operation has been performed and the counted use frequency is saved in the memory means.

4,860,053

COLOR IMAGE FORMING APPARATUS HAVING A PLURALITY OF DEVELOPING UNITS

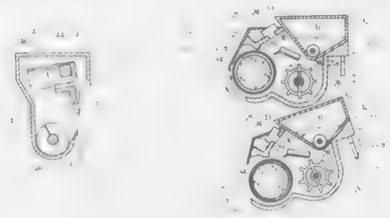
Haruo Yamamoto, Sennan; Takao Ichihashi, Sakai; Shuji Fujisawa, Ibaragi; Eiichi Tone, and Takeshi Tsuda, both of Sakai, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 20, 1987, Ser. No. 112,268

Claims priority, application Japan, Oct. 23, 1986, 61-253084; Jan. 28, 1987, 62-19493; Jan. 28, 1987, 62-19494

Int. Cl.[4] G03G *15/06*

U.S. Cl. 355—245 **9 Claims**



1. A color image forming apparatus having a plurality of developing units each containing different color toner, which can change a color of an image by alternative selection effected by bringing a newly selected developing unit close to a photoreceptor drum and moving 2 former one away therefrom, the apparatus comprising a sequence control means for rotating the photoreceptor drum by a specified amount or angle, while the former developing unit is in the state of being close to the photoreceptor drum, after making an image with the former color, but before copying an image with the newly selected color and, thereafter, alternatively selecting the newly selected developing unit.

4,860,054

COPIER CONTROL SYSTEM

Masami Higuchi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 161,094

Claims priority, application Japan, Feb. 28, 1987, 62-44131

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—300 **3 Claims**



1. A system for controlling a copier having independent units which constitute a plurality of electrical loads for forming an image on a photoconductive element and recording said image on a paper sheet, comprising:

pulse generating means for generating timing pulses;

counting means for counting said timing pulses; and

control means for controlling operations of said electrical loads on the basis of the number of timing pulses counted by said counting means;

said counting means starting counting said timing pulses at any of a plurality of points, said control means selecting one of said plurality of points for starting counting said timing pulses depending upon a copy mode.

4,860,055

IMAGE FORMING APPARATUS CAPABLE OF DISPLAYING CAPACITY AND/OR REMAINING QUANTITY OF SHEETS OF PAPER

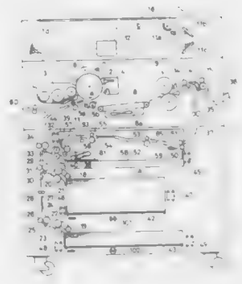
Tadashi Ohira, Toyokawa; Masazumi Ito, Toyohashi, and Syuzi Maruta, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 52,729, May 20, 1987, Pat. No. 4,748,479. This application Mar. 28, 1988, Ser. No. 174,389

Claims priority, application Japan, May 28, 1986, 61-122534

Int. Cl.[4] G03B *27/58*

U.S. Cl. 355—308 **26 Claims**



1. An image forming apparatus comprising:

a frame box;

image forming means provided inside said frame box;

first paper feed means provided inside said frame box;

second paper feed means provided outside said frame box;
means for detecting a quantity of sheets of paper stored in said first paper feed means;
display means for displaying the quantity of sheets in said first paper feed means in response to said detecting means;
means for selecting a first paper feed mode for sending out sheets of paper from said first paper feed means or a second paper feed mode for sending out sheets of paper from said second paper feed means; and
control means for enabling operation of said display means during said first paper feed mode and disabling operation of said display means during said second paper feed mode.

4,860,056

SEALABLE TONER RECOVERY BOX FOR AN IMAGE FORMING MACHINE

Atsushi Kano, Amagasaki; Yasuyuki Ishiguro; Tadakazu Ogiri, both of Osaka; Hirofumi Ozaki, Sakai, and Yuji Yamashita, Matsudo, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 17, 1987, Ser. No. 122,097
Claims priority, application Japan, Nov. 29, 1986, 61-283163; Nov. 29, 1986, 61-283164
Int. Cl.[4] G03G *15/06, 15/00, 21/00*
U.S. Cl. 355—298 **8 Claims**



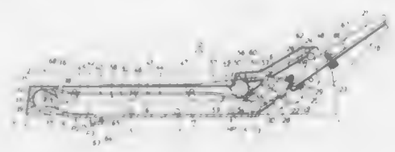
1. A cleaning device for an image-forming machine, said cleaning device comprising:
a supporting frame structure including means defining a toner recovery box receiving space having an open front surface and extending in the front-rear direction of said support frame structure;
a toner recovery box having a toner inlet extending in the front-rear direction of said toner recovery box, said box being adapted to be inserted into said receiving space by being moved rearwardly relative to said supporting frame structure and to be withdrawn from said space by being moved forwardly relative to said supporting frame structure;
a receiving member provided on the front surface of said supporting frame structure and positioned in front of said receiving space;
a protective cover having a rear end portion adapted to be inserted in said receiving member and adapted for receiving said toner recovery box as said toner recovery box is withdrawn from said receiving space and for covering said toner inlet; and
restraining means on said protective cover for inhibiting upward movement and rearward movement of said toner recovery box relative to said protective cover, and so inhibiting detachment of said toner recovery box from said protective cover once said toner recovery box has been received in said protective cover.

4,860,057

AUTOMATIC ORIGINAL CIRCULATING AND FEEDING APPARATUS

Shiro Saeki, and Sunso Ikeda, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 1, 1988, Ser. No. 177,479
Claims priority, application Japan, Apr. 3, 1987, 62-83548
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—23 **4 Claims**



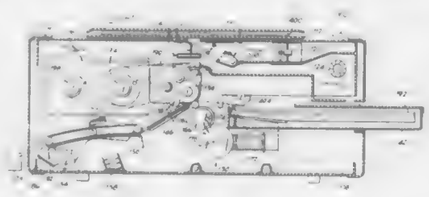
1. An automatic original circulating and feeding apparatus comprising an original feeding base for receiving a plurality of originals thereon, which are piled up with image faces thereof turned downwardly, an original separating and feeding mechanism for successively separating said piled-up originals on said original feeding base one by one from a lowermost original and feeding them one by one is an order separated, a reversible and speed-changeable belt conveyor mechanism disposed in an exposure part for exposing each of said originals fed, and a sensor disposed at a position separated by at least the largest original length from said original separating and feeding mechanism, for selectively setting a scanning copy mode for forwarding a given original to a predetermined position above said exposure part, stopping said original at said predetermined position, and setting an optical exposure system into a scanning motion for exposure of a sheet through copy mode for stopping said optical exposure system relative to said exposure part and forwarding said original by the belt conveyor mechanism for exposure and for controlling a position of the original for a copy mode selected.

4,860,058

IMAGE FORMING APPARATUS

Atsushi Kobayashi; Takashi Suzaki, and Yasuhiko Kosugi, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 149,815
Claims priority, application Japan, Feb. 2, 1987, 62-22006; Mar. 3, 1987, 62-48275; Apr. 30, 1987, 62-107702
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—27 **40 Claims**



1. An image forming apparatus for forming an image on a transfer medium by pressing the transfer medium against a photosensitive medium having light sensitive microcapsules thereon, the apparatus comprising:
an illuminating mechanism for illuminating said photosensitive medium; and
exposure means for subjecting a first predetermined region of the photosensitive medium to light representative of the image and a second predetermined region of the photosensitive medium to light nonrepresentative of the image prior to pressing the transfer medium against the photosensitive medium.

4,860,059

METHOD OF SETTING COLOR COPYING CONDITIONS

Takaaki Terashita, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 19, 1988, Ser. No. 157,812
Claims priority, application Japan, Feb. 20, 1987, 62-37249; Feb. 20, 1987, 62-37250
Int. Cl.[4] G03B *27/73*
U.S. Cl. 355—38 **33 Claims**



1. A method of setting color copying conditions of a color copying machine, said color copying machine being provided with scanning means for scanning an original with illuminating light; three light measuring means, one individual to each of three primary colors; and three adjustable color filters for regulating respective components of light, said method comprising the steps of:
scanning a test chart having density patterns for said three primary colors to detect three primary color components of light reflected from said test chart using said three light measuring means, so as to obtain three primary color exposures based on said three primary color components;
scanning said test chart to make a color copy thereof;
scanning said color copy to detect three primary color components of light reflected from said color copy using said three light measuring means, so as to detect reflected amounts of light for said three primary colors;
logarithmically transforming said reflected amounts of light into color densities for said three primary colors;
providing relationships between said three primary color densities and said three primary color exposures for said three primary colors; and
adjusting said three color filters so as to make said relationships coincide with predetermined relationships between color densities and exposures for said three primary colors, respectively.

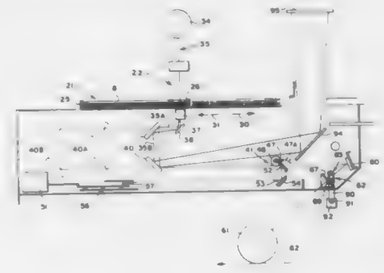
4,860,060

MICROFICHE PRINTING SYSTEM AND METHOD

David S. Wise, Solon, and Walter E. Janik, Willoughby, both of Ohio, assignors to Tameran, Inc., Chagrin Falls, Ohio

Filed Apr. 8, 1988, Ser. No. 179,507
Int. Cl.[4] G03B *27/52, 27/44*
U.S. Cl. 355—41 **13 Claims**

1. A microfiche printing system comprising
a sheet having a plurality of microfiche images thereon in a grid matrix of columns and rows;
a frame assembly carrying the sheet on at least one transparent flat;
a carriage assembly removably receiving the frame assembly and microfiche sheet carried thereby, the carriage assembly being driven relative to a light path of an optics system optically to scan a row of microfiche images in one direction during a scanning stroke, optically to print the row of microfiche images onto plain paper in the other direction during a printing stroke and to thereafter index the next row of microfiche images into alignment with the optics system to repeat the scanning and printing sequences until each microfiche image row on the sheet has been sequentially optically scanned and printed;
the optics system being operative to temporarily record edge



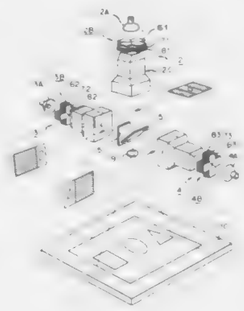
locations of each microfiche image in the row during the scanning stroke and to effectively mask each microfiche image to its recorded edge locations during the printing stroke.

4,860,061

MULTIFACE IMAGE COMPOSER

Shigeru Ikeda, 22, Nishi 8-chome, Kita 25-jo, Kita-ku, Sapporo-city, Japan

Filed Feb. 8, 1988, Ser. No. 153,254
Claims priority, application Japan, Feb. 6, 1987, 62-026796
Int. Cl.[4] G03B *27/52, 27/70*
U.S. Cl. 355—43 **4 Claims**



1. A multiface image composer comprising:
a first image generator producing a first light ray having a first optical axis;
a second image generator producing a second light ray having a second optical axis;
a third image generator producing a third light ray having a third optical axis;
said second and third image generators facing each other so that said second and third optical axes coincide;
said first image generator being disposed between said second and third image generators so that said first optical axis intersects said second and third optical axes at a right angle to provide a common intersection point for said first, second and third optical axes;
said first image generator facing towards a base plate with said common intersection point being disposed between said first image generator and said base plate;
half mirror means being disposed at said common intersection point and being movable between first and second positions;

said half mirror means permitting said first light ray to pass directly therethrough along said first optical axis towards said base plate when in both said first and second positions;

said half mirror means, when in said first position, reflecting said second light ray so that said second light ray is deflected 90 degrees towards said base plate to coincide with said first light ray along said first optical axis to produce a first composite image, while simultaneously preventing deflection of said third light ray towards said base plate;

said half mirror means, when in said second position, reflecting said third light ray so that said third light ray is deflected 90 degrees towards said base plate to coincide with said first light ray along said first optical axis to produce a second composite image, while simultaneously preventing deflection of said second light ray towards said base plate; and

a lens being positioned on said first optical axis between said half mirror means and said base plate for focusing said first and second composite images, one at a time, onto said base plate so that a final composite image can be formed on said base plate by superposing said second composite image onto said first composite image after said first composite image has been formed on said base plate.

4,860,062

DEVICE AND METHOD FOR MEASURING REFLECTIVE NOTCH CONTROL IN PHOTORESISTS

Gary D. Parks, Wayland, Mass., assignor to Shipley Company Inc., Newton, Mass.

Filed May 20, 1988, Ser. No. 196,656
Int. Cl.[4] G03B 27/42
U.S. Cl. 355—53 **15 Claims**



10. A method of measuring photoresist reflective notch control which comprises coating a metalized silicon wafer with the photoresist to be tested, said metalized silicon wafer having a topographical image thereon adapted to focus reflected light through a subsequently applied photoresist test pattern, exposing said photoresist-coated, metalized silicon wafer to activating light radiation through a maskwork having a photoresist test pattern, developing the exposed photoresist to produce a photoresist test pattern image on the metalized silicon wafer, and measuring or observing any degradation of the photoresist test pattern image.

4,860,063

METHOD OF CONTROLLING DEVELOPER TONER DENSITY OF DEVELOPING DEVICE

Yukio Okamoto, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Dec. 14, 1987, Ser. No. 132,408
Claims priority, application Japan, Dec. 12, 1986, 61-294707
Int. Cl.[4] G03G 15/08
U.S. Cl. 355—208 **8 Claims**

1. A method for controlling a toner density of a developer in a developing device, which comprises:

detecting a magnetoresistance level of said developer; comparing said magnetoresistance level with a reference level; feeding a toner to be supplied to said developing device in accordance with said comparison between said magnetoresistance level and said reference level; and decreasing said reference level in accordance with an interruption



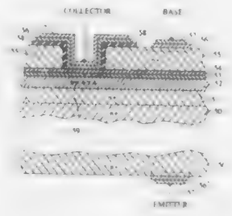
time for developing wherein said interruption time is longer than a predetermined time wherein there is no substantial attenuation of said magnetoresistance of said developer.

4,860,064

TRANSISTOR COMPRISING A 2-DIMENSIONAL CARRIER GAS COLLECTOR SITUATED BETWEEN EMITTER AND GATE

Sergey Luryi, Millington, N.J., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 21, 1987, Ser. No. 111,387
Int. Cl.[4] H01L 29/76
U.S. Cl. 357—12 **14 Claims**



1. A transistor comprising

(a) a relatively conductive first semiconductor layer;

(b) a second semiconductor layer, separated from the first layer by a relatively non-conductive first semiconductor barrier layer;

(c) a relatively conductive third layer, separated from the second layer by a relatively non-conductive second barrier layer, the first, second, and third layers to be referred to as emitter, collector, and gate layers, respectively, and the first and second barrier layers to be referred to as emitter barrier and gate barrier layers, respectively;

(d) a separate electrical contact to each of the emitter, collector, and gate layers; wherein

(e) the chemical composition and/or thickness of each of the emitter, collector, gate, emitter barrier and gate barrier layers are chosen such that the collector layer forms a quantum well with which is associated a lowest sub-band and at least one higher sub-band, such that a 2-dimensional "gas" of mobile charge carriers can be formed in the quantum well by application of a first bias voltage to at least one of the electrical contacts, and such that application of a second bias voltage can result in a current between emitter and collector layers, to be termed the collector current;

characterized in that

(f) the chemical composition and/or thickness of each of the emitter, collector, gate, emitter barrier and gate barrier layers are furthermore chosen such that application of a voltage between gate and collector induces an electrical charge in the emitter layer such that the collector current can be responsive to the voltage applied between gate and collector, and

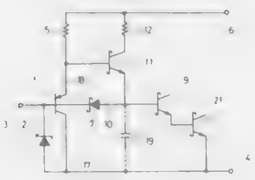
(g) the thickness d_1 of the gate barrier layer is at most about 10 nm.

4,860,065

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Tsunehiro Koyama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1986, Ser. No. 937,119
Claims priority, application Japan, Dec. 2, 1985, 60-271062
Int. Cl.[4] H01L 27/04
U.S. Cl. 357—15 **1 Claim**



1. In an integrated circuit device formed on a P-type semiconductor substrate including an input PNP transistor having an emitter, a collector and a base; a first NPN transistor having an emitter, a collector and a base, the base of said first NPN transistor being connected to the emitter of said input PNP transistor by a lead wire; a Schottky barrier diode (SBD) having an anode and a cathode; and a second NPN transistor having an emitter, a collector and a base, the anode of said SBD being connected to the emitter of said first NPN transistor and to the base of said second NPN transistor, said SBD being the only SBD connected between the base of said input PNP transistor and said first and second NPN transistors, an isolation layer provided between the input PNP transistor and SBD:

an improvement for reducing parasitic capacitance in the device and thereby improving switching speed thereof, wherein the base of said input PNP transistor is connected to the cathode of said SBD by a lead wire and lengths of the lead wires by which the emitter of said first NPN transistor and the base of said second NPN transistor are connected to the anode of said SBD are shorter than that of the lead wire between the base of said input PNP transistor and the cathode of said SBD.

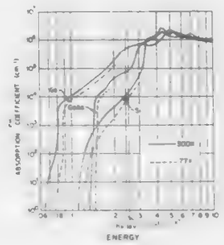
4,860,066

SEMICONDUCTOR ELECTRO-OPTICAL CONVERSION

Peter D. Kirchner, Garrison; Ronald F. Marks, Ossining; George D. Pettit, Mahopac; Jerry M. Woodall, Bedford Hills, and Steven L. Wright, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 8, 1987, Ser. No. 1,472
Int. Cl.[4] H01L 29/267, 31/00
U.S. Cl. 357—16 **8 Claims**

1. In a semiconductor electro-optical conversion device of the type wherein light is converted in a monocrystalline III–V compound semiconductor body to an electrical signal the improvement comprising a layer of epitaxial monocrystalline elemental semiconductor material having an indirect band gap greater than one electron volt covering at least a portion of the surface thereof and having a thickness in the range of 20–200 Å



to render said layer transparent to light in the energy range of 2–3 eV.

4,860,067

SEMICONDUCTOR HETEROSTRUCTURE ADAPTED FOR LOW TEMPERATURE OPERATION

Thomas N. Jackson, Peekskill; Alan W. Kleinsasser, Putnam Valley, and Jerry M. Woodall, Bedford Hills, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 876,552, Jun. 20, 1986, abandoned. This application Dec. 23, 1987, Ser. No. 137,033
Int. Cl.[4] H01L 29/161
U.S. Cl. 357—16 **15 Claims**



1. A semiconductor heterostructure comprising:

a thin planar layer of low band gap compound semiconductor material on the order of 100 nanometers with its fermi level pinned in or near the conduction band with essentially parallel first and second faces having a first face exposed and being supported by a high resistivity member contiguous with said second face, where the low band gap semiconductor material and the high resistivity member are chosen to have a lattice mismatch greater than 1.5% and

first and second electrical contact means positioned on said exposed face of said low band gap compound semiconductor material separated by a gap.

4,860,068

SEMICONDUCTOR DEVICES AND METHODS OF MAKING SUCH DEVICES

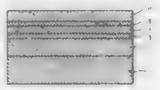
Arthur C. Gossard, Warren; Robert C. Miller, Summit, and Pierre M. Petroff, Westfield, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

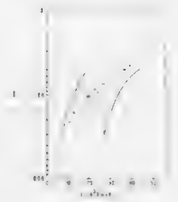
Continuation of Ser. No. 831,473, Feb. 20, 1986, abandoned, which is a division of Ser. No. 408,009, Aug. 13, 1982, Pat. No. 4,578,127. This application Jan. 27, 1988, Ser. No. 149,994
Int. Cl.[4] H01L 29/161, 29/205, 29/225
U.S. Cl. 357—16 **4 Claims**

1. A semiconductor heterostructure device comprising a layered structure on a substrate, said structure being adapted for electron-hole recombination, light absorption, or carrier transport in a single, homogeneous semiconductor layer which comprises GaAs and which here is designated as active layer, said structure further comprising

a first semiconductor cladding layer which comprises $Al_xGa_{1-x}As$, said first cladding layer being adjacent to said active layer and having a thickness less than 1500 Angstroms,

a semiconductor layer which comprises GaAs and which here is designated as getter-smoothing layer, said getter-





smoothing layer being adjacent to said first cladding layer, and said getter-smoothing layer having a thickness in the range from 10 to 100 Angstroms, and

a second semiconductor cladding layer which comprises $Al_xGa_{1-x}As$, said second cladding layer being between said substrate and said getter-smoothing layer.

4,860,069

NON-SINGLE-CRY STAL SEMICONDUCTOR LIGHT EMITTING DEVICE

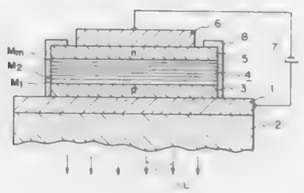
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 653,860, Sep. 24, 1984, abandoned. This application Oct. 2, 1987, Ser. No. 104,539

Claims priority, application Japan, Sep. 24, 1983, 58-176615; Sep. 24, 1983, 58-176616

Int. Cl.[4] H01L *33/00*

U.S. Cl. 357—17 10 Claims



1. A non-single-crystal semiconductor light emitting device comprising:

a first electrode;

a first conductivity type non-single-crystal semiconductor layer formed on the first electrode and making ohmic contact therewith;

an intrinsic non-single-crystal semiconductor region formed on the first conductivity type non-single-crystal semiconductor layer;

a second conductivity type non-single-crystal semiconductor layer formed on the intrinsic non-single-crystal semiconductor region; and

a second electrode formed on the second conductivity type non-single-crystal semiconductor layer and making ohmic contact therewith;

wherein the intrinsic non-single-crystal semiconductor region is formed by at least one intrinsic non-single-crystal semiconductor layer, the intrinsic non-single crystal layer being formed of silicon and doped with hydrogen or fluorine to provide therein an $(SiH_2)_n$ or $(SiF_2)_n$ structure in which SiH_2 or SiF_2 structures, each having two hydrogen or fluorine atoms combined with two bonds of the one silicon atom, are linked as a chain, and to have an energy gap of 2.2 to 2.7 eV; and

wherein either one of the first and second electrodes is light transparent.

4,860,070

SEMICONDUCTOR MEMORY DEVICE COMPRISING TRENCH MEMORY CELLS

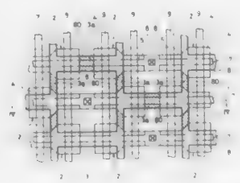
Kazutami Arimoto, and Kiyohiro Furutani, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1987, Ser. No. 131,635

Claims priority, application Japan, Jan. 9, 1987, 62-3614; Apr. 14, 1987, 62-92708

Int. Cl.[4] H01L *29/78, 29/06, 27/12, 27/02*

U.S. Cl. 357—23.6 10 Claims





1. A semiconductor memory device comprising:

a semiconductor substrate,

a plurality of word lines arranged on said semiconductor substrate,

a plurality of bit lines arranged to intersect with said word lines,

memory cells arranged at intersections of said word lines and said bit lines,

said semiconductor substrate having cell trenches each formed in a region of each of said memory cells, a first isolation trench which is formed integrally with said cell trenches in adjacent memory cells in a direction parallel with said word lines, and a second isolation trench which is formed integrally with said cell trenches in adjacent memory cells in a direction parallel with said bit lines,

each of said memory cells comprising a charge storage region formed in the inner surface of each of said cell trenches, and a switching transistor region provided between each of said bit lines and each of said charge storage regions, said switching transistor region utilizing a part of said word lines as a gate electrode, and

isolation regions formed in the inner surfaces of said first and second isolation trenches;

only portions of the bottom surface of said first isolation trench, between diagonally adjacent ones of said memory cells, containing said isolation regions.

4,860,071

SEMICONDUCTOR MEMORY USING TRENCH CAPACITOR

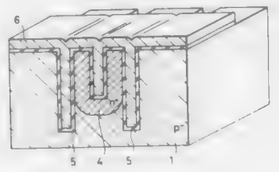
Hideo Sunami, Nishitama; Tokuo Kure, Kokubunji; Atsushi Hiraiwa, Kodaira, and Yasuo Wada, Bunkyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 836,751, Mar. 6, 1986, abandoned. This application Feb. 10, 1988, Ser. No. 157,129

Claims priority, application Japan, Mar. 8, 1985, 60-44797; May 8, 1985, 60-95901

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.6 11 Claims



1. A semiconductor memory comprising:

a plurality of word lines, data lines and memory cells that are disposed on a semiconductor substrate of a first conductivity type, wherein said memory cells are arranged in matrix;

data storage portions formed for each of said memory cells, wherein each of said data storage portions comprises:

first and second trenches formed in said substrate,

an impurity doped region having a second conductivity type opposite to said first conductivity type, wherein said impurity doped region is formed in said substrate so as to extend between a side wall of the first trench and a side wall of said second trench,

at least one insulating film formed on said side walls of said first and second trenches, and

a plate electrode disposed on said insulating film in both said first and second trenches,

wherein a first capacitance for said data storage portions is formed by the impurity doped region, a first portion of the plate electrode which is disposed in the first trench and a second portion of the insulating film which is disposed between the impurity doped region and the first portion of the plate electrode, wherein a second capacitor for said data storage portion is formed by the impurity doped region, a second portion of the plate electrode which is disposed in the second trench and a second portion of the insulating film which is disposed between the impurity doped region and the second portion of the plate electrode, and further wherein the second trench isolates data stored in the first capacitor from data storage portions of other memory cells, and

switches formed for each of said memory cells to connect each memory cell to a data line, wherein each switch includes an MOS transistor having one of a source electrode or a drain electrode connected to the impurity region of said data storage portion and having a gate electrode connected to said word line.

4,860,072

MONOLITHIC SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING SAME

Nathan Zommer, Palo Alto, Calif., assignor to IXYS Corporation, San Jose, Calif.

Continuation of Ser. No. 836,314, Mar. 5, 1986, abandoned. This application Mar. 10, 1988, Ser. No. 166,809

Int. Cl.[4] H01L *29/78*

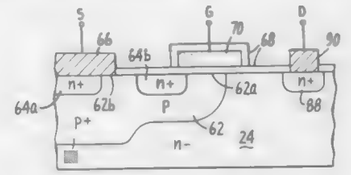
U.S. Cl. 357—23.8 30 Claims

1. A monolithic semiconductor device comprising:

a semiconductor body having a first major surface;

a contiguous first region disposed in said semiconductor body of a first conductivity type, said first region including a channel section abutting said first surface, a first intermediate section spaced apart from said channel section and abutting said first surface and a body section disposed below said first surface and interconnecting said channel and said first intermediate sections;

a contiguous second region disposed in said semiconductor body of a second conductivity type, opposite of said first conductivity type, said second region being bounded by said first region and including a peripheral section between said channel section and said first intermediate section, above said body section and abutting said first



surface, a contact section abutting said first surface, and spaced part from said peripheral section, with said peripheral section and said contact section being disposed on opposite sides of said first intermediate section and interconnected by other first portions of said second region;

an insulating layer positioned over said channel section on said first surface;

a first electrode on said insulating layer above said channel section; and

a first ohmic contact on said contact section so that at least part of current flow between said contact section and said peripheral section is around said first intermediate section and through said other first portions of said second region.

4,860,073

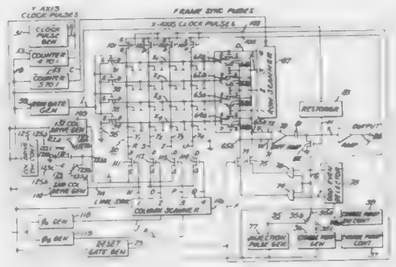
SOLID STATE IMAGING APPARATUS

Gerald J. Michon, Waterford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 29, 1982, Ser. No. 444,933

Int. Cl.[4] H01L *29/78;* H01J *40/14*

U.S. Cl. 357—24 8 Claims



1. In combination,

a substrate of semiconductor material having a major surface,

a plurality of first conductive plates, each overlying and in insulated relationship to said major surface and forming a first conductor-insulator-semiconductor capacitor with said substrate,

a plurality of second conductive plates, each adjacent a respective first conductive plate to form a plurality of

pairs of plates, said pairs of plates being arranged in a matrix of rows and columns, each of said second conductive plates overlying and in insulated relationship to said major surface and forming a second conductor-insulator-semiconductor capacitor with said substrate, each coupled to a respective first conductor-insulator-semiconductor capacitor,

a plurality of row conductor lines, the first conductive plates in each of said rows connected to a respective row conductor line,

a plurality of column conductor lines, the second conductive plates in each of said columns connected to a respective column conductor line,

a first voltage means for providing a first voltage between said row conductor lines and said substrate to deplete respective first portions of said substrate lying thereunder of majority charge carriers and provide an absolute potential of a first value therein,

a second voltage means for providing a second voltage between said column conductor lines and said substrate to deplete respective second portions of said substrate lying thereunder of majority charge carriers and providing an absolute potential of a second value therein,

means for storing charge in said second portions of said substrate,

means for reducing on each of the column conductor lines in sequence said second voltage to a first level and thereafter reestablishing said second voltage during a respective first period of time to cause said second portions of said substrate to be reduced in absolute potential to a third value less than said second value whereby charge in each of said second portions of said substrate transfers into a respective first portion of said substrate and back to said second portion,

means for sensing in sequence the signals induced on a row line during the transfer of charge from said second portions to said first portions of said substrate associated with said row line during a second period of time,

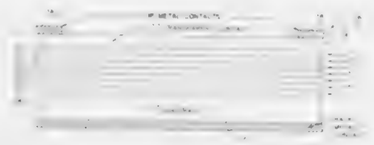
said third value being the potential of said substrate at which majority carriers in said substrate combine with charge trapped in the interface states so that a fixed quantity of each packet of charge transferred from a respective first portion to a respective second portion of said substrate functions to fill the states at the surface of a respective second portion of said substrate with charge thereby diminishing each packet of charge by said fixed quantity of charge.

4,860,074

ALTERNATING GRADIENT PHOTODETECTOR

Albert W. Overhauser, West Lafayette, Ind., and Joseph Maserjian, Goleta, Calif., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 5, 1987, Ser. No. 116,811
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 **10 Claims**



1. An infrared photodetector comprising:

(a) a substrate of a semiconductor material;

(b) first contact means for applying an electrical potential to a back side of said substrate;

(c) at least four high resistivity layers of said semiconductor material disposed on a top surface of said substrate, said layers of said first material being of substantially equal thickness and being doped a conductive type with a doping concentration therein sufficiently low as to not include conducting donor bands and being depleted of electrons;

(d) at least three impurity-band layers of said semiconductor material disposed on said layers of said first material, said layers of said second material being of substantially equal thickness and being doped said conductivity type with a doping concentration therein sufficiently high to include donor bands which can release electrons upon impingement by infrared photons of energy $h\nu$ greater than an energy gap ϵ;

(e) means for applying an electrical field across said substrate and said plurality of layers;

(f) a layer of a transparent contact material disposed on a top one of said layers of said first material; and

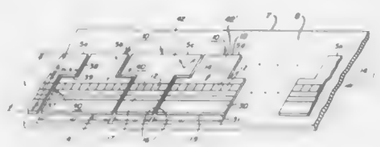
(g) second contact means for applying an electrical potential to a top side of said layer of a transparent contact material.

4,860,075

REPLACEABLE IMAGE SENSOR ARRAY

Mehdi N. Araghi, Webster, and Jagdish C. Tandon, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 39,057, Apr. 16, 1987, which is a division of Ser. No. 808,799, Dec. 13, 1985, Pat. No. 4,698,131. This application Jan. 1, 1989, Ser. No. 295,175
Int. Cl.[4] H01L *27/14, 31/00, 29/04, 29/06*
U.S. Cl. 357—30 **3 Claims**



1. A replaceable array for use in combination with other arrays butted together end to end to form a longer scanning array comprising:

(a) a generally rectangular chip of (110) silicon having a predetermined width;

(b) at least one row of photosites extending longitudinally of said chip from one end of said chip to the other to provide on abutment of said chip with another like chip an uninterrupted row of photosites;

(c) each end of said array being defined by first and second end segments extending along the chip (111) plane, the combined length of said first and second edge segments being equal to said chip width with said first and second end segments being offset longitudinally from one another; and

(d) a third end segment extending longitudinally along said chip (111) plane connecting said first and second end segments together whereby said first, second and third end segments cooperate to form said array end;

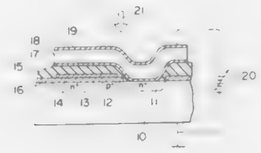
said third end segment being abuttable with the third end segment of a neighboring array to align said chip with the chip of a neighboring array when replacing a defective array.

4,860,076

SOLID STATE IMAGE DEVICE

Masatoshi Tabei; Mitsuru Ikeda, both of Asaka, and Yosuke Nakajima, Fujinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 293,170, Aug. 17, 1981, abandoned. This application Nov. 29, 1988, Ser. No. 277,414
Claims priority, application Japan, Aug. 22, 1980, 55-115545
Int. Cl.[4] H01L *45/00, 27/12, 27/14, 29/161*
U.S. Cl. 357—30 **4 Claims**



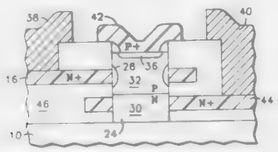
1. In a solid state imaging device, an arrangement which comprises a photoconductive layer of amorphous semiconductor containing amorphous silicon as the major component, an element for reducing capture level within the energy gap and up to 0.1 atomic percent of selenium as a chemical modifier, said layer having disposed on the light-entrance side thereof a transparent electrode, and a plurality of scanning circuits for consecutively selecting signals of the photoconductive layer being disposed beneath that layer.

4,860,077

VERTICAL SEMICONDUCTOR DEVICE HAVING A SIDEWALL EMITTER

Robert H. Reuss, Scottsdale, Ariz., and Kevin L. McLaughlin, Eau Claire, Wis., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 28, 1987, Ser. No. 101,470
Int. Cl.[4] H01L *29/72*
U.S. Cl. 357—34 **6 Claims**



1. A vertical semiconductor device having a sidewall emitter comprising:

a substrate;

a first dielectric layer on said substrate;

a first polycrystalline semiconductor region on said first dielectric layer, said first polycrystalline semiconductor region including a doped portion for contacting an emitter and acting as a diffusion source for said emitter;

a second dielectric layer on said first polycrystalline semiconductor region;

a first epitaxial region extending from said substrate through said first and second dielectric layers and said first polycrystalline semiconductor region, said epitaxial region includes an emitter, a base and a collector portion disposed beneath said base portion, and wherein said emitter portion contacts said portion of said first polycrystalline semiconductor region at a location between said first and second dielectric layers; and

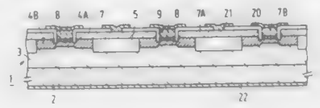
a plurality of contacts, said contacts being electrically coupled to said emitter, said base and said collector.

4,860,078

HIGH-FREQUENCY TRANSISTOR WITH LOW INTERNAL CAPACITANCE AND LOW THERMAL RESISTANCE

Henricus M. J. Vaes, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 935,994, Nov. 28, 1986, abandoned. This application Dec. 19, 1988, Ser. No. 287,510
Claims priority, application Netherlands, Dec. 11, 1985, 8503408
Int. Cl.[4] H01L *29/72*
U.S. Cl. 357—34 **4 Claims**



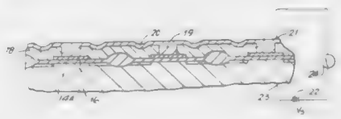
1. A high-frequency transistor comprising a semiconductor body of silicon having a highly-doped substrate of a first conductivity type, a more weakly-doped epitaxial layer of the first conductivity type on said substrate, a layer-shaped base region of a second conductivity type opposite to that of the first provided in the epitaxial layer, a pattern of silicon oxide at least partly countersunk into the epitaxial layer and subdividing the base region into a number of mutually-separated base zones, and conducting layers located partly on the isolating pattern for interconnecting said base zones, at least one emitter zone of the first conductivity type being provided in each base zone, the conducting layers each comprising a silicon layer of the second conductivity type, thin oxide layers extending into the base zone and covering at least an edge of each conducting layer, and the emitter zones being laterally bounded by said thin oxide layers such that in projection the edge of the silicon layer is about the thickness of the thin oxide layers away from the emitter zone.

4,860,079

SCREENING OF GATE OXIDES ON SEMICONDUCTORS

Timothy E. Turner, Denton, Tex., assignor to SGS-Thompson Microelectronics, Inc., Carrollton, Tex.

Division of Ser. No. 55,335, May 29, 1987, Pat. No. 4,760,032. This application Mar. 14, 1988, Ser. No. 167,546
Int. Cl.[4] H01L *27/04, 29/78*
U.S. Cl. 357—41 **4 Claims**



1. A product in an intermediate stage in the manufacture of a semiconductor integrated circuit device adaptable for testing in parallel gate insulators of transistors in each individual die portion of a semiconductive wafer comprising

a semiconductive wafer of a size for subsequent dicing into a plurality of transistors, and a plurality of source and drain zones in the wafer for inclusion in the plurality of transistors,

a gate insulating layer over the wafer,

a plurality of gate electrodes over the gate insulating layer, each between a pair of source and drain zones in the wafer for inclusion in a transistor,

a deposited insulating layer extending over the wafer including contacting entirely the surfaces of the source and drain zones of the wafer and including apertures selectively

only over regions of gate electrodes whose underlying gate insulating layer portions are to be tested,

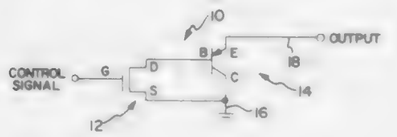
a temporary conductive contact layer designed for removal before the wafer is diced and extending over the deposited insulating layer, making low resistance connections selectively to gate electrodes through apertures in the deposited insulating layer, and patterned to include discrete portions, each of which contacts in parallel only gate electrodes of an individual die portion of the wafer and so is useful for testing in parallel the associated gate insulating layers in each individual die portion.

4,860,080

ISOLATION FOR TRANSISTOR DEVICES HAVING A PILOT STRUCTURE

Hamza Yilmaz, Raleigh, N.C., assignor to General Electric Company, Fairfield, Conn.

Filed Mar. 31, 1987, Ser. No. 32,367
Int. Cl.[4] H01L *29/78, 27/02, 27/04*
U.S. Cl. 357—48 **7 Claims**



1. A monolithic semiconductor device, comprising:

a main device;

a pilot device;

a first isolation region separated from said main and pilot devices and disposed between the main device and the pilot device, said first isolation region being electrically coupled to the pilot device;

a second isolation region separated from said main and pilot devices and spaced from the first isolation region, said second isolation region being electrically coupled to the main device and disposed between the first isolation region and the main device, wherein the first and second isolation regions define a gate region between the first and second isolation regions;

a gate electrode insulatively disposed over the gate region between the first and second isolation regions; and

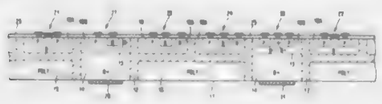
means for electrically coupling the gate electrode to the first isolation region so as to prevent substantial conduction from the first isolation region to the second isolation region.

4,860,081

SEMICONDUCTOR INTEGRATED CIRCUIT STRUCTURE WITH INSULATIVE PARTITIONS

Adrian I. Cogan, Waltham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Division of Ser. No. 625,390, Jun. 28, 1984. This application Sep. 19, 1985, Ser. No. 777,484
Int. Cl.[4] H01L *27/12*
U.S. Cl. 357—49 **3 Claims**



1. A substrate for the fabrication of semiconductor integrated circuit devices therein comprising

a plurality of first sections of single crystal semiconductor material of one conductivity type of relatively high resistivity, each first section having a surface area in a first surface of the substrate and being surrounded by partitions of adherent nonconductive protective material except at said first surface whereby each of said first sections is electrically isolated from each of the other first sections;

a plurality of second sections of single crystal semiconductor material of the one conductivity type, each second section being encircled by partitions of adherent nonconductive protective material whereby each of said second sections is electrically isolated from each of the other second sections and from each of the first sections;

each of said second sections including a first zone of single crystal semiconductor material of the one conductivity type of relatively high resistivity having a surface area in said first surface and a second zone of single crystal semiconductor material of the one conductivity type of relatively low resistivity contiguous to said first zone and having a surface area in a second surface of the substrate;

said first and second surfaces being flat, planar, parallel, opposite surfaces of the substrate;

the pattern of said partitions in said first surface forming a continuous pattern of contiguous, interconnected partitions encircling each of the plurality of first and each of the plurality of second sections; and

a plurality of segments of polycrystalline semiconductor material each having a surface area in said second surface and disposed between said first sections and said second surface;

each sgement of polycrystalline semiconductor material being surrounded by partitions of adherent nonconductive protective material except at said surface area thereof in said second surface and being electrically isolated from each of the first and second sections

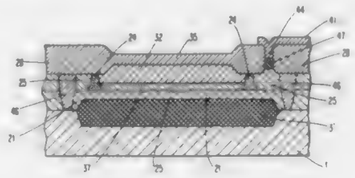
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4,860,082

BIPOLAR TRANSISTOR

Masatoshi Moriyama, and Masaki Ohira, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Division of Ser. No. 762,867, Aug. 6, 1985, Pat. No. 4,695,328. This application Jun. 10, 1987, Ser. No. 60,259
Claims priority, application Japan, Jul. 8, 1984, 59-165268
Int. Cl.[4] H01L *27/12, 29/72, 29/04*
U.S. Cl. 357—49 **11 Claims**



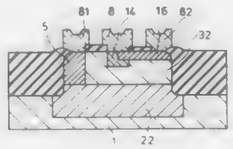
1. A semiconductor device comprising a semiconductor body of one conductivity type, a first semiconductor layer of the opposite conductivity type formed on said semiconductor body, a second semiconductor layer of said opposite conductivity type formed on said first semiconductor layer and having a PN junction forming region, a first insulating layer selectively formed on the surface of said second semiconductor layer, said first insulating layer being partially embedded in the surface of said second semiconductor layer and surrounding said PN junction forming region of said second semiconductor layer, a second insulating layer formed within said second semiconductor layer between the bottom of said first insulating layer and said first semiconductor layer, said second insulating layer having a trapezoidal cross-sectional shape with an upper face attached to a part of said bottom of said first insulating layer, a lower face and a side face surrounding said PN junction forming region, said upper face being narrower than said lower face and said side face being sloped, and a first impurity region of said one conductivity type formed in said PN junction forming region of said second semiconductor layer such that all of the end portions of the PN junction between said first impurity region and said second semiconductor layer are terminated at said side face of said second insulating layer.

4,860,083

SEMICONDUCTOR INTEGRATED CIRCUIT

Takeshi Kojo, Kyoto, Japan, assignor to Matsushita Electronics Corporation, Kadoma, Japan

Continuation of Ser. No. 4,791, Jan. 8, 1987, abandoned, which is a continuation of Ser. No. 666,609, Oct. 30, 1984, abandoned. This application Jul. 14, 1987, Ser. No. 73,851
Claims priority, application Japan, Nov. 1, 1983, 58-205174
Int. Cl.[4] H01L *27/02, 29/92, 29/06*
U.S. Cl. 357—51 **1 Claim**



1. A semiconductor integrated circuit comprising:

a. a semiconductor substrate of a first conductivity type having, at a portion thereof, a buried region of a second conductivity type which is opposite to said first conductivity type,

b. a single semiconductor island region of low impurity concentration and of said first conductivity type disposed on said buried region and surrounded by an insulation film,

c. a resistance region of said second conductivity type formed in said semiconductor island region in electrical contact therewith,

d. a diode contact region of said first conductivity type and of a high impurity concentration connected to one end of said resistance region and formed in said semiconductor island region,

e. a high impurity concentration region of said second conductivity type selectively formed in said semiconductor island region in a manner to reach said buried region, and

f. a plurality of electrodes, one formed on a part extending over said resistance region and said diode contact region of said diode, another formed on another end of said resistance region and a third formed on a surface of said high impurity concentration region.

4,860,084

SEMICONDUCTOR DEVICE MOSFET WITH V-SHAPED DRAIN CONTACT

Tadashi Shibata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 770,246, Aug. 28, 1985, abandoned. This application Jan. 3, 1989, Ser. No. 293,570
Claims priority, application Japan, Sep. 3, 1984, 59-182810
Int. Cl.[4] H01L *29/06*
U.S. Cl. 357—55 **4 Claims**

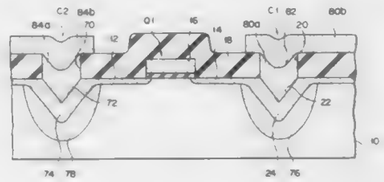
1. A metal oxide semiconductor field effect transistor formed on a semiconductive substrate of a first conductivity type having a surface, said transistor comprising:

(a) a conductive gate electrode layer insulatively provided above said substrate;

(b) first and second semiconductive layers of a second conductivity type, which are formed in the surface of said substrate to serve as source and drain regions of said transistor, said substrate having first and second concave portions formed to have inner surfaces and bottom portions, said first and second concave portions being adjacent to said first and second semiconductive layers, respectively and said first and second semiconductive layers including contact portions which extend below the bottom portions of said first and second concave portions to surround said first and second concave portions, respectively;

(c) an insulative layer formed on said substrate defining therein contact holes for said source and drain regions;

(d) first and second conductive wiring layers which are formed on said insulative layer to cover said contact holes



in such a manner that they are electrically in contact with said first and second semiconductive layers through said concave portions, respectively; and

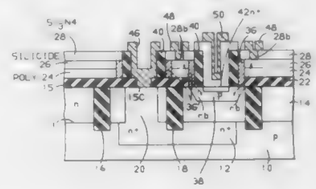
(e) third and fourth semiconductive layers of the first conductivity type, which are formed in said substrate to surround said contact portions of said first and second semiconductive layers, respectively, for suppressing current charges from leaking from said first and second concave portions, thereby preventing the occurrence of punch-through phenomenon in said transistor, said third and fourth semiconductive layers being formed by doping inpurities of the first conductivity type in said substrate through said contact holes.

4,860,085

SUBMICRON BIPOLAR TRANSISTOR WITH BURIED SILICIDE REGION

Anatoly Feygenson, Reading, Pa., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 871,264, Jun. 6, 1986, abandoned. This application Aug. 24, 1988, Ser. No. 238,990
Int. Cl.[4] H01L *29/04, 29/72, 23/48, 29/34*
U.S. Cl. 357—59 **5 Claims**



1. A high performance bipolar transistor structure comprising

a monocrystalline silicon body of a first conductivity type;

a buried collector region of a second conductivity type formed in a top major surface of said body;

an epitaxial layer of said second conductivity type disposed over said top major surface of said body;

a deep collector contact region formed in said epitaxial layer which connects said buried collector region to the top major surface of said epitaxial layer;

a base region of said first conductivity type formed in the top major surface of said epitaxial layer above said buried

collector region and separated from said deep collector contact region;
an emitter region of said second conductivity type formed within said base region and extending to said top major surface of said epitaxial layer;
said base region including an intrinsic base region located below said emitter region and an extrinsic base region located extending from said major surface and adjacent to said emitter region;
a base contact region including
an insulating layer disposed over said top major surface of said epitaxial layer above said buried collector region and adjacent to said base region;
a heavily doped polysilicon layer of said first conductivity type disposed over said insulating layer;
a silicide layer disposed over so as to completely cover said heavily doped polysilicon layer, wherein the resistance of said silicide layer is significantly less than the resistance of said polysilicon layer;
a polysilicon region forming a vertical connecting region adjacent to said insulating, polysilicon and silicide layers and extending to the top major surface of said extrinsic base region, said polysilicon region forming a vertical connection between said extrinsic base region and said polysilicon and silicide layers, wherein the combination of said polysilicon and silicide layers provides a low extrinsic base resistivity; and
a silicon nitride layer disposed over said silicide layer so as to overhang said insulating, polysilicon, and silicide layers such that said polysilicon vertical connection region is contained underneath the silicon nitride overhang region.

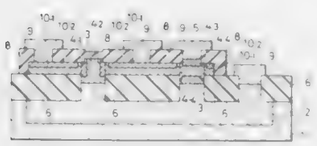
4,860,086

SEMICONDUCTOR DEVICE

Tohru Nakamura, Houya; Masahiko Ogirima, Tokyo; Kazuo Nakazato, Kokubunji; Takao Miyazaki, Hachioji; Naoki Yamamoto, Kawaguchi; Minoru Nagata, Kodaira, all of Japan, and Shojiro Sugaki, deceased, late of Nishinomiya, Japan (by Rieko Sugaki, administrator), assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 527,846, Aug. 30, 1983, abandoned. This application Mar. 16, 1987, Ser. No. 26,254
Int. Cl.[4] H01L *25/54, 21/72, 21/76*
U.S. Cl. 357—67 12 Claims





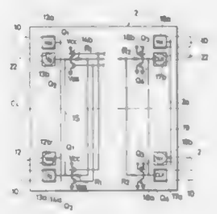
1. A bipolar transistor semiconductor device having a collector region, a base region and an emitter region comprising:
a semiconductor body of a single crystal having a first protruding portion of a first conductivity type;
an insulation film having a first opening, said insulation film being formed on a surface of said body so that said first protruding portion is located at said first opening;
a first polycrystalline semiconductor layer of a second conductivity type opposite to said first conductivity type formed on said insulation layer and in contact with said protruding portion; and
a first metal silicide layer formed on said first polycrystalline semiconductor layer and separated from said first protruding portion by a portion of said first polycrystalline semiconductor layer,
wherein said base region is formed as a first region of said second conductivity type formed in said first protruding portion, wherein one of said emitter and said collector regions is formed as a second region of the second conductivity type formed in the first region, and wherein the other of said emitter and collector regions is formed as a third region of said first conductivity type in said semiconductor body under the first protruding portion, and further wherein said polycrystalline semiconductor layer is formed in contact with said first region forming said base region of said bipolar transistor to prevent direct contact between the base region of the bipolar transistor and the first metal silicide layer.

4,860,087

SEMICONDUCTOR DEVICE AND PROCESS FOR PRODUCING THE SAME

Kiyoshi Matsubara, Kodaira; Tadashi Yamaura, Kokubunji; Toshimasa Kihara, Tachikawa, and Norishige Kawashimo, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 35,009, Mar. 26, 1987, abandoned. This application Dec. 13, 1988, Ser. No. 284,841
Claims priority, application Japan, Mar. 26, 1986, 61-65677
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—68 6 Claims



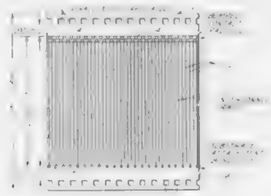
1. A semiconductor device comprising a semiconductor pellet which is provided on its principal surface with a plurality of first bonding pad electrodes electrically connected by wiring extending on the semi-conductor pellet with respective ones of a plurality of semiconductor device electric circuit functions and arranged in a first arrangement, and a plurality of second bonding pad electrodes which are electrically connected by wiring extending on the semiconductor pellet with respective ones of the same plurality of electric circuit functions as those of the corresponding first bonding pad electrodes and which are arranged in a second arrangement which is different from said first arrangement such that the first and second bonding pad electrodes electrically connected with the same electric circuit functions are located on opposite sides and substantially the same distance from an imaginary straight line traversing said principal surface of said semiconductor pellet as seen in plan view, said first bonding pad electrodes being interconnected to respective external terminal leads of said semiconductor device by means of wire bonding.

4,860,088

ELECTRICAL INTERCONNECT TAPE

Robert T. Smith, Roundrock, and Chang-Hwa Chung, Austin, both of Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Sep. 14, 1987, Ser. No. 96,866
Claims priority, application United Kingdom, Oct. 11, 1986, 8616823
Int. Cl.[4] H01B *7/08*
U.S. Cl. 357—69 8 Claims



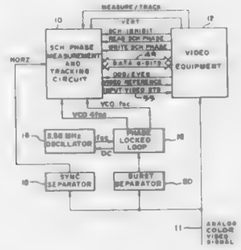
1. An electrical interconnect tape for connecting two electrical members comprising,
a flexible beam lead tape having first and second edges, each of said edges having frame sprocket perforations, said tape having a first layer of electrical conductors extending transverse to said edges and having first and second ends, a middle layer of a dielectric material, and a third electrical ground layer, said first ends of the conductors being adjacent the first edge and said second ends being adjacent the second edge, and
vias extending through the dielectric layer at the first and second ends of the electrical conductors, each of said vias aligned with one of said electrical conductors.

4,860,089

APPARATUS AND METHOD FOR TRACKING THE SUBCARRIER TO HORIZONTAL SYNC OF A COLOR TELEVISION SIGNAL

Terrance Smith, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 10, 1987, Ser. No. 36,647
Int. Cl.[4] H04N *17/02, 9/45*
U.S. Cl. 358—10 34 Claims



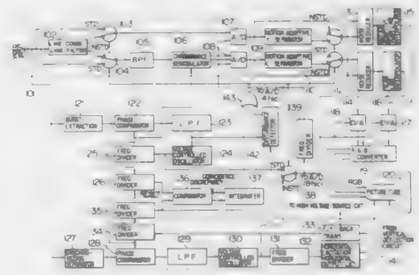
1. A circuit for tracking the subcarrier-to-horizontal sync phase of an input video signal having a horizontal sync signal, comprising:
means for providing from the input video signal a horizontal sync-related subcarrier signal whose phase is the same from line to line;
means for generating from the input video signal a horizontal pulse with controllable time delay commensurate with time variations in the horizontal sync signal;
means responsive to the providing and generating means for supplying a servo voltage indicative of a phase difference between the horizontal sync-related subcarrier signal of constant phase and the horizontal pulse of controllable time delay; and
loop mean coupling the supplying means to the generating means, for varying the controllable time delay of the horizontal pulse in response to the servo voltage to reduce said phase difference to zero, and to servo the circuit so that it tracks the subcarrier-to-horizontal sync phase.

4,860,090

DIGITAL SIGNAL PROCESSING CIRCUIT DRIVEN BY A SWITCHED CLOCK AND USED IN TELEVISION RECEIVER FOR PROCESSING STANDARD AND NONSTANDARD TELEVISION SIGNALS

Toshinori Murata; Ikuya Arai; Toshiyuki Kurita, and Isao Nakagawa, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 7, 1988, Ser. No. 164,914
Claims priority, application Japan, Mar. 9, 1987, 62-51909
Int. Cl.[4] H04N *9/64*
U.S. Cl. 358—21 R 16 Claims



1. A signal processing circuit for use in a television receiver designed to receive
a standard television signal which contains a picture signal, a chrominance subcarrier signal and a horizontal synchronizing signal and in which ratio between the frequency of said chrominance subcarrier signal and the frequency of said horizontal synchronizing signal is equal to a predetermined value, or
a nonstandard television signal which contains a picture signal, a chrominance subcarrier signal and a horizontal synchronizing signal and in which ratio between the frequency of said chrominance subcarrier signal and the frequency of said horizontal synchronizing signal differs from the corresponding ratio in said standard television signal, and including
analogue/digital converter means for converting said television signals into digital signals,
motion-adaptive signal processing circuit means for processing said television signals converted to said digital signals, and
digital/analogue converter means for converting said television signals processed by said motion-adaptive signal processing circuit means to analogue signals,
characterized in that said signal processing circuit comprises:
(a) an input terminal to which said standard television signal or said nonstandard television signal is supplied;
(b) luminance signal/chrominance signal separating circuit connected to said input terminal for receiving said standard television signal or said nonstandard television signal to separate a luminance signal and a chrominance signal from said standard television signal or said nonstandard television signal for thereby producing said luminance

signal and two color difference signals, said luminance signal and said color difference signals being supplied to said analogue/digital converter means;

(c) burst signal extracting circuit means connected to said input terminal for receiving said standard television signal to extract a burst signal from said standard television signal or said nonstandard television signal;

(d) horizontal synchronizing signal separator circuit means connected to said input terminal for receiving said standard television signal or said nonstandard television signal to separate a horizontal synchronizing signal from said standard television signal or said nonstandard television signal;

(e) first clock signal generating circuit means connected to said burst signal extracting circuit means and including a first phase-locked loop for generating a first clock signal synchronized with said burst signal;

(f) second clock signal generating circuit means connected to said horizontal synchronizing signal separating circuit and including a second phase-locked loop for generating a second clock signal synchronized with said horizontal synchronizing signal;

(g) signal decision circuit means connected to said first and second clock generating circuit means for comparing phase of said first clock signal with that of said second clock signal to thereby produce a coincidence output signal when frequencies of said first and second clock signals lie within a predetermined range while producing a discrepancy output signal when the frequencies of said first and second clock signals are out of said predetermined range; and

(h) switch circuit means connected to said analogue/digital converter means, said digital/analogue converter means, and said first and second clock signal generating circuit means and controlled by said decision circuit means such that upon reception of the coincidence signal from said decision circuit means, said switch circuit means supplies said first clock signal received from said first clock signal generating circuit to said analogue/digital converter means and said digital/analogue converter means while upon reception of said discrepancy signal from said signal decision circuit, said switch circuit means supplies said second clock signal supplied from said second clock signal generating circuit means to said analogue/digital converter circuit means and said digital/analogue converter means.

4,860,091

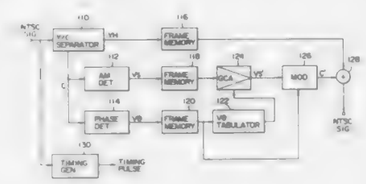
VIDEO IMAGE PROCESSING APPARATUS FOR EMPHASIZING COLOR OF AN IMAGE BY ENHANCING SATURATION

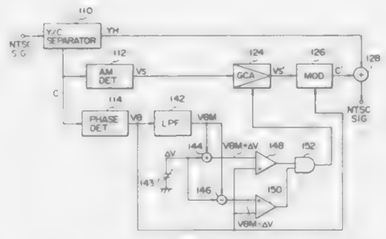
Kenji Kimura, Tachikawa, and Kiyoshi Tsuji, Tanashi, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 123,975, Nov. 20, 1987, Pat. No. 4,814,859.
This application Jan. 26, 1989, Ser. No. 302,550
Claims priority, application Japan, Nov. 28, 1986, 61-283566; Dec. 18, 1986, 61-302155
Int. Cl.[4] H04N *9/74*
U.S. Cl. 358—22 **6 Claims**

1. A video image processing means comprising:

detecting means for obtaining a frequency distribution of hues of an image of a single video frame and for detecting pixels of said video frame which have a hue falling outside a predetermined variance range from a hue of a maximum frequency; and





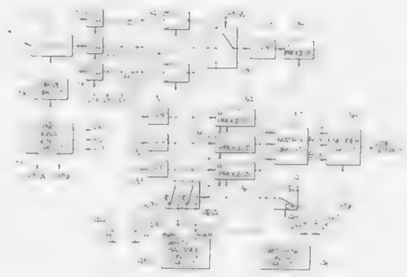
saturation enhancing means for enhancing saturation of a detected pixel.

4,860,092

COLOR IMAGE SIGNAL PROCESSING CIRCUIT WITH WHITE BALANCE CONTROL AND GAIN CONTROL

Teruo Hieda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1986, Ser. No. 922,293
Claims priority, application Japan, Nov. 9, 1985, 60-251490
Int. Cl.[4] H04N *9/73, 9/04, 9/07, 9/09*
U.S. Cl. 358—29 **32 Claims**



1. An image pickup apparatus comprising:

(A) image pickup means for producing plural color signals representing different wavelengths of light corresponding, respectively, to different colors;

(B) signal forming means for combining said color signals to form a luminance signal based on the color signals, said signal forming means including first controllable-gain circuit means for changing the level of said luminance signal, said signal forming means further including switching means for sequentially selecting each of the plural color signals in order to form the luminance signal;

(C) first gain control means for changing the gain of said first controllable-gain circuit means in said signal forming means;

(D) second controllable-gain circuit means for changing the level of one of said plural color signals; and

(E) second gain control means for changing the gain of said second controllable-gain circuit means in response to a change in the gain of said first controllable-gain circuit means in said signal forming means controlled by said first gain control means.

27. A color image pickup apparatus comprising:

(A) a color image pickup means for producing plural color signals corresponding to different colors in response to a received color image of an object;

(B) luminance signal forming means for selecting said color signals in a predetermined order to form a luminance signal;

(C) first controllable-gain circuit means for changing the level of the luminance signal;

(D) color balancing means provided between said image pickup means and said luminance signal forming means for varying the color balance of said plural color signals; and

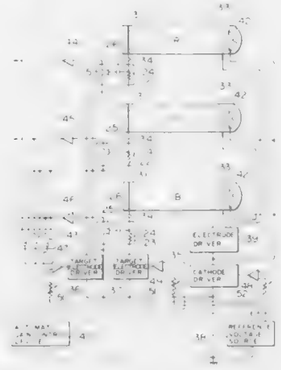
(E) control means for controlling said color balancing means to vary the color balance of said plural color signals by causing one of the color signals corresponding to a blue color to be attenuated when the gain of said first controllable-gain circuit means exceeds a predetermined level.

4,860,093

METHOD AND APPARATUS FOR DRIVING A PLURALITY OF PICK-UP TUBES HAVING THEIR CATHODES SUPPLIED BY A COMMON NEGATIVE POTENTIAL

Takashi Yamashita, Sagamihara; Keiichi Shidara, Tama; Masaaki Aiba, Tokyo; Yukio Takasaki, Kawasaki, and Tadaaki Hirai, Koganei, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of Tokyo, Japan

Filed Jan. 13, 1988, Ser. No. 143,655
Claims priority, application Japan, Jan. 14, 1987, 62-4874
Int. Cl.[4] H04N *9/09, 3/18, 5/228, 9/73*
U.S. Cl. 358—50 **18 Claims**



1. A method of driving a plurality of image pick-up tubes, each having a target including a transparent substrate, a target electrode formed on the substrate and a photoelectric converting layer formed on the target electrode to convert incident signal light into an electric signal, a cathode electrode to emit a scanning electron beam, and a group of electrodes to converge and deflect the scanning electron beam on the target, said method comprising the steps of:

supplying a substantially common negative potential to the cathode electrode of each of the plurality of image pick-up tubes;

setting the target electrode of at least one image pick-up tube of said plurality of image pick-up tubes at substantially earth potential; and

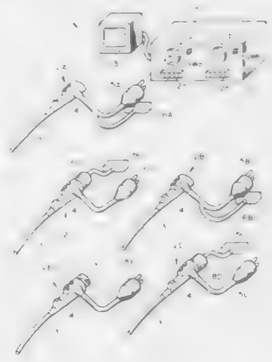
supplying potentials to the target electrodes of the remaining image pick-up tubes of said plurality of image pick-up tubes so as to drive said target electrodes.

4,860,094

CONTROL APPARATUS FOR USE WITH DIFFERENT TYPES OF ENDOSCOPES

Hiroki Hibino, Hachioji; Toshiaki Nishikori, Sagamihara, and Kenji Kumura, Tachikawa, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1988, Ser. No. 168,085
Claims priority, application Japan, Mar. 10, 1987, 52-54591; Mar. 10, 1987, 52-54592; Mar. 16, 1987, 52-60291; Mar. 16, 1987, 52-60292; Mar. 17, 1987, 52-61682
Int. Cl.[4] H04N *7/18;* **A61B** *1/04*
U.S. Cl. 358—98 **34 Claims**



1. An endoscope apparatus comprising:

a plurality of kinds of endoscopes each having

an elongate insertable part having an illuminating window and observing window in a tip part,

an illuminating light transmitting means for leading illuminating light to said illuminating window,

an imaging means for receiving returning light from an object, said returning light entering from said observing window and imaging the object,

a signal transmitting means connected at one end to said imaging means,

an illumination connector provided at an entrance side end of said illuminating light transmitting means, and

a signal connector provided at another end of said signal transmitting means, each endoscope being different in at least one of illuminating method and signal processing system;

an illuminating means, having an illumination connector receptacle removably connectable with respective illumination connectors of said plurality of endoscopes, for feeding illuminating light to said plurality of endoscopes; and

a signal processing means, having a signal connector receptacle removably connectable with respective signal connectors of said plurality of endoscopes, for processing signals for said plurality of endoscopes;

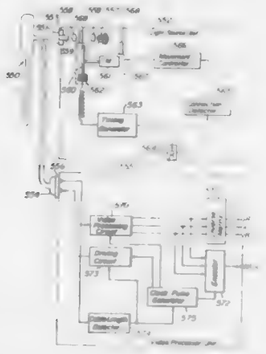
at least one of said illumination connector receptacle and said signal connector receptacle being plural.

4,860,095

VIDEO CAMERA APPARATUS AND VIDEO ENDOSCOPE APPARATUS WITH MEANS FOR COMPENSATING IMAGE ERRORS CAUSED BY DIFFERING CABLE LENGTHS

Kenji Kimura, Tachikawa, and Kiyoshi Tsuji, Tanashi, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1988, Ser. No. 179,625
Claims priority, application Japan, Apr. 21, 1987, 62-99458; May 6, 1987, 62-110062; May 6, 1987, 62-110063; May 7, 1987, 62-109666; Aug. 17, 1987, 62-203628; Feb. 17, 1988, 63-32811
Int. Cl.[4] H04N *7/18*; A61B *1/06*
U.S. Cl. 358—98 36 Claims



1. A video camera apparatus comprising

a camera unit including a solid state image sensor for converting an optical image of an object into an electric signal;

a video processor unit having a driving circuit for generating a driving signal for driving the solid state image sensor and a video processing circuit for processing the electric signal supplied from the solid state image sensor to derive an image signal;

a signal cable connected between the camera unit and the video processor unit and having a first signal line for transmitting the driving signal from the video processor unit to the camera unit and a second signal line for transmitting the electric signal supplied from the solid state image sensor from the camera unit to the video processor unit; and

a cable length detection circuit provided in the video processor unit for processing the electric signal transmitted from the solid state image sensor via the second signal line to derive from the electric signal cable length information representing the length of said signal cable.

4,860,096

MOTION ANALYSIS TOOL AND METHOD THEREFOR

Eugene C. Long, Lafayette; James E. Kubitschek, Westminster, and Stephen M. Horacek, Boulder, all of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Jul. 21, 1988, Ser. No. 222,401
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—101 28 Claims

1. A motion analysis tool for viewing the repetitive motion of an object, said motion analysis tool comprising:

means operatively connected with said object for generating a trigger signal corresponding to each repetition of said object,

means directed at said object for producing video images of said object as said object moves through each said repetition of said motion,

means directed at said object for selectively illuminating said object,

means receptive of said trigger signals from said generating means for capturing a series of video images from said producing means, said capturing means activating said illuminating means to illuminate said object when capturing each video image in said series, each of said captured images in said series being spaced a predetermined step of



time apart in said motion, and each successive captured image in said series being taken from the next or a subsequent successive repetition of said object, and

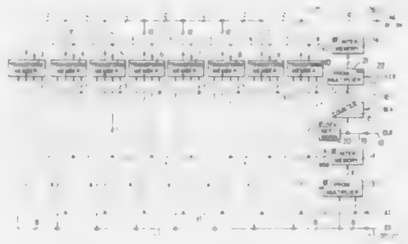
means receptive of said series of captured images from said capturing means for displaying said series of images, said displayed images providing a slow motion simulation view of said object as said object moves in said repetitive motion.

4,860,097

TRANSFORMATION CIRCUIT

Wolfgang Hartnack, Hemmingen; Werner Keesen, and Herbert Schütze, both of Hanover, all of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 914,732, Oct. 1, 1986, Pat. No. 4,807,033. This application Dec. 14, 1987, Ser. No. 132,448
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642664
Int. Cl.[4] H04N *7/133*
U.S. Cl. 358—133 7 Claims



1. In a circuit for the transformation of digital video signals, the improvement wherein said circuit comprises:

transform means including a plurality of transform members, operative for effecting transformation of a digital video signal in the form of a matrix of signal elements in a sequence which processes the matrix signal elements row by row and column by column, respectively, and

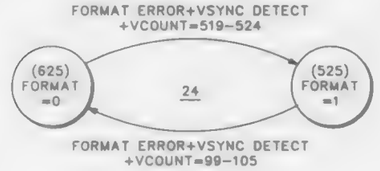
signal conducting means connected for passing the signal elements through said transform members twice serially.

4,860,098

VIDEO DISCRIMINATION BETWEEN DIFFERENT VIDEO FORMATS

Richard L. Murphy, Grass Valley, Calif., assignor to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Sep. 19, 1988, Ser. No. 246,053
Int. Cl.[4] H04N *5/05*
U.S. Cl. 358—139 4 Claims



1. A video discriminator for automatically providing a format select indicator representative of the format of a television standard video input signal comprising:

means for determining the number of vertical sync pulses within a vertical interval of the video input signal and for providing a vertical sync detect pulse;

means for generating a format error signal from the number of vertical sync pulses and the format select indicator; and

means for changing the format select indicator in response to the format error signal, the vertical sync detect pulse and a horizontal line count between consecutive vertical sync detect pulses to reflect a change in format of the video input signal.

4,860,099

VIDEO SIGNAL PROCESSING CIRCUIT FOR VTR SYSTEM

Takeshi Kuwajima, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 7, 1988, Ser. No. 216,328
Claims priority, application Japan, Jul. 7, 1987, 62-170033
Int. Cl.[4] H04N *5/04*
U.S. Cl. 358—148 8 Claims



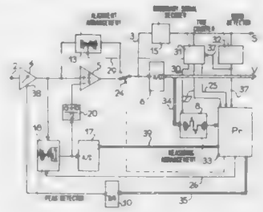
1. A video signal processing circuit comprising a first input terminal supplied with a video signal, a second input terminal supplied with a pseudo vertical synchronizing signal having a train of pulses at a predetermined cycle, means coupled to said second input terminal for detecting said pseudo vertical synchronizing signal to generate a detection signal, means coupled to said second input terminal for separating said pulses from said pseudo vertical synchronizing signal, output means coupled to said first input terminal and said separating means for outputting said video signal when said detection signal is not generated and for outputting the separated pulses when said detection signal is generated, and means for clamping an output signal from said output means at a predetermined level during a period corresponding to a synchronizing signal period except for periods when the separated pulses are present.

4,860,100

SYNCHRONIZATION SYSTEM FOR A SEMI-DIGITAL SIGNAL

Issa Rakhodai, Suresnes; Serge G. Lefebvre, Val de Reuil, and Pascal Couderc, Courbevoie, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 8, 1988, Ser. No. 154,178
Claims priority, application France, Feb. 6, 1987, 87 01471
Int. Cl.[4] H04N *5/04*
U.S. Cl. 358—148 8 Claims



1. A system for providing synchronization of a television receiver for receiving signals each of which conveys luminance and analog color information components along with a duobinary period, a predetermined number of said signals forming a picture frame wherein one signal of said number of signals further comprises analog reference frame voltage plateaus corresponding to line, black, grey and white voltage levels, and the duobinary period of said one signal containing a frame synchronization word, this frame synchronization word passing through the system via a variable gain amplifier and an aligning device for providing an alignment of a continuous component of each of said received signals, the system includes a duobinary signal decoding device, a peak detector for measuring and storing maximum and minimum values of each of the received signals, means associated with said peak detector for applying, based on said maximum and minimum values, a datum to the aligning device for correction of the continuous component of each of said received signals and a datum to a gain control input of the variable gain amplifier, a measuring arrangement for measuring the voltage levels of said plateaus of said one received signal, means associated with said measuring arrangement for applying, based on these voltage levels, a gain control value to said variable gain amplifier, and a word detector for recognizing the frame synchronization word; wherein the system further comprises a processor for controlling said system, said processor establishing, one after another, three different modes of operation, a first mode of said different modes being at a start-up of said system in which the processor activates the peak detector and the means associated with said peak detector to provide the datum for controlling the gain and the continuous component of the received signals, in which the peak detector is continuously enabled, a second mode of said different modes in which the processor provides the activation of the peak detector only during the duobinary period of each of said number of signals and during all of a next to last of the received signals in the each picture frame, the second mode being established when the word detector has recognized a frame synchronization word, and a third mode of said different modes in which the processor activates the plateau voltage measuring arrangement and the means associated with the plateau voltage measuring arrangement for applying a gain control value to the variable gain amplifier, the third mode being established when a word position checking device has detected coincidence between a new frame synchronization word and a signal supplied by a time counter at consecutive instants, each corresponding to a period of said picture

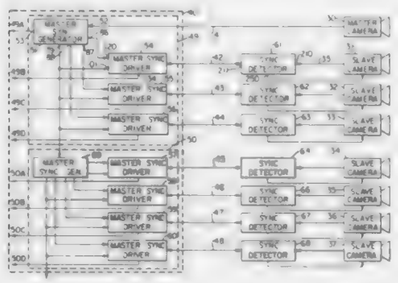
frame, after a previously recognized frame synchronization word.

4,860,101

CENTRAL STATION SYNCHRONIZATION SYSTEM

Yacov A. Pshtissky, Bayside, and Shi-Yang Gao, Uniondale, both of N.Y., assignors to Vicon Industries, Inc., Melville, N.Y.

Filed Nov. 6, 1987, Ser. No. 118,271
Int. Cl.[4] H04N 5/04
U.S. Cl. 358—149 14 Claims



1. An apparatus for synchronizing a plurality of remotely located video sources in a CCTV system in which signals are transmitted between said video sources and a central station, said video sources generating video source signals, said plurality of video sources comprising a master source and at least one slave video source, said slave video sources including means for receiving a sync signal and for synchronizing said video source signal to said received sync signal, each of said plurality of video sources being coupled to said central station by a respective single link, a master synchronization signal and said video signal from said video sources being placed on said single link, said apparatus comprising:

master sync generator means coupled to said master video sources via said respective single link, for detecting synchronization signals from said master video source;

at least one master sync driver means each coupled to said master sync generator means and to one of said at least one slave video sources by one of said single links, for one slave video sources by one of said single links, for providing a master sync signal on said respective single link, having a signal level different from a synchronization signal contained in said slave video signal; and

at least one sync detector means for detecting said master sync, each being coupled between one of said slave video sources and one of said master sync drivers for providing said master sync to said slave video source to which said sync detector means is connected and wherein said master sync generator includes means for generating an identification signal for marking said master sync signal.

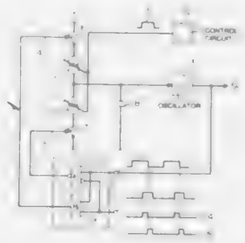
4,860,102

CIRCUITRY FOR AUTOMATICALLY SWITCHING THE CONTROL SPEED OF A PHASE-CONTROL CIRCUIT

Franz Dieterle, St. Georgen; Uwe Hartmann, and Udo Mai, both of Villingen-Schwenningen, all of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen, Fed. Rep. of Germany

Filed May 11, 1988, Ser. No. 192,851
Claims priority, application Fed. Rep. of Germany, May 23, 1987, 3717444
Int. Cl.[4] H03L 7/00; H04N 5/04
U.S. Cl. 358—158 3 Claims

1. An arrangement for automatically switching the control speed of a phase control circuit comprising: a television receiver with a Picture tube and electron beams; a phase-controlled oscillator circuit in said television receiver; a phase-control circuit in said oscillator for increasing control speed



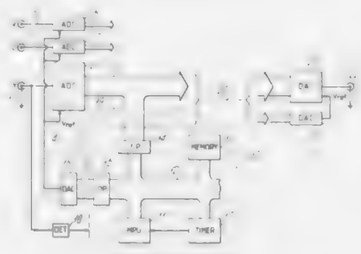
during flyback of the electron beams in said picture tube and decreasing the control speed during the picture forward stroke.

4,860,103

VIDEO LEVEL CONTROL

Mohammad S. Azam, and Michael D. Carr, both of Ipswich, England, assignors to British Telecommunications plc, London, England

Continuation of Ser. No. 917,158, Oct. 9, 1986, abandoned. This application Nov. 22, 1988, Ser. No. 275,658
Claims priority, application United Kingdom, Oct. 9, 1985, [illegible]
Int. Cl.[4] H04N 5/14
U.S. Cl. 558—160 11 Claims



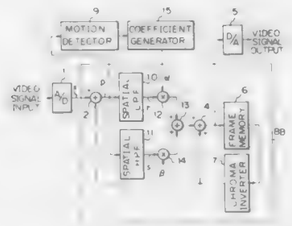
1. A digital video coder comprising a video input for receiving analogue video signals directly from a camera; an analogue-to-digital converter connected to the input and having an output for providing digital words representing successive samples of the input video signals and a control input for varying the sensitivity of the converter; and control means responsive to the digital words at the output of the converter to generate digitally, as a function of the average amplitude level represented by previous said digital words at the converter output, a control signal for application to the control input of the converter.

4,860,104

NOISE ELIMINATING APPARATUS OF A VIDEO SIGNAL UTILIZING A RECURSIVE FILTER HAVING SPATIAL LOW PASS AND HIGH PASS FILTERS

Hitoshi Katsuyama, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 22, 1988, Ser. No. 209,929
Claims priority, application Japan, Oct. 26, 1987, 62-269761
Int. Cl.[4] H04N 5/213
U.S. Cl. 358—167 3 Claims



1. A noise eliminating apparatus which includes a recursive filter having delay means for delaying a video signal by a predetermined period of time to produce a delayed video signal and which eliminates noise components included in said video signal, said apparatus comprising:

a difference means for generating a difference signal between the video signal and the delayed video signal produced by said delaying means;

movement detecting means for detecting a movement of an image on the basis of said difference signal;

control means for regulating respective recursive coefficients for a plurality of spatial frequency components, included in said difference signal on the basis of a detection output of said movement detecting means;

said recursive filter including a spatial low pass filter and a spatial high pass filter for producing low frequency and high frequency components, respectively, of said difference signal as the plurality of spatial frequency components said low frequency components and said high frequency components being subsequently multiplied by said respective recursive coefficients, and

said control means operative for varying the recursive coefficient corresponding to said low frequency components so as to decrease the proportion of said low frequency components in said plurality of spatial frequency components for the period of time when said movement detecting means detects the movement of the image, and said control means operative for keeping the recursive coefficient corresponding to the high frequency components at a constant value regardless of said movement detection.

4,860,105

NOISE REDUCING CIRCUIT OF A VIDEO SIGNAL

Hironao Sakaguchi, Tokyo; Masaji Yoshida, Yokohama, and Yasutoshi Matsuo, Kawasaki, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

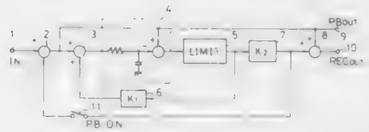
Filed May 18, 1988, Ser. No. 195,585
Claims priority, application Japan, May 22, 1987, 62-125245; May 22, 1987, 62-77177[U]; Jun. 22, 1987, 62-155128
Int. Cl.[4] H04N 9/64, 5/213, 5/91
U.S. Cl. 358—167 15 Claims

1. A noise reduction circuit for use in a video signal recording and/or reproducing apparatus comprising:

an input terminal to which an input video signal is applied;

high pass filter means for extracting a high frequency signal component according to a predetermined frequency characteristic from the input video signal applied to the input terminal;

first amplitude modifying means supplied with the high frequency signal component from the high pass filter means as an input signal for producing a first processed signal having a modified amplitude in accordance with a predetermined amplitude characteristic curve which changes a gradient thereof forming at least three slopes of different gradient with an increase in amplitude of the input signal supplied thereto, said amplitude characteristic curve having a first predetermined slope of said three slopes for an input signal supplied thereto having a small amplitude which is smaller than a first predetermined level, said amplitude characteristic curve having a second predetermined slope of said three slopes being less steep as compared with the first predetermined slope for an input signal supplied thereto having an intermediate level which is larger than the first predetermined level but smaller than a second predetermined level, said amplitude characteristic curve having a third predetermined slope of said three slopes which is substantially flat for an input signal supplied thereto having a large level which is larger than the second level;



amplifying means supplied with the first processed signal from the first amplitude modifying means for modifying the amplitude of the processed signal supplied thereto by a predetermined coefficient to produce a second processed signal;

first summing means supplied with the second processed signal from the amplifying means and the input video signal for adding the second processed signal to the input video signal to produce a preemphasis signal; and

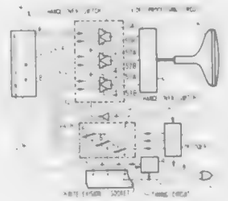
first subtracting means supplied with the second processed signal from the amplifying means and the input video signal for subtracting the second processed signal from the input video signal to produce a deemphasis signal.

4,860,106

CIRCUIT FOR SWITCHING VIDEO SOURCES

Dominique Taupin, Paris, and Philippe Vilard, Rueil, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 799,213, Nov. 18, 1985, abandoned. This application Aug. 18, 1988, Ser. No. 233,974
Claims priority, application France, Nov. 20, 1984, 84 17670
Int. Cl.[4] H04N 5/268
U.S. Cl. 358—181 9 Claims



1. A circuit for rapidly switching, in a television receiver, between at least three separate video sources which are connectable to a video processing stage providing the display of a picture, said circuit comprising at least a first change-over

switch in cascade with a second change-over switch, the first change-over switch having an output coupled directly to the video processing stage, a first input coupled to one of said at least three separate video sources, and a second input; and the second change-over switch having an output coupled to the second input of said first change-over switch and inputs coupled, respectively to the others of said at least three separate video sources the switching action of said circuit being controlled by a plurality of control signals emitted by a control signal means coupled to said second change-over switch, characterized in that said first change-over switch has a switching speed substantially faster than that of said second change-over switch and that the control signal means includes a timing circuit which preserves said control signals during at least one field period, wherein the switching speed of said first change-over switch establishes the switching speed of said rapidly switching circuit.

4,860,107

VIDEO DISPLAY DRIVER APPARATUS

John H. Furrey, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Princeton, N.J.

Filed Mar. 28, 1988, Ser. No. 174,057

Int. Cl.[4] H04N *5/68, 5/59*

U.S. Cl. 358—184 **5 Claims**



1. A video signal processing system comprising:
an image display device having a signal input electrode with an associated capacitance;
a display driver amplifier having a signal input for receiving a video signal containing information to be displayed, and having an output circuit for developing a video output signal with a magnitude suitable for driving said image display device; and
a signal coupling path for conveying said video output signal from said output circuit to said signal input electrode of said image display device; wherein for reducing the effect of said associated capacitance upon said output circuit of said display driver amplifier said signal coupling path comprising:
a first emitter follower transistor having a base input electrode coupled to said output circuit of said driver amplifier, a collector electrode and an emitter output electrode, for isolating said output circuit of said driver amplifier from said associated capacitance in the presence of video signal amplitude transients of one polarity;
a second emitter follower transistor arranged in cascade with said first transistor and having a base input electrode coupled to said emitter output electrode of said first transistor, a collector electrode and an emitter output electrode coupled to said signal input electrode of said display device, for isolating said output circuit of said driver amplifier from said capacitance in the presence of video signal amplitude transients of another polarity;
a first undirectional current conducting semiconductor device coupled across a base-emitter junction of said first transistor and poled for forward current conduction in a direction opposite to that of said base-emitter junction of said first transistor; and
a second unidirectional current conducting semiconductor device coupled across a base-emitter junction of said second transistor and poled for forward current conduction in a direction opposite to that of said base-emitter junction of said second transistor.

4,860,108

IMAGE SENSING DEVICE FOR AN ELECTRONIC STILL CAMERA

Mitsuru Saito, Ibaraki, and Kazuchika Sato, Kobe, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 28, 1987, Ser. No. 138,435

Claims priority, application Japan, Dec. 29, 1986, 61-311268; Dec. 30, 1986, 61-311898

Int. Cl.[4] H04N *5/238*

U.S. Cl. 358—209 **5 Claims**



1. An image sensing device used for an electronic still camera, comprising:
a taking lens;
a charge accumulation type image sensing means for photoelectrically converting an image of an object to be photographed formed by said taking lens into an image signal and outputting the image signal;
a charge accumulation control means for controlling initiation and termination of a charge accumulation operation of said image sensing means;
a photoelectric conversion means for performing receipt and integration of a light which has passed through said taking lens during a control period of said charge accumulation control means;
a gain control means for controlling the gain of the image signal outputted from said image sensing means; and
a gain determining means for determining the gain of said gain control means in proportion to the difference between the output of said photoelectric conversion means after termination of the charge accumulation operation of said image sensing means and a predetermined value.

4,860,109

IMAGE PROCESSING APPARATUS

Katsura Kawakami, Yokohama; Shigeo Shimazaki, Kawasaki; Satoshi Takayama, Kawasaki, and Chika Onodera, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 23, 1987, Ser. No. 137,028

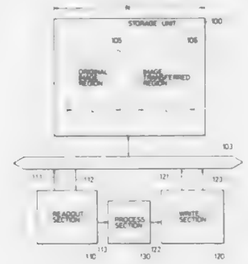
Claims priority, application Japan, Jan. 7, 1987, 62-1239; Feb. 26, 1987, 62-43335

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—400 **5 Claims**

1. An image processing apparatus comprising:
(a) a memory having a first region and a second region, the first region holding original image data;
(b) first calculation means for calculating addresses of segments of the first memory region;

(c) second calculation means for calculating addresses of segments of the second memory region;
(d) means for transferring the original image data from the first memory region to the second memory region in accordance with the calculated addresses of the segments of the first and second memory regions;



wherein the first calculation means and the second calculation means are mutually independent, and the calculation of the addresses of the segments of the first memory region is performed in parallel and simultaneously with the calculation of the addresses of the segments of the second memory region.

4,860,110

COMMUNICATION TERMINAL DEVICE

Nobuaki Kokubu, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1987, Ser. No. 46,158

Claims priority, application Japan, May 6, 1986, 61-104182

Int. Cl.[4] H04N *1/32, 1/387, 1/40*

U.S. Cl. 358—400 **16 Claims**



1. A receiving apparatus comprising:
(a) first receiving means for receiving information divided into a plurality of blocks;
(b) second receiving means for receiving data for designating predetermined one or ones of the information received through said first receiving means;
(c) recording means for visually recording on a recording material the information received through said first receiving means; and
(d) control means for controlling said recording means, said control means operating such that the designated block is record-processed differently from another block;
said control means operating such that a number of times the designated block is recorded is different from that of another block.

4,860,111

INFORMATION TRANSMISSION SYSTEM

Katsuichi Shimizu, Kunitachi, and Nao Nagashima, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 540,615, Oct. 11, 1983, abandoned. This application Apr. 15, 1988, Ser. No. 183,483

Claims priority, application Japan, Oct. 18, 1982, 57-182647; Oct. 21, 1982, 57-185287; Oct. 25, 1982, 57-187245

Int. Cl.[4] H04N *1/00*

U.S. Cl. 358—400 **36 Claims**



1. An information transmission system comprising a plurality of stations, said plurality of stations including at least a first station, which comprises at least a reader, a second station, which comprises at least a printer, and a third station, which comprises both a reader and a printer, all of said plurality of stations being connected to each other through a transmission channel;
wherein image information from each station provided with a reader is transmitted through the transmission channel to a station provided with a printer for image recording;
wherein each station provided with a reader comprises a communication control unit for transmitting image information read in said reader to the transmission channel;
wherein each station provided with both a printer and a reader operates to supply image information through said communication control unit to said printer, said communication control unit comprising selector means for releasing the image information either to said printer or to the transmission channel or to both.

4,860,112

TELERADIOLOGY SYSTEM HAVING MULTIPLE COMPRESSOR/EXPANDERS

John L. Nichols, Santa Clara; David Wang, Milpitas; Edward Kirkpatrick, Scotts Valley; Clark M. Viehweg, Los Gatos; Edwin S. Morton, Campbell, and Van T. Hua, San Jose, all of Calif., assignors to Raytel Systems Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 618,346, Jun. 7, 1984, Pat. No. 4,748,511. This application Nov. 25, 1987, Ser. No. 125,525

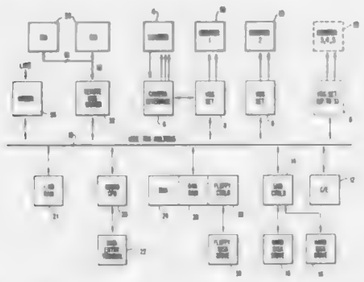
The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.

Int. Cl.[4] H04N *1/00, 1/417, 5/32, 7/12*

U.S. Cl. 358—400 **14 Claims**

1. A system for storing and transmitting still, spatial images, said system comprising
scanning means for scanning said still, spatial image and for generating analog video signals in response thereto,
interface means for digitizing said video signals generated by said scanner means to obtain pixels,
one or more compressor/expander means for alternately compressing and expanding said pixels, said compressor/expander means including a first buffer means for storing said pixels during compression and expansion, a transform processor means connected to said first buffer means for storing said pixels according to a cosine transformation during a compression operation in order to obtain a DC component value and a set of AC component values for each of said pixels and for processing said DC component value and said set of AC component values from each of

said pixels according to a reverse cosine transformation during an expansion operation, a second buffer means for storing said DC value and said set of AC values from each of said pixels and an encoding/decoding means for encoding said DC component value and said set of AC component values from each of said pixels during said compression operation and for decoding said encoded DC component value and said encoded set of AC values from each of said pixels during said expansion operation,



memory means for storing said encoded DC component value and said encoded set of AC component values from each of said pixels,

bus means for transmitting selected ones of said pixels to one or more predetermined locations, and

display means for visually displaying still, spatial type images corresponding to said transmitted pixels at said one or more locations.

4,860,113

CAMERA WITH ENHANCED COMMUNICATION WITH DETACHABLE LENS

Ryosuke Miyamoto, Kawasaki, and Shinji Saksi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 915,014, Oct. 3, 1986, abandoned. This application Sep. 7, 1988, Ser. No. 243,237

Claims priority, application Japan, Oct. 8, 1985, 60-224498

Int. Cl.[4] G03B *7/091*

U.S. Cl. 358—225 **29 Claims**



1. A camera system comprising:

(A) a camera body including:

(a) transmitting means for transmitting a command to an accessory;

(b) processor means for generating said command and applying the same to said transmitting means and for receiving, from said accessory, data generated thereby responsively to said command, and for controlling photo-taking processes in said camera body in respective first and second different manners correspondingly with such data provided by said accessory; and

(B) said accessory including:

(a) processor means for receiving said command transmitted by said transmitting means of the camera body and operable in first mode for operating said accessory in correspondence with said received command and generating first data, and operable in second mode and therein generating second data indicative either of improper receipt of said received command or of infeasibility of operation of said accessory in accordance with said received command, and

(b) transmitting means for transmitting generated such first and second data to said camera body processor means, said camera body processor means operating in said first and second manners respectively in response to receipt of said first and second data as generated by said accessory processor means.

4,860,114

METHOD AND APPARATUS FOR EXPANDING TWO-DIMENSIONAL COMPRESSIONAL CODE

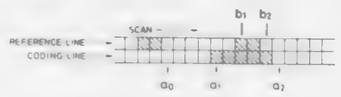
Ethuo Horikawa, Minamisshigara, and Hidefumi Masuzaki, Odawara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 19, 1987, Ser. No. 122,697

Claims priority, application Japan, Nov. 29, 1986, 61-283162

Int. Cl.[4] H04N *1/41*

U.S. Cl. 358—426 **10 Claims**





1. A method for expanding coded binary image data coded according to a line-by-line coding method in which the position of each color changing picture element on a coding line is coded in one of a plurality of code modes with respect to the position of a corresponding reference picture element situated on either the coding line or a reference line which lies immediately above the coding line, said method for expanding comprising the steps of:

analyzing each input code and producing a signal for identifying the corresponding code mode and signal for designating a reference line picture element position at which a color changing point is to be detected;

shifting the reference line data bit-serially and at the same time searching for the color changing point of the reference line data at a plurality of successive picture element positions in parallel;

producing a changing point detection signal representing that the color changing point is detected at one of said successive picture element positions designated by said designating signal;

producing, bit-serially and in synchronism with said shifting of the reference line data, expanded line data of each picture element which corresponds to each reference line picture element arriving at a predetermined one of said successive picture element positions;

controlling said shifting and searching step and both of said producing steps in response to said code mode identifying signal and said changing point detection signal; and

said shifting and searching step including a first detecting step of detecting a color change in a certain direction between each reference line picture element and its preceding picture element, a second detecting step of detecting a color change in the opposite direction between each reference line picture element and its preceding picture element, a first shifting step of shifting changing point signals obtained by said first detecting step along a first path, a second shifting step of shifting changing point signals obtained by said second detecting step along a second path, and a step of reading the shifted changing point signals simultaneously at a plurality of successive positions along a selected one of said first and second paths.

4,860,115

DIGITAL COPIER WITH A FACSIMILE FUNCTION

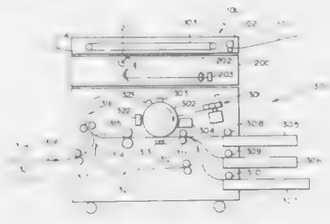
Masaaki Ogura, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 9, 1988, Ser. No. 191,438

Claims priority, application Japan, May 9, 1987, 62-113074

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—443 **5 Claims**



1. An image forming apparatus comprising:

image reading means for reading and converting an image carried on an original document into an electric signal to produce an image signal;

first reference signal generating means for outputting a first reference signal according to a first rule;

second reference signal generating means for producing a second reference signal according to a second rule which is different from said first rule;

selecting means for selecting one of the first and second reference signals to produce a selection signal;

comparing means for comparing the image signal and the selection signal to produce a comparison signal;

density converting means for converting the comparison signal with respect to density; and

control means for applying selection command signals to said selecting means and to said density converting means.

4,860,116

METHOD OF MEASURING SHADING CHARACTERISTICS IN IMAGE INFORMATION READING APPARATUS WITH A TEST RECORDING MEDIUM

Nobuyoshi Nakajima, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 13, 1988, Ser. No. 256,947

Claims priority, application Japan, Oct. 13, 1987, 62-258059

Int. Cl.[4] H04N *1/40*

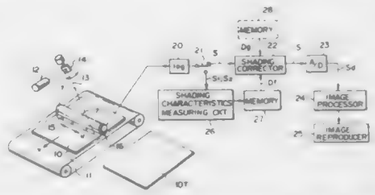
U.S. Cl. 358—447 **1 Claim**

1. A method of measuring shading characteristics of an image information reading apparatus for two-dimensionally scanning a recording medium with image information recorded thereon, with a light beam to produce light bearing said image information, and photoelectrically detecting said light with a light detector to produce an image signal representing said image information, said method comprising the steps of:

(i) recording uniform test image information on a test recording medium and scanning the test recording medium with a light beam to produce an image signal in each of two modes in which the test recording medium is oriented such that a prescribed line on the test recording medium extends in a main scanning direction and an auxiliary scanning direction substantially normal to said main scanning direction respectively in said two modes;

(ii) determining a signal level distribution A(x) along said prescribed line of a signal indicative of a logarithmic function of an output signal from said light detector when said prescribed line extends along said main scanning direction, and a signal level distribution B(x) along said prescribed line of a signal indicative of a logarithmic function of an output signal from said light detector when said prescribed line extends along said auxiliary scanning direction (x indicates a pixel position on said prescribed line); and

(iii) determining shading characteristics of the image information reading apparatus along said main scanning direction based on the difference A(x)—B(x) between said signal level distributions A(x) and B(x).



4,860,117

IMAGE PROCESSING METHOD AND SYSTEM USING MULTIPLE IMAGE SENSORS PRODUCING IMAGE DATA SEGMENTS WHICH ARE COMBINED AND SUBJECTED TO OPTICAL PROCESSING

Tomio Sasaki, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 150,297

Claims priority, application Japan, Jan. 29, 1987, 62-17159; Jan. 29, 1987, 62-17158

Int. Cl.[4] H04N *1/393, 1/028, 1/10*

U.S. Cl. 358—287 **10 Claims**



1. An image processing method comprising the steps of:

optically reading an original image line by line using a first plurality of image sensors at the same time to produce a first plurality of image data segments, each of said first plurality of image sensors optically reading a corresponding segment of a line of said original image;

processing said first plurality of image data segments to produce a second plurality of image data segments;

subjecting said second plurality of image data segments to a predetermined image data processing operation; and

combining said second plurality of image data segments into one line of image data.

8. An image processing system comprising:

a first plurality of image sensors for optically reading an original to produce image data line by line, said first plurality of image sensors reading a line of said original at the same time in a forward direction along said line;

first storing means for storing said image data produced by

said first plurality of image sensors at respective storage locations each defined by an address;

second storing means for storing image magnification data; and

write/read control means for producing addresses to address the storage locations of said first storing means and for controlling a write/read operation of said first storing means;

wherein said image magnification data is supplied to said write/read control means as a clock signal to vary the address of said first storing means as produced by said write/read control means in a write mode and a read mode of said first storing means.

4,860,118

IMAGE SIGNAL PROCESSING APPARATUS WITH EDGE EMPHASIS AND VARIABLE MAGNIFICATION

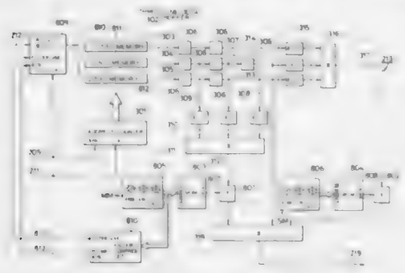
Shinobu Arimoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1988, Ser. No. 159,305

Claims priority, application Japan, Feb. 25, 1987, 62-43501; Feb. 25, 1987, 62-43509

Int. Cl.⁴ H04N *1/393, 1/40*

U.S. Cl. 358—451 **34 Claims**



8. An image signal processing apparatus comprising:

reading means for photoelectrically reading an original image in a main scanning direction and in a sub-scanning direction perpendicular to said main scanning direction and outputting an image signal;

means for setting reproduction magnification of the original image in the main scanning direction and the sub-scanning direction, respectively;

means for forming correction signals for use in an edge emphasis processing related to the main scanning and the sub-scanning directions, respectively, from the image signals of a plurality of pixels of the original image near a particular pixel of the original image;

processing means for performing the edge emphasis processing on an image signal of the particular pixel in accordance with the correction signals formed by said forming means; and

control means for varying the levels of the correction signals formed by said forming means in accordance with the main scanning and sub-scanning reproduction magnifications set by said setting means in the main scanning and sub-scanning directions.

15. An image signal processing apparatus comprising:

reading means for photoelectrically reading an original image and outputting an image signal;

setting means for setting a reproduction magnification of the original image;

processing means for performing smoothing processing of the image signal from said reading means; and

control means for controlling the smoothing processing of said processing means in accordance with the reproduction magnification set by said setting means.

21. An image signal processing apparatus comprising:

reading means for photoelectrically reading an original image and outputting an image signal;

setting means for setting a reproduction magnification of the original image;

first processing means for performing smoothing processing of the image signal from said reading means;

second processing means for performing edge emphasis processing of the image signal from said reading means; and

control means for controlling the smoothing processing by said first processing means and the edge emphasis processing by said second processing means in accordance with the reproduction magnification set by said setting means.

28. An image signal processing apparatus comprising:

reading means for photoelectrically reading an original image and outputting an image signal;

means for setting a reproduction magnification of the original image;

means for forming a processing signal, for use in processing an image signal of a particular pixel, of the original image, from image signals of a plurality of pixels of the original image near the particular pixel;

processing means for processing the image signal of the particular pixel in accordance with the processing signal formed by said forming means; and

control means for varying the level of the processing signal formed by said forming means in accordance with the reproduction magnification set by said setting means.

4,860,119

IMAGE FORMING SYSTEM WITH MEMORY DUPLEX PRINTING

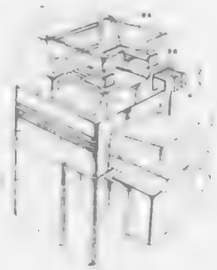
Yoshio Maniwa, and Takashi Morita, both of Yokohama, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,789

Claims priority, application Japan, May 29, 1987, 62-131888

Int. Cl.⁴ H04N *1/23*

U.S. Cl. 358—296 **15 Claims**



6. An image forming system as claimed in claim 4, wherein the controlling means divides the secured part of the memory region of the video memory means to a plurality of page blocks and forms video data corresponding to a part of one page of the sheet in page blocks except for one page block, while outputting preceding video data which corresponds to a part of one page and has been formed in the previous data forming process.

4,860,120

LOW-FREQUENCY CONVERTER FOR CARRIER CHROMINANCE SIGNAL

Hiromitsu Yamashita, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1988, Ser. No. 202,564

Claims priority, application Japan, Nov. 2, 1987, 62-277965

Int. Cl.⁴ H04N *9/79, 9/45*

U.S. Cl. 358—330 **10 Claims**

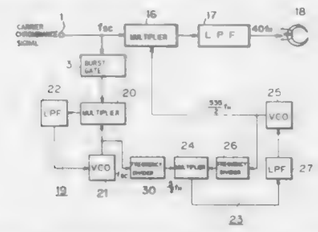
1. A low-frequency converter for converting a carrier chrominance signal including a color burst signal to a low-frequency range in order to obtain a low-frequency conversion chrominance signal, said low-frequency converter comprising:

input means for inputting said carrier chrominance signal;

first extracting means connected to said input means for extracting said color burst signal from said carrier chrominance signal to output an extracted color signal;

a first phase-locked-loop (PLL) circuit means connected to said first extracting means for receiving said extracted color burst signal and being phase-locked to said extracted color burst signal wherein the output of said first phase-locked-loop circuit means is a first continuous wave signal having a frequency which is an integral number of the frequency of said color burst signal;

frequency conversion means including at least a first frequency divider connected to said PLL circuit for frequency-dividing said first continuous wave signal and for frequency-converting said first continuous wave signal and outputting a second continuous wave signal having a frequency equal to one of the sum and the difference of said carrier chrominance signal and said low-frequency conversion chrominance signal;



a multiplier means connected to said input means and said frequency conversion means for receiving at its input said carrier chrominance signal and said second continuous wave signal and multiplying said carrier chrominance signal by said second continuous wave signal to provide a multiplied output signal; and

second extracting means connected to said multiplier means for extracting said low-frequency conversion chrominance signal from said output signal of said multiplier means.

4,860,121

DETECTOR CIRCUIT FOR DETECTING DROP-OUT IN REPRODUCED DIGITAL DATA

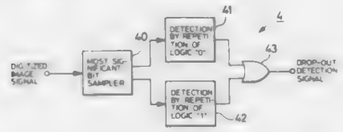
Toshio Gotoh, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 169,669

Claims priority, application Japan, Mar. 20, 1987, 62-67315; Mar. 20, 1987, 62-67316

Int. Cl.⁴ H04N *5/76*

U.S. Cl. 358—336 **6 Claims**



1. A drop-out detector circuit for a device for reproducing sequentially recorded digital data from a signal recorded on a recording medium, the recorded signal comprising a high-frequency modulated signal, comprising: means for reading said signal recorded on said recording medium and producing a digitized signal therefrom; means for extracting from each of a plurality of sequential data values contained within said digitized signal at least one bit indicative of a polarity of the respective data value; and means for detecting when a sequence of a predetermined number of the bits extracted from a plurality of said sequential data values is in a predetermined bit pattern, an output of said detecting means forming a drop-out signal.

4,860,122

DEVICE FOR REPRODUCING A SEQUENCE OF STILL PICTURES WITH AN AUDIO PORTION AND WITHOUT MOTION PICTURES BETWEEN SUCCESSIVE STILL PICTURES

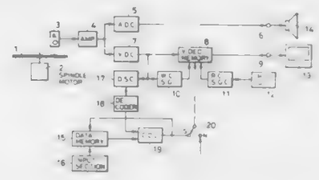
Hitoshi Kanamaru, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 161,053

Claims priority, application Japan, Feb. 26, 1987, 62-43685; Feb. 26, 1987, 62-43686

Int. Cl.⁴ G11B *7/00;* **H04N** *5/76*

U.S. Cl. 358—341 **17 Claims**



1. A device for reproducing still pictures together with audio information from a recording medium, the recording medium having video information and the audio information stored thereon, the video information including series of pictures and a frame identification code associated with each picture for identifying its associated picture, the device comprising;

(a) means for reading the audio information and the video information from said recording medium;

(b) means for outputting the audio information read from said medium to an audio reproducing means;

(c) a video memory for selectively storing pictures, one at a time;

(d) means for sequentially designating a plurality of pictures stored in said recording medium by sequentially designating their associated frame identification codes;

(e) means for comparing frame identification codes read from the recording medium with said sequentially designated frame identification codes and for generating a write command upon coincidence of a read frame identification code with a designated frame identification code;

(f) writing control means responsive to a write command for writing in said memory the video signals corresponding to the picture associated with the frame identification code upon which coincidence was detected; and

(g) means for repeatedly reading out the video signals written in said memory to produce a still picture of said video information.

4,860,123

ELECTRONIC STORE

Karl W. McCalley, Palaatine; John R. Bertram, Deerfield; Walter W. Sloan, Lake Bluff, and Rory T. McClure, Arlington Heights, all of Ill., assignors to Telaction Corporation, Schaumburg, Ill.

Continuation-in-part of Ser. No. 112,747, Oct. 22, 1987. This application Jun. 30, 1988, Ser. No. 213,586

Int. Cl.⁴ H04N *5/76*

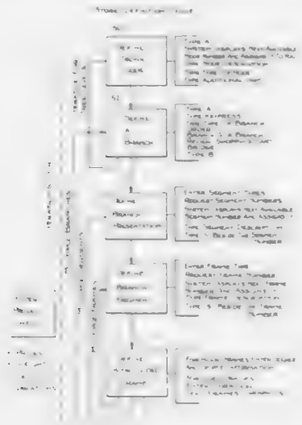
U.S. Cl. 358—342 **10 Claims**

1. An electronic store comprising: menu driven computer means responsive to signals presented to it over a communication line for selecting the next of several nodes so as to define a path through a network of nodes;

a video disk having stored thereon segments of information comprised of a plurality of video frames, and possibly audio frames, for the respective nodes of the network,

means responsive to said menu driven computer means for

reading the frames of a segment for a selected node so as to provide video and audio signals for reproduction by a television receiver and,



said menu driven computer means including a segment file for identifying the video and audio frames, and a navigation file for defining the pathways between nodes of said network, so that subscribers to the electronic store can as they desire proceed about the network of nodes.

4,860,124

COMBINED TAXIMETER AND CASSETTE OR DISK PLAYER

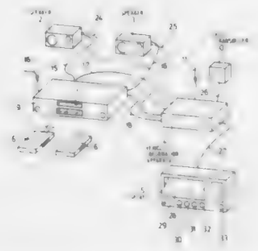
Jürgen Adams, Villingen-Schwenningen, Fed. Rep. of Germany, assignor to Mannesmann Kienzle GmbH, Fed. Rep. of Germany

Filed Aug. 25, 1987, Ser. No. 89,323

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1986, 3631994

Int. Cl.[4] G07B *13/00*; G07C *5/08*; G11B *5/00*

U.S. Cl. 360—6 **14 Claims**



1. An arrangement for use in a vehicle of a taximeter type vehicle information apparatus for recording, computation and display of data ascertainable from driving performance, comprising a transmitter module in the vehicle for making available data depending on the vehicle use, a central processing unit in the vehicle with an internal program memory and a data memory, and a display device connected to the central processing unit, in combination with an operating mechanism in the vehicle for reproducing information including digital data stored in an audio data carrier and simultaneously connected with the vehicle information apparatus, means for transmitting digital data stored on the audio data carrier from the operating mechanism to the vehicle information apparatus, and means in the vehicle information apparatus for receiving and transforming said digital data for display on said display device.

4,860,125

APPARATUS FOR RECORDING INFORMATION IN A MAGNETIC RECORD CARRIER WITH CONTROL TO SELECTIVELY RECORD A WHOLE OR PART OF A TRACK

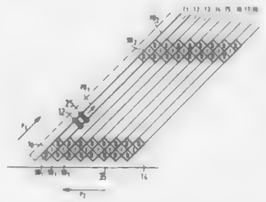
Jan van der Meer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 8, 1987, Ser. No. 94,222

Claims priority, application Netherlands, Sep. 10, 1986, 8602276

Int. Cl.[4] G11B *27/02, 27/08, 5/592*

U.S. Cl. 360—13 **6 Claims**



1. An apparatus for recording information in adjacent tracks on a magnetic record carrier, the information being contained in first blocks in the tracks, each track containing at least one first block of information and at least one second block of tracking signals, said apparatus comprising

an input terminal for receiving electric input signals,

a first unit having an input coupled to the input terminal and an output, said first unit converting said electric input signals into information suitable for being recorded on said record carrier and arranging the information in said first blocks in a predetermined manner, said first unit also having an output

a second unit having an output and generating second blocks containing said tracking signals,

a signal combination unit having a first input and a second input coupled to the output of said first unit and the output of said second unit respectively,

a central control unit generating first control signals,

said signal combination unit including a control input and an output, said signal combination unit combining first blocks and second blocks received at said first input and said second input and supplying combined signals to its output in response to said first control signals,

a write unit comprising at least two writing heads, said write unit having an input coupled to the output of said signal combination unit for recording first and second blocks of signals in said tracks, and

detection means detecting the presence of a second block of tracking signals in a predetermined track to be recorded in, said detection means upon detecting such tracking signals supplying an edit control signal to said signal combination unit to prevent it from supplying second blocks of tracking signals to its output when said writing unit is to record in said predetermined track notwithstanding said signal combination unit may receive such tracking signals from said second unit.

4,860,126

TAPE TRANSPORTING DEVICE

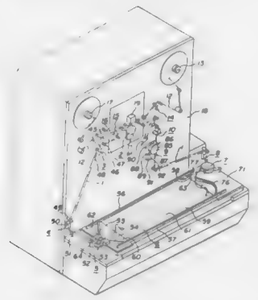
Koichi Sota, Tokyo, Japan, assignor to Otari Electric Company, Ltd., Tokyo, Japan

Filed Dec. 8, 1987, Ser. No. 130,280

Claims priority, application Japan, Dec. 24, 1986, 61-314071

Int. Cl.[4] G11B *5/86, 15/00*

U.S. Cl. 360—16 **12 Claims**



1. A tape transporting device comprising: a horizontal loop bin for storing and transporting a portion of a long and endless loop master tape, a guide rail established at an outlet of the loop bin, an air outlet post for blowing air toward the master tape and the guide rail and for forcing the master tape forward the guide rail by the blowing air, and a movement resisting mechanism which is established in the vicinity of the outlet of the loop bin, which has an outer circumferential surface for contacting the master tape and resisting movement of the master tape while it is being transported.

4,860,127

MAGNETIC DISK CARTRIDGE WITH ERASURE-PREVENTING DEVICE

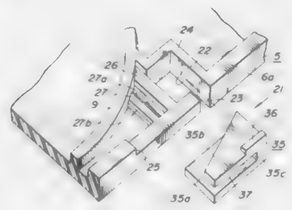
Kenji Takahashi, and Tsuneo Nemoto, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 12, 1985, Ser. No. 808,075

Claims priority, application Japan, Dec. 17, 1984, 59-191230[U]

Int. Cl.[4] G11B *15/04, 23/02*

U.S. Cl. 360—60 **45 Claims**



1. In a magnetic disk cartridge of the type which comprises a cassette having a cover and a recording medium mounted therein, said cassette being structurally adapted to cooperate with a data recording and reproducing apparatus for recording data upon said recording medium and reproducing data recorded upon said recording medium, said cassette and said apparatus further cooperating to permit data to be recorded on said recording medium when said cassette is in a write-inhibited state, the improvement comprising:

a disk state indicator means including a recording state indicator opening formed in said cassette cover for receiving at least a portion of a means for detecting the recordable state of said recording medium, said recording state indicator opening being connected to a cut-out formed in said cassette cover;

sliding means being installed on said cassette cover through said cut-out and cooperating with said disk state indicator means, for selectively covering and uncovering said recording state indicator opening to permit and inhibit respectively said opening from receiving said portion of said detecting means in said opening;

means, cooperative with said cassette cover for permitting said sliding means to pass said cut-out upon assembling, and for blocking said cut-out after installation of said sliding means in said cassette cover, said means for permitting said sliding means to pass and for blocking including a surface component lying flush with the outer periphery of said cassette cover while said cut-out is blocked; and

means provided as a portion of said cassette cover for retaining said sliding means in a sliding relationship within said opening.

4,860,128

RECORDABLE DATA DEVICE HAVING IDENTIFICATION SYMBOLS FORMED THEREON AND COOPERATING DATA PROCESSING SYSTEM HAVING REGISTERING SYMBOLS

Katsuya Nakagawa, Kusatsu, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan

Filed Apr. 24, 1986, Ser. No. 856,042

Claims priority, application Japan, Apr. 24, 1985, 60-61383; Sep. 25, 1985, 60-147057

Int. Cl.[4] G11B *19/10, 23/03*

U.S. Cl. 360—60 **22 Claims**



1. A floppy disk capable of being inserted into an insertion opening of a read/write unit, comprising:

a rigid case having a substantially rectangular shape and being insertable into said insertion opening of said read/write unit, said case having opposite substantially rectangular main surfaces which form a space for containing a magnetic disk, said case assuming a first position during insertion or ejection of said case from said read/write unit, and said case being movable to a second position after insertion to complete loading of said case into said read/write unit to enable read/write operation, wherein the movement between said first position and said second position is substantially orthogonal to said main surface of said case; and

recessed first identifying symbols formed on each of said opposite main surfaces at an end thereof in a direction of insertion of said rigid case, said recessed identifying symbols being formed symmetrically such that said case can be inserted into said opening of said read/write unit with either of said main surfaces facing upwards and one of said recessed identifying symbols will mate to a projected second identifying symbol which is formed inside said insertion opening of said read/write unit to allow said case to move from said first position to said second position to complete loading in said read/write unit, whereby reading of data by said read/write unit from said magnetic disk

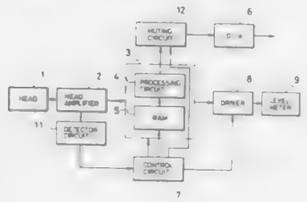
and writing of data by said read/write unit to said magnetic disk are not enabled unless one of said recessed identifying symbols and said projected identifying symbol mate.

4,860,129

SIGNAL REPRODUCING DEVICE

Nobutoshi Fukuda; Tatsuro Nagao; Naoto Arifuku; Masashi Tanabe; Shinichi Yamamisaka, and Yoshiki Furuta, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 150,275
Claims priority, application Japan, Jan. 29, 1987, 62-11865[U]
Int. Cl.⁴ G11B *15/12, 5/02*
U.S. Cl. 360—61 **6 Claims**



1. A signal reproducing device comprising:
a magnetic head for reading digital signals recorded on a recording medium;
a memory for storing digital signals outputted by said head;
means for processing said digital signal stored in said memory;
a digital-to-analog converter circuit for subjecting said digital signal processed by said processing means to digital-to-analog conversion;
a level meter for displaying the level of said digital signal;
means for detecting the presence or absence of a reproduction signal outputted by said head;
means for muting a digital-to-analog converted signal outputted according to an output of said detecting means; and
a driver for suspending the display of said level meter according to an output of said detecting means.

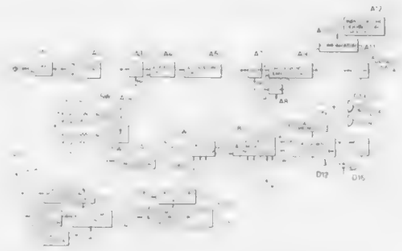
4,860,130

ROTARY HEAD TYPE DIGITAL AUDIO SIGNAL REPRODUCING APPARATUS

Seiichi Yokosawa, and Ken-ichiro Kawasaki, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 4, 1988, Ser. No. 164,028
Claims priority, application Japan, Mar. 6, 1987, 62-50301
Int. Cl.⁴ G11B *21/10*
U.S. Cl. 360—77.02 **6 Claims**

1. In a rotary head type audio signal reproducing apparatus having at least two rotary heads for reproducing a plurality of signals on a recording medium, said plurality of signals containing a digital signal and a tracking pilot signal composed of a frequency signal with a small azimuth effect, said plurality of signals being recorded on each of a plurality of helical tracks in a predetermined format with the recording region in one track being independent of the recording region in another track in the longitudinal direction, the positions of the pilot signals recorded on four consecutive tracks differing from one track to another, each of said rotary heads having a width greater than the width of each track on which it scans, and a capstan servo being supplied with a signal that represents the amount of track deviation and which is produced on the basis of the difference between the levels of crosstalk of pilot signals picked up by said rotary heads from two tracks adjacent to the one track being reproduced, the improvement wherein said apparatus further comprises means for determining if a difference between levels of crosstalk of pilot signals from said two adjacent tracks has a predetermined relationship with a level of



a signal being currently supplied to said capstan servo; and means for, if the result is negative, inhibiting said signal representing the amount of track deviation based on said level difference from being supplied to said capstan servo.

4,860,131

METHOD FOR RECORRECTING HEAD POSITION IN A DISK DRIVE

Toru Kowaguchi, Furukawa; Tooru Kaneko, Miyagi; Jun Ide, and Tomoo Iizumi, both of Furukawa, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Aug. 3, 1987, Ser. No. 81,310
Claims priority, application Japan, Sep. 8, 1986, 61-211259
Int. Cl.⁴ G11B *5/55, 21/08*
U.S. Cl. 360—78.14 **2 Claims**



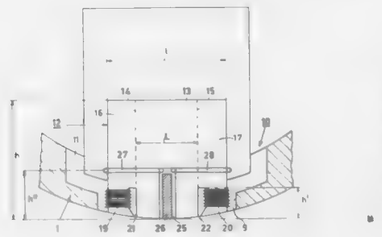
1. A method for recorrecting a position of a head in a recording medium device of a type having a recording medium, a head for reading servo information from the recording medium, head controlling means for controlling movement of the head, a plurality of concentric tracks on the recording medium, one of the tracks being a zero track and a second track being a track one adjacent to the zero track; a track counter for indicating a track position of the head, servo information recorded on the recording medium, including first servo information recorded on a guard band and second servo information recorded on a data zone; and zero track restoring means for detecting the zero track from a difference between a disposition of the first servo information and the second servo information, and for moving the head to the zero track;
the method comprising the steps of:
first, determining if a first condition is true, that the track counter indicates the head is at the zero track or is at the track one, or determining if a second condition is true, that the head is moving outwardly from a center of the recording medium; and
next, if either the first or second conditions are determined to be true, activating the zero track restoring means so as to move the head to the zero track and then providing a zero track signal of predetermined duration to the head controlling means.

4,860,132

ROTATABLE HEAD ASSEMBLY WITH OFFSET SUB-HEAD GAPS

Jean H. J. Lorteije, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1982, Ser. No. 450,315
Claims priority, application Netherlands, Dec. 24, 1981, 8105831; Taiwan, May 4, 1982, 71-11487
Int. Cl.⁴ G11B *5/027*
U.S. Cl. 360—84 **8 Claims**



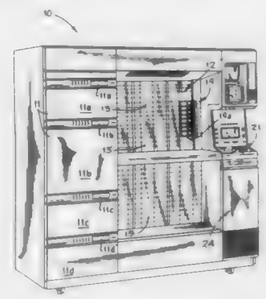
1. A rotatable magnetic head assembly for a helical scan recording/playback apparatus, said assembly comprising
a rotatable supporting member defining an axis of rotation,
two diametrically oppositely located magnetic heads mounted on said member, each head comprising two sub-heads having mutually parallel transducing gaps positioned for simultaneously forming two oblique tracks on a magnetic tape wound helically around the assembly, said tracks being spaced by a given space defining track pitch, said heads being arranged such that one sub-head of one head forms a track between the two tracks formed simultaneously by the two sub-heads of the other head,
the respective transducing gaps of each sub-head of each head being separated in both axial and circumferential directions with respect to said axis of rotation, said axial and circumferential separations of the gaps of the sub-heads of one head being respectively equal to the axial and circumferential separations of the gaps of the sub-heads of the other head,
said gaps of the sub-heads of one magnetic head being inclined at a first angle relative to the plane of rotation of the supporting member, and the transducing gaps of the sub-heads of the other magnetic head being inclined at a second angle relative to the plane of rotation of the supporting member, said second angle being opposite in direction to said first angle,
said gaps having respective heights and axial and circumferential separations such that the gaps of the sub-heads of one head form tracks of a track width W having a pitch of 2NW where N is an odd number, such that all tracks are formed substantially without protective bands between them.

4,860,133

CASSETTE BIN STRUCTURE INCLUDING A BIN SECTION FOR LOADING AND UNLOADING CASSETTES

Antoni S. Baranski, San Carlos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 851,069, Apr. 11, 1986, abandoned.
This application Jun. 14, 1988, Ser. No. 207,038
Int. Cl.⁴ G11B *15/68, 15/00*
U.S. Cl. 360—92 **9 Claims**



1. In a cart spot player having a bin structure for storing cassettes, each bin of the bin structure open at front and rear sides, the bin structure having a first bin section for the loading and unloading of cassettes and a second bin section for cassette storage, a tape transport for receiving cassettes, and a cassette transfer assembly for transferring cassettes from the first bin section to the second bin section for storage, including:
at least one cassette load/unload bin in the first bin section; and
a stop member mounted at the rear of the cassette load/unload bin, the stop member including first stop positioning means for positioning the stop member at the rear of the cassette load/unload bin to facilitate cassette loading and unloading, for locating the stop member in a first position to engage and position a cassette at a fully loaded position of the load/unload bin, the cassette so positioned as to enable the cassette transfer assembly to transfer the cassette from the load/unload bin to a storage bin and, for moving the stop member to a second position, out of engagement with said positioned cassette in the cassette load/unload bin, to enable the cassette transfer assembly to extract the cassette from the rear of the bin; and the stop member including second stop positioning means moveable, when the stop member is in an engaged position with respect to a cassette positioned in the bin, to urge the stop member and the cassette in engagement therewith forward to a predetermined position which enables an operator to extract the cassette from the front of the bin.

4,860,134

DOUBLE VIDEO CASSETTE TAPE RECORDER

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

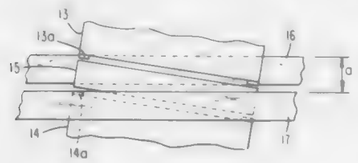
Filed Dec. 28, 1987, Ser. No. 138,895
Claims priority, application Japan, Dec. 30, 1986, 61-311788
Int. Cl.⁴ G11B *15/665, 15/295*
U.S. Cl. 360—92 **2 Claims**

1. A double video cassette tape recorder, comprising:
upper and lower tapes, in a cassette which enables said upper and lower tapes to be separately or simultaneously driven;
tape drive means for driving said tapes past an upper and a lower cylinder-type head, respectively, for interaction therewith;
left and right lower slider means having inclined posts and

guide rollers which are supported on a tape deck of said recorder outside of said cassette for guiding said lower tape;

upper slider means having inclined posts and guide rollers which are vertically movable for guiding said upper tape;

upper and lower loading mechanisms for supporting separately each of said upper and lower slider means;



upper and lower movably supported and separately rotatable pinch rollers; and

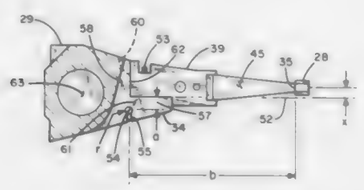
a common capstan to which said upper and lower tapes are pressed by selective movement thereagainst by said upper and lower pinch rollers respectively to be driven separately or simultaneously, to record or play back.

4,860,135

THERMAL COMPENSATION MECHANISM FOR MAGNETIC DISK DRIVE DATA STORAGE UNITS

Michael A. Cain, Oklahoma City, Okla., assignor to Magnetic Peripherals Inc., Minnetonka, Minn.

Filed Jun. 16, 1988, Ser. No. 207,080
Int. Cl.[4] G11B *17/00*
U.S. Cl. 360—97.02 **9 Claims**



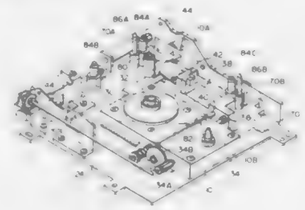
1. In a rotating disk media type magnetic data storage device having within enclosure at least one magnetic disk mounted for rotation on a deck, and a unitary arm assembly for supporting a plurality of transducers adjacent to the disk surfaces and for moving each transducer radially with respect to a disk, said arm assembly mounted for rotation on the deck, and having at least first and second bilaterally asymmetric arms projecting from the arm assembly's axis of rotation and each arm aligned adjacent to the surface of a disk and each carrying at its free end at least one transducer, and said arm assembly further formed of a material having a first temperature coefficient, and an actuator for rotating the arm assembly to position the transducers radially on the disk surfaces, said enclosure having heat sources changing the interior temperature with time, said heat sources affecting the temperature of one of said arms more than another, and said arm assembly experiencing changes in the relative angular position of a first arm of the arm assembly with respect to a second arm as a function of the relative changes in temperature, misalignment of the individual transducer carried by said first and second arms resulting misalignment of the first and second arms, comprising in the first arm an area along an edge thereof having a slot extending transversely with respect to the length of the arm, and within the slot, a body with an interference fit in the walls of the slot, said body having a second temperature coefficient different from the first temperature coefficient, whereby the different temperature coefficients of the body and the arm cause temperature-induced distortion of the first arm in which the body is placed which compensates at least in part the misalignment in the arm assembly.

4,860,136

ROTARY MAGNETIC DISC DEVICE WITH IMPROVED DISC PACK POSITIONING STRUCTURE

Hidemi Sasaki, Tokyo, and Naoki Kobayashi, Omiya, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 9, 1987, Ser. No. 71,239
Claims priority, application Japan, Jul. 9, 1986, 61-161686; Oct. 29, 1986, 61-257656
Int. Cl.[4] G11B *5/016*
U.S. Cl. 360—99.05 **16 Claims**



1. A rotary magnetic disc device for at least one of magnetically recording on and reproducing from a magnetic disc by positioning a magnetic disc pack within a main body of said rotary magnetic disc device, rotating said magnetic disc which is rotatably stored within said magnetic disc pack, bringing a magnetic head into contact with said magnetic disc, and setting a regulation plate at a predetermined recording/reproducing position opposite to said magnetic head with the magnetic disc therebetween, wherein said rotary magnetic disc device comprises a regulation plate holder with said regulation plate mounted thereto, a rotary shaft, having an axis, mounted to said main body, a cover journaled to said device main body by being mounted on said rotary shaft for movement between an open position and a closed position and having means for resiliently holding said regulation plate holder, and three height position pins respectively erected on said device main body for limiting motion of said regulation plate holder so as to determine the height of said regulation plate at a predetermined recording/reproducing position when said cover is in said closed position, two of said three height positioning pins being located adjacent to the axis of the rotary shaft of said cover and at a predetermined distance from the other, wherein said disk pack has a front end disposed facing said rotary shaft when said disk pack is positioned in said main body, said two or said three height positioning pins are disposed in front of said front end of said disk pack when said disk pack is positioned in said main body with said cover in said closed position, and said two of said three height positioning pins and disposed at a distance from each other of less than a width of said disk pack measured in a direction parallel to said axis of said rotary shaft.

4,860,137

FLEXURE-MOUNTED RADIAL ACCESS APPARATUS FOR DISK RECORDER/PLAYER

Boris A. Shtipelman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 7, 1988, Ser. No. 164,698
Int. Cl.[4] G11B *5/55, 21/08*
U.S. Cl. 360—106 **5 Claims**

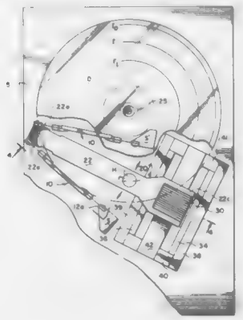
1. Radial access apparatus for controlling the radial movement of a write/read head relative to a data storage disk, whereby such head is positioned to write or read information

on any one of a plurality of concentric data tracks on such disk, said apparatus comprising:

(a) a frame;

(b) a pair of flat flexure members of the type adapted to flex only in single plane which is perpendicular to the plane of said members, each of said members having first and second spaced edges;

(c) support means mounted on said frame for supporting each flexure member along one of its edges so that the respective supported edges of said flexure members are fixed in space relative to each other, and so that the respective unsupported portions of said flexure members extend outwardly from said support means toward a line of convergence;



(d) a radial access arm interconnecting the respective outwardly extending edges of such flexure members at a location short of said line of convergence, said arm having a portion extending between sid flexures and outwardly from a line drawn between the unsupported edges of said flexure members, said portion being adapted to support a write/read head; and

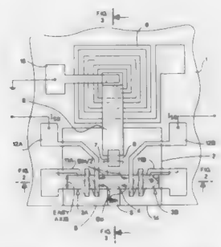
(e) means for imparting motion to said arm to cause said portion to undergo a seemingly pivotal movement about a virtual pivot axis defined by said line of convergence, whereby a write/read head supported by said arm moves along an arcuate path, relative to the radius of a disk.

4,860,138

DIFFERENTIALLY SENSITIVE SINGLE TRACK READ/WRITE HEAD DESIGN WITH IMPROVED BIASING

Albert W. Vinal, Cary, N.C., and Earl A. Cunningham, Rochester, Minn., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 12, 1987, Ser. No. 119,501
Int. Cl.[4] G11B *5/39*
U.S. Cl. 360—113 **4 Claims**



1. A magnetic head apparatus, comprising:

at least two magnetically permeable active magnetic sensor legs for developing electrical signals in response to magnetic flux said legs being joined at a first common magnetically permeable connection;

a first magnetically permeable flux conducting means for conducting magnetic flux to or from and having a surface confronting a magnetic record medium;

said first flux conducting means being magnetically connected to said first common connection, and thereby to said magnetic sensor legs to conduct flux thereto or therefrom;

said magnetic sensor legs comprising a magneto resistive element; and,

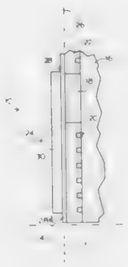
a magnetic biasing means comprising a source of constant magnetic flux and means for applying said flux to said active sensor legs for biasing their inherent magnetism at an angle with respect to the easy axis of magnetization within said legs, wherein said means for biasing comprises electromagnetic coils placed about sensor legs and supplied with the electrical sensing current through said sensor legs in series.

4,860,139

PLANARIZED READ/WRITE HEAD AND METHOD

Harold J. Hamilton, Santa Clara, Calif., assignor to Censtor Corporation, San Jose, Calif.

Filed Jun. 19, 1987, Ser. No. 64,184
Int. Cl.[4] G11B *5/16*
U.S. Cl. 360—126 **2 Claims**



1. A thin-film, probe-type, electromagnetic read/write head for perpendicular reading and writing comprising

a flux-return portion,

plural-turn coil means for carrying electrical current embedded in insulator means disposed to one side of said flux-return portion, said insulator means having a planar facial expanse substantially paralleling and facing away from said flux-return portion,

a pole portion spaced from but magnetically coupled to said flux-return portion, said pole portion including a side facing said flux-return portion, said side, throughout its entirety, residing on said facial expanse, and

a film of magnetic material formed on the side of said pole portion which is opposite the latter's first-mentioned side and cooperating with the pole portion to create a yoke in the head,

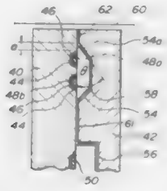
said coil means, insulator means, pole portion and film residing in compact, parallel abutting planes.

4,860,140

MAGNETIC HEAD CLOSURE HAVING FERRITE SUBSTRATE AND CLOSURE AND CONDUCTIVE THIN FILM COIL DEPOSITED IN RECESS OF SUBSTANTIALLY SAME SHAPE IN FERRITE SUBSTRATE

Kazuhiro Momata, Chigasaki; Kousaku Chida, Odawara; Tooru Takeura, Odawara, and Yukihisa Tsukada, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 911,001, Sep. 24, 1986. This application Apr. 7, 1988, Ser. No. 183,338
Claims priority, application Japan, Sep. 25, 1985, 60-210065
Int. Cl.[4] G11B *5/133, 5/147, 5/17, 5/193*
U.S. Cl. 360—127 14 Claims



1. A magnetic head having a transducing surface, comprising:

a ferrite substrate having a first recess formed in a predetermined surface thereof;

a ferrite closure having a second recess fitted to said predetermined surface of said ferrite substrate;

an insulative layer deposited on a surface of said ferrite closure, including said second recess, which surface faces said predetermined surface of said ferrite substrate, at least a portion of said insulative layer adjacent said transducing surface forming a transducing gap; and

a conductive thin film coil deposited in said first recess in a substantially same shape as said first recess;

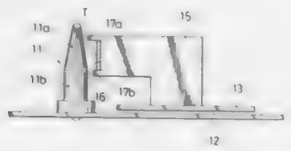
wherein said second recess is formed in a surface of said ferrite closure so as to enclose a portion of said conductive thin film coil adjacent said transducing gap, wherein said second recess has first and second inclined surfaces, an edge of said first inclined surface nearest said transducing gap being disposed in such a position as to define a depth of said transducing gap, and an edge of said second inclined surface being disposed away from said transducing surface a predetermined distance from said portion of said conductive thin film adjacent said transducing gap.

4,860,141

TAPE RECORDER OF THE CASSETTE TYPE

Toshio Yoshimura, Kawasaki, Japan, assignor to Tanashin Denki Co., Ltd., Japan

Filed Oct. 14, 1987, Ser. No. 108,428
Claims priority, application Japan, May 2, 1987, 62-66997[U]
Int. Cl.[4] G11B *15/60*
U.S. Cl. 360—130.21 4 Claims



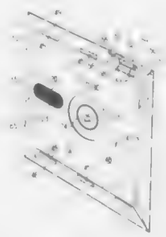
1. In a tape recorder of the cassette type which includes a stationary main base plate, a pair of cassette guide posts securely mounted at base ends thereof on said main base plate for receiving a tape cassette thereon, a head carrying plate mounted for movement toward and away from a tape cassette received in position on said cassette guide posts, a magnetic head mounted at a location of said head carrying plate between said cassette guide posts on said main base plate, and a tape guide mounted on said head carrying plate upstream of said head along a feeding passage of a magnetic tape in the tape cassette, said tape guide having a tape contacting face for contacting with the tape and a pair of upper and lower widthwise movement limiting portions formed adjacent upper and lower ends of said tape contacting face for limiting lateral widthwise movement of the tape being fed along said tape contacting face of said tape guide, the improvement wherein each of said upper and lower widthwise movement limiting portions has a top and a bottom face, each said top face being substantially parallel to said corresponding bottom face, and one of said cassette guide posts has a tapering profile presenting a lower large diameter portion and an upper small diameter portion while said upper widthwise movement limiting portion of said tape guide has a greater extension from said tape contacting face than said lower widthwise movement limiting portion, and said tape guide is located such that said upper widthwise movement limiting portion thereof is located opposite said small diameter portion of the one cassette guide post while said lower widthwise movement limiting portion thereof is located opposite said large diameter portion of the one cassette guide post and wherein the distance between said upper widthwise movement limiting portion of said tape guide and said small diameter portion of said one cassette guide post is substantially the same as the distance between said lower widthwise movement limiting portion of said tape guide and said large diameter portion of said one cassette guide post, whereby undersirable widthwise movement of said magnetic tape from within the confines of said upper and lower widthwise movement limiting portions of said tape guide is minimized.

4,860,142

COMPUTER DISK ADJUSTABLE WRITE PROTECT DEVICE

Anthony L. DiGiesi, R.D. 1, 6 Jenkins St., Stanhope, N.J. 07874

Filed Aug. 20, 1987, Ser. No. 87,220
Int. Cl.[4] G11B *23/03, 15/04, 19/04*
U.S. Cl. 360—133 4 Claims



1. A magnetic disk jacket formed of substantially plane semi-rigid material, said disk jacket constructed to enclose a disk, said jacket having a "write/erase protect device";

said jacket having a flap folded inwardly along one edge to form a partially closed channel in said folded portion;

an elongated shutter slideably mounted in covered relationship in said channel in frictional contact with the upper and lower inner surfaces of said channel;

a "write protect" opening formed in the side of said jacket of said disk, said write protect opening being so disposed in said jacket flap to enable said shutter to move slideably in frictional contact in said channel a longitudinal or lateral direction to a blocking position to block said write protect opening, and alternatively to a write allow position to unblock said write protect opening;

an elongated control opening in said jacket flap spaced apart from said write protect opening, for exposing said shutter in said channel;

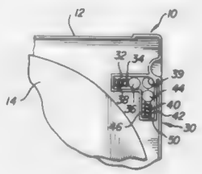
said control opening constructed to accommodate a pointed instrument for contacting and engaging said shutter through said control opening at a point below the surface of said jacket to move said shutter against frictional bias from said write allow position to said blocking position and vice versa, said frictional bias being constrained to lock said shutter into said alternative positions.

4,860,143

TEMPERATURE/HUMIDITY INDICATOR FOR A FLOPPY DISK CASSETTE

Victor B. van Blerk, San Jose, Calif., assignor to Verbatim Corp., Sunnyvale, Calif.

Filed Nov. 17, 1987, Ser. No. 122,143
Int. Cl.[4] G11B *23/03*
U.S. Cl. 360—133 10 Claims



1. In a cassette comprising a pair of opposed major surfaces spaced from each other to form an internal compartment enclosing a disk arranged for rotation for recording data on, and playing back data from, a plurality of record tracks encircling the rotational axis of the disk, the improvement comprising:

(a) an actuatable indicator mounted internally within said cassette for movement between (1) a first normal position in which said indicator is non-viewable, and (2) a second position in which said indicator is viewable; and

(b) a temperature-sensitive element which retains said indicator in its normal non-viewable position so long as said temperature-sensitive element is not exposed to an environment having a temperature above a level that is potentially harmful to the disk and which enables said indicator to be moved to its viewable position when said temperature-sensitive element is subjected to an environment having a temperature above the aforementioned level.

10. In a cassette comprising a pair of opposed major surfaces spaced from each other to form an internal compartment enclosing a disk arranged for rotation for recording data on, and playing back data from, a plurality of record tracks encircling the rotational axis of the disk, wherein the improvement comprises:

(a) at least one of said major surfaces including means for viewing a signal that is within said compartment; and

(b) a moisture-sensitive mechanism arranged internal to said cassette to provide in registration with said viewing means a first signal or a second signal depending, respectively, on whether or not said cassette has been subjected to a environment the humidity of which is above a predetermined level.

4,860,144

OVERLOAD PROTECTOR FOR A ROBOT ARM

Klaus Berner, Reilingen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 9, 1987, Ser. No. 130,714
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1986, 3641920
Int. Cl.[4] B25J *13/08*
U.S. Cl. 361—1 3 Claims

1. An overload protector for robot arms, comprising:

a piston having a rounded circumferential surface which is semi-circular in cross-section;

an open-topped cylinder receiving the piston, the cylinder having a radially inwardly extending stop surface against which the piston bears when fully inserted into the cylinder and also having a straight axially-extending slot;

a radially-extending pin with a proximal end secured to the piston and extending out of the cylinder through the slot;

means for attaching a tool to the piston; and

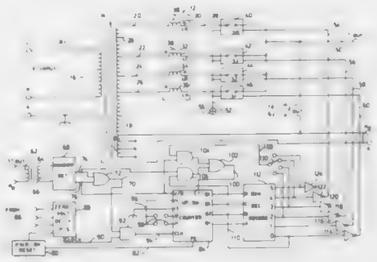
means for attaching a robot arm to the cylinder.

4,860,145

TAP SWITCHING PROTECTION CIRCUIT

August G. Klingbiel, Addison, Ill., assignor to Oneac Corporation, Libertyville, Ill.

Continuation of Ser. No. 551,357, Nov. 14, 1983, abandoned. This application Oct. 11, 1985, Ser. No. 786,368
Int. Cl.[4] H02H *7/00*
U.S. Cl. 361—18 9 Claims



1. In a circuit for switching a common point from one AC power line to another AC power line of a plurality of at least three AC power lines that are of the same phase but at differing voltage potentials, solid state switching device means being coupled in series with each of said AC power lines and said common point, each of said solid state switching device means including a control connection responsive to a control signal for selectively actuating said solid state switching device means to provide a single conduction path, and a current limiting inductor connected in series with each of said solid state switching means and connected in series with a respective one of each of said AC power lines, said inductors being wound on a common core and in a common winding sense to a circulating current between each adjacent pair of said AC power lines.

4,860,146

DIFFERENTIAL CURRENT PROTECTION CIRCUIT BREAKER

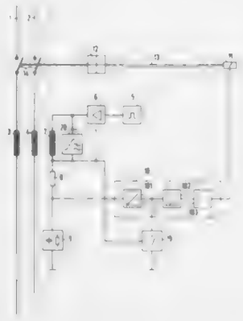
Fritz Pohl, Hemhofen, and Dieter Harr, Regensburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 22, 1987, Ser. No. 136,830

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643981

Int. Cl.[4] H02H *3/26*

U.S. Cl. 361—42 6 Claims



1. A differential current protection circuit breaker, comprising:

a magnetic amplifying circuit having a secondary winding;

means for producing a complex, predominantly capacitive measuring impedance connected to said secondary winding;

a square wave generator connected in series to said impedance producing means through said secondary winding;

a tap between said impedance means and said squarewave generator;

an evaluation circuit connected to said tap for generating a control signal;

a switch for disconnecting said magnetic amplifying circuit;

means for tripping said switch in response to said control signal from said evaluation circuit; and

means for blocking said evaluation circuit from generating said control signal during current or voltages surges.

4,860,147

SHOCK-PROTECTED DOMESTIC ELECTRICAL APPARATUS

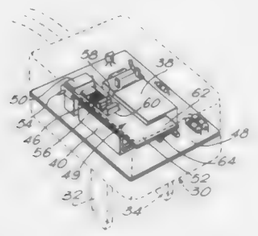
Kwok W. Fai, Chaiwan, Hong Kong, assignor to Simatelex Manufactory Company Limited, Hong Kong

Filed Jan. 29, 1988, Ser. No. 150,108

Claims priority, application United Kingdom, Jan. 30, 1987, 8702063

Int. Cl.[4] H02H *3/16*

U.S. Cl. 361—50 21 Claims



1. A domestic apparatus that automatically disconnects itself from an external circuit upon existence of a shock hazard in the apparatus, apparatus comprising:

A. a supply lead having therein,

B. a plug for electrically c the supply lead to the external circuit, said plug a housing within which are secured:

1. a normally off DC electric motor having a rotatable output shaft which turns when the motor is energized,

2. a latch having a normal position

a. in which the latch remains in the absence of a shock hazard, and

b. from which the latch is displaceable upon energizing of the motor and rotation of the shaft,

3. an on-off switch, a portion of which engages the latch when the latter is in its normal position for retaining the switch in its on position, the switch being

a. in series connection with at least one of the conductors, and

b. moveable to an off position for disconnecting such conductor from the external circuit,

4. resilient means with said portion of the switch for biasing the switch toward its off position when the DC motor rotates and causes disengagement of the latch from said portion of the switch, and

5. control means for energizing and causing rotation of the DC motor on receipt of indications of the existence of a shock hazard in the apparatus, and

C. electrical working components in the apparatus which are a source of potential shock hazard, and

D. sensor means in the apparatus adjacent the working components for sensing such shock hazard, and connected with the control means through a conductor in the supply lead for indicating to the control means that such hazard is present.

4,860,148

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH A PROTECTIVE CIRCUIT

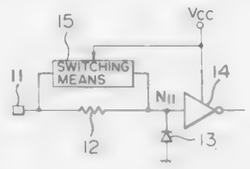
Masahiro Iwamura; Ikuro Masuda, both of Hitachi, and Hideaki Uchida, Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 13, 1987, Ser. No. 37,851

Claims priority, application Japan, Apr. 14, 1986, 61-84137

Int. Cl.[4] H02H *3/24*

U.S. Cl. 361—58 15 Claims



1. A semiconductor integrated circuit device including a signal input terminal, at least one semiconductor device and a power supply terminal therefor, comprising:

a resistor connected between said signal input terminal and one of said at least one semiconductor device; and

switching means connected to parallel with said resistor and arranged to be operable responsive to a control signal to be applied thereto so that the parallel connection of said resistor and said switching means exhibits a relatively low impedance when said at least one semiconductor device is in operation by powering through said power supply terminal and a relatively high impedance when said at least one semiconductor device is not in operation.

4,860,149

ELECTRONIC PRECIPITATOR CONTROL

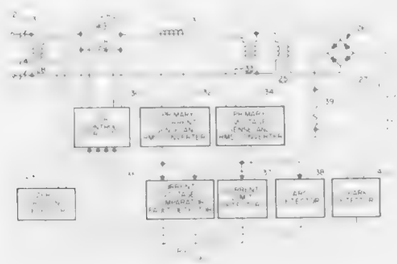
David F. Johnston, Hampton, Va., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 625,436, Jun. 28, 1984, Pat. No. 4,605,424.

This application May 14, 1986, Ser. No. 862,942

Int. Cl.[4] H02H *3/26*

U.S. Cl. 361—79 3 Claims



1. A method for controlling the power to a load comprising the steps of:

detecting the AC current in said power;

deriving the RMS value of the detected AC current;

detecting the AC voltage in said power;

deriving the RMS value of the detected AC voltage;

comparing directly the said RMS values of the current and voltage; and

whenever the difference between the RMS values of the current and voltage exceeds a predetermined value disconnecting the power from the load.

4,860,150

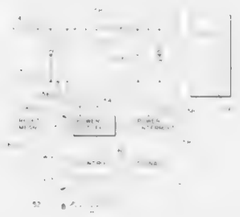
PROTECTOR NETWORK FOR A-C EQUIPMENT

Barry M. Epstein, 7523 Cliffbrook, Dallas, Tex. 75240

Filed Apr. 19, 1988, Ser. No. 183,227

Int. Cl.[4] H02H *3/24*

U.S. Cl. 361—90 24 Claims



1. A system wherein a-c power is supplied to a load from an a-c voltage source comprising:

(a) a protector network disposed between said voltage source and said load, said protector network comprising a first voltage suppressor at the source side of said network connected across the supply lines from said source, a second voltage suppressor at the load side of said network connected across the supply lines to said load, the minimum breakdown voltage of said first suppressor being that voltage, above which would damage the load, whereby the breakdown of the second voltage suppressor results in the voltage across the load being below that which would damage the load and protecting said load from power surges and voltage transients occurring at said source side;

(b) filter means disposed between said first and second voltage suppressors for filtering the power to said load, said second voltage suppressor being effective to protect the load from conditions occurring at the load side; and

(c) a power cutoff circuit having control circuitry connected across the supply lines from said source for disconnecting said source from said load in the event of a power interruption so that when a power interruption occurs, at least one suppressor remains connected to the load even though the source is disconnected from the load.

4,860,151

ELECTRICAL SAFETY BARRIERS

Ian C. Hutcheon, Luton, and David J. Epton, Dunstable, both of England, assignors to Measurement Technology Limited, Bedfordshire, United Kingdom

Filed Sep. 2, 1988, Ser. No. 247,007

Claims priority, application United Kingdom, Sep. 26, 1987, 8722470

Int. Cl.[4] H02H *3/20*

U.S. Cl. 361—91 7 Claims



1. An electrical safety barrier adapted to pass a current returning from a hazardous area to a safe area but which will transmit negligible energy from the safe area to the hazardous area under fault conditions, the barrier comprising a return channel from the hazardous area including shunt-diode means, fuse means and one or more diodes positioned on the safe-area side of said shunt-diode means.

4,860,152

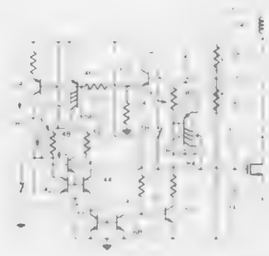
TWO STAGE PROTECTION CIRCUIT FOR A POWER MOSFET DRIVING AN INDUCTIVE LOAD

Douglas B. Osborn, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Jan. 30, 1989, Ser. No. 303,423

Int. Cl.[4] H02H *3/00*

U.S. Cl. 361—91 4 Claims



1. In a supply circuit where a control terminal of a power transistor is periodically supplied with a conduction producing control signal which causes such power transistor to supply current to an inductive load, a turn off circuit for interrupting

the load current and protecting the power transistor from damage due to the generation of transient inductive voltages when the conduction producing control signal is removed, the turn off circuit comprising:

means for detecting the magnitude of the transient inductive voltage seen by the power transistor;

current sinking means activated when the conduction producing control signal is removed for sinking current from the control terminal of the power transistor, the magnitude of such current being regulated in relation to said detected voltage to thereby stabilize the rate of increase of the transient inductive voltage seen by the power transistor; and

current sourcing means activated as said detected voltage approaches a limit value for supplying supplemental current to the control terminal of the power transistor to sustain its conduction until the energy stored in said inductive load is substantially dissipated, whereafter the current sinking means completes the turn off of the power transistor.

4,860,153

CURRENT SENSING DEVICE

Kazuhiro Ishii, Fukuyama, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1988, Ser. No. 187,561

Claims priority, application Japan, Apr. 30, 1987, 62-109331; May 29, 1987, 62-136696

Int. Cl.[4] H02H *3/08*

U.S. Cl. 361—94 **5 Claims**

1. A current sensing device comprising:

a constant d.c. voltage power supply circuit which is fed with a current flowing in one direction and outputs a positive potential, a ground potential and a negative potential at a positive output terminal, a ground output terminal and a negative output terminal, respectively;

a current sensing resistive element connected in series to the power circuit;

a differential amplifier circuit which is fed with power from the output of the power supply circuit, and converts the voltage drop across the current sensing resistive element proportional to the one-directional current into an output signal based on the ground potential between the positive potential and the negative potential of the outputs;

a switching circuit;

a control circuit which is fed with power from the power supply circuit and receives the output signal of the differential amplifier circuit proportional to the one-directional current to control the closing operation of the switching circuit;

signalling means which is activated by the closure of the switching circuit to emit light or produce a warning sound; and

a switching operation prohibitive circuit which is connected to prevent the switching circuit from being closed improperly when the output voltage of the power supply circuit is not enough to operate the differential amplifier or the control circuit properly.

4,860,154

DEVICE FOR PROTECTING AN INTEGRATED CIRCUIT AGAINST OVERLOAD AND SHORT CIRCUIT CURRENTS

Hossein Fazlollahi, Stockholm, Sweden, assignor to Telfonaktiebolaget L M Ericsson, Stockholm, Sweden

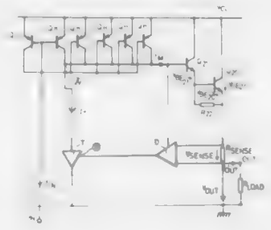
Filed Mar. 9, 1988, Ser. No. 166,053

Claims priority, application Sweden, Apr. 3, 1987, 8701415

Int. Cl.[4] H02H *3/087*

U.S. Cl. 361—101 **5 Claims**

1. Device comprising a protective circuit for protecting an integrated circuit against overload and short circuit currents, the integrated circuit containing, apart from the protective circuit, a first transistor step connected to a second transistor step, a control input, an output and a load resistor connected between said output and earth, the control input controlling the integrated circuit so that it is alternatingly switched on or off, in an ON state a supply current in the circuit being amplified by said second transistor step and delivered to the output of the circuit across the load resistor and no current being taken to the output for an OFF state in the circuit, said protective circuit comprising a detection resistor, connected in series with said load resistor; a differential step for sensing a voltage drop across the detection resistor, said differential step having a first input connected to a first side of the detection resistor and a second input connected to an other side of the detection resistor, and an output connected to a thyristor including a pilot transistor and an ignition transistor, said thyristor having a first connection to the collector on said first transistor step



and a second connection to earth, the differential step energising the thyristor when the protective circuit is activated, such that for an integrated circuit in the ON state said protective circuit assumes a ready state in which the input voltage to the pilot transistor falls below the voltage level at which the transistor is energised, such that the protective circuit is activated for overload or short circuit on the output of said circuit, the input voltage to the pilot transistor of the thyristor then exceeding the energising voltage level of the transistor so that the transistor is energised, whereby the protective circuit goes into an active state in which said current is taken through the thyristor instead of through said second transistor step, which is thus pinched off, and the overload or short circuit current is extinguished, and such that the protective circuit works in an active state until the integrated circuit is switched off.

4,860,155

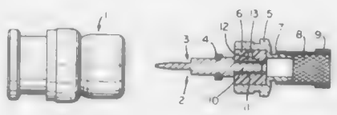
OVERVOLTAGE PROTECTION DEVICE

Martin A. Wright, Swindon, England, assignor to Raychem Limited, Swindon, England

Continuation-in-part of Ser. No. 845,660, Mar. 28, 1986. This application Dec. 23, 1986, Ser. No. 945,640

Int. Cl.[4] H02H *1/04*

U.S. Cl. 361—111 **18 Claims**



1. A device for protecting an electrical circuit from voltage transient, which comprises (a) a chalcogenide glass semiconductor threshold switching element that is connected, or arranged to be connected, between a current carrying line of the circuit and earth, the switching element having a threshold switching voltage that is higher than the normal operating voltage of the line, so that it will remain in a high resistance state during normal operation and will switch from the high resistance state to a low resistance state when subjected to the transient but will remain in its low resistance state for as long as a holding current is maintained through the switching element; and (b) a capacitor having a capacitance of not more than 2 microfarads connected in series with the threshold switching element; the device having no current-carrying paths in parallel with the capacitor or switching element so that substantially the entire transient passes through the switching element.

4,860,156

OVERVOLTAGE PROTECTIVE CIRCUIT

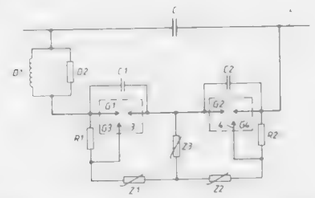
Lennart Stenström, and Allan Akerstedt, both of Ludvika, Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

Filed Sep. 2, 1988, Ser. No. 239,769

Claims priority, application Sweden, Sep. 4, 1987, 8703441

Int. Cl.[4] H02H *1/04*

U.S. Cl. 361—128 **10 Claims**



1. A circuit for overvoltage protection of an electric device (C), said circuit comprising a spark gap chain, connected in parallel with said electric device and having at least two series-connected protective spark gaps (G1, G2), at least one of which (G2) being provided with at least one trigger electrode (4), as well as a trigger circuit adapted for ignition of the spark gaps, said trigger circuit comprising a resistor chain connected in parallel with the spark gap chain and consisting of at least two series-connected resistor groups (Z1 and R2, Z2) and at least one transverse connection arranged between the two chains, each of the protective spark gaps being connected in parallel with a respective one of said resistor groups through said transverse connection, at least that one of said resistor groups which is parallel-connected to said spark gap (G2) provided with a trigger electrode comprises at least two series-connected resistors, one of which being a linear trigger resistor (R2) and the other a voltage-dependent resistor (Z2) built up of metal oxide varistors, said trigger electrode (4) of the spark gap being adapted to be supplied with the voltage prevailing across the linear trigger resistor for ignition of the spark gap when this voltage amounts to a pre-determined value.

4,860,157

MOLDED CASE CIRCUIT BREAKER ACTUATOR-ACCESSORY MODULE

Ronald R. Russell, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Apr. 25, 1988, Ser. No. 185,723

Int. Cl.[4] H01H *47/00*

U.S. Cl. 361—156 **12 Claims**

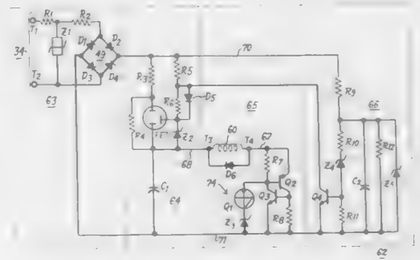
1. A circuit interrupter comprising:

a pair of separable contacts;

an operating mechanism arranged for separating said contacts upon command;

an electromagnetic coil associated with a plunger and a permanent magnet, said plunger restrained from interacting with said operating mechanism against the bias of a charged spring by contacting said permanent magnet and said electromagnetic coil arranged for counteracting with said permanent magnet to allow said plunger to interact with said operating mechanism when a current signal is applied to said electromagnetic coil; and

a shunt trip circuit connected with said electromagnetic coil for controlling said current signal to said coil, said shunt trip circuit including a storage capacitor connected with said electromagnetic coil said storage capacitor being charged through a first and second charging circuit for



supplying said current signal through an electronic switch.

4,860,158

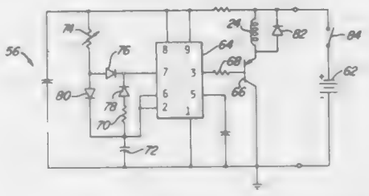
LOW PRESSURE METERING FLUID PUMP

Ralph V. Brown, Cayuta, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Division of Ser. No. 867,087, May 27, 1986, abandoned. This application Oct. 11, 1988, Ser. No. 255,639

Int. Cl.[4] H01H *9/00*

U.S. Cl. 361—165 **5 Claims**



1. A control circuit for periodically energizing the solenoid coil of an electromagnetic actuator comprising:

an electronic timer circuit having a first and second control input terminal, a control output terminal and a signal output terminal;

a capacitance connected between said first and second control input terminals and a common ground;

a serially connected variable resistance and first diode connected between a source of electrical power and said capacitance for charging said capacitance at a rate determined by the resistance value of said variable resistance;

a second diode having a cathode connected to said control output terminal and an anode connected to the junction between said variable resistance and said first diode;

a fixed resistance connected between said capacitance and said control output terminal for discharging said capacitance at a rate determined by said fixed resistance; and

a power transistor connected in series with said solenoid coil between said source of electrical power and said common ground, the base of said power transistor being connected to said signal output terminal.

4,860,159

TAPE DISPENSER WITH STATIC NEUTRALIZER

Richard D. Rodrigo, Line Lexington, Pa., assignor to The Simco Company, Inc., Hatfield, Pa.

Filed Sep. 12, 1988, Ser. No. 243,488

Int. Cl.[4] H05F *3/02*

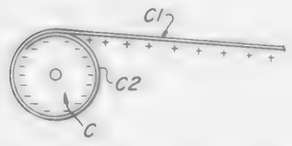
U.S. Cl. 361—212 **16 Claims**

1. In combination with a tape dispenser in which a coil of

tape is rotatably supported for uncoiling thereof to deliver selected lengths in strips therefrom, a static electricity neutralizer comprising:

(a) first passive discharging means in juxtaposition with a portion of the tape radially peeled from the roll,

(b) second passive discharging means in juxtaposition with an uncoiled outer surface of the tape just exposed by the portion previously peeled from the roll, and



(c) conductive means interconnecting said first and second passive discharging means to define independent of any external ground a conductive path for neutralizing any charges developed on the peeled away portion as a result of separation of abutting surfaces whereby neutralization will be effected without any external ground connection, or line voltage source or high voltage power source.

4,860,160

ADJUSTABLE VACUUM CONDENSER

Hans-Ulrich Boksberger, Oberbözberg, and Juraj Tomljenovic, Tegerfelden, both of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Aug. 15, 1988, Ser. No. 231,961
Int. Cl.[4] H01G *5/02*
U.S. Cl. 361—279 **2 Claims**



1. An adjustable vacuum condenser, especially for high capacities, comprising:

(a) a cylindrical housing of an insulating jacket, an upper metal jacket connected to the insulating jacket at its top end, a lower metal jacket connected to the insulating jacket at its bottom end, a cover closing the upper metal jacket, and a base part closing the lower metal jacket;

(b) in the housing; two inter-engaging electrode systems comprising a lower electrode system and an upper electrode system, the lower electrode system of which is fixed to the base part, and the upper electrode system is arranged displaceably in a direction of the housing axis by means of an actuating rod running through an opening in the cover;

(c) at least one set of bellows which concentrically surrounds the actuating rod, connects the cover with the upper electrode system and serves as current feed for the upper electrode system;

(d) an electrically conducting jacket, which concentrically surrounds the set of bellows and conducts on its inner face the high-frequency operating currents to the set of bellows via the cover;

wherein:

(e) an outside of diameter of the set of bellows and an inside diameter of the electrically conducting jacket are adapted to one another in order to reduce the self-inductivity of the vacuum condenser;

(f) the ratio of the inside diameter of the electrically conducting jacket and the outside diameter of the set of bellows is smaller than or equal to 1.5;

(g) the upper metal jacket has a diameter, which is essentially the same as a diameter of the insulating jacket;

(h) inside the upper metal jacket there is arranged an inner metal jacket which concentrically surrounds the set of bellows;

(i) the inner metal jacket forms the electrically conducting jacket; and

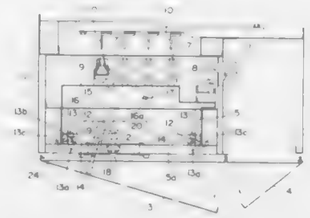
(j) the inside diameter of the electrically conducting metal jacket is adapted to the set of bellows.

4,860,161

ENCLOSED SWITCHBOARD

Kazuyoshi Maki; Masayuki Otsubo, and Shizutaka Uchida, all of Saga, Japan, assignors to Togami Electric Mfg. Co., Saga, Japan

PCT No. PCT/JP87/00547, § 371 Date Mar. 7, 1988, § 102(e) Date Mar. 7, 1988, PCT Pub. No. WO88/01107, PCT Pub. Date Feb. 11, 1988
PCT Filed Jul. 27, 1987, Ser. No. 187,663
Claims priority, application Japan, Jul. 30, 1986, 61-180743
Int. Cl.[4] H02B *11/12*
U.S. Cl. 361—338 **15 Claims**



1. An enclosed switchboard comprising a panel frame having a front opening, door means mounted on said panel frame for opening and closing off said front opening, fixed contact means mounted on said panel frame, a unit frame slidably mounted on said panel frame, lock means operably connected between said unit frame and said panel frame for locking said unit frame in a locked position on said panel frame, a contact mounting frame having mounted contacts, said contact mounting frame being slidably mounted on said unit frame between at least one operable position wherein at least one of said mounted contacts is in contact with at least one of said fixed contacts and a disconnect position wherein none of said mounted contacts are in contact with said fixed contacts, an operating lever pivotably mounted on said unit frame for pivotal movement about a pivotal axis, said operating lever having two leg portions with one leg portion being operably connected to said contact mounting frame such that pivotal movement of said operating lever about said pivotal axis moves said contact mounting frame between said at least one operable position and said disconnect position, said operating lever having another leg portion, said other leg portion having handle-receiving means, a handle means insertable into and removeable from said handle-receiving means and operable when inserted into said handle-receiving means to pivot said operating lever about said pivot axis and thereby move said contact mounting frame between said at least one operable position and said disconnect position, said contact mounting

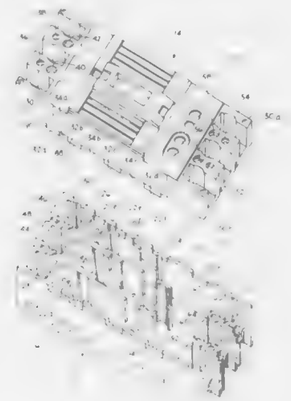
frame being disposed within said panel frame such that said door means can be closed when said contact mounting frame is in said at least one operating position and when in said disconnect position.

4,860,162

MOLDED CASE AND COVER ARRANGEMENT FOR CURRENT LIMITING CIRCUIT INTERRUPTERS

Francesco DeVizzi, Sangiuliano Milanese, Italy, assignor to General Electric Company, New York, N.Y.

Filed Sep. 29, 1988, Ser. No. 250,593
Int. Cl.[4] H01H *33/02*
U.S. Cl. 361—376 **12 Claims**



1. A circuit breaker enclosure comprising:

a molded plastic cover and a molded plastic case including means for supporting circuit breaker terminals thereon;

said cover including a pair of opposing side walls each having a plurality of dovetail projections extending therefrom, said case including a pair of complementary side walls having a corresponding plurality of recesses formed therein, said recesses receiving said dovetail projections; wherein said dovetail projections each comprise a pair of opposing interior and exterior surfaces, said exterior surfaces being larger than said interior surfaces.

4,860,163

COMMUNICATION EQUIPMENT CABINET COOLING ARRANGEMENT

Alan Sarath, Teaneck, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 5, 1988, Ser. No. 229,076
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—384 **15 Claims**

1. Apparatus comprising

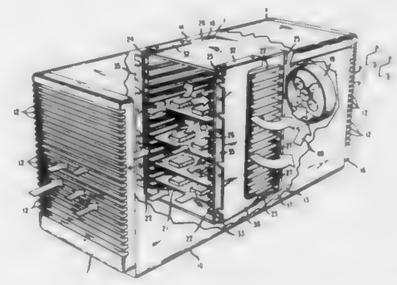
a cabinet,

a circuit pack cage disposed in said cabinet such that a plenum is formed between a rear surface of said circuit pack cage and an interior rear surface of said cabinet and a pair of ducts each communicating with said plenum are formed between respective side surfaces of said circuit pack cage and respective interior surfaces of said cabinet,

means contained in said circuit pack cage for mounting an array of circuit packs each bearing heat generating components, said circuit packs being mounted one above the other such that the component mounting surface of each of said circuit packs is parallel with a top surface of said cabinet, and

a pair of flow control baffles attached to respective side surfaces of said circuit pack cage,

whereby a cooling gas which enters a front surface of said cabinet and flows over heat generating components affixed at one end of each of said circuit packs is directed by said pair of baffles to flow over heat generating components affixed at the other end of each of said circuit packs and thence into said ducts where said cooling gas then flows into said plenum and is exhausted therefrom.

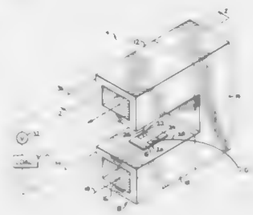


4,860,164

HEAT SINK APPARATUS WITH ELECTRICALLY INSULATIVE INTERMEDIATE CONDUIT PORTION FOR COOLANT FLOW

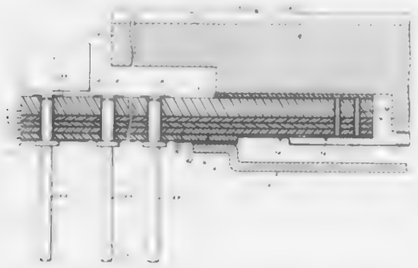
Lance R. Kaufman, 8001 N. Mohave, Paradise Valley, Ariz. 85253

Filed Sep. 1, 1988, Ser. No. 239,623
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—388 **4 Claims**



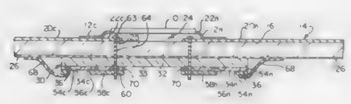
1. Heat sink cooling apparatus for an electric current conducting component, comprising a conduit having an electrically conductive first portion providing a first electrical terminal, an electrically conductive second portion providing a second electrical terminal, and an electrically insulative intermediate portion between and electrically isolating said first and second portions, said conduit having an internal passage receiving coolant flowing therethrough including through said first and second portions and said intermediate portion therebetween, a heat generating electric current conducting component mounted on said first conduit portion, an electrical conductor connected between said electric component and said second conduit portion to provide an electric circuit path through said component and said conductor between said first and second conduit portions providing first and second electrical terminals, and wherein said intermediate conduit portion prevents a short circuit between said first and second terminals, and wherein coolant flowing through said conduit cools said electric component mounted to said first conduit portion.

4,860,165
SEMICONDUCTOR CHIP CARRIER PACKAGE
Edgar Cassinelli, Marlboro, Mass., assignor to Prime Computer, Inc., Natick, Mass.
Filed Apr. 27, 1988, Ser. No. 187,057
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—388 13 Claims



1. A semiconductor chip carrier package comprising:
multi-layer circuit board means having an outer peripheral portion defining a substantially central aperture therethrough and having upper and lower surfaces;
semiconductor chip support means including a chip support button portion extending into said aperture and having a chip support surface disposed substantially adjacent the lower surface of said multi-layer circuit board means and of a smaller cross-dimension that said aperture, and a heat sink portion of larger cross-dimension that said aperture overlaying and affixed to at least a portion of the upper surface of said multi-layer circuit board means; said chip support surface having a chip mounted thereon;
said multi-layer circuit board means comprising separate dielectric boards defining multiple conductive run layers, including at least one signal layer and at least one power layer;
a plurality of pins supported by said outer peripheral portion of and extending outwardly from the lower surface of said multi-layer circuit board means, said plurality of pins including signal pins coupled to at least one of said signal layers and power pins coupled to at least one of said power layers;
said power pins being disposed adjacent the outer periphery of said peripheral portion at locations more remote from said aperture than said signal pins; and,
means conductively connecting leads of said semiconductor chip to corresponding conductive runs of said signal and power layers.

4,860,166
INTEGRATED CIRCUIT TERMINATION DEVICE
Robin P. Nicholls, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.
Continuation of Ser. No. 529,318, Sep. 6, 1983, abandoned. This application Sep. 3, 1985, Ser. No. 771,182
Int. Cl.[4] H05K *1/14*
U.S. Cl. 361—414 7 Claims



1. A termination device for an integrated circuit, the integrated circuit being packaged in a package mounted on a printed circuit board, such package having a plurality of electrical conductor connecting leads, said termination device comprising:
(a) a substrate disposed externally of the package and the printed circuit board, such substrate being attachable to the printed circuit board; and
(b) a plurality of resistors supported on the substrate, such plurality of resistors having a plurality of electrically isolated connecting first ends arranged for alignment in overlaying relationship with the plurality of electrical conductor connecting leads of the integrated circuit package for electrical connection to the first ends of such resistors.

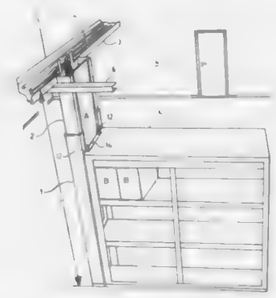
4,860,167
ELECTRICAL SWITCHING UNIT
Walter Trümpler, Karlsruhe, and Josef Schmidt, Graben-Neudorf, both of Fed. Rep. of Germany, assignors to Sew-Eurodrive Gmbh & Co., Bruchsal, Fed. Rep. of Germany
Filed Mar. 31, 1988, Ser. No. 176,150
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 8704572[U]
Int. Cl.[4] H05K *7/02*
U.S. Cl. 361—417 9 Claims



1. Electrical switching unit, such as a rectifier unit for an electromagnetic motor brake or the like, comprising a base part and a top part, as well as a mounting plate carrying electronic components, wherein the top part and the mounting plate are connected together as an insertion unit to be inserted in the base part and the top part is arranged over the electronic components on the side of the mounting plate provided with the electronic components, said top part is connected to the mounting plate by means of contact feet extending well away from the top part and emanating from connecting devices on said insertion unit.

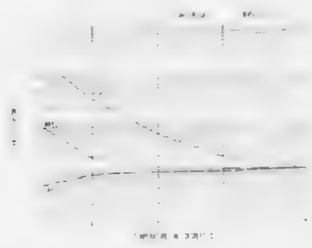
4,860,168
DEVICE IN TELEPHONE EXCHANGES FOR RUNNING TELEPHONE CABLES FROM A FIXED HORIZONTAL CABLE RUN TO EQUIPMENT IN A RACK SHELF
Bo I. Wiljanen, Upplands Väsby, and Jan-Erik Karlsson, Farsta, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed May 25, 1988, Ser. No. 198,508
Claims priority, application Sweden, Jun. 30, 1987, 8702709
Int. Cl.[4] H02B *1/20*
U.S. Cl. 361—428 4 Claims

1. A cable channel for running telephone cables from a fixed horizontal cable run in a telephone exchange to telephony equipment in a shelf rack in said telephone exchange, characterized by a cable channel including a first part and a second part movable relative to said first part, such that the height of the cable channel can be adjusted to the height at which said fixed horizontal cable run is placed the cable channel being joined up to the horizontal cable run and to said rack so that



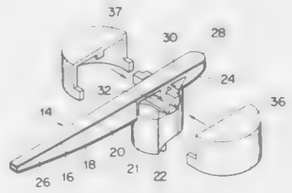
the telephone cables are run from said cable run through the cable channel to the telephony equipment in the rack.

4,860,169
LONG CHAIN CARBOXYLIC ACIDS FOR VERY HIGH VOLTAGE ALUMINUM ELECTROLYTIC CAPACITORS
Roland F. Dapo, Columbia, S.C., assignor to North American Philips Corporation, New York, N.Y.
Filed Dec. 14, 1988, Ser. No. 284,206
Int. Cl.[4] H01G *9/02*
U.S. Cl. 361—506 14 Claims



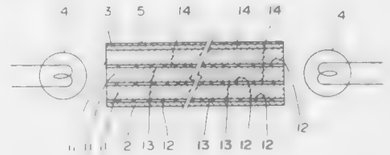
1. An electrolytic capacitor particularly adapted for use above 500 volts comprising aluminum anode and cathode members separated by an insulating spacer impregnated with an electrolyte consisting essentially of a solution of a straight chain saturated aliphatic dicarboxylic acid, the carboxylic moieties which are separated by at least 14 carbons, in a mixture of at least one polar organic solvent and water in an amount of from 2–40% by weight of the by weight of the organic solvent and a sufficient amount of ammonia or an amine to render the solution basic.

4,860,170
POINTER ILLUMINATING STRUCTURE IN MEASURING INSTRUMENT
Yutaka Sakakibara; Hidetaka Ueda, and Kunio Majima, all of Shimada, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Continuation of Ser. No. 879,973, Jun. 30, 1986, abandoned, which is a division of Ser. No. 628,278, Jul. 6, 1984, Pat. No. 4,625,262. This application Feb. 22, 1988, Ser. No. 161,252
Claims priority, application Japan, Jul. 8, 1983, 58-105444; Aug. 19, 1983, 58-127221; Aug. 19, 1983, 58-127222
Int. Cl.[4] G01D *11/28*
U.S. Cl. 362—26 2 Claims



1. A pointer illuminating structure in a measuring instrument comprising:
a transparent pointer element of generally elongated structure having a continuous flat upper surface over the entire length thereof; a pivot point intermediate opposite longitudinal ends of and below said upper surface; and first flank sides substantially perpendicular to said flat upper surface at said pivot point;
light inducing and deflecting means substantially at said pivot point and below said continuous flat upper surface for inducing light beams from below and deflecting the thus induced light beams into the transparent pointer element; said light inducing and reflecting means having second flank sides;
elongated reflective means in the transparent pointer element at a lower surface in facing relation to said continuous flat upper surface, on opposite sides of said light inducing and reflecting means; and
light shield means provided on both lateral sides of said transparent pointer element and covering said first and second flank sides, for shielding any leakage light beams from the light inducing and deflecting means while leaving said continuous flat upper surface completely exposed.

4,860,171
SURFACE ILLUMINATING APPARATUS
Takeshi Kojima, Tondabayashi, Japan, assignor to T. Chatani & Co., Ltd., Osaka, Japan
Filed Oct. 19, 1988, Ser. No. 259,730
Claims priority, application Japan, Oct. 20, 1987, 62-264717
Int. Cl.[4] F21V *7/04*
U.S. Cl. 362—31 5 Claims



1. A surface illuminating apparatus comprising:
(a) a surface illuminating body comprising a plurality of

transparent plates in layers, each of said transparent plates being provided at one side with a spotted surface provided with a large number of fine spots, said spotted surface of each of said transparent plates being different in a spot pattern from each other, said transparent plates being layered in the relation that said spotted surfaces thereof are not opposite to each other, said spotted surface of said transparent plate at the rearmost layer being positioned at the rear surface of said surface illuminating body, and a non-spotted surface of said transparent plate at the foremost layer being positioned at the surface of said surface illuminating body,

(b) a reflecting plate layered in close contact with said spotted surface of said transparent plate at the outermost layer, in turn, the rear surface of said surface illuminating body,

(c) a light diffusion plate layered in close contact with said non-spotted surface of said transparent plate at the outermost layer, in turn, the surface of said surface illuminating body, and

(d) light sources disposed at both the lateral sides of said surface illuminating body so as to irradiate light in said surface illuminating body.

4,860,172

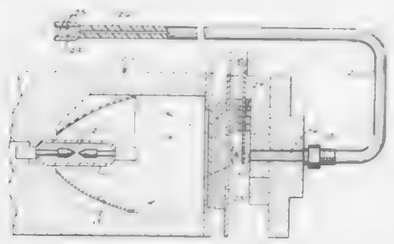
LAMP-BASED LASER SIMULATOR

Kenneth J. Schlager, Elm Grove, and Stephen H. Gorski, Wauwatosa, both of Wis., assignors to Biotronics Associates, Inc., Wauwatosa, Wis.

Filed Jan. 19, 1988, Ser. No. 145,460

Int. Cl.[4] F21V *8/00*

U.S. Cl. 362—32 **14 Claims**



1. A laser simulator for generating high energy light beam usuable for medical surgical procedures and the like comprising:

(a) a lamp-based light source establishing a concentrated light beam of low millimeter dimension;

(b) a reflector means for collecting and focusing the light;

(c) a coupling cone for receiving the focused light and concentrating the light into a narrow beam, said coupling cone constructed to maximize energy transfer of the light from the light source;

(d) an optical fiber coupled to said cone to maximize the energy transfer and receiving the concentrated beam of light from the coupling cone and to transmit the light to its distal end; and,

(e) optical terminal means at the distal end of the fiber for focusing the light exiting from the fiber wherein said light source generates a ball of light in the range of 0.5 to 3 millimeter and said reflector has an ellipsoidal shape and focuses the light on an entrance end of said coupling cone, said coupling cone having a planar exit face, and said fiber having a planar end abutting the cone exit face for a maximum energy transfer.

4,860,173

HEADLAMP FOR A MOTOR VEHICLE

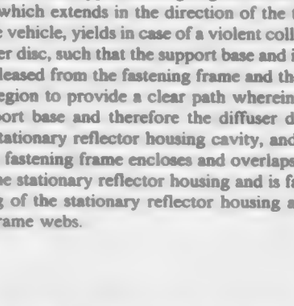
Reiner Jocher, Aidlingen; Horst Dahm, Ostelsheim, and Fritz Häberle, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,334

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1987, 3728752

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 362—61 **5 Claims**



1. Headlamp for motor vehicles, in which a light exit aperture of a reflector is maskable by a diffuser disc which is fitted into an opening in a fastening frame which anchors it to a stationary reflector housing, the diffuser disc engaging with an all-round support base shaped integrally in its edge along the fastening frame behind its opening, and being retained against the rear side of the latter as well as along the external circumference of the support base by a bonded joint, which resists customary stresses, at the fastening frame,

wherein the support base is braced towards the depth of the stationary reflector housing only against the stationary reflector housing,

wherein at least one upper bracing region of the reflector housing, which extends in the direction of the transverse axis of the vehicle, yields in case of a violent collision with the diffuser disc, such that the support base and its bonded joint is released from the fastening frame and the yielding bracing region to provide a clear path wherein the adjacent support base and therefore the diffuser disc enters into the stationary reflector housing cavity, and

wherein the fastening frame encloses and overlaps the front edge of the stationary reflector housing and is fastened to the casing of the stationary reflector housing at least by isolated frame webs.

4,860,174

LIGHTING DEVICE FOR USE WITH VEHICLES

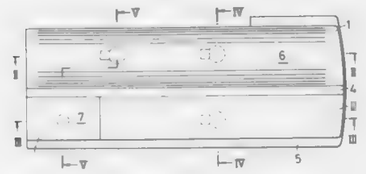
Akio Kato, Hadano, and Hideo Naito, Tokyo, both of Japan, assignors to Ichikoh Industries, Ltd., Tokyo, Japan

Filed Apr. 15, 1988, Ser. No. 182,295

Claims priority, application Japan, Apr. 17, 1987, 62-93290

Int. Cl.[4] B60Q *1/26*

U.S. Cl. 362—61 **24 Claims**



1. A lighting device for use with a vehicle comprising:

a lamp means;

a lens means disposed to distribute light from said lamp means;

a transparent sheet having disposed thereon means for shielding external light from said lighting device of the vehicle;

said means for shielding external light comprising a graduated pattern of varying density disposed along at least a first edge of said transparent sheet, thereby shielding light in different amounts according to density.

4,860,175

ACTUATOR MECHANISM FOR HEADLAMP

Marcus L. Antrim, Yorktown, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1988, Ser. No. 232,087

Int. Cl.[4] B60Q *1/06*

U.S. Cl. 362—65 **8 Claims**



1. In combination with a motor vehicle, an actuator mechanism for moving a headlamp assembly between a first position wherein said headlamp assembly is exposed to project a beam of light forwardly of said motor vehicle and a second position wherein said headlamp assembly is concealed within the body of said motor vehicle, said actuator mechanism including guide means attached to said body for supporting said headlamp assembly for movement along a vertical axis from said first position to said second position and vice versa, and drive means connected to said headlamp assembly for moving said headlamp assembly between said first and second positions while being guided by said guide means.

4,860,176

LIGHTING DEVICE FOR VEHICLE

Frank Bauwens, Guido Gezellestraat 28, and Dirk De Bom Van Driessche, Guido Gezellestraat 58/24, both of 9470 Denderleeuw, Belgium

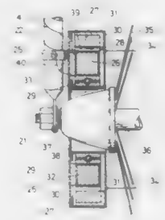
PCT No. PCT/BE87/00005, § 371 Date Nov. 10, 1987, § 102(e) Date Nov. 10, 1987, PCT Pub. No. WO87/05575, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 12, 1987, Ser. No. 130,118

Claims priority, application Belgium, Mar. 13, 1986, PV 0/216412

Int. Cl.[4] B62J *6/00*; F21V *33/00*

U.S. Cl. 362—72 **2 Claims**



1. An electrical generator adapted for use with a standard wheeled bicycle, said generator disposed on an axle and a hub of a wheel of said bicycle, wherein the revolution of said hub around said axle as said wheel revolves enables said generator to output electricity, said generator comprising:

a magnetic field induction assembly and a stator assembly;

said stator assembly circumferentially disposed on said axle of said wheel; said stator assembly comprising a conductive coil disposed within a multi-sided metal casing, said casing having a plurality of apertures alternately formed on at least two sides thereof;

said magnetic field induction assembly comprising a plurality of alternately opposed magnetic poles circumferentially disposed on said hub of said wheel, said magnetic field assembly circumferentially enclosing said stator assembly in a face to face relationship whereby rotation of said hub correspondingly rotates said magnetic field induction assembly around said stator assembly such that said alternately opposed magnetic poles pass over said plurality of apertures thereby inducing a magnetic field in said conductive coil through said plurality of apertures formed in said multi-sided metal casing.

4,860,177

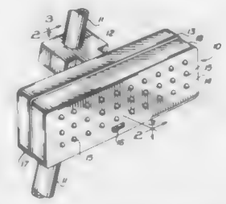
BICYCLE SAFETY LIGHT

John B. Simms, 4518 E. Arapahoe, Phoenix, Ariz. 85044, assignor to John B. Simms and Georgene M. Simms, both of Phoenix, Ariz.

Filed Jan. 25, 1988, Ser. No. 147,888

Int. Cl.[4] B62U *6/00*; F21V *33/00*

U.S. Cl. 362—72 **13 Claims**



1. A bicycle safety light which improves the location recognition of the bicycle and the rider to following traffic, said light comprising spaced multiple rows of vertically disposed lights

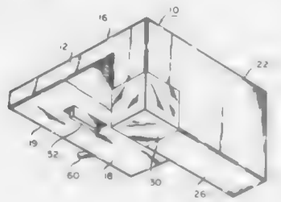
which, when said light is on, and sequentially flash to create a moving light pattern which reciprocally moves in an inward and vertical convergence to terminate in adjacent, centered parallel vertical lines to provide twin, parallel, vertical lamp columns which define the central vertical axial position of the bicycle and rider.

4,860,178

TOILET BOWL LIGHT

Joseph Picon, RD #1, Box 519, Henry St., Jackson, N.J. 08527

Filed Mar. 14, 1988, Ser. No. 167,492
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—101 **1 Claim**





1. A toilet lighting system in combination with a toilet having a toilet bowl, toilet seat, and toilet cover, said toilet seat and said toilet cover being independently pivotable between a lower position and an upper position in relationship to said toilet bowl, said toilet lighting system comprising:

an L-shaped housing, a portion of which is transparent, said L-shaped housing secured to the underside of said toilet seat thereby positioning said lighting system between said underside of said toilet seat and the rim of said toilet bowl when said toilet seat is in said lower position, one leg of said L-shaped housing extending downwardly inside said toilet;

a lighting means secured in said L-shaped housing in said portion of said L-shaped housing extending downwardly into said toilet bowl;

an electrical source means secured in said housing in connection with said lighting means;

an automatic electrical switching means secured in said housing activating said lighting means when said toilet seat is pivoted to said upper position;

a manual electrical switching means secured in said housing manually activating said lighting means when said toilet seat is positioned in either said lower or upper position.

4,860,179

ILLUMINATED UMBRELLA

Paul Y. H. Mui, 118 Tammy Ctr., West Pittsburg, Calif. 94565, and Rosa Y. M. Tao, 3218 Quintara St., San Francisco, Calif. 94116

Filed May 18, 1988, Ser. No. 195,235
Int. Cl.[4] A45B *3/02*
U.S. Cl. 362—102 **11 Claims**

1. In an umbrella of the type having a shaft with an upper shaft end and a lower shaft end, ribs connected to said upper shaft end, and a canopy having an external side covering said ribs, a visibility enhancement system comprising:

an illuminating device mounted on the external side of said canopy;

a power source;

circuit means for coupling said illuminating device to said power source, said circuit means including means for switching said illuminating device on or off; and

a flashlight pivotably and concealably mounted in said lower shaft end, for directing a light beam in a chosen direction;

said lower shaft end including a pivot pin defining a pivot axis disposed perpendicular to an axis defined by said shaft, and said lower shaft end defining a flashlight-sized cavity;

the pivot pin securing a non-illuminating end of the flashlight to the lower shaft end, enabling said flashlight to rotate 360° about the pivot axis;

means for frictionally maintaining said flashlight in any disposition of rotation, said means including a plurality of raised ribs radiating outwardly from the pivot axis, disposed on a surface of a non-illuminating end of said flashlight, and a plurality of rib-sized channels radiating outwardly from the pivot axis, disposed on an inner surface of said cavity;

said ribs and said channels frictionally engaging each other for retaining the flashlight at various dispositions of rotation;

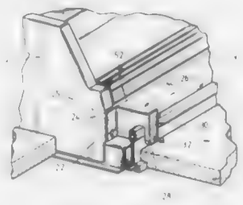
said cavity receiving and concealing said flashlight when said flashlight is rotated into a fully concealed disposition.

4,860,180

GRID SUSPENSION SYSTEM FOR FLUORESCENT TROFFERS

Paul G. Degelmann, Americus, Ga., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Feb. 4, 1988, Ser. No. 152,211
Int. Cl.[4] F21S *3/02*
U.S. Cl. 362—150 **5 Claims**



1. A troffer for fluorescent lights including a stabilizer system comprising:

a first substantially vertical plate member including a threaded fastener for mechanically attaching said first substantially vertical plate member to the troffer;

a bridge member formed substantially perpendicular to said first substantially vertical plate member, said bridge member including a slot constructed and arranged to fit over a runner or stringer used in a suspended ceiling and physically contact the side of said runner or stringer closest to said first substantially vertical plate member;

a second substantially vertical plate member including a threaded fastener for engaging the side of said runner or stringer opposite the side contacted by said slot.

4,860,181

LIGHT SHIELD-REFLECTOR FOR A LIGHTING IMPLEMENT

Gianfranco Guerra, Padua, Italy, assignor to iGuzzini Illuminazione, S.p.A., Recanati (Macerate), Italy

Filed May 10, 1988, Ser. No. 192,380
Claims priority, application Italy, Sep. 15, 1987, 22336/87[U]
Int. Cl.[4] F21V *7/02*
U.S. Cl. 362—290 **6 Claims**

1. A lighting implement comprising:

(a) a tubular base element having an end forming a support section; and

(b) a reflector having one of its ends fastened to said support section of said base element and projecting therefrom, said reflector includes a plurality of superimposed spaced apart wings with a U-shaped downwardly sloping configuration, and a parabolic cross section, surrounding a source of



light so that the light diffuses in a downward direction through the spaces defined by said U-shaped wings;

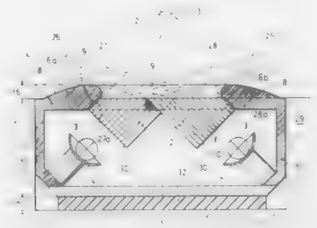
wherein said base element has a first main axis and said reflector has a second main axis, both of said axes being coincident with each other, and said U-shaped wings lying in planes which are parallel to both of said main axes.

4,860,182

AIRPORT LIGHTING

Jan E. Vadseth, Sevelen, Switzerland, assignor to Meta-Fer Holding S.A., Luxembourg-Kirchberg, Luxembourg

Filed Mar. 16, 1988, Ser. No. 168,905
Claims priority, application Switzerland, Mar. 16, 1987, 00974/87
Int. Cl.[4] F21S *1/14*
U.S. Cl. 362—364 **13 Claims**



1. A watertight lighting unit for installation in the road surfacing of an airfield or a road, which comprises, in combination:

a. two flat prism gratings with their upper side lying substantially in the plane of the surface of said road surfacing, inserted into orifices of a prism holder which has a substantially flat upper side with respect to said plane;

b. a light source having a reflector arranged under each prism grating, substantially all light being produced being emitted unimpeded through the corresponding prism grating;

c. the light sources, the associated prism gratings, and the respective light beam being arranged in the opposite direction to one another and laterally displaced with respect to one another; and

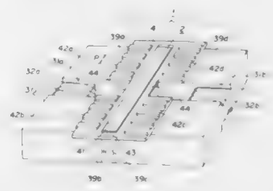
d. the surface of the upper side of the prism holder, at least in the direction toward the prism grating or in the direction of the light beam being wedge-shaped and sloping upwardly at the side of each prism grating facing away from the light beam and/or at least one side being parallel to said light beam of the said prism holder.

4,860,183

PLANAR LINEAR PULSE MOTOR

Tetsuo Maeda, Mishima; Hirofumi Ohta, Otokuni, and Hirokuni Inazumi, Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 1, 1986, Ser. No. 936,242
Claims priority, application Japan, Jan. 14, 1986, 61-5655
Int. Cl.[4] H02K *41/00*
U.S. Cl. 363—12 **24 Claims**



1. A planar linear pulse motor, comprising first and second assemblies which are mutually movable along an axial line;

said first assembly comprising a group of magnetic pole teeth, said magnetic pole teeth being arranged at a determinate pitch in a row along a line substantially parallel to said axial line, and each said magnetic pole tooth being elongated in a direction substantially perpendicular to said axial line;

and said second assembly comprising:

a magnetic pole plate member having four groups of magnetic pole teeth, each said group being arranged substantially at said determinate pitch in a row along a line substantially parallel to said axial line, with the phases of said four groups of magnetic pole teeth being substantially offset from one another, and each said magnetic pole tooth being elongated in a direction substantially perpendicular to said axial line; said four groups of magnetic pole teeth of said second assembly each substantially confronting said group of magnetic pole teeth of said first assembly in a substantially parallel relationship with a relatively small gap being present therebetween;

a permanent magnet having opposite magnetic poles on its side surfaces on either side of a central longitudinal line thereof, said central line being parallel to said axial line;

a pair of generally C-shaped magnetic core members, one of which is touching to one said magnetic pole side surface of said permanent magnet and the other of which is touching to the other said magnetic pole side surface of said permanent magnet so that said two magnetic core members and said permanent magnet are generally coplanar, said magnetic core members being fixed directly to said magnetic pole plate member so that each magnetic core member has two pole surfaces contiguous to two of said groups of magnet pole teeth of the magnetic pole plate member; and

for each of said magnetic core members, a means for inducing magnetic flux therein.

4,860,184

HALF-BRIDGE ZERO-VOLTAGE SWITCHED MULTI-RESONANT CONVERTERS

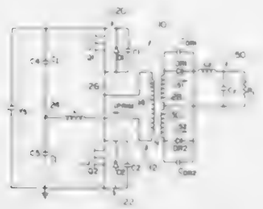
Wojciech A. Tabisz; Fred C. Lee, and Milan M. Jovanovic, all of Blacksburg, Va., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Continuation-in-part of Ser. No. 99,965, Sep. 23, 1987, which is a continuation-in-part of Ser. No. 179,926, Apr. 11, 1988. This application Sep. 27, 1988, Ser. No. 249,930
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—17 **6 Claims**

1. A device for converting an input signal from a supply to a DC output signal to be imposed across a load, said device comprising:

input terminals for receiving the input signal;

output terminals for imposing said DC output signal across the load;
first and second switching means connected in series, said serially connected first and second switching means connected in parallel across said input terminals, each of said first and second switching means including in parallel a transistor switching means, a diode means and a capacitor means;
transformer means having a primary winding, and serially connected first and second secondary windings;
a first rectifying means for connecting said first secondary winding across said output terminals;



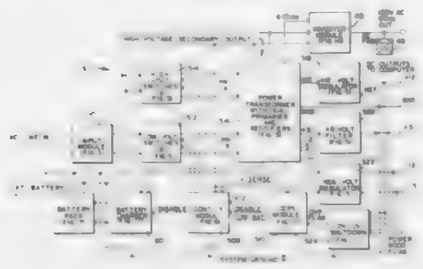
a first resonant capacitor means in parallel with said first rectifying means;
a second rectifying means for connecting said second secondary winding across said output terminals;
a second resonant capacitor means in parallel with said second rectifying means;
means for connecting the primary winding of said transformer to said input terminals and the serial connection between said first and second switching means; and
a resonant circuit formed from said first and second resonant capacitor means and the total inductance of the primary winding of said transformer.

4,860,181

INTEGRATED UNINTERRUPTIBLE POWER SUPPLY FOR PERSONAL COMPUTERS

David C. Brewer; Conrad P. Lindberg, and Paul M. Lindberg, all of San Diego, Calif., assignors to Electronic Research Group, Inc., San Diego, Calif.

Filed Aug. 21, 1987, Ser. No. 87,894
Int. Cl.[4] H02J *7/00*
U.S. Cl. 363—41 21 Claims



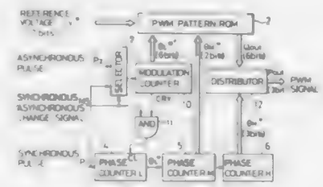
1. An integrated uninterruptible power supply for computers and associated peripherals, comprising:
a bus capable of receiving and sourcing high DC voltages;
input means for converting AC line voltage into a first high DC voltage and for placing said first high DC voltage onto said bus;
inverter means connected to said bus for generating AC output voltage from said high DC voltages to supply the peripherals with said AC output voltage;
a dual primary resonant converter including a transformer, said converter having (1) high voltage primary means connected to a first winding of said transformer and further connected to said bus for receiving said high DC voltages, (2) medium voltage primary means connected to a second winding of said transformer and further connected to a battery pack for receiving battery voltage, (3) high voltage secondary means connected to a third winding of said transformer and further connected to said bus and operable for producing a second high DC voltage and for placing said second high DC voltage onto said bus, and (4) at least one low voltage secondary means connected to a fourth winding on said transformer operable for producing at least one regulated DC voltage for the computer;
said dual primary resonant converter further includes series resonant conversion means having inductance and capacitance in series with at least one of said windings for performing series resonant conversion; and
control means connected to said dual primary resonant converter for enabling said high voltage primary when said input means receives sufficient AC line voltage.

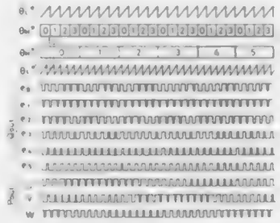
4,860,186

PWM CONTROLLER HAVING SYNCHRONOUS AND ASYNCHRONOUS MODE

Katsumi Mackawa, Tokorozawa, and Tatsuaki Ambo, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 8, 1988, Ser. No. 268,567
Claims priority, application Japan, Nov. 12, 1987, 62-284217
Int. Cl.[4] H02M *7/529*
U.S. Cl. 363—41 8 Claims





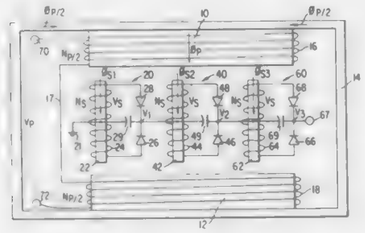
1. A PWM controller, comprising:
phase counter means for counting synchronous pulses having a proportional frequency to that of an inverter to be controlled to output a phase signal;
memory means for storing at least two PWM pattern data with addresses, the PWM pattern data being read out by addressing using a pattern selection signal and the phase signal;
distributor means for distributing the PWM pattern data read out of the memory means using upper bit of the phase signal to output PWM signals for controlling the inverter; and
modulation counter means for counting one of the synchronous pulses and asynchronous pulses having a certain frequency to output a counted value to the memory means, the one of the synchronous and asynchronous pulses being selected according to a mode signal, the counted value of the modulation counter means being used instead of lower bit of the phase signal to selectively output the PWM signals of one of synchronous and asynchronous PWM controls.

4,860,187

MAGNETIC FLUX COUPLED VOLTAGE MULTIPLICATION APPARATUS

Chester C. Thompson, Roslyn Heights, N.Y., assignor to Radiation Dynamics, Inc., Melville, N.Y.

Continuation-in-part of Ser. No. 142,695, Jan. 11, 1988. This application Sep. 6, 1988, Ser. No. 240,592
Int. Cl.[4] H02M *7/10*
U.S. Cl. 363—61 18 Claims





1. A voltage converter, comprising;
a primary electromagnetic circuit,
said primary circuit including a primary magnetic core,
a first secondary electromagnetic circuit,
said first secondary circuit including a first secondary magnetic core,
said primary core defining two arc segments supported within a housing, and
said first secondary core lying within said housing,
means for connecting said primary circuit to a supply of alternating current, and
a first rectification circuit connected to said first secondary circuit, wherein
when alternating current is connected to said primary circuit, a first magnetic field is established,
said first secondary circuit being positioned such that said first magnetic field induces a current flow in said first secondary circuit.

4,860,188

REDUNDANT POWER SUPPLY CONTROL

Walter H. Bailey, Johnson City, Tenn., and Kent Pettus, Conyers, Ga., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 2, 1988, Ser. No. 189,224
Int. Cl.[4] H02M *3/00*
U.S. Cl. 363—65 9 Claims



1. A redundant power supply system comprising:
(a) a plurality of power supplies, each power supply having a supply output terminal and a supply feedback terminal;
(b) a system output terminal for coupling the output of said power supply system to a load;
(c) a plurality of diodes, one of said diodes being coupled between each said supply output terminal and said system output terminal;
(d) a feedback circuit for each power supply, each said feedback circuit comprising:
(e) first means to provide a signal indicative of the voltage drop across the diode associated with said power supply; and
(f) second means to couple a signal to said feedback terminal indicative of the difference between the voltage at said supply output and said signal indicative of the voltage drop across said diode.

4,860,189

FULL BRIDGE POWER CONVERTER CIRCUIT

Leonard J. Hitchcock, Montrose, Pa., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 21, 1988, Ser. No. 171,098
Int. Cl.[4] H02M *7/538*
U.S. Cl. 363—132 1 Claim

1. A full bridge power converter circuit comprising:
a bridge circuit having a separate primary switching means connected in each of the four legs thereof;
direct-current power supply means connected across one diagonal of the bridge circuit;
inductive load means connected across the other diagonal of the bridge circuit;
a drive transformer having a primary winding and four secondary windings;
control signal means for supplying an alternating control signal to the primary winding of the drive transformer;
four separate secondary switching means individually coupling different ones of the drive transformer secondary windings to different ones of the primary switching means for controlling current flow conduction through the primary switching means;
the secondary windings and secondary switching means

being connected so that a first and a fourth of the primary switching means are conductive during a first half cycle of the bridge circuit operation and a second and a third of the primary switching means are conductive during a second half cycle of the bridge circuit operation, the first and fourth primary switching means being located in a first opposite pair of bridge circuit legs and the second and third primary switching means being located in the other opposite pair of bridge circuit legs;



first capacitor means connected to the secondary switching means for the fourth primary switching means for delaying the start of conduction in the fourth primary switching means for an initial portion of the first half cycle of the bridge circuit operation; and second capacitor means connected to the secondary switching means for the second primary switching means for delaying the start of conduction in the second primary switching means for an initial portion of the second half cycle of the bridge circuit operation.

4,860,190

COMPUTER SYSTEM FOR CONTROLLING VIRTUAL MACHINES

Saburo Kaneda, Yokohama, and Kazuaki Murakami, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 2, 1986, Ser. No. 902,674
Claims priority, application Japan, Sep. 3, 1985, 60-194070
Int. Cl.[4] G06F *9/46*
U.S. Cl. 364—200 **6 Claims**



1. A computer system for controlling a number of virtual machines each having a different identification number, comprising:

a central processing unit, including an instruction processing unit connected to an identification memory and to mask memories;

a channel processor connected to said central processing unit;

one or more input/output (I/O) devices connected to said channel processor, the mask memories in said central processing unit being equal in number to the virtual machines and including bits, each of the bits indicating an enabled interrupt classification, each of the mask memories corresponding to one of the different identification numbers; and

I/O interruption queues, connected to and accessible by said central processing unit and said channel processor, equal in number to the virtual machines, each corresponding to one of the different identification numbers,

the identification memory in said central processing unit storing the identification number of a currently operating virtual machine,

said central processing unit carrying out an I/O start for starting an I/O operation in one of the I/O devices by establishing a correspondence between the identification number of the currently operating virtual machine and the one of the I/O devices,

said channel processor storing an I/O interrupt request from one of the I/O devices into one of said I/O interruption queues in dependence upon the identification number corresponding to the one of the I/O devices when the I/O operation is terminated, regardless of the identification number of the currently operating virtual machine, and

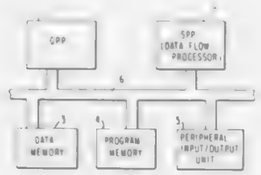
said central processing unit accessing one of the mask memories in dependence upon the identification number stored in the identification memory and said central processing unit determining whether or not the interrupt of the one of the I/O devices is enabled as indicated by the bits in the accessed one of the mask memories.

4,860,191

COPROCESSOR WITH DATAFLOW CIRCUITRY CONTROLLING SEQUENCING TO EXECUTION UNIT OF DATA RECEIVED IN TOKENS FROM MASTER PROCESSOR

Masahiro Nomura, and Yukio Machashi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 8, 1986, Ser. No. 894,535
Claims priority, application Japan, Aug. 8, 1985, 60-175117; Dec. 20, 1985, 60-288788
Int. Cl.[4] G06F *15/16, 15/20, 13/38*
U.S. Cl. 364—200 **5 Claims**



1. A microcomputer comprising:

a first processor;

a second processor;

a program memory for storing a program, said program including instructions of a first type to be executed by said first processor and instructions of a second type to be executed by said second processor; and

a system bus interconnecting said first processor, said second processor and said program memory;

said first processor including:

means for executing said first type of instructions;

means, responsive to said second type of instructions, for producing a token which contains sequence control information representative of a calculation task to be executed by said second processor and data to be processed by said second processor; and

means for transferring said token to said second processor via said system bus;

said second processor including:

input means, coupled to said system bus, for temporarily storing said token;

a first memory;

a second memory;

means, coupled between said input means and said first memory, for writing the data in said token into said first memory;

means, coupled between said input means and said second memory, for writing the sequence control information in said token into said second memory;

storage means for storing a plurality of calculation programs each designated by the sequence control information representative of the calculation task to be executed by said second processor;

means for reading the sequence control information from said second memory;

means, coupled to said first and second memories and to said sequence control information reading means, for feeding back the read sequence control information to said second memory to restore the read sequence control information therein if said first memory does not contain all data required for executing the calculation program designated by the read sequence control information;

means, coupled to said first memory and to said sequence control information reading means, for designating one of said calculation programs in response to the read sequence control information if said first memory does contain all data required for executing the calculation program designated by the read sequence control information;

means for reading data to be processed from said first memory;

an execution unit for executing the designated calculation program by use of the data read from said first memory and obtaining an execution result; and

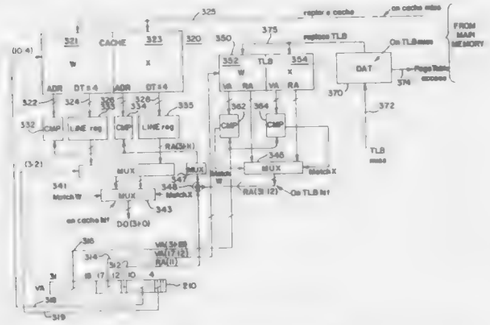
output mean for transferring the execution result from said execution unit to said system bus.

4,860,192

QUADWORD BOUNDARY CACHE SYSTEM

Howard G. Sachs; James Y. Cho, both of Los Gatos, and Walter H. Hollingsworth, Campbell, all of Calif., assignors to Intergraph Corporation, Huntsville, Ala.

Continuation of Ser. No. 704,497, Feb. 22, 1985. This application Oct. 3, 1986, Ser. No. 915,274
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **33 Claims**



1. A cache memory system comprising:

an addressable cache memory, including means for storing a plurality of lines of a plurality of data words, the data words in each line being from contiguous sequential addresses in a main memory;

first real address receiving means, coupled to the cache memory, for receiving a first real address portion from a CPU and for addressing a line of data in the cache memory with the first real address portion;

a line register, coupled to the cache memory, for independently storing the plurality of data words from a line of data in the cache memory;

line communicating means, coupled to the cache memory and to the line register, for communicating the addressed line of data to the line register;

word receiving means for receiving a word stored in the line register; and

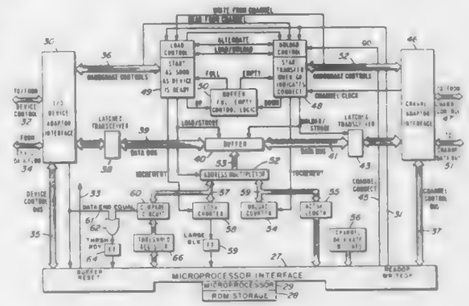
word communicating means, coupled to the line register and to the word receiving means, for selectively communicating a word stored in the line register to the word receiving means.

4,860,193

SYSTEM FOR EFFICIENTLY TRANSFERRING DATA BETWEEN A HIGH SPEED CHANNEL AND A LOW SPEED I/O DEVICE

Steven R. Bentley; David M. Fickle, and Pamela R. Nylander-Hill, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1986, Ser. No. 865,982
Int. Cl.[4] G06F *3/00, 13/12, 13/14*
U.S. Cl. 364—200 **4 Claims**



1. In a data processing system having at least one peripheral data input/output device, and a data channel having a channel data transfer rate substantially greater than a data transfer rate of said peripheral input/output device, a data buffer interface comprising:

a buffer memory for receiving data of a plurality of block lengths from said peripheral device, and transferring said data to said data channel;

a threshold register for storing the identity of a data word within said data block which indicates the start of a transfer cycle for transferring data from said buffer memory to said data channel;

a load control for loading each data word sequentially received from said peripheral device into said buffer memory;

an unload control connected to unload each data word stored in said buffer memory at a rate determined by said data channel data transfer rate;

a comparator means connected to enable said unload control when said load control loads a data word identified by said threshold register into said buffer memory, whereby data transfer to said channel is initiated before said buffer memory has completely filled; and

a microprocessor connected to supply said threshold register with the identity of said data word which indicates the start of said transfer cycle, said microprocessor connected

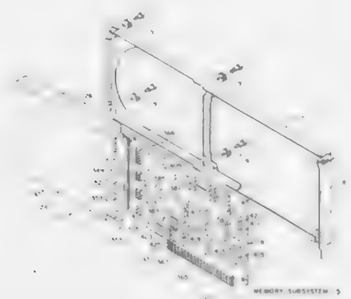
to receive a signal from said unload control for determining a new threshold identity for subsequent blocks of data based upon the length of a previous block of data transferred from said buffer memory to said channel.

4,860,194

A METHOD FOR USING A MODULAR UNITARY DISK FILE SUBSYSTEM

Joel N. Harrison, Monte Sereno; William G. Moon, Sunnyvale, and Randolph H. Graham, Fremont, all of Calif., assignors to Plus Development Corporation, Milpitas, Calif.

Continuation of Ser. No. 926,627, Nov. 3, 1986, abandoned, which is a continuation of Ser. No. 741,175, Jun. 4, 1985, Pat. No. 4,639,863. This application Nov. 28, 1988, Ser. No. 277,024
The portion of the term of this patent subsequent to Jan. 28, 2004, has been disclaimed.
Int. Cl.[4] G06F *1/00*; G11B *5/012*
U.S. Cl. 364—200 **10 Claims**



1. A method enabling a user to store and transport data among selected ones of a plurality of compatible personal computers, each having compatible operating systems and expansion slot locations located entirely within the housing of each of the plurality of compatible personal computers for receiving printed circuit electronics expansion boards, the method comprising the steps of:

(a) forming a rotating disk memory accessory subsystem module as a single unit comprised of an enclosed fixed disk assembly including a plurality of non-removable disks, at least one of which is a data storage disk, disk motor means for rotating the disks as a predetermined angular velocity, at least one data transducer for flying in close proximity to a data storage surface of said data storage disk upon an air bearing formed by rotation of the disk relative to the data transducer, a head transducer arm for mounting the data transducer for relative movement among selected radially displaced data blocks on the disk storage surface, powered mover means for moving the head transducer arm, the subsystem module further comprising electronics circuitry including data transducer position control means for controlling radial position of the head transducer in relation to user data blocks on the data storage surface, disk user data controller means for controlling the formatting, storage and retrieval of user data blocks to and from the storage surface via the head transducer, and interface means for obtaining control signals and data blocks from the said one of the compatible personal computers and for supplying control signals and retrieving data blocks from the data surface and sending said supplied control signals and retrieved data blocks to the host computer via electrical signal paths to the said one of the compatible personal computers via its expansion slot location into which said subsystem module is installed, said subsystem module being so formed as to withstand multiple insertions and withdrawals from each said expansion slot location and as to occupy substantially no greater space than that allotted to a printed circuit electronic expansion board so that slot locations located directly adjacent to the said one slot location are capable of receiving and being occupied by additional structure providing said personal computer with at least one additional accessory function when the said subsystem module is installed at the said one slot location of the personal computer;

(b) installing the subsystem module so formed at a said expansion location of a selected one of said compatible personal computers without any special skills or special tools being required by the user and without the use of any cabling;

(c) recording user data blocks supplied from the said one of the compatible personal computers onto said data surface via the head transducer;

(d) removing the subsystem module from the said one of the compatible personal computers without any special skills or special tools being required by the user;

(e) subsequently reinstalling the said subsystem module into an expansion slot location of a subsequently selected one of the compatible personal computers without any special skills or special tools being required by the user; and

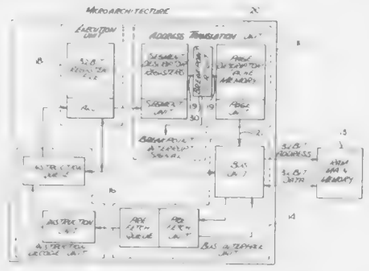
(f) subsequently reading said recorded user data blocks and transferring them to said subsequently selected one of the compatible personal computers via the interface means of the subsystem module and the expansion slot location of the said subsequently selected one of the compatible personal computers.

4,860,195

MICROPROCESSOR BREAKPOINT APPARATUS

Joseph C. Krauskopf, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 822,263, Jan. 24, 1986, abandoned. This application Nov. 15, 1988, Ser. No. 274,636
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—200 **5 Claims**



1. In an integrated circuit microprocessor formed on a single substrate which includes address generation means for generating virtual addresses for reference to program instructions and data, a virtual address bus, address translation means for converting the virtual addresses on said bus to physical addresses, interpretation means for interpreting the program instructions, arithmetic means for operating upon data in accordance with the interpreted instructions, and bus control signals, an improvement for providing a breakpoint signal comprising:

a first register for storing a virtual address at which a breakpoint is to occur;

a second register for storing control bits which determine conditions when said breakpoint is to occur;

comparator means for comparing at least a portion of said stored virtual address with a current virtual address on said bus and generating a hit signal if said comparing results in a match, said comparator means being coupled to said first register, a said second register, and said virtual address bus;

first logic means coupled to said second register to sense at least one of said stored control bits which determines if said breakpoint is to occur when said current virtual address is a reference to data or to program instructions

said first logic means also coupled to receive said bus control signals which identify if said current virtual address is a reference to data or to program instructions, and generating an enable signal if said current virtual address reference to data or to program instructions matches said reference determined by said at least one of said stored control bits;

gating means for providing said breakpoint signal while said current virtual address is still present on said virtual address bus, said gating means being coupled to said comparator means and said first logic means;

said gating means generating said breakpoint signal when receiving said hit and enable signals;

said first and second registers, comparator means, first logic means and gating means being incorporated on said substrate,

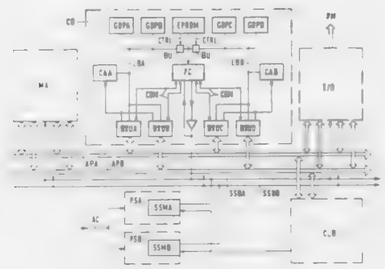
wherein a real time breakpoint signal is provided to said microprocessor.

4,860,196

HIGH-AVAILABILITY COMPUTER SYSTEM WITH A SUPPORT LOGIC FOR A WARM START

Ulrich Weagert, Beaverton, Oreg., assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 1, 1986, Ser. No. 936,523
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **1 Claim**



1. A high availability computer system comprising:

a plurality of general data processors connected respectively as Master/Checker pair units having two processors to each said data processor unit, said processors being connected to one-another within the processor unit by a local bus and connected to a bus extension unit;

the bus extension unit being connected further to a system bus, thereby providing data communication to all of the computer system;

a parameter controller communicating through at least one COM-line to each bus extension unit to control identification and parameterization during a system initialization;

each bus extension unit including an INIT counter maintained by said parameter controller during each initialization;

each of said processors thus connected to its bus extension unit reading its respective INIT counter and deciding whether to continue data processing or to stop;

each said processor receiving either a Master or a Checker identification during initialization and storing said identification;

identification and parameterization being always assigned the same way such that a logic 0 or a logic 1 of said processor always starts the same process; and

each INIT counter being incremented after each warm start such that on each subsequent warm said processor performing the initialization is different from the previous processor performing the initialization.

4,860,197

BRANCH CACHE SYSTEM WITH INSTRUCTION BOUNDARY DETERMINATION INDEPENDENT OF PARCEL BOUNDARY

Brian K. Langendorf, Worcester, and Neil J. Johnson, Burlington, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Jul. 31, 1987, Ser. No. 80,457
Int. Cl.[4] G06F *9/38*
U.S. Cl. 364—200 **8 Claims**



1. In a branch cache system for a pipelined processor having overlapping parcel prefetch and execution stages, the improvement comprising

plural memory set means, for storing plural indexed sets of branch address prediction data words, each of said address prediction data words being representative of branch address predictions, and

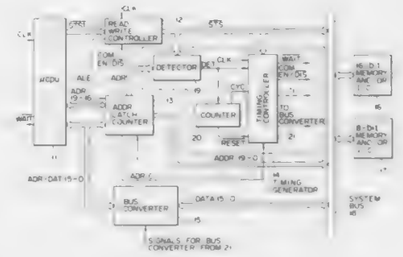
control circuitry means, connected to said plural memory set means, for determining whether there is stored in said plural memory set means an address prediction data word corresponding to a branch instruction fetched by said prefetch stage, and for causing, a responsive to detection of a data word corresponding to said branch instruction, said execution stage to execute said branch instruction to the branch address represented by said data word.

4,860,198

MICROPROCESSOR SYSTEM

Tsutomu Takenaka, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 780,291, Sep. 26, 1985, abandoned. This application May 17, 1988, Ser. No. 196,752
Claims priority, application Japan, Jan. 31, 1985, 60-16777
Int. Cl.[4] G06F *13/00, 7/00*
U.S. Cl. 364—200 **20 Claims**



1. A microprocessor system comprising:

microprocessor means, coupled to a first 2n-bit data bus and a first control bus, said first 2n-bit data bus including first and second data buses each having an n-bit data width,

and responsive to an input 2n-bit data transfer command, for outputting a transfer instruction onto said first control bus, for selectively inputting into said microprocessor means 2n-bit input data on said first 2n-bit data bus, and for selectively outputting from said microprocessor means 2n-bit output data onto said first 2n-bit data bus, an operation state of said microprocessor means being held in accordance with a wait instruction input thereto;

read/write control means, coupled to said first control bus and a second control bus and responsive to the transfer instruction from said microprocessor means and a disable instruction input thereto, for selectively and sequentially generating and outputting onto said second control bus first and second transfer instructions, the first and second transfer instructions being associated with first and second transfer cycles, respectively;

bus converter means, coupled to said first 2n-bit data bus and a second 2n-bit data bus including third and fourth data buses and responsive to an input bus conversion instruction, for selectively and sequentially inputting into said bus converter means first n-bit input data ("FNID") and second n-bit input data ("SNID") on said third data bus, for substantially simultaneously outputting from said bus converter means the FNID and SNID as the 2n-bit input data onto said first 2n-bit data bus, for selectively inputting into said bus converter means the 2n-bit output data comprising first n-bit output data ("FNOD") and second n-bit output data ("SNOD") on said first 2n-bit data bus, and for sequentially outputting from said bus converter means the FNOD and the SNOD onto said third data bus;

a device having the n-bit data width, coupled to said third data bus and said second control bus and responsive to the first and second transfer instructions, for selectively and sequentially outputting from said device the FNID and SNID onto said third data bus, and for selectively and sequentially inputting into said device the FNOD and the SNOD on said third data bus; and

timing generating means, coupled to said second control bus and responsive to the first and second transfer instructions from said read/write control means and an input address, for generating and outputting to said bus converter means the bus conversion instruction, for generating and outputting to said read/write control means the disable instruction between the first and second transfer cycles, and for generating and outputting to said microprocessor means the wait instruction from a first timing during the first transfer cycle to a second timing during the second transfer cycle.

4,860,199

HASHING INDEXER FOR BRANCH CACHE

Brian K. Langendorf, Worcester, and Robert F. Beckwith, Framingham, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Jul. 31, 1987, Ser. No. 80,451
Int. Cl.[4] G06F *9/36, 9/42*
U.S. Cl. 364—200 **15 Claims**



1. In a pipelined digital processor employing macro-instructions utilizing interpretation by micro-instructions, each of said macro-instructions being identifiable by an assoicated address and each of said micro-instructions being identifiable by an associated address, a lookahead fetch system for transmitting predicted brach addresses to a prefetch section prior to decoding of respective brach instructions, comprising:

branch cache means coupled to said prefetch section, said branch cache means receiving prefetch information from said prefetch section, and said branch cache means transmitting to said prefetch section predicted branch address information,

said branch cache means including a plurality of indexed memory loations for storing an indexed table of branch target addresses, each of said branch target addresses corresponding to an addresss of a previously fetched instruction that resulted from a succeeding execution of said instruction,

hashing means for simultaniously receiving and combining a predetermined number of bits representative of the address of a macro-instruction being fetched with a predetermined number of bits representative of the address of a micro-instruction invoked by said macro-instruction, and

index means, in communication with said hashing means and said branch cache means, for applying an address, generated by combinations of bits produced by said hashing means, to said branch cache means, to read out a branch target address;

whereby a branch target address that is predictive of a branch of a micro-instruction interpreting a macro-instruction is read out of the branch cache means.

4,860,200

MICROPROCESSOR INTERFACE DEVICE FOR COUPLING NON-COMPATIBLE PROTOCOL PERIPHERAL WITH PROCESSOR

Dennis L. Holmbo, Redmond, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 752,226, Jul. 3, 1985, abandoned. This application Jan. 11, 1988, Ser. No. 144,609
Int. Cl.[4] G06F *13/26*
U.S. Cl. 364—200 **2 Claims**



1. A device for rendering a data source in a daisy chain of peripheral devices compatible with a processor having a predetermined protocol for receiving information from the peripheral devices comprising:

an interrupt controller having a first interrupt input from one of the peripheral devices in the daisy chain and a second interrupt input from the data source, the first interrupt input indicating whether an interrupt is being processed by one of the peripheral devices higher in hierarchy in the daisy chain and the second interrupt input indicating whether the data source has information for the processor and the priority of such information, and having an interrupt request output to the processor and an interrupt inhibit output to the first peripheral device in the daisy chain, the interrupt request output indicating to the processor according to the protocol that one of the peripheral devices, including the data source, has information and the interrupt inhibit output disabling the peripheral devices higher in hierarchy when the information from the data source has a high priority; and

a vector latch for receiving an interrupt vector from the data source for transmittal to the processor, the vector latch transmitting the interrupt vector to the processor upon command from the interrupt controller.

4,860,201

BINARY TREE PARALLEL PROCESSOR

Salvatore J. Stolfo, Ridgewood, N.J., and Daniel P. Miranker, Austin, Tex., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Sep. 2, 1986, Ser. No. 902,547
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **9 Claims**



1. A parallel processor array comprising:

a plurality of processing elements, each comprising:

a processor having an arithmetic logic unit, control store, program sequences and instruction decoder;

a read/write memory associated with said processor;

an input/output means associated with said processor and read/write memory;

means for interconnecting said processing elements in a binary tree in which each processing element except those at extremities of the binary tree is connected to one parent processing element and at least first and second child processing elements;

said input/output means comprising:

means for broadcasting information received from a parent processing element to said child processing elements, such that common information is distributed to each processing element of the binary tree or a subtree thereof without direct control of the processors of the processing elements; and

means for determining a priority among respective values of information received from said child processing elements and information received from the processor with which said input/output means is associated without direct control of the processors of the processing elements;

wherein the input/output means of the processing elements connected in said binary tree cooperate so that information is broadcast from a first parent processing element to the child processing elements in said binary tree or subtree that are most remote from said first parent processing element, and a priority is determined among values of information at each processing element in said binary tree or subtree, each in a time on the order of the logarithm of the number of processing elements in said binary tree or subtree multiplied by the time for the broadcasting of information from a parent processing element to child processing elements connected thereto, and the time required to determine priority amoung values of information received from the processor of a processing element and the child processing elements connected thereto, respectively.

4,860,202

IR DECODER SYSTEM

Gary A. Jones, Arlington Heights, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 5, 1984, Ser. No. 628,008
Int. Cl.[4] G06F *7/02;* **H04N** *5/44;* **G02F** *1/00*
U.S. Cl. 364—200 **6 Claims**



1. A microprocessor decoding system including a microprocessor comprising:

means for receiving binary data in the form of a synchronizing bit followed a predetermined time later by a data bit;

latch means, coupled to said receiving means, responsive to said synchronizing bit for temporarily storing said data bit; and

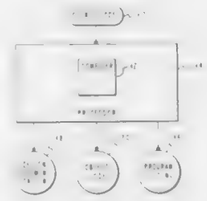
means responsive to said latch means for signalling said microprocessor that a data bit is being temporarily stored to enable processing of said stored data bit by said microprocessor prior to occurrence of the next data bit.

4,860,203

APPARATUS AND METHOD FOR EXTRACTING DOCUMENTATION TEXT FROM A SOURCE CODE PROGRAM

Colleen M. Corrigan, Chicago, Ill.; Lawrence W. Hunter, Austin, Tex., and John A. Modry, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 17, 1986, Ser. No. 908,436
Int. Cl.[4] G06F *3/00, 15/00*
U.S. Cl. 364—300 **10 Claims**



1. An apparatus for producing machine-executable object code, a program listing, and corresponding design documentation from a source program having a plurality of statements of implementation code including keywords, and a plurality of statements of design documentation code corresponding to the keywords of the implementation code, said apparatus comprising:

input means for reading said source program;

compilation means for producing

(a) the machine-executable object code from said implementation code, said machine-executable object code including executable commands derived from the implementation code keywords, and

(b) the program listing as a listing of all the implementation code in the order of appearance in the source program; and

extractor means for producing the design documentation by listing all the corresponding design documentation code

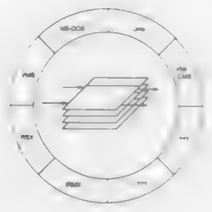
with keywords in the order of appearance in the source programs.

4,860,204

COMPUTER BASED WORKSTATION FOR DEVELOPMENT OF GRAPHIC REPRESENTATION OF COMPUTER PROGRAMS

Robert F. Gendron, Salem; E. Webb Stacy, Jr., Tewksbury, and Tudor V. Ionescu, Sudbury, all of Mass., assignors to Softron, Inc., Waltham, Mass.

Filed Feb. 5, 1987, Ser. No. 11,500
Int. Cl.[4] G06F *3/00, 15/62*
U.S. Cl. 364—300 8 Claims



1. A computer based workstation for development of graphical representations of computer programs, said graphical representations being automatically translated into object code and executed, wherein, as said object code executes, said graphical representations change visibly to show flow of data and control within said object code, said workstation comprising:

means of general purpose computing including at least one central processing unit and at least one memory;

means for inputting information to be used by said general computing means;

means for graphical display of information generated and used by said general purpose computing means;

means for automatic storage of information generated or used by said general purpose computing means;

means for controlling operation of said general computing means; and

said general purpose computing means programmed to generate graphical atoms on the display means which are connectable by input means to generate said graphical representations of computer programs and to define and show data and control flow within said computer programs.

4,860,205

SCINTILLATION CAMERA PROCESSING CIRCUITRY

Michel R. Jatteau, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 22, 1987, Ser. No. 112,652
Claims priority, application France, Oct. 24, 1986, 86 14798
Int. Cl.[4] G01T *1/164, 1/208*
U.S. Cl. 364—413.24 18 Claims

1. A scintillation camera comprising a scintillation crystal for converting each photon received into a scintillation, a light guide for coupling said crystal to an entrance window of an array of p photodetectors serving to convert each scintillation into a current, p acquisition channels receiving output signals of said photodetectors and supplying characteristic electric signals relating to the intensity of the scintillation and to the distance between the respective scintillations and each of the photodetectors, and a processor for supplying the coordinates x_j and y_j of a scintillation j and its associated energy E_j, characterized in that:

(A) said p acquisition channel realize amplification, filtering and sampling of said output signals of said photodetectors, followed by A/D conversion of the samples obtained and their summing, and apply p digital signals to the input of said processor;

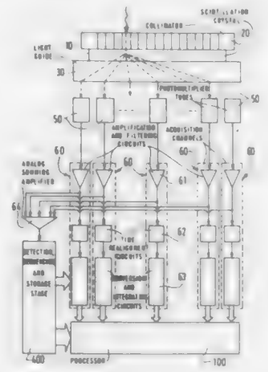
(B) said processor comprises:

(a) a bus for transferring said p digital signals;

(b) a digital summing stage comprising:

(i) a buffer memory receiving a p output signal M_{ij} of the transfer bus;

(ii) a threshold subtraction circuit having a first input receiving said p signals, delayed by said buffer memory, and having a second input receiving a dependent threshold value m_{oj}, said subtraction circuit supplying p signals $M_{ij}-m_{oj}$ which assume the value O if M_{ij} is smaller than m_{oj};



(iii) four digital weighted sum forming devices, the first two receiving the p signals M_{ij}-m_{oj} supplied by said threshold subtraction circuit, and the other two directly receiving the p output signals M_{ij} of said transfer bus; and

(iv) a threshold calculation device receiving the output signal of the fourth digital weighted sum forming device in order to evaluate the dependent threshold m_{oj} according to a proportionality relation with the value E_{mj} associated with each scintillation j, said digital summing stage supplying the following signals $X_{m,j}$, $Y_{m,j}$, $Z_{m,j}$, $E_{m,j}$ (K_i, H_i, J_i, G_i being weighted coefficients):

$$X_{mj} = \sum_{i=1}^{i=p} K_i(M_{ij}-m_{oj})$$

$$Y_{mj} = \sum_{i=1}^{i=p} H_i(M_{ij}-m_{oj})$$

$$Z_{mj} = \sum_{i=1}^{i=p} J_i M_{ij}$$

$$E_{mj} = \sum_{i=1}^{i=p} G_i M_{ij}$$

either directly on the output of the first two digital weighted sum forming devices for the first two of these signals or by two time realignment circuits connected to the output of the other two devices for the last two of these signals; and

(c) a scintillation processing storage including unpiling calculation circuits and two dividers, said processing stage supplying on the basis of the signals $X_{m,j}$, $Y_{m,j}$, $Z_{m,j}$, $E_{m,j}$ three coordinate and energy signals x_j, y_j, E_j, relating to the scintillation j; and

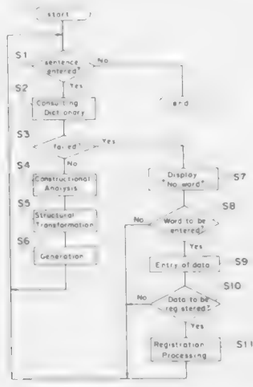
(C) a detection, sequencing and storage stage is provided in order to supply various clock signals for synchronizing the elements of the p acquisition channels and the elements of said processor, and correction coefficients for said scintillation processing stage, said detection, sequencing and storage stage receiving a signal corresponding to the sum of the p output signals of said photodetectors.

4,860,206

TRANSLATION SYSTEM ALLOWING USER DESIGNATION OF POSTPOSITIONAL WORDS

Syuzo Kugimiya; Shinji Tokunaga; Hitoshi Suzuki; Yoji Fukumochi; Shinobu Shiotani, and Ichiko Sata, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 26, 1987, Ser. No. 66,548
Claims priority, application Japan, Jun. 27, 1986, 61-152065; Jun. 30, 1986, 61-155785
Int. Cl.[4] G06F *15/38*
U.S. Cl. 364—419 2 Claims



1. A translation system for translating inputted sentences from a first language to a second language comprising:

dictionary memory means for storing a plurality of reference data corresponding to particular words in said first language, said reference data including the part of speech and equivalent word in said second language;

memory means for storing inputted sentences in said first language;

input means in communication with said memory means for inputting a sentence in said first language;

designation means connected to said dictionary means and responsive to said input means for designating a postpositional word in said second language and for storing said postpositional word as part of said reference data in said dictionary memory means; and

translation means using said reference data stored in said dictionary means for translating an inputted sentence from said first language to said second language.

4,860,207

INFORMATION TRANSMISSION CONTROL APPARATUS FOR ELEVATOR SYSTEM

Susumu Kubo, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

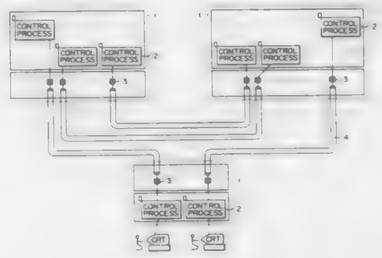
Filed Sep. 25, 1987, Ser. No. 101,135
Claims priority, application Japan, Sep. 30, 1986, 61-231767
Int. Cl.[4] G06F *15/46;* B66B *1/00*
U.S. Cl. 364—424.01 13 Claims

1. An information transmission control apparatus for an elevator system which comprises:

group control means for generating control instructions being used for controlling total operation of elevator cages of the elevator system in accordance with information of current operation modes of the elevator cages and hall calls therefor;

elevator car unit control means, coupled to said group control means, for controlling operation of each said elevator cage in accordance with the control instructions from said group control means; and

data transmission means for physically connecting said elevator car unit control means with said group control means, and serially transmitting said control instructions between said elevator car unit control means and said group control means,



wherein said group control means is provided with a plurality of predetermined processes indicated by said control instructions, and said group control means includes:

first transmitter means for selecting one-by-one said predetermined processes in accordance with given first transmission cues or queues, and serially outputting the selected predetermined processes as said control instructions to said data transmission means; and

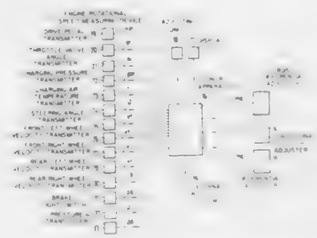
first receiver means for receiving said control instructions serially transmitted via said data transmission means, and selecting one-by-one the received control instructions as said predetermined processes in accordance with given first reception cues.

4,860,208

ARRANGEMENT FOR THE CONTROL OF THE POWER TRANSMISSION OF A FOUR-WHEEL DRIVE VEHICLE

Manfred Bantle, Vaihingen/Enz, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 29, 1988, Ser. No. 188,429
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1987, 3714330
Int. Cl.[4] B60K *17/34, 23/08, 41/18*
U.S. Cl. 364—424.1 22 Claims



1. An arrangement for the control of the power transmission onto the axles of a four-wheel drive motor vehicle, comprising a main driving axle provided with a cross differential means, an auxiliary drive axle driven by way of a longitudinal clutch means to transfer driving power from the cross differential

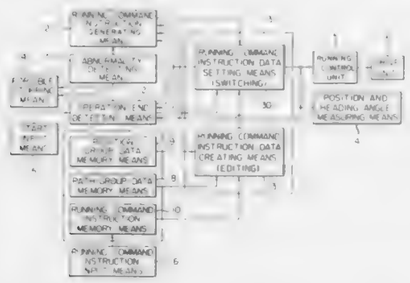
means of the main drive axle to the auxiliary drive axle, which clutch means is continuously controllable by an adjusting means, control means receiving input signals at least from transmitter means which detect the velocities of the wheels at the auxiliary drive axle, the control means being operable to produce a control actuation signal for the adjusting means to actuate the longitudinal clutch means to transfer power in a manner that is in a functional relationship, with at least the driving velocity determined from the velocity of the wheels at the auxiliary drive axle such that in a first low velocity range, the activation signal causes no power transfer and in a second higher velocity range the activation signal causes a power transfer that increases with increasing velocity starting from substantially zero to a controlled magnitude value and above the second velocity range the activation signal maintains the power transfer at this control magnitude value.

4,860,209

RUNNING COMMAND SYSTEM FOR UNMANNED VEHICLE

Gunji Sugimoto, and Takero Hongo, both of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Continuation of Ser. No. 673,529, Nov. 21, 1984, abandoned. This application Mar. 18, 1988, Ser. No. 170,313
Claims priority, application Japan, Nov. 24, 1983, 58-221070
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—424.02 **19 Claims**



1. A running command system for supplying running command instruction data corresponding to operations including travelling, stopping and turning to a running control unit of an unmanned vehicle to indicate the required operation and the position of the path by which the unmanned vehicle can travel to a destination, said command system comprising:

a position and heading angle measuring means for detecting prevailing running state values including position and heading angle of the unmanned vehicle; and for generating running state data for leading the unmanned vehicle to the destination;

running course memory means for storing information including a series of paths leading to the destination and the position of each path with reference to a coordinate system;

a running command instruction data creating and setting means connected to the running control unit:

operation end detecting means connected to the position and heading angle measuring means and to the running command instruction data creating and setting means;

(1) for comparing the current position and heading angle information of the running state data generated by the position and heading angle measurement means with the position of the path and an end point thereon given as running command instruction data currently supplied to the running control unit by the running command instruction data creating and setting means, and

(2) for transmitting an operation end signal to the running command instruction data creating and setting means when the result of the comparing operation (1) satisfies terminating conditions which are determined according to the current running command instruction, said operation end signal being transmitted to said running command instruction data creating and setting means before the unmanned vehicle reaches said end point of its current path;

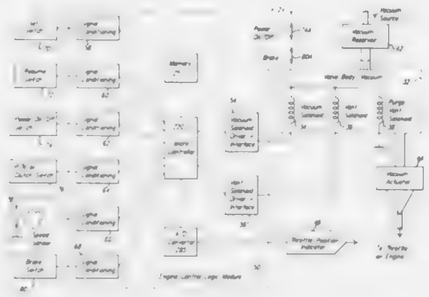
said running command instruction data creating and setting means being connected to said running course memory means and to said operation and detecting means for supplying the running command instruction data for the next operation to the running control unit, upon transmission of the operation end signal by said operation end detecting means to the running command instruction data creating and setting means, in accordance with said information relating the series of paths which is stored in said running course memory means; and said running control unit performs said next operation after completion of the operation represented by the running command instruction data currently supplied to the running control unit.

4,860,210

METHOD OF DETERMINING AND USING A FILTERED SPEED ERROR IN AN INTEGRATED ACCELERATION BASED ELECTRONIC SPEED CONTROL SYSTEM FOR VEHICLES

Jay C. McCombie, West Bloomfield, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Mar. 6, 1987, Ser. No. 23,165
Int. Cl.[4] G06G *7/70*; B60K *31/00*
U.S. Cl. 364—426.04 **3 Claims**



1. In a method for use in an electronic speed control, the method for determining and using a filtered speed error in an acceleration based electronic speed control system for a vehicle with an internal combustion engine with a throttle, a throttle position indicator, and a vacuum source where the electronic speed control system includes: a vacuum actuator, a vacuum reservoir and a valve body with a vacuum solenoid, a vent solenoid and a purge vent solenoid to work with a voltage source and switches and sensors including a set switch, resume switch, power on/orr switch, park/neutral or clutch switch, a speed sensor, and a brake switch; signal conditioning; a memory for storing data including point slope curves and look-up tables; an A/D converter; a vacuum solenoid driver and interface; a vent solenoid driver and interface and a microcontroller with input/output ports hereafter called vac/vent ports, to communicate with the valve body, where one of the uses for the microcontroller is for processing signals generated by the voltage source and switches and sensors which represent various speed control conditions as selected by the operator of the vehicle;

a method of determining and using a filtered speed error in an acceleration based electronic speed control system comprising:

monitoring a set speed selected by an operator of the vehicle;

monitoring the vehicle speed;

computing a speed error by finding the difference between set speed and the vehicle speed;

calculating a desired acceleration from point slope curves stored in memory based on the computed speed error;

monitoring the actual acceleration;

computing an acceleration error based on the difference between the desired acceleration and the actual acceleration;

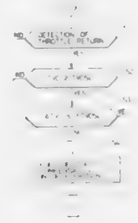
using the acceleration error to drive the vehicle speed to the set speed and reducing the speed error to zero.

4,860,211

AIR FUEL RATIO CONTROL APPARATUS

Keiji Hatanaka, Chigasaki; Kiyotoshi Sakuma, Yokohama; Kiyomi Morita, Katsuta, and Junji Miyake, Mito, all of Japan, assignors to Nissan Motor Co., Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Filed May 29, 1987, Ser. No. 55,531
Claims priority, application Japan, May 29, 1986, 61-122333
Int. Cl.[4] F02M *3/045*
U.S. Cl. 364—431.05 **10 Claims**



1. In an air fuel ratio control apparatus for internal combustion engines, wherein fuel decrease compensation is effected during deceleration with respect to an air fuel ratio based on a detected returning movement of a throttle valve, the improvement comprising:

means for inhibiting said fuel decrease compensation on the condition that opening of said throttle valve is at least equal to a predetermined opening value and an amount of returning movement of said throttle valve per unit time is no more than a predetermined velocity value.

4,860,212

ROLLED STRIP SHAPE DETECTING DEVICE WITH HIGH ACCURACY

Kenichi Uesugi, Kobe, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 6, 1987, Ser. No. 104,973
Claims priority, application Japan, Oct. 8, 1986, 61-238045; Apr. 28, 1987, 62-103197
Int. Cl.[4] G06F *15/46*; B21B *37/04*
U.S. Cl. 364—472 **12 Claims**

1. A device for detecting a rolled strip shape with high accuracy, comprising:

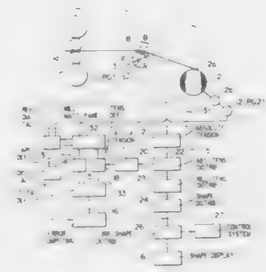
a shape detecting roller provided between a rolling mill for rolling a metal strip and a winder for winding under tension a rolled strip rolled by said rolling mill, said roller being adapted to contact said rolled strip and having means for detecting a shape of said rolled strip;

means for producing a calculated shape distribution signal based on the detected shape of the rolled strip;

tension detecting means for detecting tension applied to said roller;

storage means for storing information relating to said rolled strip and said roller; and

arithmetic means for computing deflection of said roller according to the tension detected by said tension detecting means and the information relating to said rolled strip and



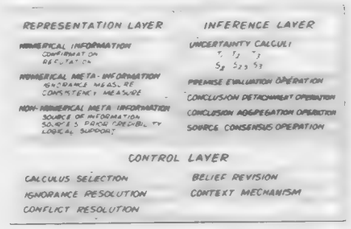
said roller stored by said storage means and for correcting the shape distribution signal for said rolled strip in accordance with the computed deflection of said roller.

4,860,213

REASONING SYSTEM FOR REASONING WITH UNCERTAINTY

Piero P. Bonissone, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 1, 1987, Ser. No. 103,465
Int. Cl.[4] G06F *15/36*
U.S. Cl. 364—513 **28 Claims**



1. A method, for practice on a computer, for reasoning with uncertainty in a rule-based reasoning system comprising a plurality of rules each having a premise and a conclusion to be determined true upon finding the premise to be true, said premise comprising at least one clause including a variable to which a value can be assigned, said method comprising the steps of:

associating a value certainty interval with each value assigned to one of said rule premise variables, said value certainty interval having a lower and an upper bound respectively representative of amounts of confirmation and failure of refutation of the assigned value;

associating a sufficiency factor and a necessity factor with each said rule, said sufficiency factor representing a strength of belief that the rule conclusion is true given the rule premise is true, said necessity factor representing a strength of belief that the rule conclusion is false given the rule premise is false;

computing a premise certainty interval from the value certainty intervals respectively associated with the values assigned to the premise variables, a lower bound of said premise certainty interval being a first predetermined function of the respective value certainty interval lower bounds, an upper bound of said premise certainty interval being said first function of the respective value certainty interval upper bounds; and

firing one of said rules by computing a conclusion detach-

ment certainty interval having a lower and an upper bound, said conclusion detachment interval lower bound being a second predetermined function of both said rule sufficiency factor and said premise certainty interval lower bound, the conclusion detachment upper bound being a third predetermined function of both said rule necessity factor and said premise certainty interval upper bound, said conclusion detachment interval lower and upper bounds respectively representing the amounts of confirmation and failure of refutation of the rule conclusion.

4,860,214

INFERENCE SYSTEM

Toru Matsuda, Kawasaki; Takanori Yano, Tokyo; Toshiaki Okamoto, Yokohama, and Akira Okamoto, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Japan

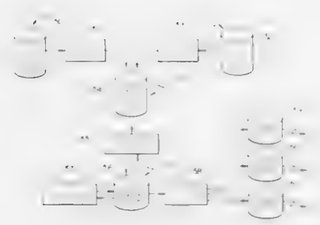
Filed Jan. 19, 1988, Ser. No. 145,237

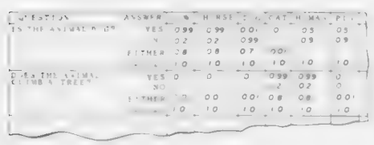
Claims priority, application Japan, Jan. 22, 1987, 62-11283; Apr. 7, 1987, 62-83855; Apr. 9, 1987, 62-88606; Apr. 9, 1987, 62-88607; May 19, 1987, 62-120132; Jun. 29, 1987, 62-159646; Nov. 30, 1987, 62-299677

Int. Cl.⁴ G06F *15/00*

U.S. Cl. 364—513 **20 Claims**







3. An inference system comprising:

input means for entering data to be used for making an inference;

data storage means for storing data showing a possibility of a conclusion depending on the data entered from said input means;

inference means for making an inference by eliminating a degree of fuzziness of said conclusion by use of the data entered from said input means, said inference means comprising means for converting the data obtained from said data storage means into Dempster-Shafer's basic probability assignment data in making the inference;

output means for outputting said conclusion obtained from said inference means;

question generating means for generating a question; and

questions selection means for selecting a question to be generated from said question generating means, said input means entering an answer to the question generated by said question generating means, said data storage means storing data showing a possibility of a conclusion depending on the answer entered from said input means, said question selection means selecting the question to be generated from the question generating means depending on the conclusion obtained from said inference means, said output means outputting at least the conclusion obtained from said inference means, said question generating means generating only the question selected by said question selection means after the answer is entered from said input means.

4,860,215

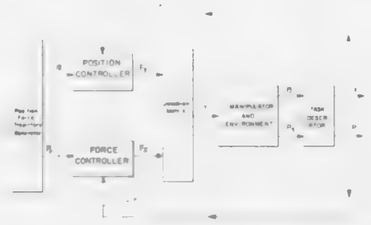
METHOD AND APPARATUS FOR ADAPTIVE FORCE AND POSITION CONTROL OF MANIPULATORS

Homayoun Seraji, La Cresenta, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Apr. 6, 1987, Ser. No. 35,061

Int. Cl.⁴ G06F *15/46*; G05B *19/42*

U.S. Cl. 364—513 **28 Claims**



1. In a hybrid controller adapted to issue a manipulator control signal which controls a manipulator's position and force in Cartesean space, wherein the manipulator and its environment form a system exhibiting dynamics which are non-linear and also include manipulator and system parameters which are not known to a user who controls the manipulator in Cartesean space through a user-initiated position and force trajectory command that is received at the hybrid controller, and wherein the hybrid controller senses force and position of said manipulator in said Cartesian space, the improvement comprising:

manipulator driving means responsive to said control signal issued by said hybrid controller for driving said manipulator in said environment to achieve, in Cartesean space said desired position and force indicated by said trajectory command received by said hybrid controller, which command is issued to said hybrid system free of a priori knowledge of any of said non-linearities and/or the manipulator's and/or system's parameters; and

adaptive control means, responsive to said sensed force and position, for varying said control signal applied to said manipulator's driving means, which variable control signal compensates in real-time for the system's nonlinearities as said manipulator is driven in Cartesean space to said commanded position and force.

4,860,216

COMMUNICATION ADAPTIVE MULTI-SENSOR SYSTEM

Glenn R. Linsenmayer, Reston, Va., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 13, 1986, Ser. No. 930,161

Int. Cl.⁴ G06F *15/36, 11/18*

U.S. Cl. 364—516 **1 Claim**



1. In a multi-sensor system which has a plurality of sensors which receive target echo return signals from a tracked target, and a plurality of local signal processors, each being electrically connected to, and receiving said target echo return signals from one of said sensor systems and producing a plurality of hypothesis identifications with probability rankings of said hypothesis identifications for said target by comparing said target echo return signals with expected characteristics of target identifies, wherein the improvement comprises:

a signal fusion processor which is programmed to produce a highest ranking hypothesis identification by composing probability sums for each hypothesis identification by adding logarithms of probability rankings of like hypothesis identifications from each of the local signal processors to create a set of probability sums, with one probability sum for each hypothesis identification, and outputting the hypothesis identification with the highest probability sum as the highest ranking hypothesis identification; and

a means for identifying said tracked target, said identifying means identifying said tracked target as having the hypothesis identification with the highest probability sum produced by said signal fusion processor.

4,860,217

METHOD AND SYSTEM FOR EFFECTING A TRANSFORMATION OF A VIDEO IMAGE

Nobuo Sasaki; Tetsuzo Kuragano, and Nobuyuki Minami, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 23, 1985, Ser. No. 812,341

Claims priority, application Japan, Dec. 27, 1984, 59-281225

Int. Cl.⁴ G06F *3/14*

U.S. Cl. 364—518 **21 Claims**



12. A system for effecting a transformation of a video image on a video screen, comprising:

(a) first means for storing input image data;

(b) second means for sequentially generating a positional output image address signal;

(c) third means for presetting parameters representing a locus on which an output of the video image is turned over as if a sheet of paper were folded up;

(d) fourth means for sequentially generating position designation signals indicative of a displacement of the input image on a two-dimensional plane;

(e) fifth means for calculating values including a positional reference point signal of the input image on the two-dimensional plane on the basis of which the input image is displaced, rotation transform matrix data based on a given angle through which the two-dimensional plane is rotated, and a radius data on a virtual geometrical image on which part of the input image is wound, said positional reference point signal, rotation transform matrix data, and radius data being based on present parameters drived from said third means and position designation signals derived from said fourth means;

(f) sixth means for executing transform arithmetic operations for transformable parts of an output video image, said transformable parts being defined by a first part representing a rear part of the output video image which is wound on an upper surface of said geometrical image as viewed through the video screen, a second part representing a front part of the output video image which is outside of a projection portion of the geometrical image, a third part representing the front part of the output video image which is wound on a lower surface of said geometrical image as viewed through the video screen, and a fourth part representing the rear part of the output image which is outside of said wound first part so as to overlap on said second part, on the basis of the reference point signal, rotation transform matrix data, and radius data of said geometrical image calculated by said fifth means and reading out the input image data the contents of which are to be the output image and specified by the positional output image address signal generated by said second means; and

(g) seventh means for displaying the input video image whose data are stored in said first means and read out from said first means by said sixth means according to the positional output image address signal on the video screen so that the whole video screen can be viewed as if a sheet of paper were being folded up about said geometrical image.

4,860,218

DISPLAY WITH WINDOWING CAPABILITY BY ADDRESSING

Michael Sleator, 2281 NW. Hoyt, Portland, Oreg. 97210

Filed Sep. 18, 1985, Ser. No. 777,345

Int. Cl.⁴ G09G *1/00*

U.S. Cl. 364—518 **20 Claims**



15. An apparatus for providing a graphic display of data, comprising:

means for creating synchronization signals;

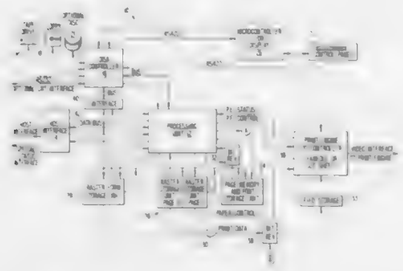
means for inputting input data, including displayable data;

displayable data storage means for storing said displayable data;

means for producing a raster-scanning signal representing

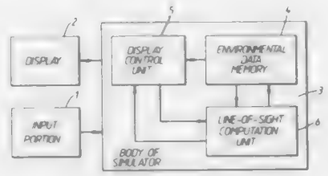
the contents of a sequence of locations in said displayable data storage means;
control data storage means for storing data that controls a sequence of accessing the contents of locations in said displayable data storage means;
control means for sequentially supplying, to said means for producing a raster-scanning signal, addresses of locations in said displayable storage means, the sequence being specified by data stored in said control data storage means; and
means for displaying the raster-scanning signal, adapted to receive said raster-scanning signal and said synchronization signals.

4,860,219
HIGH SPEED PRINTER
Daniel R. Schulz, Crystal Beach; Benton B. Warren, Clearwater, and Michael K. Reed, Largo, all of Fla., assignors to National Business Systems, Inc., Mississauga, Canada
Filed Feb. 26, 1987, Ser. No. 19,222
Int. Cl.[4] G06F *15/626*
U.S. Cl. 364—519 **49 Claims**
MICROFICHE APPENDIX INCLUDED
(873 Microfiche, 9 Pages)



1. A printing system comprising:
(a) a raster storing means including a page memory for storing at least one page of information to be printed, each page being comprised of a plurality of lines of information including a beginning line, a plurality of intermediate lines and an ending line, each line having one or more successively addressed words each having a plurality of pixels, with a beginning word having the lowest address, with each successive word having a higher address, and with the last word having the highest address;
(b) means, coupled to the page memory, for causing the readout of words stored in the page memory in either a first direction or a second direction, the first direction being from the first line successively thru the intermediate lines thru the last line with each line being read out in a direction from the lowest addressed word to the highest addressed word, the second direction being from the last line successively thru the intermediate lines thru the first line with each line being read out in a direction from the highest addressed word to the lowest addressed word and the significance of pixel positions of pixels from words read in the second direction being reversed from the significance of pixel positions of pixels from words read in the first direction; and
(c) printing means for printing on first and second sides of a printing medium, coupled to the means causing the readout of words, for printing pages of information stored in the page memory on a printing medium having a top and bottom, with the printing of the first side of the printing medium being performed by printing the page of information read out from the page memory in one of the first and second directions while moving the printing medium from the top to the bottom thru a printing station and the printing of second side of the printing medium being performed by printing the page of information readout from the page memory in the other of the first and second directions while moving the printing medium from the bottom to the top.

4,860,220
APPARATUS FOR DISPLAYING THREE-DIMENSIONAL OBJECTS
Toshiaki Tanaka, Kawasaki, and Kiroyuki Mizutani, Yokohama, both of Japan, assignors to Kabushuki Kaisha Toshiba, Kanagawa, Japan
Filed Mar. 25, 1987, Ser. No. 30,046
Claims priority, application Japan, Mar. 29, 1986, 61-72111
Int. Cl.[4] G06F *7/00*
U.S. Cl. 364—522 **9 Claims**



1. An apparatus for displaying three-dimensional objects in two dimensions comprising:
environmental data memory means for storing form and position data of a plurality of three-dimensional objects;
input means of selecting two three-dimensional objects of said plurality of three-dimensional objects;
means for reading out form and position data of the selected three-dimensional objects from said environmental data memory means;
means for computing a line-of-sight vector for displaying the selected three-dimensional objects as two-dimensional figures with no interference therebetween in accordance with the form and position data that are read out from said environmental data memory means;
means for calculating two-dimensional figure data for the selected three-dimensional objects in accordance with the form and position data read out from said environmental data memory means and the line-of-sight vector computed by said line-of-sight computing means; and
means for displaying the selected three-dimensional objects as two-dimensional figures in accordance with the two-dimensional figure data calculated by said calculating means.

4,860,221
MAGNETIC RESONANCE IMAGING SYSTEM
Makoto Sato, Ootawara, and Toshio Uehara, Tochigi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Aug. 18, 1986, Ser. No. 897,305
Claims priority, application Japan, Aug. 21, 1985, 60-181855
Int. Cl.[4] G06F *3/14*
U.S. Cl. 364—522 **10 Claims**
1. An MRI system comprising:
image pick-up means having a slice select means for selecting a position designated by position data and a gradient magnetic field of a slice, said image pick-up means exciting the magnetic resonance (MR) in the slice of an object under inspection as selected by said slice select means, to collect MR data and to obtain an MR image data;
memory means for storing the MR image data picked up by said image pick-up means, together with its associated slice position data;

display means for displaying an MR image corresponding to MR image data;
MR image display control means for reading out desired MR image data from said memory means, and causing said display means to display the MR image of one or more slices;
marker display control means for displaying a marker to designate a slice to be imaged, by obtaining set MR image data and for superposing said marker on the MR image of said arbitrary slice as displayed by said display means; and

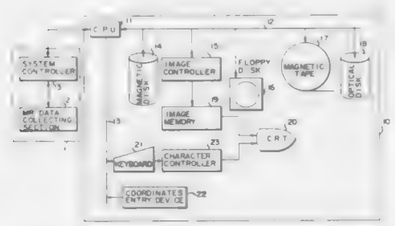
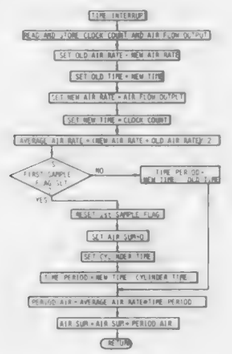


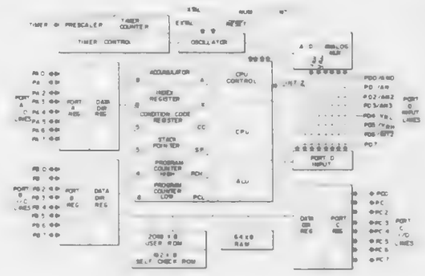
image pick up control means for obtaining the position data representing the position of the image, designated by said marker, on the basis of both the position data of the MR image of said arbitrary slice and the relative position data of said marker with respect to the arbitrary image, and controlling said slice select means of said image pick-up means in response to said position data and relative position data.

4,860,222
METHOD AND APPARATUS FOR MEASURING ENGINE MASS AIR FLOW
Edward H. Schmidt; Marvin E. Carpenter, both of Utica, and David W. Walters, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jan. 25, 1988, Ser. No. 148,296
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—550 **7 Claims**



1. The method of measuring mass air flow for each cylinder of an engine comprising the steps of
allocating an air flow measuring interval to each cylinder,
generating cylinder position signals indicating beginning and end boundaries of the air flow measuring interval for each cylinder,
periodically sampling air flow rate at sampling times set by a fixed sampling rate to provide a plurality of whole sampling time periods in each air flow measuring interval and partial sampling time periods at the beginning and end of each air flow measuring interval,
integrating the air flow rate in each whole sampling time period in each air flow measuring interval to determine the mass air flow in each whole sampling time period,
calculating the mass air flow in each partial sampling time period in each air flow measuring interval, and
accumulating the mass air flows calculated in each air flow measuring interval to determine the total mass air flow for the corresponding cylinder.

4,860,223
CARBON MONOXIDE HEALTH HAZARD MONITOR
Henry G. Grilk, West Milford, N.J., assignor to Rule Industries, Inc., Gloucester, Mass.
Filed Sep. 24, 1987, Ser. No. 100,791
Int. Cl.[4] G06F *15/20, 15/42*
U.S. Cl. 364—550 **16 Claims**



1. A monitoring instrument for use on a vehicle comprising:
means for determining a concentration of carbon monoxide present at a location of the instrument on said vehicle;
means for indicating said concentration;
means for periodically calculating a level of carbon monoxhemoglobin %COHb in the blood of a person on said vehicle proximate to said instrument resulting from breathing said carbon monoxide, said level of carbon monoxhemoglobin %COHb being calculated using the equation:

$$\%COHb_p = \%COHb_o(K1) + K2 + COC(k3),$$

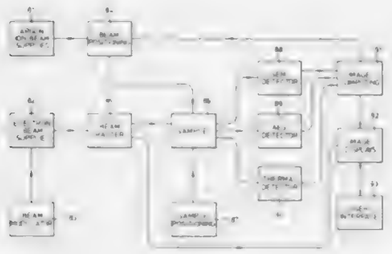
where $\%COHb_p$ is the present calculated level of %COHb, $\%COHb_o$ is the %COHb level as calculated at the time of the last periodic calculation, COC is the present measured CO concentration in PPM, and k1, K2 and K3 are predetermined constants; and
means to actuate a device if the calculated level of carbon monoxhemoglobin %COHb in the blood exceeds a predetermined health hazard level.

4,860,224
SURFACE ANALYSIS SPECTROSCOPY APPARATUS
Edmund M. Cashell, and Liam McDonnell, both of Cork, Ireland, assignors to 501 Tekscan Limited, Dublin, Ireland
Filed May 21, 1986, Ser. No. 866,062
Claims priority, application Ireland, May 22, 1985, 1278/85
Int. Cl.[4] G01N *23/00*
U.S. Cl. 364—551.01 **19 Claims**
1. Surface analysis apparatus comprising:
(a) a substantially hermetically sealable chamber;
(b) means for establishing an ultra-high vacuum environment in said chamber;
(c) means for supporting a test specimen within said chamber when ultra-high vacuum conditions prevail therein;
(d) a plurality of means for directing a beam at said test specimen for transfer of energy thereto, at least one of said

plurality of beam-directing means adapted to direct a beam at a selected surface region of said test specimen for transfer of energy to said selected surface region;

(e) means for detecting emissions from said test specimen when excited by energy transfer thereto, said emissions detecting means including means for establishing the temperature of said selected surface region when excited by energy transfer to said selected surface region from said beam of said at least one of said plurality of beam-directing means; and

(f) means for analysing said emissions to provide data indicative of at least surface properties of said test specimen.



4,860,225

METHOD AND APPARATUS FOR STORING MEASURED DATA FROM SUB-REGIONS OF A SPUTTER CRATER WHICH IS GENERATED AND ANALYZED IN A SECONDARY ION MASS SPECTROMETER

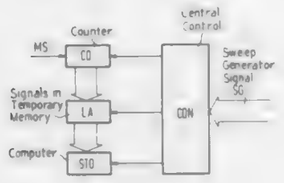
Rolf Von Criegern, Geretsried; Peter Fazekas, Munich, and Johannes Fottner, Jetzendorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 56,276, May 26, 1987, abandoned. This application Apr. 7, 1988, Ser. No. 183,336

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335625

Int. Cl.[4] G21K *5/04;* **G06F** *15/36*

U.S. Cl. 364—551.01 **19 Claims**



8. Apparatus for storing measured data from a sputter crater generated and analyzed in a secondary ion mass spectrometer which scans line-by-line the crater with an ion beam which substantially reduces the required memory capacity comprising: a counting unit including a plurality of counters for receiving and counting secondary ion signals from a plurality of sub-areas of a region of each scan line and each of said plurality of counters receiving the signals for a different column, temporary memory means connected to said plurality of counters of said counting unit and temporarily storing the contents of said plurality of counters of each counting unit for each line sweep of the ion beam over the respective sub-areas; a control unit connected to said plurality of counters for switching said counters and for controlling the storage into said temporary memory means as a function of the position of the ion beam; and computer means connected to said control unit and connected to said temporary memory means for evaluating the contents of said memory means after at least one line scan of the sputter crater generated by the ion beam.

9. A method for storing and evaluating measured data from a sputter crater generated in a secondary ion mass spectrometer which substantially reduces the required memory capacity, whereby an ion base is deflected on a specimen and whereby the secondary ions triggered on the specimen are documented, comprising the steps of:

(a) subdividing at least one sub-region of the specimen into a plurality of non-overlapping sub-surfaces;

(b) assigning each of the sub-surfaces respectively a memory location in a first memory unit;

(c) deflecting the ion beam over a sub-area of the specimen;

(d) respectively detecting the measured data from the same sub-surface and registering it in a counter allocated to the sub-surface and said data are summed up; and

(e) storing after the scanning of a sub-surface, a measured value representing the sum of the respective measured data in a memory location of a second memory allocated to the sub-surface.

4,860,226

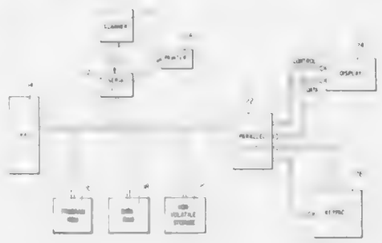
METHOD AND APPARATUS FOR BAR CODE GRAPHICS QUALITY CONTROL

Edward L. Martin, 3946 Vineyard Trace, NE.; Fred G. Graham, 3932 Rockmill Pkwy., both of Marietta, Ga. 30062, and Benjamin Roman, 4390 Marsh Rd., Marietta, Ga. 30066

Continuation of Ser. No. 905,119, Sep. 9, 1986, abandoned. This application Feb. 6, 1989, Ser. No. 306,230

Int. Cl.[4] G06F *15/20;* **G06K** *7/10, 9/00;* **B07C** *5/00*

U.S. Cl. 364—552 **17 Claims**



1. Apparatus for providing goods to an end user at a point of sale of the goods with bar codes imprinted thereon which bar codes will correctly indicate the UPC number of the goods at the point of sale thereof based on a statistical sampling of such bar codes, which comprises:

scanning means comprising a helium-neon laser scanner for scanning the imprinted bar codes in substantially the same manner as they will be scanned at the point of sale by the end user;

computer means connected with said scanning means for reading the UPC numbers of a sampling test of the bar codes, said computer means including a program ROM programmed with logic means for causing the computer means to compare the UPC numbers read by the scanning means during a sampling test with the current UPC number to which the bar codes should correspond, and indicating the number of times a correct read is made with respect to the total number of scans during the sampling test; and

a keyboard connected to the computer means for controlling the logic means during the sampling test.

4,860,227

CIRCUIT FOR MEASURING CHARACTERISTICS OF A DEVICE UNDER TEST

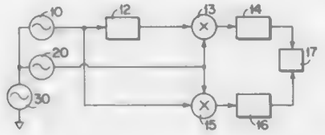
Toshio Tamamura, Tokyo, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 30, 1986, Ser. No. 824,026

Claims priority, application Japan, Jan. 31, 1985, 60-17099; Jan. 31, 1985, 60-17100

Int. Cl.[4] G01R *19/00*

U.S. Cl. 364—553 **2 Claims**



1. Apparatus for measuring the characteristics of a device under test, comprising:

first generating means for generating a periodic test signal with a period of T, based on a crystal oscillator reference signal, applied to the device under test;

second generating means coupled to the reference signal of the first generating means, and comprising a fractional N oscillator, for generating a periodic sampling signal with a period of $t=nY+T/m$, where n and m are integers, and m is the number of sampling intervals into which the test signal period is divided;

first sampling means for receiving the output signal of the device under test and the sampling signal to produce a first signal representing the momentary amplitude values of the output signal;

second sampling means for receiving the input signal to the device under test and the sampling signal to produce a second signal representing the momentary amplitude values of the input signal;

first converting means for converting the first signal to first digital values;

second converting means for converting the second signal to second digital values;

processing means coupled to the first and second converting means for receiving the first and second digital values, and for calculating characteristics of the device under test from the first and second digital values.

4,860,228

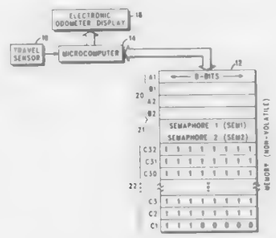
NON-VOLATILE MEMORY INCREMENTAL COUNTING SYSTEM

Christopher J. Carroll, Streamwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 24, 1987, Ser. No. 18,148

Int. Cl.[4] G01B *7/00;* **G06F** *7/00*

U.S. Cl. 364—561 **9 Claims**



9. An odometer counting system having non-volatile memory for storing information which changes in response to a sequence of events indicative of distance traveled by a vehicle, comprising:

a predetermined number of non-volatile memory locations selected to correspond to a predetermined number of said odometer information related events which will occur before an overflow condition occurs therein;

at least a first and a second pair of non-volatile memory locations, wherein each pair contains a least significant portion (lsp) and a most significant portion (msp), said lsp's for storing data in response to overflows from said plurality of non-volatile memory locations, and said msp's for storing data in response to overflows from said lsp's;

a first semaphore location in non-volatile memory for indicating whether or not an update of one of said lsp's has occurred;

a second semaphore location in non-volatile memory for indicating whether or not an update of one of said msp's has occurred;

means for detecting an overflow of said plurality of non-volatile memory locations;

means for storing, in response to said overflow from said plurality of non-volatile memory locations and said first semaphore location, an updated count in one of the lsp's of said pairs; and

means for storing, in response to said second semaphore location and overflows from said lsp's, an updated count in one of the msp's of said pairs.

4,860,229

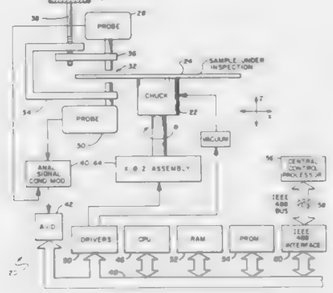
WAFER FLATNESS STATION

Robert C. Abbe, Newton; Noel S. Poduje, Needham Heights, and Neil H. Judell, Jamaica Plain, all of Mass., assignors to ADE Corporation, Newton, Mass.

Continuation of Ser. No. 572,695, Jan. 20, 1984, abandoned. This application Dec. 9, 1988, Ser. No. 282,877

Int. Cl.[4] G01R *27/26*

U.S. Cl. 364—563 **21 Claims**



21. A wafer flatness station, comprising:

means for removably holding a wafer for rotation about an axis θ radians, and for translating the wafer along orthogonal X and Z axes in response to θ, X, and Z control signals;

a capacitive sensor having a capacitive thickness measuring head;

means having memory coupled to produce θ, X, and Z control signals that controllably rotate and translate said holding means to successively bring each of a plurality of preselected discrete points of said wafer into said capacitive thickness measuring head selected to cover substantially the entire spatial extent of the wafer and to store data representative of said thickness for each such point in said memory in a data table having preselected address locations that respectively correspond to the location of each such point of the wafer; and

means defining a two-dimensional (2-D) reference surface

responsive to said data in said data table for computing a selected 2-D flatness profile relative to the 2-D reference surface for said wafer.

4,860,230

SIGNAL RECOGNITION SYSTEM

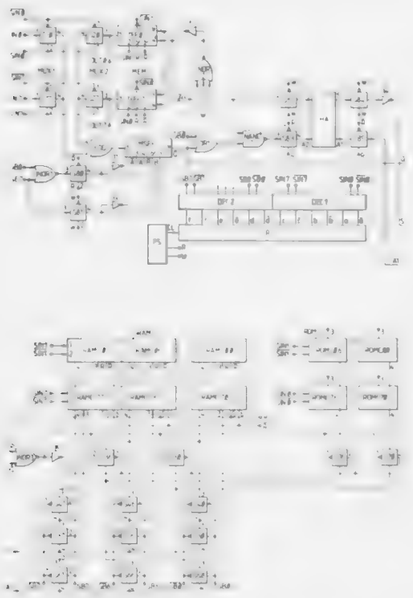
Daniel Sallaerts, Aarschot, and Michel C. A. R. Rahier, Boechout, both of Belgium, assignors to Alcatel N.V., Amsterdam, Netherlands

Continuation of Ser. No. 679,678, Dec. 7, 1984, abandoned. This application Sep. 21, 1987, Ser. No. 99,706

Claims priority, application Belgium, Dec. 22, 1983, 2/60299

Int. Cl.[4] G01R *29/02;* **H04J** *3/12;* **H03K** *5/22*

U.S. Cl. 364—569 **13 Claims**



4. A signal persistence recognition system for changing binary-valued output signals only after a change in corresponding binary-valued input signals has persisted for at least a predetermined time interval, said system comprising:

scanning means for periodically outputting a binary-valued signal representation of the state of each specified one of a plurality of said input signals;

first memory means for storing and outputting a plurality of binary output values each representative of the state of a different specified one of said output signals;

first gating means responsive to outputs from said scanning means and said first memory means for outputting a first control signal indicating whether or not the binary-valued signal output by said scanning means for a specified one of said input signals is equivalent to the binary value output by said first memory means representative of a corresponding one of said output signals;

second memory means for storing and outputting a respective multi-bit initial value representative of the duration of said predetermined time interval for each of said input signals;

third memory means for inputting, storing and outputting for each specified one of said input signals, respective input data including a respective multi-bit count value corresponding to the elapsed time since the state of said each specified input signal last changed state without any change in the corresponding output signal and a respective control bit indicative of whether said predetermined time limit has already elapsed; and

processing means responsive to the count value and the control bit output by said third memory means, to the output of said second memory means, and to said first control signal output by said first gating means

for, when said first control signal indicates a difference between corresponding specified ones of said input and output signals, and said control bit does not indicate that the respective said predetermined interval had already elapsed,

in the event said count value corresponds to an elapsed time equal to said respective predetermined time interval, setting the respective control bit stored in said third memory means and toggling the respective binary output value stored in said first memory means or,

in the event said respective predetermined time interval has not yet been reached, incrementing the respective said count value without setting the respective control bit and without toggling the respective binary output value stored in said first memory means and

for, when said first control signal indicates no difference between corresponding specified ones of said input and output signals

replacing said respective count value stored in said second memory means with said initial value stored in said second memory means, and

resetting said respective control bit,

said processing means comprising

an adder circuit having a first adder input, a second adder input, a sum output and a carry output,

second gating means responsive to said first control signal and to said control bit for coupling either an output of said second memory means or an output of said third memory means to said first adder input,

clock means for generating a first timing signal, and

third gating means responsive to said carry output, to said first control signal and to said first timing signal for causing said adder sum output to be incremented serially relative to said first adder input if and only if said first control signal indicates that the specified input signal is different from the corresponding output signal.

4,860,231

CALIBRATION TECHNIQUE FOR VARIABLE SPEED MOTORS

Gary W. Ballard, and Kevin D. Thompson, both of Indianapolis, Ind., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 809,466, Dec. 16, 1985, abandoned. This application Jan. 13, 1988, Ser. No. 144,682

Int. Cl.[4] G01F *25/00;* **B61D** *27/00;* **H02P** *5/34;* **G05B** *13/02*

U.S. Cl. 364—571.01 **7 Claims**

5. A coast down technique for calibrating and controlling an electronically commutated motor operated in response to a microprocessor to regulate the rotation of an air moving device driven by the motor comprising the steps of:

choosing a reference torque;

at the reference torque determining a reference CFM and RPM;

determining the moment of inertia for the air moving device;

selecting an arbitrary motor speed input;

energizing and operating the motor at the selected arbitrary speed input for a sufficient time to allow the RPM of the motor to stabilize;

cyclically within a predetermined time period sequentially ceasing the energizing of the motor to cause the air moving device to coast down and making multiple measurements of the angular velocity of the air moving device at predetermined time intervals and re-energizing the motor between coast downs;

determining the average actual torque acting on the air moving device over the average actual RPM during the coast downs;



determining the desired RPM knowing the average actual load torque; and

adjusting the motor to the desired RPM to thereby achieve the desired CMF output of the air moving device.

4,860,232

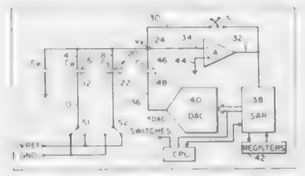
DIGITAL TECHNIQUE FOR PRECISE MEASUREMENT OF VARIABLE CAPACITANCE

Hae-Seung Lee, Watertown; Roger T. Howe, Belmont, and Joseph T. Kung, Cambridge, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 22, 1987, Ser. No. 41,773

Int. Cl.[4] G01R *27/26*

U.S. Cl. 364—571.04 **38 Claims**



23. The method of sensing a parameter which results in change in capacitance of at least one sensing capacitor comprising:

isolating a charge on a node electrically connected to the sensing capacitor;

modifying the distribution of said charge on the node by modifying at least a voltage applied to the sensing capacitor; and

determining change in voltage resulting from the modified distribution of charge by comparing in a comparator the voltage on the node to a reference and, responsive to an output from the comparator, performing successive approximations to generate a feedback signal applied to an input to the comparator.

4,860,233

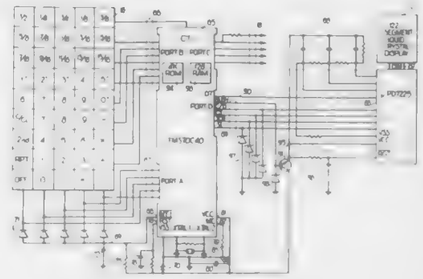
DEDICATED FOOT/INCH CALCULATOR

Leonard J. Pitchford, 6300 Shadowwood Dr., Prospect, Ky. 40059

Filed Oct. 22, 1985, Ser. No. 790,035

Int. Cl.[4] G06F *3/00*

U.S. Cl. 364—709.07 **1 Claim**



1. A calculator for operating on linear measurements, including values directly entered representative of foot and inch dimensions comprising in combination:

a keyboard including a first plurality of keys representative of the decimal digits 0 through 9, a second plurality of keys representative of inches in base 10 digits, a third plurality of keys representative of a plurality of fractional inch values having denominators which are integer powers of 2, a fourth plurality of keys representative of arithmetic functions, a dedicated repeat key, and at least one shift key for providing mode control signals in response to selective operation of at least one of said keys;

a processor for controlling operation of said calculator in response to selective operation of said keys and a plurality of stored instruction signals;

read only memory means connected to said processor for storing said plurality of stored instruction signals;

random access memory means associated with said processor including a first memory portion for storing a plurality of floating point numeric value representative of length values entered from said keyboard and calculated by said processor, and a second memory portion for storing display signals for display representing said values entered from said keyboard and calculated by said processor;

a display connected to said processor including a plurality of digit segments, at least one foot indicia indicator segment, at least one inch indicia indicator segment and a dedicated fractional display segment, said display further including a numeric segment for displaying a numeric repetition value corresponding to a number of times said dedicated repeat key has been successively operated;

said processor being responsive to said mode control signals to place said calculator in either a first mode of operation in which said values stored in said second memory portion are display values having distinct foot, inch, and fractional inch values, and a second mode of operation in which said values stored in said second memory portion are display values having decimal foot values; and wherein

said processor is responsive to said selective operation of said keys and said plurality of stored instruction signals in both said first and second modes of operation to store in said first memory portion a binary floating point value corresponding to said display values, and said processor is responsive to selective operation of said dedicated repeat key to repeat a most recent operation corresponding to operation of one of said fourth plurality of keys and at least one of said first, second or third plurality of keys, and to calculate, and cause said numeric segment to display, said numeric repetition value.

4,860,234

PORTABLE KEYBOARD OPERATED ALPHA COMPUTER SYSTEM WITH FEW KEYS AND VISUAL KEYSTROKE INSTRUCTIONS

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation-in-part of Ser. No. 729,559, May 2, 1985, and a continuation-in-part of Ser. No. 844,872, Mar. 27, 1986, which is a continuation-in-part of Ser. No. 449,998, Jan. 21, 1983, Pat. No. 4,547,860. This application Feb. 22, 1988, Ser. No. 158,653

Int. Cl.[4] G06F *3/023*

U.S. Cl. 364—709.16 12 Claims



1. Apparatus for processing keyboard entered commands in a multi-purpose alphanumeric electronic computer, comprising in combination, a keyboard assembly with a keyboard array having a set of keys, control means in the computer for operating the keyboard in respective modes requiring respectively actuation of single keystrokes and actuation of two successive keystrokes for entry of a set of alphabetic characters into the computer, and visual indicia means positioned in a location integral with the keyboard assembly for identifying the first and second keys to be stroked and the stroking sequence for entry of the alphabetic characters in said set comprising a character identification code located in the proximity of the first key to be stroked in the sequence to identify that key, and a further visual indicia identification code for identifying the second key to be actuated in the stroking sequence.

4,860,235

ARITHMETIC UNIT WITH ALTERNATE MARK INVERSION (AMI) CODING

Harufusa Kondou, and Hideki Ando, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1987, Ser. No. 132,644

Claims priority, application Japan, Dec. 10, 1986, 61-293715

Int. Cl.[4] G06F *7/38*

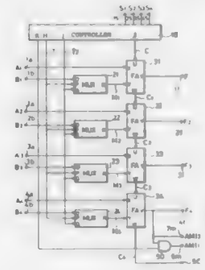
U.S. Cl. 364—716 7 Claims

1. An arithmetic unit for receiving a first input signal of a plurality of bits and a second input signal of a plurality of bits to perform one of a plurality of operations designated by function selecting signals with respect to said first and second input signals, said arithmetic unit comprising:

means for generating first, second and third control signals being in combination of prescribed values in response to a bit value indicating the sign of said second input signal and said function selecting signals;

means for selectively outputting either said second input signal or complement of said second input signal in response to said first and second control signals;

means for adding up said first input signal, output of said selective output means and said third control signal; and



means for receiving said bit indicating said sign of said second input signal and the most significant bit of output of said addition means to output the alternate mark inversion (AMI) code of said second input signal with a threshold value of said first input signal.

4,860,236

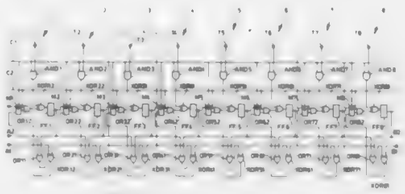
CELLULAR AUTOMATON FOR GENERATING RANDOM DATA

Robert McLeod; Howard Card; Peter Hortensius, and Werner Pries, all of Winnipeg, Canada, assignors to University of Manitoba, Winnipeg, Canada

Filed Oct. 26, 1987, Ser. No. 112,118

Int. Cl.[4] G06F *1/02*

U.S. Cl. 364—717 8 Claims



1. A cellular automaton which generates pseudorandom data, comprising:

a series of cells arranged such that each cell receives signals from first and second electrically adjacent cells;

each particular cell in the series of cells having

(a) a storage unit for electrically storing a data bit having two distinct states, the storage unit having an output terminal where the current state of the data bit is electrically detectable; and,

(b) logic circuitry coupling the storage unit of the particular cell to the storage unit of the first electrically adjacent cell and to the storage unit of the second electrically adjacent cell, the logic circuitry responding to the current state of the data bit stored by the particular cell and the data bits stored by the first and second electrically adjacent cells by changing the value of the data bit stored by the particular cell according to the following relationship

$$a(t+1)=a_{first}(t)\text{XOR}[a(t)\text{OR}a_{second}(t)]$$

where, a(t) represents the current state of the data bit stored by the particular cell, a(t+1) represents the next state of the data bit stored by the particular cell, $a_{first}(t)$ represents the current state of the data bit stored by the first electrically adjacent cell, and $a_{second}(t)$ represents the current state of the data bit stored by the second electrically adjacent cell.

4,860,237

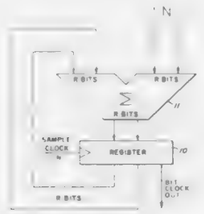
SCAN LINEARITY CORRECTION

Douglas N. Curry, Menlo Park, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 3, 1984, Ser. No. 637,660

Int. Cl.[4] G06F *1/02*

U.S. Cl. 364—718 1 Claim



1. A circuit for matching the current frequency of a bit clock to the current span speed of a raster scanner comprising:

means for generating a number which is a linear function of the instantaneous scan speed,

means for generating fixed frequency sample clock pulses, and

accumulator means for adding, at the time of each sample clock, the current sum of said accumulator to said number to generate a new sum, one bit of said sum being output as said bit clock,

wherein said number is a correction number for motor hunt, polygon signature and scan nonlinearity errors.

4,860,238

DIGITAL SINE GENERATOR

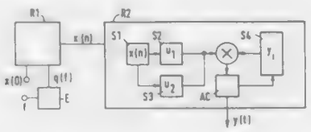
Alfred Kraker, Vienna, Austria, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 28, 1987, Ser. No. 7,710

Claims priority, application Austria, Feb. 3, 1986, 242/86

Int. Cl.[4] G06F *3/00*

U.S. Cl. 364—721 2 Claims



1. A digital sinusoidal generator for producing an output of fine resolution digital signals, the generator comprising a first computer for the selection of argument values for a second computer for calculating sine function values y(n), the first computer (R1) including an input device (E) for a frequency f to be generated by the sinusoidal generator which serves to furnish a quantization amount proportional to this frequency $q=\text{INT}\ (4f/f_s)\ 2^{14}$ wherein f_s is a scanning frequency and that the first computer (R1), whereof an output for providing argument values is coupled to a data input of a memory of said second computer, beginning with a given initial value $x(0)=\text{INT}\ (2\phi/\pi)\ 2^{14}$, where ϕ is a phase angle, yields a series of n argument values (x(n)) differing by the quantization amount lying with the limits g_1, g_2 of a given argument definition range in periodically sequential scanning segments alternatingly increasing or decreasing, such that a sum (d(n)+d(n+1)) of differences (for instance $d(n)=g_1-x(n)$, $d(n+1)=-(g_1-x(n+1))$ between a limit (g_1) and the two argument values x(n), x(n+1) belonging to two different successive scanning segments is equal to the quantization amount (q) and that integer binary increased or decreased (differing by the quantization amount) argument values $x(n)=\text{INT}\ (4f/f_s.n+x(0))\ 2^{14}$ are defined between an upper limit $g_1=2^{14}$ and a lower limit $g_2=-2^{14}$ and that obtaining the sine function value $y(n)=(\sin\ (2\pi(f/f_s).n+\phi))\ 2^{14}$ is intended to be on the basis of the following iterative polynomial formation:

$$y_0=-142$$

$$y_1=u_1.y_0.2^{-14}+2603$$

$$y_2=u_1.y_1.2^{-14}-21165$$

$$Y_3=y_2.2^{-1}$$

$$y_4=u_1y_3.2^{-14}+25736$$

$$y=y_5=u_2.y_4.2^{-14}$$

whereby expressions $u_1=\text{INT}\ (x^2)\ 2^{-14}$ and $u_2=\text{INT}\ (x(n))$ are carried.

4,860,239

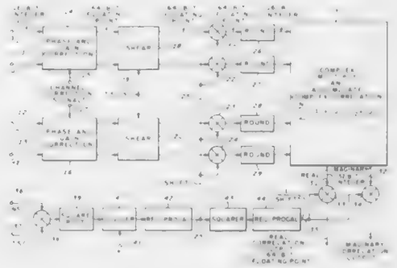
CORRELATOR WITH VARIABLY NORMALIZED INPUT SIGNALS

Kenneth C. Baron, New Hyde Park, N.Y., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Aug. 12, 1987, Ser. No. 84,521

Int. Cl.[4] G06F *15/31*

U.S. Cl. 364—728.03 13 Claims



1. Digital correlator apparatus adapted to receive, in a correlation window, digital input signal samples to be correlated and to provide a correlation output signal in accordance therewith, said apparatus including digital multiplier means responsive to said digital input signal samples for providing products therebetween and digital accumulator means coupled to said digital multiplier means for accumulating said products to provide said correlation output signal, comprising

factor multiplying means responsive to said digital input signal samples and to a variable factor signal for multiplying said digital input signal samples by said variable factor signal to provide enhanced precision digital input signal samples so as to enhance the accuracy of said correlation output signal, and

factor generating means responsive to conditions associated with said correlation window for generating said variable factor signal in accordance with said conditions so that when said digital input signal samples are multiplied by said variable factor signal, said enhanced precision digital input signal samples are as large as possible without caus-

ing overflow signals to occur in said digital multiplier means or in said digital accumulator means.

4,860,240

LOW-LATENCY TWO'S COMPLEMENT BIT-SERIAL MULTIPLIER

Richard I. Hartley, Schenectady, N.Y., and Peter F. Corbett, Princeton, N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 14, 1987, Ser. No. 134,271
Int. Cl.[4] G06F *7/44*
U.S. Cl. 364—757 **10 Claims**



1. A double precision low-latency two's complement bit-serial multiplier for receiving as input signals serial bit streams of first and second operands and for receiving a control signal indicating the presence of a sign bit in each of said first and second operands, said multiplier comprising:

a plurality of bit-slice cells corresponding to the number of bits in each word of said first and second operands, identified resepctively by consecutive ordinal numbers first through last, and connected to receive said serial bit streams and said control signal;

respective first and second latch means in each said bit-slice cell for storing bit values of said first and second operands, respectively;

respective accumulator means in each said bit-slice cell, identified by ordinal number corresponding to the bit-slice cell including it and connected to said first and second latch means in that bit-slice cell, for generating a partial sum output signal, the partial sum output signal of a last one of said bit slice cells being a less significant word of a product, each said accmulator means also being connected to receive the partial sum output of a preceding bit-slice cell and also generating respective first and second carry output signals of equal weight;

a shift register having successive first through last stages, each stage being included in a respective one of said bit-slice cells identified by the same ordinal number as the stage, for propagating sum and first and second carry output signals, the sum output signal of each said accumulator means being loaded responsive to said control signal into the shift register stage identified by corresponding ordinal number, the first and second carry output signal of the respective said accumulator means in each said bit-slice cell except the first being loaded responsive to said control signal into the shift register stage identified by ordinal number one lower than its own, and the sign bits of said first and second operands being loaded into said last shift register stage responsive to said control signal indicating the presence of a sign bit in said first and second carry output signals; and

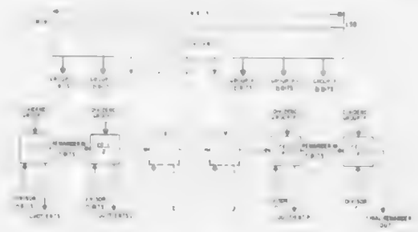
a further accumulator means arranged in an end cell adjoining said last bit slice cell for accumulating the propagated sum and first and second carry output signals from the last stage of said shift register to generate a more significant word output signal of said product.

4,860,241

METHOD AND APPARATUS FOR CELLULAR DIVISION

Andrew J. Haber, Lauderdale Lakes, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 30, 1986, Ser. No. 924,664
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—761 **10 Claims**



1. A method for dividing a number represented as a dividend by a first set of N binary signals, with each of said N binary signals arranged according to an order of place significance, with each place position in said order being indicative of a discrete value, comprising the steps of:

(a) separating said first N binary signal set, representing said dividend into P groups of b signals each, each of said P groups representing a part of said dividend and each of said P groups being in the said order of place significance of its respective b signals in said N binary signal set;

(b) applying said P groups to respective division cells arranged in said order of place significance of their respective P groups;

(c) applying a binary signal representing the divisor to said division cells;

(d) deriving a binary quotient signal and a binary remainder out signal from at least one of said cells;

(e) applying the said remainder out signal from said one cell to the next lower cell in the said order of place significance, as a binary remainder in signal;

(f) sequentially repeating steps (d) and (e) for each of said cells, in the said order of place significance:

(g) combining said quotient signals from each of said cells in their said order of place significance with the remainder out signal from the last of said cells to form the complete quotient and remainder answer.

4,860,242

PRECHARGE-TYPE CARRY CHAINED ADDER CIRCUIT

Nobuyuki Ikumi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 157,152, Feb. 11, 1988, abandoned, which is a continuation of Ser. No. 684,749, Dec. 21, 1984, abandoned. This application Jan. 5, 1989, Ser. No. 294,940
Claims priority, application Japan, Dec. 24, 1983, 58-248517
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—768 **5 Claims**

1. A precharge-type carry chained adder circuit apparatus comprising:

a plurality of adder groups, each adjacent adder group corresponding to a plurality of bits constituting a successive portion of a multibit word,

each of the plurality of adder groups having a first carry-in node and a first carry-out node, the first carry-out node of each of the plurality of adder groups being connected to the first carry-in node of the adder group corresponding to a more significant portion of the multibit word,

each of the adder groups constituting a plurality of individual adder units, each of the adder units corresponding to a single bit of the respective successive portion of the multibit word,

each of the adder units having a first carry transfer control gate connecting a unit carry-in node and a unit carry-out node

and output means connected to the unit carry-in node for providing an addition output, the first transfer control gate of each of the adder units being connected in series with the unit carry-out node of the adder unit being connected to the unit carry-in node of an adjacent adder unit, each adjacent adder unit corresponding to a more significant bit of the respective portion of the multibit word,

precharging means connected to the first transfer control gate of each of the adder units for precharging a respective one of the adder units in accordance with a precharge signal,



signal generating means connected to the first transfer control gate and the output means of each of the adder units for generating a carry propagating signal for a respective one of the adder units when a carry results from an addition operation in the respective one of the adder units, and

discharging means connected to the unit carry-out node of each of the adder units for discharging the unit carry-out node of a respective one of the adder units when no carry is propagated in the respective one of the adder units;

a plurality of second carry transfer control gates, each having a second carry-in node and a second carry-out node, said second transfer control gates being connected in series, with the second carry-out node of one of the second transfer gates connected to the second carry-in node of an adjacent second transfer control gate, said connected second carry-in and carry-out nodes of each of the second transfer control gates being connected to the connected first carry-in and carry-out nodes of each of the adder groups;

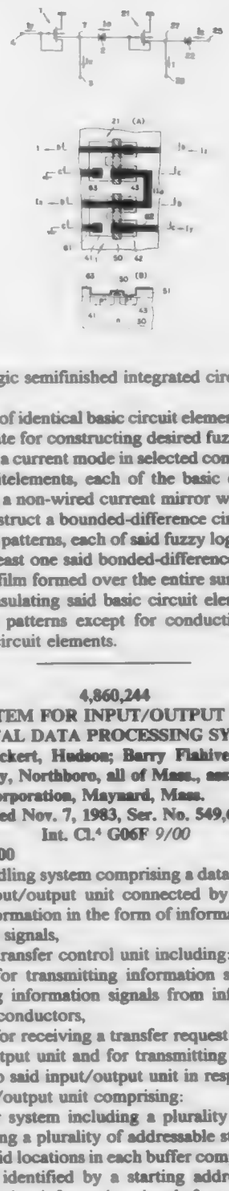
a NAND gate for each of the plurality of adder groups, each of the NAND gates having an input from a respective one of the plurality of adder groups and an output connected to a respective one of the plurality of second control transfer gates.

4,860,243

FUZZY LOGIC SEMIFINISHED INTEGRATED CIRCUIT

Fumio Ueno; Takeshi Yamakawa, both of Nishigoshi, and Yuji Shirai, Yatsushiro, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Division of Ser. No. 714,809, Mar. 22, 1985, Pat. No. 4,694,418. This application Apr. 23, 1987, Ser. No. 41,696
Claims priority, application Japan, Mar. 23, 1987, 62-57122; Mar. 23, 1987, 62-57123; Mar. 23, 1987, 62-57124; Mar. 23, 1987, 62-57125
Int. Cl.[4] G06G *7/00*; G06F *15/48*
U.S. Cl. 364—807 **9 Claims**



1. A fuzzy logic semifinished integrated circuit comprising:

a base plate,

a multiplicity of identical basic circuit elements fabricated on the base plate for constructing desired fuzzy logic circuits operable in a current mode in selected combinations of the basic circuitelements, each of the basic circuit elements comprising a non-wired current mirror which is connectable to construct a bounded-difference circuit with use of connection patterns, each of said fuzzy logic circuits comprising at least one said bonded-difference circuit, and

an insulating film formed over the entire surface of the base plate for insulating said basic circuit elements from said connection patterns except for conducting positions of said basic circuit elements.

4,860,244

BUFFER SYSTEM FOR INPUT/OUTPUT PORTION OF DIGITAL DATA PROCESSING SYSTEM

William F. Bruckert, Hudson; Barry Flahive, Westford, and James V. Lacy, Northboro, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Nov. 7, 1983, Ser. No. 549,608
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 **40 Claims**

1. A data handling system comprising a data transfer control unit and an input/output unit connected by conductors for transferring information in the form of information signals and transfer control signals,

A. said data transfer control unit including:

(i) means for transmitting information signals onto and receiving information signals from information signal transfer conductors,

(ii) means for receiving a transfer request signal from said input/output unit and for transmitting transfer control signals to said input/output unit in response thereto,

B. said input/output unit comprising:

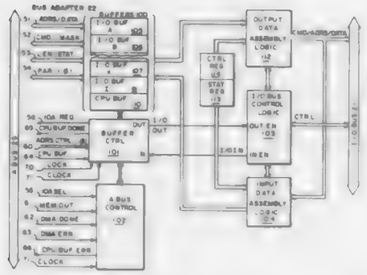
(i) a buffer system including a plurality of buffers each comprising a plurality of addressable storage locations, one of said locations in each buffer comprising a starting location identified by a starting address, said buffers accumulating information signals for transfer with said

data transfer control unit, and a special purpose buffer comprising a plurality of storage locations each identified by an address, said special purpose buffer being defined by a starting address comprising the address of its storage locations,

(ii) buffer address control means for generating address signals which identify a storage location in said buffer system,

(iii) buffer identification means for storing the starting addresses of said buffers in said buffer system,

(iv) enabling means connected to said buffer control means and said buffer identification means for receiving a transfer control signal from said data transfer control unit to enable said buffer address control means to load



the starting address of one of said buffers from said buffer identification means, said transfer control signal further enabling said enabling means to enable said buffer address control means to increment the address generated by said buffer address control means to identify the remaining storage locations in the buffer, and

(v) means for transmitting the contents of the location identified by said buffer address control means to said data transfer control unit,

wherein said input/output unit enables said special purpose buffer to be used for an information transfer in response to a special purpose buffer control signal, said buffer address control means loading the starting address of said special purpose buffer into said buffer address control means in response to the special purpose buffer control signal.

4,860,245

VECTOR DATA PROCESSING SYSTEM COMPRISING AN I/O CONTROL FOR EACH VECTOR DATA PROCESSOR AND ANOTHER I/O CONTROL FOR AT LEAST ONE OTHER VECTOR DATA PROCESSOR

Seiichiro Kinoshita, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 6, 1987, Ser. No. 105,028
Claims priority, application Japan, Oct. 8, 1986, 61-237851
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 **3 Claims**

1. In a vector data processing system comprising a predetermined number of vector data processors, each of said vector data processors comprising a plurality of vector registers, a respective distributor unit, and a respective selector unit, each of said respective distributor units and said respective selector units being connected to said vector registers, wherein;

said respective distributor units comprise a first and a second distributor;

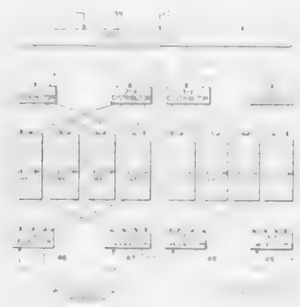
said respective selector units comprising a first and a second selector;

each of said first and the second distributors and said first and said second selectors being connected to said vector registers;

said vector data processing system further comprising a common distributor connected to the first distributors of respective vector data processors and to the first selectors of the respective vector data processors;

each of said vector data processors further comprising a bus between the second distributor and the second selector of each vector data processor; and wherein

an internal data path is formed by the vector registers, said respective second selectors which select an output of said vector registers, and the respective second distributors



which distribute said output to said plurality of vector registers, and

an external data path is formed by said respective first selectors which select an output of said vector registers, said common distributor and said respective first distributors which distribute said latter output to said respective plurality of vector registers and wherein

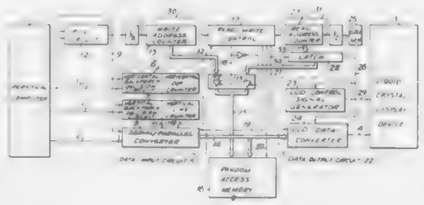
data transfer operations through said internal data path and said external data path are performed in parallel.

4,860,246

EMULATION DEVICE FOR DRIVING A LCD WITH A CRT DISPLAY

Kazuaki Inoue, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 892,684, Aug. 4, 1986. This application Jun. 30, 1988, Ser. No. 214,800
Claims priority, application Japan, Aug. 7, 1985, 60-173707; Jul. 11, 1986, 61-164144
Int. Cl.[4] G06F *3/14, 5/06*
U.S. Cl. 364—900 **32 Claims**



1. An interface device for reformatting a data-containing input video signal, the interface device comprising:

input means for receiving the input video signals, the input video signals containing data signals in an input;

memory means for temporary storage of data signals received from the input means, the memory means having addresses at which the data signals are stored;

first clock means for providing a first clock signal, the clock means being responsive to the input video signal;

write counter means responsive to the first clock signal for providing at least one write address signal to the memory means;

second clock means for generating a second clock signal which is asynchronous with the input video signal and the first clock signal;

read counter means responsive to the second clock signal for providing at least one read address signal to the memory from which data signals are read; and

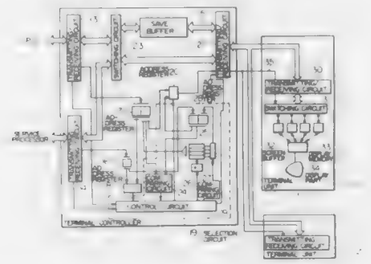
read/write control means responsive to the first and second clock signals as inputs, the control means dividing a memory cycle synchronized with the one of the first clock signal and the second clock signal having the shorter cycle to produce a writing cycle and a reading cycle which are substantially equal in length, and controlling the effectuation of the writing operation and the reading operation so that the one of the writing operation and the reading operation which has the shorter corresponding clock signal is always effected in one of the divided memory cycles and the other operation is effected in the other cycle immediately after the counting of the counter means responsive to the clock signal with the longer cycle.

4,860,247

MULTI-WINDOW CONTROL SYSTEM

Noriaki Uchida, and Hideaki Gemma, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 18, 1987, Ser. No. 16,087
Claims priority, application Japan, Feb. 21, 1986, 61-37096
Int. Cl.[4] G06F *3/00, 7/00*
U.S. Cl. 364—900 **6 Claims**



1. In a multi-window control system, which is provided with at least one terminal having a multi-window display, said at least one terminal being connected, through a terminal controller, to a plurality of processors including a first processor and a second processor having a priority higher than that of said first processor, wherein messages coming from said first processor and messages coming from said second processor are displayed under control of said terminal controller, the improvement, wherein said terminal controller comprises:

control means for controlling internal operation of the terminal controller;

first holding means for holding a first terminal address of a first terminal, which is to display a first message coming from the first processor, and a first virtual screen buffer address of a virtual screen buffer in said first terminal;

second holding means for holding a second terminal address of a predetermined terminal which is to display a second message coming from the second processor;

first comparing means, coupled to said first and second holding means and said control means, for comparing said first terminal address with said second terminal address when a message coming in from said processor is received by said

memory means for storing indicators for state of use a plurality of virtual screen buffers in said predetermined terminal;

selection means, coupled to said memory means, for selecting one of said plurality of virtual screen buffers in response to said state of use indicators;

save buffer means, coupled to said plurality of virtual screen buffers, for saving a content of said one of said plurality of virtual screen buffers selected by said selection means;

update means, coupled to said memory means, for updating said state of use indicators; and

switching means, coupled to said plurality of virtual screen buffers, said first processor and said save buffer means, for switching said first message between said first processor, and a selected one of said save buffer means and said plurality of virtual screen buffers,

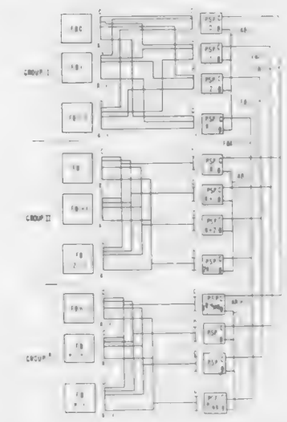
wherein said switching means, said update means, and said selection means are responsive to said control means.

4,860,248

PIXEL SLICE PROCESSOR WITH FRAME BUFFERS GROUPED ACCORDING TO PIXEL BIT WIDTH

Leon Lumelsky, Stamford, Conn., assignor to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 728,990, Apr. 30, 1985, abandoned. This application Feb. 25, 1988, Ser. No. 163,160
Int. Cl.[4] G06F *15/16, 15/66*
U.S. Cl. 364—900 **11 Claims**



1. A graphic processor for single instruction multiple data operations on k pixels simultaneously, each pixel having at most n bits, where k and n are integers each greater than one, which processor is also easily expandable in terms of pixel length and can efficiently handle conditional operations requiring efficient interpixel communications comprising:

a plurality of n frame buffers, each buffer storing data of k bit width, said plurality of frame buffers arranged in groups of i frame buffers per group, where n and i are each integers greater than one and i is an integer less than n to provide n/i groups of frame buffers,

a plurality of pixel slice processors, each operating on data of i bit width, said plurality of pixel slice processors arranged in n/i groups of k processors per group where each frame buffer group has a corresponding pixel slice processor group, data path means to provide for:

(i) bidirectional, bit-parallel data flow within a group between said frame buffers and said pixel slice processors,

(ii) data flow between pixel slice processors of a group, and

(iii) data flow between corresponding pixel slice processors of different groups,

said data path means providing bidirectional, bit parallel data flow within a group including connections between each pixel slice processor and each frame buffer where

each frame buffer of a group is connected only to pixel slice processors of that group,

whereby computations requiring intra pixel carries and conditional computations requiring inter pixel communications are provided for on said data path means and extensions of pixel length are handled by increases in the integer n.

4,860,249

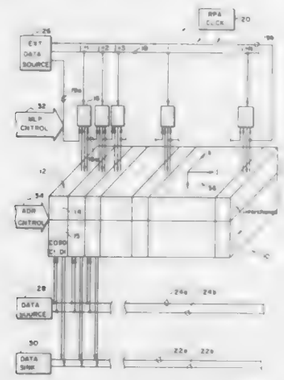
MULTIZONE ARRAY PROCESSOR IMPLEMENTING TWO SIDED ZONE BUFFERS WITH EACH SIDE BEING DYNAMICALLY CONFIGURED AS A WORKING OR I/O SIDE

Mark C. Nicely, Mountain View; Robert Schreiber, Palo Alto; Terry M. Parks; A. Joel Mannion, both of Sunnyvale; Gary R. Lang, Saratoga, and Charles F. Patton, Milpitas, all of Calif., assignors to Saxpy Computer Corporation, Sunnyvale, Calif.

Filed Oct. 4, 1985, Ser. No. 784,922

Int. Cl.[4] G06F *15/00, 15/16, 15/31, 13/00*

U.S. Cl. 364—900 2 Claims



1. In an RPA, having N zones, each zone labeled by an index j=1, . . . , N, for performing array operations, with each zone in the array having a common data input port coupled to a common data bus, C0 and C1 buffer input ports coupled to a data-in bus, and a buffer output port coupled to a data-out bus, a jth zone in said array comprising:

a zone buffer for storing data elements in addressable storage locations, said zone buffer having first and second sides with said first side being a working side having Z_1 and Z_2 output ports and a Zin input port and with the second side being an I/O side having input port and output port, said working side having a working side address and control signal port and said I/O side having an I/O address and control signal port;

a controllable multiplier connect circuit (MCC) having a common input port coupled to said common data bus, MCC Z_1, and MCC Z_2 input ports coupled to said Z_1 and Z_2 output ports, a left neighbor input port, a right neighbor output port, left and right MCC output ports, and an MCC control signal input port, said MCC for coupling one of said MCC input ports to one of said MCC output ports under control of an MCC control signal;

a multiplier having left and right multiplier input ports coupled to the left and right MCC output ports of said MCC, a multiplier output port, and a multiplier control signal input port;

a controllable ALU connect circuit (ACC) having an ALU multiplier input port coupled to the multiplier output port, left and right ACC ALU output ports, an ACCZ_1 input port coupled to said Z_1 output port, and an ACC control signal input, said ACC for coupling one of said ACC input ports to one of said ACC output ports under control of an ACC control signal; and

an ALU having left and right ALU input ports coupled to the left and right ACC ALU output ports, an ALU output port coupled to said Zin input port, and an ALU control signal input port.

4,860,250

DATA PACKET SHORTENING METHOD AND DEVICE

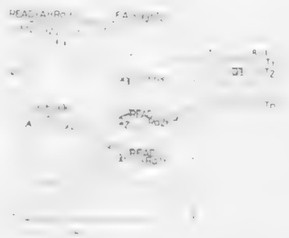
John R. Gurd, 8 Circular Road, Withington, Manchester, M20 9LP, United Kingdom, and Katsura Kawakami, 16-3 Mominokidai Midoriku, Yokohamasi Kanagawaken, Japan

Filed May 28, 1987, Ser. No. 56,133

Claims priority, application United Kingdom, May 29, 1986, 8613071

Int. Cl.[4] G06F *3/00;* H04J *3/24*

U.S. Cl. 364—900 4 Claims



1. A method of operating a data packet communication system, the system comprising a first device, a second device, means for transmitting first data packets from the first device to the second device, and means for transmitting second data packets from the second device to the first device, the first device comprising an available memory space having a plurality of addresses and a memory table which is smaller than the available memory space and having a plurality of addresses, the bit length of the addressees of the memory table being less than the bit length of the addresses of the available memory space, the method comprising the steps of:

storing addresses of the available memory space at respective addresses of the memory table,

forming the first data packets such that each first data packet comprises at least an address of the available memory space and an address in which the address of the available memory space is stored,

storing in the second device the addresses transmitted to the second device in the first data packet,

forming the second data packets such that each second data packet comprises data and the address of the memory table in which is stored the address of the available memory space at which the data is to be stored, and

storing the data in the address of the available memory space which is stored in the address of the memory table included in the transmitted second data packet.

4,860,251

VERTICAL BLANKING STATUS FLAG INDICATOR SYSTEM

Karl Bizjak, Portola Valley; Michael Shantz, Sunnyvale, and Linda Shwetz, Menlo Park, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Nov. 17, 1986, Ser. No. 931,663

Int. Cl.[4] G06F *13/00, 3/14*

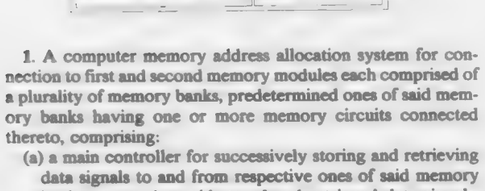
U.S. Cl. 364—900 7 Claims

1. An improved computer display system including a central processing unit (CPU) coupled to a display having vertical blanking intervals, comprising:

memory means coupled to said CPU and said display for storing a plurality of data points representative of display elements defining images to be displayed on said display;

said CPU updating said data points stored in said memory means during said vertical blanking interval of said display;

video control means coupled to said display and said CPU for providing a first status flag to said CPU having a first state during a predetermined initial period of said vertical blanking interval and a second state at all other times;



said video control means further providing a vertical interrupt signal to said CPU to initiate said updating of said data points;

wherein said CPU initiates updating of said data points if said vertical interrupt signal is received when said first status flag is in said first state and delays initiating updating of said data points if said vertical interrupt signal is received when said first status flag is in said second state.

4,860,252

SELF-ADAPTIVE COMPUTER MEMORY ADDRESS ALLOCATION SYSTEM

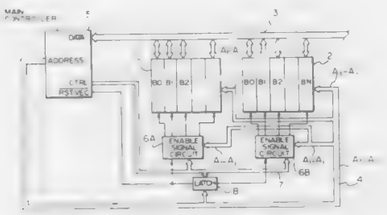
Boleslav Sykora, Kanata, Canada, assignor to Mitel Corp., Ontario, Canada

Filed Nov. 4, 1985, Ser. No. 794,695

Claims priority, application Canada, May 28, 1985, 482566

Int. Cl.[4] G06F *12/02*

U.S. Cl. 364—900 3 Claims



1. A computer memory address allocation system for connection to first and second memory modules each comprised of a plurality of memory banks, predetermined ones of said memory banks having one or more memory circuits connected thereto, comprising:

(a) a main controller for successively storing and retrieving data signals to and from respective ones of said memory banks, comparing said stored and retrieved data signals, and in response generating first and second control signals indicative of the number of said memory banks in each of said first and second modules which have memory circuits connected thereto;

(b) first and second programmable logic circuits connected to said main controller and said first and second memory modules, for receiving said first and second control signals, respectively, and further ones of said address signals, and in response generating enable signals for enabling said predetermined memory banks having memory circuits connected thereto are addressed and enabled as contiguous memory;

(c) refresh control circuitry for periodically generating refreshed signals; and

(d) first and second row and column address decoding circuits connected to said refresh control circuitry, and to said first and second programmable logic circuits respectively, for generating row and column select signals for enabling rows and columns of said memory banks in response to receiving one or more of said refresh signals or said enable signals;

wherein each of said row and column address decoding circuits includes

an inverter connected to said main controller, for receiving a memory select control signal therefrom,

a delay circuit connected to said inverter, for delaying said received memory select control signal,

a first plurality of NAND gates having inputs connected to said refresh control circuitry and predetermined outputs of a corresponding one of said programmable logic circuits,

a plurality of NOT gates having inputs connected to said outputs of the corresponding one of the programmable logic circuits, for receiving and inverting said enable signals,

a second plurality of NAND gates having first inputs connected to outputs of said plurality of NAND gates and second inputs connected to said inverter, for generating said row select signals in response to receiving said memory select control signal and generation of one of said refresh or enable signals, and

a third plurality of NAND gates first inputs connected to said NOT gates and second inputs connected to said delay circuits, for generating said column select signals in response to receiving a delayed version of said memory signal and said inverted enable signals.

4,860,253

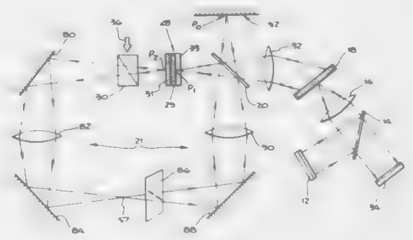
ASSOCIATIVE MEMORY SYSTEM WITH SPATIAL LIGHT MODULATOR AND FEEDBACK FOR ADJUSTABLE THRESHOLDING AND ENHANCEMENT

Yuri Owechko, Newbury Park, and Bernard H. Soffer, Pacific Palisades, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 19, 1987, Ser. No. 64,979

Int. Cl.[4] G11C *13/04, 7/00*

U.S. Cl. 365—125 12 Claims



1. An associative memory system capable of recalling a stored image when provided with a distorted input image and capable of recognizing shifted input images, comprising:

holographic means for recording and reconstructing a first stored image of a first object, said first stored image being recorded with a first reference beam, said first stored image being a transform of a first real image of said first object;

image transforming means for providing a transform of the distorted input image to said holographic means

said holographic means forming a composite product of said

first object transform, said transform of the distorted input image and said first reference beam,

so as to generate a distorted reference beam;

means for transforming said distorted reference beam into a correction function related to said first object and said distorted input image; and

means for adjustable thresholding and pseudo-conjugation of said correlation function to provide a thresholded pseudo-conjugated signal for reading out said holographic means so as to generate said stored image at an output plane, said means including:

a first spatial light modulator (SLM) in a first feedback loop for pseudo-conjugating and thresholding said correlation function and for modulating a readout beam in response thereto so as to provide a modulated readout beam, said thresholded pseudo conjugated signal being derived from said modulated readout beam.

10. An associative memory system capable of recalling a first stored image when provided with a distorted input image and capable of recognizing shifted input images, comprising:

a hologram for storing a first stored image of an object as a scattered field pattern transform within the hologram;

means for providing said distorted input image

to said hologram, said input image being correlated with said first stored image so as to generate a distorted reference beam;

means for enhancing and thresholding said distorted reference beam, including a first leg comprising:

(a) a correlation lens;

(b) an optical analyzer having an adjustable control for setting the threshold of said distorted reference beam; and

(c) a spatial light modulator, operated in a forward slope mode for enhancing said reference beam,

whereby a signal is provided for reading out said hologram so that said first stored image may be associated with the distorted input image provided to said hologram resulting in a reconstructed output image corresponding to said stored image.

4,860,254

NON-VOLATILE ELECTRONIC MEMORY

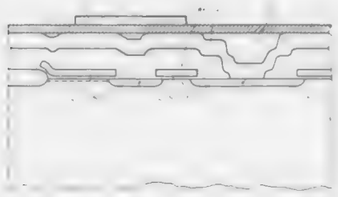
Richard Pott, Leverkusen; Aloys Elling, Bochum, and Günther Kämpf, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 27, 1987, Ser. No. 7,048

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1986, 3602587

Int. Cl.[4] G11C *11/22*

U.S. Cl. 365—145 8 Claims



1. A non-volatile integrated electronic memory module comprising a volatile semiconductor memory module (RAM) region and a permanent memory electrically polarisable ferroelectric layer region within an integrated monolithic module and means to retrieve and transfer information from said ferroelectric layer to the RAM and from said RAM to said ferroelectric layer.

4,860,255

SEMICONDUCTOR MEMORY

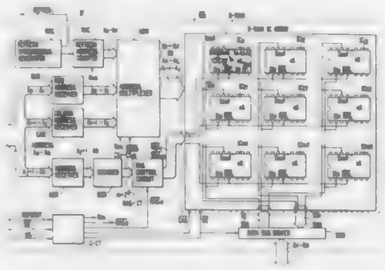
Katsuhiro Shimohigashi, Musashimurayama; Hiroo Masuda, Kodaira; Kunihiko Ikuzaki, Nishitama, and Hiroshi Kawamoto, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 120,539, Nov. 13, 1987, which is a division of Ser. No. 941,840, Dec. 15, 1986, which is a division of Ser. No. 854,502, Apr. 22, 1986, Pat. No. 4,646,267, which is a division of Ser. No. 756,707, Jul. 19, 1985, Pat. No. 4,592,022, which is a division of Ser. No. 638,982, Aug. 8, 1984, Pat. No. 4,539,658, which is a division of Ser. No. 377,958, May 13, 1982, Pat. No. 4,472,792. This application Aug. 9, 1988, Ser. No. 230,046

Claims priority, application Japan, May 13, 1981, 56-70733

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—189 2 Claims



1. A semiconductor memory formed in a semiconductor integrated circuit comprising:

a pair of data lines disposed substantially parallel and adjacent to each other;

a plurality of word lines, each of which is arranged so as to intersect with both of said pair of data lines;

a plurality of memory cells, each of which is coupled to one of said word lines and one of said pair of data lines at the cross point thereof, each memory cell having an address terminal connected to the corresponding word line which it is coupled to so that each word line is connected to the address terminal of only one memory cell, wherein each memory cell also has a data terminal connected to the corresponding data line which it is coupled to;

each said memory cell including a MISFET having a gate electrode coupled to said address terminal, a first electrode coupled to said data terminal and a second electrode coupled to a capacitor;

selecting means coupled to said plurality of word lines including means for selecting one memory cell from said plurality of memory cells and means for placing said plurality of memory cells in a non-selected state;

amplifier means coupled to said pair of data lines for amplifying a potential difference which appears between said data lines in response to selection of one memory cell from said plurality of memory cells by said selecting means, said sense amplifier comprising first and second circuits;

said first circuit including a pair of cross-coupled N-channel MISFETs coupled to said pair of data lines for bringing about a differential amplification operation, and an N-channel MISFET coupled on a source side of said cross-coupled N-channel MISFETs for controlling the differential amplification operation of said cross-coupled N-channel MISFETs;

said second circuit including a pair of cross-coupled P-channel MISFETs coupled to said pair of data lines for bringing about a differential amplification operation, and a P-channel MISFET coupled on a source side of said cross-coupled P-channel MISFETs for controlling the

differential amplification operation of said cross-coupled P-channel MISFETs;

means for supplying first and second timing signals to gates of said controlling N-channel and P-channel MISFETs, respectively, so that the differential amplification operation of said cross-coupled N-channel MISFETs is started at a time different from the time when the differential amplification operation of said cross-coupled P-channel MISFETs is started; and

precharging means for setting said pair of data lines at a potential intermediate between potentials on said pair of data lines obtained by operating said amplifier means after said selecting means places said plurality of memory cells in a non-selected state.

4,860,256

INTEGRATED CIRCUIT PROVIDED WITH SWITCHING ELEMENTS FOR CHANGEOVER TO REDUNDANCY ELEMENTS IN A MEMORY

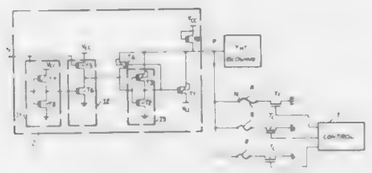
Jean Devin, aix en Provence, and Philippe Calzi, Bouc Bel Air, both of France, assignors to SGS-Thomson Microelectronics S.A., Paris, France

Filed Dec. 16, 1987, Ser. No. 133,626

Claims priority, application France, Dec. 19, 1986, 86 17888

Int. Cl.[4] G11C *7/00, 11/40*

U.S. Cl. 365—189.03 4 Claims



1. An integrated circuit having at least one memory which includes at least one redundancy element and at least one electrically fusable fuse for initrating switchover from a failing memory element to a redundancy element, comprising:

an internal pad contact which is insulated from any external pin of said integrated circuit, said internal pad contact receiving a high voltage supply and said pad contact being connected to said at least one fuse; and

a converter circuit having one input for receiving an operating mode control signal and an output connected to said internal pad wherein said converter circuit provides a high output impedance when simultaneously both said mode control signal is in a first logic state and said high voltage supply is applied to said internal pad contact and wherein said converter supplies a low supply voltage at a low impedance when simultaneously both said mode control signal is in a second logic state and said internal pad is not supplied with said high voltage supply.

4,860,257

LEVEL SHIFTER FOR AN INPUT/OUTPUT BUS IN A CMOS DYNAMIC RAM

Yun H. Choi, Inchon, Rep. of Korea, assignor to Samsung Semiconductor and Telecommunications Co., Ltd., Gumi, Rep. of Korea

Filed Nov. 25, 1987, Ser. No. 125,682

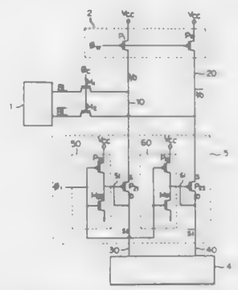
Claims priority, application Rep. of Korea, Nov. 30, 1986, 86-10238

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189.11 4 Claims

1. A level shifter for an input/output bus in a CMOS dynamic RAM having a plurality of bit line pairs, input/output line pairs, input/output sense amplifiers, and precharge voltage supply circuits, the level shifter comprising:

separating means connected between each input/output line pair and each corresponding input/output sense amplifier input line pair, the input/output sense amplifiers input line pairs being connected to corresponding input/output sense amplifiers, the means separating a capacitive load between the input/output sense amplifier input line pairs; and



a voltage maintaining means connected to said separating means for preserving a predetermined voltage difference from a supply voltage between the input/output line pairs and their corresponding input/output sense amplifier input line pairs.

4,860,258

ELECTRICALLY PROGRAMMABLE NON-VOLATILE MEMORY HAVING SEQUENTIALLY DEACTIVATED WRITE CIRCUITS

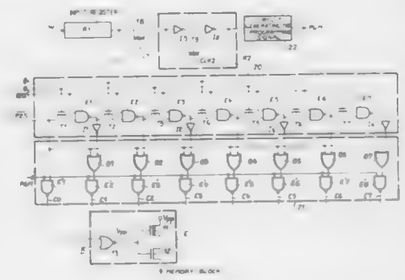
Serge Fruhauf, Peynier, and Alexis Marquot, St Maximin, both of France, assignors to Thomson Semiconducteurs, Paris, France

Filed Oct. 20, 1987, Ser. No. 110,274

Claims priority, application France, Oct. 20, 1986, 86 14523

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—194 7 Claims



1. An electrically programmable non-volatile memory circuit comprising:

a matrix of memory cells accessible by rows and columns,

N write circuits for simultaneously writing a N bit word in the memory,

an input for a read/write mode control signal, and means coupled to said input and said write circuits for activating the N write circuits in a write mode and deactivating said N write circuits in a read mode,

said means for activating and deactivating the N write circuits comprising delay means for deactivating successively one by one of said N circuits when said read/write control signal changes from a write mode to a read mode, and inhibiting means for preventing action of the delay means on the said N circuits when said read/write control signal changes from a read mode to a write mode, so that

said write circuits are activated simultaneously in response to said change from the read mode to the write mode.

4,860,259

DRAM WITH REDUCED-TEST-TIME MODE

Yoichi Tobita, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 939,137, Dec. 8, 1986, abandoned. This application Dec. 1, 1988, Ser. No. 278,374
Claims priority, application Japan, Jan. 21, 1986, 61-12319
Int. Cl.[4] G11C *7/00, 29/00*
U.S. Cl. 365—201 13 Claims



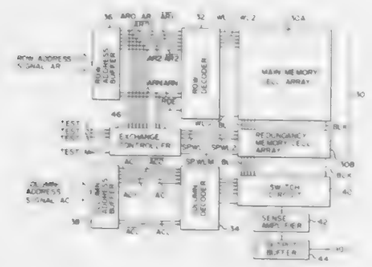
1. A semiconductor memory device, comprising:
a plurality of address lines,
a plurality of memory cells coupled with said address lines,
a test request detection circuit means to produce a test signal if a voltage has been applied on a most significant one of said address lines which is higher than a range of voltages supplied under ordinary operation conditions,
means responsive to the test signal for causing writing of data, which has been supplied to the semiconductor memory device, into a plurality of memory cells simultaneously, and, thereafter, simultaneously reading data from said plurality of memory cells, and
means for judging whether or not the data read from said plurality of memory cells coincides with the data originally supplied to the semiconductor memory device.

4,860,260

SEMICONDUCTOR MEMORY DEVICE WITH TESTING OF REDUNDANT MEMORY CELLS

Shinji Saito, Yokohama; Shigeru Atsumi, Tokyo, and Sumio Tanaka, Oomorini, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 9, 1987, Ser. No. 59,970
Claims priority, application Japan, Jun. 12, 1986, 61-136838
Int. Cl.[4] G11C *7/00, 29/00*
U.S. Cl. 365—201 14 Claims



1. A semiconductor memory device capable of operation in a test mode and an operation mode, comprising:
a memory unit including a plurality of main memory blocks and at least one redundancy memory block;
selection means for programmably selecting one of said main memory blocks or said at least one redundancy memory block, said selection means being programmable to select one of said at least one redundancy memory block in place of a specified main memory block when said device is in said operation mode; and
control means for disabling said selection means in said test mode and for selecting said one redundancy memory block for testing when said selection means has not yet been programmed.

4,860,261

LEAKAGE VERIFICATION FOR FLASH EPROM

Jerry A. Kreifels, Citrus Heights, and George Hoekstra, Santa Clara, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 157,364, Feb. 17, 1988, Pat. No. 4,841,482.
This application Mar. 14, 1989, Ser. No. 323,310
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—218 1 Claim



1. A method for determining if an electrically erasable and electrically programmable read-only memory having a plurality of memory cells which each has a floating gate, comprising the steps of:
placing a small positive voltage on control gates of said memory cells;
measuring leakage current at drains of said memory cells; and
determining if leakage current exceeds a predetermined value, which is an indication of susceptibility to an overerase condition.

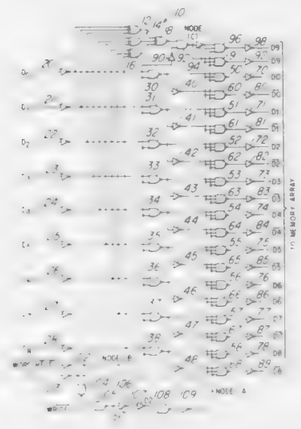
4,860,262

CACHE MEMORY RESET RESPONSIVE TO CHANGE IN MAIN MEMORY

Edison H. Chiu, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 5, 1987, Ser. No. 81,925
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—218 10 Claims

1. A circuit for writing a multi-bit word into a digital memory at a selected address upon receipt of a write command and responsive to a word reset signal for resetting a multi-bit word that includes at least one parity bit in the digital memory at a selected address, comprising:
(a) internal data memory circuit means for receiving a multi-bit word and responsive to reception of said write command to write the multi-bit word into the digital memory at a selected address;
(b) parity generator means connected to receive a multi-bit input data word and to generate at least one parity bit therefrom; and
(c) resetting means responsive to receipt of said multi-bit word, said parity bit, and said word reset signal to write a reset multi-bit word to the internal data memory circuit means, all the bits of said word being set to a predetermined level and the parity bit being set to said predetermined level corresponding to parity for the reset multi-bit word for writing into the digital memory in the presence of the write command.

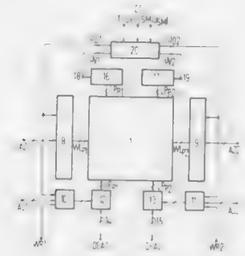


4,860,263

SEMICONDUCTOR MEMORY WITH RANDOM ACCESS VIA TWO SEPARATE INPUTS/OUTPUTS

Hans J. Mattausch, Kirchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,451
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701976
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230.05 5 Claims



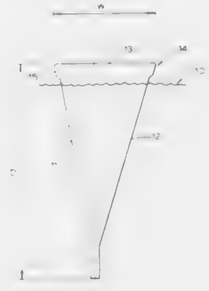
1. In a semiconductor memory with random access via two separate input/output terminals for data (DEA1, DEA2), said memory having a plurality of memory cells interconnected by data lines, each of said input/output terminals having an address control (8, 10; 8,11) and a separate write-read path (12, 13) and means for charging said data lines (L, L1', L2, L2') connecting said individual memory cells with a prescribed potential, the combination comprising; a first pre-loading circuit (16) for connecting the data lines (11, L1') allocated to the first input/output terminal (DEA1) to said prescribed potential and a second pre-loading circuit (17) for connecting the data lines (12, L2') allocated to the second input/output terminal (DEA2) to said prescribed potential, a clock circuit (20) connected to receive a clock voltage (U_T) and to produce timing signals for the address controls (8, 10; 9, 11) and the pre-loading circuits (16, 17) so that the address control (8, 10) of the first input/output terminal (DEA1) and the pre-loading circuit (17) for the data lines (L2, L2) allocated to the second input-/output terminal (DEA2) are activated during a first clock phase (PH1) and the address control (9, 11) of the second input/output terminal (DEA1) and the pre-loading circuit (20) for the data lines (L1 L1') allocated to the first input/output terminal (DEA1) are activated during a second clock phase (PH2).

4,860,264

ARRANGEMENT FOR CARRYING OUT SEISMIC PROSPECTION OF THE SEA BED

Tor A. Haugland, Rykkin; Atle Kleiven, Myking, and Ole K. Selvaer, Selvaer, all of Norway, assignors to Geophysical Company of Norway A/S, Hovik, Norway

Continuation of Ser. No. 43,163, Apr. 27, 1987, abandoned, which is a continuation of Ser. No. 805,250, Dec. 4, 1985, abandoned, which is a continuation of Ser. No. 395,072, Jun. 23, 1982, abandoned. This application May 5, 1988, Ser. No. 193,126
Claims priority, application Norway, Apr. 10, 1981, 811256
Int. Cl.[4] G01V *1/38*
U.S. Cl. 367—17 7 Claims



1. Apparatus for seismic prospection of a sea bed, comprising:
an elongate, buoyant-body paravane comprising a planar deck on only one hull, the depth of the hull from the deck being at least about twice as large as the width of the deck for facilitating towing the paravane out laterally with respect to a towing vessel;
air guns;
suspending means for relatively suspending the air guns from the paravane;
a towing line for towing connection to the vessel;
attachments means for attaching the towing line to the paravane; and
air-supply means for supplying compressed air to the air guns from the vessel.

4,860,265

SEISMIC TRACE RESTORATION USING F-K FILTERING

Stanley J. Laster, Dallas; Robert A. Meek, Sanger, and Thomas E. Shirley, Richardson, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

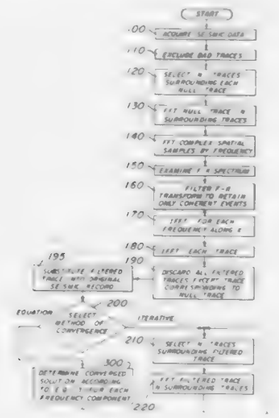
Filed Jan. 25, 1988, Ser. No. 148,307
Int. Cl.[4] G01V *1/28, 1/36*
U.S. Cl. 367—73 22 Claims

1. In seismic exploration wherein seismic sources are activated at spaced locations along a line of exploration and the amplitude of reflections are recorded as a function of time along said line to produce a series of seismic traces, said series of seismic traces including at least one null trace, a method of

restoring seismic data for said at least one null trace comprising the steps of:

producing a frequency-wave number transform for said seismic traces and said null trace;

filtering said frequency-wave number transform to retain only spatially coherent events;



producing a distance-time representation for said filtered frequency-wave number transform;

selecting a filtered trace of said produced distance-time representation which corresponds to said null trace; and

substituting said selected filtered trace for said null trace to produce a restored seismic record.

4,860,266

METHOD FOR OPERATING A TRANSMITTING/RECEIVING CIRCUIT AND A CIRCUIT UTILIZING THE METHOD

Dieter Drefahl, Hanau, Fed. Rep. of Germany, assignor to Honeywell Regelsysteme GmbH, Fed. Rep. of Germany

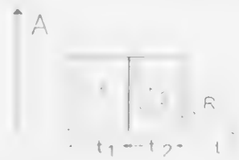
Filed Aug. 19, 1987, Ser. No. 87,008

Claims priority, application European Pat. Off., Sep. 11, 1986, 86112595.3

Int. Cl.⁴ G01S *15/14*

U.S. Cl. 367—97 **6 Claims**

1. A method for operating a transmitting/receiving circuit including a transducer controlled by a modulated carrier frequency in its transmitting mode of operation, where the carrier frequency is matched to the inherent frequency of the transducer and frequency-selective device connected to the transducer for receiving reflected signals in its receiving mode of operation, where the frequency-selective device locks-in when the received signal exceeds a predetermined amplitude and has a frequency within a predetermined bandwidth with respect to the carrier frequency or locks-out when the received signal is below the predetermined amplitude or has a frequency outside of said predetermined bandwidth with respect to the carrier frequency including the steps of first driving the transducer during the transmitting mode of operation with a first carrier



frequency matched to an inherent frequency of the transducer, subsequently driving the transducer during the transmitting mode of operation with a second carrier frequency which is outside of the inherent frequency of the transducer and outside of the lock-in range of the frequency-selective device and evaluating during the receiving mode of operation the lock-out of the frequency-selective device.

4,860,267

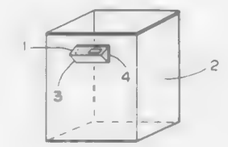
METHOD FOR PROVIDING A SIGNAL TO PREPARE WASTE MATERIALS FOR COLLECTION AND WASTE CONTAINERS INCORPORATING AN ALARM DEVICE

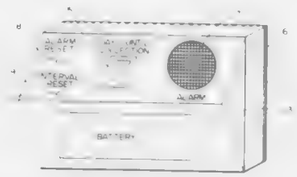
Fox J. Herrington, Holcomb, and Eric A. St. Phillips, Fairport, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 15, 1988, Ser. No. 232,050

Int. Cl.⁴ G04B *47/00;* **B65D** *90/00*

U.S. Cl. 368—10 **30 Claims**





1. A method for producing a signal to prepare waste materials for collection, comprising the steps of:

(a) setting a clock-timer circuit affixed to a container for waste materials to a predetermined time period, wherein said time period is determined with reference to a subsequent trash collection service pick-up;

(b) providing an actuation pulse upon the expiration of said time period; and

(c) generating a signal through the use of a signalling means affixed to said container in response to said actuation pulse.

4,860,268

AUTONOMOUS RADIO TIMEPIECE

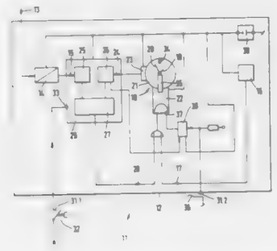
Jürgen Allgaier, Lauterbach; Wolfgang Ganter, Schramberg-Sulgau; Wolfram Hodapp, Rottweil; Arthur Kopf, Schramberg, and Roland Maurer, Lauterbach, all of Fed. Rep. of Germany, assignors to Junghans Uhren GmbH, Schramberg, Fed. Rep. of Germany

Filed Sep. 7, 1988, Ser. No. 241,238

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 8712803[U]

Int. Cl.⁴ G04C *11/02*

U.S. Cl. 368—47 **9 Claims**



1. An autonomous radio timepiece comprising:

a receiver-demodulator;

a time equalizing processor for providing time equalization in the radio timepiece by correcting a prevailing time indication when such an indication deviates from time information received by radio transmission;

a time keeping circuit;

an indexing device for adjusting the time indication; and

an interrupting connection for initiating the time equalization following an interruption of the time indication and for electrically blocking actuation of the time indication without otherwise interrupting operation of the radio timepiece.

4,860,269

ELECTROCHEMICAL TIME SWITCHING DEVICE

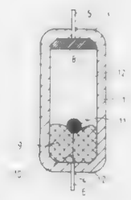
Detlev Hennings, Aachen; Hans-Peter Stormberg, Stolberg, and Manfred Peterek, Aachen, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1987, Ser. No. 116,418

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1986, 3638235

Int. Cl.⁴ G04F *8/00;* **H01G** *9/18*

U.S. Cl. 368—107 **4 Claims**



1. An electrochemical time switching device comprising a hollow body, a liquid electrolyte filling said hollow body, a disintegrable anode and a cathode located within said hollow body and separated one from the other by said liquid electrolyte, a cathode connection and an anode connection, each extending out of said hollow body, a lead-in wire connecting said anode connection and said anode, a compressed elastic sleeve arranged between said anode and said anode connection and enclosing said lead-in wire, the cross-section of said lead-in wire being smaller than the cross-section of said anode and the length of said lead-in wire being smaller than the length of said sleeve when uncompressed and said lead-in wire being completely separated from said electrolyte by said elastic sleeve when said sleeve is uncompressed.

4,860,270

DRIVE COUPLING

Wolfgang Kroener, Pforzheim, Fed. Rep. of Germany, assignor to Pforzheimer Uhren-Rohwerke PORTA GmbH, Pforzheim, Fed. Rep. of Germany

Filed Dec. 10, 1985, Ser. No. 807,457

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1984, 8436088[U]

Int. Cl.⁴ G04B *29/00*

U.S. Cl. 368—322 **1 Claim**





1. A drive coupling for the coupling of an adjustment shaft with the ratchet adjustment knob of a watch, especially a wristwatch, comprising: a slide bushing axially movably disposed on an adjustment shaft, said bushing having a collar formed thereon which collar has sections circumferentially punched therefrom, said sections being bent axially out of the plane of the collar so as to form an annular cam and detent structure.

4,860,271

SERVO CIRCUIT FOR GENERATING A TRACKING ERROR SIGNAL FOR OPTICAL DISK PLAYER

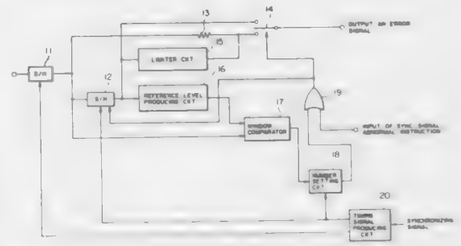
Fumihiko Yokogawa; Hiroyuki Hirano, and Akira Motoyama, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 167,284

Claims priority, application Japan, Mar. 13, 1987, 62-59747; Sep. 18, 1987, 62-234438

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—44 **7 Claims**



1. A servo circuit for generating a tracking error signal comprising:

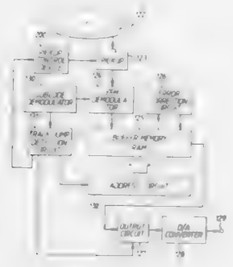
first comparison means for comparing RF signals from a pair of wobbled pits and generating a difference signal representing a difference in levels of the RF signals;
holding means for holding said difference signal for a predetermined period;
reference level producing means for setting a reference level having a predetermined range defined by two edge levels and having as a center level the level of a previously sampled difference signal from said holding means;
second comparison means for comparing the level of a presently sampled difference signal, from said first comparison means, with said reference level and for outputting a first signal representing the comparative result; and
selecting means for selecting and outputting, as a tracking error signal, only one of said presently sampled difference signal and a second signal having a level within said range of said reference level in accordance with said comparative result, so that said presently sampled difference signal is selected when the level of said presently sampled difference signal is within the range of said reference level, and so that said second signal is selected when said presently sampled difference signal is out of the range of said reference level.

4,860,272

ERRONEOUS TRACK JUMP RESTORATION APPARATUS FOR OPTICAL RECORD DISC PLAYER

Meisei Nishikawa, Musashino; Jun Inagawa, Yokohama; Takeshi Inagaki, Yokohama; Toshihiko Kaneshige, Yokohama; Yasuhiro Hayashi, Yokohama, and Tadashi Kojima, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 21, 1987, Ser. No. 99,384
Claims priority, application Japan, Sep. 19, 1986, 61-221427; Sep. 19, 1986, 61-221428; Sep. 19, 1986, 61-221430; Sep. 19, 1986, 61-221431
Int. Cl.[4] G11B 5/09, 21/08; G01D 15/10
U.S. Cl. 369—48 5 Claims



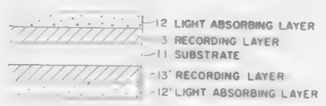
1. A apparatus for reproducing data stored on a disc in a plurality of tracks connected in a continuous spiral or separated in concentric tracks, comprising:
means for rotating the disc;
optical pickup means aligned with one of the tracks for reading the data from the track, the pickup means being subject to jump movement of alignment with the track into alignment with another track in response to movement of the apparatus;
buffer memory means for temporarily storing successive portions of the data read from the track for delaying reproduction of the data for a predetermined time after the reading of the data;
track jump detection means for detecting movement of the pickup means into alignment with another track and interrupting temporary storage of the data read from the other track by the buffer memory means;
drive means for moving the pickup means with respect to the disc for reading data, and for changing the alignment of the pickup means from the other track to the one track in response to the track jump detection means; and
output means for substantially uninterrupted reproduction of the temporarily stored data.
5. A apparatus for reproducing data stored on a disc in a plurality of tracks connected in a continuous spiral or separated in concentric tracks, comprising:
means for rotating the disc;
optical pickup means aligned with one of the tracks for reading the data from the track, the pickup means being subject to jump movement of alignment with with the one track into alignment with another track in response to movement of the apparatus;
buffer memory means for temporarily storing portions of the data read from the track for delaying reproduction of the data after the reading of the data;
track jump detection means for detecting movement of the pickup means into alignment with the other track;
drive means for moving the pickup means with respect to the disc for reading data, and for changing the alignment of the pickup means from the other track to the one track in response to the track jump detection means; and
shift register means for substantially uninterrupted reproduction of only the data read by the pickup means when the pickup means was aligned with the one track.

4,860,273

METHOD OF RECORDING INFORMATION AND INFORMATION RECORDING MEDIUM EMPLOYED FOR THE SAME

Mitsuru Sawano, and Masao Yabe, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Jul. 31, 1987, Ser. No. 80,542
Claims priority, application Japan, Jul. 31, 1986, 61-181442; Jul. 31, 1986, 61-18443
Int. Cl.[4] G11B 7/24, 7/26
U.S. Cl. 369—100 19 Claims



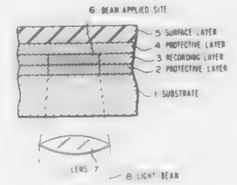
1. A method of recording information comprising the steps of:
irradiating a light-absorbing dye with a laser beam for causing said light-absorbing dye to absorb energy of the beam and generate a heat, said light-absorbing dye being arranged in contact with a polymer blend which changes in its phase condition between a homogeneous state and a phase-separated state in response to change of its temperature across its cloud point, whereby elevating the temperature of said polymer blend in the vicinity of said light-absorbing dye to a temperature of not lower than the cloud point of the polymer blend to change its phase condition into a state which is different from the original state before the elevation of the temperature; and
rapidly cooling the polymer blend to fix the polymer blend in its changed phase condition.

4,860,274

INFORMATION STORAGE MEDIUM AND METHOD OF ERASING INFORMATION

Tadashi Kobayashi, Chiba, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 6, 1987, Ser. No. 46,543
Claims priority, application Japan, Dec. 19, 1986, 61-301485
Int. Cl.[4] G11B 7/24, 7/26
U.S. Cl. 369—100 15 Claims



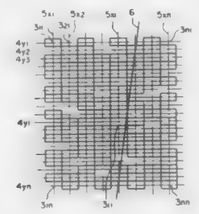
1. An information storage medium comprising:
a transparent substrate; and
a recording layer disposed on said substrate which comprises an alloy having a melting point of 200° to 900° C., and being capable of undergoing a phase transformation between a stable phase crystalline state and a metastable phase crystalline state;
wherein said recording layer is exposed to a light beam to cause the reversible phase transformation between the stable phase crystalline state as an erasing state and the metastable phase crystalline state as a recording state in a site exposed to the beam, thereby recording information therein and erasing information therefrom.

4,860,275

OPTICAL RECORDING CARD AND METHOD OF READING THE SAME

Yuji Kakinuma, and Minoru Fujita, both of Tokyo, Japan, assignors to Kyodo Printing Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1987, Ser. No. 82,820
Claims priority, application Japan, Aug. 9, 1986, 61-187475; Oct. 21, 1986, 61-250460
Int. Cl.[4] G11B 7/00
U.S. Cl. 369—109 7 Claims



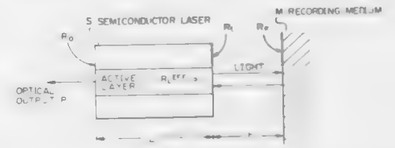
1. An optical recording card comprising
a data truck constructed of a plurality of pits in matrix arrangement, and wherein
the start and end pits in each column of the data truck are redundancy pits which are pits having previously determined different binary values.

4,860,276

MICRO OPTICAL HEAD WITH AN OPTICALLY SWITCHED LASER DIODE

Hiroo Ukita; Yoshitada Katagiri, both of Tokyo; Renshi Sawada; Yuuji Uenishi, both of Saitama; Yoshihiro Isomura, Tokyo; Tomoyuki Toshima, and Keisuke Mise, both of Saitama, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Sep. 16, 1987, Ser. No. 97,560
Claims priority, application Japan, Sep. 18, 1986, 61-218097; Feb. 26, 1987, 62-41509; Mar. 14, 1987, 62-59699; Mar. 16, 1987, 62-59016; Jun. 5, 1987, 62-140104
Int. Cl.[4] G11B 7/00
U.S. Cl. 369—119 10 Claims



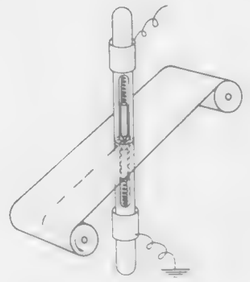
1. An optical head comprising:
a semiconductor laser having a first output end located close to an optical recording medium and a second output end facing an optical detector which detects an output intensity of said semiconductor laser, the output intensity of said semiconductor laser depending upon feedback light which is generated by the semiconductor laser and reflected by said optical recording medium, said semiconductor laser is biased so that a bias current of the semiconductor laser is lower than a first threshold current which stimulates the semiconductor laser to illuminate said recording medium on a first portion, said first portion having a first low reflection factor, and said bias current is higher than a second threshold current which stimulates the semiconductor laser to illuminate said recording medium on a second portion, said second portion having a higher reflection factor than that of said first portion.

4,860,277

MEDIUM AND METHOD FOR IRREVERSIBLE STORAGE OF INFORMATION

Karl Wisseroth, Ludwigshafen, and Richard Scholl, Gruenstadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 13, 1987, Ser. No. 14,547
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1986, 3604568
Int. Cl.[4] G01B 1/02; G01C 13/02
U.S. Cl. 369—126 5 Claims



1. A medium for irreversible information storage which comprises a carrier and substances, which are convertible to

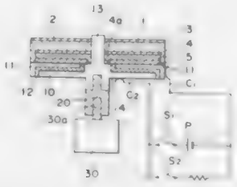
organic polymers containing conjugated double bonds, applied to said carrier and having discrete areas of electrical conductivity, wherein said discrete areas of electrical conductivity are produced by organic polymers which contain conjugated double bonds and wherein said organic polymers are formed by a field-chemical reaction.

4,860,278

OPTICAL RECORDING CARRIER, AND RECORDING-READING APPARATUS, AND RECORDING-READING PROCESS, EMPLOYING THE SAME

Takashi Nakahara, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 12, 1988, Ser. No. 143,052
Claims priority, application Japan, Jan. 13, 1987, 62-007283
Int. Cl.[4] G11B 3/60
U.S. Cl. 369—271 55 Claims



1. An optical recording carrier comprising an optical recording layer adapted to be irradiated with light for recording information thereon or reading information therefrom, and a conductive material layer capable of being electrostatically charged for generating electrostatic force between said optical recording carrier and a recording and/or reading apparatus.

4,860,279

SOURCE MODULATED COHERENCE MULTIPLEXED OPTICAL SIGNAL TRANSMISSION SYSTEM

R. Aaron Falk, Renton, and Jeffrey O. Coleman, Medina, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 30, 1988, Ser. No. 278,613
Int. Cl.[4] H04B 9/00
U.S. Cl. 370—1 5 Claims



1. A coherence multiplexed optical signal transmission system, comprising:

a plurality of optical sources, each source having a coherence length and including means for generating an optical input signal and means for modulating the amplitude of the input signal;

an optical bus;

a plurality of transmitter interferometers, one transmitter interferometer being associated with each source, each transmitter interferometer having first and second transmitter arms having an optical path length difference therebetween, each transmitter interferometer further including means for coupling optical radiation from the associated source into the transmitter arms, the optical path length difference between the first and second transmitter arms of each transmitter interferometer being greater than the coherence length of the associated source and different from the optical path length differences of all other transmitter interferometers by an amount greater than the coherence length of each source;

multiplexing means for receiving optical radiation from the transmitter arms of the transmitter interferometers, and for combining the optical radiation onto the bus;

a plurality of receiver interferometers, each receiver interferometer having first and second receiver arms having an optical path length difference therebetween, the optical path length difference between the receiver arms of each receiver interferometer being equal to the optical path length difference between the transmitter arms of an associated transmitter interferometer to within the coherence length of the associated source;

demultiplexing means for coupling optical radiation from the bus into both arms of each receiver interferometer; and

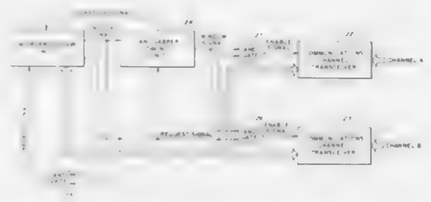
detection means coupled to each receiver interferometer, the detection means comprising an output terminal associated with each receiver interferometer and means for producing, for each receiver interferometer, an electrical output signal at the associated output terminal when the optical radiation coupled into the receiver interferometer includes a component that has passed through a transmitter interferometer having an optical path length difference equal to the optical path length difference of the receiver interferometer, to within the coherence length of the associated source.

4,860,280

APPARATUS AND METHOD FOR A SECURE AND DIAGNOSABLE ANTIJABBER COMMUNICATION CIRCUIT

Paul B. Gerhart, Horsham, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 17, 1987, Ser. No. 121,548
Int. Cl.[4] H04J 1/16, 3/14
U.S. Cl. 370—13 17 Claims



1. Apparatus for preventing uncontrolled communication in a process control network, said apparatus comprising:

microprocessor means for providing a REQUEST signal, said REQUEST signal being generated during transmission of data signals by said microprocessor means and being generated during a test procedure; and

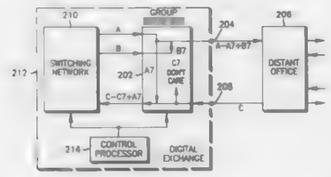
antijabber means responsive to said REQUEST signal for providing a LOCKED UP signal to said microprocessor means when said REQUEST signal exceeds a predetermined length, said LOCKED UP signal preventing transmission of data signals by said microprocessor means, said LOCKED UP signal causing said microprocessor means to apply an UNLOCK signal to said antijabber means after said REQUEST signal is removed during said test procedure, said UNLOCK signal causing microprocessor means to cancel said LOCKED UP signal, wherein said microprocessor means prevents transmission of data signals when said LOCKED UP signal is not generated during said test procedure.

4,860,281

INDIVIDUAL SUBCHANNEL LOOPBACK IN THE PCM INTERFACES OF A DIGITAL TELEPHONE EXCHANGE WITH CONTROL OF THE OUTBOUND PATH

Roger W. Finley, Barrington; Barry D. Lubin, Schaumburg, and Bruce A. Bergendahl, Lake Zurich, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 29, 1988, Ser. No. 161,884
Int. Cl.[4] H04J 1/16
U.S. Cl. 370—15 22 Claims



1. A digital telephone exchange with individual subchannel loopback, comprising:

means for coupling serial outbound data comprising a first plurality of digital subchannels from a switching network to a distant office;

means for coupling serial inbound data comprising a second plurality of digital subchannels unlike said first plurality of digital subchannels from said distant office to said switching network; and

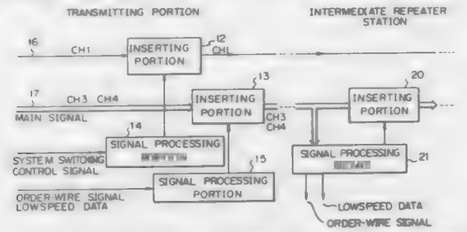
means for substituting at least one bit of a predetermined one of said first plurality of digital subchannels for at least one bit of one of said second plurality of digital subchannels in said serial inbound data while maintaining coupling of said means for coupling serial outbound data.

4,860,282

SYSTEM FOR TRANSMITTING AUXILIARY SIGNAL IN A MULTIPLEX COMMUNICATION SYSTEM

Hideaki Itoh, Chofu, and Takayuki Ozaki, Tochigi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 51,385, May 19, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 289,436
Claims priority, application Japan, May 19, 1986, 61-115362; May 27, 1986, 61-122013
Int. Cl.[4] H04J 3/08
U.S. Cl. 370—55 4 Claims



1. A system for transmiiting auxiliary signals used in a multiplex communication system which includes a transmitting terminal, at least one intermediate repeater station and a receiving terminal, said multiplex communication system transmitting a main signal together with said auxiliary signals using a plurality of channel, each comprising a plurality of time slots, for transmitting said auxiliary signals together with said main signal, said system comprising:

means for separating said auxiliary signals in the transmitting terminal into a first auxiliary signal required only in the transmitting and receiving terminals and a second auxiliary signal required in the at least one intermediate repeater station;

means for inserting said first auxiliary signal, output by said separating means, separately from said second auxiliary signal into said main signal in the transmitting terminal;

means for transmitting said first auxiliary signal without manipulative processing of said first auxiliary signal in the intermediate repeater station; and

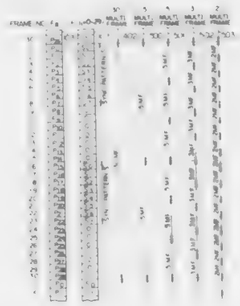
means for processing said second auxiliary signal in the intermediate repeater station, and after processing said second auxiliary signal, transmitting said second auxiliary signal from the intermediate repeater station towards the receiving terminal.

4,860,283

DATA MULTIPLEX TRANSMISSION SYSTEM

Hiroshi Takano, Tokyo; Tokumichi Murakami; Koh Kamisawa, both of Kanagawa, and Hidenori Aoyagi, Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1987, Ser. No. 105,905
Claims priority, application Japan, Nov. 28, 1986, 61-283723; Jun. 16, 1987, 62-149630
Int. Cl.[4] H04J 3/00
U.S. Cl. 370—82 18 Claims



8. A data multiplex control system for a multiplex control circuit of multiplexed data frames having a transmission frame of a fixed length of P bits such that a repetitive period

$$f_F = \frac{64\ [kbps] \times N}{P\ [bits]}\ [Hz]$$

of the transmission frame of the fixed length is an integer in a line having a transmission rate of 64 kbps×(N is an integer of 1 or more), comprising:

a multiframe producing section to produce multiframes each of which includes a P-bit fixed length transmission frame x K where K is an integer;

a frame pulse producing section to produce submultiframe pulses to further divide said K frames of the multiframe signals which are output from said multiframe producing section into small portions; and

double buffers which are alternately switched by said submultiframe pulses for inputting terminal interface data.

4,860,284

METHOD AND APPARATUS FOR IDENTIFYING LOCATION OF A LOST TOKEN SIGNAL IN A DATA COMMUNICATION NETWORK

David B. Brown, Columbus, and Richard E. Wallace, Newark, both of Ohio, assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 20, 1988, Ser. No. 183,959
Int. Cl.[4] H04J *3/14*
U.S. Cl. 370—88 **34 Claims**



1. A network having nodes interconnected by transmission paths wherein a token signal transmitted on the transmission paths sequentially enables each node to write data messages onto the network comprising

means having a plurality of counter states corresponding with each node for recording an arrival of the token signal nt the node as a change of said node counter states, and

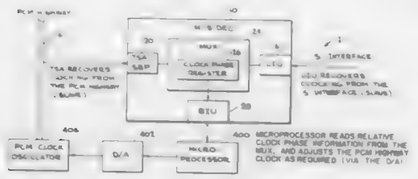
means associated with said recording means for comparing ones of said recording means counter states corresponding with adjacent nodes to detect mismatches occurring in said node counter states identifying a network location of a lost of the token signal.

4,860,285

MASTER/SLAVE SYNCHRONIZER

Merle L. Miller, and Dale E. Gulick, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 21, 1987, Ser. No. 111,475
Int. Cl.[4] H04J *3/06*
U.S. Cl. 370—100 **11 Claims**



1. A synchronizer having a plurality of ports each connected to a device, each device operable as a slave or a master device receiving or generating a clock signal, respectively, synchronizing transmission of data through said device comprising:

a plurality of registers (102) each having plural-bit contents received from and/or conducted to a microprocessor external to said synchronizer;

data-routing multiplexer means (50, 108, 110) operably connected to said plurality of registers, responsive to at least a first and a second synchronizing clock signal for selectably establishing transmission paths between pairs of said ports and for transmitting data on said paths with a selectable one of said first or second synchronizing clock signals; and

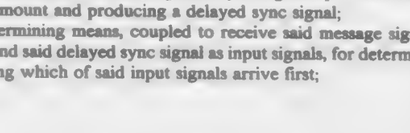
clock-routing means (100, 102, 104, 106) operably connected to said plurality of registers, responsive to said device clock signals for generating said first and said second synchronizing clock signals, said signals selected as said slave and said master, said master and said slave, or said slave and said slave signals, respectively.

4,860,286

ENCODING METHOD IN TRANSMISSION OF PLURALITY OF OVERSAMPLED DATA CHANNELS, AND APPARATUS FOR CARRYING OUT THE METHOD

Stefan G. Forsberg, Stockholm, and Ragnar S. Erkander, Lidingö, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Feb. 18, 1988, Ser. No. 157,227
Claims priority, application Sweden, Apr. 7, 1987, 8701458-5
Int. Cl.[4] H04J *3/06;* **H04L** *1/08, 25/34*
U.S. Cl. 370—106 **3 Claims**



1. Encoding method for transmitting a plurality (n) of oversampled data channels (D1–D4) in multiplexing from a corresponding number of parallel channels to a serial bit flow which comprises a series of frames (R1,R2) each of which includes the data channels (D1–D4) , the frame interval being less than the time between two succeeding sampling instants, and a synchronizing part (S), the data channels each being allocated a particular time slot in each of said frames, comprising the steps of transmitting the true sampled value of each of said data channels serially in one frame (R1) corresponding to the sampling instant of said true sampled values, transmitting the subsequently sampled value of each of the data channels with their inverted sample value in a subsequent frame (R2) corresponding to the instants of said subsequently sampled values, and transmitting said synchronizing part between the data channels in one frame (R1) and the data channels in the next frame (R2), said synchronizing part having at least one fixed part (F1, F2) and a part (T1) which alternates between the two frames (R1, R2) in response to whether the sampled data channels are transmitted with their true or their inverted values.

4,860,287

NETWORK HAVING A SYNCHRONIZER FOR SYNCHRONIZATION BETWEEN A PRIMARY AND A REMOTE STATION

Leroy Kelly, Allen, Tex., assignor to People's Telephone Cooperative, Inc., Quitman, Tex.

Filed Nov. 5, 1987, Ser. No. 117,062
Int. Cl.[4] H04J *3/06*
U.S. Cl. 370—108 **20 Claims**

1. A network synchronizer for synchronization between a primary apparatus and a remote apparatus, said remote apparatus comprising:

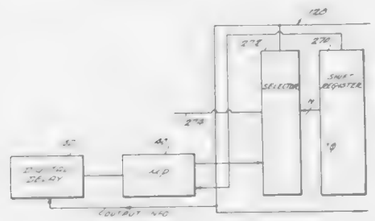
message receiving means for receiving a message signal from the primary apparatus;

means for producing a sync signal;

delay means for delaying said sync signal by a selectable amount and producing a delayed sync signal;

determining means, coupled to receive said message signal and said delayed sync signal as input signals, for determining which of said input signals arrive first;

detecting means for detecting an interval between arrival of said input signals of said receiving means; and



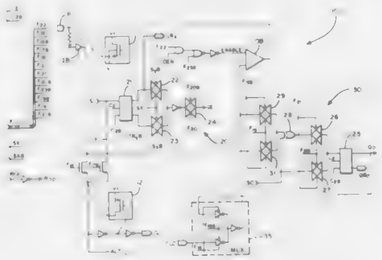
means, responsive to said determining means and said detecting means, for controlling an amount of delay produced by said delay means, to minimize said interval.

4,860,288

CLOCK MONITOR FOR USE WITH VLSI CHIPS

Judy L. Teske; Brian D. Borchers; Don A. Daane, all of Burnsville; Daniel J. Baxter, St. Paul, and William G. Ehrich, Minneapolis, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Oct. 23, 1987, Ser. No. 112,916
Int. Cl.[4] H04L *7/00*
U.S. Cl. 371—1 **4 Claims**



1. For a chip having a system clock input pin with itnernally located system clock bus for distributing said clock input, a clock skew monitoring pin for providing an output at which the chip induced clock skew can be measured, said clock skew pin being in electrical connection with the system clock bus, said clock skew pin being a pin other than the system clock input pin.

4,860,289

RESET CIRCUIT FOR ELECTRICALLY ISOLATED CIRCUITS COMMUNICATING VIA UART

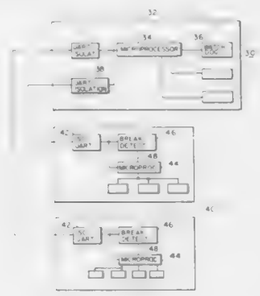
Kenneth A. Coulson, Woodinville, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Oct. 19, 1987, Ser. No. 110,354
Int. Cl.[4] G06F *11/16*
U.S. Cl. 371—12 **24 Claims**

1. In a digital multimeter having an outguard circuit and at least one inguard circuit, said outguard circuit and said inguard circuit separated from one another, said multimeter including structure for detecting occurrence of operating errors in said outguard and inguard circuits and means for initiating the inguard circuit to function properly, the improvement comprising:

reset signal generating means in said outguard circuit for generating a hardware reset signal in response to a detected operating error in said inguard circuit and for transmitting the reset signal to said inguard circuit,

said inguard circuit including reset means responsive to said hardware reset signal generated in said outguard circuit for resetting circuitry of said inguard circuit thereby initiating operation thereof to a predetermined state of operation.

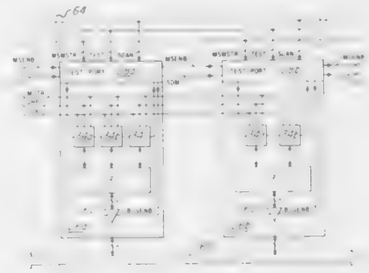


4,860,290

LOGIC CIRCUIT HAVING INDIVIDUALLY TESTABLE LOGIC MODULES

Martin D. Daniels, Houston, Tex., and Derek Roskell, Northants, England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 2, 1987, Ser. No. 57,078
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—25 **35 Claims**



26. A logic circuit including plural logic modules that each perform certain logical operations, the modules being connected together over a system bus that includes data, address and control leads, said logic circuit comprising:

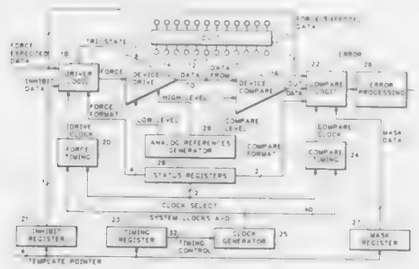
a test port connected to each logic module, each test port having a serial data input lead, a serial data output lead and plural control leads, the serial data input and output leads of said plural modules being connected together in series, and a test bus of control leads separate from said system bus and connected to the control leads of every test port, control signals on said test bus control leads determining the passage of data at said test ports over said serial input and output leads.

4,860,291

TEST VECTOR DEFINITION SYSTEM EMPLOYING TEMPLATE CONCEPT

Wendell W. Damm, Beaverton; Keith A. Taylor, Portland; Ira G. Pollock, Beaverton, and Pedro M. Janowitz, Portland, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 28, 1987, Ser. No. 138,269
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—27 **9 Claims**



1. A user interface system for defining test vectors, the test vectors being composed of digital signals on a plurality of channels, each channel having timing characteristics that may be varied from vector to vector and the capability of going in two directions, input or output, or of being masked, during each vector, the system comprising:

means for generating templates, the templates reflecting a set of user choices regarding the timing characteristics, direction, and masking of each of the channels during one test vector, and

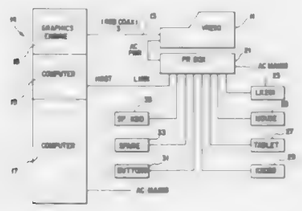
means for associating the templates so generated with test vectors on a vector-by-vector basis.

4,860,292

COMMUNICATION PROTOCOL

Bruce E. Newman, North Plainfield, N.J.; Randall A. White, Plainville, and Steven D. DiPirro, Holliston, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 13, 1987, Ser. No. 85,096
Int. Cl.[4] G06F *5/00*
U.S. Cl. 371—32 **22 Claims**



1. A method of communicating between a first control unit, a second control unit and a plurality of non-intelligent peripheral devices, comprising:

(a) transmitting a communication from the first control unit to the second control unit, the second control unit being the intermediary to confirm and/or verify the communication between the first control unit and the plurality of non-intelligent peripheral devices;

(b) checking the communication received at the second control unit to verify that the communication received from the first control unit is the transmitted communication;

(c) sending an ACK signal from the second control unit to the first control unit when the communication received is the transmitted communication;

(d) sending a NAK signal from the second control unit to the first control unit when the communication received is not the transmitted communication; and

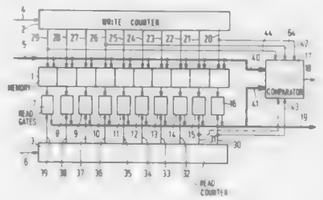
(e) upon receiving the NAK signal at the first control unit, retransmitting the communication from the first control unit to the second control unit.

4,860,293

SUPERVISION CIRCUIT FOR A NON-ENCODED BINARY BIT STREAM

Ludovicus H. M. Engel, and Pieter C. Pieket Weeserik, both of Hilversum, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Nov. 3, 1986, Ser. No. 926,476
Claims priority, application Netherlands, Nov. 26, 1985, [illegible]03130
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—51 **2 Claims**



1. A circuit for supervising a non-encoded serial binary bit stream which is produced on an output line of an elastic store in response to a non-encoded serial binary bit stream supplied on an input line to such store, the output bit stream having a bit rate differing from that of the input bit stream, said store comprising a memory having n successive bit storage locations; said circuit comprising:

a write register having successive outputs respectively coupled to the successive memory locations for supplying write clock pulses thereto at the input bit rate to write the successive bits in each group of n bits of the input bit stream respectively into the successive memory locations, each such stored group of bits having a parity which is odd or even dependent on whether the number of rising or falling edges of the bits therein is odd or even;

a read register having respective outputs coupled to the respective memory locations for supplying read clock pulses thereto at the output bit rate to read out to said output line the successive bits in each group of n bits stored in the successive memory locations; each such output group of bits having a parity which is odd or even dependent on whether the number of rising or falling edges of the bits therein is odd or even; the one of said registers having the higher clock pulse rate periodically interrupting the clock pulses produced thereby for an interval of one or more bit periods to equalize the numbers of bits written into and read from said memory between the successive interruptions; and:

a comparator having a first data input coupled to said input line to receive the input bit stream and having a second data input coupled to said output line to receive the output bit stream;

said comparator further having a first control input coupled to the output of the lower rate register which supplies clock pulses to the location in said memory in which the first bit in each of said groups of n bits is stored, a second control input coupled to the output of the higher rate register which supplies clock pulses to the location in said memory in which either the first or second bit in each of said groups of n bits is stored; and a third control input coupled to the output of the lower rate register which supplies clock pulses to the location in said memory in which the last bit in each of said groups of n bits is stored;

the clock pulses received at the first and third control inputs of said comparator opening a first time window during which the bits in the lower rate bit stream are received in said comparator, and the clock pulses at the second and third control inputs of said comparator opening a second time window during which the bits in the higher rate bit stream are received in said comparator, the first time window having a duration of n bits and the second time window having a duration of n bits plus the number of bit periods during which the higher rate clock pulses are interrupted;

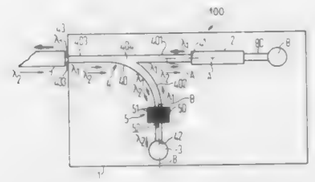
said comparator comparing the parity of the bits received during said first time window with the parity of the bits received during said second time window and producing an output signal when such parities differ, such signal signifying an erroneous correspondence between said input bit stream and said output bit stream.

4,860,294

INTEGRATED-OPTICAL ARRANGEMENT FOR BIDIRECTIONAL OPTICAL MESSAGE OR SIGNAL TRANSMISSION

Gerhard Winzer, Putzbrunn; Reinhard Maerz, and Lothar Stoll, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 25, 1988, Ser. No. 173,718
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1987, 3710549
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—7 **19 Claims**



1. In an integrated optical arrangement for a bidirectional optical message and signal transmissions, said arrangement including a semiconductor laser for producing a first light of a first wavelength, an optical detector, and a direction-selective selective coupling means comprising a waveguide structure being integrated on a common substrate, said coupling means including three ports with a first port being coupled to the laser, a second port being coupled to the detector and the third port being positioned adjacent an edge of the substrate for coupling with a transmission line with the first light of the first wavelength being coupled from the laser into the first port to be transmitted by the structure to the third port with only an insignificant amount being transmitted into the second port and a second light of a second wavelength being coupled into the third port for transmission by the structure to the second port, the improvements comprising said structure of the coupling means being constructed with the first light of the first wavelength being transmitted through the coupling from the first port to the third port and the second light of the second wavelength being transmitted basically between the third port and the second port, said structure of the coupling means including a second waveguide extending to the second port and a wavelength-selective filter being arranged adjacent the second port on the second waveguide, said wavelength-selective filter blocking the first light of the first wavelength while being transmissive to the second light of the second wavelength.

4,860,295

CLADDING FOR TRANSVERSE-PUMPED SOLID-STATE LASER

Robert L. Byer, Stanford, Calif., and Tso Y. Fan, Somerville, Mass., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 12, 1988, Ser. No. 283,431
Int. Cl.[4] H01S *3/098*
U.S. Cl. 372—19 **14 Claims**



1. In an improved method for pumping a laser oscillator, the improvement comprising:

producing a TEM_{00} mode diameter that is at least approximately equal to a transverse dimension of a gain medium of said laser oscillator; and

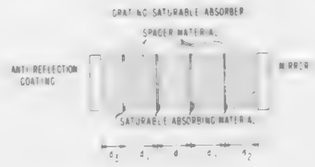
substantially equalizing a first index of refraction of said gain medium with a second index of refraction of a cladding surrounding said gain medium.

4,860,296

LASER CONTROLLED BY A MULTIPLE-LAYER HETEROSTRUCTURE

Daniel S. Chemla, Rumson; David A. B. Miller, Lincroft, and Peter W. Smith, Colts Neck, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 567,222, Dec. 30, 1983, abandoned. This application May 14, 1987, Ser. No. 53,498
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—44 **19 Claims**



1. A semiconductor device comprising:

first layers of material having a nonlinear optical absorption at a predetermined optical frequency; characterized by

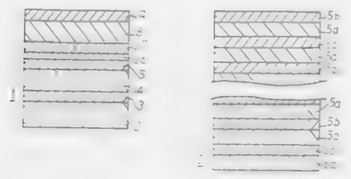
second layers of material alternated with said first layers, and the spacing of said first layers being an integer multiple of one-half the wavelength of light of said predetermined optical frequency.

4,860,297

QUANTUM WELL SEMICONDUCTOR LASER DEVICE

Toshiro Hayakawa, Nara; Takahiro Suyama, Tenri; Kohsei Takahashi, Tenri; Masafumi Kondo, Tenri, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Aug. 4, 1987, Ser. No. 81,403
Claims priority, application Japan, Aug. 8, 1986, 61-187389; Apr. 22, 1987, 62-99318
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—45 5 Claims



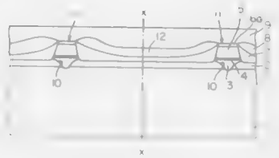
1. In a semiconductor laser device comprising $In(Ga_{1-x}Al_x)P$ cladding layers and an active region which has one or more $In(Ga_{1-x}Al_y)P$ ($0 \leq y \leq 1$) quantum well layers and which is sandwiched by said cladding layers, superlatticed structures having an alternative lamination of $In(Ga_{1-x}Al_x)P$ layers and $In(Ga_{1-y}Al_y)P$ layers are disposed in contact with said cladding layers and said quantum well layers.

4,860,298

SEMICONDUCTOR LASER DEVICE

Masahiro Hosoda, Nara; Kazuaki Sasaki, Yao; Masaki Kondo, Tenri, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 17, 1988, Ser. No. 195,069
Claims priority, application Japan, May 19, 1987, 62-121668
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—46 4 Claims



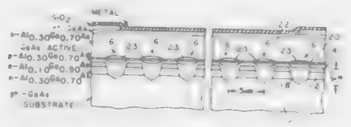
1. In a semiconductor laser device comprising a substrate; a current blocking layer disposed on said substrate; a striped channel formed in a manner to reach said substrate through said current blocking layer; a striped mesa disposed on the area of said striped channel, said striped mesa being of a multi-layered crystal that is composed of a first cladding layer, an active layer, a second cladding layer, and a protective layer in that order; and burying layers, wherein said protective layer is made of $Ga_{1-x}Al_xAs$ ($x>0$) and said burying layers are made of $Ga_{1-y}Al_yAs$ ($y>0$), whereby said burying layers are not formed on said striped mesa but they are formed on both sides of said striped mesa and the thickness of said burying layers positioned outside of said striped mesa becomes large enough to prevent the occurrence of leakage current even in the burying layer area at a distance from said striped mesa.

4,860,299

PHASED-LOCKED ARRAY OF SEMICONDUCTOR LASERS USING CLOSELY SPACED ANTIGUIDES

Dan Botez, 234 Paseo de las Delicias, Redondo Beach, Calif. 90277, and Lake J. Mawst, 22213 Redbeam Ave., Torrance, Calif. 90505

Filed Apr. 12, 1988, Ser. No. 180,415
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—45 23 Claims



1. A semiconductor laser array structure comprising:
means for producing lasing action in a semiconductor structure, including a substrate, an active semiconductor layer, electrodes for applying a voltage across the active layer, and a pair of reflective facets, at least one of which is an emitting facet, located at opposite ends of the array structure; and
an array of closely spaced negative-index waveguides with parallel longitudinal axes, formed in the structure and defined by parallel waveguide elements having a selected refractive index, and semiconductor structural means between the waveguide elements to provide interelement regions of higher refractive index than the waveguide elements, whereby optical confinement between waveguide elements is relatively low, to suppress lasing between elements, but coupling between elements is strong, to provide stable, phase-locked operation.

4,860,300

ELECTRODE FOR PULSED GAS LASERS

Jürgen Bäumler, Osterode, and Manfred Zeh, Göttingen, both of Fed. Rep. of Germany, assignors to Lambda Physik Forschungs- und Entwicklungsgesellschaft MB, Gottingen, Fed. Rep. of Germany

Continuation of Ser. No. 57,761, Jun. 3, 1987, abandoned. This application Jan. 27, 1989, Ser. No. 303,083
Int. Cl.[4] H01S 3/22
U.S. Cl. 372—57 3 Claims

1. In an excimer laser, having at least two electrodes exposed to an excimer gas mixture, the laser wherein:
said electrodes each comprise substantially copper and tungsten; and
said excimer gas mixture is substantially free of fluorides.

4,860,301

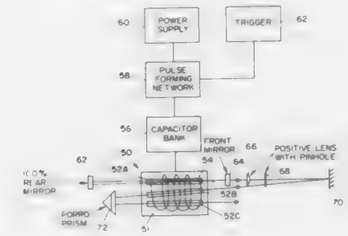
MULTIPLE CRYSTAL PUMPING CAVITY LASER WITH THERMAL AND MECHANICAL ISOLATION

Peter Nicholson, 11-51 44th Dr., Long Island City, N.Y. 11101

Continuation of Ser. No. 620,714, Jun. 14, 1984, abandoned. This application Dec. 3, 1986, Ser. No. 935,613
Int. Cl.[4] H01S 3/14
U.S. Cl. 372—68 20 Claims

1. A laser system comprising:
an optical pumping chamber;
at least three laser crystal rods disposed in said pumping chamber and having differently sized diameters and with their axes generally parallel;
means defining a resonant cavity for the smallest diameter laser rod;
means for optically coupling said laser rods in a chain of increasing diametrical rod size, wherein one end of each laser rod is optically coupled to one end of another laser rod;

means for optically pumping said laser rods with an energy level which is optimum for the largest diameter rod in the chain; and



means coupled to each laser rod but the largest diameter laser rod for attempting the energy provided respectively to said respective rods by said optical pumping means.

4,860,302

SCANNING BEAM LASER PUMPED LASER

George S. Janes, Lincoln, Mass., assignor to Avco Research Laboratory, Inc., Everett, Mass.

Filed Aug. 13, 1987, Ser. No. 84,815
Int. Cl.[4] H05S 3/091
U.S. Cl. 372—70 19 Claims



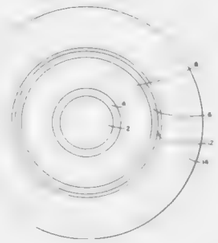
1. Laser apparatus comprising:
(a) a pumping laser for providing an output laser beam;
(b) an optically pumped laser having a resonant optical cavity including laser beam output means, said resonant cavity further having a lasing region containing a lasing medium;
(c) first means for focusing and coupling the pumping laser output beam from the pumping laser to a small spot movable within said lasing medium, said first means including second means for receiving said pumping laser output beam and directing it along a first fixed optical path having a first fixed direction and a first fixed axis, said first means further including third means for receiving said pumping laser output beam from said second means and directing it along a movable optical path having a movable second direction and movable second axis, said third means directing said pumping laser output beam to said lasing medium as a small moving spot and producing a pumped laser output beam; and
(d) "second" fourth means for coupling said pumped laser output beam out of said resonant cavity output means via at least said third means.

4,860,303

DOUBLE-SIDED CO-AXIAL LASER

Stephen D. Russell, Starkville, Miss., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 17, 1989, Ser. No. 297,893
Int. Cl.[4] H01S 3/093
U.S. Cl. 372—72 8 Claims



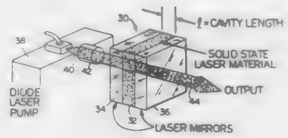
1. In a co-axial flashlamp of the type having a hollow outer cylinder, a hollow inner cylinder, said inner cylinder located concentrically within said outer cylinder so as to provide a cylindrical discharge annulus between said cylinders, plasma contained within said annulus, a first dye volume contained within the hollow of said inner cylinder, the improvement comprising a transparent, cylindrical return conductor surrounding said outer cylinder to permit radiation to issue through said conductor away from the center of said concentric cylinders, and a second dye volume, said second dye volume being situated to receive and be activated by said radiation.

4,860,304

SOLID STATE MICROLASER

Aram Mooradian, Winchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 2, 1988, Ser. No. 151,396
Int. Cl.[4] H01S 3/05, 0/98
U.S. Cl. 372—92 13 Claims



1. Solid state, optically pumped microlaser comprising:
a solid state gain medium disposed between two mirrors, the distance between the mirrors selected so that the gain bandwidth of the gain medium is less than the frequency separation of the cavity modes.

4,860,305

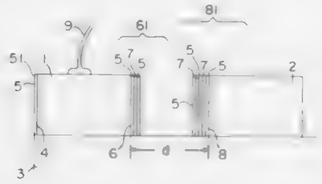
EXTERNAL CAVITY TYPE SEMICONDUCTOR LASER APPARATUS

Nobuyuki Miyauchi, Tenri; Hidenori Kawanishi, Higashiosaka; Shigeki Maei; Osamu Yamamoto, both of Nara, and Hiroshi Hayashi, Soraku, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Feb. 26, 1988, Ser. No. 161,061
Claims priority, application Japan, Feb. 27, 1987, 62-46332
Int. Cl.[4] H01S 3/08, 3/081, 3/19
U.S. Cl. 372—92 4 Claims

1. An external cavity type semiconductor laser apparatus comprising a semiconductor laser device and an external cav-

ity, which are mounted on a single mounting base with a space therebetween, wherein laser light emitted from the light-emitting rear facet of said laser device is reflected by said external



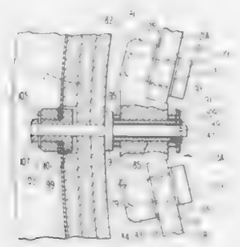
cavity and returns to said laser device. The reflectivity of the light-emitting rear facet of said laser device being different from that of the light-emitting front facet of said laser device.

4,860,306

HOT ZONE EMPLOYING GRAPHITE HEATING ELEMENTS

Thomson B. Gibb, Southampton, Pa., assignor to Vacuum Furnace Systems Corporation, Souderton, Pa.

Filed Oct. 5, 1988, Ser. No. 253,499
Int. Cl.[4] H05B *3/08*
U.S. Cl. 373—112 2 Claims



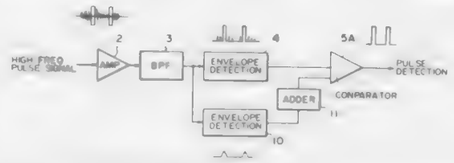
1. A section of a graphite hot zone in a vacuum furnace comprising in combination: graphite block means having first aperture means formed therethrough, said graphite block means having first and second protrusions extending therefrom, said first protrusion formed to have a first locking aperture therein, said second protrusion formed to have a second locking aperture formed therein; stud assembly means formed and disposed to fit through said first aperture to be secured to an inner part of said vacuum furnace; first graphite heating element means having a first securing aperture formed therein with said first graphite heating element means disposed to have its first securing aperture in substantial axial alignment with said first locking aperture; second graphite heating element means having a second securing aperture formed therethrough with said second graphite heating element means disposed to have said second securing aperture located in substantial axial alignment with said second locking aperture; first graphite bolt means disposed through said first securing aperture and into said first locking aperture to secure said first graphite heating element to said first protrusion means; second graphite bolt means disposed through said second securing aperture into said second locking aperture to secure said second graphite heating element means to said second protrusion means; first and second washer means formed of laminated graphite with said first washer means disposed between said first graphite bolt means and said first heating element and with said second washer means disposed between said first heating element and said first protrusion; third and fourth washer means formed of laminated graphite with said third washer means disposed between said second bolt means and said second heating element and with said fourth washer means disposed between said second heating element and said second protrusion means.

4,860,307

SYNCHRONIZATION PULSE GENERATOR IN SPREAD SPECTRUM COMMUNICATION SYSTEM

Shigeyuki Nakayama, Koganei, Japan, assignor to Kabushiki Kaisha Kenwood, Tokyo, Japan

Filed Oct. 9, 1987, Ser. No. 106,420
Claims priority, application Japan, Oct. 14, 1986, 61-242026
Int. Cl.[4] H04K *1/00*; H04L *9/00*
U.S. Cl. 375—1 3 Claims



1. A synchronization pulse generator in a spectrum spread communication system comprising:

first and second envelope detectors for subjecting a correlation output of a spectrum spread signal to envelope detection, a time constant in the second envelope detector being larger than a time constant of the first envelope detector;

threshold value generator means for generating a threshold value having a level corresponding to an output from the second envelope detector; and

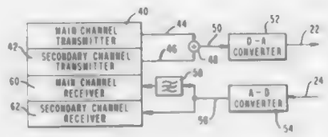
a comparator for comparing an output level of the first envelope detector with a threshold value generated by the threshold value generator means, and outputting an initial synchronization pulse.

4,860,308

MODEM COMMUNICATION SYSTEM HAVING MAIN AND SECONDARY CHANNELS

Adriaan Kamerman, Ta Nieuwegein, and Johannes P. N. Haagh, Eindhoven, both of Netherlands, assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 30, 1988, Ser. No. 175,375
Claims priority, application United Kingdom, Sep. 10, 1987, 8721760
Int. Cl.[4] H04B *1/38*
U.S. Cl. 375—8 10 Claims



1. A data modem communication system comprising;

a transmission medium having a main data channel whereon data signals are transmitted at a relatively high bit rate and a secondary data channel whereon data signals are transmitted at a relatively low bit rate;

modem transmitter means coupled to said transmission medium for transmitting data signals on said transmission medium;

a remote modem receiver means coupled to said transmission medium and including a main channel receiver and a secondary channel receiver for receiving the same data signals transmitted over the transmission medium;

first filter means coupled to said main channel receiver and second filter means coupled to said secondary channel receiver for suppressing the main channel data signals by

processing samples of the data signals a number of times; and

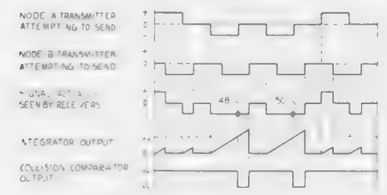
an analog-to-digital converter coupled to said transmission medium and having an output connected to said first filter means which is adapted to suppress the secondary channel data signals in said main channel receiver, said analog-to-digital converter further having an output coupled to said second filter means, wherein said second filter means includes a low-pass digital filter adapted to process samples of the data signals in said secondary channel receiver at successively decreasing sample rates.

4,860,309

TRINARY BUS COMMUNICATION SYSTEM

John F. Costello, 7110 Convoy Ct., San Diego, Calif. 92111

Filed Sep. 17, 1986, Ser. No. 908,301
Int. Cl.[4] H04L *25/34*
U.S. Cl. 375—17 6 Claims



6. In a bus communication network comprising a plurality of nodes in parallel communication with the bus, at least 2 nodes being from time to time transmitters of data signals comprising time serial trains of data cells of uniform duration, a method of avoiding synchronous simultaneous data transmissions comprising the steps:

(a) dividing the data into groups,

(b) transmitting each group in a burst followed by a time delay before sending a next burst,

(c) transmitting filler data during the time delays, and

(d) generally randomly varying the duration of the time delays.

4,860,310

DUOBINARY ENCODED SIGNAL DECODER

Mounstanir Lamnabhi, Limeil-Brevannes, and Philippe Salembier, Paris, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 7, 1988, Ser. No. 164,620
Claims priority, application France, Mar. 6, 1987, 87 03085
Int. Cl.[4] H04L *1/00*
U.S. Cl. 375—18 12 Claims

1. A device for decoding signals comprising a sequence of binary samples which have been duobinary encoded and transmitted over a transmission channel, comprising:

(a) means coupled to the output of said transmission channel, for determining for a received duobinary value y corresponding to a transmitted duobinary value x, first, second and third conditional probabilities corresponding respectively to the probability that $x=0$, $x=1$, and $x=2$ at an instant kT, where k is the order of consecutive binary samples;

(b) first selecting means coupled to said determining means for selecting the two of said conditional probabilities which at the instant $(k+1)T$, corresponds to two more probable binary sequences; and



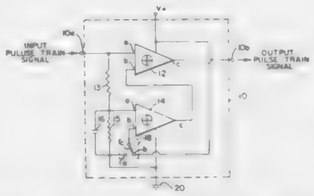
(c) second selecting means coupled to said first selecting means for selecting the most probable of said two more probable binary sequences.

4,860,311

METHOD AND APPARATUS FOR AUTOMATICALLY CONVERTING INPUT PULSE TRAIN SIGNALS TO OUTPUT SIGNALS OF DESIRED POLARITY

David G. Storberg, Lino Lakes, Minn., assignor to CPT Corporation, Eden Prairie, Minn.

Filed May 1, 1987, Ser. No. 45,033
Int. Cl.[4] H04L *25/34*
U.S. Cl. 375—19 9 Claims



1. A method of automatically converting a received pulse train signal into an output pulse train signal of desired polarity regardless of the changing polarity characteristics of the input pulse train signal, comprising the steps of:

(a) receiving an input pulse train signal;

(b) determining the average polarity of said input pulse train signal and providing a detected output signal responsive thereto;

(c) establishing a first reference signal representative of the desired polarity of the output pulse train signal comprising switchably selecting at least one of a plurality of available DC voltage levels as said first reference signal;

(d) forming a control signal responsive to said first reference signal and said detected output signal; and

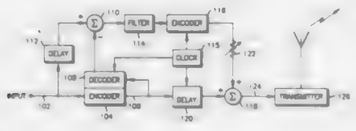
(e) conditioning the polarity of said input pulse train signal in response to said control signal to automatically produce therefrom an output pulse train signal of said desired polarity, and having substantially the same timing and phase characteristics as said input pulse train signal.

4,860,317

QUALITY IMPROVEMENT FOR A DIGITALLY TRANSMITTED INFORMATION SIGNAL

Anthony P. van den Heuvel, Arlington Heights; Michael D. Kotzin, Buffalo Grove, and Kenneth J. Crisler, Wheaton, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 12, 1988, Ser. No. 184,305
Int. Cl.[4] H04B *14/04*
U.S. Cl. 375—26 **16 Claims**



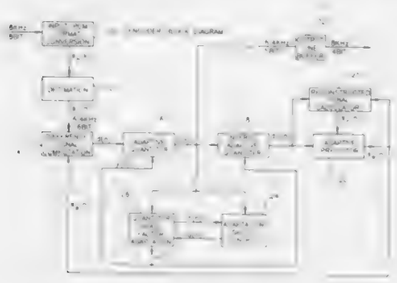
1. In a radio frequency communication system, a transmitter apparatus comprising:
means for encoding an information signal to provide an information data signal;
means for decoding said information data signal to provide a decoded signal;
means for combining said information signal and said decoded signal to provide an error signal;
means for encoding said error signal to provide an error data signal;
level-controlling means for controlling the level of said error data signal to provide a low-level error data signal, the level of said low-level error data signal being sufficiently low so as not to substantially degrade the reception of said information data signal;
combining means for combining said low-level error data signal and said information data signal to provide a combined data signal; and
means for transmitting at least said combined data signal.

4,860,313

ADAPTIVE DIFFERENTIAL PULSE CODE MODULATION (ADPCM) SYSTEMS

Zeev Shpiro, Tel Aviv, Israel, assignor to ECI Telecom Ltd., Tel Aviv, Israel

Filed Sep. 21, 1987, Ser. No. 99,068
Claims priority, application Israel, Sep. 21, 1986, 80103
Int. Cl.[4] H04B *1/66*
U.S. Cl. 375—27 **16 Claims**



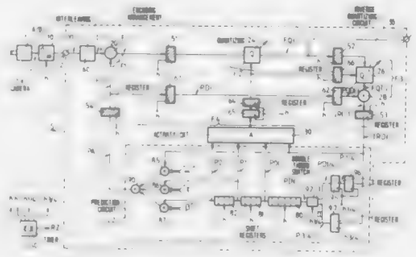
1. An ADPCM system comprising:
at a first end of a transmission line:
ADPCM transmitter means for receiving PCM encoded signals at an 8 KHz sampling rate and being operative to output data at a sampling rate of 6.4 KHz at 5 bits per sample;
output line buffer meamns for receiving the output of said ADPCM transmitter means and providing an identical information output having a converted format of a sampling rate of 8 KHz at 4 bits per sample;
at a second end of said transmission line:
input line buffer means for receiving a signal along said transmission line having a sampling rate of 8 KHz at 4 bits per sample and providing an identical information output having a converted format of a sampling rate of 6.4 KHz at 5 bits per sample; and
ADPCM receiver means for receiving the transmitted data from the input line buffer means and being operative for providing PCM encoded signals at an 8 KHz sampling rate.

4,860,314

DIFFERENTIAL PULSE CODE MODULATION ARRANGEMENT, ASSOCIATED DECODING ARRANGEMENT AND TRANSMISSION SYSTEM COMPRISING AT LEAST SUCH AN ENCODING OR DECODING ARRANGEMENT

Jean-Yves Boisson, Clamart, France, assignor to Telecommunications Radioelectriques Et Telephoniques T.R.T, Paris, France

Filed Aug. 11, 1987, Ser. No. 84,658
Claims priority, application France, Aug. 13, 1986, 86 11686
Int. Cl.[4] H04B *14/06*
U.S. Cl. 375—27 **11 Claims**



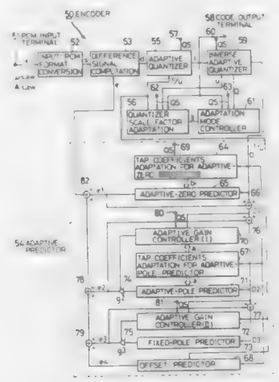
8. A transmission system comprising:
a. A differential pulse code modulation encoding apparatus comprising:
i. an input for receiving a sequence of samples to be encoded;
ii. an output for supplying encoded samples;
iii. timing means;
iv. a plurality of encoding processing circuits grouped into a plurality of independent encoding units which operate in parallel and have respective timing inputs coupled with the timing means, the plurality of processing circuits including:
A. means for reordering the samples to be encoded and supplying a sequence of reordered samples in an order;
B. means for producing differential samples of differences between the sequence of reordered samples and the prediction samples and having an output coupled with the output of the apparatus; and
C. means for producing prediction samples from the encoded samples;
the order being chosen so that, under control of the timing means, the prediction samples are provided to the differential producing means simultaneously with corresponding ones of the sequence of reordered samples, and so that the independent encoding units process at least two of the reordered samples in parallel; and
b. a decoding apparatus comprising:
i. an input for receiving transmitted reordered encoded samples;
ii. an output for supplying decoded samples; and
iii. a plurality of decoding processing circuits, grouped into a plurality independent decoding units which operate in parallel and have respective timing inputs, including
A. an adder circuit for forming a sequence of recovered reordered decoded samples from the transmitted reordered samples and prediction samples;
B. a prediction circuit for supplying the prediction samples; and
C. a de-interleaving member for recovering an original order of the recovered reordered decoded samples, which de-interleaving member supplies to the output of the decoding apparatus a sequence of decoded samples in the original order; and
i. timing means for controlling the decoding processing circuits so that the independent decoding units process at least two of the transmitted reordered encoded samples in parallel.

4,860,315

ADPCM ENCODING AND DECODING CIRCUITS

Kenichiro Hosoda; Shinji Kawaguchi; Atsushi Shinbo, and Kiyoshi Yokota, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1988, Ser. No. 184,082
Claims priority, application Japan, Apr. 21, 1987, 62-096298
Int. Cl.[4] H03M *3/04*
U.S. Cl. 375—30 **24 Claims**



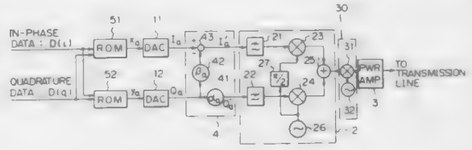
9. An ADPCM encoding circuit comprising an encoder having an adaptive predictor, an adaptive quantizer and an inverse adaptive quantizer, wherein said adaptive predictor comprises:
an adaptive-zero predictor of an arbitrary order and an adaptive-pole predictor of an arbitrary order for receiving input signals with time-varying frequency components;
a fixed-pole predictor of an arbitrary order for receiving input signals the frequency composition of which remains substantially invariant over time; and
an offset predictor for rejecting an offset component of the input signals said adaptive-zero predictor, said adaptive-pole predictor, said fixed-pole predictor and said offset predictor being coupled to the output of said inverse adaptive quantizer.

4,860,316

MULTILEVEL AMPLITUDE MODULATION AND DEMODULATION COMMUNICATION SYSTEM

Sadao Takenaka, Yokohama; Yoshihito Aono, Tochigi; Takanori Iwamatsu, Otawara; Morihiko Minowa, Machida; Yoshimasa Daido, Yokohama, and Hiroshi Nakamura, Sagamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 18, 1988, Ser. No. 156,755
Claims priority, application Japan, Feb. 19, 1987, 62-34663; Feb. 24, 1987, 62-39284
Int. Cl.[4] H04L *1/10, 5/12*
U.S. Cl. 375—39 **22 Claims**



1. A modulator comprising:
signal point transformation means for receiving in-phase data and quadrature-phase data, arranged in a quadrature lattice constellation, and transforming first signal points of said received data into second signal points arranged in a honeycomb constellation, including
position rearrangement means for receiving the input in-phase data and the input quadrature-phase data and rearranging predetermined received signal points among the received data to form a predetermined quadrature lattice constellation,
first and second digital-to-analog converters, operatively connected to said position rearrangement means, provided in parallel to receive the rearranged in-phase data and quadrature-phase data signals and output digital converted data signals, and
coordinate transformation means, operatively connected to said digital to analog converters, for receiving the two digital-converted data signals and transforming said received data signals of the quadrature lattice constellation into two data signals of signals of the honeycomb constellation,
the predetermined quadrature lattice constellation being defined by the number of multilevels of the data input to said position rearrangement means and being adaptive for transformation into the honeycomb constellation;
means operatively connected to said signal point transformation means for amplitude-modulating said coordinate-transformed data; and
means, operatively connected to said amplitude-modulating means for frequency converting the modulated data from the modulating means.

4,860,317

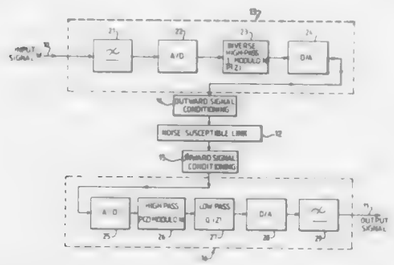
NOISE-REDUCTION SIGNAL PROCESSING ARRANGEMENT

Martin Tomlinson, Devon, England, assignor to Devon County Council, Devon, United Kingdom

Filed Mar. 21, 1986, Ser. No. 842,320
Claims priority, application United Kingdom, Mar. 26, 1985, 8507903
Int. Cl.[4] H04B *7/01*
U.S. Cl. 375—58 **18 Claims**

10. A satellite communications receiver for receiving an information signal over a noise-susceptible link from a transmitter having a digital sampled data transmitter filter using modulo N arithmetic, wherein the receiver includes a digital sample data first receiver filter using modulo N arithmetic, and

a second receiver filter which, apart from effects resulting from the modulo N arithmetic of the first receiver filter, has a



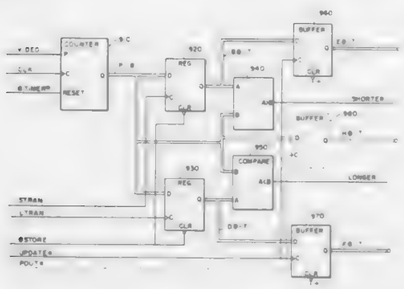
transfer function which is substantially orthogonal to the transfer function of the first receiver filter.

4,860,318

PSK DETECTION USING AN IFM RECEIVER

Rudy L. Shaw, Huber Heights; James B. Y. Tsui, Centerville, and James N. Hedge, Jr., Medway, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 6, 1988, Ser. No. 215,662
Int. Cl.[4] H04L *27/22*
U.S. Cl. 375—82 **5 Claims**



1. A signal detector for detecting of the presence of long or short pulse PSK signals, and determining a PSK clock rate relating to modulation of said signals, using an instantaneous frequency measurement (IFM) receiver having correlator means in which transient signals occur at a correlator output when a PSK signal is present, and video means producing a digital signal at a video output for the duration of each pulse signal detected by the IFM receiver, said duration being defined from a leading edge to a trailing edge, wherein said signal detector comprises:

interval timing means having input means coupled to said video output, with means for starting the interval timing means in response to said leading edge and stopping it in response to said trailing edge,

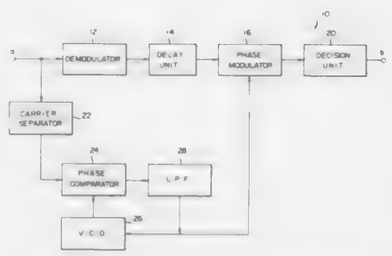
transient detector means having an input coupled to said correlator output for detecting each of said transient signals to indicate the presence of PSK signals during a pulse signal, and means responsive to detection of a transient signal for indicating a value then present in the interval timing means and starting measurement of a next interval to thereby measure the intervals between transient signals, and means for determining the shortest of said intervals for use in finding said PSK clock rate.

4,860,319

APPARATUS FOR COMPENSATING FOR PHASE HITS

Atsushi Yoshida, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 27, 1987, Ser. No. 78,045
Claims priority, application Japan, Jul. 30, 1986, 61-177738
Int. Cl.[4] H03D *3/22*
U.S. Cl. 375—83 **5 Claims**



1. An apparatus in a receiver for data transmission for compensating for a phase hit, said apparatus comprising:

a carrier phase detecting means for detecting an out of phase carrier of a received signal, said out of phase carrier having a component which has a phase change that is slower than a phase jitter;

a delaying means for delaying the received signal; and

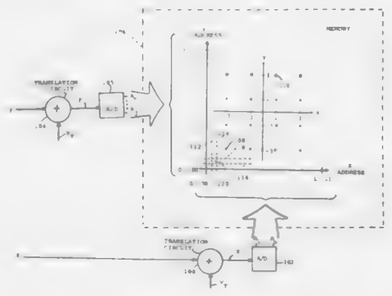
a phase modulating means for modulating a delayed signal output from said delaying means by a phase component signal which is produced by said carrier phase detecting [illegible]

4,860,320

METHOD FOR RECOVERING A CONTROL SIGNAL FOR CONTROLLING THE PHASE OF A LOCAL CARRIER SIGNAL

Michael Hoffmann, Backnang, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 62,366, Jun. 12, 1987, Pat. No. 4,811,363, and a continuation-in-part of Ser. No. 165,715, Mar. 8, 1988. This application Dec. 21, 1988, Ser. No. 287,052
Claims priority, application European Pat. Off., Jan. 23, 1988, [illegible]
Int. Cl.[4] H03D *3/02*
U.S. Cl. 375—83 **4 Claims**



1. A method for recovering a control signal to control the phase of a local carrier signal in such a manner that the local carrier signal and the carrier signal of an amplitude and/or

phase shift keyed received signal are synchronous in phase, comprising:

(a) dividing the local carrier signal into two at least approximately orthogonally oriented local carrier components which represent the coordinate axes of a signal state plane having four quadrants;

(b) mixing the received signal with the two local carrier signal components to produce two mixed signal components which represent projections of received signal states on the coordinate axes of the signal state plane;

(c) using the two mixed signal components to address a memory having a plurality of memory locations in order to read out the content of a memory location for each received signal state, the memory locations in the memory corresponding to quantized regions into which the signal state plane is divided by way of quantization thresholds extending parallel to the two coordinate axes, predetermined ones of the quantization thresholds intersecting at predetermined points which correspond to permitted signal states that migh have been transmitted

wherein each memory location stores a respective numerical value f(x, y) which is representative of a phase deviation between a quantized region corresponding to the respective memory location and the closest predetermined point, where x and y represent position coordinates of the quantized region corresponding to the respective memory location in the signal state plane,

wherein the numerical values stored in the memory are selected so that $f(-x, y) = -f(x, y)$ and $f(x, -y) = -f(x, y)$ for all four quadrants of the signal state plane,

wherein the numerical values stored in memory locations corresponding to quantized regions closely adjacent to the predetermined points are selected so that the numerical values for quantized regions lying next to one another in the direction of one of the two coordinate axes have opposite signs and the numerical values for quantized regions lying next to one another in the direction of the other coordinate axis have the same sign, and

wherein the numerical values stored in memory locations corresponding to quantized regions which are not closely adjacent to the predetermined points are selected so that

$$f(x, y) = -f(\text{sign}(y)\cdot|y|,\ \sin(y)\cdot|x|)$$

for each quadrant of the signal state plane; and

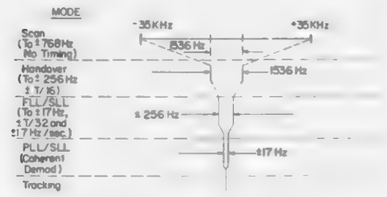
(d) averaging numerical values read out of the memory for a plurality of received signal states to produce the control signal.

4,860,321

LOCK DETECTOR FOR FEEDBACK LOOPS

U. A. von der Embse, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 13, 1985, Ser. No. 775,909
Int. Cl.[4] H03D *3/24;* **H04L** *7/00*
U.S. Cl. 375—96 **19 Claims**



1. A receiver employing matched filter detection of signals modulated with data symbols having a data symbol period, comprising:

means for matched filter detection and coherent demodulation of said signal, said means comprising a phase lock loop for tracking the phase of said signal;

means for providing an estimate of the signal amplitude;

means for calculating a lock detector statistic value, said value being normalized by an estimate of the signal amplitude to reduce its sensitivity to variations in the signal amplitude;

testing means responsive to said lock detector statistic value for determining whether said loop is tracking said signal at a false frequency or time offset, said means being operable over a wide signal to noise ratio (SNR) range over the entire frequency bandwidth at the input to said matched filter detection means and over the entire data symbol period; and

means responsive to said testing means for providing an indicator that the receiver is tracking at a false frequency or time estimate.

4,860,322

ANTI-CLOCK SKEW DISTRIBUTION APPARATUS

Stacey G. Lloyd, Aloha, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Oct. 5, 1988, Ser. No. 254,323
Int. Cl.[4] H04L *7/00*
U.S. Cl. 375—107 **3 Claims**

1. In a synchronous digital data system, an anti-clock skew distribution system comprising:

a first multiple-buffer integrated circuit having a maximum propagation delay of T_{PD1} and with a maximum variation in the propagation delay between any two buffers of said first multiple-buffer integrated circuit equal to K1 seconds;

a second multiple-buffer integrated circuit having a maximum propagation delay, T_{PD2}, and with a maximum variation in the propagation delay between any two buffers of said second multiple buffer integrated circuit equal to K2 seconds;

a clock generator having a single output connected in parallel to an input of a first buffer of said first integrated circuit and an input of a first buffer of said second integrated circuit;

a first signal connection connecting an output of said first integrated circuit first buffer to at least one other input of at least a second buffer of said second integrated circuit; and

a second signal connection connecting an output of said second integrated circuit first buffer to at least one other input of at least a second buffer of said first integrated circuit;

whereby in response to identical clock pulse inputs to each of said first buffer inputs, a clock pulse output of said second buffer of said first integrated circuit will be skewed equal to or less than /K1/ + /K2/ seconds of a clock pulse output of said second buffer of said second integrated circuit.

4,860,323

METHOD AND DEVICE FOR THE ACQUISITION OF SYNCHRONIZATION BITS IN DATA TRANSMISSION SYSTEMS

Remi Malter, Poissy, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 29, 1988, Ser. No. 213,074
Claims priority, application France, Jun. 30, 1987, 87 09236
Int. Cl.[4] H04L *7/04*
U.S. Cl. 375—111 **12 Claims**

1. A method for acquisition of synchronization bits in systems for transmission of data transmitted between at least one transmitter and one receiver, of the type in which the flow of information exchanged between a transmitter and a receiver is cut up into frame blocks belonging to one or more channels, each synchronized frame being separated from the following

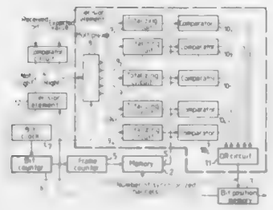
frame by at least one synchronization bit, comprising the steps of:

initially determining pre-supposed synchronization values;

receiving a plurality of bits to be synchronized;

making comparisons with said pre-supposed synchronization values, modulo a number of bits in a frame, and during a predetermined number of frames of the value of each of the bits received;

totalizing results of the comparisons made on each bit in said making comparisons step;



identifying, in the received bits, bit positions modulo the number of bits in a frame for which the totals obtained in said totalizing step are greater than an adjustable threshold value, modulo the number of bits contained in a frame, said threshold value being determined as a function of a number of comparisons already made in said making comparisons step for each bit of a frame and adapted according to probabilities of false alarms and of non-detection which characterize the transmission.

4,860,324

INFORMATION DATA RECOVERING APPARATUS

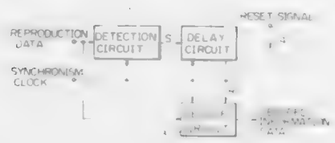
Seiichiro Satomura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1987, Ser. No. 67,958

Claims priority, application Japan, Jul. 3, 1986, 61-157013

Int. Cl.[4] H04B *1/66*

U.S. Cl. 375—122 **11 Claims**



1. An information data recovering apparatus which recovers original information data from transmitted data of (2, 7, 1, 2, 3) Run Length Limited code to which the original information data has previously been converted, comprising:

(a) means for receiving the transmitted data and detecting the data pattern of a train of n data bits of the input transmitted data, where n is an integer of 7 or more;

(b) determination means for outputting a determination signal when a train of data bits having a data pattern including 7 successive data "0"-bits is detected by the receiving and detecting means; and

(c) means for converting the input transmitted data to the original information data when the determination means outputs the determination signal, such that a bit, which is at a position spaced by a predetermined number of bits from the bit being input at a time the determination signal is output, is a border bit of the original information data.

4,860,325

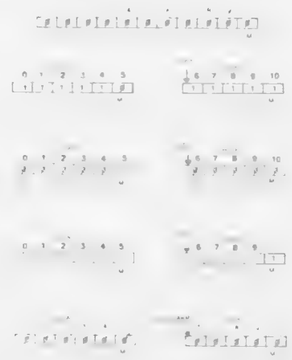
COUNTER TESTER

Percy R. Aria, Sunnyvale, Calif., and Maurice B. Richard, Westbrook, Me., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 24, 1988, Ser. No. 212,213

Int. Cl.[4] H03K *21/40*

U.S. Cl. 377—29 **20 Claims**



1. A method for testing operation of an n-bit counter with carry inputs in an electronic system, the steps comprising:

(a) dividing an n-bit counter into a high section and a low section;

(b) enabling a test bit to force a carry input to the lowest significant bit of said high section;

(c) clocking all states of both sections of said counter, each state of each of said sections being clocked substantially simultaneously with a corresponding state of the other of said sections;

(d) after each clocking operation, determining whether each state of each of said sections operates properly;

(e) disabling said test bit;

(f) after said low section is set at the highest count thereof, clocking said counter once; and

(g) determining whether the lowest significant bit of said high section operates properly.

4,860,326

SOLID-STATE IMAGE PICKUP DEVICE

Hideki Mutoh, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 10, 1988, Ser. No. 269,284

Claims priority, application Japan, Nov. 10, 1987, 62-281991

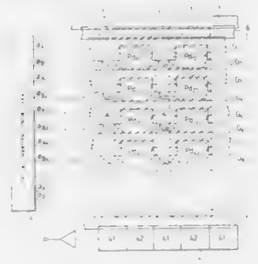
Int. Cl.[4] G11C *19/28;* **H01L** *29/78;* **H03K** *3/42;* **H04N** *3/14*

U.S. Cl. 377—58 **6 Claims**

1. A solid-state image pickup device comprising photoelectric transducer elements arranged in matrix form, vertical transfer routes, and a horizontal transfer route, said solid-state image pickup device further comprising:

vertical transfer control means for simultaneously shifting signal charges generated in said photoelectric transducer elements to said vertical transfer routes, for shifting a

horizontal one-row portion of said vertical transfer routes to said horizontal transfer route, and for alternatively



selecting and vertically transferring a next one-row portion of said signal charges to said horizontal transfer route.

4,860,327

LATCH CIRCUIT CONSTRUCTED WITH MOS TRANSISTORS AND SHIFT REGISTER USING THE LATCH CIRCUITS

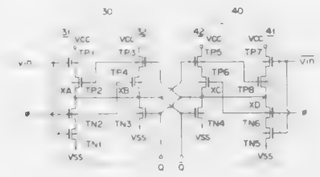
Kaoru Nakagawa, Yokohama, and Katsushi Nagaba, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 2, 1988, Ser. No. 201,187

Claims priority, application Japan, Jun. 3, 1987, 62-139406

Int. Cl.[4] G11C *11/40;* **H03K** *3/356, 23/44*

U.S. Cl. 377—79 **16 Claims**



1. A latch circuit comprising:

a first power source;

a first node;

a first signal output terminal for outputting a first output signal;

first and second transistors of a first conductivity type having current paths which are connected in series between said first power source and said first node, a gate of said first transistor connected for receiving a first input signal, and a gate of said second transistor connected to said first signal output terminal;

a second power source;

third and fourth transistors of a second conductivity type having current paths which are connected in series between said first node and said second power source, a gate of said third transistor connected for receiving a control signal, and a gate of said fourth transistor connected for receiving said first input signal;

a second node connected to said first node;

fifth and sixth transistors of the first conductivity type having current paths which are connected in series between said first power source and said second node, a gate of said fifth transistor connected with said first signal output terminal, and a gate of said sixth transistor connected for receiving said control signal;

a seventh transistor of the second conductivity type connected between said second node and said second power source, a gate of said seventh transistor connected to said first signal output terminal;

a third node connected to said first signal output terminal;

a second signal output terminal connected to said second node, for outputting a second output signal;

eighth and ninth tranistors of the first conductivity type having current paths which are connected in series between said first power source and said third node, a gate of said eighth transistor connected with said second signal output terminal, and a gate of said ninth transistor connected for receiving said control signal;

a tenth transistor of the second conductivity type connected between said third node and said second power source, a gate of said tenth transistor connected to said second signal output terminal;

a fourth node connected to said third node;

eleventh and twelfth transistors of the first conductivity type having current paths which are connected in series between said first power source and said fourth node, a gate of said eleventh transistor connected for receiving a second input signal as the inversion of said first input signal, and a gate of said twelfth transistor connected with said second signal output terminal; and

thirteenth and fourteenth transistors of the second conductivity type having current paths which are connected in series between said fourth node and said second power source, a gate of said thirteenth transistor connected for receiving said control signal, and a gate of said fourteenth transistor connected for receiving said second input signal.

4,860,328

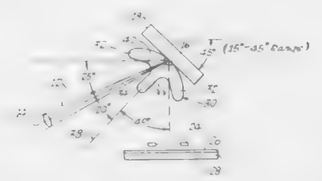
TARGET POSITIONING FOR MINIMUM DEBRIS

Robert D. Frankel, Rochester, and Jerry P. Drumheller, Webster, both of N.Y., assignors to Hampshire Instruments, Inc., Rochester, N.Y.

Filed Aug. 25, 1987, Ser. No. 89,484

Int. Cl.[4] G21K *5/00*

U.S. Cl. 378—34 **29 Claims**



1. In an X-ray system in which X-rays are generated by directing a laser beam towards a target with sufficient energy to create an X-ray emitting plasma, said plasma further emitting debris, said system further including a debris sensitive object to be irradiated, the improvement comprising:

said debris emitted from said plasma including molten droplets emitted in separated angular displacement groups relative to a line normal to said target at said plasma;

means for positioning said object so it is irradiated by said emitted X-rays emitted from between said separated angular displacement groups; and

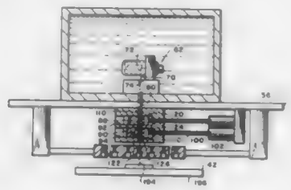
said laser beam being incident to said target along an incident path between said separated angular displacement groups.

4,860,329

X-RAY FLUORESCENCE THICKNESS MEASURING DEVICE

Murray Weiser, Syosset; William Silverman, Melville; Zvi Landau, New Gardens; Paul Finer, Roslyn Heights, and Cary I. Pincus, Wantagh, all of N.Y., assignors to UPA Technology, Inc., Syosset, N.Y.

Filed Feb. 24, 1986, Ser. No. 832,479
Int. Cl.[4] G01B 15/02
U.S. Cl. 378—50 16 Claims



1. In an X-ray fluorescence thickness measuring apparatus means for emitting primary x-radiation along an optical axis;

a plurality of coaligned bores of substantially uniform diameter defining a beam transmission path having a longitudinal axis coincident with said optical axis of said beam of said emitted radiation;

a collimator carriage mounted for movement along a direction substantially transverse to said longitudinal axis and arranged to intercept said optical axis in each position thereof to thereby expose successive portions of said collimator carriage to said beam of said emitted radiation and having a plurality of mounting bores arranged along a path defined by said successive portions;

a plurality of collimator sleeves inserted in said mounting bores of said collimator carriage disposed parallel to said longitudinal axis of said beam transmission path and spaced from each other predetermined distances, said collimator sleeves having predetermined internal diameters to control the extent of the transmission of said X-ray beam through said collimator carriage to a sample to be analyzed;

displacement means for displacing said collimator carriage to coalign a selected one of said collimator sleeves with said longitudinal axis of said X-ray beam transmission path, said displacement means comprising control means for controlling longitudinal displacements of said collimator carriage along said transverse direction;

memory means for storing data representing the positions of said collimator carriage at desired positions thereof corresponding to aligned positions of said collimator sleeves and said longitudinal axis; and

CPU means for processing data in said memory means representing said desired aligned positions and for actuating said control means to move said collimator carriage to said desired aligned positions during analysis of a sample with said apparatus.

4,860,330

METHOD AND APPARATUS FOR MARKING A FILM WITH INFORMATION IN X-RAY PHOTOGRAPHY

Pekka Strömmer, Espoo, and Arto Virta, Vantaa, both of Finland, assignors to Planmeca Oy, Finland

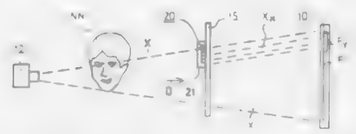
Filed Mar. 23, 1987, Ser. No. 29,315
Claims priority, application Finland, Mar. 21, 1986, 861212
Int. Cl.[4] H05G 1/28
U.S. Cl. 378—162 24 Claims

12. Apparatus for marking a film with information in X-ray photography, simultaneously with exposure of the film, comprising

a secondary blind situated between an object to be photographed and the film,

said secondary blind comprising a set of holes over a direction substantially transverse with respect to a direction of relative movement between the film and an exposure X-ray beam,

a shutter device for selectively opening and closing each said hole,



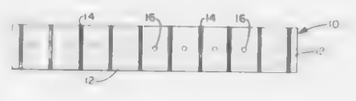
a control/coding unit for controlling said shutter device such that a marking X-ray beam passing through an opened hole outlines markings upon the film in accordance with control by said control/coding unit.

4,860,331

IMAGE MARKER DEVICE

John F. Williams, 4045 N. Oracle Rd., Apt. 237, and Jerry D. Alexander, 4045 N. Oracle Rd., Apt. 258, both of Tucson, Ariz. 85705

Filed Sep. 12, 1988, Ser. No. 242,814
Int. Cl.[4] A61B 17/00
U.S. Cl. 378—163 14 Claims



11. A marker device for indexing internal features of medical patients during image-scanning procedures comprising a flexible plastic tape adapted for attachment to patients, said tape including a rectangular substrate with a plurality of index marking lines and perforated biopsy access holes wherein said index marking lines are equidistant from each other and positioned at right angles to the longitudinal axis of said substrate, and wherein said perforations are between each pair of adjacent index marks on said substrate, wherein said substrate is substantially permeable to scanning waves striking said tape, while said marking lines are substantially impermeable thereto.

4,860,332

APPARATUS FOR THE AUTOMATIC IN-CIRCUIT TESTING OF SUBSCRIBER LINE INTERFACE CIRCUITS AND METHOD THEREFOR

Wayne R. Chism, Greeley, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

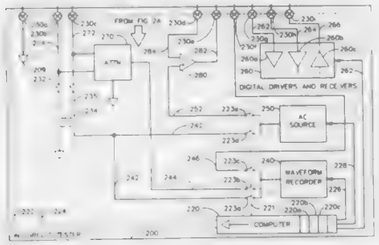
Filed Jul. 19, 1988, Ser. No. 221,062
Int. Cl.[4] H04M 1/24
U.S. Cl. 379—1 12 Claims

1. An automated apparatus for in-circuit testing of a subscriber line interface circuit mounted on a telecommunications card, said subscriber line interface circuit being interconnected with other associated components on said card, said subscriber line interface circuit being capable of generating transmit, telecommunication, hook status, ringing and ring trip signals, said automated apparatus comprising:

means connected to said telecommunications card for electrically isolating said subscriber line interface circuit from said other associated components on said card,

means connected to said electrical isolation means for selectively causing said subscriber line interface circuit to generate said transmit, telecommunication, hook status, ringing and ring trip signals by applying test signals to said subscriber line interface circuit which overdrive any analog or digital signals present on said telecommunications card,

means in said selective causing means for comparing each selectively generated transmit, telecommunication, hook status, ringing and ring trip signals to expected values, and



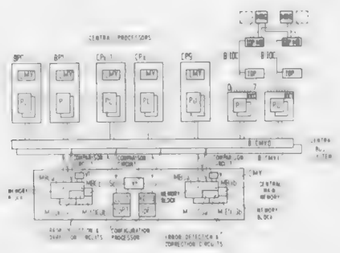
means in said selective causing means for issuing a fail signal when any one of said selectively generated signals does not correspond to said expected value.

4,860,333

ERROR PROTECTED CENTRAL CONTROL UNIT OF A SWITCHING SYSTEM AND METHOD OF OPERATION OF ITS MEMORY CONFIGURATION

Rudolf Bitzinger, Munich; Walter Engl, Feldkirchen; Siegfried Hummi, and Klaus Schreier, both of Penzberg, all of Fed. Rep. of Germany, assignors to Oread Laboratories, Inc., Lawrence, Kans.

Filed Mar. 11, 1987, Ser. No. 24,749
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608245; Jul. 24, 1986, 3625036
Int. Cl.[4] H04M 3/08, 3/22
U.S. Cl. 379—10 18 Claims



10. An error protected, highly reliable multiprocessor central control unit for a switching system, comprising:

a central bus system;

a plurality of central processors, connected in parallel to said central bus system, for processing momentary switching assignments; and

a central memory system, connected to said central bus system in parallel with said plurality of central processors, having a redundant configuration and including:

a memory block pair, comprising: a first and a second memory block operating in synchronous step in parallel during normal periods of operation, apart from a possible tolerable timing slip; and a first and a second memory error detection and correction circuit associated with said first and second memory blocks, respectively, for protecting against errors while data are stored in said first and second memory blocks; and

a memory configuration unit, connected to said memory block pair exclusive of said central bus system, and comprising: a first and a second configuration processor, operating in synchronous step in parallel, apart from a possible tolerable timing slip, each configuration processor controlled by commands and generating processing results; a first and a second processor error detection and correction circuit, associated with said first and second configuration processors, respectively, for individually checking each of said first and second processors; and a processor comparison circuit for continuously comparing the respective commands and/or processing results of said first and second processors; wherein:

said central processors access at least a section of said memory block pair for successive read-out and write operations through said central bus system; and

said memory configuration unit isolates one of said memory blocks from said central bus system in response to an indication from the memory error detection and correction circuit associated with said one of said memory blocks indicating a not-immediately-correctable failure of said one of said memory blocks, whereby the other one of said memory blocks performs said read-out and write operations with said central processors; and said memory configuration unit control correction of the data stored in said one of said memory blocks while said one of said memory blocks is isolated from said central bus system, after said one of said memory blocks is repaired, by reading out correct data from said other one of said memory blocks and writing said correct data into said one of said memory blocks; wherein, if, during this correction, a write operation to said other one of said memory blocks occurs, the data written into said other one of said memory blocks is immediately written into said one of said memory blocks.

4,860,334

SYSTEM FOR DETECTING AND LOCATING DEFECTIVE CROSSPOINT SWITCHES

James E. Kohl, Schenectady, and Donald L. Watrous, Clifton Park, both of N.Y., assignors to Pacific Bell, San Francisco, Calif.

Filed Sep. 23, 1988, Ser. No. 248,405
Int. Cl.[4] H04M 3/26
U.S. Cl. 379—16 12 Claims



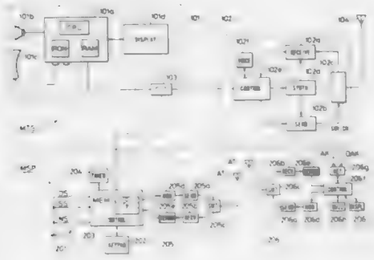
12. An apparatus for detecting and locating defective switches in a call path, said call path comprising an ordered sequence of conductive segments coupled by switches, wherein, when each said switch is in a closed state, said switches connect adjacent said conductive segments to form a conducting path, said conducting segments being electrically isolated when each of said switches is in an open state, said apparatus comprising means for measuring a change in capacitance between a measurement point in said conductive path and ground when a said switch is operated between said open and closed state.

4,860,335

METHOD FOR NOTIFYING OF A CALL ARRIVAL

Makoto Namekawa, Iwaki, Japan, assignor to Alpine Electronics Inc., Japan

Continuation of Ser. No. 881,069, Jul. 2, 1986, abandoned. This application Mar. 24, 1988, Ser. No. 177,876
Claims priority, application Japan, Jul. 9, 1985, 60-150643
Int. Cl.[4] H01Q 7/04
U.S. Cl. 379—58 4 Claims



1. A method for notifying a vehicle owner of a call arrival to a telephone system installed in a vehicle which is also equipped with an anti-theft system of the type having a remote control unit carried by the vehicle owner for remotely operating the anti-theft system, comprising:

providing the telephone system and the anti-theft system in the vehicle, and providing the remote control unit with means for generating a buzzer sound in response to transmission of a call signal from the anti-theft system when the vehicle owner is remote from the vehicle;

placing the telephone system in a call arrival notification mode wherein it generates a call arrival signal upon receipt of an incoming call;

connecting the telephone system and the anti-theft system such that the telephone system inputs the call arrival signal to the anti-theft system when the telephone system receives an incoming call while in the call arrival notification mode;

providing the anti-theft system with a call arrival notification mode wherein, upon input of the call arrival signal from the telephone system, the anti-theft system transmits a call signal to the remote control unit carried by the vehicle owner; and

setting the remote control unit to generate the buzzer sound indicating the call arrival to the vehicle owner remote from the vehicle when the call signal is transmitted from the anti-theft system.

4,860,336

RADIOTELEPHONE CREDIT CARD DATA COMMUNICATIONS

Robert F. D'Avello, Hoffman Estates; Daniel S. Rokusek, Schaumburg, and Francis P. Tobolski, Jr., Algonquin, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 57,478, Jun. 6, 1987, Pat. No. 4,831,647.
This application Jan. 15, 1988, Ser. No. 144,132
Int. Cl.[4] H01Q 7/04
U.S. Cl. 379—63 8 Claims

1. A credit-card radiotelephone responsive to a credit card number for placing telephone calls, said credit-card radiotelephone disposed in a vehicle having a door, said credit-card radiotelephone comprising:

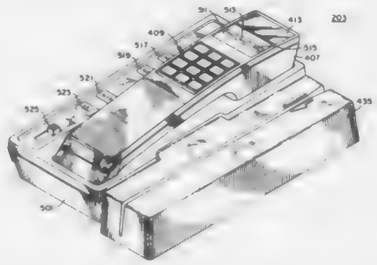
telephone handset means having microphone means with an output, speaker means with an input, and dialing means with an output indicating a dialed number;

radio transceiver means having transmitting means with an input, receiving means with an output, and first control means having an input for electronically locking and unlocking said radio transceiver means, the microphone means output being coupled to the transmitting means input, and the receiving means output being coupled to the speaker means input;

credit card reading means for reading a credit card number and producing an output indicating the read credit card number;

door switch means having an output indicating that the door is open;

hooksawith means for receiving the telephone handset means and having an output indicating that the telephone handset is removed therefrom; and



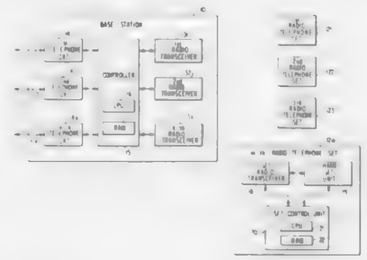
second control means coupled to the credit card reading means output for receiving the read credit card number and determining if the read credit card number is valid, said second control means coupled to the first control means input, hookswitch means output and the dialing means output for electronically unlocking said transceiver means and placing telephone calls when the read credit card number is determined to be valid, and said second control means coupled to the door switch means output for electronically locking said transceiver means when the door is opened.

4,860,337

RAPID PROCESSING OF IMMEDIATELY SUCCESSIVE ARRIVAL SIGNALS IN A BASE STATION OF A RADIO COMMUNICATION NETWORK

Yukihiro Shimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 30, 1988, Ser. No. 213,866
Claims priority, application Japan, Jun. 30, 1987, 62-160961
Int. Cl.[4] H04Q 7/04
U.S. Cl. 379—63 10 Claims



1. In a base station for use in a radio communication network comprising first and second telephone lines and a plurality of radio telephone sets, said base station comprising radio transceivers, and station controlling means coupled to said telephone lines for controlling said radio transceivers to connect said telephone lines to said radio telephone sets through a

control channel and a plurality of communication channels which are given channel codes, respectively, said station controlling means including selecting means coupled to said telephone lines and said radio transceivers and responsive to a first arrival signal arriving at said first telephone line for selecting one of idle transceivers among said radio transceivers as a first selected transceiver and one of idle channels among said communication channels as a first selected channel to make said first selected transceiver send said first arrival signal and the channel code of said first selected channel through said control channel towards said radio telephone sets, and producing means coupled to said telephone lines, said selecting means, and said radio transceivers and responsive to said first arrival signal for producing a first call signal to make said first selected transceiver send said first call signal through said first selected channel towards said radio telephone sets, the improvement wherein:

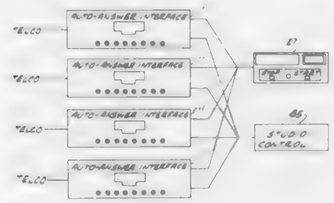
said producing means is furthermore for making said selecting means select another of said idle channels as a second selected channel in response to a second arrival signal arriving at said second telephone line while said first call signal is sent through said first selected channel towards said radio telephone sets, said producing means adding the channel code of said second selected channel to said first call signal to make said first selected transceiver send said first call signal and the channel code of said second selected channel through said first selected channel towards said radio telephone sets.

4,860,338

MULTILINE TELEPHONE ANSWERING SYSTEM AND INTERFACE THEREFOR

Michael I. Waldman, 14180 Forest Crest Dr., Chesterfield, Mo. 63017

Filed Aug. 29, 1986, Ser. No. 902,230
Int. Cl.[4] H04M 1/65
U.S. Cl. 379—68 10 Claims



7. An interface unit for selectively providing interconnection between a telephone line and an audio device such as a playback deck or the like comprising:

connection circuitry for selectively making connection between a telephone line and an audio device, said connection circuitry having three modes of operation;

means for setting the mode of operation of the connection circuitry;

enabling means responsive to the connection circuitry being in a first mode and the presence of a ring signal on the telephone line for putting the connection circuitry in a waiting state;

said connection circuitry including first switching means responsive to a first state of the audio device for making a connection between the telephone line and the audio device only when the connection circuitry is in the first mode and the waiting state;

said connection circuitry further including means independent of the first switching means for making a connection between the telephone line and the device in response to a ring signal when the connection circuitry is in a second mode;

said connection circuitry also including second switching means responsive to an external signal for making a connection between the telephone line and the audio device in response to the external signal, independently of the mode of the connection circuitry as set by the mode setting means; and

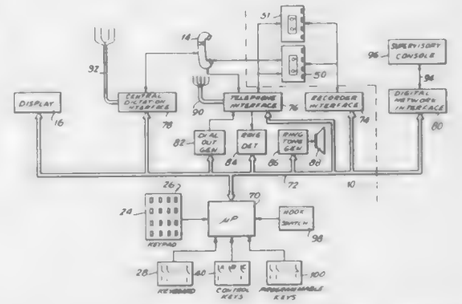
means for inhibiting the enabling means when the connection circuitry is placed in a third mode of operation, without braking a previously existing connection through the connection circuitry between the telephone line and the audio device;

4,860,339

PROGRAMMABLE TELEPHONE/DICTATION TERMINAL AND METHOD OF OPERATING SAME

Nicholas A. D'Agosto, III, Trumbull; David B. Chamberlin, Milford; Jy-Hong Su, Norwalk; Emil F. Jachmann, Greenwich, and Suzanne N. Grey, Springdale, all of Conn., assignors to Dictaphone Corporation, Stratford, Conn.

Filed Aug. 8, 1986, Ser. No. 895,017
Int. Cl.[4] H04M 1/21, 1/272, 1/64, 11/10
U.S. Cl. 379—67 52 Claims



31. A telephone/dictation system disposable in different modes of operation for dictation and for telephone communication, the system comprising:

a supervisory station including means for generating a message;

at least one remote station coupled to said supervisory station and including dictate means for dictation by a user of information for recording and telephone means for initiating and receiving telephone calls, said remote station further including:

display means for displaying in alphanumeric form a message generated at said supervisory station.

36. A method of assigning a desired one of predetermined operating functions to one of plural programmable keys provided in a telephone/dictation terminal such that the operation of that programmable key results in the selection of an operating function carried out by the terminal, said method comprising the steps of:

displaying sets of operating functions that may be carried out by the terminal;

selecting one of the displayed sets;

selecting a desired programmable key; and

entering an identification of a desired operating function, whereby the subsequent operation of the selected programmable key initiates said desired operating function;

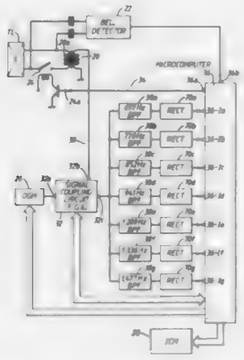
wherein said terminal is coupled to a supervisory station, and said desired operating function is the transmission of a predetermined message to said supervisory station.

4,860,340

DTMF SIGNAL DISCRIMINATING CIRCUIT

Yasuo Suzuki, Kamakura, and Yukihiko Sasaki, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 27, 1987, Ser. No. 30,502
Claims priority, application Japan, Mar. 27, 1986, 61-69232; Mar. 27, 1986, 61-69233; Mar. 31, 1986, 61-73140
Int. Cl.[4] H04M *1/65*
U.S. Cl. 379—74 6 Claims



1. A DTMF signal discriminating circuit for discriminating DTMF signals corresponding to a plurality of predetermined operating modes of the apparatus, a remote control apparatus being connected to a remote source via a transmission line having a variable impedance and the apparatus including OGM signal generating means responsive to an input signal from the remote source for indicating that the apparatus can receive DTMF signals, comprising:

signal coupling means for selectively supplying the OGM signal to the remote source and for receiving the DTMF signals from the remote source, including circuit means for suppressing the OGM signal by compensating for variations in the variable impedance associated with receipt of a signal from said remote source, for substantially preventing operation of the apparatus in any of the predetermined operating modes in response to receipt of the OGM signal by the signal coupling means;

discrimination circuit means for receiving the DTMF signals from the signal coupling means and for extracting frequencies from the received signals; and

microcomputer means responsive to the frequencies extracted by the discrimination circuit means for controlling operation of the apparatus in an operating mode corresponding to the received DTMF signals.

4,860,341

RADIOTELEPHONE CREDIT CARD CALL APPROVAL SYNCHRONIZATION

Robert F. D'Avello, Hoffman Estates; Francis P. Tobolski, Jr., Algonquin, and Joseph L. Kowalski, Fox River Grove, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 57,402, Jun. 2, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 310,499
Int. Cl.[4] H04M *1/57*
U.S. Cl. 379—91 6 Claims

1. A method of mobile radiotelephone call processing in a radiotelephone call processing in a radiotelephone system which utilizes a registration computer to approve call changes to a mobile radiotelephone unit user's credit card, the credit card having stored identification and information such as expiration data resident in the credit card, comprising the steps of:

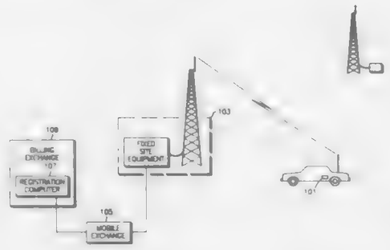
reading the credit card stored identification and information when the credit card is slid through a card reader at the mobile radiotelephone unit;

comparing said read credit card stored identification to information which is stored at the mobile radiotelephone unit and which identifies at least a last valid credit card identification and a last invalid credit card identification;

placing said mobile radiotelephone unit in a locked condition if said comparison indicates a match between said read credit stored identification and said last invalid credit card identification;

placing said mobile radiotelephone unit in a unlocked condition if said comparison indicates a match between said read credit card stored identification and said last valid credit card identification;

checking the card expiration data from the credit card stored information if a match is not found for either valid or invalid credit card identification and transmitting at least a portion of the read credit card stored identification and information to a registration computer;



receiving one of a plurality of data messages, said plurality of data messages including a data message containing service approval information and a data message containing service denial information

placing said read credit card stored identification in said last invalid credit card identification memory in the mobile radiotelephone unit if said service denial information data message is received;

placing said read credit card stored identification in said last valid credit card identification memory in the mobile radiotelephone unit if said service approval information data message is received and enabling system access to allow a telephone call;

terminating said telephone call upon the radiotelephone user's indication of the end of the telephone call; and

locking said mobile telephone unit in response to a lock trigger.

4,860,342

COMPUTER-TELEPHONE INTERFACE METHOD AND APPARATUS

David L. Danner, 1806 T St., N.W., Washington, D.C. 20009

Filed Apr. 9, 1987, Ser. No. 36,333
Int. Cl.[4] H04M *11/00, 1/56*
U.S. Cl. 379—96 21 Claims

1. A communication system for coupling to a telephone line comprising:

a microprocessor housing;

a microprocessor located within said microprocessor housing;

a keyboard having a plurality of alphanumeric data entry keys comprising a full alphanumeric key set in a non-orthogonal typewriter array in communication with said microprocessor;

memory means located within said microprocessor housing and in communication with said microprocessor for controlling the operation of said microprocessor;

random access memory means located within said microprocessor housing and in communication with said microprocessor for temporary storage of data;

communication bus means in communication with said microprocessor for communicating data and instructions to a device remote from said microprocessor;

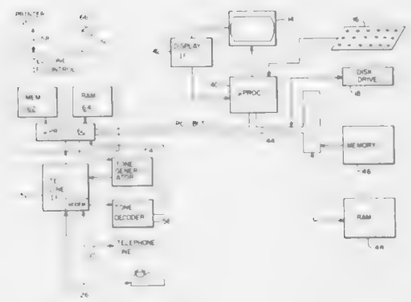
television display means, including plural display lines, in communication with said microprocessor for displaying selected visual data to a user of the system;

telephone line interface means located within said microprocessor housing for coupling to a telephone line, said telephone line interface means including means for receiving electrical signals from and providing electrical signals to a telephone line, including an off-hook signal to maintain a telephone line connection;

dialing means operatively connected to said telephone line interface means for selectively providing signals representing telephone dialing digits to said telephone interface means;

telephone line interface control means located within said microprocessor housing for controlling the operation of said telephone line interface means, said control means comprising:

a control microprocessor in communication with said communication bus means;



control memory means in communication with said control microprocessor for controlling the operation of said control microprocessor; and

control random access memory means in communication with said control microprocessor for temporary storage of data;

a telephone instrument having a speaker for converting electrical signals received from said telephone line interface means to audio signals and having a microphone for converting audio signals to electrical signals to be provided to said telephone line interface means;

tone decoding means operatively connected to said telephone line interface means for decoding selective electrical signals received from said telephone line at said telephone interface means into a predetermined set of digital signals and having an associated memory means for saving a plurality of said digital signals; and

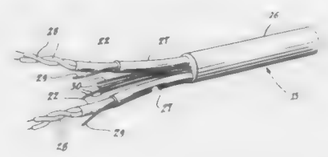
display interface means for converting a selected portion of said display lines which can be anywhere on said display means into signals representing a telephone number to be dialed; whereby a user selects any section of the display means as said selected portion of said display lines, causes a desired telephone number to be displayed within said portion of said display lines and causes said system to place a telephone call to the desired telephone number.

4,860,343

COMPOSITE CABLE FOR USE IN HIGH FREQUENCY DATA AND VOICE TRANSMISSION

Maurice F. Zetena, Jr., P.O. Box 59, Bridgewater, Conn. 06752

Continuation of Ser. No. 944,827, Dec. 22, 1986, Pat. No. 4,761,811. This application May 5, 1988, Ser. No. 190,361
The portion of the term of this patent subsequent to Aug. 2, 2005, has been disclaimed.
Int. Cl.[4] H01B *11/02*
U.S. Cl. 379—110 5 Claims



1. A low capacity, controlled impedance cable for use in a long distance networking system for interconnecting a plurality of computer terminals with a host computer or controller, said cable including

a plurality of sets of twisted pairs, said sets including at least one set of data pairs, each said set of data pairs being encased in a conductive shielding to form a shielded unit, a drain wire associated with each said set of data pairs and held in contact with said conductive shielding for its respective said set, and said shielded units being isolated from one another,

the wires in said twisted pair for data transmission having sufficiently thick insulation about them to provide for such spacing therebetween that the capacity is no greater than about 8.0 picofarads/foot dielectric constant,

said shielded units being encased within an outer casing.

4,860,344

CIRCUIT ARRANGEMENT FOR TELECOMMUNICATIONS SWITCHING SYSTEMS, PARTICULARLY TELEPHONE SWITCHING SYSTEMS, ETC.

Herbert Jans, Neuried; Klaus Brandmaier, Taufkirchen, and Siegfried Pohl, Oberschleissheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 894,763, Aug. 8, 1986, abandoned. This application May 16, 1988, Ser. No. 195,412
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1985, 3529171
Int. Cl.[4] H04M *3/36*
U.S. Cl. 379—113 3 Claims

1. In a circuit arrangement for causing acceptance or rejection of processing requests for an information-processing sequential logic system of a telecommunications switching system, which logic system has a limited call-handling capability with respect to its information-processing capacity, in which a traffic measuring device identifies the information-processing traffic load of the information-processing sequential logic system caused by processing requests, in which a rejection device serves for defense against such overloads is provided in which a critical limit value can be set based on the measuring of the identified information-processing traffic load, and in which different urgency degrees of different types of processing requests have different urgency values individually assigned thereto, the improvement comprising:

means for comparing the individual urgency values to the critical limit value and producing an acceptance character when the urgency value is greater than the critical limit value, or for producing a rejection character if the urgency value is less than the critical limit and if addition of

a residual acceptance value in a type associated residual acceptance value storage means produces an overflow; and

means for accepting or rejecting the processing requests in response to the acceptance and rejection characters for processing by the sequential logic system so that processing requests having above-average urgency are taken into consideration with a certain priority over processing



requests having below-average urgency with respect to their processing in the sequential logic system,

said type associated residual acceptance value storage means storing said residual values representing a percentage of each type of each request to be rejected, and accumulating said residual values for each type of request in respective counter storage areas to reject the request when the counter storage area overflows and accept the request when there is no overflow.

4,860,345

TELEPHONE SYSTEM AND METHOD OPERATED FROM CENTRAL OFFICE LOOP CURRENT

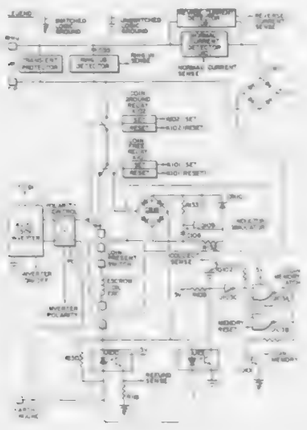
Regis B. Mellon, Mulberry, Fla., assignor to Protel, Inc., Lakeland, Fla.

Division of Ser. No. 944,568, Dec. 22, 1986. This application Jul. 11, 1988, Ser. No. 217,375

The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

Int. Cl.[4] H04M *17/00, 1/06*

U.S. Cl. 379—123 **3 Claims**



1. A coin telephone for interconnection with a central office to conduct certain coin telephone functions and adapted for operation free of any local power supply, said coin telephone comprising:

a hook switch;

first circuit means for interconnecting said telephone with tip-and-ring conductors of the central office and for permitting central office loop current to flow through said telephone while said hook switch is in an off-hook condition;

an escrow relay for coins deposited in said coin telephone;

second circuit means for conducting coin telephone functions in said coin telephone, including control of said escrow relay; and

third circuit means including a charge storage device electronically coupled with said first and second circuit means for deriving a direct current component from said loop current, charging said storage device and powering said second circuit means including said escrow relay.

4,860,346

TELEPHONE SYSTEM AND METHOD OPERATED FROM CENTRAL OFFICE LOOP CURRENT

Regis B. Mellon, Mulberry, Fla., assignor to Protel, Inc., Lakeland, Fla.

Filed Dec. 22, 1986, Ser. No. 944,568

Int. Cl.[4] H04M *17/00, 19/00*

U.S. Cl. 379—155 **22 Claims**



1. Telephone apparatus for coupling to tip and ring conductors of a telephone network, in which loop current is transmitted along said conductors from a central office in said network and through said telephone apparatus responsive to an off-hook condition, said telephone apparatus comprising means for powering said telephone entirely from said loop current during said off-hook condition and means for maintaining the flow of said loop current after termination of said off-hook condition, wherein said tip and ring conductors comprise a coin trunk.

4,860,347

PHONE SCREEN SECURITY SYSTEM

Lloyd M. Costello, 1832 N. Baltimore, Tacoma, Wash. 98406

Filed Aug. 10, 1988, Ser. No. 230,362

Int. Cl.[4] H04M *1/66*

U.S. Cl. 379—199 **1 Claim**

1. A phone screen security system for blocking unwanted incoming phone calls and unauthorized outgoing phone calls, comprising:

a housing;

outside connection means in said housing for connection with an outside phone line;

pick up circuit means in said housing for detecting a ring signal on said outside phone line;

voice synthesizer means in said housing for requesting a security code input from a caller on said outside phone line;

relay means actuated by said pick up circuit means for connecting said voice synthesizer means to said outside phone line;

programmable code detect means for comparing a tone signal from said outside phone line with a programmed security code;

said code detect means actuated by said voice synthesizer means;

timing circuit means connected to said code detect means and said pick up circuit means for disconnecting said outside phone line after a predetermined time interval if a correct security code is not detected;

said code detect means actuating said voice synthesizer means to inform a caller of a correct security code input;

line select relay means connected to a plurality of inside phone lines;

relay means activated by said code detect means for connecting said outside phone line to said line select relay means;



ringer means for sending a ring signal to one of said plurality of said inside phone lines;

a power connection on said housing for connection with a conventional source of 120 VAC;

transformer means in said housing for reducing said 120 VAC to 48 VAC;

power supply means in said housing for dividing said 48 VAC into 24 VDC supply to said line select relay means and 96 VAC to said ringer means;

a four position switch connected to said line select relay means;

said switch having an OFF position in which said inside phone lines are connected to said outside phone lines;

said switch having an AUTO position in which said inside phone lines are connected to said pick up circuit means and bypass said code detect means;

said switch having a CODE position in which said inside phone lines are connected to said code detect means and a correct security code must be input to access said outside phone line; and

said switch having a PROGRAM position which connects said inside phone lines for programming respective security codes into said programmable code detect means.

4,860,348

MODULAR JACK PANEL CONSTRUCTION

Paul V. DeLuca, Plandome Manor, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Aug. 11, 1988, Ser. No. 230,876

Int. Cl.[4] H01R *9/24*

U.S. Cl. 379—327 **2 Claims**



1. A telephone modulator jack panel construction comprising:

a unitary housing including a forward wall, a rear wall, a bottom wall, and first and second upper walls disposed in offset parallel relation, a vertical wall interconnecting said first and second upper walls to form a recess of generally rectangular cross-section when said housing is arranged in stacked vertical relation upon a mainframe; said rear wall being substantially smaller area than said forward wall and extending from said bottom wall to said second upper wall; a plurality of multi-contact plug elements mounted upon said second upper wall and facing said recess; and a plurality of jack-receiving plug elements having exposed open ends projecting through corresponding openings on said forward wall, and having rear ends electrically communicating with said multi-contact plug elements.

4,860,349

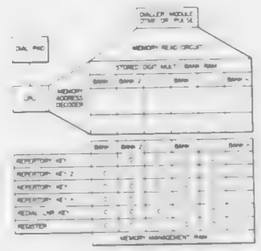
TELEPHONE MEMORY CONTROLLER ARRANGEMENT

Anthony K. D. Brown, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 25, 1988, Ser. No. 276,123

Int. Cl.[4] H04M *1/274*

U.S. Cl. 379—356 **9 Claims**



1. A memory storage assembly for use in telephones having automatic redial capability, the storage assembly comprising:

(a) a series of memory banks, each bank being capable of retaining a dialled telephone number;

(b) a series of redial actuators; and,

(c) a memory management unit comprised in part by a series of binary cells equal in number to the number of redial actuators multiplied by the number of memory banks, each binary cell being uniquely associated with a respec-

tive one of the redial actuators and a respective one of the memory banks, a first value being placed into a binary cell to indicate an association between a respective one of the redial actuators and a respective one of the memory banks, the memory management unit selecting one of the memory banks at the commencement of the dialling of each telephone number for the storage of that number and placing a first value into the binary cell uniquely associated with that memory bank and with a predefined one of the redial actuators, actuation of any other of the redial actuators after the dialling of the telephone number resulting in the memory management unit placing a first value into the binary cell uniquely associated with the selected memory bank and the other redial actuator;

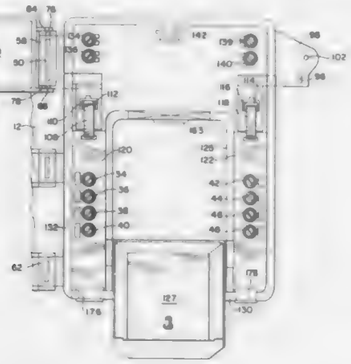
whereby, following the return to the on-hook state of a telephone having the memory storage assembly, the actuation of the predefined one of the redial actuators during the following off-hook state of the telephone results in the redialling of the last telephone number dialed, and the alternate actuation of any other one of the redial actuators during that off-hook state results in the redialling of the telephone number in that memory bank which has a first value in the binary cell uniquely associated with that any other one of the redial actuators.

4,860,350

RETROFIT NETWORK INTERFACE APPARATUS

Thomas J. Smith, 1722 Asharoken Blvd., Bay Shore, N.Y. 11706

Filed Aug. 1, 1988, Ser. No. 226,662
Int. Cl.[4] H04M *9/00*
U.S. Cl. 379—412 **15 Claims**



1. A retrofit telephone network interface apparatus providing limited access for the owner of premises having a telephone subscriber loop termination disposed thereon providing complete access by telephone service employees, said retrofit apparatus being suitable for cooperating with existing station overvoltage protector installations, comprising:

(a) a base member having;

(i) a generally open top with a closed portion extending over a portion of said existing station protector apparatus when installed.

(ii) a circumscribing wall portion, said wall portion including at least two outwardly extending C-shaped portions for receiving an elongated bar member in the open portion thereof, and

(iii) a bottom portion having an opening therein for receiving and engaging with said existing station protector;

(b) a first and second set of terminals disposed in said base member, said first set of terminals being adapted to be connected to said premises owner's subscriber loop termination and said second set of terminals being adapted to be connected to the telephone company owned portion of said subscriber loop;

(c) mating plug and socket members disposed in said base member having electrical contacts therein adapted to be electrically and mechanically engaged and disengaged with each other;

(d) first means for electrically connecting said plug means to said first set of terminals and second means for electrically connecting said socket to said second set of terminals; and

(e) cover means, said cover means being provided with,

(i) at least two outwardly extending bar members adapted to be received by and cooperate with said outwardly extending C-shaped portions to provide a complete invasive free cover for said open top base member,

(ii) said extending bar members including at least one longitudinally extending protrusion, and

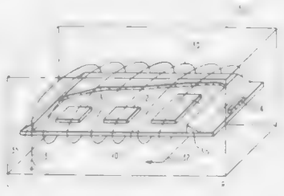
(iii) shield means, said shield means being provided with means for receiving and cooperating with said bar members' extending protrusion and having a portion adapted to cover at least said second set of terminals but not said first set of terminals.

4,860,351

TAMPER-RESISTANT PACKAGING FOR PROTECTION OF INFORMATION STORED IN ELECTRONIC CIRCUITRY

Steve H. Weingart, Peekskill, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Nov. 5, 1986, Ser. No. 927,298
Int. Cl.[4] H01L *23/02;* **H05K** *5/02;* **H04L** *9/00*
U.S. Cl. 380—3 **13 Claims**



1. A tamper resistant package for protecting information stored in an electronic circuit comprising:

sensing means distributed about said electronic circuit for sensing an intrusion, said sensing means including:

means for distributing electromagnetic energy about said electronic circuit,

means for detecting said energy distribution including:

a sensor,

a clock,

sample and hold circuit means coupled to said sensor and clocked periodically by said clock to sample and store an output of said sensor,

a comparator with at least one input subjected to a signal from said sample and hold circuit means and another input from said sensor,

and impairing means for impairing said electronic circuit or the information stored therein in response to an indication from said comparator of an intrusion into said enclosure.

4,860,352

SATELLITE COMMUNICATION SYSTEM AND METHOD WITH MESSAGE AUTHENTICATION SUITABLE FOR USE IN FINANCIAL INSTITUTIONS

Joel E. Laurance, Gaithersburg, and Walter M. Stewart, Potomac, both of Md., assignors to Satellite Financial Systems Corporation, Gaithersburg, Md.

Filed May 20, 1985, Ser. No. 736,093
Int. Cl.[4] H04K *9/00*
U.S. Cl. 380—23 **51 Claims**

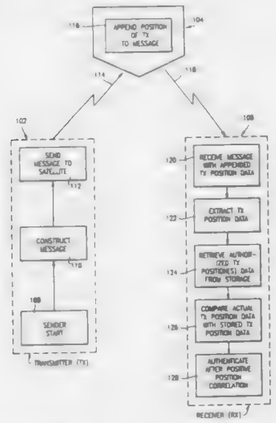
1. A radio communication system for communicating an authorized user message from a first transmitting antenna location to a second receiving antenna location, which comprises:

(a) first means for transmitting the authorized user message from the first antenna location;

(b) transmission source location system means comprising:

(1) message receiving means for receiving the authorized user message form said first means,

(2) position determining means for determining the actual position of the first antenna location by receiving the authorized user message over a plurality of difference communication paths to produce by triangulation transmitter position data from the differences between the communication paths, and



(3) retransmitting means for transmitting over the same communication channel the authorized user message having said transmitter position data appended thereto; and

(c) second means at the second location comprising:

(1) utilization means for receiving from said transmission source location system means the authorized user message with said transmitter position data appended thereto, and

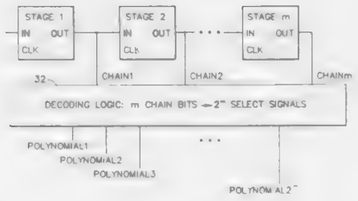
(2) means for comparing said transmitter positioned data with an authorized position data to authenticate the authorized user message received from said transmission source location system means, whereby the determination of said transmitter antenna position data by said transmission source location system means introduces an independently verifiable message authentication parameter.

4,860,353

DYNAMIC FEEDBACK ARRANGEMENT SCRAMBLING TECHNIQUE KEYSTREAM GENERATOR

David S. Brown, Encinitas, Calif., assignor to General Instrument Corporation, New York, N.Y.

Filed May 17, 1988, Ser. No. 194,850
Int. Cl.[4] H04L *9/04*
U.S. Cl. 380—44 **25 Claims**



1. A keystream generator, comprising

a feedback shift register structure, having input, intermediate and output stages through which data bits are shifted serially in response to a clock signal, a plurality of logic elements respectively located between predetermined pairs of register stages, means for feeding the data bit shifted from the output stage into the input stage and into predetermined ones of the logic elements in accordance with a polynomial code, wherein the logic elements process a data bit shifted from the preceding stage with the data bit fedback from the output stage in accordance with the polynomial code for input into the succeeding register stage;

means for processing the data bits shifted from a predetermined stage to provide a keystream; and

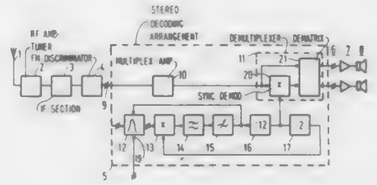
means for varying the polynomial code by applying to the logic elements an enabling polynomial code signal that varies in accordance with the content of data bits shifted from a predetermined register stage.

4,860,354

ARRANGEMENT FOR DECODING A STEREO MULTIPLEX SIGNAL

Arthur H. M. van Roermund, Eindohoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Nov. 30, 1987, Ser. No. 126,381
Claims priority, application Netherlands, Dec. 22, 1986, 8603249
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—7 **4 Claims**



1. An arrangement for decoding a stereo multiplex signal, comprising a baseband stereo sum signal (L+R), a stereo difference signal (L−R) which is amplitude-modulated on a suppressed sub-carrier and a pilot signal having a frequency located between the frequency bands of said sum and difference signals, said arrangement having an input for the stereo multiplex signal and left and right stereo signal outputs, said input being coupled both via a pilot selection circuit to a phase-locked loop for regenerating the sub-carrier and to a multiplier circuit for multiplying at least the moduled stereo difference signal (L−R) by the regenerated sub-carrier, characterized in that the pilot selection circuit comprises a bandpass filter of the switched capacitor type, a clock input of which is coupled to an output of a voltage-controlled oscillator incorporated in the phase-locked loop, wherein a phase transfer of said bandpass filter varies at least at the pilot signal frequency in dependence upon a mono-stereo control signal.

4,860,355

METHOD OF AND DEVICE FOR SPEECH SIGNAL CODING AND DECODING BY PARAMETER EXTRACTION AND VECTOR QUANTIZATION TECHNIQUES

Maurizio Copperi, Venaria, Italy, assignor to Cselt Centro Studi e Laboratori Telecomunicazioni S.P.A., Turin, Italy

Filed Oct. 15, 1987, Ser. No. 109,500
Claims priority, application Italy, Oct. 21, 1986, 67792 A/86
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—36 **6 Claims**

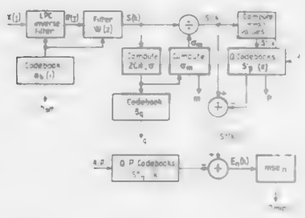
1. Method of speech signal coding and decoding, said speech

signal being subdivided into time intervals and converted into blocks of digital samples x(j), characterized in that for speech signal coding each block of samples x(j) undergoes a linear-prediction inverse filtering operation by choosing in a codebook of quantized filter coefficient vectors $a_M(i)$, the vector of index h_{opt} forming the optimum filter, and then undergoes a filtering operation according to a frequency weighting function W(z), whose coefficients are said vector $a_M(i)$ of the optimum filter multiplied by a factor λ^i, with λ constant, thus obtaining a filtered residual signal S(j) which is then subdivided into filtered residual vectors S(k) for each of which the following operations are carried out:

a zero-crossing frequency ZCR and a r.m.s. value of said vector S(k) are computed;

depending on values ZCR, σ, vector S(k) is classified by an index q ($i \leq q \leq Q$) which identifies one out of Q areas of plane (ZCR, σ);

r.m.s. value σ is quantized on the basis of a codebook of quantized r.m.s. value σ_m and vector S(k) is divided by quantized r.m.s. value σ_m with index m, thus obtaining a



first normalized filtered residual vector S'(k) which is then subdivided into Y subgroups of vectors S'(y), ($1 \leq y \leq Y$);

a mean value of the components of each subgroup of vectors S'(y) is then computed, thus obtaining a vector of mean values S'(x), with X=K/Y components, which is quantized by choosing a vector of quantized mean values Sp'(x) of index p ($1 \leq p \leq P$) in one of Q codebooks identified by said index q, thus obtaining a quantized means value Sp'(x);

the quantized means vector Sp'(x) is subtracted from said first vector S'(k), thus obtaining a second normalized filtered residual vector S''(k) which is compared with each vector in one out of Q·P codebooks of size N identified by said indices thus obtaining N quantization error vectors $E_n(k)$, ($1 \leq n \leq N$), for each of the latter a mean square error mse_n being computed, index n_{min} of the vector of the codebook which has generated the minimum value of mse_n, together with indices relevant to each filtered residual vector S(k) and with said index h_{opt}, forming the coded speech signal for a block of samples x(j).

4,860,356

ADAPTIVE EXTREMA CODING SIGNAL PROCESSING SYSTEM

Arie Visser, Reston, Va., assignor to Extrema Systems International Corp., Reston, Va.

Filed Feb. 22, 1988, Ser. No. 158,681
Int. Cl.[4] G01L *5/00*
U.S. Cl. 381—41 38 Claims

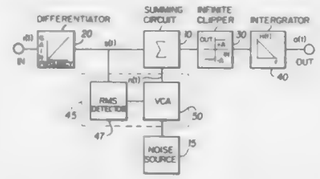
1. An apparatus for processing an analog signal comprising:

means for detecting the times of occurrence of minimum and maximum values of said analog signal, thereby producing a detected signal;

means for providing substantially random noise to said analog signal or said detected signal, said noise being superimposed thereon and having a broadband spectrum having frequencies in a frequency range substantially higher than the highest frequency in said analog signal;

means coupled to said means for detecting for encoding only said times of occurrence of minimum and maximum values of said analog signal in the presence of said noise as an encoded signal, said encoding means having a bandwidth greater than the bandwidth of said analog signal, said encoded signal containing information to enable substantial reproduction of said analog signal therefrom;

said means for providing substantially random noise to said analog signal or said detected signal comprising noise source means, and further comprising gain control means comprising amplifier means and detector means, said detector means having an input provided with said analog



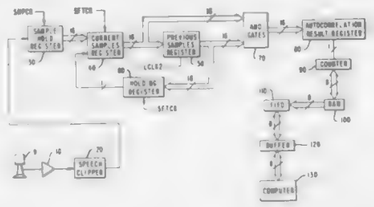
signal or said detected signal, and having an output related to an average value of the power in said analog signal or detected signal, said average value signal being provided as a control input to said amplifier means, said amplifier means having an input coupled to an output of said noise source means, said amplifier means further having an output coupled as an input to said means for encoding, whereby said amplifier means varies the amplitude of said output of said noise source means in dependance on the average value of said analog signal or detected signal.

4,860,357

BINARY AUTOCORRELATION PROCESSOR

James M. Avery, Austin, Tex., assignor to NCR Corporation, Dayton, Ohio

Filed Aug. 5, 1985, Ser. No. 762,234
Int. Cl.[4] G10L *9/08, 7/08;* G06F *15/336*
U.S. Cl. 381—41 2 Claims



1. An autocorrelation processor for speech signals comprising:

converting means for converting a speech signal to a binary signal;

means for combining a first occurring portion of said binary signal with a second occurring portion of said binary signal in an autocorrelation process to form a frame of autocorrelated binary signals;

counting means coupled to said combining means for counting the number of binary signals of one binary value contained in a frame of autocorrelated binary signals to form autocorrelation coefficients from the sum of said binary signals produced by said counting means; and

a memory coupled to said counting means for storing a number of the formed autocorrelation coefficients for future use;

wherein said means for combining is comprised of:

a current samples register for receiving and storing, in parallel, sequential occurring portions of said binary signal and for providing at its output, upon receipt of a most current sample at its input, a previous sample which is a previously received current sample;

a previous samples register for receiving the previous sample from said current samples register, wherein said previous samples register has a parallel output, and said current samples register is a parallel-in, parallel-out, shift register with a serial data bit input for shifting its output in response to serial data bits;

logic means coupled to the output of said current samples register and the output of said previous samples register for indicating the concurrence of like binary values within a previous sample portion and a current sample portion of said binary signal to form a frame of autocorrelated binary signals; and

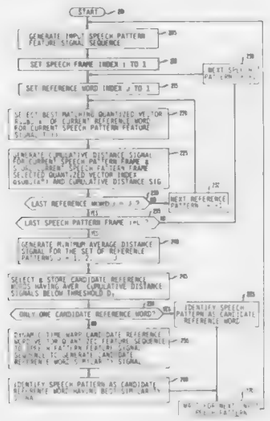
a parallel-to-serial holding register having its input coupled to the output of said previous samples register and its output coupled to said serial data input of the current samples register and for serially providing at its output the signals received from said previous samples register.

4,860,358

SPEECH RECOGNITION ARRANGEMENT WITH PRESELECTION

Lawrence R. Rabiner, Berkeley Heights, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 531,354, Sep. 12, 1983, abandoned. This application Dec. 18, 1987, Ser. No. 134,491
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—43 3 Claims



1. A method for recognizing a speech pattern, of the type comprising the steps of

storing for each reference utterance, for each of a plurality of training trials of such utterance, a reference subpattern set of acoustic feature signals without time-sequence information,

deriving from an input utterance containing the speech pattern to be recognized an input subpattern set of acoustic feature signals without time-sequence information during each time frame into which said utterance is divided to yield sets suitable for comparison with the reference sets,

comparing said input subpattern set of acoustic feature signals with each reference subpattern set of acoustic feature signals to yield a plurality of similarity signals, and

making a recognition decision regarding said similarity signals, said method being characterized in that the storing step includes

storing for each reference utterance, for each of a plurality of training trials of such utterance, a reference pattern set of acoustic feature signals including time-sequence information, each said reference pattern set being associated with the corresponding said reference subpattern set,

deriving for the said input utterance an input pattern set of acoustic feature signals including time-sequence information, said input pattern set being associated with the corresponding said input subpattern set, and

the step of making a recognition decision includes the steps of

setting a similarity signal threshold which will be satisfied or exceeded for a plurality of the reference subpattern sets (hereinafter the candidate reference subpattern sets) during the comparing step, and

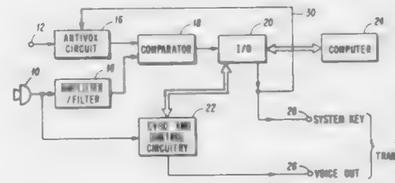
comparing by dynamic programming each of the reference pattern sets corresponding to the candidate reference subpattern sets with the said input pattern set to determine which is most similar thereto.

4,860,359

METHOD OF VOICE OPERATED TRANSMIT CONTROL

David E. Eicher, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 15, 1984, Ser. No. 660,822
Int. Cl.[4] G10L *7/08*
U.S. Cl. 381—46 2 Claims



1. A method of voice operated transmit control (VOX) for an electronic transceiver, comprising the steps of:

converting audio energy into a corresponding electronic analog signal;

generating a delayed digital signal corresponding to said analog signal;

generating an anti-VOX signal corresponding to a signal received by the transceiver;

comparing said analog signal with said anti-VOX signal and generating a trigger signal comprising a function of said analog signal and said anti-VOX signal;

programmably analyzing said trigger signal to detect a wave shape corresponding to a voice component of said audio energy;

providing a keying signal upon detection of said wave shape to enable transmission of said delayed digital signal by the transceiver; and

feeding back said keying signal to inhibit generation of said anti-VOX signal during transmission of said delayed digital signal by the transceiver.

4,860,360

METHOD OF EVALUATING SPEECH

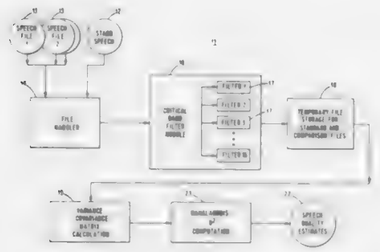
George J. Boggs, Weston, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 6, 1987, Ser. No. 34,505
Int. Cl.[4] G10L *9/08*
U.S. Cl. 381—48 16 Claims

1. A method of evaluating the quality of speech in a voice communication system comprising:

selecting a digital file of undistorted speech representative of a speech standard satisfying specified criteria for said voice communication system;

selecting a sample file of speech carried by said voice communication system for qualitative comparison with said file of standard speech, said sample file including at least one possibly distorted speech sample;
inputting said standard speech file and said sample speech file into an evaluative speech processor;
processing said files through a plurality of critical bandpass filters having filter parameters representative of the bandpass characteristics of said voice communication system



and of human auditory activity obtained from empirical observations;
storing temporarily the power spectra obtained from said standard speech file and said sample speech file, said power spectra providing a set of distorted-standard speech pairs;
calculating a variance-covariance matrix from said set of distorted-standard speech pairs, wherein diagonal elements for each matrix are calculated according to

$$MSW_p = \frac{\Sigma\,(N_k - 1)\,(S_{kp})^2}{N_1 + N_2 - 2}.$$

where MSW is the mean square within, N_k is the number of observations in the kth vector, and S_{kp}^2 is the pooled variance over the set of observations, and off-diagonal elements are calculated by

$$MSW_{pp'} = \frac{\Sigma\,(N_k - 1) r_{pp'} S_{kp} S_{kp'}}{N_1 + N_2 - 2}.$$

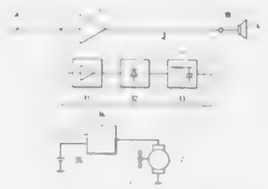
where $r_{pp'}$ is the pooled correlation coefficient, and S_{kp} and $S_{kp'}$ are the pooled standard deviations for the k vectors;
processing Mahalanobis' D^2 Calculation data by the equation:

$$D^2 = (X_2)\Sigma_{xx}^{-1}(X_1 - X_2),$$

where
X_1 and X_2 are the sample mean vectors, and Σ_{xx}^{-1} is the inverse of the variance-covariance matrix; and
outputting said D^2 data, which represents the speech quality estimate of said sample speech file.

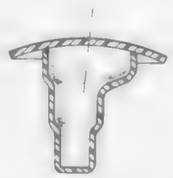
4,860,361
ACOUSTIC-DEVICE COOLING UNIT
Takeshi Sato; Hiroo Adachi, and Shigeru Munetomo, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Sep. 2, 1988, Ser. No. 239,731
Claims priority, application Japan, Sep. 2, 1987, 62-134997[U]
Int. Cl.[4] H03G *11/00*
U.S. Cl. 381—55 4 Claims

1. A cooling unit for cooling an acoustic device with a cooling fan, which comprises:
a cooling fan drive circuit for outputting a DC voltage corresponding to an input or output signal level of said acoustic device; and



a cooling fan motor which is driven by the DC voltage provided by said cooling fan drive circuit.

4,860,362
HEARING AID AND METHOD FOR MAKING IT
Allan F. Tweedle, Linden, N.J., assignor to Siemens Hearing Instruments, Inc., Piscataway, N.J.
Filed Sep. 8, 1987, Ser. No. 94,235
Int. Cl.[4] H04R *25/02;* B29C *65/00;* B32B *31/18*
U.S. Cl. 381—69 5 Claims



1. A method of manufacturing an ITE hearing aid, comprising the following steps:
manufacturing a shell with a non-planar circumferentially extending mating surface;
manufacturing a non-planar faceplate having an inner curved surface; and
securing the inner curved surface of the faceplate to the shell at the circumferentially extending mating surface thereof.

4,860,363
LOUDSPEAKER SYSTEM
Hitoshi Suzuki; Kozo Hara; Shiro Koga, and Shigeru Morita, all of Fukushima, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 849,829, Apr. 9, 1986, abandoned. This application Mar. 18, 1988, Ser. No. 171,224
Claims priority, application Japan, Apr. 12, 1985, 60-77744; Jun. 24, 1985, 60-135956
Int. Cl.[4] H04R *5/02*
U.S. Cl. 381—89 9 Claims

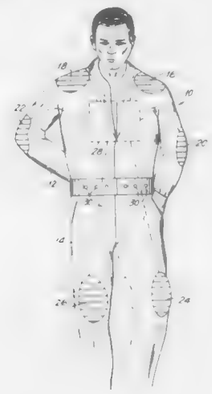
1. A loudspeaker unit, comprising:
a first speaker mounted in the unit, having a first sound projection axis and a sound reproduction bandwidth;
a second speaker mounted in the unit in a vertical direction with respect to said first speaker, having a sound reproduction bandwidth the same as said first speaker and a second sound projection axis, the first and second sound projection axes forming a projection angle therebetween in a horizontal direction; and

phase shifting means, operatively connected to said first speaker, for phase shifting the sound produced by said first



speaker compared to the sound produced by said second speaker by a phase angle.

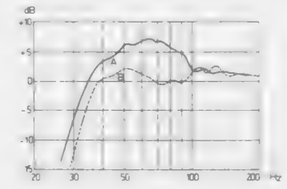
4,860,364
SOUND GENERATING OUTERWEAR AND ASSOCIATED SWITCHES
Giancarlo Giannini, Via Giuseppe Mercalli 46, Rome, Italy
Filed Sep. 17, 1984, Ser. No. 651,865
Int. Cl.[4] G10H *5/00;* H04R *1/02*
U.S. Cl. 381—90 11 Claims



1. A sound generating outer garment, comprising an outer garment which is a jacket; a plurality of switches mounted in said jacket, a switch being positioned at each shoulder and at each elbow of said jacket; and sound generating means for generating a sound, said sound generating means being mounted in said outer garment, each of said switches being connected to said sound generating means, said sound generating means generating a sound in response to actuation of one of said switches.

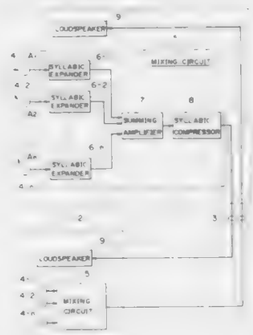
4,860,365
METHOD OF FRACTIONATING THE SOUND RESTORATION OF MODULATED SIGNALS IN PARALLEL MOUNTED TRANSDUCERS, AND SETS OF CORRESPONDING TRANSDUCERS
Clement Eloise-Pillerault, 8 a 10, rue du Plateau, 94700 Maisons-Alfort; Claude Benoit, and Vincent Benoit, both of 11, rue de Lorraine, 92600 Asnieres, all of France
Filed Oct. 21, 1987, Ser. No. 110,938
Claims priority, application France, Oct. 21, 1986, 86 14583
Int. Cl.[4] H03G *5/00;* H04R *1/02*
U.S. Cl. 381—90 15 Claims

1. A method for sound restoration from electric signals that have components in a given frequency range of acoustic frequencies that uses a set of electro-acoustic transducers that are formed by mounting at least one loudspeaker in a resonant enclosure and connecting it to an output of an electric source, said method comprising the steps of:
distributing resonance frequencies of at least two loudspeakers along said frequency range at different resonance frequencies;
mounting each loudspeaker in an enclosure that has approximately the same resonance frequency as the loudspeaker to form a transducer;



overcoupling each of said transducers so that each loudspeaker and enclosure obtains a minimum impedance for said resonance frequency; and
connecting said transducers in parallel across said source so that each transducer primarily restores a portion of said frequency range about its resonance frequency.

4,860,366
TELECONFERENCE SYSTEM USING EXPANDERS FOR EMPHASIZING A DESIRED SIGNAL WITH RESPECT TO UNDESIRED SIGNALS
Yuzo Fukushi; Hitoshi Fuda, and Taisuke Sasada, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Jul. 31, 1987, Ser. No. 79,971
Claims priority, application Japan, Jul. 31, 1986, 61-181328; Jul. 31, 1986, 61-181332
Int. Cl.[4] H03G *7/00*
U.S. Cl. 381—106 8 Claims



1. A teleconference system comprising in a first conference room:
a plurality of microphones for collecting speech energies from various sources in said first conference room so that the utterance of sound to one of said microphones produces a highest level output signal therefrom and lower level output signals from the other microphones;
a plurality of expanders connected respectively to said microphones, each of said expanders amplifying a higher level signal with a higher gain than it amplifies a lower level signal so that a first ratio between the highest level output signal from one of said expanders and an output signal from each of the other expanders is greater than a

second corresponding ratio between said highest level output signal from said one of said microphones and each of said lower level output signals from said other microphones;

a summing amplifier for summing output signals from said expanders;

a compressor for amplifying an output signal from said summing amplifier with a variable gain inversely as a function of the level of an output signal from said compressor so that the levels of said output signals of said expanders are respectively compressed with an equal ratio, and transmitting said output signal of said compressor through a channel to a second conference room; and

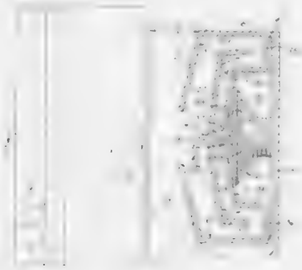
a loudspeaker for receiving a signal transmitted from said second conference room.

4,860,367

LOW FREQUENCY LOUD SPEAKER

Carl R. Hook, Peachtree Apts., #100 Berry Hill Rd., Columbia, S.C. 29210

Filed Apr. 15, 1988, Ser. No. 181,966
Int. Cl.[4] G10K *11/02*
U.S. Cl. 381—156 14 Claims



1. A speaker used adjacent two mutually perpendicular intersecting planes which planes interface and cooperate to form a part of the speaker which speaker comprises

(a) a diaphragm for generating sound waves having a front and a back which front faces one of the two intersecting planes;

(b) a means for driving the diaphragm to produce sound waves;

(c) a back air chamber surrounding the back of the diaphragm for partially enclosing a volume of air behind the diaphragm and for receiving the sound waves produced by the back of the diaphragm;

(d) a venting means centered on the front of the diaphragm and extending above and below the diaphragm for receiving the sound waves from the front of the diaphragm and from the back air chamber; and

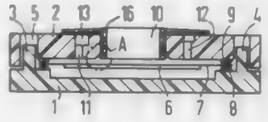
(e) a horn having a throat centered on the venting means and opposite the diaphragm to receive the sound waves issuing through the venting means from the diaphragm and the back air chamber, which horn has a mouth communicating with the throat for receiving the sound waves and projecting the sound waves out of the mouth and which horn has a means for spacing the mouth by a fixed distance a from at least one of the two intersecting planes so that a space is defined between the mouth and the at least one of the intersecting planes into which space the sound waves are projected from the horn, so that the mouth of the horn is extended by the space bounded by the at least one intersecting planes.

4,860,368

ACOUSTIC TRANSDUCERS WITH IMPROVED FREQUENCY RESPONSE

Ernst Payer, Puchheim, and Hans Schierl, Steinhoering, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 20, 1987, Ser. No. 87,324
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1986, 3630951
Int. Cl.[4] H04R *1/28, 17/00*
U.S. Cl. 381—159 5 Claims



1. An improved acoustic transducer having a transducer plate coated with a piezoelectric coating and clamped between upper and lower housing components, said upper housing component having a central sound transmitting opening, the improvement comprising:

said upper housing component defining at least two further openings being coupled openings extending to an antechamber above said transducer plate,

said upper housing component further defining generally annular channels open at one side and provided connected to said upper housing component,

a covering plate having a central opening and commonly closing said coupling openings and said channels from an exterior of said upper housing,

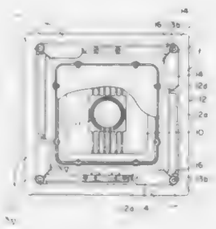
said covering plate having a cylindrical projection adjoining said central opening of said covering plate, said cylindrical projection engaged into said central sound transmitting opening of said upper housing component.

4,860,369

FLAT SPEAKER UNIT

Katsumi Koshimura, Tokyo, and Akio Koike, Tokorozawa, both of Japan, assignors to Kabushiki Kaisha Seidenko, Tokyo, Japan

Filed Apr. 9, 1987, Ser. No. 36,340
Int. Cl.[4] H04R *1/02*
U.S. Cl. 381—188 8 Claims



1. A flat speaker unit comprising:

a speaker frame having a mounting flange connectable to a wall surface and having a front portion, a back portion and a connecting portion on an inner periphery of the speaker frame;

a total-drive type flat speaker, mounted to the connecting portion, comprising a plurality of magnets juxtaposed on a plane surface and a diaphragm formed from a plurality of projections for respectively covering said plurality of magnets;

a rod-like screw member mounted within at least one opening in the speaker frame so as to pass through the speaker frame from the front portion towards the back portion;

at least one swinging blade adjacent to the back portion of the speaker frame and having a proximal end and a distal tip portion, wherein the proximal end of each blade has a threaded aperture so to threadedly engage the rod-like screw member, and wherein each blade has a length such that when said blade is radially swung outward from the speaker frame the distal tip portion thereof extends outwardly from the speaker frame; and

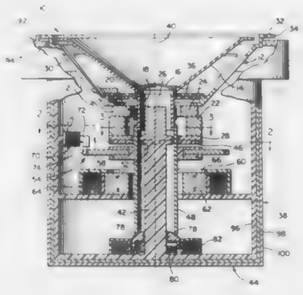
at least one coil spring disposed between each swinging blade and the back portion of the speaker frame wherein said coil spring abuts the back portion of the speaker frame and the proximal end of the swinging blade, and encircles the rod-like screw member, so as to exert axial and rotational forces on the swinging blade.

4,860,370

MAGNETICALLY SUSPENDED ACOUSTICAL SPEAKER

Gregory Grosbard, 16353 NW. 57th Avenue, Miami, Fla. 33014

Filed Feb. 12, 1988, Ser. No. 155,601
Int. Cl.[4] H04R *9/04*
U.S. Cl. 381—197 21 Claims



1. In combination with a loudspeaker having an enclosure, a diaphragm, means mounted by the enclosure for driving said diaphragm in response to an electrical signal applied thereto and means for supporting the diaphragm in operative relation to the driving means comprising, means mounted within the enclosure for producing a magnetic field, and magnetic armature means connected to the diaphragm for suspension thereof physically independent of the enclosure by coaction with the magnetic field.

4,860,371

METHOD AND APPARATUS FOR DETECTING PATTERN DEFECTS

Yukio Matsuyama, and Toshiaki Ichinose, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

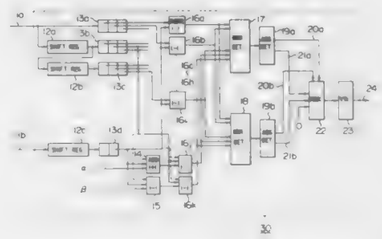
Filed Jul. 22, 1987, Ser. No. 76,213
Claims priority, application Japan, Jul. 28, 1986, 61-175502
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—8 11 Claims

1. A method of detecting pattern defects comprising the steps of:

detecting images of corresponding portions of two patterns which are originally identical to each other and registering two image signals representative of said images;

shifting a second image signal of the two registered image signals by a predetermined number of pixels with respect to a first image signal in X and Y directions defining scanning for said two registered image signals, thus providing shifted second image signals and calculating differences in brightness between said first image signal and said second image signals within intervals corresponding to pixels on one scanning line, thus providing a first group of difference image signals;

adding and subtracting preset values to and from one of said first and second image signals to provide a sum image signal and a subtraction image signal and calculating differences in brightness between the other of said first and second image signals and each of said sum and subtraction image signals within said intervals to provide a second group of at least two difference image signals;



deciding normality when said first group of difference image signals and said second group of difference image signals have coexistent positive and negative signs within one interval and calculating a minimum of absolute values of said first group of difference image signals and said second group of difference image signals when said first group of difference image signals and said second group of difference image signals have all either positive signs or negative signs within one interval; and

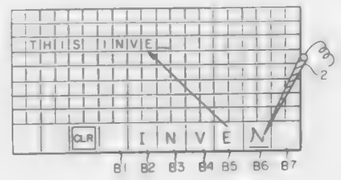
detecting the minimum as a true defect when said minimum exceeds a predetermined threshold.

4,860,372

REAL TIME HANDWRITTEN CHARACTER INPUT SYSTEM

Soshiro Kuzunuki, Katsuta; Hiroshi Shojima, Hitachi; Masaki Miura, Hitachi; Junko Mori, Hitachi, and Toshimi Mifune, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 19, 1986, Ser. No. 897,836
Claims priority, application Japan, Aug. 28, 1985, 60-187258
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—13 13 Claims



1. A handwritten character input system for a handwritten character recognizing device, comprising:

character input/display buffer areas to which a plurality of handwritten characters can be inputted and on which recognized characters of said inputted handwritten characters can be displayed;

a first cursor pointer for indicating an input buffer area for a handwritten character to be next inputted, among said character input buffer areas;

a character recognizing unit connected to said buffer areas for recognizing a handwritten character inputted to each of said buffer areas;

a recognized character display area connected to said char-

acter recognizing unit for displaying all characters recognized by said character recognizing unit;

a second cursor pointer for indicating a display position for a recognized character to be next displayed, within said recognized character display area; and

process means connected to all of the above constituent elements for recognizing, in response to the start of a new handwritten character input to the input buffer area after the input buffer area indicated by said first cursor pointer, a handwritten character in the input area indicated by said first cursor by means of said character recognizing unit, displaying said recognized character on the display positions of said buffer area and said recognized character display area indicated by said first and second pointers, and renewing the contents of said first and second cursor pointers for said new handwritten characters;

wherein said first cursor pointer has a function of cyclically indicating said buffer area, and said process means clears the display corresponding to the buffer area indicated by the renewed content of said first cursor pointer to thereby enable an endless input of handwritten characters in said buffer areas without the need for periodic operation of an "execution" or "enter" key; and

wherein said process means clears not only the content of the input buffer area indicated by the renewed content of said first cursor pointer but also the content of the input buffer area where a next handwritten character is written.

4,860,373

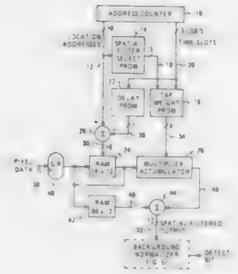
LOCATION DEPENDENT SIGNAL PROCESSOR

Mac L. Hartless, Sauquoit, and Alan L. Johnson, Utica, both of N.Y., assignors to General Electric Company, Utica, N.Y.

Filed Mar. 31, 1986, Ser. No. 845,961

Int. Cl.[4] G06K *9/30*

U.S. Cl. 382—41 **10 Claims**



1. A signal processor for use with a multi-pixel array for detecting point sources of radiant energy in the presence of background noise, comprising:

address means for sequentially addressing the pixels of said array in predetermined order such that each pixel in turn becomes the output pixel;

background pixel selection means responsive to said address means for selecting a plurality of background pixels surrounding said output pixel and together comprising at least one mask centered on said output pixel as the output pixel is sequenced from pixel to pixel of the array;

means for storing a plurality of sets of weight values for the background pixels of said mask with the weight values of such sets being dependent on the location of said output pixel on the array, the weight values of each such set for output pixel locations at which any of the surrounding background pixels comprising said mask lie outside the adjacent edge of the array being zero for all members of that set corresponding to such off-array pixels;

weight selection means responsive to said address means for selecting the one of said stored weight sets appropriate to the present location of said output pixel and selecting sequentially from such one set the stored weight value to be applied to each background pixel of said mask;

multiplier-accumulator means for multiplying each background pixel value by its selected weight value and accumulating the results of such multiplications for all background pixels of said mask; and

means for applying to the output pixel signal the output of said multiplier-accumulator means to provide a processor output free of initialization and wrap-around effects.

4,860,374

APPARATUS FOR DETECTING POSITION OF REFERENCE PATTERN

Seiro Murakami, Tokyo; Akikazu Tanimoto; Susumu Makinouchi, both of Yokohama; Hidemi Kawai, Kawasaki, and Masaichi Murakami, Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

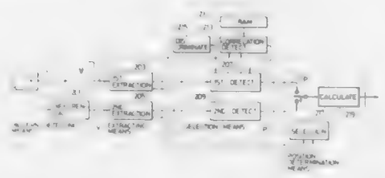
Continuation of Ser. No. 723,307, Apr. 15, 1985, abandoned.

This application Jul. 6, 1988, Ser. No. 218,503

Claims priority, application Japan, Apr. 19, 1984, 59-79061; Apr. 24, 1984, 59-82453

Int. Cl.[4] G06K *9/20*

U.S. Cl. 382—48 **7 Claims**



1. An apparatus for detecting a position of a substrate on which a reference pattern is formed, the reference pattern having at least two opposing edges and a plurality of grating elements arranged at a predetermined pitch along the two edges, comprising:

means for supplying a spot of a light beam onto said substrate;

means for scanning the reference pattern by said spot along a scanning line crossing the two edges;

means for receiving a part of the light beam diffracted by said edges and generating a time-serial output signal corresponding to the reference pattern on the scanning line, the output signal having an output waveform including two bottom portions respectively corresponding to the two edges and a peak between the bottom portions;

means for amplifying the output signal and having a nonlinear amplification characteristic wherein a gain at the bottom portions is larger than that at the peak;

means for adjusting said amplification characteristic on the basis of an evaluation of the output waveform; and

means for detecting the position of the reference pattern with respect to the scanning line from the output signal amplified by said amplifying means, wherein said position is determined at the center of the interval between said two bottom portions.

4,860,375

HIGH SPEED CELLULAR PROCESSING SYSTEM

David L. McCubbrey, and Robert M. Lougheed, both of Ann Arbor, Mich., assignors to Environmental Research Inst. of Michigan, Ann Arbor, Mich.

Filed Mar. 10, 1986, Ser. No. 837,770

Int. Cl.[4] G06K *9/54*

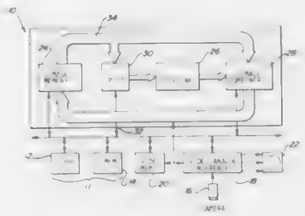
U.S. Cl. 382—49 **13 Claims**

1. A cellular data processing system for analyzing one or more images each comprising a matrix of points, each point being represented by digital image data, said system comprising:

an image memory for storing an array of digital image data corresponding to at least one image;

a pipeline processor including at least one substantially identical neighborhood transformation stages, each neighborhood transformation stage having means for receiving a serial stream of digital image data corresponding to a raster scan of a matrix of points of a selected first input image and producing a serial stream of digital image data corresponding to a raster scan of the matrix of points of a transformed image, each point in said transformed image corresponding to said digital image data of a corresponding point of said selected first input image and a predetermined plurality of points of said selected first input image in the neighborhood of said corresponding point of said selected first input image;

an image combiner connected to said pipeline processor for



performing a selected one of a predetermined set of arithmetic, logical and conditional operations for combining a serial stream of digital image data of a second selected input image with corresponding digital image data of said transformed image thereby forming a serial stream of digital image data corresponding to a combined image;

a source data bus connected to said image memory, said pipeline processor and said image combiner for supplying said serial stream of digital image data corresponding to said selected first input image from said image memory to said pipeline processor and said serial stream of digital image data corresponding to said selected second input image from said image memory to said image combiner; and

a destination data bus connected to said image memory and said image combiner for supplying said serial stream of digital image data corresponding to said combined input image from said image combiner to said image memory for storage therein.

4,860,376

CHARACTER RECOGNITION SYSTEM FOR OPTICAL CHARACTER READER

Hideaki Tanka, Osaka; Morikiro Katsurada, Nara, and Minehiro Konya, Osaka, all of Japan, assignors to Sharp Kabushiki Skaisha, Osaka, Japan

Filed Mar. 4, 1988, Ser. No. 164,347

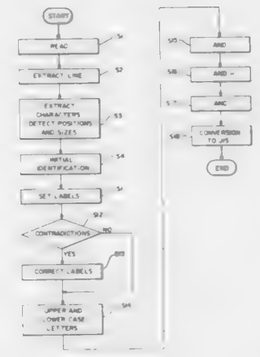
Claims priority, application Japan, Mar. 4, 1987, 62-49172

Int. Cl.[4] G06K *9/03*

U.S. Cl. 382—57 **2 Claims**

1. In a character recognition system for an optical alphanumeric character reader for recognizing characters by reading a pictorial image, extracting therefrom a line image, extracting therefrom character images of individual characters, and matching said character images with dictionary patterns, the improvement wherein said system comprises

label setting means for determining relative positions of the highest and lowest positions of individual extracted characters in a character array, assigning an upper label and a lower label to each of said individual extracted characters according to said highest and lowest positions, correspondence between each of alphanumerical characters and symbols and its upper and lower labels being predefined, correcting, if the result of initial character identification of a character in said character array by said optical character reader contradicts with said upper or lower label assigned to said character, said assigned upper or lower label to the labels corresponding to said recognized character, and storing said corrected labels and result of recognition in a memory means, and



judging means for checking whether there is a contradiction between said corrected labels stored by said label setting means and the results of initial character identification by said optical character reader regarding a preselected set of characters and symbols, and correcting, if there is such a contradiction, said results of initial character identification according to said upper and lower labels in said contradiction.

4,860,377

HAND SCANNER INPUT SYSTEM AND A SHEET USED IN HAND SCANNER INPUT SYSTEM

Toshinori Ishigaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

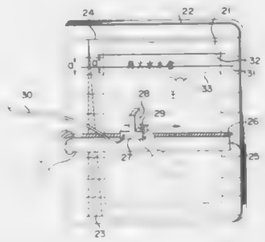
Continuation of Ser. No. 792,571, Oct. 29, 1985, abandoned.

This application Jun. 2, 1988, Ser. No. 201,264

Claims priority, application Japan, Oct. 30, 1984, 59-228510

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—59 **10 Claims**



1. A scanner input system, comprising:

a mark having first and second edges which are not parallel, said mark being continuous;

scanning means for repetitively slice-scanning a document sheet and said mark in a direction perpendicular to said first edge;

storing means for storing a plurality of data corresponding to the slice-scanned portions of said mark which are repetitively scanned by said scanning means; and

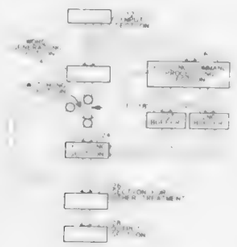
data manipulating means for manipulating the data in said storing means to align a slice-scanned portion of said mark to a prior slice-scanned portion of said mark such that said first and second edges do not overlap each other.

4,860,371

TEXT FORMATTING APPARATUS

Toshihisa Aoki, and Sotoji Watanabe, both of Tokyo, Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 26, 1987, Ser. No. 67,565
Claims priority, application Japan, Jun. 27, 1986, 61-151300
Int. Cl.[4] G06K 9/20
U.S. Cl. 382—61 7 Claims



1. Apparatus for formatting a flow of text with justified margins, comprising:

means for storing characters in the text that are designated therein as being characters that are not to appear at a line extremity,

means for building a formatted line of characters in accordance with said text,

means for comparing a character at an extremity of said formatted line with at least some of the stored characters, and

means for replacing a character at said extremity of said line with a character other than a stored character if the character at the extremity of the line is one of the stored characters.

4,860,379

DATA COMMUNICATIONS SYSTEM

Carl F. Schoeneberger, and Allan B. Bundens, both of Carrollton, Tex., assignors to General Instrument Corporation, New York, N.Y.

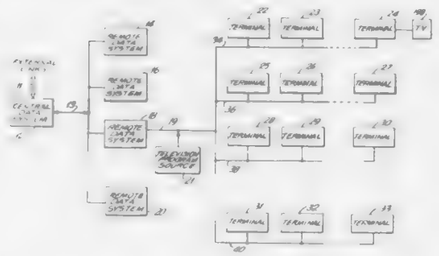
Continuation of Ser. No. 127,571, Dec. 2, 1987, abandoned, which is a continuation of Ser. No. 617,142, Jun. 4, 1984, abandoned, which is a continuation of Ser. No. 540,913, Oct. 12, 1983, abandoned, which is a continuation of Ser. No. 359,515, Mar. 18, 1982, abandoned, which is a continuation of Ser. No. 40,466, May 18, 1979, abandoned. This application Oct. 20, 1988, Ser. No. 262,245
Int. Cl.[4] H04B 3/50
U.S. Cl. 455—5 25 Claims

1. A communications system for remote data acquisition and control comprising;

a central data processing system, a plurality of remote data processing systems in communication with said central data processing system and a plurality of remote user terminals each in communication with one of said remote data processing sytems, wherein:

the central data processing system comprises first computer means for processing, storing and retrieving data, and first communication means having multiple channels for two-way data communication with each of said remote data processing systems;

said each remote processing system comprises second computer means for generating and processing data to monitor and control the operation of each of a group of said plurality of remote user terminals, said second computer means being programmed for generating control data to control the operation of each of said remote user terminals and processing response data from each of said remote user terminals to monitor the operation of said each of said remote user terminals, and second communication means for two-way data communication with said remote data processing system and with each of said group of said remote user terminals, including means for transmitting said control data to said each in said group of said remote



user terminals and means for receiving said response data from said each in said group of said remote user terminals; and

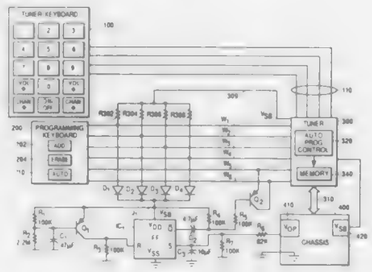
each of said plurality of remote user terminals comprises means for receiving said control data from one of said remote data processing systems, means for generating response data in response to said control data and means for transmitting said response data to said one remote data processing system.

4,860,380

AUTOPROGRAMMING TUNER APPARATUS

William H. Mengel, Marlton, N.J., assignor to General Electric Company, Fairfield, Conn.

Continuation of Ser. No. 80,274, Jul. 31, 1987. This application Jan. 19, 1989, Ser. No. 298,856
Int. Cl.[4] H04B 11/16
U.S. Cl. 455—185 11 Claims



1. In a receiver having autoprogramming means for performing an autoprogramming function of sequentially tuning a receiver through a range of channels and storing data related to achieve channels in memory means, apparatus for automatically controlling said autoprogramming means comprising:

a source of operating power energized when said receiver is turned on by a user;

a source of standby power having an energized state when said receiver is connected to a main source of AC power, and having a deenergized state when said receiver is not connected to said main source of AC power;

means coupled to said source of standby power for detecting

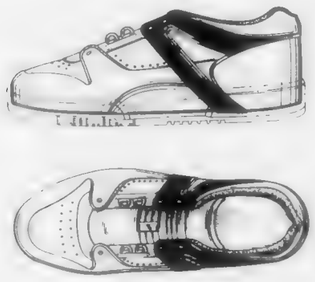
a transition of standby power from said deenergized state to said energized state;

said data stored in said memory means being maintained when said source of operating power is deenergized;

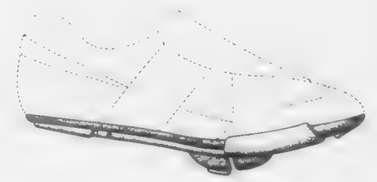
means coupled to said source of operating power for detecting energization of said receiver by a user; and

means coupled to said standby power transition detector means and to said receiver energization detection means for automatically causing the start of said autoprogramming function in response to the sequence of said detection of said transition of standby power and said first energization of said receiver by said user after said detection of said transition of standby power, and for preventing the automatic start of said autoprogramming function until after the next occurrence of said transition of standby power.

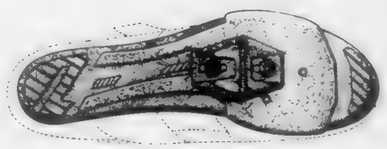
302,898
SHOE UPPER
Robert Y. Greenberg, Woodland Hills, Calif., assignor to L.A. Gear, Inc., Los Angeles, Calif.
Filed Oct. 22, 1987, Ser. No. 111,976
Term of patent 14 years
U.S. Cl. D2—314



302,900
SHOE SOLE
Kenneth R. Kolman, Lake Oswego; Michael J. Nyberg; Richard W. Cody, both of Tualatin, all of Oreg., and Rory W. Fuerst, Menlo Park, Calif., assignors to Avia Group International, Inc., Portland, Oreg.
Filed Nov. 3, 1988, Ser. No. 266,498
Term of patent 14 years
U.S. Cl. D2—317



302,899
ELEMENT OF A SHOE UPPER
Paul D. Brown, Hingham, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Sep. 12, 1988, Ser. No. 243,652
Term of patent 14 years
U.S. Cl. D2—314







302,901
SHOE SOLE
Shigeyuki Mitsui, Kobe, Japan, assignor to Asics Corporation, Hyogo, Japan
Filed May 5, 1987, Ser. No. 46,337
Claims priority, application Japan, Nov. 5, 1986, 61-43660
Term of patent 14 years
U.S. Cl. D2—320





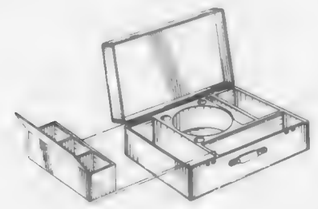
302,902
SKI CASE
Larry J. Kaufman, 5511 Springcreek Rd., Tyler, Tex. 75703
Filed Feb. 4, 1986, Ser. No. 827,368
Term of patent 14 years
U.S. Cl. D3—36



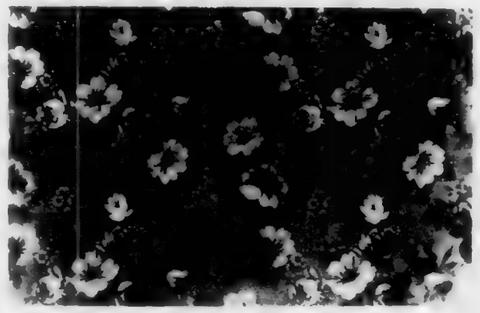
302,903
COMBINED BEACH BAG AND RADIO
Thomas J. Johnston, 1466 Dogwood Cir., Mechanicsville, Md. 20659
Filed May 2, 1986, Ser. No. 859,244
Term of patent 14 years
U.S. Cl. D3—43



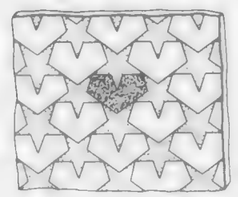
302,904
CARRYING CASE FOR PICNIC SUPPLIES
Fred O. Dunkfeld, Jr., Box 28, Newberry, Mich. 49868
Continuation-in-part of Ser. No. 694,834, Jan. 25, 1985. This application Oct. 13, 1987, Ser. No. 107,894
Term of patent 14 years
U.S. Cl. D3—74



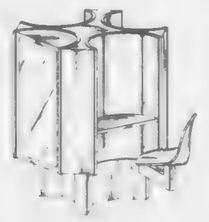
302,905
TEXTILE FABRIC OR SIMILAR ARTICLE
Gerolamo Etro, Milan, Italy, assignor to Etro S.p.A., Milan, Italy
Filed Nov. 21, 1986, Ser. No. 933,775
Claims priority, application Italy, May 21, 1986, 21921B
Term of patent 14 years
U.S. Cl. D5—37



302,906
TEXTILE FABRIC
Louis le Brocquy, 28 Ovoca Road, Dublin 8, Ireland
Division of Ser. No. 128,576, Dec. 4, 1987, Division of Ser. No. 701,098, Feb. 12, 1985. This application Aug. 24, 1988, Ser. No. 236,621
Term of patent 14 years
U.S. Cl. D5—41

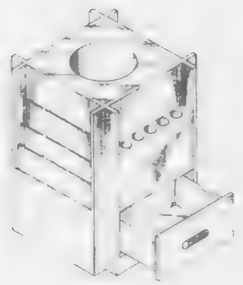


302,907
CLUSTER TYPE TELEPHONE BOOTH
Thomas J. Otto, Gower, and Stevens V. Pinkerton, Jr., St. Joseph, both of Mo., assignors to Acoustics Development Corporation, St. Joseph, Mo.
Filed Jul. 23, 1986, Ser. No. 889,481
Term of patent 14 years
U.S. Cl. D6—337

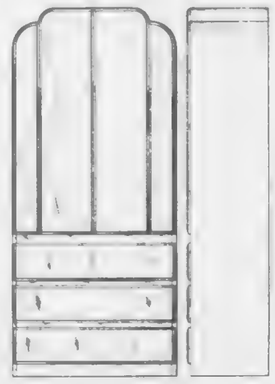


302,908
COMBINED CABINET AND MULTIPLE STORAGE UNIT
Jeng-Tsu Hwang, No. 3, Kuo-Tai Street, Taichung, Taiwan
Filed Jul. 3, 1986, Ser. No. 882,106
Term of patent 14 years
U.S. Cl. D6—397

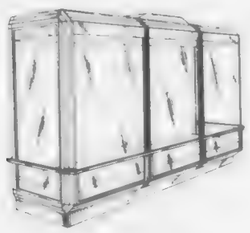




302,909
ARMOIRE
Albert Azzolina, 4 Catalpa La., Valley Stream, N.Y. 11581
Filed Apr. 15, 1987, Ser. No. 38,590
Term of patent 14 years
U.S. Cl. D6—446

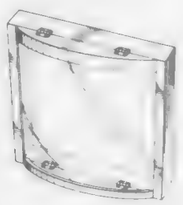


302,910
REFRIGERATED DISPLAY CASE
Pierre Cocagne, Villa Izalean, Abetze 64210, Bidart, France
Filed Apr. 7, 1986, Ser. No. 850,377
Claims priority, application France, Oct. 16, 1985, 854823
Term of patent 14 years
U.S. Cl. D6—470



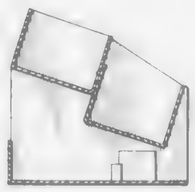


302,911
DISPLAY CASE WITH FOLDABLE EXTENSION PLATES
Yen Pei-ai, 5F No. 1, Lane 130, Chaochow St., Taipei, Taiwan
Continuation-in-part of Ser. No. 753,268, Jul. 9, 1985, abandoned. This application Feb. 11, 1986, Ser. No. 828,352
Claims priority, application China, Sep. 21, 1985, 74201527
Term of patent 14 years
U.S. Cl. D6—472

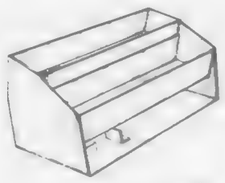


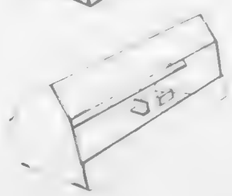
302,912
LABEL BOX DISPLAY CASE
Daniel C. Heisel, R.D. 3, Box 144, Hollsopple, Pa. 15935, assignor to Daniel C. Heisel, Hollsopple, Pa.
Filed Oct. 8, 1986, Ser. No. 916,850
Term of patent 14 years
U.S. Cl. D6—476











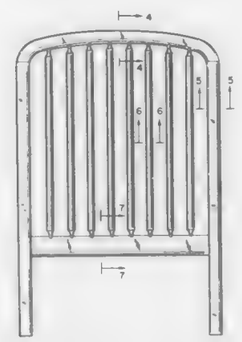
302,913
END TABLE
Leon Rosen, Scarsdale, N.Y., assignor to The Pace Collection, Inc., Long Island City, N.Y.
Filed Mar. 1, 1982, Ser. No. 353,194
Term of patent 14 years
U.S. Cl. D6—489



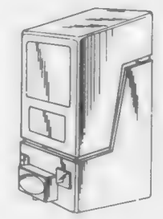
302,914
SEGMENTED SPACER FOR LINKING DESK UNITS
Thomas J. Newhouse, Grand Rapids, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.
Filed Oct. 14, 1986, Ser. No. 918,794
Term of patent 14 years
U.S. Cl. D6—491



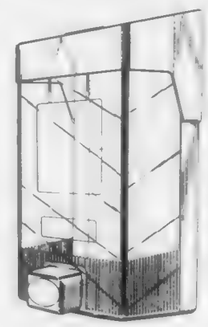
302,915
CRIB FOOTBOARD
Merlin A. Brunner, New London, and Harvey J. Drabeim, Weyauwega, both of Wis., assignors to Simmons Juvenile Products Company, Inc., New London, Wis.
Filed Jul. 7, 1986, Ser. No. 882,810
Term of patent 14 years
U.S. Cl. D6—508



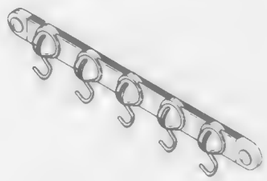
302,916
DISPENSER
Nicholas Williamson, Ontario, Canada, assignor to Debus, Inc., South Bend, Ind.
Filed Mar. 23, 1987, Ser. No. 28,764
Term of patent 14 years
U.S. Cl. D6—542



302,917
LIQUID SOAP DISPENSER OR THE LIKE
Stewart Banks, Ticknall, England, assignor to Appor Ltd., England
Filed Mar. 9, 1987, Ser. No. 23,463
Term of patent 14 years
U.S. Cl. D6—545



302,918
WALL-MOUNTED HANGER STRIP
Isao Maki, Tokyo, Japan, assignor to Soko Co., Ltd., Japan
Filed Aug. 10, 1987, Ser. No. 83,431
Term of patent 14 years
U.S. Cl. D6—569



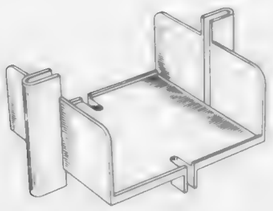
302,919
BEVERAGE MUG
Charles H. Feltman, III, Pacific Palisades, and Dirk Langer, Venice, both of Calif., assignors to 2nd Wave, A California General Partnership, Venice, Calif.
Filed Nov. 14, 1986, Ser. No. 931,174
Term of patent 14 years
U.S. Cl. D7—9



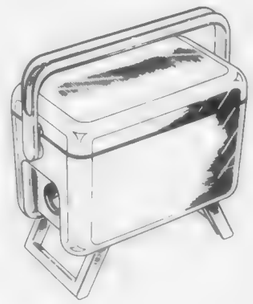
302,920
MEASURING CUP
Jane Ancona, and Bruce Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Dec. 23, 1988, Ser. No. 290,090
Term of patent 14 years
U.S. Cl. D7—50



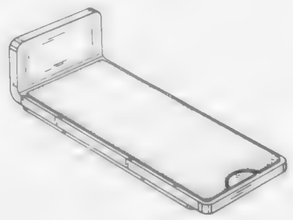
302,921
PAPER NAPKIN HOLDER
Anthony H. Wolfenden, Elwood, Australia, assignor to The Decor Corporation Proprietary Limited, Scoresby, Australia
Filed Oct. 17, 1986, Ser. No. 920,851
Term of patent 14 years
U.S. Cl. D7—72



302,922
INSULATED PORTABLE UNIT
Arthur R. Carlson, Rowville, Australia, assignor to The Decor Corporation Proprietary Limited, Scoresby, Australia
Filed May 23, 1986, Ser. No. 867,272
Claims priority, application Australia, Dec. 24, 1985, 3744/85
Term of patent 14 years
U.S. Cl. D7—77



302,923
TRAY FOR A FOOD STORAGE CONTAINER OR THE LIKE
Janice L. Schmidt, Providence, R.I., and George L. Schick, Easton, Conn., assignors to Dart Industries Inc., Deerfield, Ill.
Filed Jun. 11, 1986, Ser. No. 875,771
Term of patent 14 years
U.S. Cl. D7—84



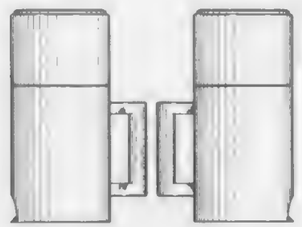
302,924
COVERED BUTTER DISH OR THE LIKE
Robert H. C. M. Daenen, Erembodegem, and Pieter K. J. De-Coster, Aalst, both of Belgium, assignors to Dart Industries Inc., Deerfield, Ill.
Filed Jun. 25, 1986, Ser. No. 878,442
Term of patent 14 years
U.S. Cl. D7—84



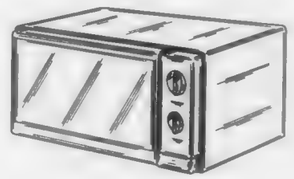
302,925
INSULATED JUG
Anso Zimmermann, Konigsbergstrasse 11, D-6434 Neideraula, Fed. Rep. of Germany, assignor to Anso Zimmermann, Niederaula, Fed. Rep. of Germany
Filed Jun. 13, 1986, Ser. No. 874,365
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1986, 8 AR 28/86
Term of patent 14 years
U.S. Cl. D7—317

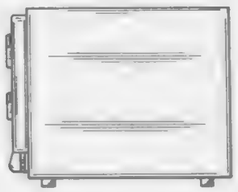


302,926
CARAFE
Aloysius J. M. Beeren, Haren, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 16, 1986, Ser. No. 919,929
Claims priority, application Benelux, Apr. 23, 1986, 61047-02
Term of patent 14 years
U.S. Cl. D7—317

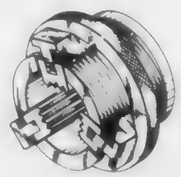


302,927
MICROWAVE OVEN
Kenzo Yoshida, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jan. 30, 1987, Ser. No. 8,922
Claims priority, application Japan, Jul. 31, 1986, 61-30315
The portion of the term of this patent subsequent to Jul. 25, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—351

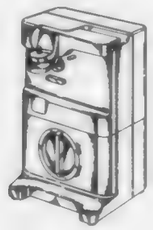




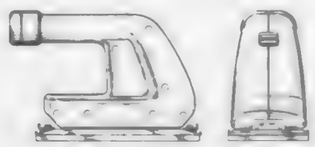
302,928
BOTTLE CAP REMOVER
Zlatko Kurtovic, Walnut, Calif., assignor to Consolidated Devices Inc., City of Industry, Calif.
Filed Aug. 4, 1986, Ser. No. 892,119
Term of patent 14 years
U.S. Cl. D8—33



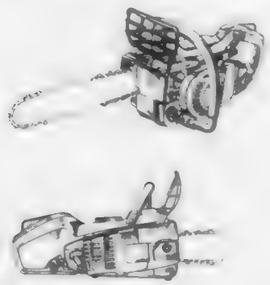
302,929
CAN OPENER
Richard K. Thomas, Elk Grove Village, Ill., assignor to Sunbeam Corporation, Downers Grove, Ill.
Filed Apr. 3, 1987, Ser. No. 34,318
Term of patent 14 years
U.S. Cl. D8—35



302,930
PORTABLE ELECTRIC SANDER
Masakazu Sakamoto, and Toshiaki Saito, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Nov. 24, 1986, Ser. No. 933,723
Claims priority, application Japan, Jul. 30, 1986, 61-30082
Term of patent 14 years
U.S. Cl. D8—62



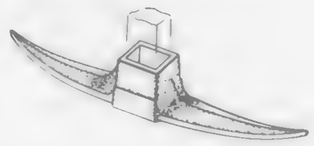
302,931
CHAIN SAW
Kazuo Nakajima, Saitama, and Kiyoshi Anbo, Fussaku, both of Japan, assignors to Komatsu Zenoah Co., Tokyo, Japan
Filed Apr. 21, 1986, Ser. No. 853,948
Claims priority, application Japan, Oct. 21, 1985, 60-43809
Term of patent 14 years
U.S. Cl. D8—65



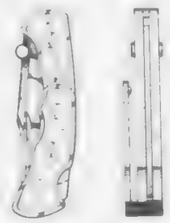
302,933
HAMMER
David S. Chapin, Raleigh, and Thomas W. Oberg, Monroe, both of N.C., assignors to Cooper Industries, Inc., Houston, Tex.
Filed Jul. 13, 1987, Ser. No. 73,121
Term of patent 14 years
U.S. Cl. D8—75



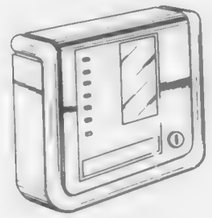
302,933
TWO EDGE PICK TOOL HEAD
Ron Zabarte, 70 Alberta Ter., Walnut Creek, Calif. 94596
Filed Mar. 3, 1986, Ser. No. 841,348
The portion of the term of this patent subsequent to Jul. 25, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—78



302,934
FOLDING KNIFE WITH ATTACHING CLIP
Charles A. Finn, 3204 Production Ave., Oceanside, Calif. 92054
Filed Jun. 11, 1986, Ser. No. 873,326
Term of patent 14 years
U.S. Cl. D8—99



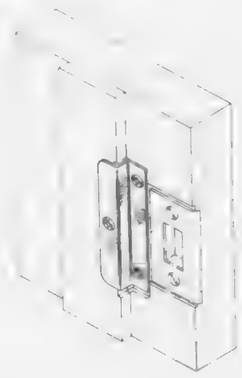
302,935
LOCK WITH DIGITAL CONTROL
Jean-Jacques Kautt, Strasbourg, France, assignor to Ferco International, Sarrebourg, France
Filed Oct. 13, 1987, Ser. No. 107,039
Claims priority, application France, Apr. 13, 1987, 87 2510
Term of patent 14 years
U.S. Cl. D8—330



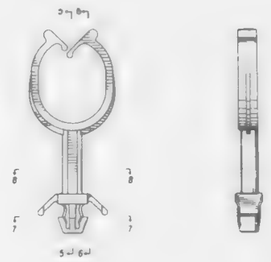
302,936
CARD-OPERATED ACCESS CONTROL UNIT
Donald G. Turner, Clearwater, Fla., assignor to Lasergate Systems, Inc., Clearwater, Fla.
Filed Feb. 27, 1987, Ser. No. 19,861
Term of patent 14 years
U.S. Cl. D8—343



302,937
SECURITY DOOR STOP PLATE
Albert T. Briggs, R.D. 3, Box 126B, Tarentum, Pa. 15084
Filed Aug. 14, 1986, Ser. No. 896,243
Term of patent 14 years
U.S. Cl. D8—344



302,938
WIRE HOLDER
Akio Fujioka, Nagoya, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan
Filed May 29, 1986, Ser. No. 868,337
Claims priority, application Japan, Dec. 4, 1985, 60-50817
Term of patent 14 years
U.S. Cl. D8—356



302,939
DOOR STOP
Arthur Ruskin, Wyncote, Pa., assignor to York Plastics Corporation, Philadelphia, Pa.
Filed Mar. 24, 1988, Ser. No. 172,841
Term of patent 14 years
U.S. Cl. D8—402



302,940
CONTAINER FOR CONFECTIONARY PRODUCTS
Pietro Ferrero, Brussels, Belgium, assignor to Ferrero S.p.A., Alba, Italy
Filed Nov. 14, 1986, Ser. No. 930,437
Claims priority, application Italy, May 16, 1986, 53419/86[U]
Term of patent 14 years
U.S. Cl. D9—318



302,941
CONTAINER FOR CONFECTIONARY PRODUCTS
Pietro Ferrero, Brussels, Belgium, assignor to Ferrero S.p.A., Alba, Italy
Filed Nov. 14, 1986, Ser. No. 930,438
Claims priority, application Italy, May 16, 1986, 53419/86[U]
Term of patent 14 years
U.S. Cl. D9—318



302,942
CONTAINER FOR CONFECTIONARY PRODUCTS
Pietro Ferrero, Brussels, Belgium, assignor to Ferrero S.p.A., Alba, Italy
Filed Nov. 14, 1986, Ser. No. 930,439
Claims priority, application Japan, May 16, 1986, 53419/86[U]
Term of patent 14 years
U.S. Cl. D9—318



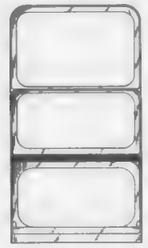
302,943
CONTAINER
John M. Cuzenza, Woodland Hills, Calif., assignor to Sebastian International, Inc., Woodland Hills, Calif.
Filed Mar. 14, 1986, Ser. No. 844,750
Term of patent 14 years
U.S. Cl. D9—337



302,944
FLUID COLLECTION RECEPTACLE
Floyd E. Mount, 105 12th Ave. N.W., Waukon, Iowa 52172
Filed Jun. 2, 1986, Ser. No. 869,952
Term of patent 14 years
U.S. Cl. D9—337

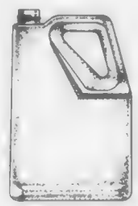


302,945
CASSETTE PACKAGE
Roger L. Mortensen, Excelsior; Barry L. Gregerson, and Larry G. Dressen, both of Chanhassen, all of Minn., assignors to Empak, Inc., Chanhassen, Minn.
Filed Jun. 9, 1986, Ser. No. 872,473
Term of patent 14 years
U.S. Cl. D9—341

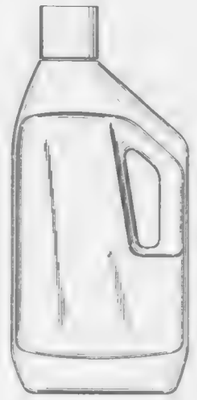




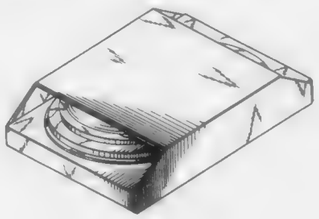
302,946
BOTTLE
Ronald G. Cramer, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed May 27, 1986, Ser. No. 867,711
Term of patent 14 years
U.S. Cl. D9—376



302,947
BOTTLE
Umberto D. I. Segati, Brussels, Belgium, assignor to Colgate-Palmolive Company, Piscataway, N.J.
Filed Mar. 31, 1988, Ser. No. 176,137
Term of patent 14 years
U.S. Cl. D9—376



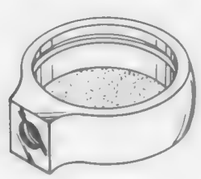
302,948
COMBINED DOME TRAY AND CRADLE IN SLEEVE PACKAGE
Jeffrey A. Blum, Somerset, and Jatinder P. Sabhlok, Cranbury, both of N.J., assignors to General Foods Corporation, White Plains, N.Y.
Filed Jul. 2, 1986, Ser. No. 882,312
Term of patent 14 years
U.S. Cl. D9—418



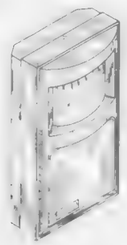
302,949
DIAPER DISPENSER
Stuart J. Eisendrath, 2175 15th Ave., San Francisco, Calif. 94116
Filed May 9, 1986, Ser. No. 862,375
Term of patent 14 years
U.S. Cl. D9—432



302,950
CALIBRATION PORT ADAPTOR FOR A GAS SENSOR
Monty Boyd, P.O. Box 6376, New Orleans, La. 70174-6376
Filed Nov. 25, 1986, Ser. No. 934,935
Term of patent 14 years
U.S. Cl. D10—94



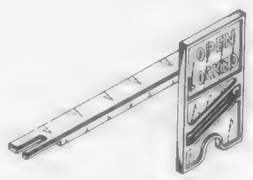
302,951
INFRA-RED DETECTOR
Yaacov Kotlicki, 20 Yoav St., Ramat Gan, and Moshe Kotlicki, 24 Weisburg Street, Tel Aviv, both of Israel
Filed Sep. 11, 1986, Ser. No. 906,204
Claims priority, application Israel, Apr. 22, 1986, 11608
Term of patent 14 years
U.S. Cl. D10—106



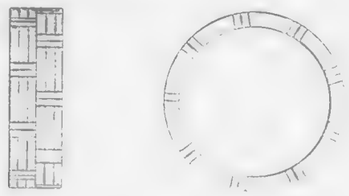
302,952
MICROWAVE AND PASSIVE INFRARED INTRUSION DETECTOR
Richard Soloway, Lido Beach, and Richard Farrell, West Babylon, both of N.Y., assignors to Napco Security Systems, Inc., Amityville, N.Y.
Filed Sep. 23, 1986, Ser. No. 910,765
Term of patent 14 years
U.S. Cl. D10—106



302,953
LOCK STATUS INDICATOR
William DeForrest, 1825 Via Burton, Anaheim, Calif. 92805
Filed Mar. 3, 1986, Ser. No. 841,339
Term of patent 14 years
U.S. Cl. D10—109



302,954
JEWELRY RING
Jonathan Goldman, New York, N.Y., and Naohiro Ueno, Tokyo, Japan, assignors to Frederick Goldman, Inc., New York, N.Y.
Filed Sep. 21, 1987, Ser. No. 99,506
Term of patent 14 years
U.S. Cl. D11—38



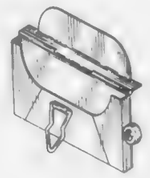
302,955
HOLDER FOR FLAGS OR THE LIKE
Nancy R. Danniger, 406 S. Alandele, Los Angeles, Calif. 90036
Filed May 14, 1986, Ser. No. 863,391
Term of patent 14 years
U.S. Cl. D11—40



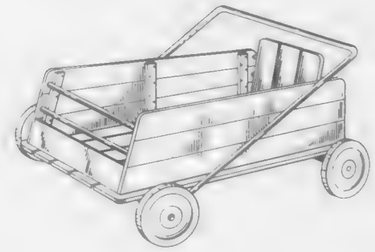
302,956
HOLDER FOR FLAGS OR THE LIKE
Nancy R. Danniger, 406 S. Alandele, Los Angeles, Calif. 90036
Filed May 14, 1986, Ser. No. 863,392
Term of patent 14 years
U.S. Cl. D11—40



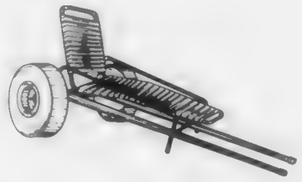
302,957
LOCKET OR SIMILAR ARTICLE
Morris B. Saxon, 12580 Gwendolyn Farms, Chardon, Ohio 44024
Filed Mar. 27, 1986, Ser. No. 847,011
Term of patent 14 years
U.S. Cl. D11—80



302,958
CONVERTIBLE WAGON AND SLED VEHICLE
Julie A. Shippee, 21 Grove St., Marshfield, Mass. 02050, and Robert K. Little, Mt. Holly, N.J., assignors to Julie A. Shippee, Greenwich, Conn.
Filed Oct. 6, 1986, Ser. No. 916,029
Term of patent 14 years
U.S. Cl. D12—6



302,959
INVALID-CARRYING BEACH CHAIR
Jack C. Turlington, Jr., 2812 Overton Rd., Richmond, Va. 23228
Filed Mar. 3, 1986, Ser. No. 841,362
Term of patent 14 years
U.S. Cl. D12—128



302,960
AUTOMOBILE TIRE
Yasuo Hinuro, and Toshiyuki Mitsutake, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Nov. 19, 1986, Ser. No. 932,532
Claims priority, application Japan, Jun. 12, 1986, 61-22414
Term of patent 14 years
U.S. Cl. D12—146



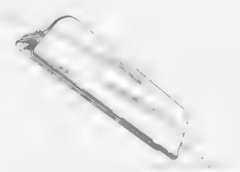
302,961
TIRE
Harold C. Gray, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Jun. 10, 1987, Ser. No. 60,583
Term of patent 14 years
U.S. Cl. D12—147



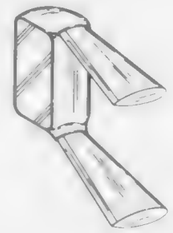
302,962
AUTOMOBILE DOOR GUARD
Victor B. Collani, Norderstedt, Fed. Rep. of Germany, assignor to Bonstrade International, Inc., Santa Ana, Calif.
Filed Sep. 9, 1987, Ser. No. 94,912
Term of patent 14 years
U.S. Cl. D12—167



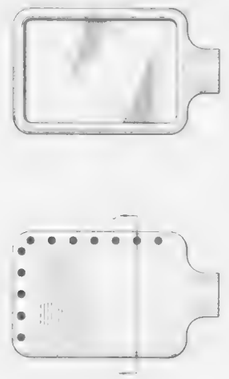
302,963
WIND DEFLECTOR FOR MOTOR VEHICLES
Bruno R. Giovannoni, P.O. Box 638, Isleton, Calif. 95641
Filed Jan. 4, 1988, Ser. No. 140,838
Term of patent 14 years
U.S. Cl. D12—181



302,964
LOW DRAG VEHICLE REAR VIEW MIRROR
Robert F. Fingerle, Fremont, Calif., assignor to Paccar Inc, Bellevue, Wash.
Filed Mar. 5, 1987, Ser. No. 22,334
Term of patent 14 years
U.S. Cl. D12—187



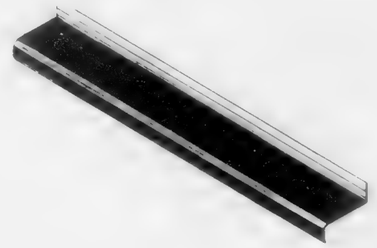
302,965
VEHICLE REARVIEW MIRROR
Salleh Rahman, 6000 Stanley Avenue, Niagara Falls, Ontario, Canada L2G 3Y1
Filed Aug. 10, 1987, Ser. No. 83,295
Term of patent 14 years
U.S. Cl. D12—187



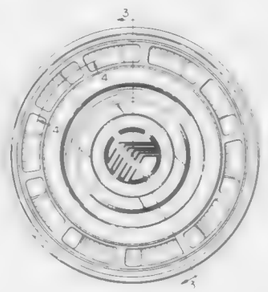
302,966
BLIND SPOT REAR VIEW MIRROR
Harold V. Sentmore, 2015 Jennifer, San Antonio, Tex. 78224, and Gloriadean A. Leggett, 843 Blue Aster, San Antonio, Tex. 78245
Filed Aug. 13, 1987, Ser. No. 84,742
Term of patent 14 years
U.S. Cl. D12—187



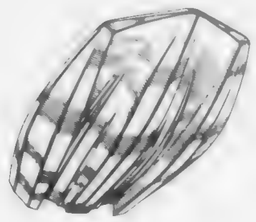
302,967
RUNNING BOARD
Robert E. Bowdoin, Elkhart, Ind., assignor to Bowdoin Products, Inc., Elkhart, Ind.
Filed Feb. 11, 1987, Ser. No. 13,381
Term of patent 14 years
U.S. Cl. D12—203



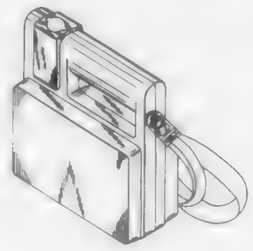
302,968
WHEEL COVER
Graham J. Bell, Bloomfield Hills, and Ramon L. Everts, Milford, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Dec. 28, 1987, Ser. No. 138,882
Term of patent 14 years
U.S. Cl. D12—211

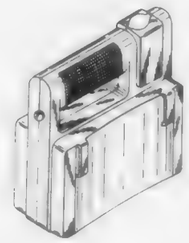


302,969
BOAT HULL
Howard W. Pipkorn, 1622 Lake Johanna Blvd., Arden Hills, Minn. 55112
Filed Oct. 19, 1987, Ser. No. 110,476
Term of patent 14 years
U.S. Cl. D12—314

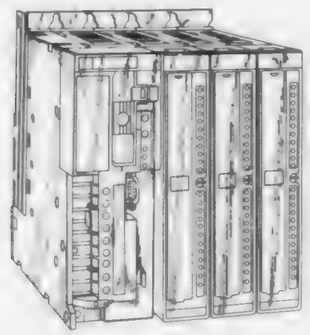


302,971
BATTERY PACK FOR USE WITH PORTABLE POWER TOOLS OR THE LIKE
Martin P. Gierke, Baltimore, Md., assignor to Black & Decker Inc., Newark, Del.
Continuation-in-part of Ser. No. 859,883, May 6, 1986. This application Jan. 28, 1988, Ser. No. 152,591
Term of patent 14 years
U.S. Cl. D13—8

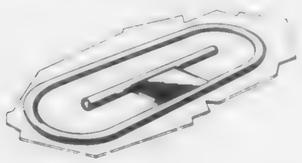




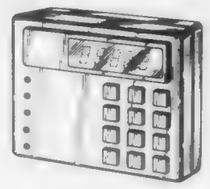
302,972
PROGRAMMABLE CONTROLLER
Guy Boucher, Paris, France, assignor to La Telemecanique Electrique, France
Division of Ser. No. 703,588, Feb. 20, 1985. This application Jan. 28, 1987, Ser. No. 13,291
Claims priority, application France, Aug. 24, 1984, 84 3762
Term of patent 14 years
U.S. Cl. D13—12



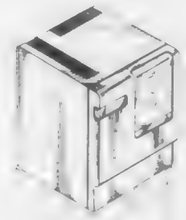
302,970
FLUSH MOUNTED CHOCK
Bill D. May, 213 8th St., Port St. Joe, Fla. 32456
Filed Mar. 11, 1986, Ser. No. 844,277
Term of patent 14 years
U.S. Cl. D12—317



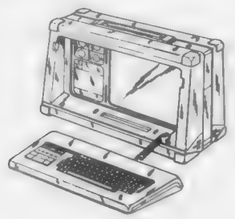
302,973
DATA ENTRY AND DISPLAY COMPUTER FOR A BUS FARE ADJUSTMENT SYSTEM
Yoshiaki Nishida, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 21, 1986, Ser. No. 845,413
Claims priority, application Japan, Oct. 3, 1985, 60-41319
Term of patent 14 years
U.S. Cl. D14—100



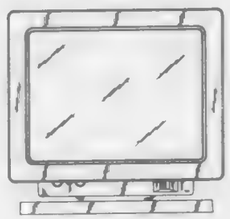
302,975
FREE STANDING TAPE DRIVE CABINET
John F. Graham, Sudbury, and Edward J. Cesarczyk, Watertown, both of Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.
Filed May 29, 1986, Ser. No. 868,417
Term of patent 14 years
U.S. Cl. D14—108



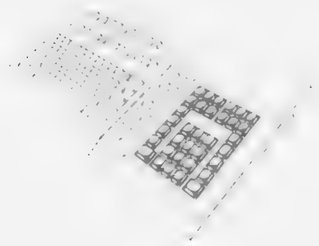
302,974
PORTABLE COMPUTER
Jae J. Shim, Kyungki-do, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Feb. 28, 1986, Ser. No. 838,056
Claims priority, application Rep. of Korea, Aug. 31, 1985, 12348/1985
Term of patent 14 years
U.S. Cl. D14—106



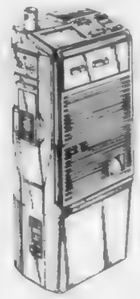
302,976
COMPUTER DISPLAY MONITOR
Yoshiyuki Manabe, and Kazuhiko Yamazaki, both of Kanagawa, Japan, assignors to International Business Machines Corp., Armonk, N.Y.
Filed Oct. 22, 1986, Ser. No. 922,988
Claims priority, application Japan, May 29, 1986, 61-20375
Term of patent 14 years
U.S. Cl. D14—113



302,977
KEYBOARD KEY ARRANGEMENT
Edmond J. Helstab, Ottawa; Michael Brown, Nepean; Thomas A. Winlow, and Hans Bergman, both of Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Nov. 18, 1986, Ser. No. 932,129
Term of patent 14 years
U.S. Cl. D14—115



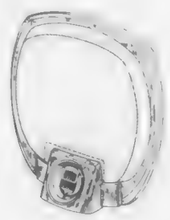
302,978
PORTABLE TWO-WAY RADIO
Jeffrey T. Mauch, Cincinnati, Ohio, assignor to General Electric Company, Lynchburg, Va.
Filed Aug. 25, 1986, Ser. No. 900,023
Term of patent 14 years
U.S. Cl. D14—137



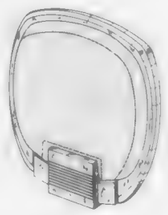
302,979
LOUDSPEAKER
Gayle M. Sanders, Lawrence, Kans., assignor to Martin-Logan, Ltd., Lawrence, Kans.
Filed May 29, 1986, Ser. No. 869,078
Term of patent 14 years
U.S. Cl. D14—214



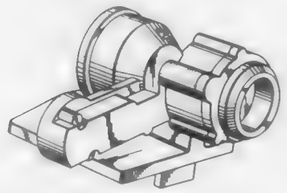
302,980
LOUDSPEAKER GRILLE
Petrus W. J. Van de Ven, Valkenswaard, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 14, 1986, Ser. No. 833,456
Claims priority, application United Kingdom, Aug. 21, 1985, 1.028.731
Term of patent 14 years
U.S. Cl. D14—219



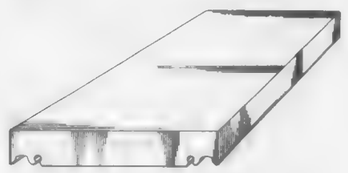
302,981
LOUDSPEAKER GRILLE
Petrus H. J. Van de Ven, Valkenswaard, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 14, 1986, Ser. No. 833,459
Claims priority, application United Kingdom, Aug. 21, 1985, 1.028.732
Term of patent 14 years
U.S. Cl. D14—219



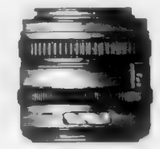
302,982
STARTER MOUNTING ASSEMBLY FOR AN AIRCRAFT ENGINE
William C. Bainbridge, III, P.O. Box B. 123 E. 4th St., Newton, Kans. 67114-0894
Filed Jun. 25, 1986, Ser. No. 878,480
Term of patent 14 years
U.S. Cl. D15—5



302,983
LINING ELEMENT FOR INTERIOR SURFACES OF LOADING BIN, SLIDING CHUTE, OR THE LIKE
Bengt L. A. Dehlén, Trelleborg, Sweden, assignor to Trelleborg AB, Trelleborg, Sweden
Division of Ser. No. 787,513, Oct. 15, 1985. This application Sep. 22, 1988, Ser. No. 247,922
Claims priority, application Sweden, Apr. 17, 1985, 85-0980
Term of patent 14 years
U.S. Cl. D15—147



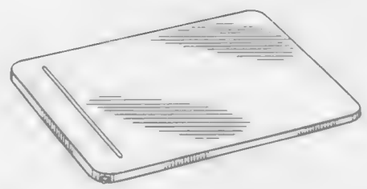
302,984
LENS FOR CAMERA
Hiroyuki Kimura, Tokyo, and Koichi Tsukyu, Utsunomiya, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 8, 1987, Ser. No. 35,704
Claims priority, application Japan, Oct. 15, 1986, 61-41056
Term of patent 14 years
U.S. Cl. D16—134



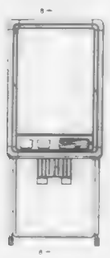


302,985
CARD PEN
Robert Vinck, 3714 Bonita Glen Ter., Bonita, Calif. 92002
Filed Oct. 20, 1986, Ser. No. 920,954
Term of patent 14 years
U.S. Cl. D19—41

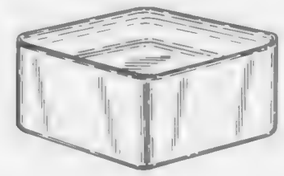


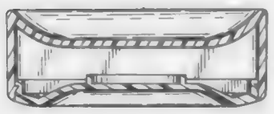


302,986
WHITEBOARD WITH PHOTOCOPIER
Kazuhito Takai; Norimi Koiwa, and Masami Suda, all of c/o Oki Electric Industry Co., Ltd., 7-12, Toranomon 1 chome, Minatoku, Tokyo, Japan
Filed Sep. 30, 1985, Ser. No. 781,962
Claims priority, application Japan, Apr. 8, 1985, DES60-13854
Term of patent 14 years
U.S. Cl. D19—52

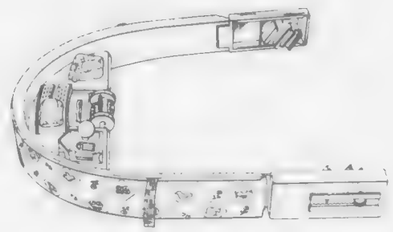


302,987
SQUARE HOLDER FOR SMALL METALLIC OBJECTS
Feather W. King, 165 Reiten Dr., Ashland, Oreg. 97520
Continuation-in-part of Ser. No. 442,156, Nov. 16, 1982, Pat. No. Des. 282,380, which is a continuation-in-part of Ser. No. 133,434, Mar. 24, 1980, Pat. No. Des. 266,934. This application Nov. 18, 1985, Ser. No. 805,462
The portion of the term of this patent subsequent to Apr. 11, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—75





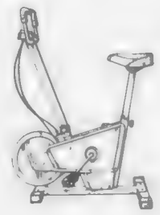
302,988
ACTIVITY TOY
Christine M. Zinter-Chahin, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 17, 1986, Ser. No. 920,856
Term of patent 14 years
U.S. Cl. D21—63



302,989
STACKING TOY DUCK
Peter A. Broadbent, Alderley Edge, and Ian T. Revell, Knutsford, both of England, assignors to Hestair Kiddicraft Limited, Bristol, England
Filed Apr. 22, 1986, Ser. No. 857,448
Claims priority, application United Kingdom, Nov. 4, 1985, 1030229
Term of patent 14 years
U.S. Cl. D21—160



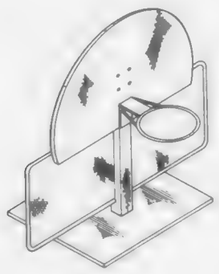
302,990
EXERCISE CYCLE
Jose L. Beistegui, Vitoria Alava, Spain, assignor to B.H., S.A., Madrid, Spain
Filed Aug. 11, 1986, Ser. No. 895,190
Claims priority, application Spain, Feb. 12, 1986, 109.971
Term of patent 14 years
U.S. Cl. D21—194



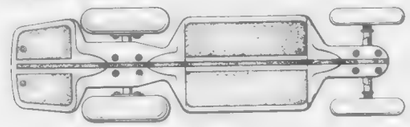
302,991
SOCCER TRAINING GOAL
Henry A. York, 610 Range Rd., Palestine, Tex. 75801
Filed Oct. 2, 1986, Ser. No. 914,755
Term of patent 14 years
U.S. Cl. D21—200



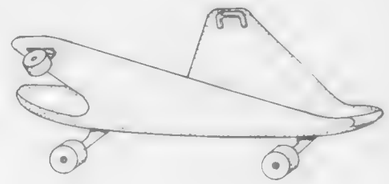
302,992
SWIMMING POOL BASKETBALL GOAL
George R. Scott, III, 2807-B Windsor St., Austin, Tex. 78703
Filed Oct. 14, 1986, Ser. No. 918,799
Term of patent 14 years
U.S. Cl. D21—201



302,993
SKATEBOARD
Mort Hellig, 2A Red Plum Cir., Monterrey Park, Calif. 91754
Filed Jul. 20, 1987, Ser. No. 75,080
Term of patent 14 years
U.S. Cl. D21—227



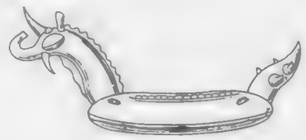
302,994
BALANCED SKATEBOARD SCOOTER
Peter Hawkes, and David Hookham, both of Sydney, Australia, assignors to Skatewing International Pty. Ltd., Brookvale, Australia
Filed Apr. 25, 1988, Ser. No. 185,923
Claims priority, application Australia, Nov. 4, 1987, 4047/87
Term of patent 14 years
U.S. Cl. D21—227



302,995
BOAT
Henry S. Wolfe, Clearwater, Fla., assignor to The Freary Company, Inc., Clearwater, Fla.
Filed Nov. 13, 1986, Ser. No. 930,383
Term of patent 14 years
U.S. Cl. D21—237

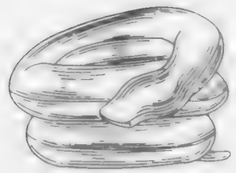


302,996
FLOAT
Henry S. Wolfe, Clearwater, Fla., assignor to The Freary Company, Inc., Clearwater, Fla.
Filed Nov. 13, 1986, Ser. No. 930,384
Term of patent 14 years
U.S. Cl. D21—237

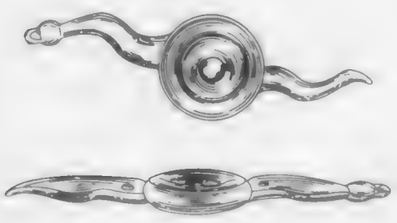


302,997
POOL FLOAT
Henry S. Wolfe, Gulfport, Fla., assignor to The Freury Company, Inc., Clearwater, Fla.
Filed Nov. 16, 1987, Ser. No. 121,776
Term of patent 14 years
U.S. Cl. D21—237

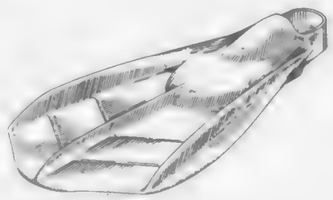




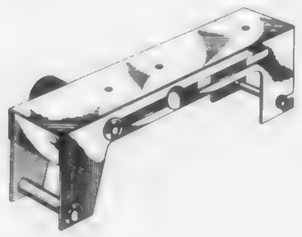
302,998
POOL FLOAT
Henry S. Wolfe, Gulfport, Fla., assignor to The Freury Company, Inc., Clearwater, Fla.
Filed Nov. 16, 1987, Ser. No. 121,777
Term of patent 14 years
U.S. Cl. D21—237



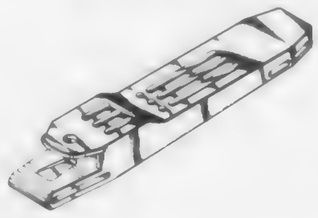
302,999
SWIM FIN
Donald B. McCredie, 3/28 Carr Street, Coogee, New South Wales, Australia
Filed Mar. 11, 1987, Ser. No. 24,547
Claims priority, application Australia, Aug. 6, 1986, 6176/86
Term of patent 14 years
U.S. Cl. D21—239



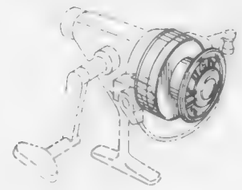
303,000
COMBINED MOUNT AND SUPPORT BRACKET FOR FIREARMS
Tibor Tamas, 4 Villa Rose Ter., Milford, Conn. 06460, and Jeffrey McClure, 1770 Boston Post Rd., Darien, Conn. 06820
Filed Mar. 23, 1987, Ser. No. 29,486
Term of patent 14 years
U.S. Cl. D22—110



303,001
DIVING KNIFE HOLDER
Yen Su, Suite 703, 7th Fl., No. 62, Fu Hsing North Rd., Taipei, Taiwan
Filed Dec. 8, 1987, Ser. No. 130,342
Term of patent 14 years
U.S. Cl. D22—118



303,002
SPOOL FACEPLATE FOR A FISHING REEL
Robert E. Haynes, Foley, Ala., assignor to Lew Childre & Sons, Inc., Foley, Ala.
Continuation of Ser. No. 760,664, Jul. 30, 1985, abandoned. This application Dec. 19, 1988, Ser. No. 287,593
Term of patent 14 years
U.S. Cl. D22—141



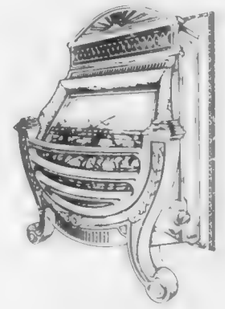
303,003
FISHING ROD HOLDER
Napoleon Combs, 3771 Second Ave., Grove City, Ohio 43123
Filed Apr. 16, 1987, Ser. No. 38,920
Term of patent 14 years
U.S. Cl. D22—147



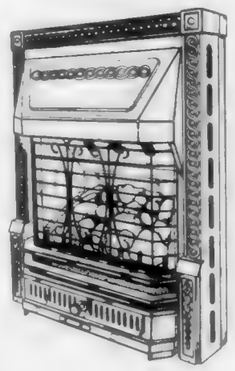
303,004
MOBILE TOWEL WARMER AND DRYER
Hanford L. Eckman, 401 Millington Rd., Shavertown, Pa. 18708, and Charles M. Eckman, 149 Lake St., Dallas, Pa. 18612
Filed Jun. 2, 1987, Ser. No. 56,674
Term of patent 14 years
U.S. Cl. D23—317



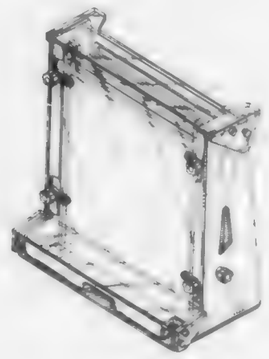
303,005
GAS-FIRED HEATER
Alan M. Lloyd, Birmingham; Alan Constable, Coleshill, and Martin L. Smith, Birmingham, all of England, assignors to Valor Heating Limited, London, England
Filed Nov. 13, 1987, Ser. No. 121,770
Claims priority, application United Kingdom, May 15, 1987, 1 042 233; Nov. 6, 1987, 1 046 134
Term of patent 14 years
U.S. Cl. D23—339



303,006
GAS-FIRED HEATER
Francis J. B. Rowley, Cuddington, and Ian M. Hollingsworth, Birmingham, both of England, assignors to Valor Heating Limited, London, England
Filed Jul. 17, 1987, Ser. No. 75,025
Claims priority, application United Kingdom, Jan. 21, 1987, 1039416
Term of patent 14 years
U.S. Cl. D23—342



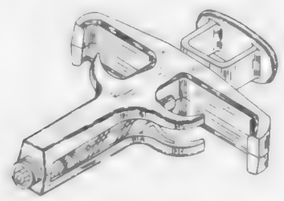
303,007
ELECTROPHORESIS SEQUENCING APPARATUS
Robert W. Flesher, Baltimore; Kevin J. Barnes; Robert W. Blakesley, both of Frederick, and Robert W. Lynn, Germantown, all of Md., assignors to Life Technologies, Inc., Gaithersburg, Md.
Filed Feb. 2, 1987, Ser. No. 10,113
Term of patent 14 years
U.S. Cl. D24—8



303,009
HANDLE FOR BONE MARROW BIOPSY DEVICE
Robert K. Strasser, Nashua, N.H., and Robert L. Netsch, Spirit Lake, Iowa, assignors to Manan Manufacturing Co., Inc., Northbrook, Ill.
Filed Feb. 26, 1987, Ser. No. 19,051
Term of patent 14 years
U.S. Cl. D24—24



303,010
INJECTOR FOR INTRODUCING CONTRAST AGENTS INTO BLOOD VESSELS
Lynn S. Jabbusch, La Mesa, Calif., assignor to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.
Filed Mar. 25, 1987, Ser. No. 30,825
Term of patent 14 years
U.S. Cl. D24—24



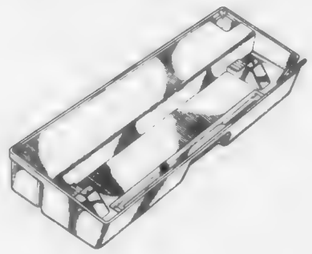
303,008
DISPOSABLE SPECULUM TO COVER THE PROBE END OF A TYMPANIC THERMOMETER
Gary J. O'Hara, Escondido, Calif., and David B. Phillips, Westford, Vt., assignors to Intelligent Medical Systems, Inc., Carlsbad, Calif.
Filed Sep. 2, 1986, Ser. No. 903,080
Term of patent 14 years
U.S. Cl. D24—18



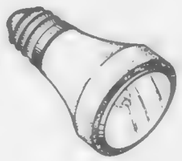
303,011
MICROTITER STICK
Wayne M. Henry, Scarborough, Me., assignor to Alerchek Associates, Portland, Me.
Filed Nov. 26, 1986, Ser. No. 935,572
Term of patent 14 years
U.S. Cl. D24—31



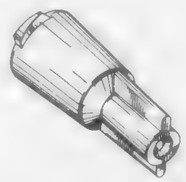
303,012
ELECTROPHORESIS SEQUENCING APPARATUS TRAY
Robert W. Flesher, Baltimore; Kevin T. Barnes; Robert W. Blakesley, both of Frederick, and Robert W. Lynn, Germantown, all of Md., assignors to Life Technologies, Inc., Gaithersburg, Md.
Filed Feb. 2, 1987, Ser. No. 10,112
Term of patent 14 years
U.S. Cl. D24—31



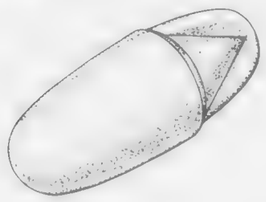
303,015
ELECTRIC REFLECTOR LAMP
Larry R. Fields, Winchester; George B. Kendrick, and Merle E. Morris, both of Lexington, all of Ky., assignors to GTE Products Corporation, Danvers, Mass.
Filed Jul. 7, 1986, Ser. No. 882,580
Term of patent 14 years
U.S. Cl. D26—26



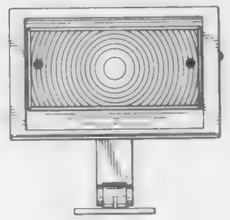
303,013
FEMALE LUER CONNECTOR
April A. Konopka, San Dimas, Calif., assignor to Pacesetter Infusion, Ltd., Sylmar, Calif.
Filed Jun. 19, 1986, Ser. No. 876,336
Term of patent 14 years
U.S. Cl. D24—53

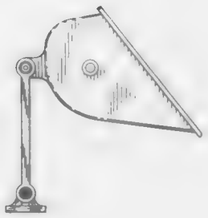


303,014
EARPLUG OR SIMILAR ARTICLE
Ross Gardner, Jr., Indianapolis, Ind., and Dennis J. Downs, Burlington, Canada, assignors to Cabot Corporation, Waltham, Mass.
Filed May 4, 1987, Ser. No. 45,813
Term of patent 14 years
U.S. Cl. D24—67

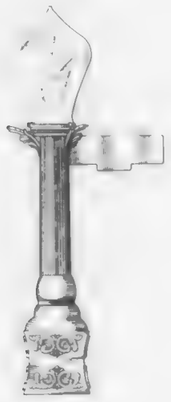


303,016
AUXILIARY AUTOMOTIVE VEHICLE BRAKE LIGHT
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Jun. 13, 1986, Ser. No. 875,745
Claims priority, application United Kingdom, Dec. 16, 1985, 1031135
Term of patent 14 years
U.S. Cl. D26—29

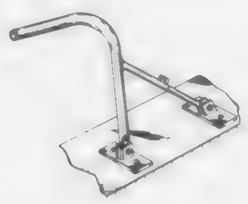




303,017
COMBINED EXTERIOR LAMP AND SIGN
Ralph Flores, 5154 Garden Grove Ave., Tarzana, Calif. 91356
Filed Sep. 8, 1986, Ser. No. 905,617
Term of patent 14 years
U.S. Cl. D26—51



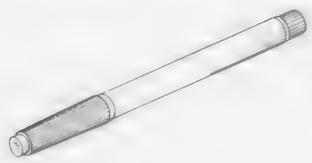
303,018
ADJUSTABLE SUPPORT BRACKET FOR PITCHED ROOF-MOUNTED EXTERIOR LIGHT OR SIMILAR ARTICLE
Mark Yates, 1005 Merced Ave., Ontario, Calif. 91764
Filed Oct. 24, 1986, Ser. No. 923,663
Term of patent 14 years
U.S. Cl. D26—140



303,019
MIRRORED WALL PANEL FOR A LIGHTING FIXTURE
William Segill, Newton, Mass., assignor to American Lighting Fixture Corp., Arlington, Mass.
Filed Jul. 28, 1986, Ser. No. 889,849
Term of patent 14 years
U.S. Cl. D26—143



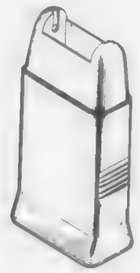
303,020
FLUTED PERFUME APPLICATOR
Charles Reichmann, 82-36 Beverly Rd., Kew Gardens, N.Y. 11415
Filed Mar. 17, 1986, Ser. No. 844,764
Term of patent 14 years
U.S. Cl. D28—5



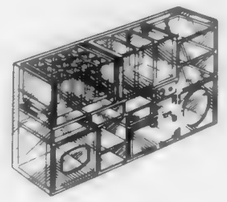
303,021
PERFUME APPLICATOR
Charles Reichmann, 82-36 Beverly Rd., Kew Gardens, N.Y. 11415
Filed Mar. 17, 1986, Ser. No. 844,765
Term of patent 14 years
U.S. Cl. D28—5



303,022
CONTAINER FOR CREAM OR LOTION
Edward H. Schmitt, Glen Rock, N.J., assignor to American Home Products Corporation, New York, N.Y.
Continuation of Ser. No. 902,331, Aug. 29, 1986, abandoned.
This application Dec. 12, 1988, Ser. No. 284,753
Term of patent 14 years
U.S. Cl. D28—10



303,024
COSMETIC ORGANIZER
Lawrence R. Zall, Northbrook, Ill., assignor to Allied of Chicago, Inc., Ill.
Filed Nov. 28, 1986, Ser. No. 936,019
Term of patent 14 years
U.S. Cl. D28—76

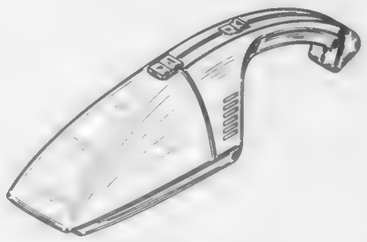


303,073
RAZOR
Brian B. Sinclair, London, England, assignor to Wilkinson Sword Limited, England
Filed Dec. 4, 1986, Ser. No. 938,734
Claims priority, application United Kingdom, Jun. 7, 1906, 10344657
Term of patent 14 years
U.S. Cl. D28—46



303,075
PORTABLE VACUUM CLEANER
Sachio Yamamoto; Chikashi Kuriya, and Mika Nakajima, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Apr. 6, 1987, Ser. No. 35,137
Claims priority, application Japan, Oct. 15, 1986, 61-41060
Term of patent 14 years
U.S. Cl. D32—18





303,026
VACUUM CLEANER EXTENSION TOOL
Betty J. Kilakis, 222 Columbia Ave., Reading, Pa. 19605
Filed Jul. 8, 1986, Ser. No. 883,142
Term of patent 14 years
U.S. Cl. D32—32

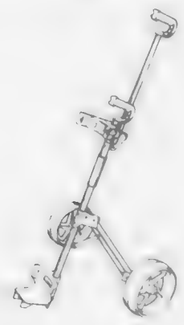


303,027
SCRAPING TOOL
Thomas C. Gray, 683 North Fox, Flagstaff, Ariz. 86001
Filed Mar. 20, 1987, Ser. No. 28,698
Term of patent 14 years
U.S. Cl. D32—49

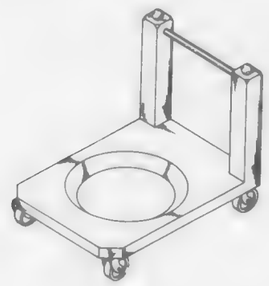




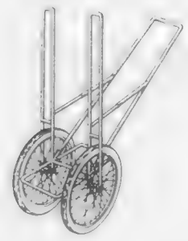
303,028
GOLF CART
Ching C. Lee, No. 281, Cherng Der Rd., Taipei, Taiwan
Filed Oct. 30, 1987, Ser. No. 114,388
Term of patent 14 years
U.S. Cl. D34—15



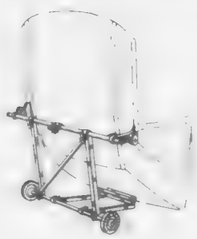
303,029
BUCKET CART
Donald W. Friskey, 2225 10th Avenue Ct., Greeley, Colo. 80631
Filed Jun. 19, 1986, Ser. No. 876,344
Term of patent 14 years
U.S. Cl. D34—23



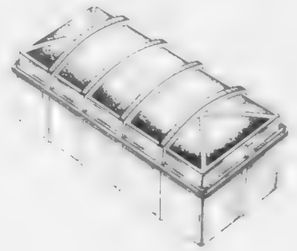
303,030
CART FOR TRANSPORTING MATTRESS OR THE LIKE
Roland H. Goldston, Box 771, Darlington, S.C. 29532
Filed Mar. 14, 1986, Ser. No. 844,751
Term of patent 14 years
U.S. Cl. D34—26



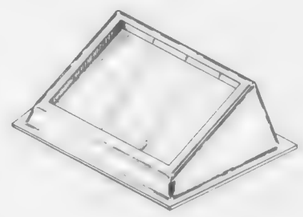
303,031
AUTOMOBILE HARDTOP STORAGE CART/RACK
Mark L. Ellis, 613 Marine Ave., Manhattan Beach, Calif. 90266
Filed Jan. 28, 1987, Ser. No. 7,891
Term of patent 14 years
U.S. Cl. D34—31



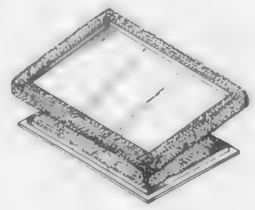
303,032
STORAGE CONTAINER FOR BURIAL, OR THE LIKE
Carl E. Clements, 7453 Mott Ave., Orlando, Fla. 32810, assignor to Carl E. Clements, Orlando, Fla.
Filed Apr. 30, 1986, Ser. No. 858,284
Term of patent 14 years
U.S. Cl. D99—1



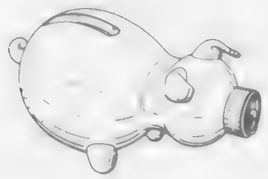
303,033
MEMORIAL MARKER
Johnese W. Powell, Memphis; Willie Parks, Millington; Levisky Powell, and Willie B. Jones, both of Memphis, all of Tenn., assignors to Creative Markers, Inc., Memphis, Tenn.
Filed Dec. 1, 1986, Ser. No. 937,148
Term of patent 14 years
U.S. Cl. D99—17



303,034
MEMORIAL MARKER
Johnese W. Powell, Memphis; Willie Parks, Millington; Levisky Powell, and Willie B. Jones, both of Memphis, all of Tenn., assignors to Creative Markers, Inc., Memphis, Tenn.
Filed Dec. 1, 1986, Ser. No. 937,149
Term of patent 14 years
U.S. Cl. D99—17



D13,035
PIGGY BANK OR THE LIKE
Eoin O'Dunlaing, County Cavan, Ireland, assignor to Cavan Crystal Group Limited, Cavan, Ireland
Filed Sep. 5, 1986, Ser. No. 904,245
Claims priority, application Ireland, Mar. 7, 1986, D48/86
Term of patent 14 years
U.S. Cl. D99—40



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF AUGUST, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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A B Oriental Trading Co., Inc.: *See*—
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A. E. Staley Manufacturing Company: *See*—
Augustine, Michael E.; and Orthoefer, Frank T., 4,859,477, Cl. 426-103.000.
A/G Technology Corporation: *See*—
Gollan, Arye Z., 4,859,334, Cl. 210-500.230.
A. Monforts GmbH & Co.: *See*—
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Planke, Tore; Nordbryhn, Andreas; and Solnordal, Steinar, 4,859,862, Cl. 250-560.000.
A. Stucki Company: *See*—
Wright, James F., 4,859,089, Cl. 384-423.000.
AB Asea-Atom: *See*—
Hannerz, Kåre, 4,859,406, Cl. 376-406.000.
Nylund, Olov, 4,859,407, Cl. 376-446.000.
Abbe, David C.; and Tatone, John M. Self-contained muffler attachment and conversion kit for small two-cycle engines. 4,858,722, Cl. 181-243.000.
Abbe, Robert C.; Poduje, Noel S.; and Judell, Neil H., to ADE Corporation. Wafer flatness station. 4,860,229, Cl. 364-563.000.
Abbott Laboratories: *See*—
Chu, Daniel T.; and Rosen, Terry J., 4,859,776, Cl. 546-123.000.
Schultz, Steven G., 4,859,420, Cl. 422-58.000.
Abe, Isao: *See*—
Matsumoto, Osamu; Abe, Isao; and Nakashiro, Takeshi, 4,859,882, Cl. 307-530.000.
Abe, Kenji: *See*—
Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; Hosono, Yoichi; Takahara, Shigeru; and Koike, Tadashi, 4,859,569, Cl. 430-270.000.
Abe, Tsutomu; and Miyashita, Hiromichi, to Kabushiki Kaisha Komatsu Siesakusho. Front frames of wheel mounted type loaders. 4,858,345, Cl. 37-118.00R.
Abe, Yasuji: *See*—
Kagami, Toshihiko; Kobayashi, Kazuyoshi; Asakawa, Eiji; Osada, Atushi; Hara, Kozo; and Abe, Yasuji, 4,859,993, Cl. 340-674.000.
Abel, Heinz: *See*—
Bouwknegt, Thys; and Abel, Heinz, 4,859,207, Cl. 8-455.000.
Abraham, William F., to Brunswick Valve & Control, Inc. Position controlled linear actuator. 4,858,481, Cl. 74-89.150.
Abrutyn, Eric S.; and Sloan, Robert J., to Wickhen Products, Inc. Process for preparing basic aluminum compounds having increased sweat resistant activity. 4,859,446, Cl. 423-462.000.
Ace, Ronald S. Method of making multi-focus ophthalmic lens. 4,859,261, Cl. 156-102.000.
Acushnet Company: *See*—
Gobush, William; Berard, Raymond A.; Brown, Robert A.; and Jepson, John W., 4,858,923, Cl. 273-62.000.
Adachi, Hiroo: *See*—
Sato, Takeshi; Adachi, Hiroo; and Munetomo, Shigeru, 4,860,361, Cl. 381-55.000.
Adair, Paul C.: *See*—
Metz, George D.; McCrary, Carl; O'Connor, Joseph G.; Adair, Paul C.; Proehl, D. Scott; Saccocio, Edward J.; and Dowler, James, 4,859,561, Cl. 430-138.000.
Adams, David G. Split gland seal assembly. 4,858,936, Cl. 277-1.000.
Adams, David W.; Ching, Larry K. W., Jr.; and Puester, Neil, to Gates Energy Products, Inc. Battery terminal and method. 4,859,547, Cl. 429-121.000.
Adams, Edward U.: *See*—
Lowry, Robert K.; and Adams, Edward U., 4,859,280, Cl. 156-662.000.
Adams, Jurgen, to Mannesmann Kienzle GmbH. Combined taximeter and cassette or disk player. 4,860,124, Cl. 360-6.000.
Adams, Peter F.: *See*—
Cole, Nigel G.; and Adams, Peter F., 4,859,951, Cl. 324-534.000.
Adams Rite Manufacturing Company: *See*—
Nail, Billie G., 4,858,386, Cl. 49-505.000.
Adamski, Maximilian; Kosrow, Robert L.; and Ruderman, Stephen, to Union Special Corporation. Hemmer seamer assembly. 4,858,546, Cl. 112-286.000.
ADE Corporation: *See*—
Abbe, Robert C.; Poduje, Noel S.; and Judell, Neil H., 4,860,229, Cl. 364-563.000.
Adelman, Stuart. Superalloy compositions and articles. 4,859,416, Cl. 420-443.000.
ADIR Et Cie: *See*—
Lavielle, Gilbert; and Lepagnol, Jean, 4,859,700, Cl. 514-470.000.
Adkins, Donald E. Preset microscopic flow valve apparatus and method. 4,858,636, Cl. 137-8.000.
Adler, Dan. Device for injecting fertilizer or other chemicals into a pipeline. 4,859,157, Cl. 417-348.000.
Adler, Klaus: *See*—
Schulze, Joachim; Adler, Klaus; Selig, Manfred; Ball, Peter; Marquardt, Klaus; Killermann, Otmar; and Hannebaum, Manfred, 4,859,751, Cl. 526-200.000.
Adler, Robert; Fogelson, Mark; and Kaplan, Sam, to Zenith Electronics Corporation. Touch control arrangement for graphics display apparatus. 4,859,996, Cl. 340-712.000.
Advanced Micro Devices, Inc.: *See*—
Aria, Percy R.; and Richard, Maurice B., 4,860,325, Cl. 377-29.000.
Miller, Merle L.; and Gulick, Dale E., 4,860,285, Cl. 370-100.000.
Advanced Plasma Systems, Inc.: *See*—
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AEG Olympia AG: *See*—
Kloppenburg, Ernst, 4,859,918, Cl. 388-815.000.
Aerospace Corporation, The: *See*—
Wong, Jimmy L. Y.; and King, Howard E., 4,860,020, Cl. 343-828.000.
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Dalbera, Jacques M., 4,858,855, Cl. 244-137.100.
AG Fur Industrielle Elektronik Agie: *See*—
Levy, Gideon; Budin, Josef; and Moergeli, Benjamin, 4,859,324, Cl. 210-195.200.
Agfa-Gevaert, N.V.: *See*—
De Keyzer, Rene M.; Pollet, Robert J.; and Vermeulen, Leon L., 4,859,565, Cl. 430-231.000.
De Keyzer, Rene M., 4,859,566, Cl. 430-232.000.
AGIP, S.p.A.: *See*—
Brandi, Roberto; and De Meio, Apollonio, 4,859,117, Cl. 405-224.000.
Aiba, Masaaki: *See*—
Yamashita, Takashi; Shidara, Keiichi; Aiba, Masaaki; Takasaki, Yukio; and Hirai, Tadaaki, 4,860,093, Cl. 358-50.000.
Aihara, Toshinori; and Sudo, Yukio, to Atsugi Motor Parts Co., Ltd. Variable-delivery vane-type rotary compressor. 4,859,154, Cl. 417-295.000.
Aikman, Robert E., Jr.: *See*—
Carl, William P.; Tasset, Emmett L.; and Aikman, Robert E., Jr., 4,859,745, Cl. 525-276.000.
Air-Loc Schrepfer AG: *See*—
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Air Products and Chemicals, Inc.: *See*—
DiStefano, Frank V., 4,859,527, Cl. 428-288.000.
Langsam, Michael; Puri, Pushpinder S.; Anand, Madhu; and Laciak, Daniel V., 4,859,215, Cl. 55-16.000.
Lipisko, Bruce A.; Schumacher, John C.; Howard, Richard E.; Randtke, Peter T.; Sandu, Adrian; Fletcher, Robert E.; and Graf, Hans-Juergen, 4,859,375, Cl. 261-20.000.
Roberts, George W.; Sircar, Shivaji; and Stepanoff, Paul, 4,859,434, Cl. 423-219.000.
Roberts, George W.; Sircar, Shivaji; and Stepanoff, Paul, 4,859,435, Cl. 423-219.000.
Takahashi, Akio; Petrella, Robert G.; and Schwartz, Joel, 4,859,774, Cl. 544-251.000.
Aisin Seiki Kabushiki Kaisha: *See*—
Imaizumi, Tomoaki; Kawai, Taneichi; Nishida, Kouji; and Murakami, Yuuichi, 4,860,002, Cl. 340-825.310.
Kano, Junichi; and Aoki, Kongo, 4,858,716, Cl. 180-233.000.
Nishii, Michiharu, 4,859,004, Cl. 303-119.000.
Ochiai, Chiaki, 4,858,437, Cl. 60-562.000.
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Shirai, Eiji; Okabe, Yoshio; and Kobayashi, Yukimori, 4,858,572, Cl. 123-90.120.
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Aisin-Warner Kabushiki Kaisha: *See*—
Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,858,500, Cl. 74-866.000.
Ito, Yasunobu; and Suzuki, Kenji, 4,858,499, Cl. 74-866.000.
Aitken, Cliff R. R.: *See*—
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Aizawa, Akira: *See*—
Hayashi, Kunioki; Tanaka, Hironori; Sasagawa, Tsutomu; Uemura, Isao; and Aizawa, Akira, 4,858,560, Cl. 119-1.000.
Ajani, Jaffer; Grossie, Bruce, Jr.; Nishioka, Kenji; and Ota, David M., to Board of Regents, The University of Texas System. Methods for

the reduction of difluoromethylornithine associated toxicity. 4,859,452, Cl. 424-10.000.
Ajax Magnethermic Corporation: *See*—
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Akai Electric Company, Limited: *See*—
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Akasaki, Toshiro; Matsunaga, Masafumi; Watanabe, Takashi; and Matsushima, Hironari, to Nordson Corporation. Method and apparatus for electrostatic powder sewing of fabrics. 4,859,266, Cl. 156-273.100.
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Arai, Masao, 4,859,414, Cl. 420-15.000.
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Akutsu, Shigeru; and Tsuchiya, Kiyoshi, to Mitsuba Electric Mfg. Co., Ltd. Alternating current generator for use in a vehicle. 4,859,894, Cl. 310-239.000.
Albrektsson, Kjell: *See*—
Persson, Per-Olof; Albrektsson, Kjell; Axinger, Jan; Fixell, Jan-Olof; and Hyvarinen, Jari, 4,858,532, Cl. 102-387.000.
Alcan International Limited: *See*—
Enright, Philip G., 4,858,674, Cl. 164-475.000.
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Alexander, Jerry D.: *See*—
Williams, John F.; and Alexander, Jerry D., 4,860,331, Cl. 378-163.000.
Alfenito, Mark R., to President and Fellows of Harvard College. Electroelution of macromolecules. 4,859,302, Cl. 204-182.800.
Alfred Teves GmbH: *See*—
Klein, Hans-Christof, 4,858,516, Cl. 92-240.000.
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Johns, Robert H., 4,858,327, Cl. 33-42.000.
Allen, George C.: *See*—
Pellon, Brian J.; Allen, George C.; and Hughes, Michael P., 4,859,757, Cl. 526-348.000.
Allen Group, Inc., The: *See*—
Calleson, Gerald C., 4,858,686, Cl. 165-173.000.
Allen, Pamela J. Disposable pet toilet unit. 4,858,559, Cl. 119-1.000.
Allgaier, Jurgen; Ganter, Wolfgang; Hodapp, Wolfram; Kopf, Arthur; and Maurer, Roland, to Junghans Uhren GmbH. Autonomous radio timepiece. 4,860,268, Cl. 368-47.000.
Allied Colloids Ltd.: *See*—
Fleaher, Peter; Langley, John; Rosier, Norma; and Farrar, David, 4,859,720, Cl. 523-332.000.
Allied Gear and Machine Co., Inc.: *See*—
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Allsop, Bryan E.: *See*—
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Altemark, Detlef; and Hess, Robert, to Ruhrgas Aktiengesellschaft. Method and apparatus of operating pre-mixed burners. 4,859,171, Cl. 431-12.000.
Alterman, Marcelo K.; and do Amaral, Luis F., to ICI Americas Inc. Herbicidal compositions of acylated 1,3-dicarbonyl herbicides and phenoxyalkanoic acids, salts, amides and esters therof as antidotes. 4,859,234, Cl. 71-103.000.
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Ambo, Tatsuaki: *See*—
Maekawa, Katsumi; and Ambo, Tatsuaki, 4,860,186, Cl. 363-41.000.
Ambrose, Ronald R.; O'Dwyer, James B.; Johnston, Byron K.; Zielinski, David P.; Porter, Samuel, Jr.; and Tyger, Wayne H., to PPG Industries, Inc. Urethane component for high solids coating compositions. 4,859,743, Cl. 525-443.000.
Ameg France: *See*—
Fritsch, Georges, 4,859,216, Cl. 55-28.000.
American Bionetics, Inc.: *See*—
Marks, Martin E.; Littlehales, William J.; and Chang, Chu-An, 4,859,419, Cl. 422-56.000.
American Cyanamid Company: *See*—
Baretz, Bruce H.; and Trzaskos, William J., 4,859,369, Cl. 252-700.000.
Carter, Guy T.; Borders, Donald B.; Goodman, Joseph J.; and Labeda, David P., 4,859,598, Cl. 435-252.100.
American Home Products Corporation: *See*—
Failli, Amedeo A., 4,859,671, Cl. 514-254.000.
American Safety Razor Company: *See*—
Iten, Clemens A., 4,858,323, Cl. 30-346.600.
American Telephone and Telegraph Company, AT&T Bell Laboratories: *See*—
Dirk, Carl W.; Katz, Howard E.; Lalama, Salvatore J.; Singer, Kenneth D.; and Sohn, John E., 4,859,876, Cl. 307-425.000.
American Telephone and Telegraph Company, 02: *See*—
Gotfryd, Casimer; Kay, Stephen L.; Klotz, Hartland P.; and Wentzel, Robert M., 4,859,820, Cl. 200-408.000.
American Telephone and Telegraph Company: *See*—
Coyle, Richard J., Jr.; and Mracek, Jaroslav, 4,859,827, Cl. 219-121.640.
Sarath, Alan, 4,860,163, Cl. 361-384.000.
American Telephone and Telegraph Company, AT&T Bell Laboratories: *See*—
Brown, David B.; and Wallace, Richard E., 4,860,284, Cl. 370-14.000.
Chemla, Daniel S.; Miller, David A. B.; and Smith, Peter W., 4,860,296, Cl. 372-44.000.
Eichenbaum, Bernard R.; and Santana, Manuel R., 4,859,023, Cl. 350-96.230.
Feygenson, Anatoly, 4,860,085, Cl. 357-59.000.
Gossard, Arthur C.; Miller, Robert C.; and Petroff, Pierre M., 4,860,068, Cl. 357-16.000.
Luryi, Sergey, 4,860,064, Cl. 357-12.000.
Rabiner, Lawrence R., 4,860,358, Cl. 381-43.000.
Ammonia Casale S.A.: *See*—
Zardi, Umberto, 4,859,425, Cl. 422-148.000.
Amoco Corporation: *See*—
Busta, Heinz H., 4,859,623, Cl. 437-48.000.
Fitzharris, William D.; Ringle, Scott J.; and Nicholes, Kathy S., 4,859,310, Cl. 208-87.000.
Heller, Michael J.; and Morrison, Larry E., 4,859,583, Cl. 435-7.000.
Wallace, William G., 4,858,534, Cl. 102-511.000.
Waynick, John A., 4,859,352, Cl. 252-41.000.
AMP Incorporated: *See*—
Daly, John K.; and Kreinberg, Earl R., 4,859,204, Cl. 439-424.000.
Fritz, William B., 4,859,205, Cl. 439-492.000.
Korsunsky, Iosif; Bateman, Steven P.; and Schroepfer, Richard C., 4,858,309, Cl. 29-764.000.
Marsh, Edward K., 4,859,201, Cl. 439-290.000.
Ampex Corporation: *See*—
Baranski, Antoni S., 4,860,133, Cl. 360-92.000.
Smith, Terrance, 4,860,089, Cl. 358-10.000.
Ampor, Inc.: *See*—
Gould, Martin; and Vulimiri, Sudhakar, 4,859,604, Cl. 436-15.000.
Amway Corporation: *See*—
VanderBilt, Herbert J.; and Modert, Timothy D., 4,859,386, Cl. 264-113.000.
Analog Devices, Inc.: *See*—
Webb, Spencer L., 4,859,944, Cl. 324-253.000.
Anand, Madhu: *See*—
Langsam, Michael; Puri, Pushpinder S.; Anand, Madhu; and Laciak, Daniel V., 4,859,215, Cl. 55-16.000.
Anders, Michael; and Heiden, Christoph, to Ernst Leitz Wetzlar GmbH. Piezoelectric precision positioning device. 4,859,896, Cl. 310-328.000.
Andersen, Gerald L.; Howes, Ronald D.; and Meyocks, Richard D., to Pioneer Hi-Bred International, Inc. Means for identifying the parentage and performance characteristics of seed. 4,858,352, Cl. 40-309.000.
Anderson, Harvey G., to Pro Power Corporation. Conversion chain saw. 4,858,318, Cl. 30-122.000.
Anderson, Russell Y., to Solid State Devices. Dual connector printed circuit board assembly and method. 4,859,190, Cl. 439-78.000.
Anderson, Stanley K. Confined liquid flotation mattress. 4,858,262, Cl. 5-451.000.
Andheden, Sigvard; and Muller, Arthur. Method for preventing mercury poisoning caused by dissolution of mercury from amalgam fillings. 4,859,453, Cl. 424-10.000.
Ando, Hideki: *See*—
Kondou, Harufusa; and Ando, Hideki, 4,860,235, Cl. 364-716.000.
Andrews, Loren E.; and Sieber, Robert L., to General Electric Company. Dynamoelectric machine. 4,859,889, Cl. 310-89.000.
Anraku, Shinji: *See*—
Yamakoshi, Akira; Fujita, Toyohiko; Tsukakoshi, Kunihiko; and Anraku, Shinji, 4,859,966, Cl. 330-288.000.
Anritsu Meter Co., Ltd.: *See*—
Kobayashi, Seishiro, 4,859,081, Cl. 374-179.000.
ANT Nachrichtentechnik GmbH: *See*—
Hoffmann, Michael, 4,860,320, Cl. 375-83.000.
Antrim, Marcus L., to General Motors Corporation. Actuator mechanism for headlamp. 4,860,175, Cl. 362-65.000.
Aoki, Katashi. Clamping device for a blow mold. 4,859,170, Cl. 425-450.100.
Aoki, Katsuyuki: *See*—
Matsuda, Kenji; Sugawara, Sakuo; Hara, Masanori; Umemura, Hiroyuki; Ishioka, Hidenori; and Aoki, Katsuyuki, 4,858,824, Cl. 236-94.000.
Aoki, Kenji: *See*—
Shiraishi, Yoshiaki; and Aoki, Kenji, 4,859,034, Cl. 350-331.00R.
Aoki, Kongo: *See*—
Kano, Junichi; and Aoki, Kongo, 4,858,716, Cl. 180-233.000.
Aoki, Makoto: *See*—
Watanabe, Yoshitaka; Sakurada, Nobuaki; Aoki, Makoto; and Sato, Eiichi, 4,860,034, Cl. 346-140.00R.
Aoki, Takayoshi: *See*—
Matsumura, Yasuo; Aoki, Takayoshi; Takeda, Masayuki; Suzuki, Chiaki; and Nagatsuka, Ikutaroh, 4,859,558, Cl. 430-110.000.
Aoki, Toshihisa; and Watanabe, Sotoji, to Hewlett-Packard Company. Text formatting apparatus. 4,860,378, Cl. 382-61.000.
Aono, Toshiaki; and Hara, Hiroshi, to Fuji Photo Film Co., Ltd. Heat developable photosensitive material. 4,859,580, Cl. 430-617.000.
Aono, Yoshihito: *See*—
Takenaka, Sadao; Aono, Yoshihito; Iwamatsu, Takanori; Minowa, Morihiko; Daido, Yoshimasa; and Nakamura, Hiroshi, 4,860,316, Cl. 375-39.000.
Aoyagi, Hidenori: *See*—
Takano, Hiroshi; Murakami, Tokumichi; Kamisawa, Koh; and Aoyagi, Hidenori, 4,860,283, Cl. 370-82.000.
Aoyagi, Takaaki: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,859,593, Cl. 435-128.000.
Apicella, Michael A., to Research Foundation of State University of New York, The. Disposable antigen concentrator and detector. 4,859,421, Cl. 422-61.000.
Appenzeller, Robert C.; and Bailey, Curtis R., to Machine Products Corporation. Hoist mechanism for assisting in manual movement of a stator coil insertion tool assembly. 4,858,307, Cl. 29-736.000.
Apperson, Joseph, to British Railways Board. Control systems for controlling the passage of vehicles. 4,858,859, Cl. 246-20.000.
Appleby, Anthony J., to Texas A & M University System, The. Method and apparatus for H_2S electrolysis. 4,859,292, Cl. 204-60.000.
Applied Science Group, Inc.: *See*—
Borah, Joshua D.; Merriam, James C.; and Velez, Jose, 4,859,050, Cl. 351-210.000.
Aquatec: *See*—
Hancock, Mark W.; and May, Marvin M., 4,859,376, Cl. 261-35.000.
Araghi, Mehdi N.; and Tandon, Jagdish C., to Xerox Corporation. Replaceable image sensor array. 4,860,075, Cl. 357-30.000.
Arai, Akihiro: *See*—
Kurei, Hiroshi; Arai, Akihiro; and Kobayashi, Takumi, 4,860,043, Cl. 354-286.000.
Arai, Ikuya: *See*—
Murata, Toshinori; Arai, Ikuya; Kurita, Toshiyuki; and Nakagawa, Isao, 4,860,090, Cl. 358-21.00R.
Arai, Katsuyoshi: *See*—
Miyamoto, Yasuo; Arai, Katsuyoshi; and Uchiyama, Keiichi, 4,858,879, Cl. 248-562.000.
Arai, Masao, to Akebono Brake Industry Co., Ltd.; and Akebono Research and Development Centre Ltd. Alloy for disk rotor. 4,859,414, Cl. 420-15.000.
Arakawa, Tadao; Hashimoto, Tsuguo; and Kawauchi, Akihiro, to Hitachi, Ltd. Reheat type waste heat recovery boiler and power generation plant. 4,858,562, Cl. 122-7.00R.
Araki, Kenji: *See*—
Ohmura, Masanori; Sakama, Hiroshi; and Araki, Kenji, 4,858,558, Cl. 118-725.000.
Aratani, Shinichi; Katano, Masaaki; and Mizoguchi, Takeshi, to Central Glass Company, Limited. Chemically strengthened glass article formed of float glass. 4,859,636, Cl. 501-72.000.
Archer, William R., to General Electric Company. Electronic control circuits, electronically commutated motor systems, switching regulator power supplies, and methods. 4,859,921, Cl. 318-599.000.
Arciszewski, Henry E.; Porzio, Linda A.; Chiang, Bin Y.; Spotts, Clyde E., Jr.; McHugh, Kevin; and Szwerc, Joseph A., to Nabisco Brands, Inc. Process for making low sodium baked crackers. 4,859,473, Cl. 426-19.000.
Ardac, Inc.: *See*—
Doleja, Anthony H.; Stopar, Henry M.; and Swetel, Patrick, 4,858,744, Cl. 194-206.000.
Arents, Donald N., to United States of America, Army. Optical assembly for aircraft trailing ground lines. 4,859,026, Cl. 350-96.250.
Argon, Gideon, to Salgad International Ltd. Mounting assembly for a saddle frame structure having a cradle for a gun barrel. 4,858,514, Cl. 89-37.050.
Argyle Diamond Mines Pty. Limited: *See*—
Hawkins, Albert P.; Boyle, Alan; and Stone, Alan M., 4,858,771, Cl. 209-552.000.
Aris, Percy R.; and Richard, Maurice B., to Advanced Micro Devices, Inc. Counter tester. 4,860,325, Cl. 377-29.000.
Arifuku, Naoto: *See*—
Fukuda, Nobutoshi; Nagao, Tatsuro; Arifuku, Naoto; Tanabe, Masashi; Yamamisaka, Shinichi; and Furuta, Yoshiki, 4,860,129, Cl. 360-61.000.
Arimoto, Kazutami; and Furutani, Kiyohiro, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device comprising trench memory cells. 4,860,070, Cl. 357-23.600.
Arimoto, Shinobu, to Canon Kabushiki Kaisha. Image signal processing apparatus with edge emphasis and variable magnification. 4,860,118, Cl. 358-451.000.
Ariyama, Kenzo: *See*—
Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kuramoto, Shinichi; Sugiyama, Yoshihiro; Takanashi, Hajime; Ishizuka, Takashi; Kudo, Yoshio; and Sato, Yoshio, 4,860,050, Cl. 355-256.000.
Arnaud, Alain; Perrochat, Jean-Michel; and Philippe, Joseph, to S.A.M.M. - Societe D'Applications Des Machines Motrices. Shock absorber for a hydropneumatic vehicle suspension element. 4,858,736, Cl. 188-322.140.
Arndt, Friedrich: *See*—
Blume, Friedhelm; Franke, Wilfried; Arndt, Friedrich; and Rees, Richard, 4,859,230, Cl. 71-93.000.
Westermann, Jurgen; Kruger, Martin; Arndt, Friedrich; Rees, Richard; and Kotter, Clemens, 4,859,231, Cl. 71-93.000.
Aro Corporation, The: *See*—
Riggs, James J., 4,858,939, Cl. 279-75.000.
Arrow Fastener Company, Inc.: *See*—
Wingert, Rudolf, 4,858,813, Cl. 227-131.000.
Arsene, Dennis J.; and Lee, Darren J. Finger moistener for handling money. 4,858,555, Cl. 118-270.000.
Artzberger, Thomas G., to M-B-W Inc. Directional control system for a riding-type surface working machine. 4,859,114, Cl. 404-112.000.
Asada, Mitunori: *See*—
Hamada, Yoshihiro; Nakagawa, Kazuhiko; Hagiwara, Katunobu; Noda, Takeoki; and Asada, Mitunori, 4,859,166, Cl. 425-204.000.
Asahi Glass Company, Ltd.: *See*—
Maekawa, Takashige; Oharu, Kazuya; and Sakaguchi, Tomoko, 4,859,754, Cl. 526-245.000.
Oyama, Takuji; Suzuki, Koichi; and Mizuhashi, Mamoru, 4,859,532, Cl. 428-336.000.
Asahi Kogaku Kogyo K.K.: *See*—
Kurei, Hiroshi; Arai, Akihiro; and Kobayashi, Takumi, 4,860,043, Cl. 354-286.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Ukaji, Shiroh; Kimura, Hisao; Urata, Kenji; and Kaneda, Toshio, 4,859,824, Cl. 219-69.150.
Asai, Toshihiro; and Hagiwara, Katsunobu, to Kabushiki Kaisha Kobe Seiko Sho. Closed mixing machine. 4,859,074, Cl. 366-97.000.
Asakawa, Eiji: *See*—
Kagami, Toshihiko; Kobayashi, Kazuyoshi; Asakawa, Eiji; Osada, Atushi; Hara, Kozo; and Abe, Yasuji, 4,859,993, Cl. 340-674.000.
Asao, Kouichiro: *See*—
Ohmae, Tadayuki; Sakurai, Tadashi; Yamaguchi, Noboru; Okada, Mitsuyuki; and Asao, Kouichiro, 4,859,710, Cl. 521-55.000.
ASEA Aktiebolag: *See*—
Carlsson, Tage; and Sandberg, Jan, 4,859,887, Cl. 310-59.000.
Asea Brown Boveri AB: *See*—
Stenstrom, Lennart; and Akerstedt, Allan, 4,860,156, Cl. 361-128.000.
ASEA Brown Boveri Ltd.: *See*—
Mayer, Andreas, 4,859,153, Cl. 417-64.000.
Ashton, Wallace T.; Walton, Edward; and Tolman, Richard L., to Merck & Co., Inc. Pyrimidine derivatives as antiviral compounds. 4,859,680, Cl. 514-274.000.
Astrope, Myrle E.; and Bushman, Norman P. Method and apparatus using bituminous sandstone for pavement repair. 4,859,502, Cl. 427-139.000.
Asyst Technologies: *See*—
Bonora, Anthony C.; and Rosenquist, Fred T., 4,859,137, Cl. 414-648.000.
AT&T Bell Laboratories: *See*—
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AT&T Information Systems Inc.: *See*—
Gotfryd, Casimer; Kay, Stephen L.; Klotz, Hartland P.; and Wentzel, Robert M., 4,859,820, Cl. 200-408.000.
AT&T Technologies, Inc.: *See*—
Dirk, Carl W.; Katz, Howard E.; Lalama, Salvatore J.; Singer, Kenneth D.; and Sohn, John E., 4,859,876, Cl. 307-425.000.
Atlantic Richfield Company: *See*—
Priebe, William F.; Milliken, Brad R.; and Braaten, Dennis A., 4,858,537, Cl. 110-243.000.

Sutter, Leroy V., Jr.; and Mofley, Robert E., 4,859,075, Cl. 374-2.000.

Atmel Corporation: *See*—
Wu, Tsung-Ching; Chern, Geeng-Chuan; and Hu, James C., 4,859,619, Cl. 437-43.000.

Atsugi Motor Parts Co., Ltd.: *See*—
Aihara, Toshinori; and Sudo, Yukio, 4,859,154, Cl. 417-295.000.

Atsumi, Shigeru: *See*—
Saito, Shinji; Atsumi, Shigeru; and Tanaka, Sumio, 4,860,260, Cl. 365-201.000.

Atwal, Karnail, to E. R. Squibb & Sons, Inc. 2-Oxo-1-sulfonyl pyrazolo(1,5-a) pyrimidine-6-carboxylic acid esters. 4,859,676, Cl. 514-258.000.

Au, Andrew: *See*—
Lunk, Hans E.; Reed, Donald A.; Deep, Marguerite E.; Hill, Charles; and Au, Andrew, 4,859,836, Cl. 219-548.000.

Aubry, Jean-Pierre; Fragneau, Marc; Craveur, Jean-Charles; Janiaud, Denis; and Muller, Serge, to Compagnie D'Electronique Et De Piezo-Electricitie C.E.P.E; and Office Nationale D'Etudes Recherches Aerospatiales Onera. Suspension springs for a vibrating piezoelectric plate. 4,859,898, Cl. 310-353.000.

Auel, RaeAnn M.: *See*—
Schneider, Alan A.; Stewart, David A.; Jolson, Joseph D.; Auel, RaeAnn M.; and Price, John F., 4,859,305, Cl. 204-412.000.

Aufdembrink, Brent A.: *See*—
Landis, Michael E.; Aufdembrink, Brent A.; Chu, Pochen; Johnson, Ivy D.; Kirker, Garry W.; Page, Nancy M.; and Rubin, Mae K., 4,859,648, Cl. 502-242.000.

Augustine, Michael E.; and Orthoefer, Frank T., to A. E. Staley Manufacturing Company. Preswectened comestible composition. 4,859,477, Cl. 426-103.000.

Ausnit, Steven: *See*—
Nocek, Robert S.; and Ausnit, Steven, 4,859,083, Cl. 383-37.000.

Autie, Pascal J. M.; Avignon, Philippe P.; Camusso, Dominique P.; Forestier, Alexandre; and Ulryck, Gilles, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, FRX. Acoustic panel for sound insulating linings of gas ducts. 4,858,721, Cl. 181-213.000.

Autoipari Kutato es Fejleszto Vallalat: *See*—
Cser, Gyula; Csikos, Antal; and Timar, Peter, 4,858,569, Cl. 123-52.0MB.

Automobiles Citroen: *See*—
Landais, Jean, 4,859,818, Cl. 200-61.45R.

Automobiles Peugeot: *See*—
Landais, Jean, 4,859,818, Cl. 200-61.45R.

Automotive Products PLC: *See*—
Maycock, Ian C.; Ball, Robert J.; and Symonds, Denzil J. W., 4,858,741, Cl. 192-98.000.

Avar, Lajos, to Sandoz Ltd. Oxalamide compounds useful as UV absorbers. 4,859,725, Cl. 524-91.000.

Avco Research Laboratory, Inc.: *See*—
Janes, George S., 4,860,302, Cl. 372-70.000.

Avery, James M., to NCR Corporation. Binary autocorrelation processor. 4,860,357, Cl. 381-41.000.

Avignon, Philippe P.: *See*—
Autie, Pascal J. M.; Avignon, Philippe P.; Camusso, Dominique P.; Forestier, Alexandre; and Ulryck, Gilles, 4,858,721, Cl. 181-213.000.

Awad, Sami B., to Henkel Corporation. Lubricant and surface conditioner for formed metal surfaces. 4,859,351, Cl. 252-32.500.

Awano, Tetsuyuki: *See*—
Muroi, Kunimasa; Inagaki, Yoshinari; and Awano, Tetsuyuki, 4,858,928, Cl. 273-73.00D.

Axinger, Jan: *See*—
Persson, Per-Olof; Albrektsson, Kjell; Axinger, Jan; Fixell, Jan-Olof; and Hyvarinen, Jari, 4,858,532, Cl. 102-387.000.

Axis S.p.A.: *See*—
Luciani, Sabatino; and Lunini, Antonio, 4,858,835, Cl. 242-1.10A.

Azam, Mohammad S.; and Carr, Michael D., to British Telecommunications plc. Video level control. 4,860,103, Cl. 558-160.000.

B.F. Goodrich Company, The: *See*—
Maddox, Charles G., 4,859,108, Cl. 403-277.000.

Babcock & Wilcox Company, The: *See*—
Coulter, John E.; Evans, Robert S.; and Robertson, Michael O., 4,858,462, Cl. 73-40.50A.
Evans, Robert S.; Latham, Wayne M.; Powers, Thomas; and Robertson, Michael O., 4,859,943, Cl. 324-216.000.

Babjak, John R.: *See*—
Shalati, Mohamad D.; Marquart, James A.; Babjak, John R.; and Harris, Rodney M., 4,859,758, Cl. 527-313.000.

Badewitz, Charles J. Glare reducing night driving glasses. 4,859,047, Cl. 351-47.000.

Badillo, Paul, to Bakron Corp. Plastic bobbin basket with needle guard plate. 4,858,543, Cl. 112-231.000.

Bacuerle, Dieter, to Siemens Aktiengesellschaft. Method for prescribed, structured deposition of micro-structures with laser light. 4,859,279, Cl. 156-656.000.

Bailey, Curtis R.: *See*—
Appenzeller, Robert C.; and Bailey, Curtis R., 4,858,307, Cl. 29-736.000.

Bailey, Samuel. Flexible heat transfer pad. 4,858,590, Cl. 126-39.00H.

Bailey, Walter H.; and Pettus, Kent, to Texas Instruments Incorporated. Redundant power supply control. 4,860,188, Cl. 363-65.000.

Baillargeon, Joseph P.: *See*—
Foye, Thomas E.; and Baillargeon, Joseph P., 4,859,247, Cl. 106-303.000.

Baker Hughes Incorporated: *See*—
Ilfrey, William T.; Spatz, Edward C.; Peterson, Elmer R.; and Moran, William, 4,858,691, Cl. 166-278.000.
McIntosh, Ronald M.; Rentzel, Richard T.; Stewart, Robert W.; and Daugherty, Daniel L., 4,859,200, Cl. 439-275.000.

Baker, Ross G., Jr.: *See*—
Bradshaw, James I.; and Baker, Ross G., Jr., 4,858,623, Cl. 128-785.000.

Bakers Hughes Inc.: *See*—
Wood, Leonard J. A., 4,859,346, Cl. 210-776.000.

Bakron Corp.: *See*—
Badillo, Paul, 4,858,543, Cl. 112-231.000.

Balch, Brent F.: *See*—
Watkins, Harry E.; Balch, Brent F.; Oakes, Jeffery T.; Copeland, Richard L.; Patterson, Hubert A.; and Martinson, Mart, 4,859,991, Cl. 340-572.000.

Balco, Inc.: *See*—
Borner, Willy; and McQueeney, Kenneth A., 4,859,111, Cl. 403-340.000.

Balderson, Simon, to Thorn EMI plc. Electrically resistive tracks. 4,859,835, Cl. 219-543.000.

Balina, Istvan; Kokai, Jozsef; Boro , Lajos; and Torba, Lajos, to "Spiral" Autojavito Vallalat. Lock for hand brake lever of motor vehicle. 4,858,451, Cl. 70-202.000.

Balke, Siegmund; and Lutkemeyer, Gunter, to Durkoppwerke GmbH. Sewing machine having means for terminating seams at a predetermined place. 4,858,545, Cl. 112-275.000.

Ball Corporation: *See*—
Long, Eugene C.; Kubitschek, James E.; and Horacek, Stephen M., 4,860,096, Cl. 358-101.000.

Ball, Peter: *See*—
Schulze, Joachim; Adler, Klaus; Selig, Manfred; Ball, Peter; Marquardt, Klaus; Killermann, Otmar; and Hannebaum, Manfred, 4,859,751, Cl. 526-200.000.

Ball, Robert J.: *See*—
Maycock, Ian C.; Ball, Robert J.; and Symonds, Denzil J. W., 4,858,741, Cl. 192-98.000.

Ballard, Gary W.; and Thompson, Kevin D., to Carrier Corporation. Calibration technique for variable speed motors. 4,860,231, Cl. 364-571.010.

Ballard, Joe B., Jr., to Dynamic Conveyor Products. Wheel assembly for conveyer system. 4,858,752, Cl. 198-845.000.

Bally Manufacturing Corporation: *See*—
Keane, Martin A., 4,858,932, Cl. 273-143.00R.

Banerjee, Chandra K.; and Shelar, Gary R., to R. J. Reynolds Tobacco Company. Smoking article with improved aerosol forming substrate. 4,858,630, Cl. 131-364.000.

Baney, Douglas M.; and Sorin, Wayne V., to Hewlett-Packard Company. Method and apparatus for optical signal analysis using a gated modulation source and an optical delay circuit to achieve a self-homodyne receiver. 4,859,843, Cl. 250-227.000.

Banks, Leslie: *See*—
Hoagood, Henry; Banks, Leslie; and Beauford, William, 4,858,469, Cl. 73-579.000.

Bantle, Manfred, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Arrangement for the control of the power transmission of a four-wheel drive vehicle. 4,860,208, Cl. 364-424.100.

Bantz, Paul E.: *See*—
Binder, Richard R.; Bantz, Paul E.; Tiedemann, William H.; McDonald, Guy D.; and Wruck, William J., 4,859,546, Cl. 429-53.000.

Baptiste, Hubert: *See*—
Ollivier, Jean; Lagaude, Christian H.; Baptiste, Hubert; and Larrouy, Michele, 4,859,373, Cl. 562-119.000.

Barall, Michael. Heartbeat collision avoidance method and circuit. 4,860,006, Cl. 340-825.500.

Baranski, Antoni S., to Ampex Corporation. Cassette bin structure including a bin section for loading and unloading cassettes. 4,860,133, Cl. 360-92.000.

Barer, Sol J.: *See*—
Hagedorn, Scott R.; East, Anthony J.; and Barer, Sol J., 4,859,592, Cl. 435-122.000.

Baretz, Bruce H.; and Trzaskos, William J., to American Cyanamid Company. Use of water-soluble polymers in aqueous chemical light formulations. 4,859,369, Cl. 252-700.000.

Bargoot, Frederick G.: *See*—
Groopman, John D.; Wogan, Gerald N.; Bargoot, Frederick G.; and Ferrari, Christopher, 4,859,611, Cl. 436-518.000.

Baria, Paul C.: *See*—
Hausler, Jeffery P.; Baria, Paul C.; Majek, Alfred; and Moore, Jeffrey B., 4,859,834, Cl. 219-497.000.

Barma, Tarachand S., to La Crosse Footwear, Inc. Vulcanized rubber footwear product. 4,858,337, Cl. 36-4.000.

Barma, Tarachand S.: *See*—
Nicholson, Joh E.; and Barma, Tarachand S., 4,858,342, Cl. 36-109.000.

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Baron, Kenneth C., to Unisys Corporation. Correlator with variably normalized input signals. 4,860,239, Cl. 364-728.030.

Baroni, Robert J., to Rockwell International Corporation. Vehicle brake support. 4,858,730, Cl. 188-205.00R.

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Barre, Lucien, to Thomson-CSF. Fitting process for packaging a semiconductor component in a plastic box. 4,859,631, Cl. 437-209.000.

Barruet, Patrick; Fauconnier, Alain; and Carle, ierre-Regis, to Societe Nationale des Poudres et Explosifs. Paper distributing an active compound on burning, and a pyrotechnic distributor using such paper. 4,859,454, Cl. 424-40.000.

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Bartholomew, Donald D., to Proprietary Technology, Inc. Spark plug connector. 4,859,194, Cl. 439-125.000.

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Baskin, David; and Lam, Dominic M. K., to Houston Biotechnology Incorporated. Pyrazine in prevention and treatment of strokes. 4,859,674, Cl. 514-255.000.

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Korsunsky, Iosif; Bateman, Steven P.; and Schroepfer, Richard C., 4,858,309, Cl. 29-764.000.

Bates, Victor T.; and Pokross, Charles, to Fansteel Inc. Fine grained embrittlement resistant tantalum wire. 4,859,257, Cl. 148-422.000.

Batt, Douglas G.; Greenberg, Richard S.; and Harris, Richard R., to Du Pont de Nemours, E. I., and Company. Antiinflammatory carbinoloimidazoles. 4,859,693, Cl. 514-397.000.

Battarel, Claude. Radiation interruption keyboard. 4,860,008, Cl. 341-31.000.

Bauch, Hartmut; Krause, Peter; Jost, Ulrike; Kersten, Ralf; Paquet, Volker; and Siefert, Wolfgang, to Schott Glaswerke. Method for the manufacture of a light wave guide. 4,859,222, Cl. 65-3.120.

Baudier, Philippe; De Boeck, Arthur; and Fossion, Jacques, to Pharlyse Societe Anonyme. Novel galenic forms of verapamil, their preparation and medicines containing said novel galenic forms. 4,859,469, Cl. 424-462.000.

Baumler, Jurgen; and Zeh, Manfred, to Lambda Physik Forschungs- und Entwicklungsgesellschaft MB. Electrode for pulsed gas lasers. 4,860,300, Cl. 372-57.000.

Bauwens, Frank; and De Bom Van Driessche, Dirk. Lighting device for vehicle. 4,860,176, Cl. 362-72.000.

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Baxter International Inc.: *See*—
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Baxter Travenol Laboratories, Inc.: *See*—
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Bayer Akt.: *See*—
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Beaumont, Jeff. Weighted exercise apparatus. 4,858,916, Cl. 272-119.000.

Bechu, Jean-Pierre; and Champleboux, Jacques J., to Caoutchouc Manufacture et Plastiques. Intercirculation tunnel between vehicles. 4,858,535, Cl. 105-15.000.

Beck, Ernst; Riehlein, Fritz; and Lenard, Peter, to Vollmer Werke Maschinenfabrik GmbH. Device for clamping a saw blade to a saw working machine. 4,858,392, Cl. 51-218.00R.

Becker, Johann A.: *See*—
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Beckman Instruments, Inc.: *See*—
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Begg, Alan R.; Brown, Colin W.; and Charmaa, Neil E. S., to British Petroleum Company p.l.c., The. Graded structure composites. 4,859,542, Cl. 428-547.000.

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Behre, Horst; Blnak, Heinz U.; Kohler, Wilfried; Muller, Nikolaus; and Schnegg, Peter, to Bayer Aktiengesellschaft. Process for the sulphonation of aromatic compounds with sulphur trioxide. 4,859,372, Cl. 562-74.000.

Behrens, Klaus F. A.: *See*—
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Bell, James A.: *See*—
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Bellis, Paul A. Detachable inflatable boat bottom. 4,858,550, Cl. 114-345.000.

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Benoit, Vincent: *See*—
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Berg, Lloyd; Szabados, Rudolph J.; and Flower, Thomas H., to Berg, Lloyd. Separation of 2-pentanone from formic acid by extractive distillation. 4,859,285, Cl. 203-51.000.
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Bernier, Paul. Swath treating attachment for a swather. 4,858,419, Cl. 56-184.000.
Bernstein, Peter R.; Brown, Frederick J.; Matassa, Victor G.; and Yee, Ying Kwong, to ICI Americas Inc. Heterocyclic amide derivatives and pharmaceutical use. 4,859,692, Cl. 514-381.000.
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Bibby, Geoffrey W., to Central Electricity Generating Board. Temperature measurement. 4,859,065, Cl. 356-45.000.
Bice, Keith C. Restoration or drill buttons. 4,858,388, Cl. 51-55.000.
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Bieber, Gunter: *See*—
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Bitzinger, Rudolf; Engl, Walter; Humml, Siegfried; and Schreier, Klaus, to Oread Laboratories, Inc. Error protected central control unit of a switching system and method of operation of its memory configuration. 4,860,333, Cl. 379-10.000.
Bivens, David J. Body brush and shower stall system. 4,858,257, Cl. 4-600.000.
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Bobb, Lloyd C.; White, Barbara J.; and Davis, Jon P., to United States of America, Navy. Thermal modulation of light beams. 4,859,059, Cl. 356-345.000.
Bobichon, Jacques; Hervouin, Lucien; and Vigneron, Gilbert, to Societe Anonyme dite: Stein Industrie. Plug for an opening providing an inspection X-ray source with access to pipework or to an apparatus. 4,858,652, Cl. 138-92.000.
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Boes, Roger T. Fiberglass fence post or column structure. 4,858,891, Cl. 256-19.000.
Boesch, Ronald D.: *See*—
Franke, Steven J.; Boesch, Ronald D.; and Magin, Richard L., 4,859,972, Cl. 333-164.000.
Boggs, George J., to GTE Laboratories Incorporated. Method of evaluating speech. 4,860,360, Cl. 381-48.000.
Bohnke, Kurt; Brandis, Helmut; Domalski, Hans-Heinrich; Fleischer, Hans-Joachim; and Frinken, Heinrich, to Thyssen Edelstahlwerke AG. Semi-finished products of ferritic steel and catalytic substrate containing same. 4,859,649, Cl. 502-439.000.
Boisson, Jean-Yves, to Telecommunications Radioelectriques Et Telephoniques T.R.T. Differential pulse code modulation arrangement, associated decoding arrangement and transmission system comprising at least such an encoding or decoding arrangement. 4,860,314, Cl. 375-27.000.
Boksberger, Hans-Ulrich; and Tomljenovic, Juraj, to BBC Brown Boveri AG. Adjustable vacuum condenser. 4,860,160, Cl. 361-279.000.
Bolfik, Lawrence J.; and Smith, Calvin G., to Ford Motor Company. Airconditioning system for a vehicle. 4,858,676, Cl. 165-2.000.
Bolling, Fritz C.; and Sellner, Josef, to Thyssen Industrie AG. Articulated joint. 4,858,962, Cl. 285-136.000.
Bolt Technology Corporation: *See*—
Chelminski, Stephen V., 4,858,718, Cl. 181-106.000.
Bonissone, Piero P., to General Electric Company. Reasoning system for reasoning with uncertainty. 4,860,213, Cl. 364-513.000.
Bonnaud, Micheline: *See*—
Sauvinet, Vincent; Bletry, Jean; Bonnaud, Micheline; and Trouve, Maurice, 4,859,499, Cl. 427-108.000.
Bonora, Anthony C.; and Rosenquist, Fred T., to Asyst Technologies. Apparatus for transporting a holder between a port opening of a standardized mechanical interface system and a loading and unloading station. 4,859,137, Cl. 414-648.000.
Borah, Joshua D.; Merriam, James C.; and Velez, Jose, to Applied Science Group, Inc. Method and system for generating a synchronous display of a visual presentation and the looking response of many viewers. 4,859,050, Cl. 351-210.000.
Borchardt, Ronald T.; and Borcherding, David R., to University of Kansas. Nucleoside analogues having antiviral activity. 4,859,677, Cl. 514-261.000.
Borcherding, David R.: *See*—
Borchardt, Ronald T.; and Borcherding, David R., 4,859,677, Cl. 514-261.000.
Borchers, Brian D.: *See*—
Teske, Judy L.; Borchers, Brian D.; Daane, Don A.; Baxter, Daniel J.; and Ehrich, William G., 4,860,288, Cl. 371-1.000.
Borden Company Limited, The: *See*—
Navratil, Martin; Mitchell, Mark S.; and Sovak, Mojmir, 4,858,693, Cl. 166-295.000.
Borders, Donald B.: *See*—
Carter, Guy T.; Borders, Donald B.; Goodman, Joseph J.; and Labeda, David P., 4,859,598, Cl. 435-252.100.
Borner, Willy; and McQueeney, Kenneth A., to Balco, Inc. Unisex connector. 4,859,111, Cl. 403-340.000.
Boro , Lajos: *See*—
Balina, Istvan; Kokai, Jozsef; Boro , Lajos; and Torba, Lajos, 4,858,451, Cl. 70-202.000.
Borsari, Gianni, to Hospal AG. Device for measuring the quantity of ultrafiltrate eliminated during a dialysis treatment. 4,859,319, Cl. 210-86.000.
Borsig GmbH: *See*—
Brucher, Peter; and Lachmann, Helmut, 4,858,684, Cl. 165-134.100
Borzatta, Valerio: *See*—
Cantatore, Giuseppe; and Borzatta, Valerio, 4,859,724, Cl. 524-91.000.
Bosanec, Thomas P.; Lukow, Kenneth R.; and Verbrugge, Calvin J., to S. C. Johnson & Son, Inc. Alkene/excess maleic anhydride polymer manufacture. 4,859,752, Cl. 526-209.000.
Boschung, Marcel, to Reberle reg. Treuunternehmen Schaan. Pavement-cleaning vehicle. 4,858,270, Cl. 15-328.000.
Boskamp, Eddy B., to U.S. Philips Corporation. Magnetic resonance imaging apparatus comprising a stacked surface coil system. 4,859,947, Cl. 324-318.000.
Bosnyak, Robert J., to Fairchild Semiconductor Corp. PLA driver with reconfigurable drive. 4,859,874, Cl. 307-296.300.
Bossart, Clayton J.: *See*—
Kush, Robert S.; and Bossart, Clayton J., 4,858,478, Cl. 73-864.350.
Bosten, Donald R.; and Cooper, Randy G., to Porter-Cable Corporation. Plate joiner with a handle having a superior orientation. 4,858,661, Cl. 144-134.00D
Bosten, Donald R.; and Cooper, Randy G., to Porter-Cable Corporation. Plate joiner having a superior miter guide for mitered carcase joints. 4,858,662, Cl. 144-136.00C.
Bosten, Donald R.; and Cooper, Randy G., to Porter-Cable Corporation. Plate joiner having a quiet drive. 4,858,663, Cl. 144-136.00C.
Boston University: *See*—
Groopman, John D.; Wogan, Gerald N.; Bargoot, Frederick G.; and Ferrari, Christopher, 4,859,611, Cl. 436-518.000.
Botar, Laszlo : *See*—
Szabo nee Mogyorossi, Katalin; Kalocsai, Istvan; Gyoni, Istyan; Remenyi, Karoly; Plaveczky, Gyorgy; Kovacs, Laszlo ; Gal, Dezso ; Nemes, Istvan; Botar, Laszlo ; Bencsura, Akos; Moger nee Jeremejeva, Galina; Heberger, Karoly; and Nemeth, Andras, 4,859,209, Cl. 44-51.000.
Botez, Dan; and Mawst, Luke J. Phased-locked array of semiconductor lasers using closely spaced antiguides. 4,860,298, Cl. 372-45.000.
Bothwell, Peter W. Internal combustion engines. 4,858,573, Cl. 123-90.150.
Boucher, Jay M.: *See*—
Lalumiere, Robert J.; and Boucher, Jay M., 4,858,394, Cl. 51-312.000.
Bouda, Keiji, to Mazda Motor Corporation. Automatic transmission system for a vehicle. 4,858,498, Cl. 74-866.000.
Bouix, Jean; Viala, Jean C.; Vincent, Henri; Vincent, Christiane; Ponthenier, Jean L.; and Dazord, Jacques, to Central National De La Recherche Scientifique (CNRS). Process for coating carbon fibers with a carbide, and carbon fibers thus coated. 4,859,503, Cl. 427-249.000.
Bouron, Jean P.; Giroux, Daniel; and Rousseau, Pierre, to Thomson-CSF. Display system for displaying essential data by separately handling different parts of the image to maximize reliability. 4,859,997, Cl. 340-752.000.
Boutterin, Rene: *See*—
Dubuisson, Jacques; and Boutterin, Rene, 4,859,520, Cl. 428-137.000.
Bouwknegt, Thys; and Abel, Heinz, to Ciba-Geigy Corporation. Process for dyeing textile planar fabrics made from polyamides: with melamine compound as resist agent. 4,859,207, Cl. 8-455.000.
Bov, Raphael F.: *See*—
Gruber, Robert J.; Bov, Raphael F.; Cometa, Thomas D.; Eakin, Paul W.; Berkes, John S.; and Grushkin, Bernard, 4,859,550, Cl. 430-39.000.
Bowlin, Robert F., to Labinal Components and Systems, Inc. Method of forming a connector. 4,858,313, Cl. 29-883.000.
Bowman, Harry F.; and Weaver, James C., to Massachusetts Institute of Technology. Apparatus for the non-invasive measurement of thermal properties and perfusion rates of biomaterials. 4,859,078, Cl. 374-44.000.
Bowman, Robert M., to Ciba-Geigy Corporation. Certain 1,2-benzisoxazole derivatives. 4,859,691, Cl. 514-379.000.
Bowman, Ronald R.; Sodal, Ingvar E.; Wilke, Thomas A.; and Weller, Frank, to Masstron, Inc. Mass spectrometer apparatus. 4,859,848, Cl. 250-296.000.
Box, Robert L.; and Cottrell, Peter R., to Vickers Shipbuilding & Engineering Limited. Structures subject to bending and fatigue loading. 4,859,107, Cl. 403-24.000.
Boyd, Billy E. Arm exercising apparatus. 4,858,912, Cl. 272-67.000.
Boyesen, Eyvind. Chair for infants. 4,858,991, Cl. 297-195.000.
Boyle, Alan: *See*—
Hawkins, Albert P.; Boyle, Alan; and Stone, Alan M., 4,858,771, Cl. 209-552.000.

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Bozek, John W. Archery device with separate bending and lauching bowstrings and front end arrow launch. 4,858,588, Cl. 124-23.00R.

Bozowski, Stanley: *See*—
Gittleman, Jonathan I.; and Bozowski, Stanley, 4,859,939, Cl. 324-158.00R.

BP Chemicals Limited: *See*—
Cloetens, Rudolphe C.; and Umpleby, Jeffrey D., 4,859,810, Cl. 174-110.0PM.

Braaten, Dennis A.: *See*—
Priebe, William F.; Milliken, Brad R.; and Braaten, Dennis A., 4,858,537, Cl. 110-243.000.

Bradbury, Roy: *See*—
Gregory, Peter; Bradbury, Roy; and Meyrick, Barry H., 4,859,651, Cl. 503-227.000.

Bradinal, Werner H. W., to U.S. Philips Corporation. Digital circuit arrangement for quantization-noise reduction. 4,859,883, Cl. 307-546.000.

Bradshaw, James I.; and Baker, Ross G., Jr., to Intermedics, Inc. Active fixation mechanism for lead assembly of an implantable cardiac stimulator. 4,858,623, Cl. 128-785.000.

Bradshaw, John: *See*—
Coates, Ian H.; Bradshaw, John; Bell, James A.; Humber, David C.; Ewan, George B.; Mitchell, William L.; and Price, Barry J., 4,859,662, Cl. 514-212.000.

Bragole, Robert A., to Worthen Industries, Inc. Method for bonding adhesives to polyolefin surfaces and the laminate formed thereby. 4,859,540, Cl. 428-522.000.

Brambilla, Enzo: *See*—
Mantegani, Sergio; Brambilla, Enzo; Temperilli, Aldemio; Ruggieri, Daniela; and Salvati, Patricia, 4,859,678, Cl. 514-269.000.

Brand, Hans-Wolfgang: *See*—
Klee, Mareike K.; and Brand, Hans-Wolfgang, 4,859,448, Cl. 423-598.000.

Brand, Reinhold; Engler, Bernd; Kleine-Moellhoff, Peter; and Koberstein, Edgar, to Degussa Aktiengesellschaft. Apparatus for the containment of monolithic catalysts. 4,859,428, Cl. 422-179.000.

Brand Scaffold Services, Ltd.: *See*—
Fowler, Ronald E.; Voss, Jeffrey L.; and Cain, Stephen D., 4,858,890, Cl. 254-335.000.

Brandeis University: *See*—
Perlman, Daniel, 4,859,423, Cl. 422-102.000.

Brandes, Wilhelm: *See*—
Fest, Christa; Hansaler, Gerd; and Brandes, Wilhelm, 4,859,235, Cl. 71-103.000.

Brandi, Roberto; and De Meio, Apollonio, to AGIP, S.p.A. Reversible mechanical coupling, particularly for tensional anchorages. 4,859,117, Cl. 405-224.000.

Brandis, Helmut: *See*—
Bohnke, Kurt; Brandis, Helmut; Domalski, Hans-Heinrich; Fleischer, Hans-Joachim; and Frinken, Heinrich, 4,859,649, Cl. [illegible]

Brandmaier, Klaus: *See*—
Jana, Herbert; Brandmaier, Klaus; and Pohl, Siegfried, 4,860,344, Cl. 379-113.000.

Branson Ultrasonics Corporation: *See*—
Wolcott, Jeffrey S., 4,859,378, Cl. 264-23.000.

Braumann, Peter: *See*—
Weise, Wolfgang; Wolmer, Roger; and Braumann, Peter, 4,859,238, Cl. 75-233.000.

Braun Aktiengesellschaft: *See*—
Heuwinkel, Lothar; and Hofinger, Herbert, 4,859,869, Cl. 307-117.000.

Braun, Walter, to BBC Brown Boveri AG. Method for demodulating an FM signal. 4,859,957, Cl. 329-50.000.

Breault, John P.; and Dickau, Ewald F., to Loctite Corporation. Sealless modular positive displacement dispenser. 4,858,789, Cl. 222-309.000.

Brecz, Imre; Schultz, Dennis; and Hinton, Dennis L., to Microdot Inc. Sheathed composite blind rivet. 4,859,128, Cl. 411-43.000.

Brenner, Nathaniel; and Osborne, James C., Jr., to Beckman Instruments, Inc. Separation of zone formation from electroosmotic impulse in tubular electrophoretic systems. 4,859,301, Cl. 204-180.100.

Breucker, Theodor: *See*—
Hoppe, Hans; Breucker, Theodor; Ernst, Reinhard; and Storf, Robert, 4,859,067, Cl. 366-341.000.

Brewer, David C.; Lindberg, Conrad P.; and Lindberg, Paul M., to Electronic Research Group, Inc. Integrated uninterruptible power supply for personal computers. 4,860,185, Cl. 363-41.000.

Brewer, Earl G.; and Lee, Robert W., to General Motors Corporation. Die-upset manufacture to produce high volume fractions of RE-Fe-B type magnetically aligned material. 4,859,410, Cl. 419-10.000.

Brewer, George W. Slide sorter and viewer. 4,858,356, Cl. 40-366.000.

Bridenbaugh, James F.: *See*—
Walton, Charles F.; Sucheski, Robert J.; Bridenbaugh, James F.; and Chapman, James J., 4,858,381, Cl. 47-79.000.

Bridge, Corinne M. Method of hand-forming needlework patterns. 4,858,544, Cl. 112-266.100.

Bridgeman, Gordon. Heat exchanger. 4,858,584, Cl. 123-557.000.

Bridgestone Corporation: *See*—
Murase, Masanori; Tomita, Naotaka; Mizuno, Keiichiro; and Iida, Kazuyoshi, 4,858,720, Cl. 181-176.000.
Noguchi, Takeshi; Kikuchi, Takashi; and Takano, Kazuya, 4,858,733, Cl. 188-267.000.
Okuyama, Kouji; and Touya, Hiroki, 4,858,901, Cl. 269-21.000.
Saito, Tasuku; and Kakiuchi, Shinichi, 4,858,924, Cl. 273-62.000.
Saotome, Masaru; Ushijima, Takao; Noguchi, Takeshi; Sato, Naomi; and Nakao, Tsutomu, 4,858,899, Cl. 267-219.000.

Bridgestone Cycle Co., Ltd.: *See*—
Kozakae, Kunitoshi; and Takeda, Toru, 4,858,485, Cl. 74-399.000.

Brierley, Michael C.; Mallinson, Stephen R.; Millar, Colin A.; and Urquhart, William P., to British Telecommunications plc. Dielectric optical Fabry-Perot waveguide device and method for making and using same. 4,859,017, Cl. 350-96.150.

Bright, Robert G., to Draftex Industries Limited. Seals. 4,858,385, Cl. 49-488.000.

Brindopke, Gerhard; Godau, Claus; and Weber, Walter, to Hoechst AG. Curing components for synthetic resins and their use. 4,859,788, Cl. 558-398.000.

Bristol-Myers Company: *See*—
Eison, Michael S.; and Krogsgaard-Larsen, Povl, 4,859,666, Cl. 514-221.000.

Britax-Kolb GmbH & Co.: *See*—
Ogris, Gottfried, 4,858,847, Cl. 242-107.40B.

British Aerospace Public Limited Company: *See*—
Standford, Richard T. A.; and Biggs, Roger, 4,859,960, Cl. 329-126.000.

British Petroleum Company p.l.c., The: *See*—
Begg, Alan R.; Brown, Colin W.; and Charman, Neil E. S., 4,859,542, Cl. 428-547.000.

British Railways Board: *See*—
Apperson, Joseph, 4,858,859, Cl. 246-20.000.

British Telecommunications: *See*—
Cole, Nigel G.; and Adams, Peter F., 4,859,951, Cl. 324-534.000.

British Telecommunications plc: *See*—
Azam, Mohammad S.; and Carr, Michael D., 4,860,103, Cl. 558-160.000.
Brierley, Michael C.; Mallinson, Stephen R.; Millar, Colin A.; and Urquhart, William P., 4,859,017, Cl. 350-96.150.

Brocklebank, Norman; and Cooper, Alan, to J.C. Bamford Excavators Limited. Boom for a vehicle including folding linkage between boom parts. 4,859,138, Cl. 414-694.000.

Brod & McClung - Pace Co.: *See*—
Passadore, Albert M., 4,859,140, Cl. 415-48.000.

Brookes, Gerald F.; and Spencer, Lynne, to Fospur Limited. Recovering coal fines. 4,859,318, Cl. 209-166.000.

Brooktree Corporation: *See*—
Colles, Joseph H., 4,860,011, Cl. 341-133.000.

Brosius, James R.; and Brosius, Ralph C., to Eldorado Cartridge Corporation. Power actuated tool with magazine feed. 4,858,811, Cl. 227-10.000.

Brosius, Ralph C.: *See*—
Brosius, James R.; and Brosius, Ralph C., 4,858,811, Cl. 227-10.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Hirose, Noboru; and Hiroae, Akira, 4,858,290, Cl. 29-35.500.
Kanemoto, Seiichi; and Fukuoka, Mutsuo, 4,859,099, Cl. [illegible]

Brown, Amos J.: *See*—
Hayek, George W.; Brown, Amos J.; Hamblin, John R.; and Robinson, Donald M., 4,858,592, Cl. 126-373.000.

Brown, Anthony K. D., to Northern Telecom Limited. Telephone memory controller arrangement. 4,860,349, Cl. 379-356.000.

Brown, Colin W.: *See*—
Begg, Alan R.; Brown, Colin W.; and Charman, Neil E. S., 4,859,542, Cl. 428-547.000.

Brown, David B.; and Wallace, Richard E., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method and apparatus for identifying location of a lost token signal in a data communication network. 4,860,284, Cl. 370-88.000.

Brown, David S., to General Instrument Corporation. Dynamic feedback arrangement scrambling technique keystream generator. 4,860,353, Cl. 380-44.000.

Brown, Frederick J.: *See*—
Bernstein, Peter R.; Brown, Frederick J.; Matassa, Victor G.; and Yee, Ying Kwong, 4,859,692, Cl. 514-381.000.

Brown, Gedney B.: *See*—
Tupper, Robert B.; Mangus, James D.; Sharbaugh, John E.; Brown, Gedney B.; Livingston, Julie M.; and Dhalla, Asfandiar K., 4,859,402, Cl. 376-285.000.

Brown, Paul M. Carburetor fuel preconditioner. 4,858,582, Cl. 123-523.000.

Brown, Ralph V., to Facet Enterprises, Inc. Low pressure metering fluid pump. 4,860,158, Cl. 361-165.000.

Brown, Robert A.: *See*—
Gobush, William; Berard, Raymond A.; Brown, Robert A.; and Jepson, John W., 4,858,923, Cl. 273-62.000.

Brucher, Peter; and Lachmann, Helmut, to Borsig GmbH. Heat exchanger, especially for cooling cracked gas. 4,858,684, Cl. 165-134.100.

Bruckert, William F.; Flahive, Barry; and Lacy, James V., to Digital Equipment Corporation. Buffer system for input/output portion of digital data processing system. 4,860,244, Cl. 364-900.000.

Bruckstein, Henry, to Dopler Industries Inc. Replacement sun visors for automobiles. 4,858,989, Cl. 296-97.200.

Bruederle, Ernst, to Messerschmitt-Boikow-Blohm GmbH. Process for the reacquisition of the pitch attitude of an earth satellite. 4,858,858, Cl. 244-165.000.

Bruninga, Kenneth J.: *See*—
Fletcher, Douglas C.; and Bruninga, Kenneth J., 4,858,827, Cl. 239-69.000.

Brunninger, Manfred: *See*—
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Brunswick Corporation: *See*—
Hesterberg, William G.; and Cleary, Terrance M., 4,858,671, Cl. 164-34.000.

Brunswick Valve & Control, Inc.: *See*—
Abraham, William F., 4,858,481, Cl. 74-89.150.

Brusasco, Enzo, to Roltra S.p.A. Vehicle power brake system. 4,858,436, Cl. 60-545.000.

Bryce Office Systems, Inc.: *See*—
Eisner, Lawrence F.; and Hurd, Bruce E., 4,858,907, Cl. 271-124.000.

Brynsvold, Glen V.: *See*—
Kliman, Gerald B.; Brynsvold, Glen V.; and Jahns, Thomas M., 4,859,885, Cl. 310-11.000.

Buchanan, Douglas A.; Callegari, Alessandro C.; Hob, Peter D.; and Lacey, Dianne L., to International Business Machines Corporation. Method for passivating a compound semiconductor surface and device having improved semiconductor-insulator interface. 4,859,253, Cl. 148-33.300.

Budd Company, The: *See*—
Bush, John W., 4,858,731, Cl. 188-218.00R.

Budin, Josef: *See*—
Levy, Gideon; Budin, Josef; and Moergeli, Benjamin, 4,859,324, Cl. 210-195.200.

Buerstinghaus, Rainer; Hofmeister, Peter; and Kuenast, Christoph, to BASF Aktiengesellschaft. Pesticidal composition and process for combating pests employing carboxamides. 4,859,706, Cl. 514-624.000.

Buess, Gerhard; Boebel, Manfred; and Hiltebrandt, Siegfried. Mediastinoscope. 4,858,595, Cl. 128-6.000.

Buessinger, Pierre; Colin, Pierre; and Rudolf, Rene, to Somex S.A. Travel device for a machine tool or a transfer machine. 4,859,085, Cl. 384-45.000.

Buhlmann, Eugen T.; Biondetti, Mario; and Stotz, Wolf-Gunter, to Sulzer-Escher Wyss AG. Controlled deflection roll. 4,858,292, Cl. 29-116.200.

Buist, Richard J. Thermoelectric pillow and blanket. 4,859,250, Cl. 136-225.000.

Bujese, David P.: *See*—
Detig, Robert H.; and Bujese, David P., 4,859,557, Cl. 430-100.000.

Buluschek, Bruno, to Maillefer SA. Method and installation for producing hose for drip irrigation. 4,859,264, Cl. 156-244.130.

Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Otamu; and Kamimae, Hajime, to Toyota Jidosha Kabushiki Kaisha. Vehicle fluid suspension circuit with equalized supply and discharge speeds. 4,858,895, Cl. 267-64.160.

Bundens, Allan B.: *See*—
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Buonomo, Franco: *See*—
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Burattini, Dino: *See*—
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Burenga, Thomas I., to Worksaver, Inc. Reinforcement means for tines and method of manufacture. 4,859,136, Cl. 414-607.000.

Burgess, Edward T.: *See*—
Kershner, Carl J.; and Burgess, Edward T., 4,859,854, Cl. 250-374.000.

Burke, Richard C.: *See*—
Prochnow, Kenneth E.; and Burke, Richard C., 4,858,520, Cl. 98-40.050.

Burke, William F.; and Kane, Daniel E., to United Technologies Corporation. Turbine clearance control duct arrangement. 4,859,142, Cl. 415-116.000.

Burkhardt, Joseph A.: *See*—
Johnson, Dale V.; Burkhardt, Joseph A.; and Childers, Thomas W., 4,858,694, Cl. 166-355.000.

Burley, George J.: *See*—
Still, Donald O.; Hovance, Hubert T.; and Burley, George J., 4,858,505, Cl. 83-49.000.

Burlington Industries, Inc.: *See*—
Hodgin, John B.; Sumner, John H.; and Wang, Kenneth Y., 4,858,288, Cl. 28-178.000.

Burmester, Alan F.: *See*—
Wessling, Ritchie A.; Chau, Chieh-Chun; and Burmester, Alan F., 4,859,339, Cl. 210-500.340.

Burnett, William V., Jr.; Eckhardt, Thomas G.; and Fare, Louis R., to SmithKline Beckman Corporation. Streptomyces Bgl protein gene promoter. 4,859,601, Cl. 435-253.500.

Burrer, Gordon J. Dual-mode resonant scanning system. 4,859,846, Cl. 250-234.000.

Bussacca, Guido; Meli, Vincenzo; and Spalla, Mario, to Selenia Industrie Elettroniche Associate. Traveling-wave tube with damping of undesired frequencies. 4,859,907, Cl. 315-3.500.

Bush, John W., to Budd Company, The. Composite brake drum. 4,858,731, Cl. 188-218.00R.

Bushman, Norman P.: *See*—
Astrope, Myrle E.; and Bushman, Norman P., 4,859,502, Cl. 427-139.000.

Bussard, Robert W., to FDX Patents Holding Company, N.V. Modular fusion power apparatus using disposable core. 4,859,399, Cl. 376-133.000.

Busta, Heinz H., to Amoco Corporation. Method of forming vertical gate thin film transistors in liquid crystal array. 4,859,623, Cl. 437-48.000.

Buta, John R. Dual arbor scrap chopper. 4,858,506, Cl. 83-342.000.

Butler, Jerry F.: *See*—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,859,463, Cl. 424-84.000.

Butts, Brian B. Body harness for supporting a fishing rod. 4,858,364, Cl. 43-21.200.

Butts, Gary, to Ling Electronics, Inc. Link arm suspension. 4,858,488, Cl. 74-519.000.

B.V. Optisch Industrie 'De Oude Delft' : *See*—
Vlasbloem, Hugo, 4,859,855, Cl. 250-385.100.

Byer, Robert L.; and Fan, Tso Y., to United States of America, National Aeronautics and Space Administration. Cladding for transverse-pumped solid-state laser. 4,860,295, Cl. 372-19.000.

Byrne, Charles. Door saddle for baseboard heating. 4,858,680, Cl. 165-55.000.

Bystronic Laser AG, Industrestrasse: *See*—
Zumstein, Ernst, 4,859,828, Cl. 219-121.670.

C. F. Spiess & Sohn GmbH & Co.: *See*—
Spiess, Wolfram; and Himmelreich, Rolf, 4,859,787, Cl. 558-235.000.

C & M Sports Enterprises Inc.: *See*—
Chang, Steven, 4,858,589, Cl. 124-24.00R.

Cabe, Alex W., Jr.; Saffel, Robert W.; and Sampson, Arthur J. Method and apparatus for preparing textured apertured film. 4,859,519, Cl. 428-131.000.

Cabianca, Walter. Stick for the billiard game. 4,858,926, Cl. 273-68.000.

Cabrera, Carlos A., to UOP. Conversion of stacked FCC unit. 4,859,424, Cl. 422-144.000.

Cain, Michael A., to Magnetic Peripherals Inc. Thermal compensation mechanism for magnetic disk drive data storage units. 4,860,135, Cl. 360-97.020.

Cain, Stephen D.: *See*—
Fowler, Ronald E.; Voss, Jeffrey L.; and Cain, Stephen D., 4,858,890, Cl. 254-335.000.

Calaby, Lauren F.: *See*—
Opdahl, Barry J.; Hooren, Douglas H.; and Calaby, Lauren F., 4,859,022, Cl. 350-96.200.

CalComp Inc.: *See*—
Rockwell, Lynn H., 4,859,813, Cl. 178-18.000.

Calder, Daniel N. Food scoop mold with ejector. 4,859,168, Cl. 425-284.000.

Caldo Internationa, Inc.: *See*—
Campana, Patsie C.; and Campana, David L., 4,858,673, Cl. 164-359.000.

California Institute of Technology: *See*—
Seraji, Homayoun, 4,860,215, Cl. 364-513.000.

Callaghan, Frank J.; and Schroeppel, Edward A., to Telectronics, N.V. Detection of cardiac evoked potentials. 4,858,610, Cl. 128-419.0PG.

Callegari, Alessandro C.: *See*—
Buchanan, Douglas A.; Callegari, Alessandro C.; Hob, Peter D.; and Lacey, Dianne L., 4,859,253, Cl. 148-33.300.

Calleson, Gerald C., to Allen Group, Inc., The. Heat exchanger. 4,858,686, Cl. 165-173.000.

Calzi, Philippe: *See*—
Devin, Jean; and Calzi, Philippe, 4,860,256, Cl. 365-189.030.

Cambon, Aime : *See*—
Lampin, Jean-Pierre, deceased; Robillart Lampin, Jeannine, heir; Lampin, Corinne, heir; Lampin, Sophie, heir; Cambon, Aime ; Szonyi, Francois; Delpuech, Jean-Jacques; Serratrice, Guy; Thiollet, Gerard; and Lafosse, Louisette, 4,859,797, Cl. 568-39.000.

Cambon, Christian, to Etat Francais as represented by the Delegue general pour l'armement. Multi-coat nonskid surfacing. 4,859,522, Cl. 428-215.000.

CAMCO Inc.: *See*—
Jeziorowski, Les A., 4,859,010, Cl. 312-312.000.

Cameron, Mickey G., to Dana Corproation. Clutch disk with cushioned friction element assembly. 4,858,742, Cl. 192-107.00C.

Campagnolo S.p.A.: *See*—
Romano, Antonio, 4,859,984, Cl. 340-432.000.

Campana, David L.: *See*—
Campana, Patsie C.; and Campana, David L., 4,858,673, Cl. 164-359.000.

Campana, Patsie C.; and Campana, David L., to Caldo Internationa, Inc. Riser construction. 4,858,673, Cl. 164-359.000.

Campbell, G. Edward: *See*—
Mitchell, Frances E.; Campbell, G. Edward; and Steichen, Dale S., 4,858,758, Cl. 206-205.000.

Campbell, Henry F.: *See*—
Spada, Alfred P.; Campbell, Henry F.; Kuhls, Donald E.; Studt, William L.; Faith, William C.; and Molino, Bruce F., 4,859,672, Cl. 514-254.000.
Youssefyeh, Raymond; Klein, Scott I.; Campbell, Henry F.; and Kuhls, Donald E., 4,859,683, Cl. 514-299.000.

Campestrini, Sandro; Di Furia, Fulvio; Modena, Giorgio; and Pasquato, Lucia, to Interox (Societe Anonyme). Process for the production of aldehyde or ketone compounds and aldehydes and ketones obtained by means of this process. 4,859,799, Cl. 568-430.000.

Camusso, Dominique P.: *See*—
Autie, Pascal J. M.; Avignon, Philippe P.; Camusso, Dominique P.; Forestier, Alexandre; and Ulryck, Gilles, 4,858,721, Cl. 181-213.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Inkol, Robert J., 4,859,985, Cl. 340-146.200.

Canadian Patents & Development Ltd.: *See*—
Dufour, L. Marc, 4,859,829, Cl. 219-124.340.

Canon Kabushiki Kaisha: *See*—
Arimoto, Shinobu, 4,860,118, Cl. 358-451.000.
Hieda, Teruo, 4,860,092, Cl. 358-29.000.
Itoh, Masahiro; Murasawa, Yoshihiro; Takeda, Atsushi; Tsuchiya, Hiroaki; and Nakahata, Kimio, 4,860,048, Cl. 355-208.000.
Kitagishi, Nozomu; and Hattori, Jun, 4,859,040, Cl. 350-413.000.
Kokubu, Nobuaki, 4,860,110, Cl. 358-400.000.
Matsumoto, Kentaro; Takaoka, Makoto; Fukumoto, Masami; Uda, Toyokazu; and Sugiura, Susumu, 4,860,026, Cl. 346-1.100.
Miyamoto, Ryosuke; and Sakai, Shinji, 4,860,113, Cl. 358-225.000.
Nakahara, Takashi, 4,860,278, Cl. 369-271.000.
Satomura, Seiichiro, 4,860,324, Cl. 375-122.000.
Shimizu, Katsuichi; and Nagashima, Nao, 4,860,111, Cl. 358-400.000.
Shiozaki, Atsushi; Komuro, Hirokazu; Sato, Koichi; and Masuda, Kazuaki, 4,860,033, Cl. 346-140.00R.
Suda, Shigeyuki, 4,859,041, Cl. 350-423.000.
Suda, Yasuo; Ohnuki, Ichiro; Akashi, Akira; Ishizaki, Akira; Ohtaka, Keiji; and Koyama, Takeshi, 4,859,842, Cl. 250-201.000.
Tamamura, Hideo; and Taku, Masakazu, 4,860,040, Cl. 354-170.000.
Tanaka, Kazuo, 4,859,042, Cl. 350-423.000.
Ueda, Hiroyuki, 4,859,091, Cl. 400-63.000.
Watanabe, Yoshitaka; Sakurada, Nobuaki; Aoki, Makoto; and Sato, Eiichi, 4,860,034, Cl. 346-140.00R.
Yamanaka, Fumie; Enomoto, Takashi; and Yoshioka, Toshifumi, 4,859,036, Cl. 350-336.000.

Cantatore, Giuseppe; and Borzatta, Valerio, to Ciba-Geigy Corporation. Bicyclic piperidine compounds for use as stabilizers for organic materials. 4,859,724, Cl. 524-91.000.

Caoutchouc Manufacture et Plastiques: *See*—
Bechu, Jean-Pierre; and Champleboux, Jacques J., 4,858,535, Cl. 105-15.000.

Capacchione, John F.: *See*—
Jerussi, Thomas P.; Capacchione, John F.; and Benvenga, Mark J., 4,859,685, Cl. 514-329.000.

Capozzola, Carl A. Identification tag. 4,858,957, Cl. 283-81.000.

Capson, Ronnie R., to Ferguson, Michael D. Hunting arrow with signal generating means. 4,858,935, Cl. 273-416.000.

Capurso, Joseph S.: *See*—
Jeter, Michael A.; and Capurso, Joseph S., 4,859,808, Cl. 174-68.500.

Card, Howard: *See*—
McLeod, Robert; Card, Howard; Hortensius, Peter; and Pries, Werner, 4,860,236, Cl. 364-717.000.

Carel, Pierre; and Blusseau, Eric, to Cibie Projecteurs. High efficiency signal light, in particular for a motor vehicle. 4,859,043, Cl. 350-452.000.

Carl, William P.; Tasset, Emmett L.; and Aikman, Robert E., Jr., to Dow Chemical Company, The. Stratified fibrous fluoropolymer compositions and process for forming such fluoropolymers. 4,859,745, Cl. 525-276.000.

Carle, ierre-Regis: *See*—
Barruet, Patrick; Fauconnier, Alain; and Carle, ierre-Regis, 4,859,454, Cl. 424-40.000.

Carlson, Donald E.: *See*—
Martin, John R.; and Carlson, Donald E., 4,859,270, Cl. 156-361.000.

Carlson, Vincent; Fenlon, Michael N.; Mansur, Robert P.; and Kadomiya, Ronald H., to Minolta Camera Kabushiki Kaisha. Keyboard to prevent erroneous simultaneous activation of keys. 4,859,100, Cl. 400-715.000.

Carlsson, Tage; and Sandberg, Jan, to ASEA Aktiebolag. Synchronous machine. 4,859,887, Cl. 310-59.000.

Carnes Company, Inc.: *See*—
Prochnow, Kenneth E.; and Burke, Richard C., 4,858,520, Cl. 98-40.050.

Carney, Robert L.; Lui, Alfred S. T.; Kuhnen, Fred; and Gruber, John M., to Sandoz Ltd. Substituted N-benzoyl-N'-thienylureas. 4,859,699, Cl. 514-447.000.

Carolina Masters, Inc.: *See*—
Blankenship, James E., 4,858,384, Cl. 49-460.000.

Carousel Investment Corporation: *See*—
Johnson, Larry B.; Curtis, Thomas K., Jr.; and Allred, Gary A., 4,858,822, Cl. 229-137.000.

Carpenter, Marvin E.: *See*—
Schmidt, Edward H.; Carpenter, Marvin E.; and Walters, David W., 4,860,222, Cl. 364-550.000.

Carr, Michael D.: *See*—
Azam, Mohammad S.; and Carr, Michael D., 4,860,103, Cl. 558-160.000.

Carrier Corporation: *See*—
Ballard, Gary W.; and Thompson, Kevin D., 4,860,231, Cl. 364-571.010.
Gray, Kenneth P., 4,858,296, Cl. 29-157.30C.
Gray, Kenneth P.; McDonough, Michael L.; Poplawski, Bruce J.; Gaffaney, Daniel P.; and Moyer, Ross A., 4,858,305, Cl. 29-727.000.

Carroll, Christopher J., to Motorola, Inc. Non-volatile memory incremental counting system. 4,860,228, Cl. 364-561.000.

Carter, E. Ray. Plastic standard for supporting a light fixture adjacent to the ground. 4,858,877, Cl. 248-545.000.

Carter, Guy T.; Borders, Donald B.; Goodman, Joseph J.; and Labeda, David P., to American Cyanamid Company. Antibiotic LL-D42067β. 4,859,598, Cl. 435-252.100.

Cascadia Technology Corporation: *See*—
Knodle, Daniel W.; Mace, Leslie E.; and Labuda, Lawrence L., 4,859,858, Cl. 250-504.00R.
Knodle, Daniel W.; and Crone, William E., 4,859,859, Cl. 250-504.00R.

Casco Products Corporation: *See*—
Markus, James A., 4,859,987, Cl. 340-450.000.

Case, Allen W., Jr.; Lillquist, Robert D.; and Sundell, Robert E., to General Electric Company. Method of determining the weldability of a part. 4,859,830, Cl. 219-130.010.

Cashell, Edmund M.; and McDonnell, Liam, to 501 Tekscan Limited. Surface analysis spectroscopy apparatus. 4,860,224, Cl. 364-551.010.

Cassani, Alexandre, to Tesa S.A. Feeler for omnidirectional contactor system. 4,859,817, Cl. 200-61.410.

Cassinelli, Edgar, to Prime Computer, Inc. Semiconductor chip carrier package. 4,860,165, Cl. 361-388.000.

Castaneda, Julio C.: *See*—
Siddoway, Craig F.; Castaneda, Julio C.; and Iezzi, Peter D., 4,858,798, Cl. 224-242.000.

Castelli, Giovanni, to Simac S.r.l. Automatic espresso coffee making machine for household use. 4,858,522, Cl. 99-280.000.

Castelluzzo, James, to Unique Knife Manufacturing Corp. Apparatus for ensuring that a knife is opened in a desired orientation. 4,858,319, Cl. 30-125.000.

Castille, Leopold A.: *See*—
Smith, Roderick J.; and Castille, Leopold A., 4,859,180, Cl. 433-31.000.

Castro, Jose M. I., to Pescanova S.A. Process for manufacturing reconstituted squid. 4,859,478, Cl. 426-272.000.

Catalysts & Chemicals Industries Co., Ltd.: *See*—
Rikimaru, Hiroaki; Nakatsuji, Tadao; Umaba, Toshikatsu; Nagano, Kuzuhiko; Mishina, Kazuya; and Shimizu, Hiromitsu, 4,859,439, Cl. 423-239.000.

Caterpillar Inc.: *See*—
Durand, James C., 4,858,880, Cl. 248-635.000.
Groezinger, John J.; and Moldenhauer, Philip E., 4,859,328, Cl. 210-232.000.
Jeffries, James R.; and Verheyen, Michael R., 4,858,576, Cl. 123-145.00A.
Knox, Lawrence D.; and Tsals, Izrail, 4,858,818, Cl. 228-164.000.

Cathey, David A.; Freeman, John C.; Dale, James; Crane, William J.; Powell, Eric A.; and Musser, Jeffrey V., to Micron Technology, Inc. Temperature controlled anode for plasma dry etchers for etching semiconductor. 4,859,304, Cl. 204-298.000.

Cavazos, Raul V., Jr.: *See*—
Edminister, Robert E.; and Cavazos, Raul V., Jr., 4,858,530, Cl. 102-208.000.

Cavazza, Claudio; De Witt, Paolo; and Tinti, Maria O., to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Novel class of acyl-derivatives of carnitine, process for preparing same and therapeutic use thereof. 4,859,698, Cl. 514-445.000.

Cawelti, Dale W.: *See*—
Hill, William H.; and Cawelti, Dale W., 4,858,819, Cl. 228-179.000.

Cawley, Keith, to Lineal Thermotech Limited. Conveyors. 4,858,750, Cl. 198-778.000.

Ceca S.A.: *See*—
Fritsch, Georges, 4,859,216, Cl. 55-28.000.

Celotex Corporation, The: *See*—
Kyminas, Stanley C.; Phillips, John C.; and Einhaus, Bernard J., 4,859,723, Cl. 524-31.000.

Censtor Corporation: *See*—
Hamilton, Harold J., 4,860,139, Cl. 360-126.000.

Center for Molecular Medicine and Immunology: *See*—
Mattes, Michael J., 4,859,449, Cl. 424-9.000.

Central Electricity Generating Board: *See*—
Bibby, Geoffrey W., 4,859,065, Cl. 356-45.000.

Central Glass Company, Limited: *See*—
Aratani, Shinichi; Katano, Masaaki; and Mizoguchi, Takeshi, 4,859,636, Cl. 501-72.000.
Kita, Yasushi; and Moroi, Shirou, 4,859,444, Cl. 423-439.000.

Central National De La Recherche Scientifique (CNRS): *See*—
Bouix, Jean; Viala, Jean C.; Vincent, Henri; Vincent, Christiane; Ponthenier, Jean L.; and Dazord, Jacques, 4,859,503, Cl. 427-249.000.

Centre Natioonal de la Recherche Scientifique (CNRS): *See*—
Gallot, Bernard; and Douy, Andre , 4,859,753, Cl. 526-238.100.

Century Adhesives Corp.: *See*—
Pike, Charles O.; and Viers, Tamela A., 4,859,521, Cl. 428-195.000.

Cesaroni, Anthony: *See*—
Shuster, Jerry P.; and Cesaroni, Anthony, 4,859,265, Cl. 156-292.000.

Cetec Corporation: *See*—
Bingaman, Barrett P.; Krum, Richard G.; and Williams, James R., 4,858,808, Cl. 226-95.000.

Cetinkaya, Ismail B.: *See*—
Julian, Scott C.; and Cetinkaya, Ismail B., 4,859,430, Cl. 422-310.000.

Ceurvorst, Joseph G.: *See*—
Lee, Fu M.; and Ceurvorst, Joseph G., 4,859,781, Cl. 548-555.000.

Chamberlin, David B.: *See*—
D'Agosto, Nicholas A., III; Chamberlin, David B.; Su, Jy-Hong; Jachmann, Emil F.; and Grey, Suzanne N., 4,860,339, Cl. 379-67.000.

Chamieh, Naji. Contoured cleaning device. 4,859,102, Cl. 401-17.000.

Champleboux, Jacques J.: *See*—
Bechu, Jean-Pierre; and Champleboux, Jacques J., 4,858,535, Cl. 105-15.000.

Chan, Hardy W.: *See*—
Nestor, John J., Jr.; Moffatt, John G.; and Chan, Hardy W., 4,859,765, Cl. 530-333.000.

Chan, Steven S.: *See*—
Wong, Anthony Y.; Wong, Daniel; and Chan, Steven S., 4,859,870, Cl. 307-263.000.

Chandley, George D., to General Motors Corporation. Countergravity casting apparatus and method. 4,858,672, Cl. 164-63.000.

Chang, Chu-An: *See*—
Marks, Martin E.; Littlehales, William J.; and Chang, Chu-An, 4,859,419, Cl. 422-56.000.

Chang, Raymond S.: *See*—
Lam, Yiu-kuen T.; Chang, Raymond S.; Hensens, Otto D.; Schwartz, Cheryl D.; and Zink, Deborah L., 4,859,690, Cl. 514-375.000.

Chang, Steven, to C & M Sports Enterprises Inc. Archery arrow sighting apparatus. 4,858,589, Cl. 124-24.00R.

Chang, Yeong-Ho: *See*—
Light, Fred W., Jr.; Hood, James D.; and Chang, Yeong-Ho, 4,859,760, Cl. 528-45.000.

Chao, Chien C., to UOP. Process for separating nitrogen from mixtures thereof with less polar substances. 4,859,217, Cl. 55-68.000.

Chapman, James J.: *See*—
Walton, Charles F.; Sucheski, Robert J.; Bridenbaugh, James F.; and Chapman, James J., 4,858,381, Cl. 47-79.000.

Chapoteau, Eddy: *See*—
Cram, Donald J.; Chapoteau, Eddy; Czech, Bronislaw P.; Gebauer, Carl R.; Helgeson, Roger C.; Kumar, Anand; and Leong, Koon-Wah, 4,859,606, Cl. 436-79.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
Fyler, Donald C., 4,858,906, Cl. 271-19.000.

Charman, Neil E. S.: *See*—
Begg, Alan R.; Brown, Colin W.; and Charman, Neil E. S., 4,859,542, Cl. 428-547.000.

Charton, Rene ; and Kleen, Berend, to WABCO Westinghouse Fahrzeugbremsen GmbH. Circuit arrangement for sensing the displacement of a movable iron core relative to a magnetic coil by measuring the decay time of a constant current flowing through the magnetic coil. 4,859,942, Cl. 324-208.000.

Chasseray, Yves. Process and device for opening by the median zone of their bodies, emptying and flattening hermetically closed metal or composite containers. 4,859,132, Cl. 414-412.000.

Chau, Chieh-Chun: *See*—
Wessling, Ritchie A.; Chau, Chieh-Chun; and Burmester, Alan F., 4,859,339, Cl. 210-500.340.

Cheetham, Jeffery James: *See*—
Parker, Graham J., 4,859,240, Cl. 75-251.000.

Chelminski, Stephen V., to Bolt Technology Corporation. Tube-wave attenuation method, system and apparatus for use with an impulsive seismic energy source in liquid-containing wells. 4,858,718, Cl. 181-106.000.

Chem Tech Equipment Corp.: *See*—
Custer, Craig S., 4,858,647, Cl. 137-599.100.

Chemcut Corporation: *See*—
Senge, F. Gerhard; Watson, Angus A.; Sanner, Kenneth E.; and Corbin, Terry R., 4,859,298, Cl. 204-146.000.

Chemical Dynamics Sweden AB: *See*—
Kjelleberg, Staffan; and Ronnow, Peter, 4,859,656, Cl. 514-54.000.

Chemical Vulcanising Systems (Proprietary) Limited: *See*—
Van Niekerk, John R., 4,859,534, Cl. 428-343.000.

Chemla, Daniel S.; Miller, David A. B.; and Smith, Peter W., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Laser controlled by a multiple-layer heterostructure. 4,860,296, Cl. 372-44.000.

Chen, Zu-yuan: *See*—
Jiang, Ke-zheng; Ren, Deng-ke; Chen, Zu-yuan; and You, Lianzhen, 4,860,019, Cl. 343-795.000.

Cheng, Chiun J. Stairway accessible carry cart with foldaway wheels. 4,858,940, Cl. 280-5.200.

Cheng, Paul J., to Phillips Petroleum Company. Apparatus for producing carbon black. 4,859,426, Cl. 422-156.000.

Cheredaryk, Lorne; and Cheredaryk, Wilfred. Reflecting ornament string. 4,858,425, Cl. 59-80.000.

Cheredaryk, Wilfred: *See*—
Cheredaryk, Lorne; and Cheredaryk, Wilfred, 4,858,425, Cl. 59-80.000.

Chern, Geeng-Chuan: *See*—
Wu, Tsung-Ching; Chern, Geeng-Chuan; and Hu, James C., 4,859,619, Cl. 437-43.000.

Chevron Research Company: *See*—
Miller, Stephen J., 4,859,311, Cl. 208-89.000.
Miller, Stephen J., 4,859,312, Cl. 208-111.000.
Zones, Stacey I.; and Innes, R. A., 4,859,442, Cl. 423-277.000.

Chiang, Alan W., to Mobil Oil Corporation. Process for reducing draw resonance by heating film after extrusion. 4,859,379, Cl. 264-25.000.

Chiang, Bin Y.: *See*—
Arciszewski, Henry E.; Porzio, Linda A.; Chiang, Bin Y.; Spotts, Clyde E., Jr.; McHugh, Kevin; and Szwerc, Joseph A., 4,859,473, Cl. 426-19.000.

Chiang, Yuan C.: *See*—
Lambert, Jack L.; Chiang, Yuan C.; and Paukstelis, Joseph V., 4,859,607, Cl. 426-135.000.

Chibnik, Sheldon, to Mobil Oil Corporation. Phenolic-containing Mannich base reaction products and lubricant compositions containing same. 4,859,355, Cl. 252-47.500.

Chicago Metallic Corporation: *See*—
Dunn, James J., 4,858,408, Cl. 52-489.000.

Chida, Kousaku: *See*—
Momata, Kazuhiro; Chida, Kousaku; Takeura, Tooru; and Tsukada, Yukihisa, 4,860,140, Cl. 360-127.000.

Chida, Shouhei; Yamaoto, Naoki; Miyazaki, Yasuo; and Sato, Yasunori, to Nittoc Constructions Co., Ltd.; Osaka Bousui Constructions Co., Ltd.; Kashiyama Kogyo Co. Ltd.; and Chida, Shouhei. Liquid chemical grouting apparatus and valve switching arrangement in conduit system for supplying liquid chemicals to the apparatus. 4,859,119, Cl. 405-269.000.

Childers, Thomas W.: *See*—
Johnson, Dale V.; Burkhardt, Joseph A.; and Childers, Thomas W., 4,858,694, Cl. 166-355.000.

Ching, Larry K. W., Jr.: *See*—
Adams, David W.; Ching, Larry K. W., Jr.; and Puester, Neil, 4,859,547, Cl. 429-121.000.

Chiou, Minshon J.: *See*—
Yang, Hung H.; and Chiou, Minshon J., 4,859,393, Cl. 264-184.000.

Chism, Wayne R., to Hewlett-Packard Company. Apparatus for the automatic in-circuit testing of subscriber line interface circuits and method therefor. 4,860,332, Cl. 379-1.000.

Chiu, Edison H., to Texas Instruments Incorporated. Cache memory reset responsive to change in main memory. 4,860,262, Cl. 365-218.000.

Cho, James Y.: *See*—
Sachs, Howard G.; Cho, James Y.; and Hollingsworth, Walter H., 4,860,192, Cl. 364-200.000.

Choi, Francis K., to Xerox Corporation. Fabrication of high resistive loads utilizing a single level polycide process. 4,859,278, Cl. 156-643.000.

Choi, Yun H., to Samsung Semiconductor and Telecommunications Co., Ltd. Level shifter for an input/output bus in a CMOS dynamic ram. 4,860,257, Cl. 365-189.110.

Chonan, Katsuhiko, to Mitsubishi Denki Kabushiki Kaisha. Inverter. 4,859,924, Cl. 318-808.000.

Chou, Chai J.: *See*—
Farah, Hani; Chou, Chai J.; and Roden, Don R., Jr., 4,859,738, Cl. 525-67.000.

Chou, Yu-Chia T.; Garrison, David F.; and Lewis, William L., to Du Pont de Nemours, E. I., and Company. Acid purification of product from alkaline peroxide processing of nonwoody lignocellulosic substrates. 4,859,282, Cl. 162-78.000.

Chow, San-Laung; and Raghunathan, Yegnaswami, to Fisons Corporation. Coatable ion exchange resins. 4,859,461, Cl. 424-79.000.

Chow, San-Laung; and Raghunathan, Yegnaswami, to Fisons Corporation. Polymer-treated ion exchange resins. 4,859,462, Cl. 424-79.000.

Christensen, Asger P.: *See*—
Voss, Jørgen T.; and Christensen, Asger P., 4,858,479, Cl. 73-865.900.

Christie, Dawson A. Building system for windows, enclosures, buildings and the like. 4,858,405, Cl. 52-208.000.

Chriswell, Colin D.; Kaushik, Surender M.; Shah, Navin D.; and Markuszewski, Richard, to Iowa State University Research Foundation, Inc. Chemical cleaning of coal by molten caustic leaching after pretreatment by low-temperature devolatilization. 4,859,212, Cl. 44-622.000.

Chrysler Motors Corporation: *See*—
Gorski, Edward J., 4,858,987, Cl. 296-195.000.
McCambridge, John M., 4,859,916, Cl. 318-293.000.
McCombie, Jay C., 4,860,210, Cl. 364-426.040.

Chu, Daniel T.; and Rosen, Terry J., to Abbott Laboratories. (S)-7-(3-aminopyrrolidin-1-yl)-1-(ortho, para-difluorophenyl)-1,4-dihydro-6-fluoro-4-oxo-1,8-naphthyridine-3-carboxylic acid and method for its preparation. 4,859,776, Cl. 546-123.000.

Chu, Pochen: *See*—
Landis, Michael E.; Aufdembrink, Brent A.; Chu, Pochen; Johnson, Ivy D.; Kirker, Garry W.; Page, Nancy M.; and Rubin, Mae K., 4,859,648, Cl. 502-242.000.

Chuang, William J. Simulated eyebrow applicator. 4,858,631, Cl. 132-218.000.

Chung, Chang-Hwa: *See*—
Smith, Robert T.; and Chung, Chang-Hwa, 4,860,088, Cl. 357-69.000.

Chung, Paul W.; and Wang, Niantsu N., to International Business Machines Corporation. High speed CMOS differential driver. 4,859,880, Cl. 307-494.000.

Ciba-Geigy Corporation: *See*—
Bouwknegt, Thys; and Abel, Heinz, 4,859,207, Cl. 8-455.000.
Bowman, Robert M., 4,859,691, Cl. 514-379.000.
Cantatore, Giuseppe; and Borzatta, Valerio, 4,859,724, Cl. 524-91.000.
Clark, Kirtland P.; and Falk, Robert A., 4,859,349, Cl. 252-3.000.
Ehrenfreund, Josef, 4,859,783, Cl. 549-439.000.
Flury, Peter; and Alder, Alex, 4,859,761, Cl. 528-123.000.
Maier, Ludwig, 4,859,466, Cl. 424-605.000.
Metzger, Andre; Grimm, Peter; Nohl, Andre J.; and Nau, Vance J., 4,859,605, Cl. 436-43.000.
Molock, Frank; Robertson, J. Richard, Jr.; and Su, Kai C., 4,859,780, Cl. 548-550.000.
O'Sullivan, Anthony C.; and Frei, Bruno, 4,859,657, Cl. 514-63.000.
Phillips, Emyr; O'Neil, Robert M.; and Wirth, Hermann O., 4,859,354, Cl. 252-47.500.

Rink, Hans, 4,859,736, Cl. 525-54.100.
Ciba-Giegy Corporation: *See*—
Riebli, Peter, 4,859,687, Cl. 514-336.000.
Cibie Projecteurs: *See*—
Carel, Pierre; and Blusseau, Eric, 4,859,043, Cl. 350-452.000.
Ciesiolka, Thomas: *See*—
Zeeck, Axel; Ciesiolka, Thomas; Rohr, Jurgen; Zahner, Hans; and Drautz, Hannelore, 4,859,655, Cl. 514-34.000.
Cincinnati Milacron Inc.: *See*—
Dreisig, Robert C.; and McDonald, David I., 4,858,980, Cl. 294-99.100.
Ciriscioli, Peter R.; and Cook, Michael W., to L.C.P., Inc. Introductory portion. 4,858,966, Cl. 285-200.000.
Citizen Watch Co., Ltd.: *See*—
Takeuchi, Fumio, 4,858,283, Cl. 24-178.000.
Civitelli, Gennaro. Door stop having multiple mounting positions. 4,858,273, Cl. 16-86.00A.
Clare, Kenneth; and Gibson, William, to Kelco International Limited. Calcium control system: hydrocolloid and alginate for dye printing. 4,859,208, Cl. 8-557.000.
Clark, Jeffrey A.: *See*—
Hartnett, Michael J.; Lugosi, Robert; Rollins, James; Cook, John P.; and Clark, Jeffrey A., 4,858,295, Cl. 29-156.40R.
Clark, Kirtland P.; and Falk, Robert A., to Ciba-Geigy Corporation. Polysaccharide/perfluoroalkyl complexes. 4,859,349, Cl. 252-3.000.
Clasen, Rolf, to U.S. Philips Corp. Method of manufacturing glass or ceramic bodies. 4,859,224, Cl. 65-17.000.
Cleary, Terrance M.: *See*—
Hesterberg, William G.; and Cleary, Terrance M., 4,858,671, Cl. 164-34.000.
Clecim: *See*—
Morel, Michel, 4,858,333, Cl. 33-552.000.
Clemons, Carl W. Bee trap. 4,858,374, Cl. 43-122.000.
Clemow, Alastair J. T.; and Jaeger, Scott H., to Johnson & Johnson Orthopaedics, Inc. Bone pin. 4,858,603, Cl. 128-92.0ZW.
Clerici, Mario: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, 4,859,785, Cl. 549-531.000.
Cloetens, Rudolphe C.; and Umpleby, Jeffrey D., to BP Chemicals Limited. Water-tree stable electrical insulating polymeric compositions. 4,859,810, Cl. 174-110.0PM.
Clorox Company, The: *See*—
Mitchell, Frances E.; Campbell, G. Edward; and Steichen, Dale S., 4,858,758, Cl. 206-205.000.
Zielske, Alfred G.; and Fong, Ronald A., 4,859,800, Cl. 568-566.000.
Cloth, Helmut. Pressure dependent release device for a parachute. 4,858,856, Cl. 244-149.000.
Clough, Arthur H.; and Knight, Edwin L. Apparatus for grinding a workpiece. 4,858,387, Cl. 51-34.00E.
Coates, Ian H.; Bradshaw, John; Bell, James A.; Humber, David C.; Ewan, George B.; Mitchell, William L.; and Price, Barry J., to Glaxo Group Limited. Tetrahydro-imidazolylmethylcarbazolones and analogs thereof for treating 5-HT function disturbances. 4,859,662, Cl. 514-212.000.
Coca-Cola Company, The: *See*—
Myers, Michael J.; and Harwick, Warren J., 4,858,767, Cl. 209-3.100.
Piester, George, 4,858,768, Cl. 209-3.100.
Cogan, Adrian I., to GTE Laboratories Incorporated. Semiconductor integrated circuit structure with insulative partitions. 4,860,081, Cl. 357-49.000.
Cohen, Abraham B.; Fan, Roxy; and Quinn, John A., to Du Pont de Nemours, E. I., and Company. Embedded catalyst receptors for metallization of dielectrics. 4,859,571, Cl. 430-272.000.
Cohn, Robert W., to Texas Instruments Incorporated. Optical interconnection networks. 4,859,012, Cl. 350-96.240.
Cohodas, Mark S.: *See*—
Westerman, Everett A.; and Cohodas, Mark S., 4,858,853, Cl. 244-119.000.
Coker, Rick. Fire damper kit. 4,858,517, Cl. 98-1.000.
Colclough, Terence, to Exxon Chemical Patents Inc. Sulphur-containing borate esters. 4,859,353, Cl. 252-46.300.
Cole, Francis X.; Davis, Gene; and Sigillo, Eric, to Hygeia Sciences, Inc. Metal sol capture immunoassay procedure, kit for use therewith and captured metal containing composite. 4,859,612, Cl. 436-523.000.
Cole, Nigel G.; and Adams, Peter F., to British Telecommunications. Detecting faults in transmission lines employing an echo cancellation signal. 4,859,951, Cl. 324-534.000.
Cole, Roger J. Bright light mask. 4,858,609, Cl. 128-395.000.
Coleman, Clarence B., to Fabricated Metals, Inc. Bulk material container with a door movable over a rectilinear path. 4,858,791, Cl. 222-510.000.
Coleman, Jeffrey O.: *See*—
Falk, R. Aaron; and Coleman, Jeffrey O., 4,860,279, Cl. 370-1.000.
Coleman, S. Ebow: *See*—
Spangle, Lloyd B.; and Coleman, S. Ebow, 4,859,344, Cl. 110-681.000.
Colford, Terence H., to Dunlop Limited a British Company. Elastomeric mounting. 4,858,896, Cl. 267-140.100.
Colgate-Palmolive Company: *See*—
Marschner, Frank W., 4,859,456, Cl. 424-47.000.
Colgate-Palmolive Company: *See*—
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Colin, Andre: *See*—
Squarer, David; Colin, Andre; Prior, Robert P.; Mink, Frederick J.; and Liparulo, Nicholas J., 4,859,405, Cl. 376-299.000.
Colin, Pierre: *See*—
Buessinger, Pierre; Colin, Pierre; and Rudolf, Rene, 4,859,085, Cl. 384-45.000.
Colles, Joseph H., to Brooktree Corporation. Flash analog-to-digital converter. 4,860,011, Cl. 341-133.000.
Colli, Luigi: *See*—
Montali, Sergio; Ferro, Francesco; and Colli, Luigi, 4,858,837, Cl. 242-18.00R.
Collins, Burk. Fishing float. 4,858,369, Cl. 43-43.100.
Collins, George L.: *See*—
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Color Quest Inc.: *See*—
Hughes, Cleveland L.; Williams, Timothy N.; and Mandel, Paul M., Jr., 4,859,242, Cl. 106-19.000.
Columbia University in the City of New York, The Trustees of: *See*—
Stolfo, Salvatore J.; and Miranker, Daniel P., 4,860,201, Cl. 364-200.000.
Columbian Chemicals Company: *See*—
McGuffin, James E., 4,859,387, Cl. 264-117.000.
Combs, Linsey L. Small animal trap. 4,858,373, Cl. 43-61.000.
Combs-Rose, Kimberly; and Rose, Carl. Sun visor for infant car seats. 4,858,990, Cl. 297-184.000.
Combustion Engineering, Inc.: *See*—
Sublette, Kerry L., 4,859,588, Cl. 435-68.000.
Cometa, Thomas D.: *See*—
Gruber, Robert J.; Bov, Raphael F.; Cometa, Thomas D.; Eakin, Paul W.; Berkes, John S.; and Grushkin, Bernard, 4,859,550, Cl. 430-39.000.
Commissariat A L'Energie Atomique: *See*—
Gualandris, Rene; Ludwig, Paul; Rocco, Jean-Claude; and Zadworny, Francois, 4,859,909, Cl. 315-111.810.
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Compagnie D'Electronique Et De Piezo-Electricitie C.E.P.E: *See*—
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Completion Services, Inc.: *See*—
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Consolidated Papers, Inc.: *See*—
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Continental Colloids, Inc.: *See*—
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Control Data Corporation: *See*—
Teske, Judy L.; Borchers, Brian D.; Daane, Don A.; Baxter, Daniel J.; and Ehrich, William G., 4,860,288, Cl. 371-1.000.
Cook, Harold T., Jr., to Marco Seattle, Inc. Artificial bait feeding apparatus. 4,858,362, Cl. 43-4.000.
Cook, John P.: *See*—
Hartnett, Michael J.; Lugosi, Robert; Rollins, James; Cook, John P.; and Clark, Jeffrey A., 4,858,295, Cl. 29-156.40R.
Cook, Michael W.: *See*—
Ciriscioli, Peter R.; and Cook, Michael W., 4,858,966, Cl. 285-200.000.
Cooper, Alan: *See*—
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Cooper Industries, Inc.: *See*—
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Cooper, Kelvin; Steele, John; and Richardson, Kenneth, to Pfizer Inc. Dihydropyridine anti-allergic and anti-inflammatory agents. 4,859,686, Cl. 514-330.000.
Cooper, Randy G.: *See*—
Bosten, Donald R.; and Cooper, Randy G., 4,858,661, Cl. 144-134.00D.
Bosten, Donald R.; and Cooper, Randy G., 4,858,662, Cl. 144-136.00C.
Bosten, Donald R.; and Cooper, Randy G., 4,858,663, Cl. 144-136.00C.
Cooperman, Michael; and Sieber, Richard W., to GTE Laboratories Incorporated. Bidirectional digital signal transmission system. 4,859,877, Cl. 307-443.000.
Copeland, Richard L.: *See*—
Watkins, Harry E.; Balch, Brent F.; Oakes, Jeffery T.; Copeland, Richard L.; Patterson, Hubert A.; and Martinson, Mart, 4,859,991, Cl. 340-572.000.
Coppage, Edward A., Jr.: *See*—
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Copperi, Maurizio, to Cselt Centro Studi e Laboratori Telecomunicazioni S.P.A. Method of and device for speech signal coding and decoding by parameter extraction and vector quantization techniques. 4,860,355, Cl. 381-36.000.
Corbett, Peter F.: *See*—
Hartley, Richard I.; and Corbett, Peter F., 4,860,240, Cl. 364-757.000.
Corbin, Terry R.: *See*—
Senge, F. Gerhard; Watson, Angus A.; Sanner, Kenneth E.; and Corbin, Terry R., 4,859,298, Cl. 204-146.000.

Corces, Ronald: *See*—
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Cordner, Michael A., to Sundstrand Corporation. Multi-range, dissipative, infinitely variable ratio transmission. 4,858,493, Cl. 74-768.000.
Cormier, Murphy. Waste material treatment apparatus. 4,859,325, Cl. 210-195.300.
Corrigan, Colleen M.; Hunter, Lawrence W.; and Modry, John A., to International Business Machines Corporation. Apparatus and method for extracting documentation text from a source code program. 4,860,203, Cl. 364-300.000.
Cortese, Richard: *See*—
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Costello, John F. Trinary bus communication system. 4,860,309, Cl. 375-17.000.
Costello, Lloyd M. Phone screen security system. 4,860,347, Cl. 379-199.000.
Cote, Warren E. Boat trailer. 4,858,943, Cl. 280-414.100.
Cotsford, Stephen G., to Tamper Corp. Undercutter with rotary trencher. 4,858,344, Cl. 37-104.000.
Cottrell, Ben: *See*—
Jay, Jerry L., Jr.; and Cottrell, Ben, 4,858,632, Cl. 134-57.00R.
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Coulson, Kenneth A., to John Fluke Mfg. Co., Inc. Reset circuit for electrically isolated circuits communicating via uart. 4,860,289, Cl. 371-12.000.
Coulter, John E.; Evans, Robert S.; and Robertson, Michael O., to Babcock & Wilcox Company, The. Acoustic emission leak source location. 4,858,462, Cl. 73-40.50A.
Counselman, Charles C., III, to Western Atlas International, Inc. Continuous wave interference rejection for reconstructed carrier receivers. 4,860,018, Cl. 342-357.000.
Counter Computer Corporation: *See*—
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Courtney, John P.: *See*—
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Cox, Christopher E.: *See*—
Cox, Raleigh L.; and Cox, Christopher E., 4,859,327, Cl. 210-219.000.
Cox, James E., to Cox-Uphoff International. Silicone foam and method for making it. 4,859,712, Cl. 521-62.000.
Cox, Raleigh L.; and Cox, Christopher E. Means for water and wastewater treatment. 4,859,327, Cl. 210-219.000.
Cox, Robert J., to Thomas Industries, Inc. Rotary vane compressor. 4,859,162, Cl. 418-152.000.
Cox-Uphoff International: *See*—
Cox, James E., 4,859,712, Cl. 521-62.000.
Coyle, Richard J., Jr.; and Mracek, Jaroslav, to American Telephone and Telegraph Company. Method for welding relatively small parts. 4,859,827, Cl. 219-121.640.
CPT Corporation: *See*—
Storberg, David G., 4,860,311, Cl. 375-19.000.
Crain, Lewis E.: *See*—
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Cram, Donald J.; Chapoteau, Eddy; Czech, Bronislaw P.; Gebauer, Carl R.; Helgeson, Roger C.; Kumar, Anand; and Leong, Koon-Wah, to Technicon Instruments Corporation; and University of California, The Regents of the. Method for detecting cations in a test sample utilizing chromogenic cryptahemispherands. 4,859,606, Cl. 436-79.000.
Cramer, Judith C. Security restraining blanket. 4,858,625, Cl. 128-872.000.
Crane, William J.: *See*—
Cathey, David A.; Freeman, John C.; Dale, James; Crane, William J.; Powell, Eric A.; and Musser, Jeffrey V., 4,859,304, Cl. 204-298.000.
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Craveur, Jean-Charles: *See*—
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Cray Research, Inc.: *See*—
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Crewson, Gary E.; and Pulliam, David J., to Rockwell International Corporation. Brake support assembly. 4,858,729, Cl. 188-205.00R.
Crisler, Kenneth J.: *See*—
van den Heuvel, Anthony P.; Kotzin, Michael D.; and Crisler, Kenneth J., 4,860,312, Cl. 375-26.000.
Crone, William E.: *See*—
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Crosti, Giovanni: *See*—
Polvara, Maria; Crosti, Giovanni; and Lapo, Sergio, 4,859,825, Cl. 219-119.000.
Crouch, John H., to Paceco Corp. Personnel trolley and elevator platform for a cargo container handling gantry crane. 4,858,775, Cl. 212-205.000.
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Crowell, Jonathan C.: *See*—
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Szenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,859,807, Cl. 174-68.500.
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Cruz, Onelio; and Cruz, Neal. Platform lifting mechanism. 4,858,888, Cl. 254-122.000.
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Cselt Centro Studi e Laboratori Telecomunicazioni S.P.A.: *See*—
Copperi, Maurizio, 4,860,355, Cl. 381-36.000.
Caer, Gyula; Csikos, Antal; and Timar, Peter, to Autoipari Kutato es Fejleszto Vallalat. Reciprocating piston-type internal combustion engine with resonance charging. 4,858,569, Cl. 123-52.0MB.
Cseri, Zoltan, to Sloan Valve Company. Fast-acting quick release valve. 4,858,638, Cl. 137-115.000.
Csikos, Antal: *See*—
Caer, Gyula; Csikos, Antal; and Timar, Peter, 4,858,569, Cl. 123-52.0MB.
Cundari, Francesco, to S.P.T. S.r.l. Increased volume synthetic fibres, procedure for producing them and their use, in particular for filters. 4,858,629, Cl. 131-332.000.
Cunningham, Earl A.: *See*—
Vinal, Albert W.; and Cunningham, Earl A., 4,860,138, Cl. 360-113.000.
Cunningham, William J., to Topaz Development Corp. Dispensing cap for shaving lubricant. 4,858,314, Cl. 30-90.000.
Cuno, Incorporated: *See*—
Hou, Kenneth C.; and Ostreicher, Eugene A., 4,859,340, Cl. 210-502.100.
Curry, Douglas N., to Xerox Corporation. Scan linearity correction. 4,860,237, Cl. 364-718.000.
Curtis, Thomas K., Jr.: *See*—
Johnson, Larry B.; Curtis, Thomas K., Jr.; and Allred, Gary A., 4,858,822, Cl. 229-137.000.
Curzon, Andrew F., to National Nuclear Corporation Ltd. Nuclear reactor core restraint. 4,859,400, Cl. 376-172.000.
Custer, Craig S., to Chem Tech Equipment Corp. Attitude-insensitive, by-pass sensor. 4,858,647, Cl. 137-599.100.
Cvek, Sava. Trace cutter for roll material. 4,858,807, Cl. 225-58.000.
Czapiewski, Manfred: *See*—
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Czech, Bronislaw P.: *See*—
Cram, Donald J.; Chapoteau, Eddy; Czech, Bronislaw P.; Gebauer, Carl R.; Helgeson, Roger C.; Kumar, Anand; and Leong, Koon-Wah, 4,859,606, Cl. 436-79.000.
Daane, Don A.: *See*—
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Dagan, Jacob; and Nezer, Shlomo, to State of Israel-Ministry of Defence, Armament Development Authority Rafael. Viewfinder system for a periscope. 4,859,045, Cl. 350-623.000.
D'Agosto, Nicholas A., III; Chamberlin, David B.; Su, Jy-Hong; Jachmann, Emil F.; and Grey, Suzanne N., to Dictaphone Corporation. Programmable telephone/dictation terminal and method of operating same. 4,860,339, Cl. 379-67.000.
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Dai Nippon Insatsu Kabushiki Kaisha: *See*—
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Daido, Yoshimasa: *See*—
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Daimler-Benz Aktiengesellschaft: *See*—
Jocher, Reiner; Dahm, Horst; and Haberle, Fritz, 4,860,173, Cl. 362-61.000.
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Daines, John W.: *See*—
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Dainippon Ink & Chemical, Inc.: *See*—
Nishio, Yoshihiro; Nakamura, Masanobu; Fukawatase, Midori; and Takahashi, Kenji, 4,859,555, Cl. 430-72.000.
Dainippon Ink and Chemicals Inc.: *See*—
Haraguchi, Kazutoshi; Tanigawa, Eiji; Nukina, Kenji; Morita, Hiroaki; and Maeda, Toyohiro, 4,859,382, Cl. 264-29.200.
Morita, Hiroaki; Haraguchi, Kazutoshi; and Tanigawa, Eiji, 4,859,381, Cl. 264-29.200.
Daiwa Seiko Inc.: *See*—
Kaneko, Kyoichi, 4,858,845, Cl. 242-285.000.
Dala, Martin L.; and Baxter, William H. Towel clip. 4,858,285, Cl. 24-555.000.
Dalbera, Jacques M., to Aerospatiale Societe Nationale Industrielle. Autonomous onboard loading device for a cargo-aircraft. 4,858,855, Cl. 244-137.100.

Dale, James: *See—*
Cathey, David A.; Freeman, John C.; Dale, James; Crane, William J.; Powell, Eric A.; and Musser, Jeffrey V., 4,859,304, Cl. 204-298.000.

Daly, John K.; and Kreinberg, Earl R., to AMP Incorporated. Method of staking a wave crimp for flat power cable termination. 4,859,204, Cl. 439-424.000.

Damm, Wendell W.; Taylor, Keith A.; Pollock, Ira G.; and Janowitz, Pedro M., to Tektronix, Inc. Test vector definition system employing template concept. 4,860,291, Cl. 371-27.000.

Dammann, Hans: *See—*
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Dammann, Hans O. B.: *See—*
Schmitt, Hans-Jurgen; and Dammann, Hans O. B., 4,859,014, Cl. 350-96.130.

Damrath, Volker; Lindner, Christian; Kress, Hans-Jurgen; and Wittmann, Dieter, to Bayer Aktiengesellschaft. Particulate multiphase polymers. 4,859,740, Cl. 525-100.000.

Damrau, Wayne A., to Consolidated Papers, Inc. High speed paper coaters. 4,859,507, Cl. 427-356.000.

Dana Corproation: *See—*
Cameron, Mickey G., 4,858,742, Cl. 192-107.00C.

Danfoss A/S: *See—*
Karlberg, Niels G., 4,858,515, Cl. 91-516.000.

Daniels, Martin D.; and Roskell, Derek, to Texas Instruments Incorporated. Logic circuit having individually testable logic modules. 4,860,290, Cl. 371-25.000.

Danner, David L. Computer-telephone interface method and apparatus. 4,860,342, Cl. 379-96.000.

D'Antonio, Lawrence E. Method for the purification of parasite antigenic factors. 4,859,464, Cl. 424-88.000.

Dantonio, Marietta T.: *See—*
Walsh, Brendan R.; and Dantonio, Marietta T., 4,858,349, Cl. 38-102.910.

D'Antonio, Nicholas F.: *See—* ,
Sugarman, Edward D.; D'Antonio, Nicholas F.; and D'Antonio, Nicholas J., 4,858,620, Cl. 128-774.000.

D'Antonio, Nicholas J.: *See—*
Sugarman, Edward D.; D'Antonio, Nicholas F.; and D'Antonio, Nicholas J., 4,858,620, Cl. 128-774.000.

Danz, J. Roger, to Danz Research & Mfg., Inc. Weapon holder. 4,858,359, Cl. 42-94.000.

Danz Research & Mfg., Inc.: *See—*
Danz, J. Roger, 4,858,359, Cl. 42-94.000.

Danziger, Jay: *See—*
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Dapo, Roland F., to North American Philips Corporation. Long chain carboxylic acids for very high voltage aluminum electrolytic capacitors. 4,860,169, Cl. 361-506.000.

Das, Sunil: *See—*
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Data Card Corporation: *See—*
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DataVend, Inc.: *See—*
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Daugherty, Daniel L.: *See—*
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D'Avello, Robert F.; Rokusek, Daniel S.; and Tobolski, Francis P., Jr., to Motorola, Inc. Radiotelephone credit card data communications. 4,860,336, Cl. 379-63.000

D'Avello, Robert F.; Tobolski, Francis P., Jr.; and Kowalski, Joseph L., to Motorola, Inc. Radiotelephone credit card call approval synchronization. 4,860,341, Cl. 379-91.000.

Davenport, William H., to TriQuint Semiconductor, Inc. Wide bandwidth push-pull parallel amplifier. 4,859,961, Cl. 330-253.000.

David, Claire; Magnier, Claude; and Latourrette, Bertrand, to Rhone-Poulenc Chimie. Novel ceric oxide particulates and process of making. 4,859,432, Cl. 423-21.100

Davidovits, Joseph. Waste solidification and disposal method. 4,859,367, Cl. 252-628.000.

Davis, Gene: *See—*
Cole, Francis X.; Davis, Gene; and Sigillo, Eric, 4,859,612, Cl. 436-523.000.

Davis, Jon P.: *See—*
Bobb, Lloyd C.; White, Barbara J.; and Davis, Jon P., 4,859,059, Cl. 356-345.000.

Davis, Kent A.: *See—*
Friedrich, Steven G.; and Davis, Kent A., 4,859,514, Cl. 428-36.600.

Davis, Lester W., Jr.; Geosits, John P.; Juedes, Dennis L.; and Kiczek, Edward F., to Exxon Research and Engineering Company. Low BTU gas staged air burner for forced-draft service. 4,859,173, Cl. 431-175.000.

Davis, Richard E.; and Fuchs, Kathryn J. Applicator bottle. 4,859,105, Cl. 401-286.000.

Davis, Stanley S.; and Wotton, David E. M., to I.S.C. Chemicals Limited. Emulsions of perfluorocarbons in aqueous media. 4,859,363, Cl. 252-312.000.

Davis, Walter L., to Motorola, Inc. Digital selective calling receiver having a selectively attachable device for multiple independent address decoding capability. 4,860,004, Cl. 340-825.440.

Davis Water & Waste Industries, Inc.: *See—*
Pauwels, Julian R., 4,859,330, Cl. 210-264.000

Dayal, Yogeshwar: *See—*
Steinle, Shelton; Sturtz, John P.; Dayal, Yogeshwar; and Wimpee, Lealon C., 4,858,461, Cl. 73-23.000.

Dazord, Jacques: *See—*
Bouix, Jean; Viala, Jean C.; Vincent, Henri; Vincent, Christiane; Ponthenier, Jean L.; and Dazord, Jacques, 4,859,503, Cl. 427-249.000.

Dealermain Ltd.: *See—*
Boden, Wilhelm, 4,858,549, Cl. 114-56.000.

Deaver, Gerald A.: *See—*
Dixon, Robert C.; and Deaver, Gerald A., 4,859,403, Cl. 376-286.000.

de Belaunde, Alfredo. Pressurized water cistern with floating valve. 4,858,251, Cl. 4-358.000.

De Boeck, Arthur: *See—*
Baudier, Philippe; De Boeck, Arthur; and Fossion, Jacques, 4,859,469, Cl. 424-462.000.

De Bom Van Driessche, Dirk: *See—*
Bauwens, Frank; and De Bom Van Driessche, Dirk, 4,860,176, Cl. 362-72.000.

Decker, Kenneth L., to Otis Engineering Corporation. Fluid flow regulator. 4,858,644, Cl. 137-504.000.

Decraemer, Alain, to U.S. Philips Corporation. Line deflection circuit with dynamic S correction. 4,859,915, Cl. 315-371.000.

Deep, Marguerite E.: *See—*
Lunk, Hans E.; Reed, Donald A.; Deep, Marguerite E.; Hill, Charles; and Au, Andrew, 4,859,836, Cl. 219-548.000.

de Framond, Remy: *See—*
Senillou, Claude; de Framond, Remy; Garnier, Marcel; Yavari, Ali R.; and Joud, Jean-Charles, 4,858,675, Cl. 164-503.000.

Degelmann, Paul G., to Cooper Industries, Inc. Grid suspension system for fluorescent troffers. 4,860,180, Cl. 362-150.000.

Degussa Aktiengesellschaft: *See—*
Brand, Reinhold; Engler, Bernd; Kleine-Moellhoff, Peter; and Koberstein, Edgar, 4,859,428, Cl. 422-179.000.
Effenberger, Franz; Ziegler, Thomas; and Foerster, Siegfried, 4,859,784, Cl. 549-491.000.
Weise, Wolfgang; Wolmer, Roger; and Braumann, Peter, 4,859,238, Cl. 75-233.000.

De Keyzer, Rene M.; Pollet, Robert J.; and Vermeulen, Leon L., to Agfa-Gevaert, N.V. Diffusion transfer reversal process. 4,859,565, Cl. 430-231.000.

De Keyzer, Rene M., to Agfa-Gevaert, N.V. Image-receiving material. 4,859,566, Cl. 430-232.000.

de Laforcade, Vincent, to L'Oreal. Storage and dispensing device. 4,858,792, Cl. 222-533.000.

Delaruelle, Dale H.: *See—*
Deno, Milton C.; Smith, Eugene A., Jr.; and Delaruelle, Dale H., 4,859,000, Cl. 303-33.000

Delco Electronics Corporation: *See—*
Jeter, Michael A.; and Capurso, Joseph S., 4,859,808, Cl. 174-68.500.
Osborn, Douglas B., 4,860,152, Cl. 361-91.000.

De Leeuw, Albert: *See—*
Hollenberg, Cornelis P.; Das, Sunil; De Leeuw, Albert; and van den Berg, Johannes A., 4,859,596, Cl. 435-172.300.

De Leeuw, Dagobert M.; Klaassen, Dirk B. M.; and Mutsaers, Cornelis A. H. A., to U.S. Philips Corporation. Method of changing the chromaticity of a cathodoluminescent phosphor, colour cathode ray tube incorporating the phosphor, and projection television using same. 4,859,902, Cl. 313-474.000.

DeLeo, John. Easily removable high voltage ground stud insulator. 4,859,192, Cl. 439-92.000.

Delpuech, Jean-Jacques: *See—*
Lampin, Jean-Pierre, deceased; Robillart Lampin, Jeannine, heir; Lampin, Corinne, heir; Lampin, Sophie, heir; Cambon, Aime ; Szonyi, Francois; Delpuech, Jean-Jacques; Serratrice, Guy; Thiollet, Gerard; and Lafosse, Louisette, 4,859,797, Cl. 568-39.000.

DeLuca, Joan S.; DeLuca, Michael J.; and Shea, George B., to Motorola, Inc. Communication system having a packet structure field. 4,860,003, Cl. 340-825.440.

DeLuca, Joan S.; and Dulaney, Randi L., to Motorola, Inc. Communication receiver with automatic turn on/off. 4,860,005, Cl. 340-825.440.

DeLuca, Michael J.: *See—*
DeLuca, Joan S.; DeLuca, Michael J.; and Shea, George B., 4,860,003, Cl. 340-825.440.

DeLuca, Paul V., to Porta Systems Corp. Modular jack panel construction. 4,860,348, Cl. 379-327.000.

DeMatteo, John A.; and Pilant, Gregory P., to Dyna-5, Inc. Hard surface cleaning and polishing compositions. 4,859,359, Cl. 252-174.150.

De Meio, Apollonio: *See—*
Brandi, Roberto; and De Meio, Apollonio, 4,859,117, Cl. 405-224.000

Demmer, Fritz; and Stemmle, Berthold, to Boehringer Mannheim GmbH. Clodronate-containing medicaments and a process for the preparation thereof. 4,859,472, Cl. 424-489.000.

Den-Mat Corporation: *See—*
Ibsen, Robert L.; and Glace, William R., 4,859,716, Cl. 522-14.000.

Den norske stats oljeselskap a.s: *See—*
Nilsen, Magne P., 4,858,692, Cl. 166-285.000.

Deno, Milton C.; Smith, Eugene A., Jr.; and Delaruelle, Dale H., to Harris Corp. Adaptive air brake control system. 4,859,000, Cl. 303-33.000

Denpou, Kazuo, to Kabushiki Kaisha Toshiba. Refrigeration with quick cooling system. 4,858,443, Cl. 62-126.000.

DeRaco, Maurice: *See—*
Rey, Pierre J.; and DeRaco, Maurice, 4,859,005, Cl. 303-119.000.

Derudder, Carlos, to N. V. Michel Van De Wiele. Pulley-block drive open shed jacquard machine. 4,858,654, Cl. 139-59.000.

Designs for Vision, Inc.: *See—*
Feinbloom, Richard E., 4,859,032, Cl. 350-235.000.

DeStefano, Peter, Jr. Golf club combined with ball position marker. 4,858,925, Cl. 273-162.00D.

Detig, Robert H.; and Bujese, David P., to Olin Hunt Specialty Products Inc. Dry powder electrophotographic toner with permanent master in electrostatic transfer. 4,859,557, Cl. 430-100.000.

Deusser, Peter G.; Boehm, Detlef M.; Eiden, Karl W.; and Becker, Johann A., to U.S. Philips Corp. Branching circuit for an optical cable comprising a plurality of optical waveguides and a method of producing same. 4,859,020, Cl. 350-96.200.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Lahr, Helfrid; and Betz, Gerhard, 4,858,306, Cl. 29-723.000.
Schroder, Gunter; and Dudek, Gunther, 4,858,978, Cl. 294-82.350.

Deutsche Thomson-Brandt GmbH: *See—*
Dieterle, Franz; Hartmann, Uwe; and Mai, Udo, 4,860,102, Cl. 358-158.000.
Hartnack, Wolfgang; Keesen, Werner; and Schutze, Herbert, 4,860,097, Cl. 358-133.000.

Devaud, Gerard; and Libault De La Chevasnerie, Arnaud, to S.A.M.M. - Societe D'Applications Des Machines Motrices. Electrohydraulic servovalve for the control of a hydraulic actuator, in particular in servomechanisms controlling the flight of aircraft. 4,858,650, Cl. 137-625.220.

Devin, Jean; and Calzi, Philippe, to SGS-Thomson Microelectronics S.A. Integrated circuit provided with switching elements for changeover to redundancy elements in a memory. 4,860,256, Cl. 365-189.030.

DeVizzi, Francesco, to General Electric Company. Molded case and cover arrangement for current limiting circuit interrupters. 4,860,162, Cl. 361-376.000.

Devon County Council: *See—*
Tomlinson, Martin, 4,860,317, Cl. 375-58.000.

de Vries, Auke F.; and Stork, Willem H. J., to Shell Oil Company. Process for the preparation of light hydrocarbon distillates by hydrocracking and catalytic cracking. 4,859,309, Cl. 208-61.000.

DeVries, Jeffrey S. Flotation separator. 4,858,769, Cl. 209-3.100.

De Witt, Paolo: *See—*
Cavazza, Claudio; De Witt, Paolo; and Tinti, Maria O., 4,859,698, Cl. 514-445.000.

Deysson, Jean-Yves; Karian, Jacques; Malgrat, Philippe; and Blondeau, Michel, to Bertin & Cie. Method and device for the dispersion of ultra-fine powders. 4,859,121, Cl. 406-114.000.

Dhalla, Asfandiar K.: *See—*
Tupper, Robert B.; Mangus, James D.; Sharbaugh, John E.; Brown, Gedney B.; Livingston, Julie M.; and Dhalla, Asfandiar K., 4,859,402, Cl. 376-285.000.

Diard, Jean-Luc; and Pascal, Roger, to Salomon S.A. Ski with dissymmetrical lateral surfaces. 4,858,944, Cl. 280-609.000.

Dibble, Richard L.: *See—*
Potepan, Agnes; and Dibble, Richard L., 4,859,526, Cl. 428-283.000.

Dickau, Ewald F.: *See—*
Breault, John P.; and Dickau, Ewald F., 4,858,789, Cl. 222-309.000.

Dictaphone Corporation: *See—*
D'Agosto, Nicholas A., III; Chamberlin, David B.; Su, Jy-Hong; Jachmann, Emil F.; and Grey, Suzanne N., 4,860,339, Cl. 379-67.000.

Dideco S.p.A.: *See—*
Panzani, Ivo, 4,859,333, Cl. 210-360.200.

Diehl GmbH & Co.: *See—*
Lindstadt, Klaus; and Rudolf, Karl, 4,858,531, Cl. 102-307.000.
Westphal, Robert; and Herrmann, Karl, 4,860,016, Cl. 342-169.000.

Diesel Kiki Co., Ltd.: *See—*
Doi, Shigetoshi; Nagayama, Yoshiaki; Iida, Katsumi; and Sakurai, Yoshihiko, 4,858,677, Cl. 165-12.000.

Dieterle, Franz; Hartmann, Uwe; and Mai, Udo, to Deutsche Thomson-Brandt GmbH. Circuitry for automatically switching the control speed of a phase-control circuit. 4,860,102, Cl. 358-158.000.

Dietz, Wolfgang; and Kuhn, Freidel. Method for the precipitation of mercury by electrolysis. 4,859,295, Cl. 204-105.00R.

Di Furia, Fulvio: *See—*
Campestrini, Sandro; Di Furia, Fulvio; Modena, Giorgio; and Pasquato, Lucia, 4,859,799, Cl. 568-430.000.

DiGiesi, Anthony L. Computer disk adjustable write protect device. 4,860,142, Cl. 360-133.000.

Digital Equipment Corporation: *See—*
Bruckert, William F.; Flahive, Barry; and Lacy, James V., 4,860,244, Cl. 364-900.000.
Newman, Bruce E.; White, Randall A.; and DiPirro, Steven D., 4,860,292, Cl. 371-32.000.
Wissell, Daniel, 4,859,952, Cl. 324-538.000.

Digital Scintigraphics, Inc.: *See—*
Genna, Sebastian; and Smith, Andrew P., 4,859,852, Cl. 250-363.100.

Digonnet, Michel J. F.: *See—*
Shaw, Herbert J.; and Digonnet, Michel J. F., 4,859,016, Cl. 350-96.150.

Dijkmans, Eise C.: *See—*
Schouwenaars, Hendrikus J.; Dijkmans, Eise C.; and Groeneveld, Dirk W. J., 4,859,930, Cl. 323-317.000.

Dike Equipment Company: *See—*
Dike, John H., Jr., 4,858,503, Cl. 81-45.000.

Dike, John H., Jr., to Dike Equipment Company. Shingle removing apparatus. 4,858,503, Cl. 81-45.000.

Dillon, Mark E., to Bio Med Sciences, Inc. Process of producing a composite macrostructure of organic and inorganic materials. 4,859,383, Cl. 264-43.000.

Dimed, Inc.: *See—*
Elliott, Clyde D., 4,858,611, Cl. 128-419.00P.

Diosady, Levente L.; Rubin, Leon J.; and Tar, Csaba G., to University of Toronto Innovations Foundation, The. Extraction of particulate materials. 4,859,371, Cl. 260-412.400.

Dioszegi, Erzsebet: *See—*
Pelyva, Jeno ; Vecsey, K. Istvan; Kolonics, Zoltan; Legradi, Laszlo; Nagy, Lajos; Horvath, Andras; Fodor, Ferenc, deceased; Soptei, Csaba; Sebok, Dezso; Tomordi, Elemer; Lendvai, Laszlo ; Karacsonyi, Bela; and Dioszegi, Erzsebet, 4,859,772, Cl. 544-11.000.

DiPirro, Steven D.: *See—*
Newman, Bruce E.; White, Randall A.; and DiPirro, Steven D., 4,860,292, Cl. 371-32.000.

Directed Energy, Inc.: *See—*
Sutter, Leroy V., Jr.; and Mofley, Robert E., 4,859,075, Cl. 374-2.000.

Dirk, Carl W.; Katz, Howard E.; Lalama, Salvatore J.; Singer, Kenneth D.; and Sohn, John E., to American Telephone and Telegraph Company, AT&T Bell Laboratories; and AT&T Technologies, Inc. Nonlinear optical materials and devices. 4,859,876, Cl. 307-425.000.

Dirkes, Heinz: *See—*
Pinto, Akiva; Lucassen, Guenter; and Dirkes, Heinz, 4,858,277, Cl. 19-200.000.

Di Schiena, Michele G.; and Paster, Zvi, to Ricerfarma S.R.L.; and Life Science Research Israel Ltd. Compound compositions with improved analgesic antipyretic and anti-inflammatory activity. 4,859,658, Cl. 514-159.000.

DiStefano, Frank V., to Air Products and Chemicals, Inc. Cellulosic nonwoven products of enhanced water and/or solvent resistance by pretreatment of the cellulosic fibers. 4,859,527, Cl. 428-288.000.

Di Sturco, Paolo. Compound cap for use with a bottle. 4,858,760, Cl. 206-222.000.

Dittmar, Walter: *See—*
Kampe, Klaus-Dieter; Raether, Wolfgang; Dittmar, Walter; and Hanel, Heinz, 4,859,670, Cl. 514-252.000.

Dixon, Carlas F.: *See—*
Rose, Thomas M.; and Dixon, Carlas F., 4,858,396, Cl. 52-11.000.

Dixon, Richard L. Camber adjusting tool for front-wheel drive vehicles. 4,858,889, Cl. 254-131.000.

Dixon, Robert C.; and Deaver, Gerald A., to General Electric Company. Feedwater sparger restraint. 4,859,403, Cl. 376-286.000.

Djiauw, Lie K.; and Icenogle, Ronald D., to Shell Oil Company. Low smoke modified polypropylene insulation compositions. 4,859,366, Cl. 252-602.000.

do Amaral, Luis F.: *See—*
Alterman, Marcelo K.; and do Amaral, Luis F., 4,859,234, Cl. 71-103.000.

Do, Anh T.: *See—*
Huvey, Michel; Do, Anh T.; Gerez, Jean-Michel; and Le Gallais, Lucien, 4,858,653, Cl. 138-144.000.

Dobberstein, Robert H.: *See—*
Suzuki, Fred K.; Mead, Sharon M.; Yoshida, Noble H.; and Dobberstein, Robert H., 4,859,360, Cl. 252-299.700.

Dobroski, Eugene H., to Winegard Company. Satellite dish antenna support rib apparatus. 4,860,022, Cl. 343-840.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Bantle, Manfred, 4,860,208, Cl. 364-424.100.
von Broock, Ulrich, 4,858,900, Cl. 267-219.000.

Doi, Shigetoshi; Nagayama, Yoshiaki; Iida, Katsumi; and Sakurai, Yoshihiko, to Mazda Motor Corporation; and Diesel Kiki Co., Ltd. Automobile air-conditioning apparatus with air blower control. 4,858,677, Cl. 165-12.000.

Doin, James E.: *See—*
Raleigh, William J.; Doin, James E.; and Traver, Frank J., 4,859,529, Cl. 428-290.000.

Dole Associates, Inc.: *See—*
Dole, Charles M.; and Webster, Gary L., 4,859,603, Cl. 435-287.000.

Dole, Charles M.; and Webster, Gary L., to Dole Associates, Inc. Personal diagnostic kit. 4,859,603, Cl. 435-287.000.

Dolejs, Anthony H.; Stopar, Henry M.; and Swetel, Patrick, to Ardac, Inc. Currency validator. 4,858,744, Cl. 194-206.000.

Domalski, Hans-Heinrich: *See—*
Bohnke, Kurt; Brandis, Helmut; Domalski, Hans-Heinrich; Fleischer, Hans-Joachim; and Frinken, Heinrich, 4,859,649, Cl. 502-439.000.

Dommel, Philip J., to Neapco, Inc. Automatic coupling device. 4,859,110, Cl. 403-325.000.

Domokos, Julius, to Hughes Aircraft Company. Adjustable carrier device for ceramic substrates and the like. 4,858,764, Cl. 206-449.000.

Donegan, Thomas E.; Leary, Timothy G.; and Patil, Arvind S., to BASF Corporation. Process for making alpha-phase phthalocyanine blue pigment comprising substantially 100 percent isometric crystals. 4,859,770, Cl. 540-136.000.

Donnelly Corporation: *See—*
Larson, Mark L.; Hanft, Karl H.; and O'Farrell, Desmond J., 4,859,867, Cl. 307-10.100.
Morgan, Cleon C.; and Nieboer, Keith A., 4,858,988, Cl. 296-201.000.
Donofrio, Deborah K.; and Whitekettle, Wilson K., to Betz Laboratories, Inc. Biocidal compositions and use thereof containing a synergistic mixture of 2 bromo-2-nitropropane-1,-3 diol and N,N-dimethyl-N-phenyl-N-fluorodichloromethylthio)-sulphamide. 4,859,705, Cl. 514-520.000.
Donofrio, Deborah K.; and Whitekettle, Wilson K., to Betz Laboratories, Inc. Biocidal compositions and use thereof containing a synergistic mixture of 2-bromo-2-nitropropane-1,3-diol and beta-bromo-beta-nitrostyrene. 4,859,708, Cl. 514-727.000.
Donofrio, Deborah K.: *See—*
Whitekettle, Wilson K.; and Donofrio, Deborah K., 4,859,702, Cl. 514-520.000.
Dopler Industries Inc.: *See—*
Bruckstein, Henry, 4,858,989, Cl. 296-97.200
Douglass, John M. Preparation of an uncooked sunflower seed foodstuff. 4,859,486, Cl. 426-629.000.
Douillet, Christian; and Vasselet, Joel, to Bendix France. Hydraulic booster device for braking circuit. 4,858,438, Cl. 60-566.000.
Douy, Andre : *See—*
Gallot, Bernard; and Douy, Andre , 4,859,753, Cl. 526-238.100.
Dow Chemical Company, The: *See—*
Carl, William P.; Tasset, Emmett L.; and Aikman, Robert E., Jr., 4,859,745, Cl. 525-276.000.
Farah, Hani; Chou, Chai J.; and Roden, Don R., Jr., 4,859,738, Cl. 525-67.000.
Fibiger, Richard F.; Koo, Ja-young; Forgach, David J.; Petersen, Robert J.; Schmidt, Donald L.; Wessling, Ritchie A.; and Stocker, Thomas F., 4,859,384, Cl. 264-45.100.
Grinstead, Robert R., 4,859,437, Cl. 423-226.000.
Priddy, Duane B.; and Pirc, Michael, 4,859,748, Cl. 526-88.000.
Spangle, Lloyd B.; and Coleman, S. Ebow, 4,859,344, Cl. 210-681.000.
Vrieland, G. Edwin, 4,859,786, Cl. 549-537.000.
Wessling, Ritchie A.; Chau, Chieh-Chun; and Burmester, Alan F., 4,859,339, Cl. 210-500.340.
Whalen, Joseph W.; Swartz, Gregory L.; Rheaume, Lisa J.; and McCoy, Karen M., 4,859,599, Cl. 435-252.600.
Dow Corning, Ltd.: *See—*
Bentz, Peter O., 4,859,647, Cl. 502-165.000.
Dowler, James: *See—*
Metz, George D.; McCrary, Carl; O'Connor, Joseph G.; Adair, Paul C.; Proehl, D. Scott; Saccocio, Edward J.; and Dowler, James, 4,859,561, Cl. 430-138.000.
Dowty Mining Machinery Limited: *See—*
Whyte, Jon F. R., 4,859,335, Cl. 210-393.000.
Doyle, Michael: *See—*
Vavra, Randall J.; and Doyle, Michael, 4,858,643, Cl. 137-486.000.
Draftex Industries Limited: *See—*
Bright, Robert G., 4,858,385, Cl. 49-488.000.
Dragerwerk Aktiengesellschaft: *See—*
Sachtler, Jurgen; and Schmidt, Wolf-Dieter, 4,859,331, Cl. 210-321.800.
Drautz, Hannelore: *See—*
Zeeck, Axel; Ciesiolka, Thomas; Rohr, Jurgen; Zahner, Hans; and Drautz, Hannelore, 4,859,655, Cl. 514-34.000.
Drechsel, Arno. Universal advancement deflector for impact irrigators. 4,858,829, Cl. 239-230.000.
Drefahl, Dieter, to Honeywell Regelsysteme GmbH. Method for operating a transmitting/receiving circuit and a circuit utilizing the method. 4,860,266, Cl. 367-97.000.
Dreisig, Robert C.; and McDonald, David L., to Cincinnati Milacron Inc. Article gripper. 4,858,980, Cl. 294-99.100.
Drent, Eit, to Shell Oil Company. Process for the dimerization of olefins. 4,859,646, Cl. 502-165.000.
Drent, Eit; Wife, Richard L.; and Van Leeuwen, Petrus W. N. M., to Shell Oil Company. Copolymerization of carbon monoxide and olefin with nitrogen containing phosphine ligand catalyst. 4,859,764, Cl. 528-392.000.
Drent, Eit: *See—*
Van Broekhoven, Johannes A. M.; and Drent, Eit, 4,859,644, Cl. 502-154.000.
Van Broekhoven, Johannes A. M.; and Drent, Eit, 4,859,645, Cl. 502-154.000.
Dresser Industries, Inc.: *See—*
Fain, John E., Jr., 4,858,642, Cl. 137-474.000.
Dreuth, Rainer: *See—*
Meinert, Norbert; Huber, Werner; Dreuth, Rainer; and Franek, Henning, 4,859,635, Cl. 501-44.000.
Drewitz, Werner: *See—*
Kaibel, Gerd; Hefner, Werner; Keller, Peter; and Drewitz, Werner, 4,859,286, Cl. 203-75.000.
Dreyer, Christian; Thomas, Jean-Claude; and Vanvoren, Claude, to Aluminium Pechiney. Apparatus and process for optimizing combustion in chamber-type furnaces for baking carbonaceous blocks. 4,859,175, Cl. 432-4.000.
Drumheller, Jerry P.: *See—*
Frankel, Robert D.; and Drumheller, Jerry P., 4,860,328, Cl. 378-34.000.
Drusch, John A., III: *See—*
Iams, John F.; Splane, Robson L., Jr.; and Drusch, John A., III, 4,858,918, Cl. 272-127.000.
Du Pont Canada Inc.: *See—*
Mitchell, David J.; and Zboril, Vaclav G., 4,859,733, Cl. 524-432.000.
Shuster, Jerry P.; and Cesaroni, Anthony, 4,859,265, Cl. 156-292.000.
Dubey, Thomas W. Tubing cutter. 4,858,316, Cl. 30-102.000.
Dubrow, Robert S.; and Froix, Michael F., to Raychem Corporation Microporous poly (arylether ketone) article. 4,859,715, Cl. 521-180.000.
Dubuisson, Jacques; and Boutterin, Rene, to Interconnexions Ceramiques. Monolithic substrate for an electronic power component and process for the production thereof. 4,859,520, Cl. 428-137.000.
Dudek, Gunther: *See—*
Schroder, Gunter; and Dudek, Gunther, 4,858,978, Cl. 294-82.350.
Dudek, Wolfram: *See—*
Frosch, Werner; and Dudek, Wolfram, 4,858,276, Cl. 19-98.000.
Duelfer, Timothy; and Blythin, David J., to Schering Corporation. Antiinflammatory and anti-hyperproliferative naphthyridin-4-ones. 4,859,669, Cl. 514-250.000.
Dufour, L. Marc, to Canadian Patents & Development Ltd. Adaptive welding control vision head. 4,859,829, Cl. 219-124.340.
Dulaney, Randi L.: *See—*
DeLuca, Joan S.; and Dulaney, Randi L., 4,860,005, Cl. 340-825.440.
Dull, Thomas J.; Riedel, Heimo; and Ullrich, Axel, to Genentech, Inc. Novel receptors for efficient determination of ligands and their antagonists or agonists. 4,859,609, Cl. 436-501.000.
Dunkle, Richard L.: *See—*
Shasha, Baruch S.; and Dunkle, Richard L., 4,859,377, Cl. 264-4.100.
Dunlop Limited a British Company: *See—*
Colford, Terence H., 4,858,896, Cl. 267-140.100.
Dunn, James J., to Chicago Metallic Corporation. Hold down clip. 4,858,408, Cl. 52-489.000.
DuPont, Charles E., Jr. Braided metal-plastic shoe lace. 4,858,282, Cl. 24-143.00R.
Du Pont de Nemours, E. I., and Company: *See—*
Batt, Douglas G.; Greenberg, Richard S.; and Harris, Richard R., 4,859,693, Cl. 514-397.000.
Chou, Yu-Chia T.; Garrison, David F.; and Lewis, William I., 4,859,282, Cl. 162-78.000.
Cohen, Abraham B.; Fan, Roxy; and Quinn, John A., 4,859,571, Cl. 430-272.000.
Ernst, Richard E., 4,859,801, Cl. 568-617.000.
Jayawant, Madhusudan D., 4,859,283, Cl. 162-78.000.
Kempf, Richard J., 4,859,551, Cl. 430-49.000.
Miller, Conrad E., 4,859,570, Cl. 430-271.000.
Ripka, William C.; and Sipio, William J., 4,859,697, Cl. 514-438.000.
Trout, Torence J., 4,859,559, Cl. 430-115.000.
Valentini, Jose E., 4,859,249, Cl. 134-22.180.
Yamamoto, Yasuo; Inaba, Akira; and Kitagaki, Takashi, 4,859,364, Cl. 252-512.000.
Yang, Hung H.; and Chiou, Minshon J., 4,859,393, Cl. 264-184.000.
Durand, James C., to Caterpillar Inc. Resilient load supporting and motion accommodating mounting apparatus. 4,858,880, Cl. 248-635.000.
Durando, Pierre; and LaFaille, Alain, to Total Compagnie Fracaise des Petroles; and Institut Francais du Petrole. Underwater electric connector. 4,859,196, Cl. 439-197.000.
Durell, William E. Variable ratio beam splitter and beam launcher. 4,859,029, Cl. 350-173.000.
Durkoppwerke GmbH: *See—*
Balke, Siegmund; and Lutkemeyer, Gunter, 4,858,545, Cl. 112-275.000.
Dye, John F.: *See—*
Kolstedt, Mark; and Dye, John F., 4,858,596, Cl. 128-24.00R.
Dykstra, Ronald A.; and Fluharty, William J., to Prince Corporation. Visor. 4,858,982, Cl. 296-97.500.
Dyna-5, Inc.: *See—*
DeMatteo, John A.; and Pilant, Gregory P., 4,859,359, Cl. 252-174.150.
Dynamat, Inc.: *See—*
Lalumiere, Robert J.; and Boucher, Jay M., 4,858,394, Cl. 51-312.000.
Dynamic Conveyor Products: *See—*
Ballard, Joe B., Jr., 4,858,752, Cl. 198-845.000.
Dynisco, Inc.: *See—*
Wareham, William, 4,858,471, Cl. 73-706.000.
Dziurla, Heinz-Jurgen; Weber, Hans-Leo; Freitag, Dieter; and Waldenrath, Werner, to Bayer Aktiengesellschaft AG. Process for the manufacture of printed circuits. 4,859,263, Cl. 156-233.000.
E.C.C. America Inc.: *See—*
Rice, Camilla A., 4,859,718, Cl. 523-202.000.
E. R. Squibb & Sons, Inc.: *See—*
Atwal, Karnail, 4,859,676, Cl. 514-258.000.
Eagar, Lee J. Beverage container possessing an improved support plate to effect more rapid carbonation. 4,858,786, Cl. 222-158.000.
Eakin, Paul W.: *See—*
Gruber, Robert J.; Bov, Raphael F.; Cometa, Thomas D.; Eakin, Paul W.; Berkes, John S.; and Grushkin, Bernard, 4,859,550, Cl. 430-39.000.
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Eastman Kodak Company: *See—*
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Gormel, Thomas M., 4,859,574, Cl. 430-372.000.
Harvey, Donald M., 4,860,037, Cl. 354-21.000.
Harvey, Donald M., 4,860,041, Cl. 354-212.000.
Hershberger, Marc, 4,859,841, Cl. 235-485.000.
Light, Fred W., Jr.; Hood, James D.; and Chang, Yeong-Ho, 4,859,760, Cl. 528-45.000.
Michno, Drake M.; Platt, Norma B.; Steele, David A.; and Southby, David T., 4,859,578, Cl. 430-544.000.
Minnick, Larry A., 4,859,732, Cl. 524-385.000.
Peng, James P., 4,859,495, Cl. 427-48.000.
Rule, Mark; Fagerburg, David R.; and Watkins, Joseph J., 4,859,762, Cl. 528-215.000.
Shtipelman, Boris A., 4,860,137, Cl. 360-106.000.
Tomko, Donna L.; and Harbison, Kenneth G., 4,859,539, Cl. 428-512.000.
Toner, John L., 4,859,777, Cl. 546-256.000.
Wang, Richard H. S.; and Myers, Garry L., 4,859,726, Cl. 524-91.000.
Eaton Corporation: *See—*
Rey, Pierre J.; and DeRaco, Maurice, 4,859,005, Cl. 303-119.000.
EBG Elektronische Bauelement Gesellschaft m.b.H.: *See—*
Peschl, Hans P., 4,859,981, Cl. 338-308.000.
Eccleston, Larry E., to John Fluke Mfg. Co., Inc. Method of and apparatus for determining AC calibration errors and apparatus using device with AC calibration errors. 4,859,936, Cl. 324-130.000.
Echevarria, Angel M.; and Echevarria, Michael A. Cellular waterbed component and bed containing same. 4,858,263, Cl. 5-451.000.
Echevarria, Michael A.: *See—*
Echevarria, Angel M.; and Echevarria, Michael A., 4,858,263, Cl. 5-451.000.
Echeverria, Fernando C., to Maquinas de Coser Alfa, S.A. Needle bar and feed drives for a zig-zag sewing machine. 4,858,548, Cl. 112-443.000.
ECI Telecom Ltd.: *See—*
Shpiro, Zeev, 4,860,313, Cl. 375-27.000.
ECIA - Equipements et Composants Pour L'Industrie Automobile: *See—*
Escaravage, Gerard, 4,858,954, Cl. 280-808.000.
Eckhardt, Thomas G.: *See—*
Burnett, William V., Jr.; Eckhardt, Thomas G.; and Fare, Louis R., 4,859,601, Cl. 435-253.500.
Eckhaus, Ira. Electrical wire connectors. 4,859,203, Cl. 439-404.000.
Ecolab Inc.: *See—*
Lehn, Chris F., 4,858,449, Cl. 68-12.00R.
Economou, Demetre J.: *See—*
Barna, Gabriel G.; and Economou, Demetre J., 4,859,277, Cl. 156-626.000.
Edge Engineering, Inc.: *See—*
Wiech, Raymond E., Jr., 4,858,324, Cl. 30-357.000.
Edminister, Robert E.; and Cavazos, Raul V., Jr., to Motorola, Inc. Power relay/safing device for a fuze system. 4,858,530, Cl. 102-208.000.
Edwards, Billy J.; and Starks, Jimmy A. Sucker rod guide. 4,858,688, Cl. 166-241.000.
Edwards, Richard C.; and Martin, Burton L., to Rockwell International Corporation. R-segment transmission line directional coupler. 4,859,971, Cl. 333-109.000.
Effenberger, Franz; Ziegler, Thomas; and Foerster, Siegfried, to Degussa Aktiengesellschaft. Process for the production of optically active cyanohydrins. 4,859,784, Cl. 549-491.000.
Egashira, Yoshimi, to Harada Kogyo Kabushiki Kaisha. Antenna for a portable radiotelephone. 4,860,024, Cl. 343-702.000.
Eger, Helmut: *See—*
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Eguchi, Koji, to Matsubishi Denki Kabushiki Kaisha. Method of making a trench capacitor for dram. 4,859,622, Cl. 437-47.000.
Eguchi, Yasuteru: *See—*
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Ehrenfreund, Josef, to Ciba-Geigy Corporation. 2,2-Difluoro-4-amino-1,3-benzodioxole. 4,859,783, Cl. 549-439.000.
Ehrhardt, Gary J., to University of Missouri, The Curators of the. Rhenium generator system and its preparation and use. 4,859,431, Cl. 423-2.000.
Ehrich, William G.: *See—*
Teske, Judy L.; Borchers, Brian D.; Daane, Don A.; Baxter, Daniel J.; and Ehrich, William G., 4,860,288, Cl. 371-1.000.
Eichenauer, Herbert; Hocker, Hartwig; and Heitz, Thomas, to Bayer Aktiengesellschaft. Polymeric dihydroxy compounds and their use as stabilizers for polymers. 4,859,731, Cl. 524-291.000.
Eichenbaum, Bernard R.; and Santana, Manuel R., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Sheathed optical fiber cable. 4,859,023, Cl. 350-96.230.
Eicher, David E., to Rockwell International Corporation. Method of voice operated transmit control. 4,860,359, Cl. 381-46.000.
Eiden, Friedrich; Gmeiner, Peter; and Schunemann, Jurgen, to Madaus GmbH & Company. Derivatives of 2,3,4,5,6,7-hexahydro-2,7-methano-1,5-benzoxazonines and -1,4-benzoxazonines, processes for their production and their use as pharmaceuticals. 4,859,664, Cl. 514-217.000.
Eiden, Karl W.: *See—*
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Einhaus, Bernard J.: *See—*
Kyminas, Stanley C.; Phillips, John C.; and Einhaus, Bernard J., 4,859,723, Cl. 524-31.000.
Einthoven, Willem G., to General Instrument Corp. Method for setting the threshold voltage of a vertical power MOSFET. 4,859,621, Cl. 437-45.000.
Eisenberg, Eliahu; Padova, Reuven; Shenfeld, Avner; Hirshfeld, Tsvi; and Stein, Jacob. Device for cultivating bacteria. 4,859,586, Cl. 435-34.000.
Eisner, Lawrence F.; and Hurd, Bruce E., to Bryce Office Systems, Inc. System for feeding envelopes for simultaneous printing of addresses and bar codes. 4,858,907, Cl. 271-124.000.
Eison, Michael S.; and Krogsgaard-Larsen, Povl, to Bristol-Myers Company. THAZ derivatives for enhancement of cerebral function. 4,859,666, Cl. 514-221.000.
Ekstrand, Per-Olof S. Improved adjustment means for sighting instrument. 4,859,058, Cl. 356-251.000.
Elben, Ulrich: *See—*
Greve, Wilfried; Elben, Ulrich; Rudolph, Karl; and Schindler, Ursula, 4,859,663, Cl. 514-212.000.
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Electric Power Research Institute, Inc.: *See—*
Feather, Landis E.; Girgis, Ramsis S.; McCormick, Leach S.; and Sletten, Andreas M., 4,859,978, Cl. 336-186.000.
Electronic Research Group, Inc.: *See—*
Brewer, David C.; Lindberg, Conrad P.; and Lindberg, Paul M., 4,860,185, Cl. 363-41.000.
Ellgass, Gerard, to Blair, Samuel, a part interest. Articulatable barrier for restricting access to parking spaces, roadways, passageways and the like. 4,858,382, Cl. 49-35.000.
Elliott, Clyde D., to Dimed, Inc. Sensing system and method for sensing minute ventilation. 4,858,611, Cl. 128-419.00P.
Ellis, Michael K.: *See—*
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Ellis, Paul E., Jr.: *See—*
Lyons, James E.; Ellis, Paul E., Jr.; Myers, Harry K., Jr.; Suld, George; and Langdale, Wayne A., 4,859,798, Cl. 568-399.000.
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Elm Industry Co., Ltd.: *See—*
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Eloise-Pillerault, Clement; Benoit, Claude; and Benoit, Vincent. Method of fractionating the sound restoration of modulated signals in parallel mounted transducers, and sets of corresponding transducers. 4,860,365, Cl. 381-90.000.
Elsbett, Gunter: *See—*
Elsbett, Ludwig; Elsbett, Gunter; and Elsbett, Klaus, 4,858,579, Cl. 123-299.000.
Elsbett, Klaus: *See—*
Elsbett, Ludwig; Elsbett, Gunter; and Elsbett, Klaus, 4,858,579, Cl. 123-299.000.
Elsbett, Ludwig; Elsbett, Gunter; and Elsbett, Klaus. Fuel-injection for direct-injection diesel engine. 4,858,579, Cl. 123-299.000.
Elscint Ltd.: *See—*
Stokar, Saul, 4,859,945, Cl. 324-309.000.
Elscint Ltd: *See—*
Keren, Hanan, 4,859,950, Cl. 324-322.000.
Elsner, Ernst; Lindenthal, Hans; and Jelfs, Stewart D., to J.M. Voith GmbH. Device for connecting two coaxial components fixedly in terms of rotation. 4,859,106, Cl. 403-5.000.
Emergency Technology, Inc.: *See—*
Holtvluwer, Douglas C., 4,859,988, Cl. 340-471.000.
Emhart Industries, Inc.: *See—*
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Endoh, Hiroshi; Zama, Yoshimasa; Kadowaki, Nobuo; Yatuka, Takeshi; Nagai, Hiroshi; and Mizumura, Yutaka, to Nippon Steel Corporation; and Toyo Boseki Kabushiki Kaisha. Viscoelastic resin for vibration damping material. 4,859,523, Cl. 428-215.000.
Energigazdalkodasi Intezet: *See—*
Szucs, Laszlo ; and Harmatha, Andras, 4,858,685, Cl. 165-166.000.
Engel, Harold J.: *See—*
Howseman, William E., Jr.; and Engel, Harold J., 4,859,073, Cl. 366-195.000.
Engel, Ludovicus H. M.; and Pieket Weeserik, Pieter C., to U.S. Philips Corp. Supervision circuit for a non-encoded binary bit stream. 4,860,293, Cl. 371-51.000.
Engelhard Corporation: *See—*
Sennett, Paul, 4,859,246, Cl. 106-487.000.
Engl, Walter: *See—*
Bitzinger, Rudolf; Engl, Walter; Humml, Siegfried; and Schreier, Klaus, 4,860,333, Cl. 379-10.000.
Engler, Bernd: *See—*
Brand, Reinhold; Engler, Bernd; Kleine-Moellhoff, Peter; and Koberstein, Edgar, 4,859,428, Cl. 422-179.000.
Engstrom, Arthur B., to Bicycle Tools, Incorporated. Bicycle tool. 4,858,266, Cl. 15-111.000.
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Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, 4,859,785, Cl. 549-531.000.
Enomoto, Takashi: *See—*
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Enright, Philip G., to Alcan International Limited. Casting aluminium alloys. 4,858,674, Cl. 164-475.000.
Enthone, Incorporated: *See—*
Sullivan, Thomas E.; and Haydu, Juan, 4,859,300, Cl. 204-164.000.
Environmental Protection Polymers, Inc.: *See—*
Unger, Samuel L.; Telles, Rodney W.; and Lubowitz, Hyman R., 4,859,395, Cl. 264-254.000.
Environmental Research Inst. of Michigan: *See—*
McCubbrey, David L.; and Lougheed, Robert M., 4,860,375, Cl. 382-49.000.
Eppenbach, Lawrence C. Tent. 4,858,635, Cl. 135-104.000.
Epstein, Barry M. Protector network for A-C equipment. 4,860,150, Cl. 361-90.000.
Epton, David J.: *See—*
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Erkander, Ragnar S.: *See—*
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Ernst, Reinhard: *See—*
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Ernst, Richard E., to Du Pont de Nemours, E. I., and Company. Synthesis of mixtures of butanediols. 4,859,801, Cl. 568-617.000.
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Escaravage, Gerard, to ECIA - Equipements et Composants Pour L'Industrie Automobile. Device for adjusting the position of a strap return element of in particular an automobile vehicle safety belt. 4,858,954, Cl. 280-808.000.
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Esselte Pendaflex Corporation: *See—*
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Etablissements Montabert: *See—*
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Etheridge, Eric P., to Tektronix, Inc. CMOS comparator bias voltage generator. 4,859,928, Cl. 323-311.000.
Ethyl Corporation: *See—*
Roark, David N.; and Lambert, Jules A., 4,859,530, Cl. 428-294.000.
Eto, Shigeo: *See—*
Shirasawa, Honai; Sugeno, Hiroto; Eto, Shigeo; and Saito, Hiroshi, 4,859,342, Cl. 210-656.000.
Eunson, Charles S., to Strong Equipment Corporation. Drive motor controlling device for a material transporting conveyor. 4,858,747, Cl. 198-718.000.
Europa Metalli-Lmi Societa Per Azioni: *See—*
Innocenti, Stefano, 4,859,417, Cl. 420-493.000.
European Space Agency/Agence Spatiale Europeenne: *See—*
Halm, Rudolf, 4,860,023, Cl. 343-912.000.
Eustice, Harold L.; and Foster, William T. Ball suspending apparatus and method. 4,858,921, Cl. 273-26.00R.
Evans, Donald: *See—*
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Evans, Louis B.; and Smith, Daniel D., to Esselte Pendaflex Corporation. Mat board cutter with adjustable cutter-carrying body. 4,858,507, Cl. 83-455.000.
Evans, Robert S.; Latham, Wayne M.; Powers, Thomas; and Robertson, Michael O., to Babcock & Wilcox Company, The. Inspection method using magnetic particles in a liquid carrier in combination with electrical detection means. 4,859,943, Cl. 324-216.000.
Evans, Robert S.: *See—*
Coulter, John E.; Evans, Robert S.; and Robertson, Michael O., 4,858,462, Cl. 73-40.50A.
Evers, Heinz, to Wiederaufarbeitungsanlage Karlsruhe Betriebsgesellschaft mbH. Electrolytic tubular mixer-settler. 4,859,326, Cl. 210-197.000.
Ewan, George B.: *See—*
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Excelermatic Inc.: *See—*
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Excello Specialty Company, The: *See—*
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Exfluor Research Corporation: *See—*
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Exxon Chemical Patents Inc.: *See—*
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Johnson, Dale V.; Burkhardt, Joseph A.; and Childers, Thomas W., 4,858,694, Cl. 166-355.000.
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Exxon Research and Engineering Company: *See—*
Davis, Lester W., Jr.; Geosits, John P.; Juedes, Dennis L.; and Kiczek, Edward F., 4,859,173, Cl. 431-175.000.
Eyre, Clarence W.; and Stevens, William E. Knock-down wardrobe cabinet. 4,859,008, Cl. 312-257.100.
Ezaki, Satoru; Tanaka, Kiyofumi; Kasahara, Tsukasa; Hirose, Tetsuya; and Nakagawa, Tetsuro, to Hitachi, Ltd.; and Hitachi Cable, Ltd. Method for forming and cutting a flat type multi-core cable and apparatus for realizing same. 4,858,659, Cl. 140-105.000.
Ezawa, Nobuyasu: *See—*
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Ezure, Yoji: *See—*
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F. Oberdorfer GmbH & Co. KG Industriegewebe-Technik: *See—*
Krenkel, Bernhard; and Joos, Heinz, 4,859,396, Cl. 264-311.000.
Faber, Michael R., to Ajax Magnethermic Corporation. Electric induction heater. 4,859,823, Cl. 219-10.690.
Fabre, Aime. Yarn cutting device of the gripper shuttle type. 4,858,657, Cl. 139-438.000.
Fabricated Metals, Inc.: *See—*
Coleman, Clarence B., 4,858,791, Cl. 222-510.000.
Facet Enterprises, Inc.: *See—*
Brown, Ralph V., 4,860,158, Cl. 361-165.000.
Fagerburg, David R.: *See—*
Rule, Mark; Fagerburg, David R.; and Watkins, Joseph J., 4,859,762, Cl. 528-215.000.
Fai, Kwok W., to Simatelex Manufactory Company Limited. Shock-protected domestic electrical apparatus. 4,860,147, Cl. 361-50.000.
Failli, Amedeo A., to American Home Products Corporation. 2-substituted 1,2-benzisothiazol-3(2H)-one 1,1-dioxide useful as an anxiolytic agent. 4,859,671, Cl. 514-254.000.
Failor, Raymond A.; Hayton, Eugene; and Reuter, Mark, to Hausted, Inc. Patient transport apparatus including Trendelenburg mechanism and guard rail. 4,858,260, Cl. 5-67.000.
Fain, John E., Jr., to Dresser Industries, Inc. Impact resistant pressure relief valve. 4,858,642, Cl. 137-474.000.
Fairchild Semiconductor Corp.: *See—*
Bosnyak, Robert J., 4,859,874, Cl. 307-296.300.
Fairlie-Clarke, Anthony C.; and Etheridge, Charles O. Pressure controller for a buffer fluid seal. 4,858,937, Cl. 277-2.000.
Faith, William C.: *See—*
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Falk, R. Aaron; and Coleman, Jeffrey O., to Boeing Company, The. Source modulated coherence multiplexed optical signal transmission system. 4,860,279, Cl. 370-1.000.
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Krinsky, Jeffrey A.; and Falk, Robert A., 4,859,015, Cl. 350-96.150.
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Farah, Hani; Chou, Chai J.; and Roden, Don R., Jr., to Dow Chemical Company, The. Environmental stress failure resistant polycarbonate blend. 4,859,738, Cl. 525-67.000.
Fare, Louis R.: *See—*
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Farid, Samir Y.; and Moody, Roger E., to Eastman Kodak Company. Dye sensitized photographic imaging system. 4,859,572, Cl. 430-281.000.
Farley, David L.: *See—*
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Farmitalia Carlo Erba: *See—*
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Stenqvist, Jan N., 4,858,844, Cl. 242-67.10R.
Faucher, Peter A.: *See—*
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Fauconnier, Alain: *See—*
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Fay, Fredric S.; Fogarty, Kevin E.; and Rodgers, Cyril, to University of Massachusetts Medical Center. Imaging microspectrofluorimeter. 4,859,063, Cl. 356-418.000.
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Fazlin, Fazal A.; and Corces, Ronald, to Advanced Plasma Systems, Inc. Lamination apparatus having multiple book platens. 4,859,271, Cl. 156-382.000.
Fazlollahi, Hossein, to Telfonaktiebolaget L M Ericsson. Device for protecting an integrated circuit against overload and short circuit currents. 4,860,154, Cl. 361-101.000.
FDX Patents Holding Company, N.V.: *See—*
Bussard, Robert W., 4,859,399, Cl. 376-133.000.
Fealey, William S., to Stanley-Bostitch, Inc. Nail driving device with improved nail feeding mechanism. 4,858,812, Cl. 227-116.000.
Feather, Landis E.; Girgis, Ramsis S.; McCormick, Leach S.; and Sletten, Andreas M., to Electric Power Research Institute, Inc. High-voltage windings for shell-form power transformers. 4,859,978, Cl. 336-186.000.
Fedrau, Dieter: *See—*
Maisch, Helmut; and Fedrau, Dieter, 4,859,141, Cl. 415-115.000.
Feinbloom, Richard E., to Designs for Vision, Inc. Hand-held magnifier apparatus. 4,859,032, Cl. 350-235.000.
Feldmuhle Aktiengesellschaft: *See—*
Hilterhaus, Bodo; and Hunger, Gunther, 4,859,650, Cl. 503-213.000.
Femcare Limited: *See—*
McQuilkin, Peter H., 4,858,608, Cl. 128-325.000.
Femto-Tech, Inc.: *See—*
Kershner, Carl J.; and Burgess, Edward T., 4,859,854, Cl. 250-374.000.
Fenlon, Michael N.: *See—*
Carlson, Vincent; Fenlon, Michael N.; Mansur, Robert P.; and Kadomiya, Ronald H., 4,859,100, Cl. 400-715.000.
Fer, Richard A. Thrust bearing. 4,859,088, Cl. 384-371.000.
Ferguson, Michael D.: *See—*
Capson, Ronnie R., 4,858,935, Cl. 273-416.000.
Ferrari, Christopher: *See—*
Groopman, John D.; Wogan, Gerald N.; Bargoot, Frederick G.; and Ferrari, Christopher, 4,859,611, Cl. 436-518.000.
Ferrer Internacional S.A.: *See—*
Foguet, Rafael; Forne, Ernesto; Sacristan, Aurelio; and Ortiz, Jose A., 4,859,675, Cl. 514-255.000.
Ferro Corporation: *See—*
Roberts, Gordon J., 4,859,637, Cl. 501-79.000.
Ferro, Francesco: *See—*
Montali, Sergio; Ferro, Francesco; and Colli, Luigi, 4,858,837, Cl. 242-18.00R.
Fest, Christa; Hanssler, Gerd; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Pesticidal α-methylsulphonyl-benzaldoximes and carbamates thereof. 4,859,235, Cl. 71-103.000.
Fey, Hans; and Czapiewski, Manfred, to Matra-Werke GmbH. Device for the continuous production of a liquid mixture of solids and liquids. 4,859,072, Cl. 366-165.000.
Feygenson, Anatoly, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Submicron bipolar transistor with buried silicide region. 4,860,085, Cl. 357-59.000.
Fibiger, Richard F.; Koo, Ja-young; Forgach, David J.; Petersen, Robert J.; Schmidt, Donald L.; Wessling, Ritchie A.; and Stocker, Thomas F., to Filmtec Corp.; and Dow Chemical Company. Novel polyamide reverse osmosis membranes. 4,859,384, Cl. 264-45.100.
Fickle, David M.: *See—*
Bentley, Steven R.; Fickle, David M.; and Nylander-Hill, Pamela R., 4,860,193, Cl. 364-200.000.
Fidi, Werner; and Renner, Heinz, to AKG Akustische u. Kino-Gerate Gesellschaft m.b.H. Pressure gradient pickup. 4,858,719, Cl. 181-158.000.
Field, Nathaniel L.; and Pulick, Michael A., to Ford Motor Company. Method of making and apparatus for monoblock engine construction. 4,858,670, Cl. 164-11.000.
Filmtec Corp.: *See—*
Fibiger, Richard F.; Koo, Ja-young; Forgach, David J.; Petersen, Robert J.; Schmidt, Donald L.; Wessling, Ritchie A.; and Stocker, Thomas F., 4,859,384, Cl. 264-45.100.
Finer, Paul: *See—*
Weiser, Murray; Silverman, William; Landau, Zvi; Finer, Paul; and Pincus, Cary I., 4,860,329, Cl. 378-50.000.
Fink, Ronald G. Ultrasorb system. 4,859,329, Cl. 210-257.100.
Finkelstein, Joseph A.; Kruse, Lawrence I.; and Leonard, Thomas B., to SmithKline Beckman Corporation. Dopamine-β-hydroxylase inhibitors. 4,859,779, Cl. 538-321.000.
Finley, Roger W.; Lubin, Barry D.; and Bergendahl, Bruce A., to Motorola, Inc. Individual subchannel loopback in the PCM interfaces of a digital telephone exchange with control of the outbound path. 4,860,281, Cl. 370-15.000.
Firestone Tire & Rubber Company, The: *See—*
Still, Donald O.; Hovance, Hubert T.; and Burley, George J., 4,858,505, Cl. 83-49.000.
First Brands Corporation: *See—*
Scheibner, Gerald H., 4,859,259, Cl. 156-66.000.
Fischer, Glenn N. Damage-resistant mailbox. 4,858,823, Cl. 232-34.000.
Fischer, Herbert; Wegemund, Bernd; Greas, Wolfgang; and Gorzinski, Manfred, to Henkel Kommanditgesellschaft auf Aktien. Air-drying lacquer binder based on polyoctenylene. 4,859,746, Cl. 525-293.000.
Fisher, Lynn E., to General Electric Company. Method of assembling a dynamoelectric machine. 4,858,303, Cl. 29-596.000.
Fisher Scientific Company: *See—*
Meijer, Robert S., 4,859,927, Cl. 323-284.000.
Qureshi, Humayun; Liffmann, Stanley M.; Webster, Milo E.; and Geiselman, Theodore S., 4,859,422, Cl. 422-81.000.
Fisons Corporation: *See—*
Chow, San-Laung; and Raghunathan, Yegnaswami, 4,859,461, Cl. 424-79.000.
Chow, San-Laung; and Raghunathan, Yegnaswami, 4,859,462, Cl. 424-79.000.
Fittro, David; and Fredericksen, Arnold E. Rocker arm bearing assembly. 4,858,575, Cl. 123-90.410.
Fitzharris, William D.; Ringle, Scott J.; and Nicholes, Kathy S., to Amoco Corporation. Catalytic cracking of whole crude oil. 4,859,310, Cl. 208-87.000.
Fixell, Jan-Olof: *See—*
Persson, Per-Olof; Albrektsson, Kjell; Axinger, Jan; Fixell, Jan-Olof; and Hyvarinen, Jari, 4,858,532, Cl. 102-387.000.
Flahive, Barry: *See—*
Bruckert, William F.; Flahive, Barry; and Lacy, James V., 4,860,244, Cl. 364-900.000.
Fleischanderl, Robert. Arrangement for mounting disk wheels on motor vehicles. 4,858,298, Cl. 29-273.000.
Fleischer, Hans-Joachim: *See—*
Bohnke, Kurt; Brandis, Helmut; Domalski, Hans-Heinrich; Fleischer, Hans-Joachim; and Frinken, Heinrich, 4,859,649, Cl. 502-439.000.
Fleishman, Roc V.: *See—*
Popovich, John M.; and Fleishman, Roc V., 4,858,254, Cl. 4-542.000.
Flemming, Udo, to Puma AG Rudolf Dassler Sport. Sole for athletic shoes, particularly for soccer shoes. 4,858,343, Cl. 36-128.000.
Flesher, Peter; Langley, John; Rosier, Norma; and Farrar, David, to Allied Colloids Ltd. Process and compositions for sizing paper. 4,859,720, Cl. 523-332.000.
Fletcher, Douglas C.; and Bruninga, Kenneth J., to L. R. Nelson Corporation. Electronic water sprinkler timer. 4,858,827, Cl. 239-69.000.
Fletcher, Robert E.: *See—*
Lipisko, Bruce A.; Schumacher, John C.; Howard, Richard E.; Randtke, Peter T.; Sandu, Adrian; Fletcher, Robert E.; and Graf, Hans-Juergen, 4,859,375, Cl. 261-20.000.
Flexi-Coil Limited: *See—*
Hundeby, David R., 4,858,832, Cl. 239-723.000.
Flow Systems, Inc.: *See—*
Tremoulet, Olivier L., Jr.; and Raghavan, Chidambaram, 4,858,967, Cl. 285-256.000.
Flower, Thomas H.: *See—*
Berg, Lloyd; Szabados, Rudolph J.; and Flower, Thomas H., 4,859,285, Cl. 203-51.000.
Floyd, Jerome M., to International Paper Company. Paper sizing. 4,859,244, Cl. 106-243.000.
Fluharty, William J.: *See—*
Dykstra, Ronald A.; and Fluharty, William J., 4,858,982, Cl. 296-97.500.
Flury, Peter; and Alder, Alex, to Ciba-Geigy Corporation. Cyanoguanidines as hardeners for epoxy resins. 4,859,761, Cl. 528-123.000.
Fodor, Ferenc, deceased: *See—*
Pelyva, Jeno ; Vecsey, K. Istvan; Kolonics, Zoltan; Legradi, Laszlo; Nagy, Lajos; Horvath, Andras; Fodor, Ferenc, deceased; Soptei, Csaba; Sebok, Dezso; Tomordi, Elemer; Lendvai, Laszlo ; Karacsonyi, Bela; and Dioszegi, Erzsebet, 4,859,772, Cl. 544-11.000.
Foerster, Siegfried: *See—*
Effenberger, Franz; Ziegler, Thomas; and Foerster, Siegfried, 4,859,784, Cl. 549-491.000.
Fogarty, Kevin E.: *See—*
Fay, Fredric S.; Fogarty, Kevin E.; and Rodgers, Cyril, 4,859,063, Cl. 356-418.000.
Fogelson, Mark: *See—*
Adler, Robert; Fogelson, Mark; and Kaplan, Sam, 4,859,996, Cl. 340-712.000.
Foguet, Rafael; Forne, Ernesto; Sacristan, Aurelio; and Ortiz, Jose A., to Ferrer Internacional S.A. 1-[2-(phenylmethyl) phenyl]piperazines as antidepressants. 4,859,675, Cl. 514-255.000.
Fong, Ronald A.: *See—*
Zielske, Alfred G.; and Fong, Ronald A., 4,859,800, Cl. 568-566.000.
Ford Motor Company: *See—*
Bolfik, Lawrence J.; and Smith, Calvin G., 4,858,676, Cl. 165-2.000.
Field, Nathaniel L.; and Pulick, Michael A., 4,858,670, Cl. 164-11.000.
Moskowitz, David; and Phillips, Charles W., 4,859,124, Cl. 409-64.000.

Forestier, Alexandre: *See—*
Autie, Pascal J. M.; Avignon, Philippe P.; Camusso, Dominique P.; Forestier, Alexandre; and Ulryck, Gilles, 4,858,721, Cl. 181-213.000.

Forgach, David J.: *See—*
Fibiger, Richard F.; Koo, Ja-young; Forgach, David J.; Petersen, Robert J.; Schmidt, Donald L.; Wessling, Ritchie A.; and Stocker, Thomas F., 4,859,384, Cl. 264-45.100.

Forne, Ernesto: *See—*
Foguet, Rafael; Forne, Ernesto; Sacristan, Aurelio; and Ortiz, Jose A., 4,859,675, Cl. 514-255.000.

Forsberg, Stefan G.; and Erkander, Ragnar S., to Telefonaktiebolaget L M Ericsson. Encoding method in transmission of plurality of oversampled data channels, and apparatus for carrying out the method. 4,860,286, Cl. 370-106.000.

Fortin, Rejean: *See—*
Lau, Cheuk K.; Yoakim, Christiane; Rokach, Joshua; Fortin, Rejean; and Guindon, Yvan, 4,859,667, Cl. 514-224.500.

Fospur Limited: *See—*
Brookes, Gerald F.; and Spencer, Lynne, 4,859,318, Cl. 209-166.000.

Fossion, Jacques: *See—*
Baudier, Philippe; De Boeck, Arthur; and Fossion, Jacques, 4,859,469, Cl. 424-462.000.

Foster, Raymond K,. Bearing system for reciprocating floor conveyor. 4,858,748, Cl. 198-750.000.

Foster Wheeler Energy Corporation: *See—*
Maffei, Charles V., 4,858,564, Cl. 122-441.000.

Foster, William T.: *See—*
Eustice, Harold L.; and Foster, William T., 4,858,921, Cl. 273-26.00R.

Fottner, Johannes: *See—*
Von Criegern, Rolf; Fazekas, Peter; and Fottner, Johannes, 4,860,225, Cl. 364-551.010.

Foundation: The Research Institute of Electric and Magnetic Alloys, The: *See—*
Masumoto, Hakaru; Sawaya, Showhachi; and Hinai, Masakatsu, 4,859,252, Cl. 148-11.50R.

Fowler, Ronald E.; Voss, Jeffrey L.; and Cain, Stephen D., to Brand Scaffold Services, Ltd. Method and apparatus for lifting objects inside a limited access vessel. 4,858,890, Cl. 254-335.000.

Foye, Thomas E.; and Baillargeon, Joseph P., to BASF Corporation. Low viscosity, highly concentrated pigment dispersions and method of making same. 4,859,247, Cl. 106-505.000.

Foyt, Douglas C. Adjustable shutter. 4,858,400, Cl. 52-98.000.

Fragneau, Marc: *See—*
Aubry, Jean-Pierre; Fragneau, Marc; Craveur, Jean-Charles; Janiaud, Denis; and Muller, Serge, 4,859,898, Cl. 310-353.000.

Francis, Terry E. Automatic nailer system. 4,858,814, Cl. 227-149.000.

Franek, Henning: *See—*
Meinert, Norbert; Huber, Werner; Dreuth, Rainer; and Franek, Henning, 4,859,635, Cl. 501-44.000.

Frank, Michael: *See—*
Wunderle, Anita, geb. Rudigier; Frank, Michael; and Schossow, Dieter, 4,859,185, Cl. 433-222.100.

Franke, Rainer, to Hoechst Aktiengesellschaft. Process for the preparation of a polyolefin with a wide molecular mass distribution. 4,859,749, Cl. 526-124.000.

Franke, Steven J.; Boesch, Ronald D.; and Magin, Richard L., to University of Illinois, The Board of Trustees of the. Continuous phase shifter for a phased array hyperthermia system. 4,859,972, Cl. 333-164.000.

Franke, Wilfried: *See—*
Blume, Friedhelm; Franke, Wilfried; Arndt, Friedrich; and Rees, Richard, 4,859,230, Cl. 71-93.000.

Frankel, Robert D.; and Drumheller, Jerry P., to Hampshire Instruments, Inc. Target positioning for minimum debris. 4,860,328, Cl. 378-34.000.

Franks, Christopher I., to Biokinetics, Inc. Foot pressure measurement system. 4,858,621, Cl. 128-779.000.

Franz, Dieter; Kummer, Rudolf; Mach, Helmut; and Rath, Hans P., to BASF Aktiengesellschaft. Motor fuel or lubricant composition containing polybutyl or polyisobutyl derivatives. 4,859,210, Cl. 44-53.000.

Franz Plasser Bahnbaumaschinen-Industriegesellslchaft m.b.H.: *See—*
Theurer, Josef; and Brunninger, Manfred, 4,858,696, Cl. 171-16.000.

Fredericksen, Arnold E.: *See—*
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Freeman, John C.: *See—*
Cathey, David A.; Freeman, John C.; Dale, James; Crane, William J.; Powell, Eric A.; and Musser, Jeffrey V., 4,859,304, Cl. 204-298.000.

Freeman, T. Austin: *See—*
Watson, Brock W.; and Freeman, T. Austin, 4,858,687, Cl. 166-153.000.

Frei, Bruno: *See—*
O'Sullivan, Anthony C.; and Frei, Bruno, 4,859,657, Cl. 514-63.000.

Frei, Jochen: *See—*
Goller, Ernst; Wurst, Dieter; Kazmaier, Guenther; and Frei, Jochen, 4,858,446, Cl. 77-126.00R.

Freisinger, Henry: *See—*
Stritzl, Karl; Freisinger, Henry; and Luschnig, Franz, 4,858,946, Cl. 280-618.000.

Freitag, Dieter: *See—*
Dziurla, Heinz-Jurgen; Weber, Hans-Leo; Freitag, Dieter; and Waldenrath, Werner, 4,859,263, Cl. 156-233.000.

Frerichs, Klaus-Dieter, to Olympia Werke AG. Ribbon cartridge for typewriters or similar office machines. 4,859,097, Cl. 400-208.000.

Freuer, Hans-Georg: *See—*
Fulberth, Werner; and Freuer, Hans-Georg, 4,859,471, Cl. 424-480.000.

Freyne, Eddy J. E.: *See—*
Raeymaekers, Alfons H. M.; Freyne, Eddy J. E.; and Sanz, Gerard C., 4,859,684, Cl. 514-314.000.

Frianeza-Kullberg, Teresita C.; and Barnette, Darrish W., to Lithium Corporation of America. Sodium removal from brines. 4,859,343, Cl. 210-679.000.

Friedrich, Marju L.: *See—*
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Szenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,859,807, Cl. 174-68.500.

Friedrich, Steven G.; and Davis, Kent A., to W. R. Grace & Co. Laminate for an easily opened package. 4,859,514, Cl. 428-36.600.

Friese, Axel, to Johnson & Johnson GmbH. Feminine hygiene tampon and method and apparatus for making same. 4,859,273, Cl. 156-446.000

Frnnken, Heinrich: *See—*
Bohnke, Kurt; Brandis, Helmut; Domalski, Hans-Heinrich; Fleischer, Hans-Joachim; and Frinken, Heinrich, 4,859,649, Cl. 502-439.000.

Fritsch, Georges, to Ameg France; and Ceca S.A. Process and equipment for the treatment and recovery of solvent vapors by recycling on active charcoal. 4,859,216, Cl. 55-28.000.

Fritsch, Karl H.; and Bier, Peter, to Bayer Aktiengesellschaft. Process for the production of polyamide mouldings. 4,859,390, Cl. 264-143.000.

Fritz, William B., to AMP Incorporated. Strain relief for flat cable termination. 4,859,205, Cl. 439-492.000.

Froix, Michael F.: *See—*
Dubrow, Robert S.; and Froix, Michael F., 4,859,715, Cl. 521-180.000

Froment, Jean-Paul: *See—*
Palau, Joseph; and Froment, Jean-Paul, 4,858,655, Cl. 139-76.000.

Frosch, Werner; and Dudek, Wolfram, to Hollingsworth GmbH. Universal textile machine for optionally manufacturing longitudinally and/or randomly oriented fiber fleece. 4,858,276, Cl. 19-98.000.

Frueh, Peter, to Mettler Instrumente AG. Method and apparatus for titrimetric content determination in a chemical solution. 4,859,608, Cl. 436-163.000.

Fruhauf, Serge; and Marquot, Alexis, to Thomson Semiconducteurs. Electrically programmable non-volatile memory having sequentially deactivated write circuits. 4,860,258, Cl. 365-194.000.

Fry, Francis J.; and Sanghvi, Narendra T., to Laboratory Equipment, Corp. Localization and therapy system for treatment of spatially oriented focal disease. 4,858,613, Cl. 128-660.030.

Fu, Chuen-Fong. Kitchen smoke exhaust device. 4,858,591, Cl. 126-299.00D.

Fuchizawa, Tetsuro: *See—*
Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, 4,859,577, Cl. 430-538.000.

Fuchs, Kathryn J.: *See—*
Davis, Richard E.; and Fuchs, Kathryn J., 4,859,105, Cl. 401-286.000.

Fuda, Hitoshi: *See—*
Fukushi, Yuzo; Fuda, Hitoshi; and Sasada, Taisuke, 4,860,366, Cl. 381-106.000.

Fuji Photo Film Co., Ltd.: *See—*
Aono, Toshiaki; and Hara, Hiroshi, 4,859,580, Cl. 430-617.000.
Funahashi, Takeshi; and Ishida, Masamitsu, 4,859,850, Cl. 250-327.200.
Hirano, Shigeo; Kojima, Tetsuro; Yamamoto, Mitsuru; Inoue, Noriyuki; and Heki, Tatsuo, 4,859,579, Cl. 430-598.000.
Kakuta, Takeshi; and Miyoshi, Takahito, 4,859,500, Cl. 427-128.000.
Miyasaka, Nobuaki; Yokoyama, Shigeki; Suga, Shuzo; Naoi, Takashi; and Satake, Masaki, 4,859,576, Cl. 430-523.000.
Mutoh, Hideki, 4,860,326, Cl. 377-58.000.
Nakajima, Nobuyoshi, 4,860,116, Cl. 358-447.000.
Okutsu, Eiichi; and Hirano, Mitsunori, 4,859,567, Cl. 430-265.000.
Sasaki, Hidemi; and Kobayashi, Naoki, 4,860,136, Cl. 360-99.050.
Sawano, Mitsuru; and Yabe, Masao, 4,860,273, Cl. 369-100.000.
Shimura, Kazuo; and Ishida, Masamitsu, 4,859,849, Cl. 250-327.200.
Suzuki, Akihiro; and Takagi, Akira, 4,858,265, Cl. 15-100.000.
Tabei, Masatoshi; Ikeda, Mitsuru; and Nakajima, Yosuke, 4,860,076, Cl. 357-30.000.
Tahara, Toshiro; and Takahashi, Mikio, 4,858,468, Cl. 73-149.000.
Tajima, Kenji; Kushima, Hiroshi; and Yamada, Sadami, 4,860,042, Cl. 354-277.000.
Takeda, Keiji; and Hayakawa, Yoshihide, 4,859,568, Cl. 430-269.000.
Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, 4,859,577, Cl. 430-538.000.
Terashita, Takaaki, 4,860,059, Cl. 355-38.000.
Tomiyama, Hideki, 4,859,564, Cl. 430-216.000.
Tsubata, Yukihiro; and Shiino, Masaru, 4,859,120, Cl. 406-84.000.
Watanabe, Kazuo; Takahashi, Yutaka; and Takimoto, Masaaki, 4,859,095, Cl. 400-124.000.

Fuji-Seiki Machine Works, Ltd.: *See—*
Tsuchiya, Tomio, 4,858,554, Cl. 118-224.000.

Fuji Xerox Co., Ltd.: *See—*
Matsumura, Yasuo; Aoki, Takayoshi; Takeda, Masayuki; Suzuki, Chiaki; and Nagatsuka, Ikutaroh, 4,859,558, Cl. 430-110.000.

Fujii, Akira: *See—*
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,860,046, Cl. 354-475.000.

Fujii, Junji: *See—*
Shimoda, Isao; Yaguchi, Mitsugu; and Fujii, Junji, 4,858,510, Cl. 84-402.000.

Fujii, Shigeru: *See—*
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Fujiki, Tsutomu: *See—*
Yamaguchi, Hideo; and Fujiki, Tsutomu, 4,858,518, Cl. 98-2.080.

Fujikura Ltd.: *See—*
Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, 4,858,679, Cl. 165-46.000.

Fujimoto, Sachito: *See—*
Hosoi, Shuichi; and Fujimoto, Sachito, 4,858,581, Cl. 123-489.000.

Fujimura, Setsuo; Sagawa, Masato; Matsuura, Yutaka; Yamamoto, Hitoshi; and Togawa, Norio, to Sumitomo Special Metals Co., Ltd. Permanent magnets. 4,859,255, Cl. 148-302.000.

Fujino, Masaru; Nishioka, Goro; and Sakabe, Yukio. Nonreducible dielectric ceramic composition. 4,859,641, Cl. 501-136.000.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Yamaguchi, Isamu; and Hirosumi, Jiro, 4,859,688, Cl. 514-344.000.

Fujisawa, Shuji: *See—*
Yamamoto, Haruo; Ichihashi, Takao; Fujisawa, Shuji; Tone, Eiichi; and Tsuda, Takeshi, 4,860,053, Cl. 355-245.000.

Fujita, Minoru: *See—*
Kakinuma, Yuji; and Fujita, Minoru, 4,860,275, Cl. 369-109.000.

Fujita, Toyohiko: *See—*
Yamakoshi, Akira; Fujita, Toyohiko; Tsukakoshi, Kunihiko; and Anraku, Shinji, 4,859,966, Cl. 330-288.000.

Fujita, Yasushi: *See—*
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Tanaka, Yoshio; Fujii, Shigeru; Nishida, Takao; and Fujita, Yasushi, 4,859,886, Cl. 310-51.000.

Fujitsu Limited: *See—*
Itoh, Hideaki; and Ozaki, Takayuki, 4,860,282, Cl. 370-55.000.
Iwamatsu, Takanori, 4,860,010, Cl. 341-118.000.
Kaneda, Saburo; and Murakami, Kazuaki, 4,860,190, Cl. 364-200.000.
Kobayashi, Osamu; and Gotch, Kunihiko, 4,859,871, Cl. 307-264.000.
Ogawa, Tsutomu, 4,858,975, Cl. 294-64.100.
Sugahara, Takehisa; Nakagawa, Toyokatu; and Yano, Junichi, 4,859,614, Cl. 437-8.000.
Takenaka, Sadao; Aono, Yoshihito; Iwamatsu, Takanori; Minowa, Morihiko; Daido, Yoshimasa; and Nakamura, Hiroshi, 4,860,316, Cl. 375-39.000.
Yoshimura, Tatsuro, 4,859,954, Cl. 328-155.000.

Fukawatase, Midori: *See—*
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Fukazawa, Masashi: *See—*
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Fukuda, Nobutoshi; Nagao, Tatsuro; Arifuku, Naoto; Tanabe, Masashi; Yamamisaka, Shinichi; and Furuta, Yoshiki, to Pioneer Electronic Corporation. Signal reproducing device. 4,860,129, Cl. 360-61.000.

Fukuma, Yasufumi; Kitao, Ikuo; and Kato, Yasuo, to Tokyo Kogaku Kikai Kabushiki Kaisha. Eye testing apparatus. 4,859,051, Cl. 351-211.000.

Fukumochi, Yoji: *See—*
Kugimiya, Syuzo; Tokunaga, Shinji; Suzuki, Hitoshi; Fukumochi, Yoji; Shiotani, Shinobu; and Sata, Ichiko, 4,860,206, Cl. 364-419.000.

Fukumoto, Masami: *See—*
Matsumoto, Kentaro; Takaoka, Makoto; Fukumoto, Masami; Uda, Toyokazu; and Sugiura, Susumu, 4,860,026, Cl. 346-1.100.

Fukumura, Kagenori: *See—*
Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,858,500, Cl. 74-866.000.

Fukumura, Takeo: *See—*
Niikura, Yoshiharu; Fukumura, Takeo; and Umetsu, Chiharu, 4,858,898, Cl. 267-218.000.

Fukuo, Koichi; Shibata, Mitsuhiro; Hiro, Toshiaki; and Matsumoto, Masahiko, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic circuit for a valve operating timing control device for an internal combustion engine. 4,858,574, Cl. 123-90.340.

Fukuoka, Mutsuo: *See—*
Kanemoto, Seiichi; and Fukuoka, Mutsuo, 4,859,099, Cl. 400-636.100.

Fukushi, Yuzo; Fuda, Hitoshi; and Sasada, Taisuke, to NEC Corporation. Teleconference system using expanders for emphasizing a desired signal with respect to undesired signals. 4,860,366, Cl. 381-106.000.

Fukuzaki, Koichiro: *See—*
Shinomura, Yasushi; Yamaguchi, Masahiko; and Fukuzaki, Koichiro, 4,859,535, Cl. 428-398.000.

Fulberth, Werner; and Freuer, Hans-Georg. Pancreatic enzyme products and a process for the preparation thereof. 4,859,471, Cl. 424-480.000.

Fuller Company: *See—*
Kreisberg, Alan J.; and Prowler, Millard E., 4,859,177, Cl. 432-14.000.

Fuller, Harold A.; and Shepard, Michael L., to Westvaco Corporation. Concentric injection flow pipe junction. 4,858,965, Cl. 285-189.000.

Fuller, Mark W.: *See—*
Robinson, Alan S.; and Fuller, Mark W., 4,858,826, Cl. 239-18.000.

Fumia, Enrico, to Pininfarina Extra S.r.l. Bag, particularly a golf bag, of variable configuration. 4,858,761, Cl. 206-315.300.

Funahashi, Takeshi; and Ishida, Masamitsu, to Fuji Photo Film Co., Ltd. Irradiation field recognizing method, and method of adjusting image processing conditions using the same. 4,859,850, Cl. 250-327.200.

Furneaux, Robin C.; and Rigby, William R., to Alcan International Limited. Porous anodic aluminum oxide films. 4,859,288, Cl. 204-11.000.

Furrey, John H., to Thomson Consumer Electronics, Inc. Video display driver apparatus. 4,860,107, Cl. 358-184.000.

Furukawa, Kaoru: *See—*
Yamashita, Mikihiro; and Furukawa, Kaoru, 4,859,931, Cl. 324-67.000.

Furukawa, Mitsuhiko: *See—*
Wada, Toshiaki; Katsuyama, Yoshiaki; Furukawa, Mitsuhiko; Kitahira, Takashi; Miyahara, Michito; Misumi, Kiyohito; and Shiroyama, Masaharu, 4,859,638, Cl. 501-58.000.

Furuta, Yoshiki: *See—*
Fukuda, Nobutoshi; Nagao, Tatsuro; Arifuku, Naoto; Tanabe, Masashi; Yamamisaka, Shinichi; and Furuta, Yoshiki, 4,860,129, Cl. 360-61.000.

Furutani, Kiyohiro: *See—*
Arimoto, Kazutami; and Furutani, Kiyohiro, 4,860,070, Cl. 357-23.600.

Fusion Systems Corportion: *See—*
Ury, Michael G.; and Wood, Charles H., 4,859,906, Cl. 313-639.000.

Fyfe, George: *See—*
Jones, Kenneth W.; and Fyfe, George, 4,858,707, Cl. 175-329.000.

Fyler, Donald C., to Charles Stark Draper Laboratory, Inc., The. Method and apparatus for manipulating and transporting limp material. 4,858,906, Cl. 271-19.000.

G.D. Societa per Azioni: *See—*
Gamberini, Antonio, 4,858,770, Cl. 209-535.000.
Neri, Armando, 4,858,626, Cl. 131-84.400.

G. P. Reeves In.: *See—*
Reeves, Gordon P., 4,858,645, Cl. 137-551.000.

Gabriel, Steven M.; and Roselle, Brian J., to Procter & Gamble Company, The. Liquid automatic dishwashing compositions containing metal salts of hydroxy fatty acids providing silver protection. 4,859,358, Cl. 252-99.000.

Gaffaney, Daniel P.: *See—*
Gray, Kenneth P.; McDonough, Michael L.; Poplawski, Bruce J.; Gaffaney, Daniel P.; and Moyer, Ross A., 4,858,305, Cl. 29-727.000.

Gagnon, Andre: *See—*
Gale, P. Michael; McMillan, Myles; and Gagnon, Andre, 4,859,934, Cl. 324-78.00D.

Gagnon, Raymond. Badge and method of making same. 4,858,358, Cl 40-616.000.

Gal, Dezso : *See—*
Szabo nee Mogyorossi, Katalin; Kalocsai, Istvan; Gyoni, Istyan; Remenyi, Karoly; Plaveczky, Gyorgy; Kovacs, Laszlo ; Gal, Dezso ; Nemes, Istvan; Botar, Laszlo ; Bencsura, Akos; Moger nee Jeremejeva, Galina; Heberger, Karoly; and Nemeth, Andras, 4,859,209, Cl. 44-51.000.

Gal, George; and Morrow, Howard E., to Lockheed Missiles & Space Company, Inc. Laser velocimeter. 4,859,055, Cl. 356-28.000.

Galarowic, Lawrence A., to Visi-Trol Engineering Co. Work station. 4,858,301, Cl. 29-563.000.

Gale, P. Michael; McMillan, Myles; and Gagnon, Andre, to Telemus Electronic Systems, Inc. Apparatus for measuring the frequency of microwave signals. 4,859,934, Cl. 324-78.00D.

Gallagher Electronics Limited: *See—*
McKissack, Jeremy J., 4,859,868, Cl. 307-106.000.

Gallot, Bernard; and Douy, Andre , to Centre Natioonal de la Recherche Scientifique (CNRS). Branched lipopeptide polymers forming thermotropic and lyotropic liquid crystals, their applications and corresponding monomers. 4,859,753, Cl. 526-238.100.

Gamberini, Antonio, to G.D. Societa per Azioni. Exit stage device for a packaging line. 4,858,770, Cl. 209-535.000.

Gamson, Bernard W.: *See—*
Simon, Wayne E.; Sadeh, Willy Z.; Kerin, Edward R.; and Gamson, Bernard W., 4,859,347, Cl. 210-788.000.

Ganter, Wolfgang: *See—*
Allgaier, Jurgen; Ganter, Wolfgang; Hodapp, Wolfram; Kopf, Arthur; and Maurer, Roland, 4,860,268, Cl. 368-47.000.

Gao, Shi-Yang: *See—*
Pshtissky, Yacov A.; and Gao, Shi-Yang, 4,860,101, Cl. 358-149.000.

Garlock Inc.: *See—*
Potepan, Agnes; and Dibble, Richard L., 4,859,526, Cl. 428-283.000.

Garnier, Marcel: *See—*
Senillou, Claude; de Framond, Remy; Garnier, Marcel; Yavari, Ali R.; and Joud, Jean-Charles, 4,858,675, Cl. 164-503.000.

Garrison, David F.: *See—*
Chou, Yu-Chia T.; Garrison, David F.; and Lewis, William I., 4,859,282, Cl. 162-78.000.

Garthoff, Bernward; Gerold, Marcel; Hefti, Fridolin; Kazda, Stanislav; and Knorr, Andreas, to Hoffmann-LaRoche Inc.; and Bayer Akt. Antihypertensive combination products containing a dihydropyridine and a pyridazodiazepine. 4,859,665, Cl. 514-221.000.
Gas Research Institute: *See—*
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Wasson, Michael R.; and Herben, William C., 4,858,704, Cl. 175-61.000.
Gassaway, Mark M. Mount for securing protected articles. 4,858,878, Cl. 248-551.000.
Gast, Theodor: *See—*
Thurn, Gerhard; and Gast, Theodor, 4,859,062, Cl. 356-371.000
Gates Energy Products, Inc.: *See—*
Adams, David W.; Ching, Larry K. W., Jr.; and Puester, Neil, 4,859,547, Cl. 429-121.000
Gavin, Michel; Grunder, Urs; and Ulmer, Karl, to Gebruder Buhler AG. Method for producing a product from oil seed. 4,859,482, Cl. 426-518.000
Gawloski, Leszek: *See—*
Segerstrom, Clifford C.; Stil, Jacob H.; Ooms, Adrianus J.; Mink, Bernardus H.; Premel, Ulrich; and Gawloski, Leszek, 4,859,214, Cl. 48-197.00R
Gayle, Edwin O. Guard structure for tomato plants. 4,858,380, Cl. 47-45.000
Gebauer, Carl R.: *See—*
Cram, Donald J.; Chapoteau, Eddy; Czech, Bronislaw P.; Gebauer, Carl R.; Helgeson, Roger C.; Kumar, Anand; and Leong, Koon-Wah, 4,859,606, Cl. 436-79.000
Gebruder Buhler AG: *See—*
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Geepard Industries, Inc.: *See—*
Seib, George E.; and Seib, Bradley D., 4,858,317, Cl. 30-115.000
Geiselman, Theodore S.: *See—*
Qureshi, Humayun; Liffmann, Stanley M.; Webster, Milo E.; and Geiselman, Theodore S., 4,859,422, Cl. 422-81.000
Gelles, Richard: *See—*
Modic, Michael J.; and Gelles, Richard, 4,859,737, Cl. 525-64.000
Gemcor Engineering Corp.: *See—*
Speller, Thomas H., Sr., 4,858,289, Cl. 29-34.00B
Gemma, Hideaki: *See—*
Uchida, Noriaki; and Gemma, Hideaki, 4,860,247, Cl. 364-900.000
Gendey, Yves: *See—*
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Gendron, Robert F.; Stacy, E. Webb, Jr.; and Ionescu, Tudor V., to Softron, Inc. Computer based workstation for development of graphic representation of computer programs. 4,860,204, Cl. 364-300.000.
Genentech, Inc.: *See—*
Dull, Thomas J.; Riedel, Heimo; and Ullrich, Axel, 4,859,609, Cl. 436-501.000.
Gray, Gregory L.; and Heyneker, Herbert L., 4,859,600, Cl. 435-252.330.
General Dynamics Pomona Division: *See—*
Mancini, Steven A.; and Kutschka, Joseph D., 4,858,851, Cl. 244-327.000.
General Electric Company: *See—*
Andrews, Loren E.; and Sieber, Robert L., 4,859,889, Cl. 310-89.000.
Archer, William R., 4,859,921, Cl. 318-599.000.
Bonissone, Piero P., 4,860,213, Cl. 364-513.000
Case, Allen W., Jr.; Lillquist, Robert D.; and Sundell, Robert E., 4,859,830, Cl. 219-130.010.
DeVizzi, Francesco, 4,860,162, Cl. 361-376.000
Dixon, Robert C.; and Deaver, Gerald A., 4,859,403, Cl. 376-286.000
Fisher, Lyan E., 4,858,303, Cl. 29-596.000
Glasheen, William M.; and Mayer, Christopher R., 4,858,474, Cl. 73-861.350.
Griffing, Bruce F.; and West, Paul R., 4,859,789, Cl. 560-35.000.
Hartless, Mac L.; and Johnson, Alan L., 4,860,373, Cl. 382-41.000.
Hartley, Richard I.; and Corbett, Peter F., 4,860,240, Cl. 364-757.000
Jenkins, Thomas B.; Ulery, Dennis R.; Wilson, Blake W.; Walko, Steven C.; Lee, Lester H.; Salerno, Robert P.; Nason, Robert W., and Courtney, John P., 4,859,891, Cl. 310-215.000.
Kim, Bang M.; and Giles, Harold F., Jr., 4,859,524, Cl. 428-236.000
Kliman, Gerald B.; Brynsvold, Glen V.; and Jahns, Thomas M., 4,859,885, Cl. 310-11.000.
Kliman, Gerald B.; and Jones, Donald W., 4,859,974, Cl. 335-229.000
Mengel, William H., 4,860,380, Cl. 455-185.000.
Michon, Gerald J., 4,860,073, Cl. 357-24.000.
Milkovic, Miran, 4,859,937, Cl. 324-142.000.
Raleigh, William J.; Doin, James E.; and Traver, Frank J., 4,859,529, Cl. 428-290.000.
Russell, Ronald R., 4,860,157, Cl. 361-156.000.
Steinle, Shelton; Sturtz, John P.; Dayal, Yogeshwar; and Wimpee, Lealon C., 4,858,461, Cl. 73-23.000
Wei, Ching-Yeu; and Pimbley, Joseph M., 4,859,620, Cl. 437-44.000.
Yates, John B., III; and White, Dwain M., 4,859,739, Cl. 525-92.000
Yilmaz, Hamza, 4,860,080, Cl. 357-48.000
General Hospital Corporation, The: *See—*
Goldman, Mark, 4,859,450, Cl. 424-9.000
General Ideas & Products Ltd.: *See—*
Gross, Joseph; Lowenstein, David; Tilman, Menachem; and Rosenberg, Etan, 4,858,600, Cl. 128-65.000.
General Instrument Corporation: *See—*
Brown, David S., 4,860,353, Cl. 380-44.000.
Einthoven, Willem G., 4,859,621, Cl. 437-45.000
Schoeneberger, Carl F.; and Bundens, Allan B., 4,860,379, Cl. 455-5.000
General Kinematics Corporation: *See—*
Musschoot, Albert, 4,858,749, Cl. 198-756.000.
Musschoot, Albert, 4,859,070, Cl. 366-114.000
General Motors Corporation: *See—*
Antrim, Marcus L., 4,860,175, Cl. 362-65.000.
Baynes, Dennis, 4,858,489, Cl. 74-547.000
Brewer, Earl G.; and Lee, Robert W., 4,859,410, Cl. 419-10.000.
Chandley, George D., 4,858,672, Cl. 164-63.000.
Haag, Ronald H.; Manuel, Mark; and Rogers, Lloyd W., 4,858,971, Cl. 292-201.000
Holcomb, Warren N., 4,858,426, Cl. 60-39.080.
King, Michael F., 4,858,501, Cl. 74-868.000.
Lippmann, Raymond; and Nelson, James E., 4,859,912, Cl 315-169.300.
McClain, John C., 4,859,149, Cl. 416-215.000
Nestor, Charles R., 4,859,202, Cl. 439-397.000.
Parker, Donald L.; Reuter, David F.; and Roussel, Patrick, 4,859,001, Cl. 303-92.000
Provenzano, Nicholas J., 4,858,427, Cl. 60-39.080.
Schmidt, Edward H.; Carpenter, Marvin E.; and Walters, David W., 4,860,222, Cl. 364-550.000.
Tracht, Steven L., 4,859,919, Cl. 318-444.000
Young, Douglas A.; and Gilson, Jay F., 4,859,953, Cl. 324-539.000.
General Signal Corporation: *See—*
Viscusi, David A., 4,859,086, Cl. 384-126.000.
Genex Corp.: *See—*
Savas, Peter G.; and Kiger, Virginia S., 4,859,336, Cl. 210-416.100.
Genna, Sebastian; and Smith, Andrew P., to Digital Scintigraphics, Inc. Collimator system with improved imaging sensitivity. 4,859,852, Cl 250-363.100
Genovese, Frank C.; and Lannom, James W., to Xerox Corporation. Vacuum fluorescent printing device. 4,859,913, Cl. 315-169.400.
Geoflow International Pty. Limited: *See—*
Kelsey, Christopher G.; and McKenzie, Ian R., 4,858,887, Cl. 251-212.000
Geophysical Company of Norway A/S: *See—*
Haugland, Tor A.; Kleiven, Atle; and Selvaer, Ole K., 4,860,264, Cl. 367-17.000
Geosits, John P.: *See—*
Davis, Lester W., Jr.; Geosits, John P.; Juedes, Dennis L.; and Kiczek, Edward F., 4,859,173, Cl. 431-175.000
Gerber, Gary A., to Gerber Group, Ltd. Invisible mount roof rack. 4,858,803, Cl. 22.4-329.000.
Gerber Group, Ltd.: *See—*
Gerber, Gary A., 4,858,803, Cl. 22.4-329.000.
Gerber Scientific Instrument Company, Inc.: *See—*
Koso, Dusan A., 4,859,999, Cl. 340-799.000
Gerdau, Thomas; Kleiner, Hans-Jerg; and Pawlowski, Georg, to Hoechst Aktiengesellschaft. Ethylenically unsaturated phosphinic acid and thiophosphinic acid isocyanates and isothiocyanates, and a process for their preparation. 4,859,795, Cl. 564-12.000
Gerdau, Thomas: *See—*
Pawlowski, Georg; Kleiner, Hans-Jerg; and Gerdau, Thomas, 4,859,562, Cl. 430-175.000.
Gerez, Jean-Michel: *See—*
Huvey, Michel; Do, Anh T.; Gerez, Jean-Michel; and Le Gallais, Lucien, 4,858,653, Cl. 138-144.000
Gerhart, Paul B., to Honeywell Inc. Apparatus and method for a secure and diagnosable antijabber communication circuit. 4,860,280, Cl. 370-13.000
Germanaud, Laurent; and Hermant, Marc, to Societe Atochem. Polyfluorinated compounds, their preparation and their use as lubricant additives. 4,859,357, Cl. 252-51.000.
Gerold, Marcel: *See—*
Garthoff, Bernward; Gerold, Marcel; Hefti, Fridolin; Kazda, Stanislav; and Knorr, Andreas, 4,859,665, Cl. 514-221.000
Gerretz, Josef; and Hurtado, Antonio, to Mannesmann Aktiengesellschaft. Drive for a pilger cold-rolling mill with balancing of masses and moments. 4,858,458, Cl. 72-214.000.
Gershon, Ezra, to Integrated Technologies Solutions, Inc. Frequency generator. 4,859,968, Cl. 331-38.000.
Gettler, Lawrence H. Organization system. 4,858,354, Cl. 40-324.000.
Geyer, Paul. Extrusion apparatus. 4,859,069, Cl. 366-77.000.
Giannini, Giancarlo. Sound generating outerwear and associated switches. 4,860,364, Cl. 381-90.000.
Gibb, Thomson B., to Vacuum Furnace Systems Corporation. Hot zone employing graphite heating elements. 4,860,306, Cl. 373-112.000.
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, to International Paper Company. Oxygen impermeable leak free container. 4,859,513, Cl. 428-34.200
Gibson, Barbara L.: *See—*
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Gibson, William: *See—*
Clare, Kenneth; and Gibson, William, 4,859,208, Cl. 8-557.000.
Gierse, Franz J.; Pabst, Manfred; Hermanns, Heinz; Ippers, Karl; Krenn, Stephan; Huppe, Friedrich; Opgenoorth, Carl H.; and Wolters, Conrad, to A. Monforts GmbH & Co. Fabric web delivery apparatus. 4,858,843, Cl. 242-65.000.
Giles, Harold F., Jr.: *See—*
Kim, Bang M.; and Giles, Harold F., Jr., 4,859,524, Cl. 428-236.000.
Gillberg-LaFore, Gunilla E.; and Kravas, Helen A., to Hoechst Celanese Corp. Viscosity regulators for water-based spin finishes. 4,859,350, Cl. 252-8.900.
Gilson, Jay F.: *See—*
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Gingerich, Richard G. W.: *See—*
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Gingrich, Marlin K.: *See—*
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Ginsburg, Arthur P.: *See—*
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Ginsburg, Robert P.: *See—*
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Girgis, Ramsis S.: *See—*
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Giroux, Daniel: *See—*
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Gist-Brocades N.V.: *See—*
Hollenberg, Cornelis P.; Das, Sunil; De Leeuw, Albert; and van den Berg, Johannes A., 4,859,596, Cl. 435-172.300.
Gittleman, Jonathan I.; and Bozowski, Stanley, to United States of America, Army. Non-destructive testing of SOS wafers using surface photovoltage measurements. 4,859,939, Cl. 324-158.00R.
Glace, William R.: *See—*
Ibsen, Robert L.; and Glace, William R., 4,859,716, Cl. 522-14.000.
Glasheen, William M.; and Mayer, Christopher R., to General Electric Co. Angular momentum mass flowmeter with optical pickoff. 4,858,474, Cl. 73-861.350.
Glasner, Alfred: *See—*
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Glatt GmbH: *See—*
Glatt, Werner; and Nowak, Reinhard, 4,858,552, Cl. 118-19.000.
Glatt, Werner; and Nowak, Reinhard, to Glatt GmbH. Apparatus pelletizing particles. 4,858,552, Cl. 118-19.000.
Glaxo Group Limited: *See—*
Coates, Ian H.; Bradshaw, John; Bell, James A.; Humber, David C.; Ewan, George B.; Mitchell, William L.; and Price, Barry J., 4,859,662, Cl. 514-212.000.
Glazer, Alexander N.: *See—*
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Glisson, Richard R. Adjustable compression bone screw. 4,858,601, Cl. 128-92.00R.
Globe-Union Inc.: *See—*
Binder, Richard R.; Bantz, Paul E.; Tiedemann, William H.; McDonald, Guy D.; and Wruck, William J., 4,859,546, Cl. 429-53.000.
Gloger, Manfred: *See—*
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Gluck, Julius: *See—*
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Gmeiner, Peter: *See—*
Eiden, Friedrich; Gmeiner, Peter; and Schunemann, Jurgen, 4,859,664, Cl. 514-217.000.
GMS Engineering Corporation: *See—*
Samaras, George M.; and Falk, Steven M., 4,858,616, Cl. 128-680.000.
Goble, Fiorenza & Tenan, A partnership: *See—*
Goble, Jon A., 4,858,695, Cl. 169-62.000.
Goble, Jon A., to Goble, Fiorenza & Tenan, A partnership. Safe entry apparatus. 4,858,695, Cl. 169-62.000.
Gobush, William; Berard, Raymond A.; Brown, Robert A.; and Jepson, John W., to Acushnet Company. Low trajectory long distance golf ball. 4,858,923, Cl. 273-62.000.
Gocking, Wolfgang: *See—*
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Godau, Claus: *See—*
Brindopke, Gerhard; Godau, Claus; and Weber, Walter, 4,859,788, Cl. 558-398.000.
Godtfredsen, Sven E.; and Bjorkling, Fredrik, to Novo Industri A/S. Enzymatic method for preparation of epoxy compounds. 4,859,589, Cl. 435-73.000
Goertz, Hans-Helmut; Oftring, Alfred; and Vogel, Friedrich, to BASF Aktiengesellschaft. Polymers of oxyalkylated unsaturated quaternary ammonium salts, their preparation and their use. 4,859,756, Cl. 526-263.000.
Goerz Electro Gesellschaft m.b.H.: *See—*
Lejcek, Franz, 4,860,031, Cl. 346-136.000.
Goff, Douglas J.: *See—*
Schrader, Stephen A.; and Goff, Douglas J., 4,859,863, Cl 250-556.000.
Gold Star Col, Ltd.: *See—*
Noh, Yang H., 4,858,450, Cl. 68-134.000.
Gold Star Co., Ltd.: *See—*
Lee, Kwan H., 4,858,969, Cl. 292-78.000.
Goldman, Mark, to General Hospital Corporation, The. Method of NMR imaging using antibody to cardiac myosin. 4,859,450, Cl. 424-9.000.
Goldman, Robert I. Modular brickwork form. 4,858,410, Cl. 52-592.000.
Goldsmith, Steven E.; and Santi, Joseph M. Combined hat and earphones device. 4,858,248, Cl. 2-209.100.
Golick, Leonard R.: *See—*
Matusz, John M.; Golick, Leonard R.; and Matusz, Walter, 4,859,409, Cl. 376-463.000.
Gollan, Arye Z., to A/G Technology Corporation. Method for forming highly porous microporous structure and the resultant microporous structure. 4,859,334, Cl. 210-500.230.
Goller, Ernst; Wurst, Dieter; Kazmaier, Guenther; and Frei, Jochen, to H. Stoll GmbH & Co. Thread-guide arm. 4,858,446, Cl. 77-126.00R.
Goltz, Kurt, to Pennwalt Corporation. Etching of copper and copper bearing alloys. 4,859,281, Cl. 156-666.000.
Gontier, Bruno, to Societe Electronique de la Region Pays de Loire. Tin-soldering machine with automatic wave barrier for printed circuit boards. 4,858,816, Cl. 228-34.000.
Goodman, Joseph J.: *See—*
Carter, Guy T.; Borders, Donald B.; Goodman, Joseph J.; and Labeda, David P., 4,859,598, Cl. 435-252.100.
Goodman, Joseph T.: *See—*
Malka, Jacob H.; and Goodman, Joseph T., 4,859,923, Cl. 318-685.000.
Goodrich, Joel L.: *See—*
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Lovell, John A.; Medved, Gary E.; and White, John R., 4,859,272, Cl. 156-415.000.
Gormel, Thomas M., to Eastman Kodak Company. Process for stabilizing photographic elements using a solution comprising a water-soluble N-methylol compound and a buffering agent. 4,859,574, Cl. 430-372.000.
Gorney, Don: *See—*
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Gorney, Donald A., Jr.: *See—*
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Goro S.A.: *See—*
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Gorski, Edward J., to Chrysler Motors Corporation. Vehicle structure including a bracket structure assembly for mounting a loose upper deck panel onto a vehicle body. 4,858,987, Cl. 296-195.000.
Gorski, Stephen H.: *See—*
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Gorzinski, Manfred: *See—*
Fischer, Herbert; Wegemund, Bernd; Gress, Wolfgang; and Gorzinski, Manfred, 4,859,746, Cl. 525-293.000.
Gossard, Arthur C.; Miller, Robert C.; and Petroff, Pierre M., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Semiconductor devices and methods of making such devices. 4,860,068, Cl. 357-16.000.
Gotch, Kunihiko: *See—*
Kobayashi, Osamu; and Gotch, Kunihiko, 4,859,871, Cl. 307-264.000.
Gotfryd, Casimer; Kay, Stephen L.; Klotz, Hartland P.; and Wentzel, Robert M., to American Telephone and Telegraph Company, 02; and AT&T Information Systems Inc. Quiet key switch. 4,859,820, Cl. 200-408.000.
Goto, Hiroshige, to Kabushiki Kaisha Toshiba. Manufacturing method of semiconductor device having CCD and peripheral circuit. 4,859,624, Cl. 437-53.000.
Goto, Hiroyuki: *See—*
Obayashi, Hideki; Nishio, Yoshitaka; Kohama, Tokio; and Goto, Hiroyuki, 4,858,568, Cl. 123-52.00M.
Gotoh, Toshio, to Pioneer Electronic Corporation. Detector circuit for detecting drop-out in reproduced digital data. 4,860,121, Cl. 358-336.000.
Gould, Martin; and Vulimiri, Sudhakar, to Ampor, Inc. Composition for stabilization of diagnostic reagents. 4,859,604, Cl. 436-15.000.
Grabowski, Edward J. J.: *See—*
Reider, Paul J.; and Grabowski, Edward J. J., 4,859,771, Cl. 540-509.000.
Graeber, Edward L.; and Lindstrom, Michael J., to Pennwalt Corporation. Process for the preparation of 2,2'-dithiobis (benzothiazole). 4,859,778, Cl. 548-158.000.
Graf, Hans-Juergen: *See—*
Lipisko, Bruce A.; Schumacher, John C.; Howard, Richard E.; Randtke, Peter T.; Sandu, Adrian; Fletcher, Robert E.; and Graf, Hans-Juergen, 4,859,375, Cl. 261-20.000.
Graham, C. A. Sectional swimming pool construction. 4,858,411, Cl. 52-601.000.
Graham, Fred G.: *See—*
Martin, Edward L.; Graham, Fred G.; and Roman, Benjamin, 4,860,226, Cl. 364-552.000.
Graham, Harold A.: *See—*
Titus, Joseph S.; Wang, Dexter; and Graham, Harold A., 4,859,080, Cl. 374-134.000.

Graham, Randolph H.: *See—*
Harrison, Joel N.; Moon, William G., and Graham, Randolph H., 4,860,194, Cl. 364-200.000.

Granger, Stanley W.: *See—*
Beard, Joseph O.; Granger, Stanley W.; and Sveen, Frode, 4,858,882, Cl. 251-1.200.

Grant, Richard W., to Hughes Aircraft Company. Two motor redundant drive mechanism. 4,858,490, Cl. 74-661.000.

Grass Valley Group, Inc., The: *See—*
Murphy, Richard L., 4,860,098, Cl. 358-139.000.
Trethewey, Paul M., 4,859,955, Cl. 328-169.000.

Gray, Gregory L.; and Heyneker, Herbert L., to Genentech, Inc. Recombinant procaryotic cell containing correctly processed human growth hormone. 4,859,600, Cl. 435-252.330.

Gray, Kenneth P., to Carrier Corporation. Method for tension expanding tubes. 4,858,296, Cl. 29-157.30C.

Gray, Kenneth P.; McDonough, Michael L.; Poplawski, Bruce J.; Gaffaney, Daniel P.; and Moyer, Ross A., to Carrier Corporation. Single station tension hairpin tube expander. 4,858,305, Cl. 29-727.000.

Great Plains Industries, Inc.: *See—*
Laqua, Fred L., 4,859,155, Cl. 417-307 000.

Green, John W.: *See—*
Miller, Thomas R.; Green, John W.; and Motz, Mark, 4,858,665, Cl. 144-380.000.

Greenberg, Richard S.: *See—*
Batt, Douglas G.; Greenberg, Richard S.; and Harris, Richard R., 4,859,693, Cl. 514-397.000.

Greenfield, Mark S.; and Conley, Edward V., to Kennametal Inc. Earth working tool having a working element fabricated from cemented tungsten carbide compositions with enhanced properties. 4,859,543, Cl. 428-552.000.

Greenland GmbH & Co. KG: *See—*
von Allwoerden, Wilhelm, 4,858,418, Cl. 56-15.500.

Greer, Larry J., to Allied Gear and Machine Co., Inc. Rotary die lateral adjustment bearing block assembly. 4,859,087, Cl. 384-255.000.

Gregg, Robert D., III: *See—*
Henne, Preston A.; and Gregg, Robert D., III, 4,858,852, Cl. 244-35.00R.

Gregory, Peter; Bradbury, Roy; and Meyrick, Barry H., to Imperial Chemical Industries PLC. Thermal transfer printing. 4,859,651, Cl. 503-227.000.

Greiche, Joussef; Hartmann, Peter; and Kohler, Joachim, to Wella Aktiengesellschaft. Method of shaping human hair using dipropylene glycol monomethyl ether. 4,859,459, Cl. 424-71.000.

Gress, Wolfgang: *See—*
Fischer, Herbert; Wegemund, Bernd; Gress, Wolfgang; and Gorzinski, Manfred, 4,859,746, Cl. 525-293.000.

Greve, Wilfried; Elben, Ulrich; Rudolph, Karl; and Schindler, Ursula, to Hoechst Aktiengesellschaft. Multiply substituted pyridine 1-oxide compounds which are useful in treating brain disorders. 4,859,663, Cl. 514-212.000.

Grey, Suzanne N.: *See—*
D'Agosto, Nicholas A., III; Chamberlin, David B.; Su, Jy-Hong; Jachmann, Emil F.; and Grey, Suzanne N., 4,860,339, Cl. 379-67.000.

Griffin, John W.: *See—*
Shores, Paul W.; Griffin, John W.; and Kobayashi, Herbert S., 4,860,014, Cl. 342-105.000.

Griffin, Lamar H. Ladder brace. 4,858,725, Cl. 182-127.000.

Griffing, Bruce F.; and West, Paul R., to General Electric Company. Diarylnitrones. 4,859,789, Cl. 560-35.000.

Griffis, Steven C. Method and means for replacing a malfunctioning air filtration unit. 4,859,221, Cl. 55-419.000.

Griffith, David W., Jr.: *See—*
Norman, Alan B.; Griffith, David W., Jr.; Holt, Dewey L.; Reynolds, John H., IV; and Sears, Stephen B., 4,858,628, Cl. 131-329.000.

Grilk, Henry G., to Rule Industries, Inc. Carbon monoxide health hazard monitor. 4,860,223, Cl. 364-550.000.

Grimm, Peter: *See—*
Metzger, Andre; Grimm, Peter; Nohl, Andre J.; and Nau, Vance J., 4,859,605, Cl. 436-43.000.

Grinstead, Robert R., to Dow Chemical Company, The. Process for the removal of H2S from fluid streams using a water soluble polymeric chelate of an oxidizing polyvalent metal. 4,859,437, Cl. 423-226.000.

Grisse, Hans Jochen: *See—*
Kreuz, Hans-Otto; and Grisse, Hans Jochen, 4,858,892, Cl. 266-99.000.

Grizzly Engineering Pty. Ltd.: *See—*
Poltrock, Bruce A., 4,858,699, Cl. 172-558.000.

Grob & Co., Aktiengesellschaft: *See—*
Steiner, Ernst, 4,859,195, Cl. 439-55.000.

Grodberg, Marcus G.; and Baylink, David J., to Colgate-Palmotive Company. Sustained release fluoride composition. 4,859,467, Cl. 424-606.000.

Groeneveld, Dirk W. J.: *See—*
Schouwenaars, Hendrikus J.; Dijkmans, Eise C.; and Groeneveld, Dirk W. J., 4,859,930, Cl. 323-317.000.

Groezinger, John J.; and Moldenhauer, Philip E., to Caterpillar Inc. Twist on disposable filter. 4,859,328, Cl. 210-232.000.

Grohe, Klaus; and Schriewer, Michael, to Bayer Aktiengesellschaft. Preparation of 1,8-bridged 4-quinoline-3-carboxylic acids. 4,859,773, Cl. 544-101.000.

Groll, Werner; Hathaway, Doris; and Schock, Gernot. Method of producing alloyed powders for dental amalgams. 4,859,412, Cl. 419-23.000.

Groo, Dora: *See—*
Keve, Tibor; Megyeri, Gabor; Stefko , Bela; Kovacs, Lajos, Jr.; Kassai nee Zieger, Anna; Kiss, Bela; Laszlovszky, Istvan; Lapis, Erzsebet; Palosi, Eva; Groo, Dora; and Szporny, Laszlo , 4,859,682, Cl. 514-288.000.

Groopman, John D.; Wogan, Gerald N.; Bargoot, Frederick G.; and Ferrari, Christopher, to Massachusetts Institute of Technology; and Boston University. Affinity column and process for detection of low molecular weight toxic substances. 4,859,611, Cl. 436-518.000.

Grosbard, Gregory. Magnetically suspended acoustical speaker. 4,860,370, Cl. 381-197.000.

Gross, Joseph; Lowenstein, David; Tilman, Menachem; and Rosenberg, Etan, to General Ideas & Products Ltd. Massaging appliance. 4,858,600, Cl. 128-65.000.

Grossie, Bruce, Jr.: *See—*
Ajani, Jaffer; Grossie, Bruce, Jr.; Nishioka, Kenji; and Ota, David M., 4,859,452, Cl. 424-10.000.

Groves, Timothy R.; Pfeiffer, Hans C.; Stickel, Werner; and Sturans, Maris A., to International Business Machines Corporation. Telecentric sub-field deflection with vail. 4,859,856, Cl. 250-398.000.

Gruber, John M.: *See—*
Carney, Robert L.; Lui, Alfred S. T.; Kuhnen, Fred; and Gruber, John M., 4,859,699, Cl. 514-447.000.

Gruber, Robert J.; Bov, Raphael F.; Cometa, Thomas D.; Eakin, Paul W.; Berkes, John S.; and Grushkin, Bernard, to Xerox Corporation. Smear resistant magnetic image character recognition processes. 4,859,550, Cl. 430-39.000.

Grudkowski, Thomas W., to United States of America, Army. Saw circuit for generating continuous time-coherent RF carriers. 4,860,017, Cl. 342-201.000.

Grunder, Urs: *See—*
Gavin, Michel; Grunder, Urs; and Ulmer, Karl, 4,859,482, Cl. 426-518.000.

Grundmann, Gabriele: *See—*
Mauthe, Peter; Grundmann, Gabriele; and Moench, Monika, 4,858,759, Cl. 206-221.000.

Grundy, James, to Johnson Matthey Inc. Metal flake and use thereof. 4,859,241, Cl. 106-1.140.

Grushka, Dov. Profile for furniture. 4,858,413, Cl. 52-823.000.

Grushkin, Bernard: *See—*
Gruber, Robert J.; Bov, Raphael F.; Cometa, Thomas D.; Eakin, Paul W.; Berkes, John S.; and Grushkin, Bernard, 4,859,550, Cl. 430-39.000.

GTE Laboratories Incorporated: *See—*
Boggs, George J., 4,860,360, Cl. 381-48.000.
Cogan, Adrian I., 4,860,081, Cl. 357-49.000.
Cooperman, Michael; and Sieber, Richard W., 4,859,877, Cl. 307-443.000.

GTE Products Corporation: *See—*
Johnson, Walter A.; Kopatz, Nelson E.; and Ritsko, Joseph E., 4,859,237, Cl. 75-0.5AA.
Keeffe, William M.; Krasko, Zeya; Karlotski, Robert; and Morris, James C., 4,859,899, Cl. 313-25.000.
Opdahl, Barry J.; Hooren, Douglas H.; and Calaby, Lauren F., 4,859,022, Cl. 350-96.200.
Owen, Alex F., 4,859,198, Cl. 439-252.000.
Passmore, Edmund M., 4,859,239, Cl. 75-235.000.
Patrician, Thomas J.; Ritsko, Joseph E.; and Martin, Harry D., III, 4,859,236, Cl. 75-0.5AB.
Reilly, Kenneth T.; and Gingerich, Richard G. W., 4,859,361, Cl. 252-301.60S.
White, Philip J.; Scholz, John A.; and White, Robert S., 4,859,905, Cl. 313-558.000.
Wolfe, Robert W.; and Morse, James E., 4,859,497, Cl. 427-68.000.

GTE Valenite Corporation: *See—*
Patterson, John H.; Lowe, Tony M.; Bernadic, Thomas J.; Val, Yefim; Katbi, Karl A.; and Zimmerman, Charles E., 4,859,122, Cl. 407-114.000.

Gualandris, Rene; Ludwig, Paul; Rocco, Jean-Claude; and Zadworny, Francois, to Commissariat A L'Energie Atomique. Process and apparatus for igniting an ultra-high frequency ion source. 4,859,909, Cl. 315-111.810.

Guenette, Martin C.: *See—*
Krebs, Arthur D.; and Guenette, Martin C., 4,858,353, Cl. 40-308.000.

Guerra, Gianfranco, to iGuzzini Illuminazione, S.p.A. Light shield-reflector for a lighting implement. 4,860,181, Cl. 362-290.000.

Guest, John H.; and Crain, Lewis E., to Vermont Castings, Inc. Ash pan assembly for wood burning stove. 4,858,536, Cl. 110-166.000.

Guillet, Jean-Gerard: *See—*
Strosberg, Arthur D.; and Guillet, Jean-Gerard, 4,859,595, Cl. 435-172.200.

Guindon, Yvan: *See—*
Lau, Cheuk K.; Yoakim, Christiane; Rokach, Joshua; Fortin, Rejean; and Guindon, Yvan, 4,859,667, Cl. 514-224.500.

Guittard, George V.; Wong, Patrick S. L.; Theeuwes, Felix; and Cortese, Richard, to Alza Corporation. Dosage form for delivering diltiazem. 4,859,470, Cl. 424-473.000.

Gulett, Michael R.: *See—*
Maheras, George; Hayworth, Hubert O.; and Gulett, Michael R., 4,859,573, Cl. 430-326.000.

Gulick, Dale E.: *See—*
Miller, Merle L.; and Gulick, Dale E., 4,860,285, Cl. 370-100.000.

Gully, John H.: *See—*
Weldon, William F.; Gully, John H.; and Pichot, Mark A., 4,858,304, Cl. 29-598.000.

Gurd, John R.; and Kawakami, Katsura. Data packet shortening method and device. 4,860,250, Cl. 364-900.000.

Gyoni, Istyan: *See—*
Szabo nee Mogyorossi, Katalin; Kalocsai, Istvan; Gyoni, Istyan; Remenyi, Karoly; Plaveczky, Gyorgy; Kovacs, Laszlo ; Gal, Dezso ; Nemes, Istvan; Botar, Laszlo ; Bencsura, Akos; Moger nee Jeremejeva, Galina; Heberger, Karoly; and Nemeth, Andras, 4,859,209, Cl. 44-51.000.

H. Stoll GmbH & Co.: *See—*
Goller, Ernst; Wurst, Dieter; Kazmaier, Guenther; and Frei, Jochen, 4,858,446, Cl. 77-126.00R.

Haag, Ronald H.; Manuel, Mark; and Rogers, Lloyd W., to General Motors Corporation. Electronic vehicle door lock/unlatch control. 4,858,971, Cl. 292-201.000.

Haagh, Johannes P. N.: *See—*
Kamerman, Adriaan; and Haagh, Johannes P. N., 4,860,308, Cl. 375-8.000.

Haas, Max; and Schroder, Joris. Escalator steps having lateral safety devices. 4,858,745, Cl. 198-333.000.

Haas, Ronald T., to Oratech Pharmaceutical Development Corporation. Water soluble ibuprofen compositions and methods of making them. 4,859,704, Cl. 514-557.000.

Haber, Andrew J., to Harris Corporation. Method and apparatus for cellular division. 4,860,241, Cl. 364-761.000.

Haberle, Fritz: *See—*
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Hackman, Larry P.: *See—*
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Hada, Hiroshi: *See—*
Iwakawa, Tsunekiyo; Hada, Hiroshi; and Nakamura, Tadashi, 4,859,910, Cl. 315-169.100.

Haden, Grant Q.: *See—*
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Haga, Hidemi: *See—*
Kawashima, Norio; and Haga, Hidemi, 4,859,098, Cl. 400-616.000.

Hagedorn, Scott R.; East, Anthony J.; and Barer, Sol J. Production of picolinic acid and pyridine products via pseudomonas. 4,859,592, Cl. 435-122.000.

Hagiuda, Yasuhiro: *See—*
Hata, Ryosuke; Yamanouchi, Shosuke; Hirose, Masayuki; Kuwabara, Hidemitsu; Mizumoto, Yasuharu; and Hagiuda, Yasuhiro, 4,859,804, Cl. 174-25.00R.

Hagiwara, Katsunobu: *See—*
Asai, Toshihiro; and Hagiwara, Katsunobu, 4,859,074, Cl. 366-97.000.

Hagiwara, Katunobu: *See—*
Hamada, Yoshihiro; Nakagawa, Kazuhiko; Hagiwara, Katunobu; Noda, Takeoki; and Asada, Mitunori, 4,859,166, Cl. 425-204.000.

Haisman, William H., to Premier Pump & Pool Products, Inc. Hydrotherapy apparatus having preheated air agitation feature. 4,858,255, Cl. 4-544.000.

Hake, Leroy, to Lantech, Inc. Method and apparatus for unitizing tires. 4,858,415, Cl. 53-438.000.

Hale, John R., to Thomson Consumer Electronics, Inc. Universal lower stem mold for manufacturing a molded glass stem. 4,859,226, Cl. 65-139.000.

Hall, Kenneth B.; and Landis, Kenneth K., to United Technologies Corporation. Cooled gas turbine blade. 4,859,147, Cl. 416-97.00R.

Halliburton Company: *See—*
Watson, Brock W.; and Freeman, T. Austin, 4,858,687, Cl. 166-153.000.
Wienck, Dennis A., 4,858,477, Cl. 73-863.540.

Halm, Rudolf, to European Space Agency/Agence Spatiale Europeenne. Parabolic reflector antennas and method of making same. 4,860,023, Cl. 343-912.000.

Halpern, Alan A. Antiosteoporosis device having drop platform with powered drop. 4,858,598, Cl. 128-33.000.

Halpern, Alan A. Antiosteoporosis device and method. 4,858,599, Cl. 128-33.000.

Halpern, John W. Portable data carrier incorporating manually presettable processing modes. 4,859,837, Cl. 235-380.000.

Hamada, Masa: *See—*
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,859,593, Cl. 435-128.000.

Hamada, Masataka; and Ishida, Tokuji, to Minolta Camera Kabushiki Kaisha. Automatic focusing device. 4,860,045, Cl. 354-402.000.

Hamada, Yoshihiro; Nakagawa, Kazuhiko; Hagiwara, Katunobu; Noda, Takeoki; and Asada, Mitunori, to Kabushiki Kaisha Kobe Seiko Sho. Screw extruding machine. 4,859,166, Cl. 425-204.000.

Hamblin, John R.: *See—*
Hayek, George W.; Brown, Amos J.; Hamblin, John R.; and Robinson, Donald M., 4,858,592, Cl. 126-373.000.

Hamby, Rodney L.; Hamby, Ronald L.; and Haden, Grant Q. Water ski storage rack for boats. 4,858,802, Cl. 224-273.000.

Hamby, Ronald L.: *See—*
Hamby, Rodney L.; Hamby, Ronald L.; and Haden, Grant Q., 4,858,802, Cl. 224-273.000.

Hamilton, Harold J., to Censtor Corporation. Planarized read/write head and method. 4,860,139, Cl. 360-126.000.

Hamlin, Humphrey A. S., to Normalair-Garrett (Holding) Systems. Low pressure breathing regulators and breathing gas systems incorporating the same. 4,858,606, Cl. 128-204.290.

Hammond, Robert W., to John Fluke Mfg. Co., Inc. Apparatus and method for providing improved resistive ratio stability of a resistive divider network. 4,859,980, Cl. 338-308.000.

Hampshire Instruments, Inc.: *See—*
Frankel, Robert D.; and Drumheller, Jerry P., 4,860,328, Cl. 378-34.000.

Hancock, Mark W.; and May, Marvin M., to Aquatec. Gas-driven carbonator and method. 4,859,376, Cl. 261-35.000.

Handley, John M.; and Khalifa, Ramzi A., to Industral Acoustics Company, Inc. Ceiling panel assembly. 4,858,409, Cl. 52-489.000.

Hanel, Heinz: *See—*
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Hanft, Karl H.: *See—*
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Hannebaum, Manfred: *See—*
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Hannerz, Kåre, to AB Asea-Atom. Reactor. 4,859,406, Cl. 376-406.000.

Hansen, Quinten A. Overload release clutch. 4,858,740, Cl. 192-56.00R.

Hansen, Ronald D.; Mock, Clayton W.; and Kadifa, Abdo G., to Xerox Corporation. Mouse pointer with switchable emulation mode. 4,859,995, Cl. 340-710.000.

Hanson, R. A.; and Morton, Jerry, to R. A. Hanson Company, Inc. Continuous excavating apparatus and methods. 4,858,347, Cl. 37-190.000.

Hanssler, Gerd: *See—*
Fest, Christa; Hanssler, Gerd; and Brandes, Wilhelm, 4,859,235, Cl. 71-103.000.

Hanulik, Jozef, to Recytec S.A. Process for recycling fluorescent and television tubes. 4,858,833, Cl. 241-24.000.

Hara, Hiroshi: *See—*
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Hara, Kozo: *See—*
Kagami, Toshihiko; Kobayashi, Kazuyoshi; Asakawa, Eiji; Osada, Atushi; Hara, Kozo; and Abe, Yasuji, 4,859,993, Cl. 340-674.000.
Suzuki, Hitoshi; Hara, Kozo; Koga, Shiro; and Morita, Shigeru, 4,860,363, Cl. 381-89.000.

Hara, Masanori: *See—*
Matsuda, Kenji; Sugawara, Sakuo; Hara, Masanori; Umemura, Hiroyuki; Ishioka, Hidenori; and Aoki, Katsuyuki, 4,858,824, Cl. 236-94.000.

Harada Kogyo Kabushiki Kaisha: *See—*
Egashira, Yoshimi, 4,860,024, Cl. 343-702.000.

Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, to Toyota Jidosha Kabushiki Kaisha; and Aisin-Warner Kabushiki Kaisha. Apparatus for controlling lock-up clutch in automatic transmission system having main transmission and sub-transmission. 4,858,500, Cl. 74-866.000.

Haraguchi, Kazutoshi; Tanigawa, Eiji; Nukina, Kenji; Morita, Hiroaki; and Maeda, Toyohiro, to Osaka Gas Company Limited; and Dainippon Ink and Chemicals Inc. Process for preparing carbon fibers elliptical in section. 4,859,382, Cl. 264-29.200.

Haraguchi, Kazutoshi: *See—*
Morita, Hiroaki; Haraguchi, Kazutoshi; and Tanigawa, Eiji, 4,859,381, Cl. 264-29.200.

Harandi, Mohsen N.; and Owen, Hartley, to Mobil Oil Corporation. Two-stage process for conversion of alkanes to gasoline. 4,859,308, Cl. 208-49.000.

Harbeke, Gerold J. Slip-joint coupling. 4,858,958, Cl. 285-31.000.

Harbison, Kenneth G.: *See—*
Tomko, Donna L.; and Harbison, Kenneth G., 4,859,539, Cl. 428-512.000.

Harbor Branch Oceanographic Institution, Inc.: *See—*
Higa, Tatsuo; Sakai, Ryuichi; and Lui, May S., 4,859,782, Cl. 549-267.000.

Harder, Hans E.: *See—*
Seidel, Hartmut R. A.; Harder, Hans E.; and Behrens, Klaus F. A., 4,858,602, Cl. 128-92.0YY.

Hardin, Grant W. Ram-rod cleaning rod device for black powder firearms. 4,858,360, Cl. 42-95.000.

Hardinge Brothers, Inc.: *See—*
Terwilliger, Donald N.; and Knox, Richard C., 4,858,938, Cl. 279-57.000.

Hari, Laszlo: *See—*
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Harmath, Sandor: *See—*
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Harmatha, Andras: *See—*
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Harmon, Raymond E.: *See—*
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Harr, Dieter: *See—*
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Harris Corp.: *See—*
Deno, Milton C.; Smith, Eugene A., Jr.; and Delaruelle, Dale H., 4,859,000, Cl. 303-33.000.
Haber, Andrew J., 4,860,241, Cl. 364-761.000.

Lowry, Robert K.; and Adams, Edward U., 4,859,280, Cl. 156-662.000.
Swanson, Hilmer I., 4,859,967, Cl. 330-298.000.

Harris, John L.: *See—*
Yang, Huei-Hsiung; Hiu, Stephen F.; and Harris, John L., 4,859,597, Cl. 435-239.000.

Harris, Jonathan H.; Tenhover, Michael A.; and Henderson, Richard S., to Standard Oil Company, The. Compositionally graded amorphous metal alloys and process for the synthesis of same. 4,859,413, Cl. 419-32.000.

Harris, Paul S.; and Stevens, Larry E., to Allied-Signal Inc. Winder fly waste management system. 4,858,838, Cl. 242-43.00A.

Harris, Richard R.: *See—*
Batt, Douglas G.; Greenberg, Richard S.; and Harris, Richard R., 4,859,693, Cl. 514-397.000.

Harris, Rodney M.: *See—*
Shalati, Mohamad D.; Marquart, James A.; Babjak, John R.; and Harris, Rodney M., 4,859,758, Cl. 527-313.000.

Harris, William G., to Boeing Company, The. Leak containment storage facility. 4,859,116, Cl. 405-52.000.

Harrison, Joel N.; Moon, William G.; and Graham, Randolph H., to Plus Development Corporation. A method for using a modular unitary disk file subsystem. 4,860,194, Cl. 364-200.000.

Harrison, Neil; Aitken, Cliff R. R.; and Holloway, Ian, to I. H. W. Engineering Ltd. Lift-off hinge assembly. 4,858,274, Cl. 16-265.000.

Harrison, Thomas R., to United States of America, Energy. Proximity fuze. 4,859,054, Cl. 356-5.000.

Harth, Ralf: *See—*
Schonlau, Juergen; Volz, Peter; and Harth, Ralf, 4,858,999, Cl. 303-9.630.

Hartless, Mac L.; and Johnson, Alan L., to General Electric Company. Location dependent signal processor. 4,860,373, Cl. 382-41.000.

Hartley, Richard I.; and Corbett, Peter F., to General Electric Company. Low-latency two's complement bit-serial multiplier. 4,860,240, Cl. 364-757.000.

Hartmann, Peter: *See—*
Greiche, Joussef; Hartmann, Peter; and Kohler, Joachim, 4,859,459, Cl. 424-71.000.

Hartmann, Uwe: *See—*
Dieterle, Franz; Hartmann, Uwe; and Mai, Udo, 4,860,102, Cl. 358-158.000.

Hartnack, Wolfgang; Keesen, Werner; and Schutze, Herbert, to Deutsche Thomson-Brandt GmbH. Transformation circuit. 4,860,097, Cl. 358-133.000.

Hartnett, Michael J.; Lugosi, Robert; Rollins, James; Cook, John P.; and Clark, Jeffrey A., to Torrington Company, The. Method of making a camshaft for reciprocating piston engines. 4,858,295, Cl. 29-156.40R.

Hartwig, Donald R.: *See—*
Williamson, Gerald E.; and Hartwig, Donald R., 4,858,698, Cl. 172-448.000.

Haruyama, Satoshi: *See—*
Kawakami, Shin; Haruyama, Satoshi; Okonogi, Hirotaka; Nikaido, Katutomo; and Mukai, Norito, 4,859,805, Cl. 174-68.500.

Harvey, Donald M., to Eastman Kodak Company. Film cassette with magnetic film leader. 4,860,037, Cl. 354-21.000.

Harvey, Donald M., to Eastman Kodak Company. Camera apparatus for advancing a film leader from a film cassette. 4,860,041, Cl. 354-212.000.

Harvey, Thomas D.: *See—*
Winter, Russell K.; Harvey, Thomas D.; Kain, Richard S.; and Savas, Nedin, 4,858,774, Cl. 211-184.000.

Harwath, Frank L., to Suntex Industries Incorporated. Diaphragm-actuated valve for a gear pump. 4,858,884, Cl. 251-61.400.

Harwick, Warren J.: *See—*
Myers, Michael J.; and Harwick, Warren J., 4,858,767, Cl. 209-3.100.

Hasegawa, Kazuo; Ouchi, Junichi; Sasaki, Hiroaki; Nakase, Koji; and Sasaki, Makoto, to Alps Electric Co., Ltd. Code reading apparatus. 4,859,840, Cl. 235-463.000.

Hasenack, Hendrikus J. A.: *See—*
Kuypers, Willem F.; and Hasenack, Hendrikus J. A., 4,858,538, Cl. 110-264.000.

Hashimoto Corporation: *See—*
Hashimoto, Kazuo, 4,860,134, Cl. 360-92.000.

Hashimoto, Fumiharu: *See—*
Yamamoto, Yoshihiro; Kume, Tsutomu; Yamazaki, Nobuo; Hashimoto, Fumiharu; and Ohya, Koichi, 4,859,881, Cl. 307-520.000.

Hashimoto, Kazuo, to Hashimoto Corporation. Double video cassette tape recorder. 4,860,134, Cl. 360-92.000.

Hashimoto, Kunio: *See—*
Ohbayashi, Yoshiaki; Hashimoto, Kunio; Sakurai, Katsumi; and Noma, Hiroyuki, 4,859,888, Cl. 310-68.00R.

Hashimoto, Susumu: *See—*
Sawa, Takao; Hashimoto, Susumu; and Inomata, Koichiro, 4,859,256, Cl. 148-304.000.

Hashimoto, Tsuguo: *See—*
Arakawa, Tadao; Hashimoto, Tsuguo; and Kawauchi, Akihiro, 4,858,562, Cl. 122-7.00R.

Hashizume, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Ignition device for an internal combustion engine. 4,858,587, Cl. 123-631.000.

Hashizume, Kenji: *See—*
Okamura, Masatoshi; Shiba, Haruo; Hashizume, Kenji; and Sakata, Yoshiya, 4,858,849, Cl. 242-199.000.

Haste, Robert H.: *See—*
Sweatman, Gerald H.; Hodgson, Roy; and Haste, Robert H., 4,859,411, Cl. 419-23.000.

Hasuly, Michael J.; and Trzasko, Peter T., to National Starch and Chemical Corporation. Textile warp size. 4,859,509, Cl. 427-442.000.

Hata, Ryosuke; Yamanouchi, Shosuke; Hirose, Masayuki; Kuwabara, Hidemitsu; Mizumoto, Yasuharu; and Hagiuda, Yasuhiro, to Sumitomo Electric Industries. Electric power supply cable using insulating polyolefin laminate paper. 4,859,804, Cl. 174-25.00R.

Hata, Yoshiaki; Taniguchi, Nobuyuki; Hoda, Takeo; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Photographic camera system and using thereof. 4,860,039, Cl. 354-106.000.

Hatakeyama, Hiroki: *See—*
Sasaki, Isao; Yamamoto, Naoki; Yanagase, Akira; and Hatakeyama, Hiroki, 4,859,727, Cl. 524-147.000.

Hatanaka, Keiji; Sakuma, Kiyotoshi; Morita, Kiyomi; and Miyake, Junji, to Nissan Motor Co., Ltd.; and Hitachi, Ltd. Air fuel ratio control apparatus. 4,860,211, Cl. 364-431.050.

Hathaway, Doris: *See—*
Groll, Werner; Hathaway, Doris; and Schock, Gernot, 4,859,412, Cl. 419-23.000.

Hattori, Jun: *See—*
Kitagishi, Nozomu; and Hattori, Jun, 4,859,040, Cl. 350-413.000.

Hattori, Yoshiaki; and Ishihara, Makoto, to Noritake Co., Ltd. Carbon fiber-reinforcing gypsum models and forming molds, gypsum powder materials for making such models and molds, and a method for producing them. 4,859,243, Cl. 106-110.000.

Haugland, Tor A.; Kleiven, Atle; and Selvaer, Ole K., to Geophysical Company of Norway A/S. Arrangement for carrying out seismic prospection of the sea bed. 4,860,264, Cl. 367-17.000.

Hausler, Jeffery P.; Baria, Paul C.; Majek, Alfred; and Moore, Jeffrey B., to Letco Management Company, Inc. Power controller for heat tracing cable which responds to ambient temperature. 4,859,834, Cl. 219-497.000.

Hausted, Inc.: *See—*
Failor, Raymond A.; Hayton, Eugene; and Reuter, Mark, 4,858,260, Cl. 5-67.000.

Hawkins, Albert P.; Boyle, Alan; and Stone, Alan M., to Argyle Diamond Mines Pty. Limited. Particle distributing and sorting method and apparatus. 4,858,771, Cl. 209-552.000.

Hayafuchi, Hideki; Moronaga, Yoshiharu; and Nakano, Kiyotaka, to Nippon Rubber Co., Ltd. Composite rubber sheet material and sports shoe employing the same. 4,858,339, Cl. 36-45.000.

Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; Kondo, Masafumi; and Yamamoto, Saburo, to Sharp Kabushiki Kaisha. Quantum well semiconductor laser device. 4,860,297, Cl. 372-45.000.

Hayakawa, Yoichi: *See—*
Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,858,500, Cl. 74-866.000.

Hayakawa, Yoshihide: *See—*
Takeda, Keiji; and Hayakawa, Yoshihide, 4,859,568, Cl. 430-269.000.

Hayami, Toshitomo; Shibata, Humio; Iguchi, Katsumi; Inoue, Hisao; Ono, Takashi; and Ishimoto, Takashi, to Kabushiki Kaisha Toshiba. Furnace for formation of black oxide film on the surface of thin metal sheet and method for formation of black oxide film on the surface of shadow mask material by use of said furnace. 4,859,251, Cl. 148-286.000.

Hayashi, Hideki: *See—*
Shikata, Shinichi; and Hayashi, Hideki, 4,859,618, Cl. 437-41.000.

Hayashi, Hiroshi: *See—*
Miyauchi, Nobuyuki; Kawanishi, Hidenori; Maei, Shigeki; Yamamoto, Osamu; and Hayashi, Hiroshi, 4,860,305, Cl. 372-92.000.

Hayashi, Kunioki; Tanaka, Hironori; Sasagawa, Tsutomu; Uemura, Isao; and Aizawa, Akira, to Toyo Jozo Co., Ltd.; and Ise Chemical Industries Co., Ltd. Method of breeding poultry for food. 4,858,560, Cl. 119-1.000.

Hayashi Manufacturing Company, Ltd.: *See—*
Onodera, Mitsuo, 4,858,300, Cl. 29-463.000.

Hayashi, Masatake, to Sony Corporation. Method of forming a fluorescent screen for a color CRT. 4,859,549, Cl. 430-23.000.

Hayashi, Torahiko; and Tashiro, Yasunori, to Rheon Automatic Machinery Co., Ltd. Method for quantitatively extruding food material. 4,859,479, Cl. 426-281.000.

Hayashi, Yasuhiro: *See—*
Nishikawa, Meisei; Inagawa, Jun; Inagaki, Takeshi; Kaneshige, Toshihiko; Hayashi, Yasuhiro; and Kojima, Tadashi, 4,860,272, Cl. 369-48.000.

Haydu, Juan: *See—*
Sullivan, Thomas E.; and Haydu, Juan, 4,859,300, Cl. 204-164.000.

Hayek, George W.; Brown, Amos J.; Hamblin, John R.; and Robinson, Donald M., to Belshaw Bros., Inc. Burner system. 4,858,592, Cl. 126-373.000.

Hayton, Eugene: *See—*
Failor, Raymond A.; Hayton, Eugene; and Reuter, Mark, 4,858,260, Cl. 5-67.000.

Hayward, Pierre: *See—*
Woilles, Jacques; and Hayward, Pierre, 4,859,071, Cl. 366-136.000.

Hayworth, Hubert O.: *See—*
Maheras, George; Hayworth, Hubert O.; and Gulett, Michael R., 4,859,573, Cl. 430-326.000.

Hazard, James T. Face shield device. 4,859,184, Cl. 433-136.000.

Healy, Donald B. Torque responsive automatic shifting hub. 4,858,494, Cl. 74-781.00B.

Heart Technology, Inc.: *See—*
Intlekofer, Michael J.; and Slota, Michael W., 4,858,810, Cl. 226-127.000.

Heberger, Karoly: *See—*
Szabo nee Mogyorossi, Katalin; Kalocsai, Istvan; Gyoni, Istvan; Remenyi, Karoly; Plaveczky, Gyorgy; Kovacs, Laszlo ; Gal, Dezso ; Nemes, Istvan; Botar, Laszlo ; Bencsura, Akos; Moger nee Jeremejeva, Galina; Heberger, Karoly; and Nemeth, Andras, 4,859,209, Cl. 44-51.000.

Heddle, Richard W.; and Ruzicka, Herbert R. Stationary pivot mechanism for use with a damper. 4,858,735, Cl. 188-299.000.

Hedge, James N., Jr.: *See—*
Shaw, Rudy L.; Tsui, James B. Y.; and Hedge, James N., Jr., 4,860,318, Cl. 375-82.000.

Hefner, Werner: *See—*
Kaibel, Gerd; Hefner, Werner; Keller, Peter; and Drewitz, Werner, 4,859,286, Cl. 203-75.000.

Hefti, Fridolin: *See—*
Garthoff, Bernward; Gerold, Marcel; Hefti, Fridolin; Kazda, Stanislav; and Knorr, Andreas, 4,859,665, Cl. 514-221.000.

Hegedus, Louis: *See—*
Pereira, Carmo J.; Kubsh, Joseph E.; and Hegedus, Louis, 4,859,433, Cl. 423-212.000.

Heh, Robert W. Radon gas home/building mitigation apparatus and method. 4,858,521, Cl. 98-42.050.

Heiden, Christoph: *See—*
Anders, Michael; and Heiden, Christoph, 4,859,896, Cl. 310-328.000.

Heil-Quaker Corporation: *See—*
Beehler, Richard F., 4,858,683, Cl. 165-125.000.

Heinen, Dennis. Manually manipulated distance measuring tool. 4,858,328, Cl. 33-722.000.

Heise, Gerhard; Wolff, Ulrich; and Matz, Richard. Method for generating a lattice structure with a phase shift on the surface of a substrate. 4,859,548, Cl. 430-1.000.

Heitz, Thomas: *See—*
Eichenauer, Herbert; Hocker, Hartwig; and Heitz, Thomas, 4,859,731, Cl. 524-291.000.

Heitzman, George D. L., III, to Boeing Company, The. Method and apparatus for locating the web center of a beam. 4,858,334, Cl. 33-673.000.

Heki, Tatsuo: *See—*
Hirano, Shigeo; Kojima, Tetsuro; Yamamoto, Mitsuru; Inoue, Noriyuki; and Heki, Tatsuo, 4,859,579, Cl. 430-598.000.

Helbling, Edward. Automatic infusion-beverage apparatus. 4,858,523, Cl. 99-280.000.

Helgeson, Roger C.: *See—*
Cram, Donald J.; Chapoteau, Eddy; Czech, Bronislaw P.; Gebauer, Carl R.; Helgeson, Roger C.; Kumar, Anand; and Leong, Koon-Wah, 4,859,606, Cl. 436-79.000.

Helix Group PLC.: *See—*
Warwicker, Clive W., 4,858,326, Cl. 33-27.020.

Heller, Michael J.; and Morrison, Larry E., to Amoco Corporation. Chemiluminescent immunochemical technique for low molecular weight antigens. 4,859,583, Cl. 435-7.000.

Helmy, Ibrahim F. Landscaping system. 4,858,378, Cl. 47-33.000.

Hench, Larry L.; and Lee, Burtrand I., to University of Florida. Method for low temperature processing of lightweight SiC/SiO_2 composites and products. 4,859,525, Cl. 428-260.000.

Henderson, Richard S.: *See—*
Harris, Jonathan H.; Tenhover, Michael A.; and Henderson, Richard S., 4,859,413, Cl. 419-32.000.

Hendricks, Udo-Winfried; and Schmidt, Adolf, to Bayer Aktiengesellschaft. Sulfosuccinamido acids of polyoxypropylenediamines and their use as emulsifiers. 4,859,374, Cl. 562-102.000.

Henkel Corporation: *See—*
Awad, Sami B., 4,859,351, Cl. 252-32.500.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Oberkobusch, Doris; Morlock, Roland; Stritzke, Karl-Heinz; and Schieferstein, Ludwig, 4,859,721, Cl. 523-402.000.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Fischer, Herbert; Wegemund, Bernd; Gress, Wolfgang; and Gorzinski, Manfred, 4,859,746, Cl. 525-293.000.
Rose, David; Lieske, Edgar; Hoeffkes, Horst; and Maak, Norbert, 4,859,206, Cl. 8-429.000.

Henne, Preston A.; and Gregg, Robert D., III, to McDonnell Douglas Corporation. Divergent trailing-edge airfoil. 4,858,852, Cl. 244-35.00R.

Hennings, Detlev; Stormberg, Hans-Peter; and Peterek, Manfred, to U.S. Philips Corporation. Electrochemical time switching device. 4,860,269, Cl. 368-107.000.

Hensens, Otto D.: *See—*
Lam, Yiu-kuen T.; Chang, Raymond S.; Hensens, Otto D.; Schwartz, Cheryl D.; and Zink, Deborah L., 4,859,690, Cl. 514-375.000.

Herben, William C.: *See—*
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Wasson, Michael R.; and Herben, William C., 4,858,704, Cl. 175-61.000.

Herbertz, Hans-Adolf: *See—*
Rammler, Roland; Weiss, Hans-Jurgen; Herbertz, Hans-Adolf; Solari, Rodolfo B.; and Hidalgo, Rafael, 4,859,284, Cl. 201-12.000.

Herczfeld, Peter R.: *See—*
Paolella, Arthur; and Herczfeld, Peter R., 4,859,965, Cl. 330-285.000.

Herget, Gerhard H.; and Kapeller, Franz. Strain monitoring system. 4,858,472, Cl. 73-784.000.

Hergeth Hollingsworth GmbH: *See—*
Pinto, Akiva; Lucassen, Guenter; and Dirkes, Heinz, 4,858,277, Cl. 19-200.000.
Pinto, Akiva; Lucasse, Guenter; Jung, Rolf R.; and Bocht, Bernhard, 4,858,278, Cl. 19-200.000.

Herman, Elvin E.; and Likes, Bart E., to Hughes Aircraft Company. Comb filter pressure/temperature sensing system. 4,859,844, Cl. 250-231.00P.

Herman, Gerald J., to Williams International Corporation. Cable starter for air launch missile. 4,858,429, Cl. 60-39.141.

Hermanns, Heinz: *See—*
Gierse, Franz J.; Pabst, Manfred; Hermanns, Heinz; Ippers, Karl; Krenn, Stephan; Huppe, Friedrich; Opgenoorth, Carl H.; and Wolters, Conrad, 4,858,843, Cl. 242-65.000.

Hermant, Marc: *See—*
Germanaud, Laurent; and Hermant, Marc, 4,859,357, Cl. 252-51.000.

Herrin, Melvin B.; and Mazurek, Richard, to Klearfold, Inc. Container. 4,858,756, Cl. 206-45.340.

Herrington, Fox J.; and St. Phillips, Eric A., to Mobil Oil Corporation. Method for providing a signal to prepare waste materials for collection and waste containers incorporating an alarm device. 4,860,267, Cl. 368-10.000.

Herrmann, Karl: *See—*
Westphal, Robert; and Herrmann, Karl, 4,860,016, Cl. 342-169.000.

Hershberger, Marc, to Eastman Kodak Company. Digital data apparatus including an application insert sensor. 4,859,841, Cl. 235-485.000.

Herting, Heinrich, to Karl Oexmann, Inh. Wolfmann Oexmann, Firma. Baked wafer or cone with printed matter. 4,859,476, Cl. 426-87.000.

Hervouin, Lucien: *See—*
Bobichon, Jacques; Hervouin, Lucien; and Vigneron, Gilbert, 4,858,652, Cl. 138-92.000.

Hess, Albert J., III, to Laser Applications, Inc. Simultaneously cutting and welding sheet metal using laser energy. 4,859,826, Cl. 219-121.630.

Hess, Robert: *See—*
Altemark, Detlef; and Hess, Robert, 4,859,171, Cl. 431-12.000.

Hesterberg, William G.; and Cleary, Terrance M., to Brunswick Corporation. Method and apparatus for accelerating metal solidification. 4,858,671, Cl. 164-34.000.

Heuwinkel, Lothar; and Hofinger, Herbert, to Braun Aktiengesellschaft. Safety switching means for controlling a current consumer. 4,859,869, Cl. 307-117.000.

Hewlett-Packard Company: *See—*
Aoki, Toshihisa; and Watanabe, Sotoji, 4,860,378, Cl. 382-61.000.
Baney, Douglas M.; and Sorin, Wayne V., 4,859,843, Cl. 250-227.000.
Chism, Wayne R., 4,860,332, Cl. 379-1.000.
Tamamura, Toshio, 4,860,227, Cl. 364-553.000.
Taylor, John B.; and Ellis, Michael K., 4,859,933, Cl. 324-77.00B.
Thompson, Dennis C., 4,858,864, Cl. 248-178.000.

Hexcel Corporation: *See—*
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Lee, Frank W.; Neuner, Jon D.; and Baron, Kenneth, 4,859,528, Cl. 428-290.000.

Heyneker, Herbert L.: *See—*
Gray, Gregory L.; and Heyneker, Herbert L., 4,859,600, Cl. 435-252.330.

Hi-Ranger, Inc.: *See—*
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Hi-Tec-Gas International GmbH: *See—*
Sonntag, Bruno, 4,858,583, Cl. 123-527.000.

Hibino, Hiroki; Nishikori, Toshiaki; and Kumura, Kenji, to Olympus Optical Co., Ltd. Control apparatus for use with different types of endoscopes. 4,860,094, Cl. 358-98.000.

Hibyan, Edward S., to United Technologies Corporation. Preloaded tunable elastomeric flapping hinge bearing and method of preloading. 4,859,148, Cl. 416-134.00A.

Hickman, Ronald P., to Tekron Licensing BV. Workbench vises. 4,858,902, Cl. 269-88.000.

Hidalgo, Rafael: *See—*
Rammler, Roland; Weiss, Hans-Jurgen; Herbertz, Hans-Adolf; Solari, Rodolfo B.; and Hidalgo, Rafael, 4,859,284, Cl. 201-12.000.

Hieda, Teruo, to Canon Kabushiki Kaisha. Color image signal processing circuit with white balance control and gain control. 4,860,092, Cl. 358-29.000.

Higa, Tatsuo; Sakai, Ryuichi; and Lui, May S., to Harbor Branch Oceanographic Institution, Inc. Misakinolide compositions and their derivatives. 4,859,782, Cl. 549-267.000.

Higgs, Jacob K.; and Gibson, Barbara L., to Sprague Electric Company. Proximity selectro with integral magnet, pole-piece plate and pair of magnetic transducers. 4,859,941, Cl. 324-208.000.

Higton, Malcolm H.; and Vecht, Aron, to Phosphor Products Company Limited. High contrast electroluminescent displays. 4,859,904, Cl. 313-506.000.

Higuchi, Kazuo: *See—*
Sasaki, Kiichi; Honda, Tadanori; Saruwatari, Hidetoshi; and Higuchi, Kazuo, 4,858,952, Cl. 280-802.000.

Higuchi, Masami, to Ricoh Company, Ltd. Copier control system. 4,860,054, Cl. 355-300.000.

Hijikigawa, Masaya: *See*—
Katagiri, Masayuki; Watanabe, Masanori; Uda, Kazutaka; Hijikigawa, Masaya; Tsuchimoto, Shuhei; and Inami, Yasuhiko, 4,859,060, Cl. 356-352.000.

Hill, Charles: *See*—
Lunk, Hans E.; Reed, Donald A.; Deep, Marguerite E.; Hill, Charles; and Au, Andrew, 4,859,836, Cl. 219-548.000.

Hill, William H.; and Cawelti, Dale W., to Hughes Aircraft Company. Orthogonal bonding method and equipment. 4,858,819, Cl. 228-179.000.

Hiltebrandt, Siegfried: *See*—
Buess, Gerhard; Boebel, Manfred; and Hiltebrandt, Siegfried, 4,858,595, Cl. 128-6.000.

Hilterhaus, Bodo; and Hunger, Gunther, to Feldmuhle Aktiengesellschaft. Pressure-sensitive recording material. 4,859,650, Cl. 503-213.000.

Hilti Aktiengesellschaft: *See*—
Mauthe, Peter; Grundmann, Gabriele; and Moench, Monika, 4,858,759, Cl. 206-221.000.

Himmelreich, Rolf: *See*—
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Hinai, Masakatsu: *See*—
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Hine, Shiro: *See*—
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Hinton, Dennis L.: *See*—
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Hirai, Tadaaki: *See*—
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Hiraiwa, Atsushi: *See*—
Sunami, Hideo; Kure, Tokuo; Hiraiwa, Atsushi; and Wada, Yasuo, 4,860,071, Cl. 357-23.600.

Hirako, Mamoru; and Ezawa, Nobuyasu, to Tanaka Kikinzoku Kogyo K.K. Process for refining gold and apparatus employed therefor. 4,859,293, Cl. 204-94.000.

Hirano, Hiroyuki: *See*—
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Hirano, Mitsunori: *See*—
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Hirano, Shigeo; Kojima, Tetsuro; Yamamoto, Mitsuru; Inoue, Noriyuki; and Heki, Tatsuo, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 4,859,579, Cl. 430-598.000.

Hirao, Takashi: *See*—
Yoshida, Akihisa; Setsune, Kentaro; and Hirao, Takashi, 4,859,908, Cl. 315-111.810.

Hirata, Toichi: *See*—
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Hiro, Toshiaki: *See*—
Fukuo, Koichi; Shibata, Mitsuhiro; Hiro, Toshiaki; and Matsumoto, Masahiko, 4,858,574, Cl. 123-90.340.

Hirose, Akio, to Tanaka Kikinzoku Kogyo K.K. Process for preparing chlororhodiumic acid. 4,859,445, Cl. 423-462.000.

Hirose, Akira: *See*—
Hirose, Noboru; and Hirose, Akira, 4,858,290, Cl. 29-35.500.

Hirose, Masayuki: *See*—
Hata, Ryosuke; Yamanouchi, Shosuke; Hirose, Masayuki; Kuwabara, Hidemitsu; Mizumoto, Yasuharu; and Hagiuda, Yasuhiro, 4,859,804, Cl. 174-25.00R.

Hirose, Noboru; and Hirose, Akira, to Brother Kogyo Kabushiki Kaisha. Machine tool indexing apparatus. 4,858,290, Cl. 29-35.500.

Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; Hosono, Yoichi; Takahara, Shigeru; and Koike, Tadashi, to Mitsui Toatsu Chemicals, Incorporated; and Yamamoto Chemicals, Inc. Optical recording medium. 4,859,569, Cl. 430-270.000.

Hirose, Tetsuya: *See*—
Ezaki, Satoru; Tanaka, Kiyofumi; Kasahara, Tsukasa; Hirose, Tetsuya; and Nakagawa, Tetsuro, 4,858,659, Cl. 140-105.000.

Hirosumi, Jiro: *See*—
Yamaguchi, Isamu; and Hirosumi, Jiro, 4,859,688, Cl. 514-344.000.

Hiroyuki Hoshino: *See*—
Kanno, Seizo, 4,858,586, Cl. 123-620.000.

Hirshfeld, Tsvi: *See*—
Eisenberg, Eliahu; Padova, Reuven; Shenfeld, Avner; Hirshfeld, Tsvi; and Stein, Jacob, 4,859,586, Cl. 435-34.000.

Hisatake, Michio; and Ishikawa, Satoru, to Janome Sewing Machine Co. Ltd. Speed control device for an electric sewing machine. 4,859,917, Cl. 388-815.000.

Hitachi Cable, Ltd.: *See*—
Ezaki, Satoru; Tanaka, Kiyofumi; Kasahara, Tsukasa; Hirose, Tetsuya; and Nakagawa, Tetsuro, 4,858,659, Cl. 140-105.000.
Kajioka, Hiroshi; Yamada, Koudo; Takuma, Yuuetsu; and Teraoka, Tatsuo, 4,859,223, Cl. 65-3.120.

Hitachi Chemical Co., Ltd.: *See*—
Nakayama, Hajime; Tsuyama, Kouichi; and Okamura, Toshiro, 4,859,505, Cl. 427-305.000.

Hitachi Construction Machinery Co., Ltd.: *See*—
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Hitachi, Ltd.: *See*—
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Ezaki, Satoru; Tanaka, Kiyofumi; Kasahara, Tsukasa; Hirose, Tetsuya; and Nakagawa, Tetsuro, 4,858,659, Cl. 140-105.000.
Hatanaka, Keiji; Sakuma, Kiyotoshi; Morita, Kiyomi; and Miyake, Junji, 4,860,211, Cl. 364-431.050.
Horikawa, Ethuo; and Masuzaki, Hidefumi, 4,860,114, Cl. 358-426.000.
Iwamura, Masahiro; Masuda, Ikuro; and Uchida, Hideaki, 4,860,148, Cl. 361-58.000.
Kurosawa, Hiroshi; and Ochiai, Izumi, 4,860,021, Cl. 343-840.000.
Kuzunuki, Soshiro; Shojima, Hiroshi; Miura, Masaki; Mori, Junko; and Mifune, Toshimi, 4,860,372, Cl. 382-13.000.
Matsubara, Kiyoshi; Yamaura, Tadashi; Kihara, Toshimasa; and Kawashimo, Norishige, 4,860,087, Cl. 357-68.000.
Matsuyama, Yukio; and Ichinose, Toshiaki, 4,860,371, Cl. 382-8.000.
Momata, Kazuhiro; Chida, Kousaku; Takeura, Tooru; and Tsukada, Yukihisa, 4,860,140, Cl. 360-127.000.
Murase, Michio; Kataoka, Yoshiyuki; Inoue, Hisamichi; Naioh, Masanori; and Sugisaki, Toshihiko, 4,859,401, Cl. 376-282.000.
Murata, Toshinori; Arai, Ikuya; Kurita, Toshiyuki; and Nakagawa, Isao, 4,860,090, Cl. 358-21.00R.
Nakamura, Tohru; Ogirima, Masahiko; Nakazato, Kazuo; Miyazaki, Takao; Yamamoto, Naoki; Nagata, Minoru; and Sugaki, Shojiro, deceased, 4,860,086, Cl. 357-67.000.
Shimohigashi, Katsuhiro; Masuda, Hiroo; Ikuzaki, Kunihiko; and Kawamoto, Hiroshi, 4,860,255, Cl. 365-189.000.
Sunami, Hideo; Kure, Tokuo; Hiraiwa, Atsushi; and Wada, Yasuo, 4,860,071, Cl. 357-23.600.
Uchida, Noriaki; and Gemma, Hideaki, 4,860,247, Cl. 364-900.000.
Yamashita, Takashi; Shidara, Keiichi; Aiba, Masaaki; Takasaki, Yukio; and Hirai, Tadaaki, 4,860,093, Cl. 358-50.000.

Hitchcock, Leonard J., to International Business Machines Corp. Full bridge power converter circuit. 4,860,189, Cl. 363-132.000.

Hiu, Stephen F.: *See*—
Yang, Huei-Hsiung; Hiu, Stephen F.; and Harris, John L., 4,859,597, Cl. 435-239.000.

Hiwatashi, Osamu: *See*—
Yasunami, Masabumi; Takase, Kahei; Meguro, Takashi; Suzuki, Katsumi; Hiwatashi, Osamu; Okutsu, Masaru; Kato, Nobuo; and Nakamura, Toru, 4,859,701, Cl. 514-510.000.

Hix, Jimmy D. Balance enhancing exercise and amusement apparatus. 4,858,914, Cl. 272-114.000

Hoashi, Chikako, to Yugenkaisha Matsubei. Extruder for food. 4,859,165, Cl. 425-133.100.

Hob, Peter D.: *See*—
Buchanan, Douglas A.; Callegari, Alessandro C.; Hob, Peter D.; and Lacey, Dianne L., 4,859,253, Cl. 148-33.300.

Hochfeld, Stanley, to Holtz, Leonard. Method for opening a wrapped roll of coins. 4,858,805, Cl. 225-2.000.

Hocker, Hartwig: *See*—
Eichenauer, Herbert; Hocker, Hartwig; and Heitz, Thomas, 4,859,731, Cl. 524-291.000.

Hoda, Takeo: *See*—
Hata, Yoshiaki; Taniguchi, Nobuyuki; Hoda, Takeo; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,860,039, Cl. 354-106.000.
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,860,046, Cl. 354-475.000.

Hodapp, Wolfram: *See*—
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Hodgin, John B.; Sumner, John H.; and Wang, Kenneth Y., to Burlington Industries, Inc. Method vortex action yarn hairiness reduction. 4,858,288, Cl. 28-178.000.

Hodgson, Roy: *See*—
Sweatman, Gerald H.; Hodgson, Roy; and Haste, Robert H., 4,859,411, Cl. 419-23.000.

Hodlewsky, Wasyly G., to Rexnord Corporation. Wide chain conveyor assembly. 4,858,751, Cl. 198-834.000.

Hodlewsky, William G., to Rexnord Corporation. Conveyor chain assembly. 4,858,753, Cl. 198-853.000.

Hoechst AG: *See*—
Brindopke, Gerhard; Godau, Claus; and Weber, Walter, 4,859,788, Cl. 558-398.000

Hoechst Aktiengesellschaft: *See*—
Franke, Rainer, 4,859,749, Cl. 526-124.000.
Gerdau, Thomas; Kleiner, Hans-Jerg; and Pawlowski, Georg, 4,859,795, Cl. 564-12.000.
Greve, Wilfried; Elben, Ulrich; Rudolph, Karl; and Schindler, Ursula, 4,859,663, Cl. 514-212.000.
Kampe, Klaus-Dieter; Raether, Wolfgang; Dittmar, Walter; and Hanel, Heinz, 4,859,670, Cl. 514-252.000.
Ohlendorf, Dieter; Interthal, Werner; and Stoll, Friedrich, 4,859,418, Cl. 422-16.000.
Pawlowski, Georg; Kleiner, Hans-Jerg; and Gerdau, Thomas, 4,859,562, Cl. 430-175.000.
Schlipf, Michael; Manz, Albrecht; and Lohr, Gernot, 4,859,755, Cl. 526-255.000.
Schneider, Manfred; Ott, Ulrich; Sieber, Alexander; and Zimmermann, Manfred, 4,859,728, Cl. 524-159.000.
Thiem, Joachim; Treder, Wolfgang; Keller, Reinhold; and Schlingmann, Merten, 4,859,590, Cl. 435-97.000.

Zeeck, Axel; Ciesiolka, Thomas; Rohr, Jurgen; Zahner, Hans; and Drautz, Hannelore, 4,859,655, Cl. 514-34.000.

Hoechst Celanese Corp.: *See*—
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Powanda, Thomas M.; Imes, Robert H.; and Collins, George L., 4,859,792, Cl. 560-204.000.

Hoefflkes, Horst: *See*—
Rose, David; Lieske, Edgar; Hoefflkes, Horst; and Maak, Norbert, 4,859,206, Cl. 8-429.000.

Hoekstra, George: *See*—
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Hoelderich, Wolfgang; Kroener, Michael; Kroetzsch, Peter; and Biffar, Werner, to BASF Aktiengesellschaft. Fixed-bed catalyst structure obtained using honeycomb elements. 4,859,642, Cl. 502-2.000.

Hoffelner, Volkwin. Mounting unit with adjustable lockable pivot arm. 4,858,868, Cl. 248-291.000.

Hoffman-La Roche Inc.: *See*—
Siddiqi, Iqbal; and Wuhrmann, Hans-Rudolf, 4,859,306, Cl. 204-410.000.

Hoffmann-La Roche Inc.: *See*—
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Hoffmann-LaRoche Inc.: *See*—
Garthoff, Bernward; Gerold, Marcel; Hefti, Fridolin; Kazda, Stanislav; and Knorr, Andreas, 4,859,665, Cl. 514-221.000.

Hoffmann, Michael, to ANT Nachrichtentechnik GmbH. Method for recovering a control signal for controlling the phase of a local carrier signal. 4,860,320, Cl. 375-83.000.

Hofinger, Herbert: *See*—
Heuwinkel, Lothar; and Hofinger, Herbert, 4,859,869, Cl. 307-117.000.

Hofler, Thomas J.: *See*—
Wheatley, John C.; Swift, Gregory W.; Migliori, Albert; and Hofler, Thomas J., 4,858,441, Cl. 62-6.000.

Hofmeister, Peter: *See*—
Buerstinghaus, Rainer; Hofmeister, Peter; and Kuenast, Christoph, 4,859,706, Cl. 514-624.000.

Hoigaard, Jan C. Electrostatic system monitor and method therefor. 4,859,992, Cl. 340-649.000.

Holcomb, Warren N., to General Motors Corporation. Secondary oil system for gas turbine engine. 4,858,426, Cl. 60-39.080.

Hollenberg, Cornelis P.; Das, Sunil; De Leeuw, Albert; and van den Berg, Johannes A., to Gist-Brocades N.V. Cloning system for Kluyveromyces species. 4,859,596, Cl. 435-172.300.

Hollingsworth GmbH: *See*—
Frosch, Werner; and Dudek, Wolfram, 4,858,276, Cl. 19-98.000.

Hollingsworth, Walter H.: *See*—
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Holloway, Ian: *See*—
Harrison, Neil; Aitken, Cliff R. R.; and Holloway, Ian, 4,858,274, Cl. 16-265.000.

Hollox, Graham E., to SKF Industrial Trading and Development Co. B.V. Method of producing an object, in particular a rolling bearing, consisting of at least two moving parts locked into each other. 4,858,294, Cl. 29-149.50R.

Holmbo, Dennis L., to Tektronix, Inc. Microprocessor interface device for coupling non-compatible protocol peripheral with processor. 4,860,200, Cl. 364-200.000.

Holmes International Inc.: *See*—
Lock, Walter G., 4,859,134, Cl. 414-563.000.

Holmes, William K.; and Mlaker, John J., to Hi-Ranger, Inc. Bucket leveling system. 4,858,723, Cl. 182-2.000.

Holt, Dewey L.: *See*—
Norman, Alan B.; Griffith, David W., Jr.; Holt, Dewey L.; Reynolds, John H., IV; and Sears, Stephen B., 4,858,628, Cl. 131-329.000.

Holt, George G. Palette with disposable mixing surface for mixing blendable materials. 4,858,955, Cl. 281-44.000.

Holtvluwer, Douglas C., to Emergency Technology, Inc. Automotive vehicle exterior light flashing circuit. 4,859,988, Cl. 340-471.000.

Holtz, Leonard: *See*—
Hochfeld, Stanley, 4,858,805, Cl. 225-2.000.

Holtzclaw, James O., Jr.; and Novotny, Marvin A., to Hunter Company Inc., The. Holster with adjustable retaining strap. 4,858,800, Cl. 224-243.000.

Homac Mfg. Company: *See*—
Klosin, John J.; and Venezia, J. William, 4,859,812, Cl. 174-135.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Fukuo, Koichi; Shibata, Mitsuhiro; Hiro, Toshiaki; and Matsumoto, Masahiko, 4,858,574, Cl. 123-90.340.
Hosoi, Shuichi; and Fujimoto, Sachito, 4,858,581, Cl. 123-489.000.
Kajiwara, Hajime; Ogura, Masami; and Sano, Shoichi, 4,858,950, Cl. 280-719.000.
Matsuura, Masaaki; Ishikawa, Mitsuru; Nakamori, Masaharu; and Kuroki, Masahiro, 4,858,577, Cl. 123-190.00A.
Miyamoto, Yasuo; Arai, Katsuyoshi; and Uchiyama, Keiichi, 4,858,879, Cl. 248-562.000.
Sasaki, Kiichi; Honda, Tadanori; Saruwatari, Hidetoshi; and Higuchi, Kazuo, 4,858,952, Cl. 280-802.000.
Tanaka, Yoshio; Fujii, Shigeru; Nishida, Takao; and Fujita, Yasushi, 4,859,886, Cl. 310-51.000.

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Honda, Tadanori: *See*—
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Honeywell Inc.: *See*—
Gerhart, Paul B., 4,860,280, Cl. 370-13.000.
Kidder, Kenneth B.; Landis, William R.; and Patton, Paul B., 4,858,885, Cl. 251-129.010.
Rotier, Donald J., 4,859,030, Cl. 350-174.000.
Smith, Dennis W., 4,859,090, Cl. 384-463.000.
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Honeywell Regelsysteme GmbH: *See*—
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Hongo, Takero: *See*—
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Hood, James D.: *See*—
Light, Fred W., Jr.; Hood, James D.; and Chang, Yeong-Ho, 4,859,760, Cl. 528-45.000.

Hook, Carl R. Low frequency load speaker. 4,860,367, Cl. 381-156.000.

Hooren, Douglas H.: *See*—
Opdahl, Barry J.; Hooren, Douglas H.; and Calaby, Lauren F., 4,859,022, Cl. 350-96.200.

Hooser, Donald L. Cap shape supports. 4,858,247, Cl. 2-185.00B.

Hoover Company, The: *See*—
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Hoover, Dennis J.; and Rosati, Robert L., to Pfizer Inc. Homocyclostatine and cyclostatine containing polypeptides as antihypertensive agents. 4,859,654, Cl. 514-19.000.

Hoppe, Hans; Breucker, Theodor; Ernst, Reinhard; and Storf, Robert, to Waeschle Maschinenfabrik GmbH. Bulk material mixer. 4,859,067, Cl. 366-341.000.

Horacek, Stephen M.: *See*—
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Horan, Paul K.; Jensen, Bruce D.; and Slezak, Sue E., to SmithKline Beckman Corporation. Cell growth rate determination by measurement of changes in cyanine dye levels in plasma membranes. 4,859,584, Cl. 435-29.000.

Horikawa, Ethuo; and Masuzaki, Hidefumi, to Hitachi, Ltd. Method and apparatus for expanding two-dimensional compressional code. 4,860,114, Cl. 358-426.000.

Horne, Colin; and Morgan, Edward B. Water turbine arrangement for power generation using tidal energy. 4,859,866, Cl. 290-54.000.

Horsch, Joachim, to J. I. Case Company. Multi-speed powershift transmission. 4,858,495, Cl. 74-745.000.

Hortensius, Peter: *See*—
McLeod, Robert; Card, Howard; Hortensius, Peter; and Pries, Werner, 4,860,236, Cl. 364-717.000.

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Hose, Eddy, to United States of America, Air Force. Delay line null command generator test set for sarcalm. 4,860,015, Cl. 342-168.000.

Hosea, Joel C.: *See*—
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Hosgood, Henry; Banks, Leslie; and Beauford, William, to Bio-Kil Chemicals Limited. Method and apparatus for testing timbers for disconformity or decay. 4,858,469, Cl. 73-579.000.

Hoshino, Hiroyasu: *See*—
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Hosiden Electronics Co., Ltd.: *See*—
Komatsu, Yasuhiro, 4,859,199, Cl. 439-267.000.
Ohbayashi, Yoshiaki; Hashimoto, Kunio; Sakurai, Katsumi; and Noma, Hiroyuki, 4,859,888, Cl. 310-68.00R.
Toramoto, Hisao; and Yagi, Tadashi, 4,859,197, Cl. 439-675.000.

Hoskin, Dennis H.; and Shu, Paul, to Mobil Oil Corporation. Crosslinked polyvinyl alcohols and oil reservoir permeability control therewith. 4,859,717, Cl. 523-130.000.

Hosoda, Kenichiro; Kawaguchi, Shinji; Shinbo, Atsushi; and Yokota, Kiyoshi, to Oki Electric Industry Co., Ltd. ADPCM encoding and decoding circuits. 4,860,315, Cl. 375-30.000.

Hosoda, Masahiro; Sasaki, Kazuaki; Kondo, Masaki; and Yamamoto, Saburo, to Sharp Kabushiki Kaisha. Semiconductor laser device. 4,860,299, Cl. 372-46.000.

Hosoe, Kazunori: *See*—
Kano, Fumihiko; Yamane, Takehiko; Yamashita, Katsuji; Hosoe, Kazunori; and Watanabe, Kiyoshi, 4,859,661, Cl. 514-183.000.

Hosoi, Shuichi; and Fujimoto, Sachito, to Honda Giken Kogyo Kabushiki Kaisha. Air-fuel ratio feedback control method for internal combustion engines. 4,858,581, Cl. 123-489.000.

Hosono, Yoichi: *See*—
Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; Hosono, Yoichi; Takahara, Shigeru; and Koike, Tadashi, 4,859,569, Cl. 430-270.000.

Hospal AG: *See*—
Borsari, Gianni, 4,859,319, Cl. 210-86.000.

Hou, Kenneth C.; and Ostreicher, Eugene A., to Cuno, Incorporated. Filter sheet. 4,859,340, Cl. 210-502.100.

Houghton, Ian, to STC PLC. Optical fibre cable. 4,859,025, Cl. 350-96.230.

Houjo, Yasuo: *See—*
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Matsumura, Yasushi; Mizuguchi, Takeshi; and Matsui, Fumio, 4,859,487, Cl. 426-639.000.
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Houston, William S., to Hoover Company, The. Fan stage configuration. 4,859,144, Cl. 415-210.000.
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Howa Machinery, Ltd.: *See—*
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Seidel, Hartmut R. A.; Harder, Hans E.; and Behrens, Klaus F. A., 4,858,602, Cl. 128-92.0YY
Howseman, William E., Jr.; and Engel, Harold J. Fluid agitator and pump assembly. 4,859,073, Cl. 366-195.000.
Hoxan Corporation: *See—*
Iura, Tadashi, 4,858,261, Cl. 5-81.00B.
Hsu, David. Soldering tool. 4,858,593, Cl. 126-414.000.
Hu, James C.: *See—*
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Hua, Van T.: *See—*
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Huang, Chien-Feng. Apparatus for precipitating exhausted smoke from a chimney. 4,859,219, Cl. 55-223.000.
Hubbard, David W.; and Randmer, Glen J., to Pitney Bowes Inc. Postage meter having a worm gear drive and guiding sleeve. 4,858,525, Cl. 101-91.000.
Huber, Hans G. Device for removing material screened or filtered out of a liquid flowing in a channel. 4,859,322, Cl. 210-162.000.
Huber, Werner: *See—*
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Hughes Aircraft Company: *See—*
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Hill, William H.; and Cawelti, Dale W., 4,858,819, Cl. 228-179.000.
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Hughes, Cleveland L.; Williams, Timothy N.; and Mandel, Paul M., Jr., to Color Quest Inc. Water soluble coloring compositions containing sparkle components. 4,859,242, Cl. 106-19.000.
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Hunter, Lawrence W.: *See—*
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Hurtel, Patrice, to Societe Chimique des Charbonnages S.A. Process for the production of fluoroalkyl acrylates. 4,859,793, Cl. 560-223.000.
Hurtel, Patrice; and Laurent, Denis, to Norsolor. Reacting a (meth)acrylic anhydride with a diamine to form a n-dialkylaminoalkyl(meth)acrylamide. 4,859,796, Cl. 564-204.000.
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Hutcheon, Ian C.; and Epton, David J., to Measurement Technology Limited. Electrical safety barriers. 4,860,151, Cl. 361-91.000.
Huvey, Michel; Do, Anh T.; Gerez, Jean-Michel; and Le Gallais, Lucien, to Institut Francais du Petrole et Coflexip. Structure formed from a straight strip bent or corrugated and the method of manufacturing same. 4,858,653, Cl. 138-144.000.
Hwang, David L.; and Hosea, Joel C., to United States of America, Energy. Graphit-ceramic RF Faraday-thermal shield and plasma limiter. 4,858,817, Cl. 228-122.000.
Hyakutake, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Synchronizing signal processing circuit. 4,859,872, Cl. 307-269.000.
Hydromatic GmbH: *See—*
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Hygeia Sciences, Inc.: *See—*
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I. H. W. Engineering Ltd.: *See—*
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I, Kanji; Kawasaki, Tatsuo; and Yasuhara, Eiko, to Kawasaki Steel Corp. Process for descaling cold-rolled and annealed stainless steel strip. 4,859,297, Cl. 204-145.00R.
I.S.C. Chemicals Limited: *See—*
Davis, Stanley S.; and Wotton, David E. M., 4,859,363, Cl. 252-312.000.
Iams, John F.; Splane, Robson L., Jr.; and Drusch, John A., III, to Superspine, Inc. Device for providing enhanced movement of a person's truncal muscles and spine. 4,858,918, Cl. 272-127.000.
Ibolyka, Edit Tavasz Fodor nee, heir: *See—*
Pelyva, Jeno ; Vecsey, K. Istvan; Kolonics, Zoltan; Legradi, Laszlo; Nagy, Lajos; Horvath, Andras; Fodor, Ferenc, deceased; Soptei, Csaba; Sebok, Dezso; Tomordi, Elemer; Lendvai, Laszlo ; Karacsonyi, Bela; and Dioszegi, Erzsebet, 4,859,772, Cl. 544-11.000.
Ibrahim, Faik K., to United Technologies Electro Systems, Inc. Noncommutated linear motor. 4,858,452, Cl. 70-275.000.
Ibsen, Robert L.; and Glace, William R., to Den-Mat Corporation. Microfilled dental composite and method for making it. 4,859,716, Cl. 522-14.000.
Icenogle, Ronald D.: *See—*
Djiauw, Lie K.; and Icenogle, Ronald D., 4,859,366, Cl. 252-602.000.
Ichihashi, Takao: *See—*
Yamamoto, Haruo; Ichihashi, Takao; Fujisawa, Shuji; Tone, Eiichi; and Tsuda, Takeshi, 4,860,053, Cl. 355-245.000.
Ichikawa, Hajime: *See—*
Uehara, Makoto; Ichikawa, Hajime; Yomoto, Masahiko; and Kato, Shigeru, 4,859,832, Cl. 219-411.000.
Ichikawa, Yukio; and Katto, Takayuki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Composition of polyarylene thioether. 4,859,734, Cl. 524-447.000.
Ichikoh Industries, Ltd.: *See—*
Kato, Akio; and Naito, Hideo, 4,860,174, Cl. 362-61.000.
Ichinose, Hideo; and Naemura, Shohei, to NEC Corporation. Ferroelectric liquid crystal light shutter device and method of controlling the driving of the same. 4,859,035, Cl. 350-332.000.
Ichinose, Toshiaki: *See—*
Matsuyama, Yukio; and Ichinose, Toshiaki, 4,860,371, Cl. 382-8.000.

ICI Americas Inc: *See—*
Prisbylla, Michael P., 4,859,228, Cl. 71-92.000.
ICI Americas Inc.: *See—*
Alterman, Marcelo K.; and do Amaral, Luis F., 4,859,234, Cl. 71-103.000.
Bernstein, Peter R.; Brown, Frederick J.; Matassa, Victor G.; and Yee, Ying Kwong, 4,859,692, Cl. 514-381.000.
Ide, Jun: *See—*
Kowaguchi, Toru; Kaneko, Tooru; Ide, Jun; and Iizumi, Tomoo, 4,860,131, Cl. 360-78.140.
Ideal Industries, Inc.: *See—*
Van Naarden, Robert, 4,858,312, Cl. 29-861.000.
Idemitsu Petrochemical Co., Ltd.: *See—*
Odaka, Hiroshi; and Kishida, Tsuyoshi, 4,858,780, Cl. 220-359.000.
Iezzi, Peter D.: *See—*
Siddoway, Craig F.; Castaneda, Julio C.; and Iezzi, Peter D., 4,858,798, Cl. 224-242.000.
Igari, Naoto; Yamamoto, Noriyuki; and Sakata, Tetshin, to Nissan Motor co., Ltd. Method for coupling tubed tire with wheel. 4,858,667, Cl. 157-1.100.
Igene Biotechnology, Inc.: *See—*
Yang, Huei-Hsiung; Hiu, Stephen F.; and Harris, John L., 4,859,597, Cl. 435-239.000.
Iguchi, Katsumi: *See—*
Hayami, Toshitomo; Shibata, Humio; Iguchi, Katsumi; Inoue, Hisao; Ono, Takashi; and Ishimoto, Takashi, 4,859,251, Cl. 148-286.000.
iGuzzini Illuminazione, S.p.A.: *See—*
Guerra, Gianfranco, 4,860,181, Cl. 362-290.000.
Iida, Katsumi: *See—*
Doi, Shigetoshi; Nagayama, Yoshiaki; Iida, Katsumi; and Sakurai, Yoshihiko, 4,858,677, Cl. 165-12.000.
Iida, Katumi. Aeration type water treating device. 4,859,321, Cl. 210-150.000.
Iida, Kazuyoshi: *See—*
Murase, Masanori; Tomita, Naotaka; Mizuno, Keiichiro; and Iida, Kazuyoshi, 4,858,720, Cl. 181-176.000.
Iizumi, Tomoo: *See—*
Kowaguchi, Toru; Kaneko, Tooru; Ide, Jun; and Iizumi, Tomoo, 4,860,131, Cl. 360-78.140.
Ikeda Bussan Co., Ltd.: *See—*
Yamashita, Takashi, 4,858,994, Cl. 297-391.000.
Ikeda, Kenji, to Kubota Ltd. Fluid pressure control circuit for working vehicle having transmission operable by fluid pressure. 4,858,435, Cl. 60-441.000.
Ikeda, Mitsuru: *See—*
Tabei, Masatoshi; Ikeda, Mitsuru; and Nakajima, Yosuke, 4,860,076, Cl. 357-30.000.
Ikeda, Shigeru. Multiface image composer. 4,860,061, Cl. 355-43.000.
Ikeda, Sunao: *See—*
Saeki, Shiro; and Ikeda, Sunao, 4,860,057, Cl. 355-23.000.
Ikegaya, Akihiko; and Tobioka, Masaaki, to Sumitomo Electric Industries, Ltd. Method for synthesizing diamond. 4,859,490, Cl. 427-38.000.
Ikezue, Tatsuya: *See—*
Yoshizawa, Shuji; and Ikezue, Tatsuya, 4,859,552, Cl. 430-57.000.
Ikumi, Nobuyuki, to Kabushiki Kaisha Toshiba. Precharge-type carry chained adder circuit. 4,860,242, Cl. 364-768.000.
Ikuzaki, Kunihiko: *See—*
Shimohigashi, Katsuhiro; Masuda, Hiroo; Ikuzaki, Kunihiko; and Kawamoto, Hiroshi, 4,860,255, Cl. 365-189.000.
Ilfrey, William T.; Spatz, Edward C.; Peterson, Elmer R.; and Moran, William, to Baker Hughes Incorporated. Gravel packing apparatus and method. 4,858,691, Cl. 166-278.000.
Imaizumi, Tomoaki; Kawai, Taneichi; Nishida, Kouji; and Murakami, Yuuichi, to Aisin Seiki Kabushiki Kaisha. Lock system for opening cover member of vehicle. 4,860,002, Cl. 340-825.310.
Imatani, Tsuneo: *See—*
Yasumuro, Hisakazu; Watanabe, Michio; Taira, Kazuo; Imatani, Tsuneo; and Kurashima, Hideo, 4,858,782, Cl. 220-458.000.
Imbt, John H.: *See—*
Weaver, Robert C., 4,858,984, Cl. 296-100.000.
Imes, Robert H.: *See—*
Powanda, Thomas M.; Imes, Robert H.; and Collins, George L., 4,859,792, Cl. 560-204.000.
Impact Systems, Inc.: *See—*
Wolze, David A., 4,859,926, Cl. 323-241.000.
Imperial Chemical Industries PLC: *See—*
Gregory, Peter; Bradbury, Roy; and Meyrick, Barry H., 4,859,651, Cl. 503-227.000.
IMS Ionen Mikrofabrikations Systeme Gesellschaft: *See—*
Stengl, Gerhard; Loschner, Hans; and Wolf, Peter, 4,859,857, Cl. 250-492.300.
Inaba, Akira: *See—*
Yamamoto, Yasuo; Inaba, Akira; and Kitagaki, Takashi, 4,859,364, Cl. 252-512.000.
Inagaki, Jitsuo. Bath water heater and circulator-purifier apparatus. 4,859,345, Cl. 210-764.000.
Inagaki, Takeshi: *See—*
Nishikawa, Meisei; Inagawa, Jun; Inagaki, Takeshi; Kaneshige, Toshihiko; Hayashi, Yasuhiro; and Kojima, Tadashi, 4,860,272, Cl. 369-48.000.
Inagaki, Yoshinari: *See—*
Muroi, Kunimasa; Inagaki, Yoshinari; and Awano, Tetsuyuki, 4,858,928, Cl. 273-73.00D.
Inagawa, Jun: *See—*
Nishikawa, Meisei; Inagawa, Jun; Inagaki, Takeshi; Kaneshige, Toshihiko; Hayashi, Yasuhiro; and Kojima, Tadashi, 4,860,272, Cl. 369-48.000.
Inami, Yasuhiko: *See—*
Katagiri, Masayuki; Watanabe, Masanori; Uda, Kazutaka; Hijikigawa, Masaya; Tsuchimoto, Shuhei; and Inami, Yasuhiko, 4,859,060, Cl. 356-352.000.
Inazumi, Hirokuni: *See—*
Maeda, Tetsuo; Ohta, Hirofumi; and Inazumi, Hirokuni, 4,860,183, Cl. 363-12.000.
Industrial Acoustics Company, Inc.: *See—*
Handley, John M.; and Khalifa, Ramzi A., 4,858,409, Cl. 52-489.000.
Inframetrics, Incorporated: *See—*
Stetson, Norman B., 4,858,442, Cl. 62-6.000.
Inkol, Robert J., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Reconfigurable parameter filter having filter sections selectively operating independently on respective low precision binary numbers or together on a higher precision binary number. 4,859,985, Cl. 340-146.200.
Innes, R. A.: *See—*
Zones, Stacey I.; and Innes, R. A., 4,859,442, Cl. 423-277.000.
Innocenti, Stefano, to Europa Metalli-Lmi Societa Per Azioni. Copper-based metal alloy of improved type, particularly for the construction of electronic components. 4,859,417, Cl. 420-493.000.
Inomata, Koichiro: *See—*
Mizoguchi, Tetsuhiko; Sakai, Isao; Niu, Hiromi; and Inomata, Koichiro, 4,859,254, Cl. 148-302.000.
Sawa, Takao; Hashimoto, Susumu; and Inomata, Koichiro, 4,859,256, Cl. 148-304.000.
Inoue, Hisamichi: *See—*
Murase, Michio; Kataoka, Yoshiyuki; Inoue, Hisamichi; Naioh, Masanori; and Sugisaki, Toshihiko, 4,859,401, Cl. 376-282.000.
Inoue, Hisao: *See—*
Hayami, Toshitomo; Shibata, Humio; Iguchi, Katsumi; Inoue, Hisao; Ono, Takashi; and Ishimoto, Takashi, 4,859,251, Cl. 148-286.000.
Inoue, Katsuyo, to Konishiroku Photo Industry Co., Ltd. Flatness examining device. 4,859,061, Cl. 356-359.000
Inoue, Kazuaki, to Seiko Epson Corporation. Emulation device for driving a LCD with a CRT display. 4,860,246, Cl. 364-900.000.
Inoue, Manabu: *See—*
Hata, Yoshiaki; Taniguchi, Nobuyuki; Hoda, Takeo; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,860,039, Cl. 354-106.000.
Inoue, Noriyuki: *See—*
Hirano, Shigeo; Kojima, Tetsuro; Yamamoto, Mitsuru; Inoue, Noriyuki; and Heki, Tatsuo, 4,859,579, Cl. 430-598.000.
Inoue, Takeshi: *See—*
Kamiya, Tetsuro; Inoue, Takeshi; Yorozu, Hidenori; Eguchi, Yasuteru; and Tsujii, Kaoru, 4,859,696, Cl. 514-420.000.
Inouye, Yoshinori; Osawa, Yoshihiko; and Ueda, Minoru, to Toray Industries, Inc. Printing press and control method of plate feeding operation. 4,858,528, Cl. 101-175.000.
Institut Francais du Petrole: *See—*
Durando, Pierre; and LaFaille, Alain, 4,859,196, Cl. 439-197.000.
Thiery, Jean, 4,858,705, Cl. 175-73.000.
Institut Francais du Petrole et Coflexip: *See—*
Huvey, Michel; Do, Anh T.; Gerez, Jean-Michel; and Le Gallais, Lucien, 4,858,653, Cl. 138-144.000.
Institut Merieux: *See—*
Roizman, Bernard, 4,859,587, Cl. 435-68.000.
Institut National de Recherche Chimique Appliquee: *See—*
Lampin, Jean-Pierre, deceased; Robillart Lampin, Jeannine, heir; Lampin, Corinne, heir; Lampin, Sophie, heir; Cambon, Aime ; Szonyi, Francois; Delpuech, Jean-Jacques; Serratrice, Guy; Thiollet, Gerard; and Lafosse, Louisette, 4,859,797, Cl. 568-39.000.
Institut Textile de France: *See—*
Meyer, Bertrand; and Pijew, Alexandre, 4,859,821, Cl. 219-10.55A.
Institute of Gas Technology: *See—*
Marianowski, Leonard G.; and Remick, Robert J., 4,859,296, Cl. 204-129.000.
Integrated Fluidics, Inc.: *See—*
Webster, Milo E., 4,858,883, Cl. 251-61.100.
Integrated Technologies Solutions, Inc.: *See—*
Gershon, Ezra, 4,859,968, Cl. 331-38.000.
Intel Corporation: *See—*
Kim, Sang U.; and Khan, Mohammad K., 4,859,938, Cl. 324-158.00D.
Krauskopf, Joseph C., 4,860,195, Cl. 364-200.000.
Kreifels, Jerry A.; and Hoekstra, George, 4,860,261, Cl. 365-218.000.
Lloyd, Stacey G., 4,860,322, Cl. 375-107.000.
Interconnexions Ceramiques: *See—*
Dubuisson, Jacques; and Boutterin, Rene, 4,859,520, Cl. 428-137.000.
Intergraph Corporation: *See—*
Sachs, Howard G.; Cho, James Y.; and Hollingsworth, Walter H., 4,860,192, Cl. 364-200.000.
Intermark Amusements, Inc.: *See—*
Santavaci, Jerome, 4,858,922, Cl. 273-26.00R.
Intermedics, Inc.: *See—*
Bradshaw, James I.; and Baker, Ross G., Jr., 4,858,623, Cl. 128-785.000.

International Business Machines Corporation: *See*—
Bentley, Steven R.; Fickle, David M.; and Nylander-Hill, Pamela R., 4,860,193, Cl. 364-200.000.
Buchanan, Douglas A.; Callegari, Alessandro C.; Hob, Peter D.; and Lacey, Dianne L., 4,859,253, Cl. 148-33.300.
Chung, Paul W.; and Wang, Niantsu N., 4,859,880, Cl. 307-494.000.
Corrigan, Colleen M.; Hunter, Lawrence W.; and Modry, John A., 4,860,203, Cl. 364-300.000.
Groves, Timothy R.; Pfeiffer, Hans C.; Stickel, Werner; and Sturans, Maris A., 4,859,856, Cl. 250-398.000.
Hitchcock, Leonard J., 4,860,189, Cl. 363-132.000.
Irwin, John W.; and Wagoner, James D., 4,859,815, Cl. 178-69.00D.
Jackson, Thomas N.; Kleinsasser, Alan W.; and Woodall, Jerry M., 4,860,067, Cl. 357-16.000.
Joseph, Charles A.; and Petrozello, James R., 4,859,268, Cl. 156-275.500.
Kinnard, J. R.; and Oliver, Dennis N., 4,859,911, Cl. 315-169.300.
Kirchner, Peter D.; Marks, Ronald F.; Pettit, George D.; Woodall, Jerry M.; and Wright, Steven L., 4,860,066, Cl. 357-16.000.
Lumelsky, Leon, 4,860,248, Cl. 364-900.000.
Vinal, Albert W.; and Cunningham, Earl A., 4,860,138, Cl. 360-113.000.
Weingart, Steve H., 4,860,351, Cl. 380-3.000.
International Flavors & Fragrances Inc.: *See*—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,859,463, Cl. 424-84.000.
International Fuel Cells Corporation: *See*—
Scheffler, Glenn W.; and Vartanian, George, 4,859,545, Cl. 429-17.000.
International Paper Company: *See*—
Floyd, Jerome M., 4,859,244, Cl. 106-243.000.
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whitlock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,859,513, Cl. 428-34.200.
Interox (Societe Anonyme): *See*—
Campestrini, Sandro; Di Furia, Fulvio; Modena, Giorgio; and Pasquato, Lucia, 4,859,799, Cl. 568-430.000.
Interthal, Werner: *See*—
Ohlendorf, Dieter; Interthal, Werner; and Stoll, Friedrich, 4,859,418, Cl. 422-16.000.
Intevep, S.A.: *See*—
Rammler, Roland; Weiss, Hans-Jurgen; Herbertz, Hans-Adolf; Solari, Rodolfo B.; and Hidalgo, Rafael, 4,859,284, Cl. 201-12.000.
Intlekofer, Michael J.; and Slota, Michael W., to Heart Technology, Inc. Quick acting pin vise for use with angiographic guidewires. 4,858,810, Cl. 226-127.000.
Ionescu, Tudor V.: *See*—
Gendron, Robert F.; Stacy, E. Webb, Jr.; and Ionescu, Tudor V., 4,860,204, Cl. 364-300.000.
Iowa State University Research Foundation, Inc.: *See*—
Chriswell, Colin D.; Kaushik, Surender M.; Shah, Navin D.; and Markuszewski, Richard, 4,859,212, Cl. 44-622.000.
Ippers, Karl: *See*—
Gierse, Franz J.; Pabst, Manfred; Hermanns, Heinz; Ippers, Karl; Krenn, Stephan; Huppe, Friedrich; Opgenoorth, Carl H.; and Wolters, Conrad, 4,858,843, Cl. 242-65.000.
IRD Mechanalysis, Inc.: *See*—
Kincaid, Harry R.; and Riggs, Walter S., 4,858,470, Cl. 73-654.000.
Irifune, Hideki. Spring. 4,858,897, Cl. 267-181.000.
Irimura, Tatsuro: *See*—
Nicolson, Garth L.; Nakajima, Motowo; and Irimura, Tatsuro, 4,859,581, Cl. 435-4.000.
Irwin, John W.; and Wagoner, James D., to International Business Machines Corporation. Serial link transparent mode disparity control. 4,859,815, Cl. 178-69.00D.
Isaacman, Marvin, to Linear Corporation. Electrically programmable transceiver security system and integrated circuit. 4,859,990, Cl. 340-539.000.
Isaksen, Robert A.: *See*—
Jones, Wallace R.; Isaksen, Robert A.; and Krieger, Paul A., 4,859,512, Cl. 428-40.000.
Ise Chemical Industries Co., Ltd.: *See*—
Hayashi, Kunioki; Tanaka, Hironori; Sasagawa, Tsutomu; Uemura, Isao; and Aizawa, Akira, 4,858,560, Cl. 119-1.000.
Iseda, Ken, to Kabushiki Kaisha Toshiba. Image information apparatus. 4,860,029, Cl. 346-76.0PH.
Ishida, Masamitsu: *See*—
Funahashi, Takeshi; and Ishida, Masamitsu, 4,859,850, Cl. 250-327.200.
Shimura, Kazuo; and Ishida, Masamitsu, 4,859,849, Cl. 250-327.200.
Ishida Scales Mfg. Co. Ltd.: *See*—
Kohno, Masami, 4,858,708, Cl. 177-25.180.
Ishida, Tokuji: *See*—
Hamada, Masataka; and Ishida, Tokuji, 4,860,045, Cl. 354-402.000.
Ishigaki, Toshinori, to Kabushiki Kaisha Toshiba. Hand scanner input system and a sheet used in hand scanner input system. 4,860,377, Cl. 382-59.000.
Ishiguro, Yasuyuki: *See*—
Kano, Atsushi; Ishiguro, Yasuyuki; Ogiri, Tadakazu; Ozaki, Hirofumi; and Yamashita, Yuji, 4,860,056, Cl. 355-298.000.
Ishihara, Hideaki: *See*—
Kurita, Kazuo; and Ishihara, Hideaki, 4,859,389, Cl. 264-130.000.
Ishihara, Makoto: *See*—
Hattori, Yoshiaki; and Ishihara, Makoto, 4,859,243, Cl. 106-110.000.
Ishii, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Current sensing device. 4,860,153, Cl. 361-94.000.
Ishikawa, Mitsuru: *See*—
Matsuura, Masaaki; Ishikawa, Mitsuru; Nakamori, Masaharu; and Kuroki, Masahiro, 4,858,577, Cl. 123-190.00A.
Ishikawa, Satoru: *See*—
Hisatake, Michio; and Ishikawa, Satoru, 4,859,917, Cl. 388-815.000.
Ishikawa, Shinji: *See*—
Kobayashi, Kazuo; Fukazawa, Masashi; and Ishikawa, Shinji, 4,859,299, Cl. 204-157.920.
Ishimoto, Takashi: *See*—
Hayami, Toshitomo; Shibata, Humio; Iguchi, Katsumi; Inoue, Hisao; Ono, Takashi; and Ishimoto, Takashi, 4,859,251, Cl. 148-286.000.
Ishioka, Hidenori: *See*—
Matsuda, Kenji; Sugawara, Sakuo; Hara, Masanori; Umemura, Hiroyuki; Ishioka, Hidenori; and Aoki, Katsuyuki, 4,858,824, Cl. 236-94.000.
Ishizaki, Akira: *See*—
Suda, Yasuo; Ohnuki, Ichiro; Akashi, Akira; Ishizaki, Akira; Ohtaka, Keiji; and Koyama, Takeshi, 4,859,842, Cl. 250-201.000.
Ishizuka, Masaaki: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,859,593, Cl. 435-128.000.
Ishizuka, Takashi: *See*—
Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kuramoto, Shinichi; Sugiyama, Yoshihiro; Takanashi, Hajime; Ishizuka, Takashi; Kudo, Yoshio; and Sato, Yoshio, 4,860,050, Cl. 355-256.000.
Isomura, Yoshihiro: *See*—
Ukita, Hiroo; Katagiri, Yoshitada; Sawada, Renshi; Uenishi, Yuuji; Isomura, Yoshihiro; Toshima, Tomoyuki; and Mise, Keisuke, 4,860,276, Cl. 369-119.000.
Isomura, Yukio: *See*—
Ogasawara, Shinji; Isomura, Yukio; and Okudaira, Souichiro, 4,858,973, Cl. 292-347.000.
Isuzu Motors Limited: *See*—
Kawamura, Hideo, 4,858,825, Cl. 237-2.00A.
Okada, Masaki, 4,858,440, Cl. 60-614.000.
Iten, Clemens A., to American Safety Razor Company. Integrally backed single-edge razor blade. 4,858,323, Cl. 30-346.600.
ITH, Inc.: *See*—
Sanders, William J., 4,858,617, Cl. 128-696.000.
Ito, Akihiro: *See*—
Ito, Shoziro; Ito, Akihiro; and Ito, Hiroyasu, 4,859,077, Cl. 374-33.000.
Ito, Hiroyasu: *See*—
Ito, Shoziro; Ito, Akihiro; and Ito, Hiroyasu, 4,859,077, Cl. 374-33.000.
Ito, Kanehiro: *See*—
Ito, Shunji; Ito, Kanehiro; Kogiso, Takashi; and Kurachi, Yoshio, 4,858,746, Cl. 198-465.400.
Ito, Masazumi; Nishimori, Kadotaro; and Oyabu, Masaaki, to Minolta Camera Kabushiki Kaisha. Copying apparatus with use frequency cancellation control. 4,860,052, Cl. 355-209.000.
Ito, Masazumi: *See*—
Ohira, Tadashi; Ito, Masazumi; and Maruta, Syuzi, 4,860,055, Cl. 355-308.000.
Ito, Shoziro; Ito, Akihiro; and Ito, Hiroyasu, to Shoziro Ito. Precision calorimeter. 4,859,077, Cl. 374-33.000.
Ito, Shunji; Ito, Kanehiro; Kogiso, Takashi; and Kurachi, Yoshio, to Howa Machinery, Ltd. Method and apparatus for transporting articles. 4,858,746, Cl. 198-465.400.
Ito, Yasunobu; and Suzuki, Kenji, to Aisin-Warner Kabushiki Kaisha. Automatic transmission with lock-up clutch. 4,858,499, Cl. 74-866.000.
Itoh, Hideaki; and Ozaki, Takayuki, to Fujitsu Limited. System for transmitting auxiliary signal in a multiplex communication system. 4,860,282, Cl. 370-55.000.
Itoh, Masahiro; Murasawa, Yoshihiro; Takeda, Atsushi; Tsuchiya, Hiroaki; and Nakahata, Kimio, to Canon Kabushiki Kaisha. Image forming apparatus. 4,860,048, Cl. 355-208.000.
Iura, Tadashi, to Hoxan Corporation. Movable bed vehicle. 4,858,261, Cl. 5-81.00B.
Iwakawa, Tsunekiyo; Hada, Hiroshi; and Nakamura, Tadashi, to NEC Corporation. Plasma display apparatus. 4,859,910, Cl. 315-169.100.
Iwamatsu, Motoshige; and Kaji, Mitsugu, to Photon Ceramics Kabushiki Kaisha. Process for production of vitreous ceramics and product thereof. 4,859,634, Cl. 501-3.000.
Iwamatsu, Takanori, to Fujitsu Limited. Automatic drift control circuit. 4,860,010, Cl. 341-118.000.
Iwamatsu, Takanori: *See*—
Takenaka, Sadao; Aono, Yoshihito; Iwamatsu, Takanori; Minowa, Morihiko; Daido, Yoshimasa; and Nakamura, Hiroshi, 4,860,316, Cl. 375-39.000.
Iwamura, Masahiro; Masuda, Ikuro; and Uchida, Hideaki, to Hitachi, Ltd. Semiconductor integrated circuit device with a protective circuit. 4,860,148, Cl. 361-58.000.
Iwasaki Electronics Co., Ltd.: *See*—
Uetsuhara, Tokio, 4,859,975, Cl. 335-230.000.
Iwashita, Yukihiro; and Mochizuki, Masashi, to Seiko Epson Corporation. Liquid crystal electrically-controlled birefringence display devices with improved contrast. 4,859,037, Cl. 350-339.00F.
Iwata, Kazuo: *See*—
Matsuno, Takeshi; and Iwata, Kazuo, 4,859,847, Cl. 250-239.000.

Iwata, Yoshikazu: *See*—
Koesashi, Yuzo; Kawade, Yasuhiko; and Iwata, Yoshikazu, 4,859,123, Cl. 408-233.000.
Iwatsuki, Kunihiro; and Shindo, Yoshio, to Toyota Jidosha Kabushiki Kaisha. Device for integrally controlling a supercharged engine and automatic transmission in vehicle. 4,858,496, Cl. 74-863.000.
IXYS Corporation: *See*—
Zommer, Nathan, 4,860,072, Cl. 357-23.800.
J.C. Bamford Excavators Limited: *See*—
Brocklebank, Norman; and Cooper, Alan, 4,859,138, Cl. 414-694.000.
J.D. Monitoring, Incorporated: *See*—
Osterweil, Josef, 4,858,622, Cl. 128-782.000.
J. I. Case Company: *See*—
Horsch, Joachim, 4,858,495, Cl. 74-745.000.
King, James A., 4,858,565, Cl. 123-41.310.
Werner, Ronald H., 4,858,866, Cl. 248-213.300.
J.M. Voith GmbH: *See*—
Elsner, Ernst; Lindenthal, Hans; and Jelfs, Stewart D., 4,859,106, Cl. 403-5.000.
Jachmann, Emil F.: *See*—
D'Agosto, Nicholas A., III; Chamberlin, David B.; Su, Jy-Hong; Jachmann, Emil F.; and Grey, Suzanne N., 4,860,339, Cl. 379-67.000.
Jackson, Frederick E.: *See*—
Jacobson, Walter E.; Summers, Donald J.; Vining, Kenneth; and Jackson, Frederick E., 4,858,475, Cl. 73-862.540.
Jackson, Norman C., to Standard Products Company, The. Method of making a smooth flexible flange cover. 4,859,391, Cl. 264-162.000.
Jackson, Thomas N.; Kleinsasser, Alan W.; and Woodall, Jerry M., to International Business Machines Corporation. Semiconductor heterostructure adapted for low temperature operation. 4,860,067, Cl. 357-16.000.
Jacobson, Barry J. Inflatable aerodynamic wing structure. 4,858,854, Cl. 244-123.000.
Jacobson, Walter E.; Summers, Donald J.; Vining, Kenneth; and Jackson, Frederick E., to Revere Corporation of America. Apparatus and method for measuring strain. 4,858,475, Cl. 73-862.540.
Jacquet, Bruno, to La Telemecanique Electrique. Thermai relay. 4,859,979, Cl. 337-3.000.
Jaeger, Scott H.: *See*—
Clemow, Alastair J. T.; and Jaeger, Scott H., 4,858,603, Cl. 128-92.0ZW.
Jahns, Thomas M.: *See*—
Kliman, Gerald B.; Brynsvold, Glen V.; and Jahns, Thomas M., 4,859,885, Cl. 310-11.000.
Jain, Mukesh; and Nadkarni, Sadashiv, to Alcan International Limited. Hollow microspheres. 4,859,711, Cl. 521-56.000.
James River Corporation: *See*—
Schutz, Rudolph W., 4,859,518, Cl. 428-126.000.
James River Corporation of Virginia: *See*—
Patterson, Robert; and Papez, Stephen M., 4,859,511, Cl. 428-40.000.
Janes, George S., to Avco Research Laboratory, Inc. Scanning beam laser pumped laser. 4,860,302, Cl. 372-70.000.
Janiaud, Denis: *See*—
Aubry, Jean-Pierre; Fragneau, Marc; Craveur, Jean-Charles; Janiaud, Denis; and Muller, Serge, 4,859,898, Cl. 310-353.000.
Janik, Walter E.: *See*—
Wise, David S.; and Janik, Walter E., 4,860,060, Cl. 355-41.000.
Jannard, James H., to Oakley, Inc. Cylindrical lens for sunglasses. 4,859,048, Cl. 351-159.000.
Janome Sewing Machine Co. Ltd.: *See*—
Hisatake, Michio; and Ishikawa, Satoru, 4,859,917, Cl. 388-815.000.
Kato, Kenji; and Okutani, Koji, 4,858,542, Cl. 112-121.120.
Janowitz, Pedro M.: *See*—
Damm, Wendell W.; Taylor, Keith A.; Pollock, Ira G.; and Janowitz, Pedro M., 4,860,291, Cl. 371-27.000.
Jans, Herbert; Brandmaier, Klaus; and Pohl, Siegfried, to Siemens Aktiengesellschaft. Circuit arrangement for telecommunications switching systems, particularly telephone switching systems, etc. 4,860,344, Cl. 379-113.000.
Jansen, Frank; and Mort, Joseph, to Xerox Corporation. Imaging members with plasma deposited silicon oxides. 4,859,553, Cl. 430-58.000.
Janssen Pharmaceutica N.V.: *See*—
Raeymaekers, Alfons H. M.; Freyne, Eddy J. E.; and Sanz, Gerard C., 4,859,684, Cl. 514-314.000.
Japan Atomic Energy Research Institute: *See*—
Konishi, Satoshi; Nagasaki, Takanori; Yokogawa, Nobuhisa; and Naruse, Yuji, 4,859,427, Cl. 422-159.000.
Jasper, Louis J., Jr., to United States of America, Army. Superconductive levitated armatures for electromagnetic launchers. 4,858,511, Cl. 89-8.000.
Jasper, Louis J., Jr., to United States of America, Army. Electromagnetic launcher with cryogenic cooled superconducting rails. 4,858,512, Cl. 89-8.000.
Jatteau, Michel R., to U.S. Philips Corporation. Scintillation camera processing circuitry. 4,860,205, Cl. 364-413.240.
Jay, Jerry L., Jr.; and Cottrell, Ben. Pneumatic desedimentation machine. 4,858,632, Cl. 134-57.00R.
Jayawant, Madhusudan D., to Du Pont de Nemours, E. I., and Company. Magnesium ions in a process for alkaline peroxide treatment of nonwoody lignocellulosic substrates. 4,859,283, Cl. 162-78.000.
Jeffries, James R.; and Verheyen, Michael R., to Caterpillar Inc. Glow plug alternator control. 4,858,576, Cl. 123-145.00A.
Jelfs, Stewart D.: *See*—
Elsner, Ernst; Lindenthal, Hans; and Jelfs, Stewart D., 4,859,106, Cl. 403-5.000.
Jenkins, Thomas B.; Ulery, Dennis R.; Wilson, Blake W.; Walko, Steven C.; Lee, Lester H.; Salerno, Robert P.; Nason, Robert W.; and Courtney, John P., to General Electric Company. Subslot liner for rotor of dynamoelectric machine. 4,859,891, Cl. 310-215.000.
Jensen, Bruce D.: *See*—
Horan, Paul K.; Jensen, Bruce D.; and Slezak, Sue E., 4,859,584, Cl. 435-29.000.
Jepson, John W.: *See*—
Gobush, William; Berard, Raymond A.; Brown, Robert A.; and Jepson, John W., 4,858,923, Cl. 273-62.000.
Jerussi, Thomas P.; Capacchione, John F.; and Benvenga, Mark J., to BOC, Inc. Anesthetic composition and method of using the same. 4,859,685, Cl. 514-329.000.
Jervis, James E., to Raychem Corporation. Splice case. 4,859,809, Cl. 174-92.000.
Jeter, Michael A.; and Capurso, Joseph S., to Delco Electronics Corporation. Electrical conductor having unique solder dam configuration. 4,859,808, Cl. 174-68.500.
Jeziorowski, Les A., to CAMCO Inc. Refrigerator door tray assembly. 4,859,010, Cl. 312-312.000.
Jiang, Ke-zheng; Ren, Deng-ke; Chen, Zu-yuan; and You, Lian-zhen, to Shanghai Dong Hai Military Technology Engineering Co. Planar TV receiving antenna with broad band. 4,860,019, Cl. 343-795.000.
Jocher, Reiner; Dahm, Horst; and Haberle, Fritz, to Daimler-Benz Aktiengesellschaft. Headlamp for a motor vehicle. 4,860,173, Cl. 362-61.000.
John, Clarence D., Jr.; McNerney, Francis C.; and Sanders, Thomas M., to Westinghouse Electric Corp. Tube flush etching, rinsing, drying, inspecting and plugging subsystem and method in a tube manufacturing system. 4,859,276, Cl. 156-626.000.
John Fluke Mfg. Co., Inc.: *See*—
Coulson, Kenneth A., 4,860,289, Cl. 371-12.000.
Eccleston, Larry E., 4,859,936, Cl. 324-130.000.
Hammond, Robert W., 4,859,980, Cl. 338-308.000.
John Labatt Limited: *See*—
Linton, John H.; and Hussar, Nick, 4,859,485, Cl. 426-623.000.
Johns, Robert H., to Allegheny Ludlum Corporation. Apparatus for determining an edge profile of a metallic workpiece. 4,858,327, Cl. 33-42.000.
Johnson, Alan L.: *See*—
Hartless, Mac L.; and Johnson, Alan L., 4,860,373, Cl. 382-41.000.
Johnson, Dale V.; Burkhardt, Joseph A.; and Childers, Thomas W., to Exxon Production Research Company. Heave compensated stabbing and landing tool. 4,858,694, Cl. 166-355.000.
Johnson, Dwight N., to Masco Corporation of Indiana. Trim assembly. 4,858,252, Cl. 4-368.000.
Johnson Electric Industrial Manufactory Limited: *See*—
Wang, Patrick S., 4,859,893, Cl. 310-234.000.
Johnson, Ivy D.: *See*—
Landis, Michael E.; Aufdembrink, Brent A.; Chu, Pochen; Johnson, Ivy D.; Kirker, Garry W.; Page, Nancy M.; and Rubin, Mae K., 4,859,648, Cl. 502-242.000.
Johnson & Johnson GmbH: *See*—
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Johnson & Johnson Orthopaedics, Inc.: *See*—
Clemow, Alastair J. T.; and Jaeger, Scott H., 4,858,603, Cl. 128-92.0ZW.
Johnson, Larry B.; Curtis, Thomas K., Jr.; and Allred, Gary A., to Carousel Investment Corporation. Prefabricated gift box. 4,858,822, Cl. 229-137.000.
Johnson Matthey Inc.: *See*—
Grundy, James, 4,859,241, Cl. 106-1.140.
Johnson, Neil J.: *See*—
Langendorf, Brian K.; and Johnson, Neil J., 4,860,197, Cl. 364-200.000.
Johnson, Walter A.; Kopatz, Nelson E.; and Ritsko, Joseph E., to GTE Products Corporation. Hydrometallurgical process for producing spherical maraging steel powders with readily oxidizable alloying elements. 4,859,237, Cl. 75-0.5AA.
Johnson, Willard L. Filter leaf cleaning jet apparatus. 4,859,332, Cl. 210-332.000.
Johnston, Byron K.: *See*—
Ambrose, Ronald R.; O'Dwyer, James B.; Johnston, Byron K.; Zielinski, David P.; Porter, Samuel, Jr.; and Tyger, Wayne H., 4,859,743, Cl. 525-443.000.
Johnston, David F., to United States of America, National Aeronautics and Space Administration. Electronic precipitator control. 4,860,149, Cl. 361-79.000.
Jolson, Joseph D.: *See*—
Schneider, Alan A.; Stewart, David A.; Jolson, Joseph D.; Auel, RaeAnn M.; and Price, John F., 4,859,305, Cl. 204-412.000.
Jones, Arthur. Apparatus for testing or exercising muscles of the lower trunk of the human body. 4,858,919, Cl. 272-134.000.
Jones, Donald W.: *See*—
Kliman, Gerald B.; and Jones, Donald W., 4,859,974, Cl. 335-229.000.
Jones, Gary A., to Zenith Electronics Corporation. IR decoder system. 4,860,202, Cl. 364-200.000.
Jones, Kenneth W.; and Fyfe, George, to Smith International, Inc. Convex shaped diamond cutting elements. 4,858,707, Cl. 175-329.000.
Jones, Wallace R.; Isaksen, Robert A.; and Krieger, Paul A., to Excello Specialty Company, The. Transfer adhesive sandwich for applying adhesive to substrates. 4,859,512, Cl. 428-40.000.

Joos, Heinz: *See—*
Krenkel, Bernhard; and Joos, Heinz, 4,859,396, Cl. 264-311.000.
Jordan, Pavel; Muff, Janet; and Strong, Bernard, to Pavel Jordan & Associates. Plastic device for injection and obtaining blood samples. 4,858,607, Cl. 128-314.000.
Jorgensen, Poul R. Method and circuit for automatic gain control of a signal. 4,859,964, Cl. 330-279.000.
Joseph, Charles A.; and Petrozello, James R., to International Business Machines Corporation. Method of using electrically conductive composition. 4,859,268, Cl. 156-275.500.
Josquin, Wilhelmus J. M. J., to U.S. Philips Corporation. Method of manufacturing a semiconductor device. 4,859,630, Cl. 437-203.000.
Jost, Ulrike: *See—*
Bauch, Hartmut; Krause, Peter; Jost, Ulrike; Kersten, Ralf; Paquet, Volker; and Siefert, Wolfgang, 4,859,222, Cl. 65-3.120.
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Jovanovic, Milan M.: *See—*
Tabisz, Wojciech A.; Lee, Fred C.; and Jovanovic, Milan M., 4,860,184, Cl. 363-17.000.
Judell, Neil H.: *See—*
Abbe, Robert C.; Poduje, Noel S.; and Judell, Neil H., 4,860,229, Cl. 364-563.000.
Juedes, Dennis L.: *See—*
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Juhlke, Timothy J.: *See—*
Bierschenk, Thomas R.; Juhlke, Timothy J.; and Lagow, Richard J., 4,859,747, Cl. 525-409.000.
Julian, Scott C.; and Cetinkaya, Ismail B., to UOP. Air distribution device. 4,859,430, Cl. 422-310.000.
Jung, Rolf R.: *See—*
Pinto, Akiva; Lucasse, Guenter; Jung, Rolf R.; and Bocht, Bernhard, 4,858,278, Cl. 19-200.000.
Junghans Uhren GmbH: *See—*
Allgaier, Jurgen; Ganter, Wolfgang; Hodapp, Wolfram; Kopf, Arthur; and Maurer, Roland, 4,860,268, Cl. 368-47.000.
Jusaitis, Walter; and Matthews, William W., to National Fluid Separators, Inc. Method and device for filtering oils from infusion beverages. 4,859,348, Cl. 210-799.000.
K-S-H Canada Inc.: *See—*
McCurdy, Ronald E., 4,858,594, Cl. 126-444.000.
Kabayashi, Seishiro, to Anritsu Meter Co., Ltd. Surface temperature sensor. 4,859,081, Cl. 374-179.000.
Kabushiki Kaisha Kenwood: *See—*
Nakayama, Shigeyuki, 4,860,307, Cl. 375-1.000.
Kabushiki Kaisha Kobe Seiko Sho: *See—*
Asai, Toshihiro; and Hagiwara, Katsunobu, 4,859,074, Cl. 366-97.000.
Hamada, Yoshihiro; Nakagawa, Kazuhiko; Hagiwara, Katunobu; Noda, Takeoki; and Asada, Mitunori, 4,859,166, Cl. 425-204.000.
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Kabushiki Kaisha Komatsu Siesakusho: *See—*
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Kabushiki Kaisha Risuron: *See—*
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Kabushiki Kaisha Seidenko: *See—*
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Kabushiki Kaisha Togo Seisakusho: *See—*
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Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See—*
Nishimura, Yuji; Kawaharazaki, Takashi; Tamura, Keiichi; Matsui, Kenji; Watanabe, Yasutaka; and Yoshitsugu, Noritada, 4,858,953, Cl. 280-807.000.
Kabushiki Kaisha Toshiba: *See—*
Denpou, Kazuo, 4,858,443, Cl. 62-126.000.
Goto, Hiroshige, 4,859,624, Cl. 437-53.000.
Hayami, Toshitomo; Shibata, Humio; Iguchi, Katsumi; Inoue, Hisao; Ono, Takashi; and Ishimoto, Takashi, 4,859,251, Cl. 148-286.000.
Ikumi, Nobuyuki, 4,860,242, Cl. 364-768.000.
Iseda, Ken, 4,860,029, Cl. 346-76.0PH.
Ishigaki, Toshinori, 4,860,377, Cl. 382-59.000.
Kobayashi, Tadashi, 4,860,274, Cl. 369-100.000.
Kubo, Susumu, 4,860,207, Cl. 364-424.010.
Kuhara, Shigehide, 4,859,946, Cl. 324-309.000.
Maekawa, Katsumi; and Ambo, Tatsuaki, 4,860,186, Cl. 363-41.000.
Makita, Sadao, 4,859,092, Cl. 400-83.000.
Matsumoto, Osamu; Abe, Isao; and Nakashiro, Takeshi, 4,859,882, Cl. 307-530.000.
Matsuo, Kenji; and Tsuchiya, Ikuo, 4,859,970, Cl. 331-57.000.
Mizoguchi, Tetsuhiko; Sakai, Isao; Niu, Hiromi; and Inomata, Koichiro, 4,859,254, Cl. 148-302.000.
Nakagawa, Kaoru; and Nagaba, Katsushi, 4,860,327, Cl. 377-79.000.
Nishikawa, Meisei; Inagawa, Jun; Inagaki, Takeshi; Kaneshige, Toshihiko; Hayashi, Yasuhiro; and Kojima, Tadashi, 4,860,272, Cl. 369-48.000.
Saito, Shinji; Atsumi, Shigeru; and Tanaka, Sumio, 4,860,260, Cl. 365-201.000.
Sato, Makoto; and Uehara, Toshio, 4,860,221, Cl. 364-522.000.
Sawa, Takao; Hashimoto, Susumu; and Inomata, Koichiro, 4,859,256, Cl. 148-304.000.
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Suzuki, Yasuo; and Sasaki, Yukihiko, 4,860,340, Cl. 379-74.000.
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Yoshino, Teruo, 4,859,884, Cl. 307-646.000.
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Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
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Kabushiki Kaisha Yakult Honsha: *See—*
Kan, Tatsuhiko; Kobayashi, Yoichi; Sonoike, Yoshiko; Terashima, Tsuneo; and Mutai, Masahiko, 4,859,488, Cl. 426-658.000.
Kabushuki Kaisha Toshiba: *See—*
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Kadifa, Abdo G.: *See—*
Hansen, Ronald D.; Mock, Clayton W.; and Kadifa, Abdo G., 4,859,995, Cl. 340-710.000.
Kadomiya, Ronald H.: *See—*
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Kadowaki, Nobuo: *See—*
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Kagami, Toshihiko; Kobayashi, Kazuyoshi; Asakawa, Eiji; Osada, Atushi; Hara, Kozo; and Abe, Yasuji, to Tokyo Electron Limited. Wafer accounting and processing system. 4,859,993, Cl. 340-674.000.
Kaibel, Gerd; Hefner, Werner; Keller, Peter; and Drewitz, Werner, to BASF Aktiengesellschaft. Isolation of 1,3-butadiene. 4,859,286, Cl. 203-75.000
Kain, Richard S.: *See—*
Winter, Russell K.; Harvey, Thomas D.; Kain, Richard S.; and Savaa, Nedin, 4,858,774, Cl. 211-184.000.
Kaiser Electronics: *See—*
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Kajioka, Hiroshi; Yamada, Koudo; Takuma, Yuuetsu; and Teraoka, Tatsuo, to Hitachi Cable Limited. Method of manufacturing polarization-maintaining optical fibers. 4,859,223, Cl. 65-3.120.
Kajiwara, Hajime; Ogura, Masami; and Sano, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle height adjusting device. 4,858,950, Cl. 280-719.000.
Kakinuma, Yuji; and Fujita, Minoru, to Kyodo Printing Co., Ltd. Optical recording card and method of reading the same. 4,860,275, Cl. 369-109.000.
Kakiuchi, Shinichi: *See—*
Saito, Tasuku; and Kakiuchi, Shinichi, 4,858,924, Cl. 273-62.000.
Kakuta, Takeshi; and Miyoshi, Takahito, to Fuji Photo Film Co., Ltd. Method for preparing a magnetic recording medium. 4,859,500, Cl. 427-128.000.
Kale, Michael: *See—*
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Kalnitsky, Alexander; Ellul, Joseph P.; Tay, Sing P.; and Poirier, Jacques G., to Northern Telecom Limited. Method and apparatus for removing coating from substrate. 4,859,303, Cl. 204-192.360.
Kalocsai, Istvan: *See—*
Szabo nee Mogyorossi, Katalin; Kalocsai, Istvan; Gyoni, Istyan; Remenyi, Karoly; Plaveczky, Gyorgy; Kovacs, Laszlo ; Gal, Dezso ; Nemes, Istvan; Botar, Laszlo ; Bencsura, Akos; Moger nee Jeremejeva, Galina; Heberger, Karoly; and Nemeth, Andras, 4,859,209, Cl. 44-51.000.
Kamaya Kagaku Kogyo Co., Ltd.: *See—*
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Kamerman, Adriaan; and Haagh, Johannes P. N., to NCR Corporation. Modem communication system having main and secondary channels. 4,860,308, Cl. 375-8.000.
Kameyama, Yasuhiro: *See—*
Miura, Konoe; Ochiai, Tameichi; and Kameyama, Yasuhiro, 4,859,563, Cl. 430-192.000.
Kamimae, Hajime: *See—*
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Kamisawa, Koh: *See—*
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Kamise, Katsuya; and Yamamoto, Shigeru, to Mazda Motor Corporation. Knocking control system for internal combustion engine. 4,858,580, Cl. 123-425.000.
Kamiya, Tetsuro; Inoue, Takeshi; Yorozu, Hidenori; Eguchi, Yasuteru; and Tsujii, Kaoru, to Kao Corporation. Precutaneous absorption accelerator and preparation containing same. 4,859,696, Cl. 514-420.000.
Kampe, Klaus-Dieter; Raether, Wolfgang; Dittmar, Walter; and Hanel, Heinz, to Hoechst Aktiengesellschaft. 2-Azolylmethyl-2-aryl-1,3-dioxolanes and the salts thereof, agents containing same, and the use thereof. 4,859,670, Cl. 514-252.000.
Kampf, Gunther: *See—*
Pott, Richard; Eiling, Aloys; and Kampf, Gunther, 4,860,254, Cl. 365-145.000.
Kan, Tatsuhiko; Kobayashi, Yoichi; Sonoike, Yoshiko; Terashima, Tsuneo; and Mutai, Masahiko, to Kabushiki Kaisha Yakult Honsha.

Liquid food for curing constipation: polydextrose and oligosaccharide. 4,859,488, Cl. 426-658.000.
Kanai, Kunio; and Yamamoto, Toshiyuki, to Konishiroku Photo Industry Co., Ltd. Photographic material processing unit. 4,860,044, Cl. 354-321.000.
Kanamaru, Hitoshi, to Pioneer Electronic Corporation. Device for reproducing a sequence of still pictures with an audio portion and without motion pictures between successive still pictures. 4,860,122, Cl. 358-341.000.
Kane, Daniel E.: *See—*
Burke, William F.; and Kane, Daniel E., 4,859,142, Cl. 415-116.000.
Kane, Richard; Meyerhoefer, Carl; Miller, David C.; and Pendleton, Thomas J., to Mobil Oil Corporation. Waste container and adjustable bag liner package holder combination. 4,858,781, Cl. 220-407.000.
Kaneda, Saburo; and Murakami, Kazuaki, to Fujitsu Limited. Computer system for controlling virtual machines. 4,860,190, Cl. 364-200.000.
Kaneda, Toshio: *See—*
Ukaji, Shiroh; Kimura, Hisao; Urata, Kenji; and Kaneda, Toshio, 4,859,824, Cl. 219-69.150.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Kano, Fumihiko; Yamane, Takehiko; Yamashita, Katsuji; Hosoe, Kazunori; and Watanabe, Kiyoshi, 4,859,661, Cl. 514-183.000.
Kaneko, Kyoichi, to Daiwa Seiko Inc. Apparatus for folding fishing reel handle. 4,858,845, Cl. 242-285.000.
Kaneko, Tooru: *See—*
Kowaguchi, Toru; Kaneko, Tooru; Ide, Jun; and Iizumi, Tomoo, 4,860,131, Cl. 360-78.140.
Kanemoto, Seiichi; and Fukuoka, Mutsuo, to Brother Kogyo Kabushiki Kaisha. Automatic paper loading apparatus for printer having paper bail actuating device. 4,859,099, Cl. 400-636.100.
Kaneshige, Toshihiko: *See—*
Nishikawa, Meisei; Inagawa, Jun; Inagaki, Takeshi; Kaneshige, Toshihiko; Hayashi, Yasuhiro; and Kojima, Tadashi, 4,860,272, Cl. 369-48.000.
Kanno, Seizo, to Hiroyuki Hoshino. Method and device for igniting engines. 4,858,586, Cl. 123-620.000.
Kano, Atsushi; Ishiguro, Yasuyuki; Ogiri, Tadakazu; Ozaki, Hirofumi; and Yamashita, Yuji, to Mita Industrial Co., Ltd. Sealable toner recovery box for an image forming machine. 4,860,056, Cl. 355-298.000.
Kano, Fumihiko; Yamane, Takehiko; Yamashita, Katsuji; Hosoe, Kazunori; and Watanabe, Kiyoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Alkyl-substituted benzoxazinorifamycin derivative, process for preparing the same and antibacterial agent containing the same. 4,859,661, Cl. 514-183.000.
Kano, Junichi; and Aoki, Kongo, to Aisin Seiki-Kabushiki Kaisha. Two wheel/four wheel drive change over apparatus for four-wheel drive vehicles. 4,858,716, Cl. 180-233.000.
Kansas State University Research Foundation: *See—*
Lambert, Jack L.; Chiang, Yuan C.; and Paukstelis, Joseph V., 4,859,607, Cl. 426-135.000.
Kanzaki Kokyukoki Mfg. Co., Ltd.: *See—*
Nemoto, Shusuke, 4,858,739, Cl. 192-18.00R.
Kao Corporation: *See—*
Kamiya, Tetsuro; Inoue, Takeshi; Yorozu, Hidenori; Eguchi, Yasuteru; and Tsujii, Kaoru, 4,859,696, Cl. 514-420.000.
Kawahito, Shiro; and Minato, Masanori, 4,859,537, Cl. 428-411.100.
Suzuki, Toshio; and Okumura, Takeo, 4,859,457, Cl. 424-70.000.
Kapeller, Franz: *See—*
Herget, Gerhard H.; and Kapeller, Franz, 4,858,472, Cl. 73-784.000.
Kaplan, Sam: *See—*
Adler, Robert; Fogelson, Mark; and Kaplan, Sam, 4,859,996, Cl. 340-712.000.
Karacsonyi, Bela: *See—*
Pelyva, Jeno ; Vecsey, K. Istvan; Kolonics, Zoltan; Legradi, Laszlo; Nagy, Lajos; Horvath, Andras; Fodor, Ferenc, deceased; Soptei, Csaba; Sebok, Dezso; Tomordi, Elemer; Lendvai, Laszlo ; Karacsonyi, Bela; and Dioszegi, Erzsebet, 4,859,772, Cl. 544-11.000.
Karian, Jacques: *See—*
Deysson, Jean-Yves; Karian, Jacques; Malgrat, Philippe; and Blondeau, Michel, 4,859,121, Cl. 406-114.000.
Karl Oexmann, Inh. Wolfmann Oexmann, Firma: *See—*
Herting, Heinrich, 4,859,476, Cl. 426-87.000.
Karlberg, Niels G., to Danfoss A/S. Priority valve for hydraulic installations. 4,858,515, Cl. 91-516.000.
Karlotski, Robert: *See—*
Keeffe, William M.; Krasko, Zeya; Karlotski, Robert; and Morris, James C., 4,859,899, Cl. 313-25.000.
Karlsson, Jan-Erik: *See—*
Wiljanen, Bo I.; and Karlsson, Jan-Erik, 4,860,168, Cl. 361-428.000.
Karlsson, Karl-Anders; Norrby, Erling; and Wadell, Goran, to Symbicom AB. Antiviral agents. 4,859,769, Cl. 536-53.000.
Kasahara, Tsukasa: *See—*
Ezaki, Satoru; Tanaka, Kiyofumi; Kasahara, Tsukasa; Hirose, Tetsuya; and Nakagawa, Tetsuro, 4,858,659, Cl. 140-105.000.
Kasai, Kotoo. Ignition plug for improving fuel economy of an internal combustion engine and decreasing the amount of toxicants expelled to the environment. 4,859,900, Cl. 313-120.000.
Kashiwa, Bryan A. Snow ski and method of making the same. 4,858,945, Cl. 280-610.000.
Kashiyama Kogyo Co. Ltd.: *See—*
Chida, Shouhei; Yamaoto, Naoki; Miyazaki, Yasuo; and Sato, Yasunori, 4,859,119, Cl. 405-269.000.
Kassai nee Zieger, Anna: *See—*
Keve, Tibor; Megyeri, Gabor; Stefko , Bela; Kovacs, Lajos, Jr.; Kassai nee Zieger, Anna; Kiss, Bela; Laszlovszky, Istvan; Lapis, Erzsebet; Palosi, Eva; Groo, Dora; and Szporny, Laszlo , 4,859,682, Cl. 514-288.000.
Kassem, Gary M. Non-penetrating elastomeric membrane anchoring system. 4,858,412, Cl. 52-713.000.
Katagiri, Masayuki; Watanabe, Masanori; Uda, Kazutaka; Hijikigawa, Masaya; Tsuchimoto, Shuhei; and Inami, Yasuhiko, to 501 Sharp Kabushiki Kaisha. Variable interferometric device and a process for the production of the same. 4,859,060, Cl. 356-352.000.
Katagiri, Yoshitada: *See—*
Ukita, Hiroo; Katagiri, Yoshitada; Sawada, Renshi; Uenishi, Yuuji; Isomura, Yoshihiro; Toshima, Tomoyuki; and Mise, Keisuke, 4,860,276, Cl. 369-119.000.
Katano, Masaaki: *See—*
Aratani, Shinichi; Katano, Masaaki; and Mizoguchi, Takeshi, 4,859,636, Cl. 501-72.000.
Kataoka, Yoshiyuki: *See—*
Murase, Michio; Kataoka, Yoshiyuki; Inoue, Hisamichi; Naioh, Masanori; and Sugisaki, Toshihiko, 4,859,401, Cl. 376-282.000.
Katbi, Karl A.: *See—*
Patterson, John H.; Lowe, Tony M.; Bernadic, Thomas J.; Val, Yefim; Katbi, Karl A.; and Zimmerman, Charles E., 4,859,122, Cl. 407-114.000.
Kato, Akio; and Naito, Hideo, to Ichikoh Industries, Ltd. Lighting device for use with vehicles. 4,860,174, Cl. 362-61.000.
Kato, Kenji; and Okutani, Koji, to Janome Sewing Machine Co. Ltd. Initial operation controlling system for a computer controlled embroidering machine. 4,858,542, Cl. 112-121.120.
Kato, Nobuo: *See—*
Yasunami, Masabumi; Takase, Kahei; Meguro, Takashi; Suzuki, Katsumi; Hiwatashi, Osamu; Okutsu, Masaru; Kato, Nobuo; and Nakamura, Toru, 4,859,701, Cl. 514-510.000.
Kato, Nobuyuki; Kuramochi, Koujiro; Nakamura, Shinya; and Houjo, Yasuo, to Toyota Jidosha Kabushiki Kaisha. Hydraulic pressure control device for clutch for controlling drive torque distribution in four wheel drive device. 4,858,646, Cl. 137-596.160.
Kato, Shigeru: *See—*
Uehara, Makoto; Ichikawa, Hajime; Yomoto, Masahiko; and Kato, Shigeru, 4,859,832, Cl. 219-411.000.
Kato, Yasuo: *See—*
Fukuma, Yasufumi; Kitao, Ikuo; and Kato, Yasuo, 4,859,051, Cl. 351-211.000.
Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Yasunori, Yukio, to Sumitomo Chemical Company, Limited. Method for the production of polymethyl methacrylate. 4,859,750, Cl. 526-135.000.
Kato, Yoshinori; Nakanishi, Mitsuaki; Fujita, Yasushi; and Takagi, Nobuo, to Kabushiki Kaisha Togo Seisakusho. Hose clamp. 4,858,279, Cl. 24-20.00R.
Katoku, Takashi; and Tanaka, Masato, to Sony Corporation. Magnetic tape cassette. 4,858,848, Cl. 242-198.000.
Katsukawa Micarome Industrial Co. Ltd.: *See—*
Takada, Koji; Miyata, Masaya; and Tamura, Isojiro, 4,859,291, Cl. 204-49.000.
Katsumata, Toshimitsu: *See—*
Tonooka, Takashi; and Katsumata, Toshimitsu, 4,859,191, Cl. 439-79.000.
Katsurada, Morihiro: *See—*
Tanka, Hideaki; Katsurada, Morihiro; and Konya, Minehiro, 4,860,376, Cl. 382-57.000.
Katsuyama, Hitoshi, to Pioneer Electronic Corporation. Noise eliminating apparatus of a video signal utilizing a recursive filter having spatial low pass and high pass filters. 4,860,104, Cl. 358-167.000.
Katsuyama, Yoshiaki: *See—*
Wada, Toshiaki; Katsuyama, Yoshiaki; Furukawa, Mitsuhiko; Kitahira, Takashi; Miyahara, Michito; Misumi, Kiyohito; and Shiroyama, Masaharu, 4,859,638, Cl. 501-58.000.
Katto, Takayuki: *See—*
Ichikawa, Yukio; and Katto, Takayuki, 4,859,734, Cl. 524-447.000.
Katz, Howard E.: *See—*
Dirk, Carl W.; Katz, Howard E.; Lalama, Salvatore J.; Singer, Kenneth D.; and Sohn, John E., 4,859,876, Cl. 307-425.000.
Katz, Ira: *See—*
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,859,463, Cl. 424-84.000.
Kaufman, Lance R. Heat sink apparatus with electrically insulative intermediate conduit portion for coolant flow. 4,860,164, Cl. 361-388.000.
Kaufman, M. Gene: *See—*
Van Auken, John A.; and Kaufman, M. Gene, 4,859,986, Cl. 340-323.00R.
Kaufmann, Klaus-Dieter. Process for feeding gas stored in a cavern storage facility into a consumer network, and a layout for implementing such a process. 4,858,640, Cl. 137-236.100.
Kaumeyer, Jean M. Hangable compartmented bag. 4,859,084, Cl. 383-39.000.
Kaushik, Surender M.: *See—*
Chriswell, Colin D.; Kaushik, Surender M.; Shah, Navin D.; and Markuszewski, Richard, 4,859,212, Cl. 44-622.000.
Kawade, Yasuhiko: *See—*
Koesashi, Yuzo; Kawade, Yasuhiko; and Iwata, Yoshikazu, 4,859,123, Cl. 408-233.000.

Kawaguchi, Shinji: *See*—
Hosoda, Kenichiro; Kawaguchi, Shinji; Shinbo, Atsushi; and Yokota, Kiyoshi, 4,860,315, Cl. 375-30.000.

Kawahara, Katsushi: *See*—
Mochizuki, Kazuto; and Kawahara, Katsushi, 4,859,977, Cl. 336-65.000.

Kawahara, Takeshi: *See*—
Yamanaka, Torao; and Kawahara, Takeshi, 4,860,001, Cl. 340-825.200.

Kawaharazaki, Takashi: *See*—
Nishimura, Yuji; Kawaharazaki, Takashi; Tamura, Keiichi; Matsui, Kenji; Watanabe, Yasutaka; and Yoshitsugu, Noritada, 4,858,953, Cl. 280-807.000.

Kawahito, Shiro; and Minato, Masanori, to Kao Corporation. Thermal transfer recording medium. 4,859,537, Cl. 428-411.100.

Kawai, Hidemi: *See*—
Murakami, Seiro; Tanimoto, Akikazu; Makinouchi, Susumu; Kawai, Hidemi; and Murakami, Masaichi, 4,860,374, Cl. 382-48.000.

Kawai, Masao: *See*—
Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,858,500, Cl. 74-866.000.

Kawai, Taneichi: *See*—
Imaizumi, Tomoaki; Kawai, Taneichi; Nishida, Kouji; and Murakami, Yuuichi, 4,860,002, Cl. 340-825.310.

Kawakami, Hiroshi; Shiratori, Harunori; Sugihara, Koichi; Watanabe, Atsushi; and Kishida, Fumio, to Toyota Jidosha Kabushiki Kaisha. Power-assisted steering system. 4,858,713, Cl. 180-143.000.

Kawakami, Katsura; Shimazaki, Shigeo; Takayama, Satoshi; and Onodera, Chika, to Matsushita Electric Industrial Co., Ltd. Image processing apparatus. 4,860,109, Cl. 358-400.000.

Kawakami, Katsura: *See*—
Gurd, John R.; and Kawakami, Katsura, 4,860,250, Cl. 364-900.000.

Kawakami, Shin; Haruyama, Satoshi; Okonogi, Hirotaka; Nikaido, Katutomo; and Mukai, Norito, to Nippon CMK Corp. Printed wiring board. 4,859,805, Cl. 174-68.500.

Kawamoto, Hiroshi: *See*—
Shimohigashi, Katsuhiro; Masuda, Hiroo; Ikuzaki, Kunihiko; and Kawamoto, Hiroshi, 4,860,255, Cl. 365-189.000.

Kawamura, Hideo, to Isuzu Motors Limited. Control system for quick heater. 4,858,825, Cl. 237-2.00A.

Kawamura, Masao; and Usui, Minoru. Apparatus and method for driving signal electrodes for liquid crystal display devices. 4,859,998, Cl. 340-784.000.

Kawanishi, Hidenori: *See*—
Miyauchi, Nobuyuki; Kawanishi, Hidenori; Maei, Shigeki; Yamamoto, Osamu; and Hayashi, Hiroshi, 4,860,305, Cl. 372-92.000.

Kawasaki, Ken-ichiro: *See*—
Yokosawa, Seiichi; and Kawasaki, Ken-ichiro, 4,860,130, Cl. 360-77.020.

Kawasaki Steel Corp.: *See*—
I, Kanji; Kawasaki, Tatsuo; and Yasuhara, Eiko, 4,859,297, Cl. 204-145.00R.
Sone, Yuji; Wada, Kayoko; Kurahashi, Hayao; Nakai, Yoichi; Narutani, Tetsu; and Suzuki, Shigeharu, 4,859,287, Cl. 204-1.00T.

Kawasaki, Tatsuo: *See*—
I, Kanji; Kawasaki, Tatsuo; and Yasuhara, Eiko, 4,859,297, Cl. 204-145.00R.

Kawashima, Norio; and Haga, Hidemi. Paper feeder for a printer. 4,859,098, Cl. 400-616.000.

Kawashima, Teruhisa: *See*—
Sugiura, Sadanobu; Tokunaga, Kunishige; and Kawashima, Teruhisa, 4,858,794, Cl. 222-606.000.

Kawashimo, Norishige: *See*—
Matsubara, Kiyoshi; Yamaura, Tadashi; Kihara, Toshimasa; and Kawashimo, Norishige, 4,860,087, Cl. 357-68.000.

Kawauchi, Akihiro: *See*—
Arakawa, Tadao; Hashimoto, Tsuguo; and Kawauchi, Akihiro, 4,858,562, Cl. 122-7.00R.

Kay, Stephen L.: *See*—
Gotfryd, Casimer; Kay, Stephen L.; Klotz, Hartland P.; and Wentzel, Robert M., 4,859,820, Cl. 200-408.000.

Kayaba Industry Co. Ltd.: *See*—
Koiwai, Hideshi; and Sekikawa, Keiji, 4,858,651, Cl. 137-869.000.
Teruyama, Hideo; and Yano, Masaru, 4,859,161, Cl. 418-102.000.

Kazda, Stanislav: *See*—
Garthoff, Bernward; Gerold, Marcel; Hefti, Fridolin; Kazda, Stanislav; and Knorr, Andreas, 4,859,665, Cl. 514-221.000.

Kazmaier, Guenther: *See*—
Goller, Ernst; Wurst, Dieter; Kazmaier, Guenther; and Frei, Jochen, 4,858,446, Cl. 77-126.00R.

Keane, Martin A., to Bally Manufacturing Corporation. Nonuniform probability reel stop mechanism for gaming machines. 4,858,932, Cl. 273-143.00R.

Keeffe, William M.; Krasko, Zeya; Karlotski, Robert; and Morris, James C., to GTE Products Corporation. Metal-halide lamp having heat redistribution means. 4,859,899, Cl. 313-25.000.

Keesen, Werner: *See*—
Hartnack, Wolfgang; Keesen, Werner; and Schutze, Herbert, 4,860,097, Cl. 358-133.000.

Keibler-Thompson Corp.: *See*—
Mancuso, Matthew A., 4,859,126, Cl. 409-293.000.

Kelco International Limited: *See*—
Clare, Kenneth; and Gibson, William, 4,859,208, Cl. 8-557.000.

Keller, Peter: *See*—
Kaibel, Gerd; Hefner, Werner; Keller, Peter; and Drewitz, Werner, 4,859,286, Cl. 203-75.000.

Keller, Reinhold: *See*—
Thiem, Joachim; Treder, Wolfgang; Keller, Reinhold; and Schlingmann, Merten, 4,859,590, Cl. 435-97.000.

Kellerman, Richard: *See*—
Pond, Stephen F.; Kneezel, Gary A.; Lorenze, Robert V.; O'Horo, Michael P.; Maltz, Martin S.; and Kellerman, Richard, 4,860,030, Cl. 346-76.0PH.

Kelly, Leroy, to People's Telephone Cooperative, Inc. Network having a synchronizer for synchronization between a primary and a remote station. 4,860,287, Cl. 370-108.000.

Kelsey, Christopher G.; and McKenzie, Ian R., to Geoflow International Pty. Limited. Valve and valve roller sealing. 4,858,887, Cl. 251-212.000.

Kelso, Robert G.: *See*—
Nodelman, Neil H.; and Kelso, Robert G., 4,859,791, Cl. 560-91.000.

Kememy, George A., to Westinghouse Electric Corp. Electromagnetic launcher with improved rail energy recovery or dissipation. 4,858,513, Cl. 89-8.000.

Kempf, Richard J., to Du Pont de Nemours, E. I., and Company. Process for preparing positive and negative images using photohardenable electrostatic master. 4,859,551, Cl. 430-49.000.

Kendall Company, The: *See*—
Kolstedt, Mark; and Dye, John F., 4,858,596, Cl. 128-24.00R.

Kendig, Albert R. Security enclosure and gate system. 4,858,383, Cl. 49-360.000.

Kenig, Nisan. Belt grinder attachment for powered rotary tools. 4,858,390, Cl. 51-135.00R.

Kennametal Inc.: *See*—
Greenfield, Mark S.; and Conley, Edward V., 4,859,543, Cl. 428-552.000.

Kent, George M., to Plato Products, Inc. Desoldering aid and method. 4,858,820, Cl. 228-264.000.

Keogh, Raymond J.: *See*—
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Szenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,859,807, Cl. 174-68.500.

Keren, Hanan, to Elscint Ltd. Balun circuit for radio frequency coils in magnetic resonance systems. 4,859,950, Cl. 324-322.000.

Kerin, Edward R.: *See*—
Simon, Wayne E.; Sadeh, Willy Z.; Kerin, Edward R.; and Gamson, Bernard W., 4,859,347, Cl. 210-788.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Zimmer, Erich; Langen, Hans; and Scharf, Kurt, 4,859,368, Cl. 252-629.000.

Kerrey, John S., to Westinghouse Electric Corp. Method and apparatus for securing structural tubes in nuclear reactor fuel assemblies. 4,859,408, Cl. 376-450.000.

Kershner, Carl J.; and Burgess, Edward T., to Femto-Tech, Inc. Open grid pulsed ion chamber operating in the linear ion collection region. 4,859,854, Cl. 250-374.000.

Kersten, Ralf: *See*—
Bauch, Hartmut; Krause, Peter; Jost, Ulrike; Kersten, Ralf; Paquet, Volker; and Siefert, Wolfgang, 4,859,222, Cl. 65-3.120.

Kesling, Peter C., to TP Orthodontics, Inc. Edgewise bracket with Sved shaped slot and control means. 4,859,179, Cl. 433-8.000.

Keur, Robert I.: *See*—
Ozelis, Joseph P.; and Keur, Robert I., 4,860,027, Cl. 346-1.100.

Keve, Tibor; Megyeri, Gabor; Stefko , Bela; Kovacs, Lajos, Jr.; Kassai nee Zieger, Anna; Kiss, Bela; Laszlovszky, Istvan; Lapis, Erzsebet; Palosi, Eva; Groo, Dora; and Szporny, Laszlo , to Richter Gedeon Vegyeszeti Gyar Rt. 2-Halogenated-8- and 1,8-substituted ergolenes. 4,859,682, Cl. 514-288.000.

Kewin, Daniel D. Packaging for paper rolls (uniform wrap system). 4,858,762, Cl. 206-414.000.

Key Pharmaceuticals, Inc.: *See*—
Loftsson, Thorsteinn; and Bodor, Nicholas, 4,859,707, Cl. 514-625.000.

Khalifa, Ramzi A.: *See*—
Handley, John M.; and Khalifa, Ramzi A., 4,858,409, Cl. 52-489.000.

Khan, Mohammad K.: *See*—
Kim, Sang U.; and Khan, Mohammad K., 4,859,938, Cl. 324-158.00D.

Kiczek, Edward F.: *See*—
Davis, Lester W., Jr.; Geosits, John P.; Juedes, Dennis L.; and Kiczek, Edward F., 4,859,173, Cl. 431-175.000.

Kidder, Kenneth B.; Landis, William R.; and Patton, Paul B., to Honeywell Inc. Anti-bounce logic for critical loads. 4,858,885, Cl. 251-129.010.

Kidman, L. La Vere. Dispensing hanger for rolls of serially connected sheets. 4,858,840, Cl. 242-55.200.

Kiger, Virginia S.: *See*—
Savas, Peter G.; and Kiger, Virginia S., 4,859,336, Cl. 210-416.100.

Kihara, Toshimasa: *See*—
Matsubara, Kiyoshi; Yamaura, Tadashi; Kihara, Toshimasa; and Kawashimo, Norishige, 4,860,087, Cl. 357-68.000.

Kikuchi, Kazuto, to Sanden Corporation. Coupling mechanism for a compressor. 4,859,156, Cl. 417-319.000.

Kikuchi, Takashi: *See*—
Noguchi, Takeshi; Kikuchi, Takashi; and Takano, Kazuya, 4,858,733, Cl. 188-267.000.

Kikui, Hitoshi: *See*—
Okumura, Takuzo; Okada, Toyokazu; and Kikui, Hitoshi, 4,859,039, Cl. 350-398.000.

Killermann, Otmar: *See*—
Schulze, Joachim; Adler, Klaus; Selig, Manfred; Ball, Peter; Marquardt, Klaus; Killermann, Otmar; and Hannebaum, Manfred, 4,859,751, Cl. 526-200.000.

Kim, Bang M.; and Giles, Harold F., Jr., to General Electric Company. Reinforced composite and method of manufacture. 4,859,524, Cl. 428-236.000.

Kim, Hyung B.: *See*—
O'Sullivan, Maurice S.; Kim, Hyung B.; So, Vincent C.; and Vella, Paul J., 4,859,018, Cl. 350-96.160.

Kim, Sang U.; and Khan, Mohammad K., to Intel Corporation. Novel technique to detect oxydonor generation in IC fabrication. 4,859,938, Cl. 324-158.00D.

Kimberly-Clark Corporation: *See*—
Maycock, William E.; Nohr, Ronald S.; and MacDonald, J. Gavin, 4,859,759, Cl. 528-27.000.

Kimbrough, Earl P. Sealing apparatus for concentric conduits. 4,858,963, Cl. 285-138.000.

Kimura, Hisao: *See*—
Ukaji, Shiroh; Kimura, Hisao; Urata, Kenji; and Kaneda, Toshio, 4,859,824, Cl. 219-69.150.

Kimura, Kenji; and Tsuji, Kiyoshi, to Olympus Optical Co., Ltd. Video image processing apparatus for emphasizing color of an image by enhancing saturation. 4,860,091, Cl. 358-22.000.

Kimura, Kenji; and Tsuji, Kiyoshi, to Olympus Optical Co., Ltd. Video camera apparatus and video endoscope apparatus with means for compensating image errors caused by differing cable lengths. 4,860,095, Cl. 358-98.000.

Kimura, Rokusaburo; Watari, Yoshie; and Makayama, Satoshi, to Matsushita Electric Works, Ltd. Electromagnetic air pump. 4,859,152, Cl. 417-63.000.

Kimura, Saburo: *See*—
Toyonaga, Yufuko; Kimura, Suzushi; Ueda, Masaaki; Tabata, Osamu; and Kimura, Saburo, 4,859,496, Cl. 427-53.100.

Kimura, Suzushi: *See*—
Toyonaga, Yufuko; Kimura, Suzushi; Ueda, Masaaki; Tabata, Osamu; and Kimura, Saburo, 4,859,496, Cl. 427-53.100.

Kincaid, Harry R.; and Riggs, Walter S., to IRD Mechanalysis, Inc. Vibration transducer mounting. 4,858,470, Cl. 73-654.000.

King, Howard E.: *See*—
Wong, Jimmy L. Y.; and King, Howard E., 4,860,020, Cl. 343-828.000.

King Instrument Corporation: *See*—
Woodley, George M.; McGrail, Richard A.; Powers, Stephen J.; and Ross, William W., 4,858,841, Cl. 242-56.00R.

King, James A., to J. I. Case Company. Engine component heating and cooling assembly. 4,858,565, Cl. 123-41.310.

King, Michael F., to General Motors Corporation. Shift inhibit valve for a transmission control. 4,858,501, Cl. 74-868.000.

King, William L., to Samsonite Corporation. Garment bag support hook. 4,858,867, Cl. 248-214.000.

Kinnan, Frank R., to Underground Technologies, Inc. Self-propelled subsoil penetrating tool system. 4,858,703, Cl. 175-19.000.

Kinnard, J. R.; and Oliver, Dennis N., to International Business Machines Corporation. Power supply for electroluminescent panel. 4,859,911, Cl. 315-169.300.

Kinoshita, Seiichiro, to NEC Corporation. Vector data processing system comprising an I/O control for each vector data processor and another I/O control for at least one other vector data processor. 4,860,245, Cl. 364-900.000.

Kirchner, Peter D.; Marks, Ronald F.; Pettit, George D.; Woodall, Jerry M.; and Wright, Steven L., to International Business Machines Corporation. Semiconductor electro-optical conversion. 4,860,066, Cl. 357-16.000.

Kirker, Garry W.: *See*—
Landis, Michael E.; Aufdembrink, Brent A.; Chu, Pochen; Johnson, Ivy D.; Kirker, Garry W.; Page, Nancy M.; and Rubin, Mae K., 4,859,648, Cl. 502-242.000.

Kirkpatrick, Edward: *See*—
Nichols, John L.; Wang, David; Kirkpatrick, Edward; Viehweg, Clark M.; Morton, Edwin S.; and Hua, Van T., 4,860,112, Cl. 358-400.000.

Kishida, Fumio: *See*—
Kawakami, Hiroshi; Shiratori, Harunori; Sugihara, Koichi; Watanabe, Atsushi; and Kishida, Fumio, 4,858,713, Cl. 180-143.000.

Kishida, Hideo, to Dai Nippon Insatsu Kabushiki Kaisha. Lenticular lens screen. 4,859,027, Cl. 350-128.000.

Kishida, Tsuyoshi: *See*—
Odaka, Hiroshi; and Kishida, Tsuyoshi, 4,858,780, Cl. 220-359.000.

Kiss, Bela: *See*—
Keve, Tibor; Megyeri, Gabor; Stefko , Bela; Kovacs, Lajos, Jr.; Kassai nee Zieger, Anna; Kiss, Bela; Laszlovszky, Istvan; Lapis, Erzsebet; Palosi, Eva; Groo, Dora; and Szporny, Laszlo , 4,859,682, Cl. 514-288.000.

Kita, Yasushi; and Moroi, Shirou, to Central Glass Company, Limited. Method of producing ultrafine particles of graphite fluoride. 4,859,444, Cl. 423-439.000.

Kitabatake, Yasosuo: *See*—
Nakamura, Tadashi; Kitabatake, Yasosuo; Takahashi, Yoshiaki; and Maeda, Kazuya, 4,859,560, Cl. 430-137.000.

Kitagaki, Takashi: *See*—
Yamamoto, Yasuo; Inaba, Akira; and Kitagaki, Takashi, 4,859,364, Cl. 252-512.000.

Kitagishi, Nozomu; and Hattori, Jun, to Canon Kabushiki Kaisha. Optical system having gradient-index lens and method for correcting aberrations. 4,859,040, Cl. 350-413.000.

Kitahira, Takashi: *See*—
Wada, Toshiaki; Katsuyama, Yoshiaki; Furukawa, Mitsuhiko; Kitahira, Takashi; Miyahara, Michito; Misumi, Kiyohito; and Shiroyama, Masaharu, 4,859,638, Cl. 501-58.000.

Kitao, Ikuo: *See*—
Fukuma, Yasufumi; Kitao, Ikuo; and Kato, Yasuo, 4,859,051, Cl. 351-211.000.

Kitayama, Shiro: *See*—
Shida, Yoshiaki; Kitayama, Shiro; and Nishikawa, Tomio, 4,859,415, Cl. 420-417.000.

Kittrell, James M.: *See*—
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whitlock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,859,513, Cl. 428-34.200.

Kjelleberg, Staffan; and Ronnow, Peter, to Chemical Dynamics Sweden AB. Method of detaching micro-flora and compositions therefor. 4,859,656, Cl. 514-54.000.

Klaassen, Dirk B. M.: *See*—
De Leeuw, Dagobert M.; Klaassen, Dirk B. M.; and Mutsaers, Cornelis A. H. A., 4,859,902, Cl. 313-474.000.

Klearfold, Inc.: *See*—
Herrin, Melvin B.; and Mazurek, Richard, 4,858,756, Cl. 206-45.34C.

Klee, Mareike K.; and Brand, Hans-Wolfgang, to U.S. Philips Corporation. Method of manufacturing powdered barium titanate. 4,859,448, Cl. 423-598.000.

Kleen, Berend: *See*—
Charton, Rene ; and Kleen, Berend, 4,859,942, Cl. 324-208.000.

Klein, Hans-Christof, to Alfred Teves GmbH. Brake cylinder-piston slave unit seal having radial roll-back protrusion for piston spring back retract. 4,858,516, Cl. 92-240.000.

Klein Meuleman, Peter; and La Vos, Peter G., to Oce-Nederland B.V. Printing device having a rotatable image-receiving support. 4,860,035, Cl. 346-157.000.

Klein, Scott I.: *See*—
Youssefyeh, Raymond; Klein, Scott I.; Campbell, Henry F.; and Kuhla, Donald E., 4,859,683, Cl. 514-299.000.

Kleine-Moellhoff, Peter: *See*—
Brand, Reinhold; Engler, Bernd; Kleine-Moellhoff, Peter; and Koberstein, Edgar, 4,859,428, Cl. 422-179.000.

Kleiner, Hans-Jerg: *See*—
Gerdau, Thomas; Kleiner, Hans-Jerg; and Pawlowski, Georg, 4,859,795, Cl. 564-12.000.
Pawlowski, Georg; Kleiner, Hans-Jerg; and Gerdau, Thomas, 4,859,562, Cl. 430-175.000.

Kleinsasser, Alan W.: *See*—
Jackson, Thomas N.; Kleinsasser, Alan W.; and Woodall, Jerry M., 4,860,067, Cl. 357-16.000.

Kleiven, Atle: *See*—
Haugland, Tor A.; Kleiven, Atle; and Selvaer, Ole K., 4,860,264, Cl. 367-17.000.

Kliman, Gerald B.; Brynsvold, Glen V.; and Jahns, Thomas M., to General Electric Company. Winding for linear pump. 4,859,885, Cl. 310-11.000.

Kliman, Gerald B.; and Jones, Donald W., to General Electric Company. Electromagnetic motor/actuator. 4,859,974, Cl. 335-229.000.

Klimt, Ulrich: *See*—
Thiel, Rudolf; Klimt, Ulrich; and Zaviska, Dalibor, 4,858,728, Cl. 188-73.310.

Klingbiel, August G., to Oneac Corporation. Tap switching protection circuit. 4,860,145, Cl. 361-18.000.

Klober GmbH & Co.: *See*—
Steinmann, Joachim, 4,858,993, Cl. 297-302.000.

Kloppenburg, Ernst, to AEG Olympia AG. Method and apparatus for producing a speed control voltage for direct current motors in typewriters or similar office machines. 4,859,918, Cl. 388-815.000.

Klosin, John J.; and Venezia, J. William, to Homac Mfg. Company. Flat cable and sealing element. 4,859,812, Cl. 174-135.000.

Klotz, Hartland P.: *See*—
Gotfryd, Casimer; Kay, Stephen L.; Klotz, Hartland P.; and Wentzel, Robert M., 4,859,820, Cl. 200-408.000.

Kluga, Benjamin. Circle cutter employing base, swivel handle, and pivot bar with adjustable knife. 4,858,322, Cl. 30-310.000.

Knapp, Heinrich, to Robert Bosch GmbH. Internal combustion engine. 4,858,567, Cl. 123-52.00M.

Knauer, Alfred; and Projahn, Ulrich, to Robert Bosch GmbH. Pilot burner for an apparatus for burning off solid particles in the exhaust gas of internal combustion engines. 4,858,432, Cl. 60-303.000.

Knauer, Alfred; Leonhard, Rolf; Projahn, Ulrich; and Stolper, Wolfgang, to Robert Bosch GmbH. Pilot burner for an apparatus for burning off solid particles in the exhaust gas of internal combustion engines. 4,858,433, Cl. 60-303.000.

Kneezel, Gary A.: *See*—
Pond, Stephen F.; Kneezel, Gary A.; Lorenze, Robert V.; O'Horo, Michael P.; Maltz, Martin S.; and Kellerman, Richard, 4,860,030, Cl. 346-76.0PH.

Knight, Douglas G.; and Benyon, William, to Northern Telecom Limited. Interrupted liquid phase epitaxy process. 4,859,628, Cl. 437-133.000.

Knight, Edwin L.: *See*—
Clough, Arthur H.; and Knight, Edwin L., 4,858,387, Cl. 51-34.00E.

Knodle, Daniel W.; Mace, Leslie E.; and Labuda, Lawrence L., to Cascadia Technology Corporation. Gas analyzers. 4,859,858, Cl. 250-504 00R.

Knodle, Daniel W.; and Crone, William E., to Cascadia Technology Corporation. Gas analyzers. 4,859,859, Cl. 250-504.00R

Knoll, Berta: *See—*
Knoll, Jozsef; Harmath, Sandor; Nagy, Janos; and Knoll, Berta, 4,859,766, Cl. 530-380.000.

Knoll, Frederick L., to Boeing Company, The. Method for consolidating composite materials. 4,859,267, Cl. 156-273.700.

Knoll, Jozsef; Harmath, Sandor; Nagy, Janos; and Knoll, Berta, to Richter Gedeon Vegyeszeti. Purified appetite-regulating substances of biological orgin, their antibodies, immunocomplexes of the appetite—regulating substances formed with the antibodies and processes for preparing same. 4,859,766, Cl. 530-380.000

Knorr, Andreas: *See—*
Garthoff, Bernward; Gerold, Marcel; Hefti, Fridolin; Kazda, Stanislav; and Knorr, Andreas, 4,859,665, Cl. 514-221.000

Knox, Lawrence D.; and Tsals, Izrail, to Caterpillar Inc. Method of bonding a magnetostrictive sheet to a shaft. 4,858,818, Cl. 228-164.000

Knox, Richard C.: *See—*
Terwilliger, Donald N.; and Knox, Richard C., 4,858,938, Cl. 279-57.000.

Knudsen, Erik. Scissor mechanism in particular for lift tables. 4,858,482, Cl. 74-110.000.

Kobayashi, Atsushi; Suzuki, Takashi; and Kosugi, Yasuhiko, to Seiko Epson Corporation. Image forming apparatus. 4,860,058, Cl. 355-27.000

Kobayashi, Herbert S.: *See—*
Shores, Paul W.; Griffin, John W.; and Kobayashi, Herbert S., 4,860,014, Cl. 342-105.000

Kobayashi, Kazuo; Fukazawa, Masashi; and Ishikawa, Shinji, to Nippon Mektron, Ltd. Novel perfluoropolyether and process for producing the same. 4,859,299, Cl. 204-157.920.

Kobayashi, Kazuyoshi: *See—*
Kagami, Toshihiko; Kobayashi, Kazuyoshi; Asakawa, Eiji; Osada, Atushi; Hara, Kozo; and Abe, Yasuji, 4,859,993, Cl. 340-674.000.

Kobayashi, Koji, to Yamatake-Honewell Co., Ltd. Data transmission system using sending right request signal transferred through loop transmission path. 4,860,000, Cl. 340-825.500.

Kobayashi, Naoki: *See—*
Sasaki, Hidemi; and Kobayashi, Naoki, 4,860,136, Cl. 360-99.050.

Kobayashi, Osamu; and Gotch, Kunihiko, to Fujitsu Limited. Voltage level setting circuit. 4,859,871, Cl. 307-264.000.

Kobayashi, Tadashi, to Kabushiki Kaisha Toshiba. Information storage medium and method of erasing information. 4,860,274, Cl. 369-100.000.

Kobayashi, Tadashi: *See—*
Takayanagi, Hiroshi; Kobayashi, Tadashi; Masuda, Takayoshi; and Shinoda, Hosei, 4,859,763, Cl. 528-357.000.

Kobayashi, Takumi: *See—*
Kurei, Hiroshi; Arai, Akihiro; and Kobayashi, Takumi, 4,860,043, Cl. 354-286.000.

Kobayashi, Yoichi: *See—*
Kan, Tatsuhiko; Kobayashi, Yoichi; Sonoike, Yoshiko; Terashima, Tsuneo; and Mutai, Masahiko, 4,859,488, Cl. 426-658.000.

Kobayashi, Yukimori: *See—*
Shirai, Eiji; Okabe, Yoshio; and Kobayashi, Yukimori, 4,858,572, Cl. 123-90.120.

Koberstein, Edgar: *See—*
Brand, Reinhold; Engler, Bernd; Kleine-Moellhoff, Peter; and Koberstein, Edgar, 4,859,428, Cl. 422-179.000.

Koboshi, Shigeharu: *See—*
Kurematsu, Masayuki; and Koboshi, Shigeharu, 4,859,575, Cl. 430-428.000.

Koch, Frank J., to Beamish, Linda Koch. Spring wire fastener and method of using same. 4,859,127, Cl. 411-16.000.

Koch, Max, to Komax AG. Transport system for electrical cables. 4,858,311, Cl. 29-857.000

Koesashi, Yuzo; Kawade, Yasuhiko; and Iwata, Yoshikazu, to Mitsubishi Kinzoku Kabushiki Kaisha. Insert boring tool. 4,859,123, Cl. 408-233.000.

Koga, Shiro: *See—*
Suzuki, Hitoshi; Hara, Kozo; Koga, Shiro; and Morita, Shigeru, 4,860,363, Cl. 381-89.000.

Kogiso, Takashi: *See—*
Ito, Shunji; Ito, Kanehiro; Kogiso, Takashi; and Kurachi, Yoshio, 4,858,746, Cl. 198-465.400.

Kohama, Tokio: *See—*
Obayashi, Hideki; Nishio, Yoshitaka; Kohama, Tokio; and Goto, Hiroyuki, 4,858,568, Cl. 123-52.00M.

Kohl, James E.; and Watrous, Donald L., to Pacific Bell. System for detecting and locating defective crosspoint switches. 4,860,334, Cl. 379-16.000.

Kohler, Joachim: *See—*
Greiche, Joussef; Hartmann, Peter; and Kohler, Joachim, 4,859,459, Cl. 424-71.000.

Kohler, Wilfried: *See—*
Behre, Horst; Blnak, Heinz U.; Kohler, Wilfried; Muller, Nikolaus; and Schnegg, Peter, 4,859,372, Cl. 562-74.000

Kohno, Masami, to Ishida Scales Mfg. Co. Ltd. Combinatorial weighing apparatus. 4,858,708, Cl. 177-25.180.

Koike, Akio: *See—*
Koshimura, Katsumi; and Koike, Akio, 4,860,369, Cl. 381-188.000.

Koike, Tadashi: *See—*
Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; Hosono, Yoichi; Takahara, Shigeru; and Koike, Tadashi, 4,859,569, Cl. 430-270.000

Koivukunnas, Pekka: *See—*
Westergard, Sivert; and Koivukunnas, Pekka, 4,858,553, Cl. 118-126.000.

Koiwai, Hideshi; and Sekikawa, Keiji, to Kayaba Industry Co. Ltd. Control valve for construction equipment. 4,858,651, Cl. 137-869.000.

Kojima, Tadashi: *See—*
Nishikawa, Meisei; Inagawa, Jun; Inagaki, Takeshi; Kaneshige, Toshihiko; Hayashi, Yasuhiro; and Kojima, Tadashi, 4,860,272, Cl. 369-48.000.

Kojima, Takeshi, to T. Chatani & Co., Ltd. Surface illuminating apparatus. 4,860,171, Cl. 362-31.000.

Kojima, Tetsuro: *See—*
Hirano, Shigeo; Kojima, Tetsuro; Yamamoto, Mitsuru; Inoue, Noriyuki; and Heki, Tatsuo, 4,859,579, Cl. 430-598.000.

Kojo, Takeshi, to Matsushita Electronics Corporation. Semiconductor integrated circuit. 4,860,083, Cl. 357-51.000.

Kokai, Jozsef: *See—*
Balina, Istvan; Kokai, Jozsef; Boro , Lajos; and Torba, Lajos, 4,858,451, Cl. 70-202.000.

Kokubu, Nobuaki, to Canon Kabushiki Kaisha. Communication terminal device. 4,860,110, Cl. 358-400.000

Kokusan Kinzoku Kogyo Kabushiki Kaisha: *See—*
Namazue, Hirotoshi, 4,858,453, Cl. 70-278.000.

Kollmorgen Technologies Corporation: *See—*
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Szenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,859,807, Cl. 174-68.500.

Kolonics, Zoltan: *See—*
Pelyva, Jeno ; Vecsey, K. Istvan; Kolonics, Zoltan; Legradi, Laszlo; Nagy, Lajos; Horvath, Andras; Fodor, Ferenc, deceased; Soptei, Csaba; Sebok, Dezso; Tomordi, Elemer; Lendvai, Laszlo ; Karacsonyi, Bela; and Dioszegi, Erzsebet, 4,859,772, Cl. 544-11.000.

Kolstedt, Mark; and Dye, John F., to Kendall Company, The. Portable sequential compression device. 4,858,596, Cl. 128-24.00R.

Komai, Yukio; and Oda, Keijiro, to Toyo Tire & Rubber Company Limited. Radial tire. 4,858,666, Cl. 152-556.000.

Komatsu, Yasuhiro, to Hosiden Electronics Co., Ltd. Connector. 4,859,199, Cl. 439-267.000.

Komax AG. *See—*
Koch, Max, 4,858,311, Cl. 29-857.000.

Komori, Ken-ichi, to Sanyo Electric Co., Ltd. Parts mounting apparatus. 4,858,308, Cl. 29-740.000.

Komuro, Hirokazu: *See—*
Shiozaki, Atsushi; Komuro, Hirokazu; Sato, Koichi; and Masuda, Kazuaki, 4,860,033, Cl. 346-140.00R.

Kondo, Edward S.: *See—*
Puritch, George S.; and Kondo, Edward S., 4,859,689, Cl. 514-358.000

Kondo, Masafumi: *See—*
Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; Kondo, Masafumi; and Yamamoto, Saburo, 4,860,297, Cl. 372-45.000.

Kondo, Masaki: *See—*
Hosoda, Masahiro; Sasaki, Kazuaki; Kondo, Masaki; and Yamamoto, Saburo, 4,860,299, Cl. 372-46.000.

Kondou, Harufusa; and Ando, Hideki, to Mitsubishi Denki Kabushiki Kaisha. Arithmetic unit with alternate mark inversion (AMI) coding 4,860,235, Cl. 364-716.000.

Kondou, Mitsushige: *See—*
Kono, Keizo; Kondou, Mitsushige; Tsubouchi, Natsuro; Hine, Shiro; Nishihara, Hiroshi; and Suhara, Toshiaki, 4,859,033, Cl. 350-320.000.

Konica Corporation: *See—*
Okamoto, Yukio, 4,860,063, Cl. 355-208.000.

Konicke, Michael L.; Veitengruber, James E.; and Loesch, James G., to Boeing Company, The. Integrated primary flight display. 4,860,007, Cl. 340-173.000.

Konishi, Keiichi: *See—*
Morishita, Akira; Konishi, Keiichi; and Tanaka, Toshinori, 4,859,895, Cl. 310-261.000.

Konishi, Ryusaku, to Nippon Zoki Pharmaceutical Co., Ltd. Adhesive bandage. 4,858,604, Cl. 128-156.000.

Konishi, Satoshi; Nagasaki, Takanori; Yokogawa, Nobuhisa; and Naruse, Yuji, to Japan Atomic Energy Research Institute. Active metal bed. 4,859,427, Cl. 422-159.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Inoue, Katsuyo, 4,859,061, Cl. 356-359.000.
Kanai, Kunio; and Yamamoto, Toshiyuki, 4,860,044, Cl. 354-321.000.
Kuramatsu, Masayuki; and Koboshi, Shigeharu, 4,859,575, Cl. 430-428.000.
Yamazaki, Toshinori; Sakai, Eiichi; Nakanishi, Tatsuo; and Nomori, Hiroyuki, 4,859,554, Cl. 430-58.000.

Konno, Mark A.; and Ripley, John A., to Baxter Travenol Laboratories, Inc. Thermodilution method and apparatus for determining right ventricular ejection fraction. 4,858,618, Cl. 128-7.300.

Kono, Keizo; Kondou, Mitsushige; Tsubouchi, Natsuro; Hine, Shiro; Nishihara, Hiroshi; and Suhara, Toshiaki, to Mitsubishi Denki Kabushiki Kaisha. Method of producing optical head assembly. 4,859,033, Cl. 350-320.000.

Konya, Minehiro: *See—*
Tanka, Hideaki; Katsurada, Morihiro; and Konya, Minehiro, 4,860,376, Cl. 382-57.000.

Koo, Ja-young: *See—*
Fibiger, Richard F.; Koo, Ja-young; Forgach, David J.; Petersen, Robert J.; Schmidt, Donald L.; Wessling, Ritchie A.; and Stocker, Thomas F., 4,859,384, Cl. 264-45.100.

Kopatz, Nelson E.: *See—*
Johnson, Walter A.; Kopatz, Nelson E.; and Ritsko, Joseph E., 4,859,237, Cl. 75-0.5AA.

Kopf, Arthur: *See—*
Allgaier, Jurgen; Ganter, Wolfgang; Hodapp, Wolfram; Kopf, Arthur; and Maurer, Roland, 4,860,268, Cl. 368-47.000.

Korsunsky, Iosif; Bateman, Steven P.; and Schroepfer, Richard C., to AMP Incorporated. Extraction tool. 4,858,309, Cl. 29-764.000.

Koshimura, Katsumi; and Koike, Akio, to Kabushiki Kaisha Seidenko. Flat speaker unit. 4,860,369, Cl. 381-188.000.

Koso, Dusan A., to Gerber Scientific Instrument Company, Inc. Pattern-boundary image generation system and method. 4,859,999, Cl. 340-799.000.

Kosrow, Robert L.: *See—*
Adamski, Maximilian; Kosrow, Robert L.; and Ruderman, Stephen, 4,858,546, Cl. 112-286.000.

Kosugi, Yasuhiko: *See—*
Kobayashi, Atsushi; Suzuki, Takashi; and Kosugi, Yasuhiko, 4,860,058, Cl. 355-27.000.

Kotter, Clemens: *See—*
Westermann, Jurgen; Kruger, Martin; Arndt, Friedrich; Rees, Richard; and Kotter, Clemens, 4,859,231, Cl. 71-93.000.

Kotzin, Michael D.: *See—*
van den Heuvel, Anthony P.; Kotzin, Michael D.; and Crisler, Kenneth J., 4,860,312, Cl. 375-26.000.

Kouchiwa, Taira, to Ricoh Company, Ltd. Large aperture lens system for use in a copier. 4,859,044, Cl. 350-464.000.

Kouno, Katsumi. Hydraulic control system for continuously variable transmission for automotive vehicle. 4,858,497, Cl. 74-866.000.

Kovacs, Lajos, Jr.: *See—*
Keve, Tibor; Megyeri, Gabor; Stefko , Bela; Kovacs, Lajos, Jr.; Kassai nee Zieger, Anna; Kiss, Bela; Laszlovszky, Istvan; Lapis, Erzsebet; Palosi, Eva; Groo, Dora; and Szporny, Laszlo , 4,859,682, Cl. 514-288.000.

Kovacs, Laszlo : *See—*
Szabo nee Mogyorossi, Katalin; Kalocsai, Istvan; Gyoni, Istyan; Remenyi, Karoly; Plaveczky, Gyorgy; Kovacs, Laszlo ; Gal, Dezso ; Nemes, Istvan; Botar, Laszlo ; Bencsura, Akos; Moger nee Jeremejeva, Galina; Heberger, Karoly; and Nemeth, Andras, 4,859,209, Cl. 44-51.000.

Koves, William J.: *See—*
Sechrist, Paul A.; and Koves, William J., 4,859,643, Cl. 502-37.000.

Kowaguchi, Toru; Kaneko, Tooru; Ide, Jun; and Iizumi, Tomoo, to Alps Electric Co., Ltd. Method for recorrecting head position in a disk drive. 4,860,131, Cl. 360-78.140.

Kowalski, Joseph L.: *See—*
D'Avello, Robert F.; Tobolski, Francis P., Jr.; and Kowalski, Joseph L., 4,860,341, Cl. 379-91.000.

Koyama, Takeshi: *See—*
Suda, Yasuo; Ohnuki, Ichiro; Akashi, Akira; Ishizaki, Akira; Ohtaka, Keiji; and Koyama, Takeshi, 4,859,842, Cl. 250-201.000.

Koyama, Tsunehiro, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device. 4,860,065, Cl. 357-15.000.

Kozakae, Kunitoshi; and Takeda, Toru, to Bridgestone Cycle Co., Ltd. Inscribed transmission device. 4,858,485, Cl. 74-399.000.

Kraker, Alfred, to Siemens Aktiengesellschaft. Digital sine generator. 4,860,238, Cl. 364-721.000.

Krasko, Zeya: *See—*
Keeffe, William M.; Krasko, Zeya; Karlotski, Robert; and Morris, James C., 4,859,899, Cl. 313-25.000.

Kraus, Charles E., to Excelermatic Inc. Infinitely variable traction roller transmission. 4,858,484, Cl. 74-200.000.

Kraus, Willibald, to TRW United Carr GmbH. Plastic holding device. 4,859,129, Cl. 411-512.000.

Krause, Brian R., to Warner-Lambert Company. Lipid regulating compositions. 4,859,703, Cl. 514-543.000.

Krause, Matthias R., to U.S. Philips Corporation. Load cell. 4,858,710, Cl. 177-211.000.

Krause, Peter: *See—*
Bauch, Hartmut; Krause, Peter; Jost, Ulrike; Kersten, Ralf; Paquet, Volker; and Siefert, Wolfgang, 4,859,222, Cl. 65-3.120.

Krauskopf, Joseph C., to Intel Corporation. Microprocessor breakpoint apparatus. 4,860,195, Cl. 364-200.000.

Kravas, Helen A.: *See—*
Gillberg-LaFore, Gunilla E.; and Kravas, Helen A., 4,859,350, Cl. 252-8.900.

Krebs, Arthur D.; and Guenette, Martin C. Grocery shopper organizer. 4,858,353, Cl. 40-308.000.

Kreifels, Jerry A.; and Hoekstra, George, to Intel Corporation. Leakage verification for flash EPROM. 4,860,261, Cl. 365-218.000.

Kreinberg, Earl R.: *See—*
Daly, John K.; and Kreinberg, Earl R., 4,859,204, Cl. 439-424.000.

Kreisberg, Alan J.; and Prowler, Millard E., to Fuller Company. Apparatus for incinerating combustible material. 4,859,177, Cl. 432-14.000.

Krenkel, Bernhard; and Joos, Heinz, to F. Oberdorfer GmbH & Co. KG Industriegewebe-Technik. Process of producing tension-proof, impermeable, flexible bands, in particular for presses to dewater fiber material webs. 4,859,396, Cl. 264-311.000.

Krenn, Stephan: *See—*
Gierse, Franz J.; Pabst, Manfred; Hermanns, Heinz; Ippers, Karl; Krenn, Stephan; Huppe, Friedrich; Opgenoorth, Carl H.; and Wolters, Conrad, 4,858,843, Cl. 242-65.000.

Kress, Hans-Jurgen: *See—*
Damrath, Volker; Lindner, Christian; Kress, Hans-Jurgen; and Wittmann, Dieter, 4,859,740, Cl. 525-100.000.

Kreuz, Hans-Otto; and Grisse, Hans Jochen. Device for determining the charge profile in a shaft furnace. 4,858,892, Cl. 266-99.000.

Krieger, Paul A.: *See—*
Jones, Wallace R.; Isaksen, Robert A.; and Krieger, Paul A., 4,859,512, Cl. 428-40.000.

Krinsky, Jeffrey A.; and Falk, Robert A., to Boeing Company, The. Optical receiver having optical gain medium and mode selector. 4,859,015, Cl. 350-96.150.

Kroener, Michael: *See—*
Hoelderich, Wolfgang; Kroener, Michael; Kroetzsch, Peter; and Biffar, Werner, 4,859,642, Cl. 502-2.000.

Kroener, Wolfgang, to Pforzheimer Uhren-Rohwerke PORTA GmbH. Drive coupling. 4,860,270, Cl. 368-322.000.

Kroetzsch, Peter: *See—*
Hoelderich, Wolfgang; Kroener, Michael; Kroetzsch, Peter; and Biffar, Werner, 4,859,642, Cl. 502-2.000.

Krogsgaard-Larsen, Povl: *See—*
Eison, Michael S.; and Krogsgaard-Larsen, Povl, 4,859,666, Cl. 514-221.000.

Kronenberg, Stanley, to United States of America, Army. Solid state gamma ray dosimeter which measures radiation in terms of absorption in a material different from the detector material. 4,859,853, Cl. 250-370.070.

Kroy Inc.: *See—*
Plotnick, Michael A., 4,859,093, Cl. 400-120.000.

Kruger, Martin: *See—*
Westermann, Jurgen; Kruger, Martin; Arndt, Friedrich; Rees, Richard; and Kotter, Clemens, 4,859,231, Cl. 71-93.000.

Krum, Richard G.: *See—*
Bingaman, Barrett P.; Krum, Richard G.; and Williams, James R., 4,858,808, Cl. 226-95.000.

Kruse, Lawrence I.: *See—*
Finkelstein, Joseph A.; Kruse, Lawrence I.; and Leonard, Thomas B., 4,859,779, Cl. 538-321.000.

Kruske, Gerhard: *See—*
Maxeiner, Heinz; Kruske, Gerhard; and Reimann, Hartwig, 4,859,541, Cl. 428-545.000.

Kubitschek, James E.: *See—*
Long, Eugene C.; Kubitschek, James E.; and Horacek, Stephen M., 4,860,096, Cl. 358-101.000.

Kubo, Michinori; and Matsuda, Reiko, to Senju Pharmaceutical Co., Ltd. Compositions and method for decomposing adipose tissue. 4,859,468, Cl. 424-195.100.

Kubo, Susumu, to Kabushiki Kaisha Toshiba. Information transmission control apparatus for elevator system. 4,860,207, Cl. 364-424.010.

Kubota Ltd.: *See—*
Ikeda, Kenji, 4,858,435, Cl. 60-441.000.

Kubota, Norio: *See—*
Tone, Shoichi; and Kubota, Norio, 4,858,836, Cl. 242-18.00R.

Kubsh, Joseph E.: *See—*
Pereira, Carmo J.; Kubsh, Joseph E.; and Hegedus, Louis, 4,859,433, Cl. 423-212.000.

Kudo, Yoshinobu: *See—*
Hata, Yoshiaki; Taniguchi, Nobuyuki; Hoda, Takeo; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,860,039, Cl. 354-106.000.

Kudo, Yoshio: *See—*
Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kuramoto, Shinichi; Sugiyama, Yoshihiro; Takanashi, Hajime; Ishizuka, Takashi; Kudo, Yoshio; and Sato, Yoshio, 4,860,050, Cl. 355-256.000.

Kudrow, Lee: *See—*
Simmons, Ethel D.; and Kudrow, Lee, 4,858,259, Cl. 5-441.000.

Kuenast, Christoph: *See—*
Buerstinghaus, Rainer; Hofmeister, Peter; and Kuenast, Christoph, 4,859,706, Cl. 514-624.000.

Kugimiya, Syuzo; Tokunaga, Shinji; Suzuki, Hitoshi; Fukumochi, Yoji; Shiotani, Shinobu; and Sata, Ichiko, to Sharp Kabushiki Kaisha. Translation system allowing user designation of postpositional words. 4,860,206, Cl. 364-419.000.

Kuhara, Shigehide, to Kabushiki Kaisha Toshiba. Magnetic resonance imaging system. 4,859,946, Cl. 324-309.000.

Kuhla, Donald E.: *See—*
Spada, Alfred P.; Campbell, Henry F.; Kuhla, Donald E.; Studt, William L.; Faith, William C.; and Molino, Bruce F., 4,859,672, Cl. 514-254.000.
Youssefyeh, Raymond; Klein, Scott I.; Campbell, Henry F.; and Kuhla, Donald E., 4,859,683, Cl. 514-299.000.

Kuhn, Freidel: *See—*
Dietz, Wolfgang; and Kuhn, Freidel, 4,859,295, Cl. 204-105.00R.

Kuhnen, Fred: *See—*
Carney, Robert L.; Lui, Alfred S. T.; Kuhnen, Fred; and Gruber, John M., 4,859,699, Cl. 514-447.000.

Kuivanen, Lawrence J. Inflatable display container. 4,858,755, Cl. 206-45.310.

Kulp, Jack H.; and Erwin, Carl L., to Signal, Inc. Plastic barricade. 4,859,983, Cl. 340-908.100.

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Kumar, Anand: *See—*
Cram, Donald J.; Chapoteau, Eddy; Czech, Bronislaw P.; Gebauer, Carl R.; Helgeson, Roger C.; Kumar, Anand; and Leong, Koon-Wah, 4,859,606, Cl. 436-79.000.

Kumazawa, Yoshiaki: *See—*
Tsuji, Kazuwo; Sumiya, Hitoshi; Kumazawa, Yoshiaki; Urakawa, Nobuo; and Satoh, Keiichi, 4,859,531, Cl. 428-333.000.

Kume, Tsutomu: *See—*
Yamamoto, Yoshihiro; Kume, Tsutomu; Yamazaki, Nobuo; Hashimoto, Fumiharu; and Ohya, Koichi, 4,859,881, Cl. 307-520.000.

Kummer, Rudolf: *See—*
Franz, Dieter; Kummer, Rudolf; Mach, Helmut; and Rath, Hans P., 4,859,210, Cl. 44-53.000.

Kumonaka, Takahiro: *See—*
Takai, Makoto; Omori, Kazuhiro; Kumonaka, Takahiro; Ozawa, Shinji; and Wakabayashi, Toshio, 4,859,673, Cl. 514-255.000.

Kumura, Kenji: *See—*
Hibino, Hiroki; Nishikori, Toshiaki; and Kumura, Kenji, 4,860,094, Cl. 358-98.000.

Kung, Joseph T.: *See—*
Lee, Hae-Seung; Howe, Roger T.; and Kung, Joseph T., 4,860,232, Cl. 364-571.040.

Kunz, Peter, to Mettler Instrumente AG. Electronic balance. 4,858,711, Cl. 177-212.000.

Kuo, Wen Tai, to Ming Tay Hardware Ind. Co., Ltd. Lock core. 4,858,455, Cl. 70-491.000.

Kupper, Friedrich-Wilhelm; Voges, Heinz-Werner; Patzold, Werner; and Schaaf, Richard, to Huels Aktiengesellschaft. Esters of 3-tert-butyl- and 3-tert-butyl-5-alkyl-4-hydroxyphenyl (alkane) carboxylic acids with oxethylates of polyhydroxyaromatics, process for their production, and their use as stabilizers. 4,859,790, Cl. 560-75.000.

Kurachi, Yoshio: *See—*
Ito, Shunji; Ito, Kanehiro; Kogiso, Takashi; and Kurachi, Yoshio, 4,858,746, Cl. 198-465.400.

Kuragano, Tetsuzo: *See—*
Sasaki, Nobuo; Kuragano, Tetsuzo; and Minami, Nobuyuki, 4,860,217, Cl. 364-518.000.

Kurahashi, Hayao: *See—*
Sone, Yuji; Wada, Kayoko; Kurahashi, Hayao; Nakai, Yoichi; Narutani, Tetsu; and Suzuki, Shigeharu, 4,859,287, Cl. 204-1.00T.

Kurakake, Mitsuo; Sakamoto, Keiji; and Toyosawa, Yukio, to Fanuc Ltd. Interface system for servo controller. 4,859,920, Cl. 318-567.000.

Kuramochi, Koujiro: *See—*
Kato, Nobuyuki; Kuramochi, Koujiro; Nakamura, Shinya; and Houjo, Yasuo, 4,858,646, Cl. 137-596.160.

Kuramoto, Shinichi: *See—*
Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kuramoto, Shinichi; Sugiyama, Yoshihiro; Takanashi, Hajime; Ishizuka, Takashi; Kudo, Yoshio; and Sato, Yoshio, 4,860,050, Cl. 355-256.000.

Kurashima, Hideo: *See—*
Yasumuro, Hisakazu; Watanabe, Michio; Taira, Kazuo; Imatani, Tsuneo; and Kurashima, Hideo, 4,858,782, Cl. 220-458.000.

Kure, Tokuo: *See—*
Sunami, Hideo; Kure, Tokuo; Hiraiwa, Atsushi; and Wada, Yasuo, 4,860,071, Cl. 357-23.600.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Ichikawa, Yukio; and Katto, Takayuki, 4,859,734, Cl. 524-447.000.

Kurei, Hiroshi; Arai, Akihiro; and Kobayashi, Takumi, to Asahi Kogaku Kogyo K.K. Apparatus for kinematic linkage in interchangeable lens type of camera. 4,860,043, Cl. 354-286.000.

Kurematsu, Masayuki; and Koboshi, Shigeharu, to Konishiroku Photo Industry Co., Ltd. Method for processing of silver halide color photographic material with dialysis treatment. 4,859,575, Cl. 430-428.000.

Kurita, Kazuo; and Ishihara, Hideaki, to Toyo Boseki Kabushiki Kaisha. Process for preparing polyamide fibers having improved properties. 4,859,389, Cl. 264-130.000.

Kurita, Toshiyuki: *See—*
Murata, Toshinori; Arai, Ikuya; Kurita, Toshiyuki; and Nakagawa, Isao, 4,860,090, Cl. 358-21.00R.

Kurlat, Gitta M.: *See—*
Massa, Frank, 4,859,897, Cl. 310-334.000.

Kuroki, Masahiro: *See—*
Matsuura, Masaaki; Ishikawa, Mitsuru; Nakamori, Masaharu; and Kuroki, Masahiro, 4,858,577, Cl. 123-190.00A.

Kurosawa, Hiroshi; and Ochiai, Izumi, to Hitachi, Ltd. Parabolic antenna. 4,860,021, Cl. 343-840.000.

Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kuramoto, Shinichi; Sugiyama, Yoshihiro; Takanashi, Hajime; Ishizuka, Takashi; Kudo, Yoshio; and Sato, Yoshio, to Ricoh Company, Ltd. Developing replenisher material for use in image forming device. 4,860,050, Cl. 355-256.000.

Kurta Corporation: *See—*
Sciacero, James R.; and Waterbury, Charles A., 4,859,814, Cl. 178-19.000.

Kurtze, Gunther; and Riedlinger, Rainer, to Richard Wolf GmbH. Piezoelectric transducer for the destruction of concretions within an animal body. 4,858,597, Cl. 128-24.00A.

Kush, Robert S.; and Bossart, Clayton J., to Mine Safety Appliances Company. Bellows type hand-operated air sampling pump. 4,858,478, Cl. 73-864.350.

Kushima, Hiroshi: *See—*
Tajima, Kenji; Kushima, Hiroshi; and Yamada, Sadami, 4,860,042, Cl. 354-277.000.

Kuster, Anton, to Spectrospin AG. Device for positioning a sample carrier in an NMR spectrometer. 4,859,948, Cl. 324-318.000.

Kuster, Hans-Werner; Radermacher, Herbert; and Vanaschen, Luc, to Saint-Gobain Vitrage. Method and device for curving sheets of glass. 4,859,225, Cl. 65-104.000.

Kutschka, Joseph D.: *See—*
Mancini, Steven A.; and Kutschka, Joseph D., 4,858,851, Cl. 244-327.000.

Kuwabara, Hidemitsu: *See—*
Hata, Ryosuke; Yamanouchi, Shosuke; Hirose, Masayuki; Kuwabara, Hidemitsu; Mizumoto, Yasuharu; and Hagiuda, Yasuhiro, 4,859,804, Cl. 174-25.00R.

Kuwajima, Takeshi, to NEC Corporation. Video signal processing circuit for VTR system. 4,860,099, Cl. 358-148.000.

Kuypers, Willem F.; and Hasenack, Hendrikus J. A., to Shell Oil Company. Partial combustion burner. 4,858,538, Cl. 110-264.000.

Kuzunuki, Soshiro; Shojima, Hiroshi; Miura, Masaki; Mori, Junko; and Mifune, Toshimi, to Hitachi, Ltd. Real time handwritten character input system. 4,860,372, Cl. 382-13.000.

Kyminas, Stanley C.; Phillips, John C.; and Einhaus, Bernard J., to Celotex Corporation, The. Coating for roof surfaces. 4,859,723, Cl. 524-31.000.

Kyodo Printing Co., Ltd.: *See—*
Kakinuma, Yuji; and Fujita, Minoru, 4,860,275, Cl. 369-109.000.

L.C.P., Inc.: *See—*
Ciriscioli, Peter R.; and Cook, Michael W., 4,858,966, Cl. 285-200.000.

L.P.E. Spa: *See—*
Pozzetti, Vittorio; Poggi, Piergiovanni; and Preti, Franco, 4,858,557, Cl. 118-725.000.

L. R. Nelson Corporation: *See—*
Fletcher, Douglas C.; and Bruninga, Kenneth J., 4,858,827, Cl. 239-69.000.

La Crosse Footwear, Inc.: *See—*
Barma, Tarachand S., 4,858,337, Cl. 36-4.000.
Nicholson, Joh E.; and Barma, Tarachand S., 4,858,342, Cl. 36-109.000.

La Telemecanique Electrique: *See—*
Jacquet, Bruno, 4,859,979, Cl. 337-3.000.

LaBate, Micheal D. Stirring block with unidirectional grain structure having improved erosion resistance. 4,858,894, Cl. 266-265.000.

Labeda, David P.: *See—*
Carter, Guy T.; Borders, Donald B.; Goodman, Joseph J.; and Labeda, David P., 4,859,598, Cl. 435-252.100.

Labinal Components and Systems, Inc.: *See—*
Bowlin, Robert F., 4,858,313, Cl. 29-883.000.

Laboratory Equipment, Corp.: *See—*
Fry, Francis J.; and Sanghvi, Narendra T., 4,858,613, Cl. 128-660.030.

Labrador, Gaudencio A. United sail windmill. 4,859,146, Cl. 416-8.000.

Labuda, Lawrence L.: *See—*
Knodle, Daniel W.; Mace, Leslie E.; and Labuda, Lawrence L., 4,859,858, Cl. 250-504.00R.

Lacey, Dianne L.: *See—*
Buchanan, Douglas A.; Callegari, Alessandro C.; Hob, Peter D.; and Lacey, Dianne L., 4,859,253, Cl. 148-33.300.

Lachmann, Helmut: *See—*
Brucher, Peter; and Lachmann, Helmut, 4,858,684, Cl. 165-134.100.

Laciak, Daniel V.: *See—*
Langsam, Michael; Puri, Pushpinder S.; Anand, Madhu; and Laciak, Daniel V., 4,859,215, Cl. 55-16.000.

Lacy, James V.: *See—*
Bruckert, William F.; Flahive, Barry; and Lacy, James V., 4,860,244, Cl. 364-900.000.

Ladd, Michael M., to Boeing Company, The. Variable heat conductance heat exchanger. 4,858,678, Cl. 165-32.000.

Ladick, Bryan E.: *See—*
Ladick, Robert B.; and Ladick, Bryan E., 4,858,934, Cl. 273-186.00A.

Ladick, Robert B.; and Ladick, Bryan E., to Syntronix Systems Limited. Golf practice apparatus. 4,858,934, Cl. 273-186.00A.

LaFaille, Alain: *See—*
Durando, Pierre; and LaFaille, Alain, 4,859,196, Cl. 439-197.000.

Lafosse, Louisette: *See—*
Lampin, Jean-Pierre, deceased; Robillart Lampin, Jeannine, heir; Lampin, Corinne, heir; Lampin, Sophie, heir; Cambon, Aime ; Szonyi, Francois; Delpuech, Jean-Jacques; Serratrice, Guy; Thiollet, Gerard; and Lafosse, Louisette, 4,859,797, Cl. 568-39.000.

Lagaude, Christian H.: *See—*
Ollivier, Jean; Lagaude, Christian H.; Baptiste, Hubert; and Larrouy, Michele, 4,859,373, Cl. 562-119.000.

Lagow, Richard J.: *See—*
Bierschenk, Thomas R.; Juhlke, Timothy J.; and Lagow, Richard J., 4,859,747, Cl. 525-409.000.

Lahr, Helfrid; and Betz, Gerhard, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Apparatus for pulling a plurality of fuel rods from a fuel element. 4,858,306, Cl. 29-723.000.

Laitram Corporation, The: *See—*
Lapeyre, James M., 4,860,234, Cl. 364-709.160.

Lalama, Salvatore J.: *See—*
Dirk, Carl W.; Katz, Howard E.; Lalama, Salvatore J.; Singer, Kenneth D.; and Sohn, John E., 4,859,876, Cl. 307-425.000.

Lalumiere, Robert J.; and Boucher, Jay M., to Dynamat, Inc. Free standing photoresist mask and the method of using the same for abrasive engraving. 4,858,394, Cl. 51-312.000.

Lam, Dominic M. K.: *See—*
Baskin, David; and Lam, Dominic M. K., 4,859,674, Cl. 514-255.000.

Lam, Yiu-kuen T.; Chang, Raymond S.; Hensens, Otto D.; Schwartz, Cheryl D.; and Zink, Deborah L., to Merck & Co., Inc. Therapeutic virginiamycin M_1 analogs. 4,859,690, Cl. 514-375.000.

Lamb, Joe H. Mechanism for extending and retracting swimming pool covers. 4,858,253, Cl. 4-502.000.

Lambard, Jacques, to Commissariat A L'Energie Atomique. Process for the preparation of uranium tetrafluoride by the reduction of uranium hexafluoride and sulphur fluorides produced by this process. 4,859,441, Cl. 423-259.000.

Lambda Physik Forschungs- und Entwicklungsgesellschaft MB: *See—*
Baumler, Jurgen; and Zeh, Manfred, 4,860,300, Cl. 372-57.000.

Lambert, Jack L.; Chiang, Yuan C.; and Paukstelis, Joseph V., to Kansas State University Research Foundation. Colorimetric detector for ozone and method of preparation. 4,859,607, Cl. 426-135.000.

Lambert, Jules A.: *See—*
Roark, David N.; and Lambert, Jules A., 4,859,530, Cl. 428-294.000.

Lamnabhi, Moustanir; and Salembier, Philippe, to U.S. Philips Corporation. Duobinary encoded signal decoder. 4,860,310, Cl. 375-18.000.

Lampin, Corinne, heir: *See—*
Lampin, Jean-Pierre, deceased; Robillart Lampin, Jeannine, heir; Lampin, Corinne, heir; Lampin, Sophie, heir; Cambon, Aime ; Szonyi, Francois; Delpuech, Jean-Jacques; Serratrice, Guy; Thiollet, Gerard; and Lafosse, Louisette, 4,859,797, Cl. 568-39.000.

Lampin, Jean-Pierre, deceased; Robillart Lampin, Jeannine, heir; Lampin, Corinne, heir; Lampin, Sophie, heir; Cambon, Aime ; Szonyi, Francois; Delpuech, Jean-Jacques; Serratrice, Guy; Thiollet, Gerard; and Lafosse, Louisette, a Societe Nationale de Recherche Chimique Appliquee. Novel non ionic fluorinated compounds, their process of preparation and applications thereof as surfactants. 4,859,797, Cl. 568-39.000.

Lampin, Sophie, heir: *See—*
Lampin, Jean-Pierre, deceased; Robillart Lampin, Jeannine, heir; Lampin, Corinne, heir; Lampin, Sophie, heir; Cambon, Aime ; Szonyi, Francois; Delpuech, Jean-Jacques; Serratrice, Guy; Thiollet, Gerard; and Lafosse, Louisette, 4,859,797, Cl. 568-39.000.

Lancsek, Thomas S., to Surface Technology, Inc. Method and article having electroless metal plating. 4,859,494, Cl. 427-47.000.

Landais, Jean, to Automobiles Peugeot; and Automobiles Citroen. Electric inertia-actuated circuit breaker. 4,859,818, Cl. 200-61.45R.

Landau, Zvi: *See—*
Weiser, Murray; Silverman, William; Landau, Zvi; Finer, Paul; and Pincus, Cary I., 4,860,329, Cl. 378-50.000.

Landis, Kenneth K.: *See—*
Hall, Kenneth B.; and Landis, Kenneth K., 4,859,147, Cl. 416-97.00R.

Landis, Michael E.; Aufdembrink, Brent A.; Chu, Pochen; Johnson, Ivy D.; Kirker, Garry W.; Page, Nancy M.; and Rubin, Mae K., to Mobil Oil Corporation. Layered metal chalcogenides containing interspathic polymeric chalcogenides. 4,859,648, Cl. 502-242.000.

Landis, William R.: *See—*
Kidder, Kenneth B.; Landis, William R.; and Patton, Paul B., 4,858,885, Cl. 251-129.010.

Lane, Bennie L.; and Taylor, William T., to Metal Era, Inc. Coping structure including rigid anchor bar. 4,858,406, Cl. 52-300.000.

Lang, Gary R.: *See—*
Nicely, Mark C.; Schreiber, Robert; Parks, Terry M.; Mannion, A. Joel; Lang, Gary R.; and Patton, Charles F., 4,860,249, Cl. 364-900.000.

Langdale, Wayne A.: *See—*
Lyons, James E.; Ellis, Paul E., Jr.; Myers, Harry K., Jr.; Suld, George; and Langdale, Wayne A., 4,859,798, Cl. 568-399.000.

Lange, Gregory A.; McManamen, John P.; and Schliesing, John A., to United States of America, National Aeronautics and Space Administration. Docking mechanism for spacecraft. 4,858,857, Cl. 244-161.000.

Langen, Hans: *See—*
Zimmer, Erich; Langen, Hans; and Scharf, Kurt, 4,859,368, Cl. 252-629.000.

Langendorf, Brian K.; and Johnson, Neil J., to Prime Computer, Inc. Branch cache system with instruction boundary determination independent of parcel boundary. 4,860,197, Cl. 364-200.000.

Langendorf, Brian K.; and Beckwith, Robert F., to Prime Computer, Inc. Hashing indexer for branch cache. 4,860,199, Cl. 364-200.000.

Langenfeld, Joseph W.; and Westendorf, Neal W., to Westendorf Manufacturing Co., Inc. Material handling attachment for a tractor having a multiple-point hitch assembly. 4,859,130, Cl. 414-703.000.

Langley, John: *See—*
Flesher, Peter; Langley, John; Rosier, Norma; and Farrar, David, 4,859,720, Cl. 523-332.000.

Langsam, Michael; Puri, Pushpinder S.; Anand, Madhu; and Laciak, Daniel V., to Air Products and Chemicals, Inc. Polymeric membrane for gas separation. 4,859,215, Cl. 55-16.000.

Lanham, Bryan, to Beloit Corporation. Chip slicer improvement. 4,858,834, Cl. 241-85.000.

Lanham, Robert L.: *See—*
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,859,513, Cl. 428-34.200.

Lannom, James W.: *See—*
Genovese, Frank C.; and Lannom, James W., 4,859,913, Cl. 315-169.400.

Lantech, Inc.: *See—*
Hake, Leroy, 4,858,415, Cl. 53-438.000.

Lantz, Paul W., to Rhodes, James A. Air-inflated hyperbolic paraboloidal roof. 4,858,397, Cl. 52-80.000.

Lanxide Technology Company, LP: *See—*
Newkirk, Marc S., 4,859,640, Cl. 501-128.000.

Lapeyre, James M., to Laitram Corporation, The. Portable keyboard operated alpha computer system with few keys and visual keystroke instructions. 4,860,234, Cl. 364-709.160.

Lapis, Erzsebet: *See—*
Keve, Tibor; Megyeri, Gabor; Stefko , Bela; Kovacs, Lajos, Jr.; Kassai nee Zieger, Anna; Kiss, Bela; Laszlovszky, Istvan; Lapis, Erzsebet; Palosi, Eva; Groo, Dora; and Szporny, Laszlo , 4,859,682, Cl. 514-288.000.

Lapo, Sergio: *See—*
Polvara, Maria; Crosti, Giovanni; and Lapo, Sergio, 4,859,825, Cl. 219-119.000.

Laqua, Fred L., to Great Plains Industries, Inc. Bypass valve for a displacement pump. 4,859,155, Cl. 417-307.000.

LaRowe, Dorian, to Paradyne Corporation. Bidirectional multiframe converter for data communications systems. 4,860,009, Cl. 341-73.000.

Larrabee, John R.; Lucas, Arthur W.; and Faucher, Peter A., to United Technologies Corporation. Stiffening ring for a stator assembly of an axial flow rotary machine. 4,859,143, Cl. 415-142.000.

Larrouy, Michele: *See—*
Ollivier, Jean; Lagaude, Christian H.; Baptiste, Hubert; and Larrouy, Michele, 4,859,373, Cl. 562-119.000.

Larsen, Leif G. Thread measuring tool. 4,858,330, Cl. 33-199.00R.

Larson, Mark L.; Hanft, Karl H.; and O'Farrell, Desmond J., to Donnelly Corporation. Windshield moisture sensing control circuit. 4,859,867, Cl. 307-10.100.

Larsson, Erik M.: *See—*
Lundin, Claes O. A.; Larsson, Erik M.; and Akermark, Bjorn J. E., 4,859,794, Cl. 560-302.000.

Laser Applications, Inc.: *See—*
Hess, Albert J., III, 4,859,826, Cl. 219-121.630.

LaSota, Larry. Conformable seat. 4,858,992, Cl. 297-284.000.

Laster, Stanley J.; Meek, Robert A.; and Shirley, Thomas E., to Mobil Oil Corporation. Seismic trace restoration using F-K filtering. 4,860,265, Cl. 367-73.000.

Laszlovszky, Istvan: *See—*
Keve, Tibor; Megyeri, Gabor; Stefko , Bela; Kovacs, Lajos, Jr.; Kassai nee Zieger, Anna; Kiss, Bela; Laszlovszky, Istvan; Lapis, Erzsebet; Palosi, Eva; Groo, Dora; and Szporny, Laszlo , 4,859,682, Cl. 514-288.000.

Latham, Wayne M.: *See—*
Evans, Robert S.; Latham, Wayne M.; Powers, Thomas; and Robertson, Michael O., 4,859,943, Cl. 324-216.000.

Latour, Robert A., Jr.; and Black, Jonathan, to University of Pennsylvania, Trustees of the. Miniature closed-loop dynamic universal mechanical testing machine. 4,858,473, Cl. 73-805.000.

Latourrette, Bertrand: *See—*
David, Claire; Magnier, Claude; and Latourrette, Bertrand, 4,859,432, Cl. 423-21.100.

Lau, Cheuk K.; Yoakim, Christiane; Rokach, Joshua; Fortin, Rejean; and Guindon, Yvan, to Merck Frosst Canada, Inc. Pharmaceutical compositions of phenothiazone derivatives and analogs. 4,859,667, Cl. 514-224.500.

Laurance, Joel E.; and Stewart, Walter M., to Satellite Financial Systems Corporation. Satellite communication system and method with message authentication suitable for use in financial institutions. 4,860,352, Cl. 380-23.000.

Laurent, Denis: *See—*
Hurtel, Patrice; and Laurent, Denis, 4,859,796, Cl. 564-204.000

Laurent, Henry: *See—*
Bittler, Dieter; Laurent, Henry; Nickisch, Klaus; and Rach, Petra, 4,859,659, Cl. 514-177.000.

Lauzanne-Morelle, Eliane M. T.: *See—*
Morelle, Jean V.; and Lauzanne-Morelle, Eliane M. T., 4,859,653, Cl. 514-2.000.

Lavielle, Gilbert; and Lepagnol, Jean, to ADIR Et Cie. 2-(2,3-dihydro-2-oxo-3-benzofuranyl)acetic acid compounds having antihypoxic and nootropic effects. 4,859,700, Cl. 514-470.000.

La Vos, Peter G.: *See—*
Klein Meuleman, Peter; and La Vos, Peter G., 4,860,035, Cl. 346-157.000.

Lawrence, David A. Immunoassays for glutathione and antibodies useful therein. 4,859,613, Cl. 436-548.000.

Lawrence Medical Systems, Inc.: *See—*
Taylor, Steve; Nelson, Dale; and Gorney, Don, 4,859,057, Cl. 356-41.000.

Layton, Jack D. Paver with discontinuous discs moving aggregate contained in the paver. 4,859,113, Cl. 404-101.000.

Lear Siegler Neway Corp.: *See—*
Wallace, Donovan B.; and Pierce, William C., 4,858,949, Cl. 280-713.000.

Leary, Timothy G.: *See—*
Donegan, Thomas E.; Leary, Timothy G.; and Patil, Arvind S., 4,859,770, Cl. 540-136.000.

Leber, Leland C.; and Hunter, Charles L., to Teledyne Industries, Inc.; and Westvaco Corporation. Cabinet controller. 4,859,220, Cl. 55-350.000.

Lebourgh, Maurice P. Diamond drill bit with hemispherically shaped diamond inserts. 4,858,706, Cl. 175-329.000.
Lee, Burtrand I.: *See—*
Hench, Larry L.; and Lee, Burtrand I., 4,859,525, Cl. 428-260.000.
Lee, Chin C. Disposable sanitary spittoon. 4,858,250, Cl. 4-258.000.
Lee, Darren J.: *See—*
Arsene, Dennis J.; and Lee, Darren J., 4,858,555, Cl. 118-270.000.
Lee, Frank W.; Neuner, Jon D.; and Baron, Kenneth, to Hexcel Corporation. Composite tooling. 4,859,528, Cl. 428-290.000.
Lee, Fred C.: *See—*
Tabisz, Wojciech A.; Lee, Fred C.; and Jovanovic, Milan M., 4,860,184, Cl. 363-17.000.
Lee, Fu M.; and Ceurvorst, Joseph G., to Phillips Petroleum Company. Recovery of N-methyl-2-pyrrolidone. 4,859,781, Cl. 548-555.000.
Lee, Hae-Seung; Howe, Roger T.; and Kung, Joseph T., to Massachusetts Institute of Technology. Digital technique for precise measurement of variable capacitance. 4,860,232, Cl. 364-571.040.
Lee, Kwan H., to Gold Star Co., Ltd. Door latch assembly. 4,858,969, Cl. 292-78.000.
Lee, Lester H.: *See—*
Jenkins, Thomas B.; Ulery, Dennis R.; Wilson, Blake W.; Walko, Steven C.; Lee, Lester H.; Salerno, Robert P.; Nason, Robert W.; and Courtney, John P., 4,859,891, Cl. 310-215.000.
Lee, Robert W.: *See—*
Brewer, Earl G.; and Lee, Robert W., 4,859,410, Cl. 419-10.000.
Lefebvre, Serge G.: *See—*
Rakhodai, Issa; Lefebvre, Serge G.; and Couderc, Pascal, 4,860,100, Cl. 358-148.000.
Le Feron de Longcamp, Guy. Manufacturing method for a non-inflatable deformable wheel. 4,858,297, Cl. 29-159.00R.
Le Gallais, Lucien: *See—*
Huvey, Michel; Do, Anh T.; Gerez, Jean-Michel; and Le Gallais, Lucien, 4,858,653, Cl. 138-144.000.
Legradi, Laszlo: *See—*
Pelyva, Jeno ; Vecsey, K. Istvan; Kolonics, Zoltan; Legradi, Laszlo; Nagy, Lajos; Horvath, Andras; Fodor, Ferenc, deceased; Soptei, Csaba; Sebok, Dezso; Tomordi, Elemer; Lendvai, Laszlo ; Karacsonyi, Bela; and Dioszegi, Erzsebet, 4,859,772, Cl. 544-11.000.
Lehn, Chris F., to Ecolab Inc. Chemical solution dispenser apparatus and method of using. 4,858,449, Cl. 68-12.00R.
Lejcek, Franz, to Goerz Electro Gesellschaft m.b.H. Register tape transport device. 4,860,031, Cl. 346-136.000.
Leland Stanford Jr. University, The Board of Trustees of the: *See—*
Stryer, Lubert; Glazer, Alexander N.; and Oi, Vernon T., 4,859,582, Cl. 435-5.000.
Leland Stanford Junior University, The Board of Trustees of the: *See—*
Shaw, Herbert J.; and Digonnet, Michel J. F., 4,859,016, Cl. 350-96.150.
Lemaire, Denis J. Wedge lock for pocket knife blade. 4,858,320, Cl. 30-162.000.
Lemelson, Jerome H. Methods of forming synthetic diamond coatings on particles using microwaves. 4,859,493, Cl. 427-45.100.
Lenard, Peter: *See—*
Beck, Ernst; Riehlein, Fritz; and Lenard, Peter, 4,858,392, Cl. 51-218.00R.
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Pelyva, Jeno ; Vecsey, K. Istvan; Kolonics, Zoltan; Legradi, Laszlo; Nagy, Lajos; Horvath, Andras; Fodor, Ferenc, deceased; Soptei, Csaba; Sebok, Dezso; Tomordi, Elemer; Lendvai, Laszlo ; Karacsonyi, Bela; and Dioszegi, Erzsebet, 4,859,772, Cl. 544-11.000.
Lengemann, Robert A.; Thompson, Gregory J.; Vickers, Anthony G.; and Mott, Raymond W., to UOP Inc. Method for reducing the temperature in a regeneration zone of a fluid catalytic cracking process. 4,859,313, Cl. 208-113.000.
Lenox Incorporated: *See—*
Mazzanti, Rino, 4,858,870, Cl. 248-316.100.
Lenzen, Reiner, to TRW Vehicle Safety Systems, Inc. Igniter for gas generating material. 4,858,951, Cl. 280-741.000.
Leo, Albert J.: *See—*
Bielskis, Edward; Leo, Albert J.; and Zeien, Jane K., 4,859,484, Cl. 426-573.000.
Leonard, Thomas B.: *See—*
Finkelstein, Joseph A.; Kruse, Lawrence I.; and Leonard, Thomas B., 4,859,779, Cl. 538-321.000.
Leong, Koon-Wah: *See—*
Cram, Donald J.; Chapoteau, Eddy; Czech, Bronislaw P.; Gebauer, Carl R.; Helgeson, Roger C.; Kumar, Anand; and Leong, Koon-Wah, 4,859,606, Cl. 436-79.000.
Leonhard, Rolf; and Projahn, Ulrich, to Robert Bosch GmbH. Apparatus for removing solid particles, especially soot particles, from the exhaust gas of an internal combustion engine. 4,858,431, Cl. 60-297.000.
Leonhard, Rolf: *See—*
Knauer, Alfred; Leonhard, Rolf; Projahn, Ulrich; and Stolper, Wolfgang, 4,858,433, Cl. 60-303.000.
Lepagnol, Jean: *See—*
Lavielle, Gilbert; and Lepagnol, Jean, 4,859,700, Cl. 514-470.000.
Leptien, Helmut, to Volkswagen AG. Spiral compressor with setback portion on radially outer peripheral wall. 4,859,159, Cl. 418-55.000.
Le Roy, Patrice: *See—*
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Letco Management Company, Inc.: *See—*
Hausler, Jeffery P.; Baria, Paul C.; Majek, Alfred; and Moore, Jeffrey B., 4,859,834, Cl. 219-497.000.
Leupold, Herbert A., to United States of America, Army. Superconducting shielded PYX PPM stacks. 4,859,973, Cl. 335-216.000.
Leupold, Herbert A., to United States of America, Army. Periodic permanent magnet structures. 4,859,976, Cl. 335-306.000.
Levy, Gideon; Budin, Josef; and Moergeli, Benjamin, to AG Fur Industrielle Elektronik Agie. Apparatus for filtering machine liquid of an electroerosion machine. 4,859,324, Cl. 210-195.200.
Levy, Raymond H., to Danziger, Jay; and Blank, George. Oral artificial ventilation apparatus. 4,858,605, Cl. 128-203.110.
Lewis, William I.: *See—*
Chou, Yu-Chia T.; Garrison, David F.; and Lewis, William I., 4,859,282, Cl. 162-78.000.
Libault De La Chevasnerie, Arnaud: *See—*
Devaud, Gerard; and Libault De La Chevasnerie, Arnaud, 4,858,650, Cl. 137-625.220.
Lieberman, Morton L., to United States of America, Energy. Spark-safe low-voltage detonator. 4,858,529, Cl. 102-202.500.
Lieske, Edgar: *See—*
Rose, David; Lieske, Edgar; Hoeffkes, Horst; and Maak, Norbert, 4,859,206, Cl. 8-429.000.
Life Science Research Israel Ltd: *See—*
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Liffmann, Stanley M.: *See—*
Qureshi, Humayun; Liffmann, Stanley M.; Webster, Milo E.; and Geiselman, Theodore S., 4,859,422, Cl. 422-81.000.
Liggett, James R. Combined package and dish for a soap bar product. 4,858,757, Cl. 206-77.100.
Light, Fred W., Jr.; Hood, James D.; and Chang, Yeong-Ho, to Eastman Kodak Company. Polyurethane powder coating compositions. 4,859,760, Cl. 528-45.000.
Likes, Bart E.: *See—*
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Lillquist, Robert D.: *See—*
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Lin, Eric: *See—*
Yee, David T.; and Lin, Eric, 4,858,947, Cl. 280-643.000.
Lin, Kuen-Ming. Chopstick seat. 4,858,863, Cl. 248-174.000.
Lindbauer, Ralf; and Glasner, Alfred, to Waagner-Biro Aktiengesellschaft. Method for separation of impurities from flowing gas. 4,859,438, Cl. 423-239.000.
Lindberg, Conrad P.: *See—*
Brewer, David C.; Lindberg, Conrad P.; and Lindberg, Paul M., 4,860,185, Cl. 363-41.000.
Lindberg, Paul M.: *See—*
Brewer, David C.; Lindberg, Conrad P.; and Lindberg, Paul M., 4,860,185, Cl. 363-41.000.
Lindblom, Kurt L., to Miller-Johannisberg Druckmaschinen GmbH. Device for combining partial piles of book pages. 4,858,904, Cl. 270-58.000.
Lindenthal, Hans: *See—*
Elsner, Ernst; Lindenthal, Hans; and Jelfs, Stewart D., 4,859,106, Cl. 403-5.000.
Lindner, Christian; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Process for the production of graft polymers of high rubber content. 4,859,744, Cl. 525-256.000.
Lindner, Christian: *See—*
Damrath, Volker; Lindner, Christian; Kress, Hans-Jurgen; and Wittmann, Dieter, 4,859,740, Cl. 525-100.000.
Lindstadt, Klaus; and Rudolf, Karl, to Diehl GmbH & Co. Warhead with metal coating for controlled fragmentation. 4,858,531, Cl. 102-307.000.
Lindstrom, Michael J.: *See—*
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Lineal Thermotech Limited: *See—*
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Linear Corporation: *See—*
Isaacman, Marvin, 4,859,990, Cl. 340-539.000.
Ling Electronics, Inc.: *See—*
Butts, Gary, 4,858,488, Cl. 74-519.000.
Lingle, Cleo M. Fastening bar assembly for frameless insulating panels. 4,858,403, Cl. 52-127.120.
Linsenmayer, Glenn R., to United States of America, Air Force. Communication adaptive multi-sensor system. 4,860,216, Cl. 364-516.000.
Linton, John H.; and Hussar, Nick, to John Labatt Limited. Animal feed supplement prepared from wet corn bran and corn steep liquor. 4,859,485, Cl. 426-623.000.
Liparulo, Nicholas J.: *See—*
Squarer, David; Colin, Andre; Prior, Robert P.; Mink, Frederick J.; and Liparulo, Nicholas J., 4,859,405, Cl. 376-299.000.
Lipisko, Bruce A.; Schumacher, John C.; Howard, Richard E.; Randtke, Peter T.; Sandu, Adrian; Fletcher, Robert E.; and Graf, Hans-Juergen, to Air Products and Chemicals, Inc. Chemical refill system. 4,859,375, Cl. 261-20.000.
Lippmann, Raymond; and Nelson, James E., to General Motors Corporation. Stable brightness vacuum fluorescent display. 4,859,912, Cl. 315-169.300.
Lithium Corporation of America: *See—*
Frianeza-Kullberg, Teresita C.; and Barnette, Darrish W., 4,859,343, Cl. 210-679.000.
Littlehales, William J.: *See—*
Marks, Martin E.; Littlehales, William J.; and Chang, Chu-An, 4,859,419, Cl. 422-56.000.
Litton Systems, Inc.: *See—*
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Livingston, Julie M.: *See—*
Tupper, Robert B.; Mangus, James D.; Sharbaugh, John E.; Brown, Gedney B.; Livingston, Julie M.; and Dhalla, Asfandiar K., 4,859,402, Cl. 376-285.000.
Llorens, Rafael G.; and Sole, Juan V., to Esselte Meto. Continuous bag strip. 4,859,082, Cl. 383-8.000.
Lloyd, Stacey G., to Intel Corporation. Anti-clock skew distribution apparatus. 4,860,322, Cl. 375-107.000.
LN Industries S.A.: *See—*
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Lock, Walter G., to Holmes International Inc. Foldable ramp extension for wheel lift apparatus. 4,859,134, Cl. 414-563.000.
Locke, Ralph J.; and Netherton, David C., to Plan B, Inc. Process and composition for protecting and cushioning. 4,859,714, Cl. 521-140.000.
Lockheed Missiles & Space Company, Inc.: *See—*
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Loctite Corporation: *See—*
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Loding, David C.; and Ernst, James D., to Magnetek Controls. Variable radius cable carrier. 4,858,424, Cl. 59-78.100.
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Konicke, Michael L.; Veitengruber, James E.; and Loesch, James G., 4,860,007, Cl. 340-173.000.
Loftsson, Thorsteinn; and Bodor, Nicholas, to Key Pharmaceuticals, Inc. Sulfur-substituted phenylacetamides. 4,859,707, Cl. 514-625.000.
Logan, Terry L., to Resource Enterprises, Inc. Coal gasification well drilling process. 4,858,689, Cl. 166-256.000.
Lohr & Bromkamp GmbH: *See—*
Welschof, Hans-Heinrich; and Beier, Rudolf, 4,858,998, Cl. 301-124.00R.
Lohr, Gernot: *See—*
Schlipf, Michael; Manz, Albrecht; and Lohr, Gernot, 4,859,755, Cl. 526-255.000.
Lonardi, Emile; and Mailliet, Pierre, to Paul Wurth S.A. Supporting framework for a loading installation of a shaft furnace. 4,859,131, Cl. 414-200.000.
Long, D. Clayton, to MacGregor Golf Company. Golf irons. 4,858,929, Cl. 273-77.00A.
Long, Eugene C.; Kubitschek, James E.; and Horacek, Stephen M., to Ball Corporation. Motion analysis tool and method therefor. 4,860,096, Cl. 358-101.000.
Long, Gary N.: *See—*
Pellet, Regis J.; Coughlin, Peter K.; Staniulis, Mark T.; Long, Gary N.; and Rabo, Jule A., 4,859,314, Cl. 208-114.000.
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Lorenze, Robert V.: *See—*
Pond, Stephen F.; Kneezel, Gary A.; Lorenze, Robert V.; O'Horo, Michael P.; Maltz, Martin S.; and Kellerman, Richard, 4,860,030, Cl. 346-76.0PH.
Lorteije, Jean H. J., to U.S. Philips Corporation. Rotatable head assembly with offset sub-head gaps. 4,860,132, Cl. 360-84.000.
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Stengl, Gerhard; Loschner, Hans; and Wolf, Peter, 4,859,857, Cl. 250-492.300.
Losehand, Reinhard; and Eger, Helmut, to Siemens Aktiengesellschaft. Method of making schottky contacts on semiconductor surfaces. 4,859,616, Cl. 437-39.000.
Lougheed, Robert M.: *See—*
McCubbrey, David L.; and Lougheed, Robert M., 4,860,375, Cl. 382-49.000.
Louisana State University Board of Supervisors, Louisana State University: *See—*
Portier, Ralph J., 4,859,594, Cl. 435-172.100.
Lovell, John A.; Medved, Gary E.; and White, John R., to Goodyear Tire & Rubber Company, The. Radial tire belt folding drum. 4,859,272, Cl. 156-415.000.
Lowe, Tony M.: *See—*
Patterson, John H.; Lowe, Tony M.; Bernadic, Thomas J.; Val, Yefim; Katbi, Karl A.; and Zimmerman, Charles E., 4,859,122, Cl. 407-114.000.
Lowenstein, David: *See—*
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Lowry, Robert K.; and Adams, Edward U., to Harris Corporation. Method of etching silicon by enhancing silicon etching capability of alkali hydroxide through the addition of positive valence impurity ions. 4,859,280, Cl. 156-662.000.
Lozachmeur, Didier, to Societe Chimique des Charbonnages Sa Tour Aurore. Aqueous suspension polymerization process of compositions containing styrene in the presence of rosin acid derivatives and their salts and expandable or non expandable polystyrene obtained. 4,859,730, Cl. 524-274.000.
LSI Logic Incorporated: *See—*
Wong, Anthony Y.; Wong, Daniel; and Chan, Steven S., 4,859,870, Cl. 307-263.000.
Lubiarz, Arthur F., to Crankshaft Machine Company. Helical broach puller. 4,859,125, Cl. 409-287.000.
Lubin, Barry D.: *See—*
Finley, Roger W.; Lubin, Barry D.; and Bergendahl, Bruce A., 4,860,281, Cl. 370-15.000.
Lubowitz, Hyman R.: *See—*
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Lucas, Arthur W.: *See—*
Larrabee, John R.; Lucas, Arthur W.; and Faucher, Peter A., 4,859,143, Cl. 415-142.000.
Lucasse, Guenter: *See—*
Pinto, Akiva; Lucasse, Guenter; Jung, Rolf R.; and Bocht, Bernhard, 4,858,278, Cl. 19-200.000.
Lucassen, Guenter: *See—*
Pinto, Akiva; Lucassen, Guenter; and Dirkes, Heinz, 4,858,277, Cl. 19-200.000.
Luciani, Sabatino; and Lunini, Antonio, to Axis S.p.A. Equipment for the actuation of needles for the realization of electric motors field windings. 4,858,835, Cl. 242-1.10A.
Ludwig, Paul: *See—*
Gualandris, Rene; Ludwig, Paul; Rocco, Jean-Claude; and Zadworny, Francois, 4,859,909, Cl. 315-111.810.
Lugosi, Robert: *See—*
Hartnett, Michael J.; Lugosi, Robert; Rollins, James; Cook, John P.; and Clark, Jeffrey A., 4,858,295, Cl. 29-156.40R.
Lui, Alfred S. T.: *See—*
Carney, Robert L.; Lui, Alfred S. T.; Kuhnen, Fred; and Gruber, John M., 4,859,699, Cl. 514-447.000.
Lui, May S.: *See—*
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Lukow, Kenneth R.: *See—*
Bosanec, Thomas P.; Lukow, Kenneth R.; and Verbrugge, Calvin J., 4,859,752, Cl. 526-209.000.
Lumbard, Marvin, to Siemens Corporate Research and Support, Inc. Method for manufacturing the same. 4,859,632, Cl. 437-209.000.
Lumelsky, Leon, to International Business Machines Corporation. Pixel slice processor with frame buffers grouped according to pixel bit width. 4,860,248, Cl. 364-900.000.
Lundin, Claes O. A.; Larsson, Erik M.; and Akermark, Bjorn J. E., to Berol Nobel Nacka AB. Peresters, their preparation and use as polymerization initiators. 4,859,794, Cl. 560-302.000.
Lundy, John. Automatic ejection snow plow. 4,858,348, Cl. 37-265.000.
Lunini, Antonio: *See—*
Luciani, Sabatino; and Lunini, Antonio, 4,858,835, Cl. 242-1.10A.
Lunk, Hans E.; Reed, Donald A.; Deep, Marguerite E.; Hill, Charles; and Au, Andrew, to Raychem Corporation. Melt-shapeable fluoropolymer compositions. 4,859,836, Cl. 219-548.000.
Luryi, Sergey, to American Telephone and Telegraph Company AT&T Bell Laboratories. Transistor comprising a 2-dimensional carrier gas collector situated between emitter and gate. 4,860,064, Cl. 357-12.000.
Luschnig, Franz: *See—*
Stritzl, Karl; Freisinger, Henry; and Luschnig, Franz, 4,858,946, Cl. 280-618.000.
Lutkemeyer, Gunter: *See—*
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Luxtron Corporation: *See—*
Wickersheim, Kenneth A.; and Sun, Mei H., 4,859,079, Cl. 374-131.000.
Lyons, James E.; Ellis, Paul E., Jr.; Myers, Harry K., Jr.; Suld, George; and Langdale, Wayne A., to Sun Refining and Marketing Company. Oxidation of alkanes. 4,859,798, Cl. 568-399.000.
M/A-Com, Inc.: *See—*
Reardon, Bruce A.; and Goodrich, Joel L., 4,859,629, Cl. 437-203.000.
M.A.N. Roland Druckmaschinen: *See—*
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Artzberger, Thomas G., 4,859,114, Cl. 404-112.000.
Maak, Norbert: *See—*
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MacDonald, J. Gavin: *See—*
Maycock, William E.; Nohr, Ronald S.; and MacDonald, J. Gavin, 4,859,759, Cl. 528-27.000.
Mace, Leslie E.: *See—*
Knodle, Daniel W.; Mace, Leslie E.; and Labuda, Lawrence L., 4,859,858, Cl. 250-504.00R.
MacFarlane, John A., personal representative: *See—*
Macfarlane, John O., deceased; and MacFarlane, John A., personal representative, 4,859,480, Cl. 426-310.000.
Macfarlane, John O., deceased; and MacFarlane, John A., personal representative, to Tillin, Inc. Composition and method for treating hay and similar matter. 4,859,480, Cl. 426-310.000.
MacGregor Golf Company: *See—*
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Mach, Helmut: *See—*
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Madaus GmbH & Company: *See—*
Eiden, Friedrich; Gmeiner, Peter; and Schunemann, Jurgen, 4,859,664, Cl. 514-217.000.
Maddox, Charles G., to B.F. Goodrich Company, The. Blind fastener. 4,859,108, Cl. 403-277.000.
Maeda, Kazuya: *See—*
Nakamura, Tadashi; Kitabatake, Yaosuo; Takahashi, Yoshiaki; and Maeda, Kazuya, 4,859,560, Cl. 430-137.000.

Maeda, Tetsuo; Ohta, Hirofumi; and Inazumi, Hirokuni, to Omron Tateisi Electronics Co. Planar linear pulse motor. 4,860,183, Cl. 363-12.000.

Maeda, Toyohiro: *See*—
Haraguchi, Kazutoshi; Tanigawa, Eiji; Nukina, Kenji; Morita, Hiroaki; and Maeda, Toyohiro, 4,859,382, Cl. 264-29.200.

Maehashi, Yukio: *See*—
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Maei, Shigeki: *See*—
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Maekawa, Katsumi; and Ambo, Tatsuaki, to Kabushiki Kaisha Toshiba. PWM controller having synchronous and asynchronous mode. 4,860,186, Cl. 363-41.000

Maekawa, Takashige; Oharu, Kazuya; and Sakaguchi, Tomoko, to Asahi Glass Company, Ltd. Water and oil repellant having desoiling properties. 4,859,754, Cl. 526-245.000.

Maerz, Judy A.: *See*—
Maerz, Ralph R.; and Maerz, Judy A., 4,859,167, Cl. 425-276.000.

Maerz, Ralph R.; and Maerz, Judy A. Snowball maker. 4,859,167, Cl. 425-276.000.

Maerz, Reinhard: *See*—
Winzer, Gerhard; Maerz, Reinhard; and Stoll, Lothar, 4,860,294, Cl. 372-7.000.

Maffei, Charles V., to Foster Wheeler Energy Corporation. Feedwater heater with improved steam distribution. 4,858,564, Cl. 122-441.000.

Maggio, Edward T., to Synbiotics Corporation. Immunoassay incubation device. 4,859,610, Cl. 436-518.000

Magin, Richard L.: *See*—
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Magnetek Controls: *See*—
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Magnetic Peripherals Inc.: *See*—
Cain, Michael A., 4,860,135, Cl. 360-97.020

Magnier, Claude: *See*—
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Maheras, George; Hayworth, Hubert O.; and Gulett, Michael R., to NCR Corporation. Multiple photoresist layer process using selective hardening. 4,859,573, Cl. 430-326.000

Mahieu, Claude; and Papantoniou, Christos, to Societe Anonyme dite L'Oreal. Method for reinforcement or permanent deformation of hair. 4,859,460, Cl. 424-72.000

Mai, Udo: *See*—
Dieterle, Franz; Hartmann, Uwe; and Mai, Udo, 4,860,102, Cl. 358-158.000.

Maier, Josef: *See*—
Zimmermann, Gerd; Maier, Josef; and Gloger, Manfred, 4,859,602, Cl. 435-280.000.

Maier, Ludwig, to Ciba-Geigy Corporation. Microbicides. 4,859,466, Cl. 424-605.000.

Maillefer SA: *See*—
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Mailliet, Pierre: *See*—
Lonardi, Emile; and Mailliet, Pierre, 4,859,131, Cl. 414-200.000

Maisch, Helmut; and Fedrau, Dieter, to MTU-Motoren-und Turbinen-Union Muenchen GmbH. Metallic hollow component with a metallic insert, especially turbine blade with cooling insert. 4,859,141, Cl. 415-115.000.

Majek, Alfred: *See*—
Hausler, Jeffery P.; Baria, Paul C.; Majek, Alfred; and Moore, Jeffrey B., 4,859,834, Cl. 219-497.000.

Majima, Kunio: *See*—
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Makayama, Satoshi: *See*—
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Maki, Kazuyoshi; Otsubo, Masayuki; and Uchida, Shizutaka, to Togami Electric Mfg. Co. Enclosed switchboard. 4,860,161, Cl. 361-338.000.

Makinouchi, Susumu: *See*—
Murakami, Seiro; Tanimoto, Akikazu; Makinouchi, Susumu; Kawai, Hidemi; and Murakami, Masaichi, 4,860,374, Cl. 382-48.000.

Makita, Sadao, to Kabushiki Kaisha Toshiba. Portable apparatus with a mechanism for holding a display above a printer while the printer is printing data. 4,859,092, Cl. 400-83.000.

Malarchik, Heidi M. Meal and market calendar. 4,858,350, Cl 40-119.000.

Malgrat, Philippe: *See*—
Deysson, Jean-Yves; Karian, Jacques; Malgrat, Philippe; and Blondeau, Michel, 4,859,121, Cl. 406-114.000

Malinowski, Gregory J.; and Schodowski, Stanley S., to United States of America, Army. Single transistor dual mode crystal oscillator(U). 4,859,969, Cl. 331-43.000

Malka, Jacob H.; and Goodman, Joseph T., to Allied-Signal Inc. Microprocessor controlled dual channel closed loop controller for stepper motors used in servo systems. 4,859,923, Cl. 318-685.000.

Mallinson, Stephen R.: *See*—
Brierley, Michael C.; Mallinson, Stephen R.; Millar, Colin A.; and Urquhart, William P., 4,859,017, Cl. 350-96.150.

Malter, Remi, to Thomson-CSF. Method and device for the acquisition of synchronization bits in data transmission systems. 4,860,323, Cl. 375-111.000.

Maltz, Martin S.: *See*—
Pond, Stephen F.; Kneezel, Gary A.; Lorenze, Robert V.; O'Horo, Michael P.; Maltz, Martin S.; and Kellerman, Richard, 4,860,030, Cl. 346-76.0PH.

Mancini, Steven A.; and Kutschka, Joseph D., to General Dynamics Pomona Division. Folding wing structure for missile. 4,858,851, Cl. 244-327.000

Mancuso, Matthew A., to Keibler-Thompson Corp. Apparatus and method for removing dross ridges from a metal workpiece. 4,859,126, Cl. 409-293.000.

Mandel, Paul M., Jr.: *See*—
Hughes, Cleveland L.; Williams, Timothy N.; and Mandel, Paul M., Jr., 4,859,242, Cl. 106-19.000.

Mangus, James D.: *See*—
Tupper, Robert B.; Mangus, James D.; Sharbaugh, John E.; Brown, Gedney B.; Livingston, Julie M.; and Dhalla, Asfandiar K., 4,859,402, Cl. 376-285.000.

Maniwa, Yoshio; and Morita, Takashi, to Ricoh Co., Ltd. Image forming system with memory duplex printing. 4,860,119, Cl. 358-296.000.

Mannesmann AG: *See*—
Pfannkuche, Heinz; and Schulte, Uwe, 4,859,193, Cl. 439-115.000.

Mannesmann Aktiengesellschaft: *See*—
Gerretz, Josef; and Hurtado, Antonio, 4,858,458, Cl. 72-214.000.

Mannesmann Kienzle GmbH: *See*—
Adams, Jurgen, 4,860,124, Cl. 360-6.000.

Mannion, A. Joel: *See*—
Nicely, Mark C.; Schreiber, Robert; Parks, Terry M.; Mannion, A. Joel; Lang, Gary R.; and Patton, Charles F., 4,860,249, Cl. 364-900.000

Manor, Gedalyahu, to Technion Research & Development Foundation Ltd. A surveying and mapping apparatus for indicating the level differences of the ground travelled in relation to the distance travelled. 4,858,329, Cl. 33-775.000.

Mansur, Robert P.: *See*—
Carlson, Vincent; Fenlon, Michael N.; Mansur, Robert P.; and Kadomiya, Ronald H., 4,859,100, Cl. 400-715.000

Mantegani, Sergio; Brambilla, Enzo; Temperilli, Aldemio; Ruggieri, Daniela; and Salvati, Patricia, to Farmitalia Carlo Erba. N-oxide ergolines as antihypertensive agents. 4,859,678, Cl. 514-269.000.

Manuel, Mark: *See*—
Haag, Ronald H.; Manuel, Mark; and Rogers, Lloyd W., 4,858,971, Cl. 292-201.000.

Manufacturers Industrial Technology, Inc.: *See*—
Peninger, Robert H., 4,859,365, Cl. 252-601.000.

Manz, Albrecht: *See*—
Schlipf, Michael; Manz, Albrecht; and Lohr, Gernot, 4,859,755, Cl. 526-255.000.

Maquinas de Coser Alfa, S.A.: *See*—
Echeverria, Fernando C., 4,858,548, Cl. 112-443.000.

Marano, Gerald A.: *See*—
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,859,513, Cl. 428-34.200.

Marco Seattle, Inc.: *See*—
Cook, Harold T., Jr., 4,858,362, Cl. 43-4.000

Marechal, Michel; Rageot, Alain; and Basly, Michel, to Societe Anonyme dite: Filotex. Method of manufacturing a flexible electric cable including a conductor comprising a plurality of fine strands of aluminum or aluminum alloy. 4,859,258, Cl. 156-51.000

Maria, Jozef G. Fork lift truck and vehicle for the transport thereof. 4,859,133, Cl. 414-462.000.

Marianowski, Leonard G.; and Remick, Robert J., to Institute of Gas Technology. Electrochemical separation of oxygen. 4,859,296, Cl. 204-129.000.

Marks, Martin E.; Littlehales, William J.; and Chang, Chu-An, to American Bionetics, Inc. Diagnostic manifold apparatus. 4,859,419, Cl. 422-56.000.

Marks, Ronald F.: *See*—
Kirchner, Peter D.; Marks, Ronald F.; Pettit, George D.; Woodall, Jerry M.; and Wright, Steven L., 4,860,066, Cl. 357-16.000.

Markus, James A., to Casco Products Corporation. Apparatus and method for monitoring liquid levels. 4,859,987, Cl. 340-450.000.

Markuszewski, Richard: *See*—
Chriswell, Colin D.; Kaushik, Surender M.; Shah, Navin D.; and Markuszewski, Richard, 4,859,212, Cl. 44-622.000.

Marosi, Laszlo, to BASF Aktiengesellschaft. Preparation of silicon nitride powder. 4,859,443, Cl. 423-344.000.

Marquardt, Klaus: *See*—
Schulze, Joachim; Adler, Klaus; Selig, Manfred; Ball, Peter; Marquardt, Klaus; Killermann, Otmar; and Hannebaum, Manfred, 4,859,751, Cl. 526-200.000.

Marquart, James A.: *See*—
Shalati, Mohamad D.; Marquart, James A.; Babjak, John R.; and Harris, Rodney M., 4,859,758, Cl. 527-313.000.

Marquis, Geoffrey F.: *See*—
Thorp, Graham M.; Allchin, James F. C.; Marquis, Geoffrey F.; Burattini, Dino; and Watt, Peter J., 4,858,401, Cl. 52-100.000.

Marquot, Alexis: *See*—
Fruhauf, Serge; and Marquot, Alexis, 4,860,258, Cl. 365-194.000.

Marschner, Frank W., to Colgate-Palmolive Company. Hair rinse conditioners with superior dry hair feel and high hair luster. 4,859,456, Cl. 424-47.000.

Marsh, Edward K., to AMP Incorporated. Data communications outlet. 4,859,201, Cl. 439-290.000.

Marshall, Steven C. Electric musical string instruments. 4,858,509, Cl. 84-1.160.

Martin Automatic, Inc.: *See*—
Martin, John R.; and Carlson, Donald E., 4,859,270, Cl. 156-361.000.

Martin, Burton L.: *See*—
Edwards, Richard C.; and Martin, Burton L., 4,859,971, Cl. 333-109.000.

Martin, Edward L.; Graham, Fred G.; and Roman, Benjamin. Method and apparatus for bar code graphics quality control. 4,860,226, Cl. 364-552.000.

Martin, Harry D., III: *See*—
Patrician, Thomas J.; Ritsko, Joseph E.; and Martin, Harry D., III, 4,859,236, Cl. 75-0.5AB.

Martin, Howard. Root canal instrument handle. 4,859,183, Cl. 433-102.000.

Martin, John R.; and Carlson, Donald E., to Martin Automatic, Inc. In-register web splicer. 4,859,270, Cl. 156-361.000.

Martinson, Mart: *See*—
Watkins, Harry E.; Balch, Brent F.; Oakes, Jeffery T.; Copeland, Richard L.; Patterson, Hubert A.; and Martinson, Mart, 4,859,991, Cl. 340-572.000.

Maruta, Syuzi: *See*—
Ohira, Tadashi; Ito, Masazumi; and Maruta, Syuzi, 4,860,055, Cl. 355-308.000.

Marvel, Fred D. Packet-type laminator. 4,859,274, Cl. 156-499.000.

Masanao, Oozeki. Screen printer with screen length and snap-off angle control. 4,858,527, Cl. 101-123.000.

Masco Corporation of Indiana: *See*—
Johnson, Dwight N., 4,858,252, Cl. 4-368.000.

Maselli, John A.: *See*—
Neidleman, Saul L.; and Maselli, John A., 4,859,474, Cl. 426-28.000.

Maserjian, Joseph: *See*—
Overhauser, Albert W.; and Maserjian, Joseph, 4,860,074, Cl. 357-30.000.

Mashiko, Kouichi: *See*—
Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, 4,858,679, Cl. 165-46.000.

Massa, Donald P.: *See*—
Massa, Frank, 4,859,897, Cl. 310-334.000.

Massa, Frank, to Massa, Frank; Massa, Donald P.; and Kurlat, Gitta M. Directional waterproof ultrasonic transducer for operating in air. 4,859,897, Cl. 310-334.000.

Massachusetts Institute of Technology: *See*—
Bowman, Harry F.; and Weaver, James C., 4,859,078, Cl. 374-44.000.
Groopman, John D.; Wogan, Gerald N.; Bargoot, Frederick G.; and Ferrari, Christopher, 4,859,611, Cl. 436-518.000.
Lee, Hae-Seung; Howe, Roger T.; and Kung, Joseph T., 4,860,232, Cl. 364-571.040.
Mooradian, Aram, 4,860,304, Cl. 372-92.000.

Masstron, Inc.: *See*—
Bowman, Ronald R.; Sodal, Ingvar E.; Wilke, Thomas A.; and Weller, Frank, 4,859,848, Cl. 250-296.000.

Masuda, Hiroo: *See*—
Shimohigashi, Katsuhiro; Masuda, Hiroo; Ikuzaki, Kunihiko; and Kawamoto, Hiroshi, 4,860,255, Cl. 365-189.000.

Masuda, Ikuro: *See*—
Iwamura, Masahiro; Masuda, Ikuro; and Uchida, Hideaki, 4,860,148, Cl. 361-58.000.

Masuda, Kazuaki: *See*—
Shiozaki, Atsushi; Komuro, Hirokazu; Sato, Koichi; and Masuda, Kazuaki, 4,860,033, Cl. 346-140.00R.

Masuda, Takahiko, to Nishikawa, Kohichi. Wave-activated power generator. 4,858,434, Cl. 60-398.000.

Masuda, Takayoshi: *See*—
Takayanagi, Hiroshi; Kobayashi, Tadashi; Masuda, Takayoshi; and Shinoda, Hosei, 4,859,763, Cl. 528-357.000.

Masumoto, Hakaru; Sawaya, Showhachi; and Hinai, Masakatsu, to Foundation: The Research Institute of Electric and Magnetic Alloys, The. High damping capacity alloy and a process for producing the same. 4,859,252, Cl. 148-11.50R.

Masuzaki, Hidefumi: *See*—
Horikawa, Ethuo; and Masuzaki, Hidefumi, 4,860,114, Cl. 358-426.000.

Matassa, Victor G.: *See*—
Bernstein, Peter R.; Brown, Frederick J.; Matassa, Victor G.; and Yee, Ying Kwong, 4,859,692, Cl. 514-381.000.

Materials Recycling Management Ltd.: *See*—
Moore, Richard S., 4,859,211, Cl. 44-589.000.

Matra-Werke GmbH: *See*—
Fey, Hans; and Czapiewski, Manfred, 4,859,072, Cl. 366-165.000.

Matsubara, Kiyoshi; Yamaura, Tadashi; Kihara, Toshimasa; and Kawashimo, Norishige, to Hitachi, Ltd. Semiconductor device and process for producing the same. 4,860,087, Cl. 357-68.000.

Matsubishi Denki Kabushiki Kaisha: *See*—
Eguchi, Koji, 4,859,622, Cl. 437-47.000.

Matsuda, Kenji; Sugawara, Sakuo; Hara, Masanori; Umemura, Hiroyuki; Ishioka, Hidenori; and Aoki, Katsuyuki, to Mitsubishi Denki Kabushiki Kaisha. Air conditioner. 4,858,824, Cl. 236-94.000.

Matsuda, Reiko: *See*—
Kubo, Michinori; and Matsuda, Reiko, 4,859,468, Cl. 424-195.100.

Matsuda, Toru; Yano, Takanori; Okamoto, Toshiaki; and Okamoto, Akira, to Ricoh Company, Ltd. Inference system. 4,860,214, Cl. 364-513.000.

Matsuda, Yoshio, to Yoshida Kogyo K. K. Warp-knit tape for hook-and-loop fasteners. 4,858,447, Cl. 66-191.000.

Matsui, Fumio: *See*—
Matsumura, Yasushi; Mizuguchi, Takeshi; and Matsui, Fumio, 4,859,481, Cl. 426-445.000.
Matsumura, Yasushi; Mizuguchi, Takeshi; and Matsui, Fumio, 4,859,487, Cl. 426-639.000.

Matsui, Kenji: *See*—
Nishimura, Yuji; Kawaharazaki, Takashi; Tamura, Keiichi; Matsui, Kenji; Watanabe, Yasutaka; and Yoshitsugu, Noritada, 4,858,953, Cl. 280-807.000.

Matsukawa, Takayuki: *See*—
Tsukamoto, Katsuhiro; and Matsukawa, Takayuki, 4,859,615, Cl. 437-38.000.

Matsumoto, Fumio, to Research Development Corporation of Japan, Junichi Nishizawa and Oki Electric Industry Co., Ltd. Method for epitaxial growth of compound semiconductor using MOCVD with molecular layer epitaxy. 4,859,625, Cl. 437-81.000.

Matsumoto, Hiroyouki; Okamura, Kazumi; Nakayama, Hideo; and Okasako, Yasuhiro, to Mazda Motor Corporation. V-type engine. 4,858,570, Cl. 123-52.0MV.

Matsumoto, Kentaro; Takaoka, Makoto; Fukumoto, Masami; Uda, Toyokazu; and Sugiura, Susumu, to Canon Kabushiki Kaisha. Halftone image recording method using recording data having a plurality of concentrations for one color. 4,860,026, Cl. 346-1.100.

Matsumoto, Masahiko: *See*—
Fukuo, Koichi; Shibata, Mitsuhiro; Hiro, Toshiaki; and Matsumoto, Masahiko, 4,858,574, Cl. 123-90.340.

Matsumoto, Osamu; Abe, Isao; and Nakashiro, Takeshi, to Kabushiki Kaisha Toshiba. Sense amplifier. 4,859,882, Cl. 307-530.000.

Matsumura, Yasuo; Aoki, Takayoshi; Takeda, Masayuki; Suzuki, Chiaki; and Nagatsuka, Ikutaroh, to Fuji Xerox Co., Ltd. Composition with fatty acid bisamide powder developer. 4,859,558, Cl. 430-110.000.

Matsumura, Yasushi; Mizuguchi, Takeshi; and Matsui, Fumio, to House Food Industrial Company Limited. Method for producing fruit chips. 4,859,481, Cl. 426-445.000.

Matsumura, Yasushi; Mizuguchi, Takeshi; and Matsui, Fumio, to House Food Industrial Company Limited. Method for producing fruit chips. 4,859,487, Cl. 426-639.000.

Matsunaga, Masafumi: *See*—
Akasaki, Toshiro; Matsunaga, Masafumi; Watanabe, Takashi; and Matsushima, Hironari, 4,859,266, Cl. 156-273.100.

Matsuno, Takeshi; and Iwata, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Photo detector adjustment device. 4,859,847, Cl. 250-239.000.

Matsuo, Kenji; and Tsuchiya, Ikuo, to Kabushiki Kaisha Toshiba. Voltage controlled oscillator. 4,859,970, Cl. 331-57.000.

Matsuo, Mu: *See*—
Takano, Hiroshi; and Matsuo, Mu, 4,858,492, Cl. 74-745.000.

Matsuo, Takao; and Sumi, Shigeo, to Somar Corporation. Apparatus for conveying base. 4,858,911, Cl. 271-240.000.

Matsuo, Yasutoshi: *See*—
Sakaguchi, Hironao; Yoshida, Masaji; and Matsuo, Yasutoshi, 4,860,105, Cl. 358-167.000.

Matsushima, Hironari: *See*—
Akasaki, Toshiro; Matsunaga, Masafumi; Watanabe, Takashi; and Matsushima, Hironari, 4,859,266, Cl. 156-273.100.

Matsushita Electric Industrial Co., Ltd.: *See*—
Kawakami, Katsura; Shimazaki, Shigeo; Takayama, Satoshi; and Onodera, Chika, 4,860,109, Cl. 358-400.000.
Sugita, Ryuji; Tohma, Kiyokazu; Honda, Kazuyoshi; and Nanbu, Taro, 4,859,501, Cl. 427-131.000.
Toyonaga, Yufuko; Kimura, Suzushi; Ueda, Masaaki; Tabata, Osamu; and Kimura, Saburo, 4,859,496, Cl. 427-53.100.
Yoshida, Akihisa; Setsune, Kentaro; and Hirao, Takashi, 4,859,908, Cl. 315-111.810.

Matsushita Electric Works, Ltd.: *See*—
Kimura, Rokusaburo; Watari, Yoshie; and Makayama, Satoshi, 4,859,152, Cl. 417-63.000.
Yamashita, Mikihiro; and Furukawa, Kaoru, 4,859,931, Cl. 324-67.000.

Matsushita Electronics Corporation: *See*—
Kojo, Takeshi, 4,860,083, Cl. 357-51.000.

Matsuura, Masaaki; Ishikawa, Mitsuru; Nakamori, Masaharu; and Kuroki, Masahiro, to Honda Giken Kogyo Kabushiki Kaisha. Rotary valve device for internal combustion engines. 4,858,577, Cl. 123-190.00A.

Matsuura, Yutaka: *See*—
Fujimura, Setsuo; Sagawa, Masato; Matsuura, Yutaka; Yamamoto, Hitoshi; and Togawa, Norio, 4,859,255, Cl. 148-302.000.

Matsuyama, Yukio; and Ichinose, Toshiaki, to Hitachi, Ltd. Method and apparatus for detecting pattern defects. 4,860,371, Cl. 382-8.000.

Mattausch, Hans J., to Siemens Aktiengesellschaft. Semiconductor memory with random access via two separate inputs/outputs. 4,860,263, Cl. 365-230.050.

Mattes, Michael J., to Center for Molecular Medicine and Immunology. Modified antibodies for enhanced hepatocyte clearance. 4,859,449, Cl. 424-9.000.

Matthews, William W.: *See*—
Jusaitis, Walter; and Matthews, William W., 4,859,348, Cl. 210-799.000.

Matusz, John M.; Golick, Leonard R.; and Matusz, Walter, to Westinghouse Electric Corp. Reactor vessel lower internals temporary support. 4,859,409, Cl. 376-463.000.

Matusz, Walter: *See*—
Matusz, John M.; Golick, Leonard R.; and Matusz, Walter, 4,859,409, Cl. 376-463.000.

Matz, Richard: *See—*
Heise, Gerhard; Wolff, Ulrich; and Matz, Richard, 4,859,548, Cl. 430-1.000.

Maurer, Peter; Pfister, Jorg; and Sauter, Wolfgang, to Rhodia Aktiengesellschaft. Method for the continuous sizing and stretching of synthetic filament yarns. 4,858,287, Cl. 28-172.000

Maurer, Roland: *See—*
Allgaier, Jurgen; Ganter, Wolfgang; Hodapp, Wolfram; Kopf, Arthur; and Maurer, Roland, 4,860,268, Cl. 368-47.000.

Maurer, William C.: *See—*
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Wasson, Michael R.; and Herben, William C., 4,858,704, Cl 175-61.000.

Maus, Otfrid, to Schenck-Auto-Service-Gerate GmbH. Method and apparatus for measurement of caster, king-pin-inclination, and camber on motor vehicles. 4,858,331, Cl. 33-203.180

Mauthe, Peter; Grundmann, Gabriele; and Moench, Monika, to Hilti Aktiengesellschaft. Container arrangement for cartridge dispensing two-component mass. 4,858,759. Cl. 206-221.000.

Mawst, Luke J.: *See—*
Botez, Dan; and Mawst, Luke J., 4,860,298, Cl. 372-45.000

Maxeiner, Heinz; Kruske, Gerhard; and Reimann, Hartwig, to Metallgesellschaft AG; and Bode Panzer Aktiengesellschaft. Safety structure. 4,859,541, Cl. 428-545.000

Maxim Integrated Products: *See—*
Schaffer, Gregory L., 4,859,963, Cl. 330-253.000.

May, Marvin M.: *See—*
Hancock, Mark W.; and May, Marvin M., 4,859,376, Cl. 261-35.000

Maycock, Ian C.; Ball, Robert J.; and Symonds, Denzil J. W., to Automotive Products PLC. Friction clutch for a vehicle. 4,858,741, Cl. 192-98.000.

Maycock, William E.; Nohr, Ronald S.; and MacDonald, J. Gavin, to Kimberly-Clark Corporation. Siloxane containing benzotriazolyl/tetraalkylpiperidyl substituent. 4,859,759, Cl. 528-27.000.

Mayer, Andreas, to ASEA Brown Boveri Ltd. Pressure wave charger. 4,859,153, Cl. 417-64.000.

Mayer, Christopher R.: *See—*
Glasheen, William M.; and Mayer, Christopher R., 4,858,474, Cl. 73-861.350.

Mayfield, John T., III, to Modular Engineering Corporation. Dispensers. 4,858,783, Cl. 221-59.000.

Mazda Motor Corporation: *See—*
Bouda, Keiji, 4,858,498, Cl. 74-866.000.
Doi, Shigetoshi; Nagayama, Yoshiaki; Iida, Katsumi; and Sakurai, Yoshihiko, 4,858,677, Cl. 165-12.000.
Kamise, Katsuya; and Yamamoto, Shigeru, 4,858,580, Cl. 123-425.000.
Matsumoto, Hiroyouki; Okamura, Kazumi; Nakayama, Hideo; and Okasako, Yasuhiro, 4,858,570, Cl. 123-52.0MV.
Yamaguchi, Hideo; and Fujiki, Tsutomu, 4,858,518, Cl. 98-2.080.

Mazurek, Richard: *See—*
Herrin, Melvin B.; and Mazurek, Richard, 4,858,756, Cl. 206-45.340.

Mazzanti, Rino, to Lenox Incorporated. Hanger clamp for garment bags, with movable hanger retaining elements. 4,858,870, Cl 248-316.100.

McAnulty, Frederick J., III. Door lock protecting device. 4,858,454, Cl. 70-455.000.

McCalley, Karl W.; Bertram, John R.; Sloan, Walter W.; and McClure, Rory T., to Telaction Corporation. Electronic store. 4,860,123, Cl. 358-342.000.

McCambridge, John M., to Chrysler Motors Corporation. H-driver. 4,859,916, Cl. 318-293.000.

McClain, John C., to General Motors Corporation. Blade locking system. 4,859,149, Cl. 416-215.000.

McClure, Rory T.: *See—*
McCalley, Karl W.; Bertram, John R.; Sloan, Walter W.; and McClure, Rory T., 4,860,123, Cl. 358-342.000.

McCombie, Jay C., to Chrysler Motors Corporation. Method of determining and using a filtered speed error in an integrated acceleration based electronic speed control system for vehicles. 4,860,210, Cl. 364-426.040

McCormick, Leach S.: *See—*
Feather, Landis E.; Girgis, Ramsis S.; McCormick, Leach S.; and Sletten, Andreas M., 4,859,978, Cl. 336-186.000.

McCoy, Karen M.: *See—*
Whalen, Joseph W.; Swartz, Gregory L.; Rheaume, Lisa J.; and McCoy, Karen M., 4,859,599, Cl. 435-252.600.

McCrary, Carl: *See—*
Metz, George D.; McCrary, Carl; O'Connor, Joseph G.; Adair, Paul C.; Proehl, D. Scott; Saccocio, Edward J.; and Dowler, James, 4,859,561, Cl. 430-138.000.

McCubbrey, David L.; and Lougheed, Robert M., to Environmental Research Inst. of Michigan. High speed cellular processing system. 4,860,375, Cl. 382-49.000.

McCullough, Timothy J. Slotted depth gauge plate. 4,858,321, Cl. 30-276.000.

McCurdy, Ronald E., to K-S-H Canada Inc. Solar heating panel with curvilinear passageway. 4,858,594, Cl. 126-444.000.

McDonald, David I.: *See—*
Dreisig, Robert C.; and McDonald, David I., 4,858,980, Cl. 294-99.100.

McDonald, Guy D.: *See—*
Binder, Richard R.; Bantz, Paul E.; Tiedemann, William H.; McDonald, Guy D.; and Wruck, William J., 4,859,546, Cl. 429-53.000.

McDonald, Rodney L. Wiring harness. 4,858,846, Cl. 242-85.100.

McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Wasson, Michael R.; and Herben, William C., to Gas Research Institute. Guided earth boring tool. 4,858,704, Cl. 175-61.000.

McDonnell Douglas Corporation: *See—*
Henne, Preston A.; and Gregg, Robert D., III, 4,858,852, Cl. 244-35.00R

McDonnell, Liam: *See—*
Cashell, Edmund M.; and McDonnell, Liam, 4,860,224, Cl 364-551.010.

McDonough, Michael L.: *See—*
Gray, Kenneth P.; McDonough, Michael L.; Poplawski, Bruce J.; Gaffaney, Daniel P.; and Moyer, Ross A., 4,858,305, Cl. 29-727.000.

McFarland, Diana R.; Ginsburg, Robert P.; and Ginsburg, Arthur P., to Vistech Consultants, Inc. Portable screen assembly for visual acuity testing. 4,859,052, Cl. 351-239.000.

McGee, Rodney M., Sr. Resettable axial tumbler lock. 4,858,456, Cl. 70-491.000

McGrail, Richard A.: *See—*
Woodley, George M.; McGrail, Richard A.; Powers, Stephen J.; and Ross, William W., 4,858,841, Cl. 242-56.00R

McGuffin, James E., to Columbian Chemicals Company. Beader drum method. 4,859,387, Cl. 264-117.000.

McHugh, Kevin: *See—*
Arciszewski, Henry E.; Porzio, Linda A.; Chiang, Bin Y.; Spotts, Clyde E., Jr.; McHugh, Kevin; and Szwerc, Joseph A., 4,859,473, Cl. 426-19.000.

McIntosh, Ronald M.; Rentzel, Richard T.; Stewart, Robert W.; and Daugherty, Daniel L., to Baker Hughes Incorporated. Downhole electrical connector for submersible pump. 4,859,200, Cl. 439-275.000

McKechnie, Ian C. Electronic dice. 4,858,931, Cl. 273-138.00A.

McKenna, Gilbert W., to Siemens Aktiengesellschaft. Magnetic resonance spectroscopy apparatus. 4,859,949, Cl. 324-321.000.

McKenzie, Ian R.: *See—*
Kelsey, Christopher G.; and McKenzie, Ian R., 4,858,887, Cl. 251-212.000.

McKissack, Jeremy J., to Gallagher Electronics Limited. Electric fence energizer. 4,859,868, Cl. 307-106.000.

McKissick, Gaylord E.; and Weppelman, Roger M., to Merck & Co., Inc. Antiestrogen agents having anabolic activity in animals. 4,859,695, Cl. 514-408.000.

McLaughlin, Kevin L.: *See—*
Reuss, Robert H.; and McLaughlin, Kevin L., 4,860,077, Cl. 357-34.000.

McLeese, Eddie S. Self erecting structure. 4,858,634, Cl. 135-104.000.

McLeod, Robert; Card, Howard; Hortensius, Peter; and Pries, Werner, to University of Manitoba. Cellular automaton for generating random data. 4,860,236, Cl. 364-717.000.

McManamen, John P.: *See—*
Lange, Gregory A.; McManamen, John P.; and Schliesing, John A., 4,858,857, Cl. 244-161.000.

McMillan, Myles: *See—*
Gale, P. Michael; McMillan, Myles; and Gagnon, Andre, 4,859,934, Cl. 324-78.00D.

McNay, Curtis E., to Boeing Company, The. Aircraft open viewing port configuration. 4,858,850, Cl. 244-1.00R.

McNerney, Francis C.: *See—*
John, Clarence D., Jr.; McNerney, Francis C.; and Sanders, Thomas M., 4,859,276, Cl. 156-626.000.

McPherson, Hugh, to W. L. Gore & Associates, Inc. Security system and signal carrying member thereof. 4,859,989, Cl. 340-510.000.

McQueeney, Kenneth A.: *See—*
Borner, Willy; and McQueeney, Kenneth A., 4,859,111, Cl. 403-340.000.

McQuilkin, Peter H., to Femcare Limited. Applicator. 4,858,608, Cl. 128-325.000

McQuirk, Kyle. Fire protection for structures. 4,858,395, Cl. 52-3.000.

Mead Corporation, The: *See—*
Metz, George D.; McCrary, Carl; O'Connor, Joseph G.; Adair, Paul C.; Proehl, D. Scott; Saccocio, Edward J.; and Dowler, James, 4,859,561, Cl. 430-138.000.

Mead, Sharon M.: *See—*
Suzuki, Fred K.; Mead, Sharon M.; Yoshida, Noble H.; and Dobberstein, Robert H., 4,859,360, Cl. 252-299.700.

Measurement Technology Limited: *See—*
Hutcheon, Ian C.; and Epton, David J., 4,860,151, Cl. 361-91.000.

Meckenstock, Fritz, to Mega Plast product- u. Verpackungsentwicklung Marketing Gesellschaft mit Beschrankter Haftung & Co. Dispensing device for dispersing liquid from a container. 4,858,788, Cl. 222-207.000.

Meckler, Gershon. Mixing box. 4,858,519, Cl. 98-384.000.

Medved, Gary E.: *See—*
Lovell, John A.; Medved, Gary E.; and White, John R., 4,859,272, Cl. 156-415.000.

Meek, Robert A.: *See—*
Laster, Stanley J.; Meek, Robert A.; and Shirley, Thomas E., 4,860,265, Cl. 367-73.000.

Mega Plast product- u. Verpackungsentwicklung Marketing Gesellschaft mit Beschrankter Haftung & Co.: *See—*
Meckenstock, Fritz, 4,858,788, Cl. 222-207.000.

Meguro, Takashi: *See—*
Yasunami, Masabumi; Takase, Kahei; Meguro, Takashi; Suzuki, Katsumi; Hiwatashi, Osamu; Okutsu, Masaru; Kato, Nobuo; and Nakamura, Toru, 4,859,701, Cl. 514-510.000.

Megyeri, Gabor: *See—*
Keve, Tibor; Megyeri, Gabor; Stefko , Bela; Kovacs, Lajos, Jr.; Kassai nee Zieger, Anna; Kiss, Bela; Laszlovszky, Istvan; Lapis, Erzsebet; Palosi, Eva; Groo, Dora; and Szporny, Laszlo , 4,859,682, Cl. 514-288.000.

Mehra, Ravinder C., to Nalge Company. Bottle closure assembly. 4,858,776, Cl. 215-270.000.

Meijer, Robert S., to Fisher Scientific Company. Power supply with improved switching regulator. 4,859,927, Cl. 323-284.000.

Meinema, Ate. J., to Sentron v.o.f. Catheter sensor and memory unit. 4,858,615, Cl. 128-668.000.

Meinert, Norbert; Huber, Werner; Dreuth, Rainer; and Franek, Henning, to Ernst Leitz Wetzlar GmbH. Optical fluorophosphate glass having anomalous positive partial dispersion and process for its production. 4,859,635, Cl. 501-44.000.

Meland, Ronald F.: *See—*
Berfield, Robert C.; and Meland, Ronald F., 4,858,271, Cl. 15-339.000.

Meli, Vincenzo: *See—*
Busacca, Guido; Meli, Vincenzo; and Spalla, Mario, 4,859,907, Cl. 315-3.500.

Mellon, Regis B., to Protel, Inc. Telephone system and method operated from central office loop current. 4,860,345, Cl. 379-123.000.

Mellon, Regis B., to Protel, Inc. Telephone system and method operated from central office loop current. 4,860,346, Cl. 379-155.000.

Melzer, James E.: *See—*
Berman, Arthur L.; and Melzer, James E., 4,859,031, Cl. 350-174.000.

Mengel, William H., to General Electric Company. Autoprogramming tuner apparatus. 4,860,380, Cl. 455-185.000.

Mercier, Jacques, to Regie Nationale des Usines Renault. Device for transmission of movement by an outside gearing. 4,858,487, Cl. 74-424.700.

Merck & Co., Inc.: *See—*
Ashton, Wallace T.; Walton, Edward; and Tolman, Richard L., 4,859,680, Cl. 514-274.000.
Lam, Yiu-kuen T.; Chang, Raymond S.; Hensens, Otto D.; Schwartz, Cheryl D.; and Zink, Deborah L., 4,859,690, Cl. 514-375.000.
McKissick, Gaylord E.; and Weppelman, Roger M., 4,859,695, Cl. 514-408.000.
Rasmusson, Gary H.; and Reynolds, Glenn F., 4,859,681, Cl. 514-284.000.
Reider, Paul J.; and Grabowski, Edward J. J., 4,859,771, Cl. 540-509.000.

Merck Frosst Canada, Inc.: *See—*
Lau, Cheuk K.; Yoakim, Christiane; Rokach, Joshua; Fortin, Rejean; and Guindon, Yvan, 4,859,667, Cl. 514-224.500.

Merriam, James C.: *See—*
Borah, Joshua D.; Merriam, James C.; and Velez, Jose, 4,859,050, Cl. 351-210.000.

Mersch, Steve, to Becton, Dickinson and Company. Measuring curvature of transparent or translucent material. 4,859,861, Cl. 250-560.000.

Meschi, Luciano, to Wully, S.A. Packing case, particularly for sheet material. 4,858,414, Cl. 53-429.000.

Messerschmidt, Robert G.; and Sting, Donald W., to Spectra-Tech, Inc. Diffuse reflectance spectroscopy system and method. 4,859,064, Cl. 356-446.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Bruederle, Ernst, 4,858,858, Cl. 244-165.000.

Meta-Fer Holding S.A.: *See—*
Vadseth, Jan E., 4,860,182, Cl. 362-364.000.

Metal Era, Inc.: *See—*
Lane, Bennie L.; and Taylor, William T., 4,858,406, Cl. 52-300.000.

Metallgesellschaft AG: *See—*
Maxeiner, Heinz; Kruske, Gerhard; and Reimann, Hartwig, 4,859,541, Cl. 428-545.000.

Metripond Merleggyar: *See—*
Tari, Gabor; and Hari, Laszlo, 4,858,903, Cl. 269-328.000.

Metro Denso Kabushiki Kaisha: *See—*
Tanaka, Masao, 4,859,816, Cl. 200-61.270.

Mettler Instrumente AG: *See—*
Frueh, Peter, 4,859,608, Cl. 436-163.000.
Kunz, Peter, 4,858,711, Cl. 177-212.000.

Metz, George D.; McCrary, Carl; O'Connor, Joseph G.; Adair, Paul C.; Proehl, D. Scott; Saccocio, Edward J.; and Dowler, James, to Mead Corporation, The. Developer sheet useful in providing transparencies or reproductions having a controlled gloss finish. 4,859,561, Cl. 430-138.000.

Metzger, Andre; Grimm, Peter; Nohl, Andre J.; and Nau, Vance J., to Ciba-Geigy Corporation. Process for preparation of samples for analysis. 4,859,605, Cl. 436-43.000.

Meyer, Bertrand; and Pijew, Alexandre, to Institut Textile de France. Device for drying, by micro-waves, the selvedge of an advancing flat material, particularly textile. 4,859,821, Cl. 219-10.55A.

Meyer, Stephen R., to Rosemount Inc. Heater clamp for injection molding. 4,859,176, Cl. 432-225.000.

Meyerhoefer, Carl: *See—*
Kane, Richard; Meyerhoefer, Carl; Miller, David C.; and Pendleton, Thomas J., 4,858,781, Cl. 220-407.000.

Meyocks, Richard D.: *See—*
Andersen, Gerald L.; Howes, Ronald D.; and Meyocks, Richard D., 4,858,352, Cl. 40-299.000.

Meyrick, Barry H.: *See—*
Gregory, Peter; Bradbury, Roy; and Meyrick, Barry H., 4,859,651, Cl. 503-227.000.

Micchelli, Albert L.: *See—*
Nowak, Frank A., Jr.; Micchelli, Albert L.; and Rouse, William M., 4,859,455, Cl. 424-47.000.

Michels, Caspar P. M.: *See—*
Simons, Johannes M. M.; and Michels, Caspar P. M., 4,859,962, Cl. 330-260.000.

Michno, Drake M.; Platt, Norma B.; Steele, David A.; and Southby, David T., to Eastman Kodak Company. Photographic recording material providing improved granularity properties. 4,859,578, Cl. 430-544.000.

Michnowski, Jane, to Nabisco Brands, Inc. Nutritional athletic bar. 4,859,475, Cl. 426-72.000.

Michon, Gerald J., to General Electric Company. Solid state imaging apparatus. 4,860,073, Cl. 357-24.000.

Microchip Technology Incorporated: *See—*
Rich, David; and Staley, Peter, 4,860,012, Cl. 341-143.000.

Microdot Inc.: *See—*
Brecz, Imre; Schultz, Dennis; and Hinton, Dennis L., 4,859,128, Cl. 411-43.000.

Microelectronics and Computer Technology Corporation: *See—*
Smith, Robert T., 4,859,806, Cl. 174-68.500.
Smith, Robert T.; and Chung, Chang-Hwa, 4,860,088, Cl. 357-69.000.

Micron Technology, Inc.: *See—*
Cathey, David A.; Freeman, John C.; Dale, James; Crane, William J.; Powell, Eric A.; and Musser, Jeffrey V., 4,859,304, Cl. 204-298.000.

Mifune, Toshimi: *See—*
Kuzunuki, Soshiro; Shojima, Hiroshi; Miura, Masaki; Mori, Junko; and Mifune, Toshimi, 4,860,372, Cl. 382-13.000.

Migliori, Albert: *See—*
Wheatley, John C.; Swift, Gregory W.; Migliori, Albert; and Hofler, Thomas J., 4,858,441, Cl. 62-6.000.

Milios, Yannis: *See—*
Tetelman, Bruce; Milios, Yannis; Park, Il-Pyung; and Recht, Tom, 4,859,839, Cl. 235-385.000.

Milkovic, Miran, to General Electric Company. Pulse width modulator in an electronic watt-hour meter with up and down integration for error correction. 4,859,937, Cl. 324-142.000.

Millar, Colin A.: *See—*
Brierley, Michael C.; Mallinson, Stephen R.; Millar, Colin A.; and Urquhart, William P., 4,859,017, Cl. 350-96.150.

Miller, Conrad E., to Du Pont de Nemours, E. I., and Company. Photosensitive element having improved antistatic layer. 4,859,570, Cl. 430-271.000.

Miller, David A. B.: *See—*
Chemla, Daniel S.; Miller, David A. B.; and Smith, Peter W., 4,860,296, Cl. 372-44.000.

Miller, David C.: *See—*
Kane, Richard; Meyerhoefer, Carl; Miller, David C.; and Pendleton, Thomas J., 4,858,781, Cl. 220-407.000.

Miller, Edward A. Chain saw and guide. 4,858,325, Cl. 30-373.000.

Miller, James J.; and Valentine, Robert C. Portable pipe testing apparatus. 4,858,464, Cl. 73-49.500.

Miller-Johannisberg Druckmaschinen GmbH: *See—*
Lindblom, Kurt L., 4,858,904, Cl. 270-58.000.

Miller, John J., deceased: *See—*
Olson, Donald C.; and Miller, John J., deceased, 4,859,436, Cl. 423-221.000.

Miller, Merle L.; and Gulick, Dale E., to Advanced Micro Devices, Inc. Master/slave synchronizer. 4,860,285, Cl. 370-100.000.

Miller, Robert C.: *See—*
Gossard, Arthur C.; Miller, Robert C.; and Petroff, Pierre M., 4,860,068, Cl. 357-16.000.

Miller, Stephen J., to Chevron Research Company. Catalytic dewaxing process using a silicoaluminophosphate molecular sieve. 4,859,311, Cl. 208-89.000.

Miller, Stephen J., to Chevron Research Company. Process for making middle distillates using a silicoaluminophosphate molecular sieve. 4,859,312, Cl. 208-111.000.

Miller, Thomas R.; Green, John W.; and Motz, Mark. Hockey stick blade bender. 4,858,665, Cl. 144-380.000.

Miller, Wayne R., executor: *See—*
Olson, Donald C.; and Miller, John J., deceased, 4,859,436, Cl. 423-221.000.

Milliken, Brad R.: *See—*
Priebe, William F.; Milliken, Brad R.; and Braaten, Dennis A., 4,858,537, Cl. 110-243.000.

Minami, Nobuyuki: *See—*
Sasaki, Nobuo; Kuragano, Tetsuzo; and Minami, Nobuyuki, 4,860,217, Cl. 364-518.000.

Minato, Masanori: *See—*
Kawahito, Shiro; and Minato, Masanori, 4,859,537, Cl. 428-411.100.

Mine Safety Appliances Company: *See—*
Kush, Robert S.; and Bossart, Clayton J., 4,858,478, Cl. 73-864.350.
Schneider, Alan A.; Stewart, David A.; Jolson, Joseph D.; Auel, RaeAnn M.; and Price, John F., 4,859,305, Cl. 204-412.000.

Minematu, Yoiti; Tajima, Toshio; and Nakajima, Shigeharu, to Yoiti Minematu; Sankyo Denki Co., Ltd.; and Nichia Kagaku Kogyo K. K. Ultraviolet fluorescent lamp for accelerated exposure test on polymer. 4,859,903, Cl. 313-487.000.

Ming Tay Hardware Ind. Co., Ltd.: *See—*
Kuo, Wen Tai, 4,858,455, Cl. 70-491.000.

Minigrip, Inc.: *See—*
Nocek, Robert S.; and Ausnit, Steven, 4,859,083, Cl. 383-37.000.
Siegel, Karl-Heinz, 4,858,286, Cl. 24-587.000.

Mink, Bernardus H.: *See—*
Segerstrom, Clifford C.; Stil, Jacob H.; Ooms, Adrianus J.; Mink, Bernardus H.; Premel, Ulrich; and Gawloski, Leszek, 4,859,214, Cl. 48-197.00R.

Mink, Frederick J.: *See—*
Squarer, David; Colin, Andre; Prior, Robert P.; Mink, Frederick J.; and Liparulo, Nicholas J., 4,859,405, Cl. 376-299.000.

Mink, George. Game article selection apparatus. 4,858,933, Cl. 273-144.00A.

Minnesota Mining and Manufacturing Company: *See—*
Ofstead, Ronald F., 4,859,719, Cl. 523-108.000.
Petersen, Kurt H.; and Schmolze, Christopher A., 4,859,189, Cl. 439-66.000.

Minnick, Larry A., to Eastman Kodak Company. Reinforced molding composition based on poly(1,4-cyclohexylene dimethylene terephthalate) having improved crystallization characteristics. 4,859,732, Cl. 524-385.000.

Minolta Camera Kabushiki Kaisha: *See—*
Carlson, Vincent; Fenlon, Michael N.; Mansur, Robert P.; and Kadomiya, Ronald H., 4,859,100, Cl. 400-715.000.
Hamada, Masataka; and Ishida, Tokuji, 4,860,045, Cl. 354-402.000.
Hata, Yoshiaki; Taniguchi, Nobuyuki; Hoda, Takeo; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,860,039, Cl. 354-106.000.
Ito, Masazumi; Nishimori, Kadotaro; and Oyabu, Masaaki, 4,860,052, Cl. 355-209.000.
Ohira, Tadashi; Ito, Masazumi; and Maruta, Syuzi, 4,860,055, Cl. 355-308.000.
Saito, Mitsuru; and Sato, Kazuchika, 4,860,108, Cl. 358-209.000.
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,860,046, Cl. 354-475.000.
Yamada, Hirokazu, 4,858,908, Cl. 271-176.000.

Minowa, Morihiko: *See—*
Takenaka, Sadao; Aono, Yoshihito; Iwamatsu, Takanori; Minowa, Morihiko; Daido, Yoshimasa; and Nakamura, Hiroshi, 4,860,316, Cl. 375-39.000.

Miranker, Daniel P.: *See—*
Stolfo, Salvatore J.; and Miranker, Daniel P., 4,860,201, Cl. 364-200.000.

Mise, Keisuke: *See—*
Ukita, Hiroo; Katagiri, Yoshitada; Sawada, Renshi; Uenishi, Yuuji; Isomura, Yoshihiro; Toshima, Tomoyuki; and Mise, Keisuke, 4,860,276, Cl. 369-119.000.

Mishina, Kazuya: *See—*
Rikimaru, Hiroaki; Nakatsuji, Tadao; Umaba, Toshikatsu; Nagano, Kuzuhiko; Mishina, Kazuya; and Shimizu, Hiromitsu, 4,859,439, Cl. 423-239.000.

Misumi, Kiyohito: *See—*
Wada, Toshiaki; Katsuyama, Yoshiaki; Furukawa, Mitsuhiko; Kitahira, Takashi; Miyahara, Michito; Misumi, Kiyohito; and Shiroyama, Masaharu, 4,859,638, Cl. 501-58.000.

Mita Industrial Co., Ltd.: *See—*
Kano, Atsushi; Ishiguro, Yasuyuki; Ogiri, Tadakazu; Ozaki, Hirofumi; and Yamashita, Yuji, 4,860,056, Cl. 355-298.000.
Yamamoto, Haruo; Ichihashi, Takao; Fujisawa, Shuji; Tone, Eiichi; and Tsuda, Takeshi, 4,860,053, Cl. 355-245.000.

Mitchell, David J.; and Zboril, Vaclav G., to Du Pont Canada Inc. Polyolefin compositions containing trialkanolamines. 4,859,733, Cl. 524-432.000.

Mitchell, Frances E.; Campbell, G. Edward; and Steichen, Dale S., to Clorox Company, The. Oxidant bleach, container and fragrancing means therefor. 4,858,758, Cl. 206-205.000.

Mitchell, Glen E. Self-attaching linking device. 4,858,977, Cl. 294-82.100.

Mitchell, Mark S.: *See—*
Navratil, Martin; Mitchell, Mark S.; and Sovak, Mojmir, 4,858,693, Cl. 166-295.000.

Mitchell, William L.: *See—*
Coates, Ian H.; Bradshaw, John; Bell, James A.; Humber, David C.; Ewan, George B.; Mitchell, William L.; and Price, Barry J., 4,859,662, Cl. 514-212.000.

Mitel Corp.: *See—*
Sykora, Boleslav, 4,860,252, Cl. 364-900.000.

Mitsuba Electric Mfg. Co., Ltd.: *See—*
Akutsu, Shigeru; and Tsuchiya, Kiyoshi, 4,859,894, Cl. 310-239.000.
Shirato, Masayoshi, 4,858,268, Cl. 15-250.210.

Mitsubishi Chemical Industries Limited: *See—*
Miura, Konoe; Ochiai, Tameichi; and Kameyama, Yasuhiro, 4,859,563, Cl. 430-192.000.

Mitsubishi Denk Kabushiki Kaisha: *See—*
Morishita, Akira; Konishi, Keiichi; and Tanaka, Toshinori, 4,859,895, Cl. 310-261.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Arimoto, Kazutami; and Furutani, Kiyohiro, 4,860,070, Cl. 357-23.600.
Chonan, Katsuhiko, 4,859,924, Cl. 318-808.000.
Hashizume, Atsushi, 4,858,587, Cl. 123-631.000.
Hyakutake, Junichi, 4,859,872, Cl. 307-269.000.
Ishii, Kazuhiro, 4,860,153, Cl. 361-94.000.
Kondou, Harufusa; and Ando, Hideki, 4,860,235, Cl. 364-716.000.
Kono, Keizo; Kondou, Mitsushige; Tsubouchi, Natsuro; Hine, Shiro; Nishihara, Hiroshi; and Suhara, Toshiaki, 4,859,033, Cl. 350-320.000.
Koyama, Tsunehiro, 4,860,065, Cl. 357-15.000.
Matsuda, Kenji; Sugawara, Sakuo; Hara, Masanori; Umemura, Hiroyuki; Ishioka, Hidenori; and Aoki, Katsuyuki, 4,858,824, Cl. 236-94.000.
Matsuno, Takeshi; and Iwata, Kazuo, 4,859,847, Cl. 250-239.000.
Shiroyama, Shigeru, 4,859,892, Cl. 310-218.000.
Suzuki, Hitoshi; Hara, Kozo; Koga, Shiro; and Morita, Shigeru, 4,860,363, Cl. 381-89.000.
Takano, Hiroshi; Murakami, Tokumichi; Kamisawa, Koh; and Aoyagi, Hidenori, 4,860,283, Cl. 370-82.000.
Tanino, Junichi, 4,858,727, Cl. 187-121.000.
Tobita, Youichi, 4,860,259, Cl. 365-201.000.
Tominaga, Tsutomu, 4,858,715, Cl. 180-170.000.
Tsukamoto, Katsuhiro; and Matsukawa, Takayuki, 4,859,615, Cl. 437-38.000.
Yamanaka, Torao; and Kawahara, Takeshi, 4,860,001, Cl. 340-825.200.
Yamashita, Hiromitsu, 4,860,120, Cl. 358-330.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Rikimaru, Hiroaki; Nakatsuji, Tadao; Umaba, Toshikatsu; Nagano, Kuzuhiko; Mishina, Kazuya; and Shimizu, Hiromitsu, 4,859,439, Cl. 423-239.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Koesashi, Yuzo; Kawade, Yasuhiko; and Iwata, Yoshikazu, 4,859,123, Cl. 408-233.000.

Mitsubishi Mining & Cement Co.: *See—*
Uetsuhara, Tokio, 4,859,975, Cl. 335-230.000.

Mitsubishi Petrochemical Co., Ltd.: *See—*
Rikimaru, Hiroaki; Nakatsuji, Tadao; Umaba, Toshikatsu; Nagano, Kuzuhiko; Mishina, Kazuya; and Shimizu, Hiromitsu, 4,859,439, Cl. 423-239.000.

Mitsubishi Petrochemical Engineering Co., Ltd.: *See—*
Rikimaru, Hiroaki; Nakatsuji, Tadao; Umaba, Toshikatsu; Nagano, Kuzuhiko; Mishina, Kazuya; and Shimizu, Hiromitsu, 4,859,439, Cl. 423-239.000.

Mitsubishi Rayon Company Ltd.: *See—*
Sasaki, Isao; Yamamoto, Naoki; Yanagase, Akira; and Hatakeyama, Hiroki, 4,859,727, Cl. 524-147.000.

Mitsuboshi Belting Ltd.: *See—*
Takano, Hiroshi; and Matsuo, Mu, 4,858,492, Cl. 74-745.000.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; Hosono, Yoichi; Takahara, Shigeru; and Koike, Tadashi, 4,859,569, Cl. 430-270.000.
Takayanagi, Hiroshi; Kobayashi, Tadashi; Masuda, Takayoshi; and Shinoda, Hosei, 4,859,763, Cl. 528-357.000.

Miura, Konoe; Ochiai, Tameichi; and Kameyama, Yasuhiro, to Mitsubishi Chemical Industries Limited. Positive photoresist composition. 4,859,563, Cl. 430-192.000.

Miura, Masaki: *See—*
Kuzunuki, Soshiro; Shojima, Hiroshi; Miura, Masaki; Mori, Junko; and Mifune, Toshimi, 4,860,372, Cl. 382-13.000.

Miyahara, Michito: *See—*
Wada, Toshiaki; Katsuyama, Yoshiaki; Furukawa, Mitsuhiko; Kitahira, Takashi; Miyahara, Michito; Misumi, Kiyohito; and Shiroyama, Masaharu, 4,859,638, Cl. 501-58.000.

Miyake, Junji: *See—*
Hatanaka, Keiji; Sakuma, Kiyotoshi; Morita, Kiyomi; and Miyake, Junji, 4,860,211, Cl. 364-431.050.

Miyamoto, Ryosuke; and Sakai, Shinji, to Canon Kabushiki Kaisha. Camera with enhanced communication with detachable lens. 4,860,113, Cl. 358-225.000.

Miyamoto, Yasuo; Arai, Katsuyoshi; and Uchiyama, Keiichi, to Honda Giken Kogyo Kabushiki Kaisha. Mount. 4,858,879, Cl. 248-562.000.

Miyasaka, Nobuaki; Yokoyama, Shigeki; Suga, Shuzo; Naoi, Takashi; and Satake, Masaki, to Fuji Photo Film Co., Ltd. Silver halide photographic material comprising a protective layer containing a polyoxyethylene surface active agent. 4,859,576, Cl. 430-523.000.

Miyashita, Hiromichi: *See—*
Abe, Tsutomu; and Miyashita, Hiromichi, 4,858,345, Cl. 37-118.00R.

Miyata, Masaya: *See—*
Takada, Koji; Miyata, Masaya; and Tamura, Isojiro, 4,859,291, Cl. 204-49.000.

Miyauchi, Nobuyuki; Kawanishi, Hidenori; Maei, Shigeki; Yamamoto, Osamu; and Hayashi, Hiroshi, to Sharp Kabushiki Kaisha. External cavity type semiconductor laser apparatus. 4,860,305, Cl. 372-92.000.

Miyazaki, Takao: *See—*
Nakamura, Tohru; Ogirima, Masahiko; Nakazato, Kazuo; Miyazaki, Takao; Yamamoto, Naoki; Nagata, Minoru; and Sugaki, Shojiro, deceased, 4,860,086, Cl. 357-67.000.

Miyazaki, Yasuo: *See—*
Chida, Shouhei; Yamaoto, Naoki; Miyazaki, Yasuo; and Sato, Yasunori, 4,859,119, Cl. 405-269.000.

Miyoshi, Takahito: *See—*
Kakuta, Takeshi; and Miyoshi, Takahito, 4,859,500, Cl. 427-128.000.

Mizelle, Ned W. Mattress and supporting structure therefor. 4,858,258, Cl. 5-12.00R.

Mizoguchi, Shoichi, to NEC Corporation. Validity decision circuit capable of correctly deciding validity of an error signal in a multilevel quadrature amplitude demodulator. 4,859,956, Cl. 329-50.000.

Mizoguchi, Takeshi: *See—*
Aratani, Shinichi; Katano, Masaaki; and Mizoguchi, Takeshi, 4,859,636, Cl. 501-72.000.

Mizoguchi, Tetsuhiko; Sakai, Isao; Niu, Hiromi; and Inomata, Koichiro, to Kabushiki Kaisha Toshiba. Permanent magnet. 4,859,254, Cl. 148-302.000.

Mizuguchi, Takeshi: *See—*
Matsumura, Yasushi; Mizuguchi, Takeshi; and Matsui, Fumio, 4,859,481, Cl. 426-445.000.
Matsumura, Yasushi; Mizuguchi, Takeshi; and Matsui, Fumio, 4,859,487, Cl. 426-639.000.

Mizuhashi, Mamoru: *See—*
Oyama, Takuji; Suzuki, Koichi; and Mizuhashi, Mamoru, 4,859,532, Cl. 428-336.000.

Mizuma, Takashi: *See—*
Toshimitsu, Kenshi; and Mizuma, Takashi, 4,860,049, Cl. 355-218.000.

Mizumoto, Yasuharu: *See—*
Hata, Ryosuke; Yamanouchi, Shosuke; Hirose, Masayuki; Kuwabara, Hidemitsu; Mizumoto, Yasuharu; and Hagiuda, Yasuhiro, 4,859,804, Cl. 174-25.00R.

Mizumura, Yutaka: *See—*
Endoh, Hiroshi; Zama, Yoshimasa; Kadowaki, Nobuo; Yatuka, Takeshi; Nagai, Hiroshi; and Mizumura, Yutaka, 4,859,523, Cl. 428-215.000.

Mizuno, Keiichiro: *See—*
Murase, Masanori; Tomita, Naotaka; Mizuno, Keiichiro; and Iida, Kazuyoshi, 4,858,720, Cl. 181-176.000.

Mizutani, Kiroyuki: *See—*
Tanaka, Toshiaki; and Mizutani, Kiroyuki, 4,860,220, Cl. 364-522.000.

Mlaker, John J.: *See—*
Holmes, William K.; and Mlaker, John J., 4,858,723, Cl. 182-2.000.

Mobay Corporation: *See—*
Nodelman, Neil H.; and Kelso, Robert G., 4,859,791, Cl. 560-91.000.

Mobil Oil Corporation: *See—*
Chiang, Alan W., 4,859,379, Cl. 264-25.000.
Chibnik, Sheldon, 4,859,355, Cl. 252-47.500.
Harandi, Mohsen N.; and Owen, Hartley, 4,859,308, Cl. 208-49.000.
Herrington, Fox J.; and St. Phillips, Eric A., 4,860,267, Cl. 368-10.000.
Hoskin, Dennis H.; and Shu, Paul, 4,859,717, Cl. 523-130.000.
Kane, Richard; Meyerhoefer, Carl; Miller, David C.; and Pendleton, Thomas J., 4,858,781, Cl. 220-407.000.
Landis, Michael E.; Aufdembrink, Brent A.; Chu, Pochen; Johnson, Ivy D.; Kirker, Garry W.; Page, Nancy M.; and Rubin, Mae K., 4,859,648, Cl. 502-242.000.
Laster, Stanley J.; Meek, Robert A.; and Shirley, Thomas E., 4,860,265, Cl. 367-73.000.
Okorodudu, Abraham O. M., 4,859,356, Cl. 252-47.500.
Prader, Randolph D., 4,858,862, Cl. 248-99.000.
Ragusa, James J.; and Sharps, Gordon V., Jr., 4,859,822, Cl. 219-10.55E.
Su, Tien-Kuei, 4,859,398, Cl. 264-564.000.
Yan, Tsoung Y., 4,859,491, Cl. 427-140.000.

Mochizuki, Kazuto; and Kawahara, Katsushi, to Akai Electric Company, Limited. Insulator device for power transformer. 4,859,977, Cl. 336-65.000.

Mochizuki, Manabu: *See—*
Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kuramoto, Shinichi; Sugiyama, Yoshihiro; Takanashi, Hajime; Ishizuka, Takashi; Kudo, Yoshio; and Sato, Yoshio, 4,860,050, Cl. 355-256.000.

Mochizuki, Masashi: *See—*
Iwashita, Yukihiro; and Mochizuki, Masashi, 4,859,037, Cl. 350-339.00F.

Mochizuki, Masataka: *See—*
Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, 4,858,679, Cl. 165-46.000.

Mock, Clayton W.: *See—*
Hansen, Ronald D.; Mock, Clayton W.; and Kadifa, Abdo G., 4,859,995, Cl. 340-710.000.

Modena, Giorgio: *See—*
Campestrini, Sandro; Di Furia, Fulvio; Modena, Giorgio; and Pasquato, Lucia, 4,859,799, Cl. 568-430.000.

Modert, Timothy D.: *See—*
VanderBilt, Herbert J.; and Modert, Timothy D., 4,859,386, Cl. 264-113.000.

Modic, Michael J.; and Gelles, Richard, to Shell Oil Company. Polymeric composition. 4,859,737, Cl. 525-64.000.

Modry, John A.: *See—*
Corrigan, Colleen M.; Hunter, Lawrence W.; and Modry, John A., 4,860,203, Cl. 364-300.000.

Modular Engineering Corporation: *See—*
Mayfield, John T., III, 4,858,783, Cl. 221-59.000.

Moebius, Peter. Lockring tube joint. 4,858,968, Cl. 285-382.200.

Moeck, Gerhard: *See—*
Roeder, Georg; and Moeck, Gerhard, 4,859,104, Cl. 401-202.000.

Moench, Monika: *See—*
Mauthe, Peter; Grundmann, Gabriele; and Moench, Monika, 4,858,759, Cl. 206-221.000.

Moergeli, Benjamin: *See—*
Levy, Gideon; Budin, Josef; and Moergeli, Benjamin, 4,859,324, Cl. 210-195.200.

Moffatt, John G.: *See—*
Nestor, John J., Jr.; Moffatt, John G.; and Chan, Hardy W., 4,859,765, Cl. 530-333.000.

Mofley, Robert E.: *See—*
Sutter, Leroy V., Jr.; and Mofley, Robert E., 4,859,075, Cl. 374-2.000.

Mogens Daugaard: *See—*
Nielsen, Poul E., 4,858,875, Cl. 248-488.000.

Moger nee Jeremejeva, Galina: *See—*
Szabo nee Mogyorossi, Katalin; Kalocsai, Istvan; Gyoni, Istyan; Remenyi, Karoly; Plaveczky, Gyorgy; Kovacs, Laszlo ; Gal, Dezso ; Nemes, Istvan; Botar, Laszlo ; Bencsura, Akos; Moger nee Jeremejeva, Galina; Heberger, Karoly; and Nemeth, Andras, 4,859,209, Cl. 44-51.000.

Mohammadi, Navroz A.: *See—*
Rempel, Garry L.; and Mohammadi, Navroz A., 4,858,637, Cl. 137-12.000.

Moldenhauer, Philip E.: *See—*
Groezinger, John J.; and Moldenhauer, Philip E., 4,859,328, Cl. 210-232.000.

Molina, Orlando G., to Rockwell International Corporation. Water washable contaminant detection and labeling compositions and method for utilizing same. 4,858,465, Cl. 73-104.000.

Molino, Bruce F.: *See—*
Spada, Alfred P.; Campbell, Henry F.; Kuhla, Donald E.; Studt, William L.; Faith, William C.; and Molino, Bruce F., 4,859,672, Cl. 514-254.000.

Molock, Frank; Robertson, J. Richard, Jr., and Su, Kai C., to Ciba-Geigy Corporation. Hydrophilic modifier monomers. 4,859,780, Cl. 548-550.000.

Momata, Kazuhiro; Chida, Kousaku; Takeura, Tooru; and Tsukada, Yukihisa, to Hitachi, Ltd. Magnetic head closure having ferrite substrate and closure and conductive thin film coil deposited in recess of substantially same shape in ferrite substrate. 4,860,140, Cl. 360-127.000.

Monachan, Brian C.: *See—*
Waddell, Ewan M.; Orr, James S.; and Monachan, Brian C., 4,859,536, Cl. 428-408.000.

Monaghan, Alfred C., to Siempelkamp Corporation. Tensionless seal apparatus and method. 4,858,416, Cl. 53-439.000.

Monsanto Company: *See—*
Singh, Rajendra K., 4,859,232, Cl. 71-100.000.

Montali, Sergio; Ferro, Francesco; and Colli, Luigi, to Savio, S.p.A. Device and method for intermittently storing and returning yarn during the winding of conical bobbins fed with yarn at constant speed. 4,858,837, Cl. 242-18.00R.

Montgomery, Calvin. Safety weight bar assembly. 4,858,917, Cl. 272-123.000.

Moody, Robert P. Golf tee dispenser. 4,858,784, Cl. 221-155.000.

Moody, Roger E.: *See—*
Farid, Samir Y.; and Moody, Roger E., 4,859,572, Cl. 430-281.000.

Mookherjee, Braja D.: *See—*
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,859,463, Cl. 424-84.000.

Moon, William G.: *See—*
Harrison, Joel N.; Moon, William G.; and Graham, Randolph H., 4,860,194, Cl. 364-200.000.

Mooradian, Aram, to Masssachusetts Institute of Technology. Solid state microlaser. 4,860,304, Cl. 372-92.000.

Moore, James; Kale, Michael; and Csanak, George, to Barnes Engineering Company. Narrow-band optical absorption filter. 4,859,028, Cl. 350-1.100.

Moore, Jeffrey B.: *See—*
Hausler, Jeffery P.; Baria, Paul C.; Majek, Alfred; and Moore, Jeffrey B., 4,859,834, Cl. 219-497.000.

Moore, Richard S., to Materials Recycling Management Ltd. Waste reclamation system for pelletizing fuel pellets. 4,859,211, Cl. 44-589.000.

Moran, William: *See—*
Ilfrey, William T.; Spatz, Edward C.; Peterson, Elmer R.; and Moran, William, 4,858,691, Cl. 166-278.000.

Morel, Michel, to Clecim. Continuous monitoring roller for the profile of a strip. 4,858,333, Cl. 33-552.000.

Morel, Simone. Container with a removable cap having side generating lines in alignment with those of the container. 4,858,777, Cl. 215-295.000.

Morelle, Jean V.; and Lauzanne-Morelle, Eliane M. T. Use of compositions of matter containing N-acylates of alpha aminoacids for the treatment of skin. 4,859,653, Cl. 514-2.000.

Moreno, Albert M. Post support. 4,858,876, Cl. 248-545.000.

Morgan, Cleon C.; and Nieboer, Keith A., to Donnelly Corporation. Vehicular window assembly. 4,858,988, Cl. 296-201.000.

Morgan, Edward B.: *See—*
Horne, Colin; and Morgan, Edward B., 4,859,866, Cl. 290-54.000.

Mori, Junko: *See—*
Kuzunuki, Soshiro; Shojima, Hiroshi; Miura, Masaki; Mori, Junko; and Mifune, Toshimi, 4,860,372, Cl. 382-13.000.

Morino, Ronald: *See—*
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Szenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,859,807, Cl. 174-68.500.

Morishita, Akira; Konishi, Keiichi; and Tanaka, Toshinori, to Mitsubishi Denk Kabushiki Kaisha. Armature coil slots having grooves formed in its throat. 4,859,895, Cl. 310-261.000.

Morita, Hiroaki; Haraguchi, Kazutoshi; and Tanigawa, Eiji, to Osaka Gas Company Limited; and Dainippon Ink and Chemicals Inc. Process for preparing pitch-type carbon fibers. 4,859,381, Cl. 264-29.200.

Morita, Hiroaki: *See—*
Haraguchi, Kazutoshi; Tanigawa, Eiji; Nukina, Kenji; Morita, Hiroaki; and Maeda, Toyohiro, 4,859,382, Cl. 264-29.200.

Morita, Kiyomi: *See—*
Hatanaka, Keiji; Sakuma, Kiyotoshi; Morita, Kiyomi; and Miyake, Junji, 4,860,211, Cl. 364-431.050.

Morita, Shigeru: *See—*
Suzuki, Hitoshi; Hara, Kozo; Koga, Shiro; and Morita, Shigeru, 4,860,363, Cl. 381-89.000.

Morita, Takashi: *See—*
Maniwa, Yoshio; and Morita, Takashi, 4,860,119, Cl. 358-296.000.

Moritani, Masahiko: *See—*
Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Yasunori, Yukio, 4,859,750, Cl. 526-135.000.

Moriyama, Masatoshi; and Ohira, Masaki, to NEC Corporation. Bipolar transistor. 4,860,082, Cl. 357-49.000.

Morlock, Roland: *See—*
Oberkobusch, Doris; Morlock, Roland; Stritzke, Karl-Heinz; and Schieferstein, Ludwig, 4,859,721, Cl. 523-402.000.

Moroi, Shirou: *See—*
Kita, Yasushi; and Moroi, Shirou, 4,859,444, Cl. 423-439.000.

Moronaga, Yoshiharu: *See—*
Hayafuchi, Hideki; Moronaga, Yoshiharu; and Nakano, Kiyotaka, 4,858,339, Cl. 36-45.000.

Morris, James C.: *See—*
Keeffe, William M.; Krasko, Zeya; Karlotski, Robert; and Morris, James C., 4,859,899, Cl. 313-25.000.

Morrison, Donald R. Blade mounting apparatus, and blade comprising same. 4,859,115, Cl. 404-112.000.

Morrison, Larry E.: *See—*
Heller, Michael J.; and Morrison, Larry E., 4,859,583, Cl. 435-7.000.

Morrow, Howard E.: *See—*
Gal, George; and Morrow, Howard E., 4,859,055, Cl. 356-28.000.

Morse, James E.: *See—*
Wolfe, Robert W.; and Morse, James E., 4,859,497, Cl. 427-68.000

Mort, Joseph: *See—*
Jansen, Frank; and Mort, Joseph, 4,859,553, Cl. 430-58.000.

Morton, Edwin S.: *See—*
Nichols, John L.; Wang, David; Kirkpatrick, Edward; Viehweg, Clark M.; Morton, Edwin S.; and Hua, Van T., 4,860,112, Cl. 358-400.000.

Morton, Jerry: *See—*
Hanson, R. A.; and Morton, Jerry, 4,858,347, Cl. 37-190.000.

Morton Thiokol, Inc.: *See—*
Salamone, Ann B.; and Snyder, Susan L., 4,859,458, Cl. 424-70.000.
Sanglet, Philippe R., 4,859,447, Cl. 423-515.000.

Moskowitz, David; and Phillips, Charles W., to Ford Motor Company. Method of cutting using a titanium diboride body. 4,859,124, Cl. [illegible]

Mosley, Virgil E.: *See—*
Smith, Robert E., III; and Mosley, Virgil E., 4,858,648, Cl. 137-614.040.

Motai, Tsuneaki: *See—*
Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, 4,858,679, Cl. 165-46.000.

Motan Gesellschaft mit beschraenkter Haftung: *See—*
Roth, Paul, 4,858,335, Cl. 34-32.000.

Motorola, Inc.: *See—*
Carroll, Christopher J., 4,860,228, Cl. 364-561.000.
D'Avello, Robert F.; Rokusek, Daniel S.; and Tobolski, Francis P., Jr., 4,860,336, Cl. 379-63.000.
D'Avello, Robert F.; Tobolski, Francis P., Jr.; and Kowalski, Joseph L., 4,860,341, Cl. 379-91.000.
Davis, Walter L., 4,860,004, Cl. 340-825.440.
DeLuca, Joan S.; DeLuca, Michael J.; and Shea, George B., 4,860,003, Cl. 340-825.440.
DeLuca, Joan S.; and Dulaney, Randi L., 4,860,005, Cl. 340-825.440.
Edminister, Robert E.; and Cavazos, Raul V., Jr., 4,858,530, Cl. 102-208.000.
Finley, Roger W.; Lubin, Barry D.; and Bergendahl, Bruce A., 4,860,281, Cl. 370-15.000
Reuss, Robert H.; and McLaughlin, Kevin L., 4,860,077, Cl. 357-34.000.
Siddoway, Craig F.; Castaneda, Julio C.; and Iezzi, Peter D., 4,858,798, Cl. 224-242.000.
van den Heuvel, Anthony P.; Kotzin, Michael D.; and Crisler, Kenneth J., 4,860,312, Cl. 375-26.000

Motoyama, Akira: *See—*
Yokogawa, Fumihiko; Hirano, Hiroyuki; and Motoyama, Akira, 4,860,271, Cl. 369-44.000.

Mott, Raymond W.: *See—*
Lengemann, Robert A.; Thompson, Gregory J.; Vickers, Anthony G.; and Mott, Raymond W., 4,859,313, Cl. 208-113.000.

Motz, Mark: *See—*
Miller, Thomas R.; Green, John W.; and Motz, Mark, 4,858,665, Cl. 144-380.000.

Mountain, George. Termite control apparatus. 4,858,375, Cl. 43-124.000.

Mouri, Mikio: *See—*
Nomoto, Tsutomu; Yosida, Mamoru; Mouri, Mikio; and Watanabe, Tsukasa, 4,859,617, Cl. 437-40.000.

Moyer, Ross A.: *See—*
Gray, Kenneth P.; McDonough, Michael L.; Poplawski, Bruce J.; Gaffaney, Daniel P.; and Moyer, Ross A., 4,858,305, Cl. 29-727.000.

Mracek, Jaroslav: *See—*
Coyle, Richard J., Jr.; and Mracek, Jaroslav, 4,859,827, Cl. 219-121.640.

MTA Kozponti Kemiai Kutato Intezet: *See—*
Szabo nee Mogyorossi, Katalin; Kalocsai, Istvan; Gyoni, Istyan; Remenyi, Karoly; Plaveczky, Gyorgy; Kovacs, Laszlo ; Gal, Dezso ; Nemes, Istvan; Botar, Laszlo ; Bencsura, Akos; Moger nee Jeremejeva, Galina; Heberger, Karoly; and Nemeth, Andras, 4,859,209, Cl. 44-51.000.

MTU-Motoren-und Turbinen-Union Muenchen GmbH: *See—*
Masch, Helmut; and Fedrau, Dieter, 4,859,141, Cl. 415-115.000.
Puchinger, Franz; and Wydra, Gerhard, 4,859,506, Cl. 427-372.200.

Muff, Janet: *See—*
Jordan, Pavel; Muff, Janet; and Strong, Bernard, 4,858,607, Cl. 128-314.000.

Mui, Paul Y. H.; and Tso, Rosa Y. M. Illuminated umbrella. 4,860,179, Cl. 362-102.000.

Mukai, Norito: *See—*
Kawakami, Shin; Haruyama, Satoshi; Okonogi, Hirotaka; Nikaido, Katutomo; and Mukai, Norito, 4,859,805, Cl. 174-68.500.

Muller, Arthur: *See—*
Andheden, Sigvard; and Muller, Arthur, 4,859,453, Cl. 424-10.000.

Muller, Gerard, to Muller, Gerard. Contact lens for oriented optical corrections. 4,859,049, Cl. 351-161.000.

Muller, Nikolaus: *See—*
Behre, Horst; Blnak, Heinz U.; Kohler, Wilfried; Muller, Nikolaus; and Schnegg, Peter, 4,859,372, Cl. 562-74.000.

Muller, Serge: *See—*
Aubry, Jean-Pierre; Fragneau, Marc; Craveur, Jean-Charles; Janiaud, Denis; and Muller, Serge, 4,859,898, Cl. 310-353.000.

Munchbach, George E.: *See—*
Walton, Richard R.; and Munchbach, George E., 4,859,169, Cl. 425-336.000.

Mundus, Friedhelm, to Windmoller & Holscher. Apparatus for winding webs to form supply rolls. 4,858,842, Cl. 242-56.900.

Munetomo, Shigeru: *See—*
Sato, Takeshi; Adachi, Hiroo; and Munetomo, Shigeru, 4,860,361, Cl. 381-55.000.

Murakami, Kazuaki: *See—*
Kaneda, Saburo; and Murakami, Kazuaki, 4,860,190, Cl. 364-200.000.

Murakami, Masaichi: *See—*
Murakami, Seiro; Tanimoto, Akikazu; Makinouchi, Susumu; Kawai, Hidemi; and Murakami, Masaichi, 4,860,374, Cl. 382-48.000.

Murakami, Seiro; Tanimoto, Akikazu; Makinouchi, Susumu; Kawai, Hidemi; and Murakami, Masaichi, to Nikon Corporation. Apparatus for detecting position of reference pattern. 4,860,374, Cl. 382-48.000.

Murakami, Tokumichi: *See—*
Takano, Hiroshi; Murakami, Tokumichi; Kamisawa, Koh; and Aoyagi, Hidenori, 4,860,283, Cl. 370-82.000.

Murakami, Yuuichi: *See—*
Imaizumi, Tomoaki; Kawai, Taneichi; Nishida, Kouji; and Murakami, Yuuichi, 4,860,002, Cl. 340-825.310.

Murasawa, Yoshihiro: *See—*
Itoh, Masahiro; Murasawa, Yoshihiro; Takeda, Atsushi; Tsuchiya, Hiroaki; and Nakahata, Kimio, 4,860,048, Cl. 355-208.000.

Murase, Masanori; Tomita, Naotaka; Mizuno, Keiichiro; and Iida, Kazuyoshi, to Bridgestone Corporation. Noise reducing apparatus. 4,858,720, Cl. 181-176.000.

Murase, Michio; Kataoka, Yoshiyuki; Inoue, Hisamichi; Naioh, Masanori; and Sugisaki, Toshihiko, to Hitachi, Ltd. Nuclear reactor. 4,859,401, Cl. 376-282.000.

Murata Kikai Kabushiki Kaisha: *See—*
Tone, Shoichi; and Kubota, Norio, 4,858,836, Cl. 242-18.00R.

Murata Manufacturing Co., Ltd.: *See—*
Yamaguchi, Masami, 4,859,498, Cl. 427-96.000

Murata, Toshinori; Arai, Ikuya; Kurita, Toshiyuki; and Nakagawa, Isao, to Hitachi, Ltd. Digital signal processing circuit driven by a switched clock and used in television receiver for processing standard and nonstandard television signals. 4,860,090, Cl. 358-21.00R.

Murayama, Yoichi, to NEC Corporation. Bi-MOS levelshift circuit capable of controlling power consumption. 4,859,878, Cl. 307-446.000.

Muroi, Kunimasa; Inagaki, Yoshinari; and Awano, Tetsuyuki, to Yamaha Corporation. Racket frame. 4,858,928, Cl. 273-73.00D.

Murphy, Patrick: *See—*
Berson, William; Gluck, Julius; Murphy, Patrick; and Tran, Duc H., 4,860,025, Cl. 346-1.100

Murphy, Richard L., to Grass Valley Group, Inc., The. Video discrimination between different video formats. 4,860,098, Cl. 358-139.000.

Mursinna, Richard C.: *See—*
Thatcher, Herbert vH.; Mursinna, Richard C.; and Tackabery, Richard E., 4,860,038, Cl. 354-64.000.

Musschoot, Albert, to General Kinematics Corporation. Mass flow spiral with absorber drive. 4,858,749, Cl. 198-756.000.

Musschoot, Albert, to General Kinematics Corporation. Omniaxis apparatus for processing particulates and the like. 4,859,070, Cl. 366-114.000

Musser, Jeffrey V.: *See—*
Cathey, David A.; Freeman, John C.; Dale, James; Crane, William J.; Powell, Eric A.; and Musser, Jeffrey V., 4,859,304, Cl. 204-298.000.

Mutai, Masahiko: *See—*
Kan, Tatsuhiko; Kobayashi, Yoichi; Sonoike, Yoshiko; Terashima, Tsuneo; and Mutai, Masahiko, 4,859,488, Cl. 426-658.000.

Mutoh, Hideki, to Fuji Photo Film Co., Ltd. Solid-state image pickup device. 4,860,326, Cl. 377-58.000.

Mutsaers, Cornelis A. H. A.: *See—*
De Leeuw, Dagobert M.; Klaassen, Dirk B. M.; and Mutsaers, Cornelis A. H. A., 4,859,902, Cl. 313-474.000.

Myers, Garry L.: *See—*
Wang, Richard H. S.; and Myers, Garry L., 4,859,726, Cl. 524-91.000.

Myers, Glen A. Multiple reuse of an FM band. 4,859,958, Cl. 329-112.000.

Myers, Harry K., Jr.: *See—*
Lyons, James E.; Ellis, Paul E., Jr.; Myers, Harry K., Jr.; Suld, George; and Langdale, Wayne A., 4,859,798, Cl. 568-399.000.

Myers, Michael J.; and Harwick, Warren J., to Coca-Cola Company, The. Plastic container inspection process. 4,858,767, Cl. 209-3.100.

N. V. Michel Van De Wiele: *See—*
Derudder, Carlos, 4,858,654, Cl. 139-59.000.

Nabisco Brands, Inc.: *See—*
Arciszewski, Henry E.; Porzio, Linda A.; Chiang, Bin Y.; Spotts, Clyde E., Jr.; McHugh, Kevin; and Szwerc, Joseph A., 4,859,473, Cl. 426-19.000.
Michnowski, Jane, 4,859,475, Cl. 426-72.000.
Simelunas, William J.; and Polifroni, Nicholas R., 4,858,524, Cl. 99-450.200.

Nabisco/Cetus Food Biotechnology Research Partnership: *See—*
Neidleman, Saul L.; and Maselli, John A., 4,859,474, Cl. 426-28.000.

Nadkarni, Sadashiv: *See—*
Jain, Mukesh; and Nadkarni, Sadashiv, 4,859,711, Cl. 521-56.000.

Naemura, Shohei: *See—*
Ichinose, Hideo; and Naemura, Shohei, 4,859,035, Cl. 350-332.000.

Nagabe, Katsushi: *See—*
Nakagawa, Kaoru; and Nagabe, Katsushi, 4,860,327, Cl. 377-79.000.

Nagai, Hiroshi: *See—*
Endoh, Hiroshi; Zama, Yoshimasa; Kadowaki, Nobuo; Yatuka, Takeshi; Nagai, Hiroshi; and Mizumura, Yutaka, 4,859,523, Cl. 428-215.000.

Nagano, Kuzuhiko: *See—*
Rikimaru, Hiroaki; Nakatsuji, Tadao; Umaba, Toshikatsu; Nagano, Kuzuhiko; Mishina, Kazuya; and Shimizu, Hiromitsu, 4,859,439, Cl. 423-239.000.

Nagao, Tatsuro: *See—*
Fukuda, Nobutoshi; Nagao, Tatsuro; Arifuku, Naoto; Tanabe, Masashi; Yamamisaka, Shinichi; and Furuta, Yoshiki, 4,860,129, Cl. 360-61.000.

Nagasaki, Takanori: *See—*
Konishi, Satoshi; Nagasaki, Takanori; Yokogawa, Nobuhisa; and Naruse, Yuji, 4,859,427, Cl. 422-159.000.

Nagashima, Nao: *See—*
Shimizu, Katsuichi; and Nagashima, Nao, 4,860,111, Cl. [illegible]

Nagata, Minoru: *See—*
Nakamura, Tohru; Ogirima, Masahiko; Nakazato, Kazuo; Miyazaki, Takao; Yamamoto, Naoki; Nagata, Minoru; and Sugaki, Shojiro, deceased, 4,860,086, Cl. 357-67.000.

Nagata, Tetsuya; and Ohmori, Hideki, to Seiko Seiki Kabushiki Kaisha. Sizing apparatus for an internal grinder. 4,858,391, Cl. 51-165.930.

Nagatsuka, Ikutaroh: *See—*
Matsumura, Yasuo; Aoki, Takayoshi; Takeda, Masayuki; Suzuki, Chiaki; and Nagatsuka, Ikutaroh, 4,859,558, Cl. 430-110.000.

Nagayama, Yoshiaki: *See—*
Doi, Shigetoshi; Nagayama, Yoshiaki; Iida, Katsumi; and Sakurai, Yoshihiko, 4,858,677, Cl. 165-12.000.

Nagy, Janos: *See—*
Knoll, Jozsef; Harmath, Sandor; Nagy, Janos, and Knoll, Berta, 4,859,766, Cl. 530-380.000.

Nagy, Lajos: *See—*
Pelyva, Jeno ; Vecsey, K. Istvan; Kolonics, Zoltan; Legradi, Laszlo; Nagy, Lajos; Horvath, Andras; Fodor, Ferenc, deceased; Soptei, Csaba; Sebok, Dezso; Tomordi, Elemer; Lendvai, Laszlo ; Karacsonyi, Bela; and Dioszegi, Erzsebet, 4,859,772, Cl. 544-11.000.

Nail, Billie G., to Adams Rite Manufacturing Company. Accurately and easily adjustable mullion. 4,858,386, Cl. 49-505.000.

Naioh, Masanori: *See—*
Murase, Michio; Kataoka, Yoshiyuki; Inoue, Hisamichi; Naioh, Masanori; and Sugisaki, Toshihiko, 4,859,401, Cl. 376-282.000.

Naito, Hideo: *See—*
Kato, Akio; and Naito, Hideo, 4,860,174, Cl. 362-61.000.

Nakagawa, Isao: *See—*
Murata, Toshinori; Arai, Ikuya; Kurita, Toshiyuki; and Nakagawa, Isao, 4,860,090, Cl. 358-21.00R.

Nakagawa, Kaoru; and Nagaba, Katsushi, to Kabushiki Kaisha Toshiba. Latch circuit constructed with MOS transistors and shift register using the latch circuits. 4,860,327, Cl. 377-79.000.

Nakagawa, Katsuya, to Nintendo Co., Ltd. Recordable data device having identification symbols formed thereon and cooperating data processing system having registering symbols. 4,860,128, Cl. 360-60.000.

Nakagawa, Kazuhiko: *See—*
Hamada, Yoshihiro; Nakagawa, Kazuhiko; Hagiwara, Katunobu; Noda, Takeoki; and Asada, Mitunori, 4,859,166, Cl. 425-204.000.

Nakagawa, Tetsuro: *See—*
Ezaki, Satoru; Tanaka, Kiyofumi; Kasahara, Tsukasa; Hirose, Tetsuya; and Nakagawa, Tetsuro, 4,858,659, Cl. 140-105.000.

Nakagawa, Toyokatu: *See—*
Sugahara, Takehisa; Nakagawa, Toyokatu; and Yano, Junichi, 4,859,614, Cl. 437-8.000.

Nakahara, Takashi, to Canon Kabushiki Kaisha. Optical recording carrier, and recording-reading apparatus, and recording-reading process, employing the same. 4,860,278, Cl. 369-271.000.

Nakahata, Kimio: *See—*
Itoh, Masahiro; Murasawa, Yoshihiro; Takeda, Atsushi; Tsuchiya, Hiroaki; and Nakahata, Kimio, 4,860,048, Cl. 355-208.000.

Nakai, Masaaki: *See—*
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,860,046, Cl. 354-475.000.

Nakai, Yoichi: *See—*
Sone, Yuji; Wada, Kayoko; Kurahashi, Hayao; Nakai, Yoichi; Narutani, Tetsu; and Suzuki, Shigeharu, 4,859,287, Cl. 204-1.00T.

Nakai, Yoshihiro: *See—*
Sawada, Kazuo; Nishio, Masanobu; and Nakai, Yoshihiro, 4,859,811, Cl. 174-126.200.

Nakajima, Motowo: *See—*
Nicolson, Garth L.; Nakajima, Motowo; and Irimura, Tatsuro, 4,859,581, Cl. 435-4.000.

Nakajima, Nobuyoshi, to Fuji Photo Film Co., Ltd. Method of measuring shading characteristics in image information reading apparatus with a test recording medium. 4,860,116, Cl. 358-447.000.

Nakajima, Shigeharu: *See—*
Minenaga, Yoiti; Tajima, Toshio; and Nakajima, Shigeharu, 4,859,903, Cl. 313-487.000.

Nakajima, Yosuke: *See—*
Tabei, Masatoshi; Ikeda, Mitsuru; and Nakajima, Yosuke, 4,860,076, Cl. 357-30.000.

Nakamori, Masaharu: *See—*
Matsuura, Masaki; Ishikawa, Mitsuru; Nakamori, Masaharu; and Kuroki, Masahiro, 4,858,577, Cl. 123-190.00A.

Nakamura, Hiroshi: *See—*
Takenaka, Sadao; Aono, Yoshihito; Iwamatsu, Takanori; Minowa, Morihiko; Daido, Yoshimasa; and Nakamura, Hiroshi, 4,860,316, Cl. 375-39.000.

Nakamura, Masanobu: *See—*
Nishio, Yoshihiro; Nakamura, Masanobu; Fukawatase, Midori; and Takahashi, Kenji, 4,859,555, Cl. 430-72.000.

Nakamura, Shinya: *See—*
Kato, Nobuyuki; Kuramochi, Koujiro; Nakamura, Shinya; and Houjo, Yasuo, 4,858,646, Cl. 137-596.160.

Nakamura, Tadashi; Kitabatake, Yaosuo; Takahashi, Yoshiaki; and Maeda, Kazuya, to Sharp Kabushiki Kaisha. Toner for use in electrophotography. 4,859,560, Cl. 430-137.000.

Nakamura, Tadashi: *See—*
Iwakawa, Tsunekiyo; Hada, Hiroshi; and Nakamura, Tadashi, 4,859,910, Cl. 315-169.100.

Nakamura, Tohru; Ogirima, Masahiko; Nakazato, Kazuo; Miyazaki, Takao; Yamamoto, Naoki; Nagata, Minoru; and Sugaki, Shojiro, deceased (by Sugaki, Rieko, administrator), to Hitachi, Ltd. Semiconductor device. 4,860,086, Cl. 357-67.000.

Nakamura, Toru: *See—*
Yasunami, Masabumi; Takase, Kahei; Meguro, Takashi; Suzuki, Katsumi; Hiwatashi, Osamu; Okutsu, Masaru; Kato, Nobuo; and Nakamura, Toru, 4,859,701, Cl. 514-510.000.

Nakamura, Toshiko; and Tahara, Tomio, to Kamaya Kagaku Kogyo Co., Ltd. Portable holder for stick-type cosmetic case. 4,858,765, Cl. 206-581.000.

Nakanishi, Mitsuaki: *See—*
Kato, Yoshinori; Nakanishi, Mitsuaki; Fujita, Yasushi; and Takagi, Nobuo, 4,858,279, Cl. 24-20.00R.

Nakanishi, Tatsuo: *See—*
Yamazaki, Toshinori; Sakai, Eiichi; Nakanishi, Tatsuo; and Nomori, Hiroyuki, 4,859,554, Cl. 430-58.000.

Nakanishi, Yasushi: *See—*
Taniguchi, Akihiko; and Nakanishi, Yasushi, 4,860,051, Cl. 250-231.0SE.

Nakano, Kiyotaka: *See—*
Hayafuchi, Hideki; Moronaga, Yoshiharu; and Nakano, Kiyotaka, 4,858,339, Cl. 36-45.000.

Nakao, Tsutomu: *See—*
Saotome, Masaru; Ushijima, Takao; Noguchi, Takeshi; Sato, Naomi; and Nakao, Tsutomu, 4,858,899, Cl. 267-219.000.

Nakase, Koji: *See—*
Hasegawa, Kazuo; Ouchi, Junichi; Sasaki, Hiroaki; Nakase, Koji; and Sasaki, Makoto, 4,859,840, Cl. 235-463.000.

Nakashima, Tsuneyasu: *See—*
Takahashi, Katsuhiko; Nakashima, Tsuneyasu; Nakatsuji, Hiroshi; and Okuda, Hiroshi, 4,859,741, Cl. 525-123.000.

Nakashiro, Takeshi: *See—*
Matsumoto, Osamu; Abe, Isao; and Nakashiro, Takeshi, 4,859,882, Cl. 307-530.000.

Nakatsuji, Hiroshi: *See—*
Takahashi, Katsuhiko; Nakashima, Tsuneyasu; Nakatsuji, Hiroshi; and Okuda, Hiroshi, 4,859,741, Cl. 525-123.000.

Nakatsuji, Tadao: *See—*
Rikimaru, Hiroaki; Nakatsuji, Tadao; Umaba, Toshikatsu; Nagano, Kuzuhiko; Mishina, Kazuya; and Shimizu, Hiromitsu, 4,859,439, Cl. 423-239.000

Nakayama, Hajime; Tsuyama, Kouichi; and Okamura, Toshiro, to Hitachi Chemical Co., Ltd. Process for metallizing glass surface 4,859,505, Cl. 427-305.000.

Nakayama, Hideo: *See—*
Matsumoto, Hiroyouki; Okamura, Kazumi; Nakayama, Hideo; and Okasako, Yasuhiro, 4,858,570, Cl. 123-52.0MV

Nakayama, Shigeyuki, to Kabushiki Kaisha Kenwood. Synchronization pulse generator in spread spectrum communication system. 4,860,307, Cl. 375-1.000.

Nakayama, Toshiaki. Device for joining frame members for picture frame. 4,859,112, Cl. 403-402.000.

Nakazato, Kazuo: *See—*
Nakamura, Tohru; Ogirima, Masahiko; Nakazato, Kazuo; Miyazaki, Takao; Yamamoto, Naoki; Nagata, Minoru; and Sugaki, Shojiro, deceased, 4,860,086, Cl. 357-67.000.

Nalge Company: *See—*
Mehra, Ravinder C., 4,858,776, Cl. 215-270.000

Namazue, Hirotoshi, to Kokusan Kinzoku Kogyo Kabushiki Kaisha. Car anti-theft device. 4,858,453, Cl. 70-278.000.

Namco, Ltd.: *See—*
Sato, Seiichi, 4,858,930, Cl. 273-85.00G.

Namekawa, Makoto, to Alpine Electronics Inc. Method for notifying of a call arrival. 4,860,335, Cl. 379-58.000.

Nanbu, Taro: *See—*
Sugita, Ryuji; Tohma, Kiyokazu; Honda, Kazuyoshi; and Nanbu, Taro, 4,859,501, Cl. 427-131.000

Naoi, Takashi: *See—*
Miyasaka, Nobuaki; Yokoyama, Shigeki; Suga, Shuzo; Naoi, Takashi; and Satake, Masaki, 4,859,576, Cl. 430-523.000.

Naruse, Yuji: *See—*
Konishi, Satoshi; Nagasaki, Takanori; Yokogawa, Nobuhisa; and Naruse, Yuji, 4,859,427, Cl. 422-159.000.

Narutani, Tetsu: *See—*
Sone, Yuji; Wada, Kayoko; Kurahashi, Hayao; Nakai, Yoichi; Narutani, Tetsu; and Suzuki, Shigeharu, 4,859,287, Cl. 204-1.00T.

Nason, Robert W.: *See—*
Jenkins, Thomas B.; Ulery, Dennis R.; Wilson, Blake W.; Walko, Steven C.; Lee, Lester H.; Salerno, Robert P.; Nason, Robert W.; and Courtney, John P., 4,859,891, Cl. 310-215.000.

National Business Systems, Inc.: *See—*
Schulz, Daniel R.; Warren, Benton B.; and Reed, Michael K., 4,860,219, Cl. 364-519.000

National Fluid Separators, Inc.: *See—*
Jusaitis, Walter; and Matthews, William W., 4,859,348, Cl. 210-799.000.

National Nuclear Corporation Ltd.: *See—*
Curzon, Andrew F., 4,859,400, Cl. 376-172.000

National Starch and Chemical Corporation: *See—*
Hasuly, Michael J.; and Trzasko, Peter T., 4,859,509, Cl. 427-442.000.
Nowak, Frank A., Jr.; Micchelli, Albert L.; and Rouse, William M., 4,859,455, Cl. 424-47.000
Pangrazi, Ronald; and Walker, James L., 4,859,508, Cl. 427-389.900.
Thaler, Martin D.; and Rubens, Roger W., 4,859,248, Cl. 127-32.000

Nau, Vance J.: *See—*
Metzger, Andre; Grimm, Peter; Nohl, Andre J.; and Nau, Vance J., 4,859,605, Cl. 436-43.000

Navratil, Martin; Mitchell, Mark S.; and Sovak, Mojmir, to Borden Company Limited, The. Compositions and methods for reducing the permeability of underground strata. 4,858,693, Cl. 166-295.000.

NCR Corporation: *See—*
Avery, James M., 4,860,357, Cl. 381-41.000.
Kamerman, Adriaan; and Haagh, Johannes P. N., 4,860,308, Cl. 375-8.000.
Maheras, George; Hayworth, Hubert O.; and Gulett, Michael R., 4,859,573, Cl. 430-326.000.

Neapco, Inc.: *See—*
Dommel, Philip J., 4,859,110, Cl. 403-325.000.

NEC Corporation: *See—*
Fukushi, Yuzo; Fuda, Hitoshi; and Sasada, Taisuke, 4,860,366, Cl. 381-106.000.
Ichinose, Hideo; and Naemura, Shohei, 4,859,035, Cl. 350-332.000.
Iwakawa, Tsunekiyo; Hada, Hiroshi; and Nakamura, Tadashi, 4,859,910, Cl. 315-169.100.
Kinoshita, Seiichiro, 4,860,245, Cl. 364-900.000.
Kuwajima, Takeshi, 4,860,099, Cl. 358-148.000.
Mizoguchi, Shoichi, 4,859,956, Cl. 329-50.000
Moriyama, Masatoshi; and Ohira, Masaki, 4,860,082, Cl. 357-49.000.
Murayama, Yoichi, 4,859,878, Cl. 307-446.000.
Nomura, Masahiro; and Machashi, Yukio, 4,860,191, Cl. 364-200.000.
Shimura, Yukihiro, 4,860,337, Cl. 379-63.000.
Sunakawa, Haruo, 4,859,627, Cl. 437-81.000.
Yoshida, Atsushi, 4,860,319, Cl. 375-83.000

Neff, Charles E., to TRW Inc. Speed responsive power steering system. 4,858,712, Cl. 180-143.000.

Neidleman, Saul L.; and Maselli, John A., to Nabisco/Cetus Food Biotechnology Research Partnership. Method of making an enzyme sweetened cereal product. 4,859,474, Cl. 426-28.000

Nelson, Dale: *See—*
Taylor, Steve; Nelson, Dale; and Gorney, Don, 4,859,057, Cl. 356-41.000

Nelson, James E.: *See—*
Lippmann, Raymond; and Nelson, James E., 4,859,912, Cl. 315-169.300.

Nemes, Istvan: *See—*
Szabo nee Mogyorossi, Katalin; Kalocsai, Istvan; Gyoni, Istyan; Remenyi, Karoly; Plaveczky, Gyorgy; Kovacs, Laszlo ; Gal, Dezso ; Nemes, Istvan; Botar, Laszlo ; Bencsura, Akos; Moger nee Jeremejeva, Galina; Heberger, Karoly; and Nemeth, Andras, 4,859,209, Cl. 44-51.000

Nemeth, Andras: *See—*
Szabo nee Mogyorossi, Katalin; Kalocsai, Istvan; Gyoni, Istyan; Remenyi, Karoly; Plaveczky, Gyorgy; Kovacs, Laszlo ; Gal, Dezso ; Nemes, Istvan; Botar, Laszlo ; Bencsura, Akos; Moger nee Jeremejeva, Galina; Heberger, Karoly; and Nemeth, Andras, 4,859,209, Cl. 44-51.000

Nemoto, Shusuke, to Kanzaki Kokyukoki Mfg. Co., Ltd. Clutch and brake assembly for working vehicles. 4,858,739, Cl. 192-18.00R.

Nemoto, Tsuneo: *See—*
Takahashi, Kenji; and Nemoto, Tsuneo, 4,860,127, Cl. 360-60.000.

Neri, Armando, to G.D. Societa' Per Azioni. Method of optimizing the standard weight variation of cigarettes on a dual-rod cigarette manufacturing machine. 4,858,626, Cl. 131-84.400.

Nerli, Robert. Dental syringe safety sheath apparatus. 4,859,182, Cl. 433-80.000.

Nestec S. A.: *See—*
Rosse, Meinrad; and Rossier, Marc-Henri, 4,858,463, Cl. 73-49.300.

Nestor, Charles R., to General Motors Corporation. Electrical connector having strain relief. 4,859,202, Cl. 439-397.000.

Nestor, John J., Jr.; Moffatt, John G.; and Chan, Hardy W., to Syntex (U.S.A.) Inc. Synthetic peptide sequences useful in biological and pharmaceutical applications and methods of manufacture. 4,859,765, Cl. 530-333.000

Netherton, David C.: *See—*
Locke, Ralph J.; and Netherton, David C., 4,859,714, Cl 521-140.000

Netschert, Walter C. Smoker's hat. 4,858,627, Cl. 131-329.000.

Neufeldt, Jacob J. Refuse disposal method and apparatus. 4,859,135, Cl. 414-572.000

Neumann, Eugene F., to Cray Research, Inc. Wire/disk board-to-board interconnect device. 4,859,188, Cl. 439-45.000

Neumeyer, Stefan. Method and apparatus for measuring relative jaw movement. 4,859,181, Cl. 433-69.000

Neuner, Jon D.: *See—*
Lee, Frank W.; Neuner, Jon D.; and Baron, Kenneth, 4,859,528, Cl. 428-290.000.

Newkirk, Marc S., to Lanxide Technology Company, LP. Method of making ceramic composite articles with shape replicated surfaces. 4,859,640, Cl. 501-128.000.

Newman, Bruce E.; White, Randall A.; and DiPirro, Steven D., to Digital Equipment Corporation. Communication protocol. 4,860,292, Cl. 371-32.000.

Nezer, Shlomo: *See—*
Dagan, Jacob; and Nezer, Shlomo, 4,859,045, Cl. 350-623.000.

NGK Insulators, Ltd.: *See—*
Nishizawa, Hitoshi; and Shibata, Kazuyoshi, 4,859,307, Cl. 204-425.000.
Yamada, Tsutomu, 4,858,393, Cl. 51-237.000.

NHK Spring Co., Ltd.: *See—*
Niikura, Yoshiharu; Fukumura, Takeo; and Umetsu, Chiharu, 4,858,898, Cl. 267-218.000

Nicely, Mark C.; Schreiber, Robert; Parks, Terry M.; Mannion, A. Joel; Lang, Gary R.; and Patton, Charles F., to Saxpy Computer Corporation. Multizone array processor implementing two sided zone buffers with each side being dynamically configured as a working or I/O side. 4,860,249, Cl. 364-900.000.

Nichia Kagaku Kogyo K. K.: *See—*
Minematu, Yoiti; Tajima, Toshio; and Nakajima, Shigeharu, 4,859,903, Cl. 313-487.000.

Nicholes, Kathy S.: *See—*
Fitzharris, William D.; Ringle, Scott J.; and Nicholes, Kathy S., 4,859,310, Cl. 208-87.000.

Nicholls, Robin P., to Raytheon Company. Integrated circuit termination device. 4,860,166, Cl. 361-414.000.

Nichols, John L.; Wang, David; Kirkpatrick, Edward; Viehweg, Clark M.; Morton, Edwin S.; and Hua, Van T., to Raytel Systems Corporation. Teleradiology system having multiple compressor/expanders. 4,860,112, Cl. 358-400.000.

Nicholson, Joh E.; and Barma, Tarachand S., to La Crosse Footwear, Inc. Thermoplastic-rubber wader and method of manufacture. 4,858,342, Cl. 36-109.000.

Nicholson, Peter. Multiple crystal pumping cavity laser with thermal and mechanical isolation. 4,860,301, Cl. 372-68.000.

Nickisch, Klaus: *See—*
Bittler, Dieter; Laurent, Henry; Nickisch, Klaus; and Rach, Petra, 4,859,659, Cl. 514-177.000

Nicolas, Pierre. Projecting apparatus with spherical screen, more particularly for advertising purposes. 4,859,053, Cl. 353-74.000.

Nicolson, Garth L.; Nakajima, Motowo; and Irimura, Tatsuro, to Board of Regents, The University of Texas System. Endoglycosidase assay. 4,859,581, Cl. 435-4.000.

Nieboer, Keith A.: *See—*
Morgan, Cleon C.; and Nieboer, Keith A., 4,858,988, Cl. 296-201.000.

Niederer, Kurt W. Yarn tension control apparatus and method. 4,858,839, Cl. 242-47.090.

Nielsen, Poul E., to Mogens Daugaard. Corner holders for mirrors or similar elements. 4,858,875, Cl. 248-488.000.

Niemeyer, Robert H., III, to AM International Corporation. Automatic pen capping mechanism. 4,860,032, Cl. 346-139.00R.

Nihei, Ryo: *See—*
Torii, Nobutoshi; Nihei, Ryo; and Terada, Akihiro, 4,859,139, Cl. 414-744.500.

Niikura, Yoshiharu; Fukumura, Takeo; and Umetsu, Chiharu, to NHK Spring Co., Ltd. Accumulator. 4,858,898, Cl. 267-218.000.

Nikaido, Katutomo: *See—*
Kawakami, Shin; Haruyama, Satoshi; Okonogi, Hirotaka; Nikaido, Katutomo; and Mukai, Norito, 4,859,805, Cl. 174-68.500.

Nikon Corporation: *See—*
Murakami, Seiro; Tanimoto, Akikazu; Makinouchi, Susumu; Kawai, Hidemi; and Murakami, Masaichi, 4,860,374, Cl. 382-48.000.
Uehara, Makoto; Ichikawa, Hajime; Yomoto, Masahiko; and Kato, Shigeru, 4,859,832, Cl. 219-411.000.

Nilsen, Magne P., to Den norske stats oljeselskap a.s. Cementing apparatus and method for execution of cementing operation. 4,858,692, Cl. 166-285.000.

Nintendo Co., Ltd.: *See—*
Nakagawa, Katsuya, 4,860,128, Cl. 360-60.000.

Nippon CMK Corp.: *See—*
Kawakami, Shin; Haruyama, Satoshi; Okonogi, Hirotaka; Nikaido, Katutomo; and Mukai, Norito, 4,859,805, Cl. 174-68.500.

Nippon Hoso Kyokai: *See—*
Yamashita, Takashi; Shidara, Keiichi; Aiba, Masaaki; Takasaki, Yukio; and Hirai, Tadaaki, 4,860,093, Cl. 358-50.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Ohmura, Masanori; Sakama, Hiroshi; and Araki, Kenji, 4,858,558, Cl. 118-725.000.

Nippon Mektron, Ltd.: *See—*
Kobayashi, Kazuo; Fukazawa, Masashi; and Ishikawa, Shinji, 4,859,299, Cl. 204-157.920.

Nippon Piston Ring Co., Ltd.: *See—*
Shimomura, Soichi, 4,859,164, Cl. 418-179.000.

Nippon Rubber Co., Ltd.: *See—*
Hayafuchi, Hideki; Moronaga, Yoshiharu; and Nakano, Kiyotaka, 4,858,339, Cl. 36-45.000.

Nippon Shinyaku Co., Ltd.: *See—*
Sugiyama, Makoto; Ezure, Yoji; Yoshikuni, Yoshiaki; Ozaki, Takayuki; and Ojima, Nobutoshi, 4,859,767, Cl. 536-17.400.

Nippon Steel Corporation: *See—*
Endoh, Hiroshi; Zama, Yoshimasa; Kadowaki, Nobuo; Yatuka, Takeshi; Nagai, Hiroshi; and Mizumura, Yutaka, 4,859,523, Cl. 428-215.000.

Nippon Telegraph and Telephone Corporation: *See—*
Ukita, Hiroo; Katagiri, Yoshitada; Sawada, Renshi; Uenishi, Yuuji; Isomura, Yoshihiro; Toshima, Tomoyuki; and Mise, Keisuke, 4,860,276, Cl. 369-119.000.

Nippon Tungsten Co., Ltd.: *See—*
Wada, Toshiaki; Katsuyama, Yoshiaki; Furukawa, Mitsuhiko; Kitahira, Takashi; Miyahara, Michito; Misumi, Kiyohito; and Shiroyama, Masaharu, 4,859,638, Cl. 501-58.000.

Nippon Zoki Pharmaceutical Co., Ltd.: *See—*
Konishi, Ryusaku, 4,858,604, Cl. 128-156.000.

Nippondenso Co., Ltd.: *See—*
Obayashi, Hideki; Nishio, Yoshitaka; Kohama, Tokio; and Goto, Hiroyuki, 4,858,568, Cl. 123-52.00M.

Nisenson, Jules, to Technological Resources Corp. Ozone generating device. 4,859,429, Cl. 422-186.130.

Nishida, Kouji: *See—*
Imaizumi, Tomoaki; Kawai, Taneichi; Nishida, Kouji; and Murakami, Yuuichi, 4,860,002, Cl. 340-825.310.

Nishida, Takao: *See—*
Tanaka, Yoshio; Fujii, Shigeru; Nishida, Takao; and Fujita, Yasushi, 4,859,886, Cl. 310-51.000.

Nishiguchi, Masanori, to Sumitomo Electric Industries, Ltd. Chip mounting apparatus. 4,859,269, Cl. 156-361.000.

Nishihara, Hiroshi: *See—*
Kono, Keizo; Kondou, Mitsuhige; Tsubouchi, Natsuro; Hine, Shiro; Nishihara, Hiroshi; and Suhara, Toshiaki, 4,859,033, Cl. 350-320.000.

Nishii, Michiharu, to Aisin Seiki Kabushiki Kaisha. Hydraulic braking system for an automotive vehicle. 4,859,004, Cl. 303-119.000.

Nishikawa, Kohichi: *See—*
Masuda, Takahiko, 4,858,434, Cl. 60-398.000.

Nishikawa, Meisei; Inagawa, Jun; Inagaki, Takeshi; Kaneshige, Toshihiko; Hayashi, Yasuhiro; and Kojima, Tadashi, to Kabushiki Kaisha Toshiba. Erroneous track jump restoration apparatus for optical record disc player. 4,860,272, Cl. 369-48.000.

Nishikawa, Tomio: *See—*
Shida, Yoshiaki; Kitayama, Shiro; and Nishikawa, Tomio, 4,859,415, Cl. 420-417.000.

Nishikori, Toshiaki: *See—*
Hibino, Hiroki; Nishikori, Toshiaki; and Kumura, Kenji, 4,860,094, Cl. 358-98.000.

Nishimori, Kadotaro: *See—*
Ito, Masazumi; Nishimori, Kadotaro; and Oyabu, Masaaki, 4,860,052, Cl. 355-209.000.

Nishimura, Yoshifumi; and Yoshimura, Yoshio, to Sumitomo Electric Industries, Ltd. Process for producing a metal wire useful as rubber product reinforcement. 4,859,289, Cl. 204-28.000.

Nishimura, Yuji; Kawaharazaki, Takashi; Tamura, Keiichi; Matsui, Kenji; Watanabe, Yasutaka; and Yoshitsugu, Noritada, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho; and Toyota Jidosha Kabushiki Kaisha. Apparatus for driving an intermediate portion of webbing. 4,858,953, Cl. 280-807.000.

Nishio, Masanobu: *See—*
Sawada, Kazuo; Nishio, Masanobu; and Nakai, Yoshihiro, 4,859,811, Cl. 174-126.200.

Nishio, Yoshihiro; Nakamura, Masanobu; Fukawatase, Midori; and Takahashi, Kenji, to Dainippon Ink & Chemical, Inc. Electrophotographic printing plate comprising disazo and perynone compounds, hole transport material and alkali soluble resin. 4,859,555, Cl. 430-72.000.

Nishio, Yoshitaka: *See—*
Obayashi, Hideki; Nishio, Yoshitaka; Kohama, Tokio; and Goto, Hiroyuki, 4,858,568, Cl. 123-52.00M.

Nishioka, Goro: *See—*
Fujino, Masaru; Nishioka, Goro; and Sakabe, Yukio, 4,859,641, Cl. 501-136.000.

Nishioka, Kenji: *See—*
Ajani, Jaffer; Grossie, Bruce, Jr.; Nishioka, Kenji; and Ota, David M., 4,859,452, Cl. 424-10.000.

Nishizawa, Hitoshi; and Shibata, Kazuyoshi, to NGK Insulators, Ltd. Electrochemical gas sensor, and method for manufacturing the same. 4,859,307, Cl. 204-425.000.

Nissan Motor Co., Ltd.: *See—*
Hatanaka, Keiji; Sakuma, Kiyotoshi; Morita, Kiyomi; and Miyake, Junji, 4,860,211, Cl. 364-431.050.
Igari, Naoto; Yamamoto, Noriyuki; and Sakata, Tetshin, 4,858,667, Cl. 157-1.100.
Saotome, Masaru; Ushijima, Takao; Noguchi, Takeshi; Sato, Naomi; and Nakao, Tsutomu, 4,858,899, Cl. 267-219.000.

Nitro Kemia Ipartelepek: *See—*
Pelyva, Jeno ; Vecsey, K. Istvan; Kolonics, Zoltan; Legradi, Laszlo; Nagy, Lajos; Horvath, Andras; Fodor, Ferenc, deceased; Soptei, Csaba; Sebok, Dezso; Tomordi, Elemer; Lendvai, Laszlo ; Karacsonyi, Bela; and Dioszegi, Erzsebet, 4,859,772, Cl. 544-11.000.

Nitta, Tomio, to Tokai Corporation. Piezoelectric lighter equipped with a safety lock. 4,859,172, Cl. 431-153.000.

Nittoc Constructions Co., Ltd.: *See—*
Chida, Shouhei; Yamaoto, Naoki; Miyazaki, Yasuo; and Sato, Yasunori, 4,859,119, Cl. 405-269.000.

Niu, Hiromi: *See—*
Mizoguchi, Tetsuhiko; Sakai, Isao; Niu, Hiromi; and Inomata, Koichiro, 4,859,254, Cl. 148-302.000.

Niwa, Masatake: *See—*
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,860,046, Cl. 354-475.000.

Nixdorf Computer AG: *See—*
Weigel, Peter, 4,858,905, Cl. 271-10.000.

Nocek, Robert S.; and Ausnit, Steven, to Minigrip, Inc. Bag chain attached to computer paper. 4,859,083, Cl. 383-37.000.

Noda, Takeoki: *See—*
Hamada, Yoshihiro; Nakagawa, Kazuhiko; Hagiwara, Katunobu; Noda, Takeoki; and Asada, Mitunori, 4,859,166, Cl. 425-204.000.

Nodelman, Neil H.; and Kelso, Robert G., to Mobay Corporation. High solids polyester polyols. 4,859,791, Cl. 560-91.000.

Noga, Edward J.; and Barthalmus, George T., to North Carolina State University. Method of inhibiting the growth of melanin-pigmented cells. 4,859,668, Cl. 514-231.200.

Noguchi, Takeshi; Kikuchi, Takashi; and Takano, Kazuya, to Bridgestone Corporation. Electroviscous liquid-filled suspension device and control damping device therefor. 4,858,733, Cl. 188-267.000.

Noguchi, Takeshi: *See—*
Saotome, Masaru; Ushijima, Takao; Noguchi, Takeshi; Sato, Naomi; and Nakao, Tsutomu, 4,858,899, Cl. 267-219.000.

Noh, Yang H., to Gold Star Col, Ltd. Stirring device for automatic washer. 4,858,450, Cl. 68-134.000.

Nohl, Andre J.: *See—*
Metzger, Andre; Grimm, Peter; Nohl, Andre J.; and Nau, Vance J., 4,859,605, Cl. 436-43.000.

Nohr, Ronald S.: *See—*
Maycock, William E.; Nohr, Ronald S.; and MacDonald, J. Gavin, 4,859,759, Cl. 528-27.000.

Noma, Hiroyuki: *See—*
Ohbayashi, Yoshiaki; Hashimoto, Kunio; Sakurai, Katsumi; and Noma, Hiroyuki, 4,859,888, Cl. 310-68.00R.

Nomori, Hiroyuki: *See—*
Yamazaki, Toshinori; Sakai, Eiichi; Nakanishi, Tatsuo; and Nomori, Hiroyuki, 4,859,554, Cl. 430-58.000.

Nomoto, Tsutomu; Yosida, Mamoru; Mouri, Mikio; and Watanabe, Tsuksa, to Oki Electric Industry Co., Ltd. Thin-film transistor fabrication process. 4,859,617, Cl. 437-40.000.

Nomura, Masahiro; and Machashi, Yukio, to NEC Corporation. Co-processor with dataflow circuitry controlling sequencing to execution unit of data received in tokens from master processor. 4,860,191, Cl. 364-200.000.

Nordbryhn, Andreas: *See—*
Planke, Tore; Nordbryhn, Andreas; and Solnordal, Steinar, 4,859,862, Cl. 250-560.000.

Nordson Corporation: *See—*
Akasaki, Toshiro; Matsunaga, Masafumi; Watanabe, Takashi; and Matsushima, Hironari, 4,859,266, Cl. 156-273.100.

Noritake Co., Ltd.: *See*—
Hattori, Yoshiaki; and Ishihara, Makoto, 4,859,243, Cl. 106-110.000
Normalair-Garrett (Holding) Systems: *See*—
Hamlin, Humphrey A. S., 4,858,606, Cl. 128-204.290.
Norman, Alan B.; Griffith, David W., Jr.; Holt, Dewey L.; Reynolds, John H., IV; and Sears, Stephen B., to R. J. Reynolds Tobacco Company. Smoking machine. 4,858,628, Cl. 131-329.000.
Norrby, Erling: *See*—
Karlsson, Karl-Anders; Norrby, Erling; and Wadell, Goran, 4,859,769, Cl. 536-53.000.
Norsolor: *See*—
Hurtel, Patrice; and Laurent, Denis, 4,859,796, Cl. 564-204.000.
North American Philips Corporation: *See*—
Dapo, Roland F., 4,860,169, Cl. 361-506.000.
North Carolina State University: *See*—
Noga, Edward J.; and Barthalmus, George T., 4,859,668, Cl. 514-231.200.
Northern Telecom Limited: *See*—
Brown, Anthony K. D., 4,860,349, Cl. 379-356.000.
Kalnitsky, Alexander; Ellul, Joseph P.; Tay, Sing P.; and Poirier, Jacques G., 4,859,303, Cl. 204-192.360.
Knight, Douglas G.; and Benyon, William, 4,859,628, Cl. 437-133.000.
O'Sullivan, Maurice S.; Kim, Hyung B.; So, Vincent C.; and Vella, Paul J., 4,859,018, Cl. 350-96.160.
Notari, Bruno: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, 4,859,785, Cl. 549-531.000.
Novo Industri A/S: *See*—
Godtfredsen, Sven E.; and Bjorkling, Fredrik, 4,859,589, Cl. 435-73.000.
Novoa, Fernando. System of auxiliary mass dampers to restrain the response of slender elastic structures to vibrations such as from earthquakes. 4,858,738, Cl. 188-378.000.
Novotny, Marvin A.: *See*—
Holtzclaw, James O., Jr.; and Novotny, Marvin A., 4,858,800, Cl. 224-243.000.
Nowak, Frank A., Jr.; Micchelli, Albert L.; and Rouse, William M., to National Starch and Chemical Corporation. Hydrocarbon tolerant hair fixing compositions. 4,859,455, Cl. 424-47.000.
Nowak, Reinhard: *See*—
Glatt, Werner; and Nowak, Reinhard, 4,858,552, Cl. 118-19.000.
Nukina, Kenji: *See*—
Haraguchi, Kazutoshi; Tanigawa, Eiji; Nukina, Kenji; Morita, Hiroaki; and Maeda, Toyohiro, 4,859,382, Cl. 264-29.200.
Nunogaki, Yoshiaki, to Sanki Engineering Ltd. Rotary joint. 4,858,961, Cl. 285-98.000.
Nylander-Hill, Pamela R.: *See*—
Bentley, Steven R.; Fickle, David M.; and Nylander-Hill, Pamela R., 4,860,193, Cl. 364-200.000.
Nylund, Olov, to AB Asea-Atom. Nuclear reactor fuel assembly. 4,859,407, Cl. 376-446.000.
Oakes, Jeffery T.: *See*—
Watkins, Harry E.; Balch, Brent F.; Oakes, Jeffery T.; Copeland, Richard L.; Patterson, Hubert A.; and Martinson, Mart, 4,859,991, Cl. 340-572.000.
Oakley, Inc.: *See*—
Jannard, James H., 4,859,048, Cl. 351-159.000.
Obayashi, Hideki; Nishio, Yoshitaka; Kohama, Tokio; and Goto, Hiroyuki, to Nippondenso Co., Ltd. Intake apparatus for internal combustion engine. 4,858,568, Cl. 123-52.00M.
Oberkobusch, Doris; Morlock, Roland; Stritzke, Karl-Heinz; and Schieferstein, Ludwig, to Henkel Kommanditgesellschaft auf Aktien. Adducts of carboxylic acids and isocyanates with epoxides, aqueous dispersions containing these adducts, processes for their preparation and their use in the autophoretic coating of metallic surfaces. 4,859,721, Cl. 523-402.000.
Oce-Nederland B.V.: *See*—
Klein Meuleman, Peter; and La Vos, Peter G., 4,860,035, Cl. 346-157.000.
Simons, Johannes M. M.; and Michels, Caspar P. M., 4,859,962, Cl. 330-260.000.
Ochiai, Chiaki, to Aisin Seiki Kabushiki Kaisha. Master cylinder. 4,858,437, Cl. 60-562.000.
Ochiai, Izumi: *See*—
Kurosawa, Hiroshi; and Ochiai, Izumi, 4,860,021, Cl. 343-840.000.
Ochiai, Tameichi: *See*—
Miura, Konoe; Ochiai, Tameichi; and Kameyama, Yasuhiro, 4,859,563, Cl. 430-192.000.
O'Connor, Joseph G.: *See*—
Metz, George D.; McCrary, Carl; O'Connor, Joseph G.; Adair, Paul C.; Proehl, D. Scott; Saccocio, Edward J.; and Dowler, James, 4,859,561, Cl. 430-138.000.
OCS, Inc.: *See*—
Oglevee, James R.; and Oglevee, Kirk A., 4,858,377, Cl. 47-17.000.
Octagon Industries Inc.: *See*—
Thorn, George T., 4,858,357, Cl. 40-450.000.
Oda, Keijiro: *See*—
Komai, Yukio; and Oda, Keijiro, 4,858,666, Cl. 152-556.000.
Odaka, Hiroshi; and Kishida, Tsuyoshi, to Idemitsu Petrochemical Co., Ltd. Hermetically sealed package and method of producing the same. 4,858,780, Cl. 220-359.000.
Odawara, Hiroyuki: *See*—
Seiya, Yuji; and Odawara, Hiroyuki, 4,859,533, Cl. 428-366.000.
Odelstam, Carl T., to Sandvik AB. Cylinder for heat exchangers. 4,858,682, Cl. 165-84.000.
O'Dwyer, James B.: *See*—
Ambrose, Ronald R.; O'Dwyer, James B.; Johnston, Byron K.; Zielinski, David P.; Porter, Samuel, Jr.; and Tyger, Wayne H., 4,859,743, Cl. 525-443.000.
O'Farrell, Desmond J.: *See*—
Larson, Mark L.; Hanft, Karl H.; and O'Farrell, Desmond J., 4,859,867, Cl. 307-10.100.
Office Nationale D'Etudes Recherches Aerospatiales Onera: *See*—
Aubry, Jean-Pierre; Fragneau, Marc; Craveur, Jean-Charles; Janiaud, Denis; and Muller, Serge, 4,859,898, Cl. 310-353.000.
Ofstead, Ronald F., to Minnesota Mining and Manufacturing Company. Polymer blends with high water absorption. 4,859,719, Cl. 523-108.000.
Oftring, Alfred: *See*—
Goertz, Hans-Helmut; Oftring, Alfred; and Vogel, Friedrich, 4,859,756, Cl. 526-263.000.
Ogasawara, Shinji; Isomura, Yukio; and Okudaira, Souichiro, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Inside door handle assembly with means to prevent inadvertent separation of door handle. 4,858,973, Cl. 292-347.000.
Ogata, Kazuhiro, to Tokai Rubber Industries, Ltd. Method and apparatus for producing fiber-reinforced rubber hose. 4,859,380, Cl. 264-25.000.
Ogawa, Kazuaki; and Shiramasa, Miyoshi, to Ryobi Ltd. Door closing device. 4,858,272, Cl. 16-80.000.
Ogawa, Tsutomu, to Fujitsu Limited. Vacuum chuck apparatus for wet processing wafers. 4,858,975, Cl. 294-64.100
Ogawa, Yoshihisa, to Data Card Corporation. Print head assembly. 4,860,028, Cl. 346-76.0PH.
Ogiri, Tadakazu: *See*—
Kano, Atsushi; Ishiguro, Yasuyuki; Ogiri, Tadakazu; Ozaki, Hirofumi; and Yamashita, Yuji, 4,860,056, Cl. 355-298.000.
Ogirima, Masahiko: *See*—
Nakamura, Tohru; Ogirima, Masahiko; Nakazato, Kazuo; Miyazaki, Takao; Yamamoto, Naoki; Nagata, Minoru; and Sugaki, Shojiro, deceased, 4,860,086, Cl. 357-67.000.
Oglevee, James R.; and Oglevee, Kirk A., to OCS, Inc. Plant oriented control system based upon vapor pressure deficit data. 4,858,377, Cl. 47-17.000.
Oglevee, Kirk A.: *See*—
Oglevee, James R.; and Oglevee, Kirk A., 4,858,377, Cl. 47-17.000.
Ogris, Gottfried, to Britax-Kolb GmbH & Co. Sensing and locking device for a safety belt system. 4,858,847, Cl. 242-107.40B.
Ogura, Masaaki, to Ricoh Company, Ltd. Digital copier with a facsimile function. 4,860,115, Cl. 358-443.000.
Ogura, Masami: *See*—
Kajiwara, Hajime; Ogura, Masami; and Sano, Shoichi, 4,858,950, Cl. 280-719.000.
Oharu, Kazuya: *See*—
Maekawa, Takashige; Oharu, Kazuya; and Sakaguchi, Tomoko, 4,859,754, Cl. 526-245.000.
Ohbayashi, Yoshiaki; Hashimoto, Kunio; Sakurai, Katsumi; and Noma, Hiroyuki, to Hosiden Electronics Co., Ltd. Cross flow type cooling fan device. 4,859,888, Cl. 310-68.00R.
Ohira, Masaki: *See*—
Moriyama, Masatoshi; and Ohira, Masaki, 4,860,082, Cl. 357-49.000.
Ohira, Tadashi; Ito, Masazumi; and Maruta, Syuzi, to Minolta Camera Kabushiki Kaisha. Image forming apparatus capable of displaying capacity and/or remaining quantity of sheets of paper. 4,860,055, Cl. 355-308.000.
Ohlendorf, Dieter; Interthal, Werner; and Stoll, Friedrich, to Hoechst Aktiengesellschaft. Process and compositions for corrosion inhibition of metallic materials. 4,859,418, Cl. 422-16.000.
Ohmae, Tadayuki; Sakurai, Tadashi; Yamaguchi, Noboru; Okada, Mitsuyuki; and Asao, Kouichiro, to Sumitomo Chemical Co., Limited. Lead accumulator. 4,859,710, Cl. 521-55.000.
Ohmori, Hideki: *See*—
Nagata, Tetsuya; and Ohmori, Hideki, 4,858,391, Cl. 51-165.930.
Ohmura, Masanori; Sakama, Hiroshi; and Araki, Kenji, to Nippon Kokan Kabushiki Kaisha. Film forming apparatus. 4,858,558, Cl. 118-725.000.
Ohnuki, Ichiro: *See*—
Suda, Yasuo; Ohnuki, Ichiro; Akashi, Akira; Ishizaki, Akira; Ohtaka, Keiji; and Koyama, Takeshi, 4,859,842, Cl. 250-201.000.
O'Horo, Michael P.: *See*—
Pond, Stephen F.; Kneezel, Gary A.; Lorenze, Robert V.; O'Horo, Michael P.; Maltz, Martin S.; and Kellerman, Richard, 4,860,030, Cl. 346-76.0PH.
Ohta, Hirofumi: *See*—
Maeda, Tetsuo; Ohta, Hirofumi; and Inazumi, Hirokuni, 4,860,183, Cl. 363-12.000.
Ohtaka, Keiji: *See*—
Suda, Yasuo; Ohnuki, Ichiro; Akashi, Akira; Ishizaki, Akira; Ohtaka, Keiji; and Koyama, Takeshi, 4,859,842, Cl. 250-201.000.
Ohwa, Nobutaka: *See*—
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Kamimae, Hajime, 4,858,895, Cl. 267-64.160.
Ohya, Koichi: *See*—
Yamamoto, Yoshihiro; Kume, Tsutomu; Yamazaki, Nobuo; Hashimoto, Fumiharu; and Ohya, Koichi, 4,859,881, Cl. 307-520.000.
Oi, Vernon T.: *See*—
Stryer, Lubert; Glazer, Alexander N.; and Oi, Vernon T., 4,859,582, Cl. 435-5.000.

Ojima, Nobutoshi: *See*—
Sugiyama, Makoto; Ezure, Yoji; Yoshikuni, Yoshiaki; Ozaki, Takayuki; and Ojima, Nobutoshi, 4,859,767, Cl. 536-17.400.
Okabe, Yoshio: *See*—
Shirai, Eiji; Okabe, Yoshio; and Kobayashi, Yukimori, 4,858,572, Cl. 123-90.120.
Okada, Chozo. Braille printing plate. 4,859,094, Cl. 400-122.000.
Okada, Masaki, to Isuzu Motors Limited. Turbo-compound engine. 4,858,440, Cl. 60-614.000.
Okada, Mitsuyuki: *See*—
Ohmae, Tadayuki; Sakurai, Tadashi; Yamaguchi, Noboru; Okada, Mitsuyuki; and Asao, Kouichiro, 4,859,710, Cl. 521-55.000.
Okada, Toyokazu: *See*—
Okumura, Takuzo; Okada, Toyokazu; and Kikui, Hitoshi, 4,859,039, Cl. 350-398.000.
Okamoto, Akira: *See*—
Matsuda, Toru; Yano, Takanori; Okamoto, Toshiaki; and Okamoto, Akira, 4,860,214, Cl. 364-513.000.
Okamoto, Toshiaki: *See*—
Matsuda, Toru; Yano, Takanori; Okamoto, Toshiaki; and Okamoto, Akira, 4,860,214, Cl. 364-513.000.
Okamoto, Yukio, to Konica Corporation. Method of controlling developer toner density of developing device. 4,860,063, Cl. 355-208.000.
Okamura, Kazumi: *See*—
Matsumoto, Hiroyouki; Okamura, Kazumi; Nakayama, Hideo; and Okasako, Yasuhiro, 4,858,570, Cl. 123-52.0MV.
Okamura, Masatoshi; Shiba, Haruo; Hashizume, Kenji; and Sakata, Yoshiya, to TDK Corporation. Tape cassette housing. 4,858,849, Cl. 242-199.000.
Okamura, Toshiro: *See*—
Nakayama, Hajime; Tsuyama, Kouichi; and Okamura, Toshiro, 4,859,505, Cl. 427-305.000.
Okasako, Yasuhiro: *See*—
Matsumoto, Hiroyouki; Okamura, Kazumi; Nakayama, Hideo; and Okasako, Yasuhiro, 4,858,570, Cl. 123-52.0MV.
Oki Electric Industry Co., Ltd.: *See*—
Hosoda, Kenichiro; Kawaguchi, Shinji; Shinbo, Atsushi; and Yokota, Kiyoshi, 4,860,315, Cl. 375-30.000.
Nomoto, Tsutomu; Yosida, Mamoru; Mouri, Mikio; and Watanabe, Tsukasa, 4,859,617, Cl. 437-40.000.
Okiharu, Ryoichi, to Omron Tateisi Electronics Co. POS terminal device. 4,859,838, Cl. 235-383.000.
Okonogi, Hirotaka: *See*—
Kawakami, Shin; Haruyama, Satoshi; Okonogi, Hirotaka; Nikaido, Katutomo; and Mukai, Norito, 4,859,805, Cl. 174-68.500.
Okorodudu, Abraham O. M., to Mobil Oil Corporation. N,N-diorganodithiocarbamate-alkylthiosulfinyl halide reaction products and lubricant compositions containing same. 4,859,356, Cl. 252-47.500.
Okuda, Hiroshi: *See*—
Takahashi, Katsuhiko; Nakashima, Tsuneyasu; Nakatsuji, Hiroshi; and Okuda, Hiroshi, 4,859,741, Cl. 525-123.000.
Okudaira, Souichiro: *See*—
Ogasawara, Shinji; Isomura, Yukio; and Okudaira, Souichiro, 4,858,973, Cl. 292-347.000.
Okumura, Takeo: *See*—
Suzuki, Toshio; and Okumura, Takeo, 4,859,457, Cl. 424-70.000.
Okumura, Takuzo; Okada, Toyokazu; and Kikui, Hitoshi, to Sumitomo Chemical Company, Limited. Light-polarizing film. 4,859,039, Cl. 350-398.000.
Okutani, Koji: *See*—
Kato, Kenji; and Okutani, Koji, 4,858,542, Cl. 112-121.120.
Okutsu, Eiichi; and Hirano, Mitsunori, to Fuji Photo Film Co., Ltd. Method of forming high contrast negative images. 4,859,567, Cl. 430-265.000.
Okutsu, Masaru: *See*—
Yasunami, Masabumi; Takase, Kahei; Meguro, Takashi; Suzuki, Katsumi; Hiwatashi, Osamu; Okutsu, Masaru; Kato, Nobuo; and Nakamura, Toru, 4,859,701, Cl. 514-510.000.
Okuyama, Kouji; and Touya, Hiroki, to Bridgestone Corporation. End holder for band-like material. 4,858,901, Cl. 269-21.000.
Olin Hunt Specialty Products Inc.: *See*—
Detig, Robert H.; and Bujese, David P., 4,859,557, Cl. 430-100.000.
Oliver, Dennis N.: *See*—
Kinnard, J. R.; and Oliver, Dennis N., 4,859,911, Cl. 315-169.300.
Ollivier, Jean; Lagaude, Christian H.; Baptiste, Hubert; and Larrouy, Michele, to Societe Nationale Elf Aquitaine (Production). Process for the production of alkanesulphonic acids. 4,859,373, Cl. 562-119.000.
Olson, Donald C.; and Miller, John J., deceased (by Miller, Wayne R., executor), to Shell Oil Company. H_2S removal process and composition. 4,859,436, Cl. 423-221.000.
Olympia Werke AG: *See*—
Frerichs, Klaus-Dieter, 4,859,097, Cl. 400-208.000.
Olympus Optical Co., Ltd.: *See*—
Hibino, Hiroki; Nishikori, Toshiaki; and Kumura, Kenji, 4,860,094, Cl. 358-98.000.
Kimura, Kenji; and Tsuji, Kiyoshi, 4,860,091, Cl. 358-22.000.
Kimura, Kenji; and Tsuji, Kiyoshi, 4,860,095, Cl. 358-98.000.
Omori, Kazuhiro: *See*—
Takai, Makoto; Omori, Kazuhiro; Kumonaka, Takahiro; Ozawa, Shinji; and Wakabayashi, Toshio, 4,859,673, Cl. 514-255.000.
Omori, Yukimitsu: *See*—
Takahashi, Takeshi; Tsuzuki, Naoyuki; Omori, Yukimitsu; and Takamura, Akio, 4,858,466, Cl. 73-119.00A.
Omron Tateisi Electronics Co.: *See*—
Maeda, Tetsuo; Ohta, Hirofumi; and Inazumi, Hirokuni, 4,860,183, Cl. 363-12.000.
Okiharu, Ryoichi, 4,859,838, Cl. 235-383.000.
Ueno, Fumio; Yamakawa, Takeshi; and Shirai, Yuji, 4,860,243, Cl. 364-807.000.
Oneac Corporation: *See*—
Klingbiel, August G., 4,860,145, Cl. 361-18.000.
O'Neil, Robert M.: *See*—
Phillips, Emyr; O'Neil, Robert M.; and Wirth, Hermann O., 4,859,354, Cl. 252-47.500.
Ono Sokki Co., Ltd.: *See*—
Takahashi, Takeshi; Tsuzuki, Naoyuki; Omori, Yukimitsu; and Takamura, Akio, 4,858,466, Cl. 73-119.00A.
Ono, Takashi: *See*—
Hayami, Toshitomo; Shibata, Humio; Iguchi, Katsumi; Inoue, Hisao; Ono, Takashi; and Ishimoto, Takashi, 4,859,251, Cl. 148-286.000.
Onodera, Chika: *See*—
Kawakami, Katsura; Shimazaki, Shigeo; Takayama, Satoshi; and Onodera, Chika, 4,860,109, Cl. 358-400.000.
Onodera, Mitsuo, to Hayashi Manufacturing Company, Ltd. Method of constructing a shock application device. 4,858,300, Cl. 29-463.000.
Ooms, Adrianus J.: *See*—
Segerstrom, Clifford C.; Stil, Jacob H.; Ooms, Adrianus J.; Mink, Bernardus H.; Premel, Ulrich; and Gawloski, Leszek, 4,859,214, Cl. 48-197.00R.
Opdahl, Barry J.; Hooren, Douglas H.; and Calaby, Lauren F., to GTE Products Corporation. Moving "S" fiber optical switch. 4,859,022, Cl. 350-96.200.
Opgenoorth, Carl H.: *See*—
Gierse, Franz J.; Pabst, Manfred; Hermanns, Heinz; Ippers, Karl; Krenn, Stephan; Huppe, Friedrich; Opgenoorth, Carl H.; and Wolters, Conrad, 4,858,843, Cl. 242-65.000.
Oratech Pharmaceutical Development Corporation: *See*—
Haas, Ronald T., 4,859,704, Cl. 514-557.000.
Oread Laboratories, Inc.: *See*—
Bitzinger, Rudolf; Engl, Walter; Humml, Siegfried; and Schreier, Klaus, 4,860,333, Cl. 379-10.000.
Orr, James S.: *See*—
Waddell, Ewan M.; Orr, James S.; and Monachan, Brian C., 4,859,536, Cl. 428-408.000
Orthoefer, Frank T.: *See*—
Augustine, Michael E.; and Orthoefer, Frank T., 4,859,477, Cl 426-103.000
Orthopedic Design: *See*—
Schmid, Rainer K., 4,858,338, Cl. 36-44.000.
Ortiz, Jose A.: *See*—
Foguet, Rafael; Forne, Ernesto; Sacristan, Aurelio; and Ortiz, Jose A., 4,859,675, Cl. 514-255.000
Osada, Atushi: *See*—
Kagami, Toshihiko; Kobayashi, Kazuyoshi; Asakawa, Eiji; Osada, Atushi; Hara, Kozo; and Abe, Yasuji, 4,859,993, Cl. 340-674.000.
Osaka Bousui Constructions Co., Ltd.: *See*—
Chida, Shouhei; Yamaoto, Naoki; Miyazaki, Yasuo; and Sato, Yasunori, 4,859,119, Cl. 405-269.000.
Osaka Gas Company Limited: *See*—
Haraguchi, Kazutoshi; Tanigawa, Eiji; Nukina, Kenji; Morita, Hiroaki; and Maeda, Toyohiro, 4,859,382, Cl. 264-29.200.
Morita, Hiroaki; Haraguchi, Kazutoshi; and Tanigawa, Eiji, 4,859,381, Cl. 264-29.200.
Osawa, Yoshihiko: *See*—
Inouye, Yoshinori; Osawa, Yoshihiko; and Ueda, Minoru, 4,858,528, Cl. 101-175.000.
Osborn, Douglas B., to Delco Electronics Corporation. Two stage protection circuit for a power MOSFET driving an inductive load. 4,860,152, Cl. 361-91.000.
Osborne, James C., Jr.: *See*—
Brenner, Nathaniel; and Osborne, James C., Jr., 4,859,301, Cl. 204-180.100.
O'Shaughnessy, Timothy G.; and Hull, Richard W., to Western Digital Corporation CMOS Schmitt trigger with independently biased high/low threshold circuits. 4,859,873, Cl. 307-290.000.
Osterwald, Henning: *See*—
Schereer, Friedrich; Schmied, Kurt; and Osterwald, Henning, 4,858,578, Cl. 123-276.000.
Osterweil, Josef, to J.D. Monitoring, Incorporated. Fall alert system with magnetically operable switch. 4,858,622, Cl. 128-782.000
Ostreicher, Eugene A.: *See*—
Hou, Kenneth C.; and Ostreicher, Eugene A., 4,859,340, Cl. 210-502.100.
Ostroski, Richard J.; Bigley, James E.; Falk, John L.; and Sallee, E. Charles, to Scott Fetzer Company, The. Wet/dry vac. 4,858,269, Cl. 15-327.00F.
Ostwald, Fritz, to Alfred Teves GmbH. Method and device for the control of the braking effect of a brake-slip-controlled brake system. 4,859,003, Cl. 303-111.000.
O'Sullivan, Anthony C.; and Frei, Bruno, to Ciba-Geigy Corporation. Pesticides. 4,859,657, Cl. 514-63.000.
O'Sullivan, Maurice S.; Kim, Hyung B.; So, Vincent C.; and Vella, Paul J., to Northern Telecom Limited. Optical fiber bandwidth limiting. 4,859,018, Cl. 350-96.160.
Ota, David M.: *See*—
Ajani, Jaffer; Grossie, Bruce, Jr.; Nishioka, Kenji; and Ota, David M., 4,859,452, Cl. 424-10.000.
Otari Electric Company, Ltd.: *See*—
Sota, Koichi, 4,860,126, Cl. 360-16.000.
Otis Engineering Corporation: *See*—
Decker, Kenneth L., 4,858,644, Cl. 137-504.000.

Otsubo, Masayuki: *See—*
Maki, Kazuyoshi; Otsubo, Masayuki; and Uchida, Shizutaka, 4,860,161, Cl. 361-338.000.

Ott, Karl-Heinz: *See—*
Lindner, Christian; and Ott, Karl-Heinz, 4,859,744, Cl. 525-256.000.

Ott, Ulrich: *See—*
Schneider, Manfred; Ott, Ulrich; Sieber, Alexander; and Zimmermann, Manfred, 4,859,728, Cl. 524-159.000.

Ouchi, Junichi: *See—*
Hasegawa, Kazuo; Ouchi, Junichi; Sasaki, Hiroaki; Nakase, Koji; and Sasaki, Makoto, 4,859,840, Cl. 235-463.000.

Outboard Marine Corporation: *See—*
Remmers, Gregry M., 4,858,585, Cl. 123-602.000.

Overhauser, Albert W.; and Maserjian, Joseph, to United States of America, Administrator, National Aeronautics and Space Administration. Alternating gradient photodetector. 4,860,074, Cl. 357-30.000.

Owechko, Yuri; and Soffer, Bernard H., to Hughes Aircraft Company. Associative memory system with spatial light modulator and feedback for adjustable thresholding and enhancement. 4,860,253, Cl. 365-125.000.

Owen, Alex F., to GTE Products Corporation. Contact assembly. 4,859,198, Cl. 439-252.000.

Owen, Hartley: *See—*
Harandi, Mohsen N.; and Owen, Hartley, 4,859,308, Cl. 208-49.000.

Oyabu, Masaaki: *See—*
Ito, Masazumi; Nishimori, Kadotaro; and Oyabu, Masaaki, 4,860,052, Cl. 355-209.000.

Oyama, Takuji; Suzuki, Koichi; and Mizuhashi, Mamoru, to Asahi Glass Company Ltd. Transparent laminated product. 4,859,532, Cl. 428-336.000.

Ozaki, Hirofumi: *See—*
Kano, Atsushi; Ishiguro, Yasuyuki; Ogiri, Tadakazu; Ozaki, Hirofumi; and Yamashita, Yuji, 4,860,056, Cl. 355-298.000.

Ozaki, Takayuki: *See—*
Itoh, Hideaki; and Ozaki, Takayuki, 4,860,282, Cl. 370-55.000.
Sugiyama, Makoto; Ezure, Yoji; Yoshikuni, Yoshiaki; Ozaki, Takayuki; and Ojima, Nobutoshi, 4,859,767, Cl. 536-17.400.

Ozawa, Hiroshi: *See—*
Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; Hosono, Yoichi; Takahara, Shigeru; and Koike, Tadashi, 4,859,569, Cl. 430-270.000.

Ozawa, Masato, to Tokyo Juki Industrial Co., Ltd. Apparatus for terminating the last stitch at a predetermined point. 4,858,541, Cl. 112-121.110.

Ozawa, Shinji: *See—*
Takai, Makoto; Omori, Kazuhiro; Kumonaka, Takahiro; Ozawa, Shinji; and Wakabayashi, Toshio, 4,859,673, Cl. 514-255.000.

Ozeki, Jiro, to Slidex Corporation. Method and apparatus for simultaneously inserting laminar materials into a file sheet. 4,858,355, Cl. 29-565.111.

Ozelis, Joseph P.; and Keur, Robert I., to A. B. Dick Company. Ink drop control system with temperature compensation. 4,860,027, Cl. 346-1.100.

Pabst, Manfred: *See—*
Gierse, Franz J.; Pabst, Manfred; Hermanns, Heinz; Ippers, Karl; Krenn, Stephan; Huppe, Friedrich; Opgenoorth, Carl H.; and Wolters, Conrad, 4,858,843, Cl. 242-65.000.

Paceco Corp.: *See—*
Crouch, John H., 4,858,775, Cl. 212-205.000.

Pacific Bell: *See—*
Kohl, James E.; and Watrous, Donald L., 4,860,334, Cl. 379-16.000.

Package Research Corporation: *See—*
Wilkinson, William T., 4,858,785, Cl. 222-145.000.

Packaging Corporation of America: *See—*
Stone, James L., 4,858,793, Cl. 222-541.000.

Padova, Reuven: *See—*
Eisenberg, Eliahu; Padova, Reuven; Shenfeld, Avner; Hirshfeld, Tsvi; and Stein, Jacob, 4,859,586, Cl. 435-34.000.

Page, Nancy M.: *See—*
Landis, Michael E.; Aufdembrink, Brent A.; Chu, Pochen; Johnson, Ivy D.; Kirker, Garry W.; Page, Nancy M.; and Rubin, Mae K., 4,859,648, Cl. 502-242.000.

Palau, Joseph; and Froment, Jean-Paul, to S.A. Des Etablissements Staubli (France). Rotating dobby for weaving looms. 4,858,655, Cl. 139-76.000.

Palosi, Eva: *See—*
Keve, Tibor; Megyeri, Gabor; Stefko , Bela; Kovacs, Lajos, Jr.; Kassai nee Zieger, Anna; Kiss, Bela; Laszlovszky, Istvan; Lapis, Erzsebet; Palosi, Eva; Groo, Dora; and Szporny, Laszlo , 4,859,682, Cl. 514-288.000.

Pangrazi, Ronald; and Walker, James L., to National Starch and Chemical Corporation. Heat resistant binders. 4,859,508, Cl. 427-389.900.

Panzani, Ivo, to Dideco S.p.A. Continous blood centrifugation cell. 4,859,333, Cl. 210-360.200.

Paolella, Arthur; and Herczfeld, Peter R., to United States of America, Army. Optical gain control of GaAs microwave monolithic integrated circuit distributed amplifier. 4,859,965, Cl. 330-285.000.

Papantoniou, Christos: *See—*
Mahieu, Claude; and Papantoniou, Christos, 4,859,460, Cl. 424-72.000.

Papez, Stephen M.: *See—*
Patterson, Robert; and Papez, Stephen M., 4,859,511, Cl. 428-40.000.

Paquet, Volker: *See—*
Bauch, Hartmut; Krause, Peter; Jost, Ulrike; Kersten, Ralf; Paquet, Volker; and Siefert, Wolfgang, 4,859,222, Cl. 65-3.120.

Paradyne Corporation: *See—*
LaRowe, Dorian, 4,860,009, Cl. 341-73.000.

Paraskevakos, T. G.; and Paris, J. P., to DataVend, Inc. Vending machine and method for automatic vending and returning of merchandise, particularly video cassette tapes. 4,858,743, Cl. 194-205.000.

Paris, J. P.: *See—*
Paraskevakos, T. G.; and Paris, J. P., 4,858,743, Cl. 194-205.000.

Park, Il-Pyung: *See—*
Tetelman, Bruce; Milios, Yannis; Park, Il-Pyung; and Recht, Tom, 4,859,839, Cl. 235-385.000.

Parker, Donald L.; Reuter, David F.; and Roussel, Patrick, to General Motors Corporation. Isolation valve bypass for master cylinder brake fluid in wheel lock control system. 4,859,001, Cl. 303-92.000.

Parker, Graham J., to Cheetham, Jeffery James. Dental amalgam alloy. 4,859,240, Cl. 75-251.000.

Parks, Gary D., to Shipley Company Inc. Device and method for measuring reflective notch control in photoresists. 4,860,062, Cl. 355-53.000.

Parks, Terry M.: *See—*
Nicely, Mark C.; Schreiber, Robert; Parks, Terry M.; Mannion, A. Joel; Lang, Gary R.; and Patton, Charles F., 4,860,249, Cl. 364-900.000.

Parma, George F., to United States of America, Administrator, National Aeronautics and Space Administration. Gripping device. 4,858,979, Cl. 294-106.000.

Parrow, R. Alan. Fuel line adaptor. 4,858,959, Cl. 285-39.000.

Pascal, Roger: *See—*
Diard, Jean-Luc; and Pascal, Roger, 4,858,944, Cl. 280-609.000.

Pasquato, Lucia: *See—*
Campestrini, Sandro; Di Furia, Fulvio; Modena, Giorgio; and Pasquato, Lucia, 4,859,799, Cl. 568-430.000.

Passadore, Albert M., to Brod & McClung - Pace Co. Centrifugal fan. 4,859,140, Cl. 415-48.000.

Passmore, Edmund M., to GTE Products Corporation. Tungsten electrode and method of producing same. 4,859,239, Cl. 75-235.000.

Paster, Zvi: *See—*
Di Schiena, Michele G.; and Paster, Zvi, 4,859,658, Cl. 514-159.000.

Pasternak, Stephen M., to Prince Manufacturing, Inc. Shoe with form fitting sole. 4,858,340, Cl. 36-88.000.

Patil, Arvind S.: *See—*
Donegan, Thomas E.; Leary, Timothy G.; and Patil, Arvind S., 4,859,770, Cl. 540-136.000.

Patrician, Thomas J.; Ritsko, Joseph E.; and Martin, Harry D., III, to GTE Products Corporation. Process for producing molybdenum-ruthenium metal powder. 4,859,236, Cl. 75-0.5AB.

Patrick, Harvey O., to PATS, Inc. Fuel tank. 4,858,778, Cl. 220-5.00A.

PATS, Inc.: *See—*
Patrick, Harvey O., 4,858,778, Cl. 220-5.00A.

Pattein, Jacky; and Le Roy, Patrice, to Societe Nationale des Poudres et Explosifs. Radiation-crosslinkable thermoplastic solid composition and curable products obtained with this composition. 4,859,742, Cl. 525-131.000.

Patterson, Hubert A.: *See—*
Watkins, Harry E.; Balch, Brent F.; Oakes, Jeffery T.; Copeland, Richard L.; Patterson, Hubert A.; and Martinson, Mart, 4,859,991, Cl. 340-572.000.

Patterson, John H.; Lowe, Tony M.; Bernadic, Thomas J.; Val, Yefim; Katbi, Karl A.; and Zimmerman, Charles E., to GTE Valenite Corporation. Polygonal cutting insert. 4,859,122, Cl. 407-114.000.

Patterson, Robert; and Papez, Stephen M., to James River Corporation of Virginia. Undercoated silicone release sheet. 4,859,511, Cl. 428-40.000.

Patton, Charles F.: *See—*
Nicely, Mark C.; Schreiber, Robert; Parks, Terry M.; Mannion, A. Joel; Lang, Gary R.; and Patton, Charles F., 4,860,249, Cl. 364-900.000.

Patton, Paul B.: *See—*
Kidder, Kenneth B.; Landis, William R.; and Patton, Paul B., 4,858,885, Cl. 251-129.010.

Patzold, Werner: *See—*
Kupper, Friedrich-Wilhelm; Voges, Heinz-Werner; Patzold, Werner; and Schaaf, Richard, 4,859,790, Cl. 560-75.000.

Paukstelis, Joseph V.: *See—*
Lambert, Jack L.; Chiang, Yuan C.; and Paukstelis, Joseph V., 4,859,607, Cl. 426-135.000.

Paul, Ana: *See—*
Paul, Marius A.; and Paul, Ana, 4,858,566, Cl. 123-41.350.

Paul, Marius A. Advanced integrated propulsion system with total optimized cycle for gas turbines. 4,858,428, Cl. 60-39.170.

Paul, Marius A.; and Paul, Ana. Axially symmetrical piston for reciprocal engines. 4,858,566, Cl. 123-41.350.

Paul Wurth S.A.: *See—*
Lonardi, Emile; and Mailliet, Pierre, 4,859,131, Cl. 414-200.000.

Paulini, Dieter; Schmitz-Bastian, Peter; Wagner, Wolfram; and Bieber, Gunter, to Bayer Aktiengesellschaft. Conveying of filament bundles over long conveying sections. 4,858,809, Cl. 226-97.000.

Pauwels, Julian R., to Davis Water & Waste Industries, Inc. Traveling bridge filter with air scour. 4,859,330, Cl. 210-264.000.

Pavel Jordan & Associates: *See—*
Jordan, Pavel; Muff, Janet; and Strong, Bernard, 4,858,607, Cl. 128-314.000.

Pavlich, Frederick M. Method for treating hoof thrush and hoof rot. 4,859,694, Cl. 514-398.000.

Pawlowski, Georg; Kleiner, Hans-Jerg; and Gerdau, Thomas, to Hoechst Aktiengesellschaft. Photosensitive mixture and photosensitive recording material produced therefrom with polymeric compound which is reaction product of unsaturated (thio)phosphinic acid iso(-thio)cyanate and active hydrogen containing compound. 4,859,562, Cl. 430-175.000.

Pawlowski, Georg: *See—*
Gerdau, Thomas; Kleiner, Hans-Jerg; and Pawlowski, Georg, 4,859,795, Cl. 564-12.000.

Payer, Ernst; and Schierl, Hans, to Siemens Aktiengesellschaft. Acoustic transducers with improved frequency response. 4,860,368, Cl. 381-159.000.

Pellet, Regis J.; Coughlin, Peter K.; Staniulis, Mark T.; Long, Gary N.; and Rabo, Jule A., to UOP. Catalytic cracking catalysts and cracking process using non-zeolitic molecular sieves. 4,859,314, Cl. 208-114.000.

Pellon, Brian J.; Allen, George C.; and Hughes, Michael P., to Rexene Products Company. Novel propylene polymers. 4,859,757, Cl. 526-348.000.

Pelyva, Jeno ; Vecsey, K. Istvan; Kolonics, Zoltan; Legradi, Laszlo; Nagy, Lajos; Horvath, Andras; Fodor, Ferenc, deceased (by Ibolyka, Edit Tavasz Fodor nee, heir); Soptei, Csaba; Sebok, Dezso; Tomordi, Elemer; Lendvai, Laszlo ; Karacsonyi, Bela; and Dioszegi, Erzsebet, to Nitro Kemia Ipartelepek. Process for the preparation of 3-isopropyl-benzo-2-thia-1,3-diazinone-(4)-2,2-dioxide. 4,859,772, Cl. 544-11.000.

Pendleton, Thomas J.: *See—*
Kane, Richard; Meyerhoefer, Carl; Miller, David C.; and Pendleton, Thomas J., 4,858,781, Cl. 220-407.000.

Peng, James P., to Eastman Kodak Co. Method of preparing perpendicularly oriented magnetic recording media. 4,859,495, Cl. 427-48.000.

Peninger, Robert H., to Manufacturers Industrial Technology, Inc. Flame retardant and smoke suppressant composition. 4,859,365, Cl. 252-601.000.

Pennwalt Corporation: *See—*
Goltz, Kurt, 4,859,281, Cl. 156-666.000.
Graeber, Edward L.; and Lindstrom, Michael J., 4,859,778, Cl. 548-158.000.

People's Telephone Cooperative, Inc.: *See—*
Kelly, Leroy, 4,860,287, Cl. 370-108.000.

Pereira, Carmo J.; Kubsh, Joseph E.; and Hegedus, Louis, to W. R. Grace & Co.-Conn. Process for treating automotive exhaust gases using monolith washcoat having optimum pore structure. 4,859,433, Cl. 423-212.000.

Perlman, Daniel, to Brandeis University. Plastic pipette canister. 4,859,423, Cl. 422-102.000.

Perrochat, Jean-Michel: *See—*
Arnaud, Alain; Perrochat, Jean-Michel; and Philippe, Joseph, 4,858,736, Cl. 188-322.140.
Philippe, Joseph; and Perrochat, Jean-Michel, 4,859,006, Cl. 305-10.000.

Perry, Richard C. Water heater cleaning apparatus. 4,858,563, Cl. 122-382.000.

Persson, Per-Olof; Albrektsson, Kjell; Axinger, Jan; Fixell, Jan-Olof; and Hyvarinen, Jari, to Aktiebolaget Bofors. Submunitions. 4,858,532, Cl. 102-387.000.

Pescanova S.A.: *See—*
Castro, Jose M. I., 4,859,478, Cl. 426-272.000.

Peschl, Hans P., to EBG Elektronische Bauelement Gesellschaft m.b.H. Electrical resistor device. 4,859,981, Cl. 338-308.000.

Peterek, Manfred: *See—*
Hennings, Detlev; Stormberg, Hans-Peter; and Peterek, Manfred, 4,860,269, Cl. 368-107.000.

Peters, Donald L., to Phillips Petroleum Company. Preventing gas leakage around blow needle in blow molding method. 4,859,397, Cl. 264-529.000.

Peters, Richard: *See—*
Crowe, David F.; Tanabe, Masato; and Peters, Richard, 4,859,370, Cl. 260-397.450.

Peters, William H. Portable and reusable safety marker for disabled vehicles. 4,858,551, Cl. 116-30.000.

Petersen, Kurt H.; and Schmolze, Christopher A., to Minnesota Mining and Manufacturing Company. Multipurpose socket. 4,859,189, Cl. 439-66.000.

Petersen, Leonard M. Cooking apparatus. 4,859,833, Cl. 219-432.000.

Petersen, Robert J.: *See—*
Fibiger, Richard F.; Koo, Ja-young; Forgach, David J.; Petersen, Robert J.; Schmidt, Donald L.; Wessling, Ritchie A.; and Stocker, Thomas F., 4,859,384, Cl. 264-45.100.

Peterson, David A.; and Benson, Douglas H., to Proctor & Gamble Company, The. Improved method of making discrete airlaid absorbent fibrous articles. 4,859,388, Cl. 264-121.000.

Peterson, Elmer R.: *See—*
Ilfrey, William T.; Spatz, Edward C.; Peterson, Elmer R.; and Moran, William, 4,858,691, Cl. 166-278.000.

Peterson, Richard E. Database management enhancement device. 4,859,187, Cl. 434-118.000.

Petrella, Robert G.: *See—*
Takahashi, Akio; Petrella, Robert G.; and Schwartz, Joel, 4,859,774, Cl. 544-251.000.

Petroff, Pierre M.: *See—*
Gossard, Arthur C.; Miller, Robert C.; and Petroff, Pierre M., 4,860,068, Cl. 357-16.000.

Petrozello, James R.: *See—*
Joseph, Charles A.; and Petrozello, James R., 4,859,268, Cl. 156-275.500.

Pettit, George D.: *See—*
Kirchner, Peter D.; Marks, Ronald F.; Pettit, George D.; Woodall, Jerry M.; and Wright, Steven L., 4,860,066, Cl. 357-16.000.

Pettus, Kent: *See—*
Bailey, Walter H.; and Pettus, Kent, 4,860,188, Cl. 363-65.000.

Pfannkuche, Heinz; and Schulte, Uwe, to Mannesmann AG. Bus bar joint. 4,859,193, Cl. 439-115.000.

Pfeiffer, Hans C.: *See—*
Groves, Timothy R.; Pfeiffer, Hans C.; Stickel, Werner; and Sturans, Maris A., 4,859,856, Cl. 250-398.000.

Pfister, Jorg: *See—*
Maurer, Peter; Pfister, Jorg; and Sauter, Wolfgang, 4,858,287, Cl. 28-172.000.

Pfizer Inc.: *See—*
Cooper, Kelvin; Steele, John; and Richardson, Kenneth, 4,859,686, Cl. 514-330.000.
Hoover, Dennis J.; and Rosati, Robert L., 4,859,654, Cl. 514-19.000.
Santini, Conrad, 4,859,679, Cl. 514-273.000.

Pfleiderer, Wolfgang: *See—*
Suhadolnik, Robert J.; and Pfleiderer, Wolfgang, 4,859,768, Cl. 536-27.000.

Pforzheimer Uhren-Rohwerke PORTA GmbH: *See—*
Kroener, Wolfgang, 4,860,270, Cl. 368-322.000.

Pharaon, Michael. Hose coupling lock. 4,858,960, Cl. 285-91.000.

Pharlyse Societe Anonyme: *See—*
Baudier, Philippe; De Boeck, Arthur; and Fossion, Jacques, 4,859,469, Cl. 424-462.000.

Philip Morris Incorporated: *See—*
Williams, David L.; Southwick, Everett W.; and Houminer, Yoram, 4,859,775, Cl. 544-405.000.

Philippe, Joseph; and Perrochat, Jean-Michel, to S.A.M.M. - Societe d'Applications des Machines Motrices. Hydropneumatic jack. 4,859,006, Cl. 305-10.000.

Philippe, Joseph: *See—*
Arnaud, Alain; Perrochat, Jean-Michel; and Philippe, Joseph, 4,858,736, Cl. 188-322.140.

Philips Electronics and Associated Industries Limited: *See—*
Wotherspoon, John T. M., 4,859,851, Cl. 250-334.000.

Phillips, Charles W.: *See—*
Moskowitz, David; and Phillips, Charles W., 4,859,124, Cl. 409-64.000.

Phillips, Emyr; O'Neil, Robert M.; and Wirth, Hermann O., to Ciba-Geigy Corporation. Nitrogen-containing additives for non-aqueous functional fluids. 4,859,354, Cl. 252-47.500.

Phillips, John C.: *See—*
Kyminas, Stanley C.; Phillips, John C.; and Einhaus, Bernard J., 4,859,723, Cl. 524-31.000.

Phillips Petroleum Company: *See—*
Cheng, Paul J., 4,859,426, Cl. 422-156.000.
Lee, Fu M.; and Ceurvorst, Joseph G., 4,859,781, Cl. 548-555.000.
Peters, Donald L., 4,859,397, Cl. 264-529.000.

Phillipson, Theodore. Carousel accessory unit. 4,858,772, Cl. 211-36.000.

Phosphor Products Company Limited: *See—*
Higton, Malcolm H.; and Vecht, Aron, 4,859,904, Cl. 313-506.000.

Photon Ceramics Kabushiki Kaisha: *See—*
Iwamatsu, Motoshige; and Kaji, Mitsugu, 4,859,634, Cl. 501-3.000.

Physio-Control Corporation: *See—*
Prosser, Stephen J.; and Smith, Robert E., 4,859,056, Cl. 356-41.000.

Picanol N.V.: *See—*
Shaw, Henry, 4,858,658, Cl. 139-452.000.

Pichot, Mark A.: *See—*
Weldon, William F.; Gully, John H.; and Pichot, Mark A., 4,858,304, Cl. 29-598.000.

Picon, Joseph. Toilet bowl light. 4,860,178, Cl. 362-101.000.

Pieket Weeserik, Pieter C.: *See—*
Engel, Ludovicus H. M.; and Pieket Weeserik, Pieter C., 4,860,293, Cl. 371-51.000.

Pierce, William C.: *See—*
Wallace, Donovan B.; and Pierce, William C., 4,858,949, Cl 280-713.000.

Pijew, Alexandre: *See—*
Meyer, Bertrand; and Pijew, Alexandre, 4,859,821, Cl. 219-10.55A.

Pike, Charles O.; and Viers, Tamela A., to Century Adhesives Corp. Cold-seal adhesives and comestible packages formed therewith. 4,859,521, Cl. 428-195.000.

Pilant, Gregory P.: *See—*
DeMatteo, John A.; and Pilant, Gregory P., 4,859,359, Cl. 252-174.150.

Pimbley, Joseph M.: *See—*
Wei, Ching-Yeu; and Pimbley, Joseph M., 4,859,620, Cl. 437-44.000.

Pincus, Cary I.: *See—*
Weiser, Murray; Silverman, William; Landau, Zvi; Finer, Paul; and Pincus, Cary I., 4,860,329, Cl. 378-50.000.

Pininfarina Extra S.r.l.: *See—*
Fumia, Enrico, 4,858,761, Cl. 206-315.300.

Pinkhasov, Eduard, to Vapor Technologies Inc. Method of coating a metal gas-pressure bottle or tank. 4,859,489, Cl. 427-37.000.

Pinto, Akiva; Lucassen, Guenter; and Dirkes, Heinz, to Hergeth Hollingsworth GmbH. Process and apparatus for cleaning and opening loose fiber stock, e.g. cotton. 4,858,277, Cl. 19-200.000.

Pinto, Akiva; Lucasse, Guenter; Jung, Rolf R.; and Bocht, Bernhard, to Hergeth Hollingsworth GmbH. Apparatus for cleaning and opening textile fiber material. 4,858,278, Cl. 19-200.000.

Pioneer Electronic Corporation: *See—*
Fukuda, Nobutoshi; Nagao, Tatsuro; Arifuku, Naoto; Tanabe, Masashi; Yamamisaka, Shinichi; and Furuta, Yoshiki, 4,860,129, Cl. 360-61.000.
Gotoh, Toshio, 4,860,121, Cl. 358-336.000.
Kanamaru, Hitoshi, 4,860,122, Cl. 358-341.000
Katsuyama, Hitoshi, 4,860,104, Cl. 358-167.000.
Sato, Takeshi; Adachi, Hiroo; and Munetomo, Shigeru, 4,860,361, Cl. 381-55.000.
Yokogawa, Fumihiko; Hirano, Hiroyuki; and Motoyama, Akira, 4,860,271, Cl. 369-44.000.
Yokosawa, Seiichi; and Kawasaki, Ken-ichiro, 4,860,130, Cl. 360-77.020.

Pioneer Hi-Bred International, Inc.: *See—*
Andersen, Gerald L.; Howes, Ronald D.; and Meyocks, Richard D., 4,858,352, Cl. 40-299.000.

Piras, Bernard, to Establissements Montabert. Hydraulic distributor for percussion apparatus driven by an incompressible fluid under pressure. 4,858,702, Cl. 173-134.000.

Pirc, Michael: *See—*
Priddy, Duane B.; and Pirc, Michael, 4,859,748, Cl. 526-88.000.

Pirelli Cable Corporation: *See—*
Rahman, Mujib, 4,859,024, Cl. 350-96.230.

Pirwitz, Robert G., to Xerox Corporation. Fuser system utilizing a pressure web. 4,860,047, Cl. 355-290.000.

Pitchford, Leonard J. Dedicated foot/inch calculator. 4,860,233, Cl. 364-709.070.

Pitney Bowes Inc.: *See—*
Berson, William; Gluck, Julius; Murphy, Patrick; and Tran, Duc H., 4,860,025, Cl. 346-1.100
Hubbard, David W.; and Randmer, Glen J., 4,858,525, Cl 101-91.000.
Sansone, Ronald P., 4,859,038, Cl. 350-357.000.

Pittard, Gerard T.: *See—*
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Wasson, Michael R.; and Herben, William C., 4,858,704, Cl. 175-61.000.

Plan B, Inc.: *See—*
Locke, Ralph J.; and Netherton, David C., 4,859,714, Cl. 521-140.000.

Planke, Tore; Nordbryhn, Andreas; and Solnordal, Steinar, to A/S Tomra Systems. Apparatus for generating detecting and characterizing a raster image of an object. 4,859,862, Cl. 250-560.000

Planmeca Oy: *See—*
Strommer, Pekka; and Virta, Arto, 4,860,330, Cl. 378-162.000.

Plato Products, Inc.: *See—*
Kent, George M., 4,858,820, Cl. 228-264.000.

Platt, Norma B.: *See—*
Michno, Drake M.; Platt, Norma B.; Steele, David A.; and Southby, David T., 4,859,578, Cl. 430-544.000.

Plaveczky, Gyorgy: *See—*
Szabo nee Mogyorosi, Katalin; Kalocsai, Istvan; Gyoni, Istyan; Remenyi, Karoly; Plaveczky, Gyorgy; Kovacs, Laszlo ; Gal, Dezso ; Nemes, Istvan; Botar, Laszlo ; Bencsura, Akos; Moger nee Jeremejeva, Galina; Heberger, Karoly; and Nemeth, Andras, 4,859,209, Cl. 44-51.000.

Plessey Incorporated: *See—*
Shube, Eugene E., 4,858,491, Cl. 74-665.00B.

Plester, George, to Coca-Cola Company, The. Method for discrimination between contaminated and uncontaminated containers. 4,858,768, Cl. 209-3.100.

Plotnick, Michael A., to Kroy Inc. Pixel preheat system for an automated thermal transfer device. 4,859,093, Cl. 400-120.000.

Plus Development Corporation: *See—*
Harrison, Joel N.; Moon, William G.; and Graham, Randolph H., 4,860,194, Cl. 364-200.000.

Poduje, Noel S.: *See—*
Abbe, Robert C.; Poduje, Noel S.; and Judell, Neil H., 4,860,229, Cl. 364-563.000.

Poggi, Piergiovanni: *See—*
Pozzetti, Vittorio; Poggi, Piergiovanni; and Preti, Franco, 4,858,557, Cl. 118-725.000.

Pohl, Fritz; and Harr, Dieter, to Siemens Aktiengesellschaft. Differential current protection circuit breaker. 4,860,146, Cl. 361-42.000.

Pohl, Siegfried: *See—*
Jans, Herbert; Brandmaier, Klaus; and Pohl, Siegfried, 4,860,344, Cl. 379-113.000.

Poirier, Jacques G.: *See—*
Kalnitsky, Alexander; Ellul, Joseph P.; Tay, Sing P.; and Poirier, Jacques G., 4,859,303, Cl. 204-192.360.

Pokross, Charles: *See—*
Bates, Victor T.; and Pokross, Charles, 4,859,257, Cl. 148-422.000.

Polderman, Hugo G., to Shell Oil Company. Process and apparatus for withdrawing solids from a vessel. 4,859,316, Cl. 208-166.000.

Polifroni, Nicholas R.: *See—*
Simelunas, William J.; and Polifroni, Nicholas R., 4,858,524, Cl. 99-450.200.

Pollet, Robert J.: *See—*
De Keyzer, Rene M.; Pollet, Robert J.; and Vermeulen, Leon L., 4,859,565, Cl. 430-231.000.

Pollock, Ira G.: *See—*
Damm, Wendell W.; Taylor, Keith A.; Pollock, Ira G.; and Janowitz, Pedro M., 4,860,291, Cl. 371-27.000.

Poltrock, Bruce A., to Grizzly Engineering Pty. Ltd. Scraper device for an agricultural implement. 4,858,699, Cl. 172-558.000.

Polvara, Maria; Crosti, Giovanni; and Lapo, Sergio. Spot welding electrode and method for making it. 4,859,825, Cl. 219-119.000.

Polyplastics Co., Ltd.: *See—*
Takahashi, Katsuhiko; Nakashima, Tsuneyasu; Nakatsuji, Hiroshi; and Okuda, Hiroshi, 4,859,741, Cl. 525-123.000.

Pond, Stephen F.; Kneezel, Gary A.; Lorenze, Robert V.; O'Horo, Michael P.; Maltz, Martin S.; and Kellerman, Richard, to Xerox Corporation. Resistive printhead arrays for thermal transfer printing. 4,860,030, Cl. 346-76.0PH.

Ponthenier, Jean L.: *See—*
Bouix, Jean; Viala, Jean C.; Vincent, Henri; Vincent, Christiane; Ponthenier, Jean L.; and Dazord, Jacques, 4,859,503, Cl. 427-249.000.

Poplawski, Bruce J.: *See—*
Gray, Kenneth P.; McDonough, Michael L.; Poplawski, Bruce J.; Gaffaney, Daniel P.; and Moyer, Ross A., 4,858,305, Cl. 29-727.000.

Popovich, John M.; and Fleishman, Roc V., to Softub, Inc. Tub apparatus. 4,858,254, Cl. 4-542.000.

Porta Systems Corp.: *See—*
DeLuca, Paul V., 4,860,348, Cl. 379-327.000.

Porter-Cable Corporation: *See—*
Bosten, Donald R.; and Cooper, Randy G., 4,858,661, Cl. 144-134.00D
Bosten, Donald R.; and Cooper, Randy G., 4,858,662, Cl. 144-136.00C.
Bosten, Donald R.; and Cooper, Randy G., 4,858,663, Cl. 144-136.00C.

Porter, Samuel, Jr.: *See—*
Ambrose, Ronald R.; O'Dwyer, James B.; Johnston, Byron K.; Zielinski, David P.; Porter, Samuel, Jr.; and Tyger, Wayne H., 4,859,743, Cl. 525-443.000.

Portier, Ralph J., to Louisana State University Board of Supervisors, Louisana State University. Microorganisms for biodegrading toxic chemicals. 4,859,594, Cl. 435-172.100.

Porzio, Linda A.: *See—*
Arciszewski, Henry E.; Porzio, Linda A.; Chiang, Bin Y.; Spotts, Clyde E., Jr.; McHugh, Kevin; and Szwerc, Joseph A., 4,859,473, Cl. 426-19.000.

Post, Herman D. Vehicle loading attachment. 4,858,981, Cl. 296-76.000.

Potepan, Agnes; and Dibble, Richard L., to Garlock Inc. High temperature compressed non-asbestos sheet. 4,859,526, Cl. 428-283.000.

Poterala, Robert J. Feather light web edge sensor. 4,859,860, Cl. 250-548.000.

Pothetes, Nicholas L. Device for disposing of sharp instruments. 4,859,515, Cl. 428-40.000.

Pott, Richard; Eiling, Aloys; and Kampf, Gunther, to Bayer Aktiengeselischaft. Non-volatile electronic memory. 4,860,254, Cl. 365-145.000.

Potucek, Frank R. Machine and method for making concrete reinforcing bars. 4,858,457, Cl. 72-187.000.

Potucek, Frank R. Machine and method for making concrete reinforcing bars. 4,858,457, Cl. 72-187.000.

Poupon, Raoul, to Synthelabo. Method of treating cirrhosis. 4,859,660, Cl. 514-182.000.

Powanda, Thomas M.; Imes, Robert H.; and Collins, George L., to Hoechst Celanese Corp. Accelerated preparation of esters. 4,859,792, Cl. 560-204.000

Powell, Eric A.: *See—*
Cathey, David A.; Freeman, John C.; Dale, James; Crane, William J.; Powell, Eric A.; and Musser, Jeffrey V., 4,859,304, Cl. 204-298.000

Powers, Stephen J.: *See—*
Woodley, George M.; McGrail, Richard A.; Powers, Stephen J.; and Ross, William W., 4,858,841, Cl. 242-56.00R.

Powers, Thomas: *See—*
Evans, Robert S.; Latham, Wayne M.; Powers, Thomas; and Robertson, Michael O., 4,859,943, Cl. 324-216.000.

Pozzetti, Vittorio; Poggi, Piergiovanni; and Preti, Franco, to L.P.E. Spa. Epitaxial reactors. 4,858,557, Cl. 118-725.000.

PPG Industries, Inc.: *See—*
Ambrose, Ronald R.; O'Dwyer, James B.; Johnston, Byron K.; Zielinski, David P.; Porter, Samuel, Jr.; and Tyger, Wayne H., 4,859,743, Cl. 525-443.000.

Prader, Randolph D., to Mobil Oil Corporation. Apparatus for suspending bag packs of different geometry. 4,858,862, Cl. 248-99.000.

Precision Carbide Tool Co., Inc.: *See—*
Stribiak, John J., 4,858,302, Cl. 29-568.000.

Preiser, Herbert W. Retractable barbless fishhook. 4,858,371, Cl. 43-43.160.

Premel, Ulrich: *See—*
Segerstrom, Clifford C.; Stil, Jacob H.; Ooms, Adrianus J.; Mink, Bernardus H.; Premel, Ulrich; and Gawloski, Leszek, 4,859,214, Cl. 48-197.00R.

Premier Pump & Pool Products, Inc.: *See—*
Haisman, William H., 4,858,255, Cl. 4-544.000.

President and Fellows of Harvard College: *See—*
Alfenito, Mark R., 4,859,302, Cl. 204-182.800.

Preston, John C. Scaffolding module and method erecting same. 4,858,726, Cl. 182-152.000.

Preti, Franco: *See—*
Pozzetti, Vittorio; Poggi, Piergiovanni; and Preti, Franco, 4,858,557, Cl. 118-725.000.

Preti, Gerard. Method of making a piece of furniture. 4,858,291, Cl. 29-91.100

Price, Barry J.: *See—*
Coates, Ian H.; Bradshaw, John; Bell, James A.; Humber, David C.; Ewan, George B.; Mitchell, William L.; and Price, Barry J., 4,859,662, Cl. 514-212.000.

Price, John F.: *See—*
Schneider, Alan A.; Stewart, David A.; Jolson, Joseph D.; Auel, RaeAnn M.; and Price, John F., 4,859,305, Cl. 204-412.000.

Priddy, Duane B.; and Pirc, Michael, to Dow Chemical Company, The. Process for anionic polymerization in a continuous stirred tank reactor. 4,859,748, Cl. 526-88.000.

Priebe, William P.; Milliken, Brad R.; and Braaten, Dennis A., to Atlantic Richfield Company. Combustion method and apparatus. 4,858,537, Cl. 110-243.000.

Priefert Mfg. Co., Inc.: *See—*
Priefert, Marvin J.; and Prifert, William D., 4,858,417, Cl. 56-6.000.

Priefert, Marvin J.; and Prifert, William D., to Priefert Mfg. Co., Inc. Mower with adjustable extension wings. 4,858,417, Cl. 56-6.000.

Pries, Werner: *See—*
McLeod, Robert; Card, Howard; Hortensius, Peter; and Pries, Werner, 4,860,236, Cl. 364-717.000.

Prifert, William D.: *See—*
Priefert, Marvin J.; and Prifert, William D., 4,858,417, Cl. 56-6.000.

Prime Computer, Inc.: *See—*
Cassinelli, Edgar, 4,860,165, Cl. 361-388.000.
Langendorf, Brian K.; and Johnson, Neil J., 4,860,197, Cl. 364-200.000.
Langendorf, Brian K.; and Beckwith, Robert F., 4,860,199, Cl. 364-200.000.

Prince Corporation: *See—*
Dykstra, Ronald A.; and Fluharty, William J., 4,858,982, Cl. 296-97.500.

Prince Manufacturing, Inc.: *See—*
Pasternak, Stephen M., 4,858,340, Cl. 36-88.000.

Prior, Robert P.: *See—*
Squarer, David; Colin, Andre; Prior, Robert P.; Mink, Frederick J.; and Liparulo, Nicholas J., 4,859,405, Cl. 376-299.000.

Prisbylla, Michael P., to ICI Americas Inc. Novel 5-aminomethylene-2,4-imidazolidinediones and 5-aminomethylene-2-thioimidazolidine-4-ones. 4,859,228, Cl. 71-92.000.

Pro Power Corporation: *See—*
Anderson, Harvey G., 4,858,318, Cl. 30-122.000.

Prochnow, Kenneth E.; and Burke, Richard C., to Carnes Company, Inc. Auxiliary frame for ceiling mounted air diffusers and the like. 4,858,520, Cl. 98-40.050.

Procter & Gamble Company, The: *See—*
Gabriel, Steven M.; and Roselle, Brian J., 4,859,358, Cl. 252-99.000.

Proctor & Gamble Company, The: *See—*
Peterson, David A.; and Benson, Douglas H., 4,859,388, Cl. 264-121.000.

Proctor, Rudy R.; and Reinstein, Fred M., to Turbo Tek Enterprises, Inc. Spraying device having an additive fluid dispenser at an exit end. 4,858,830, Cl. 239-313.000.

Proehl, D. Scott: *See—*
Metz, George D.; McCrary, Carl; O'Connor, Joseph G.; Adair, Paul C.; Proehl, D. Scott; Saccocio, Edward J.; and Dowler, James, 4,859,561, Cl. 430-138.000.

Progressive Fastening, Inc.: *See—*
Richards, Peter S., 4,858,860, Cl. 248-62.000.

Projahn, Ulrich: *See—*
Knauer, Alfred; and Projahn, Ulrich, 4,858,432, Cl. 60-303.000.
Knauer, Alfred; Leonhard, Rolf; Projahn, Ulrich; and Stolper, Wolfgang, 4,858,433, Cl. 60-303.000.
Leonhard, Rolf; and Projahn, Ulrich, 4,858,431, Cl. 60-297.000.

Proprietary Technology, Inc.: *See—*
Bartholomew, Donald D., 4,859,194, Cl. 439-125.000.

Prosser, Stephen J.; and Smith, Robert E., to Physio-Control Corporation. Multiple-pulse method and apparatus for use in oximetry. 4,859,056, Cl. 356-41.000.

Protel, Inc.: *See—*
Mellon, Regis B., 4,860,345, Cl. 379-123.000.
Mellon, Regis B., 4,860,346, Cl. 379-155.000.

Provenzano, Nicholas J., to General Motors Corporation. Secondary oil system for gas turbine engine. 4,858,427, Cl. 60-39.080.

Prowler, Millard E.: *See—*
Kreisberg, Alan J.; and Prowler, Millard E., 4,859,177, Cl. 432-14.000.

Przybysz, John X., to Westinghouse Electric Corp. Superconducting digital logic amplifier. 4,859,879, Cl. 307-476.000.

Pshtissky, Yacov A.; and Gao, Shi-Yang, to Vicon Industries, Inc. Central station synchronization system. 4,860,101, Cl. 358-149.000.

Puchinger, Franz; and Wydra, Gerhard, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Dispersion for protective coatings and method for applying such coatings. 4,859,506, Cl. 427-372.200.

Puester, Neil: *See—*
Adams, David W.; Ching, Larry K. W., Jr.; and Puester, Neil, 4,859,547, Cl. 429-121.000.

Pulick, Michael A.: *See—*
Field, Nathaniel L.; and Pulick, Michael A., 4,858,670, Cl. 164-11.000.

Pulliam, David J.: *See—*
Crewson, Gary E.; and Pulliam, David J., 4,858,729, Cl. 188-205.00R.

Puma AG Rudolf Dassler Sport: *See—*
Flemming, Udo, 4,858,343, Cl. 36-128.000.

Puri, Pushpinder S.: *See—*
Langsam, Michael; Puri, Pushpinder S.; Anand, Madhu; and Laciak, Daniel V., 4,859,215, Cl. 55-16.000.

Puritch, George S.; and Kondo, Edward S., to Safer, Inc. Synergistic fungicidal composition comprise a benzimidazole compound, an alkyl pyridinium salt, and a carrier and the use thereof to combat fungi. 4,859,689, Cl. 514-358.000.

Putz, Helmar. Building board, particularly gypsum plasterboard. 4,858,402, Cl. 52-105.000.

Quay, Steven C.; and Worah, Dilip M., to Salutar, Inc. Paramagnetic contrast agents for MR imaging. 4,859,451, Cl. 424-9.000.

Quinn, John A.: *See—*
Cohen, Abraham B.; Fan, Roxy; and Quinn, John A., 4,859,571, Cl. 430-272.000.

Qureshi, Humayun; Liffmann, Stanley M.; Webster, Milo E.; and Geiselman, Theodore S., to Fisher Scientific Company. Analysis system. 4,859,422, Cl. 422-81.000.

R. A. Hanson Company, Inc.: *See—*
Hanson, R. A.; and Morton, Jerry, 4,858,347, Cl. 37-190.000.

R. J. Reynolds Tobacco Company: *See—*
Banerjee, Chandra K.; and Shelar, Gary R., 4,858,630, Cl. 131-364.000.
Norman, Alan B.; Griffith, David W., Jr.; Holt, Dewey L.; Reynolds, John H., IV; and Sears, Stephen B., 4,858,628, Cl. 131-329.000.

Rabenau, Richard: *See—*
Wright, David; and Rabenau, Richard, 4,858,754, Cl. 206-5.100.

Rabideau, Phillip A. Weedless roll-over lure apparatus and method. 4,858,367, Cl. 43-42.250.

Rabiner, Lawrence R., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Speech recognition arrangement with preselection. 4,860,358, Cl. 381-43.000.

Rabo, Jule A.: *See—*
Pellet, Regis J.; Coughlin, Peter K.; Staniulis, Mark T.; Long, Gary N.; and Rabo, Jule A., 4,859,314, Cl. 208-114.000.

Rabska, William G. Fire hose backpack frame. 4,858,797, Cl. 224-162.000.

Rach, Petra: *See—*
Bittler, Dieter; Laurent, Henry; Nickisch, Klaus; and Rach, Petra, 4,859,659, Cl. 514-177.000.

Rademacher, Albert. Artificial vegatation or plants or parts for the same. 4,859,510, Cl. 428-17.000.

Radermacher, Herbert: *See—*
Kuster, Hans-Werner; Radermacher, Herbert; and Vanaschen, Luc, 4,859,225, Cl. 65-104.000.

Radiation Dynamics, Inc.: *See—*
Thompson, Chester C., 4,860,187, Cl. 363-61.000.

Raether, Wolfgang: *See—*
Kampe, Klaus-Dieter; Raether, Wolfgang; Dittmar, Walter; and Hanel, Heinz, 4,859,670, Cl. 514-252.000.

Raeymaekers, Alfons H. M.; Freyne, Eddy J. E.; and Sanz, Gerard C., to Janssen Pharmaceutica N.V. (1H-imidazol-1-ylmethyl) substituted benzimidazole derivatives and use thereof in treating androgen dependent disorders. 4,859,684, Cl. 514-314.000.

Rageot, Alain: *See—*
Marechal, Michel; Rageot, Alain; and Basly, Michel, 4,859,258, Cl. 156-51.000.

Raghavan, Chidambaram: *See—*
Tremoulet, Olivier L., Jr.; and Raghavan, Chidambaram, 4,858,967, Cl. 285-256.000.

Raghunathan, Yegnaswami: *See—*
Chow, San-Laung; and Raghunathan, Yegnaswami, 4,859,461, Cl. 424-79.000.
Chow, San-Laung; and Raghunathan, Yegnaswami, 4,859,462, Cl. 424-79.000.

Raguet, Philippe, to U.S. Philips Corporation. Current mirror having a high output voltage. 4,859,929, Cl. 323-316.000.

Ragusa, James J.; and Sharpe, Gordon V., Jr., to Mobil Oil Corporation. Microwaveable container. 4,859,822, Cl. 219-10.55E.

Rahier, Michel C. A. R.: *See—*
Sallaerts, Daniel; and Rahier, Michel C. A. R., 4,860,230, Cl. 364-569.000.

Rahman, Mujib, to Pirelli Cable Corporation. Optical fiber cable with tampering detecting means. 4,859,024, Cl. 350-96.230.

Raidel, John E. Suspension assembly. 4,858,948, Cl. 280-711.000.

Rakhodai, Issa; Lefebvre, Serge G.; and Couderc, Pascal, to U.S. Philips Corporation. Synchronization system for a semi-digital signal. 4,860,100, Cl. 358-148.000.

Raleigh, William J.; Doin, James E.; and Traver, Frank J., to General Electric Co. Fibers, fabrics and flexible porous substrates sized with a curable hydrophilic silicone polyether polymer. 4,859,529, Cl. 428-290.000.

Rammler, Roland; Weiss, Hans-Jurgen; Herbertz, Hans-Adolf; Solari, Rodolfo B.; and Hidalgo, Rafael, to Intevep, S.A. Combined process for the separation and continuous coking of high softening point asphaltenes. 4,859,284, Cl. 201-12.000.

Randmer, Glen J.: *See—*
Hubbard, David W.; and Randmer, Glen J., 4,858,525, Cl. 101-91.000.

Randtke, Peter T.: *See—*
Lipisko, Bruce A.; Schumacher, John C.; Howard, Richard E.; Randtke, Peter T.; Sandu, Adrian; Fletcher, Robert E.; and Graf, Hans-Juergen, 4,859,375, Cl. 261-20.000.

Ranly, Don M., to Biomedical Development Corporation. Pulpotomy agent and method of use. 4,859,186, Cl. 433-228.100.

Rasmusson, Gary H.; and Reynolds, Glenn F., to Merck & Co., Inc. 17 α-Acyl-4-aza-5α-androst-1-en-3-ones as 5 alpha-reductase inhibitors. 4,859,681, Cl. 514-284.000.

Rasovich, Ivan. Combination cryogenic and mechanical freezing system. 4,858,445, Cl. 62-374.000.

Rath, Hans P.: *See*—
Franz, Dieter; Kummer, Rudolf; Mach, Helmut; and Rath, Hans P., 4,859,210, Cl. 44-53.000.

Rawlins, David A., to Beecham Group plc. Pharmaceutical composition. 4,859,709, Cl. 514-770.000.

Ray, Lawrence J. Fish basket. 4,858,372, Cl. 43-55.000.

Raychem Corporation: *See*—
Dubrow, Robert S.; and Froix, Michael F., 4,859,715, Cl. 521-180.000.
Jervis, James E., 4,859,809, Cl. 174-92.000.
Lunk, Hans E.; Reed, Donald A.; Deep, Marguerite E.; Hill, Charles; and Au, Andrew, 4,859,836, Cl. 219-548.000.
Rosenzweig, Nachum, 4,858,293, Cl. 29-148.40A.

Raychem Limited: *See*—
Wright, Martin A., 4,860,155, Cl. 361-111.000.

Raytel Systems Corporation: *See*—
Nichols, John L.; Wang, David; Kirkpatrick, Edward; Viehweg, Clark M.; Morton, Edwin S.; and Hua, Van T., 4,860,112, Cl. 358-400.000.

Raytheon Company: *See*—
Nicholls, Robin P., 4,860,166, Cl. 361-414.000.

Reardon, Bruce A.; and Goodrich, Joel L., to M/A-Com, Inc. Method of fabricating a semiconductor beam lead device. 4,859,629, Cl. 437-203.000.

Rebardi, Wade A.; and Farley, David L., to Completion Services, Inc Upward movement only actuated gravel pack system. 4,858,690, Cl. 166-278.000.

Rebel, Herbert; and Bergmann, Marco, to M.A.N. Roland Druckmaschinen. Conveyor for a sheet-fed rotary press. 4,858,910, Cl. 271-204.000.

Reberle reg. Treuunternehmen Schaan: *See*—
Boschung, Marcel, 4,858,270, Cl. 15-328.000.

Rech, Ben M.: *See*—
Weldon, William F.; Rech, Ben M.; and Zowarka, Raymond C., Jr., 4,859,819, Cl. 200-146.00R

Recht, Tom: *See*—
Tetelman, Bruce; Milios, Yannis; Park, Il-Pyung; and Recht, Tom, 4,859,839, Cl. 235-385.000.

Recytec S.A.: *See*—
Hanulik, Jozef, 4,858,833, Cl. 241-24.000.

Reed, Barry J. Insect trap apparatus. 4,858,376, Cl. 43-139.000.

Reed, Donald A.: *See*—
Lunk, Hans E.; Reed, Donald A.; Deep, Marguerite E.; Hill, Charles; and Au, Andrew, 4,859,836, Cl. 219-548.000.

Reed, John H. Pump-off control for a pumpjack unit. 4,859,151, Cl. 417-12.000.

Reed, Michael K.: *See*—
Schulz, Daniel R.; Warren, Benton B.; and Reed, Michael K., 4,860,219, Cl. 364-519.000.

Rees, Richard: *See*—
Blume, Friedhelm; Franke, Wilfried; Arndt, Friedrich; and Rees, Richard, 4,859,230, Cl. 71-93.000.
Westermann, Jurgen; Kruger, Martin; Arndt, Friedrich; Rees, Richard; and Kotter, Clemens, 4,859,231, Cl. 71-93.000.

Reeves, Gordon P., to G. P. Reeves In. Lubricant delivery system including flow measuring. 4,858,645, Cl. 137-551.000.

Regie Nationale des Usines Renault: *See*—
Mercier, Jacques, 4,858,487, Cl. 74-424.700.

Reider, Paul J.; and Grabowski, Edward J. J., to Merck & Co., Inc. Process for resolution and racemization of amines with acidic α-hydrogens. 4,859,771, Cl. 540-509.000.

Reilly, Kenneth T.; and Gingerich, Richard G. W., to GTE Products Corporation. Process for producing electroluminescent phosphors of improved brightness. 4,859,361, Cl. 252-301.60S.

Reimann, Hartwig: *See*—
Maxeiner, Heinz; Kruske, Gerhard; and Reimann, Hartwig, 4,859,541, Cl. 428-545.000

Reinhart, Theodore J., to United States of America, Air Force. Ultrasonic assisted protective coating removal. 4,858,264, Cl. 15-93.00R.

Reinstein, Fred M.: *See*—
Proctor, Rudy R.; and Reinstein, Fred M., 4,858,830, Cl. 239-313.000.

Remenyi, Karoly: *See*—
Szabo nee Mogyorossi, Katalin; Kalocsai, Istvan; Gyoni, Istyan; Remenyi, Karoly; Plaveczky, Gyorgy; Kovacs, Laszlo ; Gal, Dezso ; Nemes, Istvan; Botar, Laszlo ; Bencsura, Akos; Moger nee Jeremejeva, Galina; Heberger, Karoly; and Nemeth, Andras, 4,859,209, Cl. 44-51.000.

Remick, Robert J.: *See*—
Marianowski, Leonard G.; and Remick, Robert J., 4,859,296, Cl. 204-129.000.

Remmers, Gregry M., to Outboard Marine Corporation. Electronically assisted engine starting means. 4,858,585, Cl. 123-602.000.

Rempel, Garry L.; and Mohammadi, Navroz A., to University of Waterloo. Gas consumption measuring system. 4,858,637, Cl. 137-12.000.

Ren, Deng-ke: *See*—
Jiang, Ke-zheng; Ren, Deng-ke; Chen, Zu-yuan; and You, Lianzhen, 4,860,019, Cl. 343-795.000.

Renner, Heinz: *See*—
Fidi, Werner; and Renner, Heinz, 4,858,719, Cl. 181-158.000.

Rentzel, Richard T.: *See*—
McIntosh, Ronald M.; Rentzel, Richard T.; Stewart, Robert W.; and Daugherty, Daniel L., 4,859,200, Cl. 439-275.000.

Research Development Corporation of Japan, Junichi Nishizawa and Oki Electric Industry Co., Ltd.: *See*—
Matsumoto, Fumio, 4,859,625, Cl. 437-81.000.

Research Foundation of State University of New York, The: *See*—
Apicella, Michael A., 4,859,421, Cl. 422-61.000.

Resource Enterprises, Inc.: *See*—
Logan, Terry L., 4,858,689, Cl. 166-256.000.

Resta Commerciale S.r.l.: *See*—
Resta, Rodolfo; Resta, Mario; and Resta, Roberto, 4,858,540, Cl. 112-117.000.

Resta, Mario: *See*—
Resta, Rodolfo; Resta, Mario; and Resta, Roberto, 4,858,540, Cl. 112-117.000

Resta, Roberto: *See*—
Resta, Rodolfo; Resta, Mario; and Resta, Roberto, 4,858,540, Cl. 112-117.000.

Resta, Rodolfo; Resta, Mario; and Resta, Roberto, to Resta Commerciale S.r.l. Quilting machine with adjustable-length cloth-holder cylinder. 4,858,540, Cl. 112-117.000.

Reuss, Robert H.; and McLaughlin, Kevin L., to Motorola, Inc. Vertical semiconductor device having a sidewall emitter. 4,860,077, Cl. 357-34.000.

Reuter, David F.: *See*—
Parker, Donald L.; Reuter, David F.; and Roussel, Patrick, 4,859,001, Cl. 303-92.000.

Reuter, Mark: *See*—
Failor, Raymond A.; Hayton, Eugene; and Reuter, Mark, 4,858,260, Cl. 5-67.000.

Revere Corporation of America: *See*—
Jacobson, Walter E.; Summers, Donald J.; Vining, Kenneth; and Jackson, Frederick E., 4,858,475, Cl. 73-862.540.

Rexene Products Company: *See*—
Pellon, Brian J.; Allen, George C.; and Hughes, Michael P., 4,859,757, Cl. 526-348.000.

Rexnord Corporation: *See*—
Hodlewsky, Wasyly G., 4,858,751, Cl. 198-834.000.
Hodlewsky, William G., 4,858,753, Cl. 198-853.000.

Rexnord Holdings Inc.: *See*—
Tedesco, Albert D.; Stammreich, John C.; Harmon, Raymond E.; and Rourne, William R., Jr., 4,858,970, Cl. 292-113.000.

Rey, Pierre J.; and DeRaco, Maurice, to Eaton Corporation. Three-port fluid valve. 4,859,005, Cl. 303-119.000.

Reynolds, Glenn F.: *See*—
Rasmusson, Gary H.; and Reynolds, Glenn F., 4,859,681, Cl. 514-284.000.

Reynolds, John H., IV: *See*—
Norman, Alan B.; Griffith, David W., Jr.; Holt, Dewey L.; Reynolds, John H., IV; and Sears, Stephen B., 4,858,628, Cl. 131-329.000.

Rheaume, Lisa J.: *See*—
Whalen, Joseph W.; Swartz, Gregory L.; Rheaume, Lisa J.; and McCoy, Karen M., 4,859,599, Cl. 435-252.600.

Rheon Automatic Machinery Co., Ltd.: *See*—
Hayashi, Torahiko; and Tashiro, Yasunori, 4,859,479, Cl. 426-281.000.

Rhodes, James A.: *See*—
Lantz, Paul W., 4,858,397, Cl. 52-80.000.

Rhodia Aktiengesellschaft: *See*—
Maurer, Peter; Pfister, Jorg; and Sauter, Wolfgang, 4,858,287, Cl. 28-172.000.

Rhone-Poulenc Chimie: *See*—
David, Claire; Magnier, Claude; and Latourrette, Bertrand, 4,859,432, Cl. 423-21.100.

Ribi, Hans O. Novel lipid-protein compositions and articles and methods for their preparation. 4,859,538, Cl. 428-474.400.

Ricchini, John A., to Universal Simplex Building System. Prefabricated building construction. 4,858,398, Cl. 52-90.000.

Rice, Camilla A., to E.C.C. America Inc. Method for surface treating metal carbonate. 4,859,718, Cl. 523-202.000.

Ricerfarma S.R.L.: *See*—
Di Schiena, Michele G.; and Paster, Zvi, 4,859,658, Cl. 514-159.000.

Rich, David; and Staley, Peter, to Microchip Technology Incorporated. Integrated analog-to-digital converter. 4,860,012, Cl. 341-143.000.

Richard, Joseph W., to Westinghouse Electric Corp. Reactor vessel internals storage area arrangement. 4,859,404, Cl. 376-293.000.

Richard, Maurice B.: *See*—
Aria, Percy R.; and Richard, Maurice B., 4,860,325, Cl. 377-29.000.

Richard Wolf GmbH: *See*—
Kurtze, Gunther; and Riedlinger, Rainer, 4,858,597, Cl. 128-24.00A

Richards, Peter S., to Progressive Fastening, Inc. Side-load type pipe hanger with single bolt closure and liner protecting insert. 4,858,860, Cl. 248-62.000.

Richardson, Kenneth: *See*—
Cooper, Kelvin; Steele, John; and Richardson, Kenneth, 4,859,686, Cl. 514-330.000.

Richter Gedeon Vegyeszeti: *See*—
Knoll, Jozsef; Harmath, Sandor; Nagy, Janos; and Knoll, Berta, 4,859,766, Cl. 530-380.000.

Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Keve, Tibor; Megyeri, Gabor; Stefko , Bela; Kovacs, Lajos, Jr.; Kassai nee Zieger, Anna; Kiss, Bela; Laszlovszky, Istvan; Lapis, Erzsebet; Palosi, Eva; Groo, Dora; and Szporny, Laszlo , 4,859,682, Cl. 514-288.000.

Ricoh Company, Ltd.: *See*—
Higuchi, Masami, 4,860,054, Cl. 355-300.000.
Kouchiwa, Taira, 4,859,044, Cl. 350-464.000.
Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kuramoto, Shinichi; Sugiyama, Yoshihiro; Takanashi, Hajime; Ishizuka, Takashi; Kudo, Yoshio; and Sato, Yoshio, 4,860,050, Cl. 355-256.000.
Maniwa, Yoshio; and Morita, Takashi, 4,860,119, Cl. 358-296.000.
Matsuda, Toru; Yano, Takanori; Okamoto, Toshiaki; and Okamoto, Akira, 4,860,214, Cl. 364-513.000.
Ogura, Masaaki, 4,860,115, Cl. 358-443.000.
Saeki, Shiro; and Ikeda, Sunao, 4,860,057, Cl. 355-23.000.
Sasaki, Masaomi, 4,859,556, Cl. 430-73.000.
Sasaki, Tomio, 4,860,117, Cl. 358-287.000.
Takanashi, Kenichi, 4,859,011, Cl. 350-6.800.

Riebli, Peter, to Ciba-Giegy Corporation. Substituted 1,3-dioxolane compounds and their use as fungicides. 4,859,687, Cl. 514-336.000.

Riedel, Heimo: *See*—
Dull, Thomas J.; Riedel, Heimo; and Ullrich, Axel, 4,859,609, Cl. 436-501.000.

Riedlinger, Rainer: *See*—
Kurtze, Gunther; and Riedlinger, Rainer, 4,858,597, Cl. 128-24.00A.

Riehlein, Fritz: *See*—
Beck, Ernst; Riehlein, Fritz; and Lenard, Peter, 4,858,392, Cl. 51-218.00R.

Rigby, William R.: *See*—
Furneaux, Robin C.; and Rigby, William R., 4,859,288, Cl. 204-11.000.

Riggs, James J., to Aro Corporation, The. Bit retention and release mechanism. 4,858,939, Cl. 279-75.000.

Riggs, Walter S.: *See*—
Kincaid, Harry R.; and Riggs, Walter S., 4,858,470, Cl. 73-654.000.

Rikimaru, Hiroaki; Nakatsuji, Tadao; Umaba, Toshikatsu; Nagano, Kuzuhiko; Mishina, Kazuya; and Shimizu, Hiromitsu, to Sakai Chemical Industry Co., Ltd.; Mitsubishi Jukogyo Kabushiki Kaisha; Mitsubishi Petrochemical Co., Ltd.; Mitsubishi Petrochemical Engineering Co., Ltd.; and Catalysts & Chemicals Industries Co., Ltd. Catalyst and a method for denitrizing nitrogen oxides contained in waste gases. 4,859,439, Cl. 423-239.000.

Ringle, Scott J.: *See*—
Fitzharris, William D.; Ringle, Scott J.; and Nicholes, Kathy S., 4,859,310, Cl. 208-87.000.

Rink, Hans, to Ciba-Geigy Corporation. Synthetic polystyrene resin and its use in solid phase peptide synthesis. 4,859,736, Cl. 525-54.100.

Ripka, William C.; and Sipio, William J., to Du Pont de Nemours, E. I., and Company. Substituted acenaphthenes and their use as inhibitors of phospholipase A2. 4,859,697, Cl. 514-438.000.

Ripley, John A.: *See*—
Konno, Mark A.; and Ripley, John A., 4,858,618, Cl. 128-7.300.

Ritsko, Joseph E.: *See*—
Johnson, Walter A.; Kopatz, Nelson E.; and Ritsko, Joseph E., 4,859,237, Cl. 75-0.5AA.
Patrician, Thomas J.; Ritsko, Joseph E.; and Martin, Harry D., III, 4,859,236, Cl. 75-0.5AB.

Ritter, Gunter: *See*—
Rohde, Rolf; and Ritter, Gunter, 4,858,480, Cl. 74-60.000.

Roark, David N.; and Lambert, Jules A., to Ethyl Corporation. High temperature adhesive for polymide films. 4,859,530, Cl. 428-294.000.

Robert Bosch GmbH: *See*—
Knapp, Heinrich, 4,858,567, Cl. 123-52.00M.
Knauer, Alfred; and Projahn, Ulrich, 4,858,432, Cl. 60-303.000.
Knauer, Alfred; Leonhard, Rolf; Projahn, Ulrich; and Stolper, Wolfgang, 4,858,433, Cl. 60-303.000.
Leonhard, Rolf; and Projahn, Ulrich, 4,858,431, Cl. 60-297.000.
Tauchenitz, Harald; and Schupp, Horst, 4,859,922, Cl. 318-628.000.

Roberts, Derek A.; and Daines, John W., to Rolls Royce plc. Friction welder mechanism. 4,858,815, Cl. 228-2.000.

Roberts, George W.; Sircar, Shivaji; and Stepanoff, Paul, to Air Products and Chemicals, Inc. Production of endothermic gases with methanol. 4,859,434, Cl. 423-219.000.

Roberts, George W.; Sircar, Shivaji; and Stepanoff, Paul, to Air Products and Chemicals, Inc. Deoxygenation of inert gas streams with methanol. 4,859,435, Cl. 423-219.000.

Roberts, Gordon J., to Ferro Corporation. Lead-free U.V. absorbing glass. 4,859,637, Cl. 501-79.000.

Robertson, J. Richard, Jr.: *See*—
Molock, Frank; Robertson, J. Richard, Jr.; and Su, Kai C., 4,859,780, Cl. 548-550.000.

Robertson, Michael O.: *See*—
Coulter, John E.; Evans, Robert S.; and Robertson, Michael O., 4,858,462, Cl. 73-40.50A.
Evans, Robert S.; Latham, Wayne M.; Powers, Thomas; and Robertson, Michael O., 4,859,943, Cl. 324-216.000.

Robey, Judith L.: *See*—
Trinh, Eugene H.; and Robey, Judith L., 4,858,717, Cl. 181-0.500.

Robillart Lampin, Jeannine, heir: *See*—
Lampin, Jean-Pierre, deceased; Robillart Lampin, Jeannine, heir; Lampin, Corinne, heir; Lampin, Sophie, heir; Cambon, Aime ; Szonyi, Francois; Delpuech, Jean-Jacques; Serratrice, Guy; Thiollet, Gerard; and Lafosse, Louisette, 4,859,797, Cl. 568-39.000.

Robinson, Alan S.; and Fuller, Mark W., to Wet Enterprises, Inc. Colored flame water fountain illumination system. 4,858,826, Cl. 239-18.000.

Robinson, Donald M.: *See*—
Hayek, George W.; Brown, Amos J.; Hamblin, John R.; and Robinson, Donald M., 4,858,592, Cl. 126-373.000.

Rocco, Jean-Claude: *See*—
Gualandris, Rene; Ludwig, Paul; Rocco, Jean-Claude; and Zadworny, Francois, 4,859,909, Cl. 315-111.810.

Rockwell International Corporation: *See*—
Baroni, Robert J., 4,858,730, Cl. 188-205.00R.
Crewson, Gary E.; and Pulliam, David J., 4,858,729, Cl. 188-205.00R.
Edwards, Richard C.; and Martin, Burton L., 4,859,971, Cl. 333-109.000.
Eicher, David E., 4,860,359, Cl. 381-46.000.
Molina, Orlando G., 4,858,465, Cl. 73-104.000.

Rockwell, Lynn H., to CalComp Inc. Digitizer tablet having electrical interconnect components on the writing substrate. 4,859,813, Cl. 178-18.000.

Roden, Don R., Jr.: *See*—
Farah, Hani; Chou, Chai J.; and Roden, Don R., Jr., 4,859,738, Cl. 525-67.000.

Rodgers, Cyril: *See*—
Fay, Fredric S.; Fogarty, Kevin E.; and Rodgers, Cyril, 4,859,063, Cl. 356-418.000.

Rodrigo, Richard D., to Simco Company, Inc., The. Tape dispenser with static neutralizer. 4,860,159, Cl. 361-212.000.

Rodriguez, Otto. Manually driven bicycle. 4,858,942, Cl. 280-233.000.

Roeder, Georg; and Moeck, Gerhard, to Schwan-Stabilo Schwanhausser GmbH & Co. Applicator device and cap. 4,859,104, Cl. 401-202.000.

Rogers, Harvey N., Jr.; and Smith, Ronald T., to Hughes Aircraft Company. Process for forming an environmentally stable optical coating thereby. 4,859,492, Cl. 427-42.000.

Rogers, Lloyd W.: *See*—
Haag, Ronald H.; Manuel, Mark; and Rogers, Lloyd W., 4,858,971, Cl. 292-201.000.

Rohde, Rolf; and Ritter, Gunter, to Hydromatic GmbH. Swash plate swivel bearing for a hydraulic axial piston machine. 4,858,480, Cl. 74-60.000.

Rohm GmbH Chemische Fabrik: *See*—
Vetter, Heinz, 4,859,392, Cl. 264-166.000.

Rohr, Jurgen: *See*—
Zeeck, Axel; Ciesiolka, Thomas; Rohr, Jurgen; Zahner, Hans; and Drautz, Hannelore, 4,859,655, Cl. 514-34.000.

Roizman, Bernard, to Institut Merieux. Recombinant herpes simplex viruses, vaccines and methods. 4,859,587, Cl. 435-68.000.

Rokach, Joshua: *See*—
Lau, Cheuk K.; Yoakim, Christiane; Rokach, Joshua; Fortin, Rejean; and Guindon, Yvan, 4,859,667, Cl. 514-224.500.

Rokusek, Daniel S.: *See*—
D'Avello, Robert F.; Rokusek, Daniel S.; and Tobolski, Francis P., Jr., 4,860,336, Cl. 379-63.000.

Rolfvondenbaumen, Theodore. Oil sand cleaning apparatus. 4,859,323, Cl. 210-181.000.

Rollins, James: *See*—
Hartnett, Michael J.; Lugosi, Robert; Rollins, James; Cook, John P.; and Clark, Jeffrey A., 4,858,295, Cl. 29-156.40R.

Rolls Royce plc: *See*—
Roberts, Derek A.; and Daines, John W., 4,858,815, Cl. 228-2.000.

Roltra S.p.A.: *See*—
Brusasco, Enzo, 4,858,436, Cl. 60-545.000.

Roman, Benjamin: *See*—
Martin, Edward L.; Graham, Fred G.; and Roman, Benjamin, 4,860,226, Cl. 364-552.000.

Romano, Antonio, to Campagnolo S.p.A. Device for displaying the gear parameters of a bicycle or the like. 4,859,984, Cl. 340-432.000.

Romano, Robert. Clip for fastening an object to a support by means of a hook and device for fitting such a clip. 4,858,871, Cl. 248-339.000.

Romano, Ugo: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, 4,859,785, Cl. 549-531.000.

Ronnow, Peter: *See*—
Kjelleberg, Staffan; and Ronnow, Peter, 4,859,656, Cl. 514-54.000.

Rorer Pharmaceutical Corporation: *See*—
Spada, Alfred P.; Campbell, Henry F.; Kuhla, Donald E.; Studt, William L.; Faith, William C.; and Molino, Bruce F., 4,859,672, Cl. 514-254.000.
Youssefyeh, Raymond; Klein, Scott I.; Campbell, Henry F.; and Kuhla, Donald E., 4,859,683, Cl. 514-299.000.

Rosati, Robert L.: *See*—
Hoover, Dennis J.; and Rosati, Robert L., 4,859,654, Cl. 514-19.000.

Rose, Carl: *See*—
Combe-Rose, Kimberly; and Rose, Carl, 4,858,990, Cl. 297-184.000.

Rose, David; Lieske, Edgar; Hoeffkes, Horst; and Maak, Norbert, to Henkel Kommanditgesellschaft auf Aktien. Hair dye preparations containing nitrodiphenylamine derivative. 4,859,206, Cl. 8-429.000.

Rose, Thomas M.; and Dixon, Carlas F. Gutter. 4,858,396, Cl. 52-11.000.

Roselle, Brian J.: *See*—
Gabriel, Steven M.; and Roselle, Brian J., 4,859,358, Cl. 252-99.000.

Rosemount Inc.: *See*—
Meyer, Stephen R., 4,859,176, Cl. 432-225.000.

Rosen, Henri E. Adjustable girth shoe constructions. 4,858,341, Cl. 36-97.000.

Rosen, Terry J.: *See—*
Chu, Daniel T.; and Rosen, Terry J., 4,859,776, Cl. 546-123.000.

Rosenberg, Etan: *See—*
Gross, Joseph; Lowenstein, David; Tilman, Menachem; and Rosenberg, Etan, 4,858,600, Cl. 128-65.000.

Rosenquist, Fred T.: *See—*
Bonora, Anthony C.; and Rosenquist, Fred T., 4,859,137, Cl. 414-648.000.

Rosenzweig, Nachum, to Raychem Corporation. Method of forming a bearing by dimensional recovery of a race or rolling element. 4,858,293, Cl. 29-148.40A.

Rosier, Norma: *See—*
Flesher, Peter; Langley, John; Rosier, Norma; and Farrar, David, 4,859,720, Cl. 523-332.000.

Roskell, Derek: *See—*
Daniels, Martin D.; and Roskell, Derek, 4,860,290, Cl. 371-25.000.

Ross, Robert H., to Seco/Warwick Corporation. Ingot pusher furnace with means for reducing heat loss. 4,859,178, Cl. 432-237.000.

Ross, William W.: *See—*
Woodley, George M.; McGrail, Richard A.; Powers, Stephen J.; and Ross, William W., 4,858,841, Cl. 242-56.00R.

Rosse, Meinrad; and Rossier, Marc-Henri, to Nestec S. A. Process and apparatus for detecting leaks in sealed packages. 4,858,463, Cl. 73-49.300.

Rossier, Marc-Henri: *See—*
Rosse, Meinrad; and Rossier, Marc-Henri, 4,858,463, Cl. 73-49.300.

Rossiter, Paul J.; and Rossiter, Tina A. Concrete finishing process. 4,859,504, Cl. 427-262.000.

Rossiter, Tina A.: *See—*
Rossiter, Paul J.; and Rossiter, Tina A., 4,859,504, Cl. 427-262.000.

Roth, Charles S. Vehicle tray. 4,858,796, Cl. 224-42.440.

Roth, Paul, to Motan Gesellschaft mit beschraenkter Haftung. Process for regenerating a moisture laden drying cartridge and apparatus for carrying out such a process. 4,858,335, Cl. 34-32.000.

Rotier, Donald J., to Honeywell, Inc. Helmet mounted display with improved brightness. 4,859,030, Cl. 350-174.000.

Rourne, William R., Jr.: *See—*
Tedesco, Albert D.; Stammreich, John C.; Harmon, Raymond E.; and Rourne, William R., Jr., 4,858,970, Cl. 292-113.000.

Rouse, William M.: *See—*
Nowak, Frank A., Jr.; Micchelli, Albert L.; and Rouse, William M., 4,859,455, Cl. 424-47.000.

Rousseau, Pierre: *See—*
Bouron, Jean P.; Giroux, Daniel; and Rousseau, Pierre, 4,859,997, Cl. 340-752.000.

Roussel, Patrick: *See—*
Parker, Donald L.; Reuter, David F.; and Roussel, Patrick, 4,859,001, Cl. 303-92.000.

Rubens, Roger W.: *See—*
Thaler, Martin D.; and Rubens, Roger W., 4,859,248, Cl. 127-32.000.

Rubin, Leon J.: *See—*
Diosady, Levente L.; Rubin, Leon J.; and Tar, Csaba G., 4,859,371, Cl. 260-412.400.

Rubin, Mae K.: *See—*
Landis, Michael E.; Aufdembrink, Brent A.; Chu, Pochen; Johnson, Ivy D.; Kirker, Garry W.; Page, Nancy M.; and Rubin, Mae K., 4,859,648, Cl. 502-242.000.

Ruderman, Stephen: *See—*
Adamski, Maximilian; Kosrow, Robert L.; and Ruderman, Stephen, 4,858,546, Cl. 112-286.000.

Rudolf, Karl: *See—*
Lindstadt, Klaus; and Rudolf, Karl, 4,858,531, Cl. 102-307.000.

Rudolf, Rene: *See—*
Buessinger, Pierre; Colin, Pierre; and Rudolf, Rene, 4,859,085, Cl. 384-45.000.

Rudolph, Karl: *See—*
Greve, Wilfried; Elben, Ulrich; Rudolph, Karl; and Schindler, Ursula, 4,859,663, Cl. 514-212.000.

Ruggieri, Daniela: *See—*
Mantegani, Sergio; Brambilla, Enzo; Temperilli, Aldemio; Ruggieri, Daniela; and Salvati, Patricia, 4,859,678, Cl. 514-269.000.

Ruhrgas Aktiengesellschaft: *See—*
Altemark, Detlef; and Hess, Robert, 4,859,171, Cl. 431-12.000.

Rule Industries, Inc.: *See—*
Grilk, Henry G., 4,860,223, Cl. 364-550.000.

Rule, Mark; Fagerburg, David R.; and Watkins, Joseph J., to Eastman Kodak Company. Process for the preparation of copoly(arylene sulfide). 4,859,762, Cl. 528-215.000.

Rushton, Richard T. Fishing rod holder and carrier. 4,858,366, Cl. 43-26.000.

Russel William Ltd.: *See—*
Winter, Russell K.; Harvey, Thomas D.; Kain, Richard S.; and Savas, Nedin, 4,858,774, Cl. 211-184.000.

Russell, Ronald R., to General Electric Company. Molded case circuit breaker actuator-accessory module. 4,860,157, Cl. 361-156.000.

Russell, Stephen D., to United States of America, Army. Double-sided co-axial laser. 4,860,303, Cl. 372-72.000.

Rutkiewicz, Joseph A.: *See—*
Benton, Robert L.; and Rutkiewicz, Joseph A., 4,859,394, Cl. 264-225.000.

Rutter, William J., to University of California, The Regents of the. Vaccine capable of eliciting multivalent antibodies. 4,859,465, Cl. 424-89.000.

Ruzicka, Herbert R.: *See—*
Heddle, Richard W.; and Ruzicka, Herbert R., 4,858,735, Cl. 188-299.000.

Ryder, Francis E., to Ryder International Corporation. Fishing lure for simulated feeding. 4,858,370, Cl. 43-43.130.

Ryder International Corporation: *See—*
Ryder, Francis E., 4,858,370, Cl. 43-43.130.
Wright, David; and Rabenau, Richard, 4,858,754, Cl. 206-5.100.

Ryobi Ltd.: *See—*
Ogawa, Kazuaki; and Shiramasa, Miyoshi, 4,858,272, Cl. 16-80.000.

S.A.M.M. - Societe D'Applications Des Machines Motrices: *See—*
Arnaud, Alain; Perrochat, Jean-Michel; and Philippe, Joseph, 4,858,736, Cl. 188-322.140.
Devaud, Gerard; and Libault De La Chevasnerie, Arnaud, 4,858,650, Cl. 137-625.220.
Philippe, Joseph; and Perrochat, Jean-Michel, 4,859,006, Cl. 305-10.000.

S. C. Johnson & Son, Inc.: *See—*
Bosanec, Thomas P.; Lukow, Kenneth R.; and Verbrugge, Calvin J., 4,859,752, Cl. 526-209.000.

S.P.T. S.r.l.: *See—*
Cundari, Francesco, 4,858,629, Cl. 131-332.000.

Saccocio, Edward J.: *See—*
Metz, George D.; McCrary, Carl; O'Connor, Joseph G.; Adair, Paul C.; Proehl, D. Scott; Saccocio, Edward J.; and Dowler, James, 4,859,561, Cl. 430-138.000.

Sachs, Howard G.; Cho, James Y.; and Hollingsworth, Walter H., to Intergraph Corporation. Quadword boundary cache system. 4,860,192, Cl. 364-200.000.

Sachtler, Jurgen; and Schmidt, Wolf-Dieter, to Dragerwerk Aktiengesellschaft. System for exchanging a substance between fluids. 4,859,331, Cl. 210-321.800.

Sacristan, Aurelio: *See—*
Foguet, Rafael; Forne, Ernesto; Sacristan, Aurelio; and Ortiz, Jose A., 4,859,675, Cl. 514-255.000.

Sadeh, Willy Z.: *See—*
Simon, Wayne E.; Sadeh, Willy Z.; Kerin, Edward R.; and Gamson, Bernard W., 4,859,347, Cl. 210-788.000.

Saeki, Shiro; and Ikeda, Sunao, to Ricoh Company, Ltd. Automatic original circulating and feeding apparatus. 4,860,057, Cl. 355-23.000.

Safer, Inc.: *See—*
Puritch, George S.; and Kondo, Edward S., 4,859,689, Cl. 514-358.000.

Saffel, Robert W.: *See—*
Cabe, Alex W., Jr.; Saffel, Robert W.; and Sampson, Arthur J., 4,859,519, Cl. 428-131.000.

Sagawa, Masato: *See—*
Fujimura, Setsuo; Sagawa, Masato; Matsuura, Yutaka; Yamamoto, Hitoshi; and Togawa, Norio, 4,859,255, Cl. 148-302.000.

Sahara, Masayoshi: *See—*
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,860,046, Cl. 354-475.000.

St-Germain, Jean. Safety fence for scaffolds. 4,858,724, Cl. 182-113.000.

Saint-Gobain Vitrage: *See—*
Kuster, Hans-Werner; Radermacher, Herbert; and Vanaschen, Luc, 4,859,225, Cl. 65-104.000.

Saint-Gobian Vitrage: *See—*
Sauvinet, Vincent; Bletry, Jean; Bonnaud, Micheline; and Trouve, Maurice, 4,859,499, Cl. 427-108.000.

St. Phillips, Eric A.: *See—*
Herrington, Fox J.; and St. Phillips, Eric A., 4,860,267, Cl. 368-10.000.

Saito, Hiroshi: *See—*
Shirasawa, Honai; Sugeno, Hiroto; Eto, Shigeo; and Saito, Hiroshi, 4,859,342, Cl. 210-656.000.

Saito, Mitsuru; and Sato, Kazuchika, to Minolta Camera Kabushiki Kaisha. Image sensing device for an electronic still camera. 4,860,108, Cl. 358-209.000.

Saito, Shinji; Atsumi, Shigeru; and Tanaka, Sumio, to Kabushiki Kaisha Toshiba. Semiconductor memory device with testing of redundant memory cells. 4,860,260, Cl. 365-201.000.

Saito, Tasuku; and Kakiuchi, Shinichi, to Bridgestone Corporation. Solid golf ball. 4,858,924, Cl. 273-62.000.

Sakabe, Yukio: *See—*
Fujino, Masaru; Nishioka, Goro; and Sakabe, Yukio, 4,859,641, Cl. 501-136.000.

Sakaguchi, Hironao; Yoshida, Masaji; and Matsuo, Yasutoshi, to Victor Company of Japan, Ltd. Noise Reducing circuit of a video signal. 4,860,105, Cl. 358-167.000.

Sakaguchi, Tomoko: *See—*
Maekawa, Takashige; Oharu, Kazuya; and Sakaguchi, Tomoko, 4,859,754, Cl. 526-245.000.

Sakai Chemical Industry Co., Ltd.: *See—*
Rikimaru, Hiroaki; Nakatsuji, Tadao; Umaba, Toshikatsu; Nagano, Kuzuhiko; Mishina, Kazuya; and Shimizu, Hiromitsu, 4,859,439, Cl. 423-239.000.

Sakai, Eiichi: *See—*
Yamazaki, Toshinori; Sakai, Eiichi; Nakanishi, Tatsuo; and Nomori, Hiroyuki, 4,859,554, Cl. 430-58.000.

Sakai, Isao: *See—*
Mizoguchi, Tetsuhiko; Sakai, Isao; Niu, Hiromi; and Inomata, Koichiro, 4,859,254, Cl. 148-302.000.

Sakai, Ryuichi: *See—*
Higa, Tatsuo; Sakai, Ryuichi; and Lui, May S., 4,859,782, Cl. 549-267.000.

Sakai, Shinji: *See—*
Miyamoto, Ryosuke; and Sakai, Shinji, 4,860,113, Cl. 358-225.000.

Sakakibara, Yutaka; Ueda, Hidetaka; and Majima, Kunio, to Yazaki Corporation. Pointer illuminating structure in measuring instrument. 4,860,170, Cl. 362-26.000.

Sakama, Hiroshi: *See—*
Ohmura, Masanori; Sakama, Hiroshi; and Araki, Kenji, 4,858,558, Cl. 118-725.000.

Sakamoto, Keiji: *See—*
Kurakake, Mitsuo; Sakamoto, Keiji; and Toyosawa, Yukio, 4,859,920, Cl. 318-567.000.

Sakano, Tetsuro, to Fanuc Ltd. Optical rotary encoder with sub-code patterns. 4,859,845, Cl. 250-231.0SE.

Sakata, Tetshin: *See—*
Igari, Naoto; Yamamoto, Noriyuki; and Sakata, Tetshin, 4,858,667, Cl. 157-1.100.

Sakata, Yoshiya: *See—*
Okamura, Masatoshi; Shiba, Haruo; Hashizume, Kenji; and Sakata, Yoshiya, 4,858,849, Cl. 242-199.000.

Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, to Fujikura Ltd. Corrugated heat pipe. 4,858,679, Cl. 165-46.000.

Sakuma, Kiyotoshi: *See—*
Hatanaka, Keiji; Sakuma, Kiyotoshi; Morita, Kiyomi; and Miyake, Junji, 4,860,211, Cl. 364-431.050.

Sakurada, Nobuaki: *See—*
Watanabe, Yoshitaka; Sakurada, Nobuaki; Aoki, Makoto; and Sato, Eiichi, 4,860,034, Cl. 346-140.00R.

Sakurai, Katsumi: *See—*
Ohbayashi, Yoshiaki; Hashimoto, Kunio; Sakurai, Katsumi; and Noma, Hiroyuki, 4,859,888, Cl. 310-68.00R.

Sakurai, Tadashi: *See—*
Ohmae, Tadayuki; Sakurai, Tadashi; Yamaguchi, Noboru; Okada, Mitsuyuki; and Asao, Kouichiro, 4,859,710, Cl. 521-55.000.

Sakurai, Yoshihiko: *See—*
Doi, Shigetoshi; Nagayama, Yoshiaki; Iida, Katsumi; and Sakurai, Yoshihiko, 4,858,677, Cl. 165-12.000.

Salamone, Ann B.; and Snyder, Susan L., to Morton Thiokol, Inc. Hair conditioning polymers containing alkoxylated nitrogen salts of sulfonic acid. 4,859,458, Cl. 424-70.000.

Salato, Peter A., Jr. Protective covering and spacer strip for a deck. 4,858,399, Cl. 52-97.000.

Salembier, Philippe: *See—*
Lamnabhi, Moustanir; and Salembier, Philippe, 4,860,310, Cl. 375-18.000.

Salerno, Robert P.: *See—*
Jenkins, Thomas B.; Ulery, Dennis R.; Wilson, Blake W.; Walko, Steven C.; Lee, Lester H.; Salerno, Robert P.; Nason, Robert W.; and Courtney, John P., 4,859,891, Cl. 310-215.000.

Salgad International Ltd.: *See—*
Argon, Gideon, 4,858,514, Cl. 89-37.050.

Sallaerts, Daniel; and Rahier, Michel C. A. R., to Alcatel N.V. Signal recognition system. 4,860,230, Cl. 364-569.000.

Sallee, E. Charles: *See—*
Ostroski, Richard J.; Bigley, James E.; Falk, John L.; and Sallee, E. Charles, 4,858,269, Cl. 15-327.00F.

Salomon S.A.: *See—*
Diard, Jean-Luc; and Pascal, Roger, 4,858,944, Cl. 280-609.000.

Salutar. Inc.: *See—*
Quay, Steven C.; and Worah, Dilip M., 4,859,451, Cl. 424-9.000.

Salvati, Patricia: *See—*
Mantegani, Sergio; Brambilla, Enzo; Temperilli, Aldemio; Ruggieri, Daniela; and Salvati, Patricia, 4,859,678, Cl. 514-269.000.

Salyer, Sidney C. Door opening limiting bar. 4,858,972, Cl. 292-338.000.

Samaras, George M.; and Falk, Steven M., to GMS Engineering Corporation. Blood pressure measurement system for filtering low-frequency, high-amplitude noise. 4,858,616, Cl. 128-680.000.

Sameniego, Manuel. Guitar strap. 4,858,801, Cl. 224-264.000.

Sampson, Arthur J.: *See—*
Cabe, Alex W., Jr.; Saffel, Robert W.; and Sampson, Arthur J., 4,859,519, Cl. 428-131.000.

Samsonite Corporation: *See—*
King, William L., 4,858,867, Cl. 248-214.000.

Samsung Semiconductor and Telecommunications Co., Ltd.: *See—*
Choi, Yun H., 4,860,257, Cl. 365-189.110.

Sandberg, Jan: *See—*
Carlsson, Tage; and Sandberg, Jan, 4,859,887, Cl. 310-59.000.

Sanden Corporation: *See—*
Kikuchi, Kazuto, 4,859,156, Cl. 417-319.000.

Sanders, Mark S., to W. L. Gore & Associates, Inc. Method for soldering a metal ferrule to a flexible coaxial electrical cable. 4,858,310, Cl. 29-828.000.

Sanders, Thomas M.: *See—*
John, Clarence D., Jr.; McNerney, Francis C.; and Sanders, Thomas M., 4,859,276, Cl. 156-626.000.

Sanders, WIlliam J., to ITH, Inc. Cardiac probe enabling use of personal computer for monitoring heart activity or the like. 4,858,617, Cl. 128-696.000.

Sandoz Ltd.: *See—*
Avar, Lajos, 4,859,725, Cl. 524-91.000.
Carney, Robert L.; Lui, Alfred S. T.; Kuhnen, Fred; and Gruber, John M., 4,859,699, Cl. 514-447.000.
Williams, John W., 4,859,233, Cl. 71-100.000.

Sandu, Adrian: *See—*
Lipisko, Bruce A.; Schumacher, John C.; Howard, Richard E.; Randtke, Peter T.; Sandu, Adrian; Fletcher, Robert E.; and Graf, Hans-Juergen, 4,859,375, Cl. 261-20.000.

Sandvik AB: *See—*
Odelstam, Carl T., 4,858,682, Cl. 165-84.000.

Sanghvi, Narendra T.: *See—*
Fry, Francis J.; and Sanghvi, Narendra T., 4,858,613, Cl. 128-660.030.

Sanglet, Philippe R., to Morton Thiokol, Inc. Process for the production of sodium hydrosulfite. 4,859,447, Cl. 423-515.000

Sanki Engineering Ltd.: *See—*
Nunogaki, Yoshiaki, 4,858,961, Cl. 285-98.000.

Sankyo Denki Co., Ltd.: *See—*
Minematu, Yoiti; Tajima, Toshio; and Nakajima, Shigeharu, 4,859,903, Cl. 313-487.000.

Sanner, Kenneth E.: *See—*
Senge, F. Gerhard; Watson, Angus A.; Sanner, Kenneth E.; and Corbin, Terry R., 4,859,298, Cl. 204-146.000.

Sano, Shoichi: *See—*
Kajiwara, Hajime; Ogura, Masami; and Sano, Shoichi, 4,858,950, Cl. 280-719.000.

Sansone, Ronald P., to Pitney Bowes Inc. Non-volatile memory display cell. 4,859,038, Cl. 350-357.000.

Santana, Manuel R.: *See—*
Eichenbaum, Bernard R.; and Santana, Manuel R., 4,859,023, Cl 350-96.230.

Santavaci, Jerome, to Intermark Amusements, Inc. Method and apparatus for determining the velocity and path of travel of a ball. 4,858,922, Cl. 273-26.00R.

Santi, Joseph M.: *See—*
Goldsmith, Steven E.; and Santi, Joseph M., 4,858,248, Cl. 2-209.100.

Santini, Conrad, to Pfizer Inc. Antiulcer (alkyldithio) quinoline derivatives. 4,859,679, Cl. 514-273.000.

Sanyo Electric Co., Ltd.: *See—*
Komori, Ken-ichi, 4,858,308, Cl. 29-740.000.

Sanz, Gerard C.: *See—*
Raeymaekers, Alfons H. M.; Freyne, Eddy J. E.; and Sanz, Gerard C., 4,859,684, Cl. 514-314.000.

Saotome, Masaru; Ushijima, Takao; Noguchi, Takeshi; Sato, Naomi; and Nakao, Tsutomu, to Nissan Motor Co., Ltd.; and Bridgestone Corporation. Bushing type vibration insulator. 4,858,899, Cl. 267-219.000.

Sarath, Alan, to American Telephone and Telegraph Company; and AT&T Bell Laboratories. Communication equipment cabinet cooling arrangement. 4,860,163, Cl. 361-384.000.

Saruwatari, Hidetoshi: *See—*
Sasaki, Kiichi; Honda, Tadanori; Saruwatari, Hidetoshi; and Higuchi, Kazuo, 4,858,952, Cl. 280-802.000.

Sasada, Taisuke: *See—*
Fukushi, Yuzo; Fuda, Hitoshi; and Sasada, Taisuke, 4,860,366, Cl. 381-106.000.

Sasagawa, Tsutomu: *See—*
Hayashi, Kunioki; Tanaka, Hironori; Sasagawa, Tsutomu; Uemura, Isao; and Aizawa, Akira, 4,858,560, Cl. 119-1.000.

Sasaki, Hidemi; and Kobayashi, Naoki, to Fuji Photo Film Co., Ltd Rotary magnetic disc device with improved disc pack positioning structure. 4,860,136, Cl. 360-99.050.

Sasaki, Hiroaki: *See—*
Hasegawa, Kazuo; Ouchi, Junichi; Sasaki, Hiroaki; Nakase, Koji; and Sasaki, Makoto, 4,859,840, Cl. 235-463.000.

Sasaki, Isao; Yamamoto, Naoki; Yanagase, Akira; and Hatakeyama, Hiroki, to Mitsubishi Rayon Company Ltd. Antistatic thermoplastic resin composition. 4,859,727, Cl. 524-147.000.

Sasaki, Kazuaki: *See—*
Hosoda, Masahiro; Sasaki, Kazuaki; Kondo, Masaki; and Yamamoto, Saburo, 4,860,299, Cl. 372-46.000.

Sasaki, Kiichi; Honda, Tadanori; Saruwatari, Hidetoshi; and Higuchi, Kazuo, to Honda Giken Kogyo Kabushiki Kaisha. Door checker for seat belt reacher system. 4,858,952, Cl. 280-802.000.

Sasaki, Makoto: *See—*
Hasegawa, Kazuo; Ouchi, Junichi; Sasaki, Hiroaki; Nakase, Koji; and Sasaki, Makoto, 4,859,840, Cl. 235-463.000.

Sasaki, Masaomi, to Ricoh Company, Ltd. Electrophotographic photoconductor containing stilbene compound. 4,859,556, Cl. 430-73.000.

Sasaki, Nobuo; Kuragano, Tetsuzo; and Minami, Nobuyuki, to Sony Corporation. Method and system for effecting a transformation of a video image. 4,860,217, Cl. 364-518.000.

Sasaki, Tomio, to Ricoh Company, Ltd. Image processing method and system using multiple image sensors producing image data segments which are combined and subjected to optical processing. 4,860,117, Cl. 358-287.000.

Sasaki, Yukihiko: *See—*
Suzuki, Yasuo; and Sasaki, Yukihiko, 4,860,340, Cl. 379-74.000.

Sata, Ichiko: *See—*
Kugimiya, Syuzo; Tokunaga, Shinji; Suzuki, Hitoshi; Fukumochi, Yoji; Shiotani, Shinobu; and Sata, Ichiko, 4,860,206, Cl. 364-419.000.

Satake, Masaki: *See—*
Miyasaka, Nobuaki; Yokoyama, Shigeki; Suga, Shuzo; Naoi, Takashi; and Satake, Masaki, 4,859,576, Cl. 430-523.000.

Satellite Financial Systems Corporation: *See—*
Laurance, Joel E.; and Stewart, Walter M., 4,860,352, Cl. 380-23.000.

Sato, Eiichi: *See—*
Watanabe, Yoshitaka; Sakurada, Nobuaki; Aoki, Makoto; and Sato, Eiichi, 4,860,034, Cl. 346-140.00R.

Sato, Hiroyuki; and Tajima, Akio, to Seikosha Co., Ltd. Device for cooling a carriage motor and printhead in a serial printer. 4,859,101, Cl. 400-719.000.

Sato, Kazuchika: *See—*
Saito, Mitsuru; and Sato, Kazuchika, 4,860,108, Cl. 358-209.000.

Sato, Koichi: *See—*
Shiozaki, Atsushi; Komuro, Hirokazu; Sato, Koichi; and Masuda, Kazuaki, 4,860,033, Cl. 346-140.00R.

Sato, Makoto; and Uehara, Toshio, to Kabushiki Kaisha Toshiba. Magnetic resonance imaging system. 4,860,221, Cl. 364-522.000.

Sato, Naomi: *See—*
Saotome, Masaru; Ushijima, Takao; Noguchi, Takeshi; Sato, Naomi; and Nakao, Tsutomu, 4,858,899, Cl. 267-219.000.

Sato, Seiichi, to Namco, Ltd. Game system. 4,858,930, Cl. 273-85.00G.

Sato, Takeshi; Adachi, Hiroo; and Munetomo, Shigeru, to Pioneer Electronic Corporation. Acoustic-device cooling unit. 4,860,361, Cl. 381-55.000.

Sato, Yasunori: *See—*
Chida, Shouhei; Yamaoto, Naoki; Miyazaki, Yasuo; and Sato, Yasunori, 4,859,119, Cl. 405-269.000.

Sato, Yoshio: *See—*
Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kuramoto, Shinichi; Sugiyama, Yoshihiro; Takanashi, Hajime; Ishizuka, Takashi; Kudo, Yoshio; and Sato, Yoshio, 4,860,050, Cl. 355-256.000.

Satoh, Keiichi: *See—*
Tsuji, Kazuwo; Sumiya, Hitoshi; Kumazawa, Yoshiaki; Urakawa, Nobuo; and Satoh, Keiichi, 4,859,531, Cl. 428-333.000.

Satoh, Shinichi; Hirata, Toichi; Sugiyama, Genroku; and Tanaka, Hideaki, to Hitachi Construction Machinery Co., Ltd. Valve apparatus. 4,858,649, Cl. 137-625.600.

Satomura, Seiichiro, to Canon Kabushiki Kaisha. Information data recovering apparatus. 4,860,324, Cl. 375-122.000.

Sauter, Wolfgang: *See—*
Maurer, Peter; Pfister, Jorg; and Sauter, Wolfgang, 4,858,287, Cl. 28-172.000.

Sauvinet, Vincent; Bletry, Jean; Bonnaud, Micheline; and Trouve, Maurice, to Saint-Gobian Vitrage. Method for coating a substrate with an electrically conductive layer. 4,859,499, Cl. 427-108.000.

Savas, Nedin: *See—*
Winter, Russell K.; Harvey, Thomas D.; Kain, Richard S.; and Savas, Nedin, 4,858,774, Cl. 211-184.000.

Savas, Peter G.; and Kiger, Virginia S., to Genex Corp. Filtering device for dispensing and filtering from samples. 4,859,336, Cl. 210-416.100.

Savio, S.p.A.: *See—*
Montali, Sergio; Ferro, Francesco; and Colli, Luigi, 4,858,837, Cl. 242-18.00R.

Sawa, Takao; Hashimoto, Susumu; and Inomata, Koichiro, to Kabushiki Kaisha Toshiba. High permeability amorphous magnetic material. 4,859,256, Cl. 148-304.000.

Sawada, Daisaku; and Takahashi, Takeshi, to Toyota Jidosha Kabushiki Kaisha. Device for varying a stroke. 4,858,439, Cl. 60-583.000.

Sawada, Kazuo; Nishio, Masanobu; and Nakai, Yoshihiro, to Sumitomo Electric Industries, Ltd. Electrical conductor. 4,859,811, Cl. 174-126.200.

Sawada, Renshi: *See—*
Ukita, Hiroo; Katagiri, Yoshitada; Sawada, Renshi; Uenishi, Yuuji; Isomura, Yoshihiro; Toshima, Tomoyuki; and Mise, Keisuke, 4,860,276, Cl. 369-119.000.

Sawano, Mitsuru; and Yabe, Masao, to Fuji Photo Film Co., Ltd. Method of recording information and information recording medium employed for the same. 4,860,273, Cl. 369-100.000.

Sawaya, Showhachi: *See—*
Masumoto, Hakaru; Sawaya, Showhachi; and Hinai, Masakatsu, 4,859,252, Cl. 148-11.50R.

Saxpy Computer Corporation: *See—*
Nicely, Mark C.; Schreiber, Robert; Parks, Terry M.; Mannion, A. Joel; Lang, Gary R.; and Patton, Charles F., 4,860,249, Cl. 364-900.000.

Scandinavian Transshpment AB: *See—*
Zimmerlund, Hans, 4,858,779, Cl. 220-6.000.

Schaaf, Richard: *See—*
Kupper, Friedrich-Wilhelm; Voges, Heinz-Werner; Patzold, Werner; and Schaaf, Richard, 4,859,790, Cl. 560-75.000.

Schaeffer, Charles W., to Birmingham Bolt Company, Inc. Mine roof support anchor and process for installing the same. 4,859,118, Cl. 405-259.000.

Schafer, Christopher E. Ticket display and dispenser. 4,858,806, Cl. 225-32.000.

Schaffer, Gregory L., to Maxim Integrated Products. High speed low gain stable amplifier. 4,859,963, Cl. 330-253.000.

Schapker, Richard L. Interlocking disk storage with sliding-dispersed access. 4,859,007, Cl. 312-12.000.

Scharf, Kurt: *See—*
Zimmer, Erich; Langen, Hans; and Scharf, Kurt, 4,859,368, Cl. 252-629.000.

Scheffler, Glenn W.; and Vartanian, George, to International Fuel Cells Corporation. Cathode flow control for fuel cell power plant. 4,859,545, Cl. 429-17.000.

Scheibner, Gerald H., to First Brands Corporation. Process and apparatus for reclosable container stock. 4,859,259, Cl. 156-66.000.

Schenck-Auto-Service-Gerate GmbH: *See—*
Maus, Otfrid, 4,858,331, Cl. 33-203.180.

Schereer, Friedrich; Schmied, Kurt; and Osterwald, Henning, to Daimler-Benz Aktiengesellschaft. Fuel injection nozzle arrangement. 4,858,578, Cl. 123-276.000.

Schering Aktiengesellschaft: *See—*
Bittler, Dieter; Laurent, Henry; Nickisch, Klaus; and Rach, Petra, 4,859,659, Cl. 514-177.000.
Blume, Friedhelm; Franke, Wilfried; Arndt, Friedrich; and Rees, Richard, 4,859,230, Cl. 71-93.000.
Westermann, Jurgen; Kruger, Martin; Arndt, Friedrich; Rees, Richard; and Kotter, Clemens, 4,859,231, Cl. 71-93.000.

Schering Corporation: *See—*
Duelfer, Timothy; and Blythin, David J., 4,859,669, Cl. 514-250.000.

Schick, Jean-Francois, to Goro S.A. Hinge-pin for coupling the ends of a conveyor belt or the like. 4,858,280, Cl. 24-33.00B.

Schieferstein, Ludwig: *See—*
Oberkobusch, Doris; Morlock, Roland; Stritzke, Karl-Heinz; and Schieferstein, Ludwig, 4,859,721, Cl. 523-402.000.

Schierl, Hans: *See—*
Payer, Ernst; and Schierl, Hans, 4,860,368, Cl. 381-159.000.

Schilling, Peter; and Schreuders, Hans G., to Westvaco Corporation. Viscosifiers for asphalt emulsions. 4,859,245, Cl. 106-277.000.

Schilling, Peter, to Westvaco Corporation. Sulfomethylated lignin amines. 4,859,362, Cl. 252-312.000.

Schindler, Ursula: *See—*
Greve, Wilfried; Elben, Ulrich; Rudolph, Karl; and Schindler, Ursula, 4,859,663, Cl. 514-212.000.

Schlager, Kenneth J.; and Gorski, Stephen H., to Biotronics Associates, Inc. Lamp-based laser simulator. 4,860,172, Cl. 362-32.000.

Schliesing, John A.: *See—*
Lange, Gregory A.; McManamen, John P.; and Schliesing, John A., 4,858,857, Cl. 244-161.000.

Schlingmann, Merten: *See—*
Thiem, Joachim; Treder, Wolfgang; Keller, Reinhold; and Schlingmann, Merten, 4,859,590, Cl. 435-97.000.

Schlipf, Michael; Manz, Albrecht; and Lohr, Gernot, to Hoechst Aktiengesellschaft. Crosslinkable, fluorine-containing copolymers as binders for highly weather-resistant surface coatings. 4,859,755, Cl. 526-255.000.

Schluter, Werner. Cleat for finishing off the ceramic tiles on a step. 4,858,404, Cl. 52-179.000.

Schmid, Rainer K., to Orthopedic Design. Kinetic energy returning shoe. 4,858,338, Cl. 36-44.000.

Schmidlin, Fred W., to Xerox Corporation. Direct electrostatic printer (DEP) and printhead structure therefor. 4,860,036, Cl. 346-159.000.

Schmidt, Adolf: *See—*
Hendricks, Udo-Winfried; and Schmidt, Adolf, 4,859,374, Cl. 562-102.000.

Schmidt, Donald L.: *See—*
Fibiger, Richard F.; Koo, Ja-young; Forgach, David J.; Petersen, Robert J.; Schmidt, Donald L.; Wessling, Ritchie A.; and Stocker, Thomas F., 4,859,384, Cl. 264-45.100.

Schmidt, Edward H.; Carpenter, Marvin E.; and Walters, David W., to General Motors Corporation. Method and apparatus for measuring engine mass air flow. 4,860,222, Cl. 364-550.000.

Schmidt, Josef: *See—*
Trumpler, Walter; and Schmidt, Josef, 4,860,167, Cl. 361-417.000.

Schmidt, Wolf-Dieter: *See—*
Sachtler, Jurgen; and Schmidt, Wolf-Dieter, 4,859,331, Cl. 210-321.800.

Schmied, Kurt: *See—*
Schereer, Friedrich; Schmied, Kurt; and Osterwald, Henning, 4,858,578, Cl. 123-276.000.

Schmitt, Hans J.; Schmitz, Gunter L.; and Dammann, Hans, to U.S. Philips Corp. Magneto-optical waveguide device with artificial optical anisotropy. 4,859,013, Cl. 350-96.120.

Schmitt, Hans-Jurgen; and Dammann, Hans O. B., to U.S. Philips Corp. Non-reciprocal optical waveguide device, particularly for use as an isolator or circulator. 4,859,014, Cl. 350-96.130.

Schmitz-Bastian, Peter: *See—*
Paulini, Dieter; Schmitz-Bastian, Peter; Wagner, Wolfram; and Bieber, Gunter, 4,858,809, Cl. 226-97.000.

Schmitz, Gunter L.: *See—*
Schmitt, Hans J.; Schmitz, Gunter L.; and Dammann, Hans, 4,859,013, Cl. 350-96.120.

Schmolze, Christopher A.: *See—*
Petersen, Kurt H.; and Schmolze, Christopher A., 4,859,189, Cl. 439-66.000.

Schnegg, Peter: *See—*
Behre, Horst; Binak, Heinz U.; Kohler, Wilfried; Muller, Nikolaus; and Schnegg, Peter, 4,859,372, Cl. 562-74.000.

Schneider, Alan A.; Stewart, David A.; Jolson, Joseph D.; Auel, RaeAnn M.; and Price, John F., to Mine Safety Appliances Company. Electrochemical cell. 4,859,305, Cl. 204-412.000.

Schneider, Manfred; Ott, Ulrich; Sieber, Alexander; and Zimmermann, Manfred, to Hoechst Aktiengesellschaft. Pasty pigment formulations, production and use thereof. 4,859,728, Cl. 524-159.000.

Schock, Gernot: *See—*
Groll, Werner; Hathaway, Doris; and Schock, Gernot, 4,859,412, Cl. 419-23.000.

Schodowski, Stanley S.: *See—*
Malinowski, Gregory J.; and Schodowski, Stanley S., 4,859,969, Cl. 331-43.000.

Schoenberg, Andrew J.: *See—*
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Szenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,859,807, Cl. 174-68.500.

Schoeneberger, Carl F.; and Bundens, Allan B., to General Instrument Corporation. Data communications system. 4,860,379, Cl. 455-5.000.

Schohl, Gerald A.; and Vigander, Svein, to Tennessee Valley Authority. Air detector for liquid-filled sensing lines. 4,858,460, Cl. 73-19.000.

Scholl, Richard: *See—*
Wisseroth, Karl; and Scholl, Richard, 4,860,277, Cl. 369-126.000.

Scholz, John A.: *See—*
White, Philip J.; Scholz, John A.; and White, Robert S., 4,859,905, Cl. 313-558.000.

Schonlau, Juergen; Volz, Peter; and Harth, Ralf, to Alfred Teves GmbH. Pressure control unit with locking device for dual circuit brake systems. 4,858,999, Cl. 303-9.630.

Schossow, Dieter: *See—*
Wunderle, Anita, geb. Rudigier; Frank, Michael; and Schossow, Dieter, 4,859,185, Cl. 433-222.100.

Schott Glaswerke: *See—*
Bauch, Hartmut; Krause, Peter; Jost, Ulrike; Kersten, Ralf; Paquet, Volker; and Siefert, Wolfgang, 4,859,222, Cl. 65-3.120.

Schouwenaars, Hendrikus J.; Dijkmans, Eise C.; and Groeneveld, Dirk W. J. Current source arrangement. 4,859,930, Cl. 323-317.000.

Schrader, Stephen A.; and Goff, Douglas J., to Sonoco Products Company. Label inspection apparatus sensing reflectivity values. 4,859,863, Cl. 250-556.000.

Schrankel, Kenneth R.: *See—*
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,859,463, Cl. 424-84.000.

Schreiber, Berthold, to Schreiber Corporation, Inc. Method for controlling aerating units in a wastewater treatment process. 4,859,341, Cl. 210-614.000.

Schreiber Corporation, Inc.: *See—*
Schreiber, Berthold, 4,859,341, Cl. 210-614.000.

Schreiber, Robert: *See—*
Nicely, Mark C.; Schreiber, Robert; Parks, Terry M.; Mannion, A. Joel; Lang, Gary R.; and Patton, Charles F., 4,860,249, Cl. 364-900.000.

Schreier, Klaus: *See—*
Bitzinger, Rudolf; Engl, Walter; Humml, Siegfried; and Schreier, Klaus, 4,860,333, Cl. 379-10.000.

Schrepfer, Rudolf, to Air-Loc Schrepfer AG. Wedge leveling mounting device. 4,858,865, Cl. 248-188.200.

Schreuders, Hans G.: *See—*
Schilling, Peter; and Schreuders, Hans G., 4,859,245, Cl. 106-277.000.

Schriewer, Michael: *See—*
Grohe, Klaus; and Schriewer, Michael, 4,859,773, Cl. 544-101.000.

Schroder, Gunter; and Dudek, Gunther, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Coupling arrangement for changing components on the block of a hoist. 4,858,978, Cl. 294-82.350.

Schroder, Joris: *See—*
Haas, Max; and Schroder, Joris, 4,858,745, Cl. 198-333.000.

Schroepfer, Richard C.: *See—*
Korsunsky, Iosif; Bateman, Steven P.; and Schroepfer, Richard C., 4,858,309, Cl. 29-764.000.

Schroeppel, Edward A.: *See—*
Callaghan, Frank J.; and Schroeppel, Edward A., 4,858,610, Cl. 128-419.0PG.

Schuller, Steven C., to Steven Schuller Performance Inc. Rotary pump having vanes guided by bearing blocks. 4,859,163, Cl. 418-192.000.

Schulte, Frank. Bucket cover for excavating implements. 4,858,346, Cl. 37-184.000.

Schulte, Uwe: *See—*
Pfannkuche, Heinz; and Schulte, Uwe, 4,859,193, Cl. 439-115.000.

Schultz, Dennis: *See—*
Brecz, Imre; Schultz, Dennis; and Hinton, Dennis L., 4,859,128, Cl. 411-43.000.

Schultz, Steven G., to Abbott Laboratories. Heating system for rotating members. 4,859,420, Cl. 422-58.000.

Schulz, Daniel R.; Warren, Benton B.; and Reed, Michael K., to National Business Systems, Inc. High speed printer. 4,860,219, Cl. 364-519.000

Schulze, Joachim; Adler, Klaus; Selig, Manfred; Ball, Peter; Marquardt, Klaus; Killermann, Otmar; and Hannebaum, Manfred, to Wacker-Chemie GmbH. Process for emulsion polymerization. 4,859,751, Cl. 526-200.000.

Schumacher, John C.: *See—*
Lipisko, Bruce A.; Schumacher, John C.; Howard, Richard E.; Randtke, Peter T.; Sandu, Adrian; Fletcher, Robert E.; and Graf, Hans-Juergen, 4,859,375, Cl. 261-20.000.

Schumann, Frank, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Rotational switching apparatus with separately driven stitching head. 4,858,539, Cl. 112-21.000.

Schunemann, Jurgen: *See—*
Eiden, Friedrich; Gmeiner, Peter; and Schunemann, Jurgen, 4,859,664, Cl. 514-217.000.

Schupp, Horst: *See—*
Tauchenitz, Harald; and Schupp, Horst, 4,859,922, Cl. 318-628.000.

Schutz, Rudolph W., to James River Corporation. Folded sheet product. 4,859,518, Cl. 428-126.000.

Schutze, Herbert: *See—*
Hartnack, Wolfgang; Keesen, Werner; and Schutze, Herbert, 4,860,097, Cl. 358-133.000.

Schwan-Stabilo Schwanhausser GmbH & Co.: *See—*
Roeder, Georg; and Moeck, Gerhard, 4,859,104, Cl. 401-202.000.

Schwartz, Cheryl D.: *See—*
Lam, Yiu-kuen T.; Chang, Raymond S.; Hensens, Otto D.; Schwartz, Cheryl D.; and Zink, Deborah L., 4,859,690, Cl. 514-375.000.

Schwartz, Joel: *See—*
Takahashi, Akio; Petrella, Robert G.; and Schwartz, Joel, 4,859,774, Cl. 544-251.000.

Schwellinger, Pius, to Swiss Aluminium Ltd. Weld filter material for fusion welding of high strength aluminum alloys. 4,859,544, Cl. 428-654.000.

Sciacero, James R.; and Waterbury, Charles A., to Kurta Corporation. Noise cancellation in digitizing system and method. 4,859,814, Cl. 178-19.000.

Scott Fetzer Company, The: *See—*
Ostroski, Richard J.; Bigley, James E.; Falk, John L.; and Sallee, E. Charles, 4,858,269, Cl. 15-327.00F.

Scott, Jeff. Portable cooler. 4,858,444, Cl. 62-372.000.

Scott, Ronnie E. Fluorescent light holster. 4,858,763, Cl. 206-419.000.

Seaburg, Stephen L. Wireless taillight system. 4,859,982, Cl. 340-475.000

Sears, Stephen B.: *See—*
Norman, Alan B.; Griffith, David W., Jr.; Holt, Dewey L.; Reynolds, John H., IV; and Sears, Stephen B., 4,858,628, Cl. 131-329.000.

Sebok, Dezso: *See—*
Pelyva, Jeno ; Vecsey, K. Istvan; Kolonics, Zoltan; Legradi, Laszlo; Nagy, Lajos; Horvath, Andras; Fodor, Ferenc, deceased; Soptei, Csaba; Sebok, Dezso; Tomordi, Elemer; Lendvai, Laszlo ; Karacsonyi, Bela; and Dioszegi, Erzsebet, 4,859,772, Cl. 544-11.000.

Sechrist, Paul A.; and Koves, William J., to UOP. Regeneration method with reduced catalyst heat exposure. 4,859,643, Cl 502-37.000.

Seco/Warwick Corporation: *See—*
Ross, Robert H., 4,859,178, Cl. 432-237.000.

Sedgewick, Richard D. Flat windings and coil forms. 4,859,890, Cl. 310-208.000.

Segerstrom, Clifford C., to Shell Oil Company. Interchangeable quench gas injection ring. 4,859,213, Cl. 48-87.000.

Segerstrom, Clifford C.; Stil, Jacob H.; Ooms, Adrianus J.; Mink, Bernardus H.; Premel, Ulrich; and Gawloski, Leszek, to Shell Oil Company. Process for treating syngas using a gas reversing chamber. 4,859,214, Cl. 48-197.00R.

Seib, Bradley D.: *See—*
Seib, George E.; and Seib, Bradley D., 4,858,317, Cl. 30-115.000.

Seib, George E.; and Seib, Bradley D., to Geepard Industries, Inc. Stoma flange cutter. 4,858,317, Cl. 30-115.000.

Seidel, Hartmut R. A.; Harder, Hans E.; and Behrens, Klaus F. A., to Howmedica GmbH Werk Schonkirchen. Bone nail for the treatment of upper arm fractures. 4,858,602, Cl. 128-92.0YY.

Seiko Epson Corporation: *See—*
Inoue, Kazuaki, 4,860,246, Cl. 364-900.000.
Iwashita, Yukihiro; and Mochizuki, Masashi, 4,859,037, Cl. 350-339.00F.
Kobayashi, Atsushi; Suzuki, Takashi; and Kosugi, Yasuhiko, 4,860,058, Cl. 355-27.000.
Shiraishi, Yoshiaki; and Aoki, Kenji, 4,859,034, Cl. 350-331.00R.

Seiko Seiki Kabushiki Kaisha: *See—*
Nagata, Tetsuya; and Ohmori, Hideki, 4,858,391, Cl. 51-165.930.

Seikosha Co., Ltd.: *See—*
Sato, Hiroyuki; and Tajima, Akio, 4,859,101, Cl. 400-719.000.
Yamakoshi, Akira; Fujita, Toyohiko; Tsukakoshi, Kunihiko; and Anraku, Shinji, 4,859,966, Cl. 330-288.000.

Seiya, Yuji; and Odawara, Hiroyuki, to Toray Industries, Inc. Composite materials of reinforced fibers. 4,859,533, Cl. 428-366.000.

Sekida, Minoru: *See—*
Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, 4,860,046, Cl. 354-475.000.

Sekikawa, Keiji: *See—*
Koiwai, Hideshi; and Sekikawa, Keiji, 4,858,651, Cl. 137-869.000.

Selenia Industrie Elettroniche Associate: *See—*
Busacca, Guido; Meli, Vincenzo; and Spalla, Mario, 4,859,907, Cl. 315-3.500.

Selig, Manfred: *See—*
Schulze, Joachim; Adler, Klaus; Selig, Manfred; Ball, Peter; Marquardt, Klaus; Killermann, Otmar; and Hannebaum, Manfred, 4,859,751, Cl. 526-200.000.

Selinko, George J. Device for aiding in the putting on of stockings or the like. 4,858,795, Cl. 223-111.000.

Sellner, Josef: *See—*
Bolling, Fritz C.; and Sellner, Josef, 4,858,962, Cl. 285-136.000.

Selvaer, Ole K.: *See—*
Haugland, Tor A.; Kleiven, Atle; and Selvaer, Ole K., 4,860,264, Cl. 367-17.000.

Semiconductor Energy Laboratory Co., Ltd.: *See—*
Yamazaki, Shunpei, 4,860,069, Cl. 357-17.000.

Semion, Robert: *See—*
Weaver, Robert C., 4,858,984, Cl. 296-100.000.

Senge, F. Gerhard; Watson, Angus A.; Sanner, Kenneth E.; and Corbin, Terry R., to Chemcut Corporation. Process and apparatus for elec-

trolytically removing protective layers from sheet metal substrate. 4,859,298, Cl. 204-146.000.

Senillou, Claude; de Framond, Remy; Garnier, Marcel; Yavari, Ali R.; and Joud, Jean-Charles, to Union Siderurgique Du Nord Et De L'Est De La France (USINOR). Process and apparatus for preparing especially metallic and semi-metallic bands of small thickness. 4,858,675, Cl. 164-503.000.

Senju Pharmaceutical Co., Ltd.: *See—*
Kubo, Michinori; and Matsuda, Reiko, 4,859,468, Cl. 424-195.100.

Sennett, Paul, to Engelhard Corporation. Use of high molecular weight sulfonate as auxiliary dispersants for structured kaolins. 4,859,246, Cl. 106-487.000.

Sensormatic Electronics Corporation: *See—*
Watkins, Harry E.; Balch, Brent F.; Oakes, Jeffery T.; Copeland, Richard L.; Patterson, Hubert A.; and Martinson, Mart, 4,859,991, Cl. 340-572.000.

Sentron v.o.f.: *See—*
Meinema, Ate. J., 4,858,615, Cl. 128-668.000.

Seraji, Homayoun, to California Institute of Technology. Method and apparatus for adaptive force and position control of manipulators. 4,860,215, Cl. 364-513.000.

Serratrice, Guy: *See—*
Lampin, Jean-Pierre, deceased; Robillart Lampin, Jeannine, heir; Lampin, Corinne, heir; Lampin, Sophie, heir; Cambon, Aime ; Szonyi, Francois; Delpuech, Jean-Jacques; Serratrice, Guy; Thiollet, Gerard; and Lafosse, Louisette, 4,859,797, Cl. 568-39.000.

Setsune, Kentaro: *See—*
Yoshida, Akihisa; Setsune, Kentaro; and Hirao, Takashi, 4,859,908, Cl. 315-111.810.

Sew-Eurodrive Gmbh & Co.: *See—*
Trumpler, Walter; and Schmidt, Josef, 4,860,167, Cl. 361-417.000.

Sewell, Charles P. B.; Sewell, Michael J. B.; and Sewell, Margaret I. Wall securement system. 4,858,351, Cl. 40-152.100.

Sewell, Margaret I.: *See—*
Sewell, Charles P. B.; Sewell, Michael J. B.; and Sewell, Margaret I., 4,858,351, Cl. 40-152.100.

Sewell, Michael J. B.: *See—*
Sewell, Charles P. B.; Sewell, Michael J. B.; and Sewell, Margaret I., 4,858,351, Cl. 40-152.100.

SGS-Thompson Microelectronics, Inc.: *See—*
Turner, Timothy E., 4,860,079, Cl. 357-41.000.

SGS-Thomson Microelectronics S.A.: *See—*
Devin, Jean; and Calzi, Philippe, 4,860,256, Cl. 365-189.030.

Shafer, James P. Articulated apparatus for positioning rock drills. 4,858,700, Cl. 173-22.000.

Shah, Navin D.: *See—*
Chriswell, Colin D.; Kaushik, Surender M.; Shah, Navin D.; and Markuszewski, Richard, 4,859,212, Cl. 44-622.000.

Shalati, Mohamad D.; Marquart, James A.; Babjak, John R.; and Harris, Rodney M., to Sherwin-Williams Company, The. Acid-functional polymers derived from cellulose ester-unsaturated alcohol copolymers, which are reacted with cyclic anhydrides. 4,859,758, Cl. 527-313.000.

Shanghai Dong Hai Military Technology Engineering Co.: *See—*
Jiang, Ke-zheng; Ren, Deng-ke; Chen, Zu-yuan; and You, Lian-zhen, 4,860,019, Cl. 343-795.000.

Shankman, Jay. Chemical equipment decontamination truck. 4,858,256, Cl. 4-597.000.

Shantz, Michael: *See—*
Buzjak, Karl; Shantz, Michael; and Shwetz, Linda, 4,860,251, Cl. 364-900.000.

Sharbaugh, John E.: *See—*
Tupper, Robert B.; Mangus, James D.; Sharbaugh, John E.; Brown, Gedney B.; Livingston, Julie M.; and Dhalla, Asfandiar K., 4,859,402, Cl. 376-285.000.

Sharp, Bruce R. Method of making storage tanks with secondary containment. 4,859,262, Cl. 156-155.000.

Sharp Kabushiki Kaisha: *See—*
Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohei; Kondo, Masafumi; and Yamamoto, Saburo, 4,860,297, Cl. 372-45.000.
Hosoda, Masahiro; Sasaki, Kazuaki; Kondo, Masaki; and Yamamoto, Saburo, 4,860,299, Cl. 372-46.000.
Kugimiya, Syuzo; Tokunaga, Shinji; Suzuki, Hitoshi; Fukumochi, Yoji; Shiotani, Shinobu; and Sata, Ichiko, 4,860,206, Cl. 364-419.000.
Miyauchi, Nobuyuki; Kawanishi, Hidenori; Maei, Shigeki; Yamamoto, Osamu; and Hayashi, Hiroshi, 4,860,305, Cl. 372-92.000.
Nakamura, Tadashi; Kitabatake, Yasuso; Takahashi, Yoshiaki; and Maeda, Kazuya, 4,859,560, Cl. 430-137.000.
Taniguchi, Akihiko; and Nakanishi, Yasushi, 4,860,051, Cl. 250-231.0SE.

Sharp Kabushiki Skaisha: *See—*
Tanka, Hideaki; Katsurada, Morihiro; and Konya, Minehiro, 4,860,376, Cl. 382-57.000.

Sharp, Kenneth J., Jr. Method and apparatus for separating interconnected stacks. 4,858,804, Cl. 225-2.000.

Sharpe, Robin, to U.S. Philips Corporation. Data demodulator carrier phase error detector. 4,859,959, Cl. 329-124.000.

Sharpa, Gordon V., Jr.: *See—*
Ragusa, James J.; and Sharpa, Gordon V., Jr., 4,859,822, Cl. 219-10.55E.

Shasha, Baruch S.; and Dunkle, Richard L., to United States of America, Agriculture. Starch encapsulation of entomopathogens. 4,859,377, Cl. 264-4.100.

Shaw, Henry, to Picanol N.V. Method and apparatus for repairing a broken weft thread in a loom. 4,858,658, Cl. 139-452.000.

Shaw, Herbert J.; and Digonnet, Michel J. F., to Leland Stanford Junior University, The Board of Trustees of the. Fiber optic amplifier. 4,859,016, Cl. 350-96.150.

Shaw, Paul V., to Shell Oil Company. Preparation of bisphenols. 4,859,803, Cl. 568-727.000.

Shaw, Rudy L.; Tsui, James B. Y.; and Hedge, James N., Jr., to United States of America, Air Force. PSK detection using an IFM receiver. 4,860,318, Cl. 375-82.000.

Shea, George B.: *See—*
DeLuca, Joan S.; DeLuca, Michael J.; and Shea, George B., 4,860,003, Cl. 340-825.440.

Shelar, Gary R.: *See—*
Banerjee, Chandra K.; and Shelar, Gary R., 4,858,630, Cl. 131-364.000.

Shelfantook, William E.; Hyndman, Alexander W.; and Hackman, Larry P. Purification process for bitumen froth. 4,859,317, Cl. 208-391.000.

Shell Oil Company: *See—*
de Vries, Auke F.; and Stork, Willem H. J., 4,859,309, Cl. 208-61.000.
Djiauw, Lie K.; and Icenogle, Ronald D., 4,859,366, Cl. 252-602.000.
Drent, Eit, 4,859,646, Cl. 502-165.000.
Drent, Eit; Wife, Richard L.; and Van Leeuwen, Petrus W. N. M., 4,859,764, Cl. 528-392.000.
Kuypers, Willem F.; and Hasenack, Hendrikus J. A., 4,858,538, Cl. 110-264.000.
Modic, Michael J.; and Gelles, Richard, 4,859,737, Cl. 525-64.000.
Olson, Donald C.; and Miller, John J., deceased, 4,859,436, Cl. 423-221.000.
Polderman, Hugo G., 4,859,316, Cl. 208-166.000.
Segerstrom, Clifford C., 4,859,213, Cl. 48-87.000.
Segerstrom, Clifford C.; Stil, Jacob H.; Ooms, Adrianus J.; Mink, Bernardus H.; Premel, Ulrich; and Gawloski, Leszek, 4,859,214, Cl. 48-197.00R.
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Smutny, Edgar J., 4,859,729, Cl. 524-170.000.
Van Broekhoven, Johannes A. M.; and Drent, Eit, 4,859,644, Cl 502-154.000.
Van Broekhoven, Johannes A. M.; and Drent, Eit, 4,859,645, Cl. 502-154.000.

Shenfeld, Avner: *See—*
Eisenberg, Eliahu; Padova, Reuven; Shenfeld, Avner; Hirshfeld, Tsvi; and Stein, Jacob, 4,859,586, Cl. 435-34.000.

Shepard, Michael L.: *See—*
Fuller, Harold A.; and Shepard, Michael L., 4,858,965, Cl. 285-189.000.

Sherbloom, Paul A. Lawn aerator. 4,858,697, Cl. 172-21.000.

Sherwin, Martin B.: *See—*
Walter, James F.; and Sherwin, Martin B., 4,859,591, Cl. 435-106.000.

Sherwin-Williams Company, The: *See—*
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Shiba, Haruo: *See—*
Okamura, Masatoshi; Shiba, Haruo; Hashizume, Kenji; and Sakata, Yoshiya, 4,858,849, Cl. 242-199.000.

Shibata, Humio: *See—*
Hayami, Toshitomo; Shibata, Humio; Iguchi, Katsumi; Inoue, Hisao; Ono, Takashi; and Ishimoto, Takashi, 4,859,251, Cl. 148-286.000.

Shibata, Kazuyoshi: *See—*
Nishizawa, Hitoshi; and Shibata, Kazuyoshi, 4,859,307, Cl. 204-425.000.

Shibata, Mitsuhiro: *See—*
Fukuo, Koichi; Shibata, Mitsuhiro; Hiro, Toshiaki; and Matsumoto, Masahiko, 4,858,574, Cl. 123-90.340.

Shibata, Tadashi, to Kabushiki Kaisha Toshiba. Semiconductor device MOSFET with V-shaped drain contact. 4,860,084, Cl. 357-55.000.

Shibukawa, Takeo, to Yamaha Corporation. Electronic musical instrument with tone-sustaining controller. 4,858,508, Cl. 84-1.010.

Shida, Yoshiaki; Kitayama, Shiro; and Nishikawa, Tomio, to Sumitomo Metal Industries, Ltd. Method of improving the resistance of Ti-based alloys to corrosion in deep-well environments. 4,859,415, Cl. 420-417.000.

Shidara, Keiichi: *See—*
Yamashita, Takashi; Shidara, Keiichi; Aiba, Masaaki; Takasaki, Yukio; and Hirai, Tadaaki, 4,860,093, Cl. 358-50.000.

Shihata, Alfred A., to Vance Products Incorporated d/b/a/ Cook Urological Incorporated and Cook OB/GYN. Device and method for intravaginal, barrier-type prevention of conception and infection. 4,858,624, Cl. 128-834.000.

Shiino, Masaru: *See—*
Tsubata, Yukihiro; and Shiino, Masaru, 4,859,120, Cl. 406-84.000.

Shikata, Shinichi; and Hayashi, Hideki, to Sumitomo Electric Industries, Ltd. Method of producing the gate electrode of a field effect transistor. 4,859,618, Cl. 437-41.000.

Shimazaki, Shigeo: *See—*
Kawakami, Katsura; Shimazaki, Shigeo; Takayama, Satoshi; and Onodera, Chika, 4,860,109, Cl. 358-400.000.

Shimizu, Hiromitsu: *See—*
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Shimizu, Katsuichi; and Nagashima, Nao, to Canon Kabushiki Kaisha. Information transmission system. 4,860,111, Cl. 358-400.000.

Shimoda, Isao; Yaguchi, Mitsugu; and Fujii, Junji, to Yamaha Corporation. Resonant musical instruments. 4,858,510, Cl. 84-402.000.

Shimohigashi, Katsuhiro; Masuda, Hiroo; Ikuzaki, Kunihiko; and Kawamoto, Hiroshi, to Hitachi, Ltd. Semiconductor memory. 4,860,255, Cl. 365-189.000.

Shimomura, Soichi, to Nippon Piston Ring Co., Ltd. Ferrous sintered alloy vane and rotary compressor. 4,859,164, Cl. 418-179.000.

Shimura, Kazuo; and Ishida, Masamitsu, to Fuji Photo Film Co., Ltd. Radiation image recording and read-out apparatus. 4,859,849, Cl. 250-327.200.

Shimura, Yukihiro, to NEC Corporation. Rapid processing of immediately successive arrival signals in a base station of a radio communication network. 4,860,337, Cl. 379-63.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Shiobara, Toshio; and Tomiyoshi, Kazutoshi, 4,859,722, Cl. 523-433.000.

Shinbo, Atsushi: *See—*
Hosoda, Kenichiro; Kawaguchi, Shinji; Shinbo, Atsushi; and Yokota, Kiyoshi, 4,860,315, Cl. 375-30.000.

Shindo, Yoshio: *See—*
Iwatsuki, Kunihiro; and Shindo, Yoshio, 4,858,496, Cl. 74-863.000.

Shinmi, Masamichi: *See—*
Watanabe, Hirokazu; and Shinmi, Masamichi, 4,858,281, Cl. 24-113.0MP.

Shinoda, Hosei: *See—*
Takayanagi, Hiroshi; Kobayashi, Tadashi; Masuda, Takayoshi; and Shinoda, Hosei, 4,859,763, Cl. 528-357.000.

Shinomura, Yasushi; Yamaguchi, Masahiko; and Fukuzaki, Koichiro, to Ube Industries, Ltd. Porous hollow-fiber. 4,859,535, Cl. 428-398.000.

Shiobara, Toshio; and Tomiyoshi, Kazutoshi, to Shin-Etsu Chemical Co., Ltd. Epoxy resin composition. 4,859,722, Cl. 523-433.000.

Shiotani, Shinobu: *See—*
Kugimiya, Syuzo; Tokunaga, Shinji; Suzuki, Hitoshi; Fukumochi, Yoji; Shiotani, Shinobu; and Sata, Ichiko, 4,860,206, Cl. 364-419.000.

Shiozaki, Atsushi; Komuro, Hirokazu; Sato, Koichi; and Masuda, Kazuaki, to Canon Kabushiki Kaisha. Base plate having an oxidation film and an insulating film for ink jet recording head and ink jet recording head using said base plate. 4,860,033, Cl. 346-140.00R.

Shipley Company Inc.: *See—*
Parks, Gary D., 4,860,062, Cl. 355-53.000.

Shirai, Eiji; Okabe, Yoshio; and Kobayashi, Yukimori, to Aisin Seiki Kabushiki Kaisha. Device for adjusting an angular phase difference between two elements. 4,858,572, Cl. 123-90.120.

Shirai, Yuji: *See—*
Ueno, Fumio; Yamakawa, Takeshi; and Shirai, Yuji, 4,860,243, Cl. 364-807.000.

Shiraishi, Yoshiaki; and Aoki, Kenji, to Seiko Epson Corporation. Liquid crystal optical printing apparatus. 4,859,034, Cl. 350-331.00R.

Shiramasa, Miyoshi: *See—*
Ogawa, Kazuaki; and Shiramasa, Miyoshi, 4,858,272, Cl. 16-80.000.

Shirasawa, Honai; Sugeno, Hiroto; Eto, Shigeo; and Saito, Hiroshi, to Suntory Limited; and Soken Kagaku Kabushiki Kaisha. Process for industrially separating biopolymers. 4,859,342, Cl. 210-656.000.

Shirato, Masayoshi, to Mitsuba Electric Mfg. Co., Ltd. Windshield wiper device for use in vehicles. 4,858,268, Cl. 15-250.210.

Shiratori, Harunori: *See—*
Kawakami, Hiroshi; Shiratori, Harunori; Sugihara, Koichi; Watanabe, Atsushi; and Kishida, Fumio, 4,858,713, Cl. 180-143.000.

Shirley, Thomas E.: *See—*
Laster, Stanley J.; Meek, Robert A.; and Shirley, Thomas E., 4,860,265, Cl. 367-73.000.

Shiroyama, Masaharu: *See—*
Wada, Toshiaki; Katsuyama, Yoshiaki; Furukawa, Mitsuhiko; Kitahira, Takashi; Miyahara, Michito; Misumi, Kiyohito; and Shiroyama, Masaharu, 4,859,638, Cl. 501-58.000.

Shiroyama, Shigeru, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for securing magnetic poles of magnet-type rotating machines. 4,859,892, Cl. 310-218.000.

Shojima, Hiroshi: *See—*
Kuzunuki, Soshiro; Shojima, Hiroshi; Miura, Masaki; Mori, Junko; and Mifune, Toshimi, 4,860,372, Cl. 382-13.000.

Shop-Vac Corporation: *See—*
Berfield, Robert C.; and Meland, Ronald F., 4,858,271, Cl. 15-339.000.

Shores, Paul W.; Griffin, John W.; and Kobayashi, Herbert S., to United States of America, National Aeronautics and Space Administration. Doppler radar with multiphase modulation of transmitted and reflected signal. 4,860,014, Cl. 342-105.000.

Shoziro Ito: *See—*
Ito, Shoziro; Ito, Akihiro; and Ito, Hiroyasu, 4,859,077, Cl. 374-33.000.

Shpiro, Zeev, to ECI Telecom Ltd. Adaptive differential pulse code modulation (ADPCM) systems. 4,860,313, Cl. 375-27.000.

Shtipelman, Boris A., to Eastman Kodak Company. Flexure-mounted radial access apparatus for disk recorder/player. 4,860,137, Cl. 360-106.000.

Shu, Paul: *See—*
Hoskin, Dennis H.; and Shu, Paul, 4,859,717, Cl. 523-130.000.

Shube, Eugene E., to Plessey Incorporated. Fail-free actuator assembly. 4,858,491, Cl. 74-665.00B.

Shubin, Steven A. Child safety car seat. 4,858,997, Cl. 297-487.000.

Shuster, Jerry P.; and Cesaroni, Anthony, to Du Pont Canada Inc. Process for manufacturing of heat exchangers from polymers. 4,859,265, Cl. 156-292.000.

Shwetz, Linda: *See—*
Bizjak, Karl; Shantz, Michael; and Shwetz, Linda, 4,860,251, Cl. 364-900.000.

Siddiqi, Iqbal; and Wuhrmann, Hans-Rudolf, to Hoffman-La Roche Inc. Selectively ion-permeable dry electrodes for analyzing selected ions in aqueous solution. 4,859,306, Cl. 204-416.000.

Siddoway, Craig F.; Castaneda, Julio C.; and Iezzi, Peter D., to Motorola, Inc. Carry case with quick release and self locating retainer apparatus. 4,858,798, Cl. 224-242.000.

Sidransky, Fred, to Sundstrand Corporation. Compressor with supercritical diffuser. 4,859,145, Cl. 415-211.100.

Sieber, Alexander: *See—*
Schneider, Manfred; Ott, Ulrich; Sieber, Alexander; and Zimmermann, Manfred, 4,859,728, Cl. 524-159.000.

Sieber, Richard W.: *See—*
Cooperman, Michael; and Sieber, Richard W., 4,859,877, Cl. 307-443.000.

Sieber, Robert L.: *See—*
Andrews, Loren E.; and Sieber, Robert L., 4,859,889, Cl. 310-89.000.

Siebert, Jerome F. Method and apparatus for physical vapor deposition of thin films. 4,858,556, Cl. 118-664.000.

Siefert, Wolfgang: *See—*
Bauch, Hartmut; Krause, Peter; Jost, Ulrike; Kersten, Ralf; Paquet, Volker; and Siefert, Wolfgang, 4,859,222, Cl. 65-3.120.

Siegel, Karl-Heinz, to Minigrip, Inc. Plastic interlocking fastener strips. 4,858,286, Cl. 24-587.000.

Siemens Aktiengesellschaft: *See—*
Baeuerle, Dieter, 4,859,279, Cl. 156-656.000.
Berner, Klaus, 4,860,144, Cl. 361-1.000.
Jans, Herbert; Brandmaier, Klaus; and Pohl, Siegfried, 4,860,344, Cl. 379-113.000.
Kraker, Alfred, 4,860,238, Cl. 364-721.000.
Losehand, Reinhard; and Eger, Helmut, 4,859,616, Cl. 437-39.000.
Mattausch, Hans J., 4,860,263, Cl. 365-230.050.
McKenna, Gilbert W., 4,859,949, Cl. 324-321.000.
Payer, Ernst; and Schierl, Hans, 4,860,368, Cl. 381-159.000.
Pohl, Fritz; and Harr, Dieter, 4,860,146, Cl. 361-42.000.
Tihanyi, Jenoe; and Weber, Roland, 4,859,875, Cl. 307-311.000.
Von Criegern, Rolf; Fazekas, Peter; and Fottner, Johannes, 4,860,225, Cl. 364-551.010.
Wengert, Ulrich, 4,860,196, Cl. 364-200.000.
Winzer, Gerhard; Maerz, Reinhard; and Stoll, Lothar, 4,860,294, Cl. 372-7.000.

Siemens-Bendix Automotive Electronics L.P.: *See—*
Taxon, Morse N., 4,858,956, Cl. 251-129.070.

Siemens Corporate Research and Support, Inc.: *See—*
Lumbard, Marvin, 4,859,632, Cl. 437-209.000.

Siemens Hearing Instruments, Inc.: *See—*
Tweedle, Allan F., 4,860,362, Cl. 381-69.000.

Siempelkamp Corporation: *See—*
Monaghan, Alfred C., 4,858,416, Cl. 53-439.000.

Sigillo, Eric: *See—*
Cole, Francis X.; Davis, Gene; and Sigillo, Eric, 4,859,612, Cl. 436-523.000.

Sigma Instruments, Inc.: *See—*
Beling, Thomas E., 4,859,925, Cl. 323-210.000.

Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See—*
Cavazza, Claudio; De Witt, Paolo; and Tinti, Maria O., 4,859,698, Cl. 514-445.000.

Signal, Inc.: *See—*
Kulp, Jack H.; and Erwin, Carl L., 4,859,983, Cl. 340-908.100.

Silverman, William: *See—*
Weiser, Murray; Silverman, William; Landau, Zvi; Finer, Paul; and Pincus, Cary I., 4,860,329, Cl. 378-50.000.

Simac S.r.l.: *See—*
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Simatelex Manufactory Company Limited: *See—*
Fai, Kwok W., 4,860,147, Cl. 361-50.000.

Simco Company, Inc., The: *See—*
Rodrigo, Richard D., 4,860,159, Cl. 361-212.000.

Simelunas, William J.; and Polifroni, Nicholas R., to Nabisco Brands, Inc. Apparatus for producing laminated products. 4,858,524, Cl. 99-450.200.

Simmering-Graz-Pauker Aktiengeselschaft: *See—*
Zechner, Franz; and Stubenvoll, Josef, 4,859,440, Cl. 423-240.000.

Simmons, Daniel M. Darts having an anti-deflection apparatus. 4,858,927, Cl. 273-416.000.

Simmons, Ethel D.; and Kudrow, Lee. Therapy pillow with removable therapeutic gel pack. 4,858,259, Cl. 5-441.000.

Simms, Georgene M.: *See—*
Simms, John B., 4,860,177, Cl. 362-72.000.

Simms, John B., to Simms, John B.; and Simms, Georgene M. Bicycle safety light. 4,860,177, Cl. 362-72.000.

Simon, Wayne E.; Sadeh, Willy Z.; Kerin, Edward R.; and Gamson, Bernard W. Centrifugal separator. 4,859,347, Cl. 210-788.000.

Simons, Johannes M. M.; and Michels, Caspar P. M., to Oce-Nederland B.V. Videoamplifier. 4,859,962, Cl. 330-260.000.

Singer, Kenneth D.: *See—*
Dirk, Carl W.; Katz, Howard E.; Lalama, Salvatore J.; Singer, Kenneth D.; and Sohn, John E., 4,859,876, Cl. 307-425.000.

Singh, Rajendra K., to Monsanto Company. Substituted-aryl cyclopropanecarbonitriles and derivatives thereof as herbicide antidotes. 4,859,232, Cl. 71-100.000.
Sipio, William J.: *See—*
Ripka, William C.; and Sipio, William J., 4,859,697, Cl. 514-438.000.
Sircar, Shivaji: *See—*
Roberts, George W.; Sircar, Shivaji; and Stepanoff, Paul, 4,859,434, Cl. 423-219.000.
Roberts, George W.; Sircar, Shivaji; and Stepanoff, Paul, 4,859,435, Cl. 423-219.000.
Sironi, Giovanni, to Societa' Cavi Pirelli S.p.A. Screw type extruder with flow chambers externally and internally of screw. 4,859,068, Cl. 366-76.000.
SKF Industrial Trading and Development Co. B.V.: *See—*
Hollox, Graham E., 4,858,294, Cl. 29-149.50R
Sleator, Michael. Display with windowing capability by addressing. 4,860,218, Cl. 364-518.000.
Slepian, Robert M.: *See—*
Hummert, George T.; Slepian, Robert M.; and Westrick, Lawrence R., 4,859,940, Cl. 324-204.000.
Sletten, Andreas M.: *See—*
Feather, Landis E.; Girgis, Ramsis S.; McCormick, Leach S.; and Sletten, Andreas M., 4,859,978, Cl. 336-186.000
Slezak, Sue E.: *See—*
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Slidex Corporation: *See—*
Ozeki, Jiro, 4,858,355, Cl. 40-366.000.
Sloan, Robert J.: *See—*
Abrutyn, Eric S.; and Sloan, Robert J., 4,859,446, Cl. 423-462.000.
Sloan Valve Company: *See—*
Cseri, Zoltan, 4,858,638, Cl. 137-115.000.
Sloan, Walter W.: *See—*
McCalley, Karl W.; Bertram, John R.; Sloan, Walter W.; and McClure, Rory T., 4,860,123, Cl. 358-342.000.
Slota, Michael W.: *See—*
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Smith, Andrew P.: *See—*
Genna, Sebastian; and Smith, Andrew P., 4,859,852, Cl. 250-363.100.
Smith, Calvin G.: *See—*
Bolfik, Lawrence J.; and Smith, Calvin G., 4,858,676, Cl. 165-2.000.
Smith, Daniel D.: *See—*
Evans, Louis B.; and Smith, Daniel D., 4,858,507, Cl. 83-455.000.
Smith, Dennis W., to Honeywell Inc. Rotating conductive heat transfer device. 4,859,090, Cl. 384-463.000.
Smith, Eugene A., Jr.: *See—*
Deno, Milton C.; Smith, Eugene A., Jr.; and Delarnelle, Dale H., 4,859,000, Cl. 303-33.000.
Smith International, Inc.: *See—*
Jones, Kenneth W.; and Fyfe, George, 4,858,707, Cl. 175-329.000.
Smith, John S. Crayfish harvester. 4,858,363, Cl. 43-6.500.
Smith, Kevin K.; and Allsop, Bryan E., to Tektronix, Inc. Method and apparatus for combining an optical and electrical channel in an oscilloscope. 4,859,935, Cl. 324-121.00R.
Smith, Peter W.: *See—*
Chemla, Daniel S.; Miller, David A. B.; and Smith, Peter W., 4,860,296, Cl. 372-44.000.
Smith, Robert E.: *See—*
Prosser, Stephen J.; and Smith, Robert E., 4,859,056, Cl. 356-41.000.
Smith, Robert E., III; and Mosley, Virgil E. Self-flushing hydraulic coupling. 4,858,648, Cl. 137-614.040.
Smith, Robert T., to Microelectronics and Computer Technology Corporation. Discretionary interconnect. 4,859,806, Cl. 174-68.500.
Smith, Robert T.; and Chung, Chang-Hwa, to Microelectronics and Computer Technology Corporation. Electrical interconnect tape. 4,860,088, Cl. 357-69.000.
Smith, Roderick J.; and Castille, Leopold A. Self-drying cheek retracting mirror. 4,859,180, Cl. 433-31.000
Smith, Roger E., to Becton, Dickinson and Company. Sensor and method for detecting the presence of air bubbles in liquid. 4,859,864, Cl. 250-577.000.
Smith, Ronald T.: *See—*
Rogers, Harvey N., Jr.; and Smith, Ronald T., 4,859,492, Cl. 427-42.000.
Smith, Terrance, to Ampex Corporation. Apparatus and method for tracking the subcarrier to horizontal sync of a color television signal. 4,860,089, Cl. 358-10.000.
Smith, Thomas J. Retrofit network interface apparatus. 4,860,350, Cl. 379-412.000.
Smithers-Oasis Company: *See—*
Walton, Charles F.; Sucheski, Robert J.; Bridenbaugh, James F.; and Chapman, James J., 4,858,381, Cl. 47-79.000.
SmithKline Beckman Corporation: *See—*
Burnett, William V., Jr.; Eckhardt, Thomas G.; and Fare, Louis R., 4,859,601, Cl. 435-253.500.
Finkelstein, Joseph A.; Kruse, Lawrence I.; and Leonard, Thomas B., 4,859,779, Cl. 538-321.000.
Horan, Paul K.; Jensen, Bruce D.; and Slezak, Sue E., 4,859,584, Cl. 435-29.000.
Smolik, Robert A. Lateral stabilizer for wall. 4,858,407, Cl. 52-481.000.
Smutny, Edgar J., to Shell Oil Company. Plasticized composition and method of production. 4,859,729, Cl. 524-170.000.
Snyder, Susan L.: *See—*
Salamone, Ann B.; and Snyder, Susan L., 4,859,458, Cl. 424-70.000.
So, Vincent C.: *See—*
O'Sullivan, Maurice S.; Kim, Hyung B.; So, Vincent C.; and Vella, Paul J., 4,859,018, Cl. 350-96.160.
Societa' Cavi Pirelli S.p.A.: *See—*
Sironi, Giovanni, 4,859,068, Cl. 366-76.000
S.A. Des Etablissements Staubli (France): *See—*
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Societe Anonyme dite: Alsthom: *See—*
Woilles, Jacques; and Hayward, Pierre, 4,859,071, Cl. 366-136.000.
Societe Anonyme dite: Filotex: *See—*
Marechal, Michel; Rageot, Alain; and Basly, Michel, 4,859,258, Cl. 156-51.000.
Societe Anonyme dite L'Oreal: *See—*
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Societe Anonyme dite: Stein Industrie: *See—*
Bobichon, Jacques; Hervouin, Lucien; and Vigneron, Gilbert, 4,858,652, Cl. 138-92.000.
Societe Atochem: *See—*
Germanaud, Laurent; and Hermant, Marc, 4,859,357, Cl. 252-51.000.
Societe Chimique des Charbonnages Sa Tour Aurore: *See—*
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Societe Chimique des Charbonnages S.A.: *See—*
Hurtel, Patrice, 4,859,793, Cl. 560-223.000.
Societe Electronique de la Region Pays de Loire: *See—*
Gontier, Bruno, 4,858,816, Cl. 228-34.000.
Societe Nationale des Poudres et Explosifs: *See—*
Barruet, Patrick; Fauconnier, Alain; and Carle, ierre-Regis, 4,859,454, Cl. 424-40.000.
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Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Autie, Pascal J. M.; Avignon, Philippe P.; Camusso, Dominique P.; Forestier, Alexandre; and Ulryck, Gilles, 4,858,721, Cl. 181-213.000
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA): *See—*
Belbouche, Lionel A., 4,858,430, Cl. 60-226.200.
Societe Nationale Elf Aquitaine (Production): *See—*
Ollivier, Jean; Lagaude, Christian H.; Baptiste, Hubert; and Larrouy, Michele, 4,859,373, Cl. 562-119.000.
Sodal, Ingvar E.: *See—*
Bowman, Ronald R.; Sodal, Ingvar E.; Wilke, Thomas A.; and Weller, Frank, 4,859,848, Cl. 250-296.000.
Soehnle-Waagen GmbH & Co.: *See—*
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Soffer, Bernard H.: *See—*
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Softron, Inc.: *See—*
Gendron, Robert F.; Stacy, E. Webb, Jr.; and Ionescu, Tudor V., 4,860,204, Cl. 364-300.000.
Softub, Inc.: *See—*
Popovich, John M.; and Fleishman, Roc V., 4,858,254, Cl. 4-542.000.
Sohn, John E.: *See—*
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Soken Kagaku Kabushiki Kaisha: *See—*
Shirasawa, Honai; Sugeno, Hiroto; Eto, Shigeo; and Saito, Hiroshi, 4,859,342, Cl. 210-656.000.
Solari, Rodolfo B.: *See—*
Rammler, Roland; Weiss, Hans-Jurgen; Herbertz, Hans-Adolf; Solari, Rodolfo B.; and Hidalgo, Rafael, 4,859,284, Cl. 201-12.000.
Sole, Juan V.: *See—*
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Solid State Devices: *See—*
Anderson, Russell Y., 4,859,190, Cl. 439-78.000.
Sollich GmbH & Co. KG: *See—*
Sollich, Helmut, 4,859,483, Cl. 426-519.000.
Sollich, Helmut, to Sollich GmbH & Co. KG. Method for continuous processing of substances containing cocoa butter or similar fats. 4,859,483, Cl. 426-519.000.
Solnordal, Steinar: *See—*
Planke, Tore; Nordbryhn, Andreas; and Solnordal, Steinar, 4,859,862, Cl. 250-560.000.
Somar Corporation: *See—*
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Sommargren, Gary E., to Zygo Corporation. Linear and angular displacement measuring interferometer. 4,859,066, Cl. 356-349.000.
Sone, Yuji; Wada, Kayoko; Kurahashi, Hayao; Nakai, Yoichi; Narutani, Tetsu; and Suzuki, Shigeharu, to Kawasaki Steel Corporation. Method for producing colored stainless steel stock. 4,859,287, Cl. 204-1.00T.
Sonnenschein, Carlos; and Soto, Ana M., to Tufts College, Trustees of. In-vitro methods for identifying compositions which are agonists and antagonists of estrogens. 4,859,585, Cl. 435-29.000.
Sonntag, Bruno, to Hi-Tec-Gas International GmbH. Arrangement for the metering of fuel and metering device therefor. 4,858,583, Cl. 123-527.000.

Sonoco Products Company: *See—*
Schrader, Stephen A.; and Goff, Douglas J., 4,859,863, Cl. 250-556.000.
Sonoike, Yoshiko: *See—*
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Sony Corporation: *See—*
Hayashi, Masatake, 4,859,549, Cl. 430-23.000.
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Sasaki, Nobuo; Kuragano, Tetsuzo; and Minami, Nobuyuki, 4,860,217, Cl. 364-518.000.
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Soto, Ana M.: *See—*
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Southwick, Everett W.: *See—*
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Spada, Alfred P.; Campbell, Henry F.; Kuhla, Donald E.; Studt, William L.; Faith, William C.; and Molino, Bruce F., to Rorer Pharmaceutical Corporation. Pyrido[2,3-d]pyrimidinone and imidazo[4,5-b]pyrimidinone. 4,859,672, Cl. 514-254.000.
Spalla, Mario: *See—*
Busacca, Guido; Meli, Vincenzo; and Spalla, Mario, 4,859,907, Cl. 315-3.500.
Spangle, Lloyd B.; and Coleman, S. Ebow, to Dow Chemical Company, The. Method for underground support and removal of hazardous ions in ground waters. 4,859,344, Cl. 210-683.000.
Spatz, Edward C.: *See—*
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Spector, Donald. Hand-actuated fragrance emitting unit. 4,858,831, Cl. 239-326.000.
Spectra-Tech, Inc.: *See—*
Messerschmidt, Robert G.; and Sting, Donald W., 4,859,064, Cl. 356-446.000.
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Speller, Thomas H., Sr., to Gemcor Engineering Corp. Dimpling and riveting apparatus. 4,858,289, Cl. 29-34.00B.
Spencer, Lynne: *See—*
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Spiess, Wolfram; and Himmelreich, Rolf, to C. F. Spiess & Sohn GmbH & Co. Process for the preparation of dialkyldithiocarbamates of multivalent metals. 4,859,787, Cl. 558-235.000.
"Spiral" Autojavito Vallalat: *See—*
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Splane, Robson L., Jr.: *See—*
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Spotts, Clyde E., Jr.: *See—*
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Sprague Electric Company: *See—*
Higgs, Jacob K.; and Gibson, Barbara L., 4,859,941, Cl. 324-208.000.
Springer, H. Thomas. Pet litter enclosure. 4,858,561, Cl. 119-1.000.
Squarer, David; Colin, Andre; Prior, Robert P.; Mink, Frederick J.; and Liparulo, Nicholas J., to Westinghouse Electric Corp. Filtered venting and decay heat removing apparatus and system for containment structures, and method of operation. 4,859,405, Cl. 376-299.000.
SRI International: *See—*
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SSG, Inc.: *See—*
Titus, Joseph S.; Wang, Dexter; and Graham, Harold A., 4,859,080, Cl. 374-134.000.
Stachowiak, J. Edward. Multi-gun control valve. 4,858,828, Cl. 239-76.000.
Stacy, E. Webb, Jr.: *See—*
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Stahl, Albrecht, to Soehnle-Waagen GmbH & Co. Digital scale. 4,858,709, Cl. 177-164.000.
Stahlecker, Fritz; and Stahlecker, Gerd, to Stahlecker, Fritz; and Stahlecker, Hans. Opening roller construction for open end spinning machine and the like. 4,858,275, Cl. 19-97.000.
Stahlecker, Fritz; and Stahlecker, Hans. Pneumatic false-twist spinning process and apparatus. 4,858,420, Cl. 57-328.000.
Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Arrangement for pneumatic false-twist spinning. 4,858,421, Cl. 57-328.000.
Stahlecker, Fritz, to Stahlecker, Hans. Suction roller arrangement for an open end friction spinning machine. 4,858,422, Cl. 57-401.000.
Stahlecker, Fritz, to Stahlecker, Hans. Fiber feeding arrangement for open-end rotor spinning. 4,858,423, Cl. 57-413.000.
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Standard Oil Company, The: *See—*
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Standard Products Company, The: *See—*
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Standford, Richard T. A.; and Biggs, Roger, to British Aerospace Public Limited Company. Digital signal demodulation. 4,859,960, Cl. 329-126.000.
Stang, Michael A. Cup attachment system. 4,858,869, Cl. 248-311.200.
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Starks, Jimmy A.: *See—*
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Steele, Donald R.: *See—*
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Steele, John: *See—*
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Steele, Robert E.: *See—*
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Keve, Tibor; Megyeri, Gabor; Stefko , Bela; Kovacs, Lajos, Jr.; Kassai nee Zieger, Anna; Kiss, Bela; Laszlovszky, Istvan; Lapis, Erzsebet; Palosi, Eva; Groo, Dora; and Szporny, Laszlo , 4,859,682, Cl. 514-288.000.
Steichen, Dale S.: *See—*
Mitchell, Frances E.; Campbell, G. Edward; and Steichen, Dale S., 4,858,758, Cl. 206-205.000.
Stein, Jacob: *See—*
Eisenberg, Eliahu; Padova, Reuven; Shenfeld, Avner; Hirshfeld, Tavi; and Stein, Jacob, 4,859,586, Cl. 435-34.000.
Steiner, Ernst, to Grob & Co., Aktiengesellschaft. Connecting clamp for warp stop motion. 4,859,195, Cl. 439-55.000.
Steinle, Shelton; Sturtz, John P.; Dayal, Yogeshwar; and Wimpee, Lealon C., to General Electric Company. Permeation cell gas detector. 4,858,461, Cl. 73-23.000.
Steinmann, Joachim, to Klober GmbH & Co. Work chair comprising a swivelling seat shell. 4,858,993, Cl. 297-302.000.
Stemmle, Berthold: *See—*
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Stemmle, Denis J., to Xerox Corporation. Sheet transporting apparatus. 4,858,909, Cl. 271-184.000.
Stengl, Gerhard; Loschner, Hans; and Wolf, Peter, to IMS Ionen Mikrofabrikations Systeme Gesellschaft. Ion-projection apparatus and method of operating same. 4,859,857, Cl. 250-492.300.
Stenqvist, Jan N., to Fas Converting Machinery Aktiebolag. Method and machine for manufacturing rolls of bags. 4,858,844, Cl. 242-67.10R.
Stenstrom, Lennart; and Akerstedt, Allan, to Asea Brown Boveri AB. Overvoltage protective circuit. 4,860,156, Cl. 361-128.000.
Stepanoff, Paul: *See—*
Roberts, George W.; Sircar, Shivaji; and Stepanoff, Paul, 4,859,434, Cl. 423-219.000.
Roberts, George W.; Sircar, Shivaji; and Stepanoff, Paul, 4,859,435, Cl. 423-219.000.

Sternlieb, Herschel, to W. S. Libbey Co. Fabric having sandwich structure. 4,858,547, Cl. 112-420.000.
Sterzel, Hans-Josef, to BASF Aktiengesellschaft. Process of making amorphous silicon nitride powder. 4,859,639, Cl. 501-97.000.
Stetson, Norman B., to Inframetrics, Incorporated. Miniature integral stirling cryocooler. 4,858,442, Cl. 62-6.000.
Steven Schuller Performance Inc.: *See*—
Schuller, Steven C., 4,859,163, Cl. 418-192.000.
Stevens, Jerry D.; Steele, Donald R.; and Gorney, Donald A., Jr. Methods of and apparatus for positioning and aiming an ultrasonic probe. 4,858,614, Cl. 128-661.070.
Stevens, Larry E.: *See*—
Harris, Paul S.; and Stevens, Larry E., 4,858,838, Cl. 242-43.00A.
Stevens, William E.: *See*—
Eyre, Clarence W.; and Stevens, William E., 4,859,008, Cl. 312-257.100.
Stewart, David A.: *See*—
Schneider, Alan A.; Stewart, David A.; Jolson, Joseph D.; Auel, RaeAnn M.; and Price, John F., 4,859,305, Cl. 204-412.000.
Stewart, Deborah L. Shoulder strap fastening device. 4,858,249, Cl. 2-305.000.
Stewart, Robert W.: *See*—
McIntosh, Ronald M.; Rentzel, Richard T.; Stewart, Robert W.; and Daugherty, Daniel L., 4,859,200, Cl. 439-275.000.
Stewart, Walter M.: *See*—
Laurance, Joel E.; and Stewart, Walter M., 4,860,352, Cl. 380-23.000.
Stickel, Werner: *See*—
Groves, Timothy R.; Pfeiffer, Hans C.; Stickel, Werner; and Sturans, Maris A., 4,859,856, Cl. 250-398.000.
Stil, Jacob H.: *See*—
Segerstrom, Clifford C.; Stil, Jacob H.; Ooms, Adrianus J.; Mink, Bernardus H.; Premel, Ulrich; and Gawloski, Leszek, 4,859,214, Cl. 48-197.00R.
Still, Donald O.; Hovance, Hubert T.; and Burley, George J., to Firestone Tire & Rubber Company, The. Pivotable knife. 4,858,505, Cl. 83-49.000.
Sting, Donald W.: *See*—
Messerschmidt, Robert G.; and Sting, Donald W., 4,859,064, Cl. 356-446.000.
Stocker, Thomas F.: *See*—
Fibiger, Richard F.; Koo, Ja-young; Forgach, David J.; Petersen, Robert J.; Schmidt, Donald L.; Wessling, Ritchie A.; and Stocker, Thomas F., 4,859,384, Cl. 264-45.100.
Stocklin, Philip L. Hearing device. 4,858,612, Cl. 128-422.000.
Stokar, Saul, to Elscint Ltd. Optimized signal to noise ratio. 4,859,945, Cl. 324-309.000.
Stolfo, Salvatore J.; and Miranker, Daniel P., to Columbia University in the City of New York, The Trustees of. Binary tree parallel processor. 4,860,201, Cl. 364-200.000.
Stoll, Friedrich: *See*—
Ohlendorf, Dieter; Interthal, Werner; and Stoll, Friedrich, 4,859,418, Cl. 422-16.000.
Stoll, Kurt. Device for handling workpieces. 4,858,976, Cl. 294-64.100.
Stoll, Lothar: *See*—
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Stolper, Wolfgang: *See*—
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Stone, Alan M.: *See*—
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Stone, Wayne B., to Wood Manufacturing Co., Inc. Top assembly for coffee pots incorporating eccentric liquid trap and retainer therefor. 4,858,787, Cl. 222-188.000.
Stopar, Henry M.: *See*—
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Storberg, David G., to CPT Corporation. Method and apparatus for automatically converting input pulse train signals to output signals of desired polarity. 4,860,311, Cl. 375-19.000.
Storf, Robert: *See*—
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Stork, Willem H. J.: *See*—
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Stormberg, Hans-Peter: *See*—
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Stotz, Wolf-Gunter: *See*—
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Stribiak, John J., to Precision Carbide Tool Co., Inc. Tool deployment apparatus. 4,858,302, Cl. 29-568.000.
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Stritzl, Karl; Freisinger, Henry; and Luschnig, Franz, to TMC Corporation. Non-sole dependent ski binding. 4,858,946, Cl. 280-618.000.
Strommer, Pekka; and Virta, Arto, to Planmeca Oy. Method and apparatus for marking a film with information in X-ray photography. 4,860,330, Cl. 378-162.000.
Strong, Bernard: *See*—
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Strong Equipment Corporation: *See*—
Eunson, Charles S., 4,858,747, Cl. 198-718.000.
Strosberg, Arthur D.; and Guillet, Jean-Gerard. Method for preparing rabbit monoclonal antibodies, the cell lines used therein and the antibodies produced thereby. 4,859,595, Cl. 435-172.200.
Struers A/S: *See*—
Voss, Jørgen T.; and Christensen, Asger P., 4,858,479, Cl. 73-865.900.
Struntz, Bernard J. Fishing rod handgrips. 4,858,365, Cl. 43-23.000.
Stryer, Lubert; Glazer, Alexander N.; and Oi, Vernon T., to Leland Stanford Jr. University, The Board of Trustees of the. Fluorescent conjugates for analysis of molecules and cells. 4,859,582, Cl. 435-5.000.
Stuart, Craig J. Aquatic exercising aid. 4,858,913, Cl. 272-71.000.
Stubenvoll, Josef: *See*—
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Sturans, Maris A.: *See*—
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Sturtz, John P.: *See*—
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Su, Kai C.: *See*—
Molock, Frank; Robertson, J. Richard, Jr.; and Su, Kai C., 4,859,780, Cl. 548-550.000.
Su, Tien-Kuei, to Mobil Oil Corporation. High shear extrusion of linear low density polyethylene. 4,859,398, Cl. 264-564.000.
Sublette, Kerry L., to Combustion Engineering, Inc. Production of a single cell protein. 4,859,588, Cl. 435-68.000.
Sucheski, Robert J.: *See*—
Walton, Charles F.; Sucheski, Robert J.; Bridenbaugh, James F.; and Chapman, James J., 4,858,381, Cl. 47-79.000.
Suda, Shigeyuki, to Canon Kabushiki Kaisha. Variable focus optical device. 4,859,041, Cl. 350-423.000.
Suda, Yasuo; Ohnuki, Ichiro; Akashi, Akira; Ishizaki, Akira; Ohtaka, Keiji; and Koyama, Takeshi, to Canon Kabushiki Kaisha. Multidirectional focus state detection apparatus. 4,859,842, Cl. 250-201.000.
Sudo, Yukio: *See*—
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Sueda, Norio; and Hoshino, Hiroyasu, to Elm Industry Co., Ltd. Reinforcing piece pasting apparatus for binding hole. 4,859,275, Cl. 156-541.000.
Suga, Shuzo: *See*—
Miyasaka, Nobuaki; Yokoyama, Shigeki; Suga, Shuzo; Naoi, Takashi; and Satake, Masaki, 4,859,576, Cl. 430-523.000.
Sugahara, Takehisa; Nakagawa, Toyokatu; and Yano, Junichi, to Fujitsu Limited. Method for manufacturing semiconductor device with leads adhered to supporting insulator sheet. 4,859,614, Cl. 437-8.000
Sugaki, Rieko, administrator: *See*—
Nakamura, Tohru; Ogirima, Masahiko; Nakazato, Kazuo; Miyazaki, Takao; Yamamoto, Naoki; Nagata, Minoru; and Sugaki, Shojiro, deceased, 4,860,086, Cl. 357-67.000.
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Sugarman, Edward D.; D'Antonio, Nicholas F.; and D'Antonio, Nicholas J., to Walgen Corporation. Warning system for excessive orthopedic pressures. 4,858,620, Cl. 128-774.000.
Sugawara, Sakuo: *See*—
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Sugimoto, Gunji; and Hongo, Takero, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Running command system for unmanned vehicle. 4,860,209, Cl. 364-424.020.
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Sugita, Ryuji; Tohma, Kiyokazu; Honda, Kazuyoshi; and Nanbu, Taro, to Matsushita Electric Industrial Co., Ltd. Method for providing a perpendicular recording medium for use with a ring-shaped recording and reproducing head. 4,859,501, Cl. 427-131.000.
Sugiura, Sadanobu; Tokunaga, Kunishige; and Kawashima, Teruhisa, to Toshiba Ceramics Co., Ltd. Submerged nozzle for steel casting. 4,858,794, Cl. 222-606.000.

Sugiura, Susumu: *See*—
Matsumoto, Kentaro; Takaoka, Makoto; Fukumoto, Masami; Uda, Toyokazu; and Sugiura, Susumu, 4,860,026, Cl. 346-1.100.
Sugiyama, Genroku: *See*—
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Sugiyama, Yoshihiro: *See*—
Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kuramoto, Shinichi; Sugiyama, Yoshihiro; Takanashi, Hajime; Ishizuka, Takashi; Kudo, Yoshio; and Sato, Yoshio, 4,860,050, Cl. 355-256.000.
Suhadolnik, Robert J.; and Pfleiderer, Wolfgang, to Temple University of the Commonwealth System of Higher Education. Derivatives of 2', 5'-oligoadenylate and antiviral uses thereof. 4,859,768, Cl. 536-27.000.
Suhara, Toshiaki: *See*—
Kono, Keizo; Kondou, Mitsushige; Tsubouchi, Natsuro; Hine, Shiro; Nishihara, Hiroshi; and Suhara, Toshiaki, 4,859,033, Cl. 350-320.000.
Suld, George: *See*—
Lyons, James E.; Ellis, Paul E., Jr.; Myers, Harry K., Jr.; Suld, George; and Langdale, Wayne A., 4,859,798, Cl. 568-399.000.
Sullivan, Thomas E.; and Haydu, Juan, to Enthone, Incorporated. Process for treating plastics with alkaline permanganate solutions. 4,859,300, Cl. 204-164.000.
Sullivan, Thomas M.; and Coppage, Edward A., Jr. Armored glove fingers. 4,858,245, Cl. 2-21.000.
Sulzberger, Kevin J., to TUI Industries. Shell and tube heat exchanger. 4,858,681, Cl. 165-70.000.
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Ohmae, Tadayuki; Sakurai, Tadashi; Yamaguchi, Noboru; Okada, Mitsuyuki; and Asao, Kouichiro, 4,859,710, Cl. 521-55.000.
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Summa, Frank A. High frequency energy saving ballast. 4,859,914, Cl. 315-354.000.
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Sunakawa, Haruo, to NEC Corporation. Group VI doping of III-V semiconductors during ALE. 4,859,627, Cl. 437-81.000.
Sunami, Hideo; Kure, Tokuo; Hiraiwa, Atsushi; and Wada, Yasuo, to Hitachi, Ltd. Semiconductor memory using trench capacitor. 4,860,071, Cl. 357-23.600.
Sundell, Robert E.: *See*—
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Sutter, Leroy V., Jr.; and Mofley, Robert E., to Directed Energy, Inc.; and Atlantic Richfield Company. Laser thermal testing method and system for use with a fire alarm system. 4,859,075, Cl. 374-2.000.
Suwa, Mitsuru, to Tsudakoma Kogyo Kabushiki Kaisha. Apparatus for removing a faulty weft on a jet loom. 4,858,656, Cl. 139-116.000.
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Sykora, Boleslav, to Mitel Corp. Self-adaptive computer memory address allocation system. 4,860,252, Cl. 364-900.000.
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Synthelabo: *See*—
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Berg, Lloyd; Szabados, Rudolph J.; and Flower, Thomas H., 4,859,285, Cl. 203-51.000.

Szabo nee Mogyorosi, Katalin; Kalocsai, Istvan; Gyoni, Istyan; Remenyi, Karoly; Plaveczky, Gyorgy; Kovacs, Laszlo ; Gal, Dezso ; Nemes, Istvan; Botar, Laszlo ; Bencsura, Akos; Moger nee Jeremejeva, Galina; Heberger, Karoly; and Nemeth, Andras, to MTA Kozponti Kemiai Kutato Intezet. Stable brown-coal/oil suspensions and a process for preparing same. 4,859,209, Cl. 44-51.000.

Szabo, William J. Weight-biased fitness machine. 4,858,915, Cl. 272-117.000.

Szenczy, George: *See*—
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; Crowell, Jonathan C.; Szenczy, George; Schoenberg, Andrew J.; and Friedrich, Marju L., 4,859,807, Cl. 174-68.500.

Szonyi, Francois: *See*—
Lampin, Jean-Pierre, deceased; Robillart Lampin, Jeannine, heir; Lampin, Corinne, heir; Lampin, Sophie, heir; Cambon, Aime ; Szonyi, Francois; Delpuech, Jean-Jacques; Serratrice, Guy; Thiollet, Gerard; and Lafosse, Louisette, 4,859,797, Cl. 362-71.000.

Szporny, Laszlo : *See*—
Keve, Tibor; Megyeri, Gabor; Stefko , Bela; Kovacs, Lajos, Jr.; Kassai nee Zieger, Anna; Kiss, Bela; Laszlovszky, Istvan; Lapis, Erzsebet; Palosi, Eva; Groo, Dora; and Szporny, Laszlo , 4,859,682, Cl. 514-288.000.

Szucs, Laszlo ; and Harmatha, Andras, to Energigazdalkodasi Intezet. Plate-type heat exchanger. 4,858,685, Cl. 165-166.000.

Szwerc, Joseph A.: *See*—
Arciszewski, Henry E.; Porzio, Linda A.; Chiang, Bin Y.; Spotts, Clyde E., Jr.; McHugh, Kevin; and Szwerc, Joseph A., 4,859,473, Cl. 426-19.000.

T. Chatani & Co., Ltd.: *See*—
Kojima, Takeshi, 4,860,171, Cl. 362-31.000.

Tabata, Osamu: *See*—
Toyonaga, Yufuko; Kimura, Suzushi; Ueda, Masaaki; Tabata, Osamu; and Kimura, Saburo, 4,859,496, Cl. 427-53.100.

Tabei, Masatoshi; Ikeda, Mitsuru; and Nakajima, Yosuke, to Fuji Photo Film Co., Ltd. Solid state image device. 4,860,076, Cl. 357-30.000.

Tabisz, Wojciech A.; Lee, Fred C.; and Jovanovic, Milan M., to Virginia Tech Intellectual Properties, Inc. Half-bridge zero-voltage switched multi-resonant converters. 4,860,184, Cl. 363-17.000.

Tackabery, Richard E.: *See*—
Thatcher, Herbert vH.; Mursinna, Richard C.; and Tackabery, Richard E., 4,860,033, Cl. 354-64.000.

Taga, Yutaka: *See*—
Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,858,500, Cl. 74-866.000.

Tahara, Tomio: *See*—
Nakamura, Toshiko; and Tahara, Tomio, 4,858,765, Cl. 206-381.000.

Tahara, Toshiro; and Takahashi, Mikio, to Fuji Photo Film Co., Ltd. Method of detecting remaining quantity of replenishing solution. 4,858,468, Cl. 73-149.000.

Taira, Kazuo: *See*—
Yasumuro, Hisakazu; Watanabe, Michio; Taira, Kazuo; Imatani, Tsuneo; and Kurashima, Hideo, 4,858,782, Cl. 220-458.000.

Tajima, Akio: *See*—
Sato, Hiroyuki; and Tajima, Akio, 4,859,101, Cl. 400-719.000.

Tajima, Kenji; Kushima, Hiroshi; and Yamada, Sadami, to Fuji Photo Film Co., Ltd. Film package and device for loading films. 4,860,042, Cl. 354-277.000.

Tajima, Toshio: *See*—
Minemata, Yoiti; Tajima, Toshio; and Nakajima, Shigeharu, 4,859,903, Cl. 313-487.000.

Takada, Koji; Miyata, Masaya; and Tamura, Isojiro, to Katsukawa Micarome Industrial Co. Ltd. Method of performing industrial low hydrogen embrittlement nickel plating by use of an insoluble anode. 4,859,291, Cl. 204-49.000.

Takagi, Akira: *See*—
Suzuki, Akihiro; and Takagi, Akira, 4,858,265, Cl. 15-100.000.

Takagi, Nobuo: *See*—
Kato, Yoshinori; Nakanishi, Mitsuaki; Fujita, Yasushi; and Takagi, Nobuo, 4,858,279, Cl. 24-20.00R.

Takahara, Shigeru: *See*—
Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; Hosono, Yoichi; Takahara, Shigeru; and Koike, Tadashi, 4,859,569, Cl. 430-270.000.

Takahashi, Akio; Petrella, Robert G.; and Schwartz, Joel, to Air Products and Chemicals Inc. Flowable triethylenediamine. 4,859,774, Cl. 544-251.000.

Takahashi, Katsuhiko; Nakashima, Tsuneyasu; Nakatsuji, Hiroshi; and Okuda, Hiroshi, to Polyplastics Co., Ltd. Polyester composition. 4,859,741, Cl. 525-123.000.

Takahashi, Kenji; and Nemoto, Tsuneo, to Sony Corporation. Magnetic disk cartridge with erasure-preventing device. 4,860,127, Cl. 360-60.000.

Takahashi, Kenji: *See*—
Nishio, Yoshihiro; Nakamura, Masanobu; Fukawatase, Midori; and Takahashi, Kenji, 4,859,555, Cl. 430-72.000.

Takahashi, Kohsei: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; Kondo, Masafumi; and Yamamoto, Saburo, 4,860,297, Cl. 372-45.000.

Takahashi, Mikio: *See*—
Tahara, Toshiro; and Takahashi, Mikio, 4,858,468, Cl. 73-149.000.

Takahashi, Muneharu, to Sumitomo Heavy Industries, Ltd. Inertia force balancing apparatus. 4,858,459, Cl. 72-214.000.

Takahashi, Takeshi; Tsuzuki, Naoyuki; Omori, Yukimitsu; and Takamura, Akio, to Toyota Jidosha Kabushiki Kaisha; and Ono Sokki Co., Ltd. Measuring apparatus of volume of an injected fluid. 4,858,466, Cl. 73-119.00A.

Takahashi, Takeshi: *See*—
Sawada, Daisaku; and Takahashi, Takeshi, 4,858,439, Cl. 60-581.000.

Takahashi, Yoshiaki: *See*—
Nakamura, Tadashi; Kitabatake, Yasuo; Takahashi, Yoshiaki; and Maeda, Kazuya, 4,859,560, Cl. 430-137.000.

Takahashi, Yutaka: *See*—
Watanabe, Kazuo; Takahashi, Yutaka; and Takimoto, Masaaki, 4,859,095, Cl. 400-124.000.

Takai, Makoto; Omori, Kazuhiro; Kumonaka, Takahiro; Ozawa, Shinji; and Wakabayashi, Toshio, to Terumo Kabushiki Kaisha. Amide derivatives and antiallergic agents containing the same. 4,859,673, Cl. 514-255.000.

Takamura, Akio: *See*—
Takahashi, Takeshi; Tsuzuki, Naoyuki; Omori, Yukimitsu; and Takamura, Akio, 4,858,466, Cl. 73-119.00A.

Takanashi, Hajime: *See*—
Kurotori, Tsuneo; Mochizuki, Manabu; Ariyama, Kenzo; Kuramoto, Shinichi; Sugiyama, Yoshihiro; Takanashi, Hajime; Ishizuka, Takashi; Kudo, Yoshio; and Sato, Yoshio, 4,860,050, Cl. 355-256.000.

Takanashi, Kenichi, to Ricoh Company, Ltd. Light scanning device. 4,859,011, Cl. 350-6.800.

Takano, Hiroshi; and Matsuo, Mu, to Mitsuboshi Belting Ltd. Power transmission system. 4,858,492, Cl. 74-745.000.

Takano, Hiroshi; Murakami, Tokumichi; Kamisawa, Koh; and Aoyagi, Hidenori, to Mitsubishi Denki Kabushiki Kaisha. Data multiplex transmission system. 4,860,283, Cl. 370-82.000.

Takano, Kazuya: *See*—
Noguchi, Takeshi; Kikuchi, Takashi; and Takano, Kazuya, 4,858,733, Cl. 188-267.000.

Takaoka, Makoto: *See*—
Matsumoto, Kentaro; Takaoka, Makoto; Fukumoto, Masami; Uda, Toyokazu; and Sugiura, Susumu, 4,860,026, Cl. 346-1.100.

Takasaki, Yukio: *See*—
Yamashita, Takashi; Shidara, Keiichi; Aiba, Masaaki; Takasaki, Yukio; and Hirai, Tadaaki, 4,860,093, Cl. 358-50.000.

Takase, Kahei: *See*—
Yasunami, Masabumi; Takase, Kahei; Meguro, Takashi; Suzuki, Katsumi; Hiwatashi, Osamu; Okutsu, Masaru; Kato, Nobuo; and Nakamura, Toru, 4,859,701, Cl. 514-510.000.

Takayama, Satoshi: *See*—
Kawakami, Katsura; Shimazaki, Shigeo; Takayama, Satoshi; and Onodera, Chika, 4,860,109, Cl. 358-400.000.

Takayanagi, Hiroshi; Kobayashi, Tadashi; Masuda, Takayoshi; and Shinoda, Hosei, to Mitsui Toatsu Chemicals, Incorporated. Preparation process of dl-lactic acid-glycolic acid-copolymer. 4,859,763, Cl. 528-357.000.

Takeda, Atsushi: *See*—
Itoh, Masahiro; Murasawa, Yoshihiro; Takeda, Atsushi; Tsuchiya, Hiroaki; and Nakahata, Kimio, 4,860,048, Cl. 355-208.000.

Takeda, Keiji; and Hayakawa, Yoshihide, to Fuji Photo Film Co., Ltd. Photographic image recording method using silver halide and vinyl monomer. 4,859,568, Cl. 430-269.000.

Takeda, Masayuki: *See*—
Matsumura, Yasuo; Aoki, Takayoshi; Takeda, Masayuki; Suzuki, Chiaki; and Nagatsuka, Ikutaroh, 4,859,558, Cl. 430-110.000.

Takeda, Osamu: *See*—
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Kamimae, Hajime, 4,858,895, Cl. 267-64.160.

Takeda, Toru: *See*—
Kozakae, Kunitoshi; and Takeda, Toru, 4,858,485, Cl. 74-399.000.

Takenaka, Sadao; Aono, Yoshihito; Iwamatsu, Takanori; Minowa, Morihiko; Daido, Yoshimasa; and Nakamura, Hiroshi, to Fujitsu Limited. Multilevel amplitude modulation and demodulation communication system. 4,860,316, Cl. 375-39.000.

Takenaka, Tsutomu, to Kabushiki Kaisha Toshiba. Microprocessor system. 4,860,198, Cl. 364-200.000.

Takeuchi, Fumio, to Citizen Watch Co., Ltd. Strap buckle structure. 4,858,283, Cl. 24-178.000.

Takeuchi, Tomio: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Mass; and Ishizuka, Masaaki, 4,859,593, Cl. 435-128.000.

Takeura, Tooru: *See*—
Momata, Kazuhiro; Chida, Kousaku; Takeura, Tooru; and Tsukada, Yukihisa, 4,860,140, Cl. 360-127.000.

Takigawa, Kazunori, to Usui Kokusai Sangyo Kabushiki Kaisha. Blades for low speed propeller fan. 4,859,150, Cl. 416-223.00R.

Takimoto, Masaaki: *See*—
Watanabe, Kazuo; Takahashi, Yutaka; and Takimoto, Masaaki, 4,859,095, Cl. 400-124.000.

Taku, Masakazu: *See*—
Tamamura, Hideo; and Taku, Masakazu, 4,860,040, Cl. 354-170.000.

Takuma, Yuuetsu: *See*—
Kajioka, Hiroshi; Yamada, Koudo; Takuma, Yuuetsu; and Teraoka, Tatsuo, 4,859,223, Cl. 65-3.120.

Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, to Fuji Photo Film Co., Ltd. Photographic support. 4,859,577, Cl. 430-538.000.

Tamamura, Hideo; and Taku, Masakazu, to Canon Kabushiki Kaisha. Camera. 4,860,040, Cl. 354-170.000.

Tamamura, Toshio, to Hewlett-Packard Company. Circuit for measuring characteristics of a device under test. 4,860,227, Cl. 364-553.000.

Tameran, Inc.: *See*—
Wise, David S.; and Janik, Walter E., 4,860,060, Cl. 355-41.000.

Tamper Corp.: *See*—
Cotsford, Stephen G., 4,858,344, Cl. 37-104.000.

Tamura, Isojiro: *See*—
Takada, Koji; Miyata, Masaya; and Tamura, Isojiro, 4,859,291, Cl. 204-49.000.

Tamura, Keiichi: *See*—
Nishimura, Yuji; Kawaharazaki, Takashi; Tamura, Keiichi; Matsui, Kenji; Watanabe, Yasutaka; and Yoshitsugu, Noritada, 4,858,953, Cl. 280-807.000.

Tanabe, Masashi: *See*—
Fukuda, Nobutoshi; Nagao, Tatsuro; Arifuku, Naoto; Tanabe, Masashi; Yamamisaka, Shinichi; and Furuta, Yoshiki, 4,860,129, Cl. 360-61.000.

Tanabe, Masato: *See*—
Crowe, David F.; Tanabe, Masato; and Peters, Richard, 4,859,370, Cl. 260-397.450.

Tanaka, Hideaki: *See*—
Satoh, Shinichi; Hirata, Toichi; Sugiyama, Genroku; and Tanaka, Hideaki, 4,858,649, Cl. 137-625.600.

Tanaka, Hironori: *See*—
Hayashi, Kunioki; Tanaka, Hironori; Sasagawa, Tsutomu; Uemura, Isao; and Aizawa, Akira, 4,858,560, Cl. 119-1.000.

Tanaka, Kazuo, to Canon Kabushiki Kaisha. Zoom lens. 4,859,042, Cl. 350-423.000.

Tanaka Kikinzoku Kogyo K.K.: *See*—
Hirako, Mamoru; and Ezawa, Nobuyasu, 4,859,293, Cl. 204-94.000.
Hirose, Akio, 4,859,445, Cl. 423-462.000.

Tanaka, Kiyofumi: *See*—
Ezaki, Satoru; Tanaka, Kiyofumi; Kasahara, Tsukasa; Hirose, Tetsuya; and Nakagawa, Tetsuro, 4,858,659, Cl. 140-105.000.

Tanaka, Masao, to Metro Denso Kabushiki Kaisha. Self canceller for a turn signal indicator. 4,859,816, Cl. 200-61.270.

Tanaka, Masato: *See*—
Katoku, Takashi; and Tanaka, Masato, 4,858,848, Cl. 242-198.000.

Tanaka, Sumio: *See*—
Saito, Shinji; Atsumi, Shigeru; and Tanaka, Sumio, 4,860,260, Cl. 365-201.000.

Tanaka, Takashi; and Watanabe, Yoshiyuki, to Toshiba Ceramics Co., Ltd. Method for making a furnace component. 4,859,385, Cl. 264-62.000.

Tanaka, Toshiaki; and Mizutani, Kiroyuki, to Kabushuki Kaisha Toshiba. Apparatus for displaying three-dimensional objects. 4,860,220, Cl. 364-522.000.

Tanaka, Toshinori: *See*—
Morishita, Akira; Konishi, Keiichi; and Tanaka, Toshinori, 4,859,895, Cl. 310-261.000.

Tanaka, Yoshio; Fujii, Shigeru; Nishida, Takao; and Fujita, Yasushi, to Honda Giken Kogyo Kabushiki Kaisha. Portable engine-operated electric generator. 4,859,886, Cl. 310-51.000.

Tanashin Denki Co., Ltd.: *See*—
Yoshimura, Toshio, 4,860,141, Cl. 360-130.210.

Tandon, Jagdish C.: *See*—
Araghi, Mehdi N.; and Tandon, Jagdish C., 4,860,075, Cl. 357-30.000.

Tanigawa, Eiji: *See*—
Haraguchi, Kazutoshi; Tanigawa, Eiji; Nukina, Kenji; Morita, Hiroaki; and Maeda, Toyohiro, 4,859,382, Cl. 264-29.200.
Morita, Hiroaki; Haraguchi, Kazutoshi; and Tanigawa, Eiji, 4,859,381, Cl. 264-29.200.

Taniguchi, Akihiko; and Nakanishi, Yasushi, to Sharp Kabushiki Kaisha. Copying process timing control system for electrophotographic copying machine. 4,860,051, Cl. 250-231.0SE.

Taniguchi, Nobuyuki; Niwa, Masatake; Fujii, Akira; Hoda, Takeo; Nakai, Masaaki; Sekida, Minoru; and Sahara, Masayoshi, to Minolta Camera Kabushiki Kaisha. Camera system. 4,860,046, Cl. 354-475.000.

Taniguchi, Nobuyuki: *See*—
Hata, Yoshiaki; Taniguchi, Nobuyuki; Hoda, Takeo; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,860,039, Cl. 354-106.000.

Tanimoto, Akikazu: *See*—
Murakami, Seiro; Tanimoto, Akikazu; Makinouchi, Susumu; Kawai, Hidemi; and Murakami, Masaichi, 4,860,374, Cl. 382-48.000.

Tanino, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus and method for transmitting signal for elevator. 4,858,727, Cl. 187-121.000.

Tanka, Hideaki; Katsurada, Morihiro; and Konya, Minehiro, to Sharp Kabushiki Skaisha. Character recognition system for optical character reader. 4,860,376, Cl. 382-57.000.

Tanner, John G., to Wheeler, N. J. Shield stripping apparatus for electrical cable. 4,858,315, Cl. 30-90.400.

Tar, Csaba G.: *See*—
Diosady, Levente L.; Rubin, Leon J.; and Tar, Csaba G., 4,859,371, Cl. 260-412.400.

Targetti, Giampaolo. Expansion type clamp for connecting coinciding ends of tubular components for reticular structures and the like. 4,859,109, Cl. 403-297.000.

Tari, Gabor; and Hari, Laszlo, to Metripond Merleggyar. Hand surgery operating table. 4,858,903, Cl. 269-328.000.

Tashiro, Yasunori: *See*—
Hayashi, Torahiko; and Tashiro, Yasunori, 4,859,479, Cl. 426-281.000.

Tasset, Emmett L.: *See*—
Carl, William P.; Tasset, Emmett L.; and Aikman, Robert E., Jr., 4,859,745, Cl. 525-276.000.

Tatara, Junichi, to Aisin Seiki Kabushiki Kaisha. Electromagnetic valve. 4,858,886, Cl. 251-129.070.

Tatone, John M.: *See*—
Abbe, David C.; and Tatone, John M., 4,858,722, Cl. 181-243.000.

Tauchenitz, Harald; and Schupp, Horst, to Robert Bosch GmbH. System for controlling the operating mode of a controlled apparatus. 4,859,922, Cl. 318-628.000.

Taupin, Dominique; and Vilard, Philippe, to U.S. Philips Corporation. Circuit for switching video sources. 4,860,106, Cl. 358-181.000.

Taxon, Morse N., to Siemens-Bendix Automotive Electronics L.P. High pressure, fast response, pressure balanced, solenoid control valve. 4,858,956, Cl. 251-129.070.

Tay, Sing P.: *See*—
Kalnitsky, Alexander; Ellul, Joseph P.; Tay, Sing P.; and Poirier, Jacques G., 4,859,303, Cl. 204-192.360.

Taylor, James L., Jr. Brake shoe. 4,858,732, Cl. 188-250.00G.

Taylor, John B.; and Ellis, Michael K., to Hewlett-Packard Company. Narrowband signal recognition for EMI measurement. 4,859,933, Cl. 324-77.00B.

Taylor, Keith A.: *See*—
Damm, Wendell W.; Taylor, Keith A.; Pollock, Ira G.; and Janowitz, Pedro M., 4,860,291, Cl. 371-27.000.

Taylor, Steve; Nelson, Dale; and Gorney, Don, to Lawrence Medical Systems, Inc. Oximeter apparatus. 4,859,057, Cl. 356-41.000.

Taylor, William T.: *See*—
Lane, Bennie L.; and Taylor, William T., 4,858,406, Cl. 52-300.000.

TDK Corporation: *See*—
Okamura, Masatoshi; Shiba, Haruo; Hashizume, Kenji; and Sakata, Yoshiya, 4,858,849, Cl. 242-199.000.

Technicon Instruments Corporation: *See*—
Cram, Donald J.; Chapoteau, Eddy; Czech, Bronislaw P.; Gebauer, Carl R.; Helgeson, Roger C.; Kumar, Anand; and Leong, Koon-Wah, 4,859,606, Cl. 436-79.000.

Technion Research & Development Foundation Ltd.: *See*—
Manor, Gedalyahu, 4,858,329, Cl. 33-775.000.

Technological Resources Corp.: *See*—
Nisenson, Jules, 4,859,429, Cl. 422-186.130.

Tedesco, Albert D.; Stammreich, John C.; Harmon, Raymond E.; and Rourne, William R., Jr., to Rexnord Holdings Inc. Low profile latch. 4,858,970, Cl. 292-113.000.

Tekron Licensing BV: *See*—
Hickman, Ronald P., 4,858,902, Cl. 269-88.000.

Tektronix, Inc.: *See*—
Damm, Wendell W.; Taylor, Keith A.; Pollock, Ira G.; and Janowitz, Pedro M., 4,860,291, Cl. 371-27.000.
Etheridge, Eric P., 4,859,928, Cl. 323-311.000.
Holmbo, Dennis L., 4,860,200, Cl. 364-200.000.
Smith, Kevin K.; and Allsop, Bryan E., 4,859,935, Cl. 324-121.00R.

Telaction Corporation: *See*—
McCalley, Karl W.; Bertram, John R.; Sloan, Walter W.; and McClure, Rory T., 4,860,123, Cl. 358-342.000.

Telecommunications Radioelectriques Et Telephoniques T.R.T: *See*—
Boisson, Jean-Yves, 4,860,314, Cl. 375-27.000.

Telectronics, N.V.: *See*—
Callaghan, Frank J.; and Schroeppel, Edward A., 4,858,610, Cl. 128-419.0PG.

Teledyne Industries, Inc.: *See*—
Leber, Leland C.; and Hunter, Charles L., 4,859,220, Cl. 55-350.000.

Telefonaktiebolaget L M Ericsson: *See*—
Forsberg, Stefan G.; and Erkander, Ragnar S., 4,860,286, Cl. 370-106.000.
Wiljanen, Bo I.; and Karlsson, Jan-Erik, 4,860,168, Cl. 361-428.000.

Telemus Electronic Systems, Inc.: *See*—
Gale, P. Michael; McMillan, Myles; and Gagnon, Andre, 4,859,934, Cl. 324-78.00D.

Telfonaktiebolaget L M Ericsson: *See*—
Fazlollahi, Hossein, 4,860,154, Cl. 361-101.000.

Telles, Rodney W.: *See*—
Unger, Samuel L.; Telles, Rodney W.; and Lubowitz, Hyman R., 4,859,395, Cl. 264-254.000.

Temperilli, Aldemio: *See*—
Mantegani, Sergio; Brambilla, Enzo; Temperilli, Aldemio; Ruggieri, Daniela; and Salvati, Patricia, 4,859,678, Cl. 514-269.000.

Temple University of the Commonwealth System of Higher Education: *See*—
Suhadolnik, Robert J.; and Pfleiderer, Wolfgang, 4,859,768, Cl. 536-27.000.

Tenhover, Michael A.: *See*—
Harris, Jonathan H.; Tenhover, Michael A.; and Henderson, Richard S., 4,859,413, Cl. 419-32.000.

Tennessee Valley Authority: *See*—
Schohl, Gerald A.; and Vigander, Svein, 4,858,460, Cl. 73-19.000.
Terada, Akihiro: *See*—
Torii, Nobutoshi; Nihei, Ryo; and Terada, Akihiro, 4,859,139, Cl. 414-744.500.
Teraoka, Tatsuo: *See*—
Kajioka, Hiroshi; Yamada, Koudo; Takuma, Yuuetsu; and Teraoka, Tatsuo, 4,859,223, Cl. 65-3.120.
Terashima, Tsuneo: *See*—
Kan, Tatsuhiko; Kobayashi, Yoichi; Sonoike, Yoshiko; Terashima, Tsuneo; and Mutai, Masahiko, 4,859,488, Cl. 426-658.000.
Terashita, Takaaki, to Fuji Photo Film Co., Ltd. Method of setting color copying conditions. 4,860,059, Cl. 355-38.000.
Terumo Kabushiki Kaisha: *See*—
Takai, Makoto; Omori, Kazuhiro; Kumonaka, Takahiro; Ozawa, Shinji; and Wakabayashi, Toshio, 4,859,673, Cl. 514-255.000.
Teruyama, Hideo; and Yano, Masaru, to Kayaba Industry Co. Ltd. Gear pump. 4,859,161, Cl. 418-102.000.
Terwilliger, Donald N.; and Knox, Richard C., to Hardinge Brothers, Inc. Two piece collet with interlocking collet segments. 4,858,938, Cl. 279-57.000.
Tesa S.A.: *See*—
Cassani, Alexandre, 4,859,817, Cl. 200-61.410.
Teske, Judy L.; Borchers, Brian D.; Daane, Don A.; Baxter, Daniel J.; and Ehrich, William G., to Control Data Corporation. Clock monitor for use with VLSI chips. 4,860,288, Cl. 371-1.000.
Tetelman, Bruce; Milios, Yannis; Park, Il-Pyung; and Recht, Tom, to Counter Computer Corporation. Point-of-sale terminal for laundry or dry cleaning establishments. 4,859,839, Cl. 235-385.000.
Texas A & M University System, The: *See*—
Appleby, Anthony J., 4,859,292, Cl. 204-60.000.
Texas Instruments Incorporated: *See*—
Bailey, Walter H.; and Pettus, Kent, 4,860,188, Cl. 363-65.000.
Barna, Gabriel G.; and Economou, Demetre J., 4,859,277, Cl. 156-626.000.
Bayraktaroglu, Burhan, 4,859,633, Cl. 437-211.000.
Chiu, Edmon H., 4,860,262, Cl. 365-218.000.
Cohn, Robert W., 4,859,012, Cl. 350-96.240.
Daniels, Martin D.; and Roskell, Derek, 4,860,290, Cl. 371-25.000.
Tonooka, Takashi; and Katsumata, Toshimitsu, 4,859,191, Cl. 439-79.000.
Wise, Rick L., 4,859,626, Cl. 437-81.000.
Thaler, Martin D.; and Rubens, Roger W., to National Starch and Chemical Corporation. Pulse combustion process for the preparation of pregelatinized starches. 4,859,248, Cl. 127-32.000.
Thatcher, Herbert vH.; Mursinna, Richard C.; and Tackabery, Richard E., to Honeywell Inc. Underwater bubble camera. 4,860,038, Cl. 354-64.000.
Theeuwes, Felix: *See*—
Guittard, George V.; Wong, Patrick S. L.; Theeuwes, Felix; and Cortese, Richard, 4,859,470, Cl. 424-473.000.
Theurer, Josef; and Brunninger, Manfred, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile ballast cleaning machine. 4,858,696, Cl. 171-16.000.
Thiel, Rudolf; Klimt, Ulrich; and Zaviska, Dalibor, to Alfred Teves GmbH. Brake pad retention spring, in particular for spot-type disc brakes for automotive vehicles. 4,858,728, Cl. 188-73.310.
Thiem, Joachim; Treder, Wolfgang; Keller, Reinhold; and Schlingmann, Merten, to Hoechst Aktiengesellschaft. Enzymatic synthesis of cyclodextrins using α-glucosyl fluoride as substrate for cyclodextrin α(1→4)glucosyltransferase. 4,859,590, Cl. 435-97.000.
Thiery, Jean, to Institut Francais Du Petrole. Assembly for making oriented bore-holes. 4,858,705, Cl. 175-73.000.
Thiollet, Gerard: *See*—
Lampin, Jean-Pierre, deceased; Robillart Lampin, Jeannine, heir; Lampin, Corinne, heir; Lampin, Sophie, heir; Camboa, Aime ; Szonyi, Francois; Delpuech, Jean-Jacques; Serratrice, Guy; Thiollet, Gerard; and Lafosse, Louisette, 4,859,797, Cl. 568-39.000.
Thomas, Eugene R.; and Steele, Robert E., to Exxon Production Research Company. Process for removing contaminants from dialkyl ethers of polyalkylene glycols. 4,859,802, Cl. 568-621.000.
Thomas, Frank, to United States Golf Association. Loft-lie tester for golf clubs. 4,858,332, Cl. 33-508.000.
Thomas Industries, Inc.: *See*—
Cox, Robert J., 4,859,162, Cl. 418-152.000.
Thomas, Jean-Claude: *See*—
Dreyer, Christian; Thomas, Jean-Claude; and Vanvoren, Claude, 4,859,175, Cl. 432-4.000.
Thompson, Chester C., to Radiation Dynamics, Inc. Magnetic flux coupled voltage multiplication apparatus. 4,860,187, Cl. 363-61.000.
Thompson, Dennis C., to Hewlett-Packard Company. Tilt and swivel mechanism. 4,858,864, Cl. 248-178.000.
Thompson, Gregory J.: *See*—
Lengemann, Robert A.; Thompson, Gregory J.; Vickers, Anthony G.; and Mott, Raymond W., 4,859,313, Cl. 208-113.000.
Thompson, Kevin D.: *See*—
Ballard, Gary W.; and Thompson, Kevin D., 4,860,231, Cl. 364-571.010.
Thompson-Russell, Kathryn C., to U.S. Philips Corporation. Color CRT shadow mask with wrinkle-free corners. 4,859,901, Cl. 313-403.000.
Thomson Consumer Electronics, Inc.: *See*—
Furrey, John H., 4,860,107, Cl. 358-184.000.
Hale, John R., 4,859,226, Cl. 65-139.000.
Thomson-CSF: *See*—
Barre, Lucien, 4,859,631, Cl. 437-209.000.
Bouron, Jean P.; Giroux, Daniel; and Rousseau, Pierre, 4,859,997, Cl. 340-752.000.
Malter, Remi, 4,860,323, Cl. 375-111.000.
Thomson Saginaw Ball Screw Co., Inc.: *See*—
Benton, Robert L.; and Rutkiewicz, Joseph A., 4,859,394, Cl. 264-225.000.
Thomson Semiconducteurs: *See*—
Fruhauf, Serge; and Marquot, Alexis, 4,860,258, Cl. 365-194.000.
Thorn EMI plc: *See*—
Balderson, Simon, 4,859,835, Cl. 219-543.000.
Thorn, George T., to Octagon Industries Inc. Reusable display sign or card having alphanumeric information. 4,858,357, Cl. 40-450.000.
Thorp, Graham M.; Allchin, James F. C.; Marquis, Geoffrey F.; Burattini, Dino; and Watt, Peter J. Cable ducting system. 4,858,401, Cl. 52-100.000.
Thurn, Gerhard; and Gast, Theodor. Optoelectrical measuring system and apparatus. 4,859,062, Cl. 356-371.000.
Thyssen Edelstahlwerke AG: *See*—
Behr, Friedrich, 4,859,338, Cl. 210-490.000.
Bohnke, Kurt; Brandis, Helmut; Domalski, Hans-Heinrich; Fleischer, Hans-Joachim; and Frinken, Heinrich, 4,859,649, Cl. 502-439.000.
Thyssen Industrie AG: *See*—
Bolling, Fritz C.; and Sellner, Josef, 4,858,962, Cl. 285-136.000.
Tice Engineering & Sales Inc.: *See*—
Tice, William A., 4,859,260, Cl. 156-88.000.
Tice, William A., to Tice Engineering & Sales Inc. Apparatus and method for cutting and sealing belt loop ends and belt loop construction. 4,859,260, Cl. 156-88.000.
Tiedemann, William H.: *See*—
Binder, Richard R.; Bantz, Paul E.; Tiedemann, William H.; McDonald, Guy D.; and Wruck, William J., 4,859,546, Cl. 429-53.000.
Tihanyi, Jenoe; and Weber, Roland, to Siemens Aktiengesellschaft. Optocoupler for power FET. 4,859,875, Cl. 307-311.000.
Tillin, Inc.: *See*—
Macfarlane, John O., deceased; and MacFarlane, John A., personal representative, 4,859,480, Cl. 426-310.000.
Tilman, Menachem: *See*—
Gross, Joseph; Lowenstein, David; Tilman, Menachem; and Rosenberg, Etan, 4,858,600, Cl. 128-65.000.
Timar, Peter: *See*—
Caer, Gyula; Csikos, Antal; and Timar, Peter, 4,858,569, Cl. 123-52.0MB.
Tinti, Maria O.: *See*—
Cavazza, Claudio; De Witt, Paolo; and Tinti, Maria O., 4,859,698, Cl. 514-445.000.
Titus, Hans-Joachim. Shut-off valve. 4,858,641, Cl. 137-244.000.
Titus, Joseph S.; Wang, Dexter; and Graham, Harold A., to SSG, Inc. Dynamic thermal display simulator. 4,859,080, Cl. 374-134.000.
TMC Corporation: *See*—
Stritzl, Karl; Freisinger, Henry; and Luschnig, Franz, 4,858,946, Cl. [illegible]
Toberg, Lloyd H. Self cleaning wood incisor. 4,858,660, Cl. 144-2.00J.
Tobin, John, to United States of America, Energy. Breathing zone air sampler. 4,858,476, Cl. 73-863.230.
Tobioka, Masaaki: *See*—
Ikegaya, Akihiko; and Tobioka, Masaaki, 4,859,490, Cl. 427-38.000.
Tobuta, Youichi, to Mitsubishi Denki Kabushiki Kaisha. Dram with reduced-test-time mode. 4,860,259, Cl. 365-201.000.
Tobolski, Francis P., Jr.: *See*—
D'Avello, Robert F.; Rokusek, Daniel S.; and Tobolski, Francis P., Jr., 4,860,336, Cl. 379-63.000.
D'Avello, Robert F.; Tobolski, Francis P., Jr.; and Kowalski, Joseph L., 4,860,341, Cl. 379-91.000.
Togami Electric Mfg. Co.: *See*—
Maki, Kazuyoshi; Otsubo, Masayuki; and Uchida, Shizutaka, 4,860,161, Cl. 361-338.000.
Togawa, Norio: *See*—
Fujimura, Setsuo; Sagawa, Masato; Matsuura, Yutaka; Yamamoto, Hitoshi; and Togawa, Norio, 4,859,255, Cl. 148-302.000.
Tohma, Kiyokazu: *See*—
Sugita, Ryuji; Tohma, Kiyokazu; Honda, Kazuyoshi; and Nanbu, Taro, 4,859,501, Cl. 427-131.000.
Tokai Corporation: *See*—
Nitta, Tomio, 4,859,172, Cl. 431-153.000.
Tokai Rubber Industries, Ltd.: *See*—
Ogata, Kazuhiro, 4,859,380, Cl. 264-25.000.
Tokunaga, Kunishige: *See*—
Sugiura, Sadanobu; Tokunaga, Kunishige; and Kawashima, Teruhisa, 4,858,794, Cl. 222-606.000.
Tokunaga, Shinji: *See*—
Kugimiya, Syuzo; Tokunaga, Shinji; Suzuki, Hitoshi; Fukumochi, Yoji; Shiotani, Shinobu; and Sata, Ichiko, 4,860,206, Cl. 364-419.000.
Tokyo Electron Limited: *See*—
Kagami, Toshihiko; Kobayashi, Kazuyoshi; Asakawa, Eiji; Osada, Atushi; Hara, Kozo; and Abe, Yasuji, 4,859,993, Cl. 340-674.000.
Tokyo Juki Industrial Co., Ltd.: *See*—
Ozawa, Masato, 4,858,541, Cl. 112-121.110.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Fukuma, Yasufumi; Kitao, Ikuo; and Kato, Yasuo, 4,859,051, Cl. 351-211.000.

Tolman, Richard L.: *See*—
Ashton, Wallace T.; Walton, Edward; and Tolman, Richard L., 4,859,680, Cl. 514-274.000.
Tolner, Betty J.: *See*—
Tolner, Raymond C.; and Tolner, Betty J., 4,858,368, Cl. 43-42.360.
Tolner, Raymond C.; and Tolner, Betty J. Fishing lure. 4,858,368, Cl. 43-42.360.
Tominaga, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha. Throttle control device. 4,858,715, Cl. 180-170.000.
Tomita, Naotaka: *See*—
Murase, Masanori; Tomita, Naotaka; Mizuno, Keiichiro; and Iida, Kazuyoshi, 4,858,720, Cl. 181-176.000.
Tomiyama, Hideki, to Fuji Photo Film Co., Ltd. Color diffusion transfer photographic element with reducing sugar. 4,859,564, Cl. 430-216.000.
Tomiyoshi, Kazutoshi: *See*—
Shiobara, Toshio; and Tomiyoshi, Kazutoshi, 4,859,722, Cl. 523-433.000.
Tomko, Donna L.; and Harbison, Kenneth G., to Eastman Kodak Company. Optically brightened polyolefin coated paper support. 4,859,539, Cl. 428-512.000.
Tomlinson, Martin, to Devon County Council. Noise-reduction signal processing arrangement. 4,860,317, Cl. 375-58.000.
Tomljenovic, Juraj: *See*—
Bolsberger, Hans-Ulrich; and Tomljenovic, Juraj, 4,860,160, Cl. 361-279.000.
Tomordi, Elemer: *See*—
Pelyva, Jeno ; Vecsey, K. Istvan; Kolonics, Zoltan; Legradi, Laszlo; Nagy, Lajos; Horvath, Andras; Fodor, Ferenc, deceased; Soptei, Csaba; Sebok, Dezso; Tomordi, Elemer; Lendvai, Laszlo ; Karacsonyi, Bela; and Dioszegi, Erzsebet, 4,859,772, Cl. 544-11.000.
Tone, Eiichi: *See*—
Yamamoto, Haruo; Ichihashi, Takao; Fujisawa, Shuji; Tone, Eiichi; and Tsuda, Takeshi, 4,860,053, Cl. 355-245.000.
Tone, Shoichi; and Kubota, Norio, to Murata Kikai Kabushiki Kaisha. Yarn end finding device. 4,858,836, Cl. 242-18.00R.
Toner, John L., to Eastman Kodak Company. Terpyridine chelating agents. 4,859,777, Cl. 546-256.000.
Tonooka, Takashi; and Katsumata, Toshimitsu, to Texas Instruments Incorporated. Multi-piece connector assembly. 4,859,191, Cl. 439-79.000.
Topaz Development Corp.: *See*—
Cunningham, William J., 4,858,314, Cl. 30-90.000.
Toramoto, Hisao; and Yagi, Tadashi, to Hosiden Electronics Co., Ltd. Pin plug connector. 4,859,197, Cl. 439-675.000.
Toray Industries, Inc.: *See*—
Inouye, Yoshinori; Osawa, Yoshihiko; and Ueda, Minoru, 4,858,528, Cl. 101-175.000.
Seiya, Yuji; and Odawara, Hiroyuki, 4,859,533, Cl. 428-366.000.
Torba, Lajos: *See*—
Balina, Istvan; Kokai, Jozsef; Boro , Lajos; and Torba, Lajos, 4,858,451, Cl. 70-202.000.
Torii, Nobutoshi; Nihei, Ryo; and Terada, Akihiro, to Fanuc Ltd. Arm structure for an industrial robot. 4,859,139, Cl. 414-744.500.
Torrington Company, The: *See*—
Hartnett, Michael J.; Lugosi, Robert; Rollins, James; Cook, John P.; and Clark, Jeffrey A., 4,858,295, Cl. 29-156.40R.
Toshiba Ceramics Co., Ltd.: *See*—
Sugiura, Sadanobu; Tokunaga, Kunishige; and Kawashima, Teruhisa, 4,858,794, Cl. 222-606.000.
Tanaka, Takashi; and Watanabe, Yoshiyuki, 4,859,385, Cl. 264-62.000.
Toshima, Tomoyuki: *See*—
Ukita, Hiroo; Katagiri, Yoshitada; Sawada, Renshi; Uenishi, Yuuji; Isomura, Yoshihiro; Toshima, Tomoyuki; and Mise, Keisuke, 4,860,276, Cl. 369-119.000.
Toshimitsu, Kenshi; and Mizuma, Takashi, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,860,049, Cl. 355-218.000.
Total Compagnie Fracaise des Petroles: *See*—
Durando, Pierre; and LaFaille, Alain, 4,859,196, Cl. 439-197.000.
Toth, Marie A. Intracranial pressure monitoring system. 4,858,619, Cl. 128-748.000.
Toti, Andrew J. Vertical window covering systems. 4,858,668, Cl. 160-84.100.
Tourneur, Roger; and Vasselet, Joel, to Bendix France. Hydraulic braking device for automobile vehicle. 4,858,737, Cl. 188-358.000.
Touya, Hiroki: *See*—
Okuyama, Kouji; and Touya, Hiroki, 4,858,901, Cl. 269-21.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Endoh, Hiroshi; Zama, Yoshimasa; Kadowaki, Nobuo; Yatuka, Takeshi; Nagai, Hiroshi; and Mizumura, Yutaka, 4,859,523, Cl. 428-215.000.
Kurita, Kazuo; and Ishihara, Hideaki, 4,859,389, Cl. 264-130.000.
Toyo Jozo Co., Ltd.: *See*—
Hayashi, Kunioki; Tanaka, Hironori; Sasagawa, Tsutomu; Uemura, Isao; and Aizawa, Akira, 4,858,560, Cl. 119-1.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Yasumuro, Hisakazu; Watanabe, Michio; Taira, Kazuo; Imatani, Tsuneo; and Kurashima, Hideo, 4,858,782, Cl. 220-458.000.
Toyo Tire & Rubber Company Limited: *See*—
Komai, Yukio; and Oda, Keijiro, 4,858,666, Cl. 152-556.000.
Toyonaga, Yufuko; Kimura, Suzushi; Ueda, Masaaki; Tabata, Osamu; and Kimura, Saburo, to Matsushita Electric Industrial Co., Ltd. Method of producing an electrically-conductive transparent film. 4,859,496, Cl. 427-53.100.
Toyosawa, Yukio: *See*—
Kurakake, Mitsuo; Sakamoto, Keiji; and Toyosawa, Yukio, 4,859,920, Cl. 318-567.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Kamimae, Hajime, 4,858,895, Cl. 267-64.160.
Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,858,500, Cl. 74-866.000.
Iwatsuki, Kunihiro; and Shindo, Yoshio, 4,858,496, Cl. 74-863.000.
Kato, Nobuyuki; Kuramochi, Koujiro; Nakamura, Shinya; and Houjo, Yasuo, 4,858,646, Cl. 137-596.160.
Kawakami, Hiroshi; Shiratori, Harunori; Sugihara, Koichi; Watanabe, Atsushi; and Kishida, Fumio, 4,858,713, Cl. 180-143.000.
Nishimura, Yuji; Kawaharazaki, Takashi; Tamura, Keiichi; Matsui, Kenji; Watanabe, Yasutaka; and Yoshitsugu, Noritada, 4,858,953, Cl. 280-807.000.
Ogasawara, Shinji; Isomura, Yukio; and Okudaira, Souichiro, 4,858,973, Cl. 292-347.000.
Sawada, Daisaku; and Takahashi, Takeshi, 4,858,439, Cl. 60-583.000.
Takahashi, Takeshi; Tsuzuki, Naoyuki; Omori, Yukimitsu; and Takamura, Akio, 4,858,466, Cl. 73-119.00A.
TP Orthodontics, Inc.: *See*—
Kesling, Peter C., 4,859,179, Cl. 433-8.000.
Tracht, Steven L., to General Motors Corporation. Window wiper control for vehicle. 4,859,919, Cl. 318-444.000.
Tran, Duc H.: *See*—
Berson, William; Gluck, Julius; Murphy, Patrick; and Tran, Duc H., 4,860,025, Cl. 346-1.100.
Traver, Frank J.: *See*—
Raleigh, William J.; Doin, James E.; and Traver, Frank J., 4,859,529, Cl. 428-290.000.
Traynor, Rodney P.; and Zeedick, Albert F. Lane viewer mirror apparatus for vehicles. 4,859,046, Cl. 350-627.000.
Treder, Wolfgang: *See*—
Thiem, Joachim; Treder, Wolfgang; Keller, Reinhold; and Schlingmann, Merten, 4,859,590, Cl. 435-97.000.
Tremoulet, Olivier L., Jr.; and Raghavan, Chidambaram, to Flow Systems, Inc. High pressure hose fitting and method for sealing high pressure hoses to fittings. 4,858,967, Cl. 285-256.000.
Trethewey, Paul M., to Grass Valley Group, Inc., The. Apparatus for smoothing an abrupt change in signal level. 4,859,955, Cl. 328-169.000.
Trias, Jose R. Device for controlling refuse discharge in textile cleaners. 4,859,218, Cl. 55-213.000.
Trinh, Eugene H.; and Robey, Judith L., to United States of America, National Aeronautics and Space Administration. Acoustic convective system. 4,858,717, Cl. 181-0.500.
TriQuint Semiconductor, Inc.: *See*—
Davenport, William H., 4,859,961, Cl. 330-253.000.
Trout, Torence J., to Du Pont de Nemours, E. I., and Company. Hydroxycarboxylic acids as adjuvants for negative liquid electrostatic developers. 4,859,559, Cl. 430-115.000.
Trouve, Maurice: *See*—
Sauvinet, Vincent; Bletry, Jean; Bonnaud, Micheline; and Trouve, Maurice, 4,859,499, Cl. 427-108.000.
Trumpler, Walter; and Schmidt, Josef, to Sew-Eurodrive Gmbh & Co. Electrical switching unit. 4,860,167, Cl. 361-417.000.
TRW Inc.: *See*—
Neff, Charles E., 4,858,712, Cl. 180-143.000.
TRW United Carr GmbH: *See*—
Kraus, Willibald, 4,859,129, Cl. 411-512.000.
TRW Vehicle Safety Systems, Inc.: *See*—
Lenzen, Reiner, 4,858,951, Cl. 280-741.000.
Trzasko, Peter T.: *See*—
Hasuly, Michael J.; and Trzasko, Peter T., 4,859,509, Cl. 427-442.000.
Trzaskos, William J.: *See*—
Baretz, Bruce H.; and Trzaskos, William J., 4,859,369, Cl. 252-700.000.
Tsai, Jame. Screwdriver with insulated shaft and polygonal driving head. 4,858,504, Cl. 81-436.000.
Tsai, Wen; S. Sucking hole structure for an aluminium foil beverage container. 4,858,766, Cl. 206-628.000.
Tsals, Izrail: *See*—
Knox, Lawrence D.; and Tsals, Izrail, 4,858,818, Cl. 228-164.000.
Tso, Rosa Y. M.: *See*—
Mui, Paul Y. H.; and Tso, Rosa Y. M., 4,860,179, Cl. 362-102.000.
Tsubata, Yukihiro; and Shiino, Masaru, to Fuji Photo Film Co., Ltd. Pneumatic conveying system. 4,859,120, Cl. 406-84.000.
Tsubouchi, Natsuro: *See*—
Kono, Keizo; Kondou, Mitsushige; Tsubouchi, Natsuro; Hime, Shiro; Nishihara, Hiroshi; and Suhara, Toshiaki, 4,859,033, Cl. 350-320.000.
Tsuchimoto, Shuhei: *See*—
Katagiri, Masayuki; Watanabe, Masanori; Uda, Kazutaka; Hijikigawa, Masaya; Tsuchimoto, Shuhei; and Inami, Yasuhiko, 4,859,060, Cl. 356-352.000.
Tsuchiya, Hiroaki: *See*—
Itoh, Masahiro; Murasawa, Yoshihiro; Takeda, Atsushi; Tsuchiya, Hiroaki; and Nakahata, Kimio, 4,860,048, Cl. 355-208.000.
Tsuchiya, Ikuo: *See*—
Matsuo, Kenji; and Tsuchiya, Ikuo, 4,859,970, Cl. 331-57.000.
Tsuchiya, Kiyoshi: *See*—
Akutsu, Shigeru; and Tsuchiya, Kiyoshi, 4,859,894, Cl. 310-239.000.

Tsuchiya, Tomio, to Fuji-Seiki Machine Works, Ltd. Solder coating apparatus. 4,858,554, Cl. 118-224.000.

Tsuda, Takeshi: *See—*
Yamamoto, Haruo; Ichihashi, Takao; Fujisawa, Shuji; Tone, Eiichi; and Tsuda, Takeshi, 4,860,053, Cl. 355-245.000.

Tsudakoma Kogyo Kabushiki Kaisha: *See—*
Suwa, Mitsuru, 4,858,656, Cl. 139-116.000.

Tsui, James B. Y.: *See—*
Shaw, Rudy L.; Tsui, James B. Y.; and Hedge, James N., Jr., 4,860,318, Cl. 375-82.000.

Tsuji, Kazuwo; Sumiya, Hitoshi; Kumazawa, Yoshiaki; Urakawa, Nobuo; and Satoh, Keiichi, to Sumitomo Electric Industries, Ltd. Method for bonding a cubic boron nitride sintered compact. 4,859,531, Cl. 428-333.000.

Tsuji, Kiyoshi: *See—*
Kimura, Kenji; and Tsuji, Kiyoshi, 4,860,091, Cl. 358-22.000.
Kimura, Kenji; and Tsuji, Kiyoshi, 4,860,095, Cl. 358-98.000.

Tsujii, Kaoru: *See—*
Kamiya, Tetsuro; Inoue, Takeshi; Yorozu, Hidenori; Eguchi, Yasuteru; and Tsujii, Kaoru, 4,859,696, Cl. 514-420.000.

Tsukada, Yukihisa: *See—*
Momata, Kazuhiro; Chida, Kousaku; Takeura, Tooru; and Tsukada, Yukihisa, 4,860,140, Cl. 360-127.000.

Tsukakoshi, Kunihiko: *See—*
Yamakoshi, Akira; Fujita, Toyohiko; Tsukakoshi, Kunihiko; and Anraku, Shinji, 4,859,966, Cl. 330-288.000.

Tsukamoto, Katsuhiro; and Matsukawa, Takayuki, to Mitsubishi Denki Kabushiki Kaisha. Semiconeductor memory cell capacitor and method for making the same. 4,859,615, Cl. 437-38.000.

Tsuyama, Kouichi: *See—*
Nakayama, Hajime; Tsuyama, Kouichi; and Okamura, Toshiro, 4,859,505, Cl. 427-305.000.

Tsuzuki, Naoyuki: *See—*
Takahashi, Takeshi; Tsuzuki, Naoyuki; Omori, Yukimitsu; and Takamura, Akio, 4,858,466, Cl. 73-119.00A.

Tufts College, Trustees of: *See—*
Sonnenschein, Carlos; and Soto, Ana M., 4,859,585, Cl. 435-29.000.

TUI Industries: *See—*
Sulzberger, Kevin J., 4,858,681, Cl. 165-70.000.

Tulenko, William. Table-chest. 4,859,009, Cl. 312-277.000.

Tupper, Robert B.; Mangus, James D.; Sharbaugh, John E.; Brown, Gedney B.; Livingston, Julie M.; and Dhalla, Asfandiar K., to Westinghouse Electric Corp. Bottom supported liquid metal nuclear reactor. 4,859,402, Cl. 376-285.000.

Turbo Tek Enterprises, Inc.: *See—*
Proctor, Rudy R.; and Reinstein, Fred M., 4,858,830, Cl. 239-313.000.

Turner, Timothy E., to SGS-Thompson Microelectronics, Inc. Screening of gate oxides on semiconductors. 4,860,079, Cl. 357-41.000.

Tweedle, Allan F., to Siemens Hearing Instruments, Inc. Hearing aid and method for making it. 4,860,362, Cl. 381-69.000.

Twerdochlib, Michael, to Westinghouse Electric Corp. Differential temperature sensors. 4,859,076, Cl. 374-10.000.

Tyger, Wayne H.: *See—*
Ambrose, Ronald R.; O'Dwyer, James B.; Johnston, Byron K.; Zielinski, David P.; Porter, Samuel, Jr.; and Tyger, Wayne H., 4,859,743, Cl. 525-443.000.

Ube Industries, Ltd: *See—*
Shinomura, Yasushi; Yamaguchi, Masahiko; and Fukuzaki, Koichiro, 4,859,535, Cl. 428-398.000.

Uchida, Hideaki: *See—*
Iwamura, Masahiro; Masuda, Ikuro; and Uchida, Hideaki, 4,860,148, Cl. 361-58.000.

Uchida, Noriaki; and Gemma, Hideaki, to Hitachi, Ltd. Multi-window control system. 4,860,247, Cl. 364-900.000.

Uchida, Shizutaka: *See—*
Maki, Kazuyoshi; Otsubo, Masayuki; and Uchida, Shizutaka, 4,860,161, Cl. 361-338.000.

Uchiyama, Keiichi: *See—*
Miyamoto, Yasuo; Arai, Katsuyoshi; and Uchiyama, Keiichi, 4,858,879, Cl. 248-562.000.

Uda, Kazutaka: *See—*
Katagiri, Masayuki; Watanabe, Masanori; Uda, Kazutaka; Hijikigawa, Masaya; Tsuchimoto, Shuhei; and Inami, Yasuhiko, 4,859,060, Cl. 356-352.000.

Uda, Toyokazu: *See—*
Matsumoto, Kentaro; Takaoka, Makoto; Fukumoto, Masami; Uda, Toyokazu; and Sugiura, Susumu, 4,860,026, Cl. 346-1.100.

Ueda, Hidetaka: *See—*
Sakakibara, Yutaka; Ueda, Hidetaka; and Majima, Kunio, 4,860,170, Cl. 362-26.000.

Ueda, Hiroshi: *See—*
Hata, Yoshiaki; Taniguchi, Nobuyuki; Hoda, Takeo; Inoue, Manabu; Kudo, Yoshinobu; and Ueda, Hiroshi, 4,860,039, Cl. 354-106.000.

Ueda, Hiroyuki, to Canon Kabushiki Kaisha. Word processor including spelling verifier and corrector. 4,859,091, Cl. 400-63.000.

Ueda, Masaaki: *See—*
Toyonaga, Yufuko; Kimura, Suzushi; Ueda, Masaaki; Tabata, Osamu; and Kimura, Saburo, 4,859,496, Cl. 427-53.100.

Ueda, Minoru: *See—*
Inouye, Yoshinori; Osawa, Yoshihiko; and Ueda, Minoru, 4,858,528, Cl. 101-175.000.

Uehara, Makoto; Ichikawa, Hajime; Yomoto, Masahiko; and Kato, Shigeru, to Nikon Corporation. Light radiation apparatus. 4,859,832, Cl. 219-411.000.

Uehara, Toshio: *See—*
Sato, Makoto; and Uehara, Toshio, 4,860,221, Cl. 364-522.000.

Uemura, Isao: *See—*
Hayashi, Kunioki; Tanaka, Hironori; Sasagawa, Tsutomu; Uemura, Isao; and Aizawa, Akira, 4,858,560, Cl. 119-1.000.

Uenishi, Yuuji: *See—*
Ukita, Hiroo; Katagiri, Yoshitada; Sawada, Renshi; Uenishi, Yuuji; Isomura, Yoshihiro; Toshima, Tomoyuki; and Mise, Keisuke, 4,860,276, Cl. 369-119.000.

Ueno, Fumio; Yamakawa, Takeshi; and Shirai, Yuji, to Omron Tateisi Electronics Co. Fuzzy logic semifinished integrated circuit. 4,860,243, Cl. 364-807.000.

Uesugi, Kenichi, to Kabushiki Kaisha Kobe Seiko Sho. Rolled strip shape detecting device with high accuracy. 4,860,212, Cl. 364-472.000.

Uetsuhara, Tokio, to Mitsubishi Mining & Cement Co.; and Iwasaki Electronics Co., Ltd. Electromagnetic actuator. 4,859,975, Cl. 335-230.000

Ukaji, Shiroh; Kimura, Hisao; Urata, Kenji; and Kaneda, Toshio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electrospark machine system, assembly for use with system, device for mounting electrospark machining electrode, and method of shaping a workpiece. 4,859,824, Cl. 219-69.150.

Ukita, Hiroo; Katagiri, Yoshitada; Sawada, Renshi; Uenishi, Yuuji; Isomura, Yoshihiro; Toshima, Tomoyuki; and Mise, Keisuke, to Nippon Telegraph and Telephone Corporation. Micro optical head with an optically switched laser diode. 4,860,276, Cl. 369-119.000.

Ulery, Dennis R.: *See—*
Jenkins, Thomas B.; Ulery, Dennis R.; Wilson, Blake W.; Walko, Steven C.; Lee, Lester H.; Salerno, Robert P.; Nason, Robert W.; and Courtney, John P., 4,859,891, Cl. 310-215.000.

Ullrich, Axel: *See—*
Dull, Thomas J.; Riedel, Heimo; and Ullrich, Axel, 4,859,609, Cl. 436-501.000.

Ulmer, Karl: *See—*
Gavin, Michel; Grunder, Urs; and Ulmer, Karl, 4,859,482, Cl. 426-518.000.

Ulryck, Gilles: *See—*
Autie, Pascal J. M.; Avignon, Philippe P.; Camusso, Dominique P.; Forestier, Alexandre; and Ulryck, Gilles, 4,858,721, Cl. 181-213.000.

Umaba, Toshikatsu: *See—*
Rikimaru, Hiroaki; Nakatsuji, Tadao; Umaba, Toshikatsu; Nagano, Kuzuhiko; Mishina, Kazuya; and Shimizu, Hiromitsu, 4,859,439, Cl. 423-239.000.

Umemura, Hiroyuki: *See—*
Matsuda, Kenji; Sugawara, Sakuo; Hara, Masanori; Umemura, Hiroyuki; Ishioka, Hidenori; and Aoki, Katsuyuki, 4,858,824, Cl. 236-94.000.

Umetsu, Chiharu: *See—*
Niikura, Yoshiharu; Fukumura, Takeo; and Umetsu, Chiharu, 4,858,898, Cl. 267-218.000.

Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, to Zaidin Hojin Biseibutsu Kagaku Kenky Kai. New physiologically active substance, arphamenine and production thereof. 4,859,593, Cl. 435-128.000.

Umpleby, Jeffrey D.: *See—*
Cloetens, Rudolphe C.; and Umpleby, Jeffrey D., 4,859,810, Cl. 174-110.0PM.

Underground Technologies, Inc.: *See—*
Kinnan, Frank R., 4,858,703, Cl. 175-19.000.

Unger, Henry M. Apparatus for wet cleaning in particular window panes. 4,858,267, Cl. 15-220.00R.

Unger, Samuel L.; Telles, Rodney W.; and Lubowitz, Hyman R., to Environmental Protection Polymers, Inc. Method for encapsulating hazardous wastes using a staged mold. 4,859,395, Cl. 264-254.000.

Union Siderurgique Du Nord Et De L'Est De La France (USINOR): *See—*
Senillou, Claude; de Framond, Remy; Garnier, Marcel; Yavari, Ali R.; and Joud, Jean-Charles, 4,858,675, Cl. 164-503.000.

Union Special Corporation: *See—*
Adamski, Maximilian; Kosrow, Robert L.; and Ruderman, Stephen, 4,858,546, Cl. 112-286.000.

Unique Knife Manufacturing Corp.: *See—*
Castelluzzo, James, 4,858,319, Cl. 30-125.000.

Unisys Corporation: *See—*
Baron, Kenneth C., 4,860,239, Cl. 364-728.030.

Unit Instruments, Inc.: *See—*
Vavra, Randall J.; and Doyle, Michael, 4,858,643, Cl. 137-486.000.

United States Golf Association: *See—*
Thomas, Frank, 4,858,332, Cl. 33-508.000.

United States of America
Administrator, National Aeronautics and Space Administration: *See—*
Overhauser, Albert W.; and Maserjian, Joseph, 4,860,074, Cl. 357-30.000.
Parma, George F., 4,858,979, Cl. 294-106.000.
Agriculture: *See—*
Shasha, Baruch S.; and Dunkle, Richard L., 4,859,377, Cl. 264-4.100.
Air Force: *See—*
Hose, Eddy, 4,860,015, Cl. 342-168.000.
Linsenmayer, Glenn R., 4,860,216, Cl. 364-516.000.
Reinhart, Theodore J., 4,858,264, Cl. 15-93.00R.
Shaw, Rudy L.; Tsui, James B. Y.; and Hedge, James N., Jr., 4,860,318, Cl. 375-82.000.

Army: *See—*
Arenta, Donald N., 4,859,026, Cl. 350-96.250.
Gittleman, Jonathan I.; and Bozowski, Stanley, 4,859,939, Cl. 324-158.00R.
Grudkowski, Thomas W., 4,860,017, Cl. 342-201.000.
Jasper, Louis J., Jr., 4,858,511, Cl. 89-8.000.
Jasper, Louis J., Jr., 4,858,512, Cl. 89-8.000.
Kronenberg, Stanley, 4,859,853, Cl. 250-370.070.
Leupold, Herbert A., 4,859,973, Cl. 335-216.000.
Leupold, Herbert A., 4,859,976, Cl. 335-306.000.
Malinowski, Gregory J.; and Schodowski, Stanley S., 4,859,969, Cl. 331-43.000.
Paolella, Arthur; and Herczfeld, Peter R., 4,859,965, Cl. 330-285.000.
Russell, Stephen D., 4,860,303, Cl. 372-72.000.

Energy: *See—*
Harrison, Thomas R., 4,859,054, Cl. 356-5.000.
Hwang, David L.; and Hosea, Joel C., 4,858,817, Cl. 228-122.000.
Lieberman, Morton L., 4,858,529, Cl. 102-202.500.
Tobin, John, 4,858,476, Cl. 73-863.230.
Wheatley, John C.; Swift, Gregory W.; Migliori, Albert; and Hofler, Thomas J., 4,858,441, Cl. 62-6.000.

National Aeronautics and Space Administration: *See—*
Byer, Robert L.; and Fan, Tso Y., 4,860,295, Cl. 372-19.000.
Johnston, David F., 4,860,149, Cl. 361-79.000.
Lange, Gregory A.; McManamen, John P.; and Schliesing, John A., 4,858,857, Cl. 244-161.000.
Shores, Paul W.; Griffin, John W.; and Kobayashi, Herbert S., 4,860,014, Cl. 342-105.000.
Trinh, Eugene H.; and Robey, Judith L., 4,858,717, Cl. 181-0.500.

Navy: *See—*
Bobb, Lloyd C.; White, Barbara J.; and Davis, Jon P., 4,859,059, Cl. 356-345.000.
Huntley, William P., 4,860,013, Cl. 342-20.000.

U.S. Philips Corporation: *See—*
Boskamp, Eddy B., 4,859,947, Cl. 324-318.000.
Bradinal, Werner H. W., 4,859,883, Cl. 307-546.000.
Clasen, Rolf, 4,859,224, Cl. 65-17.000.
Decraemer, Alain, 4,859,915, Cl. 315-371.000.
De Leeuw, Dagobert M.; Klaassen, Dirk B. M.; and Mutsaers, Cornelis A. H. A., 4,859,902, Cl. 313-474.000.
Deusser, Peter G.; Boehm, Detlef M.; Eiden, Karl W.; and Becker, Johann A., 4,859,020, Cl. 350-96.200.
Engel, Ludovicus H. M.; and Pieket Weeserik, Pieter C., 4,860,293, Cl. 371-51.000.
Hennings, Detlev; Stormberg, Hans-Peter; and Peterek, Manfred, 4,860,269, Cl. 368-107.000.
Jatteau, Michel R., 4,860,205, Cl. 364-413.240.
Josquin, Wilhelmus J. M. J., 4,859,630, Cl. 437-203.000.
Klee, Mareike K.; and Brand, Hans-Wolfgang, 4,859,448, Cl. 423-598.000.
Krause, Matthias R., 4,858,710, Cl. 177-211.000.
Lamnabhi, Moustanir; and Salembier, Philippe, 4,860,310, Cl. 375-18.000.
Lorteije, Jean H. J., 4,860,132, Cl. 360-84.000.
Raguet, Philippe, 4,859,929, Cl. 323-316.000.
Rakhodai, Issa; Lefebvre, Serge G.; and Couderc, Pascal, 4,860,100, Cl. 358-148.000.
Schmitt, Hans J.; Schmitz, Gunter L.; and Dammann, Hans, 4,859,013, Cl. 350-96.120.
Schmitt, Hans-Jurgen; and Dammann, Hans O. B., 4,859,014, Cl. 350-96.130.
Sharpe, Robin, 4,859,959, Cl. 329-124.000.
Taupin, Dominique; and Vilard, Philippe, 4,860,106, Cl. 358-181.000.
Thompson-Russell, Kathryn C., 4,859,901, Cl. 313-403.000.
Vaes, Henricus M. J., 4,860,078, Cl. 357-34.000.
van der Meer, Jan, 4,860,125, Cl. 360-13.000.
van Roermund, Arthur H. M., 4,860,354, Cl. 381-7.000.

United Technologies Corporation: *See—*
Burke, William F.; and Kane, Daniel E., 4,859,142, Cl. 415-116.000.
Hall, Kenneth B.; and Landis, Kenneth K., 4,859,147, Cl. 416-97.00R.
Hibyan, Edward S., 4,859,148, Cl. 416-134.00A.
Larrabee, John R.; Lucas, Arthur W.; and Faucher, Peter A., 4,859,143, Cl. 415-142.000.

United Technologies Electro Systems, Inc.: *See—*
Ibrahim, Faik K., 4,858,452, Cl. 70-275.000.

Universal Simplex Building System: *See—*
Ricchini, John A., 4,858,398, Cl. 52-90.000.

University of California, The Regents of the: *See—*
Cram, Donald J.; Chapoteau, Eddy; Czech, Bronislaw P.; Gebauer, Carl R.; Helgeson, Roger C.; Kumar, Anand; and Leong, Koon-Wah, 4,859,606, Cl. 436-79.000.
Rutter, William J., 4,859,465, Cl. 424-89.000.

University of Florida: *See—*
Hench, Larry L.; and Lee, Burtrand I., 4,859,525, Cl. 428-260.000.
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,859,463, Cl. 424-84.000.

University of Illinois, The Board of Trustees of the: *See—*
Franke, Steven J.; Boesch, Ronald D.; and Magin, Richard L., 4,859,972, Cl. 333-164.000.

University of Kansas: *See—*
Borchardt, Ronald T.; and Borcherding, David R., 4,859,677, Cl. 514-261.000.

University of Manitoba: *See—*
McLeod, Robert; Card, Howard; Hortensius, Peter; and Pries, Werner, 4,860,236, Cl. 364-717.000.

University of Massachusetts Medical Center: *See—*
Fay, Fredric S.; Fogarty, Kevin E.; and Rodgers, Cyril, 4,859,063, Cl. 356-418.000.

University of Missouri, The Curators of the: *See—*
Ehrhardt, Gary J., 4,859,431, Cl. 423-2.000.

University of Pennsylvania, Trustees of the: *See—*
Latour, Robert A., Jr.; and Black, Jonathan, 4,858,473, Cl. 73-805.000.

University of Toronto Innovations Foundation, The: *See—*
Diosady, Levente L.; Rubin, Leon J.; and Tar, Csaba G., 4,859,371, Cl. 260-412.400.

University of Waterloo: *See—*
Rempel, Garry L.; and Mohammadi, Navroz A., 4,858,637, Cl. 137-12.000.

UOP: *See—*
Cabrera, Carlos A., 4,859,424, Cl. 422-144.000.
Chao, Chien C., 4,859,217, Cl. 55-68.000.
Julian, Scott C.; and Cetinkaya, Ismail B., 4,859,430, Cl. 422-310.000.
Pellet, Regis J.; Coughlin, Peter K.; Staniulis, Mark T.; Long, Gary N.; and Rabo, Jule A., 4,859,314, Cl. 208-114.000.
Sechrist, Paul A.; and Koves, William J., 4,859,643, Cl. 502-37.000.

UOP Inc.: *See—*
Lengemann, Robert A.; Thompson, Gregory J.; Vickers, Anthony G.; and Mott, Raymond W., 4,859,313, Cl. 208-113.000.

UPA Technology, Inc.: *See—*
Weiser, Murray; Silverman, William; Landau, Zvi; Finer, Paul; and Pincus, Cary I., 4,860,329, Cl. 378-50.000.

Urakawa, Nobuo: *See—*
Tsuji, Kazuwo; Sumiya, Hitoshi; Kumazawa, Yoshiaki; Urakawa, Nobuo; and Satoh, Keiichi, 4,859,531, Cl. 428-333.000.

Urata, Kenji: *See—*
Ukaji, Shiroh; Kimura, Hisao; Urata, Kenji; and Kaneda, Toshio, 4,859,824, Cl. 219-69.150.

Urquhart, William P.: *See—*
Brierley, Michael C.; Mallinson, Stephen R.; Millar, Colin A.; and Urquhart, William P., 4,859,017, Cl. 350-96.150.

Ury, Michael G.; and Wood, Charles H., to Fusion Systems Corportion. Deep UV lamp bulb with improved fill. 4,859,906, Cl. 313-639.000

Ushijima, Takao: *See—*
Saotome, Masaru; Ushijima, Takao; Noguchi, Takeshi; Sato, Naomi; and Nakao, Tsutomu, 4,858,899, Cl. 267-219.000.

Usui Kokusai Sangyo Kabushiki Kaisha: *See—*
Takigawa, Kazunori, 4,859,150, Cl. 416-223.00R.

Usui Kokusai Sangyo Kaisha Ltd.: *See—*
Suzuki, Ryoichi, 4,858,734, Cl. 188-273.000.
Usui, Masayoshi, 4,858,964, Cl. 285-156.000.

Usui, Masayoshi, to Usui Kokusai Sangyo Kaisha Ltd. T-joint for connecting branch pipe. 4,858,964, Cl. 285-156.000.

Usui, Minoru: *See—*
Kawamura, Masao; and Usui, Minoru, 4,859,998, Cl. 340-784.000.

Vacuum Furnace Systems Corporation: *See—*
Gibb, Thomson B., 4,860,306, Cl. 373-112.000.

Vadseth, Jan E., to Meta-Fer Holding S.A. Airport lighting. 4,860,182, Cl. 362-364.000.

Vaes, Henricus M. J., to U.S. Philips Corp. High-frequency transistor with low internal capacitance and low thermal resistance. 4,860,078, Cl. 357-34.000.

Val, Yefim: *See—*
Patterson, John H.; Lowe, Tony M.; Bernadic, Thomas J.; Val, Yefim; Katbi, Karl A.; and Zimmerman, Charles E., 4,859,122, Cl. 407-114.000.

Valentine, Robert C.: *See—*
Miller. James J.; and Valentine, Robert C., 4,858,464, Cl. 73-49.500.

Valentini, Jose E., to Du Pont de Nemours, E. I., and Company. Process for cleaning enclosed vessels. 4,859,249, Cl. 134-22.180.

Valmet Paper Machinery Inc.: *See—*
Westergard, Sivert; and Koivukunnas, Pekka, 4,858,553, Cl. 118-126.000.

Vanaschen, Luc: *See—*
Kuster, Hans-Werner; Radermacher, Herbert; and Vanaschen, Luc, 4,859,225, Cl. 65-104.000.

Van Auken, John A.; and Kaufman, M. Gene. Object touchdown and net contact detection systems and game apparatus employing same. 4,859,986, Cl. 340-323.00R

van Blerk, Victor B., to Verbatim Corp. Temperature/humidity indicator for a floppy disk cassette. 4,860,143, Cl. 360-133.000

Van Broekhoven, Johannes A. M.; and Drent, Eit, to Shell Oil Company. Catalyst compositions and a process for polymerizing carbon monoxide and olefins. 4,859,644, Cl. 502-154.000.

Van Broekhoven, Johannes A. M.; and Drent, Eit, to Shell Oil Company. Catalyst compositions and a process for polymerizing carbon monoxide and olefins. 4,859,645, Cl. 502-154.000.

Vance Products Incorporated d/b/a/ Cook Urological Incorporated and Cook OB/GYN: *See—*
Shihata, Alfred A., 4,858,624, Cl. 128-854.000.

van den Berg, Johannes A.: *See—*
Hollenberg, Cornelis P.; Das, Sunil; De Leeuw, Albert; and van den Berg, Johannes A., 4,859,596, Cl. 435-172.300.

Vandenburgh, Herman H. Tamper resistant radon detector system. 4,859,865, Cl. 250-253.000.

van den Heuvel, Anthony P.; Kotzin, Michael D.; and Crisler, Kenneth J., to Motorola, Inc. Quality improvement for a digitally transmitted information signal. 4,860,312, Cl. 375-26.000.
VanderBilt, Herbert J.; and Modert, Timothy D., to Amway Corporation. Method of making a water filter. 4,859,386, Cl. 264-113.000.
van der Meer, Jan, to U.S. Philips Corporation. Apparatus for recording information in a magnetic record carrier with control to selectively record a whole or part of a track. 4,860,125, Cl. 360-13.000
Van Leeuwen, Petrus W. N. M.: *See*—
Drent, Eit; Wife, Richard L.; and Van Leeuwen, Petrus W. N. M., 4,859,764, Cl. 528-392.000.
Van Naarden, Robert, to Ideal Industries, Inc. Torque control for automatic connector assembly tool. 4,858,312, Cl. 29-861.000.
Van Niekerk, John R., to Chemical Vulcanising Systems (Proprietary) Limited. Method and apparatus for repairing a cable. 4,859,534, Cl. 428-343.000.
van Roermund, Arthur H. M., to U. S. Philips Corporation. Arrangement for decoding a stereo multiplex signal. 4,860,354, Cl. 381-7.000.
Vanvoren, Claude: *See*—
Dreyer, Christian; Thomas, Jean-Claude; and Vanvoren, Claude, 4,859,175, Cl. 432-4.000.
Vapor Technologies Inc.: *See*—
Pinkhasov, Eduard, 4,859,489, Cl. 427-37.000.
Varma, Shivendra. Hair dryer. 4,858,336, Cl. 34-90.000.
Vartanian, George: *See*—
Scheffler, Glenn W.; and Vartanian, George, 4,859,545, Cl. 429-17.000.
Vasselet, Joel: *See*—
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Tourneur, Roger; and Vasselet, Joel, 4,858,737, Cl. 188-358.000.
Vavra, Randall J.; and Doyle, Michael, to Unit Instruments, Inc. Fluid flow stabilizing apparatus. 4,858,643, Cl. 137-486.000.
VDO Adolf Schindling AG: *See*—
Wietschorke-Muhsold, Stephan; and Gocking, Wolfgang, 4,858,639, Cl. 137-116.500
VEB Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Schumann, Frank, 4,858,539, Cl. 112-21.000.
Vecchia, Gino D., to Sperotto Rimar S.P.A. Apparatus for the continuous decating of a fabric. 4,858,448, Cl. 68-5.00E.
Vecht, Aron: *See*—
Higton, Malcolm H.; and Vecht, Aron, 4,859,904, Cl. 313-506.000.
Vecsey, K. Istvan: *See*—
Pelyva, Jeno ; Vecsey, K. Istvan; Kolonics, Zoltan; Legradi, Laszlo; Nagy, Lajos; Horvath, Andras; Fodor, Ferenc, deceased; Soptei, Csaba; Sebok, Dezso; Tomordi, Elemer; Lendvai, Laszlo ; Karacsonyi, Bela; and Dioszegi, Erzsebet, 4,859,772, Cl. 544-11.000.
Veitengruber, James E.: *See*—
Konicke, Michael L.; Veitengruber, James E.; and Loesch, James G., 4,860,007, Cl. 340-173.000.
Velez, Jose: *See*—
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Vella, Paul J.: *See*—
O'Sullivan, Maurice S.; Kim, Hyung B.; So, Vincent C.; and Vella, Paul J., 4,859,018, Cl. 350-96.160.
Venezia, J. William: *See*—
Klosin, John J.; and Venezia, J. William, 4,859,812, Cl. 174-135.000.
Verbatim Corp.: *See*—
van Blerk, Victor B., 4,860,143, Cl. 360-133.000.
Verbrugge, Calvin J.: *See*—
Bosanec, Thomas P.; Lukow, Kenneth R.; and Verbrugge, Calvin J., 4,859,752, Cl. 526-209.000.
Verheyen, Michael R.: *See*—
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Vermeulen, Leon L.: *See*—
De Keyzer, Rene M.; Pollet, Robert J.; and Vermeulen, Leon L., 4,859,565, Cl. 430-231.000.
Vermont Castings, Inc.: *See*—
Guest, John H.; and Crain, Lewis E., 4,858,536, Cl. 110-166.000.
Vetter, Heinz, to Rohm GmbH Chemische Fabrik. Process and device for the production of plastic films. 4,859,392, Cl. 264-166.000.
Viala, Jean C.: *See*—
Bouix, Jean; Viala, Jean C.; Vincent, Henri; Vincent, Christiane; Ponthenier, Jean L.; and Dazord, Jacques, 4,859,503, Cl. 427-249.000.
Vickers, Anthony G.: *See*—
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Vickers plc: *See*—
Watkiss, Philip J., 4,859,290, Cl. 204-33.000.
Vickers Shipbuilding & Engineering Limited: *See*—
Box, Robert L.; and Cottrell, Peter R., 4,859,107, Cl. 403-24.000
Vicon Industries, Inc.: *See*—
Pshtissky, Yacov A.; and Gao, Shi-Yang, 4,860,101, Cl. 358-149.000.
Victor Company of Japan, Ltd.: *See*—
Sakaguchi, Hironao; Yoshida, Masaji; and Matsuo, Yasutoshi, 4,860,105, Cl. 358-167.000.
Viehweg, Clark M.: *See*—
Nichols, John L.; Wang, David; Kirkpatrick, Edward; Viehweg, Clark M.; Morton, Edwin S.; and Hua, Van T., 4,860,112, Cl. 358-400.000.
Viers, Tamela A.: *See*—
Pike, Charles O.; and Viers, Tamela A., 4,859,521, Cl. 428-195.000.
Vigander, Svein: *See*—
Schohl, Gerald A.; and Vigander, Svein, 4,858,460, Cl. 73-19.000.
Vigneron, Gilbert: *See*—
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Taupin, Dominique; and Vilard, Philippe, 4,860,106, Cl. 358-181.000.
Vinal, Albert W.; and Cunningham, Earl A., to International Business Machines Corp. Differentially sensitive single track read/write head design with improved biasing. 4,860,138, Cl. 360-113.000.
Vincent, Christiane: *See*—
Bouix, Jean; Viala, Jean C.; Vincent, Henri; Vincent, Christiane; Ponthenier, Jean L.; and Dazord, Jacques, 4,859,503, Cl. 427-249.000.
Vincent, Henri: *See*—
Bouix, Jean; Viala, Jean C.; Vincent, Henri; Vincent, Christiane; Ponthenier, Jean L.; and Dazord, Jacques, 4,859,503, Cl. 427-249.000.
Vining, Kenneth: *See*—
Jacobson, Walter E.; Summers, Donald J.; Vining, Kenneth; and Jackson, Frederick E., 4,858,475, Cl. 73-862.540.
Vinson, Charles S. Decorative fan assembly. 4,858,669, Cl. 160-134.000.
Virginia Tech Intellectual Properties, Inc.: *See*—
Tabisz, Wojciech A.; Lee, Fred C.; and Jovanovic, Milan M., 4,860,184, Cl. 363-17.000.
Virta, Arto: *See*—
Strommer, Pekka; and Virta, Arto, 4,860,330, Cl. 378-162.000.
Viscusi, David A., to General Signal Corporation. Apparatus with novel housing having universal bearing support structure. 4,859,086, Cl. 384-126.000.
Visi-Trol Engineering Co.: *See*—
Galarowic, Lawrence A., 4,858,301, Cl. 29-563.000.
Visser, Aric, to Extrema Systems International Corp. Adaptive extrema coding signal processing system. 4,860,356, Cl. 381-41.000.
Vistech Consultants, Inc.: *See*—
McFarland, Diana R.; Ginsburg, Robert P.; and Ginsburg, Arthur P., 4,859,052, Cl. 351-239.000.
Vlasbloem, Hugo, to B.V. Optisch Industrie 'De Oude Delft' . Dosimeter for ionizing radiation. 4,859,855, Cl. 250-385.100.
Vogel, Friedrich: *See*—
Goertz, Hans-Helmut; Oftring, Alfred; and Vogel, Friedrich, 4,859,756, Cl. 526-263.000.
Voges, Heinz-Werner: *See*—
Kupper, Friedrich-Wilhelm; Voges, Heinz-Werner; Patzold, Werner; and Schaaf, Richard, 4,859,790, Cl. 560-75.000.
Volkswagen AG: *See*—
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Vollmer Werke Maschinenfabrik GmbH: *See*—
Beck, Ernst; Riehlein, Fritz; and Lenard, Peter, 4,858,392, Cl. 51-218.00R.
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Schonlau, Juergen; Volz, Peter; and Harth, Ralf, 4,858,999, Cl. 303-9.630
von Allwoerden, Wilhelm, to Greenland GmbH & Co. KG. Mowing machine. 4,858,418, Cl. 56-15.500.
von Broock, Ulrich, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Mounting support arrangement for an engine and driving assembly of a motor vehicle which operates at a limited frequency range. 4,858,900, Cl. 267-219.000.
Von Criegern, Rolf; Fazekas, Peter; and Fottner, Johannes, to Siemens Aktiengesellschaft. Method and apparatus for storing measured data from sub-regions of a sputter crater which is generated and analyzed in a secondary ion mass spectrometer. 4,860,225, Cl. 364-551.010.
von der Embse, U. A., to Hughes Aircraft Company. Lock detector for feedback loops. 4,860,321, Cl. 375-96.000.
Voss, Jeffrey L.: *See*—
Fowler, Ronald E.; Voss, Jeffrey L.; and Cain, Stephen D., 4,858,890, Cl. 254-335.000.
Voss, Jørgen T.; and Christensen, Asger P., to Struers A/S. Methods and means for use in examining the quality of plated-through holes in circuit boards. 4,858,479, Cl. 73-865.900.
Vrieland, G. Edwin, to Dow Chemical Company, The. Olefin oxidation catalyst of unsupported silver containing low levels of magnesium. 4,859,786, Cl. 549-537.000.
Vu, Cung, to W. R. Grace & Co.-Conn. Castor oil based polyurethane for bridge deckings and related applications. 4,859,735, Cl. 524-780.000.
Vulimiri, Sudhakar: *See*—
Gould, Martin; and Vulimiri, Sudhakar, 4,859,604, Cl. 436-15.000.
Vytlacil, Richard. Process for electrochemically oxidizing sulphuric acid chromium-III-solutions to chromium-VI-solutions. 4,859,294, Cl. 204-97.000.
W. L. Gore & Associates, Inc.: *See*—
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Sanders, Mark S., 4,858,310, Cl. 29-828.000.
W. R. Grace & Co.: *See*—
Friedrich, Steven G.; and Davis, Kent A., 4,859,514, Cl. 428-36.600.
W. R. Grace & Co.-Conn.: *See*—
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Pereira, Carmo J.; Kubsh, Joseph E.; and Hegedus, Louis, 4,859,433, Cl. 423-212.000
Vu, Cung, 4,859,735, Cl. 524-780.000.
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W. S. Libbey Co.: *See*—
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WABCO Westinghouse Fahrzeugbremsen GmbH: *See*—
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Wada, Kayoko: *See*—
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Wada, Toshiaki; Katsuyama, Yoshiaki; Furukawa, Mitsuhiko; Kitahira, Takashi; Miyahara, Michito; Misumi, Kiyohito; and Shiroyama, Masaharu, to Sumitomo Special Metals Co., Ltd.; and Nippon Tungsten Co., Ltd. Magnetic head sliders, materials therefor, and the process for the production thereof. 4,859,638, Cl. 501-58.000.
Wada, Yasuo: *See*—
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Waddell, Ewan M.; Orr, James S.; and Monachan, Brian C., to Barr & Stroud Limited. Optical coating. 4,859,536, Cl. 428-408.000.
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Wagoner, James D.: *See*—
Irwin, John W.; and Wagoner, James D., 4,859,815, Cl. 178-69.00D.
Waibel, Helmut K., to Xerox Corporation. Impact mechanism for impact printer. 4,859,096, Cl. 400-157:200.
Wakabayashi, Toshio: *See*—
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Wall, Stephen W., to Hughes Aircraft Company. Hermetic feedthrough connector for fiber optic transmission. 4,859,021, Cl. 350-96.200.
Wallace, Donovan B.; and Pierce, William C., to Lear Siegler Neway Corp. Lightweight trailing arm suspension. 4,858,949, Cl. 280-713.000.
Wallace, Richard E.: *See*—
Brown, David B.; and Wallace, Richard E., 4,860,284, Cl. 370-88.000.
Wallace, William G., to Amoco Corporation. Ballistic lubricating and process. 4,858,534, Cl. 102-511.000.
Walsh, Brendan R.; and Dantonio, Marietta T. Anchoring member for a fabric stretcher. 4,858,349, Cl. 38-102.910.
Walter, James F.; and Sherwin, Martin B., to W. R. Grace & Co.-Conn. Transamination process for producing amino acids. 4,859,591, Cl. 435-106.000.
Walters, David W.: *See*—
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Walton, Charles F.; Sucheski, Robert J.; Bridenbaugh, James F.; and Chapman, James J., to Smithers-Oasis Company. Floral container and water reservoir. 4,858,381, Cl. 47-79.000.
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Wang, Patrick S., to Johnson Electric Industrial Manufactory Limited. Commutator with resiliently clamped resistor ring. 4,859,893, Cl. 310-234.000.
Wang, Richard H. S.; and Myers, Garry L., to Eastman Kodak Company. Bis-benzotriazolyl compounds and polymeric materials stabilized therewith. 4,859,726, Cl. 524-91.000.
Warburg, Richard J. Closed container opener. 4,858,502, Cl. 81-3.570.
Wareham, William, to Dynisco, Inc. Pressure transducer. 4,858,471, Cl. 73-706.000.
Warner-Lambert Company: *See*—
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Watanabe, Hirokazu; and Shinmi, Masamichi, to Yoshida Kogyo K. K. Ornamental button. 4,858,281, Cl. 24-113.0MP.
Watanabe, Kazuo; Takahashi, Yutaka; and Takimoto, Masaaki, to Fuji Photo Film Co., Ltd. Printing head with current passing through the print wire. 4,859,095, Cl. 400-124.000.
Watanabe, Kiyoshi: *See*—
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Watanabe, Yoshitaka; Sakurada, Nobuaki; Aoki, Makoto; and Sato, Eiichi, to Canon Kabushiki Kaisha. Ink jet recording apparatus with ambient temperature detecting means for providing a signal to drive control means responsive to a recording-density data signal. 4,860,034, Cl. 346-140.00R.
Watanabe, Yoshiyuki: *See*—
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Watkins, Harry E.; Balch, Brent F.; Oakes, Jeffery T.; Copeland, Richard L.; Patterson, Hubert A.; and Martinson, Mart, to Sensormatic Electronics Corporation. Electronic article surveillance system employing time domain and/or frequency domain analysis and computerized operation. 4,859,991, Cl. 340-572.000.
Watkins, Joseph J.: *See*—
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Webb, John L., to Xerox Corporation. Fuser system. 4,859,831, Cl. 219-216.000.
Webb, Spencer L., to Analog Devices, Inc. Single-winding magnetometer with oscillator duty cycle measurement. 4,859,944, Cl. 324-253.000.

Weber, Hans-Leo: *See—*
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Wei, Ching-Yeu; and Pimbley, Joseph M., to General Electric Company. Graded extended drain concept for reduced hot electron effect. 4,859,620, Cl. 437-44.000.
Weigel, Peter, to Nixdorf Computer AG. Dispensing device for sheet material. 4,858,905, Cl. 271-10.000.
Weinbrecht, John F. High ratio recirculating gas compressor. 4,859,158, Cl. 418-9.000.
Weingart, Steve H., to International Business Machines Corporation. Tamper-resistant packaging for protection of information stored in electronic circuitry. 4,860,351, Cl. 380-3.000.
Weise, Wolfgang; Wolmer, Roger; and Braumann, Peter, to Degussa Aktiengesellschaft. Silver-iron material for electrical contacts. 4,859,238, Cl. 75-233.000.
Weiser, Murray; Silverman, William; Landau, Zvi; Finer, Paul; and Pincus, Cary I., to UPA Technology, Inc. X-ray fluorescence thickness measuring device. 4,860,329, Cl. 378-50.000.
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Weldon, William F.; Gully, John H.; and Pichot, Mark A., to Board of Regents, The University of Texas System. Method of constructing a rotor assembly for homopolar generator. 4,858,304, Cl. 29-598.000.
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Welschof, Hans-Heinrich; and Beier, Rudolf, to Lohr & Bromkamp GmbH. Wheel supporting assembly. 4,858,998, Cl. 301-124.00R.
Weng, Hsi K. Gauger for cars. 4,858,467, Cl. 73-146.800.
Wenger, Jean; and Winternitz, Paul, to Hoffmann-La Roche Inc. 3-Aryluracils having an ether (thio) carbomyloxy or sulphomyloxy substituent on the aromatic moiety. 4,859,229, Cl. 71-92.000.
Wengert, Ulrich, to Siemens Aktiengesellschaft. High-availability computer system with a support logic for a warm start. 4,860,196, Cl. 364-200.000.
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Wessling, Ritchie A.; Chau, Chieh-Chun; and Burmester, Alan F., to Dow Chemical Company, The. Microporous membranes of syndiotactic vinylaromatic polymers. 4,859,339, Cl. 210-500.340.
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West, David W. Landscape edging. 4,858,379, Cl. 47-33.000.
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Westergard, Sivert; and Koivukunnas, Pekka, to Valmet Paper Machinery Inc. Short-dwell coater. 4,858,553, Cl. 118-126.000.
Westerman, Everett A.; and Cohodas, Mark S., to Boeing Company, The. Bolted repair for curved surfaces. 4,858,853, Cl. 244-119.000.
Westermann, Jurgen; Kruger, Martin; Arndt, Friedrich; Rees, Richard; and Kotter, Clemens, to Schering Aktiengesellschaft. (6,7-)dihydro-(1,2,4) triazolo (1,5-A) (1,3,5) Triazine-2-sulphonamides, and their use as herbicides and plant growth regulators. 4,859,231, Cl. 71-93.000.
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Richard, Joseph W., 4,859,404, Cl. 376-293.000.
Squarer, David; Colin, Andre; Prior, Robert P.; Mink, Frederick J.; and Liparulo, Nicholas J., 4,859,405, Cl. 376-299.000.
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Westphal, Robert; and Herrmann, Karl, to Diehl GmbH & Co. Test facility, especially for the search head of intelligent guided ammunition. 4,860,016, Cl. 342-169.000.
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Weyer, Paul P. Rotary actuator with backlash elimination. 4,858,486, Cl. 74-409.000.
Weyer, Paul P. Fluid-powered impact device and tool therefor. 4,858,701, Cl. 173-50.000.
Whalen, Joseph W.; Swartz, Gregory L.; Rheaume, Lisa J.; and McCoy, Karen M., to Dow Chemical Company, The. Antibiotic A26201-1 and antibiotic A26201-2 produced by a novel strain of actinoplanes. 4,859,599, Cl. 435-252.600.
Wheatley, John C.; Swift, Gregory W.; Migliori, Albert; and Hofler, Thomas J., to United States of America, Energy. Heat-driven acoustic cooling engine having no moving parts. 4,858,441, Cl. 62-6.000.
Wheeler, N. J.: *See—*
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White, Grover W. Detachable protective cover for a firearm. 4,858,361, Cl. 42-96.000
White, Hollis N., Jr. Hydrostatic steering device. 4,858,714, Cl. 180-148.000.
White, Hollis N., Jr. Cutaway rotor gerotor device. 4,859,160, Cl. 418-61.300.
White, Jay E.; and White, Jay R. Sun visor frame and mounting structure. 4,858,983, Cl. 296-97.130.
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Whitekettle, Wilson K.; and Donofrio, Deborah K., to Betz Laboratories, Inc. Biocidal compositions and use thereof containing a synergistic mixture of 2-bromo-2-nitropropane-1,3-diol and paratolyl sulfonyl acrylonitrile. 4,859,702, Cl. 514-520.000.
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Whitley, William E. Multi-function tester. 4,859,932, Cl. 324-72.500.
Whitley, William N.; and Whitley, James M. Automobile-mounted camper. 4,858,986, Cl. 296-165.000.

Whyte, Jon F. R., to Dowty Mining Machinery Limited. Fluid filtering systems. 4,859,335, Cl. 210-393.000.
Wickersheim, Kenneth A.; and Sun, Mei H., to Luxtron Corporation. Optical system using a luminescent material sensor for measuring very high temperatures. 4,859,079, Cl. 374-131.000.
Wickhen Products, Inc.: *See—*
Abrutyn, Eric S.; and Sloan, Robert J., 4,859,446, Cl. 423-462.000.
Wiech, Raymond E., Jr., to Edge Engineering, Inc. Knife blades and method of making said knife blades. 4,858,324, Cl. 30-357.000.
Wiederaufarbeitungsanlage Karlsruhe Betriebsgesellschaft mbH: *See—*
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Wienck, Dennis A., to Halliburton Company. Dry materials sample collector improvements. 4,858,477, Cl. 73-863.540.
Wietschorke-Muhsold, Stephan; and Gocking, Wolfgang, to VDO Adolf Schindling AG. Current-pressure transducer, particularly for a vacuum control in automotive vehicles. 4,858,639, Cl. 137-116.500.
Wife, Richard L.: *See—*
Drent, Eit; Wife, Richard L.; and Van Leeuwen, Petrus W. N. M., 4,859,764, Cl. 528-392.000.
Wiggins, Charles W. Golf gloves for improved gripping. 4,858,246, Cl. 2-161.00A.
Wiljanen, Bo I.; and Karlsson, Jan-Erik, to Telefonaktiebolaget L M Ericsson. Device in telephone exchanges for running telephone cables from a fixed horizontal cable run to equipment in a rack shelf. 4,860,168, Cl. 361-428.000.
Wilke, Thomas A.: *See—*
Bowman, Ronald R.; Sodal, Ingvar E.; Wilke, Thomas A.; and Weller, Frank, 4,859,848, Cl. 250-296.000.
Wilkinson, Joseph, III. Clamp-type pipe shoe and method. 4,858,861, Cl. 248-74.100.
Wilkinson, William T., to Package Research Corporation. Multiple fluid dispenser. 4,858,785, Cl. 222-145.000.
Williams, David L.; Southwick, Everett W.; and Houminer, Yoram, to Philip Morris Incorporated. Process for preparing acylpyrazine ethers. 4,859,775, Cl. 544-405.000.
Williams International Corporation: *See—*
Herman, Gerald J., 4,858,429, Cl. 60-39.141.
Williams, James R.: *See—*
Bingaman, Barrett P.; Krum, Richard G.; and Williams, James R., 4,858,808, Cl. 226-95.000.
Williams, John F.; and Alexander, Jerry D. Image marker device. 4,860,331, Cl. 378-163.000.
Williams, John W., to Sandoz Ltd. 2,3,6-trichlorobenzohydroxamic acid derivatives. 4,859,233, Cl. 71-100.000.
Williams, Timothy N.: *See—*
Hughes, Cleveland L.; Williams, Timothy N.; and Mandel, Paul M., Jr., 4,859,242, Cl. 106-19.000.
Williamson, Gerald E.; and Hartwig, Donald R., to Yetter Manufacturing Company. Weight transfer linkage arrangement. 4,858,698, Cl. 172-448.000.
Wilmoth, Charles C.; and Wilmoth, Rhonda A. Non-stick drink coaster. 4,858,873, Cl. 248-346.100.
Wilmoth, Rhonda A.: *See—*
Wilmoth, Charles C.; and Wilmoth, Rhonda A., 4,858,873, Cl. 248-346.100.
Wilson, Blake W.: *See—*
Jenkins, Thomas B.; Ulery, Dennis R.; Wilson, Blake W.; Walko, Steven C.; Lee, Lester H.; Salerno, Robert P.; Nason, Robert W.; and Courtney, John P., 4,859,891, Cl. 310-215.000.
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., to International Flavors & Fragrances Inc.; and University of Florida, The. Use of methyl-isoeugenol, n-dodecanol and mixtures of same as insect attractants. 4,859,463, Cl. 424-84.000.
Wimpee, Lealon C.: *See—*
Steinle, Shelton; Sturtz, John P.; Dayal, Yogeshwar; and Wimpee, Lealon C., 4,858,461, Cl. 73-23.000.
Windmoller & Holscher: *See—*
Mundus, Friedhelm, 4,858,842, Cl. 242-56.900.
Winegard Company: *See—*
Dobroski, Eugene H., 4,860,022, Cl. 343-840.000.
Wing, George S. Process for making a joint with a torque-limited collar. 4,858,299, Cl. 29-446.000.
Wingert, Rudolf, to Arrow Fastener Company, Inc. Staple driving tool. 4,858,813, Cl. 227-131.000.
Winter, Russell K.; Harvey, Thomas D.; Kain, Richard S.; and Savas, Nedin, to Russel William Ltd. Shelving system. 4,858,774, Cl. 211-184.000.
Winternitz, Paul: *See—*
Wenger, Jean; and Winternitz, Paul, 4,859,229, Cl. 71-92.000.
Winzer, Gerhard; Maerz, Reinhard; and Stoll, Lothar, to Siemens Aktiengesellschaft. Integrated-optical arrangement for bidirectional optical message or signal transmission. 4,860,294, Cl. 372-7.000.
Wirth, Hermann O.: *See—*
Phillips, Emyr; O'Neil, Robert M.; and Wirth, Hermann O., 4,859,354, Cl. 252-47.500.
Wise, David S.; and Janik, Walter E., to Tameran, Inc. Microfiche printing system and method. 4,860,060, Cl. 355-41.000.
Wise, Rick L., to Texas Instruments Incorporated. Method of forming thin epitaxial layers using multistep growth for autodoping control. 4,859,626, Cl. 437-81.000.
Wissell, Daniel, to Digital Equipment Corp. Apparatus and method for testing impedances of interconnect devices. 4,859,952, Cl. 324-538.000.
Wisseroth, Karl; and Scholl, Richard, to BASF Aktiengesellschaft. Medium and method for irreversible storage of information. 4,860,277, Cl. 369-126.000.
Withycombe, Donald: *See—*
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,859,463, Cl. 424-84.000.
Witt, Russell. Coasters. 4,858,872, Cl. 248-346.100.
Wittek, Gotz U. Self-sealing retractable writing implement. 4,859,103, Cl. 401-108.000.
Wittmann, Dieter: *See—*
Damrath, Volker; Lindner, Christian; Kress, Hans-Jurgen; and Wittmann, Dieter, 4,859,740, Cl. 525-100.000.
Wogan, Gerald N.: *See—*
Groopman, John D.; Wogan, Gerald N.; Bargoot, Frederick G.; and Ferrari, Christopher, 4,859,611, Cl. 436-518.000.
Woilles, Jacques; and Hayward, Pierre, to Societe Anonyme dite: Alsthom. Homogenizing device for a fluid carried in a pipe. 4,859,071, Cl. 366-136.000.
Wojcik, Leszek. Vehicle cover protector—"VCP". 4,858,985, Cl. 296-136.000.
Wolcott, Jeffrey S., to Branson Ultrasonics Corporation. Method of ultrasonically assembling workpieces. 4,859,378, Cl. 264-23.000.
Wolf, Peter: *See—*
Stengl, Gerhard; Loschner, Hans; and Wolf, Peter, 4,859,857, Cl. 250-492.300.
Wolfe, Robert W.; and Morse, James E., to GTE Products Corporation. Process for imparting stir-in capabilities to a silver activated zinc sulfide phosphor. 4,859,497, Cl. 427-68.000.
Wolff, Ulrich: *See—*
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Wolmer, Roger: *See—*
Weise, Wolfgang; Wolmer, Roger; and Braumann, Peter, 4,859,238, Cl. 75-233.000.
Woltermann, Erich H. Filter for making portions of coffee or tea. 4,859,337, Cl. 210-474.000.
Wolters, Conrad: *See—*
Gierse, Franz J.; Pabst, Manfred; Hermanns, Heinz; Ippers, Karl; Krenn, Stephan; Huppe, Friedrich; Opgenoorth, Carl H.; and Wolters, Conrad, 4,858,843, Cl. 242-65.000.
Wolze, David A., to Impact Systems, Inc. Power controller for heater load. 4,859,926, Cl. 323-241.000.
Wong, Anthony Y.; Wong, Daniel; and Chan, Steven S., to LSI Logic Incorporated. Two-mode driver circuit. 4,859,870, Cl. 307-263.000.
Wong, Daniel: *See—*
Wong, Anthony Y.; Wong, Daniel; and Chan, Steven S., 4,859,870, Cl. 307-263.000.
Wong, Jimmy L. Y.; and King, Howard E., to Aerospace Corporation, The. Compact, wideband antenna system. 4,860,020, Cl. 343-828.000.
Wong, Patrick S. L.: *See—*
Guittard, George V.; Wong, Patrick S. L.; Theeuwes, Felix; and Cortese, Richard, 4,859,470, Cl. 424-473.000.
Wood, Charles H.: *See—*
Ury, Michael G.; and Wood, Charles H., 4,859,906, Cl. 313-639.000.
Wood, Leonard J. A., to Bakers Hughes Inc. Ground mounted traction drive and method for sedimentation device. 4,859,346, Cl. 210-776.000.
Wood Manufacturing Co., Inc.: *See—*
Stone, Wayne B., 4,858,787, Cl. 222-188.000.
Woodall, Jerry M.: *See—*
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Kirchner, Peter D.; Marks, Ronald F.; Pettit, George D.; Woodall, Jerry M.; and Wright, Steven L., 4,860,066, Cl. 357-16.000.
Woodley, George M.; McGrail, Richard A.; Powers, Stephen J.; and Ross, William W., to King Instrument Corporation. Apparatus for loading tape into a cassette. 4,858,841, Cl. 242-56.00R.
Worah, Dilip M.: *See—*
Quay, Steven C.; and Worah, Dilip M., 4,859,451, Cl. 424-9.000.
Worksaver, Inc.: *See—*
Burenga, Thomas I., 4,859,136, Cl. 414-607.000.
Worthen Industries, Inc.: *See—*
Bragole, Robert A., 4,859,540, Cl. 428-522.000.
Wotherspoon, John T. M., to Philips Electronics and Associated Industries Limited. Thermal-radiation imaging devices and systems, and the manufacture of such imaging devices. 4,859,851, Cl. 250-334.000.
Wotton, David E. M.: *See—*
Davis, Stanley S.; and Wotton, David E. M., 4,859,363, Cl. 252-312.000.
Wright, David; and Rabenau, Richard, to Ryder International Corporation. Molding apparatus and construction of contact lens case. 4,858,754, Cl. 206-5.100.
Wright, Douglas W., to Emhart Industries, Inc. Straight line shear mechanism. 4,859,227, Cl. 65-334.000.
Wright, James F., to A. Stucki Company. Railway truck side bearing. 4,859,089, Cl. 384-423.000.
Wright, John. Rear mounted mirror apparatus for vehicles. 4,858,874, Cl. 248-467.000.
Wright, M. Bosley. Moulding routing apparatus. 4,858,664, Cl. 144-136.00R.
Wright, Martin A., to Raychem Limited. Overvoltage protection device. 4,860,155, Cl. 361-111.000.
Wright, Steven L.: *See—*
Kirchner, Peter D.; Marks, Ronald F.; Pettit, George D.; Woodall, Jerry M.; and Wright, Steven L., 4,860,066, Cl. 357-16.000.

Wruck, William J.: *See*—
Binder, Richard R.; Bantz, Paul E.; Tiedemann, William H.; McDonald, Guy D.; and Wruck, William J., 4,859,546, Cl. 429-53.000.

Wu, Tsung-Ching; Chern, Geeng-Chuan; and Hu, James C., to Atmel Corporation. EPROM fabrication process forming tub regions for high voltage devices. 4,859,619, Cl. 437-43.000.

Wuhrmann, Hans-Rudolf: *See*—
Siddiqi, Iqbal; and Wuhrmann, Hans-Rudolf, 4,859,306, Cl. 204-416.000.

Wully, S.A.: *See*—
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Wunderle, Anita, geb. Rudigier; Frank, Michael; and Schossow, Dieter. Dental cap for use in making jacket crowns. 4,859,185, Cl. 433-222.100.

Wurscher, Raimund. Apparatus for grinding twist drills. 4,858,389, Cl. 51-102.000.

Wurst, Dieter: *See*—
Goller, Ernst; Wurst, Dieter; Kazmaier, Guenther; and Frei, Jochen, 4,858,446, Cl. 77-126.00R.

Wydra, Gerhard: *See*—
Puchinger, Franz; and Wydra, Gerhard, 4,859,506, Cl. 427-372.200.

Xerox Corporation: *See*—
Araghi, Mehdi N.; and Tandon, Jagdish C., 4,860,075, Cl. 357-30.000.
Choi, Francis K., 4,859,278, Cl. 156-643.000.
Curry, Douglas N., 4,860,237, Cl. 364-718.000.
Genovese, Frank C.; and Lannom, James W., 4,859,913, Cl. 315-169.400.
Gruber, Robert J.; Bov, Raphael F.; Cometa, Thomas D.; Eakin, Paul W.; Berkes, John S.; and Grushkin, Bernard, 4,859,550, Cl. 430-39.000.
Hansen, Ronald D.; Mock, Clayton W.; and Kadifa, Abdo G., 4,859,995, Cl. 340-710.000.
Jansen, Frank; and Mort, Joseph, 4,859,553, Cl. 430-58.000.
Pirwitz, Robert G., 4,860,047, Cl. 355-290.000.
Pond, Stephen F.; Kneezel, Gary A.; Lorenze, Robert V.; O'Horo, Michael P.; Maltz, Martin S.; and Kellerman, Richard, 4,860,030, Cl. 346-76.0PH.
Schmidlin, Fred W., 4,860,036, Cl. 346-159.000.
Stemmle, Denis J., 4,858,909, Cl. 271-184.000.
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Waibel, Helmut K., 4,859,096, Cl. 400-157.200.
Webb, John L., 4,859,831, Cl. 219-216.000.

Yabe, Masao: *See*—
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Yagi, Tadashi: *See*—
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Yaguchi, Mitsugu: *See*—
Shimoda, Isao; Yaguchi, Mitsugu; and Fujii, Junji, 4,858,510, Cl. 84-402.000.

Yamada, Hirokazu, to Minolta Camera Kabushiki Kaisha. Sheet transporting speed control apparatus. 4,858,908, Cl. 271-176.000.

Yamada, Koudo: *See*—
Kajioka, Hiroshi; Yamada, Koudo; Takuma, Yuuetsu; and Teraoka, Tatsuo, 4,859,223, Cl. 65-3.120.

Yamada, Sadami: *See*—
Tajima, Kenji; Kushima, Hiroshi; and Yamada, Sadami, 4,860,042, Cl. 354-277.000.

Yamada, Tsutomu, to NGK Insulators, Ltd. Method of dynamically balancing cylindrical rotors, and device for carrying out the method. 4,858,393, Cl. 51-237.000.

Yamaguchi, Hideo; and Fujiki, Tsutomu, to Mazda Motor Corporation. Control apparatus for automobile air conditioning systems. 4,858,518, Cl. 98-2.080.

Yamaguchi, Isamu; and Hirosumi, Jiro, to Fujisawa Pharmaceutical Co., Ltd. Method for the treatment and prevention of arteriosclerosis with nitrophenyl substituted dihydropyridines. 4,859,688, Cl. 514-344.000.

Yamaguchi, Masahiko: *See*—
Shinomura, Yasushi; Yamaguchi, Masahiko; and Fukuzaki, Koichiro, 4,859,535, Cl. 428-398.000.

Yamaguchi, Masumi, to Murata Manufacturing Co., Ltd. Chip component holding plate. 4,859,498, Cl. 427-96.000.

Yamaguchi, Noboru: *See*—
Ohmae, Tadayuki; Sakurai, Tadashi; Yamaguchi, Noboru; Okada, Mitsuyuki; and Asao, Kouichiro, 4,859,710, Cl. 521-55.000.

Yamaha Corporation: *See*—
Muroi, Kunimasa; Inagaki, Yoshinari; and Awano, Tetsuyuki, 4,858,928, Cl. 273-73.00D.
Shibukawa, Takeo, 4,858,508, Cl. 84-1.010.
Shimoda, Isao; Yaguchi, Mitsugu; and Fujii, Junji, 4,858,510, Cl. 84-407.000.

Yamakawa, Takeshi: *See*—
Ueno, Fumio; Yamakawa, Takeshi; and Shirai, Yuji, 4,860,243, Cl. 364-807.000.

Yamakoshi, Akira; Fujita, Toyohiko; Tsukakoshi, Kunihiko; and Anraku, Shinji, to Seikosha Co., Ltd. Current amplifier circuit and a current amplifying type differential current converter circuit. 4,859,966, Cl. 330-288.000.

Yamamisaka, Shinichi: *See*—
Fukuda, Nobutoshi; Nagao, Tatsuro; Arifuku, Naoto; Tanabe, Masashi; Yamamisaka, Shinichi; and Furuta, Yoshiki, 4,860,129, Cl. 360-61.000.

Yamamoto Chemicals, Inc.: *See*—
Hirose, Sumio; Ozawa, Hiroshi; Abe, Kenji; Hosono, Yoichi; Takahara, Shigeru; and Koike, Tadashi, 4,859,569, Cl. 430-270.000.

Yamamoto, Haruo; Ichihashi, Takao; Fujisawa, Shuji; Tone, Eiichi; and Tsuda, Takeshi, to Mita Industrial Co., Ltd. Color image forming apparatus having a plurality of developing units. 4,860,053, Cl. 355-245.000

Yamamoto, Hitoshi: *See*—
Fujimura, Setsuo; Sagawa, Masato; Matsuura, Yutaka; Yamamoto, Hitoshi; and Togawa, Norio, 4,859,255, Cl. 148-302.000.

Yamamoto, Mitsuru: *See*—
Hirano, Shigeo; Kojima, Tetsuro; Yamamoto, Mitsuru; Inoue, Noriyuki; and Heki, Tatsuo, 4,859,579, Cl. 430-598.000.

Yamamoto, Naoki: *See*—
Nakamura, Tohru; Ogirima, Masahiko; Nakazato, Kazuo; Miyazaki, Takao; Yamamoto, Naoki; Nagata, Minoru; and Sugaki, Shojirô, deceased, 4,860,086, Cl. 357-67.000.
Sasaki, Isao; Yamamoto, Naoki; Yanagase, Akira; and Hatakeyama, Hiroki, 4,859,727, Cl. 524-147.000.

Yamamoto, Noriyuki: *See*—
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Yamamoto, Osamu: *See*—
Miyauchi, Nobuyuki; Kawanishi, Hidenori; Maei, Shigeki; Yamamoto, Osamu; and Hayashi, Hiroshi, 4,860,305, Cl. 372-92.000.

Yamamoto, Saburo: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; Kondo, Masafumi; and Yamamoto, Saburo, 4,860,297, Cl. 372-45.000.
Hosoda, Masahiro; Sasaki, Kazuaki; Kondo, Masaki; and Yamamoto, Saburo, 4,860,299, Cl. 372-46.000.

Yamamoto, Shigeru: *See*—
Kamise, Katsuya; and Yamamoto, Shigeru, 4,858,580, Cl. 123-425.000.

Yamamoto, Toshiyuki: *See*—
Kanai, Kunio; and Yamamoto, Toshiyuki, 4,860,044, Cl. 354-321.000.

Yamamoto, Yasuo; Inaba, Akira; and Kitagaki, Takashi, to Du Pont de Nemours, E. I., and Company. Conductive paste composition. 4,859,364, Cl. 252-512.000.

Yamamoto, Yoshihiro; Kume, Tsutomu; Yamazaki, Nobuo; Hashimoto, Fumiharu; and Ohya, Koichi, to Sony Corporation. Filter circuit. 4,859,881, Cl. 307-520.000.

Yamanaka, Fumie; Enomoto, Takashi; and Yoshioka, Toshifumi, to Canon Kabushiki Kaisha. Device plate having conductive films selected to prevent pin-holes. 4,859,036, Cl. 350-336.000.

Yamanaka, Minoru; and Amawa, Tetsuo, to Kabushiki Kaisha Risuron. Mat consisting of filament loop aggregations and method and apparatus for producing the same. 4,859,516, Cl. 428-92.000.

Yamanaka, Torao; and Kawahara, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Remote monitoring and controlling system. 4,860,001, Cl. 340-825.200.

Yamane, Takehiko: *See*—
Kano, Fumihiko; Yamane, Takehiko; Yamashita, Katsuji; Hosoe, Kazunori; and Watanabe, Kiyoshi, 4,859,661, Cl. 514-183.000.

Yamanouchi, Shosuke: *See*—
Hata, Ryosuke; Yamanouchi, Shosuke; Hirose, Masayuki; Kuwabara, Hidemitsu; Mizumoto, Yasuharu; and Hagiuda, Yasuhiro, 4,859,804, Cl. 174-25.00R.

Yamaoto, Naoki: *See*—
Chida, Shouhei; Yamaoto, Naoki; Miyazaki, Yasuo; and Sato, Yasunori, 4,859,119, Cl. 405-269.000.

Yamashita, Hiromitsu, to Mitsubishi Denki Kabushiki Kaisha. Low-frequency converter for carrier chrominance signal. 4,860,120, Cl. 358-330.000.

Yamashita, Katsuji: *See*—
Kano, Fumihiko; Yamane, Takehiko; Yamashita, Katsuji; Hosoe, Kazunori; and Watanabe, Kiyoshi, 4,859,661, Cl. 514-183.000.

Yamashita, Mikihiro; and Furukawa, Kaoru, to Matsushita Electric Works, Ltd. Electronic detector with capacitor sensor and magnetic field sensor for locating an object behind a wall surface. 4,859,931, Cl. 324-67.000.

Yamashita, Takashi, to Ikeda Bussan Co., Ltd. Adjustable headrest for automotive seat. 4,858,994, Cl. 297-391.000.

Yamashita, Takashi; Shidara, Keiichi; Aiba, Masaaki; Takasaki, Yukio; and Hirai, Tadaaki, to Hitachi, Ltd.; and Nippon Hoso Kyokai. Method and apparatus for driving a plurality of pick-up tubes having their cathodes supplied by a common negative potential. 4,860,093, Cl. 358-50.000.

Yamashita, Yuji: *See*—
Kano, Atsushi; Ishiguro, Yasuyuki; Ogiri, Tadakazu; Ozaki, Hirofumi; and Yamashita, Yuji, 4,860,056, Cl. 355-298.000.

Yamatake-Honewell Co., Ltd.: *See*—
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Yamaura, Tadashi: *See*—
Matsubara, Kiyoshi; Yamaura, Tadashi; Kihara, Toshimasa; and Kawashimo, Norishige, 4,860,087, Cl. 357-68.000.

Yamazaki, Nobuo: *See*—
Yamamoto, Yoshihiro; Kume, Tsutomu; Yamazaki, Nobuo; Hashimoto, Fumiharu; and Ohya, Koichi, 4,859,881, Cl. 307-520.000.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Non-single-cry stal semiconductor light emitting device. 4,860,069, Cl. 357-17.000.

Yamazaki, Toshinori; Sakai, Eiichi; Nakanishi, Tatsuo; and Nomori, Hiroyuki, to Konishiroku Photo Industry Co., Ltd. Multilayer photoreceptor. 4,859,554, Cl. 430-58.000.

Yan, Taoung Y., to Mobil Oil Corporation. Process for repairing a cryogenic heat exchanger. 4,859,491, Cl. 427-140.000.

Yanagase, Akira: *See*—
Sasaki, Isao; Yamamoto, Naoki; Yanagase, Akira; and Hatakeyama, Hiroki, 4,859,727, Cl. 524-147.000.

Yang, Chi-Kuo. Stable telescopic centerpost of multiple-fold umbrella. 4,858,633, Cl. 135-25.00R.

Yang, Huei-Hsiung; Hiu, Stephen F.; and Harris, John L., to Igene Biotechnology, Inc. Production of phage and phage-associated lysin. 4,859,597, Cl. 435-239.000.

Yang, Hung H.; and Chiou, Minshon J., to Du Pont de Nemours, E. I., and Company. Method of preparing poly (p-phenyleneterephthalamide) yarns of improved fatigue resistance. 4,859,393, Cl. 264-184.000.

Yang, Tai-Her. Liquid pump driven by a two-cycle, dual piston internal combustion engine. 4,858,571, Cl. 123-71.00R.

Yano, Junichi: *See*—
Sugahara, Takehisa; Nakagawa, Toyokatu; and Yano, Junichi, 4,859,614, Cl. 437-8.000.

Yano, Masaru: *See*—
Teruyama, Hideo; and Yano, Masaru, 4,859,161, Cl. 418-102.000.

Yano, Takanori: *See*—
Matsuda, Toru; Yano, Takanori; Okamoto, Toshiaki; and Okamoto, Akira, 4,860,214, Cl. 364-513.000.

Yasuhara, Eiko: *See*—
I, Kanji; Kawasaki, Tatsuo; and Yasuhara, Eiko, 4,859,297, Cl. 204-145.00R.

Yasumuro, Hisakazu; Watanabe, Michio; Taira, Kazuo; Imatani, Tsuneo; and Kurashima, Hideo, to Toyo Seikan Kaisha, Ltd. Metal vessel having circumferential side seam and process for production thereof. 4,858,782, Cl. 220-458.000.

Yasunami, Masabumi; Takase, Kahei; Meguro, Takashi; Suzuki, Katsumi; Hiwatashi, Osamu; Okutsu, Masaru; Kato, Nobuo; and Nakamura, Toru, to Ajinomoto Co., Inc. Azulene derivatives and pharmaceutical compositions containing them. 4,859,701, Cl. 514-510.000.

Yasunori, Yukio: *See*—
Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Yasunori, Yukio, 4,859,750, Cl. 526-135.000.

Yates, John B., III; and White, Dwain M., to General Electric Company. Compatibilized polyphenylene ether-polyamide compositions and method of preparation. 4,859,739, Cl. 525-92.000.

Yatuka, Takeshi: *See*—
Endoh, Hiroshi; Zama, Yoshimasa; Kadowaki, Nobuo; Yatuka, Takeshi; Nagai, Hiroshi; and Mizumura, Yutaka, 4,859,523, Cl. 428-215.000.

Yavari, Ali R.: *See*—
Senillou, Claude; de Framond, Remy; Garnier, Marcel; Yavari, Ali R.; and Joud, Jean-Charles, 4,858,675, Cl. 164-503.000.

Yazaki Corporation: *See*—
Sakakibara, Yutaka; Ueda, Hidetaka; and Majima, Kunio, 4,860,170, Cl. 362-26.000.

Yee, David T.; and Lin, Eric, to A B Oriental Trading Co., Inc. Folding tandem seat baby carriage. 4,858,947, Cl. 280-643.000.

Yee, Ying Kwong: *See*—
Bernstein, Peter R.; Brown, Frederick J.; Matassa, Victor G.; and Yee, Ying Kwong, 4,859,692, Cl. 514-381.000.

Yetter Manufacturing Company: *See*—
Williamson, Gerald E.; and Hartwig, Donald R., 4,858,698, Cl. 172-448.000.

Yilmaz, Hamza, to General Electric Company. Isolation for transistor devices having a pilot structure. 4,860,080, Cl. 357-48.000.

Yoakim, Christiane: *See*—
Lau, Cheuk K.; Yoakim, Christiane; Rokach, Joshua; Fortin, Rejean; and Guindon, Yvan, 4,859,667, Cl. 514-224.500.

Yoiti Minematu: *See*—
Minematu, Yoiti; Tajima, Toshio; and Nakajima, Shigeharu, 4,859,903, Cl. 313-487.000.

Yokogawa, Fumihiko; Hirano, Hiroyuki; and Motoyama, Akira, to Pioneer Electronic Corporation. Servo circuit for generating a tracking error signal for optical disk player. 4,860,271, Cl. 369-44.000.

Yokogawa, Nobuhisa: *See*—
Konishi, Satoshi; Nagasaki, Takanori; Yokogawa, Nobuhisa; and Naruse, Yuji, 4,859,427, Cl. 422-159.000.

Yokosawa, Seiichi; and Kawasaki, Ken-ichiro, to Pioneer Electronic Corporation. Rotary head type digital audio signal reproducing apparatus. 4,860,130, Cl. 360-77.020.

Yokota, Kiyoshi: *See*—
Hosoda, Kenichiro; Kawaguchi, Shinji; Shinbo, Atsushi; and Yokota, Kiyoshi, 4,860,315, Cl. 375-30.000.

Yokoyama, Shigeki: *See*—
Miyasaka, Nobuaki; Yokoyama, Shigeki; Suga, Shuzo; Naoi, Takashi; and Satake, Masaki, 4,859,576, Cl. 430-523.000.

Yomoto, Masahiko: *See*—
Uehara, Makoto; Ichikawa, Hajime; Yomoto, Masahiko; and Kato, Shigeru, 4,859,832, Cl. 219-411.000.

Yorozu, Hidenori: *See*—
Kamiya, Tetsuro; Inoue, Takeshi; Yorozu, Hidenori; Eguchi, Yasuteru; and Tsujii, Kaoru, 4,859,696, Cl. 514-420.000.

Yoshida, Akihisa; Setsune, Kentaro; and Hirao, Takashi, to Matsushita Electric Industrial Co., Ltd. Plasma processing apparatus for large area ion irradiation. 4,859,908, Cl. 315-111.810.

Yoshida, Atsushi, to NEC Corporation. Apparatus for compensating for phase hits. 4,860,319, Cl. 375-83.000.

Yoshida Kogyo K. K.: *See*—
Matsuda, Yoshio, 4,858,447, Cl. 66-191.000.
Watanabe, Hirokazu; and Shinmi, Masamichi, 4,858,281, Cl. 24-113.0MP.
Yoshimura, Eiichi, 4,858,284, Cl. 24-433.000.

Yoshida, Masaji: *See*—
Sakaguchi, Hironao; Yoshida, Masaji; and Matsuo, Yasutoshi, 4,860,105, Cl. 358-167.000.

Yoshida, Noble H.: *See*—
Suzuki, Fred K.; Mead, Sharon M.; Yoshida, Noble H.; and Dobberstein, Robert H., 4,859,360, Cl. 252-299.700.

Yoshikuni, Yoshiaki: *See*—
Sugiyama, Makoto; Ezure, Yoji; Yoshikuni, Yoshiaki; Ozaki, Takayuki; and Ojima, Nobutoshi, 4,859,767, Cl. 536-17.400.

Yoshimura, Eiichi, to Yoshida Kogyo K. K. Separable bottom end stop for slide fastener. 4,858,284, Cl. 24-433.000.

Yoshimura, Tatsuro, to Fujitsu Limited. Clock phase adjusting system. 4,859,954, Cl. 328-155.000.

Yoshimura, Toshio, to Tanashin Denki Co., Ltd. Tape recorder of the cassette type. 4,860,141, Cl. 360-130.210.

Yoshimura, Yoshio: *See*—
Nishimura, Yoshifumi; and Yoshimura, Yoshio, 4,859,289, Cl. 204-28.000.

Yoshino, Masato, to Sumitomo Electric Industries, Ltd. Antiskid brake control device. 4,859,002, Cl. 303-103.000.

Yoshino, Teruo, to Kabushiki Kaisha Toshiba. Gate signal generator for thyristor valve. 4,859,884, Cl. 307-646.000.

Yoshioka, Toshifumi: *See*—
Yamanaka, Fumie; Enomoto, Takashi; and Yoshioka, Toshifumi, 4,859,036, Cl. 350-336.000.

Yoshitsugu, Noritada: *See*—
Nishimura, Yuji; Kawaharazaki, Takashi; Tamura, Keiichi; Matsui, Kenji; Watanabe, Yasutaka; and Yoshitsugu, Noritada, 4,858,953, Cl. 280-807.000.

Yoshizawa, Shuji; and Ikezue, Tatsuya, to Kabushiki Kaisha Toshiba. Electrophotographic photoreceptor with superlattice structure. 4,859,552, Cl. 430-57.000.

Yosida, Mamoru: *See*—
Nomoto, Tsutomu; Yosida, Mamoru; Mouri, Mikio; and Watanabe, Tsukasa, 4,859,617, Cl. 437-40.000.

You, Lian-zhen: *See*—
Jiang, Ke-zheng; Ren, Deng-ke; Chen, Zu-yuan; and You, Lianzhen, 4,860,019, Cl. 343-795.000.

Young, Douglas A.; and Gilson, Jay F., to General Motors Corporation. Modular test assembly for wiring harnesses. 4,859,953, Cl. 324-539.000.

Young, Douglas D. Arm rest for motor vehicle console. 4,858,995, Cl. 297-411.000.

Young, Duane E. Three way locking system for a hand gun in a holster. 4,858,799, Cl. 224-243.000.

Youssefyeh, Raymond; Klein, Scott I.; Campbell, Henry F.; and Kuhla, Donald E., to Rorer Pharmaceutical Corporation. Certain benzoxepins and their pharmaceutical compositions and methods. 4,859,683, Cl. 514-299.000.

Yugenkaisha Matsubei: *See*—
Hoashi, Chikako, 4,859,165, Cl. 425-133.100.

Yuyama, Masahiro: *See*—
Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Yasunori, Yukio, 4,859,750, Cl. 526-135.000.

Zadworny, Francois: *See*—
Gualandris, Rene; Ludwig, Paul; Rocco, Jean-Claude; and Zadworny, Francois, 4,859,909, Cl. 315-111.810.

Zahner, Hans: *See*—
Zeeck, Axel; Ciesiolka, Thomas; Rohr, Jurgen; Zahner, Hans; and Drautz, Hannelore, 4,859,655, Cl. 514-34.000.

Zaidin Hojin Biseibutsu Kagaku Kenky Kai: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,859,593, Cl. 435-128.000.

Zama, Yoshimasa: *See*—
Endoh, Hiroshi; Zama, Yoshimasa; Kadowaki, Nobuo; Yatuka, Takeshi; Nagai, Hiroshi; and Mizumura, Yutaka, 4,859,523, Cl. 428-215.000.

Zardi, Umberto, to Ammonia Casale S.A., a part interest. System for improve the mixing of reacted gases and quench gases in heterogeneous synthesis reactors. 4,859,425, Cl. 422-148.000.

Zaviska, Dalibor: *See*—
Thiel, Rudolf; Klimt, Ulrich; and Zaviska, Dalibor, 4,858,728, Cl. 188-73.310.

Zboril, Vaclav G.: *See*—
Mitchell, David J.; and Zboril, Vaclav G., 4,859,733, Cl. 524-432.000.

Zechner, Franz; and Stubenvoll, Josef, to Simmering-Graz-Pauker Aktiengesellschaft. Method of treating flue gases and combustion residues. 4,859,440, Cl. 423-240.000.

Zeeck, Axel; Ciesiolka, Thomas; Rohr, Jurgen; Zahner, Hans; and Drautz, Hannelore, to Hoechst Aktiengesellschaft. Urdamycin G and derivatives thereof, a process for their preparation and their use. 4,859,655, Cl. 514-34.000.

Zeedick, Albert F.: *See*—
Traynor, Rodney P.; and Zeedick, Albert F., 4,859,046, Cl. 350-627.000.

Zeh, Manfred: *See*—
Baumler, Jurgen; and Zeh, Manfred, 4,860,300, Cl. 372-57.000.

Zeien, Jane K.: *See*—
Bielskis, Edward; Leo, Albert J.; and Zeien, Jane K., 4,859,484, Cl. 426-573.000.
Zellweger, Conrad; and Gendey, Yves, to LN Industries S.A. Device for igniting combustible materials. 4,859,174, Cl. 431-255.000.
Zenith Electronics Corporation: *See*—
Adler, Robert; Fogelson, Mark; and Kaplan, Sam, 4,859,996, Cl. 340-712.000.
Jones, Gary A., 4,860,202, Cl. 364-200.000.
Zetena, Maurice F., Jr. Composite cable for use in high frequency data and voice transmission. 4,860,343, Cl. 379-110.000.
Ziegler, Thomas: *See*—
Effenberger, Franz; Ziegler, Thomas; and Foerster, Siegfried, 4,859,784, Cl. 549-491.000.
Zielinski, David P.: *See*—
Ambrose, Ronald R.; O'Dwyer, James B.; Johnston, Byron K.; Zielinski, David P.; Porter, Samuel, Jr.; and Tyger, Wayne H., 4,859,743, Cl. 525-443.000.
Zielske, Alfred G.; and Fong, Ronald A., to Clorox Company, The. Phenoxyacetate peracid precursors. 4,859,800, Cl. 568-566.000.
Zimmer, Erich; Langen, Hans; and Scharf, Kurt, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Process for the containment of materials in a ceramic matrix through the chemical precipitation of a hydrosol of the matrix. 4,859,368, Cl. 252-629.000.
Zimmerlund, Hans, to Scandinavian Transshpment AB. Container. 4,858,779, Cl. 220-6.000.
Zimmerman, Charles E.: *See*—
Patterson, John H.; Lowe, Tony M.; Bernadic, Thomas J.; Val, Yefim; Katbi, Karl A.; and Zimmerman, Charles E., 4,859,122, Cl. 407-114.000.
Zimmerman, Karen M. Cooling/baking rack. 4,858,773, Cl. 211-149.000.
Zimmermann, Gerd; Maier, Josef; and Gloger, Manfred, to Boehringer Mannheim GmbH. Process for the preparation of stereoisomers of 1-aminoalkylphosphonic and phosphinic acids. 4,859,602, Cl. 435-280.000.
Zimmermann, Manfred: *See*—
Schneider, Manfred; Ott, Ulrich; Sieber, Alexander; and Zimmermann, Manfred, 4,859,728, Cl. 524-159.000.
Zink, Deborah L.: *See*—
Lam, Yiu-kuen T.; Chang, Raymond S.; Hensens, Otto D.; Schwartz, Cheryl D.; and Zink, Deborah L., 4,859,690, Cl. 514-375.000.
Zola, Daniel: *See*—
Zola, Malcolm; Zola, Marcia; and Zola, Daniel, 4,859,994, Cl. 340-705.000.
Zola, Malcolm; Zola, Marcia; and Zola, Daniel. Closed-captioned movie subtitle system. 4,859,994, Cl. 340-705.000.
Zola, Marcia: *See*—
Zola, Malcolm; Zola, Marcia; and Zola, Daniel, 4,859,994, Cl. 340-705.000.
Zommer, Nathan, to IXYS Corporation. Monolithic semiconductor device and method of manufacturing same. 4,860,072, Cl. 357-23.800.
Zones, Stacey I.; and Innes, R. A., to Chevron Research Company. Zeolite SSZ-23. 4,859,442, Cl. 423-277.000.
Zowarka, Raymond C., Jr.: *See*—
Weldon, William F.; Rech, Ben M.; and Zowarka, Raymond C., Jr., 4,859,819, Cl. 200-146.00R.
Zumstein, Ernst, to Bystronic Laser AG, Industrestrasse. Process and installation for producing workpieces. 4,859,828, Cl. 219-121.670.
Zygo Corporation: *See*—
Sommargren, Gary E., 4,859,066, Cl. 356-349.000.
501 Sharp Kabushiki Kaisha: *See*—
Katagiri, Masayuki; Watanabe, Masanori; Uda, Kazutaka; Hijikigawa, Masaya; Tsuchimoto, Shuhei; and Inami, Yasuhiko, 4,859,060, Cl. 356-352.000.
501 Tekscan Limited: *See*—
Cashell, Edmund M.; and McDonnell, Liam, 4,860,224, Cl. 364-551.010.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF AUGUST, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bainard, Dean R.; and Denton, Dennis N., to Garlock, Inc. Molded lip seal with polytetrafluoroethylene liner and method for making same. Re. 33,029, Cl. 277-153.000.
Bayer Aktiengesellschaft: *See*—
Binsack, Rudolf; Wank, Joachim; and Reese, Eckart, Re. 33,032, Cl. 524-165.000.
Binsack, Rudolf; Wank, Joachim; and Reese, Eckart, to Bayer Aktiengesellschaft. Polycarbonate films of low flammability and improved stress crack resistance. Re. 33,032, Cl. 524-165.000.
Danno, Yoshiaki; Takahashi, Akira; Iida, Kazumasa; Hashimoto, Toru; Okamoto, Yasukuki; and Nakao, Kenzo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Engine idling speed controlling system. Re. 33,027, Cl. 123-339.000.
Denton, Dennis N.: *See*—
Bainard, Dean R.; and Denton, Dennis N., Re. 33,029, Cl. 277-153.000.
Deschamps, Jean-Francois: *See*—
Petit, Pierre; Grenier, Maurice; and Deschamps, Jean-Francois, Re. 33,026, Cl. 62-36.000.
Dresser Industries, Inc.: *See*—
Simpson, Donald C., Re. 33,028, Cl. 137-82.000.
Garlock, Inc.: *See*—
Bainard, Dean R.; and Denton, Dennis N., Re. 33,029, Cl. 277-153.000.
Grenier, Maurice: *See*—
Petit, Pierre; Grenier, Maurice; and Deschamps, Jean-Francois, Re. 33,026, Cl. 62-36.000.
Hashimoto, Toru: *See*—
Danno, Yoshiaki; Takahashi, Akira; Iida, Kazumasa; Hashimoto, Toru; Okamoto, Yasukuki; and Nakao, Kenzo, Re. 33,027, Cl. 123-339.000.
Iida, Kazumasa: *See*—
Danno, Yoshiaki; Takahashi, Akira; Iida, Kazumasa; Hashimoto, Toru; Okamoto, Yasukuki; and Nakao, Kenzo, Re. 33,027, Cl. 123-339.000.
L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation Des Procedes Georges Claude: *See*—
Petit, Pierre; Grenier, Maurice; and Deschamps, Jean-Francois, Re. 33,026, Cl. 62-36.000.
Lynch, Joseph E.; Shinkai, Ichiro; and Volante, Ralph P., to Merck & Co., Inc. Process for the preparation of HMG-CoA reductase inhibitors intermediates. Re. 33,033, Cl. 560-53.000.
Marlatt, George R., to Westinghouse Electric Corp. Self rupturing gas moderator rod for a nuclear reactor. Re. 33,030, Cl. 376-209.000.
Merck & Co., Inc.: *See*—
Lynch, Joseph E.; Shinkai, Ichiro; and Volante, Ralph P., Re. 33,033, Cl. 560-53.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Danno, Yoshiaki; Takahashi, Akira; Iida, Kazumasa; Hashimoto, Toru; Okamoto, Yasukuki; and Nakao, Kenzo, Re. 33,027, Cl. 123-339.000.
Morrison, Garrett L., to Passamaquoddy Tribe, A Sovereign Indian tribe recognized by the Government of The United States of America. Method for simultaneously scrubbing cement kiln exhaust gas and producing useful by-products therefrom. Re. 33,031, Cl. 423-225.000.
Nakao, Kenzo: *See*—
Danno, Yoshiaki; Takahashi, Akira; Iida, Kazumasa; Hashimoto, Toru; Okamoto, Yasukuki; and Nakao, Kenzo, Re. 33,027, Cl. 123-339.000.
Okamoto, Yasukuki: *See*—
Danno, Yoshiaki; Takahashi, Akira; Iida, Kazumasa; Hashimoto, Toru; Okamoto, Yasukuki; and Nakao, Kenzo, Re. 33,027, Cl. 123-339.000.
Passamaquoddy Tribe, A Sovereign Indian tribe recognized by the Government of The United States of America: *See*—
Morrison, Garrett L., Re. 33,031, Cl. 423-225.000.
Petit, Pierre; Grenier, Maurice; and Deschamps, Jean-Francois, to L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation Des Procedes Georges Claude. Process and device for vaporizing a liquid by heat exchange with a second fluid and their application in an air distillation installation. Re. 33,026, Cl. 62-36.000.
Reese, Eckart: *See*—
Binsack, Rudolf; Wank, Joachim; and Reese, Eckart, Re. 33,032, Cl. 524-165.000.
Shinkai, Ichiro: *See*—
Lynch, Joseph E.; Shinkai, Ichiro; and Volante, Ralph P., Re. 33,033, Cl. 560-53.000.
Simpson, Donald C., to Dresser Industries, Inc. Electropneumatic transducer system. Re. 33,028, Cl. 137-82.000.
Takahashi, Akira: *See*—
Danno, Yoshiaki; Takahashi, Akira; Iida, Kazumasa; Hashimoto, Toru; Okamoto, Yasukuki; and Nakao, Kenzo, Re. 33,027, Cl. 123-339.000.
Volante, Ralph P.: *See*—
Lynch, Joseph E.; Shinkai, Ichiro; and Volante, Ralph P., Re. 33,033, Cl. 560-53.000.
Wank, Joachim: *See*—
Binsack, Rudolf; Wank, Joachim; and Reese, Eckart, Re 33,032, Cl. 524-165.000.
Westinghouse Electric Corp.: *See*—
Marlatt, George R., Re. 33,030, Cl. 376-209.000.

LIST OF DESIGN PATENTEES

Acoustics Development Corporation: *See*—
Otto, Thomas J.; and Pinkerton, Stevens V., Jr., 302,907, Cl. D6-337.000.
Advanced Cardiovascular Systems, Inc.: *See*—
Jabbusch, Lynn S., 303,010, Cl. D24-24.000.
Alerchek Associates: *See*—
Henry, Wayne M., 303,011, Cl. D24-31.000.
Allied of Chicago, Inc.: *See*—
Zall, Lawrence R., 303,024, Cl. D28-76.000.
American Home Products Corporation: *See*—
Schmitt, Edward H., 303,022, Cl. D28-10.000.
American Lighting Fixture Corp.: *See*—
Segill, William, 303,019, Cl. D26-143.000.
Anbo, Kiyoshi: *See*—
Nakajima, Kazuo; and Anbo, Kiyoshi, 302,931, Cl. D8-65.000.
Ancona, Bruce: *See*—
Ancona, Jane; and Ancona, Bruce, 302,920, Cl. D7-50.000.
Ancona, Jane; and Ancona, Bruce, to M. Kamenstein, Inc. Measuring cup. 302,920, 8-22-89, Cl. D7-50.000.
Appor Ltd.: *See*—
Banks, Stewart, 302,917, Cl. D6-545.000.
Asics Corporation: *See*—
Mitsui, Shigeyuki, 302,901, Cl. D2-320.000.
Avia Group International, Inc.: *See*—
Kolman, Kenneth R.; Nyberg, Michael J.; Cody, Richard W.; and Fuerst, Rory W., 302,900, Cl. D2-317.000.
Azzolina, Albert. Armoire. 302,909, 8-22-89, Cl. D6-446.000.
B.H., S.A.: *See*—
Beistegui, Jose L., 302,990, Cl. D21-194.000.
Bainbridge, William C., III. Starter mounting assembly for an aircraft engine. 302,982, 8-22-89, Cl. D15-5.000.
Banks, Stewart, to Appor Ltd. Liquid soap dispenser or the like. 302,917, 8-22-89, Cl. D6-545.000.
Barnes, Kevin J.: *See*—
Flesher, Robert W.; Barnes, Kevin J.; Blakesley, Robert W.; and Lynn, Robert W., 303,007, Cl. D24-8.000.
Barnes, Kevin T.: *See*—
Flesher, Robert W.; Barnes, Kevin T.; Blakesley, Robert W.; and Lynn, Robert W., 303,012, Cl. D24-31.000.
Beeren, Aloysius J. M., to U.S. Philips Corporation. Carafe. 302,926, 8-22-89, Cl. D7-317.000.
Beistegui, Jose L., to B.H., S.A. Exercise cycle. 302,990, 8-22-89, Cl. D21-194.000.
Bell, Graham J.; and Everts, Ramon L., to Ford Motor Company. Wheel cover. 302,968, 8-22-89, Cl. D12-211.000.
Bergman, Hans: *See*—
Helstab, Edmond J.; Brown, Michael; Winlow, Thomas A.; and Bergman, Hans, 302,977, Cl. D14-115.000.
Black & Decker Inc.: *See*—
Gierke, Martin P., 302,971, Cl. D13-8.000.

Blakesley, Robert W.: *See—*
Flesher, Robert W.; Barnes, Kevin J.; Blakesley, Robert W.; and Lynn, Robert W., 303,007, Cl. D24-8.000.
Flesher, Robert W.; Barnes, Kevin T.; Blakesley, Robert W.; and Lynn, Robert W., 303,012, Cl. D24-31.000.

Blum, Jeffrey A.; and Sabhlok, Jatinder P., to General Foods Corporation. Combined dome tray and cradle in sleeve package. 302,948, 8-22-89, Cl. D9-418.000.

Bonatrade International, Inc.: *See—*
Collani, Victor B., 302,962, Cl. D12-167.000

Boucher, Guy, to La Telemecanique Electrique. Programmable controller. 302,972, 8-22-89, Cl. D13-12.000.

Bowdoin Products, Inc.: *See—*
Bowdoin, Robert E., 302,967, Cl. D12-203.000.

Bowdoin, Robert E., to Bowdoin Products, Inc. Running board. 302,967, 8-22-89, Cl. D12-203.000.

Boyd, Monty. Calibration port adaptor for a gas sensor. 302,950, 8-22-89, Cl. D10-94.000.

Bridgestone Corporation: *See—*
Himuro, Yasuo; and Mitsutake, Toshiyuki, 302,960, Cl. D12-146.000.

Briggs, Albert T. Security door stop plate. 302,937, 8-22-89, Cl. D8-344.000.

Broadbent, Peter A.; and Revell, Ian T., to Hestair Kiddicraft Limited. Stacking toy duck. 302,989, 8-22-89, Cl. D21-160.000.

Brown, Michael: *See—*
Helstab, Edmond J.; Brown, Michael; Winlow, Thomas A.; and Bergman, Hans, 302,977, Cl. D14-115.000.

Brown, Paul D., to Reebok International Ltd. Element of a shoe upper. 302,899, 8-22-89, Cl. D2-314.000.

Brunner, Merlin A.; and Draheim, Harvey J., to Simmons Juvenile Products Company, Inc. Crib footboard. 302,915, 8-22-89, Cl. D6-508.000.

Bull HN Information Systems Inc.: *See—*
Graham, John F.; and Cesarczyk, Edward J., 302,975, Cl. D14-108.000.

Cabot Corporation: *See—*
Gardner, Ross, Jr.; and Downs, Dennis J., 303,014, Cl. D24-67.000.

Canon Kabushiki Kaisha: *See—*
Kimura, Hiroyuki; and Tenkyu, Koichi, 302,984, Cl. D16-134.000.

Carlson, Arthur R., to Decor Corporation Proprietary Limited, The. Insulated portable unit. 302,922, 8-22-89, Cl. D7-77.000.

Cavan Crystal Group Limited: *See—*
O'Dunlaing, Eoin, 303,035, Cl. D99-40.000.

Cesarczyk, Edward J.: *See—*
Graham, John F.; and Cesarczyk, Edward J., 302,975, Cl. D14-108.000.

Chapin, David S.; and Oberg, Thomas W., to Cooper Industries, Inc. Hammer. 302,932, 8-22-89, Cl. D8-75.000.

Clements, Carl E., to Clements, Carl E. Storage container for burial, or the like. 303,032, 8-22-89, Cl. D99-1.000

Cocagne, Pierre. Refrigerated display case. 302,910, 8-22-89, Cl. D6-470.000.

Cody, Richard W.: *See—*
Kolman, Kenneth R.; Nyberg, Michael J.; Cody, Richard W.; and Fuerst, Rory W., 302,900, Cl. D2-317.000

Colgate-Palmolive Company: *See—*
Segati, Umberto D. I., 302,947, Cl. D9-376.000.

Collani, Victor B., to Bonatrade International, Inc. Automobile door guard. 302,962, 8-22-89, Cl. D12-167.000.

Combs, Napoleon. Fishing rod holder. 303,003, 8-22-89, Cl. D22-147.000.

Consolidated Devices Inc.: *See—*
Kurtovic, Zlatko, 302,928, Cl. D8-33.000.

Constable, Alan: *See—*
Lloyd, Alan M.; Constable, Alan; and Smith, Martin L., 303,005, Cl. D23-339.000.

Cooper Industries, Inc.: *See—*
Chapin, David S.; and Oberg, Thomas W., 302,932, Cl. D8-75.000.

Cramer, Ronald G., to S. C. Johnson & Son, Inc. Bottle. 302,946, 8-22-89, Cl. D9-376.000.

Creative Markers, Inc.: *See—*
Powell, Johnese W.; Parks, Willie; Powell, Levisky; and Jones, Willie B., 303,033, Cl. D99-17.000.
Powell, Johnese W.; Parks, Willie; Powell, Levisky; and Jones, Willie B., 303,034, Cl. D99-17.000.

Cuzenza, John M., to Sebastian International, Inc. Container. 302,943, 8-22-89, Cl. D9-337.000.

Daenen, Robert H. C. M.; and DeCoster, Pieter K. J., to Dart Industries Inc. Covered butter dish or the like. 302,924, 8-22-89, Cl. D7-84.000.

Danniger, Nancy R. Holder for flags or the like. 302,955. 8-22-89, Cl. D11-40.000.

Danniger, Nancy R. Holder for flags or the like. 302,956, 8-22-89, Cl. D11-40.000.

Dart Industries Inc.: *See—*
Daenen, Robert H. C. M.; and DeCoster, Pieter K. J., 302,924, Cl. D7-84.000.
Schmidt, Janice L.; and Schick, George L., 302,923, Cl. D7-84.000.

Debus, Inc.: *See—*
Williamson, Nicholas, 302,916, Cl. D6-542.000.

Decor Corporation Proprietary Limited, The: *See—*
Carlson, Arthur R., 302,922, Cl. D7-77.000.
Wolfenden, Anthony H., 302,921, Cl. D7-72.000.

DeCoster, Pieter K. J.: *See—*
Daenen, Robert H. C. M.; and DeCoster, Pieter K. J., 302,924, Cl. D7-84.000.

DeForrest, William. Lock status indicator. 302,953, 8-22-89, Cl. D10-109.000.

Dehlen, Bengt L. A., to Trelleborg AB. Lining element for interior surfaces of loading bin, sliding chute, or the like. 302,983, 8-22-89, Cl. D15-147.000.

Downs, Dennis J.: *See—*
Gardner, Ross, Jr.; and Downs, Dennis J., 303,014, Cl. D24-67.000.

Draheim, Harvey J.: *See—*
Brunner, Merlin A.; and Draheim, Harvey J., 302,915, Cl. D6-508.000.

Dressen, Larry G.: *See—*
Mortensen, Roger L.; Gregerson, Barry L.; and Dressen, Larry G., 302,945, Cl. D9-341.000.

Dunkfeld, Fred O., Jr. Carrying case for picnic supplies. 302,904, 8-22-89, Cl. D3-74.000.

Eckman, Charles M.: *See—*
Eckman, Hanford L.; and Eckman, Charles M., 303,004, Cl. D23-317.000.

Eckman, Hanford L.; and Eckman, Charles M. Mobile towel warmer and dryer. 303,004, 8-22-89, Cl. D23-317.000.

Eisendrath, Stuart J. Diaper dispenser. 302,949, 8-22-89, Cl. D9-432.000.

Ellis, Mark L. Automobile hardtop storage cart/rack. 303,031, 8-22-89, Cl. D34-31.000.

Empak, Inc.: *See—*
Mortensen, Roger L.; Gregerson, Barry L.; and Dressen, Larry G., 302,945, Cl. D9-341.000.

Etro, Gerolamo, to Etro S.p.A. Textile fabric or similar article. 302,905, 8-22-89, Cl. D5-37.000.

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Farrell, Richard: *See—*
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Feltman, Charles H., III; and Langer, Dirk, to 2nd Wave, A California General Partnership. Beverage mug. 302,919, 8-22-89, Cl. D7-9.000.

Ferco International: *See—*
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Ferrero, Pietro, to Ferrero S.p.A. Container for confectionary products. 302,941, 8-22-89, Cl. D9-318.000.

Ferrero, Pietro, to Ferrero S.p.A. Container for confectionary products. 302,942, 8-22-89, Cl. D9-318.000.

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Ferrero, Pietro, 302,941, Cl. D9-318.000.
Ferrero, Pietro, 302,942, Cl. D9-318.000.

Fields, Larry R.; Kendrick, George B.; and Morris, Merle E., to GTE Products Corporation. Electric reflector lamp. 303,015, 8-22-89, Cl. D26-26.000.

Fingerle, Robert F., to Paccar Inc. Low drag vehicle rear view mirror. 302,964, 8-22-89, Cl. D12-187.000.

Finn, Charles A. Folding knife with attaching clip. 302,934, 8-22-89, Cl. D8-99.000.

Firestone Tire & Rubber Company, The: *See—*
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Flesher, Robert W.; Barnes, Kevin J.; Blakesley, Robert W.; and Lynn, Robert W., to Life Technologies, Inc. Electrophoresis sequencing apparatus. 303,007, 8-22-89, Cl. D24-8.000.

Flesher, Robert W.; Barnes, Kevin T.; Blakesley, Robert W.; and Lynn, Robert W., to Life Technologies, Inc. Electrophoresis sequencing apparatus tray. 303,012, 8-22-89, Cl. D24-31.000.

Flores, Ralph. Combined exterior lamp and sign. 303,017, 8-22-89, Cl. D26-51.000.

Ford Motor Company: *See—*
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Frederick Goldman, Inc.: *See—*
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Frenry Company, Inc., The: *See—*
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Wolfe, Henry S., 302,996, Cl. D21-237.000.
Wolfe, Henry S., 302,997, Cl. D21-237.000.
Wolfe, Henry S., 302,998, Cl. D21-237.000.

Friskey, Donald W. Bucket cart. 303,029, 8-22-89, Cl. D34-23.000.

Fuerst, Rory W.: *See—*
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Gardner, Ross, Jr.; and Downs, Dennis J., to Cabot Corporation. Earplug or similar article. 303,014, 8-22-89, Cl. D24-67.000.

General Electric Company: *See—*
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Gierke, Martin P., to Black & Decker Inc. Battery pack for use with portable power tools or the like. 302,971, 8-22-89, Cl. D13-8.000.

Giovannoni, Bruno R. Wind deflector for motor vehicles. 302,963, 8-22-89, Cl. D12-181.000.

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Goldston, Roland H. Cart for transporting mattress or the like. 303,030, 8-22-89, Cl. D34-26.000.

Graham, John F.; and Cesarczyk, Edward J., to Bull HN Information Systems Inc. Free standing tape drive cabinet. 302,975, 8-22-89, Cl. D14-108.000.

Gray, Harold C., to Firestone Tire & Rubber Company, The. Tire. 302,961, 8-22-89, Cl. D12-147.000.

Gray, Thomas C. Scraping tool. 303,027, 8-22-89, Cl. D32-49.000.

Greenberg, Robert Y., to L.A. Gear, Inc. Shoe upper. 302,898, 8-22-89, Cl. D2-314.000.

Gregerson, Barry L.: *See—*
Mortensen, Roger L.; Gregerson, Barry L.; and Dressen, Larry G., 302,945, Cl. D9-341.000.

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Haynes, Robert E., to Lew Childre & Sons, Inc. Spool faceplate for a fishing reel. 303,002, 8-22-89, Cl. D22-141.000.

Heilig, Mort. Skateboard. 302,993, 8-22-89, Cl. D21-227.000.

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Helstab, Edmond J.; Brown, Michael; Winlow, Thomas A.; and Bergman, Hans, to Northern Telecom Limited. Keyboard key arrangement. 302,977, 8-22-89, Cl. D14-115.000.

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Hookham, David: *See—*
Hawkes, Peter; and Hookham, David, 302,994, Cl. D21-227.000.

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Kaufman, Larry J. Ski case. 302,902, 8-22-89, Cl. D3-36.000.

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King, Feather W. Square holder for small metallic objects. 302,987, 8-22-89, Cl. D19-75.000.

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le Brocquy, Louis. Textile fabric. 302,906, 8-22-89, Cl. D5-41.000.

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Mount, Floyd E. Fluid collection receptacle. 302,944, 8-22-89, Cl. D9-337.000.

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Newhouse, Thomas J., to Herman Miller, Inc. Segmented spacer for linking desk units. 302,914, 8-22-89, Cl. D6-491.000

Nishida, Yoshiaki, to Kabushiki Kaisha Toshiba. Data entry and display computer for a bus fare adjustment system. 302,973, 8-22-89, Cl. D14-100.000.

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Powell, Johnese W.; Parks, Willie; Powell, Levisky; and Jones, Willie B., to Creative Markers, Inc. Memorial marker. 303,033, 8-22-89, Cl. D99-17.000.

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Reichmann, Charles. Fluted perfume applicator. 303,020, 8-22-89, Cl. D28-5.000.

Reichmann, Charles. Perfume applicator. 303,021, 8-22-89, Cl. D28-5.000.

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Rowley, Francis J. B.; and Hollingsworth, Ian M., to Valor Heating Limited. Gas-fired heater. 303,006, 8-22-89, Cl. D23-342.000.

Ruskin, Arthur, to York Plastics Corporation. Door stop. 302,939, 8-22-89, Cl. D8-402.000.

Ryobi Ltd.: *See*—
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Saito, Toshiaki: *See*—
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Sakamoto, Masakazu; and Saito, Toshiaki, to Ryobi Ltd. Portable electric sander. 302,930, 8-22-89, Cl. D8-62.000

Sanders, Gayle M., to Martin-Logan, Ltd. Loudspeaker. 302,979, 8-22-89, Cl. D14-214.000.

Saxon, Morris B. Locket or similar article. 302,957, 8-22-89, Cl. D11-80.000.

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Strasser, Robert K.; and Netsch, Robert L., to Manan Manufacturing Co., Inc. Handle for bone marrow biopsy device. 303,009, 8-22-89, Cl. D24-24.000

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Tamas, Tibor; and McClure, Jeffrey. Combined mount and support bracket for firearms. 303,000, 8-22-89, Cl. D22-110.000.

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Van de Ven, Petrus H. J., to U.S. Philips Corporation. Loudspeaker grille. 302,981, 8-22-89, Cl. D14-219.000

Van de Ven, Petrus W. J., to U.S. Philips Corporation. Loudspeaker grille. 302,980, 8-22-89, Cl. D14-219.000.

Vinck, Robert. Card pen. 302,985, 8-22-89, Cl. D19-41.000.

Wilkinson Sword Limited: *See*—
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Wolfe, Henry S., to Frenry Company, Inc., The. Float. 302,996, 8-22-89, Cl. D21-237.000.

Wolfe, Henry S., to Frenry Company, Inc., The. Pool float. 302,997, 8-22-89, Cl. D21-237.000.

Wolfe, Henry S., to Frenry Company, Inc., The. Pool float. 302,998, 8-22-89, Cl. D21-237.000.

Wolfenden, Anthony H., to Decor Corporation Proprietary Limited, The. Paper napkin holder. 302,921, 8-22-89, Cl. D7-72.000.

Yamamoto, Sachio; Kuriya, Chikashi; and Nakajima, Mika, to Sharp Corporation. Portable vacuum cleaner. 303,025, 8-22-89, Cl. D32-18.000.

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York, Henry A. Soccer training goal. 302,991, 8-22-89, Cl. D21-200.000.

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Ruskin, Arthur, 302,939, Cl. D8-402.000.

Yoshida, Kenzo, to Sharp Corporation. Microwave oven. 302,927, 8-22-89, Cl. D7-351.000.

Yuen, John S., to John Manufacturing Limited. Auxiliary automotive vehicle brake light. 303,016, 8-22-89, Cl. D26-29.000.

Zabarte, Ron. Two edge pick tool head. 302,933, 8-22-89, Cl. D8-78.000.

Zall, Lawrence R., to Allied of Chicago, Inc. Cosmetic organizer. 303,024, 8-22-89, Cl. D28-76.000.

Zimmermann, Anso, to Zimmermann, Anso. Insulated jug. 302,925, 8-22-89, Cl. D7-317.000.

Zinter-Chahin, Christine M., to Quaker Oats Company, The. Activity toy. 302,988, 8-22-89, Cl. D21-63.000

2nd Wave, A California General Partnership: *See*—
Feltman, Charles H., III; and Langer, Dirk, 302,919, Cl. D7-9.000.

LIST OF PLANT PATENTEES

Chamberlin, Thomas O., Sr., to Metzler Investments; and Metropolitan Life Insurance Company. Plum tree, "Del Rey Sun" . 6,991, 8-22-89, Cl. 38.000.

Chamberlin, Thomas O., Sr., to Metzler Investments; and Metropolitan Life Insurance Company. Peach tree "May Sun" . 6,992, 8-22-89, Cl. 43.000.

Holtkamp, Reinhold, Sr. African violet plant named Nancy. 6,998, 8-22-89, Cl. 69.000.

Klemm, Siegfried, to Klemm & Sohn. Geranium plant named Klefisall. 6,994, 8-22-89, Cl. 68.000.

Klemm, Siegfried, to Klemm & Sohn. Geranium plant named Klefice. 6,995, 8-22-89, Cl. 68.000.

Klemm, Siegfried, to Klemm & Sohn. Geranium plant named Manepi. 6,996, 8-22-89, Cl. 68.000.

Klemm, Siegfried, to Klomm & Sohn. Geranium plant named Mareli. 6,997, 8-22-89, Cl. 68.000.

Klemm & Sohn: *See*—
Klemm, Siegfried, 6,994, Cl. 68.000.
Klemm, Siegfried, 6,995, Cl. 68.000.
Klemm, Siegfried, 6,996, Cl. 68.000.

Klomm & Sohn: *See*—
Klemm, Siegfried, 6,997, Cl. 68.000.

Metropolitan Life Insurance Company: *See*—
Chamberlin, Thomas O., Sr., 6,991, Cl. 38.000.
Chamberlin, Thomas O., Sr., 6,992, Cl. 43.000.

Metzler Investments: *See*—
Chamberlin, Thomas O., Sr., 6,991, Cl. 38.000.
Chamberlin, Thomas O., Sr., 6,992, Cl. 43.000.

VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant name Hekla. 6,999, 8-22-89, Cl. 74.000.

VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Coral Charm. 7,000, 8-22-89, Cl. 80.000.

Wandell, Willet N. Red maple named Wandell. 6,993, 8-22-89, Cl. 51.000.

Yoder Brothers, Inc.: *See*—
VandenBerg, Cornelis P., 6,999, Cl. 74.000.
VandenBerg, Cornelis P., 7,000, Cl. 80.000.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 22, 1989

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

21	4,858,245
161 A	4,858,246
185 B	4,858,247
209.1	4,858,248
305	4,858,249

CLASS 4

258	4,858,250
358	4,858,251
368	4,858,252
502	4,858,253
542	4,858,254
544	4,858,255
597	4,858,256
606	4,858,257

CLASS 5

12 R	4,858,258
67	4,858,260
81 B	4,858,261
441	4,858,259
451	4,858,262
	4,858,263

CLASS 8

429	4,859,206
455	4,859,207
557	4,859,208

CLASS 15

93 R	4,858,264
[illegible]	4,858,265
111	4,858,266
220 R	4,858,267
250.21	4,858,268
327 F	4,858,269
328	4,858,270
339	4,858,271

CLASS 16

80	4,858,272
86 A	4,858,273
265	4,858,274

CLASS 19

97	4,858,275
98	4,858,276
200	4,858,277
	4,858,278

CLASS 24

20 R	4,858,279
33 B	4,858,280
113 MP	4,858,281
143 R	4,858,282
178	4,858,283
433	4,858,284
555	4,858,285
587	4,858,286

CLASS 28

172	4,858,287
178	4,858,288

CLASS 29

34 B	4,858,289
35.5	4,858,290
91.1	4,858,291
116.2	4,858,292
148.4 A	4,858,293
149.5 R	4,858,294
156.4 R	4,858,295
157.3 C	4,858,296
159 R	4,858,297
273	4,858,298
[illegible]	4,858,299
463	4,858,300
563	4,858,301
[illegible]	4,858,302
[illegible]	4,858,303
598	4,858,304
723	4,858,306
727	4,858,305
736	4,858,307
740	4,858,308
764	4,858,309
[illegible]	4,858,310
857	4,858,311
[illegible]	4,858,312
883	4,858,313

CLASS 30

90	4,858,314
90.4	4,858,315
102	4,858,316
115	4,858,317
122	4,858,318
125	4,858,319
162	4,858,320
276	4,858,321
310	4,858,322
346.6	4,858,323
357	4,858,324
373	4,858,325

CLASS [illegible]

27.02	4,858,326
42	4,858,327
199 R	4,858,330
203.18	4,858,331
508	4,858,332
552	4,858,333
673	4,858,334
722	4,858,328
775	4,858,329

CLASS 34

32	4,858,335
[illegible]	4,858,336

CLASS 36

4	4,858,337
44	4,858,338
45	4,858,339
88	4,858,340
97	4,858,341
109	4,858,342
128	4,858,343

CLASS 37

104	4,858,344
118 R	4,858,345
184	4,858,346
190	4,858,347
265	4,858,348

CLASS [illegible]

102.91	4,858,349

CLASS 40

119	4,858,350
152.1	4,858,351
299	4,858,352
[illegible]	4,858,353
324	4,858,354
366	4,858,355
	4,858,356
450	4,858,357
616	4,858,358

CLASS 42

94	4,858,359
95	4,858,360
96	4,858,361

CLASS [illegible]

[illegible]	4,858,362
6.5	4,858,363
21.2	4,858,364
23	4,858,365
26	4,858,366
42.25	4,858,367
42.36	4,858,368
43.1	4,858,369
43.13	4,858,370
43.16	4,858,371
55	4,858,372
61	4,858,373
122	4,858,374
124	4,858,375
139	4,858,376

CLASS 44

51	4,859,209
53	4,859,210
589	4,859,211
622	4,859,212

CLASS 47

17	4,858,377
33	4,858,378
	4,858,379
45	4,858,380
79	4,858,381

CLASS [illegible]

87	4,859,213
197 R	4,859,214

CLASS [illegible]

35	4,858,382
360	4,858,383
[illegible]	4,858,384
488	4,858,385
505	4,858,386

CLASS 51

34 E	4,858,387
55	4,858,388
[illegible]	4,858,389
135 R	4,858,390
165.93	4,858,391
218 R	4,858,392
237	4,858,393
312	4,858,394

CLASS 52

3	4,858,395
11	4,858,396
[illegible]	4,858,397
90	4,858,398
97	4,858,399
[illegible]	4,858,400
[illegible]	4,858,401
105	4,858,402
127.12	4,858,403
179	4,858,404
[illegible]	4,858,405
[illegible]	4,858,406
[illegible]	4,858,407
[illegible]	4,858,408
	4,858,409
592	4,858,410
601	4,858,411
713	4,858,412
823	4,858,413

CLASS 53

429	4,858,414
438	4,858,415
439	4,858,416

CLASS 55

16	4,859,215
[illegible]	4,859,216
[illegible]	4,859,217
213	4,859,218
223	4,859,219
350	4,859,220
419	4,859,221

CLASS [illegible]

[illegible]	4,858,417
15.5	4,858,418
189	4,858,419

CLASS 57

328	4,858,420
	4,858,421
401	4,858,422
413	4,858,423

CLASS 59

78.1	4,858,424
[illegible]	4,858,425

CLASS 60

39.08	4,858,426
	4,858,427
39.141	4,858,429
39.17	4,858,428
226.2	4,858,430
297	4,858,431
303	4,858,432
	4,858,433
398	4,858,434
441	4,858,435
545	4,858,436
562	4,858,437
[illegible]	4,858,438
583	4,858,439
614	4,858,440

CLASS 62

6	4,858,441
	4,858,442
36	Re.33,026
126	4,858,443
372	4,858,444
374	4,858,445

CLASS 65

3.12	4,859,222
	4,859,223
17	4,859,224
104	4,859,225
139	4,859,226
334	4,859,227

CLASS 66

191	4,858,447

CLASS 68

5 E	4,858,448
12 R	4,858,449
134	4,858,450

CLASS 70

[illegible]	4,858,451
275	4,858,452
278	4,858,453
455	4,858,454
491	4,858,455
	4,858,456

CLASS 71

92	4,859,228
	4,859,229
93	4,859,230
	4,859,231
[illegible]	4,859,232
	4,859,233
103	4,859,234
	4,859,235

CLASS 72

187	4,858,457
214	4,858,458
	4,858,459

CLASS 73

[illegible]	4,858,460
23	4,858,461
40.5 A	4,858,462
49.3	4,858,463
49.5	4,858,464
[illegible]	4,858,465
119 A	4,858,466
146.8	4,858,467
149	4,858,468
579	4,858,469
[illegible]	4,858,470
706	4,858,471
784	4,858,472
[illegible]	4,858,473
861.35	4,858,474
862.54	4,858,475
863.23	4,858,476
863.54	4,858,477
864.35	4,858,478
865.9	4,858,479

CLASS 74

[illegible]	4,858,480
89.15	4,858,481
110	4,858,482
143	4,858,483
[illegible]	4,858,484
[illegible]	4,858,485
[illegible]	4,858,486
424.7	4,858,487
519	4,858,488
547	4,858,489
[illegible]	4,858,490
665 B	4,858,491
745	4,858,492
	4,858,495
[illegible]	4,858,493
781 B	4,858,494
863	4,858,496
866	4,858,497
	4,858,498
	4,858,499
	4,858,500
868	4,858,501

CLASS 75

0.5 AA	4,859,237
0.5 AB	4,859,236
233	4,859,238
235	4,859,239
251	4,859,240

CLASS 77

126 R	4,858,446

CLASS 81

3.57	4,858,502
45	4,858,503
436	4,858,504

CLASS [illegible]

49	4,858,505
342	4,858,506
455	4,858,507

CLASS 84

1.01	4,858,508
1.16	4,858,509
402	4,858,510

CLASS [illegible]

8	4,858,511
	4,858,512
	4,858,513
37.05	4,858,514

CLASS 91

516	4,858,515

CLASS 92

[illegible]	4,858,516

CLASS [illegible]

1	4,858,517
2.08	4,858,518
40.05	4,858,520
42.05	4,858,521
[illegible]	4,858,519

CLASS [illegible]

[illegible]	4,858,522
	4,858,523
450.2	4,858,524

CLASS 101

91	4,858,525
111	4,858,526
123	4,858,527
175	4,858,528

CLASS 102

202.5	4,858,529
208	4,858,530
307	4,858,531
387	4,858,532
434	4,858,533
511	4,858,534

CLASS 105

15	4,858,535

CLASS [illegible]

1.14	4,859,241
19	4,859,242
110	4,859,243
243	4,859,244
277	4,859,245
487	4,859,246
[illegible]	4,859,247

CLASS 110

166	4,858,536
243	4,858,537
[illegible]	4,858,538

CLASS 112

21	4,858,539
117	4,858,540
121.11	4,858,541
121.12	4,858,542
231	4,858,543
266.1	4,858,544
275	4,858,545
286	4,858,546
420	4,858,547
443	4,858,548

CLASS 114

56	4,858,549
345	4,858,550

CLASS 116

[illegible]	4,858,551

CLASS 118

19	4,858,552
126	4,858,553
224	4,858,554
270	4,858,555
[illegible]	4,858,556
725	4,858,557
	4,858,558

CLASS 119

1	4,858,559
	4,858,560
	4,858,561

CLASS 122

7 R	4,858,562
382	4,858,563
[illegible]	4,858,564

CLASS 123

41.31	4,858,565
41.35	4,858,566
52 M	4,858,567
	4,858,568
52 M V	4,858,570
52 MB	4,858,569
71 R	4,858,571
90.12	4,858,572
90.15	4,858,573
90.34	4,858,574
90.41	4,858,575
145 A	4,858,576
190 A	4,858,577
276	4,858,578
[illegible]	4,858,579
339	Re.33,027
425	4,858,580
[illegible]	4,858,581
523	4,858,582
527	4,858,583
557	4,858,584
[illegible]	4,858,585
[illegible]	4,858,586
631	4,858,587

CLASS 124

23 R	4,858,588
24 R	4,858,589

CLASS 126

39 H	4,858,590
299 D	4,858,591
373	4,858,592
414	4,858,593
444	4,858,594

CLASS 127

32	4,859,248

CLASS 128

[illegible]	4,858,595
7.3	4,858,618
24 A	4,858,597
24 R	4,858,596
33	4,858,598
	4,858,599
65	4,858,600
92 R	4,858,601
92 YY	4,858,602
92 ZW	4,858,603
156	4,858,604
203.11	4,858,605
204.29	4,858,606
314	4,858,607
325	4,858,608
395	4,858,609
419 P	4,858,611
419 PG	4,858,610
422	4,858,612
660.03	4,858,613
661.07	4,858,614
668	4,858,615
[illegible]	4,858,616
[illegible]	4,858,617
[illegible]	4,858,619
774	4,858,620
779	4,858,621
782	4,858,622
785	4,858,623
[illegible]	4,858,624
872	4,858,625

CLASS 131

84.4	4,858,626
329	4,858,627
	4,858,628

332 4,858,629
364 4,858,630

CLASS 132

218 4,858,631

CLASS 134

22.18 4,859,249
57 R 4,858,632

CLASS 135

25 R 4,858,633
104 4,858,634
4,858,635

CLASS 136

225 4,859,250

CLASS 137

8 4,858,636
12 4,858,637
82 Re.33,028
115 4,858,638
116.5 4,858,639
236 1 4,858,640
244 4,858,641
474 4,858,642
[illegible] 4,858,643
504 4,858,644
551 4,858,645
596.16 4,858,646
599 1 4,858,647
614 04 4,858,648
625 22 4,858,650
625 6 4,858,649
869 4,858,651

CLASS 138

92 4,858,652
144 4,858,653

CLASS 139

59 4,858,654
76 4,858,655
116 4,858,656
438 4,858,657
452 4,858,658

CLASS 140

105 4,858,659

CLASS 144

2 J 4,858,660
134 D 4,858,661
136 C 4,858,662
4,858,663
136 R 4,858,664
380 4,858,665

CLASS 148

11.5 R 4,859,252
33.3 4,859,253
286 4,859,251
302 4,859,254
4,859,255
304 4,859,256
422 4,859,257

CLASS 152

556 4,858,666

CLASS 156

51 4,859,258
66 4,859,259
88 4,859,260
102 4,859,261
155 4,859,262
233 4,859,263
244.13 4,859,264
273.1 4,859,266
273.7 4,859,267
275.5 4,859,268
292 4,859,265
361 4,859,269
4,859,270
382 4,859,271
415 4,859,272
446 4,859,273
499 4,859,274
541 4,859,275
626 4,859,276
4,859,277
643 4,859,278
656 4,859,279
662 4,859,280
666 4,859,281

CLASS 157

1.1 4,858,667

CLASS 160

84.1 4,858,668
134 4,858,669

CLASS 162

78 4,859,282
4,859,283

CLASS 164

11 4,858,670
34 4,858,671
63 4,858,672
359 4,858,673
475 4,858,674
503 4,858,675

CLASS 165

2 4,858,676
12 4,858,677
32 4,858,678
46 4,858,679
55 4,858,680
70 4,858,681
[illegible] 4,858,682
125 4,858,683
134 1 4,858,684
[illegible] 4,858,685
173 4,858,686

CLASS 166

153 4,858,687
241 4,858,688
256 4,858,689
278 4,858,690
4,858,691
285 4,858,692
295 4,858,693
355 4,858,694

CLASS 169

62 4,858,695

CLASS 171

16 4,858,696

CLASS 172

21 4,858,697
448 4,858,698
558 4,858,699

CLASS 173

22 4,858,700
50 4,858,701
134 4,858,702

CLASS 174

25 R 4,859,804
68 5 4,859,805
4,859,806
4,859,807
4,859,808
92 4,859,809
110 PM 4,859,810
126 2 4,859,811
135 4,859,812

CLASS 175

19 4,858,703
61 4,858,704
73 4,858,705
329 4,858,706
4,858,707

CLASS 177

25.18 4,858,708
164 4,858,709
211 4,858,710
212 4,858,711

CLASS 178

18 4,859,813
19 4,859,814
69 D 4,859,815

CLASS 180

143 4,858,712
4,858,713
148 4,858,714
170 4,858,715
233 4,858,716

CLASS 181

0.5 4,858,717
106 4,858,718
158 4,858,719
176 4,858,720
213 4,858,721
243 4,858,722

CLASS 182

2 4,858,723
113 4,858,724
127 4,858,725
152 4,858,726

CLASS 187

121 4,858,727

CLASS 188

73.31 4,858,728
205 R 4,858,729
4,858,730
218 R 4,858,731
250 G 4,858,732
267 4,858,733
273 4,858,734
299 4,858,735
322 14 4,858,736
358 4,858,737
378 4,858,738

CLASS 192

18 R 4,858,739
56 R 4,858,740
98 4,858,741
107 C 4,858,742

CLASS 194

205 4,858,743
206 4,858,744

CLASS 198

333 4,858,745
465 4 4,858,746
718 4,858,747
750 4,858,748
756 4,858,749
778 4,858,750
834 4,858,751
845 4,858,752
853 4,858,753

CLASS 2.4

329 4,858,803

CLASS 200

61.27 4,859,816
61 41 4,859,817
61.45 R 4,859,818
146 R 4,859,819
[illegible] 4,859,820

CLASS 201

12 4,859,284

CLASS 203

51 4,859,285
75 4,859,286

CLASS 204

1 T 4,859,287
11 4,859,288
28 4,859,289
33 4,859,290
49 4,859,291
60 4,859,292
94 4,859,293
97 4,859,294
105 R 4,859,295
129 4,859,296
145 R 4,859,297
146 4,859,298
157.92 4,859,299
164 4,859,300
180 1 4,859,301
182 8 4,859,302
192.36 4,859,303
298 4,859,304
412 4,859,305
416 4,859,306
425 4,859,307

CLASS 206

5.1 4,858,754
45.31 4,858,755
45 34 4,858,756
77.1 4,858,757
205 4,858,758
221 4,858,759
222 4,858,760
315.3 4,858,761
414 4,858,762
419 4,858,763
449 4,858,764
581 4,858,765
628 4,858,766

CLASS 208

49 4,859,308
61 4,859,309
87 4,859,310
89 4,859,311
111 4,859,312
113 4,859,313
114 4,859,314
153 4,859,315
166 4,859,316
391 4,859,317

CLASS 209

3.1 4,858,767
4,858,768
4,858,769
4,859,318
535 4,858,770
552 4,858,771

CLASS 210

86 4,859,319
136 4,859,320
150 4,859,321
162 4,859,322
181 4,859,323
195.2 4,859,324
195.3 4,859,325
197 4,859,326
219 4,859,327
232 4,859,328
257.1 4,859,329
264 4,859,330
321 8 4,859,331
332 4,859,332
360 2 4,859,333
393 4,859,335
416.1 4,859,336
474 4,859,337
490 4,859,338
500 23 4,859,334
500 34 4,859,339
502 1 4,859,340
614 4,859,341
656 4,859,342
679 4,859,343
683 4,859,344
764 4,859,345
776 4,859,346
788 4,859,347
799 4,859,348

CLASS 211

36 4,858,772
149 4,858,773
184 4,858,774

CLASS 212

205 4,858,775

CLASS 215

270 4,858,776
295 4,858,777

CLASS 219

10.55 A 4,859,821
10.55 E 4,859,822
10 69 4,859,823
69 15 4,859,824
119 4,859,825
121.63 4,859,826
121 64 4,859,827
121 67 4,859,828
124 34 4,859,829
130.01 4,859,830
216 4,859,831
411 4,859,832
432 4,859,833
497 4,859,834
543 4,859,835
548 4,859,836

CLASS 220

5 A 4,858,778
6 4,858,779
359 4,858,780
407 4,858,781
458 4,858,782

CLASS 221

59 4,858,783
155 4,858,784

CLASS 222

145 4,858,785
158 4,858,786
188 4,858,787
207 4,858,788
309 4,858,789
402.2 4,858,790
510 4,858,791
533 4,858,792
541 4,858,793
606 4,858,794

CLASS 223

111 4,858,795

CLASS 224

42 44 4,858,796
162 4,858,797
242 4,858,798
243 4,858,799
4,858,800
264 4,858,801
273 4,858,802

CLASS 225

2 4,858,804
4,858,805
32 4,858,806
58 4,858,807

CLASS 226

95 4,858,808
97 4,858,809
127 4,858,810

CLASS 227

10 4,858,811
116 4,858,812
131 4,858,813
149 4,858,814

CLASS 228

2 4,858,815
34 4,858,816
122 4,858,817
[illegible] 4,858,818
179 4,858,819
264 4,858,820

CLASS 229

123.1 4,858,821
137 4,858,822

CLASS 232

34 4,858,823

CLASS 235

380 4,859,837
383 4,859,838
385 4,859,839
463 4,859,840
485 4,859,841

CLASS 236

94 4,858,824

CLASS 237

2 A 4,858,825

CLASS 239

18 4,858,826
69 4,858,827
76 4,858,828
230 4,858,829
313 4,858,830
326 4,858,831
723 4,858,832

CLASS 241

24 4,858,833
85 4,858,834

CLASS 242

1.1 A 4,858,835
18 R 4,858,836
4,858,837
43 A 4,858,838
47 09 4,858,839
55.2 4,858,840
56 R 4,858,841
56 9 4,858,842
65 4,858,843
67.1 R 4,858,844
85 1 4,858,846
107.4 B 4,858,847
198 4,858,848
199 4,858,849
285 4,858,845

CLASS 244

1 R 4,858,850
35 R 4,858,852
4,858,853
123 4,858,854
137.1 4,858,855
149 4,858,856
161 4,858,857
165 4,858,858
327 4,858,851

CLASS 246

20 4,858,859

CLASS 248

62 4,858,860
74.1 4,858,861
99 4,858,862
174 4,858,863
178 4,858,864
188 2 4,858,865
213.3 4,858,866
214 4,858,867
291 4,858,868
311.2 4,858,869
316.1 4,858,870
339 4,858,871
346 1 4,858,872
4,858,873
467 4,858,874
488 4,858,875
545 4,858,876
4,858,877
551 4,858,878
562 4,858,879
635 4,858,880

CLASS 249

135 4,858,881

CLASS 250

201 4,859,842
227 4,859,843
231 P 4,859,844
231 SE 4,859,845
4,860,051
234 4,859,846
239 4,859,847
253 4,859,865
296 4,859,848
327.2 4,859,849
4,859,850
334 4,859,851
363 1 4,859,852
370 07 4,859,853
374 4,859,854
385 1 4,859,855
398 4,859,856
492.3 4,859,857
504 R 4,859,858
4,859,859
548 4,859,860
556 4,859,863
560 4,859,861
4,859,862
577 4,859,864

CLASS 251

1.2 4,858,882
61.1 4,858,883
61.4 4,858,884
129 01 4,858,885
129.07 4,858,886
4,858,956
212 4,858,887

CLASS 252

3 4,859,349
8.9 4,859,350
32.5 4,859,351
41 4,859,352
46.3 4,859,353
47.5 4,859,354
4,859,355
4,859,356
51 4,859,357
99 4,859,358
174.15 4,859,359
299.7 4,859,360
301.6 S 4,859,361
312 4,859,362
4,859,363
512 4,859,364
601 4,859,365
602 4,859,366
628 4,859,367
629 4,859,368
700 4,859,369

CLASS 254

122 4,858,888
131 4,858,889
335 4,858,890

CLASS 256

19 4,858,891

CLASS 260

397.45 4,859,370
412.4 4,859,371

CLASS 261

20 4,859,375
35 4,859,376

CLASS 264

4.1 4,859,377
23 4,859,378
25 4,859,379
4,859,380
29.2 4,859,381
4,859,382
43 4,859,383
45 1 4,859,384
62 4,859,385
113 4,859,386
117 4,859,387
121 4,859,388
130 4,859,389
143 4,859,390
162 4,859,391
166 4,859,392
184 4,859,393
225 4,859,394
254 4,859,395
311 4,859,396
529 4,859,397
564 4,859,398

CLASS 266

99 4,858,892
249 4,858,893
265 4,858,894

CLASS 267

64.16 4,858,895
140.1 4,858,896
181 4,858,897
218 4,858,898
219 4,858,899
4,858,900

CLASS 269

21 4,858,901
88 4,858,902
328 4,858,903

CLASS 270

58 4,858,904

CLASS 271

10 4,858,905
19 4,858,906
124 4,858,907
176 4,858,908
184 4,858,909
[illegible] 4,858,910
240 4,858,911

CLASS 272

67 4,858,912
71 4,858,913
114 4,858,914
117 4,858,915
119 4,858,916
123 4,858,917
127 4,858,918
134 4,858,919

CLASS 273

1.5 R 4,858,920
26 R 4,858,921
4,858,922
62 4,858,923
4,858,924
[illegible] 4,858,926
73 D 4,858,928
77 A 4,858,929
85 G 4,858,930
138 A 4,858,931
143 R 4,858,932
144 A 4,858,933
162 D 4,858,925
186 A 4,858,934
416 4,858,927
4,858,935

CLASS 277

1 4,858,936
2 4,858,937
153 Re.33,029

CLASS 279

57 4,858,938
75 4,858,939

CLASS 280

5.2 4,858,940
233 4,858,942
414.1 4,858,943
609 4,858,944
[illegible] 4,858,945
[illegible] 4,858,946
643 4,858,947
711 4,858,948
[illegible] 4,858,949
713 4,858,950
741 4,858,951
802 4,858,952
[illegible] 4,858,953
[illegible] 4,858,954
851 4,858,941

CLASS 281

44 4,858,955

CLASS 283

81 4,858,957

CLASS 285

31 4,858,958
39 4,858,959
91 4,858,960
[illegible] 4,858,961
136 4,858,962
138 4,858,963
156 4,858,964
[illegible] 4,858,965
200 4,858,966
256 4,858,967
382.2 4,858,968

CLASS 290

54 4,859,866

CLASS 293

78 4,858,969
113 4,858,970
201 4,858,971
338 4,858,972
347 4,858,973

CLASS 294

2 4,858,974
64.1 4,858,975
4,858,976
82.1 4,858,977
82.35 4,858,978
99.1 4,858,980
106 4,858,979

CLASS 294

76 4,858,981
97.13 4,858,983
97.2 4,858,989
97.5 4,858,982
100 4,858,984
136 4,858,985
165 4,858,986
195 4,858,987
201 4,858,988

CLASS 297

[illegible] 4,858,990
195 4,858,991
[illegible] 4,858,992
[illegible] 4,858,993
391 4,858,994
411 4,858,995
446 4,858,996
487 4,858,997

CLASS 301

124 R 4,858,998

CLASS 303

9.63 4,858,999
33 4,859,000
92 4,859,001
103 4,859,002
111 4,859,003
119 4,859,004
4,859,005

CLASS 305

10 4,859,006

CLASS 307

10.1 4,859,867
106 4,859,868
117 4,859,869
263 4,859,870
[illegible] 4,859,871
269 4,859,872
290 4,859,873
296.3 4,859,874
311 4,859,875
425 4,859,876
443 4,859,877
[illegible] 4,859,878
476 4,859,879
[illegible] 4,859,880
520 4,859,881
[illegible] 4,859,882
[illegible] 4,859,883
[illegible] 4,859,884

CLASS 310

11 4,859,885
51 4,859,886
59 4,859,887
[illegible] 4,859,888
[illegible] 4,859,889
[illegible] 4,859,890
215 4,859,891
218 4,859,892
[illegible] 4,859,893
239 4,859,894
261 4,859,895
328 4,859,896
334 4,859,897
353 4,859,898

CLASS 312

12 4,859,007
257.1 4,859,008
277 4,859,009
312 4,859,010

CLASS 313

25 4,859,899
[illegible] 4,859,900
[illegible] 4,859,901
474 4,859,902
[illegible] 4,859,903
[illegible] 4,859,904
558 4,859,905
[illegible] 4,859,906

CLASS 315

3.5 4,859,907
111.81 4,859,908
4,859,909
169.1 4,859,910
169.3 4,859,911
4,859,912
169.4 4,859,913
354 4,859,914
371 4,859,915

CLASS 318

293 4,859,916
[illegible] 4,859,919
[illegible] 4,859,920
599 4,859,921
[illegible] 4,859,922
[illegible] 4,860,006
808 4,859,924

CLASS 323

210 4,859,925
241 4,859,926
284 4,859,927
311 4,859,928
316 4,859,929
317 4,859,930

CLASS 324

67 4,859,931
72.5 4,859,932
77 B 4,859,933
78 D 4,859,934
121 R 4,859,935
130 4,859,936
142 4,859,937
158 D 4,859,938
158 R 4,859,939
[illegible] 4,859,940
208 4,859,941
4,859,942
216 4,859,943
253 4,859,944
[illegible] 4,859,945
4,859,946
318 4,859,947
4,859,948
321 4,859,949
322 4,859,950
534 4,859,951
538 4,859,952
539 4,859,953

CLASS 328

155 4,859,954
169 4,859,955

CLASS 329

[illegible] 4,859,956
4,859,957
112 4,859,958
124 4,859,959
126 4,859,960

CLASS 330

253 4,859,961
4,859,963
260 4,859,962
279 4,859,964
[illegible] 4,859,965
288 4,859,966
[illegible] 4,859,967

CLASS 331

38 4,859,968
43 4,859,969
57 4,859,970

CLASS 333

[illegible] 4,859,971
[illegible] 4,859,972

CLASS 336

216 4,859,973
229 4,859,974
[illegible] 4,859,975
306 4,859,976

CLASS 336

[illegible] 4,859,977
[illegible] 4,859,978

CLASS 337

3 4,859,979

CLASS 338

308 4,859,980
4,859,981

CLASS 340

146.2 4,859,985
173 4,860,007
323 R 4,859,986
432 4,859,984
[illegible] 4,859,987
471 4,859,988
475 4,859,982
510 4,859,989
539 4,859,990
572 4,859,991
[illegible] 4,859,992
674 4,859,993
705 4,859,994
710 4,859,995
712 4,859,996
752 4,859,997
[illegible] 4,859,998
[illegible] 4,859,999
820.200 4,860,001
825.310 4,860,002
825.440 4,860,003
4,860,004
4,860,005
825.5 4,860,006
[illegible] 4,860,006
[illegible] 4,859,983

CLASS 341

31 4,860,008
73 4,860,009
118 4,860,010
133 4,860,011
143 4,860,012

CLASS 342

20 4,860,013
[illegible] 4,860,014
[illegible] 4,860,015
169 4,860,016
201 4,860,017
357 4,860,018

CLASS 343

702 4,860,024
[illegible] 4,860,019
[illegible] 4,860,020
840 4,860,021
4,860,022
912 4,860,023

CLASS 346

1.1 4,860,025
4,860,026
4,860,027
76 PH 4,860,028
4,860,029
4,860,030
136 4,860,031
139 R 4,860,032
140 R 4,860,033
4,860,034
157 4,860,035
159 4,860,036

CLASS 348

1.1 4,859,028
[illegible] 4,859,011
96.12 4,859,013
96.13 4,859,014
96.15 4,859,015
4,859,016
4,859,017
96.16 4,859,018
4,859,019
[illegible] 4,859,020
4,859,021
4,859,022
96.23 4,859,023
4,859,024
4,859,025
96.24 4,859,012
96.25 4,859,026
128 4,859,027
173 4,859,029
174 4,859,030
4,859,031
235 4,859,032
320 4,859,033
331 R 4,859,034
332 4,859,035
336 4,859,036
339 F 4,859,037
357 4,859,038
[illegible] 4,859,039
413 4,859,040
423 4,859,041
4,859,042
452 4,859,043
[illegible] 4,859,044
623 4,859,045
627 4,859,046

CLASS 351

47 4,859,047
159 4,859,048
161 4,859,049
210 4,859,050
211 4,859,051
239 4,859,052

CLASS 353

74 4,859,053

CLASS 354

[illegible] 4,860,037
[illegible] 4,860,038
106 4,860,039
170 4,860,040
212 4,860,041
277 4,860,042
[illegible] 4,860,043
321 4,860,044
[illegible] 4,860,045
475 4,860,046

CLASS 355

23 4,860,057
27 4,860,058
[illegible] 4,860,059
41 4,860,060
43 4,860,061
53 4,860,062
[illegible] 4,860,048
4,860,063
4,860,052
218 4,860,049
245 4,860,053
[illegible] 4,860,050
[illegible] 4,860,047
[illegible] 4,860,056
[illegible] 4,860,054
308 4,860,055

CLASS 356

[illegible] 4,859,054
4,859,055
[illegible] 4,859,056
4,859,057
[illegible] 4,859,065
251 4,859,058
[illegible] 4,859,059
[illegible] 4,859,066
352 4,859,060
359 4,859,061
371 4,859,062
418 4,859,063
446 4,859,064

CLASS 357

12 4,860,064
15 4,860,065
[illegible] 4,860,066
4,860,067
4,860,068
17 4,860,069
23.6 4,860,070
4,860,071
23.8 4,860,072
[illegible] 4,860,073
[illegible] 4,860,074
4,860,075
4,860,076
34 4,860,077
4,860,078
41 4,860,079
48 [illegible]
[illegible]
4,860,082
51 4,860,083
55 4,860,084
59 4,860,085
67 [illegible]
[illegible] 4,860,087
69 [illegible]

CLASS 358

10 4,860,089
21 R 4,860,090
22 4,860,091
29 4,860,092
50 4,860,093
98 4,860,094
4,860,095
[illegible] 4,860,096
133 4,860,097
139 4,860,098
[illegible] 4,860,099
4,860,100
[illegible] 4,860,101
158 4,860,102
167 4,860,104
4,860,105
181 4,860,106
[illegible] 4,860,107
[illegible] 4,860,108
225 4,860,113
287 4,860,117
[illegible] 4,860,119
330 4,860,120
336 4,860,121
341 4,860,122
342 4,860,123
[illegible] 4,860,109
4,860,110
4,860,111
4,860,112
[illegible] 4,860,114
[illegible] 4,860,115
447 4,860,116
451 4,860,118

CLASS 360

[illegible] 4,860,124
13 4,860,125
16 4,860,126
[illegible] 4,860,127
4,860,128
[illegible] 4,860,129
77.02 4,860,130
78.14 4,860,131
[illegible] 4,860,132
92 4,860,133
4,860,134
97.02 4,860,135
99.05 4,860,136
[illegible] 4,860,137
113 4,860,138
126 4,860,139
127 4,860,140
130.21 4,860,141
133 4,860,142
4,860,143

CLASS 361

1 4,860,144
[illegible] 4,860,145
42 4,860,146
[illegible] 4,860,147
58 4,860,148
[illegible] 4,860,149
90 4,860,150
91 4,860,151
4,860,152
[illegible] 4,860,153
[illegible] 4,860,154
111 4,860,155
[illegible] 4,860,156
[illegible] 4,860,157
165 4,860,158
212 4,860,159
279 4,860,160
[illegible] 4,860,161
376 4,860,162
384 4,860,163
[illegible] 4,860,164
4,860,165
414 4,860,166
417 4,860,167
[illegible] 4,860,168
[illegible] 4,860,169

CLASS 362

[illegible] 4,860,170
31 4,860,171
32 4,860,172
[illegible] 4,860,173
4,860,174
[illegible] 4,860,175
72 4,860,176
4,860,177
101 4,860,178
[illegible] 4,860,179
[illegible] 4,860,180
290 4,860,181
[illegible] 4,860,182

CLASS 363

12 4,860,183
17 4,860,184
41 4,860,185
4,860,186
61 4,860,187
65 4,860,188
132 4,860,189

CLASS 364

[illegible] 4,860,190
4,860,191
4,860,192
4,860,193
4,860,194
4,860,195
4,860,196
4,860,197
4,860,198
4,860,199
4,860,200
4,860,201
[illegible]
300 4,860,203
[illegible]
413.24 4,860,205
[illegible]
424.01 4,860,207
424.02 [illegible]
424.1 [illegible]
426.04 4,860,210
431.05 4,860,211
472 4,860,212
513 4,860,213
4,860,214
4,860,215
516 4,860,216
[illegible] 4,860,217
4,860,218
519 4,860,219
[illegible] 4,860,220
4,860,221
[illegible] 4,860,222
4,860,223
551.01 4,860,224
4,860,225
552 4,860,226
553 4,860,227
[illegible] 4,860,228
[illegible] 4,860,229
[illegible] 4,860,230
571.01 4,860,231
571.04 4,860,232
[illegible] 4,860,233
709.16 4,860,234
716 4,860,235
717 4,860,236
718 4,860,237
721 4,860,238
728.03 4,860,239
757 4,860,240
761 4,860,241
[illegible] 4,860,242
[illegible] 4,860,243
900 4,860,244
4,860,245
4,860,246

4,860,247
4,860,248
4,860,249
4,860,250
4,860,251
4,860,252

CLASS 365

125 4,860,253
145 4,860,254
189 4,860,255
189.03 4,860,256
189.11 4,860,257
194 4,860,258
201 4,860,259
4,860,260
218 4,860,261
4,860,262
230.05 4,860,263

CLASS 366

76 4,859,068
77 4,859,069
97 4,859,074
114 4,859,070
136 4,859,071
165 4,859,072
195 4,859,073
341 4,859,067

CLASS 367

17 4,860,264
73 4,860,265
97 4,860,266

CLASS 368

10 4,860,267
47 4,860,268
107 4,860,269
322 4,860,270

CLASS 369

4,860,271
4,860,272
100 4,860,273
4,860,274
109 4,860,275
119 4,860,276
126 4,860,277
271 4,860,278

CLASS 370

1 4,860,279
13 4,860,280
15 4,860,281
55 4,860,282
82 4,860,283
88 4,860,284
100 4,860,285
106 4,860,286
108 4,860,287

CLASS 371

1 4,860,288
12 4,860,289
25 4,860,290
27 4,860,291
32 4,860,292
51 4,860,293

CLASS 372

7 4,860,294
19 4,860,295
44 4,860,296
45 4,860,297
4,860,298
46 4,860,299
57 4,860,300
68 4,860,301
70 4,860,302
72 4,860,303
92 4,860,304
4,860,305

CLASS 373

112 4,860,306

CLASS 374

2 4,859,075
10 4,859,076
33 4,859,077
44 4,859,078
131 4,859,079
134 4,859,080
179 4,859,081

CLASS 375

1 4,860,307
8 4,860,308
17 4,860,309
18 4,860,310
19 4,860,311
26 4,860,312
27 4,860,313
4,860,314
30 4,860,315
39 4,860,316
58 4,860,317
82 4,860,318
83 4,860,319
4,860,320
96 4,860,321
107 4,860,322
111 4,860,323
122 4,860,324

CLASS 376

133 4,859,399
172 4,859,400
209 Re 33,030
282 4,859,401
285 4,859,402
293 4,859,403
293 4,859,404
4,859,405
4,859,406
4,859,407
450 4,859,408
463 4,859,409

CLASS 377

29 4,860,325
4,860,326
79 4,860,327

CLASS 378

34 4,860,328
50 4,860,329
162 4,860,330
163 4,860,331

CLASS 379

1 4,860,332
10 4,860,333
16 4,860,334
58 4,860,335
63 4,860,336
4,860,337
67 4,860,339
68 4,860,338
74 4,860,340
91 4,860,341
96 4,860,342
110 4,860,343
113 4,860,344
123 4,860,345
155 4,860,346
199 4,860,347
4,860,348
356 4,860,349
412 4,860,350

CLASS 380

3 4,860,351
23 4,860,352
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International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

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USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

May 3, 1989. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel For A Decision Without a Hearing as of July 31, 1989.

Chemical Discipline -	October 31, 1988
Mechanical Discipline -	January 11, 1988
Electrical Discipline -	February 5, 1988

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of July 31, 1989.

Chemical -	June 2, 1987
Electrical -	July 14, 1987
Mechanical	April 1, 1987

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of July 1989.

Affirmed	220
Affirmed-in-Part	48
Reversed	174
Total Decided	442

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on August 26, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,607,396 through 4,608,714
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on August 24, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,345,335 through 4,346,480
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

" (e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small entity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JUNE 11, 1989
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,521,921	06/416,748	06/11/85
4,521,923	06/561,041	06/11/85
4,521,926	06/425,042	06/11/85
4,521,930	06/439,827	06/11/85
4,521,934	06/555,137	06/11/85
4,521,939	06/566,472	06/11/85
4,521,945	06/310,188	06/11/85
4,521,948	06/463,536	06/11/85
4,521,962	06/584,004	06/11/85
4,521,965	06/511,536	06/11/85
4,521,978	06/558,938	06/11/85
4,521,982	06/607,674	06/11/85
4,521,989	06/547,719	06/11/85
4,521,992	06/547,008	06/11/85
4,522,000	06/372,974	06/11/85
4,522,006	06/503,691	06/11/85
4,522,025	06/582,015	06/11/85
4,522,026	06/464,402	06/11/85
4,522,031	06/274,572	06/11/85
4,522,034	06/595,199	06/11/85
4,522,040	06/532,894	06/11/85
4,522,042	06/514,511	06/11/85
4,522,054	06/535,806	06/11/85
4,522,057	06/545,456	06/11/85
4,522,064	06/560,752	06/11/85
4,522,065	06/595,780	06/11/85
4,522,068	06/553,585	06/11/85
4,522,069	06/224,460	06/11/85
4,522,076	06/544,981	06/11/85
4,522,077	06/505,400	06/11/85
4,522,081	06/561,321	06/11/85
4,522,088	06/563,204	06/11/85
4,522,089	06/546,237	06/11/85
4,522,090	06/490,933	06/11/85
4,522,092	06/508,835	06/11/85
4,522,099	06/561,172	06/11/85
4,522,101	06/434,869	06/11/85
4,522,109	06/553,692	06/11/85
4,522,114	06/474,823	06/11/85
4,522,120	06/539,941	06/11/85
4,522,126	06/569,803	06/11/85
4,522,127	06/472,487	06/11/85
4,522,130	06/481,360	06/11/85
4,522,133	06/660,168	06/11/85
4,522,146	06/409,016	06/11/85
4,522,171	06/505,072	06/11/85
4,522,185	06/551,060	06/11/85
4,522,187	06/487,968	06/11/85
4,522,202	06/566,740	06/11/85
4,522,225	06/442,829	06/11/85
4,522,227	06/493,259	06/11/85
4,522,234	06/333,136	06/11/85
4,522,236	06/475,495	06/11/85
4,522,238	06/467,182	06/11/85
4,522,240	06/578,003	06/11/85
4,522,241	06/520,654	06/11/85
4,522,244	06/505,328	06/11/85
4,522,248	06/409,358	06/11/85
4,522,255	06/405,437	06/11/85
4,522,257	06/468,162	06/11/85

Patent Number	Serial Number	Issue Date
4,522,260	06/583,065	06/11/85
4,522,273	06/260,045	06/11/85
4,522,278	06/580,186	06/11/85
4,522,281	06/486,778	06/11/85
4,522,283	06/385,264	06/11/85
4,522,299	06/573,291	06/11/85
4,522,304	06/369,652	06/11/85
4,522,306	06/471,231	06/11/85
4,522,314	06/476,055	06/11/85
4,522,318	06/490,658	06/11/85
4,522,324	06/591,315	06/11/85
4,522,325	06/544,513	06/11/85
4,522,328	06/463,438	06/11/85
4,522,339	06/500,779	06/11/85
4,522,345	06/506,038	06/11/85
4,522,361	06/442,852	06/11/85
4,522,362	06/524,647	06/11/85
4,522,366	06/519,844	06/11/85
4,522,368	06/562,821	06/11/85
4,522,372	06/554,108	06/11/85
4,522,376	06/610,419	06/11/85
4,522,379	06/468,690	06/11/85
4,522,380	06/529,639	06/11/85
4,522,381	06/505,454	06/11/85
4,522,385	06/421,655	06/11/85
4,522,386	06/503,494	06/11/85
4,522,391	06/381,435	06/11/85
4,522,395	06/576,178	06/11/85
4,522,398	06/463,966	06/11/85
4,522,402	06/466,978	06/11/85
4,522,403	06/565,382	06/11/85
4,522,408	06/585,270	06/11/85
4,522,414	06/649,732	06/11/85
4,522,415	06/571,478	06/11/85
4,522,448	06/224,294	06/11/85
4,522,472	06/350,466	06/11/85
4,522,482	06/467,479	06/11/85
4,522,508	06/640,606	06/11/85
4,522,509	06/506,712	06/11/85
4,522,512	06/375,066	06/11/85
4,522,518	06/511,741	06/11/85
4,522,520	06/618,213	06/11/85
4,522,523	06/512,981	06/11/85
4,522,528	06/495,900	06/11/85
4,522,529	06/444,684	06/11/85
4,522,538	06/549,475	06/11/85
4,522,543	06/572,846	06/11/85
4,522,549	06/485,097	06/11/85
4,522,558	06/567,678	06/11/85
4,522,561	06/501,369	06/11/85
4,522,564	06/501,370	06/11/85
4,522,572	06/417,631	06/11/85
4,522,594	06/459,818	06/11/85
4,522,598	06/612,064	06/11/85
4,522,604	06/526,957	06/11/85
4,522,606	06/463,986	06/11/85
4,522,615	06/544,496	06/11/85
4,522,618	06/366,569	06/11/85
4,522,627	06/447,289	06/11/85
4,522,637	06/556,476	06/11/85
4,522,638	06/612,885	06/11/85
4,522,639	06/485,179	06/11/85
4,522,647	06/508,971	06/11/85
4,522,659	06/594,822	06/11/85
4,522,683	06/570,056	06/11/85
4,522,687	06/463,868	06/11/85
4,522,706	06/564,843	06/11/85
4,522,711	06/539,717	06/11/85
4,522,714	06/552,264	06/11/85
4,522,715	06/640,925	06/11/85
4,522,735	06/505,516	06/11/85
4,522,738	06/488,770	06/11/85
4,522,740	06/601,477	06/11/85
4,522,746	06/579,406	06/11/85
4,522,747	06/624,821	06/11/85
4,522,765	06/623,445	06/11/85
4,522,770	06/357,350	06/11/85
4,522,800	06/491,860	06/11/85
4,522,817	06/475,166	06/11/85
4,522,823	06/568,451	06/11/85
4,522,827	06/394,797	06/11/85
4,522,860	06/456,914	06/11/85
4,522,866	06/354,359	06/11/85
4,522,871	06/482,414	06/11/85
4,522,886	06/659,147	06/11/85
4,522,890	06/540,106	06/11/85
4,522,912	06/462,104	06/11/85
4,522,923	06/538,692	06/11/85
4,522,932	06/603,141	06/11/85
4,522,942	06/500,435	06/11/85
4,522,972	06/398,415	06/11/85
4,522,986	06/633,025	06/11/85
4,522,997	06/501,537	06/11/85
4,523,004	06/506,250	06/11/85
4,523,009	06/636,076	06/11/85
4,523,021	06/638,500	06/11/85
4,523,026	06/526,581	06/11/85
4,523,033	06/571,845	06/11/85
4,523,046	06/352,417	06/11/85
4,523,061	06/550,311	06/11/85
4,523,062	06/490,269	06/11/85
4,523,065	06/538,115	06/11/85
4,523,080	06/444,422	06/11/85
4,523,084	06/298,796	06/11/85
4,523,087	06/451,169	06/11/85
4,523,090	06/506,706	06/11/85
4,523,091	06/360,338	06/11/85
4,523,094	06/578,126	06/11/85
4,523,099	06/489,769	06/11/85
4,523,103	06/522,036	06/11/85
4,523,104	06/468,629	06/11/85
4,523,105	06/424,264	06/11/85
4,523,107	06/371,110	06/11/85
4,523,148	06/282,394	06/11/85
4,523,152	06/481,358	06/11/85
4,523,157	06/422,952	06/11/85
4,523,167	06/453,130	06/11/85
4,523,173	06/536,118	06/11/85
4,523,195	06/354,433	06/11/85
4,523,218	06/425,102	06/11/85
4,523,219	06/526,556	06/11/85
4,523,220	06/459,334	06/11/85
4,523,242	06/408,442	06/11/85
4,523,245	06/414,334	06/11/85
4,523,247	06/628,122	06/11/85
4,523,258	06/594,854	06/11/85
4,523,264	06/569,446	06/11/85
4,523,278	06/618,447	06/11/85
4,523,306	06/568,140	06/11/85
4,523,318	06/437,840	06/11/85
4,523,319	06/493,149	06/11/85
4,523,327	06/455,674	06/11/85

Errata

In the Notice of Patents Which Expired April 16, 1985 Due to Failure to Pay Maintenance Fees, published at 1104 OG 4, the following correction should be made.

Patent Number		Patent Number	Issue Date
4,510,146	Should Have Read	4,511,146	4/16/85

Addendum

In the List of Patents Which Expired on April 30, 1989, Due to Failure to Pay Maintenance Fees, in the O.G. of July 18, 1989, the following patents should have appeared:

Patent Number	Serial Number	Issue Date
4,513,451	06/468,584	04/30/85

Patent Number	Serial Number	Issue Date
4,513,454	06/544,843	04/30/85
4,513,456	06/509,420	04/30/85
4,513,460	06/487,175	04/30/85
4,513,469	06/503,771	04/30/85
4,513,474	06/441,913	04/30/85
4,513,478	06/484,989	04/30/85
4,513,486	06/520,716	04/30/85
4,513,491	06/507,079	04/30/85
4,513,492	06/479,550	04/30/85
4,513,496	06/540,043	04/30/85
4,513,501	06/461,163	04/30/85
4,513,513	06/550,435	04/30/85
4,513,516	06/525,677	04/30/85
4,513,518	06/431,756	04/30/85
4,513,521	06/623,018	04/30/85
4,513,524	06/497,090	06/03/85
4,513,529	06/519,242	04/30/85
4,513,530	06/507,291	04/30/85
4,513,531	06/398,438	04/30/85
4,513,539	06/475,534	04/30/85
4,513,541	06/444,131	04/30/85
4,513,548	06/488,261	04/30/85
4,513,564	06/580,545	04/30/85
4,513,580	06/543,072	04/30/85
4,513,583	06/501,247	04/30/85
4,513,584	06/283,510	04/30/85
4,513,593	06/439,273	04/30/85
4,513,595	06/559,809	04/30/85
4,513,599	06/532,260	04/30/85
4,513,600	06/455,000	04/30/85
4,513,603	06/453,369	04/30/85
4,513,607	06/313,231	04/30/85
4,513,609	06/502,653	04/30/85
4,513,610	06/550,448	04/30/85
4,513,617	06/455,289	04/30/85
4,513,626	06/468,715	04/30/85
4,513,642	06/489,542	04/30/85
4,513,644	06/566,320	04/30/85
4,513,647	06/557,276	04/30/85
4,513,655	06/556,557	04/30/85
4,513,657	06/551,678	04/30/85
4,513,658	06/421,387	04/30/85
4,513,674	06/329,796	04/30/85
4,513,685	06/480,375	04/30/85
4,513,690	06/493,622	04/30/85
4,514,285	06/478,018	04/30/85
4,514,292	06/550,163	04/30/85
4,514,294	06/538,307	04/30/85
4,514,297	06/558,931	04/30/85
4,514,299	06/585,231	04/30/85
4,514,300	06/521,564	04/30/85
4,514,305	06/446,029	04/30/85
4,514,306	06/594,766	04/30/85
4,514,333	06/465,549	04/30/85
4,514,361	06/423,242	04/30/85
4,514,362	06/437,351	04/30/85
4,514,366	06/502,929	04/30/85
4,514,377	06/444,860	04/30/85
4,514,378	06/482,750	04/30/85
4,514,381	06/420,328	04/30/85
4,514,386	06/558,571	04/30/85
4,514,387	06/358,097	04/30/85
4,514,388	06/517,801	04/30/85
4,514,393	06/516,251	04/30/85
4,514,403	06/303,269	04/30/85
4,514,407	06/476,181	04/30/85
4,514,408	06/522,749	04/30/85
4,514,409	06/398,028	04/30/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,176,316, Re. S. N. 07/378,472, Filed July 12, 1989, Cl. 380/, SECURE SINGLE SIDEBAND COMMUNICATON SYSTEM USING MODULATED NOISE SUBCARRIER, L. A. De Rosa, et al., Owner of Record: *Inventor(s)*, Attorney or Agent: Mary C. Werner, Ex. Gp.: 222

4,449,667, Re. S. N. 07/381,589, Filed July 13, 1989, Cl. 239/167, APPARATUS FOR FOLDING AN OUTBOARD BOOM ON A LIQUID SPRAYING IMPLEMENT, Loren E. Tyler, Owner of Record: *W. W. J. Inc. Benson, Minn*, Attorney or agent: Curtis B. Hamre, Ex. Gp.: 314

4,679,609, Re. S. N. 07/379,622, Filed July 12, 1989, Cl. 168/124, THERMALLY PROTECTIVE DRAPERY CONSTRUCTION FOR WINDOWS, SLIDING GLASS DOORS, GLASS WALL PANELS AND THE LIKE, Frank E. Bateman, Owner of Record: *Inventor*, Attorney or Agent: Thomas O. Hoover, Ex. Gp.: 355

4,679,786, Re. S. N. 07/378,595, Filed July 11, 1989, Cl. 272/70, UNIVERSAL EXERCISE MACHINE, Robert E. Rodgers, Jr., Owner of Record: *Inventor*, Attorney or Agent: Nick A. Nichols, Jr., Ex. Gp.: 332

4,680,764, Re. S. N. 07/379,627, Filed July 13, 1989, Cl. 371/040, METHOD AND APPARATUS FOR TRANSMITTING DIGITAL DATA, Tadao Suzuki, et al., Owner of Record: *Sony Corp., Tokyo, Japan*, Attorney or Agent: Jay H. Maioli, Ex. Gp.: 236

4,681,162, Re. S. N. 07/381,027, Filed July 17, 1989, Cl. 166/242, BOREHOLE DRILL PIPE CONTINUOUS SIDE ENTRY OR EXIT APPARATUS AND METHOD, Harper Boyd, Owner of Record: *Boyd's Bit Service, Inc., Lake Charles, La.*, Attorney or Agent: Gregory C. Smith, Ex. Gp.: 356

4,687,827, Re. S. N. 07/381,775, Filed July 18, 1989, Cl. 427/340, BRUSHING CYANOACRYATERS: PACKAGING AND METHOD, Libby J. Russo, Owner of Record: *Inventor*, Attorney or Agent: Clifton L. Anderson, Ex. Gp.: 139

4,707,595, Re. S. N. 07/379,271, Filed July 13, 1989, Cl. 250/504R, INVISIBLE LIGHT BEAM PROJECTOR AND NIGHT VISION SYSTEM, Brad E. Meyers, Owner of Record: *Inventor*, Attorney or Agent: Richard D. Multer, Ex. Gp.: 256

4,708,689, Re. S. N. 07/378,401, Filed July 11, 1989, Cl. 446/301, TOY MUSIC ROCKING CHAIR, Jack Hou, Owner of Record: *Inventor*, Attorney or Agent: Eugene Mar, Ex. Gp.: 331

4,716,212, Re. S. N. 07/379,858, Filed July 14, 1989, Cl. 528/226, PREPARATION OF A HIGH MOLECULAR WEIGHT POLY (ARYLENE SULFIDE KETONE), Roger G. Gaughan, Owner of Record: *Phillips Petroleum Co., Bartlesville, Okla.*, Attorney or Agent: Kenneth D. Goetz, Ex. Gp.: 153

4,729,313, Re. S. N. 07/380,207, Filed July 14, 1989, Cl. 101/380, TYPE SEGMENT FOR PRINTING ROLL, Lester R. Medlen, Owner of Record: *Porelon Inc., Cookeville, Tenn.*, Attorney or Agent: Vance A. Smith, Ex. Gp.: 337

4,757,408, Re. S. N. 07/383,139, Filed July 19, 1989, Cl. 360/64, MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS, Hiroyuki Umeda, Owner of Record: *Victor Co. of Japan, Ltd., Yokohama, Japan*, Attorney or Agent: Daniel D. Fitteriey, Ex. Gp.: 235

4,773,549, Re. S. N. 07/380,206, Filed July 14, 1989, Cl. 215/100A, REUSABLE BOTTLE HOLDER, Yecheal A. Auraham, Owner of Record: *Inventor*, Attorney or Agent: Michael D. Harris, Ex. Gp.: 341

4,791,168, Re. S. N. 07/379,244, Filed July 12, 1989, Cl. 524/601, POLYURETHANE RESINS IN WATER-DILUTABLE BASECOATS HAVING LOW FLASH AND QUICK-DRYING CHARACTERISTICS, Timothy Salatin,

Owner of Record: *Base Corp., Clifton, N.J.*, Attorney or Agent: Richard C. Billups, Ex. Gp.: 153

4,796,324, Re. S. N. 07/384,270, Filed July 20, 1989, Cl. 15/144R, BROOM OR BRUSH WITH HINGED HANDLE, Francesco Sartori, Owner of Record: *Inventor*, Attorney or Agent: Charles A. Laff, Ex. Gp.: 242

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be, constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,464,223, Reexam. No. 90/001,809, Requested July 14, 1989, Cl. 153/643, PLASMA REACTOR APPARATUS AND METHOD, Georges J. Gorin, Owner of Record: *Tegal Corp., Novato, Calif.*, Attorney or Agent: Unknown, Ex. Gp.: 131, Requester: R. J. Patch, Arlington, Va.

4,511,488, Reexam. No. 90/001,808, Requested July 10, 1989, Cl. 252/162, D-LIMONENE BASED AQUEOUS CLEANING COMPOSITION, Grant B. Matta, Owner of Record: *Penetone Corp., Tenafly, N. J.*, Attorney or Agent: A. C. Gogoris, Ex. Gp.: 157, Requester: Owner

4,584,569, Reexam. No. 90/001,806, Requested July 10, 1989, Cl. 340/566, MOTION SENSITIVE SECURITY SYSTEM, Michael J. Lopez, Owner of Record: *Electromotive Technologies, Santa Ana, Calif.*, Attorney or Agent: Unknown, Ex. Gp.: 260, Requester: Code Alarm Inc., Madison Heights, Mich

COMMISSIONER ORDERED REEXAMINATIONS

Notice under 37 CFR 1.11(c). The orders for reexamination listed below are open to inspection by the general public in the indicated Examining Group. Copies of the Orders and other related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21 (b)).

In the event correspondence to the patent owner is not received, this notice will be considred to be constructive notice to the patent owner and reexamination will proceed. 37 CFR 1.248(a)(5) and 1.525(b).

4,787,938, Reexam. No. 90/001,807, Requested July 12, 1989, Cl. 106/273, COUNTERCURRENT DRUM MIXER ASPHALT PLANT, Michael R. Hawkins, Owner of Record: *Standard Hawens, Inc., Kansas City, Mo.*, Attorney or Agent: Kokjer, Kircher, Bradley, et al., Ex. Gp.: 110, Requester: Commissioner of Patents, Dept. of Commerce, Washington, D. C.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

White Mitchell, dba Matthew Industries, Chicago, Ill., Reg. No. 879,109, for the mark "PUT-ONS", Canc. No. 17,679.

ERMA S. BROWN
Administrator of the Trademark Trial and Appeal Board
For JEFFERY M. SAMUELS
Assistant Commissioner for Trademarks

Department of Commerce
Patent and Trademark Office
37 CFR Parts 1 and 2
[Docket No. 90143-9144]
RIN 0651-AA35

Amendment of Patent and Trademark Rules Concerning Judicial Review of Decisions of the Board of Patent Appeals and Interferences and the Trademark Trial and Appeal Board and Other Miscellaneous Matters

Agency Patent and Trademark Office, Commerce
Action Final Rule; Correction
Summary The Patent and Trademark Office is correcting errors in the final rule which appeared in the Federal Register on Thursday, July 13, 1989 (54 FR 29548).

1. On page 29551, in the third column, in § 1.136(b), in the tenth line, "affect" should read "effect".

2. On page 29553, in the first column, in § 1.303(c), the tenth line, "provided in 35 U.S.C. 146. The notice of" should read "provided in 35 U.S.C. 146, the notice of".

August 4, 1989 FRED E. McKELVEY
Solicitor

Membership of Patent and Trademark Office Performance Review Board

Agency Patent and Trademark Office, Commerce.
Action: Announcement of Membership of the Patent and Trademark Office Performance Review Board.
Summary: In conformance with the Civil Service Reform Act of 1978, 5 U.S.C. 4314(c)(4), the Patent and Trademark Office announces the appointment of persons to serve as members of its Performance Review Board (PRB).

This notice announces the termination of the appointments and replacement of Rene D. Tegtmeyer and Robert F. Burnett, who have retired. Marilyn G. Wagner and Al L. Smith, whose terms expire on September 30, 1989, are also being replaced.
Address: Comments should be addressed to Personnel Officer, Patent and Trademark Office, Office of Personnel, One Crystal Park, Suite 700, Washington, D. C. 20231.
For Further Information Contact: Carolyn P. Acree at the above address or (703) 557-2662.
Supplementary Information: The new membership of the Patent and Trademark Office Board is as follows:

Bradford R. Huther, Chairman, Assistant Commissioner for Finance and Planning, Patent and Trademark Office, Washington, D. C. 20231. Term - permanent

James E. Denny, Member, Acting Assistant Commissioner for Patents, Patent and Trademark Office, Washington, D. C. 20231. Term - permanent

Jeffrey M. Samuels, Member, Assistant Commissioner for Trademarks, Patent and Trademark Office, Washington, D. C. 20231. Term - permanent

Theresa A. Brelsford, Member, Assistant Commissioner for Administration, Patent and Trademark Office, Washington, D. C. 20231. Term - permanent

Thomas P. Giammo, Member, Assistant Commissioner of Information Systems, Patent and Trademark Office Washington, D. C. 20231. Term - permanent

Fred E. McKelvey, Member, Solicitor, Patent and Trademark Office Washington, D. C. 20231. Term - expires September 30, 1992.

Dr. Michael G. Hansen, (Outside) Member, Director, Federal Executive Institute, Charlottesville, Va. 22901. Term - expires September 30, 1992.

Edward Kubasiewicz, Member, Director, Patent Examining Group 250, Patent and Trademark Office, Washington, D. C. 20231. Term - expires September 30, 1992.

August 4, 1989 CAROLYN P. ACREE
Personnel Officer

Status of PTO Services

The following is an update of the status of PTO services for July 1989:

Service Item	FY 1989 Goal (Calendar Days [1])	Monthly Average (Calendar Days [1])
Filing Receipts:		
Patents	22	19
Trademarks	30	18
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	16 Hours
Window Coupons	5	2
Mail Coupons	12	5
Letter Orders	16	8
Certified Copies:		
Trademark Registrations	21	35
Applications-As-Filed	17	11*
File-Wrapper/Contents	N/A	13
Walk-up Certification	1	1
Trademark Search Library:		
Filing Pending Marks	21	30**
Filing Reg. Certificates	Issue Date+2 Days	+2 Days**
Filing Temp. Drawings	6	8
Assignments:		
Recording Patent-New Applications	43	133***
Recording Patents-Mail Room Recpts.	20	90***
Receipt Date of Bulk Pat. Docs. Returned by End of Month		Mar. 6-20, 1989***
Recording Trademarks	20	72***
Receipt Date of Bulk Trademark Documents Returned by End of Month		Apr. 19-May. 3, 1989***
Avg. Days from Issue Fee Payment to Issue Date	90-100	87
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	+20 Days****
Patent Copies Available	95% on Issue Date	+40 Days****
Trademark Copies Available	95% on Issue Date	99% on Issue Date

[1] Unless otherwise noted.
* The 5% of orders for which fiche are not on site are not included in calculations.
** Problems with trademark print products caused delays.
*** See narrative.
**** Contractor difficulties in keeping up with the increase in the quantities of patents being issued.

SERVICE STATISTICS

•*Assignment Backlog Update* — During July the focus was on processing of those assignments received with new patent applications in order to get back on track with our first-in/first-out workflow. The result of this cleanup effort has been several days increase in the time to record patent assignments received from the Mail Room. Over 6,200 new patent application assignments and 2,500 mail room assignments were processed this month. Now both types of work are moving properly through the branch. Currently, information for assignments filed with new patent applications through March 17, 1989, is availible to the public. For patent assignments received in the Mail Room, the public information date is April 18, 1989.

During the last several weeks there has been an increase in the number of trademark assignments filed. An average of 242 were received per week this month compared to an average of 197 per week in June. This increase in filings, and our introduction of additional training for conveyance examiners and paralegals on the complexities of trademark assignments, has resulted in some increased processing time for trademark assignment documents.

During this reporting period, a total of 10,281 recorded patent assignments and 1,725 recorded trademark assignments were mailed back to the correspondent. This compares to 6,565 patent assignments and 1,109 trademark assignments in the previous period.

IMPROVEMENTS TO SERVICE

•*Assignment Inquiries*— A new Records Control and Status Section of the Assignment Branch has been staffed and is available for public inquiries regarding assignment document processing. The telephone number is (703) 557-8691.

August 4, 1989

THERESA A. BRELSFORD
Assistant Commissioner for Administration

PATENT NOTICES

Certificates of Correction For Week of August 29, 1989

D. 298,740	4,767,063	4,793,204	4,807,464
D. 299,115	4,767,403	4,793,775	4,807,704
D. 300,046	4,767,598	4,793,799	4,807,718
4,622,421	4,768,235	4,794,618	4,807,722
4,663,478	4,768,900	4,794,638	4,807,820
4,666,714	4,769,368	4,796,155	4,807,872
4,666,771	4,769,715	4,796,403	4,808,027
4,668,816	4,770,915	4,797,113	4,808,185
4,674,122	4,772,690	4,797,272	4,808,267
4,691,344	4,774,337	4,797,461	4,808,367
4,695,647	4,776,864	4,798,654	4,808,638
4,700,214	4,777,146	4,798,711	4,808,894
4,702,003	4,777,629	4,798,727	4,809,013
4,703,058	4,777,853	4,798,866	4,809,179
4,706,157	4,778,259	4,800,267	4,809,254
4,724,992	4,778,443	4,801,085	4,809,397
4,726,382	4,778,588	4,801,497	4,809,500
4,726,572	4,783,360	4,801,627	4,809,554
4,729,807	4,783,572	4,801,793	4,809,657
4,731,980	4,784,229	4,801,801	4,809,804
4,735,974	4,786,686	4,802,228	4,809,894
4,737,554	4,787,535	4,802,793	4,810,352
4,737,794	4,787,734	4,803,223	4,810,499
4,744,846	4,787,947	4,804,552	4,810,747
4,748,717	4,788,375	4,804,852	4,810,812
4,749,414	4,789,386	4,804,880	4,811,754
4,749,588	4,789,617	4,805,334	4,811,923
4,753,333	4,789,722	4,805,340	4,811,983
4,756,221	4,790,712	4,805,407	4,814,789
4,756,426	4,791,167	4,805,437	4,814,996
4,756,808	4,791,295	4,806,236	4,817,814
4,760,959	4,791,324	4,806,253	4,822,052
4,761,264	4,791,343	4,807,082	4,823,312
4,762,483	4,791,588	4,807,167	4,824,346
4,764,851	4,792,077	4,807,304	
4,766,062	4,792,620	4,807,457	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

Box _____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs
Box 5	"No fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement.
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 8	All papers for the Office of the Solicitor except communications relating to pending litigation.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 13	Mail for the Employee and Labor Relations Division.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box FWC	Requests for File Wrapper Continuation Applications.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection.)
Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.
Box Assignments	All assignment documents except those filed in new patent applications.

Reference Collection of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public in gaining effctive access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 261-2916
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Kentucky	Louisville Free Public Library	(502) 561-8614
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada-Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(201) 932-2895
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State University	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5330
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775

Reference Collection of U. S. Patents Available for Public Use in Patent Depository Libraries—(continued)

State	*Name of Library*	*Telephone Contact*
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 572-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF July 29, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	7-30-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	12-23-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. SHAW, Acting Director	5-12-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-27-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-18-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-2-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—D. G. KELLY, Director	4-5-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	4-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-1-88

Expiration of patents: The patents within the range of numbers indicated below expire during July 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,673,609 to 3,680,148 inclusive
Plant Patents ..... 3,224 to 3,244 inclusive

REEXAMINATIONS

AUGUST 29, 1989

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,656,269 (1118th)

HISTIDINE DERIVITIVES

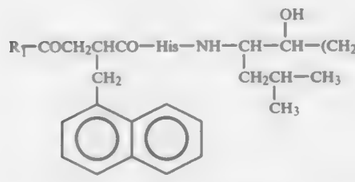
Kinji Iizuka; Tetsuhide Kamijo; Tetsuhiro Kubota, all of Nagano; Kenji Akahane, Tokyo; Hideaki Umeyama, Chiba, and Yoshiaki Kiso, Osaka, all of Japan, assignors to Kissei Pharmaceutical Co., Ltd.

Reexamination Request No. 90/001,688, Jan. 10, 1988.
Reexamination Certificate for Patent No. 4,656,269, issued Apr. 7, 1987, Ser. No. 852,260, Apr. 15, 1986.
Filed Jan. 10, 1989, Ser. No. 852,260
Claims priority, application Japan, Apr. 15, 1985, 60-79726
Int. Cl.[4] C07D *233/64, 413/12*
U.S. Cl. 544—139

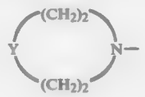
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–17 is confirmed.

1. An amino acid derivative represented by formula (I)



wherein R^1 represents a monoalkylamino group having 1 to 3 carbon atoms, a dialkylamino group having 2 to 6 carbon atoms, or



in which Y represents a chemical bond, an oxygen atom or a methylene group, His represents an L-histidyl group, n represents 0 or 1, X represents an oxygen atom or —NH—, R^2 represents a straight or branched-chain alkyl group having 1 to 7 carbon atoms; or a pharmaceutically acceptable salt thereof.

B1 4,710,490 (1119th)

COMPOSITIONS CONTAINING GANGLIOSIDE MOLECULES WITH ENHANCED ANGIOGENIC ACTIVITY

Nicholas Catsimpoolas, Newton Centre; Robert McCluer, Acton, both of Mass.; Robert S. Sinn, New York, N.Y., and James Evans, Winchester, Mass., assignors to Angio-Medical Corporation, New York, N.Y. and Trustees of Boston University, Boston, Mass.

Reexamination Request No. 90/001,601, Sep. 8, 1988.
Reexamination Certificate for Patent No. 4,710,490, issued Dec. 1, 1987, Ser. No. 782,724, Oct. 1, 1985.
Filed Sep. 8, 1988, Ser. No. 782,724
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—25

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 16–27 is confirmed.

Claims 11, 12 and 15 are cancelled.

Claims 1–10, 13 and 14 are determined to be patentable as amended.

Claims 28 and 29, dependent on an amended claim, are determined to be patentable.

New claims 30–40 are added and determined to be patentable.

1. A composition with angiogenic activity [comprising] *consisting essentially of* a mixture of angiogenically active gangliosides *derived from mammalian omentum* in an angiogenically effective amount.

B1 4,711,958 (1120th)

MORPHOLINE CONTAINING AMINO ACID DERIVATIVES

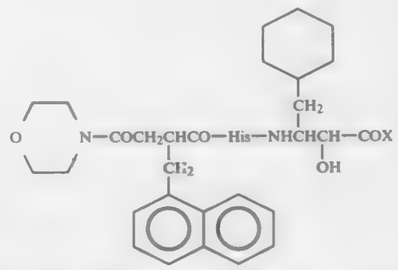
Kinji Iizuka; Tetsuhide Kamijo; Tetsuhiro Kubota; Kenji Akahane, all of Nagano; Hideaki Umeyama, Chiba, and Yoshiaki Kiso, Osaka, all of Japan, assignors to Kissei Pharmaceutical Co., Ltd.

Reexamination Request No. 90/001,687, Jan. 10, 1989.
Reexamination Certificate for Patent No. 4,711,958, issued Dec. 8, 1987, Ser. No. 32,693, Apr. 1, 1987.
Filed Jan. 10, 1989, Ser. No. 32,693
Claims priority, application Japan, Apr. 1, 1986, 61-74511; Jul. 10, 1986, 61-162563
Int. Cl.[4] C07D *295/18*
U.S. Cl. 544—139

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–3 is confirmed.

1. Amino acid derivatives represented by formula (I):



wherein His represents an L-histidyl group, X represents a straight or branched alkoxy group having 1 to 7 carbon atoms, a straight or branched alkylamino group having 1 to 7 carbon atoms, a cycloalkyloxy group having 3 to 7 carbon atoms, a morpholino group, said alkoxy group having one or more halogen atoms as substituents; or a pharmaceutically acceptable salt.

REISSUES

AUGUST 29, 1989

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,034

PRESS ROLL FOR WEB MATERIAL WITH CLAMPED PRESS JACKET

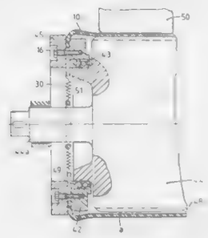
Christian Schiel; Hans Flämig; Udo Grossmann; Joseph Müllner, all of Heidenheim, and Karl Steiner, Herbrechtingen, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Original No. 4,625,376, dated Dec. 2, 1986, Ser. No. 717,761, Mar. 28, 1985. Application for reissue Aug. 31, 1988, Ser. No. 239,135

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1985, 3501635

Int. Cl.[4] A61F *13/20*; D04H *1/22*

U.S. Cl. 241—119 30 Claims



26. A press jacket for forming the exterior of a press roll which forms a press nip with a counter roll, the press jacket comprising:

an endless, flexible, liquid-impervious press jacket for being wrapped around and being rotatable on a press roll support member that has a respective rotatable press jacket support element with a periphery at each press roll end;

the endless press jacket having opposite lateral ends; at at least one of the lateral ends, the press jacket having an edge zone for extending past the periphery of the respective support element and for then extending radially inward, thereby to define an annular end sealing surface at the respective end zone of the press jacket;

at least one edge zone of the press jacket being formed into a plurality of tongues which are adapted for extending laterally outward of the jacket and which then are adapted for extending radially inward past the outside of the support element, with a respective cut-out being defined between each two neighboring tongues around the lateral edge zone of the press jacket.

Re. 33,035

Patent Not Issued For This Number

Re. 33,036

CLOSURE MECHANISM WITH GAS SEAL

Bernhard Schiefer, Cincinnati, Ohio, and Herbert Bumberger, Linz, Austria, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany and Voest-Alpine AG, Linz, Austria

Original No. 4,555,050, dated Nov. 26, 1985, Ser. No. 512,127, Jul. 8, 1983. Application for reissue Nov. 25, 1987, Ser. No. 125,605

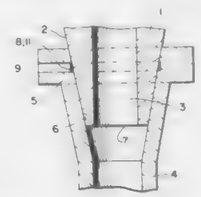
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1982, 3226047

Int. Cl.[4] B22D *41/08*

U.S. Cl. 222—597 8 Claims

1. In a closure mechanism of the type operable alternately for discharging molten metal from a molten metal containing vessel and for blocking such discharge, said closure mechanism being of the type including a conical discharge nozzle and a shielding tube fitted over the exterior of said discharge nozzle, the improvement of means for preventing exterior air from entering between said discharge nozzle and said shielding tube into the interior of said shielding tube, said preventing means comprising:

a conical joint formed by conical surfaces of said discharge nozzle and said shielding tube, said conical surfaces of said



discharge nozzle and said shielding tube being closely complementary [and in abutment] *without an open space therebetween*, thereby forming a snug said conical joint; and

at least one ring-shaped seal in said joint, said ring-shaped seal comprising an annular recess formed in one of said concial surfaces, thereby defining an annular chamber, and an inert gas filling said chamber.

Re. 33,037

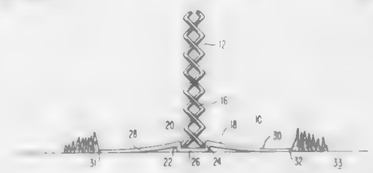
FENCELINER

Lawrence R. Kauffman, Rte. 10, Box 101, and Kenneth L. Kauffman, Lot 26, Horizon La., both of Gadsden, Ala. 35901

Original No. 4,595,175, dated Jun. 17, 1986, Ser. No. 718,971, Apr. 2, 1985. Application for reissue Jan. 19, 1988, Ser. No. 145,157

Int. Cl.[4] E04H *17/06*

U.S. Cl. 256—1 10 Claims



1. A fenceliner for inhibiting the growth of grass, weeds or like vegetation beneath and closely adjacent to a fence having a plurality of posts and at least one fence panel, and for inhibiting the passage of small animals across the border defined by the fence, comprising:

a strip of flexible sheet material having a width greater than the width of the fence and a length coextensive with the length of the fence and adapted to be arranged on the ground beneath the fence;

said strip including a recess extending along the center longitudinal axis thereof, for receiving said at least one fence panel, and outwardly extending legs extending integrally from said recess symmetrically to lie beyond the opposite sides of the fence panel, for covering areas of the ground on opposite sides of the fence, said legs being [substantially thicker adjacent said recess and gradually thinning at their opposite ends,] *configured* for upwardly biasing said fenceliner when said recess is urged downwardly by the panel of a fence, said biasing providing for facilitated installation under an existing fence, for quick destruction

of undesirable vegetation around the fence for inhibiting of the passage of small animals underneath the fence; and a plurality of pad members for receiving the posts, said flexible strip extending over opposite ends of said pad members, said pad members maintaining the continuity of said fenceliner underneath the fence adjacent the posts.

Re. 33,038

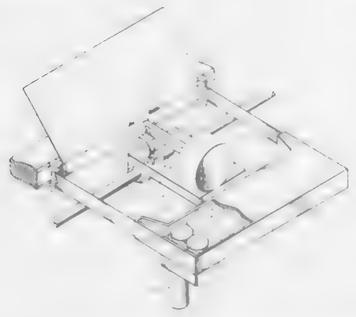
DOT MATRIX PRINTING SYSTEM

Samuel D. Zerillo, Hillsborough, N.H., assignor to Genicom Corporation, Waynesboro, Va.

Original No. 4,568,209, dated Feb. 4, 1986, Ser. No. 542,525, Oct. 17, 1983. Application for reissue Feb. 1, 1988, Ser. No. 151,300

Int. Cl.[4] B41J *35/10*

U.S. Cl. 400—216.1 **5 Claims**



1. In a dot matrix printer of the type having an elongate platen, a printhead having a projecting nosepiece through which a plurality of print pins are journaled, and means for travesing said printhead along said platen and selectively actuating said pins to effect printing on a web overlying said platen; a [multicolor] ribbon system comprising:

a [multicolor] ribbon having [parallel strips of different colors] *a plurality of portions;*

stationary ribbon holder means for holding a substantial quantity of said ribbon and for positioning a length of said ribbon generally parallel to said platen;

pivot pin means on each side of said nosepiece *for serving as a pivotable mount;*

shiftable ribbon guide *member* means including, on each side of said nosepiece, a disk-like base portion and a cylindrical wall means *for guiding said ribbon*, each wall means being attached to said base portion at spaced locations thereby to form an arcuate slot therebetween, the length of each slot being substantially equal to the width of the ribbon, the base portions being centrally apertured to receive said *pivot* pin [portions] *means;*

gear tooth means on [the periphery of at least one of said base portions;] *said shiftable ribbon guide member* means *for enabling the guide member means to be rotated*; and

selectively energizable stepper motor means *for driving said gear tooth means* including gear means engagable with said gear tooth means for rotating said guide [members] *member means* thereby to roll different [stripes] *portions* of said ribbon into alignment with said print pins.

Re. 33,039

LENS IMPLANT FOR INSERTION IN THE HUMAN EYE

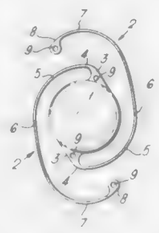
Eric J. Arnott, 11-12 Milford House, 7 Queen Anne Street, London W1n 9FD, England

Original No. 4,476,591, dated Oct. 16, 1984, Ser. No. 528,337, Aug. 31, 1983. Application for reissue Mar. 13, 1986, Ser. No. 839,695

Claims priority, application United Kingdom, Oct. 7, 1982, 8228754

Int. Cl.[4] A61F *2/16*

U.S. Cl. 623—6 **8 Claims**



1. A lens implant for insertion in the posterior chamber of a human eye after an extra-capsular extraction, said implant comprising a lens [of polymethyl methacrylate] and first and second similar holding loops formed integrally with and projecting from the periphery of said lens, each of said loops lying substantially in the plane of said lens and being open-ended with one end of said loop integral with said lens and the other end of said loop free, said ends of said loops which are integral with said lens being substantially diametrically opposite each other around the periphery of said lens, and each of said loops, starting from said end which is integral with said lens, including a first portion extending substantially radially outwards from said lens, a sharp bend extending from said first portion, a second portion extending from said bend, said second portion being of a curvature such that [is] *it* follows, but is spaced radially outwards from, said periphery of said lens, a third portion which extends from, and is of less curvature than, said second portion, and a fourth portion which extends from said third portion and is of a curvature substantially similar to that of said second portion, the end of said fourth portion remote from said third portion being free and lying radially outwards of [said second portion of] the other of said loops, whereby said two loops together surround said lens, and said first portion of each of said loops being relatively stiff and the other portions of said loops being more flexible and resilient so that, in use, when said implant is to be inserted through an incision into a human eye, said fourth portion of each of said loops can be pressed inwards into contact with [the second portion of] the other of said loops, and both said loops bend in such a way that together they form a substantially circular ring surrounding said lens, and, after insertion, said loops spring open [again, but] *and* the configuration of an encircling ring is maintained and said ring tends to adhere to the underlying posterior lens capsule of said eye.

Re. 33,040

ELECTROCHROMIC DISPLAY DEVICE

Hiroshi Kakiuchi, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Original No. 4,519,930, dated May 28, 1985, Ser. No. 456,787, Jan. 10, 1983. Application for reissue May 28, 1987, Ser. No. 55,184

Claims priority, application Japan, Jan. 11, 1982, 57-2622; Sep. 7, 1982, 57-156065

Int. Cl.[4] G02F *1/17*; C09K *3/00*

U.S. Cl. 252—62.2 **25 Claims**

1. An electrochromic [display] *optical* device comprising:

at least two electrodes at least one of which is comprised of electrochromic material, and an electrolyte gel in contact with said electrodes and comprising an electrolytic solution absorbed and thereby gelated by a copolymer formed of a first monomer which when polymerized forms polymer soluble in the solvent of said electrolytic solution and a second monomer which when polymerized forms polymer insoluble in the solvent of said electrolytic solution in a proportion such that said copolymer is capable of absorbing an amount of said electrolytic solution sufficient to form a gel which is effective as an electrolyte.

Re. 33,041

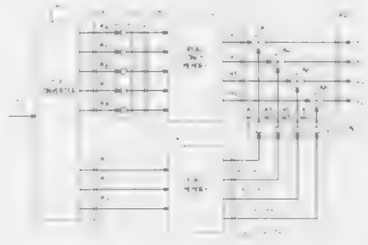
MULTI-DIMENSIONAL CODING FOR ERROR REDUCTION

Arthur R. Calderbank, Plainfield, and Neil J. A. Sloane, Highland Park, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Original No. 4,581,601, dated Apr. 8, 1986, Ser. No. 624,274, Jun. 25, 1984. Application for reissue Aug. 17, 1987, Ser. No. 85,609

Int. Cl.[4] H03M *7/00*

U.S. Cl. 341—50 **30 Claims**



21. A method for coding information comprising the steps of

separating said information into first and second groups of signals,

encoding the signals in said second group to provide an expanded group of signals,

addressing any one of a plurality of multidimensional code words by said first group of signals, and

determining the sign of each component of said multi-dimensional code words by said expanded group of signals.

PLANT PATENTS

GRANTED AUGUST 29, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,001

APPLE TREE: YATAKA

Tadao Hiraragi, Masuda, Japan, assignor to Makoto Okada, Hagashino, Japan

Filed Dec. 5, 1986, Ser. No. 938,399
Claims priority, application Japan, Dec. 5, 1985, 1707
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct apple tree substantially as shown and described, particularly characterized by fruit which matures and colors earlier than the fruit of the known "Fuji" variety.

7,002

APPLE TREE NAMED PIONEER MAC

Ernest B. Greiner, Marlboro, N.Y., assignor to Adams County Nursery, Inc., Aspers, Pa.

Filed Jul. 20, 1988, Ser. No. 225,075
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of apple tree, substantially as herein shown and described, characterized particularly as to novelty by its similarity to McIntosh, but having higher red skin color, glassy appearance, having no speckling or russetting, later maturity, firmer fruit, growing on a tree of medium size, of upright growth habit and having small size leaves, of medium length tapering to an abrupt point.

7,003

PEACH TREE, "JEFFERSON SUN"

Ronald H. Metzler, Del Rey, Calif., assignor to Metzler Investments and Metropolitan Life Insurance Company, both of Del Rey, Calif.

Filed Oct. 17, 1988, Ser. No. 258,875
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described and which is somewhat remotely similar to the Berenda Sun Peach Tree (U.S. Plant Pat. No. 5,297) from which it was derived as a chance sport but from which it is distinguished therefrom and characterized principally as to novelty by producing fruit which are mature for commercial harvesting and shipment during the last week of June through July 5 in the San Joaquin Valley of central California and which further produces a freestone fruit which has a red and yellow skin color and a flesh color which is a pleasing light yellow, the fruit of the subject variety having noteworthy shipping and handling characteristics.

7,004

BEGONIA PLANT NAMED APPLEBLOSSOM

Lyndon W. Drewlow, Ashtabula, and Arthur Barco, Medina, both of Ohio, assignors to Mikkelsens, Inc., Ashtabula, Ohio

Filed Sep. 29, 1988, Ser. No. 251,230
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia plant named Appleblossom, as illustrated and described.

7,005

AFRICAN VIOLET PLANT NAMED MARTINIQUE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Sep. 12, 1988, Ser. No. 244,030
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Martinique, as described and illustrated, and particularly characterized by its single, blue flowers with slightly frilled white edges; strong, upright flower stems that curve slightly toward the center to form a compact bouquet above the leaves; bright green, oval to heart-shaped, serrated leaves with a bright center; profuse flowering, vigorous and compact growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

7,006

AFRICAN VIOLET PLANT NAMED DOLLY

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 251,248
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Dolly, as described and illustrated, and particularly characterized by its single, variegated flowers with a white background and a purplish blue frilled edge that is larger on the 2 small petals than on the 3 big petals; strong, upright flower stems that curve slightly toward the center to form a compact bouquet above the leaves; medium green velvety leaves, profuse flowering, vigorous growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

7,007

AFRICAN VIOLET PLANT NAMED TAURUS

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 251,321
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of african violet named Taurus, as described and illustrated, and particularly characterized by its single, dark lilac flowers with darker center radiating into the 2 small petals; strong, upright flower stems that curve toward the center to form a compact bouquet above the leaves; bright green, slightly serrated girl-type leaves; profuse flowering, vigorous growth habit, flowering as early as 8–9 weeks after potting, and its long lasting and non-dropping flowers.

7,008

AFRICAN VIOLET PLANT NAMED KNOXVILLE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 251,323
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Knoxville, as described and illustrated, and particularly characterized by its single, pink flowers with frilled edges and darker pink center radiating into the 2 smaller petals; strong, upright flower stems that curve toward the center to form a bouquet above the leaves; medium green, serrated girl-type leaves with bright light green center; profuse flowering, vigorous growth habit, flowering 10–11 weeks after potting, and its long-lasting and non-dropping flowers.

7,009

CHRYSANTHEMUM PLANT NAMED TANAGA

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Sep. 22, 1988, Ser. No. 247,526
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct Chrysanthemum plant named Tanaga, as described and illustrated.

7,010

DIEFFENBACHIA HYBRIDA MAUI

Edwin J. Frazer, Brisbane, Australia, assignor to Hartman Plant Laboratories, Inc., Santa Paula, Calif.

Filed Mar. 9, 1987, Ser. No. 23,606
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—88 1 Claim

1. A new and distinct cultivar of Dieffenbachia as described and illustrated.

PATENTS

GRANTED AUG. 29, 1989

ERRATA

For CLASS	See PATENT NO.
160-134	4,861,090
371-010	4,862,416

PATENTS

GRANTED AUGUST 29, 1989

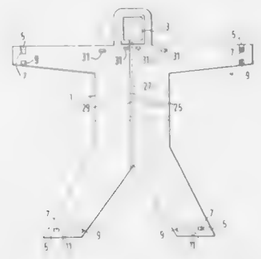
GENERAL AND MECHANICAL

4,860,381
BIB-BOWL
Tracy L. Bartley, P.O. Box S, Wharton, N.J. 07885
Continuation-in-part of Ser. No. 172,333, May 20, 1988, abandoned. This application Jan. 9, 1989, Ser. No. 294,218
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—49 A 18 Claims



1. A bib-bowl for use during feeding of a user comprising:
a bowl to carry food to be eaten by said user having a rim, a bottom and a given portion adjacent the body of said user containing therein a circular slot of predetermined length; and
a sheet of material having means to fasten said material about the neck of said user and a given width adjacent said bowl, said material being threaded through said slot from the inside of said bowl to the outside thereof, said predetermined length and said given width having a predetermined relative value to cause said material to assume a concave channel configuration extending from the neck of said user to said bowl to enhance the return of food and liquid to said bowl when spilled.

4,860,382
PROTECTIVE GARMENT
Edgar R. Markwell, Wereham, England, assignor to Freudenberg Nonwovens Ltd., England
Filed Dec. 22, 1987, Ser. No. 136,259
Claims priority, application United Kingdom, Dec. 24, 1986, 8630881
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—82 9 Claims



1. A protective suit made up of separate outer and inner plies held together at seams in the suit, the outer ply comprising a fire-retardant fabric having bonded to it a microporous material arranged such that the microporous material arranged such that the microporous material can allow passage of moisture vapor but prevent passage of droplets of liquid; and the inner ply including a vapor-absorbent material; and where in the outer and inner plies have separate openings and separable fastenings means for sewering each of said opening in a closed position, allowing the suit to be removed, whereby the outer ply can be opened while the inner ply is closed.

4,860,383
DECORATIVE GARMENT
Storme G. Warn, 231 SW. 11th Ave., Hallandale, Fla. 33009
Filed Jun. 6, 1988, Ser. No. 202,302
Int. Cl.[4] A41D *3/08, 15/00*
U.S. Cl. 2—88 7 Claims



1. A convertible decorative garment to be worn in a variety of styles and also structured for use as a decorative drape over a variety of objects, said garment comprising:
a sheet of an integral, one piece construction being formed of a seamless, flexible, drapable material comprising a central zone having a central cutout with the center of the cutout being coincident with the center of the sheet,
said sheet having a first pair of wing zones and a second pair of wing zones, each pair extending from the central zone in generally perpendicular relation to one another, said wing zones of said first pair extending a greater distance from the central zone than said wing zones of said second pair,
said sheet including an elongated pocket structure extending continuously about a periphery portion of said cutout,
drawstring means movably mounted within said pocket for selectively varying the peripheral size of the cutout, said drawstring means being effective to be tightened or loosened to adjust the size of the cutout to a peripheral dimension of a portion of the object on which it is mounted,
an aperture formed along the length of said pocket and disposed in communicating relation with an interior of said pocket, said drawstring means having an elongated configuration of sufficient length to extend along the entire length of said pocket and further including opposite free ends extending outwardly from the interior of the pocket through said aperture, and
each pair of wing zones including an imaginary centerline, said imaginary centerlines intersecting one another through the center of said sheet and said cutout, said sheet being symmetrical about each of said centerlines of each pair of wing zones.

4,860,384

SLEEVE ARRANGEMENT AND METHOD OF MANUFACTURE THEREOF

Ralph H. Widenbäck, Stenungsund, Sweden, assignor to New Pac Systems AB, Sweden

Filed Nov. 13, 1987, Ser. No. 120,625
Claims priority, application Sweden, Nov. 14, 1986, 8604882
Int. Cl.[4] D05B *3/00*
U.S. Cl. 2—115 12 Claims



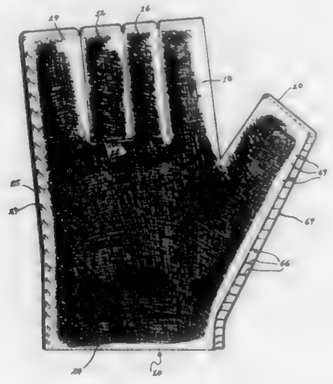
1. A protective garment comprising:
a body section having a continuous vertical panel;
a substantially tubular sleeve member defining sleeves for receiving both of a wearer's arms; the sleeve member being secured to and extending transversely of the vertical panel around a continuous boundary defining a respective joining section in both the sleeve member and the panel, the joining sections overlying each other and being of a length along the sleeve member and also of a height sufficient for a wearer's arms to pass through the joining sections into the sleeve member;
the joining sections of the sleeve member and of the panel, being removed around the boundary for forming an opening into the sleeve member for access of the wearer's arm from the interior of the body section behind the panel and into the sleeve member.

4,860,385

REVERSIBLE SEAMLESS GLOVE

Israel Zidele, 1303 Ditmas Ave., Brooklyn, N.Y. 11226

Filed Aug. 31, 1984, Ser. No. 646,572
The portion of the term of this patent subsequent to Feb. 29, 2005, has been disclaimed.
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—163 10 Claims



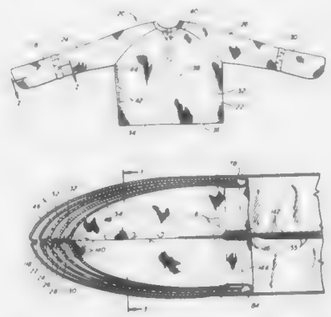
1. A reversible right to left hand glove or vice versa comprising a front and a back panel; said front panel consisting of a unitary piece of material cut such that there are five finger stall pieces including the thumb, index middle, ring, and little finger; the back panel consisting of a unitary piece of material cut such that there are thumb, index and little finger stall pieces, the middle finger stall piece being cut such that it is substantially extending over the ring finger and forming a flap being free at its base from the material of the back panel; the front and the back panel being superimposed and sewn together at all peripheries except the ring finger stall piece of the front panel, with the back panel's extending flap being sewn to the middle finger stall piece of the front panel leaving a material gap confronting the ring finger stall piece of the front panel, a separate piece of material representing a ring finger stall piece of the back panel being sewn to the ring finger stall piece of the front panel at their peripheries and at its base to the back panel thereby representing the only seam within the periphery of the glove and five finger stalls.

4,860,386

METHOD OF MAKING AN ENCLOSED SLEEVE

Mary Ann Martin, 115 E. Embargo St., Rome, N.Y. 13440

Division of Ser. No. 86,361, Aug. 17, 1987, Pat. No. 4,815,480.
This application Dec. 7, 1988, Ser. No. 281,244
Int. Cl.[4] A61F *13/00;* B32B *7/08;* A41D *27/02*
U.S. Cl. 2—243 R 2 Claims



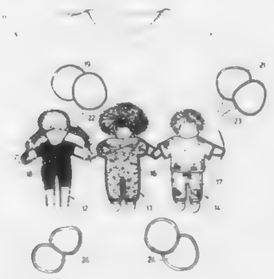
1. A method of making a sleeve member comprising the steps of:
(a) disposing a plurality of superposed sheets of fabric material upon a front section of an external sheet, each sheet of said plurality of sheets and said external sheet having an exterior surface and an interior surface, said plurality of sheets being orientated such that their exterior surfaces face the interior surface of said external sheet;
(b) fastening one edge of an internal sheet to a rear section of said external sheet in opposing relation to said plurality of sheets, said internal sheet having an exterior surface and an interior surface and being in a first position such that its interior surface faces said interior surface of said external sheet;
(c) pivoting said internal sheet about its fastened edge from said first position to a second position, whereby said internal sheet is substantially superposed upon said plurality of sheets and its exterior surface is facing said interior surface of said external sheet;
(d) fastening a first base portion of said internal sheet and a base portion of each of the sheets of said plurality of sheets to said front section of said external sheet;
(e) folding said front section of said external sheet such that its exterior surface is substantially enclosed;
(f) seaming the folded edges of said front section such as to produce an external envelope having an interior surface exposed;
(g) pushing said external envelope inside-out such that an exterior surface is exposed;
(h) folding, seaming and pushing inside-out each sheet of said plurality of sheets in the same manner as said front section, such as to produce a plurality of envelopes, one inside the other, and all of said plurality of envelopes inside said external envelope, each of said envelopes being in concentric relation to the other;
(i) folding said internal sheet such that its interior surface is substantially enclosed;
(j) seaming the folded edges of said internal sheet such as to produce an internal envelope having an exterior surface exposed;
(k) pivoting said internal envelope about said first base portion such as to align said internal envelope with said concentrically disposed envelopes; and
(l) tucking said internal envelope inside the innermost envelope of said concentrically disposed envelopes.

4,860,387

DOLL DECORATED GARMENT WITH DETACHABLE DOLL CLOTHING

Lesia M. Williams, 5554 Kingsport Dr., Atlanta, Ga. 30342

Filed Oct. 24, 1988, Ser. No. 261,601
Int. Cl.[4] A41D *27/08;* A41B *1/00*
U.S. Cl. 2—244 11 Claims



1. A garment having a garment face,
at least one doll figure or the like having front and rear surfaces, said figure being mounted on said garment face with its rear surface contacting said garment face,
the said front surface of said figure having attached thereto a layer of fastening material,
an article of clothing or the like for said figure, said article of clothing having a layer of stabilizing material and a front surface and a rear surface, and at least one member of fastening material mounted to the rear surface of said article of clothing.

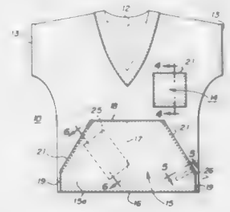
4,860,388

UNIFORM GARMENT

Tracy C. Dean, Odessa, Tex., assignor to Paul Agnew, Odessa, Tex.

Division of Ser. No. 88,283, Aug. 24, 1987, Pat. No. 4,791,681.
This application Sep. 7, 1988, Ser. No. 241,218
Int. Cl.[4] A41D *1/18, 27/20*
U.S. Cl. 2—247 3 Claims

1. A pocket structure for a nurses' uniform blouse or the like comprising a pocket panel having a lower edge, an upper edge and two opposing parallel side edges, said pocket panel oriented along a line which is coextensive with the fold of the



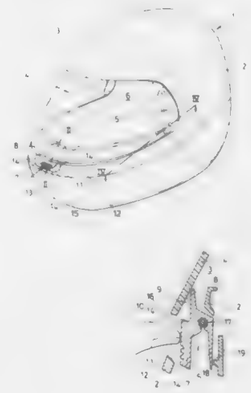
groin of the wearer, said pocket panel attached at its side edges and lower edge to the front of said uniform blouse.

4,860,389

PROTECTIVE HELMET WITH MOVABLE INTEGRATED SCREEN

Claude Morin, Peymeinade, France, assignor to T.A.C. (Tongerese Automaten Centrale), Tongeren, Belgium

Filed Apr. 7, 1988, Ser. No. 178,968
Claims priority, application Belgium, Apr. 17, 1987, 08700424
Int. Cl.[4] A42B *3/02*
U.S. Cl. 2—424 9 Claims



1. A protective helmet (1) for drivers or passengers of vehicles, of the "integral" type, comprising a rigid impact-resistant helmet (2) intended for protecting the forehead, the crown of the skull, the temples, the back of the skull, the nape and the chin and having an aperture (3) exposing the part of the face containing the eyes and the nose, a movable transparent screen (4), means (5) for fastening, articulating and controlling this screen on the helmet (2), which are designed so that the said screen (4) can assume two end positions, namely a first position in which it closes off the aforesaid aperture (3) and a second position in which it opens this aperture at least partially, the said helmet being defined in that the aperture in the helmet (2) and the screen (4) are matched so that, when the latter occupies its abovementioned first end position, the screen (4) is integrated into the helmet (2) so that its outer face (6) and that of the helmet are adjoined virtually without a gap or a difference in level, the means (5) for fastening, articulating and controlling the screen comprising a pushbutton (7) mounted on the helmet (2) so as to be accessible from outside the latter, and a lever (8) associated with the said pushbutton (7) and accommodated in the thickness of the helmet (2) and bearing on the

inner face (9) of the screen (4) in order to make it possible to bring the latter, under the action of the pushbutton (7), from its aforesaid first end position into an intermediate position, in which the screen (4) is released from the helmet aperture (3) and in which it is possible to place the end of at least one finger (10) between the helmet (2) and the screen (4) so as to bring it manually to its second end position.

4,860,390

DRAINAGE PLUG

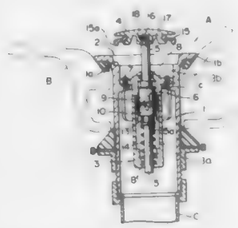
Ikumi Ohta, 2800-31, Oaza Nao, Asahi-cho, Mie-gun, Mie-ken, Japan

Filed Mar. 17, 1988, Ser. No. 169,422

Claims priority, application Japan, Mar. 31, 1987, 62-49646[U]

Int. Cl.[4] F16K *31/44*

U.S. Cl. 4—295 13 Claims



1. A drainage plug for opening and closing a drainage port in a reservoir, comprising:

a guide cylinder located at a central part of the drainage port;

a supporting shaft slidably fitted into said guide cylinder so that said supporting shaft may axially slide along an advancing or retracting path with respect to said guide cylinder;

a plug cap supported on the upper end of the supporting shaft;

a first spring for biasing the supporting shaft in an upward direction, whereby the plug cap can be moved downwardly when the drainage plug is closed;

a thrust lock mechanism within the guide cylinder for locking and releasing the supporting shaft at one end of the advancing or retracting path, the thrust lock mechanism includes a fixing ring connected to said supporting shaft and a rotary ring arranged to slidably and rotatably move with respect to said supporting shaft, and a second spring for biasing the rotary ring in an upward direction.

4,860,391

ARRANGEMENT FOR TREATMENT OF HAIR WITH CIRCULATING LIQUID

Bodo Hildebrandt, Riedstadt, Fed. Rep. of Germany, assignor to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

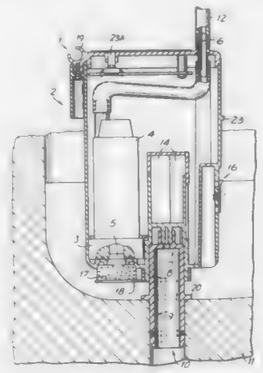
Filed Dec. 10, 1987, Ser. No. 133,281

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3643417

Int. Cl.[4] A45D *19/00*

U.S. Cl. 4—518 20 Claims

1. An arrangement for treatment of hair with circulating liquid held in a flushing basis having a drain opening, comprising a circulating pump unit provided with a pump and having a suction opening and a discharge opening adapted to be connected to a liquid discharge member for treating hair; and a foot including plug means insertable into said opening and arranged to seal said opening of a flushing basin said plug means being formed so as to provide a sole support for said



circulating pump unit with respect to the opening of the flushing basin.

4,860,392

HYDROTHERAPY MASSAGE UNIT

John Gardenier, 18 Cromer Ave., Schenectady, N.Y. 12304, and John Maiuccoro, 40 Bentwood Crt., Albany, N.Y. 12203

Filed Oct. 20, 1987, Ser. No. 110,688

Int. Cl.[4] A61H *33/02*

U.S. Cl. 4—542 7 Claims



1. A hydrotherapy tub massage apparatus comprising a mixing chamber which is provided by the cooperative disposition of a human body with a nearly vertical surface of said tub and further comprising:

a directional water ejector for directing a stream of water in a flow coplanar to said surface of said tub, said ejector's discharge port attached to said tub proximate the high water line;

a surface of said tub having facility for attaching thereto said ejector so as to allow said coplanar flow with said surface, said tub allowing immersion of a human body and comfortable placement of said body adjacent said flow so as to form said mixing chamber and compelling said flow to move between said body and said surface and to entrain air from above said high water line; and

a flexible fabric attached near the source of said flow which is being ejected from said ejector, said fabric disposed between said body and said flow, whereby water ejecta flowing across said surface entrains air, causes said flow to become turbulent and thereby imparts a rhythmic, undulating movement to said fabric which in turn massages

portions of the body placed in said cooperative relationship therewith.

4,860,393

CONVERTIBLE CHAIR FOR EITHER SITTING OR LYING

Alois Schefthaler, Solching, Fed. Rep. of Germany, assignor to Himolla Polstermöbelwerk GmbH, Taufkirchen/Vils, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 141,988

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1987, 3700477

Int. Cl.[4] A47C *17/13, 17/04*

U.S. Cl. 5—21 5 Claims



1. A piece of furniture convertible from a chair to a cot, and vice versa, comprising: a frame having a curved frame guide and a fixed back cushion; an inner carriage, and an outer carriage, both movable from a first, chair position within the frame to a second, cot position outside the frame, and vice versa, in said second position the outer carriage being further away from the frame guide than the inner carriage; a head cushion guidingly received in said frame guide and hinged to said inner carriage, the head cushion being movable from a stowed position behind the fixed back cushion when the inner carriage is in said first position, to a cot position when the inner carriage is in said second position, and vice versa; said frame having guides along which said inner carriage is displacable within the frame, wheels connected to said inner carriage remote from said head cushion for rolling along a floor; said outer carriage having a cushion carrier frame, a double cushion on said cushion carrier frame, lever means interposed between said cushion carrier frame and said outer carriage for adjusting the cushion carrier frame from a lowered position when the inner and outer carriages are in said chair position, to a raised position when said inner and outer carriages are in said cot position, and vice versa; means coupling said inner and outer carriages to each other, said coupling means comprising guide rails at said inner carriage and extending essentially parallel to a bottom of the inner carriage, sliding or rolling means connected to said outer carriage and displacable within said guide rails; a platform hinged to said inner carriage at an end thereof close to said head cushion, for receiving thereon one part of the double cushion in the cot position; and means for moving said platform into an essentially horizontal position when said inner and outer carriages are in said the cot position, said moving means including supporting elements connected to said lever means and adapted to support said platform when said lever means is in a dead center or over-center position, when said cushion carrier frame is in said raised position.

4,860,394

HOSPITAL BED OR HOSPITAL TABLE

Philippe L. Benessis, and Patrick H. Jannitte, both of Castelmaurou, France, assignors to Societe Sofratemed S.A., Plaisance du Touch, France

Filed Nov. 18, 1987, Ser. No. 122,069

Claims priority, application France, Nov. 18, 1986, 86 16511

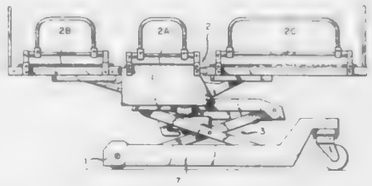
Int. Cl.[4] A61G *7/00*

U.S. Cl. 5—62 12 Claims

1. A hospital bed or hospital table comprising a base, a platform consisting of several sections mounted on a set of means supported by the base, which set of means comprises a level means to adjust and modify the height of the platform above the ground, a first angular means to adjust and modify the inclination of the platform in forward and backward direction, and a second angular means to adjust and modify the inclination of the platform in sideways direction, wherein the second angular means of adjustment of the inclination of the platform comprises:

(a) a center axis parallel to the plane of the platform, interdependent with one of the first angular means of adjustment of the inclination and the level means for the adjustment of the height,

(b) a first connecting rod extending from one side of a vertical plane, containing the central axis, hinged by its base to



this central axis, and by its top to the platform of the bed, along a geometric axis BB' parallel to the central axis,

(c) a second connecting rod extending from the other side of the vertical plane, containing the central axis, hinged by its base to said central axis, where the top of said connecting rod is provided with at least one roller mounted freely rotating on an axis parallel to the center axis, with said roller cooperating in closed circuit with a guide track fixed to the platform,

(d) and first and second control devices to adjust to modify and to maintain the angular position of each connecting rod in relation to the center axis, i.e. in relation to a reference point allocated to said center axis.

4,860,395

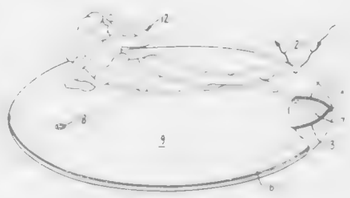
WATER-COOLED LOUNGING PAD

Michael G. Smith, 415 Turrin Dr., Pleasant Hill, Calif. 94523

Filed May 24, 1988, Ser. No. 198,129

Int. Cl.[4] A47C *27/08*

U.S. Cl. 5—420 5 Claims



1. A water-cooled lounging pad, comprising

a circular top sheet of solar heat reflective flexible plastic material adapted to be lain upon by a person obtaining a suntan,

a circular bottom sheet of flexible plastic material substantially coextensive with said top sheet,

a heat seal joining said top and bottom sheets at their peripheries to form a flattened circular waterproof enclosure capable of retaining a body of water therein, and

valve means in one of said sheets formed for selectively admitting a desired quantity of water into said enclosure and for retaining said body of water in said enclosure and for retaining said body of water in said enclosure and for

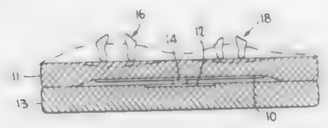
discharging desired quantities of water from said enclosure, said top sheet being of substantially white color for reflection of the sun's rays so as to avoid solar heating of said body of water whereby said body of water exerts a cooling effect on the portions of the body of said person in contact with said top sheet.

4,860,396

BACKBOARD FOR DUAL OCCUPANCY BED

Frank D. Vogel, II, 1108 36th St., Parkersburg, W. Va. 26104

Filed Aug. 5, 1988, Ser. No. 228,452
Int. Cl.[4] A47C *21/06*
U.S. Cl. 5—446 7 Claims



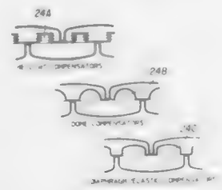
1. A bedboard assembly particularly adapted for use with dual occupancy bed having a mattress, comprising a first bedboard having longitudinal and transverse dimensions and adapted to underlie the mattress of said bed and provide support to occupants thereto, a second bedboard having longitudinal and transverse dimensions and underlying said first bedboard, and a unitary horizontally elongated connecting element substantially narrower than either the first or second bedboards positioned between and attached to said first and second bedboards and extending a substantial portion of the longitudinal dimensions of said first and second bedboards and spacing said bedboards at the region of connection, so that the effect of disparate downward forces exerted on the mattress creates depressions in said mattress on each side of said longitudinally extending connecting element rather than above said element.

4,860,397

PNEUMATIC CUSHION

Ignaty Gusakov, E. Aurora, N.Y., assignor to Gaymar Industries, Inc., Orchard Park, N.Y.

Filed Aug. 17, 1988, Ser. No. 232,992
Int. Cl.[4] A47C *27/08*
U.S. Cl. 5—455 9 Claims



1. A pneumatic cushion having preinflated sealed cells with pressure compensators for distributing air between cells in response to loads placed thereon, said pneumatic cushion comprising:

(1) a mid sheet having top and bottom surfaces,

(2) a top layer of preinflated sealed cells attached to the top surface of the mid sheet,

(3) a bottom layer of preinflated sealed cells attached to the bottom surface of the mid sheet, and

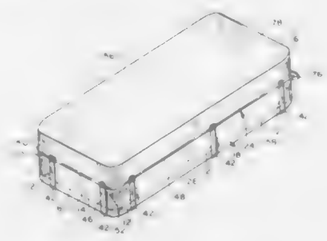
(4) pressure compensating means affixed to the mid sheet and in communication with each top and bottom cell whereby upon uneven loading of the sealed cells air is stepwise transferred by said pressure compensating means from a cell of high pressure on a top layer to a cell on a bottom layer and then to another cell on the said top and so on to smooth out the uneven pressure.

4,860,398

ROD AND BRACKET ASSEMBLY AND ASSOCIATED BED SKIRT

Vivian L. Karpinski, 2511 Madison St., New Port Richie, Fla. 34652

Filed Apr. 4, 1988, Ser. No. 177,361
Int. Cl.[4] A47C *21/00*
U.S. Cl. 5—493 12 Claims



1. In combination:

a box which is to be supported a mattress and over which bedding is to be placed;

a rod and bracket assembly secured to the box spring, such rod and bracket assembly including rods, such rod and bracket assembly also including a plurality of brackets secured to the box spring adjacent to their lower extents and projecting upwardly and terminating in resilient fingers of a size as to receive the rods around the opposite sides and bottom end of the box spring, and

a bed skirt having means at its upper end for coupling the bed skirt to the rod means.

4,860,399

METHOD OF AND APPARATUS FOR CONDITIONING A TRAVELING TEXTILE FABRIC SUBSTRATE

Kurt van Werach, Wegberg, and Klaus Voigt, Moenchengladbach, both of Fed. Rep. of Germany, assignors to A. Monforts GmbH & Co., Fed. Rep. of Germany

Filed Jul. 29, 1988, Ser. No. 226,285
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1987, 3725420
Int. Cl.[4] D06B *1/14, 23/00*
U.S. Cl. 8—151 13 Claims



1. A method of conditioning a traveling textile fabric substrate during temporary change-over discontinuance of treating liquor applications in a textile treating and drying range that includes a liquor applicator and a dryer, said method comprising applying non-treating liquid to the substrate in advance of the dryer independent of the liquor applicator and in an amount sufficient to approximate the amount of treating liquor applied during normal operation of the treating liquor applicator so as to allow the dryer to continue operating at substantially normal operating temperature without damage to the fabric substrate.

6. Apparatus for conditioning a traveling textile fabric substrate during temporary change-over discontinuance of treating liquor application in a textile treating and dyeing range that includes a liquor applicator and a dryer, said apparatus comprising means for applying non-treating liquid to the substrate in advance of the dryer independent of the liquor applicator and in an amount sufficient to approximate the amount of treating liquor applied during normal operation of the treating liquor applicator so as to allow the dryer to continue operating at substantially normal operating temperature without damage to the fabric substrate.

4,860,400

DEVICE CAPABLE OF ADHERING TO A WALL SURFACE BY SUCTION AND TREATING IT

Fukashi Urakami, 5-21-204 Konandai 4-chome, Konan-ku, Yokohama, Japan

Division of Ser. No. 825,305, Feb. 3, 1986, Pat. No. 4,688,289. This application Jun. 3, 1987, Ser. No. 57,087
Claims priority, application Japan, Feb. 25, 1985, 60-36009; Nov. 5, 1985, 60-247667
Int. Cl.[4] B63B *9/00*
U.S. Cl. 15—98 17 Claims



1. A device capable of adhering to a wall surface by suction by the pressure of an ambient fluid and treating the wall surface, said device comprising

means for treating the wall surface;

a pressure receiver member;

a partition provided on the pressure receiver member and facing toward the wall surface, the partition being rotatable with respect to the pressure receiver member about an axis of rotation,

said device maintaining said axis of rotation slightly inclined to an axis which is perpendicular to the wall surface, said partition having apart which is adapted to make contact with the wall surface to define a pressure reduction zone in cooperation with the pressure receiver member and the wall surface;

means for creating a vacuum within the pressure reduction zone by discharging fluid from the pressure reduction zone;

a driving source mounted on the pressure receiver member for rotating the partition with respect to the pressure receiver member;

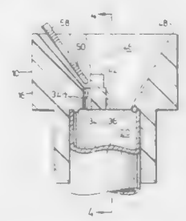
said driving source and partition, due to said slightly inclined axis of rotation, constituting means for moving the device along the wall surface by generating a force between the wall surface and the rotating inclined partition; wherein the device is caused to adhere to the wall surface by suction due to a difference in fluid pressure between the inside and outside of the pressure reduction zone, and the device is moved by rotating the partition by the driving source.

4,860,401

DIPSTICK WIPER

George A. Deveaux, 100 Century Drive, Unit 2, Orangeville, Ontario, Canada L9W 4L1

Filed Sep. 30, 1988, Ser. No. 251,359
Int. Cl.[4] G01F *15/12*
U.S. Cl. 15—210 B 13 Claims



1. A dipstick wiper for use in association with a dipstick of the type having an elongated blade which is proportioned to extend through an open end of an access passage of an access tube into a fluid reservoir for the purposes of determining the level of fluid in the reservoir comprising;

(a) a stopper for stopping the open end of the access passage of the access tube, said stopper having an upper end and a lower end,

(b) a seat formed in the lower end of the stopper for receiving the open end of the access tube in a close-fitting relationship to mount the stopper at the open end of the access tube in a position in which it stops the access passage,

(c) first and second through passages opening through said stopper from said upper end to said lower end,

(d) said first passage being proportioned to accommodate a blade of a dipstick in a close fitting sliding relationship so as to serve to wipe the blade clean when it passes therethrough in use,

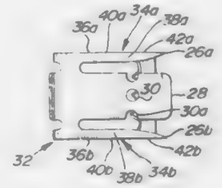
(e) said second passage being proportioned to permit the blade of a dipstick to pass freely therethrough without cleaning the blade such that the liquid which adheres to the blade during the liquid level testing operation is not removed.

4,860,402

CARPET MAT RETAINER CLIP

Ronald J. Dichtel, 618 Brookwood La. East, Rochester Hills, Mich. 48309

Filed Jun. 9, 1988, Ser. No. 204,572
Int. Cl.[4] A47G *27/04*
U.S. Cl. 16—4 18 Claims



1. A clip for retaining a mat in stationary relationship with respect to an underlying carpet, said clip comprising:

a main body having a substantially U-shaped configuration, said substantially U-shaped configuration defining a first portion, a second portion spaced from said first portion and a closed end curved portion defining means for biasing said first portion towards said second portion, said first

and second portion defining a converging opening therebetween when said said main body is in a relaxed state for releasably receiving said mat;

at least one tooth located at one end of said main body, said at least one tooth protruding into said opening of said substantially U-shaped configuration of said main body so as to grip said mat when said mat is inserted into said opening; and

a pair of prongs connected with said main body, each prong of said pair of prongs being in substantially mutual parallel alignment, each said prong having an anchorage portion which is oriented in a substantially parallel relationship with an adjacent portion of said main body, each said prong having a substantially pointed end facing in a direction away from said opening, said pair of prongs providing selective anchorage of said clip with respect to said underlying carpeting, said closed end curved portion further comprising a control member portion whereby a user may apply a force against said control member portion to anchor said pair of prongs into said underlying carpet

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4,860,403

METHOD OF ELIMINATING AGING STEP IN POULTRY PROCESSING

Jerry E. Webb, Farmington; Roger L. Dake, Fayetteville, and Rodney E. Wolfe, Springdale, all of Ark., assignors to Campbell Soup Company, Camden, N.J.

Filed Jul. 18, 1988, Ser. No. 220,472
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—1 E 15 Claims

1. A method for processing poultry in substantilly less time and using substantially less energy, which method comprises the steps of:

(a) providing a live poultry bird;

(b) slaughtering said bird with the application of electrical energy to stun or electrocute said bird and bleeding said bird;

(c) subjecting the carcass of step (b) to intermittent electrical stimulation while it is bleeding;

(d) scalding the carcass resulting from step (c);

(e) subjecting said scalded carcass to a relatively short conditioning step wherein said carcass is held in a warm, humid atmosphere and during which intermittent electrical stimulation is applied to said carcass for a period of time sufficient to render the poultry meat tender upon subsequent cooking without the need for an extended, low temperature carcass aging period; and

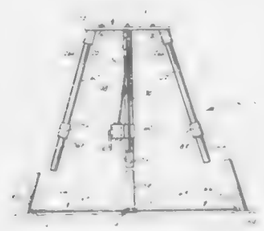
(f) defeathering and eviscerating said carcass.

4,860,404

PORTABLE DEER POLE

Bernard E. Flachs, 2305 Jones, Pierson, Mich. 49333

Filed Mar. 21, 1988, Ser. No. 171,110
Int. Cl.[4] A22B *1/00*
U.S. Cl. 17—44 12 Claims



1. A portable game support apparatus comprising:

a general planar platform including three sockets and a plurality of hangers, said sockets and hangers extending from a surface of said platform;

three leg members having first ends configured for telescoping engagement with said sockets;

an elongated member between one of said sockets and said platform, said elongated member having one end nonrotatably attached to said platform;

a hoisting device attached to said elongated member in a manner to resist rotation about said elongated member;

a cable extending from said hoisting device over one of said hangers and configured to elevate game toward said platform in response to operation of said hoisting device; and

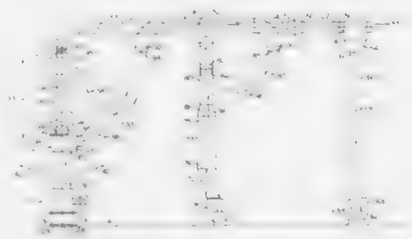
said hangers being fixedly positioned on said platform in close spatial association such that game elevated to a position proximate said platform by said cable extending from one of said hangers may be tied to another one of said hangers, whereby multiple game may be supported from said platform without movement of said hangers, by elevating each game by said cable and connecting the elevated game to other ones of said hangers.

4,860,405

APPARATUS FOR DRYING MATERIAL TRANSPORTED IN A FLUID STREAM

Robert C. Eckley, 1424 Claire Ave., Corcoran, Calif. 93212

Filed Apr. 26, 1988, Ser. No. 186,303
Int. Cl.[4] D01B *1/48*
U.S. Cl. 19—0.27 11 Claims



1. An apparatus for drying material transported in a fluid stream, the apparatus adapted to be mounted on a conduit and which is operable to transport the material therethrough, the apparatus comprising:

a nozzle adapted to be received on the conduit and having a main body defining an intake end and further having a fluid channel with an opening disposed adjacent to said intake end of the main body; and

means for supplying heated fluid to said fluid channel for discharge from the opening and movement into the intake end of the main body to dry said material entering into the main body.

4,860,406

METHOD FOR DETECTING THE DENSITY OR THICKNESS AND VARIATIONS THEREOF OF FIBER MATERIAL AT THE INFEED OF A TEXTILE MACHINE AS WELL AS A METHOD FOR EVENING THE DENSITY OR THICKNESS VARIATIONS OF FIBER MATERIAL AT THE INFEED OF A TEXTILE MACHINE MACHINE

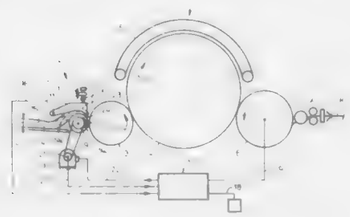
Paul Stäbeli, Wilen b. Wil; Robert Demuth, Nürensdorf, and Peter Fritzsche, Winterthur, all of Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Dec. 10, 1987, Ser. No. 132,204
Claims priority, application Switzerland, Dec. 12, 1986, [redacted]
Int. Cl.[4] D01G *15/36, 15/40*
U.S. Cl. 19—105 25 Claims

1. A method of determining the instantaneous thickness of fiber material at the infeed of a textile machine, comprising the steps of:

infeeding a mass of fiber material to a fiber infeed means possessing a nipping zone of essentially invariable size during operation of the fiber infeed means when determining the instantaneous thickness of the infed mass of fiber material;

passing the infed mass of fiber material through the essentially invariable size nipping zone; and



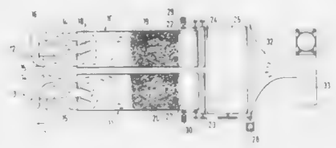
deriving, during and as a result of the passage of the infed mass of fiber material through the essentially invariable size nipping zone, from the essentially invariable size nipping zone a signal representative of the instantaneous thickness of at least a part of the infed mass of fiber material passing through the essentially invariable size nipping zone.

4,860,407

DEVICE FOR THE BLENDING OF DIFFERENT FIBRES IN A DESIRED RATIO OF COMPONENTS

Hans Roess, Bernhardstrasse 24, 2832 Twistringen, Fed. Rep. of Germany

Filed Feb. 25, 1988, Ser. No. 160,361
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, 3706008
Int. Cl.[4] D01G *13/00*
U.S. Cl. 19—145.5 4 Claims



1. A device for the blending of different fibres in a desired ratio of components, especially for the production of envelopes for drain pipes, wherein at least two pressure passages are arranged in parallel side by side and with a small distance therebetween, the entrance of the pressure passages each being joined to the outlet of a separate conveying fan for one fibre component, the interior space of the pressure passages being provided with at least one air exit port for the venting of the pressurized air in front of the material column of homogeneously compressed fibres built up in the pressure passages, the rear area of each of the pressure passages being associated with a separate conveyor means driven by a continuously variable drive, a distal end of the conveyor means facing the longitudinal opening of a drum housing, which extends over the total width of the passages, a beater being arranged within the housing for rotation therein and a common suction passage including a suction fan, being connected to the housing opposite the pressure passages.

4,860,408

CARGO STRAP

Brian K. Johnson, 11 Hammond St., Somerville, Mass. 02143

Filed Oct. 16, 1987, Ser. No. 111,485
Int. Cl.[4] F16G *11/00*
U.S. Cl. 24—68 CD 75 Claims



1. A stretchable, flexible, fail-safe cargo strap assembly able to retain restoring force for holding a cargo object in place in the event of failure of a portion of the strap, said cargo strap comprising:

I. an elongated, stretchable first member having the properties of

A. generating restoring force when stretched from a relaxed condition to a tensioned condition,

B. generating, without exceeding its breaking elongation (as manufactured), an amount of such force which is sufficient for performing a cargo binding function, including binding a cargo object together or to another object, and

C. susceptibility to failure, leading to potential loss or damage to the cargo, as a result of overstressing or aging of the first member; and

II. an elongated second member having a portion which

A. coextends with at least a portion of said first member,

B. is secured to said first member of a plurality of securing members distributed

1. at two or more longitudinally spaced locations

2. along the coextending portions of the first and second members and

3. intermediate the ends of said members,

4. for substantially inhibiting or limiting relative longitudinal movement of the first and second members at said locations while providing for such movement between such locations, thus providing, upon failure of the first member when in a stretched condition, reserve restoring force for maintaining tension in the cargo strap and continuing to restrain the cargo,

C. is extendable, by stretching of said assembly, to an extended position in which

1. The assembly is stretched sufficiently for performing a cargo binding function, and

2. the end-to-end distance of the second member is at least about 1.2 times the end-to-end distance which the second member exhibits when the assembly is in an unstretched condition, and

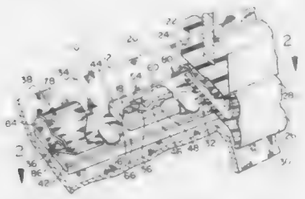
D. develops a greater resistance to extension said first member, but only after extension at least to said extended position.

4,860,409

MOLDING RETENTION CLIP ASSEMBLY

Anton J. Bering, Mt. Clemens, and William V. Hildebrandt, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1988, Ser. No. 235,022
Int. Cl.[4] A44B *21/00*; E04F *19/02*
U.S. Cl. 24—289 2 Claims



1. A molding retention clip assembly adapted to fit on a headed stud projecting from a painted surface of a vehicle body and receive a molding, said clip assembly comprising:

a molded plastic base having a planar bottom surface adapted to rest upon the painted surface of the vehicle body and having a key hole slot in the center thereof adapted to fit over the headed stud to retain the base on the vehicle body and permit rotation of the base relative the vehicle body,

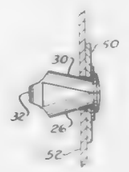
a stamped metal spring clip having a base wall overlying the plastic base and attached thereto, and first and second clips integral with the base wall and positioned in spaced apart relation on opposite sides of the key hole slot of the base, whereby the installation of the molding into the first and second clips causes the clip assembly to rotate so that the first and second clips obtain effective grip of the molding to retain the molding on the vehicle body.

4,860,410

CAM ACTION FASTENER

Ronald L. Voller, 1375 Williamsburg Dr., Schaumburg, Ill. 60172

Filed Mar. 22, 1988, Ser. No. 171,849
Int. Cl.[4] F16B *13/04*
U.S. Cl. 24—297 17 Claims



15. A single piece cam action fastener comprising an elongate member having a first outer circumferential surface shaped semicircular in cross section, having a second flat outer surface forming a plane of intersection with said semi circular cross section along a diameter thereof,

a first semi-circular flange having a predetermined thickness disposed on a first distal end of said member,

a second semi-circular flange having a predetermined thickness disposed on a second distal end of said member,

a first notch portion formed in said outer circumferential surface slightly outwardly toward said first distal end adjacent to a midpoint of said elongate member, said first notch portion having side surfaces forming inclined planes converging inwardly from said outer circumferential surface to form a first truncated apex in said member at a point slightly less than a point of intersection with said plane of said flat outer surface so as to form a thin wall section having a flat surface substantially parallel to said plane of said flat outer surface,

a second notch portion formed in said outer circumferential surface at a position slightly outwardly toward said second distal end adjacent to said midpoint of said elongate member,

said second notch portion having side surfaces forming inclined planes converging inwardly from said outer circumferential surface to form a second truncated apex in said member at a point slightly less than a point of intersection with said plane of said flat outer surface so as to form a thin wall section having a flat surface substantially parallel to said plane of said flat outer surface,

said first distal end being formed in a shape of an elongate section substantially semi-circular in cross section extending from said first flange inwardly toward said first portion for a predetermined length,

said second distal end being formed in the shape of an elongate section substantially semi-circular in cross section extending from said second flange inwardly toward said second notch portion for a predetermined length, and

one of said first and said second ends being adaptable to bend about one of said first or said second truncated apexes to form a cylindrically shaped member having a first end portion,

said cylindrically shaped member being adaptable for insertion into an opening and thereafter cause said first and said second truncated apexes to spread apart from each other and thereby fixedly secure said fastener in said opening.

4,860,411

THREAD SEPARATOR FOR SEAMING MACHINES

Fritz Vöhringer, Heidenheim, Fed. Rep. of Germany, assignor to F. Oberdorfer GmbH & Co. KG, Industriegewebe-Technik, Heidenheim, Fed. Rep. of Germany

Filed Dec. 22, 1987, Ser. No. 136,694
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714517
Int. Cl.[4] D03D *3/04*
U.S. Cl. 28—141 8 Claims



1. A thread separator for seaming machines especially for use in seaming dewatering webs of a type having a web having an upper side and a lower side and formed of a row of threads, said thread separator comprising:

a separating head positioned on a level generally perpendicular to said row of threads, said separating head being movable along said level and selectively shiftable against said row of threads of said web, said separating head having an arm extending on one side of said row of threads, said separating head having an entry gap for accepting said row of threads;

at least one gripper needle shiftable within a guiding groove of said separating head, said at least one gripper needle having at least one first hook and at least one second hook, said at least one first and at least one second hooks disposed on said at least one gripper needle in directions opposite to one another, each of said at least one first and second hooks having a concave aperture forming a point on one side of said at least one needle, each said point being aligned in a direction towards a thread of said row of threads to be separated, said concave aperture having a diameter corresponding to a diameter of said thread to be separated such that said thread to be separated is separated from a following thread by said point without engaging said following thread; and

means for selectively shifting said at least one gripper needle.

4,860,412

LOOP BREAKER FOR TEXTURED YARN

Andre M. Goineau, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 161,584, Feb. 29, 1988. This application Dec. 27, 1988, Ser. No. 289,712
Int. Cl.[4] D02J *3/02*
U.S. Cl. 28—219 4 Claims



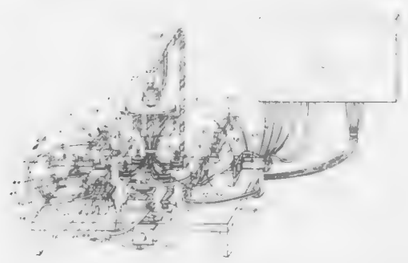
1. A loop breaker for a textured yarn having a plurality of loops on the surface thereof comprising: a housing having a partial hollow interior, a door closing the hollow interior of said housing, means applying a suction pressure inside said housing, a plurality of rolls rotatably mounted in said housing around which the textured yarn is wrapped, means biasing said door to the closed position and a means operably associated with said housing to periodically open said door to allow accumulated lint to fall from interior surfaces of the housing and rolls.

4,860,413

METHOD OF AND APPARATUS FOR USE IN FORMING DIAMETRICALLY OPPOSED STUDS ON TUBULAR CONNECTORS

Richard Woodward, Box 147, Harrison, Me. 04040

Continuation of Ser. No. 886,049, Jul. 16, 1986, abandoned. This application Nov. 23, 1987, Ser. No. 123,959
Int. Cl.[4] B23C *1/14*; B23P *13/02*; B23Q *7/02*
U.S. Cl. 29—38 C 6 Claims



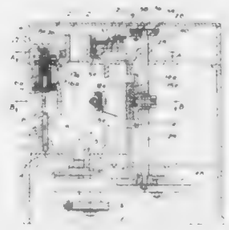
4. Apparatus for completing a connector having a threaded portion and an unfinished portion having a flange by forming therefrom two diametrically disposed studs, said apparatus including a base, a turntable rotatably supported by the base, at least four units mounted on said turntable equally spaced with reference to the axis thereof and to each other, each unit including a collet of a type having expandable fingers and an air cylinder having a piston movable into and out of position within said collet expanding said fingers from a normal relationship in which a connector may be seated on or removed therefrom into a relationship gripping said connector, said base provided with a station for each unit, the first station a loading and unloading station, the second, third and fourth stations operation stations, means operable to so index the turntable that each unit is successively stopped at the stations in the order named, means at the second station, operable when a unit stops there, to so mill the flange from one side of the connector as to remove said flange through an arc of less than but close to 180° in extent, means at the third station, operable when a unit stops there, to mill said flange from the opposite side of the connector to the similar extent thereby leaving two diametrically opposed flange portions, means at the fourth station, operable when a unit stops there, to form said studs from said flange portions, means to deliver air to each cylinder, means operable when a unit stops at the loading and unloading station to effect the first position of the fingers of the collet then to permit the removal and replacement of a connector, each of the milling means includes at least one piston-cylinder device having one component connected to the base and the other component reciprocable between retracted and advanced positions, and including a fork, an air motor connected to each arm of the fork, and a tool attached to and rotated by each motor and adapted to perform a wanted operation on a portion of the flange of the connector, the reciprocable component at the fourth station including a fork to each arm of which a tool equipped motor is attached, said tools having a common axis and disposed to receive a connector between them when the fork is in its advanced position, and valve controlled means operable during a dwell to effect the reciprocation of the tool into and out of working engagement with said flange portion and the operation of said motor.

4,860,414

INDEXING AND TRANSPORTING MECHANISM

Arthur E. Bishop, Northwood, and David W. Scott, Ruse, both of Australia, assignors to Bishop & Associates, A. E., Union Lake, Mich.

Filed Jan. 19, 1988, Ser. No. 145,329
Claims priority, application Australia, Jan. 29, 1987, PI0089
Int. Cl.[4] B23P *23/00*; B23B *29/00*
U.S. Cl. 29—38 C 2 Claims



1. An indexing and transporting mechanism comprising a plurality of work-holding spindles spaced around a carousel, and journaled therein, the carousel being journaled for rotation about its longitudinal axis on a machine frame provided with work performing stations, means for indexing the carousel about its axis to carry the spindles sequentially from station to station, means for indexing the work-holding spindles through

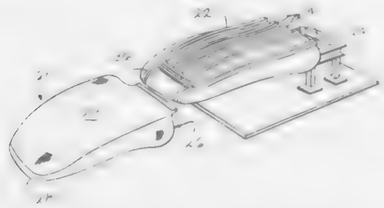
one complete revolution at some stations and not at others, a work-holding spindle orienting and indexing mechanism comprising an annular track carried by the machine frame concentric with the carousel axis, projecting means extending from the work-holding spindles engaging the track to prevent rotation of the work-holding spindles relative to the carousel over part of a revolution of the carousel, the track being interrupted at both sides of the stations where indexing occurs, there being an interrupted portion at each of the last named stations each interrupted portion of the track being mounted on track-carrying spindles carried by the machine frame and means for indexing each interrupted portion of the track on its track-carrying spindle through one complete revolution while the work-holding spindle is at the station.

4,860,415

METHOD OF MAKING A VEHICLE SEAT ASSEMBLY WITH POUR-IN-PLACE FOAM BODY

Duane W. Witzke, Adrian, Mich., assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Jun. 13, 1988, Ser. No. 205,929
Int. Cl.[4] B29C *67/22*
U.S. Cl. 29—91.1 **3 Claims**



1. A method of manufacturing at least a portion of a seat said seat including a supporting frame, a foam pad mounted on said frame, and an envelope cover member over said foam pad, said member being generally tubular in shape and having an open end and inner and outer sides and a seating load engaging portion having a predetermined shape, comprising the steps of:

a. turning said envelope cover member inside out so that said inner side is on the outside of said envelope cover member;

b. telescoping said cover member onto a forming tool;

c. shaping the load engaging portion of said envelope cover member to said predetermined shape;

d. molding said foam pad in place upon said load engaging portion of said envelope cover member by pouring-in-place an expandable liquid foaming material in such a manner that said foam pad is bonded to said load engaging portion and conformed in shape to the shape of said load engaging portion of said envelope cover;

e. manipulating said envelope cover member so that said outer side is on the outside of said envelope cover member and said foam pad is enclosed therein; and

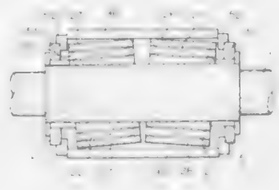
f. telescoping said envelope cover member with said foam pad therein open end first over and onto said supporting frame.

4,860,416

VARIABLE-CROWN ROLL

Takeshi Masui; Yoshiro Matsumoto, both of Nishinomiya; Atsushi Tomizawa, Kobe, and Eiji Hirooka, Yamato-Koriyama, all of Japan, assignors to Sumitomo Metal Industries, Osaka, Japan

Filed Oct. 31, 1988, Ser. No. 264,348
Claims priority, application Japan, Mar. 30, 1988, 63-78445
Int. Cl.[4] B21B *13/02*
U.S. Cl. 29—116.2 **42 Claims**



1. A variable-crown roll comprising:

a straight arbor; and

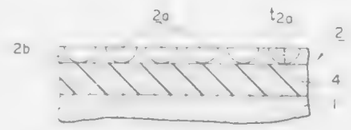
a plurality of antifriction bearings which are mounted on said arbor, each of said bearings having a cylindrical outer surface which is sloped with respect to the outer surface of said arbor, said bearings being symmetrically disposed with respect to the lengthwise center of said arbor, the slopes of the outer surfaces of said bearings on one side of the lengthwise center of said arbor being symmetric with respect to the slopes of the outer surfaces of said bearings on the other side of the lengthwise center.

4,860,417

DEVELOPER CARRIER

Shoji Tajima, Higashikana; Yasuo Kadomatsu, Yokohama; Yoshio Miyazaki, Funabashi; Michikazu Sakurai, Yokohama, and Kimio Anze, Kawasaki, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Division of Ser. No. 654,257, Sep. 25, 1984, Pat. No. 4,707,382. This application Sep. 18, 1987, Ser. No. 98,392
Claims priority, application Japan, Sep. 28, 1983, 58-178286; Sep. 28, 1983, 58-178287; Sep. 28, 1983, 58-178288; Oct. 5, 1983, 58-185122; Oct. 11, 1983, 58-188308; Dec. 13, 1983, 58-233488; Dec. 13, 1983, 58-233489; Dec. 26, 1983, 58-244340; Dec. 26, 1983, 58-244341
The portion of the term of this patent subsequent to May 13, 2003, has been disclaimed.
Int. Cl.[4] F16C *13/00*
U.S. Cl. 29—130 **10 Claims**



1. A developer carrier for use in a developing device, comprising:

an electrically conductive support;

a first layer of composite material formed on said support, said composite material including at least an elastic material and a magnetic material so that said first layer is magnetized in alternating polarities at a . predetermined pitch; and

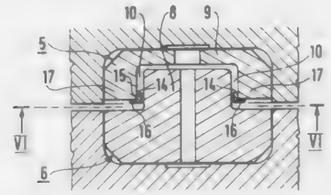
a second layer formed on said first layer, said second layer including a dielectric material and a plurality of electrode particles which are embedded in said second layer as electrically isolated from one another and each partly exposed at an outer surface of said second layer.

4,860,418

METHOD OF ASSEMBLING A ROTOR OF A STEAM TURBINE CONSTITUTED BY DISKS SHRUNK ONTO A SHAFT

Daniel Fleury, Nanteui Le Haudouin, France, assignor to Societe Anonyme dite: ALSTHOM, Paris, France

Filed May 16, 1988, Ser. No. 194,253
Claims priority, application France, May 14, 1987, 87 06784
Int. Cl.[4] B21K *3/00*
U.S. Cl. 29—156.8 R **2 Claims**



1. A method of assembling a rotor of a steam turbine constituted by disks shrunk onto a shaft, said disks being provided with cavities facing one another and having female pegs disposed in said cavities in one disk and male pegs disposed in the facing cavities of an adjacent disk with each of the disks being shrunk on while disposing the male pegs of said disks into the female pegs of the already shrunk-on adjacent disk, wherein spacer means are provided in the female pegs prior to inserting the male pegs in the female pegs so that the male pegs do not come into contact with the female pegs, with the spacer means subsequently being removed.

4,860,419

SPLIT BEARING ASSEMBLIES, METHOD FOR MAKING

Frederick A. Hekman, Grosse Pointe Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 85,687, Aug. 17, 1987, abandoned. This application Jul. 1, 1988, Ser. No. 211,802
Int. Cl.[4] B23P *15/10*
U.S. Cl. 29—156.5 A **8 Claims**



1. A method of making a split bearing assembly having a saddle-like main body with first and second legs and a removable saddle-like bearing cap with first and second legs having ends respectively secured in end-to-end engagement with mating ends of the first and second legs of said body to define a journal receiving opening, said method comprising the steps of:

initially forming the bearing assembly body and cap integral with their mating leg ends integrally joined, said integral body and cap being in a relatively brittle condition, at least along generally predetermined split planes defining the leg ends on opposite sides of said opening, said body and cap having essentially their assembled final dimensions, with said opening being centered on an axis lying within said main body and said cap, generally between said split planes, and

separating the cap from the main body by fracturing the integral legs generally along said split planes on opposite sides of said opening to form said legs of the saddle-like cap and body, said first and second legs of the cap and body comprising respectively first and second pairs mateable along said split planes,

wherein the fracturing step is accomplished by forcing the cap and main body linearly and longitudinally apart while continuously applying a damping force to said cap and main body, thereby restraining said cap and main body against any substantial relative rotation, thereby fracturing and separating the ends of both said pairs of integral legs at their respective split planes in one essentially linear separating motion of the cap from the main body,

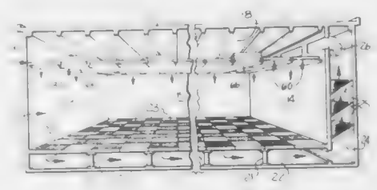
thereby avoiding bending of the legs at the split planes and producing mating fracture surfaces on engaging legs edges to provide the capability of mating reassembly without substantial dimensional change.

4,860,420

METHOD OF FABRICATING A CLEAN ROOM FILTER BANK

George H. Cadwell, Jr., Blounts Creek, and Joseph A. Wood, Greenville, both of N.C., assignors to Flanders Filters, Inc., Washington, N.C.

Filed Apr. 7, 1987, Ser. No. 35,373
Int. Cl.[4] B21B *1/46*
U.S. Cl. 29—157 R **11 Claims**



1. A method of fabricating a horizontal latticework which is adapted to form a portion of a filter bank in a clean room, and which is characterized by the ability to protect a sealant from contamination during the manufacturing, shipment, storage and assembly operations, said method comprising the steps of

providing a plurality of channel members, with each member comprising a pair of longitudinally extending outer side walls, a plate extending horizontally between said side walls, and a post extending upwardly from the medial portion of said plate and longitudinally along at least a substantial portion of the length thereof so that said post, outer side walls, and plate of each of said channel members define an upwardly open receptacle on each side of said post and between said post and the adjacent outer side wall,

placing an end dam in each receptacle of each of said channel members, and adjacent each of the ends thereof,

depositing a liquid which is adapted to solidify and form a self-healing sealant, in the portion of each receptacle of each of said channel members between the end dams thereof,

causing the liquid in the receptacles of the channel members to solidify so as to form a self healing sealant, and

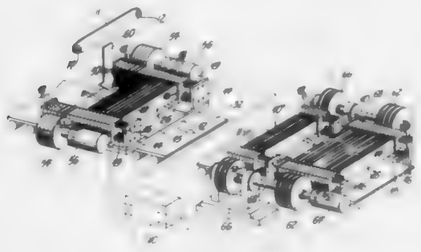
enclosing each of the channel members in a flexible plastic wrapping so as to avoid contamination of said sealant during shipment and storage.

4,860,421

METHOD FOR ASSEMBLING PLATE TYPE HEAT EXCHANGERS

Michael A. Breda, E. Amherst, and George K. Snyder, Lockport, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 23, 1989, Ser. No. 314,860
Int. Cl.[4] B21D *53/02*
U.S. Cl. 29—157.3 A **5 Claims**



1. The method of assembling heat exchangers having tubes comprised of pairs of formed plates with the tubes laterally coupled at their ends and fins sandwiched between the tubes, comprising the steps of;

mating pairs of plates together to form plate pairs,

dropping each plate pair into a fixture at a distance from any plate pair already in the fixture to facilitate insertion,

moving adjacent plate pairs together to couple the ends of adjacent plate pairs while dropping additional plate pairs into the fixture,

separating plate pairs from adjacent pairs to receive fin elements,

forming fin elements for insertion between the plate pairs and immediately inserting each fin element into the fixture between separated plates, and

moving adjacent plate pairs together into engagement with intervening fin elements.

4,860,422

REBUILDING OF THE STACK, BOSH AND HEARTH OF A BLAST FURNACE USING A REMOTE CONTROLLED REFRACTORY GUNNING DEVICE

Joseph J. Marino, Wilton, Conn., assignor to Quigley Company, Inc., New York, N.Y.

Filed Oct. 1, 1987, Ser. No. 103,982
Int. Cl.[4] C21B *5/00, 13/00, 15/00*
U.S. Cl. 29—402.18 **4 Claims**

1. A method of repairing an area of damages to the wall of the stack, bosh, or hearth of a blast furnace comprising

(a) withdrawing raw material present in the blast furnace to a point below the area to be repaired,

(b) creating a reusable opening in the side of said blast furnace, said opening located in the vicinity of the stock line of said furnace,

(c) introducing through said opening a gantry supporting a vertical remote-controlled refractory gunning apparatus, said opening adapted to receive said gantry, said vertical remote-controlled refractory gunning apparatus comprising

(i) a vertical gunning conduit, terminating at its lower extremity in a nozzle,

(ii) a control unit,

(iii) bearing means rotatably connecting and mounting said vertical gunning conduit from said control unit.

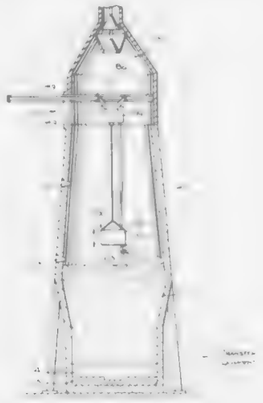
(iv) an oscillating drive in said control unit,

(v) a drive coupling in said control unit connecting said oscillating drive to said vertical gunning conduit,

(vi) supply conduits entering said control unit for supplying refractory material and water,

(vii) a mixing head in said control unit to which said supply conduits are connected,

(viii) a swivel coupling connecting said mixing head to said vertical gunning conduit for providing a mixture of water and refractory to said nozzle, and



(ix) actuating means connected to said oscillating drive for selectively actuating it to control the angular orientation of said nozzle whereby said nozzle is angularly oriented about said vertical gunning conduit in stationary and oscillating modes of operation,

(d) spraying refractory materials onto the area to be repaired.

4,860,423

METHOD OF MOUNTING AND REGULATING A VEHICLE OPENING DEVICE UTILIZING A WINDER

Dennis Baynes, Longford, Great Britain, assignor to General Motors Corporation, Detroit, Mich.

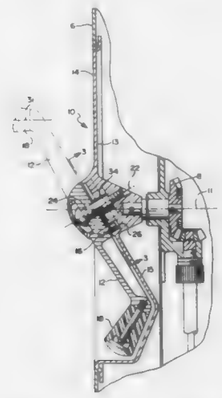
Division of Ser. No. 897,499, Aug. 18, 1986. This application Sep. 16, 1988, Ser. No. 245,092
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—434 **2 Claims**

1. A method of regulating a vehicle opening device utilizing a winder, said method in combination comprising:

rotatably mounting a mounting plate into the vehicle along a first rotational axis;

rotatably mounting to said mounting plate a handle along a second rotational axis at an intersecting angle with the first rotational axis within first and second predetermined angular positions; and

angularly displacing said handle with respect to said mounting plate past said first or second predetermined angular



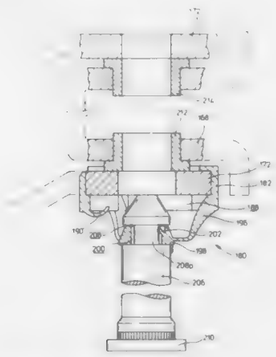
position whereby said handle is rotating along said first rotational axis.

4,860,424

METHOD OF AND MECHANISM FOR ATTACHING AN AUTOMOBILE DOOR

Shigeo Kaibuki; Shinpei Watanabe; Mitsugu Takahashi, and Hiroshi Moriya, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1987, Ser. No. 73,589
Claims priority, application Japan, Jul. 15, 1986, 61-167360; Jul. 15, 1986, 61-167362; Apr. 22, 1987, 62-100777
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—434 **20 Claims**



1. A method of attaching a door to an automobile body, comprising the steps of:

(a) temporarily positively holding a hinge pin with a hinge pin support mechanism which supports and temporarily positively holds the hinge pin on a first hinge member on the automobile body and retains said first hinge pin against removal.

(b) holding the door to bring a second hinge member on the door into engagement with said first hinge member; and

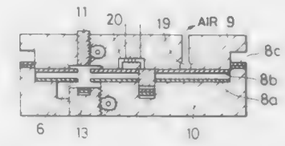
(c) pressing said hinge pin into said second hinge member through said first hinge member to couple said door to said automobile body.

4,860,425

COMPOSITE MEMBER MANUFACTURING METHOD

Toshiharu Kunisaki, and Masamori Higuchi, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1988, Ser. No. 230,548
Claims priority, application Japan, Aug. 27, 1987, 62-211322
Int. Cl.[4] B23P *17/00*
U.S. Cl. 29—527.4 **6 Claims**



1. A method of manufacturing a composite member composed of metal plates and synthetic resin, comprising the steps of:

(a) mounting a stack of two metal plates between first and second metal molds, each of said two metal plates having an adhesive layer and said two metal plates being put with their respective adhesive layers inside, said first metal mold having at least one of a fixed piercing punch and a movable piercing punch, and said second metal mold having at least one of a fixed piercing die and a movable piercing die;

(b) performing pressing work on said metal plates;

(c) separating said first and second metal molds by a predetermined distance by moving at least one of said first and second metal molds from the other while holding said metal plates facing each other to thereby form a cavity of a predetermined distance between said two metal plates

(d) injection-pouring melted synthetic resin into said cavity between said metal plates to form a resin layer therein; and

(e) removing a molded product after said resin layer has been hardened.

4,860,426

SYSTEM FOR ROLLING CONTINUOUSLY CAST PROFILES

Georg Engel, Kaarst, and Dietmar Kosak, Neuss, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 27, 1987, Ser. No. 114,344
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1986, 3636478
Int. Cl.[4] B21B *1/46, 1/14, 13/10, 13/22*
U.S. Cl. 29—527.7 **4 Claims**



1. A method of making steel structural shapes, comprising the steps of:

continuously casting an initial steel structural shape having a web and a pair of flanges flanking said web; and

rolling said initial structural shape, in the first rolling to which the initial structural shape is subjected, in at least one pass through a compact rolling train of a succession of four mills simultaneously engaging the initial structural shape and subjecting said initial structural shape in said compact rolling train to:

compaction between vertical rolls engaging said flanges to increase the thickness of said web in a first of said mills constituting a vertical-roll compaction stand,

rolling of both said web and said flanges in a first universal rolling stand forming a second of said mills immediately downstream of said first of said mills,

rolling only of said flanges between horizontal rolls rotatable about vertical axes of a further compaction stand forming a third of said mills immediately downstream of said second of said mills, and

rolling of both said web and said flanges in a second universal rolling stand constituted as a finishing universal rolling stand forming the fourth of said mills immediately downstream of said third of said mills.

4,860,427

WIRE STRIPPING APPARATUS AND AN AUTOMATIC WIRING DEVICE WHICH INCORPORATES IT

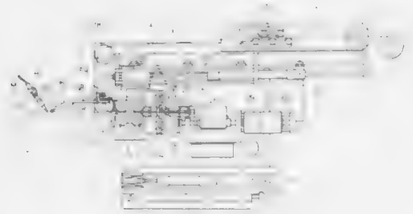
Seiji Kawaguchi, Tokyo, Japan, assignor to Apollo Seiko Ltd., Tokyo, Japan

Continuation of Ser. No. 25,750, Mar. 13, 1987, Pat. No. 4,738,019. This application Apr. 13, 1988, Ser. No. 181,146

Claims priority, application Japan, Apr. 9, 1986, 61-80221

Int. Cl.⁴ H01R *43/00*

U.S. Cl. 29—564.4 **20 Claims**



1. Apparatus for cutting a lead wire having a predetermined length from a supply wire having an extended length, and for removing portions of insulation covering from opposite ends of said cut lead wire of said predetermined length, comprising:

a supply reel upon which said supply wire of said extended length is disposed and from which said supply wire is withdrawn in a wire feeding direction;

cutter means, having a first supply wire cutting section and a second insulation covering cutting section, mounted so as to be indexably movable within a plane substantially transverse with respect to said wire feeding direction between two predetermined positions for selectively aligning said first and second cutting sections with said supply and lead wires, respectively, and mounted so as to be reciprocably movable within a plane substantially perpendicular to said supply and lead wires so as to cut said supply wire at a predetermined portion thereof in order to form said lead wire, and to remove said insulation covering portions from said opposite ends of said lead wire;

first reversibly-driven means for feeding said supply wire in a first direction from said supply reel, and for moving said supply wire in a second direction back toward said supply reel, relative to said cutter means so as to operatively cooperate with said cutter means in order to facilitate the formation of said lead wire of said predetermined length and the removal of a first insulation covering portion from a first end portion of said lead wire; and

second reversibly-driven means for gripping said cut lead wire and for moving said cut lead wire in opposite directions relative to said cutter means so as to operatively cooperate with said cutter means in order to facilitate removal of a second insulation covering portion from a second end portion of said lead wire.

4,860,428

LIFTING HAND FOR A PUNCH PRESS TOOL CHANGER

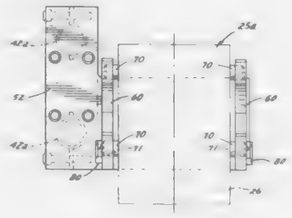
Theodore F. Brolund, and Joel C. E. Arnesson, both of Rockford, Ill., assignors to W. A. Whitney Corp., Rockford, Ill.

Filed Jan. 9, 1987, Ser. No. 1,917

The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.

Int. Cl.⁴ B23Q *3/155*

U.S. Cl. 29—568 **6 Claims**



1. Apparatus for transferring a tool cartridge between a tool storage shelf and a machine tool, the tool cartridge having a pair of horizontally extending carrying elements projecting laterally from opposite sides of the cartridge, said apparatus comprising a lifting and carrying mechanism, means for moving said mechanism upwardly to lift the tool cartridge from the storage shelf and downwardly to place the cartridge on the shelf, means for moving said mechanism horizontally to transfer the cartridge between the storage shelf and the machine tool, said mechanism comprising a pair of laterally spaced retainers adapted to closely straddle the sides of the cartridge, upwardly opening notches formed in said retainers and sized to slidably receive said carrying elements so as to enable said retainers to lift and carry said cartridge while permitting said cartridge to float vertically relative to said retainers, said apparatus being characterized in that said retainers are fixed laterally relative to one another and are provided with cam means adjacent said notches, said cam means being engageable with said carrying elements to cam said cartridge to a laterally centered position between said retainers automatically as an incident to said retainers initially lifting said cartridge.

4,860,429

AUTOMATIC TOOL CHANGING DEVICE

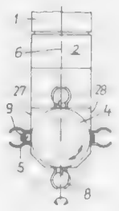
Rainer von Haas, Geesthacht, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Jun. 23, 1988, Ser. No. 210,564

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1987, 3720805

Int. Cl.⁴ B23Q *3/157*

U.S. Cl. 29—568 **16 Claims**



1. A tool changing device for changing tool heads in a tool system in which a tool head and a tool holder are releasably connected together by a clamping mechanism in which a clamping screw is integrated in the tool holder, said tool changing device comprising:

gripper means for carrying the tool heads;

actuating means for actuating the clamping mechanism to selectively clamp and unclamp the tool heads, the actuating means including an axially displaceable clamping shaft having two ends and having means at both ends for engaging a clamping mechanism; and

a rotatably mounted support on which the gripper means and the actuating means are mounted.

4,860,430

COMPLETING A LINEAR MOTOR STATOR

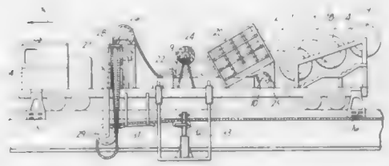
Hans G. Raschbichler; Luitpold Miller; Manfred Weisio, all of Ottobrunn, and Otto Breitenbach, Nuremberg, all of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hanover and Thyssen Industrie AG, Essen, both of, Fed. Rep. of Germany

Filed Nov. 7, 1988, Ser. No. 268,232

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737719

Int. Cl.⁴ H02K *15/085*

U.S. Cl. 29—596 **6 Claims**



1. Method of providing a multiphase winding into the grooves of a stator of a linear motor, the stator being mounted, with open grooves facing down, on the underside of a support and carrier plate being carried in an elevated position, comprising the steps of:

providing a plurality of individual separate cables on a vehicle and moving the vehicle on said carrier;

withdrawing the cables individually as the vehicle moves along the carrier and bending the cables individually commensurate with a desired meandering configuration for each of the cables as becoming thereby a part of a winding package to be placed into said grooves;

providing on said vehicle a plurality of holders which holders are being paid in steps and being spaced from each other commensurate with the spacing of the grooves;

placing the meander shaped cables in superimposed staggered relationship corresponding to the winding pattern to be attained and providing ribbon connection as well as placing the holding elements at a fixed distance onto portions of the cables which extend transversely to the extension and direction of extension of the stator as a whole to thereby complete a winding package; and

placing said portions with attached holding elements into said grooves, in sequence and pursuant to the propagation of the vehicle on the carrier.

4,860,431

FABRICATION OF MULTIFILAMENT INTERMETALLIC SUPERCONDUCTOR USING STRENGTHENED TIN

William G. Marancik, Basking Ridge, and Seung-Ok Hong, New Providence, both of N.J., assignors to Oxford Superconducting Technology, Carteret, N.J.

Filed Feb. 17, 1988, Ser. No. 157,402

Int. Cl.⁴ H01L *39/24*

U.S. Cl. 29—599 **19 Claims**

1. In a method for the fabrication of a multifilament Nb_3Sn superconducting wire comprising the steps of:

(a) filling the center of one or more copper tubes with tin and drawing said tubes to form copper-tin wires, the percentage of Sn in the wire being in the range of 10–50 weight % Sn;

(b) cabling a plurality of said copper-tin wires around a core predominantly Nb wire;

(c) Bundling a plurality of the cables of step (b) with an enveloping layer of copper;

(d) drawing the assembly of step (c) to reduce its diameter; and

(e) heat treating the product of step (d) to cause the Sn to diffuse and form Nb_3Sn at the surface of the Nb filaments, the improvement which comprises using in place of tin an alloy of tin with a minor amount of aluminum that is sufficient to increase the tensile strength of the tin.

4,860,432

METHOD OF MANUFACTURING A MAGNETORESISTIVE SENSOR

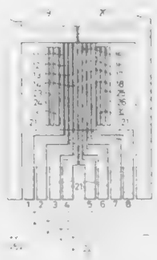
Sadao Kawata, Koide, Japan, assignor to Alps Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 42,379, Apr. 24, 1987. This application May 6, 1988, Ser. No. 190,770

Claims priority, application Japan, Sep. 2, 1986, 61-134706

Int. Cl.⁴ H01F *7/06*

U.S. Cl. 29—602.1 **3 Claims**



1. In a method of manufacturing a magnetic sensor by etching a ferromagnetic film on a substrate with an etching solution to form a plurality of magnetoresistive elements of a given width disposed in a row in parallel with each other on the substrate, wherein said magnetoresistive elements are connected by bridge circuits so that the magnetic sensor can be used in proximity to a rotating magnetic member to detect rotation information based upon changes in electrical resistance in the magnetoresistive elements,

the improvement comprising the steps of:

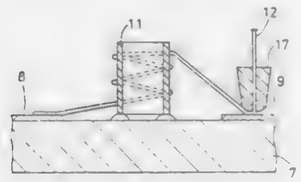
etching said ferromagnetic film to form dummy elements outwardly of each end of said row of magnetoresistive elements so as to allow all of said magetoresistive elements to be formed of a uniform width by preventing the magnetoresistive elements at each end of said row from being affected by etching solution collected in the spaces outwardly of the ends of said row; where said etching of said dummy elements occurs simultaneously with said etching of said magnetoresistive elements.

4,860,433

METHOD OF MANUFACTURING AN INDUCTANCE ELEMENT

Norio Miura, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Division of Ser. No. 24,880, Mar. 11, 1987, abandoned. This application Aug. 11, 1987, Ser. No. 84,332
Int. Cl.[4] H01F 7/06
U.S. Cl. 29—605 14 Claims



1. A method of manufacturing an inductance element, which comprises:

a first step of preparing a substrate provided with two conductive paths;

a second step of mounting insulated wire of conductive material coated with an insulating layer on a reel of an ultrasonic bonding apparatus;

a third step of feeding said insulated wire from said reel of said ultrasonic bonding apparatus and locally heating an end thereof and ultrasonic bonding the same on one of said conductive paths provided on said substrate by applying ultrasonic vibration to said end;

a fourth step of feeding said insulated wire to form a coil; and

a fifth step of ultrasonically - bonding the other end of said insulated wire on the other of said conductive paths provided on said substrate;

wherein said first step includes a step of forming a spool member on said substrate, and

said fourth step includes a step of winding said insulated wire around said spool member, and wherein

said bonding apparatus includes a capillary chip for holding an end of said insulated wire fed from said reel,

said third step includes a step of locating said capillary chip of said bonding apparatus on said one conductive path to bond an end of said insulated wire on said one conductive path,

said fourth step includes a step of locating said capillary chip around the periphery of said spool member from said location on said one conductive path and rotating said chip about said periphery of said spool member thereby to wind said insulated wire around said spool member, and

said fifth step includes a step of, after winding said insulated wire around said spool member, locating said capillary chip on said other conductive path to bond the other end of said insulated wire on said other conductive path.

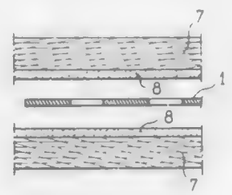
4,860,434

METHOD OF MAKING FLAT ELECTRICAL RESISTANCE HEATING ELEMENT

Bernard Louison, Saint-Etienne, and Jean Hennuy, Villefranche, both of France, assignors to Seb S.A., Selongey, France

Division of Ser. No. 852,028, Apr. 14, 1986, abandoned. This application Apr. 7, 1988, Ser. No. 177,905
Claims priority, application France, Apr. 19, 1985, 85 05963
Int. Cl.[4] H05B 3/10; H01C 1/02; B32B 31/00; D02G 3/00
U.S. Cl. 29—611 8 Claims

1. A method of producing a flat electrical resistance heating element, especially for a household article having a heating surface, comprising cutting out a heating resistance from a metal sheet, preparing two sheets of mica paper consisting of mica flakes impregnated with an unpolymerized silicone resin that is adapted to polymerize under the action of heat, forming a sandwich of said heating resistance between said two sheets of mica paper impregnated with an unpolymerized silicone



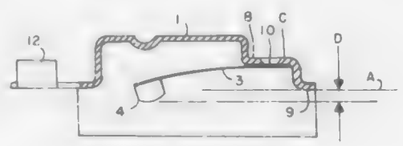
resin, and heating said sandwich until said two sheets and said heating resistance are secured together by the polymerization of said silicone resin.

4,860,435

CALIBRATION PROCESS FOR BIMETALLIC CIRCUIT BREAKER

John R. Powell, Cumberland, Me., assignor to GTE Products Corporation, Stamford, Conn.

Filed Nov. 25, 1988, Ser. No. 275,861
Int. Cl.[4] H01H 11/04
U.S. Cl. 29—622 5 Claims



1. In the manufacture of a circuit breaker comprising a cover having a snap action blade attached thereto, with a movable contact mounted on the snap action blade, the steps comprising. determining, prior to final sealing of the circuit breaker, an optimum position of the movable contact with respect to a preselected locus to prevent frying of the circuit breaker during operation and adjusting the movable contact to said optimum position prior to said final sealing.

4,860,436

METHOD OF MANUFACTURING A COMPACT SWITCH

Michio Hirabayashi, Ibaraki; Tosio Koizumi, Nara, and Kiyotada Shibao, Amagasaki, all of Japan, assignors to 501 IDEC IZUMI Corporation, Osaka, Japan

Filed Dec. 9, 1987, Ser. No. 130,579
Int. Cl.[4] H01H 11/00
U.S. Cl. 29—622 7 Claims

1. A method of mounting a bimetallic plate in a compact switch comprising the steps of:

fixing a bimetallic plate to a predetermined portion of at least one terminal member punched as a hoop member so that the bimetallic plate stands on the terminal member at a right angle;

forming a base by insert modling on the terminal member; and

bending at a right angle a portion of the terminal member to which the bimetallic plate has been fixed so that the bimetallic plate is disposed in a predetermined position on the base.

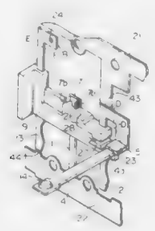
3. A method of manufacturing a compact switch comprising the steps of:

(a) punching to form two hoop members, each hoop member having a lead frame and at least one terminal member connected to the lead frame, a terminal member of one of the hoop members having a bimetallic plate fixing portion and the terminal member of the other of the hoop members having engaging grooves for engagement with a movable spring member;

(b) attaching a fixed contact to one end of a bimetallic plate, the one end of the bimetallic plate being displaced when temperature of the bimetallic plate is raised;

(c) fixing the bimetallic plate to the bimetallic plate fixing portion of the terminal member of the one hoop member;

(d) forming a base by insert molding on the terminal members, terminal pins of the terminal members extending downward through the base;





(e) attaching a movable contact, to be facing the fixed contact, to one end of the movable spring member;

(f) bringing the movable spring member into engagement with the engaging grooves of the terminal member of the other hoop member;

(g) bringing a lower end portion of a push button member into engagement with the movable spring member;

(h) cutting the terminal pins at predetermined positions from lead frames of the hoop members; and

(i) accommodating in a housing a switch unit thus formed by steps (a) to (h).

4,860,437

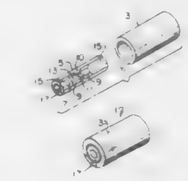
METHOD OF MAKING A SUB-MINIATURE FUSE

Vaughan Morrill, Jr.; John H. Scandrett, both of St. Louis County, Mo., and David E. Hudson, Madison County, Ill., assignors to Morrill Glasstek, Inc., Maryland Heights, Mo.

Division of Ser. No. 5,964, Jan. 22, 1987, Pat. No. 4,749,980.
This application May 25, 1988, Ser. No. 198,762
Int. Cl.[4] H01H 69/02
U.S. Cl. 29—623 20 Claims

1. The method of forming a fuse comprising a step of metallizing the outer surface of an insulative tube to produce a metallized tube, a further step of sleeving the metallized tube into an outer tube, and thereafter a step of cutting through the outer tube and the metallized tube to form a plurality of fuses.

16. The method of forming a fuse comprising a step of metallizing a conductor onto the outer surface of a glass tube, the conductor comprising a fusible element, a step of sleeving the metallized glass tube within an outer tube, and a step of soldering the metallized glass tube to the outer tube to form a hermetic seal between the glass tube and the outer tube.

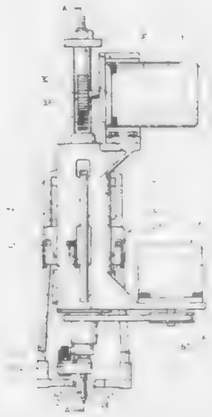


4,860,438

SURFACE MOUNTING DEVICE PICK-AND-PLACE HEAD

Horng-Hwei Chen, Hsinchu Hsien, Taiwan, assignor to Industrial Technology Research Institute, Chutung, Taiwan

Filed Feb. 9, 1988, Ser. No. 160,943
Int. Cl.[4] H05K 3/30
U.S. Cl. 29—740 6 Claims



1. An SMD pick-and-place head for picking up and placing a surface mounting device (SMD) automatically, which comprises:

a shell body;

a nozzle device having an opening hole;

a vacuum source for both producing and releasing vacuum pressure;

a passageway having one end communicating with said opening of said nozzle device and the other end communicating with said vacuum source;

at least one pair of centering links pivotally mounted on said shell body, having a cam follower mounted on each of a first end portion thereof, and a pad mounted on a second end portion thereof;

pad driving means for driving the pads of each pair of said centering links to move toward or away from each other; and

a mechanism engaging with said nozzle device and enclosed in said shell body for drawing said nozzle device to move linearly between a first position and a second position, relative to said shell body, and actuating said pad drawing means,

wherein said mechanism comprises:

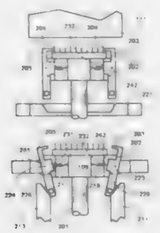
a stepping motor disposed in such a manner that it moves integrally with said shell body, having a drive shaft;
a pinion connected to said drive shaft;
a rack slidably mounted on said shell body for meshing with said pinion, so as to be driven to slide relative to said shell body by said stepping motor; and
a coupling device for coupling said rack and said nozzle device; said coupling device comprising:
a flange formed in one end portion of said rack, having a first receptacle surface;
a coupling sleeve sleeved around the outer peripheral surface of said rack above said flange, having a second receptacle surface formed therewithin opposite to said first receptacle surface of said flange and a connecting portion connected with said nozzle device for drawing said nozzle device to move integrally;
a stopper formed within said shell body for engaging with said coupling sleeve to restrict the upward movement of said coupling device; and
a first spring member constrained between said first receptacle surface of said flange and said second receptacle surface of said coupling sleeve, for enabling said rack to move upward relative to said coupling sleeve when said coupling sleeve is engaged with said stopper;
such that when said nozzle device is at its second position, said vacuum source produces vacuum pressure to enable said nozzle device to hold said SMD by means of vacuum pressure, then said mechanism drives said nozzle device to move to its first position and subsequently actuates said pad driving means to drive said pads of each pair of said centering links to move toward each other in order to grab and center said SMD, then said mechanism actuates said pad driving means to drive said pads of each pair of said centering links to move away from each other to release said SMD and subsequently drawing said nozzle device to move to its second position, finally said vacuum source releases vacuum pressure to enable said nozzle device to disengage from said SMD.

4,860,439

UNIVERSAL ALIGNMENT FIXTURE

Bryan R. Riley, 15212 Dickens Ave., San Jose, Calif. 95066

Filed Oct. 25, 1988, Ser. No. 262,470
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—741 **4 Claims**



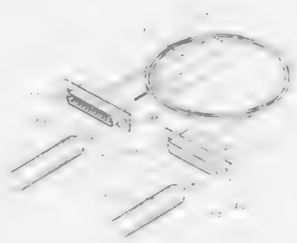
1. An apparatus for picking up, aligning, and holding a pin grid array, hereinafter PGA, said PGA having an array of electrical lead pins imbedded in a base, with said pins forming a rectangular perimeter around the base of said PGA, comprising:
a plurality of grippers, each of said grippers having an alignment surface for engaging from outside said rectangular perimeter at least one side of said rectangular perimeter of said pins, each of said grippers having a gripper indexing surface;
base means holding the PGA, said base means for holding said plurality of grippers, said base means having a base indexing surface for each gripper indexing surface, said base means having spring means for pulling on each of said grippers so as to bring each of said gripper indexing surfaces into juxtaposition with its respective base indexing surface, said base indexing surface located such that when said gripper indexing surface is pulled against said base indexing surface, the alignment surface of each gripper is located at a position that would engage said at least one side of said rectangular perimeter of said pins.

4,860,440

TOOL AND METHOD FOR ASSISTING THE EXTRACTION OF A WIRE FROM A CONNECTOR

Randy Garbrick, 6710 8th Ave. N.W., Seattle, Wash. 98117

Filed Jun. 6, 1988, Ser. No. 202,550
Int. Cl.[4] H01R *43/00;* **B23P** *19/00*
U.S. Cl. 29—825 **6 Claims**



1. A method for removing a wire from an electrical connector comprising the steps of:
inserting a first tool into a hole of one side of the connector,
spreading a sleeve within the hole of the connector with a shaft of said first tool,
inserting a second tool into an opposite side of the connector,
and pushing said second tool against the end of the wire thereby extracting the wire from the hole of the connector.

4. A two tool combination for extracting an individual wire from a connector head comprising:
a first tool comprising a handle portion and a shaft portion, said shaft portion being hollow throughout its longitudinal length and including means for allowing the individual wire to be enclosed by said hollow shaft portion, said shaft portion further including an open end for insertion into an opening within the rear side of the connector head;
a second tool comprising a handle portion and a shaft portion, said shaft portion having a free end for applying a pushing force on a lead of the individual wire;
wherein, said shaft portion of said first tool is inserted into a rear hole of the connector head over the individual wire and spreads a catch sleeve of the connector head thereby releasing the back side of the wire lead, and said free end of said second tool, pushes upon the front side of the wire lead and pushes the wire out of the rear hole of the connector head.

4,860,441

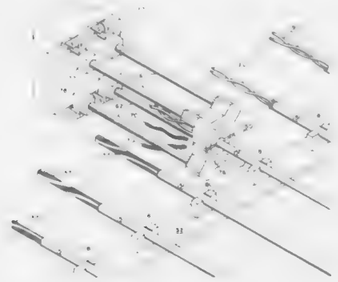
ELECTRICAL CORD FILLER REMOVAL APPARATUS AND METHOD

James W. Pierpoint, Winston-Salem, N.C., assignor to Automated Technology Systems, Inc., Winston-Salem, N.C.

Continuation-in-part of Ser. No. 82,747, Aug. 7, 1987, Pat. No. 4,821,410. This application Oct. 7, 1988, Ser. No. 256,149
Int. Cl.[4] H01R *43/00;* **B08B** *1/02;* **A62C** *31/02*
U.S. Cl. 29—825 **19 Claims**

1. A cord receptacle for containing a cord while removing filler therefrom comprising: a nozzle, said nozzle having a cord channel, a degradation fluid duct, said nozzle hingedly connected to said duct, said nozzle in fluid communication with said duct whereby said nozzle can move relative to said duct to an open posture to allow a cord to be positioned within said cord channel.

15. A method of removing filler from electrical cords comprising the steps of:



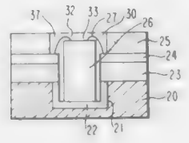
(a) opening a filler degradation nozzle;
(b) placing the cord within the open nozzle;
(c) closing the nozzle around the cord; and
(d) directing a degradation fluid through the nozzle to remove said filler.

4,860,442

METHODS FOR MOUNTING COMPONENTS ON CONVOLUTED THREE-DIMENSIONAL STRUCTURES

Roger W. Ainsworth, Oxford; John L. Allen, Eynsham, both of England, and Anthony D. Kurtz, Teaneck, N.J., assignors to Kulite Semiconductor, Leonia, N.J.

Filed Nov. 28, 1988, Ser. No. 276,879
Int. Cl.[4] H05K *3/30*
U.S. Cl. 29—8.32 **20 Claims**



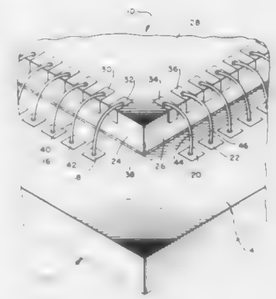
1. A method for mounting components on a convoluted three-dimensional structure, comprising the steps of:
forming a groove on a surface of said structure,
coating said structure including said groove with a first layer of ceramic material,
placing conductors on said first layer of ceramic material so that they overlie and span said groove,
coating said structure including said first layer and conductors with a second layer of ceramic material to embed said conductors between said first and second layers,
forming a second groove in said first and second layers which overlies said first groove and which extends into the same to separate said conductors as overlying said first groove,
removing ceramic material from said second layer on each side of said second groove to expose the separated end surfaces of said conductor,
placing a component having terminals within said second groove and bonding said component terminals to said exposed conductor surfaces.

4,860,443

METHOD FOR CONNECTING LEADLESS CHIP PACKAGE

Philip V. Pesavento, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 5,715, Jan. 21, 1987, abandoned. This application Mar. 23, 1988, Ser. No. 173,018
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—840 **17 Claims**



1. The method for mounting and connecting a hermetically sealed leadless chip package with connection pads selected from the group consisting of gold and gold-plated copper on the top face thereof on a printed wiring board, comprising the steps of:
positioning the hermetically sealed leadless chip package on the printed circuit board and attaching it thereto adjacent pads selected from the group consisting of gold and gold-plated copper on the exposed top face of the printed wiring board and orienting the leadless chip package so that the pads on the top face thereof are directed in the same direction as the pads on the exposed top face of the printed wiring board;
selecting a conductor from the group consisting of gold and gold-plated copper; and
attaching the electrical conductor to an upwardly facing pad on the chip carrier and to an adacent upwardly facing pad on the printed wiring board by means of an attachment step selected from the group of attachment steps consisting of:
ultrasonic welding, thermocompression bonding, ball bonding, wedge bonding and thermalsonic bonding.

4,860,444

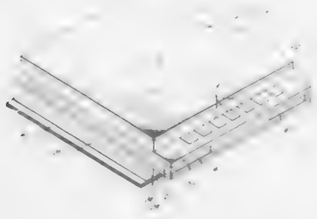
METHOD OF ASSEMBLING A FLUID-COOLED INTEGRATED CIRCUIT PACKAGE

Dennis J. Herrell, and David A. Gibson, both of Austin, Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Division of Ser. No. 846,087, Mar. 31, 1986, Pat. No. 4,758,926. This application Mar. 31, 1988, Ser. No. 175,784
Int. Cl.[4] H05K *3/34*
U.S. Cl. 29—840 **3 Claims**

1. The method of forming a fluid-cooled integrated circuit package having a planar substrate member, a plurality of integrated circuit chips, a heat sink member in a generally parallel plane with the substrate, a closure member abutting the heat sink comprising,
soldering the integrated circuit chips to the substrate member with a first solder having a predetermined melting point,
soldering the substrate member to the heat sink with a solder

having a melting point lower than the melting point of the first solder, and



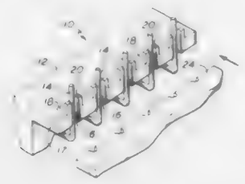
soldering the closure member to the heat sink with a solder having a melting point lower than the melting point of the first solder.

4,860,445

METHOD OF MOUNTING ELECTRICAL CONTACTS IN CONNECTOR BODY

Gerald M. Jones, Titusville, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Feb. 9, 1989, Ser. No. 308,064
Int. Cl.[4] H01R *9/16*
U.S. Cl. 29—842 3 Claims



1. In a method of fixing an electrical contact into a connector body, said connector body having at least one relatively thin-walled portion including a plurality of transversely extending slots, each of said slots including oppositely disposed wings upstanding from said thin-walled portion; and an electrical contact portion in said slot and extending normal thereto and projecting therefrom, the steps comprising: positioning said connector body and its attendent contacts at a work station; engaging said contacts with an alignment plate to position said contacts at the rearwardmost portion of said slots; lifting said connector body and alignment plate until the projecting portions of said contacts engaging mating apertures in an ultrasonic horn, said horn having ribs which engage said wings; and ultrasonically vibrating said horn to melt said wings and substantially close said slots, thereby securing said contacts.

4,860,446

MEDICAL ELECTRICAL LEAD AND METHOD OF MANUFACTURE

Joseph F. Lessar, Coon Rapids; Duane L. Rosenberg, Columbia Heights; Robert E. Kraska, Minneapolis; James M. Speckien, Vadnais Heights, and James E. Upton, New Brighton, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 16, 1988, Ser. No. 156,145
Int. Cl.[4] A61N *1/05*
U.S. Cl. 29—858 6 Claims

1. A method of fabricating a medical electrical lead, comprising the steps of:

coating a wire fabricated of a first metal which comprises an alloy containing cobalt, chromium, or molybdenum with a second, inert metal selected from the group consisting of platinum, tantalum, niobium, titanium, or alloys thereof;

coiling said wire; and



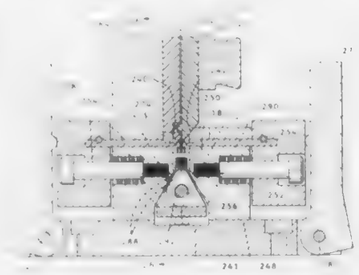
mounting said coiled wire within an insulative sheath of polyether urethane and coupling the proximal and distal ends of said coiled wire, respectively, to an electrical connector and an electrode.

4,860,447

METHOD AND APPARATUS FOR COUPLING CONNECTORS TO RIBBON CABLES

Vincent Nicholas, Spring Hill, and Paul P. Siwinski, Seminole, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 15, 1988, Ser. No. 168,308
Int. Cl.[4] H01R *43/04;* B23P *19/00*
U.S. Cl. 29—863 11 Claims



1. A method for attaching the conductor wires of the stripped free end of a ribbon cable to an electrical connector comprising the steps of:

positioning the stripped free end in a guide member;

providing a coupling fixture having a fixed recipient block with a slot for the initial receipt of a connector housing and for the subsequent receipt of the stripped free end, the coupling fixture having crimping fingers reciprocable toward and away from the slot to effect the bending of at least a portion of the connector into crimping engagement with at least some of the wires to thereby couple the connector to the wires; and

moving the crimping fingers between an inoperative orientation whereat the crimping fingers are remote from the slot and an operative orientation whereat the crimping fingers are adjacent to the slot for the crimping of the connector onto the wires.

4. For use in association with apparatus for terminating the free end of a ribbon cable, apparatus for coupling the stripped free end of a ribbon cable with a connector comprising:

a fixed recipient block having a slot for the receipt of the stripped and bent wires of a ribbon cable;

reciprocable blocks located on opposite sides of the fixed recipient block with crimping fingers secured thereto and reciprocal through apertures in the fixed recipient block; and

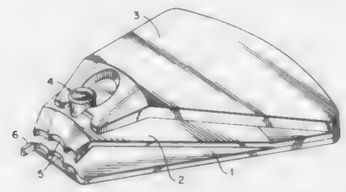
means to move the reciprocable blocks and crimping fingers toward each other into the slot for effecting the mechanical coupling of the connector located in the slot with at least some of the stripped wires.

4,860,448

TRIANGULAR-SHAPED ORNAMENTAL NAIL CLIPPER WITH SIDE FLAP

Abbas Husain, Merchantville, N.J., assignor to Ennovation Corporation, Merchantville, N.J.

Filed May 12, 1988, Ser. No. 194,031
Int. Cl.[4] A45D *29/00*
U.S. Cl. 30—28 3 Claims



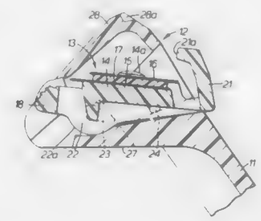
1. A nail clipper comprising a pair of superimposed triangular-shaped body members and a triangular-shaped activating lever, said body members being of spring material connected at their bases and biased apart to provide yieldable spacing between cooperating cutter jaws located at the vertices of said body members opposite to the connected bases, said activating lever mounted pivotably on a post located adjacent to the cutter jaws, said post being connected at its bottom to the lower body member and extending up and through an opening in the upper body member.

4,860,449

RAZOR BLADE ASSEMBLY

David S. Duncan, London, England, assignor to Wilkinson Sword Limited, Buckinghamshire, England

Filed Jan. 11, 1983, Ser. No. 457,314
Claims priority, application United Kingdom, Jan. 27, 1982, 8202174
The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.
Int. Cl.[4] B26B *21/00*
U.S. Cl. 30—47 7 Claims



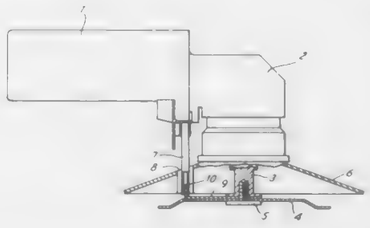
1. A razor blade assembly comprising a blade platform, at least one blade mounted on said blade platform, a guard bar and a razor head frame including a top cap, the blade platform having thereon a first set of guide surfaces and the razor frame having thereon a second set of guide surfaces, the second set of guide surfaces being in engagement with the first set of guide surfaces and captively supporting the blade and blade platform on the frame for rolling movement of the first set of guide surfaces relative to the second set of guide surfaces along a predetermined guide path defined by said second set of guide surfaces, between a shaving position in which the blade, guide bar and top cap are relatively positioned for shaving and a retracted position in which the blade is retracted from the shaving position and underlies said top cap in proximal relation thereto.

4,860,450

SURFACE STRIPPER

Geoffrey D. Achille, London, England, assignor to Asdren Limited, Braintree, England

PCT No. PCT/GB86/00720, § 371 Date Jul. 24, 1987, § 102(e) Date Jul. 24, 1987, PCT Pub. No. WO87/03253, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 26, 1986, Ser. No. 82,642
Claims priority, application United Kingdom, Nov. 27, 1985, 8529158
Int. Cl.[4] B26B *3/00*
U.S. Cl. 30—172 23 Claims



1. A surface stripping device, said device comprising a blade in the form of a generally circular disc with a generally concave profile having one or more cutting edges around its periphery, means for mounting said disc, driving means for causing said disc to undertake an orbital motion in a plane generally parallel to the general plane of the disc such that substantially the entire periphery of the cutting edge of said disc is in contact with the surface to be stripped when said device is in use, means for inhibiting rotary motion of the blade when said device is in use, and means for causing the disc to reciprocate through a small arc.

4,860,451

STRING TRIMMER

Edward J. Pilatowicz, Los Angeles, and Leonid Zatulovsky, Arleta, both of Calif., assignors to Allegretti & Company, Chatsworth, Calif.

Filed Nov. 28, 1986, Ser. No. 935,042
Int. Cl.[4] B26B *7/00*
U.S. Cl. 30—276 13 Claims



1. A string trimmer comprising

a housing containing a rotary power source such as an electric motor for supplying power to a string trimmer head,

string trimmer head housing means including spindle means for driving a string trimmer head for rotation for trimming vegetation and the like,

connecting housing means comprising a substantially tubular housing connecting the motor housing and the head housing means, and including drive means for interconnecting the power source and spindle means in the head housing

means for driving the spindle means from the power source for driving a string trimmer head, and

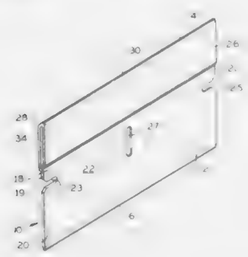
handle means attached to and extending from the motor housing in the direction of the tubular housing, the handle means comprising a handle inclined at an angle with respect to the longitudinal axis of the tubular housing, and the head housing means being disposed at an angle with respect to the axis of the tubular housing so that, during operation of the string trimmer, the handle can be grasped by the hand of a downwardly extending arm of the user and the plane of rotating string from the trimmer head will be substantially parallel to or at a small angle with respect to the ground, said handle being elongated to allow the same to be grasped at different positions along its length so as to help accommodate users of different heights and to allow a grasping position which results in a balanced weight distribution between the motor housing and the trimmer head housing.

4,860,452

SINGLE EDGE RAZOR BLADE WITH INTEGRAL BACK

Joseph J. Guarnaccia, Wethersfield, and Ernest J. Masucci, Plantsville, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Dec. 12, 1988, Ser. No. 282,490
Int. Cl.[4] B26B *21/54*
U.S. Cl. 30—346.6 11 Claims



8. A one-piece single edge razor blade well suited for mounting in a manual instrument of the type employed for shaving, scraping or cutting comprising:

an elongated flat sheet metal main blade body having a sharp cutting edge along the bottom longitudinal edge thereof and an integrally formed force-bearing blade backing extending along the top thereof,

said blade backing integrally extending from the top of said main blade body and being of generally U-shaped cross section with opposing forward and rearward walls disposed generally parallel to said main blade body and offset therefrom on opposite sides thereof, the walls of said backing being spaced by a distance up to approximately twice the thickness of said main blade body,

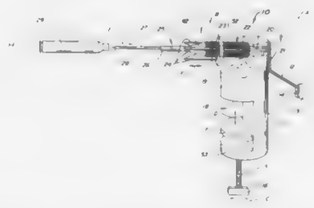
one of said forward and rearward walls being integrally connected to the top of said main blade body by a connector portion extending obliquely to said blade body, the other of said forward and rearward walls having an interlock portion cooperating with said connector portion for fixably maintaining the spaced relationship of said walls at the top of said blade body.

4,860,453

DEBURRING TOOL

Joseph J. Carroll, 10141 Rockinghorse La., Redding, Calif. 96003

Filed Oct. 16, 1987, Ser. No. 109,483
Int. Cl.[4] B26B *9/00;* B23P *15/22*
U.S. Cl. 30—347 7 Claims



1. A deburring tool for simultaneously deburring an inner edge and an outer edge of a wall of hollow tubing, comprising:

a substantially cylindrically shaped body having:

a first end;

a second end;

an axis substantially concentrically located extending from said first end to said second end;

a cone positioned at said first end, and

at least four slots extending lengthwise from said cone toward said second end positioned substantially equiangularly about said axis of said substantially cylindrically shaped body;

at least two inner blades, each having a cutting edge and positioned in said slots near said cone and substantially equiangularly about said axis, each of said inner blades being oriented so that said cutting edge is directed away from said axis and positioned at an angle which facilitates efficient deburring of said inner edge of said wall of said tubing;

first capturing means for capturing said inner blades in said slots;

at least two outer blades, each having a cutting edge, positioned in said slots near said cone and substantially equiangularly about said axis, each of said outer blades being oriented so that said cutting edge is directed toward said axis and positioned at an angle which facilitates efficient deburring of said outer edge of said wall of said tubing;

second capturing means for capturing said outer blades in said slots;

a substantially concentrically located first attaching means substantially rigidly attached to and extending outward from said cone along said axis whereby auxiliary tools are attached to said deburring tool, and

a cap recess cleaning tool having blades for cleaning a cap recess of a cartridge shell and having third attaching means whereby said cap recess cleaning tool attaches to said first attaching means.

4,860,454

SELF-PROPELLED, SELF-STEERED VEHICLE FOR POWER DRIVEN PLANT TRIMMING TOOLS

Jacobus C. van der Merwe, and Lucas C. van der Merwe, both of 801 Beechwood Dr., Kingsport, Tenn. 37663

Continuation-in-part of Ser. No. 886,801, Jul. 18, 1986, Pat. No. 4,694,577. This application Jun. 30, 1987, Ser. No. 67,862
Int. Cl.[4] B23D *45/20*
U.S. Cl. 30—379.5 19 Claims

1. A self-propelled, self-steered vehicle for supplying power to a plurality of power driven plant trimming tools, comprising:

(a) a wheeled vehicle having a pair of driving wheels mounted on a vehicle frame, a steered wheel rotatably mounted on a steered wheel carrier, said steered wheel carrier mounted at one end of the vehicle and pivotal about a vertical axis, an engine supported by the vehicle frame, driving said pair of driving wheels, a reel mounted for rotation on a winch frame, said winch frame mounted on connecting means which interconnects said steered wheel carrier and said vehicle frame, said engine also causing the reel to rotate so that a cable having a wound end secured to said reel is wound onto said reel, said cable anchored at an unwound end thereof opposite said wound end so that as said engine drives said reel, said cable is wound onto said reel to propel said vehicle, speed control means for controlling the speed of the vehicle, and a tool power source driven by the engine for providing power to a plurality of plant trimming tools;



(b) steering means connected to the steered wheel, said steering means including a steering lever pivotally connected at one end to said steered wheel carrier, a cable guiding element, through which said unwound end of said cable has been passed, disposed at an opposite end of said steering lever, wherein as said cable is wound onto said reel to propel said vehicle, the cable guiding element cooperates with said cable to constantly orient said steering lever towards the anchored end of said cable to steer said steered wheel so that said wheeled vehicle automatically follows the entire unwound length of said cable; and

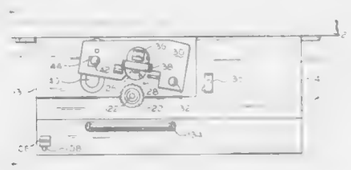
(c) carrier means connected with said vehicle for carrying a plurality of conduits communicating with said tool power source to supply power to a plurality of individual plant trimming tools connected to the conduits.

4,860,455

SINGLE HAND OPERATION CAN OPENER

Martin L. Conneally, Lombard, Ill., assignor to Sears, Roebuck & Co., Chicago, Ill.

Filed Jan. 28, 1988, Ser. No. 149,392
Int. Cl.[4] B67B *7/38*
U.S. Cl. 30—404 26 Claims



1. An automatic can opener comprising:

a housing having an outer wall defining an inner chamber;

a rotary turning wheel outwardly of said wall coupled to a shaft extending into said chamber;

a motor having an output shaft together with means for coupling said output shaft to said turning wheel shaft for rotary driven movement thereof;

a cutting blade;

electrically operable actuator means operatively associated with said motor for effecting movement of said cutting blade between positions respectively proximate to and remote from said turning wheel;

sensing means for sensing when a can is placed proximate said wall in a select opening position;

first control means coupled to said motor, said actuator means and said sensing means for automatically operating said can opener in a cutting mode, whereby responsive to said sensing means sensing a can in the select opening position, said actuator means moves said blade proximate to said turning wheel to retain the upper lip of the can therebetween and thus retain the can in the opening position, and said motor is energized to rotate said turning wheel to cut through the periphery of a top portion of the can; and

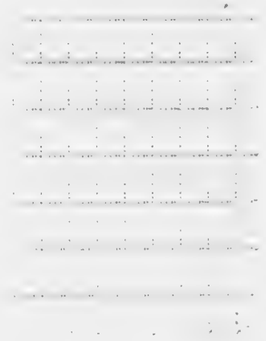
second control means coupled to said actuator means and said sensing means for automatically operating said can opener in a release mode, whereby responsive to said sensing means sensing that the can is moved partially away therefrom, said actuator means moves said blade remotely from said turning wheel to release the can from the opening position.

4,860,456

FORMS LAYOUT GAUGE

Marlene Arnao, 6661 W. 87th Pl., Los Angeles, Calif. 90045

Continuation of Ser. No. 3,722, Jan. 16, 1987, abandoned. This application Mar. 22, 1988, Ser. No. 173,028
Int. Cl.[4] G01B *5/26*
U.S. Cl. 33—1 B 14 Claims



1. A forms layout gauge for measuring the coordinates of blank spaces on a paper form at which to print characters using a computer-controlled printer, the gauge consisting essentially of:

a sheet for fitting atop the paper form;

the sheet being transparent and having, solely for coordinate determination, printed thereon a plurality of rows of vertically-oriented characters in line spacing and a plurality of rows of horizontally-oriented characters, in pitch spacing the vertically-oriented and horizontally-oriented rows intersecting sized and shaped rectangular windows through which the underlying paper from can be viewed;

the characters in the rows having the same orientation so that when the sheet is fitted atop the paper form, the characters in the vertically-oriented rows appear upright, the characters in the horizontally-oriented rows likewise appear upright;

the characters between each intersection being selected from a common symbol set comprising single integer decimal digits and being spaced apart from each other along the rows so as to form means for measuring the coordinates of

blank spaces on the paper form in units of pitch and line spacing.

4,860,457

APPARATUS FOR MEASURING THE STEERING ANGLE OF A STEERING WHEEL OF A VEHICLE

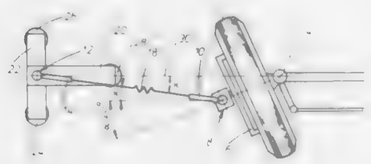
Osmond Beissbarth, Salzbacher Strasse 15, D-8000 Muenchen 40, Fed. Rep. of Germany

Filed Dec. 15, 1987, Ser. No. 133,300

Claims priority, application European Pat. Off., Dec. 15, 1986, 86117436.5

Int. Cl.[4] G01B *5/255, 7/315*

U.S. Cl. 33—203.18 10 Claims



1. An apparatus for measuring the steering angle of a steerable wheel of a vehicle comprising:

(a) a first electric angle measurement instrument with a measuring arm pivotable about a generally vertical axis, said first instrument being fixed to the steerable wheel;

(b) a second electric angle measurement instrument with a measuring arm pivotable about a generally vertical axis, the second instrument being mounted at a measuring base which is positioned generally along an axis of rotation of the wheel;

(c) an elastic tensile member mutually connecting the two measuring arms;

(d) electronic circuitry means connected to the angle measurement instruments for processing angle signals issued by the angle measurement instruments and for generating a steering angle signal; and

(e) display means connected to the electronic circuitry means for displaying the steering angle corresponding to the steering angle signal.

4,860,458

BOW STRING PEEP SIGHT

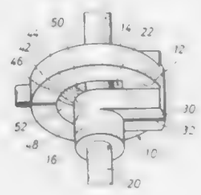
Leif Ernstsen, 2 D, Lilletjernveien, N-4550 Farsund, Norway

Continuation-in-part of Ser. No. 903,902, Sep. 4, 1986, abandoned, and a continuation-in-part of Ser. No. 737,084, May 23, 1985, abandoned. This application Nov. 10, 1987, Ser. No. 119,126

Claims priority, application Denmark, May 23, 1984, 2522/84

Int. Cl.[4] F41G *1/00;* F41B *5/00*

U.S. Cl. 33—265 5 Claims



1. A peep sight for mounting on the bow string of an archery bow comprising a body having a main plane, a front side, and a rear side, and being provided with a central elongated hub portion defining a hub axis perpendicular to said main plane and being provided with a hub bore concentric to said hub axis and adapted to receive a bow string,

said hub portion further defining an opaque inner portion of said body,

said body being provided with an opaque outer portion and between said outer and said inner portion with a transparent sighting area adapted to constitute a sighting aperture and being shaped as a sector of a circle ring extending over an angle of between 120° and 270°,

said sighting area being outwardly limited at said front side as well as at said rear side by an outer front circular arc and an outer rear circular arc, respectively,

said circular arcs being situated respectively in two spaced planes parallel to said main plane, thereby causing, when the peep sight is tilted to a line of sight, the outer limitation of said sighting aperture to appear as composed of a first outer elliptic arc corresponding to a portion of said outer front circular arc and of a second outer elliptic arc corresponding to a portion of said outer rear circular arc and forming an angle with said first outer elliptic arc,

said sighting area being inwardly defined by two edges of axially spaced portions of said body defining a front inner circular arc and a rear inner circular arc and leaving between them a recess occupied by a transparent medium, thereby causing, when the peep sight is tilted to a line of sight, the inward limitation of said sighting aperture to appear as composed of a first inner elliptic arc corresponding to a portion of said inner rear circular arc and a second elliptic arc corresponding to a portion of said inner front circular arc and forming an angle with said first inner elliptic arc, whereby

said sighting aperture of the peep sight appears as a quadrangle having elliptic sides and sharp edges.

4,860,459

BUBBLE LEVEL

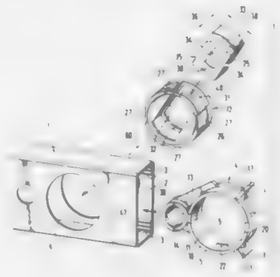
Herbert Dengler, Grosshabersdorf, Fed. Rep. of Germany, assignor to Bayerische Mass-Industrie Arno Keller GmbH, Hersbruck, Fed. Rep. of Germany

Filed Mar. 3, 1988, Ser. No. 164,160

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1987, 3707425

Int. Cl.[4] G01C *9/28*

U.S. Cl. 33—379 14 Claims



1. A bubble level comprising an elongated hollow section having a transversely extending cylindrical window, a level support means disposed in said hollow section and aligned with said window, said level support means having an inner cylindrical seat, a level holder support means supporting a level, mounting means mounting said level holder support means within said cylindrical seat of said level support means, and fastening means fastening said level holder support means in a fixed position on said level support means, said mounting means comprising a plurality of cams disposed in a common plane along one of said support means and a plurality of transverse guide grooves arranged in the other of said support means in complementary relation to said cams, said mounting means further comprising a ring groove in said other support means interconnecting said guide grooves, whereby said level holder support means is adapted to be mounted in said level support means and to be rotated relative to said level support means prior to being fastened to said level support means by said fastening means.

4,860,460

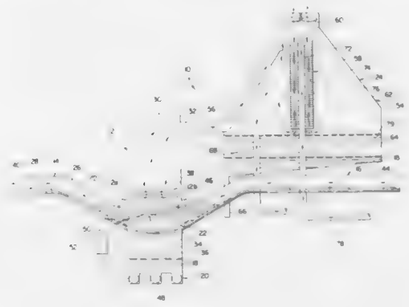
APPARATUS FOR HEATING ARTICLES

Paul D. Gaudreau, No. Attleboro, Mass.; J. Gordon Hickling, San Clemente, Calif., and Howard E. Schachter, Providence, R.I., assignors to Electrafio Technology Corp., North Attleboro, Mass.

Filed Feb. 29, 1988, Ser. No. 162,036

Int. Cl.[4] F26B *21/06*

U.S. Cl. 34—26 12 Claims



1. An apparatus for heating articles comprising a vessel having an inlet opening, an outlet opening and an exhaust opening therein, said inlet opening and said outlet opening being open to atmosphere, a quantity of vaporizable liquid transfer medium in said vessel, said transfer medium being vaporizable to produce a vapor having a density greater than that of air, means for heating said transfer medium to produce a vapor blanket of vaporized transfer medium in said vessel, means for controlling said vapor blanket to maintain the upper extremity thereof at a predetermined level in said vessel, at least a portion of each of said inlet opening, said outlet opening and said exhaust opening being disposed above said predetermined level, exhaust means for applying a partial vacuum to said vessel through said exhaust opening in order to withdraw air and any of said transfer medium intermixed therewith from said vessel and to draw air inwardly into said vessel through said inlet opening and said outlet opening, said exhaust means being the sole means for inducing the inward flow of air through said inlet opening and said outlet opening, and transport means for transporting said articles through said vessel so that they pass sequentially through said inlet opening, said vapor blanket and said outlet opening.

4,860,461

COFFEE BEANS ROASTING DEVICE

Yoji Tamaki, Kagamigahara; Takuya Kino, Nagoya; Takashi Ito, Okazaki, and Akihiko Nakamura, Nagoya, all of Japan, assignors to Pokka Corporation and NGK Insulators Ltd, Aichi, Japan

Filed Apr. 1, 1988, Ser. No. 177,353

Int. Cl.[4] F26B *19/00*

U.S. Cl. 34—68 4 Claims

1. A coffee bean roasting device comprising in combination a roasting chamber,

a drum mounted for rotary movement within said roasting chamber and serving as a container for coffee beans during the roasting operation,

heating means mounted interiorly of said roasting chamber, exteriorly of said drum,

means to circulate hot air withdrawn from the roasting chamber back into the roasting chamber,

(a) said roasting chamber

(1) being insulated so as to retain heat within the interior of the chamber,

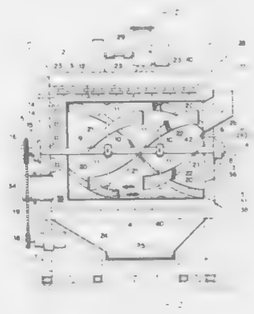
(2) having side walls and first and second end walls, said end walls containing an inlet air opening and an outlet opening for heated gases and vapors,

(3) the first end wall of the roasting chamber having openings for the introduction of fresh coffee beans to said drum and an outlet opening for removing roasted coffee beans discharged from said drum,

(b) said rotary drum

(1) having cylindrically-shaped side walls that contain numerous small openings,

(2) being mounted for rotary movement about a horizontal axis,



(3) having a first end that is open and a second end that is closed, and

(4) said first open end being positioned closely adjacent to said first end wall of said roasting chamber and being sufficiently open to both receive fresh coffee beans and to discharge coffee beans after they are roasted,

(c) said heating means comprising a plurality of infrared heaters mounted around the interior of said roasting chamber and disposed around more than half of the outer circumference of said drum, and

(d) said means to control the movement of the coffee beans within said drum comprising at least one spirally shaped vane fixed to the interior surface of the drum and twisted in one direction so as to move coffee beans in one direction upon rotation of the drum, and at least one other drum spirally shaped vane fixed to the interior surface of the drum and twisted in the opposite direction so as to move coffee beans in the opposite direction upon rotation of the drum.

4,860,462

FLIGHT ARRANGEMENT FOR ROTARY DRUM DRYERS

Richard J. Gobel, Scappoose, Oreg., assignor to Beloit Corporation, Beloit, Wis.

Filed Apr. 4, 1988, Ser. No. 177,193

Int. Cl.[4] F26B *11/02*

U.S. Cl. 34—108 10 Claims

1. In a drum for a rotatably driven dehydrator through which pieces of material are passed and dried by hot gases, the drum being hollow, open at either end and including a longitudinally extending shaft, the improvement comprising:

a plurality of flights are mounted along the inner surface of

the hollow drum, each flight extending longitudinally from one end of the drum to the other end, and spaced circumferentially about the inner surface of the drum, at least some of the flights comprising a plurality of tines extending inwardly from the drum;

a plurality of flights are mounted to the shaft, each flight



extending substantially longitudinally therealong, and spaced circumferentially about the shaft, at least some of the flights comprising a plurality of tines extending outwardly from the shaft;

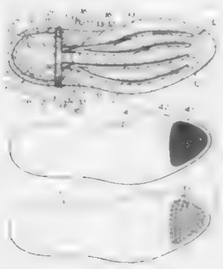
whereby the tines intercept the material introduced into the drum and separate, turn, move and convey pieces of the material as the drum rotates.

4,860,463

FOOTWEAR HAVING VENTILATION AND SHOCK-ABSORBING PROPERTIES

Huang Pin, P.O. Box 10160, Taipei, Taiwan

Filed Aug. 30, 1988, Ser. No. 238,133
Int. Cl.[4] A43B *7/06*
U.S. Cl. 36—3 B **7 Claims**



1. A footwear comprising:

a sole having a rear socket formed on a heel portion of the sole, a transverse ventilation channel transversely formed in the sole in front of the rear socket having two discharge ports formed through the sole on two opposite ends of the transverse channel, and a plurality of longitudinal ventilation channels formed in a front portion of said sole each longitudinal ventilation channel having a front port fluidically communicated with a wearer's toe portions and a rear port fluidically communicated with said transverse ventilation channel;

an elastic pad having a plurality of longitudinal holes having front openings formed therein inserted in said rear socket of said sole, all front openings of said longitudinal holes communicated with said transverse ventilation channel;

a plurality of inlet valves provided in the rear ports of said longitudinal ventilation channels, each inlet valve being a check valve allowing a suction air flow through each said longitudinal channel to be discharged through said transverse channel and the discharge ports;

two outlet valves respectively provided on two discharge ports of the sole, each outlet valve being a check valve allowing an air flow discharge therethrough;

an upper cover having a filter formed on its front portion corresponding to said front ports of said longitudinal channels of said sole sealingly formed on an upper surface of said sole to form an air tight ventilation system of said longitudinal channels, said transverse channel, said check valves and said elastic pad between said upper cover and said sole; and

an inner sole having a plurality of perforations formed in a front portion thereof corresponding to said filter of said upper cover and corresponding to said front ports of said longitudinal channels of said sole embedded on said upper cover;

said longitudinal holes of said elastic pad defining a pumping chamber for sucking air from a wearer's toe portions and for discharging the air through the check valves and discharge ports in said sole, said elastic pad serving as a shock absorber.

4,860,464

TRANSVERSE SUPPORT SLING

Kenneth W. Misevich, Piscataway, N.J.; Rob R. McGregor, Concord, Mass., and Thomas E. Mintel, Somerset, N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.

Filed Apr. 9, 1987, Ser. No. 36,774
Int. Cl.[4] A43B *7/14, 11/00*
U.S. Cl. 36—114 **11 Claims**



1. A foot support structure which is attached to the outsole of a s hoe so as to provide support to the medial arch of a foot in a sling configuration, comprising:

a shoe outsole; and

a plurality of sling straps attached to said outsole so as to extend generally transverse to the longitudinal axis of said outsole, said sling straps being attached to the upper surface of said outsole at a position below the upper column of the foot, wherein the upper column of the foot is defined as including the navicular, the first, second and third cuneiforms and the first, second and third metatarsals, said position of attachment of said sling straps below the upper column of the foot being defined by an arcuate slot which lies beneath three anatomical points of the foot, said points including the posterior edge of the first metatarsal head, the second or third cuneiform and the medial side of the calcaneus.

4,860,465

SNOW GROOMING VEHICLE AND ATTACHMENTS

Claude R. Brandt, 2655 E. Manor Dr., Salt Lake City, Utah 84121

Division of Ser. No. 140,482, Jan. 4, 1988, Pat. No. 4,815,223.
This application Jan. 4, 1989, Ser. No. 293,347
Int. Cl.[4] E01H *4/00*
U.S. Cl. 37—221 **17 Claims**

1. A wheel-driven vehicle for use in ski-area winter snow grooming operations and the like and also for use in maintenance operations in mud or hard surface operating conditions comprising:

(a) a rigid chassis having a central longitudinal axis aligned in generally parallel relationship with a vehicle supporting base surface and having a front portion, a rear portion, and an intermediate portion;

(b) a front axle assembly fixedly mounted on said front end portion of said chassis;

(c) a rear axle assembly flexibly mounted on said rear portion of said chassis;

(d) a first pair of inflatable-tire-carrying front wheels operably, pivotally and rotatably mounted at opposite end portions of said front axle assembly;

(e) a first pair of inflatable-tire-carrying rear wheels operably, pivotally and rotatably mounted at opposite end portions of said rear axle assembly;

(f) four-wheel steering means for pivoting said front and rear wheels for steering said vehicle;

(g) internal combustion engine means for providing power to operate said vehicle, fixedly mounted on said chassis at said intermediate portion thereof;

(h) hydrostatic transmission means for transferring power from said internal combustion engine to said first pair of front wheels and said first pair of rear wheels for providing operator-selectable, infinitely variable, wheel speed adjustment and for providing engine-hold-back type braking of said vehicle in addition to braking provided by a primary braking means;

(i) primary braking means operably associated with said first pair of front wheels and said first pair of rear wheels for providing operator selectable, primary braking of said vehicle;

(j) vehicle body means fixedly mounted on said chassis for enclosing various vehicle components and comprising a high visibility operator cab means for enabling an operator seated in a normal operating position in the cab to unobstructively view a portion of a generally planar base surface on which the vehicle is positioned which is within 8 ft. of the front end of the vehicle or which is within 8 ft. of the rear end of the vehicle, the viewing position of an operator in the cab being at least 8 ft. above the base surface supporting the vehicle;

(k) operator control means located in the cab means for enabling an operator to control said vehicle;

(l) said vehicle comprising a center of gravity located at approximately mid-distance between said front and rear axle assemblies and at a height above a planar base surface upon which said vehicle is supported of between 3 ft. and 4 ft.;

(m) said first pair of front wheels and said first pair of rear wheels defining a wheel base having a longitudinal dimension of between 10 ft. and 14 ft. and having a transverse dimension of between 6.5 ft. and 9 ft. and having a longitudinal dimension to transverse dimension ratio of between 1.11 and 2.15;

(n) said vehicle having an unloaded and unfueled weight of between 8.000 lbs. and 12.000 lbs.;

(o) said vehicle having an internal combustion engine means with an SAE power rating of between 200 hp and 300 hp;

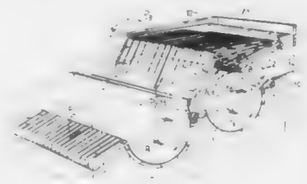
(p) said vehicle having a power-to-weight ratio of between 0.0167 hp/lb. and 0.0375 hp/lb.

4,860,466

ROTARY IRONING ROLLS WITH SERIAL FEED

Herman E. C. Vanderheyden, Aalter, Belgium, assignor to 501 E.M. D'Hooge N.V., Belgium

Filed Jun. 23, 1988, Ser. No. 210,404
Int. Cl.[4] D06F *65/10*
U.S. Cl. 38—8 **12 Claims**



1. Apparatus for ironing laundry which comprises the combination of a pair of dished beds arranged in a series, a rotating and heated ironing roll nested in each dished bed to pass laundry between each roll and its bed to a region of discharge means for feeding fresh laundry to a first one of the rolls, means for withdrawing pressed laundry from the first one of the rolls and feeding it in a first feeding stage overhead of the second one of the rolls and then in a second feeding stage back downwardly to the second one of the rolls to an inlet zone disposed between the first and second rolls.

4,860,467

STRETCHING FRAME WITH ADHESIVE FASTENING OF A FABRIC WORKPIECE

James D. Larson, 6323-83rd Ave. SE., Snohomish, Wash. 98290

Filed May 24, 1988, Ser. No. 198,180
Int. Cl.[4] D06C *3/08*
U.S. Cl. 38—102.4 **4 Claims**



1. A method of preparing a screen for silk screening comprising the steps of:

1. preparing the screen by squaring the edges thereof;

2. laying the screen on an appropriate sized frame having a plurality of frame elements and aligning each of the edges with an encoded portion of the frame;

3. sequentially securing the corners of the screen to each end of each frame element while placing each edge under tension along the frame element, said securement being made with an adhesive;

4. applying an epoxy resin along the entire edge portion of each of the edges;

5. tensioning the screen by rotating the frame elements, outwardly.

4,860,468

WINDOWED MATRIX DISPLAY FOR BASEBALL CARDS AND SIMILAR OBJECTS

David L. Clibora, 23835 Nicolle Ave., Carson, Calif. 90745

Filed Oct. 29, 1987, Ser. No. 114,553

Int. Cl.[4] G09F *1/00*

U.S. Cl. 40—124.2 3 Claims



1. A windowed display for displaying baseball cards and similar flat objects that comprises:

a front panel having planar front and rear sides and having a matrix of rectangular cutouts which are smaller in area than the flat objects to be displayed; and

an intermediate panel having planar front and rear sides and having a corresponding matrix of rectangular cutouts which are larger in area than said rectangular cutouts on said front panel and are larger in area than said flat objects to be displayed and wherein said planar front side of said intermediate panel is attached to said planar rear side of said front panel and aligned such that said matrix of rectangular cutouts on said front panel are entirely visible and centered horizontally and offset lower vertically with respect to said intermediate panel rectangular cutouts when viewed from said rear planar side of said intermediate panel and wherein there is a larger space between the top edges of said rectangular cutouts in said front panel and the top edges of said rectangular cutouts in said intermediate panel than the space between the bottom edges of said rectangular cutouts in said front panel and the bottom edges of said rectangular cutouts in said intermediate panel; and

a rear panel having planar front and rear sides and having a corresponding matrix of rectangular slots wider and much shorter than the corresponding width and height of said rectangular cutouts on said intermediate panel and wherein said planar front side of said rear panel is attached to said planar rear side of said intermediate panel and aligned such that said top edges of said rectangular cutouts of said intermediate panel are above the bottom edges of said rectangular slots; and

wherein said front, intermediate and rear panels are attached to one another to form a matrix of display vaults that can be filled by inserting flat objects through said slots in said rear panel; and

wherein said flat objects are viewable from said front side of said front panel through said rectangular cutouts in said front panel; and

wherein said intermediate panel is slightly thicker than said flat objects which are to be inserted into said windowed display; and

wherein the relative dimensions between said flat objects to be displayed and said rectangular cutouts in said front and said intermediate panels are such that said flat objects are snugly aligned in said matrix of display vaults.

4,860,469

APPARATUS FOR EXHIBITING GRAINS OF PRECIOUS STONE

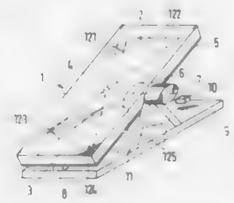
Dietrich Borse, Hamburg, Fed. Rep. of Germany, assignor to Firma Ernst Winter & Sohn (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Feb. 2, 1988, Ser. No. 151,574

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1987, 3703979

Int. Cl.[4] G09F *19/00*

U.S. Cl. 40—409 8 Claims



1. An apparatus for exhibiting grains of precious stone, comprising a container assembly that includes at least two compartments enclosed by container walls, a communicating passageway connecting the at least two compartments and constituting a singling path for grains of precious stone, which singling path constitutes a constriction relative to the compartments and has in relation to the size of the grains a cross-section which permits single grains to move freely through the passageway, wherein an aggregation of grains of precious stone is container in at least one of the compartments, two communicating compartments having different elevations, and the constricted passageway between said two compartments is adapted to loosen and to single the grains of aggregation thereof as they move from one compartment to another, the grains of precious stone being selected from the group consisting of monocrystalline material having planar surfaces for producing presentational light reflexes and particles having a secondary granulation and broken surfaces, and said material is selected from the group consisting of natural and synthetic diamond, zircon and sapphire, the two compartments being constricted toward the singling path and combined in the shape of an invertible hourglass.

4,860,470

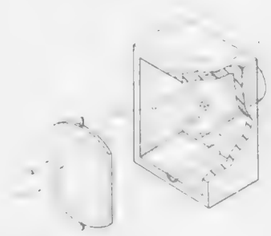
SINGLE CORE DISPLAY DEVICE

John Browne, Georgetown, Canada, assignor to NEI Canada Limited, Rexdale, Canada

Filed Feb. 1, 1988, Ser. No. 151,286

Int. Cl.[4] G09F *9/00*

U.S. Cl. 40—449 26 Claims



1. Electromagnetic display device having a predetermined viewing direction;

a housing;

a rotor having a body of thin generally flat shape defining a median plane, mounted on said housing for rotation about an axis substantially in said median plane,

said axis being approximately perpendicular to said viewing direction.

a permanent magnet mounted on said rotor on only one side of said axis and having its polar axis transverse to the median plane of the rotor,

said rotor being contrastingly colored on opposite sides,

stop means on said housing defining an arc of movement for said rotor between two limiting positions,

said permanent magnet defining a path while moving over said arc,

each limiting position corresponding to the display of a different contrasting face in the viewing direction,

a reversible polarity, high remanence core mounted on said housing with a free end projecting generally in the viewing direction,

an energizing winding for controlling the polarity of said core,

said free end being located rearward of the path of said magnet to exert selectively reversible torque to influence said magnet to move said rotor between limiting positions in an angular direction determined by the torque.

4,860,471

DISPLAY MEANS

Jacques Bonanomi, Neuchatel, Switzerland, assignor to Observatorie Cantonal, Switzerland

Filed Oct. 5, 1987, Ser. No. 105,099

Claims priority, application France, Oct. 6, 1986, 86 13983

Int. Cl.[4] G09F *3/04*

U.S. Cl. 40—450 6 Claims



1. Display means comprising:

a pivotable means having a low moment of inertia and at least two differently colored principal surfaces, said pivotable means being rotatable through predetermined angles between at least two stop positions wherein respective principle surfaces are displayed,

a rotary stepper motor operably connected to said pivotable means by rotary drive means whereby said pivotable means is rotated over less than 15 degrees for each step of the stepper motor, said predetermined angles each corresponding to several steps of the stepper motor, and said stop positions being determined by said stepper motor, and

elastic means for absorbing forces resulting from angular speed variations caused by the stepper motor operatively disposed between the stepper motor and the pivotable means.

4,860,472

PICTURE VIEWING DEVICE

Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

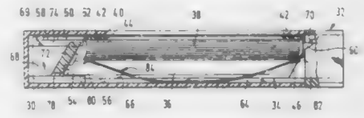
PCT No. PCT/EP86/00749, § 371 Date Aug. 13, 1987, § 102(e) Date Aug. 13, 1987, PCT Pub. No. WO87/03971, PCT Pub. Date Jul. 2, 1987

PCT Filed Dec. 13, 1986, Ser. No. 104,868

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1985, 3545164

Int. Cl.[4] G09F *11/30*

U.S. Cl. 40—513 24 Claims



1. Picture viewing device for rectangular pictures of like format comprising: a viewing window, behind which there lies a pile of pictures; first and second frame parts which are able to be pulled apart and pushed back together relative to one another and parallel to the plane of the window; transporting means which, upon a movement of the frame parts backwards and forwards, remove an individual picture at one side of the pile and add it to the other side of the pile, wherein, as the frame parts are pulled apart, the first frame part carries the individual picture with it and the second frame part supports the remainder of the pile; and a removable container containing the pile of pictures and assigned to the second frame part, which container, at an end of the pile facing towards the first frame part, has a picture withdrawal opening and a picture return opening, on which container the side facing towards the viewing window is open, and which allows said transporting means for an individual picture to engage operatively with the pile.

4,860,473

DEVICE FOR THE CYCLIC REARRANGEMENT OF A PILE OF RECTANGULAR OR SQUARE SHEETS

Peter Ackeret, Kusaacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

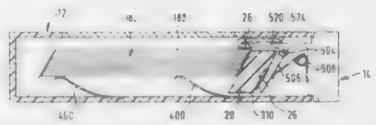
PCT No. PCT/EP85/00604, § 371 Date Jul. 11, 1986, § 102(e) Date Jul. 11, 1986, PCT Pub. No. WO86/03018, PCT Pub. Date May 22, 1986

Division of Ser. No. 888,333, Jul. 11, 1986, abandoned. This PCT application Nov. 12, 1985, Ser. No. 148,966

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441481

Int. Cl.[4] G09F *11/30*

U.S. Cl. 40—513 30 Claims



1. Apparatus for use in cyclically rearranging a pile of substantially planar rectangular sheets such as photographic prints, said pile having a first end and an opposite second end, the sheet at said first end of said pile being an individual sheet and having an exposed surface facing away from said pile and a parallel opposite surface, said apparatus comprising a first frame member and a second frame member, said frame members being relatively reciprocable in a reciprocation direction parallel to the plane defined by any one of said sheets between

an inner end position and an outer end position, and comprising means for removing, upon each reciprocation of said frame members, an individual sheet from said first end of said pile leaving a remainder of said pile and for returning said individual sheet to said second end of said pile, said means including:

(a) separating means disposed in said frame members for separating said individual sheet from said pile,

(b) feeding means disposed in said frame members for feeding sheets to said separating means,

(c) first retaining means disposed in said first frame member for retaining said individual sheet in said first frame member, and

(d) second retaining means disposed in said second frame member for retaining the remainder of said pile in said second frame member,

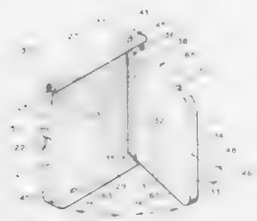
wherein said first retaining means includes a clamping system comprising (i) a first clamping member, (ii) a second clamping member, (iii) means responsive to reciprocation of said frame members from said inner end position toward said outer end position for causing said first clamping member to engage said opposite surface of said individual sheet after separation of said individual sheet from said pile, and to releasably press an adjacent portion of said exposed surface of said individual sheet against said second clamping member, and (iv) means responsive to reciprocation of said frame members from said outer end position toward said inner end position for causing said first clamping member to disengage from said opposite surface of said individual sheet.

4,860,474

SINGLE-POSITION SIGNAL DEVICE

David Leflet, 8610 NW. 178th St., Miami, Fla. 33015

Filed Apr. 15, 1988, Ser. No. 182,484
Int. Cl.[4] G09F *19/00*
U.S. Cl. 40—530 18 Claims



1. A signal device for use with a primary object, such as an office file or the like, said device comprising:

a base plate adapted to be attached to a primary object;

a signal panel having an obverse display side and a reverse display side mounted in a single signaling position against said base plate wherein said signal panel has a proximal edge and an opposite distal edge, and said device includes a pivotal mounting connecting said proximal edge of said signal panel to said base plate at one end of said signal panel, whereby said signal panel can be rotated about said pivoted mounting out of said single signaling position;

means for releasably holding said signal panel in said single signaling position and displaying one of said display sides;

means for reversing said signal panel into said single signaling position to display the other of said display sides of said signal panel; and

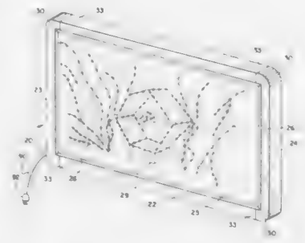
means for attaching said base plate to said primary object.

4,860,475

FIBER OPTIC PICTORIAL DISPLAY KIT

Zubin Levy, Box 717, Ojai, Calif. 93023, and Gerry E. Swemer, 4699 S. Valley View Blvd., Las Vegas, Nev. 89103

Filed Aug. 4, 1987, Ser. No. 81,449
Int. Cl.[4] G09F *13/00*
U.S. Cl. 40—547 12 Claims



1. A fiber optic display kit comprising a frame means, a panel means carried by said frame means, a plurality of optical fibers mounted to said frame means, each of said optical fibers having first and second end portions, a light source means mounted to said frame means adjacent said first end of said plurality of optical fibers, a plurality of openings in said panel means, said second end of each of said optical fibers being selectively insertable through said openings in said panel means, energy source means for supplying electrical power to illuminate said light source means, at least one color wheel means mounted to said frame means intermediate said light source means and said first end of said optical fibers, means connecting said color wheel to said energy source means, said energy source means including a battery module means, said battery module means being supported by said frame means, whereby said second ends of said optical fibers may be positioned through said openings in said panel means to create a lighted display with respect thereto.

4,860,476

AUTOMOBILE DISPLAY DEVICE

Tony R. Hall, Naranja, Fla., assignor to Lite Works, Inc., Naranja, Fla.

Filed Sep. 9, 1987, Ser. No. 94,689
Int. Cl.[4] G09F *21/04*
U.S. Cl. 40—593 6 Claims



1. A message display apparatus for an automobile window comprising:

(a) a display member assembly comprised of a housing, said housing having a display board, array of holes, a reflective back and passive pin lights in each hole of the array of holes;

(b) a transparent lens located in front of the display board;

(c) a peripheral recess formed around the front of the housing to accommodate the display member assembly and transparent lens; screw bosses behind the peripheral recess and screws adapted to pass through the display member assembly and lens to hold the display member and lens in the peripheral recess;

(d) means for mounting the housing and display member assembly adjacent to an automobile window; and

(e) means for illuminating the display member assembly.

4,860,477

STYROFOAM BALL ADVERTISING DISPLAY APPARATUS AND METHOD

William E. Gooch, Rte. 1, Box 37A, Mill Spring, Mo. 63952

Filed Jul. 21, 1987, Ser. No. 75,997
Int. Cl.[4] A47G *33/10*
U.S. Cl. 40—603 14 Claims



1. An advertising display apparatus comprising at least one display body,

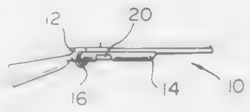
a connector connected to at least one body for hanging the body on a display article, wherein an outer surface of the display body is coated with a conspicuous material, wherein the display body is made of styrofoam, wherein the connector comprises an anchor embedded in the body and an eyelet at one end of the anchor extending outwardly from the body, wherein an end of the anchor opposite the eyelet is hooked, wherein a U portion of the hook is disposed on a diametrically opposite side of the body from the eyelet, and wherein a free leg of the U portion is embedded in the body parallel to a leg of the anchor.

4,860,478

CARTRIDGE HOLDER

Cameron Clayton, Carcross, Canada, assignor to Willard L. Phelps Consultants Ltd., Whitehorse, Canada

Filed Sep. 2, 1987, Ser. No. 92,187
Claims priority, application Canada, Sep. 9, 1986, 517793
Int. Cl.[4] F42B *39/02*
U.S. Cl. 42—71.01 3 Claims



1. A cartridge holder, comprising:

a base of substantially rigid material and of generally rectangular configuration and having an upper surface, a lower surface, a rear surface, a front surface, and opposed end surfaces;

said base having means by which the holder can be secured with its rear surface to the side of a stock of a firearm;

said upper surface including a longitudinally extending recess intermediate the end surfaces of said base said base including a row of generally vertical bores extending downwardly from said recess through said base;

said front surface including a plurality of upwardly opening notches, each said notch communicating with one of said bores adjacent said recess, whereby a portion of the underside of a rim of a cartridge in a bore is exposed and contactable by the fingers of a user of the firearm;

an elongated, substantially rigid cover pivotally secured to said base adjacent the juncture of the upper surface and an end surface which in a closed position covers said recess and the rims of cartridges in said bores and which is laterally pivotable outwardly of said base to an open position to expose said cartridges for use;

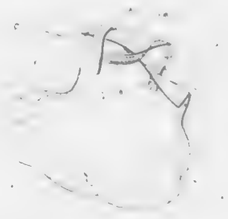
said cover means having a free end of reduced width relative to that of the rest of said cover means, thereby defining a finger engageable protrusion spaced from the plane of the rear surface and providing means for initiating pivotal movement of the cover from the closed to the open position.

4,860,479

WRAPAROUND COVER FOR GUNS DURING FIELD USE

Michael D. Easter, 840 J St., Penrose, Colo. 81240

Filed Jan. 11, 1988, Ser. No. 142,193
Int. Cl.[4] B65D *85/00*
U.S. Cl. 42—96 13 Claims



1. A protective covering device for guns with telescopic sights comprising:

a one piece flexible cover unit made from an expanse of flexible material having a flat end portion on an intermediate flap portion connected to a pouch portion and being of sufficient size and shape to envelop the midsection of a gun including the trigger, action and telescopic sight when placed in a closed covering position;

attachment means for attaching said end portion of said cover unit to an intermediate portion of the telescopic sight of a gun and fixedly holding said end portion of said cover unit on the telescopic sight in juxtaposition to the gun with the cover unit located in an open non-covering position whereat the trigger and the action of the gun and the telescopic sight are uncovered and operable; and also fixedly holding said cover unit in a closed covering position whereat the trigger and action of the gun and the telescopic sight are completely covered and not operable; and

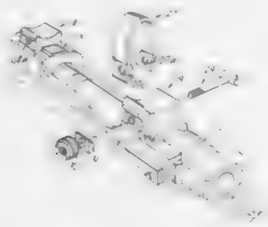
stretchable resilient retaining and sealing means associated with said pouch portion of said cover unit for locating and retaining and sealing of said pouch portion over and around the top and both ends of the telescopic sight and for locating said flap portion in engagement with the midsection of the gun when the cover unit is in the closed covering position.

4,860,480

FIREARM RECEIVER INCLUDING SCOPE MOUNT ARRANGEMENT

William B. Ruger, Croydon, N.H., assignor to Sturm, Ruger & Company, Inc., Southport, Conn.

Filed Jan. 4, 1988, Ser. No. 140,507
Int. Cl.[4] F41G *1/38*
U.S. Cl. 42—101 4 Claims



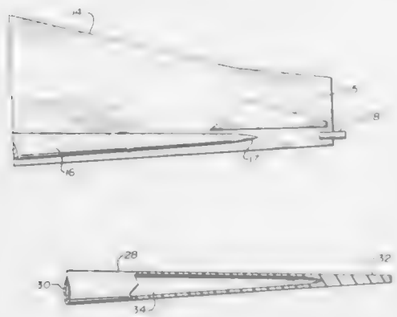
1. A firearm receiver including a scope mount comprising
(a) a plurality of spaced-apart metallic block portions integrally formed with a metallic receiver;
(b) a top surface on each block portion;
(c) strap engagement means for engaging the scope to said block portions which means is detachably connected to each such block portion; and
(d) side depression means in said block portions for accommodating said scope strap engagement means;
whereby the strap means and the block portions are connected together to mount and hold the scope.

4,860,481

SOLID GRAPHITE ROD TIP

Harlan B. Christenson, Spirit Lake, Iowa, assignor to Berkley, Inc., Spirit Lake, Iowa

Filed Apr. 15, 1988, Ser. No. 181,930
Int. Cl.[4] A01K *87/00*
U.S. Cl. 43—18.1 7 Claims



1. A method for making a fishing rod having an exterior cross-section which tapers from a larger butt end to a smaller tip end, and having a hollow body section and a solid tip section, comprising:
forming a shortened mandrel from a conventional mandrel, by removing a portion of a tapered tip end of the conventional mandrel that is slightly longer than the desired length of the solid tip section;
aligning the shortened mandrel on a pattern sheet comprised of a fiber reinforced laminar resin material, said pattern having a tip end and a butt end, said butt end of the pattern cut for aligning with the butt end of the original full length of the conventional mandrel and the tip end cut for aligning with the tip end of the conventional mandrel;
aligning the shortened mandrel along the pattern, with a butt end of the shortened mandrel generally adjacent the butt end of the pattern, the shortened mandrel extending longitudinally along the pattern and the tip end of the mandrel aligned adjacent the tip end of the pattern;
aligning a dowel along the pattern in axial alignment with and spaced from the shortened mandrel and extending from the tip end of the mandrel along the pattern and beyond the tip end of the pattern;
rolling the pattern around the axially aligned shortened mandrel and dowel such that the dowel extends beyond the tip end of the rolled pattern;
withdrawing the dowel, thereby forming a hollow tip section in the tip end of the rod;
wrapping the mandrel and pattern with an overlapping layer of tape, such that the overlapping tape layer compresses the hollow tip section of the pattern to form a solid tip section; and
curing the rod and removing the mandrel.

5. A one-piece fishing rod of unitary construction formed from a fiber reinforced laminar resin material, the rod having a generally circular cross-section tapering from a large butt end to a small tip end, and having a hollow body section extending along the rod axis from the butt end to a solid tip section, said solid tip section being a unitary part of the rod and forming a smooth exterior profile therewith, said solid tip section providing improved compressive strength and impact resistance to the tip end of the rod, while maintaining the flexibility thereof.

4,860,482

FISHING ROD

Yoshiro Yamato, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Nov. 7, 1988, Ser. No. 268,049
Claims priority, application Japan, Nov. 12, 1987, 62-173421[U]
Int. Cl.[4] A01K *87/04*
U.S. Cl. 43—18.1 4 Claims



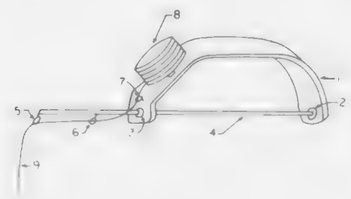
1. A fishing rod, comprising:
a rod body having a root portion, a tip portion and an intermediate portion between said root portion and said tip portion;
a reel fixture fixed to one circumferential side of said root portion;
a plurality of first fishing line guides fixed to said root portion and said intermediate portion so as to guide to said tip portion a fishing line drawn out from a fishing reel mounted to said reel fixture; and
a second top fishing line guide mounted on said tip portion; each of said first fishing line guides including (i) a first line guide ring having an inner diameter enabling it to be inserted onto an outer periphery of said rod body and comprising guide means for guiding said fishing line and (ii) a first mounting piece extending parallel to a longitudinal direction of said rod body and from one circumferential side of said first line guide ring, said first mounting piece being fixed to an intermediate circumferential position of said rod body between said one circumferential side of said room portion at which said reel fixture is fixed and another circumferential position of said rod body radially opposite to said one circumferential side of said root portion.

4,860,483

ROD HANDLE

Myron Hlad, 428 25th Ave. No., St. Cloud, Minn. 56303

Filed Mar. 7, 1988, Ser. No. 164,883
Int. Cl.[4] A01K *87/00*
U.S. Cl. 43—18.1 14 Claims



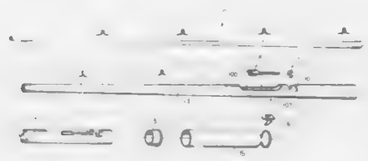
1. A fishing rod comprising
a handle means for grasping by a human hand,
a flexible rod,
plural resilient means for attaching said handle means to said flexible rod,
said flexible rod being absolutely responsive to positioning of said handle means,
a minimum distance of said rod between a first and a second of said plural resilient attaching means void of any of said plural resilient attaching means, wherein
said minimum distance is greater than a distance required for grasping by a human hand, and wherein
said handle means is substantially continuous between said first and said second resilient attaching means and is spaced from said minimum distance of said flexible rod by a first distance sufficient to allow insertion of a human hand therebetween.

4,860,484

REEL SEAT STRUCTURES FOR FISHING RODS

Milton J. Green, Rte 2, Box 73417, Quilence, Wash. 98376, and Timothy D. Grennan, 5901 Croupier Dr., Huntington Beach, Calif. 92647

Continuation-in-part of Ser. No. 884,902, Jul. 14, 1986, abandoned. This application Nov. 16, 1987, Ser. No. 121,044
Int. Cl.[4] A01K *87/06*
U.S. Cl. 43—22 10 Claims



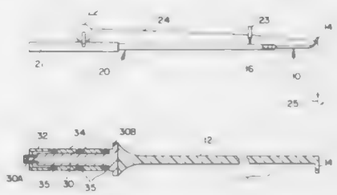
1. In a fishing rod having a handle portion and a reel seat structure
, the reel seat structure including a tubular body means, a stationary hood member, a movable hood member, and adjustment means connected with the movable hood member for adjusting the position of same lengthwise along the body toward and away from the stationary hood member for releasably clamping a fishing reel therebetween, the improvement comprising a mounting arrangement for the movable hood member including an elongate keyhold-shaped aperture on the tubular body means having an elongate slot portion and an enlarged head portion at one end of the slot portion, a stem and an enlarged head depending from the movable hood member, the stem and head being inserted through the head portion of the aperture for sliding of the stem in the slot portion during adjusting movements of the movable hood member with the head trapped thereunder, the adjustment means being connected to the head within the tubular body means.

4,860,485

DETACHABLE TIP FOR FISHING ROD

William L. Rhoton, 39260 W.C.R. 68, Briggsdale, Colo. 80611, and Gary M. Sabell, Northglenn, Colo., assignors to William L. Rhoton, Briggsdale, Colo.

Continuation-in-part of Ser. No. 136,104, Dec. 21, 1987, which is a continuation-in-part of Ser. No. 906,929, Sep. 15, 1986, abandoned. This application Jan. 23, 1989, Ser. No. 299,035
Int. Cl.[4] A01K *87/00*
U.S. Cl. 43—24 13 Claims



1. In combination with a conventional fishing rod base section having a fishing reel attached thereto, a tip section detachably mounted to said base section, said tip being adapted to convert said fishing rod base section to an ice fishing pole, wherein said detachable tip comprises a resiliently flexible shaft having first and second ends and a length in the range of about 4 to 10 inches, wherein said first end of said shaft includes attachment means adapted to detachably secure said tip to said fishing rod section, wherein said second end of said shaft includes an eyelet; and wherein said tip is capable of being deflected 180° without breaking; wherein said attachment means comprises:
(a) an elongated shank having forward and rearward portions; wherein said forward portion is secured to said first end of said flexible shaft; and wherein said rearward portion is threaded;
(b) a plurality of elastomeric O-rings carried on said shank;
(c) a plurality of sleeve members slidably engaging said shank adjacent said O-rings; and
(d) a threaded sleeve member carried by and threadably engaging said rearward portion of said shank.

4,860,486

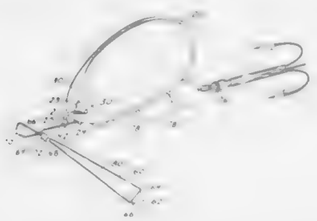
KEELED FISHING LURE APPARATUS

Allen P. Vanderplow, 5712 Glenwood Dr., Racine, Wis. 53406

Filed Jun. 10, 1988, Ser. No. 204,904
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.19 20 Claims

1. In fishing lure apparatus of the type having line attachment means, a principal axis, and a keel extending from a keel proximal end near such axis to a keel distal end, the improvement wherein:
the keel is formed of a wire doubled back on itself from the keel distal end into first and second wire portions which are together at the keel proximal end; and
the first wire portion extends from said keel proximal end to

form a line-attachment loop and has a first end segment returning from the line-attachment loop which is wound



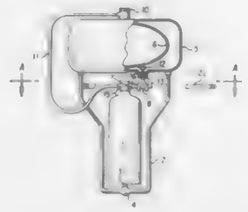
around the first and second wire portions at the keel proximal end.

4,860,487

MULTI-CYCLE SEA BED TRAVERSING SYSTEM

William Kingston, 49 Sandymount Avenue, Dublin 4, Ireland
Continuation-in-part of Ser. No. 274,519, Jun. 17, 1981, abandoned. This application Jun. 29, 1983, Ser. No. 509,016

Int. Cl.[4] A01K *69/08*
U.S. Cl. 43—102 3 Claims



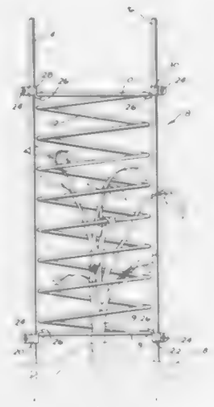
3. An autonomous, multi-cycle seabed traversing system, comprising, in combination, flotation means wherein water can be displaced by gas, a source of gas under pressure for charging said flotation means, independent timer control means for opening said flotation means to said gas source at intervals, means for isolating said source from said flotation means when charging causes flotation, means for venting said flotation means when said system has risen to a predetermined depth and autonomous means for moving said system horizontally.

4,860,488

ADJUSTABLE PLANT SUPPORT

Stanley A. Bork, 6705 Shelburn Dr., Crestwood, Ky. 40014

Filed Nov. 12, 1987, Ser. No. 119,732
Int. Cl.[4] A01G *17/06, 17/14*
U.S. Cl. 47—47 6 Claims



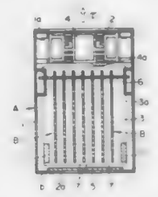
1. An adjustable plant support comprising
a pair of generally circular end rings,
a cylindrically shaped coil constructed of flexible material connected between said end rings,
stake means supporting said coil and an upper one of said end rings, stake means comprising two stakes adapted for being driven into the ground in spaced apart relation to one another on opposite sides of a plant for supporting opposite portions of said end rings over and around said plant, whereby said coil is disposed over and around said plant, and
means movably connected to said stake means for supporting an upper one of said end rings and for adjusting the length of said coil along said stake means, said movably connected means comprising at least two pairs of hook assemblies slidably adjustable along said stake means for confining a lower one of said end rings at or near ground level and for supporting an upper one of said end rings above the lower end ring.

4,860,489

VOLATILE INSECTICIDE EMITTER

Hiromi Shigetoyo, Tokyo, Japan, assignor to Nihon Naishi Co., Ltd., Japan

Filed Jun. 23, 1987, Ser. No. 65,935
Int. Cl.[4] A01M *1/20*
U.S. Cl. 43—129 3 Claims



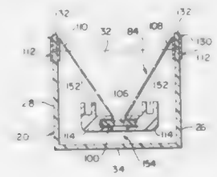
1. An insecticide emitter comprising:
a container, said container having an air inflow port and an insecticide emission port;
an air filter covering said air inflow port for filtering the inflowing air;
a plurality of insecticidal plates each formed by impregnating a plastic absorbent material with dimethyl dichlorovinylphosphate as an insecticidal component, said plates being juxtapositioned with one another and having a set spacing between each of said plates, said plates positioned inside said container;
a heater for only heating the inside of said container when the temperature is less than or equal to about 17° C.; and
a motorized fan for drawing air in through said inlet port, over said plates and expelling said air through said insecticide emission port.

4,860,490

MOVABLE ROOT CONTACT-PRESSURE PLATE ASSEMBLY FOR HYDROPONIC SYSTEM

Carlton E. Morris; Philip A. Loretan, both of Tuskegee Institute; Conrad K. Bonsi, Tuskegee Institute, and Walter A. Hill, Tuskegee University, all of Ala., assignors to Tuskegee University, Tuskegee, Ala.

Filed Feb. 16, 1988, Ser. No. 156,013
Int. Cl.[4] A01G *31/00*
U.S. Cl. 47—63 19 Claims



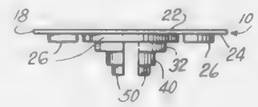
1. A hydroponic system for growing root crops in the absence of an aggregate, and for stimulating the growth of storage roots by the application of continuous downward pressure to such roots, comprising:
a growing channel having a bottom wall and side and end walls, and having an open top;
movable root contact/pressure plate means within said growing channel and spaced above the bottom wall thereof to define a root zone, said contact/pressure plate means having a weight selected to provide a growth-stimulating pressure on storage roots within said root zone;
plant support means in said plate means for receiving and supporting crop plants having storage roots with their storage roots extending below said plate into said root zone;
flexible sheet means interconnecting said plate means with the side walls of the growing channel for substantially free vertical motion of said plate means within said channel, said plate means being positioned by said flexible sheet means to contact and continuously apply the weight of said contact/pressure plate means and thereby said growth-stimulating pressure on storage roots within said root zone to thereby promote storage root growth, said flexible sheet means permitting vertical motion of said plate means in response to storage root growth to accommodate root enlargement while retaining plate pressure on said storage roots; and
means supplying liquid nutrient to said root zone in said growing channel to contact the roots of plants carried in said plant support means.

4,860,491

POTTER'S GRATE

William R. Panuski, 5 Ocean Ave., Magnolia, Mass. 01930

Filed Dec. 18, 1987, Ser. No. 135,062
Int. Cl.[4] A01G *9/02*
U.S. Cl. 47—66 7 Claims



1. A molded grate for disposition in a hole in the bottom of a planter's pot to facilitate drainage and minimize erosion with respect to soil placed over said grate in a pot, said grate comprising:
a flat resilient molded plastic disc shaped element having an upper surface and a lower surface,
a plurality of openings disposed through said disc;
a plurality of standoffs disposed on the lower surface of said disc, said standoffs having spaces therebetween to define first channels for drainage and ventilation;
said first channels and said openings being in fluid communication;
an arrangement of first pie shaped elements radially disposed against the lower surface of said disc;
an arrangement of several successive pie-shaped elements disposed on each of said first pie-shaped elements, to define a stepped configuration in which the radii of the successive pie-shaped elements decrease in a direction away from the lower surface of said disc.

4,860,492

LOUVERED BLIND STRUCTURE, MORE PARTICULARLY FOR DOUBLE-GLAZED SEALED WINDOW UNIT

Fernand Roy, 405 Vanier Street, Brossard, Canada J4W 1Y1

Filed Jun. 23, 1988, Ser. No. 210,551
Int. Cl.[4] E06B *7/086*
U.S. Cl. 49—84 16 Claims



1. A louvered blind structure comprising a frame having one straight side and a first opposite side, which is not parallel to said straight side, a first set of slats extending from said straight side to said opposite side, each having a first and a second pivot shaft, fixed to opposite ends of each slat, and co-axial about a first axis, said first pivot shaft of each slat journalled in said straight side, a block for each slat in which said second pivot shaft is journalled, said block pivotally mounted in said first opposite side of said frame about a second axis which is transverse to said first axis, and actuating means mounted in said straight side drivingly interconnecting said slats for simultaneously pivoting the same between open and closed position.

4,860,493

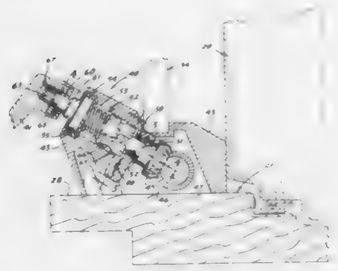
NON-BACKDRIVING ACTUATOR FOR OPENING AND CLOSING A WINDOW SASH

Robert F. Lense, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Nov. 10, 1988, Ser. No. 269,492
Int. Cl.[4] E05F *11/02, 11/24*
U.S. Cl. 49—279 10 Claims

1. An actuator for moving a window sash between open and closed positions, said actuator comprising a housing, a shaft assembly rotatably supported by said housing, said shaft assembly having first and second end portions and having a section located between said end portions, a linkage connected between said shaft assembly and said sash and operable to move said sash toward said open position when said shaft section is rotated in one direction and to move said sash toward said closed position when said shaft section is rotated in the opposite direction, the improvement in said actuator comprising means for restricting rotation of said shaft section in either direction when torque of predetermined magnitude is applied to said first end portion of said shaft assembly without being

transmitted to said first end portion from said second end portion, said means permitting said shaft section to rotate in either direction when torque of the same magnitude is applied



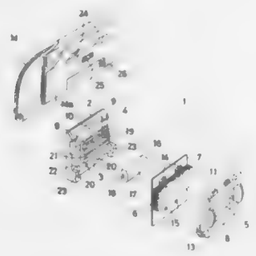
to said second end portion of said shaft assembly without being transmitted to said second end portion from said first end portion.

4,860,494

VERTICALLY MOVABLE WINDOW GLASS RETAINER FOR MOTOR CAR DOOR

Hiroshi Fujii, and Atsushi Takahashi, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd. and Nifco Inc., both of Yokohama, Japan

Filed Apr. 19, 1988, Ser. No. 183,073
Claims priority, application Japan, Apr. 20, 1987, 62-[illegible][U]
Int. Cl.[4] E06B 7/16
U.S. Cl. 49—493 1 Claim



1. A vertically movable window glass retainer for a motor car door, comprising:

a base portion to be in contact with an inner surface of an inner leg portion of a molding mounted on a lower end of a motor car door window, the inner surface being positionable in facing opposition to a window glass surface,

an inner extension extending inwardly from a lower portion of said base portion in the thickness direction of the molding inner leg portion and having a free end,

an upright portion upwardly extending from the free end of said inner extension,

opposed surfaces of said base and upright portions being provided with respective, inwardly projecting pawls which can be engaged forwardly and rearwardly in mounting holes formed in the molding inner leg portion,

a frame mounted on both said upright portion and said inner extension and having a central opening, said frame also having locking portions for locking said frame to said inner extension,

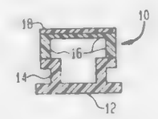
and a cloth member having an embedded fur portion for contact with the window glass surface and detachably stretched over said opening, a back surface of said frame being provided with upward projections and pin-like projections penetrating through said cloth member for preliminarily holding said cloth member independently of said inner extension and said upright portion, said cloth member being clamped between said inner extension, said upright portion and said frame by said upward projections and pin-like projections engaging in recesses of said upright portion and inner extension when said frame is mounted on said upright portion and said inner extension.

4,860,495

LOW FRICTION PLASTIC WEATHERSTRIP

Gerald Kessler, P.O. Box 389, Youngstown, Ohio 44512

Filed Dec. 23, 1987, Ser. No. 137,362
Int. Cl.[4] E06B 7/16
U.S. Cl. 49—498 15 Claims



1. An extruded all-polymer weatherstrip having a longitudinally extending base portion of sufficient mechanical strength to support the weatherstrip in a slot below a surface to be sealed,

a longitudinally extending support portion projecting upwardly from said base portion and integral and unitary therewith, said support portion being sufficiently rigid to substantially retain its shape and position when said weatherstrip is subjected to pressure from the surface to be sealed;

a longitudinally and transversely extending elastic portion projecting upwardly from said support portion and integral therewith, said elastic portion being formed of an elastomer or resilient plastic; and

a self-supporting, longitudinally extending generally planar contact strip of thickness on the order of about 25–30 mils for directly contacting the surface to be sealed, said contact strip being supported by and integral with the said elastic portion, said contact strip extending transversely and defining the width of said weatherstrip and being sufficiently rigid to substantially retain its shape and position when said weatherstrip is subjected to pressure from the surface to be sealed.

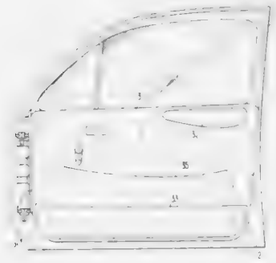
4,860,496

DOOR FOR A MOTOR VEHICLE

Edmund Hellriegel, Pulheim, Fed. Rep. of Germany, assignor to Dynamit Nobel Akiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Oct. 29, 1987, Ser. No. 113,915
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1986, 3642429
The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.
Int. Cl.[4] B60J 5/04
U.S. Cl. 49—502 21 Claims

1. A door for a vehicle, the door comprising an outer wall, an inner wall disposed at a distance from the outer wall, at least one of said outer wall and inner wall consisting essentially of a synthetic resin material, a rigidifying reinforcing means embedded in the outer wall and connected with at least one of a hinge means and hinge support means and at least one of a door lock means and a door lock support means, an impact protection strut means extending substantially horizontally of the door and connected to the door lock support means and hinge means, the rigidifying reinforcing means is formed as a closed frame corresponding to a contour of the door, said closed frame is embedded in the synthetic resin material and enveloped thereby, and the impact protection strut means is in direct



contact with an outer periphery of the outer wall for transmitting static or dynamic forces acting on the outer wall directly into the vehicle body.

4,860,497

DRILL GRINDER HAVING DRILL HOLDER INCLUDING CHUCKS FOR GRIPPING SHANK AND BODY OF THE DRILL

Seiji Ohya, Ichinomiya, and Tetsuro Harada, Konan, both of Japan, assignors to Toyo Machinery Co., Ltd. and OSG Corporation, both of Aichi, Japan

Filed Oct. 7, 1987, Ser. No. 105,223
Claims priority, application Japan, Oct. 8, 1986, 61-239879
Int. Cl.[4] B24B 19/16
U.S. Cl. 51—98.5 9 Claims



8. A drill grinder for grinding a point of a drill including a shank, and a body which has said point, said drill grinder comprising a holding device for removably holding said drill, and a grinding wheel adapted to be forced on said point and thereby grind said point while said drill is held by said holding device, wherein the improvement comprises:

said holding device including a first chuck for gripping said shank of the drill, and a second chuck for gripping said body of the drill, said first and second chucks engaging each other such that the first and second chucks are rotatable and axially movable relative to each other, said first and second chucks gripping said drill such that the drill is held in a predetermined circumferential position relative to said second chuck;

a holder device for removably holding said holding device during a grinding operation on said point of the drill by said grinding wheel;

rotary support means for supporting said holder mounting device rotatably about an axis thereof;

an operating member for rotating said holder mounting device and consequently said holding device holding said drill;

a pair of parallel guide rods which are inclined relative to the axis of said holder mounting device and which slidably support said rotary support means; and

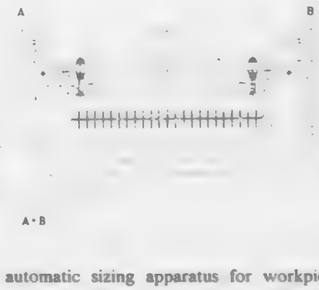
a cam mechanism which includes a stationary cam, and a cam follower which is secured to said holder mounting device and engageable with said stationary cam to move said rotary support means along said guide rods, when said holder mounting device is rotated by said operating member, whereby a rotary movement of said holder mounting device causes said drill, held by said holding device mounted on said holder mounting device, to be moved in a radial direction thereof away from said grinding wheel, and in an axial direction thereof toward said grinding wheel.

4,860,498

AUTOMATIC WORKPIECE THICKNESS CONTROL FOR DUAL LAPPING MACHINES

Anatoly Gosis, Palatine, Ill., assignor to General Signal Corp., Stamford, Conn.

Filed Aug. 15, 1988, Ser. No. 231,969
Int. Cl.[4] B24B 49/00
U.S. Cl. 51—165.77 15 Claims



1. An automatic sizing apparatus for workpieces being lapped by a machine having rotatable upper and lower lap plates comprising,

(a) a responsive workpiece sizing means attached to the upper lap plate for rotation therewith,

(b) means for adjustably connecting said responsive workpiece sizing means concentrically of and in parallelism to the upper lap plate,

(c) a workpiece sizing assembly including means for continuously indicating the thickness of the workpiece during the lapping operation,

(d) means for adjustably supporting said workpiece sizing assembly circumferentially of and in radial relation to said responsive workpiece sizing means,

(e) said workpiece sizing assembly including a pivotal lever, one end of which supports a means in contact with said responsive workpiece sizing means with its opposite end adapted to engage and actuate a sensing probe,

(f) a sensing probe carried in a fixed position relative to said lever and including a moveable element in contact with and moveable in response to any pivotal movement of said lever, and

(g) means for pivotally connecting said lever to said workpiece sizing assembly.

4,860,499

APPARATUS FOR MEASURING GRINDING FORCES ON CERAMIC PARTS

Bruce R. Dinger, Davison; Mark R. McClanahan, Clio; David B. Quinn, Grand Blanc, and Frederick Kennard, Holly, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 10, 1988, Ser. No. 204,832
Int. Cl.[4] B24B *5/32*
U.S. Cl. 51—165.74 6 Claims



1. An apparatus for grinding a ceramic part and measuring grinding force on the part comprising;

a spindle for holding the part for rotation,

means for imposing grinding forces on the part comprising a control means and a grinding wheel,

the control means for engaging the part to impart rotation to the part,

the grinding wheel for engaging the part in opposition to the control means such that forces imparted by the grinding wheel and the control means to the part interact and resultant components are transferred to the spindle and to the control means, and

a transducer on said spindle for measuring at least one grinding force equipment.

4,860,500

PASSIVE ACTUATOR TO MAINTAIN A CONSTANT NORMAL CUTTING FORCE DURING ROBOTIC DEBURRING

Robert A. Thompson, Quaker Street, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 27, 1987, Ser. No. 90,176
Int. Cl.[4] B24B *41/00*
U.S. Cl. 51—165.77 15 Claims

3. A robotic device comprising:

a metal removal tool for removing metal from a workpiece by frictional engagement therewith;

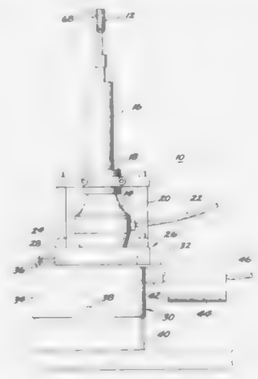
a motor operably connected to rotate said metal removal tool;

a slide having a moving portion and a fixed portion, said motor and said metal removal tool being secured to said moving portion of said slide, said fixed portion adapted to be securable to a robot arm;

an air cylinder with a piston disposed for movement between limits of travel therein, said air cylinder and piston connected as a passive driver to said moving portion of said slide and adapted to position said moving portion of said slide relative to said fixed portion of said slide; and

an accumulator communicating with said air cylinder, said accumulator having at least 10 times the displaced volume of said air cylinder such that air pressure in said air cylinder is substantially independent of the movement of said piston relative to said air cylinder;

wherein said robotic device is operable to maintain said metal removal tool against the workpiece with a substantially constant force independent of variations of the relative positions of



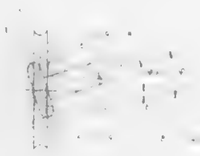
the workpiece and robot arm within a range corresponding to movement of said piston between said limits of travel.

4,860,501

METHOD OF AND MACHINE FOR GRINDING INTERNAL THREADS

Heinz Belthle, Aichwald, Fed. Rep. of Germany, assignor to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 8, 1987, Ser. No. 71,156
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1986, 3624472
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—288 3 Claims



1. A method of grinding an internal thread having a predetermined lead angle, especially a ball thread, in a rotary workpiece by means of a grinding wheel which is mounted on a rotary grinding spindle, comprising the steps of introducing the grinding wheel into the workpiece and maintaining the axes of the grinding spindle and the workpiece at a predetermined grinding angle smaller than the lead angle; and thereupon dressing the grinding wheel including correcting the profile of the grinding wheel, said correcting step comprising contacting the grinding wheel with a rotary diamond profiling tool including maintaining the axes of the profiling tool and grinding wheel at a predetermined dressing angle greater than the lead angle of the internal thread.

4,860,502

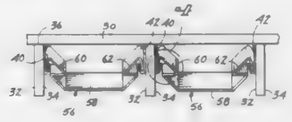
DECK GUTTER SYSTEM

Michael M. Mickelsen, N. 13818 Karen La., Spokane, Wash. 99208

Filed Dec. 2, 1987, Ser. No. 127,635
Int. Cl.[4] E04D *13/00*
U.S. Cl. 52—11 9 Claims

1. A deck gutter for mounting between two adjacent wooden deck joists of a wooden deck for receiving and directing water that passes through a wooden deck material away from any area below the wooden deck, comprising:

an elongated sheet metal body having an elongated central portion and a first side wall portion extending upward from the central portion terminating in a first flange for attaching to a side surface of one joist and a second side portion extending upward from the central portion terminating in a second flange for attaching to a side surface of the adjacent joist;



at least one of the side wall sections having a longitudinal expansion bend formed therein to enable the deck gutter to expand or contract transversely to accommodate spacing variations between adjacent joists and to accommodate bows in either of the adjacent joists; and

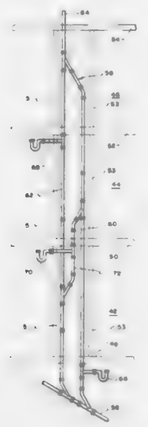
at least one of the side wall sections has an inward bend acting as a gripping means intermediate the central portion and the flange for enabling an installer to grip and install the deck gutter from beneath the joist by pulling downward to attach the flanges.

4,860,503

PLUMBING APPARATUS

Winston H. Palmer, #5 Latitude Ct., Newport Beach, Calif. 92663

Continuation-in-part of Ser. No. 64,404, Jun. 22, 1987, abandoned. This application May 2, 1988, Ser. No. 188,899
Int. Cl.[4] A47K *3/16*
U.S. Cl. 52—35 3 Claims



1. In combination with a building structure having a plurality of stories located in a vertically stacked arrangement, said building structure having a base floor at its lowest level and a roof at its highest level, said building structure having walls, each said wall being formed of a series of spaced apart studs, a discharge sewer line located directly adjacent said base floor, a waste water plumbing apparatus extending between said stories and generally disposed in a vertically oriented manner, said waste water plumbing apparatus being located between a single pair of directly adjacent said studs, said waste water plumbing apparatus to be prefabricated at a manufacturing facility and then transported to be used at the job site, said waste water plumbing apparatus being standardized with the exact waste water plumbing apparatus to be usable at a plurality of job sites, said discharge sewer line being located substantially horizontal and is adapted to connect with a plurality of said waste water plumbing apparatuses, said waste water plumbing apparatus comprising:

a vent pipe, one end of said vent pipe being connected to said discharge sewer line, the opposite end of said vent pipe being located directly adjacent said roof, said opposite end being open to the ambient;

a first water supply pipe connected by first attaching means to said vent pipe, said first water supply pipe located in juxtaposition with said vent pipe, said first water supply pipe being substantially similar in length to said vent pipe;

a waste pipe, said waste pipe terminating in an upper end and a lower end, said lower end connecting with said discharge sewer line, said upper end connecting with said vent pipe directly adjacent to said roof, said waste pipe being in close proximity with said vent pipe;

a second water supply pipe connected by second attaching means to said waste pipe, said second water supply pipe located in juxtaposition with said waste pipe, said second water supply pipe being substantially similar in length to said waste pipe, said second water supply pipe being identical to said first water supply pipe;

a first waste receiving drain adapted to connect with a waste depositing receptacle, said first waste receiving drain connecting directly with said vent pipe with said first waste receiving drain being the only said drain connected directly to said vent pipe; and

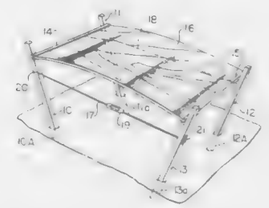
a second waste receiving drain connecting directly with said waste pipe, said second waste receiving drain adapted to connect with a waste depositing receptacle with said second waste receiving drain being the only said drain connected directly to said waste pipe, whereby waste material deposited within either said waste pipe or said vent pipe is conducted directly into said discharge sewer line so that any clogging of said waste pipe will not interfere with the normal operation of said vent pipe and vice versa.

4,860,504

STRESSED STRUCTURE SHELTER

Albert B. R. Lawrence, 23 Davidson Drive, Ottawa, Ontario, Canada

Filed Apr. 14, 1988, Ser. No. 181,418
Int. Cl.[4] E04B *1/32*
U.S. Cl. 52—86 9 Claims



1. A shelter comprising:

(A) at least four spaced apart posts supported at their lower end and having an opposite upper end at a higher elevation;

(B) a roof covering the area of the shelter and comprising an elastic bendable rectangular panel having a pair of respective opposite ends, two of said posts being located at one of said opposite ends of said panel and another two of said

posts being located at the other of said opposite ends of said panel;

(C) means connecting said roof panel to said posts adjacent their upper ends for support thereby, said roof panel being stressed into a curved form bowing upwardly between said opposed opposite ends thereof, said means connecting said roof panel to said posts comprising a pair of elongate channel members located one at each of said respective opposite ends of said panel, said channels extending from one post to the other at said respective opposite ends of said roof panel and having an end portion of the roof panel projecting thereinto; and

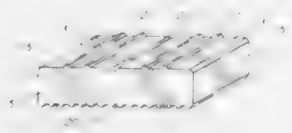
(D) tension members anchored at their opposite ends to said posts at opposite ends of said roof panel and tensioned forcibly retaining said roof panel in said curved form.

4,860,505

CONSTRUCTION BLOCK

David C. Bender, 39 Manitou Drive, Kitchener, Ontario, Canada

Filed May 26, 1988, Ser. No. 198,839
Int. Cl.[4] E04C *1/10*
U.S. Cl. 52—98 **10 Claims**



1. A construction block for interacting with other like blocks comprising:

a body substantially in the shape of a rectangular parallelepiped having a front face, a rear face, a top face, a bottom face and a pair of side faces;

a plurality of substantially identical parallel transverse grooves only in said bottom face and extending thereacross from one side face to the other;

said grooves being of constant cross-section and being spaced apart evenly between the front face and the rear face; and

at least two substantially identical ridges only on said top face, each said ridge being parallel with and in vertical alignment with one of said grooves, and receivable within a groove of a like block, there being fewer ridges than grooves, and the outermost of said ridges being set back from said front and rear faces at least a distance equal to that between said faces and the second closest groove.

4,860,506

FLOOR PANEL FOR FLOATING FLOOR

Satoshi Yoshimi, and Youichiro Koga, both of Osaka, Japan, assignors to Daiken Trade & Industry Co., Ltd., Toyama, Japan

Filed Mar. 4, 1988, Ser. No. 163,986
Claims priority, application Japan, Mar. 6, 1987. 62-51438
Int. Cl.[4] E04B *1/82*
U.S. Cl. 52—144 **4 Claims**



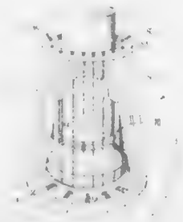
1. A floor panel for a floating floor, said floating floor having a plurality of said floor panels elastically supported by buffer members laid on a floor slab, said floor panel comprising a hollow panel and plural supporting means mounted on said hollow panel, said hollow panel having upper and lower face panels spaced by sash bars arranged between them at proper intervals to form elongated cavities, each of said cavities being opened at opposite ends, said upper and lower face panels being provided with a plurality of through holes distributed uniformly over the face panel, said holes of said upper face panel being respectively aligned with those of the lower face panel and each having an upper opening diameter ranging from 5 to 20 milimeters, a ratio of whole upper opening area of said holes to an upper surface area of said floor panel being within the range of 0.1 to 20%, said supporting means being mounted on said lower face panel at proper intervals to form space between said floor panel and buffer members when said floor panel is arranged on said buffer members.

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STRUCTURE STABILIZATION SYSTEM

Federico Garza-Tamez, Rio Tamesi 305 Col. Mex., Monterrey N.L., Mexico

Filed Jul. 15, 1988, Ser. No. 219,568
Int. Cl.[4] E02D *27/34*
U.S. Cl. 52—167 **34 Claims**



1. A structure stabilization system for protecting a structure from effects of seismic disturbances, the structure having at least a first floor and plural vertical support columns supporting the weight of the structure and its contents, each vertical support column having upper and lower ends and being attached to the structure with the lower ends extending below the first floor, and an associated foundation formed in the earth, comprising:

a base isolation system comprising plural bases anchored to the foundation and respectively corresponding to the plural vertical support columns, each base being connected to the lower end of a corresponding vertical support column and supporting same in suspension while affording limited, relative movement therebetween to limit the transmission to the structure of movement of the earth and foundation resultant from a seismic disturbance;

a releasable interlock subsystem comprising a single interlock mechanism anchored to the foundation and normally interlocked with the structure at a single, central interlock position thereby to inhibit horizontal translational movement of the structure relative to the foundation and an automatic release mechanism automatically operative, in response to forces exceeding a predetermined level attending to produce relative linear displacement of the structure and the associated foundation as a result of movement of the earth and the foundation during a seismic disturbances, to release the interlock mechanism thereby to permit relative displacement of the structure and its foundation; and

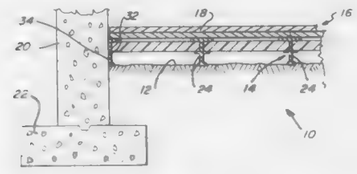
a damping subsystem comprising plural dampers connected at predetermined positions between the structure and the foundation and arranged as orthogonally related pairs of oppositely disposed dampers, relative to the center of gravity of the structure, the associated dampers of each pair being hydraulically interconnected and respectively, mechanically connected between the structure and its associated foundation in inverse relationship thereby to impede rotation of the structure relatively to the foundation and permit only damped relative lateral displacement therebetween.

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FLOORING SYSTEM AND METHOD FOR CONSTRUCTING SAME

Thomas L. A. Jackson, 592 S. Victor Way, Aurora, Colo. 80012, and James L. Hamit, 3800 S. Ogden, Englewood, Colo. 80110

Filed Jan. 24, 1989, Ser. No. 301,809
Int. Cl.[4] E02D *27/42*
U.S. Cl. 52—169.1 **8 Claims**



1. A flooring system for placement on an earth surface comprising in combination:

a substructure formed by joining together a plurality of longitudinally-extending I-beams having an upper flange, a bottom flange and an integrally-connecting web, said I-beams transversely connected by longitudinally extending blocks connected to the web and upper flange of said I-beams by glue, the bottom flange of said I-beams setting on the earth surface;

a floor structure connected to the upper flange of said I-beams by fastening means; and

a floor connected to said floor structure.

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PHOTOVOLTAIC CELLS IN COMBINATION WITH SINGLE PLY ROOFING MEMBRANES

Heshmat O. Laaly, 9037 Monte Mar Dr., Los Angeles, Calif. 90035, and Edward J. Stevenson, 2970 Avacado Ct., Newbury Park, Calif. 91320

Filed May 18, 1987, Ser. No. 50,966
Int. Cl.[4] E04D *13/18*
U.S. Cl. 52—173 R **7 Claims**



7. A prefabricated multi-functional roofing system formed in elongated flexible sections of substantially uniform thickness constructed for being rolled up in lengths suitable for being transported to a building site for unrolling and for being affixed to a roof structure, comprising:

a roof substrate formed within said roof structure;

means for forming an elongate section of flat, flexible single-ply roofing membrane extending over said roof substrate;

said roofing membrane having a top side for exposure to the elements and being heat reflective and a bottom side for being placed on said roof substrate to form a roof thereon, said membrane having a predetermined softening temperature, and further including a fibrous material for reinforcing said membrane over a wide range of temperatures;

means for forming a plurality of photovoltaic cells distributed in a two dimensional flat array continuously over said membrane, said array having a plurality of transversely extending space channels between adjacent groups of said photovoltaic cells for permitting rolling up and unrolling of said array, each of said space channels including a depression groove formed therein;

electrical circuiting means for interconnecting said photovoltaic cells and for extracting electrical power therefrom, said circuiting means comprising a plurality of bus bars;

means forming a flat flexible thermoplastic pottant layer extending above and below said cells and over the area of said membrane to thereby mount, cover, and adhere said cells and circuiting means over the top side of the membrane in a predetermined pattern and to encapsulate the cells in a structure sufficiently flexible to be rolled up, said pottant layer having a second predetermined softening temperature and having a thermal coefficient of expansion compatible with said roofing system;

a flexible cover layer adhered on top of said roofing membrane, pottant layer, and photovoltaic cells, said cover layer being transparent, tough and weatherproof, and having a softening temperature higher than said pottant layer;

said membrane and said cover layer having predetermined first and second softening temperatures and said pottant layer having a third softening temperature lower than said first and second softening temperatures; and;

said membrane, pottant layer, and cover layer being assembled and joined into a composite structure by heating above the softening temperature of said pottant layer but below the softening temperature of said membrane and said cover layer to thereby fuse and adhere the layers together for forming said roofing system adapted to conform to said roof structure of any shape.

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MODULAR PROTECTIVE SURFACING MEMBER

Daniel Kotler, Sandy, Utah, assignor to Duragrid, Inc., Salt Lake City, Utah

Filed Mar. 14, 1988, Ser. No. 167,708
Int. Cl.[4] E04F *10/00*
U.S. Cl. 52—177 **9 Claims**

1. A modular tile for interlocking with other similar tiles to form a floor or ground covering which provides a cushioned impact object but which allows water to substantially flow thereunder for purposes of draining free from the tile, said tile comprising:

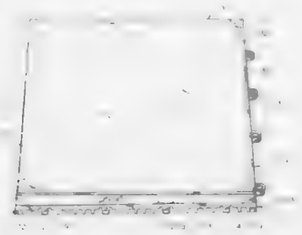
a flat plastic support grid having top and bottom surfaces and including a repeating pattern of intersecting cross members integrally formed with interstitial openings therebetween communicating through the grid, said cross members being integrally joined at cross junctions;

a plurality of resilient support legs of common length integrally coupled to a base side of the cross junctions in general perpendicular orientation with respect to the support grid;

means coupled around the perimeter of the support grid for

joining the grid at each edge to additional grids in interlocking manner;

a foamed, closed-cell resilient, cushion plate having top and bottom surfaces and width dimensions substantially the



same as those of the support grid, said top surface being adapted for foot traffic, said bottom surface being adapted for attachment at the top surface of the support grid; and means for integral attachment of the cushion plate at the top surface of the support grid.

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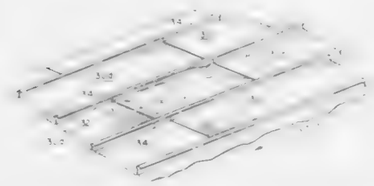
STANDING SEAM ROOF SKYLIGHT SYSTEMS

Kent A. Weisner, Maitland, and Lester L. Walls, Jr., Deltona, both of Fla., assignors to Kenergy Enterprises Limited Partnership, Wausau, Wis.

Continuation-in-part of Ser. No. 700,106, Feb. 11, 1985, Pat. No. 4,649,680. This application Oct. 16, 1986, Ser. No. 920,254

Int. Cl.[4] E04B *7/18*

U.S. Cl. 52—200 **10 Claims**



1. A skylight molded from sheet plastic for installation in a roof formed from a plurality of metal roof panels, each of said metal panels having a pair of upstanding edges with the top edges thereof folded inwardly with means for joining such edges with adjacent abutting upstanding edges comprising:

an essentially rectangular first sheet of plastic having a pair of longitudinal edges thereof folded upwardly to form an angle with said sheet of plastic, each of said upwardly folded edges having a top edge thereof folded inwardly to match said upstanding seam edges of said metal roof panels in which said folded up edges are spaced apart a distance slightly less than the spacing of said upstanding seam edges of said metal standing seam roof panels at one end of said sheet of plastic and spaced apart a distance slightly greater than the spacing of said standing seam edges of said metal standing seam roof panels at the other end thereof, said first sheet of plastic having a pair of lateral edges thereof forming a first lateral self flashing flange at said one end of said sheet of plastic for overlapping a first of said metal roof panels, and a second lateral self flange at said other end of said sheet of plastic for underlapping a second of said metal roof panels; and

a dome formed in and projecting upward from said sheet of plastic.

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COMPRESSION MOLDED DOOR ASSEMBLY

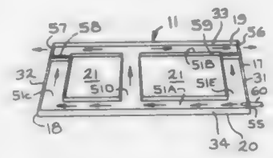
John E. Thorn, Sylvania, Ohio, assignor to Therma-Tru Corp., Toledo, Ohio

Filed Jun. 15, 1988, Ser. No. 207,173

The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.

Int. Cl.[4] E04C *1/00*

U.S. Cl. 52—309.11 **18 Claims**



1. A door assembly comprising in combination first and second compression molded skins, means joining said skins together to form a structure having top and bottom edges and opposed side edges, a chamber formed by said skins, said chamber having at least four passageways defining a rectangle, each of said top, bottom and opposed side edges having a passageway adjacent and parallel thereto, dam means positioned in at least one of said passageways, a flowed-in foam core in said chamber, the positioning of said dam means being such as to enhance the flow of said flowed-in foam core to all portions of said chamber, at least one of said skins having an opening encircled by said passageways, and a compression molded panel having opposed surfaces positioned in said opening.

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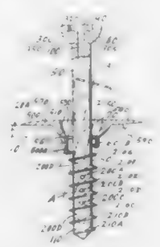
ROOFING FASTENER

Robert E. Whitman, 1-2143 Sherwood La., Swanton, Ohio 43558

Filed Jan. 25, 1988, Ser. No. 147,810

Int. Cl.[4] E04D *13/16*

U.S. Cl. 52—410 **3 Claims**



1. A device for fastening rubber roof sheeting to a roof deck having an upper surface:

(a) a longitudinally extending fastener member with a longitudinally extending shank member, adapted to pierce a roof structure for fastening purposes, said longitudinally extending shank member having an enlarged head member, said enlarged head member having an upper portion and a lower portion, and wherein said lower portion is rounded on its lower surface in a semispherical manner, with receptacle means on the upper portion of said head member to receive fluids, and with venting means for said fluid along extended portions of said longitudinally extended shank member;

(b) disc means having an opening and depression therethrough to receive the longitudinally extending shank member through such opening and wherein said opening is rounded in a semispherical manner to hold the bottom semispherical portion of the head of the fastening member, with the diameter of said opening and depression in the disc means being larger than the diameter of the enlarged head on the longitudinally extending shank member;

(c) circular receiptacle means disposed integrally on the bottom portion of said disc means, said circular receptacle means being concentrically disposed beneath the bottom portion of opening and depression in the disc means, with said circular receptacle having two opposing portions integrally disposed thereon, with such opposing portions being positioned at different vertical heights.

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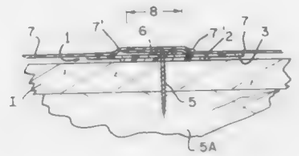
SINGLE PLY ROOF MEMBRANE SECURING SYSTEM AND METHOD OF MAKING AND USING SAME

Thomas L. Kelly, 31 Sands St., Waterbury, Conn.

Continuation of Ser. No. 921,409, Oct. 22, 1986, abandoned. This application May 19, 1988, Ser. No. 196,884

Int. Cl.[4] E04D *5/10*

U.S. Cl. 52—410 **64 Claims**



1. A roof membrane securing unit formed of a relatively rigid washer means and flexible membrane material exhibiting an upwardly facing surface which can be adhered securely to an underside to a flexible roof membrane to hold the roof membrane in position on a roof, wherein said securing unit is formed of a material which is compatible with material forming the flexible roof membrane for purposes of achieving welding of the securing unit to the flexible roof membrane, and wherein the flexible membrane material of said membrane securing unit exhibits varying thickness across its surface area and is formed separately of the roof membrane to be secured thereby, wherein said membrane securing unit includes an opening for accommodating penetration thereof by a roof fastener, and wherein the flexible membrane material of said membrane securing unit is thicker adjacent said opening than adjacent substantial portions of its edges.

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SELF-SUPPORTING CONCRETE FORM

Bruce E. Browning, Jr., P.O. Box 56, Carrboro, N.C. 27510

Filed May 26, 1987, Ser. No. 54,430

Int. Cl.[4] E04B *2/40*

U.S. Cl. 52—426 **6 Claims**

1. A self-supporting form for use in construction with cementitious materials, said form comprising:

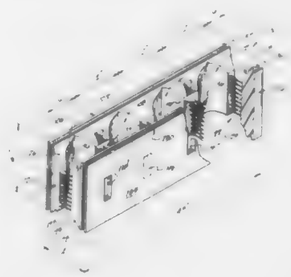
a generally regularly-shaped body of insulating material, said body including at least two opposing sidewalls each having exterior and interior sides with respect to said body, and said sidewalls mutually defining at least one cavity therebetween adapted for the receipt of cementitious materials; and

securement means, operatively associated with said cavity and at least one of said sidewalls, adapted for enabling securement of cladding materials to the exterior side of said least one sidewall with said securement being anchored in cementitious materials received in said cavity, whereby a desired finishing surface of selected cladding materials may be securely applied to a construction formed with a plurality of said forms and reinforced with cementitious materials received in the cavities thereof; and wherein

said insulating material comprises resilient low-density foamed material;

said securement means includes a member comprising relatively rigid material extending through said at least one sidewall and into said cavity so as to be embedded in said cavity when cementitious materials are poured and cured therein;

said at least one sidewall defines an opening therein interconnecting the exterior side thereof with said body cavity; and



said rigid material member includes a folded metal plate at least partially received in said opening, and having at least one pivotable wing member adapted for selective positioning from an initial to a final position thereof, said pivotable member being positioned adjacent the interior side of said at least one sidewall to facilitate placement and retention of said rigid material member in said form, and intended to be subsequently pivoted to a final position which is projecting into said cavity during pouring of cementitious materials therein so as to become anchored in said cavity by curing of such materials.

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PORTABLE CUSHIONED FLOOR SYSTEM

Gregory V. Koller, 1633A N. 24th St., Milwaukee, Wis. 53205, and Harold A. Koller, R.R. #2, Box 83, Osceola, Wis. 54020

Filed Jan. 15, 1988, Ser. No. 144,509

Int. Cl.[4] E04B *5/52*

U.S. Cl. 52—480 **13 Claims**



1. A portable cushioned floor module comprising:

(a) rigid upper plate means including a hardwood floor surface;

(b) lower plate means substantially coextensive with and disposed in parallel spaced relation to the upper plate means for rigidly supporting the module directly on a base surface;

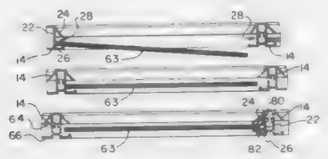
(c) flexible resilient cushioning means disposed between and in abutting relation to the opposed surfaces of the plate;
(d) said cushioning means being substantially uniformly distributed across the opposed surface areas of the plate means;
(e) fastening means interconnecting the upper plate means and the lower plate means to prevent relative horizontal movement between said plate means; and,
(f) said fastening means further adapted to allow vertical downward movement of the upper plate means in response to vertical compression of the cushioning means under live floor load.

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FRAMEWORK STRUCTURE FOR WINDOWS AND DOORS

Stanley Kiproos, Durban, South Africa, assignor to Hulett Aluminium Limited, Pietermaritzburg, South Africa

Filed Apr. 27, 1988, Ser. No. 186,600
Claims priority, application South Africa, Jul. 24, 1987, 87/5465
Int. Cl.[4] E06B *3/68*
U.S. Cl. 52—656 **25 Claims**



1. A rectangular framework structure for a door or window, comprising:
four primary framework elements forming the outer perimeter of the rectangular framework structure;
a plurality of secondary framework elements extending between two opposing primary framework elements;
a plurality of auxiliary framework elements located perpendicularly between the secondary elements and parallel adjacent primary elements, spacing apart these elements; and
a plurality of tie-rods holding together the framework elements, bracing them into a rigid substantially planar structure,
the framework elements all defining an operative front wall, a rear wall, at least one side wall extending between the front wall and the rear wall and an elongate angularly disposed locating flange extending operatively rearwardly from a location near the front wall on the sides of the framework elements that oppose other framework elements in their operative configuration, the angle of the angular locating flange to the plane of adjacent sidewalls of the framework elements being between about 30° to about 60° and the angular locating flanges of the primary and secondary elements being cut away to receive and frictionally locate the auxiliary elements in their required configuration.

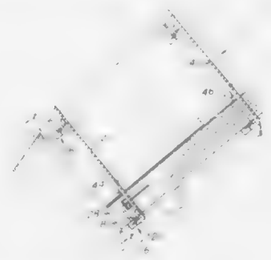
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FIXTURE AND METHOD OF LAYING SHINGLES ON THE SURFACE OF A ROOF OR VERTICAL WALL

James R. Kingham, 226 Rutgers Ave., Swartmore, Pa. 19081

Continuation-in-part of Ser. No. 81,770, Aug. 14, 1987, abandoned. This application Apr. 13, 1988, Ser. No. 183,386
Int. Cl.[4] E04D *15/02*
U.S. Cl. 52—748 **33 Claims**

1. Fixture for use in laying shingles on the surface of a roof or vertical wall, comprising a pair of rails, each provided with discrete openings at predetermined spaced locations therealong,
means for supporting each of said rails such that said rails are spaced from said surface,
a shingle support member, and
means for pivotably attaching said shingle support member to said rails at said predetermined spaced locations therealong such that said shingle support member is swingable



at each location from a first position to a second position, the shingle support member providing an abutment surface for supporting the bottom edge of a row shingles to laid when in said first position and the shingle support member clearing the shingles when in said second position, such that the shingle support member is displaceable along the surface in predetermined increments corresponding to the spacing between said predetermined rail locations.

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MACHINE FOR THE AUTOMATIC PACKAGING OF CONTAINERS

Didier Lemaire, Cherisy, and Jean-Marc Dronet, Putanges Pont Ecrepin, both of France, assignors to E.P. Remy & Cie, France

Filed Apr. 29, 1988, Ser. No. 188,359
Claims priority, application France, May 12, 1987, 87 06661
Int. Cl.[4] B65B *59/04*
U.S. Cl. 53—167 **2 Claims**



1. A machine for the automatic packaging of containers such as goblets, comprising:
at least one conveyor for transporting said containers;
various stations successfully disposed above said conveyor for at least depositing said containers on the conveyor, filing, obturating and evacuating said containers respectively and successively;
successive modular frames crossed by said conveyor and each supporting one of said successive stations;
openings provided in each modular frame and cylindrical elements inserted into the openings of two successive and juxtaposed modular frames for centering said frames with respect to one another;
apertures provided in each modular frame for allowing said successive modular frames to be interconnected by bolt fastening with one another;
control means associated to and housed in each modular frame for permitting the station supported thereby to work in an autonomous and separate way;
one multiprocessor solid with one of said modular frames and operatively connected to said control means;
lateral door means provided on each said modular frame for providing an access to said control means; and
rail means mounted on at least one of said modular frames for slidingly supporting said control means,
whereby said control means can be mounted into and extracted from said modular frames through said door means.

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SYSTEM FOR CONTROLLING THE MOVEMENT OF FILLED AND SEALED CONTAINERS

Larry M. Dugan, Boulder, Colo., assignor to Adolph Coors Company, Golden, Colo.

Continuation of Ser. No. 33,335, Mar. 31, 1987, abandoned. This application Jul. 11, 1988, Ser. No. 217,377
Int. Cl.[4] B65B *7/28*
U.S. Cl. 53—287 **20 Claims**



1. A system for controlling the movement of filled and sealed beverage containers from a sealing operation to a liquid level testing apparatus so that the desired elapsed time for movement of each filled and sealed container therebetween may be set to a desired period of time and maintained substantially constant at the desired period of time comprising:
container sealing apparatus mounted at a fixed location;
moving endless conveyor means mounted at a location near said container sealing apparatus for receiving, supporting and conveying filled and sealed containers away from said container sealing apparatus, each of said containers having substantially the same maximum diameter;
rotatable star wheel means for transferring filled and sealed containers from said container sealing apparatus to said moving endless conveyor means;
drive means for rotating said rotatable star wheel means;
said moving endless conveyor means having a width slightly greater than twice the diameter of each container;
said moving endless conveyor means having a first half width portion and a second half width portion, each of said first and second half width portions moving at substantially the same linear velocity;
said rotating star wheel means transferring filled and sealed containers onto said moving endless conveyor means so that all of said transferred filled and sealed containers are located on said first half width portion;
container pushing means for contacting every other filled and sealed container on said first half width portion and pushing said every other filled and sealed container from said first half portion to said second half width portion of said moving endless conveyor means;
first and a second moving fill test conveyor means, each of said first and second moving fill test conveyor means moving at substantially the same linear velocity;
container transfer means for transferring said filled and sealed containers on said first half width portion to said first moving fill test conveyor means and for transferring said filled and sealed containers on said second half width portion to said second moving fill test conveyor means;
said first and second half width portions cooperating with said container transfer means so that each container transferred by said star wheel means to said endless moving conveyor means and moving with said first half width portion to said container transfer means is transferred onto said first moving fill test conveyor means by said container transfer means in a period of time which is substantially the same as the period of time that each container transferred onto said endless moving conveyor and moving with said second half portion is transferred onto said second moving fill test conveyor means by said container transfer means;
a first and a second liquid level testing apparatus;
said first moving fill test conveyor means feeding said filled and sealed containers thereon into said first liquid level testing apparatus and said second moving fill test conveyor means feeding said filled and sealed containers thereon into said second liquid level test apparatus; and
said first and second moving fill test conveyor means cooperating with said container transfer means so that each container transferred to said first moving fill test conveyor means by said container transfer means moves with said first moving fill test conveyor means and passes through said first liquid level testing apparatus in a period of time which is substantially the same as the period of time that each container transferred onto said second moving fill test conveyor means by said container transfer means moves with said second moving fill test conveyor means and passes through said second liquid level testing apparatus.

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METHOD OF PACKING SMALL COMPONENTS

Hans-Werner Rüter, Klein Nordende, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 83,545, Aug. 6, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 298,191
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626976
Int. Cl.[4] B65B *15/04*
U.S. Cl. 53—397 **6 Claims**



1. A method of packing small components on a packing body having a multi-layer structure comprising an elastic thermo-plastically deformable carrier layer fixedly connected to a relatively non-deformable layer forming a base plate, said method comprising heating said carrier layer between a temperature in the range of 70° to 180° C., placing a small component on said carrier layer and applying pressure to said small component to press it into said heated carrier layer toward said base plate which forms a compartment in said carrier layer which compartment corresponds to the shape of said small component, said carrier layer possessing the specific property that when said pressure is applied in a prescribed manner the bottom of said compartment immediately adjacent said base

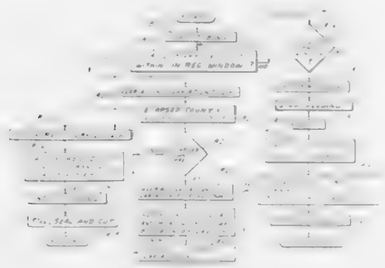
plate remains substantially undeformed during the formation of said compartment in said carrier layer.

4,860,522

FORM, FILL AND SEAL REGISTRATION SYSTEM APPARATUS AND METHOD INCLUDING VARIABLE LENGTH COMPENSATION AND OUT OF REGISTRATION RESTORATION

Dale M. Cherney, Howards Grove, Wis., assignor to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Jun. 20, 1988, Ser. No. 208,687
Int. Cl.[4] B65B *57/04, 9/08, 9/20*
U.S. Cl. 53—451 76 Claims



1. In an apparatus for sealing packages wherein a web of flexible packaging material having a series of registration marks is formed into tubing and fed past sealing means for sealing the tubing to form packages, an improved control system comprising:

means for feeding the tubing past the sealing means;

sensor means for detecting the registration marks;

means, responsive to the sensor means, for comparing the location of registration marks relative to a window;

delay means, responsive to the comparing means, for setting a delay length of tubing to be fed past the sealing means in response to the relative location of the registration marks and the window;

means for stopping the feeding of the tubing after said delay length of tubing has passed the sealing means.

4,860,523

HERMETIC PACKAGING APPARATUS

Iwao Teteishi, Nara; Yoshiyuki Ogura; Takeshi Hashimoto, both of Osaka; Tuguyoshi Ritou, Nara; Katsufumi Kajiyama, Osaka; Fumiaki Shimizu, Nara; Kenji Tanaka, Osaka; Yutaka Aibara, Osaka; Hiroaki Kataoka, Osaka; Katsuya Nakai, Osaka; Takashi Yoshikawa, Osaka; Masaaki Kanamori, Nagano; Masao Miyajima, Nagano; Shuzo Seki, Nagano, and Sadanobu Takahashi, Nagano, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka and Nihon Dennetsu Co., Ltd., Tokyo, both of, Japan

Filed Oct. 30, 1987, Ser. No. 114,603
Claims priority, application Japan, Oct. 31, 1986, 61-261076; Dec. 19, 1986, 61-304931; Dec. 22, 1986, 61-306124; Dec. 22, 1986, 61-306125
Int. Cl.[4] B65B *31/06, 67/00*
U.S. Cl. 53—512 17 Claims

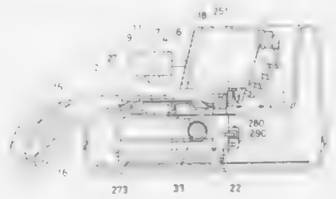
1. A hermetic packaging apparatus in which an opening portion of a thermoplastic packaging bag containing contents is heat-sealed, comprising:

a nozzle for at least one of reducing, increasing and maintaining pressure within said packaging bag;

pressure control means connected to said nozzle for controlling pressure within said packaging bag to control at least one of reducing the pressure, increasing the pressure and keeping a prescribed gas pressure in said packaging bag;

heat-sealing means for applying heat to the opening portion of said packaging bag with one of the pressure reduced, the pressure incrreased and the pressure kept at a prescribed gas pressure for heat-sealing;

a metal base on which said nozzle, said pressure control means and said heating means are attached;



a resin cover covering at least said pressure control means and constituting an outer casing; and

waste water storage means for storing liquid sucked from the contents of said packaging bag when the pressure in said packaging bag is reduced by said nozzle.

4,860,524

RIDING SADDLE AND METHOD OF MANUFACTURE

Patrick Dumoulin, Bourron-Marlotte, and Hugues Recalt, Villenave D'Ornon, both of France, assignors to Anciens Etablissements Warin Fils BWF, Evry, France

Filed Sep. 9, 1987, Ser. No. 94,424
Claims priority, application France, Sep. 12, 1986, 86 12809
Int. Cl.[4] B68C *1/02*
U.S. Cl. 54—44 16 Claims



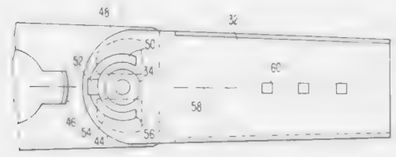
2. A riding saddle having a tree including a rigid arch which is mounted between two thicknesses of flexible plastic material, one of which constitutes the seat of the saddle and the other of which constitutes the underside of the saddle and includes saddle flaps, said tree being formed in one piece by a thin strip of composite material which is rigid and substantially undeformable over the major portion of the tree, in particular at the arch, and which has controlled flexibility in predetermined zones in order to adapt to the morphology of a horse, and wherein the tree is constituted by superposing layers of fibers which are assembled and bonded together by a polymerizable resin including layers of glass fiber cloth, and layers of carbon fiber cloth, and wherein the flexible zones of the tree are defined, relative to the rigid zones to which they are connected, by reducing the number of layers of base fiber, optionally by giving a particular orientation to the base fibers, and by omitting the reinforcing fibers.

4,860,525

ROTARY CUTTING MACHINES AND COMPONENTS THEREFOR

Seck W. Chee, 25 Jalan Unggas, Singapore, Singapore

Division of Ser. No. 802,191, Nov. 25, 1985, Pat. No. 4,736,573. This application Jan. 26, 1988, Ser. No. 148,551
Claims priority, application United Kingdom, Nov. 28, 1984, 8429954; Jun. 11, 1985, 8514667; Jul. 3, 1985, 8516793
Int. Cl.[4] A01D *34/73*
U.S. Cl. 56—12.7 8 Claims



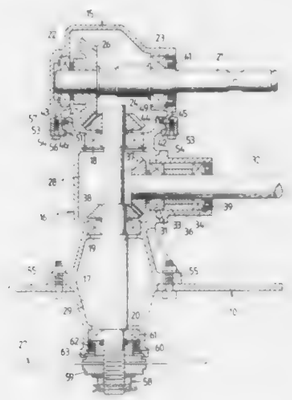
1. A cutter blade assembly for a rotary cutting machine comprising a cutter head rotatable about an axis, a cutter blade having a cutting surface, a pivotal mounting for the cutter blade on the cutter head, the pivotal mounting being positioned so the cutting surface of the cutter blade can be pivotal outwards clear of the cutter head under centrifugal force during orbiting of the blade with the head, and retention means for the cutter blade operatively engageable with a slot, the slot having a pair of opposed ends joined by side edges the retention means being operatively disengaged during said orbiting from said opposed ends and side edges until loss of said pivotal mounting the retention means being an upstanding projection engageable upon said loss of the pivotal mounting with a side edge of the slot, the cutter head including one of the projection and slot and the cutter blade including the other of the projection and slot.

4,860,526

ANGLE DRIVE ASSEMBLY FOR ROTARY CUTTERS

Ronald W. Hottes, Selma, Ala., assignor to Allied Products Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 870,648, Apr. 29, 1986, abandoned, which is a continuation of Ser. No. 585,576, Mar. 3, 1984, abandoned. This application Dec. 15, 1987, Ser. No. 133,189
Int. Cl.[4] A01D *34/66*
U.S. Cl. 56—13.6 18 Claims



1. A rotary cutter device for being pulled behind a towing vehicle having a power take-off, said towing vehicle being movable in a towing direction, said rotary cutter device including a translatable frame, a drive assembly mounted to said translatable frame, and an intermediate shaft drivingly joining said drive assembly with said towing vehicle power take-off, said drive assembly being an angle drive assembly including a primary drive unit comprising:

(a) a basic housing having an output shaft generally vertically mounted for rotation therein,

(b) a cap housing coupled in rotatable relationship with said basic housing and having an input shaft generally horizontally mounted for rotation therein and operatively connected to said output shaft at one end, and said input shaft is operatively connected to said intermediate shaft at the other end through one angle drive means for driving said input shaft with said intermediate shaft through a range of generally horizontal subtended angles,

(c) another angle drive means for driving said intermediate shaft with said power take-off through a range of generally horizontal subtended angles,

(d) a transmission shaft in driven engagement with said output shaft,

(e) coupling means for rotatably joining said cap housing onto said basic housing and for selectively orienting the input shaft with respect to the transmission shaft through a plurality of different angular relationships upon rotation of said generally horizontal input shaft with respect to said generally vertical output shaft,

(f) means for operatively connecting the input shaft to the output shaft and for maintaining this operative connection when the input shaft is selectively oriented with respect to the output shaft, and

(g) a rotary cutter unit in operative interengagement with an end of said output shaft, said rotary cutter unit having a blade below said translatable frame;

said drive assembly further includes a secondary drive unit supported by said translatable frame and driven by through said transmission shaft, said secondary drive unit having a rotary cutter blade below said translatable frame, and said secondary drive unit is generally beside said primary drive unit; and

said coupling means and said operative connection means cooperate to permit movement of said translatable frame and said primary drive unit and secondary drive unit supported thereby, said movement being in a direction generally transverse to the towing direction, and said movement including angular movement of said one angle drive means to a selected one of said generally horizontal subtended angles, said movement further including substantially simultaneous angular movement of said another angle drive means to one of its said generally horizontal subtended angles which is substantially equal to said selected one of the substantially horizontal subtended angles of the one angle drive means.

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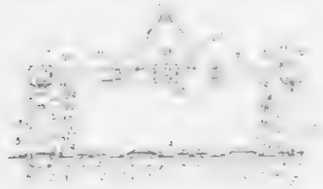
MOWING MACHINE

Koorn Maarten, JC Vlaardingen, Netherlands, assignor to C. van der Lely, N.V., Maasland, Netherlands

Filed Nov. 12, 1987, Ser. No. 119,709
Claims priority, application Netherlands, Nov. 12, 1986, 8602865
Int. Cl.[4] A01D *34/66, 69/06*
U.S. Cl. 56—13.6 21 Claims

1. A closed drive mowing machine, comprising: at least three mower members which are arranged on a supporting beam having accommodated therein drive means for driving said mower members to rotate about substantially vertical axes, said supporting beam, during operation, extending substantially transversely to the direction of operative travel, said drive means being driven from both ends of said supporting

beam by means of mechanically intercoupled secondary drive shafts, wherein said drive means includes a single rotatable



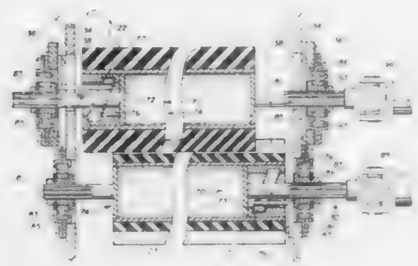
torsion shaft extending through said supporting beam and carrying gear wheels for driving said mower members.

4,860,528

RECIPROCATING CONDITIONING ROLLS

Shaun A. Seymour, New Holland, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.

Filed Jan. 19, 1989, Ser. No. 299,482
Int. Cl.[4] A01D *43/10, 82/00*
U.S. Cl. 56—16.4 20 Claims



1. In a harvesting machine having a mobile frame adapted for movement over a field to harvest crop material; a conditioning mechanism for conditioning crop material and including a pair of transverse counterrotating conditioning rolls rotatably supported by said frame to condition crop material passing therebetween; a crop gathering header supported by said frame to collect crop material from the field and convey the gathered crop material to said conditioning rolls for passage therebetween; and power means for operatively powering said crop gathering header and said conditioning rolls, an improved conditioning mechanism comprising:

means connected to one of said conditioning rolls to reciprocate said one conditioning roll in a transverse direction relative to the other said conditioning roll during operative rotation thereof.

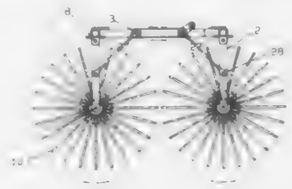
4,860,529

SHAKING MECHANISM FOR FRUIT HARVESTING

Donald L. Peterson, and Tadeusz Kornecki, both of Martinsburg, W. Va., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 8, 1988, Ser. No. 229,877
Int. Cl.[4] A01D *46/00, 46/28*
U.S. Cl. 56—330 7 Claims

2. An improved spiked-drum fruit harvester comprising: a ground-traversing carriage; one or more spiked-drum shakers; means attached to said carriage for supporting and powering said shakers; collecting means supported by said carriage below said shaker designed to collect fruit removed by said shaker; wherein the improvement comprises: adjustable con-



trol means to vary the force required to rotate said spiked-drum shaker.

4,860,530

CORESPUN YARN FRICTION SPINNING APPARATUS AND METHOD

Terry G. Montgomery, Matthews, N.C., and William G. Martin, Fort Mill, S.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Filed Dec. 22, 1988, Ser. No. 288,767
Int. Cl.[4] D01H *1/12;* D02G *3/36*
U.S. Cl. 57—5 7 Claims



1. In a friction spinning apparatus for forming a corespun yarn comprising a pair of adjacent rotatable suction drums defining an elongated throat extending between said suction drums and including entrance and exit ends, a draw frame section including entrance and exit ends and with said exit end being positioned adjacent said entrance end of said elongated throat extending between said suction drums, trumpet means positioned adjacent said entrance end of said draw frame section and including a guiding passageway for guiding a sliver of fibers into said draw frame section, yarn withdrawal means positioned adjacent said exit end of said elongated throat, and roller drawing frame means including entrance and exit ends, said roller drawing frame means being positioned adjacent said elongated throat and being operable to receive slivers of fibers in said entrance end thereof and to feed drawn wrapping fibers into said elongated throat so that said wrapping fibers are wound about the fibers extending along said elongated throat, the combination therewith of means for feeding an additional sliver of fibers to said draw frame section to form a three component corespun yarn, said additional fiber feeding means comprising an additional sliver guiding passageway in said trumpet means and positioned adjacent said first sliver guiding passageway for directing the additional sliver into the central portion of the sliver passing through said first sliver guiding passageway of said trumpet means so that said first and additional slivers pass therethrough and are drafted in said draw frame section with the first sliver surrounding said additional sliver, and wherein the fibers from said roller drawing frame means are wrapped around the first and additional slivers passing through said elongated throat to form the three component corespun yarn.

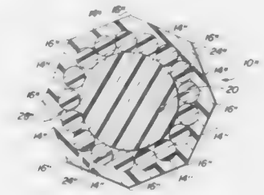
6. A method of forming a three component corespun yarn on a friction spinning apparatus including a pair of adjacent rotatable suction drums defining an elongated throat extending between said suction drums and including entrance and exit ends, a draw frame section including entrance and exit ends and with said exit end being positioned adjacent the entrance end of said elongated throat extending between said suction drums, yarn withdrawal means positioned adjacent said exit end of said elongate throat, and roller drawing frame means including entrance and exit ends, said roller drawing frame means being positioned adjacent said elongate throat and being operable to receive slivers of fibers in said entrance end thereof and to feed drawn wrapper fibers into said elongated throat so that said wrapping fibers are wound about the fibers extending along said elongated throat, said method comprising the steps of feeding a first core roving of fibers to said draw frame section, feeding an additional core wrapper sliver of fibers to said draw frame section, and feeding a plurality of outer sheath wrapper slivers to said roller drawing frame means to wrap the drawn wrapper fibers around the core fibers and the core wrapper fibers passing through said elongated throat to form the three component corespun yarn.

4,860,531

RACQUET STRINGS

D. Phillips Wells, and Stephen R. Phelps, both of P.O. Box 10191, Naples, Fla. 33941

Filed Dec. 16, 1987, Ser. No. 133,756
Int. Cl.[4] D02G *3/34, 3/44;* D02J *1/00*
U.S. Cl. 57—234 10 Claims



1. A synthetic string for a sports racquet, comprising:

an inner core of twisted and glued monofilament strands;

plurality of larger diameter strands helically wound about said inner core; and

a coating of synthetic material surrounding and bonded to said core; said coating providing said string with an outer surface presenting five to eight planes extending circumferentially about said core, the respective junctions of which planes provide projecting parallel, axially extending biting edges peripherally of said string for frictional engagement with a ball or similar playing object to impart topspin and slice effects thereto.

4,860,532

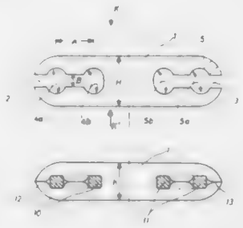
METHOD FOR JOINING TOGETHER TWO SEGMENTS OF A SNOW-CHAIN, AND CONNECTING ELEMENT TO IMPLEMENT THE METHOD

Arthur Milz, Wald, Switzerland, assignor to Milz Produkte AG, Switzerland

Filed Jul. 22, 1988, Ser. No. 222,834
Claims priority, application Switzerland, Jul. 24, 1987, 2827/87
Int. Cl.[4] B21L *13/00*
U.S. Cl. 59—35.1 17 Claims

1. A method of uniting two links, each link being included in a respective segment of a chain, the method comprising:

providing a first link of one chain segment and a second link of a second chain segment, said links of said chain segments having a width and length each of the first and second links comprising a closed loop including two opposite side legs, said opposite side legs having a width and length; providing an elongated connecting element having an elongated slot at each longitudinal end defined by and between opposite sides of the connecting element, each slot being initially open toward the respective longitudinal end of the element defining link entry mouths, each slot



having a width at least as wide as the width of the legs of the link to be received in the slot and a length greater than the width of said links of said chain segments;

introducing one of the links into each slot far enough that both opposite legs of the one link are in the slot;

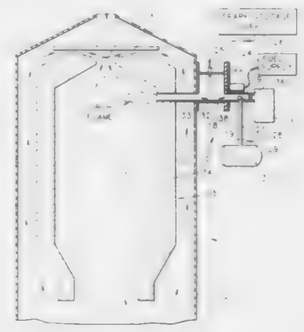
thereafter compressing the opposite sides of the element against the legs of the link in each slot until the legs in the slot are restrained in the slot by the sides of the element.

4,860,533

TORCH IGNITER FOR A COMBUSTOR HAVING U.V. FLAME DETECTION

Narendra D. Joshi, Phoenix, Ariz., assignor to Prutech II, San Jose, Calif.

Filed Sep. 17, 1987, Ser. No. 97,676
Int. Cl.[4] F02C *7/264*
U.S. Cl. 60—39.06 16 Claims



1. In a method for torch igniting a gas turbine combuster operating at above atmospheric pressure and for detecting the existence of flame in a torch igniter and of flame in the ignited combustor by a single detector, the steps of:

flowing a stream of torch air through the wall of a refractory insulated combustion chamber into a combustion zone within the combustion chamber;

mixing torch fuel into the stream of torch air flowing into the combustion chamber;

selectively igniting the stream of torch air mixed with torch fuel to provide a torch flame for igniting a combustion

flame in a mixture of air and fuel within the combustion zone of the combustion chamber; and

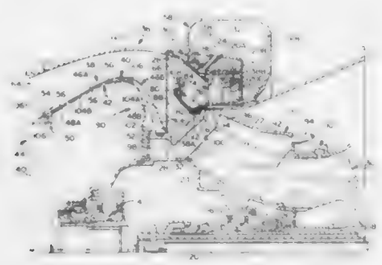
detecting at said single detector, U.V. radiation emanating from the torch and combustor flame, such radiation passing back through the torch stream of air flowing into the combustion chamber to derive an output representative of the existence of at least one of said torch and combustor flames.

4,860,534

INLET PARTICLE SEPARATOR WITH ANTI-ICING MEANS

Sydney E. Easley; Craig E. Heathco, both of Indianapolis, and Clayton L. Smith, Brownsburg, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 24, 1988, Ser. No. 235,586
Int. Cl.[4] F02G *3/00*
U.S. Cl. 60—39.092 3 Claims



1. On a gas turbine engine having a source of hot compressed air and an annular compressor entry,

an inlet particle separator comprising:

an annular inner wall,

an annular outer wall around said inner wall and cooperating therewith in defining a main inlet channel having an inlet at one end,

a splitter in said main channel having a first wall facing said annular outer wall and defining therewith an annular outer branch between said main inlet channel and a scroll chamber of said separator and a second wall facing said annular inner wall and defining therewith an annular inner branch between said main inlet channel and said compressor entry and a nose connecting said inner and said outer walls,

means defining a surface portion on one of said inner and said outer walls and said first and said second walls generally frontally exposed to an airstream in a corresponding one of said main inlet channel and said inner and said outer branches,

a partition on said separator cooperating with said one of said inner and said outer walls and said first and said second walls in defining an annular tunnel behind said surface portion,

means defining a heating air inlet passage connecting an upstream end of said annular tunnel to said source of hot compressed air,

means defining a heating air discharge passage connecting a downstream end of said annular tunnel to a discharge so that a heating air channel is defined between said inlet and said discharge for flow of hot compressed air from said source,

one of said heating air inlet and said heating air discharge passages having a flow area exceeding the flow area of said annular tunnel so that said annular tunnel defines a high velocity segment of said heating air channel and said one of said heating air inlet and said heating air discharge passages defines a low velocity segment of said heating air channel, and

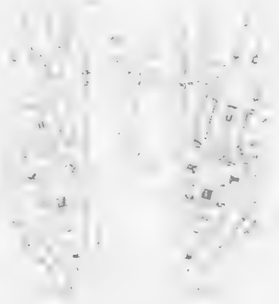
means defining a heat conducting bridge across said annular tunnel between said partition and said one of said inner and said outer walls and said first and said second walls.

4,860,535

POWER PLANT FOR BURNING A FUEL AT HIGH PRESSURE AND A GAS TURBINE DRIVEN BY THE COMBUSTION GASES

Martin MÅnsson, and Ragnar Torstenfelt, both of Finspong, Sweden, assignors to ABB Stal AB, Sweden

Filed Mar. 9, 1988, Ser. No. 166,129
Claims priority, application Sweden, Mar. 9, 1987, 8700960
Int. Cl.[4] F02C *3/26*
U.S. Cl. 60—39.464 6 Claims



1. A power plant comprising:

a combustion chamber for burning fuel at a pressure exceeding atmospheric pressure;

a gas turbine driven by the combustion gases generated;

a compressor driven by the gas turbine for compression of combustion air;

a first gas conduit for conveying combustion gases from the combustion chamber to the turbine;

a second gas conduit for conveying combustion air from the compressore to the combustion chamber; and

a single valve unit in communiction with the first and second gas conduits, the valve unit including;

a valve unit housing;

a through-cylinder located centrally therein and connected to the first gas conduit;

at least one first shut-off valve provided in the cylinder;

a channel formed between the valve unit housing and the cylinder, arranged around the cylinder, and extending through the valve unit housing, the channel being connected to the second gas conduit;

a plurality of second shut-off valves arranged parallel in the channel;

a communication means between the channel and the cylinder constituting a short circuit connection between the compressor and the turbine; and

a plurality of third valves arranged in the communication means.

4,860,536

POWER PLANT WITH DRYING MEANS FOR FUEL

Roine Brännström, Finspong, Sweden, assignor to ABB Stal AB, Sweden

Filed Mar. 23, 1988, Ser. No. 172,094
Claims priority, application Sweden, Mar. 25, 1987, 8701231
Int. Cl.[4] F02C *3/26*
U.S. Cl. 60—39.464 5 Claims

1. A power plant burning a fuel, primarily coal, in a fluidized bed of particulate material at a pressure exceeding atmospheric pressure, comprising:

a first bed vessel having a bottom provided with at least one nozzle for supplying the bed vessel with air to effect fluidization of the bed material and combustion of the fuel supplied to the bed vessel;

a turbine driven by combustion gases generated in the bed vessel;

a compressor for compressing the air for the fluidization and combustion processes;

a gas cleaner for separating ashes from the combustion gases before supplying the combustion gases to the turbine;

a pressure-reducing pneumatic ash discharge means located in the bed vessel below the bottom, for receiving ashes from said gas cleaner, said pressure-reducing ash discharge means having a plurality of series-connected pipe sections and turning sections for conveying ashes in a



gas/ash flow with deflection of the gas/ash flow direction between the pipe sections, said pressure-reducing ash discharge means being arranged as a cooler for the gas/ash flow;

a second bed vessel forming a dryer for moisture containing fuel;

at least a part of the discharge means being arranged within said second bed vessel;

means for supplying the moisture containing particulate fuel to be dried to the second bed vessel, said fuel forming bed material around said at least a part of the discharge means and acting as a cooling medium for said gas/ash flow, said discharge means acting as a heater for said bed material;

means for supplying gas to said second bed vessel for fluidizing said bed material and removing vaporized moisture; and

means for discharging said particulate fuel from said second bed vessel after being dried.

4,860,537

HIGH BYPASS RATIO COUNTERROTATING GEARLESS FRONT FAN ENGINE

John B. Taylor, Cincinnati, Ohio, assignor to Brandt, Inc., Bensalem, Pa.

Continuation of Ser. No. 902,341, Aug. 29, 1986, abandoned.
This application Mar. 10, 1988, Ser. No. 169,135
Int. Cl.[4] F02K *3/072*
U.S. Cl. 60—226.1 16 Claims

8. A gas turbine engine, comprising:

a pair of spaced apart annular stationery frame supports;

a core gas generator engine comprising an outer casing and including a core compressor, combustor, and turbine in serial flow relationship effective for generating combustion gases, said core engine with its outer casing supported by said frame supports;

a power turbine aft of said core engine, including first and second counter rotatable turbine blade rows effective for rotating first and second drive shafts, respectively, said power turbine supported by one of said frame supports;

a fan section forward of said core section including a first fan blade row connected to said first drive shaft and a second fan blade row connected to said second drive shaft, said fan section supported by one of said frame supports;



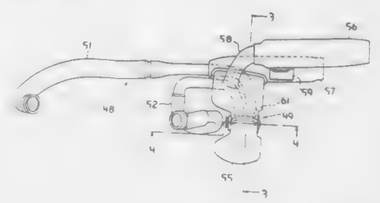
a booster compressor including a first compressor blade row connected to said first drive shaft and a second compressor row connected to said second drive shaft and supported by one of said frame supports, and a non structure supporting outer annular nacelle disposed coaxially about a center line of said engine and outwardly of said casing.

4,860,538

EXHAUST GAS CONTROL MEANS FOR MOTORCYCLE AND THE LIKE

Yoshikiho Takeuchi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 23, 1988, Ser. No. 159,174
Int. Cl.[4] F02B *27/02*
U.S. Cl. 60—313 29 Claims



1. A motorcycle having an internal combustion engine having a pair of oppositely facing exhaust ports and first and second exhaust pipes conveying exhaust gases from respective of said exhaust ports downwardly and to the rear of said engine, an expansion chamber positioned transversely beneath and to the rear of said engine, each of said exhaust pipes extending into said expansion chamber and at least one of said exhaust pipes extending transversely across said expansion chamber from one side thereof and terminating at a place spaced from the other side thereof, and means for discharging exhaust gases from said expansion chamber to the atmosphere.

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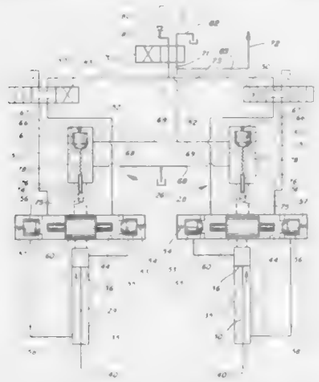
VEHICLE STABILIZER APPARATUS AND STABILIZER ACTUATOR COMPONENT THEREOF

John T. Parrett, St. Joseph; James P. Fairbairn, Benton Harbor, and Walter Jaworski, St. Joseph, all of Mich., assignors to Terex Corporation, Benton Harbor, Mich.

Filed Jun. 9, 1988, Ser. No. 204,220
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—426 14 Claims

1. A hydraulic stabilizer actuator for pressing an element against a support surface and usable in a hydraulic circuit having a device only operable after the element engages the support surface, comprising: a cylinder having a piston and a piston rod extended therefrom for mounting said element; means for mounting said cylinder for movement along the axis of the piston rod between two positions whereby said cylinder

has a first lower position when said element is out of engagement with the support surface and a second upper position when said element presses against the support surface; and an



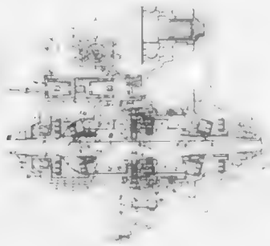
isolation valve carried by the cylinder and connectable into said hydraulic circuit and operable to prevent operation of said device when said cylinder is in said first lower position.

4,860,540

STATIC HYDRAULIC PRESSURE TYPE CONTINUOUSLY VARIABLE TRANSMISSION

Tsutomu Hayashi, Tokyo, and Eiichi Hashimoto, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 148,102, Jan. 26, 1988, abandoned, which is a continuation of Ser. No. 811,706, Dec. 20, 1985, abandoned. This application Sep. 8, 1988, Ser. No. 243,169
Claims priority, application Japan, Dec. 26, 1984, 59-277816
Int. Cl.[4] F16D *39/00*
U.S. Cl. 60—487 **114 Claims**



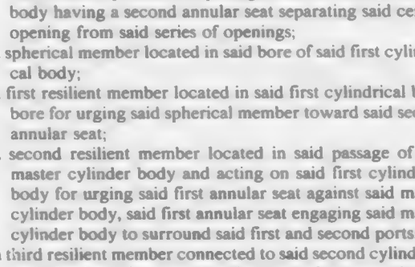
1. A static hydraulic pressure type continuously variable transmission formed with a hydraulic closed circuit between a swashplate type hydraulic pump and a swashplate type hydraulic motor, comprising a pump cylinder of said hydraulic pump and a motor cylinder of said hydraulic motor which are integrally connected to each other in a coaxial manner with said hydraulic closed circuit being formed between both the cylinders; a first shaft integrally projected from an outer end surface of said pump cylinder and rotatably supported on a casing; an input member mounted on said first shaft relatively rotatably and axially immovably, a pump swashplate of said hydraulic pump being mounted on said input member; a second shaft rotatably supported on said casing coaxially with said first shaft, said second shaft being integrally projected from an outer end surface of said motor cylinder; and a non-rotatable swashplate anchor mounted on said second shaft axially immovably, said hydraulic motor having a motor swashplate tiltably supported on said swashplate anchor.

4,860,541

TWO STAGE RELIEF VALVE FOR MASTER CYLINDER QUICK-FILL CHAMBER

John E. Steer, South Bend, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Sep. 28, 1988, Ser. No. 250,049
Int. Cl.[4] B60T *11/16, 11/34;* **F16K** *15/04, 15/14*
U.S. Cl. 60—578 **4 Claims**



1. In a master cylinder having a body with a stepped bore therein, a piston located in said stepped bore having opposite ends slidable in said stepped bore, said piston defining in said stepped bore a low volume pressure chamber and a larger volume quick-fill chamber, a first port in said body for connecting a passage from a reservoir with said larger volume pressure chamber and a second port in said body for connecting said passage with said low volume pressure chamber, and valve means for controlling communication of fluid between said reservoir and bore to compensate for changes in the volume of fluid in said bore and to allow fluid to be released from said larger volume chamber when a fluid pressure therein reaches a predetermined level, the improvement in said valve means comprising:

a first cylindrical body having a closed end with a first diameter section connected to a second diameter section by a radial-flange section, said radial flange section having a plurality of axial passages therethrough, said second diameter section having a plurality of linear slots on its peripheral surface and a series of tabs projecting from its inner surface, said first cylindrical body having a bore that extends from said flange section into said first diameter section;

a second cylindrical body having a lip on a first end and a first annular seat on a second end, said tabs on the inner surface of said second diameter section of said first cylindrical body engaging said lip to define a unitary structure, said second cylindrical body having a central opening surrounded by series of openings, said second cylindrical body having a second annular seat separating said central opening from said series of openings;

a spherical member located in said bore of said first cylindrical body;

a first resilient member located in said first cylindrical body bore for urging said spherical member toward said second annular seat;

a second resilient member located in said passage of said master cylinder body and acting on said first cylindrical body for urging said first annular seat against said master cylinder body, said first annular seat engaging said master cylinder body to surround said first and second ports; and

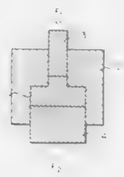
a third resilient member connected to said second cylindrical body having a face member that controls communication through said series of openings, said piston responding to an input by moving in said bore of the master cylinder to create an operational fluid pressure in said low volume and quick fill chambers, said fluid pressure in said quick fill chamber being communicated to said low volume chamber to assist in supplying operational fluid to a brake system and through said first port to act on said face of said third resilient member to prevent the flow of fluid though said series of opening while allowing operational fluid pressure to be communicated through said central opening from said quick fill chamber to act on said spherical member, said operational fluid pressure overcoming said first resilient member at a predetermined fluid pressure level to allow fluid to be communicated to said reservoir and thereby limit the fluid pressure development in said quick-fill chamber, said operational fluid pressure communicated through said first port acting on said second cylindrical body and at a second preset fluid pressure level overcoming said second resilient member to move said first and second cylindrical bodies and allow fluid to be communicated into said passage through said linear slots for delivery to said reservoir.

4,860,542

PISTON-CYLINDER PULSATOR CIRCUIT WITH SUPERPLASTIC ALLOY PRESSURE TRANSMITTING MEDIUM

Haruaki Hatayama; Hideo Takei; Takuji Okabe, all of Higashihiroshima; Yoshiharu Waku, Ube, and Toyoaki Ueno, Yoshiki, all of Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Division of Ser. No. 816,201, Jan. 6, 1986, Pat. No. 4,729,730. This application Sep. 4, 1987, Ser. No. 93,795
Claims priority, application Japan, Jan. 9, 1985, 60-1724
Int. Cl.[4] B23P *17/04;* **B21F** *21/00*
U.S. Cl. 60—583 **7 Claims**



5. An apparatus for transmitting force comprising a first cylinder enclosing a first piston with an area normal to an axial force on said first piston, a second cylinder enclosing a second piston having an area normal to an axial force on said second piston different from the normal area of said first piston, and a pressure transmitting medium substantially filling a pressure transmitting zone in pressure communication with said first and second pistons, characterized in that said pressure transmitting medium is a superplastic alloy.

4,860,543

VIBRATION ISOLATION SYSTEM FOR A LINEAR RECIPROCATING MACHINE

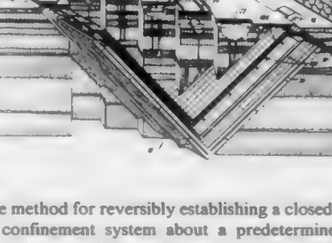
Graham J. Higham, Ashland; Ronald N. Morris, Acton, and Gerald R. Pruitt, Mendon, all of Mass., assignors to Helix Technology Corporation, Waltham, Mass.

Continuation of Ser. No. 894,777, Aug. 8, 1986, Pat. No. 4,783,968. This application Sep. 1, 1988, Ser. No. 239,436
The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.
Int. Cl.[4] F25B *9/00*
U.S. Cl. 62—6 **11 Claims**

1. A vibrating isolation system for a compressor having a linear reciprocating compressor piston comprising:

(a) a dynamic absorber tuned to resonate at the same frequency as the compressor's operating frequency; and

(b) an isolator having a damping ratio of 0.1 or greater secured between the compressor and a mounting frame



for attenuating vibrations transmitted into and out of the compressor.

4,860,544

CLOSED CRYOGENIC BARRIER FOR CONTAINMENT OF HAZARDOUS MATERIAL MIGRATION IN THE EARTH

Ronald K. Krieg, Blaine, and John A. Drumheller, Issawuah, both of Wash., assignors to Concept R.K.K. Limited, Bellevue, Wash.

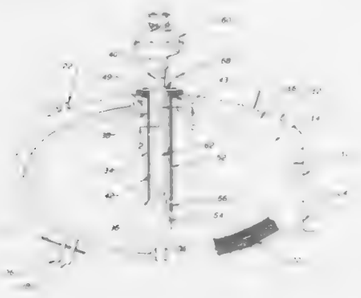
Filed Dec. 8, 1988, Ser. No. 281,493
Int. Cl.[4] F17C *1/00*
U.S. Cl. 62—45.1 **84 Claims**

1. The method for reversibly establishing a closed cryogenic barrier confinement system about a predetermined volume extending downward beneath a surface region of the Earth, comprising the steps of:

A. establishing an array of barrier boreholes extending downward from spaced-apart locations on the periphery of said surface region,

B. establishing a flow of refrigerant medium in said boreholes, whereby the water in the portions of the Earth adjacent to said barrier boreholes freezes to establish ice columns extending axially along and radially about the central axes of said barrier boreholes, wherein the position of said central axes, the radii of said columns, and the lateral separations of said barrier boreholes are selected so that adjacent columns overlap, said overlapping columns collectively establishing a barrier enclosing said volume.

4,860,545
CRYOGENIC STORAGE TANK WITH A RETROFITTED IN-TANK CRYOGENIC PUMP
Eugene B. Zwick, and William D. Brigham, both of Huntington Beach, Calif., assignors to Zwick Energy Research Organization, Inc., Huntington Beach, Calif.
Filed Nov. 7, 1988, Ser. No. 268,193
Int. Cl.[4] F17C *13/00*
U.S. Cl. 62—50.6 14 Claims



1. A low boiloff submersible pump assembly for use in a conventional cryogenic tank having an open access port comprising:
a pump;
a removable pump mounting tube extending through said access port of said cryogenic tank, said pump mounting tube having an inner surface thermally insulated from an outer surface of the tube and thermally insulated from said access port of said cryogenic tank, said tube having an open lower end, the upper end of said tube including means adapted to make a gas-tight seal with said pump mounted thereto, said tube extending through said tank and into said cryogen stored in said tank; and
block means for thermally insulating said removable pump mounting tube from said cryogenic tank at said access port of said cryogenic tank, said mounting tube contacting said tank only at said access port through said block means.

4,860,546
VACUUM SYSTEM WITH MOLECULAR FLOW LINE
John T. Harvell, Subduby, and Philip A. Lessard, Boxborough, both of Mass., assignors to Helix Technology Corporation, Waltham, Mass.
Filed Aug. 10, 1988, Ser. No. 230,573
Int. Cl.[4] B01D *8/00*
U.S. Cl. 62—55.5 22 Claims



1. A vacuum system comprising:
a work chamber;
a load lock for receiving material to be introduced into and removed from the work chamber;
a first high vacuum pump for fluid communication with the load lock;
a second high vacuum pump for fluid communication with the work chamber; and
a flow line from the first high vacuum pump to the work chamber for allowing noncondensible gases in the first high vacuum pump to be passed to the work chamber and subsequently pumped away by the second high vacuum pump.

4,860,547
PROCESS AND APPARATUS FOR EXTRACTING LIQUIDS FROM AGGREGATES AND FROM GAS/VAPOR MIXTURES
Pierre Maldague, Brussels, Belgium, assignor to S.A. Separgaz, Luxembourg
Filed Nov. 12, 1986, Ser. No. 930,149
Claims priority, application Luxembourg, Nov. 12, 1985, [illegible]
Int. Cl.[4] F25B *9/00*
U.S. Cl. 62—86 27 Claims

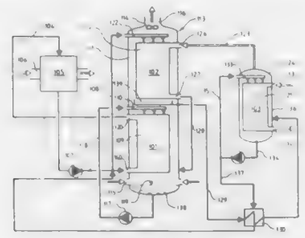


1. A process for at least partially extracting a liquid from an aggregate by evaporation of the liquid and dispersing the resultant vapors in a stream of carrier gas in an open or closed circuit and for separating at least a portion of said vapors from said stream of carrier gas, said separation comprising:
(a) at least partly in a rotary wave pressure exchanger, by at least one step of wave pressure exchange including furnishing energy to a compression step described in (c) below, expanding carrier gas containing such vapors to a lower pressure for cooling the gas and thus condensing at least a portion of such vapors;
(b) separating resulting liquid condensate from the gas;
(c) returning gas recovered from (b) with retained latent heat of vaporization to said wave pressure exchanger and compressing the returned gas by at least on step of wave pressure exchange including receipt of energy from the foregoing expansion of the gas in (a) above, and thus heating the gas;
(d) both said expansion and said compression steps being performed substantially adiabatically.

4,860,548
AIR CONDITIONING PROCESS AND APPARATUS THEREFOR
Rolf Ryham, Princeton, N.J., assignor to Ahlströmföretagen Svenska AB, Norrköping, Sweden
Filed Jun. 13, 1988, Ser. No. 206,021
Int. Cl.[4] F25D *17/06*
U.S. Cl. 62—94 9 Claims

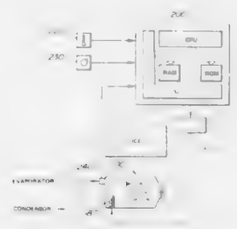
1. A process for conditioning air comprising:
contacting water containing air in an absorber with circulating absorption liquid comprising an aqueous salt solution to form diluted absorption liquid;
heating at least a portion of said absorption liquid to its boiling point by indirect heat exchange with a heating fluid in an evaporator to form concentrated absorption liquid;

condensing water vapor produced by heating said absorption liquid by indirect heat exchange in the evaporator with a cooling liquid in a condenser;
utilizing as a cooling liquid in said condenser absorption liquid which is concentrated in said evaporator;



causing air to flow through said condenser in contact with said absorption liquid to lower the water vapor pressure thereof; and
recirculating said concentrated absorption liquid from said evaporator to said absorber.

4,860,549
VARIABLE DISPLACEMENT WOBBLE PLATE TYPE COMPRESSOR
Koji Murayama, Tokyo, Japan, assignor to Nihon Radiator Co., Ltd., Tokyo, Japan
Filed Dec. 16, 1987, Ser. No. 133,645
Claims priority, application Japan, Dec. 16, 1986, 61-297500
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—115 8 Claims



1. In a refrigeration system an evaporator, said evaporator being arranged to vary the temperature of a fluid in an enclosed space via heat exchange;
a variable displacement wobble plate compressor, said compressor having a crankcase, said compressor being so constructed and arranged that the displacement of said compressor is controlled by the pressure in said crankcase, said compressor having an induction port in fluid communication with said evaporator;
a valve for controlling the pressure in said crankcase;
a sensor arrangement for determining the ambient air temperature and the temperature to which the fluid in said enclosed space is to be controlled;
a pressure sensor responsive to the pressure prevailing in said evaporator; and
a control circuit responsive to said sensor arrangement and said pressure sensor for producing a control signal via which said valve is exclusively controlled in a manner to selectively vary the pressure prevailing in said crankcase.

4,860,550
APPARATUS FOR PREPARING ICE CREAMS
Ken Aoki, Ashikaga; Katsuhiko Hoshi, Ohta; Shigeo Satoh; Mitsuru Kakinuma, both of Gumma; Shigeru Togashi, Ashikaga, and Hiromi Saitoh, Gumma, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed Aug. 8, 1988, Ser. No. 229,601
Claims priority, application Japan, Aug. 8, 1987, 62-197310; Aug. 8, 1987, 62-197312; Sep. 29, 1987, 62-149196
Int. Cl.[4] F25C *1/00*
U.S. Cl. 62—135 9 Claims



1. An apparatus for preparing ice creams comprising a freezing cylinder having an inlet port for receiving liquid mix into the inside of the cylinder, agitating means for agitating the liquid mix received into the inside, a dispensing port for dispensing ice creams prepared in the inside, liquid mix supply means for supplying the liquid mix to the inlet of the freezing cylinder, refrigerating means for refrigerating the freezing cylinder, temperature control means for controlling the refrigerating means to keep the temperature of the ice creams in the freezing cylinder within a predetermined temperature range, means for supplying hot water to the inside of the freezing cylinder, means for discharging the hot water supplied to the inside of the freezing cylinder after a predetermined period of time, heating means for heating the inside of the freezing cylinder, temperature detector means for detecting the temperature in the freezing cylinder, and heat control means for keeping the temperature of the hot water supplied to the inside of the freezing cylinder at thermal death points during the predetermined period of time by operating and controlling the heating means on the basis of the temperature detected by the temperature detector means and a preset temperature.

4,860,551
FROST SENSOR FOR AN APPLIANCE
Daniel S. Query, Antioch, Tenn., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 29, 1987, Ser. No. 139,266
Int. Cl.[4] F25D *21/02*
U.S. Cl. 62—140 10 Claims

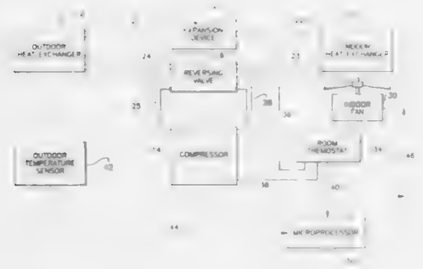
1. A frost sensor for refrigeration equipment having a cooling means for cooling air, said frost sensor comprising:
a transmitter means for emitting light;
a receiver means for detecting light emitted by said transmitted means; and
a fiber optic cable extending between said transmitter means and said receiver means, said fiber optic cable being continuous for transmitting light from said transmitter means through said fiber optic cable to said receiver means and said fiber optic cable being positioned adjacent to said

cooling means so that the amount of light being transmitted by said fiber optic cable to said receiver means is



altered by ice or frost accumulating on said fiber optic cable.

4,860,552
HEAT PUMP FAN CONTROL
Thomas J. Beckey, Edina, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.
Filed Dec. 23, 1988, Ser. No. 289,106
Int. Cl.[4] F25B *13/00*
U.S. Cl. 62—158 **8 Claims**



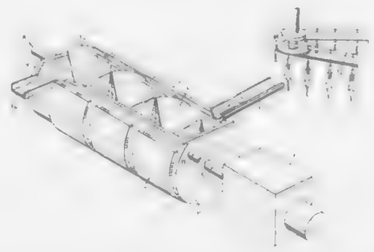
1. A control device for controlling a temperature conditioning apparatus for heating a temperature conditioned space and a fan delivering air heated by a heat exchanger of the apparatus to the space, comprising:
first temperature responsive means for sensing the air temperature of the conditioned space;
second temperature responsive means for sensing the outdoor temperature; and
control means responsive to said first and second temperature responsive means for initiating operation of the fan at the same time as the initiation of the operation of the temperature conditioning apparatus when the outdoor temperature is above a predetermined temperature, and for delaying initiation of operation of the fan for a period of time after the initiation of operation of the temperature conditioning apparatus when the outdoor temperature is below said predetermined temperature with said period of time increasing as the outdoor temperature decreases until a maximum period of time for delaying initiation is reached.

4,860,553
APPLIANCE LEVELING APPARATUS
Jack L. Evans, 136 Calle Arriba, Palm Springs, Calif. 92264
Filed Aug. 5, 1988, Ser. No. 228,939
Int. Cl.[4] F25D *19/00*
U.S. Cl. 62—297 **4 Claims**



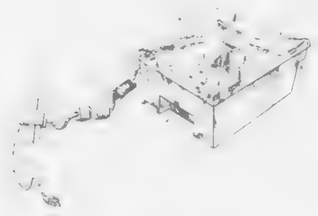
1. In a leveling device for appliances having refrigerator absorption and freezing units, the combination comprising:
pivotal means joining said refrigerator absorption and freezing unit together;
socket means carried on said appliance for movably mounting said refigerator absorption and freezing unit permitting relative movement therebetween;
sensing means for detecting a non-level position of said unit; and
means operably carried on said appliance for selectively positioning said unit in response to said sensing means.

4,860,554
COUNTER-FLOW POULTRY CHILLER
Robert S. Innes, 92 Queensdale Avenue East, Ontario, Canada L9A 1K3, and Bernard McGuire, 211 Cochran Road, Ontario, Canada L8K 3G5
Filed Sep. 19, 1988, Ser. No. 246,078
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—374 **8 Claims**



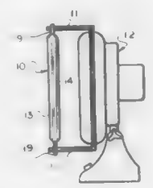
1. A food product chiller comprising a tank of cylindrical form mounted with its axis substantially horizontal and having an opening extending axially along its upper side, said tank being closed at each end, means to supply a flow of food product through said opening at a first end of said tank and means to remove food product from the second end of said tank, means to supply a flow of water into said second end of said tank and means to remove water from said first end of said tank, a screw-feed mechanism mounted within said tank with its axis coaxial with axis of said tank and its outer edges closely approaching the inner surface of said tank, means to rotate said screw-feed on its axis with an intermittently reversing rotary motion with a net rotary motion such as to feed said food product from said first end of said tank to said second end of said tank, while simultaneously agitating and oscillating said food product and said water.

4,860,555
VEGETABLE CRISPER
Jerry W. Bishop; Keith G. Savas, and Wendell G. Wilson, all of Atlanta, Ga., assignors to Jerry W. Bishop, Atlanta, Ga.
Filed Dec. 2, 1988, Ser. No. 279,112
Int. Cl.[4] F25N *17/02*
U.S. Cl. 62—376 **11 Claims**



1. A vegetable crisper comprising:
a container sized to be removably placed in a refrigerator and adapted to contain a body of water in a lower portion thereof;
support means mounted within said container for supporting vegetables above said container lower portion;
sprinkling means mounted in said container above said support means for sprinkling vegetables supported upon said support means with water;
electrically powered pump means for pumping water from said lower portion to said sprinkling means;
and filtering means for filtering water within said container;
whereby vegetables may be placed in the container for storage within a refrigerator and supported above a standing body of water and sprinkled with water that is recycled and filtered to remove impurities introduced by the interaction of the water and the vegetables.

4,860,556
AIR COOLING AND DIRECTING APPARATUS
Rawlings H. Hammett, P.O. Box 307, Grandview, Mo. 64030
Filed Aug. 17, 1988, Ser. No. 232,959
Int. Cl.[4] F25D *17/04*
U.S. Cl. 62—406 **6 Claims**



1. A plastic container for a freezable liquid, said container being of monolithic construction having been fabricated of a thermoplastic polymer by a molding operation and being further characterized in having:
(a) upper and lower extremities,
(b) opposed parallel front and rear surfaces,
(c) a high ratio of total surface area to confined volume,
(d) a multitude of parallel channels that extend between said front and rear surfaces,
(e) a plane of symmetry that bisects said upper and lower extremities,
(f) attaching means for removably associating said container with an air circulation device, said attaching means being apertured tabs associated with said upper and lower extremities and centered upon said plane of symmetry.
(g) a closable opening permitting entrance and egress of said liquid, and
(h) a configuration amenable to the stacking of a number of said containers in a compact grouping

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4,860,557
NEEDLE SELECTION SYSTEM FOR A CIRCULAR KNITTING MACHINE
José M. D. Güell, Barcelona, Spain, assignor to Jumberca, S.A., Barcelona, Spain
Filed Feb. 29, 1988, Ser. No. 162,085
Claims priority, application Spain, Mar. 17, 1987, 8700741
Int. Cl.[4] D04B *9/10, 15/78*
U.S. Cl. 66—14 **10 Claims**



1. A needle selection system for a cicular knitting machines, comprising:
(a) non-rotating members including, for each needle:
a selector jack capable of rocking movement and of vertical movement and having an alignment butt, a selector butt and a rocking cancellation butt;
an intermdiate jack having a butt, being capable of rocking integrally with the selector jack and being capable of vertical movement independent of the vertical movement of the selector jack; and
a slider also having a butt and being associated with the needle but not associated with the rocking movement of the jacks, while being capable of accompanying the intermdiate jack in the upward movement thereof; and
(b) rotary members including, in turn:
operative cams;
rocking cancellation cams;
electronic multilevel jacquard controls, each of which includes: an alignment cam, and a plurality of selectors located at different levels, each of which selectors is capable of occupying a retracted position in which it does not engage a selector butt and an extended position in which there is mutual engagment between a selector and a selector butt, the corresponding selector jack being caused to rise and the selector being moved to said retracted position;
wherein, in association with each of said operative cams, there is a first means which is complementary to second means disposed in said selector jack, such that when one selector jack is caused to rise, said first and second means mutually engage and cause selection of the selector jack by rocking it; and
wherein one operative cam includes a first main track adapted to receive the butt of the intermediate jack and a second main track along which there moves the butt of the slider, said second track being provided with an uninterrupted lower horizontal portion over which said slider butt travels when the slider has not been previously raised

by a vertical upward movement of the intermediate jack, there being two electronic controls for each operative cam, such that each selector jack is capable of not being selected or of being selected one or two times during its successive passage in front of said first means associated with one same operative cam.

4,860,558

MONITORING CIRCUIT FOR A KNITTING MACHINE

Kurt A. G. Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

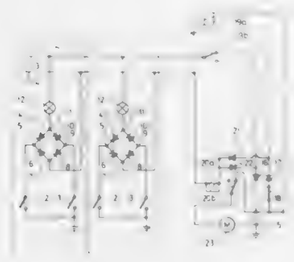
PCT No. PCT/EP87/00336, § 371 Date Feb. 26, 1988, § 102(c) Date Feb. 26, 1988, PCT Pub. No. WO88/00257, PCT Pub. Date Jan. 14, 1988

PCT Filed Jun. 25, 1987, Ser. No. 165,272

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1986, 3621428

Int. Cl.⁴ D04B *35/12, 35/14*

U.S. Cl. 66—163 **10 Claims**



1. A monitoring circuit for a knitting machine, comprising at least one yarn feeding device having two yarn monitoring means provided with two switches, said switches being connected via a first rectifier circuit and an indicating lamp to a supply line connected to a supply voltage source in such a way that when one of said two yarn monitoring means is operated, said indicating lamp is only activated by one half-wave associated with said yarn monitoring means and belonging to an a.c. voltage signal generated by said supply voltage source, the improvement wherein said a.c. voltage signal generated by said supply voltage source comprises first intervals during which said signal has exclusively positive a.c. voltage half-waves and second intervals during which said signal has exclusively negative a.c. voltage half-waves, and said supply voltage source includes an a.c. voltage source, first and second rectifier elements which are of opposite polarity and connected to said a.c. voltage source, and a periodically operated change-over switch which alternately connects said rectifier elements to said supply line.

4,860,559

INFORMATION TRANSFER

Malcolm D. Hill, Leicester, England, assignor to Camber International Limited, Leicester, England

Division of Ser. No. 829, Jan. 6, 1987, abandoned. This application Jul. 5, 1988, Ser. No. 215,393

Claims priority, application United Kingdom, Jan. 11, 1986, 8600629

Int. Cl.⁴ D04B *35/32, 15/00*

U.S. Cl. 66—168 **2 Claims**

1. A circular knitting machine comprising:
a stationary part,
a rotary part having an axis of rotation,
a first optical fiber bundle,
a second optical fiber bundle,
the first optical fiber bundle having a first end and a second end, the first end of the first optical fiber bundle being operatively connected to the stationary part,
the second optical fiber bundle having a first end and a second end, the first end of the second optical fiber bundle being operatively connected to the rotary part,
the second ends of the first and second optical fiber bundles being provided in mutually opposed configuration in radial planes and centered on the axis of rotation of the rotary part,
the second optical fiber bundle being arranged for movement with the rotary part so as to be rotatable about the axis of rotation of the rotary part,
the first optical fiber bundle having a first set of optical fibers and a second set of optical fibers, the first set of optical fibers and the second set of optical fibers being separated from each other at the first end of the first optical fiber bundle, the first set of optical fibers and the second set of





optical fibers being randomly intermingled at the second end of the first optical fiber bundle,
the second optical fiber bundle having a first set of optical fibers and a second set of optical fibers, the first set of optical fibers and the second set of optical fibers being separated from each other at the first end of the second optical fiber bundle, the first set of optical fibers and the second set of optical fibers being randomly intermingled at the second end of the second optical fiber bundle,
whereby simultaneous two-way transfer of optical information during rotation of the rotary part is enabled, and further comprising:
slip ring means for conveying power to the rotary part, whereby commands transferred to the rotary part by the optical fiber bundles may be carried out,
a plurality of rotatable air pressure devices for removing lint from the machine, the rotatable air pressure devices acting through a stationary air pressure chamber positioned on the rotary axis, a portion of the first optical fiber bundle being routed so as to pass through at least a portion of the stationary air pressure chamber,
a rotary member rotatable about the rotary axis and including a further chamber,
the stationary air pressure chamber being provided with an extension portion through which a portion of the first optical fiber bundle passes so as to be on the rotary axis,
a portion of the second optical fiber bundle being mounted in the rotary member so as to lie on the rotary axis, and
the further chamber having walls defining passages for air from the stationary air pressure chamber to the further chamber.

4,860,560

RESTRAINING DEVICE

William Lundelius, 31277 Meadowbrook Ave., Hayward, Calif. 94544

Filed Aug. 5, 1987, Ser. No. 81,977

Int. Cl.⁴ E05B *75/00*

U.S. Cl. 70—16 **2 Claims**



1. A device for restraining a person comprising
a belt adapted to be fastened around the waist of said person being restrained, said belt having front, back, right and left sides,
an arm restraining member comprising
means for attaching said arm restraining member proximate the wrist of said person being restrained,
means for restricting said arm restraining member to move a predetermined distance back and forth along the side of said belt, said means for restricting comprising
a belt connector member slidably connected to said belt and restricted to move a predetermined distance along the side thereof,
said predetermined distance being sufficient to permit the attachment of other arm restraining devices to said person being restrained when said arm restraining member is positioned proximate the back of said belt, and
means for connecting said belt connector member to said arm restraining member,
means for locking said arm restraining member proximate a predetermined position along the length of said means for restricting said arm restraining member to move a predetermined distance back and forth along a side of said belt.

4,860,561

NUMERICAL LOCK

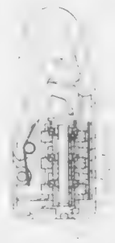
Blake Hwang, No. 40, Sau-an St., Taipei, Taiwan

Filed Mar. 1, 1989, Ser. No. 317,431

Int. Cl.⁴ E05B *37/08*

U.S. Cl. 70—28 **1 Claim**

1. A numerical lock comprising a housing and a cover cooperating with each other to suitably interconnect therein as in the prior art a plurality of numerical wheels, a plurality of sleeves, a control rod, a spring and a numeral-changing piece, wherein the improvement resides in that: said housing includes a hooking member; each of said sleeves includes an inner keyway; said control rod includes a head and a plurality of axial projections each of which is capable of engaging and disengaging with said inner keyway; said lock further includes a locking piece having a first end pivotally mounted in said



cooperated housing and cover, a second opposite end capable of cooperating with said hooking member and said housing to form a locking hook, and an intermediate projection capable of engaging with said head to slide said control rod in said lock.

4,860,562

ACTUATING DEVICE AND KEY

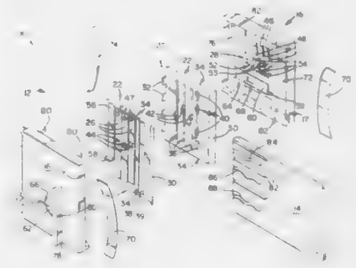
Izchak Koren, 49 Florence Avenue, Bedfordview, Transvaal Province; Robert J. Gates, 19 Third Avenue,, Northmead, Benoni, Transvaal Province, and Craig J. Smith, No 6 Beacon Royal, Cnr. Grafton and Louis Botha, Yeoville, Transvaal Province, all of South Africa

Filed Nov. 25, 1986, Ser. No. 934,740

Claims priority, application South Africa, Nov. 28, 1985, 85/9125

Int. Cl.⁴ E05B *27/06*

U.S. Cl. 70—352 **13 Claims**



1. In combination, a lock actuating device and a key therefor, of the kind in which the key resembles a card, the lock actuating device comprising:
a casing formed with a slot for receiving the key:
a cartridge disposed within said casing and arranged for displacement in an actuating direction and defining an internal zone within said casing; a slide member mounted on the cartridge for displacement in a direction transverse to said actuating direction between an interference position and a free position, and having
a finger formation extending into the internal zone, and
an interference formation operatively connected to the finger formation;
and a gate member fixed to said casing and having a check formation and a gate, the gate member being arranged such that the check formation checks movement of the interference formation in said actuating direction when the slide member is in its interference position and such

that the gate allows movement of the interference formation in the actuating direction when the slide member is in its free position;

the key having a key formation complemental to the finger formation and being arranged, when the key is inserted into the slot of the casing, to cause displacement of the slide member to its free position to allow displacement of the slide member and cartridge in unison in said actuating direction, the cartridge being adapted for operative connection to an actuatable device such as to cause actuation of the device when it moves in said actuating direction in use.

4,860,563

KEYHOLDER FOR LUGGAGE

Edward L. Gerch, Chicago, Ill., assignor to Kingport International Corporation, Evanston, Ill.

Filed Aug. 15, 1988, Ser. No. 232,080
Int. Cl.[4] A44B *15/00*
U.S. Cl. 70—456 R **11 Claims**



1. In combination with luggage having an interior adapted to be opened and closed and an inner face which is accessible when the luggage is opened, a keyholder which comprises a strap secured to said inner face of the luggage at its longitudinal midsection having wings extending in opposite directions from the secured midsection, fasteners on the outer ends of the wings, cooperating fasteners on said inner face of the luggage holding the wings flatwise against the inner face, said wings adapted to be pulled free from the fasteners on said inner face and folded together on opposite sides of the midsection for insertion through a key ring and said fasteners adapted to be reattached to hold the key ring flatwise against the inner face of the luggage with any keys depending flatwise therefrom in the interior of the luggage.

4,860,564

METHOD AND APPARATUS FOR TAPER ROLLING CONTROL FOR A ROLLING MILL

Naum M. Kaplan, Pittsburgh, Pa., assignor to United Engineering, Inc., Pittsburgh, Pa.

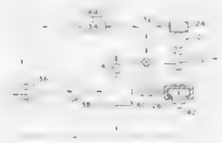
Filed Sep. 21, 1987, Ser. No. 99,216
Int. Cl.[4] B21B *37/14*
U.S. Cl. 72—19 **6 Claims**

1. A method for operating a rolling mill for producing metal strip-like material having at least a portion with a thickness taper in the direction of rolling and in which the mill has one or more stands each including a roll gap, comprising the steps of:

(a) passing the material through a roll gap of a stand of the mill to perform a reduction of the material,

(b) during the reduction of a first portion of the material adjusting the roll gap as a function of a change in the roll force to compensate at least for some of a change in said roll gap due to mill spring according to the mill spring curve for the stand, said function being represented by a selected first value greater than the natural stiffness value of the stand but less than or equal to the value representing compensation of the total spring of the stand,

(c) at a selected point during the rolling of the first portion making an additional adjustment of said roll gap as a function of the change in roll force during the rolling of a second portion of the material to compensate at least for some of a change in said roll gap due to mill spring according to the mill spring curve for the stand, said function of





step (c) being represented by a value different from said selected first value to cause a further controlled change in reduction of the material to roll said taper condition in the material, said functions performing according to the following relationship:

$$G = h - \frac{[Fact \times \alpha + Fant\,(1-\alpha)] \times \beta}{MS}$$

wherein:

G=gap reference for the pass

h=target exit strip thickness for the pass

Fact=actual roll separating force during the pass

Fant=anticipated roll separating force for the pass

MS=mill spring

α=mill stiffness multiplier for said first function (said first value)

β=taper multiplier for said predetermined function (said different value).

4,860,565

PROCESS FOR PREPARING HOLLOW ALUMINUM EXTRUDATES FOR USE IN VACUUM

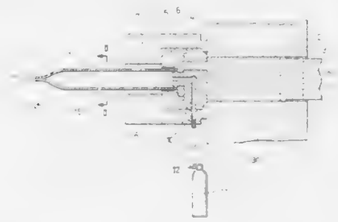
Yutaka Kato, and Eizo Isoyama, both of Sakai, Japan, assignors to Showa Aluminum Corporation, Osaka, Japan

Filed Jun. 13, 1988, Ser. No. 205,777
Claims priority, application Japan, Jun. 15, 1987, 62-149910
Int. Cl.[4] B21C *23/00*
U.S. Cl. 72—38 **8 Claims**

1. A process for producing a hollow shaped aluminum extrudate, comprising the steps of:

extruding aluminum to form a hollow shaped aluminum extrudate and, simultaneously,

supplying a gaseous medium consisting essentially of dry air within the hollow shaped aluminum extrudate so as to form an aluminum oxide coating in the absence of water



on the inner wall surface of the hollow shaped aluminum extrudate.

4,860,566

METHOD AND APPARATUS FOR STRAIGHTENING A WORKPIECE

Karl-Heinz Augustin, Wedemark, Fed. Rep. of Germany, assignor to Hans-Georg Augustin, Fed. Rep. of Germany

Filed Jan. 7, 1988, Ser. No. 141,422
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1987, 3701223
Int. Cl.[4] B21H *7/00*
U.S. Cl. 72—110 **11 Claims**



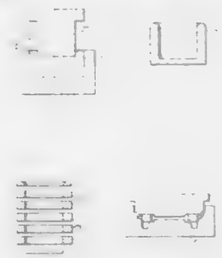
1. A method of rolling for hardening and straightening purposes a crankshaft or the like having a theoretical axis, a plurality of main journals and crankpins, crankwebs joining the crankpins and the main journals and fillets having walls, running about said axis and being disposed at transitions between the crankwebs and the main journals or crankpins, respectively, comprising the steps of: hardening said crankshaft by rolling the fillets of all main journals and crankpins by laying tools into the fillets and moving said tools transversely of said axis for exerting pressure on said walls, then measuring the true running of the crankshaft by means of measuring deviations of the main journals of the true running and then straightening said crankshaft by again rolling the fillets of a plurality or all main journals in dependence on said measured deviations in a manner to reduce them by again laying tools into the fillets and moving said tools transversely of said axis for exerting pressure on at least preselected sections of said walls.

4,860,567

RING FORGING PROCESS

William G. Askey, Jupiter, and Steven M. Hopkins, North Palm Beach, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1987, Ser. No. 135,768
Int. Cl.[4] B21C *23/20, 29/00*
U.S. Cl. 72—254 **1 Claim**



1. Method for producing rings from superalloys and titanium alloys including the steps of

a. forging starting materials in a condition of low strength and high ductility, in a punch and die assembly wherein an annulus exists between the punch and die to form a cup shaped intermediate article;

b. slicing the cup into rings.

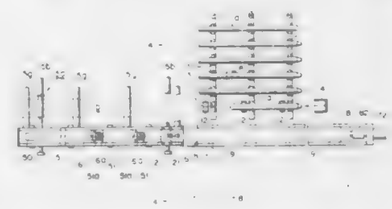
c. forging said rings, under conditions of low strength and high ductility, to produce a final desired cross-section.

4,860,568

TUBULAR MATERIAL DRAWING APPARATUS FOR MANUFACTURING PRECISION TUBE

Tukio Yamanoi; Mitsuo Kandachi; Masahiro Iwata, and Kazumi Kato, all of Oyama, Japan, assignors to Furukawa Aluminum Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1988, Ser. No. 184,368
Claims priority, application Japan, Jul. 27, 1987, 62-187443; Jul. 27, 1987, 62-187444
Int. Cl.[4] B21C *1/24*
U.S. Cl. 72—291 **10 Claims**



1. A tubular material drawing apparatus for manufacturing precision tubes comprising:

a back bench having guide means with an axis;

a plug set device, coupled to said back bench, for holding a plug rod parallel to said axis;

a travel base movable backward with respect to said back bench and guided by said guide means along said axis;

first holding means, couples to said travel base, for holding a rear end portion of a tube element and for moving the tube element parallel to said axis to fit the tube element on said plug rod upon movement of said travel base along said axis;

second holding means, separate from said first holding means, movably coupled said travel base parallel to said axis, for holding the rear end portion of the tube element and for bringing the rear end portion to said first holding means;

carriage guide means extending along said axis;

a carriage which is guided by said carriage guide means along said axis and which is movable in a forward direction;

die means provided between said block bench and said carriage, said die means including a die; and

third holding means, coupled to said carriage, for holding a front end portion of the tube element;

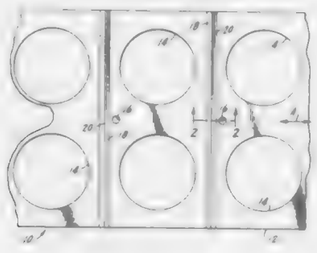
said third holding means, said die, and said first holding means being coaxially positioned so that said third holding means holds the front end portion of the tube element while said first holding means holds the rear end portion of the tube element in which said plug rod is inserted, and while said carriage is moved forward, thereby allowing said die to draw the tube element.

4,860,569

CONVEYOR FOR CONVERSION SYSTEMS

Frank J. Herdzina, Schaumburg, Ill., assignor to Service Tool Die & Mfg. Company, Elk Grove Village, Ill.

Filed May 2, 1988, Ser. No. 189,015
Int. Cl.[4] B21D *43/12*
U.S. Cl. 72—361 6 Claims



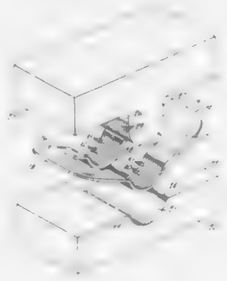
1. In a press for converting work pieces into parts, the press having lower tooling including a tool shoe mounted on a bed and upper tooling mounted on a reciprocating ram which moves the upper tooling into and out of operative engagement with the lower tooling, the upper and lower tooling having a plurality of stations where work is performed on the work pieces, and an endless conveyor having a forward run disposed between the upper and lower tooling for successively advancing work pieces to each of the stations of the tooling, the conveyor having openings therein in which work pieces rest normally spaced from the tooling, and a vacuum box which applies a vacuum to the side of the conveyor opposite the work pieces so as to hold them on the conveyor, an improved conveyor comprising a web having a plurality of transverse beads formed therein and spaced intermediate the work piece openings to inhibit deflection of the conveyor as it travels past the vacuum box, the beads defining flat portions of the web therebetween and the beads having a configuration which does not alter the condition of the flat portions such that they remain in a planar condition while carrying work pieces.

4,860,570

LOW TONNAGE HIGH QUALITY THREAD STAMPING

Frederick Perrault, 1727 Date Ave., Torrance, Calif. 90503, and Raymond E. Perrault, 3845 Crest Rd., Rancho Palos Verdes, Calif. 90274

Continuation-in-part of Ser. No. 14,116, Feb. 2, 1987, abandoned, which is a continuation of Ser. No. 827,890, Feb. 10, 1986, abandoned. This application Jun. 10, 1988, Ser. No. 204,890
Int. Cl.[4] B21D *53/24*
U.S. Cl. 72—379 57 Claims



1. The method of producing a threaded element for use in providing a threaded part comprising the steps of

providing a first means having at least one portion concavely curved to define a cavity,

providing a second means having at least one portion having a convex curvature,

forming a plurality of ribs on said portion of said second means such that said ribs in elevation at the crests thereof collectively are complementary to said cavity less a predetermined distance, and

relatively moving said first and second means so as to engage a sheet metal workpiece and to cause said portion of said second means to force at least a portion of said workpiece against the wall of said cavity so that said ribs provide grooves in said workpiece and ridges intermediate said grooves,

said workpiece being dimensioned so that circumferentially of said cavity when said portion of said workpiece is so forced against the wall of said cavity it extends through an arc of no more than around 120°.

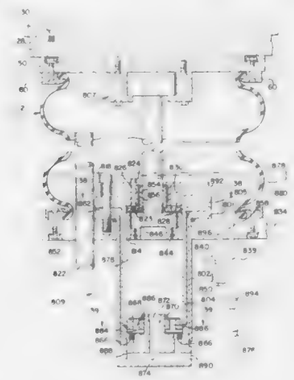
4,860,571

POWER PRESS WITH IMPROVED CUSHIONING SYSTEM

Kenneth L. Smedberg, 5 Oak Hill Dr., Crete, Ill. 60417; George J. Bozich, Chicago, and Robert J. Kotynski, South Holland, both of Ill., assignors to Kenneth L. Smedberg, Crete, Ill.

Continuation-in-part of Ser. No. 912,332, Sep. 26, 1986, Pat. No. 4,732,033, and a continuation-in-part of Ser. No. 6,732, Jan. 22, 1987, Pat. No. 4,825,681, and a continuation-in-part of Ser. No. 21,981, Mar. 5, 1987, Pat. No. 4,736,615, and a continuation-in-part of Ser. No. 55,687, May 29, 1987, Pat. No. 4,796,460. This application Sep. 24, 1987, Ser. No. 100,765
The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.
Int. Cl.[4] B21D *24/02*
U.S. Cl. 72—453.13 29 Claims

1. A pneumatic die cushion for use in a power press comprising, in combination, a pair of substantially parallel spaced plates, each of said plates being adapted for attachment to a separate portion of a power press, one of said plates being movable in a vertical direction relative to the other plate, a resilient pneumatic bellows mounted between the plates resiliently connecting the spaced plates, a hydraulic snubber actuator connected to the spaced plates, said hydraulic snubber actuator including a cylinder connected to a selected spaced plate, a piston slideably mounted in the cylinder, a piston rod having one end connected to the piston and the other end connected to the other of the spaced plates, a cover plate sealingly connected to one end of the cylinder slideably receiving the piston rod, said cover plate sealingly closing the one end of the cylinder, said cover plate having a control passage connected to the interior of the cylinder, and a metering valve connected to the control passage to regulate the flow of hydraulic fluid liquid from the interior of the cylinder out through the passage for regulating the movement of the spaced plates away from each other.

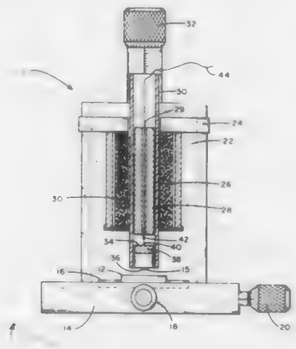


4,860,572

APPARATUS AND METHODS FOR TESTING SURFACE PROPERTIES OF A MATERIAL

Amarjit S. Brar, Edina; Jagdish P. Sharma, Bloomington, and Suryanarayana Kaja, Eden Prairie, all of Minn., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Division of Ser. No. 96,185, Sep. 11, 1987, Pat. No. 4,776,202.
This application Jun. 28, 1988, Ser. No. 212,463
Int. Cl.[4] G01N *3/30*
U.S. Cl. 73—12 4 Claims



1. A method for determining the impact energy capable of being withstood by a brittle sample surface comprising the steps of:

dropping an indentor having a known mass onto the sample from a predetermined height above the sample;

inspecting the sample for failure at the surface in the area adjacent the indention by determining the presence of chips in the area adjacent the indentation; and

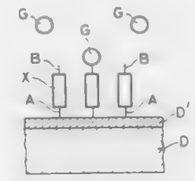
determining the energy imparted on the surface from the known mass and the predetermined height through which the indentor was dropped.

4,860,573

COMPOSITE SUBSTRATE, INTENDED FOR AN APPARATUS FOR QUANTITATIVE DETECTION OF A COMPONENT PRESENT IN A GAS OR LIQUID

Anton W. Barendz, Katwijk aan Zee, and Maarten S. Nieuwenhuizen, The Hague, both of Netherlands, assignors to Nederlandes Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek TNO, The Hague, Netherlands

PCT No. PCT/NL86/00033, § 371 Date Jul. 17, 1987, § 102(e) Date Jul. 17, 1987, PCT Pub. No. WO87/02135, PCT Pub. Date Apr. 9, 1987
PCT Filed Oct. 3, 1986, Ser. No. 61,281
Claims priority, application Netherlands, Oct. 3, 1985, 8502705
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—23 10 Claims



1. A composite substrate for use in an apparatus for the quantitative detection of a substance present in a gas or liquid of the type having transducer means for inducing elastic vibrations in a surface layer of the substrate and detector means for sensing changes in the elastic vibrations resulting from bonding of the substance to be detected with the surface layer, the improvement wherein the surface layer (D') of said substrate (D) comprises a first substance having first active sites (A) adapted for covalent chemical bonding and molecules (X) of a second substance, said molecules (X) having at least one first active site forming a covalent bond with a respective active site (A) of said substrate (D'), and having at least one second active site (B) different from said first site, said second active sites (B) of said molecules (X) being adapted for selectively and reversibly making a coordinative bond with molecules (G) of the substance to be detected.

4,860,574

PARAMAGNETIC OXYGEN ANALYZER

Masato Maeda, and Hideo Takeuchi, both of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Jun. 21, 1988, Ser. No. 209,431
Claims priority, application Japan, Jun. 29, 1987, 62-161601; Dec. 24, 1987, 62-327916
Int. Cl.[4] G01N *27/76*
U.S. Cl. 73—27 A 3 Claims

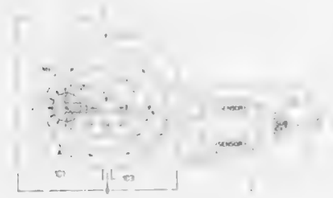
1. A paramagnetic oxygen analyzer comprising

a measuring chamber comprising

a closed loop-like measuring passage, said passage having an inlet and an outlet disposed at symmetrically opposing positions for inletting and outletting a sample gas through said loop-like measuring passage, and

a bypass pipe disposed between two parts of said loop-like measuring passage and generally at an intermediate position between said inlet and outlet, said bypass pipe having an inflow port disposed generally at the center thereof for inletting of a purge gas to said bypass pipe,

whereby two connecting portions are formed between the bypass pipe and the loop-like measuring passage;
means for generating a magnetic field, said means being disposed in one of said two connecting portions; and
a pair of purge gas stream detecting sensors disposed inside of said bypass pipe at symmetrical positions on either side of said inflow port;



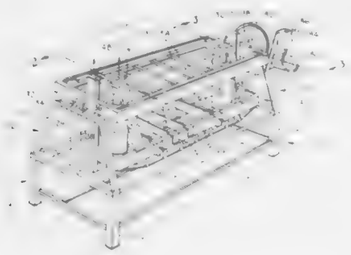
wherein the concentration of an oxygen gas contained in the sample gas is measured by said detecting sensors detecting changes of purge gas streams passing through said respective sensors and by producing a signal difference between the thus detected changes.

4,860,575

APPARATUS FOR TESTING WATER JACKETS ON CYLINDER HEADS OF INTERNAL COMBUSTION ENGINES

Robert C. Robinson, Cleveland, S.C., assignor to Dover Cylinder Head Service, North Charleston, S.C.

Filed Jul. 13, 1988, Ser. No. 218,540
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—49.7 **11 Claims**



1. Apparatus for testing heads of internal combustion engines of various sizes and configurations for fluid tightness of internal cavities in said head, comprising:
(a) a base having two vertically extending end frame members;
(b) a generally rectangular retaining frame, pivotally supported on said end frame members for pivotal movement about a horizontal axis and having a plurality of adjustable retaining means extending transversely of said horizontal axis;
(c) a head support frame extending parallel to said retaining frame, and supported by said retaining frame for relative movement towards and away from said retaining frame, and having a plurality of adjustable support means extending transversely of said supporting frame for supporting engine heads;
(d) a test plate having a plurality of cavities to match the cavities in the engine head being tested and having a gasket interposed between the mating surfaces of said engine head and the adjacent surfaces of the test plate to seal said surfaces against fluid leakage, said test plate having a port for admitting fluid to the cavities in said engine head under pressure;
(e) spaced pneumatic means for moving said head support frame towards said retaining frame to hold said test plate and said head in sealing contact with each other, between said adjustable support means on said head support frame and said adjustable retaining means on said retaining frame; and
(f) means for supplying fluid under pressure to said cavity in said engine head, to test for defects in said head.

4,860,576

DEVICE IN VISCOSITY METERS

Bengt Skalen, Saffle, Sweden, assignor to BTG Kalle Inventing AB, Sweden

Filed Sep. 2, 1988, Ser. No. 240,152
Claims priority, application Sweden, Sep. 4, 1987, 8703445
Int. Cl.[4] G01N *11/14*
U.S. Cl. 73—59 **4 Claims**



1. A self-cleaning and straining meter for measuring the viscosity of liquids which have a large number of contaminants and a low viscosity, said meter comprising:
an outer cylinder, said outer cylinder defining a cavity therein;
an inner cylinder rotatably mounted within said outer cylinder;
a drive unit connected to said inner cylinder for rotating said inner cylinder within said outer cylinder;
a gap located between said cylinders, said gap forming a measuring chamber; and
a propeller for propelling liquid through said gap, said propeller being located upstream from said inner cylinder and within said cavity;
wherein said inner cylinder has an edge which projects into said gap and wherein said outer cylinder has a longitudinally extending slot through which contaminants fastened between said edge and said outer cylinder are discharged as said inner cylinder rotates so that the contaminants only negligibly disturb the measurement of viscosity.

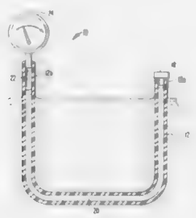
4,860,577

OSMOTIC APPLICATIONS OF HOLLOW FIBERS

Patterson James A., Sarasota, Fla., assignor to Southeastern Illinois College Foundation, Harrisburg, Ill.

Filed Jan. 6, 1989, Ser. No. 294,480
Int. Cl.[4] G01N *13/04*
U.S. Cl. 73—64.3 **14 Claims**

1. An apparatus for determining osmotic pressure, said apparatus comprising:
a semipermeable, hollow fiber, said fiber having a sealed end and a pressure sensing end;
a media component contained within said fiber, said media component having a predetermined osmolarity;
a relatively small amount of gas located adjacent said media component and distal to the sealed end of said fiber; and
a sensor located in the sensing end of said fiber, said sensor in association with said gas, said sensor for measuring



changes occurring within said fiber due to volume changes occurring in said media component.

4,860,578

METHOD AND APPARATUS FOR DETERMINING THE CENTER OF GRAVITY OF A SPHERICAL BALL

Nyle O. Movick, 4600 Macky Way, Boulder, Colo. 80303

Filed Sep. 9, 1987, Ser. No. 94,495
Int. Cl.[4] G01M *1/12*
U.S. Cl. 73—65 **8 Claims**



1. A method of determining the axis of an unbalanced spherical ball comprising:
immersing said ball in a liquid in which said ball does not float,
supporting said ball by spherical support means slightly larger than said ball,
vibrating said liquid at such a power level and frequency that apparent flotation is produced and the unbalanced axis of the ball is oriented vertically due to gravity.

4,860,579

TIRE LEAKAGE DETECTION METHOD FOR CENTRAL TIRE INFLATION SYSTEM

James A. Beverly, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 25, 1988, Ser. No. 198,404
Int. Cl.[4] B60C *23/02*
U.S. Cl. 73—146.2 **9 Claims**

1. A diagnostic method for sensing and reacting to conditions indicative of leakage of an inflatable tire, the pressurization of which tire is measured and controlled by an on-board CTIS, said CTIS automatically measuring inflation pressurization of said tire at predetermined extended time intervals and, in the absence a sensed system fault condition or pressure modification commands, assuming a steady-state condition during each of said extended time intervals between automatic pressure measurements, said method characterized by:
at the completion of each automatic pressure measurement operation and pressure adjustment operation, after desired tire pressurization is sensed, assuming steady state conditions for a predetermined period of time, then performing a confirming pressure measurement to sense change in tire pressurization during said predetermined period of time, said predetermined period of time substantially shorter than said extended time interval, and;



if the sensed change in tire pressurization is less than a reference value, allowing said CTIS to assume steady state conditions until expiration of said extended time interval; and
if the sensed change in tire pressurization is equal to or greater than said reference value, causing said CTIS to pressurize the tire to desired pressurization and to perform continuing automatic tire pressurization measurements after shortened time intervals of steady-state condition.

4,860,580

FORMATION TESTING APPARATUS AND METHOD

David DuRocher, P.O. Box 821, College Station, Tex. 77841

Filed Nov. 7, 1988, Ser. No. 268,333
Int. Cl.[4] E21B *49/10*
U.S. Cl. 73—155 **16 Claims**



1. A formation testing apparatus for testing subsurface earth formations penetrated by a borehole, comprising:
a body of the type adapted to be suspended in a well bore penetrating such formations;
first sealing means carried on said body and having a first

central opening therein, said first sealing means being adapted for sealing engagement with said well bore to isolate a first portion thereof adjacent to said first central opening from well bore fluids;

a second sealing means carried at a different location longitudinally on said body and having a second central opening therein, said second sealing means being adapted for sealing engagement with said well bore to isolate a second portion thereof adjacent to said second central opening from well bore fluids;

actuating means for moving said first and second sealing means into sealing engagement with said well bore to establish communication at said first and second sealing means with connate fluids in earth formations there beyond;

a first sample-collecting means carried by said body and connected by a first sample passageway with said first central opening for receiving samples of connate fluids produced from such formations;

a second sample-collecting means carried by said body and connected by a second sample passageway with said second central opening for receiving samples of connate fluids produced from such formations;

a primary control fluid passage containing a control fluid of known density which is pressure communicative with the connate fluid contained in said first sample passageway;

a secondary control fluid passage containing a control fluid of known density which is pressure communicative with the connate fluid contained in said second sample passageway; and

pressure sensing means for sensing the pressure of said known density control fluid in said primary and secondary control fluid passages and for comparing said pressures to determine a fluid pressure-depth gradient from which the nature of the connate fluid in the earth formations adjacent said formation testing device can be predicted.

4,860,581

DOWN HOLE TOOL FOR DETERMINATION OF FORMATION PROPERTIES

Thomas H. Zimmerman; Julian J. Pop, both of Houston, and Joseph L. Perkins, Sugar Land, all of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Sep. 23, 1988, Ser. No. 248,867
Int. Cl.[4] E21B *49/08*
U.S. Cl. 73—155 **28 Claims**



1. A multi purpose downhole tool for obtaining data regarding formation fluid properties comprising:

formation fluid pulsing means having an inlet positioned to provide fluid communication between the formation fluids and the interior of the tool for selectively creating a pressure transient in the formation fluid zone;

packer means mounted above and below said inlet of said formation fluid pulsing means for sealing off a segment of the bore hole from well fluids located above and below said packer means;

pressure sensing means for detecting a formation pressure transient created by said pulsing means.

4,860,582

METHOD AND DEVICE FOR ASSESSING THE CLOGGING RISKS OF A WELL OR BORE HOLE PASSING THROUGH A POROUS REVERVOIR, MORE PARTICULARLY A GEOLOGICAL FORMATION

Lucien Bourguet, Boulogne-Billancourt, and Claude Gatellier, Boulogne, both of France, assignors to Institut Francais du Petrole, France

Filed Dec. 19, 1986, Ser. No. 943,436
Claims priority, application France, Dec. 26, 1985, 85 19374
Int. Cl.[4] E21B *49/02*
U.S. Cl. 73—155 **5 Claims**



1. A method for assessing the clogging risks of a well or bore hole passing through a porous reservoir, particularly a geological formation, into which a fluid is to be injected or pumped, which comprises obtaining a plurality of samples representative of the material forming the porous reservoir; placing the samples in containers arranged in parallel; maintaining the temperature of the samples within the containers substantially constant; causing controlled amounts of said fluid to flow through the plurality of samples within the containers in parallel; and measuring the loss of permeability of said samples as a function of time.

4,860,583

AIR VELOCITY TRANSMITTER DEVICE

Thomas R. Olson, Chesterton, Ind., assignor to Dwyer Instruments, Inc., Michigan City, Ind.

Filed May 27, 1988, Ser. No. 199,955
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204.15 **2 Claims**



1. An air velocity transmitter unit for providing an electrical output analog signal for measuring and controlling the velocity of an air flow, which signal is linear with respect to such velocity and is independent of the temperature variations of such air flow, said unit comprising:

a thermal anemometer type probe having mounted in same a self regulating bridge circuit that includes in spaced relation longitudinally of said probe a bead thermistor and a chip thermistor,

said probe being ported transversely across same at said bead thermistor and said chip thermistor, respectively, for passage of the air flow therethrough about said bead thermistor and said chip thermistor,

a source of electrical energy,

means for electrically operating said bead thermistor in a self heated mode at a constant predetermined temperature from said energy source to provide a nonlinear thermistor signal in proportion to the velocity and the difference in temperature between that of the bead thermistor and the ambient temperatures of the air flow,

means for operating said thermistor from said energy source to provide a signal for canceling out from the thermistor signal the effect on same of the ambient temperatures of the air flow,

and means for converting said nonlinear signal to said linear signal,

said operating means for said bead thermistor, said operating means for said chip thermistor, and said converting means are contained in a housing separate from said probe, with said probe being electrically connected to said electrically operating means by flexible connector means,

said converting means comprising:

means for adjusting said nonlinear thermistor signal for gain and offset to provide a corrected nonlinear thermistor signal,

and including linearizer circuit means to which the corrected nonlinear thermistor signal is applied including,

an analog to digital converter for changing said corrected nonlinear thermistor signal an eight bit nonlinear digital signal,

an eprom that receives the eight bit nonlinear digital signal and has an output signal that is linear with such velocity,

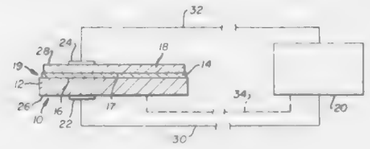
and a digital to analog converter that receives the eprom output signal and includes means for controlling the gain and zero setting for said unit output.

4,860,584

COMPOSITE MOISTURE SENSING APPARATUS AND METHOD

William C. Mercer, Brookfield, Conn.; Peter K. Coughlin, Yorktown Heights, N.Y.; Donald McLeod, Jr., Briarcliff Manor, N.Y., and Edith M. Flanigen, White Plains, N.Y., assignors to UOP, Des Plaines, Ill.

Filed Jun. 29, 1988, Ser. No. 213,239
Int. Cl.[4] G01N *1/00*
U.S. Cl. 73—336.5 **70 Claims**



1. A moisture sensing element comprising an electrically continuous article comprising a multi-compositional, multiphase composite composition comprising as phases thereof (i) an electrically conducting or semiconducting substrate, (ii) an inorganic oxide composition layer in proximity to at least a portion of the surface of said electrically conducting or semiconducting substrate and (iii) an inorganic crystalline molecular sieve composition layer upon at least a portion of the surface of said inorganic oxide composition layer, wherein the different phases of the composite composition are substantially contiguous and exhibit at least one of a distinct compositional heterogeneity and a distinct structural heterogeneity of one phase to the other; and at least one electrode affixed to said article in current carrying relationship so that the current carried by said electrode passes through at least a portion of said inorganic molecular sieve crystalline composition layer.

10. The element of claim 1 wherein said inorganic crystalline molecular sieve composition layer is a molecular sieve selected from the group consisting of zeolitic molecular sieves, silica molecular sieves or non-zeolitic molecular sieves and mixtures thereof.

13. The element of claim 10 wherein said molecular sieve is selected from the group consisting of an A-type zeolitic molecular sieves, X-type zeolitic molecular sieves, Y-type zeolitic molecular sieves, L-type zeolitic molecular sieves, F-type zeolitic molecular sieves, W-type zeolitic molecular sieves, LZ-202, LZ-105 and mixtures thereof.

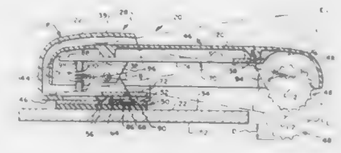
15. The element of claim 10 wherein said molecular sieve is a silica molecular sieve selected from the group consisting of silicalite, silicalite II, fluoride silicalite and mixtures thereof.

4,860,585

MEASURING AND INDICATING DEVICE FOR A SNOW SKIER

William W. Tuya, 449 Lakewood Pkwy., Snyder, N.Y. 14226, and Richard R. Tuya, 14 Eagan Blvd., Rochester, N.Y. 14623

Filed Jan. 4, 1988, Ser. No. 140,581
Int. Cl.[4] G01P *3/16*
U.S. Cl. 73—493 **22 Claims**



2. A measuring and indicating device for use by the rider of a vehicle such as a ski or the like which slides across an underlying surface in a forward direction; said device comprising:

support means adapted to be attached to the vehicle of the rider;

roller means connected to the support means for rotational movement relative thereto and supported thereby so that when the support means is operatively attached to the vehicle and the vehicle is moved in a forward direction across the underlying surface, the roller means will rotate in rolling engagement with the surface;

signal generating means supported by the support means adjacent the roller means for sensing the rotation thereof and generating signals corresponding to the sensed rotation;

sending means associated with the signal generating means for sending the signals generated thereby;

an indicator unit including calculator means for receiving the signals sent by the sending means and calculating a predetermined characteristic of travel of the vehicle corresponding to the received signals, the indicator means further including display means associated with the calculator means for informing the rider of the calculated characteristic; and

biasing means between the vehicle and the support means for biasing the roller means into engagement with the underlying surface when the vehicle is in contact therewith to enhance the rolling engagement between the underlying surface and the roller means as the roller means is moved across the underlying surface;

wherein said support means includes the bracket member being mounted on the vehicle, the roller means being journalled within said level member for rotation relative thereto, and said lever member being pivotally attached to the bracket member for pivotal movement of said lever member and roller means between a raised position in relation to the vehicle and a lowered position in relation to

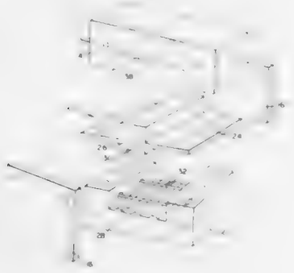
the vehicle, and wherein said biasing means is associated with said bracket member and said lever member for biasing the roller means from the raised position to the lowered position so that if the vehicle is raised or lowered between a position at which the vehicle is in contact with the underlying surface and a elevated position above the underlying surface, the roller means maintains the rolling contact with the underlying surface.

4,860,586

FIBEROPTIC MICROBEND ACCELEROMETER

David R. Miers, Hamburg, N.J.; David Raj, Alliance, Ohio, and Deepak Varshneya, Delmar, Calif., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 20, 1988, Ser. No. 146,052
Int. Cl.[4] G01P *15/08*
U.S. Cl. 73—517 R 5 Claims



1. An accelerometer, comprising:
a base having a first corrugated surface with a plurality of spaced apart teeth thereon;
an inertial mass having a second corrugated surface with a plurality of spaced teeth thereon;
a diaphragm connected to said base and carrying said inertial mass with said first and second corrugated surfaces facing each other and said teeth of said inertial mass being offset with respect to said teeth of said base;
an optical fiber extending between said corrugated surfaces and being clamped between said teeth of said inertial mass and said base, said inertial mass moving with respect to said base when said base is subjected to acceleration to bend said optical fiber between said teeth thereby causing light passing through said optical fiber to change in intensity; and
a cover connected to said base and extending over said inertial mass, said base and cover together defining a hermetically sealed chamber containing said inertial mass.

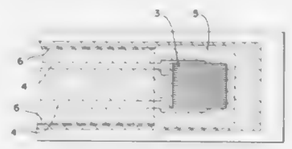
4,860,587

STRESS GAUGE

Carl E. Keller, P.O. Box 8413, Santa Fe, N. Mex. 87504

Filed May 31, 1988, Ser. No. 200,419
Int. Cl.[4] G01N *1/18*
U.S. Cl. 73—774 2 Claims

1. An electrical stress gauge comprising:
a. a stress sensor material which generates a voltage proportional to applied stress;
b. electrical insulating means surrounding said sensor;
c. a closed housing surrounding said sensor and insulating means;
d. a flat jack positioned with said housing and overlying said sensor in closely spaced parallel relation, thereto,
e. conduit means extending through said housing and affording connection of a source of pressurized fluid to said flat jack for uniaxial loading of said sensor; and



f. conductive means extending through said housing affording electrical connection to said sensor.

4,860,588

DEVICE FOR MEASURING WEATHERSTRIP TORSIONAL RIGIDITY

Stephen St. Angelo, Rochester Hills, and John J. Lucci, Lansing, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 11, 1988, Ser. No. 255,262
Int. Cl.[4] G01N *3/26*
U.S. Cl. 73—794 6 Claims



1. A device for measuring the torsional rigidity of a motor vehicle weatherstrip of the type which tends to twist upon bending about its longitudinal axis, comprising:
means gripping the weatherstrip at spaced apart points along the longitudinal axis of the weatherstrip and operable to bend the weatherstrip about its longitudinal axis so that the weatherstrip tends to twist;
indicator means indicating that the weatherstrip has experienced a predetermined degree of twist;
and read out means readable to identify the extent of bending of the weatherstrip causing the predetermined degree of twist to provide a measure of the torsional rigidity of the weatherstrip.

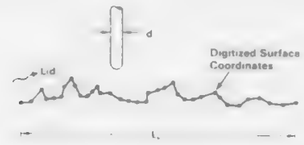
4,860,589

PROCEDURE FOR ESTIMATING FRACTURE ENERGY FROM FRACTURE SURFACE ROUGHNESS

Ralph E. Williford, Kennewick, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Filed Dec. 10, 1987, Ser. No. 130,869
Int. Cl.[4] G01N *19/08*
U.S. Cl. 73—799 2 Claims

1. A method of determining the fracture energy of a piece of material having a fractured surface comprising measuring the length of the profile of a section through said fracture surface taken on a plane perpendicular to the mean plane of said fractured surface, determining therefrom the fractal dimensionality of the surface and determining the fracture energy from said



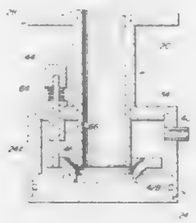
fractal dimensionality, the yield strength of said material and Young's Modulus of said material.

4,860,590

PRIMARY STANDARD GAS FLOW CALIBRATOR

Albert P. Buck, 3139 S. Orange Ave., Orlando, Fla. 32806

Filed Dec. 9, 1986, Ser. No. 939,758
Int. Cl.[4] G01F *1/708, 25/00*
U.S. Cl. 73—861.05 9 Claims



1. A primary standard gas-flow meter comprising:
(a) a tube having an inner surface, an outer surface, a first end and a second end;
(b) a reservoir for containing a film-forming fluid, said reservoir being connected to the first end of said tube and having a least one inlet port for admitting as to said tube;
(c) return means for returning the film-forming fluid to said reservoir through said tube for wetting said inner surface of said tube and for existing gas from said tube;
(d) a ring in sliding contact with said tube adjacent the first end thereof, said ring being dimensioned to slide into fluid contained within said reservoir; and
(e) means extending outwardly of said tube and connected to said ring for imparting sliding motion of said ring into and out of said reservoir, said ring being effective to establish a single film extending across the first end of said tube when said ring moves out of the film-forming fluid in said reservoir so that the film is positioned to respond to gas flow into said reservoir by moving through said tube at a speed proportional to the rate of gas flow.

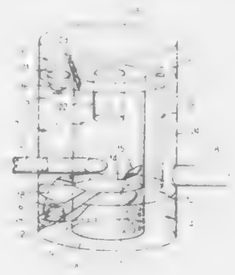
4,860,591

GAS-LIQUID SEPARATION AND FLOW MEASUREMENT APPARATUS

Emmanuel Garland, St. Gaudens, France, assignor to Societe Nationale Elf Aquitaine (Production), La Defense, France

Filed Jan. 26, 1988, Ser. No. 148,649
Claims priority, application France, Jan. 26, 1987, 87 00854
Int. Cl.[4] G01F *1/08*
U.S. Cl. 73—861.04 2 Claims

1. A two-phase separator-counter for continuously measuring the respective quantities of gas and liquid in a dynamic flow of a gas-liquid mixture, in which a gas-liquid mixture delivered by a feed pipe is divided into a gas stream and a liquid stream, the rate of flow of the gas stream and of the liquid stream is measured, and the gas stream and liquid stream are then collected in a common single discharge pipe, comprising:
a vertical-axis vortex enclosure into a central portion of which tangentially opens a feed pipe for delivering a dynamic flow of a gas-liquid mixture, said vortex enclosure subjecting the gas-liquid mixture flow to a gravity separation,
a verticular annular collecting chamber surrounding the vortex enclosure
a flat cylindrical gas collecting chamber provided atop the top end of the vortex enclosure and having a diameter the same as that of the verticular annular collecting chamber, the gas collecting chamber being separated from the vertical annular collecting chamber by a first horizontal partition wall, the vortex enclosure opening at its top end into said gas collecting chamber,
a flat cylindrical liquid collecting chamber provided below the bottom end of the vortex enclosure and having a



diameter the same as that of the vertical annular collecting chamber, the liquid collecting chamber being separated from the vertical annular collecting chamber by a second horizontal partition wall, the vortex enclosure opening at its bottom end into said liquid collecting chamber,
a gas passage piercing the first horizontal partition wall for communicating the gas collection chamber with the vertical annular collection chamber, a gas flow measurement turbine being provided in the gas passage,
a liquid passage piercing the second horizontal partition wall for communicating the liquid collection chamber with the vertical annular collection chamber, a liquid flow measurement turbine being provided in the liquid passage,
a drainage pipe passing through the vertical annular collecting chamber and communicating a bottom portion of the gas collection chamber with a top portion of the liquid collection chamber, and
a discharge pipe opening laterally into the vertical annular collecting chamber proximate a base thereof.

4,860,592

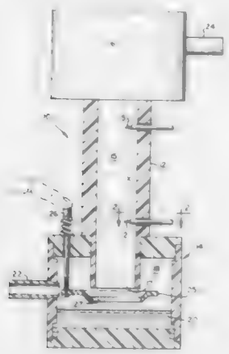
SOAP FILM GAS FLOW MEASURING DEVICE

Bernard Van Emden, Florham Park, and Roman Stobnicki, Haldon, both of N.J., assignors to Gilian Instrument Corp., Wayne, N.J.

Filed Dec. 16, 1987, Ser. No. 133,614
Int. Cl.[4] G01F *1/708*
U.S. Cl. 73—861.05 4 Claims

1. A soap film gas flow measuring device comprising a flow tube having a hollow body with an open bottom and top end, respectively; a first closed chamber housing a soap solution, with the open bottom end of the flow tube mounted in the first chamber; a second closed chamber into which the open top end of the flow tube extends; gas inlet means extending into the first chamber for introducing gas at a flow rate to be measured by said flow measuring device; gas exit means extending into the second chamber for discharging the gas; means for generat-

ing a soap film from said soap solution and transferring it to the bottom end of the flow tube and means for electronically detecting the presence of said soap film as it passes two selected locations along the flow tube wherein said electronic means comprises a first set of at least three electrically insulated wire conductors extending a predetermined minimum stick out distance through the hollow body of said flow tube at a first position above the flow tube with each wire electrode protruding from its insulator, a second set of at least three electrically insulated wire conductors extending a predeter-



mined minimum stick out distance through the hollow body of said flow tube at a second position above the flow tube, with each wire electrode protruding from its insulator and with said second set of electrodes spaced a predetermined distance from the first position; circuit means for detecting a predetermined drop in conductivity between said first set of conductors corresponding to when said soap film crosses said first set of conductors and circuit means for detecting a predetermined drop in conductivity between said second set of conductors corresponding to when said soap film crosses said second set of conductors.

4,860,593

ULTRASONIC DEVICE FOR MEASURING THE RATE OF FLOW OF FLUID IN A DUCT

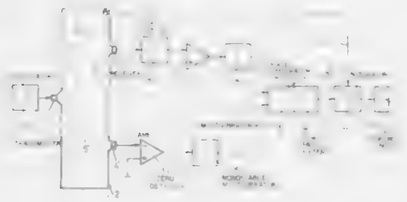
Roberto de Concini, Zola Predosa, and Massimo Brighi, Bologna, both of Italy, assignors to Weber s.r.l., Turin, Italy

Filed Dec. 29, 1987, Ser. No. 139,184

Claims priority, application Italy, Dec. 30, 1986, 67982 A/86

Int. Cl.[4] G01F *1/66*

U.S. Cl. 73—861.29 **11 Claims**



1. An ultrasonic device for measuring the rate of flow of fluid in a duct (2.2') characterized by the fact that it comprises, disposed in diametrically opposite positions in the said duct:

an ultrasonic signal transmitter (3) and respectively two ultrasonic signal receivers (4.4') operating simultaneously and in which the signal paths (5.5') extending respectively between the receivers (4.4') and the transmitter (3) form respective predetermined angles of inclination (θ, $-\theta$) with respect to the axis of the said duct (2.2'); and including electronic means (15, 21) which receive signals provided by the said receivers (4,4'), and produce therefrom a first signal (20) dependent on the phase difference between the signals received by the said receivers (4, 4'), the said electronic means processing the said first signal (20) together with a second received signal (22) proportional to the pressure of the fluid in the said duct (2, 2') to provide an output signal (25) indicative of the mass flow rate of fluid in the duct (2, 2'), said duct including a pair of axially extending facing walls (30) disposed in the said duct (2') delimiting the section of the duct in which the said signal paths (5, 5') extending between the said receivers (4, 4') and the transmitter (3) are contained.

4,860,594

APPARATUS AND METHOD FOR MEASURING MASS FLOW AND DENSITY

Gary C. Hammond, Bancroft; George A. Corser, and Dale P. Eddy, both of Flint, all of Mich., assignors to GMI Engineering & Management Institute, Flint, Mich.

Filed Mar. 1, 1988, Ser. No. 162,650

Int. Cl.[4] G01F *1/42*

U.S. Cl. 73—861.42 **33 Claims**



1. A meter to measure flow, comprising:

a thin wall tube having an inlet and an outlet and a central region therebetween which deforms circumaxially and longitudinally proportional to fluid flow, said tube central region provided with a first zone of diameter D_1, having a wall thickness of T_1, and a second zone of diameter, D_2, having a wall thickness of T_2, wherein D_1 and D_2 are substantially different; and

sensor means to measure the distortion of the central region wall caused by the fluid flow to provide a deformation signal from which flow may be determined.

4,860,595

APPARATUS FOR ADJUSTING A SAFETY SKI BINDING

Jacques Epitaux, Route de Genève 82, 1004 Lausanne, Switzerland

Filed Aug. 2, 1988, Ser. No. 227,294

Claims priority, application Switzerland, Aug. 11, 1987, 3090/87

Int. Cl.[4] G01L *5/03*

U.S. Cl. 73—862.02 **11 Claims**

1. Apparatus for adjusting a safety ski binding, comprising:

a support with means for rigidly fixing a ski to said support.

A foot-simulating device intended to be introduced and fixed in a ski boot mounted in a ski binding which belongs to said ski, said device including an upright,

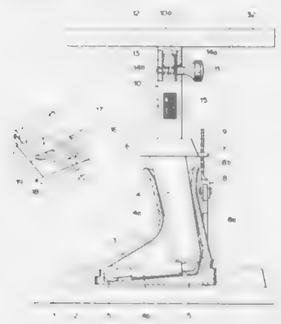
means for applying stress to said upright according to a plurality of different stress modes, said means for applying stress to said upright comprising:

an elongated stress-transmission element having a first end integral with said upright, a second end formed as a coupling part and a central portion between said ends, arranged for undergoing resilient deformations as a function of said stresses applied to said upright; and

a stress creating means connectable to said coupling part

according to a plurality of different ways for imparting stresses to said upright in different ranges corresponding to said different stress modes, said stresses imparting to said central portion, in each of said stress modes, resilient deformations in a corresponding range of deformations;

and said apparatus further comprising measuring means



including means for commutation between a plurality of functioning modes, each of which corresponds to another one of said stress modes, and able in each functioning mode to provide information on the stresses applied to the upright, said information being responsive to measurements by said measuring means of the deformations imparted to said central portion in the corresponding stress mode.

4,860,596

MOTOR OPERATED VALVE ANALYSIS AND TESTING SYSTEM WITH MONITORING OF SPRING PACK MOVEMENT THROUGH TORQUE SWITCH POST

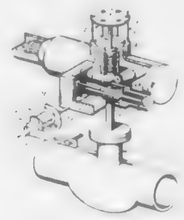
Arthur G. Charbonneau; John A. McMennamy, both of Marietta, and Steven Nafziger, Gwinnett, all of Ga., assigaors to NSS of Delaware, Inc., Campbelltown, Pa.

Continuation of Ser. No. 816,749, Jan. 7, 1986, Pat. No. 4,735,101. This application Jun. 25, 1987, Ser. No. 66,721

The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.

Int. Cl.[4] G01M *19/00;* **G01P** *13/00;* **G01L** *5/00*

U.S. Cl. 73—862.32 **2 Claims**



1. In combination, a valve operation, wherein said valve operator includes a driven worm shaft, which in turn drives a worm which in turn drives a worm gear which in turn drives a valve stem to open and close a valve attached to the valve stem, wherein said worm develops axial movement in response to a load acting on said valve stem, a spring pack provided at one end of said worm shaft for compression by axial movement of said worm, axial movement of the worm being thereby related to spring pack movement, a rack movable with said worm as it compresses said spring pack, a gear member driven by said rack, and a post member protruding from said gear member for rotation about a central longitudinal axis thereof as said gear member is driven by said rack; means for detecting the rotational movement of said post member; means for measuring said detected rotational movement of said post member; and means for correlating said detected rotational movement of said post member with the load on said valve stem.

4,860,597

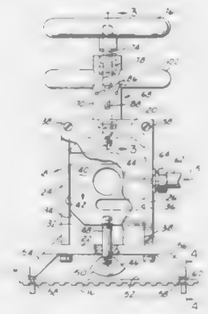
BELT TENSION TESTER

Anthony J. Fenech, Flat Rock, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 31, 1988, Ser. No. 264,923

Int. Cl.[4] G01L *5/04*

U.S. Cl. 73—862.45 **9 Claims**



1. A gauge for measuring the tension of an elongated flexible belt element, comprising: frame means defining a hollow interior and having spaced side wall portions, upper and lower end wall portions and front and rear walls; a load cell in the hollow interior, the load cell being supported between the side wall portions and so configured to permit the cell to be moved between the upper and lower wall portions; a belt contact member being operatively attached to and movable with the load cell and positioned adjacent the lower wall portion of the frame means; a pair of arms extending from the lower wall portion of the frame means for engaging and supporting the belt at spaced intervals on either side of the contact member; means including a shaft attached to the load cell and extending outward from the upper wall portion of the frame for manually moving the load cell and its attached belt contact member from a first position out of contact with the belt to a second position contacting the belt, thus subjecting the load cell to a force; a releasable catch means and a shaft detent means operative to capture the downward second position of the shaft.

4,860,598

AIR-STREAM SAMPLING DEVICE

Christian E. Bailey, Port Deposit, Md., and John J. Bowser, Wilmington, Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Mar. 26, 1985, Ser. No. 716,361

Int. Cl.[4] G01N *1/22, 1/20*

U.S. Cl. 73—863.33 **7 Claims**

1. A device for sampling a small representative fraction of a laminar flow air stream to be monitored for the presence of particles in a clean room environment, said device comprising:

(a) a gridwork of a plurality of sampling tubes evenly spaced apart, each said sampling tube connected to a single outlet tube, said gridwork having a size and configuration selected to minimize any diversion of said air stream from its original path, said sampling tubes having a multiplicity of regularly spaced orifices therein, said orifices being of substantially smaller size than the interior bores of said sampling tubes, and each orifice being capable of drawing equally from said air stream;

(b) means for drawing a sample of air from said air stream through said orifices; and



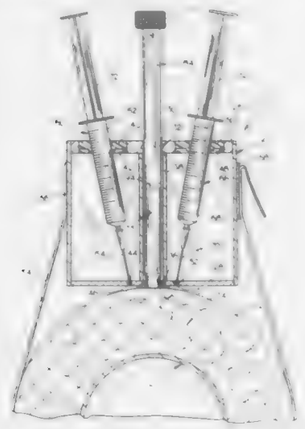
(c) means to analyze the particles in said sample drawn from said air stream.

4,860,599

APPARATUS FOR SAMPLING HAZARDOUS MATERIALS

Steven C. Griffis, 2929 Avenue D, Council Bluffs, Iowa 51501

Filed Feb. 10, 1989, Ser. No. 308,821
Int. Cl.[4] G01N *1/04, 1/08*
U.S. Cl. 73—864.45 9 Claims



1. A device for taking bulk samples of possible hazardous materials, comprising,

a housing means having upper and lower ends and an interior compartment therebetween,

a first opening formed in the upper end of said housing means and having a first sealing means extending therearound,, a second opening formed in the lower end of said housing means and having a second sealing means extending therearound, said second opening being positioned directly below said first opening,

an elongated cylindrical handle means having upper and lower

ends and structured to be extended downwardly through said first opening,

an elongated hollow sampling tube selectively removably secured to the lower end of said handle means and having a lower end located such that it will be extended downwardly to penetrate the material being sampled such that the material will be forced into the interior of said sampling tube for subsequent removal,

a third opening formed in the upper end of said housing means at one side of said first opening and having an annular sealing means extending therearound for sealably engaging the barrel of a first syringe,

a fourth opening formed in the lower end of said housing means at one side of said second opening,

a fifth opening formed in the upper end of said housing means at the other side of said first opening and having an annular sealing means extending therearound for sealably engaging the barrel of a second syringe,

a sixth opening formed in the lower end of said housing means at the other side of said second opening,

a first syringe removably mounted in said housing means such that its barrel is sealably engaged by the annular sealing means in said third opening and such that its needle, may extend through said fourth opening for penetration into the material being sampled so that at least a portion of the contents thereof may be injected into the material around the area where the sample is to be taken by the sampling tube,

a second syringe removably mounted in said housing means such that its barrel is sealably engaged by the annular sealing means in said fifth opening and such that its needle may extend through said sixth opening for penetration into the area from which the sample has been taken so that at least a portion of the contents of said second syringe may be injected into said area

a wetting solution contained in said first syringe for wetting the area around the sampling location prior to the sample being taken,

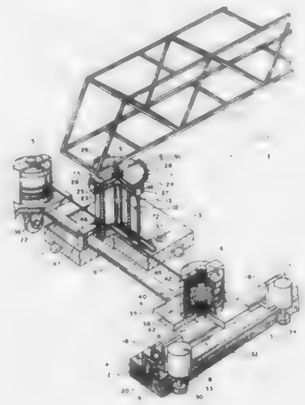
and an encapsulating solution contained in said second syringe for encapsulating the area around the sampling location after the sample has been taken.

4,860,600

THREE DEGREE OF FREEDOM MICRO-GRAVITY SIMULATOR

Larry L. Schumacher, 18876 Tenderfoot Trail, Newhall, Calif. 91321

Continuation-in-part of Ser. No. 40,060, Apr. 20, 1987, abandoned. This application Dec. 7, 1987, Ser. No. 129,700
Int. Cl.[4] B64G *7/00*
U.S. Cl. 73—865.6 20 Claims



1. A mechanism for eliminating all forces orthogonal to the gravity vector on a test object comprising:

a reference plane structure orthogonal to the gravity vector;

a test object support means supporting test object weight above said reference plane structure;

means to permit test object translation free of test object support means acceleration forces parallel to said reference plane structure;

means to transform test object translation relative to test object support means, and parallel to said reference plane structure, into measurable electrical characteristics proportional to an amount of test object translation;

means to transform said measurable electrical characteristics into said test object support means translation signals;

means to translate said test object support means parallel to said reference plane structure;

means to eliminate effects of mechanical backlash and friction from said means to translate said test object support means; said test object support means being translated away from any measurable translation of said test object parallel to said reference plane eliminating forceful contact with said test object orthogonal to the gravity vector.

4,860,601

APPARATUS FOR DETERMINING A ROTATION CENTER OF A ROTATING BODY

Hiroki Shibata; Atsushi Toda; Kazuki Takahashi, and Kiyoshi Wada, all of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 2,947, Jan. 13, 1987, abandoned. This application Jul. 5, 1988, Ser. No. 217,062
Claims priority, application Japan, Jan. 14, 1986, 61-4352; Jan. 14, 1986, 61-4353; Sep. 26, 1986, 61-225795
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 73—865.8 1 Claim



1. A device for determining a rotational angular center of a rotary body rotating in cooperation with a steering wheel of a vehicle, said rotary body having a rotational angular position defined to be a rotational angular center when said vehicle is traveling in a straight line, said rotary body being free to rotate through the same amount on both the clockwise and counterclockwise sides of said rotational angular center, comprising:

sensor means for sending the rotation of said angular rotary body;

counter means for inputting an output from said sensor means to respectively increment and decrement counts according to the clockwise and counterclockwise rotations of said rotary body through a complete revolution;

first decoder means for decoding a count value output from said counter means to output the decoded count value as rotational angular information;

second decoder means provided with a first output terminal and a plurality of secondary output terminals for decoding said count value output from said counter means to output the decoded count value thereof from said first output terminal and said secondary terminals, said decoded count value being output on one of said secondary terminals when said output from said counter means is different from zero; and

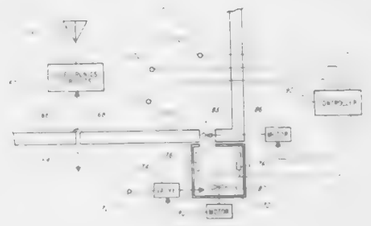
logic circuit means which is inoperative when a signal output of high level appears at said first output terminal and which produces a signal for resetting said counter means when a logic signal output appears at any one of said secondary output terminals.

4,860,602

RF TRANSPARENT THERMAL TEST CHAMBER

Edward E. Hines, Palm Bay; Lee J. Royer, Satellite Beach; Thomas D. Jehring, Palm Bay; William E. Faulkenberry, Palm Bay; Norvan J. Posey, Palm Bay, and Joseph T. Richeson, Melbourne, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed May 18, 1988, Ser. No. 195,229
Int. Cl.[4] G01M *19/00;* G01N *25/00*
U.S. Cl. 73—865.9 6 Claims



1. A thermal test chamber for testing an antenna over a predetermined temperature range, comprising:

a shell of thermal insulating non-RF reflective material for enclosing the antenna;

a window portion in said shell, wherein said window portion is constructed of a material that provides thermal insulation and is substantially transparent to RF energy; and

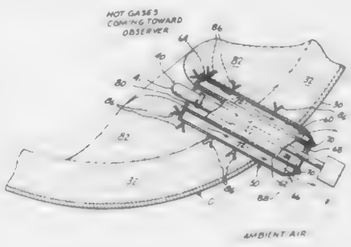
means for controlling the temperature within said shell.

4,860,603

COVECTION COOLING PROBE MOUNTING JACKET

Fabio Russoniello, 4520 Stine Rd., Suite 7, Bakersfield, Calif. 93313

Filed Dec. 5, 1988, Ser. No. 280,709
Int. Cl.[4] G01L *19/04*
U.S. Cl. 73—866.5 16 Claims



1. In an enclosed subject environment containing media having an operation temperature higher than the temperature of a substantially gaseous ambient environment in connection with a probe for measuring some aspect of the subject environment, an apparatus for protecting the probe from heat damage comprising:

a probe housing at least partially within the subject environment for housing the probe;

a convection housing at least partially within the subject environment for housing the portion of the probe housing within the subject environment and defining a convection space there between which is substantially closed to the subject environment and at least partially open to the ambient environment through areas defining openings from the defined convection space to the ambient environment which are adapted to substantially allow the free

flow of gases between the defined convection space and the ambient environment;

the higher temperature of the subject environment relative to the ambient environment causing gas convection currents to flow from the defined convection space to the ambient environment and protecting the probe from heat damage.

4,860,604

STARTER

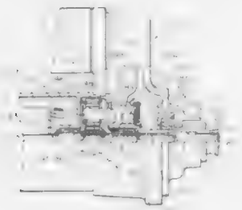
Takashi Kinoshita, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1988, Ser. No. 166,038

Claims priority, application Japan, Mar. 10, 1987, 62-55929

Int. Cl.[4] F02N *15/06*

U.S. Cl. 74—7 E **12 Claims**



1. A starter comprising:

a motor having an armature rotary shaft which includes an extended shaft portion having a distal end, and a motor casing within which is supported at least said armature rotary shaft;

an epicyclic gear reduction train means coaxially disposed about and intermeshed with said armature rotary shaft;

an overrunning clutch means coaxially and slidably disposed about said armature rotary shaft;

a tubular primary output shaft means coaxially disposed about said armature rotary shaft for coupling between said epicyclic gear reduction train means and said overrunning clutch means;

a pinion gear means disposed coaxially with said armature rotary shaft;

a tubular secondary output shaft means having a proximal end and distal end for coupling between said overrunning clutch means and said pinion gear means, said tubular secondary output shaft means rotatably and coaxially attached at its proximal end about said armature rotary shaft and extending in the axial direction from and beyond the distal end of said armature rotary shaft;

a bearing means disposed intermediate the secondary output shaft and the motor casing to enable rotary support of as well as axial sliding of the secondary output shaft within a predetermined range; and

shift means for applying axial force to cause said overrunning clutch to slide.

4,860,605

APPARATUS AND SYSTEM FOR CONVERTING PIVOTING MOTION TO AN AXIAL DISPLACEMENT

Armin Olschewski, Schweinfurt; Armin Schlereth, Wasserlosen-Gressthal, and Paul-Gerhard Hoch, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Apr. 7, 1988, Ser. No. 178,619

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1987, 3713245

Int. Cl.[4] F16H *21/44, 21/54, 25/18*

U.S. Cl. 74—99 R **9 Claims**



1. Device for producing an axial displacement of two opposing relatively rotatable thrust members, comprising a plurality of conical rolling elements installed between the thrust members which roll on angled ramps and thus change the distance between the thrust members, at least one of the thrust members (3, 4) having a conical race; and a loose outside flange designed as a closed, flexible ring (16, 22, 24, 27, 31) having a continuous uninterrupted inner face confronting the outer axial end faces of the rollers, circumscribing the rollers which absorbs the radial forces proceeding from the loaded conical rollers (14) and exerts a binding effect on the conical rollers (14).

4,860,606

RATCHET APPARATUS WITH HAND TRUCK ASSEMBLY

Kenneth E. Rousseau, Wichita, Kans., assignor to Harper Truck, Inc., Wichita, Kans.

Filed May 23, 1988, Ser. No. 197,669

Int. Cl.[4] F16D *41/16;* **B60P** *7/08;* **B62B** *1/06*

U.S. Cl. 74—157 **4 Claims**



1. A ratchet apparatus mounted on a hand truck assembly adapted to rotate an article connector assembly having a connector belt member mounted on a connector shaft, comprising:

(a) a ratchet housing assembly mounted on a support plate and having a connector shaft rotatably connected thereto;

(b) a ratchet handle assembly mounted about said connector shaft and pivotal relative to said ratchet housing assembly;

(c) a ratchet actuator assembly including a main actuator assembly and a ratchet drive assembly;

(d) said main actuator assembly includes a ratchet dog assembly connected to said ratchet housing assembly and a ratchet pawl assembly connected to said ratchet handle assembly;

(e) said ratchet drive assembly includes a ratchet gear member mounted on said connector shaft to positively drive same in opposite rotational directions;

(f) said ratchet dog assembly and said ratchet pawl assembly are engagable with said ratchet gear member operable in one selected position to positively rotate said connector shaft in one direction and prevent rotation of said connector shaft in an opposite direction caused by tension on the connector belt member;

(g) said ratchet pawl assembly includes a pawl member pivotally connected to said ratchet handle assembly and engagable with said ratchet gear member to achieve positive rotation of said connector shaft in either direction of rotation;

(h) said ratchet pawl assembly includes a bias assembly engagable with said pawl member to bias same into engagement with said ratchet gear member in either direction of rotation; and

(i) said bias assembly of said ratchet pawl assembly includes a spring member mounted in said ratchet handle assembly engagable with a ball member which, in turn, is engagable with said pawl member to bias same into engagement with said ratchet gear member for positive drive of the connector shaft.

4,860,607

AUTOMATIC TRANSMISSION FOR AUTOMOTIVE VEHICLE

Akio Numazawa, Nagoya; Akira Sato, Susono, and Fumihiro Ushijima, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 19, 1987, Ser. No. 64,134

Claims priority, application Japan, Jun. 20, 1986, 61-145930; Sep. 24, 1986, 61-225644

Int. Cl.[4] F16H *3/08, 5/42, 5/60;* **F16D** *67/00*

U.S. Cl. 74—330 **15 Claims**



1. An automatic transmission for an automotive vehicle, including an input shaft connected to an engine of the vehicle via a primary clutch, an output shaft parallel to said input shaft and operatively connected to drive wheels of the vehicle, a plurality of pairs of gears for transmitting a drive force of the input shaft tot he output shaft at different speed reduction ratios, respectively, at least one shift member for selecting one of said pairs of gears into an operative position, and an actuator device for automatically activating said at least one shift member, comprising:

second clutch means connected to said primary clutch by said input shaft, for engaging said input shaft with said output shaft;

an intermediate shaft operatively connecting said input shaft to said output shaft, said intermediate shaft being provided with one of the gears of each of at least one of said pairs of gears;

a one-way clutch disposed between said intermediate shaft and one of said input and output shafts, said one-way clutch permitting power to be transmitted only in a direction from said input shaft toward said output shaft; and

control means for controlling said actuator device, said primary clutch and said secondary clutch means, said control means operating said actuator device to place said selected one of said pairs of gears in said operative position while holding said primary clutch in a fully engaged position thereof and said secondary clutch means in a partially engaged position thereof.

4,860,608

CONTROL DEVICE FOR A VERTICAL SHAFT TYPE ENGINE

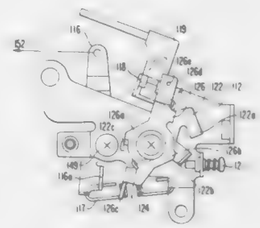
Kazuyuki Kobayashi, Nagoya, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 12, 1988, Ser. No. 143,057

Claims priority, application Japan, Jan. 14, 1987, 62-2878[U]

Int. Cl.[4] F16C *1/10;* **F02D** *11/02*

U.S. Cl. 74—501.6 **8 Claims**



1. In a control assembly for controlling the operation, between stopping and choking, of a vertical shaft type engine to be mounted on a working machine and having an engine stop terminal and a carburetor including a choke valve and a throttle valve, said control assembly comprising a choke lever to be mounted on the engine in operable connection with the choke valve for rotation between a non-choking position and a choking position, a control device to be rotatably mounted on the engine for cooperation with said choke lever, the throttle valve and the engine stop terminal, a Bowden wire including an outer cable to be fixedly mounted on the engine and an inner cable movable relative to said outer cable, said inner cable having a first end connected to said control device and a second end, and a single acceleration control lever connected to said second end of said inner cable and to be mounted on the working machine, the improvement wherein said control device comprises:

a first control lever to be mounted on the engine for rotation in a direction of increasing engine speed between an engine stop position, whereat a portion of said first control lever operates the engine stop terminal to stop the engine, and a highest engine speed rotation position, whereat further rotation of said first control lever is prevented, said first control lever to be operatively connected to the throttle valve to change the engine speed in response to rotation of said first control lever in said direction of increasing engine speed, and said first control lever having an abutment member;

a second control lever having a connecting portion connected to said first end of said inner cable of said Bowden wire, said second control lever to be mounted on the engine for rotation about an axis of rotation in response to manipulation of said single acceleration control lever and having a pair of engaging portions phase-shifted relative to each other by 180° about said axis of rotation and a pair of contact portions phase-shifted relative to each other by 180° about said axis of rotation, said second control lever being rotatable about said axis of rotation in said direction of increasing engine speed between a first position, whereat said abutment member of said first control lever engages a first said engaging portion of said second control lever, and a second position, whereat a first said contact portion of said second control lever moves said choke lever to said choking position, said second position being beyond said highest engine speed rotation position

of said first control lever in said direction of increasing engine speed;

means for, upon said second control lever being rotated in said direction of increasing engine speed from said first position toward said second position, causing said first control lever to rotate with said second control lever between said engine stop position and said highest engine speed rotation position; and

said second control lever being remountable in an alternative orientation with said connecting portion phase-shifted relative to said first control lever by 180° about said axis of rotation, such that said abutment member of said first control lever engages a second said engaging portion of said second control lever at said first position of said second control lever and a second said contact portion of said second control lever moves said choke lever to said choking position at said second position of said second control lever; and

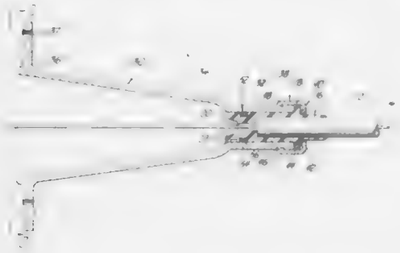
further comprising means for mounting said outer cable of said Bowden wire at four alternative locations, depending on the orientation of said second control lever relative to said first control lever and on the orientation of the engine relative to the working machine.

4,860,609

SEALED ROTATING END FITTING FOR A FLEXIBLE CABLE

Arthur L. Spease, Bloomfield Hills, Mich., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Aug. 31, 1988, Ser. No. 238,418
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—502.4 **9 Claims**



1. A motion transmitting remote control assembly of the type for transmitting forces in a curved path by a flexible motion transmitting core element, said assembly (10) comprising:

a conduit (12);

a flexible motion transmitting core element (14) slideably supported by said conduit;

a connector member (16) fixedly disposed about a portion of said conduit (12), said connector member including a radially extending flange (18);

an end fitting (30) adapted for mating engagement with a portion of said connector member (16), said end fitting (30) engaging said flange (18) when disposed on said connector member (16);

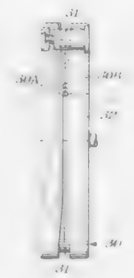
said assembly (10) characterized by retaining means (38) for simultaneously engaging said flange (18) of said connector member (16) and said end fitting (30) and for preventing relative axial movement between said connector member (16) and said end fitting (30) while permitting relative rotational movement therebetween.

4,860,610

WOUND ROTOR ELEMENT AND CENTRIFUGE FABRICATED THEREFROM

Peter Popper, and William E. Velvel, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 684,937, Dec. 21, 1984, abandoned. This application Jan. 27, 1988, Ser. No. 148,190
Int. Cl.[4] F16F *15/22;* **B04B** *5/02*
U.S. Cl. 74—572 **23 Claims**



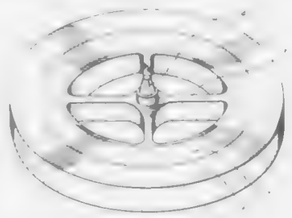
8. An M place centrifuge rotor comprising a tiered stack of N-arms, where N equals one-half M, each arm being a generally elongated member having a major axis, each arm being formed from a plurality of turns of fiber wound in generally parallel side portions connected through curved end turn portions, the fiber in each side portion being generally parallel to the major axis, the height dimension of a side portion of each arm at a point substantially midway along its length being less than the height dimension of the arm at its end turn portions.

4,860,611

ENERGY STORAGE ROTOR WITH FLEXIBLE RIM HUB

Ralph C. Flanagan, 42 Bearbrook Road, Gloucester, Ontario, Canada K1B 3X8, and Jimmy J. Wong, 2409-500 Laurier Avenue West, Ottawa, Ontario, Canada K1R 5E1

Filed Aug. 17, 1987, Ser. No. 86,376
Claims priority, application Canada, Aug. 15, 1986, 516037
Int. Cl.[4] F16F *15/10*
U.S. Cl. 74—574 **5 Claims**



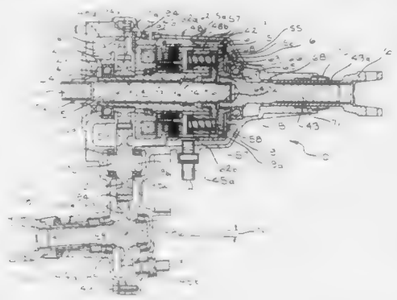
1. An energy storage rotor comprising a unitary metallic hub defining a center of rotation, said hub having a plurality of spaced apart spokes and a continuous rim to which said spokes are integrally connected at spaced apart locations, and a composite ring surrounding said rim, wherein said rim is in a tight interference fit with the composite ring at rest and behaves essentially as a solid body at lower rotational speeds, and wherein those portions of the rim disposed between said spokes are adapted to deflect radially outwardly under the influence of centrifugal force when in use at higher rotational speeds so as to follow the centrifugal force-induced radial expansion of the composite ring surrounding the rim such that at said higher rotational speeds portions of said composite ring can lift away from the rim of the hub at said locations where said spokes are connected to said rim and so that a tight fit between the rim and the ring is maintained at all operating speeds of the rotor and further wherein said rim portions between said spokes define respective radially inwardly directed curved surface portions each having a center of curvature which is located radially outwardly of said center of rotation such that each of said rim portions becomes thinner toward a central portion between adjacent said spokes.

4,860,612

VEHICLE TORQUE TRANSFER CASE FOR A FOUR WHEEL DRIVE SYSTEM

Wesley M. Dick, and David C. Reuter, both of Fort Wayne, all of Ind., assignors to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 718,748, Apr. 1, 1985, Pat. No. 4,688,447. This application Aug. 25, 1987, Ser. No. 89,283
Int. Cl.[4] F16H *37/08*
U.S. Cl. 74—665 H **19 Claims**



1. A four wheel drive system for a vehicle having front and rear drive wheels and an engine and transmission assembly for providing a supply of output torque, said system comprising:

a torque transfer unit including a torque input shaft for receiving output torque from the vehicle engine and transmission assembly, a front output shaft, a rear output shaft, and means for drivingly connecting said torque input shaft to said front and rear output shafts;

said front output shaft having a rotational axis which is oriented in a non-parallel, non-intersecting relationship with the rotational axis of said rear output shafts;

said rotational axis of said front output shaft and said rotational axis of said rear output shaft cooperating to define skew lines;

a rear differential connected to drive the vehicle rear wheels and having a rear input shaft positioned lower than said rear output shaft of said torque transfer unit;

a rear drive shaft connected between said rear output shaft and said rear input shaft and angled downwardly from said rear output shaft to said rear input shaft;

said rear output shaft and said rear input shaft being oriented such that when the vehicle is loaded with a predetermined weight the angle between said rear drive shaft and said rear output shaft is substantially equal to the angle between said rear drive shaft and said rear input shaft;

a front differential having a front input shaft and connected to drive the vehicle front wheels;

a front drive shaft connected between said front output shaft of said transfer unit said front input shaft of said front differential; and

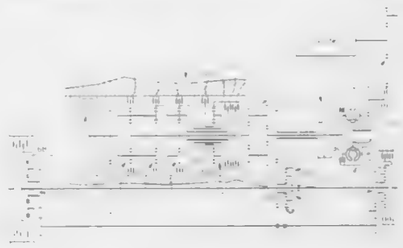
said front output shaft and said front input shaft being oriented such that when the vehicle is loaded with said predetermined weight the angle between said front drive shaft and said front output shaft is substantially equal to the angle between said front drive shaft and said front input shaft.

4,860,613

STEER-BY-DRIVING TRANSMISSION WITH GROUND SPEED CONTROL

Arthur Hall, III, Indianapolis, and Robert F. Combs, Mulberry, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 14, 1988, Ser. No. 284,019
Int. Cl.[4] F16H *47/08, 47/04*
U.S. Cl. 74—687 **1 Claim**



1. An improvement in single input, dual output transmissions having a pair of planetary gear output units, a range gear unit selectively connectible with the input and including an output means drivingly connected with both of the planetary gear output units for delivering an input rotation thereto, a hydraulic steer mechanism including a variable ratio hydraulic drive unit and a gearing unit and a steer shaft drivingly connected with both of the planetary gear output units in a manner to impose equal and opposite forces on the planetary output gear units, the ratio of said variable drive unit being established by an operator; said improvement comprising means for selectively connecting said variable ratio drive unit with said steer shaft; and means for selectively connecting said variable ratio hydraulic drive unit with said output means for connecting the variable ratio drive unit to drive said planetary gear output units at a speed proportional to the ratio established by the operator in the variable ratio hydraulic drive unit and said steer shaft connections establishing a reaction in each said planetary gear output unit.

4,860,614

TRANSMISSION DIFFERENTIAL

Alan J. Erdmann, and Ralph E. Shirley, both of Waterloo, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 26, 1988, Ser. No. 226,336
Int. Cl.[4] F16H *1/40*
U.S. Cl. 74—710 **7 Claims**

1. A transmission differential comprising:

a case mounted for rotation about a main axis;

first and second output shafts received by the case and rotatable about the main axis;

first and second bevel sun gears, each being non-rotatably mounted on a corresponding one of the output shafts;

a plurality of planet pin members, each pin member received by an aperture in the case and extending perpendicular to the main axis;

a plurality of bevel planet gears, each rotatably mounted on a corresponding one of the pin members in meshing engagement with the first and second bevel sun gears; and

a central member positioned between the output shafts, the central member and each planet pin member having portions engageable with each other to prevent rotation of each planet pin member.

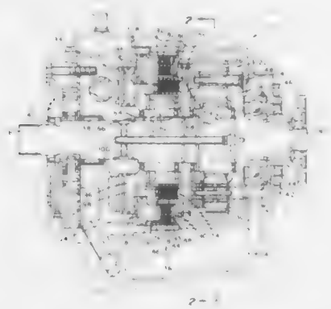


4,860,615

REVERSIBLE TRANSMISSION

Thomas V Huber, Franklin, and Ronald D. Hone, Fairview, both of Tenn., assignors to DNE Corporation, Brentwood, Tenn.

Filed Nov. 12, 1987, Ser. No. 119,661
Int. Cl.[4] F16H *3/44*
U.S. Cl. 74—785 16 Claims



1. A reversible transmission for use with a motor vehicle comprising:

a housing;

a driving shaft rotatably mounted within said housing;

a planetary gear train having a sun gear rotatably driven by said driving shaft, first planetary gears in meshing engagement with said sun gear, second planetary gears in meshing engagement with said first planetary gears, a planetary gear carrier for holding said first planetary gears and said second planetary gears in position about said sun gear, and a ring gear surrounding said planetary gear carrier in meshing engagement with said second planetary gears;

a driven shaft rotatably mounted in said housing and driven by said planetary gear carrier; and

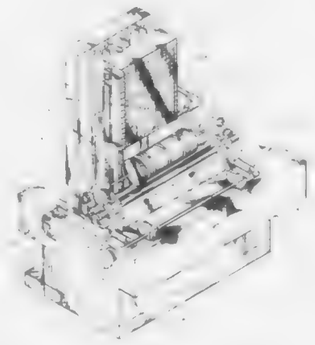
means for selectively interconnecting said ring gear to said driving shaft for rotation therewith in the same angular direction whereby said driven shaft is given in the same angular direction as said driving shaft or interconnecting said ring gear to said housing against rotation whereby said driven shaft is driven in the opposite angular direction from said driving shaft, said means for selectively interconnecting including a hydraulic system having a pair of annular pistons mounted within said housing for linear movement relative thereto and prevented from rotating relative to the housing and having a pair of reaction chambers associated with the housing for holding hydraulic fluid wherein each reaction chamber is in communication with a corresponding one of the pistons, a first of said pistons adapted to move linearly with respect to the housing for interconnecting said ring gear to said driving shaft in response to the application of hydraulic pressure applied to said first piston from a first of said reaction chambers, and a second of said pistons adapted to move linearly with respect to said housing for interconnecting said ring gear to said housing in response to the application of hydraulic pressure applied to said second piston from a second of said reaction chambers so that neither the pistons, reaction chambers nor hydraulic fluid held in the reaction chambers are exposed to centrifugal forces during a drive mode of the transmission during which said ring gear is interconnected to said driving shaft or said housing.

4,860,616

METHOD AND APPARATUS FOR THE MANUFACTURE OF ROTARY SHEET DIES

Winford L. Smith, 109 Grassland Dr., Gallatin, Tenn. 37066

Filed Jun. 17, 1988, Ser. No. 208,228
Int. Cl.[4] B23H *9/04*
U.S. Cl. 76—4 7 Claims



1. The method of manufacturing a rotary sheet die for use in the cutting of blanks or patterns in gasket material, paper webs, and the like, comprising the steps of:

a. wrapping a steel sheet which is to be machined into a sheet die around a hollow cylindrical mandrel and securing said sheet by clamp means attached to and around said mandrel;

b. placing the assembly of said mandrel and said sheet into a machine adapted for the cutting of patterns in cylindrical sheet dies; and

c. drawing the inner surface of said sheet to the surface of said mandrel by means of vacuum applied from the center of said mandrel through holes in the surface of said mandrel.

4,860,617

OIL FILTER TOOL

Jerry B. Robbins, 5290 Taylor's Creek Dr., Asheboro, N.C. 27203

Filed Sep. 14, 1988, Ser. No. 244,411
Int. Cl.[4] B25B *13/52*
U.S. Cl. 81—64 9 Claims

1. A wrench including a means for engaging and rotating an oil filter, said means comprising a flexible strap, a cinch member, said cinch member joined to one end of said strap for slidably receiving said strap therethrough to form an adjustable loop, and cinch stop means, said stop means joined to said strap for releasable engagement with said cinch member, said cinch stop means for maintaining the loop open while positioning the loop over an oil filter and for release thereafter for tightening the loop around the oil filter.



4,860,618

HAND HELD WRENCH FOR HELICAL SPRING TYPE WIRE CONNECTORS

George Givot, Box 102, Aniak, Ak. 99557

Filed Aug. 11, 1987, Ser. No. 83,810
Int. Cl.[4] B25B *13/06*
U.S. Cl. 81—121.1 12 Claims



5. A wrench for twisting a first type of wire nuts having rectangular flanges and a second type of wire nuts, having flanges that are rounded, onto the ends of wires comprising:

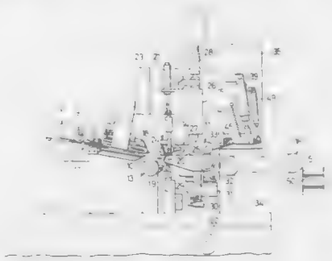
A. a housing having a generally cylindrical shape, and having a top end and a bottom end, said top end and said bottom end being generally flat, said housing also having a length greater than its width, said cylinder also having a first tapered receptacle extending inwardly from the bottom end into the housing, said first receptacle being generally cylindrical in shape and having two rectangular extension portions, being oppositely disposed, extending radially therefrom within the plane of said bottom end, said rectangular end portions being disposed such that the flange portions of said first type wire nuts having rectangularly shaped flanges portions are aligned with said rectangular end portions when said first type wire nut is placed within said first receptacle; said top end having a second tapered receptacle extending inwardly from the top end into the housing, said second receptacle also being generally cylindrical in shape, and having two semicircular extension portions, being oppositely disposed, extending radially therefrom within the plane of said top end, said semicircular end portions being disposed such that the flange portions of said second type wire nuts having rounded flanged are aligned with said semicircular end portions when said second type wire nut is placed within said second receptacle.

4,860,619

ELONGATE ARTICLE PROCESSING APPARATUS WITH AN IMPROVED DISCHARGE DEVICE

Akio Yunoki, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 21, 1988, Ser. No. 184,595
Claims priority, application Japan, Apr. 22, 1987, 62-100411
Int. Cl.[4] B21D *53/54;* B26D *7/32;* B65H *51/08*
U.S. Cl. 83—80 1 Claim



1. An apparatus for successively processing an elongate article into finished products as the article is fed longitudinally, the apparatus including a cutter disposed under the control of a sensor to sever the elongate article into products of individual lengths, and a discharge device for discharging the finished products, said discharge device comprising:

(a) a discharge unit disposed immediately downstream of the cutter and including a continuously rotating drive roller and a pinch roller coacting with said drive roller for discharging the finished products, and further including a pivot lever and a fluid cylinder pivotably connected to one of opposite ends of said pivot lever, said pinch roller being rotatably supported on the other end of said pivot lever, said pinch roller being vertically movable in response to the operation of said fluid cylinder between a lower operating position to engage said drive roller and an upper standby position remote from said drive roller, said pinch roller being held in said upper standby position while the cutter is in operation; and

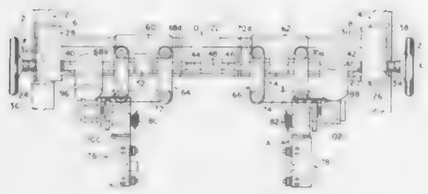
(b) a conveyor unit disposed downstream of said discharge unit and including a belt conveyor for conveying the finished products and a presser roller disposed above said belt conveyor for urging the products against said belt conveyor, and further including a pivot lever and a fluid cylinder pivotably connected to one of opposite ends of said pivot lever, said presser roller being rotatably supported on the opposite end of said pivot lever, said presser roller being vertically movable in response to the operation of the least-named fluid cylinder between a lower operating position to engage said belt conveyor and an upper standby position remote from said belt conveyor, said pinch roller being normally held in said lower operating position, said presser roller being normally held in said upper standby position and operatively linked with said pinch roller such that said presser roller is moved under the control of said sensor from said upper standby position to said lower operating position substantially at the same time or slightly after the beginning of movement of said pinch roller from its lower operating position to said upper standby position.

4,860,620

DEVICE APT FOR CUTTING OR FOR TRIMMING THE EDGES OF RUBBERIZED FABRICS

Augusto Pizzorno, Milan, Italy, assignor to Pirelli Coordinamento Pneumatici S.p.A., Milan, Italy

Filed Nov. 24, 1987, Ser. No. 124,967
Claims priority, application Italy, Nov. 28, 1986, 22496 A/86
Int. Cl.[4] B27B *13/00*
U.S. Cl. 83—156 **10 Claims**



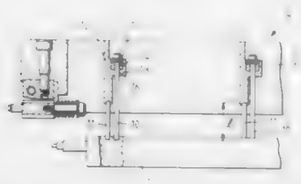
1. A device for cutting and trimming the edges of a rubberized fabric provided with longitudinal reinforcing elements, such as metallic cords, along one of said reinforcing elements, which comprises providing at least one pair of shears for each edge of said fabric, each pair of shears including opposing rotatable blades provided with sharp edges, said edges being disposed on opposite sides of said fabric in such a way so as to be reciprocally superimposed, each pair of shears being mounted on an oscillating frame, such as an articulated parallelogram, whereby said shears can move transversely on the rubberized fabric cutting said fabric precisely along one of said reinforcing elements.

4,860,621

HEAT KNIFE HOLDING DEVICE FOR HEAT CUTTING PLASTIC FILMS

Mikio Totani, Muko, Japan, assignor to Totani Giken Kogyo Co., Ltd., Kyoto, Japan

Filed Apr. 20, 1988, Ser. No. 183,724
Int. Cl.[4] B26F *3/08*
U.S. Cl. 83—171 **10 Claims**



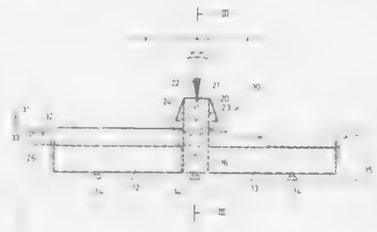
1. A heat knife holding device comprising a heat knife, an arm for holding said heat knife, said heat knife being spaced from and disposed parallel to said arm, a plurality of spacers disposed between said heat knife and said arm, and a plurality of pull bolts disposed between said heat knife and said arm for connecting said heat knife to said arm, said pull bolts pulling said knife toward said arm to reduce the distance therebetween and clamp said spacers between said heat knife and said arm, whereby said heat knife and said arm are held parallel to each other, said heat knife extending horizontally and having a heater contained therein to heat said knife to 300° C.—500° C., said arm including a pair of side plates and a plurality of bridge plates disposed between said side plates, said bridge plates being spaced from each other along said arm and fixed to said side plates.

4,860,622

MACHINE FOR CUTTING SHEET MATERIAL BY MEANS OF A DINKING DIE

Pietro Di Bernardo, Milano, Italy, assignor to Interdibipack S.p.A., Milano, Italy

Filed Sep. 14, 1987, Ser. No. 95,646
Claims priority, application Italy, Oct. 7, 1986, 2330 86[U]
Int. Cl.[4] B26F *1/42*
U.S. Cl. 83—285 **2 Claims**



1. A machine for cutting sheet material against a dinking die comprising a main frame, a cooperating pair of spaced upper and lower pressure rollers mounted on the main frame parallel to each other, means for rotating at least one of the rollers of said pair alternatively in either direction, a control means for controlling rotation of said one roller, said control means comprising a pair of electrical switches, one switch being mounted to the main frame on one side of the pair of rollers and the other switch being mounted on the opposite side with one switch controlling rotation of said one roller in one direction and the other switch controlling rotation of said one roller in the other direction, a work surface extending outwardly from both sides of the main frame transverse to the axis of rotation of the pair of pressure rollers, and a rectangular containment frame for holding a dinking die, at least one piece of sheet material and a pressure plate in position for travel along the work surface and through the pressure rollers, said containment frame comprising two longitudinal sides and two transverse sides joined together to form a rectangular shape, said sides having a thickness greater than the thickness of the die and means for locking the die in position in the containment frame so that the containment frame surrounds the die and the piece of sheet material to be cut and a portion of the pressure plate while a portion of the pressure plate extends above the sides of the containment frame for contact with the upper pressure roller, said longitudinal sides of the containment frame extending beyond the transverse sides and having lever arms pivotally mounted to the ends of said longitudinal sides for movement between a first position where they do not obstruct passage of the frame through the rollers and an operating position where they deactuate one of the said electrical switches after the sheet material and die have passed through the pair of rollers to stop further rotation of said one roller.

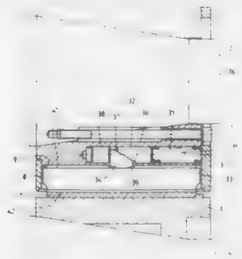
4,860,623

APPARATUS FOR SEVERING A RUNNING WEB OF TIPPING PAPER OR THE LIKE

Karl-Heinz Pawelko, Marschacht, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Feb. 2, 1988, Ser. No. 151,556
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1987, 3703463
Int. Cl.[4] B26D *1/62*
U.S. Cl. 83—346 **16 Claims**

1. Apparatus for subdividing a running web, particularly a web of tipping paper in a filter tipping machine, into discrete sections, comprising a rotary knife carrier; a counterknife adjacent and defining with said carrier a path for the running web; a plurality of adjustable knives on said carrier; and means for positioning said knives with reference to said carrier, including discrete adjusting means for each of said knives, each of said adjusting means including means for moving the respective knife substantially radially of said carrier and into a position of abutment with said counterknife so that, in the absence of a web in said path, the counterknife barely contacts and exerts negligible pressure against the knife once during each revolution of the carrier, said positioning means further comprising means for unyieldingly holding the knives in said positions to that the knives cut across the web in said path, said positioning means also comprising means for deactivating said holding means so as to permit substantially radial movements of said knives, said adjusting means comprising means for permanently urging the respective knives substantially radially of said carrier and against said counterknife so that the knives move relative to said carrier to assume said positions in response to deactivation of said holding means.

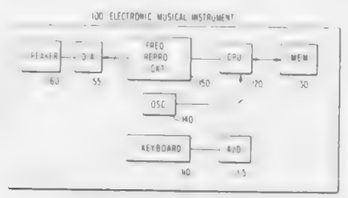


4,860,624

ELECTRONIC MUSICAL INSTRUMENT EMPLOYING TRU-SCALE INTERVAL SYSTEM FOR PREVENTION OF OVERTONE COLLISIONS

James A. Dinnan, and Joseph A. Dinnan, both of Athens, Ga., assignors to Meta-C Corporation, Athens, Ga.

Filed Jul. 25, 1988, Ser. No. 223,840
Int. Cl.[4] G10H *1/00, 3/03;* G10G *7/02*
U.S. Cl. 84—1.01 **10 Claims**



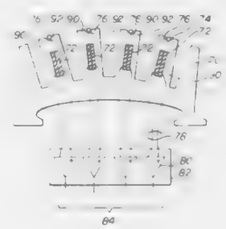
1. In an electronic musical instrument, comprising:
a keyboard, including a plurality of keys which may be depressed singly or in combination; and
means for reproducing sound in accordance with ones of said keys being depressed singly or in combination, wherein depression of said ones of said keys in combination normally results in overtone collision;
the improvement wherein said sound reproducing means includes means for eliminating said overtone collision, said overtone collision eliminating means comprising means for reproducing musical notes in accordance with an octave transformation which assigns a predetermined interval between consecutive notes in an octave, wherein operation of said sound reproducing means in conjunction with said octave transformation results in elimination of said overtone collision.

4,860,625

BIMORPHIC PIEZOELECTRIC PICKUP DEVICE FOR STRINGED MUSICAL INSTRUMENTS

Max V. Mathews, Stanford, Calif., assignor to The Board of Trustees of the Leland Stanford, Jr. University, Stanford, Calif.

Filed May 16, 1988, Ser. No. 194,316
Int. Cl.[4] G10H *3/18*
U.S. Cl. 84—1.16 **7 Claims**



7. A pickup for a stringed musical instrument having a plurality of strings, comprising: a bridge member having a multiplicity of separate cantilevered beams, each said beam having means for supporting one string; and a multiplicity of bimorphic piezoelectric elements, one bimorphic piezoelectric element embedded in each of said beams and oriented so that each said bimorphic piezoelectric element bends and generates electric signals when a string supported by the corresponding beam vibrates.

4,860,626

WIPPEN HEEL MECHANISM FOR AN UPRIGHT PIANO

Hajime Tanaka, 855-20 Ooaza Shimogo, Ogoori-cho, Yosikigun, Yamaguchi, and Shiro Saito, 25-23 Ebizuka 2-chome, Hamamatsu-shi, Shizuoka, both of Japan

Filed Sep. 8, 1987, Ser. No. 93,708
Claims priority, application Japan, Sep. 9, 1986, 61-138348[U]; Sep. 9, 1986, 61-138349[U]; Sep. 9, 1986, 61-212427
Int. Cl.[4] G10C *3/18*
U.S. Cl. 84—236 **7 Claims**



1. A wippen heel mechanism of an upright piano for transmitting thrust between a piano key and a hammer of the piano, said mechanism comprising:
a piano key pivotally mounted in the piano about a fulcrum point between normal and depressed positions;
a pillar projecting from and threadingly engaged with the piano key in a manner in which the extent to which the pillar projects from the piano key is adjustable;
a wippen operatively connected between the piano key and a hammer for transmitting thrust from the piano key to the hammer when the piano key is depressed;
a wippen heel attached to said wippen, said wippen heel having a lower surface that is semispherical;
a stationary shaft spaced from said wippen heel, said shaft

having a longitudinal axis and mounted in the piano with said longitudinal axis immovably fixed in the piano;

a wippen joint pivotally mounted in the piano via said stationary shaft about the longitudinal axis thereof,

said wippen joint extending between said pillar and said wippen heel, contacting said pillar at an initial contact point when the piano key is in said normal position, and having an upper flat surface contacting the lower surface of said wippen heel,

said wippen joint pivoting between first and second positions via said pillar as the piano key is moved from said normal to said depressed position; and

said stationary shaft, the initial point of contact between said wippen heel and said pillar, and said fulcrum point defined relative to one another in the piano so as to establish an operating relationship between said wippen jont and said pillar in which the point of contact therebetween travels in a substantially straight line as said piano key is depressed from said normal position to said depressed position and said wippen joint is pivoted about the longitudinal axis of said stationary shaft by said pillar without slip occurring between said wippen joint and said pillar.

4,860,627

TUNING MACHINES

Irving Sloane, McGhee Hill Rd., Millerton, N.Y. 12546

Filed Apr. 4, 1988, Ser. No. 177,535

Claims priority, application United Kingdom, Apr. 2, 1987, 8707870

Int. Cl.[4] G10D *3/14*

U.S. Cl. 84—306 **1 Claim**



1. A machine for tuning a guitar having a wooden head comprising a base adapted to be mounted on the head, the base including first, second and third pairs of facing posts extending at right angles to a wall of the base, the first pair being on the center of the base, the second and third pairs being oppositely disposed on the base relative to the first pair of posts, the posts and wall being formed as an integral investment casting, the post of each of said pairs having bores with a common axis; first, second and third worm gear assemblies mounted in said base in said bores of said first, second and third pairs of posts, respectively, each of the worm gear assemblies including a worm gear shaft extending between the respective bores and a shaft protruding one of said posts of the respective pair of posts away from the other post of the pair of posts, the protruding and worm gear shafts associated with each of said pairs being aligned; a handle on each of the protruding shafts; first, second and third gear wheel assemblies secured to and extending through first, second and third bores in the wall in close proximity to the bores associated with the first, second and third pairs, each of said first, second and third gear wheel assemblies having a gear wheel portion with a longitudinal axis at right angles to the worm gear shaft of the first, second and third worm gear assemblies, respectively, the first, second and third gear wheel portions respectively engaging the first, second and third worm gear shafts so that turning of the handles and the worm gears of the first, second and third worm gear assemblies results in the turning of the gear wheel portions of the first, second and third gear wheel assemblies respectively; the first, second and third gear wheel assemblies including first, second and third tuning pegs coaxial with the respective gear wheels, each of the tuning pegs extending away from a first side of the wall opposite from a second side of the wall from which each of the gear wheel portions extends, each of the tuning pegs being adapted to receive the string so that as each of the tuning pegs is turned in response to turning of the respective gear wheel portion, the respective string is wound on the respective tuning peg; the first side of the wall being smooth, without bumps, so that the machine can be mounted on the wooden guitar head without making corresponding holes in the wooden head, except through holes for receiving the gear wheel assembly; the bore in the post closest to the handle of each of the first, second and third pairs of facing posts being threaded; each of the first, second and third gear wheel assemblies including a threaded collar threaded into the threads of the threaded bores of said first, second and third pairs of facing posts, respectively; first, second and third metal washers respectively positioned between the collars and an end face on the worm gear shaft of each of the first, second and third worm gear assemblies, respectively; each of the tuning pegs having an end with a drilled and tapped bore, a screw in each of the drilled and tapped bores holding the respective tuning peg in place on the base; said ends of each of said first, second and third tuning pegs having a shoulder effectively abutting against the first side of the base wall and fitting snugly in the first, second and third bores of the base, respectively; a nylon washer between each of the shoulders and the first side of the base wall; and a structure on each of the collars for receiving a tool for rotating the collar to screw it into position.

4,860,628

STRING SUPPORTING APPARATUS FOR STRINGED MUSICAL INSTRUMENTS

David C. Storey, 1012 Mill Pl., Santa Paula, Calif. 93060

Filed Jun. 6, 1988, Ser. No. 202,545

Int. Cl.[4] G10D *3/04*

U.S. Cl. 84—313 **22 Claims**



1. Flexible string supporting apparatus for a musical instrument having a plurality of longitudinally extending strings stretched between a head and a body of the instrument, having head-end and body-end string break points which establish the vibrating length of the strings and having string tensioning means for adjusting the tensioning of said strings, said apparatus comprising:

(a) a plurality of string supporting means each having a laterally fixed, string supporting surface;

(b) means for resiliently mounting said string supporting means at at least one of said head-end and body-end string break points with each of said strings being supported by said string supporting surface of a corresponding one of the string supporting means;

said mounting means being configured for permitting the string supporting surface of each of said supporting means to move independently in the longitudinal string direction in response to adjusting tensioning of said strings by said tensioning means, the vibrating length of the strings being thereby caused to change; and

(c) means for fixing the strings to the associated string supporting means adjacent said supporting surfaces.

4,860,629

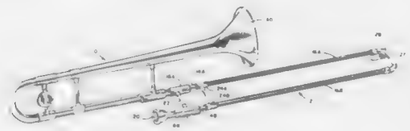
GRAPHITE TROMBONE SLIDE

James E. Del Giudice, 5774 Halloween Ave., Las Vegas, Nev. 89119

Filed Jul. 28, 1988, Ser. No. 226,187

Int. Cl.[4] G10D *7/10*

U.S. Cl. 84—395 **18 Claims**



1. A trombone comprising:

a) a body member having a bell, a slide and a mouthpiece,

b) said slide comprising an inner slide member and an outer slide member which telescopes over the inner slide member,

c) said inner slide member comprising an upper inner slide tube connected to the body member of the trombone by an upper inner slide bracket and a lower inner slide tube connected to the body member of the trombone by a lower inner slide bracket,

d) said outer slide member comprising an upper outer slide tube connected to an upper outer slide bracket and a lower outer slide tube connected to a lower outer slide bracket,

e) the upper outer slide tube and the lower outer slide tube being fabricated from graphite tube.

4,860,630

MANUAL FOR ELECTRONIC ORGANS AND THE LIKE

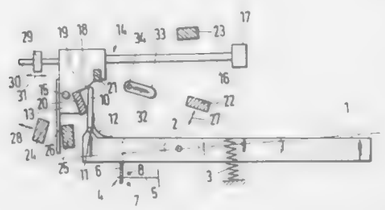
Reinhard Franz, Tulpenstrasse 15, D-5401 Emmelshausen, and Walfired Dost, Koblenz, both of Fed. Rep. of Germany, assignors to Reinhard Franz, Emmelshausen, Fed. Rep. of Germany

Filed Dec. 7, 1987, Ser. No. 129,659

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1986, 3641813

Int. Cl.[4] G10C *3/16*

U.S. Cl. 84—439 **24 Claims**



1. A manual with piano effect for use in electronic organs and analogous musical instruments, comprising a key which is depressible to thereby pivot about a first axis; a reaction member adjacent said key and pivotable about a second axis between first and second end positions, said member having a first arm, a second arm, an arcuate cam face, and means for biasing said member to one of said end positions; and means for pivoting said member from said one end position toward the other of said end positions in response to depression of said key, including a pusher pivotable with and movable relative to said key and having a portion in frictional engagement with said cam face in the one end position of said member and in undepressed position of said key, said portion of said pusher being located at a first distance and said biasing means being located at a greater second distance from said second axis in the one end position of said member, said portion of said pusher being arranged to move along a predetermined path in response to depression of said key so as to pivot said member from the one end position during depression of said key, said cam face being designed in such a manner that, during depression of said key, the frictional force between said portion of said pusher and said cam face abruptly decreases in a preselected release position of said portion of said pusher and a preselected intermediate position of said member, one of said arms being arranged to move said portion of said pusher relative to said key and into said release position in response to depression of said key.

4,860,631

OUTER TUBULAR ENVELOPE FOR INSERTING APPARATUS

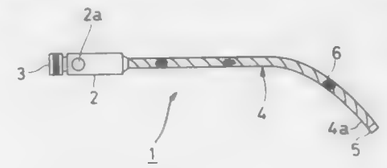
Hisatake Aoshiro, Misato, Japan, assignor to Kabushiki Kaisha Machida Seisakusho, Japan

Continuation of Ser. No. 918,149, Oct. 14, 1986, abandoned. This application Apr. 28, 1988, Ser. No. 187,503

Claims priority, application Japan, Apr. 16, 1986, 61-56090

Int. Cl.[4] D04C *1/06, 1/02*

U.S. Cl. 87—9 **7 Claims**



1. An endoscope comprising:

an operating body;

an elongated inserting portion extending from said operating body; and

an outer tubular envelope with which said elongated inserting portion is covered, said outer tubular envelope having a plurality of strands braided into the form of a tube, at least one of said strands being different in color from the remaining strands and being incorporated therein so as to extend helically at a substantially constant pitch to define graduations for determining a predetermined length of the inserting portion inserted into an object.

4,860,632

APPARATUS FOR RADIALLY SECURING A CARTRIDGE INSERTED BY A BREECHBLOCK INTO THE WEAPON BARREL OF A FIRING WEAPON

Werner Bruderer, Zürich, and Erwin Bohler, Dübendorf, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Mar. 30, 1987, Ser. No. 31,861

Claims priority, application Switzerland, Apr. 10, 1986, 417/86

Int. Cl.[4] F41C *15/06*

U.S. Cl. 89—33.25 **3 Claims**

1. An apparatus for radially securing in a weapon barrel of an externally driven firing weapon a cartridge having a cartridge case equipped with an extracting groove, said cartridge further including a cartridge base, comprising:

a weapon housing;

at least one weapon barrel rotatably mounted in said weapon housing;

a forwardly and rearwardly movable breechblock cooperating with said at least one weapon barrel for inserting cartridges into said at least one weapon barrel;

said weapon housing defining a region associated with said breechblock in a rearward position of said breechbock;
said breechblock including a breechblock head;
and extracting element provided at said breechblock and engageable with the extracting groove of the cartridge case of the cartridge and preventing sliding off of the cartridge from the breechblock head in a radial direction;
a feeler element located opposite to said extracting element for determining whether a cartridge has been inserted into said at least one weapon barrel;
means for mounting said feeler element to be displaceable in axial direction thereof between a forward position and a rearward position;
spring means for loading said feeler element;
said spring means striving to retain said feeler element in said forward position of said feeler element;
said feeler element being slidable against the force of said spring means into its rearward position in the presence of



a cartridge due to the action of the base of the cartridge upon said feeler element;
said feeler element possessing an axially projecting securing element laterally bearing against an edge of the base of said cartridge case in order to secure said cartridge against sliding out of said extracting element;
control means fastened at said weapon housing in the region of the rearward position of said breechblock;
a lever member operatively associated with said control means in the region of the rearward position of said breechblock;
said feeler element being pivotably hinged at said lever member; and
said control means in the region of the rearward position of said breechblock cooperating with said lever member and thereby pushing back said feeler element at least during such time as said cartridge is infed into a position in front of said breechblock.

4,860,633

AUTOLOADER FOR MILITARY VEHICLE

Roger H. Wiethoff, Minnetonka, and Gary J. Nelson, Buffalo, both of Minn., assignors to FMC Corporation, Chicago, Ill.

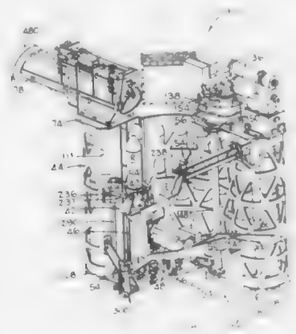
Division of Ser. No. 784,921, Oct. 4, 1985, Pat. No. 4,700,609. This application May 7, 1987, Ser. No. 46,741

Int. Cl.[4] F41F *9/04*

U.S. Cl. 89—45 **5 Claims**

1. An autoloading apparatus for loading and unloading cartridges having cases into or out of a gun having a breach block and mounted for pivotal movement about a substantial horizontal axis, comprising:

locking means for selectively locking the gun in a predetermined position and unlocking the gun for pivotal movement about said horizontal axis;
magazine conveying means for supporting a plurality of cartridges and having a load-unload station;
load tray means mounted for pivotal movement between a substantially vertical position and a substantially horizontal position in alignment with the gun when locked;
cartridge clamp means on said tray for movement between a cartridge clamping position and an open cartridge guiding position;
rammer and extensible empty tray case ejecting means for ramming a cartridge on said load tray means into said gun and after firing to eject the empty cartridge case from said autoloading apparatus;
power means for operating said gun locking means, said magazine conveyor, said load tray means, said cartridge clamping means and said rammer and extensible tray case and eject means;
automated control means for sequentially locking the gun in said predetermined position, driving said magazine to position a selected cartridge at said load-unload station, translating said load tray into said load-unload station, moving the clamp means into gripping engagement with said selected cartridge, moving the tray and selected cartridge into alignment with the gun, moving the rammer for ramming the cartridge into the gun to be fired, closing the breach block, and unloading said locking means for releasing the gun to be aimed and fired;



a rotatable turret mounted for rotation about a vertical axis; the gun and autoloader apparatus being supported by said turret, means defining a cartridge reload-eject port in said turret, means defining a reload hatch door movably mounted on said turret for opening and closing said reload-eject port, said load tray means including a rear restraint damper, a magazine housing having said magazine conveyor means therein and having a load-unload port therein, a magazine gate assembly having restraining arms movable between a closed and an open position in said load-unload port:
wherein when a cartridge is to be loaded into the magazine conveyor from externally of said turret;
said automatic control means sequentially opening said restraining arms, raising said load tray means into said substantially horizontal position in alignment with said gun, opening said reload hatch doors, and retracting said rear restraint damper;
after one of said cartridges is manually inserted through said reload-eject port and is manually rammed onto said load tray means;
said automatic control means sequentially extending said rear restraint dampener, lowering said load tray means, translating said load tray means into said magazine load-unload port, closing said load station restraining arms,

opening said load tray cartridge clamps, translating said load tray means out of said load-unload port, and closing said cartridge clamp means while indexing said magazine conveyor and the cartridge away from said load-unload station.

4,860,634

ARRANGEMENT FOR CONTROLLING THE TRAVEL OF TWO HYDRAULIC CYLINDERS

Theo Hein, Lohr am Main, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Filed Aug. 8, 1988, Ser. No. 229,926

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1987, 3726605

Int. Cl.[4] F15B *9/03, 9/09*

U.S. Cl. 91—363 R **12 Claims**



1. Arrangement for controlling the travel of two hydraulic cylinders which are provided for adjusting the position of different portions of the same component, each cylinder having associated with it a respective directional control valve for connecting the respective hydraulic cylinder to a fluid source or a tank, a position pickup for measuring the travel of the component portion and a position controller for generating an error quantity from the measured position and a desired position signal for driving the directional control valves, characterized in that for each hydraulic cylinder a position controller is provided, and means for supplying to both position controllers the same desired value and a correction value is generated in dependence upon the adjustment of the component as actual value and is added to the desired position signal or subtracted from the desired position signal.

4,860,635

STEERING CONTROL VALVE FOR VARIABLE POWER ASSIST STEERING SYSTEM

Koh Uchida, Tokyo, and Takashi Kurihara, Atsugi, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 29, 1987, Ser. No. 44,065

Claims priority, application Japan, May 12, 1986, 61-109293; Sep. 29, 1986, 61-228456

The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—375 A **18 Claims**

1. A steering control valve for a power steering system for a vehicle, the power steering system including a pump as a source of fluid flow, and a fluid motor adapted to be connected to a steering linkage of the vehicle, the steering control valve comprising:

an inner valve member;
a surrounding sleeve, said surrounding sleeve having a fluid flow inlet port communicating with the pump, a fluid flow return port, a left turn outlet port, and a right turn outlet port, said left turn and right turn outlet ports communicating with the fluid motor;
said inner valve member having formed thereon a set of valve lands, said surrounding sleeve having a set of internal lands registering with said set of valve lands;
said inner valve member being movable relative to said surrounding sleeve upon application of an input torque to said inner valve member;
said set of valve lands cooperating with said set of internal lands to define a plurality of variable flow orifices fluidly disposed between said fluid flow inlet port and said fluid flow return port, said plurality of variable flow orifices varying their flow areas as said inner member moves relative to said surrounding sleeve in response to said input torque applied thereto to cause hydraulic fluid pressures to develop at said left turn and right turn outlet ports to effect pressure differential forces acting on the fluid motor;
said plurality of variable flow orifices consisting of and being divided into a first group of variable flow orifices and a second group of variable flow orifices,



said first group of variable flow orifices decreasing their flow areas and being arranged so as to be effective in development of the hydraulic fluid pressure at said right turn outlet port as said inner member moves in one direction relative to said surrounding sleeve;
said second group of variable flow orifices decreasing their flow areas and being arranged so as to be effective in development of hydraulic fluid pressure at said left turn outlet port as said inner member moves in the opposite direction relative to said surrounding sleeve; and
a variable flow orifice valve means fluidly disposed between said fluid flow inlet port and said fluid flow return port, said variable flow orifice valve means connected in series with at least one of each of said first and second group of variable flow orifices, said variable low orifice valve means being responsive to vehicle control exclusive of said input torque applied to said inner valve member.

4,860,636

BRAKE BOOSTER FOR VEHICLES

Hannes Bertling, Vaihingen/Enz; Robert Mergenthaler, Markgroningen; Edgar Schmitt, Vaihingen/Enz, and Heinz Siegel, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 27, 1988, Ser. No. 186,875

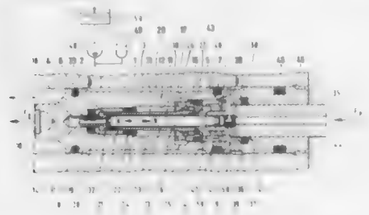
Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3715569

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—376 R **5 Claims**

2. A brake booster comprising a brake booster piston (3), a stepped bore (11) in said brake booster piston, a slide (13) including two parts pivotally connected to one another in said stepped bore of said brake booster piston, a bushing (15) within said bore of said brake booster piston, a valve seat (16) on said bushing, said slide (13) includes a valve cone (14) on one end

that in a position of repose is pressed against the valve seat (16) of said bushing to form a brake valve, a spring 23 that force said valve cone of said slide against said valve seat, said slide



(13) is supportedly spaced far apart from said valve seat (16) with play in the vicinity of a bearing on at least one of said two parts, and seals (20, 22) on the circumference of said slide (13) that have an elastic behavior.

4,860,637

BRAKE VALVE WITH BRAKE BOOSTER

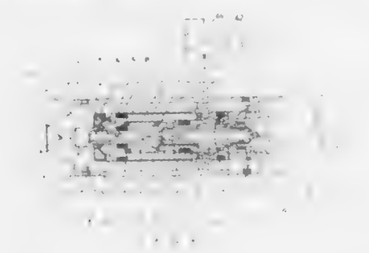
Edgar Schmitt, Vaihingen/Enz, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 15, 1988, Ser. No. 182,008

Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3715568

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—376 R 4 Claims



1. A brake valve for brake boosters operable in a housing, said brake valve being disposed in a blind bore in a booster piston (3), an axially displaceable slide (20) supported in a sheath (13) operable in said booster piston, one end of said slide forming a valve cone shape (21) operable relative to a valve seat (24), said sheath (13) is spherically supported on an end face of said brake valve remote from said valve seat (24) and is slightly pivotable about a pivot point (M), a spring (22) positioned relative to said slide that in a position of repose is pressed by a spring force against said valve seat (24) of the brake valve, said slide (20) being supported pivotably in said booster piston (3) remote from said valve cone shape (21).

4,860,638

ACTUATOR DRIVING SYSTEM

Masayuki Hosono; Kengi Waragai, and Jun Hiramoto, all of Sohka, Japan, assignors to SMC Corporation, Tokyo, Japan

Filed Nov. 17, 1987, Ser. No. 122,121

Claims priority, application Japan, Nov. 18, 1986, 61-274394; Nov. 18, 1986, 61-176990

Int. Cl.[4] F15B *11/00, 13/00*

U.S. Cl. 91—536 7 Claims

1. An actuator driving system for driving a plurality of actuators operable by a fluid under pressure, comprising: a plurality of tube joints connected respectively to the actuators for being coupled with a plurality of double-walled tubes each having a plurality of passages; and a plurality of speed controllers connected between said actuators and said tube joints for controlling the speed of operation of said actuators, respectively, wherein said tube joints are selectively positionable



with respect to said actuators, respectively, so as to permit said double-walled tubes to be connected to ports of said actuators in desired positions, said speed controllers being selectively positionable with respect to said actuators.

4,860,639

FLEXIBLE TUBULAR WALL ACTUATOR WITH END-MOUNTED STRAIN GAUGE

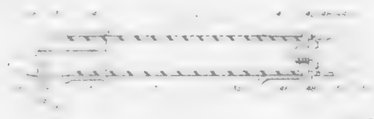
Yuji Sakaguchi, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 804,959, Dec. 5, 1985, abandoned. This application Apr. 4, 1988, Ser. No. 180,724

Claims priority, application Japan, Dec. 11, 1984, 59-259896; Dec. 28, 1984, 59-279771; Dec. 28, 1984, 59-279773

Int. Cl.[4] F15B *15/02;* F01B *31/12*

U.S. Cl. 92—5 R 3 Claims



1. A pneumatic actuator comprising: a tubular body made of a rubber-like elastic material, a braided structure made of organic or inorganic high tensile strength fibers reinforcing an outside of said tubular body and closure members sealingly closing ends of said tubular body, at least one of said closure members having a connecting passage, said tubular body being deformed to expand its diameter by introducing pressurized fluid thereinto through said connecting passage to cause a contractive force in its longitudinal direction, said actuator comprising contraction detecting means having strain gauges, said contraction detecting means provided at one of said closure members for detecting said contractive force in the longitudinal direction, and contraction output means for outputting signals corresponding to the contractive force on the basis of output signals from said contraction detecting means, and wherein said one of the closure members comprises, a closure member body sealingly closing the end of the tubular body, a connecting member on an outer side of the closure member body, a housing connected to said connecting member and having a diaphragm portion to which said strain gages are attached, and a screw thread member connecting said diaphragm portion to said closure member body.

4,860,640

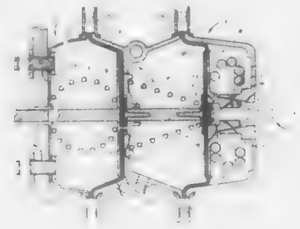
AIR OPERATED DIAPHRAGM SPRING BRAKE

Nathan C. Ware, North Muskegon, Mich., assignor to Neway Corp., Muskegon, Mich.

Filed Dec. 3, 1986, Ser. No. 937,371

Int. Cl.[4] F01B *7/00*

U.S. Cl. 92—63 17 Claims



1. An air operated spring brake having a spring-operated brake actuator in tandem with an air-operated service brake actuator, the spring-operated actuator having:

a spring housing with a wall dividing the service brake actuator and the spring brake actuator;

an imperforate elastomeric diaphragm in said spring housing dividing the latter into a spring chamber and a fluid pressure chamber;

a pressure plate in said spring chamber in abutting relationship with said diaphragm;

guide means between said pressure plate and said spring housing for guiding reciprocation of said pressure plate with respect to said spring housing;

a spring in said spring chamber acting on said pressure plate to move the latter and said diaphragm generally longitudinally of said housing in a brake-applying direction upon a decrease in fluid pressure in said fluid pressure chamber;

said diaphragm being movable generally longitudinally in the other direction to compress said spring in the presence of pressure in said fluid pressure to allow operation of said service brake actuator independently of said spring-operated actuator;

a push plate in said fluid pressure chamber abutting said diaphragm for movement therewith;

a push member extending generally longitudinally of said spring housing and having an end portion projecting through said wall and another end secured to said push plate;

interengaging means formed by a first side of said imperforate diaphragm and said pressure plate to prevent lateral shifting of said diaphragm with respect to said pressure plate; when the two are in contact with one another;

said interengaging means preventing lateral shifting between said pressure plate and said spring housing.

4,860,641

VARIABLE STROKE COMPRESSOR SOCKET PLATE

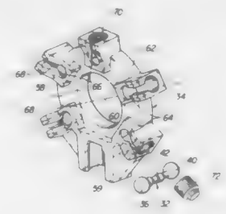
Thomas D. Spears, East Amherst, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 25, 1988, Ser. No. 223,329

Int. Cl.[4] F04B *1/18;* F01B *29/00;* B23D *15/00*

U.S. Cl. 92—71 5 Claims

1. A wobble plate of the type for operating a variable stroke variable displacement compressor comprising a forward surface and a peripheral surface about said forward surface, the improvement comprising a plurality of bores extending radially into said plate from said peripheral surface, each of said bores including an inner socket portion and an outer passageway, said forward surface including a slot extending radially inwardly from said peripheral surface, said slot defining a lip for retaining a spherical portion of a rod member within said



socket portion and plug means for plugging said outer passageway.

4,860,642

PERSONALIZED AIR CONDITIONING AND METHOD

Otto J. Nussbaum, 144 Penns Woods Dr., Newtown, Pa. 18940

Continuation of Ser. No. 905,475, Sep. 8, 1986, abandoned, which is a continuation-in-part of Ser. No. 743,384, Jun. 11, 1985, Pat. No. 4,646,966. This application Dec. 19, 1988, Ser. No. 291,404

Int. Cl.[4] F24F *7/06*

U.S. Cl. 98—40.19 4 Claims



1. In the method of air conditioning a room space, the steps which comprise; providing a horizontally generally unobstructed plenum chamber vertically contiguous to and horizontally generally coextensive with the room space without duct work between the plenum chamber and room space, supplying substantially all necessary conditioned air to the plenum chamber at a pressure above atmospheric just sufficiently to overcome gravity and friction and fill the plenum chamber, selectively locating a vertical passageway in said room space and communicating at one end directly with the adjacent portion of said plenum chamber, the conditioned air being supplied to the plenum at not more than 0.1 inch of water which is insufficient pressure to move a selected rate of conditioned air through said passageway during air conditioning operation, and applying air moving force in said passageway for moving said substantially all necessary conditioned air at a selected rate from said plenum chamber through said passageway to the selected location in said room space for both cooling of a person proximate to the passageway and general cooling throughout the room.

4,860,643

VENTILATED CLEAN ROOM WORK STATION WITH AERODYNAMIC EXHAUST BAFFLE

Ralph G. Spearow, Kuna, Id., assignor to Santa Clara Plastics, Boise, Id.

Filed Jul. 21, 1988, Ser. No. 222,526
Int. Cl.[4] B08B *15/02*
U.S. Cl. 98—115.3 5 Claims



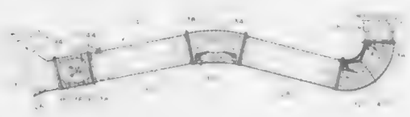
1. A ventilated work station for workpiece processing in a laminar flow clean room which comprises:
(a) an elongate rectangular work surface, lying in a horizontal plane, having front and rear edges parallel to said work surface longitudinal axis;
(b) at least one well within said work surface for receiving workpieces to be processed;
(c) an aerodynamic exhaust baffle having two substantially vertical surfaces joined by two continuous curved surfaces, said baffle positioned above said rectangular work surface, said first substantially vertical surface and a first curved surface extending substantially across one half the width of said elongate, rectangular work surface and extending along the entire length of said elongate, rectangular work surface, and said second substantially vertical surface and second curved surface extending vertically from the rear edge of said work surface and extending along the entire length of said elongate, rectangular work surface;
(d) primary exhaust means for exhausting a large volume of air, falling upon said rectangular work surface, said primary exhaust means disposed on said second vertical surface; and,
(e) curved surface exhaust means for improving laminar flow along said aerodynamic exhaust baffle surfaces, disposed on said first curved surface.

4,860,644

ARTICULATABLE FUME EXHAUSTER TRUNK

James W. Kohl, Eagan, and Mark D. Belcher, Burnsville, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Feb. 29, 1988, Ser. No. 162,175
Int. Cl.[4] B08B *15/00*
U.S. Cl. 98—115.4 5 Claims



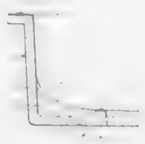
1. A flume exhauster apparatus adapted for fluid communication with a vacuum source, the apparatus having an end attached to a supporting structure, the apparatus comprising:
a fume receiving scoop;
a collar member adapted for attachment to the supporting structure;
means for directing fluid communication between said scoop and said collar member, said directing means including first and second rigid tubes having first and second axes, respectively, said directing means further including a flexible tube fastened between said first and second rigid tubes;
first means for attaching said directing means to said collar member;
second means, located inside said flexible tube, for attaching said first and second rigid tubes together, said second attaching means including first means for inclining one of said first and second rigid tubes with respect to the other so that said first and second axes remain in a plane, said first inclining means including first and second brackets with first and second gear portions, respectively, said first inclining means further including means for operably holding said first and second gear portions in contact with one another; and
third means for attaching said directing means to said scoop.

4,860,645

DISPOSABLE FILTER CARTRIDGE, WHETHER OR NOT COMBINED WITH A WATER RESERVOIR

Joost van der Lijn, Utrecht, and Bernardus M. van Thoor, Maarssenbroek, both of Netherlands, assignors to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel, Netherlands

Filed Nov. 10, 1986, Ser. No. 928,969
Claims priority, application Netherlands, Nov. 11, 1985, 8503092; Apr. 16, 1986, 8600958
Int. Cl.[4] A47J *31/06*
U.S. Cl. 99—295 10 Claims



1. A disposable filter cartridge comprising a housing substantially including a bottom and an upright side wall, the underside or bottom being provided with one or more holes, said filter cartridge being provided at its top and at least a part of its bottom with filter material or a filter film, with at least a filter material for the top being connected to the side wall or a flanged-shaped extension thereof by means of a sealed joint, characterized in that the filter material destined for the underside or bottom of the housing is cup-shaped and is received in the housing of the filter cartridge so as to be immovable, said filter bottom material being supported by at least one arcuately shaped support element extending between said bottom and said side wall and terminating at said bottom.

4,860,646

COMPACTOR WITH HYDRAULIC DWELL AND METHOD

Kent Spiers, Caledonia, Miss., assignor to Marathon Corporation, Birmingham, Ala.

Filed Feb. 10, 1987, Ser. No. 13,079
Int. Cl.[4] B30B *15/18, 15/22;* F15B *11/15, 15/22*
U.S. Cl. 100—48 14 Claims



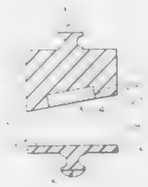
1. A compactor, comprising:
(a) a longitudinally extending ground supported frame assembly with an open end and a closed end;
(b) an hydraulic motor means including a cylinder means and piston means, said motor means having one of said cylinder means and piston means connected with said closed end and said motor means extending longitudinally toward said open end;
(c) a compactor ram connected with the other one of said cylinder means and piston means for transferring waste through said open end and said other one of said cylinder means and piston means being movable relative to said one of said cylinder means and piston means;
(d) said cylinder means including first and second fluid ports at opposite first and second ends thereof;
(e) hydraulic fluid supply means are in fluid communication with said ports for directing pressurized fluid therebetween for causing selective movement of said other one of said cylinder means and piston means and thereby of said ram;
(f) hydraulic dwell means carried by said piston means for permitting fluid to flow between said ports for preventing displacement of said other one of said cylinder means and piston means when said dwell means engages one of said cylinder ends;
(g) said dwell means including a spool assembly displaceable with and selectively displaceable relative to said piston means and including a dwell portion disposed between first and second land portions, each of said land portions engageable with an associated one of said cylinder means ends for permitting relative displacement of said dwell means with said piston means;
(h) said piston means including fluid port means communicable with said dwell portion when one of said land means engages one of said cylinder means ends for permitting fluid to flow between said ports and through said dwell portion;
(i) a continuous diameter aperture extends through said piston means;
(j) said dwell means is positioned within said aperture and said land portions have a common continuous diameter substantially equal to said aperture diameter;
(k) said aperture extends generally parallel to said cylinder means; and,
(l) first and second fluid ducts are disposed in said piston means, each duct has a first opening in a wall of said piston means and a second opening communicating with said aperture for permitting fluid flow to be selectively established between said ports.

4,860,647

CAN DRAINING IMPLEMENT

James L. Kerslake, 4038 Hanna St., Fort Wayne, Ind. 46806

Filed May 19, 1988, Ser. No. 195,856
Int. Cl.[4] B30B *7/00*
U.S. Cl. 100—234 6 Claims



1. An improved can draining implement, comprising:
(a) a first handle and a second handle, said handles being pivotably connected together at a hinge member;
(b) said first handle having a can holding plate thereon having a periphery sized to allow a depending peripheral lip on a can bottom to surround said plate periphery when a can is placed on said plate;
(c) a plunger on said second handle alignable with said plate, said plunger having a face facing said plate which extends in a first plane angled with respect to a second plane defining the lateral extent of said plate.

4,860,648

PRINTING APPARATUS FOR MARKING INDICIA ON ARTICLES BEING SUCCESSIVELY CONVEYED

Robert A. Beaver, Fort Wayne; Leonard L. Johnson, Huntertown, and Lester R. Medlen, Fort Wayne, all of Ind., assignors to Lincoln Logotype Company, Inc., Fort Wayne, Ind.

Filed May 24, 1988, Ser. No. 198,113
Int. Cl.[4] B41F *17/26*
U.S. Cl. 101—35 12 Claims



1. A marking apparatus for printing indicia on a surface of products being transported along a predetermined path relative to the apparatus comprising:
a mounting base lacated adjacent said predetermined path;
a printing roll journaled on said base and having a drive rim adapted for rolling engagement with said surface to turn said printing roll, and a cylindrical marking surface adapted for rolling engagement with said surface to print indicia thereon;
a lever arm mounted at one end on said base for pivotal movement thereon about an axis;

means operative between said lever arm and said base for urging said lever arm with a predetermined force in one direction of rotation toward an operating position;

an ink supply roll journaled on the other end of said lever arm and having a porous ink-containing cylindrical surface;

an ink tranfer roll journaled on said base and having a cylindrical ink transfer surface adapted for engagement with said ink supply roll surface and said marking surface to tranfer ink from said supply roll to said printing roll; and

gear means operatively connected between said printing roll and said transfer roll for turning said ink transfer surface at a surface speed differential of between 5% and 12% relative to the surface speed of said marking surface to provide sliding contact between said ink transfer surface and said marking surface.

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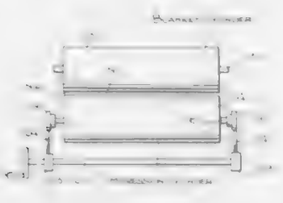
OFFSET PRESS WITH ADJUSTABLE AXLE-BEARING ASSEMBLY FOR IMPRESSION CYLINDER

Leonard I. Popkin, 84-28 115th St., Richmond Hill, N.Y. 11418

Filed Sep. 26, 1988, Ser. No. 249,120

Int. Cl.[4] B41F *9/00*

U.S. Cl. 101—137 **5 Claims**



1. A rotary offset press in which an inked image carried by a plate cylinder is transferred to a blanket cylinder from which the image is offset to a paper sheet fed into a nip between the blanket cylinder and an impression cylinder which is mounted for rotation on an axle, each end of which is received in a cylindrical bearing; an adjustable axle-bearing assembly for the impression cylinder for setting the nip to a value appropriate to a paper sheet being fed into the nip, said assembly comprising:

A. a cylindrical bushing having a circular bore therein to accommodate one of said cylindrical bearings, said bore being eccentric with respect to the outer circumference of the bushing; and

B. a crank mechanism coupled to the bushing at each end of the impression cylinder to adjust the rotary angle thereof and thereby the size of the nip to provide a printing pressure appropriate to the paper sheet being printed, said crank mechanism including a crank arm pivotally coupled to one end of a link whose other end is pivotally coupled to a lug projecting from the bushing; a common shaft supported for rotation at a position parallel to the impression cylinder, the crank arm for each bushing being mounted on said shaft, and a handle attached to one end of the shaft to effect concurrent adjustment of the bushings whereby the resultant nip size is uniform throughout its length.

4,860,650

METHOD FOR ATTAINING LONGITUDINAL REGISTRY OF ROLLS IN PRINTING PRESSES

Lee F. Houser, 855 Maple Tree La., Nazareth, Pa. 18064

Filed Jul. 21, 1987, Ser. No. 76,128

Int. Cl.[4] B41F *7/22, 5/16;* **B41L** *29/00*

U.S. Cl. 101—211 **18 Claims**

1. A method for rough registration of a set of printing plate cylinders preparatory to printing multicolor images using multiple individual printing plates mounted upon said plate cylinders in a multistation rotary type printing press using matched sets of plate cylinders comprising:

(a) providing a center line on each plate cylinder,

(b) aligning the center of each printing plate with the center line on the plate cylinder upon which it is mounted,

(c) bringing the plate cylinders and the respective printing plates mounted thereupon while mounted in said rotary printing press into initial at least rough registration with each other by trial and error,

(d) at least partially encircling one of the plate cylinders of the at least rough registered plate cylinders with a flexible linear material having a transverse center line indication,

(e) aligning the center line of said flexible linear material with the center line of said one of the plate cylinders,

(f) marking the flexible linear material with an indication of its position with respect to a pointer having a pre-determined mounting position with respect to the press framework at the cylinder position in the press at which the

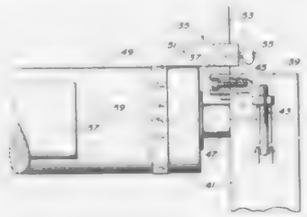


plate cylinder is positioned when the plate cylinders of the press are in at least rough registration,

(g) repeating the procedure of subparagraphs (d) through (f) for each cylinder position of the rotary printing press which is to be used to develop an alignment strip indicator in the form of an appropriately marked flexible linear material having recorded thereupon the pointer positions with respect to each plate cylinder when the plate cylinders are in at least rough registration,

(h) using said alignment strip indicator to rough register plate cylinders in the printing press for a subsequent run of said press by laying said strip about said plate cylinders while the center lines of said plate cylinders and the alignment strip indicator are aligned to determine the proper initial set up angular position of said plate cylinders with said pointers on the press to provide initial rough registration of said plate cylinders used in said subsequent run prior to operation of said printing press.

4,860,651

SKEW CORRECTING APPARATUS FOR MULTI-COLOR PRINTING MACHINE

Koji Ishii, Fuchu, and Yukito Okuda, Tokyo, both of Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Nov. 10, 1988, Ser. No. 269,846

Claims priority, application Japan, Nov. 13, 1987, 62-174175[U]

Int. Cl.[4] B41F *5/18*

U.S. Cl. 101—232 **9 Claims**

1. An apparatus for correcting a skew of an output image to be printed on a paper in a multi-color printing machine, comprising:

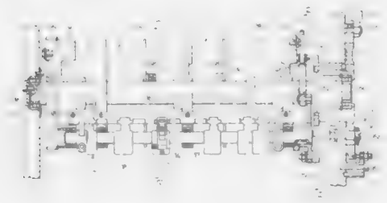
a frame;

a base impression cylinder rotatably supported on said frame and having a first shaft which has a first central axis;

a paper-feed cylinder for feeding the paper to said base impression cylinder, said paper-feed cylinder having a second shaft rotatably supported at opposite ends by said frame, said second shaft having a second central axis;

a shaft holder for holding one end of said second shaft of said paper-feed cylinder and having first and second end portions, said shaft holder being pivotally supported to said frame at said first end portion;

a pivot shaft for pivotally supporting said first end portion of said shaft holder, said pivot shaft extending from said frame and disposed on an imaginary line extending between said axes of said first and second shafts;



an operating shaft rotatably supported on said frame and operatively connected to said second end portion of said shaft holder; and

means for pivoting said shaft holder about said pivot shaft in response to rotation of said operating shaft, said means being disposed between said operating shaft and at least one of said frame and said shaft holder.

4,860,652

MESH ROLLER FOR PLANOGRAPHY

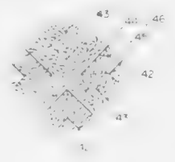
Tomoshi Kawata, Kanagawa, Japan, assignor to Kabushikigaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Filed May 18, 1987, Ser. No. 50,557

Claims priority, application Japan, May 24, 1986, 61-119901; May 30, 1986, 61-126686

Int. Cl.[4] B41F *31/26*

U.S. Cl. 101—348 **15 Claims**



1. A mesh roller for planography, having an external surface comprising a protruded surface and a plurality of fine cells for storing ink, wherein the external surface is made of or covered with a mixture of a high hard material and a lipophilic metal material which are finely mixed with each other.

4,860,653

DETONATOR ACTUATOR

David M. Abouav, Victoria, Australia, assignor to D. J. Moorhouse and S. T. Deeley, both of Victoria, Australia

PCT No. PCT/AU86/00177, § 371 Date Feb. 26, 1987, § 102(e) Date Feb. 26, 1987, PCT Pub. No. WO87/00265, PCT Pub. Date Jan. 15, 1987

PCT Filed Jun. 20, 1986, Ser. No. 46,918

Claims priority, application Australia, Jun. 28, 1985, PH1256; Jun. 28, 1985, PH1257; Jun. 28, 1985, PH1259

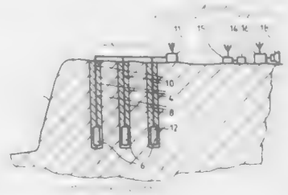
Int. Cl.[4] F42C *15/40*

U.S. Cl. 102—200 **6 Claims**

1. An actuator for a detonator responsive to at least one input signal from a control device comprising:

means for inputting a predetermined input signal from said control device, the predetermined input signal being a voltage step signal, the leading edge of which comprises an arm signal and the trailing edge of which an actuate signal;

means for generating an output arm signal upon input of said predetermined input signal to cause said detonator to



change from a disarmed state to an armed state in which said detonator is capable of being actuated; and

means for generating an output actuate signal to cause an explosive actuation of said detonator a predetermined period after the input of said predetermined input signal.

4,860,654

IMPLOSION SHAPED CHARGE PERFORATOR

Manmohan S. Chawla, and William A. McPhee, both of Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed May 22, 1985, Ser. No. 736,742

Int. Cl.[4] F42B *1/02*

U.S. Cl. 102—306 **16 Claims**



1. An implosion jet perforating device, comprising:

a liner of implosive geometry;

primary explosive means contiguous to said liner for providing implosive impulse to said liner; and

impact means for impacting said primary explosive means with detonating impingement, wherein said impact means comprises means for producing particles under explosive impulse, said particles impacting said primary explosive means with detonating impingement.

4,860,655

IMPLOSION SHAPED CHARGE PERFORATOR

Manmohan S. Chawla, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed May 22, 1985, Ser. No. 367,436

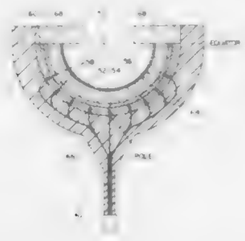
Int. Cl.[4] F42B *1/02*

U.S. Cl. 102—306 **18 Claims**

1. An implosion jet perforating device, comprising:

a liner of implosive geometry; primary explosive means

contiguous to said liner for providing implosive impulse to said liner;



detonation means for detonating said primary explosive means.

4,860,656

JOINING METAL TUBES IN A LIQUID ENVIRONMENT

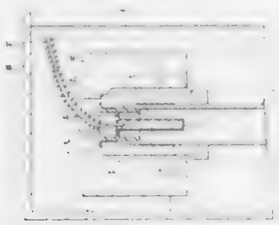
Roy Hardwick, Troon, Scotland, assignor to Imperial Chemical Industries PLC, London, United Kingdom

Filed Sep. 7, 1988, Ser. No. 241,185

Claims priority, application United Kingdom, Sep. 21, 1987, 8722151

Int. Cl.[4] F42B *3/00*

U.S. Cl. 102—312 **8 Claims**



1. A method of expanding a metal tube into engagement with a surrounding coaxial tubular metal member comprising:

locating at least a portion of the tube coaxially within a bore of the metal chamber to define a first space between the external wall of the said portion of the tube and the metal member; and exploding an explosive charge which is located coaxially in the bore of the tube and axially coincident with at least a portion of said first space, the space between the explosive charge and the inner wall of the metal tube being filled with shock transmitting material; the said metal member and tube portion being located coaxially within a bore of a thick walled metal die member to define a second space between the said metal member and metal die member, said second space extending axially at least over the length of said first space and being filled with liquid.

4,860,657

PROJECTILE

Wolfgang Steinicke; Alois Schiessl, both of Marzoll, and Horst Büsel, Hammer, all of Fed. Rep. of Germany, assignors to Buck Chemisch-Technische Werke GmbH & Co.

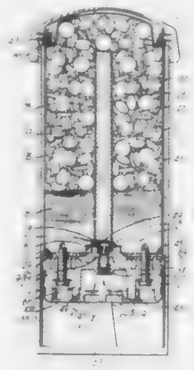
Filed May 2, 1979, Ser. No. 36,555

Claims priority, application Fed. Rep. of Germany, May 5, 1978, 2819863

Int. Cl.[4] F42B *13/44*

U.S. Cl. 102—334 **11 Claims**

1. A projectile consisting of a contact head having a box-shaped centrally disposed interior charge chamber containing a propellant charge, ports for firing leads and an outer casing therearound, said contact head having connected thereto a screen material canister (3) consisting of a drawn aluminum container having a base (29), a plate (71) located in the bottom of the canister for fastening the canister to the contact head, and aluminum container (3) being composed of wall (41) being closed at its top (42) by flanging with an aluminum cover (5), said canister containing a screen material, the outer casing of the contact head having contact rings arranged thereon which are connected via firing leads to a primer capsule, said charge chamber being gas-tight by virtue of a screw cover at its base and at the firing lead ports by virtue of a sealing agent, the screw cover having rupture discs thereon for the escape of the



propellant gas upon ignition, the canister having therein a centrally disposed tube-like igniter-destruction unit with an igniter-destructor charge for igniting the screen material contained in the canister and fragmenting the canister wall, the contact head and canister being securely connected to one another by bolts and having disposed between the two, a delayed action fuse assembly which communicates with the igniter-destructor unit and the interior charge chamber, said screen material being composed of a single pressed body (123) which partially or completely fills the interior of the canister (3) and which is produced by pressing pellets (125) of a smoke charge based on red phosphorus and a granulate (127) of a smoke charge based on red phosphorus to form an enveloping porous structure of the granulate around the individual pellets.

4,860,658

REMOTE ACTION MINE

Klaus Lindstadt, Schwaig, and Detlev Wittmer, Lauf, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nurnberg, Fed. Rep. of Germany

Filed Mar. 23, 1988, Ser. No. 171,961

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711500

Int. Cl.[4] F42B *23/26, 23/04*

U.S. Cl. 102—427 **6 Claims**

1. A projectile-launching anti-tank remote action mine, including a sensor logic for the obtention of a firing signal, comprising a range finder; and a memory storage for the initial and final value of each of a series of regions of action within an overall region containing regions of action and regions of ineffectiveness interposed between said regions of action in dependence upon the range along the axis of action of the mine, with suppression of the emission of firing signals for

target distances in between neighboring regions of action which are stored in said memory storage so as to inhibit the



erroneous initiation of said mine against a dummy target within a region of ineffectiveness.

4,860,659

TUBULAR SHELL FOR ARTILLERY PROJECTILES

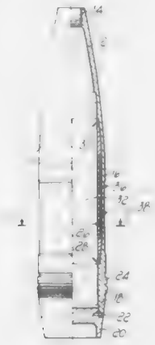
Rodolfo Andreetta, Montebelluna, Italy, assignor to Simmel Difesa S.p.A., Treviso, Italy

Continuation-in-part of Ser. No. 889,938, Jul. 9, 1986, abandoned. This application Apr. 13, 1988, Ser. No. 181,230

Claims priority, application Italy, Nov. 14, 1984, 23581 A/84

Int. Cl.[4] F42B *13/12*

U.S. Cl. 102—473 **3 Claims**



1. A tubular shell for artillery projectiles, comprising:

a casing having a fuse-carrying forward portion, a substantially cylindrical intermediate portion formed with an inside undercut delimited by a rear shoulder and a front shoulder, and a tapered rear portion defining an aperture;

a base plug received in the rear portion;

at least three pre-formed, rigid segments of a cylindrical liner, received in the undercut so that they abut both shoulders, each segment being of a cross-section smaller than the aperture of the casing in its rear portion.

4,860,660

PROJECTILE

Reinhard Synofzik, Jüchen; Karl-Friedrich Doherr, Braunschweig; Dieter Münscher, Braunschweig, and Christos Saliaris, Braunschweig, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 16, 1987, Ser. No. 135,510

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, 3643294

Int. Cl.[4] F42B *13/32*

U.S. Cl. 102—501 **13 Claims**



1. A spin-stabilized projectile comprising:

a projectile body having a rear end; and

deceleration means composed of a sheet of material at said rear end, said deceleration means having an edge region and being deployable from a folded condition to an expanded condition with the aid of rotation of said projectile, said deceleration means, when in said expanded condition, having the general form of a disk with a periphery defined by said edge region and being effective for decelerating said projectile, and wherein said deceleration means are constructed such that said edge region has a higher mass density than the remainder thereof.

4,860,661

SABOTED PROJECTILE WITH PROPELLANT CAGE

Erich Bock, Nurnberg, and Adolf Weber, Neunkirchen, both of Fed. Rep. of Germany, assignors to DIEHL GmbH & Co., Nurnberg, Fed. Rep. of Germany

Filed Oct. 7, 1988, Ser. No. 255,048

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737708

Int. Cl.[4] F42B *13/16*

U.S. Cl. 102—523 **3 Claims**



1. A sabot projectile which is a practice projectile or a cannon combat projectile, for utilization within a liner for a weapon barrel, said projectile including a projectile member equipped with fins and a propellant cage for retaining said projectile member, said propellant cage including hinge-like

segments articulated forwardly in the firing direction for said projectile, said segments circumferentially encompassing said projectile member; a retainer ring for holding said segments together such that said segment rotate in conjunction with said projectile member; said segments each having a groove formed therein, said retainer ring being arranged in said groove; said groove including a step for the support of the retainer ring in an initial position, and said groove having an abutment surface for said retainer ring at a depth providing for the formation of an open space for the unhindered spreading apart of the segments until contacting against the retainer ring; said step on the segments being located on an end surface of the groove facing towards a propellant charge for the projectile, and said retainer ring being constituted from an expandable plastically-deformable material selected from the group consisting of metal, plastic and composite materials.

4,860,662

LINEAR MOTOR TRUCK APPARATUS

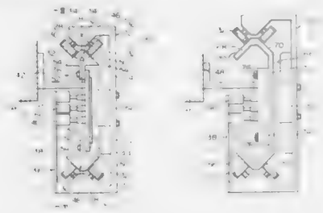
Takashi Matsumoto, Ise, and Shigeru Udagawa, Mie, both of Japan, assignors to Shinko Electric Co., Ltd., Japan

Continuation of Ser. No. 844,828, Mar. 27, 1986, abandoned. This application Sep. 7, 1988, Ser. No. 241,758

Claims priority, application Japan, Mar. 29, 1985, 60-47809[U]; Jul. 31, 1985, 60-117532[U]

Int. Cl.[4] B60L *13/02*

U.S. Cl. 104—93 4 Claims



1. A linear motor truck apparatus of the type which includes a truck having pairs of wheels rotatably mounted thereon; supporting means having a plurality of rails extending along a line of travel of the truck, for supporting and guiding the truck along a line of travel by engaging the wheels with the rails, each rail comprises a pair of elongated sub-rail members, each sub-rail member having a pair of inclined engaging faces parallel to the line of travel and converging to each other so that each sub-rail member has substantially V-shaped cross section, and jointing means for jointing the sub-rail members so that the truck may travel along the line of travel, the inclined engaging face pairs facing away from each other, comprising:

a primary unit mounted to the truck to face the jointing means; and wherein:

the rails comprise a straight rail and a curved rail connected in series;

the straight rail comprises an elongated flat portion as the jointing means, having opposite lateral edges and opposite flat faces, a first elongated yoke plate member mounted at one face thereof on one flat face of the flat portion, and a first set of trolley rails mounted to the other face of the first yoke plate member, the straight rail being integrally formed at opposite lateral edges thereof with respective sub-rail members, the flat portion having the other flat face thereof facing the primary unit to serve as a secondary unit, the flat portion extending along the line of travel as a secondary unit;

the curved rail comprises a second elongated yoke iron plate member as the jointing means, having opposite lateral edges and opposite flat faces, an elongated secondary unit aluminum plate as the secondary unit, mounted at one face on one flat face of a second yoke plate member to extend along the line of travel to face the primary unit and a second set of the trolley rails mounted to the other flat face of the second yoke plate member for supplying electric power, the curved rail being curved along the line of the travel the sub-rail members of the curved rail being a solid aluminum alloy rod and being jointed to respective lateral edges thereof;

the wheels are mounted in at least four pairs; and

the truck comprises a power receiving means mounted thereto to electrically contact the trolley rails for receiving electric power from the trolley rails and electrically connected to the primary unit for energizing the primary unit, and means for mounting the at least four pairs of wheels thereto so that two pairs of the wheels are disposed to engage with the pair of the engaging faces of one sub-rail of each rail and the other pairs are disposed to engage with the pair of the engaging faces of the other sub-rail.

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APPARATUS FOR TRANSFERRING WORK PIECES BETWEEN STATIONS IN AN ASSEMBLY LINE

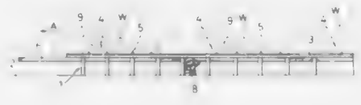
Kazuo Naruse, Okazaki; Hideaki Tobita, Toyota, and Yoichi Shibata, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 1, 1987, Ser. No. 127,120

Claims priority, application Japan, Jun. 8, 1987, 62-142874

Int. Cl.[4] B61B *13/00;* B65G *25/04*

U.S. Cl. 104—162 9 Claims





1. Apparatus for transferring workpieces between spaced work stations, comprising:

a pair of elongated rails connecting at least two work stations;

a jig pallet having a frame for holding a workpiece, the jig pallet being movably mounted on said pair of rails;

an elongated transfer bar reciprocably mounted adjacent to and extending longitudinally along said pair of rails below said mounted pallet;

at least one blocking member fixedly attached to and movable with said transfer bar, said at least one blocking member having a portion extending upwardly substantially perpendicular to the longitudinal extent of the transfer bar;

the jig pallet including a support member mounted to the frame and disposed above the pallet, bearing means having a central axis perpendicular to and aligned with the transfer bar during movement of the jig pallet along the rails, said bearing means being open at opposite ends in communication above and below the pallet frame;

a claw member having a central axis slidably mounted axially in said bearing means;

said claw member extending into the bearing means and extending below the pallet frame into abutting engagement with the blocking member when in a first position and in the bearing means out of engagement with and spaced above the blocking member when in a second position; and

claw member driving means, including a piston cylinder assembly mounted on said support member above the frame and a piston rod means connecting the piston and claw member, for operating the claw member selectively, to the first and second position.

4,860,664

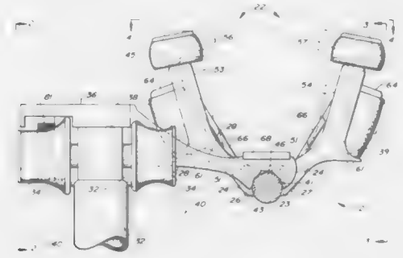
HAUL ROPE GRIP ASSEMBLY FOR AERIAL TRAMWAY WITH ELASTIC BLOCK JAW ACTUATING MEANS

Jan K. Kunczynski, Boulder Cove, Nev., assignor to Zygmunt A. Kunczynski and Alexander J. Kunczynski, both of Carson City, Nev.

Continuation-in-part of Ser. No. 37,719, Apr. 13, 1987, abandoned, which is a continuation of Ser. No. 766,710, Aug. 19, 1985, Pat. No. 4,658,733. This application Apr. 20, 1988, Ser. No. 183,829

Int. Cl.[4] B61B *12/12*

U.S. Cl. 104—204 13 Claims



1. In a detachable haul rope grip assembly for an aerial tramway, said assembly including a gripping head carrying a pair of opposed movable jaws mounted for selective movement between a closed position gripping said haul rope and an open position releasing said haul rope, resilient biasing means biasing said movable jaws toward said closed position and generating a gripping force between said jaws, and jaw actuating means coupled to said movable jaws and formed for movement of said movable jaws from said closed position to said open position against biasing of said biasing means, the improvement in said grip assembly comprising:

said gripping head including a pair of opposed stationary gripping surfaces positioned proximate said movable jaws, each one of said stationary gripping surfaces being positioned to cooperate with an opposed one of said movable jaws to grip said haul rope therebetween in the event of release of the gripping force provided by the other of said movable jaws; and

said resilient biasing means generating two independent biasing forces and being mounted to and applying one of said independent biasing forces to each of said movable jaws to independently bias said movable jaws toward each other and toward an opposed stationary gripping surface.

4,860,665

METHOD FOR PRODUCING A BELLOWS STRUCTURE

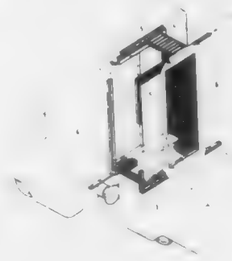
Helmbrecht Schmidt, Niestetal-Sandershausen, Fed. Rep. of Germany, assignor to Hubner Gummi- und Kunststoff GmbH, Fed. Rep. of Germany

Filed Mar. 17, 1988, Ser. No. 169,415

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1987, 3711032

Int. Cl.[4] B60D *5/00;* B05D *3/06*

U.S. Cl. 105—18 5 Claims



1. A method for producing a bellows structure for the connection of segments of an articulated vehicle in which a mask is placed adjacent to material of such bellows structure having a fabric coated with a polymer, and irradiation of such polymer through at least one opening in such mask is performed in order to modify cross-linking of such polymer.

4,860,666

MULTI-AXLE, STEERED ARTICULATED RAILWAY VEHICLE WITH COMPENSATION FOR TRANSITIONAL SPIRALS

Roy E. Smith, Kingston, Canada, assignor to UTDC Inc., Kingston, Canada

Filed Feb. 19, 1988, Ser. No. 157,565

Int. Cl.[4] B61F *5/38*

U.S. Cl. 105—168 8 Claims



1. An articulated railway vehicle comprising:

first and second body portions;

a frame to which each of the car body portions is pivotally joined and supported;

first and second wheelsets pivotally affixed to said frame for supporting said frame,

a third wheelset for supporting said first body portion remote from said frame,

a fourth wheelset for supporting said second body portion remote from said frame, and

a steering means for steering all of said wheelsets to a substantially radial alignment when said vehicle is travelling on curved track, said steering means having,

first detecting means to detect changes in the angle between said frame and said first body portion,

guide means responsive to said first detecting means to guide said first and third wheelsets to said radial alignment,

second detecting means to detect changes in the angle between said frame and said second body portion,

guide means responsive to said second detecting means to guide said second and said fourth wheelsets to said radial alignment.

4,860,667

DISASSEMBLABLE CORRUGATED BOARD TABLE

Alfonso Cardenas, Pico Rivera, and Juan de la Cruz, Huntington Park, both of Calif., assignors to Sunclipse, Inc., Montebello, Calif.

Filed Oct. 12, 1988, Ser. No. 256,737
Int. Cl.[4] A47B *3/00*
U.S. Cl. 108—115 3 Claims



1. A disassemblable table having a rectangular top surface supported by four legs extending downwardly from each corner of said surface, said table being formed of a single rectangular sheet of corrugated paper board material from each corner which has been removed an approximately square shaped piece having a side dimension in the order of ¼ of the shortest side dimension of said sheet, and from which sheet has further been removed from the center of each side edge, a trapezoid piece having an inner side dimension which is also approximately ¼ the dimension of the side of the sheet from which the said trapezoid piece has been removed, said removals leaving along each side of the rectangular sheet, two projecting members spaced from each other by the last said approximately ¼ distance, and each said member in width being approximately ⅛ of the side dimension of the sheet, said sheet being creased for inward folding along lines bisecting each of said projecting members, the intersections of said creases defining the four corners of a panel comprising the rectangular table top; said sheet being further creased at a 45 degree angle outwardly from each of said intersections also for inward folding, each of said members being slotted for a short distance inwardly from its outer extremity along its crease or fold line; whereby when each of said member is bent inwardly to assume a 90 degree angle with said panel, ¼ of each member will be brought into face-to-face abutment with an adjacent half of its most proximate member with their slottings in register, to form one leg projecting downwardly from the panel forming the table top; each said pair of face-to-face engaged members being secured together by a small rectangular element folded to a 90 degree angle and slotted from one edge inwardly along its fold, said element having its slotting inserted in the registering slottings of said pair of abutting face-to-face engaged members.

4,860,668

MOVEMENT-CONTROLLED LOCKING MECHANISM, PARTICULARLY FOR MOVABLE SUPPORT TABLES OR PLATFORMS

Christian Baudenbacher, Fideris, Switzerland, assignor to Visita Mtc Ltd., Chur, Switzerland

Filed Apr. 19, 1988, Ser. No. 183,043
Claims priority, application Switzerland, Apr. 21, 1987, 1532/87
Int. Cl.[4] A47B *9/00*
U.S. Cl. 108—144 17 Claims

1. Movement-controlled locking or latching mechanism for releasably locking a first part (13) of a device (10) with respect to a second part (15) thereof,

in which, upon movement of one (13) of the parts in a first direction (UP) relative to the other (15) of the parts, movement is inhibited at a predetermined stopping position on the device (10), said mechanism comprising

at least one abutment and stop element (19) secured to the other (15) of the parts for defining at least one stopping position;

an engagement and locking element (21) secured to said one of the parts (13), and operatively engageable with said abutment and stop element to stop movement of said one of the parts upon movement thereof in said first direction (UP) while permitting, subsequent to release of the locking element from said abutment and stop element (19), unlimited movement of said one of the parts (13) with respect to the other part (15) in both the first direction and in a second direction, opposite to said first direction,

wherein said engagement and locking element (21) comprises a pivotable lever (21) pivotably coupled to said one part (13),

said pivotable lever having a stopping or locking arm (31) and a control arm (33),

said pivotable lever being operatively engageable with said abutment and stop element (19) to stop movement of the



one (13) of the parts upon movement thereof in said first direction (UP) while permitting release of said one of the parts upon movement in said second direction (DN) by a predetermined distance, and then permitting unobstructed movement of said one part (13) in said first direction (UP) past said abutment or stop element (19) or, selectively, continued movement in said second direction (DN);

wherein said abutment and stop element (19) includes

a first camming means (55);

a second camming means (51);

a third camming means (47); and

a fourth camming means (51′, 49);

a first cam engagement means (31) located on said locking arm (31) of the engagement and locking element (21);

a second cam engagement means (35) located on said control arm (33) of the engagement and locking element (21);

wherein the first camming means (55) is located to engage the first cam engagement means (31) when the one of the parts (13) is moved in said second direction (DN) to pivot the engagement and locking element (21) in position for engagement of the second cam engagement means (35) with the second camming means (51);

wherein said second camming means (51), upon engagement of said second cam engagement means therewith, pivots said engagement and locking element (21) in position to

place said stopping or locking arm out of engagement with said abutment or stop element (19);

the third camming means (47), upon movement of the engagement and locking element (21) in said first (UP) direction after prior movement in said second direction (DN) by said predetermined distance, pivoting the control arm (33) of the engagement and locking element (21) into position in which the stopping or locking arm (31) thereof comes in engagement with a stop abutment (37) on said abutment and stop element (19); and

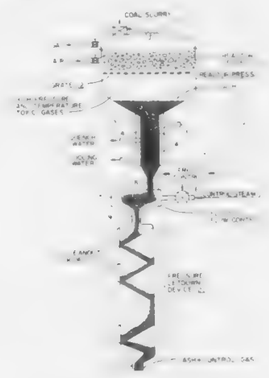
wherein the fourth camming means (51′, 49) engages said control arm (33) of the engagement and locking element (21) upon movement in said second direction (DN) for release of said stopping or locking arm (31) of the engagement and locking element (21) from said stop abutment (37) of the abutment and stop element (19).

4,860,669

ENERGY EFFICIENT CONTINUOUS FLOW ASH LOCKHOPER

Earl R. Collins, Jr., La Canada; Jerry W. Suitor, El Toro, both of Calif., and David Dubis, Morgantown, W. Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 18, 1988, Ser. No. 195,222
Int. Cl.[4] F23J *1/00*
U.S. Cl. 110—165 R 20 Claims



1. A continuous flow lockhopper for the removal of output product, or byproduct, of a reactor comprising a hopper at the bottom outlet of a high temperature, high pressure reactor vessel containing heated high pressure gas for continuous removal of said reactor products or byproducts by gravity force,

a fluidics flow control chamber having an input port connected to said hopper of said reactor vessel, said control chamber further having an output port for the passage of nongaseous reactor products and a pressure control inlet port,

a continuous flow pressure letdown means connected to said output port of said control chamber for gradually reducing the pressure of said nongaseous reactor products,

a source of pressurized control gas connected to said pressure control inlet of said control chamber, and

means for controlling the pressure of said control gas into said control chamber to maintain the gas pressure in said control chamber equal to or slightly higher than the gas pressure in said reactor vessel to substantially eliminate or minimize reactor gas losses from said reactor vessel through said hopper during flow control adjustment, and to eliminate such losses during steady state operation of said continuous flow lockhopper.

4,860,670

METHOD AND APPARATUS FOR THE CLEANING OF FLUE GAS AND THE RECOVERY OF HEAT FROM SAME

Lars L. S. Jorgensen, Brabrand, Denmark, assignor to Jydsk Varmekedelfabrik A/S, Braband, Denmark

PCT No. PCT/DK87/00067, § 371 Date Feb. 2, 1988, § 102(e) Date Feb. 2, 1988, PCT Pub. No. WO87/07701, PCT Pub. Date Dec. 17, 1987
PCT Filed Jun. 3, 1987, Ser. No. 148,510
Claims priority, application Denmark, Jun. 4, 1986, 2656/86
Int. Cl.[4] F23J *15/00*
U.S. Cl. 110—215 16 Claims



6. Apparatus for cleaning the flue gas from a boiler and recovery of heat from said flue gas, whereby the flue gas is led from the boiler through a heat exchanger for water, and at least one of an economizer and heat exchanger, and is subsequently washed with a scrubber fluid withdrawn from a sedimentation tank and then returned to said sedimentation tank, and means for recycling the thermal energy collected in the scrubber fluid, the apparatus comprising:

means for feeding the flue gas through the economizer in such a manner that the flue gas still has a temperature above an acid dew point when the flue gas meets the scrubber fluid in a scrubbing element,

means for measuring the pH value of the scrubber fluid and determining the addition of a liquid additive base from a tank so that the scrubber fluid is maintained substantially neutral,

means for connecting the tank to a high-speed reactor, said high-speed reactor being supplied with precipitated sediment and liquid from the sedimentation tank in that sediment and liquid is led down through a substantially vertical downpipe together with a lime-water suspension from a mixing vessel.

4,860,671

ODOR CONTROL FOR A SLUDGE TREATMENT PROCESS

John D. Glorioso, Clearwater, Fla., assignor to Enviro-Gro Technologies, Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 924,630, Oct. 29, 1986, Pat. No. 4,761,893. This application Jul. 18, 1988, Ser. No. 220,207
Int. Cl.[4] F23J *15/00;* F26B *3/24*
U.S. Cl. 110—236 18 Claims

1. A process for drying mechanically dewatered sewage sludge to produce pellets of a predetermined small and uniform size comprising the steps of:

mixing said sludge with recycled, previously dried sludge particles and pellets;

drying said mixture in a thermal drier to form pellets and particles thereof;

conveying the dried pellets and particles and dryer off-gas to

a low velocity gas/solids separator and separating and collecting the pellets and a substantial portion of the particles;

clarifying the collected pellets and particles and separating and collecting the pellets of a predetermined size, the undersized pellets and particles, and the oversize pellets;

mechanically crushing the oversized pellets and collecting the crushed pellets and undersized pellets and particles;

recycling the collected undersized pellets and particles and crushed pellets by mixing said recycled materials with said incoming sludge to the dryer;

collecting the off-gas from the gas/solids separator and removing substantially all of the fines therefrom;

condensing at least a portion of the water vapor contained therein;

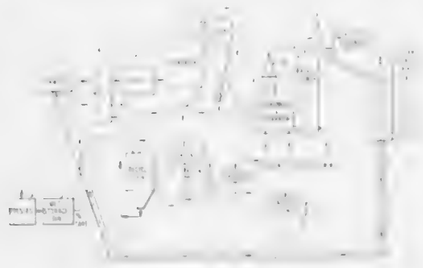
and burning said gases to remove impurities therein before releasing said gases into the atmosphere.

10. An apparatus for drying mechanically dewatered sewage sludge to produce pellets of a predetermined small and uniform size comprising:

means for mixing said sludge with recycled, previously dried sludge particles and pellets;

thermal drying means downstream of said mixing means for receiving said mixture and drying said mixture to form pellets and particles thereof;

gas/solids separator means downstream of drying means for



receiving the dried pellets and particles and off-gas and separating a substantial portion of said particles and pellets;

clarifying means downstream of said separator for receiving said separated particles and pellets and separating the particles of predetermined size, the undersized pellets and particles, and the oversized pellets;

mechanical crushing means downstream of said clarifying means for receiving and mechanically crushing the oversized pellets;

storage bin means and conveying means for conveying the crushed oversized particles and undersized pellets and particles from the clarifying means into the storage bin means whereby the contents of said storage bin means may be recycled by mixing the same with incoming dewatered sludge to be admitted to said drying means;

cyclone means coupled to said gas/solids separators means for receiving the off-gas therefrom and for separating substantially all remaining solids therefrom and conveying means for conveying said separated solids to said storage bin means for recycling;

condenser means coupled to said cyclone means for receiving the off-gas therefrom and for condensing at least a portion of the water vapor therein; and

afterburner means coupled to said cyclone means for receiving the off-gas therefrom and for burning said off-gas to remove impurities therein.

4,860,672

TRIP MECHANISM FOR DRILL SEED BOOT

Robert Zimmerman, Box 6, Almira, Wash. 99103

Continuation of Ser. No. 45,075, Apr. 30, 1987, abandoned. This application Oct. 20, 1988, Ser. No. 260,455

Int. Cl.[4] A01C *5/06*

U.S. Cl. 111—84 **10 Claims**



1. A seed drill including a mobile frame adapted to be moved longitudinally forward during planting of seed and a seed delivery system having a seed delivery tube with an open lower end through which seeds are directed during planting, the seed drill comprising:

a rigid seed boot having opposed upper and lower ends, the seed boot including an open upright seed passage extending between its upper and lower ends, the seed passage at the upper end of the seed boot being in communication with the lower end of the seed delivery tube, the upper end of the seed boot further including a forwardly protruding arm fixed to the seed boot and having a bottom edge leading to a front edge on the arm;

a shovel at the lower end of the seed boot;

a longitudinal drag bar having forward and rear ends, the forward end of the drag bar being pivotally connected to the mobile frame about a transverse axis, the rear end of the drag bar overlapping the seed boot arm;

a transverse pivot connection mounting the seed boot arm to the rear end of the drag bar;

a longitudinal leaf spring having front and rear ends, the front end of the leaf spring being mounted to the drag bar and its rear end underlying the seed boot arm at a position forward of the transverse pivot connection to bias the seed boot arm upwardly and the seed boot forwardly in a pivotal path about the transverse pivot connection; and

adjustable stop means mounted on the drag bar above the seed boot arm for limiting upward movement of the seed boot arm about the transverse pivot connection, the adjustable stop means being engaged by the seed boot arm in response to the biasing action of the leaf spring to define a changeable pre-selected planting position of the seed boot and shovel about the transverse pivot connection;

and arcuate abutment means interposed between the rear end of the leaf spring and the seed boot arm for assuring smooth continuing engagement between them at all operative angular positions of the seed boot and shovel about the transverse pivot connection while the seed boot and shovel are swinging rearwardly about the transverse pivot connection from their pre-selected planting position due to engagement of hard soil or rocks by the forwardly-moving shovel.

4,860,673

TUFTING MACHINES

Gerald F. Ward, Mellor, and Allan Beckett, Pleckgate, both of Great Britain, assignors to Tufting and Textile Systems Limited, Blackburn, United Kingdom

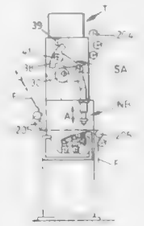
PCT No. PCT/GB86/00750, § 371 Date Aug. 8, 1988, § 102(e) Date Aug. 8, 1988, PCT Pub. No. WO87/03629, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 9, 1986, Ser. No. 203,992

Claims priority, application United Kingdom, Dec. 10, 1985, 8530355

Int. Cl.[4] D05C *15/06*

U.S. Cl. 112—80.4 **31 Claims**



1. A tufting machine comprising:

(A) a needle bar adapted for reciprocation;

(B) eccentric drive means adapted to impart reciprocating movement to the needle bar;

(C) a pivotal linkage system operatively connecting the eccentric drive means to the needle bar;

(D) the pivotal linkage system including

(i) push link means pivotally connected to the needle bar, and

(ii) stroke-adjusting link means pivotally connected to the push link means; and

(E) an adjusting mechanism connected to the pivotal linkage system for determining the length of stroke of reciprocation of the needle bar;

(F) the adjusting mechanism including

(i) gear means operable from an end of the tufting machine and including gear quadrant means and being adapted for movement along an arcuate path bodily to move the push link means and consequently to effect the needle bar stroke adjustment.

4,860,674

TUFTING MACHINE AND METHOD FOR PRODUCING LEVEL CUT AND LOOP PILE

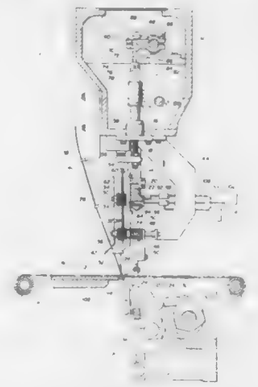
Ian Slattery, Hixson, Tenn., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Feb. 3, 1989, Ser. No. 306,643

Int. Cl.[4] D05C *15/20*

U.S. Cl. 112—80.42 **21 Claims**

1. In a tufting machine having a head for mounting drive means including a drive bar reciprocating in a linear path, a bed disposed beneath the head having means for supporting a base material fed in a longitudinal direction substantially normal to said path, a needle carrier for mounting at least one needle at a bottom distal end thereof, means for mounting said needle carrier for reciprocation parallel to said path, said drive bar carrying a latch member selectively operable between an active position for coupling said needle carrier to said drive bar at a first location for reciprocation therewith for driving said needle to a first bottom dead center position, and an inactive position, said drive bar and said needle carrier having respective abutment means adapted to cooperatively engage at a second location only when said latch member is in said inactive position for driving said needle carrier and said needle to a second bottom dead center position spaced from said first-bottom dead center position, loop seizing means in said bed for seizing and retaining loops of yarn presented by said needle when driven to said first bottom dead center position and for seizing and shedding loops kf yarn presented by said needle when driven to said second bottom dead center position, a



knife cooperating with said loop seizing means for severing loops of yarn seized and retained by said loop seizing means, and control means for selectively moving said latch member between said active position and said inactive position.

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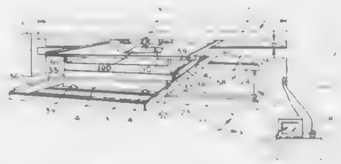
AUTOMATIC QUILTING MACHINE FOR SPECIALIZED QUILTING OF PATTERNS WHICH CAN BE CONTROLLED BY A REMOTE JOY STICK AND MONITORED ON A VIDEO SCREEN

David Brower, Tarzana, and Thomas K. Jernigan, Canoga Park, both of Calif., assignors to TD Quilting Machinery, Burbank, Calif.

Filed Jul. 18, 1988, Ser. No. 220,734

Int. Cl.[4] D05B *11/00, 35/00*

U.S. Cl. 112—119 **31 Claims**



1. A frame quilting machine comprising:

a. a frame member for retaining a fabric;

b. said frame member mounted on a structure which can be moved in the X-direction, the Y-direction, or any X-Y combination direction;

c. a first cross beam extending horizontally over said frame member;

d. a second cross beam aligned parallel to said first cross beam and extending horizontally beneath said frame member;

e. a remote control apparatus for controlling the movement of said structure and said frame member to enable the frame member and the fabric retained thereon to be moved horizontally in the X-direction, the Y-direction, and any combination X-Y direction between said first cross beam and said second cross beam;

f. a sewing machine head attached to said first cross beam and having a source of thread;

g. a sewing needle extending from said sewing machine head

and positioned to sew threads into said fabric while the frame member and structure move underneath said first cross beam and above said second cross beam;

h. a sewing machine plate attached to said second cross beam and aligned with said sewing machine head and sewing needle;

i. a source of illumination focused on the intersection of said sewing machine needle and fabric;

j. a video camera movably secured to said first cross beam and focused on the intersection of said sewing machine needle and fabric; and

k. said video camera connected to a monitor;

l. whereby an operator may view the needle sewing thread into the fabric on the video monitor and may control the movement of the frame and fabric relative to the sewing needle by said remote apparatus.

4,860,676

WAISTBAND SEW-IN DEVICE

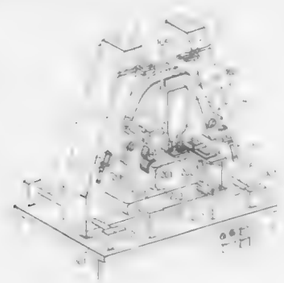
Hironao Kawai, Nara; Shigetoshi Fukui, Kadoma, and Kenji Ikeda, Neyagawa, all of Japan, assignors to Morimoto Mfg. Co., Ltd., Shijonawate, Japan

Filed Mar. 14, 1988, Ser. No. 167,968

Claims priority, application Japan, May 11, 1987, 62-70601[U]; May 11, 1987, 62-70602[U]; May 11, 1987, 62-70603[U]; May 11, 1987, 62-70604[U]; May 11, 1987, 62-115394

Int. Cl.[4] D05B *3/00, 23/00, 35/04*

U.S. Cl. 112—121.14 **6 Claims**





1. A waistband sew-in device comprising:

a cloth feed mechanism comprising a stationary frame having two legs defining an inverted-U shaped guide surface for retaining a cloth into a hoop shape, a slidable belt strip reeled on said guide surface, and a take-up and rewinding mechanism mounted on each one of said two legs of said stationary frame;

a reciprocally movable sewing machine movable between an operating position corresponding to the belt strip reeled on said guide surface and a waiting position behind it, said sewing machine having a sewing unit;

a rubber mounting mechanism to insert a waistband outside the cloth retained in a hoop shape and a stretched state;

a first cloth edge folding-over mechanism to fold over a cloth edge of the cloth retained in a hoop shape outside the waistband; and

a second cloth edge folding-over mechanism to fold over again a cloth edge of the part already folded over by said first cloth edge folding mechanism before said sewing unit set at said operating position, and to press it between the waistband and the cloth.

4,860,677

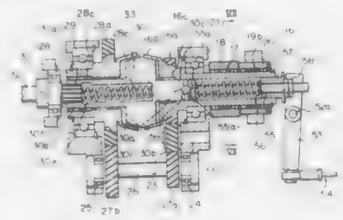
CLUTCH REVERSING ROLL FEED FOR A SEWING MACHINE

Yoshihiro Ishihara, Shimane, Japan, assignor to Juki Corporation, Tokyo and Nakajima Seisakusho Company, Shimane, both of, Japan

Filed Jun. 1, 1988, Ser. No. 201,478

Int. Cl.[4] D05B *27/14*

U.S. Cl. 112—318 **4 Claims**



1. A workpiece feeding apparatus for a sewing machine wherein a workpiece is transported by a pair of feed wheels which clamp the workpiece therebetween, said workpiece feeding apparatus comprising:

a feed shaft having a first clutch portion provided at one end thereof adapted to intermittently rotate in a certain direction in synchronism with the movement of a needle;

a feed reversing shaft having a second clutch portion provided at one end thereof in opposition to said first clutch portion;

a first transmission means disposed between said feed shaft and said feed reversing shaft for rotating said feed reversing shaft in the direction reverse to the rotational direction of said feed shaft;

a clutch means having clutch portions adapted to selectively contact either said first or second clutch portions which rotate in opposite directions in order to define the direction of transportation of said workpiece; and

a second transmission means disposed between said clutch means and said feed wheels for transmitting the rotational direction of the clutch means to said feed wheels.

4,860,678

SEWING MACHINE WITH GRAPHIC INSTRUCTIONS

Kenneth O. E. Skogward, Huskvarna, Sweden, assignor to Husqvarna Aktiebolag, Huskvarna, Sweden

Filed Oct. 4, 1988, Ser. No. 253,049

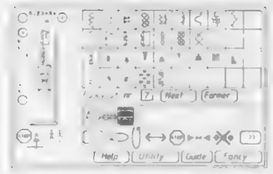
Claims priority, application Sweden, Oct. 5, 1987, 8703830

Int. Cl.[4] D05B *3/02*

U.S. Cl. 112—445 **8 Claims**

1. A sewing machine with graphic instructions provided with a needle bar mechanism, a cloth feeder and a computer (12) with a memory unit for producing stitch codes for control of the needle bar mechanism as well as the cloth feeder, and an arranged display (10) connected to the computer, which display has a module (16) for showing at least seam pictures, symbols, and accessories, characterized in that an operating unit (11) is attached to a control module (14) for a cursor on said display and that a picture shown on said display is divided in fields illustrating each of the said seam pictures, symbols and accessories between which the cursor is dirigible, and that





those fields together with the cursor and an activation arrangement (13) constitute an input selector of the machine.

4,860,679

ICE BREAKER VESSEL

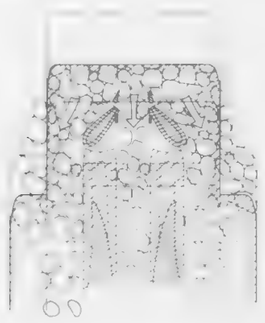
Göran Liljeström, Västra Frölunda, and Bengt Johansson, Calgary, both of Sweden, assignors to Gotaverken Arendal AB, Goteborg, Sweden

Filed Apr. 20, 1988, Ser. No. 184,403

Claims priority, application Sweden, Apr. 27, 1987, 8701716

Int. Cl.[4] B63B *35/08*

U.S. Cl. 114—40 **9 Claims**



1. A method for an ice breaker vessel, for increasing maneuverability and protecting the propellers against broken ice when going backwards, wherein said ice breaker has two propeller shafts and a steering rudder aligned with each shaft, each of said rudders being rotatable about a vertical axis, comprising turning the steering rudders in opposite directions until they cooperate and form backward converging rudder surfaces, at end positions being defined by end stop means.

4,860,680

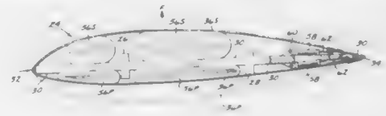
SAILBOAT WITH LEEWAY REDUCING KEEL

H. A. Faulconer, 10405 Sierra Vista Dr., LaMesa, Calif. 92041

Filed Oct. 19, 1987, Ser. No. 109,915

Int. Cl.[4] B63B *30/38*

U.S. Cl. 114—140 **18 Claims**



1. A sailboat comprising:

a hull having a mast extending in an upward direction from said hull, and sails; and

a stabilization structure extending in a downward direction from said hull and having two laterally facing sides, said structure including

panel means for forming the outer sides of said stabilization structure, said panel means including a pair of deformable panels, one forming each outwardly facing lateral surface of said structure in direct contact with the water, each of said panels being independently deflectable under a deflection force to alter the shape of said structure to form in cross section a lifting body,

structural support means for supporting said panel means, said structural support means including reaction surface means for reacting against the deflection force, and

means for controllably and selectively applying the deflection force to each of said panels without the use of a mechanical linkage within said structure, the degree of deflection of each panel being independent of the degree of deflection of the other panel, said means for applying acting to return both panels to a neutral, undeformed position upon failure.

4,860,681

APPARATUS FOR CARRYING OUT OPERATIONS UNDER WATER

Bjornar Svenning, Trondheim, Norway, assignor to Den norske stats oljeselskap a.s., Norway

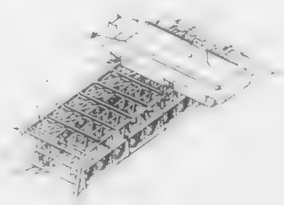
PCT No. PCT/NO87/00039, § 371 Date Jan. 25, 1988, § 102(e) Date Jan. 25, 1988, PCT Pub. No. WO87/07232, PCT Pub. Date Dec. 3, 1987

PCT Filed May 22, 1987, Ser. No. 149,228

Claims priority, application Norway, May 23, 1986, 862053

Int. Cl.[4] B63G *8/00*

U.S. Cl. 114—321 **10 Claims**



1. A twin-hull autonomous submarine for docking and moving about a protective structure of the type that protects underwater production systems, said submarine having two pressure hulls, said two pressure hulls defining a cargo hold therebetween, said cargo hold limited externally by a top hatch and a bottom hatch, said top hatch and bottom hatch movably affixed to said pressure hulls, said submarine comprising:

(a) at least three pair of longitudinal rails, each pair of rails of

said three pair of rails positioned at different levels between said pressure hulls, one rail of each pair of said three pair of rails affixed to one of said two pressure hulls and the other rail of said pair of said three pairs of rails affixed to the other of said two pressure hulls;

(b) at least one tranverse crane, movably positioned on a first pair of rails of said three pair of longitudinal rails, said transverse crane having raising means for raising and lowering said transverse crane with respect to said one pair of rails;

(c) at least one cargo wagon, movably positioned on a second pair of rails of said three pair of longitudinal rails;

(d) a belly manipulator, movably positioned on a third pair of rails of said three pair of longitudinal rails; and

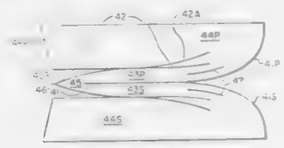
(e) docking and moving means for docking and moving said submarine on said protective structure, said docking and moving means affixed to said pressure hulls.

4,860,682

UNITARY-PANEL BOAT HULL CONSTRUCTION

Charles F. Gunderson, 1622 N. Marconi Rd., Belmar, N.J. 07719

Filed Jun. 10, 1988, Ser. No. 204,869
Int. Cl.⁴ B63B *5/02*
U.S. Cl. 114—358 **10 Claims**



1. A displacement hull formed of a single, elongated, flat panel of resilient material, said panel having a bow end and an aft end comprising at least one, basic, bow, primary cut in said panel, said bow primary cut extending from said bow end of said panel towards said aft end of said panel to a basic terminating point before reaching said aft end of said panel; at least one, opposing, aft, primary cut in said panel beginning from said aft end of said panel, and extending towards said bow end of said panel, to an opposing terminating point before reaching said bow end of said panel; said basic, bow, primary cut and said opposing, aft, primary cut overlapping each other for a considerable distance to form at least one, elongated, relatively-narrow, centrally-located, inner, flexible strip between said basic and opposing primary cuts within said panel; said panel having one outer portion along said basic, bow, primary cut and another outer portion along said opposing, aft, primary cut that can be bent to any desired angle with respect to each other and said inner flexible strip; said basic, bow, primary cut and said opposing, aft, primary cut forming edges that are adaptable to be drawn together and secured in a watertight manner to form a bow and a bow chine, and a stern and stern chine, respectively, for said displacement hull.

4,860,683

FLEXIBLE GUARDRAIL FOR A SAILING VESSEL

Carlos Herrera Sanguinetti, Guayaqui 3428, Apt. 001, Montevideo, Uruguay

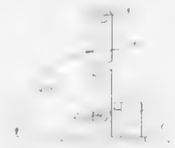
Filed Jul. 8, 1988, Ser. No. 216,724
Int. Cl.⁴ B63B *17/00*
U.S. Cl. 114—364 **11 Claims**

1. A guardrail device for protecting a convex edge of a planar working surface to retain personnel on the planar surface comprising:

a flexible elongated guardrail extending along the periphery of the convex edge to provide horizontal restraint;

a plurality of vertical posts for maintaining said flexible elongated guardrail at a certain height above the planar surface;

tension means, securely fastened to the planar surface and connected to said flexible guardrail for providing a force to said flexible guardrail, said force causing said flexible guardrail and said plurality of vertical posts to move toward the inside of the convex edge of the planar surface;



stopper means securely fastened to the planar surface, for preventing said flexible guardrail and said vertical posts from moving completely to the inside of the convex edge; and

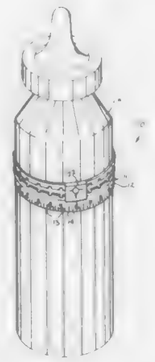
flexing means, connected to said vertical posts, for allowing said vertical posts and said flexible guardrail to move away from the inside of the convex edge, thereby giving the guardrail device a characteristic of flexibility.

4,860,684

INFANT BOTTLE TIMER APPARATUS

Tarik S. Al-Harbi, 60 E. 32nd St. #712, Chicago, Ill. 60616

Filed May 19, 1988, Ser. No. 195,894
Int. Cl.⁴ G09F *9/40*
U.S. Cl. 116—308 **6 Claims**



1. An infant bottle timer apparatus comprising in combination,

an infant nursing bottle, and

an encircling band timer means secured about an external surface of said bottle orthogonally thereto relative to a central axis of said bottle, and

said band timer means including a bottle contact band adjacent to and in contact with said bottle and a lower external face of said band including timing indicia corresponding to hours and portions of hours of a twenty-four hour time cycle equally spaced along the band, and

an upper external face of said band having movable secured thereto an indicator slide means captured between an upper and lower parallel coextensive rail means secured to said upper external face for mounting said indicator slide means for movement therebetween, said slide means being mounted for parallel movement relative to said lower face with a pointer marking imposed thereon for cooperation with said timing indicia for indication of an infant feeding events and

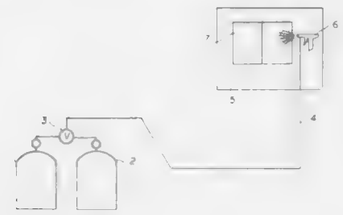
wherein said upper and lower rail means each include an inwardly directed flange formed with spaced and aligned recesses for securement of a portion of said slide means within said aligned spaced recesses such that said pointer marking registers with one of said timing indicia.

4,860,685

TREATMENT OF CELLULOSIC MATERIALS

Richard D. Smith, 224 Early St., Park Forest, Ill. 60466

Continuation-in-part of Ser. No. 753,663, Jul. 10, 1985, abandoned. This application Mar. 9, 1987, Ser. No. 49,394
Claims priority, application PCT Int'l Appl., Jul. 10, 1986, PCT/US86/01438
Int. Cl.⁴ B05C *5/00*
U.S. Cl. 118—300 **13 Claims**



1. A soft spray system for treatment of cellulosic materials having an image thereon, a delivery system in communication with a container and terminating in an airless spray gun, a deacidification solution in the container minimizing acid attack and aging of cellulosic materials, said solution including a deacidification agent comprising carbonated magnesium alkoxides, a lower alcohol for solubilizing said agent, said lower alcohol being present in an amount sufficient to dissolve said agent and less than that which will detrimentally affect the image, a diluent for said alcohol solution, a propellant having a boiling point below 0° F. and an inert gas in such amount as to maintain a substantially uniform pressure in the container, said propellant serving to propel said deacidification solution from said container through said delivery system to said spray gun, and said solution and said propellant being substantially free from carbon dioxide gas.

4,860,686

COATING WIDTH REGULATING APPARATUS

Kenzo Kato, and Kengi Yamada, both of Mihara, Japan, assignors to Beloit Corporation, Beloit, Wis.

Filed Nov. 26, 1986, Ser. No. 935,424
Int. Cl.⁴ B05C *3/02*
U.S. Cl. 118—410 **4 Claims**

1. In a coating apparatus wherein a liquid coating material is applied to a travelling web supported on a backing roll, including a coater blade, and an end seal, and end seal support flange means near either end of the backing roll, the improvement comprising:

a case having a mechanical means for securing the end seal thereon;



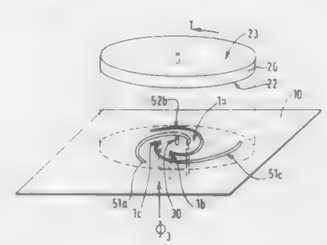
means for magnetically securing the case to the coater blade to provide a sealing relationship, and relative movement, between the case with end seal and coater blade.

4,860,687

DEVICE COMPRISING A FLAT SUSCEPTOR ROTATING PARALLEL TO A REFERENCE SURFACE ABOUT A SHIFT PERPENDICULAR TO THIS SURFACE

Peter M. Frijlink, Crosne, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1987, Ser. No. 26,497
Claims priority, application France, Mar. 21, 1986, 86 04078
Int. Cl.⁴ B05C *11/00*
U.S. Cl. 118—500 **18 Claims**



1. A device comprising

a reference surface having a plurality of non-aligned orifices, said plurality being greater than 2,

a flat susceptor disk rotating parallel to said reference surface, said disk being supported from said reference surface by at least one flow of gas from said orifices, said orifices in said reference surface being within the periphery of said disk, and

a rotary shaft perpendicular to said reference surface, said rotary shaft being cylindrical with a small diameter relative to a diameter of said disk, and said rotary shaft being disposed between said reference surface and said disk at the center of symmetry of said disk,

wherein said disk is maintained at a separation distance h greater than zero from said reference surface by said flow of gas, and

wherein said orifices are separated from one another by a rotation of $2\pi/n$, where n is the number of orifices,

wherein rotary movement of said disk is obtained by a force of viscosity of a supplementary flow of gas, and wherein said reference surface includes at least one additional orifice and a groove having a curved portion extending from said additional orifice for passing said supplementary flow of gas into said groove to effect rotary movement of said disk, said curved groove portion being disposed within said periphery of said disk, and a second portion

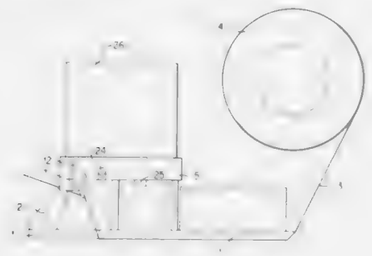
extending from said curved portion outwardly beyond said periphery of said disk.

4,860,688

DEPILATORY WAX AUTOMATIC DISPENSER ON DEPILATORY STRIPS

Ugo Nazzarro, Via dei Coltelli, 28/2, I-40124 Bologna, Italy

Filed Mar. 22, 1988, Ser. No. 171,802
Claims priority, application Italy, Apr. 6, 1987, 3418 A/87
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—694 **11 Claims**



1. A depilatory wax automatic dispenser for dispensing wax on depilatory strips, said dispenser comprising: a pot for containing wax; a cavity placed at a bottom end of said pot and which communicates at a top portion with said pot and at a bottom portion with the ambient via an outlet; said dispenser further comprising a closing element for said outlet, said closing element being movable to a first closing position at which said outlet is closed and a second at least partial opening position at which said outlet is at least partially open; an electrical resistance means for heating said wax in said cavity; said electrical resistance means being adapted to be electrically connected to a known device adapted to adjust the intensity of the electric current passing through said resistance means; a coil cartridge having a strip wound therearound; a dragging means for dragging said strip from said cartridge to move said strip by said outlet; a first means cooperating with said dragging means to place said strip in a nearly horizontal attitude adjacent said outlet when said closing element is in said second position to enable wax from said cavity to be placed on said strip through said outlet; a second means for maintaining a clearance between said strip and said outlet as said strip is being moved to pass by said outlet; a third means for maintaining a constant wax level within said pot as said wax is being placed on said strip.

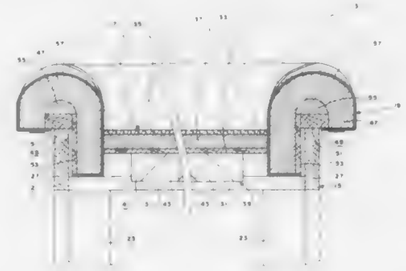
4,860,689

PET LOUNGE

Robert M. Stewart, 260 N. Yates Rd., Memphis, Tenn. 38119

Filed Mar. 14, 1988, Ser. No. 167,642
Int. Cl.[4] A01K *1/00*
U.S. Cl. 119—1 **11 Claims**

1. A pet lounge comprising:
(a) a base member;
(b) a body support platform for resting on said base member and for providing a body support for the pet;
(c) a bolster means for surrounding at least a portion of said body support platform and for providing a headrest for the pet; and



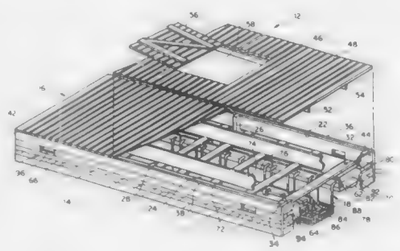
(d) height adjustment means for allowing the vertical height of said body support platform relative to said bolster means to be varied.

4,860,690

MARINA DOCK AND AQUATIC LIFE HABITAT

Robert S. De Santo, 8 Sylvan Glen, East Lyme, Conn. 06333, and Jeffrey H. Shapiro, Cedar Island Marina, P.O. Box 181, Clinton, Conn. 06413

Filed Aug. 31, 1987, Ser. No. 91,495
Int. Cl.[4] A01K *61/00*
U.S. Cl. 119—3 **11 Claims**



1. A marina dock and aquatic life habitat apparatus comprising:
a dock providing secure moorings for a plurality of boats, the dock including a pair of opposed walls and a deck spanning the tops of the walls;
first means, associated with the dock, for maintaining the dock in a stationary position in a body of water with the water line below the deck and along said walls;
a plurality of aquaculture trays associated with the dock;
second means, supported from within the walls below the deck, for defining a track; and
third means slidably supported by the track, for suspending the aquaculture trays into the water below the deck.

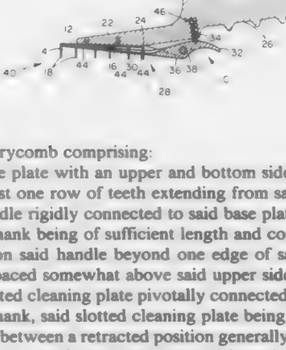
4,860,691

ANIMAL FEEDER

Lowell A. Mayer, N. 3900 Fairwood Rd., Reeseville, Wis. 53579

Filed Feb. 1, 1988, Ser. No. 150,827
Int. Cl.[4] A01K *5/00*
U.S. Cl. 119—51.5 **19 Claims**

1. An animal feeder comprising:
a. a housing having top, bottom, and back walls, and first and second side walls arranged to form a five-sided enclosure with an open front;
b. a front panel extending across the housing open front and having a first wall portion adjacent the housing first side wall that extends from the housing bottom wall for a first predetermined distance thereabove and a second wall portion adjacent the housing second side wall that extends for a second predetermined distance above the housing bottom wall;
c. a center divider extending between the housing back wall and the front panel and extending above the housing bottom wall for a height approximately equal to the height of the front panel first wall portion;



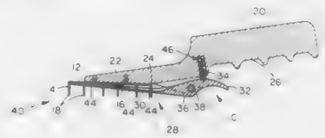
d. a first panel located at a first predetermined height above the housing bottom wall and having a periphery that contacts the housing first side and back walls, front wall first wall portion, and center divider to cooperate therewith to define a first compartment; and
e. a second panel located at a second predetermined height above the housing bottom wall higher than the first predetermined height, the second panel having a periphery that contacts the housing second side and back walls, front panel second wall portion, and center divider to cooperate therewith to define a second compartment.

4,860,692

ONE HANDED CURRYCOMB APPARATUS AND METHOD

Larry R. Beard, 16000 Decker Lake Rd., Austin, Tex. 78724

Filed Nov. 21, 1988, Ser. No. 273,552
Int. Cl.[4] A01K *13/00*
U.S. Cl. 119—88 **8 Claims**



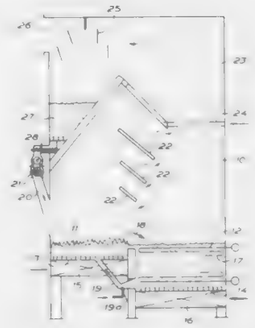
1. A currycomb comprising:
A. a base plate with an upper and bottom side;
B. at least one row of teeth extending from said base plate;
C. a handle rigidly connected to said base plate by a shank, said shank being of sufficient length and configuration to position said handle beyond one edge of said base plate and spaced somewhat above said upper side thereof;
D. a slotted cleaning plate pivotally connected at one end to said shank, said slotted cleaning plate being movable pivotally between a retracted position generally adjacent said bottom side of said base plate with each of said teeth extending from said bottom side of said base plate through slots in said cleaning plate, and an extended position in which said cleaning plate is spaced from said base plate sufficiently so that none of said teeth extend through said slotted cleaning plate;
E. an actuating lever rigidly connected to said cleaning plate, said actuating lever extending from said pivotally connected end of said cleaning plate beyond said shank and beneath said handle, for pivoting said cleaning plate between said retracted position and said extended position; and
F. a biasing means for biasing said actuating lever away from said handle such that said cleaning plate is maintained normally in said retracted position, whereby said actuating lever may be pulled by a user, using one hand only, toward said handle causing said cleaning plate to pivot from said retracted position to said extended position thereby ejecting debris from between said teeth, and whereby when said actuating lever is released by said user, said biasing means moves said actuating lever away from said handle thereby returning said cleaning plate to said retracted position so that grooming may be resumed.

4,860,693

METHOD IN FLUIDIZED BED COMBUSTION

Göran Järvstrat, Linköping, Sweden, assignor to Asea Stal AB, Linköping, Sweden

Filed Aug. 26, 1987, Ser. No. 89,737
Claims priority, application Sweden, Aug. 28, 1986, 8603625
Int. Cl.[4] F22B *1/00*
U.S. Cl. 122—4 D **9 Claims**



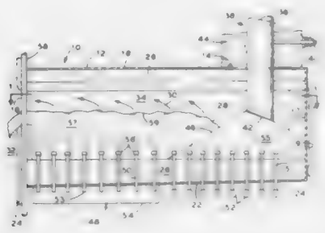
1. Method of combusting solid fuel in a first fluidized bed and a second fluidized bed located laterally of the first bed, said beds being mutually separated but communicating with each other, a common freeboard being provided above the beds, the method comprising the steps of:
(a) operating the first bed substoichiometrically;
(b) positively directing flue gas from the first bed towards the second bed in said common freeboard in counterflow to the flue gas from the second bed to direct fuel particles entrained in the flue gas from the first bed towards the second bed;
(c) regulating the height of said first and second beds to cause overflow of fuel particles from said first to said second bed;
(d) supplying particulate material from said second bed to said first bed by removing material from the bottom of the second bed and supplying it to the bottom of the first bed;
(e) operating the second bed with large excess of air;
(f) efficiently mixing the flue gases from the two beds; and
(g) recovering heat power by heat exchange solely from said second bed.

4,860,694

CONTROLLED DISCHARGE FROM A STANDPIPE CONTAINING PARTICULATE MATERIALS

David J. Walker, Wadsworth, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 12, 1988, Ser. No. 242,656
Int. Cl.[4] F22B *1/00*
U.S. Cl. 122—4 D 18 Claims



1. An apparatus for the control and conveyance of particulate material from a standpipe in a circulating fluidized bed boiler comprising:

(a) a pressurized, high temperature conduit having a particulate entrance and at least one side discharge opening that opens onto the furnace of said circulating fluidized bed boiler;

(b) a standpipe projecting through said particulate entrance a set distance, said standpipe depositing said particulate material into a first area of said conduit, said particulate material having a specific at-rest angle of repose within said pressurized conduit and forming, as best it can, a generally conical mound in said conduit, the apex of said mound being at the discharge end of said standpipe;

(c) aerating means underneath said first area of said conduit for aerating and moving said conically deposited particulate material from said first area to a second area of said conduit beyond said first area, said moved particulate material being replaced with additional particulate material deposited into said first area from said standpipe; and

(d) fluidizing means underneath said second area of said conduit for fluidizing said moved particulate material and for transporting said now fluidized material along said conduit toward said side discharge opening, said fluidized and transported particulate material having a generally uniform height in said second area, said height being less than the height of said conduit;

(e) whereby said fluidized and transported particulate material departs said conduit through said side discharge opening into said furnace of said circulating fluidized bed boiler with the rate of said departure being dependent upon the height of said particulate material in said second area above the lower edge of said side discharge opening, said rate of departure also being dependent upon the rate at which said particulate material is moved form said first area of said conduit to said second area.

4,860,695

CYCLONE COMBUSTION APPARATUS

Jacob Korenberg, York, Pa., assignor to Donlee Technologies, Inc., York, Pa.

Filed May 1, 1987, Ser. No. 44,735
Int. Cl.[4] F22B *7/00, 31/02*
U.S. Cl. 122—136 R 28 Claims

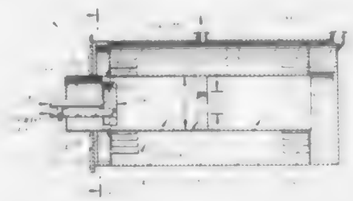
1. A cyclone combustion apparatus, comprising:

a combustion chamber having a front end, a rear end and a substantially cylindrical wall having an inner surface;

a substantially cylindrical exit throat at the rear end of the combustion chamber and aligned substantially concentrically therewith, for exhausting hot gases from the combustion chamber, the exit throat having a diameter less than the diameter of said inner surface;

means for supplying partially preburned fuel into said combustion chamber from the front end thereof, said means for supplying partially preburned fuel including a precombustion chamber having a fuel inlet and a jet air supply inlet for admitting a desired mixture of fuel and air and an outlet connected to the front end of the combustion chamber for exhausting hot partially burned fuel gases into said combustion chamber;

an annular primary air supply chamber having an annular outlet for discharging a primary air stream surrounding said partially burned fuel gases exhausted into said combustion chamber;



means for supplying secondary air into said combustion chamber and for forming a cyclonic flow pattern of hot gases for combustion within said chamber, said air supply means including a plenum chamber fixed on the front end of the combustion chamber, said plenum chamber having an air inlet and an annular air supply opening in communication with and coaxial with the combustion chamber, said annular air supply opening having spaced radial vanes tilted at a selected angle from the axis of said combustion chamber to affect cyclonic air swirling in the combustion chamber; and

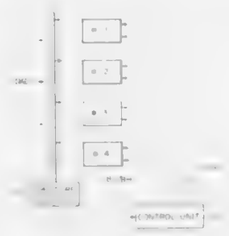
heat exchange means surrounding and extending substantially throughout the axial length of the combustion chamber for cooling the wall in the combustion chamber.

4,860,696

APPARATUS FOR CONTROLLING BOILER SYSTEM

Tadao Fujita, Tokyo, Japan, assignor to Ebara Corporation, Tokyo, Japan

PCT No. PCT/JP87/00949, § 371 Date Oct. 3, 1988, § 102(e) Date Oct. 3, 1988
PCT Filed Dec. 8, 1987, Ser. No. 243,552
Claims priority, application Japan, Dec. 8, 1986, 61-291954
Int. Cl.[4] F22B *37/42*
U.S. Cl. 122—448 B 1 Claim



1. An apparatus for controlling a boiler system, comprising:

a plurality of boiler units (**10**) connected in common to a steam header (**11**) and shiftable between the halting state and the operating state in response to each of a combustion starting signal (BI) and a combustion stopping signal (BD) and further shiftable in said operating state between a high combustion state and a low combustion state in response to each of a high combustion state selecting signal (BH) and a low combustion state selecting signal (BL);

a pressure adjuster (**12**) connected to said steam header (**11**) for outputting a vapor pressure signal (P) indicating the vapor pressure in said header (**11**); and

a control unit (**13**) for controlling each of said plurality of boiler units (**10**) such that these boiler units takes one of three states in response to said vapor pressure signal (P) transmitted from said pressure adjuster (**12**),

said control unit (**13**) including:

combustion unit number increase request signal generating means (**15***a*) for outputting a combustion unit number increase request signal (Bi) by detecting the fact that said vapor pressure indicated by said vapor pressure signal (P) is equal to or smaller than a first critical value;

high combustion state request signal generating means (**15***b*) for outputting a high combustion state request signal (Bh) by detecting the fact that said vapor pressure indicated by said vapor pressure signal (P) is equal to or smaller than a second critical value greater than said first critical value;

low combustion state request signal generating means (**15***c*) for outputting a low combustion state request signal (Bl) by detecting the fact that said vapor pressure indicated by said vapor pressure signal (P) is equal to or larger than a third critical value greater than said second critical value;

combustion unit number decrease request signal generating means (**15***d*) for outputting a combustion unit number decrease request signal (Bd) by detecting the fact that said vapor pressure indicated by said vapor pressure signal (P) is equal to or larger than a fourth critical value greater than said third critical value;

combustion unit number setting means (**17**) for sequentially supplying each of said plurality of boiler units (**10**) with said combustion starting signal (BI) in response to said combustion unit number increase request signal (Bi) according to the order of starting said boiler units every time a predetermined time passes, and for sequentially supplying each of said plurality of boiler units with said combustion stopping signal (BD) in response to said combustion unit decrease request signal (Bd) in the order reverse to said starting order every time a predetermined time passes;

combustion state selecting means (**18**) for sequentially supplying each of said plurality of boiler units (**10**) with a high combustion state selecting signal (BH) in response to said high combustion state request signal (Bh) in the order of starting said boiler units every time a predetermined time passes, and for sequentially supplying each of said plurality of boiler units (**10**) with a low combustion state selecting signal (BL) in response to said low combustion state request signal (Bl) in the order reverse to the starting order every time a predetermined time passes;

adjustment unit number setting means (**21**) for outputting an adjustment unit number increase signal (Bp) by deciding that the number of said boiler units operating in the low combustion state is smaller than the number of adjustment units on the basis of said combustion starting signal (BI) supplied from said combustion unit number setting means (**17**) to each of said plurality of boiler units (**10**), said low combustion state selecting signal (BL) supplied from said combustion state selecting means (**18**) to each of said plurality of boiler units (**10**) and an adjustment unit number setting signal indicating the number of said adjustment units; and

low combustion state request signal supplying means (**19**) for allowing said combustion state selecting means (**18**) to supply said low combustion state request signal (Bl) in response to said adjustment unit number increase signal (Bp).

4,860,697

APPARATUS FOR THE ANTIVIBRATORY WEDGING OF COMPONENT PARTS OF AN INSTALLATION, AND IN PARTICULAR ANTIVIBRATORY BARS FOR WEDGING THE TUBES OF A STEAM GENERATOR

Claude Malaval, Antony, France, assignor to Framatome, Courbevoie, France

Filed Jul. 18, 1988, Ser. No. 220,710
Claims priority, application France, Jul. 17, 1987, 87 10158
Int. Cl.[4] F22B *37/24*
U.S. Cl. 122—510 10 Claims



1. Apparatus for the antivibratory wedging of component parts (**4**) of an installation which are disposed in such a manner as to form successive rows separated by a space of substantially constant width, which apparatus is intended to be inserted between two successive rows and is composed of a sectional member (**11, 31, 41**) having a hollow section, in which are disposed at least two wedging members (**12, 13, 14**) mounted for movement relative to one another in the longitudinal direction of the sectional member and having complementary operating surfaces and a relative longitudinal displacement means, in such a manner as to be displaced relative to one another both in the longitudinal direction and in the transverse direction corresponding to the direction of the width of the rows, at least one of the wedging members (**12, 13**) coming to bear against component parts (**4**) disposed in a row, characterized by the fact that at least one of the wedging members (**12, 13**) is in the form of an elastic metal strip folded in such a manner as to form transverse crenellations disposed in succession in the longitudinal direction, and having opposite support faces (**16, 17; 36, 37; 45, 46**) directed in the one case towards the interior of the sectional support (**11, 31, 41**) and in the other case towards the outside, and a flat strip (**14, 34, 44**) provided with openings (**20, 40, 50**) separated by intermediate portions (**21, 39, 49**) of the flat strip and whose dimensions and arrangement along the length of the strip (**14, 34, 44**) correspond to the dimensions and arrangement of the inner support surfaces (**17, 37, 45**) of the folded strip (**12, 13; 32, 42**); the longitudinal displacement means being associated with the flat strip (**14, 34, 44**) for the displacement of the latter between an unlocked position, in which the inner support surfaces (**17, 37, 45**) coincide with the openings (**20, 40, 50**) in the flat strip, and a locked position in which the inner support surfaces are in contact with the intermediate portions (**21, 39, 49**) of the flat strip between the openings (**20, 40, 50**).

4,860,698

PYROTECHNIC PISTON DEVICE

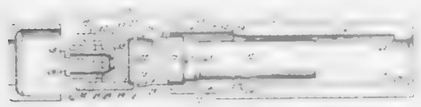
Mihai D. Patrichi, Los Angeles, and Delbert L. Evanson, Mission Hills, both of Calif., assignors to Networks Electronic Corp., Chatsworth, Calif.

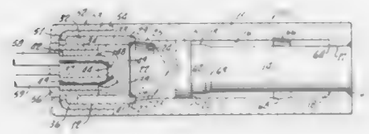
Filed May 11, 1988, Ser. No. 193,267
Int. Cl.[4] F01B *29/08;* F02N *13/00*
U.S. Cl. 123—24 R 9 Claims

1. A pyrotechnic piston device, which comprises:

(a) an elongate housing having a cylinder portion therein, said cylinder portion having a cylindrical internal wall, said cylindrical internal wall communicating coaxially with a rearwardly divergent internal wall of said cylinder portion,

(b) pyrotechnic means mounted in said housing and communicating with the end of said cylinder portion,
said divergent wall being adjacnet said pyrotechnic means,
(c) a piston mounted in said cylinder portion,
said piston having a head at the inner end thereof, relatively adjacent said pyrotechnic means, and
(d) means on said head to create an effective metal-to-metal seal between said head and said cylindrical interior wall during the stroke of said piston when said pistion is impelled by explosion of said pyrotechnic means,
whereby to prevent blow-by of products of the explosion past said piston,
said metal-to-metal seal means (d) comprising a head end portion relatively adjacent said pyrotechnic means,





said end portion being hollow and being formed of springy metal,
the chamber within said hollow end portion communicating with said pyrotechnic means, the edge of said head end portion closest to said pyrotechnic means engaging said cylindrical internal wall while said piston is impelled by the explosion,
said end portion of said head being in resilient engagement with said cylindrical internal wall while said piston is impelled by the explosion,
said end portion of said head being rearwardly divergent,
said rearwardly divergent wall of said head being in engagement with said rearwardly divergent wall of said cylinder portion when said piston and housing are in fully assembled condition prior to the explosion.

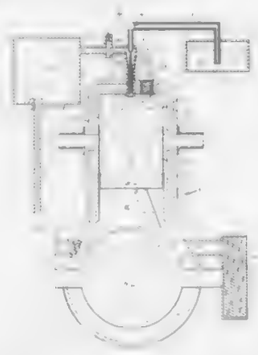
4,860,699

TWO-CYCLE ENGINE

John Rocklein, 947 Van Houten Ave., Clifton, N.J. 07013

Filed Jul. 5, 1988, Ser. No. 217,719
Int. Cl.[4] F02B *41/00*
U.S. Cl. 123—26 **19 Claims**

1. A two-cycle internal combustion engine having a cylinder; an ignition means for igniting a combustible mixture of air and fuel; piston means for reciprocal movement between a top dead center position and a bottom dead center position within said cylinder; a connecting rod extending from said piston means and attaching at one end thereof to said piston means; and a crankshaft attached to the other end of said connecting rod, said internal combustion engine comprising, in combination:
a combustion chamber portion at one end of said cylinder for receiving predetermined amounts of air and fuel, said chamber defined by the crown of said piston means and the upper end of the wall of said cylinder and varying between a minimum volume with said piston means at the top dead center position and a maximum volume with said piston means at the bottom dead center position;
inlet port means for injecting fuel and compressed air into the upper end of said combustion chamber portion;
exhaust port means in said cylinder for the conduction of exhaust gases and air from said combustion chamber portion, said exhaust port means being covered and uncovered by the side of said piston means and positioned to be fully uncovered at the bottom dead center position of the piston means;
a fuel/air mixing system in communication with said inlet port means, said system comprising in turn:
air supply means for providing a continuous supply of compressed air to said combustion chamber portion, said supply of compressed air generated by the engine;
fuel supply means for providing predetermined quantities of fuel at specified intervals; and,



precombustion chamber means for receiving and mixing said compressed air and said predetermined quantities of fuel and providing the continuously flowing air and the mixture of air and fuel to said inlet port means, said precombustion chamber means being increasingly restrictive along its length from the point of injection to said inlet port means;
a crankshaft housing attached to the lower end of said cylinder and sealed from said combustion chamber portion thereof for housing and lubricating said crankshaft and connecting rod; and,
whereby said two-cycle engine provides combustion and exhaust with continuously flowing air through the combustion chamber portion and permits lubrication of the crankshaft in the region of perfect lubrication.

4,860,700

TANGENT FLOW CYLINDER HEAD

Stephen Smith, Downers Grove, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 20, 1988, Ser. No. 260,412
Int. Cl.[4] F01P *1/06*
U.S. Cl. 123—41.31 **9 Claims**



1. A cylinder head for an internal combustion engine, said cylinder head defining a coolant receiving jacket compartment and comprising

a combustion chamber defining wall,
a cylindrical wall portion adapted to mount a fuel injector extending through said jacket compartment and opening through said combustion chamber defining wall,
exhaust passage defining walls extending through said jacket compartment and spacedly embracing a portion of said injector mounting wall portion, said passage defining walls terminating in an even number of valve controllable ports opening through the surface of said combustion chamber defining wall in equispaced relation to each other and to the injector mounting opening,
a partition wall extending transversely through said coolant jacket compartment in closely spaced parallel relation to said combustion chamber defining wall and dividing said jacket compartment into a flow restricting lower jacket chamber and a relatively unrestricted upper jacket chamber, said partition wall connecting with said injector mounting wall and said passage defining walls,
a plurality of partition webs in said lower jacket chamber, one extending outwardly from each of said passage defining walls and dividing said lower jacket chamber into an even number of sections, comprising alternate inlet and outlet sections, connected by passages between said passage defining walls and said injector mounting wall,
a plurality of primary coolant inlet openings through said combustion chamber defining wall and opening into said inlet sections of said lower jacket chamber adjacent the periphery thereof, said openings being connectable to the outlet of coolant circulating means,
primary coolant passage means adjacent the periphery of said jacket compartment and connecting said upper jacket chamber with said outlet sections of said lower jacket chamber,
a coolant outlet port opening to said upper jacket chamber and connectable to the inlet of coolant circulating means,
whereby a primary coolant flow path is established into the outer edges of the inlet sections of said lower jacket chamber, around said exhaust passage defining walls and past said fuel injector mounting wall into the outlet sections of said lower jacket chamber, up through the primary coolant passage means adjacent the outer edges of the outlet sections into the upper jacket chamber and out through said coolant outlet port, and
the improvement wherein said partition webs lie substantially tangent with their respective passage defining walls on the sides thereof toward said outlet sections to avoid the formation of stagnant pockets of coolant in the outlet sections between the passage defining walls and the periphery of said lower jacket chamber.

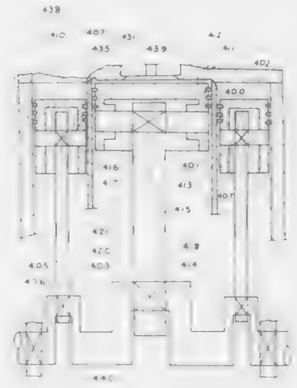
4,860,701

MULTIPLE PISTON EXPANSION CHAMBER ENGINE

Francis W. Jackson, 409 Penwyn Rd., Wynnewood, Pa. 19096

Division of Ser. No. 924,887, Oct. 30, 1986, Pat. No. 4,741,296, which is a continuation of Ser. No. 727,338, Apr. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 688,954, Dec. 31, 1984, Pat. No. 4,570,580, which is a continuation-in-part of Ser. No. 647,842, Sep. 6, 1984, Pat. No. 4,580,532, which is a division of Ser. No. 326,902, Dec. 2, 1981, Pat. No. 4,489,681. This application Feb. 1, 1988, Ser. No. 150,637
Int. Cl.[4] F02B *75/18*
U.S. Cl. 123—51 A **10 Claims**

1. The method of operation for the extraction of work from combusted products in two piston chambers hereafter referred to as working and auxiliary having a means of controlling isolation between the two said chambers, said method comprising of
admitting a charge of carbureted air into both said chambers and compressing the charge from both said chambers into said working chamber,
timing said auxiliary chamber piston to be at about TDC following a compression stroke as said working chamber piston on a compression stroke is approaching and within 45 degrees of TDC,
isolating said working chamber from said auxiliary chamber when said auxiliary chamber piston is at substantially TDC,
initiating combustion of said charge in said working chamber with said working chamber piston within 30 degrees of and before reaching TDC on said compression stroke,
the compression ratio at working chamber piston TDC shall not exceed eighteen,
expanding said combusted products by the working chamber piston until a point in the cycle after combustion is completed and before said working chamber piston is within 60 degrees of BDC,



both said combustion and said expansion occurring while said working chamber is isolated from said auxiliary chamber,
said combusted products are permitted to communicate freely to said auxiliary chamber, said auxiliary chamber piston being at about TDC and about to enter an expansion stroke as said communication is commenced,
working chamber piston expansion ratio from TDC prior to communication being established shall not exceed four,
said auxiliary chamber piston then expands said combusted products communicated from said working chamber,
before the combined expansion of both said chambers reaches maximum expansion an exhaust valve between said chamber containing said combusted products and an exhaust manifold opens and said combusted products, except for residual gases, are exhausted.

4,860,702

COMPRESSION RATIO CONTROL IN RECIPROCATING PISTON ENGINES

George J. Doundoulakis, 2498 Kayron La., North Bellmore, N.Y. 11710

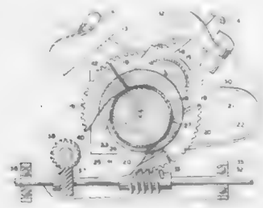
Filed Mar. 21, 1988, Ser. No. 170,803
Int. Cl.[4] F02B *75/04*
U.S. Cl. 123—78 F **9 Claims**

1. Compression ratio control for reciprocating piston engines comprising:
a reciprocating engine crankcase;
a plurality of compression/expansion cylinders rigidly attached to said crankcase;
each of said cylinders including a curved surface and a cylinder head;
a fuel mixture in-taken in said cylinders;
a piston reciprocating along each cylinder's said curved surface for providing compression/expansion to said fuel mixture;
a crank mechanism including a crankshaft rotating about an

axial line that is substantially equidistant from said heads, crankcheek lobes radially extending from said crankshaft, crankpins inside and in contact with crankpin bearings, axially extending between said crankcheek lobes, and crankshaft journal bearings for providing low frictional support to said crankshaft;

a connecting rod for each of said cylinders connecting said piston with said crankpin, thereby converting the piston's reciprocating motion to crankshaft's rotary motion;

crankshaft positioning means for varying the distance of said crankshaft journal bearings and said crankshaft with respect to said cylinder heads; wherein said crankshaft positioning means is comprising crankshaft vertically displacing means and crankshaft horizontal displacement con-



straining means so that the axis of said crankshaft is being displace vertically, while it is simultaneously kept substantially near the vertical plane in order that said crankshaft positioning means work equally for all compression/expansion cylinders;

a first transmission gear, a crankshaft gear for meshing with said transmission gear, and a slot cut on said crankcase; wherein the constraint in the displacement of said crankshaft in the horizontal sense is provided by the vertical edges of said slot, and wherein the vertical edges of said slot are preferably being curved with a radius of curvature substantially equal to the average pitch diameter of said crankshaft gear and said first transmission gear for accurate meshing of said gears.

4,860,703

COWL ASSEMBLY WITH WATER RESISTANT AIR INTAKE DUCT AND SEALING

James C. Boda, Winneconne, and Gordon C. Slattery, Omro, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 77,689, Jul. 24, 1987, Pat. No. 4,800,854. This application Dec. 6, 1988, Ser. No. 280,687

Int. Cl.[4] F02F *7/00*

U.S. Cl. 123—195 P **13 Claims**



1. In an outboard marine motor including a cowl having an interior cavity for housing the engine of said outboard motor, said cowl including an air intake opening in its rear top portion, a one-piece air intake duct for placement in said air intake opening and for connection to said cowl, comprising:

a bottom wall;

a pair of upstanding side walls connected to said bottom wall;

an upstanding back wall connected to said bottom wall; and

a top wall extending between said upstanding side walls and spaced from said bottom wall, said top wall having an upwardly facing opening therein forming an air inlet, said walls defining an air flow path in which air enters said duct at said air intake opening in said rear top portion of said cowl and flows in a forward direction toward said back wall and then flows upwardly through said air inlet in said top wall and enters the interior cavity of said cowl, to thereby prevent the entrance of any moisture contained in said air into said interior cavity due to the change in direction of air flow provided by said air flow path.

4,860,704

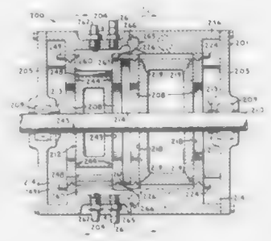
HINGE VALVED ROTARY ENGINE WITH SEPARATE COMPRESSION AND EXPANSION SECTIONS

Eldon E. Slaughter, 9 Sachem Rd., Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 45,153, Apr. 30, 1987, Pat. No. 4,471,164, which is a continuation of Ser. No. 787,677, Oct. 15, 1985, abandoned. This application Apr. 29, 1988, Ser. No. 187,938

Int. Cl.[4] F02B *53/00*

U.S. Cl. 123—237 **10 Claims**



1. A rotary combustion engine comprising:

(a) an engine housing;

(b) an engine shaft rotatably supported through said engine housing and having a rotary axis;

(c) positive displacement rotary compression means positioned within said housing, engaged with said shaft, and operative to compress air upon the rotation of said shaft, said compression means including a compression chamber;

(d) combustor means including a combustor passage communicating with said compression means to receive compressed air therefrom, mix a fuel therewith, and ignite a fuel/air mixture of said compressed air and fuel;

(e) a compression rotor affixed to said engine shaft and positioned within said compression chamber, said compression rotor having a continuous compression rotor surface and including a compression rotor lobe forming a substantially sealing relationship with compression chamber surface;

(f) a cylindrical expansion chamber formed within said housing coaxial with said rotary axis, said expansion chamber including a cylindrical expansion chamber surface;

(g) an exhaust port communicating with said expansion chamber;

(h) an expansion rotor affixed to said engine shaft and positioned within said expansion chamber, said expansion rotor having a continuous expansion rotor surface and including an expansion rotor lobe sealingly engaging said expansion chamber surface;

(i) an expansion rotor lobe seal between said expansion rotor lobe and said expansion chamber surface, said expansion rotor lobe seal comprising:

(1) a cylindrical pivot base pivotally mounted through said expansion rotor lobe adjacent said expansion rotor surface and extending parallel to a rotary axis;

(2) a sealing vane extending substantially tangentially from said pivot base in a direction opposite an angular direction of rotation of said engine shaft, said sealing vane having an outer contact surface and an opposite inner pressure surface, said sealing vane being urged by centrifugal force to force said contact surface into sealing contact with said expansion chamber surface; and

(3) resilient means positioned between said vane and said rotor lobe to additionally urge said sealing vane outward from said rotary axis to engage said expansion rotor surface and to expose said pressure surface to pressure within said expansion chamber which further urges said contact into engagement with said expansion chamber surface; and

(j) air control valve means positioned in said combustor means and controlling the communication of compressed air between said compression chamber and said combustor means, said air control valve means including:

(1) a cylindrical shaft extending across said combustor means;

(2) an air control valve vane extending tangentially from said cylindrical shaft; and

(3) air control valve bias means engaged between said cylindrical shaft and said housing and urging said cylindrical shaft to move said air control valve vane to a position to close said combustor passage.

4,860,705

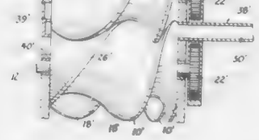
POSITIVE DISPLACEMENT ROTARY MECHANISM

Constantinos A. Koromilas, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 5,077, Jan. 20, 1987, Pat. No. 4,782,802. This application Jul. 22, 1988, Ser. No. 222,981

Int. Cl.[4] F02B *53/00*

U.S. Cl. 123—246 **2 Claims**



1. A positive displacement rotary mechanism comprising at least three and no more than four essentially identical rotary helical intermeshing lobes with parallel axes and identical helical surfaces extending between axially spaced ends thereof, a stationary cylindrical member extending centrally of said lobes and parallel to said axes, said helical surfaces having a continuously varying pitch and a cross sectional profile as viewed axially having at least two convex circular apexes joined by convex circular sides such that said helical surfaces cooperate through close apex-to-side and apex-to-apex relationships therebetween and also cooperate with said cylindrical member through close apex relationship therewith to define a repetitive working space internal of said lobes having boundaries along and between said lobes and along and between said lobes and said cylindrical member which boundaries move on rotation of said lobes to effect expansion and contraction of said working space while repetitively moving same from one of said ends of said lobes toward the other end, and said stationary member having an exhaust passage extending therethrough with an opening to said working space.

4,860,706

THROTTLE BODY

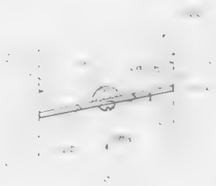
Takio Suzuki, and Kaneo Imamura, both of Obu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

Filed Sep. 13, 1988, Ser. No. 243,795

Claims priority, application Japan, Sep. 14, 1987, 62-141311[U]; Sep. 14, 1987, 62-141312[U]; Sep. 14, 1987, 62-141313[U]; Sep. 14, 1987, 62-141314[U]

Int. Cl.[4] F02M *9/08*

U.S. Cl. 123—337 **6 Claims**



1. A throttle valve comprising:

(a) a first outer peripheral portion linearly contacting an inner wall of a suction passage at a predetermined throttle angle; and

(b) a second outer peripheral portion formed in the vicinity of a throttle shaft in such a manner as to gently continue from said first outer peripheral portion and not contacting said inner wall.

4,860,707

NON-LINEAR FEEDBACK CONTROLLER FOR INTERNAL COMBUSTION ENGINE

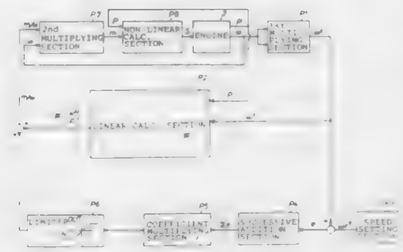
Akira Ohata, Mishima, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 29, 1988, Ser. No. 174,962

Claims priority, application Japan, Apr. 21, 1987, 62-98344

Int. Cl.[4] F02D *41/16*

U.S. Cl. 123—399 **7 Claims**



1. A non-linear feedback controller for an internal combustion engine, the controller determining a control quantity which is feedback-input to the internal combustion engine according to a dynamic physical model of said internal combustion engine, the model being obtained by approximation from an equation of motion of said internal combustion engine and a mathematical formula expressing mass conservation of the quantity of intake air sucked into said internal combustion engine, thereby controlling the rotational speed of said internal combustion engine, said controller comprising:

operating condition detecting means for detecting at least an intake pressure equivalent quantity which is equivalent to an intake pressure of said internal combustion engine and a rotational speed equivalent quantity which is equivalent to a rotational speed of said internal combustion engine;

opening area control means for controlling the opening area

of an intake passage of said internal combustion engine in accordance with an external command manipulating quantity;

control means for calculating a control quantity concerned with the control of the opening area of the intake passage of said internal combustion engine from at least the intake pressure equivalent quantity and rotational speed equivalent quantity detected by said operating condition detecting means by using a parameter set on the basis of the dynamic physical model of said internal combustion engine; and

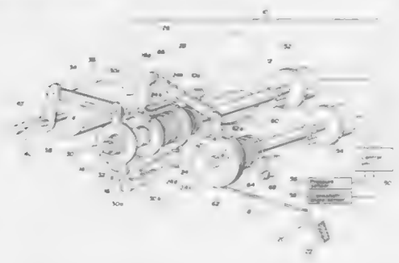
compensating means for outputting a manipulating quantity to said opening area controlling means in such a manner that, when the intake pressure equivalent quantity detected by said operating condition detecting means is equal to or less than a critical pressure equivalent quantity, a value which is determined on the basis of the control quantity calculated by said control means and a predetermined constant is defined as a manipulating quantity; whereas, when the intake pressure equivalent quantity exceeds the critical pressure equivalent quantity, a value obtained by compensating said control quantity in accordance with said intake pressure equivalent quantity is defined as a manipulating quantity.

4,860,708

THROTTLE CONTROL SYSTEM FOR AUTOMOTIVE INTERNAL COMBUSTION ENGINE

Kouji Yamaguchi; Yoshikazu Ishikawa; Toshihiro Kameda; Shogo Hattori, and Junichi Miyake, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1988, Ser. No. 200,988
Claims priority, application Japan, Jun. 3, 1987, 62-86789
Int. Cl.[4] F02D *11/10*
U.S. Cl. 123—399 7 Claims



1. In a system for controlling the degree of opening of a throttle valve disposed in an air intake passage of an internal combustion engine mounted in a vehicle, including:

a rotatable shaft for rigidly supporting said throttle valve in the air intake passage;

first spring means for urging said shaft in the direction in which said throttle valve closes said air intake passage;

an accelerator pedal disposed adjacent at the operator's seat in the vehicle and linked with said shaft;

second spring means for urging said shaft in the opposite direction in which said throttle valve opens said air intake passage when said accelerator pedal is depressed, force of said second spring means being greater than that of said first spring means; and

a motor connected to said shaft for driving said shaft in the valve closing direction counter to the force of said second spring means when actuated; the improvement comprising:

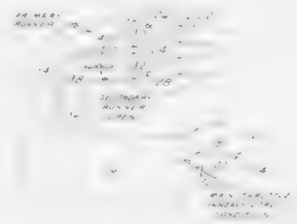
third spring means disposed in the linkage between said shaft and said accelerator pedal for urging said shaft in the valve closing direction in cooperation with said first spring means.

4,860,709

ENGINE INDUCTION SYSTEM AND METHOD

James R. Clarke, Northville, and Brian C. Wolfe, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 20, 1988, Ser. No. 246,837
Int. Cl.[4] F02M *35/10*
U.S. Cl. 123—432 11 Claims



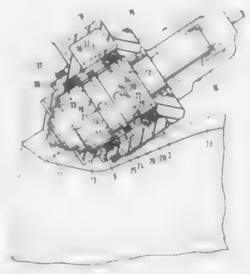
1. A method of inducting air into the intake of an internal combustion engine to reduce engine pumping losses, the engine having an intake plenum connected to a plurality of cylinders each having at least one primary and one secondary intake valve, comprising the steps of: first, blocking the flow of air to the secondary valves; second, opening each primary intake valve one at a time and closing that valve prior to the opening of the primary intake valve of any other cylinder thereby precluding overlap between the openings of primary valves of different cylinders; and third, at heavier loads, unblocking the flow of air to the secondary valves to obtain greater air flow.

4,860,710

FUEL SUPPLY LINE

Udo Hafner, Lorch, and Heinrich Knapp, Leonberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 643,769, Aug. 24, 1984, abandoned, which is a continuation of Ser. No. 475,787, Mar. 16, 1983, abandoned. This application Aug. 1, 1988, Ser. No. 227,479
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228508
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—470 10 Claims



1. A one piece fuel supply line in combination with a plurality of rigid fuel injection valve receptacles for a fuel injection system for internal combustion engines, said fuel supply line including an inlet at one end, a continuous flow through cross-section along its length and a pressure regulator valve at one of the ends, said plurality of rigid fuel injection valve receptacles

are integral with said fuel supply line and spaced in an axial direction along said fuel supply line, each receptacle having a plurality of annular inner and outer surface steps of different cross-sectional dimension to form a stepped receiving bore (10) of predetermined shape offset with respect to said flow through cross-section and embodied such that each of said receptacles is insertable tightly into one each of a plurality of bearing bores (36) in an air intake tube (23), said stepped bearing bore of each receptacle being open on each end and arranged to receive one each of a plurality of injection valves (9), each of said fuel injection valves are provided with fuel openings in the circumference thereof transverse to the axis of the fuel injection valve, an opening (32) from said flow through cross-section to each of said plurality of rigid fuel injection valve receptacles, said opening extends in a direction transverse to the axis of said fuel supply line and in a direction transverse to the axis of the receptacle, each of said fuel injection valves have a mouthpiece (11) and remote from the mouthpiece a connection end (12) which extends from the receptacle and is engaged by electrical plug contact (16), said stepped receiving bore of each of said receptacles opens toward the mouthpiece and toward the connection end of each fuel injection valve with each annular inner step of each receptacle having a greater diameter toward said connection end of said stepped bore, said opening (32) from said flow through cross-section to said stepped bore arranged to permit fuel flow from the supply line directly to one side of said fuel injection valve perpendicular to the axis of the fuel injection valve, each of said fuel injection valves are stepped to conform with each step of said stepped bore of each rigid fuel injection receptacle, each fuel injection valve further including a shoulder portion which is received in a holding step in said stepped bore, means mounted on said fuel injection valve to secure said fuel injection valve in said receptacle, and means on said fuel supply line for securing said fuel supply line onto said engine.

4,860,711

ENGINE WITH VARIABLE COMPRESSION RATIO

Koji Morikawa, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 252,584
Claims priority, application Japan, Oct. 9, 1987, 62-255913
Int. Cl.[4] F02B *75/04*
U.S. Cl. 123—48 D 1 Claim



1. In a variable compression ratio engine wherein an adjusting piston is slidably fitted in a subcompression chamber communicating with a combustion chamber of the engine and is actuatable by an actuator activatable in response to an activation signal outputted by control means in accordance with the operational state of the engine, said control means comprising:

a basic compression ratio computing component for computing a basic compression ratio from an engine rotational speed and an intake air pressure;

an indicated mean effective pressure computing component for computing the indicated mean effective pressure from the detection signal outputted from a cylinder interior pressure sensor;

a knocking detecting component for detecting knocking from said detection signal outputted from said cylinder interior pressure sensor;

an ignition timing computing component operable at the time of high load operation, in accordance with the computation output signal of said indicated mean effective pressure computing component, to compute the ignition advance angle, and, at the same time, to correct said ignition advance angle in accordance with a knocking detection signal outputted by said knocking detecting component thereby to derive the actual ignition advance angle;

a compression ratio feedback correction quantity computing component for comparing the minimum ignition advance angle for obtaining maximum torque from the output signal of said indicated mean effective pressure computing component with the ignition advance angle computed by said ignition timing computing component and computing the feedback correction value with respect to the basic compression ratio computed by said basic a compression ratio computing component; and

a compression ratio computing component for correcting said basic compression ratio according to said feedback correction value and computing said activation signal with respect to said actuator.

4,860,712

METHOD OF CONTROLLING AN OXYGEN CONCENTRATION SENSOR

Toyohei Nakajima, and Toshiyuki Mieno, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 2, 1988, Ser. No. 189,183
Claims priority, application Japan, Jul. 1, 1987, 62-164394; Jul. 1, 1987, 62-164395
Int. Cl.[4] G01N *27/46;* F02M *51/00;* F02D *41/14*
U.S. Cl. 123—489 3 Claims



1. A method for controlling an oxygen concentration sensor having an oxygen concentration sensing unit mounted in an exhaust system of an internal combustion engine, the oxygen concentration sensing unit including an oxygen pump element and a sensor cell element, each element being made of an oxygen ion conductive solid electrolyte and electrodes sandwiching the solid electrolyte, these elements forming a gas diffusion restriction region, a pump current supply device supplying a pump current to the electrodes of the oxygen pump element, a heater element for heating the oxygen concentration sensing unit by a heater current supplied thereto, and a heater current supply device supplying the heater current to the heater element, comprising the steps of:

a first detection step for detecting a predetermined starting state of the engine;

a first command step for starting the supply of the heater current from the heater current supply device to the

heater element when the predetermined starting state is detected by said first detection step;

a second detection step for detecting a condition when an internal resistance of the heater element is in a predetermined range after an execution of said first command step; and

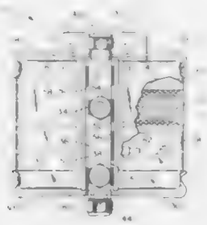
a second command step for starting the supply of the pump current from the pump current supply device to the oxygen pump element when said condition is detected by said second detection step.

4,860,713

BACK-TO-BACK FUEL FILTER AND WATER SEPARATOR

David H. Hodgkins, Granby, Conn., assignor to Stanadyne Automotive Corp., Windsor, Conn.

Filed Sep. 30, 1988, Ser. No. 252,185
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—510 **17 Claims**



1. A fuel conditioning unit comprising:

a vertically oriented frame;

a first filter housing connected to a first side of the frame and defining a first filter chamber for containing a first filter element adapted to separate water from fuel;

a second filter housing connected to the second side of the frame and defining a second filter chamber containing a second filter element adapted to remove particulates from fuel;

inlet means for introducing fuel from outside the unit to the first chamber;

means associated with the frame for conveying fuel that is filtered through the first chamber to the upper portion to the second chamber;

outlet means for drawing fuel out of the unit from a lower portion of the second chamber; and

drain means for discharging from the unit, water that is separated from fuel in the first chamber.

4,860,714

IN-TANK FUEL PUMP ASSEMBLY FOR FUEL-INJECTED ENGINES

George H. Bucci, Tolland, Conn., assignor to Whitehead Engineered Products, Inc., Meriden, Conn.

Filed Aug. 20, 1986, Ser. No. 898,432
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—514 **8 Claims**

1. Apparatus for pumping fuel from a fuel tank to an engine comprising:

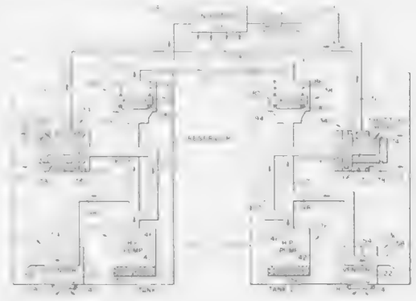
(a) a supply port for carrying fuel from the apparatus to the engine;

(b) a pump having an inlet connected to the fuel tank and a high pressure outlet;

(c) means for routing fuel leaving the high pressure outlet to the supply port;

(d) a return port connected to the fuel tank for receiving fuel returning from the engine; and

(e) a valve associated with the return port and including a diaphragm and a spring, said diaphragm having a first position in which the valve is closed so that fuel cannot pass between the engine and the fuel tank through the return port, and a second position in which the valve is open so that fuel can pass between the engine and the fuel tank through the return port, said spring urging the diaphragm towards its first position; and



(f) means for connecting the high pressure outlet of the pump to the valve so that when the pump is operating, fuel from the high pressure outlet moves the diaphragm to its second position against the force of the spring.

4,860,715

DEVICE FOR PURIFYING FUEL VAPORS GENERATED IN VEHICLE FUEL TANK

Akira Hiraku; Morio Minezawa; Isao Katoh, and Kouichi Itoh, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Horie Metal Co., Ltd., both of Aichi, Japan

Filed May 27, 1988, Ser. No. 199,650
Claims priority, application Japan, May 29, 1987, 62-85101[U]; May 29, 1987, 62-85103[U]; May 29, 1987, 62-85104[U]; May 29, 1987, 62-85105[U]; May 29, 1987, 62-85106[U]; May 29, 1987, 62-85107[U]
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—519 **11 Claims**



1. A device for purifying fuel vapours generated in a vehicle fuel tank comprising:

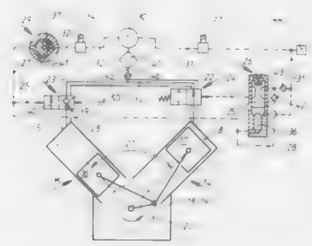
valve means normally closing a hole formed in an upper wall of the tank and communicating with a canister through a conduit, a flap normally closing a filler piper mounted on the tank for refuelling, said flap being opened when a fuel dispensing nozzle is inserted in the filler pipe for refuelling, an extended flexible wire for connecting the flap with the valve means so as to open the valve means to allow the fuel vapours to pass through the hole and the conduit into the canister when the flap is opened, and a valve chamber accommodating the valve means and defined by the upper wall of the tank, an opposite bottom wall which is formed with a second hole to the interior of the tank in order to allow the fuel vapours filled in the tank and the filler pipe to enter the valve chamber and a sleeve for guiding a stem of the valve means which is partly protruded out of the valve chamber and connected with the flexible wire so as to move up and down, and vertical walls therebetween.

4,860,716

MULTI-CYLINDER DIESEL INTERNAL COMBUSTION ENGINE WITH LOW COMPRESSION RATIO IN THE CYLINDERS

Herbert Deutschmann, Friedrichshafen, Fed. Rep. of Germany, assignor to Mtu-Motoren und Turbinen Union, Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/DE87/00302, § 371 Date May 3, 1988, § 102(e) Date May 3, 1988, PCT Pub. No. WO88/02065, PCT Pub. Date Mar. 24, 1988
PCT Filed Jul. 3, 1987, Ser. No. 214,714
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1986, 3631284
Int. Cl.[4] F02D *17/02;* F02B *33/02*
U.S. Cl. 123—560 **6 Claims**



1. A multi-cylinder diesel internal combustion engine with relatively low compression ratio in its cylinders, in which all cylinders are supplied with fuel during normal operation and are operable to produce power output while during the starting and possibly during partial load some of the cylinders operate in the so-called divided operation as compressors operable to supply compressed air to the cylinders operating as engine, and in which a respective compressor cylinder is operatively connected with a respective engine cylinder by way of a line manes independent of customary suction and exhaust lines, said line means including at its one end in proximity of the respective compressor cylinder a donor valve means operable to be controllably opened in the divided operation and at its other end in proximity of the respective engine cylinder a receiver valve means closing in the direction to the respective compressor cylinder, the piston of each compressor cylinder leading the piston of the coordinated engine cylinder by about 30° to 150° of crankshaft angle, each donor valve means being operatively combined with a control means for the selective opening of the respectively associated line means in the direction toward the corresponding compressor cylinder, the opening control of the line means by the control means taking place during the exhaust stroke of the associated engine cylinder, and distributor means operable to produce a pulse for the actuation of the control means from an energy storage means, said distributor means being operable in dependence on the crankshaft rotational speed.

4,860,717

SELF-LOADING, REMOTELY OPERABLE AND VARIABLE, PORTABLE BALL THROWING APPARATUS AND METHOD

Richard Powell, and Bert L. Powell, Jr., both of Austin, Tex., assignors to Powell/Teeple Enterprises, Inc., Austin, Tex.

Continuation of Ser. No. 54,568, May 21, 1987, abandoned. This application Jul. 14, 1988, Ser. No. 219,896
Int. Cl.[4] F41B *3/04;* A63B *69/40*
U.S. Cl. 124—7 **26 Claims**



24. A ball throwing device comprising:

(a) a frame;

(b) an arm rotatably mounted to said frame and adapted for releasably supporting a ball to be thrown;

(c) a biasing means connected to said arm and to said frame to normally bias said arm in a forward direction;

(d) an arm positioning means having two ends, one end of said positioning means connected to said arm;

(e) means attached to the other end of said arm positioning means for anchoring said other end to the ground; and

(f) a cocking handle attached to said arm positioning means between the ends of the positioning means, said handle cooperating with the positioning means upon operation of the device to pull the arm in a rearward direction so that when said cocking handle is released, said arm is pulled forward by said biasing means and said ball is thrown, yet said cocking handle remains near its original position.

26. A method for throwing a ball comprising the steps of:

(a) constructing a frame;

(b) rotatably mounting an arm to said frame for releasably supporting the ball;

(c) connecting a biasing means to said arm and to said frame;

(d) connecting one end of an arm positioning means to said arm;

(e) providing a means for adjusting the height of the thrown ball;

(f) anchoring said adjusting means to the ground;

(g) attaching the second end of said arm positioning means to said height adjusting means; and

(h) attaching a cocking handle at one end to said arm positioning means between said ends of said positioning means and in close proximity to said adjusting means, so that when said cocking handle is pulled and then released, said arm is pulled forward by said elastic biasing means and said ball is thrown, yet said cocking handle remains in close proximity to said adjusting means.

4,860,718

PROJECTILE TOY

Keith C. Howell, 14800 132nd Ave. NE., Kirkland, Wash. 98034

Filed Nov. 30, 1988, Ser. No. 278,128
Int. Cl.[4] F41B *7/02*
U.S. Cl. 124—18 **4 Claims**

3. A projectile toy comprising a stock having a horizontally elongated barrel portion and a horizontally elongated butt portion opposite said barrel portion, said barrel portion having a tip remote from said butt portion, said tip of said stock barrel portion having an outwardopening blind bore aligned with the length of said barrel portion, an elongated tubular, elastic

projectile having an outside diameter approximately equal to the diameter of said bore for fitting of one end portion of said projectile into said bore leaving a long section of said projectile projecting from said bore for bending around said tip and stretching of said projectile rearward toward said stock butt portion, and trigger means mounted on said stock including means for securing the end portion of said projectile remote from its end portion received in said bore in substantially fixed



position relative to said stock, said trigger means being manipulable so as to release said other end portion of said projectile so as to effect projection of said projectile from said stock and including an elongated trigger pin and means for reciprocating said pin transversely of the length of said stock barrel portion between a projected position for fitting of an end portion of said projectile over said pin and a retracted position for releasing such end portion from said pin.

4,860,719

MAGNETIC HOLD-DOWN DEVICE FOR CROSSBOW

Ernst Scheiterlein, New Berlin, Wis., assignor to Anthony J. Czaja, West Allis, Wis., a part interest

Filed Nov. 5, 1987, Ser. No. 117,049
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—25 **3 Claims**



1. In a crossbow having a frame, including a stock having a fore end and a rear end portion, flexible bow members, a string and arrow release mechanism and an arrow rest supported on the stock, the improvement comprising cooperative magnetic means on the arrow and said stock to releasably retain an arrow against said arrow rest in a ready firing position on said arrow rest prior to shooting the same to prevent inadvertent displacement of the arrow from the ready firing position, and wherein said cooperative magnetic means comprising a magnet and magnet supporting means on said stock to adjustably position the magnet adjacent to ferromagnetic means on said arrow, and wherein said support means comprises a ferromagnetic tray that is magnetically attracted to said magnet and said tray is sized to adjustably receive said magnet and said magnet supporting tray including mounting means for vertically adjusting said tray and said magnet to a plurality of fixed positions beneath said arrow, said mounting means including a depending flange portion having a slot and a bolt extending through said slot into said fore end of said stock and wherein said tray is larger than said magnet to allow movement of said magnet fore and aft in said tray and laterally beneath said arrow.

4,860,720

BOW STRING RELEASE DEVICE

Gary J. Todd, 8324 Southfield Dr., Utica, Mich. 48087

Filed Aug. 10, 1987, Ser. No. 83,280
Int. Cl.[4] F41C *19/00;* **F16G** *11/04*
U.S. Cl. 124—35 A **2 Claims**



1. In a bow string release device including a horizontally elongate body having a forward end and a rearward end, means defining a vertically extending forwardly opening bow string receiving slot in the forward end of said body, releasable means for releasably retaining a blow string in said slot, and an actuable trigger projecting horizontally from one side of said body operable when actuated to cause said releasably means to release a bow string from said slot,

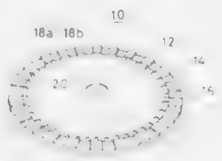
the improvement comprising said body having a forward section extending along a horizontal first longitudinal axis with said trigger projecting horizontally from one side of said forward section, a rearward section on said body extending along a horizontal second longitudinal axis inclined from said first axis toward the side of said body from which said trigger projects, a flexible hand grip assembly coupled to the rearward section extending generally along the horizontal second longitudinal axis, and a plate-like abutment member disposed in a general plane transverse to said horizontal second longitudinal axis, said hand grip assembly including a flexible substantially inextensible cord coupled at one end to said rearward section, and a sleeve of flexible material coupled to the rearward section extending generally along the horizontal second longitudinal axis and having a cord receiving passage therethrough, said abutment member abutting against an end of said sleeve opposite from said rearward section and having a surface and a cord receiving bore extending through the abutment member, and clamp means for releasably and adjustably clamping said cord against the surface of said abutment member remote from said body.

4,860,721

SUPER ABRASIVE CUTTING SAW

Yusaku Matsuda, Osaka, Japan, assignor to Sanwa Diamond Industrial Co., Ltd., Japan

Filed Aug. 27, 1987, Ser. No. 90,220
Claims priority, application Japan, May 30, 1987, 62-137213
Int. Cl.[4] B28D *1/04*
U.S. Cl. 125—15 **3 Claims**



1. A super abrasive rotatable cutting saw comprising

a cutting saw plate having an outer periphery, the plate having concave sections extending inwardly from the outer periphery of the plate, the concave sections having a suitably spaced relation around the outer periphery of the cutting saw plate; the spaced concave sections alternating with convex sections extending radially outwardly from the outer periphery of the plate; the plate also having opposite side surfaces;

each of the convex sections of the cutting saw plate around the outer periphery of the plate being bent in a direction toward a respective outside surface of the plate, such that alternate convex sections are bent toward the opposite side surface of the cutting saw plate from the neighboring convex portions; the convex sections of the cutting saw plate are of thinner thickness than the rest of the plate for defining a step between the plate and the convex sections thereof,

a continuous, annular, sinter comprised of press-molded powder containing super abrasives, which is divided into two parts and is sintered to the cutting saw plate by heating under pressure; the sinter has a radial thickness from the outer periphery of the cutting saw plate inward over the convex sections toward an inner rim of the sinter; the concave sections being radially deep enough and the inner rim of the sinter being radially so placed that the concave sections of the plate extend inward from the inner rim of the sinter and define holes through the cutting saw plate radially inward of the sinter wherein the holes inward of the sinter reduce thermal conductivity of the plate radially inward from the outer periphery and cause cooling air flow as the cutting saw plate rotates;

each of the two parts of the sinter having a series of alternating convex and concave portions at the respective side surface of the cutting saw plate for each sinter part; the sinter parts are placed so that the convex portions of each part are opposed to the concave portions of the other part; the sinter parts being bonded together with the aid of the convex and concave portions;

the combined sinter parts varying along the direction of the saw plate thickness to define the series of convex and concave portions, and each convex portion of the cutting saw plate which is bent in one direction toward one cutting saw plate surface being within a respective convex portion of the sinter which is convex toward the same one surface of the cutting saw plate.

spaced openings having substantially the same cross sections and the second main surface being free of openings;

(f) the depth of each opening is at least one-half the thickness of the inserts; and

(g) the inserts are disposed on the periphery of the disk where:

(i) the main surfaces are disposed perpendicular to the longitudinal axis of the disk;

(ii) the openings are arranged in rows which are obliquely oriented with respect to longitudinal axis of the disk; and

(iii) each insert is turned 180° with respect to the adjacent inserts, wherein the disk when viewed from the side includes a plurality of inserts where every other insert includes openings.

4,860,722

DIAMOND SEGMENTS AND INSERTS

Oreste Veglio, Pianezza, Italy, assignor to HS Veglio S.r.l., Pianezza, Italy

Continuation of Ser. No. 937,723, Dec. 4, 1986, abandoned. This application Apr. 20, 1988, Ser. No. 185,304
Claims priority, application Italy, Dec. 13, 1985, 68048 A/85
Int. Cl.[4] B24D *7/06, 7/10*
U.S. Cl. 125—15 **6 Claims**



1. A cutting disk for global cutting comprising:

(a) a disk;

(b) a plurality of hardened inserts uniformly disposed around the periphery of the disk;

(c) each insert includes a first and second main surface that are disposed substantially parallel to each other;

(d) the distance between the main surfaces defines the insert's thickness;

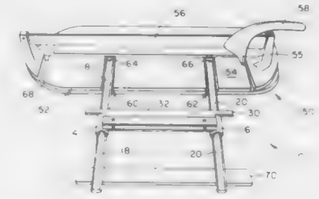
(e) the first main surface includes a plurality of uniformly

4,860,723

CERAMIC TILE SPACING GAUGE AND TILE HOLDER

Conrad Fortin, 534 Main St., Van Buren, Me. 04785

Filed Jan. 25, 1988, Ser. No. 148,291
Int. Cl.[4] B26F *3/00;* **B28D** *1/32*
U.S. Cl. 125—23 T **14 Claims**



1. A tile spacing gauge and tile holder comprising:

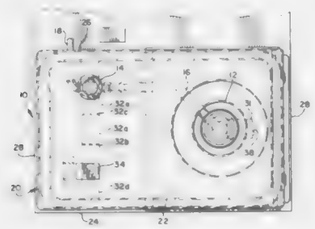
an elongate frame cross arm comprising first and second brackets spaced apart at either end of the cross arm, said brackets being constructed and arranged for slideably receiving elongate gauge arms in parallel with each other and at right angles to the frame cross arm, said brackets being formed with reference edge means for placement against a working reference line such as a row of installed tiles;

first and second elongate gauge arms slidably mounted in the respective first and second brackets with gauge arm ends slideably projecting from the brackets for parallel and independent measurement of the distances from the reference edge means and working reference line to a boundary or finishing line at two spaced apart locations by slidably positioning the gauge arms;

abutment means adjustably mounted on the frame cross arm defining a butting edge in spaced relation to the reference edge means for setting the desired width of a grout line and for positioning a row of tiles to be scored;

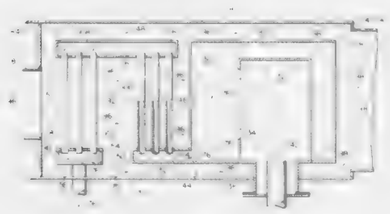
and coupling means for coupling the tile spacing gauge to a tile cutter so that the tile spacing gauge can form a component of the tile cutter after measurement positioning of the gauge arms for holding tiles in position at the butting edge for scoring and cutting by the tile cutter along a line set by the positioning of the respective gauge arms, said coupling means being positioned at the ends of said elongate gauge arms and further comprising adapter means to be secured on the tile cutter for mounting the tile spacing gauge on the tile cutter at the ends of the gauge arms.

4,860,724
GAS BURNER ASSEMBLY
Erich J. Schlosser, Barrington, and Andrzej Leja, Palatine, both of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.
Filed Aug. 12, 1988, Ser. No. 231,499
Int. Cl.[4] F24C *5/20*
U.S. Cl. 126—38 **16 Claims**



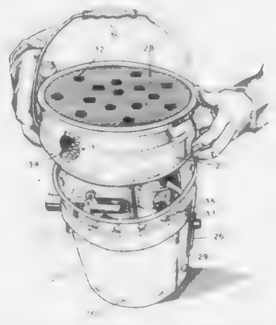
1. A burner assembly for an outdoor cooking device comprising:
- a pan including a base surface and opposing, upwardly directed first and second walls, said base surface including a base slot and said first and second walls having respective first and second wall slots;
- a gas burner;
- a gas valve;
- a tube for transmitting gas from said gas valve to said burner;
- a first bracket secured to said burner, said first bracket extending downwardly from said burner and terminating at a first bracket tab;
- a second bracket secured to said valve, said second bracket having generally horizontal first and second end tabs, wherein said first bracket tab is disposed in said base slot and said first and second end tabs are disposed in respective ones of said first and second wall slots.

4,860,725
POWER BURNER-FLUID CONDENSING MODE FURNACE
William R. Tallman, Huntington; Steven C. McDevitt, Fort Wayne, both of Ind., and Warren H. Delancey, Elyria, Ohio, assignors to Yukon Energy Corporation, Minneapolis, Minn.
Continuation of Ser. No. 526,107, Aug. 24, 1983, abandoned. This application Apr. 27, 1989, Ser. No. 346,365
Int. Cl.[4] F24H *3/02*
U.S. Cl. 126—110 R **9 Claims**



1. In a hot air furnace including a gun-type power fluid fuel burner, heat exchanger means for extracting heat from the products of combustion of the burner, exhaust passage means for carrying the products of combustion from the heat exchanger means to an exhaust flue, air passage means for receiving a flow of cool air over the heat exchanger means thereby to remove heat therefrom and to supply heated air to a space to be heated, and air moving means for causing a flow of air through the air passage means, the improvement comprising; condenser means serially disposed in said exhaust passage means for removing water from the products of combustion therein, said condenser means being disposed to be exposed to cool air entering said air passage means; drain means connected to said exhaust passage means for receiving condensate therefrom; second air moving means in said exhaust passage means for causing fluid flow therein from said heat exchanger means to said exhaust flue and wherein said first-named air moving means comprises a first motor-driven blower, said second air moving means comprises a second motor-driven blower, and said burner includes a blower; and said burner blower providing higher pressure than said second blower.

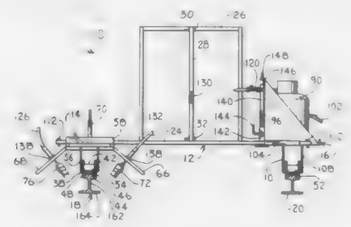
4,860,726
MULTIPURPOSE WARMING AND HEATING VESSEL
Stanley G. Barker, 607 Madison St., Joilet, Ill. 60435
Filed May 19, 1988, Ser. No. 195,878
Int. Cl.[4] A61F *7/00, 7/08;* **F24C** *1/14, 13/00*
U.S. Cl. 126—208 **10 Claims**



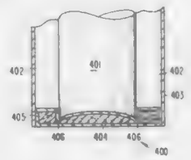
1. A multipurpose warming and heating vessel comprising; a housing, an aperture in said housing for receiving a component to supply a source of heat to the interior of the vessel, a mounting bracket on the housing to retain said component in position, a flame tube having a portion interior of the vessel housing and a portion exterior to the vessel housing, said interior portion adapted to receive said source of heat, the exterior portion adapted to receive a duct for conveying hot air from the vessel, a separate warming pod section that fits either on the bottom or on the top of the vessel, and a lid.

4,860,727
MOBILE RAIL HEATER AND METHOD FOR EXPANDING RAILS
Mark E. Eads, and George W. Eads, both of 1020 NW. Blvd., Neosho, Mo. 64850
Filed Jun. 16, 1988, Ser. No. 207,240
Int. Cl.[4] F23C *5/00*
U.S. Cl. 126—271.2 A **11 Claims**

1. A mobile rail heated for use with a pair of spaced rails each having a longitudinal axis comprising:
- a pair of spaced apart wheeled carriage assemblies oriented for riding atop one of said spaced rails;
- burner means carried by said carriage assemblies and oriented for applying heat to said one rail;
- wheeled support means spaced laterally from said assemblies and located for riding atop the other of said rails; and
- frame means for interconnecting said carriage assemblies in laterally spaced relationship to said support means, including structure for varying the spacing between said carriage assemblies and said support means while maintaining said burner means in said heat-applying orientation relative to said one rail, said frame structure serving to vary said spacing in response to variable distances between said one rail and said other rail encountered during movement of said heater as a unit along said rails.

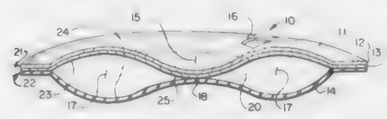


4,860,728
WATER HEATER DEVICE
Thomas E. Nelson, 2407 Greten La., Anchorage, Ky. 40223
Continuation-in-part of Ser. No. 177,393, Apr. 4, 1988. This application Feb. 22, 1989, Ser. No. 313,480
Int. Cl.[4] F24H *1/00*
U.S. Cl. 126—361 **1 Claim**



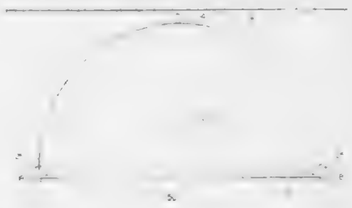
1. A water heater device comprising:
(a) a water tank;
(b) an outer shell concentrically located over the water tank defining an annular clearance space therebetween; and
(c) a thermal insulating member including a pliable material envelope which is filled with loose, discrete insulation material, said envelope being arranged into a disc-shaped portion disposed beneath the bottom end of the water tank and connected thereto an annular collar portion disposed around said water tank and positioned within said annular clearance space, said collar having a radial thickness greater than the radial width of said annular clearance space such that the collar is radially compressed between the shell and tank.

4,860,729
METHOD AND APPARATUS FOR NUCLEATING THE CRYSTALLIZATION OF UNDERCOOLED MATERIALS
David K. Benson, Golden, Colo., and Peter F. Barret, Peterbourgh, Canada, assignors to Midwest Research Institute
Filed Feb. 10, 1988, Ser. No. 154,364
Int. Cl.[4] F24H *7/00;* **F24J** *1/00*
U.S. Cl. 126—400 **21 Claims**



1. The method of controlling the release of latent heat of transition of a supercooled, phase-change material, comprising:
trapping a crystallite of the material between two solid objects and retaining it there by pressing said objects together with enough force to create sufficient pressure to keep the crystallite isolated between the two solid objects when it is immersed in the phase-change material and to keep it from melting;
exposing said crystallite to said supercooled, phase-change material by releasing said pressure and allowing said supercooled, phase-change material to contact said crystallite.

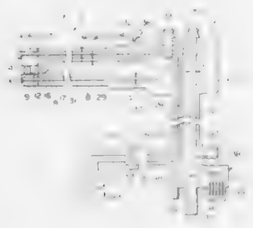
4,860,730
AIR-WARMING UNIT
Sergio Capilli, 19 Via Ottavilla, and Anna D. Capilli, 607 Via Aurelia, both of, Rome, Italy
Filed Oct. 5, 1987, Ser. No. 104,153
Claims priority, application Italy, Apr. 29, 1987, 47894 A/87
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—450 **16 Claims**



1. In apparatus for using solar energy to transport or heat the air within a structure, which apparatus includes a chamber for heating air by solar energy having entrance and exit apertures, the improvement comprising a radiation recipient element for said chamber; a radiation absorbent element for said chamber comprising two sheets of metal and insulating material therebetween shaped so as to form a stackable and deformable body; a rubber gasket around the edge of said body to hold said sheets together; and a gasket receiving element around the edge of said radiation recipient element and shaped to receive said rubber gasket; said rubber gasket and gasket receiving element cooperating to absorb the differences of deformation along the edge between said deformable body and said radiation recipient element.

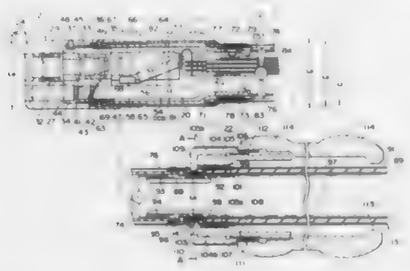
4. In apparatus for using solar energy to transport or heat the air within a structure; which apparatus includes a chamber for heating air by solar energy having a lower entrance aperture and an upper exit aperture, whereby air within said chamber will tend to flow upwards as a thermal current upon being heated by solar energy, said structure having a passageway therethrough (between said entrance aperture and the interior of said structure) the improvement comprising a valve for controlling the flow of air into said entrance aperture, said valve including a tubular member mounted in said passageway, said tubular member forming an axial conduit through which (when open) air is drawn from within said structure into said chamber by said thermal current, the wall of said tubular member having a circumferential aperture at a location outside said structure through which (when open) air is drawn from the atmosphere outside said structure into said chamber by said thermal current, first means adapted to open and close said axial conduit, and second means adapted to open and close said aperture, or partially to open both said axial conduit and said aperture.

4,860,731
ENDOSCOPE
Nobuyuki Matsuura, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Oct. 11, 1988, Ser. No. 255,568
Claims priority, application Japan, Dec. 17, 1987, 62-322603
Int. Cl.[4] A61B *1/06, 1/12*
U.S. Cl. 128—6 **5 Claims**



1. An endoscope comprising:
an insertable part inserted into a body cavity and having in the front end part an illuminating window illuminating an observed part and an observing window for observing the illuminated object;
an operating part provided in the rear of said insertable part;
a first sucking tube line communicating with a sucking part provided at the front end of said insertable part, inserted through said insertable part and leading to said operating part;
a suction switching part provided in said operating part, communicating with said first sucking tube line and making a sucking operation from said sucking port; and
a second sucking tube line communicating with said first sucking tube line through said suction switching part and having an inside diameter larger than the inside diameter of said first sucking tube line.

4,860,732
ENDOSCOPE APPARATUS PROVIDED WITH ENDOSCOPE INSERTION AID
Hiroshi Hasegawa, and Hirofumi Miyanaga, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Nov. 23, 1988, Ser. No. 275,499
Claims priority, application Japan, Nov. 25, 1987, 62-296725; Feb. 8, 1988, 63-26840; Feb. 8, 1988, 63-26841
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **17 Claims**



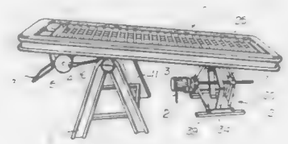
1. An electronic endoscope comprising:
an endoscope including an elongated inserting section and an inserting end portion provided at the leading end of said inserting section and having a leading end surface provided with an illuminating window through which illuminating light is projected onto an object to be observed and an observation window for receiving light reflected from said object for the purposes of observation;
an optical adapter having a first optical element which is detachably mounted on a first mounting portion provided on the outer periphery of said inserting end portion and mounted in opposed relationship with said illuminating window and a second optical element mounted in opposed relationship with said observation window;
an endoscope insertion aid capable of being mounted on a second mounting portion provided on the outer periphery of said inserting section which is disposed rearwardly of said first mounting portion of said inserting end section, said endoscope insertion aid projecting outwardly from the outer periphery of said inserting section so as to aid said inserting section to be inserted; and
means for preventing said endoscope insertion aid from coming off, said means being formed such that its minimum effective inner diameter does not exceed the maximum effective inner diameter of said optical adapter.

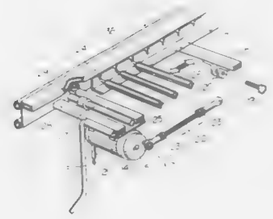
4,860,733
OSCILLATING RECLINING CHAIR
Alonzo E. Parker, Jr., P.O. Box 11276, Durham, N.C. 27703
Continuation-in-part of Ser. No. 152,075, Feb. 4, 1988, abandoned. This application Sep. 2, 1988, Ser. No. 240,253
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—25 R **6 Claims**



1. A reclining chair having means for tilting and reclining, seat back and footrest members thereof enabling such members to be positionable between upright and reclining positions, comprising:
(a) an upper back portion for supporting the upper torso of a user;
(b) a lower back portion for supporting the lumbar portion of a user, the upper back portion being connected to the lower back portion to oscillate with respect to the lower back portion about an axis parallel to the central longitudinal axis of said upper back portion and to tilt in unison with the lower back portion between upright and reclining positions utilizing the tilting and reclining means of the chair;
(c) a seat portion for supporting the lower body of a user, the seat portion connected to the lower back portion in a manner such that the lower back portion, utilizing the tilting and reclining means of the chair, tilts in correspondence with tilting of the seat portion; and
(d) drive means, mounted on a selected rearwardly disposed portion of the chair for oscillating the upper back portion with respect to the lower back portion about said axis.

4,860,734
EXERCISING APPARATUS FOR ADJUSTING INTERVERTEBRAL DISC AND ARTICULATIONS CLEARANCES
Keun Chul Lyu, 129-172 Yongdu-Dong, Dongdaemun-Ku, Seoul 131, Rep. of Korea
Filed Jul. 8, 1988, Ser. No. 216,330
Claims priority, application Rep. of Korea, Jul. 29, 1987, 87-1241[U]; Dec. 12, 1987, 87-2201[U]
Int. Cl.[4] A61H *15/00*
U.S. Cl. 128—57 **12 Claims**

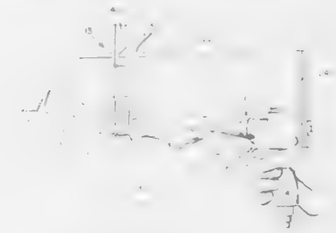




1. A therapeutic exercising apparatus for adjusting intervertebral disc and articulations clearances comprising:
a main frame supported by a supporting member,
an eccentric cam attached to a motor mounted below a first end of said main frame,
a movable and adjustable link connected to said eccentric cam at a first end thereof,
a pair of movable brackets disposed in said main frame, said pair of movable brackets being connected to a second other end of said movable link,
a plurality of rotatable rollers disposed between said brackets and forming a bedfloor, and
elevation member supported below a second end of said main frame, said adjustable elevation member including a plurality of foldable supporters and an adjusting screw member operatively connected to said plurality of supporters and to a direction-changeable motor for controlling the height of said adjustable elevation member whereby, the plurality of rollers contact and rotate under a human body lying on the bedfloor of the main frame upon being moved back and forth by the brackets through the movement of the movable link so that the rotating rolling rollers treat and massage regions of the human body lying thereon.

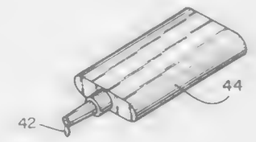
4,860,735
DRILL ALIGNMENT GUIDE FOR OSTEOPLASTIC SURGERY
John R. Davey, Toronto, Canada, and William H. Harris, Belmont, Mass., assignors to The General Hospital Corporation, Boston, Mass.
Filed Aug. 8, 1988, Ser. No. 229,633
Int. Cl.[4] A61B *17/56*
U.S. Cl. 128—92 V **17 Claims**

1. A drill alignment apparatus for guiding along a predetermined drilling path a drill having an elongated drill shaft extending along a drill axis from a housing assembly, said shaft having a cutting element disposed at its distal end,
said alignment apparatus comprising:
(A) an alignment rod secured to said housing assembly and extending along a rod axis, said rod axis being spaced a predetermined distance (D) from said drill axis and oriented substantially parallel thereto; and



(B) a clamp element having at one end an aperture for permitting the passage therethrough of said alignment rod along said rod axis, and having at its other end a clamping means for clamping said clamp element to a bone with said drill axis being substantially coaxial with the central axis of the intramedullary canal of the bone when the alignment rod is positioned within the aperture.

4,860,736
FINGERNAIL SOLUTION APPLICATOR PAD AND NUTRIENT SOLUTION KIT
Richard A. Kaitz, Golden Valley, and Miriam J. Kaitz, Minneapolis, both of Minn., assignors to Miriam Collins - Palm Beach Laboratories Co., Minneapolis, Minn.
Filed Feb. 17, 1988, Ser. No. 157,297
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—155 **1 Claim**



1. A nail solution applicator kit, comprising:
an applicator comprising a backing member having an outer side and an inner side, said inner side having an adhesive coating, said adhesive coating providing for removably attaching said backing member to a finger or toe, and said inner side further having an absorbent pad centered and permanently affixed thereon;
a container of liquid nutrient solution, said solution for application to said absorbent pad;
a mounting sheet having a top and a bottom side, said bottom side having a wax-like, nonabsorbent, coating for permitting said backing member and absorbent pad to be adhesively and removeably affixed thereon, said mounting sheet also having a hole therein, said hole being disposed in line with said absorbent pad for application of said liquid nutrient solution through said hole to said absorbent pad, said backing member and absorbent pad being removable from said mounting sheet for adhesive attachment to a finger or toe, with said absorbent pad being oriented across the cuticle and nail area of the finger or toe; and
said applicator being generally in the shape of a triangle with

an elongated base and two sides sloping to an apex opposite said base, said applicator thereby being constructed and arranged to be adhesively secured to a finger or toe with said pad disposed over the nail, with said base being oriented across the back end or cuticle area of the nail and with said apex being at the forward end of the finger or toe, said generally triangular shape providing improved conformal attachment of said applicator to said finger or toe.

4,860,737

WOUND DRESSING, MANUFACTURE AND USE

Stephen M. Lang, Wicken Benhunt, Nr. Saffron Walden, and David F. Webster, Bishops Stortford, both of United Kingdom, assignors to Smith and Nephew Associated Companies p.l.c., United Kingdom

Continuation-in-part of Ser. No. 516,119, Jul. 20, 1983, which is a continuation-in-part of Ser. No. 506,501, Jun. 21, 1983, which is a continuation-in-part of Ser. No. 396,754, Jul. 9, 1982, which is a continuation-in-part of Ser. No. 396,732, Jul. 9, 1982, which is a continuation-in-part of Ser. No. 345,550, Feb. 3, 1982, which is a continuation-in-part of Ser. No. 345,488, Feb. 3, 1982. This application Aug. 11, 1983, Ser. No. 522,414

Claims priority, application United Kingdom, Feb. 13, 1981, 8104568; May 22, 1981, 8115742; Feb. 12, 1982, 8204133; Feb. 12, 1982, 8204132; Jun. 22, 1982, 8218088; Jul. 21, 1982, 8221112; Aug. 12, 1982, 8223253

Int. Cl.⁴ A61F *13/00*

U.S. Cl. 128—156 **11 Claims**

1. A laminate wound dressing which consists essentially of a low adherency wound facing layer, an absorbent layer and an outer layer laminated together wherein the wound facing layer comprises a conformable net of elastomer, the absorbent layer comprises a conformable hydrophilic foam and the outer layer comprises a conformable microporous film which is a barrier to bacteria and liquid water.

4,860,738

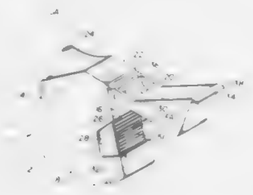
HAND HELD METERED SPRAY DISPENSER

Manfred K. Hegemann, South Nyack, N.Y., and Edward J. Drozd, Jr., Lake Hiawatha, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 451,311, Dec. 20, 1982, Pat. No. 4,771,769. This application Jun. 29, 1988, Ser. No. 212,847

Int. Cl.⁴ A61M *11/00*

U.S. Cl. 128—200.22 **13 Claims**



1. A hand held metered spray dispenser comprising:

housing means;

nozzle means extending from the top of said housing means and shaped for insertion into an orifice for directing a spray along a dispensing axis;

container means movably mounted to the interior of said housing means for holding fluid to be dispensed;

manual pump means interconnecting said nozzle means and said container means and having a pumping axis substantially coincidental to said dispensing axis for pumping a metered amount of fluid from said container means to said nozzle means in a single pumping cycle;

orifice means in said housing means for providing excess to the interior of said housing means along a manual force axis transverse to said dispensing axis; and

converting means pivotally connected to said housing means and engaging said container means for converting a manual force applied through said orifice means along said manual force axis to a force moving said container means along said pumping axis activating said pump means to dispense a metered amount of fluid through said nozzle means wherein said converting means includes hinge means for pivotally mounting said container means to the interior of said housing means with a side of said container means adjacent said orifice means whereby said manual force is applied to said container means through said orifice means.

4,860,739

SNORKEL

Herbert D. Vandepol, North Palm Beach, Fla., assignor to Wenoka Seastyle, West Palm Beach, Fla.

Filed Jun. 6, 1988, Ser. No. 202,407

Int. Cl.⁴ B63C *11/16, 11/18*

U.S. Cl. 128—201.11 **13 Claims**



1. A snorkel having a mouthpiece assembly and a breathing tube attached to said mouthpiece assembly, said mouthpiece assembly comprising;

means forming a chamber within said mouthpiece assembly,

a mouthpiece connected to said chamber,

a pair of purge valves located in said chamber in fluid communication with said mouth piece with both valves below the level of the mouthpiece when the snorkel is in normal use and with one of said purge valves closer to said mouthpiece than the other of said purge valves.

4,860,740

POWDER INHALATION DEVICE

William F. Kirk, Loughborough; Anthony C. L. Wass, Duddington; Eric A. Baum, Bishops Stortford; Ian P. Tansey, Barrow on Soare Loughborough, and William G. Meredith, Rothley, all of United Kingdom, assignors to Riker Laboratories, Inc., St. Paul, Minn.

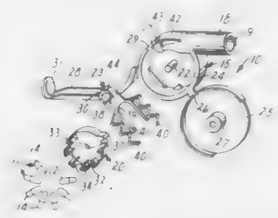
Continuation of Ser. No. 679,602, Dec. 7, 1984, abandoned, which is a continuation of Ser. No. 403,768, Jun. 29, 1982, abandoned. This application Feb. 10, 1987, Ser. No. 13,191

Claims priority, application United Kingdom, Oct. 30, 1980, [illegible]

Int. Cl.⁴ A61M *15/00*

U.S. Cl. 128—203.15 **7 Claims**

1. A device facilitating the inhalation of powdered medicaments from within capsules of the type each comprising a first capsule portion adapted to contain the powder and having an open end, and a second capsule portion closing the open end of the first capsule portion, said device comprising a body having walls defining a chamber in the upper portion thereof, a cavity adjacent the chamber, at least a portion of the cavity being located below the chamber, an air opening into said cavity for the entry of air, at least one inlet port up into said chamber from said lower portion of said cavity for the entry of air, and a mouthpiece having a central opening fluidically communicating with said chamber; a generally cylindrical support member having an axis and sockets extending radially and opening through its periphery adapted to receive and support the first capsule portions of a plurality of capsules, respectively, with the second capsule portions projecting from the sockets radially of the support member, said support member being mounted in the cavity of said body for rotation about said axis relative to said body, said inlet port being generally radially adjacent the support member, a portion of the periphery of the cylindrical support member adjacent said inlet port closing a portion thereof, means for moving said sockets one by one



from a first position wherein a capsule received in the socket is outside said inlet port to a dispense position wherein the open end of the first capsule portion within the socket is within the confines of said inlet port between said air opening and mouthpiece so that airflow into said air opening and said inlet port and through said chamber induced by suction at the mouthpiece will cause the powdered medicament in the first capsule portion in the socket to become entrained in the airflow; and manually activatable means mounted on said body for removing the second capsule portion from the first capsule portion in the socket at said first position, said manually activatable means for removing comprising an extractor including means for frictionally engaging said second capsule portion, and manually actuatable means for moving the means for frictionally engaging relative to said body between a raised position at which raised position said means for frictionally engaging is spaced from the capsule in the socket of said support member at said first position, and an engage position at which engage position said means for frictionally engaging is in frictional engagement with the second capsule portion of the capsule within the socket of said support member at said first position.

4,860,741

MODULAR INHALATION TOWER FOR LABORATORY ANIMALS

David M. Bernstein, Geneva, and Hermut Fleissner, Bernex, both of Switzerland, assignors to Research & Consulting Co. A.G., Switzerland

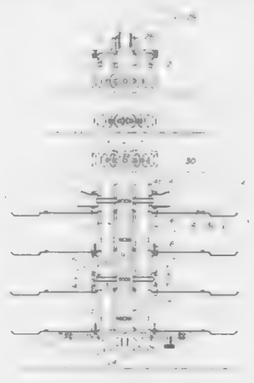
Filed Jan. 6, 1988, Ser. No. 141,255

Claims priority, application Switzerland, Feb. 9, 1987, 475/87

Int. Cl.⁴ A61M *16/00*

U.S. Cl. 128—204.18 **5 Claims**

1. A modular inhalation tower for laboratory animals comprising two concentric vertical ducts defining a central external evacuation duct and a central internal distribution duct around the vertical axis of the tower, which has a number of tiers, each of which comprises a tray for supporting individual inhalation chambers and radial connecting ducts grouped in tiers and distributed at equal angles on each tier, in order to connect each inhalation chamber to the central internal distribution duct, the central external duct for evacuating the inhaled gas being formed with openings concentric with each connecting duct in order to connect each inhalation chamber to the central external evaluation duct, wherein each duct is divided into segments each corresponding to a tier, each segment ending in surfaces shaped so as to fit into complementary surfaces of adjacent segments, the complementary surfaces of adjacent segments, the complementary surfaces of the segment forming the central external duct comprising, firstly, an external annular portion and, secondly, and internal annular portion of complementary diameter, the axial height of the internal annular portion is less than that of the external annular portion by a value corresponding of the thickness of one of the trays so



as to define an annular space for receiving a tray between each pair of adjacent segments, a cylindrical annular recess being formed in the outer surface of each segment of the central external duct between two projecting annular parts extending from the two respective ends of the duct segment, one of the projecting annular parts being formed with holes parallel to the duct axis and distributed at equal angles around the axis and the other annular part having threads parallel to the duct axis and equal in number to the holes and distributed at equal angles, the threads being adapted to receive screws guided through the corresponding holes in the annular part of the adjacent duct segment and the tray disposed in the annular space.

4,860,742

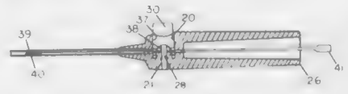
ASSEMBLY OF WIRE INSERTER AND LOCK FOR A MEDICAL WIRE

Harry Park, and Udi Fishman, both of Santa Clara, Calif., assignors to Medical Innovations Corporation, Milpitas, Calif.

Filed May 16, 1988, Ser. No. 193,945

Int. Cl.⁴ A61B *17/00*

U.S. Cl. 128—303 R **12 Claims**



1. An assembly of a wire inserter, and a lock for a medical wire, comprising:

a. an elongate housing;

b. a proximal nozzle portion providedby the housing and defining an outlet bore;

c. a push button cavity defined by the housing;

d. a riser element in the cavity, the riser element defining an alignment slot aligned with the outlet bore of the nozzle;
e. an exit bore defined by the housing positioned between the outlet bore and one end of the alignment slot;
f. an entry bore defined by the housing and positioned at an opposed end of the alignment slot at the exit bore, the outlet bore, entry and exit bore, and alignment slot being aligned;
g. an outwardly biased, spring loaded push button mounted on the riser element, the push button defining radially opposed bores, including wedge-shaped portions aligned with the alignment slot; and,
h. a medical wire mounted for movement through the outlet bore, the entry and exit bores, the wedge shaped bores, and the alignment slot; whereby:
i. when the push button is biased outwardly, the medical wire will be compressed into the wedge shaped portions of the radially opposed bores on the push button, and thereby lock the wire against movement along the housing;
ii. additional locking action on the medical wire is provided along the entry and exit bores; and,
iii. when the push button is pressed inwardly, the medical wire will be unlocked from the wedge-shaped portions of the opposed bores, and the entry exit bores for free movement through the housing.

4,860,743

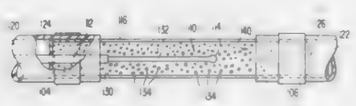
LASER METHOD AND APPARATUS FOR THE RECANALIZATION OF VESSELS AND THE TREATMENT OF OTHER CARDIAC CONDITIONS

George S. Abela, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Continuation-in-part of Ser. No. 924,292, Oct. 27, 1986, abandoned, which is a continuation of Ser. No. 757,778, Jul. 24, 1985, abandoned, which is a continuation of Ser. No. 559,722, Dec. 9, 1983, abandoned. This application Jun. 3, 1987, Ser. No. 56,878

Int. Cl.[4] A61B *17/36*

U.S. Cl. 128—303.1 **10 Claims**



1. Apparatus for treating cardiac conditions with laser radiation comprising a catheter adapted to be inserted into a blood vessel and threaded through the blood vessel to a region to be treated, the catheter comprising a tubular body having a window of laser radiation transparent material formed in a sidewell thereof; an optical fiber for guiding a laser beam disposed within the catheter, the optical fiber having an end terminating adjacent to said window; and lens means on the end of the optical fiber for dispersing a laser beam guided by the optical fiber sideways outwardly through said window for treating tissue adjacent to the window and wherein said window comprises a closed tubular section of said transparent material which is coaxially disposed between a first catheter body section and a second catheter body section, said optical fiber entering the closed tubular section and terminating therein and wherein said closed tubular section has a cylindrical inner surface which is mirrored except for a part thereof which forms said window so as to reflect the laser beam from the optical fiber outwardly through the window.

4,860,744

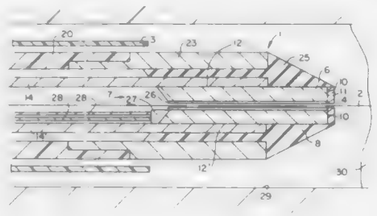
THERMOELECTRICALLY CONTROLLED HEAT MEDICAL CATHETER

Norman J. Johnson, Lexington, Mass., and Raj K. Anand, 210 Lincoln St., Worcester, Mass. 01605, assignors to Raj K. Anand, Worcester, Mass.

Filed Nov. 2, 1987, Ser. No. 116,526

Int. Cl.[4] A61B *17/38*

U.S. Cl. 128—303.1 **32 Claims**



1. An apparatus for applying highly controlled, localized heating or cooling to precise points in a patient to treat the patient comprising:
a P-doped thermocouple leg including first and second end portions and an N-doped thermocouple leg including first and second end portions, said legs being connected at said first end portions to form a probe tip junction and not being connected at said second end portions, said legs being oriented to be opposite each other;
a metal sleeve surrounding said unconnected second end portions of said thermocouple legs;
a layer of thermally conductive, electrically insulative material separating said thermocouple legs from said metal sleeve;
means for delivering said pair of thermocouple legs into a patient's body; and
means for passing a current through said pair of legs to heat or cool said probe tip junction.

4,860,745

HIGH FREQUENCY ELECTROSURGICAL APPARATUS FOR THERMAL COAGULATION OF BIOLOGIC TISSUES

Gunter Farin, Tubingen-Hirschau; Reiner Haag, Rietheim, and Peter Putz, Tubingen, all of Fed. Rep. of Germany, assignors to Erbe Elektromedizin GmbH, Tubingen, Fed. Rep. of Germany

Filed Jul. 15, 1987, Ser. No. 74,553

Claims priority, application European Pat. Off., Jul. 17, 1986, 86 109 794.7

Int. Cl.[4] A61B *17/39*

U.S. Cl. 128—303.17 **10 Claims**



1. High frequency electro surgical apparatus for thermal coagulation of biologic tissues comprising a high frequency electric generator having a fundamental frequency (f_1) of operation and having an output circuit equipped with a coagulation electrode for contact with biological tissues of a patient and with switching means for manual or automatic activation of said generator to produce an output of high frequency current and for automatic switching off of a coagulation operation in dependence upon changes in electric conductivity of said tissues of said patient, and further comprising, in accordance with the invention:
electrical monitoring means (25) having an input coupled to said output circuit of said high frequency generator for monitoring amplitude fluctuations of the output of said high frequency electric generator during each coagulation operation by monitoring at least one of the current and voltage of said output, said monitoring means including means (50, 51, 52) for deriving from the output high frequency current (I_{HF}) of said generator, a voltage proportional to the amplitude fluctuations (A(t)2) of said high frequency current (I_{HF}), first detection means (53, 55, 58, 60, 62) coupled for being responsive to the output of said voltage deriving means for producing, at an output of said first detection means, a first DC voltage (U_a) proportional to said amplitude fluctuations (A(t)) of said high frequency current (I_{HF}) and second detection means (54, 56, 61, 63) coupled for response to rising portions of fluctuations of said high frequency current and constituted as a peak value detector, for producing, at an output of said second detection means, a second DC voltage (U_b) which rises proportionally to the rising portion of fluctuations of said high frequency current;
voltage comparison means (67) coupled for response to said respective outputs of said first and second detection means for comparing said first DC voltage (U_a) and a predetermined adjustable fraction (kU_b) of said second DC voltage and producing a comparison result signal at an output of said comparison means;
a bistable switching control circuit (70) coupled to said output of said comparison means and connected for being set by the comparison result signal of said voltage comparison means (67) when said first DC voltage (U_a) becomes smaller than said predetermined fraction (kU_b) of said second DC voltage and thereby to produce an output control signal (Q);
means coupled for response to said bistable circuit (70) and connected to said high frequency generator for shutting off the output of said high frequency generator in response to said output control signal (Q) of said bistable circuit (70), and
means (23) for reactivating, and usable for initially activating, the output of said high frequency generator in response to operation of a manual switch (21), to operation of an automatic switch (22) or to both said manual switch and said automatic switch.

4,860,746

ELASTIC SURGICAL RING CLIP AND RING LOADER

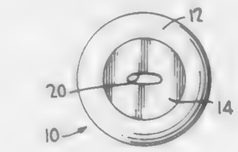
InBae Yoon, 2131 Highland Ridge Dr., Phoenix, Md. 21131

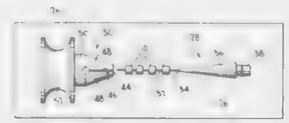
Continuation-in-part of Ser. No. 789,663, Oct. 21, 1985, Pat. No. 4,794,927, which is a division of Ser. No. 370,170, Apr. 20, 1982, Pat. No. 4,548,201. This application Jun. 19, 1987, Ser. No. 63,913

Int. Cl.[4] A61B *17/12*

U.S. Cl. 128—326 **17 Claims**

1. An elastic surgical ring clip comprising:
a body made of elastic material, said body having a generally spherical configuration exhibiting a pair of generally flattened and diametrically opposed faces, and
means defining an anatomical tissue engaging lumen generally extending centrally through said elastic body with opposite ends of the lumen forming orifices centrally disposed in said opposed faces,
said opposed faces having greatest cross-sectional dimensions in a plane perpendicular to a longitudinal axis of said lumen, substantially less than corresponding greatest cross-sectional dimensions of said spherical configuration of said body taken parallel to said plane,
said body being made of an elastic material having sufficient elastic memory to return to its initial configuration after





being stretched to enlarge said lumen so that tissue may be drawn into said lumen, whereby, upon return of said clip to its initial configuration with tissue located within said lumen, secure engagement of said clip about tissue is assured.

4,860,747

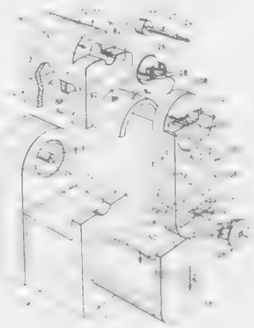
EAR PIERCING APPARATUS

Anthony Sciara, Oakville, Canada, assignor to First Lady Coiffures Ltd., Toronto, Canada

Filed Dec. 21, 1987, Ser. No. 136,042

Int. Cl.[4] A61B *17/00*

U.S. Cl. 128—330 **26 Claims**



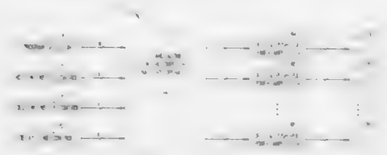
1. An ear piercing apparatus comprising: an instrument which comprises a body including a handle, a first, fixed jaw on the body, an arm movably mounted in the body and extending in alignment with the first jaw, a second jaw secured to the arm, a plunger slideably mounted in the body and aligned with the first and second jaws and actuating means mounted on the body for engaging and driving the plunger towards the second jaw; a disposable stud holder and a stud mounted within the stud holder, with the stud holder mounted on the first jaw; a disposable clasp holder and a clasp mounted in the clasp holder, with the clasp holder mounted on the second jaw; and a protective cover member integral with one of the stud holder and the clasp holder and extending between the first and second jaws and covering a portion of the arm, whereby, in use, a person's earlobe only contacts the clasp and stud holders and the protective cover member.

4,860,748

THERMAL PATTERN GENERATOR FOR PAIN RELIEF

Anthony A. Chiurco, Princeton, N.J., and Michael G. Littman, Philadelphia, Pa., assignors to Thermapeutics, Inc., Princeton, N.J.

Filed Feb. 23, 1988, Ser. No. 159,237
Int. Cl.[4] A61F 7/00
U.S. Cl. 128—399 18 Claims



1. An apparatus for treating pain by creating a series of temperature patterns in a sequence on the kin adjacent the pain, said apparatus comprising:

a plurality of spatially separated, thermoelectric means for producing a temperature change in said skin adjacent to the pain in response to an electrical input;

electronic controller means connected to said plurality of thermoelectric means for independently controlling each of said thermoelectric means so that said plurality of thermoelectric means creates changeable temperature patterns in a sequence on said adjacent skin; and,

delay time control means for producing a delay of at least sixty seconds between temperature patterns in a given sequence before a reversal of temperature gradient for said thermoelectric means,

wherein said temperature patterns in a sequence and said delay of at least sixty seconds reduce the sensation of pain by minimizing adaptation.

4,860,749

TACHYCARDIA DETECTION FOR AUTOMATIC IMPLANTABLE CARDIOVERTER/DEFIBRILLATOR WITH ATRIAL AND VENTRICULAR SENSING CAPABILITY

Michael H. Lehmann, West Bloomfield, Mich., assignor to Wayne State University, Detroit, Mich.

Filed Jan. 6, 1988, Ser. No. 141,280
Int. Cl.[4] A61N 1/00; H05G 00/00
U.S. Cl. 128—419 PG 12 Claims



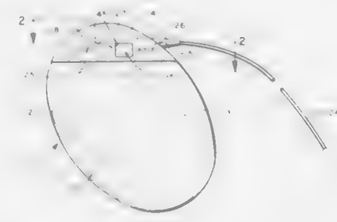
1. An automatic tachycardia detection and cardiac stimulating assembly adapted to be implanted in a person for stimulating the heart of the person upon detection of an abnormal tachycardia, said assembly comprising; atrial sensing means (16) for sensing electrophysiological activity within an atrium of said heart ventricular sensing means (18) for sensing electrophysiological activity within a ventricle stimulation means (20, 22) adapted to be connected to the heart for electrically and therapeutically stimulating the heart, and control (14) operatively connected to said atrial sensing means and said ventricular sensing means and said stimulating means and responsive to said sensed activity from said atrial sensing means (16) and said ventricular sensing means (18) for (a) determining cycle length of atrial activity and cycle length of ventricular activity (b) for determining the atrium to ventricle time interval (AV interval) (c) detecting ventricular tachycardia from said determined ventricular cycle length and actuating said stimulating means (20, 22) when ventricular tachycardia is detected, and (d) for distinguishing sinus tachycardia when the determined ventricular cycle length is equal to the determined atrial cycle length and the AV interval during tachycardia is less than or equal to a predetermined AV interval representing a normal sinus AV conduction interval and preventing activation of said stimulating means, thereby to prevent unnecessary stimulation of the heart.

4,860,750

SIDELOCK PACER LEAD CONNECTOR

Michael L. Frey, Alvin, Tex., and Gunter Becker, Sterling Heights, Mich., assignors to Intermedics Inc., Angleton, Tex.

Filed Apr. 17, 1986, Ser. No. 853,195
Int. Cl.[4] A61N 1/00
U.S. Cl. 128—419 P 24 Claims



1. A tissue stimulator comprising:

a housing having therein means for generating electrical pulse, and a source of electrical energy connected to said pulse generating means;

at least one electrical conductor extending between the tissue to be stimulated and said housing, each said at least one conductor having an electrode at one end for attachment to the tissue to be stimulated and a lead at the other end;

at least one bore in said housing adapted to receive therein a respective lead and electrical contact means located at one end of each said bore and electrically connected to said pulse generating means, each said bore having a longitudinal axis; and

locking means for fixing said conductor lead end against withdrawal from said bore including a channel transversely intersecting said bore off-axis, and at least one wedge member slidingly received in said channel for axial movement therealong to engage a side of said conductor adjacent said lead end and wedge said conductor in place within said bore.

4,860,751

ACTIVITY SENSOR FOR PACEMAKER CONTROL

Frank J. Callaghan, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Feb. 4, 1985, Ser. No. 697,919
Int. Cl.[4] A61N 1/36
U.S. Cl. 128—419 PG 18 Claims

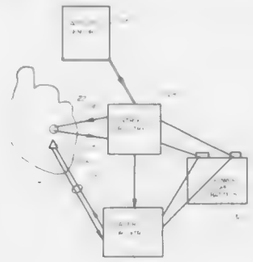
1. A cardiac pacing system which comprises:

an implantable pacer;

passive means requiring no power for sensing the physical activity of the pacer-wearing patient;

a physical activity threshold detector coupled to said physical activity sensing means;

means for sensing a selected physiological parameter of the patient; and



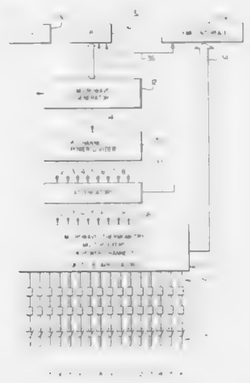
means for controlling the operation of said physiological parameter sensing means in response to detection of a physical activity threshold by said physical activity threshold detector.

4,860,752

INVASIVE MICROWAVE ARRAY WITH DESTRUCTIVE AND COHERENT PHASE

Paul F. Turner, North Salt Lake, Utah, assignor to BSD Medical Corporation, Salt Lake City, Utah

Filed Feb. 18, 1988, Ser. No. 161,456
Int. Cl.[4] A61N 5/02
U.S. Cl. 128—422 7 Claims



1. An electromagnetic hyperthermia system for heating local regions within living body tissue comprising:

(a) a microwave generator for producing microwave energy at a preselected frequency;

(b) a power dividing means operatively connected to the microwave generator for dividing the microwave energy selectively for distribution;

(c) applicator means operatively connected to the power dividing means for radiating the microwave energy into surrounding body tissue, the applicator means including a plurality of applicator groups and at least one applicator for central location within the plurality of applicator groups to thereby define an array when geometrically arranged about a selected area of living body tissue; and

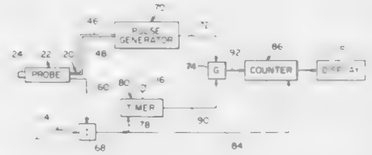
(d) a phase and power microwave energy control means including a plurality of preselected phase and power setting means connected to the plurality of applicator groups and to the at least one applicator for central location for supplying power in phase to the plurality of applicators and for providing the at least one central applicator with power and phase selection sufficient to cause a partial destructive interference zone in a central zone of the array, and means responsive to a reference temperature signal and signals of the temperature sensor means for producing microwave energy control signals for adjusting the amount of radiated microwave energy to each applicator whereby the distributed microwave energy is radiated sufficiently to treat the tissue area with a predetermined heating pattern for destroying cancerous growth within the array while leaving unharmed the normal tissue surrounding the applicator array.

4,860,753

MONITORING APPARATUS

William A. Amerena, Middleton, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Nov. 4, 1987, Ser. No. 117,211
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—632 18 Claims



1. Apparatus for monitoring a parameter of human skin comprising

probe structure including a probe member, said probe member having a pair of spaced electrodes for engagement with a skin surface to be monitored,

switch means responsive to engagement of said probe member with a skin surface to be monitored for providing an output signal,

monitoring circuitry including gate circuitry,

pulse generator circuitry coupled to said electrodes and said gate circuitry and adapted to apply output pulses at a rate that is a function of a parameter of the skin surface engaged by said electrodes to said gate circuitry,

counter circuitry coupled to the output of said gate circuitry,

timer circuitry coupled to said switch means and said gate circuitry and responsive to the output signal of said switch means for applying a conditioning signal for a predetermined period of time to said gate circuitry so that the conditioned gate circuitry passes pulse signals from said pulse generator circuitry to said counter circuitry for accumulation, and

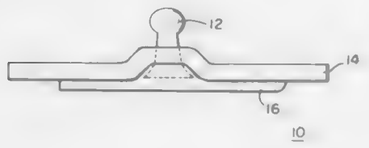
output means responsive to said counter circuitry for providing an indication of a parameter of the skin surface contacted by said probe electrodes.

4,860,754

ELECTRICALLY CONDUCTIVE ADHESIVE MATERIALS

Clyde L. Sharik, Trenton, N.J., and Anthony J. Berejka, Huntington, N.Y., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 33,313, Apr. 1, 1987, abandoned. This application Jan. 3, 1989, Ser. No. 294,970
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—640 **28 Claims**



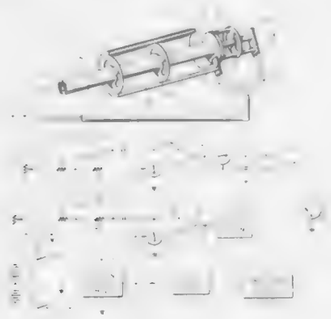
1. An electrically conductive adhesive material comprising:
a low molecular weight plasticizer selected from non-volatile alcohols and polyhydric alcohols;
a high molecular weight, water soluble, cross-linkable polymer which is also soluble in said plasticizer;
a tackifier comprising uncrosslinked polyvinylpyrrolidone; and
an electrolyte dopant in an amount sufficient to render said adhesive material electrically conductive.

4,860,755

DIFFERENTIAL PRESSURE APPLANATION TONOMETER

Louis W. Erath, Abbeville, La., assignor to Erath-Young Instrument Company, Inc., Abbeville, La.

Filed Feb. 8, 1988, Ser. No. 153,436
Int. Cl.[4] A61B *3/16*
U.S. Cl. 128—645 **14 Claims**



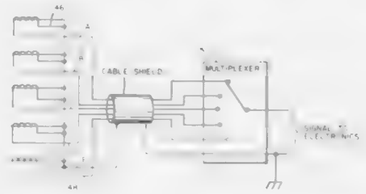
1. An applanation tonometer, comprising:
first and second probes for contacting the surface of an eye, the probes being arranged coaxially in a housing and being movable longitudinally with respect to one another and with respect to the housing; and
a first sensor circuit coupled to the first and second probes and operative to sense longitudinal movement of the first probe relative to the second probe and generate a first signal in response to the relative movement,
the first signal being related to the intraocular pressure of the eye.

4,860,756

ELECTROMAGNETIC BONE HEALING SENSOR USING A MULTI-COIL SENSOR ARRAY

Harvey W. Ko; Lynn W. Hart, both of Columbia, and Joseph P. Skura, Ellicott City, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 753,824, Jul. 11, 1985, Pat. No. 4,688,580. This application Aug. 25, 1987, Ser. No. 89,190
Int. Cl.[4] A61B *5/05*
U.S. Cl. 128—653 **2 Claims**



1. An apparatus for sensing bone healing, comprising:
an excitation means for sequentially generating a plurality of spatially concentrated oscillating magnetic fields along a bone in the area of a fracture site, whereby eddy currents induced in bone and other biological matter will produce secondary magnetic fluxes which vary in response to the impedance of bone and other biological matter located in each of said spatially concentrated oscillating magnetic fields, wherein said excitation means comprises a plurality of coil means for producing said plurality of spatially concentrated magnetic fields and an oscillator means operably coupled to each of said coil means through a multiplexing means for sequentially connecting each of said means to said oscillator means, and wherein said plurality of coil means are mounted in a plug adapted to be inserted in a window formed in a cast, so as to enable said plug to be inserted through said window into a position in close proximity to the patient's skin; and,
a processing means for detecting said secondary magnetic fluxes and for processing and displaying information indicating the local impedance along the bone.

4,860,757

GUIDEWIRE ADVANCEMENT SYSTEM

Arthur S. Lynch, Westwood, and A. Walter MacEachern, Woburn, both of Mass., assignors to Medical Parameters, Incorporated, Woburn, Mass.

Filed Oct. 28, 1987, Ser. No. 114,451
Int. Cl.[4] A61B *6/00*
U.S. Cl. 128—657 **4 Claims**



1. A catheter guidewire advancement system comprising:
a hollow casing for housing a catheter guidewire with a first outlet at one end and a second outlet;
straightener means for straightening the guidewire such that the straightener is disposed to receive said guidewire as it is dispensed through the first outlet; and
a first aperture for exposing a portion of the guidewire and a second aperture adjacent the second outlet such that a frictional force applied laterally to the guidewire through the first or second aperture will displace the guidewire relative to the casing and through the first or second outlet.

4,860,758

MULTIPLE DIAGNOSABLE DISTANCE RANGE ULTRASONIC DIAGNOSTIC APPARATUS

Yutaka Yanagawa, and Akira Taniguchi, both of Tokyo, Japan, assignors to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Aug. 14, 1987, Ser. No. 85,547
Claims priority, application Japan, Aug. 14, 1986, 61-190925; Aug. 14, 1986, 61-190926; Aug. 28, 1986, 61-202081
Int. Cl.[4] A61B *8/12*
U.S. Cl. 128—662.06 **5 Claims**



1. An ultrasonic diagnostic apparatus comprising:
a plurality of transducer means scanned in a predetermined cycle and having different resonance frequencies;
drive pulse generating means for periodically generating a drive pulse having a constant pulse width in synchronism with scanning of said ultrasonic transducer means;
pulse width adjusting means for adjusting a pulse width of the drive pulse in accordance with a resonance frequency of a selected one of said ultrasonic transducer means, to apply it to said selected one of said ultrasonic transducer means;
means for amplifying an echo signal from said transducer means;
means for A/D converting the amplified echo signal and writing the converted signal in a memory provided in a diagnostic device;
means for reading out data from the memory in accordance with an operation of display means; and
means for D/A converting and displaying the readout data.

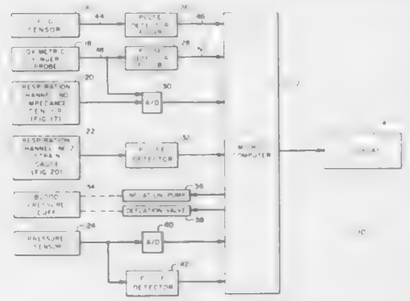
4,860,759

VITAL SIGNS MONITOR

Alan R. Kahn, and Jennifer K. Chandler, both of Cincinnati, Ohio, assignors to Criticare Systems, Inc., Waukesha, Wis.

Filed Sep. 8, 1987, Ser. No. 93,952
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—668 **4 Claims**

1. In a monitor of the type comprising an ECG signal channel and an oximeter signal channel, the improvement comprising:
means, responsive to the ECG signal channel, for generating a series of first pulses indicative of heart pulses of a subject as indicated by the ECG signal channel;
means, responsive to the oximeter signal channel, for generating a series of second pulses indicative of heart pulses of the subject as indicated by the oximeter signal channel;
means, responsive to both the first and second pulses, for identifying those pulses having more regularly repeating pulse intervals, said identifying means comprising:
means for storing a previous pulse rate measure;
means for determining a first pulse rate measure in response to the first pulses during a selected interval;
means for determining a second pulse rate measure in response to the second pulses during the selected interval; and
means for selecting the one of the first and second pulse rate measures which is closer to the previous pulse rate measure; and
means, responsive to the identified pulses, for generating a pulse rate signal indicative of pulse rate of the subject.

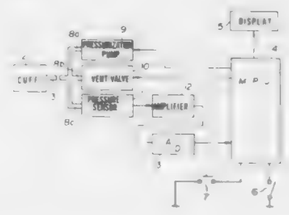


4,860,760

ELECTRONIC BLOOD PRESSURE METER INCORPORATING COMPENSATION FUNCTION FOR SYSTOLIC AND DIASTOLIC BLOOD PRESSURE DETERMINATIONS

Yoshinori Miyawaki, Yawata; Kazuhiro Matumoto, Kyoto, and Osamu Shirasaki, Amagasaki, all of Japan, assignors to Omron Tateisi Electronics Co. and Isao KAI, both of Kyoto, Japan

Filed May 14, 1987, Ser. No. 49,871
Claims priority, application Japan, May 15, 1986, 61-112381; May 16, 1986, 61-113078; May 23, 1986, 61-119754
Int. Cl.[4] A61B *5/02, 5/00*
U.S. Cl. 128—680 **8 Claims**



1. An electronic blood pressure meter, comprising:
(a) a cuff adapted to be fitted around the arm of a patient whose blood pressure is to be measured, said cuff having a cavity;
(b) means for pressurizing the cavity of said cuff;
(c) means for gradually depressurizing the cavity of said cuff;
(d) means for sensing the prssure in the cavity of said cuff, and for producing an output signal representative of the pressure in the cavity;
(e) means for detecting a pulse wave component in said output signal produced by the sensing means;
(f) means for determining the amplitude of the pulse wave component detected by said detecting means;
(g) means for determining values for systolic blood pressure and diastlic blood pressure, according to the amplitude of the pulse wave component and according to the output signal produced by the sensing means; and

(h) means for performing compensation related to said values for systolic blood pressure and diaastolic blood pressure, comprising:

(1) means for determining a compensation parameter according to the maximum value of the amplitude of the pulse wave component; and

(2) means for compensating the amplitude of the pulse wave component by subtracting the compensation parameter therefrom.

4,860,761

PULSE WAVE DETECTING APPARATUS FOR BLOOD PRESSURE MEASUREMENT

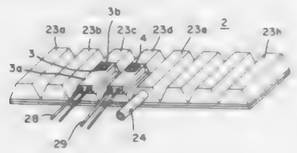
Tsutomu Yamasawa, Takatsuki; Kenichi Yamakoshi, Sapporo, and Hideaki Shimazu, Tokyo, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation-in-part of Ser. No. 50,386, May 18, 1987, abandoned, which is a division of Ser. No. 850,819, Apr. 11, 1986, abandoned, which is a division of Ser. No. 933,892, Nov. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 850,819, Apr. 11, 1986, abandoned. This application Oct. 23, 1987, Ser. No. 112,320

Claims priority, application Japan, Apr. 12, 1985, 60-78651; Apr. 12, 1985, 60-78653; Apr. 12, 1985, 60-78655; Apr. 12, 1985, 60-78657; Apr. 12, 1985, 60-78658; Nov. 25, 1985, 60-181640

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—686 **3 Claims**



1. A cuff for blood pressure apparatus, which is made of a flexible material and has an inner surface defining a cylindrical shape for a finger to be inserted thereinto and an outer surface together with said inner surface defining a plurality of fluid chambers therebetween which apply pressure to the finger, comprising:

a light-emitting element mounted on said inner surface for emitting light at an artery of the finger, said light-emitting element being associated with one of said chambers; and

a light-sensitive element mounted on said inner surface adjacent to said light emitting element for receiving the reflected light from said artery, said light-sensitive element being associated with one of said chambers, wherein a plurality of elements are provided at least for the light-emitting element or for the light sensitive element, and wherein said fluid chamber associated with said light-sensitive element is recessed relative to an adjacent fluid chamber.

4,860,762

DUAL CHANNEL RESOLVER FOR REAL TIME ARRYTHMIA ANALYSIS

John M. Heumann, Loveland, Colo., and James M. Lindauer, San Francisco, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 206,990, Jun. 3, 1988, abandoned, which is a continuation of Ser. No. 905,821, Sep. 10, 1986, abandoned. This application Jan. 12, 1989, Ser. No. 298,220

Int. Cl.[4] A61B *5/04*

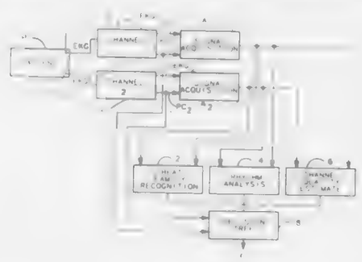
U.S. Cl. 128—702 **7 Claims**

1. Apparatus for classifying beats in EKG signals comprising:

a first channel to which EKG signals from a first set of electrodes may be coupled;

a second channel to which EKG signals form a second set of electrodes may be coupled;

the first channel including means for continuously monitoring the EKG signals from the first set of electrodes and for producing a first preliminary classification signal indicative of a preliminary classification of beats in the EKG signals from the first set of electrodes, the second channel including means for continuously monitoring the EKG signals from the second set of electrodes for producing a second preliminary classification signal indicative of a preliminary classification of beats in the EKG signals from the second set of electrodes, the first preliminary classification signal being determined independently of the EKG signals from the second set of electrodes and the second preliminary classification signal being determined independently of the EKG signals from the first set of electrodes;



means for providing a third signal indicative of the quality of said first channel;

means for providing a fourth signal indicative of the quality of said second channel;

means for continuously deriving a fifth signal independently of the EKG signals applied to said second channel and indicative of at least one physiological factor of the EKG signals coupled to said first channel;

means for continuously deriving a sixth signal independently of the EKG signals applied to said first channel and indicative of at least one physiological factor of the EKG signals coupled to said second channel; and

analysis means responsive to said first and second preliminary classification signals and to the third, fourth, fifth and sixth signals for deriving a final classification of a beat applied to at least one of said channels.

4,860,763

CARDIOVASCULAR CONDITIONING AND THERAPEUTIC SYSTEM

Kevin L. Schminke, 224-10th Ave. North, Fort Dodge, Iowa 50501

Filed Jul. 29, 1987, Ser. No. 78,898

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—707 **14 Claims**

1. A programmable cardiac rehabilitation system which allows flexible setting of prescribed exertion level or levels for rehabilitation for a patient, and which requires the patient to reach the prescribed level or levels of exertion and remain in a target range defining the prescribed level or levels of exertion, while at the same time being protected from dangerous or damaging exertion, so that the system automatically prevents both underexertion and overexertion comprising:

a treadmill which is electrically controlled;

a transducer means connected to the patient, said transducer means being in communication with a heart rate monitor whereby the heart rate of said patient is converted to an electrical signal;

a computer system in communication with said monitor and said treadmill;

an input/output card means electrically connected to said treadmill, said monitor, and said computer system, whereby said card means electrically interfaces between said treadmill, monitor, and said computer system and whereby said card means electrically communicates said electrical signal from said monitor to said computer system and allows electrical instructions to be transmitted from said computer system to said treadmill;

a software system loaded into said computer system providing instructions to said computer system, said computer system receiving signals from said monitor and sending signals to said treadmill, said software system providing an exercise program comprising a warm-up period having slow incremental increases in any of the treadmill operational factors in the set comprising elevation and speed of said treadmill, until a pre-selected target heart rate of said patient is achieved, a work period maintaining said target heart rate of said patient for a pre-selected length of time



by controlling the treadmill operational factors and preventing either underexertion and overexertion, and a cool-down period decreasing said heart rate of said patient at slow increments by controlling the treadmill operational factors;

the exercise program having predetermined parameters selected for the particular patient, based on factors such as age, physical condition, medical criteria, and intended exercise purpose, including but not limited to target heart rate and length of work period;

means for recursive comparison of heart rate of the patient and the target heart rate including warm-up, work, and cool-down periods;

clock means for automatic timing of the work period, the clock means beginning timing upon completion of the warm-up period, and upon completion of the work period signalling the beginning of the cool-down period; and

automatic shut-down means for monitoring extreme variations in the heart rate of the patient and causing the treadmill to stop.

4,860,764

AIR FLOW SENSOR

George S. Hudimac, Jr., Allentown, Pa., assignor to Mechanical Service Co., Inc., Allentown, Pa.

Division of Ser. No. 862,291, May 12, 1986, abandoned. This application Oct. 1, 1987, Ser. No. 103,358

Int. Cl.[4] A61B *5/08*

U.S. Cl. 128—725 **4 Claims**

1. Air flow sensor means comprising:

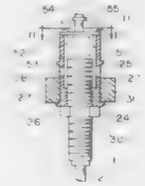
an elongated tubular member;

a proximity switch having a housing, one end of which is a sensing face and having means to develop a magnetic field in a zone adjacent the exterior of the sensing face, the housing being secured inside of said tubular member with the sensing face adjacent one end thereof with the periphery of the housing being spaced from the inside of the tubular member;

an end piece made of non-magnetic material and having a top and a skirt, the top engaging said one end of said tubular member and the skirt extending into the tubular member adjacent to and spaced from the periphery of said housing and being in tight engagement with the tubular member;

said top having a post means positioned adjacent said sensing face and extending outwardly from the sensing face through said field when the same is present;

the space between the periphery of said housing and said skirt and the space between the periphery of said housing and said tubular member forming a chamber for the flow of air;



said top having a plurality of openings being in communication with said chamber;

a plurality of openings in said elongated member in communication with said chamber;

abutment means made of non-magnetic material on said post means;

a metal disk mounted on said post means between said abutment means and said sensing face for reciprocating motion toward and away from the sensing face through said field when the same is present, the abutment means preventing the metal disk from moving off of the post means and the weight and cross-sectional area of the disk permitting the same to be moved on the post means by the flow of air.

4,860,765

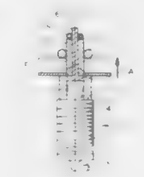
AIR FLOW SENSOR

George S. Hudimac, Jr., Allentown, Pa., assignor to Mechanical Service Co. Inc., Allentown, Pa.

Continuation of Ser. No. 862,291, May 12, 1986, abandoned. This application Oct. 1, 1987, Ser. No. 103,359

Int. Cl.[4] A61B *5/08*

U.S. Cl. 128—725 **11 Claims**



1. Air flow sensor means comprising:

a proximity switch having a housing, one end of which is a sensing face and having means to develop a magnetic field in a zone adjacent the sensing face;

a shoulder formed on said one end of the housing;

an end piece comprising a cap portion and a post portion, the cap portion being mounted on said shoulder with the post portion extending away from said sensing face outwardly through said field when the same is present, the end piece being made of non-magnetic material;

a glass cylinder disposed on said post portion;

a first rubber O-ring mounted on said glass cylinder;

a metal disk mounted on said glass cylinder for reciprocating

motion toward and away from said sensing face, through said field when the same is present, the metal disk being disposed between said first O-ring and said face and the O-ring functioning as abutment means to prevent the metal disk from sliding off of the glass cylinder, the weight and cross-sectional area of the metal disk permitting the same to be moved on the glass cylinder by the flow of air; and

a second rubber O-ring mounted on said post portion, the second O-ring functioning to maintain said glass cylinder on the post portion.

4,860,766

NONINVASIVE METHOD FOR MEASURING AND MONITORING INTRAPLEURAL PRESSURE IN NEWBORNS

Marvin A. Sackner, Miami Beach, Fla., assignor to Respitrace Corp., Miami Beach, Fla.

Continuation of Ser. No. 852,399, Apr. 15, 1986, abandoned, which is a continuation of Ser. No. 746,000, Jun. 18, 1985, abandoned, which is a continuation of Ser. No. 553,240, Nov. 18, 1983, abandoned. This application Jan. 14, 1987, Ser. No. 8,062
The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—748 13 Claims



1. A method of non-invasively monitoring and detecting changes in intrapleural pressure of a newborn subject, comprising:

mounting an external means for detecting movement across at least two adjacently-proximate cranial bones of the subject to detect relative movement between said bones; and

generating a signal indicative of changes in the relative positions of said cranial bones detected by said means, changes in said signal being indicative of changes in intrapleural pressure of the subject.

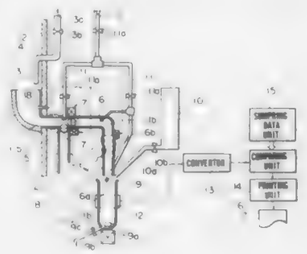
4,860,767

TOILET BOWL WITH HEALTH TESTING SYSTEM

Satoei Maekawa, Yokosuka, Japan, assignor to Maekawa Seisakujo Co., Ltd., Kanagawa, Japan

Filed Apr. 12, 1988, Ser. No. 180,788
Claims priority, application Japan, Apr. 14, 1987, 62-89864
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—760 1 Claim

1. A toilet bowl with a health testing system characterized by comprising a portion for sampling specimens which is formed in an excreta-receiving portion of said toilet bowl, a test vessel which communicates with said sampling portion, to which a supply portion for supplying reagents or samples is connected and in which a sensor for detecting the condition of said specimen received in said vessel is provided, said sensor being connected to a conversion unit which codes the information obtained in said sensor and to which a comparison output unit for comparing the coded information supplied from said



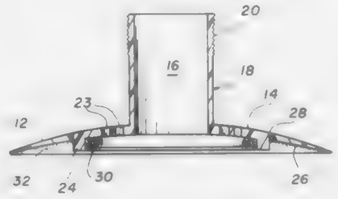
conversion unit with coded data and outputting the results of comparison is connected.

4,860,768

TRANSDUCER SUPPORT BASE WITH A DEPENDING ANNULAR ISOLATION RING

Edward H. Hon, Bradbury; Edward D. Hon, San Francisco, and Robert W. Hon, Los Altos, all of Calif., assignors to The Hon Group, Encino, Calif.

Continuation-in-part of Ser. No. 118,441, Nov. 9, 1987, which is a continuation-in-part of Ser. No. 915,130, Oct. 2, 1986. This application Mar. 3, 1988, Ser. No. 163,859
Int. Cl.[4] A61B 5/10
U.S. Cl. 128—778 12 Claims



1. A pressure transducer support base comprising a concave support plate having an upper and a lower surface, an opening in said pressure transducer base for receiving a transducer, and an isolating means for isolating the pressure transducer, said isolating means comprising a member depending from said lower surface substantially surrounding said opening.

4,860,769

IMPLANTABLE DEFIBRILLATION ELECTRODE

Thomas J. Fogarty, 770 Welch Rd., Palo Alto, Calif. 94304; Albert K. Chin, Palo Alto, and Joe Feehan, Cupertino, both of Calif., assignors to Thomas J. Fogarty and Ventritex, Inc., Santa Clara County, Calif.

Filed Nov. 12, 1987, Ser. No. 120,124
Int. Cl.[4] A61N 1/00
U.S. Cl. 128—786 19 Claims

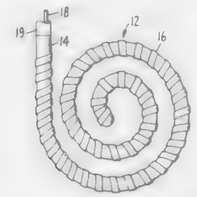
1. An implantable defibrillator electrode, comprising:

a linear guide of a predetermined elongate non-rectilinear configuration, said guide being resiliently deflectable from the non-rectilinear configuration to a generally rectilinear configuration and having an electrically non-conductive exterior surface and a distal portion;

an electrically conductive element carried by and extending over at least part of the length of said guide, at least a portion of said element being on the exterior surface of the guide;

guide extension means operatively associated with the guide to selectively:

(a) deflect the guide into a generally rectilinear configuration; and



(b) relax the guide for return to the predetermined non-rectilinear configuration.

4,860,770

HEATING APPARATUS FOR HYPERTHERMIA

Makoto Kikuchi, Mitaka; Shinsaku Mori, Tokyo; Yoshio Nikawa, Tokyo, and Takashige Terakawa, Tokyo, all of Japan, assignors to Tokyo Keiki Co., Ltd., Tokyo, Japan

Division of Ser. No. 756,071, Jul. 17, 1985, Pat. No. 4,747,416.
This application Nov. 16, 1987, Ser. No. 121,145
Claims priority, application Japan, Jul. 24, 1984, 59-153678; Jul. 24, 1984, 59-153679; Jul. 24, 1984, 59-153680; Jul. 24, 1984, 59-153681; Jul. 24, 1984, 59-153682
Int. Cl.[4] A61N 5/02
U.S. Cl. 128—804 6 Claims



1. Hyperthermia apparatus comprising:

(a) at least one treatment branch including:

(1) a microwave source for generating microwaves that are applied to the branch;

(2) a power source including a switch responsive to a power control signal for turning said microwave source on for a predetermined period of time and then turning it off thereby controlling the application microwaves to the branch;

(3) an applicator for applying microwaves in the branch to a treatment region of a patient thereby heating said region; and

(4) a cooling mechanism for cooling said treatment region with coolant including a cooler in heat exchange relationship with said coolant, and a cooling control circuit for controlling the operation of said cooler and responsive to a coolant control signal for step-wise changing the temperature of said coolant, and

(b) a main control unit comprising:

(1) means for establishing a target internal temperature for said region;

(2) drive means for periodically supplying a control signal to said switch;

(3) temperature measuring means made effective each time the said microwave source is turned off for measuring the internal temperature of said treatment region; and

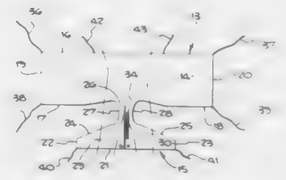
(4) means responsive to the internal temperature each time it is measured for producing a coolant control signal that either increases or decreases the coolant temperature by one step as compared to the coolant temperature before the succeeding coolant control signal depending upon whether the measured internal temperature is respectively less or greater than said target temperature.

4,860,771

HOSPITAL SHEET

Stephen W. Burgos, 1441 Kapiolani Blvd. #1005, Honolulu, Hi. 96814

Filed Jun. 24, 1988, Ser. No. 210,793
Int. Cl.[4] A61F 13/00
U.S. Cl. 128—872 13 Claims



1. A hospital bed sheet adapted to be tied to a hospital bed and wrapped around a patient to hold the latter in a fixed position with respect to the bed comprising:

an elongated rectangular planar upper portion having a longitudinal axis;

a lower portion joined to the upper portion by a neck portion, said lower portion being comprised of a pair of separable sections releasably connected to each other along a line formed when said separable sections are joined together extending generally normal to said longitudinal axis of said upper portion;

first flexible connecting means at each corner of said upper portion for securing the same to the side rails of a hospital bed;

said rectangular portion having an elongated upper edge with second flexible connecting means disposed at spaced locations along said upper edge inwardly of the ends of said edge; and

said lower portion having an elongated lower edge with third flexible means disposed at each end of said lower edge whereby said first flexible means can be connected to the side rails of a hospital bed and said lower portion can be folded up over the lower torso of a patient about said neck portion with said second and third flexible means connected to each other to thereby secure said patient in a fixed position with respect to said bed.

4,860,772

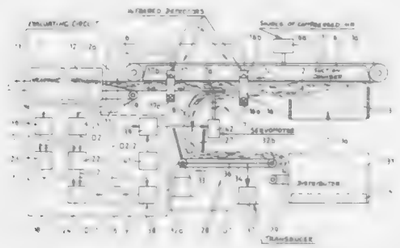
METHOD OF AND APPARATUS FOR MAKING A ROD OF FIBROUS MATERIAL

Gerhard Hensgen; Uwe Heitmann; Peter Brand, all of Hamburg, and Peter Pinck, Gross-Hansdorf, all of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany

Filed May 26, 1988, Ser. No. 199,112
Claims priority, application Fed. Rep. of Germany, May 29, 1987, 3718176
Int. Cl.[4] A24C 5/14
U.S. Cl. 131—84.1 19 Claims

1. A method of forming a rod of fibrous material, comprising the steps of gathering fibrous material into a continuous surplus containing stream and advancing the stream in a predetermined direction along a predetermined path; monitoring the density of the stream including generating first signals denoting the monitored density; removing the surplus from the stream in a predetermined portion of said path; measuring the quantity of the removed surplus including generating a series of second signals denoting such quantity; modifying said

first signals as a function of said second signals; and utilizing

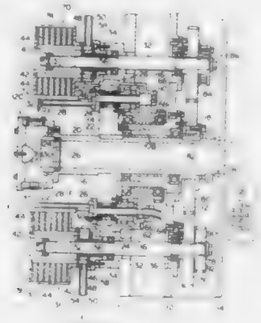


said modified first signals to influence when necessary the density of the rod.

4,860,773
PERFORATING APPARATUS FOR ROD-SHAPED OBJECTS

Yutaka Okumoto, and Takao Furukawa, both of Tokyo, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

Filed Mar. 28, 1988, Ser. No. 172,798
Claims priority, application Japan, May 28, 1987, 62-129691
Int. Cl.[4] A24C *5/60*
U.S. Cl. 131—281 **6 Claims**



1. A perforating apparatus for rod-shaped objects, comprising:

a rotatable hollow shaft having two open ends;

a disc mounted on said hollow shaft and rotated together with said hollow haft;

a plurality of holding arms, arranged on the periphery of said disc and spaced apart from one another in the circumferential direction of said disc, for holding rod-shaped objects, each of said holding arms extending parallel to said hollow shaft, toward one open end thereof;

a feed section for feeding rod-shaped objects to each of said holding arms when each holding arm is positioned at a first rotational angle position in the circumferential direction of said disc, by rotation of said disc, the rod-shaped object held by said holding arm having a work portion projecting from said holding arm toward one open end side of said hollow shaft;

a pickup section for picking up the rod-shaped objects from each of said holding arm when each holding arm of said disc is positioned at a second rotational angle position, separated from the first rotational angle position by a predetermined angle in the circumferential direction of said disc;

a rotating mechanism for rotating the rod-shaped objects once about their axes when said holding arms holding the rod-shaped objects are moved from the first to the second rotational angle position by rotation of said disc;

a laser generating source for emitting a laser beam, concentric with the axis of said hollow shaft, into said hollow shaft, toward one open end of said hollow shaft and at a predetermined pulse separation; and

an optical system for focusing the laser beam emitted by said laser generating source on the work portion of the rod-shaped objects held by said holding arms, said optical system including;

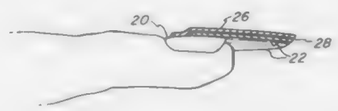
(i) a reflecting mirror, located on one open end of said hollow shaft, arranged to oppose the laser beam emitted form said laser generating source, and rotated about the axis of said hollow shaft, together with that shaft, at the same rotating speed as that of the disc, one end portion of said reflecting mirror, which is closer to said laser generating source, having a top facing said laser generating source, said one end portion reflecting surfaces of a number equal to that of said holding arms, each reflecting surface rotating in accordance with the rotation of the disc while facing a corresponding one of said holding arms, and said reflecting surfaces dividing the laser beam emitted from the laser generating source into beam components and reflecting the beam components toward the corresponding holding arms, and

(ii) focusing means for focusing said beam components to be reflected by said reflecting surfaces onto the outer peripheries of the work portions of the rod-shaped objects when those objects are held by said holding arms. a reflecting surface.

4,860,774
FINGERNAIL REINFORCEMENT MATERIAL AND METHOD

Mary G. Becker, Fort Lauderdale, Fla., assignor to Maria Talerico, Ft. Lauderdale, Fla., one half interest to each

Continuation-in-part of Ser. No. 805,610, Dec. 6, 1985, abandoned, and Ser. No. 618,267, Jun. 7, 1984, abandoned. This application Jul. 2, 1986, Ser. No. 881,065
Int. Cl.[4] A45D *40/30*
U.S. Cl. 132—200 **25 Claims**



1. A nail covering for reinforcing a fingernail comprising:

a woven fiberglass fabric having a vertical and horizontal cross-thread count in the range from 25 to 55 threads per inch, said fabric preimpregnated with a suspension of resin polymer and monomer in water and then allowed to dry, said dried fabric having open interstices between the fabric threads;

a layer of pressure sensitive adhesive coated on one side of said fabric; and

adhesion release means adhered to said pressure sensitive adhesive coating.

11. A fingernail reinforcement and extension material, comprising:

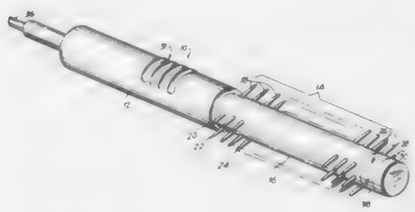
(a) a woven fiberglass fabric having a vertical and horizontal cross-thread count in the range of 25 to 55 threads per inch; and

(b) a preparation impregnated within the weave of said fabric, said preparation consisting essentially of cellulose, nylon fiber, resin, plasticizer and solvent, whereby upon evaporation of said solvent, said preparation forms a hardened matrix within the weave of said fiberglass fabric.

4,860,775
HAIR BRUSH

Kevin E. Reeves, Trumbull, and Daniel Santhouse, Stratford, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

Continuation of Ser. No. 916,929, Oct. 8, 1986, abandoned. This application Mar. 7, 1988, Ser. No. 168,566
Int. Cl.[4] A45D *24/10*
U.S. Cl. 132—118 **5 Claims**



1. In a hair brush having a handle and an elongated hairwinding portion attached thereto, the hairwinding portion provided with a plurality of longitudinally spaced bristles along its length, the improvement comprising:

said hairwinding portion provided with only six rows of said bristles, said rows comprising:

a first row of bristles, each bristle in said first row extending radially in a first direction relative to the axis of said hairwinding portion;

a second row of bristles, each bristle in said second row extending radially relative to said axis in a second direction diametrically opposite to said first direction;

a third and fourth row of bristles, each bristle in said third and fourth rows extending parallel to said first direction, said third and fourth rows being displaced on opposite sides of said first row by predetermined first and second distances, respectively; and

a fifth and sixth row of bristles, each bristle in said fifth and sixth rows extending parallel to said second direction, said fifth and sixth rows being displaced on opposite sides of said second row by predetermined third and fourth distances, respectively.

4,860,776
SHIELD FOR A PERSON

Beverly A. McQuain, Morriston, Canada, assignor to Instant Defence Inc., Toronto, Canada

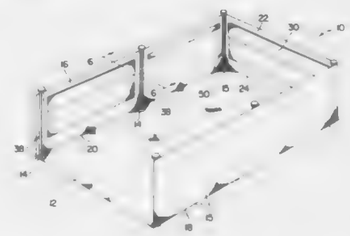
Continuation-in-part of Ser. No. 860,943, May 2, 1985, abandoned. This application Dec. 23, 1986, Ser. No. 945,714
Int. Cl.[4] A45B *13/00, 25/14*
U.S. Cl. 135—19.5 **23 Claims**

1. A shield for a person, the shield comprising: a rigid shaft; a first handle means at one end of the shaft; a first release trigger; a plurality of substantially rigid ribs pivotally attached to the shaft adjacent another distal end of the shaft; substantially rigid support means supporting the ribs and movable between an open, stable configuration in which the ribs extends substantially radially out from the shaft and a closed configuration in which the ribs are adjacent the shaft, the release trigger holding the support means in the closed configuration; biasing means urging the support means from the closed to the open, stable configuration; and a high strength flexible cover attached to the ribs, the shield and cover being sufficiently strong in the open configuration to withstand impact from a large, heavy, blunt object.

4,860,777
COMBINATION BEACH BLANKET AND WIND PROTECTOR DEVICE

Anthony Orlando, 99 Mercy St., Providence, R.I. 02909

Filed Feb. 16, 1988, Ser. No. 157,257
Int. Cl.[4] E04H *15/00, 15/20*
U.S. Cl. 135—87 **5 Claims**



1. A combination beach blanket and wind protector device, comprising a flexible mat that is movable from a rolled-up, closed, carry position to a flat, open position, wherein said mat is disposed in a substantially horizontal position on a selected ground site, opposed and spaced, flexible side panels joined to said mat along longitudinally extending fold lines, said side panels having a first Velcro-type fastening means joined thereto, and a flexible head panel joined to said mat at an end thereof along a laterally extending fold line, a plurality of openings formed in said mat in spaced relation adjacent to said side panels, and a plurality of posts, each of which extends through an opening for penetration into the ground for fixing said mat in the flat open position on said ground, and a second Velcro-type fastening means located on said posts and cooperating with said first fastening means joined to said side and head panels for securing said side panels to said posts for locating said side and head panels in an upright position for sheltering an occupant lying on said mat, said posts each comprising an elongated shank portion, a pointed tip portion at one end of the shank portion thereof and a head portion at the opposite end of the shank portion thereof, said posts comprising a first set thereof and a second set thereof, said first set of posts having said second fastening means secured to a first surface as

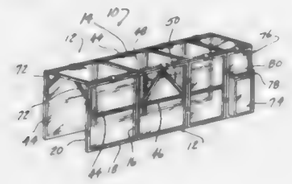
formed on the shank portion thereof, each of said second set of posts including a first surface portion on the shank portion thereof and a second surface portion on the shank portion thereof that is located in perpendicular relation with respect to said first surface portion, said first and second surface portions meeting to define an outer corner of said second posts, said second set of posts having said second fastening means secured to said first and second surface portions as formed thereon, wherein said side panels are interlocked to said second fastening means located on said first surface portion of said second set of posts, and said head panel is interlocked to said second fastening means located on said second surface portion of said second sets of posts.

4,860,778

CONTAMINANT SHIELD AND METHOD OF CONSTRUCTING SAME

Ronald R. Pohl, Rochester, Mich., assignor to Venderbush Industrial Corporation, Mt. Clemens, Mich.

Filed Mar. 4, 1988, Ser. No. 164,220
Int. Cl.[4] E04H *15/34*
U.S. Cl. 135—97 **11 Claims**



5. A contaminant shield comprising:
a plurality of like frames, each frame comprising:
a plurality of side frame members joined into a frame having a predetermined shape;
a flexible sheet; and
means for sealingly attaching substantially the entire edge of the flexible sheet to the periphery of the frame; the attaching means comprising:
each of the side frame members being formed with spaced side walls interconnected at one end by a central portion and inwardly and downwardly extending flanges formed at the opposite end of each side wall having spaced opposed surfaces forming an aperture opening into the hollow interior of the side frame member; and
a cap member having a first portion shaped complimentary to the aperture in the side frame member and an enlarged second portion having flanges extending outward beyond the first end portion for trapping the edge of the flexible sheet in the aperture in the side frame as the cap member is inserted over the flexible sheet into the aperture in the side frame; and
a plurality of connectors joined at spaced locations to the side frame members of abutting frames to join a plurality of like frames with attached sheets into a complete contaminant shield of predetermined shape.

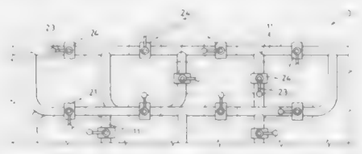
4,860,779

VALVE CONTROL MEANS

Darryl R. Whitford, Rosedale, Australia, assignor to S. Smith & Son Pty. Ltd., Angaston, Australia

Filed Dec. 29, 1987, Ser. No. 178,915
Claims priority, application Australia, May 5, 1986, PH5741
Int. Cl.[4] F17D *3/00*; F16K *51/00, 31/46*
U.S. Cl. 137—1 **4 Claims**

4. A method of controlling a plurality of valves in an arrangement of valves wherein their respective operating arms are rotatable in a first 'x–y' plane, comprising driving a carriage of an x–y plotter in an 'x' direction of a second 'x–y' plane which is parallel to the first 'x–y' plane by a stepping motor, driving a slide on the carriage by a stepping motor on the carriage, in a 'y' direction of said second plane such that driven movement of the carriage in the 'x' direction and driven movement of the slide in the 'y' direction is operable to vary the position of the slide in the 'x' and 'y' directions, engaging selective ones of said arms in a predetermined sequence by a



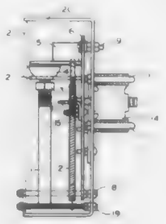
valve actuating pin which projects from said slide to intersect the first said plane, such that the valve actuating pin can be aligned with any selected valve arm in accordance with the positional movement of the slide and rotating said valve arm about a 'z' axis after said alignment of the actuating pin with the selected valve arm has been effected by controlling operation of said stepping motors.

4,860,780

EARTHQUAKE SAFETY VALVE SHUT-OFF

Wesley Fisher, 301 N. Brown St., Benton, Ill. 62812

Filed Jul. 26, 1988, Ser. No. 224,291
Int. Cl.[4] F16K *17/36*
U.S. Cl. 137—45 **3 Claims**



1. A device to close a gas valve during an earthquake, comprising:
a. A base of aluminum or other hard material which is fastened to a commercial utility gas valve altered by a latch groove on the end of the valve control lever,
b. a pivot arm fastened to said base,
c. an activator fastened to said pivot arm at one end,
d. at least one latch fastened on said pivot arm in the proximity of said latch groove on the end of said valve control lever when said valve control lever is in the open position,
e. a trigger which when moved raises said activator,
f. a pendulum fastened to said trigger at one end which swings to move said trigger, a pendulum bracket fastened to said base and containing a hole in which said trigger sits,

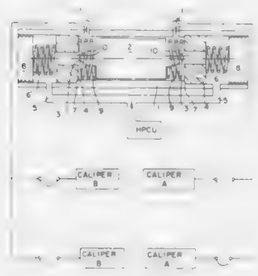
g. a control spring fastened to said base at one end and to said valve control lever at the other end, so as to pull said valve control lever to the closed position when said latch is released from said latch groove, and
h. a means of fastening said base to said valve.

4,860,781

HYDRAULIC ISOLATION VALVE

Ronald E. Fairman, Adams, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Apr. 20, 1988, Ser. No. 184,062
Int. Cl.[4] B60T *17/18*
U.S. Cl. 137—118 **6 Claims**



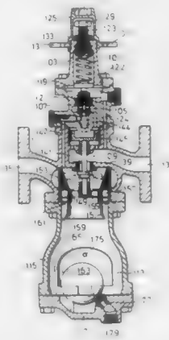
1. A safety system for hydraulic train brake systems comprising:
a housing means;
an isolation spool valve means connected to a source of hydraulic fluid for controlling delivery of said hydraulic fluid from said source in an axial direction to said spool valve and from the spool valve to at least two sets of hydraulic brake actuators;
said isolation spool valve means located and slidable in said housing and being biased to a neutral position by two spring bias means acting in opposition to each other;
said housing means having two inlet means from the source of hydraulic pressure and two outlet means;
said isolation spool valve means also being biased to a neutral position by two fluid pressure forces proportional to the fluid pressure delivered to each brake actuator;
wherein said spring bias means each are of such strength that the spool valve means only slides to close off an inlet when a drop in the pressure delivered to said one of said sets of hydraulic brake actuators exceeds a predetermined amount, which amount corresponds to a brake line rupture and wherein minor drops in pressure will not close off an inlet;
said spool valve means including two metal valving surfaces at opposite ends of the spool valve means which is a unitary valve and wherein said valving surfaces cooperate with two metal valving seats located outboard of said unitary spool valve; said valving seats being spring biased into position to cooperate with said two valving surfaces;
wherein the two spring bias means are located in an area between the valving seats and the spool valve.

4,860,782

REDUCING VALVE EQUIPPED WITH A VAPOR-LIQUID SEPARATOR

Katsuji Fujiwara, and Hideaki Yumoto, both of Hyogo, Japan, assignors to TLV Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 250,969, Sep. 23, 1988, abandoned, which is a continuation of Ser. No. 85,252, Aug. 11, 1987, abandoned, which is a continuation of Ser. No. 11,380, Feb. 5, 1987, abandoned, which is a continuation of Ser. No. 660,720, Oct. 15, 1984, abandoned. This application Mar. 3, 1989, Ser. No. 319,417
Claims priority, application Japan, Oct. 27, 1983, 58-167151; Feb. 15, 1984, 59-26527; Mar. 19, 1984, 59-39905; Jun. 28, 1984, 59-97811
Int. Cl.[4] F16T *1/20*
U.S. Cl. 137—193 **5 Claims**



1. A reducing valve assembly for steam including vapor-liquid separator means comprising:
a valve casing having contained therein reducing valve means comprising an orifice;
inlet and outlet means having said reducing valve means operatively interposed therebetween;
a sump chamber defined below said orifice by an extended portion of said valve casing below said reducing valve means, said extended portion extending from a part of said valve casing surrounding said orifice;
an annular partition at the upper part of said sump chamber forming an annular space between said partition and said extended portion of said valve casing;
said annular space being arranged to communicate with said inlet means from above and with said sump chamber from below;
said annular partition being configured to define a central passage in flow communication between said sump chamber and a space below said valve orifice;
rotation deflector means arranged in said annular space for imparting rotational motion to fluid entering said annular space from said inlet means; and
float valve means arranged in said sump chamber to discharge liquid accumulated therein, said float valve means comprising a valve float for opening and closing said float valve means in accordance with a liquid level in said sump chamber and a float cover shaped in the form of an inverted cup having a vent hole in an upper part thereof and arranged so as to leave a gap between a lower part thereof and a bottom of said sump chamber, said float cover having said valve float contained therein and being so arranged that said lower part thereof is submerged in liquid accumulated in said sump chamber, said float cover having a pair of spaced apart vertically extending planar portions on opposite sides of said float for guiding the displacement of said float for opening and closing said float valve means, said float valve means including a drain

orifice extending obliquely below said float cover, said drain orifice being positioned so that upon displacement of said float to close said float valve means, said float pivots into a position closing said drain orifice.

4,860,783

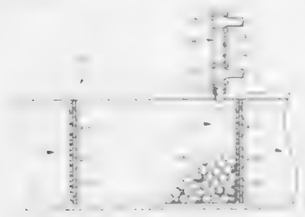
APPARATUS FOR CONTROLLING THE PRESSURE OF GASES FLOWING THROUGH A CONDUIT

Bryan A. Megee, and James D. Whiteside, II, both of Borger, Tex., assignors to Philips Petroleum Co., Bartlesville, Okla.

Division of Ser. No. 52,947, May 22, 1987, Pat. No. 4,787,419, which is a division of Ser. No. 828,482, Feb. 12, 1986, Pat. No. 4,679,579. This application Jul. 29, 1988, Ser. No. 226,030

Int. Cl.[4] F15D *1/02*

U.S. Cl. 137—268 **4 Claims**



1. Apparatus suitable for use in controlling the flow of hot gases through a condut, comprising:

a plurality of generally spherically shaped objects substantially constructed of refractory material located within said conduit;

means for introducing said generally spherically shaped objects into said conduit; and

a perforated baffle with a plurality ofperforations having a diameter smaller than the diameter of said generally spherically shaped objects, said baffle extending transversely across said conduit and being located immediately downstream of said means for introducing said generally spherically shaped objects into said conduit.

4,860,784

NON-RISING STEM VALVE ASSEMBLY AND METHOD OF REPLACING A PERMANENT SEAL

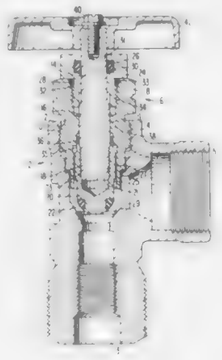
James A. Petersen, Greensboro, and Timothy G. Crater, Winston-Salem, both of N.C., assignors to Engineered Controls International, Inc., Elon College, N.C.

Filed Jan. 11, 1989, Ser. No. 295,742

Int. Cl.[4] F16K *43/00, 41/00*

U.S. Cl. 137—315 **11 Claims**

1. A non-rising stem valve assembly comprising a bonnet adapted for attachment to a valve body, said bonnet including an upper end, a lower end and a central passageway extending through said bonnet between the upper and lower ends thereof, a valve stem extending through the upper end of said bonnet into said passageway and having a stem lower end within said passageway, means for securing said valve stem within said bonnet for rotational movement but against movement in the direction of said upper and lower ends, packing means disposed in the upper end of said bonnet for providing a seal between said valve steam and said bonnet, a lower valve portion means mounting said lower valve portion on said stem lower end for axial movement relative to said valve stem between a valve closed position and a valve open position and between the valve open position and a backseat position, said backseat position being closest to the upper end of said bonnet, said lower valve portion having an upper extremity which extends into said passageway at the lower end thereof and a lower extremity for movement outwardly beyond the lower end of said bonnet, said passageway being widened adjacent the lower end of said bonnet to receive said lower valve portion which engages said bonnet within said passageway, said passageway being narrowed to form a radially extending flange spaced a distance above said lower valve portion to create a cavity between said valve stem and said bonnet below said radially extending flange, and a sealing means loosely positioned in said cavity and extending between said valve stem and said bonnet in all positions of said lower valve portion to provide a substantial seal, said sealing means being normally uncompressed when said lower valve portion is in said valve closed and valve open positions, said sealing means being



compressed into sealing engagement with said bonnet and said valve stem by said upper extremity of said lower valve portion when said lower valve portion is moved to the backseat position so that the upper extremity of said lower valve portion moves into said cavity and engages and simultaneously moves said sealing means within said cavity to the backseat position to compress said sealing means between said bonnet passageway and valve stem to create a seal between said valve stem and bonnet, whereby said packing means can be removed from said bonnet for repair or replacement.

4,860,785

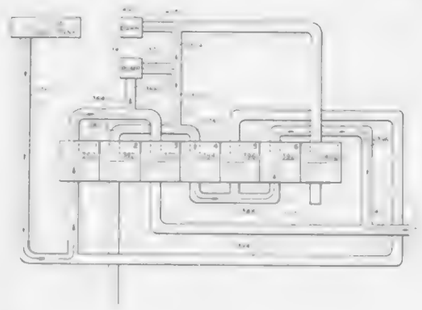
EMERGENCY FUEL TRANSFER ACCESSORY

Lowell W. Sandstrom, Jr., 9094 N. Hwy. 40, #17, Lake Point, Utah 84074

Continuation of Ser. No. 940,394, Dec. 11, 1986. This application May 31, 1988, Ser. No. 200,631

Int. Cl.[4] A01M *7/00*

U.S. Cl. 137—351 **3 Claims**



1. A multi-use valve system adapted for placement in the fuel supply system of a first vehicle's engine, said valve system comprising:

a valve body;

a valve core adjustably associated with said valve body;

a first conduit mounted in said valve body to communicate with said valve core, said first conduit being associated with a fuel tank of said first vehicle;

said first conduit being adapted for conveying fuel between said valve core and said first vehicle's fuel tank;

a second conduit mounted in said valve body to communicate with said valve core, said second conduit being associated with a carburetor of said first vehicle; said second conduit being adapted for conveying fuel between said valve core and said carburetor;

a third conduit mounted in said valve body to communicate with said valve core, said third conduit being associable with a second fuel system tank, said third conduit being adapted for for conveying fuel between said valve core and said second fuel system;

a fourth conduit mounted in said valve body to communicate with said valve core, said fourth conduit being associated with a fuel pump of said first vehicle, said fourth conduit being adapted for conveying fuel between said valve core and said fuel pump;

wherein said valve core includes a plurality of channels adjustable between two distinct conditions, a first condition wherein said core channels interconnect said first conduit with said fourth conduit, whereby fuel is received from said first vehicle's fuel tank, passed through said fuel pump and carburetor; and a second condition wherein said core channels interconnect said third conduit to said fourth conduit, and said second conduit to said first conduit whereby fuel is received from a second vehicle's fuel system, passed from said fuel pump to said carburetor and any excess fuel is directed to said first vehicle's fuel tank.

4,860,786

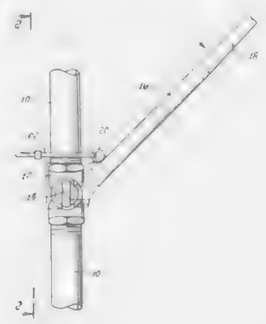
SHUT OFF FOR A GAS LINE

Stephen L. Pollard, 27703 Ortega Hwy., Space 14, San Juan Capistrano, Calif. 92675

Continuation-in-part of Ser. No. 20,128, Feb. 27, 1987, abandoned. This application Sep. 3, 1987, Ser. No. 93,133

Int. Cl.[4] F16K *31/62, 35/12*

U.S. Cl. 137—384 **4 Claims**



1. The combination of a fluid conductive pipe line and an in-line valve adapted to open and close the fluid passage in said line, said valve having an external handle operatively connected to open and close the valve, said handle having an enlarged free end forming a foot pedal and being positioned such that the handle can be pivotally rotated to close said valve by foot or other pressure on said foot pedal, and said handle is restrained against inadvertent closure by a loop of material passing around said pipe line and the handle has an eyelet on its upper surface through which said loop also passes such that said handle cannot be moved from an open valve to a closed valve position without cutting said loop.

4,860,787

PRESSURE REGULATOR WITH INTEGRATED SENSOR

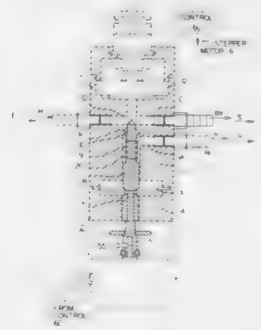
Pascal Grosselin, Bren, France, assignor to IMAJE, S.A., Bourg les Valence, France

PCT No. PCT/FR87/00009, § 371 Date Sep. 10, 1987, § 102(e) Date Sep. 10, 1987, PCT Pub. No. WO87/04537, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 12, 1987, Ser. No. 105,303

Int. Cl.[4] G05D *16/00*

U.S. Cl. 137—487.5 **15 Claims**



1. Device for regulating the pressure of a fluid including a pusher (8) bearing on a spring (9) and acting on a valve (10) adapted for closing a fluid passage or not; characterized in that the fluid (ff) transmits through a duct (c) in the fluid passage from an inlet (E) towards an outlet (S) formed in a body (11), into which duct (C) opens, on each side thereof and perpendicularly to said duct, a bore (20) also formed in said body (11) and connected on one side to said pusher (8) and with said valve in said bore adjacent to said duct and on the other to a pressure sensor (12) also integrated in said body (11), said body (11) being solidly connected to a second body (4) in which a spool (7) freely slides capable of cooperating with said pusher (8), and a flexible membrane (3) provides sealing between the two bodies (11) and (4) which then form a monolithic assembly.

4,860,788

METERING VALVE

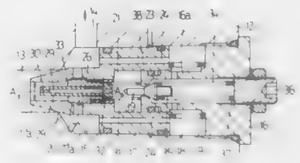
Masaharu Asaoka, Saitama, Japan, assignor to Kayaba Industry Co. Ltd., Japan

Filed Jun. 29, 1988, Ser. No. 213,291

Claims priority, application Japan, Jun. 29, 1987, 62-161836; Jul. 3, 1987, 62-102318[U]; Jul. 6, 1987, 62-168299; Jul. 6, 1987, 62-168300; Jul. 6, 1987, 62-168298; Jul. 10, 1987, 62-173453; Jul. 10, 1987, 62-173452

Int. Cl.[4] G05D *16/00*

U.S. Cl. 137—491 **17 Claims**



1. A metering valve, comprising:

a valve casing;

a main poppet arranged in said valve casing and provided with a poppet section;
a seat provided on a side of an actuator port in said valve casing;
said poppet section of said main poppet operating said seat to selectively communicate said actuator port to a tank pas-
said main poppet being formed with a pressure chamber at a portion thereof opposite to said poppet section;
said pressure chamber having a pressure receiving area substantially equal to that on a side of said seat or slightly larger than the same;
said main poppet being formed with a through-hole constantly communicating with said actuator port;
said main poppet being formed with a pilot chamber to which pilot pressure for moving said main poppet in a direction of opening said seat is applied; and
a relief poppet arranged in said main poppet, said relief poppet functioning as a relief valve, or as both a relief valve and a suction valve.

4,860,789

SWING CHECK VALVE WITH HINGE PIN INSERT

John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170

Continuation of Ser. No. 78,410, Jul. 27, 1987, abandoned. This application Sep. 22, 1988, Ser. No. 247,885
Int. Cl.[4] F16K *15/03*
U.S. Cl. 137—515.7 **14 Claims**



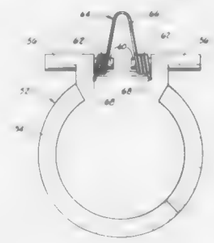
1. A valve, comprising:
a tubular body;
an annular seat in the body;
a disc in the body having a substantially round, flat main body portion sized to mate with the seat when the valve is closed, and having a hinge pin thereon extending in a plane at a right angle to the longitudinal axis of the main body portion;
a cage in the body surrounding a portion of the periphery of the disc when the disc is closed;
an insert removably supported in the body in the plane of the cage, said insert having at least one hinge pin recess therein sized to receive the hinge pin and support the disc in the cage when the disc is closed and for supporting the disc for swinging movement between open and closed positions; and
said insert encircling less than one-half the periphery of the disc when the disc is closed.

4,860,790

SWING CHECK VALVE DISC

John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170

Division of Ser. No. 60,249, Jun. 9, 1987, Pat. No. 4,781,214, which is a continuation-in-part of Ser. No. 49,383, May 13, 1987, Pat. No. 4,809,738, and a continuation-in-part of Ser. No. 23,786, Mar. 9, 1987, abandoned. This application Jul. 14, 1988, Ser. No. 220,074
Int. Cl.[4] F16K *15/03*
U.S. Cl. 137—527 **5 Claims**



1. A disc for a swing check valve, comprising:
a plate-like body having a sealing face on one side thereof;
a pair of bearing pins formed integrally with the body, the bearing pins being in axial alignment along an axis parallel with the sealing face and being in spaced apart relation;
a spring retainer pin formed integrally with and projecting from at least one of the bearing pins in the space between the bearing pins; and
a coil spring having the coils thereof surrounding the spring retainer pin, one end portion of said spring engaging the side of the body opposite the sealing face and the other end of the spring extended for engagement with a stationary portion of the valve, whereby the spring urges the disc closed.

4,860,791

STRAIN RELIEF CLAMP FOR WASHING MACHINE DRAIN HOSE

Brett J. Putnam, Ripon, Wis., assignor to Speed Queen Company, Ripon, Wis.

Filed Dec. 5, 1988, Ser. No. 280,471
Int. Cl.[4] F16L *5/00*
U.S. Cl. 137—565 **10 Claims**



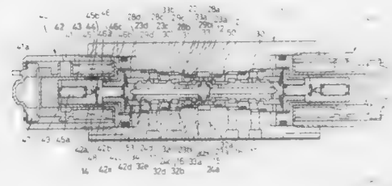
1. Apparatus adapted for securing a corrugated drain hose having a rib and a groove to peripheral portions of an aperture through which the drain hose exits a clothes washer cabinet, the apparatus comprising:
first and second clamp members each having a substantially arcuate notch adapted for receiving said drain hose on opposite sides and cooperatively forming a collar around said drain hose, said first and second clamp members each having a predetermined thickness adapted for seating in said groove and engaging said rib wherein said hose is prevented from being pulled through said collar; and
means connected to said first and second clamp members and insertable through said aperture for cooperatively snap locking said first and second clamp members to said peripheral portions of said aperture wherein said drain hose is secured to said washer cabinet at the point of exit.

4,860,792

ELECTROMAGNETIC CONTROL VALVE

Kouji Ichihashi, and Akira Inaba, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1988, Ser. No. 234,165
Claims priority, application Japan, Sep. 10, 1987, 62-225242
Int. Cl.[4] F15B *13/06*
U.S. Cl. 137—596.17 **2 Claims**



1. An electromagnetic proportional pressure control valve for controlling a forward clutch and a rearward clutch, said valve comprising:
(a) housing means formed therein with a guide bore extending straight, tank port means having one end thereof opening to an axial central portion of a peripheral wall surface of said guide bore and the other end adapted to be connected to a tank, a pair of pump ports having their respective one ends opening to the peripheral wall surface of said guide bore on both sides of the location where said tank port means opens to the peripheral wall surface of said guide bore, the other ends of the respective pump ports being adapted to be connected to a common pump, and a pair of actuator ports, each of said pair of actuator ports having one end thereof opening to the peripheral wall surface of said guide bore at a location between a location where a corresponding one of said pair of pump ports opens to the peripheral wall surface of said guide bore and a location where said tank port means opens to the peripheral wall surface of said guide bore, the other end of one of the actuator ports being adapted to be connected to said forward clutch, the other end of the other actuator port being adapted to be connected to said rearward clutch;
(b) a pair of spools accommodated within said guide bore in said housing means in coaxial relation to each other for axial movement relative to said housing means, said pair of spools having their respective inner ends facing toward each other, said inner ends being spaced away from each other when said pair of spools are in their respective initial positions, wherein an entire region by which said inner ends are spaced away from each other defines a moving region by which each of said inner ends is movable, wherein each of said pair of spools is provided on its outer peripheral surface with a pair of axially spaced annular lands, one of said pair of lands being smaller in pressure receiving area than the other land, wherein when each of said pair of spools is in its initial position, one of the pair of lands on the spool is spaced away from a corresponding one of a pair of first sections of the peripheral wall surface of said guide bore, each first section extending between said tank port means and a corresponding one of said pair of actuator ports, thereby permitting flow of the hydraulic fluid between said tank port means and the actuator port, and the other land on the spool is in contact with a corresponding one of a pair of second sections of the peripheral wall surface of said guide bore, each second section extending between a corresponding one of said pair of actuator ports and a corresponding one of said pair of pump ports, thereby intercepting flow of the hydraulic fluid between the actuator port and the pump port, and wherein, supposing that a distance between the inner ends of the respective spools in their respective initial positions is W, axial distances by which the one lands of the respective spools are spaced respectively away from said first sections when said spools are in their respective initial positions are Lx, and distances by which the other lands of the respective spools are in contact respectively with said second sections when said pair of spools are in their respective initial positions are La, the following conditions are satisfied:

$La \geqq Lx$;

$W > La$; and

$W \leqq 2La$,

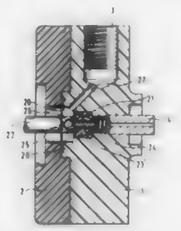
(c) a pair of stopper means with which outer end portions of said pair of spools are engageable, to determine said initial positions respectively;
(d) a coil spring which is arranged under compression between the inner ends of the respective spools to bias them toward their respective initial positions; and
(e) a pair of electromagnetic drive means for controlling movements of the respective spools independently of each other, said pair of electromagnetic drive means being mounted to opposite end portions of said housing means respectively, each of said pair of electromagnetic means comprising a solenoid, an armature electromagnetically communicated with said solenoid and a communicating member for mechanically communicating said armature with corresponding one of said pair of spools, wherein when said pair of electromagnetic drive means are in their respective unexcited states, said pair of spools are in their respective initial positions, wherein said pair of electromagnetic drive means apply forces respectively to said pair of spools substantially in proportion to electric current supplied respectively to said pair of electromagnetic drive means, wherein a second force is produced by application of pressure of the hydraulic fluid at each of said pair of actuator ports, to the pair of lands on a corresponding one of said pair of spools, which are different in pressure receiving area from each other, the second force being reverse in direction to the first-mentioned force due to a corresponding one of said pair of electromagnetic drive means, and wherein when the first-mentioned force and the second force are balanced with each other, the pair of lands on the spool are in contact respectively with a corresponding one of said pair of first sections and a corresponding one of said pair of second sections of the peripheral wall surface of said guide bore, thereby intercepting flow of the hydraulic fluid between the actuator port and said tank port means and flow of the hydraulic fluid between the actuator port and a corresponding one of said pair of pump ports.

4,860,793

MIXING VALVE

Hans-Georg Härtl, Karlsruhe-Durlach, Fed. Rep. of Germany, assignor to Hewlett-Packard, Palo Alto, Calif.

Filed Aug. 19, 1987, Ser. No. 87,068
Claims priority, application European Pat. Off., Aug. 19, 1986, 86111487.4
Int. Cl.[4] F16K *1/14, 1/26, 11/20*
U.S. Cl. 137—606 11 Claims



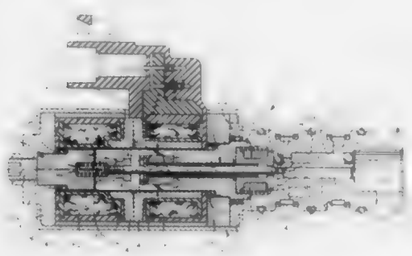
1. A valve unit comprising:
a valve body,
a valve chamber contained within said valve body,
an inlet through which liquid may be introduced into said valve chamber,
a diaphragm forming one side of said valve chamber,
means forming a circular valve seat in the opposite side of said valve chamber, said means having a passageway communicating with said valve seat,
a ball holder in said chamber having a flat surface in contact with said diaphragm and a socket on the side thereof opposite said flat surface,
a ball retained between said socket and said valve seat,
means for applying a resilient force to said ball via said passageway so as to urge it against the side of said diaphragm that is on the interior of said valve chamber,
an outlet communicating with said passageway, and
means bearing against the side of said diaphragm opposite said ball whereby application of force to said means overcomes the resilient force applied to said ball and forces said ball toward a sealing relationship with said circular valve.

4,860,794

SINGLE ENDED SOLENOID VALVE ASSEMBLY

Richard M. Parrott, Noblesville; Jack A. Colvin, Anderson, and Lyle W. Shuey, Pendleton, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 31, 1988, Ser. No. 238,949
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—637.2 9 Claims



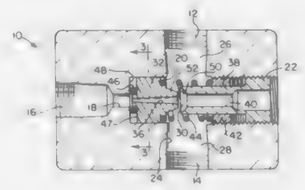
1. A solenoid valve assembly having a casing joined to a housing, said housing having a pressure inlet, a pressure outlet and an exhaust port, a first fluid path connecting said pressure inlet and said pressure outlet, and a second fluid path intersecting said first fluid path and connected with said exhaust port and a first valve seat in said first fluid path and a second valve seat in said second fluid path said valve assembly in combination comprising:
a first solenoid coil mounted within said casing;
a first magnetic solenoid stop mounted within said first coil;
a first solenoid plunger slidably mounted within said first coil biased away from said first valve seat;
a first tubular valve stem fixably connected with said first plunger with a head assembly for sealably contacting said first valve seat upon activation of said first coil whereby fluid communication is allowed in said first fluid valve when said first coil is deactivated;
a second solenoid coil mounted within said casing on a side of said first coil opposite said housing;
a second magnetic stop mounted within said second coil;
a second solenoid plunger biased away from said stop and slidably mounted within said second coil;
a second valve stem fixably connected with said second plunger projecting through into said first magnetic stop, said first plunger and said first valve stem, said second valve stem having a head for sealably contacting said second valve seat upon deactivation of said second coil whereby fluid communication is allowed in said second fluid path when said second coil is activated.

4,860,795

VENTURI BLOCK HAVING CUT OFF

Peter D. Oten, 1731 Harrow Ct., No. B, Wheaton, Ill. 60187

Filed Mar. 3, 1988, Ser. No. 163,794
Int. Cl.[4] F15D *1/02*
U.S. Cl. 138—46 20 Claims



1. A vacuum venturi device comprising; a body member having a gas inlet, a gas outlet, a passage connecting said gas inlet to said gas outlet, said passage defining venturi means for creating a low pressure area as said gas flows from said gas inlet to said gas outlet in said passage at a predetermined operating inlet pressure, a vacuum port in communication with said low pressure area and means responsive to a predetermined positive inlet pressure in said passage greater than said operating inlet pressure for increasing the pressure at said vacuum port to about said greater predetermined positive inlet pressure.

4,860,796

SOLVENT WELD PIPE TEST DISK

Roy Hagin, 33 Agate Rd., East Brunswick, N.J. 08816

Filed Oct. 6, 1986, Ser. No. 915,656
Int. Cl.[4] F16L *55/00*
U.S. Cl. 138—90 12 Claims

1. A pipe test disk, for use in pressure testing the integrity of a pipe end joined to a fitting comprising:
a planar disk portion having opposite lower and upper surfaces, said lower surface being continuous and having a lower circumferential edge portion which is permanently joined to the pipe end, and said upper surface being continuous and having an upper circumferential edge portion which is permanently joined to the pipe fitting, whereby said planar disk portion extends completely across said pipe end and said fitting,
a center portion of said planar disk portion in which a center opening is to be formed through said planar disk portion for inlet of fluid to pressurize the pipe for testing and
a coupling pipe portion integrally formed with said planar disk portion surrounding the center portion thereof, said coupling pipe portion having a passageway provided with an open end, which is remote from said planar disk portion, and another end, which is opposite to said open end and which is closed off by the center portion of said planar disk portion, whereby said pipe test disk plugs said pipe end as well as said fitting, and extending upwards from the upper surface of said planar disk portion for coupling said pipe portion of said pipe test disk and the pipe end joined to said lower surface of said pipe test disk to an external fluid pressurizing apparatus whereby after a pressure test is completed a portion of said planar disk portion remains joined between said pipe end and said pipe fitting and communication therebetween is afforded by a formed center opening.

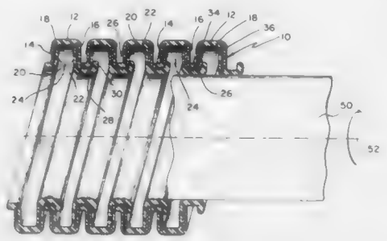


4,860,797

REINFORCED STRIP AND FLEXIBLE HOSES PRODUCED THEREWITH

Toby D. Richards, Morris Plains, and Anthony I. Antonio, Jr., Bridgewater, both of N.J., assignors to Fabricated Plastics, Inc., Morristown, N.J.

Continuation of Ser. No. 52,553, May 21, 1987, abandoned. This application Jan. 18, 1989, Ser. No. 298,839
Int. Cl.[4] F16L *11/11*
U.S. Cl. 138—122 15 Claims



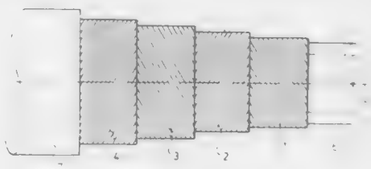
1. A strip for use in forming a flexible hose from helically wound convolutions of said strip, said strip consisting essentially of a substantially U-shaped body portion including a pair of radially projecting first and second wall members spaced apart and having a predetermined height connected by a transverse portion having a predetermined length, said predetermined length of said transverse portion not being substantially greater than said predetermined height of said first and second wall members, said body portion comprising a first polymeric material having a predetermined Young's modulus, substantially the entire surface of said body portion comprising said polymeric material, whereby adjacent portions of said body portion can be directly bonded together to form said flexible hose upon said helical winding of said strip so as to provide a flexible hose comprising a plurality of substantially adjacent U-shaped body portions along the length thereof, said first and second wall members comprising first and second plate-like support members, respectively, embedded within said first and second wall members and said first and second support members being spaced apart by said transverse portion and comprising a second polymeric material having a predetermined Young's modulus higher than said predetermined Young's modulus of said first polymeric material of said body portion, whereby said transverse portion is substantially free of plate-like support members, said plate-like support members thereby reinforcing said wall members and permitting said body portion to substantially retain its shape upon the application of external force thereto.

4,860,798

REINFORCED FLEXIBLE HOSE

Ferenc Kovács; Miklósné Lengyel; Tibor Nagy; Sándor Antal, all of Budapest; György Gyöngyösi, Szeged; László Palotás, and Nándor Pfiaztner, both of Budapest, all of Hungary, assignors to Taurus Gumiipari Vallalat, Budapest, Hungary

PCT No. PCT/HU86/00051, § 371 Date Nov. 25, 1987, § 102(e) Date Nov. 25, 1987, PCT Pub. No. WO87/02116, PCT Pub. Date Apr. 9, 1987
PCT Filed Sep. 25, 1986, Ser. No. 138,191
Claims priority, application Hungary, Sep. 25, 1985, 3642/85
Int. Cl.[4] F16L *11/08*
U.S. Cl. 138—133 11 Claims



1. A flexible hose with a longitudinal axis reinforced by wire plies, wherein at least two wire plies are provided and the wires of each wire ply are disposed in helical convolutions about the longitudinal axis of the hose the hose being provided with at least one inner and one outer layer, each layer impermeable to liquids, characterized in that the wire plies satisfy the following formula:

$$1.05 > \frac{\sum_{b=1}^{l} r_b N_b F_b \cos \alpha_b}{\sum_{j=1}^{m} r_j N_j F_j \cos \alpha_j} > 0.95 \quad (1)$$

wherein:
subscript b indicated the wire plies arranged with left hand thread,
subscript j indicated the wire plies arranged with right hand thread,
r_b and r_j are the mean radii of the wire plies,
N_b and N_j are the number of wires in each wire ply,
F_b and F_j are the tensile strengths of the wires,
α_b and α_j are the angles of lay of the respective wire plies,
l stands for the number of wire plies with left hand thread,
m is the number of wire plies with right hand thread.

4,860,799

CLOSURE FOR WRAPAROUND SLEEVE

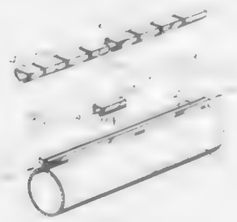
Louis Van Noten, Leuven, Belgium, assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 71,536, Jul. 9, 1987, abandoned, which is a continuation of Ser. No. 920,493, Oct. 17, 1986, abandoned. This application Apr. 14, 1988, Ser. No. 183,515

Claims priority, application United Kingdom, Oct. 21, 1985, 8525919

Int. Cl.[4] F16L *11/12*

U.S. Cl. 138—167 8 Claims



1. An assembly for environmentally sealing a substrate which comprises:

a wraparound dimensionally-recoverable sleeve having closure members comprising rails hoving bases with the rails undercut at their respective bases adjacent opposing edge portions thereof, which members can be held together to hold the sleeve in a wrap-around configuration;

an elongate closure channel that is generally cshaped in transverse cross-section and is positioned over the closure members thereby holding them together and being resistant to lateral removal therefrom due to its c-shape, the channel having a discontinuity along its length, the discontinuity extending through the channel entirely such that the channel is in two or more separate parts which may be positioned end-to-end, each over both closure members; and

a clip installed over and gripping both closure members at a position between the channel and the closure members and bridging the discontinuity in the channel.

4,860,800

WEFT CARRYING GRIPPER FOR WEAVING LOOMS

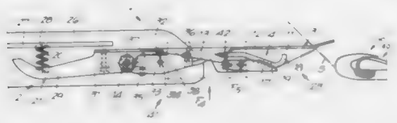
Johnny Victoor, Langemark; Lucien Coopman, Zonnebeke, and Denis Moeneclaey, Westrozebeke-Staden, all of Belgium, assignors to Picanol N.V., Ieper, Belgium

Filed Jun. 2, 1987, Ser. No. 56,723

Claims priority, application Belgium, Jun. 3, 1986, 2/60987

Int. Cl.[4] D03D *47/20*

U.S. Cl. 139—448 9 Claims



1. A weft thread carrying gripper for a gripper weaving loom including a cooperating weft drawing gripper that receives each inserted weft thread from the weft thread carrying gripper at a moment of passing over when the grippers converge in overlapping relationship from opposite sides of the loom, said weft carrying gripper comprising a body portion; a thread guide portion pivotally secured to the body portion for movement about a pivot axis intersecting the body portion, said thread guide portion including a guide clamp forward of the pivot axis in the direction of weft insertion; a body clamp secured to the body portion; means for resiliently biasing the guide clamp into contact with the body clamp; said body and guide portions of said weft carrying gripper arranged so that during operation of the loom, any colliding contact between the carrying and drawing grippers at the moment of thread passing over displaces the guide clamp in a direction tending to increase the clamping force between the body and guide portions.

4,860,801

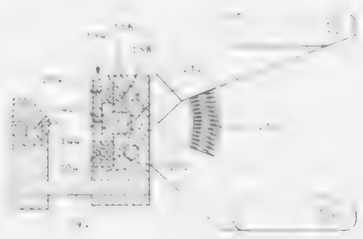
METHOD AND APPARATUS FOR BENDING RIBBON CABLES

Vincent Nicholas, Spring Hill, and Paul P. Siwinski, Seminole, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 15, 1988, Ser. No. 168,351

Int. Cl.[4] B21F *45/00*

U.S. Cl. 140—105 12 Claims



1. A method preparing the stripped free end of a ribbon cable for coupling with a connector housing comprising the steps of:

positioning the stripped free end in a first fixture, wherein the positioning step includes locating the cable in a guide member and then positioning the guide member in the first fixture;

providing a second fixture having a fixed block with slot means for the receiving of the stripped free end and with bending fingers reciprocal toward and away from the slot means to effect the bending of at least some of the stripped wires; and

shifting one of the fixtures with respect to the other between an inoperative orientation whereat the ribbon cable may be coupled and uncoupled with respect to the first fixture and an operative position whereat the ribbon cable is located in the slot of the second fixture for being bent.

4,860,802

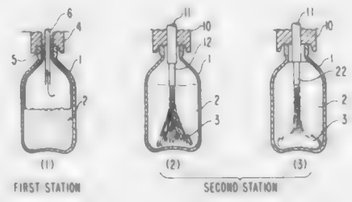
FILLING LIQUIDS

Shogo Yamaguchi; Kazunori Araki, and Hisashi Tazuke, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1987, Ser. No. 96,405

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—6 4 Claims



1. A method for filling a container with predetermined amounts of a gas-generating water or water and of an undiluted solution to thereby provide a filled liquid product, said method comprising:

first supplying into said container an amount of said gas-generating water or water greater than said predetermined amount thereof;

subsequently filling into said container said predetermined amount of said undiluted solution such that the upper stratum of liquid product filled into said container comprises substantially entirely said gas-generating water or water unmixed with said undiluted solution; and

removing from said upper stratum and from said container the amount of said gas-generating water or water in excess of said predetermined amount thereof;

whereby said filled liquid product within said container includes said predetermined amounts of said gas-generating water or water and of said undiluted solution.

4,860,803

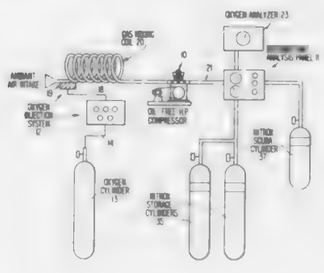
CONTINUOUS NITROX MIXER

J. Morgan Wells, Gaithersburg, Md., assignor to The United States of America as represented by the Department of Commerce, Washington, D.C.

Filed Sep. 15, 1988, Ser. No. 244,762

Int. Cl.[4] F17C *5/06*

U.S. Cl. 141—9 6 Claims



1. A system for forming precise and regulated mixture percentages of oxygen and air in a breathing gas comprising:

means for supplying a stream of oxygen gas;

means for injecting said oxygen into a stream of ambient air;

means for mixing said oxygen and ambient air;

means for compressing said mixed gas stream; and

means for analyzing and distributing said compressed gas stream into high pressure storage tanks.

4,860,804

FILLED AMOUNT CONTROL SYSTEM

Shogo Yamaguchi, and Hisashi Tazuke, both of Aichi, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1987, Ser. No. 98,056

Claims priority, application Japan, Dec. 23, 1986, 61-19815[U]; Dec. 23, 1986, 61-198148[U]

Int. Cl.[4] B65B *31/00*

U.S. Cl. 141—94 4 Claims

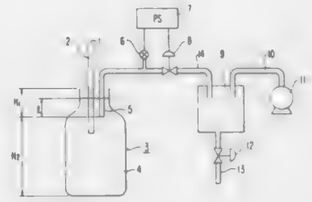
1. A control system for regulating the amount of liquid filled into a container to be a predetermined amount and for use with a filling system that can supply to the container an amount of the liquid in excess of said predetermined amount, said control system comprising:

a liquid discharge member adapted to extend into a container to be filled with liquid and having an inlet opening to be positioned within the container at a level whereat liquid filled into the container up to such level corresponds to said predetermined amount;

means for applying to the interior of the container a pressure different than atmospheric pressure, and thereby for causing, upon the liquid being filled into the container above said level, liquid to pass through said inlet opening and said liquid discharge member until the level of liquid in the container reduces to said level;

pressure sensor means, operatively connected to said liquid discharge member, for detecting a first pressure condition therein during passage of liquid therethrough, for detecting a second pressure condition thereof upon stopping of passage of liquid therethrough, and for generating first and second signals representative of said detected first and second pressure conditions, respectively; and

controller means, operatively connected to said pressure sensor means for receiving said signals therefrom, and operatively connected to said pressure applying means for, upon receipt of said second signal from said pressure sensor means, stopping application of said pressure to the interior of the container.



4,860,805

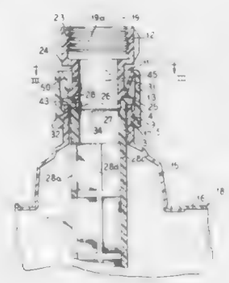
FILTERED WATERBED FILLING SYSTEM

Arthur M. Townsend, 505 N. Lake Shore Dr. Apt. 3911, Chicago, Ill. 60611

Continuation-in-part of Ser. No. 121,661, Nov. 11, 1987, abandoned. This application Jul. 7, 1988, Ser. No. 216,124

Int. Cl.[4] B65B *3/04;* A47C *17/86*

U.S. Cl. 141—382 30 Claims



9. A filtered waterbed filling and draining system for filling and draining a waterbed through a male coupling on the waterbed, comprising:

hose coupling means having at a first end means for coupling to a hose and at an opposite end means for coupling to the male coupling on the waterbed to be filled or drained of water;

a separate filtered filling probe dimensioned to be insertable into the male coupling of the waterbed, means for sealably mating the hose coupling assembly to the filling probe, and the filtered filling probe having a filter means for preventing passage of at least some bacteria or other

matter to aid in the prevention of bacteria or algae growth in the water within the waterbed; and

a separate drain probe also dimensioned to be receivable within the waterbed male coupling, means for sealably mating said hose coupling assembly to the drain probe, and said drain probe having drain aperture means for draining water out of the waterbed.

4,860,806

WOODSPLITTING HEAD ASSEMBLY

Regie P. Brace, Lot 33 Bert's Trailer Park, 401 South Rt. 7, Milton, Vt. 05468

Filed Oct. 24, 1988, Ser. No. 261,694
Int. Cl.[4] A01G *23/08*
U.S. Cl. 144—193 E 5 Claims



1. A woodsplitting head assembly, for obtaining a plurality of split wood pieces with a single stroke of a woodsplitter, comprising:

vertical base means;

said vertical base means comprising a vertical splitting post attached to the horizontal frame of the woodsplitter;

said vertical base means having at least one blade support [illegible]

said blade support means comprising projections extending outward from the vertical base means;

said vertical base means further having blade angling means coupled to the rear edge of said vertical base means for maintaining said blade at a predetermined angle below level;

moveable cutting blades;

said moveable cutting blades having apertures centrally located to fit over said vertical support base;

said moveable cutting blades further having wood flaring means located on said blades for providing a lifting force on the wood being split; and

said moveable cutting blades further having vertical base protection means located on said blades at least partially surrounding said aperture of said blade forcing said wood away from said vertical base means.

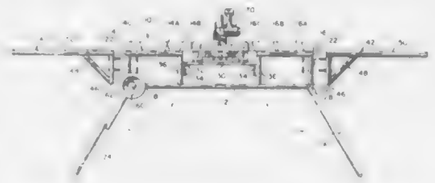
4,860,807

PORTABLE WORKBENCH AND POWER SAW STAND

Ted Vacchiano, 295 Cranberry Rd., Farmingdale, N.J. 07727

Filed Oct. 13, 1988, Ser. No. 257,061
Int. Cl.[4] B27B *5/24;* B27C *9/00*
U.S. Cl. 144—286 R 3 Claims

1. A portable workbench and power saw stand transportable with power saw attached, said portable workbench and power saw stand comprising an adjustable power saw station centrally disposed on said portable workbench for mounting said power saw, and a workpiece station disposed of opposing sides of said power saw station for supporting said workpieces, said power saw station and said workpiece station supported by integrated tubular frame to permit adjustment of said power saw station to heights proximate to said workpiece station, said support frame supported on a second rectangular tubular frame, said second tubular rectangular frame having mounted thereon, at one opposing end, a pair of wheels for transportation of said portable workbench and power saw stand, said second tubular rectangular frame having extending downwardly from opposing ends thereof, pairs of foldable support legs for supporting said portable workbench and power saw stand, said foldable support legs removably securable to said second tubular rectangular frame when in a transport position such that said pair of wheels permit the transportation of the portable workbench and power saw stand with power saw attached.

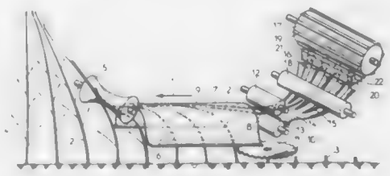


4,860,808

PROCESS AND DEVICE FOR HARVESTING COPSES GROWN IN LINES

Jacques Le Clerc De Bussy, 80290 Poix De Picardie, Bussy, France

Filed Sep. 12, 1988, Ser. No. 242,896
Claims priority, application France, Sep. 14, 1987, 87 12674; Jan. 4, 1988, 88 00012
Int. Cl.[4] A01G *23/08*
U.S. Cl. 144—335 14 Claims



1. Process for harvesting in successive rows and simultaneously chopping ligneous stem which are virtually vertical and which originate from cultivated copses in the ground, comprising the steps of:

bending the stems in a first direction to bring upper parts thereof close to horizontal and maintaining their upper parts approximately in this position;

cutting the stems near the ground such that lower parts of the stems will move upwardly by means of elasticity;

moving the cut stems, lower parts first, in a second direction opposite to the first, whilst gathering them into a continuous bundle of parallel stems;

moving the bundle into and through a guide funnel having a sharp-edged outlet orifice;

moving over the outlet orifice of this guide channel at least one cutting blade for cutting the stems into successive sections; and

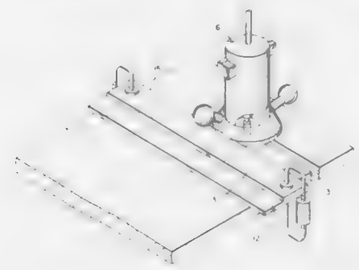
moving the cut sections away from the outlet orifice.

4,860,809

DEVICE FOR AND METHOD OF PRODUCING WORKPIECES WITH ALTERNATING CONTOUR MATING SURFACES

Lawrence M. Cotton, and Gery R. Compton, both of New Bern, N.C., assignors to Robert Bosch Power Tool Corporation, New Bern, N.C.

Filed Sep. 27, 1988, Ser. No. 249,852
Int. Cl.[4] B27C *5/10, 1/12*
U.S. Cl. 144—371 12 Claims



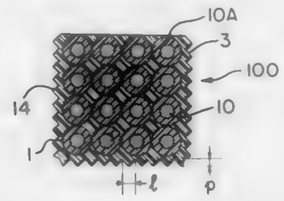
1. A device for producing mating alternating contour surfaces on workpieces, comprising a rotatable and displaceable working tool with a alternating contour surface; and a base member arranged to be placed on a workpiece and to guide said tool during said displacement, said base member having a first substantially flat surface, and a second opposite surface transversely spaced from said first surface and provided with two surface portions which are offset from one another in a transverse direction so that when said working tool is guided by said base member it produces two alternating contour mating surfaces on two workpieces.

4,860,810

PNEUMATIC TIRE HAVING BEAD RING WITH SAWTOOTH RIDGES

Jean-Charles Lacour, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand Cedex, France

Filed Jul. 9, 1987, Ser. No. 71,479
Claims priority, application France, Jul. 9, 1986, 86 10373
The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.
Int. Cl.[4] B29D *30/48, 30/06*
U.S. Cl. 152—540 10 Claims



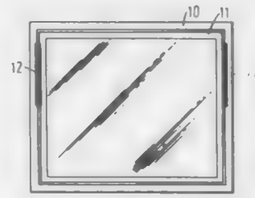
1. A pneumatic tire comprising at least one bead, at least one carcass ply within said bead and a bead ring for reinforcing the bead, said carcass ply having a region which extends around the bead ring, said bead ring having a surface made of a material whose secant modulus in extension, measured at 10% elongation and at 160° C., is equal to at least 70 MPa, said surface having a plurality of sawtooth ribs having a width less than 3 mm, which ribs contact, either directly or via a thin layer of rubber having a thickness less than 1 mm, the carcass ply in the region where the carcass ply extends around the bead ring for anchoring the bead ring with the region of the carcass ply which extends around the bead ring.

4,860,811

TURNABLE WINDOW ARRANGEMENT

Egil Flakk, Ålesund, Norway, assignor to A/S Spilka Inco Ltd., Alesund, Norway

Filed Feb. 18, 1988, Ser. No. 157,647
Int. Cl.[4] E06B *3/32*
U.S. Cl. 160—92 9 Claims



1. A turnable window arrangement comprising a window frame; a sash; a pair of support arm mechanisms secured to said frame and said sash, each mechanism having a pair of pivot arms to permit pivoting of said sash; a pair of guide shoes mounted in opposite sides of said sash; a pair of grooves in opposite sides of said frame, each said groove slidably receiving a respective guide shoe of said sash to limit pivoting of said sash to a swing path of approximately 180°; said window frame being provided with a separately removable air screening filter secured to the frame in a position inside the swinging path of said sash, a link arm mechanism arranged to lock said sash in different positions between completely closed and opened venting positions, said link arm mechanism comprising a socket member connected to said sash and a link arm pivotally mounted at the outer end of a support arm protruding from said socket member to allow pivoting of said link arm about a first axis extending laterally of said support arm, said support arm being arranged to penetrate through a guiding in a lock member secured to said frame in a position circumferentially outside said screen filter to allow unprevented movement of said link arm at an inwards facing side of the frame, said link arm and said support arm being pivotable in said socket member about a second axis extending axially of said support arm to allow pivoting of the link arm from a locking position to an unlocked position, and vice versa, at said inwards facing side of the frame and also to allow a minor pivoting between said support arm and said link arm when moving said window sash into different venting positions, said link arm being provided with a number of arresting means extending laterally of said link arm for cooperation with an adjustable locking pin in said locking member.

4,860,812

CONNECTING MEANS FOR PARTITION SYSTEMS

Mark A. DePietro, Warren; William T. Klim, New Middletown, both of Ohio; Robert H. Ashworth, Pittsburgh, and Robert E. Thiele, Wexford, both of Pa., assignors to GF Furniture Systems, Inc., Youngstown, Ohio

Filed Aug. 31, 1988, Ser. No. 238,495
Int. Cl.[4] A47G *5/00*
U.S. Cl. 160—135 10 Claims

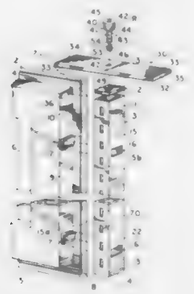
1. A partition system including:

a plurality of panels each having top and bottom channels and opposite edge channels,

said panel edge channels including a slot adjacent said top channels,

a plurality of tabs projecting outwardly from said edge channels,

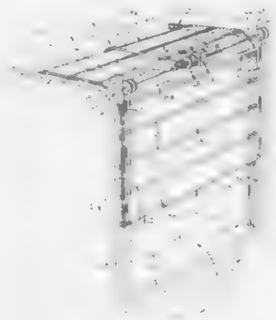
a connecting tube having a top and a bottom for joining said panels by engagement with said edge channels,
a top wall on said connecting tube and having a passageway therethrough,
said connecting tube having a plurality of apertures adapted to receive said tabs,
an alignment assembly attached adjacent the top of said panels and overlying said top of said tube,
said alignment assembly including a top plate carrying releasable lock means operable to apply a vertical biasing force in one direction against said tube while concurrently



applying a vertical biasing force in an opposite direction against said panels to forcefully retain said panel tabs within said tube apertures,
said top plate having opposite ends respectively inserted within opposed ones of said edge channel slots of adjacent pairs of said panels, and
said releasable lock means including a threaded fastener having a shank provided with alternate portions selectively engageable with said tube top wall, whereby
manipulation of said threaded fastener in opposite directions alternately displaces said tube away from and toward said top plate.

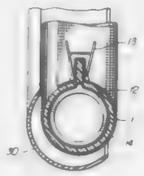
4,860,813
DOORS FOR VANS
Jan Ballyns, Pickering; Paul H. Martin, and John C. Martin, both of Toronto, all of Canada, assignors to Diesel Equipment Limited, Toronto, Canada
Filed Sep. 2, 1987, Ser. No. 92,571
Claims priority, application Canada, Apr. 29, 1987, 535955
Int. Cl.[4] E05F *15/16*
U.S. Cl. 160—188 **3 Claims**

1. A drive mechanism for raising and lowering a roll-up door comprising;
(a) a primary drive shaft,
(b) first and second winding spools mounted on said primary drive shaft, each winding spool having a winding drum,
(c) first and second winding straps each having first and second ends, the first end of the first strap being mounted on the winding drum of the first spool and the second end of the first strap being connected to one end of a roll-up door, the first end of the second strap being mounted on the winding drum of the second spool and the second end of the second strap being connected to the other end of the roll-up door, the winding drums and straps being proportioned to cause each successive turn of each strap to be wound upon one another as the straps are wound in such that the effective diameter of the winding surface of each winding drum will vary as its associated strap is wound in or paid out,
(d) slipping clutch means communicating between said primary shaft and one of said winding spools to permit said one of said winding spools to slip with respect to said primary drive shaft to accommodate the difference between the effective diameter of the winding surface of the



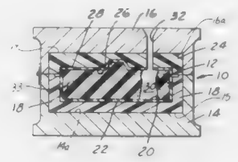
winding drums such that the first and second winding drums may both be driven by the primary drive shaft.

4,860,814
STRETCHER FRAME ASSEMBLY
James R. Vilmann, and Margaret J. D. Vilmann, both of 2033 E. Ramon Rd., No. 3C, Palm Springs, Calif. 92262
Continuation of Ser. No. 819,194, Jan. 14, 1986, abandoned. This application May 27, 1988, Ser. No. 201,363
Int. Cl.[4] D06C *3/08*
U.S. Cl. 160—381 **5 Claims**



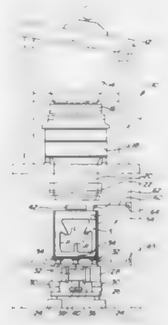
1. A readily assembled stretcher assembly for mounting a sheet of fabric thereon, comprising:
a frame structure having a front and rear plane for tautly mounting a sheet of fabric over the front plane thereof;
interconnected open-ended tubular frame sections which are secured together by means of angled elements interfitting with the ends of the frame sections to form said frame structure in a manner preventing rotational movement therebetween;
a plurality of fixed, rigid inwardly projecting planar ridges, each extending parallel to and between the front and rear plane and disposed around and secured to an inner perimeter of the frame structure and having inner rims over which the edges of the fabric are to be secured; and
each frame section of the frame structure having a plurality of individual clamping means which are removable from the assembled frame structure and which clamp over the ridges on said frame sections the peripheral edges of fabric, to be mounted, which edges are folded over the inner rims of the inwardly projecting ridges without penetration thereby when said fabric is manually tightened thereover, the removable clamping means being disposed between the front and rear planes of the frame structure thereby avoiding interferring with the placement of the stretcher assembly.

4,860,815
METHOD FOR FORMING RECYCLABLE POUR TOOL
Kent Parker, Dover; Bruce Batchelder, Barrington, and Norman Clavette, Dover, all of N.H., assignors to Davidson Textron Inc., Dover, N.H.
Filed Aug. 17, 1987, Ser. No. 85,796
Int. Cl.[4] B22C *7/00*
U.S. Cl. 164—47 **5 Claims**



1. A method for manufacturing liners with outer surfaces for mounting on a production mold apparatus to define a mold cavity, the metal liners having inner surfaces which exactly conform to the exterior dimensions of a composite plastic article having a preformed skin adapted to be supported on the inner surface of one of the metal liners and a preformed load bearing insert adapted to be supported on the inner surface of the other of the metal liners and wherein a layer of foam material is located between the performed skin and the preformed load bearing insert to be bonded thereto comprising the steps of:
dimensionally shaping a single piece pattern which has outer dimensions thereon corresponding to those of the composite plastic article including the foamed preformed skin and preformed load bearing insert;
providing metal casting mold means having an interior space greater than the dimensions of the single piece pattern;
supporting the single piece pattern in the interior space of the metal casting mold means to provide a space for filling with metal to form liners conformed to the outer surface of the single piece pattern and conformed to the metal casting mold means;
casting aluminum filled methyl methacrylate into the last mentioned space for filling said space to form liners conformed to the single piece pattern and conformed to the metal casting mold means;
providing a mold assembly having liner support surfaces thereon;
removing the cast aluminum filled methyl methacrylate liners from the metal casting mold means and placing them on the liner support surfaces of the mold assembly;
shimming the aluminum filled methyl methacrylate liners with respect to the liner support surfaces of the mold assembly to form a space within the mold assembly which corresponds to the outer dimensions of a foamed preformed load bearing insert and preformed skin of a composite plastic part;
pouring material into the space to form a second single piece pattern which is conformed to the shape of the interior surfaces of the aluminum filled methyl methacrylate liners; and
supporting the second single piece pattern on the metal casting mold to form a space for forming a second set of liners that have outer surfaces thereon which are supportable on a mold assembly to form an interior space when supported on the mold assembly which corresponds to the outer dimension of the foamed preformed load bearing insert and preformed skin and to form the support surfaces on the mold assembly for the performed load bearing insert and the preformed skin.

4,860,816
CONTROL SYSTEM FOR VIBRATORY APPARATUS
Robert Bond, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.
Filed Sep. 15, 1988, Ser. No. 244,335
Int. Cl.[4] B22C *15/10*
U.S. Cl. 164—154 **13 Claims**

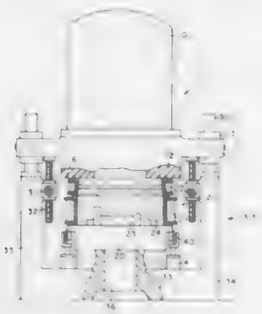


1. In a vibratory apparatus including a table having means for supporting a flask into which is supplied a pattern and sand, and exciter means in operative relation with the table for imparting a vibratory force thereto to move sand in the flask, a control system comprising:
means for setting a desired rate of acceleration of vibratory movement of sand in a flask supported on the table;
means for sensing actual rate of acceleration of vibratory movement of sand in the flask; and
means for mounting the sensing means on the apparatus in a manner that the sensing means is above the table and is extendable within the periphery of the flask
control means coupled to said exciter means, said setting means, and said sensing means for controlling said exciter means responsive to the desired rate of acceleration and the actual rate of acceleration to control movement of the sand.

4,860,817
APPARATUS FOR THE COMPACTING OF GRANULAR MOLDING MATERIALS
Alfred Joern, Bibern, Switzerland, and Wendelin Weimann, Klettgau, Fed. Rep. of Germany, assignors to Georg Fischer AG, Schaffhausen, Switzerland
Filed Jan. 3, 1989, Ser. No. 292,775
Claims priority, application Switzerland, Jan. 14, 1988, 00129/88
Int. Cl.[4] B22C *15/00*
U.S. Cl. 164—169 **11 Claims**

1. An apparatus for compacting granular molding material comprising: molding means for containing said granular molding material to be compacted; a rack; compacting means for applying a compacting force to said granular molding material in said molding means, said compacting means being mounted on said rack for vertical movement thereon between a first load position and a second compact force applying position; sealing means arranged on said compacting means for sealing said molding means when said compacting means is in said second position; a supporting pedestal mounted on said rack in

opposition to said compacting means and transporting means for locating said molding means on said pedestal where said



sealing means seals said molding means when said compacting means is in said second position.

4,860,818

DIE CASTING APPARATUS

Sadayuki Dannoura, Yamaguchi, Japan, assignor to Ube Industries, Ltd., Ube, Japan

Filed Sep. 20, 1988, Ser. No. 247,129

Claims priority, application Japan, Sep. 21, 1987, 62-236637; Sep. 21, 1987, 62-236638; Sep. 21, 1987, 62-236639; Sep. 21, 1987, 62-144267[U]; Oct. 19, 1987, 62-263586

Int. Cl.[4] B22D *17/08, 17/22*

U.S. Cl. 164—314 24 Claims



1. A casting apparatus comprising:

a mold including a cavity for solidifying molten metal therein, and a runner and a biscuit portion for introducing the molten metal into said cavity;

means removably mounted in said biscuit portion for feeding the molten metal through said biscuit portion and runner into said cavity;

a feeding rod disposed in said mold for freely protruding into said runner, and means for reciprocating said feeding rod; and

means for selecting communication and non-communication between said biscuit portion and said runner to allow the molten metal to flow from said biscuit portion to said runner, said communication and non-communication means being actuated to close the runner from the biscuit portion after the molten metal is fed into the cavity so that when the feeding rod is actuated, the molten metal in the cavity is compressed.

4,860,819

CONTINUOUS CASTING TUNDISH AND ASSEMBLY

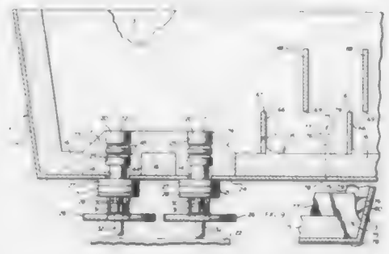
Gerald F. Moscoe; Joel C. Mastervich, both of Crown Point; William J. Kreevich, St. John; John R. Knoepke, Munster, all of Ind.; Daniel Rellis, Jr., Lansing, Ill.; Roger J. Glennon, and Howard M. Pielet, both of Munster, Ind., assignors to Inland Steel Company, Chicago, Ill.

Division of Ser. No. 65,042, Jun. 22, 1987, which is a continuation-in-part of Ser. No. 808,570, Dec. 13, 1985. This application Oct. 27, 1988, Ser. No. 263,363

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[4] B22D *1/00*

U.S. Cl. 164—437 2 Claims



1. An assembly for the continuous casting of molten metal containing liquid lead and wherein said liquid lead is denser than the rest of the molten metal, said assembly including a tundish and comprising:

a metal tundish shell having a bottom and an opening in said bottom;

a refractory material lining the interior of said shell bottom to form a tundish interior bottom;

a vertically disposed nozzle element separate and discrete from said shell and said lining and extending through said lining material and said opening in the shell;

said tundish having a pair of sidewalls and a pair of endwalls;

an elongated dam resting atop and extending across the interior bottom of said tundish between said pair of tundish sidewalls, said elongated dam being located upstream of said nozzle element;

said dam comprising means for accumulating liquid lead on the upstream side of said dam;

and pressure-relieving means on said dam, for relieving the pressure head of the molten metal on said liquid lead accumulating on the upstream side of said dam to prevent the lead from being squeezed underneath the dam to the downstream side of the dam;

said pressure-relieving means comprising a drain hole located slightly above the highest level at which said liquid lead will accumulate on said upstream side of the dam;

the walls of said tundish having a containment height for containing molten metal having a depth of at least 600 cm;

the ratio of drain hole height on the dam to said containment height of the tundish walls being no greater than about 10/600.

4,860,820

METHOD AND APPARATUS FOR THE LOW-PRESSURE DIE-CASTING OF METALS

Joseph A. T. Pereira, Weybridge, England, assignor to A. W. Plume Limited, Twickenham, England

Filed May 27, 1988, Ser. No. 203,589

Claims priority, application United Kingdom, Jul. 27, 1983, [illegible]

Int. Cl.[4] B22D *17/32*

U.S. Cl. 164—457 16 Claims

1. A low pressure die-casting apparatus comprising:

(i) a container for molten metal,

(ii) a riser tube for conveying molten metal from said container to a die having a charging aperture in communication with a cavity,

(iii) a first pressure circuit for applying a first gaseous pressure to the molten metal to force the latter through the riser tube to the charging aperture of the die,

(iv) a second pressure circuit for applying a second gaseous pressure to the molten metal for forcing the latter into the cavity of the die at a controlled rate,

(v) sensor means for establishing for each successive charging operation a datum pressure when the molten metal reaches a predetermined level adjacent said aperture and for causing changeover from said first to said second pressure,

(vi) means for storing gas at a datum pressure,

(vii) a third pressure circuit for applying an after pressure to the molten metal when the die cavity has been filled, the after pressure having a reference value equal to the stored



datum pressure plus a constant predetermined difference, said third pressure circuit including pressure control means supplied from a source of pressure gas independently of said first and second pressures and controlled by the datum pressure so as to supply and maintain constant the required after pressure, and

(viii) means in communicetion with and responsive solely to the second and after pressures to cause changeover from the second pressure to the after pressure at the time the second pressure has risen to that of the reference value and thereafter continuously apply the after pressure on said molten metal until the molten metal in the die has solidified,

(ix) whereby the after pressure is applied during solidification, and despite changes in the molten metal level in the container during successive charging operations, the difference between the after pressure and the datum pressure remains constant.

4,860,821

PROCESS FOR CLEANING TUBE TYPE HEAT EXCHANGERS

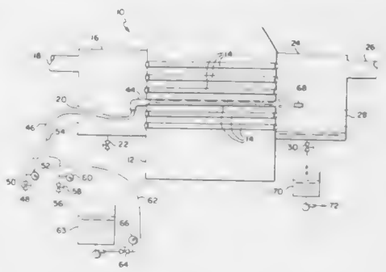
Brown T. Hagewood, 35 Jerome Dr., Glen Cove, N.Y. 11542

Filed Jul. 15, 1988, Ser. No. 219,476

Int. Cl.[4] F28G *9/00*

U.S. Cl. 165—95 11 Claims

1. An improved process for cleaning heat exchanger tubes using propellant air water to shoot pigs, brushes, or scrapers, or similar devices through the heat exchanger tubes wherein the improvement comprises adding a minimal amount of a treatment chemical to the water portion of the air and water propellant which forms an aerosol mixture assuring chemical contact with the heat exchanger tubes so that corrosion and mechanical wear and scaling of the heat exchanger tubes are controlled, said minimal amount of the treatment chemical being environmentally acceptable because the waste is also a minimal amount due to said minimal amount of said treatment chemical, the treatment easily capturing and processing said waste in an approved waste water treatment plant and said treatment being substantially less costly because only said minimal amount of chemicals are required per treatment and being a variety of chemicals used singularly and in combination, said water portion of said air and water propellant mix-



ture lubricates the pigs, brushes, or scrapers as they travel through the heat exchanger tubes, the expansion of the air portion of said air and water propellant mixture propels the pigs, brushes, or scrapers to travel through the heat exchanger tubes.

4,860,822

LANCED SINE-WAVE HEAT EXCHANGER

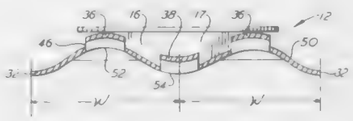
Paul S. Sacks, Cazenovia, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 2, 1987, Ser. No. 127,837

The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.

Int. Cl.[4] F28F *1/24;* F28D *1/04*

U.S. Cl. 165—151 8 Claims



1. A heat transfer plate fin including opposite facing first and second surfaces for transferring heat between the first and second surfaces and a fluid flowing over the surfaces comprising:

a convoluted heat transfer means for enhancing the exchange of heat between the fluid flowing over the surfaces, said convoluted heat transfer means having a sine-like wave pattern of predetermined height along the first and second surfaces in a direction parallel to the flow of the fluid flowing over the surfaces, said sine-like wave pattern having curved peaks at a maximum of said wave heights of the pattern and curved troughs at a minimum of said wave heights of the pattern whereby said peaks and troughs extend along said convoluted heat transfer means generally transverse to the direction of flow of fluid flowing over the surfaces;

a plurality of enhanced heat transfer sections disposed generally along a selected number of said peaks and troughs, said enhanced heat transfer sections having a group of generally elongate raised lance elements only at said curved peaks and said curved troughs, and

a leading edge section and trailing edge section upstream and downstream of the direction of flow of fluid flowing over the surfaces of each of said enhanced heat transfer sections

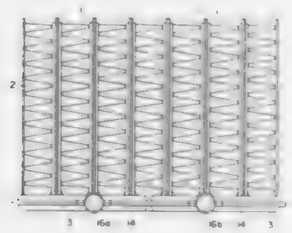
respectively, said leading and trailing sections being free from raised lance elements.

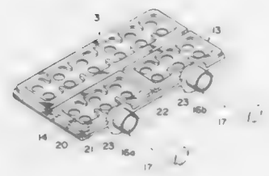
4,860,823

LAMINATED HEAT EXCHANGER

Ichiro Noguchi, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1988, Ser. No. 163,106
Int. Cl.[4] F28D *1/03;* F28F *9/22*
U.S. Cl. 165—153 7 Claims





1. A laminated heat exchanger comprising:

a single tank element, said single tank element including a single stamped plate having a bendable central portion and a pair of tank-forming recessed portions on opposite sides of said bendable central portion, said stamped plate being folded over itself about said bendable central portion, said bendable central portion having an inlet and an outlet, said pair of confronting tank-forming recessed portions jointly defining therebetween a tank, and said single tank element having at least one pair of rows of first connecting holes defined in one face thereof;

a plurality of tube elements each having a pair of confronting channel-forming recessed portions jointly defining therebetween a tube-element channel for passage therethrough of a heat transferring medium, each one of said plurality of tube elements having first and second ends, each said first end having at least one pair of second connecting holes, said plurality of tube elements being laminated with one another, and said plurality of tube elements and said single tank element being joined together via said first and second connecting holes; and

a plurality of fins interposed between adjacent ones of said plurality of tube elements.

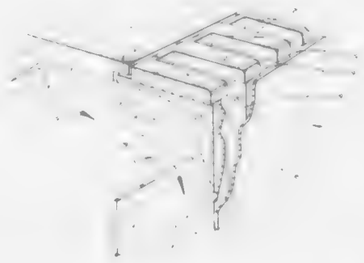
4,860,824

HEAT EXCHANGE ELEMENT

John M. Foley, Grafton; Ronald L. Piuze, Shrewsbury; Ralph I. Larson, Jr., Bolton, and George Doumani, North Andover, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 37,046, Apr. 10, 1987. This application Oct. 27, 1988, Ser. No. 263,600
Int. Cl.[4] F28D *15/00;* F28F *7/00*
U.S. Cl. 165—165 9 Claims

1. A heat exchange element having a heat receiving side and a heat dissipating side and comprising a serpentine member defining a first plurality of parallel elongate grooves, having elongate openings all in the heat receiving side, and a second plurality of parallel elongate grooves, having elongate openings all in the heat dissipating side, the grooves of the first



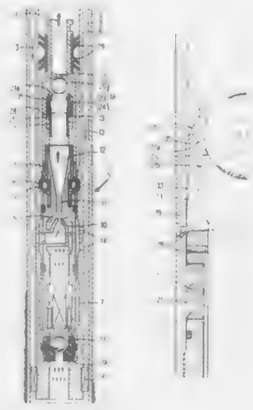
plurality being interdigitated with the grooves of the second plurality, the groove ends all terminating in open ends, and closure means closing all of the open ends of only one of the first and second plurality of grooves, said closure means being molded and cured in situ in the groove ends they close.

4,860,825

DEVICE FOR POSITIONING A TOOL OR INSTRUMENT IN A DUCT

Jacques Corteville, Rueil Malmaison; André Pauc, Villennes sur Seine, and Frédéric Hoffmann, Courbevoie, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Continuation of Ser. No. 829,188, Feb. 14, 1986, abandoned. This application Feb. 1, 1989, Ser. No. 304,601
Claims priority, application France, Feb. 14, 1985, 85 02285
Int. Cl.[4] E21B *23/08, 43/18*
U.S. Cl. 166—68 41 Claims



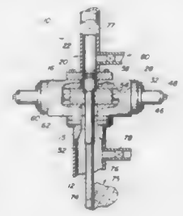
1. A device for enabling a positioning of a tool or instrument in a given working position inside a duct and for enabling a recovery of the tool or instrument by causing fluid to flow through the device, the device comprising a tubular element adapted to be connected to the tool or instrument, and an annular sealing means mounted on the tubular element for sealing engagement with the duct, wherein said tubular element comprises means for selecting the direction of movement of the tool or instrument in said duct, said selecting means including an annular member disposed in said tubular element, a closure means displaceably mounted in said tubular member, and means for enabling a reversing of a direction of movement of said tubular element in said duct, said annular member including at least one annular sealing surface means associated with said annular means and said closure means for permitting the closure means to slide through said annular sealing surface of said annular member, so as to enable said closure means to have at least three states, in a first state, said closure means cooperates with said annular member for allowing the fluid to pass in a first direction, in a second state, said closure means cooperates with said at least one annular sealing surface for preventing a passage of fluid in a direction opposite to said first direction, and in a third state, said closure means cooperates with said annular member for preventing the fluid from passing in said first direction, and wherein, in the first and second states, said closure means is on the same side in relation to said at least one annular sealing surface, and in said third state, said closure means is on an opposite side, in relation to said at least one annular sealing surface, to the one corresponding to the first and second states, said means for enabling a reversing being adapted to hold the closure means in either one of said first and second states while excluding the third state, or in said third state.

4,860,826

APPARATUS FOR SEALING A TUBING STRING IN A HIGH PRESSURE WELLBORE

John L. Land, P.O. Box 1997, Hobbs, N. Mex. 88240

Filed Jan. 28, 1988, Ser. No. 149,389
Int. Cl.[4] E21B *19/02, 33/06, 34/02*
U.S. Cl. 166—80 9 Claims



1. Apparatus for supporting the upper end of a tubing string that extends downhole in a cased borehole while packing off an upper annulus between the tubing and the casing, comprising:

a main body having a lower surface by which said body is mounted to the upper end of a casing; a tubing hanger removably received within said main body, one end of said tubing hanger is connected to the upper end of the tubing string for supporting the tubing string therefrom; a tubing support means in said main body;

said tubing hanger is a hollow member having a boss formed thereon which forms a circumferentially extending shoulder by which the hollow member is received in seated relationship respective to the tubing support means;

said main body has a vertical passageway and a horizontal passageway formed therethrough in intersecting relationship and perpendicular respective to one another; said tubing support means includes opposed piston members sealingly received in a reciprocating manner within said horizontal passage, said piston members are located within opposed ends of said horizontal passageway and can be moved toward the axial centerline of the vertical passageway and into abutting engagement with one another;

a passageway axially aligned with said vertical passageway and formed through the confronting faces of the piston members for receiving the hollow member in supported relationship therein; a seat on each piston member which is aligned with the piston passageway for receiving the boss of the tubing hanger in seated relationship therein;

seal means on the confronting faces of each said piston member for sealingly engaging the tubing hanger and one another to prevent flow from a lower to an upper part of the vertical passageway; and,

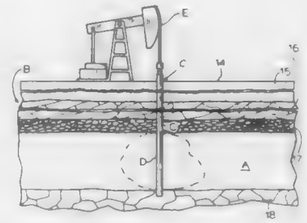
actuator means for reciprocating said piston members from a retracted open position into an extended closed position; said main body has an upper surface, an upper flange removably mounted in supported relationship on said upper surface, seal means on a marginal terminal end of said boss, the marginal terminal end of said boss is sealingly received within said upper flange whereby a stripper assembly can be connected above said flange, the interior of the boss can be engaged and lifted upwardly to thereby remove the tubing from the borehole.

4,860,827

PROCESS AND DEVICE FOR OIL RECOVERY USING STEAM AND OXYGEN-CONTAINING GAS

Robert Lee, Montreal; Derek Hornsey, Beaconsfield; Guillermo Garrido, St. Bruno, and José M. Diéguez, St. Bruno de Montarville, all of Canada, assignors to Canadian Liquid Air, Ltd., Montreal, Canada

Filed Jan. 11, 1988, Ser. No. 142,869
Claims priority, application Canada, Jan. 13, 1987, 527166
Int. Cl.[4] E21B *43/243*
U.S. Cl. 166—261 11 Claims



1. A method of recovering oil from an underground formation, comprising carrying out a priming stage by injecting steam into the formation until the temperature within the formation near the site of the injection reaches the temperature of combustion of the oil,

then carrying out a combustion stage by injecting the steam and oxygen-containing gas in alternative increments,

said injecting of steam and oxygen-containing gas being carried out through a conventional tubing string of carbon steel leading from the surface of the reservoir and causing combustion of oil adjacent to the site of injection, thereby causing a further rise in temperature, further heating the steam, forming gases including carbon dioxide, carbon monoxide and more steam, increasing the mobility of the oil, and increasing the pressure within the formation,

injecting an inert gas through the tubing string after each steam increment to dry it out in preparation for the following oxygen-containing gas increment.

11. A device for injecting steam and oxygen into a formation, comprising,

a cylindrical casing of corrodable steel having a lower part provided with perforations as steam outlets or oil and gas inlets,

a corrosive resistant cylindrical liner within said lower part having a wall spaced inward from the casing in the area containing the perforations

a lead sleeve having a part surrounding the corrosive resistant liner to block off the perforations,

a thermal cement plug filling the lower end of the casing and embedding the bottom of the corrosive resistant liner and sealing the bottom of the lead liner against the casing,

and cement sealing the top of the lead liner against the casing.

4,860,828

GAS FLOODING PROCESSING FOR THE RECOVERY OF OIL FROM SUBTERRANEAN FORMATIONS

Thomas Oswald, Fort Saskatchewan, and Ian A. Robson, Edmonton, both of Canada, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 1, 1988, Ser. No. 200,824
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—274 19 Claims

1. A method for recovering hydrocarbons from a subterranean formation comprising injecting, under non-steam flood conditions, into the subterranean formation through an injection well, a first fluid selected from group consisting essentially of (1) a drive fluid of a gas or a gas/aqueous fluid mixture and (2) a miscible fluid to move the hydrocarbon from the formation to a producing well; and a second fluid which is a mobility control fluid comprising a surfactant/water mixture wherein the surfactant component of the mobility control fluid consists essentially of a mixture of at least one alkylated diphenyl sulfonate and at least one alpha-olefin sulfonate.

4,860,829

INHIBITION OF RESERVOIR SCALE

Bob L. Carlberg; Nicholas O. Wolf; Kenneth W. Pober, all of Ponca City, Okla., and William D. Nash, Orange, Tex., assignors to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 196,848, May 12, 1988, abandoned, which is a continuation of Ser. No. 74,804, Jul. 17, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 274,543
Int. Cl.[4] E21B *41/02, 43/12*
U.S. Cl. 166—279 17 Claims

11. A treating process for inhibiting scaling by fluid which is produced from a non-carbonate subterranean reservoir via a wellbore which comprises injecting down the wellbore and into the reservoir a mixture of a phosphonate scale inhibiting compound and a metal chelate where the metal chelate has a lower stability constant (Ke) than the phosphonate inhibitor and where the metal in the metal chelate forms an insoluble salt upon reaction with the phosphonate.

4,860,830

METHOD OF CLEANING A HORIZONTAL WELLBORE

Alfred R. Jennings, Jr., Plano, and John K. Shucart, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 5, 1988, Ser. No. 229,050
Int. Cl.[4] E21B *37/00*
U.S. Cl. 166—312 18 Claims



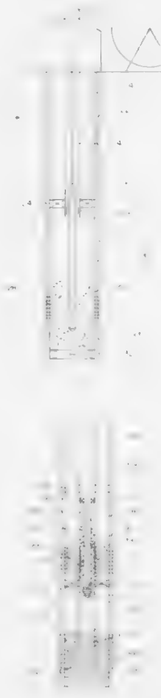
1. A method for cleaning a horizontal wellbore comprising:
(a) introducing into said wellbore a first fluid having a known specific gravity;
(b) ceasing the introduction of said first fluid into the wellbore and allowing said first fluid to equilibrate;
(c) introducing into said wellbore a second fluid having a specific gravity of at least 0.1 less than the specific gravity of said first fluid whereby said second fluid overrides said first fluid so as to contact contaminants in the top section of said wellbore while said first fluid contacts contaminants in the bottom section of said wellbore;
(d) ceasing the introduction of said second fluid into the wellbore and allowing both fluids to equilibrate; and
(e) removing both fluids containing said contaminants from said wellbore thereby cleaning said wellbore.

4,860,831

WELL APPARATUSES AND METHODS

Michael J. Caillier, 261 Rees St., Breaux Bridge, La. 70517

Filed Sep. 17, 1986, Ser. No. 908,188
Int. Cl.[4] E21B *43/08*
U.S. Cl. 166—384 5 Claims



3. A method for emplacing a bottom hole assembly in a well adjacent to a production string in a second production zone above a first abandoned production zone, the well having the production string extending to the first abandoned production zone and primary packer means sealing off the space between the exterior of the production string and the wellbore or the casing of the wellbore, the method including
plugging the production string at a location below the second production zone,
perforating the primary production string adjacent the second production zone,
placing filter media for filtering production fluid both exteriorly of the primary production string and interiorly thereof adjacent the second production zone,
emplacing sealing means above the secondary production zone for sealing off the space between the primary production string and the wellbore casing,
inserting a system including (a) a length of coil tubing, (b) a hydraulic running and release tool means, (c) the bottom hole assembly which includes an isolation packer means attached to the hydraulic running and release tool means, a length of blank pipe connection to and below the isolation packer means, a sand control means connected to the blank pipe, and (d) a wash pipe means inserted into the sand control means and connected to the running and release tool means,
sealing the space within the primary production string so that production fluid can flow upward only through the sand control means,
the said sealing being accomplished by emplacing and activating isolation packer means between the lower portion of the hydraulic running and release tool and the production string's interior surface, and
disconnecting the top portion of the hydraulic running and release tool means.

movement between a sealing position relative to said seat to seal said passage and a non-sealing position, said second sealing member normally being in said passage sealing position to limit the volume of air available to sustain burning of liquid fuel to only that available in the reception tank receiving burning fuel and only movable to said non-sealing position after liquid fuel entering said reception tank fills said tank to said top portion to permit overflow through said sealable passage.

4,860,832

DRAFT CONNECTION

Billy R. Barnes, Lamesa; Rosny L. Barnes, and David A. Gary, both of O'Donnell, all of Tex., assignors to Bar-Gar Corporation, O Donnell, Tex.

Continuation-in-part of Ser. No. 754,619, Jul. 12, 1985. This application Oct. 31, 1986, Ser. No. 925,162
The portion of the term of this patent subsequent to Apr. 7, 2004, has been disclaimed.
Int. Cl.[4] A01B *69/00, 51/00, 59/043, 59/00*
U.S. Cl. 172—26 6 Claims

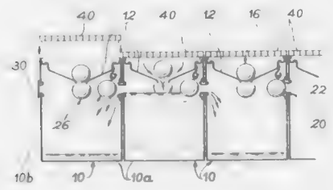


4,860,832

RECEPTACLE FOR EXTINGUISHING A BURNING LIQUID FUEL BY ISOLATION

Claude Levillain, Aix en Provence, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 27, 1987, Ser. No. 126,127
Claims priority, application France, Dec. 8, 1986, 86 17122
Int. Cl.[4] A62C *7/00*
U.S. Cl. 169—49 9 Claims



1. A receptacle for extinguishing a burning liquid fuel by isolation comprising:
a plurality of elementary separate reception tanks (**10**) each including a bottom (**10***a*), side walls (**10***b*) having a top portion and a top opening, said tanks being disposed with said side wall portions of one reception tank being in face-to-face relation with the side wall portions of adjacent reception tanks;
a funnel-shaped cover (**12**) sealing said top opening of each receptacle tank and having at least one fuel admitting orifice;
a first sealing member (**16**) for opening and closing said orifice including a means for opening said sealing member in response to the presence of liquid fuel in said cover;
means for joining and linking at least some of said adjacent reception tanks in communication with each other including
side wall openings in said top portions of at least one of said adjacent face-to-face side walls of each of two adjacent reception tanks, in open registry with each other, to provide at least one pair of aligned side wall openings,
an eyelet surrounding each of said pairs of aligned side wall openings to define a sealable passage (**22**) interconnecting said top portions of adjacent reception tanks, and
a sealing seat (**20***b*) on said eyelet; and a second sealing member (**26**) mounted in each of said reception tanks for

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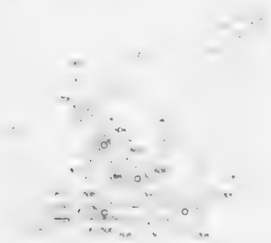
1. Agricultural equipment having
a. a tractor for moving in a direction of draft with
b. rear wheels and
c. front wheels,
d. a tractor frame connecting the front wheels to the rear wheels,
e. large low pressure pneumatic tires on the rear wheels,
f. rear axles carrying said rear wheels extending from
g. an axle housing extending on each side of
h. a differential housing,
j. a standard three point rear hitch attached to the differential housing including
i. two lower draft links,
ii. a top link, and
iii. lift arms connected from the tractor to the lower draft links;
k. a quick hitch yoke attached to the three point hitch, and
l. an agricultural tillage implement attached to the quick hitch yoke;
Wherein the improvement comprises:
m. stabilizer draw arms pivoted to the axle housings by
n. horizontal bolts so as to prevent lateral movement of the stabilizer arms,
o. frame draft arms pivoted to said stabilizer arms and attached to said tractor frame forward of the rear axles,
p. a cross brace connecting the stabilizer arms at their rear, and
q. connection means between said stabilizer draft arms and quick hitch yoke for
i. stabilizing the agricultural implement from the stabilizer draw arms,
ii. raising and lowering the stabilizer arms by the lift arms, and
iii. preventing lateral movement of the implement relative to the stabilizer arms.

4,860,834

CONVERTING ASSEMBLY

William E. Bidgood, 428 Seacroft Ct., Mequon, Wis. 53092

Filed Jan. 7, 1988, Ser. No. 142,531
Int. Cl.[4] E02F *3/96*
U.S. Cl. 172—820 23 Claims



1. A converting assembly for attaching an implement to a tractor, said tractor being of the type having at least one lift frame member and at least one tilt cylinder, capable of extension and retraction, for imparting a scooping motion about a substantially horizontal axis to a bucket when the bucket is attached directly to the tractor, the assembly comprising:

a frame;

frame connecting means for rigidly but readily removably connecting said frame to said lift frame member;

means for pivotally connecting said implement to said frame for movement of said implement in a substantially horizontal plane; and

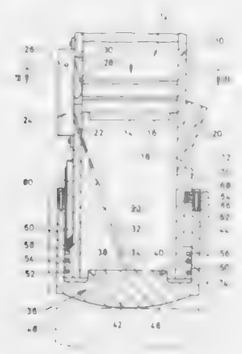
means, pivotally mounted to said frame and interconnecting said tilt cylinder and said implement, for converting extension and retraction of said tilt cylinder into side-to-side motion of said implement in said substantially horizontal plane.

4,860,834

DIESEL TYPE PILE-DRIVER

Magnus Mauch, Göppingen, Fed. Rep. of Germany, assignor to Gebruder Lindenmeyer GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 943,036, Dec. 18, 1986, abandoned.
This application Aug. 11, 1988, Ser. No. 230,979
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1985, [illegible]
Int. Cl.[4] B25D *17/06*
U.S. Cl. 173—133 21 Claims



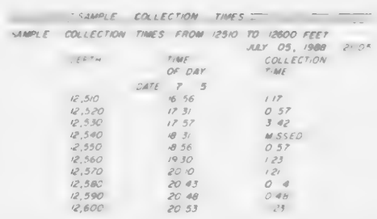
1. A diesel type pile-driver having a diesel cylinder 10 with an outer face and an open bottom end, a ram 12 accommodated in the diesel cylinder, a monkey 36 which slides around the bottom end of the diesel cylinder and seals off the latter to define a diesel working area thereabove, and means for supplying fresh air and fuel in phase with the movement of the ram to said diesel working area delimited by the ram, cylinder and monkey, and to take away the diesel combustion gases from the working area, characterized in that the monkey (36) is cup-shaped and runs with its cylindrical peripheral wall (44) in a sliding fit impervious to flowing agents on the outer face of the diesel cylinder (1), said diesel cylinder 10 having a radially projecting packing collar (50) in which at least one sliding seal ring (52, 54) is seated.

4,860,836

METHOD AND APPARATUS FOR INDICATING SAMPLE COLLECTION TIMES DURING WELL DRILLING

Larry J. Gunther, P.O. Box 100, Neola, Utah 84053

Filed Aug. 1, 1988, Ser. No. 226,808
Int. Cl.[4] E21B *44/00*
U.S. Cl. 175—44 22 Claims



SAMPLE COLLECTION TIMES

SAMPLE DEPTH	COLLECTION TIMES FROM 12510 TO 12600 FEET		JULY 05, 1988 21:04
	TIME OF DAY	DATE 7 5	COLLECTION TIME
12,510	16 56		1 17
12,520	17 31		0 57
12,530	17 57		3 42
12,540	18 31		MISSED
12,550	18 56		0 57
12,560	19 30		1 23
12,570	20 10		1 21
12,580	20 43		0 4
12,590	20 48		0 48
12,600	20 53		1 21

1. In a well drilling operation wherein a drilling fluid is pumped down the well to the bottom of the well during drilling of the well, wherein the fluid pumped down the well flows to the surface of the well carrying drill cuttings from the bottom of the well with it, and wherein well personnel are present at the well site during such drilling, an apparatus for determining when a sample of drill cuttings reaching the surface of the well should be collected to provide a sample of drill cuttings cut at a preselected desired well depth and for determining if and when the sample is actually collected, comprising means for tracking the movement of the drilling fluid and drill cuttings carried thereby from the bottom of the well at a preselected depth as they travel to the surface of the well; indicator means for indicating to well personnel that drill cuttings from a preselected well depth are arriving at the surface of the well and that a sample of such cuttings should be collected; reset means to be activated upon collection of the sample to reset the indicator means; and timer means to determine the time between activation of the indicator means and activation of the reset means to thereby indicate when the sample indicated as ready for collection is actually collected.

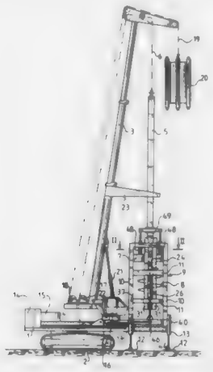
4,860,837

ROTARY AND RECIPROCATING DRILLING MACHINE

Henri F. A. Robert, Herblay, France, assignor to Sorenam, Argenteuil, France

Filed Jul. 21, 1988, Ser. No. 222,544
Claims priority, application France, Jul. 23, 1987, 87 10477
Int. Cl.[4] E21B *3/02, 7/20*
U.S. Cl. 175—113 10 Claims

1. Drilling machine comprising a kelly (5) suspended from a boom (3) mounted for pivoting on a chassis (1), a rotary table (7) through which the kelly is movable axially, drive members provided in the rotary table for rotating the kelly and a rotary drilling tool (8) fixed to a bottom end of the kelly, characterized in that the rotary table (7) comprises at least two protuberances (24) extending symmetrically with respect to the longitudinal axis of the kelly (5), in that the chassis (1) comprises two guide channels (26) disposed one opposite the other so as to receive the protuberances (24) and in that locking means (27) are provided for locking the protuberances (24) at any predetermined height in the guide channels (26), said channels (26) being carried by a cradle (25) mounted on a frame (9) fixed to the chassis (1) for pivoting about a horizontal axis perpendicular to the median longitudinal axis thereof.

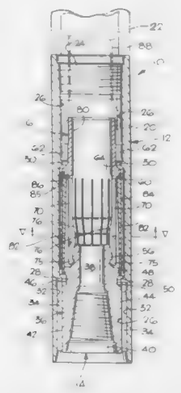


4,860,838

LATCHING BIT SUB

Kare Asak, Calgary, Canada, assignor to Drill Systems International Ltd., Calgary, Canada

Filed Dec. 12, 1988, Ser. No. 283,196
Int. Cl.[4] E21B *17/046, 17/06*
U.S. Cl. 175—320 17 Claims



1. A drill bit latch assembly for use in an earth drilling apparatus, said assembly comprising:

a tubular housing for mounting on the bottom end of a tubular drill string;

holder means for carrying a drill bit, said holder means being axially movable within said housing between a latched position and the bottom end of said housing and being coupled to said housing for rotation therewith; and

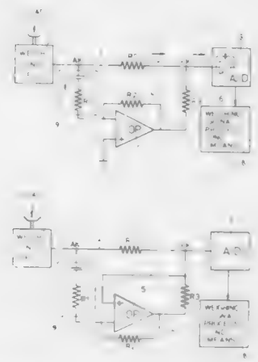
tubular latch means concentrically disposed within said housing in a drill bit holder latching position, said latch means being operable to engage said holder means disposed in said latched position for normally retaining said bit holder means in said position and being responsive to an unlatching tool inserted into said latch means to release said holder means and thereby permit said holder means and a drill bit secured thereto to drop out of said housing under the influence of gravity.

4,860,839

WEIGHING APPARATUS INCLUDING ACTIVE LOW-PASS FILTER MEANS

Arthur Reichmuth, Wetzikon, Switzerland, assignor to Mettler Instruments AG, Greifensee, Switzerland

Filed Jan. 18, 1989, Ser. No. 298,056
Claims priority, application Switzerland, Feb. 5, 1988, 413/88
Int. Cl.[4] G01G *23/10*; H03K *5/00*
U.S. Cl. 177—185 7 Claims



1. In a high-resolution weighing system including a weighing cell (1) having an output terminal for supplying a direct-current loadresponsive weighing signal (I) having an alternating-current interference signal (i) superimposed thereon, analog-to-digital converter means (3) having an output terminal adapted for connection with weighing signal processing means (8), said converter means also having an input terminal, a connecting resistor (RO) connected in series between said weighing cell output terminal and said converter means input terminal, means (9) connected with a decoupling junction (AK) between said weighing cell outlet and said resistor for separating said interference signal from said weighing signal, inverter means (4) for shifting the phase of said interference signal by 180°, and means for reintroducing the phase-shifted interference signal at a recoupling junction (EK) between said resistor and said converter means;

the improvement wherein said reintroducing means comprises a galvanic coupling (R3).

4,860,840

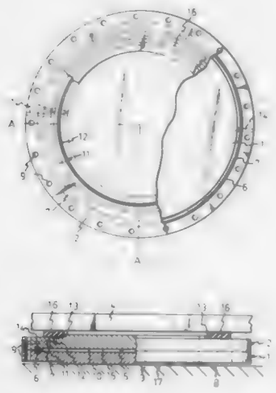
ARRANGEMENT IN A LOAD-SENSING BODY

Lauri Holm, Lidingö, Sweden, assignor to Systemteknik AB, Lidingo, Sweden

Filed May 25, 1988, Ser. No. 198,214
Int. Cl.[4] G01G *5/04, 21/10*
U.S. Cl. 177—208 7 Claims

1. An arrangement in a load-sensing body for weighing machines and the like, comprising a first substantially circular plate circumferentially mounted to a second substantially circular plate such that opposing inner surfaces of said first and second plates define a space therebetween for containing a pressure-sensing fluid, an elastic deformable O-ring seal circumferentially sealing said space, and duct means communicating with said space for providing fluid communication between said space and a pressure transducer means, said first plate having bellows means including at least two radially

spaced circumferentially extending grooves formed respectively in the inner surface and an outer surface of said first plate for allowing movement of a central portion of said first plate toward said second plate upon application of a load to the outer surface of said first plate, and characterized in that elastically yieldable means is arranged to act between the outer



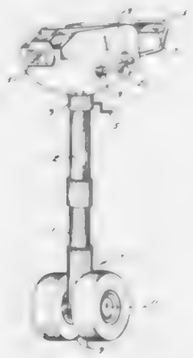
surface of one of said plates and a load supporting means opposite the outer surface of said one plate for elastically yielding upon loading of the outer surface of said first plate such that said central portion of said first plate moves toward said second plate to a lesser degree than it would if said load were applied to the outer surface of said first plate in the absence of said elastically yieldable means.

4,860,841

DEVICE FOR MANEUVERING OF TRAILERS

Angelo Sacco, Rue Garde Dieu 21, B-4900 Liege, Belgium

Filed Feb. 8, 1988, Ser. No. 153,435
Claims priority, application Belgium, Feb. 12, 1987, 08700111
Int. Cl.[4] B60S *9/16*
U.S. Cl. 180—13 5 Claims



1. A motorized device for maneuvering trailers detached from a towing vehicle, the trailers including a drawbar, comprising:

a vertically adjustable shaft attachable to the drawbar of a trailer, said shaft having opposed upper and lower ends;

at least one wheel mounted on said lower end of said shaft, said wheel having an axis perpendicular to said shaft;

at least one driving means for driving said wheel in rotation about said wheel axis, said driving means comprising driving motor means and speed reducer means mounted on said upper end of said shaft wherein said speed reducer means transmits rotary movement to said wheel;

swivelling means for swivelling said wheel, said swivelling means comprising a handle or manual steering wheel operatively connected to said driving motor means; and

said shaft further comprising;

a hollow casing vertically adjustable and adapted for attachment to the trailer drawbar; and

a rotatable pin in said casing, said pin transmitting the rotary movement of said driving means to said at least one wheel.

4,860,842

STEERING SYSTEM IN WHEELED VEHICLE

Masashi Yamashita; Koichi Sugihara, and Hiroshi Kawakami, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 11, 1988, Ser. No. 255,392
Claims priority, application Japan, Oct. 9, 1987, 62-255721
Int. Cl.[4] B62D *5/20*
U.S. Cl. 180—140 4 Claims



1. A steering system in a wheeled vehicle, comprising a front-wheel steering linkage arranged to be operated by a steering wheel, a rear-wheel steering linkage including a lateral control shaft operatively connected at the opposite ends thereof with a set of rear steerable road wheels, and a rear-wheel steering mechanism operatively connected to said front-wheel steering linkage for effecting axial displacement of said control shaft in response to operation of said front-wheel steering linkage, said rear-wheel steering mechanism comprising a housing mounted on a body structure of the vehicle for axially slidably and rotatably supporting thereon said control shaft, a first carrier body mounted within said housing for rotation about a vertical axis perpendicular to the central axis of said control shaft and arranged to be rotated in response to operation of said front-wheel steering liknage, a second carrier body mounted within said first carrier body for rotation about the central axis of said control shaft, a radial rod integral with said control shaft and being slidably and rotatably carried by said second carrier body, and an actuator assembly mounted on said housing for rotating said control shaft,

wherein said actuator assembly comprises a hydraulic power cylinder mounted on said housing and having a piston axially slidably disposed therein to subdivide the interior of said cylinder into a pair of fluid chambers one of which is supplied with hydraulic fluid under pressure and the other of which is connected to a fluid reservoir and a piston rod connected at one end thereof with said piston for axial movement therewith, resilient means for biasing said piston toward a forward stroke end against the hydraulic pressure applied thereto, and a drive mechanism arranged between said power cylinder and said control shaft to rotate said control shaft in accordance with axial movement of said piston rod in such manner that said radial rod of said control shaft is retained on the vertical axis when said piston has been positioned in the forward stroke end under the biasing force of said resilient means.

4,860,843

PULLING OR LOADING VEHICLE WITH FREE SPACE BETWEEN THE REAR WHEELS

Eduard Baltensperger, Brüttea, Switzerland, assignor to Eduard Baltensperger, Brütten and Kurt Eicher, Regensdorf, both of, Switzerland

Filed Jun. 21, 1988, Ser. No. 210,573
Claims priority, application Switzerland, Jul. 1, 1987, 2497/87
Int. Cl.[4] B60K *17/00*
U.S. Cl. 180—373 13 Claims



1. A pulling or loading vehicle, particularly a tractor, comprising

two front and two rear wheels;

drive means for driving at least said rear wheels;

a substantially rigid vehicle frame supporting the front wheels of said vehicle and said drive means, said frame having a front end and a rear end; and

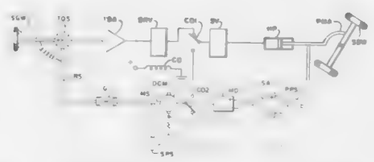
wheel mounting means rigidly attached to said vehicle frame for rotatably supporting said rear wheels of said vehicle, said wheel mounting means comprising longitudinally extending struts spaced outwardly from said rear end and laterally spaced from each other, thereby defining an open space between said rear wheels in which auxiliary equipment for said vehicle can be mounted.

4,860,844

POWER STEERING SYSTEM

Walter K. O'Neil, Birmingham, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 29, 1988, Ser. No. 187,109
Int. Cl.[4] B62D *5/04*
U.S. Cl. 180—79.1 10 Claims



1. Power steering apparatus for a vehicle having a cab, a steering wheel and steered wheels comprising:

means communicating with said steered wheels for sensing their positions and for providing a first electrical signal related thereto;

mechanical position means (G) in the cab settable for representing the position of the steered wheels;

means (MS, DCM) receiving said first signal and responsive thereto for setting and holding said mechanical position means to represent the position of the steered wheels;

means for coupling a reaction torque from said mechanical position means to the steering wheel so as to oppose torque applied by a driver to the steering wheel;

torque sensing means (TQS, TLS) intermediate said mechanical position means and said steering wheel for sensing driver torque applied at the steering wheel and for producing an electrical demand signal in accordance therewith;

means receiving said demand signal and responsive thereto for applying to the steering wheels an amplified torque;

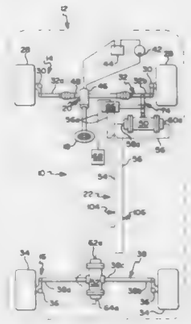
whereby no mechanical or hydraulic linkages must connect from the cab to other areas.

4,860,845

FOUR WHEEL STEERING SYSTEM

David A. Janson, Plymouth, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 2, 1988, Ser. No. 240,880
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—140 7 Claims



1. A steering apparatus for a wheeled vehicle having front and rear dirigible wheel assemblies, the apparatus comprising:

first means for transmitting left and right steering movement to a front wheel steering assembly in response to a steering wheel being turned left and right from a neutral position to effect left and right steering angles of the front wheels;

second means for transmitting steering movement to a rear wheel steering assembly in response to steering movement of the front wheel steering assembly; the second means characterized by:

a closed hydraulic system including first and second closed fluid flow branches comprising a fluid displacement assembly and a hydraulic actuator assembly each including a reciprocal piston disposed in a bore of a housing defining a first and a second variable fluid volume at each end of the piston, the system including means for mechanically connecting the displacement and actuator pistons respectively to the front and rear wheel steering assemblies;

the first and second fluid flow branches respectively including one volume of each assembly; and

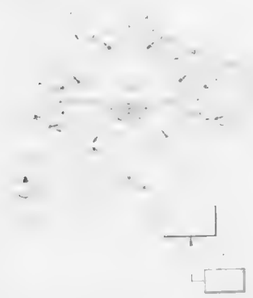
a control assembly including a rear wheel steering direction valve interposed in the branches between the assemblies, and having a valving member movable to a same direction position interconnecting the first and second displacement assembly volumes respectively with the first and second actuator assembly volumes for effecting same direction steering of the front and rear wheels and movable to an opposite direction position interconnecting the first and second displacement assembly volumes respectively with the second and first actuator assembly volumes for effecting opposite direction steering of the front and rear wheels.

4,860,846

VEHICLE SPEED RESPONSIVE VARIABLE ASSIST POWER STEERING SYSTEM

Koh Uchida, Sagamihara; Takashi Kurihara, Atsugi, and Makoto Miyoshi, Kawasaki, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 28, 1987, Ser. No. 138,490
Claims priority, application Japan, Dec. 27, 1986, 61-313521
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—141 4 Claims



1. A variable assist power steering system for vehicles including a hydraulic fluid source, a fluid reservoir, and a hydraulic pressure operated power cylinder adapted to be connected to a steering linkage, comprising:

a control valve including valve elements relatively displaceable in response to a predetermined variable to define therebetween two parallel fluid flow paths connected between the fluid source and the fluid reservoir to produce pressure difference in the power cylinder in response to said predetermined variable,

said two parallel fluid paths including a plurality of first variable flow orifices, each having an orifice area variable in response to said predetermined variable, wherein said control valve comprises a second variable flow orifice that has an orifice area variable in response to said predetermined variable, said second variable flow orifice being arranged in series with one of said first variable flow orifices, and a bypass path provided with an externally controlled variable flow orifice valve that has an orifice area variable in response to a second predetermined variable which is different from said predetermined variable, said bypass path having one end connected to one of said two parallel fluid flow paths at an intermediate portion between said second variable flow orifice and the adjacent one of said variable flow orifices.

4,860,847

VEHICLE TRACTION CONTROL DEVICE

Shuji Shiraishi; Masakazu Sakaguchi, and Takashi Nishihara, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1988, Ser. No. 181,954
Claims priority, application Japan, Apr. 17, 1987, 62-94392; Apr. 17, 1987, 62-94393
Int. Cl.[4] B62D *28/16*
U.S. Cl. 180—197 3 Claims

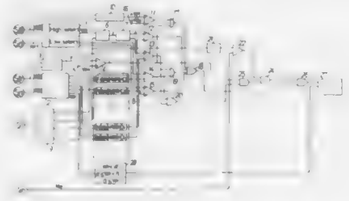
1. A vehicle traction control device, comprising:

an excessive slip detecting means for detecting an excessive slip in a driving wheel which is driven by an engine;

an engine output controller for deactivating a combustion stroke of the engine in response to detection of the excessive slip by said detecting means;

a vehicle speed index output means for outputting an index representative of a vehicle speed; and

a combustion stroke deactivating means for reducing a rate of a period of deactivating the combustion stroke of the



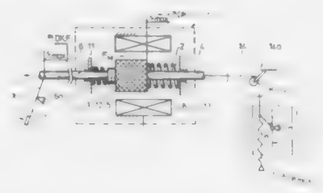
engine per revolution of the engine, caused by said engine output controller, in accordance with said index.

4,860,848

APPARATUS FOR ACTUATING THE THROTTLE VALVE OF AN INTERNAL COMBUSTION ENGINE

Guenter Barth, Korntal-Munch.; Alwin Stegmaier, Schwieberdingen, and Anton van Zanten, Ditzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 27, 1988, Ser. No. 199,884
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1987, 3719323
Int. Cl.[4] B60K *28/16, 26/00;* F02D *9/02, 11/02*
U.S. Cl. 180—197 31 Claims



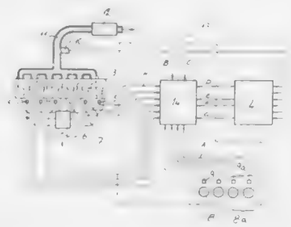
1. An apparatus for actuating the throttle valve of an internal combustion engine disposed in a motor vehicle, having means for its adjustment independently of an intention of the operator thereof, in particular adapted selectively for at least one of drive slip control (ASR) and engine drag moment control (MSR) in said motor vehicle driven by the engine via actuation of a driving pedal (7), a disconnect point being (12/5; 17/18; 17'/18') provided to interrupt a connection with a throttle valve (9), during a course of movement of said driving pedal (7), first, second and third springs having spring forces (F(1); F(2); F(3)) being provided to act on opposite sides of said disconnect point, said spring forces being dimensioned such that the disconnect point is closed during normal driving pedal actuation, an electromagnetic linear adjuster (10) disposed between the disconnect point (12/5; 17/18; 17'/18') and the throttle valve (9) to introduce and maintain a throttle valve movement upon receipt of an ASR or MSR signal, said electromagnetic linear adjuster being operative independently of or counter to the driving pedal positon.

4,860,849

METHOD AND APPARATUS FOR ELIMINATION OF WHEEL SPIN OF VEHICLES

Bengt H. Andersson, and Kent I. Palmgren, both of Eskilstuna, Sweden, assignors to Autoliv-Cipro Aktiebolag, Eskilstuna, Sweden

Filed Mar. 18, 1988, Ser. No. 169,841
Claims priority, application Sweden, Mar. 20, 1987, 8701170
Int. Cl.[4] B60K *31/00*
U.S. Cl. 180—197 11 Claims



9. An apparatus for preventing unacceptable wheel spinning and subsequent lateral sliding of a vehicle which includes: driving and idle wheels; an engine having combustion cylinders fired in an ignition order, and inlet and exhaust valves; and an air and fuel supply means including a throttle for sequentially supplying an optimum amount of air and fuel to each one of said cylinders; comprising a calculation and control means having

means for determining a maximum acceptable wheel spinning limit value;

means for determining an actual wheel spinning value by comparing the actual rotation speed of said driving wheels with the actual rotational speed of said idle running wheels;

means for comparing said acceptable wheel spinning limit value with said actual wheel spinning value and if the latter is higher than the former generating a wheel spinning signal;

means responsive to said wheel spinning signal for completely inhibiting the supply of fuel to one or more of said cylinders while simultaneously continuing the supply of said optimum amount of air and fuel to all of the non-inhibited cylinders and

means for successively increasing the number of said inhibited cylinders to thereby reduce the torque output of said engine until said actual wheel spinning value equals or is lower than said acceptable wheel spinning value.

4,860,850

SADDLE RIDING TYPE VEHICLE

Hirotake Takahashi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 790,485, Oct. 23, 1985, abandoned.
This application Jul. 6, 1987, Ser. No. 70,127
Claims priority, application Japan, Oct. 26, 1984, 59-225398; Dec. 19, 1984, 59-268172
Int. Cl.[4] B62D *61/08*
U.S. Cl. 180—215 2 Claims

1. A saddle type riding vehicle having a pair of driving wheels comprising:

a body;

a power unit mounted on said body;

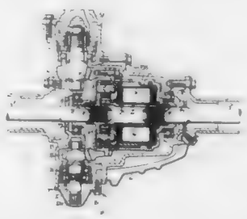
a drive pinion rotatably driven by said power unit;

a pair of axially aligned, oppositely extending, independently rotatable wheel axles mounting the driving wheels of said vehicle;

a housing supported by said body containing means for rotatably mounting said drive pinion and said wheel axles;

a differential mechanism in said housing drivingly connecting said wheel axles to said drive pinion, said differential mechanism comprising a differential case attaching an external ring gear drivably connected to said drive pinion and an internal ring gear, a plurality of planetary gears drivably connected to said internal ring gear, a planetary gear carrier drivably connected to one of said wheel axles and a sun gear driven by said planetary gears drivably connected to the other of said wheel axles;

a differential control means within said housing operative to increase the differential torque to said wheel axles in response to an increase in relative rotational velocity therebetween, said differential control means comprising a cylindrical wall connected to one of said axles in concentrically spaced relation from the axis thereof to form a substantially closed chamber, said chamber containing a



fluid body and alternately disposed first and second clutch plates movably connected to said cylindrical wall and to the other wheel axle, respectively, said fluid body immersing said clutch plates, whereby reactive forces imposed on said clutch plates due to relative movement between said clutch plates and said fluid body in response to differential rotational movement between said axles operates to retard said differential rotational movement; and

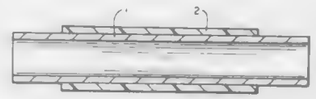
a power takeoff shaft rotatably mounted on and extending through said housing, one end of said shaft disposed within said housing and mounting an input gear engaging said ring gear and the other end of said shaft being disposed exteriorly of said housing and containing means for selectively drivingly connecting a work producing apparatus.

4,860,851

DIMENSIONALLY-RECOVERABLE DAMPING ARTICLE

David H. Krevor, San Carlos, and Paul Martens, Fremont, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 27, 1987, Ser. No. 7,050
Int. Cl.[4] F16F *15/00*
U.S. Cl. 181—207 11 Claims



1. An article for acoustic damping of a substrate, comprising

(i) a damping first layer comprising a material that

(a) alone exhibits viscoelastic damping, having a tangent delta value of at least 0.2 at a temperature between −10° C. and 300° C. and at a frequency between 5 and 100,000 Hz; and

(ii) a constraining layer that is laminated to a substantial portion of a major surface of said first layer and that

comprises a material that is dimensionally-recoverable having a recovery of at least 10%;

the first and second layers together having a tangent delta value of at least 0.1 at a temperature between −10° C. and 300° C. and at a frequency between 5 and 100,000 Hz; and being capable of exhibiting constrained layer damping when installed on the substrate.

4,860,852

ASSEMBLY FOR MOUNTING AN EXHAUST SYSTEM ON AN EXHAUST GAS SOURCE SOURCE OF AN INTERNAL COMBUSTION ENGINE

Assen Valev, Perchtoldsdorf, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Nov. 14, 1988, Ser. No. 271,119
Claims priority, application Austria, Nov. 24, 1987, 3086/87
Int. Cl.⁴ F01N *7/10*
U.S. Cl. 181—240 **10 Claims**



1. In a mounting assembly for mounting an exhaust system on an exhaust gas source structure of an internal combustion engine and for connecting inlet means of said exhaust system to exhaust gas outlet means of said source structure, comprising

a holder, which is adapated to carry said exhaust system and has passages which are adapted to be connected to said inlet means,

metal bellows means, which are connected to said passages and adapted to be connected to said exhaust gas outlet means, and

a plurality of axial vibration dampers, which are connected to said holder and adapted to mechanically connect said holder to said source structure in operating positions in which the axes of said dampers lie in a plane,

the improvement residing in that

said plurality of axial vibration dampers consist of three dampers, not more than two of which have axes which are adapted to be parallel to each other in said operating positions, and

three additional axial vibration dampers are connected to said holder and adapted to mechanically connect said holder to said source structure in operating positions in which the axes of said additional dampers are parallel to each other and intersect said plane.

4,860,853

STAMP FORMED MUFFLER WITH NONPLANAR ARRAY OF TUBES

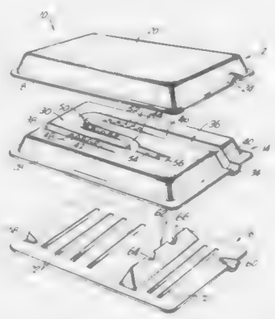
Walter G. Moring, III, Toledo, Ohio, assignor to AP Parts Manufacturing Company, Toledo, Ohio

Filed Dec. 20, 1988, Ser. No. 287,391
Int. Cl.⁴ F01N *1/02, 7/18*
U.S. Cl. 181—282 **16 Claims**

1. An exhaust muffler comprising:

a first external shell formed to define a peripheral portion and a nonplanar portion extending away from the peripheral portion;

an internal plate formed to define a peripheral portion and a nonplanar portion extending from said peripheral portion, said internal plate being formed to be placed in nested generally face-to-face relationship with the first external shell, said internal plate further being formed to define a nonplanar array of channels in the nonplanar portion of the internal plate, said channels being formed to be in spaced relationship to said first external shell when said internal plate and said first external shell are disposed in nested relationship to one another, such that an array of tubes are defined between the first external shell and the channels formed in the internal plate, said channels formed in the internal plate being provided with a plurality of aperture means for permitting the flow of exhaust from the array of channels, said array of tubes defined by said channels and by said first external shell defining at least one inlet to the muffler and at least one outlet from the muffler; and



a second external shell secured to the peripheral portion of said internal plate such that at least one chamber is defined intermediate said second external shell and said internal plate.

4,860,854

RETRACTABLE LADDER ASSEMBLY

Gus A. Lodholz, Jr., 1010 Flora La., Florissant, Mo. 63031

Filed Sep. 6, 1988, Ser. No. 240,531
Int. Cl.⁴ B60R *3/02;* **E06C** *5/04*
U.S. Cl. 182—88 **12 Claims**



1. A ladder assembly for vehicles comprising:

a ladder, a storage portion, and a bracing portion;

said ladder being slidably attached to said storage portion for movement between a retracted storage position in said storage portion and a substantially vertical operative position, said ladder being conveniently and reachably displaced above the ground in the operative position allowing easy access to a vehicle compartment inconveniently displaced from the ground;

said storage portion having means for retractably and securely storing said ladder when not in use; and

said bracing portion comprising vertically offset members at opposite sides of said ladder preventing swinging movement of the ladder in its operative position towards said storage portion.

4,860,855

COLLAPSIBLE SAFETY ATTACHMENT FOR LADDER

Jon D. Riley, 159 Hill Dr., Vallejo, Calif. 94590

Continuation-in-part of Ser. No. 83,592, Aug. 6, 1987, Pat. No. 4,770,272. This application Mar. 17, 1988, Ser. No. 169,792
Int. Cl.⁴ E06C *7/18*
U.S. Cl. 182—106 **11 Claims**



1. A safety attachment for use with a ladder having a plurality of spaced rungs comprising:

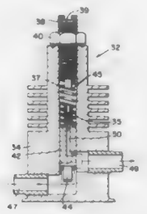
a frame having means thereon for removably coupling the frame to at least a pair of the rungs of the ladder with the frame having a part extending outwardly from the ladder, said frame part having means for locking a leg of the user on the ladder, whereby the user can extend laterally of the ladder while remaining locked to the frame when the frame is coupled to the ladder, said frame being collapsible to reduce the size thereof.

4,860,856

OIL PRESSURE ADJUSTMENT DEVICE FOR ENGINES

Dwaine E. Esslinger, 712 Montecito, San Gabriel, Calif. 91733

Filed Jun. 28, 1988, Ser. No. 212,513
Int. Cl.⁴ F01M *1/18, 49/08*
U.S. Cl. 181—6.4 **3 Claims**



1. In combination with an engine lubrication system having a high side and a low side, the improvement comprising:

a bypass means extending from the high side around the lubrication system to the low side, said bypass means including a pressue-responsive valve operable to pass liquid through the bypass means when the high side pressure is above a predetermined value,

said pressure-responsive valve comprising a housing having a bore extending from one of its faces, threads formed in the outer end area of the bore, a flow control piston slidably positioned in an unthreaded portion of the bore, a set screw threaded into the threaded area of the bore, a compression spring trained between the set screw and the piston for biasing the piston toward the blind end of the bore, an inlet passage extending into the housing in liquid communication with the blind end of the bore, and an outlet passage extending into the housing to communicate with a point on the bore spaced axially from the inlet passage communication point, whereby movement of the piston away from the blind end of the bore brings the outlet passage into liquid communication with the inlet passage, and

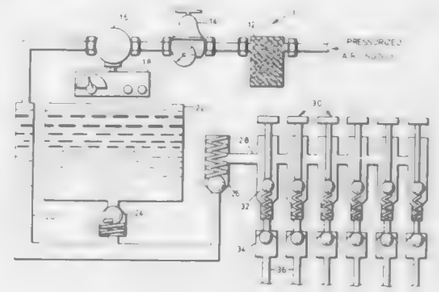
an L-shaped pressure-equalization passage in the piston to maintain the space occupied by the spring at the same pressure as the outlet passage, said L-shaped passage having one leg exposed to the space occupied by the spring and the other leg exposed to the outlet passage.

4,860,857

PISTONLESS AIR POWERED LUBRICATING SYSTEM

Dale J. Warner, Palm Harbor, Fla., assignor to Gits Manufacturing Company, Creston, Iowa

Filed Jun. 27, 1988, Ser. No. 212,289
Int. Cl.⁴ F16N *13/22;* **F04F** *1/06*
U.S. Cl. 184—7.4 **3 Claims**



1. A cyclic lubrication system, comprising:

a solenoid connected to a pressurized air supply and an adjustable timer connected to and cyclically operating said solenoid in an on-off cycle;

an injector manifold including a lubricant input, a plurality of lubricant outputs, a plurality of injector valves connected to said lubricant input, and the plurality of output check valves each connected to a respective injector valve and serving as a respective lubricant output of said injector manifold;

a reservoir holding a lubricant;

a lubricant chamber connected to receive lubricant from said resevoir and connected between said solenoid and said injector manifold to be presurized and deliver lubricant to said manifold during the on portion of the cycle;

a reservoir check valve connecting said reservoir to said lubricant chamber and operable to open in response to the weight of the lubricant inthe reservoir during the off portion of the cycle to gravity feed lubricant to said lubricant chamber; and

a manifold check valve connecting said lubricant chamber to said lubricant input of said manifold and operable to open during the on portion of the cycle and closed during the off portion of the cycle and wherein

said reservoir check valve comprises a passageway including a valve seat and a ball in said passageway; and

a spring urging said ball towards said resevoir during the off portion of the cycle.

4,860,858

SPOT-TYPE DISC BRAKE WITH RESETTING MEANS

Ralf Erbes, Vallendar; Albert Laggert, Neuwied; Frank-Wilhelm Madzgalla, and Hans-Georg Madzgalla, both of Koblenz, all of Fed. Rep. of Germany, assignors to Lucas Industries public limited Company, Birmingham, England

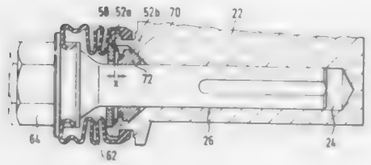
PCT No. PCT/EP87/00694, § 371 Date Jun. 30, 1988, § 102(e) Date Jun. 30, 1988, PCT Pub. No. WO88/03614, PCT Pub. Date May 19, 1988

PCT Filed Nov. 10, 1987, Ser. No. 223,068

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1986, 8630214[U]; Aug. 31, 1987, 8711776[U]

Int. Cl.[4] F16D *65/54*

U.S. Cl. 188—71.8 6 Claims



1. Spot-type disc brake comprising

a floating caliper member which is displaceably guided on a brake support member by means of sliding pins,

an inner and an outer brake pad which are displaceable parallel to the sliding pins with respect to the brake support member,

an actuator with which the inner brake pad is operable directly and the outer brake pad by displacement of the floating caliper, and

a resetting means on at least one of the sliding pins carried by one of said members including a spring which is arranged around the sliding pin as part of a frictional connection between said pin and a bore in the other of said members guiding said pin and is resiliently yieldable to a limited extent in an axial direction,

the bore comprising at one end, from which the associated sliding pin is inserted into said bore, a widening in which the spring is installed, wherein

the spring comprises a first and a second spring element,

the first spring element is a coil spring and biased in axial direction, one end of said first spring element is supported by a rigid ring which is attached to an edge of the widening, and an other end of said first spring element is supported at the second spring element, said first spring element reacting against said second spring element to reset said floating caliper to its original position upon release of the brake,

the second spring element comprises a conical surface which is urged into engagement with a complementary conical surface of said widening of said bore by the axial bias of said first spring element, characterized in that

said second spring element is a slit ring which is radially biased into engagement with said pin and said radial bias is substantially greater than said axial bias produced by said first spring element, and that

said second spring element and said first spring element act together to retain said pin substantially rattle free within said bore.

4,860,859

BRAKE DEVICE

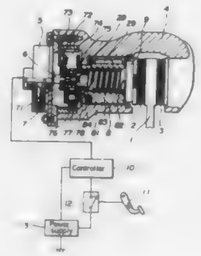
Kouhei Yamatoh, and Masami Ogura, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1988, Ser. No. 183,008

Claims priority, application Japan, Apr. 17, 1987, 62-094929

Int. Cl.[4] F16D *65/21*

U.S. Cl. 188—72.1 9 Claims



1. A brake device arranged to press a friction member against a member to be braked, thereby applying a braking action to said member to be braked, said brake device comprising;

an ultrasonic motor including a stator, a rotor and a piezoelectric vibrator mounted on the stator to generate an elastic travelling wave to drive said rotor; and

torque converting means for converting a rotating torque produced by said ultrasonic motor into a pressing force for pressing the friction member against the member to be braked, said pressing force being transmitted to said friction member.

4,860,860

AUTOMATIC TRANSMISSION CASING WITH SERVOMOTOR AND ANCHOR PIN INSTALLED IN UPPER SIDE OF CASING

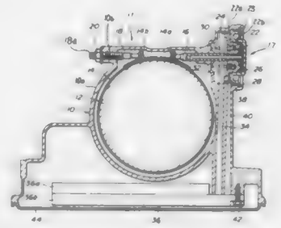
Osamu Furuya, Isehara, and Hiromi Taguchi, Zama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 31, 1988, Ser. No. 264,719

Claims priority, application Japan, Oct. 30, 1987, 62-273228

Int. Cl.[4] F16D *51/00*

U.S. Cl. 188—77 R 8 Claims



1. An automatic transmission comprises:

a casing receiving therein a power transmitting mechanism and having opposed upper and lower side portions;

a control valve installed in said lower side portion of said casing; and

a band brake for controlling the operation of said power transmitting mechanism, having a brake band, a servomotor operatively connected to said control valve and one end of said brake band for selectively putting said brake band into a brake engaged state and a brake disengaged state and an anchor pin operatively connected to the other end of said brake band for supporting a reaction, force therefrom;

said servomotor and said anchor pin being installed in said upper side portion of said casing.

4,860,861

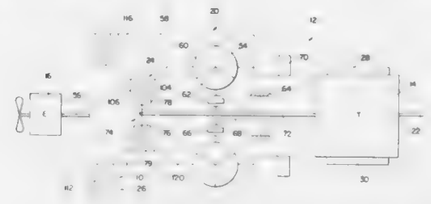
TORQUE CONVERTER LOCK-UP AND DISCONNECT CLUTCH STRUCTURE

Douglas C. Gooch, Galesburg, and Timothy J. Morscheck, Kalamazoo, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 17, 1987, Ser. No. 98,104

Int. Cl.[4] F16D *33/00*

U.S. Cl. 192—3.26 14 Claims



1. A torque converter and clutch structure (**10**) for a drive system of the type comprising a torque converter (**20**) drivingly interposed a prime mover (**16**) and an input shaft (**72**) of a mechanical change gear transmission (**14**), said torque converted having an impeller input member (**54**) adapted to be driving by said prime mover and a turbine output member (**67**) fluidly driven by said impeller input member, said torque converter and clutch structure characterized by:

a first connecting member (**74**) adapted to be rotationally fixed to said input shaft;

a second connecting member (**79**) adapted to be rotationally fixed to said input shaft;

a first friction clutch (**24**) selectively engagable and disengagable to drivingly connect and disconnect, respectively, said first and second connecting members, said first friction clutch comprising at least one first friction member (**104**) carried for rotation with said first connecting member (**74**) and at least one second friction member (**106**) carried for rotation with said second connecting member;

a second friction clutch selectively engageable and disengageable to drivingly connect and disconnect, respectively, said torque converter impeller input member (**54**) to said second connecting member, said second friction clutch comprising at least one third friction member (**112**) fixed for rotation with said second connecting member and at least one fourth friction member (**116**) fixed for rotation with said impeller input member;

said first friction clutch providing the sole driving connection between said input shaft and said prime mover and the sole driving connection between said unput shaft and the turbine of said torque converter; and

means (**38, 40, 50**) to independently engage and disengage said first and second friction clutches.

4,860,862

CLUTCH/BRAKE UNIT WITH SELF-CONTAINED ACTUATING PUMP SYSTEM

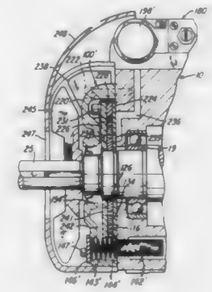
Jerry L. Yater, and Stephen L. Carmichael, both of Hamilton, Ohio, assignors to Force Control Industries, Inc., Fairfield, Ohio

Continuation-in-part of Ser. No. 880,189, Jun. 30, 1986, Pat. No. 4,739,865. This application Apr. 18, 1988, Ser. No. 182,341

The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

Int. Cl.[4] F16D *67/04*

U.S. Cl. 192—18 A 19 Claims



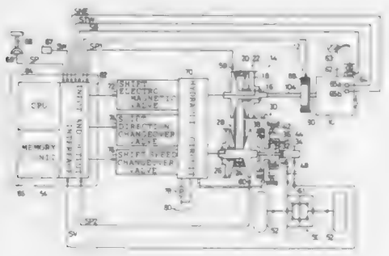
1. Apparatus comprising a housing having means for containing a supply of oil, an input shaft and an output shaft rotatably supported within said housing on a common axis of rotation, a series of interfitting clutch plates and clutch discs within said housing, said clutch plates mounted on said input shaft for rotation therewith and the interfitting said clutch discs mounted on said output shaft for rotation therewith, a piston supported within said housing for axial movement, means connected to said housing and cooperating said said piston to define a clutch pressure chamber, means connected to said piston for applying an axially compressive force to said series of clutch plates and discs in response to movement of said piston in one axial direction to couple said input shaft with said output shaft, means for recirculating oil within said housing and between said plates and discs, a high pressure hydraulic gear pump including a pump body supported by said housing and enclosing a substantially flat inner rotor secured to said input shaft for rotation therewith, a generally flat outer rotor surrounding said inner rotor, said inner and outer rotors connected by intermeshing teeth, said outer rotor having a rotary axis eccentric to said axis of said shaft, an annular wear plate disposed between said housing and said pump body and engaging said inner and outer rotors, means defining an oil receiving passage within said wear plate adjacent said teeth, means defining an inlet passage for directing oil within said housing to said pump, means defining an outlet passage for directing pressurized oil from said pump to said clutch pressure chamber, valve means connected to control the flow of oil through said outlet passage to said clutch pressure chamber, means for adjusting said valve means to control the hydraulic pressure to said clutch pressure chamber for conveniently selecting the torque transmitted through said clutch plates and discs, said inlet passage being disposed within the lower portions of said housing and said pump body, an oil filter within said inlet passage, and means on said pump body for removing said oil filter.

4,860,863

METHOD AND APPARATUS FOR CONTROLLING A CLUTCH OF A VEHICLE

Takashi Hayashi, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 1, 1988, Ser. No. 200,918
Claims priority, application Japan, Jun. 4, 1987, 62-140507
Int. Cl.[4] B60K *41/02*; F16D *37/02*
U.S. Cl. 192—0.033 6 Claims



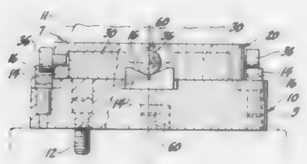
1. A clutch control apparatus for a vehicle comprising:
a clutch connected, at an input side thereof, to an engine and having an actuator for changing a transmitting torque thereof;
first detecting means for detecting speed Ne of said engine;
second detecting means for detecting speed N_{in} of an input shaft of a transmission, said input shaft being connected to the output side of said clutch;
means for calculating a speed ratio $e=N_{in}/Ne$ from said speeds Ne and N_{in};
means for determining a fluid coupling capacity factor C of said clutch from a predetermined relationship between said speed ratio e and said fluid coupling capacity factor C; and
means for calculating a transmitting torque Tcl of said clutch using said fluid coupling capacity factor C and said engine speed Ne and outputting said torque Tcl of said actuator.

4,860,864

CLUTCH FOR ROBOT OR LIKE

Walter Cwycyshyn, Harsens Island, and Frank J. Kudwa, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 16, 1987, Ser. No. 121,405
Int. Cl.[4] B25J *17/02, 19/00*
U.S. Cl. 192—56 R 7 Claims



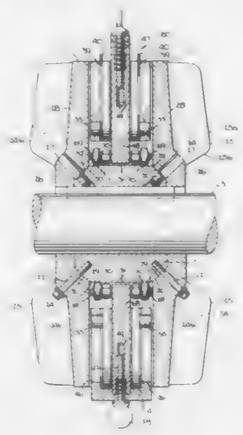
1. A clutch adapted for connection between a robot or like and an attached end of arm tool (EOAT) for separation upon an applied load upon said EOAT beyond a predetermined amount, said clutch in combination comprising:
a first plate for connection with said robot or like, said first plate having tapered masts;
a second plate for connection with said EOAT having a fixed relationship with respect to said first plate, and said second plate having sensing means to provide a signal to said robot or like upon separation of said second plate from said first plate, said second plate further including means of connection to allow said second plate to hang from said first plate upon separation of said second plate from said first plate and said second plate having rotative cam members nested within said tapered cam nests of said first plate whereby rotation of said second plate with respect to said first plate causes said second plate to be urged away from said first plate; and
permanent magnets connected with said first second plate holding said first and second plates together in a fixed relationship with one another whereby said second plate moves relative to said first plate when said second plate is moved torsionally along at least one of three coordinate axis or transversely along at least one of two linear axis via an applied load on said EOAT beyond a predetermined amount and the load transmitted between said plates diminishes instantaneously upon any separation of said second plate from said first plate.

4,860,865

QUICK RELEASE, HIGH TORQUE, FRICTION BRAKES AND CLUTCHES

William W. Montalvo, III, Raymond, and Philip R. Metcalf, Jr., West Brook, both of Me., assignors to The Montalvo Corporation, Portland, Me.

Filed Sep. 10, 1987, Ser. No. 95,301
Int. Cl.[4] F16D *13/40, 55/04*
U.S. Cl. 192—70 17 Claims



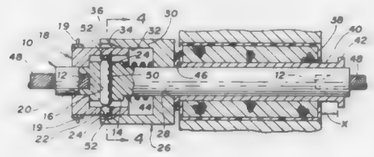
1. An assembly for use in a friction coupling mechanism of the type wherein relative rotation between two bodies is controlled by selective engagement of friction members, comprising a body carrying at least one friction member and a locking torque post extending transversely across said body and normally holding said friction member in a working position, said torque post being releasable from a locking position and movable to allow sliding removal of the friction member and wherein said torque post is secured to said body by a thumbscrew which can be manipulated to release said torque post from its locking position without removal of the thumbscrew.

4,860,866

VEHICLE SEAT ADJUSTER CLUTCH

Carl E. Stanek, Hamtramck, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 20, 1988, Ser. No. 209,159
Int. Cl.[4] F16D *11/06*
U.S. Cl. 192—71 3 Claims



1. A self aligning clutch for selectively transferring torque in a vehicle seat adjuster mechanism, comprising,
a generally cylindrical shaft supported on said vehicle so as to spin about its axis, said shaft including a passage therethrough normal to said axis that slidably supports a rod therein with an end to end length greater than the length of said passage,
a powered member having a cylindrical wall that is supported on said vehicle so as to be driven about its axis coaxial to said shaft and in surrounding relation to the ends of said rod, said cylindrical wall further having spaced holes on its circumference for supporting a pair of balls therein for radial movement in and out of said holes from a first position where said balls are spaced apart farther than the length of said rod to a second position where said balls are spaced apart less than the length of said rod, said balls also being supported in said wall with an angular offset corresponding to the width of said rod, and,
control means selectively operable from an on mode that confines said balls in said second position to an off mode that allows said balls to move back to said first position, whereby, in said off mode, said balls will be moved out to their disengaged position by contact with the ends of said rod, which contact will self center said rod within its passage so that it does not positively engage either of said balls, while in said on mode, said rod will be shifted within said passage by contact of one rod end with one of said balls, thereby bringing the side of said other rod end against said other ball to automatically create a positive driving connection between said powered member and said shaft.

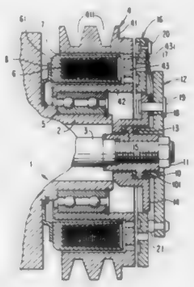
4,860,867

ELECTROMAGNETIC CLUTCH

Kazuo Nishimura, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Jun. 30, 1987, Ser. No. 67,879
Claims priority, application Japan, Jul. 14, 1986, 61-163687
Int. Cl.[4] F16D *27/10, 3/68*
U.S. Cl. 192—84 C 12 Claims

1. In an electromagnetic clutch including a first rotatable member having an axial end plate of magnetic material, a second rotatable member connected to a drive shaft, an annular armature plate of magnetic material disposed to face said axial end plate of said first rotatable member with an axial gap therebetween, said annular armature plate being capable of limited axial movement, and electromagnetic means associated with said axial end plate for attracting said armature plate to said axial end plate of said first rotatable member, the improvement comprising:
a boss element forming at least a part of said second rotatable member, said boss element comprising a double sided wave-shaped portion, plate means coupled to said armature plate and having wave-shaped portions for interfacing with said wave-shaped portion of said boss element, and an elastic element mounted between said wave-shaped portions of said boss element and said plate means to absorb torsional and vibrational forces upon actuation of said electromagnetic clutch, wherein said plate means further comprises a pair of axially extending flanges on which said wave-shaped portions are mounted.

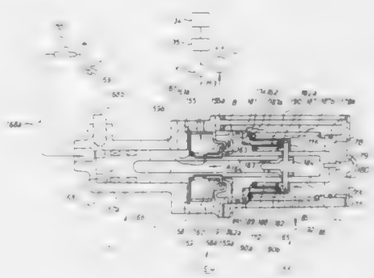


4,860,868

AIR PRESSURE CONTROL VALVE OF AN AIR CLUTCH

Kiyoharu Murakami, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Mar. 10, 1988, Ser. No. 166,342
Claims priority, application Japan, Mar. 11, 1987, 62-56146; Mar. 17, 1987, 62-61943
Int. Cl.[4] F16D *25/14*
U.S. Cl. 192—85 R 3 Claims



1. An air pressure control valve for an air clutch wherein an air valve assembly interlocking with the operation of a clutch pedal controls air pressure supplied from an air pressure source to the air clutch, said air valve assembly including a first valve body for supplying air pressure from said air pressure source to said air clutch when said clutch is engaged and a second valve body interlocking with said clutch pedal for releasing said air pressure supplied to said air clutch when said clutch is disengaged characterized by a piston slidably arranged in a cylindrical cylinder fixed to one end surface of said air valve assembly, a hydraulic chamber connected to a master cylinder interlocking with said clutch pedal between said piston and said cylinder, a rod penetrating said air valve assembly fixed to said piston, a cylindrical body fixed to the other end surface of said air valve assembly, a first balance piston slidably arranged in said cylindrical body, said second valve body closely contacting said first valve body and positioned at one end surface of said first balance piston, a cylindrical projection formed on the other end surface of said first balance piston, a second balance piston slidable with respect to said cylindrical body at the end

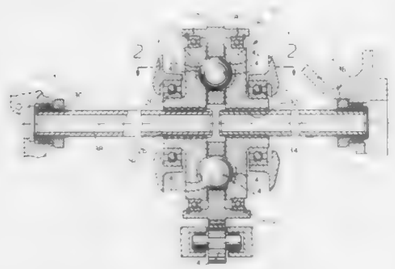
of said cylindrical projection, an air chamber formed between said second balance piston and an end cover of said cylindrical body, said air chamber having an air passage to which compressed air to be supplied to said air clutch is introduced, said cylindrical projection including a long aperture having a predetermined length, a pin fixed to the end of said rod fitted into said long aperture, a first spring member operating against the hydraulic force from said hydraulic chamber and second and third spring members setting a valve-opening pressure of the second valve body positioned between said cylindrical body and said rod, said first, second and third spring members being concentrically disposed to operate in series, a spring force transmission mechanism for transmitting the spring force of said second and third spring members to said second valve body, and air pressure suitable for clutch controlling being obtained by slide positioning said piston with hydraulic pressure from said master cylinder interlocking with said clutch pedal.

4,860,869

BRAKE APPLY SYSTEM WITH A DIFFERENTIAL MECHANISM

Arthur Hall, III, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 18, 1988, Ser. No. 220,287
Int. Cl.[4] F16D *65/62*
U.S. Cl. 192—93 A 2 Claims



1. A brake apply mechanism in a vehicle having two independently operated brake mechanisms including a brake apply member for each brake mechanism; said brake apply mechanism comprising: a rotary input member supported for rotation about an axis; a pair of rotary output members operatively connected to respective ones of the brake apply members; cam means disposed on each of said output members; and cam driver means operatively connected for rotation with said input member for cooperating with both said cam means for enforcing rotation of said output members, said cam driver means being free for relative movement parallel to the support axis to permit differential rotation of said output members during brake application.

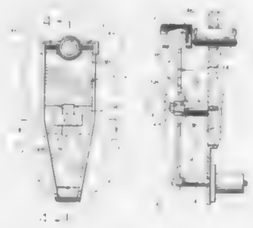
4,860,870

CLUTCH CONTROL MECHANISM

Kenneth L. Romig, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 20, 1988, Ser. No. 208,446
Int. Cl.[4] F16D *23/00*
U.S. Cl. 192—99 S 1 Claim

1. A clutch fork lever assembly for a transaxle comprising: a housing; operator controlled portion means for receiving input forces from an operator; clutch control portion means for manipulating a clutch release bearing means in response to forces at said operator controlled portion; fulcrum portion means including a transverse groove portion having a substantially cylindrical surface for providing a pivot area for said clutch fork lever; support means for pivotally supporting said clutch fork lever at said fulcrum portion means and including mounting member portion means including a bar member having a substantially cylindrical surface alignable in said transverse groove portion, said cylindrical surfaces being disposed in mating relation and of sufficiently different diametral



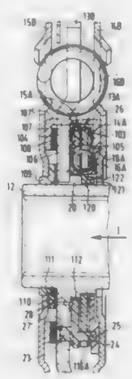
dimensions to promote rolling contact during pivoting of said clutch fork lever; and a longitudinally extending slot in said fulcrum portion means intersecting said transverse groove and having a sufficient width to permit passage of said bar member during assembly and disassembly of said transaxle to an engine.

4,860,871

CLUTCH FRICTION DISC WITH PREDAMPER

Michel Graton, Paris, and Alain Jochun, Levallois-Perret, all of France, assignors to Valeo, Paris, France

Filed Feb. 18, 1988, Ser. No. 156,977
Claims priority, application France, Feb. 24, 1987, 87 02396
Int. Cl.[4] F16D *3/14*
U.S. Cl. 192—106.1 5 Claims



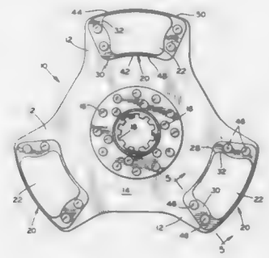
1. A clutch friction disc of the kind comprising a support for friction linings and a hub which are angularly movable with respect to one another within predetermined limits, the support and the hub being coupled by two torsion damping devices which act in stages, the first device or predamper being weaker than the second device or principal damper, each of said devices comprising an annular plate, two guiding washers integral with one another and disposed axially on either side of the annular plate, and elastic means for controlling angular movement being interposed circumferentially between the annular plate and the washers, the annular plate of the predamper being integral in rotation with the hub, and the washers of the predamper being integral in rotation with the annular plate of the principal damper, and this principal annular plate being mounted on the hub with a clearance permitting a predetermined angular movement; and friction damping means comprising elastic means for balancing friction; wherein one of the guiding washers of the predamper is provided with a plurality of axially projecting spacing lugs which fit into corresponding holes in the other of the said guiding washers, and elastic tongues are provided for axial connection between the washers, said elastic tongues extending from one of said washers to hook onto the other of said washers, said spacing lugs and said elastic tongues passing radially to the outside of the annular plate of the predamper and alternating around the periphery thereof.

4,860,872

FRICTION DISC ASSEMBLY

Richard A. Flotow, Butler, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 15, 1987, Ser. No. 132,393
Int. Cl.[4] F16D *13/60*
U.S. Cl. 192—107 R 10 Claims



1. In a friction disc assembly adapted for use in a friction clutch, said assembly comprising an annular clutch disc having a plurality of radially extending torque transmitting support segments uniformly spaced circumferentially apart absent an axis; an improvement comprising each support segment including an opening, a unitary friction pad disposed rigidly within each segment opening, each pad defining a circumferentially extending axially centered tongue and a pair of opposed radially extending friction surfaces, each friction surface spaced axially from said tongue, each friction surface defining an axially extending, circumferentially continuous boundary, a pair of axially opposed backing plates, each backing plate defining an opening, said openings being radially aligned, each opening defining a boundary substantially aligned with said continuous boundary of one associated friction surface, each friction surface axially protruding beyond the exterior surface of each associated backing plate, wherein said backing plates are axially juxtaposed against and axially retain only said tongue portion of each friction pad, and wherein said boundary of said plate opening provides a bearing surface under an interference fit with said associated axially aligned friction surface boundary for supporting radially imposed loads on said friction pads.

4,860,873

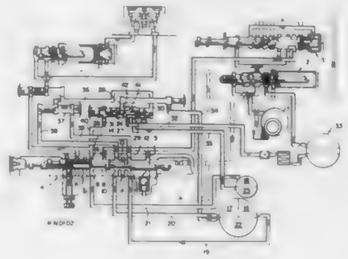
LUBRICATING SYSTEM FOR FRICTION ENGAGING MEANS IN TRANSMISSION

Toshiyuki Inagaki, and Hiroaki Maeda, both of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 863,064, May 14, 1986, abandoned.
This application Jul. 7, 1988, Ser. No. 217,069
Claims priority, application Japan, May 17, 1985, 60-103864
Int. Cl.[4] F16D *13/74, 25/11*
U.S. Cl. 192—113 B 31 Claims

1. A lubricating system for friction engaging means for supplying lubricant to a plurality of forward friction engaging means and a reverse friction engaging means in a power shift transmission having a plurality of shift ranges, which comprises:

(a) a first lubricating subsystem for supplying the lubricant to the plurality of forward friction engaging means;
(b) a second lubricating subsystem for supplying the lubricant to the reverse friction engaging means;
(c) a select valve having a plurality of positions including at least one forward position for alternatively supplying a friction engaging means pressure to one of said forward friction engaging means and draining a friction engaging means pressure from said reverse friction engaging means, a reverse position for alternatively supplying friction engaging means pressure to said reverse friction engaging means and draining a friction engaging means pressure from said forward friction engaging means and a neutral position for alternatively draining friction engaging means



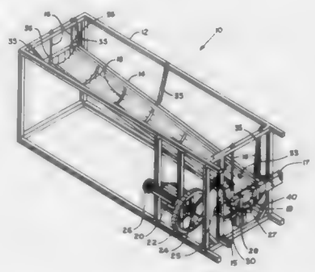
pressure from said reverse friction engaging means and said forward friction engaging means, said friction engaging means pressure being supplied from a friction engaging means pressure source; and
(d) a control valve connected with said select valve for controlling communication of a lubricant source with the first and second lubricating subsystems, said control valve supplying more quantity of lubricant to the first lubricant subsystem than the second lubricant subsystem at said at least one forward position of the select valve, and said control valve supplying more quantity of lubricant to the second lubricating subsystem than the first lubricating subsystem at said neutral position and at said reverse position of the select valve.

4,860,874

VIBRATING SLUICE BOX

Stephen Winderl, Box 236, Sleepy Hollow RV Ct., Lincoln, Mont. 59639

Filed Mar. 31, 1988, Ser. No. 176,223
Int. Cl.[4] B65G *11/20*
U.S. Cl. 193—2 B 12 Claims



1. A new and improved vibrating sluice box, comprising:
frame means;
inclined elongated trough means suspended from said frame means;

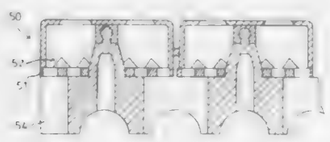
means for transversely reciprocating said trough means;
means for vibrating said trough means; and
a pair of arcuate levers pivotally mounted on said frame means on opposite sides of said trough means for striking said trough means.

4,860,875

ROLL-BLOCK AND TO A ROLL-WAY ASSEMBLED FROM ROLL BLOCKS

Paul Couwenbergs, Scheibenbergstrasse 17, 7500 Karlsruhe, Fed. Rep. of Germany

PCT No. PCT/EP87/00079, § 371 Date Oct. 29, 1987, § 102(e) Date Oct. 29, 1987, PCT Pub. No. WO87/05280, PCT Pub. Date Sep. 11, 1987
PCT Filed Feb. 14, 1987, Ser. No. 127,295
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1986, 3606889; Aug. 8, 1986, 3626958
Int. Cl.[4] B65G *13/00*
U.S. Cl. 193—35 MD 14 Claims



1. A roll block comprising:
a base member having a bottom side for connection to a foundation, and a top side;
a support projecting outwardly from and above said top side of said base member;
a bearing support member mounted at said support;
said bearing support member defining a plane and containing a multitude of groups of integral bearing elements protruding from said plane;
said multitude of groups of bearing elements being symmetrically located with respect to said support;
a multitude of rolling balls each of which is rollingly supported at a respective one of said groups of bearing elements;
a cover member covering said support and said bearing support member on said top side of said base member;
said cover member being mounted at said support; and
said cover member containing a multiple number of gaps each of which is aligned to one group of said multitude of groups of bearing elements of said bearing support member wherein one of said rolling balls supported by said one group of bearing elements, partially protrudes outwardly of a respective one of said gaps.

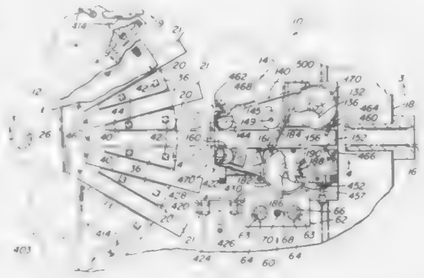
4,860,876

ARTICLE VENDING MACHINE EMPLOYING UNIQUE ROBOTIC ARM AND THE ROBOTIC ARMS EMPLOYED THEREIN

William A. Moore, Easton; Constantine F. Economy, Allentown, and Theodore F. Economy, Orefield, all of Pa., assignors to Midway Video, Ltd., Wilkes-Barre, Pa.

Filed Aug. 11, 1987, Ser. No. 84,259
Int. Cl.[4] G07F *11/54, 7/08*
U.S. Cl. 194—205 12 Claims

1. A vending machine for dispensing articles, said machine including:
(a) a rotatable turret including article retaining compartments therein, said article-retaining compartments being disposed in vertically aligned tiers, with the compartments in each tier being disposed circumferentially about the periphery of the turret;
(b) an elevator means mounted for vertical movement adjacent the turret;
(c) robotic arm means carried by the elevator means for engaging an article, said robotic arm means including an article-supporting platform, means mounting said platform for movement toward and away from said turret in a transverse direction relative to the vertical direction in which said elevator means is mounted for movement, article gripping means secured for movement with said platform in said transverse direction, said gripping means including opposed rotatable gripping members for engaging opposite sides of said article;



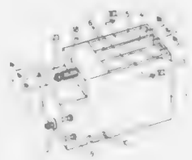
(d) turret drive means for rotating said turret;
(e) elevator drive means for vertically moving said elevator means;
(f) robotic arm drive means including article-supporting platform drive means for moving said platform in said transverse direction and gripping means drive means for rotating said opposed rotatable gripping members for moving a gripped article in said transverse direction onto and off of said platform.

4,860,877

TILTING MULTIPLE PASSAGE RECTANGULAR BLOCK COIN SORTER

Jesus E. Ibarrola, Navarra, Spain, assignor to Azkoyen Industrial, S.A., Peralta, Spain

Filed Mar. 3, 1988, Ser. No. 163,735
Claims priority, application Spain, Mar. 6, 1987, 8700623; Nov. 30, 1987, 8703430
Int. Cl.[4] G07F *1/04*
U.S. Cl. 194—346 11 Claims



1. A coin sorter for coin-operated machines, comprising a right rectangular prismatic frame, the interior of which is subdivided into consecutive, longitudinal, vertical passages having a rectangular section, the length and width of which are greater than the diameter and thickness, respectively, of the largest acceptable coin, but length of which is less than that of the frame; said passages having upper ends which open out on the top of the frame through parallel, transversely aligned openings, and having lower ends which open out on the bottom through openings in two axially shifted positions; at least one of the passages having a second lower lateral opening; and a piece that can be attached to said lower openings of said one

passage to block one of the lower openings of the one passage; said frame being mounted so as to be able to rotate around a medium axis parallel to and near the bottom of the frame; and a mechanism connected to the frame for partially tilting said frame toward one side or the other, away from a vertical central position, moving the upper openings of the passages sideways.

4,860,878

COLLAPSIBLE CONVEYOR SUPPORT STRUCTURE/CARRIER

Dennis Mraz, and Donald R. Skuce, both of Saskatoon, Canada, assignors to D M Enterprises Inc., Saskatoon, Canada

Filed Apr. 26, 1988, Ser. No. 186,131
Int. Cl.[4] B65G *41/00*
U.S. Cl. 198—309 7 Claims



1. A longitudinally extensible support system for endless conveyor belts and the like, which are extendable in a generally longitudinal direction, comprising
a plurality of pairs of primary and secondary interconnected elongated members disposed generally parallel to each other in a retracted position, each of said primary elongated members being adapted at its lower end to rest upon a supporting surface and each being pivotally secured at a lower portion to one of said secondary members adjacent thereto on one longitudinal side thereof, each of said primary elongated members having an upper connecting portion spaced along the member from its lower portion, each of said primary elongated members being pivotally secured at its upper connecting portion to the upper end portion of the secondary member adjacent thereto on the other longitudinal side thereof, each of said secondary members comprising a pair of elongated planar members positioned adjacent and pivotally secured to transverse sides of successive primary members, and said primary and secondary members being extendable at an angle therebetween from a retracted position wherein said members are generally parallel to each other,
a plurality of flexible restrictive means each secured between successive primary members and secondary members which are pivotally secured to each other at the upper connecting portion of the primary member and the upper end portion of the secondary member, said restrictive means being adapted to restrict successive primary and secondary members from being spread apart in a generally longitudinal direction at their lower ends when in the extended position for more than a predetermined distance,
a first plurality of elongate third members disposed transversely and interconnecting the upper portions of generally transversely aligned pairs of primary members,
a second plurality of elongated third members disposed transversely and interconnecting the lower portions of said generally transversely aligned pairs of primary members,
and a plurality of conveyor belt and the like supporting elements supported by at least selected ones of said pairs of elongated primary and secondary members between said interconnecting of successive primary and secondary members, said supporting elements being adapted to support conveyor belts and the like while the system is in an extended position or in a retracted position

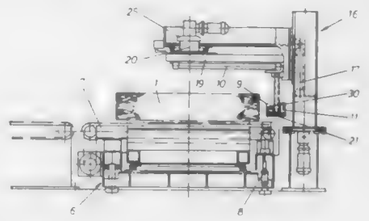
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4,860,879

PLATE BAR LOADING SYSTEM INCLUDING AN AUTOMATIC PACKET OR PLATE BAR STACK ALIGNMENT STATION

Erich Harsch, Weingarten, and Franz Gaissmaier, Schlier, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Mueller-Weingarten AG, Weingarten, Fed. Rep. of Germany

Filed Sep. 20, 1987, Ser. No. 92,097
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1986, 3630141
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—395 9 Claims



1. A device for aligning a stack of sheet metal or plate bars, comprising:
a transporting carriage movable in a horizontal transport direction, having a first vertical axis and having means for vertically supporting thereon the stack to be aligned, such that the stack has a horizontally extending edge;
means on said carriage for lifting the stack;
first conveyor means on said carriage for loading and unloading the stack onto and from said carriage;
a measuring system, including
a measuring ruler,
means for rotatively supporting the measuring ruler adjacent the edge of the stack for rotation about a second vertical axis,
means for moving said ruler against the edge of the stack so that said ruler adopts an angle with respect to the transport direction corresponding to the angular orientation of the stack with respect to said transport direction, and
means for sensing the angle of said ruler; and
means on said carriage, for rotating the stack about said first vertical axis an amount which is based on the angle of said ruler sensed by said sensing means, while lifted by said lifting means, to angularly align the stack.

4,860,880

CONVEYOR SYSTEM FOR ROD-LIKE ARTICLES

Dennis Hinchcliffe, Deptford, and William A. Stone, New Eltham, both of United Kingdom, assignors to Molins Limited, London, United Kingdom

Continuation of Ser. No. 571,943, Jan. 19, 1984, abandoned, which is a continuation of Ser. No. 151,983, May 21, 1980, abandoned. This application Sep. 7, 1984, Ser. No. 648,262
Claims priority, application United Kingdom, May 22, 1979, 7917751
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—405 37 Claims

1. A conveyor system for rod-like articles, comprising first conveyor means for conveying a multi-layer stream of articles in a direction tranverse to their lengths, transfer conveyor means for conveying a continuous multi-layer stream of articles in stack formation from said first conveyor means, a junction zone to which articles are delivered by said transfer conveyor means, and second conveyor means for moving articles away from the junction zone as a continuous multi-layer stream, wherein the transfer conveyor means comprises spaced conveyors defining opposite sides of a path for said multi-layer stream and arranged to grasp said multi-layer stream therebe-

tween and to twist said stream about a generally horizontal axis substantially parallel to its direction of conveyance, including



means providing stationary guides for guiding articles on said path.

4,860,881

APPARATUS FOR CONVEYING ASSEMBLY PARTS

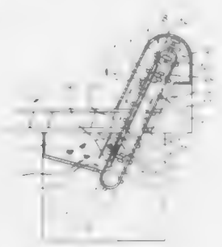
Walter Sticht, Attnang-Puchheim, Austria, assignor to Stiwa-Fertigungstechnik Sticht GesmbH, Attnang-Puchheim, Austria

Continuation of Ser. No. 910,266, Sep. 19, 1986, abandoned, which is a continuation of Ser. No. 823,130, Jan. 27, 1986, abandoned, which is a continuation of Ser. No. 589,737, Mar. 15, 1984, abandoned. This application Feb. 22, 1988, Ser. No. 161,372

Claims priority, application Austria, Mar. 29, 1983, A 1115/83

Int. Cl.[4] B65G *47/26, 15/44*

U.S. Cl. 198—443 6 Claims



1. An apparatus for conveying assembly parts from a storage container to a singling device for the assembly parts, which comprises a conveyor including

(a) an endless elastic carrier for the assembly parts ascending from an inlet end in the storage container to a discharge end whence the conveyed assembly parts are thrown from the carrier onto the singling device,

(b) means for driving the endless carrier in an endless path about reversing rollers at the inlet and discharge ends,

(c) entrainment elements on one side of the endless carrier for entraining the assembly parts from the inlet to the discharge end in a conveying direction, the entrainment elements being spaced from each other in the conveying direction and extending transversely thereto,

(d) a support plate in supporting contact with the endless carrier extending in the conveying direction between the rollers, the support plate facing and extending over substantially the entire width of a side of the endless elastic carrier opposite the one side and defining a guide track for the carrier extending in the conveying direction between the rollers,

(1) the guide track being constituted by a plurality of transversely spaced guide grooves in the support plate and the rollers defining grooves aligned with the guide grooves in the support plate,

(e) means adjustably mounting the plate for displacement perpendicularly and laterally in relation to the endless elastic carrier, and

(f) a plurality of individual guide elements on the opposite side of the carrier, the guide elements being spaced from each other in the conveying direction and engaging the guide grooves along the entire length thereof whereby the guide track and the guide elements constitute a guide for the endless carrier in the conveying direction and prevent displacement of the endless carrier transversely to the conveying direction,

(1) respective ones of the entrainment elements and respective ones of the guide elements having the same spacing in the conveying direction whereby all the entrainment elements are aligned with respective guide elements, and

(2) the entrainment elements extending transversely over at least two adjacent ones of the guide grooves.

4,860,882

METHOD AND DEVICE FOR DISTRIBUTING AND FEEDING

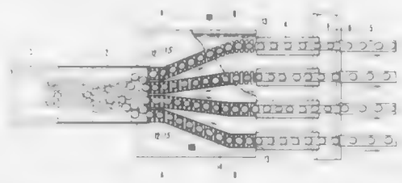
Hiromu Maeda; Kazuo Haraguchi, and Yasutsugu Ohbuchi, all of Shizuoka, Japan, assignors to Kabushiki Kaisha Maki Seisakusho, Japan

Continuation of Ser. No. 804,373, Dec. 2, 1985, abandoned. This application Sep. 16, 1988, Ser. No. 246,949

Claims priority, application Japan, Aug. 20, 1985, 60-182647

Int. Cl.[4] B65G *47/68*

U.S. Cl. 198—458 13 Claims



4. A distributive feeding apparatus for distributively feeding articles which roll easily and which are susceptible to scratches and bruises, such as fruits and vegetables, which have been supplied from a previous operation by diverging the articles into a plurality of separate lanes which are spaced laterally from each other in the direction of transporting the articles, comprising:

an input end and a downstream end;

a receiving part at said input end for receiving articles from the previous operation in a random manner which includes uneven lateral spacing;

a bar conveyor mechanism extending from and movable in a direction from said receiving part to said downstream end, and having a plurality of carrier elements mounted on the bars thereof for lateral sliding movement with respect to the direction of advancement of said conveyor mechanism, each carrier element having a carrying area having portions on the opposite lateral ends extending in the width direction of the conveyor which slant upwardly and the carrying area having on the upper surface a plurality of relatively soft resilient protrusions, there being the same number of carrier elements across the width of said conveyor mechanism as there are lanes into which the articles are to be distributed and said conveyor mechanism having a width sufficient for accommodating said plurality of carrier elements spaced corresponding to the spacing of said lanes so as to be able to feed articles into said lanes;

a plurality of narrow sorting partitions, one in the space between the opposed lateral end portions of each pair of adjacent carrier elements for causing articles on the receiving part which are not aligned with a carrier element to be gently rolled onto an adjacent carrier element; and

a plurality of guide rail means, one coresponding to each lane, and engaged with a corresponding one of said carrier elements for causing said carrier elements to slide transversely with respect to the direction of advancement of said conveyor mechanism as said carrier elements are advanced on said bar conveyor to bring said carrier elements into alignment with corresponding lanes, whereby articles fed to the input end of the apparatus are carried by said carrier elements into the plurality of separate lanes for transfer to a connecting and transfer device for each lane at the downstream end of the apparatus.

4,860,884

BUCKET CONVEYOR, PARTICULARLY FOR UNLOADING SHIPS

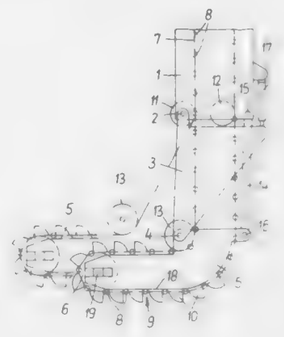
Ludwig Kostrewa, Moers, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 24,797, Mar. 11, 1987, abandoned. This application Jun. 10, 1988, Ser. No. 204,982

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608116

Int. Cl.[4] B65G *17/36*

U.S. Cl. 198—509 17 Claims



1. A bucket conveyor having means, including self-scooping bucket elements, a support structure, and means linking said elements for displacing said elements over a closed path along said support structure, for conveying bulk material from a region below said structure to a region in the vicinity of the top of said support structure, the closed path having two substantially parallel reaches, each reach having a substantially vertical portion and a substantially horizontal portion, wherein said support structure comprises: a vertically oriented upper member extending from the region of the top of said support structure; a lower member connected to said upper member for pivotal movement relative to said upper member about a first horizontal axis; a base member having first and second ends and connected to said lower member via said first end for pivotal movement relative to said lower member about a second horizontal axis and having a longitudinal dimension which is transverse with respect to the vertical and protrudes laterally from said structure; a guide roller at the second end of said base member for guiding said means linking said elements between the two reaches of said path, said horizontal portions of said reaches being disposed one above the other adjacent said guide roller; bucket guide means, located in the region where said lower member is connected to said upper member, for guiding the two reaches; supporting means connected between said upper member and said base member and forming, with said lower member, a parallelogram linkage between said upper member and said base member; and displacement means connected between said upper member and said lower member for pivoting said lower member relative to said upper member; said means linking said elements being movable in a direction such that the reach whose substantially vertical portion is more remote from the first horizontal axis moves upwardly and the horizontal portion of that reach is below the horizontal portion of the other reach, and said base member being connected to said lower member in a manner such that said base member can be positioned so that its longitudinal dimension is horizontal for any angular position of said lower member relative to said upper member.

4,860,883

APPARATUS FOR CLEANING OF AN ENDLESS CONVEYOR BELT

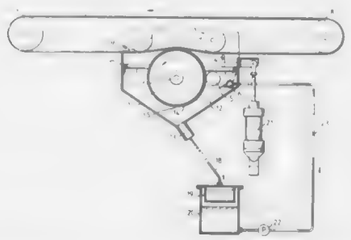
Per Knaul, Speichersdorf; Fritz Schelhorn, and Roland Witte, both of Bayreuth, all of Fed. Rep. of Germany, assignors to B.A.T. Cigarettenfabriken GmbH, Fed. Rep. of Germany

Filed Nov. 2, 1987, Ser. No. 115,964

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637340

Int. Cl.[4] B65G *45/00*

U.S. Cl. 198—495 10 Claims



1. An endless conveyor belt apparatus, comprising:

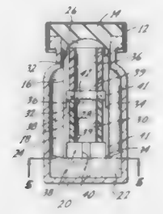
an endless conveyor belt for conveying goods including two press down rollers;

a cleaning roller pressing against and rotatably driven in a direction opposite to a part of the conveyor belt engaged by said cleaning roller, said cleaning roller being movable relative to the conveyor belt between operative and inoperative positions, in said operative position the two press down rollers of the conveyor belt engage and press the conveyor belt against said cleaning roller on opposite sides of said cleaning roller under predetermined pressure;

spraying means for directing cleaning fluid at an acute angle against a surface area portion of said cleaning roller in a direction counter to movement of said surface area portion, said surface area portion being generally opposite the conveyor belt; and

pressure roller means, following said spraying means in the direction of cleaning roller rotation, for engaging and removing excess cleaning fluid from said cleaning roller.

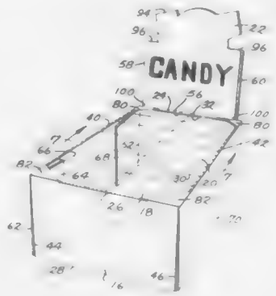
4,860,805
LENS STORAGE SYSTEM
Herbert E. Kaufman, New Orleans, La.; Patricia M. Knight, Laguna Niguel, and Shelley Buchen, Irvine, both of Calif., assignors to Allergan, Inc., Irvine, Calif.
Filed Apr. 29, 1988, Ser. No. 187,840
Int. Cl.[4] B65D *81/22*
U.S. Cl. 206—5.1 37 Claims

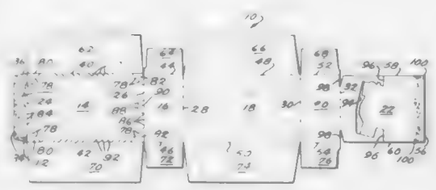


1. A system useful for holding a lens device comprising:
a chamber having a hollow interior space therein;
seal means capable of being placed in association with said chamber to substantially seal said interior space from the environment surrounding said chamber;
absorbent means located in said interior space and capable of carrying a material which is capable of being released into said interior space over a period of time and;
carrier means sized and adapted to carry a lens device and to be placed in said interior space so that the lens device being carried by said carrier means is out of direct contact with said absorbent means and is exposed to the material released into said interior space.

4,860,836
PRE-GLUED DISPLAY CARTON WITH INTEGRAL DISPLAY PANEL
David Northrup, Waco, Tex., and Jimmy J. Hanko, Lexington, Ky., assignors to Gulf States Paper Corporation, Tuscaloosa, Ala.
Filed Mar. 9, 1988, Ser. No. 166,009
Int. Cl.[4] B65D *51/00*
U.S. Cl. 206—45.29 12 Claims

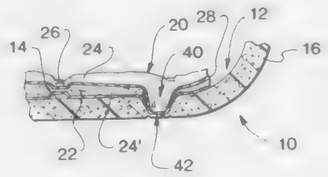
1. A display carton comprising
six flat panel structures of carton material interconnected to define an enclosed product containing space,
said panel structures including a top panel structure having a first side and two second sides extending perpendicularly from opposite ends of said first side,
a display panel structure hinged to one of the remaining five panel structures adjacent said top panel structure for movement from an inoperative position underlying said top panel structure into an upright operative display position,
said display panel structure having a hinge defining peripheral side disposed adjacent the first side of said top panel structure and having opposite ends spaced from the opposite ends of said first side and a remaining periphery defined by smooth cuts or folds,
said top panel structure having perforations along said first side between the opposite ends thereof to an extent greater than the extent of said hinge defining side and then diagonally to said second sides and then along the second sides for an extent sufficient to define a portion of said top panel structure greater than said display panel structure,
said perforations enabling said top panel portion to be manually moved into top opening relation with respect to said enclosed space enabling the enclosed space to be accessed after said display panel structure is moved from said inoperative position into said upright display position,
the diagonal extent of said perforations leaving fixed corner portions of said top panel structure between the junctions of the opposite ends of said first side with said second sides,
the cut periphery of said display panel structure defining deflectable portions extending outwardly from the opposite ends of said hinge defining side which (1) underlie said fixed corner portions when said display panel structure is





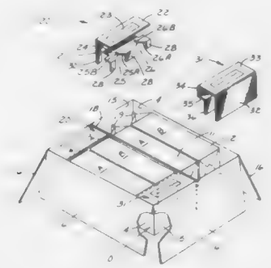
in said inoperative position, (2) deflect around said fixed corner portions during the movement of said display panel structure into said upright display position, and (3) overlie said fixed corner portions when said display panel structure is in said upright display position so as to tend to retain the same therein.

4,860,887
METHOD OF FORMING PACKAGING AND PACKAGING STRUCTURE IN ACCORDANCE WITH THE METHOD
Daniel K. Fosse, 361 104th La., Coon Rapids, Minn. 55433
Filed Jul. 22, 1988, Ser. No. 222,950
Int. Cl.[4] B65D *81/26*
U.S. Cl. 206—204 8 Claims



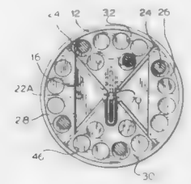
1. A method of forming a packaging for meat products and the like, comprising the steps of:
(a) providing a tray, as known in the art, made of expanded polystyrene;
(b) placing a soaker pad, including a lamina made of polyethylene, into a recess defined in the tray; and
(c) securing the soaker pad to the tray by sonic welding the polyethylene lamina to the expanded polystyrene tray at a plurality of discrete locations at their interface.

4,860,888
SHIPPING AND HANDLING CONTAINER FOR TWO PART COMPOSITION
Roger H. Keith, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jun. 29, 1988, Ser. No. 212,901
Int. Cl.[4] B65D *69/00*
U.S. Cl. 206—223 11 Claims



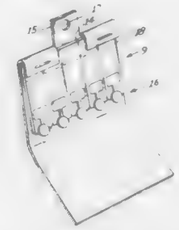
1. A shipping carton for a plurality of gabletopped containers containing compositions that are to be mixed, i.e. the contents of one container with the contents of another container, and the containers are provided in the carton in an equal number of the containers of each composition, said shipping carton comprising:
a plurality of containers with gabletops including a plurality of containers of a first composition and a plurality of containers of a second composition,
a rigid carton having wall means defining a cavity and flap means connected to said wall means for closing said cavity,
dividing means for dividing said carton cavity into areas for nesting pairs of said containers with a container having a first composition and a container having a second composition in each said area, and
support means for supporting the gable tops of said containers in each area.

4,860,889
UNIVERSAL GOLF CLUB SEPARATOR
Andre Lemieux, 922 Charette, Chambly, Quebec, Canada J3L 3E3, and Gabriel Charland, 923 St-Jean, Chambly, Quebec, Canada J3L 2W2
Filed Jul. 20, 1988, Ser. No. 222,074
Int. Cl.[4] A63B *55/00*
U.S. Cl. 206—315.6 14 Claims



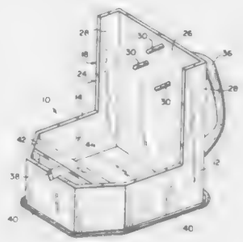
1. A separator member for maintaining the handles of golf clubs in relatively spaced substantially parallel positions into a golf bag, comprising: first to fourth rigid planar sections including means for joining said sections to form a generally circular assembly, each of said sections having at least one through-bore adapted to be freely engaged by the handle of a golf club including the grip and ferrule thereof, said first and second sections being opposite each other; said means for joining said sections including connector means slidingly interconnecting said sections about a common plane; and adjustment means for adjusting the spacing between said first and second opposite sections and adapted to coact with said connector means, whereby when said assembly is mounted into the golf bag mouth, said adjustment means may be actuated to bias said first and second sections to releasably frictionally engage the inner wall of the bag defined by said mouth.

4,860,890
BATTERY HOLDER
Elmer J. Cerny, Des Plaines, and Mark F. Stanton, Mundelein, both of Ill., assignors to Beltone Electronics Corporation, Chicago, Ill.
Filed Aug. 31, 1988, Ser. No. 238,895
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—333 4 Claims



1. An apparatus for energizing an electrical device comprising, in combination:
a base member;
a plurality of elongate handles extending substantially perpendicularly from said base member, each of said handles including an engaging end and a battery end, each of said handles being removably attached to said base member at said engaging end; and
a battery removably attached to each of said handles at said battery end.

4,860,891
PAINT AND BRUSH HOLDER
Raymond Biggio, 1115 7th St., West Babylon, N.Y. 11704
Filed May 16, 1988, Ser. No. 194,502
Int. Cl.[4] B65D *25/10*
U.S. Cl. 206—362 5 Claims



1. A paint and brush holder which comprises:
(a) a paint reservoir base having an open top for holding paint therein; and
(b) means for supporting a paint brush in a vertical position over said paint reservoir base with bristles facing down-

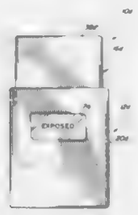
wardly so that in one situation the paint can drip from the bristles back into said paint reservoir base and in another situation the paint can cover the bristles to keep them moist when the paint brush is not being used during a short period of time, said paint brush supporting means comprising an elongated C-shaped housing having a rear wall and a pair of side walls and extending vertically upwardly from the open top at rear of said paint reservoir base, and a plurality of pins affixed at different levels in a zig-zag arrangement to the rear wall of said housing so that one of various sized paint brushes can be vertically suspended on one of said pins by a paint brush handle having a hole therethrough.

4,860,892

FILM CONTAINER

Keith Roberts, 27520 N. Sierra Way, Suite F-208, Canyon Country, Calif. 91351, and Thomas A. McConnell, 2912 Henrietta, La Crescenta, Calif. 91214

Filed Oct. 17, 1988, Ser. No. 258,917
Int. Cl.[4] B65D *85/67*
U.S. Cl. 206—389 **1 Claim**



1. I claim: an indicating container for a roll of photographic film comprised of:

a. a hollow, cylindrical receptacle closed at one end with an inner wall of radially decreasing thickness along a major portion of the receptacle's length to form a tapering opening into the other end and containing a window in said wall;

b. a hollow, open-ended plug of a length similar to that of said receptacle having an outer wall of radially-decreasing thickness to form a taper which mates with the tapering opening in the receptacle to provide a close-fitting, frictionally held, releasable seal with the words "exposed" and "unexposed", to indicate the condition of the roll of photographic film, imprinted on the side of said plug at a position so as to be separably viewable in said window of the receptacle when the container is closed;

whereby a roll of film can be placed into the receptacle, the plug inserted and turned so that the word applicable to the condition of the film appears in the window and the seal completed by axial pressure between the plug and the receptacle.

4,860,893

PAPER ROLL COVER AND PROCESS FOR MANUFACTURE

Kevin W. Kaufman, 301 Hollowood Dr., West Lafayette, Ind. 47906

Filed Dec. 21, 1987, Ser. No. 135,833
Int. Cl.[4] B65D *85/60*
U.S. Cl. 290—390 **7 Claims**

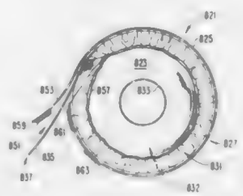
1. A holder for a roll of absorbent paper with a longitudinal core comprising:

a tubular portion made of flexible plastic, said tubular portion having a longitudinal means for defining a dispensing opening in said tubular portion;

a flexible plastic flap covering said opening, said flap being integrally formed from said tubular portion;

a top portion made of flexible plastic and integrally formed with said tubular portion; and

a bottom portion made of flexible plastic and integrally formed with said tubular portion, wherein said top portion



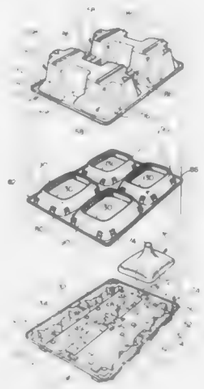
and said tubular portion and said bottom portion collectively provide a cover for the roll of paper, where said top portion includes first elastic means for radially collapsing said cover upon dispensing of the roll, and wherein said bottom portion includes second elastic means for radially collapsing said cover upon dispensing of the roll.

4,860,894

PACKAGE ASSEMBLY FOR GLASS FUNNEL PARTS

David G. Koenig, Reynoldsburg, Ohio, assignor to OI-NEG TV Products, Inc., Toledo, Ohio

Continuation of Ser. No. 922,645, Oct. 23, 1986, abandoned. This application Aug. 30, 1988, Ser. No. 239,004
Int. Cl.[4] B65D *85/42*
U.S. Cl. 206—421 **7 Claims**



1. A package assembly for shipping a plurality of video glass funnel parts, wherein each glass part has a larger end for attachment of a face plate to the edge thereof and a smaller end for attachment of a neck tube and with contoured side walls tapering from the larger end to the smaller end, comprising;

(a) base means for receiving and supporting in spaced locations the larger ends of a plurality of video glass funnels arranged in a first layer,

(b) tray means for supporting a second layer of funnels including a floor and a plurality of integral funnel support components extending upwardly from said floor at locations corresponding in number and position to said plurality of funnels in said first layer,

(c) each of said funnel support components including a plurality of ribs extending upwardly from the floor of said tray means and sloping inwardly to define a generally

pyramidal shape, each rib having innermost edges and an outermost upper surface spaced from said innermost edges,

(d) each said funnel support component further including web means for connecting said innermost edges of said ribs, said web means having lower surfaces configured to receive and mate with at least a portion of the upper surfaces of the contoured side walls of a funnel in a layer below said tray means,

(e) each of said ribs of a funnel component having a step formed in said upper surface thereof for receiving the edge of a larger end of a funnel in said second layer, each step being formed with a substantially horizontal wall to positively locate and firmly support a funnel edge and a substantially vertically extending wall, the two walls intersection partially through the depth of a rib to provide a shock absorbing space between funnels on and below said components, the horizontal walls of the steps in all ribs in the plurality of support components of a tray means being formed the same distance from the floor thereby supporting all funnels in the layer on that tray means at the same height enabling additional tray means to be supported above in a horizontal position to permit vertical stack building, and

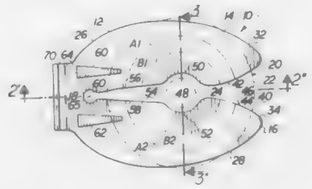
(f) top cover means for protecting the upper surfaces of an uppermost layer of funnels supported on a tray means.

4,860,895

STEMWARE HOLDER

Michael Iaslovits, North Miami Beach, Fla., assignor to Safetray, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 49,655, May 4, 1987. This application Jun. 22, 1987, Ser. No. 65,090
Int. Cl.[4] A65D *85/44*
U.S. Cl. 206—426 **38 Claims**



1. A stemware holder adapted to retain a stemware base against a tray surface comprising:

a dome defined by two fingers joined along an aft region, the outboard periphery of said fingers in close proximity to said tray surface and the inboard region of said fingers defining an open top of said dome, the inboard edges of said fingers defining a slot leading aft to said open top and having an open fore end, wherein the aft section is adapted to be attached to said tray surface.

4,860,896

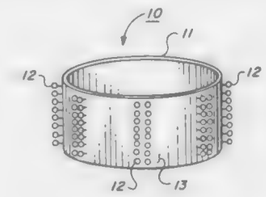
LOCKING RING FOR ALUMINUM BEVERAGE CANS

Keith Snider, 530 So. 98th Way, Mesa, Ariz. 85208

Filed May 9, 1988, Ser. No. 191,914
Int. Cl.[4] B65D *67/02*; A63H *33/08*
U.S. Cl. 206—427 **2 Claims**

1. A locking ring for creating imaginative structures from used beverage cans comprising an annular belt member having a plurality of axially extending attachment means formed on the perimeter thereof in uniformly spaced relationship to each other, each of said attachment means comprising a first row of spaced radially extending pin-like members having a ball-like member disposed on the outer end thereof and a second row of spaced radially extending pin-like members having a ball-like member disposed on the outer end thereof, said first row and said second row being disposed in spaced generally parallel relationship to each other with said space being less than the diameter of said ball-like member.

2. A locking ring for creating imaginative structures from used beverage cans comprising an annular belt member having a plurality of axially extending attachment means formed on the perimeter thereof in uniformly spaced relationship to each



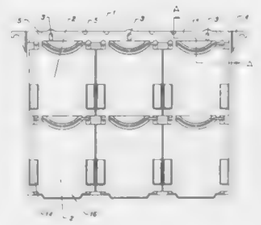
other, each of said attachment means comprising a first and second axially extending flange members disposed on the outer surface of said belt member in spaced generally parallel relationship to each other, each said flange member having a curvilinear enlargement in the outer edge thereof having a diameter sufficiently larger than the space between corresponding enlargements to be lockingly engaged thereby when inserted therebetween.

4,860,897

DISC STORAGE DEVICE

James F. Fowler, 9209 176th St. SE., Snohomish, Wash. 98290; Nick Barker, 12115 Shorewood Dr. SW., Seattle, Wash. 98146; Steven Kaneko, 505 E. Denny Way #512, Seattle, Wash. 98122, and Loyd C. Moore, 2242 100th Ave. SE., Bellevue, Wash. 98004

Filed Mar. 21, 1988, Ser. No. 171,375
Int. Cl.[4] B65D *1/36*
U.S. Cl. 206—444 **12 Claims**



1. A disc storage device for holding and storing a disc comprising, a module having a planar surface and four walls extending perpendicular to said surface, first and second walls of said four walls acting as guide means for restraining the disc as it is moved into said module, third and fourth walls of said four walls comprising lateral holding means to prevent the disc from moving in a direction perpendicularly outward from said planar surface, said module further including ejector means for removing the disc from the module in response to movement of the disc in a single direction toward said fourth wall.

4,860,894

PACKAGING ARRANGEMENT FOR ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Masaaki Hiro; Masaru Nakagawa; Yoichi Kawamorita, and Koji Yamazaki, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,338
Claims priority, application Japan, Sep. 10, 1987, 62-227347
Int. Cl.[4] B65D *81/30*
U.S. Cl. 206—455 40 Claims



1. A packaging arrangement for an electrophotographic photosensitive member, comprising:

an electrophotographic photosensitive member; and

a packaging member covering and protecting said electrophotographic photosensitive member from physical damage and capable of generating a frictional electrostatic charge on the surface of said electrophotographic photosensitive member in the same polarity as the electrophotographic photosensitive member.

21. A method of packaging an electrophotographic photosensitive member, comprising:

providing a sheet having edges of a packaging member for covering and protecting said electrophotographic photosensitive member from physical damage and capable of generating a frictional electrostatic charge on the surface of said electrophotographic photosensitive member in the same polarity as the electrophotographic photosensitive member, whereby said packaging member has a stronger electron acceptor characteristic than said electrophotographic photosensitive member when said electrophotographic photosensitive member possesses a positive charge, and said packaging member has a stronger electron donor characteristic than said electrophotographic photosensitive member when said electrophotographic photosensitive member possesses a negative charge; and

applying said sheet to cover the surface area of said electrophotographic photosensitive member.

23. A method for packaging a cylindrical electrophotographic photosensitive member, comprising:

providing a packaging member for covering and protecting said electrophotographic photosensitive member from physical damage and capable of generating a frictional electrostatic charge on the surface of said electrophotographic photosensitive member in the same polarity as the electrophotographic photosensitive member, whereby said packaging member has a stronger electron acceptor characteristic than said electrophotographic photosensitive member when said electrophotographic photosensitive member possesses a positive charge, and said packaging member has a stronger electron donor characteristic than said electrophotographic photosensitive member possesses a negative charge;

shaping said packaging member into a cylindrical tube having a diameter substantially the same as the diameter of said cylindrical electrophotographic photosensitive member; and

inserting said cylindrical electrophotographic photosensitive member into said cylindrical tube.

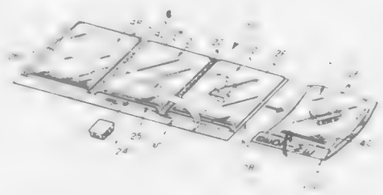
25. A packaging member for packaging an electrophotographic photosensitive member, comprising a material which is capable of generating frictional electrostatic charges on the surface of said electrophotographic photosensitive member in the same polarity as the charging polarity of said electrophotographic photoensitive member.

4,860,899

MEDICATION CONTROL SYSTEM

John H. McKee, Dayton, Ohio, assignor to RNA, Incorporated, Engelwood, Ohio

Filed Jan. 11, 1988, Ser. No. 142,101
Int. Cl.[4] B65D *83/04*
U.S. Cl. 206—534 8 Claims



1. A medicine dispensing aid for dispensing by a pharmacy of labelled packets of medication, comprising

a set of related individual envelopes joined together along separation lines which permit manual separation of the envelopes, one at a time, from the set;

a plurality of packets for enclosing medication to be dispensed to a patient according to a predetermined time and dosage schedule, said packets having indicia thereon providing identification of the medication contained within the packet;

said envelopes containing one or more of said packets of medication to be given to a patient at a designated time at which the envelopes are to be opened;

each of the envelopes in the set having a unique marking distinguishing it from the other envelopes in the set;

each of the envelopes in the set having a visible data entry area on which is entered at least information identifying the patient and identification of medication enclosed in whichever of said packets are placed within the envelope; and

each of said envelopes having a transparent area separate from said data entry area through which identification of medication enclosed in that envelope can be viewed and verified against the information entered on said data entry area of the envelope.

4,860,900

GARMENT KIT AND METHOD OF ASSEMBLY THEREOF

Horst Forschner, Scheffelstrasse 4, 8011 Kirchheim, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 115,007
Int. Cl.[4] B65D *85/00;* A41H *3/08*
U.S. Cl. 206—574 20 Claims

1. An industrially prefabricated garment kit of a plurality of kits, said plurality of kits being in a plurality of different garment sizes over a substantial range of garment sizes for sale to a consumer-wearer, for the self assembly of a garment by the consumer-wearer, said kit comprising:

a partially industrially prefabricated garment comprising at least one industrially prefabricated precut fabric garment piece dimensioned to cover a plurality of sizes;

said at least one precut fabric piece being provided with attachment markings thereon corresponding to said plurality of sizes; and

said precut fabric already being provided with at least one substantially finished, industrially prefabricated, structural detail of said garment being industrially sewn on at least one of said at least one industrially prefabricated precut fabric piece;

said plurality of garment size attachment markings being of a smaller number of sizes than the number of sizes of said range of garment sizes.

10. A method for the self assembly of a garment by a consumer-wearer from a kit, said method comprising the steps of:

a. industrially prefabricating a kit in production with other such kits;

said production comprising:

(I) making a plurality of precut fabric pieces for kits, said kits being made over a predetermined range of garment sizes;

(II) each said kit comprising a partially prefabricated garment comprising at least one precut fabric dimensioned to cover a predetermined plurality of sizes;

(III) providing said pre-cut fabric with attachment markings thereon corresponding to said plurality of sizes; and

(IV) providing said at least one precut fabric with at least one substantially finished structural detail during said production; and

b. obtaining said kit;

c. choosing at least one of said plurality of sizes to be the finished size of said garment in said kit; and

d. assembling said precut fabric along said attachment markings corresponding to said chosen size of step (c);

said plurality of size attachment markings being of a smaller number of sizes than the number of sizes of said range of garment sizes.

20. A plurality of industrially prefabricated garment kits, said plurality of kits for the same kind of garment being in a plurality of different garment sizes over a substantial range of garment sizes, said plurality of kits being for sale to consumer-wearers, for the self assembly of a garment by the consumer-wearers, substantially all of said kits each comprising:

a partially industrially prefabricated garment comprising at least one industrially prefabricated precut fabric garment piece dimensioned to cover a plurality of sizes;

said at least one precut fabric piece being provided with attachment markings thereon corresponding to said plurality of sizes; and

said plurality of size attachment markings on any one piece being of a smaller number of sizes than the total number of sizes of said range of sizes;

said precut fabric already being provided with at least one substantially finished, industrially prefabricated, structural detail of said garment which is industrially sewn on at least one of said at least one industrially prefabricated precut fabric piece;

said at least one substantially finished, industrially prefabricated, structural detail being substantially similar on a substantially number of different kit sizes in said range;

said structural detail, over a first range of said range of sizes, being in substantially the same position on the corresponding garment pieces in the first part of said range of garment sizes;

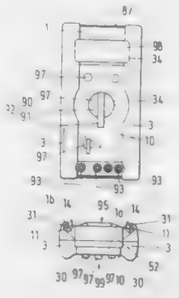
the garment sizes of said first part of said range of garment sizes being greater in number than the number of the size attchment markings indicating different sizes on any one garment piece.

4,860,901

HOUSING WITH A FLEXIBLE SHOCK PROTECTOR FOR A PORTABLE MEASURING INSTRUMENT

Karl Hochreuther, and Edmund Reichler, both of Nürnberg, Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Apr. 1, 1987, Ser. No. 33,479
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1986, 3611067
Int. Cl.[4] B65D *81/08*
U.S. Cl. 206—586 12 Claims



1. Housing for a portable measuring instrument, comprising inherently stable supporting housing parts formed of hard plastic, said supporting housing parts including a front and a back separate from said front each with relatively long right and left sides, relatively short sides and two opposite outer edges, an operating surface on said front, a display on said front, and operating elements on said front; and a flexible, frame-like shock protector discrete from said supporting housing parts in the form of two side parts formed of soft plastic integrated in the housing, said side parts protruding beyond all of said sides of said supporting housing parts and extending at said right and left sides between said front and back, means for permanently securing said side parts to said housing parts when the housing is assembled, each of said side parts including a bead being disposed at a respective one of said outer edges of said front for protecting said front including said display and said operating elements, said beads protruding along said long sides beyond said front, said beads and said operating surface together defining a recessed grip for accommodating the thumb of an operator of the instrument next to said operating elements.

4,860,902

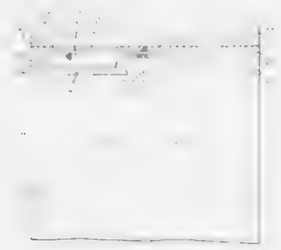
SEALING OF CONTAINER CLOSURE

Wolfgang Kieser, Hohenhöllen, Fed. Rep. of Germany, assignor to Elopak A/S, Lierstrada, Norway

Continuation of Ser. No. 918,010, Oct. 10, 1986, abandoned.
This application Aug. 11, 1988, Ser. No. 231,603
Claims priority, application United Kingdom, Oct. 10, 1985, 8525028
Int. Cl.[4] B65D *5/74*
U.S. Cl. 206—631.3 12 Claims

1. A container in the form of a carton, comprising a closure comprised of a first zone not intended to be opened by a consumer of contents of said carton and including surface portions sealed together by a method comprising ultrasonic heating and a second zone intended to be opened by the consumer and including surface portions sealed together by a method com-

prising ultrasonic heating, said surface portions of said first zone and said surface portions of said second zone including surface portions separated from each other by substantially unsealed portions, said closure being an end closure of said carton including a sealing fin which extends from one one side of said closure to an opposite side thereof and which comprises a mainly four-ply part extending from said one side to said opposite side and including a spout part at said second zone,



said surface portions of said first zone and said surface portions of said second zone comprising a meandering band of surface portions included in said mainly four-ply part and extending continuously in said mainly four-ply part the length of said mainly four-ply part.

4,860,903

COMPONENT INSERTION MACHINE WITH RELEASABLE MAGAZINE

Lois R. Jennings, Harrah, and Roger W. Long, Oklahoma City, both of Okla., assignors to American Telephone and Telegraph Company, AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jun. 28, 1988, Ser. No. 212,442
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—4 **8 Claims**



1. A component insertion machine having apparatus mounting a component magazine on the component insertion machine, the apparatus comprising:
   a pair of pins extending from one of the surfaces of the magazine;
   a plate secured to said machine, the plate having a pair of openings arranged to accommodate said pins; and
   means for releasably locking the magazine to the plate.

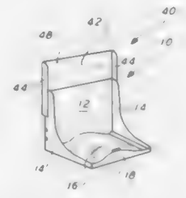
2. A component insertion machine in accordance with claim 1, wherein each of said pins has a cylindrical bearing surface and the free end has a recessed cylindrical surface forming the bottom of an annular groove.

4,860,904

PAPER STACKER

Henry R. Williams, 138-16 232nd St., Laurlton, N.Y. 11413

Continuation of Ser. No. 1,960, Jan. 9, 1987, abandoned. This application Jul. 19, 1988, Ser. No. 220,905
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—50 **3 Claims**



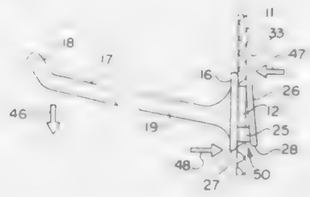
1. A paper stacker for stacking paper at high speed, said stacker comprising:
   (a) a back panel disposed in an essentially vertical plane and having a first width;
   (b) a pair of side panels fixedly attached to said back panel, said side panels being mutually parallel to each other and perpendicular to said back panel and spaced from each other said first width, said side panels extending forward from said back panel a predetermined distance to a front panel, said side panels being curved downward from said back panel to said front panel in a continuously downward curve to said front panel;
   (c) said front panel fixedly attached to said side panels at front end thereof, said front panel being significently lower than said back panel;
   (d) a bottom panel generally rectangular in shape fixedly attached to said back panel and to said front panel and to said side panels proximate a lower edge of each and having a non-plane surface said bottom panel having a width defined by said side panels, said bottom panel having a raised portion disposed essentially at an apex proximate a midpoint between said side panels, said raised portion extending said extending said predetermined distance between said front panel but less than the width of said bottom panel; and
   (e) molding means disposed along the intersection of said bottom panel and a side panel, said molding means extending essentially parallel with said raised portion and extending said predetermined distance so as to make the width of said bottom panel virtually shorter than said first width.

4,860,905

DISPLAY AND METHOD OF FORMING

David B. Schott, Cuyahoga Falls; Danny J. Kump, Mayfield, and Gerald A. Conway, Cleveland, all of Ohio, assignors to Gerald Conway & Company, Cleveland, Ohio

Filed Jan. 30, 1989, Ser. No. 303,198
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—59.1 **26 Claims**



1. A display hook for insertion into a rectangular slot of a

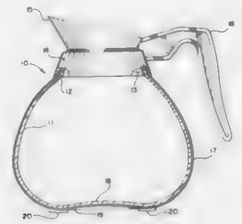
panel comprising a front plate, a forwardly projecting hook extending upwardly in slightly inclined fashion from said plate, a narrow short projection extending rearwardly from said front plate above the lower edge thereof and adapted to extend through such slot and connecting said front plate to a rear plate, said rear plate extending upwardly generally parallel to said front plate and including an upper portion adapted to bear against the rear of the panel above such slot.

4,860,906

GLASS CONTAINER WITH SAFETY COATING

Louis Pellegrini, Oak Brook, and Melvin F. Roberts, Niles, both of Ill., assignors to Bloomfield Industries, Inc., Chicago, Ill.

Filed Sep. 14, 1987, Ser. No. 96,624
Int. Cl.[4] A47G *19/14*; A47J *31/58*
U.S. Cl. 215—12.2 **4 Claims**



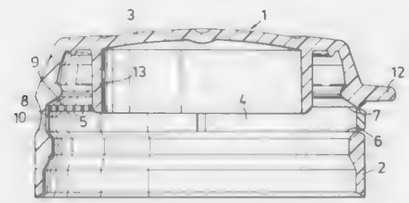
1. Coated glassware having improved resistance to breakage and shattering comprising:
   a decanter for holding a volume of liquid during heating thereof, said decanter having a wall thickness in the range of from about 0.045 inches to about 0.165 inches, having a generally bulbous shape, and made from borosilicate glass,
   a silicone rubber safety coating substantially covering the complete exposed exterior surface of said decanter and having no covering layer thereover, the safety coating being under tension and having a substantially uniform thickness of from about 4 mils to about 8 mils and providing shatter resistant containment for said decanter upon breakage, and wherein said safety coating is heat stable up to at least about 500° F.

4,860,907

CLOSURE FOR CONTAINERS

Sven Sondal, Lidingö , Sweden, assignor to Duma AB, Sweden

Filed Nov. 30, 1988, Ser. No. 278,181
Claims priority, application Sweden, Dec. 8, 1987, 8704884
Int. Cl.[4] B65D *41/48*
U.S. Cl. 215—230 **4 Claims**



1. A closure (1) for containers, formed in its closed state of a springy, elastomeric plastic material, comprising a retaining portion (2) intended to retain the closure (1) on the container, and a lid portion (3) hinged to the retaining portion (2) via a hinge (10), a tear-off member (4) being located between the lid (3) and the retaining portion (2) and initially holding these portions together in order to guarantee that the seal is unbroken, the tear-off member being located in the area opposite the hinge (10) and extending along 25–75% of the circumference of the closure, wherein a plurality of bridges spaced around the circumference are arranged between the lid and the retaining portion within the circumferential sections extending between the ends of the tear-off member (4) and the hinge (10).

4,860,908

CRUSHABLE CONTAINER AND METHOD FOR WEAKENING THE CONTAINER

Richard R. Rumble, 11 Parkway Ct., Orinda, Calif. 94563, and

Filed Jun. 6, 1985, Ser. No. 742,169
Int. Cl.[4] B65D *1/40*
U.S. Cl. 220—1 R **17 Claims**



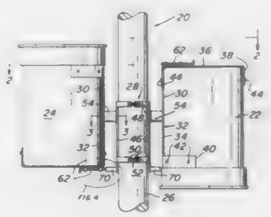
1. A method for weakening a metal container comprising the following steps:
   selecting a pattern of folding regions according to the configuration of the metal container and the mode of crushing to be used; and
   nondeformably weakening the material strength of the container along the folding regions to promote crushing of the container.

4,860,909

TRASH RECEPTACLE MOUNTED FOR ROTATION

Dov A. Leumi, 812 S. 9th St., Philadelphia, Pa. 19147

Filed Jan. 28, 1988, Ser. No. 149,346
Int. Cl.[4] B65F *1/12*
U.S. Cl. 220—1 T **3 Claims**



1. A trash receptacle to facilitate collecting and removal of trash, said trash receptacle comprising a pair of baskets and a supporting member for said baskets, said baskets being connected to said supporting member by a rotatable mounting means which mounts said baskets on diametrically opposed sides of said supporting member, fixing means for fixing each of said baskets against rotation with respect to said supporting member, said rotatable mounting means including an axis of rotation which extends through said supporting member enabling said baskets to be rotated with respect to said supporting member when said baskets are receiving trash and enabling each of said baskets to be rotated by releasing said fixing means, said fixing means comprises a rod slidably connected to each basket, said supporting member including a pair of diametrically opposed openings in said supporting member

aligned with each said slidable member rod when each said basket is in an upright position vertically disposed with respect to the axis thereof, each said rod slid in a horizontal direction to enable the rods to be slid in said openings to fix said baskets with respect to said supporting member.

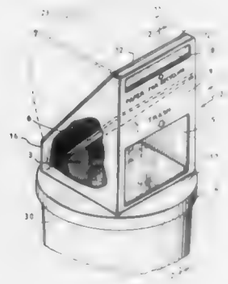
3. A trash receptacle to facilitate collecting and removal of trash, said trash receptacle comprising a basket and a supporting member for said basket, said supporting member being connected to said basket by a rotatable mounting means which enables said basket to be rotated with respect to said support and means for fixing said basket with respect to said support when said basket is being used as a receptacle for receiving trash, said rotatable mounting means having an axis of rotation which extends through said supporting member, said basket being rotatable about said axis of rotation, said means for fixing comprising a rod slideably connected to said basket and an opening in said supporting member, said rod being slid in said opening to fix said basket with respect to said supporting member, said supporting member comprising a vertically extending post and a suitable bracket being provided for rotatably supporting said basket on said post, said bracket being connected to said post by a pair of straps which embrace said post.

4,860,910

PAPER SEPARATION DEVICE FOR WASTE CONTAINERS

Joseph D. Zipper, Farmingdale, N.Y., assignor to State University of New York, Albany, N.Y.

Filed May 27, 1988, Ser. No. 199,603
Int. Cl.[4] B65D *90/00*
U.S. Cl. 220—1 T **7 Claims**



1. A removable separation device for placement over the central opening of various types of waste containers which comprises:

a single and removable housing having continuous walls forming an enclosure and an opening for fitting over a waste container;

a means for maintaining said housing upon the waste container;

a lower opening formed in one of said walls for entry of waste articles into the waste container;

an upper opening formed above said lower opening in said wall for inserting therethrough sheets of paper within said enclosure;

a partition disposed in said enclosure adapted to receive said sheets of paper and store said sheets of paper within said enclosure while simultaneously permitting said other waste articles to be deposited in said waste container;

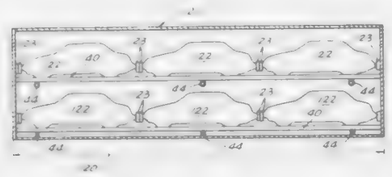
an opening formed in said housing above said partition so that stored sheets of paper in said enclosure can be removed.

4,860,911

CARGO CONTAINER

John L. Jones, Sr., P.O. Box 233, Pasadena, Calif. 91102

Continuation of Ser. No. 649,522, Sep. 11, 1984, Pat. No. 4,836,411. This application May 9, 1985, Ser. No. 732,303
Int. Cl.[4] B65D *87/00*
U.S. Cl. 220—1.5 **3 Claims**



1. In a heavy duty product transportation container having a rectangular box having an axial length of from 10 to 40 feet, having a box width of from 7 to 12 feet, and a box depth of from 7 to 12 feet, said rectangular box having two long opposed flat rigid panel sides, a fixed flat rigid front end, a full rear flat rigid door, equivalently equal in area to said front end, and a flat rigid box bottom, said box area components disposed and integrally secured at the area perimeters, forming a commerical box structure, the combination comprising:

dual full length flat rigid top hinged half lids lid and said a flat rigid box bottom having bottom structural trusses disposed interiorly on said bottom and permanently secured thereto said bottom length,

each said full length flat rigid top hinged lid having at least one hinge securing said lid to an adjacent said long panel side, and at least one locking hasp pair means securing said dual lids to each other,

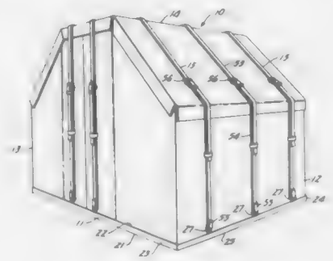
at least two horizontal automobile supporting ramps are secured parallel inside the horizontal length of said rectangular box, each supporting ramp adaptively secured in a spaced position in said box necessary for supporting at least one automobile on each said ramp, each one of said horizontal ramps supported by a plurality of hollow pipe cross members and by a plurality of restraining bars secured and positioned in a plurality of apertures in said box by restraining pins disposed in said restraining bars.

4,860,912

COLLAPSIBLE CARGO CONTAINER FOR AIRCRAFT

Julius B. Kupersmit, 299 W. 12th St., New York, N.Y. 10014

Filed Jun. 10, 1988, Ser. No. 205,234
Int. Cl.[4] B65D *87/14*
U.S. Cl. 220—1.5 **2 Claims**



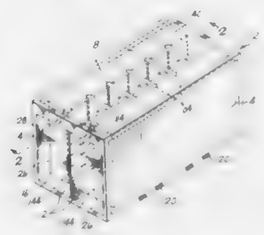
1. An improved collapsible shipping container element of domed roof configuration including: a rigid planar slip sheet element; first and second wall elements, and a roof element; said slip sheet element including a peripheral edge, and having a plurality of ring members projecting upwardly from said edge; said wall elements each comprising a planar blank of corrugated material and including a side wall panel and first and second end wall panels foldably interconnected thereto, a door member foldably interconnected to a vertical edge of each of said end wall panels, said side wall panels being of rectangular configuration, said end wall panels having an angularly disposed upper edge and being of a height greater than said side wall panel; said roof element comprising a single blank of material and including a rectangular central roof panel positioned above said doors of said first and second wall elements, and first and second rectangular roof panels overlying the end walls of said first and second wall elements, said roof element having peripheral edge flap members overlying outer surfaces of said first and second wall elements for detachable interconnection therewith; and a plurality of strap elements interconnecting said rings on said slip sheet and passing over said roof and wall elements, serving to place said container under tension when in closed condition.

4,860,913

CABINET RESTRAINT SYSTEM FOR CARGO CONTAINER

William A. Bertolini, 805 S. 295th Pl., Federal Way, Wash. 98003

Filed Aug. 11, 1988, Ser. No. 231,216
Int. Cl.[4] B65D *88/00*
U.S. Cl. 220—1.5 **25 Claims**



1. A system for installing storage cabinets in a cargo container and integrating the cabinets into the structure of the container to enable them to maintain their positioning and shape when the container is subjected to external forces during transportation of the container, said container having opposite sidewalls, a front wall, a floor, a rear door, and a header extending laterally substantially above the door, said system comprising:

a row of cabinets each of which has a rear wall, opposite sidewalls, a bottom wall, a top wall, and front closure means; said cabinets being arranged adjacent to each other with their rear walls adjacent to the inner surface of one of the sidewalls of the container, a sidewall of the frontmost cabinet adjacent to the front wall of the container, and the rearmost cabinet spaced inwardly from the door and the header;

first attaching means for attaching the rear walls of the cabinets to the adjacent sidewall of the container;

second attaching means for attaching adjacent sidewalls of the cabinets to each other;

third attaching means for attaching the bottom walls of the cabinets to the floor; and

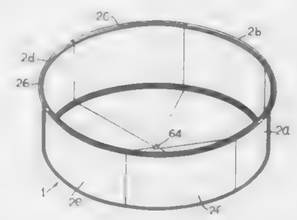
force transmitting means for transmitting forces from the cabinets to the header to provide a continuous load path from the cabinets through the header to the structure of the container to prevent deformation of the cabinets when the container is subjected to forces tending to accelerate it in a forward direction; said force transmitting means comprising a cabinet support portion that engages an upper portion of the rearmost cabinet, a header portion that engages the header and the cabinet support portion, and means for adjusting the overall length of said cabinet support portion and said header portion to accommodate variations in the space between the header and the rearmost cabinet.

4,860,914

COLLAPSIBLE SWIMMING POOL

Roxanne M. Dersi, and Nicodeme B. Dersi, both of 450 N. Prospect Dr., Brookfield, Wis. 53005

Filed Apr. 25, 1988, Ser. No. 186,038
Int. Cl.[4] B65D *8/00*
U.S. Cl. 220—4 C **5 Claims**



1. A collapsible swimming pool structure for supporting a water retaining liner comprising a plurality of nestable sections each of which includes:

a bottom wall having an outer periphery, an inner portion, leading and trailing margins which extend radially outward from said inner portion to said outer periphery, and a lost motion aperture in said inner portion with said inner portions of said plurality of sections being in overlapping relation one on top of the other with said lost motion apertures aligned to define a pivot member receiving bore, said bottom walls forming a complete bottom wall for said swimming pool when it is set up;

a side wall connected to said outer periphery of said bottom wall and extending therefrom in a generally vertical direction, said side wall of each section cooperating with vertical side walls of adjacent sections to form a continuous side wall for the swimming pool when it is set up, said side wall having,

generally vertical leading and trailing edges intersecting said bottom wall leading and trailing margins respectively,

a first locking means including a first flange portion on said leading edge extending circumferentially outward beyond said intersection of said leading edge with said leading margin,

a second locking means including a second flange portion on said trailing edge extending circumferentially outward beyond said intersection of said trailing edge with said trailing margin,

said first locking means of one of said sections being secured to said second locking means of a side wall of an adjacent section when said swimming pool is in said setup position; and

a retainer means for releasably securing said bottom wall inner portions together, said retainer means including a pivot member mounted in said bore to loosely secure said inner portions together to permit simultaneous radial and pivotal movements of each of said sections relative to the other of said sections, said movements allowing said sections to be rotated fan-like about said pivot member between

a collapsed closed position in which said sections are nested one on top of the other for storage, and

a setup open position in which said bottom walls coact one with another to form a circular swimming pool bottom and said side walls coact one with another to form a continuous circular side wall with said first locking

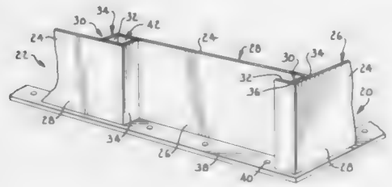
means of each of said side wall sections releasably interlocked with said second locking means of an adjacent side wall section to secure said individual side walls into an integrated circular side wall.

4,860,915

BAGHOUSE WITH INTEGRAL WALL STIFFENERS

Jack T. Clements, Raytown, Mo., assignor to Standard Havens, Inc., Kansas City, Mo.

Filed Jul. 20, 1987, Ser. No. 75,442
Int. Cl.[4] B65D *88/26, 90/02*
U.S. Cl. 220—4 R 2 Claims



1. A housing for the separation of particulate matter from a gas stream, said housing being formed from a plurality of individual panels, each of said panels having a planar member and two spaced apart opposing sides integral with said planar member, each side presenting a free edge and each panel presenting top and bottom edges, said housing comprising:

interconnected walls, each wall formed by aligning said panels substantially upright and coupling together a plurality of said individual panels in an overlapping arrangement where each individual panel is in reverse orientation with respect to its adjoining panels, said walls being interconnected in a manner forming a rectangular housing;

a plurality of spaced apart channels presented along each of said walls, each channel being formed between two of said adjoining panels where said panels overlap when arranged in said overlapping, reverse orientation arrangement, whereby said channels form stiffening elements integral with said walls;

a flange extending outwardly from each of said top and bottom edges of each of said individual panels, said flange presenting means for attachment;

an upper structure coupled with said housing to provide a clean gas plenum;

a lower structure coupled with said housing; and

supporting structures coupled with said lower structure in a manner supporting said housing above ground.

4,860,916

TANK AND METHOD OF MAKING SAME

Raymond S. Winters, LaGrange, Ill., assignor to Environetics, Inc., Lockport, Ill.

Filed Sep. 15, 1988, Ser. No. 244,325
Int. Cl.[4] B65D *8/12*
U.S. Cl. 220—5 A 21 Claims

3. A tank for holding liquids comprising:

A. an upstanding enclosure wall having inner and outer surfaces and upper and lower edges said enclosure wall defining a bottom surface therewithin:

B. a removable, flexible, liner buffer within said enclosure wall, said buffer having inner and outer surfaces, said liner buffer overlying completely and continuously and substantially conforming in shape to said inner surface of said enclosure wall from said lower to said upper edge, and said liner buffer also overlying completely and continuously and substantially conforming in shape to said bottom surface;

C. a removable, flexible, liquid impervious inner liner within said enclosure, said liner comprising a plastic sheet having a thickness in the range of about 25 to 50 mils, said liner having inner and outer surfaces and said liner overlying and substantially conforming in shape to said inner surface of said liner buffer, said surfaces of said enclosure wall and said bottom surface being capable of damaging said liner;

D. said outer surface of said liner buffer being in contact with said inner surface of said enclosure wall and said bottom surface, said outer surface of said liner being in



contact with said inner surface of said liner buffer, whereby said liner buffer protects said liner from damage by preventing said liner from contacting surfaces of said enclosure wall and said bottom surface; and

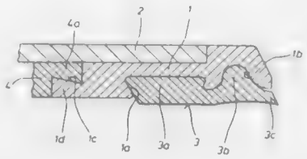
E. said liner buffer comprising a liquid pervious fibrous mat made of an integral network of discrete interconnected synthetic plastic fibers, said mat having a thickness of at least about twice said thickness of said liner.

4,860,917

SCRAPING ARRANGEMENT FOR TELESCOPIC COVERS

Albert Stöhr, Markt Schwaben, Fed. Rep. of Germany, assignor to Gebr. Hennig GmbH, Fed. Rep. of Germany

Filed May 5, 1988, Ser. No. 190,536
Claims priority, application PCT Int'l Appl., May 13, 1987, PCT/EP87/00250; Fed. Rep. of Germany, Jul. 7, 1987, [illegible]
Int. Cl.[4] B23Q *11/08*
U.S. Cl. 220—8 9 Claims



1. Scraping arrangement for a telescopic cover consisting of a plurality of cover boxes, especially for a telescopic steel cover, containing

(a) a carrier strip (1, 1', 1'') which is made from rigid material and can be connected to the top wall (2) of a cover box,

(b) and a scraper (3, 3', 3'') which is made from flexible material and is connected in a form-locking and releasable manner to the underside of the carrier strip.

characterised in that

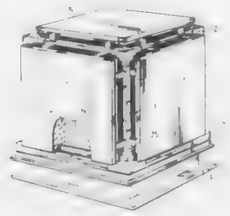
(c) a buffer (4, 4', 4'') which is made from a different material from that of the scraper is arranged on the rear face of the scraping arrangement.

4,860,918

SYSTEM FOR CONSTRUCTING AIR CONDITIONING CABINETS AND METHOD FOR CONSTRUCTING SAME

Johannes M. Wuyten, and Adriaan L. Daelmans, both of Waalwijk, Netherlands, assignors to Holland Heating BV, Netherlands

Filed Dec. 23, 1986, Ser. No. 945,863
Claims priority, application Netherlands, Jan. 2, 1986, 8600002; Jul. 7, 1986, 8601764
Int. Cl.[4] B65J *1/00*
U.S. Cl. 220—84 15 Claims



1. An air conditioning cabinet system comprising the combination of a subframe forming a supporting base for air conditioning components and an open, upstanding framework on the subframe, the upstanding framework comprising bottom rib profiles attached to the subframe in overlying, circumscribing relation thereto, vertically extending rib profiles attached to the bottom profiles at the corners of the subframe, and horizontally extending upper rib profiles joining the upper ends of the vertically extending rib profiles, each of the bottom rib profiles being of angled construction defining an open channel facing outwardly along a corresponding bottom side of the subframe, each of the vertically extending rib profiles being of angled construction defining mutually outwardly facing channels along the vertical sides of the framework, and each of the upper rib profiles being of angled construction defining mutually outwardly facing channels along the upper side edges of the framework, wall constructions received from outside the framework within the open spaces at the sides of the framework and lying in flush relation between the various rib profiles to expose the various channels defined thereby, clamp means around the peripheries of the wall constructions engaging over lips of the various channels and corresponding side edges of the wall constructions so as to be accessible due to the exposed channels, and cover profile means for covering the exposed channels and lying flush with the wall constructions to form a smooth exterior cabinet surface.

4,860,919

BI-DIRECTIONAL SEALED NOZZLE DAM

Eric M. Weisel, Windsor Locks, and Glen F. Schukei, Windsor, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

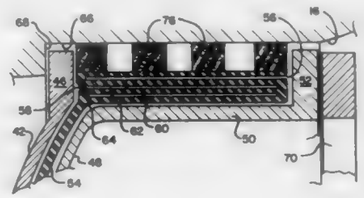
Filed Jul. 29, 1988, Ser. No. 225,973
Int. Cl.[4] F16L *55/10*
U.S. Cl. 220—240 11 Claims

1. A nozzle dam for use in sealing a steam generator nozzle which includes in combination:

means forming a bulkhead having a peripheral surface in opposing face-to-face relation with the inside surface of the nozzle;

seal means between said peripheral surface and said inside surface of the nozzle; and

said seal means including separate strata of flexible material defining separate and oppositely facing cavities whereby hydraulic forces from either side of said bulkhead creates a force in one of said cavities and on at least one of said



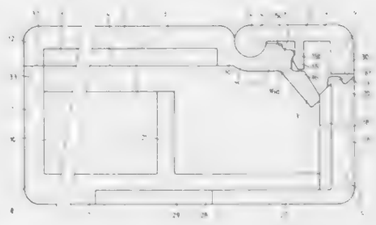
strata to create a seal between said peripheral surface and said inside surface of the nozzle.

4,860,920

COSMETICS BOX WITH IMPROVED CLOSING MEANS

Rene Quennessen, Creteil, France, assignor to AMS Packaging, Saint-Ouen-L'aumone, France

Filed Nov. 2, 1987, Ser. No. 116,321
Claims priority, application France, Nov. 3, 1986, 86 15275
Int. Cl.[4] B65D *43/22, 43/24*
U.S. Cl. 220—326 4 Claims



1. A box for cosmetics, comprising:

a base defining an upper recess for receiving cosmetics and having front and rear transverse walls, a rear transverse pivot, a main bottom wall, and a main upper wall, said rear transverse pivot comprising a rounded protuberance and said rear transverse wall having an aperture formed therein and having a bend formed therein upwardly of said aperture and adjacent said rounded protuberance and said bend having extending therefrom in proximity to said rounded protuberance a vertical transverse rib extending downwardly toward said main bottom wall, said rib having a rib protuberance at the end thereof;

a cover having a main upper wall and a rear side, said rear side having formed therein an annular sector cooperating with said rounded protuberance, said cover being pivotably mounted on said base around said rear transverse pivot and movable between a closed position and an open position and said bend in said rear transverse wall of said base being coplanar with said main upper wall of said cover when said cover is in said closed position;

a movable pusher slidably carried by said base, said aperture in said rear transverse wall being complementary in shape with said pusher; and

a drive lever extending from said rear side adjacent said annular sector inside said box and cooperating with said pusher, said drive lever being inclined with respect to said upper main wall of said cover at an angle of between approximately 120° and 150°, said drive lever having a drive lever base facing said rib and said drive lever base having a lever protuberance complementary to said rib protuberance, said rib protuberance and said lever protu-

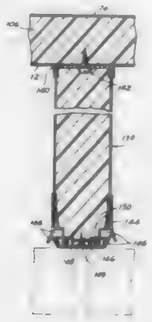
berance comprising closing means for holding said cover in said closed position.

4,860,921

THERMAL BREAKER STRIP FOR REFRIGERATION CABINETS

Edward Gideg, 87-77 Lefferts Blvd., Richmond Hill, N.Y. 11418

Division of Ser. No. 608,189, May 9, 1984, Pat. No. 4,676,852. This application May 1, 1987, Ser. No. 45,953
Int. Cl.[4] B65D *25/18*
U.S. Cl. 220—467 18 Claims



11. A refrigeration cabinet comprising a plurality of plate members forming inner and outer box-like structures and defining respective inner and outer rear, top, bottom, and side walls having a polymerized thermal insulating medium therebetween, said medium being adhered to said plate members and substantially retaining said plate members in their predetermined arrangement as a single unit, the forward marginal portions of said inner top, bottom, and side plate members having extending therealong at least one thermal insulating member formed of a substantially non-heat conducting material to form a thermal barrier between the inner walls of the cabinet and the outside atmosphere, said thermal insulating member being configured and dimensioned to extend across the forward portion between the inner and outer walls to at least contain the polymerized thermal insulating medium forming components therebetween during polymerization, said thermal insulating member defining a plurality of generally elongated continuous grooves therealong for reception of electrical wires connected to the electrical system of the cabinet, and cover means constructed of a similar or identical resilient substantially non-heat conducting material and dimensioned and configured to be positioned over said thermal insulating member so as to cover said grooves, and means for removable engaged attachment of said correspondingly dimensioned cover means.

4,860,922

AUTOMATIC DISPENSER FOR CYLINDRICAL COMMODITIES, IN PARTICULAR PACKETS OF COIN

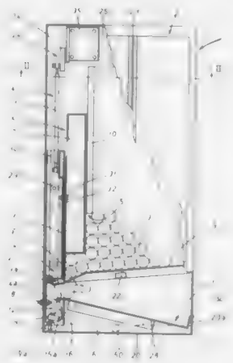
William Maiservisi, Zola Predosa; Claudio Righetti, Bologna; Raffaele Nadalini, Zola Predosa; Umberto Braga, Castelmaggiore, and Marino Romagnoli, S.Lazzaro Di Savena, both of Italy, assignors to Unimac s.n.c. di Nadalini Raffaele & C., Bologna, Italy

Filed Nov. 29, 1988, Ser. No. 277,259
Claims priority, application Italy, Dec. 4, 1987, 3722 A/87
Int. Cl.[4] G07F *11/16, 9/02;* B65H *5/00*
U.S. Cl. 221—6 6 Claims

1. An automatic dispenser for cylindrical commodities, in particular packets of coin, comprising:

a bin including means for adjusting the width of the bin and a bottom, said bin being enclosed at the bottom by an angled shelf that slopes downward toward an outlet located in a vertical rear wall of the bin and communicating with a release mechanism by which packets of coin are dispensed singly; said release mechanism including

a vertically disposed sliding shutter provided with a slot that is angled in the same direction as that of the angled shelf, wherein said slot includes means for adjusting its height and wherein said shutter moves said slot between at least a raised position, in which the slot and the shelf are substantially in alignment and a packet of coins can be received into the slot, and a lowered knockout position in which the slot lies substantially level with a dispensing tray;



knockout means for engaging the packet of coins occupying the slot and ejecting it from the slot onto the dispensing tray; and

a vertically disposed baffle parallel with and freely accommodated between the shutter and the rear wall adjacent to the outlet, and urged into contact with the shutter by the weight of the packets of coin emerging from the bin by way of the outlet.

4,860,923

POSTMIX JUICE DISPENSING SYSTEM

Jonathan Kirschner; Kenneth G. Smazik, both of Marietta, and Gary V. Paisley, Lilburn, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 137,307, Dec. 23, 1987, which is a continuation-in-part of Ser. No. 924,381, Oct. 29, 1986, abandoned. This application Mar. 4, 1988, Ser. No. 164,364
Int. Cl.[4] B67D *5/56*
U.S. Cl. 222—1 14 Claims

12. A method for postmix juice dispensing from a narrow countertop juice dispensing unit having a width of less than about five inches comprising:

(a) providing a concentrate reservoir in said unit;

(b) providing a remote, under-the-counter refrigeration unit with a remote cold water bath;

(c) recirculating cold water from said remote water bath to heat exchange coil in heat exchange relationship to said reservoir, to chill concentrate in said reservoir; and

(d) pre-cooling potable water to be used in said dispensing unit by feeding it through a heat exchange coil in said



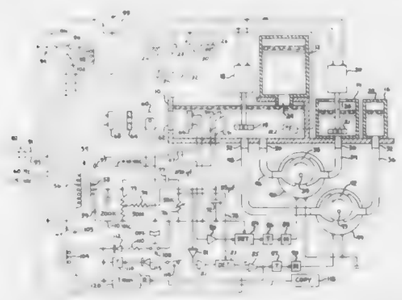
remote cold water bath and then feeding the pre-cooled water to said dispensing unit.

4,860,924

LIQUID DEVELOPER CHARGE DIRECTOR CONTROL

Robert M. Simms, and George A. Gibson, both of Endwell, N.Y., assignors to Savin Corporation, Stamford, Conn.

Continuation of Ser. No. 154,497, Feb. 4, 1988, abandoned, which is a continuation of Ser. No. 829,618, Feb. 14, 1986, abandoned. This application Jul. 25, 1988, Ser. No. 224,231
Int. Cl.[4] G03G *15/10*
U.S. Cl. 222—56 20 Claims



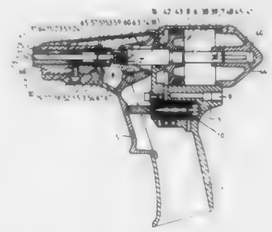
1. A liquid developer control system including in combination a first source of carrier liquid, a second source of toner, a third source of charge director, a working supply of liquid developing means for supplying carrier liquid from the first source to the liquid developer, first means for measuring the optical transmissivity of the liquid developer, means responsive to the first means for supplying toner from the second source to the liquid developer, second means for measuring the conductivity of the liquid developer, and means responsive to the second means for supplying charge director from the third source to the liquid developer.

4,860,925

DEVICE FOR MIXING FLUIDS, NOTABLY LIQUIDS, AND DISPENSING THE MIXTURE THUS OBTAINED, AND APPARATUS INCORPORATING THIS DEVICE

Henri Carrillon, Villeurbanne, France, assignor to Comptoir General d'Emballage, Villeurbanne, France

Filed Jan. 25, 1988, Ser. No. 149,918
Claims priority, application France, Jan. 30, 1987, 87 01117
Int. Cl.[4] B67D *5/60*
U.S. Cl. 222—145 23 Claims



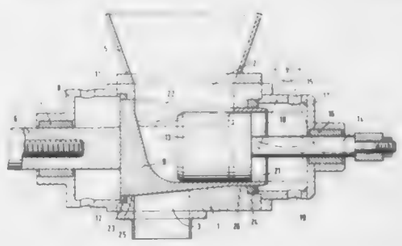
1. A device for mixing fluids, notably liquids, and dispensing the mixture thus obtained, which comprises support means, a mixing chamber rigidly yet releasably connected to said support means, adjustment rod means sliding in said mixing chamber for adjusting from inside the output of the fluids introduced into said mixing chamber and permitting closing or opening of conduit means supplying said fluids to said mixing chamber, and control means for controlling said adjustment rod means, said control means being rigidly mounted integral with said support means, wherein said adjustment rod means are connected to said control means so as to be movable with respect to said control means but not readily disconnectable with respect to said control means, said adjustment rod means being furthermore independent of said support means, whereby said adjustment rod means can be moved with said mixing chamber in relation to said support means thus permitting access to and cleaning said conduit means without disconnecting said adjustment rod means with respect to said control means.

4,860,926

ARRANGEMENT FOR DOSINGLY FILLING OF FLUID OR PASTY MATERIAL INTO CONTAINERS

Harald Juenkersfeld, Wuppertal, and Georg Fischer, Velbert, both of Fed. Rep. of Germany, assignors to Benz & Hilgers BmbH, Duesseldorf, Fed. Rep. of Germany

Filed Sep. 29, 1987, Ser. No. 102,508
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1986, 3636804
Int. Cl.[4] B65B *3/04*
U.S. Cl. 222—148 11 Claims



1. An improved device for dosingly filling of fluid or pasty material into containers, including a housing having an inlet

and an outlet for said filling material, a cylinder rotatably mounted in said housing for alternately blocking and unblocking said inlet and outlet, said cylinder having at least one window-like opening in its cylindrical peripheral surface, said cylinder having a free end and, being coaxially mounted on a trunnion pin which is axially slidably and rotatably mounted in a first support and a dosing piston being coaxially mounted on a piston rod which is axially reciprocally slidably mounted in a second support, the improvement comprising in combination,

said dosing piston being guidingly contacted by at least a portion of the inner wall surface of said cylinder and being axially slidably movable therein, said piston rod being adapted to slidably move said dosing piston into an extreme inner position and an extreme outer position with respect to said cylinder, said piston blocks at least a third of said window-like opening of said cylinder by means of the peripheral cylindrical surface of said dosing piston when in said extreme inner position and completely exposes said window-like opening when in said extreme outer position in which position said dosing piston is slidably mounted in the region of said free end of said cylinder, said inlet of said housing and said window-like opening in said cylinder being substantially of the same size, the free end of said dosing piston being essentially in alignment with one edge of said inlet and window-like opening when in said extreme outer position.

4,860,927

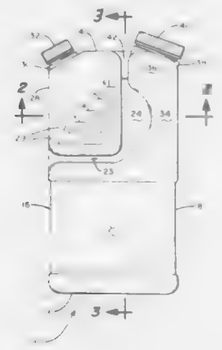
BLOW MOLDED TWO-COMPARTMENT CONTAINER

James E. Grinde, 2401 - 147th La., NE., Anoka, Minn. 55303

Continuation of Ser. No. 79,042, Jul. 29, 1987, abandoned. This application Nov. 30, 1988, Ser. No. 278,008

Int. Cl.[4] G01F *11/26*

U.S. Cl. 222—158 **6 Claims**



1. A container for storing, measuring and dispensing pourable material comprising:

(a) a generally rectangular, hollow, molded bottle having mutually perpendicular bottom, top, end and side walls, said side walls being parallel and spaced apart except for being joined along a first, generally horizontal web extending inwardly from one end wall toward, but short of, the opposed end wall at a predetermined height above said bottom wall and a second, vertically extending web joined to said horizontal web at a right angle at the internal terminus of said horizontal web and extending toward, but short of, said top wall, said webs partitioning said generally rectangular bottle into:

(i) a lower, relatively large capacity reservoir having a tubular neck extending vertically along one of said end walls, said tubular neck converging in three directions to a minimum cross-sectional area generally midway along said vertically extending web and then diverging to form a generally rectangular filling chamber proximate said top wall,

(ii) an upper, generally rectangular measuring chamber having a storage capacity greater than that of said filling chamber and less than that of said large capacity reservoir, and

(iii) a connecting tube extending along said top wall and joining the filling chamber and said measuring chamber;

(b) a first opening formed through said top wall leading into said filling chamber;

(c) a second opening formed through said top wall leading into said measuring chamber; and

(d) first and second removable closure means for sealing said first and second openings.

4,860,928

POWDER CONSTANT-VOLUME FEEDER

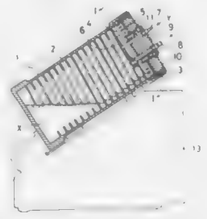
Tadahiro Shimazu, 1, Konohana-cho, 1 chome, Gifu-City, Japan

Filed Dec. 24, 1987, Ser. No. 137,766

Claims priority, application Japan, Dec. 24, 1986, 61-314494; Dec. 1, 1987, 62-304892

Int. Cl.[4] B65G *53/08*

U.S. Cl. 222—167 **7 Claims**



1. A powder constant-volume feeder including:

a canister having on the inner surface thereof a fin for transferring powder upwards and being inclined to form a return portion for the powder which has been transferred by said fin;

a bucket wheel having a plurality of buckets for transferring the powder from said return portion to a powder hopper continuously; and

said powder hopper for receiving therein the powder from the interior of the buckets of said bucket wheel.

4,860,929

DISPENSING DEVICE FOR SOLUBLE GRANULAR MATERIALS

Christopher H. Lowe, 21 Charleston Court, Forrestfield, Furnace Green, Crawley, Sussex, and Nicholas J. Allen, Flat 2, 23 Hampstead Lane, Highgate, London N6, both of England

Filed Dec. 16, 1987, Ser. No. 133,534

Claims priority, application United Kingdom, Dec. 16, 1986, 8629966

Int. Cl.[4] A47J *31/00*; B65B *29/02*

U.S. Cl. 222—189 **3 Claims**

1. A dispensing device for a soluble granular material comprising:

an elongated cylindrical plastic tube of continuous unitary thin walled plastic construction as found in a straw;

said tube having a diameter of between 0.3 and 1.5 centimeters and said tube having a length of between 10 and 20 centimeters;

said tube having first and second ends, said first end being heat sealed and formed into a flat paddle, having a transverse extent greater than the diameter and a thickness of substantially twice the wall thickness of said tube and

constituting means for stirring a liquid, and said second end being sealed;

particulate material within said tube adjacent said first end thereof;

said tube having perforations through the side wall thereof in two zones only, the first directly adjacent said first end and the second at diametrically opposite sides of the tube



extending longitudinally on the tube and aligned in a plane defined by the paddle to permit fluid engagement with said particulate material when immersed in fluid and prevent leakage of residual fluid from the tube when laid on a horizontal surface after use;

whereby said dispenser may be immersed in a cup of hot liquid and said particulate material dispensed into said hot liquid, with said paddle serving to stir said liquid.

4,860,930

QUANTITATIVE FEEDING DEVICE

Ming L. Tu, 10-2, 104 Alley, Cheng I Street, Taichung, Taiwan

Filed Jun. 29, 1988, Ser. No. 213,178

Claims priority, application Taiwan, May 26, 1988, 77204957

Int. Cl.[4] G01F *11/10*

U.S. Cl. 222—231 **1 Claim**



1. A quantitative feeding device, comprising:

a hollow housing having an upper truncated cone portion joined with and narrowing into a lower round tubular portion, the housing being adapted for mounting under a vessel containing a material to be fed;

a hollow ball valve having an open top and a diameter at least equal to that of the housing tubular portion, the ball valve sealingly seating within the housing proximate the junction of the cone and tubular portions thereof by an annular surface of the ball valve contacting with the housing for thereby sealing the cone portion from the tubular portion, the ball valve being sealingly rotatable in the housing, the ball valve including a radial protrusion for contactingwith respective opposite side walls of the housing for thereby limiting rotation of the ball valve within the housing between a first position at which the open top of the ball valve faces generally upwardly and a second position at which the open top of the ball valve faces generally downwardly;

a pair of aligned shafts passing through respective opposite side walls of the housing and respectively fixed in diametrically opposite sides of the ball valve;

a handle secured to one of the shafts for rotating the ball valve between said first and second positions thereof;

an elastic member mounted between the housing and the other of the shafts for urging the ball valve towards said first position thereof; and

an oscillating element mounted in the truncated cone portion of the housing, the oscillating element having an upwardly extending extension portion extending above the housing cone portion for extending into a vessel mounted thereabove, and a downwardly extending reactive portion extending adjacent the ball valve in the housing cone portion for being contacted by the radial protrusion of the ball valve as the ball valve is rotated between the first and second positions thereof for oscillating the oscillating element.

4,860,931

KEG TAP

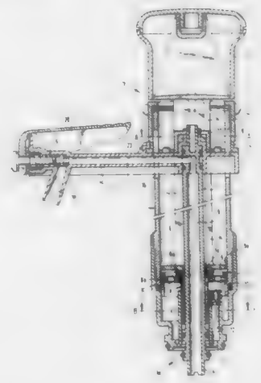
Julian D. Hubbard, Monaco, Monaco, assignor to Romneya Trading Co., England

Filed Mar. 16, 1988, Ser. No. 168,767

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1987, 3709334

Int. Cl.[4] B65D *83/06*

U.S. Cl. 222—400.8 **5 Claims**



1. A key tap for dispensing a liquid from a vessel having a keg seal, comprising:

an essentially cylindrical housing;

an axially movable valve-opening rod located within the housing and extending along essentially the entire length of the housing, one end of said valve-opening rod projecting out of one end of said housing so as to define a valve-opening element which interacts with the keg seal, said valve-opening rod having a continuous liquid passage therein which is open at said one end of the valve-opening rod;

moving means for moving said valve-opening rod axially;

a stirrup extending through a recess in a side wall of the housing in a direction essentially perpendicular to said valve-opening rod, said stirrup having a liquid duct therein which is connected to the liquid passage in said

valve-opening rod at a point adjacent an end of the valve-opening rod opposing said one end of the valve-opening rod;

an outflow conduit connected to said stirrup;

valve means for selectively connecting a passage in said outflow conduit to the liquid duct of said stirrup; a piston which is movable within said housing and which defines a pressure space adjacent said one end of the housing, said piston having a central axial bore through which said valve-opening rod is axially movable, said piston comprising a gasket which selectively seals an outlet from said pressure space;

a handle located at an end of said housing opposing said one end of the housing;

at least one piston rod connecting the piston to the handle; and

an outflow duct connected to said pressure space, said outflows duct having a non-return valve which allows a pressure medium to flow out from said pressure space through said outflow duct but not into said pressure space through said outflow duct.

4,860,932

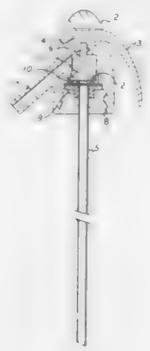
BOTTLE SIPHON AND DISPENSER

Imre Nagy, 2733 Columbine St., San Diego, Calif. 92105

Filed May 27, 1988, Ser. No. 199,423

Int. Cl.[4] B65D *83/00*

U.S. Cl. 222—402.1 **8 Claims**



1. A fluid dispenser and siphon device in combination with a container having a container port and holding pressurized fluids, said device comprising:

a dispenser body removably attached to said container proximate to said container port, said dispenser body having an inlet port proximate to said container port when said body is attached to said container, a fluid discharge port and a fluid passage from said inlet port to a said discharge port;

a sealing element attached to said fluid passage proximate to said inlet port, shaped and positioned to contact and seal said container port;

a hollow tube, extending from a bottom region within said container to said inlet port said hollow tube providing a fluid path from said bottom region through said sealing element to said fluid passage;

a valve seat within said fluid passage;

an obstructor shaped and dimensioned to block the flow of pressurized fluid through said fluid passage when said obstructor is in a first sealing position in contact with said valve seat, and to allow flow of pressurized fluid when moved to at least one other position within said fluid passage;

means for moving said obstructor from one of said obstructor positions to another; and

a ported bias element having fluid port dimensions smaller than said fluid passage, having a first surface in contact with and tending to seal said sealing element against said container port and a second surface, distal from said first surface, in contact with said obstructor and tending to move said obstructor toward said first sealing position.

4,860,933

CONTAINER FOR PACKAGING A PRODUCT AND DISPENSING IT UNDER GOOD CONDITIONS OF CLEANLINESS

Bruno Morane, Neuilly, and Vincent de Laforcade, Vincennes, both of France, assignors to L'Oreal, Paris, France

Filed Jul. 1, 1988, Ser. No. 214,518

Claims priority, application France, Jul. 6, 1987, 87 09536

Int. Cl.[4] B65D *83/00*

U.S. Cl. 222—402.13 **4 Claims**



1. A dispensing device for mounting on a container of the type having an ejection duct on one end thereof which, upon movement thereof, results in dispensing of the product through the duct, said dispensing device comprising a cap for mounting in a fixed position on the one end of the container about the dispensing duct, said cap including an ejection outlet and a dispensing portion movably carried in said cap and including an ejection tube having one end for establishing flow communication with the ejection duct of the container and another end located proximately to said ejection outlet of said cap, said ejection tube having means for closing said ejection outlet of said cap, said dispensing portion including push means for moving said dispensing portion from a first position of repose wherein said means for closing closes said ejection outlet of said cap to a second position for dispensing wherein said dispensing member moves the ejection duct of the container and moves said closing means away from said ejection outlet of said cap to allow dispensed product to travel along said ejection tube and out of said ejection outlet, said cap having guide means adjacent said ejection outlet for receiving a portion of said ejection tube, said ejection tube having an end wall provided with peripheral openings for the product, said openings being disposed about said closing means, said ejection tube further including core means defining with said ejection tube a plurality of passages along the interior of said ejection tube and communicating with said peripheral openings in said end wall at said one end of said ejection tube and being in flow communication with the ejection duct of the container at the other end thereof.

4,860,934

CLOSURE FOR RECEPTACLES FOR RECEIVING FREE-FLOWING FILLING MATERIAL

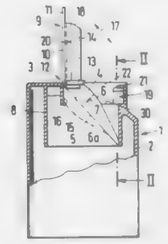
Karl-Heinz Komischke, Lehrte, Fed. Rep. of Germany, assignor to Schmalbach-Lubeca AG, Braunschweig, Fed. Rep. of Germany

Filed Feb. 16, 1988, Ser. No. 156,278

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1987, 3704977

Int. Cl.[4] B65D *47/06*

U.S. Cl. 222—534 **1 Claim**



1. A one-piece closure for a receptacle containing flowable material, said closure comprising:

a substantially rigid closure cap body attached to an end of said receptacle in firmly sealing fashion, said receptacle having a vertical axis that passes through said cap body, and said cap body including:

a cylindrical wall coaxial with said vertical axis,

a cap base continuous with but perpendicular to said cylindrical wall,

a rigid wall section parallel to said cap base and defining a bottom of a generally rectangular recess formed in said base,

a sleeve coaxial with said cylindrical wall and extending from said rigid wall section away from said cap base;

a pair of webs inward of said cylindrical wall and formed perpendicular to said rigid wall section and on said rigid wall section, said webs having first and second ends, said first ends being formed on said rigid wall section,

a respective bar projection facing inwardly and formed on each of said second ends of said webs; and

a substantially rigid pouring spour including:

a plate having a first end connected to said cap base through a joint line whereby said pouring spout is swivellable between a swung-out pouring position and a locked position, said plate in said locked position being approximately in a plane defined by said cap base and covering said recess,

said plate having a second end distant from said first end of said plate,

a hollow conduit formed on said plate allowing passage of said flowable material, said conduit extending between said first and second ends of said plate in said recess in said locked position of said spout,

respective bar sections formed along opposite sides of an outer curved surface of said conduit and projecting outwardly and elastically engageable by the respective bar projections when said pouring spout is in the locked position, and

a membrane-like flexible wall sealingly connecting said sleeve with a first end of said spout.

4,860,935

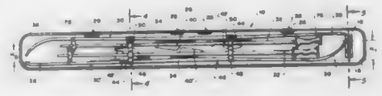
APPARATUS AND METHOD FOR CONTAINING SNOW SKIS AND SKI POLES

Joseph F. Paylinsky, 5650 Los Angeles Ave., Simi Valley, Calif. 93063

Filed Mar. 16, 1988, Ser. No. 168,918

Int. Cl.[4] A45F *3/02*

U.S. Cl. 224—202 **8 Claims**



1. A light weight apparatus for containing snow skis and ski poles, comprising:

(a) a rigid, unitary, elongated tube of sufficient length to contain skis, said tube formed by,

a first flat surface having a length, L, and width, W_L,

an opposing, parallel second flat surface having the same dimensions as said first flat surface,

a third flat surface oriented perpendicular to said first and second flat surfaces having the same length as said first and second flat surfaces, but having a shorter width, W_S, than said first and second flat surfaces,

a fourth flat surface having the same dimensions as said third flat surface which opposes said third flat surface,

and four curved surfaces, each curved surface having a radius of curvature, R, for joining said flat surfaces, the elongated tube thereby having a substantially rectangular cross-section but having said curved surfaces at the corners of said cross-section, the geometrical dimensions of the cross-section of said elongated tube being defined by the relationships

$$\left(\frac{[1 + .712(n-1)]2R}{[5(n-1) + W_L] + 2R}\right) = K_1, \quad (1)$$

pairs of skis to be inserted into the ski container,

$$\left[\frac{2R}{W_S + 2R}\right] = K_2, \text{ where } .549 < K_2 < .671, \quad (2)$$

said elongated tube having a closed first end for containing said skis and an open second end for allowing the introduction of said skis;

(b) an end cap hingedly attached to the opposite second end of said elongated tube;

(c) carrying means being attached to one of said flat surfaces for aiding in the carrying of said apparatus;

(d) locking means connected to said end cap and elongated tube for securing said end cap to a closed position relative to said elongated tube; and

(e) means for strapping a pair of said skis and a pair of ski poles together as a single strapped unit for convenient insertion into and removal from said elongated tube, each ski having a flat portion and a tip formed on the forward portion of the ski and curved from the flat portion, said flat portion terminating in a tail end, each ski further having a toe binding and a heel binding each rigidly attached to said flat portion, the skis in each strapped unit being held closely adjacent to each other and oriented so that the bindings face each other and so that the tip of one ski is adjacent the tail of the other paired ski,

each pair of ski poles being located adjacent each other on one side of the skis between the edges of the skis,

each said strapped unit thereby being adapted to be insertable within said elongated tube with said ski poles adjacent the first flat surface of said tube and the flat surface of

each ski being parallel to the third and fourth flat surfaces of said tube.

8. A method for manufacturing an apparatus for containing snow skis and ski poles, comprising the steps of:

(a) blowmolding an elongated tube of sufficient length to contain skis, said tube defined by,

a first flat surface having a length, L, and width, W_L,

an opposing, parallel second flat surface having the same dimensions as said first flat surface,

a third flat surface oriented perpendicular to said first and second flat surfaces having the same length as said first and second flat surfaces, but having a shorter width, W_S, than said first and second flat surfaces,

a fourth flat surface having the same dimensions as said third flat surface which opposes said third flat surface,

and four curved surfaces, each curved surface having a radius of curvature, R, for joining said flat surfaces, the elongated tube thereby having a substantially rectangular cross-section but having said curved surfaces at the corners of said cross-section, the geometrical dimensions of the cross-section of said elongated tube being defined by the relationships

$$\left(\frac{[1 + .712(n-1)]2R}{[5(n-1) + W_L] + 2R}\right) = K_1, \quad (1)$$

pairs of skis to be inserted into the ski container,

$$\left[\frac{2R}{W_S + 2R}\right] = K_2, \text{ where } .549 < K_2 < .671, \quad (2)$$

said elongated tube having a closed first end and a closed second end;

(b) detaching one of said end portions after the blowmolding process is completed;

(c) hinging said detached end portion to the elongated tube;

(d) attaching carrying means to one of said flat surfaces for aiding in the carrying of said apparatus;

(e) connecting locking means to said elongated tube for securing said end cap to a closed position relative to said elongated tube; and

(f) providing means for strapping a pair of said skis and a pair of ski poles together as a single strapped unit for convenient insertion into and removal from said elongated tube each ski having a flat portion and a tip formed on the forward portion of the ski and curved from the flat portion, said flat portion terminating in a tail end, each ski further having a toe binding and a heel binding each rigidly attached to said flat portion, the skis in each strapped unit being held closely adjacent to each other and oriented so that the bindings face each other and so that the tip of one ski is adjacent the tail of the other paired ski,

each pair of ski poles being located adjacent each other on one side of the skis between the edges of the skis,

each said strapped unit thereby being adapted to be insertable within said elongated tube with said ski poles adjacent the first flat surface of said tube and the flat surface of each ski being parallel to the third and fourth flat surfaces of said tube.

4,860,936

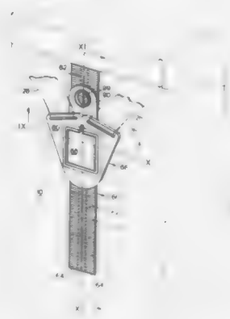
METHOD AND STRUCTURE FOR ATTACHING ADJUSTABLE BACKPACK STRAPS

Greg E. Lowe, 4172 Piedra Ct., Boulder, Colo. 80301

Continuation-in-part of Ser. No. 570,662, Jan. 13, 1984, abandoned. This application Feb. 5, 1987, Ser. No. 11,250

Int. Cl.[4] A45F *3/08*

U.S. Cl. 224—210 **17 Claims**



1. Structure for adjustably mounting attachment points to a wall of a pack member, the structure comprising:

a base member including means adapted to be secured to the wall of the pack member and having defined thereon at least one elongated track having opposed ends;

a movable member slidingly carried on the base member at the track, the movable member including attachment point mounting structure and track engaging means for slidably securing the movable member to the base member with the base member and movable member being slidably interfaced with one of such members partially but less than fully encircling the other, and with the attachment point mounting structure being positionable between the ends of the track; and

locking means carried on the movable member to releasably secure the moveable member against sliding movement along the track.

4,860,937

DEVICE FOR DRIVING IN NAILS FOR HANGING PICTURES AND SIMILAR ARTICLES

Gerhard Arnold, Wiesbaden, Fed. Rep. of Germany, assignor to Friedhelm Pickhan, Siegen-Meiswinkel, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 176,132

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3710774

Int. Cl.[4] B25C *1/02*

U.S. Cl. 227—147 **8 Claims**

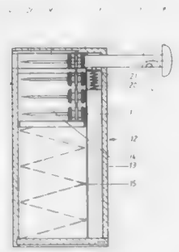
1. A device for driving nails into a wall, each of the nails having an elongated cylindrical nail head, the nail head having an abutment surface to which a shaft is connected so as to limit insertion of the nail into the wall and a recess for engaging a loop, said device comprising:

a nail magazine for storing a plurality of the nails;

a driving-in channel for receiving one of said plurality of the nails from the magazine;

means for forcing said plurality of the nails toward said driving-in channel;

a ram located in said driving-in channel and movable axially relative to the nail received in said driving-in channel so as to drive the nail into the wall; and



indexing means for audibly indexing the ram when the ram is depressed to a point where the nail is completely driven into the wall.

4,860,938

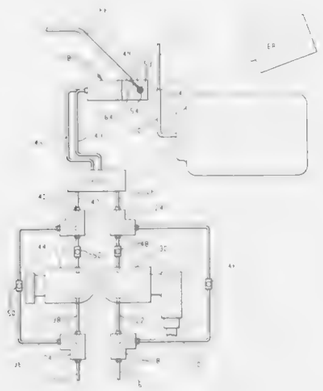
AUTOMATED METHOD OF BRAZING

Clair D. Clark, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jul. 6, 1988, Ser. No. 215,863

Int. Cl.[4] B23K *1/19*

U.S. Cl. 228—102 **5 Claims**



1. An automated method of brazing to join two metal parts together at a joint with a braze alloy comprising:

moving the two parts to a brazing station,

maintaining the two parts in a fixed position,

heating the two metal parts at the joint at a high heat rate to a predetermined temperature which exceeds the temperature that would melt the braze alloy and less than a temperature that would cause degradation of the metal parts, said heating being by a flame from ignition of a gas and oxygen mixture exiting a burner head which is fed by a gas line and an oxygen line, each line having two parallel branches with one branch of each line having a flow control valve in an open position to accomplish the high heat rate,

detecting the temperature of the metal parts in close proximity to the joint where the parts are to be joined,

reducing the heating rate responsive to detection of the predetermined temperature to a lower heat rate sufficient to keep the braze alloy in a liquidus state, said lower heat rate being accomplished by closing the flow control valves,

introducing the braze alloy to the joint between the two metal parts while they are being heated at the lower heat rate to join the two metal parts together, and

removing the joined two metal parts from the brazing station.

4,860,939

METHOD FOR BONDING A COPPER SHEET TO A SUBSTRATE MADE OF AN ELECTRICALLY INSULATING MATERIAL

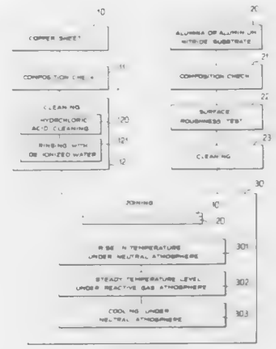
Jannick Guinet, Montmorency; Jean-Claude Hubert, Sucy En Brie, and Marie-Francoise Martial, Puteaux, all of France, assignors to La Telemecanique Electrique, France

Filed Nov. 10, 1988, Ser. No. 269,394

Claims priority, application France, Nov. 10, 1987, 87 15547

Int. Cl.[4] C04B *37/02*

U.S. Cl. 228—122 **12 Claims**



1. A method for the direct bonding of a copper sheet to a substrate made of electrically insulating material chosen from among alumina and aluminium nitride, said method consisting in the placing of a copper sheet on the substrate and in the heating of this set under a controlled atmosphere with the use, at least temporarily, of an oxidating reactive gas, at a temperature ranging between the temperature for the formation of a eutectic mixture, based on copper and the reactive gas, and the melting temperature of copper, and then in the cooling of the set, said method comprising the following steps:

i—cleaning the copper to remove traces of oxidation at its surface before placing the copper on the substrate

ii—heating the copper/substrate set under a neutral atmosphere until a temperature is obtained which is greater than the eutectic mixture forming temperature, and

iii—applying the oxidating reactive gas only after the obtaining of a temperature greater than the temperature for the formation of the eutectic mixture in such a way that this temperature is reached before any oxidation of the surface of the copper.

4,860,940

METHOD OF MAKING A POST SUPPORT

Derek J. Mills, Wales, United Kingdom, assignor to Metpost Ltd., Cardiff, United Kingdom

Filed Jul. 27, 1988, Ser. No. 225,005

Claims priority, application United Kingdom, Jul. 27, 1987, 8717737

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—173.4 **2 Claims**

1. A method of making a post support of the type having a box section which is open at one end and at least partially

closed at the other end, and a cruciform ground engaging portion welded to the at least partially closed end of the box section, the method comprising the steps of: forming the box section from a blank or blanks, including forming a base of the box section by bending portions of the blank or blanks inwardly and by bending portions of said inturned portions away



from the open end of the box section thereby to form in the base of the box section a cruciform slot bounded on both sides by dependent flanges extending away from the open end of the box section; and welding one end of the ground engaging portion of corresponding cruciform section into the slot between the dependent flanges.

4,860,941

BALL BONDING OF ALUMINUM BONDING WIRE

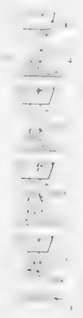
Alexander J. Otto, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Mar. 19, 1987, Ser. No. 27,647

Claims priority, application Canada, Mar. 26, 1986, 505168

Int. Cl.[4] B23K *31/00*

U.S. Cl. 228—179 **7 Claims**



1. In a method for ball bonding an aluminum wire to a contact pad wherein the aluminum wire is fed through and protrudes from a capillary hole in a bonding head, an electric arc melts the protruding wire into a ball, the solid ball thus formed is pressed and flattened onto the contact pad by the bonding head and the ball contact surface interface is subjected to ultrasonic vibrations to form a bond between the flattened ball and the contact pad,

the improvement which comprises utilizing an aluminum wire coated with an electrically insulating film that melts above the melting temperature of aluminum, said film being an oxide coating having a thickness of about 0.01 to about 1.0 micron and a melting temperature of at least about 7007° C., said film having an electrical resistance sufficient to prevent the electric arc from shifting up the wire and away from the tip,

whereby a round, axisymmetric ball is formed.

4,860,942

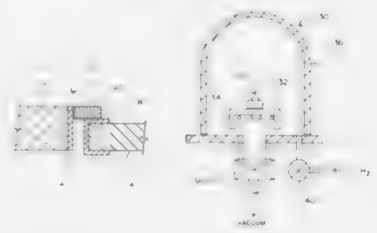
METHOD FOR SOLDERING VOID-FREE JOINTS

Lawrence K. Takvorian, Costa Mesa, Calif., assignor to Ceradyne, Inc., Costa Mesa, Calif.

Filed Nov. 30, 1987, Ser. No. 126,532

Int. Cl.[4] B23K *20/00*

U.S. Cl. 228—220 **9 Claims**



1. A method for joining at least two structural elements; the method comprising the steps of:

(a) positioning the elements to be joined adjacent one another;

(b) placing at least one solder preform adjacent the joint to be formed between said elements;

(c) evacuating the atmosphere surrounding the elements;

(d) replacing said atmosphere with a reducing gas at a selected pressure;

(e) heating said elements and solder preform until said solder preform melts and flows into said joint;

(f) evacuating said reducing gas surrounding said joint;

(g) surrounding said joint with a reducing gas; and

(h) allowing said joint to cool.

4,860,943

WRAP-AROUND CARTON LOCKING MEANS

Leonard M. Cooper, West Monroe, La., assignor to Manville Corporation, Denver, Colo.

Filed Apr. 29, 1988, Ser. No. 187,810

Int. Cl.[4] B65D *75/06*

U.S. Cl. 229—40 **14 Claims**



1. A carton for holding one or more articles, comprising:

two side panels connected to top and botton panels;

the bottom panel comprising an inner flap connected to one of the side panels along a fold line and an outer flap connected to the other side panel along a fold line, the outer flap overlapping the inner flap;

the outer flap acontaining a female locking opening;

the inner flap having a male locking member engaging the female locking opening; and

the male locking member being connected to the carton along a fold line substantially coinciding with the fold line connecting the inner flap to said one side panel.

4,860,944

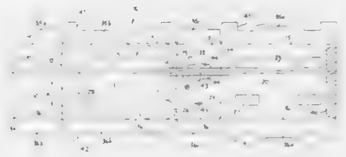
CARTON AND BLANK THEREFOR

Roger J. Wonnacott, Launceston, United Kingdom, assignor to St. Regis Packaging Limited, Launceston, United Kingdom

Filed Dec. 12, 1988, Ser. No. 283,195

Int. Cl.[4] B65D *5/46*

U.S. Cl. 229—52 B **9 Claims**



1. A carton formed from stiff but foldable carton material which contains an even number of rows of articles which has a median plane passing mid-way between said even number of rows and which incorporates a length of flexible reinforcing mateiral extending in a plane parallel to said median plane, a handle strip being created in the carton material by means of a pair of cuts extending on opposite sides of the reinforcing material, wherein the length of reinforcing material is off-set from the median plane of the carton whereby the said length of reinforcing material surrounds the articles in one of said rows.

4,860,945

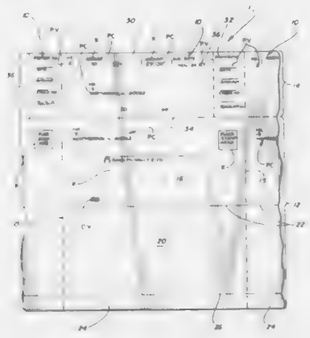
FAN-FOLDED, MULTIPLE COUPON/ENVELOPE FORM SET AND METHOD OF MAKING SAME

Thomas J. Breen, Northbrook, Ill., assignor to National Computer Print, Inc., Birmingham, Ala.

Filed Dec. 7, 1987, Ser. No. 129,727

Int. Cl.[4] B65D *27/10*

U.S. Cl. 229—69 **13 Claims**



1. A form set having a plurality of coupon/envelope forms, each comprising:

an envelope having a closed bottom edge and sealed side edges formed of a first panel for providing an address, said first panel defining an envelope front panel, a second panel for defining an envelope back panel and sealingly joined to said first panel, said panels defining an envelope bottom and envelope side edges, and a sealing flap secured to one of said first and second panels along a fold line for confronting a surface of the other of said panels, adhesive disposed on one of said sealing flap and said other panel for sealing closure of said envelope along on edge opposite said bottom edge,

each of said plurality of envelopes being formed with a next adjacent envelope along a line of perforations,

a separable associated printed coupon secured to each said envelope for separation therefrom, and secured to the next adjacent printed coupon along a line of perforations, said coupon being adapted for insertion in its associated envelope, each said coupon differing from the next adjacent coupon in the set by personalized sequential variable data, said

printed coupon being integrally formed with its associated envelope, and a line of severance therebetween for separation of said coupon from said envelope along said line of severance,

and wherein each said printed coupon comprises a coupon portion and a stub portion which are together separable from its associated envelope along said line of severance and which are separable from each other along a second line of severance.

4,860,946

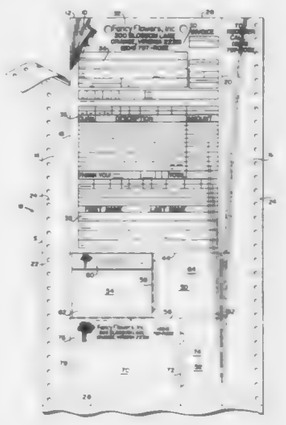
INVOICE FORM WITH CARD AND ENVELOPE

Harry A. Brand, Bossier City, La., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Jun. 29, 1988, Ser. No. 213,279

Int. Cl.[4] B65D *27/10*

U.S. Cl. 229—69 **20 Claims**



1. A multi-ply carbonless business form set, comprising:

elongated first and second plies having first and second sections longitudinally adjacent one another;

a first line of perforations extending transversely of said form set whereby the sections are separable one from the other;

said first section having invoice information recorded thereon, means for reproducing the invoice information on said first section of said first ply on said first section of said second ply whereby the first section of the first ply may be forwarded for payment and the first section of the second ply retained for record keeping purposes;

said second section including a first part separable from said form set and having a portion in the form of a card having a transverse extent less than the transverse extent of said form set and a remaining transversely adjacent stub portion separable from said card portion along a longitudi-

nally extending line of perforations in said first part intermediate the lateral edges of the form set such that said card and stub portions extend the full transverse extent of said form set; and

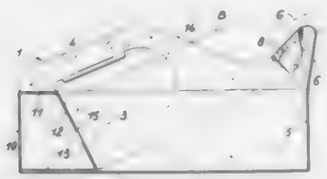
said second section having a second part separable from said form set and including an envelope portion defined by portions of said first and second plies, said envelope portion having a transverse extent less than the transverse extent of said form set and greater than the transverse extent of said card portion, said second part also having a stub portion transversely adjacent said envelope portion and separable therefrom along a longitudinally extending line of perforations in said second part intermediate the lateral edges of said form set such that said envelope and stub portions of said second part extend the full transverse extent of said form set, said envelope portion being formed by adhesive strips about the margins of said first and second ply portions defining said envelope portion and securing said first and second ply portions one to the other along said margins, with an opening to the envelope provided along corresponding registering edges of said first and second ply portions for receiving the card.

4,860,947

BOTTLE BOXES

Jacques G. Wauters, Moutreuil, France, assignor to Ch. Wauters & Fils, Palaiseau Cedex, France

Filed Oct. 6, 1988, Ser. No. 254,239
Claims priority, application France, Oct. 9, 1987, 87 13971
Int. Cl.[4] B65D *5/38, 5/44*
U.S. Cl. 229—103 20 Claims



5. A box for packaging objects comprising

(a) a first box portion comprising a rectangular shaped container having

(i) two opposed major side surfaces,

(ii) two opposed smaller side surfaces; and

(iii) a foldable extension that extends continuously along an upper edge of at least one of said smaller side surfaces and an upper edge portion of both of said major side surfaces; and

(b) a second case portion; said first box portion being engagable in the second case portion, whereby said foldable extension is foldable in a first position in which said first box portion may be engaged in said second case portion, and a second position to receive and support an object in an inclined position.

4,860,948

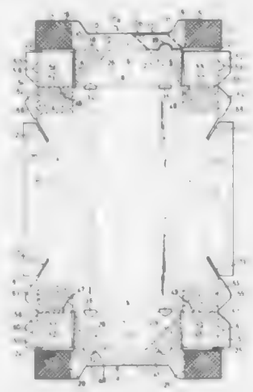
FOLDABLE BOX AND BLANK THEREFOR

Wilhelmus Hofstede, 3772 KK Barneveld, Livingstonestraat 94, Netherlands

Continuation of Ser. No. 906,582, Sep. 19, 1986, abandoned, which is a continuation of Ser. No. 581,298, Feb. 17, 1984, abandoned. This application Sep. 9, 1988, Ser. No. 244,522
Int. Cl.[4] B65D *5/36*
U.S. Cl. 229—143 4 Claims

1. A foldable box comprising a bottom (1), a first (6,7) and a second pair (2,3) of opposed upright walls being foldably connected to the bottom, the first pair of walls being provided with first widening strips (10,11), said first widening strips being foldable along a line (12,13) between each said strip and each first wall, said first widening strips being provided with first foldable lengthening flaps (14,15,16,17), at least a part of said first lengthening flaps being fastened to a corresponding part of the second pair (2,3) of opposed upright walls, said first pair of upright walls each having first oblique folding lines (26,27,28,29) extending from a corner defined by a folding line (8,9) between said first pair of walls and said bottom and a folding line (4,5) between said bottom and each of said second pair of walls, said first oblique folding lines of each wall of said first pair of walls including an angle of about 45° with the folding lines between said first pair of walls and said bottom;

said foldable box further comprising said first foldable widening strips (10,11) being folded at a position of being substantially parallel to the bottom so that the first oblique folding lines of the first pair of walls are extended in the widening strips, each said widening strip having second oblique folding lines (30,31,32,22) crossing each said widening strip from the folding line between said first wall (12,13) and said widening strip (10,11), said second oblique lines (30,31,32,33) being substantially parallel to said first oblique lines (26,27,28,29);



said second pair of upright walls being provided with second lengthening flaps (42,43,44,45), each corner of said box comprising one of said second lengthening flaps (42,43,44,45) and a corresponding one of said first pair of walls (6,7) attached together by means for attaching applied only to a portion of said one of said first pair of walls defined by said first oblique line (26,27,28,29) and said folding line (12,13) between each first wall (6,7) and each first widening strip (10,11) and to the portion to said second lengthening flap (42,43,44,45) that contacts said defined portion, whereby at least said first pair of upright walls (6,7) in their assembled condition are foldable in the direction of the bottom.

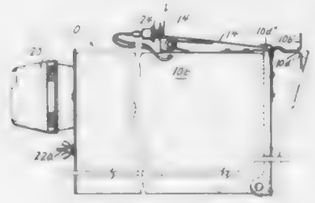
4,860,949

MAILBOX SIGNALING ARRANGEMENT

John R. Moore, 2303 Orchard Rd., Evansville, Ind. 47712

Filed Apr. 12, 1988, Ser. No. 180,783
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—35 4 Claims

1. A signaling arrangement for a delivery box including a top wall, side walls, a back wall, and a bottom wall arranged to present an article receiving cavity, comprising a control unit mounted on said top wall and including a one-piece pivotal laterally extending signal plate member retained in a non-signaling position by a latch and selectively movable from said non-signaling position to an upwardly directed signaling position upon release of said latch by outward movement of the latter in response to delivery of an article, and spring means continually urging said signal plate member from said non-signaling position to said signaling position, where electrical switching means is disposed on said top wall of said delivery box for selective energization by movement of said signal plate member to said signaling position, where said electrical switching means is part of an electrical circuit including a power source and a light source, and where said signal plate member remains at said signaling position until said article is removed and the signal plate member returned to a non-signaling position upon inward movement of said latch to a retaining relationship therewith.



4,860,950

REMOTE CONTROLLED THERMOSTAT

Larry J. Reeser, 2305 C Springhouse Rd., Martinez, Ga. 30907, and Henry H. Morton, Wadesboro, N.C., assignors to Larry J. Reeser, Martinez, Ga.

Filed Jun. 24, 1988, Ser. No. 211,277
Int. Cl.[4] F24B *1/18;* G08C *19/00*
U.S. Cl. 236—51 7 Claims



1. A battery powered apparatus for remotely adjusting the temperature of a closed environment having a heating/cooling unit comprising:

(a) a means for encoding a desired temperature into series of pulses having

an up-temperature signal for increasing a preset temperature setting by an incremental step above the preset temperature;

a down-temperature signal for decreasing the preset temperature setting by the incremental step below the preset temperature;

a preset temperature signal for changing the closed environment temperature to the preset temperature by activating the heating/cooling unit;

an up-preset temperature signal for increasing the preset temperature by the incremental step; and

a down-preset temperature signal for decreasing the preset temperature by the incremental step to decrease the preset temperature by the incremental step;

(b) a means for generating a radio frequency carrier;

(c) a means for modulating the radio frequency carrier with the series of encoded pulses which modulating means is operatively connected to the encoding means and with the radio frequency carrier generating means;

(d) a transmitter for transmitting the modulated radio frequency carrier which transmitter is operatively connected to the modulating means;

(e) a receiver for receiving the modulated radio frequency carrier which receiver is in spaced relation to said transmitter;

(f) a means for demodulating the series of pulses from the radio frequency carrier which demodulating means is operatively connected to the receiver;

(g) a means for decoding the series of pulses into the desired temperature which decoding means is operatively connected to the demodulator;

(h) a means for comparing continuously two temperatures which comparing means is operatively connected to the heating/cooling unit so that any significant difference between the two temperatures causes the heating/cooling unit to activate and which comparing means is in communication with the decoding means so that the desired temperature is communicated to the comparing means and is one of the two temperatures compared; and

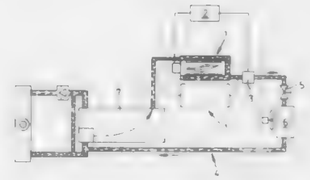
(i) a means for continuously sensing a temperature of the building which temperature sensing means is in communication with the comparing means so that the closed environment temperature can be compared to the desired temperature.

4,860,951

HEATING APPARATUS, ESPECIALLY A VEHICLE AUXILIARY HEATING APPARATUS

Peter Wass, Munich, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Gauting, Fed. Rep. of Germany

Filed Dec. 1, 1986, Ser. No. 936,356
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544024
Int. Cl.[4] G05D *23/00*
U.S. Cl. 237—2 A 20 Claims



1. In heating apparatus, especially vehicle auxiliary heating apparatus, for incorporation in a vehicle heat exchange circuit, of the type having a burner, ignition means, pump means, a heat exchanger and a control device for controlling operation of the heating apparatus, in the improvement wherein a liquid flow measuring device is so connected to the control device that the heating apparatus, as a whole, can be activated only if the measuring device detects that a predetermined liquid flow amount within the vehicle heat exchange circuit is being exceeded, thereby preventing consumption of power and component wear as well as the creation of conditions which would otherwise cause an excessive temperature shutdown of the apparatus.

4,860,952

ELASTIC PLATE FOR LEVEL RAIL CROSSINGS

Peter Schmidt, Waldkraiburg, Fed. Rep. of Germany, assignor to Gummiwerke Kraiburg Elastik Beteiligungs GmbH & Co., Tittmoning, Fed. Rep. of Germany

Filed Mar. 1, 1988, Ser. No. 162,570
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 3707305
Int. Cl.[4] E01C *9/04*
U.S. Cl. 238—8 10 Claims

1. An elastic plate for supporting highway traffic at a railroad crossing at the level of the rails:

said plate having at least a first pair of upper and lower

parallel grooves formed in respective upper and lower surfaces of said plate, said first grooves extending parallel of said rail and offset laterally from one another in a direction transverse to said rail forming a first expansion and contraction crease running parallel of said rail; and



said plate having at least a second pair of upper and lower parallel grooves formed in respective upper and lower surfaces of said plates said second grooves extending transversely to intersect said first grooves and offset laterally from one another in a direction parallel of said rail to provide a second expansion and contraction crease running transversely of and intersecting said first crease.

4,860,953

AESTHETICALLY PLEASING AIR FRESHENER

Simon Hsien, No. 29-26, Che La Chien, Pao An Tsun, Jen Te Hsiang, Tainen Hsien, Taiwan

Filed Nov. 18, 1988, Ser. No. 272,914
Int. Cl.[4] A24F *25/00*
U.S. Cl. 239—47 6 Claims



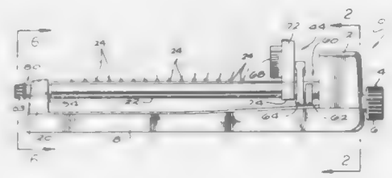
1. An air freshener system comprising a can member having an internal volume and an internally directed recess trough volume and an internally directed recess trough member, a tab member, a cover member releasably secured to an upper end of said can member, said tab member secured to an upper surface of said cover member, a dried compressed sponge layer located adjacent a bottom portion of the can member, a resilient layer positionally located on the dried compressed sponge layer, a layer of fragrance composition located on the resilient layer, and an object having a stem member inserted within the resilient layer, whereby when liquid is poured into the can member, the dried sponge layer absorbs the liquid resulting in an expression in the volume of the sponge layer for displacing the object in an upward direction.

4,860,954

ADJUSTABLE OSCILLATING WAVE-TYPE SPRINKLER

James G. Allemann, Orange, Calif., assignor to Rain Bird Consumer Products MFG. Corp., Glendora, Calif.

Filed Apr. 20, 1987, Ser. No. 40,059
Int. Cl.[4] B05B *1/08, 3/16*
U.S. Cl. 239—101 22 Claims



1. An oscillating wave sprinkler of the type primarily intended for use in irrigating lawns, flowers, shrubs and the like comprising:

a housing having an internal watertight cavity formed therein;

means for coupling said housing to a source of pressurized water and for directing water from said source into said cavity;

support base means projecting forwardly from said housing and terminating in an upstanding arbor;

an elongated, generally hollow spray tube extending between said housing and said arbor and disposed for rotary oscillating about a generally horizontal axis;

means coupling one end of said spray tube to said housing and having a water passageway with an inlet disposed within said cavity for conveying water from said cavity to said spray tube;

means coupling the other end of said spray tube to said arbor;

motor means coupled with said housing and said spray tube for oscillating said spray tube about said axis; and

throttling means disposed adjacent said inlet for periodically throttling the flow of water from said cavity to said spray tube to produce a cyclical reduction in the distance the water projects outwardly from said spray tube during oscillation of said spray tube.

4,860,955

SPRAYING EQUIPMENT WITH ROTATABLE CAP FOR ADJUSTING FLOWRATE

David C. Gill, Bristol, Great Britain, assignor to Nomix Manufacturing Co. Lmited, United Kingdom

Continuation of Ser. No. 229,740, Aug. 3, 1988, abandoned, which is a continuation of Ser. No. 57,588, Jun. 3, 1987, abandoned, which is a continuation of Ser. No. 935,528, Nov. 21, 1986, abandoned, which is a continuation of Ser. No. 713,185, Mar. 18, 1985, Pat. No. 4,690,326. This application Jan. 27, 1989, Ser. No. 303,086
Claims priority, application United Kingdom, Mar. 19, 1984, 8407088
Int. Cl.[4] B05B *3/10, 1/32, 1/26;* A62C *31/02*
U.S. Cl. 239—223 9 Claims

1. A spraying head comprising a body and a rotary distribution element supported by the body, the body comprising:

a first motor housing body component having a projection which extends coaxially with the distribution element;

a second body component having an aperture in which the projection is situated, the second body component adapted to telescopically receive said first component and to be rotatable with said first component;

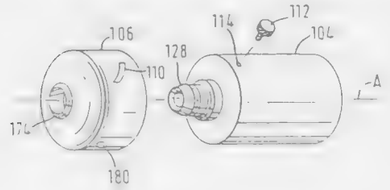
an inlet in said second body component for receiving material to be sprayed;

an annular gap defined between the projection and the periphery of the aperture, and inlet communicating with said gap;

an annular cavity defined between the first and second body components, the cavity communicating with the gap;

an opening provided in one of the body components receiving an inlet fitting;

a groove provided in the other body component, the groove



extending circumferentially of that body component and having a cross-sectional area which increases in the direction from one end to the other; and

a passage which extends between the wider end of the groove and the cavity,

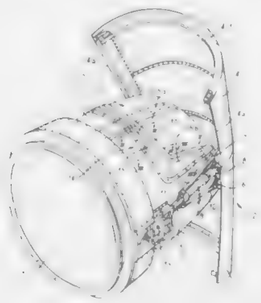
whereby rotation of the second body component relatively to the first body component displaces the opening along the groove, thereby to vary the flow cross-sectional area between the opening and the passage.

4,860,956

THRUST REVERSER FOR AIRCRAFT JET ENGINE AND AIRCRAFT ENGINE EQUIPPED WITH SAID THRUST REVERSER

Etienne Fage, Jouy En Josas, France, assignor to The Dee Howard Co., San Antonio, Tex.

Filed Aug. 13, 1987, Ser. No. 84,910
Claims priority, application France, Sep. 25, 1986, 86 13377
Int. Cl.[4] F02K *1/60*
U.S. Cl. 239—265.19 9 Claims



1. A thrust reverser for an aircraft jet engine having a jet generator, comprising:

at least one door mounted at the downstream end with respect to the jet generator to pivot about an axis which is transverse and at least substantially diametral to the jet from the jet generator;

means for pivoting the door between a retracted position in which it forms a part of the nozzle of the engine and an extended position in which it is disposed at least substantially transverse to the jet, a space between the door and the jet generator being provided when the door is in its retracted position; and

an at least partly elastic seal provided between the opposite parts of the inner and outer surfaces, respectively, of the door and the jet generator, the transverse section of the seal being configured to intimately contact the inner and outer surfaces for confining gas flow from the jet genrerator to exit from the jet engine at the downstream end of the jet generator only when the door is in its retracted position, the elastic property of the seal causing it to be pressed with increasing pressure to the contacting surface of the door, or the jet generator, as the pressure existing in the space between the door and the jet generator becomes higher, to thereby assist in preventing gas flow in the space from leaking upstream around the seal to the ambient environment, the elastic property of the seal further causing it to part from intimate contact with either the inner or outer surfaces when the pressure existing within the space between the door and the jet generator becomes less than that of the ambient environment to thereby allow air to be sucked into the space to equalize the pressure existing within the space to that of the environment.

4,860,957

TREATMENT OF MIDDLINGS

Lars Lidström, Nyhemsvägen 26, S-134 00 Gustavsberg, Sweden

Filed Mar. 29, 1988, Ser. No. 174,803
Int. Cl.[4] B02C *17/16*
U.S. Cl. 241—20 9 Claims



1. A method for dressing a mineral product comprising the steps of:

providing a finely divided mineral product to a concentration zone, said finely divided mineral product having a particle size suitable for a dressing treatment;

subjecting said finely divided mineral product to a dressing treatment in said concentration zone, said dressing treatment comprising at least two stages and being selected from the group consisting of flotation separation processes and magnetic separation processes;

recovering middlings formed during said dressing treatment;

grinding said middlings in a mill containing an agitated grinding medium with the aid of grinding bodies having an original size of from 2 to 12 mm to produce ground middlings having a particle size smaller than $k_{80}=100\ \mu m$, said middlings being ground in order to crush individual half-grains of said middlings and release valuable mineral therefrom; and then

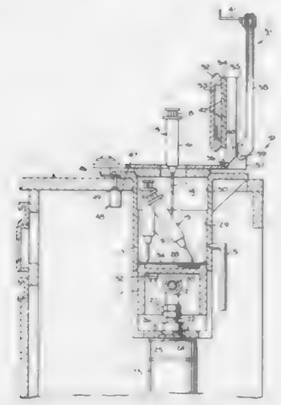
passing said ground middlings to said concentration zone and subjecting said ground middlings to said dressing treatment.

4,860,958

PLASTIC SYRINGE DESTRUCTION DEVICE

Emil A. Yerman, 2348 Terrace Ave., South Plainfield, N.J. 07080

Filed May 27, 1988, Ser. No. 199,627
Int. Cl.[4] B02C *19/14*
U.S. Cl. 241—23 27 Claims



1. A plastic syringe destruction device comprising

a cylinder defining a chamber having an open upper end for receiving a plurality of used plastic syringes;

cover means for selectively closing said open end of said cylinder chamber;

heating means including a heating disc for heating the syringes in said chamber to a temperature sufficient to permit remolding of the syringes; and

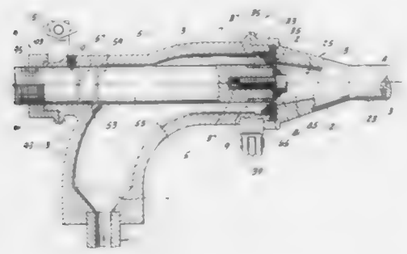
a piston slidably mounted in said chamber for compacting the heated syringes in said chamber against said cover means under a pressure sufficient to remold the heated syringes into a set compacted mass.

4,860,959

APPARATUS FOR SUBJECTING PARTICLES DISPERSED IN A FLUID TO A SHEARING ACTION

Avrom R. Handleman, Webster Groves, Mo., assignor to Semi-Bulk Systems, Inc., Overland, Mich.

Filed Jun. 23, 1988, Ser. No. 211,552
Int. Cl.[4] B02C *19/00*
U.S. Cl. 241—39 50 Claims



1. Apparatus for subjecting particles dispersed in a fluid to a shearing action thereby to reduce the size of the particles, comprising:

a body having a passage therein for flow of a pressurized fluid therethrough,

a first nozzle member comprising a ring generally adjacent one end of the passage and generally coaxial with said one end of the passage, said ring having upstream and downstream faces and a central opening therethrough from its upstream to its downstream face, said ring having an inner peripheral surface forming a first nozzle surface extending from the upstream to the downstream face of the ring generally coaxial with said one end of the passage;

a second nozzle member extending generally coaxially with respect to said one end of the passage into the central opening in the ring, said second nozzle member having an exterior surface forming a second nozzle surface generally coaxial with said ring, said second nozzle surface being spaced radially inward from and surrounded by said first nozzle surface to form an annular orifice between the first and second nozzle surfaces through which pressurized fluid from the passage is adapted to pass with the particles in the fluid being subjected to shearing action as they are forced through the orifice thereby to reduce the size of the particles, said orifice having an axial dimension constituting its length and a radial dimension constituting its width, said first and second nozzle surfaces being generally parallel to one another and generally parallel to the axis of said one end of the passage; and

means for effecting movement of the second nozzle member axially of said one end of the passage to vary the relative axial positions of said first and second nozzle surfaces thereby to adjust the length of said orifice, without changing the width of the orifice, so as to vary the extent of shearing action on said particles;

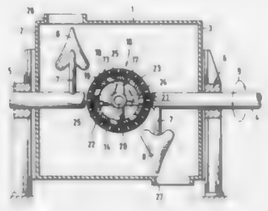
one of said nozzle members being formed separate from said body and being removably mounted in said passage whereby the width of the orifice may be adjusted to vary the severity of shearing action on said particles per unit length of orifice by removing said one nozzle member from said passage and replacing it with another nozzle member having a nozzle surface configured to provide the desired orifice width.

4,860,960

MIXING APPARATUS CONTAINING A MIXER AND A PULVERISER

Manfred Schwarz, Paderborn, Fed. Rep. of Germany, assignor to Gebruder Lodige Maschinenbaugesellschaft mbH, Paderborn-Wewer, Fed. Rep. of Germany

Filed Aug. 1, 1988, Ser. No. 226,678
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1987, 3728710
Int. Cl.[4] B02C *18/22*
U.S. Cl. 241—89.3 18 Claims



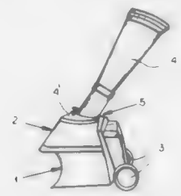
1. Mixing apparatus for mixing materials comprising a container, said container being generally cylindrical in shape, mixing means arranged in said container, said mixing means comprising a rotatably mounted shaft, radial arms thereon, and mixing tools on said radial arms, and said apparatus further comprising at least one pulveriser, said pulveriser being mounted in a wall of said container and having pulverising elements arranged at such a spacing from said wall that said mixing tools move material between said wall and said pulverising elements allowing said pulveriser to receive material, said pulveriser comprising two mutually concentric relatively rotatable shearing rings.

4,860,961

GARDEN CHIPPER/SHREDDER

Günter Hilgarth, Leutershausen-Neuenkirchen, Fed. Rep. of Germany, assignor to Crones & Co., GmbH, Ansbach, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 213,638
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1987, 3722339
Int. Cl.[4] B02C *18/12*
U.S. Cl. 241—92 12 Claims



1. A garden chopping/shredding apparatus comprising:

a frame;

an upwardly open intake hopper on the frame having a lower end;

a generally horizontal blade plate in the lower end rotatable about an upright axis and formed about the axis with a plurality of angularly spaced apertures;

respective flat blades carried on the blade plate and having cutting edges above the apertures;

a plurality of prechopping blades carried on the blade plate and projecting upward therefrom, the prechopping blades having cutting edges inclined upward and inward toward the axis;

drive means for rotating the plate and the blades in a predetermined direction about the axis, for defining with the cutting edges of the flat blades a generally planar and circular orbit perpendicular to the axis and having an inner periphery offset radially outward from the axis, and for defining with the cutting edges of the prechopping blades an upwardly tapered frustoconical orbit centered on the axis and having a small-diameter upper end and a large-diameter lower end; and

a deflector plate fixed against rotation in the lower end of the hopper and having a panel with a lower cutting edge juxtaposed with the orbit of the flat blades and an inner edge juxtaposed with the orbit of the prechopping blades, the panel forming an acute angle open backward into the direction of rotation with the orbit of the flat blades, the panel's lower cutting edge extending generally tangentially to a circle centered on the axis and having a greater diameter than the inner periphery of the orbit of the flat blades.

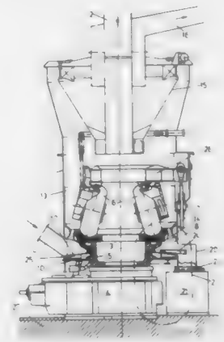
4,860,962

BOWL-MILL CRUSHER

Dieter Kiefer, Wesel Bislich, and Helmut Grommes, Duisburg, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 281,093
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1987, 3741611
Int. Cl.[4] B02C *15/00*
U.S. Cl. 241—117 4 Claims

1. A bowl-mill crusher comprising: a housing having a top and a bottom; stationary grinding rollers inside said housing; a grinding bowl inside said housing, said grinding rollers rolling over said grinding bowl; a rotating grinding bowl support for supporting said grinding bowl; an air box at the bottom of said housing and beneath said grinding bowl; an extraction shaft extending laterally from said air box; a removal container coupled to said extraction shaft; cleanout means coupled to said grinding bowl support and comprising: a circular-conical disk secured to said grinding bowl support and having an outer edge pointing downwardly, and a stationary cleanout arm positioned above said disk and having an end extending into said extraction shaft coupled to said removal container.

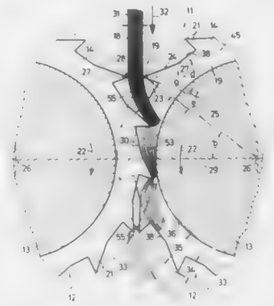


4,860,963

CUTTING MECHANISM FOR DEVICES FOR COMMINUTING MATERIAL

Albert Goldhammer, Ueberlingen; Hans Schleicher, Markdorf; Hartmut Stangenberg, Owingen, and Rolf Gasteier, Markdorf, all of Fed. Rep. of Germany, assignors to Feinwerktechnik Schleicher & Co., Fed. Rep. of Germany

Filed Mar. 3, 1988, Ser. No. 163,625
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706855
Int. Cl.[4] B02C *4/08*
U.S. Cl. 241—236 19 Claims



1. Cutting mechanism for devices for comminuting material, particularly flat material layers, such as documents, comprising:

two cooperating cutting rollers driven in rotary synchronized manner in opposite rotation directions, the rollers having alternating, overlapping cutting disks, each cutting disk of one of the cutting rollers engaging in a ring slot between adjacent cutting disks of the other of the cutting rollers, outer edges of each cutting disk forming two cutting edges and having on an outer circumference of the

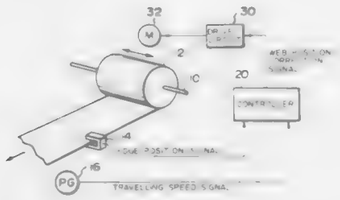
disk teeth defining tooth tips extending from tooth roots, the tooth tips being aligned and the disks being synchronized such that on adjacent cutting disks two corresponding teeth are approximately juxtaposed in a longitudinal direction of the cutting rollers in a tooth -on-tooth relationship, the teeth being inclined forwards in sawtooth manner pointing in the rotation direction of the corresponding cutting roller, the adjacent cutting disks of the two cooperation cutting rollers being positioned such that the teeth of the adjacent cutting disks overlap one another radially at said tooth roots.

4,860,964

METHOD FOR CONTROLLING THE POSITION OF A WEB MOVING ALONG A GIVEN PATH AND APPARATUS FOR USE IN SUCH METHOD

Yoshiyuki Ishii, and Shigehisa Shimizu, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 10, 1987, Ser. No. 119,873
Claims priority, application Japan, Nov. 19, 1986, 61-275803
Int. Cl.[4] B65H *16/00*
U.S. Cl. 242—57.1 4 Claims



2. An apparatus for controlling the position of a web moving along a given path, comprising:

an edge position detector for detecting the position of the edge of said web;

correction means for correcting the meandering of said web occurring when said web is wound or unwound in accordance with the detection output of said edge position detector;

a speed detector for detecting the travelling speed of said web when said web is wound or unwound; and,

control means for controlling a correction speed for correcting the meandering of said web by means of said correction means in accordance with said detection output of said speed detector such that, as said travelling speed is accelerated, said correction speed can also be accelerated accordingly.

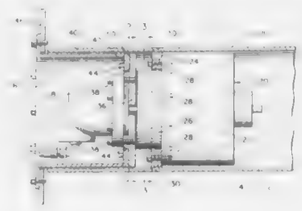
4,860,965

INTERNALLY MOUNTED DRIVE MECHANISM FOR A BELT-WINDING DRUM

Graham L. Hodgetts, Mars, Pa., assignor to Rolflor Industries, Evans City, Pa.

Continuation-in-part of Ser. No. 24,719, Mar. 11, 1987, Pat. No. 4,760,971. This application Dec. 10, 1987, Ser. No. 130,999
Int. Cl.[4] B66D *1/14*
U.S. Cl. 242—67.1 R 15 Claims

1. An internally mountable drive mechanism for a rotary drum having an internal cylindrical cavity for accommodating the drive mechanism, said cavity having a peripheral wall and an access opening at one end of the drum, the drive mechanism including a gearbox having a housing adapted to fit the cavity, ring-like mounting flange means on the gearbox housing having an outside diameter substantially conforming to the diameter of said wall, fastener means for releasably attaching the flange means to the wall of the cavity in predetermined axial position, the fastener means comprising circumferentially spaced fasteners extending radially into the flange means through oversize apertures in the drum, a motor for driving the gearbox in a manner to rotate the gearbox housing and thereby apply torque to the drum through said mounting flange means,



and a motor mounting assembly for mounting the motor in driving position in the cavity adjacent an end of the gearbox facing said access opening and for supporting the motor from an anchor means externally of the drum adjacent said one end thereof.

4,860,966

FILM CASSETTE

Robert P. Cloutier, Spencerport, N.Y., assignor to [redacted] Kodak Company, Rochester, N.Y.

Filed Mar. 25, 1988, Ser. No. 173,393
Int. Cl.[4] G03B *17/26*
U.S. Cl. 242—71.1 9 Claims



1. An improved film cassette wherein (a) a spool is rotatable in an unwinding direction within a cassette shell having a film passage slit and (b) a convoluted film roll wound on said spool tends to expand radially and has an inner end attached to the spool, and wherein the improvement comprises:

constraining means for radially confining successive outermost convolutions of said film roll to prevent the film roll from radially expanding substantially into contact with said cassette shell, said constraining means being rotatable with said spool in the unwinding direction and adapted to allow any outermost convolution of the film roll to readily slide in contact with the constraining means during its radial confinement in order to facilitate radial expansion of said film roll; and

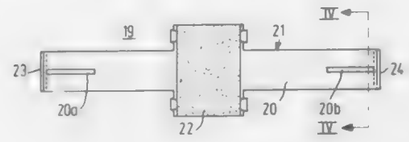
release means for freeing successive sections of any outermost convolution of said film roll from its radial confinement as said constraining means is rotated with said spool in the unwinding direction, whereby said spool when rotated in the unwinding direction can thrust freed sections of said outermost convolution through said film passage slit.

4,860,967

MAGNETIC-TAPE CASSETTE AND TAPE-PRESSURE MEMBER FOR USE IN SUCH A CASSETTE

Matheus J. M. Meermans, As, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 4, 1987, Ser. No. 142,081
Claims priority, application Netherlands, Feb. 20, 1986, 8600423
Int. Cl.[4] G11B *23/00*
U.S. Cl. 242—199 4 Claims



1. A magnetic-tape cassette comprising:

a housing having a plurality of peripheral walls and two supporting elements, one of said walls having an opening therethrough adapted for the passage of a magnetic head mounted on a magnetic-tape apparatus,

a length of magnetic tape disposed in the housing, and tape guide elements for guiding a portion of said length of tape in a transport direction across said opening,

a tape pressure member comprising a pressure element abutting against the back of the magnetic tape near said opening, and

a substantially U-shaped leaf spring having a main portion elongated in said transport direction, said pressure element being arranged near the center of said main portion, said leaf spring being arranged for pressing said pressure element against the length of tape so as to press the tape against a magnetic head which has been introduced through the opening, at a side of the leaf spring remote from the opening said leaf spring abutting against said two supporting elements at locations near the ends of said main portion,

characterized in that said leaf spring comprises two elongate embossments having elongated crests extending substantially parallel to said tape transport direction, said locations at which the spring abuts the supporting elements being respective locations along said crests.

4,860,968

COMMUNICATION LINK BETWEEN MOVING BODIES

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 15, 1988, Ser. No. 182,025
Int. Cl.[4] F41G *7/32*; F42B *15/04*
U.S. Cl. 244—3.12 32 Claims



1. Apparatus for providing a data-link between two moving bodies comprising:

a continuous strand of a data-carrying fiber;

a pair of fiber bobbins, one carried by each of the two moving bodies, respective parts of said continuous fiber strand being wound on each of said pair of bobbins, and an unwound part interconnecting said pair of bobbins;

means for deploying said wound fiber strand parts in streaming realtion from each of said pair of bobbins during relative separation motion between the two bodies;

means operatively connected to the fiber strand portion remaining on the fiber bobbin carried by one of the moving bodies during deployment, for transmitting data along said deployed fiber strand; and

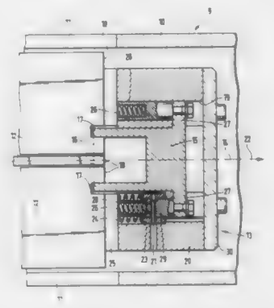
means operatively connected to the fiber strand portion remaining on the fiber bobbin carried by the other moving body during deployment, for receiving data transmitted along said deployed fiber strand.

4,860,969

AIRBORNE BODY

Peter Muller, Nuremberg; Josef Nagler, Rothenbach, and Utz-Udo Ahlers, Schnaittach, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jun. 1, 1988, Ser. No. 201,031
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1987, 3721512
Int. Cl.[4] F42B *15/027, 13/32*
U.S. Cl. 244—3.27 7 Claims



1. Airborne body with over-caliber size guidance mechanism, including control surfaces retracted into the airborne body; a securing arrangement latching the control surfaces at the end surfaces thereof into said airborne body for releasing said control surface in dependence upon acceleration of said airborne body in the launching direction for effectuating the extension of said control surfaces into the operative position of the guidance mechanism; a pusher rod which concurrently engages into all control surfaces and which is axially displaceable in the launching direction relative to the structure of the airborne body, said pusher rod disengaging from said control surfaces into the launching direction upon a reduction in the acceleration of the airborne body; a shear pin latching said pusher rod to a housing in said airborne body; and a shearing mass for shearing aid pin which is displaceable relative to said pusher rod opposite the launching direction.

4,860,970

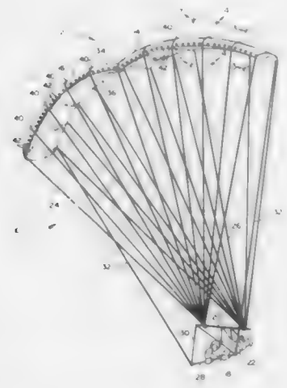
NONRIGID WING AIRCRAFT

Auro Roselli, 319 E. 51st St., New York, N.Y. 10022

Continuation-in-part of Ser. No. 807,211, Dec. 11, 1985, abandoned, which is a continuation of Ser. No. 559,631, Dec. 9, 1983, abandoned. This application Nov. 28, 1986, Ser. No. 935,733
Int. Cl.[4] B64C *31/02*
U.S. Cl. 244—16 23 Claims

1. An aircraft, the aircraft comprising a nonrigid wing, the wing having a chordal airfoil configuration, the airfoil configu-

ration including means for generating lift in the presence of airspeed relative to the wing, the lift comprising an upward force the resultant of which is effective at a center of lift, the craft further including means for suspending a payload from



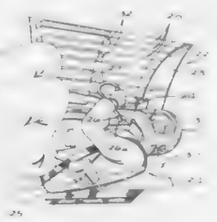
the wing, the suspending means including the means for distributing the payload weight between the leading and trailing edges of the wing, the craft, having a center of gravity, the center of gravity being positioned rearwardly of the center of lift.

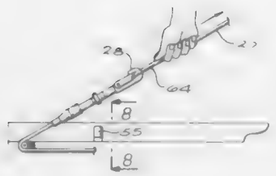
4,860,971

EMERGENCY EGRESS FIXED ROCKET PACKAGE

Margaret A. Allen, Huntington Beach, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 9, 1988, Ser. No. 242,253
Int. Cl.[4] B64D *25/08*; B64G *1/60*
U.S. Cl. 244—122 AD 11 Claims





1. The method of effecting an in-flight departure of an astronaut from a shuttle craft, said method comprising the steps of: providing a harness for the astronaut; providing a ring connected with said harness; providing a rocket assembly including a rocket and two rods actuable to propel said rocket over an initial period of time before said rocket is fired; providing a lanyard having one end connected from said rocket assembly; providing a hook connected from the other end of said lanyard; connecting said ring to said hook; and pulling said lanyard to actuate said two rods.

4,860,972

AUXILIARY FUEL TANKS FOR AIRCRAFT

Robert F. Lannerd, and David K. Murphy, both of Lake Charles, La., assignors to ERA Aviation, Inc., Lake Charles, La.

Filed Feb. 9, 1988, Ser. No. 154,001
Int. Cl.[4] B64D *37/04*
U.S. Cl. 244—135 R 9 Claims



1. On a helicopter having outer curved walls with connector lugs thereon, an auxiliary fuel tank for each side of said helicopter, comprising:

each tank being of aerodynamically streamlined configuration having an outer convex wall, a top rounded wall, a bottom rounded wall and an inner concave wall for abutment against said outer curved walls of the helicopter, and

a plurality of connector ears on said tanks for attachment to said connector lugs,

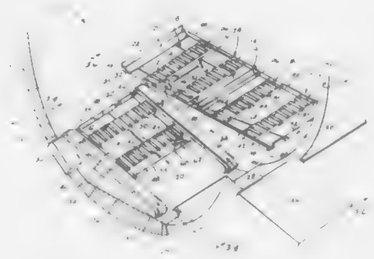
said auxiliary fuel tanks being designed and positioned such that said bottom rounded wall extends no lower than the lowermost point of the helicopter fuselage, and the distance from the center longitudinal vertical plane of the helicopter fuselage to the outermost surface of said tanks being such that the bending moments on the rotor mast and main rotor are not adversely affected.

4,860,973

CARGO CONVEYING SYSTEM

James A. Fenner, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 27, 1988, Ser. No. 186,929
Int. Cl.[4] B64D *9/00*; B64C *1/22*
U.S. Cl. 244—137.1 11 Claims



1. A cargo conveying system for loading and unloading cargo between multiple levels in the cargo hold of an aircraft fuselage, comprising:

a first cargo support member mounted in the cargo hold of an aircraft fuselage and adapted to move laterally in the cargo hold between a first position and a second position;

a second cargo support member mounted in the cargo hold of the aircraft fuselage and adapted to move vertically between an intermediate horizontal level and an upper horizontal level laterally adjacent the first cargo support member, when the first cargo support member is moved to the second position; and

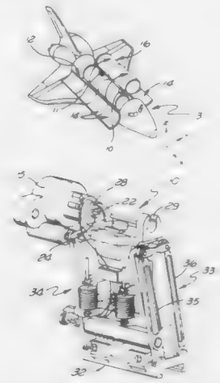
platform means for raising and lowering the cargo between a lower inclined position and a vertically raised, horizontally level position that is substantially coplanar with the upper horizontal level.

4,860,974

PAYLOAD DEPLOYMENT METHOD AND SYSTEM

Clifford J. Barnett, Costa Mesa; John E. Greenwood, Anaheim, and Earl V. Holman, Whittier, all of Calif., assignors to United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 15, 1988, Ser. No. 182,080
Int. Cl.[4] B64G *1/22*
U.S. Cl. 244—158 R 3 Claims



1. In a space shuttle or orbiter type craft having a cargo bay and a payload mounted within the cargo bay, the payload having first and second trunnions fixed thereto at two points spaced along the length thereof, an x axis extending longitudinally forward of the shuttle craft, a y axis extending abeam through the x axis, a z axis extending vertically in a position intersecting the x and y axes, said two points lying on a predetermined line substantially parallel to the x axis, the combination comprising:

first and second support means fixed relative to said first and second trunnions, respectively;

first and second shafts fixed relative to said first and second support means, respectively;

a motor fixed relative to said space shuttle, said motor having an output shaft keyed to said first shaft, said motor being energizable to rotate said payload from within to without said cargo bay;

first and second yokes positionable around said first and second shafts respectively when said payload lies within said cargo bay, said first and second shafts being rotatable in said respective first and second yokes;

first and second latches actuable to hold said first and second shafts within said first and second yokes, respectively;

said first and second latches being deactuatable to release said first and second shafts, respectively, to release said first and second support means, and to release said payload from said space shuttle;

first and second mounting fittings fixed relative said shuttle craft; and

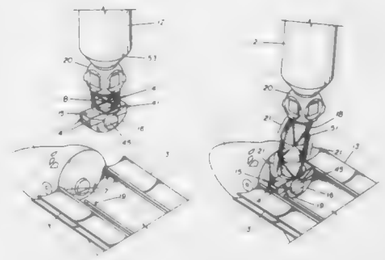
first and second means connected from said first and second yokes, respectively, to yieldably support said yokes on said first and second mounting fittings, respectively.

4,860,975

SMART TUNNEL - DOCKING MECHANISM

John A. Schliesing, Houston, and Kevin L. Edensborough, Lubbock, both of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 30, 1988, Ser. No. 292,131
Int. Cl.[4] B64G *1/64*
U.S. Cl. 244—161 8 Claims



1. A docking mechanism for the docking and undocking of a space vehicle with a space station or another space vehicle, said docking mechanism comprising:

a deployable extensible tunnel structure mounted on said space station, said tunnel structure comprising a plurality of interconnected serially arranged frame sections with an end frame section of said series of frame sections being connected about an egress hatch of the space station, each said frame section including a pair of docking ring members interconnected in a normally coaxial spaced apart relationship defining an unobstructed central opening through said frame section;

actuator control means connected to said docking ring members for imparting a relative motion between said docking ring members of each said frame section in six degrees of freedom of movement;

a docking module attached to the other end section of said series of connected frame sections and provided with an opening communicating with the central opening of the adjacent frame section to which it is attached;

a plurality of latch mechanisms mounted on the space vehicle;

a plurality of trunnion members affixed to said docking module and adapted for interconnection with said latch mechanisms whereby said trunnion members are latchable thereto for coupling the space vehicle to the space station;

a pressurizeable tubular member disposed to extend through the central openings defined by said series of interconnected frame sections and of a cross section diameter suitable for the passage of personnel and cargo therethrough, said tubular member being attached at one end about said egress hatch in sealing relationship with the space station;

hatch means provided on said docking module adapted for interconnection in sealing relationship with the space vehicle for establishing communication therebetween when said docking module trunnions are latched to said space vehicle; and

means interconnecting said tubular member with said docking module in sealing relationship therewith about said

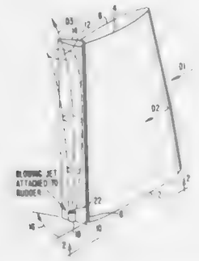
opening of the docking module when the docking module trunnions are latched to the space vehicle, said tunnel structure being controllable in movement with respect to its end attachment to the space station by the control by said actuator means of the individual frame sections in six degrees of freedom of movement.

4,860,976

ATTACHED JET SPANWISE BLOWING LIFT AUGMENTATION SYSTEM

Russell E. McFadden, Andale, and Charles H. Shure, III, Haysville, both of Kans., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 5, 1987, Ser. No. 104,385
Int. Cl.[4] B64C *21/04*
U.S. Cl. 244—207 5 Claims



1. A lift enhancing system for an aircraft having wings and at least one deflectable airfoil attached to the trailing edge of each wing, comprising:

nozzle means connected to and movable with said deflectable airfoil for directing fluid at a predetermined volumetric flow rate spanwise along at least one surface of said deflectable airfoil to reduce the separated flow area behind the deflectable airfoil of air moving chordwise across said at least one surface to thereby enhance the lifting capability of said wing and deflectable airfoil;

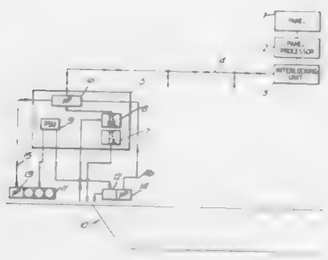
means for supplying fluid to said nozzle means to effect said volumetric flow rate.

4,860,977

RAILWAY SIGNALLING SYSTEM

David J. Norton, Poole, United Kingdom, assignor to Westinghouse Brake & Signal Co. Ltd., Chippenham, United Kingdom

Filed Jul. 21, 1987, Ser. No. 76,108
Claims priority, application United Kingdom, Jul. 24, 1986, 8618112
Int. Cl.[4] B61L *27/00*
U.S. Cl. 246—3 13 Claims



1. A railway signalling system comprising;

a plurality of trackside equipments;

means for transmitting control information to said equipments and for receiving status information therefrom;

microprocessor means coupled to each of said trackside equipment; and

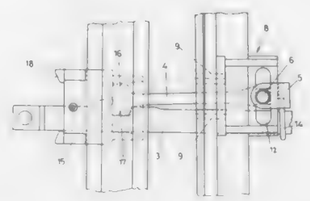
means coupling said microprocessor means to said means for transmitting and receiving for transmitting said control information to said equipment through said microprocessor means and for receiving said status information from said equipment through said microprocessor means.

4,860,978

CONTROL MECHANISM FOR RAILWAY SWITCHES

Gerald Durchschlag, Zeltweg, and Alfred Lang, Wiesen, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jun. 9, 1988, Ser. No. 204,355
Claims priority, application Austria, Jun. 9, 1987, 1456/87
Int. Cl.[4] E01B *7/02*
U.S. Cl. 246—448 7 Claims



1. A switch control mechanism, comprising:

a locking piece including means for fixing the locking piece in relation to a stock rail;

a connecting member including means for fixing the connecting member to a laterally shiftably supported switch tongue rail which is laterally shiftable between an open position in which it is spaced laterally from the stock rail, and a closed position in which it is engaged side by side with the stock rail;

means defining a longitudinally elongated slot in said connecting member;

a pivot pin;

means mounting said pivot pin in said slot for limited movement longitudinally of said switch control mechanism;

a laterally extending locking clamp having a swivel head provided thereon at one end thereof;

said swivel head being mounted to said connecting member by said pivot pin, whereby said connecting member is constrained to move laterally with said locking lamp, but said one end of said locking clamp can move longitudinally of said switch control mechanism to a limited extent as said pivot pin moves longitudinally of said switch control mechanism in said slot;

said locking clamp including at an opposite end thereof an enlarged locking clamp head;

said locking piece including a laterally oriented entry opening therethrough having associated with an end facing away from said connecting member a locking shoulder;

a laterally elongated push rod;

means mounting said push rod in relation to said swivel head of said locking clamp such as to permit said push rod to be reciprocated laterally of said switch control mechanism;

said push rod having a flank surface facing longitudinally of said switch control mechanism and towards a flank surface of said locking clamp;

means defining a recess in said flank surface of said push rod, for reversibly receiving a first portion of said enlarged locking clamp head;

said locking clamp and said push rod extending through said entry opening of said locking piece;

caming surface means provided on said flank surface of push rod adjacent said recess, for cooperating with said flank surface of said locking clamp; and

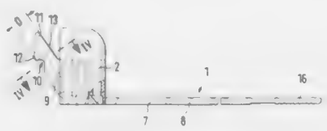
a second portion of said enlarged locking clamp head being arranged to engage said locking shoulder of said locking piece upon caming of said locking head longitudinally of said switch control mechanism by engagement of said first portion of said enlarged locking clamp head by said caming surface means of said flank surface of said push rod, whereby, as said push rod is reciprocated laterally of the switch control mechanism to provide a switch-open position from a switch-closed position said second portion of said locking clamp enlarged head slides into said recess, freeing said first portion of said locking clamp enlarged head from locking engagement with said shoulder of said locking piece, whereupon said locking clamp reciprocates laterally of the switch control mechanism as a unit with the push rod, thus moving the pivot pin and connecting member laterally of the switch control mechanism, away from the locking piece, and, as said push rod is reciprocated laterally of the switch control mechanism to provide a switch-closed position from a switch-open position, said locking clamp initially reciprocates laterally of the switch control mechanism as a unit with the push rod, thus moving the pivot pin and connecting member laterally of the switch control mechanism, towards the locking piece, and, as the switch tongue rail engages the stock rail side-by-side, and the push rod continues to be moved laterally of the switch control mechanism, said second portion of said locking clamp enlarged head is pushed out of said recess and camed longitudinally of the switch control mechanism, causing the first portion of the locking clamp enlarged head to engage said shoulder of said locking piece.

4,860,979

ADJUSTABLE FASTENING STRAP

Gian C. Camenisch, Magden, Switzerland, assignor to A. Raymond, Lorrach, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 167,176
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1987, 3707782
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—74.3 6 Claims



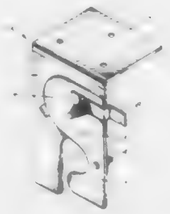
1. A plastic fastening strap for holding a plurality of elongated objects to a support comprising a holding part having means for securing it to the support, a flexible tightening band integral with and extending outwardly from one side of the holding part, said band having a plurality of spaced transverse crossbars, and a locking projection integral with and extending outwardly from the opposite side of the holding part that cooperates with the crossbars after the band is wrapped around the objects to lock the band in place, said projection having a downwardly extending notch forming a locking hook for engaging and holding a crossbar of the band and having a thickness forward of the notch that is slightly larger than the longitudinal distance between the crossbars so that adjacent crossbars of the band are spread apart as they are brought down over the locking projection and before a crossbar engages with the notch.

4,860,980

CONNECTOR HOLDER

Alain F. Michot, Cary, N.C., assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 29, 1988, Ser. No. 212,794
Int. Cl.[4] F16L *3/10*
U.S. Cl. 248—74.4 12 Claims



1. A latching device used for fastening large power cable connectors, comprising:

a securing frame having receptacle means for receiving said connector;

said securing frame defining an arcuate guide slot therein;

a retaining member for retaining said connector in said receptacle means, said member being mounted to said frame at a pivot point, rotatable about said point between a latched and an unlatched position, said member having:

(a) a first end forming a retaining section when said member rotates to a latched position;

(b) a second end, opposite said first end, extending over said receptacle means when said retaining member is in said unlatched position, said second end forming a latching actuator such that when said connector is inserted in said receptacle means, said connector will abut said second end and rotate said member about said pivot point to a latched position; and

locking means moveably mounted to said retaining member;

said locking means being adapted to secure said retaining member in said latched position;

said locking means having a guiding portion adapted to slide within said arcuate guide slot.

4,860,981

COMBINATION BAG HOLDER AND BAG THEREFOR

Tyler V. Pierson, Arlington, Tex., assignor to Tyler's Fine Dry Cleaning, Inc., Fort Worth, Tex.

Filed Dec. 30, 1987, Ser. No. 139,725
Int. Cl.[4] A63B *55/04*
U.S. Cl. 248—97 3 Claims



1. A combination bag holder and bag for standing on a first surface and receiving dirty clothes and the like, comprising:

a. a bag holder consisting essentially of:

i. a base for free standing;

ii. a vertical support means connected rigidly with said base and extending upwardly therefrom; said base comprising at least one vertically extending member having a first length L-1 and a top for holding a collection bag off the first surface; said vertical support means comprising three tubular members—one central and one supporting member on each side thereof; said central member extending above said supporting members on each side;

iii. a hangar rack means connected with said vertical support means and near its said top and extending laterally for removably supporting the bag; and

b. a collection bag consisting essentially of:

i. a flexible front portion that is permeable to moisture;

ii. a flexible rear portion having a top, bottom and sides connected to said flexible top portion along said sides and with its top adapted to be open to receive dirty clothes and the like; said rear portion being permeable to moisture, also;

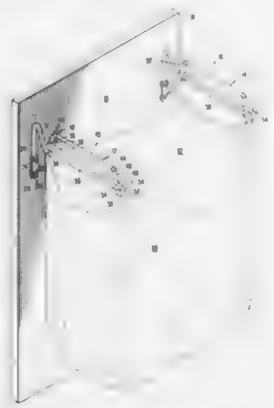
iii. a yoke connected with said rear portion adjacent said top of said rear portion; said yoke being connected at at least its corners and open at its bottom to receive said hangar rack means of said bag holder; said bag having a second length L-2 that is shorter than L-1 such that the bottom of the said bag is retained above the first surface.

4,860,982

CONTAINER SUPPORT

Sigmund Berlant, 1332 NW. 14 Ave., Pompano Beach, Fla. 33069

Filed Jul. 12, 1985, Ser. No. 754,119
Int. Cl.[4] B65B *67/04*
U.S. Cl. 248—100 2 Claims



1. A container support comprising:

a first component having a vertical arm attached at one end to a vertical surface;

a second arm extending downwardly and away from said vertical arm to form an angle of less than 90 degrees therebetween;

a third arm extending upwardly and away from said second arm to form an angle of less than 90 degrees therebetween;

a horizontal rod extending away from said third arm to a distal end;

a fourth arm extending downwardly and away from said distal end;

an fifth arm extending upwardly and away from said fourth arm to form an angle of less than 90 degrees therebetween;

a first handle of a container positioned between said second and said third arms and said fourth and said fifth arms;

a second component equally structured as the first component and spaced a distance therefrom in alignment therewith and also having a vertical arm attached to a flat surface and second and third arms and fourth and fifth arms identical to the second and third arms and the fourth and fifth arms of said first component; and

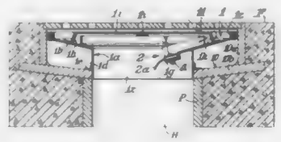
a second handle of the container positioned between said second and third arms and said fourth and fifth arms of said second components.

4,860,983

ATTACHMENT BRACKET FOR A LIQUID LEAKAGE SENSOR USED IN DRAIN OPENINGS

Jyuji Akiba, Saitama, Japan, assignor to Junkosha Co., Ltd., Japan

Filed Oct. 13, 1988, Ser. No. 257,318
Claims priority, application Japan, Oct. 16, 1987, 62-157546[U]
Int. Cl.[4] G01M *3/04*
U.S. Cl. 248—205.1 2 Claims



1. An attachment bracket for attaching a liquid leakage sensor to a drain opening comprising:

(a) a funnel-shaped bracket body whose outer circumference is fitted in a liquid-tight relation inside the upper portion of said drain opening, the upper, tapered funnel portion being inclined downwardly toward a central discharge opening leading to said drain;

(b) a generally circularly-cylindrical, "C"-shaped wall member of a prescribed height installed on an upper funnel surface of said bracket body which extends around a circumference of said central opening of said bracket body except in the region of the opening of the "C" of said wall member; and

(c) a leak detecting sensor attached to said bracket body within the opening of the "C" of said wall member, whereby, in use, a leak that enters said drain is blocked by the wall member and channelled by the wall member around to the opening of the "C", thereby concentrating the leak to the region of the sensor location more rapidly than would otherwise occur.

4,860,984

HEIGHT-EXTENDER ADAPTER FOR RETAILING DISPLAY BRACKETS

Joel H. Alperson, 3306 South 157th St., Omaha, Nebr. 68130

Filed Dec. 5, 1988, Ser. No. 279,870
Int. Cl.[4] A47F *5/08*
U.S. Cl. 248—225.2 4 Claims

1. In combination with a retailing display bracket comprising an elongate arm portion having an aft-end attached to a upright lower-length of a bracket laminar anchor portion, said anchor portion having an upper-end and a lower-end, having a frontal-surface extending between upper-end and lower-end, and having substantially parallel to said frontal-surface a rear-surface extending between upper-end and lower-end, and further comprising an upright upper-length rearwardly offset from said lower-length by virtue of a substantially horizontal web-length, the improvement of a height-extender securely slidably engaging said retailing bracket laminar anchor portion and said height-extender comprising:

(A) a rear-plate comprising:

(Ai) a lower-region bearing against the anchor portion rear-surface at upper portions of the lower-length, at the web-length, and along the entire upper-length, and

(Aii) an inverted-U upper-region overlying the anchor portion upper-end and forwardly terminating as a downwardly extending frontal-leg;

and



(B) a front-plate comprising:

(Bi) a lower-realm bearing against the anchor portion frontal-surface at upper portions of the lower-length, the web-length, and at the anchor portion upper-length, and

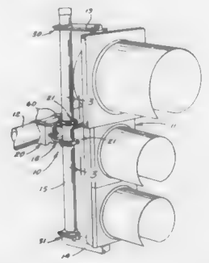
(Bii) an upper-realm relegated wholly rearwardly of said frontal-leg and being attached to the rear-plate upper-region at an elevation above the anchor portion upper-end.

4,860,985

BRACKET ASSEMBLY FOR SUPPORTING A TRAFFIC SIGN

Raylin J. Olson, Loves Park; Lawrence L. Prunty, and Wendell W. Whitehead, both of Rockford, all of Ill., assignors to Olson Pattern & Foundry Works, Inc., Rockford, Ill.

Filed Sep. 14, 1988, Ser. No. 244,020
Int. Cl.[4] A47H *1/10*
U.S. Cl. 248—229 9 Claims



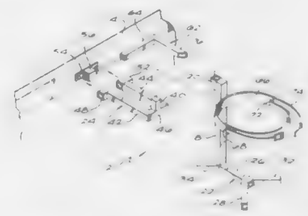
1. A bracket assembly adapted to support a traffic sign and adapted to be fastened to a generally cylindrical mast, said bracket assembly comprising a saddle having front and rear sides, means for attaching the traffic sign to the front side of the saddle, the rear side of the saddle being sized and shaped to conform generally to the size and shape of said mast, said saddle being generally U-shaped in cross-section with the open end of the U facing rearwardly, and means for clamping said saddle releasably to said mast, said means comprising first and second flexible clamping bands adapted to be wrapped around the mast in spaced relation from one another along the mast, first and second pairs of spaced eyes formed through said mast with one pair of eyes being spaced from the other pair in accordance with the spacing of said bands, each eye of each pair being aligned with the other eye of the pair, said first and second bands being threaded through the eyes of said first and second pairs, respectively, means for securing the end portions of each band together while permitting relative adjustment of said end portions for purposes of cinching the band loosely around said mast and clamping said saddle loosely to said mast, and means independent of said securing means for tightening said bands to cause the bands to pull the saddle toward the mast and to clamp the saddle rigidly to the mast, said tightening means comprising first and second plates disposed within said saddle and engageable with the front sides of said first and second bands, respectively, and first and second screws threaded through the front side of said saddle and engageable with said first and second plates, respectively, said screws being operable when tightened to push said plates rearwardly against said bands and cause said bands to cinch tightly around said mast and clamp said saddle tightly to said mast.

4,860,986

MOUNTING RACK

Kenneth A. Couzens, 56965 Panchita Rd., Yucca Valley, Calif. 92284

Filed Sep. 19, 1988, Ser. No. 245,559
Int. Cl.[4] A47K *1/08*
U.S. Cl. 248—313 3 Claims



1. A mounting rack for a liquid storage jug comprising:

a hollow vertical arm which interconnects a support at its lower end and a mounting structure at its top end;

said support comprising a horizontal central leg which is secured to and extends at one end from adjacent the lower end of said hollow vertical arm, the other end of said central leg having a pair of horizontal support legs extending therefrom, said horizontal central leg and said horizontal support legs forming means for supporting the liquid storage jug thereon;

positioning legs extending in a horizontal plane from adjacent the lower end of said hollow vertical arm in a direction generally opposite to the direction said central leg extends;

a hollow attachment leg integrally formed with the top end of said vertical arm on a side of said vertical arm opposite to said central leg and having an axis parallel to the axis of said vertical arm; and

a jug securing mechanism connected to the central portion of said vertical arm for attaching said liquid storage jug to said mounting rack.

4,860,987

ADJUSTABLE TELESCOPIC DEVICES

Per G. Werner, Spro, Norway, assignor to Mec-Lift A.S., Fagerstrand, Norway

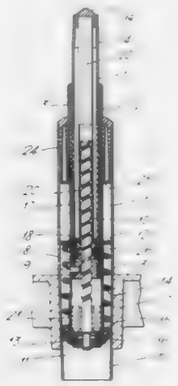
PCT No. PCT/NO85/00034, § 371 Date Feb. 18, 1986, § 102(e) Date Feb. 18, 1986, PCT Pub. No. WO86/00205, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 14, 1985, Ser. No. 835,118

Claims priority, application Norway, Jun. 18, 1984, 842441; Mar. 29, 1985, 851295

Int. Cl.[4] A47C *3/24*

U.S. Cl. 248—405 14 Claims



1. An adjustable telescopic device comprising an inner tube slidable in an outer tube and extending therefrom, a threaded spindle coaxial with the tubes and rotatably mounted in the outer tube, said spindle serving to transmit an axial load from the inner tube to the outer tube, a load transmitting member fixed with respect to the inner tube and non-rotatably connected to the outer tube, said member having female threads engaging the spindle threads and forming a threaded connection with the spindle having a pitch allowing an axial load on said member to move the member axially with respect to the spindle so as to rotate the latter, said pitch also allowing axial load to be transferred to the spindle, and releasable locking means for preventing rotation of the spindle relative to the inner tube the locking means being non-rotatably connected with the load transmitting member and acting directly on the spindle.

4,860,988

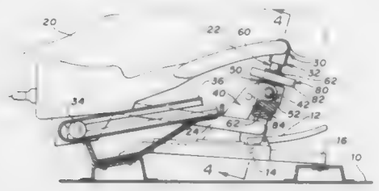
VERTICAL SEAT ADJUSTER APPARATUS AND METHOD

Richard W. A. Rees, Holland Landing, Canada, and Mladen Humer, East Detroit, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 21, 1987, Ser. No. 135,801

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—420 7 Claims



1. A vehicle manual seat adjuster for setting the elevation of a vehicle seat pivotally mounted with respect to said vehicle, said adjuster in combination comprising:

a support vertically fixed with respect to said vehicle with means of connection with said vehicle;

an interior threaded sleeve pivotally connected to said support;

an exterior threaded rod with threads of an opposite hand of said sleeve threads, said rod being fixably connected with said seat and projecting through said sleeve; and

a knob having interior threads encircling and engaged with said rod and said knob having exterior threads projecting into and engaged with said sleeve whereby rotation of said knob causes said knob to have relative linear movement with respect to said sleeve in a first direction and causes said rod to have relative linear movement with respect to said knob in said first direction to set the elevation of said seat.

4,860,989

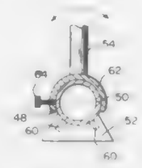
QUICKIE MIRROR

James H. Rose, c/o George Spector, 233 Broadway, Rm. 3815, and George Spector, 233 Broadway, Rm. 3815, both of, New York, N.Y. 10007

Filed Apr. 28, 1987, Ser. No. 43,367

Int. Cl.[4] A47F *7/00*; A47G *1/16*

U.S. Cl. 248—471 1 Claim



1. A mirror stand being an elongated pipe with ends mounted on axially symmetrical spaced supports at said ends adapted to sit upon a flat surface;

(a) a hollow arm centrally extending away from said pipe along an axis normal to horizontal plane of said base stand;

(b) an adjustable arm extending upwardly and outwardly from said hollow arm;

(c) a wing bolt threaded into end of said hollow arm for holding said adjustable arm stationary after positioned thereto;

(d) a mirror attached to upper end of said adjustable arm so that hands of a person can be free to other uses than holding and positioning said mirror;

(e) a pair of spaced stop members extending radially from predetermined places on circumference of said pipe;

(f) a C-shaped sleeve having opposite longitudinal edges pivotally mounted on said pipe whereby said sleeve pivots about the pipe axis between said stop members, said hollow arm being transversely attached to said C-shaped sleeve so that said hollow arm can be angularly positioned on said pipe; and

(g) a set screw threaded into said C-shaped sleeve for holding said C-shaped socket stationary after positioned thereto.

4,860,990

DIAPHRAGM TYPE WATER INLET VALVE

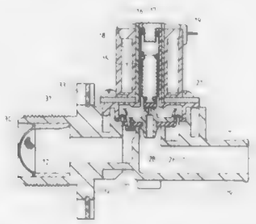
Sooichi Fukuzawa; Yoshiaki Takeda, both of Hitachi, and Yoshio Ohwa, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 9, 1988, Ser. No. 269,073

Claims priority, application Japan, Nov. 18, 1987, 62-289352; Feb. 24, 1988, 63-39420; Feb. 24, 1988, 63-39421; Jun. 24, 1988, 63-154756

Int. Cl.[4] F16K *31/02*

U.S. Cl. 251—30.03 14 Claims



1. A diaphragm type water inlet valve comprising an assembly of:

a valve main body having an inlet, an outlet, and a cylindrical chamber which provides communication between said inlet and said outlet;

an electric control means having an electro-magnetic solenoid, a plunger, a spring member, and a pilot valve, said plunger moving back against a pressure of said spring member when said electro-magnetic solenoid is energized, said pilot valve being provided at a tip end of said plunger;

a diaphragm valve opposed to a valve seat provided in said cylindrical chamber of said valve main body and held at its outer periphery, said diaphragm valve having a flexible member, and a hole forming member, said flexible member being fixed at its end portion to said valve main body, said hole forming member having a central orifice and a communicating extraction hole, a cross-sectional area of said central orifice being formed larger than a cross-sectional area of said communicating extraction hole, said central orifice being opened and closed by said pilot valve, said diaphragm valve being arranged to form, at a back side thereof, a back pressure chamber separated from a flow passage of a fluid to move upwardly and downwardly under a control of said pilot valve in said back pressure chamber, said communicating extraction hole providing communication between said flow passage and said back pressure chamber, said diaphragm valve being seated on said valve seat to shut off a flow of the fluid when said diaphragm valve reaches its the lowest position;

a volute chamber is provided so as to surround an inlet portion of said communicating extraction hole of said diaphragm valve, water is made to flow into said volute chamber in a circumferential direction thereof, said communicating extraction hole is positioned in a vicinity of a center of said volute chamber, and an axis of an inflow port of said volute chamber is orthogonal with an axis of said communicating extraction hole.

4,860,991

SAFETY VALVE

William A. Blizzard, and Ronald E. Pringle, both of Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Apr. 6, 1989, Ser. No. 334,035

Int. Cl.[4] E21B *43/12*

U.S. Cl. 251—62 12 Claims

1. A safety valve for controlling the fluid flow through a conduit comprising,

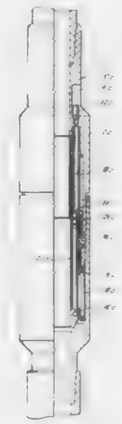
a housing having a bore therethrough,

a valve seat in the bore,

a valve closure element moving between open and closed positions relative to the valve seat,

a longitudinal flow tube telescopically movable in the housing for controlling the movement of the valve closure element,

biasing means in the housing for biasing the flow tube in a direction for causing the valve closure element to move to the closed position,



a piston and cylinder assembly positioned in the housing including a piston member movable relative to a cylinder member and one of said members engaging and moving the flow tube, and

said one member being positioned overlapping said biasing means, thereby allowing the length of the valve to be reduced.

4,860,992

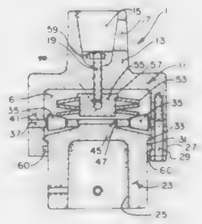
VALVE/ACTUATOR TORQUE OVERLOAD PROTECTOR

Dale Aunspach, St. Louis, Mo., assignor to Aunspach Controls Co., St. Louis, Mo.

Filed Jul. 19, 1988, Ser. No. 221,211

Int. Cl.[4] F16K *31/44*

U.S. Cl. 251—81 13 Claims



1. In a valve/actuator torque overload protector having driving and driven members pre-set to transmit limited torque between the members, the improvement comprising: spring-loaded tapered rollers operably associated with one of said members for engaging complementary detents on the other of said members, said spring-loaded tapered rollers being pre-set relative to said complementary detents to permit limited torque engagement of said driving and driven members during relative rotation thereof, such that upon encountering torque

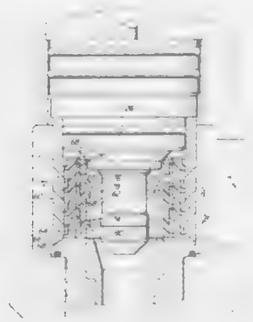
pre-set limits, the spring-loaded tapered rollers disengage from said detents to interrupt the transmission of torque between said members, the diameter of said tapered rollers progressively increases along the path thereof in direct proportion to the radial distance from the center of rotation of said driving and driven members, said tapered rollers each having an axis extending perpendicular to said center of rotation.

4,860,993

VALVE DESIGN TO REDUCE CAVITATION AND NOISE

William B. Goode, Dallas, Tex., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jan. 14, 1988, Ser. No. 143,980
Int. Cl.[4] F16K *47/14*
U.S. Cl. 251—127 12 Claims



1. A valve comprising: a valve body having inlet and outlet passages communicating with a valve chamber; flow control means in said chamber, said flow control means being adapted to form an entrance section and an outlet section in valve chamber said flow control means having an annular plenum formed therein with an array of inlet bores in fluid communication with said entrance section of said valve chamber and said plenum and an array of exit bores in fluid communication with said plenum and said outlet section of said valve chamber, said inlet bores and said outlet bores being arranged and configured to form a tortuous flow path from said inlet section to said outlet section of said valve chamber; said flow control means comprising sleeve means, said plenum being formed in said sleeve means and bores in said array of inlet bores being inclined relative to bores of said array of exit bores to form said tortuous flow path from said inlet section to said outlet section of said valve chamber and valve means in said valve chamber adapted to control flow of fluid from said outlet section of said valve chamber to said outlet passage in said valve body.

4,860,994

SEAL SYSTEM FOR BUTTERFLY VALVE

Akira Oshima, No. 136, Idogayanakamchi, Minami-ku, Yokohama-City, Japan

Continuation of Ser. No. 139,008, Dec. 29, 1987, abandoned. This application Mar. 2, 1989, Ser. No. 318,497
Claims priority, application Japan, Jan. 29, 1987, 62-161812
Int. Cl.[4] F16K *1/22*
U.S. Cl. 251—173 1 Claim

1. A seal system for a butterfly valve comprising:
a valve body;
a groove disposed about the circumference of said valve body;
a metal seal member disposed in said groove for radial displacement and having a curved outer face extending outwardly beyond said valve body circumference;
a valve casing having an inner face directed toward said valve body;
a metal seat stripe disposed on said casing inner face and extending inwardly to engage said metal seal member curved outer face, said stripe having an inner face inclined with respect to the axis of said valve casing; and,
a buffer ring having an axially split C-shaped cross-sectional form disposed in said groove below said metal seal with said split facing inwardly, said buffer ring resiliently supporting said metal seal member against said metal seat stripe so as to effect a tight engagement therebetween with the interior of said buffer ring being exposed to the hydrostatic fluid pressure within said valve to thereby uniformly increase the force exerted by said buffer ring on said metal seal member in response to any increase in said hydrostatic fluid pressure.

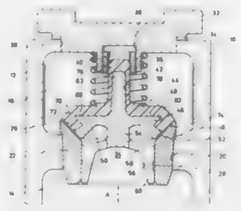


4,860,995

VALVE ELEMENT FOR USE IN PUMPS FOR HANDLING FLUIDS CONTAINING ABRASIVE MATERIALS

John T. Rogers, Houston, Tex., assignor to Utex Industries, Inc., Houston, Tex.

Filed Apr. 19, 1988, Ser. No. 183,652
Int. Cl.[4] F16K *15/00*
U.S. Cl. 251—356 16 Claims



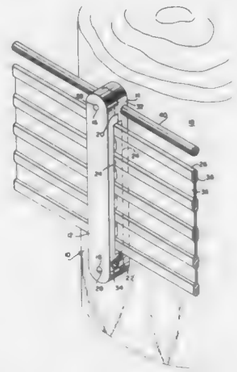
1. A valve element having a lowered center of gravity comprising:
a body portion having a top side and a bottom side;
a first guide means attached to and projecting downwardly away from said bottom side of said body portion; and
an insert secured to said top side of said body portion, said insert including a second guide means projecting upwardly away from said top side of said body portion and a flange portion defining an annularly extending sealing surface, said flange portion being disposed between the first and second guide means, said insert being formed of a substantially non-metallic material having a specific gravity less than the specific gravity of material forming said body portion and said first guide means.

4,860,996

COMPOSITE STRAND FENCE

Edward S. Robbins, III, 459 N. Court St., Florence, Ala. 35630

Continuation-in-part of Ser. No. 643,008, Aug. 22, 1984, Pat. No. 4,684,107, and a continuation-in-part of Ser. No. 892,042, Aug. 1, 1986, Pat. No. 4,706,942. This application Jan. 30, 1987, Ser. No. 8,659
Int. Cl.[4] A01K *3/00*
U.S. Cl. 256—10 27 Claims



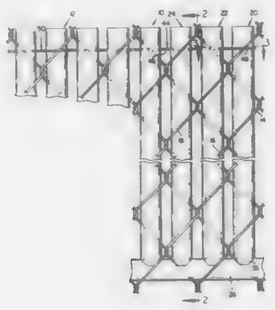
1. A fence system comprising a plurality of spaced fence posts supporting a plurality of vertically spaced, generally horizontally extending composite strands, each of said composite strands having a substantially semicircular cross-sectional shape, and each composite strand comprising an elongated, high-tensile strength core member fixedly encased in a relatively thick, solid plastic sheath, said system further comprising means for attaching said composite strands to said fence posts such that said strands are free to move horizontally with respect to said fence posts.

4,860,997

SLAT FENCE WITH RETAINER WIRE CONSTRUCTION

Joseph W. Schoenheit, Portland, and Stephen E. Weisensee, West Linn, both of Oreg., assignors to Pacific Fence and Wire Company, Clackamas, Oreg.

Filed Mar. 18, 1988, Ser. No. 170,406
Int. Cl.[4] B21F *27/00*
U.S. Cl. 256—34 9 Claims



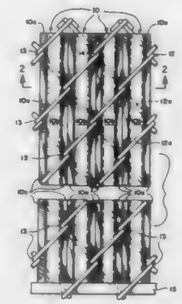
8. A slat assembly for insertion in a chain link fence comprising:
a plurality of elongate slat members predimensioned to be interwoven between vertically consecutive links of the fence, each slat member having opposed, spaced apart, substantially planar faces integrally formed with opposed, spaced apart, curved edges which extend between said faces, and having aligned apertures on each of the edges adjacent the upper end of each slat member; and
a flexible retainer constructed and arranged to be received in said apertures, said retainer including a length of wire, arranged in a substantially straight line through said apertures, said wire having a loop connector at the ends thereof for securing said retainer to the fence.

4,860,998

SLATTED CHAIN LINK FENCE CONSTRUCTION, SLATS THEREFOR, AND METHOD OF SLAT INSTALLATION

Daniel E. Snyder, 87 W. 750 North, Orem, Utah 84057

Filed Oct. 26, 1987, Ser. No. 113,061
Int. Cl.[4] B21F *27/00*; E04H *17/02*
U.S. Cl. 256—34 17 Claims



1. A slatted chain link fence, comprising chain link fence structure having wire mesh fencing fabric with knuckles at wire intersections and providing slat-receiving channels extending from top to bottom of such fencing fabric a plurality of slats in the respective channels, each slat having an elongate, imperforate body member of slat formation with a width approximating the width of its associated receiving channel; fringes that are thin and flexible relative to said body member, said fringes extending along and outwardly from respective opposite longitudinal sides of said body member beyond said width of the receiving channel so as to surround and hug said knuckles, and each of said fringes being made up of a plurality of closely adjoining, substantially position-maintaining strands extending transversely from the body member.

4,860,999

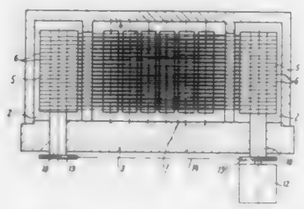
DEVICE FOR HEAT-TREATING, IN PARTICULAR ANNEALING, A CONTINUOUSLY ADVANCED METAL WIRE

Gerhard Ritter, and Klaus Ritter, both of Graz, Austria, assignors to EVG Entwicklungsu. Verwertungs-Gesellschaft m.b.H, Graz, Austria

Filed Jan. 14, 1988, Ser. No. 144,256
Claims priority, application Austria, Jan. 19, 1987, 83/87
Int. Cl.[4] C21D *9/52*
U.S. Cl. 266—103 10 Claims

1. A device for heat-treating a single continuously advancing metal wire, said device comprising first and second spaced deflection drums formed with wire-guiding grooves adapted to locate said single wire wound in a multiplicity of adjacent windings around said first and second drums; means rotatably mounting said first and second drums with axes thereof substantially parallel to one another; a heating chamber located between said first and second drums and having a wall, portions of said wall in the regions of intersection with common outer tangential planes of said first and second drums being

provided with entry and exit opening for said wire; said single wire being wound in helical fashion about said first and second drums a multiplicity of times and passing through said heating



chamber multiple times; at least one motor for driving at least one of said first and second drums; and heating elements mounted in said heating chamber along a transport path of said wire through said heating chamber.

4,861,000

INSTALLATION HAVING SEVERAL ELEMENTS FOR HEAT TREATMENTS

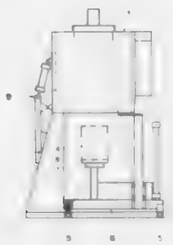
Pierre Beuret, and Pascal Beuret, both of Porrentruy, Switzerland, assignors to Pierre Beuret, Switzerland

Filed May 31, 1988, Ser. No. 200,417

Claims priority, application Switzerland, Jun. 3, 1987, 2099/87

Int. Cl.[4] C21D *9/00*

U.S. Cl. 266—143 **9 Claims**



1. A metal charge treatment installation comprising a first set of treatment elements comprising at least one open-bottom furnace and a second set of treatment elements comprising at least one hardening vat and at least one car, wherein all of the elements of said second set are moveable along a common horizontal lower track, all of the elements of said first set are disposed in an upper position above said lower track, each of the elements of said first set comprises inner receiving means movable into an operative position for supporting a charge within a respective element of said first set and means associated with said respective element and independent from the second elements on the lower track for closing a bottom aperture of said respective element after a charge has been inserted therein, and each of the elements of said second set is provided with a lifting means comprising a platform able to support a charge and to insert it into an element of said first set placed above it.

4,861,001

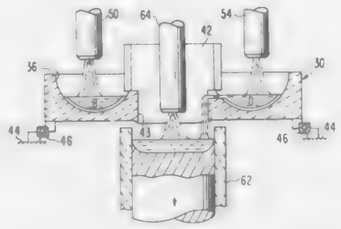
MELTING RETORT AND METHOD OF MELTING MATERIALS

Max P. Schlienger, Ukiah, Calif., assignor to Retech, Inc., Ukiah, Calif.

Filed Jul. 21, 1987, Ser. No. 76,102

Int. Cl.[4] C22B *7/00*

U.S. Cl. 266—242 **16 Claims**



1. Apparatus for melting raw materials comprising:
a retort having an open top recess;
means mounting the retort for rotational movement relative to a fixed reference;
means adjacent to one location of the retort for feeding raw materials into the recess of the retort;
a heat source above and aligned with the recess of the retort at a second location spaced from the first location and in a position to direct heat energy into the open top of the recess of the retort, said retort being rotatable to move the materials directed into the recess at said one location to a position beneath the heat source at said second location, whereby the heat source will be aligned with and will melt the materials, said retort having an exit zone for allowing molten raw materials to flow out of the retort, said retort having an inner periphery defining a central hole and a lip at said exit zone adjacent to the inner periphery, said molten materials melted in the retort being movable out of the retort over the lip and out of the retort through the central hole thereof, there being a secondary crucible aligned with the central hole and adapted to receive the molten materials flowing over the lip; and
a heat source above the secondary crucible and aligned with the central hole for heating the molten material directed into the crucible from the retort.

4,861,002

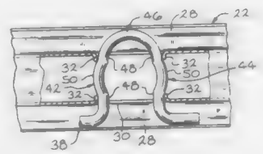
SPRING MODULE WITH IMPROVED MOUNTING FOOT STRUCTURE

Upton R. Dabney, Georgetown, Ky., assignor to Hoover Group, Inc., Roswell, Ga.

Filed Aug. 29, 1988, Ser. No. 237,845

Int. Cl.[4] A47C *23/02*; F16F *3/04*

U.S. Cl. 267—103 **5 Claims**



1. In a box spring assembly having a frame including at least one frame rail member with horizontally spaced generally upright side walls having a pair of aligned horizontal slots

therethrough, said slots having closed ends, each of said ends having a bearing surface, at least one wire spring module having an upright yieldable portion supported on said rail member by a generally U-shaped mounting foot at the lower end of said upright portion, said foot being insertable within said pair of slots, said foot comprising a pair of spaced leg portions joined together by a connecting portion spring urging said leg portions apart, at least one of said leg portions having a pair of spaced bearing sections at least one of said bearing sections being parallel to said bearing surfaces for engaging said bearing surfaces of said ends at one end of said pair of slots in side walls of said frame rail member, said one leg portion having an outwardly convex retaining portion between said bearing sections for wedging coaction with said side walls of said frame rail member to retain said foot in said pair of slots in said frame rail.

4,861,003

CUP-SHAPED HYDRAULIC BEARING

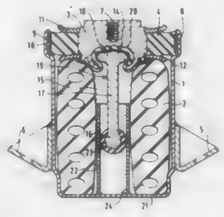
Franz J. Wolf, and Hubert Pletsch, both of Bad Soden-Salmünster, Fed. Rep. of Germany, assignors to WOCO Franz-Josef Wolf & Co., Fed. Rep. of Germany

Filed Jan. 20, 1988, Ser. No. 146,090

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1987, 3701490

Int. Cl.[4] F16F *13/00*; B60K *5/12*

U.S. Cl. 267—140.1 **25 Claims**



1. A bearing comprising:
a beaker-type housing;
a soft support spring positioned within said beaker-type housing;
a load supporting plate bearing upon an upper end of said support spring;
a disc-type radially compressable bistable control spring coupled to and circularly enclosing said load supporting plate, said disc-type bistable control spring in combination with said load supporting plate hermetically closing said beaker-type housing in a gas-tight and liquid-tight manner;
stop means for limiting a spring deflection path of said disc-type bistable control spring, said stop means being arranged normal to a spring deflection path of said support spring;
a clapper-type piston comprising a piston head connected to a piston shaft and a piston base connected to said piston shaft, said clapper-type piston being suspended from a lower part of said load supporting plate and being axially movable with respect to said beaker-type housing; and
a cylindrical tube attached to a bottom of the beaker type housing; said piston head being slidably positioned within said cylindrical tube in a substantially closely fitting manner.

4,861,004

FLUID DAMPED ELASTOMERIC BUSHING

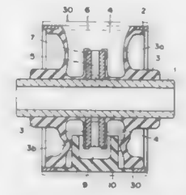
Motoyuki Yokota; Mamoru Tanabe, both of Okayama, and Tatsuo Fujiki, Kurashiki, all of Japan, assignors to Marugo Rubber Industries, Ltd., Okayama, Japan

Filed Jun. 22, 1988, Ser. No. 210,016

Claims priority, application Japan, Oct. 27, 1987, 62-165197[U]

Int. Cl.[4] F16F *1/48*

U.S. Cl. 267—140.1 **13 Claims**



1. A fluid-damped elastomeric bushing comprising:
an inner sleeve and an outer sleeve disposed radially outwardly of said inner sleeve;
an elastic member interposed between said inner sleeve and said outer sleeve;
a pair of liquid compartments defined in said elastic member at a central portion thereof relative to an axial direction of said elastic member, said pair of liquid compartments being disposed in spaced opposed relation relative to said inner sleeve, each one of said pair of liquid compartments having spaced opposed elastic side walls in an opposing relation and defining an interior, at least a part of each said side wall being bent inwardly toward the interior of each of said liquid compartments, and an inner elastic member in each one of said pair of liquid compartments, each said inner elastic member having a bottom and a recess for receiving an orifice means therein; and
orifice means disposed in said recess of each said inner elastic member of said pair of liquid compartments for communicating said pair of liquid compartments for causing a liquid in one of said pair of liquid compartments to be forcibly fed to the outer one of said pair of liquid compartments when a load is supplied to said bushing, and each said orifice means projecting into said recess of each said inner elastic member for facilitating movement of a liquid between said pair of liquid compartments, and each said orifice means being sufficiently long for limiting an over displacement of said inner sleeve relative to said outer sleeve.

4,861,005

THREE FLUID CHAMBER MOUNTING FOR RESILIENT, VIBRATION-DAMPING MOUNTING OF COMPONENTS

Paul Bausch, Hattenheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 27, 1988, Ser. No. 211,633

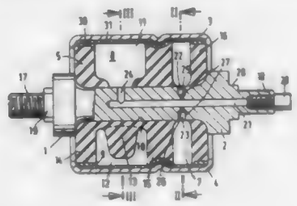
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730582

Int. Cl.[4] F16M *5/00*

U.S. Cl. 267—140.1 **6 Claims**

1. Mounting comprising an inner portion, an outer portion surrounding the inner portion at a distance, and an elastomeric body disposed between the inner portion and outer portion having recesses which form first and second fluid chambers an unrestricted fluid passage in said inner portion, separate throttle passages connecting said first and second fluid chambers to said unrestricted fluid passage, characterized in that said elastomeric body has an additional recess forming a third fluid

chamber and an unthrottled passage connecting said third chamber to said unrestricted fluid passage whereby said third



chamber is connected by said separate throttle passages to said first and second fluid chambers.

4,861,084

ANTI-VIBRATION APPARATUS

Kazuya Takano, Kamakura, and Takeshi Noguchi, Yokohama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Sep. 11, 1987, Ser. No. 96,028
Claims priority, application Japan, Sep. 16, 1986, 61-217645; Dec. 22, 1986, 61-306099
Int. Cl.[4] F16F *6/00*
U.S. Cl. 267—140.1 **20 Claims**



1. An anti-vibration apparatus comprising:
an expandable liquid chamber interposed between a vibration generating section and a vibration receiving section, said liquid chamber being partially formed by an electric main body containing electrorheologic fluid;
a partitioning portion partitioning said liquid chamber into a plurality of small liquid chambers;
an elongated long orifice opening into said small liquid chambers and communicating with said small liquid chambers thereby allowing flow of said electrorheologic fluid; and
electrode means disposed within said elongated orifice to directly contact said electrorheologic fluid for varying the viscosity of said electrorheologic fluid within said elongated orifice, the viscosity of said electrorheologic fluid being varied in proportion to the strength of an electric field of said electrode means to thereby absorb a wide range of engine vibrations when a current is passed through said electrode means.

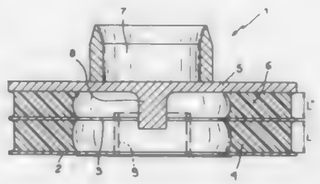
4,861,087

ELEMENT FOR SUPPORTING SUSPENSION-SPRINGS

Emilio Morini, Milan, Italy, assignor to Pirelli Sistemi Antivibranti S.p.A., Milan, Italy

Filed Mar. 31, 1988, Ser. No. 176,296
Claims priority, application Italy, Mar. 31, 1987, 19906 A/87
Int. Cl.[4] F16F *1/36;* **B16F** *5/02*
U.S. Cl. 267—153 **11 Claims**

1. Element for supporting suspension-springs comprising:
a bottom plate;
a supporting plate positioned above and parallel to the bottom plate;
a positioning collar extending from a surface of said supporting plate in a direction perpendicular to the supporting plate and towards the opposite direction of the bottom plate;
an intermediate plate parallely interposed between said bottom plate and said supporting plate;
a first ring of elastomeric material coaxially disposed with respect to the positioning collar and interposed between said bottom plate and said intermediate plate, said first



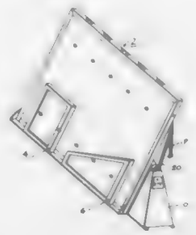
ring being united with said bottom plate and said intermediate plate;
a second ring of elastomeric material coaxially disposed with respect to the positioning collar and interposed between said intermediate plate and said supporting plate, to which said second ring is united, wherein said second ring has a height (L') in a direction perpendicular to said surface smaller than a height (L') of the first ring, wherein a ratio between the height of each said first and second ring and the difference between the respective outer and inner diameter thereof is between 0.1 and 0.25.

4,861,098

VACUUM SUPPORT TABLE FOR GLASS GLAZING AND THE LIKE

Willard A. Steele, and Jeffrey S. Steele, both of 35082 S. Turtle Dr., Willoughby, Ohio 44094

Filed Dec. 22, 1987, Ser. No. 136,288
Int. Cl.[4] B25B *11/00*
U.S. Cl. 269—21 **4 Claims**



1. A glazing table of the type for supporting a window pane, plate or window assembly thereof, said table including a support frame having a pair of oppositely disposed support columns, a single elongated hollow manifold member rotatably journaled on said columns adapted for pivotally mounting said table, a base member fixedly attached to said rotatable manifold member having a resilient material thereon, a resilient platen member made from an elastomeric or polymeric material attached to said base member, a plurality of vacuum ports extending through said base and resilient platen members, and a vacuum supply source for automatically applying a vacuum to said vacuum ports adapted for drawing a vacuum against the confronting undersurface of a glass plate or panel mounted on said base member, wherein said manifold member is of a hollow construction including a plurality of conduits connecting said vacuum ports to a vacuum motor, and said manifold member having axle members at the opposed ends thereof adapted for mounting in bearings mounted on said support columns and wherein said vacuum ports include a horizontal collar which holds said resilient platen member in a recessed condition around the periphery thereof.

4,861,009

VARIABLE FORCE EXERTING CLAMP ASSEMBLY HAVING A VARIABLE CLAMPING AREA

Michael D. Thomas, 17 Pine Lake Dr., Arab, Ala. 35016

Filed Feb. 25, 1988, Ser. No. 160,290
Int. Cl.[4] B25B *1/20*
U.S. Cl. 269—43 **15 Claims**



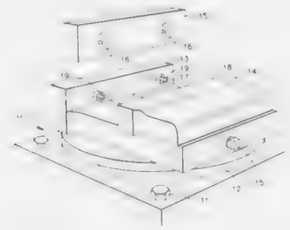
1.A variable force exerting clamp assembly having a variable clamping area comprising:
an elastic stretchable strap;
a first fixed clamping member rigidly secured to a first end of said strap;
a second clamping member disposed in slidable relation on said elastic strap;
frictional clamping means carried by said second clamping member in biased relation therewith and in contactual relation with said strap, said strap disposed for deformation from a first normal configuration to a second, thinner, more elongated configuration responsive to application of a tensional force thereto, and said clamping means disposed for gripped engagement with said strap responsive to said strap returning to said first normal configuration in response to release of said tensional force; and
said first and second clamping members disposed for receiving a workpiece therebetween, whereby the distance between said clamping members is defined by the distance said second clamping member is moved along said strap, and the force exerted on said workpiece is determined by the amount of tensional force applied to said strap.

4,861,010

AFFIXATION OF VISE JAW REMOVABLE FACEPLATES BY KEYHOLE APERTURES

Michael A. Neil, c/o Quad-One Corporation, 14397 Janal Way, San Diego, Calif. 92129

Filed Apr. 8, 1988, Ser. No. 179,053
Int. Cl.[4] B25B *1/24*
U.S. Cl. 269—282 **15 Claims**



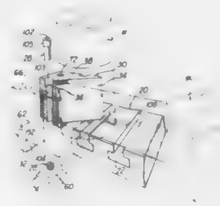
1. A vise comprising:
a frame;
two opposed jaws, at least one of which is slidable relative to the frame, for selectively grasping a workpiece between opposed faces of the jaws;
a fastener, having a relatively wider head region and a relatively narrower shank, mounted at the face of at least one jaw and protruding therefrom for tightening and loosening to extend relatively closer to, and relatively further from, the jaw's face; and
a removable faceplate, defining at least one keyhole aperture, that is removably rigidly affixable by the fastener at the face of the at least one jaw by action of (i) slipping a wide portion of the keyhole aperture over the relatively wider head region of the fastener and then (ii) sliding this relatively wider head region over a relatively narrower region of the keyhole aperture so that the relatively narrower shank of the fastener fits through this relatively narrower region of the keyhole aperture and then (iii) tightening the fastener.

4,861,011

WORKPIECE RECEIVING AND POSITIONING DEVICE FOR MACHINING OPERATIONS

Paul Varga, 213 Philadelphia Ave., Salisbury, Md.

Filed Apr. 18, 1988, Ser. No. 182,522
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 269—99 **20 Claims**



1. A workpiece receiving and positioning device for use in combination with a clamp means for securing and orienting a workpiece relative to the slotted surface of a machine tool table or the like, said clamp means having means for abutting the workpiece, said device comprising a generally rectangular main body portion adapted to rest on said surface, a workpiece receiving block portion adjacent said main body portion with generally opposed inner side faces extending radially outwardly from said main body portion and forming a recess therebetween for receiving a workpiece, a base portion integral with said main body portion and depending downwardly therefrom for engaging a selected slot of said slotted surface of the machine tool table, said base portion having substantially equal halves defined by a slot therebetween, said body portion and said base portion also including at least one bore formed therethrough and having fastening means disposed in said bore for spreading said halves into gripping relationship with said slotted surface.

4,861,012

PAPER FEEDER FOR IMAGE FORMING APPARATUS

Tadafumi Shimizu, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 18, 1988, Ser. No. 157,270
Claims priority, application Japan, Feb. 20, 1987, 62-38852
Int. Cl.[4] B65H *3/06, 5/06*
U.S. Cl. 271—3.1 **15 Claims**

12. An image forming apparatus provided with an intermediate tray for temporarily accommodating paper having an image already formed on at least one side thereof and a paper feeding roller producing a rotary motion for refeeding the paper from within said intermediate tray, which comprises:

first supporting means supported swingably above said intermediate tray and adapted to support said paper feeding roller at the leading end thereof,

second supporting means supported so as to be rotated around the axis of said paper feeding roller and adapted to support rotatably at the leading end thereof an oblique travel preventing roller parallelly to the axis of said paper feeding roller, and



a lever supported swingably above said intermediate tray and adapted to revolve said paper feeding roller and said oblique travel preventing roller from the paper feeding position to the retracting position outside the paper passage by being connected to said first supporting means and said second supporting means.

4,861,013

MECHANISM FOR PREVENTING THE FEEDING OF MORE THAN ONE SHEET OF PAPER AT ONE TIME

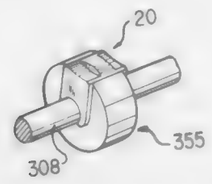
Kiyotaka Shibata, Takatsuki, and Kiyoshi Morimoto, Osaka, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 850,789, Apr. 11, 1986, abandoned. This application Jan. 25, 1989, Ser. No. 301,296

Claims priority, application Japan, Apr. 15, 1985, 60-80638; Apr. 15, 1985, 60-56766

Int. Cl.[4] B65H *3/06*

U.S. Cl. 271—119 **2 Claims**



1. A mechanism for preventing the feeding of more than one sheet of paper at one time comprising a document feeder having a pair of parallel shafts, one of which is a paper-supply roller shaft supporting a plurality of paper-supply rollers, and the other of which is a separation roller shaft supporting a plurality of separation rollers, wherein the distance between the shafts is slightly less than the sum of the radii of said paper-supply rollers and said separation rollers, and said paper-supply rollers and said separation rollers are arranged in a zigzag manner, an outer peripheral surface of each of said paper-supply rollers serially having a large frictional section producing much friction between the paper-supply roller and the paper and a small frictional section producing little friction between the paper-supply roller and the paper, said small frictional section of said paper-supply roller is made of an adapter, which has a roller-compensating part including a roller-compensating section functioning as one part of the outside of the paper-supply roller and a supporting section for supporting said roller-compensating part that is to be put on the roller shaft so as to be straddled by the paper-supply roller in the direction of the width of the paper-supply roller.

4,861,014

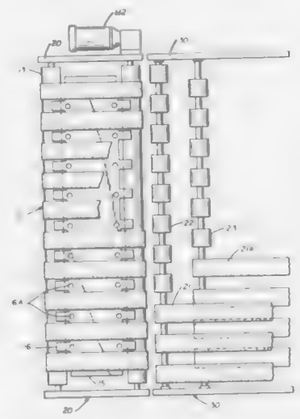
SHEET STACKING MACHINE

Merrill D. Martin, Geo. M. Martin Company, P.O. Box 8464, Emeryville, Calif. 94608

Division of Ser. No. 82,280, Aug. 6, 1987, Pat. No. 4,805,890. This application Jul. 21, 1988, Ser. No. 222,952

Int. Cl.[4] B65H *43/04*

U.S. Cl. 271—198 **3 Claims**



1. In a machine for handling sheets employing a plurality of narrow endless belts in parallel spaced relation the improvement comprising:

a first plurality of lower driving pulleys axially positioned along a shaft to define gaps therebetween;

said lower pulleys engaging a lower first set of belts providing longitudinal gaps therebetween said first belts;

a second plurality of upper idler pulleys axially positioned along a shaft to define gaps therebetween;

said upper pulleys engaging an upper second set of belts providing longitudinal gaps between said second belts;

said lower and said upper belts having upper and lower flat parallel surfaces and longitudinal edges;

said lower surfaces of said upper second belts being superimposed tightly upon said upper surfaces of said lower first belts and disposed to overlap said gaps between said lower first belts along the longitudinal edges thereof;

means for driving said lower first pulleys thereby causing said upper second belts to travel at a uniform linear speed.

4,861,015

SHEET ACCUMULATING APPARATUS

Floyd E. Stearns, Warsaw; Jeffery A. Pitas, Fairport; Robert D. LeRoy, Rochester, and Roger E. Ditzel, Corfu, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 943,469, Dec. 19, 1986, abandoned. This application May 20, 1988, Ser. No. 196,887

Int. Cl.[4] B65H *31/04*

U.S. Cl. 271—213 **2 Claims**

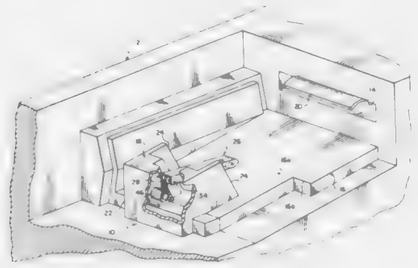
1. Apparatus for receiving sheets traveling seriatem along a path, and accumulating such sheets in a stack justified along one margin thereof, said apparatus comprising:

a tray in juxtaposition with said sheet travel path;

means for directing sheets from said travel path to said tray one after the other for accumulating such sheets in a stack on said tray;

a striker plate associated with one marginal edge of said tray;

means for continuously urging accumulated sheets on said tray into engagement with said striker plate to justify one margin of such accumulated sheet stack, said urging means, supported on the opposite side of said striker plate from said sheet travel path and extending over said tray to be urged by gravitational forces in a direction to follow the level of the topmost sheet of such accumulated sheet



stack, including a pair of pulleys, a belt entrained about said pulleys and having an external surface thereof extending above the peripheral surface of said pulleys, and means for driving one of said pulleys to move said belt about a closed loop path, at least a portion of such closed loop path being in engagement with the topmost sheet of such accumulated sheet stack; and

means, located beneath said tray, for selectively moving said tray in a direction transverse to such sheet travel path to relatively offset groups of accumulated sheets.

4,861,016

DELIVERY SAFETY APPARATUS FOR SHEET-FED PRINTING PRESS

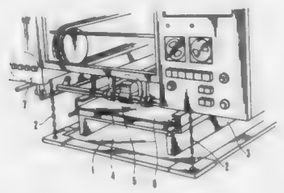
Hisaaki Ohyoshi, and Nobuaki Saito, both of Ibaraki, Japan, assignors to Komori Printing Machinery Co., Ltd., Japan

Filed Sep. 21, 1988, Ser. No. 247,253

Claims priority, application Japan, Sep. 22, 1987, 62-236162

Int. Cl.[4] B65H *43/04*

U.S. Cl. 271—215 **1 Claim**



1. A delivery safety apparatus for a sheet-fed printing press, comprising:

delivery height detecting means for detecting a height of a pile exceeding a predetermined position for sheets delivered and stacked on a delivery table;

delivery table automatic descending means for vertically moving said delivery table on the basis of a detection result of said delivery height detecting means regardless of an operation mode of a delivery table lifting unit for vertically moving said delivery table;

alarming means for detecting that automatic descending of said delivery table by said delivery table automatic descending means is not started when a predetermined period of time has elapsed and for generating an alarm; and

sheet delivery interrupting means for detecting that automatic descending of said delivery table is not started when another predetermined period of time has elapsed after the alarm is generated and for interrupting delivery of the sheet to said delivery table.

4,861,017

PAPER-FEEDING DEVICE

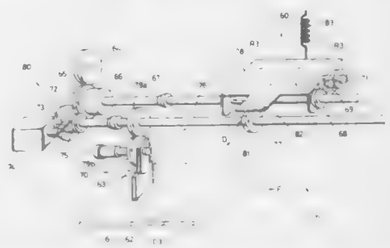
Kiyonori Yamamoto; Osamu Seta, both of Osaka; Masahiko Sakae, Nara; Yoshinori Makiura, Osaka; Masahiro Murakami, Osaka, and Toshiyuki Mitsuya, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 22, 1987, Ser. No. 111,478

Claims priority, application Japan, Oct. 23, 1986, 61-252180

Int. Cl.[4] B65H *7/02*

U.S. Cl. 271—258 **6 Claims**



1. A paper-feeding device for feeding paper in a paper-conveying direction to an image processing apparatus, said device comprising:

a paper-feeding cassette means including a paper-feeding cassette and a paper-feeding cassette mount, said cassette being adapted for loading into the image processing apparatus and removable from the image processing apparatus in a direction substantially perpendicular to said paper-conveying direction.

locking means for engaging said paper-feeding cassette means to prevent said paper feeding cassette from being removed from the image processing apparatus; and

locking control means for controlling said locking means to engage said paper-feeding cassette means during a paper-feeding operation and during a paper jam in a paper-feeding path, said locking-control means comprising means for determining a condition when a copying paper fails to pass through a predetermined position during a specific period of time from a start-up of copying paper delivery from said paper-feeding cassette, said locking control means causing said locking means to engage said paper-feeding cassette means in response to determination of said condition by said determining means.

4,861,018

IDLER RELEASE PULLEY LEVER MECHANISM FOR DOCUMENT TRANSPORT

Melvin Kerstein, Lincolnwood, Ill., assignor to Bell & Howell Co., Skokie, Ill.

Filed May 26, 1988, Ser. No. 199,951

Int. Cl.[4] B65H *5/06*

U.S. Cl. 271—274 **7 Claims**

1. A document transport system for transporting documents of varying thicknesses along a document path comprising:

document drive assembly means forming one side of said document path,

idler roller assembly means forming an opposite side of said document path,

said document drive assembly means including moving means adapted to engage said document and move said document along said document path,

said idler roller assembly means including idler roller means

adapted to move automatically and manually, alternately, between a first position contacting said moving means when no documents are present in said document path and contacting said documents when present in said document path, and a second position out of contact with said moving means on said documents, thereby forming a gap between said idler roller means and said moving means,

said idler roller means being connected by lost motion connecting means to idler release lever means, whereby said idler release lever means remains stationary when said idler rollers move automatically between said first position and said second position, and whereby actuation of said idler release lever means causes movement of said



idler roller means from said first position to said second position to permit the clearance of jams in said document path,

each said idler roller means being disposed for free rotation adjacent one end of idler arm means, the other end of said idler arm means being rigidly connected by means of a shaft supported by said idler roller assembly means to idler roller release pulley means,

said lost motion connecting means comprising flexible means operatively extending between said idler release lever means and said idler roller release pulley means, whereby rotative motion of said idler roller release pulley means is not transmitted from said idler roller release pulley means to said idler release lever means.

4,861,019

DEVICE TO DELIVER PRINTED PRODUCTS FROM A FANWHEEL

Horst B. Michalik, Höchberg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Würzburg, Fed. Rep. of Germany

Filed Sep. 13, 1988, Ser. No. 243,721

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731215

Int. Cl.[4] B65H *29/20*

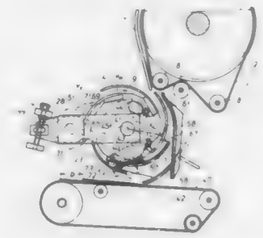
U.S. Cl. 271—315 **4 Claims**

1. A device to deliver printed products from delivery fanwheels of a folder to form a stream of said printed products, said device comprising:

at least a first cam section, said cam section being positioned about a driving shaft for said delivery fanwheels;

a chain guided by said cam section; and

angle elements and clamping pieces attached to links of said chain at spaced intervals along said chain, said clamping



pieces being disposed to cooperate with vanes of said fanwheels to clamp said printed products.

4,861,020

EXERCISE DEVICE FOR INSTALLATION IN A DOORWAY

Robert E. Soligny, Sr., 600 NE. 128 St., N. Miami, Fla. 33161

Filed Jan. 19, 1988, Ser. No. 146,578

Int. Cl.[4] A63B *1/02*

U.S. Cl. 272—62 **5 Claims**



1. An exercise apparatus for use with a conventional door jamb comprising:

support members including an upper support member to be affixed horizontally on the header portion of the door jamb, and a pair of elongated support members to be affixed vertically on opposite sides of the door jamb facing each other in a bi-lateral relationship, each support member including means for securing the support member to

the door jamb, and the elongated support members being sized to extend substantially along the entire vertical extent of the door opening:

a plurality of open end eyelets mounted on each support member;

a plurality of resilient members, each resilient member having looped ends; and,

a bar having a pair of gripping portions surrounding a central portion, the central portion including a plurality of open end eyelets, wherein the looped ends of the resilient members are detachably connectable to the open end eyelets of the bar and support members.

4,861,021

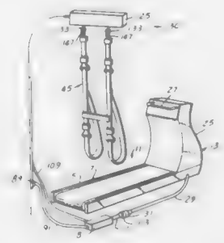
SAFETY HARNESS ON/OFF SWITCH ASSEMBLY FOR TREADMILLS

Marysue Edwards, Grand Blanc, and Max M. Dubrinsky, West Bloomfield, both of Mich., assignors to Safe/Stress, Inc., Grand Blanc, Mich.

Filed Nov. 18, 1987, Ser. No. 121,924

Int. Cl.[4] A63B *23/06*

U.S. Cl. 272—69 **7 Claims**



1. A safety harness on/off switch assembly for a motorized treadmill comprising a support means positioned over the treadmill;

a safety harness including a pair of spaced laterally interconnected straps, at their upper ends flexibly and yieldably suspended from said support means and at their lower ends including a pair of loops, said loops passing upwardly under the groin and over the shoulder of the user such that said harness does not support said person during operation of said treadmill but will function in response to collapse of the user to catch the user in a seated position;

an electrical circuit connected to the treadmill and adapted to be connected to a power source;

a normally closed safety switch means mounted upon said support means and interconnected in said circuit and including a movable member;

control means connected to at least one of the straps, on downward movement adapted to actuate said movable member, whereby when a user falls, trips, faints or is injured the body of the user rests upon said loops extending said straps and actuating said movable member thereby opening said switch means and deactivating the treadmill;

the treadmill including an electric motor connected into said circuit, whereby actuation of said movable member deactivates said electric motor;

said electrical circuit including a normal open relay switch connected to said motor and including a magnetic coil when energized adapted for closing said relay switch;

said switch means being connected to said magnetic coil for closing said relay switch and energizing said treadmill motor, actuation of said movable member opening said switch means, deactivating said relay and shutting down said treadmill.

4,861,022

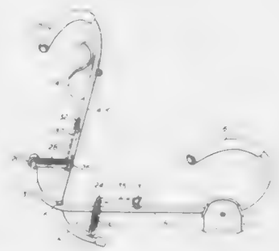
PORTABLE FOREARM EXERCISER

Billie Boatcallie, 7047 Bissonet, #51, Houston, Tex. 77074

Filed Aug. 5, 1988, Ser. No. 228,481

Int. Cl.[4] A63B *21/02*

U.S. Cl. 272—137 **4 Claims**



1. An exerciser comprising a pair of levers secured together by a pivot pin near one set of ends to operate in the manner of a pair of scissors, such pivot pin separating each lever into a short distal portion and a longer proximal or handle portion, resilient means biasing the exerciser in an open position and having one of its ends connected to the distal portion of one lever and its other end to the proximal portion of the other lever, and a pair of concave forearm cups secured to the proximal portions of the levers adjacent their free ends, each such forearm cup being secured to the outside of its lever with its concavity facing away from the center plane of the device, whereby the user may insert her forearms into the cups and use the device by pushing the proximal ends of the levers toward one another to the closed position of the exerciser against the restraining force of the resilient means,

in which said distal portions of the levers are curved relative to a plane passing through the pivot pin and bisecting the angle betweem the levers, the curvature at each distal portion being away from such bisecting plane, the proximal portions of the levers between the pivot pin and said forearm cups being lineal, and

in which said proximal portions of the levers include a curved handrest subportion disposed between said forearm cups and the tips of the levers, said subportion of each lever being bent to extend above the lineal portion and offset inwardly toward said bisecting plane, whereby when the user grips the exerciser between her forearms her hands fall naturally into the handrests.

4,861,023

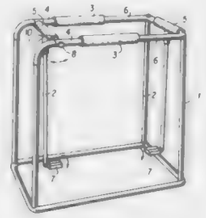
LEG MUSCLE EXERCISE DEVICE AND METHOD

Mike Wedman, 2920 Sixth St., Boulder, Colo. 80302

Filed Jul. 31, 1987, Ser. No. 80,490

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—120 **16 Claims**



1. An exercise device for leg muscle conditioning of an individual in an upright position, comprising:

a rectangular, box-shaped frame having at an upper portion thereof a first and second parallel and horizontally oriented hand rail and a third and fourth parallel and horizontally oriented hand rail interconnecting said first and second hand rails, respectively;

a first and second pedal stem mounted on said frame;

a pedal connected to an end portion of each of said first and second pedal stems and upon which the feet of the individual are placed; and

means mounted on said frame for pivotally connecting said first pedal stem to said first hand rail so as to allow for movement of said first pedal stem towards and away from said second pedal stem in a single plane of motion perpendicular to said first and second hand rails along a longitudinal axis of said frame for conditioning of the leg muscles of the individual in said upright position and to allow for support of an upper portion of said individual between said third and fourth hand rail upon movement of said first pedal stem in said single plane of motion.

4,861,024
EXERCISE BENCH
Scott Lee, Box 10, Church St., Putnam, Conn. 06260
Filed Feb. 19, 1988, Ser. No. 158,235
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 7 Claims



1. In an exercise bench of the type having a frame, a platform supported by said frame, said platform comprising generally planar head and foot sections, and a pair of generally vertical weight supports disposed adjacent said head section, said weight supports having disposed thereon a hook member adapted to receive a barbell;

wherein the improvement comprises said vertical weight supports comprising a bottom portion and a top portion, said bottom portion being disposed at an angle ϕ from perpendicular, where angle ϕ is 0° to 45° angled away from said foot section and said top portion angled toward said foot section forming an obtuse angle Ω with said bottom portion, such that said hook member is disposed generally over the neck of a user lying on said platform in use;

whereby said vertical weight supports are disposed such that there is substantially no interference with a user's arms or barbell during performance of bench pressing exercises.

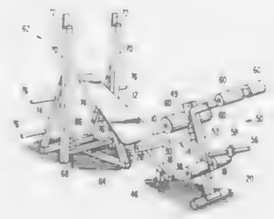
4,861,025
ARTICULATED STORABLE EXERCISE BENCH
Gary Rockwell, Auburn, Ala., assignor to Diversified Products Corporation, Opelika, Ala.
Filed Dec. 30, 1987, Ser. No. 139,662
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—144 20 Claims

1. An adjustable, floor-supported exercise bench for use in performing weight-lifting or other resistance-type exercises, and which supports a user in either a horizontal or an inclined position comprising:

front and rear seat cushions arranged end-to-end, longitudinally of the bench;

front and rear subframes respectively supporting said front and rear seat cushions;

front and rear support means respectively pivotally supporting said front and rear subframes above the floor, said front support means being rigidly secured to said front subframe adjacent its distal end to pivot about the floor as it supports the said distal end above the floor while maintaining said end at a substantially constant distance from the floor; and



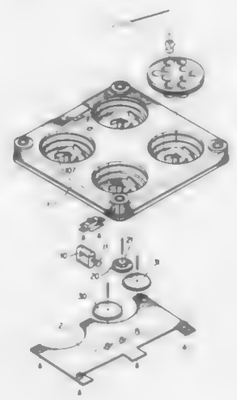
coupling means intermediate said front and rear support means for:

(a) pivotally interconnecting said subframes;

(b) maintaining said subframes in a locked position with said seat cushions substantially coplanar; and

(c) permitting said subframes to pivot downwardly intermediate said front and rear support means from a locked horizontal position to an unlocked inclined position with said seat cushions diverging upwardly from their proximal ends.

4,861,026
WISHING GAME
Chuang Chuan-Tien, No. 2, Lane 174, Ta-Hsing Street, Tainan, Taiwan
Filed May 20, 1987, Ser. No. 51,780
Int. Cl.[4] A63B *67/00, 71/00;* A63F *9/00*
U.S. Cl. 273—1 GD 7 Claims



1. A fishing game toy comprised of:

a support body having at least two cavities;

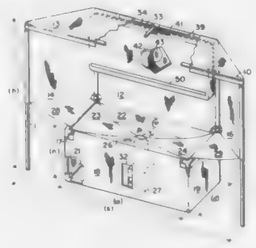
a plurality of pans each having a plurality of vertically extending sockets, said pans being supported for rotation in the cavities of said support body, each of said pans including an annular peripheral surface having teeth thereon; a

plurality of game targets positioned in the sockets of said pans for access by a number of players corresponding to the number of such pans;

means supported by the support body for displacing individual ones of the plurality of game targets in the sockets of each pan upon rotation thereof; and

a drive means including at least one idler gear engaged with the teeth on the annular peripheral surface of said pans for simultaneously rotating the pans in the same relative direction of rotation.

4,861,027
TENNIS PRACTICE AND GAME APPARATUS
George K. Thaxton, 758 S. County Rd., Palm Beach, Fla. 33480
Filed Dec. 4, 1987, Ser. No. 128,711
Int. Cl.[4] A63B *61/00*
U.S. Cl. 273—29 A 2 Claims



1. An apparatus for practicing tennis whereby balls are hit by a player over a simulated net comprising:

(A) a bin for collecting spent tennis balls,

(B) a plurality of flexible sheets and a frame for supporting said sheets whereby said sheets deflect said spent balls into said bin, said sheet comprising:

(1) a central back sheet,

(2) left and right wing sheets extending therefrom and

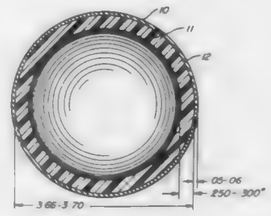
(3) triangular sheet members connecting said bin to said wing sheets whereby balls striking said wing sheets will enter said bin,

(C) a substantially vertical surface of said simulated net defining a narrow opening,

(D) a ball-throwing machine, said machine being positioned to throw said spent balls through said opening toward said player, and

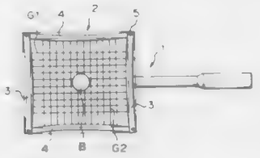
(E) funnel means for paying said spent balls from said sheets into said said ball-throwing machine.

4,861,028
GAME BALL
Donald E. Williams, Glendale Heights, Ill., assignor to Wilson Sporting Goods Co., River Grove, Ill.
Filed Jul. 29, 1988, Ser. No. 226,236
Int. Cl.[4] A63B *39/00, 37/06*
U.S. Cl. 273—60 B 19 Claims



1. A molded plastic game ball comprising a hollow spherical core of a mixture of a low density polyethylene and an ethylene acid copolymer.

4,861,029
RACKET FRAME
Masanori Takatsuka, Hamamatsu, Japan, assignor to Yamaha Corp., Japan
Filed Jan. 27, 1988, Ser. No. 148,902
Claims priority, application Japan, Jan. 26, 1987, 62-15726; Feb. 3, 1987, 62-23308
Int. Cl.[4] A63B *49/02*
U.S. Cl. 273—73 C 9 Claims



1. A racket frame, comprising:

a head frame, a grip and a yoke, the head frame being coupled to the grip via the yoke and defining a bounded ball striking area;

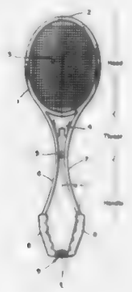
a ball striking face disposed in the ball striking area, the ball striking face being secured to the head frame and comprising a lattice of longitudinal and lateral strings secured to said head frame; and

said head frame including a first pair of elongate, opposed and spaced head frame members and hinge means for hingedly securing at least one end of each of said frame members in said head frame in a manner which facilitates flexing of the frame members toward one another, a portion of said lattice of strings secured to said frame members whereby, in response to a striking of said ball striking face by a ball, said frame members flex toward one another to a degree greater than without said hinge means.

4,861,030
TWO-HANDED RACQUET
Lionel J. Burt, 2504 Armour Ln., Redondo Beach, Calif. 90278
Filed Aug. 4, 1988, Ser. No. 228,164
Int. Cl.[4] A63B *49/08*
U.S. Cl. 273—73 J 13 Claims

1. In a racquet of the type including a frame defining a racquet head, the frame extensions from said racquet head

converging to a throat and extending to form a handle; the improvement comprising the division of said handle into two separate symmetrically shaped shafts that are formed and spaced to dispose two separate grips set angularly apart from the major axis or centerline of said racquet by an angle of 12 to 20 degrees such that a player can comfortably hold both grips at the same time; the bottom or butt end of said grips being joined by a torque stabilizer means, said torque stabilizer means



providing torsional rigidity to the lower handle portion of said racquet and also a means of adjusting the distance between said grips; said grips having an adjustable angle set with the major axis of said racquet so as to allow the player to align the forearm with the handle axis and the 'sweet spot' of the racquet head; said two grips being mounted on two separated shafts provided for the purpose of permitting a two-handed hold on said racquet, allowing a player to play 'forehand' with either hand without the need to switch grip holds.

4,861,031

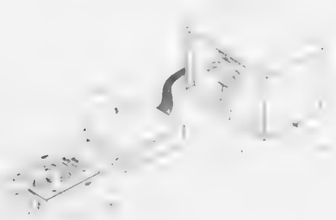
CARD WRESTLING GAME

Cosmian E. Simms, 5510 Fernpark Ave., Baltimore, Md. 21207

Continuation-in-part of Ser. No. 66,225, Sep. 28, 1987, abandoned. This application Apr. 18, 1988, Ser. No. 182,496

Int. Cl.[4] A63F *1/00, 1/02, 9/22*

U.S. Cl. 273—85 G **9 Claims**



1. An apparatus for playing a competitive game for two or more competitors that simulates a competitive wrestling match, said apparatus comprised of:

a plurality of images including a first portion of the images comprising a plurality of wrestling "combat" maneuvers, a second portion of the images comprising a plurality of wrestling "submission hold" maneuvers, and a third portion of the images comprising a plurality of wrestling "escape" maneuvers, the images being devoid of any numerical point value for scoring purposes; and

means for distributing the images to the competitors and sequentially displaying the images in a chosen sequence such that display by one competitor of a "combat" image immediately followed by display of a "submission" image signifies said competitor to be the winner unless the other competitor displays an "escape" image, whereby the wrestling match is simulated.

4,861,032

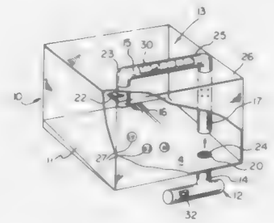
RANDOM NUMBER SELECTOR

Eli Gaylor, North Vancouver, Canada, assignor to The Winners' Choice Selector Inc., Vancouver, Canada

Continuation of Ser. No. 15,041, Feb. 17, 1987, abandoned. This application Nov. 1, 1988, Ser. No. 266,336

Int. Cl.[4] A63F *9/00*

U.S. Cl. 273—144 B **7 Claims**



1. A lottery number selection apparatus comprising a mixing chamber, a tube mounted wholly within said chamber, said tube having a plurality of cylindrical sections, one of said cylindrical sections being a display section, said tube having an inlet and an outlet end, each of said inlet and outlet ends being in open in said mixing chamber, a retaining means to retain a plurality of balls in said tube, a cover for said mixing chamber surrounding said tube, air supply means to provide air to said chamber through an aperture, the first of said plurality of cylindrical sections including said inlet end located substantially coaxial with, directly adjacent to and above said aperture, said display section being operably connected with said first section and extending in a direction generally parallel with the uppermost portion of said cover of said mixing chamber, said display section being visible external of said chamber.

6. A method of displaying a plurality of balls bearing indicia in a cylindrical display tube comprising the steps of supplying an air stream to a chamber from an aperture, continuously blowing each of said plurality of balls with said airstream until each of said balls enters said cylindrical display tube, said display tube extending adjacent to and parallel with the outside profile of said chamber, retaining said plurality of balls in said cylindrical display tube for a predetermined period of time, and releasing a retaining means to allow said plurality of balls to return to said chamber.

4,861,033

PRACTICE PUTTING CUP

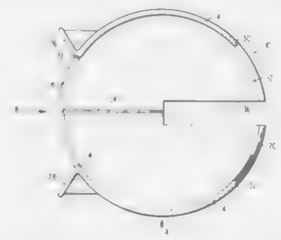
Robert A. Miner, P.O. Box 650460, Vero Beach, Fla. 32965-0460

Filed Jul. 5, 1988, Ser. No. 215,154

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—177 R **6 Claims**

1. A practice putting cup comprising a flat disk having a substantially circular periphery, a pair of spaced apart upstanding arcuate wall portions connected to the disk along the periphery thereof, each of said wall portions having first and second ends extending upwardly from said disk with the first ends of said wall portions being spaced apart a sufficient distance to provide a first opening for the entry of a golf ball onto the disk and radially disposed indicia formed on the disk and



bisecting the distance between said first ends of said wall portions.

4,861,034

GOLF-GRIP TRAINING DEVICE

Sung Y. Lee, 99-639 Aiea Heights Dr., Aiea, Hi. 96701

Filed Jul. 28, 1988, Ser. No. 225,717

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—183 D **10 Claims**



1. In a training device attachable to a golf club handle to signal a proper grip pressure, a grip pressure sensing element comprising a plurality of elongated resilient conducting strips separated by a plurality of spaced blocks of compressible material, said blocks of compressible material being adhesively bonded to said conducting strips, an electrical cable connected at one end to end portions of said resilient conducting strips, an elastomeric housing encasing said conducting strips, signalling means connected to the other end of said electrical cable, securing means connected to end portions of said elastomeric housing to secure said grip pressure sensing element to said golf club handle whereby said grip pressure sensing element is responsive to a predetermined grip pressure around the golf club handle as signaled by said signalling means.

4,861,035

GOLF PRACTICE APPARATUS

Joseph U. Page, 58 Douglas Avenue, Ottawa, Ontario K1M 1G2, Canada

Filed Feb. 4, 1988, Ser. No. 152,303

Int. Cl.[4] A63B *67/10, 69/36*

U.S. Cl. 273—184 B **12 Claims**

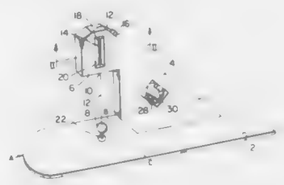
4. Golf practice apparatus comprising:

(a) a support portion,

(b) a tethered ball freely suspended below a point on said support portion,

(c) a first and a second member spaced above said point whereby when said ball strikes the first member said first and second member make contact, and

(d) indicating means to provide an indication when said first and second members make contact,



(e) wherein said second member is a metallic rod, and said first member is a wire parallel to and spaced from said rod on one side.

4,861,036

MULTI-LEVEL CROSSING MAZE TOY

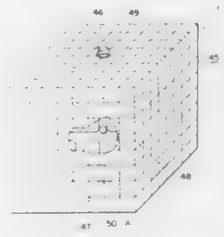
Tsutomu Watanabe, 515-1, Otake, Sodegaura-machi, Kimitsu-gun, Chiba-ken, Japan

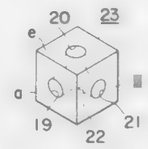
Filed Nov. 1, 1988, Ser. No. 265,581

Claims priority, application Japan, Nov. 4, 1987, 62-168648[U]

Int. Cl.[4] A63B *67/14, 67/00;* **A63F** *9/06*

U.S. Cl. 273—113 **4 Claims**





1. A multi-level crossing maze toy comprising a combination of the required number of solid single cubes, first single cubes formed in its front surface with a circular opening and having a dead end continuous to said circular opening and having the same size as that of said solid single cube, second single cubes formed in its front and back surface portion with a circular opening and having a linear passage continuous to said circular opening and having the same size as that of said solid single cube, third single cubes formed in its front and upper surface portion with a circular opening and having a curved passage continuous to said circular opening and having the same size as that of said solid single cube, fourth single cubes formed in its front surface, upper surface and back surface portions with a circular opening and having a T-passage continuous to said circular opening and having the same size as that of said solid single cube, fifth single cubes formed in its front surface, upper

surface and right surface portions with a circular opening and having a right-angled three-forked passage crossing at right angles to and contonuous to said circular opening and having the same size as that of said solid single cube, sixth single cubes formed in its front surface, left surface, back surface and right surface portions with a circular opening and having a cross passage continuous to said circular opening and having the same size as that of said solid single cube, seventh single cubes formed in its front surface, left surface, back surface, right surface and upper surface portions with a circular opening and having the same size as that of said solid single cube, and eighth single cubes formed in its front surface, left surface, back surface, right surface, upper surface and bottom surface portions with a circular opening and having a six-forked passage crossing to and continuous to said circular opening and having the same size as that of said solid single cube to form a combined hexahedron, a multi-level crossing maze in which said combined hexahedron has two surface formed with an entrance or an exit is formed, and an insertable ball is movably introduced into said multi-level crossing maze.

4,861,037

PINBALL RUNWAY AND SCORING FEATURE

Barry Oursler, Elmwood Park, Ill., assignor to Williams Electronics Games, Inc., Chicago, Ill.

Filed Sep. 1, 1988, Ser. No. 239,306
Int. Cl.[4] A63D *3/02*
U.S. Cl. 273—121 D 6 Claims



1. In a pinball game machine having an inclined playfield and a rolling ball initially projected onto the playfield by a player from one end thereof, the play feature comprising:
- a ramp disposed in the path of the initially actuated ball adapted to permit the ball to roll therealong; and
- a plurality of scoring means, disposed along said ramp having selected score values associated therewith; said scoring means includes a plurality of openings along the length of said ramp, each opening having associated therewith means for signaling the score to be awarded, whereby the velocity of the ball determines which of said scoring means is operated.

4,861,038

GOLF PUTTER

Gene J. Facinato, 21 Belden St., Binghamton, N.Y. 13903

Filed Jan. 27, 1987, Ser. No. 7,638
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—169 4 Claims

1. A golf putter for putting a golf ball on a golf surface, said golf putter comprising a shaft, a grip and a head, said head having cylindrical top and bottom surfaces, and a horizontal center line midway between said top and said bottom surfaces, and said head further including a cavity, said cavity having a top, wherein said horizontal center line passes through said cavity and the majority of the volume of said cavity is disposed above said horizontal center line so that the center of gravity of the head is located below said horizontal center line, and



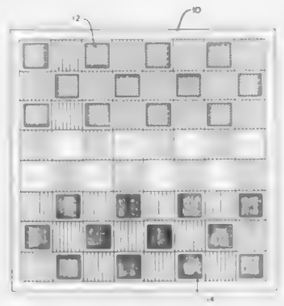
wherein the top of said head extends over the full length of said cavity.

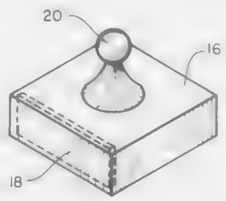
4,861,039

METHOD OF PLAYING A MAGNETIC CHECKERS GAME

E. Lakin Phillips, 2733 Centerville Rd., Herndon, Va. 22071, and Bernardino Romero, 8500 SW. 99th Ave., Miami, Fla. 33173

Filed Aug. 1, 1988, Ser. No. 226,629
Int. Cl.[4] A63F *3/00, 3/02*
U.S. Cl. 273—239 4 Claims





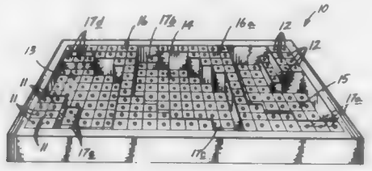
1. A method of playing a two player game using in combination
- a checker board having sixty-four square boxes,
- first and second sets of movable playing pieces, the sets being distinguished by different colors and each having four flat facing surfaces at right angles to each other,
- the first set of playing pieces having a magnetic device with a positive pole imbedded within one of the four facing surfaces on each playing piece,
- the second set of playing pieces having a magnetic device with a negative pole imbedded within one of the four facing surfaces on each playing piece,
- each playing piece having an identifying code on a bottom surface,
- the two players making alternative moves by moving one square box to the right, left, straight ahead, back, diagonally or turning a piece ninety or one hundred-eighty degrees, the moving player being able to jump over an adjacent playing piece with the objective of landing adjacent an opponent player's piece and to capture that piece if matching positive and negative poles meet,
- the moving player's turn being completed after landing adjacent an opponent player's piece without capturing the opponent's piece,
- the game continuing with each player making moves until one player captures all his opponent's pieces.

4,861,040

MULTI-LEVEL BOARD GAME

Jeffrey D. Peterson, 912 Noyes St., Apt. H, Evanston, Ill. 60201

Filed Sep. 8, 1988, Ser. No. 241,457
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—241 7 Claims



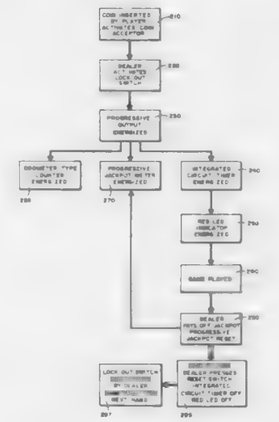
1. A combat game for use by two players comprising,
- a game board including a three dimensional game board surface wherein said game board is defined by a rectangular perimeter, and
- said game board surface is divided into a first, second, and third valley section of a first geometrical height, and
- a first and second cliff section of a third geometrical height, and
- a plurality of plateau sections of a second geometrical height greater than the defined geometrical height of the valley sections and less than the defined geometrical height of the cliff sections wherein said plateau sections are positioned on said game board surface adjacent said cliff sections to permit game tokens traverse between said valley and said cliff sections and provide a step therebetween to permit such traverse, and
- a first castle section in the first valley section of a height equal to the third geometrical height with a plateau section adjacent thereto, and
- a second castle section in the third valley section of a height equal to the third geometrical height with a plateau section adjacent thereto, and
- each section comprising a matrix of squares of predetermined area wherein each square includes a bore to slidingly accept a single token of a plurality of tokens, and
- said plurality of tokens are of varying capabilities and positionable in said game board surface with an equal number of said tokens awarded each castle section and player, and
- a Demon token utilized alternatively by each player, and
- a plurality of pyramidal dice to determine movement of said Demon token.

4,861,041

METHODS OF PROGRESSIVE JACKPOT GAMING

Daniel A. Jones, Louisville, Ky., and James P. Suttle, Las Vegas, Nev., assignors to Caribbean Stud Enterprises, Inc., Las Vegas, Nev.

Continuation-in-part of Ser. No. 182,374, Apr. 18, 1988, Pat. No. 4,836,553. This application Jul. 5, 1988, Ser. No. 214,934
Int. Cl.[4] A63F *1/00, 1/06*
U.S. Cl. 273—292 19 Claims



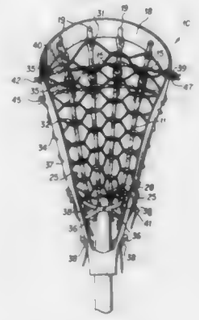
1. A method of including a jackpot component in a live casino table game comprising the steps of:
- (a) a player wagering a first gaming token to participate in the live casino game,
- (b) a player wagering a second gaming token to participate in the jackpot component,
- (c) a dealer dealing a hand of playing cards to the player,
- (d) if the player's hand comprises a predetermined arrangement of cards, the player wins a preselected amount of the jackpot.

4,861,042

REPLACEABLE NET FOR LACROSSE STICK

Douglas F. Trettin, 714 Southern Hills Dr., Arnold, Md. 21012

Filed Oct. 11, 1988, Ser. No. 255,492
Int. Cl.[4] A63B *59/02*
U.S. Cl. 273—326 7 Claims



1. A lacrosse stick having a head and a base and a pocket in said base, comprising, a plurality of spaced leather thongs positioned longitudinally in said head and said base, button means for buttoning the corresponding ends of each said

spaced leather thong at the top of said head, the other ends of said spaced leather thongs being tied at a desired pocket depth at said base, wall strings and a throw string applied to the sides of said head.

4,861,043

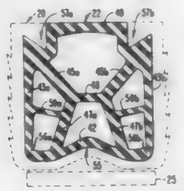
PRESSURE/COMPRESSION CONCRETE JOINT SEAL

Joseph Anderson, Atherton; Barney T. Baldi, Eldorado Hills, and John M. Engstrom, Walnut Creek, all of Calif., assignors to Bechtel International Corporation, San Francisco, Calif.

Continuation of Ser. No. 846,371, Mar. 31, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 144,599

Int. Cl.[4] E01C *11/02, 11/10;* **F16J** *15/10*

U.S. Cl. 277—1 **13 Claims**



1. A seal for insertion into a gap of rectangular cross-section between facing edges of adjacent concrete slabs comprising:

an elastomeric sealing element adapted to extend longitudinally within the gap, being in the form of a generally U-shaped channel with a pair of opposed channel sides, a channel bottom spanning respective lower ends of said channel sides and being formed with an upwardly extending, downwardly opening center fold, and a pair of inwardly extending flanges, each formed at an upper end of a respective one of said channel sides, said channel sides each having inner and outer surfaces, said outer surfaces being formed for frictional engagement with the slab edges when the seal is inserted into the gap; and

an elastomeric core element having a tubular outer wall and an internal framework of interconnecting webs;

said tubular outer wall having a pair of core sides, a core top, and a core bottom, said tubular outer wall having lower corner regions and upper corner regions formed with recesses;

said tubular outer wall being configured so as to fit within said sealing element with said core sides contacting said inner surfaces of said channel sides, at least a portion of said core bottom contacting said center fold in said channel bottom, at least said lower corner regions of said tubular outer wall engaging said channel bottom, and said recesses engaging said flanges;

said interconnecting webs including major webs extending diagonally from regions near the corners of said tubular outer wall to a central region within said tubular outer wall, said interconnecting webs acting to resist horizontal compression while accommodating shear so as to maintain said channel sides in contact with said slabs under differential vertical movement of said slabs.

11. A method of sealing the gap between adjacent slabs in a liquid-retaining structure, comprising the steps of:

providing an elastomeric seal that includes an outer sealing element in the form of a generally U-shaped channel having a pair of channel sides, a channel bottom spanning respective lower ends of the channel sides and having an upwardly extending, downwardly opening center fold, and a pair of inwardly extending flanges, each formed at an upper end of a respective one of the channel sides, and an inner core element in the form of a hollow open-ended rectangular tube with an internal reinforcing framework of interconnecting webs;

inserting the core element within the outer sealing element so that the core element contacts the channel sides, and the flanges positively retain the core element with at least lower corner portions of the core element engaging the channel bottom and bottom portions of the core element engaging the center fold;

forming a longitudinally extending seal-receiving recess of rectangular cross-section having a bottom seal-engaging portion and a width less than the width of the seal; and

installing the seal under lateral compression with the seal-receiving recess with the outer sealing element in a continuous strip coextensive with the joint to be sealed and the inner core element in segments with gaps therebetween to allow water to infiltrate the seal interior.

4,861,044

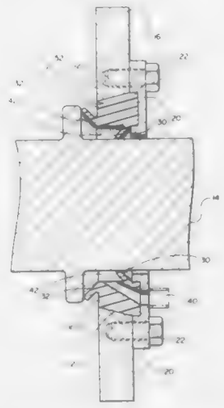
HYGENIENIC SHAFT SEAL FOR A FOOD PROCESSING VAT

Jeffrey L. Jay, Winsted, Minn., assignor to Scherping Systems, Inc., Winsted, Minn.

Filed Nov. 9, 1988, Ser. No. 269,154

Int. Cl.[4] F16J *15/32, 15/34*

U.S. Cl. 277—24 **12 Claims**



1. A hygenienic shaft seal for a food processing vat having a wall with an aperture therein and a rotatable shaft passing through the aperture and into the interior of the vat, comprising:

an annular seal adapted to be inserted into the aperture for surrounding the shaft, the seal having an outer lip means for abutably engaging a portion of the shaft disposed in the aperture and an inner lip means for abutably engaging an annular flange on the rotatable shaft adjacent to the interior side of the wall, the seal, the inner lip means and the outer lip means forming an annular channel around the shaft;

means for securing the seal in the aperture such that the seal is stationary with respect to the rotation of the shaft; and

an access port means for accessing the annular channel from the exterior of the vat,

whereby a cleaning solution may be introduced into the annular channel under pressure to force the inner lip means away from the annular flange and flush any contaminants present in the annular channel into the interior of the vat and to force the outer lip means to seal more tightly against the portion of the shaft disposed in the aperture to prevent the loss of the cleaning solution along the shaft to the exterior of the vat.

4,861,045

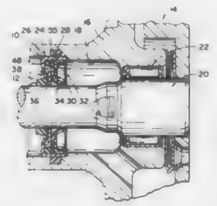
DUST EXCLUDER FOR VEHICLE AIR CONDITIONING COMPRESSOR SEAL ASSEMBLY

William M. Riley, Milan, Mich., assignor to Mather Seal Company, Milan, Mich.

Filed Jun. 16, 1988, Ser. No. 207,822

Int. Cl.[4] F16J *15/42*

U.S. Cl. 277—25 **9 Claims**



9. A seal assembly for use in a housing defining a chamber and also including a rotatable shaft that extends outwardly from the chamber, the seal assembly comprising:

an annular support for mounting on the housing with the shaft extending through the support, said support having an axially-extending wall portion;

an annular seal having an inner portion for sealing with the shaft in a sliding relationship upon shaft rotation so as to seal the chamber; and

an annular dust excluder having an inner portion for mounting the dust excluder for rotation with the shaft on the opposite side of the seal from the chamber, and the dust excluder having an outer portion engaging said axially-extending wall portion of the annular support with a sliding relationship upon shaft rotation so as to exclude dust and other debris from entering the seal assembly and abrading the seal.

4,861,046

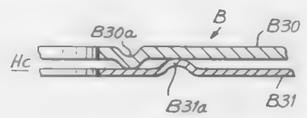
STEEL LAMINATE GASKET WITH SEPARATE BEADS

Tsunekazu Udagawa, Ichikawa, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed May 16, 1988, Ser. No. 194,377

Int. Cl.[4] F16J *15/08*

U.S. Cl. 277—235 B **12 Claims**



1. A steel laminate gasket for an internal combustion engine having at least one hole therein, comprising:

a first plate having at least one first hole therein corresponding to the hole of the engine, and a first bead situated adjacent to the first hole to surround the same, and

a second plate having at least one second hole therein corresponding to the hole of the engine, and at least one second bead situated adjacent to the second hole to surround the same, the distance form the second hole to the second bead being different from the distance from the first hole to the first bead, said first and second beads facing against the second and first plates respectively when the first and second plates are assembled together and forming a plurality of corrugated beads at selected areas around the hole to securely seal around the same when the gasket is tightened.

4,861,047

METAL PLATE WITH REINFORCED BEADS FOR A METAL GASKET

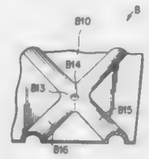
Takashi Okano, Tokyo, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1988, Ser. No. 280,394

Claims priority, application Japan, Dec. 3, 1987, 62-184474[U]

Int. Cl.[4] F16J *15/08*

U.S. Cl. 277—235 B **11 Claims**



1. A metal plate for a metal gasket, comprising:

a metal plate,

a plurality of beads formed on the metal plate around portions to be sealed, said beads intersecting with each other and having at least one intersecting portion; and

at least one depression formed on the bead at the intersecting portion so that the intersecting portion of the beads can provide surface pressure at least substantially equal to the portions of the beads other than the intersecting portion when the beads are compressed.

4,861,048

JAW ASSEMBLY FOR LATHE CHUCK

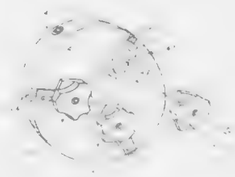
Paul S. Slater, Derbyshire, England, assignor to Indexible Soft Jaws Limited, Derbyshire, England

Filed Feb. 16, 1988, Ser. No. 155,902

Claims priority, application United Kingdom, Feb. 20, 1987, 8703967

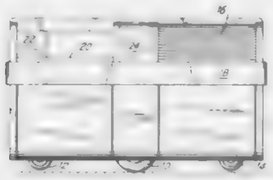
Int. Cl.[4] B23B *31/10*

U.S. Cl. 279—123 **19 Claims**



1. A clamping jaw for a lathe chuck, comprising a jaw member having at least one leading edge, and adapted to be mounted in a chuck for reciprocal longitudinal movement an an indexible polygonal clamping member detachably secured to a leading edge of the jaw member, wherein, for the purpose of indexing, an upright projection is provided extending upwardly from an upper surface of the jaw member to engage the clamping member and wherein a recess having a peripheral surface is formed on the underside of the clamping member with a plurality of slots formed in the peripheral surface of the recess, each of said slots being positioned to engage the projection in one working position of the clamping member.

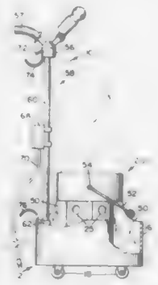
4,861,049
MOBILE BANK TELLER UNIT
Paul F. Lost, Toms River, N.J., assignor to Chemical New York Corporation, New York, N.Y.
Filed Oct. 28, 1983, Ser. No. 546,721
Int. Cl.[4] B62B *1/12*
U.S. Cl. 280—47.16 2 Claims



1. A mobile bank teller unit comprising a generally rectangular cabinet having front and rear sides and a pair of ends,
the cabinet having a central pair of main wheels and a pair of vertically adjustable caster wheels near each end,
the adjustable caster pairs being adapted to raise the cabinet to remove the load from the main wheels for sidewise movement and being independently adjustable to permit leveling of the cabinet,
the front side of the cabinet being adapted to serve banking customers and the rear side being adapted to accommodate bank tellers,
the customer service side having at least one opening for the service of customers with a track slot at either side of the opening and being closeable by tambour doors comprising parallel slats which are movable from storage to slide in the track slots,
the bank teller side including an enclosure for the tellers,
the teller enclosure being formed by an enclosure rear panel parallel to and spaced from the rear side of the cabinet and two enclosure end panels parallel to and extending from the ends of the cabinet to the enclosure rear panel,
the enclosure end panels being foldable for storage parallel to the rear side of the cabinet,
the enclosure rear panel being moveable toward the rear side of the cabinet for storage and to thereby form the rear wall of the cabinet when closed,
additional, vertically adjustable casters wherein the rear panel is extended away from the cabinet to form the teller enclosure on roller slides and is supported by the vertically adjustable casters,
wherein the enclosure end panels are access doors for the teller enclosure, and
wherein the enclosure rear panel includes a central hinged door for access to an automated cash dispenser.

4,861,050
CRAFTMAN'S VALET
Jean J. Bergeron, 23 W. Boylston Dr., Worcester, Mass. 01606
Filed Nov. 25, 1987, Ser. No. 125,485
Int. Cl.[4] B62B *3/02*
U.S. Cl. 280—47.35 15 Claims

1. A craftsman's valet comprising:
(a) a supporting base having a bottom surface, a top surface and an annular vertical wall which extends upwardly from said top surface,
(b) a pedestal which is mounted on said top surface, said pedestal having annular outer surface which is spaced from said vertical wall and defines with said vertical wall an annular storage space, said pedestal having an upper end for supporting a circular bucket,
wherein the upper end of said pedestal comprises an annular vertical wall having an inner annular vertical surface, and an upper annular edge surface which defines a circular top opening for receiving the bottom end of a circular bucket, and
supporting means adjacent the upper end of said pedestal for limiting the vertical distance that the bottom end of the bucket can be inserted into said circular opening, said supporting means consisting of a shelf along said



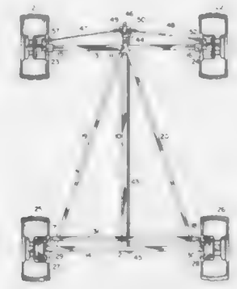
inner annular vertical surface below said upper annular edge and defining with said inner annular surface and said upper annular edge surface an upper storage compartment, and
(c) a removable circular tray which rests on said shelf within said upper storage compartment when there is no bucket in said annular storage space.

4,861,051
REHABILITATION WALKER DEVICE
John C. Napper, 600 7th St., International Falls, Minn. 56649
Filed Jun. 6, 1988, Ser. No. 203,288
Int. Cl.[4] B62B *7/00*
U.S. Cl. 280—87.021 18 Claims



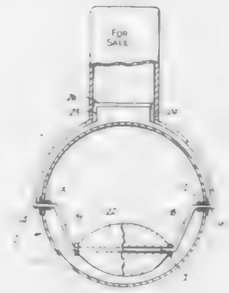
1. A rehabilitation walker device comprising:
(a) a seat having a center and a width;
(b) frame means including means for supporting said seat, handlebar means including upright means for supporting said handlebar means, said upright handlebar support means including a plurality of vertical support members, two of said vertical support members being adjacent one another, and centerbar means, including adjacent bar members, for connecting said seat support means with said adjacent vertical support members, said handlebar means being located in front of said seat;
(c) a pair of forward wheels pivotally attached to said handlebar support means, said forward wheels being located in front of said seat and being separated by a first wheel span, said first wheel span having a width greater than the width of said seat and being wide enough to allow sufficient space for a person to walk with both feet within said first wheel span while straddling said centerbar means; and
(d) a pair of rear wheels independently and pivotally attached to said frame means, said rear wheels being located behind the center of said seat and being separated by a second wheel span, said second wheel span being substantially the same as or narrower than the width of the seat, each of said rear wheels being connected to extensions of one of said adjacent bar members.

4,861,052
SLED DOG TRAINING CART
Ernst H. Hediger, Rte. 3, Box 89, Chapel La., Neillsville, Wis. 54456
Filed Dec. 27, 1988, Ser. No. 290,633
Int. Cl.[4] B62C *7/00*
U.S. Cl. 280—87.043 8 Claims



1. A sled-dog training cart comprised of:
(a) a chassis having a longitudinal support member centered upon an axis oriented in the general direction of motion of the cart, said longitudinal support member having front and rear extremities, a forward support member attached at its midpoint to said front extremity in a manner permitting pivotal movement in a vertical plane, a stationary axle attached at its midpoint to said rear extremity, said forward support member and stationary axle terminating in lateral extremities, and diagonally disposed struts extending from said front extremity to the lateral extremities of said stationary axle.
(b) front wheels mounted upon stand off arms associated with the lateral extremities of said forward support member in a manner constraining said wheels to rotation in parallel vertical planes angularly positionable with respect to said forward support member,
(c) rear wheels mounted at the lateral extremities of said stationary axle in a manner to rotate in fixed parallel vertical planes,
(d) a brake system comrpised of frum type brake means associated with said rear wheels, said brake means having activating levers, and rigid brake pedal means in operative joinder with sid levers,
(e) a body removably mounted upon said chassis and comprised of a cargo platform having rearwardly directed foot platform means, upright structure disposed between said cargo platform and foot platform means, and left and right side frame means disposed above said cargo platform forward of said upright structure, and
(f) a steering system comprised of a handlebar pivotably associated with said upright structure and adapted to raise and lower a control rod, said control rod having an upper extremity pivotably associated with said handlebar and a lower exremity pivotably associated with a control linkage, and a steering shaft adapted for longitudinal reciprocating motion and having forward and rear extremities, said rear extremity pivotably associated with said linkage and said forward extremity pivotably associated with a steering yoke, said yoke pivotably connected to said longitudinal support member and extending forwardly therefrom, and left and right tie rods having proximal and distal extremities, said proximal extremities pivotably associated with said yoke and said distal extremities pivotably associated with said stand off arms and adapted to turn said front wheels about the extremities of said forward support member in response to pivotal movement of said yoke.

4,861,053
SPHERICAL SUPPORT APPARATUS MOVABLE OVER PLANE SURFACES
Arthur S. Yeomans, Jr., 16 Ridgewood Ave., Madison, Conn. 06443
Filed Jun. 13, 1988, Ser. No. 205,834
Int. Cl.[4] A63G *25/00*
U.S. Cl. 280—205 9 Claims



1. A support apparatus movable over plane surfaces comprising:
a hollow spherical element having a continuous, flexible external skin,
an external bail pivotably supported by said sphere,
an extension of said bail being disposed within said spherical element,
a counterweight fixed to said extension, and,
a unicycle fixed to said bail making a driving connection with said external skin, said counterweight being spaced from said skin whereby a momentary indentation or deflection of said skin creates frictional contact between the skin and the counterweight causing momentary imbalance to said unicycle.
a counterweight pivotally mounted to said extension, and,
permanent support means on said bail serving as a foundation for fixing various instrumentalities to said support means whereby said instrumntalities are maintained in an upright position by said counterweight when said spherical element is moving over said plane surface or at rest, said external skin being flexible whereby a momentary indentation of said skin makes frictional contact with said counterweight to create a momentary driving connection therewith.

4,861,054
PEDAL-POWERED SKATEBOARD
Wade Spital, 2319 Dutton Ave., Santa Rosa, Calif. 95407-6979
Filed Jul. 28, 1987, Ser. No. 78,657
Int. Cl.[4] B62M *1/04*
U.S. Cl. 280—221 14 Claims

1. A human-powered vehicle, comprising:
a plurality of wheels for enabling said vehicle to roll when placed on a surface,
a rider-supporting platform having a discontinuous surface so as to provide a plurality of sections, one of said sections comprising a front pedal, and one of said sections comprising a rear pedal,

pedal-support means attached to each said pedal for mounting said pedals,

pivoting means attached to each said pedal-support means for enabling said pedals to reciprocate in generally vertical directions,

said pivoting means for said front pedal being located generally to the rear of said pivoting means for said rear pedal so as to make each of said pedals have as long a lever arm as possible, thereby reducing the angular deviation re-



quired of each of said pedals for any given length of pedal stroke,

power-transmission means for causing at least one of said wheels to rotate in response to the depression of one of said pedals,

pedal-return means for biasing said pedals to return to the top of their strokes, and

retaining means for holding all of the foregoing components of said vehicle in their aforecited functional relationships.

4,861,055

DRIVE MECHANISM

Micheal D. Jones, 3641 S.E. Lambert, Portland, Oreg. 97202

Filed Dec. 9, 1987, Ser. No. 130,304

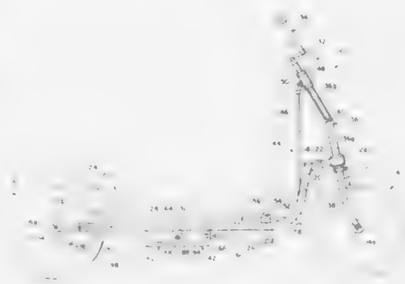
Int. Cl.[4] B62M *1/04, 1/08, 1/12, 1/16*

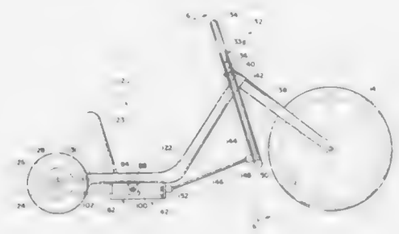
U.S. Cl. 280—234 **15 Claims**

1. A drive mechanism for use in a human-powered vehicle wherein the vehicle has a frame and plural wheels mounted on the frame, for allowing rolling motion over a surface, wherein at least one of the wheels is a steerable wheel and at least one of the wheels is a driving wheel, comprising:

linear motion generating means, operable by a human being, for generating a substantially linear, oscillating motion;

motion converting means for converting said oscillating motion into rotary motion including a pair of oscillating gears, a carrier for said oscillating gears mounted on the frame for oscillating motion relative thereto, a hub rotatably mounted on the frame, a pair of ratcheting gears constructed and arranged on said hub to alternately drive said hub in one direction only, each ratcheting gear being intermeshed with an oscillating gear such that, with said carrier moved in one direction, one ratcheting gear drive said hub while the other ratcheting gear is in a free-wheel condition, and with said carrier moved in the other direction, the other ratcheting gear drives said hub while the one ratcheting gear is in a free-wheel condition, said carrier including a box like structure substantially enclosing said ratcheting gears, oscillating gears and said hub, and said oscillating gear comprises a length of chain secured to said structure, and adjustment means for adjusting tension on said chains, said adjustment means having an adjustable tensioner connected between at least one end of each chain and said carrier; and





means for transmitting said rotary motion to the driving wheel.

4,861,056

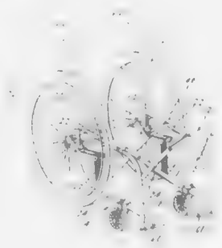
FOLDING WHEELCHAIR WITH IMPROVED FRAME AND SUSPENSION SYSTEM

George Y. Duffy, Jr., Port Huron, and Ted O. Flum, St. Clair, both of Mich., assignors to Iron Horse Productions, Inc., Port Huron, Mich.

Filed Nov. 12, 1987, Ser. No. 119,730

Int. Cl.[4] A61G *5/02*

U.S. Cl. 280—250.1 **18 Claims**



1. A folding wheelchair comprising a rigid frame and main wheels rotatably mounted on said frame by wheel axles, said wheelchair further comprising:

left and right opposing closed frame members, each having a plurality of substantially horizontal and vertical frame members, said horizontal members including an upper and lower horizontal frame member and said vertical members including a forward and aft vertical frame member;

a plurality of sets of cross-tubes, each set of said cross-tubes including a right and left diagonally-extending cross-tube, each of said cross-tubes having an upper and lower portion wherein said upper portion of each of said cross-tubes is movably attached to one of said upper horizontal frame members and said lower portion of each of said cross-tubes is movably attached to an opposing lower horizontal frame member, said sets of cross-tubes having pivot means for scissoring said sets together to fold said frame, a hinge tube rotationally engaging each upper horizontal frame member and hingedly coupled with each cross-tube for enhancing said scissoring; and

a seat portion connected to at least two of said cross-tubes.

4,861,057

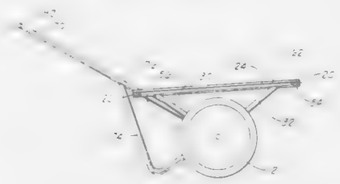
CART AND METHOD OF USE

Jerry A. Kunkle, 1314 S. 2nd St., Arkansas City, Kans. 67005

Filed Feb. 22, 1988, Ser. No. 158,604

Int. Cl.[4] B62B *1/04*

U.S. Cl. 280—47.131 **7 Claims**



1. A cart, comprising:

bracing means for supporting a load, said bracing means including:

a lower bracing member having a hole defined therein;

an upper bracing member; and

means for rigidly connecting said lower bracing member and said upper bracing member;

two wheels connected to said bracing means;

a handle detachably connected to both said lower bracing member and said upper bracing member, said handle including:

a lifting member, having an upper end and a lower end, detachably connected to said upper bracing member intermediate said upper and lower ends;

a support stand connected to said lifting member; and

receiving means for receiving said lower bracing member into detachable engagement with said lower end of said lifting member, said receiving means including:

a bracket disposed at said lower end of said lifting member;

a threaded pin disposed within said bracket for passing through said hole defined in said lower bracing member; and

fastener means for fastening on said threaded pin adjacent said lower bracing member;

a retaining stud connected to said upper bracing member; and wherein

said lifting member has a slot defined therein for engaging said retaining stud.

4,861,058

DISASSEMBLABLE SULKY VEHICLE

Thomas A. Cresswell, P.O. Box 834, Palm Desert, Calif. 92261

Continuation-in-part of Ser. No. 13,363, Feb. 11, 1987, Pat. No. 4,757,868, which is a continuation-in-part of Ser. No. 861,365, May 9, 1986, Pat. No. 4,708,219. This application Nov. 18, 1987, Ser. No. 122,061

Int. Cl.[4] B62D *27/06;* **B62K** *5/06, 15/00*

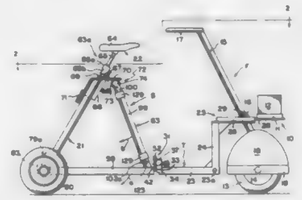
U.S. Cl. 280—278 **16 Claims**

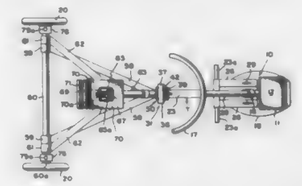
1. A demountable three-wheeled, sulky vehicle for the handicapped and others desiring assistance comprising:

a. a front wheel steering unit comprising a steering column mounting assembly and a front wheel;

b. sulky frame means for connection to said front wheel steering unit including rigid axle means for supporting a pair of transversely spaced apart rear wheels in tricycle formation with said front wheel, and including rear wheels on said axle means; said axle means including transversely spaced axles and a rigid axle support member rigidly spanning said axles;

c. coupling means for detachably securing the front wheel steering unit and sulky frame means comprising mating components;





d. said coupling means incorporating latch means for releasably locking said components in interconnected position;

e. a seat support structure for said sulky frame means including a seat mount and seat;

f. said seat support structure also including a rear seat support frame comprising upwardly extending, vertically transversely inwardly inclined posts connected between said seat mount and axle means; and

g. a releasable front seat structure brace element extending downwardly at a vertically inclined angle connected between said seat support structure and said sulky frame means.

4,861,059

HOLDER APPARATUS ATTACHABLE ON A WHEELCHAIR FOR HOLDING A CATHETER BAG AND THE LIKE

Lynn V. Shirk, 2209 St. Joe Center Rd., Apt. 207-B, Fort Wayne, Ind. 46805

Filed Apr. 22, 1988, Ser. No. 185,088

Int. Cl.[4] A47C *7/62*

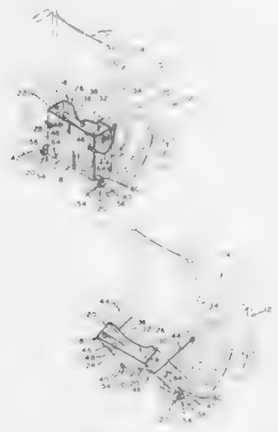
U.S. Cl. 280—304.1 **18 Claims**

1. A holder apparatus attachable on a wheelchair, the wheelchair comprising a seat and a frame, for holding a catheter bag, said apparatus comprising;

(a) a pouch substantially shaped with a rectangular vertical cross-section defining a compartment including structurally rigid interconnected walls, closed at its bottom and open at its top for permitting a catheter bag to be easily inserted therein or removed therefrom; and

(b) attachment means mounted to said pouch adjacent to said closed bottom thereof for pivotally mounting said pouch to said wheelchair frame so as to locate said pouch below and behind a seat of the wheelchair, said attachment means including adjustment means for releasably mounting said pouch whereby said pouch is mounted for pivotal movement relative to the wheelchair frame so as to permit said pouch to be titled away from the wheelchair seat to a

service position in which the catheter bag can be easily inserted into or removed from said pouch and titled



toward the wheelchair seat to a storage position in which said pouch holds the catheter bag substantially out of sight and out of the way while a patient uses the wheelchair.

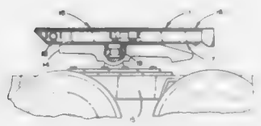
4,861,060

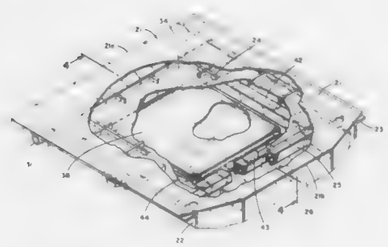
AIR SUSPENSION APPARATUS

Leslie H. Schult, Eagan, and Charles J. Tekautz, Jr., Tower, both of Minn., assignors to Tartan Transportation Systems, Inc., Edina, Minn.

Filed Oct. 2, 1987, Ser. No. 104,828
Int. Cl.[4] B62D *53/08*
U.S. Cl. 280—439 13 Claims







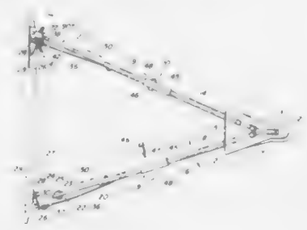
1. Air suspension apparatus for the fifth wheel connection between a tractor and semitrailer, comprising:
upper and lower frame sections;
first means for mounting one of said upper and lower frame sections to one of said tractor and semitrailer;
second means for removably connecting the other of said upper and lower frame sections to the other of said tractor and semitrailer;
third means for operably connecting the upper and lower frame sections for relative movement;
and inflatable air bag means disposed between the upper and lower frame sections to absorb portions of forces transmitted therebetween, the air bag means having a predetermined external effective surface area and a predetermined internal volume with the ratio of internal volume to effective surface area of no more than about 1 with the air bag means in its fully inflated state.

4,861,061

TOW BAR FOR TOWING A MOTOR VEHICLE

Marvin O. Frantz, No. 3 Greenbrier Ct., Ponca City, Okla. 74604

Filed May 2, 1988, Ser. No. 189,065
Int. Cl.[4] B60D *1/16*
U.S. Cl. 280—479.2 9 Claims



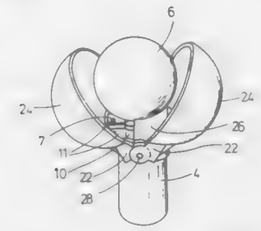
1. In a towing device for attachment between the rear end of a towing vehicle and the front end of a towel vehicle and wherein said towing device comprises a pivotal attachment between said towing vehicle and said towing device with first and second arms having one end closely attached to said pivotal attachment and the remaining ends attached to said towed vehicle at attachment locations with said attachment locations spaced apart on said towed vehicle, an improved towing device comprising;
(a) said first and second arms including first and second telescoping portions, respectively;
(b) first and second securing means mounted on said first and second arms, respectively, configured to engage said first and second telescoping portions so that when either said first or second securing means is released, the length of said telescoping portions can be shortened to facilitate attachment of said arms to said attachment location on said towed vehicle regardless of the alignment of said towed vehicle with respect to said towing vehicle;
(c) means carried by said first and second securing means for automatically locking said first and second securing means when each of said first and second telescoping portions have extended to a predetermined length so that when said towing vehicle moves forward, said telescoping portions will lengthen until said predetermined length is reached wherein said first and second securing means will lock said first and second telescoping portions; and,
(d) swivel means comprising a ball joint means and mating pin means attaching said remaining ends of said first and second arms at said spaced location on said towed vehicle, said mating pin means being attached to said towed vehicle so that the axis of each of said mating pin means is 90° degrees to the axis of each of said first and second arms when said arms are attachment to said mating pin means.

4,861,062

COVERING HOOD FOR HITCH BALLS

Poul Stidsen, Toftegaardsvej 10, DK-8370 Hadsten, Denmark

Filed Dec. 17, 1987, Ser. No. 153,614
Claims priority, application Denmark, Dec. 17, 1986, 6073/86
Int. Cl.[4] B60D *1/06*
U.S. Cl. 280—507 10 Claims



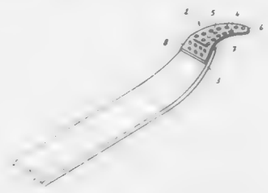
1. A covering hood for hitch balls on a hitch rod of a vehicle for after-coupled trailer means, the covering hood comprising two half bowl members pivotably fastened to a connection structure between a hitch ball and the vehicle so as to be pivotal between a closed position enclosing a major part of the hitch ball, and an open position in which the bowl members are situated projecting outwardly to opposite sides in a level below the hitch ball.

4,861,063

DOWNHILL SKI WITH ELONGATED TIP

Roger Abondance, Rives, France, assignor to Skis Rossignol S.A., Voiron, France

Filed Jul. 1, 1988, Ser. No. 214,361
Claims priority, application France, Jul. 9, 1987, 87 10321
Int. Cl.[4] A63C *11/00*
U.S. Cl. 280—601 4 Claims



1. A downhill ski comprising an asymmetric deflector projecting on an upwardly extending tip tapered along a longitudinal line of the ski and ending in a horizontal transverse line, the asymmetric deflector comprising an upstream part which is placed on top of the tapered end of the tip, the upstream part consequently assuming the shape of the tapered end and being connected, at the level of said transverse line, to a projecting downstream part, the downstream part being dissymmetric and approximately horizontal, said deflector having an end which is directed toward the other ski of a pair of skis, wherein said end is slightly raised with respect to the remainder of the deflector, and is offset toward an inside side relative to the longitudinal median plane of the ski.

4,861,064

SKI SAFETY BINDING

Karl Stritzl, Vienna; Hubert Wurthner, Hainburg/Donau, and Andreas Riegler, Vienna, all of Austria, assignors to TMC Corporation, Barr/Zug, Switzerland

PCT No. PCT/EP87/00254, § 371 Date Jan. 6, 1988, § 102(e) Date Jan. 6, 1988, PCT Pub. No. WO87/07516, PCT Pub. Date Dec. 17, 1987
PCT Filed May 14, 1987, Ser. No. 153,825
Claims priority, application Austria, Jun. 6, 1986, 1544/86
Int. Cl.[4] A63C *9/08*
U.S. Cl. 280—618 5 Claims



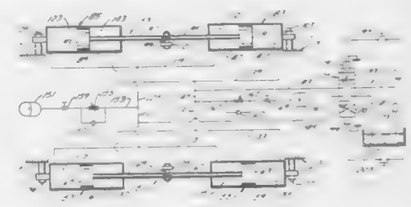
1. A safety ski binding for a ski comprising:
a sole plate provided on the ski having at least one toe piece and a heel holder for holding a ski boot, said sole plate being retained in a travel position for skiing by a locking member movable against the force of a spring and engaging a fastener;
a pivot pin fixed in the ski about which said sole plate is pivotably supported and along which said sole plate can move vertically in a limited range;
securing means for securing said sole plate to the ski, said securing means including a guide plate,
said guide plate being displaceably guided with respect to a base plate in the longitudinal direction of the ski;
wherein the front of said sole plate functions as a link means with said guide plate for allowing displacement in the longitudinal direction of the ski; and
said sole plate including an upwardly projecting part engageable with a guide groove provided in said guide plate, said guide groove including an upwardly widened portion and extending essentially transversely to the longitudinal direction of the ski.

4,861,065

SUSPENSION SYSTEM FOR A BOGIE VEHICLE

Jean-Marie Cote, Pierrefonds, Canada, assignor to Forest Engineering Research Institute of Canada, Pointe Claire, Canada

Filed Jun. 3, 1988, Ser. No. 202,012
Claims priority, application Canada, Jun. 10, 1987, 539382
Int. Cl.[4] B60G *9/00*
U.S. Cl. 280—678 11 Claims



1. A vehicle with an improved suspension system consisting of a chassis with a first bogie on one side of the vehicle and a second bogie on the other side of the vehicle; each bogie consisting of a walking beam, pivot means pivotally mounting the walking beam at about its longitudinal center to a side of the chassis at about the longitudinal location of the vehicle's center of gravity, and at least one wheel at each end of the beam; a hydraulic system having actuator means connected between

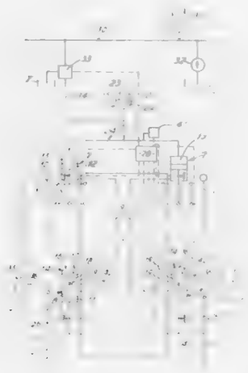
each walking beam and the chassis for generally maintaining the chassis level on level ground; the hydraulic system having first and second connecting systems extending between the two actuator means in a manner to have movement of one wheel in one bogie in one direction when passing over uneven ground simultaneously and automatically tend to move the corresponding wheel in the other bogie in the opposite direction to the one direction to minimize tilting of the chassis and to stabilize the vehicle.

4,861,066

VEHICLE SUSPENSION SYSTEMS

Frank W. Dernie, Wantage, United Kingdom, assignor to Williams Grand Prix Engineering Limited, Oxfordshire, United Kingdom

Filed Apr. 29, 1988, Ser. No. 187,952
Claims priority, application United Kingdom, Apr. 30, 1987, 8710240
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—707 11 Claims



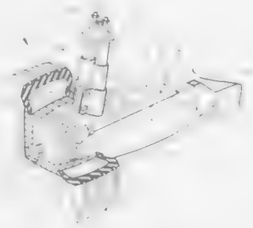
1. A vehicle suspension system for a vehicle having a structure supported on at least two pairs of wheels by means of a liquid-filled strut for each wheel of first and second pairs of wheels, first and second valves controlled by sensors responsive to up-and-down movement of respective wheels of a first wheel pair to admit liquid under pressure or release liquid to or from a chamber of the respective struts to resist vehicle roll, a third valve controlled by a sensor responsive to up-and-down movement of the structure relative to the second pair of wheels to admit or release liquid under pressure to or from both struts of the second pair, the struts of the second pair each having a second liquid chamber the volume of which varies with up-and-down movement, each such second chamber being in open communication with the chamber of a strut of the first pair so that the pressure in said second chamber of each strut of the second pair varies with the pressure in the first chamber of one of the struts of the first pair, the arrangement being such that the changes of pressure in said second chambers produce roll resistance at the second pair of wheels in the same sense as the roll resistance produced at the first pair of wheels, wherein each strut has a sensor associated therewith for indicating the amount and sense of departure from a datum position and the system includes means for controlling the flow rate through each valve to or from the associated strut(s) in such a manner that each said flow rate is proportional to the sensed departure (or the algebraic sum of the sensed departures) from the datum position or positions, the direction of flow being such as to restore the associated strut or struts to the datum position(s).

4,861,067

ACTIVE VEHICLE SUSPENSION WITH COMPOSITE CONTROL ARM

Benjamin V. Booher, Leucadia, Calif., assignor to Suspension Group, Ltd., Encinitas, Calif.

Continuation-in-part of Ser. No. 835,187, Mar. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 717,791, Mar. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 525,011, Aug. 22, 1983, Pat. No. 4,509,774. This application Jul. 24, 1987, Ser. No. 77,398
Int. Cl.[4] B60G *17/00*
U.S. Cl. 280—707 17 Claims



9. A suspension system for an automotive vehicle comprising:

first spring means providing a first portion of support or a vehicle body;

second spring means responsive to variance in dynamic conditions of said vehicle body for providing a second portion of said support;

said first spring means provides support for normal load for straight line cruise on normal road conditions;

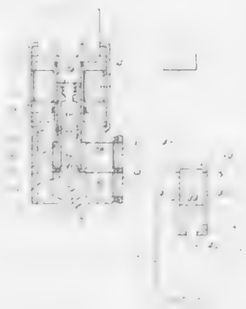
said second spring means comprises variable spring means and sensing means for sensing road conditions and control means responsive to said sensing means for changing the spring rate of said variable spring means.

4,861,068

SOLENOID VALVE FOR PROGRAMMER VEHICLE SUSPENSION SYSTEM

Ralph P. McCabe, Troy, Mich., assignor to Colt Industries Inc., New York, N.Y.

Filed Aug. 29, 1988, Ser. No. 237,706
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—714 5 Claims



1. A solenoid actuated control valve operable to establish a variable time averaged restriction to flow of fluid, said valve comprising a housing having a main passage therein extending along a first axis, a solenoid coil mounted in said housing adjacent one end of said main passage in coaxial surrounding relationship to said main passage, a first section of said passage of a first diameter extending from one axial end of said coil to a second section of said passage of a diameter greater than said first diameter, said second section of said passage extending from said first section to a third section of said passage of a diameter less than said first diameter, said passage having a radially inwardly projecting annular shoulder at the juncture of said second and third sections, an elongate hollow tubular aramature slidably and sealingly received in said first section of said passage and having one end projecting into said second section engageable in seated engagement with said shoulder to establish one end limit of movement of said armature axially of said passage and to establish a maximum restriction to flow of fluid from said second section of said passage to said third section, spring means biasing said armature to said one end limit, said solenoid coil being operable when energized to attract said armature to an opposite end limit of movement wherein said one end of said armature is spaced from said shoulder to establish a minimum restriction to flow of fluid from said second section of said passage to said third section, first means in said housing for placing said second section of said main passage in fluid communication with a source of fluid under pressure, and second means in said housing for placing said third section of said passage in fluid communication with a fluid sump.

4,861,069

ADJUSTABLE VEHICLE COUNTERWEIGHT DEVICE WITH CYLINDER POSITIONING MEANS

Willard C. Gunter, Rte. 2, Box 13, Sevierville, Tenn. 37862

Filed Jun. 13, 1988, Ser. No. 205,741
Int. Cl.[4] E02F *9/18*
U.S. Cl. 280—758 10 Claims



1. An adjustable vehicle counterweight device for being mounted on a motor vehicle for selectively altering the center of gravity of said vehicle, said vehicle having at least one axle defining a rotational axis, said device comprising:

a frame for being secured to said motor vehicle, said frame having a first end portion and a second end portion, said frame including first and second selectively spaced track members, each said track member defining a travelway extending from said first end portion of said frame to said second end portion of said frame and aligned substantially parallel to said axis of said axle of said vehicle;

a weight member reciprocatably supported by said frame, said weight member defining a first side portion provided with at least a pair of rotatably mounted wheel members for being received in said travelway of said first track member and defining a second side portion provided with at least a pair of rotatably mounted wheel members for being received in said travelway of said second track member, whereby said weight member is reciprocatable between a first position proximate said first end portion of said frame and a second position proximate said second end portion of said frame;

a hydraulic cylinder for selectively reciprocating said weight member, said cylinder including a cylinder portion and a reciprocating actuator arm having a free end portion secured to said weight member; and

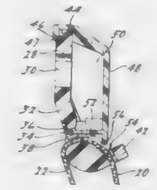
cylinder positioning means for adjusting the axial position of said cylinder portion of said hydraulic cylinder, said means including a channel bracket for securing to said frame, said channel bracket defining a channel, and including a cylinder mounting plate for engaging said cylinder portion, and for being slidably received in said channel of said channel bracket, said cylinder positioning means being provided with locking means for releasably locking said plate in a selected position as said plate is slidably received by said channel bracket.

4,861,070

SEATBELT GUIDE RING WITH ANTI-TWIST FEATURE

John Boag, Ferndale, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 27, 1987, Ser. No. 125,978
Int. Cl.[4] B60R *22/20*
U.S. Cl. 280—808 27 Claims



1. A guide ring assembly for controlling the retracting movement of an automobile seat belt from its occupant restraining position to its stored position in a seat belt retractor mounted in the body of the automobile, the guide ring assembly:

a body member including a mounting portion for pivotally mounting the body member on an interior portion of the automobile and a guide portion having a first slot formed therethrough substantially alignable with the path of the seat belt to the retractor and having an entrance receiving the seat belt and an exit through which the seat belt passes to the retractor as it retracts from the occupant restraining position, the slot being closely sized to the thickness of the seat belt; and

a cover member carried on the body in overlying fashion and having an edge portion positioned adjacent to and overlying only the exit of the slot.

4,861,071

ANCHORING DEVICE FOR SEAT BELT

Juichiro Takada, Setagaya, Japan, assignor to Takata Corporation, Tokyo, Japan

PCT No. PCT/JP87/00885, § 371 Date Apr. 8, 1988, § 102(e) Date Apr. 8, 1988, PCT Pub. No. WO88/03883, PCT Pub. Date Jun. 2, 1988
PCT Filed Nov. 16, 1987, Ser. No. 188,795
Claims priority, application Japan, Nov. 26, 1986, 61-180565
Int. Cl.[4] B60R *22/20*
U.S. Cl. 280—808 9 Claims

1. An anchoring device for a seat belt on a vehicle, comprising:

an elongated rail member fixed to the vehicle to extend vertically, said rail member having a plurality of holes longitudinally spaced apart from each other,

a slide anchor slidably engaging the rail member to move in the longitudinal direction of the rail member,

an anchor bolt fixed in the center of the slide anchor, said anchor bolt extending in the direction away from the rail member and having a through hole therein,

a slip anchor rotatably attached around the anchor bolt, said

slip anchor adapted to hold a center portion of the seat belt,

a retaining pin situated in the through hole of the anchor bolt to be slidable along an axis of the through hole, said retaining pin being urged in the direction toward the hole of the rail member to engage therewith, and



operation means having connecting means attached to the retaining pin, and a movable member fixed relative to the anchor bolt to slide perpendicular thereto, said movable member engaging the connecting means so that when the movable member is pushed toward the retaining pin, the connecting means is raised to disengage the retaining pin from the hole of the rail member to adjust the position of the slide anchor on the rail member.

4,861,072

APPARATUS AND METHOD FOR CARRYING SKIS AND SKI POLES

Lloyd E. Humphrey, 9204 Dover Way, Broomfield, Colo. 80020

Filed Jul. 19, 1988, Ser. No. 221,205

Int. Cl.[4] A63C *11/02*

U.S. Cl. 280—814 **4 Claims**



1. A method of carrying a pair of skis and ski poles, both of said skis having a bottom surface, a top surface, and a toe and heel bindings attached to said top surface adapted to removably secure the ski to a ski boot worn by the skier; both of said ski poles having an elongated shaft, a handle attached to the upper end of said shaft, and a basket extending radially outward from said shaft at a predetermined distance from the lower end of said shaft; said method comprising:

(a) securing one end of an elongated member to a first ski pole at a point above the ski pole basket;

(b) removably securing the other end of the elongated member to the lower end of the second ski pole;

(c) establishing a substantially parallel orientation of both ski poles, with the elongated member extending between the ski poles to provide a space between said ski poles;

(d) stacking the pair of skis together, with their bottom surfaces facing one another, and the ski bindings facing outward;

(e) placing the skis perpendicularly through the space between the ski poles, until the toe bindings of the skis rest against the ski poles; and

(f) carrying the ski poles over the shoulder of the skier, with the ski pole handles extending in front of the skier, and the skis held in a substantially vertical orientation between the back of the skier and the ski pole baskets.

4,861,073

NEWSPAPER HOLDER

Leonid Poretsky, 101 West 12th St., Apt 14X, New York, N.Y. 10011

Filed Apr. 26, 1988, Ser. No. 186,302

Int. Cl.[4] B42D *5/00, 9/00;* **A45C** *11/00;* **B32B** *3/04*

U.S. Cl. 281—45 **9 Claims**



1. A holding element for releasably holding at least one newspaper-like sheet of paper in a manner which obviates the transfer of print form the sheet to a user while that user holds and/or folds the sheet for reading, comprising:

transparent front and back panels each of which includes an outer edge and an inner edge and a panel width dimension as measured between said outer edge and said inner edge and which is sized and shaped to correspond in size and shape with approximately half of the sheet of paper, said front and back panels each including at least two orthogonally oriented intersecting crease lines for permitting each of said front and back panels to be folded over itself in at least two directions whereby to fold the sheet in a manner that facilitates columnar reading of the sheet through said panels;

a flexible spine connecting said front and back panels together at said panel inner edges in a manner such that said front and back panels can be congruently oriented on top of each other; and

leaf means associated with said front and back panels and foldably mounted to fold over a corresponding one of said front and back panels, said leaf means having an outer edge and an inner edge and a width dimension as measured between said leaf means inner edge and said leaf means outer edge which is essentially equal to said panel width dimension and including a crease line located to be congruent with one of said crease lines of said corresponding panel with said leaf means is in overlying relationship with said corresponding panel for permitting said leaf means to be folded over itself when said corresponding panel is folded over itself.

4,861,074

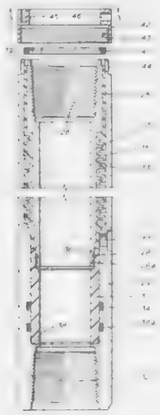
TUBING COLLAR

Bernard J. Eastlund; Kenneth J. Schmitt, and Douglas C. Anderson, all of Spring, Tex., assignors to Production Technologies International Inc., Houston, Tex.

Filed May 6, 1988, Ser. No. 190,780

Int. Cl.[4] F16L *11/12*

U.S. Cl. 285—53 **7 Claims**



1. A tubing collar comprising:

inner and outer tubular connectors of electrically conducting materiai concentrically arranged with one end of the inner connector positioned intermediate the ends of the outer connector,

each of said connectors provided with threads for connecting the collar in a tubing, (and provided with threads for making up with the tubing above and below the collar,)

a plurality of circumferentially extending (interlocking) shelves carried by the inner and outer connectors and interlocking with each other,

insulating material between the inner and outer connectors electrically insulating them from each other,

a sleeve of substantially non-conducting and substantially non-permeable material lining a section of the bore through the outer connector and telescoped with said one end of the inner connector,

first seal means sealing between the sleeve and the inner connector, and

second seal means sealing between the sleeve and the outer connector.

4,861,075

COUPLING FOR RIGIDLY CONNECTING PIPE SECTIONS

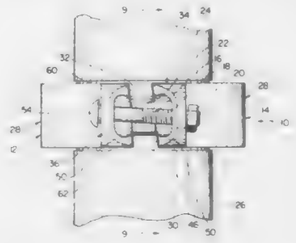
Jerome S. Pepi, No. Attleboro, Mass., and Michael W. Horgan, Coventry, R.I., assignors to Grinnell Corporation, Cranston, R.I.

Filed Jun. 20, 1988, Ser. No. 208,976

Int. Cl.[4] F16L *17/00*

U.S. Cl. 285—112 **8 Claims**

1. A coupling construction for securing the adjacent ends of a pair of pipe sections together, said pipe sections having substantially aligned central longitudinal axes and having annular grooves therein proximal the adjacent ends thereof, said grooves having opposite side edges which are substantially perpendicular to the longitudinal axes of their respective pipe sections, said coupling comprising a plurality of coupling segments each including an arcuate main portion, a pair of flanges extending outwardly from opposite ends of said main portion and axially spaced first and second engagement means extending inwardly from said main portion and extending substantially between the opposite ends thereof, said first and second engagement means being receivable in said annular grooves for securing said pipe sections together, and means for securing said coupling segments in substantially end-to-end encircling relation around said pipe sections, said coupling having a Z—Z axis which is substantially aligned with the longitudinal axes of said pipe sections when said coupling segments are secured in substantially end-to-end encircling relation around said pipe sections, each of said flanges having an aperture therethrough and including a fastening element seating surface around each aperture which faces substantially away from the adjacent flange, the apertures in adjacent flanges being offset from each other in a direction substantially parallel to the Z—Z axis of said coupling when adjacent flanges are in substantially aligned relation, said securing means comprising threaded nuts and bolts, said bolts being received in the apertures in adjacent flanges and being in cocked positions wherein the heads



thereof and the nuts thereon are disposed at oblique angles to their respective seating surfaces when the respective flanges thereof are in aligned relation, said bolts moving toward aligned positions wherein the heads thereof and the nuts thereon are in seated positions relative to their respective seating surfaces as the respective nuts thereon are tightened, said nuts and bolts therefore being operative for first drawing the adjacent flanges into the offset positions wherein they are offset from each other in a direction substantially parallel to the Z—Z axis of said coupling and for then drawing the adjacent flanges together, the first and second engagement means of said coupling segments being urged against opposite side edges of the grooves in which they are received proximal opposite ends of the coupling segments thereof for rigidly securing said pipe sections together when the flanges on the adjacent ends of said coupling segments are secured in the offset positions thereof.

4,861,076

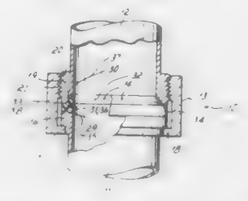
GASKET FOR SANITARY PIPE FITTINGS

David W. Newman, Lebanon, and George Y. Lin, Kettering, both of Ohio, assignors to Newman Sanitary Gasket Company, Lebanon, Ohio

Filed Apr. 13, 1988, Ser. No. 181,399

Int. Cl.[4] F16L *19/02*

U.S. Cl. 285—332.3 **8 Claims**



1. A pipe union for a sanitary fitment, which pipe union comprises a first pipe terminating in a head with male threads,

a second pipe terminating in an outer annular flange, said head and said flanges being provided with confronting annular faces of generally conical configuration and with like inside diameters, one of said faces having a radial-plane, outer annular shoulder and a conical recess adjoining said outer shoulder, the other of said faces having a radial-plane, inner annular shoulder and a conical projection adjoining said inner shoulder, a nut having an internal flange traversed by said second pipe and engaging said outer flange, said nut being provided with female threads engaging said male threads,

said gasket comprising an annular deformable ring adapted to be inserted within said nut between said faces, said gasket being of generally parallelogram cross section and having an inner annular surface of the same diameter as the inside diameters of said pipes, said gasket having an outer annular cylindrical surface, said gasket having end faces substantially complementary to said confronting annular faces of said pipes, said gasket end faces having an inner radial shoulder and an outer radial shoulder, said shoulders of said gasket being adapted to lie flat against the corresponding shoulders of said faces of said pipes, said gasket faces having substantially parallel inner and outer conical surfaces, said inner conical surface extending between said inner radial shoulder and said outer annular cylindrical surface of said gasket and being adapted to rest against said conical projection, said outer conical surface of said gasket extending between said outer radial shoulder and said inner annular cylindrical surface of said gasket, and

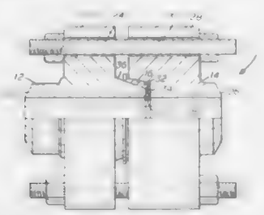
said gasket comprising a cured elastomeric material having a compression set of less than about 30 percent, a hardness of 85–95 durometer and a tensile strength greater than about 800 psi.

4,861,077

TRAPEZOIDAL SEAL RING CONNECTION

Joseph J. Welkey, P.O. Box 40082, Houston, Tex. 77240

Filed Oct. 31, 1988, Ser. No. 264,824
Int. Cl.[4] F16L *25/00*
U.S. Cl. 285—334.1 **11 Claims**



1. In a high pressure flow line connection, including male and female tubular members in generally mating alignment with a central bore of generally uniform inside diameter and an annular seal ring disposed between said tubular members, and means for urging said male and female tubular members axially toward each other, where in the male member has an annular face extending radially outwardly from the bore to a frustoconical exterior surface which is tapered from a minimum outside diameter adjacent said annular face to a maximum outside diameter spaced axially from said annular face, wherein the female member has an annular shoulder extending radially outwardly from said bore to an interior frustoconical surface which is tapered from a minimum inside diameter adjacent said shoulder to a maximum inside diameter spaced axially from said shoulder, wherein the seal ring has a frustoconical outer surface tapered to complement and sealingly engage said interior female member frustoconical interior surface and an inner frustoconical surface tapered to complement and sealingly engage said male member frustoconical exterior surface, wherein the female member shoulder is spaced axially from the male member annular face, and wherein the seal ring frustoconical inner surface has a minimum inside diameter less than the minimum inside diameter of the male member exterior frustoconical surface, the improvement comprising a crush ring disposed between the annular face of the male member and the shoulder of the female member, wherein the crush ring comprises:

an inside diameter matching that of the central bore and coaxial therewith to present a generally continuous surface for fluid flow therethrough;

a first annular face substantially coextensive with said annular face of the male member for abutment therewith;

a second annular face having a first portion in abutment with said shoulder of the female member adjacent said central bore and a second portion spaced axially from said shoulder adjacent said minimum inside diameter of the interior frustoconical surface of the seal ring to form a fluid pocket therebetween; and

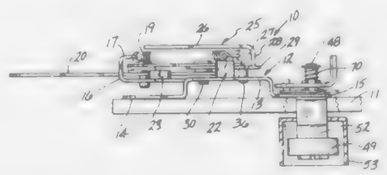
an outer peripheral edge forming a frustoconical surface having a taper corresponding to that of the male member exterior frustoconical surface, the frustoconical surface of the edge having a maximum outside diameter larger than the minimum inside diameter of the seal ring frustoconical inner surface for centering of the crush ring between the male and female members.

4,861,078

OVEN DOOR LATCH WITH HANDLE STABILIZER

Jose Munoz, Kensington, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Sep. 22, 1987, Ser. No. 99,610
Int. Cl.[4] E05C *5/00*
U.S. Cl. 292—113 **3 Claims**



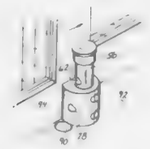
1. A latch for an appliance door comprising a support member adapted to be mounted within the appliance; and a latch assembly movable on said support member between latching and unlatching positions, said assembly comprising a bracket member, a pivot member pivotally mounting said bracket member on said support member, an elongated operating handle affixed to said bracket member, a latch arm for locking the associated applicance door and having a slot through which said pivot member extends whereby said latch arm may have rotational and translational motion with respect to said pivot member, a toggle arm pivotally connected at one end thereof to said bracket member and at the other end thereof to said latch arm, a spring connected between said one end of said toggle arm and said support member whereby, upon operation of said handle on said bracket member to move said latch assembly from an unlatched to a latched position, said latch arm is moved to a position to latch the associated door and said spring holds said assembly in a stable latched position, said support member having an arcuate slot therein beneath said bracet member, said assembly also including a pin on said bracket member extending through said slot, said pin being of greater cross section than said slot and having a reduced cross sectional groove cooperatively configured and dimensioned to permit sliding movement of said pin in said slot and defining upper and lower shoulders above and below said support member which closely overlie the surfaces of said support member defining said arcuate slot, whereby said pin is prevented from any substantial rocking movement transversely of said slot and thereby prevents said bracket and handle thereon from rocking movement about the longitudinal axis of said pin.

4,861,079

MULTI-PURPOSE LOCK BOLT

William DeForrest, Sr., 1825 Via Burton, Anaheim, Calif. 92806

Filed Dec. 3, 1987, Ser. No. 128,053
Int. Cl.[4] E05C *1/04*
U.S. Cl. 292—148 **19 Claims**



1. A multi-purpose lock-bolt which comprises:

a body;

said body shaped as a cylinder having end surfaces and a cylindrical surface truncated by a plane passing parallel to the cylindrical axis of said cylinder and through both of said end surfaces and said cylindrical surface;

said body including a bolt hole, a lock shackle hole and a mounting hole each located in and passing through said body;

said lock shackle hole intersecting with and tranversing across said bolt hole whereby said bolt hole divides said lock shackle hole into two sections;

said mounting hole intersecting with and traversing across said bolt hole whereby said bolt hole divides said mounting hole into two sections;

an elongated bolt, said bolt sized and shaped to fit into and slide in said bolt hole, said bolt sliding in said bolt hole between an extended locked position wherein a portion of said bolt extends out from said bolt hole beyond said body and a retracted unlocked position wherein said same portion of said bolt is essentially retracted into said body; and

said elongated bolt including an alignment hole extending through said bolt in a direction transverse to the elongated dimension of said elongated bolt, said alignment hole positioned in said bolt and said lock shackle hole positioned in said body in association with each other such that said alignment hole aligns with said lock shackle hole when said bolt is in said locked position whereby a lock shackle can be passed through both of said lock shackle hole and said alignment hole to fixedly position said bolt in said locked position in said body.

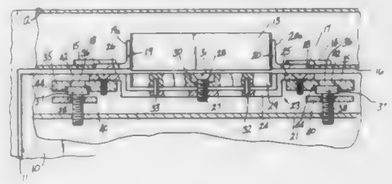
4,861,080

SUPPORT FOR ELECTROMAGNETIC SHEAR LOCK ARMATURE

George Frolov, Farmington, Conn., assignor to Harrow Products, Inc., Grand Rapids, Mich.

Filed Jun. 30, 1988, Ser. No. 213,882
Int. Cl.[4] E05C *19/16*
U.S. Cl. 292—251.5 **4 Claims**

1. A support system for the armature of an electromagnetic shear lock in a door having a rail spaced from the top edge thereof where the armature includes a mounting plate having mounting flanges at either end thereof, comprising two pairs of spaced apart headed bolts, each pair having a clamping plate below the heads thereof, a support plate on the heads of each pair of bolts and secured to each clamping plate, the mounting flanges of said mounting plate being secured to said support



plate, and passages defined in said support plates to permit access to the heads of said bolts.

4,861,081

APPARATUS FOR CONNECTING A HANDLE AND A LOCKING DEVICE ON AUTOMOTIVE DOORS

Seiki Satoh, Utsunomiya, Japan, assignor to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 255,583
Claims priority, application Japan, Oct. 24, 1987, 62-162913
Int. Cl.[4] E05C *21/00*
U.S. Cl. 292—336.3 **1 Claim**



1. An apparatus for connecting a handle and a locking device on automotive doors, comprising:

a locking device mounted on the door, the locking device having a latch to engage with a striker mounted on the car body;

a handle mounted on the door for releasing the engagement between the latch and the striker;

a rod for connecting the handle and the locking device, the rod having at one part a second raised or recessed surface that engages with a first raised or recessed surface; and

a connector rotatably mounted on the handle or the locking device, the connector having a pair of oppositely directed hooks with a gap therebetween, the hooks having on their inner surfaces the first raised or recessed surface such as threaded grooves;

whereby the second raised or recessed surface of the rod is put in the gap of the connector and the connector is turned 90° to engage the second raised or recessed surface of the rod with the inner surface of the hooks of the connector.

4,861,082

DOOR SECURITY SYSTEM

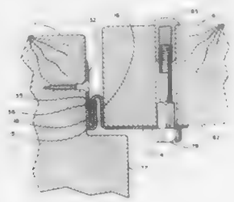
James W. Priola, Bonsall, Calif., and James W. Sauder, Reno, Nev., assignors to Omni Systems, Inc., Vista, Calif.

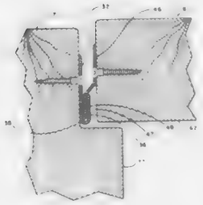
Filed May 4, 1988, Ser. No. 190,245
Int. Cl.[4] E05B *17/00*
U.S. Cl. 292—346 **9 Claims**

1. In combination, an assembly comprising a doorjamb having a substantially flat planar strike face surface extending between a front and a back edge and having a latch bolt recess therealong, and a strike plate having an opening therein, said

strike plate secured on said strike face surface with said opening exposing said latch bolt recess therethrough, and a door having a substantially flat planar end face extending between an inside and an outside door edge, and a latch bolt exposed on said end face, said door secured in opening and closing relationship with said doorjamb,

said door having a unitary first member comprising a first elongated flat plate portion lying substantially entirely in a first plane and a first elongated flat blade portion lying substantially entirely in a second plain, said first and said second planes being parallel with said end face of said door, said unitary member secured on said door with said blade portion spanning said latch bolt and extending parallel along said end face substantially entirely between said latch blot and said outside door edge,





said doorjamb having a unitary second member comprising a second elongated flat plate portion lying substantially entirely in a third plane and a second elongated flat blade portion lying substantially entirely in a fourth plane, said third and said fourth plane being substantially parallel with each other and with said first and said second planes, said second plate and second blade portions having an elongated slot therebetween, said unitary second member secured on said strike face surface with said second flat blade portion spanning said strike plage and extending substantially entirely between said back edge and said latch bolt recess,

and wherein said first flat plate portion, first flat blade portion, second flat plate portion, and second flat blade portion are positioned between said strike face surface and said end face and said first and second flat blade portions are overlapped, when said door is closed in said doorjamb.

4,861,083

LOCK ACTUATOR ASSEMBLY AND CARD READER

Aaron M. Fish, Cote St. Luc; Leon Matzeld; Alexander Branwer, both of Montreal; Masoud Miresmaili, LaSalle, all of Canada, and Sean-Paul Dausseine, De Sillery, France, assignors to Ilco Unican Inc., Montreal, Canada

Division of Ser. No. 779,455, Sep. 24, 1985, Pat. No. 4,762,212.
This application Mar. 4, 1988, Ser. No. 164,773
Int. Cl.[4] E05C *21/02*
U.S. Cl. 292—347 **5 Claims**

1. A security arrangement for mounting a handle on the rear of a door, said door having an opening therethrough, said arrangement comprising:

a shaft extending through said opening;

spring means biasing said shaft in the direction of said handle;

a floating collar mounted on said shaft and coaxial therewith for rotation with respect to said shaft;

external threads on an outer periphery of said floating collar;

said handle comprising internal threads in mating engagement with said external thread;

whereby said handle is fixedly mounted on said collar;



said internal and external screw thread arrangement being tightenable and loosenable by a special tool;

said arrangement further including a casing covering said arrangement of said floating collar and said shaft;

an opening in said casing through which said special tool can be extended; and

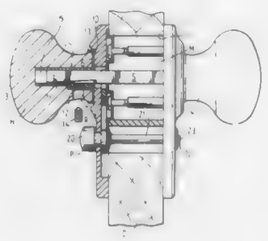
cover plate means covering said opening in said casing.

4,861,084

DOOR LOCK WITH EXTRA RELEASE

Ozcan Ozagir, Bolton, and Raymond Proffitt, Manchester, both of Great Britain, assignors to Celmac Limited, Manchester, England

Filed Mar. 9, 1988, Ser. No. 165,947
Claims priority, application United Kingdom, Mar. 13, 1987, 8705983
Int. Cl.[4] E05C *1/16*
U.S. Cl. 292—359 **17 Claims**



1. For use in forming locking means accessible from both sides of a door of a given thickness and having a mortice set incorporating a spindle having a length greater than the door thickness, a kit of parts comprising:

a pin mountable to extend through the door generally parallel to the spindle of the mortice set, and having a length great enough to extend through the door, the pin having at one end means by which it may be rotated by hand and having at the other end a slot for receiving the blade of a screwdriver;

a locking plate having a recess at one end for receiving the spindle and preventing its rotation when receiving it, and having towards the other end an enclosed slot having a wall which includes a row of teeth; and

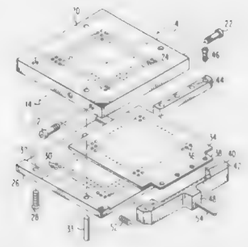
a wheel mountable on the pin for rotation therewith and including cogs for cooperation with the teeth of the enclosed slot of the locking plate when the pin extends therethrough.

4,861,085

PIN TRANSFER APPARATUS

Brian E. Lock, Princeton, and John G. Aceti, Princeton Junction, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 1, 1988, Ser. No. 151,291
Int. Cl.[4] B25B *11/00;* **B65H** *5/14*
U.S. Cl. 294—87.1 **7 Claims**



1. An apparatus for transferring a plurality of headed pins comprising:

a frame having spaced, parallel side rails and an end plate connected between said side rails at one end thereof;

a pair of plates secured together with at least portions of opposed surfaces being in spaced, parallel relation, said plates having aligned holes therethrough, the pair of plates being secured between said side rails adjacent the other ends of the side rails;

a third plate slidably fitting between said pair of plates and having holes therethrough; and

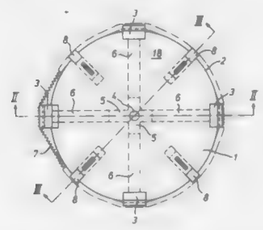
means attached to the third plate for selectively moving said third plate with respect to the pair of plates between a first position in which the holes in the third plate are aligned with the holes in the pair of plates, and a second position in which the holes in the third plates only partially overlap the holes in the pair of plates.

4,861,086

APPARATUS FOR TAKING UP AND DEPOSITING SPOOLS

José Toral, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 13, 1987, Ser. No. 73,003
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1986, 3624307
Int. Cl.[4] B25J *15/10;* **B65H** *19/30*
U.S. Cl. 294—88 **3 Claims**



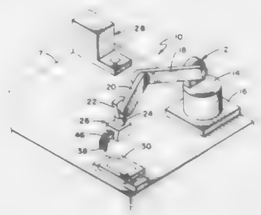
1. Apparatus for automatically taking up and depositing one or more spools, consisting of a hub and at least one flange on each side, which apparatus is mounted to rotate, characterised by a circular body (1) seated on a shaft (13) and having a diameter slightly smaller than the diameter of the spool flange (10) which is to be mounted thereon, at least two radially displaceable claws (3) being seated on the cylindrical external surface (2) of said circular body (1), the height of which claws (3) is greater on the outside than the height of the circular cylindrical body (1), which claws are pushed outwards by pistons (6) operated by compressed air from a central bore (4) and channels (5) and acting against the resistance of a spring (7) connecting all the claws (3) on the cylindrical external surface (2), bent pins (8) which are put under the bias tension of helical springs (9) and displaceable substantially in an axial direction being situated between the claws (3), the top ends of which pins (8) can be applied to the periphery of the underside of the spool flange (10).

4,861,087

OFFSET MECHANICAL GRIPPER

Joon Park, Glendale, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 5, 1988, Ser. No. 215,179
Int. Cl.[4] B66C *1/62*
U.S. Cl. 294—119.1 **26 Claims**



1. A gripper device comprising:

a body

at least one movable carriage on said body, said body being mountable upon a robot for positioning said body upon X, Y and Z orthogonal axes, said carriage being movable on said body in a direction parallel to said X axis;

first and second arm actuators movably mounted on said carriage for movement substantially on said Y-axis, a motor to move said first arm actuator with respect to said carriage, interconnection means between said first and second arm actuators so that said second arm actuator moves substantially parallel to said first arm actuator in the opposite direction therefrom upon movement of said first arm actuator;

third and fourth arm actuators mounted on said body for movement on said Y-axis, said third arm actuator having a motor connected thereto for motion of said third arm actuator along said Y-axis and means interconnecting said fourth arm actuator with said third arm actuator for motion of said fourth arm actuator on said Y-axis in a direction opposite to said third arm actuator; and

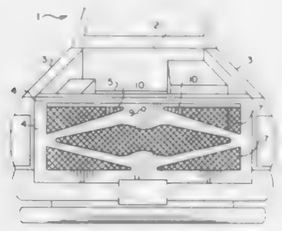
first, second, third and fourth L-shaped arms respectively mounted on said first, second, third and fourth arm actuators and first, second, third and fourth component grasping fingers respectively on said first, second, third and fourth arms, said fingers being directed generally in a direction parallel to said Z-axis away from said body so that motion of said carriage on said body changes the spacing between said first and second fingers and said third and fourth fingers and motion of said motor opens and closes said first finger with respect to said second finger and said third finger with respect to said fourth finger for component grasp and positioning.

4,861,088

VEHICLE TAILGATE ASSEMBLY

Joseph G. Fedrigo, 3615 Reposo Way, Belmont, Calif. 94002

Continuation-in-part of Ser. No. 904,110, Sep. 4, 1986, Pat. No. 4,743,058. This application Nov. 4, 1987, Ser. No. 117,713
The portion of the term of this patent subsequent to May 10, 2005, has been disclaimed.
Int. Cl.[4] B62D *25/00*
U.S. Cl. 296—57.1 9 Claims



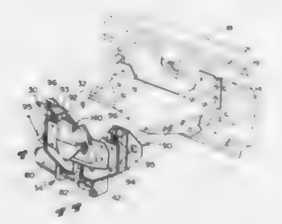
1. A tailgate assembly for vehicles, comprising:
a tailgate frame, the tailgate frame having a central opening, an air permeable screen securely mounted within the opening;
a material shield hingedly connected to the tailgate frame for preventing the loss of cargo of such a size that it would readily pass through the screen; and
means for latching the material shield to the frame.

4,861,089

VEHICLE VENTING ARRANGEMENT RESPONSIVE TO SIDE DOOR OPENING AND CLOSING

David E. Compeau, Mt. Clemens; Lloyd W. Rogers, Utica, and Robert J. Myslicki, W. Bloomfield, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 29, 1988, Ser. No. 237,485
Int. Cl.[4] B62D *25/10*
U.S. Cl. 296—76 4 Claims



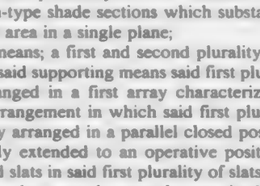
1. In an automotive vehicle having a vehicle body defining an interior and provided with a door which is movable between open and closed positions, a rear closure which is supported by said body for movement between an open position, a partially closed position, in which the interior of the vehicle is still vented to the ambient atmosphere and a fully closed position in which the interior is not vented to the ambient atmosphere, a latch and pull down mechanism for latching said closure to said body when the closure is moved from an open position to its partially closed position and for moving said closure downwardly from its partially closed position to its fully closed position, said latch and pull down mechanism including a striker carried by one of said closure and body, a latch assembly carried by the other of said body and closure, and a pull down unit including a motorized drive means operatively connected to one of said striker and latch assembly for moving the same between an extended position in which the striker is engageable with the latch assembly to latch the closure to the vehicle upon the closure being moved to its said partially said closed position, and a retracted position in which the closure is in its fully closed position, and a control means including a door jamb switch for effecting operation of said motorized drive means of said pull down unit to move said one of said striker and latch assembly from its retracted position to its extended position to move said closure from its fully closed position to its partially closed position to vent the interior of the vehicle to the atmosphere in response to movement of said door from its closed position to an open position and for effecting operation of said motorized drive means to move said one of said striker and latch assembly from its extended position to its retracted position to move said closure from its partially closed position to its fully closed position in response to movement of said door to its closed position whereby said interior of said vehicle is vented during door closing to allow interior air to escape and substantially reduce door closing effort.

4,861,090

FAN-TYPE AUTOMOBILE WINDOW SHADE

Haviv Gavrieli, 7943 Haskell Ave 1, Van Nuys, Calif. 91406

Filed Mar. 13, 1987, Ser. No. 25,363
Int. Cl.[4] B60J *3/02*
U.S. Cl. 160—134 9 Claims



1. A fan-type sunshade for protecting the interior of a vehicle against light radiation by being placed on the dashboard in the vehicle in close proximity to the windshield, said sunshade comprising fan-type shade sections which substantially cover the windshield area in a single plane;
supporting means; a first and second plurality of slats connected to said supporting means said first plurality of slats being arranged in a first array characterized by a first fan-like arrangement in which said first plurality of slats are serially arranged in a parallel closed position and are sequentially extended to an operative position in which one of said slats in said first plurality of slats is maximally extended and a second array characterized by a second fan-like arrangement in which second plurality of slats are serially arranged in a parallel closed position and are sequentially extended to an operative position in which one of said slats in said second plurality of slats is maximally extended, whereby said maximally extended slats in said first and second pluralities of slats each define edges which abut one another in the extended operative position at a common interface plane without creating an overlap; and
means for connecting said first array and said array in the extended operative position.

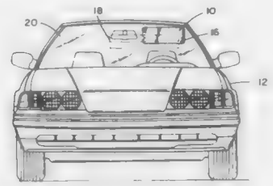
4,861,091

GLARE REDUCING ADJUSTABLE VISOR SYSTEM

Russell J. Wallen, 1810 Hayes St. NE., Minneapolis, Minn. 55411

Filed Aug. 17, 1988, Ser. No. 233,211
Int. Cl.[4] B60J *3/02*
U.S. Cl. 296—97.6 15 Claims

1. A glare reducing adjustable visor system for use in a windowed vehicle comprising:
(a) visor means attached to the interior of the vehicle, the visor means having outer surfaces defining glare reducing areas, a bottom surface, a first end surface defining an opening, and inner surfaces defining a chamber extending from the first end surface opening and including a groove portion of a tongue and grove engaging mechanism; and
(b) a visor plate having surfaces defining a glare reducing area, the visor plate having:



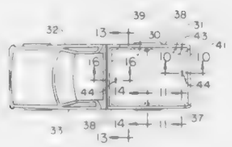
(1) handle means for holding the visor plate, the handle means also comprising the tongue portion of the tongue and groove engaging mechanism for positioning the visor plate in the visor means chamber; and,
(2) means for attaching the visor plate to a window in the interior of the vehicle.

4,861,092

PICK-UP TRUCK TONNEAU COVER

Donald E. Bogard, 22204 Dolphin Ct., Dearborn Heights, Mich. 48127

Filed Jul. 28, 1987, Ser. No. 78,528
Int. Cl.[4] B60D *7/02*
U.S. Cl. 296—100 2 Claims



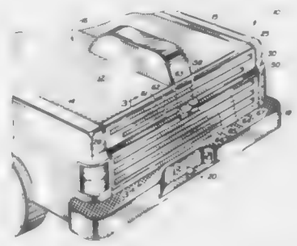
1. In combination with a pick-up truck of the type having an open bed for carrying cargo bounded at the side margins by a pair of spaced apart vertical panels in parallel relationship, bounded at the forward end margin by a fixed wall extending across the forward portion of said side panels, and bounded at the opposite rear end margin by a rotatably mounted gate extending across the rearward portion of said side panels; a tonneau cover for covering said open bed, said tonneau cover comprising a front panel having a forward edge portion disposed proximally to the forward fixed wall of said open bed, a rear panel rotatably joined to said front panel, said front and rear panels being laminated structures comprising thin upper and lower outer sheets; a peripheral molding, said molding having a horizontal upper wall, a spaced apart lower horizontal wall, an interconnecting vertical wall recessed inwardly from the inner edges of the upper and lower walls for receiving a cellular core, and a pair of spaced apart vertical ribs extending downwardly from the outer portion of the upper wall for receiving a seal; a cellular core bonded to said upper and lower sheets; and a resilient seal retained within the space between said downward extending ribs.

4,861,093

TAILGATE ASSEMBLY

Fred L. Chapman, 18205 N. 25th Pl., Phoenix, Ariz. 85032

Filed Nov. 13, 1987, Ser. No. 120,622
Int. Cl.[4] B62D *25/00*
U.S. Cl. 296—180.1 9 Claims



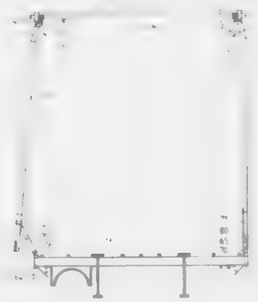
1. A tailgate pivotally mountable in the access opening of the cargo area betwen the side walls of a pickup truck bed having a floor, said tailgate comprising:
(a) a frame having a plurality of spacedapart louver members, said louver members each having a front side and rear side and at least one louver having a first surface inclined rearwardly and downwardly between said sides which together with a similarly oriented second surface on the next adjacent louver member define an air passageway for directing airflow downwardly toward the roadway surface; and
(b) hinge means for securing said frame to the bed whereby the frame is moveable relative to the access opening between a closed vertical position between the truck bed side walls and an open position generally co-planar with the truck bed floor with said front side of said louvers defining a generally planar load bearing surface.

4,861,094

CURTAIN SIDED TRAILERS

John G. Krueger, Werribee, Australia, assignor to Krueger Transport Equipment Pty. Ltd., Victoria, Australia

Filed Jan. 4, 1988, Ser. No. 140,642
Claims priority, application Australia, Oct. 7, 1987, 79448/87
Int. Cl.[4] A63G *9/10*; F16C *11/00*
U.S. Cl. 296—181 9 Claims



1. A support post for a curtain sided trailer, said post comprising; an elongate member having first and second ends, a roller assembly, a rigid link pivotally connected to the first end of the elongate member at a pivot point and pivotally connected to the roller assembly for guiding the first end and pivot point in arcuate movement to a position laterally beside the roller assembly, said rigid link being constrained, via its con-

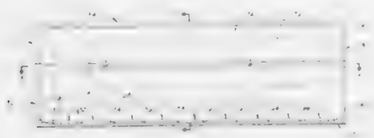
nection with said elongate member at said pivot point, from any further motion with respect to said elongate member, a leg secured to the second end at a knee joint for pivotally moving the leg with respect to the elongate member, and means to lock the knee joint with the elongate member and leg extending in a straight line.

4,861,095

FLOOR FOR CONDITIONED AIR VEHICLES

Albert H. Zajic, Oklahoma City, Okla., assignor to American Trailers, Inc., Oklahoma City, Okla.

Filed Dec. 8, 1987, Ser. No. 130,292
Int. Cl.[4] B61D *3/00*
U.S. Cl. 296—182 8 Claims



1. A vehicular floor structure, comprising:
a first T-panel defining a first outermost portion of said floor structure;
a first duct panel connected directly to said first T-panel;
a second duct panel connected directly to said first duct panel;
a third duct panel connected directly to said second duct panel;
a second T-panel connected directly to said third duct panel;
a fourth duct panel connected directly to said second T-panel;
a fifth duct panel connected directly to said fourth duct panel;
a sixth duct panel connected directly to said fifth duct panel; and
a third T-panel, connected directly to said sixth duct panel, defining a second outermost portion of said floor structure.

4,861,096

UTILITY VEHICLE

John M. Hastings, P.O. Box 39, Shepherd, Tex. 75243

Filed Jul. 15, 1988, Ser. No. 219,655
Int. Cl.[4] B60R *3/00*; B62D *25/00*
U.S. Cl. 296—183 17 Claims



1. A utility vehicle comprising:
a passenger cab;
a frame extending lengthwise behind the cab;
a bed mounted on top of the frame extending from adjacent the cab to a tail end;
upstanding first and second side panels secured to opposite sides of the bed and extending substantially along the bed from adjacent the cab to adjacent the tail end;
a vertically hinged door positioned in a said side panel for passenger access to said bed; and
a port for filling a fuel tank concealed beneath said bed, a said port being positioned below an upper surface of said bed and behind said door for concealment of the port when the door is in a closed position and access thereto when the door is in an open position.

4,861,097

LIGHTWEIGHT COMPOSITE AUTOMOTIVE DOOR BEAM AND METHOD OF MANUFACTURING SAME

Joseph Wycech, Grosse Pointe Woods, Mich., assignor to Essex Composite Systems, Fraser, Mich.

Filed Sep. 18, 1987, Ser. No. 98,159
Int. Cl.[4] B60J *5/00*
U.S. Cl. 296—188 18 Claims



1. A lightweight, composite reinforcing door beam adapted to be mounted in the cavity of a motor vehicle door which has an outer panel and an inner panel, the door beam providing structural reinforcement in the form of increased side-impact resistance when mounted in the cavity of the vehicle door, the door beam comprising:
a body having a longitudinal axis, said body including a first wall and a second wall, said first and second walls extending in the direction of said longitudinal axis and spaced from one another in opposed relation;
said body further including a generally U-shaped portion integral with said first and second walls, said generally U-shaped portion being co-extensive with said first and second walls in the direction of said longitudinal axis;
said first and second walls and said generally U-shaped portion defining a channel-shaped area in said body, said channel-shaped area extending in the direction of said longitudinal axis;
a core disposed in said channel-shaped area of said body, and core substantially filling said channel-shaped area in rigid contact with said first and second walls and with generally U-shaped portion;
first and second mounting means attached to opposite ends of said body and adapted for mounting the door beam in the cavity of the vehicle door, with the longitudinal axis of the door beam positioned horizontally with respect to the vehicle door, thereby increasing the side-impact resistance of the vehicle door; and
one of said first and second walls being curved outwardly along said longitudinal axis.

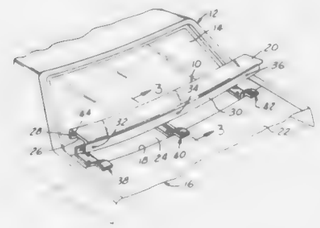
4,861,098

VEHICLE STRUCTURE INCLUDING A BRACKET STRUCTURE ASSEMBLY FOR MOUNTING A LOOSE UPPER DECK PANEL ONTO A VEHICLE BODY

William J. Gorski, Warren, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed May 9, 1988, Ser. No. 191,939
Int. Cl.[4] B62D *25/08*, *27/00*
U.S. Cl. 296—195 6 Claims

1. Vehicle structure including a bracket structure assembly for mounting a loose upper deck panel onto a vehicle body, the vehicle body including a rear window and a deck lid spaced rearwardly therefrom, the loose upper deck panel being mounted between the rear window and the forward edge of the deck lid, the vehicle including a support shelf positioned between the rear window and the forward edge of the deck lid, the loose upper deck panel being generally U-shaped and including an upper wall extending transversely of the vehicle with forward and rearward walls extending downwardly therefrom, the loose upper deck panel being mounted on the vehicle with the upper surface of the upper wall thereof being in alignment with the upper surface of the deck lid, the bracket structure including at least two first brackets, each first bracket being generally U-shaped and including a bottom wall extending longitudinally on said support shelf of the vehicle with forward and rearward bracket walls extending upwardly therefrom, the forward bracket wall having a protuberance on the rearward surface thereof, the forward wall of the loose upper deck panel having opening means therein, said protuberance extending through said opening means to secure said forward wall in the desired vertical location, the rearward bracket wall having opening means therein, the rearward wall of the loose upper deck panel having opening means therein mating with the lastmentioned opening means, fastening means extending through said mating opening means to secure the



rearward wall of the loose upper deck panel to the rearward bracket wall in the desired vertical location, at least one of said first brackets being mounted adjacent each transverse end of the loose upper deck panel, the bracket structure including a second bracket, the second bracket including a bottom wall extending longitudinally on said support shelf of the vehicle, a rearward bracket wall extending upwardly from said lastmentioned bottom wall, a central bracket wall extending upwardly from said lastmentioned bottom wall, a spacer element extending rearwardly from the upper end of each rearward bracket wall, the spacer elements each having a generally vertical location surface for contact with the forward edge of the deck lid to locate each bracket a predetermined distance forwardly of the forward edge of the deck lid, each spacer element having a generally horizontal locator surface for contact with the upper surface of the deck lid to locate the brackets at a predetermined vertical orientation with respect to the upper surface of the deck lid, shim structure for positionment between the bracket bottom walls and the support shelf to maintain said vertical orientation, and fastening means securing the bracket bottom walls to the support shelf, the spacer elements being joined to the rearward bracket walls by a frangible joint whereby the spacer elements may be easily broken away from the rearward bracket walls after the brackets have been located and fastened in place on the support shelf.

4,861,099

DOOR ALIGNMENT ASSEMBLY AND METHOD

Ross S. Sasamura, and John H. Jewell, II, both of Fremont, Calif., assignors to Paccar Inc., Bellevue, Wash.

Filed Mar. 11, 1988, Ser. No. 167,308
Int. Cl.[4] B60J *1/00*
U.S. Cl. 296—202 21 Claims



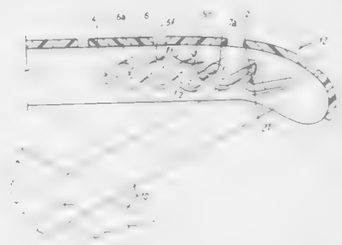
1. A door alignment assembly for aligning a door in a door jamb as the door is rotated into a closed position, the door being mounted for rotation between an open and a closed position about a pivot axis, said door alignment assembly comprising:
first and second door alignment components mounted in proximity to one another generally opposite the pivot axis of the door, one alignment component mounted on the door and the other alignment component mounted on the door jamb;
said first alignment component comprising at least one alignment wedge having an arcuate surface extending between a base edge and an opposite leading edge, and said second alignment component comprising an alignment assistor having at least one angled lateral edge;
said alignment wedge and said alignment assistor positioned to provide a line of contact between said arcuate surface of said alignment wedge and said angled lateral edge of said alignment assistor when said door is moved into the closed position.

4,861,100

RECLINING ANGLE FOLDING CHAIR

Mario Baccaro, Bologna, Italy, assignor to O.M.S.I. s.a.s. di Baccaro Vincenzo & C., Italy

Filed May 2, 1988, Ser. No. 189,199
Claims priority, application Italy, Apr. 30, 1987, 3458 A/87
Int. Cl.[4] A47C *4/16*
U.S. Cl. 297—19 14 Claims



1. A folding chair comprising a seat with a backrest which are hinged together and carried by two pairs of crossed legs pivotably connected with each other, upper ends of said legs being pivoted respectively and laterally to a back side and a

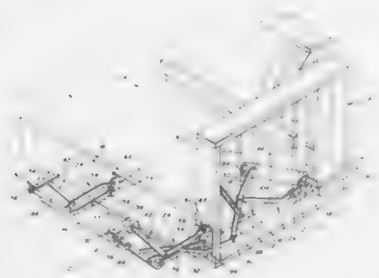
front side of the seat, one of the upper ends of each of said pairs of crossed legs having a pin slidable along a notched slot located on the seat into a plurality of resting positions, the pin having a double oval head defining a double cam profile, said head having a projection extending from the head, the notched slot having a first and a second track defining a substantially zig-zag arrangement that occupies relative parallel planes set apart one from the other to accommodate the projection and the double oval head, respectively, so that adjustment of the reclining angle of the chair is effected by moving the pin along the two tracks from end to end through a succession of mandatory steps that coincide with said plurality of resting positions of the pin, each one of said resting positions corresponding to a respective reclining angle of the backrest.

4,861,101

SOFA OTTOMAN

Michael F. Hartline, Saltillo, Miss., assignor to Super Sagless Corp., Tupelo, Miss.

Filed Apr. 28, 1988, Ser. No. 187,232
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—69 **9 Claims**



1. A sofa ottoman assembly for mounting independently of the sofa seat comprising

a first bracket adapted to be mounted on the front rail of a sofa below the front edge of the sofa seat cushion, said bracket including a flange disposed in a vertical plane perpendicular to the plane of the front rail;

a second bracket carrying an ottoman adapted to lie in a a vertical plane immediately in front of the front rail when the ottoman is retracted and in a generally horizontal plane at the approximate elevation of the seat cushion when the ottoman is extended, said second bracket having a flange extending vertically and perpendicular to the ottoman when the ottoman is retracted;

said first and second brackets also having plates lying substantially parallel to one another attached respectively in face to face relationship with the rail and ottoman when the ottoman is retracted,

a lazy tong linkage interconnecting the flanges of the first and second brackets supporting the ottoman for movement between the retracted position immediately adjacent the front of a sofa and the extended position, said lazy tong linkage including a plurality of pairs of levers with each lever disposed in a separate plane and each separate from the planes of the flanges enabling the lazy tong linkage to be collapsed flat between the ottoman and front rail when the ottoman is retracted; and

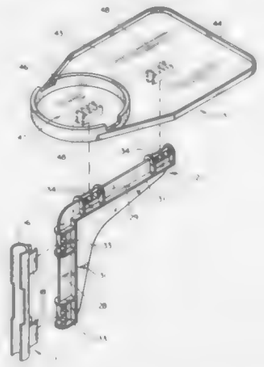
a handle operated lever assembly adapted to be mounted on the arm of the sofa and connected to the lazy tong linkage for actuating the linkage and moving the ottoman between the extend and retracted positions.

4,861,102

TRAY ASSEMBLY FOR ATTACHMENT TO FOLDING CHAIRS AND OTHER SUPPORTING STRUCTURES

Jerald W. Fuller, 2000 Skyline Blvd., Reno, Nev. 89509

Continuation of Ser. No. 169,749, Mar. 18, 1988, abandoned.
This application Mar. 1, 1989, Ser. No. 317,136
Int. Cl.[4] A47B *83/02*; A47C *7/62*
U.S. Cl. 297—162 **18 Claims**



1. In a tray assembly for use with a support: a base adapted to be mounted on the support and having a pair of semi-cylindrical mounting ferrules spaced apart along an axis which is oriented in a vertical plane when the base is mounted on the support, an L-shaped arm having a generally planar body with first and second sets of mounting pins disposed along generally perpendicular edges thereof, said first set of mounting pins snapping into the ferrules on the base and being gripped thereby with a frictional engagement which permits the arm to be rotated about the axis of the ferrules to align the second set of mounting pins in a generally horizontal plane, and a tray having a pair of spaced apart ferrules which snap onto the second set of mounting pins and grip the same so that the tray can be rotated about the horizontally aligned set of pins to a level position where it remains due to frictional engagement between the ferrules and the pins, said base, said arm and said tray each being fabricated of a plastic material with the mounting pins and ferrules being formed as integral parts thereof.

4,861,103

STRUCTURE FORMING A MOUNTING FOR A SEAT OF AN AIR TRANSPORT CRAFT

Bernard Vallee, Antony, France, assignor to 501 Societe Industrielle et Commerciale de Materiel Aeronauti Que Societe Anonyme, Issoudun, France

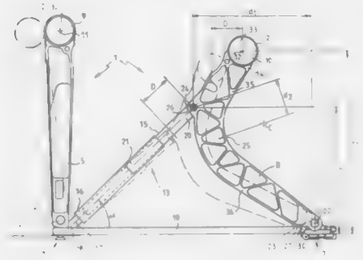
Filed Mar. 11, 1988, Ser. No. 167,248
Claims priority, application France, Mar. 12, 1987, 87 03422
Int. Cl.[4] B64D *25/04*
U.S. Cl. 297—216 **37 Claims**

1. A structure forming a mounting for a seat of an air transport craft having a fixed structure, said structure being non-deformable under normal conditions of use but deformable when the deceleration exceeds a specific value corresponding to an accident situation, said structure comprising:

a framework defining a sitting surface and a back surface of the seat;

a front foot having an upper end, a lower end, an anchorage at said lower end anchoring said front foot to the fixed structure of the craft, and a pivot joint at said upper end articulably connecting said front foot to said framework, said pivot joint having an upper transverse horizontal pivot axle, whereby said front foot can pivot about said upper pivot axle, said anchorage comprising joint means having a lower transverse horizontal pivot axle for allowing said front foot to pivot forward from its normal position about said lower pivot axle;

a rear foot having an upper end, an upper part adjacent said upper end, a lower end, a lower part adjacent said lower end, an anchorage at said lower end anchoring said rear foot to the fixed structure of the craft, and an upper pivot joint at said upper end articulably connecting said rear foot to said framework, said pivot joint having a horizontal and transverse pivot axle, whereby said rear foot can pivot about said pivot axle;



a deformable energy absorption device connected to and extending between said front foot anchorage and said upper part of said rear foot and spaced apart from said rear foot pivot joint; and

prevention means associated with said lower end of said rear foot for preventing said rear foot from pivoting forward about said rear foot anchorage;

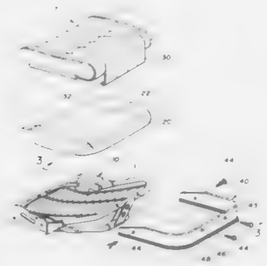
said framework being supported by said front and rear feet.

4,861,104

SEAT CUSHION CONSTRUCTION AND METHOD OF UTILIZATION THEREOF

Ronald J. Malak, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 29, 1988, Ser. No. 149,806
Int. Cl.[4] A47C *31/02*
U.S. Cl. 297—218 **2 Claims**



1. A vehicle seat construction, said construction in combination comprising:

a seat frame having curvilinear shape and including a general U-shaped tubular supporting portion;

a seat cushion bun mounted on said on said tubular portion

a seat cover for enclosing said seat cushion bun, said cover along a lower edge having a connective means; and

a flexible non-molded polymeric trim retainer having a generally flat planar portion which is extending along a vertical plane with means of attachmeht at at least two separate locations with said frame and said tubular supporting portion whereby said trim retainer shapes said cover, and at a lower end of said retainer planar portion, said retainer has means of joining with said cover connective means for retaining said cover to said seat cushion bun thereby retaining said seat cushion bun to said frame.

4,861,105

INFANT CAR SEAT MOUNTABLE ON A GROCERY CART

Barron C. Merten, Orchard Park, and Kenneth P. Morton, East Aurora, both of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Aug. 15, 1988, Ser. No. 232,487
Int. Cl.[4] A47D *1/10*
U.S. Cl. 297—250 **2 Claims**



1. An infant car seat that is mountable on a cart of the type having a rear end wall and a spaced child back support wall having an upper crossbar comprising:

a car seat frame having a rear end portion supportable by the upper crossbar of the cart; and said end-portion including a pair of spaced side walls, each side wall having a notch for receiving the crossbar; and

pivotally movable latch member having a hook at one end thereof, and spring means for urging the hook into latching engagement with the crossbar for releasably latching the car seat to the cart, wherein the car seat frame has a curved bottom to allow the car seat frame to be rocked, the infant car seat further having means for preventing rocking movement of the car seat frame, and wherein the rocking preventing means comprises a pivotal support member pivotally mounted between said side walls and movable between a retracted position to allow rocking, and an extended position to prevent rocking and means for holding said support member in said extended position.

4,861,106

SEAT FOR AN OFFICE CHAIR OR THE LIKE, WITH SEAT AND BACK ADJUSTABLE, ESPECIALLY BY BODY WEIGHT DISPLACEMENT

Horst Sondergeld, Schongauer Weg 47, D-7800 Freiburg, Fed. Rep. of Germany

Filed Jun. 21, 1988, Ser. No. 209,544
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1987, 3720849; Jan. 13, 1988, 3800754
Int. Cl.[4] A47D *13/10*; A47C *1/02*
U.S. Cl. 297—316 **14 Claims**

1. Seat units for an office chair or the like, with a seat and back which are adjustable especially by body weight displacement, and having a cradle, in which the seat and the back are hinged to one another by a first freely disposed articulation containing a first axis of rotation, characterized in that the seat (6) and the back (7) are suspended and guided each by means of at least one positive guide on the cradle (5, 34, 64) and are mounted for movement each along a path established by the positive guide, and that the positive guides are so constructed

that the opening angle (c) between the seat (6) and the back (7) is variable both by the simultaneous changing of the angle of



inclination of the seat and back and by changing the angle of inclination only of the seat (6) or only of the back (7).

4,861,107
HEAD REST WITH FORWARDLY PIVOTABLE PAD MOUNTED ON FRICTION HINGE
Mohan P. Vidwans, Saline; Duane Potes, Adrian, and John P. Opalia, Ypsilanti, all of Mich., assignors to Hoover Universal, Inc., Ann Arbor, Mich.
Filed Jun. 13, 1988, Ser. No. 208,032
Int. Cl.[4] A47C *1/10*
U.S. Cl. 297—408 **7 Claims**



1. A head rest for mounting on an automotive vehicle seat back comprising:
- a rod affixed to said back, said rod having a generally horizontal mounting portion;
- a frame having a pad thereon;
- a friction bushing substantially surrounding said horizontal mounting portion of said rod and in frictional engagement with said rod;
- a mounting bracket secured to said frame, said bracket attaching said frame to said rod by sandwiching said rod and said friction bushing between said frame and said bracket for pivotal movement of said frame forward and backward about said horizontal mounting portion;
- fastening means for clamping said frame and bracket together and biasing said friction bushing against said rod to apply a frictional force against said rod resisting pivoting of said frame about said rod; and
- stop means fixed to said rod for limiting the movement of said frame relative to said rod to rotation through a limited arc, said frame being freely rotatable through said arc except for the resistance of said frictional force of said bushing on said rod.

4,861,108
AUDITORIUM SEAT
Hugh C. Acton, Augusta, and Robert S. Walworth, Grand Rapids, both of Mich., assignors to American Seating Company, Grand Rapids, Mich.
Filed Jun. 7, 1988, Ser. No. 203,742
Int. Cl.[4] A47C *5/04*
U.S. Cl. 297—445 **21 Claims**



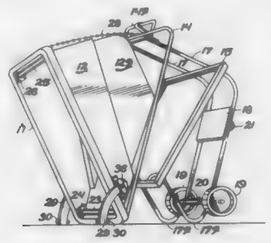
1. A seat frame comprising:
an elongated structural member forming a loop, the ends of said loop being brought together in a "Y" configuration to form a pedestal, the opposite side of said loop extending upward from said "Y" configuration and curving to a substantially horizontal plane in a "U" configuration to form arm and back support sections.

4,861,109
BODY RESTRAINT DEVICE
Jamie S. Leach, Ada, Okla., assignor to C. J. Leacho, Inc., Ada, Okla.
Continuation-in-part of Ser. No. 233,420, Aug. 18, 1988. This application Sep. 26, 1988, Ser. No. 248,625
Int. Cl.[4] A47D *15/00*
U.S. Cl. 297—467 **8 Claims**



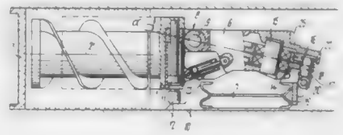
1. A body restraint device comprising:
an elongated waistband having a pair of opposed, elongated waistband wings joined to each other through a lower back-supporting central portion and being aligned with each other along aligned longitudinal axes of the elongated wings;
- a crotch portion joined to said waistband at said central portion and extending therefrom in a direction generally normal to said aligned longitudinal axes of said elongated waistband wings to impart a T-shaped overall configuration to said body restraint device, said crotch portion having:
- a proximal part immediately adjacent said waistband;
- a distal part having spaced slots therethrough, with said slots being spaced from each other along a line substantially parallel to the aligned longitudinal axes of said elongated waistband wings; and
- a narrow central part joining said distal portion to said proximal portion, with said narrow central part having a lesser dimension along the line measured substantially parallel to the aligned longitudinal axes of said elongated waistband wings than the dimension of said proximal part and also the dimension of said part as said dimensions are measured along lines extending parallel to the aligned longitudinal axes of said elongated waistband wings; and
- cooperating fastening elements carried on the free ends of said elongated waistband wings, each of said elongated waistband wings having a length such that the respective wing can be extended through one of said slots and then be reverse bent through 180° back upon itself and extended around behind the central portion of said waistband to a location where the fastening element carried on the free end of the respective waistband wing meets the fastening element carried on the free end of the other of the waistband wings after the other of said waistband wings has been extended through the other of said slots, bent through 180° and doubled back upon itself and extended to the location where its fastening element is able to engage and cooperate with the fastening element on said one elongated waistband wing at a location behind the central portion of said waistband.

4,861,110
TILT TRUCK APPARATUS
Joseph M. Rumpke, 3642 Kirchling Rd., Hamilton, Ohio 45013
Filed Jun. 8, 1988, Ser. No. 203,889
Int. Cl.[4] B62B *1/00*
U.S. Cl. 298—2 **8 Claims**



1. A tilt truck apparatus comprising a framework means including an upper perimeter framework and a lower perimeter framework secured together by downwardly extending rails;
- said rails secured to said upper perimeter framework at first ends and joined to said lower perimeter framework underlying said upper perimeter framework, and
- curving to underlie said upper and lower framework including a planar platform for support of a tub on said platform and to maintain said tub within said upper and lower perimeter frameworks, and
- wheel means secured to said downward extending rails underlying said upper and lower perimeter frameworks, and a tub comprised of a sloping forward wall, a rear wall, and side walls, said side walls having upper and lower portions, and
- said tub including a downwardly depending flange spaced from side walls of said tub for overlying said upper perimeter framework, and
- a forward and rear reinforcing bar positioned between upper interior side walls of said tub adjacent to but spaced from said depending flange, and
- tether means joining said rear reinforcing bar and a rear member of said upper perimeter framework to prevent overtipping of said tub during emptying of said tub, and whereby the tilt truck can be tilted upwardly and forwardly so as to tilt the tub relative to the framework so as to dump the contents therefrom.

4,861,111
MINING CUTTER-LOADER FOR WINNING MINERALS
Felix Z. Masovich, ulitsa Chaikovskogo, 15, kv. 59; Vladimir N. Khorin, Fakultetsky pereulok, 3, kv. 206; Vladimir V. Starichnev, ulitsa Novolesnaya, 18, korpus 1, kv. 128, and Vladimir V. Turkin, ulitsa Smolenskaya, 7, kv. 181, all of Moscow, U.S.S.R.
PCT No. PCT/SU83/00013, § 371 Date Aug. 13, 1984, § 102(e) Date Aug. 13, 1984, PCT Pub. No. WO84/02737, PCT Pub. Date Jul. 19, 1984
PCT Filed May 27, 1983, Ser. No. 643,964
Claims priority, application U.S.S.R., Jan. 11, 1983, 3528702
Int. Cl.[4] E21C *27/02*
U.S. Cl. 299—43 **1 Claim**



1. A mining cutter-loader for thin seam mining having a chainless feed system comprising:
a housing having a working face side substantially parallel with a longitudinal axis of said housing;
- at least two work-performing members attached to ends of said housing, a longitudinal axis of said work-performing members extending in a perpendicular direction relative to said longitudinal axis of said housing, said work-performing members breaking and loading minerals onto the cutter-loader;
- a drive accommodated within said housing and moving said work-performing members;
- a conveyor having a working base side and a goaf side;
- first hydraulic cylinders arranged in a vertical direction relative to said longitudinal axis of said housing and bearing said housing upon a loading shear of said conveyer;
- a gantry pivotally connected to said housing and overlying said conveyer, said gantry propelling the cutter-loader along said working face side of said conveyer;
- a chainless feed system accommodated in said gantry and comprising at least two propulsion gears mounted in said gantry along said longitudinal axis of said housing, a drive moving said gears, and a guiding rack mounted on said goaf side of said conveyer by means of a pivot and interacting with said propulsion gears, saiid propulsion gears pivoting jointly with said guiding rack, said propulsion gears and said guiding rack being inclined in a direction transverse to the motion of the cutter-loader and said gears and said guiding rack defining an acute angle with said longitudinal axis of said work-performing members, said angle having an open side facing said housing;
- second hydraulic cylinders having first ends pivotally connected to said housing along a longitudinal axis of said housing and having second ends pivotally connected to said gantry, said second hydraulic cylinders retaining said housing relative to said gantry; and
- a pump feeding working fluid to said first and second hydraulic cylinder.

4,861,112
APPARATUS FOR CLEANING ALUMINUM CELLS
Louis A. Grant, Pittsburgh, Pa., assignor to Louis A. Grant, Inc., Pittsburgh, Pa.
Filed Jul. 26, 1988, Ser. No. 224,315
Int. Cl.[4] E21C *3/00, 11/00*
U.S. Cl. 299—70 **14 Claims**

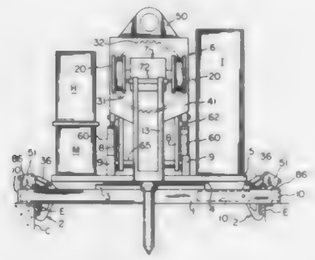
1. Apparatus for removing frozen aluminum, spent alumina, dross, aluminum pads, refractories and other accumulated materials from an open top pit-like cell having an interior

bounded by a bottom, vertical side walls bordered by a peripheral edge and a floor surface adjacent said peripheral edge, and end walls, said apparatus comprising:

a. a plurality of outrigger members adapted to span the open top of the cell and having extensible outer end portions adapted to rest on said floor surfaces;

b. means associated with the outer end portion of each of said outrigger members for clamping said outrigger members to said peripheral edges of the side walls of said pit-like cell when said means is in a first position and for releasing said clamping action and engaging a roller means when in a second position to rollably support said outrigger members on said floor surfaces for travel therealong;

c. a mounting head positioned above said outrigger members including means for pivotally and rotatably supporting said mounting head on said outrigger members;



d. extensible and retractable boom means for movement along a longitudinal axis;

e. means for mounting said boom means within said mounting head for rotative movement about the longitudinal axis of said boom means;

f. tool means for one of digging and removing loosened material from said cell;

g. means for detachably and pivotally mounting said tool means to the end of the forward portion of said boom means;

h. hydrualic actuation means and control means for selective movement of said tool means within and above the pit whereby three degrees of freedom of motion of said tool means are achieved.

4,861,113

CAST WHEEL

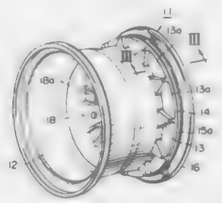
Tadashi Imamura, Atsugi; Kazuyuki Shigaki, Toyohashi; Yuji Yamazaki; Tadashi Masuda, both of Toyokawa, and Tsunemasa Okumura, Aichi, all of Japan, assignors to Topy Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,189

Claims priority, application Japan, Feb. 25, 1987, 62-27130[U]

Int. Cl.[4] B60B *3/02*

U.S. Cl. 301—65 **10 Claims**



1. A wheel wherein a rim portion is integrally cast to a disk portion and wherein said rim portion is for holding a tire having a bead portion, comprising:

a bead seat portion for said rim portion, said bead seat portion receiving said bead portion of said tire;

a dropped portion for said rim;

a side wall portion extending between said bead seat portion and said dropped portion, said side wall portion extending around the rim portion in a circumferential direction of the wheel and having a surface facing the tire;

a plurality of recessed portions defined in said side wall, said recessed portions being intermittently spaced in the circumferential direction on the surface of said side wall and said recessed portions acting to lighten the wheel and to aid prevention of blowholes during manufacture of the wheel;

a plurality of decorative openings disposed on said disk portion in the circumferential direction of the wheel; and

spoke portions disposed between said openings, said recessed portions being disposed on said side wall portion at positions corresponding to positions meeting said spoke portions, each of said spoke portions having a longitudinal axis, which radiates outwardly from the center of the wheel, and each of said recessed portions being aligned with one of said longitudinal axes such that said recessed portions are positioned on said axes.

4,861,114

PROPORTIONING CONTROL VALVE FOR USE WITH ANTILOCK DEVICE

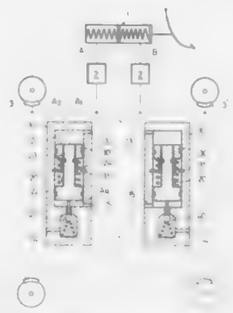
Koji Takata, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 27, 1988, Ser. No. 249,933

Claims priority, application Japan, Sep. 28, 1987, 62-245292

Int. Cl.[4] B60T *13/00*

U.S. Cl. 303—9.72 **1 Claim**



1. A proportioning control valve for use in an antilock device for a motor vehicle, comprising a cylinder; a first piston slidably mounted in said cylinder and having a first control input pressure receiving portion and a braking output pressure receiving portion; a second piston slidably mounted in said cylinder on said first piston and having a second control input pressure receiving portion; a spring having one end thereof in abutment with said first piston to bias it in the direction of application of the control input pressure and having the other end thereof in abutment with said second piston; a stopper means for limiting the movement of said second piston toward said first piston, said cylinder being formed with a control input port communicating with said first and second control input pressure receiving portions, a braking pressure output port communicating with said braking output pressure receiving portion, a braking input port; and a passage connecting said braking input port with said braking pressure output port; and a valve means provided in said passage and adapted to open when said first piston moves in the direction of application of the control input pressure and close when said first piston moves in the reverse direction to above.

4,861,115

ELECTRICALLY-CONTROLLED MOTOR VEHICLE BRAKE SYSTEM

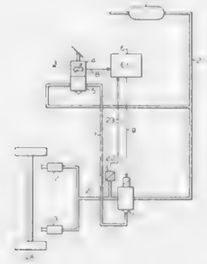
Erwin Petersen, Wunstorf, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 68,001, Jun. 29, 1987, abandoned, which is a continuation of Ser. No. 818,292, Jan. 13, 1986, abandoned. This application Oct. 24, 1988, Ser. No. 261,792

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1985, 3501179

Int. Cl.[4] B60T *8/38, 13/68*

U.S. Cl. 303—15 **12 Claims**



1. An electrically-controlled motor vehicle brake system which responds to pneumatic pressure supplied from a common source positioned on such motor vehicle and which exhausts said pneumatic pressure solely through an exhaust port of a brake valve means forming a portion of said vehicle brake system, said vehicle brake system comprising:

(a) an electronic control system positioned on such vehicle;

(b) a brake cylinder associated with each respective wheel brake on such vehicle to apply and release said each such respective wheel brake;

(c) at least one solenoid valve means which includes three fluid communication ports, a first of said three fluid communication ports is connected to receive pneumatic pressure from such source and a second of said three fluid communication ports is connected to communicate said pneumatic pressure to said brake cylinder of said each respective wheel brake, said at least one solenoid valve is electrically connected to receive a control signal from said electronic control system so that upon receipt of an appropriate control signal from said electronic control system said pneumatic pressure will be one of supplied to and exhausted from said each respective wheel brake; and

(d) a brake power selector positioned on such vehicle, said brake power selector including:

(i) a pedal-operated brake valve means connected on an input side thereof to receive pneumatic pressure from such source and connected on an output side thereof to a third fluid communication port of said at least one solenoid valve means for modulating braking pressure, said brake valve means including an exhaust for sole venting of said pneumatic pressure from said brake system to atmosphere; and

(ii) an electrical frequency selector connected to provide an input signal to said electronic control system upon actuation by an operator of such vehicle during a brake application.

4,861,116

ANTI-SKID AND DRIVE SLIP CONTROL SYSTEM

Wolfgang Bernhardt, Korntal, and Gerhard Wetzel, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 20, 1988, Ser. No. 246,705

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1987, 3741310

Int. Cl.[4] B60T *8/64*

U.S. Cl. 303—100 **20 Claims**



1. An anti-skid and drive slip control system for vehicles, with driven wheels having associated therewith a respective wheel brake cylinder, a multicircuit master cylinder communicating via a brake line with each said wheel brake cylinder, at least one first valve assembly connected with one of the driven wheels and located in a brake circuit and switchable in anti-skid and drive slip control situations by assuming switching positions for pressure buildup, pressure holding and pressure reduction at a wheel brake, at least one second valve assembly connected with one of the brake circuits and between the multi-circuit master cylinder and the first valve assembly, said second valve assembly connected between the multi-circuit master cylinder and the first valve assembly in one of the brake circuits is controllable only in a drive slip control situation, at least one pump element by which pressure fluid can be pumped into the brake line between the first and second valve assemblies, a third valve assembly in a pressure line connected with each undriven wheel in a brake circuit, said third valve assembly comprises first and second valves (**17***a*, **17***b*; **18***a*, **18***b*), of which said first valve (**17***a*; **18***a*) establishes or interrupts a connection with the wheel brake cylinder (**5**; **5***a*) of the undriven wheel and bypasses said second valve assembly (**6**; **6***a*), and said second valve (**17***b*; **18***b*) is located in a connection branching off from the brake line between the wheel brake cylinder (**5**; **5***a*) and said first valve (**17***a*; **18***a*) and leads to an inlet side (**20**; **29a**) of said pump element (**14**; **14***a*), and in the drive slip control situation, said first and second valves (**17***a*, **17***b*; **18***a*, **18***b*) are open.

4,861,117

BRAKE PRESSURE REGULATOR

Hans-Dieter Reinartz, Frankfurt am Main, and Helmut Steffes, Hattersheim, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 28, 1988, Ser. No. 264,475

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1987, 3737466

Int. Cl.[4] B60T *8/64*

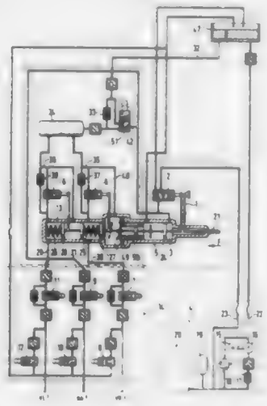
U.S. Cl. 303—100 **18 Claims**

1. A brake pressure regulator for a hydraulic brake system for use with automotive vehicles for carrying out anti-locking control and traction skid control the system having a master cylinder, wheel cylinder pressure modulator means for changing hydraulic pressure in wheel cylinders, wheel sensor means for generating sensor signals, electronic regulator means for receiving the generated sensor signals, for processing the received sensor signals in accordance with at least one control

algorithm, and for sending corrective variables to the wheel cylinder pressure modulator means, pressure fluid supply means for generating a hydraulic source pressure, a pressure fluid reservoir, and hydraulic brake force booster means actuable by a brake pedal for generating a controlled hydraulic booster pressure,

the improvement comprising:

valve means, disposed between said pressure fluid supply means, said wheel cylinder pressure modulator means, and said hydraulic brake force booster means for controlling traction skid, said valve means including a first member openable under hydraulic source pressure to control traction skid by establishing a hydraulic connection between



said pressure fluid supply means and said wheel cylinder pressure modulator means, and further including a second member movable upon termination of traction skid control and upon commencement of brake application under booster pressure, said second member establishing a hydraulic connection between said pressure fluid supply means and said wheel cylinder pressure modulator means while controlling said hydraulic source pressure adjusted to said control hydraulic booster pressure, wherein said first and second members include at least one plunger and ball combination such that the ball acts as a valve closing member and is displaceable from a valve seat by the plunger.

4,861,118

ANTI-LOCK BRAKE SYSTEM

Manfred Burckhardt, Waiblingen; Franz Brugger, Weinstadt, and Andreas Faulhaber, Winnenden, all of Fed. Rep. of Germany, assignors to Dailmer-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jan. 26, 1989, Ser. No. 301,959

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1988, 3802132; Nov. 19, 1988, 3839178

Int. Cl.[4] B60K *28/16;* **B60T** *8/32, 13/12*

U.S. Cl. 303—110 **12 Claims**

1. Anti-lock brake system (ABS) for a road vehicle which is also equipped with a wheel slip control system (ASR) which operates on the principle of decelerating a vehicle wheel tending to spin by activating its wheel brake so that wheel slip remains held within a defined range of values compatible with adequate directional stability, wherein:

the brake system is a hydraulic dual-circuit brake system having two static brake circuits, one brake circuit being allocated to the undriven wheels of the vehicle and the other brake circuit being allocated to the driven wheels of the vehicle;

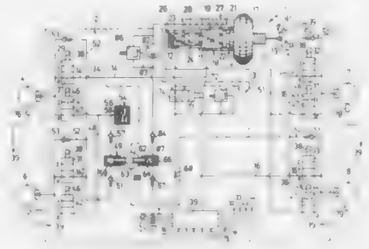
a brake unit is provided for supplying brake pressure to the two brake circuits, and has a primary and a secondary output-pressure space, one of which is allocated to each of the brake circuits respectively and from which brake unit, pressures can be applied to the brake circuits after being built up by a pedal-force-controlled displacement of piston means in said brake unit which movably delimits the output pressure spaces;

a high-pressure pump means is provided for each of the two brake circuits to feed brake fluid into the output pressure spaces of the brake unit in control phases of the ABS system for the purpose of preventing the brake circuits from becoming empty as well as to obtain a warning as to the activation of the ABS system;

the high-pressure pump means for the brake circuit of the driven vehicle wheels also provides an auxiliary pressure source for the ASR system to supply brake pressure to the wheel brake(s) of the driven wheels subjected to wheel slip under control of brake pressure control valve means individually allocated to the wheel brakes;

means connecting and disconnecting the brake circuit of the driven vehicle wheels to the secondary output-pressure space, which is separated with respect to the primary output-pressure space of the brake unit by a floating piston of the piston means, in response to output signals from an electronic control unit means by an ASR control valve means for the duration of control cycles of the ASR system;

the ASR control valve means assuming a throughflow position during normal braking mode and braking mode sub-



jected to an anti-lock control, wherein the brake circuit of the driven vehicle wheels is connected to the secondary output-pressure space of the brake unit;

the brake circuit of the undriven wheels of the vehicle operating on the feedback principle during ABS system control, wherein during pressure reduction phases of the anti-lock control, brake fluid is discharged from at least one of the wheel brakes of the undriven vehicle wheels and is pumped back into the primary output-pressure space of the brake unit;

the brake circuit of the driven vehicle wheels, operating on the discharge principle during ABS system control wherein, during brake pressure reduction phases of the antilock control, brake fluid is discharged at one of the wheel brakes of the driven vehicle wheels and is channelled off towards a brake fluid reservoir of the brake system and wherein for a duration of the activation of the ABS system, brake fluid is pumped out of the reservoir into the secondary output-pressure space by a high-pressure pump;

inlet pressure control valve means and an outlet pressure control valve means are provided for each wheel brake of the driven vehicle wheels;

said inlet and outlet valve means being separately controllable by output signals from the electronic control unit means;

a neutral position of the inlet valve means being their throughflow position;

an excited position of the inlet valve means being their blocking position;

a neutral position of the outlet valve means being their blocking position;

an excited position of the outlet valve means being their throughflow position;

wherein if a signal characteristic of activation of the ASR control is still present at the beginning of braking, the electronic control until means generates output signals for a specifiable retardation period t_r, the duration of which is between 100 and 300 ms;

and wherein the output signals hold the ASR control valve means in its blocking position switches the inlet valve means back into their neutral position sets the outlet valve means into their excited position and switches off the drive of the high-pressure pump.

4,861,119

PRESSURE MODULATOR FOR AN ANTI-LOCK VEHICLE WHEEL BRAKING SYSTEM

Milorad Zivkovic, Filderstadt, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 19, 1988, Ser. No. 286,084

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1987, 3743187

Int. Cl.[4] B60T *8/42*

U.S. Cl. 303—115 **9 Claims**



1. A pressure modulator for a vehicle hydraulic brake system having wheel brakes which are connected via a brake circuit to a brake operator means through the pressure modulator and wherein an anti-locking braking control means modifies the operation of the brake operator means by causing the pressure modulator to reduce the brake pressure applied to the wheel brakes in response to an anti-locking signal from the anti-locking brake control means and

wherein the pressure modulator comprises: a housing, a moveable modulator piston means, a control pressure space, and an annular modulation chamber;

an auxiliary pressure source means;

a sump means;

a control valve means for alternatively connecting said auxiliary pressure source means and said sump means to said control pressure space;

wherein connection of said auxiliary pressure to said control pressure space by said control valve means causes said modulator piston means to reduce the size of said annular modulation chamber to a minimum volume; and

wherein connection to said sump enlarges the size of said annular modulation chamber to a maximum volume;

the modulation chamber being connected to the pressure in the brake circuit coming from the brake operator;

automatic valve means for opening and closing the connection between the annular modulation chamber and the brake operator upon an activation of the anti-lock control means;

wherein when the control-pressure space is connected by the control valve means to the sump means it is relieved of pressure and the modulator piston means is forced by a pre-stressed modulator spring into an end position increasing the size of the modulation chamber to its maximum;

wherein the modulation chamber has two movable sides, as seen in the axial direction, with one moveable side created by a radial flange of a first central piston element of said modulator piston means, and with the other moveable side created by a piston step of a second annular piston element of said modulator piston means, which surrounds an inner portion of the first central piston element co-axially;

a bore step in said modulator housing with a diameter which is larger than a diameter of the annular modulation chamber;

the two piston elements each having a piston flange means guided displaceably in a pressure-tight manner for forming two axially moveable sides of the control-pressure space in said bore step; and wherein;

the connection of the auxiliary-pressure source to the controlled pressure space by the control valve means causes the central piston element to be forced, counter to the pre-stress of the modulator spring means to axially move the first and second piston elements into an end position limited by the second annular piston and in which an axial distance between piston faces of the first and second piston elements delimit the volume of the modulation chamber axially to a minimum.

4,861,120

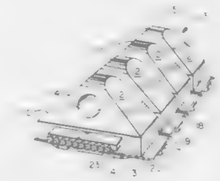
MODULAR ENDLESS TRACK DRIVE SYSTEM AND METHODS OF MAKING, INSTALLING AND REPAIRING SAME

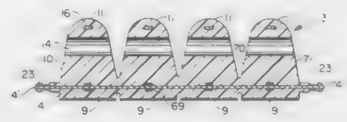
John W. Edwards, Brandon; Daniel R. Harper, and Quinton B. McNew, both of Ft. Myers, all of Fla., assignors to Edwards, Harper, McNew & Company, Fort Myers, Fla.

Filed May 14, 1987, Ser. No. 49,819

Int. Cl.[4] B62D *55/20*

U.S. Cl. 305—35 R **55 Claims**





1. An endless track drive module comprising:

at least one connector member; and

a polymeric structure encasing all but ends of said at least one connector member;

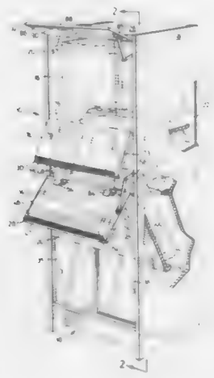
said polymeric structure forming a plurality of endless track drive members, each said drive member including at least one drive face, and said ends of said connector member respectively extending from opposite longitudinal ends of said drive module.

4,861,121

SPACE EFFICIENT CABINET FOR HOUSING A COMPUTER WORK STATION

Lasar Gotz, Don Mills, Canada, assignor to Lam-Wood Products Inc., Rexdale, Canada

Filed Oct. 1, 1987, Ser. No. 103,337
Int. Cl.[4] A47B *21/00*
U.S. Cl. 312—208 **7 Claims**



1. A space efficient cabinet for housing a computer work station having at least a computer, a video display monitor and keyboard, said cabinet comprising:

two generally opposed upstanding side walls, opposed front and back walls positioned at right angles to said side walls, and a horizontal top, said front wall comprising a plurality of hingeable partitions, each having at least an open position and a closed position and being moveable therebetween, said partitions comprising

a first rectangular partition adopted to carry said keyboard on an inner face, said first partition having opposed top and bottom edges and opposed side edges, said top and bottom edges being at least slightly longer than the length of said keyboard, said side edges being at least slightly longer than the width of said keyboard,

a second rectangular partition having a pair of opposed side edges and opposed top and bottom edges and being adapted to carry documentary material on an inner face; and

a third rectangular partition having a pair of opposed side edges and opposed top and bottom edges, the sum of the length to one side edge of said second partition plus the length of one side edge of said third partition being slightly greater than the height of said video display monitor,

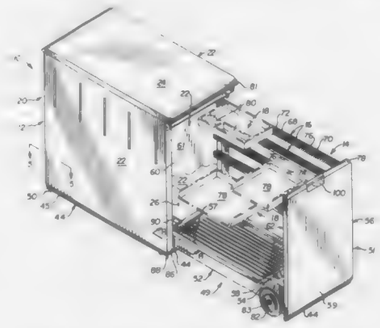
said cabinet further including at least one horizontal shelf running between said side walls for supporting said video display monitor behind said second and third partitions when said second and third partitions are in the closed position, and at least one angled shelf, running between said side walls for carrying said computer, said angled shelf being angled downwardly from front to back relative to the horizontal, and having an upper edge located adjacent said first partition, said computer being accessible when said first partition is in the open position, said side walls of said cabinet being only sufficiently long from front to back to accommodate said video display monitor and any electrical connections thereto, said cabinet, when said partitions are all closed, occupying a minimum of floor space, and when said partitions are open, providing a computer work station wherein said first partition forms an extended keyboard support, said second partition forms an extended document holder and said third partition substantially shades said video display monitor from overhead glare.

4,861,122

STORAGE CABINET

Thomas J. Newhouse, Grand Rapids; Lynne M. Allen, Holland, and Donald D. Goeman, Holland, all of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Continuation-in-part of Ser. No. 59,543, Jun. 8, 1987. This application Jun. 1, 1988, Ser. No. 200,950
Int. Cl.[4] A47B *91/00*
U.S. Cl. 312—317.1 **16 Claims**



1. In a cabinet comprising a housing and a drawer, said housing including a base, said base adapted to rest on a floor, said drawer being slidably received in said housing for movement between open and closed conditions, said drawer having support means adapted to support said drawer from said floor at least in said open condition, the improvement wherein:

said drawer comprises support means having first and second support elements, said first support element being adapted to support said drawer from said floor at least in said open condition of said drawer, said second support element being connected to said first support element and extending outwardly therefrom, said second support element being spaced above said first element relative to said floor; and

said housing further comprises positioning means disposed adjacent an outer edge of said base and adapted to engage said second support element when said drawer is moved to said closed condition to dispose said drawer in a predetermined position relative to said housing regardless of height of said housing relative to said floor and contour of said floor.

4,861,123

INTEGRAL SLIDE FORMED FROM DRAWER SHELL

Milo F. Russell, Waterloo, Iowa, assignor to Waterloo Industries, Inc., Waterloo, Iowa

Continuation of Ser. No. 110,554, Oct. 19, 1987, abandoned, which is a continuation of Ser. No. 621,423, Jun. 18, 1984, abandoned. This application Nov. 2, 1988, Ser. No. 268,670
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—330.1 **3 Claims**

1. A drawer in a cabinet having a bottom, sidewalls including integral opposed drawer slides, a front wall, and a back wall formed from a single metal sheet by a process comprising the steps of:

bending a back portion of said single metal sheet to form a back boundary of said bottom and said back wall;

bending a front portion of said single metal sheet to form a front boundary of said bottom and said front wall;

bending two side portions of said single metal sheet along a multiplicity of side fold lines to form boundaries of said bottom and said sidewalls; said multiply folded sidewalls each having a continuous cross-section including a lower sidewall portion extending from said side boundary, a lower slide portion, a central slide portion substantially coplanar with said lower sidewall portion, and an upper slide portion to engage said cabinet;

said lower, central and upper slide portions defining one of said integral opposed drawer slides;

said lower slide portion including first and fourth lower segments extending adjacently and substantially perpendicularly from said lower sidewall portion and second and third lower segments extending at a first predetermined angle from said first and fourth segments, respectively;

said upper slide portion including first and fourth upper segments extending substantially adjacently and substantially perpendicular from said central slide portion and including second and third upper segments extending at a second predetermined angle from said first and fourth upper segments, respectively.

4,861,125

SUSPENSION ASSEMBLY FOR A SCANNING MIRROR

John L. Vaught, Palo Alto, Calif., assignor to Tencor Instruments, Mountain View, Calif.

Filed May 6, 1988, Ser. No. 190,760
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.6 **16 Claims**



1. Oscillatory scanning apparatus comprising,

a fixed body,

a first and a second flexural suspension, each having a least one pair of spaced apart, crossed flexure legs, each flexure leg having a first end attached to said fixed body and having a second end and a radial stiffness exceeding a torsional stiffness,

a vibratory body secured at said second ends of said first flexural suspension in spaced-apart relation to said fixed body, said vibratory body having a reflector means mounted thereon, and

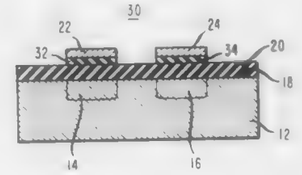
a drive means for varying the angular position of said vibratory body about an axis of rotation defined by distortion of said flexure legs of said first flexural suspension, said drive means mounted on said second ends of said second flexural suspension in spaced-apart relation to said fixed body for oscillation about said axis of rotation, thereby providing a force on said fixed body which is substantially equal in magnitude and opposite in phase to a force exerted by angular displacement of said vibrating body.

4,861,126

LOW TEMPERATURE INTRINSIC GETTERING TECHNIQUE

Mindaugas F. Dautartas, Macungie; Alain S. Harrus, Philadelphia; Edward P. Martin, Jr., Bethlehem, and Fred A. Stevie, Upper Macungie Township, Lehigh County, all of Pa., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 115,286, Nov. 2, 1987. This application May 5, 1988, Ser. No. 190,721
Int. Cl.[4] G02B *6/12*
U.S. Cl. 350—96.11 **6 Claims**



1. An integrated optical device formed in a substrate of optically anisotropic material which includes mobile alkali ions, said device comprising

waveguiding means formed in said substrate;

dielectric means disposed over said waveguiding means;

electrode means overlaying said waveguiding means; and

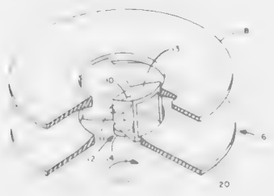
an annealed gettering material disposed between said dielectric means and said electrode means, said gettering material including alkali ions which migrated from the said substrate during an annealing process.

4,861,124

DUAL-SECTION SPATIAL MODULATION TRANSMITTER

Kenneth D. Labaugh, Milford, N.H., and John D. Kuppenheimer, Jr., Tewksbury, Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Continuation-in-part of Ser. No. 49,192, May 13, 1987, abandoned. This application Oct. 3, 1988, Ser. No. 252,461
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.5 **6 Claims**



1. A spatial modulation transmitter, comprising:

a source of incoherent radiation;

at least one étendue preserving rotatable collector to collect the radiation emitted by said source of incoherent radiation and form at least one beam;

said source of incoherent radiation being arranged within said étendue preserving rotatable collector so as to allow said rotatable collector to collect substantially all of the radiation emitted from the source;

said rotatable collector configured so as to separately shape said beam in azimuth and in elevation;

means for rotating said collector so as to scan the beam spatially; and

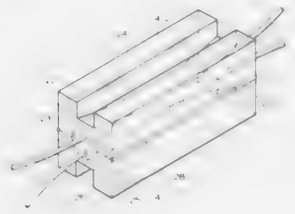
a stationary collector arranged above and below said rotatable collector and so disposed so as to preserve étendue and further shape the beam, said stationary collector extending beyond the rotatable collector so as to limit the angular extent of the beam.

4,861,127

OPTICAL COUPLER

Michael Failes, Moffat, Canada, assignor to Canadian Instrumentation & Research Ltd., Burlington, Canada

Filed May 9, 1988, Ser. No. 191,399
Int. Cl.[4] G02B *6/26*
U.S. Cl. 350—96.15 **14 Claims**



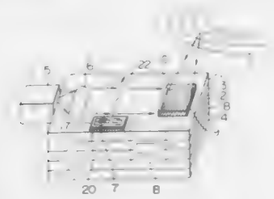
1. An improved optical contact coupler which comprises two optically contacted optical fibers in a substrate, wherein the externally induced stress on the fibers in the region of optical contact is reduced by selecting a substrate material which has a defined coefficient of expansion and wherein the thermal expansion coefficient is near as possible to the mean of the optically contacted fiber assembly in the centre of the coupler.

4,861,128

OPTICAL PICKUP USING A WAVEGUIDE

Sachiko Ishikawa, Braunschweig, Fed. Rep. of Germany, and Akira Arimoto, Kodaira, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 3, 1988, Ser. No. 151,964
Claims priority, application Japan, Feb. 4, 1987, 62-22308
Int. Cl.[4] G02B *6/10;* **G01D** *9/00;* **G11B** *7/00*
U.S. Cl. 350—96.13 **18 Claims**



1. An optical pickup comprising:
a semiconductor laser which emits a linearly polarized light;
a first waveguide for leading light emitted from said semiconductor laser to recording medium recording information and coupling again light returning from said recording medium;
splitting means comprising a mode splitter for separating said light returning from said recording medium from said first waveguide using its polarization direction; and
a second waveguide propagating light returning from said recording medium and separated by said splitting means.

4,861,129

INORGANIC-ORGANIC COMPOSITE COMPOSITIONS EXHIBITING NONLINEAR OPTICAL RESPONSE

Tessie M. Che, Westfield; Dagobert E. Stuetz, Watchung; Alan Buckley, Berkeley Heights, all of N.J., and Donald R. Ulrich, Alexandria, Va., assignors to Hoechst Celanese Corp., Somerville, N.J.

Division of Ser. No. 15,759, Apr. 17, 1987. This application Oct. 24, 1988, Ser. No. 261,582
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.13 **4 Claims**

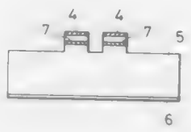
1. In an optical light switch or light modulator device the improvement which comprises an optical medium element comprising a composite composition consisting of an inorganic oxide glass monolith with a microporous structure containing an organic component which exhibits nonlinear optical response; wherein the glass monolith microporous structure has an average pore diameter in the range between about 50–300 angstroms, and substantially all of the pores in the microporous structure have diameters within about 100 angstroms diameter variation range.

4,861,130

OPTICAL MODULATING DEVICE UTILIZING POLARITON SUBSTANCE

Toshio Katsuyama, Hachioji; Hiroyoshi Matsumura, Saitama; Hiroaki Inoue, Hachioji; Tadashi Fukuzawa, Tokyo, and Naoki Chinone, Chofu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 26, 1987, Ser. No. 112,494
Claims priority, application Japan, Oct. 29, 1986, 61-255649; Feb. 12, 1987, 62-18203
Int. Cl.[4] G02F *1/015*
U.S. Cl. 350—96.14 **22 Claims**



19. An optical device comprising:
a polariton substance having a super-lattice structure of GaAs/AlGaAs; and
a pair of electrodes, at least one of which transmits light;
said polariton substance receiving incident light and absorbing the incident light so as to generate polaritons therein for emitting modulated light.

4,861,131

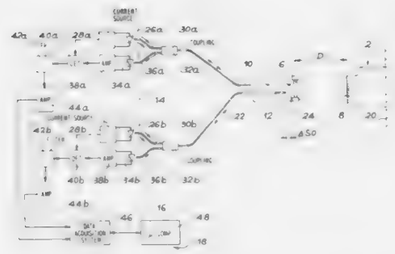
DISPLACEMENT TRANSDUCER WITH STAGGERED OPTICAL FIBRES

Emmanuel Bois, Massy; Serge Huard, Aubagne, and Gilbert Boisde, Bures sur Yvette, all of France, assignors to Sick-Optique-Electronique, Emerainville and Commissariat a l'Energie Atomique, Paris, both of, France

Filed May 4, 1988, Ser. No. 190,058
Claims priority, application France, May 11, 1987, 87 06577
Int. Cl.[4] G02B *6/32*
U.S. Cl. 350—96.18 **6 Claims**

1. An optical transducer for determining the longitudinal displacement, relative to said transducer, of an object reflecting optically in a given range of optical wavelengths, said transducer comprising:
an optical system, the object being positioned facing one face of said optical system,
a first and a second optical fibre being at a predetermined distance with respect to the optical system and located on either side of the optical axis of said optical system and whereof the respective ends are positioned facing the other face of the optical system and are longitudinally staggered along said optical axis,
first means for emitting light of a wavelength belonging to said range and for injecting said light into the other end of the first optical fibre with a view to supplying it to the object via the optical system,
first means for the recovery of light and for detecting the light returned to the other end of the first fibre after reflection on the object, the first detection means then supplying a first electric signal,





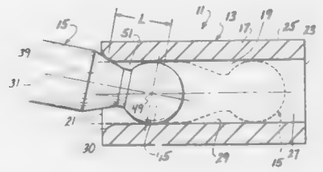
second means for emitting light of a wavelength belonging to said range and for injecting said light into the other end of the second fibre with a view to supplying it to the object via the optical system,
second means for the recovery of light and for the detection of light returned to the other end of the second fibre after reflection on the object, the second detection means then supplying a second electric signal and
electronic means for the processing of said first and second signals for determining on the basis of the latter the displacement of the object relative to the optical system.

4,861,132

SELF-ALIGNING PRECISION GUIDE PIN

Norbert L. Moulin, Placentia, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 23, 1987, Ser. No. 124,235
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **3 Claims**



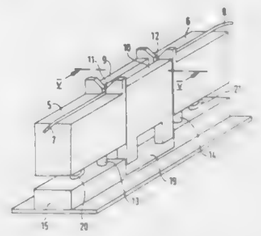
1. A precision guide assembly comprising:
a receptacle having an at least part-cylindrical passage and an outer surface, said passage having an axis and an opening at the outer surface;
a guide pin sized to be inserted into the passage of the receptacle and having an axis;
said guide pin having a head with a part-spherical surface and an at least part-cylindrical stem joined to the head by a neck;
said part-spherical surface extending proximally and distally from a diameteral plane perpendicular to the axis of the guide pin;
said stem and said part-spherical surface of said head having substantially the same diameter and a lesser diameter than the diameter of the passage so that the guide pin can be slid into the passage;
said neck having a cross-sectional dimension less than the diameter of the stem and an inclined surface which is inclined with respect to the axis of the guide pin so that the inclined surface extends radially inwardly as it extends distally; and
wherein the clearance between said passage and said stem is less than 0.001 percent of the diameter of said stem.

4,861,133

DEVICE FOR APPLYING A SPLICE PROTECTOR TO OPTICAL CONDUCTORS

Georg Blume; Dieter Bohmwetsch, both of Backnang, and Fritz Eckardt, Oppenweiler, all of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Mar. 25, 1988, Ser. No. 173,450
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 3710089
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.2 **6 Claims**



1. A device for attaching a splice protector to a splice provided between two conductors; said splice protector having two facing plates for accommodating the splice therebetween, comprising
(a) a base;
(b) a receiving means mounted on said base for receiving the splice protector in an open state thereof, wherein the plates thereof are in a spread-apart position; said receiving means having a length dimension and opposite ends;
(c) two backup members situated at each end of said receiving means and having supporting faces for supporting the two conductors while the splice extends between the splice protector positioned in said receiving means;
(d) mounting means for holding said backup members on said base for motion relative to said base and in a direction perpendicular to said supporting faces;
(e) pressing jaws mounted on at least one of said backup members; said pressing jaws being disposed bilaterally of said receiving means relative to the length dimension thereof; at least one of said pressing jaws being pivotally attached to said one backup member for a pivotal motion towards and away from the other pressing jaw about an axis generally parallel to said length dimension; and

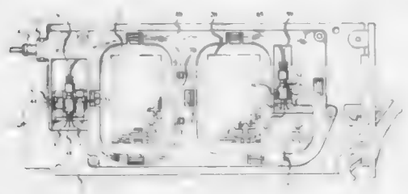
(f) force-transmitting means for applying to the pivotally attached pressing jaw a force component of an external force upon motion of said backup members towards said base in response to said external force for effecting a relative displacement of said pressing jaws towards one another to compress the plates of the splice protector toward one another about said splice.

4,861,134

OPTO-ELECTRONIC AND OPTICAL FIBER INTERFACE ARRANGEMENT

George M. Alameel, Duluth, Ga., and Alexander Petrunia, Madison, N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 29, 1988, Ser. No. 213,003
Int. Cl.[4] G02B *6/36*; H01J *5/16*
U.S. Cl. 350—96.20 **15 Claims**



1. An optical fiber organizing arrangement comprising:
a closed loop trough for retaining optical fibers;
means for directing a plurality of optical fibers into the closed loop trough at different locations therealong;
means disposed in said closed loop trough for selectively interconnecting the optical fibers;
said closed loop trough having first and second portions and at least one optical fiber retaining channel forming a passageway for optical fibers between the first and second portions to change the direction of optical fiber passing therethrough between clockwise and counter-clockwise directions,
said each of the first and second closed loop trough portions comprises a generally U shaped portion having first and second ends,
the first ends of the U shaped portions being joined together and the second ends of the U shaped portions being joined together to form the closed loop; and
said at least one optical fiber retaining channel forming an optical fiber passageway between the first and second U shaped portions.

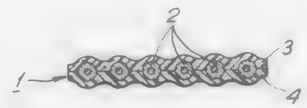
4,861,135

RIBBON CABLE WITH OPTICAL WAVEGUIDES

Peter Rohner, Isernhagen, and Gerhard Ziemek, Langenhagen, both of Fed. Rep. of Germany, assignors to Kabelmetal Electro Gesellschaft mit beschränkter Haftung, Hanover, Fed. Rep. of Germany

Filed Feb. 16, 1988, Ser. No. 156,280
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1987, 3706323
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 **7 Claims**

1. A ribbon cable with light waveguides comprising
a ribbon-shaped support material comprising two ribbons provided on a facing side thereof with an adhesive layer,
at least two light waveguides extending parallel to each other being embedded, spaced apart from each other, in said ribbon-shaped support material, such that the light waveguides are laminated between said two ribbons, said two ribbons extending towards each other to contact each other between each of said light waveguides and to contact completely the side surfaces of the respective light waveguides, said ribbons being bonded to the complete side surfaces of said light waveguides, said ribbons being bonded to each other at points of contact between said light waveguides, and wherein



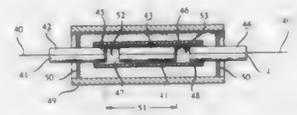
said ribbons have a coefficient of thermal expansion corresponding to that of said light waveguides.

4,861,136

OPTICAL COMMUNICATION SYSTEMS USING FABRY-PEROT CAVITIES

Julian Stone, Rumson, and Lawrence W. Stulz, Neptune, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 15, 1987, Ser. No. 72,956
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.3 **8 Claims**



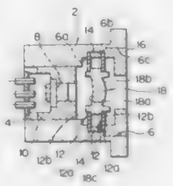
1. An optical communication system comprising:
(a) means for wavelength multiplexing at least two optical signals
(b) means for transmitting the multiplexed signals to a receiver, the receiver comprising a Fabry-Perot cavity bounded by reflecting surfaces the invention characterized in that
the cavity region includes a waveguiding portion and a non-waveguiding portion.

4,861,137

MOUNTING DEVICE FOR A RESIN LENS

Niro Nagata, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 14, 1987, Ser. No. 134,973
Claims priority, application Japan, Dec. 19, 1986, 61-301347
Int. Cl.[4] G02B *7/02*
U.S. Cl. 350—253 **12 Claims**



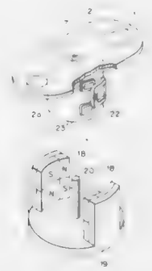
1. A temperature compensating mounting device for a refractive lens, comprising:
a light source;
means for supporting the light source; and
temperature compensating means, deformable in response to a temperature change, for displacing the lens in respect to the light source, the temperature compensating means being donut-shaped and having:
an outer peripheral edge supported by the supporting means;
and
an inner peripheral edge supporting the lens and displaceable with reference to the outer peripheral edge in response to a temperature change.

4,861,138

DEVICE FOR DRIVING OPTICAL PARTS OF AN OPTICAL PICKUP

Jun Suzuki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 11, 1988, Ser. No. 179,802
Claims priority, application Japan, Apr. 17, 1987, 62-94711
Int. Cl.[4] G02B *7/02*
U.S. Cl. 350—255 **15 Claims**



9. A device for driving optical parts of an optical pickup comprising:
a base having a circular plate;
a holding member including a cylindrical portion;
a pair of first and second adjacent coil means disposed on an outer circumferential portion of said cylindrical portion; and
a magnetic means fixedly connected to said circular plate, said magnetic means having first and second adjacent magnetic pole surfaces opposing corresponding first and second coil means, each of said first and second magnetic pole surfaces being constituted by adjacent different magnetic poles oriented in such a manner that magnetic poles of said first magnetic pole surfaces are different than the adjacent magnetic poles of said second magnetic pole surface so as to generate a magnetic field that is disposed perpendicularly to the magnetic field of the other magnetic pole surface.

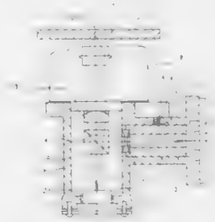
4,861,139

APPARATUS FOR POSITIONING AN OPTICAL ELEMENT

Nobuyoshi Andou, and Hitoshi Imai, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki, Tokyo, Japan

Filed Jul. 22, 1988, Ser. No. 222,764
Claims priority, application Japan, Jul. 24, 1987, 62-114012[U]
Int. Cl.[4] G02B *7/02*
U.S. Cl. 350—255 **11 Claims**

1. Apparatus for positioning an optical element comprising:
a housing member having a guide bore formed therein, the bore being aligned along an optical axis;
a holder axially movable within the guide bore;
an optical element attached to the holder so as to be movable along the optical axis;
the housing member having a tapped hole disposed substantially perpendicular to the optical axis, said tapped hole terminating short of the guide bore and having defined at the base thereof a deformable bottom wall portion provided between the tapped hole and guide bore; and



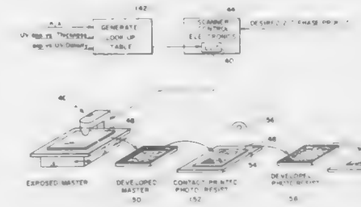
a screw having a first end which is screwed into the tapped hole to cause the bottom wall portion to deform and engage the holder for fixing the holder to the housing member.

4,861,140

METHOD OF MAKING A THIN LENS

Richard D. Lacitte, Holcomb; Paul W. Melnychuck, West Henrietta; Joseph J. Murray, Rochester; Lawrence A. Ray, Brockport, and James R. Sullivan, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/US88/00155, § 371 Date Jan. 13, 1988, § 102(e) Date Jan. 13, 1988
PCT Filed Jan. 13, 1988, Ser. No. 242,260
Int. Cl.[4] G02B *27/00*
U.S. Cl. 350—320 **7 Claims**



7. A method of making a continuous phase mask having a desired two-dimensional continuous phase profile, for shaping the spot from a laser beam having a wavelength λ, comprising the steps of:
a. providing a layer of UV sensitive photoresist transparent to laser light of wavelength λ, said photoresist having a known index of refraction and thickness versus UV exposure response;
b. providing a high resolution photographic film, said film having a known exposure versus UV density response;
c. cascading the known index of refraction, thickness versus UV exposure response, and exposure versus density response to produce a computer look-up table of integer code values necessary to effect the desired phase response in the final step of fabrication;
d. exposiing said high resolution film in a film scanner with said two-dimensional phase profile employing said look-up table to determine exposure values from desired phase values;
e. developing the exposed photographic film to produce an intermediate mask;
f. contact printing said intermediate mask onto said layer of photoresist with UV exposure; and
g. developing the exposed layer of photoresist to produce said continuous phase mask.

4,861,141

ELECTRO OPTICAL DEVICE AND METHOD FOR MANUFACTURING SAME

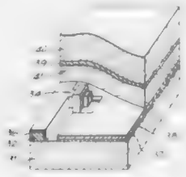
Takashi Nakazawa, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 700,213, Feb. 11, 1985. This application Apr. 6, 1988, Ser. No. 177,794

Claims priority, application Japan, Feb. 7, 1984, 59-20485

Int. Cl.[4] G02F *1/133*

U.S. Cl. 350—336 **25 Claims**



1. A metal-insulator-metal device, formed on a substrate, comprising:

a first metal film selectively patterned on the substrate;

an insulating film on said first metal film;

a transparent second metal film formed on the substrate in the configuration of a display electrode and on the insulating film so that at least a portion of the transparent second metal film is opposed to a portion of the first metal film with the insulating film between, to form a metal-insulator-metal structure; and

a transparent picture cell electrode formed from a different material than the second metal film on said second metal film in the same configuration and shape as the second metal film to overlap completely the second metal film.

4,861,142

PROJECTION TYPE LIQUID CRYSTAL DISPLAYING DEVICE

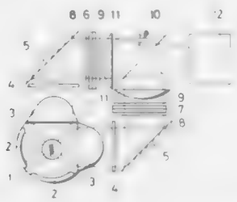
Sakae Tanaka; Tadahiko Yamaoka; Shingo Takahashi, and Tomoaki Takahashi, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan

Filed May 12, 1987, Ser. No. 49,718

Claims priority, application Japan, May 12, 1986, 61-108257; Jul. 8, 1986, 61-159934

Int. Cl.[4] G02F *1/13, 1/23;* G03B *21/26*

U.S. Cl. 350—345 **3 Claims**



1. A projection type liquid crystal displaying device comprising: a light source; condenser lenses for splitting light emitted from said light source into two orthogonal groups of beams of substantially parallel light; two optical reflection means, each in the path of one of the beams of light, for effecting the beams of the light of the two groups to reflect at a right angle to an area in which the beams of light of the two groups cross each other; a dichroic mirror disposed in said area for synthesizing beams of the light from the two optical reflection means including means for transmitting the light coming from one of said optical reflection means and for reflecting the light from the other of said optical reflection means; a liquid crystal panel comprising green picture elements disposed between said dichroic mirror and one of said optical reflection means; a liquid crystal panel comprising red and blue picture elements disposed between said dichroic mirror and the other of said optical reflection optical means; and projection means for projecting beams of the light from said dichroic mirror.

4,861,143

LIQUID CRYSTAL DISPLAY CAPABLE OF DISPLAYING GRAY TONE

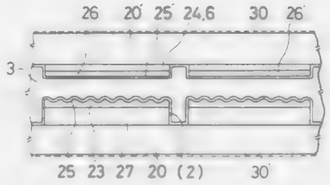
Shunpei Yamazaki, Tokyo; Takashi Inujima, Atsugi; Toshimitsu Konuma, Atsugi; Toshiji Hamatani, Atsugi; Akira Mase, Atsugi; Mitsunori Sakama, Hiratsuka; Minoru Miyazaki, Atsugi; Kaoru Koyanagi, Saku, and Toshiharu Yamaguchi, Zama, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Division of Ser. No. 895,029, Aug. 8, 1986, abandoned. This application Dec. 2, 1987, Ser. No. 127,433

Claims priority, application Japan, Aug. 8, 1985, 60-175193

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—350 S **4 Claims**



1. A display device comprising:

a liquid crystal device including a transparent substrate, an opposed substrate, a smectic liquid crystal layer disposed between said substrates and a pair of electrodes formed on the both insides of said substrates in order to define a plurality of pixels, each said pixel of said liquid crystal device being provided with a corrugated inside surface contiguous to said liquid crystal layer so that a number of narrower liquid crystal layer regions and a number of wider liquid crystal layer regions are disposed over each pixel;

means for applying a first voltage to said pair of electrodes so that said liquid crystal device is made transparent inbetween;

means for applying a second voltage to said pair of electrodes so that said liquid crystal device is made opaque inbetween; and

means for applying an intermediate voltage between said first and second voltages to said pair of electrodes so that each said pixel subjected to said intermediate voltage is provided with a grey scale tone.

4,861,144

FIELD CORRECTION APPARATUS

James T. Russell, Bellevue, Wash., assignor to Optical Recording Corporation, Toronto, Canada

Filed Feb. 29, 1988, Ser. No. 162,299

Claims priority, application Canada, Nov. 30, 1987, 553063

Int. Cl.[4] G02B *26/10*

U.S. Cl. 350—412 **20 Claims**

1. An optical system comprising:

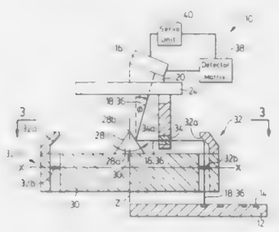
support means rotatable about an axis and having at least one lens means spaced from said axis;

drive means rotating said support means about said axis;

a source for generating an optical beam;

optical distributing means to direct said optical beam from said source to said lens as said lens means passes across a record medium; and

field correction means receiving said optical beam from said distributing means and altering the path of said optical beam so that said optical beam between said field correction means and said lens means is substantially coincident with a line extending from the optical axis of said lens means to the axis of rotation of said support means.



4,861,145

SMALL-SIZE ZOOM LENS OF WIDELY VARIABLE MAGNIFICATION

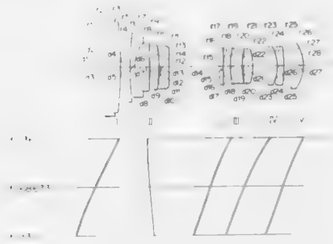
Shuichi Kikuchi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

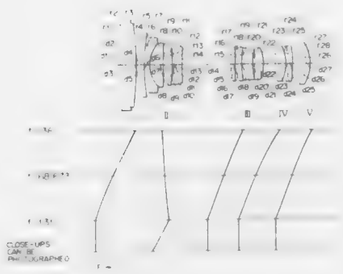
Filed Jun. 29, 1988, Ser. No. 213,250

Claims priority, application Japan, Jun. 30, 1987, 62-163696; Jun. 30, 1987, 62-163697

Int. Cl.[4] G02B *15/20, 15/22*

U.S. Cl. 350—427 **5 Claims**





1. A zoom lens comprising, successively in order from an object toward an image, a first lens group having positive refracting power, a second lens group having negative refracting power, a third lens group having positive refracting power, a fourth lens group having positive refracting power, and a fifth lens unit having negative refracting power, said first lens group, said third lens group, said fourth lens group, and said fifth lens unit being movable toward the object, and said second lens group being movable toward the image for zooming the zoom lens from a wide angle setting toward a telephoto setting, said zoom lens meeting the following conditions:

(i) $1.5<|f_5/f_W|<6$

(ii) $f_4>|f_5|$

(iii) $D_{3W}<D_{3M}$

where f_4 is the focal length of the fourth lens group, f_5 is the focal length of the fifth lens unit, f_W is the focal length of the zoom lens at the wide angle end, D_{3W} is the distance between the third and fourth lens at the wide angle end, and D_{3M} is the distance between the third and fourth lens groups when the focal length of the zoom lens is

$$f_M = \sqrt{f_W \cdot f_T}$$

where f_T is the focal length of the zoom lens at the telephoto end.

4,861,146

VARIABLE FOCAL LENS DEVICE

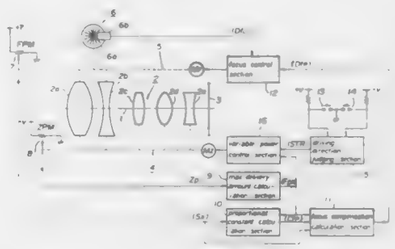
Takayuki Hatase, Yokohama, and Yoshimi Ohno, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 21, 1988, Ser. No. 146,394

Claims priority, application Japan, Jan. 24, 1987, 62-13345; May 22, 1987, 62-123877; May 26, 1987, 62-128775; May 26, 1987, 62-128776

Int. Cl.[4] G02B *7/11*

U.S. Cl. 350—429 **10 Claims**



1. A variable focal lens device having an optical system comprising a variable power lens group and a focusing lens group disposed on one identical optical axis in which a deviation of a focusing position is resulted from an identical object when the focusing lens group is set at a predetermined focusing position from a nearest position to an infinite position on the optical axis corresponding to an object distance from a nearest distance to an infinite distance and then moving said variable power lens group along the optical axis thereby renewing an entire system focal length of said variable power optical system from a first focal length to a second focal length wherein said device comprises;

a focal length detection means for detecting said entire system focal length,

a focusing lens group position detection means for detecting a position of said focusing lens group on said optical axis,

a maximum delivery amount computing means for receiving an output from said focal length detection means and computing a delivery amount of said focusing lens group from said infinite position to said nearest position for said entire system focal length,

a proportional constant computing means for receiving outputs from said maximum delivery amount computing means and from said focusing lens group position detection means respectively and computing a ratio between said outputs,

a focusing compensation calculation means for receiving

outputs from said proportional constant computing means, from said maximum delivery amount computing means and from said focusing lens group position detection means respectively, and calculating an amount of deviation of the focusing position from the focusing position resulted from the renewal of said entire system focal length as a compensation value,

a focusing drive means for driving said focusing lens group,

a moving amount monitor means for generating a signal corresponding to the moving amount of said focusing lens group,

a focusing control means for receiving outputs from said moving amount monitor means and from said focusing compensation calculation means respectively and driving said focusing lens group to said focusing position,

a variable power drive means for driving the variable power lens group, and

a variable power control means for receiving a start signal from a start means and controlling said variable power drive means, the deviation of the focusing position due to the renewal of the entire system focal length of said optical system being automatically compensated.

4,861,147

ZOOM LENS SYSTEM

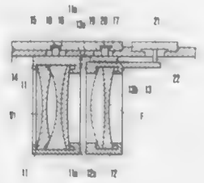
Tsunefumi Tanaka, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 523,728, Aug. 16, 1983, abandoned. This application Jun. 6, 1986, Ser. No. 873,464

Claims priority, application Japan, Aug. 17, 1982, 57-143109; Aug. 17, 1982, 57-143110

Int. Cl.[4] G02B *15/00*

U.S. Cl. 350—429 **9 Claims**



9. A zoom lens comprising:

a plurality of lens units simultaneously movable for zooming, one of said plurality of lens units serving as a focusing lens unit arranged on the image side of the plurality of lens units and movable for focusing, moving means for simultaneously moving the plurality of lens units, having a first cam path for controlling movement of one of the plurality of lens units not including the focusing lens unit and a second cam path for controlling movement of the focusing lens unit, said first and second cam paths being parallel to each other, and said second cam path being parallel to a border line, between a wide end and a telephoto end, passing through a position which the focusing lens unit takes for focusing onto one of an infinite object and a closest object.

4,861,148

PROJECTION OPTICAL SYSTEM FOR USE IN PRECISE COPY

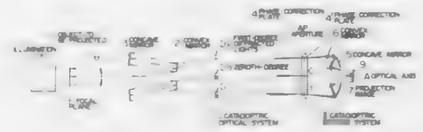
Takeo Sato, Sagamihara; Nobuhiro Araki, Yokohama; Koichi Kawata, Tama; Noboru Nomura, Kyoto; Atushi Ueno, Hirakata, and Shotaro Yoshida, Sendai, all of Japan, assignors to Matsushita Electric Industrial Co., Inc., Osaka, Japan

Filed Mar. 11, 1987, Ser. No. 24,134

Claims priority, application Japan, Mar. 12, 1986, 61-54051; Jul. 7, 1986, 61-159055

Int. Cl.[4] G02B *17/08, 27/10*

U.S. Cl. 350—505 **4 Claims**



1. A projection optical system for use in making a precise copy, comprising:

a pair of catadioptric optical systems each including an associated phase correction member, a convex mirror member having an opening at the center, and a concave mirror member having an opening at the center thereof, said convex mirror member and said concave member being arranged on a coaxis with a center of an entrance pupil,

said pair of catadioptric optical systems being arranged rotationally symmetric around a reference axis as a center and being coupled coaxially by the associated phase correction member of each, one of said pair of catadioptric optical systems being arranged on a side of an object to be projected, and the other catadioptric optical system being arranged on aside of a projection image,

said object being placed on a focal plane which is formed by one of said pair of catadioptric optical systems and on which said object is to be projected; and

a coherent illuminating light source for convergently illuminating the object to be projected such that the illumination rays from said light source are focused by said one catadioptric optical system to the center of a plane of the entrance pupil.

4,861,149

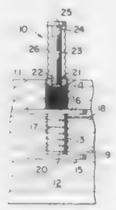
MAGNETODISTORTIVE ACTUATOR ARRANGEMENT

Mark A. Ealey, Juno, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 7, 1988, Ser. No. 142,621

Int. Cl.[4] G02B *7/18, 5/08*

U.S. Cl. 350—611 **20 Claims**



1. A magnetodistortive actuator arrangement comprising

an elongated core of a highly magnetically permeable material, centered on a longitudinally axis and having two axially spaced end portions;

a solenoid coil surrounding one of said end portions of said core and operative when energized for generating an electromagnetic field which permeates said core and has a high intensity region extending beyond the other of said end portions of said core; and

an active member of a magnetodistortive material separate from and connected to said core and extending axially beyond said other end portion thereof remotely from said coil at least partially through said high-intensity region of said electromagnetic field for the latter to change at least the axial dimension of said active member.

4,861,150

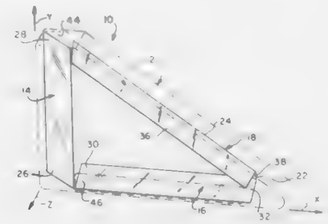
IMAGE ROTATOR FOR ROTATING AN IMAGE NINETY DEGREES

Linda Mandel, 1392 S. Euclid, La Habra, Calif. 90631, and Edward Ensign, Costa Mesa, Calif., assignaors to Linda Mandel, La Habra, Calif.

Filed Jan. 10, 1988, Ser. No. 208,294

Int. Cl.[4] G02B *17/06, 5/08*

U.S. Cl. 350—622 **6 Claims**



1. An image rotating device for rotating an image ninety degrees as viewed in a plane defined by first and second axes in an orthogonal coordinate system having first, second and third axes comprising linearly extending first, second and third mirrors disposed relative to each other in the shape of a right isosceles triangle, wherein said first mirror is a planar reflector disposed to extend parallel to said first axis to form a leg of said triangle and oriented at angles of forty five degrees both to a plane defined by said first and second axes and to a plane defined by said first and third axes, said second mirror is a planar reflector disposed to extend parallel to said second axis to form another leg of said triangle and oriented at angles of forty five degrees both to a plane defined by said first and second axes and to a plane defined by said second and third axes, and said third mirror is a dihedral oriented to form the hypotenuse of said triangle and having first and second planar reflecting surfaces which intersect each other at right angles at a linear intersection, and said linear intersection is parallel to said plane defined by said first and second axes and is oriented at angles of forty five degrees both to a plane defined by said second and third axes and a plane defined by said first and third axes.

4,861,151

FRAME FOR MULTIFOCAL SPECTACLES

Tohru Negishi, 264-2, Bonsai-cho, Ohmiya-shi, Saitama-ken, Japan

Filed Dec. 15, 1987, Ser. No. 133,489

Claims priority, application Japan, Dec. 26, 1986, 61-198840[U]; Oct. 12, 1987, 62-254709

Int. Cl.[4] G02C *5/12*

U.S. Cl. 351—137 **1 Claim**

1. A frame for multifocal spectacles, comprising:

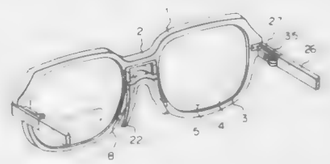
left and right lens rims of mounting left and right multifocal lenses therein;

a bridge connected between the inner sides of respective lens rims;

left and right guide portions on the inner sides of said left and right lens rims and in spaced opposed positions and having guide means forming a part thereof and extending downwardly from said bridge and gradually curving away from each other;

a nose pad member having left and right nose pads;

left and right flexible resilient pieces integrally connected to said left and right nose pads, respectively, at upper positions thereon, said left and right resilient pieces gradually curving downwardly and away from each other with a somewhat greater degree of curvature than the curvature



of said guide means and having the lower ends thereof resiliently engaged in and being guided by said guide means, said resilient pieces being under tension for producing a small outward resilient force against said guide means for holding said resilient pieces in said guide means; and

a plurality of stop means spaced along said guide means for being engaged by said left and right resilient pieces for stopping said nose pad member at different positions along said guide means.

4,861,152

CONTACT LENS HAVING AT LEAST ONE ASPHERICAL, PROGRESSIVE MULTIFOCAL FACE, PROCESS FOR THE PREPARATION THEREOF AND USE OF THIS CONTACT LENS AS AN INTRA-OCULAR IMPLANT TO BE SUBSTITUTED FOR THE EYE CRYSTALLINE LENS

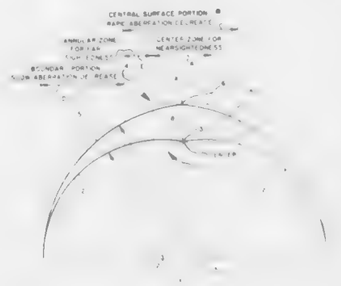
Francis D. Vinzia, 23, Avenue Général Leclerc, 92350 Le Plessis Robinson, and Roger J. A. Bonnet, 122, Avenue du Commandant Roland, Bat, K3, La Cadenelle, 13008 Marseille, both of France

Filed Nov. 19, 1985, Ser. No. 799,585

Claims priority, application France, Nov. 26, 1984, 84 17989

Int. Cl.[4] G02C *7/04*

U.S. Cl. 351—161 **6 Claims**



1. A multifocal contact lens having a convex external face (4) and a concave inner face (1),

said inner face (1) being aspherical and having an aberration and thus corrective power varying continuously from a center (3) of said inner face (1) towards a periphery (2, 2') of said inner face (1),

said inner face (1) having a central portion (B) locatable in

front of the most sensitive part of an eye and having at its center (3) a maximum aberration value which rapidly and progressively decreases radially from said center (3) within said central portion (B) and slowly towards the periphery (2, 2') of the lens so as to provide in a central zone (A) of said central portion (B), a correction for vision for near and in a portion (E) radially succeeding, a correction for vision for far,

said aspherical face (1) having a shape of a portion of a surface of revolution, a meridian of which having the shape of a curve with an axis of revolution (X—X) located in a way such that said center (3) in the central zone (A) is angularly projecting towards the eye.

4,861,153

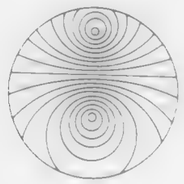
PROGRESSIVE ADDITION SPECTACLE LENS

John T. Winthrop, Wellesley, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 944,702, Dec. 19, 1986, abandoned. This application Dec. 10, 1987, Ser. No. 131,987

Int. Cl.[4] G02C *7/06*

U.S. Cl. 351—169 **38 Claims**





1. A progressive power ophthalmic lens comprising:

a lens body with a progressive power surface having a first vision portion and a second vision portion, the power of one of said portions being different than the other;

at least one of said first and second vision portions being a point surrounded by an area of optical stability in which the power changes gradually but imperceptively across said area toward said point;

an intermediate portion of gradually changing power between said point of said one vision portion and the other of said vision portions;

the form of the progressive surface of said lens being effective to distribute surface astigmatism over substantially the entire surface of the lens from said point of said one vision portion to the other vision portion.

4,861,154

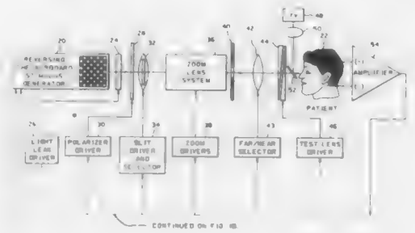
AUTOMATED VISUAL ASSESSMENT SYSTEM WITH STEADY STATE VISUAL EVOKED POTENTIAL STIMULATOR AND PRODUCT DETECTOR

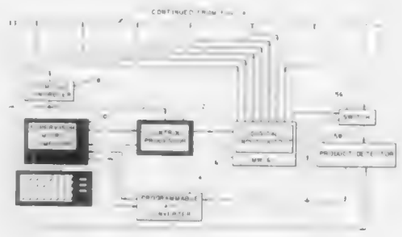
Gary W. Sherwin, Yukon; Albert L. Schmidt, Murrysville, and Lewis F. Hanes, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 6, 1986, Ser. No. 893,758

Int. Cl.[4] A61B *3/10, 5/04*

U.S. Cl. 351—205 **12 Claims**





1. A visual testing apparatus, comprising:

control means for stimulating the visual system of a patient with a test image at a stimulus frequency during a selected one of refractometry, acuity, astigmatism, contrast and color vision tests; said control means comprising:

a control processor;

a mirror stimulus generator connected to and controlled by said control processor to produce an alternating stimulus pattern image; and

a lens system between the patient and said mirror stimulus generator, and connected to and controlled by said control processor, said lens system including eye drift prevention means for preventing the patient's eye from adapting to a changing stimulus;

sensing means for detecting evoked potentials produced by the test image in the patient's brain at the stimulus frequency during the selected test; and

analysis means for analyzing the evoked potentials produced by the patient during the selected test and displaying the results of the selected test.

4,861,155

METHOD AND APPARATUS FOR MEASURING CURVATURE OF THE CORNEA

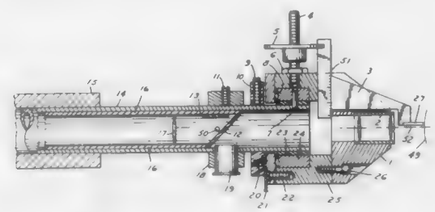
Max Downey, 904 Greensburg St., Columbia, Ky. 42728

Continuation-in-part of Ser. No. 929,483, Nov. 12, 1986, abandoned. This application May 4, 1988, Ser. No. 188,709

Int. Cl.[4] A61B *3/10;* **A61F** *17/32*

U.S. Cl. 351—212 **8 Claims**

1. Method for measuring corneal curvature comprising the steps of establishing fixed position of subject's eye for examination directed by visual focusing longitudinally toward a fixation point on a fixed solid apparatus base, moving an electrically conductive probe mounted on said base successively to a plurality of spaced predetermined positions relative to the corneal apex of the subject, moving said probe at each of said



positions longitudinally to a point of sensing the corneal surface at said position, and recording the relative longitudinal differential dimensions of probe advancement to effectively map corneal curvature corresponding to said points over a predetermined corneal surface area

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4,861,156

VISUAL ACUITY TESTING SYSTEM

Clifford M. Terry, 1733 Rocky Rd., Fullerton, Calif. 92635

Continuation of Ser. No. 666,996, Oct. 31, 1984, abandoned. This application Sep. 8, 1987, Ser. No. 93,603

Int. Cl.[4] A61B *3/02*

U.S. Cl. 351—243 **14 Claims**

1. Vision testing apparatus comprising:

a patient display;

display circuitry for generating a plurality of alphanumeric character test targets on the patient display defined by first pixels illuminated to a first level of luminance, and second pixel illuminated to a second level of luminance;

and means for varying the contrast of said target-defining pixels on the patient display including first controllable means for varying the luminosity of said first pixels, second controllable means for varying the luminosity of said second pixels, said first and second controllable means being operated independent of each other.

4,861,157

APPARATUS FOR CONTINUOUSLY PHOTOGRAPHING ROAD SURFACE

Masanori Ohama, Machida, and Koroku Soma, Hachioji, both of Japan, assignors to Pasco Corporation, Tokyo, Japan

PCT No. PCT/JP85/00681, § 371 Date Apr. 24, 1987, § 102(e) Date Apr. 24, 1987

PCT Filed Dec. 10, 1985, Ser. No. 58,223

Int. Cl.[4] G03B *29/00*

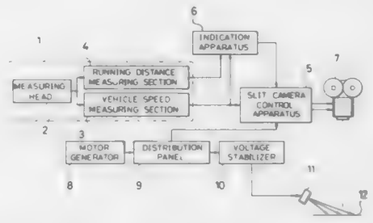
U.S. Cl. 352—132 **2 Claims**

1. An apparatus for continuously photographing a road surface:

a motion picture camera attached to an outside upper part of a vehicle body;

a road surface light projector projecting a light on to a road surface to be photographed by the motion picture camera; and

a vehicle speed detector having an output, said vehicle speed



detector being a non-contact type of optical sensor, wherein an iris and a film feed speed of the motion picture camera is controlled according to the output of the vehicle speed detector.

4,861,158

CHIRP AND DOPPLER OPTICAL GAUGE

Michael T. Breen, Garden City, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 30, 1987, Ser. No. 103,086

Int. Cl.[4] G01C *3/08*

U.S. Cl. 356—5 **16 Claims**

1. A gauge for measuring the distance to a place on an object by (a) a Doppler principle to measure rate of change of distance, and (b) a chirp principle to measure absolute distance, with both the Doppler and chirp principles being employed over the same span of distances, comprising:

a laser producing a laser beam;

means receiving at least some energy from said laser beam for providing a reference beam based upon said laser beam;

means receiving at least a portion of the beam of said laser for providing a constant frequency signal beam;

means for controllably directing the constant frequency signal beam to the object for reflection;

means for receiving from said object coherent reflected energy; and,

(a) for Doppler measurement,

said reflected energy having a Doppler shifted frequency in accordance with the time rate of change of distance to the places at which reflection is occurring;

means for measuring the Doppler shift of said reflected energy relative to said reference beam to ascertain the rate of change of distance to the place of reflection, and;

(b) for chirp absolute distance measurement,

said means receiving at least a portion of said laser beam comprising means for frequency modulating it as a function of time to serve as a signal beam of modulated frequency;

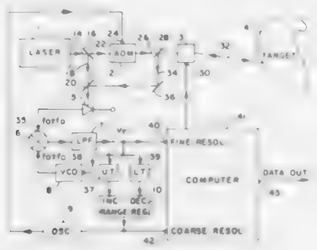
means for measuring the frequency difference between said reference beam and said reflected energy to derive indicia of the distance to the place of reflection on said object, based upon the elapsed propagation time of the signal beam to the place of reflection and back.

4,861,159

DYNAMIC DOPPLER OPTICAL GAUGE

Michael T. Breen, Garden City, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 30, 1987, Ser. No. 103,085
Int. Cl.[4] G01C *3/08*
U.S. Cl. 356—5 **2 Claims**



1. A Doppler optical distance gauge comprising:
laser means for providing a light beam;
means for splitting the beam into a reference beam and a target beam;
acoustooptical modulator means on the target beam intermediate the laser and a target, for offsetting the frequency of the target beam in response to a control signal;
means for directing the target beam to the target and receiving a reflected return beam therefrom;
frequency comparison means for comparing the return beam with the reference beam, and including frequency discriminator means;
said frequency discriminator means being operable over at least a predetermined span of frequency variation, for measuring the frequency of the difference between the return beam and the reference beam and producing indicia of that difference;
means responsive to said indicia for providing said control signal, to change the frequency of said target beam in a step change in a sense that maintains said measured frequency difference to an amount within said predetermined span of frequency variation; and
means for combining said measured difference and said indicia to provide output data of Doppler shift;
whereby automatic range changing occurs, to keep said measured frequency difference within said span.

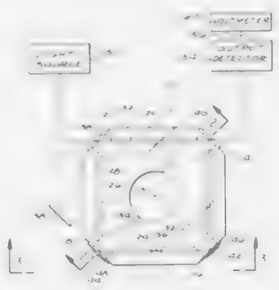
4,861,160

METHOD FOR PLANAR BEAM PATH ALIGNMENT OF A SQUARE RING LASER GYROSCOPE

Sheridan W. Hammons, Thousand Oaks, and Robert H. Moore, Camarillo, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 28, 1987, Ser. No. 90,559
Int. Cl.[4] G01B *11/27*
U.S. Cl. 356—138 **5 Claims**

1. A method for alignment of a ring laser gyroscope of the type that includes a frame having an internal cavity that forms a square path with first and second curved mirrors fixed to adjacent first and second corner surfaces, respectively, of said frame, said method comprising the steps of:
(a) replacing said first curved mirror with an planar mirror; then
(b) directing a beam of light into said cavity; and
(c) measuring the intensity of said light beam in said cavity; then
(d) translating said second curved mirror until said measured intensity is a maximum; then
(e) replacing said planar mirror with said first curved mirror; then
(f) translating said first curved mirror until said measured intensity is a maximum; then



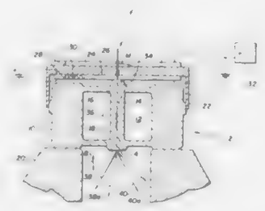
(g) measuring the tilt angles α_1 and α_2 of opposed corner mirror mounting surfaces of said frame; then
(h) calculating the total misalignment $\epsilon_T=\epsilon_1\epsilon_2$ between said opposed corner mirror mounting surfaces; then
(i) translating said first and second curved mirrors in opposite directions by equal amounts $d=\epsilon_T R\text{-}4.85E{-}06$ where R is the mirror radius of curvature.

4,861,161

METHOD OF CONSTRUCTING A MOMENT INSENSITIVE PATHLENGTH CONTROL MIRROR ASSEMBLY FOR A RING LASER GYROSCOPE

Bo H. G. Ljung, Wayne, N.J., assignor to Kearfott Guidance & Navigation Corporation, Wayne, N.J.

Filed Mar. 18, 1988, Ser. No. 169,668
Int. Cl.[4] G01C *19/64*; H01S *3/08*
U.S. Cl. 356—350 **9 Claims**



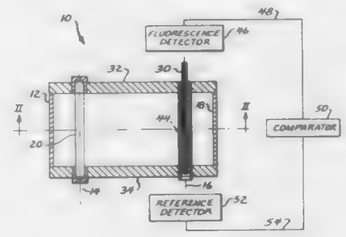
1. In a pathlength controller for a ring laser gyro having an assembly including an internal annular space for bounding a central hub and defining transverse upper and lower diaphragm portions in spaced coaxial relation, a mirror mounted on a first substantially planar surface of the assembly encircled by the lower diaphragm portion, transducer means mounted on a second surface of the assembly opposite to the first surface for applying a force through the assembly to translatedly deflect the mirror so as to control predefied pathlengths of laser beams circulating in the gyro, a method of eliminating tilting of the mirror due to an unintended moment resulted from the force being applied through the assembly, the method comprising the steps of:
predetermining a diameter of the hub;
selecting a first length for the hub;
calculating a first angle of tilt of the mirror, due to the unintended moment, based on the predetermined diameter and the first length;
selecting a second length for the hub;
calculating a second angle of tilt of the mirror, due to the unintended moment, based on the predetermined diameter and the second length, the second angle having an opposed sense to the first angle; and
extrapolating from the first and second angles a third length for the hub, the third length being an optimal length unaffected by the unintended moment.

4,861,163

ELLIPSOIDAL CYLINDER FLUORESCENCE ANALYZER

David T. Bach, Westborough, Mass., assignor to Amoco Corporation, Chicago, Ill.

Filed Jan. 6, 1988, Ser. No. 141,160
Int. Cl.[4] G01N *21/64*
U.S. Cl. 356—417 **22 Claims**



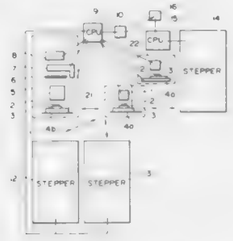
1. An ellipsoidal cylinder fluorescence analyzer for analyzing a sample comprising:
an ellipsoidal cylinder having a first focal line, a second focal line, and an internal reflective surface;
a radiation source disposed substantially along said first focal line;
a container suitable for containing the sample disposed substantially along said second focal line;
filter means disposed inside said ellipsoidal cylinder effective to shield said sample container from all but a selected portion of the radiation emanating from said radiation source, including reflected radiation;
fluorescence detector means for detecting fluorescent radiation emanating from said sample container and generating a signal in response thereto;
reference detector means for detecting radiation that has passed through said filter means and generating a signal in proportion thereto; and
comparator means for comparing the signals from said fluorescence and reference detector means.

4,861,162

ALIGNMENT OF AN OBJECT

Hideki Ina, c/o Kosugi Jigyosho, Canon Kabushiki Kaisha, 53 Imaikamicho, Nakahara-ku, Kawasaki-shi, Kanagawa-ken, Japan

Continuation of Ser. No. 152,926, Feb. 5, 1988, abandoned, which is a division of Ser. No. 862,621, May 13, 1986, abandoned. This application Nov. 15, 1988, Ser. No. 273,707
Claims priority, application Japan, May 16, 1985, 60-102727; Oct. 21, 1985, 60-235924
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—401 **10 Claims**



1. A method of sequentially positioning different regions of a semiconductor wafer, onto each of which regions an image is to be transferred at a transfer station, said method comprising the steps of:
detecting, at a non-transfer station, positions of the different regions of the wafer with respect to a reference mark;
detecting, at the transfer station, a position of the reference mark with respect to a standard mark;
detecting positions of the different regions of the wafer with respect to the standard mark on the basis of the detection of the position of the reference mark with respect to the standard mark and the detection of the positions of the different regions of the wafer with respect to the reference mark; and
moving the wafer so as to sequentially place the different regions thereof at the transfer station while controlling the movement of the wafer, for the sequential placing, in accordance with the detection of the positions of the different regions of the wafer with respect to the standard mark, whereby the different regions of the wafer are sequentially and accurately positioned with respect to the standard mark.

4,861,164

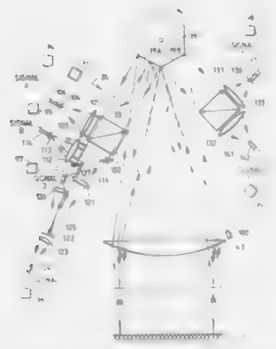
APPARATUS FOR SEPARATING SPECULAR FROM DIFFUSE RADIATION

Robert N. West, Chislehurst, United Kingdom, assignor to SIRA Limited, Chislehurst, United Kingdom

Division of Ser. No. 88,659, Aug. 24, 1987, abandoned. This application Nov. 10, 1988, Ser. No. 271,396
Claims priority, application United Kingdom, Sep. 5, 1986, 8621411
Int. Cl.[4] G01N *21/47, 21/55, 21/88*
U.S. Cl. 356—445 **18 Claims**

1. Apparatus for separating specular from diffuse radiation from an area of a surface under inspection, comprising means for passing radiation to said surface, retroreflective means positioned with respect to said surface for reflecting radiation from said surface back to said surface, focusing means for receiving radiation from said surface, and filter means having a first central area on its optical axis and a second surrounding area, said filter means and the area of said surface under examination being conjugate with respect to the focusing means whereby all of said diffuse radiation from said area of said

surface under inspection is passed to said central area of said filter means and specular radiation from said area of said surface under inspection is passed to said second surrounding area so that said specular and said diffuse radiation are separated.

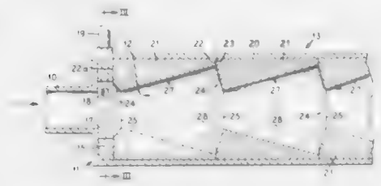


4,861,165

METHOD OF AND MEANS FOR HYDRODYNAMIC MIXING

Borje Fredriksson, Dalton, Mass., and Jeffery L. Cahmberlin, Lebanon Springs, N.Y., assignors to Beloit Corporation, Beloit, Wis.

Filed Aug. 20, 1986, Ser. No. 898,475
Int. Cl.[4] B01F *5/06, 3/04;* **B01D** *43/00;* **B03D** *1/02*
U.S. Cl. 366—165 **4 Claims**



1. A method of attaining an intimate mixture of a plurality of fluent substances in a continuous flow-through passage having an entry end and a discharge end, and comprising:

combining said plurality of fluent substances at said entry end in a continuously flowing stream filling said flow through passage under substantial hydrodynamic pressure;

subjecting said stream in said passage to turbulence and substantial dispersion and mixing effect from a series of adjacent alternating radially inwardly tapering relatively short frustoconical turbulence surfaces providing acceleration and radially outwardly flaring relatively longer frustoconical turbulence surfaces providing gradual dispersion;

effecting abrupt turbulent transition of the stream from each of said surfaces to the next of said surfaces in the series;

influencing the stream continuously between the entry end and the discharge end by one of gradual expansion and dispersion from the outwardly flaring surfaces, relatively more rapid acceleration and restriction from the inwardly flaring surfaces, and abrupt transition between expansion and restriction;

thereby attaining progressively more thorough dispersion and mixing of said substances in the continuously flowing stream from said entry end to said discharge end of said passage; and

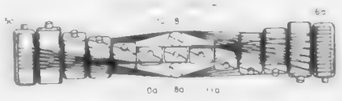
discharging the thus treated stream from said discharge end of the passage to receiving means.

4,861,166

METHOD FOR REMOVING BUBBLES FROM CONTAINER MADE OF SYNTHETIC RESIN FILLED WITH SOLUTION AND DEVICE THEREOF

Chihiro Kuwabara, Kamisato, Japan, assignor to Eisai Co., Ltd., Japan

Filed Jan. 28, 1988, Ser. No. 149,667
Claims priority, application Japan, Feb. 5, 1987, 62-26075
Int. Cl.[4] B01F *9/02;* **B65G** *15/14, 47/24*
U.S. Cl. 366—219 **12 Claims**



1. A method for removing bubbles from the entire inner walls of a container made of a synthetic resin and filled with a liquid, comprising:

(1) gripping and moving a container between a plurality of endless belts engaged between a first pair of vertical rolls, a second pair of vertical rolls and a first pair of horizontal rolls disposed between said first and second pairs of vertical rolls,

(2) causing a gradual inclination of the container between said first pair of vertical rolls and said first pair of horizontal rolls, such that the container is oriented in a generally horizontal direction,

(3) causing a further gradual inclination of the container between said first pair of horizontal rolls and said second pair of vertical rolls, such that the container is oriented in a generally vertical and reversed orientations, and

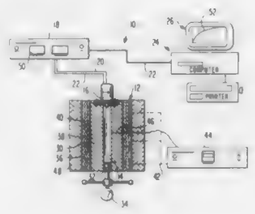
wherein the upper surface of the liquid is caused to gradually contact the entire inner walls of the container and move bubbles attached to the inner walls of the container to outside of the liquid, and wherein said movement of the container is in the absence of shock to the container.

4,861,167

LINE-HEAT-SOURCE THERMAL CONDUCTIVITY MEASURING SYSTEM

Hubert Lobo, and Kuo K. Wang, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Sep. 28, 1988, Ser. No. 250,406
Int. Cl.[4] G01N *25/18*
U.S. Cl. 374—44 **22 Claims**



1. Apparatus for the measurement of polymer melts, comprising:

an elongated cylindrical container for receiving a sample polymer material;

sample heater means surrounding said container;

temperature controller means energizing said sample heater means to heat a sample material in said container to a predetermined, initial, base temperature;

probe means insertable into said container to contact sample material within the container, said probe means comprising:

(a) an elongated, thin hollow needle secured at a near end to a probe connector housing and having its distal end sealed;

(b) transient heater means within said needle and extending substantially the entire length thereof; and

(c) temperature sensing means within said needle and substantially in contact with the wall of said needle;

power supply means connected to said transient heater means and operable to energize said transient heater means to raise the temperature of a sample material surrounding said needle toward a temperature above said base temperature; and

means connected to said temperature sensing means to measure the temperature of the probe to determine the change in temperature with time of a sample material in contact with the probe due to the energization of said transient heater means, whereby the thermal conductivity of a sample material in said container can be determined.

17. A method of measuring the thermal conductivity of a polymer melt, comprising:

placing a sample polymer material in an elongated cylindrical container;

positioning the container in a sample heater;

energizing said sample heater to heat said sample material in said container to a predetermined, stable base temperature at or above the melting temperature of said sample material;

inserting an elongated, thin measuring probe including a transient heater and a temperature sensor into said sample material;

stabilizing the temperature of said measuring probe at said base temperature;

energizing said transient heater in said probe to increase the temperature of the sample material surrounding said probe from said base temperature toward a second, higher temperature;

measuring the temperature of the sample material in contact with said probe to obtain a temperature profile of the sample material during a time of transient temperature change in the sample material; and

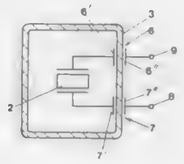
determining from said temperature profile the thermal conductivity of said sample material.

4,861,168

ELECTRONIC THERMOMETER

Horst Ziegler, Paderborn, and Horst Behlen, Paderborn-Dahl, both of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Oct. 25, 1988, Ser. No. 262,513
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744239
Int. Cl.[4] G01K *7/32, 11/26*
U.S. Cl. 374—117 **10 Claims**



1. An electronic thermometer having

a generally cylindrical rotatable sealed housing (3) of electrically insulating material;

a temperature-sensitive piezoelectric element (2) with a mechanical resonance frequency which is temperature-dependent, located in said housing (3), said element including a pair of terminals (4,5);

an oscillator circuit (1), having a pair of oscillator input terminals (8, 9) galvanically separated from said rotatable housing and piezoelectric element, and an output;

evaluation unit means (0) for detecting temperature, connected to said oscillator output;

a respective inner capacitor electrode (6', 7') located adjacent an outer wall of said rotatable housing (3) and connected to a respective one of said piezoelectric element terminals (4,5), and

a respective outer capacitor electrode (6'', 7'') separated from said rotatable housing (3) and connected to a respective one of said oscillator input terminals (8,9),

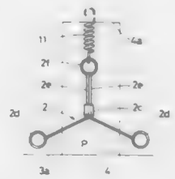
said inner (6' 7') and outer (6'', 7'') capacitor electrodes together defining a pair of capacitors (6,7) which transmit a temperature-dependent signal from said piezoelectric element (2) to said oscillator circuit (1), thus directly specifying the oscillation frequency thereof, while providing said galvanic separation therebetween.

4,861,169

TEMPERATURE SENSOR USING THERMOCOUPLE

Hiroshi Yoshimura, Osaka, Japan, assignor to Hakko Metal Industries Limited, Osaka, Japan

Filed Aug. 23, 1988, Ser. No. 235,225
Claims priority, application Japan, May 16, 1988, 63-120153
Int. Cl.[4] G01K *7/06*
U.S. Cl. 374—179 **4 Claims**



1. A temperature sensor comprising: a support member,

a thermocouple formed by mutually joining dissimilar metal materials, wherein:

the thermocouple has opposite ends and a junction formed therebetween of two dissimilar metal materials, a portion of the junction or the two dissimilar metal materials forming said thermocouple being covered with a conductive metallic sleeve to form a temperature measuring part;

mounting parts are formed at both ends of said thermocouple; and

said mounting parts are detachably fixed to said temperature measuring part and the thermocouple is secured on said support member in a state of a tension, said metallic sleeve being made of a metal material which has excellent solder wettability properties, and wherein the end parts of said two metal materials are projected from the junction of said thermocouple, and the projected end parts are detachably fixed to the temperature measuring part of said temperature measuring apparatus by way of an tension member elasticity.

4,861,170

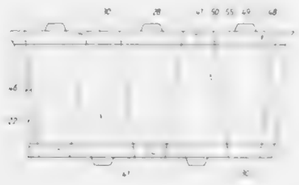
PORTABLE CONTAINER

Stig Patriksson, Lilla Edet, Sweden, assignor to Patriksson Inventing AB, Alvangen, Sweden

Filed Apr. 20, 1988, Ser. No. 183,886
Claims priority, application Sweden, Oct. 3, 1985, 8504567; Jul. 14, 1986, 8603106
Int. Cl.[4] B65D *33/12*
U.S. Cl. 383—6 **2 Claims**

1. A portable container comprising an encasing member

arranged so as to form a space in which objects can be carried, and a handle member, said handle member comprising at least one handle loop of string, which over its length has a varying cross sectional dimension and is attached to the encasing member, attachment of the handle loop being accomplished in part by inserting at least one section of the string between two material layers of the encasing member, which are joined together by means of adhesive, whereby a channel is created between the layers of material through which said section of the handle member extends and in part by the varying cross sectional dimension over the length of said string when positioned in said channel upon completion of the container and by giving the channel such a form that its shape and dimensions at least to a certain extent follow said varying cross sectional in



the string, whereby the handle member is secured to the encasing member even when the handle member is pulled in longitudinal direction of the channel, the encasing member consisting of two encasing walls which are joined together along at least two side edge sections and which display two opening edge sections which encircle an opening, two sections of the handle member being secured between said two material layers, said handle loop being formed by a section of the string extending freely beyond said opening edge section, said two sections of the handle member extending between said material layers each having a first section which extends essentially parallel to said opening edge section at a distance from same, and a second section which extends at an obtuse angle to said first section towards said opening edge section.

4,861,171

COMPOSITE CYLINDRICAL ROLLER BEARING ASSEMBLY

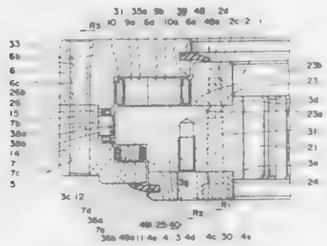
Takehiro Adachi, Osaka, Japan, assignor to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Dec. 1, 1988, Ser. No. 278,173

Claims priority, application Japan, Dec. 23, 1987, 62-195170[U]

Int. Cl.[4] F16C *19/38*

U.S. Cl. 384—455 **9 Claims**



1. A composite cylindrical roller bearing assembly comprising:

an inner ring which has one of an annular projection and an annular recess provided on an outer peripheral side thereof, and can be recomposably divided into at least first and second inner ring sections by an imaginary division plane perpendicular to a rotating axis, the first and second inner ring sections each also being capable of being recomposably divided into at least two parts by imaginary division planes including the axis;

an outer ring which has the other of the annular projection and recess to loosely engage with the one of the annular projection and recess of the inner ring on an inner peripheral side thereof, and can be recomposably divided into at least first and second outer ring sections by an imaginary division plane perpendicular to the axis, the first and second outer ring sections each also being capable of being recomposably divided into at least two parts by imaginary division planes including the axis;

upper and lower cylindrical thrust rollers disposed at regular intervals in a circumferential direction in upper and lower annular spaces formed between opposite surfaces of the loosely engaged annular projection and recess;

upper and lower retainers to hold the upper and lower cylindrical thrust rollers, each being capable of being recomposably divided into at least two parts by imaginary division planes including the axis;

cylindrical radial rollers disposed at regular intervals in a circumferential direction in an annular space formed between peripheral surfaces of the loosely engaged annular projection and recess;

a retainer to hold the cylindrical radial rollers, being capable of being recomposably divided into at least two parts by imaginary division planes including the axis; and

an annular gear which is formed either on an inner peripheral side of the inner ring or on an outer peripheral side of the outer ring to be meshed with an external gear, being capable of being recomposably divided into at least two parts by imaginary division planes including the axis.

4,861,172

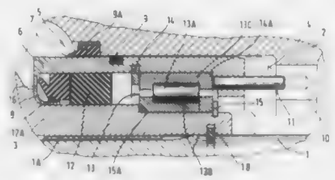
LIQUID SEAL FOR MACHINE PARTS MOVING ROTATIONALLY AND AXIALLY IN RELATION TO ONE ANOTHER

Annast Rudolf; Max Schuster, both of Passau; Dieter Maurer, and Jürgen Rauter, both of Friedrichshafen, all of Fed. Rep. of Germany, assignors to Zahradfabrik Friedrichshafen AG, Fed. Rep. of Germany

Filed Jun. 21, 1988, Ser. No. 264,275

Int. Cl.[4] F16C *3/035, 21/00, 31/00, 33/72*

U.S. Cl. 384—477 **8 Claims**



1. An anti-leak seal for machine parts rotationally and axially movable relative to each other,

especially for universal shafts connected by means of universal cross joints on steering axles of vehicles in housings full of a lubricant,

and having an axial seal gap (7) separated from a radial seal gap (8) by means of a rigid intermediate sleeve (6) supported against the rotatably movable machine part via a bearing (13A),

both seal gaps (7, 8) being closed by means of elastomeric sealing elements (9, 12) kept under pre-load relative to said intermediate sleeve (6),

wherein said sealing element (9) situated in said axial gap (7) is axially fixed relative to said intermediate sleeve (6), characterized in that

said bearing (13A) is situated in said radial seal gap (8) on the side of the lubricant and said intermediate sleeve (6) is fixed relative to said bearing (13A) by axial stops (14, 15), and in said axial seal gap (7) said intermediate sleeve (6) has a torsional safety (11) in relation to the non-rotating machine part (1 or 2),

wherein recesses (10) are provided in said machine part (1 or 2) in which meshing elements (bolts, pawls) of said torsional safety (11) have a relative limited axial mobility.

4,861,173

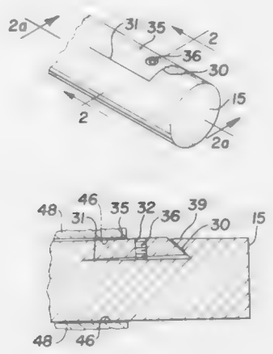
BEARING LOCKING APPARATUS

Norman H. Kemp, Hurst, Tex., assignor to Advanced Graphics Technology, Inc., Grapevine, Tex.

Continuation-in-part of Ser. No. 86,697, Aug. 17, 1987, abandoned. This application Jan. 25, 1988, Ser. No. 147,937

Int. Cl.[4] F16C *43/00*

U.S. Cl. 384—538 **16 Claims**



1. Apparatus comprising an elongated shaft and a bearing surface surrounding said shaft adapted for relative movement between said shaft and said bearing surface including locking means to prevent relative movement between said bearing surface and said shaft comprising:

(a) a radial cut in said shaft between the ends thereof extending from one surface toward the center of said shaft having a radial depth of less than one-half the diameter of said shaft;

(b) an axial cut in said shaft substantially parallel with the axis of said shaft extending through the shaft in a plane which intersects the surface of said shaft at two radial points and which intersects said radial cut, thereby forming an axial flap having a free end; and

(c) wedge means movable radially with respect to said shaft for spreading the free end of said flap away from the axis of said shaft.

4,861,174

DEVICE FOR DRIVING PRINT MEMBER OF PRINTER

Shuichi Aratsu, Iwate, Japan, assignor to Alps Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 900,235, Aug. 25, 1986, abandoned, which is a continuation of Ser. No. 653,939, Sep. 24, 1984, abandoned. This application Jul. 18, 1988, Ser. No. 220,918

Claims priority, application Japan, Sep. 22, 1983, 58-146814[U]

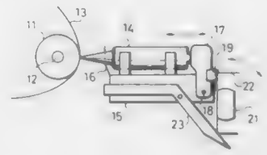
Int. Cl.[4] B41G *3/00*; G01D *15/16*

U.S. Cl. 400—18 **6 Claims**

1. In a device for driving a print member of a printer which includes a platen on which a recording sheet is supported, a carriage movable along the platen, at least one print member carried on a moving means supported on the carriage and adapted to be changeably moved to a printing position on the carriage for printing, means including a change lever for actuating the moving means to move a selected print member to the printing position, a push member mounted on the carriage for pushing a print member at the printing position toward the platen in order to print on the recording sheet, and a driving source for providing a driving output for actuating the moving means and the push member, an improved driving device comprising:

a rotatable shaft extending parallel to said platen;

a driven frame fixed to said shaft and having one portion disposed so as to bear against said push member for driving a print member when said shaft is rotated in one direction, and another portion disposed so as to bear against an end of said change lever for actuating said moving means when said shaft is rotated in the other direction;



a rotatable driving lever coupled to said driving source and being rotatable in one or the other direction for rotatably driving said shaft and driven frame in the corresponding directions, said driving lever having a grooved can formed therein; and

a connecting lever having one end portion mounted to said shaft and another end portion including a tip slidably engaged in said grooved cam of said driving lever,

whereby the driving lever is rotated to drive the print member for printing in one direction and to actuate the change lever in the other direction while a sliding connection between the tip of the connecting lever and the grooved cam of the driving lever is maintained in both directions of rotation, and the need for biasing means for biasing the tip of the connecting lever into pressure contact with the cam of the driving lever is eliminated.

4,861,175

SERIAL PRINTER CONTROL SYSTEM

Masaaki Hori, and Mitsuharu Kamiya, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 884,092, Jul. 10, 1986, abandoned. This application Apr. 20, 1988, Ser. No. 185,314

Claims priority, application Japan, Jul. 13, 1985, 60-154855; Jul. 13, 1985, 60-154856; Sep. 6, 1985, 60-198163

Int. Cl.[4] B41J *11/42, 5/46*

U.S. Cl. 400—76 **12 Claims**

1. A serial printer for receiving a sequence of plural unit print data to be distinguished from each other by a distinguishing signal, moving a printing head (92), feeding a print paper in a direction perpendicular to a moving direction of said printing head (92), and sequentially printing characters or the like at desired positions on said print paper; said serial printer comprising:

(a) cursor key means (351–354) for outputting a signal relating to the movement of said printing head (92) and the feed of said print paper according to key operation;

(b) printing head position control means (12) for controlling a moving position of said printing head (92) and a feed quantity of said print paper according to said signal relating to the movement of said printing head (92) and the feed of said print paper;

(c) print format control data storage means (16, 38) for sequentially stacking data relating to the moving position of said printing head (92) and the feed quantity of said paper every time said printing head (92) is actually moved to a desired position with respect to said print paper by driving said control means (12) according to the operation of said cursor key means (351–354);
(d) receive means (14A) for sequentially receiving said sequence of said plural unit print data distinguished from each other by said distinguishing signal;
(e) output means (14B) for sequentially outputting one of said data stacked by said storage means (16, 38) and one of said plural unit print data; and



(f) print control means (18) for printing characters or the like corresponding to said unit print data output from said output means (14B); wherein:
said serial printer is programmed such that when said output means (14B) outputs one of said data relating to the moving position of said printing head and the feed quantity of said print paper said control means (12) is driven to move said printing head with respect to said print paper to a position to be determined by said one of said data relating to the moving position of said printing head and the feed quantity of said print paper, and then said print control means (18) is driven to print one of said unit print data, and when the print operation of said print control means is ended, said output means (14B) outputs a subsequent data according to said distinguishing signal.

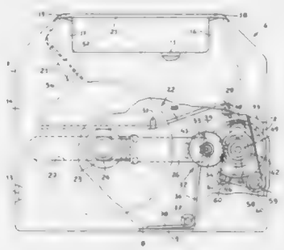
4,861,176

CARTRIDGE INCLUDING EPICYCLIC GEARING DRIVE FOR A MULTISTRIKE TYPING RIBBON FOR PRINTING MACHINES

Giorgio Di Stefano, Turin, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jun. 24, 1988, Ser. No. 211,290
Claims priority, application Italy, Jul. 2, 1987, 67567 A/87
Int. Cl.[4] B41J *32/00*
U.S. Cl. 400—208 **12 Claims**

1. A cartridge for a multistrike typing ribbon for printing machines comprising a single drive shaft for unidirectional feed of the typing ribbon and in which the cartridge comprises a containeer for a multistrike typing ribbin having a bottom and a cover, a multistrike ribbon feed roller rotatably supported in said container for feeding said typing ribbon, and the combination comprising:
a gear transmission arrangement which is disposed on said bottom away from the internal trajectory of the typing ribbon and comprises a drive element to be rotated by the drive shaft of the machine, a driven element for rotating said multistrike ribbon feed roller and a series of gears interconnecting said drive element with said driven element;
wherein said series of gears are coplanar each other and parallel to said bottom, and wherein said drive element is



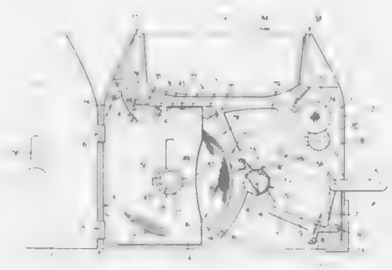
coaxial with said multistrike ribbon feed roller and is engageable with said single drive shaft.

4,861,177

RELOADABLE RIBBON CASSETTE SYSTEM

Hans-Peter Heins; Alfred Kelter, both of Wilhelmshaven, and Hermann Jendricke, Varel, all of Fed. Rep. of Germany, assignors to AEG Olympia Aktiengesellschaft, Wilhelmshaven, Fed. Rep. of Germany

Filed Feb. 18, 1988, Ser. No. 157,201
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1987, 3705057; Dec. 17, 1987, 3742860
Int. Cl.[4] B41J *35/28*
U.S. Cl. 400—208 **18 Claims**



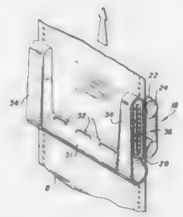
1. A reloadable ribbon cassette system, comprising:
a bottom member;
a foldable cover for the bottom member;
a reloadable supply spool core;
a ribbon having an end, the ribbon initially being wound on the supply spool core in a coil, the coil having a coil face;
a bearing pin to receive the supply spool core and rotatably mount the supply spool core in the bottom member;
a reloadable take-up spool core for the ribbon;
another bearing pin to receive the take-up spool core and rotatably mount the take-up spool core in the bottom member;
means in the bottom member for defining a plurality of ribbon reversal points;
fastening element means at the end of the ribbon for fastening the ribbon to the take-up spool core after the ribbon has been threaded around the ribbon reversal points; and
a cover plate on the coil face of the ribbon wound on the supply spool core, the cover plate having a contact shelf for the fastening element means at the end of the ribbon when the ribbon is wound entirely on the supply spool core, the cover plate projecting beyond the coil face at least in the region of the contact shelf to prevent removal of the first few turns of the coil in the axial direction.

4,861,178

VACUUM SYSTEM FOR COMPUTER PRINTERS

Patrick G. Reed, 187 Peary Clr., Creason, Pa. 16630

Filed Jul. 6, 1988, Ser. No. 215,767
Int. Cl.[4] B41J *29/00*
U.S. Cl. 400—719 **18 Claims**



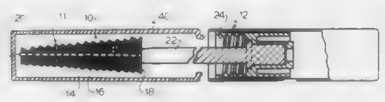
1. A printing apparatus, comprising:
(a) a computer printer for printing on a continuous perforated paper;
(b) an enclosure for said printer;
(c) said computer printer including a paper feeder having means for engaging a continuous, perforated paper having a series of pre-punched holes on the left and right marginal strips thereof;
(d) means for generating a vacuum;
(e) nozzle means, operably connected to said vacuum means, for directing said vacuum for collecting debris generated during printing operations;
(f) means for mounting said nozzle means adjacent said paper feeder; and
(g) said nozzle means including a tube, being disposed below said engaging means within said enclosure and adjacent the face and across the entire width of the paper.

4,861,179

MASCARA BRUSH

Volker Schrepf, East Islip, N.Y., and Franklin J. Hartel, Palmer, Mass., assignors to Henlopen Manufacturing Co., Inc., Melville, N.Y. and Sanderson-Macleod, Inc., Palmer, Mass.

Division of Ser. No. 837,523, Mar. 7, 1986. This application Dec. 5, 1988, Ser. No. 279,808
Int. Cl.[4] A45D *40/26;* **A46B** *11/00*
U.S. Cl. 401—129 **3 Claims**



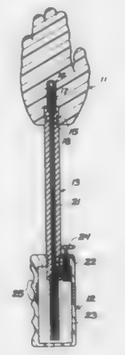
1. A spiral mascara brush in combination with a container of mascara, said brush comprising
(a) a multiplicity of bristles each having opposed free ends, and
(b) a twisted wire fixedly mounting the bristles in a continuous helical array such that the free ends of the bristles are generally disposed along a helix, wherein the improvement comprises
(c) said multiplicity of bristles comprising
(i) one type of relatively soft bristles having a flexural strength adapted to apply mascara to a user's eyelashes;
(ii) another type of relatively stiff bristles having a flexural strength, substantially greater than the flexural strength of said soft bristles adapted to comb applied mascara through a user's eyelashes, and
(iii) both said soft and stiff bristles being randomly intermingled through out the length of said helical array.

4,861,180

LOTION APPLICATOR APPARATUS WITH TIMER

David W. Adams, 748 SE. 3rd Ave., Hillsboro, Oreg. 97123

Filed May 19, 1988, Ser. No. 196,052
Int. Cl.[4] A45D *34/00*
U.S. Cl. 401—195 **3 Claims**



1. A fluid applicator apparatus for applying a fluid to an individual comprising, an applicator means for receiving fluid remotely from a container means including,
a forwardly directed applicator surface coextensive with an exterior surface, and
an elongated rigid conduit means formed with an interior coaxial channel secured at one end to a first end of said applicator means between said applicator surface and said exterior surface for directing said fluid to said applicator surface, and
said container means rigidly secured to said conduit means at a remaining end of said conduit means for supplying said fluid to said conduit means under pressure, and
wherein said applicator means includes a rigid elongate insert formed with a channel for accepting fluid from said conduit means and directing said fluid to an opening formed medially of said applicator surface, and wherein said opening is oriented generally parallel to said applicator surface, and
wherein said exterior surface is formed with a timer spaced in an opposed overlying orientation to said applicator surface for timing a sunbathing event subsequent to application of fluid to said individual wherein said fluid comprises suntan lotion, and
wherein said container means is formed with a base threadedly securable to a cap wherein said cap is rigidly secured to said conduit means and said cap is securable to said base by complementary threads formed on said cap and said base, and
wherein said cap includes an orthogonally and outwardly directed pump plunger for pressurizing fluid within said container means to provide said pressure.

4,861,181

REMOVABLY PLUGGING ELEMENT CHANNELS

Staffan Sundberg, Hofors, Sweden, assignor to Ovako Steel Couplings AB, Sweden

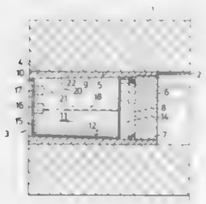
Filed Sep. 9, 1988, Ser. No. 242,825
Claims priority, application Sweden, Sep. 11, 1987, 8703525
Int. Cl.[4] F16D *1/06*
U.S. Cl. 403—15 **2 Claims**

1. An expansion plug for removably plugging a channel in an element, such as a turbine shaft in the form of a hollow shaft, said plug comprising:
a sleeve having an outer dimension, an end, and an inner curved wall, the outer dimension of the sleeve permitting

the plug to be easily inserted into the channel, the inner curved wall of the sleeve being slightly conical so that the end of the sleeve has a relatively large internal diameter;

a conical stopper arranged in the sleeve and fitting the inner curved wall of the sleeve, the stopper having two ends and an outer surface, the outer surface of the stopper and the inner curved wall of the sleeve defining a boundary surface therebetween; and

wherein the end of the sleeve having the relatively large inner diameter is closed, wherein the plug is provided with a first channel for injecting pressure medium, the first



channel extending from one end of the plug to a space between the stopper and the closed end of the sleeve to cause expansion of the plug, and wherein the plug is provided with a second channel for injecting pressure medium, the second channel extending from the one end of the plug to the boundary surface between the outer surface of the stopper and the inner curved wall of the sleeve for dismantling the plug; and

wherein the closed end of the sleeve comprises a lid which is connected by an outer screw-thread to an inner screw-thread in the sleeve, a seal applied on the inside of the lid being designed to seal against the inner curved wall of the sleeve.

4,861,182

DEVICE FOR FIXING AN ELEMENT ON AN OUTER SURFACE OF A SUPPORT WALL OF A HOLLOW BODY

Guy Gillet, Marines, France, assignor to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly/Seine, both of, France

Filed Nov. 30, 1987, Ser. No. 126,935

Claims priority, application France, Dec. 2, 1986, 86 16820

Int. Cl.[4] F16B *9/00*

U.S. Cl. 403—264 **6 Claims**



1. A device for fixing an element to an outer surface of a support wall of a hollow body which comprises a second wall substantially perpendicular to said outer surface and inner wall means substantially parallel to said outer surface, an opening being provided in said second wall, said element being in proximity to said second wall, said device comprising a bolt which extends through a part of said element and said support wall, a plate defining at least one tapped hole and bearing against said inner wall means and screw threadedly engaged with the bolt, and a fastener elastically fixed to said plate and extending through said opening in said second wall, the opening permitting the introduction of the plate, and elastically yieldable means directly engaging the second wall thereby securing the fastener to the second wall.

4,861,183

OVERLAPPING CONNECTION

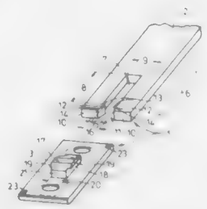
Horst Loos, Freudenberg, Fed. Rep. of Germany, assignor to Siegenia-Frank KG, Siegen, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 114,433

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637317

Int. Cl.[4] B25G *3/28*

U.S. Cl. 403—354 **8 Claims**



1. An overlap connection including two limitedly shiftable platelike parts for use in fittings such as U-rails of connection rod fittings and associated contact point covering or blocking platelets in windows, doors, or the like comprising:

(a) a first platelike part having an end which is provided with an oblong hole whose length is chosen to correspond to the intended non-zero displacement path length along which the parts are limitedly shiftable, the oblong hole with parallel sides ending at an enlarged section to form a mouth opening displaying at least one hooklike construction on the longitudinal rim of the oblong hole, the hooklike construction being elastically enlargeable, and

(b) a second platelike part having a bridging extension adapted to be inserted in the oblong hole and moved through the length of the hole and having lateral projections on a free end adapted to project over the longitudinal rims of the oblong hole on insertion, the bridging extension having an extended contact area with each of the sides of the oblong hole to give torsion resistance and provided with an abutment shoulder to positively engage with a stop shoulder of the hooklike constriction of the oblong hole.

4,861,184

CONTINUOUS FLOW CLOVERLEAF TYPE INTERCHANGE

Francisco D. Mier, 6437 Park Ridge Blvd.., San Diego, Calif. 92120

Filed Dec. 11, 1987, Ser. No. 131,440

Int. Cl.[4] E01C *1/00*

U.S. Cl. 404—1 **13 Claims**

1. A continuous flow cloverleaf type interchange for accommodating traffic from a plurality of road surfaces comprising:

a first road surface for traffic traveling in a first direction;

a second road surface for traffic traveling in a direction opposite to said first direction;

a third road surface for traffic traveling in a direction intersecting said first and second road surfaces;

a fourth road surface for traffic traveling in a direction opposite to said traffic traveling on said third road surface;

said first and second road surfaces intersecting said third and fourth road surfaces;

said first and second road surfaces being disposed at a first elevation distinct relative to said third and fourth road surfaces in an area adjacent to an interchange;

a first road surface left turn lane forming a distinct section of and being disposed along side said first road surface, said first road surface left turn lane diverting traffic from said first road surface to cross said second road surface at a point displaced a predetermined distance from the inter-



change and to continue traveling in a direction opposite to said second road surface in an area displaced laterally from said first road surface without diverting thru traffic traveling along said first and second road surfaces; and

at least one substantially circular clover-leaf section for diverting traffic from said fourth road surface to merge with traffic from said second road surface;

said first road surface left turn lane traverses said interchange at said first elevation distinct from said third and fourth road surfaces and enables traffic to curve along said cloverleaf section to turn left without stopping and to merge from the right with traffic traveling along said fourth road surface without weaving.

4,861,185

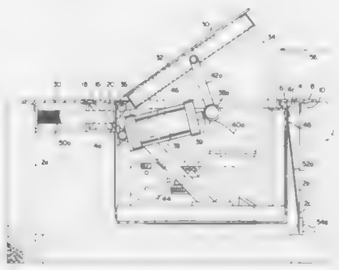
COLLAPSIBLE ROAD BARRIER

Peter A. J. Eikelenboom, Nijverheidscentrum 6, 2706 AA Zevenhuizen, Netherlands

Filed Jun. 21, 1988, Ser. No. 209,371

Int. Cl.[4] E01F *9/00*

U.S. Cl. 404—6 **5 Claims**



1. A collapsible road barrier which comprises

a foundation pit having a front wall, a rear wall and a floor,

a frame which is positioned in said foundation pit, said frame having a front side and a rear side,

an extendable barrier element mounted within said frame,

an energy absorption element extending between said rear wall of said foundation pit and said rear side of said frame, and

a stretching element which is connected from said front side of said frame near a top edge thereof to said front wall of said foundation pit near said floor,

said collapsible road barrier functioning such that a vehicle moving towards said rear wall of said foundation pit from said front wall and impacting said extendable barrier element will cause said frame to move towards said rear wall of said foundation pit, thereby causing said energy absorption element to become compressed and said stretching element to become stretched and to break, said frame then pivoting upwardly in order to stop the movement of the vehicle.

4,861,186

COVERING FOR AN OPENING WITH A COVER OR GRATING PLACED IN A FRAME

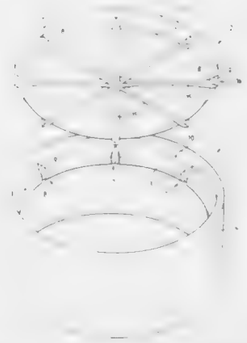
Derek Ferns, Gwent, Great Britain, assignor to Von Roll, AG., Gerlafingen, Switzerland

Filed Jan. 29, 1988, Ser. No. 149,754

Claims priority, application United Kingdom, Feb. 2, 1987, 8702111

Int. Cl.[4] E02D *29/14*

U.S. Cl. 404—25 **13 Claims**



1. Covering for an opening in road surfaces, squares, courtyards and floors, which comprises a frame and a cover placed in the frame, said frame including a support flange provided on the inside of the frame, said flange having a top surface constructed as a bearing surface, on which is mounted said cover, said cover having a marginal contact surface, said bearing surface of the support flange of said frame and said contact surface of the cover being both constructed as conical, downwardly and inwardly directed matching surfaces, and means provided at said matching surfaces for fixing a relative reciprocal position of the cover and the frame, said fixing means including lugs provided at one of said matching surfaces and grooves provided at another of said matching surfaces, said lugs cooperating with said grooves to center said cover in said frame and fix said cover relative to said frame in one position only, each lug having an end cooperating with a corresponding base of a respective groove, each lug and each groove having at said end and said base, respectively, downwardly and inwardly inclined surfaces, each lug and each groove having side walls directed at right angles to an extension of said support flange.

4,861,187

METHOD FOR ARRANGING THE COOLING IN A COMPACTOR AND A COOLING SYSTEM FOR THE REALIZATION OF THE METHOD

Matti Sinkkonen, Vaajakoski, Finland, assignor to Tana Jyra Ky, Vaajakoski, Finland

Continuation-in-part of Ser. No. 44,431, Apr. 24, 1987, abandoned. This application Apr. 13, 1988, Ser. No. 181,076
Claims priority, application Canada, May 4, 1987, 536250; Finland, Apr. 14, 1988, 871624
Int. Cl.[4] E01C *19/26*
U.S. Cl. 404—72 14 Claims



1. A method for arranging cooling in a compactor equipped with a motor and at least one roller drum having an outer cover, in which the motor has forced circulation fluid cooling comprising the steps of:

a. circulating the cooling fluid through the roller; and

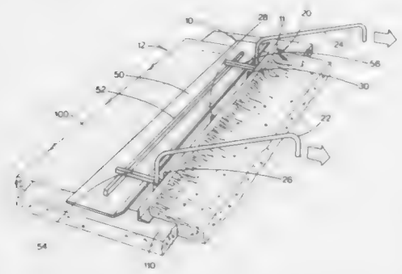
b. bringing the cooling fluid in thermal contact with the outer cover of the roller to transfer the heat from the cooling fluid to the roller to the surrounding air and the ground.

4,861,188

APPARATUS FOR LEVELLING CONCRETE

Roger Rouillard, Charlesbourg, Canada, assignor to Les Placements Paro Inc., Canada

Filed Mar. 2, 1987, Ser. No. 20,429
Claims priority, application Canada, Mar. 5, 1986, 503,379
Int. Cl.[4] E01C *19/40*
U.S. Cl. 404—75 12 Claims



1. A screed for levelling concrete or other similar material, comprising:

(a) a first section comprising first means for levelling and compacting the concrete or similar material, and second means for removing excess concrete;

(b) a second flat section operatively associated with said first section and including third means comprising a plane surface of sufficient area for causing the screed to float on the freshly poured concrete; and

(c) displacing means secured to said screed for displacing said screed so that said first section is used as a front section of said screed and said second section is used as a rear section of said screed, said front section passing over the concrete prior to said rear section passing over the concrete.

8. A method for compacting and levelling a concrete surface, comprising the steps of:

(a) pouring and hand levelling two freshly poured concrete strips;

(b) filling with concrete the volume comprised between the two strips, said strips defining sides of said concrete surface;

(c) roughly levelling the concrete surface;

(d) providing a screed which comprises a first section having first means for levelling and compacting the concrete surface and second means for removing excess concrete, and a second flat section operatively associated with said first section and including third means comprising a plane surface of sufficient area for causing the screed to float on the concrete surface; and

(e) moving the screed on said two freshly poured concrete strips by displacing the screed so that said first section is used as the front section of said screed and said second section is used as the rear section of said screed.

4,861,189

SYSTEM FOR PAVING INCLINED AND/OR CURVED SURFACES

Mitsuo Fukukawa, Saitama; Masayuki Yazawa, Chiba; Kazumitsu Asai; Yoshiharu Okamoto, both of Saitama, and Kouhei Mio, Kanagawa, all of Japan, assignors to Kajima Corporation and Kajima Road Company, both of Tokyo, Japan

Division of Ser. No. 155,905, Feb. 16, 1988. This application Nov. 23, 1988, Ser. No. 274,923
Claims priority, application Japan, Feb. 26, 1987, 62-41500; Feb. 26, 1987, 62-26428
Int. Cl.[4] E01C *19/00*
U.S. Cl. 404—84 4 Claims



1. An apparatus for supporting a paving vehicle on an inclined surface with a wire which connects the paving vehicle to an anchor vehicle, one of said vehicles having adjustment means for adjusting the position of the wire extending therefrom, said anchor vehicle having beam-receiving means located at a preset position thereon for receiving a light beam which is projected from the paving vehicle, and control means for moving the adjustment means vertically when the position of a light beam received by said beam-receiving mean deviates from said preset position.

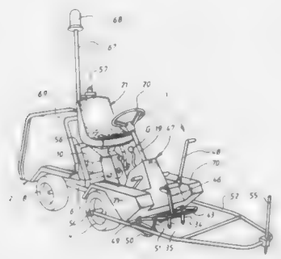
4,861,190

RIDE-ON ROAD STRIPERS

Brian D. Glassel, 77 Humphries Road, Frankston South, Victoria, Australia

Filed Oct. 2, 1987, Ser. No. 104,678
Int. Cl.[4] E01C *23/16*
U.S. Cl. 404—93 7 Claims

1. A ride-on road striper comprising a rear supporting frame carried by a pair of rear wheels, a front supporting frame carried by at least one front wheel, propulsion means for driving at least one of said wheels, pivotal joint means for articulating said front frame to said rear frame, steering means for pivoting said front frame with respect to rear frame to cause steering of said striper, an operator's seat and steering control means carried by said front frame, at least one pair of striping means mounted at the forward end of said front frame, striping material storage means and associated striping material pump



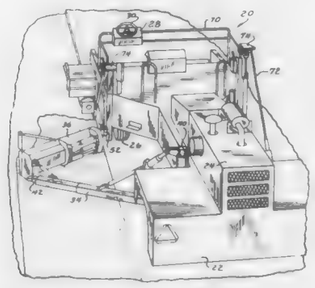
means carried by said rear frame, delivery lines connecting said storage means to said striping means, control means excessible to said operator for actuating said striping means, wherein the construction of said front frame and the positioning of said striping means thereon being such that the operator has a direct line of sight from a seated position on said operator's seat to said striping means to view the discharge of said striping material on a road surface whereby said striper and said striping means may be accurately controlled to perform the striping operation.

4,861,191

ROAD WIDENER

Donald W. Smith, Aurora, and James J. Plociennik, North Aurora, both of Ill., assignors to Barber-Greene Company, DeKalb, Ill.

Filed Jun. 14, 1988, Ser. No. 206,312
Int. Cl.[4] E01C *19/48*
U.S. Cl. 404—104 15 Claims



1. A machine for widening a road, the machine comprising:

a self-propelled chassis supported on front and rear wheels, wherein the chassis contains a recessed area on each side within the tread width of said wheels;

two strike-off tool systems supported on the chassis, one set located on each side about the recess on that side, each tool system capable of being moved substantially into the recess, each tool system including a folding strike-off tool and a telescopic support post, the support post being pivotally supported from a hinge post attached to the chassis within the tread width of the wheel; and

a conveyor supported near the front of the chassis, the conveyor capable of discharging paving material to either side of the chassis;

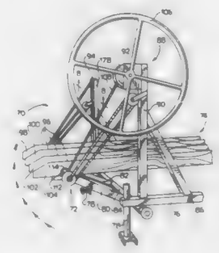
whereby the machine is capable of converting from paving on one side of the machine to another with two tool systems, and the tool systems are substantially within the machine width during transport.

4,861,192

MARINE CRAFT LIFT

Glenn A. Porter, 604 Washington St., Woodstock, Ill. 60098

Filed Jul. 26, 1988, Ser. No. 224,337
Int. Cl.[4] B63C *1/08*
U.S. Cl. 405—3 18 Claims



1. An apparatus for elevating objects, said apparatus comprising:

a fame for bearing on a subjacent support surface for said apparatus;

a platform having an upwardly facing surface for bearing against an object to be elevated and laterally spaced sides;

means mounting the platform to the frame for movement of at least a part of the platform relative to the frame in a vertical direction between a lowered position and a raised position;

a flexible cord;

a winch mounted on said frame for selectively retrieving and paying out said flexible cord;

an elongate hollow conduit with spaced opposite ends;

means for mounting the conduit to the platform so that the conduit length is laterally directed with respect to the platform and so that the conduit spans substantially the entire distance between said platform sides,

said flexible cord extending through and from the spaced opposite ends of the conduit; and

means for connecting the flexible cord to the winch and frame and for causing a lifting force to be exerted at laterally spaced locations on the conduit by the flexible cord as the flexible cord is retrieved by the winch to thereby move the platform from the lowered position to the raised position,

said conduit shielding the flexible cord along the lateral extent of said platform,

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4,861,193

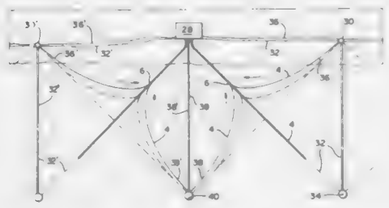
SOFT SEAWALL

Haywood H. Newkirk, P.O. Box 7036, Wilmington, N.C. 28406

Filed Jan. 26, 1988, Ser. No. 148,614
Int. Cl.[4] E02B *3/06*
U.S. Cl. 405—28 16 Claims

1. A removable seawall comprising barrier means for extending into a body of water and engaging waves in said body of water, means for deploying said barrier to an operative position and for retracting said barrier to an inoperative position, and dolphin means for attachment to a floor in said body of water, said barrier means comprising a flexible membrane having at least two walls which intersect at a non-zero angle for forming an area for confining said water, said means for

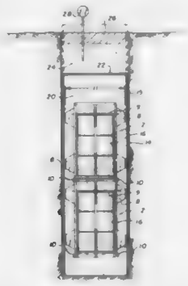
deploying and retracting said barrier means comprising cable means attached to each of said two walls for extending from a first location near the edge of said body of water to said dol-



phin means and to said first location, means for longitudinally moving said cable means and means for gathering said barrier

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4,861,194
WASTE DISPOSAL SYSTEM
Raymond G. Lang, 19961 36th Ave., Langley, British Columbia, Canada V3A 2R3
Filed May 9, 1988, Ser. No. 191,346
Claims priority, application Canada, Feb. 2, 1988, 557907
Int. Cl.[4] B09B *1/00*
U.S. Cl. 405—128 **11 Claims**



1. A waste disposal apparatus comprising:

a containment cage for holding conventional waste containers having a base platform with attached support feet, upwardly extending members to define the containment portion of the cage, the members having attached centring guides, and a perimeter member to define the open top of the container whereby each containment cage is stacked atop a previous containment cage in a column within a shaft, the support feet of each containment cage engaging the perimeter member of the previous containment cage and the centring guides engaging the walls of the shaft to provide a clear space around the containment cage.

4,861,195
CABLE PLOW CHUTE
Randy H. Hillard; Robert G. Draney, and Joseph J. Lesher, all of Wichita, Kans., assignors to J. I. Case Company, Racine, Wis.
Filed Aug. 12, 1988, Ser. No. 231,405
Int. Cl.[4] E02F *5/02*
U.S. Cl. 405—180 **5 Claims**

1. In a cable laying apparatus comprising a ground slitting blade attached to a prime mover and a cable laying chute assembly connected to a trailing portion of said blade, said chute assembly including:

a pair of spaced generally parallel J-shaped side wall plates defining a portion of said chute assembly, the space between upper end portions of said side walls defining an entrance region for a cable and a space between lower end portions of said side walls defining an exit region for said cable;

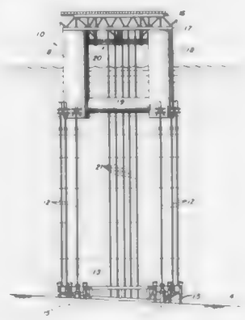
a plurality of selectively usable gate members, each said gate member releasably maintained in position between said side walls during a cable laying operation, each gate member cooperating with said side walls to define a cable guiding channel extending from said entrance region to said exit region, each gate member having a generally arcuate portion for guiding and supporting a cable at a



specific drop radius as the cable is fed through the chute assembly into a horizontal position within a slot cut in the ground by said blade, and the generally arcuate portion for each gate member being configured differently from the generally arcuate portion of another gate member whereby said gate members are selectively used within said chute assmbly depending upon the desired cable radius drop that is required for a specific task; and

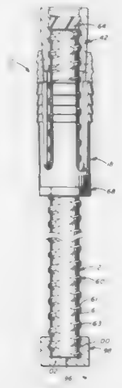
means releasably maintaining a selected gate member in position between said side walls such that the selected gate member may be withdrawn from the chute assembly to enable expeditious insertion or removal of said cable within said chute assembly for all locations of said blade.

4,861,196
OFFSHORE DRILLING/PRODUCTION PLATFORM WITH A RETRACTABLE WORK DECK
Keith A. Folse, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.
Filed May 6, 1988, Ser. No. 191,315
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—224 **12 Claims**



1. A drilling platform for offshore use comprising at least one fixed deck mounted on said platform; a retractable deck mounted beneath a lowermost one of said at least one fixed deck means mounting said retractable deck for vertical movement beneath said lower most one of said at least one fixed deck, means for extending, said retractable deck to at least one working position within a region susceptible to contact by waves in high seas and retracting said retractable deck to a second storage position out of said susceptible region.

4,861,197
ROOF BOLT SYSTEM
Frank Calandra, Jr., Pittsburgh, Pa., assignor to Jennmar Corporation, Pittsburgh, Pa.
Filed Jun. 15, 1987, Ser. No. 62,729
Int. Cl.[4] E21D *20/00*
U.S. Cl. 405—259 **13 Claims**



1. An apparatus for anchoring a ribbed bar in a bore hole comprising,

an elongated bar adapted for use in a bore hole, said bar having a plurality of helically extending discontinuous rib segments formed on the outer surface of said bar, said discontinuous rib segments forming a thread on said bar,

an expansion plug having first and second end portions and an outer wall surface, said expansion plug having a bore therethrough defining an inner wall extending from said first end portion to said second end portion,

said expansion plug inner wall having a continuous helical thread portion to receive and mate with certain of said helically extending discontinuous rib segments formed on said outer surface of said bar,

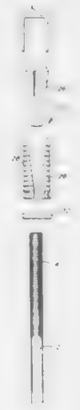
an expansion shell having a base portion and a plurality of longitudinal fingers extending from said base portion, said base portion having an opening therethrough for receiving a portion of said bar,

said plurality of fingers each having an outer surface for engaging the wall of said bore hole and an inner surface, a portion of said expansion plug outer wall surface abutting said plurality of fingers inner surfaces,

a portion of said bar extending through said opening in said expansion shell base portion and surrounded by said longitudinal fingers, portions of said bar discontinuous rib segments engaging said continuous helical thread portion of said expansion plug, and

means for rotating said elongated bar relative to said expansion plug to threadably move said bar discontinuous rib segments in said expansion plug continuous helical thread portion and move said expansion plug on said elongated bar to more rapidly and with fewer revolutions expand said expansion shell fingers and anchor said expansion shell and said bar in said bore hole and apply a tension to said ribbed bar.

4,861,198
EXPANSION ASSEMBLY FOR MINE ROOF BOLTS
John C. Stankus, Canonsburg, Pa., assignor to Jennmar Corporation, Pittsburgh, Pa.
Filed Nov. 22, 1988, Ser. No. 275,205
Int. Cl.[4] E21D *20/02*
U.S. Cl. 405—261 **10 Claims**



1. An expansion assembly for a mine roof bolt having a threaded portion at one end and a bolt head at the other end comprising;

a tapered plug having a body portion with a threaded internal bore adapted to be threaded onto said bolt threaded end portion, said tapered plug having two legs depending from said body portion that straddle said bolt and extend toward said bolt head when said plug is threaded onto said bolt threaded portion, said body portion and said depending legs forming continuous tapered surfaces that each form an angle of at least 8° to the axis of said bolt when said plug is threaded onto said bolt;

a pair of expansion leaves each having a serrated outer surface, a smooth inner surface and tapering edge surfaces joining said inner and outer surfaces, said expansion leaves each surrounding said bolt at a radially spaced distance from said bolt when said expansion assembly is positioned on said roof bolt, each of said leaf tapering edge surfaces being in abutting contact with said tapered plug tapered surfaces whereby said leaves are forced apart when said tapered plug is threaded axially onto said roof bolt and said leaves are restrained from axial movement relative to said roof bolt, each of said leaf serrated outer surfaces being formed with nine serration edges extending circumferentially around said leaf outer surface in parallel planes perpendicular to the axis of said bolt and being equally spaced a distance of no more than 0.27″ and no less than 0.22″ apart, said edges of said serrations being formed by intersecting surfaces with the surface closer to said bolt head being a planar surface perpendicular to said bolt axis and the surface closer to said bolt threaded portion being a frusto-conical surface whose conical elements are at an angle of 69° to said planar surface;

a metal bail connected to each of said expansion leaves and extending over the end of said roof bolt to prevent axial movement of said leaves relative to said bolt when said tapered plug is threaded onto said bolt threaded portion to force said leaves apart; and

a breakable holding ring positioned around said expansion

leaves to hold said expansion assembly in an assembled position on said roof bolt until expansion of said assembly by forcing said leaves apart causes said holding ring to break.

4,861,199

SLIT TRENCHER

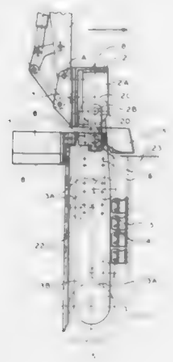
Alfred Hackmack, Am Deich 30, D-2095 Obermarschacht, Fed. Rep. of Germany

Filed Jan. 13, 1987, Ser. No. 2,963

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1986, 3600663; Jan. 16, 1986, 3601039; Oct. 19, 1986, 3638555

Int. Cl.[4] E02F *5/06, 3/14*

U.S. Cl. 405—267 **18 Claims**



1. A slit trencher for mounting on a carrier machine which moves longitudinally in a driving direction, comprising:

a holding means adapted to be mounted on said carrier machine;

a boom mounted on said holding means;

a circulating means mounted on said boom to circulate thereon, said circulating means being operable to work when circulating along a running direction; and

a plurality of slit formers mounted on said circulating means and each having a cutting edge slanted both laterally and longitudinally with respect to the running direction of the circulating means, said slit formers each having a rear side and each including:

(a) a cover plate-cutter combination having a horizontal width sized to cover the width of the slit, said cover plate-cutter combination being slanted in a direction outward and opposite to said running direction of said circulating means; and

(b) a rear plate mounted adjacent to said cover platecutter combination to block the rear side, so that said cover plate-cutter combination excavates by lifting and pushing outwardly.

4,861,200

APPARATUS FOR PNEUMATICALLY CONVEYING BULK MATERIAL

Paul Lübbehusen, Ravensburg; Norbert Eberhard, Ertingen, and Hans Hoppe, Vogt, all of Fed. Rep. of Germany, assignors to Waeschle Maschinenfabrik GmbH, Ravensburg, Fed. Rep. of Germany

Filed May 4, 1988, Ser. No. 190,105

Claims priority, application Fed. Rep. of Germany, May 5, 1987, 3714924

Int. Cl.[4] B65G *53/66*

U.S. Cl. 406—14 **2 Claims**

1. Apparatus for pneumatically conveying bulk material; comprising:

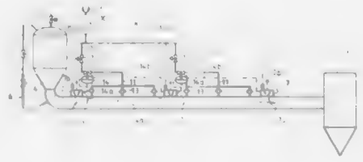
a conveyor line for transporting the bulk material;

a secondary line carrying clean gas;

pressure measuring means for determining the pressure in said conveyor line, said pressure measuring means including pressure transmitters spaced along said conveyor lines so as to divide said conveyor line into sections;

connecting means for providing a multiple communication between said secondary line and each section of said conveyor line; and

control means for regulating the flow of clean gas through said connecting means in dependence on the pressure difference between adjacent pressure transmitters, said



control means including a differential pressure switch operatively connected to pressure measurement ports of adjacent pressure transmitters, and a valve contained in said connecting means and being actuated by said differential pressure switch when said pressure differential exceeds a predetermined value so as to allow clean gas to be introduced through said connecting means into said conveyor line, said connecting means further including a pressure reducing valve interposed between said secondary line and said valve and having a control port connected with the pressure measuring port of the associated one of said pressure transmitters.

4,861,201

QUICK CHANGE ADAPTER WITH A TORQUE LIMITER FOR A TAPPING CHUCK

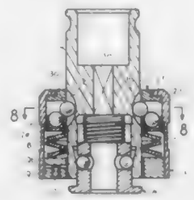
Jean Cuilleron, Saint Etienne, France, assignor to Societe Francaise D'Etudes et de Realisation D'Outillage, France

Filed Sep. 19, 1986, Ser. No. 909,212

Claims priority, application France, Sep. 19, 1985, 85 14303

Int. Cl.[4] B23B *31/38*

U.S. Cl. 408—139 **2 Claims**



1. Quick change adapter provided with a torque limiter for a tapping chuck, comprising a cylindrical tap holder having a plurality of dissymetrical recesses on its surfaces consisting of two vertically disposed walls that intersect, an annular driving element mounted concentrically with respect to the tap holder and adapter and constructed to be driven, an outer cylindrical casing mounted concentrically with respect to said driving element, said driving element having a plurality of radially extending bores in communication with said tap holder, said driving element having a plurality of axially extending bores through the bottom thereof an in communication with the radially extending bores, each of said radially extending bores and said axially extending bores together in said driving element being supplied with two balls, the bottom of the driving element having spring loaded means adapted and constructed

to impinge on one of said two balls in said bores whereby to drive said so impinged balls upwardly against the said second of said balls whereby to thrust said second of said balls against the said cylindrical wall of said tap holder when said second of said balls is in one disengaged position and into one of said recesses when said second of said balls is in another position whereby said tap holder and said driving element are in operative rotational engagement.

4,861,202

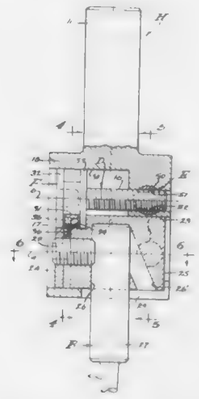
BORING HEAD

Arthur H. Fendler, 2476 Corinth Ave., Apt. 2, Los Angeles, Calif. 90064

Filed Oct. 17, 1988, Ser. No. 258,627

Int. Cl.[4] B23B *29/03*

U.S. Cl. 408—181 **18 Claims**



1. A boring head for adjusting a boring a bar eccentrically with respect to a spindle having a turning axis, and including;

a body with means for attachment to the spindle and having spaced transverse axes, a carrier axis normal to and intersecting the aforesaid turning axis and an adjustment axis spaced from and parallel to the carrier axis and constituting said spaced transverse axes,

a carrier of right cylinder form slidably carried in a cylinder bore on said carrier axis and shiftable transversely of the body, the axis of the carrier being coincidental with the carrier axis and intersecting the turning axis, and the carrier having a bore therein normal to its axis and parallel to said turning axis to receive the boring bar and means securing said boring bar within said bore,

guide means maintaining the rotational position of the carrier in the cylindrical bore of the carrier as it shifts transversely of the body and comprised of a slot in the body and in a plane coincidental with the carrier axis, and a follower on the carrier and projecting from one side thereof to slidably engage in the slot, the slot having parallel top and bottom faces and the follower being of right cylinder form with diametrically opposite peripheral portions thereof engaged with said top and bottom faces and of collet configuration having a slot separating said opposite peripheral portions thereof for expansion into tight sliding engagement with said parallel top and bottom faces of the slot in the body,

and adjustment means shifting and positioning the carrier in the cylindrical bore to an eccentric positioning of the boring bar with respect to the first mentioned turning axis.

4,861,203

CUTTING TOOL HOLDER ADAPTOR

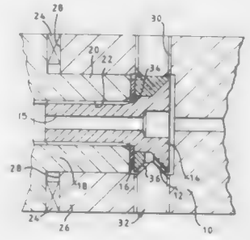
Roger Bassett, and Terence I. Negus, both of Cornwall, England, assignors to Multi-Bar Systems Ltd., Cornwall, England

Filed Sep. 9, 1988, Ser. No. 242,340

Claims priority, application United Kingdom, Sep. 12, 1987, 8721509

Int. Cl.[4] B23C *5/26*

U.S. Cl. 409—136 **8 Claims**



1. A tool holder adaptor for enabling a tool holder having a sleeve with a keyway arrangement and a plurality of locking screws to be mounted on an arbor having an internally screw-threaded boss and a drive key arrangement, said adaptor comprising a ring having a multiplicity of recesses disposed in side-by-side relationship around its peripheral surface, said recesses tapering inwardly from said peripheral surface of the ring, and a retaining screw upon which said ring is adapted to be rotatably mounted, said retaining screw being engageable in the screw-threaded boss of the arbor so as to mount said ring rotatably on a free end of the boss, the arrangement being such that (a) the sleeve of the tool holder is slidable over the boss to a position in which the keyway arrangement can engage the drive key arrangement, and the locking screws are aligned with the peripheral surface of said ring, and (b) engagement of the locking screws in respective ones of said recesses in said ring is enabled as a result of freedom of said ring to rotate so as to adopt a position in which said recesses are aligned with the locking screws.

4,861,204

TURN BROACHING TOOL

Garri Berstein, Erkelenz; Hans W. Obrig, Essen, and Helmut Wittkopp, Erkelenz, all of Fed. Rep. of Germany, assignors to Wilhelm Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany

Filed Oct. 16, 1987, Ser. No. 109,935

Claims priority, application European Pat. Off., Oct. 21, 1986, 86114600.9

Int. Cl.[4] B23C *3/06*

U.S. Cl. 409—200 **16 Claims**



1. A turn broaching tool having a first rotational axis constructed for machining crankshafts having a second rotational

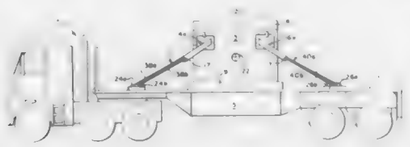
axis arranged in parallel to said first axis, comprising at least one disk type tool body having an outer contour, said disk type tool body having at least one sector type first section, a plurality of cutting tool edges secured to said outer contour of said disk type tool body along said first section, and at least one sector type second section having an opening angle of less than 180°, said second section having a recess (4) in said disk type tool body along a circumferential surface free of any cutting tool edges for providing a spacing between said recessed circumferential surface and said crankshaft when said recessed circumferential surface is facing said crankshaft, whereby previously machined surfaces of said crankshaft can be kept free of cutting tool edges when said recessed circumferential surface is facing said crankshaft, wherein said recess (4) following a last cutting tool edge in said disk type tool body has a sufficient concave depth for shifting said turn broaching tool axially along said crankshaft without first shifting said turn broaching tool radially away from said crankshaft when said spacing is facing said crankshaft thereby avoiding any contact between said crankshaft and said second section of said tool, and wherein said disk type tool body comprises a base member rotatable about said first rotational axis (11) and at least one cutting tool edge carrier having said cutting tool edges secured thereto and forming said first section secured to said base member, said cutting tool edge carrier being so dimensioned that said section having an opening angle of less than 180° remains free of said cutting tool edge carrier to form said recess (4).

4,861,205

TIE-DOWN ASSEMBLY FOR SECURING A CASK CONTAINING RADIOACTIVE WASTE TO A VEHICLE

David J. Wozniak, Clementon, N.J., and Charles W. Mallory, Severna Park, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 10, 1988, Ser. No. 154,403
Int. Cl.[4] B60P 7/12
U.S. Cl. 410—47 31 Claims



1. An improved tie-down assembly for securing a cask to a vehicle having support beams, comprising:

a plurality of cask lugs, each of which of attached to a portion of the outer wall of the cask for connecting the cask to tensioned cables which in turn are attached to the vehicle, wherein said cask lugs are formed from a material whose ratio of ultimate stress to yield stress is at least about 6 percent lower than the ratio of ultimate stress to yield stress of the material forming said portions of the outer wall of the cask so that said cask lugs will break off or pull out of the cask before they apply a force great enough to break or rupture said outer wall portions of said cask.

4,861,206

STRADDLING PLUG

Josef Riedel, Überlingen, Fed. Rep. of Germany, assignor to Tox-Dübel-Werk Richard M. Heckhausen GmbH & Co. KG, Fed. Rep. of Germany

Filed Nov. 23, 1987, Ser. No. 123,937
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1986, 3640312
Int. Cl.[4] F16B 13/06
U.S. Cl. 411—36 14 Claims



1. A plastic straddling and buckling plug for placing a screw in a surface, comprising:

a neck having a longitudinal aperture for receiving the screw;

an expandable shank attached at one end to the neck, the shank having a rupturable jacket with a plurality of longitudinal slits and a support rib helically oriented about the outside of the jacket, the jacket supporting the rib while the plug is positioned in the surface; and,

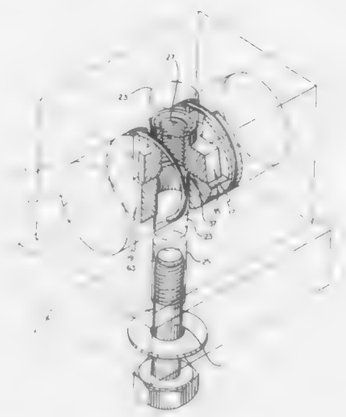
a foot attached to another end of the shank, the foot having a longitudinal aperture for threadably receiving the screw.

4,861,207

BARREL NUT FASTENER APPARATUS

Tai H. Do, Fountain Valley, Calif., assignor to Rexnord Inc., Torrance, Calif.

Filed Jun. 24, 1988, Ser. No. 210,798
Int. Cl.[4] F16B 37/00
U.S. Cl. 411—104 20 Claims



1. A barrel nut fastener apparatus adapted to be positioned within a cylindrical bore in a panel and to threadedly receive a bolt extending through a bolt hole in the panel, the bolt hole being oriented transversely to the cylindrical bore, the apparatus comprising:

a nut having a threaded bore with a longitudinal axis and

further having a generally cross-shaped configuration in a plane perpendicular to the longitudinal axis, the cross-shaped configuration including four generally rectangular wings projecting laterally away from the threaded bore along two mutually-perpendicular transverse axes; and

retainer means adapted to be positioned with the cylindrical bore in the panel, for supporting the nut in a position to threadedly receive the bolt extending through the bolt hole in the panel oriented transversely to the cylindrical bore, the retainer means including

a partial cylindrical body sized to be slidable into the cylindrical bore in the panel,

means defining a generally cross-shaped seat for conformably receiving the nut in a prescribed position, the seat being sized to permit limited movement of the nut along transverse axes perpendicular to the nut's longitudinal axis while preventing rotation of the nut about the longitudinal axis,

means defining a first circular groove in the outer surface of the partial cylindrical body,

a first resilient ring disposed in the first circular groove and overlying the nut, to retain the nut in its prescribed position on the cross-shaped seat, and

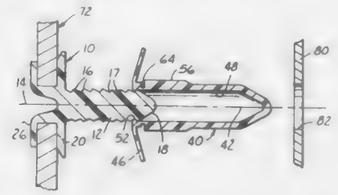
means defining a bore extending through the partial cylindrical body and emerging in a center portion of the generally cross-shaped seat, the bore being oriented substantially perpendicular to the seat and configured to guide the bolt into threaded engagement with the nut.

4,861,208

DOOR TRIM PANEL FASTENING ASSEMBLY

Timothy M. Boundy, Auburn Hills, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jan. 30, 1989, Ser. No. 303,206
Int. Cl.[4] F16B 21/00; E04F 19/02
U.S. Cl. 411—339 1 Claim



1. A fastening assembly for securing a door trim panel to a door body inner panel, the assembly comprising:

a male member having a head portion adapted to be removably secured to a slot in the door trim panel, the male member having a cylindrical portion having a plurality of barbs spaced longitudinally along the longitudinal length of the cylindrical portion;

a female member including means for removably securing the female member to the door body inner panel, the female member having a cylindrical portion with a longitudinal axis, the cylindrical portion having a pocket formed therein along the longitudinal axis, the pocket extending from one end thereof and terminating short of the other end thereof, the pocket defining an opening at said one end, the pocket including means for engaging a groove between a pair of adjacent barbs on the male member for adjusting the door trim panel relative to the door body inner panel;

the engaging means comprising an annular ring extending radially inwardly into the pocket adjacent said opening,

the female member including a plurality of circumferentially spaced and longitudinally extending ribs extending radially outwardly from the cylindrical portion;

a plurality of longitudinally extending slots formed in the cylindrical portion, each of the slots being disposed between an adjacent pair of ribs to allow the ribs to be deflected radially inwardly;

an annular groove formed between a first end of the ribs and the sealing portion, the door body inner panel being retained between the first end of the ribs and the seal portion;

the male member including a sealing flange extending radially outwardly from the cylindrical portion at one of the barbs;

the axle member including a gripping flange extending radially outwardly and spaced longitudinally from the sealing flange;

the male member including an annular head portion formed between and having a diameter less than the diameter of the gripping flange and sealing flange and adapted to be disposed in a slot formed in the door trim panel such that the door trim panel is disposed between the gripping flange and sealing flange; and

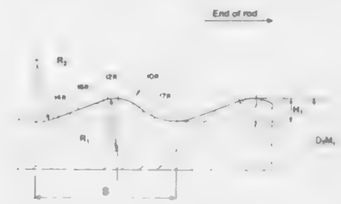
the male member and female member being made of a plastic material.

4,861,209

THREADED COUPLING

Kenneth L. Larsson, Sandviken, Sweden, assignor to Sandvik AB, Sandviken, Sweden

Filed Jul. 14, 1987, Ser. No. 73,801
Claims priority, application Sweden, Jul. 15, 1986, 8603118
Int. Cl.[4] F16B 35/04; F16L 15/00
U.S. Cl. 411—411 5 Claims



1. A threaded coupling for a high-frequency percussion drill assembly comprising a rod and a sleeve,

said rod comprising an external thread having continuously curved crown and root portions interconnected by shoulder portions,

said sleeve comprising an internal thread having continuously curved crown and root portions interconnected by shoulder portions arranged to oppose respective ones of said shoulder portions of said external thread,

said internal and external threads each being of asymmetrical configuration so as to make contact along opposing shoulder portions disposed on only one side of each crown portion,

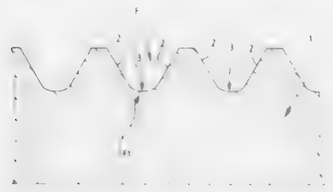
said external thread having a maximum diameter in the range of 30 to 40 mm, a pitch in the range of 7 to 11 mm, and a height in the range of 1.2 to 1.6 mm, the parts of said root and crown portions located immediately adjacent the contacting shoulder portions having radii in the range of 3 to 5 mm, said internal thread having a maximum diameter in the range of 30 to 40 mm, a pitch in the range of 7 to 11 mm, and a height in the range of 1.2 to 1.6 mm, and the parts of said root and crown portions located immediately adjacent the contacting shoulder portions having radii in the range of 3 to 5 mm.

4,861,210

THREADED ELEMENT FORMING FOR EXAMPLE A SCREW, AND ASSEMBLY OF PIECES OBTAINED WITH THE AID OF THIS ELEMENT

Jean-Claude Frerejacques, Saint-Cosme-en-Vairais, France, assignor to Simmonds S.A., Suresnes Cedex, France

Filed Dec. 16, 1988, Ser. No. 285,036
Claims priority, application France, Dec. 18, 1987, 87 17774
Int. Cl.[4] F16B *35/04*; B25G *3/00*; F16L *25/00*
U.S. Cl. 411—411 8 Claims



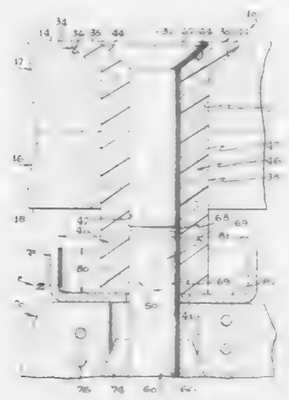
1. A threaded element, such as for example a male threaded element forming a screw, comprising at least one helical thread whose bottom presents, in cross-section along a plane containing the axis of the threaded element, a rounded shape which is connected tangentially with the sides of the thread, wherein the bottom of the thread, seen from the said section, comprises at least three arcs of a circle which are connected tangentially with one another and with the sides of the thread.

4,861,211

COMPOSITE RIVET

Richard F. Dunsmore, Simi Valley, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Oct. 17, 1988, Ser. No. 189,261
Int. Cl.[4] F16B *19/08*
U.S. Cl. 411—501 6 Claims



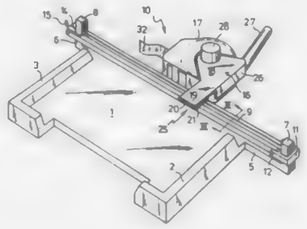
1. A composite rivet comprising:
a tubular preform having a longitudinal axis and an aperture therethrough aligned with said longitudinal axis, a head portion, a head forming portion and a shear portion therebetween, said preform composed of filamentary material in a resin matrix with the filamentary material in said shear portion parallel to said longitudinal axis and the filamentary material in said head forming portion in a helical pattern about said longitudinal axis; and
a mandrel mounted in said aperture, said mandrel having an end extending outward from said head forming portion.

4,861,212

APPARATUS FOR BINDING A PILE OF PAPER

Anne-Louise Cordia, Delft, Netherlands, assignor to Avery International Corporation, Pasadena, Calif.

Continuation of Ser. No. 39,578, Apr. 15, 1987, abandoned. This application May 16, 1988, Ser. No. 195,477
Claims priority, application Netherlands, Apr. 18, 1986, 8600986
Int. Cl.[4] B42B *5/04*
U.S. Cl. 412—36 11 Claims



1. An apparatus for binding a pile of paper which comprises:
(a) a table for supporting a pile of paper providing a back for binding,
(b) a pressure rail adapted to fix the pile of paper on the table with the back of the pile of paper parallel thereto, said pressure rail being movable away from the table to adjust to the thickness of the pile of paper,
(c) an adhesive tape emitting means comprising support means including an arm and means to hold in rotatable relation to the arm a roll of adhesive tape, said adhesive tape having an adhesive surface and means to permit rotation of the support means about an axis normal to the pressure rail to engage said adhesive surface of the tape with the back of the pile of paper, said adhesive tape emitting means being movable parallel with respect to the pressure rail and in movement relative to the pressure rail and against the pile of paper causing pressing of the adhesive tape against the back of the pile of paper as the adhesive tape is emitted from the roll, said means including means to fold a portion of the adhesive tape around a portion of each said of the pile of paper.

4,861,213

STACKING DEVICE FOR THE DISPLACEMENT OF [redacted]

Werner K. H. Fuchs, Sedlmayrster. 14, D 8 München 19, Fed. Rep. of Germany

Continuation of Ser. No. 783,960, Oct. 4, 1985, abandoned. This application Apr. 27, 1987, Ser. No. 62,311
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520246
Int. Cl.[4] B65G *57/08*; B65H *33/08*
U.S. Cl. 414—791.2 12 Claims

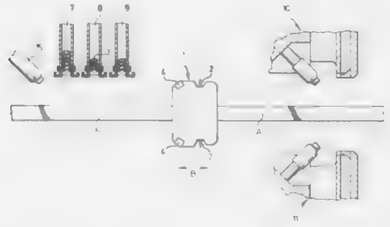
11. A stacking device for the displacement of sheets comprising:
a feed slot for supplying sheets to the stacking device,
a storage tray for the sheets fastened behind said feed slot in the direction the sheets are moving in order to accommodate relatively displaced sheets,
a ledge fastened between the feed slot and the storage tray beneath the sheets emerging from said slot,
at least one anchor mounted above said ledge so that the sheets emerging from said feed slot pass between the ledge and the anchor on the way to the storage tray, and
a control means connected with said anchor so that the anchor is adjustable left and right above the emerging sheets, whereby said anchor presses the sheet onto said ledge causing rotation of said sheet about an axis passing vertically through the anchor so that the sheet arrives at said storage tray in a position corresponding to its rotary motion.

4,861,214

APPARATUS FOR CONVEYING COUNTERWEIGHTS AND RETAINING SPRINGS FROM STORAGE MAGAZINES TO INSERTION HEADS OF A WHEEL BALANCING INSTALLATION

Rembrandt Sander, Darmstadt, Fed. Rep. of Germany, assignor to Gebr. Hofmann GmbH & Co. KG, Pfungstadt, Fed. Rep. of Germany

Filed Aug. 7, 1987, Ser. No. 82,622
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1986, 3626911
Int. Cl.[4] B65G *1/04*
U.S. Cl. 414—225 11 Claims



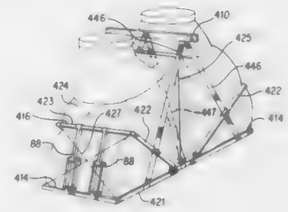
1. Apparatus for transferring counterweights and retaining springs from storage magazines and a spring supply device respectively to spring and counterweight insertion means of a wheel balancing installation comprising a transfer unit having external receiving means for counterweights and further external receiving means for retaining springs adjacent the receiving means for counterweights, a rigid rectilinear guide on which the transfer unit is mounted for movement between the magazines and the insertion heads, the guide and transfer device being mutually configured for selectively positioning the transfer unit in selected stationary positions adjacent respective ones of the magazines and spring supply device on one hand and adjacent the insertion means on the other hand in such a way that for withdrawal of a counterweight from a respective magazine, the receiving means for the counterweights may be aligned with a magazine opening corresponding to a required counterweight and that the receiving means for the retaining springs may be aligned with the spring supply device, and that for inserting of the counterweight and spring, the receiving means for the counterweights and springs may be aligned with the respective counterweight and spring insertion means.

4,861,215

BULK STORAGE BIN WITH PNEUMATICALLY ASSISTED DISCHARGE

Timothy C. Bonerb, East Aurora, N.Y., assignor to Flexair, Inc., East Aurora, N.Y.

Continuation-in-part of Ser. No. 142,744, Jan. 11, 1988, which is a continuation-in-part of Ser. No. 33,744, Apr. 3, 1987, Pat. No. 4,722,655. This application Mar. 21, 1988, Ser. No. 171,459
The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.
Int. Cl.[4] B60P *1/16, 1/56*
U.S. Cl. 414—288 18 Claims



1. A bin for storing and handling bulk material, the bin having a fill opening through which material is introduced into the bin for storage, and a discharge opening in a bottom portion of the bin through which material stored in the bin is discharged, the bin further including a primary bin support frame, the bin having at least one dump assembly with a bin floor panel that is hinged adjacent the discharge opening of the bin and pivotable from a position at rest for loading the bin to a position inclined toward the discharge opening for dumping bulk material into the discharge opening, the dump assembly including a selectively collapsible secondary frame connected to the bin floor panel and pivotable with the bin floor panel, the bin further including a flexible and collapsible bin wall portion connected to the primary and secondary frames and to the bin floor panel to form an enclosure for storage of bulk materials, the flexible bin wall portion being supported in an erect configuration by the primary and secondary frames for storage and discharge of bulk materials, the bin further including an inflatable bag underlying the bin floor panel, for inclining the floor panel toward the discharge opening and thereby directing bulk material stored in the bin through said discharge opening, the bin further including a rigid lifting shield underlying the inflatable bag and hoisting means for raising the rigid lifting shield to a bin storage position with the secondary frame and the flexible bin wall collapsed.

4,861,216

FEEDING DEVICE FOR FEEDING PULVEROUS OR GRANULAR MATERIAL FROM A CONTAINER TO A MATERIAL CONSUMING APPARATUS

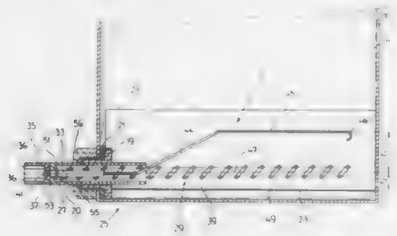
Jörg Füllemann, Mastrils; Heinrich Boner, Malans, and Erik Granwehr, Mastrils, all of Switzerland, assignors to VTH AG, Vaduz, Liechtenstein

Filed Jan. 13, 1988, Ser. No. 143,472
Claims priority, application Switzerland, Jan. 15, 1987, 130/87
Int. Cl.[4] B65G *65/00*
U.S. Cl. 414—326 22 Claims

1. A feeding device for feeding pulverous or granular material from a container to an apparatus for receiving said material, said container having sides and a substantially horizontal bottom thereof, said feeding device comprising:
axial feed means having its axis located substantially parallel

to and at a predetermined distance l_2 from the bottom of said container;

movable, flexible loosening means and means for rotating said loosening means about said axis for loosening said material in said container, said loosening means having at least an exterior section thereof being located, when furthest from said bottom, at a distance l_1 from said axis,



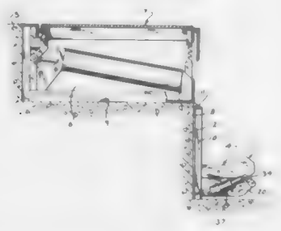
said distance l_1 of said loosening means from said axis of said feed means being larger than said predetermined distance l_2 so that scraping of said bottom by said exterior section of said loosening means occurs during each revolution of said loosening means about said axis.

4,861,217

VEHICLE RESTRAINT USING BOTH LINEAR AND PIVOTAL MOVEMENT

Kjell I. Erlandsson, Milwaukee, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed Feb. 17, 1987, Ser. No. 15,851
Int. Cl.[4] B65G *67/02*
U.S. Cl. 414—401 **20 Claims**



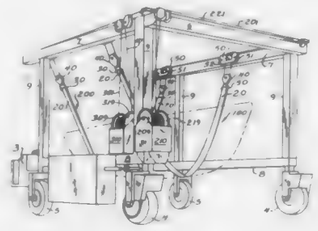
1. A vehicle restraint for preventing accidental movement of a vehicle away from a fixed structure, comprising a frame mounted on the structure and including vertical guide means, vehicle restraining means mounted for vertical movement on said guide means from a lower storage position to an upper operative position where said restraining means is adapted to engage an abutment on said vehicle to prevent movement of said vehicle in a direction away from said structure, biasing means operably connected to said restraining mens for biasing said restraining means to said upper operative position, and power operated drive means for moving said restraining means from the upper operative position to the lower storage position, said drive means being constructed and arranged so that the force of said drive means will overcome the force of said biasing means, a linkage including a first link having one end pivotally connected to said frame means and a second link having one end pivotally connected to said restraining means, the opposite ends of said first and second links being connected together at a pivot shaft, said links being disposed at an acute angle with respect to each other when said restraining means is in said lower storage position, said biasing means being operably connected to said linkage and constructed and arranged to pivot said links and enlarge said angle to thereby move said restraining means to the upper operative position, and said drive means being operably connected to said linkage and constructed and arranged to pivot said links and decrease said angle to thereby move said restraining means to the lower storage position.

4,861,218

MOBILE BOAT HOIST

Gerald P. Lamer, Sturgeon Bay, Wis., assignor to Marine Travelift, Inc., Sturgeon Bay, Wis.

Filed Feb. 16, 1984, Ser. No. 580,879
Int. Cl.[4] B60P *3/10*
U.S. Cl. 414—461 **8 Claims**



8. A straddle type crane for lifting and carrying loads comprising

a frame including at least two parallel spaced upper support members fixedly positioned on one side of an upper cross member connected therewith to form a U-shaped frame having a lower portion open at both ends,

at least two load-supporting slings extending between and operatively coupled to said parallel spaced fixedly positioned support members for engaging a load to be lifted and carried by said crane,

at least two cable means each one mutually exclusively supported from one of said fixedly positioned upper support members and operatively connected to the ends of each one of said load-supporting slings for effecting vertical movement thereof relative to said parallel spaced fixedly positioned support members and independent of the movement of the opposite end of said load-supporting slings when engaging a load to be lifted and carried by said hoist, and

all of said load-supporting slings extending between and operatively coupled to said parallel spaced fixedly positioned support members being carried by said cable means on the same side of said cross member fixedly interconnecting said two parallel spaced support members.

4,861,219

APPARATUS FOR LIFTING AND CARRYING HEAVY LOADS

Steven R. Mayle, 153 St. Thomas Dr., Fremont, Ohio 43420

Continuation-in-part of Ser. No. 23,723, Mar. 9, 1987, Pat. No. 4,740,131. This application Feb. 3, 1988, Ser. No. 151,919
The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.
Int. Cl.[4] B60P *3/00*
U.S. Cl. 414—469 **14 Claims**

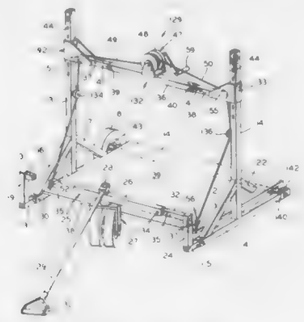
1. An apparatus for lifting and carrying loads comprising:

a generally horizontally extending support beam including means for adjusting the distance between opposite ends of said support beam;

a pair of generally vertically extending posts each attached at a lower end to one of a pair of generally horizontally extending side beams with said side beams having at least one ground engaging wheel;

means for releasably attaching each said end of said support beam to a corresponding one of said posts including a sleeve attached to said support beam and slidably engaging one of said posts, and a releasable locking mechanism attached to said support beam and releasably engaging an aperture formed in said post;

means for adjusting the distance between said posts to correspond to the distance between said ends of said support beam including a tubular steering beam, a pair of adjustment beams connected at their outer ends to said side beams and telescopically engaging at their inner ends



opposite ends of said steering beams and means for releasably attaching said adjustment beams to said steering beam;

a steering mechanism having at least one ground engaging wheel mounted on said steering beam for rotation about a generally vertical axis and a steering rod attached to said wheel;

means for adjusting the length of said side beams; and

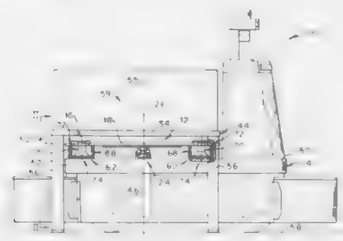
means attached to said support beam for releasably engaging and lifting a load.

4,861,220

LOAD POSITIONING ASSEMBLY AND METHOD

Adam J. Smith, Aylestone, England, assignor to Caterpillar Industrial Inc., Mentor, Ohio

Filed Aug. 23, 1988, Ser. No. 235,149
Claims priority, application United Kingdom, May 27, 1988, 8812634.7
Int. Cl.[4] B60P *1/64*
U.S. Cl. 414—495 **19 Claims**



1. A load positioning assembly for a material handling vehicle having a frame, comprising:

a load carrying device having a load carrying portion mounted on the frame and movable in directions along an elevationally oriented axis;

a carrier having a support portion and being connected to and movable with the load carrying portion;

a pilot member freely carried on the support portion of the carrier and being elevationally movable with the load carrying portion between first and second preselected elevationally spaced apart positions relative to the frame; and

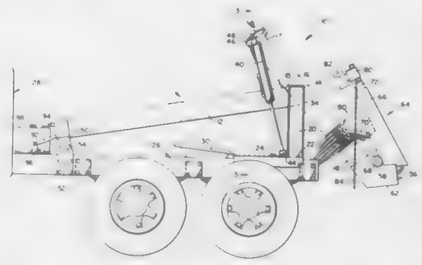
first means for engaging the pilot member, moving said pilot member in directions transverse to the axis in response to movement of the pilot member towards the first elevational position, and for maintaining the pilot member at a first preselected transverse location relative to the axis in response to being at the first elevational position.

4,861,221

VEHICLE LIFTING AND TOWING ATTACHMENT

Michael Krisa, R.D. 2, Box 50, Carbondale, Pa. 18407

Filed Mar. 29, 1988, Ser. No. 174,814
Int. Cl.[4] B60P *3/12*
U.S. Cl. 414—563 **12 Claims**



1. A lifting and towing attachment for use on a trailer cab having a horizontal frame with front and rear ends, the attachment comprising a boom assembly including a substantially horizontal beam portion, a generally vertical beam portion rigidly connected to said horizontal beam portion, and a tow bar assembly connected to a lower end of said vertical beam portion for engaging a disabled vehicle, substantially horizontal mounting plate means adapted to be readily mounted on the rear of said frame, a pair of spaced vertical guide posts fixed on said plate means, said boom assembly being mounted between said guide posts for vertical sliding movement, a front end of said horizontal beam portion adapted to be pivotally connected to the front of said frame, power lift means connected between said plate means and said boom assembly for moving said boom assembly up and down within said guide posts between raised and lowered positions, said horizontal plate means being crowned so as to be flattened when said lift means raises said boom assembly and a disabled vehicle engaged by said tow bar assembly, thereby causing said guide posts to squeeze against and laterally stabilize said boom assembly during transportation of the disabled vehicle, whereby said boom assembly, said plate means, said guide posts, and said lift means are readily attachable and detachable as a complete unit from said frame.

4,861,222

CASSETTE ELEVATOR FOR USE IN A MODULAR ARTICLE PROCESSING MACHINE

Ninko T. Mirkovich, Novato, Calif., assignor to Tegal Corporation, Petaluma, Calif.

Filed Mar. 9, 1984, Ser. No. 587,860
Int. Cl.[4] B65G *69/24*
U.S. Cl. 414—648 **7 Claims**

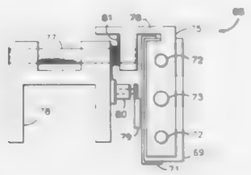
1. In a wafer processing machine, a cassette elevator comprising:

a cassette platform adapted to carry a multi-wafer cassette;

a carrier plate, said cassette platform being pivotally coupled to said carrier plate in a cantilever fashion; and

drive means coupled to said carrier plate for vertically posi-

tioning said carrier plate and cassette platform, said drive means being positioned to allow passage of a spatula under



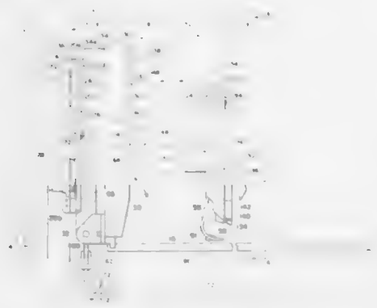
said cassette platform when said cassette platform is in a fully raised position.

4,861,223

AUTOMATIC LOAD PUSH-PULL SLIPSHEET HANDLER

John E. Olson, Portland, Oreg., assignor to Cascade Corporation, Portland, Oreg.

Filed Feb. 9, 1988, Ser. No. 154,646
Int. Cl.[4] B66F *9/20*
U.S. Cl. 414—661 **12 Claims**



1. A push-pull slipsheet handler comprising:

(a) a forwardly-extending load-carrying member for supporting a load;

(b) a push-pull assembly comprising a frame, a push plate, power means mounted on said frame for selectively extending said push plate in a forward direction and retracting said push plate in a rearward direction relative to said frame, and selectively openable and closable jaw means on said push plate for gripping a slipsheet and thereby engaging said load forwardly of said push plate;

(c) sensor means mounted on said push plate for sensing the proximity of said load to said push plate; and

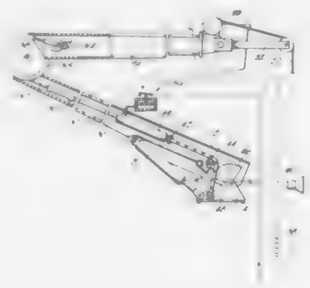
(d) control means responsive to said sensor means, said control means including means for moving said frame in said forward direction and stopping the forward movement of said frame in response to the sensing by said sensor means of a first predetermined proximity of said load to said push plate, said control means further including means for causing said power means to extend said push plate after said stopping and then interrupt the extension of said push plate relative to said frame in response to the sensing by said sensor means of a second predetermined proximity of said load to said push plate which is greater than said first predetermined proximity, and for causing said jaw means thereafter to grip said slipsheet at said second predetermined proximity.

4,861,224

AERIAL LIFT INCLUDING OVERLOAD SENSING SYSTEM

William K. Holmes, Delafield, Wis., assignor to Hi-Ranger, Inc., Waukesha, Wis.

Filed Jun. 14, 1988, Ser. No. 206,613
Int. Cl.[4] B66C *23/00*
U.S. Cl. 414—680 **10 Claims**



1. An aerial lift comprising:

a support structure;

a lower boom having an upper end and a lower end, the lower end of the lower boom being pivotally joined to the support structure for pivotal movement about a horizontal axis;

means for causing pivotal movement of the lower boom with respect to the support structure;

an upper boom having opposite ends, one end being pivotally joined to the upper end of the lower boom for pivotal movement about a pivot axis and an upper end adapted to support a load;

means for causing pivotal movement of the upper boom with respect to the lower boom, the means for causing pivotal movement including a hydraulic cylinder having opposite ends, the means for causing movement of the upper boom with respect to the lower boom including a sheave supported by the upper end of the lower boom, the sheave having a radius about the pivot axis, and a cable reeved over the sheave, the cable having opposite ends, one end connected to the upper boom and the opposite end connected to one end of the hydraulic cylinder;

compensating means for maintaining the upper boom in a selected position with respect to horizontal during movement of the lower boom with respect to the support structure; the compensating means including a flexible member having opposite ends, one end of the flexible member being fixed to the support structure and an opposite end of the flexible member being fixed to an opposite end of the hydraulic cylinder, and a curved support member supported by the support structure and having a curved surface for supporting a portion of the flexible member, and the curved surface having a radius about the horizontal pivot axis substantially the same as the radius of the sheave; and,

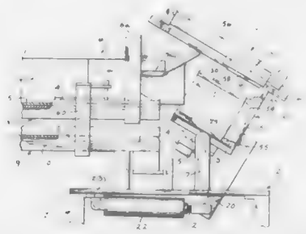
means for providing a signal when the combination of the load on the upper boom and the relative position of the upper boom with respect to horizontal generates a moment in excess of a selected moment.

4,861,225

APPARATUS FOR STACKING ARTICLES IN A SIDE-BY-SIDE RELATION

Wolfgang C. Dorner; Michael C. Allen, both of Oconomowoc; Mark C. Wedell, Delafield, and Michael A. Hosch, Hartland, all of Wis., assignors to Dorner Mfg. Corp., Hartland, Wis.

Filed Apr. 6, 1987, Ser. No. 34,614
Int. Cl.[4] B65G *61/00*
U.S. Cl. 414—789.9 **17 Claims**



1. An apparatus for stacking a plurality of articles in side-by-side relation, comprising first conveyor means for conveying articles in end-to-end relation, article receiving means disposed adjacent a downstream end of said first conveyor means for individually receiving each article from said first conveyor means, said receiving means including a bottom wall and a rear wall, aid receiving means being movable between a receiving position where said bottom wall slopes downwardly and outwardly from the downstream end of said first conveyor means to a discharge position where said bottom wall is disposed substantially horizontal, stacking means disposed to move laterally of the direction of movement of said first conveyor means for stacking each article into contiguous side-by-side relation with adjacent articles on the downwardly sloping bottom wall of said receiving means to form a stack, said stacking means further including a support member against which said articles are stacked, and means for mounting the support member for movement in a direction transverse to the direction of movement of said article on said first conveyor means from a first position to a second position, said support member being moved from said first to said second position as said articles are stacked in said receiving means, means for moving said receiving means from the receiving position to the discharge position, and means for discharging the stack from said receiving means.

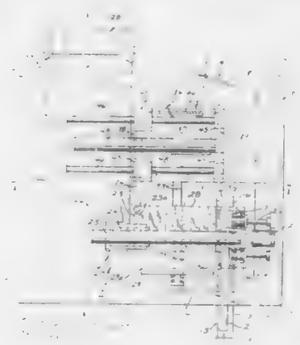
4,861,226

APPARATUS FOR STACKING ARTICLES AND FEEDING THE STACKS TO A DISCHARGE SITE

Wolfgang C. Dorner, Oconomowoc, and Michael A. Hosch, Hartland, both of Wis., assignors to Dorner Mgf. Corp., Hartland, Wis.

Filed Nov. 9, 1987, Ser. No. 118,534
Int. Cl.[4] B65G *61/00*
U.S. Cl. 414—790.3 **13 Claims**

13. A stacking apparatus, comprising first conveyor means to convey a plurality of articles in end-to-end relation, means for moving each article laterally from said first conveyor means to form a stack of side-by-side articles, second conveyor means including a moving belt conveyor member, a carriage movable between a stack receiving position offset from said second conveyor means and a stack discharge position located above said second conveyor means, said carriage having first and second open ends, means for feeding said stack through said first open end to said carriage when said carriage is in said receiving position, gate means disposed transversely of said second conveyor means for enclosing said second open end and movable between a closed and open position, drive means for moving said carriage from the receiving position to the discharge position, and means for moving said gate means from the closed to open position when said carriage is in the discharge position to permit said stack to be dischargd from said second open end of said carriage onto said moving conveyor member while maintaining side-by-side alignment of said articles in the stack.

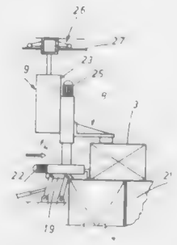


4,861,227

APPARATUS FOR THE AUTOMATIC SEPARATION OF STACKED SHEETS OF LARGE FORMAT PAPER INTO REAMS, AND FOR SUBSEQUENT TRANSFER OF THE REAMS TO WRAPPING MACHINERY

Andrea Cinotti, Bologna, Italy, assignor to Wrapmatic S.p.A., Bologna, Italy

Filed Nov. 16, 1987, Ser. No. 121,233
Claims priority, application Italy, Dec. 16, 1986, 3608 A/86
Int. Cl.[4] B65H *3/32*
U.S. Cl. 414—796.8 **2 Claims**



1. An apparatus for the automatic separation of stacked sheets of large format paper into reams, and for subsequent transfer of the reams to a wrapping machinery, comprising:

means for compacting the stack of sheets, said compacting means movable vertically in relation to the stack and means to move said stack in relation to the compacting means;

at least one separator mechanism having a tapered edge directed toward the stack of sheets, said separator mechanically connected to said compacting means, and said separator being adjustable by drive means to horizontally move said separator between a retracted position distanced from the stack and at least one extended position in which the stack is penetrated at least by the tapered edge to separate the ream from the stacked sheets; and the separator mechanism and the drive means being carried

by and connected through a damper to a support associated with a drive system by which the support itself is traversed horizontally so as to feed the separated ream to the wrapping machine;

the separator mechanism and the compacting means are carried by a main support having a top and a bottom part;

said top part is associated with a drive system which, when the separator mechanism occupies its extended, penetrating position, traverses the support between a retracted position, in which the ream separated in readiness for transfer remains vertically aligned with the remainder of the stacked sheets, and an extended position in which the ream is transferred to an infeeder section of the wrapping machine;

said bottom part is interconnected with the top part by way of a damper and carries the separator mechanism at its lower end;

wherein the separator mechanism is capable of moving vertically in relation to the bottom part of the main support between a raised position of initial penetration, adjustable for level to match the depth of the ream to be separated and enabling horizontal movement of the separator mechanism between the retracted position and a near extended position, and a lowered position at which full penetration and transfer are effected, which enables both horizontal movement of the separator mechanism between the near extended position and a farther extended position, and horizontal movement of the top part of the main support toward its extended position.

4,861,228

VARIABLE STATOR VANE ASSEMBLY

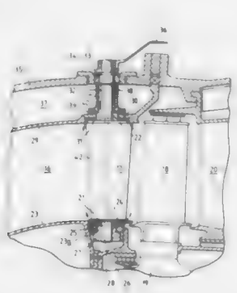
Michael T. Todman, Warwick, England, assignor to Rolls-Royce PLC, London, England

Filed Aug. 16, 1988, Ser. No. 232,858

Claims priority, application United Kingdom, Oct. 10, 1987, 8723855

Int. Cl.[4] F01D *5/18*

U.S. Cl. 415—115 **8 Claims**



1. A variable stator aerofoil vane assembly comprising an annular array of generally radially extending aerofoil cross-section stator vanes, and support structure supporting the radially inner and outer extents of said vanes so that said vanes are pivotable about their longitudinal axes, each of said vanes being provided at each of its longitudinal extents with platform means to cooperate with said support structure to limit any radial movement of said vane, and bush means interposed between each of platform means and said support structure, means being provided to supply a cooling fluid to said bush means at pressure higher than that of any fluid operationally flowing over said vanes so that said cooling fluid flows between each of said bush means and at least one platform means and said support structure so the said cooling fluid is placed in heat exchange relationship with said bush means and is subsequently exhausted into said fluid operationally flowing over said vanes, each of said bush means adjacent a radially inner or outer platform being grooved to at least partially define passages for said cooling fluid.

4,861,229

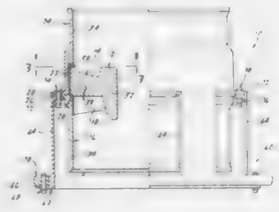
CERAMIC-MATRIX COMPOSITE NOZZLE ASSEMBLY FOR A TURBINE ENGINE

Lawrence T. Halstead, Milford, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Nov. 16, 1987, Ser. No. 120,968

Int. Cl.[4] F01D *9/04*

U.S. Cl. 415—138 **13 Claims**



1. A reinforced ceramic nozzle assembly for a turbine engine comprising

an annular, right circular cylindrical hub formed of a first reinforced ceramic material so as to exhibit quasi-isotropic characteristics within a plane normal to the longitudinal axis of said hub, said hub having a plurality of integral radially outwardly extending vanes having leading and trailing edges, the radially outermost ends of said vanes nominally generating a right circular cylinder coaxial with said hub: and

a first and second annular, right circular cylindrical shroud formed of a second reinforced ceramic material so as to exhibit quasi-isotropic characteristics in all directions therein normal to a radial vector thereof, an end of said first shroud being secured in contiguity with an end of said second shroud, at least one of said contiguous ends of said shrouds having a plurality of internal grooves extending axially therefrom, the radially outermost ends of said vanes being located generally within said grooves, said vane ends interlockingly engaging with said grooves upon cooperative thermal expansion of said hub and said shrouds, whereby relative axial and circumferential movement of said hub to said shrouds is prevented.

4,861,230

INTERLOCKING FAN GUARD

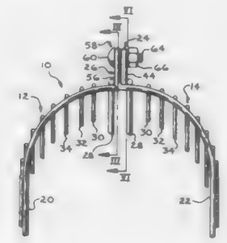
Frank E. Breining, Jackson, Mich., assignor to Airmaster Fan Company, Jackson, Mich.

Filed Feb. 17, 1989, Ser. No. 311,755

Int. Cl.[4] F04D *29/70*

U.S. Cl. 416—247 R **7 Claims**

1. A fan guard comprising front and rear guard portions each including an outer periphery and an axis, and means for detachably securing said front and rear guard portions together adjacent the peripheries thereof, the improvement comprising tabs defined on the guard portions adjacent the peripheries thereof, said tabs being offset in an axial direction whereby upon locating the front and rear guard portions peripheries adjacent each other and rotating one of said guard portions relative to each other said tabs overlap in the axial direction to form abutments with each other preventing axial separation of said guard portions, and a fastener interconnecting interlocked tabs.



4,861,231

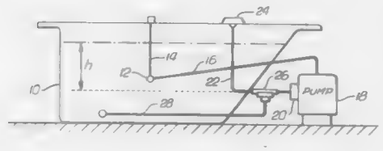
LIQUID LEVEL SENSING DEVICE

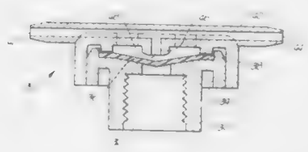
Herbert H. Howard, 20345 Ruston Rd., Woodland Hills, Calif. 91364

Filed Nov. 10, 1988, Ser. No. 269,893

Int. Cl.[4] F04B *49/02*; **H01H** *35/30*

U.S. Cl. 417—38 **3 Claims**





3. A liquid level device for use in disabling an air-actuated pump motor switch, the device comprising:

an air-filled control line extending between an air-actuated electrical switch and a manually operated plunger;

a normally sealed pneumatic port in fluid communication with the control line, venting of which would disable operation of the switch;

a device body;

a bendable diaphragm installed in the device body, the diaphragm being movable between first and second positions, and having one surface exposed to atmospheric pressure, and in sealing contact with the pneumatic port when the diaphragm is in its first position; and

means for coupling a water pressure to the other surface of the diaphragm, wherein the diaphragm is bent to its first position so long as the water pressure exceeds a preselected minimum level, but assumes the second position, bent away from the pneumatic port, when the water pressure falls below the preselected minimum.

4,861,232

VACUUM GENERATING DEVICE

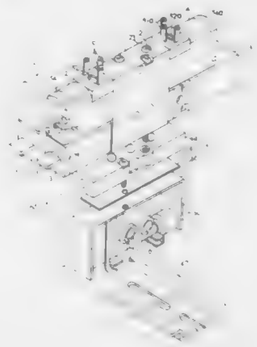
Yoji Ise, and Akira Yamaguchi, both of Tokyo, Japan, assignors to Myotoku Ltd., Tokyo, Japan

Filed May 26, 1988, Ser. No. 199,069

Claims priority, application Japan, May 30, 1987, 62-84873

Int. Cl.[4] F04F *5/44*

U.S. Cl. 417—76 **1 Claim**



1. A vacuum generating device comprising an ejector pump **1** having at least three side surfaces, a vacuum generating electromagnetic valve **2** and a filter **3** each disposed on one of said side surfaces of said pump **1**, and a vacuum breaking electromagnetic valve **4** and a vacuum switch **5** each disposed on another of said side surfaces of said pump **1**, said ejector pump **1** having a nozzle hole **8**, an ejector hole **6** and an air intake chamber **10** formed therebetween, wherein air in said air intake chamber **10** is discharged therefrom by injecting compressed air from said nozzle **8** into said ejector hole **6** so that a vacuum is generated in a system connected to said air intake chamber **10**, said pump **1** being provided the third of said side surfaces thereof with an air intake port **14** communicating with said air intake chamber **10** through said filter **3** and a vacuum keeping valve **11** provided in said pump **1**, and said vacuum switch **5** being in communication with said air intake port **14**, a compressed air inlet port **15** communicating with said nozzle hole through said vacuum generating electromagnetic valve **2**, as well as communicating with said air intake port **14** through said vacuum breaking electromagnetic valve **4**, and an exhaust port **20** leading to said ejector hole **6**, and attached on said one of the remaining side surfaces of said pump **1** with a fitting base **63** which is provided with an air intake pipe **60**, an air inlet pipe **61** and an exhaust pipe **62** capable of communicating with said air intake port **14**, said air inlet port **15** and said exhaust port **20** in said pump **1**, respectively said compressed air inlet port **15** and said exhaust port **20** passing sidewardly through said fitting base **63**, whereby when a plurality of said vacuum generating devices are assembled on a fitting rail **67**, the fitting bases **63** of said vacuum generating devices are arranged parallel and close to one another in a compact form with said air inlet pipes **61** and said exhaust pipes **62** being held in communication with one another, respectively.

4,861,233

COMPRESSOR SURGE CONTROL SYSTEM

Donald J. Dziubakowski, Seven Hills; Marion A. Keyes, IV, Chagrin Falls, and Jeremiah J. Shaffer, Mentor, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 539,773, Jul. 10, 1983, abandoned. This application May 11, 1988, Ser. No. 192,807

Int. Cl.[4] F04B *27/02*

U.S. Cl. 417—201 **2 Claims**

1. A surge control system for a centrifugal compressor hav-

ing an associated surge line and a bypass line and being connected to a base load machine to provide a combined output therewith comprising:

first means for establishing a main surge control line a predetermined distance from the centrifugal compressor surge line and identifying a point thereon as a function of the pressure differential across the centrifugal compressor and across an orifice in the inlet line of the centrifugal compressor;

a second means for establishing a feed forward control signal based on a demand variation on the base load machine



connected to the centrifugal compressor which may cause a surge condition in the centrifugal compressor;

summing means for combining the signals of said first and second establishing means to provide an anticipatory surge control line offset from the main surge control line of said first means in proportion to the magnitude of the signal from said second means and a control signal indicative thereof; and

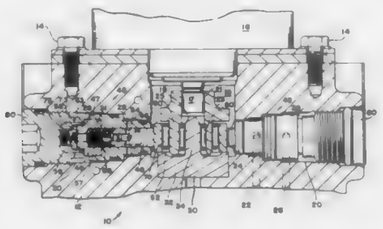
bypass valve control means connected to said summing means for varying the amount of bypass across the centrifugal compressor in response to the control signal therefrom.

4,861,234

LOW-NOISE PUMP ASSEMBLY

Theodore J. Joy, Mishawaka; Vivek V. Mohile, and William L. Richards, both of South Bend, all of Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Sep. 28, 1988, Ser. No. 250,197
Int. Cl.[4] F04B *1/06*
U.S. Cl. 417—273 **11 Claims**



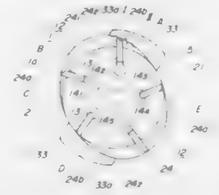
1. A pump assembly, comprising motor means mounted to a pump housing, the pump housing having a pump opening into which extends a drive shaft of said motor means, at least one pump piston extending into said pump opening and a center post disposed at one end of the pump opening, an eccentric coupling having a bore therethrough, the drive shaft and center post extending into the bore and aligned coaxially, said eccentric coupling directly coupled to said drive shaft, inner bearing means disposed between said center post and bore, a ring member disposed about said eccentric coupling and engaging said piston, the ring member having an inner ring opening, and radially outer bearing means disposed between the exterior of said eccentric coupling and within the inner ring opening, so that rotation of said shaft by the motor means effects rotation of the eccentric coupling to effect reciprocating movement of the piston.

4,861,235

VARIABLE CAPACITY TYPE COMPRESSOR

Nobuyuki Nakajima; Kenichi Inomata; Masaya Moruta; Kazuo Eitai, and Toshio Yamaguchi, all of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1989, Ser. No. 309,618
Claims priority, application Japan, Apr. 12, 1988, 63-89676
Int. Cl.[4] F04B *49/00*; F04C *29/08*
U.S. Cl. 417—295 **5 Claims**



1. In a variable capacity type compressor including a cylinder formed by a cam ring having a camming inner peripheral surface, and a pair of side blocks closing opposite ends of said cam ring, one of said side blocks having at least one inlet port formed therein, a rotor rotatably received within said cylinder and having an outer peripheral surface, a plurality of vanes carried by said rotor, at least one compression space defined between said cylinder and said rotor, and a control element mounted in said one of said side blocks for rotation about an axis thereof in opposite circumferential directions between a first extreme position providing the maximum capacity of the compressor and a second extreme position providing the minimum capacity of the compressor, to vary the compression starting timing, said cam ring having an end face facing said control element, said control element having an outer peripheral edge thereof formed with at least one cut-out portion through which compression medium is drawn into said compression space, said cut-out portion having one end and another end being downstream and upstream relative to each other with respect to the direction of rotation of said rotor, said one end determining the compression starting timing in cooperation with each of said vanes passing said one end, said cut-out portion comprising a first portion circumferentially extending from said one end of said cut-out portion to a circumferentially intermediate portion thereof and being almost flush with said outer peripheral surface of said rotor, and a second portion circumferentially extending continuously from said first portion to said another end, said second portion being located radially outwardly of said camming inner peripheral surface of said cam ring,

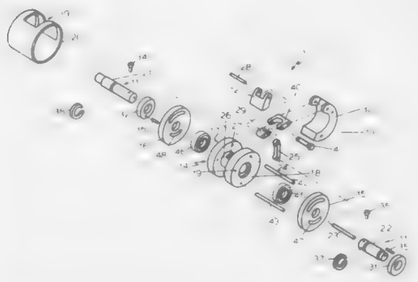
the improvement comprising at least one recess formed in said end face of said cam ring facing said control element, said recess opening in said camming inner peripheral surface of said cam ring and circumferentially extending from a circumferential location at which a suction stroke is started in said compression space or from a point proximate thereto, toward a downstream side with respect to the direction of rotation of said rotor, said recess being disposed such that when said control element is in said second extreme position, said recess has a downstream end thereof with respect to the direction of rotation of said rotor positioned downstream of said another end of said cut-out portion.

4,861,236

BIROTATIONAL PUMP

Ryon Kustes, and Alan M. Kustes, both of 4018 Contractors Ct., Louisville, Ky. 40213

Filed Sep. 26, 1988, Ser. No. 248,731
Int. Cl.[4] F04B *21/00*
U.S. Cl. 417—315 **9 Claims**



1. A birotational pump contained within an outer body pump housing containing inlet and exit ports comprising:

(a) a cylindrical piston housing comprised of a pair of end sections and a middle section containing a plurality of openings both in the end sections and in the middle section thereof;

(b) a pump shaft running through the piston housing wherein said pump shaft may rotate a full 360 degrees in either direction within said piston housing;

(c) one or more piston linkage assemblies secured to the pump shaft;

(d) a piston secured to the piston linkage;

(e) an inlet and outlet valve plate which cover the ends of the piston housing containing openings which during the rotation of the piston shaft will line up with openings in the piston housing; and

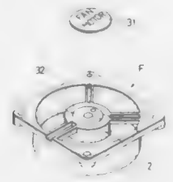
(f) a cylindrical pump housing surrounding the piston housing with an opening to allow for the rhythmic movement of the piston and piston linkage.

4,861,237

AXIAL-FLOW FAN APPARATUS

Manabu Shiraki, and Kazuhito Egami, both of Yamato, Japan, assignors to Shicoh Engineering Co., Ltd., Kanagawa, Japan

Filed Oct. 22, 1986, Ser. No. 921,396
Claims priority, application Japan, Nov. 7, 1985, 60-171260[U]
Int. Cl.[4] F04B *17/02*
U.S. Cl. 417—353 **1 Claim**



1. An axial-flow fan apparatus, said apparatus comprising:

a fan casing;

a motor casing made of a resin and formed integrally with said fan casing and arranged inside said fan casing, said fan casing and said resin motor casing having stays interposed therebetween;

a flattened single-phase energized coreless brushless motor housed within said motor casing, said motor being capable of self-starting through the use of a cogging torque, said motor including a printed circuit board, an air-core type armature coil disposed on said circuit board, a stator armature without a stator yoke arranged on one side of said circuit board, and a rotatable field magnet spaced from said stator armature; and

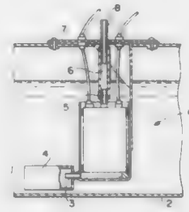
a magnetic seal name plate having desired indications legible on one side thereof, the other side of said name plate being adhesively coupled to the outer bottom face of said motor casing, said name plate preventing axial leakage of magnetic flux from said field magnet of said flattened coreless brushless motor.

4,861,238

PULSATION PREVENTIVE MEMBER FOR PUMP

Akira Kamiyama; Nobuo Yamagisawa, and Nobuyuki Oshima, all of Kiryu, Japan, assignors to Mitsuba Electric Manufacturing Co., Ltd., Gunma, Japan

Filed Jun. 8, 1987, Ser. No. 59,535
Claims priority, application Japan, Jun. 7, 1986, 61-132172; Aug. 4, 1986, 61-183038; May 27, 1987, 62-131006
Int. Cl.[4] F04B *35/04*; F16L *11/00*
U.S. Cl. 417—363 **10 Claims**



1. A pulsation preventive hose for use with a fuel supply pump, both said hose and said fuel supply pump being located in a fuel tank, said hose comprising:

a resilient conduit capable of elastically increasing and decreasing in cross-sectional area under the influence of pulsation of fluid discharged from the fuel supply pump; and

a mesh-shaped thread layer incorporated in the resilient conduit, said thread layer comprising at least one rightwardly wound thread and at least one leftwardly wound thread, the threads being roughly wound within said resilient conduit at a mesh angle in the range of 34 to 49 degrees with respect to a longitudinal axis of the resilient conduit and with sufficient spacing between the threads to provide the conduit with relatively stronger and weaker portions in a longitudinal direction thereof while also providing adequate rupture resistance;

whereby said pulsation is substantially prevented under such a condition that elastic deformation of said resilient conduit caused by fluid pulsation is permitted to a certain extent.

4,861,239

HIGH EFFICIENCY PUMP METHOD AND APPARATUS WITH HYDRAULIC ACTUATION

Eugene D. Simmons; Graham C. Thomson, III, and Richard J. Reynaud, all of Roswell, N. Mex., assignors to Rent, Ltd., Sunnyvale, Calif.

Continuation of Ser. No. 854,374, Apr. 21, 1986, abandoned.
This application Jun. 13, 1988, Ser. No. 205,588
Int. Cl.[4] F04B *47/08*
U.S. Cl. 417—383 **25 Claims**

7. Pumping apparatus having a power stroke and a reset stroke for removing source fluid from a source location to a higher collection location, comprising:

hydraulic power means for providing hydraulic pressure during the power stroke for actuating the pumping apparatus;

power tube means extending from the hydraulic power means to the source location and containing hydraulic power fluid for transferring power from the hydraulic power means to the source location during the power stroke;

hydraulic reset means for resetting the pumping apparatus during the reset stroke;

source tube means extending from the source location up to the collection location for conduiting source fluid up to the collection location during power stroke;

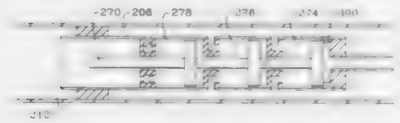
chamber means positioned at the source end of the power tube means and formed by a power section having a power end and a reset end and by a pump section having a transfer end and a pump end;

chamber reciprocating means slidably positioned within the chamber means for movement in a power direction from a power position to a reset position during the power stroke in response to the hydraulic power means, and movement in the opposite reset direction from the reset position to the power position during the reset stroke in response to the hydraulic reset means;

power piston means formed on the chamber reciprocating means within the power section of the chamber means, having a power face and a reset face;

pump piston means formed on the chamber reciprocating means within the pump section of the chamber means, having a transfer face and a pump face;

a power chamber formed by the power face of the power piston means and the power end of the power section and



in fluid communication with the power tube means, the power chamber receives power fluid to expand during the power stroke in response to the hydraulic pressure provided by the hydraulic power means and expels power fluid to contract during the reset stroke;

a power reset chamber formed by the reset face of the power piston means and the reset end of the power section and in fluid communication with the hydraulic reset means, the power reset chamber contracts during the power stroke in response to the expanding power chamber and expands during the reset stroke in response to the hydraulic reset means;

a pump transfer chamber formed by the transfer face of the pump piston means and the transfer end of the pump section, which expands during the power stroke and contracts during the reset stroke;

a transfer port between the pump transfer chamber and the source fluid in the source location for establishing fluid communication therebetween which permits the transfer chamber to fill with source fluid during the power stroke when the pump transfer chamber is expanding and which permits the pump transfer chamber to return the source fluid to the source location during the reset stroke when the pump transfer chamber is contracting;

a pump chamber formed by the pump face of the pump piston means and the pump end of the power section, which contracts during the power stroke and expands during the reset stroke;

pump valve means between the pump chamber and the source tube means for permitting the flow of source fluid from the pump chamber into the source tube means during the power stroke, and for preventing the return flow of source fluid from the source tube means into the pump chamber during the reset stroke; and

reset valve means between the pump chamber and the source location for permitting the flow of source fluid from the source location into the pump chamber during the reset stroke, and for preventing the return flow of source fluid from the pump chamber into the source location during the reset stroke.

4,861,240

CENTRIFUGAL PUMP FOR ELECTRIC HOUSEHOLD APPLIANCES SUCH AS WASHING MACHINES, DISHWASHERS AND THE LIKE

Elio Marioni, and Vittorio Cavalcante, both of Dueville, Italy, assignors to Askoll S.r.l., Dueville, Italy

Filed Apr. 19, 1988, Ser. No. 183,208
Claims priority, application Italy, Apr. 22, 1987, 41585 A/87
Int. Cl.[4] F04B *9/00*
U.S. Cl. 417—423.3 **5 Claims**



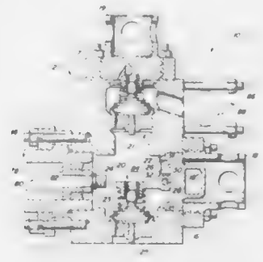
1. Improved centrifugal pump for electric household appliances such as washing machines, dishwashers and the like, of the type having a pump body and a volute forming a waterproof cntainer, said container enclosing a permanent magnet rotor having a shaft and an impeller in a first and in a second chamber respectively, said first and second chambers being separated by a perforated partition traversed by the shaft, said shaft being connected to said impeller by connection means comprising a tab which is contained in a toroidal cavity of said impeller, said connection means comprising a first cylindrical body associated with the end of the shaft protruding from the rotor chamber, said cylindrical body having, frontally, a non-axial tab extending for a reduced angle of approximately 90 degrees, said impeller having an axial cavity, substantially cylindrical for a first portion and toroidal for a second portion extending for less than 360 degrees and for more than the angular extension of said tab of said first cylindrical body, said first cylindrical body associated with the motor shaft having a peripheral groove adapted to partially contain an O-Ring, elastically interfering with the inner wall of said cavity of the impeller in the region in which it is cylindrical, wherein within the cavity of the impeller, closed by said O-Ring, there is contained a viscous fluid for damping and absorbing knockings and noise.

4,861,241

VALVE GUIDE BRACKET

Gerardo Gamboa, and Dwayne V. Cochran, both of Midland, Tex., assignors to Parker Technology, Inc., Odessa, Tex.

Filed Feb. 8, 1988, Ser. No. 153,766
Int. Cl.[4] F04B *29/02*
U.S. Cl. 417—454 **20 Claims**



1. A pump device having a main body at a fluid end thereof, a chamber formed within said main body, said chamber is in communication with the variable chamber of the pump, a check valve assembly positioned within said main body for controlling flow through the main body chamber; a flow passageway extending into said main body into communication with the main body chamber for conducting fluid flow therethrough, said check valve assembly includes a valve seat formed in said flow passageway, said valve seat having a longitudinal axis; said check valve assembly includes a valve element, a valve spring, and a valve guide assembly; an access port formed into said main body through which said valve element, spring, and valve guide assembly therefor can be introduced into said main body chamber, said access port has a longitudinal axis arranged perpendicularly respective to said longitudinal axis of said seat; the improvement comprising:

a valve guide adaptor having a window formed therein; means removably mounting said valve guide adaptor in said access port, said valve guide assembly includes a yoke and a bracket; valve stem guide means on said bracket for reciprocatingly receiving and guiding a valve stem of the valve element;

means by which said valve guide bracket is pivotally mounted to said yoke; abutment means on said bracket and said yoke by which the yoke is mounted in a plane perpendicular to the bracket while the yoke is mounted in a plane which is parallel to the axis of the valve stem, and by which the bracket can be pivoted away from the yoke; means formed on said yoke and said adaptor by which the bracket is removably mounted in a plane perpendicular to the axis of the valve stem, and with the valve seat being axially aligned with the valve stem guide means; whereby the yoke can be released from the adaptor, the valve stem removed from the bracket, and the yoke pivoted away from the bracket and then removed through the access port along with the other components of the valve guide assembly.

4,861,242

SELF-LOADING PERISTALTIC PUMP

P. Michael Finsterwald, Denver, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.

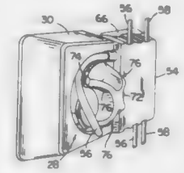
Filed Aug. 19, 1987, Ser. No. 87,096
Int. Cl.[4] F04B *43/12*
U.S. Cl. 417—477 **14 Claims**

1. A self-loading perstaltic pump comprising:

a rotor rotatably mounted about a rotor axis, and

a race having an internal surface for supporting a flexible tube in a pumping region between said rotor and said race, said surface including points that are at equal radii from said rotor axis in planes that are perpendicular to said rotor axis,

said rotor including at least one roller for intermittently and progressively compressing said flexible tube against said race in said pumping region, each said roller comprising a large diameter roller portion adjacent to a smaller diameter roller portion, the shape of each said roller causing said



flexible tube to be self-aligning at said large diameter portion,

said rotor including a radially extending rotor tab located outside of said pumping region for displacing said flexible tube toward said pumping region so as to be engaged by said smaller diameter portion as said rotor rotates,

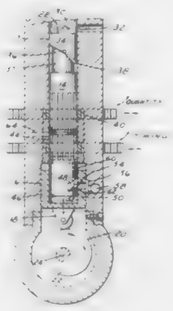
said smaller diameter portion being located closer to said radially extending tab than said large diameter portion.

4,861,243

DIESEL FUEL INJECTION PUMP WITH VARIABLE INJECTION TIMING

Wallace R. Wade, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 8, 1988, Ser. No. 179,446
Int. Cl.[4] F02M *59/20*
U.S. Cl. 417—499 **2 Claims**



1. A fuel injection pump of the spill port type having an engine camshaft cam driven plunger reciprocably movable in a plunger barrel through pumping and return strokes past a fuel fill/spill port in the wall of the barrel, the plunger having a fuel metering helix thereon movable axially with the plunger from positions of non-alignment and alignment with the spill port to provide a set opening and closing duration of the spill port to thereby provide a set quantity of fuel to be injected for each axial lift of the plunger, and thereby a set fuel injection timing, and adjustable lost motion means between the cam and plunger for varying the initial axial position of the metering helix from a set position at the end of the return stroke to vary the timing of injection, the lost motion means including a pair of nested cup-shaped members facing one another wherein at least one member is movable axially relative to the other to change the distance between the cam and plunger, the nested members defining a closed fluid chamber between, each of the nested members having a fill/spill-like port/passage, the latter being

alignable in one relative position of the nested members to supply a fluid under pressure to said chamber or vent the fluid therefrom to effect a movement of the one member without movement of the other, and being misalignable in another relative position of the nested members to block entry or exit of the fluid to or from the chamber to effect a unitary movement of the members thereafter, and means to rotate one of the members to vary the duration of alignment of one of the ports relative to the other to thereby vary the axial position of the metering helix.

4,861,244

SPIRAL DISPLACEMENT MACHINE WITH CONCAVE CIRCULAR ARCS SEALINGLY ENGAGING CIRCULAR STEPS

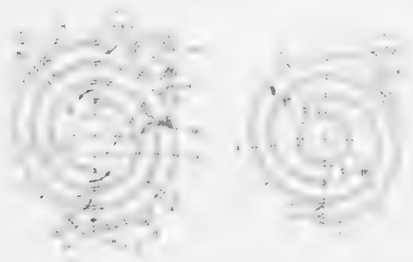
Roland Kolb, Dielsdorf, and Jürg Weber, Birmenstorf, both of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Mar. 15, 1988, Ser. No. 168,226

Claims priority, application Switzerland, Mar. 24, 1987, 1108/87

Int. Cl.[4] F04C *18/04, 27/00*

U.S. Cl. 418—15 **1 Claim**



1. A displacement machine for compressible media, comprising:

a stationary housing comprised of two housing halves, each of said housing halves having web means for defining two spiral feed spaces, each of said feed spaces having an inlet and defining a spiral slot having parallel cylinder walls arranged at a uniform distance from one another, said feed spaces being offset such that said inlets of said two feed spaces are offset by substantially 180°, wherein for each said housing halves, two outer portions of said web means form a radially outer wall of said housing, said outer portions of said web means forming a radially outer wall having an axial height greater than that of a remainder of said web means, said outer portions of said web means each corresponding to one of said feed portions and merging with said remainder at circular steps positioned adjacent said inlet of the other one of said feed portions;

a disc shaped rotor having a plurality of spiral strips formed thereon, said rotor being positioned relative to said housing halves such that each of said spiral strips fits into one of said feed spaces to form a displacement body capable of displacing a fluid from a respective one of said inlets when said rotor is eccentrically driven, wherein portions of said spiral strips define the radially outer periphery of said rotor and;

first and second guide eccentric means for eccentrically driving said rotor, wherein said first and second guide eccentric means oscillate said rotor at a position wherein a radially outer end of each of said spiral strip is adjacent one of said inlets of each of said housing halves, and wherein an edge of said rotor disc at each said outer end of said spiral strips forms a concave circular arc in sealing engagement with said circular steps during 180° of the oscillation of said rotor,

whereby sealing cooperation of said circular arcs and said circular steps prevents leakage at said inlets between ones of said feed spaces having different pressures therein.

4,861,245

SCROLL COMPRESSOR WITH SEALED PRESSURE SPACE BIASING THE ORBITING SCROLL MEMBER

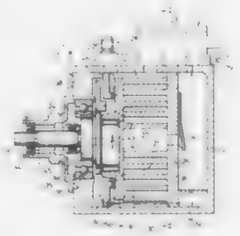
Kenji Tojo, Chiyoda; Kenichi Kawashima, Katsuta; Kazutaka Suefuji, Shimizu, and Yozo Nakamura, Chiyoda, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 17, 1987, Ser. No. 85,754

Claims priority, application Japan, Aug. 22, 1986, 61-196643

Int. Cl.[4] F04C *18/04, 27/00*

U.S. Cl. 418—55 **11 Claims**



1. A scroll compressor comprising a orbiting scroll member having an end plate with a boss for receiving a shaft at a central portion thereof and a spiral wrap formed perpendicularly on said end plate, a stationary scroll member provided with a wrap meshable with the wrap of said orbiting scroll member, a housing means having an axially extending wall portion and a radially extending frame portion for enclosing said oribiting and stationary scroll members and defining a backside space by said orbiting scroll end plate, said axially extending wall portion and said radially extending frame portion, on the orbiting scroll end plate side, and a working chamber formed by opposingly meshing the wraps of said stationary and orbiting scroll members with each other said orbiting scroll member being orbited with respect to said stationary scroll member so that said orbiting scroll member is not self-revolved, to suck a fluid from a suction chamber, which is provided on the outer side of said working chamber, into said working chamber and compress the same therein, the resultant fluid being discharged to the outside, wherein said suction chamber is defined by outer surfaces of said spiral wraps meshed with each other, said axially extending wall portion of said housing means which directly faces said outer surface of said meshed spiral wraps, and a ring-shaped seat member disposed in said backside space between said end plate of said oribiting scroll member and said radially extending frame portion so as to provide a space between said end plate of said orbiting scroll member and said ring-shaped seat member, said ring-shaped seat member having an outer peripheral portion sealingly mounted on said housing means and an inner peripheral portion extending toward said boss, a sealing means is disposed in a circumferential region of said boss between said ring-shaped seat member and said end plate of said orbiting scroll member for fluidly separating said suction chamber from said backside space to close said backside space, and a small-diameter port for communicating said closed backside space and said working chamber with each other are provided in the end plate of said orbiting scroll member.

4,861,246

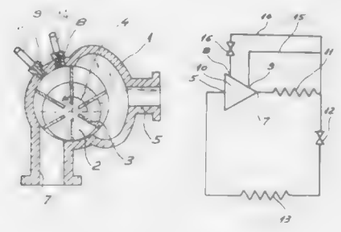
INJECTED COMPRESSOR WITH LIQUID SWITCH

Bernard Zimmern, 6 New St., East Norwalk, Conn. 06855

Filed Jan. 7, 1988, Ser. No. 141,969

Int. Cl.[4] F04C *29/02*

U.S. Cl. 418—84 **1 Claim**



1. A positive displacement rotary compressor comprising a stationary casing provided with a low pressure intake port for gas to be compressed, a high pressure discharge port for compressed gas, at least one first and one second injection hole through the casing, an average pressure of the gas being compressed being lower in front of the first injection hole than in front of the second injection hole, each injection hole being connected by respective tubes to a high pressure source of liquid connected to the high pressure discharge port for pressurization of said liquid, wherein at least a said tube connected to the first injection hole is equipped with a check valve adapted to stop the liquid flow when the difference between the average pressure in front of the first injection hole and the pressure in the high pressure discharge exceeds a preset value, said check valve having a valve member biased by a spring tending to open the valve, and said valve member having a first face exposed to the pressure of the liquid from the source of liquid with said pressure of liquid tending to close the check valve, and a second face exposed to said pressure in front of the first injection hole, with said pressure in front of the first injection hole tending to open the valve.

4,861,247

EXPANDABLE RING FOR SEALING AN ENVELOPE AGAINST THE BEAD OF A TIRE TO BE RETREADED

Karl Schimanek, Baumackerstr. 24, Zurich CH 8050, Switzerland

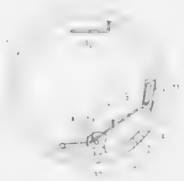
PCT No. PCT/EP87/00459, § 371 Date Jun. 21, 1988, § 102(e) Date Jun. 21, 1988, PCT Pub. No. WO88/01228, PCT Pub. Date Feb. 25, 1988

PCT Filed Aug. 18, 1987, Ser. No. 201,119

Claims priority, application European Pat. Off., Aug. 23, 1986, 86111707.5

Int. Cl.[4] B29C *33/00, 35/00*

U.S. Cl. 425—11 **30 Claims**



1. An expandable ring assembly for sealing an envelope against the bead of the ordinary tire to be retreaded or repaired in an autoclave by pressure and heat treatment, said expandable ring assembly comprising:

a one-piece ring of substantially rigid, elastic material, said ring having overlapping end portions which are movable relative to each other to spread said ring to thereby increase the diameter thereof during a sealing action and to shrink said ring and to thereby decrease the diameter thereof for removing said ring after autoclave pressure and heat treatment, said ring having a generally cylindrical sealing surface and an axially outer part, with a single, radially extending circumferential lip at said axially outer part; said end portions being overlapped in a tongue and stepped configuration as viewed perpendicularly to the ring central axis; and

a spread clamp means for moving said end portions towards each other.

4,861,248

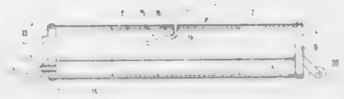
APPARATUS FOR REPAIRING BURIED PIPES

Franz J. Ben, Prostewardsweg 27,, 4192 Kalkar-Wissel, Fed. Rep. of Germany

Filed Feb. 8, 1988, Ser. No. 153,761

Int. Cl.[4] B29B *9/00*

U.S. Cl. 425—13 **10 Claims**



1. Apparatus for repairing underground pipes such as sewer pipes, comprising a cylindrical packing device capable of being inflated by compressed air, and pipes for supplying sealing material, said pipes opening through said packing device between its inflatable end portions to the outside of said packing device, wherein said packing device comprises a hose tube made of elastic material over its entire length, said tube having said end portions closed by rigid end pieces, said end portions having a greater ability to expand than the central region of said tube between said portions, an inlet in one end piece for introducing compressed air into the tube to thereby simultaneously expand the end portions of the tube, the central region of said tube carrying a cylindrical insert of elastic maetrial, said packing device containing two separate pipes for separately supplying the components of a two-component sealing material, said pipes leading to a common outlet radially through the hose of said central region.

4,861,249

APPARATUS FOR THERMALLY TREATING TAPE

James N. Ruddell, Craigavon, Ireland, assignor to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 144,718, Jan. 14, 1988, abandoned, which is a continuation of Ser. No. 887,102, Jun. 18, 1986, abandoned. This application Mar. 18, 1988, Ser. No. 169,089

Claims priority, application United Kingdom, Oct. 18, 1984, 8426151

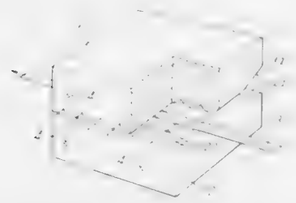
Int. Cl.[4] B29C *35/00*

U.S. Cl. 425—66 **18 Claims**

1. Apparatus for thermally treating long flexible material such as tape, comprising:

two opposed spaced unitary immobile profiled members between which material may be passed, the profile of said members being ridges and valleys running generally transversely to the direction of passage of the material, said ridges of one of said members facing said valleys of the opposing member, said member being spaced sufficiently closely that material passing between them would touch

each member at a plurality of locations yet being spaced sufficiently far apart that the material can pass between



them without being constrained to deflect from coplanarity by more than its own thickness; and

including means for heating or cooling said members.

4,861,250

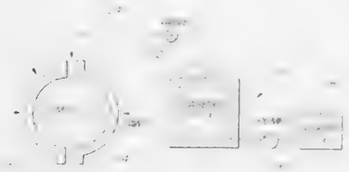
MOLD SULFONATION SYSTEM

Wilhem E. Walles, Freeland, and Donald L. Tomkinson, Auburn, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 29, 1988, Ser. No. 237,366

Int. Cl.[4] B29C *45/17, 49/42*

U.S. Cl. 425—90 **7 Claims**





1. A system for simultaneously molding and sulfonating plastic articles, comprising

(a) a mold having a cavity in which a thermoplastic resin is molded to produce a plastic article,

(b) a pre-mold chamber in fluid communication with said mold,

(c) a source of liquid sulfur trioxide in fluid communication with said pre-mold chamber,

(d) means for injecting a charge of liquid sulfur trioxide from said source of liquid trioxide into said pre-mold chamber,

(e) means for converting said charge of liquid sulfur trioxide to a relatively high pressure gaseous sulfur trioxide,

(f) means for applying to said thermoplastic resin in said mold heat and pressure at a forming temperature and pressure to form said thermoplastic resin into a plastic article and means to cool said plastic article after forming, and

(g) means for introducing said relatively high pressure gaseous sulfur trioxide into said mold cavity before any significant cooling of said plastic article takes place whereby said gaseous sulfur trioxide contacts a surface of the formed plastic article in said mold and sulfonates said surface.

4,861,251

APPARATUS FOR ENCAPSULATING SELECTED PORTIONS OF A PRINTED CIRCUIT BOARD

Max Moitzger, Lodi, Calif., assignor to Diehard Engineering, Inc., San Jose, Calif.

Filed Feb. 29, 1988, Ser. No. 162,065

Int. Cl.[4] B29C *45/14*

U.S. Cl. 425—116 **19 Claims**

8. An apparatus for encapsulating selected portions of a pin grid array in molding compound, said array comprising a printed circuit board, and a plurality of pins which extend from a surface of said board, comprising:

a first mold plate;

a second mold plate;

a first cavity in said first mold plate, said first cavity having a bottom wall, a plurality of side walls, a horizontal cross-section such that said board can fit within said side walls and a plurality of holes which extend through said bottom wall for receiving said plurality of pins which extend from said board;

means for supporting said board at a predetermined distance from said bottom wall in said first cavity;

a second cavity in said second mold plate, said second cavity having a horizontal cross-section which is substantially equal to said horizontal cross-section of said first cavity; and

means for transferring molding compound into said first and said second cavities.

17. An apparatus for encapsulating selected portions of a pin grid array in molding compound, said array comprising a printed circuit board and a plurality of pins which extend from said board, comprising:

a first mold plate having a planar surface;

a second mold plate having a planar surface;

a first cavity in said planar surface of said first mold plate for receiving said pins, said cavity having a bottom wall and a plurality of side walls and dimensions such that the outside edges of said board extend beyond said cavity so that a predetermined portion of the periphery of said board rests on said planar surface of said first mold plate;

a plurality of supporting members which extend from said bottom wall of said first cavity for supporting said array at selected points within the periphery of said board;

means located in at least one of said mold plates for positioning said array relative to said first cavity;

vacuum means for holding said predetermined portion of the periphery of said board tightly against said planar surface of said first mold plate, said vacuum means including means for providing a vacuum within the interior of said first cavity when said board covers said cavity, a flexible cup-shaped member adapted to form a vacuum-tight seal with the undersurface of said board, said cup-shaped member having a vacuum passageway centrally located therein, and means for coupling said vacuum passageway to a source of vacuum;

a second cavity in said second mold plate which extends beyond the periphery of said first cavity and said board when said first and said second cavities are placed in a facing relationship with said array located therein; and

means for transferring molding compound into said second cavity to encapsulate said selected portions of said pin grid array with said molding compound.

4,861,252

VIBRATOR TYPE CONCRETE PIPE MAKING MACHINES HAVING COMBINED LUBRICATION AND COOLING SYSTEM

Thomas D. Grau, Sioux City, Iowa, assignor to International Pipe Machinery Corp., Sioux City, Iowa

Continuation of Ser. No. 906,044, Sep. 11, 1986, abandoned. This application Sep. 29, 1988, Ser. No. 253,365

Int. Cl.[4] B28B *21/16*

U.S. Cl. 425—135 **3 Claims**



1. In combination,

a dry cast concrete pipe making machine having a generally vertically oriented, generally cylindrical mold,

a hydraulic vibrator assembly for secondary densification of material cast in the mold, and

means for vertically traversing the hydraulic vibrator assembly within the mold,

said hydraulic vibrator assembly including

an impact platen and

a hydraulic vibrator mounted on the impact platen said hydraulic vibrator including impact means mounted on shaft means for producing impact vibrations upon movement of the shaft means,

a housing having an internal chamber for receiving said impact means and shaft means, said chamber extending substantially from end to end of the housing,

bearing means within the housing for supporting the shaft means,

said housing completely enclosing said shaft means and bearing means,

hydraulic motor means associated with said housing and arranged to drive the shaft means,

said hydraulic motor means having pressure inlet means and pressure drain means connected to a source of hydraulic vibrator actuating pressure fluid and a return line, respectively, and

a combined lubrication and coolant system,

said combined system including

a source of pressurized lubricant/coolant fluid,

pressure conduit means for conveying said fluid under pressure from said source to the housing,

lubricant/coolant inlet means associated with the housing for admitting said fluid under pressure to the chamber,

lubricant/coolant outlet means associated with the housing for draining said fluid from the chamber after flowing through the chamber and

return conduit means for returning drain fluid to the source of pressurized lubricant/coolant fluid, and

means for maintaining the hydraulic vibrator actuating pressure fluid and the pressurized lubricant/coolant fluid isolated from one another at all times, and

means for precluding the start up of the vibrator actuating hydraulic system unless the combined lubricant/coolant is operating under pressure.

4,861,253

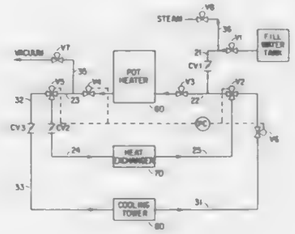
APPARATUS FOR CURING THICK-WALLED ARTICLES

William F. Mattson, Hinckley, Ohio, assignor to The Uniroyal Goodrich Tire Company, Akron, Ohio

Division of Ser. No. 102,956, Sep. 30, 1987, Pat. No. 4,816,198, which is a continuation-in-part of Ser. No. 704,850, Feb. 25, 1985, abandoned. This application Jan. 23, 1989, Ser. No. 301,009

Int. Cl.[4] B29C *35/04*

U.S. Cl. 425—143 **1 Claim**



1. In an apparatus for curing a thick-walled article located in a cavity in a mold against the surfaces of which cavity said article is to be shaped, molded and cured, said apparatus including piping means for providing hot liquid under pressure to transfer heat from a bladder to one surface of said article, and means for providing heating to substantially concurrently heat its opposed surface until the point of least cure within said article has received a predetermined number of cure equivalents required to cure the article to an extent such that no porosity will develop in the article upon release of pressure, the improvement consisting of

(a) a heating loop including a first valve means including a first three-way valve, and a supply valve upstream of said bladder to selectively flow hot liquid to said bladder through a supply conduit means, and a return valve downstream of said bladder to control said flow further, while continuing to heat said mold externally of said cavity,

(b) a cooling loop including a second valve means including said first three-way valve, said supply valve, said return valve, and a second three-way valve adapted to make a change-over to a relatively cold liquid flow,

(c) means to open a cold liquid valve upstream of said first three-way valve before flow of said hot liquid through said first three-way valve is shut-off, so as not to lose sufficient pressure in said bladder to cause porosity in said article, and,

(d) means to control flow through said return valve and maintain the back pressure in the supply conduit so that the pressure in the bladder is substantially unchanged, whereby said cold liquid valve is opened and said flow of hot liquid is shut off to said bladder before the point of least cure receives the required number of cure equivalents which is sufficient to negate the porosity of said article, yet the temperature of said point of least cure continues to rise after said change-over is completed until said required number of cure equivalents are delivered thereto.

4,861,254

CASSETTE-TYPE MOLDING DIE

Hiroshi Takeuchi, and Yoshiaki Takeuchi, both of Tokyo, Japan, assignors to Shinkoh Sellbic Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1988, Ser. No. 163,113
Claims priority, application Japan, Apr. 16, 1987, 62-56632; Aug. 17, 1987, 62-125022
Int. Cl.[4] B29C *45/66*
U.S. Cl. 425—190 **3 Claims**



1. A cassette-type molding die for molding resin materials, said molding die comprising:
- a stationary die plate having a plurality of inner surfaces defining an upwardly open fitting bore;
- attachment means in said upwardly open fitting bore for detachably receiving a stationary-side cassette plate inserted downwardly into said fitting bore, said attachment means including at least two spaced opposed seat members detachably embedded in said plurality of inner surfaces of said stationary die plate, a screw means for detachably securing each one of said at least two spaced opposed seat members, and a projecting member on each one of said at least two spaced opposed seat members for projecting into and engaging with a stationary-side cassette plate when a stationary-side cassette plate is detachably received in said upwardly open fitting bore of said stationary die plate;
- a stationary-side cassette plate detachably received in said upwardly open fitting bore of said stationary die plate and detachably engaged by said projecting members of said at least two spaced opposed seat members;
- a movable die plate spaced opposed to said stationary die plate, said movable die plate having a plurality of inner surfaces partially defining a substantially U-shaped upwardly open fitting bore;
- a movable-side retaining plate partially defining said substantially U-shaped upwardly open fitting bore;
- at least two spacer blocks disposed between said movable-side retaining plate and said movable die plate, said at least two spacer blocks further defining said substantially U-shaped upwardly open fitting bore;
- attachment means in said upwardly open substantially U-shaped fitting bore for detachably receiving a movable-side cassette plate inserted downwardly into said U-shaped fitting bore, said attachment means including at least two spaced opposed seat members detachably embedded in said plurality of inner surfaces of aid movable die plate, a screw means for detachably securing each one of said at least two spaced opposed seat members, and a projecting member on each one of said at least two spaced opposed seat members for projecting into and engaging with a movable-side cassette plate when a movable-side cassette plate is detachably received in said upwardly open U-shaped fitting bore of said movable die plate;
- an ejector plate;
- at least one ejector pin attached to said ejector plate;
- a movable-side cassette plate attached to said at least one ejector pin; and
- said ejector plate, said at least one ejector pin, and said movable-side cassette plate being detachably received in said substantially U-shaped upwardly open fitting bore, said ejector plate being adjacent to said at least two spacer blocks, and said movable-side cassette plate being adjacent to said movable die plate.

4,861,255

MIXING ORIFICE EXTRUDER

Robert J. Ney, 4215 E. Bay Dr., Ste. 1103 B, Clearwater, Fla. 34624

Filed Aug. 27, 1987, Ser. No. 90,702
Int. Cl.[4] A23G *9/12*
U.S. Cl. 425—202 **6 Claims**



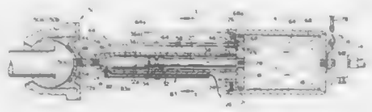
1. A food mixing, chopping and extrusion apparatus comprising: a piston and a cylindrical cup for pressurizing the charge for extrusion with a mixing cutting and sweeping device mounted on a retractable shaft extending into said cylindrical cup having an extrusion orifice in its bottom wall said mixing cutting and sweeping device being a rotating wheel having through channels for mixing and cutting aggregates in a confection charge said rotating wheel sweeps the aggregates into said extrusion orifice of said cylindrical cup and said channels of said rotating wheel being provided with trailing edges wherein said trailing edges of said channels are beveled in order to force more of the aggregates in a charge under said wheel and in co-operation with said bottom surface of said cylindrical cup mill said aggregates.

4,861,256

INJECTION MOLDING TOOL

Michael K. Covey, West Linn, Oreg., assignor to The Anchor Group, Vancouver, Wash.

Continuation-in-part of Ser. No. 877,309, Jun. 23, 1986, abandoned, which is a continuation-in-part of Ser. No. 837,428, Mar. 7, 1986, abandoned. This application Feb. 25, 1988, Ser. No. 160,263
Int. Cl.[4] B29C *35/00*
U.S. Cl. 425—378.1 **17 Claims**



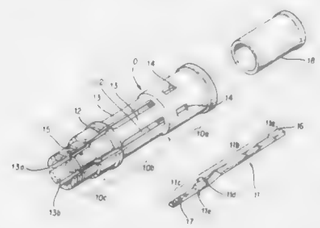
1. An injection molding tool comprising:
- a fluid operated cylinder having opposite ends,
- fluid inlet and outlet means in said cylinder,
- a piston in said cylinder,
- a piston rod having one end secured to said piston and having a free end projecting from said other end of the cylinder,
- an enlarged head portion on the free end of said piston rod having a face surface,
- an applicator barrel having an interior surface and also having opposite ends, said barrel being supported at one of its ends on said cylinder and the other end comprising an ejecting nozzle with an outlet opening,
- said piston rod extending into said applicator barrel and being arranged upon heating said ejecting nozzle and operation of said cylinder to force a molten portion of a solid resin cartridge in said barrel through said nozzle opening,
- and a heat conducting core member within said barrel adjacent said ejecting nozzle,
- said core member being of reduced diameter relative to said interior surface of said barrel to provide a passageway for molten material therearound,
- and heat conducting mounting means leading from said core member to the exterior of said barrel.

4,861,257

CORE STRUCTURE OF MOLDING APPARATUS

Masao Siotani, Kitakyushu, Japan, assignor to Toto Ltd., Kitakyushu, Japan

Filed Jun. 1, 1988, Ser. No. 201,516
Claims priority, application Japan, Jun. 5, 1987, 62-142073
Int. Cl.[4] B29C *43/00*
U.S. Cl. 425—438 **6 Claims**



1. A core structure for a molding apparatus comprising:
- (a) a generally cylindical core having a core body and a radially movable resilient part, the resilient part being longitudinally divided into plural arcuate segments spaced apart to define slots therebetween,
- (b) a plurality of elongated, arcuate complementary core members corresponding in external shape to said slots and fittable into said slots to form a cylinder with said segments, an end of each of said members being fixed to said generally cylindrical core, and
- (c) a core-expanding rod, which is insertable into the generally cylindrical core to radially expand the segments and the complementary core members to form a cylindrical smooth surface for molding an article thereupon.

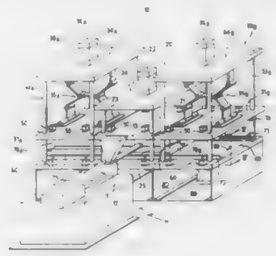
4,861,258

PRESS AND METHOD FOR MOLDING PLASTICS ARTICLES, IN PARTICULAR THERMOPLASTIC, THERMOSETTING AND POLYURETHANE POLYMERIC ARTICLES

Giorgio Margiaria, Moncalieri, and Giuseppe Brizio, Fossano, both of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Nov. 9, 1987, Ser. No. 118,903
Claims priority, application Italy, Nov. 20, 1986, 67862 A/86
Int. Cl.[4] B29F *1/00*
U.S. Cl. 425—444 **10 Claims**

1. A press for molding plastics articles, in particular thermoplastic, thermosetting and polyurethane polymeric articles, comprising three workstations arranged side by side and including a central molding station and two lateral stations for alternately cooling and extracting molded articles, two molds comprised of two lower half-shells rigidly connected to one another side by side for common lateral movement and two upper half-shells independently movable relative thereto, mold transfer means for alternately moving said molds laterally from said central molding station to one of said lateral stations, and first presser means at said workstations to apply a cooling



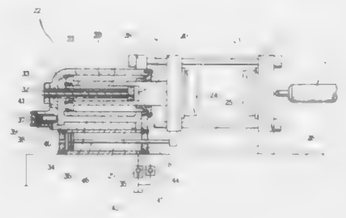
pressure to said molds during movement of said molds from said central station to a lateral station and during cooling of a mold article within a mold at a lateral station.

4,861,259

MOLD CLAMPING DEVICE

Minoru Takada, Sakaki, Japan, assignor to Nissei Jushi Kogyo Kabushiki Kaisha, Nagano, Japan

Filed Feb. 26, 1988, Ser. No. 161,121
Claims priority, application Japan, Feb. 28, 1987, 62-045982; Mar. 20, 1987, 62-067606
Int. Cl.[4] B29C *45/67;* **F15B** *11/02*
U.S. Cl. 425—451.2 **18 Claims**



1. A mold clamping device comprising in combination:
- a mold including a movable mold component fixed to a movable board and a fixed mold component fixed to a fixed board;
- a clamping cylinder slidably fitted with a clamping ram whose front end is connected to said movable board of said mold;
- a high-speed piston for opening and closing said mold slidably fitted in said clamping ram from a rear end thereof having a base section fixed on an inner rear wall of said clamping cylinder;
- a support cylinder provided in parallel to said clamping cylinder having a support piston slidably fitted in said support cylinder, a front end of a rod of said support piston being connected to said movable board;
- a rear high pressure chamber and a front oil chamber of said clamping cylinder divided by a piston section of said clamping ram;
- a front oil chamber and an air chamber of said support cylinder divided by said support piston, said air chamber opening to the atmosphere;
- a connecting path connecting said rear high pressure oil chamber and said front oil chamber of said clamping cylinder and said front oil chamber of said support cylinder;
- a front pressure chamber for high speed mold closure and a rear pressure chamber for high speed mold opening of said

clamping ram divided by a large-diameter piston section of said high-speed piston;

means for opening and closing said connecting path, said means opening said path during high speed mold closure and high speed mold opening, and closing the connection from said rear high pressure chamber of said clamping cylinder to said front oil chamber thereof and said front oil chamber of said support cylinder during tight clamping; and

an oil pressure circuit supplying oil to said front pressure chamber for high speed mold closure of said clamping ram during high speed mold closure, supplying oil to said rear pressure chamber for high speed mold opening thereof during high speed mold opening, and supplying oil to said rear high pressure chamber of said clamping cylinder during tight clamping,

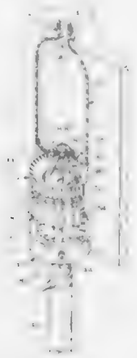
wherein the sum of the effective pressure receiving area of said front oil chamber of said clamping cylinder and said front oil chamber of said support cylinder is substantially equal to the effective pressure receiving area of said rear high pressure chamber of said clamping cylinder.

4,861,260

APPARATUS FOR FORMING A BLOWN PLASTIC CONTAINER

Harold D. Bartley, Springfield, and William R. Gaiser, Dayton, both of Ohio, assignors to Broadway Companies, Inc., Dayton, Ohio

Filed Feb. 19, 1988, Ser. No. 157,449
Int. Cl.[4] B29C *49/10*
U.S. Cl. 425—529 **6 Claims**



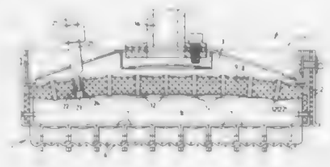
4. Apparatus for the formation on a blow-molded container of a skirt on the container bottom to provide for the free standing of the container in an upright position, said container being blown in a mold cavity from a preform having an annular skirt portion at an end thereof remote from the container top and surrounding an end of the preform, comprising a mold having a mold cavity, a closed bottom a plurality of articulated fingers in said mold cavity arranged in an annular array, said fingers terminated in distal ends proportioned to be received within said preform skirt portion prior to blowing of said preform, means supporting said fingers for axial and radial movement with respect to said mold cavity, means responsive to movement of said preform in said mold cavity during blowing thereof for causing programmed radial movement of said fingers in unison concurrently with axial movement thereof, to stretch said skirt portion into an annular support skirt on the container bottom.

4,861,261

METHOD OF OPERATING A GAS-INFRARED RADIATOR, AND THE GAS-INFRARED RADIATOR

Kurt Krieger, Oberlinstrasse 16, Düsseldorf, Fed. Rep. of Germany D-4000

Filed Oct. 5, 1987, Ser. No. 124,990
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1986, 3603387
Int. Cl.[4] F23C *11/04*
U.S. Cl. 431—1 **8 Claims**



1. A method of operating a gas infrared radiator with variable energy output and comprising means forming a combustion chamber surrounded substantially on all sides by components and a pre-chamber adjacent the combustion chamber, a barrier layer of fibrous material with a plurality of pipes extending therethrough separating the pre-chamber from the combustion chamber the amount of gas other than air supplied to the combustion chamber or said pre-chamber chamber being variable by a control device, characterized in that the amount of gas supplied is intermittently varied by a pulse control system down to a range corresponding to an energy delivery less than about 40% of the maximum rated energy obtainable from the infrared radiator, the air supply being continuously maintained, and a flame supplied with gas is maintained in the combustion chamber separately from the controlled gas supply when operating in the previously-mentioned range.

4,861,262

METHOD AND APPARATUS FOR WASTE DISPOSAL

Gregory M. Gitman, Duluth, and Boris M. Khudenko, Atlanta, both of Ga., assignors to American Combustion, Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 883,769, Jul. 9, 1986, Pat. No. 4,797,087, which is a continuation-in-part of Ser. No. 755,831, Jul. 15, 1985, Pat. No. 4,642,047, which is a continuation-in-part of Ser. No. 642,141, Aug. 17, 1984, Pat. No. 4,622,007. This application Jan. 29, 1987, Ser. No. 9,145
Int. Cl.[4] F23D *14/00*
U.S. Cl. 431—5 **90 Claims**



1. A method of thermal destruction of waste material which comprises the steps of:

(a) introducing solid waste material into a primary incineration combustion means;

(b) providing a controllable amount of primary oxidizing gas into said primary incineration combustion means;

(c) incinerating said solid waste in said primary incineration combustion means to produce solid residue and gaseous exhaust;

(d) directing said gaseous exhaust from said primary incineration combustion means to containment means having an auxiliary burner generating hot auxiliary combustion product;

(e) controllably introducing fluid combustible material into said auxiliary burner;

(f) providing two secondary oxidizing gases having different oxygen and nitrogen concentrations from each other to said containment means, at least one of said oxidizing gases being provided into said auxiliary burner;

(g) combusting the residual combustible components of said gaseous exhaust in said containment means and said fluid combustible material in said auxiliary burner;

(h) sensing process characteristics in said primary incineration means and said containment means and generating signals indicative of the value of the process characteristics sensed;

(i) comparing said sensed process characteristic signals with predetermined values for said process characteristics which insure reduction of hazardous components in said gaseous exhaust below a desired level and communicating the results of said comparison to means for controlling the flow of at least one of said two secondary oxidizing gases provided to said containment means;

(j) sensing when batch of said waste material is about to be introduced into said primary incineration combustion means and generating a signal indicative of said introduction and communicating said introductions signal to said means for controlling the flow at least one of said two secondary oxidizing gases provided to said containment means; and

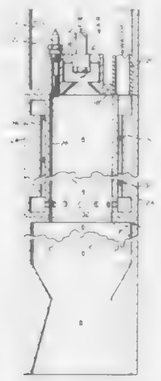
(k) adjusting the flows of at least one of said oxidizing gases provided to said containment means to increase in response to said introduction signal the total amount of oxygen momentarily provided to said containment means and to increase the proportion of oxygen to nitrogen provided with said oxidizing gases.

4,861,263

METHOD AND APPARATUS FOR THE RECOVERY OF HYDROCARBONS

Robert M. Schirmer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 4, 1982, Ser. No. 354,858
Int. Cl.[4] F23R *3/44*; E21B *43/24*
U.S. Cl. 431—158 **80 Claims**



1. An elongated modular steam generating means including the following modules, detachably coupled in series from its upstream end to its downstream end, each said module being adapted to be replaced by a module, including at least one differently operating element, adapted to perform the same function as the module replaced:

(a) combustor head means, including fuel introduction means and combustion-supporting gas introduction means;

(b) combustion chamber means in open communication with the downstream end of said combustor head, adapted to burn said fuel in the presence of said combustion-supporting gas and produce a flue gas substantially free of unburned and partially burned fuel;

(c) water introduction means adapted to introduce water into said flue gas adjacent the downstream end of said combustion chamber; and

(d) vaporization chamber means in open communication with the downstream end of said combustion chamber and adapted to vaporize a major portion of said water and discharge a mixture of flue gas and steam from the downstream end of said vaporization chamber;

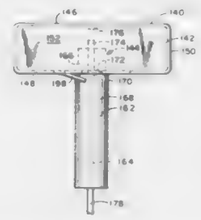
(e) said fuel introduction means, said combustion supporting gas introduction means and said combustion chamber means being adapted to produce a power output of at least 7 MM Btu/hr. with a heat release rate of at least about 50 MM Btu/hr. ft.[3].

4,861,264

GAS COLLECTOR ELECTRODE ASSEMBLY FOR GAS BURNERS

Alfred J. Romanak, Broadview Heights, and Russell W. Moss, Richmond Heights, both of Ohio, assignors to Channel Products, Inc., Chesterland, Ohio

Filed Jul. 21, 1988, Ser. No. 672,227
Int. Cl.[4] F23Q *7/06*
U.S. Cl. 431—263 **11 Claims**



1. A gas collector for a spark electrode assembly utilized in gas burner applications comprising a housing having spaced apart walls defining a collector chamber, and means for grippingly engaging the spark electrode assembly so that a portion thereof is within said collector chamber, said engaging means being formed in one of said walls of said collector chamber and including a first aperture for receiving the spark electrode assembly and a tab portion with grippingly engages the spark electrode assembly.

4,861,265

APPARATUS AND METHOD FOR THE HEAT TREATMENT OF FINE-GRAINED MATERIAL

Manfred Dürr, Oelde; Georg Unland, Ennigerloh; Günter Driemeier, Lienen; Karl Krützner, Beckum; Heinz-Herbert Schmits, Rheda-Wiedenbrück; Michael von Seebach, Ennigerloh; Otto Heinemann, Ennigerloh; Wolfgang Rother, Oelde, and Dieter Dreyer, Ennigerloh, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed Oct. 13, 1988, Ser. No. 257,208

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 3736905

Int. Cl.[4] F27B *7/02*

U.S. Cl. 432—103 7 Claims



1. Apparatus for the heat treatment of fine-grained material, such as cement raw material, having

(a) a multi-stage cyclone preheater for preheating the material,

(b) a combustion chamber for precalcination of the preheated material,

(c) a mixing and reaction reactor for almost complete calcination of the precalcined material,

(d) a rotary kiln connected to the cyclone preheater by the mixing and reaction reactor for final burning of the calcined material,

(e) a cooler for cooling the finally burnt material,

(f) a tertiary air pipe which leads from the cooler to the combustion chamber and branches into at least two branch pipes which are both connected to the combustion chamber,

(g) a material discharge pipe connected to the second-lowest stage of the cyclone preheater, the material discharge via this pipe being delivered to the combustion chamber,

(h) a connection between the combustion chamber and the mixing and reaction reactor and through which the exhaust gases from the combustion chamber and the precalcined material are introduced into the mixing and reaction reactor,

characterised by the following features:

(i) the branched part of the tertiary air pipe extends upwards; and

(j) the material discharge pipe from the second-lowest stage of the cyclone preheater opens into one branch pipe of the tertiary air pipe at a point which is lower than the point at which said one branch pipe of the tertiary air pipe is connected to the combustion chamber.

4,861,266

DENTAL ASPIRATOR VALVE AND VALVE SHEATH

Mark Ashiku, 475 Eastlick, Apt. 1, Ukiah, Calif. 95482

Filed Mar. 22, 1988, Ser. No. 171,561

Int. Cl.[4] A61C *17/04*

U.S. Cl. 433—95 2 Claims

1. A dental aspirator valve and sheath assembly comprising an aspirator valve piece comprising an elongated housing adapted at a first end for attachment to a vacuum source and adapted at the second end to securely receive a sheath thereover, said piece also accommodating valve means operable by mechanical engagement means; and a sheath comprising an open-ended hollow housing and handle wherein said handle is adapted to mechanically engage said mechanical engagement



means on said aspirator valve piece upon securing said sheath over said second end of said aspirator valve piece.

4,861,267

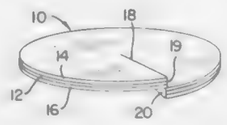
SLITTED METAL FOIL FOR FORMING A DENTAL COPING AND METHOD

Itzhak Shoher, 50 Shlomo-Hamelech St., Tel-Aviv, Israel (64386), and Aharon E. Whiteman, 13 J. L. Perez St., Petach-Tikvah, Israel (49206)

Filed Sep. 8, 1987, Ser. No. 93,772

Int. Cl.[4] A61C *5/08*

U.S. Cl. 433—218 9 Claims



1. A metal foil having a composite body formed from at least two layers of precious metal with at least one layer composed of a low fusing temperature gold based metal composition of up to 100% gold and another layer composed of a relatively high fusing temperature metal and including at least one slit extending from the perimeter of the foil to a location at or relatively close to the center of the foil to form slitted ends adapted to be overlaid in an arrangement for forming a coping having a substantially conical or frusto-conical shape.

4,861,268

TOOTH-ANCHORED BENEFICIAL AGENT DELIVERY DEVICE

Gabriel L. Garay, Atherton; Anne-Ly Garay, Redwood City, and Robert Tacy, Los Altos Hills, all of Calif., assignors to Transpharm Group, San Francisco, Calif.

Filed Jun. 13, 1988, Ser. No. 206,098

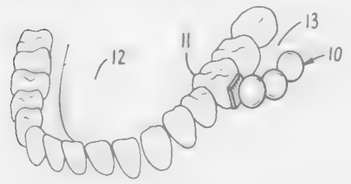
Int. Cl.[4] A61C *19/06*

U.S. Cl. 433—229 10 Claims

1. A beneficial agent delivery device adapted to be semipermanently affixed to a tooth comprising:

(a) an anchor member that is adapted to be removably affixed to the side of a tooth out of the way of the biting surface of the teeth; and

(b) a cartridge member adapted to be removably affixed to said anchor member, said cartridge member containing a beneficial agent, being capable of releasing said agent into



the oral cavity, and comprising a chain of individual cartridges that are linked to each other.

4,861,269

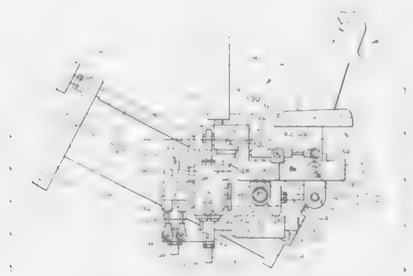
SIDESTICK FLIGHT CONTROL SIMULATOR

Raymond P. Meenen, Jr., Huntington Station, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Mar. 30, 1988, Ser. No. 175,377

Int. Cl.[4] G09B *9/08*

U.S. Cl. 434—45 10 Claims



1. A sidestick flight control simulator comprising:

a main stationary support;

a sidestick grip mounted to a separate support located in spaced relation to the stationary support;

a pitch assembly including

(a) a first clevis for pivotally mounting the grip support thereby allowing pitch deflection of the grip,

(b) first spring means for establishing break-away force and force-deflection characteristics, the spring means including a housing fastened to the first clevis and a displaceable rod pivotally mounted to a second clevis which is itself pivotally fastened to the grip support, the rod undergoing spring-loaded linked pitch displacement with the grip,

(c) a first damper having its housing fastened to the housing of the first spring means,

(d) first bracket means linking a rod of the damper to the spring means rod for damping motion of the spring means rod;

a roll assembly including

(a) means for pivotally mounting the first clevis in the roll direction, thereby allowing roll deflection of the grip,

(b) a third clevis extending to the main stationary support and pivotally mounting a second spring means,

(c) a rod of the second spring means having a first end pivotally mounted to the main stationary support while the housing thereof is pivotally mounted to the third clevis, wherein roll deflection of the grip results in spring-loaded linked displacement of the rod simulating force-displacement characteristics in the roll direction,

(d) a second damper having its housing fastened to the housing of the second spring means,

(e) second bracket means linking a rod of the second damper to the second spring means rod for damping motion of the second spring means.

4,861,270

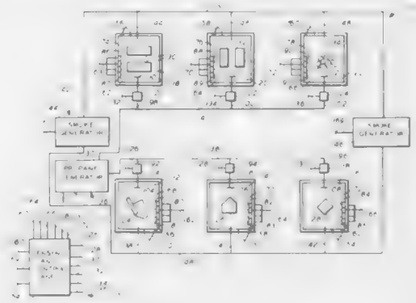
FIRE FIGHTING TRAINER

James Ernst, Livingston; Steven Williamson, Haledon; George Rogers, Linden, and Dominick Musto, Middlesex, all of N.J., assignors to Symtron Systems, Inc., Fair Lawn, N.J.

Filed Aug. 30, 1988, Ser. No. 238,453

Int. Cl.[4] G09B *9/00*

U.S. Cl. 434—226 7 Claims



1. A fire fighting trainer comprising:

a plurality of chambers having respective contents including items chosen from a group of items including furniture and fixtures and equipment;

a smoke generating means having a plurality of outlets disposed in the respective chambers;

a flame generating means having a plurality of outlets disposed in the respective chambers; and

a sensing and control means having a plurality of sensor assemblies disposed in the respective chambers and each sensor assembly connecting to a main control panel, wherein

each said sensor assembly includes a a multi-agent sensor unit comprising:

a collection funnel for receiving an extinguishing medium portion;

a separation means for separating out foam from the extinguishing medium portion;

a foam chute connecting to the collection funnel;

a sonic beam source and detector mounted inside the foam chute for sensing the presence of foam in the chute;

an outlet pipe connecting to the collection funnel with an outlet opening disposed below the separation means;

a magnetostrictive fluid sensor unit mounted on and extending into the outlet pipe above the outlet opening for sensing the presence of water in the outlet pipe; and

an infrared source and detector mounted inside the collection funnel for sending the the presence of a cloud of powder in the collection funnel.

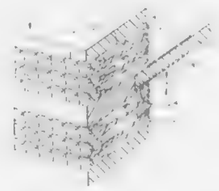
4,861,271
RIGHT-ANGLE COAXIAL PLUG CONNECTOR
Jerry H. Bogar, Harrisburg; Willard F. Cassel, Jr., Mechanicsburg; Dale B. Mummey, Camp Hill; Carl D. Oberman, New Cumberland, and Donald J. Summers, Shiremanstown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Continuation of Ser. No. 932,253, Nov. 19, 1986, abandoned. This application Dec. 7, 1987, Ser. No. 131,307
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—63 2 Claims



1. A coaxial plug connector of the type mountable to a circuit panel and matable with a receptacle connector parallel to the circuit panel to complete a signal path of a coaxial system having a nominal impedance, and having an inner right-angle contact member having a horizontal portion extending rearwardly from a first pin contact section matable with inner contact means of the receptacle connector, and having a vertical portion joined to the horizontal portion at a bend and extending to a second pin contact section insertable into a hole of the circuit panel in electrical engagement with a corresponding contact means thereof, the inner contact member having a dielectric cover means therearound having an outer surface concentric with the inner contact member and including a horizontal cover portion around portions of the horizontal inner contact portion and a vertical cover portion around portions of the vertical inner contact portion, an outer contact member having a centered bore through which extend insulated horizontal portions of the inner contact member and including a forward section matable with outer contact means of the receptacle connector and further including means shielding the top of the inner contact member therealong, and a conductive housing having a channel extending thereinto from the top and front surfaces thereof to receive the inner and outer contact members thereinto with forward sections thereof extending forwardly of the housing, said housing including a vertical hole extending through the housing bottom and in communication with the channel through which extends the insulated vertical portion of the inner contact member, with the outer contact member mechanically and electrically joined to the conductive housing, the bottom of the conductive housing further including a vertical depending ground post insertable into a corresponding hole of the circuit panel in electrical engagement with a ground means thereof, said coaxial plug connector characterized in that:

said dielectric cover means is self-retaining on said inner contact member, said vertical hole communicating with said channel of said housing has a diameter slightly larger than the outer diameter of said vertical cover portion disposed therethrough, said centered bore of said outer contact member has a rearwardly facing stop surface corresponding to a forwardly facing stop surface defined by said horizontal cover portion therealong and located slightly forwardly of said forwardly facing stop surface after assembly, and said centered bore is slightly larger than said horizontal cover portion therealong whereby said covered inner contact member is slightly movable after assembly within said outer contact member and said conductive housing.

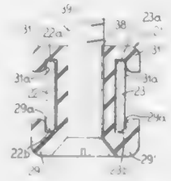
4,861,272
IMPEDANCE CONTROLLED CONNECTOR INTERFACE
Stephen L. Clark, Dillsburg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 31, 1988, Ser. No. 175,785
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—79 19 Claims



1. A connection interface for electrically connecting a multi-row connector or header having N rows of connection devices (where N≧2) to a circuit bearing substrate, comprising:

a flex circuit having a first field of N rows of connection areas for connection to a corresponding tail-portion field and having a second field of N rows of connection areas for connection to a corresponding connection field associated with a circuit bearing substrate, said flex circuit having N sets of electrically conductive traces extending between corresponding ones of the connection areas in each corresponding row of the first connection field and the second connection field, each of said traces presenting substantially the same impedance between its connection areas as the other of the traces.

4,861,273
LOW-VOLTAGE MINIATURE TRACK LIGHTING SYSTEM
James A. Wenman, Holland, Mich.; Douglas Bray, Riverside, N.J., and David H. Porter, Cleveland, Ohio, assignors to Thomas Industries, Inc., Louisville, Ky.
Filed Oct. 13, 1987, Ser. No. 108,087
Int. Cl.[4] H01R *25/14*
U.S. Cl. 439—111 23 Claims



9. A power track section for mounting at least one electrical device and for extending electrical power to the electrical device, comprising:

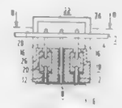
an elongated support member of a semi rigid electrical insulating material;

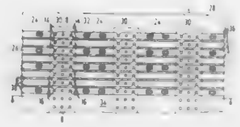
first and second elongated electrical conductors;

said support member having a generally I-shaped cross-section and defining first and second vertical channels extending the length of said support member on opposite sides thereof;

said first and second conductors located in said first and second channels, respectively, and extending substantially the length of said support member, said conductors oriented vertically edgewise in said channels to define electrical conducting surfaces along opposite sides of said support member along the length thereof, said support member and said conductors supported thereby being bendable in a first plane, and said edgewise oriented conductors preventing bending of said support member in a plane perpendicular to said first plane.

4,861,274
BACKPLANE HAVING A MOVABLE CONTACT MEANS
Johannes Brune, Erlangen, and Hans-Peter Latussek, Feucht, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Mar. 18, 1988, Ser. No. 170,147
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709118
Int. Cl.[4] H01R *9/22, 13/70*
U.S. Cl. 439—189 8 Claims





1. A backplane for subtrack having modules, comprising:

a plurality of socket connectors arranged in parallel next to each other on a side of the backplane that faces the modules;

each socket connector having a plurality of contact pins, the contact pins being arranged in three rows, the two outer rows of pins to function as bus contact pins and being shorter than the pins the middle one of the rows;

at least one bus comprising a plurality of bus lines mounted on the backplane, the backplane being provided with auxiliary contact pins mounted thereon aligned with said bus contact pins in each socket connectors;

said auxiliary pins being electrically interconnected to said bus lines on the backplane; and

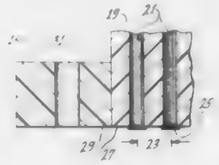
said bus contact pins of each socket connector being electrically connectable to the corresponding auxiliary contact pins through a movable contact means moved by a handling means such movement causing connecting or disconnection of the bus contact pins to the auxiliary contact pins.

4,861,275
VERY HIGH DENSITY INTERCONNECTIONS
William D. Cross, Vista, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Jul. 15, 1988, Ser. No. 220,056
Int. Cl.[4] H01R *13/04*
U.S. Cl. 439—289 11 Claims

1. A cable and connector section comprising:

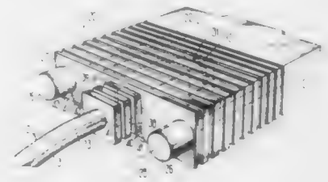
a section of flexible cable including an elongated, flexible body of insulating material and a plurality of conductors carried by said body, each of said conductors terminating in a conductor end;

a connector body section on the section of flexible cable for use in connecting the section of flexible cable to a member, said connector body section having a face and said conductor ends being adjacent said face; and



a plurality of contacts on said conductor ends, respectively, said contacts protruding from said face.

4,861,276
ADAPTOR WITH NOTCHED STRAIN RELIEF PLATE
Peter H. Muller, Los Gatos; Peter E. Lowe, Palo Alto; Peter R. Edwards, San Lorenzo, all of Calif., and Samuel W. Harris, Norcross, Ga., assignors to Hayes Microcomputer Products, Inc., Norcross, Ga.
Filed Feb. 25, 1988, Ser. No. 160,352
Int. Cl.[4] H01R *13/627*
U.S. Cl. 439—365 5 Claims



4. An adaptor for facilitating data transmission between a data communications plug and a mating connector to which the adapter is to be attached, said plug having at least one flange extending radially therefrom, comprising in combination:

a body having a front end, and at least three body sides;

a first connector, disposed at said front end of said body;

a well formed within said body so that said data communications plug may be selectively inserted into said well to a seate position and having an opening in one of said three body sides of said body, a plurality of side walls, and a characteristic well longitudinal axis;

a second connector disposed within said well, said second connector having a configuration of pin connectors which is compatible with said data communications plug;

a strain relief plate rotatably connected to one of said body sides of said body for selective rotation between an open position and a closed position about a rotational axis disposed laterally from said longitudinal axis;

said strain relief plate including a notch formed therein cutting into at least one edge of said strain relief plate at two edge points and forming a notch periphery surface such that when said data communications plug is inserted into said well to said seated position and said strain relief plate is in said closed position, said flange is forward of said strain relief plate and said notch periphery surface engages said flange, thereby preventing withdrawal of said data communications plug; and

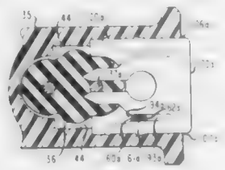
a pair of retaining screws for securing said strain relief plate in said closed position, said retaining screws each extending through said body and each engaging said mating connector.

4,861,277
PRINTED CIRCUIT CARD GUIDE
Dale C. Bina, Wheaton, Ill., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems, Inc., Morristown, N.J.
Filed Nov. 21, 1988, Ser. No. 274,515
Int. Cl.[4] H01R *13/629*
U.S. Cl. 439—377 4 Claims



1. A card guide for aligning and guiding a circuit card towards a connector mounted on a backplane of an electrical apparatus, the card guide comprising:
- a first member having a first end arranged for mounting on a backplane such that a second end extends away from the backplane and is substantially perpendicular to it;
- a second member having a slot extending longitudinally from its first end along one of its sides substantially the length of the second member; the slot having a width to slidably accommodate an edge of the circuit card; and
- means for releasably joining said first and second members such that the first and second members are aligned coaxially, said joining means comprising:
- a pair of flexible fingers extending from the second end of the second member, the flexible fingers forming a substantially rectangular opening with an inlet to the opening formed by the tips of said fingers;
- a pair of grooves extending from the second end of the first member, the grooves arranged to slidably receive the flexible fingers; and
- a rib separating said grooves of the first member, the rib having a cross sectional area with dimensions such that it passes through the inlet by forcing apart the tips of the flexible fingers until the rib is completely within the rectangular opening.

4,861,278
CONNECTOR FOR DROP WIRE AND OTHER CONDUCTORS
Antoinette D. McBride, Milford, and Arnold R. Smith, Chester, both of N.J., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.
Filed Apr. 26, 1988, Ser. No. 186,335
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—395 23 Claims



1. A connector for a wire comprising a pair of spaced conductors and an insulative jacket around them and of greater lateral than transverse dimension in cross-section, said connector comprising:
- a synthetic resinous cap having a vertically spaced top and base and having extending thereinto from said base a vertical channel into which a free end of said wire is insertable, said channel of fixed size and shape horizontally being of greater lateral than transverse dimension and of a non-circular cross-section adapted to fit around said wire when inserted to restrict angular rotation thereof relative to said cap, and said cap having formed therein a pair of slots on laterally opposite sides of said channel and passing from outer openings of such slots on the outside of said cap to respective inner openings of said slots into said channel, a pair of metal contacts respectively received in said slots and having shaped inner ends adapted upon inward driving of said contacts into said slots to pierce the insulation of said inserted wire to make electromechanical contact with respective ones of the conductors thereof, and a pair of electrical leads each comprising a conductor and insulation therefor and having their bottom ends disposed adjacent said contacts to permit connection at such ends of their respective conductors to, respectively, one and the other of said contacts, said leads extending from such ends thereof away from said cap to permit electrical connection of said conductors of said wire via said leads to external terminals.

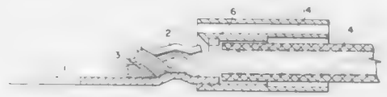
4,861,279
ELECTRICAL APPARATUS TO BE DIRECTLY COUPLED TO SHEATHED CABLE AND TO WALL STRUCTURES
Robert K. Sheehan, Cincinnati, Ohio, and Paul R. Smester, Mt. Sinai, N.Y., assignors to Corecon Corporation, Cincinnati, Ohio
Filed Oct. 26, 1987, Ser. No. 113,541
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—412 34 Claims



1. In combination:
- a non-metallic sheathed cable having at least three elongated parallel wires extending between opposite ends of said cable; an uninterrupted band of insulating skin surrounding said wires and defining a width of said cable measured perpendicular said wires; and insulator means interiorly of said skin electrically isolating said wires from one another within said skin; and
- electrical apparatus including:
  - a housing having a body and a clamp attached to said body;
  - three laterally spaced conductive tangs in said body and connected to electrical elements within said body;
  - a cable-receiving channel having a width about equal to said cable width, said cable being received within said cable-receiving channel and maintained in a position overlying said tangs with each said tang aligned with a respective wire of said cable, said cable being disposed between said body and said clamp; and
  - means for tightening said clamp against said cable to force said tangs through said skin and any intervening said insulator means and into contact with said respective wires of said cable;

such that upon tightening said clamp against said cable, said respective wires of said cable will be electrically coupled to said electrical elements, without first cutting said skin between said cable ends to expose said wires and insulator means prior to said cable being received in said cable-receiving channel.

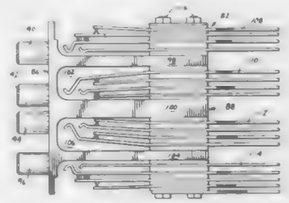
4,861,280
ELECTRIC CABLE TERMINAL CONSISTING OF TWO INDEPENDENT ELEMENTS TO BE ASSEMBLED BY AXIAL SLIDING
Ivana Piana, and Silvano Piana, both of Genova, Italy, assignors to Grafoplast S.p.A., Italy
Filed Jun. 15, 1988, Ser. No. 207,285
Claims priority, application Italy, Jun. 19, 1987, 12503 A/87
Int. Cl.[4] H01R *13/432, 4/70*
U.S. Cl. 439—491 6 Claims



1. A cable terminal comprising an elongated metal conducting element and an elongated tubular insulating sleeve, wherein
- (a) said elongated metal conducting element comprises
  - (i) a first end terminating in means for connection to an appliance or equipment and an opposed cable receiving end;
  - (ii) first ring means for securing a cable lead to said conducting element, said first ring means having a length and internal and external diameters and being positioned between said ends of said conducting element; and
  - (iii) second ring means for locking said conducting element in said insulating sleeve, said second ring means being positioned at the cable receiving end of said conducting element, said second ring means being spaced apart from and aligned with said first ring means, said second ring means having an external diameter larger than that of said first ring means;
- (b) said elongated tubular insulating sleeve comprises
  - (i) first and second opposed ends and an internal bore extending from said first end to said second end, said bore having a first portion having a diameter substantially the same as the external diameter of said first ring means and a second portion having a diameter substantially the same as the external diameter of said second ring means;
  - (ii) an internal annular wall defined by the transition from said first portion of said bore to the second portion of said bore;
  - (iii) an internally directed flaring at said first end of said sleeve; and
  - (iv) an annular recess positioned between said flaring and said first portion of said bore, said annular recess having a length substantially the same as the length of said first ring means and having a diameter smaller than the external diameter of said second ring means;

whereby when said second ring means of said conducting element is inserted into the first end of said sleeve past said flaring of said sleeve, it temporarily mates with said annular recess of said sleeve while a wire lead is secured to said first ring means, said second ring means then being forced through said first portion of said bore past said annular wall into said second portion of said bore whereby said conducting element becomes locked in said insulating sleeve.

4,861,281
ELECTRICAL JACK UNIT
Robert J. Warner, Veradale, Wash., assignor to Telect, Inc., Spokane, Wash.
Filed Sep. 1, 1988, Ser. No. 239,459
Int. Cl.[4] H01R *13/60*
U.S. Cl. 439—540 9 Claims



1. In a modular electrical jack unit having a stack of jack spring switch assemblies that is adapted for side-by-side mounting with other modular electrical jacks in an electrical jack panel, a jack frame comprising:
- an integral cast frame body,
- said body having an elognated jack sleeve section extending between upper and lower mounting ends that are adapted to connect to the electrical jack panel,
- said elongated jack sleeve section having a front face and a rear face,
- said elongated jack sleeve section having a plurality of spaced jack sleeve members formed therein that extend outward from and normal to the front face of the elongated jack sleeve section,
- each of the spaced jack sleeve members having a cylindrical bore extending therethrough to the rear face of the elongated jack sleeve section to receive a cylindrical jack plug therein,
- said body having two or more vertically spaced support beams cantilevered outwardly from the rear surface of the elongated jack sleeve section and forming at least one open-ended U-shaped cavity between them, the support beams being adapted to vertically support a stack containing a plurality of jack spring switch assemblies spaced from and in vertical alignment with one another, in which contacts of the jack spring switch assemblies are movable perpendicular to the support beams, in which at least one of the jack spring switch assemblies is supported within the open-ended U-shaped cavity between a pair of adjacent support beams; and
- said support beams extending outward from the rear surface of the elongated jack sleeve section intermediate adjacent jack sleeve members to more evenly support the stack of jack spring switch assemblies and maintain the stack of stack spring switch assemblies in vertical alignment with each other.

4,861,282
WATERPROOF CONNECTING STRUCTURE FOR CONNECTOR
Yasuo Kobayashi, and Masahiko Endo, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Dec. 7, 1988, Ser. No. 280,901
Claims priority, application Japan, Dec. 9, 1987, 62-186384[U]
Int. Cl.[4] H01R *13/518, 13/60*
U.S. Cl. 439—540 6 Claims

1. A waterproof connecting structure for a connector in a hole of a panel; comprising:
- at least one pair of first and second connector elements connected to electrical cords, respectively, and mated to each other in an opposed manner;

a waterproof grommet provided on the cord of the first said connector element;

a connector holder secured in said hole in a watertight manner by means of a first resilient seal on a peripheral portion of said holder which engages the periphery of said hole, said holder being conjoined at one side thereof to the second said connector element, said connector holder having an opening and grommet fitting portions at an



opposite side of said holder, said grommet being received in one of said grommet fitting portions which is located on the periphery of said holder; and

a cover with a second resilient seal for closing and opening in a watertight manner, wherein there is a said grommet, cord and first connector element for each of said grommet fitting portions so that said opposite side of said holder is watertight.

4,861,283

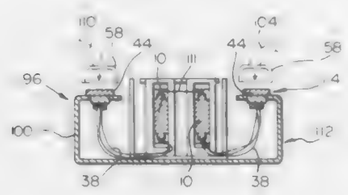
DISTRIBUTION FRAMES AND ELECTRICAL CONNECTORS

Laurence A. J. Beaulieu, Kanata, and Alex G. Cristescu, Montreal, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 856,517, Apr. 28, 1986, abandoned. This application Feb. 24, 1987, Ser. No. 18,234

Int. Cl.[4] H01R *13/60*

U.S. Cl. 439—540 **3 Claims**



1. A distribution frame comprising:

a substantially planar main frame structure having a front;

a plurality of pairs of mounting means carried by one region of the structure, the mounting means extending forwardly of the structure and each pair comprising two spaced latches for holding between them a cross-connect connector in a position forwardly of the main frame structure;

another region of the structure formed with mounting apertures for securing multiple contact connectors to the structure with the multiple contact connectors facing forwardly of the structure for attachment to them of mating connectors at the front of the structure, the mounting apertures lying spaced apart side-by-side in a row; and

a holding bar for the mating connectors, the holding bar having a connector holding portion located across the front of the frame structure and two end arms extending at an angle to the holding portion, the holding bar pivotally mounted to the frame structure by pivotal reception of the end arms into the frame structure so as to move the connector holding portion into and out of a mating connector holding position directly in front of and spaced from the apertures.

4,861,284

SWITCH ACTIVATING PLUG FOR A COAXIAL CONNECTOR

William V. Pauza, Palmyra, and Wilmer L. Sheesley, Dauphin, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 14, 1988, Ser. No. 181,458

Int. Cl.[4] H01R *17/04*

U.S. Cl. 439—580 **13 Claims**



1. An electrical plug with coaxial mating regions for engaging a corresponding connector, comprising

a housing having a longitudinal axis,

an inner conductor,

an intermediate conductor, and

a dielectric member for supporting said inner and intermediate conductors in said housing and for separating said inner and intermediate conductors from each other, said dielectric member including a first axial passageway for slidably receiving said inner conductor and a second axial passageway for slidably receiving said intermediate conductor,

said inner conductor comprising an elongated shaft and including a flange and a slanted central region along said elongated shaft, said flange coming into contact with a first edge region of said dielectric member when said inner conductor is moved in a first axial direction and said slanted central region of said shaft coming into contact with a second edge region of said dielectric member when said inner conductor is moved in an opposite axial direction thereby to prevent axial movement of said inner conductor,

said intermediate conductor including projecting means which abuts against a third edge region of said dielectric member to prevent movement of said intermediate conductor in an axial direction.

4,861,285

SWITCHING FUSIBLE APPARATUS

Alexander R. Norden, New York, N.Y., assignor to Connectron, Inc., Laurence Harbor, N.J.

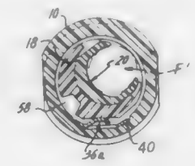
Filed Feb. 16, 1988, Ser. No. 155,815

Int. Cl.[4] H01R *33/95*

U.S. Cl. 439—621 **11 Claims**

1. Switching fusible apparatus for use with either a larger fuse or a smaller fuse each of which has an elongated insulating tube, metal end caps on the tube and a fusible link connected between said end caps, the smaller fuse being shorter than the larger fuse and having smaller-diameter end caps than those of the larger fuse, said apparatus including a receptacle having an elongated cavity open at one end and an elongated fuse holding device receivable lengthwise in said cavity and rotatable about an axis that extends along the cavity for shifting a fuse carried by the fuse holding device into and out of an "ON"

position, said fuse holding device having means for selectively containing either said larger fuse or said smaller fuse with the end caps of the contained fuse exposed outward of said axis, contact portions of the end caps being movable in respective circular paths as the fuse holder is turned about said axis, said



receptacle having contact means including at least three resilient contact elements at positions distributed along said cavity for engaging the end caps of that fuse, whether it is the larger fuse or the smaller fuse, which is carried by said fuse holding device, when in said "ON" position.

4,861,286

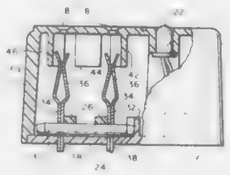
ELECTRICAL CONNECTOR DEVICE

William L. Fosnaugh, Libertyville, Ill., assignor to ACCO World Corporation, Wheeling, Ill.

Filed Jul. 27, 1987, Ser. No. 77,814

Int. Cl.[4] H01R *25/00*

U.S. Cl. 439—651 **5 Claims**



1. A connector device comprising

a planar base having a yoke defining a mounting aperture having an axis parallel to the planar base and a terminal opening located adjacent to said yoke;

a terminal oriented substantially perpendicular to the planar base and extending through the terminal opening of said base and containing a mounting hole having an axis parallel to the planar base and such hole aligned with the mounting aperture of said yoke; and

a pin extending parallel to the planar base through the mounting hole of said terminal and the aperture of said yoke to hold said terminal in place.

4,861,287

TELEPHONE NETWORK MULTIPLE TRANSMISSION LINE INTERFACE

Joseph P. Bevacqua, Paterson, N.J.; Robert E. Eastep, Walkerville, Md., and Thomas J. Collins, Wall, N.J., assignors to Bell Atlantic, Washington, D.C.

Filed Feb. 19, 1988, Ser. No. 158,325

Int. Cl.[4] H01R *9/24*

U.S. Cl. 439—718 **11 Claims**

1. A multiple transmission line interface terminal, comprising:

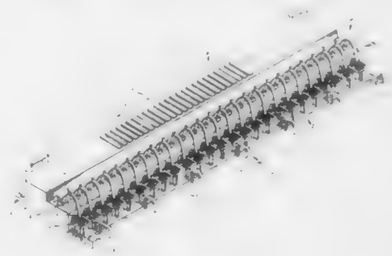
a unitary panel adapted to be mounted on a surface and having opposite side portions defining, respectively, facility connection and subscriber terminal regions;

the side portion of said panel defining said facility connection region having wall portions disposed to form with said side portion a housing for said facility connection region, which housing opens in the direction of the surface upon which the panel is to be mounted;

a facility cable connector means mounted on one of said portions forming said housing and extending thereinto;

a plurality of spaced modular jacks arrayed longitudinally in said housing;

a printed circuit board means have an etched pattern of conductors interconnecting said facility cable connector means and said plurality of spaced modular jacks, said printed circuit board means being disposed within said housing;



a plurality of subscriber wiring bridges arrayed longitudinally in said subscriber terminal region, said subscriber wiring bridges comprising at one end thereof modular plugs and at opposite ends thereof screw terminal means;

said modular plugs being received within said jacks, said plugs being releasably coupled to said jacks and having wires extending therefrom to said screw terminal means; and

a unitary cover pivotally mounted to said panel and positioned to overlie said subscriber wiring bridges, said plugs, said screw terminal means and said wires.

4,861,288

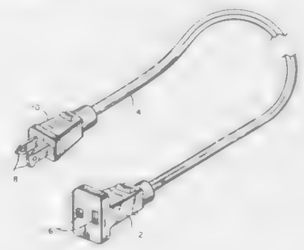
ELECTRICAL CORDSET

Samuel B. Friedman, East Greenwich, R.I., assignor to Royal Technologies USA, Inc., Pawtucket, R.I.

Filed Dec. 14, 1987, Ser. No. 132,533

Int. Cl.[4] H01R *13/50*

U.S. Cl. 439—736 **3 Claims**



1. An electrical wire and cable assembly comprising in combination, at least one conductor in an insulated jacket, and a plug member at least partially encased in an insulator, said plug member being electrically connected to said conductor and said insulator being molded and bonded without any adhesive to one end of said insulated jacket;

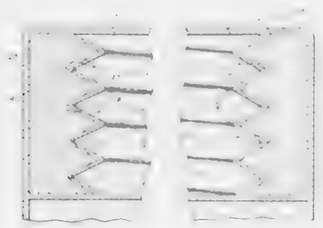
said insulated jacket comprising a thermosetting type chloropolyethylene composition and said insulator for said plug member comprising a thermoplastic type chloropolyethylene composition.

4,861,289
HARDENED ELECTRICAL CONNECTOR
Stuart Biddulph, Provo, Utah, assignor to Eyring Research Institute, Inc., Provo, Utah
Filed Feb. 17, 1984, Ser. No. 606,672
The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.
Int. Cl.[4] H01R *4/00*
U.S. Cl. 439—792 24 Claims



19. An apparatus for securing and maintaining electrical conductors in electrical contact comprising:
a first plate having a cavity on an interior face;
a second plate whose interior face is positionable adjacent the interior face of the first plate, and wherein the second plate has a cavity on its interior face which is aligned with the cavity on the first plate so as to form a chamber defined by said cavities;
a plurality of channels in the interior faces of the first and second plates, each channel extending between the cavity and an outer edge of the plate, wherein the channels of each plate are aligned so as to form converging conduits within which said conductors are slideably secured, said conductors each comprising a portion which extends into said chamber when the plates are secured together;
wherein said conductors are free to slideably move relative to one another at the point of electrical contact between them; and
wherein the chamber is configured so as to maintain said conductors in electrical contact with one another even when said conductors slide relative to one another.

4,861,290
ALUMINUM ELECTRICAL CONNECTOR WITH THREADED OPENING HAVING ELECTROPLATED LAYER OF UNIFORM THICKNESS
Terrence R. Halmstad, Brookfield, and Steven R. Schachameyer, Whitefish Bay, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio
Filed Dec. 9, 1987, Ser. No. 130,738
Int. Cl.[4] H01R *4/30*
U.S. Cl. 439—810 5 Claims



1. An aluminum electrical connector having a connector body with a threaded opening receiving a clamping screw which is tightened down to hold one or more electrical terminals in said connector body, the threads of said opening being formed by a series of roots and crowns, and comprising an electroplated coating layer on said connector body having substantially the same thickness at said roots as at said crowns.

4,861,291
MARINE ENGINE PROTECTION DEVICE
Takashi Koike, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
Filed Sep. 2, 1987, Ser. No. 92,182
Claims priority, application Japan, Sep. 10, 1986, 61-213436
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—1 16 Claims



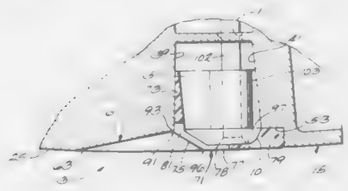
1. A marine outboard drive adapted to be mounted on the transom of a watercraft and carrying propulsion means, said mounting of said outboard drive permitting adjustment of the height of said propulsion means relative to the transom, an internal combustion engine for driving said propulsion means and wherein operation of said propulsion means at a height greater than a predetermined height and at a speed greater than a predetermined speed is likely to cause damage to said outboard drive, means for sensing the height of said propulsion means and for providing an output signal when said propulsion means is operated at a speed greater than the predetermined speed and when the height of said propulsion means is greater than the predetermined height, and means for reducing the speed said internal combustion engine drives said propulsion means when said means for sensing provides such output signal for avoiding said damage to said outboard drive.

4,861,292
SPEED OPTIMIZING POSITIONING SYSTEM FOR A MARINE DRIVE UNIT
John M. Griffiths; Wayne T. Beck, both of Fond du Lac, and Neil A. Newman, Omro, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.
Filed Jan. 38, 1988, Ser. No. 218,686
Int. Cl.[4] B63H *5/06*
U.S. Cl. 440—1 17 Claims



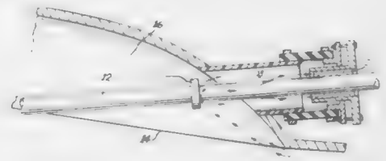
1. A system for positioning a marine drive unit with respect to a boat on which it is mounted to optimize boat speed comprising:
means for moving the drive unit relative to the boat;
means for sensing the boat speed and for providing an output signal indicative of the boat speed;
control means operative to cause the moving means to impart a first incremental movement in one direction to the drive unit and to compare the output signals of speed before and after said first incremental movement, said control means being selectively responsive to a first signal indicative of an after speed greater than the before speed by an amount in excess of a first incremental speed, a second signal indicative of an after speed greater than the before speed by an amount less than said first incremental speed, and a third signal indicative of an after speed not greater than the before speed, to cause the moving means, respectively, to continue said first incremental movement of the drive unit in the same direction, to discontinue said first incremental movement of the drive unit, and to impart a first incremental movement to the drive unit in the opposite direction.

4,861,293
MARINE PROPULSION DEVICE WITH SCREENED WATER INLET
Philip J. McGowan, Grayslake; Steven R. McNeill, Waukegan; Matthew H. Mondek, Wonder Lake, and James A. Mahnich, Lake Villa, all of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Apr. 20, 1988, Ser. No. 183,842
Int. Cl.[4] B53H *21/26*
U.S. Cl. 440—76 9 Claims



1. A marine propulsion device comprising a lower unit including a gear case rotatably supporting a propeller shaft adapted to support a propeller, said gear case including an interior passage leading to a water pump, said gear case also including a leading ad ge and opposite side surfaces having outwardly convex configurations extending rearwardly from said leading edge, one of said side surfaces including a cooling water inlet comprising means defining an opening located in said one side surface, communicating with said interior passage, and having forward and rearward walls, a recess located in said one side surface forwardly of said opening and having a rearward end located at said forward wall of said opening and a forward end, said recess increasing in lateral depth from said forward end to said rearward end, and a screen located in said opening and including an inclined portion extending outwardly and rearwardly from said forward wall of said opening, and a side portion extending rearwardly from said inclined portion to said rearward wall of said opening, said screen also including a series of horizontal parallel slots respectively having forward ends located in said inclined portion, having rearward ends located in said side portion, extending continuously form said forward ends to said rearward ends, and affording inflow of cooling water to said passage.

4,861,294
SHAFT PRESSURE RING AND METHOD FOR LUBRICATING SHAFT LOG SEALS
Frank B. Ousley, II, Cocoa, Fla., assignor to Sea Ray Boats, Inc., Merritt Island, Fla.
Filed Jun. 22, 1987, Ser. No. 65,253
Int. Cl.[4] B21D *39/00;* B63H *5/00;* F04D *29/06, 29/10*
U.S. Cl. 440—83 7 Claims

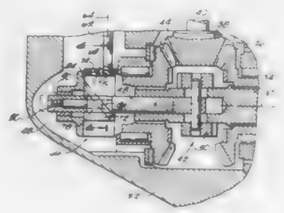


1. A drive shaft log seal lubricating and cooling system for a shaft pressure ring seal in a hull of a boat, activated by movement in water, with a log area portion in an aft portion of the boat hull comprising:
a shaft pressure ring seal connected to a drive shaft,
said drive shaft connectable to an inboard motor in said boat hull by way of a channel having an inner portion and an exit, said channel having a center line oriented at an angle to a horizontal in a generally upward, forward direction away from said log area portion and said aft portion, said exit positioned at said log area portion of said boat hull, said drive shaft exiting out of said boat hull through said channel and into said log area portion and extending through said inner portion, said shaft pressure ring seal positioned at said inner portion of said channel about said drive shaft to restrict the leakage of water into said boat hull, said log area portion having a generally concave shape in said boat hull around said exit,
a deflector including deflector connecting means for connecting said deflector around and to said drive shaft in said log area portion and spaced from said exit and positioned outside of said boat hull,
said deflector being of rigid material and having a deflecting surface means positioned generally perpendicular to said drive shaft, said deflecting surface means being operably positioned for deflecting water passing by said drive shaft and passing through said log area portion wherein said drive shaft is rotating, said deflecting surface means deflecting said water through said exit and into contact with said shaft pressure ring seal in said channel for continuous cooling and lubricating of said shaft pressure ring seal as said boat moves over and through said water.

4,861,295
MARINE PROPULSION DEVICE WITH REVERSIBLE SHIFT APPARATUS
Kennedy K. McElroy, Jr., Lindenhurst; Jeffrey P. Higby, Waukegan, both of Ill., and Philip A. Zorc, St. Joseph, Mich., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Mar. 14, 1988, Ser. No. 167,789
Int. Cl.[4] B63H *21/28*
U.S. Cl. 440—86 23 Claims

11. A marine propulsion device comprising a lower unit including a propeller shaft mounted for rotation about a generally horizontal axis, a drive gear, and a transmission including an actuator movable along said propeller shaft axis for selectively effecting driving engagement between said drive gear and said propeller shaft, an engine drivingly connected to said drive gear, a shift member movable along a generally vertical axis, and means selectively connectable, in alternative first and second conditions, between said shift member and said actuator for moving said actuator in opposite directions along said propeller shaft axis in response to movement of said shift member in opposite directions, said means moving said actuator

forwardly when connected in said first condition and when said shift member is moved downwardly, and said means moving said actuator rearwardly when connected in said second condition and when said shift member is moved downwardly.

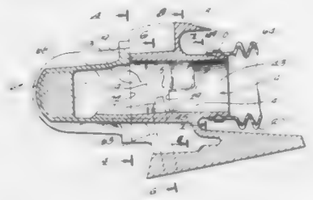


4,861,296

MARINE PROPULSION DEVICE EXHAUST SYSTEM

Richard A. Wlezien, Antioch, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 23, 1987, Ser. No. 137,509
Int. Cl.[4] F01H *3/02*
U.S. Cl. 440—89 **12 Claims**



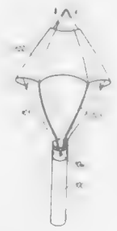
1. A marine propulsion device comprising a stern drive unit including a member adapted to be fixed to a boat transom, or fixed to an engine assembly having a portion passing through a transom, a propulsion unit connected to said member for pivotal steering movement relative to said member and for vertical tilting movement relative to said member, an exhaust gas passage in said propulsion unit and including an outlet normally located under water and an inlet normally located above water, a flexible exhaust gas bellows having a rearward end connected to said inlet of said exhaust gas passage in said propulsion unit and having a forward end, and an exhaust gas and coolant discharge conduit comprising a forwardly located inlet passage located in said member and adapted to receive combined exhaust gas and coolant discharge from an engine and including a rearwardly located lower transverse partial wall, said inlet passage being undivided forwardly of said lower transverse partial wall, an exhaust gas discharge passage located in said member rearwardly of and communicating with said inlet passage above said lower transverse partial wall, said exhaust gas discharge passage having a rearward end connected to said forward end of said bellows, and a coolant discharge passage located in said member and communicating with said inlet passage in forwardly adjacent relation to said lower transverse partial wall.

4,861,297

RELEASABLE AIRBORNE BUOY PARTICULARLY FOR UNDERSEA LISTENING

Francois Warnan, Trappes; Joël Barbot, L'Hay Les Roses, and Claude Brochard, Viry Chatillon, all of France, assignors to Thomson-CSF, Paris, France

Filed Apr. 26, 1988, Ser. No. 186,293
Claims priority, application France, Apr. 29, 1987, 87 06102
Int. Cl.[4] B63B *22/26*
U.S. Cl. 441—33 **3 Claims**



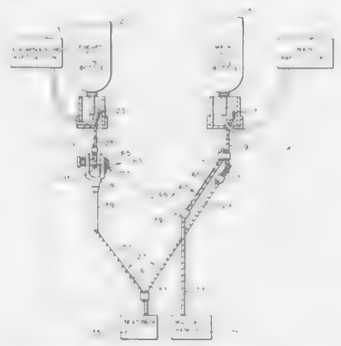
1. A releasable airborne buoy, particularly for undersea listening purposes, including a body with a neck which closes its upper part, a balloon having a closed top and an open lower base and intended to slow down the fall of the buoy through the air and to maintain it at the surface of the water after impact thereon, means for inflating this balloon by means of the relative wind during the fall, a set of halyards fixed to the surface of the balloon between the top and the base thereof and being fixed inside said neck, the base of the balloon penetrating inside the neck, wherein the means for inflating the balloon include a set of openings situated at the lower part of the neck, and a flexible and waterproof sleeve fixed to the internal wall of the neck above the inflation openings; this sleeve allowing air to pass freely during the fall of the buoy and being turned inside out under the effect of the pressure exerted by the water on the buoy after impact for closing the inflation openings.

4,861,298

ACTUATION SYSTEM FOR AN ENCAPSULATING LIFE RAFT

Gary R. Whitman, Holland, and Daniel S. McCauley, Roslyn, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 24, 1988, Ser. No. 210,893
Int. Cl.[4] B63C *9/24*
U.S. Cl. 441—42 **14 Claims**



1. In an inflation system for a two-section raft for an aviator, wherein the first inflatable raft section is a main section and is inflated by a first pressurized source, wherein the second inflatable raft section is an encapsulating section and is inflated by a second pressurized source, wherein both raft sections are automatically inflated during parachute descent of the aviator by means for automatically actuating said raft sections, the improvement comprising:

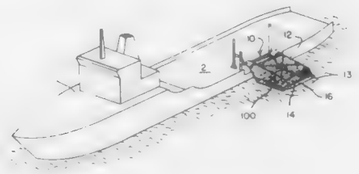
an actuation system for the raft sections including a manually releasable energy-stored linkage assembly connected between the pressurized source for the encapsulating raft section and the automatic actuation means.

4,861,299

RESCUE LIFT

Hubert Ueberschaer, 110 Aston Ct., McMurray, Pa. 15317

Filed Feb. 24, 1988, Ser. No. 159,708
Int. Cl.[4] B63C *9/00*
U.S. Cl. 441—80 **12 Claims**



8. A rescue apparatus for use on a boat to retrieve at least one person or object from the sea comprising;

(a) frame means pivotally attached to said boat, said frame means comprising an upper portion and a lower portion, said upper portion and lower portion connected along first and second opposite sides of said frame means, a forward portion on a side of said frame means in which said boat moves and a back portion opposite said forward portion, said frame means having a pivotal attachment along said first side adapted to rotate said frame means from a first position extending into the sea to a second position extending upwardly from said boat;

(b) netting means attached to and covering said frame means creating a pocket having at least one opening sized to allow for entry of an object, said netting means provided on the upper portion, lower portion, and back portion of said frame means, and to on the forward portion of said frame means; and

(c) float means attached to said upper portion and said lower portion of said frame means on the second side of said frame moans wherein said float means provides buoyancy to the frame means, said float means positioned on said frame means to maintain said lower portion of said frame means generally submerged in the sea and to maintain said upper portion of said frame means generally out of the sea.

4,861,300

POOL FLOTATION DEVICE

Angelo F. Casagrande, and Rocco J. Casagrande, both of 251 Highview La., Media, Pa. 19063

Filed Aug. 3, 1988, Ser. No. 227,787
Int. Cl.[4] B63C *9/08*
U.S. Cl. 441—81 **6 Claims**

1. A personal flotation device for use in a swimming pool or other body of water, comprising:

a. a shapeless body-supporting endless, freely flexible, buoyant loop having a circular cross-section, capable of easily conforming to the user's body,

b. two or more cylindrical removable flotation pontoons freely movable about and encircling said body-supporting loop, said pontoons having a diameter substantially greater than the diameter of said body-supporting loop and being substantially more buoyant than said loop, and



c. at least one, anatomically-shaped pontoon affixed to said body-supporting loop.

4,861,301

PERSONAL FLOTATION SYSTEM

Jimmy R. Pomeroy, and Ruth N. Warwick, both of 1339 Wald Rd., New Braunfels, Tex. 78130

Filed Jan. 11, 1988, Ser. No. 142,429
Int. Cl.[4] B63C *9/04*
U.S. Cl. 441—131 **11 Claims**



1. A personal flotation system comprising in combination:

(a) flotation means for supporting a person in the water;

(b) a haversack secured to said flotation means; said haversack comprising:

(i) a substantially tubular pliant cloth body having an upper margin and a lower margin, said margins defining upper and lower openings respectively;

(ii) a first strap attached to said body to releasably secure said body to said flotation means in a substantially upright position;

(iii) a closure means for substantially closing said lower opening to support said ice chest within said body; and

(iv) a second strap attached to said upper margin and extending across said upper opening to releasably secure said ice chest within said body; and

(c) an ice chest secured within said haversack; said ice chest comprising:

(i) a substantially rectangular body formed of lightweight insulation material, said rectangular body having four sides and a bottom defining a cavity having an opening at the top;

(ii) first flanges on opposite sides of said rectangular body at the top, said first flanges defining vertical holes therethrough;

(iii) a rectangular lid of the same material as said body and of substantially the same dimension as said top, said lid having a top side and a bottom side;

(iv) a downwardly projecting lip about the margin of said lid on said bottom side, the outer dimension of said lip being substantially the same as said opening, such that said lip provides a seal between said lid and said body;

(v) second flanges on opposite sides of said lid, said second flanges defining vertical holes therethrough, said first and second flanges mating such that said vertical holes align; and

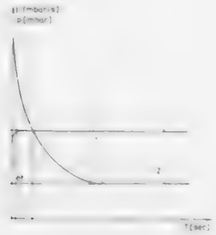
(vi) a cord secured on the underside of said first flanges and passing through said vertical holes and over said lid to secure said lid to said body.

4,861,302

PROCESS FOR FLUSHING AND FILLING A LOW PRESSURE GAS DISCHARGE LIGHT SOURCE

Kálmán Antal; László Ugrósdy, and Béla Rimay, all of Budapest, Hungary, assignors to Tungsram Részvénytársaság, Budapest, Hungary

Filed Jan. 21, 1988, Ser. No. 146,531
Claims priority, application Hungary, Jan. 23, 1987, 204/87
Int. Cl.[4] H01J *9/38*
U.S. Cl. 445—38 **7 Claims**



1. A process for flushing and filling a low pressure gas discharge light source having a discharge vessel containing a cathode at each end and carbonates at said cathodes, said discharge vessel being adapted to contain an electrical discharge arc, the maximum ratio of the internal diameter of the discharge vessel and the length of the arc being 1:10, said discharge vessel having a first end, a discharge tube connected to said first end for attachment from a vacuum pump, said discharge vessel having a second end, a charging tube connected to said second end for attachment from a gas charging source, the process which takes place entirely within a few seconds, comprising dissociating the carbonates into their corresponding oxides, while exhausting the contents of said discharge vessel through said discharge tube, and substantially simultaneously with said exhausting charging the interior of the discharge vessel through said charging tube with a charge of flushing or filling gas while adjusting to an equilibrium pressure between the exhaust and the charge, said equilibrium pressure being approximately the same as the ultimate charge pressure within said discharge vessel, and then tipping off said discharge tube and said charging tube.

4,861,303

TOY BUBBLE PIPE WITH BLOW AIR-ACTUATED PIVOTING ANIMAL SHAPED BLOWPIPE

Lin Moug-Sheng, P.O. Box 96-405,, Taipei 10098, Taiwan

Filed Aug. 28, 1987, Ser. No. 89,985
Int. Cl.[4] A63H *33/28, 3/28*
U.S. Cl. 446—17 **1 Claim**

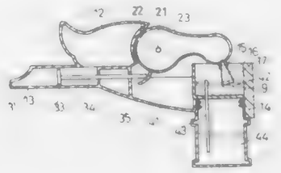
1. A toy bubble pipe comprising:

a main body portion having a hollow inner body and an outer appearance in the shape of an animal's body;

a bubble solution liquid supply chamber connected to a front part of the main body portion and extending forward of the main body portion a collapsible liquid tank chamber extending downwardly from a lower end of the liquid supply chamber, with a guide pipe extending downwardly from the liquid supply chamber into the liquid tank chamber, whereby when the liquid tank chamber is collapsed liquid may be supplied from the liquid tank chamber upwardly via the guide pipe to the liquid supply chamber;

an air blowing structure connected with a bottom portion of the main body portion and having an air blowing mouthpiece and air blowing pipe, the air blowing structure being in communication with the hollow inner body of the main body portion;

a hollow movable swaying portion pivotably mounted to the main body portion and having an outer appearance in the shape of an animal's head, the swaying portion being provided with a trumpet-shaped bubble blowpipe at a portion thereof corresponding to the animal's mouth and extending forward of the mouth, the swaying portion being eccentrically weighted to be urged to a downward position wherein the bubble blowpipe portion thereof is inserted into the liquid supply chamber, the swaying portion being provided with a drive plate;



a piston provided within the air blowing pipe of the air blowing structure and having a piston shaft engaging the drive plate of the swaying portion, the piston being drivable by blown air thereagainst in the air blowing pipe for causing the piston shaft thereof to drive the swaying portion drive plate for pivoting the swaying portion to an upward bubble blowing position whereby the bubble blowpipe portion of the swaying portion is raised from the liquid supply chamber; and

connection holes respectively provided in the main body portion and swaying portion and communicable with each other when the swaying portion is in its upward bubble blowing position for supplying blown air from the inner body of the main body portion to the blowpipe of the swaying portion for blowing bubbles.

4,861,304

THROWING TOY

Harvey R. Toews, Rt. 2, Box 271, MacPherson, Kans. 67460

Filed Sep. 11, 1987, Ser. No. 95,213
Int. Cl.[4] A63H *27/00*
U.S. Cl. 446—34 **8 Claims**

1. A throwing toy comprising: a pair of substantially identical, elongated wing sections,

each of said wing sections being configurated to present

a longitudinal axis,

a pair of opposed, arcuate surfaces with said surfaces being substantially mirror images of one another about said longitudinal axis, and

substantially eliptical cross-sectional having a greater width than depth; and

manually graspable means respectively interconnecting said wing sections with said longitudinal axes thereof aligned with one another and with said graspable means in order to define a throwing axis for said toy for grasping and throwing said toy and for imparting rotation thereto about said throwing axis,

said wing structures cooperatively presenting airfoil means for providing aerodynamic lift to said toy when thrown and rotated about said throwing axis and for enabling



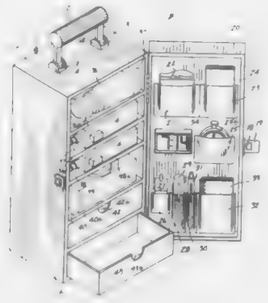
aerodynamic lift and return to a thrower of said toy in a generally vertical plane.

4,861,305

CHILD'S CRIMINAL INVESTIGATIVE GAME KIT

Rickey D. Wilson, 25941 E. 9 St., #50, San Bernadino, Calif. 92410

Filed Jul. 5, 1988, Ser. No. 215,415
Int. Cl.[4] A63H *33/04, 33/30*
U.S. Cl. 446—75 **3 Claims**



1. A child's criminal investigative game kit comprising in combination,

an elongate vertical container formed with a carring handle pivotally secured on a top surface of said container;

a single hinged vertical door pivotally secured to said container and formed with a latch on said door selectively securable to a spring-loaded clasp mechanism proximate an edge of said container;

the door including an interior surface with a plurality of flexible pouch means secured to the interior surface for positioning a like plurality of game kit components therein;

said container formed with a series of vertically stacked compartments for selective positioning of a like number further game kit components therein, and

slidable drawer means reciprocatably removable from said container underlying said compartments for securement of a plurality of rules and theme cards and allegiance cards therein for distribution, and

wherein said handle comprises an elongate portion formed with a plurality of legs secured to either terminal end of said portion with each of said legs terminating in arcuate surfaces securable within spaced bifurcated stanchions, said stanchions integrally secured to the top surface of said container, and

wherein said pouch means includes a first pouch securing an arm band for selective removal from said pouch means and securement about an arm of a child;

a second pouch selectively securing therein an identification wallet wherein said identification wallet has a plurality of pockets therein for securement of an identification card and a first badge card;

said first pocket and said second pocket aligned in a first row;

an LED clock device secured underlying said first pouch and aligned therewith and adjacent a third pouch wherein said third pouch selectively secures therein a compass;

a fourth pouch underlying said LED clock and defining a third row securing a whistle therein;

a fifth pouch adjacent said fourth pouch selectively securing a flashlight therein,

a sixth pouch adjacent said fifth pouch securing a writing instrument therein, and

a seventh pouch adjacent said sixth pouch selectively securing a notebook therein.

4,861,306

TOY COG RAILWAY

Peter Bolli, Steinhausen; Heniz Looser, and Werner Tanner, both of Baar, all of Switzerland, assignors to Interlego A.G., Baar, Switzerland

Filed Jul. 16, 1987, Ser. No. 74,533
Claims priority, application Switzerland, Jul. 21, 1986, 2901/86
Int. Cl.[4] A63H *33/04, 17/00, 18/14*
U.S. Cl. 446—90 **31 Claims**



1. A toy cog railway system having a train and an associated track, said track including at least one smooth driving face and a cogging member mounted along said driving face and extending perpendicularly to said driving face, said cogging member being provided with two teeth-bearing racks transversely spaced apart from each other, said racks being disposed symmetrically with respect to said driving face, the longitudinal direction of the teeth of said rack extending perpendicularly to said driving face, said at least one smooth driving face having the form of a flat strip;

said train including at least one vehicle in the form of an engine car, said engine car including at least two axles each having rimless wheels for running on said driving face, a drive motor in driving engagement with a cogwheel that engages said track cogging member, the rotating axis of said cogwheel extending perpendicularly to said axles, and means for guiding said engine car along said driving face includign at least one pair of opposed guide means formed to contact opposite sides of said cogging member, said cogwheel being laterally displaced with respect to the center line between said guide means

so as to engage a single one of said racks; and means for coupling said engine car to a further vehicle, said coupling means being attached to said engine in the vicinity of said guide means.

4,861,307

WHEEL FOR A MODULAR ASSEMBLY SYSTEM

Peter Larws, Usingen, Fed. Rep. of Germany, assignor to Palimondial S.A., Brasseur, Luxembourg

Filed Jul. 13, 1987, Ser. No. 72,674

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1986, 3624084

Int. Cl.[4] A63H *17/00, 33/08*

U.S. Cl. 446—95 **6 Claims**



1. A wheel for use in a modular assembly system including plug-in-type elements, the wheel having a central axle hole with a square cross-section the sides of which have the dimension a and having pairs of circumferentially distributed, radially extending rectangular slots with a width a radially cut into opposing lateral faces of the wheel and arranged axially opposite to each other, said slots each having a flat base and parallel side walls normal to said base, said wheel furthermore comprising axially extending through passages of uniform rectangular cross section from end to end, each interconnecting the slots of one of the pairs, said passages having top, bottom and side walls, at least said bottom wall being a continuation of the base of said one of said pairs of slots and being dimensioned as a function of the dimension a so that the elements can be plugged into the wheel axially.

4,861,308

DRIVE CONTROL MECHANISM FOR SPRING-DRIVEN TOY

Katsumi Kakizaki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Continuation of Ser. No. 122,342, Nov. 18, 1987, abandoned. This application Feb. 27, 1989, Ser. No. 315,188

Claims priority, application Japan, Nov. 18, 1986, 61-177378

Int. Cl.[4] A63H *33/26, 3/52*

U.S. Cl. 446—129 **9 Claims**

1. A spring driven toy, comprising:

(a) a base;

(b) an operation member movably mounted on the base;

(i) a spring means for moving the movable operation member relative to the base,

(ii) a speed control mechanism connected to the spring means,

(iii) a lever selectively movable between a position engaged to the speed control mechanism to prevent the spring means from operating and a position disengaged from the speed control mechanism to allow the spring means to operate, said lever including a first magnetic means; and

(c) a separate body having a second magnetic means and being magnetically attachable to the movable operation member adjacent the first magnetic means of the lever and movable with the movable operation member,

wherein, when the body is positioned on the movable operation member adjacent the first magnetic means of the lever, the lever moves due to magnetic forces of the first second magnetic means from the engaged position to the disengaged position, thereby allowing the spring means to operate and move the movable operation member with the body thereon relative to the base, and



wherein, when the body is removed from the movable operation member, the lever returns to its original engaged position, thereby preventing the spring means from operating and moving said movable member.

4,861,309

SPIRAL CYLINDER TOY

D. Michael Williams, New York, N.Y., and Lawrence B. Grubb, Monkton, Md., assignors to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J.

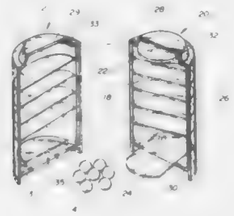
Continuation of Ser. No. 763,266, Aug. 7, 1985, Pat. No. 4,720,283. This application Jul. 10, 1987, Ser. No. 72,076

The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.

Int. Cl.[4] A63H *33/00*

U.S. Cl. 446—168 **2 Claims**

1. In a cylindrical toy comprising a first half and a second half, each of said halves having a top portion, a side portion, and a bottom portion, and each of said halves having secured to their respective inner surfaces a plurality of substantially semi-circular flat plates which, when said halves are connected, define a spiral passage in the interior of said cylindrical toy, the improvement wherein the bottom portion of said first half includes a bottom guide disk and the second half includes a reinforcing plate spaced from and disposed parallel to the bottom portion of said second half whereby said halves may be



accurately positioned with respect to each other prior to their being connected together.

4,861,310

AMUSEMENT DEVICE

Patrick A. Hemenway, 4400 Ocean Beach Hwy. Space 8, Longview, Wash. 98632

Filed Jul. 25, 1988, Ser. No. 228,129

Int. Cl.[4] A63H *33/02*

U.S. Cl. 446—453 **4 Claims**



1. An amusement device for receiving and launching a rolled article, said device comprising,

a shaft having a handgrip at one end,

a cross head affixed to the remaining end of said shaft, and

a pair of wire rails parallel to and laterally offset from said shaft, said pair of rails and said shaft defining a guideway for the rolled article for launching and retrieving same when the device is inclined,

said rails merging with a U-shaped segment secured to said shaft.

4,861,311

BEARING ARRANGEMENT FOR RODS AND AXLES IN PLASTIC TOYS

Björn Alskog, Hajdeby, S-620 23 Romakloster, Sweden

Filed Feb. 2, 1988, Ser. No. 151,342

Claims priority, application Sweden, Feb. 3, 1987, 8700409

Int. Cl.[4] A63H *17/26*

U.S. Cl. 446—469 **4 Claims**



1. A toy, comprising:

a body of plastics material having an axle supporting wall;

an axle;

means defining a closed perimeter bearing opening through said wall for receiving said axle therethrough, said closed perimeter bearing opening being formed by at least two substantially circular holes, located on spaced centers and connected by a slot whose width is less than the diameter of the circular holes, said holes being of a diameter to slidably and rotatably receive said axle therethrough, said axle being insertable in said bearing opening only axially in view of the closed perimeter of said opening, means on said body interfering with axial insertion of said axle in the second of said holes but not in the first of said holes, said first hole being so located on said wall that the axle can be inserted axially therethrough without obstacle, said second hole representing the working position of the axle, said slot being of width less than the diameter of said axle, the width of said slot being set in relation to the stiffness of the plastic material of said wall so that the axle can be pushed radially from said first hole through said slot to said second hole by overcoming a resistance to deformation of said wall at said slot, said axle being positively retained against radial movement out of said bearing opening by the closed perimeter of said bearing opening.

4,861,312

COIN HANDLING APPARATUS

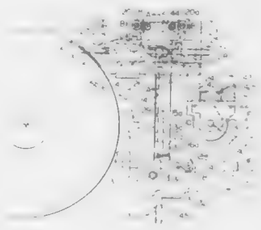
Hideshi Sentoku, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 170,379

Claims priority, application Japan, Mar. 19, 1987, 62-65348; Mar. 19, 1987, 62-65349

Int. Cl.[4] G07D *3/16*

U.S. Cl. 453—7 **11 Claims**



1. A coin sorting device for a coin handling apparatus, said coin sorting device comprising a rotatable disc to which various kinds of coins of various diameters are introduced and which feeds the coins one by one into the inside of the device by a centrifugal force, a discriminating section for discriminating the coins from said rotatable disc and for counting the number of the respective denominations of coins, a large coin separating path having a guide member for separating coins larger in diameter than a predetermined denomination of coins among the coins introduced from said rotatable disc via said discriminating section, conveyor belt means for conveying coins introduced from said rotatable disc along said large coin separating path, a selecting path having rail members and at least one groove for excluding coins smaller in diameter than the predetermined denomination of coins by dropping coins smaller in diameter than the predetermined denomination of coins through said at least one groove whereby only the predetermined denomination of coins remain and said guide member being provided with an inclined surface onto which the coins of larger diameter climb up and an arcuate lead wall for leading coins other than the coins of larger diameter to said selecting path.

4,861,313

ELASTOMERIC SHAFT COUPLING FOR CONCENTRIC SHAFTS

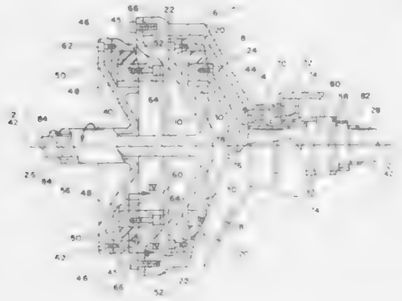
Philip Zeiser, and John Readman, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 9, 1987, Ser. No. 71,244

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.[4] F16D *3/10, 3/76*

U.S. Cl. 464—89 8 Claims



1. A concentric shaft coupling, comprising:

an inner driving member rotatable about a first axis of rotation;

an inner driven member rotatable about a second axis of rotation, said inner driven member being removably connected to said inner driving member to form an inner coupling assembly;

an inner intermediate member removably attached between said inner driving and driven members;

said inner intermediate member comprising a first compliant portion disposed to transmit torque between said inner driving and driven members;

a first spline arrangement disposed between said inner driving member and said inner intermediate member, said first spline arrangement having a plurality of mating teeth being disposed in non-contact relation, said plurality of mating teeth being movable into a torque transmitting relation upon the occurrence of a first deformation of said first compliant portion wherein said inner driving and driven members move rotationally relative to each other;

said inner intermediate member comprising a first rigid portion and a second rigid portion, said first compliant portion being disposed radially between said first and second rigid portions of said inner intermediate member, said first compliant member being disposed radially outward from said second rigid portion of said inner intermediate member, said first compliant portion of said inner intermediate member being disposed in radial alignment with said second rigid portion of said inner intermediate member, said second rigid portion of said inner intermediate member having a plurality of spline teeth extending radially inward and disposed in the interstices of a plurality of spline teeth of said inner driving member extending radially outward to form said first spline arrangement;

said first compliant member being selected to permit said first deformation upon the occurrence of a predetermined magnitude of torque between said inner driving and driven members;

an outer driven member rotatable about a third axis of rotation;

an outer driving member rotatable about a fourth axis of rotation, said outer driven member being removably connected to said outer driving member to form an outer coupling assembly;

an outer intermediate member removably attached between said outer driving and driven members;

said outer intermediate member comprising a second compliant portion disposed to transmit torque between said outer driving and driven members;

a second spline arrangement disposed between said outer driven member and said outer intermediate member, said second spline arrangement having a plurality of mating teeth being disposed in non-contact relation, said plurality of mating teeth being movable into torque transmitting relation upon the occurrence of a second deformation of said second compliant portion wherein said outer driving and driven members move rotationally relative to each other;

said outer intermediate member comprising a first rigid portion and a second rigid portion, said second compliant portion being disposed radially between said first and second rigid portions of said outer intermediate member, said second compliant member being disposed radially outward from said second rigid portion of said outer intermediate member, said second compliant portion of said outer intermediate member being disposed in radial alignment with said second rigid portion of said outer intermediate member, said second rigid portion of said outer intermediate member having a plurality of spline teeth extending radially inward and disposed in the interstices of a plurality of spline teeth of said outer driving member extending radially outward to form said second spline arrangement;

said second compliant member being selected to permit said second deformation upon the occurrence of a predetermined magnitude of torque between said outer driving and driven members;

an inner driving shaft, connected to said inner driving member, being rotatable about said first axis of rotation; and

an outer driving shaft, connected to said outer driving member, being rotatable about said third axis of rotation, said outer driving shaft being a hollow cylinder, said inner driving shaft being disposed within said outer driving shaft, said first and third axis of rotation being aligned coaxially.

4,861,314

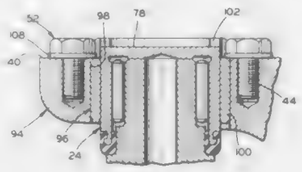
VERSATILE MOUNTING FOR BEARING CUPS OF UNIVERSAL JOINTS

Philip J. Mazziotti, Toledo, Ohio, assignor to The Zeller Corporation, Defiance, Ohio

Filed Jan. 6, 1988, Ser. No. 141,141

Int. Cl.[4] F16D *3/41*

U.S. Cl. 464—130 8 Claims



1. A universal joint comprising a yoke having a pair of spaced arms, each of said arms having a transverse cylindrical bore aligned with the transverse cylindrical bore of the other arm, said arms also having planar locating surfaces near said bores, with said locating surfaces on said spaced arms being spaced apart predetermined distances, a flangeless bearing cup in each of said bores, said cup having a side wall of predetermined thickness, an open end, and a closed end with an outer, precise, planar locating surface, the diameter of the transverse cylindrical bore in each of said arms exceeding the outer diameter of the bearing cup therein, an adapter sleeve around the bearing cup and within said bore, said sleeve comprising an annular side wall having an inner cylindrical surface of predetermined diameter slightly larger than the outer diameter of said bearing cup and having an outer cylindrical surface of predetermined diameter slightly smaller than the diameter of said bore, said adapter sleeve having at least one locating surface to enable said sleeve to be mounted in a predetermined longitudinal position relative to the yoke arm, said adapter sleeve having an inwardly-extending, annular flange at one end of said annular side wall and engagable with the precise planar locating surface of the closed end of the bearing cup, said adapter sleeve having at least one recess in one end of said annular side wall and extending toward the other end of said annular wall, said recess terminating in said adapter sleeve locating surface, and mounting means for each of said cups and the corresponding arm and cooperating with said adapter sleeve locating surface and said arm locating surface to hold said cup in a predetermined position relative to the arm and to the opposite cup.

4,861,315

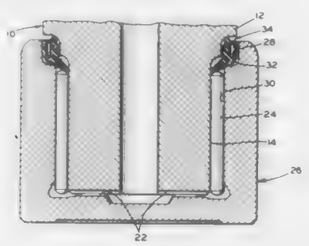
FLEXIBLE INTERNAL UNIVERSAL JOINT SEAL

Philip J. Mazziotti, Toledo, Ohio, assignor to The Zeller Corporation, Defiance, Ohio

Continuation-in-part of Ser. No. 37,045, Apr. 10, 1987, abandoned. This application Apr. 4, 1988, Ser. No. 177,155

Int. Cl.[4] F16J *15/32;* F16D *3/26*

U.S. Cl. 464—131 13 Claims



7. In combination, a cross having four trunnions and annular shoulders around said trunnions, a bearing cup having an open end which receives the trunnion, said bearing cup having a first interior portion of a circular cross section of one diameter adjacent the open end, said cup having a second, cylindrical interior portion of a smaller diameter away from said open end, with an internal shoulder formed between said portions, a universal joint seal for each of said bearing cups, said seal comprising a sealing member having a thick, sealing body and a much thinner, lubricant-escape flap, said sealing member having a deep, annular groove between said sealing body and said lubricant-escape flap, said thick, sealing body having at least two inner lips engaging the associated trunnion along narrow, annular areas, a first lip engaging a portion of the associated trunnion shoulder along an annular area, and a second lip engaging the associated cup shoulder along an annular area, said lubricant-escape flap being joined with said thick, sealing body adjacent said second lip, said flap having at least two outer lips engaging said first interior portion of the associated cup along narrow, annular areas, said lubricant-escape flap enabling lubricant under pressure to escape from said cup between said flap and said first interior portion of said cup, some of said inner and outer lips having discontinuities, each of said lips which have discontinuities having at least three of said discontinuities substantially uniformly spaced around the periphery thereof.

4,861,316

CONSTANT VELOCITY UNIVERSAL BALL JOINT

Hans-Heinrich Welschof, Offenbach am Main, Fed. Rep. of Germany, assignor to Löhr & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Jun. 11, 1987, Ser. No. 61,869

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1986, 3619693

Int. Cl.[4] F16D *3/23*

U.S. Cl. 464—145 4 Claims



1. A constant velocity universal joint, comprising:

an outer joint member having an inner surface with a plurality of axially extending circumferentially spaced outer tracks;

an inner joint member having an outer surface with a plurality of axially extending circumferentially spaced inner tracks;

a ball cage between said inner and outer joint members; and

a plurality of balls retained in said cage, each ball having a center and being engaged for rolling between said outer and inner tracks for permitting pivoting between said inner and outer members between an axially aligned undeflected position between said members, and an axially offset maximum deflected position between said members;

each track having a middle portion which is regularly impacted by said balls under load between the undeflected and maximum deflected positions of said inner and outer joint members, each track also having runout portions which are impacted by said balls for assembling reasons only when said inner and outer joint members are deflected beyond the maximum deflected position, said middle portions of said inner and outer tracks for each ball being symmetrical with respect to the center of that ball between the undeflected and maximum deflected positions of said inner and outer members, said runout portions for said inner and outer tracks of each ball being asymmetrical with respect to the center of that ball in the undeflected position of said inner and outer members;

at least one of the inner and outer tracks of said inner and outer members being free of undercuts whereby said at least one of said inner and outer members can be produced by non-cutting shaping.

4,861,317

SPEED CHANGER PULLEY

Jean-Jacques Brasse, Montigny-les-Cormeilles, and Ciriaco Bonfilio, Clichy, both of France, assignors to Valeo, Paris, France

Filed Jul. 22, 1988, Ser. No. 222,777

Claims priority, application France, Jul. 23, 1987, 87 10466

Int. Cl.[4] F16H *55/14*

U.S. Cl. 474—11 6 Claims

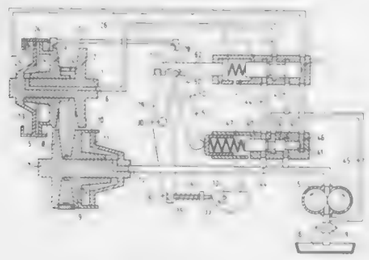
1. A speed changer pulley of the kind comprising a hub and two annular flanges disposed opposite each other around said hub, one of said flanges being axially movable relative to said hub under the control of elastic return means constituted by at least one annular element comprising a diaphragm presenting, on the one hand, a circular peripheral part forming a Belleville washer which bears axially to rock against the movable flange

by means of a covering of resilient material which encases the circular peripheral part and, on the other hand, a central part divided by gaps into radial fingers, which rocks against a bearing piece, wherein said covering of resilient material is prolonged radially outwards beyond the circular peripheral



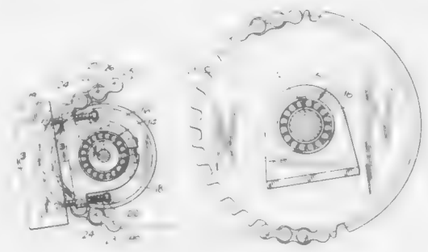
part of the diapragm by an annular deformable rim made of resilinet material fitted in a housing formed in the movable flange and axially off-set relative to the diaphragm which is disposed outwards said housing so as to constitute a rocking bearing for the diaphragm and to fix them at least axially to said axially movable flange.

4,861,318
CONTROL OF AN INFINITELY VARIABLE TRANSMISSION OF A VEHICLE
Coenraad H. van Beek, Diessen, and Wilhelmus J. M. van Wijk, Tilburg, both of Netherlands, assignors to Van Doorne's Transmissie B.V., Tilburg, Netherlands
Filed Mar. 16, 1988, Ser. No. 168,717
Claims priority, application Netherlands, Mar. 17, 1987, 8700676
Int. Cl.[4] F16H *11/02*
U.S. Cl. 474—18 **11 Claims**



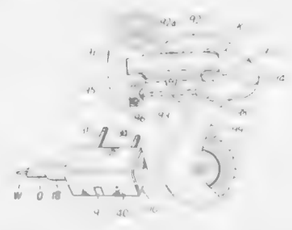
1. Control device for controlling the transmission ratio of an infinitely variable transmission including a belt and two pulleys, each pulley having conical discs which are hydraulically movable toward and away from each other, comprising hydraulic means including axially movable slide means for supplying and exhausting hydraulic fluid to the movable pulley discs to effect movement thereof, first means for urging said slide means in a first direction for exhausting hydraulic fluid to the movable pulley discs, second means responsive to the desired engine speed to urge said slide means in an opposite direction to supply hydraulic fluid to the movable pulley discs and third means for limiting the resulting movement of said slide means in said one direction, said third means being responsive to the transmission ratio.

4,861,319
SPEED REDUCTION DRIVE
Dennis E. Kemp, Jr., Maplewood, N.J., assignor to Mark T. Basseches, Pleasantville, N.Y., a part interest
Filed Jan. 3, 1989, Ser. No. 292,919
Int. Cl.[4] F16H *7/06*
U.S. Cl. 474—69 **7 Claims**



1. A speed reduction drive for connection to an input shaft comprising a drive roller mounted for rotation about a first axis, a chain having links and a plurality of rollers supported on said links for rotation about an axis parallel to said first axis, the periphery of a plurality of said rollers engaging said drive roller, a sprocket member meshed with said chain, a stator having an arcuate surface co-axial with said first axis engaging the periphery of a plurality of said rollers, said rollers being in frictional driving connection with said drive roller and said surface of said stator whereby said chain is driven at a linear speed less than the linear speed of the periphery of said drive.

4,861,320
POSITIONING DEVICE FOR A DERAILLEUR FOR A BICYCLE
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Jan. 25, 1988, Ser. No. 147,512
Claims priority, application Japan, Jan. 28, 1987, 62-11213[U]
Int. Cl.[4] F16H *7/22*
U.S. Cl. 474—80 **13 Claims**



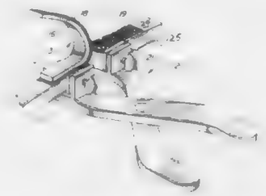
1. A positioning device for a bicycle derailleur which is provided with a linkage mechanism which is deformed by operation of a control wire for changing the bicycle speed, said positioning device comprising:
(a) a fixing member having a bottom wall and a side wall rising therefrom, said fixing member further comprising one of a fixture for securing one end portion of said control wire and an outer sheath holder for holding an outer sheath guiding said control wire,
(b) a moving member supported to said fixing member to be movable relative thereto, said moving member further including the other of said fixture and said outer sheath holdler,
(c) one of said fixing member and said moving member comprising a plurality of engaging portions for setting speed change stages of the bicycle,
(d) the other of said fixing member and said moving member comprising a retainer selectively engageable with at least one of said engaging portions,
(e) first coupling means for coupling said fixing member to one of two members at said linkage mechanism movable relative to each other when said linkage mechanism is deformed; and
(f) second coupling means for coupling said moving member to the other of said two members.

4,861,321
PULLEY SHIFT ASSEMBLY
John T. Siegwart, Jr., Birmingham, Ala., assignor to Research Corporation Technologies, Inc., Tucson, Ariz.
Division of Ser. No. 934,276, Nov. 24, 1986, Pat. No. 4,790,554. This application Jun. 9, 1988, Ser. No. 204,651
Int. Cl.[4] F16H *7/08*
U.S. Cl. 474—133 **6 Claims**



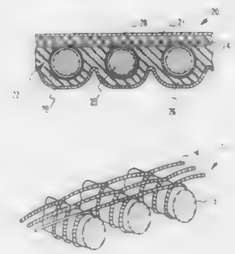
1. A tensioning mechanism for use with a sprocket assembly having at least first and second sprockets and a chain that, in use, in mounted on one of the sprockets and shifted from one sprocket to another, with the chain having a drive section held under a high tension on one side of the sprocket assembly, and return section on another side thereof, the tensioning mechanism comprising:
first and second spaced apart, rotatable pulleys to engage the return section of the chain;
means supporting the first and second pulleys for movement between a first position to maintain tension on the return section of the chain when the chain is mounted on the first sprocket, and a second position to maintain tension on the return section of the chain when the chain is mounted on the second sprocket; and
holding means connected to the supporting means to hold first and second pulleys in the first position when the chain is mounted on the first sprocket, and to hold the first and second pulleys in the second position when the chain is mounted in the second sprocket, the holding means including
(i) a third pulley to engage the drive section of the chain, and
(ii) connecting means connected to and rotatably supporting the third pulley, and further connected to the supporting means to hold the first and second pulleys in said first and second positions by means of force applied to the third pulley by the drive section of the chain.

4,861,322
EMERGENCY DRIVE (FAN) BELT
Gary M. Reddick, 6729 W. Earl Dr., Phoenix, Ariz. 85033
Filed Feb. 17, 1988, Ser. No. 157,415
Int. Cl.[4] F16G *7/04*
U.S. Cl. 474—254 **20 Claims**



1. The method for making an emergency drive belt installation on an engine comprising the steps of:
(a) bonding a first mating type coupling element adjacent a first terminal butt end of a linear segment of drive belting;
(b) bonding a second mating type coupling element adjacent a second terminal butt end of said linear segment of drive belting;
(c) threading said linear segment of drive belting around the appropriate engine pulleys;
(d) drawing said first and second terminal butt ends of said linear segment together in butting juxtaposition; and,
(e) coupling said first and said second coupling elements to maintain said first and second terminal butt ends in butting jaxtaposition forming an endless drive belt.

4,861,323
BELT HAVING EMBEDDED WIRES INTERLACED ACROSS LENGTHWISE SURFACES OF SHAFTS
Toshimitsu Kobayashi, Tokai; Akio Inagaki, Okazaki; Yasuhiro Kobayashi; Masanori Mori, both of Chiryu, and Takashi Sakakibara, Handa, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan
Division of Ser. No. 216,520, Jul. 8, 1988. This application Jan. 6, 1989, Ser. No. 293,971
Claims priority, application Japan, Jul. 10, 1987, 62-173407; Jul. 10, 1987, 62-173408
Int. Cl.[4] F16G *1/08*
U.S. Cl. 474—260 **10 Claims**



1. A belt comprising:
a main body formed into an endless configuration;
a plurality of substantially equally pitched approximately round shafts embedded in the main body; and
a plurality of wires engaged along nearly an entire lengthwise portion of each of said shafts and wherein each of said wires are wound on said shafts.

4,861,324

APPARATUS FOR MANUFACTURING TOBACCO FILTER

Ichiro Hirose; Shichisei Tani; Motonori Inamura, and Takashi Koyama, all of Hiratsuka, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 831,336, Feb. 20, 1986, abandoned. This application Jun. 8, 1987, Ser. No. 69,511
Claims priority, application Japan, Apr. 11, 1985, 60-075397; May 22, 1987, 62-123674
Int. Cl.[4] B31C *13/00*
U.S. Cl. 493—48 7 Claims



1. A tobacco filter manufacturing apparatus comprising

air permeable conveyor means for conveying a length of belt-like tobacco filter material longitudinally in a predetermined direction;

a mask member disposed in facing relation to said air permeable conveyor means to hold said length of belt-like tobacco filter material therebetween, said mask member having a plurality of slits therein extending laterally with respect to said length of filter material, each slit in said mask member having an intermediate portion lagging behind opposite lateral ends thereof with respect to said predetermined direction, and a plurality of mask sections between said slits, said air permeable conveyor means having air permeable sections and air non-permeable sections extending laterally and alternately, and extending downstream of said mask member, said air permeable sections of the conveyor means being set in registry with said slits in the mask member, said air non-permeable sections of the conveyor means being set in registry with said mask sections of the mask member, said mask member being movable synchronously together with said air permeable conveyor means in said predetermined direction;

suction means provided on a remote side of the air permeable conveyor means from the filter material; and

means for supplying granular additive into said slits such that said granular additive adheres onto the tobacco filter material in laterally extending separate areas thereof through said slits due to suction from said suction means.

4,861,325

CARTON FORMER

Frank DiMarzio, Gleanmore, and David Mitman, Atglen, both of Pa., assignors to Dopaco, Inc., Downingtown, Pa.

Continuation-in-part of Ser. No. 72,145, Jul. 10, 1987, Pat. No. 4,832,675. This application Sep. 4, 1987, Ser. No. 93,995
Int. Cl.[4] B31B *3/62, 1/44*
U.S. Cl. 493—124 19 Claims

1. An apparatus for forming paperboard blanks into containers with depressed central compartments and peripheral flanges, said blanks having peripheral wall-defining panels, said apparatus including feeder means for receiving a stack of blanks and sequentially presenting the blanks in said stack forwardmost for removal therefrom, a forming chamber with an upwardly directed receiving opening, swinging vacuum transfer means for individually transferring the forwardmost blank from said feeder means and positioning said blank over said receiving opening, and vertically reciprocating container forming means for engaging a positioned blank and moving said positioned blank into said chamber with the panels folding upward to define walls; the improvement including glue applicator means for applying glue to said blanks prior to transfer thereof from said feeder means to said forming chamber; and



control means for synchronizing the motion of said glue applicator means with the motion of said swinging vacuum transfer means, said control means having a cam and a linking means for selectively engaging said glue applicator means with the forwardmost blank including pivot means mounting said glue applicator means adjacent a discharge end of the feeder means independently of said swinging vacuum transfer means, said pivot means comprising a pair of shafts rotatably mounted outward of said feeder means along opposed edge portions thereof.

4,861,326

MODULAR FOLDING APPARATUS

Rudolf Kühner, Rimpar; Günter K. Schmitt, Würzburg, and Rudolf Stäb, Frankenthal, all of Fed. Rep. of Germany, assignors to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Jul. 14, 1987, Ser. No. 73,183
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 3626287
Int. Cl.[4] B65H *45/28, 45/16*
U.S. Cl. 493—359 23 Claims

1. A folding apparatus, comprising a plurality of separate modules,

one of said modules including a basic frame having connecting means and further connecting means, and to which folding apparatus intake means and at least one transverse cutting and transverse folding unit are mounted, said at least one traverse cutting and transverse folding unit adapted to be fed by a longitudinal folding unit and having a cutting cylinder, a cylinder having a folding blade and pins and a folding jaw cylinder,

another of said modules including an additional frame having connecting means and to which at least one further longitudinal folding unit is mounted, said at least one further longitudinal folding unit having a belt conveyor adapted to feed a delivery unit, and

a further one of said modules including a superposed frame having another folding jaw cylinder mounted thereto and another longitudinal folding unit associated therewith,

said another longitudinal folding unit being fed by said another folding jaw cylinder, said superposed frame having support surfaces forming connection means, wherein:

the basic frame and the additional frame having aligned bottom levels,

the connecting means of said basic frame is located in the vicinity of the folding jaw cylinder of said basic frame, said folding jaw cylinder being at a lower level than the



folding blade cylinder and said folding blade cylinder being located in the vicinity of said further connecting means, and

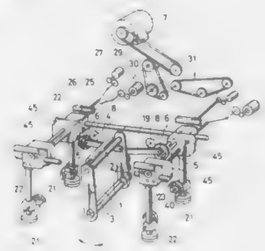
on their side remote from said basic frame, said additional frame and said superposed frame being provided with superposed connecting means for one respective add-on frame with at least one transverse folder delivery unit which can be actuated as an alternative to said at least one further longitudinal folding unit.

4,861,327

ZIGZAG FOLDING APPARATUS FOR A FORM PRINTING MACHINE

Akinobu Hanyu, and Tsukasa Kurokawa, both of Higashihiroshima, Japan, assignors to Fuji Kikai Kogyo Co., Ltd., Hiroshima, Japan

Filed Oct. 29, 1987, Ser. No. 114,806
Int. Cl.[4] B41L *1/32*
U.S. Cl. 493—415 11 Claims



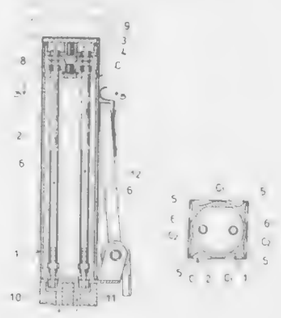
1. Apparatus for folding paper in a zigzag manner along transverse fold lines comprising folding arm means which pivotably oscillate about a transverse axis to guide said paper to effect folding of said paper in a zigzag manner, link means connected to said folding arm means, a motor drive, operable means operably connected between said motor drive and said link means such that rotation of said motor drive effects said pivotal oscillation of said folding arm means, said folding arms having an oscillating stroke determined by the extent of pivotal oscillation of said folding arms, adjusting means incorporated in said operable means for adjusting said oscillating stroke, rotary spiral drive means, and rotary spiral means driven by said rotary spiral drive means for receiving said paper from said folding arm means and arranging the folded paper in stacked array.

4,861,328

MANDREL FOR FORMING A BOTTOM IN A PACKAGING CONTAINER

Rickard Franke, Lund, and Lars Martensson, Malmö, both of Sweden, assignors to AB Tetra Pak, Lund, Sweden

Continuation of Ser. No. 45,836, May 1, 1987, abandoned. This application Dec. 21, 1988, Ser. No. 289,409
Claims priority, application Japan, Jun. 9, 1986, 61-87742[U]
Int. Cl.[4] B31B *1/28*
U.S. Cl. 493—470 1 Claim



1. A mandrel mounted on a packaging machine on which the bottom of a tubular package carton blank provided with thermo-plastic coatings and folding lines thereon is folded to be heat-sealed after said blank is inserted on said mandrel, wherein the body of said mandrel is formed in a tubular shape and provided with a cooling chamber at one end of the body of said mandrel so as to cool a plane plate, which is the top of said mandrel and contacts the heated, infolded and compressed bottom of said tubular package carton blank, four fins formed on the outer surface of the body of said mandrel respectively projecting outwardly so as to contact the inside corners of said tubular package carton blank, side walls of the body of the mandrel between said fins outwardly project and make tight contact with inner walls of the tubular package carton blank to securely hold the tubular package carton blank and a pair of pipes for injecting and discharging cooling water being connected to said cooling chamber and arranged inside the body of said tubular mandrel with a space between the inner wall of the body of said tubular mandrel, said pair of cooling pipes further being provided at the center of said tubular mandrel and apart from the inner surface of said mandrel.

4,861,329

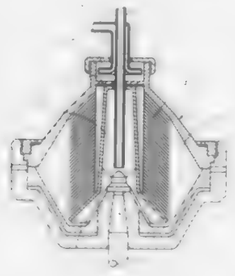
CENTRIFUGAL SEPARATOR

Leonard Borgström, Bandhagen; Claes G. Carlsson; Peter Franzén, both of Tullinge; Claes Inge, Saltsjö-Duvnäs; Torgny Lagerstedt; Hans Moberg, both of Stockholm, and Olle Nabo, Tullinge, all of Sweden, assignors to Alfa-Laval Separation AB, Sweden

Filed Dec. 6, 1988, Ser. No. 280,714
Claims priority, application Sweden, Dec. 7, 1987, 8704871
Int. Cl.[4] B04B *1/08*
U.S. Cl. 494—73 6 Claims

1. In a centrifugal separator for the separation of a substance dispersed in a liquid, comprising a rotor having a separation chamber, an inlet for a dispersion, an outlet for separated liquid, a stack of conical separation discs arranged coaxially with the rotor in the separation chamber and having interspaces between them, and flow influencing members situated

in at least part of the interspaces between the separation discs, which members in each of said interspaces are arranged in contact with the surface of the one of the separation discs, from which the dispersed substance moves away during operation of the rotor as a consequence of centrifugal force but at a distance from the other separation disc towards which the dispersed substance moves during operation of the rotor as a consequence of centrifugal force so that a space is formed between the members and said other separation disc admitting flow of dispersion in the circumferential direction of the rotor past the members, said flow influencing members forming flow paths between themselves extending between radially outer and inner areas of said one separation disc, the improvement in which



said flow influencing members are formed and positioned to prevent to a substantial degree the formation of Ekman layers along the surface of said one separation disc and so that the relation (L/H), where L is the distance between adjacent flow influencing members, seen in the circumferential direction of the rotor, and H is the distance between the surfaces of the separation discs, and the relation (1/H), where 1 is the extension of each flow influencing member in the circumferential direction of the rotor and H is the distance between the surfaces of the separation discs, are greater than zero but less than 2;

and the surface of said other separation discs, opposite to the flow influencing members is formed to promote the formation of an Ekman layer along the same during operation of the rotor.

4,861,330

CARDIAC ASSIST DEVICE AND METHOD

Gene Voss, 7614 Louis Pasteur, Suite 200, San Antonio, Tex. 78129

Filed Mar. 12, 1987, Ser. No. 24,986
Int. Cl.[4] A61B *19/00*
U.S. Cl. 600—16 **6 Claims**



1. A method of assisting the pumping action of a heart, comprising the steps of:

inserting a balloon member into the femoral vein, said balloon member joined in fluid communication to a catheter member;

guiding said balloon member and said catheter member within said femoral vein toward said heart, into the inferior vena cava and the right atrium;

pushing said balloon member past the foramen ovale into the left atrium and past the mitral valve into the left ventricle of said heart; and

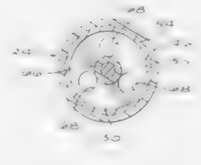
activating pump means connected to said catheter member whereby said balloon member is inflated during each contraction of said ventricle, and deflated shortly thereafter.

4,861,331

IMPLANTABLE SHUNT SYSTEM AND METHOD OF ASSEMBLY

Gary P. East, Santa Barbara; Stephen W. Laguette; Alfons Heindl, both of Goleta, and Leanne M. Lintula, Santa Barbara, all of Calif., assignors to Pudenz-Schulte Medical Research Corp., Goleta, Calif.

Continuation-in-part of Ser. No. 173,092, Mar. 24, 1988. This application Apr. 22, 1988, Ser. No. 184,749
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—9 **44 Claims**



1. A surgically implantable shunt system, comprising:

an inlet;

an outlet;

a first base adjacent to the inlet, the first base including an inlet fluid passageway therethrough and a first valve seat surrounding a portion of the inlet fluid passageway;

a first flow control member attached to the first base and being positioned with respect to the first valve seat to normally permit free fluid flow through the inlet fluid passageway, and alternately, to selectively contact the first valve seat in a manner to occlude the inlet fluid passageway;

a second base adjacent to the outlet, the second base including an outlet fluid passageway therethrough and a second valve seat surrounding a portion of the outlet fluid passageway; and

a second flow control member attached to the second base so that the second flow control member contacts the second valve seat in a manner normally occluding the outlet fluid passageway but selectively opening to permit controlled unidirectional flow therethrough.

4,861,332

ULTRASONIC PROBE

Tullo T. Parisi, San Diego, Calif., assignor to Ultramed Corporation

Continuation-in-part of Ser. No. 851,220, Apr. 14, 1986, abandoned. This application Nov. 26, 1986, Ser. No. 935,396
Int. Cl.[4] A61B *17/20*
U.S. Cl. 604—22 **15 Claims**

1. An ultrasonic probe for removing and aspirating material, comprising:

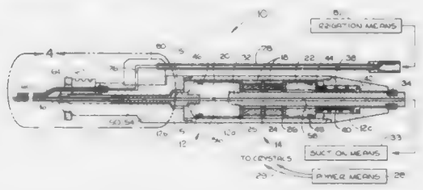
a housing;

compressible piezoelectric transducer means disposed within said housing and energizable to provide ultrasonic vibrations, said transducer means having an axial bore;

power means for energizing said transducer means, said power means having a first and a second body member formed with axial bores, said body members disposed in said housing on opposite sides of said transducer means with said axial bores of said transducer means and said first and second body members substantially in alignment with one another;

an operative tip connected to said power means for ultrasonic vibration by the power means, said operative tip having an inner passage for the aspiration of material, said inner passage being aligned, and communicating with, said axial bore in said first body member when said tip is connected to said first body member;

a coil spring disposed in said housing for compressing and transducer means to prestress said transducer means,



a connecting tube extended through respective axial bores of said transducer means and said second body member and at least partially through said first body member in communication with said inner passage of said operative tip; and

a guide sleeve disposed on said connecting tube, said coil spring provided within said housing and disposed on said guide sleeve,

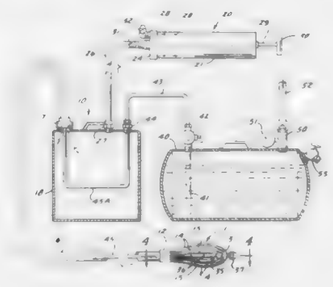
the power means, the operative tip and the coil spring being disposed in a coaxial relationship, the coil spring means being disposed against the power means only at the end removed from the tip to amplify the ultrasonic movements of the tip in the direction away from the housing.

4,861,333

ANIMAL ASPIRATING AND IRRIGATING APPARATUS

Lawrence D. Meador, P.O. Box 94, Lanark, Ill. 61046

Filed Oct. 13, 1987, Ser. No. 106,875
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—35 **13 Claims**



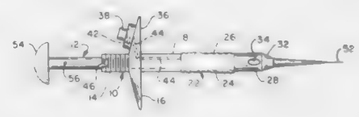
1. Apparatus for aspirating and irrigating an organ of a non-human mammal, said apparatus comprising a nozzle shaped for insertion into the organ and having a plurality of ports, a first flexible tube having one end portion communicating with said nozzle, a first portable container for holding an opposite end portion communicating with said container, a suction pump communicating with said container and selectively operable to create a negative pressure in said container, said tube and said nozzle thereby to suck material from said organ into said ports and said nozzle, through said tube, and into said container, a second flexible tube located within said first tube and having one end portion communicating with said nozzle, a second portable container adapted to hold a liquid for irrigating said organ, said second tube having an opposite end portion communicating with said second container, means within said first container for establishing communication between said second container and said opposite end of said second tube, and means on said second container for admitting pressure fluid into said second container for the purpose of pressuring said second container in order to force said liquid out of said second container, through said second tube and said nozzle, and out of said ports so as to remove clogged material from said ports and to irrigate said organ.

4,861,334

SELF-RETAINING GASTROSTOMY TUBE

Arain Nawaz, 620 Belle Terre Rd., Port Jefferson, N.Y. 11777

Filed Jun. 24, 1988, Ser. No. 211,254
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—49 **15 Claims**



1. A self-retaining gastrostomy tube for implantation through the abdominal and stomach walls of a patient, the distal end of said tube to terminate within said stomach and the proximate end of said tube to terminate outside of said patient, comprising:

a. collar means adjacent the proximate end of said tube for engaging the outer surface of the abdominal wall;

b. inflatable means mounted on the outside of said tube located within said stomach upon implantation of said tube;

c. said tube including a stretchable section located between said collar means and said inflatable means;

d. trocar means for surgically implanting said tube and elongating said stretchable section during implantation, said stretchable section extending through said abdominal and stomach walls and being elongated and becoming taut during installation of said tube; and

e. means for inflating said inflatable means after implantation of said tube to cause said inflatable means upon inflation to exert a force against the inside surface of said stomach wall transmitted to said collar means on the surface of said abdominal wall whereby said tube is held in place by said collar means and said inflatable means acting on said abdominal and stomach walls as a result of said stretchable section being taut.

4,861,335

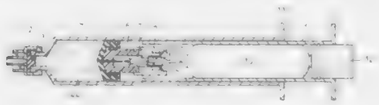
SYRINGE

David L. Reynolds, Montreal, Canada, assignor to Duoject Medical Systems Inc., Montreal, Canada

Continuation-in-part of Ser. No. 759,432, Jul. 26, 1985, abandoned. This application Feb. 25, 1987, Ser. No. 18,934
Int. Cl.[4] A61M *3/00*
U.S. Cl. 604—88 **15 Claims**

1. A syringe for the administration of a medicament having two components requiring separate storage comprises: a barrel having a neck at one end, a penetrable closure for said neck, means mounted on said neck for receiving a double ended needle with one end thereof in penetrating relationship with said closure, a hollow plunger stem movable with the barrel, a capsule defining a sealed collapsible chamber comprising a first, liquid component of the medicament and entering within

the hollow plunger stem, a plunger head sealingly slidable within the barrel to isolate a second component of the medicament stored within the barrel beyond the plunger head, means coupling the plunger head and the plunger stem, hollow needle means located at the inner end of the plunger stem between the capsule and the plunger head, and means to drive the capsule towards the plunger head whereby the needle means is caused to pierce said capsule and place the interior of the capsule in communication with the hollow needle means, the coupling means comprising two relatively axially movable parts having twist coupling means such that they are capable of assuming two alternative axially spaced relative positions, in each of which they can be retained against relative axial movement in at least one direction, the longitudinal position of the plunger head relative to the needle in a first of the positions, in which



the parts can be retained against movement toward one another, being such that the needle does not pierce the head, and in a second of the positions, in which the parts can be retained against movement away from each other, being such that the needle does pierce the head;

wherein the first of said axially movable parts is a sleeve attached to one of the head and the plunger stem, and the second of said parts is a hollow stem attached to the other of the head and the plunger stem and telescopically entering the sleeve, the sleeve having an axially asymmetric opening, and the stem having an asymmetric section having at least one orientation in which it can move axially into said opening, and at least one neck permitting the opening in the sleeve to be rotated out of said at least one orientation in at least the second of said axially spaced positions.

4,861,336

PUNCTURE CATHETER

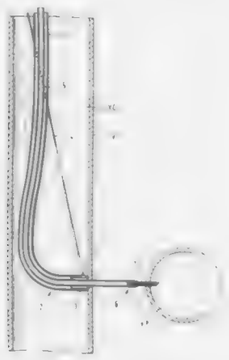
Manfred W. Helzel, Frankenstrasse 29, 8700 Wurzburg, Fed. Rep. of Germany

Filed Apr. 1, 1988, Ser. No. 177,293

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710913

Int. Cl.[4] A61M *5/00, 25/00*

U.S. Cl. 604—95 **10 Claims**



1. A catheter suitable for establishing a porto-caval shunt, comprising:

a directing catheter having an inserted end segment, said directing catheter being flexible at least at the end segment;

a pulling mechanism located outside said directing catheter and attached to an outer surface of said end segment so as to selectively bend and guide the end segment; and

a puncutre catheter located inside said directing catheter and having an open catheter tip which can extend past the end segment of said directing catheter.

4,861,337

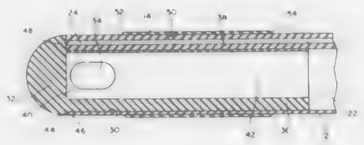
COLLAPSIBLE URETHRAL CATHETER

Robert D. George, Lake Saint Louis, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Mar. 2, 1988, Ser. No. 163,264

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—96 **17 Claims**



1. A urethral catheter comprising an elongated tubular member of a relatively flexible material having inner and outer surfaces and adjacent but separated drainage and inflation passageways extending the length thereof, said tubular member having a distal end to be inserted into a bladder to be drained and a proximal opposite end, a separate plug member disposed into the tubular member from the distal end to stiffen the adjacent end portion of the tubular member to facilitate insertion of the catheter into a bladder, said plug member including a generally cylindrical body with a bore in communication with the drainage passageway, an inflatable bladder surrounding the tubular member over a portion of the length where the plug member is inserted, said inflatable bladder having opposed spaced end portions and means sealing the end portions to the tubular member to define an enclosed area therebetween, means in the tubular member communicating the inflation passageway with the enclosed area between the bladder and the tubular member, and communicating drain port means in the plug member and in the tubular member adjacent to the distal end of the tubular member for passing drainage fluid from the exterior of the catheter to the drainage passageway.

4,861,338

SAFETY SYRINGE

George E. Mathiesen, Iaver Grove Heights, and Charles H. Mayo, II, Marine on St. Croix, both of Minn., assignors to Mediverse Inc., St. Paul, Minn.

Filed Feb. 11, 1988, Ser. No. 154,904

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—110 **18 Claims**

1. A safety syringe comprising:

(a) a cylindrical hollow barrel member having axially abutting and connected top and bottom tubular portions having, respectively, a top end and a bottom end, said bottom tubular portion having an internally disposed female threaded section of a preselected axial length, and said female threaded section having top and bottom axial ends;

(b) a cylindrical axially extended needle means having (i) top and bottom axial ends, (ii) an externally disposed male threaded section adjacent said bottom axial and of a preselected axial length and having top and bottom axial ends, and (iii) a central axially extending bore;

(c) elongated hollow needle means having a pointed end and being positioned in said central bore and fixed with respect to said needle holder means so that said pointed end of said hollow needle means projects a preselected axial extent beyond said bottom axial end of said needle holder means, said needle holder means being positioned within said barrel member bottom portion (i) with said male and female threaded sections in mutual mating and coacting engagement and said bottom axial end adjacent said bottom end of said barrel member, and (ii) so that said pointed end of said needle means is projecting axially beyond said bottom end of said barrel member;

(d) an elongated plunger means having a longitudinal axis and top and bottom ends and including (i) integral cylindrical piston means and (ii) torque transmitting tool means at said bottom end thereof insertable into said top portion of said barrel member so that, upon axial movement of said plunger means into said barrel member, said piston means and said tool means are moved axially toward and, after a preselected axial movement, said tool means is engageable with said top end of said needle holder means;

(e) means on said top end of said needle holder means for receiving said tool means and for receiving torque from said plunger means so that said needle holder means is



thereby (i) rotated relative to said bottom tubular portion, and (ii) moved simultaneously axially upwardly in said bottom tubular portion toward said top axial end of said female threaded section; and

(f) locking means for locking said needle holder means within said barrel member against any further axial movement, said locking means becoming effective automatically upon disengagement of said male threaded section from said female threaded section, whereby further use of said needle holder means is prevented, and said preselected axial length of said female threaded section of said bottom tubular portion of said barrel member being selected to be greater than said preselected axial projection of said hollow needle means beyond said bottom axial end of said needle holder means so that, upon said needle holder means being moved axially upwardly, said pointed end of said needle means is axially moved up into and within said bottom tubular portion of said barrel member and is axially displaced from said bottom end of said barrel member thus preventing accidental contact of said pointed end of said hollow needle means by an errant body part.

4,861,339

INJECTION SPRAY GUN WITH ADJUSTABLE PRESSURE LIMITATION

Horst Jonischkeit, Tuttlingen, Fed. Rep. of Germany, assignor to Henke-Sass, Wolf GmbH, Tuttlingen, Fed. Rep. of Germany

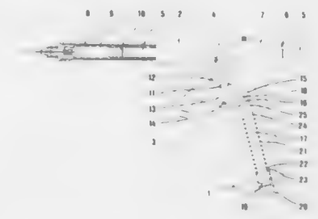
PCT No. PCT/DE86/00392, § 371 Date May 26, 1987, § 102(e) Date May 26, 1987, PCT Pub. No. WO87/01945, PCT Pub. Date Apr. 9, 1987

PCT Filed Sep. 24, 1986, Ser. No. 55,625

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1985, 3534215

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—118 **16 Claims**



1. An injection spray gun with a holder configured for attachment of a sheathing provided to receive a cylindrical ampule containing a piston comprising: a handle fastened to said holder; an actuating lever pivotally attached to said handle; a plunger guided in said holder and connected with said actuating lever so that when the sheathing is attached to said holder, movement of said plunger causes forward thrust of the piston; and a pressure limiting device connected for acting on at least one of said actuating lever and said plunger.

4,861,340

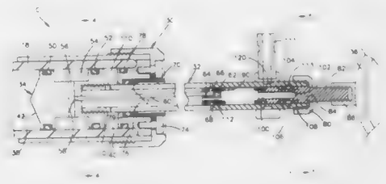
HAND-HELD PNEUMATIC POWER ASSISTED SYRINGE

Kevin W. Smith, Miami, and Charles R. Slater, Fort Lauderdale, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Oct. 17, 1988, Ser. No. 258,396

Int. Cl.[4] A61M *37/00*

U.S. Cl. 604—141 **18 Claims**



1. A hand-held manually operable-pneumatic power assisted syringe for injection of fluids, comprising:

an elongated cylindrical barrel-shaped housing having a distal end and a proximal end;

a piston slidably mounted within said housing and dividing said housing into a fluid chamber on the distal end of said piston and a gas chamber on the proximal end of said piston;

a nozzle assembly mounted on the distal end of said housing and having a discharge passageway for discharging fluid from said fluid chamber as said piston is being displaced toward said distal end;

an end cap mounted on the proximal end of said housing and having an aperture therein;

a piston push rod slidably extending through said cap aper-

ture and extending through said gas chamber and having a distal end thereof mounted to said piston for displacing said piston and having a proximal end located beyond the proximal end of said housing, said push rod being hollow for essentially its entire length;

said push rod having a first passageway at a location adjacent to said piston for communication with said gas chamber and a second passageway at a location exterior to said housing adjacent the proximal end of said push rod for communication with a source of pressurized gas for filling said gas chamber with pressurized gas;

valve means carried by said push rod and including first valve means slidably mounted within said push rod and having a normal valve closed position for blocking said second passageway and being slidable to a valve open position for permitting gas to flow through said second passageway and thence through said hollow push rod and to said gas chamber by way of said first passageway; and

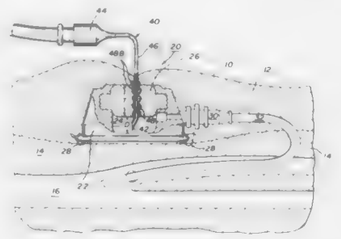
manually operable means for displacing said first valve means from said valve closed position to said valve open position and for displacing said push rod to move the piston in the distal direction assisted by said gas pressure acting on the proximal end of said piston for injection of fluid from said fluid chamber by way of said nozzle assembly discharge passageway.

4,861,341

SUBCUTANEOUS VENOUS ACCESS DEVICE AND NEEDLE SYSTEM

Robert T. Woodburn, 19271 Ravine Dr., New Buffalo, Mich. 49117

Filed Jul. 18, 1988, Ser. No. 220,609
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—175 **16 Claims**



1. In a subcutaneous venous access system of

a port device defining a chamber with a septum for allowing a needle input into the chamber and a catheter output from the chamber:

a needle assembly having a shaft section and a point, means for allowing the non-coring entry of the needle point through skin and the septum and which, when seated in the chamber, has a shaft segment which extends through the septum and into the chamber; and

means for providing a changed outside diameter portion of the outside surface of the shaft in said segment;

whereby said needle assembly may be seated into the chamber of the port device and said changed diameter section serve to prevent or reduce the possibility of said needle being unintentionally removed from the chamber and septum during use.

4,861,342

DYEING OR FINISHING PROCESS USING PADDING WITH CONTINUOUS FIXING OF TEXTILE MATERIALS: GRAFT POLYMER AND MICROWAVE HEATING

Paul Danel, Sèvres, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 3, 1988, Ser. No. 202,752
Claims priority, application Switzerland, Jun. 5, 1987, 2146/87
Int. Cl.[4] D06L *3/02;* **D06P** *1/61, 5/20*
U.S. Cl. 8—444 **16 Claims**

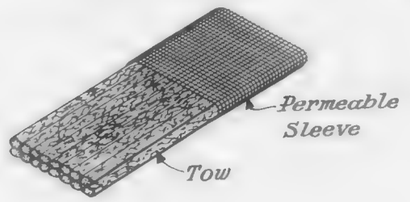
1. A process for dyeing or finishing textile materials, which process comprises padding the textile materials with an aqueous dyeing or finishing liquor which additionally contains a graft polymer obtained from (a) an adduct of an alkylene oxide with an at least trihydric aliphatic alcohol of 3 to 10 carbon atoms and (b) acrylamide or methacrylamide, and subsequently fixing the dye or the finish continuously by treatment with microwaves for 5 to 30 seconds.

4,861,343

PROCESS TO ENCLOSE FLOCK TOW IN A PERMEABLE SLEEVE FOR DYEING OR TEXTILE TREATMENT BEFORE CUTTING INTO A FLOCK

Franz-Theo Neunzig, Rommerskirchen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 26, 1987, Ser. No. 53,793
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1986, 3619033
Int. Cl.[4] B05D *1/14;* **D01G** *1/06;* **D06B** *5/14;* **D06M** *11/04*
U.S. Cl. 8—488 **11 Claims**



1. A process for preparing a flock for the mechanical and/or electrostatic flocking, in which the flockmaking tow is introduced into a sleeve which is permeable to liquid of a treatment bath, the flockmaking tow is subjected in this form to at least one treatment bath and is then cut into flock.

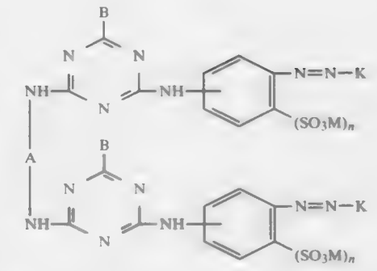
4,861,344

REACTIVE WATER-SOLUBLE AZO DYES CONTAINING CARBOXY- OR CARBAMOYL-PYDRIDINIUM GROUPS FOR DYEING TEXTILES

Ludwig Schläfer, Kelkheim; Hartmut Springer, and Reinhard Hähnle, both of Königstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 115,435
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637337
Int. Cl.[4] C09B *62/09, 35/02;* **D06P** *1/38, 3/10*
U.S. Cl. 8—532 **8 Claims**

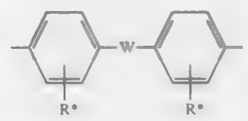
1. A process for dyeing a hydroxy group-containing fiber material in an aqueous bath, wherein a water-soluble azo compound is applied to the material in an aqueous solution and allowed to act on the material from the aqueous solution at a pH value between 4 and 8 and at a temperature between 100° and 150° C. to be fixed on the material, said water-soluble azo compound having the formula



in which

A is phenylene unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms, chlorine, sulfo and carboxy, or

A is a group of the formula

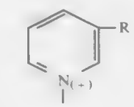


in which

W is a direct bond or a vinylidene group of the formula —CH=CH— or a group of the formula —NH—CO—NH— and

R° is hydrogen or nitro, sulfo, carboxy, methyl, ethyl, methoxy or ethoxy;

B is a pyridinium group of the formula



(3)

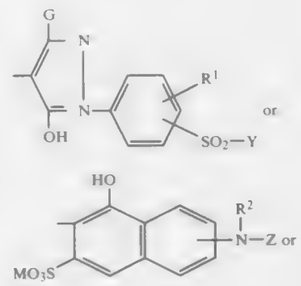
in which

R is carboxy or carbamoyl;

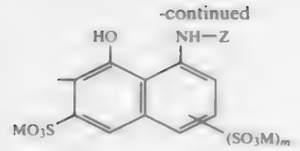
n is zero or 1;

M is hydrogen or an alkali metal;

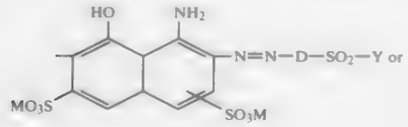
K is a group of the formula

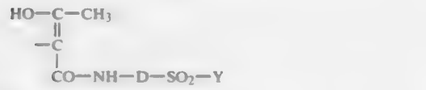


-continued



the one —SO_3M group being bonded in the meta- or para-position relative to the —NH—Z group or is





in which

D is phenylene unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, bromine, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, carboxy and sulfo, or is naphthylene unsubstituted or substituted by 1 or 2 sulfos;

R^1 is hydrogen, chlorine, alkyl group of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms;

R^2 is hydrogen or alkyl of 1 to 4 carbon atoms;

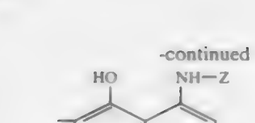
G is carboxy, methyl or carbalkoxy of 2 to 5 carbon atoms;

Y is a vinyl, β-sulfatoethyl or β-chloroethyl;

M has the abovementioned meaning;

m is zero or 1;

Z is α- or β-bromoacryloyl or is β-chloropropionyl, β-chloroethylsulfonylbenzoyl or (β-chloroethylsulfonylmethyl)-benzoyl or a group of the formula



in which D and Y have the abovementioned meanings and Hal is chlorine or fluorine;

one of the sulfo, sulfato and carboxy groups forming an anion equivalent to the pyridinium cation.

4,861,345

METHOD OF BONDING A CONDUCTIVE LAYER ON AN ELECTRODE OF AN ELECTROCHEMICAL CELL

Jeffrey C. Bowker, Richland Township, Allegheny County, and Prabhakar Singh, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 13, 1988, Ser. No. 194,065

Int. Cl.[4] H01M *8/02*

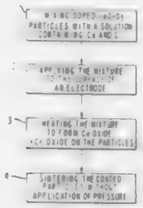
U.S. Cl. 29—623.1 **10 Claims**

1. A method of bonding a dense, electronically conductive layer on a porous, electronically conductive electrode structure comprising the steps:

(A) providing an electrode surface;

(B) forming, on a selected portion of the electrode surface, without the application of pressure, particles of $LaCrO_3$ doped with an element selected from the group consisting of Sr, Mg, Ca, Ba, Co, and mixtures thereof, where the particles have a deposit on their surface comprising calcium oxide and chromium oxide;

(C) heating the particles with the oxide surface deposit in an oxidizing atmosphere at from 1,300° C. to 1,550° C., without the application of pressure, to provide a dense, sintered, interconnection material bonded to the electrode, where calcium and chromium from the surface deposit are incorporated into the structure of the $LaCrO_3$.



4,861,346

STABLE AQUEOUS SUSPENSION OF PARTIAL OXIDATION ASH, SLAG AND CHAR CONTAINING POLYETHOXYLATED QUATERNARY AMMONIUM SALT SURFACTANT

Mitri S. Najjar; Farokh Yaghmaie, both of Hopewell Junction, and Louis S. Sorell, Carmel, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 7, 1988, Ser. No. 141,445

Int. Cl.[4] C10L *1/32*

U.S. Cl. 44—51 **3 Claims**

1. A pumpable aqueous suspension of particulate matter with reduced viscosity and increased resistance to sedimentation and having a particle size in the range of about 37–2000 microns as produced by quench cooling or scrubbing the hot raw effluent gas stream comprising H_2+CO at a temperature in the range of about 1700° F.–3000° F. from the partial oxidation of solid carbonaceous fuel selected from the group consisting of anthracite, bituminous, sub-bituminous and lignite coal, coke from coal, petroleum coke, coal liquefaction solid residue, oil shale, tar sands, asphaltic bitumen, and mixtures thereof, wherein said aqueous suspension comprises water, about 1.0–50.0 weight percent of said particulate matter consisting of a mixture of slag and char, and about 0.1–10.0 weight percent of a polyethoxylated quaternary ammonium salt surfactant of the formula:

where R is an alkyl radical selected from the group consisting of coco, tallow, lauryl, oleyl, and octadecyl, and x+y has a value in the range of 2–15.

4,861,347

COMPACT CHEMICAL REACTION VESSEL

Donald F. Szydlowski, Ellington, and George T. Suljak, Vernon, both of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Dec. 29, 1986, Ser. No. 947,068

Int. Cl.[4] B01J *8/06*

U.S. Cl. 48—61 **5 Claims**

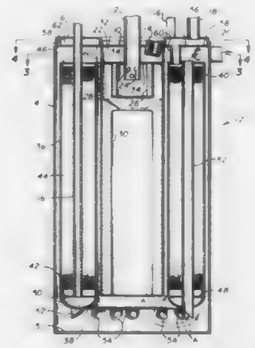
1. A vessel for catalytically reforming raw hydrocarbon fuels, said vessel comprising:

(a) a housing having a cylindrical side wall;

(b) burner means in said housing on the axis thereof for heating the interior of the housing, said burner means including a tubular refractory heat shield into which heat is propagated by said burner means;

(c) means forming an annular catalyst bed in said housing, said catalyst bed being radially outwardly spaced from and surrounding said tubular heat shield, and radially inwardly spaced from and surrounded by said cylindrical side wall of said housing;

(d) a plurality of circumferentially spaced heat tubes extending through said catalyst bed for ducting hot gases from said burner means through interior portions of said catalyst bed to heat the latter from the inside;

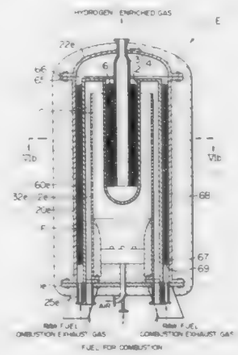


(e) means for admitting raw liquid hydrocarbon fuel to a heated area in said vessel adjacent to said catalyst bed for vaporization of the raw fuel and subsequent percolation of the vaporized fuel through said catalyst bed to reform the raw fuel to a hydrogen-rich fuel gas;

(f) means for collecting reformed fuel gas from said catalyst bed for subsequent use; and

(g) heat exhaust means for exhausting hot burner gases through said heat tubes, through a first heating zone between said catalyst bed and said tubular heat shield, and through a second heating zone between said catalyst bed and said housing cylindrical side wall to a location outside said vessel.

steam mixed therein into the volume including a fuel gas supplying passage means disposed around the combustion gas passage means and in heat exchange relationship with the combustion gas passage means, the fuel gas supplying passage means having means for retaining a catalyst therein;



fuel passage means for supplying fuel to the combustor;

air passage means for supplying air to the combustor; and

insulating layer means for preventing heat radiation from the fuel forming apparatus, the insulating layer means being disposed around the fuel gas supplying passage means.

4,861,348

FUEL REFORMING APPARATUS

Kazuhito Koyama; Shigehisa Sugita, both of Hitachi; Seiichiro Sakaguchi, Ibaraki; Nobuhiro Seiki, Hitachi, and Asao Hanzawa, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 8, 1987, Ser. No. 105,808

Claims priority, application Japan, Oct. 8, 1986, 61-237963; Nov. 17, 1986, 61-271956

Int. Cl.[4] B01J *7/00*

U.S. Cl. 48—94 **12 Claims**

1. A fuel reforming apparatus, comprising:

a reaction tube means forming a volume where an endothermic reaction for converting a fuel gas, with steam mixed therein, into hydrogen-enriched gas, using a catalyst, occurs, with said volume including means for retaining a catalyst therein, said reaction tube means having an inlet means for transmitting fuel gas with steam mixed therein into the volume and outlet means for removing hydrogen-enriched gas from the volume;

a combustor for generating a combustion gas, to heat said reaction tube means;

combustion gas passage means for passing said combustion gas adjacent said reaction tube means so as to heat said reaction tube means, said combustion gas passage means being positioned around the volume, said combustion gas passage means including a combustion gas outlet means for discharging combustion gas from the fuel reforming apparatus, the inlet means for transmitting fuel gas with

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4,861,349

GRINDING METHOD

Eugene P. Bublik, Buckinghamshire, England, and Zbigniew Sartowski, Budapest, Hungary, assignors to Allied Colloids Ltd., England

Filed Jun. 6, 1988, Ser. No. 202,893

Claims priority, application United Kingdom, Jun. 5, 1987, #713205

Int. Cl.[4] B24D *18/00*

U.S. Cl. 51—293 **12 Claims**

1. In a process comprising a grinding step for grinding a friable particulate, solid material to form ground particles, the improvement wherein water absorbent polymeric material that remains non-sticky throughout the process is included in said grinding step to substantially prevent the ground particles from caking.

4,861,350

TOOL COMPONENT

Cornelius Phaal, 34 Rutland Avenue, Craighall Park, and Richard P. Burnand, 39 Constantia Avenue, Alan Manor, both of Johannesburg, Transvaal, South Africa

Continuation of Ser. No. 898,612, Aug. 21, 1986, abandoned. This application Aug. 18, 1988, Ser. No. 233,976

Claims priority, application South Africa, Aug. 22, 1985, 85/6379

Int. Cl.[4] B24D *3/04*

U.S. Cl. 51—307 **9 Claims**

1. A tool for engaging a work material, comprising:

a body defining a working surface; and

a tool component including a cemented carbide support body having a top surface; and an abrasive compact bonded to the support body, and including a polycrystalline mass of ultra-hard abrasive particles bonded into a hard conglomerate and containing at least 70 percent by volume of ultra-hard abrasive particles, the polycrystalline mass including:

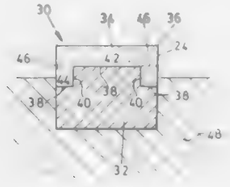
(i) first and second major surfaces on opposite sides of the polycrystalline mass, the first major surface forming a

cutting edge or point to engage and cut the work material, the second major surface being bonded to the support body, and

(ii) upper and lower layers joined together by an interlocking, common boundary,

the upper layer comprising ultra-hard abrasive particles, extending upward from said common boundary and over the top surface of the carbide support body, and forming the first major surface of the polycrystalline mass,

the lower layer comprising particles selected from the group consisting of (a) ultra-hard abrasive particles coarser than the abrasive particles used to form the upper layer, and (b) a mixture of ultra-hard abrasive particles and carbide particles,



the lower layer extending downward from said common boundary and forming the second major surface of the polycrystalline mass;

wherein the tool component is recessed in the working surface with the cutting edge or point of the tool component located above the working surface, with the common boundary joining the upper and lower layers of the polycrystalline mass also located above the working surface and with the lower layer of the polycrystalline mass extending below the top surface of the support body and surrounding the support body beneath the working surface;

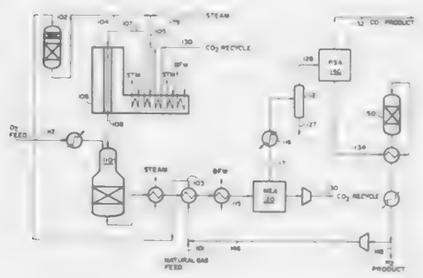
wherein the working surface and the abrasive compact completely enclose the carbide support body to protect the carbide support body from cut pieces of the work material.

4,861,351

PRODUCTION OF HYDROGEN AND CARBON MONOXIDE

David M. Nicholas, New Tripoli; Jeffrey A. Hopkins, Whitehall, and Joseph P. Bushinsky, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 16, 1987, Ser. No. 97,573
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—23 8 Claims



1. The method of producing indivdiual high purity streams of hydrogen and carbon monoxide which comprises:

(a) subjecting a gas feed rich in methane to two-stage reforming wherein said feed undergoes reaction with steam in the first stage and further reaction in the presence of added oxygen in said second stage, thereby producing a mixed gas composition containing hydrogen and carbon monoxide as key components accompanied by carbon dioxide and minor gaseous contaminants,

(b) subjecting said mixed gas composition to absorptive contact with a solvent selective in dissolving carbon dioxide, cooling the undissolved substantially C_2-free gaseous remainder of said composition to a temperature effective for condensation of water vapor contained therein,

(c) separating condensed water from the remaining vapor and passing said vapor at superatmospheric pressure as feed through a bed of solid adsorbent selective for sorption of carbon monoxide, thereby recovering hydrogen as an unsorbed primary effluent discharged from said adsorbent bed, and

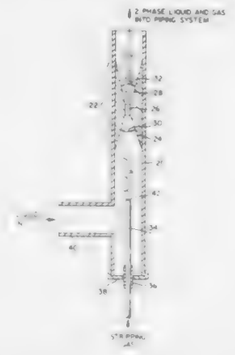
(d) recovering the sorbed carbon monoxide from said bed by desorption at reduced pressure.

4,861,352

METHOD OF SEPARATING A GAS AND/OR PARTICULATE MATTER FROM A LIQUID

Alan T. Cheng, Flushing, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 30, 1987, Ser. No. 139,462
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—53 25 Claims



1. A method of separating at least one gas or vapor present in a liquid from said liquid, said method comprising:

(a) contacting said liquid with a stripping gas or vapor which is immiscible in or which has low solubility in said liquid under operating conditions, said stripping gas or vapor being different from said gas or vapor initially present in said liquid which is to be separated from said liquid;

(b) causing cocurrent flow of a composition comprising said liquid and said stripping gas or vapor;

(c) causing at least a portion of said concurrently flowing composition to flow at a linear velocity which is supersonic; and

(d) separating said stripping gas or vapor from said liquid, whereby at least a portion of said gas or vapor which was present in said liquid initially is removed from said liquid.

4,861,353

FILTER ELEMENT AND ASSEMBLY

Kurt H. Wyss, Meyrin, Switzerland, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 7, 1987, Ser. No. 129,211
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—96 6 Claims

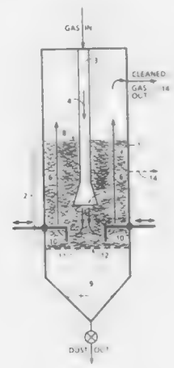
1. In a process of filtering a gas containing particulate matter using an outside bag filtration system, in which the bag is flexed and particulate matter removed from the outside surface of the bag by pulses of gas released inside the bag, the improvement comprising the steps of covering the cage of the outside bag filtration system with a tubular textile of poly(tetrafluoroethylene) having an air permeability of at least 1000 ft^3 per ft^2 per minute at a pressure of ½ inch of water said tubular textile conforming to the outer dimension of the cage, and then applying the filter bag in the standard manner.

4,861,354

REMOVING POLLUTANT

H. Nicholas Conkle, Columbus, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Jul. 29, 1988, Ser. No. 226,252
Int. Cl.[4] B01D *41/00*
U.S. Cl. 55—96 9 Claims



1. A method for removing dust from a gas stream comprising

providing a nested array of fibers in a substantially confined region in housing means, the nested array having a voidage of about 90 to 96 percent,

passing the dust-containing gas stream predominantly upward through a substantial portion of the nested array from inlet conduit means communicating with an inlet area therein substantially below the level of the top of the array to a gas-outlet area at the level of the top of the nested array that is spaced apart substantially from the inlet area, from which gas-outlet area the gas may flow on through outlet means above the nested array to its intended destination,

separating a substantial fraction of the dust from the gas stream in a portion of the nested array generally nearer to the inlet area than to the gas-outlet area and mostly near or below the level of the inlet area, and

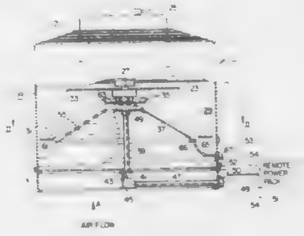
removing a substantial fraction of the separated dust from the nested array at a dust-outlet area at the level of the bottom of the array that is spaced apart from the inlet area and from the gas-outlet area, while continuing to pass the gas stream through the nested array, by vigorously moving the fibers repeatedly in a substantial portion of the array between the inlet area and the dust-outlet area and directing the dust outward through the dust-outlet area.

4,861,355

IONIZER DIFFUSER AIR PURIFIER

Lawrence Macrow, 1142 Cypress Point Dr. S., Venice, Fla. 33595

Filed Apr. 6, 1987, Ser. No. 34,638
Int. Cl.[4] B03C *3/12*
U.S. Cl. 55—127 15 Claims



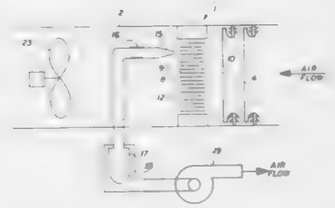
1. An ionizing diffuser being frusto-conical in shape and having a plurality of orifices through which contaminated gas passes, each of said orifices having a plurality of points around its perimeter and being so arranged that a gas stream passing through each orifice forms jets and each jet passes around a stream of ionized particles generated from said points within said gas stream.

4,861,356

CLOSE-SPACED ELECTROSTATIC PRECIPITATOR

Gaylord W. Penney, 216 Paris Rd., Pittsburgh, Pa. 15235

Continuation of Ser. No. 735,566, May 17, 1985, abandoned.
This application Apr. 3, 1987, Ser. No. 36,130
Int. Cl.[4] B03C *3/00*
U.S. Cl. 55—137 10 Claims



1. A two-stage gas-cleaning precipitator comprising:

(a) an ionizing means for charging a plurality of particles;

(b) a means for causing a gas to pass first through the ionizing means and then through a collecting means, the collecting means comprising a plurality of parallel collecting electrodes, alternate electrodes at a reference potential and intermediate electrodes electrically isolated from each other and the alternate electrodes; and

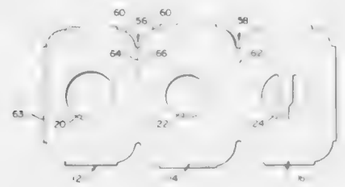
(c) a means for individually energizing each intermediate electrode with a similar corona, current comprising a corona source separate from the ionizing means having a plurality of parallel corona wires such that each wire is in close proximity to and equidistant from each intermediate electrode.

4,861,357

VACUUM CLEANER BAR COLLAR

Thomas W. Gavin, and Michael T. Gavin, both of 3380 Merrick Rd., Seaford, N.Y. 11783

Filed May 10, 1988, Ser. No. 192,678
Int. Cl.[4] B01D *46/00*
U.S. Cl. 55—367 **21 Claims**



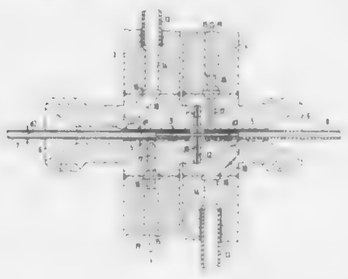
1. A mounting collar for a collection bag, said collar being engageable on the exhaust tube of a vacuum cleaner, said collar comprising at least three panels in face-to-face overlying relation with each other, adhesive means between adjacent panels bonding the panels intimately to each other, each of said panels having an opening defined therethrough, said opening being in alignment for engagement of an exhaust tube therethrough, one of said panels having sealing means for sealing the collar to the tube, each panel being of a thickness of between 0.015 inch and a maximum thickness of 0.030 inch.

4,861,358

BRANCH COUPLING FOR USE BETWEEN CAPILLARY COLUMNS OF GAS CHROMATOGRAPHS

Friedhelm Mueller, Linkenheim-Hochstetten, and Horst Straub, Karlsruhe, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 26, 1988, Ser. No. 160,882
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1987, 3707488
Int. Cl.[4] B01D *15/08*
U.S. Cl. 55—386 **10 Claims**



1. A branch coupling for use between capillary columns of gas chromatographs, comprising:

first and second mating housing sections each having an axially extending guide bore, the guide bore being different from and not including the capillary columns, and being coaxial when the housing sections are mated together;

a high density and low absorbency disk which is axially aligned with the guide bores and is located between them between the housing sections;

a connecting capillary tube which is centrally mounted to the disk, which extends only part way into each of the guide bores, and which satisfies the relationship

$$d3 > d1 - d2$$

when d3 is an outer diameter of the connecting capillary tube, d1 is an inner diameter of each of the guide bores, and d2 is an outer diameter of each capillary column which is to be used with the branch coupling; and

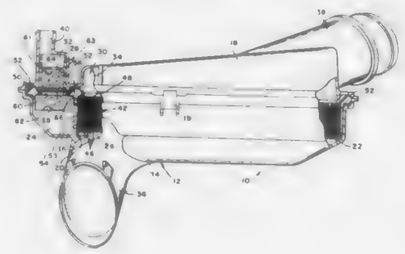
first and second means for feeding and draining gas into and from a corresponding one of the guide bores.

4,861,359

DUAL FUNCTION AIR FILTER

Barton J. Tettman, Shakespeare, Canada, assignor to Allied-Signal Inc., Morristown, N.J.

Filed Feb. 10, 1989, Ser. No. 309,564
Int. Cl.[4] B01D *46/00*
U.S. Cl. 55—419 **14 Claims**



1. An engine induction air filter element and positive crankcase ventilation breather element combined into a single discardable cartridge for an air cleaner housing installed in an internal combustion engine induction air system, said air filter element comprising a longitudinally extending array of air filter media, said array having edges defining the perimeter of said array, a band of sealing material extending around said perimeter for providing sealing between said air filter element and said housing, said sealing material on at least one edge of said air filter media including a projecting portion projecting beyond said one edge of said air filter media, said breather element comprising breather media having edges, one edge of said breather media engaging the projecting portion of the sealing material on said one edge of the air filter media whereby the sealing material secures the breather media to said air filter media and also seals both the one edge of the air filter media and the one edge of the breather media against said housing, and a band of said sealing material extending around the other edges of said breather media.

4,861,360

CARBON DIOXIDE ABSORPTION METHANOL PROCESS

Fred Apffel, Houston, Tex., assignor to Flexivol, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 832,747, Feb. 24, 1984, Pat. No. 4,675,035. This application Jun. 5, 1987, Ser. No. 58,485
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—17 **29 Claims**

1. A process for removing carbon dioxide from a feed stream of natural gas having at least methane, ethane and heavier comprising:

A. first, separating the feed stream in a first separator to form a first stream having substantially all of the propane and heavier hydrocarbons and carbon dioxide and ethane and a second stream, having methane, carbon dioxide and ethane:

B. separating the second stream in a second separator into a stream of carbon dioxide product and a third stream having ethane, methane and carbon dioxide:

C. mixing at least a portion of the third stream with a polar compound; stream after said mixing in an absorber;

D. separating the vapor and liquid of the third stream after said mixing in an absorber;

E. absorbing the remaining unabsorbed carbon dioxide of Step D in a lean portion of the polar compound in the absorber, the absorbed carbon dioxide and ethane with the polar



F. separating the first stream in a third separator to separate the propane and heavier hydrocarbons from the carbon dioxide and ethane, which carbon dioxide and ethane forms a fifth stream; and

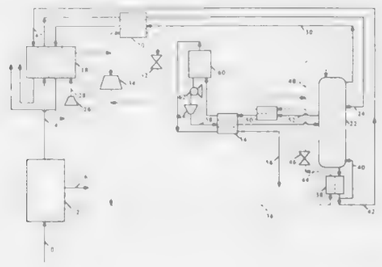
G. separating the polar compound/carbon dioxide effluent of the absorber in a fourth separator, to separate the carbon dioxide from the polar compound, the polar compound forming a sixth stream.

4,861,361

ARGON AND NITROGEN COPRODUCTION PROCESS

Ravi Jain, Piscataway; Alberto LaCava, South Plainfield; Mark J. Andrecovich, Somerville, and Donald L. MacLean, Annandale, all of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Filed Sep. 27, 1988, Ser. No. 249,793
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—18 **12 Claims**



1. A process for the coproduction of purified nitrogen and argon from a gaseous stream containing them in combination with at least oxygen comprising:

(a) introducing said stream under pressure into a noncryogenic separation means and recovering therefrom a gaseous stream enriched in nitrogen and argon;

(b) introducing said enriched stream into a distillation column;

(c) withdrawing a purified nitrogen product stream from the top of said column, an oxygen-rich stream from the bottom of said column and an argon-enriched side stream from an intermediate point in said column where there is a relatively high argon content;

(d) introducing said side stream into a pressure swing adsorption unit to further enrich said stream in argon; and

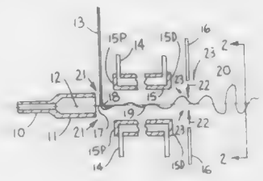
(e) withdrawing said further enriched argon stream as product.

4,861,362

METHOD AND APPARATUS FOR FORMING FIBERS FROM THERMOPLASTIC MATERIALS

Donald W. Denniston, 5565 Lakeside Blvd., Dunkirk, N.Y. 14048

Filed May 25, 1988, Ser. No. 198,399
Int. Cl.[4] C03B *37/06, 37/04*
U.S. Cl. 65—5 **22 Claims**



1. Apparatus for producing glass fibers comprising means for producing a primary, high temperature, high velocity gaseous blast along a primary axis, means for introducing a plurality of primary glass fibers into the blast so that the glass is attenuated into fibers by the heat and velocity of said primary blast as said glass fibers are carried by said primary blast, a bank of thin tubes spaced downstream of said glass introducing means, said bank comprising opposed transversely extending rows of said thin tubes disposed on opposite sides of and essentially normal to said primary blast, means to deliver through said tubes a plurality of opposed, closely spaced, fine jets of fuel and/or oxidant, at least some of said jets comprising fuel, at speeds sufficiently higher than said primary blast speed in directions essentially normal to said primary blast to penetrate into said primary blast at a distance downstream from said introducing means where said primary blast is at a temperature at which said glass is attenuated and at a rate of mass flow less than the rate of mass flow of said primary blast so that said jets cause local increased turbulent flow within said primary blast and said fuel oxidizes in said primary blast to maintain the temperature of said primary blast above a minimum temperature at which glass attenuates.

4,861,363

LUBRICANT SPRAY DEVICE FOR GLASS MOULDS

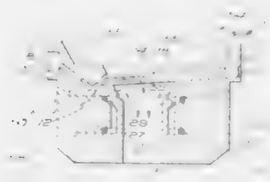
Roy Brown, Sheffield, England, assignor to Graphoidal Developments Limited, Sheffield, England

Continuation of Ser. No. 33,654, Apr. 3, 1987, abandoned, which is a continuation of Ser. No. 871,130, Jun. 2, 1986, abandoned, which is a continuation of Ser. No. 614,838, May 29, 1984, abandoned. This application Nov. 30, 1987, Ser. No. 126,492
Claims priority, application United Kingdom, Jun. 2, 1983, 8315153
Int. Cl.[4] C03B *40/02*
U.S. Cl. 65—24 **17 Claims**

1. In combination a hollow glassware moulding machine comprising blank moulds for forming glass parisons, one or more spray devices fitted to said machine, each spray device comprising an air inlet for pressurised air, means defining a discharge opening for said air, air passage means communicating said air inlet with said discharge opening, said air discharge opening being shaped and arranged such that discharging pressurised air creates a region of reduced pressure drawing in a greater volume of additional air from surrounding atmosphere and forms an air stream therefrom; a lubricant inlet for liquid lubricant, a discharge opening for said lubricant, lubricant passage means communicating said lubricant inlet with

said lubricant discharge opening, said lubricant discharge opening being positioned to discharge said lubricant into said indrawn air; and means for periodically discharging lubricant simultaneously with air through said one or more devices onto said blank moulds of said machine.

12. In a method of moulding parisons for hollow glassware by forming molten glass into parisons in blank moulds of an automatic moulding machine, and periodically lubricating said blank moulds, the improvement comprising effecting said lubrication by means of a spray of lubricant in air through one or more spray devices, each such spray device comprising an air inlet for pressurised air, means defining a discharge opening for said air, air passage means communicating said air inlet



with said discharge opening, said air discharge opening being shaped and arranged such that discharging pressurised air creates a region of reduced pressure drawing in a greater volume of additional air from surrounding atmosphere and forms an air stream therefrom; a lubricant inlet for liquid lubricant, a discharge opening for said lubricant, lubricant passage means communicating said lubricant inlet with said lubricant discharge opening, said lubricant discharge opening being positioned to discharge said lubricant into said indrawn air, the lubricating being effected by periodically discharging pressurized air from said air discharge opening and simultaneously discharging lubricant from said lubricant discharge opening into said indrawn air.

4,861,364

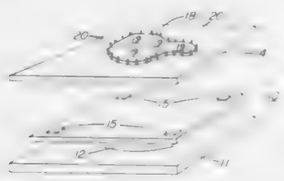
METHOD FOR USING STAINED GLASS REVOLVING WORK STATION WITH REMOVABLE WORK SURFACE

Ted A. Trujillo, and Suzanne S. Trujillo, both of 1715 W. Flamingo, #66, Nampa, Id. 83651

Continuation of Ser. No. 897,073, Aug. 18, 1986, abandoned. This application Nov. 14, 1988, Ser. No. 271,413

Int. Cl.[4] C03B *23/20*

U.S. Cl. 65—36 **1 Claim**



1. A method for assembling glassware which comprises:
placing a template which outlines the mosaic fit of the component glass pieces which comprises the glassware on a workboard; and
nailing to the workboard flat-sided nails around the outer perimeter of the glassware to be assembled as it is defined by the template; and
cutting the component glass pieces to the size and shape defined by the template; and
wrapping copper foil around the edges of the component glass pieces; and
positioning the component glasswares on the template; and
attaching the workboard to a rotatable support assembly; and
rotating the workboard to suitably position the component glasswares for soldering; and
soldering the glasswares together; and
removing the flat sided nails from the perimeter of the glassware; and
removing the template from the workboard; and
turning over the glassware on the workboard; and
rotating the workboard to again suitably position the glass component pieces for soldering; and
soldering the exposed surface of the glasswares together.

4,861,365

SUPPORTING MECHANISM FOR THREE MOULDS IN A GLASSWARE FORMING MACHINE

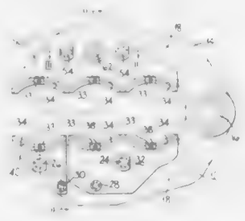
Johann Zaifkovits, Forch, Switzerland, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Dec. 6, 1988, Ser. No. 280,768

Claims priority, application United Kingdom, Dec. 29, 1987, 8730249

Int. Cl.[4] C03B *9/353*

U.S. Cl. 65—323 **3 Claims**



1. A triple gob individual section glassware forming machine for carrying out glassware forming processes in which three molds are formed by clamping together opposing mold halves supported by a supporting device, said supporting device comprising
first and second arm means,
first pivot means for pivotally supporting said first and second arm means at inner ends thereof,
single, double and triple mold support means,
second pivot means for pivotally supporting said triple mold support means on said first arm means centrally of the formed three molds,
third pivot means for pivotally supporting said double mold support means on said second arm means centrally of the inner two formed molds, and
fourth pivot means for pivotally supporting said single mold support means on said second arm means centrally of the outermost formed mold.

4,861,366

HERBICIDAL ACETALS AND KETALS

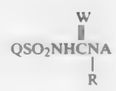
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 6,434, Jan. 23, 1987, Pat. No. 4,753,672, which is a division of Ser. No. 754,709, Jul. 16, 1985, Pat. No. 4,659,369, which is a continuation-in-part of Ser. No. 644,259, Aug. 27, 1984, abandoned. This application Mar. 31, 1988, Ser. No. 176,254

Int. Cl.[4] C07D *401/12, 405/12;* **A01N** *43/66, 43/68*

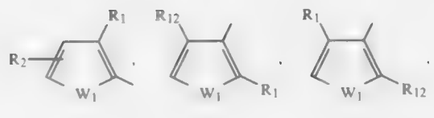
U.S. Cl. 71—90 **49 Claims**

1. A compound of the formula

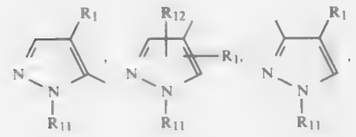


I

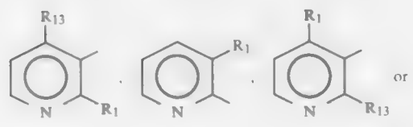
wherein
Q is



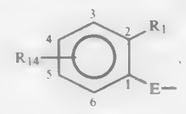
Q-1 Q-2 Q-3



Q-4 Q-5 Q-6

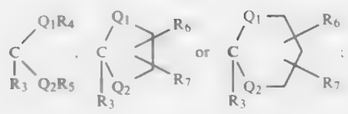


Q-7 Q-8 Q-9 or

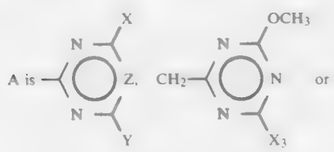


Q-10

R is H or CH_3;
R_1 is

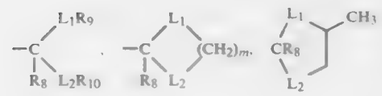


E is CH_2 or a single bond;
R_2 is H, C_1–C_2 alkyl or Cl;
R_3 is H, C_1–C_3 alkyl or C_1–C_3 alkoxy;
R_4 and R_5 are independently C_1–C_2 alkyl;
R_6 and R_7 are independently H or C_1–C_2 alkyl;
W is O or S;
W_1 is O or S;
Q_1 and Q_2 are independently O, S or NCH_3;



A-1 A-6

X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3)alkylamino;
Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3)alkylamino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylsulfinylalkyl, C_1–C_4 haloalkyl, C_2–C_5 alkylsulfonylalkyl, C_3–C_5 cycloalkyl, C_2–C_4 alkynyl, C_2–C_5 alkylthioalkyl, $C(O)R_8$,



or $N(OCH_3)CH_3$;
m is 2 or 3;
L_1 and L_2 are independently O or S;
R_8 is H or CH_3;
R_9 and R_{10} are independently C_1–C_2 alkyl;
R_{11} is C_1–C_3 alkyl;
R_{12} is H, F, Cl, NO_2, C_1–C_2 alkyl, C_1–C_2 alkoxy, C_1–C_2 alkylthio, C_1–C_2 alkylsulfinyl, C_1–C_2 alkylsulfonyl, di(C_1–C_2)alkylsulfamoyl or CO_2(C_1–C_2 alkyl);
R_{13} is H, C_1–C_2 alkyl, C_1–C_2 alkoxy, Cl, F or NO_2;
R_{14} is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 haloalkyl, C_1–C_3 haloalkoxy, Cl, Br, F, NO_2, di(C_1–C_3) alkylsulfamoyl, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, amino, C_1–C_3 alkylamino, di(C_1–C_3)alkylamino, CH_2OCH_3, CH_2SCH_3 or CH_2CN.
Z is N;
X_3 is CH_3 or OCH_3;
and their agriculturally suitable salts; provided that
(a) when R_3 is C_1–C_3 alkoxy, then Q_1 and Q_2 are oxygen;
(b) when R_3 is H or C_1–C_3 alkyl, then Q is Q-1 through Q-9;
(c) X or Y are other than OCF_2H;
(d) when the total number of carbon atoms of X and Y is greater than four, then the combined number of carbons of the substituents on Q is less than or equal to ten;
(e) when W is S, then A is A-1, R is H, and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$ or



(f) when E is CH_2, then R_{14} is H, CH_3, OCH_3, Cl or NO_2 and is not in the 4-position.

32. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid inert diluent.

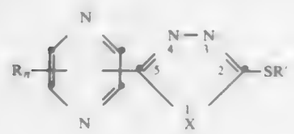
4,861,367

2-MERCAPTO-5-PYRAZINYL-1,3,4-OXADIAZOLES OR 2-MERCAPTO-5-PYRAZINYL-1,3,4-THIADIAZOLES AS NEMATICIDES

Robert Nyfeler, Basel, Switzerland; Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, and Ernst Beriger, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 25, 1988, Ser. No. 172,884
Claims priority, application Switzerland, Apr. 3, 1987, 1283/87
Int. Cl.[4] A01N *43/26, 43/60*; C07D *241/12*
U.S. Cl. 71—92 10 Claims

1. A 2-mercapto-5-pyrazinyl-1,3,4-oxadiazole or 2-mercapto-5-pyrazinyl-1,3,4-thiadiazole of formula I



(I)

wherein

X is oxygen or sulfur,

R′ is C_1–C_5alkyl which is substituted by halogen, C_1–C_3alkoxy or cyano; halogen-substituted C_3–C_7alkenyl; halogen-substituted C_3–C_7alkynyl,

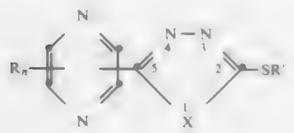
R is C_1–C_3alkyl, unsubstituted C_1–C_3alkoxy or C_1–C_3alkoxy which is mono-substituted by halogen or C_1–C_3alkoxy; halogen, cyano, hydroxy, amino or amino which is substituted by one or two C_1–C_3alkyl groups; or is aminocarbonyl; and

n is 0, 1, 2 or 3,

provided that n is 1, 2 or 3 when R′ is cyanomethyl,

or a salt thereof.

10. A method of controlling nematodes or of protecting cultivated plants from attack by nematodes, which method comprises applying to the plant or to the locus thereof a compound of the formula



wherein

X is oxygen or sulfur,

R′ is C_1–C_5 alkyl which is substituted by halogen, C_1–C_3 alkoxy or cyano; halogen-substituted C_3–C_7 alkenyl; halogen-substituted C_3–C_7 alkynyl,

R is C_1–C_3alkyl, unsubstituted C_1–C_3alkoxy or C_1–C_3alkoxy which is mono-substituted by halogen or C_1–C_3alkoxy; halogen, cyano, hydroxy, amino or amino which is substituted by one or two C_1–C_3alkyl groups; or is aminocarbonyl; and

n is 0, 1, 2 or 3,

provided that n is 1, 2 or 3 when R′ is cyanomethyl,

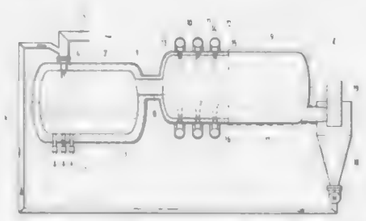
or a salt thereof.

4,861,368

METHOD FOR PRODUCING IRON

Karl Brotzmann, Sulzbach-Rosenberg; Jonathan P. Moodie, Amberg, both of Fed. Rep. of Germany, and Richard E. Turner, deceased, late of Applecross, Australia (Trenna R. Turner, executor), assignors to Kloeckner CRA Technologie GmbH, Duisburg, Fed. Rep. of Germany

Filed Mar. 9, 1987, Ser. No. 23,367
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607776
Int. Cl.[4] C21B *11/00*
U.S. Cl. 75—25 8 Claims



1. A method for producing iron in an apparatus including an elongated reaction vessel having a top and a bottom, containing a melt and provided with nozzles under the melt surface, and with means for blowing substances into the vessel from the top thereof, said method comprising feeding carbonaceous fuels and iron ore and/or prereduced iron ore to the melt, with the carbonaceous fuel introduced into the melt in a reaction zone to produce reaction gases escaping from the melt, and afterburning the reaction gases with oxygen-containing gases in at least one stage to produce afterburned reaction gases, with the afterburned reaction gases discharged from the vessel through a discharge port, wherein the afterburned reaction gases have iron droplets entrained therein, the improvement comprising reducing the carryover of entrained droplets in the afterburned reaction gases by passing the afterburned waste gases from the reaction zone to a second area of the reaction vessel different from the reaction zone and then through the discharge port, wherein the discharge port is in an area of the reaction vessel removed from any area of the reaction vessel wherein the melt is prone to eruption and splashing, and through a waste gas conduit to a gas cooling chamber, while maintaining the temperature of the waste gas in the discharge port and the waste gas conduit above the solidifying temperature of iron droplets which may be entrained in the waste gas stream, and cooling the waste gas to a temperature of less than 1,000° C. in the gas cooling chamber.

4,861,369

PROCESS FOR GAINING ELECTRIC ENERGY IN ADDITION TO PRODUCING MOLTEN PIG IRON AND AN ARRANGEMENT FOR CARRYING OUT THE PROCESS

Ludwig von Bogdandy; Werner Kepplinger, both of Linz; Kurt Stift, Leoben, all of Austria; Gero Papst, Kaarst, and Rolf Hauk, Düsseldorf, both of Fed. Rep. of Germany, assignors to Korf Engineering GmbH, Fed. Rep. of Germany

Filed Nov. 25, 1987, Ser. No. 125,482
Claims priority, application Austria, Nov. 25, 1986, 3145/86
Int. Cl.[4] C21B *3/04*
U.S. Cl. 75—38 12 Claims

1. In a process for gaining electric energy in addition to producing molten pig iron from lumpy iron ore and solid fuels by using a direct reduction zone operating under overpressure to reduce the iron ore to sponge iron and a meltdown-gasifying zone to produce molten pig iron, said sponge iron being fed to said meltdown-gasifying zone as produced, introducing a charge of carbon carriers including volatile constituents and a C_{fix} portion into said meltdown-gasifying zone and supplying oxygen-containing gases thereto to form reduction gas, injecting said reduction gas into said direct reduction zone to obtain reacted reduction gas, withdrawing said reacted reduction gas as a top gas, and feeding said reacted reduction gas as said top gas to a power generation plant including at least one turbine, the improvement comprising



with a higher top gas consumption of said power generation plant, increasing said volatile constituents of said charge and decreasing said C_{fix} portion; and with a lower top gas consumption, decreasing said volatile constituents and increasing said C_{fix} portion while keeping the amount and composition of said pig iron produced substantially constant.

4,861,370

PROCESS FOR TREATING MOLTEN ALUMINUM ALLOY WITH POWDERED FLUX

Michael C. Reeve-Parker, Kidderminster, England, assignor to Ashland Oil, Inc., Russell, Ky.

Division of Ser. No. 180,876, Apr. 13, 1988, which is a continuation of Ser. No. 105,076, Sep. 30, 1987, abandoned. This application Nov. 25, 1988, Ser. No. 275,826
Int. Cl.[4] C22B *21/00*
U.S. Cl. 75—68 R 11 Claims

1. A process for treating a molten mixture of aluminum and silicon to remove impurities and enhance grain refinement comprising

injecting a powdered flux, dispersed in a carrier gas, into a molten mixture of aluminum and silicon in an amount and for a time effective to produce an acceptable aluminum alloy casting, wherein said powdered flux comprises

(a) from 1 to 10 weight percent of a non hygroscopic carbonate;

(b) from 1 to 25 weight percent of a sodium and hydrogen free fluoride; and

(c) red phosphorus selected from the group consisting of amorphous red phosphorous, encapsulated red phosphorus, and mixtures thereof;

wherein said weight percent is based upon the total weight of the powdered flux and the red phosphorus is used in an amount effective to produce alloys having an acceptable primary silicon particles.

4,861,371

NICKEL-CONTAINING LEACHATE HAVING LOW ALUMINUM CONTENT

Harris Lowenhaupt, Brookings, Oreg., assignor to California Nickel Co., Crescent City, Calif.

Continuation of Ser. No. 942,240, Dec. 16, 1986, abandoned. This application Dec. 28, 1988, Ser. No. 291,330
Int. Cl.[4] C22B *23/04*
U.S. Cl. 75—101 R 13 Claims

1. A process for preparing a leachate, comprising the steps of:

forming a mixture of a nickel-bearing ore which also contains aluminum as an impurity, sulfuric acid, and a source of a monovalent cation which is soluble in the sulfuric acid; and

heating the mixture to an elevated temperature of from about 200° C. to about 300° C., under pressure, to leach the nickel values from the ore into the liquid portion of the mixture, thereby forming a liquid leachate containing nickel values, the source of monovalent cations being added to the mixture no later than the beginning of the leaching and in an amount sufficient to suppress the dissolution of the aluminum impurity so that the aluminum content of the leachate is less than about 0.5 grams per liter.

4,861,372

ROLLER IN ROTARY COMPRESSOR AND METHOD FOR PRODUCING THE SAME

Soichi Shimomura, Yono, Japan, assignor to Nippon Piston Ring Co., Ltd., Japan

Filed Nov. 14, 1988, Ser. No. 270,629
Claims priority, application Japan, Nov. 20, 1987, 62-291747
Int. Cl.[4] C22C *29/12*
U.S. Cl. 75—232 3 Claims



1. A roller for use in a rotary compressor, which roller comprising a sintered body consisting essentially of 0.5–2.0% by weight of C, 1.0–5.0% by weight of Cu, 0.5–3.5% by weight of Cr, 0.1–1.0% by weight of Co, 0.1–1,0% by weight of W and a balance Fe and unavoidable impurities; and wherein hard particles of Cr-Co-W alloy are dispersed in one of pearlitic and tempering martensitic matrix, and sintered pores of said sintered body are sealed with tri-iron tetroxide.

4,861,373

INFILTRATED POWDER METAL PART HAVING IMPROVED IMPACT STRENGTH TENSILE STRENGTH AND DIMENSIONAL CONTROL AND METHOD FOR MAKING SAME

Erhard Klar, Beachwood; Mark Svilar, Orange Village, and David F. Berry, Westlake, all of Ohio, assignors to SCM Metal Products, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 935,854, Nov. 28, 1986, Pat. No. 4,731,118, which is a continuation-in-part of Ser. No. 879,502, Jun. 25, 1986, abandoned, which is a continuation-in-part of Ser. No. 866,184, May 20, 1986, abandoned. This application Mar. 8, 1988, Ser. No. 165,587
Int. Cl.[4] C22C *29/14*
U.S. Cl. 75—244 35 Claims

1. A copper infiltrated ferrous powder metal part having an effective amount of an additive for improving the microstructure resulting in rounded-off copper-filled pores.

4,861,374
NON-ABRASIVE POLISH OR CLEANING COMPOSITION AND PROCESS FOR ITS PREPARATION
Jan-Olof Eriksson, Midsommarstigen 23, S-391 52 Skelleftea, Sweden
Filed Oct. 30, 1987, Ser. No. 114,834
Claims priority, application European Pat. Off., Oct. 30, 1986, [illegible]
Int. Cl.[4] C09G *1/04;* C11D *7/08*
U.S. Cl. 106—3 8 Claims

1. A non-abrasive composition for polishing or cleaning surfaces of copper, nickel, zinc, tin, lead, a noble metal, or an alloy substantially comprising at least one of said metals, which composition comprises an aqueous solution having a pH-value within the range of −1 to 0 and containing 0.01–10% by weight of a substance obtained by

(a) oxidizing an aqueous solution comprising 0.01–10% by weight of thiourea having a pH-value of 0–1 by means of 4–9% by weight potent oxidizing agent, or by electrolysis of the solution to thereby form a disulphide derivative of thiourea,

(b) subsequently heating the solution to the boiling point thereof for at least two hours.

4,861,375
RUST PREVENTIVE COMPOSITION FOR STEEL REINFORCEMENTS
Sota Nakano, Tokyo, and Shinsaku Tada, Hino, both of Japan, assignors to Misawa Home Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 24, 1985, Ser. No. 726,424
Claims priority, application Japan, Jul. 30, 1984, 59-159959
Int. Cl.[4] C04B *24/10*
U.S. Cl. 106—90 7 Claims

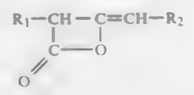


1. A rust preventive composition for steel reinforcements for concrete, which consists essentially of 100 parts by weight of Portland cement, 0.3 to 3 parts by weight of a gluconic acid, 0.3 to 3 parts by weight of sorbitol, 2 to 10 parts by weight as solids of a styrene-butadine copolymer latex and 30 to 45 parts by weight of water.

4,861,376
HIGH-SOLIDS ALKYL KETENE DIMER DISPERSION
Derek W. Edwards, Wilmington, and David F. Townsend, Hockessin, both of Del., assignors to Hercules Incorporated, Wilmington, Del.
Filed Nov. 10, 1988, Ser. No. 270,338
Int. Cl.[4] C08L *97/02;* D21D *3/00*
U.S. Cl. 106—123.1 16 Claims

1. An aqueous dispersion consisting essentially of

(a) from about 12 to about 30% by weight of ketene dimer having the general formula



where R_1 and R_2 are hydrocarbon groups having from 8 to 30 carbon atoms;

(b) from about 10 to about 30%, based upon the weight of dimer, of water soluble cationic starch carrying sufficient cationic amino groups to render the starch positively charged in solution;

(c) from about 1 to about 5%, based upon the weight of dimer, of sulfonate selected from the group consisting of salts of lignin sulfonic acid and the condensation product of formaldehyde and salts of naphthalene sulfonic acid and mixtures thereof.

(d) from about 0.15 to about 1.5%, based upon the weight of dimer, of aluminum sulfate; and

(e) from about 0.1 to about 5%, based upon the weight of dimer, of carboxylic acid having from 1 to 10 carbon atoms, a pKa of up to about 5 and water solubility of at least about 0.1 parts in 100 parts,

said aqueous dispersion being colloidally stable as evidenced by a viscosity increase of less than 100 centistokes upon quiescent aging at 32° C. for a period of at least 4 weeks.

4,861,377
CATIONIC AQUEOUS BITUMINOUS EMULSION-AGGREGATE SLURRIES
Peter Schilling, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.
Filed Apr. 18, 1988, Ser. No. 182,874
Int. Cl.[4] C08L *95/00*
U.S. Cl. 106—277 6 Claims

1. A method of forming a bituminous emulsion at a temperature above 100° F. comprising from about 30% to about 80% by weight of bitumen, from about 0.1% to about 10% by weight of an emulsifier obtained by reacting a modified polyamine formed by a Michael addition reaction of a polyalkylene polyamine with a 1,2-unsaturated acid with a member of the group of precursors consisting of fatty acids; animal fats; vegetable oils; tall oil; reaction products of tall oil fatty acids with acrylic acid, methacrylic acid, fumaric acid, maleic anhydride; sulfonated fatty acid; resin acids; reaction products of resin acids with arylic acid, fumaric acid or maleic anhydride; epoxidized fats; and fatty acid esters; and water to make up 100% by weight.

4,861,378
CEMENT ADDITIVE CONTAINING SUPERPLASTICIZER AND BENTONITE
Yoshiharu Watanabe; Hisayuki Shimizu; Mineo Ito, all of Niigata, and Hitoshi Moriyama, Itoigawa, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 10, 1988, Ser. No. 166,418
Claims priority, application Japan, Mar. 13, 1987, 62-56425; Mar. 13, 1987, 62-56426
Int. Cl.[4] C04B *24/20*
U.S. Cl. 106—314 6 Claims

1. A cement additive comprising a superplasticizer, an inorganic strength increasing agent, an organic acid and bentonite, said superplasticizer being selected from the group consisting of polyalkylaryl sulfonate superplasticizer and melamine/formalin resin sulfonate superplasticizer, said inorganic strength increasing agent being selected from the group consisting of calcium sulfate, silica fumes and a mixture thereof, said organic acid being selected from the group consisting of oxalic acid, maleic acid, fumaric acid, malonic acid, succinic acid, glutaric acid, adipic acid, lactic acid, heptonic acid, gluconic acid, glycolic acid, malic acid, tartaric acid, citric acid, salts thereof, derivatives thereof and a mixture thereof, said superplasticizer being contained in an amount of 0.25 to 5 parts by weight based on 100 parts by weight of cement, said calcium sulfate being contained in an amount not more than 15 parts by weight, calculated as anhydride, based on 100 parts by weight of cement, said silica fume being contained in an amount of not more than 20 parts by weight based on 100 parts by weight of cement, said organic acid being contained in an amount of 0.005 to 0.5 parts by weight based on 100 parts by weight of cement, and said bentonite being contained in an amount of 0.1 to 10 parts by weight based on 100 parts by weight of cement.

4,861,379
SPHERICAL FINE PARTICULATE PIGMENT AND PROCESS FOR PREPARING THE SAME
Takeo Imai, Matsudo, and Kazuko Iwano, Shakujii, both of Japan, assignors to Kao Corporation, Tokyo, Japan
Filed Dec. 16, 1987, Ser. No. 133,809
Claims priority, application Japan, Dec. 23, 1986, 61-307163
Int. Cl.[4] C09B *63/00;* C08K *5/00*
U.S. Cl. 106—402 8 Claims



1. A spherical fine particulate pigment which is a reaction product of a water soluble dye and an insolubilizing agent therefor, wherein said particulate pigment is spherical in shape, has a diameter of not more than 0.5μ, and the surface thereof is treated by a surface active agent, wherein said spherical fine particulate pigment is prepared by the reaction of (i) an acidic water soluble dye and an insolubilizing agent selected from the group consisting of basic polyaluminum salts or salts of a divalent metal selected from calcium, barium, or zirconium or (ii) a basic water soluble dye and an insolubilizing agent which is tannic acid or a complex acid selected from the group consisting of phosphomolybdic acid and phosphotungstic acid, in a water-in-oil emulsion aqueous phase.

4,861,380
COMPOSITION
Frederick Campbell, Manchester; John M. Geary, Heywood, and John D. Schofield, Bury, all of England, assignors to Imperial Chemical Industries PLC, London, England
Continuation of Ser. No. 83,878, Aug. 10, 1987, abandoned, which is a continuation of Ser. No. 813,776, Dec. 27, 1985, abandoned. This application Oct. 22, 1988, Ser. No. 263,985
Claims priority, application United Kingdom, Jan. 22, 1985, 8501527; Jun. 17, 1985, 8515327
Int. Cl.[4] C04B *14/00*
U.S. Cl. 106—504 11 Claims

1. A composition comprising a finely-divided non-magnetic solid dispersed in an organic medium selected from amines, ether, organic acids, esters, ketones, glycols, glycol ethers, glycol esters, amides, aromatic hydrocarbons, halogenated aromatic and aliphatic hydrocarbons and polar, film-forming resins in the presence of a dispersant comprising a poly(C_{2-4}-alkyleneimine) carrying at least two mono- or poly-(carbonyl-C_{1-7}-alkyleneoxy) groups.

4,861,381
PROCESS FOR THE ENZYMATIC PREPARATION FROM SUCROSE OF A MIXTURE OF SUGARS HAVING A HIGH CONTENT OF ISOMALTOSE, AND PRODUCTS OBTAINED
Francois B. Paul, Saint-Orens-De Gameville; Pierre F. Monsan, Mondonville; Magali M. C. Remaud, Ramonville, and Vincent P. Pelenc, Toulouse, all of France, assignors to Sucre Recherches et Developpements, France
Filed Jul. 1, 1987, Ser. No. 68,940
Claims priority, application France, Jul. 9, 1986, 86 09989
Int. Cl.[4] C12N *9/10, 9/46;* C13K *7/00, 1/00*
U.S. Cl. 127—41 10 Claims

1. A process for preparing an aqueous syrup, the dry extract of which includes a high content of isomaltose, fructose and glucose as the main constituents, which comprises treating an aqueous solution of sucrose with a mixture of the enzyme in an amount of 0.2 to 2 units per milliliter of said solution of dextransucrase and 0.2 to 5 units per milliliter of said solution of dextranase at a temperature of between 0° and 50° C. and at a pH in the range from 4.5 to 7, so as to obtain said aqueous syrup the dry extract of which includes isomaltose in a proportion of from 39–80%, fructose, and glucose.

4,861,382
SUGAR PROCESS
Brita C. Goodacre, Sonning, and Alan Smithson, Reading, both of England, assignors to Tate & Lyle PLC, United Kingdom
Continuation of Ser. No. 839,365, Mar. 13, 1986, abandoned. This application Oct. 5, 1987, Ser. No. 105,510
Claims priority, application United Kingdom, Mar. 13, 1985, 8506482
Int. Cl.[4] C13F *1/02*
U.S. Cl. 127—60 12 Claims

1. A continuous process for the total solidification of fructose comprising the steps of, in the absence of organic solvent, (a) rapidly and thoroughly mixing together aqueous fructose syrup containing at least 90% by weight fructose on a dry solids basis and a total solids content of at least 95% by weight with 5–30 weight % fructose seed crystals, in a screw extruder at a temperature of 55°–75° for up to 2.5 minutes to form a viscous flowable slurry having a degree of crystallinity not much more than provided by the seed; (b) depositing the viscous flowable slurry onto a surface and allowing it to solidify under quiescent conditions at a temperature of about 50°–70°, until a solid cake is formed; and (c) breaking up and comminuting the solid cake to provide a free-flowing granular product having a degree of crystallinity of over 50%.

4,861,383
PROCESS FOR RECOVERING SUBTERRANEAN STEM STARCH AND PROTEIN
Masahiko Ishida; Ryooichi Haga; Yoji Odawara; Sankichi Takahashi, all of Hitachi, and Katsuya Ebara, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 706,949, Feb. 28, 1985, abandoned. This application Sep. 29, 1987, Ser. No. 102,346
Claims priority, application Japan, Mar. 2, 1984, 59-38580
Int. Cl.[4] C08B *30/02, 30/04;* A23L *1/195*
U.S. Cl. 127—67 6 Claims

1. In a process for recovering potato starch and protein by crushing a starch-containing potato and separating and recovering starch and protein from the resulting crushed slurry, the improvement which comprises crushing said potato in the presence of sodium thiosulfate, the amount of sodium thiosulfate added being 0.005 to 0.5 percent by weight on the wet-potato basis, the sodium thiosulfate being added to the potato at the crushing of the potato, to thereby avoid darkening of the recovered starch and protein.

4,861,384
FLUID REMOVAL CANNISTER DEVICE
Owen E. Jackson, Scottsdale, Ariz., assignor to Jog Corporation, Commerce, Calif.
Filed May 28, 1985, Ser. No. 738,440
Int. Cl.[4] B08B *11/00, 11/02*
U.S. Cl. 134—9 16 Claims



1. A device for recovering fluid from a chain comprising:
a cannister positioned to envelop a portion of the chain,
fluids removal nodules disposed in said cannister, through which said chain is drawn, oil escape means to permit removed fluid to pass exteriorally of said cannister.

4,861,385
ARTICLE WASHING METHOD
Aisaburo Yagishita, 5-2, Shinpocho 4 chome, Chikusa-ku, Nagoya-shi, Aichi 464, Japan
Continuation of Ser. No. 914,862, Oct. 2, 1986, abandoned. This application Nov. 25, 1987, Ser. No. 125,542
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—10 13 Claims

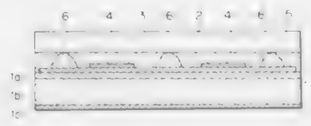


1. An article washing method wherein a dirty or contaminated article is washed with at least one spray nozzle in a washing chamber by using a specific washing liquid supplied to the nozzle with a pump from a first liquid storage tank, said washing chamber being connected selectively to a drain and said first liquid storage tank through a selector valve, comprising the steps of:
(a) bringing said article into said washing chamber;
(b) spraying a predetermined quantity D of said washing liquid pumped from said first liquid storage tank through said spray nozzle to said article to wash the contaminants therefrom by (i) first initially spraying and draining from said washing chamber an initial part D_1 of said washing liquid initially sprayed, to remove an initial portion of said contaminants washed from said article thereby, (ii) then subsequently spraying the article with a subsequent part D_2 of said washing liquid, wherein $D=D_1+D_2$, and (iii) switching the selector valve to recover the subsequent part D_2 of said washing liquid by directing said part D_2 from said washing chamber to said first liquid storage tank while continuing to wash said article; stopping the spray of said washing liquid after a first predetermined time has elapsed; removing said article from said washing chamber; transferring said article into a washing liquid tank to immerse the same in an amount of washing liquid stored in said washing liquid tank; removing said article from said washing liquid tank after a second predetermined time has elapsed; supplying an amount D_1 of said washing liquid from said washing liquid tank to said first liquid storage tank; and supplying an amount D_1 of fresh washing liquid to said washing liquid tank from a supply of fresh washing liquid.

4,861,386
ENHANCED CLEANING PROCEDURE FOR COPPER ALLOY EQUIPMENT
Edgar F. Hoy, Broken Arrow, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.
Continuation of Ser. No. 940,828, Dec. 12, 1986, abandoned.
This application Nov. 9, 1988, Ser. No. 269,110
Int. Cl.[4] B08B *3/00*
U.S. Cl. 134—27 5 Claims

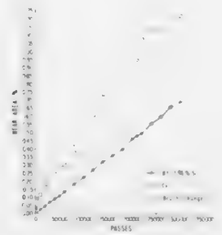
1. A sequential process for removing deposits from waterside surfaces of copper alloy tubes employed in environments where thermal differentials occur the sequential steps consisting essentially of:
(a) contacting the surfaces with an aqueous acid formulation including an inhibitor and a gas and a surfactant to effect foaming of the formulation;
(b) flushing the surfaces with an aqueous flush solution including about 0.1 to about 1.0 percent by weight of a chelating agent for metals present in the deposits and having a pH between about 1 and about 5.5, and
(c) neutralizing the surfaces with an aqueous neutralizing solution including an alkali metal salt of mercaptobenzotriazole present in an amount of from about 200 to about 1000 parts by weight per million parts by weight of the aqueous neutralizing solution, the neutralizing solution having a pH of from about 7 to about 8.5.

4,861,387
SOLAR CELL AND METHOD OF FABRICATING SOLAR CELL
Hideo Matsumoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 15, 1988, Ser. No. 232,092
Claims priority, application Japan, Sep. 4, 1987, 62-222513
Int. Cl.[4] H01L *31/04, 31/18*
U.S. Cl. 136—256 6 Claims



1. A solar cell comprising:
(a) a solar cell body in which a photoelectric element is formed,
(b) at least one convexly-shaped adhesive member selectively provided on the surface of said solar cell body,
(c) an adhesive layer provided on said solar cell body such that said at least one convexly-shaped adhesive member is buried in said adhesive layer, and
(d) a transparent plate provided on said adhesive layer, said transparent plate and said solar cell body being adhered through said adhesive layer.

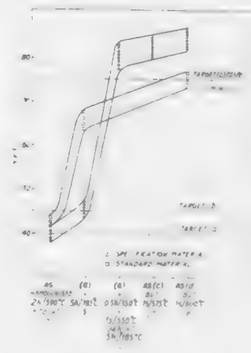
4,861,388
METHOD FOR CONTACT CONDUCTOR FOR ELECTRIC VEHICLES
Paul-Emile Fortin, and Willard M. Gallerneault, both of Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada
Filed Aug. 18, 1987, Ser. No. 86,521
Claims priority, application Canada, Aug. 20, 1986, 516434; May 20, 1987, 537462
Int. Cl.[4] C22F *1/04*
U.S. Cl. 148—2 6 Claims



1. A process for producing a contact conductor of improved physical strength from a wear-resistant aluminum alloy comprising 0.2–1% by weight magnesium, 1–7% by weight silicon and the balance being aluminum and incidental impurities,
said process comprising the steps of: (1) casting said alloy into a continuous bar, (2) hot rolling to form rod without intermediate cooling, (3) quenching the hot rolled rod, (4) cold deforming the quenched rod and (5) subjecting the cold deformed rod to artificial aging.

4,861,389
AL-MG-SI EXTRUSION ALLOY AND METHOD
Anthony J. Bryant, Banbury; David J. Field, Teanford, and Ernest P. Butler, Wroxton-St-Mary, all of England, assignors to Alcan International Limited, Montreal, Canada
Division of Ser. No. 910,896, Sep. 24, 1986. This application May 27, 1988, Ser. No. 199,616
Claims priority, application United Kingdom, Sep. 30, 1985, 8524077
Int. Cl.[4] C21D *8/00*
U.S. Cl. 148—3 10 Claims

1. A method of forming an extrusion ingot of an aluminum based Al-Mg-Si alloy, which method comprises the steps of:
Casting an ingot of the Al-Mg-Si alloy,
Homogenising the ingot,
Cooling the homogenised ingot to a temperature of 250° C. to 425° C. at a cooling rate of at least 400° C./h,
Holding the ingot at a holding temperature of from 250° C. to 425° C. for a time to precipitate substantially all the Mg as beta'-phase Mg_2Si in the substantial absence of beta-phase Mg_2Si,
Cooling the ingot.



4,861,390
METHOD OF MANUFACTURING FORMABLE AS-ROLLED THIN STEEL SHEETS
Susumu Satoh; Saiji Matsuoka; Takashi Obara; Kozo Tsunoyama, and Toshio Irie, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan
Filed Feb. 28, 1986, Ser. No. 835,052
Claims priority, application Japan, Mar. 6, 1985, 60-43971; Mar. 6, 1985, 60-43972; Mar. 6, 1985, 60-43973; Mar. 6, 1985, 60-43974; Mar. 6, 1985, 60-43975; Mar. 6, 1985, 60-43976; Mar. 6, 1985, 60-43977; Mar. 6, 1985, 60-43978; Mar. 6, 1985, 60-43979; Mar. 6, 1985, 60-43980; Mar. 6, 1985, 60-43981; Mar. 6, 1985, 60-43982; May 15, 1985, 60-101562
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.
Int. Cl.[4] C21D *7/00*
U.S. Cl. 148—12 R 6 Claims



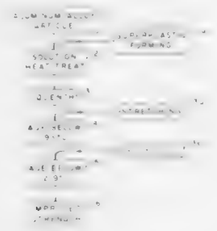
6. A method of manufacturing formable as-rolled thin steel sheets having an improved ridging resistance through a step of rolling a low carbon steel to a given thickness without subsequent cold rolling step, which comprises performing at least one rolling pass within a temperature range of from 500° C. to Ar_3 transformation point at a draft of not less than 35% and a strain rate of not less than 300 sec^{-1}, including the step after the thin steel sheet is rolled to a given thickness of cooling, coiling and holding at a temperature of 200°–500° C. for at least one minute.

4,861,391

ALUMINUM ALLOY TWO-STEP AGING METHOD AND ARTICLE

Roberto J. Rioja, Lower Burrell; Edward L. Colvin; Asuri K. Vasudevan, both of Pittsburgh, and Brian A. Chesney, Leechburg, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 14, 1987, Ser. No. 132,889
Int. Cl.[4] C22F *1/04*
U.S. Cl. 148—12.7 A **27 Claims**



14. A method for improving the strength of a superplastically formed, solution heat treated article made from a precipitation-hardenable aluminum-lithium alloy, said method comprising:

(a) heating the article at one or more elevated temperatures below about 93° C. (200° F.) for a few hours to several months; and

(b) heating the article above about 121° C. (250° F.) and below about 219° C. (425° F.) until desired strength is achieved.

4,861,392

WELDING AID

Richard J. Grabe, Pretoria, South Africa, assignor to Evelyn A. Grabe, South Africa

Filed Jun. 14, 1988, Ser. No. 206,435
Int. Cl.[4] B23K *35/34*
U.S. Cl. 148—23 **13 Claims**

1. A welding aid, which welding aid includes:

a particulate carbon-based weld spatter adhesion inhibitor;

a particulate calcium-based adjuvant mixed with the inhibitor; and

a liquid carrier for the adhesion inhibitor and the adjuvant, whereby the mixture is capable of being applied to a metal surface, thereby to inhibit adhesion of weld spatters to the metal surface.

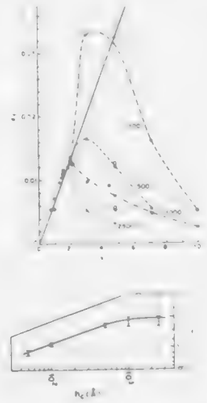
4,861,393

SEMICONDUCTOR HETEROSTRUCTURES HAVING GE_xSI_{1-x} LAYERS ON SI UTILIZING MOLECULAR BEAM EPITAXY

John C. Bean, New Providence; Leonard C. Feldman, Berkeley Heights, and Anthony T. Fiory, Summit, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 749,921, Jun. 28, 1985, abandoned, which is a division of Ser. No. 546,736, Oct. 28, 1983, Pat. No. 4,529,455. This application May 28, 1987, Ser. No. 57,679
Int. Cl.[4] H01L *29/165, 31/06, 21/203*
U.S. Cl. 148—33.4 **12 Claims**

1. A structure comprising a substrate consisting of material selected from the group consisting of Ge and Si and disposed on said substrate, at least one pseudomorphic layer comprising Ge_xSi_{1-x}, x greater than 0.0 and less than or equal to 1.0 when said substrate is Si, and x greater than or equal to 0.0 and less than 1.0 when said substrate is Ge, said at least one pseudomorphic layer having a thickness approximately equal to h_c where h_c is approximately equal to 0.014 af^{-2}, a is the silicon lattice



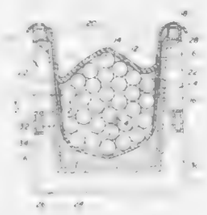
constant and f=(b−a)/a where b is the bulk Ge_xSi_{1-x} lattice constant.

4,861,394

CONTROLLED SLOW COOLING OF STEEL TUBULARS

Joseph F. Colin, Darlington; Leo T. Kaercher, Beaver Falls, and Charles D. Roberts, Gibsonia, all of Pa., assignors to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 79,843, Jul. 30, 1987, Pat. No. 4,798,368. This application Sep. 21, 1988, Ser. No. 247,148
Int. Cl.[4] C21B *8/00*
U.S. Cl. 148—153 **3 Claims**



1. A method for treating hot steel stock after it has been milled, comprising:

lining the bottom of an insulated container with shock absorbant, granular insulating material, said container being closeable and having an insulating characteristic that permits cooling of its contents at a selected rate;

depositing the hot steel stock into the container onto at least one sling used to remove the stock from the container;

closing the container with a flexible, removable blanket of insulting material to retain at least some of the hot stock in the container;

retaining the stock in the container for sufficient time to allow the stock to cool at the cooling rate so as to form a desired microstructure for the steel stock;

opening the container; and

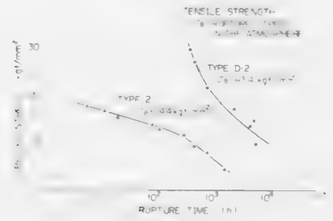
removing the steel stock from the container by lifting the steel stock with the at least one sling.

4,861,395

METHOD OF USING MACHINE PARTS MADE OF AUSTENITIC CAST IRON HAVING RESISTANCE TO STRESS CORROSION CRACKING IN CONTACT WITH SALT WATER

Matsuho Miyasaka, Yokohama; Katsuhiro Ichikawa, Zama; Katsumi Sasaki, Tokyo; Syotaro Mizobuchi, Ebina, and Naoaki Ogure, Tokyo, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Jun. 17, 1985, Ser. No. 745,624
Claims priority, application Japan, Jun. 22, 1984, 59-127632
Int. Cl.[4] C22C *38/36*
U.S. Cl. 148—321 **3 Claims**



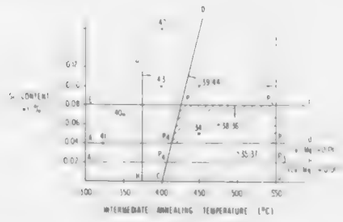
1. A method for improving the resistance to stress corrosion cracking of machines and machine parts made of austenitic cast iron which are in contact with salt water and operated under conditions of stress, said method comprising contacting salt water with a machine or machine part made of austenitic cast iron with graphite in the form of spheroids or nodules, said cast iron consisting essentially of not more than 3% by weight C, 1–3% Si, not more than 1.5% Mn, not more than 0.08% P, more than 24% and not more than 28% Ni, not more than 5.5% Cr and the balance Fe, under conditions which cause stress in said machine or machine part.

4,861,396

ALUMINUM ALLOY MATERIAL PLATE FOR PRINTING

Mamoru Matsuo; Yutaka Okuda, both of Saitama; Kazushige Takizawa, and Hirokazu Sakaki, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa and Sky Aluminum Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 720,231, Apr. 5, 1985, abandoned. This application Aug. 25, 1987, Ser. No. 89,111
Claims priority, application Japan, Apr. 6, 1984, 59-69821; Apr. 6, 1984, 59-69822; Apr. 6, 1984, 59-69823; Apr. 6, 1984, 59-69824
Int. Cl.[4] B41N *1/08*; C22C *21/06, 21/16*
U.S. Cl. 148—439 **2 Claims**



1. A lithographic printing plate support consisting essentially of Al, Si, Fe, Cu, Ti, Mg, and unavoidable impurities, wherein Si is present in an amount up to 0.25 wt %, Fe is present in an amount of from 0.05 to 1.0 wt %, Cu is present in an amount of up to 0.03 wt %, Ti is present in an amount up to 0.10 wt %, Mg is present in an amount up to 0.03 wt % and the balance of unavoidable impurities and Al, and the amounts of Si, Cu and Mg satisfy the following expression:

$$Si\ wt\ \% \geqq 0.08\ wt\ \% - 4(Cu\ wt\ \% - Mg\ wt\ \%)$$

the amount of Si also satisfies the following expression:

$$0.25 \geqq Si\ wt\ \% \leqq 2T/625 - 128$$

wherein T is the temperature in °C. of an intermediate annealing step used in production of the lithographic printing plate, T being between 300° and 550° C., and wherein the difference between the Cu wt % and Mg wt % is in a range which satisfies the following expression:

$$0 \leqq (Cu\ wt\ \% - Mg\ wt\ \%) \leqq 0.03.$$

4,861,397

FIRE-RESISTANT EXPLOSIVES

Warren W. Hillstrom, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 9, 1988, Ser. No. 166,070
Int. Cl.[4] C06B *45/10*
U.S. Cl. 149—19.4 **2 Claims**

1. A thermally stabilized, nitramine explosive comprising:

(a) an explosive selected from the group consisting of 2,4,6-trinitrotoluene; hexahydro-1,3,5-trinitro-1,3,5-triazine; and octahydro-1,3,5,7-tetranitro-1,3,5,7 tetrazocine

(b) a triaryl phosphate additive in an amount of 10–20% based on the weight of the starting material.

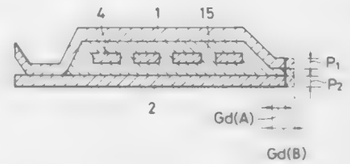
(c) an isocyanate resin binder having a hydrophilic structure in an amount of 15–30% based on the weight of the starting material.

4,861,398

METHOD FOR MAKING A THIN FILM MAGNETIC HEAD

Hirotsugu Fukuoka, Hitachi; Kanji Kawakami, Mito; Makoto Aihara; Mitsuo Suda, both of Hitachi; Kouji Takeshita, and Yukihiro Isono, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 20, 1987, Ser. No. 123,278
Int. Cl.[4] G11B *5/127*
U.S. Cl. 156—64 **6 Claims**



1. A method for making a thin film magnetic head comprising the steps of:

laminating magnetic layers, an electric insulating layer, and a conducting wire in the thickness directions thereof in a predetermined order;

effecting lapping processing of tip portions of the layers so as to form the magnetic head with a throat height;

detecting an overwrite characteristic of the magnetic head in such a manner that a ratio $|Z_1-Z_0|/Z_2-Z_0$ of each variation Z_1-Z_0, Z_2-Z_0 of an impedance Z_0 is lower than a predetermined value when the conducting wire has a DC bias current I_0 having a magnitude containing a zero value applied thereto so that the impedance value thereof is Z_0, and when the conducting wire has at least two DC bias currents of I_1 and I_2 applied thereto so that the impedance values are Z_1 and Z_2, respectively; and

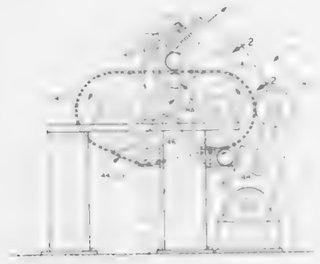
determining that the overwrite characteristic OW of the magnetic head reaches a desired value when the ratio $|Z_1-Z_0|/|Z_2-Z_0|$ becomes lower than the predetermined value.

4,861,399

APPARATUS AND METHOD FOR FORMING FILAMENT AND LOOP FASTENERS

Gregory J. Rajala, and Lon M. King, both of Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 4, 1987, Ser. No. 118,120
Int. Cl.[4] B32B *31/08*
U.S. Cl. 156—66 **83 Claims**



31. A method for producing fastening components, comprising:
(a) drawing an array of filaments onto a forming wheel having a plurality of transversely arranged grooves;
(b) positioning a plurality of pins against said filaments and aligned with said grooves;
(c) urging said pins into said grooves, said filaments being positioned between the surfaces of said grooves and said pins, in said grooves, thereby forming loops in said filaments, said loops having tops thereof in said grooves, said filaments being in contact with said wheel between said grooves;
(d) placing a backing material against said filaments and bonding said backing material to said filaments at first spaced locations between said grooves while said filaments are in said contact with said wheel between said grooves, to thereby form a bonded product, and thereby trapping said pins in spaces between said filaments and said backing material; and
(e) releasing said pins from said spaces.

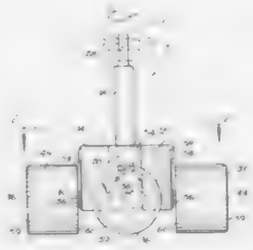
4,861,400

TOOL FOR ELIMINATING AIR VOIDS UNDERNEATH A MEMBRANE SEAM AND METHOD THEREFOR

Richard G. Sargent, 70 G. W. Briar, Stafford, Va. 22554

Filed Feb. 24, 1988, Ser. No. 159,695
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—71 **8 Claims**

1. A tool for eliminating gas bubbles trapped underneath a membrane, comprising:
a body having an axis of rotation;
means for mounting said body for rotation about the axis;
a plurality of generally cylindrical wheels means each having an axis of rotation generally perpendicular to the axis of rotation of said body and each further having opposed inner and outer ends facing toward and away from the body, respectively, and an outer periphery for engaging said membrane; and
mounting means for rotatably mounting said wheel means to said body so that said wheels roll along the membrane when placed in contact therewith and said body is rotated about the axis of rotation thereof, said mounting means including an axle for each wheel aligned along the axis of rotation thereof and extending from the inner end of each said wheel, inwardly into said body toward a center thereof and said mounting means further including means



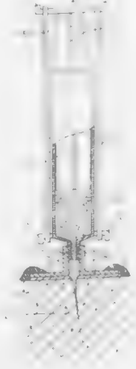
in said body adjacent the center thereof to provide a cantilever support for said axles.

4,861,401

METHOD OF INJECTING ADHESIVES INTO CRACKS

Ryuichi Miura, Kyoto, and Toshinobu Nakao, Kawanishi, both of Japan, assignors to Konishi Co., Ltd., Osaka and Sunkit Co., Ltd., Kobe, both of, Japan

Filed Dec. 15, 1987, Ser. No. 133,465
Claims priority, application Rep. of Korea, Jul. 3, 1987, 1987-7099
Int. Cl.[4] B32B *35/00*
U.S. Cl. 156—94 **2 Claims**



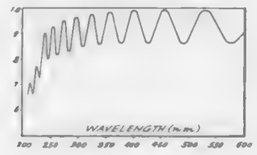
1. A method of injecting adhesives into cracks of a structure comprising the steps of:
sealing a crack at the surface of the structure but providing non-sealed surface portions with adequate space to affix at the surface an injection pipe;
affixing an injection pipe at the surface said crack;
connecting a nozzle end of an adhesives injecting device to said injection pipe, said injecting device being composed of a transparent cylinder having a scale graduated from a rear end toward the nozzle end and of a piston which can move forward and rearward in said cylinder; and
utilizing the resilience of an elastic member attached between said piston and a nonmoveable member to move said piston toward said nozzle to inject said adhesives into said crack.

4,861,402

METHOD OF MAKING A CELLULOSE ACETATE BUTYRATE PELLICLE

Joseph Gordon, Wappingers Falls, N.Y., assignor to Du Pont Tau Laboratories, Inc., Wilmington, Del.

Division of Ser. No. 94,026, Sep. 4, 1987, Pat. No. 4,796,973, which is a continuation of Ser. No. 661,577, Oct. 16, 1984, abandoned. This application Aug. 31, 1988, Ser. No. 238,413
Int. Cl.[4] B29C *41/04*
U.S. Cl. 156—108 **8 Claims**



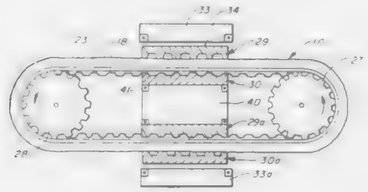
1. A process of making a pellicle comprising the steps of dissolving cellulose acetate butyrate in a solvent, filtering said dissolved cellulose acetate butyrate and solvent, spin coating said cellulose acetate butyrate and solvent on a spinning substrate and driving off said solvent to form a substantially uniformly thick film of cellulose acetate butyrate, lifting said film from said substrate and cementing said film to one end of a support frame with said film tautly stretched over said frame.

4,861,403

METHOD OF FABRICATING A DOUBLE-TOOTHED BELT

Keiichi Yoshimi, Hyogo; Shigeo Goto, Himeji, and Masaaki Asazuma, Hyogo, all of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Filed Sep. 30, 1987, Ser. No. 102,884
Int. Cl.[4] F16G *1/00*
U.S. Cl. 156—138 **19 Claims**



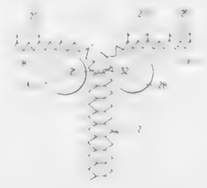
19. A method of fabricating a double-toothed belt comprising the steps of:
(a) forming a belt preform with all components defining the completed double-toothed belt;
(b) heating said belt preform to cause the formation of teeth which have sufficient body to maintain their configuration in the subsequent steps wherein the torque thereof increases by no more than approximately one dN-m above the minimum torque ML of said belt preform, whereby said preform components form a partially molded, substantially unvulcanized preform having an inner toothed portion and an outer nontoothed portion;
(c) entraining the preform toothed inner portion about a pair of axially spaced toothed pulleys;
(d) forming teeth in said outer portion of a limited portion of the preform and concurrently vulcanizing said limited portion of the preform between a pair of upper and lower toothed molds to form a vulcanized molded belt portion having upper and lower vulcanized toothed portions;
(e) advancing the vulcanized molded belt portion to bring a subsequent substantially unvulcanized portion of the preform between said pair of upper and lower toothed molds; and
(f) repeating sequentially step (d) to completely form a vulcanized endless double timing belt having vulcanized teeth in each of said inner and outer portions the entire length of the belt.

4,861,404

METHOD OF MAKING A HONEYCOMB PRODUCT

Craig A. Neff, Golden, Colo., assignor to Hunter Douglas Inc., Upper Saddle, N.J.

Filed Aug. 28, 1987, Ser. No. 90,766
Int. Cl.[4] B32B *31/08, 3/12*
U.S. Cl. 156—204 **10 Claims**



1. A process for the manufacture of expandable, collapsible material having hollow portions therein, for use in a blind, shade or the like, comprising folding a first sheet of material to provide a plurality of transverse creased folds therein, folding a second sheet of material to provide a plurality of transverse creased folds therein, modifying the first sheet to provide a plurality of first legs therein by forming folds and by securing parts of each of said folds together and combining said first and second sheets of material so that said first legs are directed towards the second sheet and a fold of said second sheet is directed towards and in-line with each of said first legs, and adhering said first legs at their free ends to the folds of the second sheet in line therewith.

4,861,405

METHOD AND APPARATUS FOR APPLYING BABY POWDER TO DISPOSABLE DIAPERS

Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

Filed Jul. 12, 1988, Ser. No. 218,320
Claims priority, application Japan, Jul. 13, 1987, 62-174418
Int. Cl.[4] B32B *31/12*
U.S. Cl. 156—204 **10 Claims**



1. A method for applying baby powder to disposable diapers comprising the steps of:
moving a laminated continuous sheet, which, when cut, is to become individual disposable diapers, at high speed in the direction of the length thereof, whereby in an air zone of

predetermined thickness disposed on at least a predetermined surface of the laminated continuous sheet, there is produced an air flow having a velocity gradient such that the speed of the air flow increases as said predetermined surface is approached,

feeding baby powder at a position within said air zone of predetermined thickness in which said air flow is produced, so that the baby powder thus fed contacts said air zone, and

making use of a decreasing-pressure phenomenon resulting from said air flow having said velocity gradient in which phenomenon the pressure decreases as said predetermined surface is approached, whereby said baby powder is caused to adhere to said predetermined surface of said laminated continuous sheet as it is drawn toward said predetermined surface.

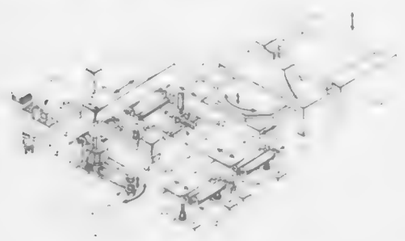
4. A method for applying baby powder to disposable diapers as set forth in claim 1, further including the step of bending the opposite lateral edges of said laminated continuous sheet immediately after said step of causing baby powder to adhere has been performed.

4,861,406

METHOD AND APPARATUS FOR HANDLING PLIES OF COMPOSITE MATERIAL

Edwin T. Baker; George V. Neilson, both of Auburn, and George R. Stumpf, Jr., Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 17, 1987, Ser. No. 86,312
Int. Cl.[4] B32B *31/04*
U.S. Cl. 156—230 **5 Claims**



1. In a system of fabricating an article from a plurality of plies of fiber reinforced/resin matrix composite material in which a cut ply is carried by and removably adhered to a web of backing material, apparatus for positioning said ply on a mold surface and detaching said ply from the backing material, comprising:

means for tensioning the web of backing material;

means for moving the mold surface relative to said web to locate said ply and the mold surface in oriented closely spaced positions relative to each other; and

locating means for applying localized force to the surface of the tensioned backing material opposite said ply to move portions of said ply into contact with the mold surface and adhere said portions of said ply to the mold surface, and for removing said force; said locating means including a vacuum cup, means for urging the vacuum cup against the backing material to apply said localized force and push the ply into contact with the mold surface, and means for applying suction to the backing material through the vacuum cup;

said means for tensioning being positioned to allow said tensioning to detach said ply from the backing material upon removal of said force; and

said locating means including an array of vacuum cups each of which is independently extensible toward the backing material and retractable away from the backing material, valve means for applying suction through each vacuum cup when the vacuum cup is moved into an extended position, and means for moving the array along the tensioned backing material to progressively adhere portions of the ply to the mold surface and to allow said tensioning, assisted by said suction, to progressively detach the ply from the backing material.

4,861,407

METHOD FOR ADHESIVE BONDING ARTICLES VIA PRETREATMENT WITH ENERGY BEAMS

Curtis L. Volkmann; John J. Kester, and Gregory A. Stevens, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 746,170, Jun. 18, 1985, abandoned, and a continuation-in-part of Ser. No. 876,029, Jun. 18, 1986, abandoned. This application Oct. 16, 1987, Ser. No. 109,664
Int. Cl.[4] B32B *31/28*
U.S. Cl. 156—272.8 **14 Claims**



1. A method for adhesively bonding a first body to a second body, the first body having a metallic substrate, the method comprising the steps of pretreating an area of the first body, contacting an adhesive agent with a member of the group consisting of the pretreated area of the first body or an area of the second body, and then joining the first body with the second body so that the adhesive agent is interposed between the pretreated area of the first body and the area of the second body, the improvement which comprises as the step of pretreating an area of the first body;

placing the first body in the path of an energy beam having a selected energy density of from 0.001 to 1,000 joules/cm^2 for a duration of from 0.1 to 100 nanoseconds effective to form projections on the metallic substrate of the first body, the projections formed by melting of the metallic substrate of the first body, substantially all of the projections being less than 20 micrometers in height.

4,861,408

MODIFICATION OF POLYMERIC SURFACE FOR IMPROVED ADHESION VIA ELECTRON BEAM EXPOSURE

Jeffry A. Kelber, Paradise Hills, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 8, 1987, Ser. No. 36,039
Int. Cl.[4] B32B *31/28*
U.S. Cl. 156—273.3 **18 Claims**

1. In a process for improving the adhesion properties of a halocarbon polymer surface, wherein the polymer surface is exposed to an electron bombardment in a controlled atmosphere, the improvement wherein the polymer surface is exposed to an electron beam of low energy electrons having an energy level of not more than about 1000 eV, under vacuum pressures not higher than about 10^{-6} Torr, for a time sufficient

to chemically modify the polymer surface to improve the adhesion properties of said surface.

4,861,409

PROCESS AND APPARATUS FOR FORMING LAMINATE BY THERMOCOMPRESSION BONDING

Kenji Hashida, Kyoto; Takeshi Yamamoto, Shiga; Tatsuya Fukumoto; Tetsuji Deguchi, both of Kyoto; Shigeyuki Hirata; Osamu Uehara, both of Kyoto, and Kazuhiko Akebi, Kyoto, all of Japan, assignors to Gunze Kabushiki Kaisha, Ayabe, Japan

PCT No. PCT/JP87/00155, § 371 Date Oct. 30, 1987, § 102(e) Date Oct. 30, 1987, PCT Pub. No. WO87/05560, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 11, 1987, Ser. No. 130,114
Claims priority, application Japan, Mar. 18, 1986, 61-61722
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—308.2 **18 Claims**



1. A process for thermocompression bonding lamination of a first film to a second film using a nipping roll unit having a heat roll and a pressure roll, comprising the steps of: subjecting the films to thermocompression bonding by guiding the first film onto the heat roll while guiding the second film onto the pressure roll to obtain a laminate film, and subsequently, releasing the laminate film over a discharge angle adjusting roll for automatically adjusting the distance of contact of the laminate film with the heat roll in accordance with the line speed.

4,861,410

METHOD OF JOINING METAL OXIDE CONTAINING CERAMIC BODIES

David E. Clark, and Robert H. Krabill, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Continuation of Ser. No. 704,970, Feb. 25, 1985, abandoned. This application Jan. 16, 1987, Ser. No. 5,293
Int. Cl.[4] C03B *29/00*; C09J *1/00, 5/06*
U.S. Cl. 156—325 **4 Claims**



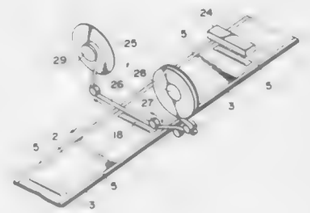
1. A method of joining two metal oxide containing ceramics bodies, said two ceramic bodies containing the same metal oxide, said method comprising the steps of preparing a sol from an alkoxide of the metal in said metal oxide containing ceramic bodies; mixing said sol with a gelling agent to form a paste; applying said paste to a surface of one of the ceramic bodies; and joining the two ceramic bodies by contacting the surface having said paste thereon with a surface of the other ceramic body and then heating at an elevated temperature.

4,861,411

METHOD OF PRODUCING GEL SHEET FOR ELECTROPHORESIS

Shigeru Tezuka, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 19, 1988, Ser. No. 246,408
Claims priority, application Japan, Jan. 20, 1988, 63-10453
Int. Cl.[4] B29C *39/00*; B32B *31/18*
U.S. Cl. 156—344 **5 Claims**



1. In a method of producing a gel sheet for electrophoresis comprising a gel membrane acting as the medium for electrophoresis composed of a hydrophilic polymer having a uniform thickness, two sheets of transparent or translucent electrical insulating films disposed on the front and the rear surfaces of the gel membrane and two spacers disposed along two facing sides of the gel membrane, wherein an end of the gel membrane is cut to form a slot for laoding samples, the improvement which comprises cutting out a portion of the gel membrane before one surface of the gel membrane is covered with said electrical insulating film in the shape of the slot for loading samples, pressing an adhering member on the cut-out portion of the gel membrane to adhere the cut-out, and removing the adhering member and attached cut-out portion from the gel membrane.

4,861,412

LARGE AREA WELDING MACHINE FOR PLASTIC SHEETS

Anton Meister, Sarnen, Switzerland, assignor to Meistermatic AG, Switzerland

Filed Feb. 12, 1988, Ser. No. 155,297
Claims priority, application Switzerland, Feb. 17, 1987, 00558/87
Int. Cl.[4] B32B *31/08, 31/20*
U.S. Cl. 156—499 **4 Claims**

1. A large-area welding machine for plastic sheets laid out with overlapping edges, having a machine frame wheelable on rollers in the direction of the sheet edges, a heating nozzle running along and engaging between the sheet edges in front of a press-on roller mounted on a driver shaft, as well as hold-down means disposed next to the heating nozzle and pressing the sheet edges together, the improvement comprising: means for synchronously driving the press-on roller and two travel rollers in a direction of travel, means for mounting the travel rollers laterally offset from the press-on roller, and hold-down means with a press-on belt rotating in the direction of travel

and rolling on the sheet edges, said hold down means being mounted on said machine frame next to said press-on roller



with vertical play guided at the drive shaft of the press-on roller by a vertical slot.

4,861,414

EASY-OPEN FLEXIBLE POUCH AND APPARATUS AND METHOD FOR MAKING SAME

Dennis J. Vogan, Etobicoke, Ontario, Canada, assignor to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 109,673, Oct. 16, 1987, Pat. No. 4,808,010.
This application Oct. 7, 1988, Ser. No. 254,992
Int. Cl.[4] B32B *31/18, 31/20;* **B65B** *61/18, 51/14*
U.S. Cl. 156—530 **1 Claim**



1. An apparatus for producing an easy-open seal for a flexible pouch comprising a seal bar having:

(a) a plurality of parallel spaced-apart ribs disposed in a substantially U-shaped arrangement along a portion of the seal bar for forming a plurality of U-shaped seal ribs around a U-shaped unsealed portion in the seal of the pouch; and

(b) a straight blade having an edge of sharpened teeth, said blade disposed parallel to the long dimension of the seal bar, between the U-shaped portion of the seal rib arrangement and a side edge of the seal bar, and intermediate the height of the U-shaped portion.

4,861,413

WELDING AND CUTTING TONGS FOR A FILM OF SYNTHETIC MATERIAL

Roger Schmitz, Vittel, France, assignor to Societe Generale Des Eaux Minerales de Vittel, Vittel, France

Filed Mar. 2, 1988, Ser. No. 173,530
Claims priority, application France, Jul. 2, 1986, 86 09701
Int. Cl.[4] B29C *65/74;* **B65B** *61/10*
U.S. Cl. 156—515 **10 Claims**



1. An apparatus for welding and cutting a film formed of a single-layer or a multi-layer synthetic material and including a pair of jaws movable relative to one another and comprising:

a first jaw which includes a welding contact zone formed as a strip having a substantially v-shaped groove and a pair of wings extending from opposite sides of the v-shaped groove; and

a second jaw which includes means for cutting the film formed of a wire of generally circular cross-section and projecting from the second jaw so that the wire and the groove can cooperate with one another to cut the film as the film is welded together by the welding contact zone of the first jaw.

4,861,415

MACHINE FOR MOISTENING A COVER TO BE FIXED ONTO A BASE FILLED FOR EXAMPLE WITH A PHARMACEUTICAL PRODUCT

Ernesto Gamberini, Rostignano-Pianoro, Italy, assignor to MG 2 S.p.A., Italy

Filed Apr. 22, 1988, Ser. No. 184,967
Claims priority, application Italy, Apr. 27, 1987, 3448 A/87
Int. Cl.[4] B65B *51/02*
U.S. Cl. 156—556 **25 Claims**



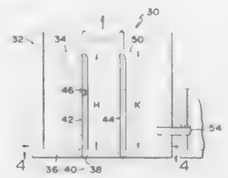
2. A machine for moistening a cover (2) of a capsule for pharmaceutical products, comprising a supply hopper for said covers (2), the supply hopper having an outlet opening (9); withdrawal means to withdraw the covers (2) from the supply hopper through said opening (9); and moistening means to moisten, with a sealing liquid, a rim of each cover (2) on the wihdrawal means (5); the withdrawal means comprising a first disc (16) having a first axis, and mounted for rotation about both said first and a transverse second axis, and a plurality of withdrawal devices (5) carried by the first disc (16); and said moistening means comprising a plurality of moistening devices (6) carried by said first disc (16), and each said moistening device (6) being associated to a respective withdrawal device (5).

4,861,416

RIBBON GROWING METHOD AND APPARATUS

Andrew D. Morrison, Altadena, Calif., assignor to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 4, 1985, Ser. No. 718,798
Int. Cl.[4] C30B *9/06*
U.S. Cl. 156—608 **12 Claims**



1. An apparatus for growing a ribbon of material, comprising:

walls forming a container for holding heated ribbon-growable material, said container having a bottom wall and at least one hole extending through said bottom wall to pass filaments therethrough;

means for drawing a pair of filaments up through said holes and above said container to form a ribbon of said material between the filaments;

said container including a pair of guides having upper ends and forming passages aligned with said at least one hole, said guides extending to a height above said bottom wall to isolate filaments inside said passages from the rest of the inside of the container below said height.

10. A method for growing silicon ribbon comprising:

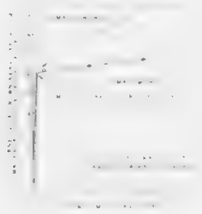
pulling a pair of filaments upwardly through a pair of passages that have walls largely surrounded by a mass of molten silicon and that have upper ends lying above the bottom of the mass of silicon, establishing contact between only the top of the mass of molten material and the filaments, and drawing up material from the mass.

4,861,417

METHOD OF GROWING GROUP III-V COMPOUND SEMICONDUCTOR EPITAXIAL LAYER

Kouji Mochizuki, Isehara; Masashi Ozeki, Yokohama, and Nobuyuki Ohtsuka, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 24, 1988, Ser. No. 172,671
Claims priority, application Japan, Mar. 27, 1987, 62-71747
Int. Cl.[4] C30B *25/14*
U.S. Cl. 156—610 **30 Claims**



1. A method of growing a group III-V compound semiconductor epitaxial layer on a substrate by use of atomic layer epitaxy, said method comprising the steps of:

growing an aluminum layer on one of the {100 }, (111)B, ($\bar{1}\bar{1}$1)B, ($\bar{1}$1$\bar{1}$)B, and (1$\bar{1}\bar{1}$)B planes of the substrate by supplying a quantity of aluminum amounting to at least two times the surface density of aluminum in a molecular layer of said group III-V compound semiconductor epitaxial layer, wherein the obtained aluminum layer contains a quantity of aluminum essentially equal to at least the total quantity of aluminum in two molecular layers of said group III-V compound semiconductor epitaxial layer; and

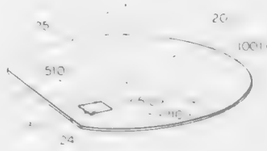
growing a layer of a group V material on the aluminum layer by supplying a quantity of the group V material amounting to at least two times the surface density of said group V material in a molecular layer of said group III-V compound semiconductor epitaxial layer, said layer of the group V material and said aluminum layer constituting said group III-V compound semiconductor epitaxial layer.

4,861,418

METHOD OF MANUFACTURING SEMICONDUCTOR CRYSTALLINE LAYER

Tadashi Nishimura; Yasuo Inoue; Kazuyuki Sugahara, and Shigeru Kusunoki, all of Hyogo, Japan, assignors to Kozo Iizuka, Director General, Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 6, 1987, Ser. No. 22,402
Claims priority, application Japan, Mar. 7, 1986, 61-48468
Int. Cl.[4] C30B *13/22*
U.S. Cl. 156—620.72 **8 Claims**



1. A method of manufacturing a semiconductor crystalline layer comprising the following steps:

a first step of forming, on a single crystalline substrate composed of a semiconductor having a main face on (001) face or crystal face equivalent thereto and having a diamond-type crystal structure, an orientation flat face in which the direction of the intersection with said main face makes an angle within a range of from about 30 degrees to about 45 degrees relative to the direction <110> or the direction equivalent thereto on said main face and which serves as a reference for defining the direction of arranging semiconductor chips formed on said substrate;

a second step of forming, on the main face of said substrate, and insulation layer at least a portion of which has an opening reaching said main face and which insulates the atmosphere on the side of the surface of said single crystalline substrate at a region other than the opening;

a third step of forming a semiconductor layer composed of a polycrystalline or amorphous semiconductor on the entire surface of said opening and said insulation layer;

a fourth step of forming a reflectivity varying layer which is in a direction substantially parallel with or perpendicular to the interstation between said orientation flat face and said main face, and which has a width and a spacing in a range and is made of a material having periodic reflectivity variation to laser beams; and

a fifth step of scanning said laser beams under continuous irradiation by way of said reflectivity varying layer to said semiconductor layer in the direction identical with or at an angle within a range of about plus or minus 10 degrees relative to the direction <110> of said main face or the direction equivalent thereto.

4,861,419

APPARATUS AND METHOD FOR PRODUCTION PROCESS DIAGNOSIS USING DYNAMIC TIME WARPING

Bruce E. Flinchbaugh; Steven B. Dolins, both of Dallas; Aditya Srivastava, Richardson, and Jon Reese, Waxahachie, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 117,002, Nov. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 81,494, Aug. 4, 1987, abandoned. This application Aug. 15, 1988, Ser. No. 233,878

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—626 **65 Claims**



17. A method for monitoring end point traces of a plasma etch reactor comprising:

establishing a reference end point trace for a predetermined etch process;

dividing the reference end point trace at critical points thereof into predetermined regions;

conducting the predetermined etch process on a semiconductor device;

obtaining an actual end point trace for the etch of the semiconductor device;

matching the critical points on the reference trace with corresponding critical points on the actual trace using a dynamic time warping function;

dividing the actual trace at the critical points thereof to define regions of the actual trace; and

comparing characteristics of regions of the actual end point trace with corresponding characteristics of matched regions of the reference end point trace.

4,861,420

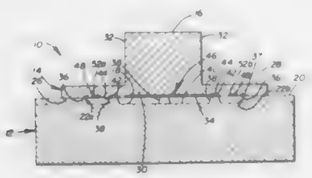
METHOD OF MAKING A SEMICONDUCTOR TRANSDUCER

James W. Knutti; Henry V. Allen, both of Fremont; Kurt E. Petersen, San Jose, and Carl R. Kowalski, Fremont, all of Calif., assignors to Tactile Perceptions, Inc., Fremont, Calif.

Division of Ser. No. 617,122, Jun. 4, 1984, Pat. No. 4,680,606. This application Jul. 14, 1987, Ser. No. 73,675

Int. Cl.[4] H01L *29/84;* **G01L** *1/18*

U.S. Cl. 156—633 **4 Claims**



1. A method for assembling a semiconductor transducer comprising the steps of:

selectively etching one surface of a substrate to form a well therein;

forming a channel in a first surface of a semiconductor layer;

bonding said first surface of said semiconductor layer to said substrate about the periphery of said well, wherein the channel in the semiconductor layer is situated over the peripheral edge of said well; and

selectively sawing edge portions of said semiconductor layer to a selected depth to form a second surface of said semiconductor layer and a pedestal projecting outwardly from said second surface of said semiconductor layer, said second surface being substantially parallel with said first surface, said pedestal being disposed above said well.

4,861,421

PHOTOCHEMICAL SEMICONDUCTOR ETCHING

Rachelle J. Bienstock, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 1, 1988, Ser. No. 201,007

Int. Cl.[4] H01L *21/306;* **B44C** *1/22*

U.S. Cl. 156—635 **7 Claims**



1. A method of etching $Hg_{1-x}Cd_xTe$, comprising the steps of:

(a) immersing a substrate containing a $Hg_{1-x}Cd_xTe$ region at a surface in a solution of an oxidant; and

(b) photoactivating said oxidant at predetermined areas of said surface to etch predetermined portions of said $Hg_{1-x}Cd_xTe$ region.

4,861,422

METHOD OF MANUFACTURING SHADOW MASK AND APPARATUS

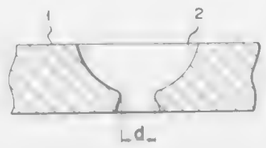
Makoto Kudou, and Katsumi Ichikawa, both of Kumagaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 18, 1988, Ser. No. 195,625

Claims priority, application Japan, May 19, 1987, 62-120142

Int. Cl.[4] C23F *1/02;* **B44C** *1/22*

U.S. Cl. 156—640 **15 Claims**



1. A method of manufacturing a shadow mask, comprising the steps of: forming a first resist pattern having a large number of openings on one major surface of a thin metal plate and a second resist pattern on the other major surface, the second resist pattern having a large number of openings with an opening size different from that of the first resist pattern; etching the thin metal plate surface having the first resist pattern to form first recesses; removing the first resist pattern; forming an etching-resistive layer on the thin metal plate surface having the first recesses; etching the thin metal plate surface having the second resist pattern to form second recesses which have a size different from that of the first recesses and communicate with the first recesses; treating and swelling the etching-resistive layer with an alkali solution; spraying warm water to the

etching-resistive layer to remove the etching-resistive layer; and removing the second resist pattern.

4,861,423

METHOD OF ETCHING A SURFACE OF AN INDIUM PHOSPHIDE PART

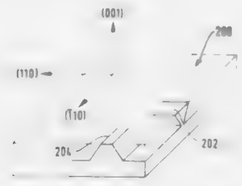
Claude Carrière, Marcoussis; Jean Renard, Paris, and Thierry Lavolée, Sainte Genevieve Des Bois, all of France, assignors to Societe Anonyme dite: ALCATEL CIT, Paris, France

Filed Mar. 31, 1988, Ser. No. 176,055

Claims priority, application France, Apr. 1, 1987, 87 04575

Int. Cl.[4] C23F *1/00*

U.S. Cl. 156—643 **9 Claims**



1. In a method of etching a surface of an indium phosphide part, said method comprising the following operations:

inserting said indium phosphide part in an etching enclosure provided with electrodes;

admitting a gaseous etching mixture into the enclosure; and

applying a high frequency alternating electric voltage between said electrodes to form a plasma from said etching mixture and subjecting said indium phosphate part to the action of constituents of said plasma;

the improvements wherein; said operation of admitting a gaseous etching mixture into the enclosure comprises admitting a gaseous etching mixture containing ammonia (NH_3) and a diluting gas; and

said operation of inserting said indium phosphate part comprises disposing said indium phosphate part so that said plasma is formed in contact with said surface to be etched and etching said surface.

4,861,424

ASHING PROCESS OF A RESIST LAYER FORMED ON A SUBSTRATE UNDER FABRICATION TO A SEMICONDUCTOR DEVICE

Shuzo Fujimura, Towa, and Junichi Kouno, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 19, 1988, Ser. No. 234,134

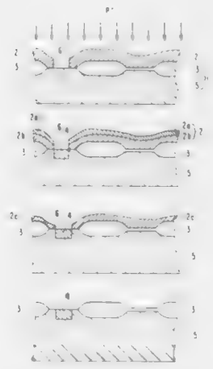
Claims priority, application Japan, Aug. 19, 1987, 62-203986

Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06;* **B29C** *37/00*

U.S. Cl. 156—643 **7 Claims**

1. A method for removing a resist layer formed on a substrate, said resist layer including an ion-implanted region, expanded from an upper surface of the resist layer, in which high doses of ions are implanted, said method comprising the steps of:

removing a first region including the ion-implanted region, by a first etching step performed by a plasma discharge process requiring a relatively high amount of power, using hydrogen as a reactive gas, leaving a second region, said first region and said second region forming the resist layer; and



removing the second region by a second etching step being performed by a process requiring less power than the plasma discharge process.

4,861,425

LIFT-OFF PROCESS FOR TERMINAL METALS

Stuart E. Greer, Shelburne, and Robert T. Howard, Jr., Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 22, 1988, Ser. No. 234,728

Int. Cl.[4] B44C *1/22;* **B05D** *3/06;* **B29C** *37/00;* **C23F** *1/02*

U.S. Cl. 156—644 **19 Claims**



1. A lift-off process for removing a metallic layer deposited over a layer of masking material deposited on a semiconductor device comprising the steps of:

depositing a layer of masking material on the surface of the semiconductor device,

creating an opening in the layer of masking material, and

depositing a layer of metal over said layer of masking material and in said opening,

heating said metal layer to cause melting of said metal layer in said opening, removing said metal outside of said opening.

4,861,426

METHOD OF MAKING A MILLIMETER WAVE MONOLITHIC INTEGRATED CIRCUIT

Arthur Paolella, Howell, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 23, 1989, Ser. No. 300,508

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—644 **3 Claims**

1. Method of making a millimeter wave monolithic integrated circuit from a semi-insulating substrate material, said method including the steps of:

(A) depositing a thin passivation layer of silicon nitride on the top surface of the semi-insulating substrate material,
(B) depositing a layer of photoresist over the silicon nitride layer,
(C) placing a mask on top of the photoresist layer wherein the mask bears a pattern of the millimeter wave monolithic device and exposing the mask to ultraviolet light,
(D) removing the mask and placing the millimeter wave monolithic integrated circuit in an etching solution causing unexposed photoresist to be etched away and exposing the semi-insulating substrate material in the desired pattern,
(E) making the millimeter wave monolithic device by epitaxially growing layers of semi-insulating substrate material so that under the exposed semi-insulating substrate material there will be single crystal growth that will make up the millimeter wave monolithic device and where there was silicon nitride, there will be an amorphous crystal that will act as an insulator, isolating each millimeter wave monolithic device,
(F) electroplating a gold heat sink over the entire structure,
(G) turning the entire structure upside down and depositing photoresist onto the semi-insulating substrate material,



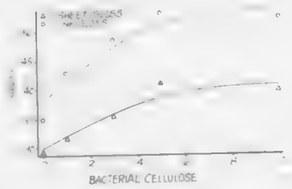
(H) placing a mask on top of the photoresist layer wherein the mask bears a pattern of the millimeter wave monolithic device and exposing the mask to ultraviolet light,
(I) removing the mask and placing the substrate in an etching solution causing unexposed photoresist to be etched away and exposing the semi-insulating substrate material in the desired pattern,
(J) placing the semi-insulating substrate material in a solution that will etch a hole in the semi-insulating substrate material that has been exposed,
(K) filling the hole that was made in the semi-insulating substrate material with gold to make contact to the millimeter wave monolithic integrated circuit.
(L) depositing photo-resist onto the semi-insulating substrate,
(M) placing a mask on top of the photo-resist layer wherein the mask bears the pattern of the millimeter wave monolithic circuit and exposing to UV,
(N) removing the mask and placing the substrate in an etching solution and exposing the substrate in the desired pattern,
(O) electroplating gold over the entire substrate and etching off the photo-resist, and
(P) lifting off the gold which was under the photo-resist leaving behind the desired circuit pattern.

4,861,427

BACTERIAL CELLULOSE AS SURFACE TREATMENT FOR FIBROUS WEB

Donald C. Johnson, Auburn; Amar N. Neogi, Seattle, and Henry A. LeBlanc, Federal Way, all of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 45,985, May 4, 1987, abandoned. This application Mar. 10, 1988, Ser. No. 166,283
Int. Cl.[4] D21F *11/00*; D21H *5/12*
U.S. Cl. 162—129 **21 Claims**



1. A method of making a treated fibrous web which comprises applying a coating of a bacterial cellulose having a reticulated structure from an aqueous suspension to at least one surface of a substrate fibrous web.

4,861,428

REINFORCED POLYMER SHEET

Adriaan W. Van Breen, and Johannes C. M. Gillemans, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 25, 1988, Ser. No. 172,895
Claims priority, application United Kingdom, Mar. 27, 1987, 8707404
Int. Cl.[4] D21H *3/38*
U.S. Cl. 162—168.1 **8 Claims**

1. A process for producing a fiber reinforced polymer sheet by paper-making technology comprising:
(a) mixing particles of a thermoplastic polyketone polymer and water to form an aqueous dispersion of thermoplastic polymer particles and fibers having a minimum length of 2.0 mm, said polyketone polymer being an alternating copolymer of carbon monoxide and an olefinically unsaturated compound with an average molecular weight of at lest 2000 and having recurring units [A—CO] where A represents the olefinicially unsaturated compound polymerized therein;
(b) passing said aqueous dispersion onto a filter; and
(c) draining the water from the dispersion, characterized in that the fibers are used in an amount of from 5 to 450 pbw per 100 pbw of polymer.

4,861,429

PROCESS FOR INHIBITING WHITE PITCH DEPOSITION IN PAPERMAKING FELTS

Daniel J. Barnett, and Daniel L. Michalopoulos, both of Jacksonville, Fla., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Jul. 29, 1988, Ser. No. 225,978
Int. Cl.[4] D21F *1/32*
U.S. Cl. 162—199 **19 Claims**

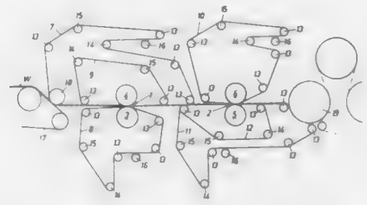
1. A process for inhibiting the deposition of white pitch in felts of a papermaking system which comprises applying to said felts an effective inhibiting amount of one or more organic, anionic polyelectrolytes in an aqueous spray.

4,861,430

CONTROLLING A PAPER WEB PATH IN THE PRESS SECTION WITH AN IMPERMEABLE BELT

Nils T. Andersson, Halmstad, Sweden, assignor to Nordiskafilt AB, Halmstad, Sweden

PCT No. PCT/SE86/00555, § 371 Date May 16, 1988, § 102(e) Date May 16, 1988, PCT Pub. No. WO87/03631, PCT Pub. Date Jun. 18, 1987
PCT Filed Dec. 8, 1986, Ser. No. 194,231
Claims priority, application Sweden, Dec. 9, 1985, 8505796
Int. Cl.[4] D21F *3/02*
U.S. Cl. 162—205 **6 Claims**



1. A method for controlling a paper web leaving a press nip formed by a first press roller and a second press roller in a press section of a papermaking machine comprising:
passing said paper web through said press nip between a first permeable press felt and a second permeable press felt, said first permeable press fabric having a front side in contact with said paper web and a back side facing away from said paper web and toward said first press roller;
passing an impermeable element through said press nip between said back side of said first permeable press felt and said first press roller so that, when said first permeable press felt expands upon leaving said press nip, a partial vacuum is created within said first permeable press felt to hold said paper web in contact therewith;
separating said second permeable press felt from said paper web, said first permeable press felt, and said impermeable element upon leaving said press nip, while maintaining contact between said impermeable element and said back side of said first permeable press felt and between said front side of said first permeable press felt and said paper web;
next separating said impermeable element from said back side of said first permeable press felt, so that said partial vacuum within said first permeable press felt is removed; and
next separating said paper web from said front side of said first permeable press fabric.

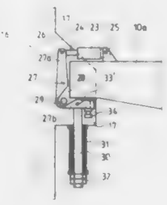
4,861,431

APPARATUS IN A CANTILEVERED FRAME PART OF A PAPER MACHINE

Aimo Törmänen, Jyväskylä, Finland, assignor to Valmet Paper Machinery, Inc., Finland

Filed Nov. 30, 1988, Ser. No. 278,187
Claims priority, application Finland, Dec. 3, 1987, 875332
Int. Cl.[4] D21F *3/02, 1/24*
U.S. Cl. 162—273 **5 Claims**

1. Apparatus in a cantilevered frame part of a press section and/or wire section of a paper machine located in a machine hall in which a cantilevered beam extends between side frames, said cantilevered beam including a projecting part, comprising:
a loading lever pivotally connected to said projecting part of said cantilevered beam;
power means mounted on said projecting part of said cantilevered beam for applying a force to said loading lever; and



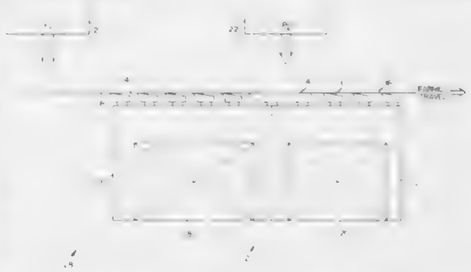
a pull/draw bar including one end pivotally connected to said loading lever and another end coupled to a stationary counter-member.

4,861,432

DUAL COMPARTMENT VACUFOIL UNIT TO ELIMINATE SECONDARY HEADBOX CHATTER

Roy Jones, Raleigh, N.C., assignor to Hayck Corporation, Wake Forest, N.C.

Division of Ser. No. 116,402, Nov. 3, 1987, Pat. No. 4,780,183. This application Jun. 2, 1988, Ser. No. 201,605
The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.
Int. Cl.[4] D21F *1/48*
U.S. Cl. 162—300 **3 Claims**



1. In a forming section of a papermaking machine used to produce linerboard grade or other multi-layer papers by applying a secondary discharge of pulp onto a primary paper sheet, said forming section including a primary headbox for discharging a primary pulp onto a traveling papermaking fabric to form the primary paper sheet and a secondary headbox for discharging a secondary pulp onto the primary paper sheet on the traveling papermaking fabric downstream in the direction of travel of the papermaking fabric from the primary headbox, a dual compartment vacufoil unit comprising:
a forming blade positioned directly beneath said secondary headbox so as to be positioned directly beneath the secondary pulp discharge;
an upstream vacuum compartment, said upstream vacuum compartment located beneath an upstream portion of said forming blade;
a downstream vacuum compartment, said downstream vacuum compartment located beneath a downstream portion of said forming blade; and
means to create pressure differentials in said upstream vacuum compartment and said downstream vacuum compartment, wherein the pressure differential in said upstream vacuum ocmpartment evacuates air and moisture from the primary paper sheet immediately before the secondary discharge of pulp is delivered onto the primary paper sheet and wherein the pressure differential in said downstream vacuum compartment evacuates air and moisture

from said primary sheet and the secondary pulp discharge after secondary pulp is discharged onto said primary paper sheet.

4,861,433

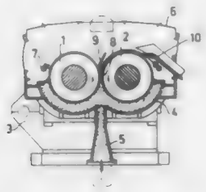
DEWATERING PRESS WITH PERFORATED METAL OUTER SHELL AND RESILIENT ELASTIC MOUNTING MEANS

Hans E. K. Eriksson, Sundsvall, Sweden, assignor to Sunds Defibrator Aktiebolag, Sweden

Continuation of Ser. No. 07/130,453, Nov. 13, 1987, abandoned. This application Mar. 21, 1989, Ser. No. 327,353

Int. Cl.[4] D21F *1/60, 1/74, 3/08*

U.S. Cl. 162—323 **10 Claims**



1. A press for dewatering pulp comprising a rotatable first press roll, a rotatable second press roll having an overall roll diameter, said second press roll including a substantially rigid roll body having a plurality of first apertures therethrough, a perforated metal outer shell surrounding said roll body to provide an annular region therebetween, and resilient mounting means of elastic material disposed within said annular region for mounting said metal outer shell to said rigid roll body, said resilient mounting means having a plurality of continuously open second apertures in communication with said plurality of first apertures of said rigid roll body, said first press roll positioned juxtaposed said second press roll to provide an extended nip therebetween in the range of about 3 to 5% of said overall roll diameter upon yielding of said metal outer shell due to the presence of said elastic material upon passage of pulp between said first and second press rolls during the dewatering of pulp, and a trough arranged so as to partially enclose therebeneath said first press roll and said second press roll, and means for supplying pulp to said trough.

4,861,434

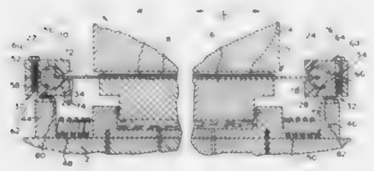
EXTENDED NIP PRESS APPARATUS WITH TRACKS TO SLIDEABLY ACCOMMODATE BEADED BLANKET EDGES

James Bonander, Clarks Summit, Pa., and Sergio Torza, International Falls, Minn., assignors to Beloit Corporation, Beloit, Wis.

Filed Oct. 21, 1988, Ser. No. 260,978

Int. Cl.[4] D21F *3/02*

U.S. Cl. 162—358 **14 Claims**



1. An extended nip press apparatus for pressing water from a web, said apparatus comprising:

a press frame;

a backing roll rotatably secured to said frame;

an elongate shoe connected to said frame, said shoe being movable relative to said roll, said shoe defining a concave surface having a lubricant thereon, said concave surface cooperating with said roll for defining therebetween an extended nip;

an endless blanket having a first and second lateral edge, said blanket sliding relative to said shoe, and extending contiguously with the web through said nip, such that the web is disposed between said blanket and said roll for pressing water from the web, said lubricant being supplied between said concave surface and said blanket;

first and second beads connected to said first and second edges respectively, said beads extending continuously around said respective edges; and

a first and second track rigidly secured in a radial direction to said frame, said first and second tracks constructed an arranged so as to slidably accommodate said first and second beads respectively, such that said edges of said blanket are guided by said tracks so that said blanket, said beads, and said tracks cooperate together to define an enclosure for confining said lubricant supplied between said concave surface and said blanket.

4,861,435

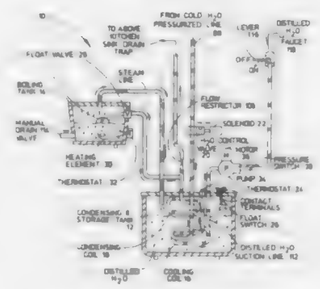
WATER DISTILLATION APPARATUS FOR UNDER-THE-SINK OPERATION

Herbert F. Sweet, Jr., 2412 Mount Blanco Rd., Chester, Va. 23831

Filed Jan. 25, 1988, Ser. No. 147,750

Int. Cl.[4] B01D *3/02*

U.S. Cl. 202—180 **8 Claims**



1. A water distillation apparatus, comprising in combination:

(a) means for generating pressurized steam including a boiling tank;

(b) means for condensing the pressurized steam into distilled water and for cooling the distilled water, said condensing and cooling means including

(i) a storage tank having an upper region in which steam is condensed and a lower region in which distilled water is collected and stored,

(ii) a cooling coil disposed in said storage tank at said lower region thereof below a desired level of distilled water stored therein, said cooling coil having a portion extending through said storage tank to the exterior thereof for connecting at the exterior of said storage tank and in flow communication with a source of pressurized feed water for receiving the same therethrough and causing cooling of the distilled water stored in said lower region of said tank in a heat exchange relationship with said cooling coil, and

(iii) a condensing coil disposed in said storage tank at said upper region thereof above the desired level of distilled water stored therein where the exterior surface of said condensing coil is contacted directly in a heat exchange relationship by steam located within said storage tank, said condensing coil connected in flow communication with and located above said cooling coil for receiving the feed water therefrom, said condensing coil also having a portion extending through said storage tank to the exterior of said storage tank for routing the feed water from said storage tank after passage through said cooling and condensing coils;

(c) means for supplying pressurized steam to said storage tank and means for supplying feed water to said boiling tank, said means for supplying pressurized steam to said storage tank including

a steam flow line located between said boiling tank and said storage tank and connecting said boiling tank in flow communication with said storage tank for permitting the flow of pressurized steam from said boiling tank into said storage tank, and said means for supplying feed water to said boiling tank including

(i) a water flow conduit means located between said boiling tank and said storage tank and having a main branch connected in flow communication with said condensing coil and a pair of secondary branches connected in flow communication with said main branch one of the pair connected to said boiling tank and the other of the pair to a drain line located above said storage tank, and

(ii) a flow restrictor interposed in the other of the pair of said secondary branches connected to the drain line so as to insure that there is sufficient head pressure to force the flow of water to said boiling tank.

3. A water distillation apparatus, comprising in combination:

(a) means for generating and supplying pressurized steam;

(b) means for condensing the pressurized steam into distilled water and for cooling the distilled water, said condensing and cooling means including

(i) a storage tank for storing a desired level of distilled water therein and in which steam is condensed above said distilled water level,

(ii) means for connecting said pressurized steam generating and supplying means in flow communication with said storage tank at an upper region thereof for permitting flow of pressurized steam into said storage tank,

(iii) a condensing coil disposed in said storage tank above the desired level of distilled water stored therein and for direct contact at its exterior surface in a heat exchange relationship with steam in said tank above the distilled water level, and

(iv) a cooling coil disposed in said storage tank below the desired level of distilled water stored therein and below said condensing coil, said cooling coil for receiving pressurized feed water and causing cooling of the distilled water stored in said storage tank in a heat exchange contacting relationship with said cooling coil, said condensing coil connected in flow communication with said cooling coil for receiving pressurized feed water therefrom, causing condensing of the steam into distilled water and routing the feed water to the exterior of said storage tank;

(c) means for controlling delivery of pressurized feed water from a source thereof to said cooling coil; and

(d) a temperature sensing element mounted on said tank and extending therein for sensing the temperature of said tank at the location where said sensing element is mounted on said tank and for actuating means for controlling delivery of pressurized water for either allowing or terminating delivery of pressurized feed water to said cooling coil depending upon the level of the temperature sensed by said sensing element within a predetermined temperature range.

4,861,436

RECOVERY OF 4-METHYL-3-PENTANONE FROM ACETIC ACID BY DISTILLATION

Lloyd Berg, 1314 S. 3rd Ave., Bozeman, Mont. 59715; Richard R. Rall, and Marc W. Paffhausen, both of Bozeman, Mont., assignors to Lloyd Berg, Bozeman, Mont.

Filed Feb. 7, 1989, Ser. No. 307,035

Int. Cl.[4] B01D *3/34;* **C07C** *45/82, 45/89*

U.S. Cl. 203—38 **1 Claim**

1. A method for recovering 4-methyl-2-pentanone from mixtures of 4-methyl-2-pentanone and acetic acid which comprises contacting a mixture of 4-methyl-2-pentanone and acetic acid with a mixture of dimethylsulfoxide and pelargonic acid in a rectification column, heating said mixtures in said column, allowing the acetic acid to decompose into ketene and water while in the rectification column, recovering the ketene, 4-methyl-2-pentanone and water as an overhead vapor stream, partially condensing the overhead vapor stream to recover ketene as a gaseous stream and 4-methyl-2-pentanone and water as a condensed liquid stream, separating the gaseous ketene stream from the condensed liquid stream, separating the condensed liquid stream into a 4-methyl-2-pentanone phase and a water phase, separating the two phases by decantation and obtaining the dimethylsulfoxide-pelargonic acid mixture and any undecomposed acetic acid from the stillpot.

4,861,437

METHOD OF MANFACTURING A MOULD AND PROVIDING IT WITH A BACKING AND MOULD MANUFACTURED ACCORDING TO THE INVENTION

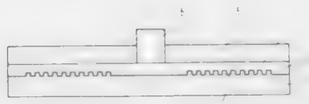
Hermann Koop, Roxxenberg, and Claudia Pechtheiden-Meier, Hanover, both of Fed. Rep. of Germany, assignors to Philips & DuPont Optical Company, New York, N.Y.

Filed Jul. 21, 1988, Ser. No. 223,466

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725231

Int. Cl.[4] C25D *1/10*

U.S. Cl. 204—5 **12 Claims**

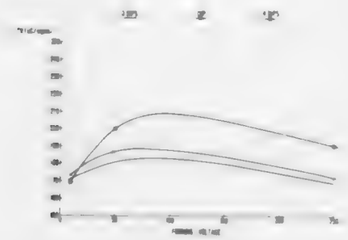


1. A method of manufacturing a mould (2) and providing said mould with a backing, which mould after at least one further multiplication step serves for manufacturing disc-shaped information carriers (1), and is derived from a parent information carrier (1) in an electroforming process in which an information structure (2) formed in the parent information carrier (1) is transferred to the mould (3), after which electroforming process and prior to its separation from the parent information carrier (1) the mould is provided at its back (4) with a backing (5) which serves for mechanical reinforcement, in which method the backing (5) is formed in the form of a UV-curable lacquer which is applied in liquid form, which is distributed over the back (4) of the mould (3), and which is subsequently cured by exposure to ultraviolet light.

4,861,438
METHOD OF MAKING PATTERNS
Christopher P. Banks, Saffron Walden, and Edward Irving, Burwell, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Jan. 17, 1989, Ser. No. 297,372
Claims priority, application United Kingdom, Jan. 27, 1988, 8801726
Int. Cl.[4] C25D *5/48, 9/02*
U.S. Cl. 204—15 20 Claims

1. A method of making a metallic pattern on a substrate having a surface comprising bare metal in predetermined areas and metal coated by a resist in remaining areas which comprises
(i) protecting the bare metal by electrodepositing thereon a heat-curable polymeric film having (a) a group which is reactive with an isocyanate group and (b) a blocked isocyanate group,
(ii) heating the electrodeposited polymeric film to render it resistant to a solvent with which the resist is removable,
(iii) removing the resist from said remaining areas using a solvent which does not remove the electrodeposited polymeric film, thereby exposing metal in said remaining areas, and
(iv) etching the metal exposed in step (iii) using an etchant which does not remove the electrodeposited polymeric film, thereby leaving a metallic pattern protected by the electrodeposited polymeric film.

4,861,439
METHOD OF IMPROVING THE CAPACITANCE OF ANODIZED ALUMINUM FOIL
James L. Stevens, Ireco, and Roland F. Dapo, Columbia, both of S.C., assignors to North American Philips Corporation, New York, N.Y.
Filed Jul. 5, 1988, Ser. No. 215,701
Int. Cl.[4] C25D *11/16, 11/20*
U.S. Cl. 204—27 15 Claims



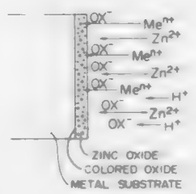
1. A method for increasing the capacitance of anodized aluminum foil particularly adapted for use as an anode in an electrolytic capacitor, said method comprising:
(a) wetting an etched aluminum foil with an aqueous solution of a salt of a valve metal, the oxide of which has a dielectric constant of at least about 20,
(b) heating said wetted foil at a temperature sufficient to dry said foil and convert said salt to said oxide and
(c) anodizing said thus treated foil.

2. A method for increasing the capacitance of anodized aluminum foil particularly adapted for use as an anode in an electrolytic capacitor, said method comprising:
(a) wetting an etched aluminum foil with an aqueous solution of a salt of a valve metal selected from the group consisting of Ti, Zr, Ta, Nb and W,
(b) drying said wetted foil at a temperature sufficient to dry said foil and convert said salt to an oxide and
(c) anodizing said thus treated foil.

4,861,440
ELECTROLYTIC FORMATION OF AN ALUMINUM OXIDE SURFACE
Charles P. Covino, Boas Rd., P.O. Box 265, Ringoes, N.J. 08551
Division of Ser. No. 41,723, Apr. 23, 1987, Pat. No. 4,784,732, which is a continuation-in-part of Ser. No. 888,695, Jul. 24, 1986, abandoned. This application Jul. 12, 1988, Ser. No. 218,084
The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.
Int. Cl.[4] C25D *11/08, 11/18*
U.S. Cl. 204—38.3 10 Claims

1. A process for making a composite aluminum article, which comprises immersing an aluminum substrate in an oxidizing acid bath containing sulfuric acid and a carboxylic acid; electrolytically forming on the surface of the aluminum substrate an irregular, highly porous, and ncoarsely crystalline aluminum oxide layer integral with such surface; during formation of the aluminum oxide layer, applying to the substrate a voltage which is steadily and continuously increased from start to finish of the electrolysis from about 5–15 volts to about 65–85 volts at a rate of about 1–3 volts/minute, and a current density which is increased from start to finish of the electrolysis from about 10–30 amps/sq. ft. to about 60–80 amps/sq. ft. at a rate of about 1–3 amps/sq. ft./minute; dehydrating the aluminum oxide layer to render it hygroscopic; and treating the hygroscopic aluminum oxide layer with an aqueous solution or suspension containing at least one salt having an anion, a cation, or both of a divalent metal or a trivalent metal.

4,861,441
METHOD OF MAKING A BLACK SURFACE TREATED STEEL SHEET
Katsuhi Saito; Yoshio Shindou; Toshimichi Murata; Fumio Yamazaki, and Takashi Shimaza, all of Kimitsu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed Aug. 13, 1987, Ser. No. 84,727
Claims priority, application Japan, Aug. 18, 1986, 61-192613; Sep. 6, 1986, 61-208863; Dec. 16, 1986, 61-299200
Int. Cl.[4] C25D *5/26*
U.S. Cl. 204—38.7 16 Claims



1. A method for making a colored zinc composite plated steel which comprises effecting the electrolysis in an acidic aqueous solution mainly composed of Zn^{2+}, coloring metal ion Me^{n+} and strongly oxidizing ion OX^- using steel sheet or said plated steel sheet as a cathode, said ion being at least one selected from the group consisting of NO_3^-, NO_2^-, ClO_4^- and ClO_3^- to deposit a colored composite-plating film mainly composed of metallic zinc or a zinc alloy and coloring metal oxide or hydrated oxide on said sheet at a coverage of 0.–5 g/m^2 and then applying a transparent top coat of 3 μm or less thick onto said film.

4,861,442
ZINC-NICKEL ALLOY PLATING BATH AND PLATING METHOD
Noriko Tanaka, Osaka, Japan, assignor to Okuno Chemical Industries Co., Ltd., Japan
Filed Feb. 21, 1989, Ser. No. 313,124
Claims priority, application Japan, Feb. 26, 1988, 63-45343
Int. Cl.[4] C25D *3/56*
U.S. Cl. 204—44.2 13 Claims

1. A zinc-nickel alloy plating bath comprising about 3 to about 30 g/l of Zn ion, about 0.2 to about 20 g/l of Ni ion, about 20 to about 300 g/l of alkali hydroxide, about 0.05 to about 10 g/l of amino-alcohol polymer, an Ni-complexing agent in an amount of about 1 to about 20 moles per mole of ni ion, and about 0.01 to about 20 g/l of amino acid and/or a salt of amino acid, the bath having a pH of 11 or more.

4,861,443
PROCESS FOR PREPARING 4,4'-ISOPROPYLIDENEDITHIO-BIS-(2,6-DI-TERTIARYBUTYLPHENOL) BY ELECTROCATALYSIS
Richard M. Van Effen, Midland, Mich., assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio
Division of Ser. No. 3,115, Jan. 14, 1987, Pat. No. 4,772,363.
This application Jun. 22, 1988, Ser. No. 209,763
Int. Cl.[4] C25B *3/00*
U.S. Cl. 204—72 6 Claims

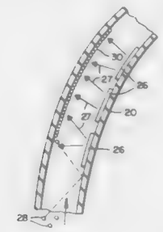
1. In a process for making 4,4'-isopropylidenedithiobis-(2,6-di-tertiarybutylphenol) by reduction of bis(3,5-di-tertiarybutyl-4-hydroxyphenol)polysulfide and reaction of the product with acetone, the improvement which comprises carrying out the reduction electrocatalytically at a lead cathode in an acidic electrolyte medium containing acetone and isolating 4,4'-isopropylidenedithio-bis-(2,6-di-tertiarybutylphenol) from the medium.

4,861,444
PROCESS FOR TREATING RADIOACTIVE MATERIAL TO MAKE IT SAFE FOR DISPOSAL
Glen J. Schoessow, 300 N.W. 34th Ter., Gainesville, Fla. 32607, and John A. Wethington, Jr., 109 N.W. 22nd Dr., Gainesville, Fla. 32605
Filed Sep. 6, 1988, Ser. No. 240,674
Int. Cl.[4] C02F *1/46*
U.S. Cl. 204—130 8 Claims

1. A process for making radioactive waste material disposable in an ecologically acceptable manner, which comprises: (a) preparing a solution or a dispersion of radioactive waste material in a liquid electrolyte; (b) subjecting the solution or dispersion to an electrolysis employing nonmetallic electrodes; (c) pyrolizing the electrodes containing said radioactive waste material that is substantially inseparable from the pyrolized electrode material by leaching.

4,861,445
BARRIER FOR MOLECULAR CONTAMINATES
Robert J. Champetier, San Pedro, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Dec. 24, 1987, Ser. No. 137,639
Int. Cl.[4] B01J *19/08;* B64G *1/46*
U.S. Cl. 204—157.3 12 Claims

1. A molecular contaminate entrapment apparatus comprising:
means for exhausting substantially all of a gas, including molecular contaminates, from an enclosure, said means for exhausting including an exhaust path having inner surfaces and at least one source of ionizing radiation disposed within said exhaust path and
upon said inner surfaces thereof, said at least one source being operable for polymerizing a molecular contaminate traversing said exhaust path such that the molecular contaminate is permanently immobilized upon said inner surfaces of said exhaust path.



4,861,446
TREATMENT OF GAS LIQUOR
Peter W. E. Blom, Vereeniging, and Johann H. Wingard, Johannesburg, both of South Africa, assignors to The Union Steel Corporation of South Africa Limited, Vereeniging and Edward L. Bateman Limited, Boksburg, both of, South Africa
Continuation of Ser. No. 108,696, Oct. 15, 1987, abandoned.
This application Jan. 5, 1989, Ser. No. 293,612
Claims priority, application South Africa, Oct. 16, 1986, 87/7844
Int. Cl.[4] C07C *3/24*
U.S. Cl. 204—170 12 Claims

1. A method for treating a raw gas containing a carbonaceous component resulting from a coal gassification process to increase its CO and H_2 content comprising passing said raw gas through a plasma arc heater in the presence of CO_2 and $H_2$to convert at least part of the carbonaceous component therein to a mixture of CO and H_2.

4,861,447
PROCESS FOR REDUCING CORROSIVE IMPURITIES IN SULFOLANE USED FOR EXTRACTING AROMATIC HYDROCARBONS
George C. Blytas, and Robert F. Knott, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.
Filed May 27, 1988, Ser. No. 199,837
Int. Cl.[4] B01D *17/06;* B03C *5/00;* C02F *1/48*
U.S. Cl. 204—181.8 4 Claims

1. A process for reducing the level of corrosive impurities in sulfolane solution containing corrosive impurities and originating from a process for the extraction of aromatic hydrocarbons from petroleum, which process comprises in sequence:
(a) providing an aqueous solution containing less than about 80% by weight of said sulfolane containing corrosive impurities as feed to a membrane-containing electrodialysis unit,
(b) electrodialyzing said feed to obtain: (1) a concentrate stream containing a substantial portion of said corrosive impurities, and (2) a diluate stream containing a major portion of said sulfolane, and
(c) withdrawing said diluate stream from said electrodialysis unit.

4,861,448
ELECTROPHORETIC METHODS EMPLOYING GEL INSERTS

Charles R. Cantor, and David C. Schwartz, both of New York, N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Division of Ser. No. 654,641, Sep. 25, 1984, Pat. No. 4,695,548, which is a continuation-in-part of Ser. No. 442,580, Nov. 18, 1982, Pat. No. 4,473,452. This application Sep. 22, 1987, Ser. No. 99,535
Int. Cl.[4] C25D *13/00*
U.S. Cl. 204—182.8 11 Claims

1. In an electrophoretic method for separating particles by subjecting the particles in a suitable medium to an electric field so as to move the particles, the improvement comprising first suspending the particles in a liquid agarose or acrylamide compatible with the medium and capable of solidifying into a gel to form a solid gel matrix containing the particles, allowing the liquid containing the suspended particles to solidify and inserting the solidified gel into the medium and then subjecting the particles to the electric field.

4,861,449
COMPOSITE ANODE

Hank St. Onge, 226 Catalina Dr., Scarborough Ontario, Canada

Filed Feb. 8, 1988, Ser. No. 153,789
Int. Cl.[4] C23F *13/00*
U.S. Cl. 204—197 19 Claims



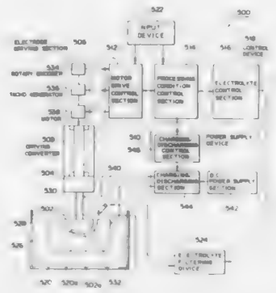
1. A composite sacrificial anode comprising a core of a metal having a negative potential relative to steel, and an adjacent electrode, said adjacent electrode having a first substrate of a material having a positive potential relative to steel generally facing said core and a second
substrate in direct electrical communication with said first substrate and of a material having negative potential relative to steel substantially shielded from said core by said first substrate having a positive potential relative to steel, said core including means for securing an electrical lead thereto, said anode including a suitable porous material between said core and said electrode which tends to retain water, said anode producing a potential voltage in the presence of an electrolyte between said core and electrode which is the collective effect of the material of said core and the materials of said electrode.

4,861,450
POWER SUPPLY SYSTEM FOR ELECTROLYTIC PROCESSING APPARATUS

Teruo Aonoka, Kakogawa, and Shogo Yoshioka, Iwata, both of Japan, assignors to Shimooka Seiki Co., Ltd., Shizuoka, Japan

Filed Apr. 29, 1988, Ser. No. 188,316
Claims priority, application Japan, Jul. 7, 1987, 62-169945
Int. Cl.[4] B23H *3/02*
U.S. Cl. 204—224 M 5 Claims

1. A power supply system for an electrolytic processing apparatus of the type having an electrode which is positioned to oppose a work within an electrolyte such that the work is processed and finished by discharge of pulses of different current densities between the work and the electrode, comprising: a plurality of capacitors capable of discharging charges so as to supply discharge pulses across said work and said electrode, charging means for selectively supplying electric charge to each said capacitor as a function of the voltage currently on the capacitor, a plurality of discharge switches connected between said capacitors and the work and adapted to selectively cause the charges from said capacitors to be discharged; and control section means for simultaneously turning a plurality of said discharge switches on and off in accordance with said current densities; wherein at least two groups of said plurality of said capacitors and at least two groups of said plurality of discharge switches are provided, and wherein said charging means includes means for charging the capacitors of the other said group to a second voltage different from said first voltage.



4,861,451
CHLORINATOR CELL

Lennie F. David, Victoria, Australia, assignor to Hammond Royce Corporation Pty. Limited, Victoria, Australia

Filed Nov. 23, 1987, Ser. No. 123,731
Int. Cl.[4] C25B *9/00, 15/08*
U.S. Cl. 204—230 6 Claims



1. An electrolyte cell comprising an elongated body adapted to be disposed with the longitudinal axis thereof horizontal, an inlet into and an outlet from the body, both the inlet and outlet being on the lower surface of the body, electrodes located within the body and having conductors extending outwardly therefrom, the arrangement being such that, if there is any build up of gas within the body, then the liquid in the body is displaced by the gas, thereby exposing part of the electrodes, thus reducing the amount of electrolysis until, when the electrodes are fully exposed, electrolysis ceases completely.

4,861,452
FIXTURE FOR PLATING TALL CONTACT BUMPS ON INTEGRATED CIRCUIT

Roger J. Stierman, Richardson; Archie N. McCauley, Little Elm, and Robert C. Zart, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 13, 1987, Ser. No. 37,760
Int. Cl.[4] C25D *17/06*
U.S. Cl. 204—297 W 12 Claims

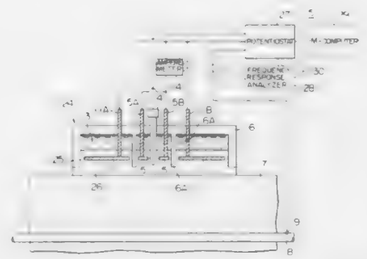


1. A bump plating fixture for minimizing the number of trapped bubbles in the vias on a wafer, comprising:
holding means for holding the wafer in a face up orientation;
wherein the holding means includes sealing means for preventing the plating bath from coming into contact with the back of the wafer;
anode means disposed above the holding means;
frame means for supporting the anode means a fixed distance above the holding means and the wafer;
cathode connection means for electrically biasing metallization on the face of the wafer to be the plating cathode;
top plate means for supporting the anode means, wherein the top plate means is supported by the frame means; and
base plate means for supporting the holding means.

4,861,453
CORROSION DETECTING PROBE FOR STEEL BURIED IN CONCRETE

Kazumi Matsuoka; Hiroshi Kihira; Satoshi Ito, and Tomomi Murata, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 137,027
Claims priority, application Japan, Dec. 26, 1986, 61-310706
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—404 6 Claims

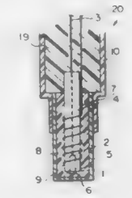


1. A corrosion detecting probe for inspecting the state of corrosion of a steel material buried in a concrete structure, comprising:
a container made of an electrically insulating material and including an open end adapted to be in close contact with a surface of a concrete layer coating of said steel material to be measured and closed by a cover member made of a water permeable porous material, said container being filled, at least when the probe is used, with an electrolyte solution to such a level that said cover is sufficiently impregnated with said electrolyte solution;
an electrode assembly immersed at least partially in said electrolyte solution and including a reference electrode, a counter electrode having an electrode plate of a configuration symmetrical with respect to said reference electrode and disposed outside of said reference electrode at a distance therefrom, and a current flow line control electrode having an electrode plate of a configuration symmetrical with respect to said reference electrode and disposed outside of said counter electrode at a distance from said counter electrode in a same plane as said electrode plate of said counter electrode; and
terminal means for connecting said reference electrode, said counter electrode and said current flow line control electrode to an electrochemical measuring apparatus.

4,861,454
OXYGEN SENSOR

Norihiko Ushizawa, and Takeshi Shimomura, both of Fujinomiya, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 8,365, Jan. 29, 1987, abandoned. This application Sep. 12, 1988, Ser. No. 244,616
Claims priority, application Japan, Feb. 4, 1986, 61-22509
Int. Cl.[4] G01N *27/30*
U.S. Cl. 204—414 16 Claims



1. An oxygen sensor comprising an electrically conductive carbon substrate and an electrolytic oxidation polymeric membrane formed by electrolytic polymerization coating a surface of said electrically conductive substrate, said electrolytic oxidative polymeric membrane comprising at least one substance selected from porphyrin compounds in which a hydroxy aromatic derivative is substituted at the meso-position and porphyrin compounds in which an amino aromatic derivative is substituted at the meso-position, and metal complexes thereof.

5. An oxygen sensor comprising:
an oxygen electrode consisting of an electrically conductive carbon substrate directly coated with an electrolytic oxidative polymeric membrane, said membrane being formed by electrolytic polymerization and comprising at least one substance selected from porphyrin derivative compounds and metal complex compounds thereof;
a reference electrode wound around said oxygen electrode and having an insulator formed therebetween;
a gelled polymeric electrolyte in which said oxygen electrode and said reference electrode are immersed; and
an oxygen-selective permeable membrane coating said gelled polymeric electrolyte.

4,861,455

ELECTRODE MEMBRANE

Hideki Segihara; Kazuhisa Hiratani, and Tatsuhiro Okada, all of Tsukuba, Japan, assignors to Director General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 28, 1988, Ser. No. 174,040
Claims priority, application Japan, Oct. 13, 1987, 62-257535
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—418 **9 Claims**

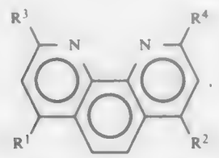


1. An electrode membrane having selectivity for lithium ions which is shaped from a polymeric composition comprising, in admixture;

(a) a polymeric material;

(b) a plasticizer; and

(c) an aromatic compound having a structure of 1,10-phenanthroline represented by the general formula



in which R^1 and R^2 are each an atom or group selected from the class consisting of a hydrogen atom, alkyl groups, aryl groups and aralkyl groups and R^3 and R^4 are each a group selected from the class consisting of alkyl groups, aryl groups and aralkyl groups.

4,861,456

ELECTROCHEMICAL DEVICE

Syunzo Mase, Aichi, and Shigeo Soejima, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Continuation of Ser. No. 858,826, Apr. 29, 1986, abandoned, which is a continuation of Ser. No. 670,878, Nov. 13, 1984, abandoned. This application Nov. 9, 1987, Ser. No. 119,281
Claims priority, application Japan, Nov. 18, 1983, 58-218399
The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—425 **15 Claims**

1. An electrochemical device for determining or controlling the concentration of specific components of a fluid, comprising:

a plurality of solid electrolyte bodies;

at least one pair of electrodes in communcation with a gaseous fluid and in contacting engagement with exterior and interior surfaces of at least one of said plurality of solid electrolyte bodies;

at least one conductor disposed on said interior surface of said at least one solid electrolyte body, in electrical connection with each of the electrodes of said at least one pair of electrodes; and

at least one electrical insulation layer located between at least one of said at least one conductor and said interior surface of said at least one solid electrolyte body upon which said at least one conductor is disposed, and covering a substantial portion of said at least one conductor, said at least one conductor being isolated from direct communication with any gaseous fluid, for effectively



protecting said at least one solid electrolyte body against electrolysis.

4,861,457

CRYSTALLINE GALLOPHOSPHATE COMPOSITIONS

Stephen T. Wilson, Shrub Oak; Naomi A. Woodard, Peekskill, and Edith M. Flanigen, White Plains, all of N.Y., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 53,735, May 26, 1987, Pat. No. 4,799,942, which is a division of Ser. No. 811,282, Dec. 20, 1985, Pat. No. 4,690,808. This application Oct. 12, 1988, Ser. No. 256,753
Int. Cl.[4] C10G *11/04, 47/04;* **C07C** *2/10, 2/18*
U.S. Cl. 208—46 **11 Claims**

1. A process for converting a hydrocarbon comprising contacting the hydrocarbon under hydrocarbon converting conditions with a crystalline gallophosphate composition having a framework structure whose chemical composition expressed in terms of mole ratios of oxides is

$$mR:Ga_2O_3:1.0\pm0.2P_2O_5$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system, "m" has a value of from 0.02 to 0.3 and represents the moles of "R"; said framework structure being microporous in which the pores have nominal diameters within the range of about 3 to about 10 Angstroms to give a hydroconverted product.

4,861,458

PROCESS FOR CATALYTIC CRACKING OF A HYDROCARBON CHARGE SUBJECTED TO A PRETREATMENT WITH SOLID PARTICLES OF LOW ACTIVITY

Gérard Martin, Rueil-Malmaison, and Alain Feugier, Orgeval, both of France, assignors to Institut Francais Du Petrole, Rueil-Malmaison, France

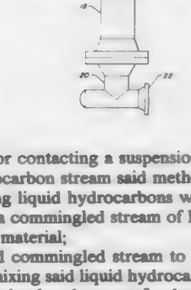
Continuation of Ser. No. 929,450, Nov. 12, 1986, abandoned. This application Aug. 29, 1988, Ser. No. 239,006
Claims priority, application France, Jun. 2, 1986, 86 08008; Nov. 12, 1986, 85 17817
Int. Cl.[4] C10G *51/04*
U.S. Cl. 208—73 **14 Claims**

1. A process for the fluid bed catalytic cracking of a hydrocarbon charge containing residual products in a reaction zone wherein catalyst particles circulate under cracking conditions, wherein the charge is subjected to at least one pretreatment comprising:

providing solid particles in at least one enclosure comprising a central axis and an internal periphery and circulating said solid particles in a pretreatment zone of said enclosure at the internal periphery of the enclosure, said solid particles having low catalyst activity being distinct from said catalyst particles:

contacting at least a portion of said charge with said solid particles;

circulating in said enclosure in vortex flow, said charge and said solid particles cocurrently so that a pretreatment



effluent, free of the major part of said residual products is obtained;

separating said effluent from said solid particles in said enclosure,

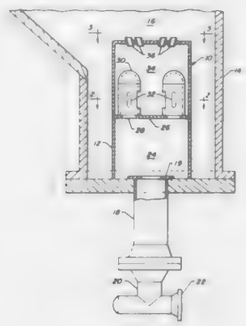
feeding said pretreatment effluent substantially free of solid particles directly into the reaction zone, said effluent being at a temperature substantially equal to the temperature prevailing in said enclosure, said reaction zone being telescoped at least in part on said enclosure substantially along the central axis.

4,861,459

LOW PRESSURE MIXING PROCESS FOR ATOMIZING FLUIDS

Ismail B. Cetinkaya, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 16, 1987, Ser. No. 5,044
Int. Cl.[4] C10G *11/18;* **B01J** *8/18*
U.S. Cl. 208—157 **11 Claims**



1. A method for contacting a suspension of fluidized particles with a hydrocarbon stream said method comprising:

(a) commingling liquid hydrocarbons with a gaseous material to form a commingled stream of liquid hydrocarbons and gaseous material;

(b) passing said commingled stream to a mild mixing zone and mildly mixing said liquid hydrocarbons and said gaseous material in the absence of substantial quantities of particles to form a mixture having a distribution hydrocarbon and gaseous material of increased uniformity relative to said commingled stream;

(c) passing said mixture from said mild mixing zone to a vigorous mixing zone and vigorously mixing said mixture in the absence of substantial quantities of particles by dividing said mixture plurality of discrete streams and directing the projection of each of said on streams into impingement with an impact medium, said impact medium comprising at least one of an imperforate wall section or another of said discrete stream homogenize said hydrocarbons and said gaseous material; and

(d) passing said mixture from said vigorous mixing zone to a discharge zone and discharging said mixture through a discharge zone into a stream of fluidized particles, said discharge zone including at least one discharge device for atomizing said liquid hydrocarbons into a mist of fine droplets and dispersing said mist over said suspension of fluidized particles.

4,861,460

HYDROTREATING WITH WIDE-PORE HYDROGEL-DERIVED CATALYSTS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 924,228, Oct. 28, 1986, Pat. No. 4,717,706. This application Aug. 13, 1987, Ser. No. 84,778
Int. Cl.[4] C10G *45/08*
U.S. Cl. 208—216 PP **61 Claims**

1. A process for hydrotreating metals-containing crude oil feedstocks by contacting said feedstocks at a temperature in the range of from about 300° F. to about 850° F. and a pressure in the range of from about 200 psig to about 2500 psig with a hydrotreating catalyst which has a surface area above about 300 m^2/g and at least about 20% of its pore volume in pores having diameters greater than about 150 Å, wherein said catalyst is prepared by a process which comprises:

(a) precipitating an aqueous solution of one or more aluminum salt(s) in the presence of a phosphorus-containing compound in an amount of from about 0.06 to about 0.30 moles of phosphorus per mole of aluminum in an aqueous solution containing about 15%v to about 50%v of an alcohol selected from the group consisting of methanol, ethanol and mixtures thereof, by adjusting the pH of said solution to a range between about 5.5 and about 10.0,

(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 9.0 to about 12.0,

(c) washing the precipitate,

(d) mixing the precipitate with a solution containing solubilized salts of a heavy metal selected from the group consisting of molybdenum, tungsten and mixtures thereof, and an element selected from the group consisting of nickel, cobalt and mixtures thereof, at a pH in the range between about 4.0 and about 8.0 and a temperature in the range between about 20° C. and about 90° C. until adsorption of said salts onto the gel is sufficient to yield a final catalyst having a catalytically effective amount of metals present,

(e) extruding the product of step (d), and

(f) drying and calcining the product of step (e) at a temperature ranging from about 300° C. to about 900° C.

4,861,461

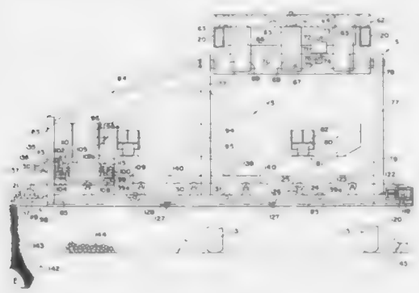
PIPELINE PADDING MACHINE AND METHOD

Eugene C. Utterback, 484 W. Remus Rd., Mt. Pleasant, Mich. 48858

Filed Jun. 8, 1987, Ser. No. 59,491
Int. Cl.[4] E02F *5/22*
U.S. Cl. 209—234 **32 Claims**

1. In a pipeline padding supplying system for supplying earth of a fine consistency to cover and pad a pipeline disposed in a trench, the combination comprising:

a. a vehicle frame supported for travel longitudinally along a highway, or alternately along a trench;
b. hopper means into which raw earth, containing large chunks and rocks, is supplied at one end of the frame;
c. a longitudinally disposed conveyor, having an end disposed beneath said hopper means to receive earth from the hopper and convey said earth longitudinally toward the opposite end of the frame;
d. vibrating screen means mounted on said frame to receive earth from the opposite end of said conveyor;
e. a cross conveyor mounted by said frame beneath said vibrating screen means for pivotal movement about a vertical axis from a position in which it is longitudinally aligned with said vehicle frame and longitudinally disposed conveyor for transport therewith when the vehicle frame is moving from one job location to another to a position crosswise to said frame and longitudinally disposed conveyor, said crosswise conveyor being of a length to have one end disposed beneath the vibrating screen means to receive screened earth therefrom and another discharge end projecting out over said trench to deliver screened earth thereto as the vehicle is moved longitudinally along said trench; and
f. a tailings conveyor associated with said vibrating screen means to receive material screened out by said vibrating screen means, and having a discharge end located at a spaced distance from said discharge end of the cross conveyor to discharge the tailings remotely from the screened earth.

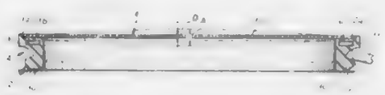


4,861,462

METHOD OF FORMING SIEVE UNIT FOR SCREENING MACHINE

Wolfgang Lehmann, Oberndorf-Kuppenheim, and Christian Neukam, Karlsruhe, both of Fed. Rep. of Germany, assignors to Heis, Lehmann AG, Dusseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 859,129, May 2, 1986, abandoned. This application Sep. 11, 1987, Ser. No. 96,035
Claims priority, application Fed. Rep. of Germany, May 3, 1985, 3515937
Int. Cl.[4] B07B *1/30, 1/46;* **B29C** *63/44, 65/04*
U.S. Cl. 209—269 **15 Claims**



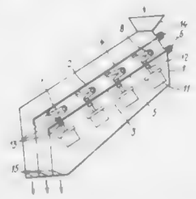
1. A method of making a rectangular sieve unit for removable mounting in a screening machine, comprising the steps of:
(a) forming a substantially rectangular frame body of a synthetic resin or elastomeric material with a reinforcement received therein, said frame body having a substantially rectangular window surrounded by said frame body;
(b) uniformly heating a substantially rectangular screen layer of synthetic resin or elastomeric material with original length and width dimensions in excess of those of said window over the entire area of said screen layer thermally to elongate said screen layer in its length and with dimensions;
(c) thereafter affixing said screen layer to said frame body across said opening all around the peripheries of said screen layer and said frame body;
(d) thereafter cooling said screen layer while said screen layer is affixed to said frame body to contact said screen layer is its length and width dimensions and develop a screening tension in said layer of the sieve unit formed by said frame body and said layer and;
(e) mounting said sieve unit in a screening machine for the screening of material by vibration of said layer.

4,861,463

VIBRATORY SCREENING MACHINE

Vladimir F. Slesarenko, Leningrad, U.S.S.R., assignor to Vsesojuzny Nauchno-Issledovatelsky Institut Mekhanicheskoi Obrabotki Poleznykh Iskopaemykh, Leningrad, U.S.S.R.

Filed Dec. 3, 1987, Ser. No. 128,270
Claims priority, application U.S.S.R., Dec. 10, 1986, 4158006
Int. Cl.[4] B07B *1/28*
U.S. Cl. 209—315 **3 Claims**



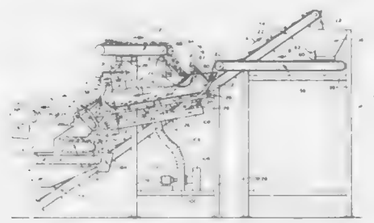
1. A vibratory screening machine comprising
a frame;
an upper screen and a lower screen with meshes provided therein, arranged in said frame so that an interscreen space is formed between said screens, the size of said meshes in said upper screen exceeding the size of said meshes in the lower screen, and said upper screen extending in a first plane and said lower screen extending in a second plane;
pushers formed by said double-arm levers, each of them including a first arm, a second arm, and a section common to both arms, said first arms of said lvers being longer than said second arms, said first arms being unattached to and making contact with said upper screen, and said second arms being unattached to and making contact with said lower screen;
supports for mounting said pushers thereon, located in said interscreen space and fixed in said frame, said sections common to both arms being hinged to said supports and
vibrating drives in communication with said pushers for imparting vibrational movement thereto such that said pushers impart vibrational movements to the screens in a direction substantially perpendicular to the first and second planes.

4,861,464

METHOD AND APPARATUS FOR SEPARATION USING FLUIDIZED BED

Arthur Zaltzman, Bat-Yam; Zeev Schmilovitch, MOB P. Ephraim, both of Israel; Brahm P. Verma, Griffin, Ga., and Aharon Hoffman, Ramat-Gan, Israel, assignors to State of Israel, Ministry of Agriculture, Jerusalem, Israel

Filed May 29, 1987, Ser. No. 55,705
Int. Cl.[4] B07B *4/08, 11/00, 13/08*
U.S. Cl. 209;474 **54 Claims**



1. An apparatus for separation of a mixture of articles into a float fraction of the mixture made up of articles generally having a first density and a sink fraction of the mixture made up of articles generally having a second density that is greater than the first density, the apparatus comprising:
(a) an inclined channelization means having input and output ends and otherwise enclosed along the length of the sides and bottom thereof so as to form a continuous channel for containing a fluidized bed flowing under the influence of gravity from said input end to said output end thereof, said channelization means being laterally narrower at said output end than at said input end thereof to progressively increase the depth of said fluidized bed in the direction of the flow thereof;
(b) medium feed means for supplying to said input end of said channelization means a fluidization medium from which to create a fluidized bed in said channelization means;
(c) pneumatic means for forcing gas upwardly through said fluidization medium in said channelization means to create from said fluidization medium a fluidized bed having a substantially uniform density regardless of said progressive increase in the depth of said fluidized bed in the direction of the flow thereof, said density of said fluidized bed being intermediate the densities of the articles of the float and sink fractions of the mixture; and
(d) mixture feed means for supplying the mixture of articles to said input end of said channelization means for entrainment in said fluidized bed.

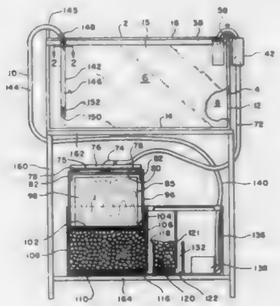
4,861,465

ANTI-REVERSE SIPHONING WATER CIRCULATING SYSTEM FOR AQUARIUMS

Stanley D. Augustyniak, 4029 Fern Ave., Lyons, Ill. 60534

Filed Jan. 25, 1988, Ser. No. 148,051
Int. Cl.[4] A01K *63/00*
U.S. Cl. 210—109 **15 Claims**

1. Apparatus for use in a recirculating purifying system of an aquarium having a tank containing a body of water comprising:
means for withdrawing water from the tank, and means for replenishing the withdrawn water into the tank, comprising:
a U-shaped nozzle in the form of a siphon having a bight portion and a discharge leg joined in curved juncture with the bight portion, said leg extending into the water in the tank and having a lower end positioned adjacent to the bottom of the tank, and
means on said nozzle comprising apertures in the nozzle at the curved juncture of the bight portion with said discharge leg and positioned above the water level for spraying water onto the top surface of the water in the tank for creating ripples and aerating the water.

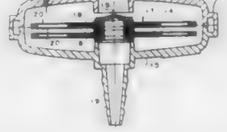


4,861,466

PRESSURE FILTER ASSEMBLY WITH BLEED VALVE

Richard A. Leoncavallo, Pittsford; Gregory R. Phillips, Penfield, and Ravinder C. Mehra, Fairport, all of N.Y., assignors to Naige Company, Rochester, N.Y.

Filed Apr. 14, 1988, Ser. No. 181,416
Int. Cl.[4] B01D *27/10, 35/14*
U.S. Cl. 210—120 **8 Claims**



1. A plastic pressure filter assembly having a housing which forms a filtering chamber, filter means disposed within said filtering chamber for filtering a liquid, said housing having an inlet for allowing a liquid to be filtered to flow within the filtering chamber, an outlet for allowing a filtrate to exit said filtering chamber and a bleed valve assembly for removing trapped air or gas within said filtering chamber, said bleed valve assembly comprising:
a stem secured to said housing, said stem having a bore extending therethrough into said filtering chamber, said bore having a first longitudinal section defining a longitudinal axis which communicates with atmosphere, transition section having a cross sectional diameter which decreases in size along its length and a narrow section which communicates with said filtering chamber, said transition section having an annular mating sealing surface disposed at an acute angle with respect to the longitudinal axis of said bore;
a bleed cap having means for engaging said stem portion, said cap having a central longitudinal plunger which extends into said bore of said stem, said plunger having a first longitudinal section, a contact annular tip section for mating with said annular mating sealing surface and a longitudinal inner end capable of extending into said narrow section of said bore, said cap when tightly secured to said stem causes said contact annular tip section to matingly seal with said annular mating sealing surface of said

transition section and when said cap is loosened causes said contact annular tip section to move away from said transition section to allow controlled escape of air trapped within said filtering chamber to atmosphere.

4,861,467

SYSTEM FOR REMOVING CONTAMINANTS FROM AN OIL TANK IN A HYDRAULIC DEVICE

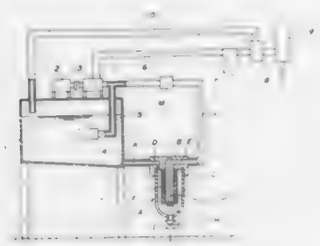
Hiroshi Fukuhara, Yokohama, Japan, assignor to Fukuhara Seisaku Co., Ltd., Japan

Continuation of Ser. No. 20,995, Mar. 2, 1987, abandoned. This application Jun. 7, 1988, Ser. No. 207,900

Claims priority, application Japan, Nov. 7, 1986, 61-171831[U]

Int. Cl.[4] B01D *21/00*

U.S. Cl. 210—168 **1 Claim**



1. A hydraulic system comprising:
an oil tank, said oil tank having four sides, a bottom, and a top so as to define a volume for containing oil;
inlet means for directing oil into said oil tank;
first outlet means for withdrawing oil from said oil tank, said first outlet means being positioned so as to withdraw oil from said bottom of said oil tank;
a first flow path originating at said first outlet means;
filter means for removing oil contaminants passing therethrough, said filter means being fluidly coupled to said first flow path so as to remove contaminants from oil passing through said first flow path;
second outlet means for withdrawing oil from said oil tank, said second outlet means being positioned within said volume;
a suction strainer mounted to said second outlet means;
a second flow path originating at said second outlet means;
said first and second flow paths being fluidly coupled to define a recombined flow path downstream of said filter means, there being simultaneous flow through said first outlet means and said second outlet means;
hydraulic pump means fluidly coupled to said recombined flow path for drawing oil therethrough and supplying pressurized oil;
a motor for driving said pump means;
secondary filter means fluidly coupled to said recombined flow path downstream of said pump means for filtering oil flowing through said recombined flow path;
return means for returning oil to said oil tank via said inlet means; and
flow rate throttle means defined within said first flow passage between said filter and said pump means for throttling the flow of oil to said pump means from said filter means and said first outlet means.

4,861,468

ROTOR IMPELLER ASSEMBLY

Allan H. Willinger, Oakland, N.J., and Jonas Ivasauskas, West Nyack, N.Y., assignors to Willinger Brothers, Inc., Oakland, N.J.

Filed Feb. 1, 1988, Ser. No. 150,932

Int. Cl.[4] A01K *63/04*

U.S. Cl. 210—169 **2 Claims**



1. An aquarium filter comprising a filter housing having an intake chamber for receiving contaminated aquarium water and a filter chamber in which the contaminated aquarium water is filtered and subsequently discharged back into the aquarium, a stator unit mounted onto the housing, and having a well therein, and a rotor assembly electromagnetically driven by said stator unit, said rotor assembly comprising a shaft, a magnetic rotor directly mounted onto the shaft and supported within said well, and an impeller rotatably mounted with respect to the shaft and driven by said magnetic rotor, said impeller drawing the aquarium water into the filter and into the well, said magnetic rotor being arranged to fit within said well, said magnetic rotor including an integral magnetic tube, with said tube and rotor being integrally formed of injection molded magnet material, said rotor and tube having a tapered coaxial bore and a push-in bearing inserted into at least one end of said bore for alignment of the shaft in the rotor, and said impeller comprises a sleeve mounted over said tube.

4,861,469

FUEL TANK DEWATERING APPARATUS

James L. Rossi, San Jose, and Franklin B. Lawrence, Los Gatos, both of Calif., assignors to American Transportation Technology, Inc., Los Gatos, Calif.

Filed Apr. 28, 1988, Ser. No. 187,498

Int. Cl.[4] B01J *20/22*

U.S. Cl. 210—172 **6 Claims**



1. For use in conjunction with an engine fuel tank having a bottom and having an inlet therein for filling the tank with liquid fuel, the combination which comprises:
(a) a substantially hollow and cylindrical submersible container adapted for insertion into and removal from the fuel tank through said inlet;
(b) said container comprising an elongate, substantially rigid structural cage, which encompasses an elongate cylindrical volume, and a correspondingly cylindrical screen immediately encompassed by, contained within and secured to the cage;
(c) the cage having a plurality of circumferentially spaced longitudinal ribs, a plurality of longitudinally spaced circumferential ribs, and opposite end closures, said ribs and end closures being joined together;
(d) said cylindrical screen being secured within the confines of said spaced longitudinal and spaced circumferential ribs and providing porous wall portions of substantial extent exposed therebetween along the length and around the girth of the container and, in conjunction with the cage, defining a substantially open and fixed, approximately cylindrical internal volume;
(e) elongate tie means for manually retrieving the container from the bottom of the fuel tank through said inlet, the tie means having proximate and distal end portions;
(f) means for attaching the distal end portion of the tie means to the structural cage of the container;
(g) means for releasably anchoring the proximate end portion of the tie means at an accessible location near said fuel tank inlet;
(h) a dry volume of particulate hygroscopic material disposed inside the container and filling a minor portion of said fixed internal volume of said container, said hygroscopic material being expandable to n any times said dry volume in the presence of water;
(i) said exposed porous wall portions of the screen being permeable to air, water and to the liquid fuel, but substantially impermeable to the hygroscopic material; and,
(j) the dry volume of said hygroscopic material in said container being selected to limit its fully expanded volume in the presence of water to a predetermined hydrated volume which substantially fills said fixed internal volume of the container without rupturing the container, or extruding the material through the porous wall portions of the container, whereby said container with the hygroscopic material therein may be inserted into and later retrieved from the fuel tank to remove water from the liquid fuel therein.

4,861,470

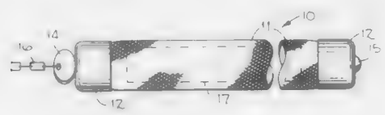
DEVICE FOR REMOVING WATER FROM A FUEL TANK

Edward P. J. Casey, 3546 Speno Dr., San Jose, Calif. 95117

Filed Nov. 16, 1987, Ser. No. 121,392

Int. Cl.[4] B01D *15/00, 27/08, 29/10*

U.S. Cl. 210—172 **9 Claims**



1. A water absorbent device comprising:
(a) a permeable housing having at least one open end;
(b) permeable means removably disposed within said housing, said permeable means including a removable permeable container;
(c) water absorbing material disposed within said permeable container; and
(d) a removable closure at said open end of said housing for retaining said removable permeable container within said housing and for removing said removable permeable container from said housing.

4,861,471

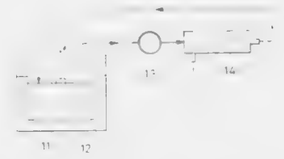
ACTIVATED SLUDGE TREATMENT APPARATUS

Shinichi Nakao; Shunji Yasuda, and Shigehito Ikeda, all of Nagareyama, Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1987, Ser. No. 28,418

Int. Cl.[4] B01D *36/04*

U.S. Cl. 210—182 **3 Claims**



1. An activated sludge treatment apparatus comprising:
a bath;
a sludge tank for containing waste water and for treating activated sludge, said tank being in thermal communication with said bath so as to maintain a substantially constant temperature within said tank;
a ceramic filter for separating waste water into activated sludge and treated water, said filter having a multi-layer structure which becomes gradually larger in pore diameter from its inner surface toward its outer surface and having an inlet, a first outlet located at a side opposite said inlet, and a second outlet located at a side adjacent said inlet, wherein the waste water passes through the interior of the ceramic filter, the treated water is obtained at said second outlet and the activated sludge is obtained at said first outlet;
a first passage connecting said tank to said inlet of said filter, so as to facilitate the passing of the waste water from said tank into said filter;
a second passage connecting said first outlet of said filter to said tank, so as to facilitate the passing of the activated sludge from said filter into said tank.

4,861,472

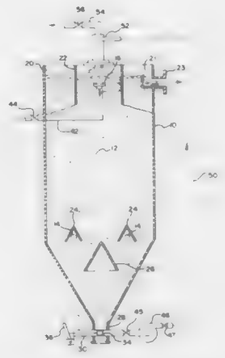
APPARATUS FOR FILTRATION OF A SUSPENSION

Frank G. Weis, Kansas City, Mo., assignor to Smith & Loveless, Inc., Lenexa, Kans.

Filed Jul. 14, 1988, Ser. No. 219,078

Int. Cl.[4] B01D *29/08*

U.S. Cl. 210—189 **7 Claims**



1. A filtration apparatus, comprising: a housing defined a lower zone for containing a filter bed of particle filter media

and an upper zone for receipt of filtered liquid passing through said filter bed thereinto; a bed of particle filter media in said lower zone; an inlet means extending into a lower portion of said filter bed for directing a liquid suspension to be filtered upwardly through said filter bed into said upper zone; a filtered liquid outlet means for withdrawing filtered liquid from said upper zone; a filter media outlet means for withdrawing particulate containing filter media from a bottom portion of said lower zone; a valve means for controlling the flow of particulate containing filter media through said filter media outlet means; first transfer conduit means having a first end in fluid communication with the filtered liquid in said upper zone and a second end in fluid communication with said filter media outlet means for mixing filtered liquid with the withdrawn particulate containing filter media; pump means in fluid communication with said filter media outlet means for scouring the mixed filtered liquid and particulate containing filter media received from said filter media outlet means and pumping same into a first end of second transfer conduit means; separator means having an inlet in fluid communication with a second end of said second transfer conduit means for separating filter media and liquid containing filtered particulates therein, said separator means having a first outlet means for withdrawing the liquid containing filtered particulates and a second outlet means for withdrawing the separated filter media and returning cleaned filter media to said filter bed in said lower zone.

4,861,473

APPARATUS FOR FACILITATING COMPRESSION OF PACKING MATERIAL IN A LIQUID CHROMATOGRAPHY COLUMN

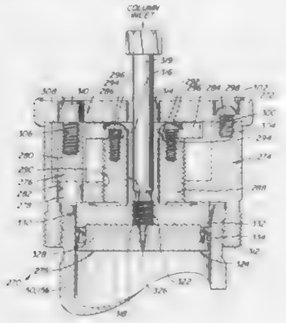
Carl L. Shackelford, San Pablo, and Kenneth Rainin, Piedmont, both of Calif., assignors to Rainin Instrument Co., Inc., Emeryville, Calif.

Continuation of Ser. No. 55,819, May 29, 1987, abandoned, which is a continuation of Ser. No. 742,265, Jun. 7, 1985, Pat. No. 4,670,141, which is a continuation-in-part of Ser. No. 584,611, Feb. 29, 1984, Pat. No. 4,551,249. This application Sep. 8, 1988, Ser. No. 243,177

The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—198.2 **4 Claims**



1. A high pressure modular liquid chromatography column utilizing material for separating constituents comprising:

(a) a tube filled with the material, said tube having a first end portion, a second end portion, and an inside wall;

(b) means for enclosing said first end portion of said tube, said enclosing means for said first end portion of said tube including a passage therethrough which communicates with the material within said tube, said first enclosing means having at least a part within said tube and being axially adjustable within said tube and wherein said part comprises a separate stopper wholly within said first end portion and lying against said material for retaining said material within said first end portion, said stopper having at least one passage therethrough to said material and being movable within said first end portion along said inside wall to axially compress said material and eliminate voids therefrom in response to axial movement of said first enclosing means;

(c) means for enclosing said second end portion of said tube, said enclosing means for said second portion of said tube including a passage therethrough communicating with the material within said tube, said second enclosing means having at least a part within said tube, said material being positioned between said first and second enclosing means;

(d) means for circumferentially sealing a portion of the inside of said first and second end portions of said tube between said parts of said first and second enclosing means within said first and second end portions, respectively, and said inside wall of said tube; and

(e) means for retaining said parts of said first and second enclosing means within said tube.

4,861,474

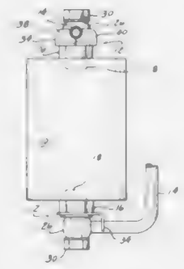
FUEL FILTER COUPLING

John L. Kroha, Ferndale, Mich., assignor to Flexon, Inc., Ferndale, Mich.

Filed Oct. 22, 1987, Ser. No. 111,491

Int. Cl.[4] B01D *23/00*

U.S. Cl. 210—232 **2 Claims**



1. A fuel filter connection for coupling a fuel line to a fuel filter, said connection comprising:

(a) a one piece, longitudinally extending, tubular coupling base having first and second ends;

(b) a first end porton on said coupling base configured for engagement with said filter;

(c) external surfaces configured for engagement with standard wrench tools extending midway of said first end and said second end of said coupling base;

(d) a second end portion on said coupling base configured for engagement with a fluid fitting connected with the fuel line;

(e) an annular groove disposed about the external perimeter of said coupling base, adjacent to said second end;

(f) a plate-like supporting bracket having a keyhole shaped opening formed therein, rotatably mounted in communication with said annular groove for rotation about the longitudinal axis of said coupling base;

(g) said keyhole shaped opening in said fuel line supporting bracket having an internal radius with a diameter corresponding to the radius of said annular groove and mountable for engagement therewith;

(h) said fuel line supporting bracket having a series of teeth formed within said internal radius for frictional engagement with said annular groove;

(i) said fuel line supporting bracket having opposing ends separated by a distance to allow rotational movement of said bracket within said annular groove, said opposing ends being movable toward each other into adjacent relationship therewith; and

(j) said opposing ends configured to encompass a portion of an outer surface of said fuel line, in supporting relationship therewith, when said opposing ends are moved into adjacent relationship therewith to bring said aperture of said internal radius, and said teeth disposed therein, into registry with said annular groove of said coupling base and to frictionally fix said bracket into permanent radial position about the axis of said coupling base.

4,861,475

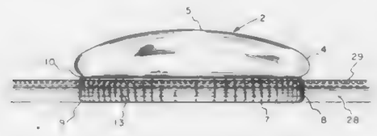
DEVICE FOR ABSORBING LIQUID CONTAMINANTS SUCH AS OIL AND GASOLINE AND FUMES THEREOF

Gary J. Peterson, P.O. Box 822, Homer, Ak. 99603

Filed Aug. 19, 1985, Ser. No. 766,505

Int. Cl.[4] C02F *1/40*

U.S. Cl. 210—242.4 **4 Claims**



1. A device for absorbing liquid contaminants such as oil and gasoline and/or the fumes thereof, comprising:

(a) a hollow container having a wall defining a storage space, said wall having a multiplicity of openings sized to admit said contaminant through said openings into the interior of said container and preclude the passage of water therethrough;

(b) a body of sorbent material enclosed within said container and having an affinity for said contaminants, whereby said contaminants are sucked through said openings and absorbed by said sorbent material;

(c) said container being formed of two parts comprising a cap and a base and means are provided for detachably securing said cap to said base;

(d) said openings are formed in said base member; and

(e) each of said two container parts comprises a dish-shaped receptacle having a transverse wall integral with a generally perpendicularly extending peripheral wall having a rim portion defining the open end of the receptacle, the rim portion of one of said container parts including a radially inwardly projecting bead, while the rim portion of the other container part is formed with a peripheral groove adapted to receiving mating relationship the bead of said first mentioned part, whereby said two parts of the container are retained interlocked in mutually facing relationship.

4,861,476

SEPARATOR CELL FOR PRESSURE FILTERING AND REVERSE OSMOSIS

Robert Kohlheb, Einbeck, and Robert Rautenbach, Aachen, both of Fed. Rep. of Germany, assignors to Amafilter Membrantechnik GmbH, Hanover, Fed. Rep. of Germany

Filed May 28, 1986, Ser. No. 867,578

Claims priority, application Fed. Rep. of Germany, May 28, 1985, 3519060

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—321.76 **6 Claims**

1. In a separator cell for pressure filtration and reverse osmosis, including a housing; a filtering membrane supported in said housing and having a feed side and an opposite filtrate side; a flow guide plate supported in said housing and being in a face-to-face engagement with said membrane on the feed side thereof; channel means defined in said flow guide plate for guiding fluid therein; said channel means being covered by said membrane; a feed pipe supported in said housing and having an outlet means communicating with said channel means; a concentrate discharge pipe supported in said housing and having an inlet means communicating with said channel means; a filtrate discharge pipe supported in said housing and having an inlet means at the filtrate side of said membrane; the improvement comprising said outlet of said feed pipe and said inlet of said concentrate discharge pipe being situated at generally diametrically opposite locations of said flow guide plate; said



channel means comprising a channel having a shape of a continuous spiral formed of a first and a second turn; said first turn starting at the outlet of the feed pipe and having a curvilinear course of continuously decreasing radius; said second turn being a continuation of said first turn and having a curvilinear course of continuously increasing radius; said second turn terminating at the inlet of said concentrate discharge pipe; said channel having a relatively large width for occupying substantially the entire surface area of said flow guide plate oriented towards said membrane.

4,861,477

TUBULAR CONTAINER FOR CENTRIFUGAL SEPARATION

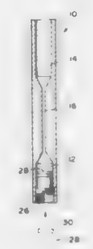
Shiro Kimura, c/o Cosmic Inc. of Nadaya-BLDG. No. 51-5 Jingu-Mae, 5-chome, Shibuya-ku, Tokyo 150, Japan

Filed Apr. 21, 1988, Ser. No. 184,245

Claims priority, application Japan, Feb. 4, 1988, 63-22829

Int. Cl.[4] B01D *33/00*

U.S. Cl. 210—359 **2 Claims**



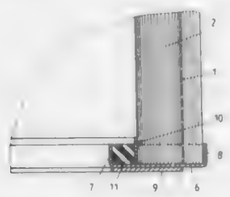
1. A tubular container for centrifugal separation of a specimen characterized in that said container has a first section defining a bottom chamber of a certain volume for containing therein a heaviest phase of said specimen, a second section contiguous to said first section and defining an intermediate chamber for containing therein a phase of said specimen having an intermediate specific gravity, a third section contiguous to said second section and defining an upper chamber for containing therein a lightest phase of said specimen, said second section having a diameter which is smaller than diameters of said first and third sections, and means for adjustably positioning a movable plug fitted into and sealing a bottom of said first section, said plug being adjustably positioned over a predetermined distance to be moved into or out of said section in order to vary the volume thereof.

4,861,478
REMOVABLE FUEL TANK FILTER
Morris D. Hall, 2509 Geraldine, Midland, Tex. 79707
Continuation-in-part of Ser. No. 146,266, Jan. 20, 1988, abandoned. This application Mar. 30, 1988, Ser. No. 176,047
Int. Cl.[4] B01D *27/08*
U.S. Cl. 210—416.4 1 Claim



1. A removable fuel tank filter device, comprising:
a hollow body tube having a cylindrical wall and upper and lower ends, the diameter of the hollow body tube being small enough to allow it to be inserted into the fuel filling inlet of a fuel tank, with the upper end of the tube being open and with the cylindrical wall and lower end consisting across their entire surface area of a filtering mesh, the mesh being unblocked by any portion of the device, and further being adapted to allow liquid hydrocarbon fuel to pass through and to prevent sediment from passing through;
an outer, horizontally-extending rim which is attached to the upper end of the hollow body tube in a liquid tight fashion, the outer rim not substantially obstructing the flow of liquid hydrocarbon fuel into the hollow body tube, with the outer rim extending sufficiently far in the horizontal direction to prevent the outer rim from being able to enter into the fuel filling inlet of the fuel tank;
whereby the fuel tank filter device can be placed in the fuel filling inlet of a fuel tank, where it will be held in place at the inlet by the outer rim, and the fuel tank filter device can be removed at will.

4,861,479
TUBULAR FILTER ELEMENT WITH BIASING ELEMENT AND METHOD OF MAKING
Willi Solzer, Flörsbachtal/Mosborn, Fed. Rep. of Germany, assignor to Faudi Feinbau GmbH, Oberursel, Fed. Rep. of Germany
Filed Sep. 26, 1988, Ser. No. 249,331
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1987, 3739297
Int. Cl.[4] B01D *27/06*
U.S. Cl. 210—485 9 Claims

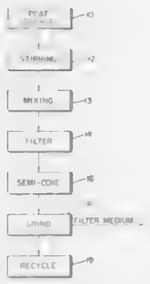


1. A tubular filter element comprising:
a perforated cylindrical support pipe including inner and outer peripheries,
a tubular folded filter layer disposed around said inner periphery,
a pair of disks defining recesses within which are disposed longitudinal ends of said pipe and said filter layer, said ends being secured to said disks by a hardened cast-in material disposed in each said recess, and
spring means disposed within respective longitudinal ends of said folded filter layer, each said spring means disposed in a each said recess and extending around an inner periphery of said folded filter layer for elastically pre-biasing said ends of said folded filter layer outwardly against said pipe.

4,861,480
ORGANOMINERAL SEMIPERMEABLE MEMBRANE AND ITS PRODUCTION PROCESS
Michel Berardo, Roquemaure; Charles Darnez, Bordeaux-Caudéran; Jean-Marie Martinet, Montelimar, and Gilbert Roche, Bourg Saint Andeol, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France
Filed Apr. 13, 1988, Ser. No. 181,191
Claims priority, application France, Apr. 23, 1987, 87 05748
Int. Cl.[4] B01C *13/00*
U.S. Cl. 210—490 19 Claims

1. Organomineral semipermeable membrane, characterized in that it comprises a porous inorganic material support coated with a dense semipermeable organic layer comprising a vinylidene fluoride polymer or copolymer having functional groups giving the membrane a selective permeability with respect to water or other solvents, the porous support comprising a macroporous inorganic material substrate coated with a microporous inorganic material layer having a thickness of from about 1 to about 2 μm.

4,861,481
MULTI-FUNCTIONAL FILTERING MEDIUM
Ralph S. Allen, III, 30003 Arena Dr., Evergreen, Colo. 80439
Division of Ser. No. 856,368, Apr. 28, 1986, Pat. No. 4,778,602. This application Aug. 1, 1988, Ser. No. 226,785
Int. Cl.[4] B01D *39/04*
U.S. Cl. 210—502.1 5 Claims



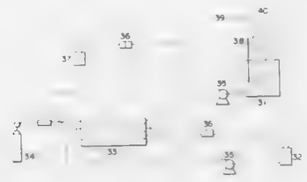
1. A filtering medium having hydrophobic properties together with anionic and cationic exchange capacities, said filtering medium composed at least in part of heat activated humic and fulvic acid fractions and produced from the steps of:
(a) mixing a source of peat in an alkaline aqueous solution until the humic and fulvic acid fractions in the peat are solubilized;
(b) precipitating said humic and fulvic acid fractions from said peat and alkaline aqueous solution by introducing into said solution a quaternary amine and mixing for a time period sufficient to precipitate said humic and fulvic acid fractions therefrom;
(c) removing said humic and fulvic acid fractions from said solution; and
(d) activating said humic and fulvic acid fractions so removed to a substantially dry state by heating at an elevated temperature in a closed, pressurized container for a time period sufficient to dehydrate said fractions to a substantially dry state, said closed, pressurized container being pressurized to a pressure level on the order of 40 psi.

4,861,482
SELENIUM DETOXIFICATION
William Frankenberger, Jr., 109 Masters Ave., Riverside, Calif. 92507, and Ulrich Karlson, 3473 Avocado St., Riverside, Calif. 92507-3933
Filed Aug. 2, 1988, Ser. No. 227,229
Int. Cl.[4] C02F *3/34*
U.S. Cl. 210—611 12 Claims

1. A method for increasing the rate of volatilization of selenium from a non-volatile selenium compound, which comprises exposing the non-volatile selenium compound, in a solid medium, to microbes which are capable of converting the selenium to a volatile alkylselenide, and adding to the medium a carbon source which enhances alkylation selected from the group consisting of proteins, carbohydrates and mixtures thereof, alone or in combination with at least one metal ion selected from the group consisting of cobalt, zinc and nickel.

7. A method for the removal of non-volatile selenium from a medium comprising soil, which comprises adding to the soil containing microbes which are capable of converting the selenium to a voltatile alkylsenide a carbon source which enhances alkylation selected from the group consisting of proteins, carbohydrates and mixtures thereof, alone or in combination with at least one metal ion selected from the group consisting of cobalt, zinc and nickel.

4,861,483
APPARATUS AND PROCESS TO ELIMINATE DIFFUSIONAL LIMITATIONS IN A MEMBRANE BIOLOGICAL REACTOR BY PRESSURE CYCLING
George S. Efthymiou, Limassol, Cyprus, and Michael L. Shuler, Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.
Continuation-in-part of Ser. No. 882,803, Jul. 7, 1986. This application Jun. 17, 1988, Ser. No. 207,812
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—636 21 Claims



9. A process for reacting a nutrient and reactant gas with a biocatalyst in an immobilized multilayer biological reactor to form one or more biological products and one or more by-product gases which comprises:
(a) providing a multilayer biological membrane reactor as described in claim 3 which comprises a gaseous layer, a cell layer having an immobilized biocatalyst cell and a nutrient layer, all separated from one another by semipermeable membranes;
(b) charging the respective layers with reactant gas, concentrated biocatalyst and nutrients to initiate a biocatalyst conversion of nutrient to biological product and by-product gas;
(c) reacting the nutrient and reactant gas with biocatalyst to form biological product and byproduct gas,
(d) causing a systematic convective flow of nutrient to flow into and out of the biocatalyst layer thus accelerating the transfer of fresh nutrient from the nutrient layer to the cell layer, the transfer of product from the cell layer to the nutrient layer and the transfer of gaseous byproduct, if any, to the gaseous layer; and
(e) separating the biological product from the nutrient layer and the gaseous byproduct from the gaseous layer.

4,861,484
CATALYTIC PROCESS FOR DEGRADATION OF ORGANIC MATERIALS IN AQUEOUS AND ORGANIC FLUIDS TO PRODUCE ENVIRONMENTALLY COMPATIBLE PRODUCTS
Norman N. Lichtin, Newton Center, Mass.; Thomas M. DiMauro, New York, N.Y., and Richard C. Svriuga, Brookline, Mass., assignors to Synlize, Inc., Brookline, Mass.
Filed Mar. 2, 1988, Ser. No. 163,341
Int. Cl.[4] C02F *1/30;* B01D *15/00*
U.S. Cl. 210—638 34 Claims

1. A catalytic process for the degradation of an undesired organic material into environmentally compatible products without need for pretreating the organic material to be degraded, said process comprising the steps of:
obtaining the undesired organic material to be degraded in a fluid state;
combining said fluid organic material in the presence of water with a solid catalyst comprising at least one transition element and a peroxide as a reaction mixture; and
adding photoenergy absorbable by said catalyst to said reaction mixture to yield environmentally compatible reaction products comprising at least carbon dioxide.

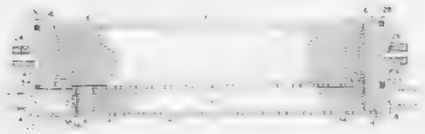
20. A catalytic process for the purification of an organic solvent containing dissolved organic material without need for pretreating the organic solvent to be purified, said process comprising the steps of:
obtaining an organic solvent containing dissolved organic material as an undesired impurity;
combining said impure organic solvent in the presence of water with a solid catalyst comprising at least one transition element and a peroxide as a reaction mixture; and
adding photoenergy absorbable by said solid catalyst to said reaction mixture to yield a substantially purified organic solvent and environmentally compatible reaction products comprising at least carbon dioxide.

21. An environmentally compatible process for regenerating granular activated carbon from exhausted granular activated carbon containing organic material, said process comprising the steps of:
mixing the exhausted, granular activated carbon with an organic solvent such that the organic material becomes dissolved in said organic solvent and granular activated carbon is regenerated in a form substantially free of adsorbed organic material;
separating said regenerated, granular activated carbon from said organic solvent containing dissolved organic material;
combining said separated organic solvent with water, a solid catalyst comprising at least one transition element, and a peroxide as a reaction mixture; and
adding photoenergy absorbable by said solid catalyst to said reaction mixture to yield an organic solvent substantially free of dissolved organic material and environmentally compatible reaction products comprising at least carbon dioxide.

4,861,485
HEMODIAFILTRATION DEVICE
Luciano Fecondini, Bologna, Italy, assignor to W. R. Grace & Co., Lexington, Mass.
Filed Mar. 28, 1988, Ser. No. 174,068
Claims priority, application Italy, Jan. 22, 1988, 19179 A/88
Int. Cl.[4] B01D *13/01*
U.S. Cl. 210—641 42 Claims

1. A hemodiafiltration cartridge comprising:
means defining a dialysate chamber;

means defining a dialysate inlet;
means defining a dialysate outlet;
means defining a blood chamber;
means defining a blood inlet;
means defining a blood outlet;



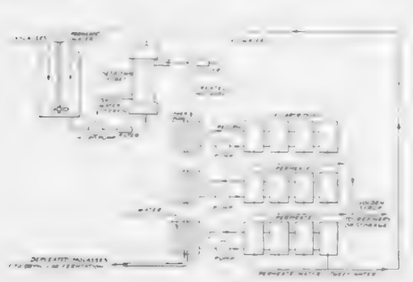
a first semipermeable membrane means within said dialysate chamber for sterilizing and depyrogenating dialysate prior to its contact with blood; and a second semipermeable membrane means within said blood chamber for the removal of wastes from blood.

4,861,486

IMMOBILIZED INORGANIC DIFFUSION BARRIERS AND THE USE THEREOF IN THE SEPARATION OF SMALL MOLECULAR SPECIES FROM A SOLUTION

Michel S. M. Lefebvre, Sydney, Australia, assignor to Limitinstant Limited, London, United Kingdom

Division of Ser. No. 552,035, Oct. 12, 1983, Pat. No. 4,717,425.
This application Oct. 14, 1987, Ser. No. 108,720
The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—644 **1 Claim**



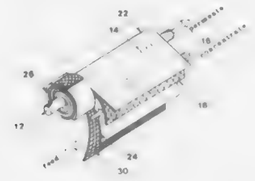
1. A process for the separation by counter diffusion of small molecular species from a primary liquid containing a plurality of dissolved molecular species of different molecular weights and diffusion coefficients, said process comprising the steps of:
providing a diffusion barrier having a substantially uniform structure defining pores or channels therethrough having a diameter in the range of about 10 to about 50 Angstroms;
providing said primary liquid on one side of said diffusion barrier;
providing on the other side of said diffusion barrier a solvent having a lower osmotic pressure than the primary liquid, such that an osmotic gradient exists between said solvent and said primary liquid and causes osmotic current to flow from said other side of said diffusion barrier through said diffusion barrier to said one side thereof;
causing said primary liquid to flow along said one side of said diffusion barrier in a direction generally parallel to said one side; and
adjusting at least one of the shear rate of said primary liquid along said one side of said diffusion barrier and the osmotic gradient across said diffusion barrier such that said molecular species are selectively transferred from said primary liquid to said solvent through said barrier against said osmotic gradient and current, said selectively being greater than the relative diffusion coefficients of the separated species.

4,861,487

SPIRAL WOUND MEMBRANE MODULES AND SYSTEMS WITH IMPROVED FEED SPACER

Clyde W. Fulk, Jr., 48 Arlington St., Haverhill, Mass. 01830

Filed Feb. 8, 1989, Ser. No. 308,147
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—644 **13 Claims**



1. In a spirally wound membrane module to separate a feed stream into a permeate stream and a concentrate stream, which module comprises:
(a) a housing for the module;
(b) a central tube having passageways therein and disposed in the housing;
(c) a membrane leaf which comprises a first and second membrane sheet materials with a permeate collection sheet material interposed between the membrane sheet materials and the membrane sheet materials sealed about their peripheral edges to form a spirally wound membrane leaf about the central tube;
(d) a open mesh spacer material spiral wound and disposed between the adjacent membrane sheet materials of the membrane leaf to form a spiral wound flow channel for the feed stream, the improvement which comprises:
(i) means for minimizing the pressure drop of the feed stream through said module including a low pressure drop, open mesh-type spacer sheet material to form said flow channel comprising elongated filaments positioned generally parallel to the flow of the feed stream in the flow channel, the elongated filaments connected by bridge filaments, which bridge filaments are positioned at an angle to the flow of the feed stream;
(e) an inlet at one end of the housing for the introduction of a feed stream to be separated;
(f) an outlet at the other end of the housing for the withdrawal of a concentrate stream from the housing; and
(g) a permeate outlet in the central tube to permit the withdrawal of a permeate stream from the central tube whereby the feed stream flows axially from one to the other end in the flow channel and the permeate stream flows radially inwardly toward the central tube within the membrane leaf.

11. In a method of separating a feed stream into a concentrate stream and a permeate stream in a spirally wound ultrafiltration membrane module comprising a spirally wound membrane leaf separated by a mesh-like spacer material to form a flow channel, which method comprises:
(a) flowing feed stream generally axially from the one to other end in the flow channel of the spirally wound membrane module;
(b) withdrawing a concentrate stream from the other end of the flow channel;
(c) withdrawing a permeate stream which flows radially toward the center of the module within the membrane leaf from the module, the improvement which comprises providing minimal pressure drop through said module by:
(i) disposing as the spacer material to form the said flow channel an open, mesh-like spacer material comprising elongated filaments connected with bridge filaments,

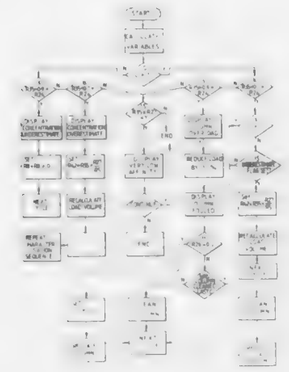
the elongated filaments having a length greater than the bridge filaments and disposed generally parallel to the flow of the feed stream in the said flow channel; and
(ii) flowing the feed stream generally parallel to the elongated filaments from the one to other end to provide a low pressure drop in the membrane module.

4,861,488

AUTOMATIC CHROMATOGRAPHY PROCESS

Andrew C. Kenney, Windsor; Philip W. Thompson, Burnham, and John L. Harris, Slough, all of England, assignors to Oros Systems Limited, England

Division of Ser. No. 117,014, Nov. 4, 1980, Pat. No. 4,802,981.
This application Sep. 23, 1988, Ser. No. 248,789
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—656 **9 Claims**



1. A method of automatic chromatography characterisation comprising the automatic steps of;
loading onto a column packed with adsorbent or attractant material a relatively small sample containing a substance to be eluted, the relatively small sample being sufficiently small so as to ensure that the adsorption capacity of the column is not exceeded;
eluting the substance from the column to obtain an elution peak;
integrating the elution peak with respect to the relatively small sample so as to derive the concentration of the substance in the sample;
loading the column with a relatively large sample containing the substance, the relatively large sample being sufficiently large to ensure that the capacity of the column is exceeded; and
calculating the maximum practical capacity of the column.

4,861,489

WATER RECIRCULATING APPARATUS AND METHOD

Thomas R. Swift, London, and Dennis H. Desty, Walton-On-Thames, both of England, assignors to Safety First Limited, London, England

Filed Jun. 1, 1987, Ser. No. 67,776
Claims priority, application United Kingdom, Oct. 1, 1985, 8524155
Int. Cl.[4] B01D *15/00*
U.S. Cl. 210—668 **29 Claims**

21. A method of operating a water recirculating apparatus, comprising the steps of:
(a) discharging a recirculating flow of water into an evaporation zone through which atmospheric air passes in contact with the discharging water;
(b) breaking up the flow of discharging water in said zone, thereby to increase the free water surface area available for evaporation;
(c) collecting unevaporated water exiting from said zone and recirculating it for re-use in step (a) above; and
(d) passing the recirculating water before its re-use in said step (a) through an ion releasing chamber and there releasing into the recirculating water silver ions at a release rate to produce in water being discharged into said evaporation zone a concentration of silver ions sufficient to kill or render innocuous, particularly in any fine water droplete that escape from the apparatus, bacteria which may cause Legionnaires' disease and related respiratory disease if said droplets are breathed in by people.

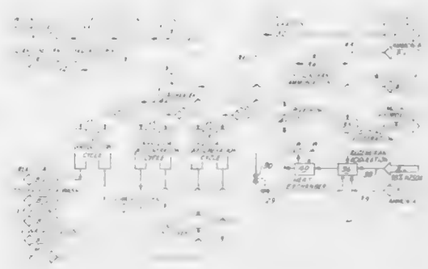


4,861,490

REMOVAL OF CATIONIC IMPURITIES FROM INORGANIC SOLUTIONS

Susan B. Morris, Lithia, Fla., assignor to Phosphate Engineering & Construction Co., Inc., Lakeland, Fla.

Filed Aug. 21, 1987, Ser. No. 87,915
Int. Cl.[4] B01D *15/04*
U.S. Cl. 210—669 **16 Claims**



1. A method for removing cationic impurities from inorganic feed solutions comprising the steps of passing the feed solution through an ion exchanger having an ion exchange resin charged with a cation selected from the group consisting of ammonium ions and hydrogen ions in order to remove the cationic impurities from the feed solution, regenerating the ion exchange resin within the ion exchanger by passing a saturated ammonium sulfate regenerant solution therethrough and recovering a dilute regenerant solution, resaturating the dilute regenerant solution passing from the ion exchanger to thereby precipitate impurities therefrom as sulfate salts and recovering a resaturated ammonium sulfate solution.

4,861,491

METHOD OF DETACKIFYING PAINT OVERSPRAY

Anders Svensson, Växjö, Sweden, assignor to NI Chemicals, Inc., Hightstown, N.J.

Filed Jun. 2, 1988, Ser. No. 201,193

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1987, 3719929

Int. Cl.[4] C02F *1/28, 1/54*

U.S. Cl. 210—691 13 Claims

1. A method of detackifying paint overspray comprised of paint particles and wash water, said method comprising contacting the overspray with an organophilic clay to detackify the paint particles, said organophilic clay being the reaction product of a smectite-type clay with ammonium cation containing at least one lineal or branched, saturated or unsaturated alkyl group having 12 to 22 carbon atoms, said ammonium cation being in an amount ranging from about 90 to about 150% of the cation exchange capacity of said smectite-type clay and separating the detackified paint particles from the wash water.

4,861,492

METHOD OF DEWATERING SEWAGE SLUDGE PARTICULARLY ON RECESSED PLATE PRESSING EQUIPMENT

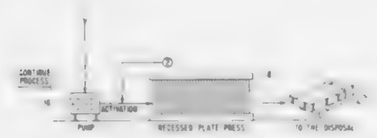
Josef Lehmkuhl, Hofheim/Ts.; Ulrich Nikeasch, Usingen, and Kurt Preuslein, Buettelborn, all of Fed. Rep. of Germany, assignors to Nalco Chemical Company, Naperville, Ill.

Filed Sep. 3, 1987, Ser. No. 92,509

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1986, 3630665

Int. Cl.[4] C02F *11/14*

U.S. Cl. 210—709 6 Claims



1. A method of dewatering sewage sludge in a filter press including a filter cloth wherein organic polymeric flocculants are added to the sludge to improve the dewatering behavior of the sludge and water is removed from the flocculated sludge in a preparatory stage, comprising the steps of:

adding a flocculating amount of an aqueous cationic acrylamide copolymer solution to form a flocculated sludge;

maturing the flocculated sludge in a conditioning container for at least two minutes in the absence of mechanical strain prior to feeding it to the filter press,

thickening the flocculated sludge in said conditioning container by separating part of the sludge water by decantation

using a pump to transport the thickened sludge to the filter press;

adding an additional amount of the organic polymeric flocculant to the thickened sludge on the delivery side of the sludge pump to reactivate the flocculated solids agglomerates, wherein the weight ratio of pre-decantation flocculant addition to reactivating flocculant addition is within the range of 3:1 to 9:1; delivering the reactivated solids agglomerates directly to the filter press; and

filtering the sludge to provide a filter cake containing at least about 40% dry solids which do not stick to the filter cloth,

said aqueous cationic acrylamide polymer solution having been prepared by inverting a water-in-oil emulsion of the polymer, and said aqueous cationic acrylamide polymer solution containing hydrophobic components which hydrophobise the filter cloth during filtering to facilitate filter cake removal therefrom.

4,861,493

PROCESS FOR THE REMOVAL OF METALS, IN PARTICULAR HEAVY METALS, FROM WASTE WATER

Cornelis W. Jansen, Amersfoort, Netherlands, assignor to DHV Raadgevend Ingenieursbureau BV, Netherlands

Filed Feb. 4, 1988, Ser. No. 152,319

Claims priority, application Netherlands, Feb. 27, 1987, 8700499

The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.

Int. Cl.[4] C02F *1/52*

U.S. Cl. 210—715 7 Claims



1. Process for the removal of metals selected from the group consisting of heavy metals and Sr, from a metal containing water in the form of their sulfide comprising, thoroughly mixing the metal containing water with an effective amount of an aqueous sulfide solution at a pH of about 4–10 said mixing occurring in a reactor with a fluidized bed of a suitable material upon which the metal crystallizes exclusively in the form of metal sulfide into the crystal lattice of the bed material and the metal sulfide crystals grow in substantially pure form on the bed material to form granules having a water content of about 0.5%, separating purified water from said reactor, and removing said granules from the reactor periodically.

4,861,494

AUTOMATIC CYCLE CONTROL ARRANGEMENT AND METHOD FOR A PRESSURE FILTER

Jack R. Bratten, 5970 St. James Dr., West Bloomfield, Mich. 48033

Filed Jul. 13, 1988, Ser. No. 218,170

Int. Cl.[4] B01D *29/02*

U.S. Cl. 210—739 6 Claims



1. An improved automatic cycle control arrangement for a filter for filtering liquid in which there are changes in the quantity of filtered material per unit volume of liquid, said filter of the type having a housing defining a filter chamber adapted to be supplied with a liquid under pressure to be filtered under pressure, a filter media layer disposed in said filter chamber to subdivide said filter chamber into high and low pressure regions, means inducing a flow of said liquid from said high pressure region to said low pressure region to be filtered and collected after being filtered, a distensible diaphragm disposed in said filter chamber on the high pressure side of said filter media layer defining in part a diaphragm chamber therein, mean for periodically causing a volume of fluid flow into said diaphragm chamber to pressurize said diaphragm chamber so as distend said diaphragm against accumulated filter cake, said filter including a cycle control means for continuing filter operation for periods of predetermined duration alternated with periods in which filter cake removal occurs, the improvement comprising:

volume totalizer means totalling the volume of said fluid flow into said diaphragm required to compress said accumulated filter cake and generating a corresponding control signal; and,

means responsive to said control signal indicating a change in said volume of fluid flow from cycle-to-cycle, to act on said cycle control means to cause a corresponding increase or decrease in the duration of the next period of filter operation to increase or decrease the accumulation of filter cake over the next cycle of filter operation,

whereby the effect of changes in the quantity of filtered material per unit volume of said liquid on the rate of accumulation of filter cake automatically causes compensating increases or decreases in cycle durations.

4,861,495

PRESS BELT DEVICE FOR HORIZONTAL FILTERS

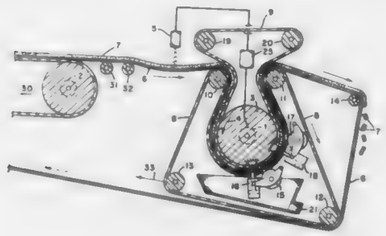
Kurt E. Pletzsch, Wiesbaden-Sonnenberg, Fed. Rep. of Germany, assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Mar. 16, 1988, Ser. No. 168,729

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1987, 3709329

Int. Cl.[4] B01D *33/04*

U.S. Cl. 210—739 14 Claims



1. In a method of further dewatering filter cakes (7) with a belt press in which the filter cake (7) which lies on a filter cloth (6) is guided over a belt filter (30), and then through a belt press which comprises a drum (3) around which the filter cloth (6) is partially laid in such a way that the filter cake (7) lies against the drum (3), wherein additional pressing rollers (15, 17) press the filter cloth (6) and the filter cake (7) against the drum (3) and thereby dewater same and wherein the filter cloth (6) is driven so that the drum (3) rolls against the filter cake (7); the improvement comprising driving the drum (3) at a variable speed of rotation to thereby drive the filter cloth (6) through contact with the intermediate filter cake (7) which is subjected to a shear effect, measuring the tension of the filter cloth (6) and regulating the speed of rotation of the drum (3) in dependence on the tension of the filter cloth (6).

4,861,496

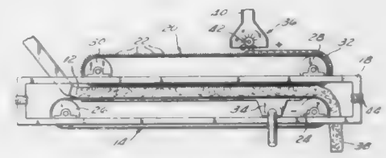
ELECTRO-DEWATERING METHOD AND APPARATUS

Manuel Diaz, El Monte, Calif., assignor to Recycled Energy, Inc., Los Angeles, Calif.

Filed Jun. 13, 1988, Ser. No. 206,188

Int. Cl.[4] B01D *17/06, 35/06*

U.S. Cl. 210—748 11 Claims



1. A method of electromotively dewatering wet cake sludge comprising:

(a) placing wet cake on a conveyor cathode;

(b) moving said wet cake through an interface between the conveyor cathode and a conveyor anode, said conveyor cathode having electrically conductive means that engage said wet cake, said conveyor anode having electrically conducting metallic bristles;

the metallic bristles contacting the wet cake for substantially the same distance as the conveyor cathode; and said cathodes being substantially electrically insulated from said anode thereby providing substantially constant direct current electric contact through said wet cake;

(c) removing water freed from said wet cake; and

(d) removing dry cake from said conveyor anode.

4,861,497

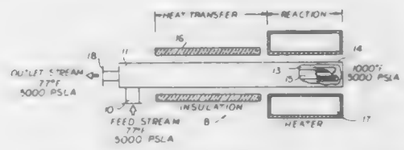
METHOD FOR THE PROCESSING OF ORGANIC COMPOUNDS

James F. Welch, P.O. Box 1235, Boulder, Colo. 80306-1235, and James D. Siegwarth, 85 S. 35th St., Boulder, Colo. 80303

Filed Mar. 18, 1988, Ser. No. 169,851

Int. Cl.[4] C02F *1/74, 11/08*

U.S. Cl. 210—759 7 Claims



1. A method of oxidizing an organic material which comprises:

mixing an oxidant in a liquid phase with an aqueous feed ,stream containing therein an organic compound to be oxidized substantially only outside of a reaction zone;

compressing said mixture to a pressure in excess of 3200 psia;

heating said mixture to a reaction temperature of greater than 710° F. and into a supercritical phase for a time sufficient to decompose said oxidant and oxidize the organic compound within said reaction zone;

cooling said reacted mixture by counter current flow of said reacted mixture to said unreacted mixture; and

collecting the said reacted and cooled mixture.

4,861,498

BACKWASH SYSTEM FOR FILTER-THICKENERS

Eli I. Robinsky, Toronto, Canada, assignor to R & L Filtration Limited, Toronto, Canada

Filed Dec. 30, 1987, Ser. No. 139,531
Int. Cl.[4] B01D *29/38*
U.S. Cl. 210—791 **11 Claims**



12. A method for backwashing filter elements in a vessel for filtering solids from a liquid-solids mixture including a lower mixture compartment and an upper filtrate compartment, a plurality of filter elements each enveloped by a filter fabric suspended from said filtrate compartment into the mixture compartment, and means for supplying a liquid-solids mixture to the mixture compartment for passing liquid through the filter elements with the deposit of filtercake on the filter fabric and flow of filtrate to the filtrate compartment, comprising vertically suspending at least one collapsible tube in the mixture compartment, said tube having an expanded volumetric displacement at least as great as the volume of filtrate required to reverse the flow from the filtrate compartment into the filter elements to expand the filter fabric and to disengage the filtercake deposited thereon, and intermittently filling said tube with a fluid for expansion thereof and rapidly emptying fluid from said tube for sudden collapse thereof.

4,861,499

WATER-DISPERSIBLE HYDROPHOBIC THICKENING AGENT

Roger E. Neff, Stamford, and Roderick G. Ryles, Milford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 13, 1987, Ser. No. 107,819
Int. Cl.[4] C09K *7/02, 7/06;* **E21B** *43/26;* **F17D** *1/16*
U.S. Cl. 252—8.551 **9 Claims**

1. A water-soluble composition for thickening aqueous liquids consisting essentially of:

A. a water-soluble thickening agent which agent consists essentially of a water-soluble terpolymer of:

(a) acrylamide,

(b) 2-acrylamido-2-methylpropane sulfonic acid salt; acrylic acid; or dimethylaminoethyl acrylate methyl chloride salt; and

(c) a C_8–C_{20} alkyl ester of acrylic acid, and

B. a water-soluble inorganic salt,

wherein the molecular weight of the terpolymer is such that, at the same concentration, a copolymer of only components (a) and (c) having the same molecular weight, is water-insoluble, the concentration of monomer (b) being replaced by an equal concentration of acrylamide (a).

4,861,500

DELAYED CROSSLINKER COMPOSITION CONTAINING ORGANIC TITANIUM COMPLEXES AND HYDROXYCARBOXYLIC ACIDS

Richard M. Hodge, Sand Springs, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Division of Ser. No. 831,230, Feb. 19, 1986, Pat. No. 4,657,080.
This application Nov. 17, 1986, Ser. No. 931,775
Int. Cl.[4] E21B *43/26;* **C07F** *7/28*
U.S. Cl. 252—8.551 **16 Claims**

1. A composition that can produce delayed crosslinking of an aqueous solution of a crosslinkable organic polymer, comprising about 1% to about 10% by weight organic titanium complex selected from a group consisting of triethanolamine titanante, titanium ammonium lactate and titanium acetylacetonate and about 2% to about 37% by weight hydroxyacetic acid.

4,861,501

STAIN RESISTANT COMPOSITION FOR SYNTHETIC ORGANIC POLYMER FIBERS AND METHOD OF USE: FLUOROCARBON POLYMER

Charles R. Pfeifer, Newport News, Va., assignor to BASF Corporation, Williamsburg, Va.

Filed May 16, 1988, Ser. No. 195,068
Int. Cl.[4] D06M *13/34*
U.S. Cl. 252—8.6 **38 Claims**

1. An aqueous composition which is capable of rendering synthetic fibers repellent to soiling, staining, or combinations thereof, comprising:

(a) a rewetting agent; and,

(b) a water-repelling fluorocarbon comprising a fluoroaliphatic radical-containing polymer derived from one of more monomers represented by the formula:

AM

wherein:

A represents a fluorinated monovalent aliphatic moiety containing from about 6 to about 12 carbon atoms and from 11 to about 23 fluorine atoms; and,

M is a polymerizable acrylate or methacrylate moiety.

4,861,502

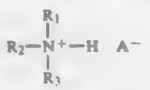
CONDITIONING AGENT CONTAINING AMINE ION-PAIR COMPLEXES AND COMPOSIITONS THEREOF

Debra S. Caswell, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 8, 1988, Ser. No. 153,172
The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.
Int. Cl.[4] D06M *13/30, 13/32, 13/36, 13/38*
U.S. Cl. 252—8.75 **49 Claims**

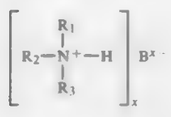
1. A conditioning agent comprising water-insoluble particles having an average diameter of from about 10 microns to about 500 microns, said particles comprising:

(i) from about 5% to about 95% of an amine-organic anion ion-pair complex having the formula:



wherein each R_1 and R_2 independently is C_{12}–C_{20} alkyl or alkenyl, each R_3 is H or CH_3, and A is an organic anion selected from the group consisting of alkyl sulfonates, aryl sulfonates, alkylaryl sulfonates, alkyl sulfates, dialkyl sulfosuccinates, alkyl oxybenzene sulfonates, acyl isethionates, acylalkyl taurates, alkyl ethoxylated sulfates, and olefin sulfonates, and mixtures of said ion-pair complexes; and

(ii) from about 95% to about 5%, by weight of said particles, of an amine-inorganic anion ion-pair complex having the formula:



wherein each R_1 and R_2 independently is C_{12}–C_{20} alkyl or alkenyl, each R_3 is H, CH_3, or C_2–C_{20} alkyl or alkenyl, B is an inorganic anion selected from the group consisting or nitrate, sulfate, hydrogen sulfate, phosphate, hydrogen phosphate and dihydrogen phosphate, and x is an integer between 1 and 3, inclusive, and mixtures of said ion-pair complexes.

4,861,503

ZERO-PHOSPHOROUS DETERGENT POWDERS CONTAINING ALUMINOSILICATE, SUCCINATE AND POLYCARBOXYLATE POLYMER

Michael W. Hollingsworth, Bebington, and Peter J. Russell, Eastham, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 921,664, Oct. 21, 1986, abandoned.
This application May 24, 1988, Ser. No. 198,680
Claims priority, application United Kingdom, Nov. 1, 1985, 8526999
Int. Cl.[4] C11D *3/08, 3/12, 11/02*
U.S. Cl. 252—135 **9 Claims**

1. A granular spray-dried detergent composition substantially free of phosphate builders and comprising:

(a) one or more detergent-active compounds selected from the group consisting of anionic, nonionic and detergent-active mixtures thereof,

(b) one or more non-phosphate detergency builders, comprising from 25 to 60% by weight of crystalline or amorphous sodium aluminosilicate,

(c) from 0 to 10% by weight of sodium silicate,

(d) from 0.5 to 2.5% by weight of a compound selected from the group consisting of succinic acid, water-soluble salts of succinic acid, and mixtures thereof,

(e) from 0.5 to 5% by weight of a film-forming polymeric polycarboxylate selected from the group consisting of polyacrylate, arcylic acid/maleic acid copolymer and acrylic phosphinate.

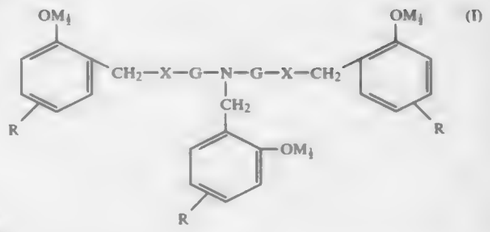
4,861,504

OIL ADDITIVE HAVING REDUCED LACQUER FORMING TENDENCIES

Tai S. Chao, Olympis Fields, Ill., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 25, 1988, Ser. No. 148,278
Int. Cl.[4] C01M *105/08, 105/72*
U.S. Cl. 252—48.2 **3 Claims**

1. An antioxidant additive for lubricating oil having reduced tendencies to form lacquer comprising alkaline earth metal salts of the reaction products formed by treating an alkylphenol and formaldehyde with a sulfur-containing polyalkylene amine, which products contain



where:

X is selected from the group consisting of sulfur moiety, and a tertiary amine moiety;

G is an alkylene group containing 1 to 8 carbon atoms;

R is an alkyl group containing 7 to 24 carbon atoms; and

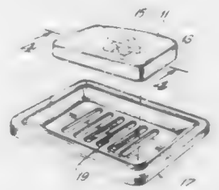
M is an alkaline earth metal.

4,861,505

NOVELTY SOAP

Jacqueline Farman, 345 E. 57th St., New York, N.Y. 10022

Filed Dec. 1, 1988, Ser. No. 278,341
Int. Cl.[4] C11D *17/04, 17/00*
U.S. Cl. 252—92 **22 Claims**



1. A novelty soap comprising a soap bar having disposed in the interior thereof a water-impermeable housing containing an electronic circuit including switch means for activating and deactivating the same and which is programmed to send forth a visible signal, tone, melody or message when said switch means is activated.

4,861,506

STABILIZED PARTICLES OF PEROXYGEN COMPOUNDS, PROCESS FOR THEIR MANUFACTURE, AND COMPOSITIONS CONTAINING THEM

Jean-Marie Chauvier, Jemeppe-sur-Sambre; Léon Moussiaux, and Henry Scoman, both of Sambreville, all of Belgium, assignors to INTEROX (Société Anonyme), Brussels, Belgium

Filed Feb. 19, 1988, Ser. No. 158,805
Claims priority, application Belgium, Feb. 19, 1987, 087.00148
Int. Cl.[4] C11D *3/395, 7/54*
U.S. Cl. 252—95 **5 Claims**

1. Particles of peroxygen compounds chosen from alkali metal persalts, which particles are stabilized by incorporation of a combination of metal ions, wherein the combination of metal ions comprises about 400 to about 1000 ppm magnesium ions and about 10 to about 100 ppm zinc ions wherein the said amounts of magnesium ions and zinc ions are relative to the peroxygen compounds.

2. A process for the manufacture of particles of peroxygen compounds chosen from alkali metal persalts, which particles are stabilized by the incorporation of a combination of metal ions, comprising the steps of:

(a) providing particles of a peroxygen compound selected from the group consisting of alkali metal persalts;

(b) spraying an aqueous solution of metal ions comprising at least one at least partially soluble magnesium compound

and at least on least partially soluble zinc compound onto said particles; and

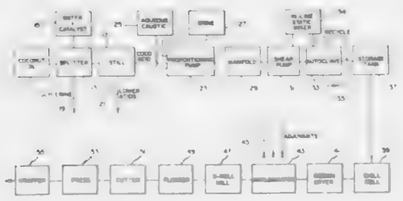
(c) evaporating water from said sprayed particles to produce stabilized particles comprising about 400 to about 1000 ppm magnesium ions and about 10 to about 100 ppm zinc ions wherein the said amounts of magnesium ions and zinc ions are relative to the peroxygen compounds.

4,861,507

TOILET SOAP BARS MADE FROM TOPPED, DISTILLED COCO FATTY ACID

Gregorio C. Gervasio, Manila, Philippines, assignor to Colgate-Palmolive Company, Piscataway, N.J.

Division of Ser. No. 914,691, Oct. 2, 1986, Pat. No. 4,767,560.
This application May 19, 1988, Ser. No. 195,987
Int. Cl.[4] C11D *17/00*
U.S. Cl. 252—108 10 Claims



1. A toilet soap bar of improved cold water lathering properties, improved stability on storage and improved plasticity, which is mild to the skin and which does not slough excessively when deposited wet on a soap dish, which consists essentially of at least 70% of sodium soap of topped, distilled coco fatty acid from which all caproic and caprylic acids have been removed, and in which the capric acid content is less than 2% of the total coco fatty acid, 4 to 14% of topped, distilled free coco fatty acid, 6 to 16% of water and no more than 8% of adjuvant wherein the coco fatty acid soap is hydrogenated coco fatty acid soap.

4,861,508

MOULDED DETERGENT COMPOSITIONS

Ingo Wegener, Duesseldorf; Brigitte Giesen, Duesseldorf-Grafenberg; Alfred Meffert, Monheim; Claus Werner, Neuss; Udo Heanen, and Marlene Hormes, both of Krefeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 164,157
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1987, 3707035
Int. Cl.[4] C11D *1/14, 17/00*
U.S. Cl. 252—121 11 Claims

1. A moulded detergent composition comprising from about 30 to about 70% by weight of a C_{12}–C_{18} sodium alkyl sulfate, from about 5 to about 25% by weight of a C_{12}–C_{18} fatty alcohol, from about 5 to about 25% by weight of a fatty acid selected from the group consisting of palmitic acid, stearic acid and mixtures thereof, and from about 1 to about 30% by weight of an α-sulfofatty acid salt corresponding to the following formula (I) wherein R^1 is a linear C9–C_{21} alkyl group, A is an alkali metal ion, an ammonium ion or a mono-, di- or trialkanolammonium ion containing 2 or 3 carbon atoms in the alkanol group, and B is hydrogen or has one of the meanings of A and from about 5 to about 25% by weight of a sulfosuccinic acid monoalkyl (C_8–C_{18}) ester disodium salt.

4,861,509

ENZYMATIC DETERGENT AND BLEACHING COMPOSITION

Johannes M. Cornelissen; Jan Klugkist, both of Vlaardingen; Cornelis A. Lagerwaard; Swarthoff Ton, both of Hellevoetsluis, all of Netherlands; David Thom, Parkgate, Great Britain, and David Thom, Parkgate, Great Britain, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 128,256, Dec. 3, 1987, Pat. No. 4,769,173. This application Jun. 23, 1988, Ser. No. 210,464
The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.
Int. Cl.[4] C11D *3/386*
U.S. Cl. 252—174.12 3 Claims

1. A detergent composition comprising from 1–50% by weight of one or more detergent-active materials, from 0–60% by weight of a builder, from 1–50% by weight of a bleaching agent and lipolytic enzymes in an amount of 0.005–100 lipolytic units per milligram of the composition, wherein the bleaching agent is comprised of an organic peracid or salt thereof, said organic peracid being selected from the group consisting of diperoxy dodecanedioic acid, diperoxy tetradecanedioic acid, diperoxyhexadecane dioic acid, mono- and diperazelaic acid, mono- and diperbrassylic acid, monoperoxy phthalic acid and perbenzoic acid, or is comprised of an inorganic persalt and a bleach precursor which yields on perhydrolysis a peracid, said precursor being selected from the group consisting of sodium nonanoyloxy benzene sulphonate and sodium benzoyloxy benzene sulphonate, and the lipolytic enzyme shows a positive immunological cross-reaction with the antibody of the lipase produced by *Chromobacter viscosum* var. lipolyticum NRRL B-3673.

4,861,510

PORPOUS LAYER SILICATE/SODIUM SULFATE AGGLOMERATE

Elman Wilms, Dormagen; Dieter Jung, Hilden; Herbert Linsenbold; Lothar Ploch, both of Duesseldorf, and Winfried Wichelhaus, Mettmann, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 21, 1988, Ser. No. 146,450
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 37021117
Int. Cl.[4] C11D *3/12, 7/20, 11/02, 17/06*
U.S. Cl. 252—174.13 11 Claims

6. A detergent composition comprising a surfactant, builder, and a spray-dried, porous granular product consisting essentially of layer silicate/sodium sulfate wherein said layer silicate consists of a synthetic layer silicate having a smectite-like crystal phase, and an increased content of bound alkali metal and alkali metal silicate and a distinctly reduced swelling power in aqueous suspension compared with a pure smectite, and which has the following oxide summation formula

$$MgO{\cdot}a\ M_2O{\cdot}b\ Al_2O_3{\cdot}c\ SiO_2{\cdot}n\ H_2O \qquad (I)$$

wherein M represents sodium, or a mixture of sodium with lithium, with the proviso that the molar ratio of Na to Li is at least 2, and wherein a is equal to about 0.05 to about 0.4, b is equal to 0 to about 0.3, c is equal to about 1.2 to about 2.0 and n is equal to about 0.3 to about 3.0, n representing the water bound in the crystal phase, said layer silicate and sodium sulfate being present in a weight ratio of from about 3:1 to about 1:3, said spray-dried granular product containing from about 0.5% to about 15% by weight of water in addition to the water bound in the crystal phase of said layer silicate, based on the weight of the granular product, and said granular product having a liquid adsorbing capacity of from about 2% to about 50% by weight of a liquid, based on the weight of the granular product.

4,861,511

TOILET BOWL CLEANER AND STAIN-INHIBITING COMPOSITION

Roy I. Kaplan, Naperville, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Jun. 26, 1987, Ser. No. 77,106
Int. Cl.[4] C11D *17/00;* C02F *5/10;* E03D *9/02*
U.S. Cl. 252—174.23 25 Claims

1. A composition suitable for cleaning toilet bowls and for preventing staining of the toilet bowls due to the deposition of minerals on the surface thereof, said composition comprising about 2% to about 15% of a low molecular weight water-soluble polyacrylate having a weight average molecular weight ranging from about 1000 to about 50,000, or an alkali metal salt thereof as polymer A, about 5% to about 60% of a low molecular weight water-soluble copolymer having a weight average molecular weight varying from about 1,000 to about 25,000 selected from the group consisting of a copolymer of an acrylamide and acrylic acid, consisting of 70% to 80% by weight of the acrylamide and 20% to 30% by weight of acrylic acid, a copolymer of acrylic acid and methyl acrylate, a copolymer of acrylic acid and ethyl acrylate, and a copolymer of acrylic acid and hydorxypropyl acrylate and alkali metal salts thereof as polymer B, and about 8% to 60% of a binder, said percentages being based on the total weight of the composition

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4,861,512

SULFONATED BLOCK POLYESTERS USEFUL AS SOIL RELEASE AGENTS IN DETERGENT COMPOSITIONS

Eugene P. Gosselink, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 80,523, Jul. 31, 1987, abandoned, which is a division of Ser. No. 801,020, Nov. 22, 1985, Pat. No. 4,702,857, which is a continuation of Ser. No. 684,511, Dec. 21, 1984. This application Aug. 2, 1988, Ser. No. 228,814
The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.
Int. Cl.[4] C11D *3/37*
U.S. Cl. 252—174.23 16 Claims

1. A detergent composition which comprises:

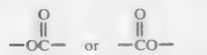
(a) from about 1 to about 75% by weight of a nonionic, anionic, ampholytic, zwitterionic, or cationic detergent surfactant, or mixture thereof; and

(b) a soil release component which comprises an effective amount of a sulfonated soil release compound of formula:

$$X—(OCH_2CH_2)_n(OR^5)_m][(A—R^1—A—R^2)_u(A—R^3—A—R^2)_v—$$

$$—A—R^4—A—(R^5O)_m(CH_2CH_2O)_n—X$$

wherein the A moieties are essentially



moieties; the R^1 moieties are essentially 1,4-phenylene moieties; the R^2 moieties are essentially substituted ethylene moieties having C_1–C_4 alkyl or alkoxy substituents, or are combinations thereof with ethylene moieties; the R^3 moieties are substituted C_2–C_{18} hydrocarbylene moieties having at least one —SO_3M substituent; the R^4 moieties are R^1 or R^3 moieties, or a mixture thereof; each R^5 is C_3–C_4 alkylene, or the moiety —R^2—A—R^6—, wherein R^6 is a C_1–C_{12} alkylene, alkenylene, arylene or alkarylene moiety; each M is H or a water-soluble cation; each X is H, C_1–C_4 alkyl or



wherein R^7 is C_1–C_4 alkyl; m and n are numbers such that the moiety —(CH_2CH_2O)— comprises at least about 50% by weight of the moiety —$(R^5O)_m(CH_2CH_2O)_n$—, provided that when R^5 is the moiety —R^2—A—R^6—, m is 1; each n is at least about 6; u and v are numbers such that v is greater than 0 and the sum of u+v is from about 3 to about 25; w is 0 or at least 1; and when w is at least 1, u, v and w are numbers such that the sum of u+v+w is from about 3 to about 25.

4,861,513

PREPARATION OF SPECIFICALLY ADJUSTED POLYALCOHOL MIXTURES BASED ON SORBITOL

Harald Lueders, Recklinghausen; Hans-Josef Ratajczak, and Ekkehard Wienhoefer, both of Marl, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 9, 1987, Ser. No. 106,507
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1987, 3703257
Int. Cl.[4] C09G *3/00*
U.S. Cl. 252—182.24 10 Claims

1. A process for the production of a polyalcohol mixture, comprising the steps of:

(i) heating and dehydrating a reaction mixture comprising D-sorbitol, L-sorbitol or an optically active mixture thereof in the presence of an acid catalyst to form an anhydropolyol product reaction mixture;

(ii) measuring the optical rotation value of said reaction mixture during said heating and dehydrating step; and

(iii) stopping said heating and dehydrating when said optical rotation value of said reaction mixture corresponds to the optical rotation value of said product reaction mixture.

4,861,514

COMPOSITIONS CONTAINING CHLORINE DIOXIDE AND THEIR PREPARATION

Richard S. Hutchings, Cincinnati, Ohio, assignor to The Drackett Company, New York, N.Y.

Filed Jan. 8, 1988, Ser. No. 204,065
Int. Cl.[4] A01N *59/00;* C11D *3/48;* C01B *11/02;* D06L *3/08*
U.S. Cl. 252—187.21 21 Claims

1. A composition having an initially basic pH consisting essentially of:

(1) from about 0.01% to about 1% by weight of sodium chlorite; and

(2) a chlorine dioxide initiator in an amount suitable to interact with sodium chlorite to form chlorine dioxide selected from the group consisting of: (A) hydroxyalkyl cellulose having from 2 to about 5 carbons in the alkyl group, an alkali metal alginate, xanthan gum, carrageenan, and agar; (B) dyes; (C) compounds having an aldehyde or acetal substitutent group; (D) perfumes not including a compound (C), and (E) mono-and disaccharides, and mixtures thereof, said composition forming an antimicrobial concentration of chlorine dioxide of about 0.1 to about 10 ppm equilibrium by interaction of the sodium chlorite and the initiator within a predetermined time subsequent to preparation of the composition and having a viscosity suitable to maintain the chlorine dioxide at a steady-state concentration.

4,861,515

POLYESTER COMPOSITION

Tsuyoshi Minamisawa, Mishima; Katsunori Endo, and Toshio Kanoe, both of Fuji, all of Japan

Filed Dec. 7, 1987, Ser. No. 129,779
Claims priority, application Japan, Dec. 26, 1986, 61-309869
Int. Cl.[4] C09K *19/52, 9/06*
U.S. Cl. 252—299.01 9 Claims

1. A polyester composition which comprises 30 to 99.5 percent by weight of a polyester being processable in the melt

state and being capable of forming the anisotropic phase in the melt state and 0.5 to 70 percent by weight of an inorganic filler having been surface treated with an epoxysilane compound.

4,861,516

LAUNDRY PRETREATMENT COMPOSITION FOR OILY AND GREASY SOIL

Claus-Peter Kurzendoerfer, Duesseldorf, and Winfried Wichelhaus, Mettmann, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 22, 1988, Ser. No. 184,736

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1987, 3713962

Int. Cl.[4] C11D *1/14, 3/075*

U.S. Cl. 252—531 **13 Claims**

1. A laundry pretreatment composition for oily and greasy soil comprising:

(a) from about 5 to about 15% by weight of at least one anionic surfactant selected from the group consisting of C_{12}–C_{18} alkali metal alkylsulfate, or
from about 25 to 45% by weight of at least one nonionic surfactant selected from the group consisting of alkyl polyglycol ether and alkylphenol polyglycol ether respectively containing from about 6 to about 10 ethylene oxide groups, the alkyl alcohol groups containing from about 12 to about 18 carbon atoms and the alkyl phenol groups from about 8 to 9 carbon atoms in the alkyl portion, or
from about 5 to about 15% by weight of a mixture of at least one of said anionic surfactant and at least one of said nonionic surfactant, the anionic surfactant component making up at least two thirds of said mixture,

(b) from about 50 to about 55% by weight of at least one cosurfactant in the presence of said anionic surfactant, and from about 35 to about 50% by weight of at least one cosurfactant in the absence of said anionic surfactant, said cosurfactant consisting of a C_5 or C_6 monoalcohol or adduct thereof containing from about 1 to about 2 ethylene oxide groups, and

(c) from about 45 to about 30% by weight of water in the absence of said anionic surfactant, all weights being based on the weight of said composition, and wherein said composition is in the form of an invertmicellar ternary mixed phase.

4,861,517

METHOD FOR THE PREPARATION OF CONCENTRATED FLOWABLE AQUEOUS SOLUTIONS OF BETAINES: ADDITION OF MINERAL ACID

Volkbert Bade, Essen, Fed. Rep. of Germany, assignor to Th. Goldschmidt AG

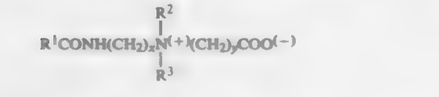
Filed Jul. 22, 1988, Ser. No. 223,286

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726322

Int. Cl.[4] A61K *7/07;* **B01F** *17/18;* **C07C** *103/54;* **C11D** *1/90*

U.S. Cl. 252—546 **14 Claims**

1. In a method for the preparation of flowable aqueous solutions of betaines of the general formula



wherein

R^1 is the alkyl portion of a fatty acid with 6 to 18 carbon atoms,

R^2, R^3 are the same or different and represent alkyl with 1 to 4 carbon atoms

x is 2 or 3 and

y is 1, 2 or 3

by quaternization of fatty acid amides

$$R^1CONH(CH_2)_xNR^2R^3$$

wherein R^1, R^2, R^3 and x have the above meaning, with ω-halogenalkylcarboxylic acids $X(CH_2)_yCOOY$ or their salts (X=halogen, Y=a hydrogen, alkali or ammonium ion) in aqueous solution at elevated temperatures, the improvement which comprises that after the quaternization, mineral acid is added to the aqueous betaine solution thus obtained, said mineral acid being added in an amount sufficient to obtain a pH of the solution of about between 1 to 4.5.

4,861,518

NON-FILMING HIGH PERFORMANCE SOLID FLOOR CLEANER

Stephen A. Morganson, and John L. Beecher, both of Eagan, Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed Aug. 1, 1988, Ser. No. 226,609

Int. Cl.[4] C11D *3/26, 17/00*

U.S. Cl. 252—548 **16 Claims**

1. A solid cleaning concentrate composition for aqueous dilution to form a non-filming floor cleaner, said concentrate comprising:

a major portion of a water soluble organic carrier for inertly containing the active ingredients of said concentrate in a solid cast mass prior to dilution, said active ingredients comprising:

(i) an effective amount of a nonionic surfactant component for imparting wettability and lypophilic solubilizing character to said nonfilming floor cleaner,

(ii) an effective amount of an organic solubilizer for solvating fatty oils and grease on the surface of application,

(iii) an effective amount of an alkalinity source for maintaining said non-filming floor cleaner above a pH of 9.0 upon dilution and selected from the group consisting of alkali metal salts of hydroxide and monoethanolamine,

wherein said concentrate composition is diluted to form an aqueous floor cleaner which imparts a non-filming character upon application.

4,861,519

METHOD FOR VOLUME REDUCTION OF LOW ACTIVITY ORGANIC WASTES FROM NUCLEAR POWER PLANTS BY ANAEROBIC DECOMPOSITION

Esko Tuas, Kauniainen; Raimo Mäläntti, Helsinki, and Antti Ruuskanen, Kerava, all of Finland, assignors to Imatran Voima Oy, Finland

Filed Mar. 25, 1988, Ser. No. 173,650

Claims priority, application Finland, Apr. 8, 1987, 871550

Int. Cl.[4] C02F *3/28, 3/00;* **G21F** *9/12, 9/00*

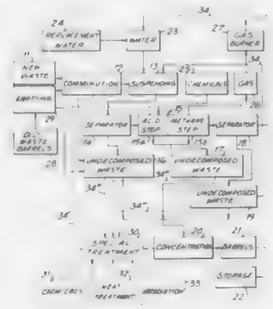
U.S. Cl. 252—633 **13 Claims**

1. Method for treating low activity organic wastes from a nuclear power plant, which comprises:

pre-treating said waste to render the same suitable for anaerobic decomposition,

subjecting said pretreated waste to anaerobic decomposition in two stages, a first acid stage and a second methane stage, the anaerobic decomposition producing gasses,

burning the gasses produced by the anaerobic decomposition, and



collecting and packing the undecomposed waste for further disposition,

whereby the volume of the waste is substantially reduced.

4,861,520

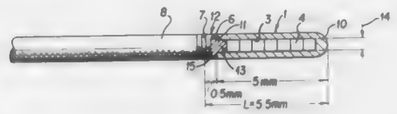
CAPSULE FOR RADIOACTIVE SOURCE

Eric van't Hooft, Gezichtslaan 16, 3956 BB Leersum, and Libbe van Zwol, Leersum, both of Netherlands, assignors to Eric van't Hooft, Netherlands

Filed Oct. 28, 1988, Ser. No. 263,848

Int. Cl.[4] G21G *4/00;* **C09K** *11/00;* **A61F** *2/66*

U.S. Cl. 252—644 **15 Claims**



1. A drivable radioactive source capsule comprising:

(1) a tubular body containing therein one or more radioactive sources, said tubular body having a first end and a second end which is a terminus of the tubular body;

(2) a plug having an elongated closure portion with the diameter of said closure portion being substantially equal to the inside diameter of said tubular body, said closure portion being disposed within the tubular body through the second end thereof and being attached to said second end of the tubular body, and said plug having a connection portion adjacent said closure portion with the diameter of the connecting portion being substantially equal to the outside diameter of the tubular body: and

(3) an elongated flexible drive cable connected to said connection portion of said plug;

whereby radioactive sources may be placed in said tubular body and said body closed by disposing the closure portion of the plug into the second end of the tubular body and attaching the closure portion to the second end of the tubular body.

4,861,521

POLYMERIZABLE LIPOSOME-FORMING LIPID, AND METHOD FOR PRODUCTION THEREOF

Kazuhiko Suzuki, and Hiroshi Yoshioka, both of Fujinomiya, Japan, assignors to Terumo Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 813,540, Dec. 26, 1985, abandoned. This application Jul. 14, 1987, Ser. No. 73,175

Claims priority, application Japan, Dec. 28, 1984, 59-274894; Dec. 28, 1984, 59-274895

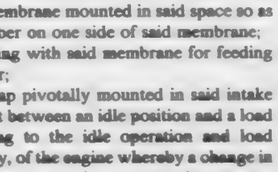
Int. Cl.[4] C07F *9/10*

U.S. Cl. 260—403 **4 Claims**

1. A polymerizable liposome-forming lipid represented by the general formula I:

$$CH_3(CH_2)_3CH{=}CHCH{=}CHCH{=} \qquad (I)$$

$$CH_3(CH_2)_3CH{=}CHCH{=}CHCH{=}$$



wherein R stands for $-(CH_2)_2N^{\oplus}(CH_3)_3$.

4,861,522

CARBURETOR FOR AN INTERNAL COMBUSTION ENGINE

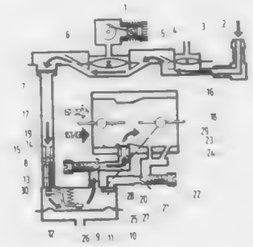
Reinhard Gerhardy, Korb; Hans Holderle, Freiberg; Jürgen Wolf, Stuttgart, and Werner Vonderau, Backnang, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed May 2, 1988, Ser. No. 189,129

Claims priority, application Fed. Rep. of Germany, May 8, 1987, 3715272

Int. Cl.[4] F02M *7/22*

U.S. Cl. 261—35 **10 Claims**



1. A membrane carburetor for an internal combustion engine for a handheld apparatus such as a chain saw, the carburetor comprising:

a housing having an interior space and defining an intake passage communicating with the engine and through which a stream of air is drawn by suction when the engine is operating;

a movable regulating membrane mounted in said space so as to define a fuel chamber on one side of said membrane;

feed valve means coacting with said membrane for feeding fuel into said chamber;

an adjustable throttle flap pivotally mounted in said intake passage for movement between an idle position and a load position corresponding to the idle operation and load operation, respectively, of the engine whereby a change in the speed of the engine occurs in correspondence to an

adjustment of said throttle flap between said idle and load positions;

idle-nozzle means for metering fuel into said intake passage during the idle operation of the engine; said idle-nozzle means including: an idle-nozzle channel extending from said chamber to said intake passage; and, an idle adjusting screw for adjusting the quantity of fuel supplied to the intake passage through said idle-nozzle channel;

main nozzle means for metering fuel into said intake passage during the load operation of the engine; said main-nozzle means including a main-nozzle channel also extending from said chamber to said intake passage; and, a main adjusting screw for adjusting the quantity of fuel supplied to the intake passage through said main-nozzle channel;

a control member movable between a first position for closing said-nozzle means during said idle operation and a second position for closing said idle-nozzle means during said load operation; said control member being mounted in said housing so as to be disposed between said membrane and said adjusting screws; and,

connecting means for operatively connecting said throttle flap to said control member so as to cause the latter to be in said first position when said throttle flap is in said idle position and to move into said second position when said throttle flap is displaced into said load position; and, said connecting means including direct connecting means for directly connecting said control member to said throttle flap thereby making the position to which said control member is moved dependent upon the speed of the engine.

4,861,523

HUMIDIFICATION IN RESPIRATORY SYSTEMS

Anthony V. Beran, 1472 La Loma Dr., Santa Ana, Calif. 92705

Filed Jul. 13, 1987, Ser. No. 72,543

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—104 **6 Claims**



1. In a humidifier for humidifying respiratory gas, the structure comprising:

a flexible, gas tight bag comprising a front wall and back wall of pliable material bonded together at a marginal bond;

a labyrinth means having an inlet and an outlet and suspended within said bag and comprising:

a rear layer porous to water vapor but not to water;

a front layer porous to water vapor but not to water;

an intermediate foam layer porous to water vapor;

bond line means for forming a flow path through said labyrinth means between said inlet and said outlet; and

bond line means for providing a first passage way between said inlet and the exterior of said bag and a second passageway between said outlet and the exterior of said bag.

4,861,524

APPARATUS FOR PRODUCING A GAS MIXTURE BY THE SATURATION METHOD

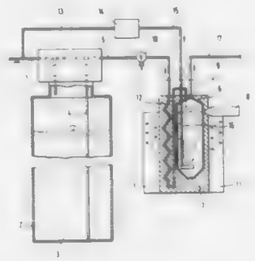
Günter Sielaff, Bensheim; Frank Joseph, Gernsheim, and Norbert Harder, Aschaffenburg, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Mar. 18, 1988, Ser. No. 170,222

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1987, 3708967

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—130 **14 Claims**



1. A device for producing a gas mixture with a liquid by saturation, the device having a stock vessel (2) for containing the liquid and a dip tube (16) for introducing a carrier gas into the liquid, wherein the stock vessel (2) is connected via a liquid line (5) to a separate reaction vessel (6) to which the carrier is fed via the dip tube (16), the reaction vessel having a volume substantially smaller than the volume of the stock vessel (2), the reaction vessel (6) having a contactless level sensor (8) which precisely controls a flow regulation instrument (10) in the liquid line (5) leading to the reaction vessel (6), and to maintain a substantially constant liquid level in the reaction vessel, a temperature control system (11) disposed in juxaposition with the reaction vessel, the temperature control system comprising a metal heat sink (7) completely surrounding and in direct contact with the reaction vessel (b) with Peltier elements in direct contact with the heat sink (7) so as to precisely control the temperature thereof.

4,861,525

METHOD OF IDENTIFYING THE LENGTH DIFFERENCE BETWEEN AN OPTICAL FIBER AND AN ENVELOVE

Ulrich Oestreich, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 4, 1988, Ser. No. 177,172

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1987, 3712516

Int. Cl.[4] B29D *11/00;* **G02B** *6/44*

U.S. Cl. 264—1.5 **19 Claims**



1. In a method of identifying a measured quantity proportional to the length difference between an optical element and an envelope during a manufacture of an optical lead having the element loosely received in the envelope, said process including extruding the envelope around the element to form the lead and then passing the lead through at least one cooling path, the improvements comprising measuring the speed of travel of the envelope prior to entering the cooling path and measuring the speed of travel of the envelope after passing through the cooling path and determining the difference between the two measured speeds.

4,861,526

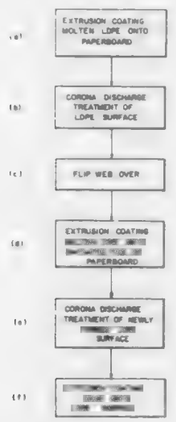
METHOD OF MAKING A LAMINATE USING HEAT SEALABLE BARRIER MATERIAL FOR IMPROVED JUICE PACKAGING (EVOH)

Charles E. Gibbons, and Allan A. Whillock, both of Mobile, Ala., assignors to International Paper Company, Purchase, N.Y.

Division of Ser. No. 864,142, May 16, 1986, Pat. No. 4,701,360. This application Jun. 10, 1987, Ser. No. 60,199

Int. Cl.[4] B29C *47/06*

U.S. Cl. 264—22 **4 Claims**



1. A process for improving the resistance of paperboard to the migration of essential oils and/or flavorings, and process comprising the steps of:

(a) extrusion coating an outer layer of a low density polyethylene polymer onto said outer surface of said paperboard;

(b) corona discharge treating said outer layer of low density polyethylene polymer;

(c) extrusion coating an inner layer of a low density polyethylene polymer onto said inner surface of said paperboard;

(d) corona discharge treating said inner layer of low density polyethylene polymer; and

(e) extrusion coating a layer of a heat-sealable ethylene vinyl alcohol copolymer onto said surface of said inner layer of low density polyethylene polymer and heat-sealed with the outer layer of low density polyethylene polymer on conventional equipment at temperatures ranging from 250° F.–500° F.

4,861,527

HIGH STRENGTH CHITOSAN FIBERS AND FABRICS THEREOF

George V. DeLacca, 1816 Gravers La., Wilmington, Del. 19810; Lorenzo F. Pelosi, 4900 Old Hill Rd., Wilmington, Del. 19807, and John P. O'Brien, 353 Saginaw Rd., Oxford, Pa. 19363

Continuation-in-part of Ser. No. 942,442, Dec. 16, 1986, Continuation-in-part of Ser. No. 90,144, Aug. 27, 1987, and a continuation-in-part of Ser. No. 90,145, Aug. 27, 1987. This application Feb. 8, 1988, Ser. No. 153,358

Int. Cl.[4] D01F *9/00;* **C08B** *37/10;* **C07H** *13/02*

U.S. Cl. 264—186 **6 Claims**

1. A method for preparing high strength chitosan fibers comprising spinning an anisotropic solution of a derivative of chitin or of chitosan through an inert gas and into a coagulating bath, removing as-spun fiber and treating it with alkali to remove acetyl, formyl or other pendant groups at the 2, 3 and 6 carbon positions of the glucosamine repeating unit to form chitosan.

4,861,528

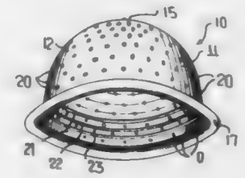
METHOD OF MAKING A HAIR-STREAKING CAP

Vincent L. Ramik, Annandale, Va., assignor to Duchess Limited, Alexandria, Va.

Division of Ser. No. 848,203, Apr. 4, 1986, Pat. No. 4,724,852. This application Jan. 29, 1988, Ser. No. 149,818

Int. Cl.[4] B29C *33/42, 33/74, 43/00*

U.S. Cl. 264—39 **1 Claim**



1. A method of forming a second cup-shaped article in a mold in which a first cup-shaped article was first formed but in which the second cup-shaped article includes at least one lesser internal dimension comprising the steps of providing a mold defined by a male plunger having an exterior convex surface which is received in a female cavity defined by a concave surface with the surfaces being spaced a predetermined distance from each other, forming the first cup-shaped article in the cavity between the latter-noted surfaces, removing the first-formed cup-shaped article from the cavity forming a circumferential groove in the convex surface of the plunger to form an altered plunger, and molding the second cup-shaped article in the female cavity between the altered plunger and concave surface to thereby form the second cup-shaped article with an internally directed circumferential rib whose radial depth constitutes a reduction in the internal diameter at the link area of the first cup-shaped article.

4,861,529

PRESS ROLLER ADJUSTMENT

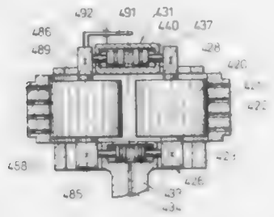
Werner Groebli, Flawil; Hugo Hegelbach, Busswil, and Hanspeter Schaffner, Niederuzwil, all of Switzerland, assignors to Gebroder Buhler, Switzerland

Division of Ser. No. 6,507, Jan. 22, 1987, Pat. No. 4,770,621, which is a continuation-in-part of Ser. No. 744,056, Jun. 12, 1985, Pat. No. 4,711,622. This application Apr. 25, 1988, Ser. No. 185,559

Claims priority, application Switzerland, Jan. 24, 1986, 00287/86

Int. Cl.⁴ B29C *47/32, 47/52*

U.S. Cl. 264—40.1 **5 Claims**



1. A method for operating a pellet mill having die means and at least one press roller engaging a perforated cylindrical surface thereof, said die means and said press roller being rotated relative to each other by a drive motor during operation of the pellet mill to force a material through said perforated cylindrical surface to form pellets, the method comprising:

feeding the material into said pellet mill;

driving the motor to effect relative rotation between said die means and said press roller;

monitoring the load on the drive motor, while being driven, and generating a signal representative of an actual load;

comparing the actual load with a first predetermined nominal load;

stopping the feeding of the material under overload condition, when the actual load exceeds said first predetermined nominal load;

disengaging said press roller away from said cylindrical surface to a predetermined distance, when said overload condition occurs; and

reapproaching said press roller toward said surface, until it engages said cylindrical surface and the distance has become zero, said reapproaching step being interrupted, when the load exceeds a second predetermined nominal load.

4,861,530

METHOD FOR ENABLING THE CUTTING TO SIZE OF A CONTINUOUSLY EXTRUDED WEATHER STRIP WITH VARIABLE CHARACTERISTICS, PARTICULARLY FOR MOTOR VEHICLE BODIES

Mauricio Zaccaria, Cirlè , Italy, assignor to S.A.I.A.G. S.p.A., Cirle, Italy

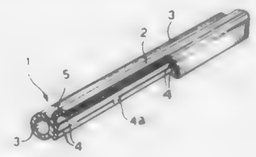
Filed Jun. 3, 1988, Ser. No. 201,979

Claims priority, application Italy, Jun. 5, 1987, 67483 A/87

Int. Cl.⁴ B29C *47/02, 47/92*

U.S. Cl. 264—40.2 **2 Claims**

1. A method for enabling the cutting to size of a continuously extruded weather strip intended particularly for fitting to an edge of an aperture or closure element of a motor vehicle body, comprising a U-sectioned retaining profile of elastomeric material provided with internal longitudinal ribs for retaining the weather strip on the edge, and a tubular sealing profile also of elastomeric material and co-extruded with the retaining profile, in which the tubular profile and/or the anchoring profile have variable characteristics and in which the cutting must be carried out in correspondence with predetermined zones related to the variations in the characteristics of the weather strip, the method consisting of at least partial omission, during extrusion of the weather strip, of at least one of the internal longitudinal retaining rib in sections which can



be related to predetermined cutting zones, detection of the omitted sections and provision of corresponding signals to enable cutting.

4,861,531

PROCESS FOR PRODUCTION OF EXPANSION-MOLDED ARTICLES IN A MOLD OF LINEAR LOW DENSITY POLYETHYLENE RESINS

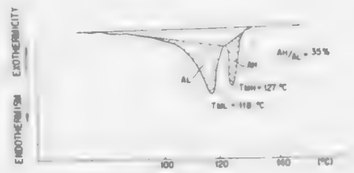
Hirofumi Maeda, Takatsuki, Japan, assignor to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 16, 1988, Ser. No. 155,907

Claims priority, application Japan, Feb. 20, 1987, 62-38844

Int. Cl.⁴ C08J *9/22, 9/14, 9/18*

U.S. Cl. 264—50 **5 Claims**



1. A process for production of an expansion-molded article of a linear low density polyethylene resin in a mold, which comprises compressing in a pressure vessel pre-expanded linear low density polyethylene resin beads having two melting points when measured by differential scanning calorimetry and, when the melting point at a low temperature side and the melting point at a high temperature side are designated T_{ML} and T_{MH} respectively, between said two melting points and the peak fusion area at said T_{ML} is designated A_L and the peak fusion area at said T_{MH} is designated A_H satisfying:

$$5\% < A_H/A_L < 80\%$$

under a gaseous pressure, filling a mold capable of closing but incapable of sealing with said compressed beads, then venting excess gas from said mold and, heating and fusing with steam in such a state that a compressive rate of said pre-expanded beads immediately before said heating with steam to the original pre-expanded beads is maintained to 5 to 60%, thereby producing a molded article in the shape of the mold.

4,861,532

METHOD OF PREPARING CERAMICS FROM POLYMERS DERIVED FROM CYCLIC SILAZANES, AND HALOSILANES

Lorea A. Haluska, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 926,607, Nov. 4, 1986, Pat. No. 4,742,143. This application Jan. 4, 1988, Ser. No. 141,647

Int. Cl.⁴ C04B *35/58*

U.S. Cl. 264—65 **5 Claims**

1. A method of preparing a ceramic material, the method comprising pyrolyzing a preceramic polymer in an inert atmosphere or in a vacuum, to a temperature of at least 750° C., until the preceramic polymer is ceramified and a ceramic material obtained, the preceramic polymer consisting essentially of a polymer prepared by contacting and reacting in an inert, essentially anhydrous atmosphere, a component selected from the group consisting of halogen-containing monosilanes having the general formula

$$R'SiX3$$

and mixtures of halogen-containing monosilanes having the general formula

$$R_c'SiX_{(4-c)}$$

wherein c has a value of 1 or 2 and in the mixtures, the number of monosilanes having diorgano-substituted silicon atoms does not exceed the number of monosilanes having monoorgano-substituted silicon atoms, with a cyclic silazane or a mixture of cyclic silazanes selected from the group consisting of silazanes having the general formula (i) $(CH_3R''SiNH)_x$ and (ii) $(C_6H_5R''SiNH)_x$ at a temperature in the range of 0° C. to 260° C. and removing by-produced volatile products by distillation, wherein R' and R'' are each independently selected from the group consisting of hydrogen, vinyl, phenyl and alkyl radicals containing 1 to 3 carbon atoms; x has a value of 3 to 6 and X is a halogen atom.

4,861,533

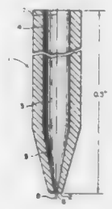
METHOD OF PREPARING SILICON CARBIDE CAPILLARIES

Robert Bertin, San Jose, Calif.; Michael B. Miller, DeSota, Tex.; Burl M. Moon, Richardson, Tex., and Robert C. Post, Dallas, Tex., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 933,007, Nov. 20, 1986, Pat. No. 4,772,498. This application Nov. 18, 1987, Ser. No. 121,203

Int. Cl.⁴ C04B *35/56*

U.S. Cl. 264—81 **8 Claims**



1. A method of making a capillary having an axially extending passage terminating in a relatively small diameter opening at one end thereof through which a fine electrical conductor wire is adapted to pass comprising the steps of:

(a) chemically vapor depositing a substantially smooth outer refractory coating into a substrate having a tapered end by introducing, in the absence of oxygen or oxygen containing compound, a gaseous mixture capable of depositing silicon carbide onto the substrate;

(b) controlling the rate of deposition of silicon carbide onto the substrate within the range of about 1 to 3 mils/hour at a temperature in the range of about 1200° to 1400° C.;

(c) machining the resulting silicon carbide coated substate to the desired length;

(d) machining the resulting tapered end of the coating to the desired diameter; and

(e) removing said substrate from the outer silicon carbide coating to form said axially extending passage and the guide opening through which the wire to be bonded is fed.

4,861,534

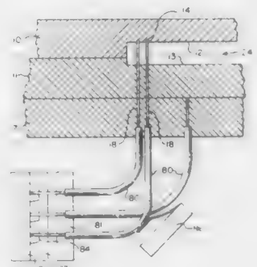
METHOD AND APPARATUS FOR THE INJECTION MOLDING OF CIRCUIT BOARDS

Russell W. Boehm, Longmont, Colo.; Rex A. Guinn, Stamping Ground, Ky., and Hans J. Koerner, Round Rock, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1988, Ser. No. 212,815

Int. Cl.⁴ B29C *45/26*

U.S. Cl. 264—102 **29 Claims**



1. A method of molding a selected one of a family of circuit boards, wherein the plural circuit boards of the family include through-holes that are arranged in different physical patterns, the method comprising;

providing a plurality of different cavity block pairs, one pair for each of said plural different-pattern circuit boards,

the cavity blocks of each of said pairs of cavity blocks having through-holes arranged in the pattern of the through-holes to be molded into its circuit board,

providing a molding site that will accommodate any one of said cavity block pairs and whereat said one of said family of cavity block pairs may be mounted,

providing a plurality of mold penetrating core pin means at said molding site,

said core pin means being sufficient in number, and being located in a pattern so as to cooperate with the through-holes of all cavity block pairs of said family,

placing said one cavity block pair at said molding site,

moving only the core pin means corresponding to those required by said one cavity block pair, so as to penetrate the through-holes of said one cavity block pair,

filling a circuit board cavity within said one cavity block pair with a molding material,

opening said one cavity block pair, and removing a molded circuit board from the cavity in said one cavity block pair.

4,861,535

PROCESS FOR PREPARING FORMABLE SHEET STRUCTURES

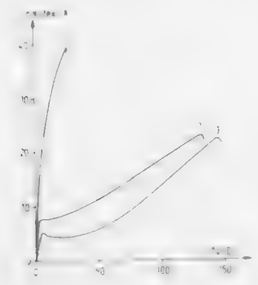
Jorgen Due, Silkeborg; Bjarne Graves, Them, and Henning Bak, Silkeborg, all of Denmark, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 12, 1986, Ser. No. 873,426

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1985, 3521479

Int. Cl.[4] D03D *15/08;* D01D *10/02*

U.S. Cl. 264—103 4 Claims



1. A process for preparing a textile sheet stucture, comprising: weaving or knitting of a yarn which has a degree of elasticity under a load of 5 cN/tex of less than 50% and which consists at least in part of partially oriented, undrawn synthetic filaments which have birefringence values above 20×10^{-3}, elongations at break between 70 and 200% and flow stresses of at least 6 cM/tex, which have been produced by high-speed spinning and are then subjected to a heat treatment under stress at temperatures between 100° and 180° C., in order to prepare a sheet structure which is irreversibly highly deformable.

4,861,536

METHOD FOR MANUFACTURING A SEALING RING

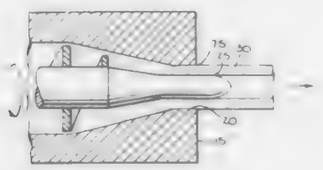
Gunter Graf, Weinheim; Heinz Gross, Birkenau, and Stefan Sponagel, Rimbach, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Jun. 12, 1987, Ser. No. 62,476

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1986, 3621242

Int. Cl.[4] B29C *57/00;* F16J *15/00*

U.S. Cl. 264—108 7 Claims



4. A method for manufacturing a sealing ring having hydrodynamically acting return transport properties, comprising the steps of:

extruding a hollow cylinder of plastically deformable material through a ring nozzle having an exit slot, said extruded hollow cylinder having a surface;

relatively rotating inner and outer surfaces of the ring nozzle at said exit slot during extrusion of the plastically deformable material thereby imparting a helical motion to the extruded material and thereby generating hydrodynamically acting return transport properties in the surface of the extruded hollow cylinder of plastically deformable material prior to solidification after said extruding, said hydrodynamically acting return transport properties being a microscopically fine pleating of the surface of the extruded hollow cylinder;

solidifying the extruded cylinder;

cutting the extruded cylinder to a predetermined length; and

shaping the cylinder into a sealing ring having a trumpet-shaped end with a flanged lip.

4,861,537

PROCESS OF MAKING A SINTERED POLYBENZIMIDAZOLE ARTICLE

Bennett C. Ward, Pineville; Edwardo Alvarez, Houston, Tex., and Ralph S. Blake, Lake Wylie, S.C., assignors to Hoechst Celanese Corp., New York, N.Y.

Division of Ser. No. 92,493, Sep. 3, 1987, Pat. No. 4,814,530. This application Jul. 25, 1988, Ser. No. 223,856

Int. Cl.[4] B29C *67/04;* C08G *69/26*

U.S. Cl. 264—126 6 Claims

1. A process which comprises compacting a particulate polybenzimidazole resin having a particle size such that the particles pass through a 100 mesh screen in a mold to a pressure in the range of 2,000 to 20,000 psi at ambient temperature for a period of at least one minute, said resin having a water and volatiles concentration below 0.1 weight percent and an IV of at least 0.4, heating the compacted polybenzimidazole resin in a first heating step to a temperature in the range of 825° to 950° F. and maintaining said compacted polybenzimidazole resin in said temperature range for a period of at least four hours so as to form a molded article, cooling said polybenzimidazole molded article to a temperature below 800° F. while maintaining said article under a pressure in the range of 2,000 to 20,000 psi, and thereafter heating the formed polybenzimidazole article to a temperature in the range of 825° to 950° F. in a second heating step under constraint, maintaining the article at this temperature for a period of at least one hour.

4,861,538

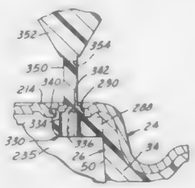
METHOD FOR MOLDING COMPOSITE METAL-ELASTOMER WHEELS

Robert J. Stalter, Sr., Bowling Green, Ohio, assignor to Motor Wheel Corporation, Lansing, Mich.

Division of Ser. No. 15,165, Feb. 17, 1987, Pat. No. 4,786,027. This application May 19, 1988, Ser. No. 196,019

Int. Cl.[4] B29C *37/02, 39/10*

U.S. Cl. 264—161 4 Claims



1. A method for molding a composite styled wheel of the type comprising a metal part consisting of a metal disc and rim subassembly operable as metal street wheel when a pneumatic tire is mounted on said rim, and a decorative urethane plastic body permanently molded to the metal part at the outboard face thereof, utilizing molding apparatus comprising a base mold part configured to receive said metal wheel part thereagainst and having an annular lip adapted for sealing engagement against an annular portion of the outboard face of the metal wheel part radially outwardly of the center of the disc in the closed condition of said molding apparatus, the base mold part having a mold cavity surface to provide an ornamental configuration for the outboard face of the plastic body of the composite wheel, the mold cavity surface in the mold closed

condition defining with at least part of the outboard face of the metal wheel part a mold cavity axially adjacent the outboard face of the metal wheel part, a clamp adapted to seat in the mold closed condition against the inboard face of the metal wheel part at least adjacent the outer perimeter of the disc for urging the metal wheel part into sealing engagement with the base mold part, the mold parts being axially separable from one another to open the molding apparatus and at clear said metal wheel part from the clamp and base mold parts, funnel means adapted for registry with a liquid urethane reaction mixture injection nozzle coupled with injection mixing apparatus, the funnel means having a nozzle passage registering with the inboard side of a pour opening in the disc in the closed condition of the mold, and sprue pin means affixed to the base mold part in juxtaposed relation to the disc pour opening, the sprue pin means being adapted to cooperate with the dics pour opening to define a restricted annular access opening to the mold cavity during the injection pour of the urethane reaction mixture, the sprue pin means being operable to restrict back-flow of the reaction material via the pour opening during gelation of the same in the cure cycle, the sprue pin means being adapted to cooperate with the disc in the vicinity if said pour opening to define a zone of weakness in the cured urethane reaction mixture operable to induce fracture in the weakness zone upon separation of the clamp funnel means from the metal part to thereby cause cleavage of the urethane reaction material adjacent the inboard surface of the metal part, wherein the wheel is molded pursuant to the following steps:

(1) said middle wheel mold part is seated and located on said base mold part with the inboard side of said disc of said middle metal mold part exposed for access thereto,

(2) a thin film mold release plastic in sheet form is next placed so as to overlie the inboard side of said disc of said middle metal mold part so as to cover said inboard side at least over and around the pour opening in said disc.

(3) said clamp is seated in closed condition against the inboard face of said middle metal wheel mold part to urge said mold parts to closed condition with said thin film sheet clamped between said middle metal wheel mold part and said clamp,

(4) said urethane reaction mixture in liquid form is injected via said funnel means under injection pressure to thereby rupture said thin film juxtaposed to said restricted access opening and thence flow into the mold cavity to fill the same, and

(5) said urethane reaction mixture is allowed to cure sufficiently in said mold to permit demolding by separation of said mold parts whereby cleavage of the urethane reaction material occurs in the vicinity of the rupture zone in said thin film sheet.

4,861,539

PROCESS OF MAKING WATER-ABSORBENT, WATER-INSOLUBLE, CROSS LINKED FIBER OR FILM

Adrian S. Allen, North Yorkshire; David Farrar, and Peter Flesher, both of West Yorkshire, all of Great Britain, assignors to Allied Colloids Ltd., England

Filed Nov. 20, 1987, Ser. No. 123,571

Claims priority, application United Kingdom, Nov. 20, 1986, 8627729; Apr. 10, 1987, 8708601; Apr. 10, 1987, 8708600; Aug. 4, 1987, 8718396

Int. Cl.[4] D01D *1/02, 10/02*

U.S. Cl. 264—204 18 Claims

1. A process of making water-absorbent, water-insoluble, cross linked polymer fibre or film having a gel capacity of at least 50 g deionized water per gram comprising extruding into a gas atmosphere a 5 to 50 weight percent solution in a solvent of a substantially linear polymer formed of a water soluble bend of monoethylenically unsaturated monomers and thereby precipitating the polymer by evaporation of the solvent and forming polymeric fibre or film, stretching the fibre or film and then cross linking the polymer in the stretched fibre or film, and in which the polymer fibre or film is permanently plasticised by inclusion of a plasticising amount of plasticising monomer in the monomer blend and the said solvent comprises an external plasticiser that is dissolved in the polymer of the fibre or film and that plasticises the fibre or film throughout the stretching and that is present in the stretched fibre or film in a plasticising amount and that comprises a volatile liquid, and in which the volatile liquid is evaporated during or after the cross linking.

4,861,540

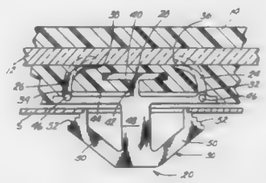
METHOD FOR FORMING A MOLDED ASSEMBLY WITH AN EMBEDDED PART

Keith A. Nieboer, Holland, and Herbert D. Tucker, Rochester, both of Mich., assignors to Donnelly Corporation, Holland, Mich.

Division of Ser. No. 26,049, Mar. 16, 1987, which is a division of Ser. No. 852,416, Apr. 16, 1986,. This application Feb. 22, 1988, Ser. No. 158,703

Int. Cl.[4] B29C *43/36*

U.S. Cl. 264—263 5 Claims



1. A method for molding a gasket or casing around a peripheral portion of sheet material with portions of a separate part embedded within said gasket or casing and other portions extending out of said gasket or casing, said method comprising:

providing a mold assembly having cooperating mold sections defining a mold cavity;

supporting a sheet of material within said old sections with said mold cavity outlining at least a portion of the periphery of said sheet material such that said sheet periphery projects into said mold cavity;

providing said separate part for insertion in the mold assembly, said separate part having a first, second and third portions, said first portion being resilient and compressible;

inserting said second portion of said separate part into a recess in one of the mold sections prior to closing said mold sections such that said second portion of said separate part is held in said recess and out of said mold cavity while said first portion extends into said mold cavity;

closing said mold sections to engage and compress said first portion of said separate part with and against said sheet material to cause pressure which urges said third portion of said separate part into tight contact with another part of said one mold section;

filling said mold cavity with a flowable molding material to form the gasket or casing around the sheet periphery and to embed said first portion of said separate part in said gasket or casing while said second portion of said separate extends out of said gasket or casing, said pressure of said third portion of said separate part in tight contact against said other part of said one mold section preventing flow of molding material around said second portion of said separate part to prevent embedding of that second portion in said gasket or cashing; and

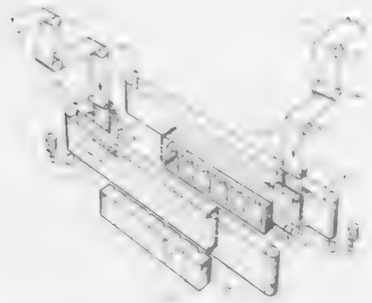
opening said mold sections after formation of said gasket or casing and removing said sheet material from said mold assembly with said gasket or casing thereon and said second portion of said separate part extending out of said gasket or casing.

4,861,541

METHOD FOR APPLYING LABELS TO BLOW MOLDED ARTICLES

Ronald S. Kaminski, Bowling Green; Robert P. Snyder, Sylvania, and Michael J. Crowley, Pleasant Plain, all of Ohio, assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed May 28, 1987, Ser. No. 54,928
Int. Cl.[4] B29C *49/24*
U.S. Cl. 264—509 7 Claims



1. In a method of making hollow plastic articles wherein a label is positioned in each of a plurality of sets of spaced partible molds, a preform is positioned in each set of partible molds and the molds are closed and the preform is blown outwardly to the confines of the mold to apply the label to the resultant hollow plastic article, the method of positioning the labels in the molds which comprises:

providing labels on a roll of labels in a web having a free end, successively engaging the free end of the web of the roll of labels by a first endless vacuum conveyor and tensioning a portion of the web between a point upstream of the free end and the free end by said first endless vacuum conveyor by operating the endless vacuum conveyor to tension the portion of the web,

successively cutting labels from successive tensioned portions while the free end is engaged by said first endless vacuum conveyor,

transferring each label successively adjacent a second endless vacuum conveyor by moving the first endless vacuum conveyor bodily to a position adjacent said second endless vacuum conveyor,

indexing the second conveyor successively to provide an array of labels which corresponds in spacing to the spacing of the sets of molds,

simultaneously engaging the array of labels and moving the array of labels from a first position on said second conveyor to a second position within the partible molds; and,

simultaneously depositing the array of labels in the molds.

4,861,542

ROTARY BLOW MOLDING METHOD

Paul M. Oles, and Frederick J. Shepps, both of York, Pa., assignors to Graham Engineering Corporation, York, Pa.

Division of Ser. No. 28,975, Mar. 23, 1987, abandoned. This application Nov. 4, 1987, Ser. No. 116,410
Int. Cl.[4] B29C *49/36, 49/04*
U.S. Cl. 264—542 4 Claims

1. A method of blow molding an article using a pair of mold halves defining a mold cavity when closed and an extrusion die head, including the steps of:

a. continuously extruding a thermoplastic resin parison vertically downwardly from an extrusion die head and into an extrusion station;

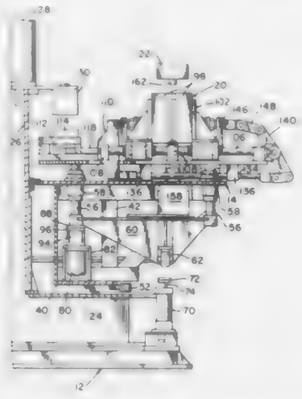
b. moving an open pair of vertically supported mold halves into the extrusion station to either side of the downwardly growing parison;

c. supporting said mold halves vertically at said extrusion station by a support pad movable away from the mold halves;

d. closing the mold halves to capture the parison within the mold cavity;

e. separating the captured parison from a growing new parison above the closed mold halves;

f. moving the closed mold halves from the growing new parison by rapidly withdrawing the support pad away



from the mold halves and allowing the closed mold halves and captured parison to gravity free-fall vertically downwardly away from the extrusion die head without lateral shifting at a rate greater than the rate of new parison growth down from the extrusion die head until the mold halves are free of the new parison and then moving the mold halves away from the extrusion station;

g. maintaining the new parison without lateral shifting during steps e. and f.;

h. blowing the captured parison against the mold cavity to form the article; and,

i. opening the mold halves and ejecting the blown article.

4,861,543

METHOD FOR THERMOFORMING MULTIPLE COVERSTOCK AND SUCH STOCK HAVING FINISHED STYLING LINES THEREIN

Scott Rafferty, Dover, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Filed Feb. 22, 1988, Ser. No. 158,618
Int. Cl.[4] B29C *65/18*
U.S. Cl. 264—545 5 Claims

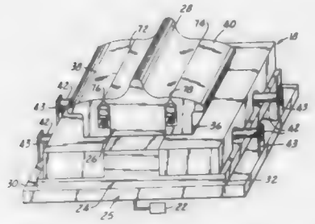
1. A method for forming a finished joint line between segments of a multiple coverstock comprising the steps of:

joining edge portions of the segments of the cover material to form a rough seam therebetween;

supporting the rough seam with respect to a shaping die having an expandable joint defined by moveable mold parts;

locating the moveable mold parts in an open position to expand the expandable joint;

applying a vacuum to the expanded joint of the shaping die to draw the rough seam inwardly of the shaping die while folding in the cover material at the rough seam to conceal the rough seam with respect to the remainder of the exposed surface of the cover material; and



pinching the fold together to closely gather the cover material at the exposed surface thereof for forming finished styling lines therealong.

4,861,544

BWR CONTROL ROD

Gerald M. Gordon, Soquel, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Feb. 24, 1988, Ser. No. 159,972
Int. Cl.[4] G21C *7/10*
U.S. Cl. 376—333 2 Claims



1. An improvement to an elongate flat planar member comprising a portion of a nuclear reactor control rod for insertion within the core of a nuclear reactor for control of the reaction, said planar members of said control rod comprising in combination:

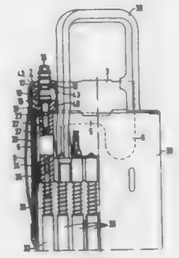
a plurality of tubes defining cylindrical volumes and having square cross sections exteriors, each said tube defining a cylinder of constant sidewall thickness sufficient for defining therewithin a cylindrical volume for containment of neutron absorbing poisons; corner sections integrally formed to said constant sidewall thickness cylinder having a placement on the outside of said cylinder at 90 intervals to the sidewalls of said constant sidewall thickness tube, said four corner sections defining volumes of increased thickness neutron absorbing poisons confined within each of said cylindrical volumes in said tube of constant sidewall thickness; said tubes joined in side-by-side relation by welding at said corner sections to form said elongate flat planar member of said control rod, the improvement comprising a flexible sheath fastened around said flat planar member, said sheath not fastened under tension, said sheath fastened at the extremities thereof to said control rod to enclose said welded side-by-side square exterior sectioned tubes in water tight relation.

4,861,545

NUCLEAR REACTOR FUEL ASSEMBLY

Hans-Joachim Lippert, Höchstadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 672,793, Nov. 19, 1984, abandoned. This application Nov. 13, 1987, Ser. No. 120,725
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1983, 3341966
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—448 3 Claims



1. A nuclear reactor fuel assembly having fuel rods containing nuclear fuel, comprising a fuel assembly box in which the fuel rods are disposed, a head plate in said box having feedthroughs formed therein in which fuel rods are guided, at least some of the fuel rods being fastened to said head plate in said feedthroughs, a corner bolt disposed on top of said head plate, a cross piece disposed on said corner bolt at an angle inside corner of said box, an angular part disposed on two outer surfaces of said box above said corner bolt, said angular part having a shoulder, two leaf springs each extended in longitudinal direction of said box on a respective one of said two outer surfaces, a screw bolt connecting said box and said angular part to said corner bolt, said screw bolt having an expansion shank formed therein with a reduced diameter at said corner bolt, said screw bolt having a screw head with two ends, said screw head having a lower surface being supported on said shoulder of said angular part, said screw head having a constriction formed therein between said ends thereof defining a coaxial screw head shank with a reduced diameter disposed in a hole formed in said angular part above said shoulder, and a holding body in the form of a transverse pin fastened to said angular part in said hole and engaging said screw bolt at said constriction for connecting said screw bolt to the top of said angular part and preventing movement of said screw head relative to said angular part.

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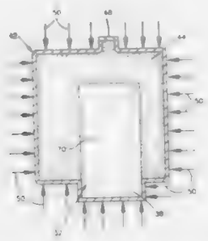
METHOD OF FORMING A METAL ARTICLE FROM POWDERED METAL

Gerald I. Friedman, Cleveland Heights, Ohio, assignor to Precision Castparts Corp., Portland, Oreg.

Filed Dec. 23, 1987, Ser. No. 137,802
Int. Cl.[4] B22F *7/00*
U.S. Cl. 419—8 37 Claims

1. A method of forming a metal article from powdered metal, said method comprising the steps of providing a metal container with a rigid core disposed therein, filling the container with metal powder, said step of filling the container with metal powder including at least partially surrounding the core with the metal powder, thereafter, cold compacting the metal powder to plastically deform particles of the metal powder without significant bonding between the particles of the metal

powder, said step of cold compacting the metal powder includes exposing the container to fluid at a relatively low temperature and a relatively high pressure, pressing the metal powder particles against each other under the influence of fluid pressure applied against the container, pressing the metal powder particles against the core under the influence of fluid pressure applied against the container, and deforming the metal powder particles as they are pressed against each other and against the core, thereafter, hot compacting the metal powder to bond the particles of metal powder together and form a unitary body which at least partially surrounds the core, and removing the core from the unitary body to form a recess in the unitary body.



4,861,547

IRON-CHROMIUM-NICKEL HEAT RESISTANT ALLOYS

John H. Calling, St. Louis, Mo., assignor to Carondelet Foundry Company, St. Louis, Mo.

Filed Apr. 11, 1988, Ser. No. 179,846
Int. Cl.[4] C22C *38/44, 30/00*
U.S. Cl. 420—53 **12 Claims**

1. An air-meltable and air-castable alloy which is free of titanium consisting essentially of, in weight percent, between about 8% and about 62% nickel, between about 12% and about 32% chromium, between about 0.25% and about 1.1% molybdenum, between about 0.05% and about 0.8% tungsten, between about 0.10% and about 0.65% columbium, up to about 0.5% carbon, up to about 1% silicon, up to about 3% manganese, up to about 0.2% nitrogen, and the balance essentially iron.

4,861,548

SEAWATER-CORROSION-RESISTANT NON-MAGNETIC STEEL MATERIALS

Haruo Shimada, and Yoshiaki Sakakibara, both of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 40,103, Jan. 20, 1987, abandoned. This application Jan. 6, 1988, Ser. No. 141,224
Claims priority, application Japan, Apr. 30, 1986, 61-100234; May 23, 1986, 61-117539; Apr. 2, 1987, 62-81664
Int. Cl.[4] C22C *38/06*
U.S. Cl. 420—79 **5 Claims**

1. A seawater-corrosion-resistant non-magnetic steel material consisting essentially of

C: not more than 1.0%
Si: not more than 0.25%
Mn: not more than 2.0%
Al: more than 20.0 up to 37.3%
Cr: 1.0 to 5.5%
P: not more than 0.015%
S: not more than 0.005%
Balance: iron and unavoidable impurities.

4,861,549

ROLLER CASTER SHELL STEEL

Ashok E. Khare, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Filed Feb. 18, 1988, Ser. No. 157,657
Int. Cl.[4] C22C *38/44, 38/46*
U.S. Cl. 420—109 **6 Claims**

1. A ferritic alloy steel, in weight percent, consisting essentially of from about 0.45% to about 0.49% carbon, about 0.90% to about 1.00% manganese, about 0.010% maximum phosphorus, about 0.002% maximum sulphur, about 0.15% to about 0.35% silicon, about 1.20% to about 1.50% nickel, about 1.20% to about 1.45% chromium, about 0.80% to about 1.00% molybdenum, about 0.15% to about 0.20% vanadium, an effective amount of rare earth up to about 0.08% to avoid temper embrittlement, and balance essentially iron.

4,861,550

CORROSION-RESISTANT NICKEL-BASE ALLOY HAVING HIGH RESISTANCE TO STRESS CORROSION CRACKING

Takeshi Yoshida; Yoshio Takizawa, both of Urawa, and Ichiro Sekine, Kitamoto, all of Japan, assignors to Mitsubishi Metal Corporation of Tokyo, Tokyo, Japan

Continuation of Ser. No. 607,619, May 7, 1984, abandoned. This application Mar. 14, 1988, Ser. No. 135,958
Claims priority, application Japan, Jul. 25, 1983, 58-135313; Jul. 25, 1983, 58-135314; Jul. 25, 1983, 58-135315
Int. Cl.[4] C22C *19/00*
U.S. Cl. 420—460 **7 Claims**

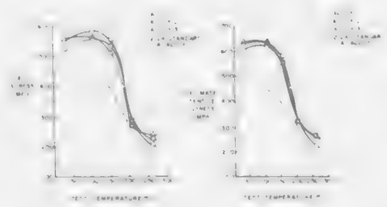
1. A corrosion-resistant Ni-base alloy having high resistance to stress corrosion cracking and consisting of, by weight: 25–35% Mo, 0.3–2% Al, 0.1–4% of at least one of the elements W, Cr and Cu, balance Ni and incidental impurities including up to 0.02% C and up to 0.1% Si.

4,861,551

ELEVATED TEMPERATURE ALUMINUM ALLOYS

Peter Meschter, Florissant; Richard J. Lederich, U. City, and James E. O'Neal, Bridgeton, all of Mo., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 30, 1987, Ser. No. 79,316
Int. Cl.[4] C22C *21/00*
U.S. Cl. 420—533 **6 Claims**



2. An aluminum based alloy consisting essentially of in weight percent;

Copper	3.0
Lithium	2.0
Magnesium	1.0
Zirconium	0.2
Chromium	1.6
Aluminum	Balance (except for incidental impurities)

which is produced by inert gas atomization at solidification rates on excess of 10^3 ° K./S.

4,861,552

BIOLOGICAL REACTION LAYER AND ITS PREPARATION

Nobuhito Masuda; Shigeru Nagatomo; Hajime Makiuchi, and Yukio Yasuda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 557,660, Dec. 2, 1983, abandoned. This application Apr. 11, 1986, Ser. No. 851,878
Claims priority, application Japan, Dec. 3, 1982, 57-211382
The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.
Int. Cl.[4] C12Q *1/00*; G01N *33/52, 33/543, 33/548*
U.S. Cl. 422—56 **4 Claims**

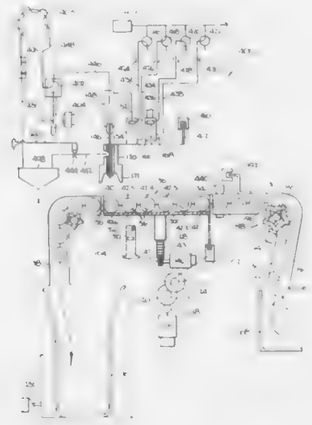
1. A composite porous layer for a dry analytical element comprising a particulate material carrying an immunologically active material fixed thereon which is dispersed in a fibrous porous matrix, wherein a dry weight ratio of said particulate material to said fibrous material ranges from 1:20 to 1:0.3 and said particulate material is contained in the range of 1 to 60 g/m^2.

4,861,553

AUTOMATIC SAMPLING SYSTEM

James A. Mawhirt, Brooklyn; Luigi Cantatore, White Plains; Joseph E. DiFlora, Eastchester, all of N.Y.; William J. C. McCandless, Ringwood, N.J., and Marvin Trieb, Irvington, N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jun. 11, 1987, Ser. No. 61,249
Int. Cl.[4] G01N *35/04*
U.S. Cl. 422—65 **16 Claims**



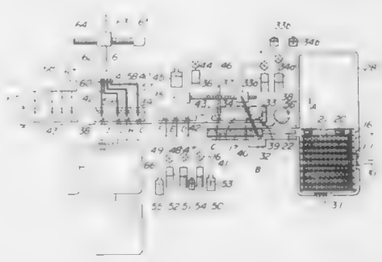
1. A conveyor system for transporting test tubes to a sampling location of a test apparatus comprising,
(a) a plurality of elongated test tube holders, with respective longitudinal axes, detachably joined together to form a continuous linkage, a test tube being receivable in and removable from each of said test tube holders,
(b) latching means for detachably joining the test tube holders together to permit a first bi-directional pivotal movement between said test tube holders such that the longitudinal axis of one test tube holder is an axis of rotation for an adjacent test tube holder, whereby said linkage is flexible about the longitudinal axes of the respective test tube holders,
(c) drive means for engaging the test tube holders of said linkage to move the linkage in a second direction past a sampling location,
(d) mixing means for moving a first predetermined number of test tube holders in the linkage, separate from the other test tube holders in the linkage, in a predetermined pattern of movement, when said first predetermined number of test tube holders are in a first predetermined location with respect to a sampling location,
(e) said latching means further including a pivot joint between adjacent test tube holders for permitting a second bi-directional pivotal movement between said adjacent test tube holders such that one of said adjacent test tube holders can be tilted about said pivot joint with respect to the other adjacent test tube holder whereby the longitudinal axis of said one adjacent test tube holder is inclinable with respect to the longitudinal axis of the other adjacent test tube holder, the inclinable bi-directional movement of said one adjacent test tube holder about said pivot joint with respect to the other adjacent test tube holder constituting said predetermined pattern of movement.

4,861,554

AUTOMATIC ANALYZING APPARATUS FOR ANALYZING AGGLUTINATION PATTERNS

Hajime Sakuma, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 741,728, Jun. 6, 1985, abandoned, which is a continuation of Ser. No. 448,327, Dec. 9, 1982, abandoned. This application Apr. 8, 1987, Ser. No. 36,210
Claims priority, application Japan, Dec. 14, 1981, 56-200062; Dec. 15, 1981, 56-200818; Dec. 15, 1981, 56-200824
The portion of the term of this patent subsequent to Feb. 23, 2005, has been disclaimed.
Int. Cl.[4] G01N *35/04*
U.S. Cl. 422—65 **6 Claims**



1. An immunological agglutination reaction analyzing apparatus comprising:
a microplate carrying line including, in sequence, a microplate feeding line, a reagent delivery transporting line, a microplate sending line, a reaction transporting line, a measurement transporting line and a microplate discharging line, said microplate sending line, said reaction transporting line and said measurement transporting line together forming a reaction line;
a plurality of sample tubes;
means for carrying said plurality of sample tubes along a sample carrying line to successively place said sample tubes at a first delivery position, said sample tubes containing blood samples to be analyzed, said means for carrying a plurality of sample tubes comprising:
a plurality of removable racks;
a cassette tray having a plurality of partitions successively arranged at spaced distances to define a plurality of gaps, each gap being constructed to receive a removable rack containing a plurality of sample tubes;
means for receiving said cassette tray and for intermittently advancing said cassette tray towards a discharge

position, said cassette tray being advanced by the distance between adjacent partitions for each intermittent advance and presenting racks successively at a feed position;

means for moving a rack selected from a gap of a cassette tray located at said feed position after each intermittent advance and transporting that rack to position its sample tubes at said first delivery position; and

means for returning the selected rack to said gap of the cassette tray located at said feed position prior to the next advance;

means for forming a plurality of diluted blood samples by transferring a blood sample from each sample tube at the first delivery position to a respective diluting tube located at a beginning end of a diluted blood sample carrying line, and by adding diluent to each respective diluting tube, said means for forming a plurality of diluted blood samples comprising, a plurality of diluting tubes, means for delivering a blood sample contained in a sample tube into a plurality of diluting tubes and means for discharging diluent solutions into each respective diluting tube at the same time or before a blood sample is delivered therein from a sample tube to form diluted blood samples;

means for carrying the diluted blood samples within the diluting tubes along said diluted blood sample carrying line to a position adjacent a beginning end of said microplate sending line;

a plurality of microplates;

means for successively feeding said plurality of microplates to the beginning end of said reagent delivery transporting line from said microplate feeding line, each of said microplates including a plurality of reaction vessels therein, said microplate feeding means comprising:

means for holding a vertical stack of said plurality of microplates;

belt drive means having a belt for receiving the lowest microplate from the stack and a claw for engaging a rear surface of a received microplate; and means engaging a channel in a side surface of a microplate for detecting a direction of orientation of the microplate;

first transporting means for transporting said microplates in a horizontal direction along said reagent delivery transporting line to a reagent delivery position at said beginning end of said microplate sending line;

means disposed adjacent said reagent delivery position for delivering given amounts of the diluted blood samples from the diluting tubes in said diluted blood sample carrying line into at least one reaction vessel of said microplates positioned at the beginning end of said microplate sending line;

means disposed adjacent said reagent delivery position for delivering given amounts of reagents into said at least one reaction vessel at the beginning end of said microplate sending line in accordance with an analysis to be performed;

first sending means for sending microplates with reaction vessels having said diluted blood samples and reagent contained therein in a horizontal direction along said microplate sending line to the beginning end of said reaction transporting line;

means for lowering said microplates with reaction vessels vertically in a stacked configuration along said reaction transporting line to the beginning end of said measurement transporting line in a substantially non-vibrating manner such that antigen and antibody combination reactions may occur in said at least one reaction vessel as a result of the receipt of said diluted blood sample and reagent in said at least one reaction vessel to form an agglutination pattern on a bottom surface of said reaction vessel, said means for lowering said microplates comprising,

first circulating belt drive means having a belt defining a drive axis which extends in the vertical direction and a plurality of partition members disposed on said belt orthogonal to said drive axis and equidistant from one another,

second circulating belt drive means having a belt defining a drive axis which extends in the vertical direction and a plurality of partition members disposed on said belt orthogonal to said drive axis and equidistant from one another, said first and second circulating belt drive means being positioned in opposed relation such that the vertical planes including the drive axis of each circulating belt drive means are parallel to one another and separated by a distance equal to the width of a microplate and such that each partition on one belt of a circulating drive means is in the same horizontal plane as a partition on the belt of the opposed circulating drive means along the length of the drive axis to form pairs of opposed partitions, and means for synchronously moving the belts of said circulating belt drive means to intermittently move said opposed partitions vertically while maintaining said horizontal plane, said circulating belt drive means being positioned such that microplates are received by said pairs of opposed partitions from said microplates sending line in a horizontal position and thereafter moved vertically;

second transporting means for transporting said at least one reaction vessel having agglutination patterns formed on a bottom surface thereof horizontally along said measurement transporting line to a measuring position;

means for photoelectrically detecting agglutination patterns formed on said bottom surface of said at least one reaction vessel at said measuring position to thereby produce a detection signal;

means for receiving said detection signal to effect an analysis as a result of a detected signal agglutination pattern;

second sending means for horizontally sending microplates after measurement to a raised position; and

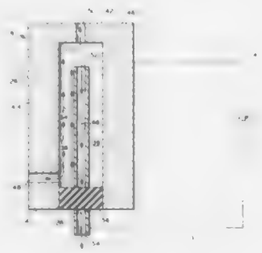
means for discharging said microplates along said microplate discharging line from said raised position after visual observation of the agglutination patterns in all reaction vessels of one microplate.

4,861,555

APPARATUS FOR CHROMATOGRAPHIC ANALYSIS OF IONIC SPECIES

Richard A. Mowery, Jr., Bartlesville, Okla., assignor to Applied Automation, Inc., Bartlesville, Okla.

Filed Mar. 11, 1985, Ser. No. 710,780
Int. Cl.[4] G01N *30/02, 30/96*
U.S. Cl. 422—70 **6 Claims**



1. An apparatus for chromatographic analysis comprising:

separation ion exchange resin bed means capable of separating a plurality of ionic species on being added to and eluted from such resin bed means with an eluant solution;

means for introducing to said resin bed means a plurality of ionic species in solution and an eluant solution, wherein each ionic species is of a common first polarity, said first polarity being opposite to a second polarity, and wherein said eluant solution includes an eluting reagent in solution to form first eluant ions of said first polarity and second eluant ions of said second polarity, whereby an effluent consisting of separated ionic species and eluant ions is discharged from said resin bed means;

an eluant ion suppressor cell which includes a first electrode, a second electrode, and a cell inlet for receiving effluent therethrough such that effluent flows along and in contact with a surface of said first electrode and a surface of said second electrode, said suppressor cell having a first outlet downstream from said cell inlet and closely adjacent to said first electrode surface so as to receive a portion of said effluent flowing closely adjacent to said first electrode surface, said cell also having a second cell outlet downstream from said cell inlet and closely adjacent to said second electrode surface so as to receive therethrough a portion of said effluent flowing closely adjacent to said second electrode surface;

means for applying an electrical voltage to said first and second electrodes such that said first electrode is maintained at said first polarity and said second electrode is maintained at said second polarity, said voltage applying means being capable of applying a voltage sufficient to neutralize first eluant ions flowing along said second electrode;

detector means for receiving said portion of said effluent from said second outlet, said detector means detecting ionic species in said received effluent portion;

wherein one of said first and second electrodes comprises a hollow electrically conductive member having an interior surface which defines an interior space therein, said inlet being in fluid communication with said interior space such that said interior surface comprises the surface corresponding to said one electrode, and wherein the other of said first and second electrodes is disposed within said interior space; and

wherein said other electrode comprises a tubular member which has a first open end, a second open end, and an exterior surface, said first open end being positioned within said interior space so as to be downstream from said cell inlet and in fluid communication therewith, and wherein said second open end defines said second outlet, and wherein the exterior surface of said tubular member comprises the surface corresponding to said other electrode.

5. An apparatus comprising:

a first hollow electrically conductive member having a first end, a second end, and an interior surface which defines an interior space therein, said first member including a wall with a first passage at said first end and a wall with a second passage near said second end, each of said passages being in fluid communication with said interior space; and

a second electrically conductive tubular member generally coaxially positioned within said first member, and having two open ends, one of said ends being positioned in said space and in fluid communication with said first passage, and wherein said open ends define the only openings in said tubular member.

4,861,556

MICROWAVE-BASED APPARATUS AND KJELDAHL METHOD

Edwin D. Neas, Indian Trail, N.C., and Terry S. Floyd, Clover, S.C., assignors to CEM Corporation, Matthews, N.C.

Continuation-in-part of Ser. No. 874,278, Jun. 13, 1986, abandoned. This application Jun. 8, 1987, Ser. No. 55,921
Int. Cl.[4] G01N *31/12*
U.S. Cl. 422—78 **14 Claims**

1. Apparatus useful at operating temperatures of about 375°–425? C., comprising a microwave system comprising a chamber, microwave energy-generating means disposed exterior to said chamber, and means for transmitting microwave energy from said microwave energy-generating means into said chamber, wherein a wall forming said chamber has an aperture formed therethrough; a reaction vessel disposed within said chamber; a hollow tubular body that extends through said aperture into said chamber, and that has a generally spherical end sealingly joined to said reaction vessel, wherein a tapered, inner wall of the reaction vessel mouth is adapted to seat a portion of said generally spherical end such that a freeze-up preventing, tubular body to reaction vessel joint is formed; means for air flow into said hollow tubular body from said chamber; and external suction means connected to said hollow tubular body and in fluid communication with said means for air flow.

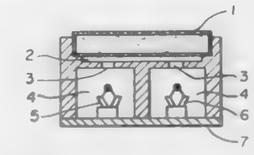


4,861,557

COMBUSTIBLE GAS DETECTOR THROUGH USE OF REACTION CONTROL BLOCK

Frank X. McNally, Venetia, Pa., assignor to Industrial Scientific Devices, Inc., Oakdale, Pa.

Filed Jan. 21, 1986, Ser. No. 803,971
Int. Cl.[4] G01N *27/16*
U.S. Cl. 422—97 **6 Claims**



1. In an apparatus for detecting a combustible gas which comprises a Wheatstone bridge circuit having a detector element comprising an electrically conducting member coated with a refractory having a surface, and having on said surface of said refractory a catalyst for the oxidation of said gas, said detector element constituting one leg of said bridge, and a reference element comprising an electrically conducting member coated with a refractory, said reference element constituting a second leg of said bridge, whereby upon catalytic oxidation of said gas an electrical signal approximately proportional to the amount of said gas present at the detector element is produced; the improvement which comprises a reaction control block having a cover in the form of a dust shield and having two chambers, one containing said detector element,

and the other containing said reference element, and a partition which is contained in said block parallel to and spaced throughout its entire length from said dust shield to form a single continuous plenum space therebetween, said partition having a pair of opening means, each communicating with one of said chambers and with said continuous plenum space to provide communication with said continuous plenum space to limit the diffusion of the combustible gas so as to control the reaction rate at the detector element and improve the characteristic of the detector, said partition forming a cover totally enclosing said two chambers except for said opening means, said pair of openings being in unobstructed communication with each other through said plenum space.

4,861,558

FLUE GAS SCRUBBER SYSTEM WITH CHLORIDE REMOVAL

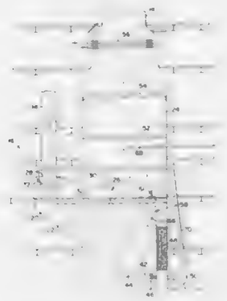
John M. Lehto, Cokato, Minn., assignor to Northern States Power Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 61,217, Jun. 12, 1987, which is a continuation of Ser. No. 872,118, Jun. 9, 1986, Pat. No. 4,767,686. This application Oct. 6, 1988, Ser. No. 254,095

The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.

Int. Cl.[4] B01D *47/02, 50/00, 53/34*

U.S. Cl. 422—106 **8 Claims**



1. A scrubber system for removal of fly ash, sulfur dioxide and chlorides from flue gas, comprising:

a tank having upper and lower ends, said tank including a gas inlet and a gas outlet located in mutually spaced-apart relationship in the upper end thereof;

aqueous absorbent filling the lower end of said tank;

a cyclone separator having a flue gas inlet, a flue gas outlet connected in fluid communication with the gas inlet of said tank, and a material outlet;

means for spraying aqueous absorbent across the flue gas inlet of said cyclone separator in order to effect removal of chlorides therefrom in dry particulate form;

partition means for dividing the upper end of said tank into two subchambers in respective fluid communication with the gas inlet and the gas outlet, said partition means including a plurality of horizontal fingers each bounded in part by interconnected spaced-apart side walls with end walls connected between adjacent fingers in order to define a zig zag lower edge submerged in the aqueous absorbent, one side of said partition means opening into the subchamber communicating with the gas inlet for directing the flue gas through the aqueous absorbent, and the other side of said partition means opening into the subchamber communicating with the gas outlet; and

means extending into said tank beneath said partition means for introducing an oxygen-containing gas into the aqueous absorbent in order to effect removal of fly ash and sulfur dioxide therefrom in liquid slurry form.

4,861,559

CONTINUOUS STERILIZING AND PACKING APPARATUS

Ko Sugisawa; Kazuya Sekiguchi; Kiyoaki Tuji, and Akinobu Ono, all of Nara, Japan, assignors to House Food Industrial Company Limited, Osaka, Japan

Filed Dec. 16, 1986, Ser. No. 942,376

Claims priority, application Japan, Dec. 16, 1985, 60-282350

The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.

Int. Cl.[4] A61L *2/24*

U.S. Cl. 422—110 **7 Claims**



1. An apparatus for continuously sterilizing and filling materials containing solids therein, said apparatus comprising:

(a) a feeding device for feeding materials;

(b) a sterilizer in fluid communication with an outlet of said feeding device for sterilizing the materials.

(c) a back-pressure tank in direct fluid communication with an outlet of said sterilizer, said back-pressure tank having a controllable internal pressure for applying a controlled back pressure to said sterilizer;

(d) filler means positioned in fluid communication with said back-pressured tank for successively filling sterilized materials in containers; and

(e) control means disposed between said backpressure pressured tank and said filler means for controlling the flow rate of the materials, which are delivered from said back-pressure tank to said filler means, to a value not higher than the flow rate of the materials which are fed from said sterilizer to said back-pressure tank.

4,861,560

LIQUID SUPPLY DEVICE

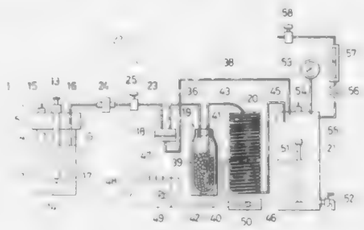
Masahiko Nakajima, Tokyo, Japan, assignor to Nakajima Doko Company Limited, Tokyo, Japan

Filed Jul. 18, 1988, Ser. No. 220,512

Claims priority, application Japan, Jul. 16, 1987, 62-177910

Int. Cl.[4] G05D *7/01*

U.S. Cl. 422—111 **8 Claims**



1. A liquid supply device comprising:

a tightly sealed vessel containing said reactive liquid, wherein said reactive liquid is catalyically decomposed to evolve gases while leaving a space at the upper portion of said vessel,

a cylindrical guide means disposed to the inside of said tightly sealed vessel,

a piston means disposed to the inside of said cylindrical guide means so as to slide along the inside of said guide means depending on the change of the pressure in said tightly sealed vessel,

a spring means for resiliently pressing said piston means toward the inside of said tightly sealed vessel at a predetermined spring force,

a pressure generating catalyst means attached to said piston means so as to move with the piston means into and out of the reactive liquid for catalytically decomposing the reactive liquid to evolve gases upon contact with the reactive liquid, and

delivery means for delivering the reactive liquid out of said tightly sealed vessel due to the increase of the pressure inside said vessel caused by the evolution of the gases.

4,861,561

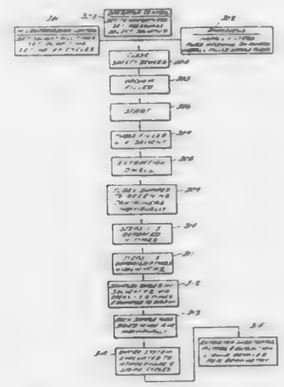
HIGH SPEED EXTRACTION AND TREATMENT APPARATUS

F. D. Pritchard, Clarksville, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Nov. 27, 1985, Ser. No. 802,464

Int. Cl.[4] B01D *11/00*

U.S. Cl. 422—116 **10 Claims**



1. An extraction and treatment apparatus, in which solvent is caused to interact with material, said apparatus comprising:

a plurality of solvent tanks each provided for containing a solvent for use in an extraction or treatment operation;

a plurality of sample tubes for holding solid material and for receiving solvent and within which said extraction or treatment operation being carried out for producing processed materials;

means for interconnecting any one of said plurality of solvent tanks to said plurality of sample tubes;

draining means connected to said plurality of sample tubes for removing processed materials;

control means operatively connected to said interconnecting means and said draining means for operating said interconnecting means and said draining means in accordance with a predetermined sequential program of operating steps for carrying out said extraction or treatment operation from a specified period of time with a specific solvent;

a plurality of thermal tanks each one of which is associated with at least one of said plurality of solvent tanks for receiving solvent;

means for providing steam connected through a corresponding steam valve to each one of said plurality of thermal tanks for circulating steam within said plurality of thermal tanks in order to heat said receive solvent, said circulated steam being exhausted from each of said thermal tanks through a corresponding check valve; and

a condensate reclamation means for collecting said circulated steam exhausted from said thermal tanks through said corresponding check valves.

4,861,562

FLUIDIZED BED APPARATUS FOR THE MIXING OF FLUIDS AND SOLIDS

Frederick Rowe, Middlesbrough, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 416,231, Sep. 7, 1982, abandoned, which is a division of Ser. No. 194,931, Oct. 7, 1980, abandoned. This application Apr. 16, 1984, Ser. No. 600,594

Claims priority, application United Kingdom, Oct. 18, 1979, 7936151

Int. Cl.[4] B01J *8/38, 8/18;* **F27B** *15/10*

U.S. Cl. 422—143 **4 Claims**



1. Fluidized bed apparatus for mixing solid particles with a fluid comprising a chamber having a peripheral wall extending only in a vertical direction and an upwardly facing bottom wall for supporting a fluidized bed of particles and means for creating a fluidizing condition within the chamber, said means including a single, upwardly facing fluidizing orifice, said fluidizing orifice being centrally located in said bottom wall and means for injecting through said orifice a stream of fluid having a high angular velocity as it passes through said orifice, said orifice having a diameter less than the diameter of said bottom wall and less than 1/5 the inside diameter of said peripheral wall at the lower end thereof whereby the fluid entering the chamber forms a centrally located vortex into which the solid particles are drawn.

4,861,563

VACUUM LOAD LOCK

Brian H. Shekerjian, Tempe, and J. B. Price, Scottsdale, both of Ariz., assignors to Spectrum CVD, Inc., Phoenix, Ariz.

Filed May 14, 1987, Ser. No. 49,489

Int. Cl.[4] B01J *19/08;* **C23F** *1/02*

U.S. Cl. 422—186.05 **5 Claims**

1. Apparatus for subjecting a single wafer to a plasma glow discharge comprising:

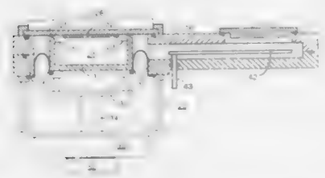
chamber means for substantially enclosing a first volume, said means being wider than it is high and having an aperture in a lower surface thereof;

a first member for holding said wafer and having a maximum width less than the maximum width of said aperture and having a raised portion along the edge thereof extending into said chamber means; and

flexible sealing means interconnecting said chamber means and the edge of said first member for closing said aperture;

wherein said first member is movable within said volume so

that the raised portion engages an upper surface of said chamber means to enclose a second, smaller volume



within said first volume and in which said wafer is subjected to said discharge.

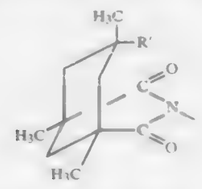
4,861,564

METHOD OF USE OF 1,3 DISUBSTITUTED AROMATIC CYCLOHEXANE IMIDES AS CHELATING AGENTS

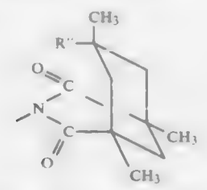
Julius Rebek, Pittsburgh, Pa., assignor to Year Laboratories, Inc., Los Angeles, Calif.

Division of Ser. No. 634,053, Jul. 24, 1984, Pat. No. 4,698,425. This application Oct. 2, 1987, Ser. No. 104,633
Int. Cl.[4] C01F *17/00*
U.S. Cl. 423—21.5 50 Claims

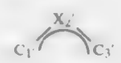
1. The method of chelating utilizing chelating compounds comprising a first group having the structure.



and a second group having the structure,



bonded by the imide nitrogens in a 1,3 relationship to a fused or monocyclic, substituted or unsubstituted, aromatic compound, consisting of at least one five or six membered ring where a portion of the ring structure is,



and wherein said imide nitrogens are bonded to C1′ and C3′ respectively, X_2' is either N or CH and R′ and R″ are either the same or different and each is a moiety selected from the group consisting of carboxyl, nitrile, hydroxyaminocarbonyl, thiocarboxy, dithiocarboxy, aminoiminomethyl and amino carbonyl said method comprising:

(a) selecting at least one of said chelating compounds;
(b) ionizing each of the said selected chelating compounds;
(c) contacting the ionized chelating compound and an ionized metal or metal complex which binds to sulfur containing or nitrogen containing ligands to thereby bind the metal or metal complex to the chelating compound.

4,861,565

METHOD OF SEPARATELY RECOVERING METAL VALUES OF PETROLEUM REFINING CATALYST

Verner B. Sefton, Victoria, Canada; Robert Fox, and William P. Lorenz, both of Arab, Ala., assignors to The Hall Chemical Company, Wickliffe, Ohio

Filed Jan. 27, 1987, Ser. No. 7,199
Int. Cl.[4] C01G *31/00, 39/00, 51/00, 53/00*
U.S. Cl. 423—55 12 Claims



1. The method of recovering vanadium, iron, nickel, cobalt, aluminum, molybdenum and tungsten metal values from spent hydrodesulphurization catalyst additionally containing carbon and silicon which comprises the steps of contacting the catalyst with aqueous HCl at temperature near the aqueous acid boiling point in a primary leach stage and thereby dissolving substantially all the values of metals other then molybdenum and tungsten, separating and removing the resulting primary acid leach solution from the primary leach residue consisting mainly of molybdenum sulfide or tungsten values, carbon and silicon, removing from the primary acid leach residue substantially all the molybdenum and tungsten values, adding caustic soda and an oxidant to the primary acid leach solution and thereby precipitating vanadium and iron contained in the said solution in the form of redcake in which the vanadium is in the pentavalent state, separating and removing the redcake from the liquid phase, contacting the resulting substantially vanadium-free solution with a source of sulfur selected from the group consisting of sodium sulfide, sodium hydrogen sulfide and a combination of hydrogen sulfide and caustic soda and thereby precipitating nickel sulfide and cobalt sulfide, separating the resulting solid phase from the liquid phase, and recovering aluminum values from the liquid phase.

4,861,566

DESULPHURIZATION

Patrick J. Denny, Darlington, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 876,747, Jun. 20, 1986, which is a continuation-in-part of Ser. No. 889,464, Jul. 25, 1986, Pat. No. 4,717,552. This application Nov. 30, 1987, Ser. No. 126,499
Claims priority, application United Kingdom, Dec. 24, 1986, [illegible]
Int. Cl.[4] C01B *17/16*
U.S. Cl. 423—230 7 Claims

1. A process for the removal of hydrogen sulphide from a gaseous stream comprising passing the gaseous stream at a temperature below 120° C. through a bed of a particulate zinc oxide-containing absorbent having a surface area above 50 $m^2.g^{-1}$, characterised by controlling the water content and the temperature of the gaseous stream such that the degree of saturation of the gaseous stream with water is at least 30%, both as it enters and leaves the bed, but is such that there is no separate liquid aqueous phase in the stream entering and leaving the bed.

4,861,567

METHODS OF REDUCING NO_x AND SO_x EMISSIONS FROM COMBUSTION SYSTEMS

Michael P. Heap, Corona Del Mar; Shih L. Chen, Irvine; James M. McCarthy, Laguna Beach, all of Calif., and David W. Pershing, Salt Lake City, Utah, assignors to Energy and Environmental Research Corporation, Irvine, Calif.

Filed Apr. 16, 1987, Ser. No. 39,324
Int. Cl.[4] C01B *21/00, 17/00;* B01J *8/00*
U.S. Cl. 423—235 44 Claims

1. A process for selectively reducing nitrogen oxides in combustion effluent streams, comprising the steps of:

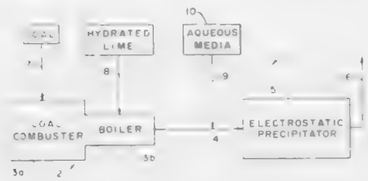
(a) introducing cyanuric acid into a gaseous decomposition zone wherein the decomposition zone is substantially oxygen deficient and contains CO and H_2O, and is maintained at a temperature in the range of from approximately 1000° F. to approximately 3000° F.;
(b) allowing the cyanuric acid sufficient residence time within the decomposition zone to allow for substantial mixing of the cyanuric acid and gaseous species within the decomposition zone;
(c) introducing the resulting gaseous mixture from the decomposition zone to a reaction zone containing combustion effluents, said reaction zone having an excess of oxygen; and
(d) allowing the gaseous mixture from the decomposition zone sufficient residence time within the reaction zone to achieve substantial reduction of the nitrogen oxides within the combustion effluents.

4,861,568

PROCESS FOR REMOVING SULFUR DIOXIDE FROM FLUE GASES

Melville W. Robinson, Jr., 2 Darlington Rd., Beaver Falls, Pa. 15010

Filed Sep. 16, 1988, Ser. No. 245,276
Int. Cl.[4] C01B *17/00;* B01J *8/00*
U.S. Cl. 423—243 6 Claims



1. In a dry process for the removal of sulfur dioxide from flue gases by the addition thereto of hydrated lime containing sugar in a coal combustion unit, wherein the flue gases result from the combustion of coal in a combustion chamber, and the flue gases are treated in an electrostatic precipitator prior to discharge to the atmosphere, the improvement comprising:

passing said flue gases, after the addition of said hydrated lime containing sugar, wherein said hydrated lime is of fine particles of a specific surface of 7 to 25 square meters per gram, through a conduit towards said electrostatic precipitator; and
adding an aqueous media to said flue gases in said conduit in an amount to increase the water content of the flue gases and cool the same by evaporative cooling to a temperature no lower than 20° F. above the dew point of the gas, so as to avoid forming water droplets in the gas, so as to prevent condensation of water therefrom.

4,861,569

REFORMED, INORGANIC POLYSILAZANE AND METHOD OF PRODUCING SAME

Osamu Funayama; Mikiro Arai, both of Saitama, and Takeshi Isoda, Niiza, all of Japan, assignors to Petroleum Energy Center and Toa Nenryo Kogyo Kabushiki Kaisha, Japan

Filed Aug. 10, 1988, Ser. No. 230,421
Claims priority, application Japan, Aug. 13, 1987, 62-202765
Int. Cl.[4] C01B *33/00*
U.S. Cl. 423—324 10 Claims

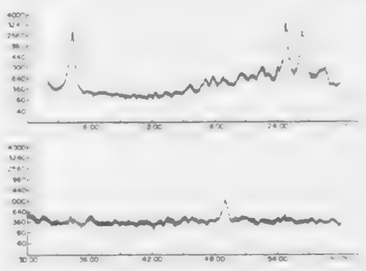
1. A method of reforming an inorganic polysilazane having a skeletal structure represented by the following recurring unit: —SiH_2—NH—, said method comprising reacting a solution of the polysilazane in an organic base-containing solvent at a temperature and for a period of time sufficient polycondense the polysilazane by dehydrogenative polycondensation, said organic base being unreactive with said inorganic polysilazane and being selected from the group consisting of trimethylamine, dimethlethylamine, diethylmethylamine, triethylamine, pyridine and a substituted pyridine, dimethylaniline and a substitued dimethylaniline, pyrazine and a substituted pyrazine, pyrimidine and a substituted pyrimidine, pyridazine and a substituted pyridazine, pyrrole, 3-pyrroline, pyrazole, 2-pyrazoline and mixtures thereof.

4,861,570

NOVEL SILICATE

Guenter H. Kuehl, Cherry Hill, and Michael E. Landis, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 797,084, Nov. 12, 1985, abandoned. This application Jul. 14, 1987, Ser. No. 73,379
Int. Cl.[4] C01B *33/24, 33/28*
U.S. Cl. 423—326 15 Claims



1. A silicate or metallosilicate having an x-ray diffraction pattern as set forth in Table 1 of the specification.

4,861,571

PROCESS FOR PREPARATION OF SYNTHETIC MORDENITE MOLDED BODY

Masashi Harada; Hiroshi Miyazaki, and Keiji Itabashi, all of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Sep. 19, 1986, Ser. No. 909,246
Claims priority, application Japan, Sep. 20, 1985, 60-206637
Int. Cl.[4] C01B *33/26*
U.S. Cl. 423—328 12 Claims

1. An improvement in a process for the preparation of a synthetic mordenite molded body, which comprises molding a starting mixture consisting essentially of as the main components a silica source, an alumina source, an alkali source and water to obtain a starting molded body, calcining the molded body to obtain a calcined molded body and crystallizing the calcined molded body in an aqueous solution of sodium silicate, wherein the improvement comprises (a) making a mordenite seed crystal powder present in the starting mixture, in an amount of 0.1 to 10% by weight based on the starting mixture

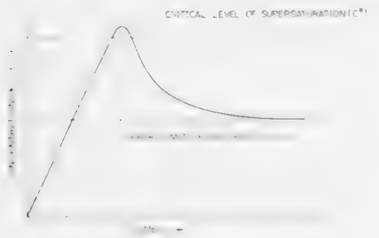
on a dry basis; (b) when the starting molded body is calcined, elevating the temperature by heating to a calcination temperature not lower the 400° C. at an average elevation rate of at least 10° C./min and carrying out the calcination at said calcination temperature within 2 hours; and (c) when the calcined molded body is crystallized, using an aqueous solution of sodium silicate having an SiO_2 concentration of 7 to 25% by weight, an Na_2O concentration of 2 to 8% by weight and an SiO_2/Na_2O molar ratio of from 0.9 to 4.0 as the aqueous solution of sodium silicate.

4,861,572

PROCESS FOR MANUFACTURE OF METAL OXIDE

Yoshihisa Sugoh, Hino, and Yasuo Ochi, Yokohama, both of Japan, assignors to Kabushiki Kaisya Advance, Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,736
Claims priority, application Japan, Dec. 27, 1986, 61-309017
Int. Cl.[4] C04B *35/00*
U.S. Cl. 423—339 10 Claims



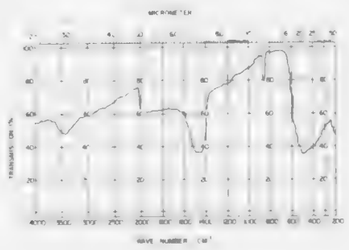
1. A process for the manufacture of a metal oxide wherein a hydrolyzable organometallic compound is hydrolyzed by an alkaline hydrolyzing agent in an organic solvent, and thereafter, the metal oxide is formed by a condensation reaction of a metal hydroxide resulting from the hydrolysis of the organometallic compound, characterized in that the organometallic compound and the hydrolyzing agent are fed into the organic solvent so that a concentration of the hydrolyzed compound is initially above a critical level of supersaturation, and thereafter, is maintained in a range from above an upper limit of solubility to the critical level of supersaturation.

4,861,573

COMPOSITE COATING FOR ELECTROCHEMICAL ELECTRODE AND METHOD

John P. deNeufville, Mendham; Dalbir Rajoria, Glengardner, both of N.J., and Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignors to Voltaix, Inc., North Branch, N.J.

Division of Ser. No. 872,730, Jun. 10, 1986, Pat. No. 4,707,422, which is a continuation-in-part of Ser. No. 769,857, Aug. 26, 1985, Pat. No. 4,624,902, which is a continuation of Ser. No. 507,752, Jun. 27, 1983, abandoned. This application Nov. 16, 1987, Ser. No. 121,262
Int. Cl.[4] C01B *9/08, 11/00, 33/08, 25/10*
U.S. Cl. 423—464 4 Claims



1. The chemical compound Li_4SiF_4.

4,861,574

PROCESS FOR PREPARING CHLOROPOLYSILANES

Hiroshi Ikeda, Omiya; Makoto Tsunashima, Tokyo, and Akihiko Mieda, Omiya, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1988, Ser. No. 163,262
Claims priority, application Japan, Mar. 23, 1987, 62-65770
Int. Cl.[4] C01B *33/08*
U.S. Cl. 423—342 2 Claims

1. A process for preparing chloropolysilane $Si_n\ Cl_{2n+2}$ wherein n=2 or 3 comprising contacting chlorine gas with silicon particles mixed with copper compound or a mixture of a copper compound with copper at a temperature not lower than 140° C. and not higher than 300° C. wherein the copper compound is at least one compound selected from a group consisting of cuprous chloride, cupric chloride, cuprous oxide and cupric oxide.

4,861,575

METHOD OF PRODUCING CARBON FIBERS BY OVERWRAPPING TOWS

Chris D. Levan, Brunswick, Ohio, assignor to Amoco Corporation, Chicago, Ill.

Filed May 8, 1986, Ser. No. 860,857
Int. Cl.[4] D01F *9/22*
U.S. Cl. 423—447.2 5 Claims



1. A method of making carbon fibers, comprising the steps of:

(a) overwrapping a multifilament polyacrylonitrile tow with a 10 to 150 denier thread;
(b) stabilizing said tow by heating in an oxidizing atmosphere at a temperature between about 180° and about 400° C.; and
(c) carbonizing the stabilized tow by heating.

4,861,576

METHOD FOR REDUCING CORROSION IN A BYPASS SYSTEM

Albert F. Stegelman, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 3, 1988, Ser. No. 202,775
Int. Cl.[4] C01B *17/02*
U.S. Cl. 423—574 R 12 Claims

1. A method for reducing leakage of a sulfur-containing process fluid through a bypass means around a fluid processor when said sulfur-containing process fluid is flowing through said fluid processor, said method comprising the steps of:
establishing a blocked-in portion in said bypass means;
feeding said sulfur-containing process fluid to said fluid processor;
introducing an inert purge fluid into said blocked-in portion of said bypass means when bypass circulation of said sulfur-containing process fluid is undesired; and
maintaining sufficient pressure of said inert purge fluid in said blocked-in portion to essentially prevent said sulfur-containing process fluid flowing to said fluid processor from leaking into said blocked-in portion of said bypass means.

4,861,577

METHOD FOR REMOVING THE SULPHUR CONTENT OF A WEAK GAS CONTAINING SULFUR DIOXIDE

Timo T. Talonen, Nakkila; Jaakko T. I Poijärvi, and Maija-Leena Metsärinta, both of Ulvila, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Oct. 6, 1987, Ser. No. 105,553
Claims priority, application Finland, Oct. 22, 1986, 864281
Int. Cl.[4] C01B *17/05*
U.S. Cl. 423—577 18 Claims

1. A method for removing the sulphur content of exhaust gases which contain sulphur dioxide or sulphur dioxide and hydrogen sulphide, the sulphur dioxide content of the exhaust gases being about 1% or less by volume, comprising:
(A) absorbing the gas into a scrubbing solution containing sulphide,
(B) conducting said scrubbing solution into an autoclave under reaction conditions and at a temperature in the range of 120° C. to 200° C.,
(C) feeding into said scrubbing solution, either while said scrubbing solution is in said autoclave or before said scrubbing solution is conducted into said autoclave, an agent for decomposing in the autoclave any unstable compounds of sulphur and oxygen, including thiosulphate and polythionates, formed in the scrubbing solution during the absorbing step (A), and
(D) recovering from the autoclave after reaction a product consisting essentially of elemental sulphur and a sulphate solution;
said agent causing the pH of the sulphate solution to be within the range of 2.0 to 2.9.

4,861,578

METHOD OF TREATING WASTE GAS

Akira Fukunaga, and Yoichi Mori, both of Kanagawa, Japan, assignors to Ebara Corporation, Tokyo and Ebara Research Co., Ltd., Kanagawa, both of, Japan

Filed Jul. 26, 1988, Ser. No. 235,574
Claims priority, application Japan, Jul. 28, 1987, 62-186587
Int. Cl.[4] B01D *53/02, 53/04, 53/34*
U.S. Cl. 423—240 2 Claims



1. A method of treating a waste gas containing at least boron trichloride and chlorine, comprising treating the waste gas with a treating agent containing a magnesium compound packed in a tower and subsequently treating said waste gas with a treating agent containing a calcium compound packed in the same or another tower, said magnesium compound being selected from the group consisting of magnesium hydroxide, magnesium oxide, magnesium carbonate and a mixture thereof, said calcium compound being selected from the group consisting of calcium hydroxide, calcium oxide, calcium carbonate and a mixture thereof, the temperature within said tower being in the range of from about 20° C. to about 80° C., the waste gas being passed through said tower under a pressure of from about 0.9 atm to about 2 atm, and the particle size of the treating agents being about 0.3 mm to about 5.0 mm in diameter.

4,861,579

SUPPRESSION OF B-LYMPHOCYTES IN MAMMALS BY ADMINISTRATION OF ANTI-B-LYMPHOCYTE ANTIBODIES

Harry M. Meyer, Jr., Mahwah, and Martin J. Weiss, Fort Lee, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 17, 1988, Ser. No. 169,263
Int. Cl.[4] A61K *43/00, 49/00, 39/395*
U.S. Cl. 424—1.1 12 Claims

1. A method to suppress the response of B-lymphocytes in mammals to diagnostic or therapeutic doses of unmodified antibodies or antibody fragments; or of conjugates thereof with radioisotopes, toxins or cytotoxic agents; or of diagnostic or therapeutic doses of non-antibody foreign proteins comprising
administering to a mammal one or more
anti B-lymphocyte unmodified antibodies or fragments thereof or
anti B-lymphocyte antibodies or fragments thereof conjugated to a radioisotope, cytotoxic agent or toxin or
anti B-lymphocyte antibodies or fragments thereof altered to elicit antibody or cell mediated cytotoxicity
in a pharmaceutically effective amount to suppress the response of the B-lymphocytes to concurrent, subsequent, or prior administration to the mammal of effective doses of the diagnostic or therapeutic unmodified antibodies, antibody fragments or conjugates thereof with radioisotopes, toxins or cytotoxic agents; or the diagnostic or therapeutic doses of non-antibody foreign proteins.

4,861,580

COMPOSITION USING SALT FORM OF ORGANIC ACID DERIVATIVE OF ALPHA-TOCOPHERAL

Andrew S. Janoff, Yardley, Pa.; Lois E. Bolcsak; Alan L. Weiner, both of Lawrenceville, N.J.; Paul A. Tremblay, Hamilton, N.J.; Michael V. W. Bergamini, Easton, Pa., and Robert L. Suddith, Robbinsville, N.J., assignors to The Liposome Company, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 786,740, Oct. 15, 1985, abandoned. This application Sep. 24, 1986, Ser. No. 911,138
Int. Cl.[4] A61K *31/355, 43/00;* C07D *311/72*
U.S. Cl. 424—1.1 49 Claims

1. A composition comprising a tris(hydroxymethyl-)aminomethane, a 2-amino-2-methyl-1,3-propanediol, a 2-aminoethanol, a bis-tris-propane, or a triethanolamine salt form of an organic acid derivative of alpha-tocopherol.

4,861,581

DETECTION OF NECROTIC MALIGNANT TISSUE AND ASSOCIATED THERAPY

Alan L. Epstein, LaCanada, and Clive R. Taylor, S. Pasadena, both of Calif., assignors to Cancer Biologics, Inc., Santa Ana, Calif.

Filed Dec. 5, 1986, Ser. No. 938,425
Int. Cl.[4] A61K *49/02, 49/04, 49/00, 43/00*
U.S. Cl. 424—1.1 8 Claims

1. A method for measuring the effectiveness of therapy intended to kill malignant cells in vivo in a mammal, comprising the steps of:

obtaining monoclonal antibody that is specific to an insoluble internal cellular component of cell ghosts of both normal and malignant cells of said mammal but not to external cellular components, said monoclonal antibody being labeled;

contacting said labeled antibody with tissue of a mammal that has received therapy to kill malignant cells in vivo, thereby permitting said antibody to bind preferentially to said insoluble internal cellular component of said cell ghosts of cells that have been killed by said therapy; and

determining the effectiveness of said therapy by measuring the binding of said labeled antibody to said insoluble internal cellular component of said cell ghosts of cells killed by said therapy.

4,861,582

DENTAL COMPOSITIONS CONTAINING MONOVALENT IONS

Jerry J. Pollock, Nesconset, and Thomas F. McNamara, Port Jefferson, both of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed Jul. 16, 1986, Ser. No. 886,276
The portion of the term of this patent subsequent to Oct. 21, 2003, has been disclaimed.
Int. Cl.[4] A61K *9/16, 9/18*
U.S. Cl. 424—520 3 Claims

1. A method of enhancing the lysis of cariogenic bacteria, periodontopathic bacteria or plaque-forming bacteria, which comprises administering to the teeth of a mammal in need of therapy against such bacteria an effective amount of a composition comprising

from about 0.08% to about 1.6% bicarbonate anion, and from about 0.08% to about 1.8% of a monovalent anion selected from the group consisting of chloride, thiocyanate and fluoride or mixtures thereof in a vehicle suitable for oral or oral cavity administration, said composition being essentially free of bivalent anion.

4,861,583

HOT CURLING HAIR TREATMENT

John A. Sramek, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 903,805, Sep. 4, 1986, abandoned. This application Nov. 20, 1987, Ser. No. 123,452
Int. Cl.[4] A61K *7/06, 7/11*
U.S. Cl. 424—70 10 Claims

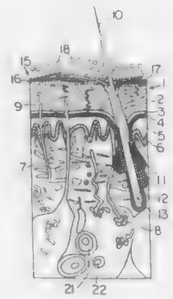
1. A method of treating dry hair comprising applying a source of heat in a styling manner to said hair previously treated with a heat activated composition comprising from about 0.1% to about 20% by weight of a water soluble polyethylene oxide polymer in a cosmetically acceptable solvent wherein the polymer is selected from the group consisting of (I) a linear polyethylene oxide polymer consisting of ethyleneoxy units, optionally further containing propyleneoxy units, having an average molecular weight of from about 50,000 to about 250,000 and (II) a branched or cross-linked polymer which is the reaction product of an initiator selected from the group consisting of a polyhydric organic compound having at least three reactive hydrogens selected from the group consisting of alcoholic hydrogens and amine hydrogens, per molecule of said compound, ammonia and an organic epoxide having at least two epoxide groups per molecule with a reactant selected from the group consisting of ethylene oxide, propylene oxide, polyethylene oxide polymers, polypropylene oxide polymers and copolymers of ethylene oxide and propylene oxide and having an average molecular weight in the range of from at least 20,000 to about 250,000, wherein there are no more than about 40 percent propylenoxy units present in said polymer based upon the total moles of ethylenoxy units and propyleneoxy units present in said polymer, said polymer being a solid at 25° C. and having a melting point in the range of about 50° to 80° C. and forming a strong, moisture resistant film upon cooling, said heat being sufficient to melt said polyethylene oxide polymer, and removing the source of heat while retaining the hair as it was styled until the polymer has cooled to form said film, thereby styling the hair.

4,861,584

ALLERGEN ABSORBENT AND BLOCKING AEROSOL COMPOSITION

Thomas W. Powell, Jr., Las Vegas, Nev.; Anthony A. Schulz, Floyds Knobs, Ind., and Gary W. Beall, Fairfield, Ky., assignors to United Catalysts, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 940,946, Dec. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 785,167, Oct. 7, 1985, abandoned. This application Sep. 23, 1987, Ser. No. 99,960
Int. Cl.[4] A61K *31/14, 31/74*
U.S. Cl. 424—79 9 Claims



1. A method of protecting the skin from contact with an allergen comprising applying to the skin of a subject in need thereof a barrier composition consisting essentially of

(1) from about 5% to about 15% by weight of a smectite clay having an ion exchange capacity of at least 50 milliequivalents per 100 grams, said clay having been ion exchanged with at least 50 milliequivalents per 100 grams of said clay of a quaternary ammonium compound having at least one alkyl group containing more than 10 carbon atoms, and

(2) from about 95% to about 85% by weight of a pharmaceutically acceptable non-toxic vehicle.

4,861,585

ENHANCED RODENT EDIBLE WITH NATURAL ATTRACTANTS

Bennett G. Galef, Jr., Dundas, Canada, and J. Russell Mason, Philadelphia, Pa., assignors to Monell Chemical Senses Center, Philadelphia, Pa.

Continuation of Ser. No. 922,185, Oct. 23, 1985, abandoned. This application Sep. 22, 1988, Ser. No. 247,899
Int. Cl.[4] A01N *25/00*
U.S. Cl. 424—84 5 Claims

1. A rodent edible for feeding to rodents comprising:

(a) an edible component selected from the group consisting of a poison, a sterilant, a food, a bait and tracking powder, and

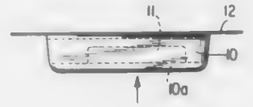
(b) a rodent attractant naturally present in the breath of said rodents selected from the group consisting of carbon disulfide and carbonyl sulfide in an amount effective to increase the preference for said edible component to said rodents.

4,861,586

ANIMAL BAIT

Lothar Schneider, and Irma Schneider, both of Tüingen, Fed. Rep. of Germany, assignors to Hartmut Klocke, Weingarten/-Baden, Fed. Rep. of Germany

Filed Apr. 3, 1987, Ser. No. 33,951
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1986, 3611122
Int. Cl.[4] A01N *25/00*
U.S. Cl. 424—84 20 Claims



1. A prefabricated animal bait, comprising:

a unit of a veterinary composition for the treatment of an animal disease or a disease carried by an animal, said veterinary composition unit enveloped by

a carrier comprising a fat material having a melting point between about 20° and 60° C., mixed with at least one additive material to stabilize the shape retention of said bait, and at least one lure for said animal to be baited, said fat material and additive material being selected in a ratio to provide a thick paste at about 20° C. and adapted not to become brittle at temperatures at least as low as 0° C.

4,861,587

USE OF TNF FOR THE PREVENTION OR TREATMENT OF RADIATION DAMAGE

Renate Urbaschek; Berhard Urbaschek, both of Heidelberg, and Daniela Maennel, Gaiberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 14, 1987, Ser. No. 37,971
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1986, 3613167
Int. Cl.[4] A61K *37/02*
U.S. Cl. 424—85.1 1 Claim

1. The method of preventing or treating radiation damage in a patient, which comprises administering an effective amount of TNF.

4,861,588

PRE-S GENE CODED PEPTIDE HEPATITIS B IMMUNOGENS, VACCINES, DIAGNOSTICS, AND SYNTHETIC LIPID VESICLE CARRIERS

Alexander R. Neurath, New York, N.Y., and Stephen B. H. Kent, Pasadena, Calif., assignors to New York Blood Center, Inc., New York, N.Y. and California Institute Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 698,499, Feb. 5, 1985, which is a continuation-in-part of Ser. No. 587,090, Mar. 7, 1984, abandoned. This application Apr. 28, 1986, Ser. No. 856,522
Int. Cl.[4] A61K *39/12, 37/02;* C07K *7/06, 7/10*
U.S. Cl. 424—89 6 Claims

1. A Hepatitis B peptide comprising an amino acid chain of at least six consecutive amino acids within the pre- S gene coded region of the envelope of hepatitis B virus, said peptide not comprising a naturally occuring envelope protein of Hepatitis B virus, wherein the peptide is selected from the group consisting of pre-S (12-47), pre- S(21-47), pre-S (120-153), pre S (132-137), pre-S (53-73) and pre-S (128-139), whrein said peptide additionally comprises and amino acid sequence having no more than three amino acids, said sequence containing Cys at one end thereof.

4,861,589

METHOD FOR THERAPEUTICALLY TREATING ABNORMAL CELLS EXPRESSING A MAJOR HISTOCOMPATIBILITY COMPLEX CLASS II ANTIGEN USING CYTOLYTIC INDUCER T4 CELLS

Shyr-Te Ju, Winchester, Mass., assignor to Trustees of Boston University, Boston, Mass.

Filed Mar. 23, 1987, Ser. No. 28,848
Int. Cl.[4] A61K *45/05, 35/26;* C12N *5/00, 5/02*
U.S. Cl. 424—93 7 Claims

1. An in-vivo method for therapeutically treating a living subject afflicted with abnormal cells which express a major histocompatibility complex Class II antigen, said method comprising the steps of:

administering a plurality of non-activated inducer T-cell lymphocytes to the living subject, said non-activated inducer T-cell lymphocytes having a demonstratable specificity for another antigen in addition to a major histocompatibility Class II antigen;

introducing said other antigen to the abnormal cells within the subject at a desired time such that the abnormal cells take up said introduced other antigen and act in-vivo as antigen-presenting cells;

allowing said administered T-cell lymphocytes to become activated in-vivo by said introduced other antigen; and

waiting for said in-vivo activated inducer T-cell lymphocytes to express cytolytic activity against said antigen-presenting cells comprising the abnormal cells in the living subject.

4,861,590

SUSTAINED RELEASE FLUORIDE AND CALCIUM COMPOSITION

Mg32arcus G. Grodberg, Newton, Mass., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 25, 1986, Ser. No. 911,686
Int. Cl.[4] A61K *9/22, 9/26, 33/16*
U.S. Cl. 424—602 1 Claim

1. A medication for providing fluoride ions for the treatment and prevention of bone loss disease, including osteoporosis and alveolar bone loss, which comprises a unitary dosage capsule containing from about 20 to 100 milligrams of sodium monofluorophosphate and of a calcium-containing composition providing 250 mg of calcium ion selected from calcium car-

bonate, dicalcium phosphate, calcium citrate, calcium glycerophosphate, calcium lactate, calcium levulinate, calcium galactogluconate and calcium gluconate and further containing means for controlling the release of the monofluorophosphate over a period extending from four hours up to eight hours after swallowing, whereby the quantity of fluoride ions at any given time is below the threshold value at which gastric irritation will occur, the means for controlling release of the monofluorophosphate and calcium comprising a hard dry compacted mass of water-swellable powder or fibers of cellulose material forming a coherent network as a matrix in which the monofluorophosphate and calcium are uniformly and homogeneously dispersed, whereby, upon introduction of the unitary dosage into an aqueous medium, the powder or fibers at the surface of the unitary dosage soften and loosen from the remaining mass to thereby release a stream of the monofluorophosphate and calcium.

4,861,591

FORMULATIONS FOR HYGROSCOPIC PHARMACEUTICALS

Richard P. Weierstall; Robin P. Enever, both of Rouses Point; Kathleen L. Brunelle, Plattsburgh; Gerard F. Those, Chazy, all of N.Y., and Ronald N. Warner, Morgantown, W. Va., assignors to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 121,971, Nov. 18, 1987, abandoned. This application Feb. 7, 1989, Ser. No. 309,019

Int. Cl.[4] A01N *59/06*

U.S. Cl. 424—690 **7 Claims**

1. A pharmaceutical cytoprotective dosage form for oral administration comprising a hard gelatin capsule encapsulating an admixture consisting essentially of (i) about 2% to about 30% by weight of the admixture of a spray dried solid hygroscopic cytoprotective powder , the powder having been formed by spray drying an exogenously acidified aluminum base composition wherein the aluminum base composition is acidifed to a pH at which the aluminum base composition is solubilized and wherein the resulting acidified composition contains about 50 to about 98 grams of precursor aluminum base composition per 100 milliliters of acidified composition, the powder being blended into (ii) an at least partially hydrogenated and/or solidified vegetable oil having a melting point below about 125° C.

4,861,592

PHARMACEUTICAL COMPOSITIONS

Eberhard F. Gottwald, Bovenden, and Horst M. Machoczek, Gleichen-Reinhausen, both of Fed. Rep. of Germany, assignors to Smith Kline Dauelsberg GmbH, Göttingen, Fed. Rep. of Germany

Continuation of Ser. No. 744,096, Jun. 6, 1985, abandoned. This application Jun. 2, 1987, Ser. No. 57,578

Int. Cl.[4] A61K *33/10, 33/08, 59/06, 31/415*

U.S. Cl. 424—687 **8 Claims**

1. A pharmaceutical composition suitable for oral administration comprising from about 100 mg. to about 200 mg of particulate cimetidine per unit dose suspended in an aqueous phase containing a buffer which maintains the pH at from greater than 7.0 to 9.5, a suspending agent and/or a thickening agent, said compostion having a viscosity in the range of from greater than 1,500 m Pa.s. to 8,000 m Pa.s.

4,861,593

CONDITIONER-HAIR DRESSING

JoAnn M. Spearmon, 4616 21st St., Mount Ranier, Md. 20712, and Sharon I. Jackson, 2604 Pinebrook, Landover, Md. 20785

Filed Oct. 29, 1987, Ser. No. 114,058

Int. Cl.[4] A61K *7/075*

U.S. Cl. 424—195.1 **2 Claims**

1. A creamy homogeneous water-in-oil hair conditioner-hair dressing composition for topical application to the hair consisting essentially of:

Wheat Germ Oil: 30 ml
Brewers Yeast Flakes: 0.3 gm
Vitamin E Oil: 12 ml
Vitamin A Oil: 12 ml
Vitamin D Oil: 12 ml
Propylene Glycol: 36 ml
Glycerol: 30 ml
Jojoba Oil: 30 ml
Methyl Paraben: 0.2 gm
Propyl Paraben: 0.2 gm
Deionized Water: 216 ml
Petrolatum: 120 gm
Sodium Lauryl Sulfate: 0.2 gm
n-Stearyl Alcohol: 11.1 gm
n-Cetyl Alcohol: 25 gm
Fragrance: 10 ml

4,861,594

GUARANA SEED EXTRACT AND METHOD OF PREPARATION

M. T. Ravi Subbiah, Cincinnati, Ohio, assignor to University of Cincinnati, Cincinnati, Ohio

Filed Mar. 16, 1987, Ser. No. 26,102

Int. Cl.[4] A61K *35/78*

U.S. Cl. 424—195.1 **6 Claims**

1. A method of preparing a composition capable of inhibiting platelet aggregation in mammalian blood and deaggregating platelet aggregations therein induced by at least one of adenosine diphosphate and arachidonic acid, comprising the steps of:

preparing an aqueous extract of dried and powdered seeds of the plant Paullinia cupana by adding about 10 parts by weight of said seeds to about 90 parts by weight distilled water at room temperature for a time sufficient to complete dissolution, centrifuging and filtering the solution;

subjecting said aqueous extract to thin-layer chromatographic fractionation on 250 μm silica gel G plates to obtain a fraction from the first bank (origin) having an RF value of 0.03 to 0.1 as defined herein;

separating and dissolving said fraction obtained from the first band (origin) of said chromatographic fractionation in a solvent consisting essentially of chloroform and 96% ethanol in a 9:1 ratio, v/v. whereby to free said fraction of salicylic acid, xanthines and nicotinic acid;

eluting said fraction with 96% ethanol; and

centrifuging the eluate at 3000 rpm in order to remove gel.

4,861,595

CELLULAR ENCAPSULATION OF BIOLOGICALS FOR ANIMAL AND HUMAN USE

Andrew C. Barnes, and David L. Edwards, both of San Diego, Calif., assignors to Mycogen Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 750,369, Jun. 28, 1985, Pat. No. 4,695,462. This application Sep. 11, 1987, Ser. No. 95,749

The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.

Int. Cl.[4] A01N *65/00*

U.S. Cl. 424—195.1 **44 Claims**

35. A process for treating an animal or human hosting a nematocide infestation which comprises administering to said animal or human a nematocide compound effective to control said infestation, wherein said nematocide compound is delivered to said animal or human host by a microbial delivery means consisting essentially of a microbe comprising a desired intracellular compound produced by a homologous gene, said microbe, while substantially intact, treated with chemical or physical means sufficient to render said microbe nonproliferative, and stabilize the microbial cell without significant loss of activity of the intracellular compound.

4,861,596

ROLLED MATRIX DEVICE HAVING ENHANCED ABILITY TO UNROLL AND METHOD FOR ITS PRODUCTION

Alan C. Curtiss, and Jeelin Lo, both of Old Lyme, Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Mar. 21, 1988, Ser. No. 170,529

Int. Cl.[4] A61K *9/24*

U.S. Cl. 424—438 **14 Claims**

9. A laminate device for controlled release of an active agent to an aqueous use environment, said device comprising a morentel or water-soluble acid addition salt thereof-containing polymer matrix sandwiched between ethylene vinylacetate copolymer films one side of said device being coated with an elastomer.

10. A laminate device according to claim 9 wherein the active agent is morantel tartrate and the elastomer is a silicone rubber.

4,861,597

NOVEL FUNCTIONALLIZED LIPOSOMES AND A PROCESS FOR PRODUCTION THEREOF

Masaaki Kida, Suita; Isako Kitabata, Amagasaki; Kazuhisa Kubotsu, Osaka, and Yoshitsugu Sakata, Otsu, all of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed May 19, 1987, Ser. No. 51,349

Claims priority, application Japan, May 20, 1986, 61-115405; Oct. 13, 1986, 61-242746

Int. Cl.[4] A61K *37/22*

U.S. Cl. 424—450 **17 Claims**

1. A functionalized liposome comprising at least one phospholipid and an amphiphilic compound selected from the group consisting of natural and synthetic lipopoly saccharides, natural and synthetic polypeptides having hydrophobic substituents and synthetic hydrophilic polymers whose ends have been made hydrophobic, and having a molecular weight of about 5,000 to about 30,000.

4,861,598

CONTROLLED RELEASE BASES FOR PHARMACEUTICALS

Benjamin Oshlack, New York, N.Y., assignor to Euroceltique, S.A., Luxembourg

Filed Jul. 18, 1986, Ser. No. 887,340

Int. Cl.[4] A61K *9/22, 9/26*

U.S. Cl. 424—468 **10 Claims**

1. Extended action controlled release pharmaceutical composition for oral administration, comprising a pharmaceutically effective amount of a pharmaceutically active agent distributed in a controlled release core or matrix comprising a higher aliphatic alcohol of 10–18 carbon atoms and a pharmaceutically acceptable acrylic resin, said acrylic resin being in an amount of about 10–60% by weight of the weight of said higher aliphatic alcohol plus said acrylic resin wherein said pharmaceutical agent is amitryptaline, atropine, chlorpheniramine, chlorpromizine, codeine, dexbrompheniramine, diphenylhydramine, doxilamine, ephedrine, hyoscyamine, morphine, oxycodone, papavarine, phenylpropanolamine, propranolol, quinidine, scoplamine or thioridazine.

4,861,599

GALENIC FORMULATIONS FOR ORAL USE OF RHEIN DERIVATIVES WITH DELAYED RELEASE FOR THERAPEUTICAL USE

Vanna Springolo; Germano Coppi, and Mario E. Scevola, all of Milan, Italy, assignors to Proter S.p.A., Milan, Italy

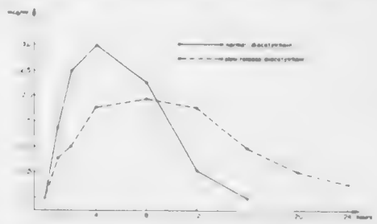
Filed Sep. 30, 1987, Ser. No. 102,936

Claims priority, application Italy, Oct. 1, 1986, 21867 A/86

Int. Cl.[4] A61K *9/16*

U.S. Cl. 424—494 **2 Claims**

1. A pharmaceutical composition containing a pharmaceutically active ingredient selected from the group consisting of rhein, diacetylrhein and dipropionylrhein in the form of granules, said granules being coated with a film containing at least



one ingredient selected from the group consisting of polyvinylpyrrolidone, shellac, hydroxypropylmethyl cellulose.

4,861,600

METHOD OF IMPROVING CHEWING GUM TO REDUCE ALDITOL BULKING AGENT SPOTS USING GUM REWORK MATERIAL

Paul R. Chisari, Chicago, Ill., and Christian Midon, Wihr au Val, France, assignors to Wm. Wrigley Jr., Company, Chicago, Ill.

Filed Nov. 1, 1988, Ser. No. 265,740

Int. Cl.[4] A23G *3/30*

U.S. Cl. 426—3 **15 Claims**

1. In a process of manufacturing chewing gum, of a composition comprising at least one chewing gum base; at least one sugar alcohol bulking agent; at least one non-aqueous liquid softener selected from the group consisting of glycerin, propylene glycol, lecithin, oils, fats, acetylated monoglycerides and mono- , di- , and tri-fatty acid esters of glycerin; the improvement which comprises:

(a) adding trim material, having essentially the same composition as the other ingredients of the gum, and at least one non-aqueous liquid softener to gum base;

(b) premixing the trim material, liquid softener and gum base before the addition of bulking agents;

(c) adding alditol bulking agents and other desired ingredients to the premixed trim material, liquid softener and gum base;

(d) mixing the trim material, liquid softener, gum base, bulking agents and other desired ingredients until a suitable homogenous gum mass is achieved; and

(e) forming and cutting the mixed ingredients into the desired chewing gum shape.

4,861,601

PREPROOFED, PARTIALLY-BAKED AND FROZEN, CRUSTY BREAD AND METHOD OF MAKING SAME

Bernard Seneau, Woodbridge, Conn., assignor to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 65,821, Jun. 23, 1987, Pat. No. 4,788,067. This application Aug. 5, 1988, Ser. No. 229,368

The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.

Int. Cl.[4] A21D *10/02, 15/02;* **A23L** *3/36*

U.S. Cl. 426—19 **13 Claims**

1. A method of producing a frozen, partially-baked, proofed, crusty bread product having improved storage stability, with respect to quality of the fully-baked bread product, in the frozen state, in the thawed and refrigerated state, and in the thawed and ambient state comprising the steps of:

(a) forming a bread dough comprised of water, flour, yeast, and salt;

(b) allowing the dough to ferment and rise;

(c) dividing and molding the fermented dough;

(d) proofing the molded dough in a high humidity atmosphere for a period of time effective to obtain a proofed volume of from 2.0 to 3.0 times the pre-proofed volume;

(e) placing the proofed dough of step (d) in a preheated oven;
(f) injecting a first stream of low-pressure, saturated steam into the oven during the initial stages of baking in order to keep the skin of the dough plastic while the dough is expanding in the oven;
(g) interrupting the flow of steam and continuing to bake the dough for at least ten minutes, thereafter;
(h) injecting a second stream of low-pressure, saturated steam during the latter stages of baking and removing a partially baked bread from the oven, said second stream of injected steam and the total baking period being effective to produce a moisture content in said partially-baked bread which is at least about 20% by weight greater than the moisture content of a fully-baked bread;
(i) cooling the partially-baked bread to about ambient temperature; and thereafter
(j) Quickly freezing the cooled bread of step (i) to a temperature of below 0° F.

4,861,602

PROCESS FOR TREATING FISH BODIES

Yasuzo Uchida, Tokyo, and Yoichi Shirakawa, Urawa, both of Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 21,967, Mar. 5, 1987, abandoned. This application Jul. 29, 1988, Ser. No. 227,432
Int. Cl.[4] A23J *1/04*; A23L *1/325*
U.S. Cl. 426—56 **4 Claims**

1. A process for treating fish bodies or fish bodies from which skin or internals have been removed which process consists essentially of partially decomposing fish proteins contained in said fish bodies by enzymatically treating said fish bodies with a protease enzyme, for five minutes to two hours at 20° C. to 70° C., until the gain in soluble nitrogen contained in the treated material is 5 to 30% based on the total nitrogen contained in the starting material, and calculated as follows:

$$(Ne-No)Nt\times 100:$$

where
Nt is the amount in % by weight of the total nitrogen contained in said fish bodies;
Ne is the amount in % by weight of the soluble nitrogen contained in the product obtained by the enzymatic treatment; and
No is the amount in % by weight of the soluble nitrogen contained in the product which would have been obtained by treating said fish bodies in the same manner except using no enzyme; and
thereafter separating at least one product selected from the group consisting of fish bones, fish oil and partially decomposed fish proteins from said treated material.

4,861,603

FOOD FILLED SOYBEAN PROTEIN CASING

Toshiaki Saito; Chizaru Ueno, and Fumiyuki Sunada, all of Osaka, Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Filed Sep. 3, 1987, Ser. No. 95,375
Claims priority, application Japan, Sep. 3, 1986, 61-208709; Dec. 26, 1986, 61-309346
Int. Cl.[4] A23G *3/00*
U.S. Cl. 426—93 **8 Claims**

1. A filled food comprising a non-heat coagulable wet filling material having moisture content of about 30 to 90% contained in a water insoluble soybean protein film casing, said casing containing 0.05 to 0.45 parts of a wetting agent per 1 part of crude protein in the casing, and said casing being in sealed form which completely covers said filling material and which does not break or melt under food heating conditions.

4,861,604

SHEETABLE THERMOSTABLE FILLING COMPOSITION

Jiunn-Yann Tang, Dallas; Regina A. Brown, North Richland Hills, and Victor H. Ke, Grand Prairie, all of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 880,808, Jul. 1, 1986, abandoned. This application Jan. 27, 1988, Ser. No. 149,085
Int. Cl.[4] A21D *13/00*
U.S. Cl. 426—94 **10 Claims**

1. A method for producing a sheetable, thermostable filling composition, which is capable of being baked to a crisp texture, the method comprising:
(a) dispersing gelatin in an amount from about 2% to about 3% of the total weight of the composition and maltodextrin in an amount from about 35% to about 45% of the total weight of the composition in water in an amount from about 20% to about 25% of the total weight of the composition at a temperature of at least 140° F.; and
(b) adding a pregelled starch in an amount from about 5% to about 20% of the total weight of the composition and an emulsifier to the mixture of gelatin, maltodextrin and water.

4,861,605

PROCESS OF PREPARING INSTANT POWDERED FOOD

Juhn W. Moon; Bun Hwang, and Jin K. Chang, all of Seoul, Rep. of Korea, assignors to Dongsuh Foods Corp., Rep. of Korea

Filed Aug. 21, 1987, Ser. No. 88,162
Claims priority, application Rep. of Korea, Aug. 23, 1986, 1986-6986
Int. Cl.[4] A23D *5/00*
U.S. Cl. 426—96 **4 Claims**

1. A process for producing an instant powdered food extract consisting essentially of the steps of:
mixing 70% to 90% of a melted hydrogenated vegetable oil, 0.5% to 5% of an emulsifier and 5% to 30% of a vegetable protein powder with 20% to 70% of a supersaturated crystalline carbohydrate solution;
adding an amount of a crystalline carbohydrate effective to semi-solidify said mixture and thereby obtaining a semi-solidify mixture;
cooling said semi-solidified mixture at a temperature ranging between 20° C. to 10° C., and reducing said cooled-semi-solidified mixture to a powder, and
recovering a powdered instant food extract.

4,861,606

METHOD OF ADDING LIQUID SUBSTANCES TO PRODUCTS MADE BY EXTRUSION

Finn N. Jensen, Skyttevaenget 44, Esbjerg V, Denmark (6710)

PCT No. PCT/DK87/00062, § 371 Date Feb. 24, 1988, § 102(e) Date Feb. 24, 1988, PCT Pub. No. WO87/07116, PCT Pub. Date Dec. 3, 1987
PCT Filed May 26, 1987, Ser. No. 149,225
Claims priority, application Denmark, May 26, 1986, 2447/86
Int. Cl.[4] A23B *4/10*
U.S. Cl. 426—305 **2 Claims**

1. A method of adding an additive substance in liquid form to products comprising extruded foodstuffs and fodder pellets, which method comprises:
extruding an expandable aqueous basic foodstuff material, at a temperature higher than the boiling point of water and at a pressure sufficient to maintain the water in said expandable aqueous foodstuff material in its liquid phase, through a nozzle of an extruder mouthpiece to form an extrudate, whereby in passing through and out of said nozzle the pressure in said aqueous basic product material extrudate is rapidly lowered, and thus rapidly converting the water in said aqueous basic material into its steam phase resulting in a simultaneous expansion of said extrudate caused by evaporation of said water therein;
immediately after extrusion of said aqueous basic product material extrudate from said nozzle and the simultaneous expansion of said extrudate, spraying an additive substance in liquid form onto the surface of said extrudate for coating said surface therewith; and
immediately after coating said extrudate with said additive substance in liquid form, cooling said coated extrudate to promote absorption of said coating inwardly into said extrudate, whereby, during cooling of said coated extrudate, condensation of steam trapped therein creates a vacuum therewithin drawing said coated liquid additive thereinto towards the core thereof under a pressure gradient between said vacuum and the ambient temperature.

4,861,607

REMOVAL OF XANTHINE STIMULANTS FROM COCOA

Geoffrey Margolis, Bussigny; Jacky Chiovini, Daillens, both of Switzerland, and Fulvio A. Pagliaro, Marysville, Ohio, assignors to Nestec S. A., Vevey, Switzerland

Continuation of Ser. No. 478,252, Mar. 24, 1983, abandoned, which is a continuation of Ser. No. 288,741, Jul. 31, 1981, abandoned, which is a continuation-in-part of Ser. No. 245,924, Mar. 20, 1981, abandoned. This application Nov. 16, 1984, Ser. No. 672,207
Int. Cl.[4] A23G *1/00*
U.S. Cl. 426—481 **12 Claims**

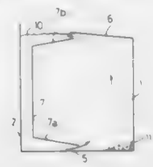
1. A process for extracting xanthine stimulants from a cocoa material containing a fat which comprises adding water to the cocoa material for swelling it with at least 0.1 part by weight of water per part by weight of cocoa, contacting the swollen cocoa material with a food-acceptable solvent gas which is supercritical in respect to temperature and pressure and separating the solvent gas containing the xanthine stimulants from the swollen cocoa material having a reduced content of xanthine stimulants.

4,861,608

METHOD OF SEPARATING TRUB FROM HOT WORT

Christiaan W. Versteegh, Delft, Netherlands, assignor to Heineken Technisch Beheer B.V., Amsterdam, Netherlands

Filed Oct. 1, 1987, Ser. No. 103,516
Claims priority, application Netherlands, Oct. 2, 1986, 8602488
Int. Cl.[4] C12C *7/14*
U.S. Cl. 426—489 **6 Claims**



1. In a method of separating trub from hot wort liquid in a settling device including a container having a bottom wall, side walls, a top, and an upstanding partition wall dividing the interior of the container into a first and a second space, said partition wall having an upper end in the region of the top of said container and a lower end separated from said bottom wall by a first gap establishing communication between said first and second spaces near the bottom of the container, which method includes the steps of introducing unpurified hot wort liquid and trub into said container so as to fill the same up to a level below the top of the container, with trub settling out of said hot wort liquid in said container, withdrawing purified wort from said container, and withdrawing settled trub from said container at a level near or at said bottom wall;
wherein the improvement comprises the steps of:
(a) providing a top wall member in overlying relation to said second space and said upper end of said partition wall, with said upper end of the latter being spaced from the underside of said top wall member to define thereat a second gap establishing communication between said first and second spaces adjacent the top of said container; and
(b) withdrawing heat from the uncovered surface of a first column of the wort liquid disposed in said first space while, by means of said top wall member, screening the surface of a second column of the wort liquid disposed in said second space against heat loss, thereby to cause the wort liquid in said first space to become heavier than the wort liquid in said second space and to effect a consequent gravity-induced circulation of the wort liquid from said first space through said first gap into said second space and from second space through said second gap into said first space;
(c) said gravity-induced circulation of the wort liquid causing settled trub in said second space to be swept together on said bottom wall of said container.

4,861,609

PREVENTION OF PUFFING DURING FRYING OF EXPANDED SNACK PRODUCTS

Miles J. Willard, P.O. Box 1747, Idaho Falls, Id. 83401, and Kyle E. Dayley, Rte. 4, Box 361, Rigby, Id. 83442

Continuation of Ser. No. 786,162, Oct. 9, 1985, abandoned, which is a continuation of Ser. No. 684,966, Dec. 20, 1984, abandoned, which is a continuation of Ser. No. 583,283, Feb. 27, 1984, abandoned. This application Oct. 7, 1988, Ser. No. 257,144
Int. Cl.[4] A23L *1/217, 1/10*; A21D *2/36*
U.S. Cl. 426—550 **17 Claims**

1. A method for reducing puffing of a fried expanded snack product made from a dough comprising finely divided dry starch-containing solids from which the dough is formed as a thin dough sheet and fried, the method comprising the steps of:
a. preparing a dough principally comprised of finely divided dry starch-containing solids selected from the group consisting of corn, potatoes, wheat, rice, oats, tapioca, and mixtures thereof, in which a portion of the starch in the finely divided dry starch-containing solids is gelatinized and additional starch in the finely divided dry starch-containing solids comprises extraneously added ungelatinized starch, and in which the finely divided dry starch-containing solids are mixed with water to form a dough having a moisture content from about 40% to about 60% by weight of the dough;
b. cracking dry cereal grains and combining said dry cracked cereal grains with said dough, the dry cracked cereal grains having a larger average particle size than the average particle size of the finely divided dry starch-containing solids;
c. roller forming the dough for compressing the dough into sheet form of essentially uniform thickness and forming a piece from the dough sheet, the dry cracked cereal grains having an average particle size at least about the same as the thickness of the formed dough piece so that said dry cracked cereal grains project through or are contained in the surface of the formed dough piece; and
d. frying the dough piece in hot cooking oil at said 40% to 60% moisture content and with said combination of gelatinized and ungelatinized starches contained in the dough piece at the time of frying, for forming an expanded fried snack product in which the dry cracked cereal grains provide a means of escape for the moisture contained in the dough piece and in which the larger food particles are present in the dough piece in an amount sufficient to reduce puffing of the snack product during frying when compared with the amount of puffing of a fried snack product made from the same dough piece that does not contain said larger food particles.

4,861,610

PROCESS FOR PREPARING EMULSIFIED FAT COMPOSITION CONTAINING CHEESE

Masaaki Kato; Katumi Shinohara, and Hiromu Sugiyama, all of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1988, Ser. No. 167,357
Claims priority, application Japan, Mar. 27, 1987, 62-73855
Int. Cl.[4] A23C *19/00*; A23D *5/00*
U.S. Cl. 426—582 **9 Claims**

1. A process for preparing an emulsified fat composition containing cheese without adding gums which comprises mixing a fat, 0.1 to 5% by weight, based on the fat, of phospholipid

containing at least 40% by weight of a mono acyl glycero phospholipid as an emulsifier component, 10–75% by weight cheese and 0.5 to 5% by weight, based on cheese, of molten salt in the emulsification of cheese, fat and water to thereby give an oil-in-water type emulsified fat composition containing cheese; and heating said emulsified fat composition containing cheese to a temperature of 110° to 150° C.

4,861,611

FRACTIONATED SOFT LAURIN FAT AND FOOD CONTAINING THE SAME

Hideki Baba, Seanan; Hirokazu Maeda, Sakai; Akira Kurooka, Seanan, and Atsushi Nago, Izumisano, all of Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Filed May 26, 1988, Ser. No. 198,842

Claims priority, application Japan, May 30, 1987, 62-137109; Dec. 16, 1987, 62-319840

Int. Cl.[4] A23D *5/00;* **A23G** *3/00*

U.S. Cl. 426—601 **4 Claims**

1. A fractionated soft fat of laurin fat having an iodine value of 30–40, a melting point of not higher than 15° C., and SFI of 10–30 at 5° C., 0–20 at 10° C., 0–10 at 15° C. and 0 at 20° C.

4,861,612

METHOD OF SEPARATING OLEAGINOUS MATTER INTO COMPONENTS HAVING VARIOUS MELTING POINTS

Akira Nakano, Hazakimachi; Hiroshi Higashioka, Ibaraki; Masaki Nomura, Hazakimachi; Yoshiharu Kawahara, Sahara; Ko Yamashita; Yoshito Sano, both of Hazakimachi, and Minoru Kase, Choshi, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 149,733

Claims priority, application Japan, Feb. 6, 1987, 62-25855; Feb. 6, 1987, 62-25856; Aug. 10, 1987, 62-199382; Sep. 22, 1987, 62-238387

Int. Cl.[4] A23D *5/00*

U.S. Cl. 426—607 **14 Claims**

1. A method of fractionating an oleaginous material into two fractions having different melting points, comprising the steps of:

emulsifying said oleaginous material with water using, as an emulsifier, a surfactant having an HLB value of from 5 to 10 at a temperature effective to melt substantially all of said oleoginous material, whereby an emulsion is formed;

then cooling said emulsion to a crystallization temperature at which one of said fractions is crystallized while the other fraction of said oleaginous material is maintained molten so that said emulsion comprises an oil phase containing said other fraction and an aqueous phase containing crystals of said one fraction dispersed therein;

separating said oil phase from said aqueous phase;

and then removing said crystals of said one fraction from said aqueous phase.

4,861,613

NON-DIGESTIBLE FAT SUBSTITUTES OF LOW-CALORIC VALUE

John F. White, Summit, N.J., and Michael R. Pollard, Dublin, Calif., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

Filed Jul. 25, 1986, Ser. No. 889,552

Int. Cl.[4] A23D *3/00, 5/00*

U.S. Cl. 426—611 **13 Claims**

1. A low calorie food composition containing fat-type organoleptic ingredient and non-fat ingredients, wherein from about 10 to 100% of the total fat-type ingredients comprise at least one epoxide-extended polyol ester of the formula $P(OH)_{a+c}(EPO)_n(COOR)_b$ where P(OH) is a polyol having a=2–8 primary hydroxyls, c=0–8 secondary plus tertiary hydroxyls, a+c is in the range of 3–8, EPO is a C_{3-C6} epoxide, n is a minimum epoxylation index average number n ≧a sufficient that greater than 95% of the primary hydroxyls of said polyol are converted to secondary or tertiary hydroxyls, COOR is a fatty acid acyl moiety in which R is a C_{7-C23} alkyl chain, and b is an average number in the range of 2<b ≦a+c, $(EPO)_n$ forming polyepoxide interlink between said polyol and said acyl ester moiety.

4,861,614

INSTANT TRADITIONAL OATMEAL AND METHOD OF PREPARATION

Jonathan Seaborne, Corcoran, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Feb. 19, 1988, Ser. No. 157,764

Int. Cl.[4] A23L *1/164*

U.S. Cl. 426—619 **34 Claims**

4,861,615

METHODS FOR PREPARING CHOCOLATE MIXTURES

Werner Wiedmann, Stuttgart, Fed. Rep. of Germany, assignor to Werner & Pfleiderer GmbH, Fed. Rep. of Germany

Filed Jul. 17, 1987, Ser. No. 74,728

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629526

Int. Cl.[4] A23G *1/00, 3/00*

U.S. Cl. 426—631 **15 Claims**

1. A method of preparing a chocolate mixture comprising the successive steps of

feeding a starting product formed by cocoa-bean fragments to a first housing zone of a first housing section of a twin-shaft screw extruder having a plurality of housing sections, a steam lock being arranged at the downstream end of said first housing zone,

treating said product in a second zone of said first housing section by high-pressure steam supplied by means of a feed pipe at the upstream end of said second housing zone,

mixing and kneading said product in said second and a third housing zone of said first housing section,

degassing said thus formed product mixture by removing steam by means of a vacuum pump connected with the downstream end of said third housing zone by means of a pipeline,

feeding said product mixture from a second housing section arranged downstream said first housing section to a comminuting device arranged outside the extruder,

processing the product mixture in a comminuting device,

feeding said processed product mixture directly to a third housing section of said extruder arranged downstream said second housing section, and

degassing said product mixture by removing steam by a vacuum pump connected to the downstream end of a first housing zone of said third housing section by means of a pipeline.

4,861,616

STABLE PEPPERMINT OIL HAVING REDUCED PULEGONE CONTENT AND METHOD OF PRODUCING THE SAME

Jeffrey S. Spencer, Kalamazoo, Mich., assignor to A. M. Todd Company, Kalamazoo, Mich.

Filed Aug. 18, 1988, Ser. No. 234,028

Int. Cl.[4] C11B *9/00*

U.S. Cl. 426—651 **13 Claims**

1. A method for the reduction of the pulegone content in peppermint oil without detraction from the desirable flavoring-agent characteristics thereof which comprises the step of subjecting peppermint oil to a reduction process employing sodium sulfite by mixing the reactants in the presence of water supplying hydrogen ions for hydrogenation of pulegone at a pH between about 6 and about 8.

4,861,617

METHOD OF REDUCING THE ADHESION OF BUBBLES IN MEDICAL EQUIPMENT

David B. Pall, Roslyn Estates; Peter J. Degen, Huntington; Vlado I. Matkovich, Glen Cove, and Thomas C. Gsell, Glen Cove, all of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Jul. 20, 1987, Ser. No. 75,658

Int. Cl.[4] A61M *31/00;* **B05D** *3/06*

U.S. Cl. 427—2 **6 Claims**

1. A method of reducing the adhesion bubbles to the polymeric surfaces of a medical administration set with which a parenteral liquid comes in contact prior to its introduction into a patient, comprising treating said polymeric surfaces of the medical administration set with which the liquid comes in contact to increase the critical surface tension thereof prior to contacting the polymeric surfaces of the medical administration set with the liquid wherein said treatment comprises:

contacting said polymeric surface with a solution of a monofunctional reactive monomer compound having at least one hydroxyl group, and

exposing said polymeric surface and said monomer compound to ionizing radiation to effect polymerization of said monomer compound and grafting at the polymeric surface.

4,861,618

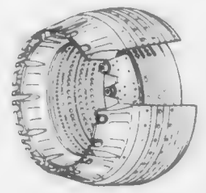
THERMAL BARRIER COATING SYSTEM

Raymond W. Vine, East Hartford; Keith D. Sheffler, Wethersfield, and Charles E. Bevan, Colchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 925,654, Oct. 30, 1986. This application Nov. 16, 1987, Ser. No. 121,029

Int. Cl.[4] B05D *1/00*

U.S. Cl. 427—34 **1 Claim**



1. A method of applying a durable thermal barrier coating to a metallic substrate including the steps of

a) providing a clean substrate surface

b) depositing a metallic bond coat having a composition consisting of 15–40%Cr, 6–15%Al, 0–2%Hf, 0–7%Si, 0.01–1.0%Y bal essentially Ni by plasma deposition in air to a thickness of 0.005–0.015 in.

c) depositing a ceramic coating of zirconia stabilized with 6–8wt% yttria by plasma deposition in air to a thickness of 0.010–0.015 in.

4,861,619

METHOD FOR PRODUCING MAGNETIC RECORDING MEDIUM

Tetsuo Satake, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 4, 1987, Ser. No. 45,491

Claims priority, application Japan, May 8, 1986, 61-105250

Int. Cl.[4] B05D *3/14*

U.S. Cl. 427—48 **1 Claim**

1. A method for producing a magnetic recording medium comprising:

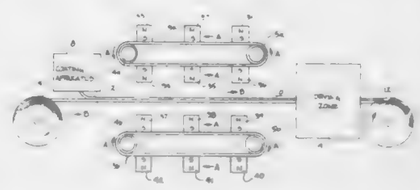
providing a nonmagnetic substrate;

mounting said nonmagnetic substrate for movement along a conveyance path;

conveying said nonmagnetic substrate at a predetermined velocity along said conveyance path;

coating said nonmagnetic substrate with a magnetic paint as said nonmagnetic substrate is being conveyed at said predetermined velocity;

providing at least one pair of magnets in spaced apart facing relation such that the poles of the magnets that are in facing relation are of the same polarity;



conveying said pair of magnets along a path parallel to said conveyance path at a velocity which is lower than said predetermined velocity of said nonmagnetic substrate;

orienting magnetic particles in said magnetic paint coated on said nonmagnetic substrate by conveying said nonmagnetic substrate between the magnets of said at least one pair; and

drying said magnetic paint coated on said nonmagnetic substrate as said substrate is being conveyed.

4,861,620

METHOD OF LASER MARKING

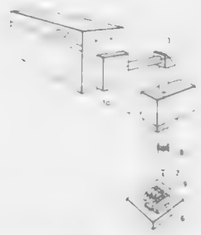
Kenkoku Azuma, and Masaaki Sakaki, both of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1987, Ser. No. 111,320

Claims priority, application Japan, Nov. 14, 1986, 61-271273; Nov. 20, 1986, 61-277406

Int. Cl.[4] B05D *3/06;* **G01D** *9/00*

U.S. Cl. 427—53.1 **4 Claims**



1. A method of marking an article surface comprising the steps of

coating the article surface with pigment or mixing the pigment into the material of the article, wherein said pigment is capable of changing its original color to another color at or higher than a predetermined temperature, and

irradiating portions of the pigment coating with a marking laser light, whereby the irradiated portions are marked by the another color,

wherein said pigment is a combination of a plurality of different pigments providing different colors at different temperatures, respectively, and said marking laser is a mixture of a corresponding number of laser beams having different energy densities necessary to heat said article surface to said different temperatures, respectively,

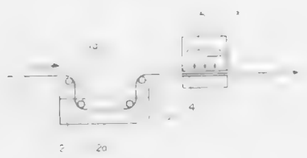
whereby said irradiated portions of said article surface are marked with said different colors.

4,861,621

PULTRUSION WITH CURE BY ULTRAVIOLET RADIATION

Takashi Kanzaki, Seanan, Japan, assignor to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Apr. 21, 1988, Ser. No. 184,559
Claims priority, application Japan, Apr. 27, 1987, 62-104999
Int. Cl.[4] B05D *3/06;* **B05C** *11/02*
U.S. Cl. 427—54.1 **24 Claims**



1. A method of pultrusion comprising:
(a) impregnating a continuous reinforcing material with a UV curable resin;
(b) pulling the impregnated continuous reinforcing material through a pipe die having a cross-section corresponding to the cross-section of the product to be obtained; the die being made of a material capable of transmitting UV rays and which is provided on its inner surface with a silicone or fluorine compound capable of transmitting UV rays and which resists sticking with the UV curable resin; and
(c) irradiating the impregnated continuous reinforcing material during its passage through the die with the UV rays to substantially cure the UV curable resin and form a product having the desired cross-section.

5. A method of pultrusion comprising
(a) impregnating a continuous reinforcing material with a UV curable resin;
(b) pulling the impregnated continuous reinforcing material through a die having a cross-section corresponding to the cross-section of the product to be obtained and shaping the impregnated continuous reinforcing material;
(c) introducing the shaped impregnated continuous reinforcing material exiting from the die into a medium liquid which is capable of transmitting UV rays and immiscible with the UV curable resin; and
(d) irradiating the shaped impregnated continuous reinforcing material in the liquid medium with UV rays to substantially cure the UV curable resin and form a product having the desired cross-section.

6. The method of pultrusion of claim 5, wherein the die is made of a UV absorptive material.

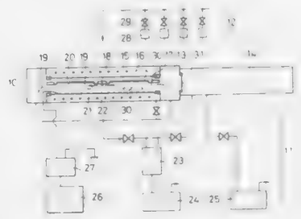
16. A pultrusion apparatus comprising:
(a) means for impregnating a continuous reinforcing material with a UV curable resin;
(b) a pipe die downstream of said means (a) for receiving the impregnated continuous reinforcing material, said pipe die having a cross section corresponding to the cross section of the product to be obtained and being provided on its inner surface with a silicone or fluorine compound resistant to sticking with the UV curable resin and said die having a length insufficient to effect cure of the UV curable resin but sufficient to effect shaping of the impregnated continuous reinforcing material;
(c) a liquid medium arranged downstream of the pipe die for forming a continuous passage for effecting cure of the UV curable resin of the impregnated continuous reinforcing material, said liquid medium being capable of transmitting UV rays and being immiscible with the UV curable resin;
(d) means for irradiating the liquid medium with UV rays;
(e) means for pulling the impregnated continuous reinforcing material through the passage formed by the pipe die and liquid medium.

4,861,622

METHOD FOR FORMING A FILM COAT ON THE INSIDE OF A DEPRESSION

Shunpei Yamazaki, Tokyo, and Takashi Inujima, Atsu, both of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 909,203, Sep. 19, 1986, Pat. No. 4,735,821. This application Dec. 24, 1987, Ser. No. 137,566
Claims priority, application Japan, Sep. 21, 1985, 60-209597
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—54.1 **8 Claims**



1. A method for forming a film coated on the inside of a depression formed on a substrate other than the bottom surface of said depression, the width of said depression being less than 2.5 micrometers, said method comprising the steps of:
disposing said substrate in a reaction chamber;
depositing a uniform film on the inside of said depression by photo CVD in such a deposition condition that said film is formed by the deposited material whose excited energy is attributed mainly to photo energy; and
anisotropically etching the film deposited on the bottom of said depression.

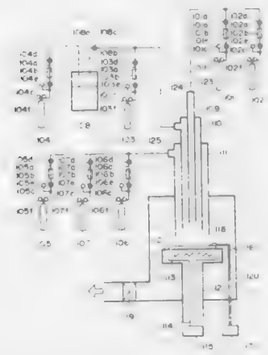
4,861,623

METHOD FOR FORMING DEPOSITED FILM BY GENERATING PRECURSOR WITH HALOGENIC OXIDIZING AGENT

Masao Ueki, Urayasu; Masaaki Hirooka, Toride; Junichi Hanna, and Isamu Shimizu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,209
Claims priority, application Japan, Dec. 18, 1985, 60-285278
Int. Cl.[4] B05D *5/06, 5/12;* **C23C** *16/42*
U.S. Cl. 427—69 **17 Claims**

1. A method for forming a deposited silicide and/or germanide film without the assistance of plasma discharge, comprising:
introducing into reaction space (a) a gaseous first starting material, (b) a second starting material capable of being converted to a gaseous state, and (c) a gaseous halogenic oxidizing agent capable of exerting an oxidation effect on said starting materials; said gaseous first starting material being selected from the group consisting of silicon-containing compounds, geramnium-containing compounds and mixtures thereof; said second starting material containing at least one metal selected from the group consisting of Al, Mo, W, Ti, Ta and Cr; said gaseous halogenic oxidizing agent being selected from the group consisting of F_2, Cl_2, Br_2 and I_2;
allowing said starting materials and said gaseous halogenic oxidizing agent to mix and contact each other thereby forming without the use of external energy a plurality of precursors including precursors in an excited state; and



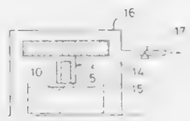
feeding at least one of said precursors into a film-forming space containing a substrate to form said deposited film on said substrate.

4,861,624

METHOD OF MANUFACTURING A CYLINDRICAL CAPACITOR

Shuzou Matsuda; Satoomi Naitou, and Takahiro Wakano, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 24, 1987, Ser. No. 88,884
Claims priority, application Japan, Aug. 29, 1986, 61-204270; Aug. 29, 1986, 61-204271
Int. Cl.[4] B05D *5/12;* **H01G** *4/28*
U.S. Cl. 427—81 **18 Claims**



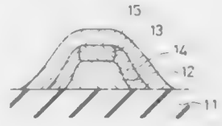
1. A method of manufacturing a cylindrical capacitor comprising a cylindrical ceramic body having opposite first and second end surfaces at first and second ends of said body, an inner peripheral surface and an outer peripheral surface extending between said first and second end surfaces, an opening in said first end surface communicating with an inner space enclosed by said inner peripheral surface, and an inner electrode and an outer electrode formed on said inner peripheral surface and said outer peripheral surface respectively to be opposite to each other and separated by said ceramic body, thereby providing a selected capacitance, said method comprising the steps of:
(a) preparing said cylindrical ceramic body;
(b) preparing a bath of metal paste containing metal for forming said inner electrode;
(c) closing said opening with said metal paste by bringing said first end surface of said ceramic body at least into contact with the surface of said metal paste bath;
(d) after closing said opening with said metal paste, then causing an air pressure difference such that the air pressure in said inner space of said ceramic body, whose opening is closed by means of said metal paste, is lower than the air pressure in an outer space defined to be outside the exterior of said outer peripheral surface of said ceramic body;
(e) making a portion of the surface of said metal paste bath located in said inner space higher than a portion of said surface of said metal paste bath located in said outer space, in response to said pressure difference, and selectively adjusting said pressure difference, thereby to selectively bring said metal paste into contact with a selected substantial portion of said inner peripheral surface; and
(f) then cancelling said pressure difference and thereby forming a film of said metal paste to serve as said inner electrode in said selected substantial portion of said inner peripheral surface.

4,861,625

METHOD OF MANUFACTURINC A THERMAL PRINTING HEAD HAVING A PARTIALLY-GLAZED CERAMIC SUBSTRATE

Kazuo Kondo, and Tatsunori Kurachi, both of Aichi, Japan, assignors to NGB Spark Plug co., Ltd., Aichi, Japan

Continuation of Ser. No. 814,054, Dec. 27, 1985, abandoned. This application Dec. 16, 1986, Ser. No. 942,962
Claims priority, application Japan, Dec. 27, 1984, 59-275749
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—126.2 **6 Claims**



1. A method of manufacturing a partially-glazed ceramic substrate for use in a thermal printing head, said method comprising the steps of:
providing a ceramic substrate having a surface roughness of 0.2 μm or less;
applying a glaze to said substrate to form raised glaze regions having a transverse width of 1.0 mm or less and a thickness in the range from greater than 60 μm to approximately 100 μm, said glaze having a surface tension of at least 250 dyne/cm;
baking the substrate and glaze; and
forming a heating element on said raised glaze regions.

4,861,626

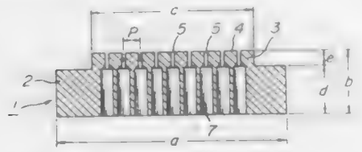
EXTRUSION DIE, METHOD OF PRODUCING THE SAME AND METHOD OF RECLAIMING THE SAME

Masahiro Ihara, Munakata; Kazuo Suzuki, Inazawa; Hideya Maekawa, Tokai; Haremi Ito, Tokoname, and Kenichi Tanaka, Chita, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Continuation-in-part of Ser. No. 874,631, Jun. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 897,227, Jul. 12, 1982, abandoned, which is a continuation of Ser. No. 231,784, Feb. 15, 1981, abandoned, which is a continuation of Ser. No. 71,290, Aug. 30, 1979, abandoned, which is a continuation of Ser. No. 653,479, Sep. 21, 1984, abandoned, which is a continuation of Ser. No. 520,221, Aug. 5, 1985, abandoned, which is a continuation of Ser. No. 388,267, Jun. 14, 1982, abandoned, which is a continuation of Ser. No. 239,605, Mar. 21, 1981, abandoned, which is a continuation of Ser. No. 70,644, Aug. 24, 1979, abandoned. This application Jan. 6, 1988, Ser. No. 141,258
Claims priority, application Japan, Apr. 21, 1979, 54-49219; Apr. 21, 1979, 54-49220; Jan. 19, 1987, 62-8333
Int. Cl.[4] B29F *3/04*
U.S. Cl. 427—133 **5 Claims**

1. A die for extruding a ceramic honeycomb structural body from a ceramic batch of raw materials, said die comprising a

metallic matrix having latticelike slits, said slits having a desired width for defining a thickness of a plurality of cell walls of said honeycomb structural body and a plurality of independent inlet holes in communication with said slits for introducing said batch into said slits from a supply of said batch, said matrix comprising a composite plating film of a double layered structure formed on at least the surface of the slits, such that



said structure defines said desired width, said structure consisting essentially of a metallic plating layer formed on at least the surface of the slits and a composite abrasive-resistant plating layer formed on said metallic plating layer, said composite abrasive-resistant plating layer comprising at least one metal and at least one type of abrasive-resistant particles dispersed in the metal.

4,861,627

PREPARATION OF MULTIWALL POLYMERIC MICROCAPSULES

Edith Mathiowitz, Brookline, and Robert S. Langer, Somerville, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 1, 1987, Ser. No. 45,840
Int. Cl.[4] A61K *9/56, 9/58;* **B01J** *13/02*
U.S. Cl. 427—213.31 **14 Claims**

1. A method for forming multi-layered polymeric microcapsules comprising:

selecting first and second polymers, wherein the polymers are selected from the group consisting of polyanhydrides, polyorthoesters, polylactic acid, polystyrene, polyamides, ethylene vinyl acetate, polybutadiene, polyurethanes, and copolymers and combinations thereof, to form microcapsules;

selecting a substance to be incorporated into said microcapsules;

dissolving said polymers in a volatile solvent;

adding the substance to the polymer solution;

mixing the polymer and substance solution;

suspending the polymer substance mixture in a nonsolvent wherein said polymers separate into distinct phases; and

evaporating the volatile solvent to form microcapsules having at least one distinct polymer layer around a polymer core.

8. The method of claim 1 further comprising forming additional polymer layers around said microcapsules.

4,861,628

THIN FILM COMPOSITE MEMBRANE PREPARED BY SUSPENSION DEPOSITION

Robert C. Schucker, Baton rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 14, 1987, Ser. No. 108,819
Int. Cl.[4] B05D *5/00;* **B01J** *20/26;* **C07C** *7/144*
U.S. Cl. 427—245 **7 Claims**

1. A method for producing thin film composite membranes for separating aromatic hydrocarbons from non-aromatic hydrocarbons, consisting of a thin active layer of polymer, selected from polyurea/urethane copolymer, polyurea, polyurea-polyurethane alloy, or a polyurea-polyurea/urethane alloy on a porous support layer by synthesizing the polymer in a dispersing solvent thereby producing a dispersion-suspension of the polymer in the dispersing solvent which does not dissolve the porous support layer, the polymer being present in the dispersion-suspension at a concentration of from about 0.5 to about 10% polymer, depositing a layer of the dispersion-suspension on one face of the porous support layer, and permitting the dispersing solvent to either evaporate from the dispersion-suspension layer or permeate through the porous support layer, thereby depositing the thin film of a thickness 2 microns or less on the support layer.

4,861,629

POLYFUNCTIONAL ETHYLENICALLY UNSATURATED CELLULOSIC POLYMER-BASED PHOTOCURABLE COMPOSITIONS

Steven H. Nahm, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 23, 1987, Ser. No. 137,832
Int. Cl.[4] B05D *3/02, 3/12;* **B32B** *27/00, 27/40*
U.S. Cl. 427—355 **10 Claims**

1. A photocurable coating composition comprising a polyfunctional cellulosic polymer having an average of at least 1.5 terminal alpha,beta-ethylenic unsaturations per substituted position of anhydroglucose unit of the polymer which is derived from the reaction product of (a) from about 48 to about 69 weight percent of at least one cellulosic polymer having isocyanate reactive hydroxyl functionality, and (b) from about 52 to about 31 weight percent of at least one hydroxyl reactive poly(alpha,beta-ethylenically unsaturated) isocyanate produced from the reaction of (i) a hydroxyl functional (meth)acrylic ester with (ii) a polyisocyanate having an average of at least three hydroxyl reactive isocyanate groups wherein the molar ratio of (meth)acrylate ester to polyisocyanate ranges from about 0.6 to about 0.9.

8. A method for coating a substrate comprising the steps of:

(a) coating the substrate with the composition as claimed in claim 1, and

(b) drying the coating, then

(c) during said coating.

9. The method as claimed in claim 8, wherein said coating is sanded after the drying step (b), prior to the curing step (c).

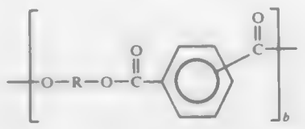
4,861,630

MULTILAYERED ARTICLES FORMED BY COEXTRUSION OF POLYCARBONATE AND POLYESTER

James M. Mihalich, Rexford, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 30, 1987, Ser. No. 139,721
Int. Cl.[4] B65D *1/00;* **B32B** *27/08, 27/36*
U.S. Cl. 428—34.1 **18 Claims**

1. A multilayer article comprising two outer layers and a middle layer, said outer layers comprising a polyester resin of the formula:



where b represents a whole number in excess of 1, R is a divalent alkylene radical containing from 1 to 10 or more carbon atoms, and the two carbonyl groups are located on the aromatic ring in a para- or meta- position relative to each other, said middle layer comprising a polycarbonate resin.

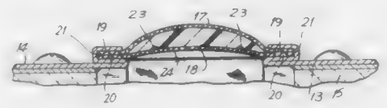
2. The multilayer article of claim 1, wherein said article is in the form of a film or container.

4,861,631

FLEXIBLE CONNECTOR MATERIAL

Milton Hinden, Glen Head, and John Lyons, Levitown, both of N.Y., assignors to Duro Dyne Corporation, Farmingdale, N.Y.

Filed Jul. 5, 1988, Ser. No. 215,302
Int. Cl.[4] F16L *21/06, 59/14*
U.S. Cl. 428—34.5 **2 Claims**



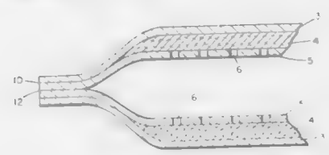
1. As an article of manufacture, an elongate supply of improved flexible connector stock material from which lengths are adapted to be cut for formation by transverse bending to the configuration of an air duct, said stock material comprising two elongate metallic strips substantially flat in transverse section and an elongate composite web of air-impervious insulating and vibration damping material secured therebetween, each said metallic strip having a free marginal edge and a clamping marginal edge comprised of a folded-over longitudinal marginal portion of said strip, said flexible web comprising upper and lower layers of flexible, air-impervious sheet material defining a flattened tubular conformation, each of the side marginal edges of said upper and lower layers being clampingly crimped within said clamping marginal edge of a respective one of said metallic strips, thereby to maintain said layers in said tubular conformation, and a compressible depthwisely resiliently expansible strip of insulating material interposed between said layers and captured within said flattened tubular conformation, characterized in that said strip comprises a fibrous batt of insulating material extending between said clamping marginal edges and substantially filling the space within said tubular conformation, the improvement comprising said batt being bonded along its length to said lower layer by two longitudinally extending bands of flexible adhesive material, said bends being offset to opposite sides of the transverse center line of said batt, and being displaced from a marginal edge of said batt by one quarter to one third of the width of said batt, said batt being free of connection to said lower layer in the area between said bands and the adjacent marginal edges of said batt.

4,861,632

LAMINATED BAG

Michael A. Caggiano, 710 N. Myers St., Burbank, Calif. 91506

Filed Apr. 19, 1988, Ser. No. 182,950
Int. Cl.[4] B65D *81/26, 30/08*
U.S. Cl. 428—35.2 **14 Claims**



1. A sealed bag container formed from a laminated packaging material able to establish and maintain a dry environment within said container comprising:

a) an outer imperforate moisture impervious layer defining an interior within:

b) a middle moisture absorbent layer within said interior;

c) an inner layer apertured by a plurality of perforations substantially uniformly distributed over the whole area circumscribed by a perimeter smaller than the perimeter of said middle absorbent layer located within said interior;

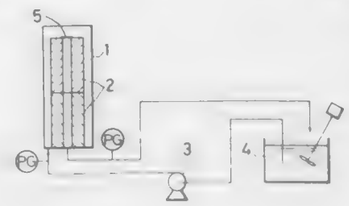
d) said outer and inner layers overlying and covering said absorbent layer and having their peripheral edges extending beyond the edges of said absorbent layer, said inner and outer layers being sealed together at their peripheral edges to enclose said absorbent layer, wherein said sealed bag container is formed by attaching the peripheral edges of one or more sheets of said packaging material together, said inner perforated layers being in a superimposed configuration thereby creating a moisture trap space.

4,861,633

CYLINDRICAL FILTER

Morio Abe, Shiga, Japan, assignor to Chisso Corporation, Osaka, Japan

Filed May 19, 1988, Ser. No. 196,380
Claims priority, application Japan, May 19, 1987, 62-122050
Int. Cl.[4] D04H *1/04*
U.S. Cl. 428—36.3 **7 Claims**



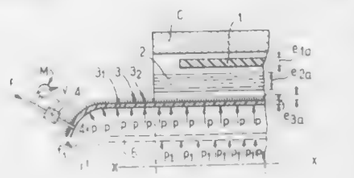
1. A cylindrical filter composed of interlaced filaments comprising 20% by weight or more of hot-melt adhesive composite filaments composed of a plurality of components having a melting point difference of 20° C. or more therebetween and having two or more interlaced portions per meter of said interlaced filaments of which portions the interlacing strength is 15×D mg or more, wound up on a central core material in cylindrical form under a tension of 15×D mg or less, where D equals the total denier of said interlaced filaments, the contact points of said interlaced filaments being bonded by melt-adhesion of the low melting component of said composite filaments to integrate said interlaced filaments.

4,861,634

METHOD FOR INTERNALLY LINING DUCTS AND SLEEVES FOR DUCTS LINED WITH THIS METHOD

Alain S. Renaud, Montfermeil, France, assignor to Coopetanche S.A., Vaux-le-Penil, France

Filed Dec. 22, 1986, Ser. No. 944,952
Claims priority, application France, Dec. 27, 1985, 85 19349; Apr. 21, 1986, 86 05693
Int. Cl.[4] B32B *31/20*
U.S. Cl. 428—36.1 **19 Claims**


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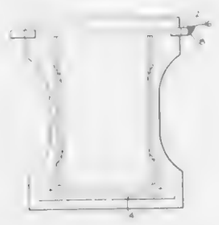
said composite material undergoing elastic or plastic deformation;
(3) preparing a second sleeve whose longitudinal edges are fixed together and which is made from a synthetic material having on its outer face fibers adhering to said first sleeve and a heat hardenable resin coated on the inner face of said first sleeve, said second sleeve only being able to enlarge its section under the action of a pressure by plastic deformation of the material forming it;
(4) preparing an envelope whose longitudinal edges are fixed together and which is made from a synthetic material impermeable to the heat hardenable resin and whose section may enlarge under the action of a fluid;
(5) preparing an inflatable balloon;
(6) introducing said inflatable balloon into said second sleeve, said second sleeve and said inflatable balloon being introduced into said first sleeve;
(7) impregnating said first sleeve with a heat hardenable resin, ensuring penetration of said resin over the whole thickness of said first sleeve as fas as its inner face;
(8) introducing into said envelope of the assembly including said first resin impregnated sleeve and at least said second sleeve and said inflatable balloon;
(9) introducing into the duct of the assembly, the assembly being folded so as to facilitate introduction thereof through one end of the duct and transporting thereof towards the other end of the duct;
(10) introducing a pressurized fluid into the inflatable balloon;
(11) enlarging the section of said second sleeve by plastic deformation of the synthetic material forming it until the outer fiber carrying face of said sleeve is applied against the inner face of said first sleeve and adheres to this face; and simultaneously enlarging the section of said first sleeve and of said second sleeve until the outer face of said first sleeve is applied towards the inner wall of the duct and against the inner face of said envelope, whose section enlarges simultaneously with sections of said first and second sleeves until the outer face of the envelope is applied firmly against the inner wall of the duct;
(12) maintaining the internal pressure and the temperature until the resin hardens; and
(13) totally deflating the balloon and then withdrawing the balloon.

4,861,635

PRESSURE-SENSITIVE ADHESIVE CLOSURE FOR DISPOSABLE DIAPER

Theresa L. Carpenter, Pine Springs; Alan J. Sipinen, Maplewood, and Stephen W. Bany, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 6, 1987, Ser. No. 118,319
Int. Cl.[4] C09J *7/02*; A61F *13/16*
U.S. Cl. 428—40 15 Claims



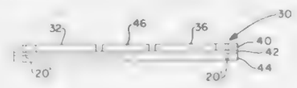
1. Pressure-sensitive adhesive closure for a disposable garment such as a diaper comprising
a pressure-sensitive adhesive fastening tape, the adhesive of which comprises a blend of (1) an AB block copolymer wherein A consists essentially of a polyvinylarene, B consists essentially of a polymer of at least one monomer selected from the group consisting of conjugated dienes and lower alkenes, and A comprises from 8 to 50 weight percent of the block copolymer, and (2) tackifying resin, the AB copolymer comprising from 20 to 60 weight percent of total AB copolymer plus tackifier and the B phase of the blend having a composite Tg of from 250° to 275° K., and
a polyolefin layer which forms the fastening area of the garment, the fastening surface of which has a large number of closely spaced asperities that have a jagged appearance at about 500×, are present over at least one-half the fastening surface, and are at least two micrometers in height,
said closure affording a Mean Peel Force of at least 175 N/m both at 30 and 1250 cm/min.

4,861,636

FEEDSTOCK LAMINATION

C. Joseph Barnette, Akron, Ohio, assignor to Kent Adhesive Products Company, Kent, Ohio

Filed Apr. 7, 1988, Ser. No. 178,599
Int. Cl.[4] B32B *3/10, 7/06, 7/12*
U.S. Cl. 428—41 1 Claim



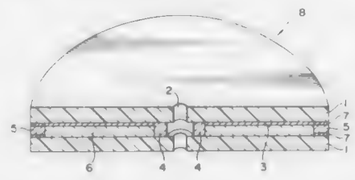
1. A laminated feedstock for a microprocessor-controlled precision, electromechanical drawing device comprising:
a paper carrier substrate sheet whose upper surface is coated with pressure sensitive adhesive, and
a protective cover sheet whose lower surface is coated with a release agent, wherein said upper and lower surfaces are in cohering contact with each other, thereby forming a lamination, and where said cover sheet includes at least one removable panel strip bounded by slits disposed therein formed by scoring said cover sheet parallel to the longitudinal axis thereof, said lamination being perforated with a plurality of spaced transport holes adjacent to each of its longitudinal edges, and wherein one of the said at least one removable panel strips has been removed and replaced with a second panel strip removably attached to said adhesive, said second panel strip being of a material different from said first panel strip.

4,861,637

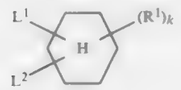
OPTICAL INFORMATION RECORDING MEDIUM

Yutaka Ueda, Yokohama, and Eiji Noda, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 12, 1988, Ser. No. 155,292
Claims priority, application Japan, Feb. 16, 1987, 62-031577
Int. Cl.[4] B32B *7/12*
U.S. Cl. 428—65 7 Claims



1. An optical information recording medium comprising a pair of substrates, with a recording layer comprising an organic dye being formed on one side of at least one substrate, fixed to each other through or without through a spacer and by an adhesive agent, in such a manner that said recording layer comes between said substrates, said adhesive agent comprising:
(a) a compound of formula (I),



(I)

wherein
L^1 represents

$$CH_2{=}CHCOOC_nH_{2n}O{+}CCH_2CH_2CH_2CH_2CH_2O{+}_mCONHCH_2{-}$$

(m = 0 or 1, and n = 2 to 4),

L^2 represents

$$CH_2{=}CHCOOC_nH_{2n}O{+}CCH_2CH_2CH_2CH_2CH_2O{+}_mCONH{-}$$

(m = 0 or 1, and n = 2 to 4),

R^1 represents a methyl group or an ethyl group, and k is an integer of 1 to 4; and (b)
(b) one compound selected from the group consisting of a compound of formula (II),

$$CH_2{=}CHCOO{+}CH_2CHO{+}_{\overset{|}{R^2}}{}_{\overline{l}}COCH{=}CH_2 \quad (II)$$

wherein R^2 represents hydrogen or a methyl group, and l is an integer of 3 to 15, a compound of formula (III)

$$CH_2{=}CHCOO{-}CH_2)_{l'}OCOCH{=}CH_2 \quad (III)$$

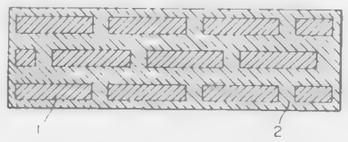
wherein l' is an integer of 4 to 6, and a mixture of said compound of formula (II) and said compound of formula (III).

4,861,638

MOLDED ARTICLE MADE OF A COMPOSITE MATERIAL INCLUDING METALS AND NONMETALLIC SUBSTANCES

Werner Huether, Karlsfeld, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 202,798
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1987, 3718677
Int. Cl.[4] B32B *3/10*
U.S. Cl. 428—71 8 Claims



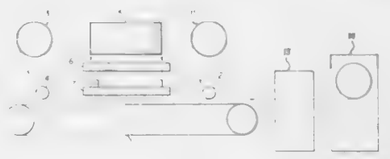
1. A shaped article, comprising a plurality of individual members made of a first material having a high mechanical strength and a low oxidation resistance at high temperatures, a matrix made of a second material having a lower mechanical strength than said first material and a higher oxidation resistance than said first material at said high temperatures, said individual members being fully embedded in said matrix, said individual members being so dimensioned and arranged in rows and staggered columns that the members of one row partially overlap the members of the next row without any contact between said members to form an intermediate space all around each member, said intermediate space being filled by said second material so that said members form a running bond inside said shaped article.

4,861,639

RETICULAR STRUCTURES HAVING IMPROVED MECHANICAL CHARACTERISTICS

Andrea Vittone, Milan, and Giuseppe Chiappini, Albiano Magra, both of Italy, assignors to Moplefan S.p.A., Milan, Italy

Filed May 5, 1986, Ser. No. 859,494
Claims priority, application Italy, May 7, 1985, 20595 A/85
Int. Cl.[4] B32B *5/12*
U.S. Cl. 428—105 5 Claims



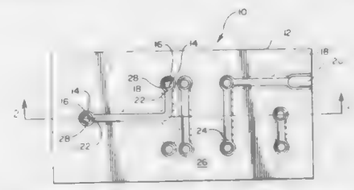
1. Reticular structures consisting of fibrillated films and having a high mechanical strength both in the longitudinal and in the transversal directions, characterized in that they consist of a first layer of one or more longitudinal fibrillated films; of a second layer of one or more fibrillated films, which is superposed to the first layer and is arranged in such manner that the extrusion and stretch direction is perpendicular to the one of the film or films of the first layer, and of a third layer of one or more fibrillated films which is arranged in such manner than the extrusion and stretch direction of the films is parallel with the one of the films of the first layer.

4,861,640

MOLDED CIRCUIT BOARD AND MANUFACTURING METHOD THEREFOR

Ismail M. Gurol, Stafford, Pa., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Continuation-in-part of Ser. No. 804,464, Dec. 4, 1985, abandoned, which is a division of Ser. No. 414,954, Sep. 3, 1982, Pat. No. 4,604,799. This application Feb. 3, 1988, Ser. No. 153,565
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—137 14 Claims



1. A circuit carrier made by the process of providing a nonconductive molded polymer substrate base with at least one channel in a surface thereof and sputtering a conductive film in said channel and onto a virgin polymer surface thereof to establish a circuit line in said channel.

4,861,641

SUBSTRATES WITH DENSE METAL VIAS

Brian C. Foster, Sutton, and Roger S. Lind, Acton, both of Mass., assignors to Ceramics Process Systems Corporation, Cambridge, Mass.

Filed May 22, 1987, Ser. No. 53,323
Int. Cl.[4] B32B 3/10; B22F 7/00; H01B 1/02
U.S. Cl. 428—137 24 Claims

1. A green ceramic body having a substrate with a plurality of via holes, wherein the substrate is composed of alumina, an alumina-based composite, aluminum nitride, beryllia, silicon carbide, or zirconia, and the via holes contain a composition with inorganic constituents consisting essentially of, by weight:

tungsten	85–97%
alumina	2–8%

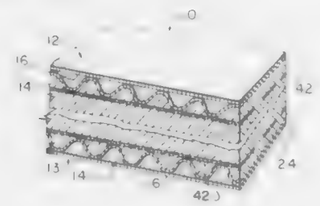
and 1–7% of a metal selected from the group consisting of nickel and palladium, the via holes substantially free of glassy fillers.

4,861,642

REINFORCEMENT OF PHENOLIC FOAMS COMPOSITE

Malcolm J. Stagg, Beaconsfield; Eric P. Stera, Montreal, and Sunil Vidyarthi, Beaconsfield, all of Canada, assignors to BPCO Inc., Canada

Filed Mar. 9, 1988, Ser. No. 165,748
Claims priority, application Canada, Mar. 13, 1987, 532004
Int. Cl.[4] B32B 3/26
U.S. Cl. 428—139 27 Claims



1. In a foam composite comprising first and second opposed corrugated skins having corrugations with inwardly facing apices and a core of foam material between the opposed inwardly facing surfaces of said skins, the improvement wherein one or each of said skins is provided with a mat of porous or apertured reinforcement material extending across the apices of said corrugations and said foam extends through the pores or apertures of each said mat to fill the spaces defined by the inwardly facing surfaces of said corrugations and embed said reinforcement material within said foam.

4,861,643

AEROSPACE STRUCTURE HAVING A CAST-IN-PLACE NONCOMPRESSIBLE VOID FILLER

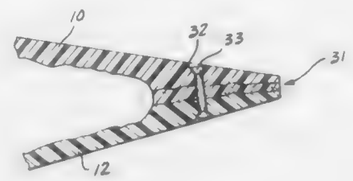
Cynthia M. Scollard, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 13, 1987, Ser. No. 25,403
Int. Cl.[4] B32B 3/00; B64C 1/06
U.S. Cl. 428—162 9 Claims

1. An aerospace structure having aerodynamic surfaces positioned in a desired orientation comprising:

two structural elements, each of the structural elements having an aerodynamic surface and an abutting surface, the aerodynamic surfaces being positioned in the desired orientation thereby positioning the abutting surfaces in a mutually opposed spaced relationship, at least one of the mutually opposed abutting surfaces being irregular;

a noncompressible, crack-resistant shim comprising a cured void filler, the cured void filler complementarily contoured to conform to the irregularities of the abutting surfaces and sized to fill the space therebetween, the non-



compressible shim sandwiched between the mutually opposed abutting surfaces, so that no voids exist; and,

at least one fastener joining and compressing the abutting surfaces against the noncompressible shim, the stresses in the structural elements adjacent the abutting surfaces being evenly distributed.

4,861,644

PRINTED MICROPOROUS MATERIAL

James Young, Corvallis, Oreg., and Dennis D. Leatherman, Upper St. Clair, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 42,404, Apr. 24, 1987, abandoned. This application Aug. 30, 1988, Ser. No. 238,684
Int. Cl.[4] B32B 3/00, 3/26, 27/14
U.S. Cl. 428—195 62 Claims

1. Printed microporous material comprising:

(a) a microporous material substrate having at least one surface and comprising:

(1) a matrix consisting essentially of essentially linear ultrahigh molecular weight polyolefin which is essentially linear ultrahigh molecular weight polyethylene having an intrinsic viscosity of at least about 18 deciliters/gram, essentially linear ultrahigh molecular weight polypropylene having an intrinsic viscosity of at least about 6 deciliters/gram, or a mixture thereof,

(2) finely divided particulate substantially water-insoluble siliceous filler distributed throughout said matrix, said filler constituting from about 50 percent to about 90 percent by weight of said microporous material substrate, and

(3) a network of interconnecting pores communicating throughout said microporous material substrate, said pores constituting at least about 35 percent by volume of said microporous material substrate, and

(b) printing ink on at least a portion of said surface in the form of indicia, one or more patterns, one or more designs, or a combination thereof.

4,861,645

FENCING TAPE WITH ELECTRICALLY CONDUCTING WIRES

Colin A. Standing, Cambridge, New Zealand, assignor to Joubert S. A., Ambert, France and Gallagher Electronics Limited, Hamilton, New Zealand

Filed Jan. 6, 1988, Ser. No. 141,186
Claims priority, application New Zealand, Jan. 6, 1987, [illegible]
Int. Cl.[4] B32B 7/00
U.S. Cl. 428—196 12 Claims

1. A conductive tape for an electrifiable fence comprising a tape of woven or knitted construction having at least two conducting wires arranged longitudinally and integrally in the woven or knitted structure, including a bridging conductor carried in or on the knitted or woven structure and extending transversely across each of the at least two longitudinal con-



ductors at intervals, so that, if a break occurs in one of the conductors, the current path is capable of continuing via the bridging conductor.

4,861,646

CO-FIRED METAL-CERAMIC PACKAGE

Eric A. Barringer, Waltham; Sheldon I. Lieberman, Burlington; Mark S. Schmidt, West Newton; James D. Hodge, Medway; Richard Wasek, Wayland, all of Mass.; Donald J. Kelley, Suffolk, Va.; Brian W. Saxton, Norwell, and William C. Gruber, Arlington, both of Mass., assignors to Ceramics Process Systems Corp., Milford, Mass.

Filed Aug. 13, 1987, Ser. No. 85,950
Int. Cl.[4] B32B 18/00
U.S. Cl. 428—210 20 Claims

1. A process of making a co-fired ceramic composite package, comprising:

(a) preparing a slurry comprising (i) a ceramic fraction composed of particles selected from the group consisting of alumina, spinel, cordierite, mullite, forsterite, quartz, and mixtures thereof, and (ii) a glassy fraction composed of 20–57 wt. % alkaline earth oxides, of which calcium oxide comprises 50–100 wt. % and magnesium oxide comprises 0–50 wt. %, 0–10 wt. % aluminum oxide, 23–40 wt. % silicon dioxide, and 25–40 wt. % boron oxide, and (iii) at least one binder;

(b) casting the slurry to form a tape having a solids portion composed of at least 40 wt. % to 60 wt. % ceramic and the remainder essentially the glassy fraction;

(c) forming a plurality of via holes at desired positions on the tape;

(d) applying conductive formulations to selected areas of the tape, including via holes, the formulations including at least one metal selected from the group consisting of copper, silver, palladium, gold, alloys including any of the foregoing, and mixtures thereof to form a conductive green piece;

(e) heating the conductive green piece to a temperature of less than approximately 800° C. and for a sufficient length of time to ensure substantially complete binder burnout; and

(f) raising the temperature to a peak temperature of less than approximately 1000° C. for a time sufficient to ensure the piece reaches a density of at least 90% of theoretical density.

4,861,647

PRECOATING METAL SHEET FOR TWO-PIECE CAN

Hiroshi Ishikawa; Hiroshi Takano, both of Tokyo; Ryosuke Ohtomo; Yoshinori Hoshino, both of Kawagoe, and Taro Ohyama, Tokyo, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha and Toyo Ink Mfg. Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 7,755, Jan. 28, 1987, abandoned. This application Mar. 14, 1988, Ser. No. 167,355
Claims priority, application Japan, Feb. 27, 1986, 61-40363; May 19, 1986, 61-112738
Int. Cl.[4] B32B 7/02, 15/08
U.S. Cl. 428—216 8 Claims

1. A precoated metal sheet for a two-piece can, which comprises:

a metal sheet having first and second opposed surfaces and

a film formed on said first surface of said metal sheet by applying a precoating composition onto said first surface and then curing same, said precoating composition comprising:

(a) a thermosetting coating material comprising a resin as a solid content and a solvent, said resin comprising any one of a mixture of vinyl chloride resin and at least one of phenolic resin and epoxy resin; a mixture of epoxy resin and phenolic resin; a mixture of epoxy resin and amino resin; a mixture of polyester resin and amino resin; a mixture of epoxy resin and acrylic resin; and a mixture of epoxy ester resin and amino resin; and

(b) an internal lubricant, said internal lubricant comprising a modified hydrocarbon wax having a structure in which a plurality of repeated units of a fluorine substituted olefin are combined with a hydrocarbon wax, and having a melting point within the range of from 70° to 200° C. and a particle size within the range of from 1 to 5 μm, and the content ratio of said modified hydrocarbon wax as said internal lubricant is within the range of from 0.1 to 30 weight parts relative to 100 weight parts of said resin as said solid content in said thermosetting coating material;

wherein:

said first surface of said metal sheet is to be an outer surface of said two-piece can; and

said second surface of said metal sheet is to be an inner surface of said two-piece can, and said second surface has thereon another film formed by applying a precoating composition which comprises said thermosetting coating material and substantially contains no internal lubricant, onto said second surface and then curing same.

2. The precoated metal sheet of claim 1, wherein:

the thickness of said film of said precoating composition formed on said first surface of said metal sheet is within the range of from 1 to 10 μm.

3. The precoated metal sheet of claim 2, wherein:

the thickness of said another film of said precoating composition formed on said second surface of said metal sheet is from 1 to 10 μm.

4,861,648

MATERIALS FOR LAMINATING FLEXIBLE PRINTED CIRCUITS

Eric W. Kleinschmidt, Mesa; Thomas M. Kloss, Jr., Tempe, and William R. Bell, Chandler, all of Ariz., assignors to Gila River Products, Inc., Chandler, Ariz.

Filed Mar. 14, 1988, Ser. No. 167,390
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.[4] B32B 9/00
U.S. Cl. 428—40 15 Claims

1. A stratiform press sheet for use in laminating three dimensional flexible printed circuits on a flat bed press, said press sheet having its component layers bonded together to form a unified sheet containing:

(a) a median layer comprising a polymeric thermoplastic film having a glass transition point lower than the laminat-

ing temperature peak and a thickness at the laminating temperature peak at least as great as the differences between the minimum and maximum thicknesses in the cross-section of the three-dimensional flexible printed circuit for uniform transmission of pressure in said laminating process;

(b) a polymeric release layer having a thickness of from 0.1 to 4 mils and having an outer surface for releasable disposition against a printed circuit which is being laminated;



(c) an outer stabilizing layer comprising a sheet of metal foil and being formed as an integral part of said unified press sheet in order to prevent lateral movement of said thermoplastic film when in a plastic state in said laminating process; and

(d) adhesive means to bond the component layers in a single, stratiform press sheet,

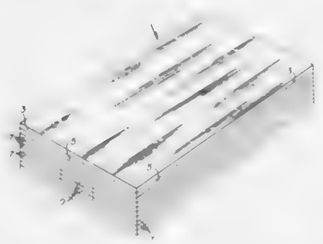
said press sheet being further characterized by substantial freedom from creases, entrapped gases, and contaminants between said layers.

4,861,649

IMPACT RESISTENT COMPOSITES

James M. Browne, 21 Pillon Real, Pleasant Hill, Calif. 94523

Filed Nov. 2, 1987, Ser. No. 115,280
Int. Cl.[4] B32B *3/26*
U.S. Cl. 428—240 5 Claims



1. An impact resistent synthetic foam-prepreg composite material comprising at least one layer of a thin film of uniform thickness of a syntactic foam containing rigid microballoons in a resin matrix laminated to a prepreg construction of continuous filaments of high modulus fiber in a thermosetting resin matrix in which the syntactic foam is one or more thin uniform layers located within the composite material sufficiently close to an impact prone surface of the composite to enhance the composite's ability to withstand the impact through such surface and wherein the matrix resin of the syntactic foam is compatible and cocurable with the resin matrix of the prepreg.

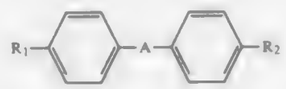
4,861,650

POLYIMIDE LAMINATES

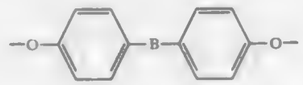
Ronald H. Dahms, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 944,158, Dec. 18, 1986, Pat. No. 4,816,512. This application Dec. 14, 1988, Ser. No. 284,016
Int. Cl.[4] B32B *27/12, 27/18, 27/28*
U.S. Cl. 428—251 18 Claims

1. A prepreg comprising a cloth impregated with an organic solvent solution comprising a polyamine and a mixture of maleimide and maleamic acid compounds represented by the formula:



wherein —A— moiety is



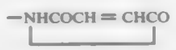
or —B—, and the B moiety is —O—, —SO_2—, —$CHCH_3$—, —CH_2—, —CO—, —$C(CH_3)_2$—, —$C(CF_3)_2$— or B is a carbon-carbon bond; where R_1 and R_2 are independently selected from the group consisting of the maleamic acid group, —NHCOCH=CHCOOH and the maleimide group,



wherein the mixture comprises per 100 parts by weight of the mixture, from about 45 to parts by weight bismaleimide in which R_1 and R_2 are



from about 1 to about 40 parts by weight of bismaleamic acid in which R_1 and R_2 are —NHCOCH=CHCOOH, and from about 0 to about 54 parts by weight of maleimide-maleamic acid in which R_1 is



and R_2 is —NHCOCH=CHCOOH; and wherein the polyamine is present in sufficient amount to maintain in solution the bismaleimide component of the mixture of maleimide and maleamic acid compounds.

4,861,651

ULTRAVIOLET BLOCKING MATERIAL AND METHOD OF MAKING SAME

Michael A. Goldenhersh, 203 Bluff Rd., Belleville, Ill. 62223

Filed Jun. 2, 1988, Ser. No. 201,594
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—255 24 Claims

1. An ultraviolet blocking material comprising:

(A) a breathable fabric defining porosity-creating apertures; and



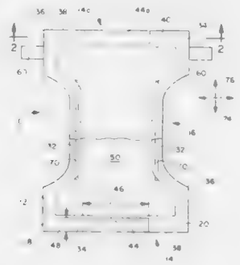
(B) a coating on said fabric at least partially disposed in said apertures, said coating containing an effective amount of at least one UV blocker.

4,861,652

DIAPER ARTICLE WITH ELASTICIZED WAIST PANEL

Mary E. Lippert, Outagamie County; Kenneth M. Enloe, Winnebago County; Debra J. Koch, Winnebago County; Thomas H. Roessler, Winnebago County, and Patrick A. Pazdernik, Winnebago County, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 13, 1987, Ser. No. 108,515
Int. Cl.[4] B05D *5/00;* A61F *13/18;* B32B *31/08*
U.S. Cl. 428—284 39 Claims



1. An absorbent article, comprising:

a. a substantially liquid impermeable backsheet layer which delimits at least one waistband portion of said article;

b. a substantially liquid permeable topsheet layer which is located in facing relation with an inner surface of said backsheet layer;

c. an absorbent body located between said topsheet layer and said backsheet layer; and

d. an elastic member connected to a selected surface of said waistband portion, said elastic member comprising an elastomeric nonwoven fibrous web material which is arranged to shirr said waistband portion and is composed of at least one layer of nonwoven fabric secured to a meltblown fibrous elastic layer, said elastic member having an untensioned bulk thickness of at least about 0.025 in, wherein said backsheet layer, topsheet layer and elastic member provide a composite waistband which has an untensioned total bulk thickness of at least about 0.050 in, has a buckling force value within the range of about 30–50 grams-force, and has a porosity value of at least about 3 cfm/sq. ft.

4,861,653

PITCH CARBON FIBERS AND BATTS

Robert G. Parrish, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Sep. 2, 1987, Ser. No. 92,217
Int. Cl.[4] D04H *1/58*
U.S. Cl. 428—288 8 Claims



1. A batt of randomly disposed carbon fibers, said fibers predominantly having in cross-section a width of less than about 12 micrometers and a fracture surface exhibiting a lamellar microstructure composed of lamellae arranged in an isoclinic relationship and disposed in a direction generally parallel to an axis of the fiber cross-section, the lamellae extending to the periphery of the fiber cross-sections.

4,861,654

MULTILAYER CARRIER FILMS

Paul E. Glover, Taunton, England, assignor to BCL Limited, Bridgewater, United Kingdom

Filed Nov. 13, 1987, Ser. No. 120,427
Claims priority, application United Kingdom, Nov. 14, 1986, 8627292
Int. Cl.[4] B32B *29/34*
U.S. Cl. 428—287 11 Claims

1. A multilayer carrier film for supporting a fibrous mat which is impregnated with a curable fluid synthetic resin composition against a surface during curing of said resin, said multilayer carrier film comprising a base layer of a nylon which is impermeable to said resin composition, said base layer having first and second opposite surfaces; a first adherent layer on said first surface of said base layer, said first adherent layer being composed of a polyamide copolymer having a softening point at a temperature of below 170° C. and being sealable to said fibrous mat with the application heat and pressure; and a second adherent layer on said second surface of said base layer, said second adherent layer being composed of a weldable synthetic plastic composition to which patches of weldable material may be secured to cover joints and breaks in said second adherent layer.

4,861,655

THERMOPLASTIC MAGNETIC COATING COMPOSITION

Dennis W. Karle, San Jose, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Sep. 8, 1986, Ser. No. 904,730
Int. Cl.[4] G11B *5/74*
U.S. Cl. 428—328 13 Claims

1. A flexible magnetic medium adapted for high speed digital data recording comprising a substrate and a coating thereon, this coating including a non-cross-linked thermoplastic binder copolymer comprised of an elastomeric urethane essentially free of isocyanate groups plus a vinyl chloride terpolymer having a maleic ester component free of acid groups and an

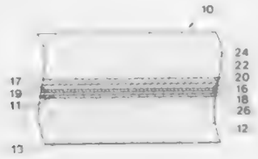
acrylate component wherein the ratio of said elastomeric urethane to said vinyl chloride terpolymer ranges from about 50/50 to about 85/15.

4,861,656

OPTICAL RECORDING MEDIUM

Kenji Uchiyama; Hideki Ishizaki, and Suguru Takayama, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 136,973
Claims priority, application Japan, Dec. 24, 1986, 61-313615; Dec. 25, 1986, 61-314949
Int. Cl.[4] G11B *5/66*
U.S. Cl. 428—333 **12 Claims**



1. A magneto-optical recording medium comprising
(i) a substrate,
(ii) a recording layer on the substrate, and
(iii) an intermediate layer between the substrate and the recording layer having a thickness of from about 300 to about 3,000Å, said intermediate layer comprising a mixture of a rare earth element oxide, silicon oxide, and silicon nitride, wherein said rare earth element oxide is present in the intermediate layer in a weight ratio of rare earth element oxide to the total of silicon oxide, silicon nitride, and rare earth element oxide of from about 1:30 to about 1:2, and wherein said silicon oxide and silicon nitride are present at a molar ration of from about 50:50 to about 90:10, calculated as SiO_2 and Si_3N_4.

4,861,657

ARTICLE HAVING INSULATION ABRASION COATED LAYER

Atsushi Nishino, Neyagawa; Masaki Ikeda, Hirakata; Yoshihiro Watanabe, Moriguchi, and Masahiro Hiraka, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 6, 1986, Ser. No. 871,760
Claims priority, application Japan, Jun. 7, 1985, 60-124467
Int. Cl.[4] B32B *15/04, 17/06*
U.S. Cl. 428—336 **12 Claims**



1. An article having an insulation abrasion-resistance layer coated on a metal substrate, said coated layer composed of glass ceramics, said glass ceramics containing 15% or more by weight of at least one oxide of a divalent alkaline earth metal selected from the group consisting of BaO, MgO, CaO and ZnO, and further containing 2% or less by weight of an oxide of a univalent alkali metal selected from the group consisting of Na_2O, K_2O and Li_2O.

2. An article having an insulation abrasion-resistance coated layer in accordance with claim 1, wherein the coated layer of the glass ceramics is 20 through 200 μm in thickness and the central-line surface roughness Ra of the coated layer is 0.05 through 0.5 μm.

4,861,658

HYPOALLERGENIC JEWELRY AND METHOD OF MAKING THE SAME

Donald L. Griffin, West Chester, and Ralph E. Pfister, Wayne, both of Pa., assignors to Barriergen, Inc., Malvern, Pa.

Filed May 2, 1988, Ser. No. 188,991
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—336 **18 Claims**

1. An article of manufacture adapted to be worn in juxtaposition to a living human or animal body, comprising:
a metal substrate containing at least a predetermined small amount of an allergen; and
a coating applied to and bonded to said metal substrate, said coating being comprised of a layer of poly(p-xylylene) polymer to provide a hypoallergenic surface on said metal substrate to eliminate the formation of an allergenic reaction by said living body.

14. A process comprising the steps of:
selecting metal substrates that are adapted to be placed in contact with a living human or animal body;
determining the likelihood that said selected metal substrates may contain an allergen selected from the group consisting of nickel and chromates; and
coating said selected metal substrates that are determined to contain an allergen with a poly(p-xylylene) polymer.

4,861,659

HIGH TENACITY ACRYLONITRILE FIBERS AND A PROCESS FOR PRODUCTION THEREOF

Takashi Takada; Kenichi Hirao, both of Otsu; Hiroyoshi Tanaka, and Mitsuo Suzuki, both of Ehime, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 688,393, Jan. 2, 1985, abandoned. This application Apr. 17, 1987, Ser. No. 39,336
Claims priority, application Japan, Jun. 19, 1984, 59-125818
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—364 **4 Claims**

1. A high tenacity acrylonitrile fiber comprising an acrylonitrile polymer mainly composed of acrylonitrile having an intrinsic viscosity of 2.5 to 3.5, and having a degree of crystalline orientation measured by wide-angle X-ray diffraction within a range of 93 to 97%, a tensile strength of at least 10 g/d, an initial modulus of at least 180 g/d, a knot strength of at least 2.2 g/d and a surface smoothness of at least 7% when expressed by the contrast glossiness.

4,861,660

STRETCHABLE SYNTHETIC POLYMER COMPOSITE FILAMENT

Seiji Ishii, Mihara, Japan, assignor to Teijin Limited, Osaka, Japan

Filed Jan. 13, 1987, Ser. No. 2,876
Claims priority, application Japan, Jan. 20, 1986, 61-7874
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—371 **19 Claims**



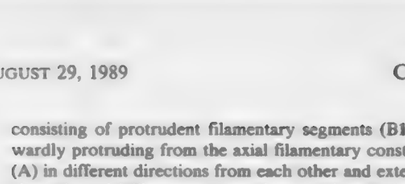
1. A stretchable synthetic polymer composite filament, comprising:
(A) an axial filamentary constituent extending along the longitudinal axis of the filament;
(B) a plurality of composite lobe filamentary constituents consisting of protrudent filamentary segments (B1) outwardly protruding from the axial filamentary constituent (A) in different directions from each other and extending along the axial filamentary constituent (A) and edge filamentary segments (B2) attached to outside ends of the protrudent filamentary segments (B1) and extending along the protrudent filamentary segments (B1),
the axial filamentary constituent (A) and the protrudent filamentary segments (B1) consisting essentially of a synthetic thermoplastic elastomer (a) having a melting point of from 180° C. to 240° C., and
the edge filamentary segments (B2) consisting essentially of at least one synthetic thermoplastic low elastic polymer (b) having a melting point of from 205° C. to 265° C.,
in which filament, when not under tension, the composite lobe filamentary constituents (B) are asymmetric with respect to at least one feature of the location thereof and cross-sectional configurations and sizes of the protrudent and edge filamentary segments (B1 and B2), about the longitudinal axis of the filament, and are spirally coiled around the axial filamentary constituent (A) in alternately reversed two opposite directions.

4,861,661

CO-SPUN FILAMENT WITHIN A HOLLOW FILAMENT AND SPINNERET FOR PRODUCTION THEREOF

Harry V. Samuelson, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 879,571, Jun. 27, 1986, Pat. No. 4,743,189. This application Jan. 19, 1988, Ser. No. 145,110
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—398 **2 Claims**



1. A hollow-within-a-hollow filament consisting of a first elongated hollow polymeric filament defined by an annular wall having an inner surface, the hollow portion of said filament containing a single cospun hollow polymeric filament extending throughout its length, said cospun filament being free from said inner surface and formed from a polymer that is not fusible with the polymer forming the first elongated hollow filament.

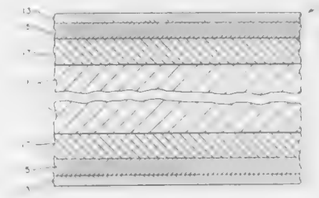
4,861,662

PROTECTIVE LAYER FOR MAGNETIC DISK

Robert J. Kobliska, San Jose, and Eric K. Li, Palo Alto, both of Calif., assignors to Akashic Memories Corporation, Santa Clara, Calif.

Filed Feb. 3, 1987, Ser. No. 10,381
Int. Cl.[4] G11B *5/64*
U.S. Cl. 428—408 **7 Claims**

1. A method of increasing the lifetime of a magnetic disk recording device of the type having an outer carbon layer of elemental carbon over a magnetic recording layer, comprising the step of:
imbedding oxygen in the outer carbon layer until the atomic ratio in the outer 100 Angstroms of the carbon layer is in



the range between 15% oxygen:85% carbon and 40% oxygen:60% carbon.

4,861,663

PROCESS FOR ANTISTATIC TREATMENT OR PRETREATMENT OF POLYAMIDES, POLYIMIDES, ANTISTATICALLY TREATED OR PRETREATED MATERIALS, AND THE USE THEREOF

Kirkor Sirinyan, Bergisch Gladbach; Hans-Joachim Laue, Krefeld; Rudolf Merten, Leverkusen; Dietrich Michael, Krefeld, and Milan-Josef Tima, Roesrath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jul. 15, 1987, Ser. No. 73,567
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1986, 3625188; Oct. 28, 1986, 3636606
Int. Cl.[4] B05D *3/02;* **B32B** *5/14*
U.S. Cl. 428—409 **11 Claims**

1. Process for antistatic treatment or pretreatment of a polymeric material based on a polyamide, a polyimide or a polyamideimide, characterized in that the polymeric material is first treated with a solution consisting essentially of
(a) halides of elements of main groups 1 and 2 of the periodic system of the elements with
(b)
(1) salts of weak inorganic bases and strong inorganic acids
(2) or the chelate complexes of (b1) with a Schiff base, a complex-forming amine, a carboxylic acid, a diketone, an α,β-unsaturated ketone, or mixtures of (b1) and (b2)
or mixtures of (a) and (b) in
(c) a non-corrosive, organic swelling agent or solvent for the materials mentioned;
at temperatures up to the boiling point of the organic swelling agent or solvent (c), for from 0.5 to 30 minutes, and then washed with water or solvents and dried.

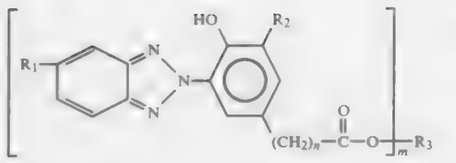
4,861,664

PROCESS FOR UV STABILIZER IMPREGNATION OF PLASTIC SURFACES

John C. Goossens, Mt. Vernon, Ind.; Arnold Factor, and Peter M. Miranda, both of Scotia, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 31, 1987, Ser. No. 140,106
Int. Cl.[4] B32B *27/36;* **B05D** *5/00*
U.S. Cl. 428—409 **17 Claims**

1. A process for producing a thermoplastic article having resistance to degradation by ultraviolet radiation, comprising impregnating the surface of the thermoplastic article with a UV-absorbing effective amount of a solution of a UV absorbing compound of the formula:



wherein R_1 is hydrogen, a halogen, a lower alkyl of from 1 to about 6 carbon atoms or a lower alkoxy of from 1 to about 6 carbon atoms, R_2 is hydrogen, halogen, lower alkyl of from 1 to about 6 carbon atoms, or arylsulfonyl, wherein the aryl group contains from 6 to about 10 carbon atoms; n is an integer from 1 to about 4; m is 3; and R_3 is a trivalent hydrocarbon radical or lower alkyl ether radical of from 2 to about 22 carbon atoms.

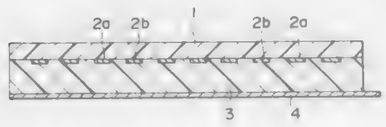
17. A thermoplastic article made according to the process of claim 1.

4,861,665

ELECTROSTATIC ABSORPTION SHEET

Keiji Kasahara, Kakegawa, Japan, assignor to Abisare Co., Ltd., Shizuoka, Japan

Filed Apr. 26, 1988, Ser. No. 186,189
Claims priority, application Japan, Feb. 5, 1988, 63-14692[U]
Int. Cl.[4] B32B *9/04*; H02N *13/00*
U.S. Cl. 428—411.1 **2 Claims**



1. An electrostatic absorption sheet in which an absorption layer, a group of electrodes and an insulation layer are integrally connected to each other by a method wherein said insulation layer is formed by an insulation material having an adhesive characteristic which permits adhering of the insulation layer to the absorption layer solely by means of pressure.

4,861,666

ASYMMETRIC IMPACT RESISTANT LAMINATES

Donald G. LeGrand, Burnt Hills, and William V. Olszewski, Stillwater, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Aug. 13, 1984, Ser. No. 639,708
Int. Cl.[4] F06B *3/26*; B32B *9/04*
U.S. Cl. 428—412 **8 Claims**

1. A shock and penetration resistant asymmetric laminate exhibiting reduced internal stress consisting essentially of: at least three forward laminae from about 50 mils to about 500 mils in thickness selected from the group consisting of polycarbonate laminae and glass laminae which laminae include one fewer of said polycarbonate laminae than of said glass laminae and are laid up to alternate in composition between glass and polycarbonate; an additional back lamina of polycarbonate laid up opposite the direction of impact or shock and having a thickness of from about 30 mils to about 20 mils; and a suitable adhesive interlayer at each internal interface of said laminate to bond all laminae.

4,861,667

COATING COMPOSITION AND COATED PRODUCT

Takashi Takayanagi, Yokohama; Seiji Munekata, Tokyo; Nobuyuki Miyazaki, Yokohama, and Ken Moriwaki, Kawasaki, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Dec. 15, 1987, Ser. No. 133,428
Claims priority, application Japan, Dec. 19, 1986, 61-301558
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—421 **14 Claims**

1. A coating composition comprising a fluorine-containing copolymer containing at least 10% by weight of fluorine based on fluoroolefin units, being soluble in a solvent and having curable reactive sites, and a polyfunctional organic silicon compound having at least one isocyanate group directly bonded to a silicon atom, said curable reactive sites being capable of reacting with an isocyanate group and the functional groups other than the isocyanate groups of the polyfunctional organic silicon compound being groups capable of reacting with the curable reactive sites of the fluorine-containing copolymer or being hydrolyzable groups each convertible to a silanol group by hydrolysis, any groups attached to silicon of the polyfunctional organic silicon compound other than the isocyanate groups and the hydrolyzable groups being organic groups attached to silicon through a carbon bonded to silicon atom, the solvent being one capable of dissolving both the fluorine-containing copolymer and the polyfunctional organic silicon compound.

4,861,668

PROCESS FOR COATING URETHANE SUBSTRATES

Christopher J. Hardiman, Belchertown, and Gary R. Bowers, Westfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 946,742, Dec. 24, 1986, Pat. No. 4,816,535. This application Dec. 19, 1988, Ser. No. 286,012
Int. Cl.[4] B32B *27/00*; B05D *3/02*
U.S. Cl. 428—424.4 **8 Claims**

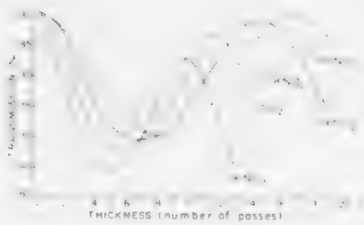
1. A process for coating a molded urethane article which comprises coating the molded urethane article with an allyloxy activated free-radical polymerizable coating composition containing a free radical initiator and a metal drier reversibly deactivated with a strong fugitive acid, and subjecting the coating to conditions which volatilize or decompose the strong fugitive acid and allow the metal drier and free-radical initiator to be activated to cure the coating composition.

4,861,669

SPUTTERED TITANIUM OXYNITRIDE FILMS

Frank H. Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 26, 1987, Ser. No. 31,319
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—434 **6 Claims**



1. An article of manufacture comprising:
a. a transparent, nonmetallic substrate;

b. a first transparent metal film of highly infrared reflective metal;
c. a second transparent metal film of a protective metal over the infrared reflective metal film; and
d. a sputtered titanium oxynitride film.

4,861,670

MARINE FOULANT RELEASE COATING

Warren R. Lampe, Charlton; Annette A. Moore, Gansevort, and Kathleen R. Hartley, Troy, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Dec. 15, 1987, Ser. No. 132,379
Int. Cl.[4] A01N *9/00*
U.S. Cl. 428—447 **7 Claims**

1. A ship's hull normally immersed in sea water and coated with an outermost coating of a curable silicone rubber composition comprising:
(1) 100 parts of a liquid vinyl chain-stopped polysiloxane having the formula:

$$(CH_2{=}CH)R_2SiO{-}[R'_2SiO]_n{-}R_2Si(CH{=}CH_2)$$

where R and R' are monovalent hydrocarbon radicals free of aliphatic unsaturation, with at least 50 mole percent of the R' groups being methyl and where n has a value sufficient to provide a viscosity of from about 2,500 to 750,000 centistokes at 25° C.,
(2) from 20 to 50 parts of an organopolysiloxane copolymer comprising $(R'')_3SiO_{0.5}$ units and $SiO_{4/2}$ units, where R'' is a member selected from the class consisting of vinyl radicals and monovalent hydrocarbon radicals free of aliphatic unsaturation, where the ratio of $(R'')_3SiO_{0.5}$ units to $SiO_{4/2}$ units is from about 0.5:1 to 1:1, and where from about 2.5 to 10 mole percent of the silicon atoms contain silicon-bonded vinyl groups,
(3) from 1 to 200 parts of a finely divided inorganic filler which is non-reinforcing for silicone elastomers,
(4) a platinum catalyst,
(5) an amount of a liquid organohydrogen polysiloxane having the formula:

$$(R)_a(H)_bSiO_{(4-a-b)/2}$$

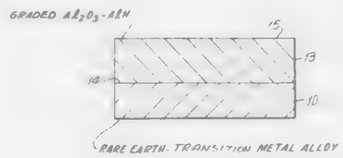
sufficient to provide from about 0.5 to 1.0 silicon-bonded hydrogen atom per silicon-bonded vinyl group in the composition, where R is as previously defined, a has a value of from 1.00 to 2.00, b has a value of from about 0.1 to 1.0, and the sum of a plus b is from about 2.00 to 2.67, there being at least two silicon-bonded hydrogen atoms per molecule.

4,861,671

MAGNETO-OPTIC RECORDING MEDIA WITH PROTECTIVE LAYER

Boris J. Muchnik, and Frank H. Robertson, III, both of Boulder, Colo., assignors to Kerdix, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 790,497, Oct. 23, 1985, abandoned. This application Nov. 25, 1987, Ser. No. 125,401
Int. Cl.[4] G11B *7/21*
U.S. Cl. 428—457 **9 Claims**



1. A magneto-optic medium having a recording layer of an active magneto-optic material and a protective layer thereon, comprising:
a first material of said protective layer which is not in contact with the surface of said recording layer;
a second material of said protective layer adjacent to said surface of said recording layer;
said first material being a pure oxide composition material layer in its uppermost layer adjacent to the external surface of said protective layer;
said second material being a pure non-oxide composition material layer in its lowermost layer which is contiguous with said recording layer; and
said first and second materials in said protective layer being graded in composition continuously between the pure oxide uppermost and the pure non-oxide lowermost layers within said protective layer.

4,861,672

ONE-CAN HEAT-CURABLE RESIN COMPOSITIONS AND PRECOATED METAL

Shigeaki Miyabayashi, Kobe; Hiroshi Kanai, Kimitsu; Joji Oka, Tokyo, and Yoshikatsu Matsuura, Minoo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka and Nippon Steel Corporation, Tokyo, both of, Japan

Filed Jul. 13, 1988, Ser. No. 218,298
Claims priority, application Japan, Jul. 14, 1987, 62-175761
Int. Cl.[4] B32B *15/08*; C08G *18/81*
U.S. Cl. 428—458 **5 Claims**

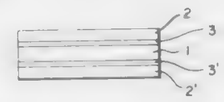
1. A precoated metal obtained by coating a metal sheet with a one-can heat-curable resin composition comprising: (1) a polyester polyol having at least three functional groups; (2) an adduct of an epoxy resin having at least one secondary hydroxyl group with a lactone compound or an alkylene oxide; and (3) a blocked organic polyisocyanate or a product of blocking of a prepolymer having terminal NCO groups obtained by reacting an organic polyisocyanate and an active hydrogen-containing compound; and curing said composition with heating.

4,861,673

COMPOSITE SINTERED MATERIAL HAVING SANDWICH STRUCTURE

Akio Hara, and Akihiko Yamamura, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 793,825, Nov. 1, 1985, abandoned. This application Nov. 30, 1987, Ser. No. 127,604
Claims priority, application Japan, Nov. 1, 1984, 59-228998
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—469 **3 Claims**



1. A composite sintered material having a sandwich structure comprising:
a hard layer of sintered diamond compact comprising 5 to 15 vol % of an iron group metal and the balance of diamond particle;
a pair of intermediate layers each having a thickness of 10 to 500 microns and being bonded respectively to one of the opposite surfaces of said hard layer, each of said intermediate layers consisting essentially of 80 to 20 wt % of high-pressure boron nitride and the balance which is at least one member selected from the group consisting of nitride, carbide, carbonitride, boride, oxide and mutual solid solution thereof of the elements which belong to the IIIb, IVa, IVb, Va or VIa groups of the Periodic Table; and

a pair of substrates bonded respectively to one of the surfaces of said intermediate layers to form a sandwich construction with said hard layer, each of said substrates comprising a sintered alloy composed of 5 to 2 wt % of Co and/or Ni and the balance of Wc and/or MoC.

4,861,674

MAGNETIC RECORDING MEDIUM

Hiroo Inaba; Akira Ushimaru; Nobuyuki Yamamoto; Noburo Hibino, and Kenzo Iwamoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 30, 1988, Ser. No. 238,067
Claims priority, application Japan, Aug. 31, 1987, 62-218730
Int. Cl.⁴ G11B *5/70*
U.S. Cl. 428—480 **9 Claims**



1. A magnetic recording medium comprising a nonmagnetic support having coated thereon a magnetic layer, the non-magnetic support being a film substantially composed of polyethylene terephthalate and having a cutting index (Z) of 6 or less as defined by equation (1):

$$Z = 383.3 - 2.76A - 2000B + 840\Delta n \quad (1)$$

wherein A is the haze value, B is the surface orientation coefficient represented by $\{(n_{MD}+n_{TD})/2\}-n_{ZD}$, n_{MD} is the refractive index in the machine direction, n_{TD} is the refractive index in the transverse direction, n_{ZD} is the refractive index in the thickness direction, and Δn is the difference of the refractive indices represented by $n_{MD}-n_{TD}$;

and said magnetic layer has yield elongation (L) of 10% or lower and requires energy (E) of 1.0 kg/mmp^2 or less to reach the yield point.

4,861,675

COATING PROCESS

Eric R. George, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 25, 1988, Ser. No. 185,577
Int. Cl.⁴ B32B *27/42;* **B05D** *1/08*
U.S. Cl. 428—501 **13 Claims**

1. A process for coating a solid object with a polymeric material which process comprises flame spraying a polymeric material, provided as a powder having a particle size from about 20 mesh to about 100 mesh, the polymeric material comprising a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon having up to 20 carbon atoms, which linear alternating polymer has a limiting viscosity number about 0.5 to about 10 as measured at 60° C. in m-cresol, uniformly mixed with from about 0.1% by weight with up to 80% by weight based on the total of a copolymer of ethylene and α,β-ethylenically unsaturated carboxylic acid of up to 10 carbon atoms inclusive, by heating the polymeric material powder to substantially melt the polymeric material and thereafter propelling the substantially molten polymeric material onto the surface of the solid object, thereby forming a coating.

4,861,676

IMPROVED COEXTRUDABLE ADHESIVE AND PRODUCTS THEREFROM

I-Hwa Lee, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 29, 1988, Ser. No. 237,171
Int. Cl.⁴ C08L *25/04, 51/04, 51/06*
U.S. Cl. 428—516 **18 Claims**

1. An extrudable bonding resin composition consisting essentially of:

(a) about 35 to about 84 percent by weight of an ethylene copolymer portion consisting essentially of

(i) about 1 to 100 percent by weight of a copolymer of about 45 to about 95 weight percent ethylene and about 5 to about 55 weight percent of at least one comonomer copolymerized therewith selected from the group consisting of unsaturated mono- or dicarboxylic acids of 2–20 carbon atoms, esters of said unsaturated mono- or dicarboxylic acids, vinyl esters of saturated carboxylic acids where the acid group has 1–18 carbon atoms, acrylonitrile, methacrylonitrile, and carbon monoxide, the carbon monoxide being present in an amount of 0 to about 30 weight percent; and a grafted comonomer containing pendant carboxylic acid or carboxylic acid derivative functionality, wherein the amount of said grafted comonomer comprises about 0.03 to about 0.5 percent by weight of the total bonding resin composition, and

(ii) 0 to about 99 percent by weight of a copolymer of about 45 to about 95 weight percent ethylene and about 5 to about 55 weight percent of at least one comonomer copolymerized therewith selected from the group consisting of unsaturated mono- or dicarboxylic acids of 2–20 carbon atoms, esters of said unsaturated mono- or dicarboxylic acids, vinyl esters of saturated carboxylic acids where the acid group has 1–18 carbon atoms, acrylonitrile, methacrylonitrile, and carbon monoxide, the carbon monoxide being present in an amount of 0 to about 30 weight percent,

wherein the copolymer of (i) and the copolymer of (ii) contain at least one said copolymerized comonomer in common, the amount of each such common comonomer in the copolymer of (ii) being within about 10% of the amount of the corresponding comonomer in copolymer (i), and the total amount of said copolymerized comonomers other than such common comonomers in either copolymer being less than about 10%;

(b) about 15 to about 45 percent by weight polystyrene; and

(c) about 1 to about 25 weight percent of a saturated alicyclic hydrocarbon resin modifier having a degree of saturation of at least about 80%.

4,861,677

COEXTRUDABLE ADHESIVE FOR POLYSTYRENE, AND PRODUCTS THEREFROM

I-Hwa Lee, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 3, 1988, Ser. No. 202,033
Int. Cl.⁴ C08L *51/04, 51/06*
U.S. Cl. 428—516 **12 Claims**

1. An extrudable bonding resin composition consisting essentially of:

(a) about 55 to about 80 percent by weight of an ethylene vinyl acetate copolymer portion consisting essentially of

(i) 0 to about 99 percent by weight of a copolymer of about 60 to about 87 weight percent ethylene and about 13 to about 40 weight percent vinyl acetate comonomer, and

(ii) about 1 to 100 percent by weight of a copolymer of at least about 50 weight percent ethylene; about 3 to about 50 weight percent vinyl acetate comonomer, the amount of said vinyl acetate comonomer being within about 10 percent of the amount of vinyl acetate comonomer in copolymer (i), if present; and a grafted comonomer containing pendant carboxylic acid or carboxylic acid derivative functionality, wherein the amount of said grafted comonomer comprises about 0.03 to about 0.5 percent by weight of the total composition and the total amount of copolymerized vinyl acetate of (i) and (ii) exceeds about 13.5 percent by weight of the total composition; and

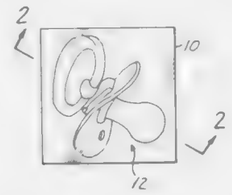
(b) about 20 to about 45 percent by weight of an impact modified polystyrene having a molecular weight of greater than 50,000.

4,861,678

DISPLAY APPARATUS

Levon Kassabian, 1306 N. Lake, Pasadena, Calif. 91104

Filed Aug. 19, 1987, Ser. No. 87,095
Int. Cl.⁴ A61J *9/00;* **B44C** *3/06;* **G09F** *19/00*
U.S. Cl. 428—542.4 **8 Claims**



1. Momento display apparatus comprising a baby's feeding nipple, teething ring or pacifier device, an integrally formed support therefor, and a solid rigid transparent plastic airtight enclosure embedding said device supported by said support and away from the atmosphere in displaying relation.

4,861,679

COMPOSITE MATERIAL OF ZN-AL ALLOY REINFORCED WITH SILICON CARBIDE POWDER

Renato Guerriero, and Ilario Tangerini, both of Mestre, Italy, assignors to Nuova Samim S.p.A., Rome, Italy

Filed Aug. 19, 1987, Ser. No. 86,864
Claims priority, application Italy, Aug. 19, 1986, 21497 A/86
Int. Cl.⁴ C22C *1/10*
U.S. Cl. 428—614 **8 Claims**

1. A composite material containing a matrix consisting of Zn-Al alloy reinforced with a silicon carbide powder, said powder having a granulometric distribution within the range of from about 1 to 200 μm and wherein said Zn in said Zn-Al alloy is present in an amount of from 73% to 96% by weight.

4,861,680

BRONZE-GREY GLAZING FILM AND WINDOW MADE THEREFROM

Stephen F. Meyer, Los Altos, and Claude A. Sans, Mountain View, both of Calif., assignors to Southwall Technologies, Palo Alto, Calif.

Filed Feb. 11, 1988, Ser. No. 155,068
Int. Cl.⁴ E06B *3/24;* **B32B** *15/08*
U.S. Cl. 428—623 **10 Claims**



1. A bronze-grey film glazing component comprising

a. a plastic film support;

b. a 25 to 100 angstrom layer of titanium suboxide reactive sputter-deposited to a composition of TiO_x, wherein the value of x is between about 0.8 and about 1.95, said layer being adhered to the surface of the support;

c. a transmissive layer of copper metal adhered to the titanium suboxide layer; and

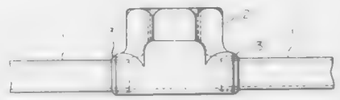
d. a transmissive layer of greying metal adhered to the layer of copper.

4,861,681

BRAZED ALUMINUM ARTICLE

Masami Asano, Susono; Ken Toma, Mishima, and Yo Takeuchi, Susono, all of Japan, assignors to Mitsubishi Aluminum Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1988, Ser. No. 194,382
Claims priority, application Japan, Jun. 12, 1987, 62-145375
Int. Cl.⁴ B32B *15/20*
U.S. Cl. 428—654 **2 Claims**



1. A brazed aluminum article comprising at least two aluminum members brazed together with a filler metal, which consists essentially of:

zinc: from 30 to 50 wt. %,

silicon: from 2 to 6 wt. %, and

the balance being aluminum and incidental impurities,

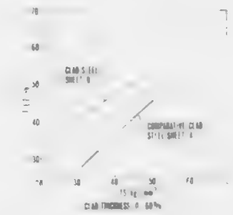
the ratio of the content of said silicon to the content of said aluminum in said filler metal being within the range of from 0.05 to 0.12.

4,861,682

CLAD STEEL MATERIALS HAVING EXCELLENT DUCTILITY AND CORROSION RESISTANCE

Yoshio Hashimoto; Tsuyoshi Kawano; Kaname Hasuka, and Seiji Otomo, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 868,104, May 29, 1986, abandoned. This application Feb. 1, 1988, Ser. No. 150,496
Claims priority, application Japan, May 29, 1985, 60-114326; May 29, 1985, 60-114327; Jun. 26, 1985, 60-137820; Jan. 7, 1986, 61-272; Jan. 24, 1986, 61-11887; Jan. 24, 1986, 61-11888
Int. Cl.⁴ B32B *15/18*
U.S. Cl. 428—685 **9 Claims**



1. A stainless clad steel sheet of about 0.5 to 0.8 mm thickness comprising a carbon steel sheet consisting of not more than 0.0045% of carbon, not more than 0.5% of manganese, not more than 0.080% of aluminum, not more than 0.02% of silicon contained as unavoidable impurity, not more than 0.0050% of nitrogen, and at least one of titanium and niobium under the following conditions:

(Ti + Nb) . . . not more than 0.15%

$$\frac{Nb}{7.74C} + \frac{Ti}{4C + 3.43N} \text{ . . . not less than 0.8\%,}$$

with the balance being Fe, and an austenite stainless steel layer on at least one side of said carbon steel sheet.

4,861,683

QUATERNARY-CONTAINING RESIN USED FOR MAGNETIC RECORDING MEDIA

Takeshi Nakachi; Akio Hata, both of Shinnanyo, and Yoshihisa Watanabe, Uji, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 30,457, Mar. 25, 1987, abandoned. This application Aug. 22, 1988, Ser. No. 236,350

Int. Cl.[4] G11B *5/68*

U.S. Cl. 428—694 **4 Claims**

1. A magnetic recording medium comprising a non-magnetic substrate on which is coated a layer of a dispersion of a particulate magnetic material in a vinyl chloride copolymer containing, as component units, 60–95% by weight of vinyl chloride, 1 to 30% by weight of vinyl monomers with hydroxyl groups, and 0.05% to 8% by weight of vinyl monomers with quaternary ammonium salt groups.

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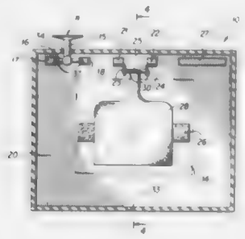
ELECTRICAL SAFETY SYSTEM FOR BATTERIES

Dwight D. Law, Rte. 1, Box 55, Petersburg, W. Va. 23804

Filed Jul. 21, 1988, Ser. No. 222,022

Int. Cl.[4] H01M *2/20, 2/34*

U.S. Cl. 429—7 **17 Claims**



1. A system for totally eliminating fire and/or electrical hazards associated with maintaining batteries for both automobiles and aircraft having a pair of spaced positive and negative terminals, a plunge, a shaft means in said battery connected to said plunger for manually opening the internal circuit of said battery, said battery having at least a pair of cells with a cell bridge lug means connected between said pair of cells, spring clip means connected to said cell bridge means, and a weighted disconnect link means bridging said pair of cells of said battery and coupled to said spring clip means.

4,861,685

PORTABLE RECHARGEABLE BATTERY

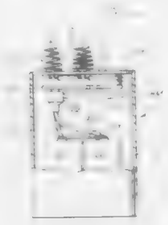
Spencer W. H. Tien, 11921 Goldring Rd., Arcadia, Calif. 91006, and Ronnie A. Matheny, 19731 Jalora St., Corona, Calif. 91719

Filed Aug. 19, 1988, Ser. No. 234,138

Int. Cl.[4] H01M *14/00, 10/48*

U.S. Cl. 429—7 **17 Claims**

1. A rechargeable battery comprising a housing, rechargeable battery means having positive and negative direct current terminals arranged in the housing and the terminals connectable from outside the housing for powering a device connected to the terminals, circuit means arranged within the housing and connected to the battery means terminals for connecting a power source thereto to cause a charging current to flow into the battery means in the reverse direction from which current normally flows from the battery means, said circuit means having terminals accessible on the outside of the housing for permitting a battery charging power pack to be coupled thereto for charging the battery means, measuring circuit means coupled to the battery means for sensing the amount of charge or current transferred to the battery means from a



power pack connected to the circuit means in a battery charging relationship, and signaling means coupled with the measuring circuit means to be responsive to the measuring circuit means when it senses that the charge transferred to the battery means has recharged the battery means and automatically signals the charged condition, said measuring circuit means being essentially de-coupled from the battery means when the battery charging power pack is disconnected therefrom to thereby remove any current drain on the battery means.

4,861,686

MULTI-CELL, VACUUM ACTIVATED DEFERRED ACTION BATTERY

Gilbert R. Snyder, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 151,761, Feb. 3, 1988, abandoned. This application Oct. 31, 1988, Ser. No. 265,305

Int. Cl.[4] H01M *6/38*

U.S. Cl. 429—90 **10 Claims**



1. A multi-cell, vacuum activated, deferred action battery comprising:

a battery cell assembly including a plurality of stacked battery cells defining a fill hole therethrough, a bibulous material filling said battery cells, and a hermetically sealed container having a puncturable seal on a surface thereof, a terminal insulated from said sealed container, a vacuum terminal insulated from said sealed container and electrically separated from said insulated terminal by a gap, and said container enclosing said battery cells under a partial vacuum;

an ampule assembly coupled to said surface of said container having said puncturable seal including a non-frangible, pliant ampule enclosing a battery fluid and a cutting means for puncturing said non-frangible ampule and said puncturable seal thus allowing said fluid to enter said battery cell assembly; and

an actuator means for providing an actuating force to said cutting means.

4,861,687

BATTERY HANDLE ADAPTER

Randall F. Brantley, Sylvester, Ga., and Harry D. McVey, Pendleton, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1988, Ser. No. 226,708

Int. Cl.[4] H01M *2/10;* **B65D** *25/28*

U.S. Cl. 429—187 **6 Claims**



1. A detachable adapter for mounting a carrying handle to a battery having an elongated preformed fingerhole recessed in opposite ends thereof and extending substantially parallel to the top of the battery, said adapter comprising a comb-like insert adapted to be inserted into and closely received within a said fingerhole and comprising an elongated spine conforming substantially to the length of said fingerhole and a plurality of fingers projecting in substantially the same direction substantially normal to a longitudinal side of said spine for close fitting within said fingerhole and binding engagement therein when lifting forces are applied to said insert by said handle.

4,861,688

ZINC-ALKALINE BATTERY

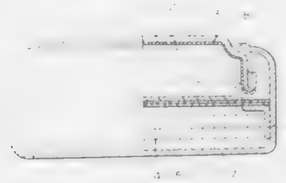
Akira Miura, Katano; Kanji Takata, Neyagawa; Ryoji Okazaki, Katano; Toyohide Uemura, and Keiichi Kagawa, both of Takehara, all of Japan, assignors to Matsushita Electric Indus. Co. Ltd., Osaka and Mitsui Mining & Smelting Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 804,821, Dec. 5, 1985, abandoned. This application Mar. 19, 1987, Ser. No. 29,343

Claims priority, application Japan, Dec. 12, 1984, 59-262135; Dec. 12, 1984, 59-262138; Feb. 5, 1985, 60-20372; Feb. 5, 1985, 60-20373; Oct. 16, 1985, 60-230159; Oct. 16, 1985, 60-230161; Oct. 17, 1985, 60-231599

Int. Cl.[4] H01M *4/40*

U.S. Cl. 429—206 **3 Claims**



1. A zinc-alkaline battery provided with a cathode, an electrolyte consisting of an aqueous alkali solution, and an anode, in which the active material of said anode is a zinc alloy powder containing zinc as the principal component, 0.01 to 0.5% by weight of Ni, 0.01 to 0.5% by weight of In and/or Pb, and 0.01 to 0.2% by weight of Al.

4,861,689

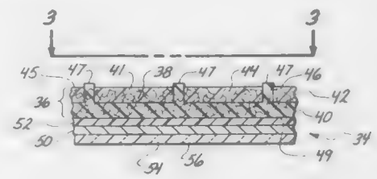
BATTERY ELEMENT AND METHOD FOR MAKING SAME

Thomas J. Clough, Santa Monica, and Naum Pinsky, Thousand Oaks, both of Calif., assignors to Ensci, Inc., Woodland Hills, Calif.

Filed Nov. 23, 1987, Ser. No. 123,896

Int. Cl.[4] H01M *4/16, 6/48*

U.S. Cl. 429—210 **86 Claims**



25. A battery element useful as at least a positive plate in a lead-acid battery comprising: a fluid impervious, electrically conductive matrix having mutually opposing first and second surfaces, said first surface being conditioned to render said first surface more wettable by said positive active electrode material or a precursor thereof; and positive active electrode material associated with said first surface and being situated in a plurality of segments.

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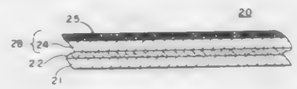
LIGHTWEIGHT BATTERY CONSTRUCTION

Henry F. ope, and Stephen F. Hope, both of c/o Hope Industries, Inc., 5701 Moreland Rd., Willow Grove, Pa. 19090

Filed Jun. 6, 1988, Ser. No. 202,457

Int. Cl.[4] H01M *4/64, 4/66*

U.S. Cl. 429—233 **3 Claims**



1. In an electric battery which includes a positive electrode, a negative electrode, and an electrolyte

wherein at least one of the electrodes comprises

a current collector and carrier of carbon fibre material, and

a coating of alkaline earth metal on said current collector and carrier.

4,861,691

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL CONTAINING HYDRAZONE COMPOUND

Masami Kuroda; Yoichi Nakamura, and Noboru Furusho, all of Kanagawa, Japan, assignors to Fuji Electric Company, Ltd., Kanagawa, Japan

Filed Dec. 22, 1987, Ser. No. 137,212

Claims priority, application Japan, Dec. 22, 1986, 61-305652; Dec. 29, 1986, 61-310176; Jan. 27, 1987, 62-16764

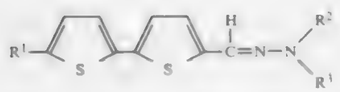
Int. Cl.[4] G03G *5/14*

U.S. Cl. 430—59 **9 Claims**

1. An electrophotographic photosensitive material comprising a photosensitive layer containing at least one hydrazone

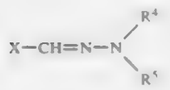
compound selected from the group consisting of compounds having the general formulae (I) and (II):





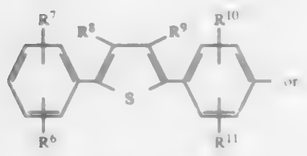
(I)

wherein R^1 is a hydrogen or halogen atom or an alkyl group, an alkoxy group, a nitro group, an acyl group or an amino group and R2 and R3 each represents a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group;

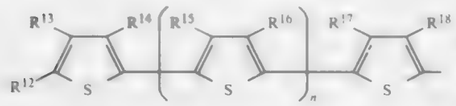


(II)

wherein R^4 and R^5 each represents a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group and X is a group of the formula



or



in which R^6 to R^{18} each represents a hydrogen or halogen atom or a hydroxy group, an alkyl group, an alkoxy group, an allyl group, an acyl group, an acyloxy group, an alkoxycarbonyl group, an aryl group, a cyano group, a nitro group, an amino group, an alkylamino group or an arylamino group and n is an integer of 1, 2, 3, 4 or 5.

4,861,692

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL CONTAINING THIOPHENE COMPOUND

Masami Kuroda; Yoichi Nakamura, and Noboru Furusho, all of Kanagawa, Japan, assignors to Fuji Electric Company, Ltd., Kanagawa, Japan

Filed Dec. 22, 1987, Ser. No. 136,661

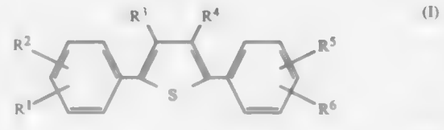
Claims priority, application Japan, Dec. 22, 1986, 61-305633; Dec. 22, 1986, 61-305653; Dec. 23, 1986, 61-306874; Dec. 23, 1986, 61-306876; Dec. 23, 1986, 61-306880

Int. Cl.[4] G03G *5/14*

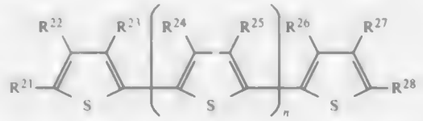
U.S. Cl. 430—59 **9 Claims**

1. An electrophotographic photosensitive material comprising a photosensitive layer containing at least one thiophene compound selected from the group consisting of compounds having the general formulae (I) and (II):





(I)



(II)

wherein R^1, R^2, R^3, R^4, R^5 and R^6, and R^{21}, R^{22}, R^{23}, R^{24}, R^{25}, R^{26}, R^{27} and R^{28} each represents a hydrogen or halogen atom or a hydroxy group, an alkyl group, a hydroxyalkyl group, an alkoxy group, an allyl group, a vinyl group, an acyl group, a formylalkyl group, an acyloxy group, an alkoxycarbonyl group, an aryl group, a cyano group, a nitro group, an amino group, an alkylamino group or an arylamino group and n is an integer of 1, 2, 3, 4 or 5.

4,861,693

CARRIER FOR ELECTROPHOTOGRAPHY

Junji Ohtani; Junji Machida; Eiichi Sano, and Fumio Masuda, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 19, 1988, Ser. No. 157,973

Claims priority, application Japan, Feb. 20, 1987, 62-38621

Int. Cl.[4] G03G *9/10*

U.S. Cl. 430—106.6 **1 Claim**

1. A carrier for electrophotography comprising: a binder component which comprises a binder resin, a polymeric-magnetic coordination complex comprising polybis (2,6-pyridinediyl methylidene nitrilohexamethylene nitrilomethylidene) iron sulfate, the simplified formula thereof being PPH-$FeSO_4$, and an inorganic magnetic material dispersed in said binder component at a ratio of 100 to 900 parts by weight of said magnetic material to 100 parts by weight of said binder component.

4,861,694

PROCESS FOR PRODUCING CARRIERS FOR DEVELOPER

Takayoshi Aoki; Masayuki Takeda; Ikutaroh Nagatsuka, all of Kanagawa; Toshio Honjo, Chiba; Kazuhiro Itoh, Chiba, and Kenji Uchida, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 63,048, Jun. 17, 1987, abandoned. This application Dec. 16, 1988, Ser. No. 285,383

Claims priority, application Japan, Jun. 17, 1986, 61-139182

Int. Cl.[4] G03G *9/10*

U.S. Cl. 430—137 **11 Claims**

1. A process for producing carriers for developers used in electrophotography comprising the steps of

(A) mixing and heating a carrier material containing a binder resin and a magnetic powder, said material being essentially free of solvent, to obtain a molten dispersion of the magnetic powder in the binder resin, said dispersion having a viscosity of not more than 10,000 cp and a temperature of from 100° to 250° C.;

(B) spraying the molten dispersion into droplets; and

(C) cooling the droplets to solidity the droplets into carrier particles having an average particle diameter from about 30 μm to about 200 μm.

4,861,695

LIGHT-SENSITIVE RECORDING MEDIUM, CARTRIDGE ENCASING SAME, AND IMAGE RECORDING SYSTEM THEREFOR

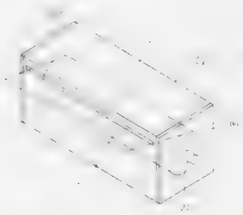
Shunichi Higashiyama, Nagoya, Japan, assignor to Brother Kogyo Kabushiki, Aichi, Japan

Filed Oct. 13, 1988, Ser. No. 256,972

Claims priority, application Japan, Oct. 14, 1987, 62-156920[U]; Oct. 15, 1987, 62-260435

Int. Cl.[4] G03C *1/72*

U.S. Cl. 430—138 **7 Claims**



1. A light-sensitive recording medium comprising a base sheet composed of a water-soluble material having carried thereon light-sensitive microcapsules encapsulating a dye precursor.

4,861,696

LIGHT-SENSITIVE MATERIAL COMPRISING LIGHT-SENSITIVE LAYER PROVIDED ON SUPPORT HAVING LOW AIR PERMEABILITY

Shigehisa Tamagawa, Shizuoka, and Masayuki Kuroishi, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 28, 1987, Ser. No. 101,709

Claims priority, application Japan, Sep. 26, 1986, 61-227768

Int. Cl.[4] G03C *1/72, 1/86*

U.S. Cl. 430—138 **12 Claims**

1. A light-sensitive material comprising a light-sensitive layer containing silver halide, a reducing agent and an ethylenic unsaturated polymerizable compound provided on a paper support, wherein the paper support comprises a base paper coated on a side or both sides with a latex of a hydrophobic polymer, and the paper support has a low air permeability of not less than 1,000 seconds, said air permeability being expressed in terms of a time required for 100 ml of air to pass through the paper support of an area of 645 mm^2 at pressure of 567 g, and said paper support having an internal bond strength of not less than 0.8 kg-cm.

4,861,697

RECORDING MEDIUM FOR OPTICAL DATA STORAGE

Alan G. Hulme-Lowe, Bishops Stortford; Vivien L. Bell, Brentwood, both of Great Britain, and Ian J. Ferguson, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

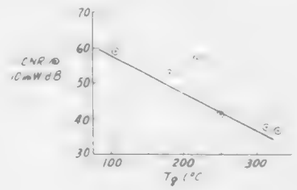
Filed Jun. 3, 1988, Ser. No. 202,499

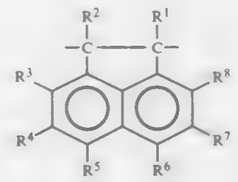
Claims priority, application United Kingdom, Jun. 10, 1987, 8713563

Int. Cl.[4] G03C *1/76*

U.S. Cl. 430—270 **24 Claims**

1. An optical data storage element in which information can be recorded and read directly afterwards by means of laser light comprising, as a recording medium a dye dissolved in a binder characterised in that at least 25% by weight of the binder comprises a polymer in which at least 50% of the repeating units have the general formula:





(I)

in which:

R^1 to R^8 are independently selected from hydrogen, an alkyl group of up to 12 carbon atoms, an aromatic group of up to 12 carbon atoms, halogen, ether, carboxylic acid, ketone, nitro, amino and hydroxy groups or any two adjacent groups of R^1 to R^8 may comprise the necessary atoms to complete a carbocyclic or heterocyclic ring, and there are at least 10 units of formula (I) within the polymer chain.

4,861,698

PHOTOSENSITIVE LITHOGRAPHIC PLATE USING NO DAMPENING WATER

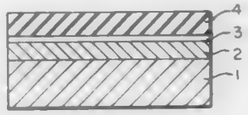
Toshihiko Hiruma; Hiroshi Takahashi, and Norihiko Kato, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Nov. 23, 1987, Ser. No. 123,787

Claims priority, application Japan, Nov. 26, 1986, 61-281194

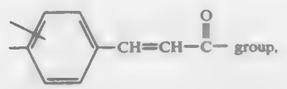
Int. Cl.[4] G03C *1/94, 1/70, 1/71*

U.S. Cl. 430—272 **15 Claims**

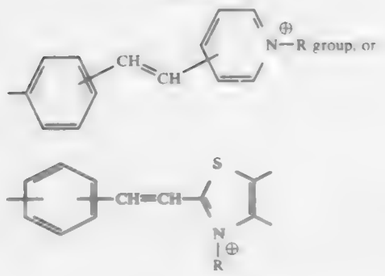


1. A photosensitive lithographic plate requiring no dampening water, which comprises a metal substrate, and a primer layer containing a hardened gelatin, a photosensitive layer and a silicone rubber layer, in said order.

10. A photosensitive lithographic plate of claim 1, wherein the photosensitive layer comprises a polymer having, in a main chain or side chain of the polymer the following group of



-continued



4,861,699

METHOD OF MAKING A MASTER DISK USED IN MAKING OPTICAL READABLE INFORMATION DISKS

Jacob Wijdenes; Johannes M. Ramaker, and Cornelis Weening, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 536,145, Sep. 28, 1983, abandoned. This application Nov. 26, 1985, Ser. No. 802,934

Claims priority, application Netherlands, Mar. 16, 1983, [redacted]

Int. Cl.[4] G03C *5/00;* **G03F** *7/26;* **G11B** *11/03*

U.S. Cl. 430—321 **5 Claims**

1. A method of making a master disk used in manufacturing of optically readable information disks having at least two optical structures situated at different levels, said method comprising the steps of providing a first layer of photosensitive material on one side of a supporting plate, providing a separation layer on said first layer, providing a second photosensitive layer on said separation layer so as to form an assembly comprised of said plate having on one side thereof two superposed layers of said photosensitive material with said separation layer being disposed between said photosensitive layers, exposing said assembly with laser light of a first intensity sufficient to produce a change in said photosensitive material of said second layer and a second intensity level which is higher than said first intensity level, and developing said photosensitive material of said first and second layers, said separation layer being partly transparent to and being adapted to reduce the intensity of said laser light by an amount such that during exposure with said laser light of said first intensity level, the energy of said light reaching said first layer is insufficient to produce a change in said photosensitive material thereof, whereas during exposure with said laser light of said second intensity level, the energy of said light passing through said separation layer is sufficient to produce a change in said photosensitive material of said first layer, as well as in the photosensitive material of said second layer, so that upon development optical structures are formed in said first and second layers which are disposed at different levels with respect to said one side of said supporting plate.

4,861,700

PHOTOGRAPHIC ELEMENT CONTAINING YELLOW FILTER DYES HAVING TRICYANOVINYL GROUPS

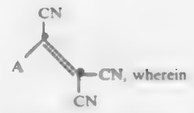
Leslie Shuttleworth, Webster, and Paul B. Merkel, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 19, 1987, Ser. No. 122,829

Int. Cl.[4] G03C *1/84*

U.S. Cl. 430—517 **7 Claims**

1. A photographic element comprising a support having thereon a radiation-sensitive silver halide emulsion layer and another layer comprising a hydrophilic colloid binder and from about 0.01 to 1 g/m^2 of a dye capable of absorbing blue light that would expose said silver halide, said dye having the formula:



A is a pyrrole or indole nucleus, with the tricyanovinyl radical occupying the 2 or 3 position of the nucleus.

4,861,701

PHOTOGRAPHIC ELEMENT AND PROCESS COMPRISING A COMPOUND WHICH COMPRISES TWO TIMING GROUPS IN SEQUENCE

Paul A. Burns, and Terry R. Taber, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 5, 1987, Ser. No. 105,062

Int. Cl.[4] G03C *7/32*

U.S. Cl. 430—543 **16 Claims**

1. In a photographic element comprising a support, at least one photographic emulsion layer and at least one compound A capable upon reaction in a coupling position with an oxidized color developing agent of releasing a photographically useful group, the improvement

wherein the compound A comprises at least two differing timing groups in sequence capable, upon activation, of timing the release of the photographically useful group [redacted]

wherein two separate fragments are formed from the two differing timing groups upon processing the photographic element.

4,861,702

RAPIDLY PROCESSING SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL AND THE PROCESSING THEREOF

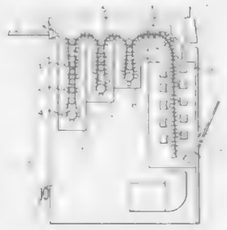
Akio Suzuki; Eiji Yoshida, both of Hachioji; Satoru Nagasaki; Masumi Arai, both of Hino, and Nobuaki Tsuji, Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 130,107, Dec. 7, 1987, abandoned. This application Jan. 11, 1989, Ser. No. 296,327

Claims priority, application Japan, Dec. 8, 1986, 61-291939

Int. Cl.[4] G03C *1/02, 5/24, 5/38*

U.S. Cl. 430—564 **24 Claims**



1. A silver halide photographic light-sensitive material comprising a support having on at least one side thereof one or more hydrophilic layers containing gelatin, at least one of the hydrophilic layers being a light-sensitive silver halide emulsion layer, wherein the amount of said gelatin and an amount of silver halide in terms of silver contained in said hydrophilic layer or layers are each within the range of from 1.90 to 3.50 g/m^2 and from 1.2 to 3.2 g/m^2, respectively, and the swelling amount of said hydrophilc layer or layers is within the range of said 58 g/m^2 when said light-sensitive material is treated with a developer.

4,861,703

CYCLIC DICHALCOGENIDE FOG INHIBITING AGENTS FOR SILVER HALIDE PHOTOGRAPHY

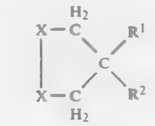
Roger Lok, Hilton, N.Y.; Wolfgang H. H. Gunther, Westchester, Pa., and John P. Freeman, Beverly, Mass., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 15, 1988, Ser. No. 232,255

Int. Cl.[4] G03C *1/34*

U.S. Cl. 430—608 **9 Claims**

1. A photographic element containing a radiation-sensitive silver halide emulsion and a nonsensitizing amount of a fog inhibiting agent having the general formula:



wherein

each X represents a divalent sulfur, selenium or tellurium atom, at least one X is either a selenium or a tellurium atom;

R^1 and R^2 each independently represent substituted or unsubstituted alkyl, aralkyl or aryl group having from 1 to 20 carbon atoms or

R^1 and R^2 together form a cyclic alkylene or ether group having from 1 to 20 carbon atoms.

4,861,704

PROCESSES FOR DEVELOPMENT OF ACCEPTANCE OF TRANSPLANTED ORGANS AND TISSUES

Keith Reemtsma, New York; Mark A. Hardy, Scarsdale, and Henry T. Lau, New York, all of N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation of Ser. No. 528,525, Sep. 1, 1983, abandoned. This application Oct. 8, 1986, Ser. No. 918,282

Int. Cl.[4] A01N *1/02;* **C12N** *13/00*

U.S. Cl. 435—1 **5 Claims**

1. A method for transplanting a foreign organ or tissue from a donor into a subject so as to enhance acceptance of the transplanted foreign organ or tissue by the subject which comprises removing the foreign organ or tissue from the donor, irradiating the removed foreign organ or tissue to be transplanted with ultraviolet —B radiation at a dosage of less than 1000 J/m^2 so as to enhance acceptance of the transplanted foreign organ or tissue and then transplanting the irradiated foreign organ or tissue into the subject.

4,861,705

METHOD FOR REMOVING COMPONENTS OF BIOLOGICAL FLUIDS

Shlomo Margel, Rehovot, Israel, assignor to Yeda Research and Development Company, Ltd., Rehovot, Israel

Division of Ser. No. 462,315, Jan. 31, 1983, abandoned. This application Oct. 22, 1986, Ser. No. 922,021

Int. Cl.[4] A01N *1/02*

U.S. Cl. 435—2 **8 Claims**

1. A method of removing a component from a biological fluid which comprises (a) contacting the fluid with substantially spherical, agarose-polyaldehyde beads, each of the beads having a diameter between 40 μm and 2 cm and comprising a polymer which binds to the component and which contains aldehyde groups, the polymer being in the form of substantially uniform microspheres and being a polyacrolein-type compound, polyglutaraldehyde or starch dialdehyde, the microspheres being encapsulated within an aqueous homogeneous, porous matrix of agarose or agar gel, the aldehyde groups of the polymer being bound to a compound containing at least one primary amine or thiol group by means of such amine or thiol group, and the compound to which the polymer is bound being capable of binding to the component to be removed from the fluid, so that the polymer binds to the component; and (b) removing the beads containing the polymer to which the component is bond from the fluid, and thereby removing the component from the biological fluid.

4,861,706

ASSAY FOR HEPATITIS A VIRUS

William M. Hurni; William J. Miller, both of North Wales, and William J. McAleer, Ambler, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 296,602, Aug. 26, 1981, abandoned, and a continuation-in-part of Ser. No. 296,603, Aug. 26, 1981, abandoned. This application Apr. 29, 1986, Ser. No. [redacted]

Int. Cl.[4] C12Q *1/70;* **C12N** *7/00;* **C12R** *1/91*

U.S. Cl. 435—5 **5 Claims**

1. A method for carrying out an assay for HAV comprising (A) adding to cell sheets in a multi-well assay plate a dilution series of a sample to be tested for the presence of hepatitis A virus, allowing hepatitis A virus if present in the sample to infect the cell sheets, adding NDV to the cell sheets and incubating the cell sheets in the presence of NDV at a temperature of from about 31 to 33° C. for a time sufficient to permit CPE to become manifest; and (b) repeating (a) repeating (a) at from 34° to about 36° C. for a time sufficient to permit CPE to become manifest wherein the absence of CPE indicating the presence of HAV, and the presence of CPE indicating the absence of HAV at a selected temperature of from about 31° to 33° C., and the absence of CPE indicating the absence of HAV and the presence of CPE indicating the presence of HAV at a selected temperature of from about 34° to about 36° C.

4,861,707

HUMAN IMMUNODEFICIENCY VIRUS ANTIGEN

Lucinda A. Ivanoff, Springfield, Pa., and Steven R. Petteway, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 2, 1987, Ser. No. 10,056

Int. Cl.[4] C12Q *1/70;* **C07K** *15/04, 15/14;* **G01N** *33/569*

U.S. Cl. 435—5 **9 Claims**



1. A recumbinant peptide displaying the antigenicity of Human Immunodeficiency Virus (HIV) viral antigens comprising an antigenic segment having about 286 amino acids corresponding to about 46 amino acids of the C-terminal region of the gp120 domain and about 240 amino acids of the N-terminal region of the gp41 domain, said antigenic segment corresponding to the amino acid sequence shown in FIG. 2.

4,861,708
RESTRICTION FRAGMENT ANALYSIS OF INDIVIDUALS USING CARDIOVASCULAR SYSTEM PROBES

Philippe M. Frossard, Palo Alto, Calif., assignor to Biotechnology Research Partners, Ltd., Mountain View, Calif.

Continuation-in-part of Ser. No. 796,904, Nov. 12, 1985, abandoned. This application Jan. 9, 1986, Ser. No. 817,433
Int. Cl.[4] C12Q *1/68*; G01N *33/48*
U.S. Cl. 435—6 4 Claims

4. A method of genetically identifying an individual, which method comprises:

obtaining a sample of genomic DNA from said individual;

digesting said DNA with a restriction endonuclease selected from the group consisting of EcoRI, PstI, DraI, NciI, NsiI, MboI, TthIIII, and StuI to provide DNA fragments;

hybridizing said DNA fragments with λHK1 probe or a substantial equivalent;

detecting the presence or absence of hybridized polymorphic DNA fragments to provide a set of hybridized fragments characteristic of said individual.

4,861,709
DETECTION AND/OR IDENTIFICATION OF MICROORGANISMS IN A TEST SAMPLE USING BIOLUMINESCENCE OR OTHER EXOGENOUS GENETICALLY-INTRODUCED MARKER

Shimon Y. Ulitzur, and Jonathan C. Kuhn, both of Haifa, Israel, assignors to Technicon Research A.G., Chur, Switzerland

Filed May 31, 1985, Ser. No. 739,957
Int. Cl.[4] C12Q *1/68, 1/66, 1/02, 1/04*
U.S. Cl. 435—6 18 Claims

1. A method for detecting and identifying the presence of a target microorganism of interest in a sample suspected of containing one or more unknown microorganisms, comprising the steps of:

a. preparing by genetic engineering techniques a DNA vector containing a genetic system capable of generating a detectable function,

(i) said genetic system comprising DNA coding for one or more proteins required for the expression of a detectable function in said target microorganism which function is not a normal metabolic function of said target microorganism or essentially not expressed in said target microorganism; and

(ii) said vector being capable of the selective introduction of said genetic system into said target microorganism to the exclusion of other microorganisms present in said sample;

b. exposing said sample to said vector under conditions whereby said vector introduces said genetic system into said target microorganism;

c. expressing said detectable function in said target microorganism present in said sample; and

d. detecting expression of said detectable function, the expression of said detectable function indicating the presence and identity of said target microorganism in said sample.

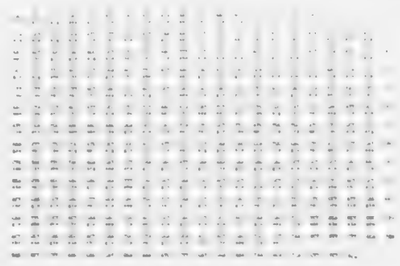
4,861,710
RECOMBINANT DNA CLONE ENCODING LAMININ RECEPTOR

Mark E. Sobel, Bethesda; Lance A. Liotta, Potomac; Ulla M. Wewer, Rockville, all of Md.; Michael C. Jaye, Arlington, and William N. Drohan, Springfield, both of Va., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Sep. 26, 1986, Ser. No. 911,863
Int. Cl.[4] C12Q *1/68*; C07H *21/00*; C12N *1/19, 1/185*
U.S. Cl. 435—6 19 Claims

1. A clone comprising a recombinant cDNA clone for encoding cell surface receptor for laminin having a nucleotide sequence as follows:

CGT GAT GGC ATC TAT ATC ATA AAT CTC AAG
AGG ACC TGG GAG AAG CTT CTG CTG GCA GCT
CGT GCA ATT GTT GCC ATT GAA AAC CCT GCT
GAT GTC AGT GTT ATA TCC TCC AGG AAT ACT
GGC CAG AGG GCT GTG CTG AAG TTT GCT GCT
GCC ACT GGA GCC ACT CCA ATT GCT GGC CGC
TTC ACT CCT GGA ACC TTC ACT AAC CAG ATC
CAG GCA GCC TTC CGG AAG CCA CGG CTT CTT
GTG TTT ACT GAC CCC AGG GCT GAC CAC CAG
CCT CTC ACG GAG GCA TCT TAT GTT AAC CTA
CCT ACC ATT GCG CTG TGT AAC ACA GAT TCT
CCT CTG CGC TAT GTG GAC ATT GCC ATC CCA
TGC AAC AAC AAG GGA GCT CAC TCA GTG GGT



TTG ATG TGG TGG ATG CTG GCT CGG GAA GTT
CTG CGC ATG CGT GGC ACC ATT TCC CGT GAA
CAC CCA TGG GAG GTC ATG CCT GAT CTG TAC
TTC TAC AGA GAT CCT GAA GAG ATT GAA AAA
GAA GAG CAG GCT GCT GCT GAG AAG GCA
GTG ACC AAG GAG GAA TTT CAG GCT GAA TGG
ACT GCT CCC GCT CCT GAG TTC ACT GCT ACT
CAG CCT GAG GTT GCA GAC TGG TCT GAA GGT
GTA CAG GTG CCC TCT GTG CCT ATT CAG CAA
TTC CCT ACT GAA GAC TGG AGC GCT CAG CCT
GCC ACG GAA GAC TGG TCT GCA GCT CCC ACT
GCT CAG GCC ACT GAA TGG GTA GGA GCA ACC
ACT GAC TGG TCT TAA GCT GTT CTT GCA TAG
GCT CTT AAG CAG CAT GGA AAA ATG GTT GAT
GGA AAA TAA ACA TCA GTT TCT.

4,861,711
SHEET-LIKE DIAGNOSTIC DEVICE

Heinz-Jürgen Friesen; Gerd Grenner, both of Marburg; Hans-Erwin Pauly, Dautphetal; Helmut Kohl; Klaus Habenstein, both of Wetter, and Joseph Stärk, Ebsdorfergrund, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg/Lahn, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,563
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1984, 3445816
Int. Cl.[4] G01N *31/00*
U.S. Cl. 436—7 34 Claims

1. An analytical device for the detection or determination of a component in a fluid wherein said component is an analyte with bioaffinity binding properties, comprising a layer of a plurality of substantially planar zones adjacent one another and in absorbent contact with one another, said layer including:

a mobile phase application zone (MPAZ), an intermediate zone (IZ) and an adsorption zone (AZ), liquid being capable of moving by adsorption from said MPAZ through said IZ to said AZ, and wherein said IZ further comprises a solid phase zone (SPZ) having at least one unlabelled reactant, capable of interactions of biological affinity with at least one analyte;

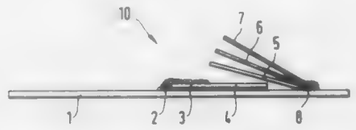
at least one unattached, labelled reactant (conjugate), capable of interactions of biological affinity with said at least one analyte, disposed in an area between the MPAZ and the SPZ; and

an analyte application zone disposed at said MPAZ or in between said MPAZ and said AZ, wherein after application of said at least one analyte, said at least one analyte is reacted with said reactants in said layer and is detected in said layer.

4,861,712
ANALYSIS ELEMENT FOR DETERMINATION OF A COAGULATION PARAMETER

Knut Bartl, Wilzhofen; Helmut Lill, Wielenbach, and Hans Wielinger, Weinheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed May 4, 1987, Ser. No. 46,659
Claims priority, application Fed. Rep. of Germany, May 16, 1986, 3616496
Int. Cl.[4] C12Q *1/56*; G01N *33/86, 1/48*
U.S. Cl. 435—13 22 Claims



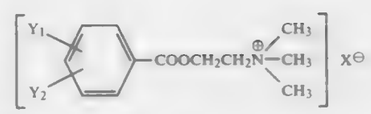
18. Analysis element useful for determining a coagulation parameter comprising a first filamentous structure which neither activates nor inactivates a coagulation cascade system, at least one factor or co-factor of said coagulation cascade system coated onto said first filamentous material and a water soluble, non-ionic polymer which coats and impregnates the filamentous material of said first filamentous structure, said water soluble non-ionic polymer not falsely influencing said coagulation cascade system, and a second filamentous structure consisting of filamentous material which neither activates nor inactivates a coagulation cascade system, a detectable substrate or a detection reaction initiating substrate of said coagulation system coated on said second filamentous structure and a water soluble, non-ionic polymer which coats and impregnates the filamentous material of said second filamentous structure, said water soluble non-ionic polymer not falsely influencing said coagulation cascade system, wherein said first filamentous structure and said second filamentous structure are separate from each other.

4,861,713
NOVEL METHOD FOR DETERMINING CHOLINESTERASE ACTIVITY

Katsumasa Kuroiwa; Katsuhiro Katayama, both of Koriyama, and Takeshi Nagasawa, Urawa, all of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Apr. 14, 1987, Ser. No. 38,293
Claims priority, application Japan, Apr. 15, 1986, 61-86744
Int. Cl.[4] C12Q *1/46*
U.S. Cl. 435—20 6 Claims

1. A method for determining pseudocholinesterase activity in a sample containing pseudocholinesterase as one of cholinesterases which comprises admixing said sample with a substrate, a choline derivative represented by the general formula (I):



(I)

wherein X is a halogen atom; Y_1 is a hydroxyl group as a substituent in the 2- or 5- position; and Y_2 is a hydroxyl group as a substituent in the 3-position; and measuring the optical absorbance of the reaction product of the admixture to determine the pseudocholinesterase activity.

4,861,714
WEIGHTED COLLAGEN MICROSPONGE FOR IMMOBILIZING BIOACTIVE MATERIAL

Robert C. Dean, Jr., Norwich, Vt.; Frederick H. Silver, Long Valley; Richard A. Berg, Lambertville, both of N.J.; Philip G. Phillips, Norwich, Vt., and Peter W. Runstadler, Jr., Hanover, N.H., assignors to Verax Corporation, Hanover, N.H.

Filed Apr. 4, 1985, Ser. No. 719,881
Int. Cl.[4] C12P *21/00*; C12N *11/02, 5/02, 1/20*
U.S. Cl. 435—68 21 Claims

1. A weighted collagen microsponge for immobilizing bioactive materials in motive bioreactor systems, said microsponge comprising a porous, biostable, insoluble highly crosslinked collagen matrix containing an inert weighting material, said collagen matrix having an open to the surface pores structure with an average pore size in the range of from about 1 micron to about 150 microns, the pores of said matrix occupying from about 70 to about 98% by volume of the microsponge, said microsponge also having an average particle size of from about 100 to about 1000 microns and a specific gravity above about 1.05, wherein said highly crosslinked collagen matrix is prepared by the steps of

(a) milling a source of collagen selected from the group consisting of Types I, II, and III collagen,

(b) admixing said milled collagen with an acidic liquid medium,

(c) adding inert weighting material to said acid/collagen mixture,

(d) freezing droplets of the weighted acid/collagen mixture to form a solid matrix,

(e) vacuum drying said solid matrix to form a dry matrix; and

(f) crosslinking the collagen in said dry matrix by a treatment selected from the group consisting of

(i) contacting said collagen with a crosslinking agent selected from the group consisting of carbodiimides and bifunctional succinimidyl active esters,

(ii) subjecting said collagen to elevated temperatures under a vacuum, and

(iii) a combination thereof.

4,861,715

PROCESS FOR THE PRODUCTION OF NOURSEOTHRICINE AND ITS ADSORBATE

Friedrich Bergter; Harald Bocker; Ernst-Joachim Bormann; Wolfgang Forberg; Heinz Fricke; Udo Grüfe; Hans-Helmut Grosse; Ingeborg Heller; Matthias Hilliger; Wolf Junne; Hellmut Linde, all of Jena; Michael Meuser, Ammerbach; Klaus-Dieter Meuzel, Apolda; Peter-Jürger Müller, Ammerbach; Gunter Plonka, Jena; Hans D. Pohl, Jena; Jörg Schneider, Jena, and Heinz Thrum, Jena, all of German Democratic Rep., assignors to VEB Jenapharm, Jena, German Democratic Rep.

Filed Jan. 20, 1984, Ser. No. 572,928

Claims priority, application German Democratic Rep., Jan. 20, 1983, 2473707; Sep. 28, 1983, 2552658; Oct. 25, 1983, 2559431; Oct. 25, 1983, 2559464; Oct. 25, 1983, 2559465; Oct. 25, 1983, 2559448

Int. Cl.[4] C12P *21/02, 1/04*

U.S. Cl. 435—70 11 Claims

1. Process for the production of nourseothricin, its salts or adsorbate, comprising cultivation of nourseothricin-forming streptomycetes stock, streptomyces noursei ZIMET 43716 under submersed aerobic culture conditions in a suitable nutrient medium containing carbon and nitrogen sources and mineral salt, and subsequent isolation of the active substance, comprising adding to the nutrient medium water-soluble zinc salt, in a 0.2 to 1.75 milimolar concentration, β-alanine in a 0.25 to 1.75 milimolar concentration, alkali metal azide in a 0.05 to 0.25 milimolar concentration, pyrocatechol in a 0.20 to 1.75 milimolar concentration or ethyl isoamyl barbituric acid in a 0.25 to 1.75 milimolar concentration, performing a heat sterilization of the nutrient medium at a temperature from about 115°–125° C. in the presence of 0.10 to 1.75 milimolar concentration of a salt of zinc (II), iron (III), aluminum (III) or manganese (II), so that after conclusion of the sterilization a pH-value in the range from 7.2 to 8.8 is obtained, with or without addition of caustic soda before the sterilization, fermenting the main culture with a phosphate provision in a range from 0.1 up to 10 mg phosphate-phosphorus per liter medium per hour at a pH value from 5.0 to 6.5 over a period of 110–145 hours, at . fermentation temperature in the range from 26°–32° C., and with an oxygen partial pressure from 30 to 80%, as well as further substrate limitation to maintain a carbon-nitrogen ratio of 5 to 10 g glucose units to 0.015 to 0.2 g ammonium-nitrogen per liter medium, isolating the so-produced antibiotic by means of adsorption, eluting, concentrating, and then purifying, the antibiotic.

4,861,716

REARRANGEMENT PROCESS

Alasdair R. Macrae, Bromham, and Peter How, Yelden, both of England, assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 817,751, Jan. 2, 1986, Pat. No. 4,719,178, which is a continuation of Ser. No. 490,461, May 2, 1983, abandoned. This application Jul. 21, 1987, Ser. No. 111,239

Claims priority, application United Kingdom, Apr. 30, 1982, [redacted]

Int. Cl.[4] C12P *7/62, 7/64;* C12N *11/14, 1/20*

U.S. Cl. 435—134 5 Claims

1. A continuous interesterification process comprising the steps of:

(a) precipitating a 1,3-specific lipase on inert particulate support material;

(b) activating the lipase by addition of water in an amount effective to activate the lipase;

(c) packing the inert support material carrying the precipitated lipase in a fixed bed;

(d) preparing a fatty reactant mixture selected from the group consisting of fatty acids containing 3 to 20 carbon atoms, their esters including triglyceride oils and fats, their fractionated and hydrogenated derivatives, and combinations thereof;

(e) dissolving water in said mixture in an amount sufficient to favor interesterification and minimize hydrolysis;

(f) continuously flowing said mixture of step (e) through the fixed bed whereby a total contact time of less than two hours is achieved and glycerides in the 1,3-positions are formed; and

(g) recovering from the solution of step (f), the glycerides enriched in the 1,3-positions.

4,861,717

MICROORGANISMS AND PLASMIDS FOR THE CONSTITUTIVE FORMATION OF CREATINAMIDINOHYDROLASE AND PROCESSES FOR THE PRODUCTION THEREOF

Günter Schumacher; Peter Buckel, both of Bernried, and Klaus Beaucamp, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Jan. 6, 1986, Ser. No. 816,565

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1985, 3500184

Int. Cl.[4] C12N *15/00, 1/20;* C07H *15/12*

U.S. Cl. 435—172.3 15 Claims



1. Substantially pure microorganism which constitutively produces creatinamidinohydrolase comprising a microorganism of the species *Escherichia coli* or *Pseudomonas putida* transformed by a recombinant plasmid containing DNA which constitutively expresses creatinamidinohydrolase.

7. Process for the production of a microorganism which constitutively produces creatinamidinohydrolase comprising digesting *Pseudomonas putida* chromosomal DNA with one of EcoR1 alone to form a 5.8 kb fragment or with EcoR1 and PvuII to form a 2.2 kb fragment ligating the fragment obtained into a vector which has been cleaved with one of Ecor1 alone or EcoR1 and PvuII together, ligating said vector and transforming said ligated vector into an *Escherichia coli* or *Pseudomonas putida* strain receptive for said ligated vector, culturing said transformed strains to constitutively produce creatinamidinohydrolase and isolating clones which constitutively form creatinamidinohydrolase.

4,861,718

GENE CODING FOR THERMOSTABLE BETA-GALACTOSIDASE, BACILLUS SUBTILIS HAVING THE GENE, ENZYME CODED BY THE GENE AND A PROCESS FOR THE PRODUCTION THEREOF

Haruhisa Hirata, Osaka; Hirosuke Okada, Toyonaka, and Seiji Negoro, Suita, all of Japan, assignors to Wakamoto Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1985, Ser. No. 780,842

Claims priority, application Japan, Sep. 29, 1984, 59-202965; May 24, 1985, 60-110565

Int. Cl.[4] C12N *9/38, 9/14;* C12R *1/125*

U.S. Cl. 435—207 2 Claims

1. Thermostable β-galactosidase having the following physicochemical properties:

a. action and substrate specificity: to hydrolyse substrates having a β-D-galactosidic linkage to release D-galactose,

b. optimal pH and pH range for stability: optimal pH 5.5 pH range for stability 5.5 to 9.0

c. temperature range appropriate for activity: optimal temperature for activity about 70° C.

d. temperature range for stability: half periods of the β-galactosidase activity at 55° C., 60° C. and 65° C. are about 620, 150 and 55 hours, respectively,

e. influences of metal ions: Mg^{++}, Ca^{++}, Cu^{++}, Fe^{++}, Co^{++} and Li^{+} at a level of 1 mM do not inhibit the enzyme activity but Ag^{+} inhibits the activity by about 80% or more, and Hg^{++} by about 90% or more,

f. molecular weight:

(a) about 67,000 (measured by SDS-polyacrylamide electrophoresis)

(b) 78,051 (calculated from amino acid sequence)

g. Michaelis constant to lactose (Km): 2.4 mM.

4,861,719

DNA CONSTRUCTS FOR RETROVIRUS PACKAGING CELL LINES

A. Dusty Miller, Seattle, Wash., assignor to Fred Hutchinson Cancer Research Center, Seattle, Wash.

Filed Apr. 25, 1986, Ser. No. 856,672

Int. Cl.[4] C12N *7/04, 15/00, 5/00;* C12R *1/91*

U.S. Cl. 435—236 11 Claims

1. An improved DNA construct useful for making retrovirus packaging cell lines comprising an amphotropic retroviral gene sequence derived from murine leukemia virus encoding in trans all virion proteins required for packaging a replication-incompetent retroviral vector and characterized by its ability, when transferred into susceptible host cells, to produce virion proteins capable of packaging said replication-incompetent retroviral vector at high titer, without the production of replication-competent helper virus, which vector contains a heterologous gene, said retroviral gene sequence lacking a packaging signal, a site for translocation of reverse transcriptase during first strand DNA synthesis, a site for initiation of second strand DNA synthesis and a proviral integration signal.

4,861,720

ONCORNAVIRUS VACCINES AND FELINE ALPHA-TYPE INTERFERON

Neils C. Pedersen, Winters, and Janet Yamamoto, Woodland, both of Calif., assignors to Regents of the University of California, Calif.

Filed Jul. 3, 1986, Ser. No. 882,088

Int. Cl.[4] C12N *7/06;* A61K *39/21*

U.S. Cl. 435—238 9 Claims

1. A method for producing a retroviral vaccine form a B-type or C-type retrovirus, said method comprising: growing mammalian host cells infected with said retrovirus in the presence of interferon for a sufficient time for incompetent retrovirus particles to bud from said cells; and

harvesting said retrovirus particles for use as a vaccine.

4,861,721

BACTERIA FOR CELLULOSE DIGESTION

John B. Waterbury, Woods Hole; Charles B. Calloway, Shrewsbury, and Ruth D. Turner, Cambridge, all of Mass., assignors to Research Corporation, New York, N.Y.

Filed Sep. 25, 1984, Ser. No. 654,336

Int. Cl.[4] C12N *1/20;* C12P *21/00*

U.S. Cl. 435—252.1 1 Claim



1. A biologically pure culture of a microorganism isolatable from the gland of Deshayes of a member of the Teredinidae, said microorganism being a Gram-negative rigid rod-shaped bacterium, possessing a single polar flagellum, and a guanine plus cytosine content in the DNA of 49 to 51 mole percent, having the identifying characteristics of ATCC No. 39867, and genetic derivatives thereof, and being further characterized by an ability to degrade cellulose in the presence and the absence of combined nitrogen.

4,861,722

CORYNEFORM BACTERIA CARRYING RECOMBINANT PLASMIDS AND THEIR USE IN THE FERMENTATIVE PRODUCTION OF L-LYSINE

Konosuke Sano, Tokyo; Koichi Ito, Kawasaki; Kiyoshi Miwa, Matsudo, and Shigeru Nakamori, Yokohama, all of Japan, assignors to Ajinomoto Company, Inc., Tokyo, Japan

Continuation of Ser. No. 525,993, Aug. 24, 1983, abandoned. This application Jan. 1, 1987, Ser. No. 56,310

Int. Cl.[4] C12N *1/20*

U.S. Cl. 435—252.32 9 Claims

1. A bacterium comprising a Coryneform host containing an expression vehicle comprising a genetic sequence obtained from a Coryneform bacterium and comprising information coding for the production of diaminopimelic acid decarboxylase, said bacterium producing a greater amount of lysine than said host under identical conditions,

wherein said Coryneform host comprises at least one member selected from the group consisting of *Brevibacterium saccarolyticum* ATCC 14066, *Brevibacterium immariophilum* ATCC 14068, *Brevibacterium lactofermentum* ATCC 13869, *Brevibacterium lactofermentum* ATCC 39134, *Brevibacterium roseum* ATCC 13825, *Brevibacterium flavum ATCC 13826,* and *Corynebacterium acetoacidophilum* ATCC 13870;

wherein said information coding for the production of diaminopimelic acid decarboxylase is obtained from *Brevibacterium lactofermentum* ATCC 13869 (wild type); and

wherein said expression vehicle is obtained from at least one member selected from the group consisting of *Corynebacterium glutamicum* FERM-P 5484, *Escherichia coli* FERM-BP 136, *Corynebacterium glutamicum* ATCC 39135, *Escherichia coli* FERM-BP 138, *Escherichia coli* FERM-BP 137, *Corynebacterium glutamicum* ATCC 39136, *Bacillus subtilis* FERM-BP 140, and *Corynebacterium glutamicum* ATCC 39137.

4,861,723

MICROBIOLOGICAL DESULFURIZATION OF COAL AND COAL WATER ADMIXTURE TO PROVIDE A DESULFURIZED FUEL

Ajay M. Madgavkar, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 15, 1986, Ser. No. 941,666
Int. Cl.[4] C10L *10/00, 1/00*
U.S. Cl. 435—262 5 Claims



1. A process of the combustion of coal containing sulfur which comprises the sequential steps of:

(a) wet grinding said coal in a grinding means in the presence of water to a majority solid particulate size of about 30 microns to about 350 microns at grinding conditions to form an aqueous slurry of said ground coal particles;

(b) contacting said aqueous coal slurry with an aqueous solution of a desulfurizing microorganism to remove sulfur from said coal and transfer said sulfur to the aqueous phase of said slurry where said coal has a reduced level of inorganic sulfur equal to less than 0.1 wt %;

(c) separating said aqueous phase of said coal slurry, containing said removed sulfur, from said particulate coal particles in a separation zone to acquire at least two streams comprising (1) an aqueous steam containing said sulfur and said microorganism and (2) a solid particulate coal having water associated therewith;

(d) passing said solid particulate coal having water associated therewith, without substantial drying, to a coal-water admixture preparation zone wherein combustion-aid additives are added to said admixture and wherein said coal-water admixture is proportioned to a predetermined coal and water content for combustion;

(e) passing said prepared coal water admixture of step (d) to a combustion means wherein said coal water admixture is combusted;

(f) treating said aqueous stream containing said sulfur and microorganism of step (c) in a sulfur removal zone to remove said sulfur; and

(g) recycling said treated stream of step (f) to said contact with said coal as a portion of said aqueous solution of step (b).

4,861,724

PROCESS FOR PREPARING OPTICALLY ACTIVE 2,2'-DIHYDROXY-1,1'-BINAPHTHYL

Charles J. Sih, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 741,066, Jun. 4, 1985, abandoned. This application Nov. 3, 1987, Ser. No. 120,248
Int. Cl.[4] C12P *41/00*
U.S. Cl. 435—280 10 Claims

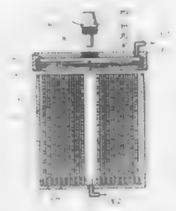
1. A process for preparing optically active 2,2'-dihydroxy-1,1'-binaphthyl, which comprises subjecting esters of (+)-2,2'-dihydroxy-1,1'-binaphthyl to the enantio-selective hydrolytic enzymatic action of microorganisms of the orders Moniliales and Mucorales and recovering the desired optically-active compound from the reaction mixture.

4,861,725

MAMMALIAN CELL CULTURE APPARATUS

Ming Y. Liau, 4th Fl., No. 48, Lane 225, Chu Lin Rd., Yuang-Ho City, Taipie, Taiwan

Filed Mar. 29, 1988, Ser. No. 174,705
Int. Cl.[4] C12M *1/28*
U.S. Cl. 435—294 11 Claims



1. A cell culture apparatus, comprising:

a plurality of porous tubular members,

a sealed container including said plurality of porous tubular members therein and having a sampling bar mounted removably thereon, said sealed container having a top wall through which a threaded hole is formed, said sampling bar having an externally threaded portion engaged with said threaded hole in said container, a diameter-reduced sampling portion connected to a lower end of said externally threaded portion for insertion into said container and into the innermost tubular member, a diameter-increased actuator portion connected to an upper end of said externally threaded portion, and an O ring sleeved on said sampling bar and clamped between said externally threaded portion of said sampling bar and said container for establishing a liquid-tight seal between said sampling bar and said container, said sampling portion of said sampling bar having a diameter slightly smaller than the inner diameter of said innermost tubular member, and

means for positioning said tubular members in said container so that the tubular members are concentrically arranged.

4,861,726

METHOD OF THIOACYLATION PEPTIDE SEQUENCING WITH ACYLATION OF TRIAZOLINONES

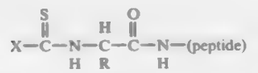
Mark L. Stolowitz; Vyas M. Dixit, both of Long Beach, and Edward A. Kesicki, San Pedro, all of Calif., assignors to Bio-Affinity Systems, Inc., Torrance, Calif.

Filed Mar. 10, 1988, Ser. No. 166,420
Int. Cl.[4] G01N *21/64, 33/68*
U.S. Cl. 436—89 13 Claims

1. A method for determining the identity of an N-terminal amino acid of a polypeptide comprising the steps of:

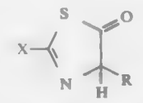
(a) providing a starting polypeptide having an N-terminal amino acid;

(b) reacting said polypeptide with a thioacylating reagent having a reactive functionality of the form —C(S)W where W is a leaving group, to form a compound having the formula IV, wherein X is H, alkyl, aryl or aryl-alkyl, R represents an amino acid side chain and -(peptide) represents the starting peptide, not including the N-terminal amino acid;



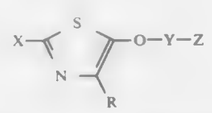
IV

(c) cleaving the compound of formula IV with a volatile anhydrous acid to form a residual polypeptide, which comprises the starting polypeptide with the N-terminal amino acid removed, and a 2-substituted-5(4H)-thiazolinone compound of general formula V;



V

(d) reacting the compound of general formula V with a fluorescent reagent with a reactive functionality selected from the group consisting of carboxylic acid chloride, sulfonic acid chloride, chloroformate, isocyanate and anhydride, in the presence of a tertiary amine catalyst, to yield a corresponding 5-O-acyl-2-(substituted)thiazole of general formula VI wherein Y is selected from the group consisting of —C(O)—, —SO_2—, —C(O)O— or —C(O)NH— and Z is a substituent containing a moiety which exhibits enhanced ultraviolet absorption or fluorescence emission properties detectable at extremely low concentration;



VI

(e) identifying the 5-O-acyl-2-(substituted)thiazole of general formula VI.

4,861,727

LUMINESCENT OXYGEN SENSOR BASED ON A LANTHANIDE COMPLEX

Bennett L. Havenstein, Andover; Raysna Picerno, Acton, both of Mass.; Harry G. Brittain, Maplewood, N.J., and James R. Nestor, Nashua, N.H., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Sep. 8, 1986, Ser. No. 904,963
Int. Cl.[4] G01N *33/00*
U.S. Cl. 436—136 43 Claims



33. An oxygen gas sensor comprising an oxygen-quenchable luminescent lanthanide complex in solid form and detector means operatively connected to said complex for detecting oxygen-quenching of said complex.

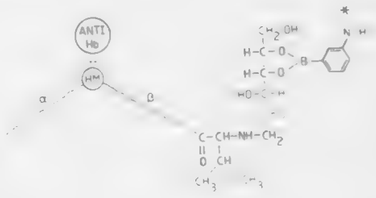
38. A method for detecting the presence or determining the concentration of oxygen gas in a sample comprising exposing an oxygen-quenchable luminescent lanthanide complex in solid form to said sample and to radiation which causes said lanthanide complex to luminesce and detecting the change in the luminescent intensity emitted by said lanthanide complex resulting from said exposure to said oxygen gas.

4,861,728

IMMUNOASSAY OF GLYCOSYLATED HEMOGLOBIN USING A LABELED BORON REAGENT

Daniel B. Wagner, Raleigh, N.C., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jul. 24, 1987, Ser. No. 77,363
Int. Cl.[4] G01N *33/566, 33/72*
U.S. Cl. 436—501 16 Claims



1. A method for determining the percentage of glycosylated hemoglobin in the total hemoglobin of a blood sample comprising:

(a) contacting a solid support having affixed thereto antibodies that bind to total hemoglobin with a mixture including a blood sample, a lysin agent and a fluorescent dye conjugated to a dihydroxyboryl reagent reactive with glycosylated hemoglobin, whereby hemoglobin and glycosylated hemoglobin in said sample bind to said antibodies and said glycosylated hemoglobin reacts with said reagent;

(b) separating said support from said mixture;

(c) applying incident light having a wavelength within the absorption range of hemoglobin and measuring the color of said support;

(d) applying excitation light having a wavelength within the absorption range of said dye on said support and measuring fluorescence therefrom said excitation wavelength being different from the wavelength of said incident light; and

(e) determining the percentage of glycosylated hemoglobin in said sample from the intensity of said color and said fluorescence.

4,861,729

METHOD OF DOPING IMPURITIES INTO SIDEWALL OF TRENCH BY USE OF PLASMA SOURCE

Genshu Fuse, Hirakata; Takashi Hirao, Kishiwada, and Takashi Ohzone, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 24, 1987, Ser. No. 88,216
Int. Cl.[4] H01L *21/223*
U.S. Cl. 437—18 6 Claims

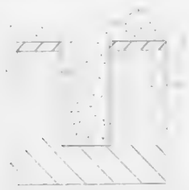
1. A method of doping impurities into a sidewall of a trench of a semiconductor substrate, comprising:

selectively forming said trench in said semiconductor substrate;

disposing said substrate in a plasma of a gas containing diluted doping impurities or in the vicinity of said plasma, and

doping said impurities at least into the sidewall of said

trench, wherein one of a diluted B_2H_6 gas and diluted AsH_3 gas is chosen as the gas of the plasma, whereby one



of B and As as the impurities directly enters the sidewall of the trench without first passing through a film.

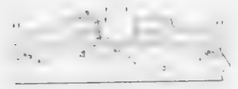
4,861,730

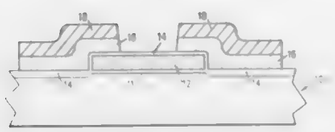
PROCESS FOR MAKING A HIGH DENSITY SPLIT GATE NONVOLATILE MEMORY CELL

Steve K. Hsia, Saratoga; Pritpal S. Mahal, and Wei-Ren Shih, both of San Jose, all of Calif., assignors to Catalyst Semiconductor, Inc., Santa Clara, Calif.

Filed Jan. 25, 1988, Ser. No. 147,843
Int. Cl.[4] H01L *27/10, 29/78*
U.S. Cl. 437—43 **3 Claims**







1. A process for making a high density split gate EEPROM cell having source and drain regions spaced by a channel, comprising the steps of:

providing a semiconductor body;

implanting a P-type impurity in said body;

growing a thin oxide layer over said body;

depositing and defining a first layer of polysilicon over said thin oxide layer;

growing a second gate oxide layer over said first layer of polysilicon and a portion of said body;

depositing a second layer of polysilicon over said second gate oxide layer;

masking with a first mask and etching said second layer of polysilicon to define a control gate having a first edge positioned above said first layer of polysilicon and a second edge positioned on said second gate oxide above said body;

providing a second mask covering the area of said body below which the source region will be formed and covering at least a portion of said first mask such that the surface of said body where said source region will be formed will be protected during an etching process;

etching said first layer of polysilicon to define a floating gate with one edge self-aligned with said first edge of said control gate;

implanting N-type impurities in said drain region which is self-aligned to said floating gate and said control gate to form an N-type conductivity region;

removing said first and second mask; and implanting N-type impurities in said source region which is self-aligned to said control gate and into the drain region.

4,861,731

METHOD OF FABRICATING A LATERAL DUAL GATE THYRISTOR

Jayant K. Bhagat, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 2, 1988, Ser. No. 151,534
Int. Cl.[4] H01L *49/00*
U.S. Cl. 437—51 **8 Claims**



1. A method for forming a semiconductor power device comprising the steps of:

(A) forming an electrically isolated region of semiconductor material in a substrate, said isolated region having a first conductivity type;

(B) forming a buried layer of highly conductive semiconductor material is said electrically isolated region;

(C) forming a highly conductive ring in said isolated region;

(D) introducing dopant impurities into a region within said ring to form an island having second conductivity type;

(E) forming strips of highly conductive semiconductor material at the surface of said electrically isolated region, said strips having said first conductivity type and electrically linking said ring and said highly conductive buried layer;

(F) forming a heavily doped cathode region within said island, by said cathode region having said first conductivity type;

(G) forming an anode region within said isolated region;

(H) doping a portion of said isolated region between said ring and said anode to form a channel having said second conductivity type;

(I) forming a drain region within said channel at the surface of said isolated region;

(J) forming a layer of dielectric over the surface of said isolated region;

(K) depositing a layer of electrode material over said layer of said dielectric material; and

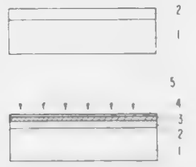
(L) etching said electrode layer and said dielectric material to define contact windows respectively above said cathode, ring, drain and anode to define a first insulated gate electrode registering with a portion of said island and to define a second insulated gate electrode registering with a portion of said isolated region.

4,861,732

METHOD FOR REMOVING AN ION-IMPLANTED ORGANIC RESIN LAYER DURING FABRICATION OF SEMICONDUCTOR DEVICES

Shuzo Fujimura, Tokyo, and Junichi Kouno, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 13, 1988, Ser. No. 243,907
Claims priority, application Japan, Oct. 15, 1987, 62-259998
Int. Cl.[4] H01L *21/00, 21/02, 21/30, 21/20*
U.S. Cl. 437—229 **18 Claims**



1. A method of making semiconductor devices, comprising the steps of:

forming an organic material layer on a substrate, the organic material layer being made of an organic resin capable of being removed by a plasma;

implanting ions in the organic material layer, thereby forming an inorganic contamination layer on a surface of the organic material layer;

etching off the inorganic contamination layer with an etching solution; and

after etching, exposing the substrate with the organic material layer to a plasma capable of removing the organic material layer by decomposition of the organic material.

4,861,733

CALCIUM PHOSPHATE BONE SUBSTITUTE MATERIALS

Eugene W. White, Rossiter, Pa., assignor to Interpore International, Irvine, Calif.

Filed Feb. 13, 1987, Ser. No. 14,466
Int. Cl.[4] A61F *1/24;* **C01B** *25/32;* **C04B** *35/00*
U.S. Cl. 501—1 **44 Claims**



1. A uniform calcium phosphate-containing material useful as bone substitute material or for the manufacture of prosthetic devices, having a cancellous structure characteristic of boney tissue or bone or a substantially uniformly permeable microporous structure characterized by a substantially uniform pore volume in the range from about 10 to about 90% and by a pronounced three-dimensional fenestrate structure corresponding to the microstructure of the porous carbonate echinoderm or scleractinian coral skeletal material of marine life and providing a periodic minimal surface, said periodic minimal surface dividing the volume of said material into two interpenetrating regions, each of which is a single multiple connected domain, said material having a substantially uniform pore size diameter and substantially uniform pore connections or openings in the range from about 5 microns to about 500 microns, said material comprising a calcium phosphate having a calcium to phosphorus Ca/P atomic ratio in the range 1.0–2.0 and consisting essentially of a mixture of dicalcium phosphate $Ca_2P_2O_7$ and tricalcium phosphate $Ca_3P_2O_8$ or a mixture of tricalcium phosphate $Ca_3P_2O_8$ and hydroxyapatite or a mixture of tetracalcium phosphate $Ca_4P_2O_9$ and hydroxyapatite.

18. As an article of manufacture a shaped structure consisting essentially of substantially organic-free uniform calcium phosphate material having a substantially uniformly permeable microporous structure characterized by a substantially uniform pore volume in the range from about 10 to about 90% and by a pronounced three-dimensional fenestrate structure corresponding to the microstructure of the porous carbonate echinoderm or scleractinian coral skeletal material of marine life and providing a periodic minimal surface, said periodic minimal surface dividing the volume of said material comprising said shaped structure into two interpenetrating regions, each of which is a single multiple connected domain, said material having a substantially uniform pore size diameter and substantially uniform pore connections or openings int eh range from about 5 microns to about 500 microns, said material comprising a calcium phosphate having a calcium to phosphorus Ca/P atomic ratio in the range 1.0–2.0 and consisting $Ca_2P_2O_7$ and tricalcium phosphate $Ca_3P_2O_8$ or a mixture of tricalcium phosphate $Ca_3P_2O_8$ and hydroxyapatite or a mixture of tetracalcium phosphate $Ca_4P_2O_9$ and hydroxyapatite.

22. Finely divided substantially organic-free uniform calcium phosphate material useful as bone substitute material and the like, the particles making up said finely divided calcium phosphate material having a substantially uniformly permeable microporous structure characterized by a substantially uniform pore volume in the range of from about 10 to about 90% by a pronounced three-dimensional fenestrate structure corresponding to the microstructure of the porous carbonate echinoderm or scleractinian coral skeletal material of marine life and providing a periodic minimal surface, said periodic minimal surface dividing the volume of said material into two interpenetrating regions, each of which is a single multiple connected domain, said material having a substantially uniform pore size diameter and substantially uniform pore connections or openings in the range from about 5 microns to about 500 microns, said material comprising a calcium phosphate having a calcium phosphorus Ca/P atomic ratio in the range 1.0–2.0, and consisting essentially of a mixture of dicalcium phosphate $Ca_2P_2O_7$ and tricalcium phosphate $Ca_3P_2O_8$ or a mixture of tricalcium phosphate $Ca_3P_2O_8$ and hydroxyapatite or a mixture of hydroxyapatite and tetracalcium phosphate $Ca_4P_2O_9$.

28. A method of converting calcium hydroxyapatite material having a calcium to phosphorus Ca/P atomic ratio of 1.66 to a uniform calcium phosphate material useful as bone substitute material or for the manufacture of prosthetic devices, said hydroxyapatite material having a substantially uniformly permeable microporous structure characterized by a substantially uniform pore volume in the range from about 10 to about 90% and by a pronounced three-dimensional fenestrate structure corresponding to the microstructure of the porous carbonate echinoderm or scleractinian coral skeletal material of marine life and providing a periodic minimal surface, said periodic minimal surface dividing the volume of said hydroxyapatite material into two interpenetrating regions, each of which is a single multiple connected domain, said hydroxyapatite material having a substantially uniform pore size diameter and substantially uniform pore connections or openings in the range from about 5 microns to about 500 microns, said calcium

phosphate material having a calcium to phosphorus Ca/P atomic ratio lower than 1.66 and consisting essentially of a mixture of dicalcium phosphate $Ca_2P_2O_7$ and tricalcium phosphate $Ca_3P_2O_8$ which comprises contacting said hydroxyapatite material with a phosphate solution to effect substantially uniform wetting of said hydroxyapatite material by said phosphate solution, drying the resulting treated hydroxyapatite material to effect deposition of the phosphate from said solution substantially uniformly onto the surface of said hydroxyapatite material and heating or firing the resulting phosphate treated hydroxyapatite material to decrease the calcium to phosphorus Ca/P atomic ratio thereof to a value less than 1.66 to produce a calcium phosphate material consisting essentially of a mixture of dicalcium phosphate $Ca_2P_2O_7$ and tricalcium $Ca_3P_2O_8$ or a mixture of dicalcium phosphate $Ca_2P_2O_7$ tricalcium phosphate Ca_3F2O_8 and hydroxyapatite.

35. A method of converting calcium hydroxyapatite material having a calcium to phosphorus Ca/P atomic ratio of 1.66 to a uniform phosphate material useful as bone substitute material or for the manufacture of prosthetic devices, said hydroxyapatite material having a substantially uniformly permeable microporous structure characterized by a substantially uniform pore volume in the range from about 10 to about 90% and by a pronounced three-dimensional fenestrate structure corresponding to the microstructure of the porous carbonate echinoderm or scleractinian coral skeletal material of marine life and providing a periodic minimal surface, said periodic minimal surface dividing the volume of said hydroxyapatite material into two interpenetrating regions, each of which is a single multiple connected domain, said hydroxyapatite material having a substantially uniform pore size diameter and substantially uniform pore connections or openings in the range from about 5 microns to about 500 microns, said calcium phosphate material having a calcium to phosphorus Ca/P atomic ratio greater than 1.66 and up to 2.0 and containing tetracalcium phosphate $Ca_4P_2O_9$ which comprises contacting said hydroxyapatite material with a calcium-containing solution to effect substantially uniform absorption or wetting of said calcium-containing solution by said hydroxyapatite material or substantially uniform wetting of said hydroxyapatite material by said calcium-containing solution, drying the resulting treated hydroxyapatite material to effect deposition of the calcium-containing component of said solution substantially uniformly onto the surface of said hydroxyapatite material and heating or firing the resulting calcium treated hydroxyapatite material to increase the Calcium to phosphorus Ca/P atomic ratio thereof to a value greater than 1.66 and up to 2.0 and to produce a calcium phosphate material consisting essentially of a mixture of hydroxyapatite and tetracalcium phosphate $Ca_4P_2O_9$.

4,861,734

ALKALINE EARTH ALUMINOBORATE GLASS-CERAMICS

John F. MacDowell, Penn Yan, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Aug. 1, 1988, Ser. No. 226,773
Int. Cl.[4] C03C *10/02, 3/145*
U.S. Cl. 501—10 2 Claims

1. A glass-ceramic article containing an alkaline earth metal aluminoborate of essentially 1.1.1. stoichiometry as the predominant crystal phase, said alkaline earth metal being selected from the group consisting of calcium, strontium, barium, and mixtures thereof, and having a composition essentially free of alkali metal oxides and consisting essentially, expressed in terms of weight percent on the oxide basis, selected from the group consisting of:

(a) 20–30% CaO, 35–55% Al_2O_3, and 20–40% B_2O_3;
(b) 30–45% SrO, 30–45% Al_2O_3, and 20–35% B_2O_3;
(c) 40–55% BaO, 25–40% Al_2O_3, and 15–30% B_2O_3; and
(d) mixtures thereof.

4,861,735

PRODUCTION OF CERAMIC MATERIALS

James D. Manley, Mouldsworth; Mary J. Mockford, Upton, and David R. Stanley, Knutsford, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Oct. 27, 1987, Ser. No. 112,890
Claims priority, application United Kingdom, Oct. 29, 1986, [illegible]
Int. Cl.[4] C04B *35/58*
U.S. Cl. 501—96 18 Claims

1. A process for the production of a refractory boride or silicide of a metallic or non-metallic element which process comprises producing an oxygen-containing polymeric product by reacting a mixture of a first reactant which comprises a compound of the metallic or non-metallic element having two or more groups reactive with hydroxyl groups, a second reactant which comprises a compound of boron or silicon having two or more groups reactive with hydroxyl groups, and a third reactant which comprises an organic compound having two or more hydroxyl groups, and heating the polymeric product in an inert atmosphere to pyrolyse the polymeric product and produce a refractory boride or silicide of the metallic or non-metallic element, said boride or silicide being characterized by its uniform composition.

4,861,736

SEMICONDUCTIVE CERAMIC COMPOSITION

Shuichi Ono; Masahiro Yahagi; Shuichi Itagaki, and Nobuaki Kikuchi, all of Akita, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Aug. 4, 1987, Ser. No. 82,688
Claims priority, application Japan, Aug. 11, 1986, 61-186930; Feb. 25, 1987, 62-40429; Feb. 25, 1987, 62-40430; Feb. 25, 1987, 62-40431
Int. Cl.[4] C04B *35/46*
U.S. Cl. 501—137 14 Claims

1. A semiconductive ceramic composition consisting essentially of 99.6 to 94.4 wt. % $BaTiO_3$, 0.24 to 3.4 wt. % of Nb_2O_5, and 0.15 to 2.2 wt. % CeO_2, and, based on the total amount of $BaTiO_3$, Nb_2O_5 and CeO_2, 0.3 to 0.8 wt. % Co_3O_4 and 0.003 to 0.25 wt. % $MnCO_3$.

4,861,737

CERAMIC TRANSLUCENT MATERIAL, METHOD OF MANUFACTURING SUCH A MATERIAL AND HIGH-PRESSURE DISCHARGE LAMP PROVIDED WITH SUCH A MATERIAL

Peter R. Prud'Homme van Reine, and Leonardus J. van Ijzendoorn, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 6, 1988, Ser. No. 178,119
Claims priority, application Netherlands, Apr. 10, 1987, [illegible]
Int. Cl.[4] C04B *35/50, 35/10, 35/48*
U.S. Cl. 501—152 1 Claim

1. A densely sintered translucent ceramic material consisting essentially of polycrystalline yttrium aluminum garnet and between 20 and 1500 ppm by weight of ZrO_2.

4,861,738

PROCESS FOR REGENERATING AND STABILIZING PHOSPHORUS-VANADIUM-OXYGEN COMPLEX CATALYSTS

Robert C. Edwards, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Jan. 29, 1988, Ser. No. 150,223
Int. Cl.[4] B01J *38/04, 38/42, 38/46, 38/64*
U.S. Cl. 502—34 25 Claims

1. A process for regenerating and for stabilizing a phosphorus-vanadium-oxide catalyst having an atomic ratio of phosphorus to vanadium in the range of about 0.5 to about 5, which process comprises:

(A) Contacting said catalyst at a temperature in the range of from about 300° C. to about 550° C. with an effective amount of a halogen-containing material selected from the group consisting of:
(1) molecular chlorine or fluorine or mixtures thereof;
(2) Carbon halides of fluorine, chlorine, bromine or iodine being in the vapor state above about 250° C. at atmospheric pressure represented by the following formula:

$C(X)_n$

where each X is a selected halide and n is an integer from 1 to 4, any remaining radicals being hydrogen, or mixtures of said carbon halides;
(3) Organic halides of flourine, chlorine, bromine or iodine being in the vapor state above about 250° F. at atmospheric pressure represented by the formula:

$R(X_1)_m$

where R is alkane, alkene or alkyene of straight or branched structure having at least two carbon atoms and X_1 is independently a primary, secondary, or tertiary halide and m is an integer of from about 1 to about 20 consistent with the number of carbon atoms of said structure or mixtures;
(4) Hydrogen halides singularly or mixtures thereof at regeneration conditions including a temperature in the range of from about 300° C. to about 550° C.; and
(B) Contacting the catalyst with an effective amount of an alkyl ester of orthophosphoric acid and water, said amount of said halogen-containing material and said amount of said alkyl ester of orthophosphoric acid effective to regenerate said catalyst.

4,861,739

MICROPOROUS CRYSTALLINE COMPOSITE COMPOSITIONS

Regis J. Pellet, Croton; Peter K. Coughlin, Yorktown Heights; Albert R. Springer, Mount Vernon, all of N.Y., and Richard T. Gajek, New Fairfield, Conn., assignors to UOP, Des Plaines, Ill.

Filed Jun. 4, 1987, Ser. No. 58,259
Int. Cl.[4] B01J *29/04, 29/06*
U.S. Cl. 502—64 48 Claims

3. A multiphase, multi-compositional composite comprising different inorganic crystalline compositions as phases thereof wherein at least one phase comprises a deposition substrate upon which another phase is deposited or there are multiple phases jointly formed, in which:

(a) the different phases are contiguous and have a common crystal framework structure;
(b) one phase contains phosphorus and aluminum atoms as part of the crystal's framework structure; and
(c) the phase comprising the deposition substrate and one of the phases jointly formed constituting the deposition substrate contains at least about 20 weight percent of the total weight of the phases making up the composite.

9. The composite of claim 3 wherein there are two of such phases and one comprises the structure and composition of a non-zeolitic molecular sieve and the other of such phases comprises the structure and composition of an aluminosilicate molecular sieve.

14. The composite of claim 9 wherein the aluminosilicate molecular sieve is a Y-type zeolitic molecular sieve.

4,861,740

MAGNESIUM-EXCHANGED ZEOLITIC CATALYST FOR ISOMERIZATION OF ALKYLAROMATICS

J. W. Sachtler, Des Plaines, and R. J. Lawson, Palatine, both of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 60,195, Jun. 10, 1987, Pat. No. 4,762,957. This application Jul. 11, 1988, Ser. No. 217,505
Int. Cl.[4] B01J *29/20, 29/30*
U.S. Cl. 502—66 21 Claims

1. An isomerization catalyst comprising an alumina matrix, at least one Group VIII metal component, and 1 to 50 wt. % of a magnesium-containing zeolite, wherein the zeolite is either mordenite or a pentasil, and the magnesium-containing zeolite is prepared from a hydrogel comprising pseudo-boehmite alumina and the zeolite, with the hydrogel having been contacted with an aqueous magnesium solution.

4. The catalyst of claim 1 wherein the magnesium-containing zeolite is a pentasil selected from the group consisting of ZSM-5, ZSM-8, ZSM-11, ZSM-12, ZSM-23, and ZSM-35 zeolites.

4,861,741

MIXED CATALYST SYSTEM AND CATALYTIC CONVERSION PROCESS EMPLOYING SAME

Joseph A. Herbst, Turnersville; Hartley Owen, Belle Mead, both of N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 903,311, Sep. 3, 1986, abandoned. This application Feb. 8, 1988, Ser. No. 153,522
Int. Cl.[4] B01J *29/06, 29/08*
U.S. Cl. 502—67 25 Claims

24. A cracking catalyst system for a fluid catalytic cracking zone which comprises

particles of a first catalyst component which requires frequent regeneration in a catalyst regenerator; and

particles of a second catalyst component which requires less frequent regeneration than said first catalyst component which second catalyst component is composited with a matrix material, which possesses a coking rate which is higher than the coking rate of the first catalyst component, wherein said second catalyst component is less coke deactivated and

wherein a physical property of particles of the first catalyst component imparts a settling rate R_1 thereto and a physical property of particles of the second catalyst component imparts a different settling rate R_2 thereto;

wherein a difference between R_1 and R_2 is effective to cause the residence time of the second catalyst component in the fluid catalytic cracking zone to be greater than that of the first catalyst component.

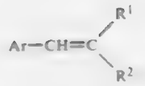
4,861,742

BIFUNCTIONAL ALKALI METAL COMPOUNDS, PREPARATION AND USE THEREOF AS POLYMERIZATION INITIATORS

Klaus Bronstert, Carlsberg; Siegbert Bohnet, Mannheim; Walter Himmele, Walldorf, and Kaspar Bott, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 238,851
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1987, 3729144
Int. Cl.[4] C08F *4/46, 4/48*
U.S. Cl. 502—157 6 Claims

1. A process for preparing a bifunctional initiator for polymerizing an anionically polymerizable monomer, which comprises dimerizing an alkenylaromatic compound of the general formula I



(I)

where Ar is pyridy, quinolyl or aromatic hydrocarbyl which may be substituted by alkyl or another group inert toward organoalkali metal compounds,

R^1 is linear or branched alkyl, cycloalkyl, alkenyl or aralkyl where at least the carbon adjacent to the double bond is saturated and aliphatic,

R^2 is hydrogen or linear or branched alkyl, cycloalkyl, alkenyl or aralkyl where at least the carbon adjacent to the double bond is saturated and aliphatic, and where R^1 and R^2 may be part of a common cycloaliphatic ring, in the presence of one or more ethers and of one or more tertiary amines and in the presence or absence of an inert aliphatic, alicyclic or aromatic solvent, at from −20° to +70° C. with an alkali metal under an inert gas atmosphere.

4,861,743

PROCESS FOR THE PRODUCTION OF MOLECULAR SIEVES

William H. Flank, Chappaqua; Stephen T. Wilson, Shrub Oak; Julio C. Marte, Peekskill, and Edith M. Flanigen, White Plains, all of N.Y., assignors to UOP, Des Plaines, Ill.

Filed Nov. 25, 1987, Ser. No. 126,192

Int. Cl.⁴ B01J *27/14*

U.S. Cl. 502—214 **61 Claims**

59. A process for the production of a crystalline silicoaluminophosphate as claimed in U.S. Pat. No. 4,440,871 in a preformed body of alumina or silica-alumina, which process comprises contacting this body with a liquid reaction mixture containing a reactive source of phosphorus pentoxide, and an organic templating agent, at least one of the body and the liquid reaction mixture containing a reactive source of silicon, the contacting being effected at a time and temperature so as to cause the body to react with the liquid reaction mixture and to form crystals of the silicoaluminophosphate within the body.

60. A process according to claim **59** wherein the non-zeolitic molecular sieve produced is any one or more of SAPO-5, SAPO-11, SAPO-34 and SAPO-41.

4,861,744

PROCESS FOR PREPARING A FLUORINATION CATALYST AND THE CATALYST PREPARED BY THE PROCESS

Igor Sobolev, Orinda, Calif., assignor to LaRoche Chemicals, Inc., Baton Rouge, La.

Division of Ser. No. 62,655, Jun. 16, 1987, Pat. No. 4,792,643. This application Sep. 26, 1988, Ser. No. 248,841

Int. Cl.⁴ B01J *27/12, 27/132, 27/135*

U.S. Cl. 502—227 **11 Claims**

1. A process for preparing a fluorination catalyst, comprising:

(a) codepositing from an aqueous solution hexavalent chromium oxide and a compound of a transition metal said transition metal selected from the group consisting of titanium, zirconium, vanadium, molybdenum and manganese at a chromium to transition metal atomic ratio of about 1:1 to about 10:1 on solid porous alumina particles having a surface area of at least about 50 m^2/g prior to said codeposited to produce impregnated alumina particles of which said hexavalent chromium oxide and said transition metal together comprise from about 5 to about 30 weight percent; and

(b) contacting the product of step (a) with hydrogen fluoride gas from about 3 to about 20 hours at a temperature of about 300° C. to about 500° C.

4,861,745

HIGH TEMPERATURE SHIFT CATALYST AND PROCESS FOR ITS MANUFACTURE

Dinah C. Huang, Prospect, Ky., and Jeffrey L. Braden, New Albany, Ind., assignors to United Catalyst Inc., Louisville, Ky.

Filed Aug. 3, 1988, Ser. No. 227,650

Int. Cl.⁴ B01J *23/72, 23/86, 21/04*

U.S. Cl. 502—314 **13 Claims**

1. A high temperature water-gas shift reaction catalyst which comprises:

(a) a major portion of iron oxide, and

(b) a minor portion of chromium oxide modified with

(c) a minor portion of copper oxide wherein the copper oxide is substantially on the surface of the catalyst.

4,861,746

CATALYST FOR HYDROTREATING HEAVY HYDROCARBON OILS AND A METHOD OF PREPARING THE CATALYST

Yasuyuki Oishi, and Akira Inoue, both of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Nishi-Shimbo and Petroleum Energy Center Foundation, Koji, both of, Japan

Filed Jan. 27, 1988, Ser. No. 148,986

Claims priority, application Japan, Feb. 6, 1987, 62-24878

Int. Cl.⁴ B01J *23/22, 23/24, 23/74*

U.S. Cl. 502—314 **5 Claims**

1. A catalyst for hydrotreating a heavy hydrocarbon oil, comprising a porous refractory inorganic oxide carrier component and at least one hydrogenating active metal component which is a member selected from the group consisting of nickel, cobalt, molybdenum, vanadium and tungsten, wherein the highest concentration of the metal component in the cross-section of the catalyst is in the region between the center of the cross-section and the periphery thereof, said region being defined by r/R =0.01-0.9, wherein R is the distance between the center of the cross-section and the periphery thereof; and r is the distance between said periphery and said region of the highest concentration, the concentration of the metal component at the periphery region of the cross-section is a value defined by Co/C =0-0.5, and the concentration of the metal component in the center region of the cross-section is at a level defined by Ci/C =0-0.8, wherein C is the highest concentration of the metal component, Co is the concentration of the metal component at the periphery of the cross-section and Ci is the concentration of the metal component in the center of the cross-section.

4,861,747

CATALYSTS COMPRISING RUTHENIUM ON TITANIA SURFACE MODIFIED WITH GROUP VA OXIDE OF VANADIUM, NIOBIUM OR TANTALUM

Israel E. Wachs, Bridgewater, N.J., and Darchun B. Yang, Houston, Tex., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 808,008, Dec. 11, 1985, Pat. No. 4,711,871, which is a continuation-in-part of Ser. No. 626,457, Jun. 29, 1984, abandoned. This application Apr. 3, 1987, Ser. No. 34,492

Int. Cl.⁴ B01J *21/06, 23/64*

U.S. Cl. 502—325 **6 Claims**

1. A catalyst comprising ruthenium supported on a surface modified titania support wherein said support comprises an oxide of a metal selected from the group consisting of niobium, vanadium, tantalum or mixture thereof, in a non-crystalline form, supported on said titania.

4,861,748

RECORDING MATERIAL

Keiso Saeki; Masanobu Takashima, and Ken Iwakura, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 9, 1987, Ser. No. 71,683

Claims priority, application Japan, Jul. 9, 1986, 61-161495; Jul. 28, 1986, 61-177381

The portion of the term of this patent subsequent to Dec. 21, 2088, has been disclaimed.

Int. Cl.⁴ B41M *5/16, 5/18, 5/22*

U.S. Cl. 503—208 **18 Claims**

1. A recording material comprising a support or supports ahving provided thereon a layer containing at least one electron-donating colorless dye comprising a p-substituted aminophenylindolyazaphthalide and a layer containing at leaat one electron-accepting compound selected from the group consisting of zinc 3,5-bis (α-methylbenzyl) salicylate and zinc 5-α-(α-methylbenzyl)-phenethylsalicylate.

4,861,749

HEAT-SENSITIVE RECORDING MATERIAL

Toshimi Satake; Tomoaki Nagai, and Fumio Fujimura, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

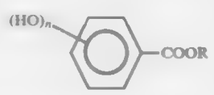
Continuation of Ser. No. 916,190, Oct. 7, 1986, abandoned. This application Jun. 22, 1988, Ser. No. 211,165

Claims priority, application Japan, Nov. 1, 1985, 60-246063

Int. Cl.⁴ B41M *5/18*

U.S. Cl. 503—211 **6 Claims**

1. A heat-sensitive recording material comprising a support and color-developing layer, wherein said color-developing layer comprises a colorless leuco dyestuff and the combination of a saturated higher fatty acid iron salt having 16–35 carbon atoms with a polyvalent phenolic derivative represented by the following general formula (I):



(I)

where R represents an alkyl group having 18–35 carbon atoms, and n represents an integer from 2 to 3, said colorless leuco dyestuff being used in an amount of at most 25% by weight based on said polyvalent phenolic derivative.

4,861,750

PROCESS FOR PRODUCING SUPERCONDUCTING THIN FILM

Shuichi Nogawa, and Eiji Kamijo, both of Kyoto, Japan, assignors to Nissin Electric Co., Ltd., Kyoto, Japan

Filed Apr. 19, 1988, Ser. No. 183,099

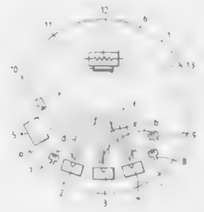
Claims priority, application Japan, Apr. 20, 1987, 62-96785; Apr. 20, 1987, 62-96786; Apr. 20, 1987, 62-96787

Int. Cl.⁴ B05D *5/12, 3/06;* **C23C** *16/00*

U.S. Cl. 505—1 **6 Claims**

1. A process for producing a superconducting thin film comprising:

supplying onto a substrate a group IIa metal and/or an oxide thereof, a group IIIa metal and/or an oxide thereof, and copper and/or an oxide thereof; and



irradiating the substrate with an oxygen neutral beam, to thereby form a thin film of IIa-IIIa-Cu oxide.

4,861,751

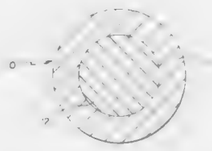
PRODUCTION OF HIGH TEMPERATURE SUPERCONDUCTING MATERIALS

Michael A. Tenhover, Solon, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed Jul. 23, 1987, Ser. No. 76,586

Int. Cl.⁴ C23C *8/06;* **B22D** *11/00;* **B05D** *5/12*

U.S. Cl. 505—1 **24 Claims**



1. A process for the production of an elongated superconducting oxide body including the steps of: **(a)** forming an elongated body of amorphous material made by rapid soldification of a metal of non-oxygen elements to be included in said superconducting oxide, and (b) reacting said elongated body with oxygen at a temperature below the crystallization temperature of said amorphous material to form a sheath of superconducting oxide exterior to a core of amorphous material.

4,861,752

HIGH-FIELD PERMANENT-MAGNET STRUCTURES

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

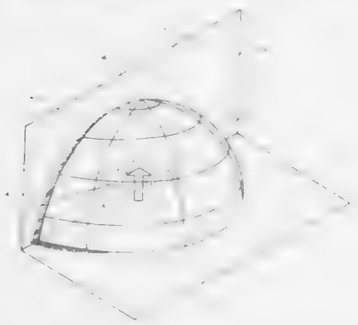
Filed May 27, 1988, Ser. No. 199,501

Int. Cl.⁴ H01F *7/02, 7/22*

U.S. Cl. 505—1 **21 Claims**

1. A permanent magnet structure comprising an azimuthally circumscribed section of a hollow hemispherical magnetic flux source, the magnetic orientation in said section with respect to the polar axis being substantially equal to twice the polar angle,

a superconducting planar sheet abutting one flat face of said section along a longitudinal meridian, and at least one other



planar sheet of selected material abutting another flat face of said section and perpendicular to the first-mentioned sheet.

4,861,753

PROCESS FOR MAKING SUPERCONDUCTORS USING BARIUM NITRATE

Eugene M. McCarron, III, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Jan. 22, 1987, Ser. No. 64,459

Int. Cl.[4] C01F *17/00;* **C01G** *3/02;* **C04B** *35/64;* **H01L** *39/12*

U.S. Cl. 505—1 **8 Claims**

1. An improved process for preparing a superconducting composition having the formula $MBa_2Cu_3O_x$ wherein

M is selected from the group consisting of Y, Nd, Sm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu;

x is from about 6.5 to about 7.0;

said process consisting essentially of mixing $Ba(NO_3)_2$, M_2O_3 and CuO powders in an atomic ratio of M:Ba:Cu of about 1:2:3 to form a precursor powder and heating the precursor powder in an oxygen-containing atmosphere at a temperature from about 875° C. to about 950° C. for a time sufficient to form $MBa_2Cu_3O_y$, where y is from about 6.0 to about 6.4; and maintaining the $MBa_2Cu_3O_y$ in an oxygen-containing atmosphere while cooling for a time sufficient to obtain the desired product, said process being limited to a single heating step without subsequent grinding and reheating.

4,861,754

BACTERIOCINS AND COMPOSITIONS THEREOF IN ANTI-VIRAL TREATMENT

Hannah Farkas-Himsley, 21 Edgar Avenue, Toronto, Ontario, M4W 2B1, Canada

Continuation-in-part of Ser. No. 868,250, May 28, 1986, abandoned. This application May 26, 1987, Ser. No. 54,321

Int. Cl.[4] A01N *25/00;* **A61K** *37/02;* **C07G** *7/02*

U.S. Cl. 514—2 **36 Claims**

1. A method of inhibiting the growth of virally infected, non-malignant mammalian cells which comprises treating said cells with a growth inhibiting and viricidal amount of a bacteriocin.

4,861,755

PEPTIDES WITH VASORELAXANT, NATRIURETIC AND DIURETIC EFFECTS A PROCESS FOR THEIR PREPARATION, AGENTS CONTAINING THEM, AND THEIR USE

Gerhard Breipohl, Frankfurt am Main; Jochen Knolle, Kriftel; Wolfgang König, Hofheim am Taunus, and Bernward Schölkens, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

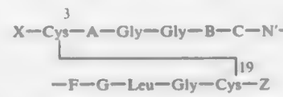
Filed Jan. 14, 1987, Ser. No. 3,237

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1986, 3601049; May 2, 1986, 3614833

Int. Cl.[4] A61K *37/02;* **C07K** *7/10, 7/08*

U.S. Cl. 514—11 **13 Claims**

1. A peptide of the formula I



in which

X denotes (C_1–C_{12})-alkanecarbonyl or (C_3–C_8)-cycloalkanecarbonyl, each of which is optionally branched in the α-position and is optionally monosubstituted in the ω-position by amino or guanidino, or represents Ser, Thr, Ser(Y), Thr(Y), Q or Leu, in each case in their L-or D-configuration, or Ser-Ser, Thr-Thr, Ser-Thr, Q-Ser, Q-Thr, Thr-Q, Ser-Q, Ser(Y)-Ser or Ser-Ser(Y), wherein each amino acid is in its L- or D-configuration and the N-terminal amino group of the amino acid or of the dipeptide residue being free or acylated by (C_1–C_5)-alkoxycarbonyl, (C_6–C_{12})-arloxycarbonyl, (C_7–C_{13})-aralkyloxycarbonyl, (C_1–C_6)-alkanoyl, (C_7–C_{13})-aroyl, arginyl, lysyl, ε-aminocaproyl, arginyl-arginyl, arginyl-lysyl, lysyl-arginyl or lysyl-lysyl; A denotes Phe, Trp or an L-2-thienylalanine residue; B denotes Arg, Lys, or Orn; C denotes Ile, Met, Phe, Trp, Leu, Ser, Thr, Val, His, Pro, Asn, Ser(Bu[t]) or an L-2-thienylalanine residue; N denotes Asp, Glu, Gln, Asn, Phe, Leu, Ile, Trp, Pro, Tyr, Ala, Asp(OBu[t]), Asp(OBzl), Glu(OBu[t]), Glu(OBzl), a 2-thienylalanine residue, Aad, Tyr(Bu[t]) or Tyr(Me),

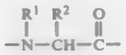
wherein each of the amino acids is in their L- or D-configuration;

E denotes Gln, Thr or Pro;

F denotes Ser, Thr, Pro, Ala, Ser(Bu[t]) or Thr(Bu[t]), each in their L- or D-configuration;

G denotes Gly, Ala or D-Ala;

Q denotes a radical of the formula IV



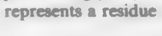
(IV)

in which

R^1 and R^2, together with the atoms carrying these radicals, form a heterocyclic mono-, bi- or tri-cyclic ring system having 3 to 15 carbon atoms;

Y denotes tert.-butyl or an optionally partially or completely protected glycosyl radical; and

Z represents a residue of the formula II



(II)

in which

H denotes Asn, Ser, Q or Thr, each in their L- or D-form;

I denotes Ser, Thr, Ala, Ser(Bu[t]), Thr(Bu[t]) or Pro, each in their L- or D-form;

J denotes Phe, Trp, D-Phe, D-Trp or a 2-thienylalanine residue;

K denotes Arg, Lys, Orn or a bond;

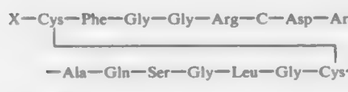
L denotes Tyr, Tyr(Bu[t]) or a bond;

M denotes Arg-OH, Arg-NH_2, OH, OR, NH_2, NHR', Gly-Lys-Arg-OH, Gly-Lys-Arg-NH_2 or L-argininol;

Q is as defined above;

R denotes unbranched (C_1–C_6)-alkyl, and

R' denotes —$[CH_2]_n$-NH_2 or —$[CH_2]_n$-NH-C(NH)NH_2, n being an integer and representing 3–8; and to its physiologically tolerated salts, with the proviso that the peptides, corresponding to the sequence of the natural ANF, of the formula III



in which

X denotes Ser, Ser-Ser, Arg-Ser-Ser or Arg-Arg-Ser-Ser,

C denotes Ile or Met,

Z denotes Asn-Ser-Phe-K-L-M,

K denotes Arg or a bond,

L denotes Tyr or a bond and

M denotes OH or NH_2, and their salts are excluded.

4,861,756

SYNTHETIC PULMONARY SURFACTANT

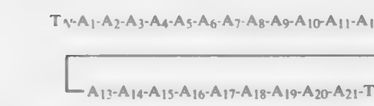
Richard L. Jackson, Cincinnati, Ohio, assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 169,092, Mar. 8, 1988, abandoned, which is a continuation of Ser. No. 88,031, Aug. 18, 1987, abandoned, which is a continuation of Ser. No. 801,172, Nov. 22, 1985, abandoned. This application Oct. 26, 1988, Ser. No. 266,263

Int. Cl.[4] A61K *37/02;* **C07K** *7/08, 7/10*

U.S. Cl. 514—11 **23 Claims**

1. A polypeptide of the formula



wherein

A_1, A_4, A_5, A_8, A_9, A_{11}, A_{12}, A_{15}, A_{16}, A_{18}, A_{19} and A_{20} are each independently selected from Gln, Glu, Asp, His, Arg, Lys, Ser, Ala, Gly, Tyr, Typ, and Thr;

A_2 is Leu, Gln, Glu, Asp, His, Arg, Lys, Ser, Ala, Gly, Thr, Typ or Thr;

A_3 is Pro, Ile, Val, Phe, Met, Ala, Gly, Tyr, Typ or Thr;

A_6, A_7, A_{13} and A_{14} are each independently selected from Leu, Ile, Val, Phe, Met, Gln, Glu, Asp, His, Arg, Lys, Ser, Ala, Gly, Tyr, Typ and Thr;

A_{10}, A_{17} and A_{21} are each independently selected from Leu, Ile, Val, Phe, Met, Gln, Glu, Asp, His, Arg, Lys, Ser, Ala, Gly, Tyr, Typ, and Thr;

T_n is

T_N'-Arg-Gly-Pro-Pro-,

T_N'-Gly-Pro-Pro-,

T_N'-Pro-Pro-,

T_N'-Pro-, or

T_N'-;

T_C is

-Leu-Gln-Thr-Arg-Gly-T_C',

-Leu-Gln-Thr-Arg-T_C',

-Leu-Gln-Thr-T_C',

-Leu-Gln-T_C',

-Leu-T_C', or

-T_C';

T_N' is hydrogen, an amino acid, dipeptide, or tripeptide, or an aliphatic, aromatic or cyclic organic acid having 1 to 10 carbon atoms; and

T_C' is hydrogen, a (C_1–C_6) alkyl, or benzyl, optionally substituted with one or two members of the group consisting of nitro, methyl and methoxy, or T_C' phenacyl, phthalimidomethyl, benzhydryl, trichloroethyl, 4-picolyl, β-methylthioethyl or 4(methylthio)phenyl or a pharmaceutically acceptable salt thereof.

4,861,757

WOUND HEALING AND BONE REGENERATION USING PDGF AND IGF-I

Harry N. Antoniades, Newton; Samuel E. Lynch, Jamaica Plain, and Ray C. Williams, Arlington, all of Mass., assignors to Institute of Molecular Biology, Boston and President and Fellows of Harvard College, Cambridge, both of, Mass.

Continuation-in-part of Ser. No. 930,762, Nov. 14, 1986. This application Nov. 16, 1987, Ser. No. 120,943

Int. Cl.[4] A61K *37/36*

U.S. Cl. 514—21 **9 Claims**

1. A method for healing an external wound of a mammal comprising applying to said wound a wound-healing amount of a composition comprising platelet-derived growth factor and insulin-like growth factor-1, each said platelet-derived growth factor and insulin-like growth factor-1 being pure so as to yield a single major band on a polyacrylamide gel.

4,861,758

COCCIDIOCIDAL COMPOSITIONS

Wolfgang Raether, Dreieich, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt Am Main, Fed. Rep. of Germany

Filed Nov. 9, 1987, Ser. No. 118,321

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1986, 3638445

Int. Cl.[4] A61K *31/44, 31/47, 31/70, 31/505*

U.S. Cl. 514—27 **12 Claims**

1. A coccidiocidal composition which contains maduramicin or its physiologically acceptable salt in combination with one of the following active ingredients or ingredient mixtures in a ratio of maduramicin to said ingredients as indicated:

(a) with meticlorpindol in a ratio between 1:12 to 24,

(b) with methyl benzoquate in a ratio between 1:1 to 2,

(c) with halofuginone in a ratio between 1:3 to 6,

(d) with a mixture of 10 parts of meticlorpindol to 1 parts of methyl benzoquate in a ratio between 1:2.7 to 3.8,

(e) with amprolium in a ratio between 1:12.5 to 25, or

(f) with a mixture of 20 parts of amprolium to 1 part of ethopabate in a ratio between 1:12.5 to 25.

4,861,759

ANTIVIRAL COMPOSITIONS AND METHODS

Hiroaki Mitsuya, Rockville, and Samuel Broder, Bethesda, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

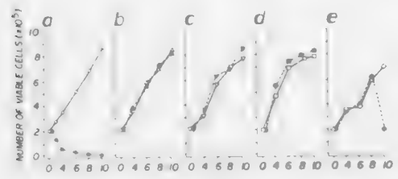
Continuation-in-part of Ser. No. 937,925, Dec. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 769,016, Aug. 26, 1985, abandoned. This application Aug. 11, 1987, Ser. No. 84,055

Int. Cl.[4] A61K *31/70;* **C07D** *473/16;* **C07H** *17/00, 19/06*

U.S. Cl. 514—46 **22 Claims**

1. A method for treating the cytopathic destructive effects of a retroviral disease in a host infected with a retrovirus comprising administering to said host an effective amount of an antiviral composition comprising an effective amount of at least one

compound selected from the group consisting of 2',3'-dideoxyadenosine, 2',3'-dideoxyinosine, 2',3'-dideoxyguanosine, and



salts and esters thereof, in a pharmaceutically acceptable carrier.

4,861,760

OPHTHALMOLOGICAL COMPOSITION OF THE TYPE WHICH UNDERGOES LIQUID-GEL PHASE TRANSITION

Claude Mazuel, and Marie-Claire Friteyre, both of Riom, France, assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 25, 1986, Ser. No. 911,606
Claims priority, application France, Oct. 3, 1985, 85 14689
Int. Cl.⁴ A61K *31/715, 31/70*
U.S. Cl. 514—54 **8 Claims**

1. A liquid aqueous ophthalmological composition comprising 0.1 to 2% by weight of gellan gum which on administration to the eye changes from a liquid to a gel as a result of the ionic strength of the lacrimal fluid.

4,861,761

ALOEFERON ISOLATION, MANUFACTURING AND ITS APPLICATIONS

Valdemar H. Madis; Mostafa M. Omar, both of Hawthorne, and Voldemar Madis, Ho Ho Kus, all of N.J., assignors to Dr. Madis Laboratories, Inc., S. Hackensack, N.J.

Continuation of Ser. No. 625,521, Jun. 28, 1984, abandoned. This application Feb. 24, 1986, Ser. No. 833,084
Int. Cl.⁴ A61K *31/715*
U.S. Cl. 514—54 **5 Claims**

1. A substantially pure pharmaceutically active aloe isolate comprising:

a polysaccharide including nitrogen, sulfur and phosphorous and having a molecular weight of about 70,000;

having an infra red spectra with principal peaks at about 3400, 2900, 1720, 1550 and 1420 cm^{-1}; and

an NMR spectrum with absorbtio eaks at about 20 ppm (singlet) 70 ppm (broad multiplet) and 174 ppm (broad multiplet).

4,861,762

INSECTICIDE MIXTURES CONTAINING FATTY ACIDS

George S. Puritch, Brentwood Bay, and Sergi F. Condrashoff, Victoria, both of Canada, assignors to Safer, Inc., Wellesley, Mass.

Continuation of Ser. No. 118,305, Nov. 6, 1987, Pat. No. 4,774,234, which is a continuation of Ser. No. 722,460, Apr. 12, 1985, abandoned. This application Jul. 12, 1988, Ser. No. 218,093
Int. Cl.⁴ A01N *57/00*
U.S. Cl. 514—122 **13 Claims**

1. An insecticidal composition having synergistic insecticidal activity, consisting essentially of:

(a) an insecticide active against defoliating insects comprising, S-(1,2-dicarbethoxyethyl)-O,O-dimethyldithiophosphate; and

(b) oleic acid, a salt thereof, or a mixture thereof

wherein the weight proportion of said insecticide (a): said oleic acid or its salt (b) is from about 1:1,000 to about 1:1.

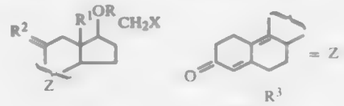
4,861,763

17α-(SUBSTITUTED-METHYL)-17β-HYDROXY/ESTERIFIED HYDROXY STEROIDS AND THEIR PROGESTATIONAL USE

C. Edgar Cook; C. Ray Tallent; Jerry R. Reel, and Mansukh C. Wani, all of Research Triangle Park, N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.

Continuation of Ser. No. 908,288, Sep. 17, 1986, Pat. No. 4,774,236. This application Jul. 25, 1988, Ser. No. 223,873
Int. Cl.⁴ A61K *31/58, 31/56;* **C07J** *1/00, 17/00*
U.S. Cl. 514—172 **5 Claims**

1. A steroid having binding affinity for the progesterone receptor and possessing progestational activity, represented by partial formula II, wherein Z has partial structure III,



(II)

(III)

wherein:

X is selected from the group consisting of, CN, N_3, SCN, OMe, and Ph which is unsubstituted or substituted by C_{1-3} alkyl;

R is H or C_1–C_5 acyl;

R^1 is methyl or ethyl;

R^2 is α-H and β C_1–C_3 alkyl; or

R^2 is α-H and β C_2–C_4 alkenyl; or R^2 is methylene; or

R^2 is α-H and β p-fluorophenyl or trifluoromethylphenyl; or

R^2 is α-H, β-thienyl; and

R^3 is H or methyl.

4,861,764

PERCUTANEOUS ABSORPTION ENHANCERS, COMPOSITIONS CONTAINING SAME AND METHOD OF USE

Carlos M. Samour, Wellesley, and Stefanos Daskalakis, Lawrence, both of Mass., assignors to Macro Chem. Corp., Billerica, Mass.

Filed Nov. 17, 1986, Ser. No. 931,653
Int. Cl.⁴ A61K *31/56*
U.S. Cl. 514—177 **17 Claims**

1. A therapeutic composition suitable for transdermal administration to humans and animals comprising a therapeutically effective amount of a physiologically active agent and as a penetration enhancer an effective amount of a pharmaceutically acceptable 1,3-di oxacyclopentane or 1,3-dioxacyclohexane containing at least one aliphatic group having 4 to 18 carbon atoms.

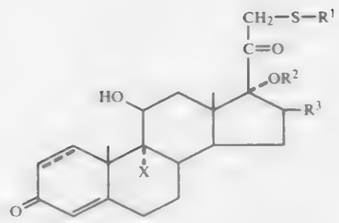
4,861,765

21-ALKYL-, CYCLOALKYL- OR ARYL-SUBSTITUTED THIS STEROIDS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Morihiro Mitsukuchi; Tomoyuki Ikemoto, both of Ohmiya; Yoshiaki Watanabe, Kodaira, and Kaoru Sota, Tokorozawa, all of Japan, assignors to Jouveinal, Paris, France

Filed Jun. 23, 1986, Ser. No. 877,355
Claims priority, application Japan, Jun. 26, 1985, 60-139276
Int. Cl.⁴ A61K *31/57;* **C07J** *7/00, 31/00;* **C61K** *31/56*
U.S. Cl. 514—181 **9 Claims**

1. A 21-substituted thiosteroid having the formula



(I)

wherein

R^1 represents alkyl having 1–6 carbon atoms, cycloalkyl having 5 or 6 carbon atoms, phenyl, benzyl or benzyl substituted on the benzene ring,

R^2 represents alkanoyl having 2–6 carbon atoms,

R^3 represents hydrogen or methyl,

X represents hydrogen or halogen and

the bond between positions 1 and 2 is a single bond or a double bond as represented by the dotted line.

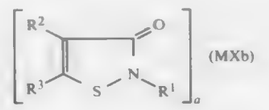
4,861,766

ANTIMICROBIAL COMPOSITION

Susumu Mitsui; Shigeru Kurose, and Hiroshi Saimoto, all of Saitama, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 19, 1986, Ser. No. 946,506
Claims priority, application Japan, Dec. 23, 1985, 60-287930
Int. Cl.⁴ A01N *55/02, 46/06*
U.S. Cl. 514—184 **6 Claims**

1. An antimicrobial composition comprising, as a mixture of active ingredients, (A) one or two complexes of the formula



(MXb)

wherein R^1 is hydrogen or C_{1-10} alkyl, R^2 and R^3 are each independently hydrogen or halogen, M is a metal having a valence of 2, X is a complex-forming anion, a is 1 or 2 and b is an integer which is such that the anion X satisfies the valence of the metal M, and (B) 3,3,4,4-tetrachlorotetrahydrothiophene 1.1-dioxide, wherein the complex and 3,3,4,4-tetrachlorotetrahydrothiophene 1,1-dioxide are contained in the mixture in a weight ratio 1/10 to 10/1.

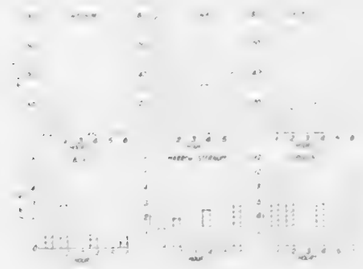
4,861,767

PHARMACEUTICAL COMPOSITIONS

Robert C. Hider, Clacton; George Kontoghiorghes, London, and Michael A. Stockham, Saffron Walden, all of England, assignors to National Research Corporation, London, England

Continuation of Ser. No. 717,660, Mar. 29, 1985, abandoned, which is a division of Ser. No. 542,976, Oct. 18, 1983, Pat. No. 4,575,502. This application Jul. 13, 1987, Ser. No. 73,330
Claims priority, application United Kingdom, Oct. 22, 1982, 8230130
The portion of the term of this patent subsequent to Mar. 11, 2003, has been disclaimed.
Int. Cl.⁴ A61K *31/555*
U.S. Cl. 514—184 **35 Claims**

1. A pharmaceutical composition, comprising: an amount, effective for the treatment of iron deficiency anaemia, of a compound being a tissue permeable, neutral 3:1 hydroxypyrone:iron(III) complex of 3-hydroxy-4-pyrone or of a 3-hydroxy-4-pyrone in which at least one of the hydrogen atoms attached to ring carbon atoms is replaced by an aliphatic hydrocarbon group of 1 to 6 carbon atoms, together with a physiologically acceptable solid carrier, said composition being in tablet form.



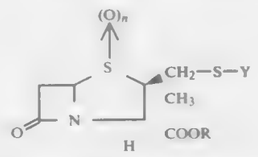
4,861,768

2 β-SUBSTITUTED THIOMETHYLPENICILLIN DERIVATIVES AND THEIR PREPARATION AND USE

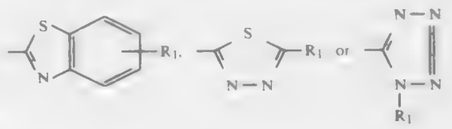
Sigeru Torii; Hideo Tanaka; Motoaki Tanaka, all of Okayama; Shozo Yamada, Honjye; Akira Nakai, Okayama; Hisashi Ohbayashi, Honjyo; Hideo Tanaka; Motoaki Tanaka, both of Okayama; Shozo Yamada, Honjyo; Akira Nakai, Okayama, and Hisashi Ohbayashi, Honjyo, all of Japan, assignors to Taiho Pharmaceutical Company, Limited, Tokyo, Japan

Filed Feb. 18, 1987, Ser. No. 16,114
Claims priority, application Japan, Feb. 27, 1986, 61-43763; Nov. 10, 1986, 61-268137
Int. Cl.⁴ A61K *31/425;* **C07D** *499/00*
U.S. Cl. 514—195 **26 Claims**

1. A penicillin derivative of the formula:



wherein n is an integer of 0, 1 or 2; Y is a cyano group, a lower acyl group, a mono- or di-lower alkylthiocarbamoyl group,



wherein R_1 is a hydrogen atom, a lower alkyl group, a phenyl group, a phenyl group substituted by at least one member selected from the class consisting of a lower alkyl group, halogen atom and a lower alkoxy group or a group $—(CH_2)_m—OR_2$ or $—(CH_2)_m COOR_2$ wherein m is an integer of 1 to 6 and R_2 is a hydrogen atom or a penicillin carboxyl ester-forming group which is commonly used for penicillin derivatives and R is a hydrogen atom or a penicillin carboxyl ester-forming group, or a pharmaceutically acceptable salt thereof.

17. A method for treating bacterial infections in mammals, which comprises administering to a mammal in need of such treatment a therapeutically effective amount of a compound as claimed in claim 1.

4,861,769

CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Zenzoburo Tozuka, Osaka; Nobuyoshi Yasuda, Nishinomiya, and Shintaro Nishimura, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

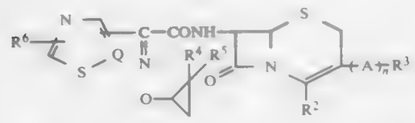
Filed Feb. 12, 1986, Ser. No. 828,527

Claims priority, application United Kingdom, Feb. 18, 1985, 8506072

Int. Cl.[4] C07D *501/36*; A61K *31/545*

U.S. Cl. 514—202 **13 Claims**

1. A compound of the following formula:



wherein

R^6 is amino or protected amino,

Q is CH or N,

R^2 is carboxy or protected carboxy,

R^3 is hydrogen; lower alkanoyloxy; heterocyclicthio selected from a group consisting of pyridylthio, isothiazolylthio, thiadiazolylthio, tetrahydrotriazinylthio, tetrazolylthio and tetrazolopypridazinylthio, in which heterocyclicthio may be substituted with lower alkyl, lower alkenyl, carboxy, oxo or hydroxy; or a heterocyclic group selected from a group consisting of pyridinio, tetrahydropyridyl, pyrazolio and dihydropyridinio, in which a heterocyclic group may be substituted with lower alkyl or caramoyl;

R^4 and R^5 are each hydrogen, halogen or phenylthio, A is lower alkylene, and n is an integer of 0 or 1, and a pharmaceutically acceptable salt thereof.

4,861,770

USE OF BENZOTHIAZEPINE DERIVATIVES AS LYMPHOCYTE PROTECTORS

Ute Weiershausen, Gundelfingen; Volker Ganser, Freiburg, and Gerhard Satzinger, Denzlingen, all of Fed. Rep. of Germany, assignors to Goedecke Aktiengesellschaft, Berlin, Fed. Rep. of Germany

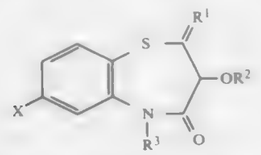
Filed Feb. 1, 1988, Ser. No. 150,578

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1987, 3705117

Int. Cl.[4] A61K *31/55*

U.S. Cl. 514—211 **1 Claim**

1. A method for treating lymphocytotropic virus in human or higher mammals which comprises administering to said human or higher mammal in need thereof from 10 to 100 mg per orally administered dose of a compound of

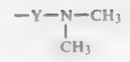


or a pharmaceutically acceptable salt thereof, wherein R^1 is hydrogen, phenyl, phenyl substituted by methyl, one to three methoxy groups, or one to two chlorine atoms,

R^2 is hydrogen or acetyl,

X is hydrogen or chlorine, and

R^3 is hydrogen or a group of formula



wherein Y is alkylene of from two to three carbon atoms.

4,861,771

CARBAMATES OF 6-CHLORO-7,8-DIHYDROXY-1-(4'-HYDROXYPHENYL)-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINE AS PRODRUGS

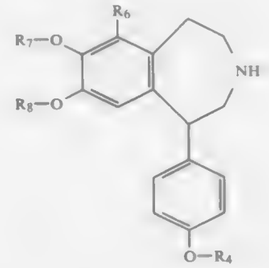
Dimitri Gaitanopoulos, Eagleville, Pa.; Bruce Mico, Bridgewater, N.J., and Joseph Weinstock, Phoenixville, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Jan. 27, 1989, Ser. No. 303,519

Int. Cl.[4] C07D *223/16*; A61K *31/55*

U.S. Cl. 514—213 **16 Claims**

1. A compound of the structural formula:



in which:

R_6 is halo; and

R_7, R_8 and R_4 are each independently hydrogen or —CONHR wherein R is lower alkyl having from one to four carbon atoms; or a nontoxic pharmaceutically acceptable acid addition salt thereof.

11. The method of inducing antihypertensive activity in a subject in need thereof comprising administering orally or by injection a nontoxic antihypertensive quantity of a compound of claim 1.

4,861,772

METHOD AND COMPOSITION TO TREAT PANIC SYNDROME

Walter Merz, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 7, 1988, Ser. No. 178,671

Claims priority, application Switzerland, Jan. 27, 1988, 272/88

Int. Cl.[4] A61K *31/55*

U.S. Cl. 514—219 **4 Claims**

1. A method for the prevention or interruption of panic states, accompanying phobias and the associated social consequences, including anticipatory anxiety and avoidance behavior, in a host with panic syndrome, which method comprises administering perorally to such a host an effective amount of t-butyl (S)-8-bromo-11,12,13,13a-tetrahydro-9-oxo-9H-imidazo [1,5-a]pyrrolo[2,1-c][1,4]benzodiazepine-1-carboxylate.

4,861,773

HETEROCYCLIC COMPOUNDS

William J. Coates, Welwyn Garden City, and Lawrence I. Kruse, Tewin, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

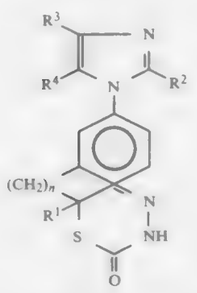
Continuation-in-part of Ser. No. 41,819, Apr. 23, 1987, abandoned. This application Jan. 29, 1988, Ser. No. 149,743

Claims priority, application United Kingdom, Apr. 28, 1986, 8610369; Oct. 24, 1987, 8724962

Int. Cl.[4] A61K *31/54*; C07D *417/04*

U.S. Cl. 514—222.8 **12 Claims**

1. A compound of the formula (1):



(1)

or a pharmaceutically acceptable salt thereof, wherein:

R^1 is hydrogen or methyl;

n is one, and when R^1 is hydrogen n can also be two;

R^2, R^3 and R^4 are independently hydrogen, C_{1-4}alkyl or hydroxy(C_{1-4})alkyl.

8. A method for stimulating cardiac activity in a host in need thereof by administration of a non-toxic but effective amount of a compound according to claim 1.

4,861,774

METHOD OF TREATING TUMORS USING TETRACYCLO COMPOUNDS

Masanobu Kohsaka, Sakai; Hiroshi Terano, Ibaraki; Tadaaki Komori, Takatsuki; Morita Iwami, Ibaraki; Michio Yamashita, Takarazuka; Masashi Hashimoto, Ibaraki; Itsuo Uchida, Ibaraki, and Shigehiro Takase, Ibaraki, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

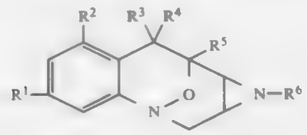
Continuation-in-part of Ser. No. 870,950, Jun. 5, 1986, abandoned, which is a continuation-in-part of Ser. No. 743,616, Jun. 11, 1985, Pat. No. 4,645,765. This application Dec. 30, 1986, Ser. No. 947,759

Claims priority, application United Kingdom, Jun. 25, 1984, 8416141; Spain, Feb. 14, 1985, 552029; Feb. 14, 1985, 552030; United Kingdom, Apr. 24, 1985, 8510378; South Africa, Jun. 13, 1985, 85/4469; Australia, Jun. 17, 1985, 43728/85; Canada, Jun. 19, 1985, 484513; European Pat. Off., Jun. 21, 1985, 85107681.0; Denmark, Jun. 24, 1985, 2855/85; Rep. of Korea, Jun. 24, 1985, 85-4482; Spain, Jun. 24, 1985, 544482; Taiwan, Jun. 24, 1985, 74102727; Japan, Jun. 25, 1985, 60-140084

Int. Cl.[4] A61K *31/535*

U.S. Cl. 514—299.5 **5 Claims**

1. A method for treatment of tumor in mammals which comprises administering to said mammal an effective amount of a tetracyclo compound of the formula:

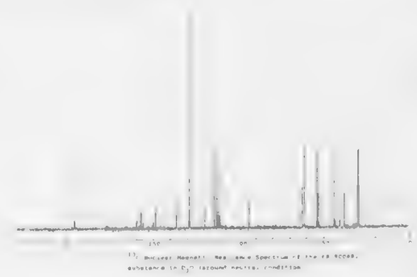


in which

R^1 is formyl, protected formyl, hydroxymethyl, protected hydroxymethyl, arylaminomethyl, carboxy, protected carboxy, aryliminomethyl, hydroxyiminomethyl, alkoxyiminomethyl, acyloxyiminomethyl, semicarbazonomethyl or arylsemicarbazonomethyl,

R^2 is hydroxy, alkoxy or protected hydroxy,

R^3 is hydrogen and R^4 is methyl, hydroxymethyl or protected hydroxymethyl, or



R^3 and R^4 are combined together to form methylene or oxo,

R^5 is hydroxy, alkoxy or protected hydroxy, and

R^6 is hydrogen, imino-protective group or alkyl, and pharmaceutically acceptable salts thereof said tumor being carcinoma or sarcoma.

4,861,775

PHARMACOLOGICAL USE OF PHENOXAZINONES

Axel Zeeck, Göttingen; Sabine Breiding-Mack, Döhren; Susanne Grabley, Königstein/Taunus; Hartmut Voelskow, Hattersheim am Main, and Gerhard Seibert, Darmstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

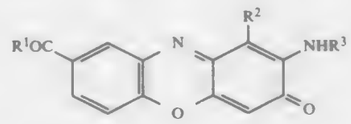
Filed Aug. 25, 1987, Ser. No. 89,153

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1986, 3629062

Int. Cl.[4] A61K *31/535*

U.S. Cl. 514—229.8 **4 Claims**

1. A method for the treatment of an animal for fungal, protozoa, viral and anthelmintic infections which comprises administering to said animal an amount effective for said treatment of a compound of formula

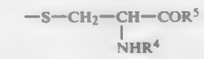


I

in which

R^1 is hydroxyl or (C_1–C_5)-alkoxy or amino,

R^2 is hydrogen or the group of the formula



wherein R^4 is hydrogen or (C_1–C_5)-acyl and R_5 is hydroxyl or (C_1–C_5)-alkoxy, and

R^3 is hydrogen or (C_1–C_5)-acyl.

4,861,776

HETEROCYCLIC AMINOALKYL ESTERS OF MYCOPHENOLIC ACID AND DERIVATIVES THEREOF, COMPOSITIONS AND USE

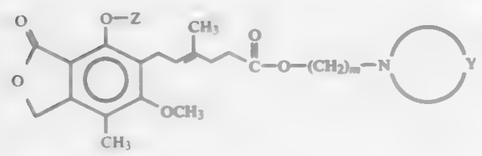
Peter H. Nelson, Los Altos; Chee-Liang L. Gu, Sunnyvale; Anthony C. Allison; Elsie M. Eugui, both of Belmont, and William A. Lee, Menlo Park, all of Calif., assignors to Syntex (U.S.A) Inc., Palo Alto, Calif.

Division of Ser. No. 99,950, Sep. 23, 1987, Pat. No. 4,748,173, which is a division of Ser. No. 8,909, Jan. 30, 1987, Pat. No. 4,727,069. This application Feb. 25, 1988, Ser. No. 160,212

Int. Cl.[4] A61K *31/535, 31/54;* **C07D** *413/12, 417/12*

U.S. Cl. 514—233.5 **11 Claims**

1. A compound represented by the formula:



wherein:

m is an integer from two to four;

Z is selected from Formulae (a) (b) or (c), as follows:

(a)



in which:

R^4 is hydrogen, alkyl, aryl, or $—NR^2R^3$; where R^2 is hydrogen or lower alkyl, and

R^3 is hydrogen, lower alkyl, —phenyl—CO_2R^2 or a pharmaceutically acceptable cation;

(b)

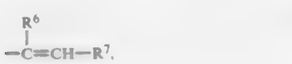


in which:

n is an integer from zero to six, and

R^5 is hydrogen, lower alkyl, or a pharmaceutically acceptable cation;

(c)



in which:

R^6 and R^7 are independently hydrogen or $—CO_2R^5$; and

Y is lower alkylene for four to six carbon atoms, or lower alkylene of three to five carbon atoms plus one member that is —O—, —S—, or



where R^8 is hydrogen or alkyl of one to five carbon atoms;

or a pharmaceutically acceptable salt thereof.

11. A pharmaceutical composition comprising a pharmaceutically acceptable non-toxic excipient and a therapeutically effective amount of a compound of claim **1**.

4,861,777

PYRAZOLE DERIVATIVE AND INSECTICIDAL AND MITICIDAL COMPOSITION CONTAINING THE DERIVATIVE AS ACTIVE INGREDIENT

Itaru Okada, Kanagawa; Shuko Oku; Masa Nishimata, both of Tokyo; Yoji Takahashi, Machida, and Toshiki Fukuchi, Yokohama, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

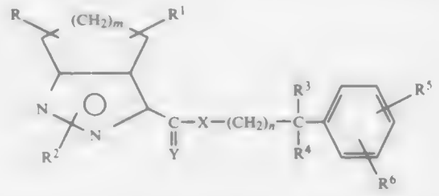
Filed Sep. 7, 1988, Ser. No. 241,387

Claims priority, application Japan, Sep. 11, 1987, 62-227735

Int. Cl.[4] C07D *231/56, 413/08, 403/08;* **A01N** *43/90*

U.S. Cl. 514—234.5 **7 Claims**

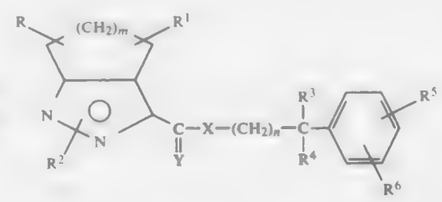
1. A pyrazole derivative represented by the following formula (I):



(I)

wherein R and R^1 independently represent a hydrogen atom or a C_1–C_4 alkyl group; R^2 represents a hydrogen atom, a C_1–C_4 alkyl group, a phenyl group or a benzyl group, which bonds to one of the nitrogen atoms of the pyrazole ring; R^3 and R^4 independently represent a hydrogen atom, a C_1–C_4 alkyl group or a phenyl group; R^5 and R^6 independently represent a hydrogen atom, a halogen atom a C_1–C_6 alkyl group, a C_3–C_6 cycloalkyl group, a C_1–C_4 alkoxy group, a C_1–C_4 halogenoalkoxy group, a C_1–C_4 hydroxyalkoxy group, a C_2–C_7 alkoxyalkoxy group, a nitro group, a trifluoromethyl group, a phenyl group, a phenoxy group, a benzyloxy group, an amino group, a C_1–C_4 alkylamino group, a C_2–C_8 dialkylamino group, a cyano group, a carboxyl group, a C_2–C_5 alkoxycarbonyl group, a C_4–C_7 cycloalkoxycarbonyl group, a C_3–C_9 alkoxyalkoxycarbonyl group, a C_2–C_7 alkylaminocarbonyl group, a C_3–C_{11} dialkylaminocarbonyl group, a piperidinocarbonyl group, a morpholinocarbonyl group, a trimethylsilyl group, a C_1–C_4 alkylthio group, a C_1–C_4 alkylsulfinyl group or a C_1–C_4 alkylsulfonyl group; X represents an oxygen atom, a sulfur atom, NHO or NR^7 wherein R^7 represents a hydrogen atom or a C_1–C_4 alkyl group; Y represents an oxygen atom or a sulfur atom; m represents 1 or 2; and n represents 0 or 1.

7. A method for controlling insects and mites, which comprises applying an insecticidally and miticidally effective amount of a pyrazole derivative represented by the following formula (I):



(I)

wherein R and R^1 independently represent a hydrogen atom or a C_1–C_4 alkyl group; R^2 represents a hydrogen atom, a C_1–C_4 alkyl group, phenyl group or a benzyl group, which bonds to one of the nitrogen atoms of the pyrazole ring; R^3 and R^4 independently represent a hydrogen atom, a C_1–C_4 alkyl group or a phenyl group; R^5 and R^6 independently represent a hydrogen atom, a halogen atom, a C_1–C_6 alkyl group, a C_3–C_6 cycloalkyl group, a C_1–C_4 alkoxy group, a C_1–C_4 halogenoalkoxy group,a C_1–C_4 hydroxyalkoxy group, a C_2–C_7 alkoxyalkoxy

group, a nitro group, a trifluoromethyl group, a phenyl group, a phenoxy group, a benzyloxy group, an amino group, a C_1–C_4 alkylamino group, a C_2 –C_8 dialkylamino group, a cyano group, a carboxyl group, a C_2–C_5 alkoxycarbonyl group, a C_4–C_7 cycloalkoxycarbonyl group, a C_3–C_9 alkoxyalkoxycarbonyl group, a C_2–C_7 alkylaminocarbonyl group, a C_3–C_{11} dialkylaminocarbonyl group, a piperidinocarbonyl group, a morpholinocarbonyl group, a trimethylsilyl group, a C_1–C_4 alkylthio group, a C_1–C_4 alkylsulfinyl group or a C_1–C_4 alkylsulfonyl group;

X represents an oxygen atom, a sulfur atom, NHO or NR^7 wherein R^7 represents a hydrogen atom or a C_1–C_4 alkyl group; Y represents an oxygen atom or a sulfur atom; m represents 1 or 2; and n represents 0 or 1, to eggs or larvae of said insects or mites.

4,861,778

2,3-DIHYDROPHTHALAZINE-1,4-DIONES

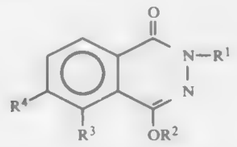
Iris H. Hall, Chapel Hill; Steven D. Wyrick, Durham, both of N.C., and James M. Chapman, Jr., Columbia, S.C., assignors to Research Corporation, N.Y.

Filed Jun. 16, 1986, Ser. No. 874,939

Int. Cl.[4] A61K *31/495*

U.S. Cl. 514—248 **10 Claims**

1. A method for controlling hyperlipidemia in mammals comprising administering to a mammal in need thereof a hyperlipidemia controlling effective amount of a compound having the structural formula



where R^1 is hydrogen, C_1–C_6 alkyl, C_2–C6 carboxyalkyl, C_2–C_6 carbalkoxyalkyl, phenyl or phenyl substituted with C_1–C_3 alkyl or halogen; R^2 is hydrogen or C_1–C_6 alkyl; and R^3 and R^4 are the same or different and are hydrogen, C^1–C_3 alkyl, C_1–C_3 alkoxy or halogen.

4,861,779

ANTI-BACTERIAL SUBSTITUTED BRIDGED-DIAZABICYCLOALKYL QUINOLONE CARBOXYLIC ACIDS

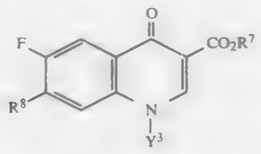
Martin R. Jefson, Oakdale, and Paul R. McGuirk, Gales Ferry, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 777,471, Sep. 18, 1985, abandoned. This application Aug. 19, 1986, Ser. No. 898,473

Int. Cl.[4] A61K *31/495, 31/44;* **C07D** *471/08, 487/08*

U.S. Cl. 514—249 **15 Claims**

1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein

R^7 is hydrogen, a pharmaceutically acceptable cation, or $(C_1$–$C_6)$alkyl;

Y^3 is cyclopropyl; and

R^8 is 8-methyl-3,8-diazabicyclo[3.2.1]oct-3-yl, (1S, 4S)-2,5-diazabicyclo[2.2.1]hept-2-yl, or (1S, 4S)-5-methyl-2,5-diazabicyclo[2.2.1]hept-2-yl.

4,861,780

4(3H)-QUINAZOLINONE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS

Toshihiro Takahashi, Kawagoe; Tatsuo Horaguchi, Fujimi; Koichi Nakamaru, Ohimachi, and Yoshikuni Suzuki, Ohmiya, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Japan

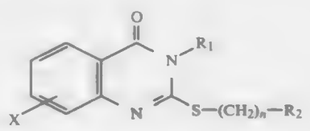
Filed Jan. 26, 1988, Ser. No. 148,491

Claims priority, application Japan, Jan. 30, 1987, 62-20123; Aug. 20, 1987, 62-205071

Int. Cl.[4] A61K *31/305;* **C07D** *401/12*

U.S. Cl. 514—259 **8 Claims**

1. A compound of formula (I)



(I)

wherein R_1 is an aryl group or a substituted aryl group, or an aralkyl group; R_2 is a C_1–C_6 alkylamino group; pyridyl group or substituted pyridyl group; n is 1 or 2; and X is a hydrogen atom, a C_1–C_6 alkyl group or a halogen atom, and pharmaceutically acceptable acid addition salts thereof.

5. A pharmaceutical composition which comprises as an active ingredient an effective amount of the compound of claim **1** or pharmaceutically acceptable acid addition salts thereof, in admixture with additives for pharmaceutical preparation.

4,861,781

QUATERNARY DERIVATIVES OF NOROXYMORPHONE WHICH RELIEVE NAUSEA AND EMESIS

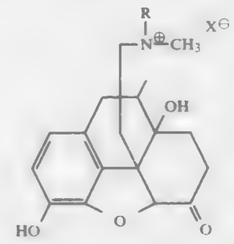
Leon I. Goldberg, Chicago, Ill., assignor to The University of Chicago, Chicago, Ill.

Continuation-in-part of Ser. No. 837,399, Mar. 7, 1986, Pat. No. 4,719,215. This application Sep. 3, 1987, Ser. No. 92,470

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—282 **10 Claims**

1. A method for preventing or relieving nausea and emesis associated with the use or narcotic analgesics in warm-blooded animals, which comprises administering to an animal prone towards nausea or emesis on receiving narcotic analgesics, an amount of at least about 0.05 mg/kg and less than 0.25 mg/kg of at least one nausea and emesis relieving compound of the formula:



wherein

R is allyl or a related radical such as chloroallyl, cyclopropyl-methyl or propargyl, and

X is the anion of an acid, especially a chloride, bromide, iodide or methylsulfate anion, prior to or simultaneously with administration of the narcotic analgesic.

4,861,782

CERTAIN 2H-BENZO[A]QUINOLIZIN-2-YL-AMINOALKYL ESTERS OF 1,4-DIHYDRO-3,5-PYRIDINEDICARBOXYLATES USEFUL FOR TREATING CIRCULATION DISORDERS

Eckhard Schwenner, Wuppertal; Hartmut Stegelmeier, Hilden; Stanislav Kazda, Wuppertal, and Andreas Knorr, Erkrath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 25, 1987, Ser. No. 18,652

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607821

Int. Cl.[4] A61K *31/435;* **C07D** *455/06*

U.S. Cl. 514—294 **10 Claims**

1. An aminoalkyl ester of a dihydropyridinedicarboxylic acid of the formula

in which

R^1 is phenyl, pyridyl or benzoxadiazolyl, the phenyl ring being substituted by 1 or 2 identical or different substitutents selected from the group consisting of chlorine, trifluoromethyl, nitro and cyano,

R^2 is a straight-chain or branched hydrocarbon radical which has up to 7 carbon atoms and is optionally interrupted in the chain by an oxygen atom and/or is optionally substituted by fluorine, cyano, phenyl or α, β- or γ-pyridyl or by N-benzyl-N-methylamino, and

X is a number from 2 to 6.

9. A method of improving the circulation of a patient in need thereof which comprises administering to such patient a circulation-active effective amount of a compound or salt according to claim 1.

4,861,783

4-QUINOLINE CARBOXYLIC ACID DERIVATIVES USEFUL FOR TREATING SKIN AND MUCO-EPITHELIAL DISEASES

Neil R. Ackerman, Greenville; Richard R. Harris, Wilmington; Scott E. Loveless, Newark, all of Del., and Russel H. Neubauer, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

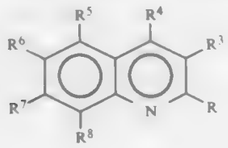
Filed Apr. 26, 1988, Ser. No. 186,242

Int. Cl.[4] A61K *31/47*

U.S. Cl. 514—311 **18 Claims**

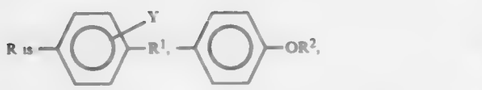
1. A method of treating a skin or mucoepithelial disease in a mammal selected from the group consisting of psoriasis, lichen planas, chronic eczema, icthyosis, pityriasis and chronic uticaria comprising administering to the mammal an efficaceous amount of a compound having the formula:

(I)

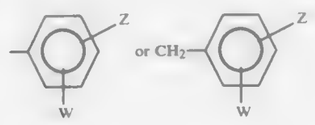


wherein

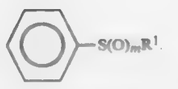
R is



R^1 is $CH_3C_2(CH_3)CH$, alkyl of 5–12 carbon atoms, cyclohexyl,

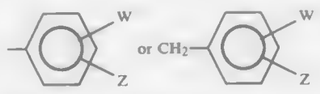


when R is



R^1 can be in addition alkyl of 3–4 carbon atoms;

R^2 is



R^3 is H, alkoxy of 1–3 carbon atoms, or alkyl of 1–2 carbon atoms,

R^4 is CO_2H or CO_2R^{11};

R^5, R^6, R^7 and R^8 are independently H, F, Cl, Br, I, CH_3, CF_3, SCH_3 or CH_2CH_3, at least two of R^5, R^6, R^7 and R^8 being H;

R^9 and R^{9A} are independently H or alkyl of 1 to 3 carbon atoms;

R^{11} is $(CH_2)_{2-4}NR^9R^{9A}$;

W, Y and Z are independently H, F, Cl, Br, alkyl of 1–5 carbon atomns, NO_2, OH, CF_3 or OCH_3;

m is 0 or 1; or

a pharmaceutically suitable salt thereof; with the following provisos:

(1) R^5, R^6 and R^7 cannot all be H;

(2) when R^4 is $CO_2CH_2CH_2N(CH_3)_2$, R^6 is CH_2CH_3, or R^7 is Cl, R^1 cannot be cyclohexyl;

(3) when R^1 is cyclohexyl and R^3 is H, R^6 must be Cl or F, but R^6 and R^8 cannot both be Cl; and

(4) when R^6 is CH_3, then R^7 cannot be Cl.

4,861,784

USE OF OXOQUINAZOLINE DERIVATIVES IN THE TREATMENT OF HYPERURICAEMIA

Gerhard Rauber, Ingelheim am Rhein, and Roland Stechert, Bingen am Rhein, both of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Feb. 4, 1988, Ser. No. 152,190

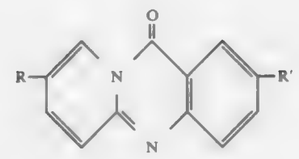
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1987, 3704203

Int. Cl.[4] A61K *31/47*

U.S. Cl. 514—314 **5 Claims**

1. A method for treating hyperuricaemisa or a disease state caused thereby, which method comprises orally administering, to a host suffering from hyperuricaemia or a disease state caused thereby, a therapeutic amount of a compound of the formula

(III)



wherein R and R^1 are respectively:

H and COOH, CH_3, and COOH, OCH_3 and COOH, $CH(CH_3)_2$ and COOH, H and tetrazol-5-yl, H and $CONH_2$, H and CN, COOH and H, COOH and CH_3, COOH and OCH_3, COOH and $CH(CH_3)_2$, or tetrazol-5-yl and H.

4,861,785

BENZOXAZOL-AND BENZOTHIAZOLAMINE DERIVATIVES, USEFUL AS ANTI-ANOXIC AGENTS

Raymond A. Stokbroekx, Beerse; Marcel G. M. Luyckx, Geel, and Frans E. Janssens, Bonheiden, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

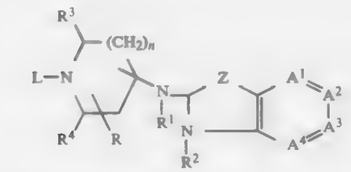
Continuation-in-part of Ser. No. 677,412, Dec. 3, 1984, abandoned. This application Oct. 11, 1985, Ser. No. 786,895

Int. Cl.[4] A61K *31/38, 31/40, 31/395;* **C07D** *413/12*

U.S. Cl. 514—321 **18 Claims**

1. A chemical compound having the formula

(I)



a pharmaceutically acceptable acid addition salt or a possible stereochemically isomeric form thereof, wherein:

$-A^1=A^2-A^3=A^4-$ is a bivalent radical having the formula

$-C=CH-CH=CH-$ (a);

$-N=CH-CH=CH-$ (b);

$-CH=N-CH=CH-$ (c);

$-CH=C-N=CH-$ (d); or

$-CH=CH-CH=N-$ (e);

wherein

one or two hydrogen atoms in the radical $-A^1=A^2-A^3=A^4-$ may, each independently from each other, be replaced by halo, C_{1-6} alkyl, hydroxy, C_{1-6} alkyloxy or trifluoromethyl;

Z is O or S;

n is 0 or the integer 1;

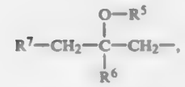
R is a member selected from the group consisting of hydrogen, C_{1-6} alkyl, hydroxy and C_{1-6} alkyloxy or trifluoromethyl;

R^1 or R^2 is hydrogen, C_{1-6} alkyl, or Ar C_{1-6} alkyl; the dotted line between the nitrogen atom bearing R^1, the interjacent carbon atom and the nitrogen atom bearing R^2 indicating that a double bond exists between the nitrogen bearing R^1 and said interjacent carbon atom, in which case R^1 is absent, or a double bond exists between the interjacent carbon and the nitrogen bearing R^2, in which case R^2 is absent; and wherein said interjacent carbon atom is the carbon atom positioned between the nitrogen bearing R^1 and the nitrogen bearing R^2;

R^3 or R^4 are both hydrogens or R^3 and R^4 combined may form a bivalent radical of formula $-CH_2-CH_2-$;

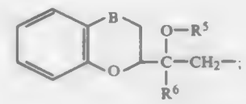
L is a member selected from the group consisting of C_{1-12} alkyl, substituted C_{1-6} alkyl, Ar C_{2-6}alkenyl, C_{3-6} cycloalkyl, substituted C_{3-6} cycloalkyl, a radical of formula

(a)



and a radical of formula

(b)



R^5 being hydrogen or C_{1-12} alkylcarbonyl;

R^6 being hydrogen or C_{1-6} alkyl;

R^7 being Ar, a radical R^8-O or a radical R^8-S;

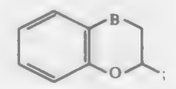
B being a bivalent radical of formula $-CH_2-$ or $-O-$; and

said R^8 being hydrogen; Ar; 2,3-dihydro-1H-indenyl; benzodioxolyl; (2,3-dihydro-1,4-benzodioxin-2-yl)methyl; (2H-1-benzopyran-2-yl)methyl; or phenyl substituted with C_{2-6}-alkenyloxy, C_{1-6} alkylcarbonylamino or C_{1-6} alkylphenylcarbonyl; and

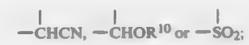
wherein said substituted C_{3-6} cycloalkyl is C_{3-6} cycloalkyl being substituted with up to two substitutents each independently selected from the group consisting of aryl, aryloxy and cyano;

said substituted C_{1-6} alkyl is C_{1-6} alkyl being substituted with a member selected from the group consisting of C_{3-6} cycloalkyl, pyridinyl, pyridinyloxy, Ar, benzimidazolyl, indolyl, isoxazolyl being optionally substituted with phenyl, 3-oxo-1,2,4-triazolo[4,5-a]-pyridin-2(3H)-yl, a radical of formula ArY—, a radical of formula R^9O— and a radical of formula

(c)



Y being O, S, NH, —CONH—,

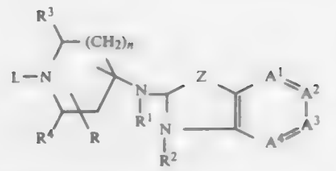


R^9 being hydrogen, Ar C_{1-6} alkyl, C_{3-6} cycloalkyl, phenyl substituted with phenyl, or phenyl substituted with C_{1-6} alkyloxycarbonyl;

R^{10} being hydrogen or C_{1-6} alkyl; and

wherein Ar is phenyl optionally substituted with up to three substituents each independently selected from the group consisting of C_{1-6} alkyl, C_{1-6} alkyloxy, halo, trifluoromethyl, cyano, C_{1-6} alkylcarbonyl, nitro, amino and aminocarbonyl.

13. A method of treating warm-blooded animals suffering from anoxia which method comprises the systemic administration to warm-blooded animals of an anti-anoxic effective amount of a compound having the formula



(I)

a pharmaceutically acceptable acid addition salt or a possible stereochemically isomeric form thereof, wherein:

$-A^1=A^2-A^3=A^4-$ is a bivalent radical having the formula

$-CH=CH-CH=CH-$ (a);

$-N=CH-CH=CH-$ (b);

$-CH=N-CH=CH-$ (c);

$-CH=CH-N=CH-$ (d); or

$-CH=CH-CH=N-$ (e);

wherein one or two hydrogen atoms in the radical $-A^1=A^2-A^3=A^4-$ may, each independently from each other, be replaced by halo, C_{1-6} alkyl, hydroxy, C_{1-6} alkyloxy, or trifluoromethyl;

Z is O or S;

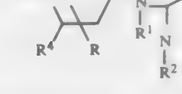
n is 0 or the integer 1;

R is a member selected from the group consisting of hydrogen, C_{1-6} alkyl, hydroxy and C_{1-6} akyloxy;

R^1 or R^2 is hydrogen, C_{1-6} alkyl, or Ar C_{1-6} alkyl; the dotted line between the nitrogen atom bearing R^1, the interjacent carbon atom and the nitrogen atom bearing R^2 indicating that a double bond exists between the nitrogen bearing R^1 and said interjacent carbon atom, in which case R^1 is absent, or a double bond exists between the interjacent carbon and the nitrogen bearing R^2, in which case R^2 is absent; and wherein said interjacent carbon atom is the carbon atom positioned between the nitrogen bearing R^1 and the nitrogen bearing R^2;

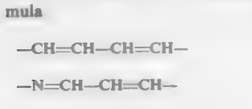
R^3 or R^4 are both hydrogens or R^3 and R^4 combined may form a bivalent radical of formula $-CH_2-CH_2-$;

L is a member selected from the group consisting of C_{1-12} alkyl, substituted C_{1-6} alkyl, Ar C_{2-6} alkenyl, C_{3-6} cycloalkyl, substituted C_{3-6} cycloalkyl, a radical of formula



(a)

and a radical of formula



(b)

R^5 being hydrogen or C_{1-12} alkylcarbonyl;

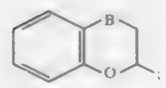
R^6 being hydrogen or C_{1-6} alkyl;

R^7 being Ar, a radical R^8-O or a radical R^8-S;

B being a bivalent radical of formula $-CH_2-$ or $-O-$; and said R^8 being hydrogen; Ar; 2,3-dihydro-1H-indenyl; benzodioxolyl; (2,3-dihydro-1,4-benzodioxin-2-yl)methyl; (2H-1-benzopyran-2-yl)methyl; or phenyl substituted with C_{2-6} alkenyl oxy, C_{1-6} alkylcarbonylamino or C_{1-6} alkylphenylcarbonyl; and

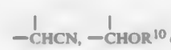
wherein said substituted C_{3-6} cycloalkyl is C_{3-6} cycloalkyl being substituted with up to two substituents each independently selected from the group consisting of aryl, aryloxy and cyano;

said substituted C_{1-6} alkyl is C_{1-6} alkyl being substituted with a member selected from the group consisting of C_{3-6} cycloalkyl, pyridinyl, pyridinyloxy, Ar, benzimidazolyl, indolyl, isoxazolyl being optionally substituted with phenyl, 3-oxo-1,2,4-triazolo[4,5-a]-pyridin-2(3H)-yl, a radical of formula ArY—, a radical of formula R^9O- and a radical of formula



(c)

Y being O, S, NH, —CONH—,



R^9 being hydrogen, Ar C_{1-6} alkyl, C_{3-6} cycloalkyl, phenyl substituted with phenyl, or phenyl substituted with C_{1-6} alkyloxycarbonyl;

R^{10} being hydrogen or C_{1-6} alkyl; and

wherein Ar is phenyl optionally substituted with up to three substituents each independently selected from the group consisting of C_{1-6} alkyl, C_{1-6} alkyloxy, halo, trifluoromethyl, cyano, C_{1-6} alkylcarbonyl, nitro, amino and aminocarbonyl.

4,861,786

COMPOSITION FOR A STABLE VEIN COMPATIBLE INJECTABLE SOLUTION OF TORASEMIDE PROCESS FOR THE PREPARATION AND METHOD OF USE

Fritz Demmer, Hirschberg-Leutershausen; Werner Gruber, Birkenau, and Heinrich Woog, Laudenbach, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jul. 8, 1987, Ser. No. 71,201

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1986, 3623620

Int. Cl.[4] A61K *31/64*

U.S. Cl. 514—347 **19 Claims**

1. A composition for an aqueous, sterile, alkaline pharmaceutically active and vein-compatible solution of torasemide for injection in mammals for inhibition of inflammation or promotion of diuresis, comprising 2–40 mg/ml torasemide or a physiologically acceptable salt thereof in a physiologically compatible alkaline buffer of pH 9.3–9.9 and with a buffer capacity of up to 0.1 val/liter, together with an organic solvent substantially free of aldehyde or ketone wherein the organic solvent contains less than 30 ppm aldehyde in an amount of from 5 to 20% by weight selected from the group consisting of at least one of polyethylene glycol in a 100–1500 molecular weight range, polypropylene glycol in a 150–1000 molecular weight range, glycerol, propylene glycol, ethanol and propanol wherein the composition is stored in an oxygen-free atmosphere or in the presence of a physiologically compatible reducing agent.

4,861,787

NEMATICIDAL COMPOSITIONS

Ernst Beriger, Allschwil, Switzerland; Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, and Robert Nyfeler, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

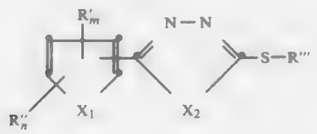
Continuation of Ser. No. 95,728, Sep. 14, 1987, abandoned. This application Oct. 25, 1988, Ser. No. 263,961

Claims priority, application Switzerland, Sep. 26, 1986, 3870/86

Int. Cl.[4] C07D *417/04, 413/04*; A01N *43/82*

U.S. Cl. 514—363 **9 Claims**

1. A compound of the formula



in which

R′ is methyl, chlorine, bromine or methoxy;

R″ is methyl, chlorine or bromine; and

R‴ is C_1–C_3-alkyl that is substituted by 1 to 3 fluorine atoms, and

m is 0 or 1,

n is 0 or 1, X_1 and X_2 independently of the other, is oxygen or sulfur.

4,861,788

ANTIBACTERIAL 1-NORMON-2-YL-HETEROCYCLIC COMPOUNDS

Norman H. Rogers, Horsham; Graham Walker, Guildford; Michael J. Crimmin, Horsham, and Peter J. O'Hanlon, Redhill, all of England, assignors to Beecham Group plc, Middlesex, England

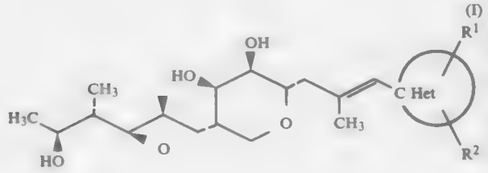
Continuation of Ser. No. 582,832, Feb. 23, 1984, abandoned. This application Jan. 30, 1987, Ser. No. 8,893

Claims priority, application United Kingdom, Feb. 25, 1983, 8305316

Int. Cl.[4] A61K *31/41*; C07D *417/14, 413/14*

U.S. Cl. 514—364 **7 Claims**

1. A compound of formula (I):



(I)

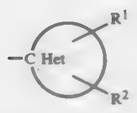
wherein



is a tri-valent, 5-membered heterocyclic group having a 6-π electron system, the five ring atoms being

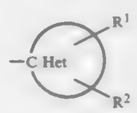
two carbon atoms, two nitrogen atoms and one atom selected from oxygen and sulphur,

and R^1 is a substitutent on a carbon or nitrogen of



selected from C_{1-20} alkyl, C_{2-8} alkenyl, phenyl, C_{1-4} alkylene) phenyl and a 5 or 6 membered heterocyclic ring having from 1 to 3 heteroatoms each selected from oxygen, nitrogen and sulphur, each of which may be substituted or unsubstituted; hydrogen and C_{3-7} cycloalkyl,

and, where appropriate, R^2 is a substituent on a carbon or nitrogen of



and when present is the same or different than R^1 and is selected from C_{1-20} alkyl, C_{2-8} alkenyl, phenyl, (C_{1-4} alkylene) phenyl and a 5 or 6 membered heterocyclic ring having from 1 to 3 heteroatoms each selected from oxygen, nitrogen and sulphur, each of which may be substituted or unsubstituted; hydrogen and C_{3-7} cycloalkyl; and wherein, when either of R^1 or R^2 is a C_{1-20} alkyl or C_{2-8} alkenyl group, it may be substituted with up to two substituents selected from the group consisting of: halogen, carboxy, C_{1-6} alkoxy-carbonyl, carbamoyl, mono- or di-(C_{1-6}) alkylcarbamoyl, sulphamoyl, mono- and di-(C_{1-6}) alkylsulphamoyl, amino, mono- and di-(C_{1-6}) alkylamino, C_{1-6} acylamino, ureido, C_{1-6} alkoxycarbonylamino, 2,2,2-trichloroethoxy-carbonylamino, phenyl, a 5 or 6 membered heterocyclic ring containing from 1 to 3 heteroatoms each selected from oxygen, nitrogen and sulphur, hydroxy, C_{1-6} alkoxy, oxo, aroyl, 2-thenoyl, C_{1-6} alkylthio, C_{1-6} alkanesulphinyl, C_{1-6} alkanesulphonyl, hydroxyimino, hydrazono, benzohydroximoyl, 2-thiophenecarbohydroximoyl; when either of R^1 or R^2 is a phenyl, (C_{1-4} alkylene) phenyl or a 5 or 6 membered heterocyclic ring containing from 1 to 3 heteroatoms each selected from oxygen, nitrogen and sulphur, the phenyl and heterocyclic moieties may be substituted with up to two substituents selected from the group consisting of: halogen, C_{1-6} alkyl, C_{1-6} alkoxy, hydroxy, carboxy, C_{1-6} alkoxycarbonyl, carbamoyl, mono- or di-(C_{1-6}) alkyl carbamoyl, sulfamoyl, mono- and di-(C_{1-6})alkysulfamsyl, cyano, nitro, amino, mono- and di-(C_{1-6}) alkylamino, (C_{1-6}) acylamino, ureido, C_{1-6} alkoxycarbonylamino, 2,2,2-trichloroethoxycarbonylamino, C_{1-6} alkanoyl, C_{1-6} alkylthio, C_{1-6} alkanesulphinyl, and C_{1-6} alkanesulphonyl.

7. A method for treating mycoplasmal or bacterial infections in human and non-human animals comprising administering an effective non-toxic amount of a compound of formula (I) according to claim 1 to the sufferer.

4,861,789

DIHYDRO-INDENE-AMINE-DIHYDROOXAZOLES

John Berge, and Lee J. Beeley, both of Epsom, England, assignors to Beecham Group plc, Middlesex, England

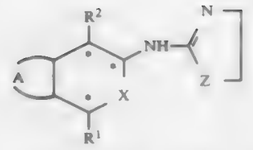
Filed May 4, 1987, Ser. No. 47,720

Claims priority, application United Kingdom, May 3, 1986, 8610709

Int. Cl.[4] C07D *277/18, 263/28, 233/50*; A61K *31/42*

U.S. Cl. 514—370 **23 Claims**

1. A compound of formula (I):



or a pharmaceutically acceptable acid addition salt and/or a pharmaceutically acceptable solvate thereof, wherein

A represents a residue of a benzene ring optionally having up to four substituents selected from the group consisting of halogen, C_{1-6} alkyl and C_{1-6} alkoxy;

R^1 and R^2 each independently represent a hydrogen atom or a C_{1-6} alkyl group;

X represents a bond or a moiety CHR^1 wherein R^1 is as defined above; and

Z represents O, NH or S.

4,861,790

USE OF AZUMOLENE FOR THE TREATMENT OF MALIGNANT HYPERTHERMIA

Ralph L. White, Jr., and Keith O. Ellis, both of Norwich, N.Y., assignors to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.

Filed Oct. 28, 1987, Ser. No. 114,462

Int. Cl.[4] A61K *31/42*

U.S. Cl. 514—374 **10 Claims**

1. A method for treatment of a malignant hyperthermic reaction, comprising administering, to a human or lower animal subject in need of said treatment, an amount of azumolene that is safe and effective for treatment of said malignant hyperthermic reaction.

4,861,791

DIHYDRO-OXAZOLYL SUBSTITUTED-PHENYL-ALIPHATIC LOWER ALKYL AND THEIR USE AS ANTIVIRAL AGENTS

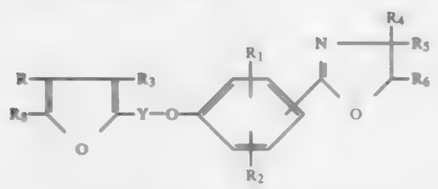
Guy D. Diana, Stephentown, and Philip M. Carabateas, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 751,348, Jul. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 624,302, Jun. 25, 1984, abandoned, which is a continuation-in-part of Ser. No. 527,583, Aug. 29, 1983, abandoned. This application Dec. 3, 1987, Ser. No. 128,251

Int. Cl.[4] A61K *31/42*; C07D *413/10, 413/12*

U.S. Cl. 514—374 **10 Claims**

1. A compound of the formula



wherein:

Y is an alkylene bridge of 3 to 9 carbon atoms optionally interrupted by one or two oxygen atoms, by cyclohexyl, or by an olefinic linkage;

R_1 and R_2 are selected from the group consisting of hydrogen, lower-alkyl, lower-alkenyl, halogen, nitro, lower-alkoxy, lower-alkylthio, difluoromethyl, trifluoromethyl, amino, lower-alkanoylamino, di-lower-alkylamino, hydroxy, lower-alkenoyl, lower-alkanoyl, hydroxymethyl and carboxy;

R, R_3, R_4, R_5 and R_6 are each hydrogen or alkyl or hydroxyalkyl of 1–3 carbon atoms; and

R_8 is hydrogen or lower-alkanoyl;

or a pharmaceutically acceptable acid-addition salt thereof.

4,861,792

HYDANTOIN DERIVATIVES FOR TREATING COMPLICATIONS OF DIABETES

Masayasu Kurono, Mie; Yasuaki Kondo, Kasugai; Takuji Yamaguchi, Kuwana; Kenji Miura, Kasugai; Toshinao Usui, Gifu; Naofumi Terada; Kyoichi Asano, both of Nagoya; Kuniharu Mizuno, Aichi; Akira Matsubara, Owari-asahi; Noriaki Kato, Kasugai; Kiichi Sawai, Funabashi; Ryoichi Ueno, Nagoya; Hiroshi Ozawa, Nagoya, and Masato Fukushima, Nagoya, all of Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Aichi, Japan

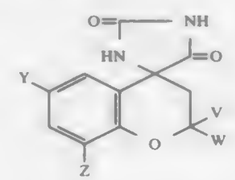
Filed Aug. 28, 1987, Ser. No. 90,729

Claims priority, application Japan, Aug. 28, 1986, 61-199924; Nov. 14, 1986, 61-272612; Apr. 8, 1987, 62-84577

Int. Cl.[4] A61K *31/415*; C07D *491/107*

U.S. Cl. 514—389 **9 Claims**

1. A hydantoin compound of the formula



wherein

one of V and W is a hydrogen atom and the other is halogenomethyl or $CONH_2$; Y is a halogen atom; and Z is NO_2, NH_2 or NHR, in which R is a carboxylic acyl group having 2 to 4 carbon atoms;

or a non-toxic salt thereof.

9. A composition for treating complications of diabetes, which comprises an effective amount of at least one compound of claim 1 and a pharmaceutical carrier or excipient therefor.

4,861,793

D-NOR-7-ERGOLINE DERIVATIVES HAVING ANTI-PARKINSON AND ANTIPSYCHOSIS ACTIVITY AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Luigi Bernardi; Laura Chiodini, and Aldemio Temperilli, all of Milan, Italy, assignors to Farmitalia Carlo Erba, S.p.A, Milan, Italy

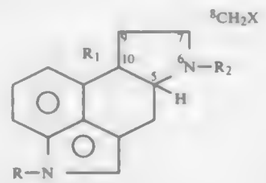
Filed Mar. 31, 1987, Ser. No. 32,447

Claims priority, application United Kingdom, Apr. 11, 1986, [illegible]

Int. Cl.[4] A61K *31/40*; C07D *209/56*

U.S. Cl. 514—410 **10 Claims**

1. A compound of the formula I



I

wherein R and R_1 are each hydrogen atoms, R_2 is a methyl

group and X is a cyano, benzyloxycarbamoylmethyl, 2,4-dioxoimidazol-1-ylmethyl or N-(3-dimethylaminopropyl)-N-(ethylcarbamoyl)carbamoyl group.

9. A method treating Parkinson's disease in a human, which comprises administering to a human in need of such treatment, an anti-Parkinson's disease effective amount of a compound of formula (I) as defined in claim 1.

10. A method of treating depression in a human, which comprises administering to a human in need of such treatment, an anti-depressive effective amount of a compound of formula (I) of claim 1.

4,861,794

3-SUBSTITUTED-2-OXINDOLE-1-CARBOXAMIDES AS INHIBITORS OF INTERLEUKIN-1 BIOSYNTHESIS

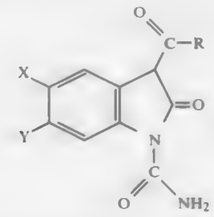
Ivan G. Otterness, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Apr. 13, 1988, Ser. No. 181,131

Int. Cl.[4] A61K *31/40*

U.S. Cl. 514—414 **45 Claims**

1. A method of inhibiting interleukin-1 biosynthesis in a mammal which comprises administering to a mammal in need thereof an interleukin-1 biosynthesis inhibiting amount of a compound of the formula



or a pharmaceutically-acceptable base salt thereof, wherein X is H, Cl or F; Y is H or Cl; and R is benzyl or thienyl.

4,861,795

TREATMENT OF CONDITIONS REQUIRING ENHANCED OXYGEN AVAILABILITY TO MAMMALIAN TISSUES

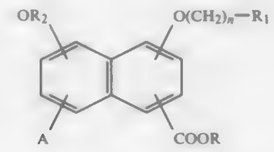
John T. Suh, Maple Glen; Robert G. Pendelton, Hatfield; Charles E. Pendley, II, Abington; Kin T. Yu, Collegeville; Paul R. Menard, North Wales, and Alain B. Schreiber, Fort Washington, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Filed Jun. 23, 1988, Ser. No. 211,486

Int. Cl.[4] A61K *31/21, 31/19, 31/195*

U.S. Cl. 514—510 **28 Claims**

1. A method of treatment for increasing the oxygen-delivery capacity of blood to the tissues of a mammal by increasing the levels of 2,3-diphosphoglyceric acid in said blood comprising oral or parenteral administration to said mammal in need thereof a therapeutically effective amount of a compound of the formula



wherein

R is H, alkyl, aryl or aminoalkyl;

R_1 is H, alkyl, amino, NR_3R_4 where R_3 and R_4 is H or alkyl;

R_2 is H, acyl, aminoacyl, alkyl, substituted alkyl wherein the substitutents are aryl, cycloalkyl, CONHR, phenoxy or alkoxyalkyl;

A is H, halo, CF_3, OH, aminoalkyl, aryl, acryl, or alkoxyalkyloxy; and

n is 0–6;

wherein said alkyl group in alkyl, aminoalkyl, substituted alkyl, alkoxyalkyl, and alkoxyalkyloxy contains up to 8 carbon atoms and said cycloalkyl group contains 3 to 10 carbon atoms or pharmaceutically acceptable salts thereof admixed with a pharmaceutically acceptable carrier.

4,861,796

GENTISIC ACID DERIVATIVES HAVING ANTIBIOTIC ACTIVITY

Axel Zeeck, Göttingen; Sabine Breiding-Mack, Gross Döhren; Susanne Grabley, Königstein/Taunus; Hartmut Voelskow, Hattersheim am Main, and Gerhard Seibert, Darmstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

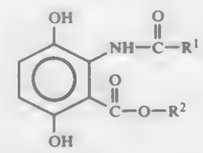
Continuation of Ser. No. 93,184, Sep. 4, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 286,046

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1986, 3630521

Int. Cl.[4] A61K *31/195*

U.S. Cl. 514—535 **16 Claims**

9. A compound according to Formula Ia



Ia

wherein R^1 is selected from the group consisting of a hydrogen group or a C_1–C_9-alkyl group, and R^2 is selected from the group consisting of a hydrogen group or a C_1–C_{10}-alkyl group.

10. A method of treating a mammal for a gram-positive bacterial infection, which comprises administering to said mammal a compound according to claim 9 in an amount effective to treat said bacterial infection.

4,861,797

LIQUID IBUPROFEN COMPOSITIONS AND METHODS OF MAKING THEM

Ronald T. Haas, West Windsor Township, Mercer County, N.J., assignor to Oratech Pharmaceutical Development Corporation, Princeton, N.J.

Filed Oct. 15, 1987, Ser. No. 110,184

Int. Cl.[4] A61K *31/19*

U.S. Cl. 514—557 **46 Claims**

1. An aqueous solution of ibuprofen, comprising:

a predetermined therapeutically effective amount of an ibuprofen composition dissolved in an aqueous medium comprising a predetermined amount of a bicarbonate composition, the therapeutically effective amount of the ibuprofen composition being such that there is approximately 25 mg. to 400 mg. of the ibuprofen composition per 5 ml. of the aqueous solution of ibuprofen.

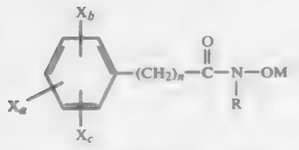
4,861,798

LIPOXYGENASE INHIBITORY COMPOUNDS

Kenneth M. Tramposch, Williamsville; Fred C. Zusi, and Suresh A. Marathe, both of Tonawanda, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 947,334, Dec. 29, 1986, Pat. No. 4,731,382. This application Dec. 22, 1987, Ser. No. 133,601
The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.
Int. Cl.[4] C07C *87/10*; A61K *31/185*
U.S. Cl. 514—575 19 Claims

1. A compound having the formula



III

wherein n is an integer from six to eleven; M is hydrogen or a pharmaceutically acceptable cation; R is (lower)alkyl unsubstituted or substituted by a carboxyl group; and X_a, X_b and X_c each independently represent hydrogen (lower)alkyl, (lower-)alkenyl, (lower)alkoxy, halo, nitro, hydroxy, amino, cyano, thio, unsubstituted or substituted aryl, unsubstituted or substituted aryl(lower)alkyl, (lower)alkylthio, acyl, acyloxy, acylamino, cycloalkyl having from 3 to 6 carbons, cycloalkyloxy wherein the cycloalkyl groups has from 3 to 6 carbons, (lower-)alkylamino and di(lower)alkylamino.

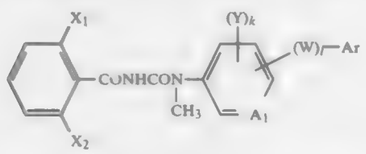
4,861,799

BENZOYLUREA COMPOUNDS AND PESTICIDES CONTAINING THEM

Takahiro Haga; Tadaaki Toki; Toru Koyanagi; Yasuhiro Fujii; Kiyomitsu Yoshida, and Osamu Imai, all of Kusatsu, Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

Filed Sep. 30, 1987, Ser. No. 102,855
Claims priority, application Japan, Oct. 3, 1986, 61-235857; Mar. 11, 1987, 62-56006; Jun. 5, 1987, 62-141214
Int. Cl.[4] A61K *33/00, 33/06*; C07C *127/22, 157/09, 101/00*
U.S. Cl. 514—594 9 Claims

1. A benzoylurea compound having the formula:



(I)

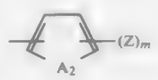
wherein each of X_1 and X_2 is hydrogen atom, a halogen atom or a methyl group, provided that X_1 and X_2 are not simultaneously hydrogen atoms, Y is independently a hydrogen atom, a halogen atom, a C_1–C_6 alkyl group which may be substituted by halogen, a $—CO_2R_1$ group wherein R_1 is a hydrogen atom, an alkali metal atom or a C_1–C_6 alkyl group, or a $—OR_1$ group wherein R_1 is as defined above, A_1



wherein Y is as defined above, W is an oxygen atom, a sulfur atom or



wherein R_1 is as defined above, k is an integer of from 1 to 3, l is 0 or 1, and Ar is



wherein Z is independently a hydrogen atom, a halogen atom, a C_1–C_6 alkyl group which may be substituted by halogen, a C_1–C_6 alkoxy group which may be substituted by halogen, a nitro group, a cyano group or a $—S(O)_nR_2$ group wherein R_2 is a C_1–C_6 alkyl group which may be substituted by halogen and n is 0, 1 or 2, A_2 is



wherein Z is as defined above, and m is an integer of from 1 to 3, or a salt thereof.

7. A pesticidal composition comprising a pesticidally effective amount of a benzoylurea compound as defined in claim 1 and an agriculturally acceptable adjuvant.

4,861,800

METHOD FOR ADMINISTERING THE DRUG DEPRENYL SO AS TO MINIMIZE THE DANGER OF SIDE EFFECTS

Donald A. Buyske, 18 Sherman Ave., Morris Plains, N.J. 07950

Filed Aug. 18, 1987, Ser. No. 86,795
Int. Cl.[4] A61K *31/135*
U.S. Cl. 514—646 7 Claims

1. A method for the treatment of Parkinson disease or Alzheimer disease in a human patient, comprising maintaining in contact with the skin of said patient a quantity of L-deprenyl or a salt thereof in a form permitting migration of said L-deprenyl or salt thereof through the skin of said patient into the bloodstream of the patient in an amount effective for said treatment and to produce a therapeutically effective amount of deprenyl within the blood supply to the brain of said patient.

4,861,801

TREATMENT OF DEPRESSION BY USING A FLUOROPHENACYLAMINE DERIVATIVE

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, France

Continuation-in-part of Ser. No. 68,702, Jul. 1, 1987, Pat. No. 4,835,315, which is a continuation of Ser. No. 867,409, May 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 443,934, Nov. 23, 1982, abandoned, which is a continuation of Ser. No. 252,506, Apr. 8, 1981, abandoned. This application Mar. 10, 1989, Ser. No. 321,356
Claims priority, application France, Mar. 23, 1981, 81 05771
Int. Cl.[4] A61K *31/135, 31/205*
U.S. Cl. 514—653 2 Claims

1. A process for the treatment of depression comprising administering to a human in need thereof an antidepressant amount of a compound selected from 1-(2-fluorophenyl)-2-tertiary-butylamino-1-ethanol and an addition salt thereof.

4,861,802

PREPARATION OF LOW MOLECULAR WEIGHT OLEFINIC HYDROCARBONS USING A PEROVSKITE CATALYST

Elrey L. McCann, Mendenhall, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 17, 1988, Ser. No. 156,907
Int. Cl.[4] C07C *1/04*
U.S. Cl. 518—717 11 Claims

1. In a process for the selective, catalytic gas phase preparation of low molecular weight olefins from mixtures of H_2 and CO, the improvement consisting of contacting and reacting a mixture of H_2 and CO, at a H_2/CO molar ratio within the range 0.3 to 1.5, at a space velocity of 1 to 100 minutes^{-1}, at a pressure of 1 to 2000 psia (6.894 kPa to 13.788 MPa), at a temperature within the range 200° to 400° C., in the presence of the catalyst of the empirical formula $AB_{1-a}Fe_aO_3$ wherein:

A is at least one of Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Th or U;

B is at least one of Al, Ga, In, Tl, Ge, Sn, Pb, Sc, Y, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Tc, Re, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag, Au, Zn, Cd or Hg; and

a is within the range 0.01 to 1, provided, however, in the aforesaid formula, A and B are chosen in concert in accordance with known oxidation state and ionic radius rules as required to produce the perovskite (ABO_3) crystal structure and allowing for deviation from the ideal stoichiometry of oxygen by ±0.5.

4,861,803

ORGANIC POLYMERS REINFORCED WITH RIGID ROD MICRO FILLERS

Robert B. Turner, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 878,451, Jun. 25, 1986, Pat. No. 4,701,745. This application Oct. 16, 1987, Ser. No. 109,548
The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—37 7 Claims

1. An organic bulk polymer having microscopically dispersed therein a high-melting, rigid polymer in an amount sufficient to measurably increase the tensile strength and/or elongation of the bulk polymer relative to a like bulk polymer which does not contain said rigid polymer.

4,861,804

COMPOUND TYPE SILICONE GEL MATERIAL

Motoyasu Nakanishi, Fujishi, Japan, assignor to Kabushiki Kaisha Cubic Engineering, Shizuokaken, Japan

Continuation-in-part of Ser. No. 814,726, Dec. 30, 1985. This application Aug. 17, 1987, Ser. No. 87,970
Claims priority, application Japan, Dec. 28, 1984, 59-277787
Int. Cl.[4] C08J *9/32, 9/22*
U.S. Cl. 521—54 5 Claims



1. A silicone gel composition useful as a shock absorbing material or as a sound and vibration-proof material consisting essentially of a blend of a silicone gel having a penetration of 50–200 as measured by JIS K 2530-1976, 50 g load, and fine hollow microspheres formed of a synthetic resin and each having an elastic shell, the content of said hollow microspheres in the silicone gel material being 1–4% by weight.

4,861,805

ANTISTATIC POLYURETHANE SHOE SOLE COMPOSITIONS

Jose V. Saavedra; Douglas L. Hunter, both of Lake Jackson; Steve A. Sims, Angleton; Donald M. Maschmeyer, and Thomas M. Knobel, both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 5, 1986, Ser. No. 938,221
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—105 18 Claims

1. An antistatic polyurethane shoe sole which is prepared by reacting in a closed mold a reaction mixture comprising

(a) a relatively high equivalent weight polyester polyol, or a relatively high equivalent weight polyether polyol containing about 5–25 weight percent repeating units derived from ethylene oxide and about 75–95 weight percent repeating units derived from a C_3–C_6 cyclic ether,

(b) a chain extender compound, in an amount from about 5 to about 40 parts per 100 parts of component (a),

(c) a sufficient amount of a blowing agent to provide a density of about 10 to about 65 pounds per cubic foot,

(d) a polyisocyanate, in an amount to provide about 0.9 to about 1.2 isocyanate groups per active hydrogen-containing group present in the reaction mixture, and

(e) a non-volatile ionizable metal salt, in an amount from about 0.01 to about 1 part per 100 parts by weight of component (a),

said reaction being conducted in the substantial absence of a carboxylic acid ester of 6–30 carbon atoms, a fatty acid salt and a phosphate ester compound.

4,861,806

PROCESS FOR CURING POLYISOCYANATE COATINGS IN THE PRESENCE OF A FERROCENIUM COMPOUND

Manfred Rembold, Aesch; Franciszek Sitek, Therwil; Werner Rutsch, Fribourg, and Godwin Berner, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Hawthorne, N.Y.

Filed Sep. 14, 1987, Ser. No. 95,726
Claims priority, application Switzerland, Sep. 19, 1986, 3755/86
Int. Cl.[4] C08G *18/08, 18/18, 18/16*
U.S. Cl. 522—66 11 Claims

1. A process for curing polyisocyanate coatings, which comprises adding a ferrocenium compound of formula I

$$[(R^1)Fe^{II}(R^2)]_a{}^+[X]^{a-}$$

in which a is 1, 2 or 3, R^1 is an uncharged carbocyclic unsubstituted aromatic ring, an uncharged carbocyclic substituted aromatic ring, an uncharged heterocyclic unsubstituted aromatic ring or an uncharged heterocyclic substituted aromatic ring R^2 is an unsubstituted or substituted cyclopentadienyl or indenyl anion and $[X]^{a-}$ is an anion which is F^-, Cl^-, Br^-, I^-, CN^-, NCO^-, NCS^-, CH_3COO^-, CF_3COO^-, $SO_4{}^{2-}$, $PO_4{}^{3-}$, NO_3^-, ClO_4^-, $[(phenyl)_4B]^-$, $C_6H_5SO_3^-$, $CH_3C_6H_4SO_3^-$ $CF_3C_6H_4SO_3^-$, $CH_3SO_3^-$, $CF_3SO_3^-$, $C_4F_9SO_3^-$, $C_6F_{13}SO_3^-$, $C_8F_{17}SO_3^-$, $C_6F_5SO_3^-$, BF_4^-, AlF_4^-, $AlCl_4^-$, TiF_6^-, PF_6^-, SbF_6^-, $SbCl_6^-$, GeF_6^-, AsF_6^-, $FeCl_4^-$, SnF_6^-, $SnCl_6^-$, or $BiCl_6^-$, as a latent curing catalyst to at least one polyisocyanate, applying the resulting mixture to a substrate as a coating, irradiating the coating with actinic light and then heating to 60°–200° C.

4,861,807

RADIATION-CROSSLINKABLE COMPOSITIONS

Gerhard Preiner, Burghausen; Friedrich Hockemeyer, Marktl, and Christa Burger, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 28, 1987, Ser. No. 137,897
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1987, 3708958
Int. Cl.[4] C08G 77/28
U.S. Cl. 522—99 3 Claims

1. A radiation-crosslinkable organopolysiloxane composition for preparing adhesive-repellent coatings containing an organopolysiloxane in which at least 95 mole percent of the siloxane units are those of the formulas

$HR^1C{=}CR^2COOR^3R_2SiO_{\frac{1}{2}}$, HSR^4SiRO and R^5_2SiO

in which R is selected from the group consisting of a monovalent hydrocarbon radical and a halogenated monovalent hydrocarbon radical, R^1 is selected from the group consisting of hydrogen and a halogenated phenyl radical, R^2 is selected from the group consisting of hydrogen and an alkyl radical having from 1 to 4 carbon atoms per radical, and R^3 is selected from the group consisting of a divalent hydrocarbon radical and a halogenated divalent hydrocarbon radical, R^4 is a divalent hydrocarbon radical, R^5 is selected from the group consisting of R and a hydrocarbon radical which is substituted by a group of the formula $HR^1C{=}CR^2COO{-}$, in which R^1 and R^2 are the same as above and at least 95 percent of the silicon-bonded oxygen atoms in the siloxane units having the HS group are present in the ≡SiOSi≡ group, and at least one organopolysiloxane having units selected from the group consisting of the formulas

(i) $R^6_3SiO_{\frac{1}{2}}$ and $R^6SiO_{3/2}$,
(ii) $R^6_3SiO_{\frac{1}{2}}$ and $SiO_{4/2}$,
(iii) $R^6_3SiO_{\frac{1}{2}}$, $R^6SiO_{3/2}$ and $SiO_{4/2}$, and
(iv) mixtures thereof,

in which 0.5 to 50 percent of the R^6 radicals are those of the formula

$HSR^4{-}$

where R^4 is the same as above, and the remaining R^6 radicals are the same as R^5.

4,861,808

GLASS/POLY (CARBOXYLIC ACID) CEMENT COMPOSITIONS

Richard W. Billington, London, and Jill A. Williams, Thorpe, both of England, assignors to Dentsply Limited, Weybridge, England

Division of Ser. No. 34,880, Apr. 6, 1987. This application Jul. 7, 1988, Ser. No. 216,049
Claims priority, application United Kingdom, Apr. 18, 1986, 8608546
Int. Cl.[4] A61K 6/08; C08K 3/34, 3/08, 3/40
U.S. Cl. 523—116 7 Claims

1. A prepolymer composition comprising one or more ethylenically unsaturated compounds, particulate filler, and strontium in which strontium is present as strontium fluoride.

4,861,809

FRICTION MATERIAL

Hiroyasu Ogawa; Kenji Shimazaki, and Kenji Niijima, all of Shizuoka, Japan, assignors to Toho Rayon Co., Ltd., Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,825
Claims priority, application Japan, May 29, 1987, 62-134168; Aug. 13, 1987, 62-202518
Int. Cl.[4] C08K 7/06; C08J 5/14
U.S. Cl. 523—149 20 Claims

1. A friction material comprising from about 0.5 -29 wt % of carbonaceous fibers with a bond nitrogen content of from about 14 to 21 wt %, the remainder being an auxiliary material and a thermosetting resin.

4,861,810

NEW RESIN MATERIALS BASED ON AMINES

Kenneth C. Dewhirst, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 871,950, Jun. 9, 1986, abandoned. This application Aug. 15, 1988, Ser. No. 233,863
Int. Cl.[4] C08G 59/50
U.S. Cl. 523—445 87 Claims

1. A polymer composition comprising lightly crosslinked linear molecules having the repeating structures prior to crosslinking of the general formula:

$$\dagger A{-}CH_2{-}\underset{OH}{CH}{-}CH_2{-}B{-}CH_2{-}\underset{OH}{CH}{-}CH_2\dagger$$

where A is selected from the group consisting of:

$$\left[\begin{matrix}X\\|\\-N-,\end{matrix}\right] \quad \begin{matrix}Y\\|\\-N-,\end{matrix} \quad \left[\begin{matrix}R'&R\\|&|\\-N-X-N,\end{matrix}\right] \quad \begin{matrix}R'&R\\|&|\\-N-Y-N-\end{matrix}$$

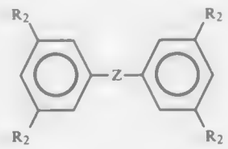
and mixtures thereof, and B is selected from the group consisting of:

$$-O-X-O-,\ O-Y-O,\ \left[\begin{matrix}X\\|\\-N-,\end{matrix}\right] \begin{matrix}Y\\|\\-N-,\end{matrix}$$

$$\left[\begin{matrix}R'&R\\|&|\\-N-X-N-,\end{matrix}\right] \begin{matrix}R'&R\\|&|\\N-Y-N-\end{matrix}$$

where R and R′ are selected from the group consisting of unsubstituted or inertly substituted C_1–C_{20} aliphatic, cycloaliphatic or aromatic hydrocarbyl groups, and wherein said repeating structures are lightly crosslinked such that between 1 and 50 of said repeating structures per 100 total repeating structures are crosslinked to repeating structures of other molecules, and where:

(a) "X" represents



where each R_2 is independently selected from H, Cl, Br or C_1–C_5 alkyl and Z is a gem-bivalent radical having 1 to 2 aromatic hydrocarbon rings and a gem-bivalent non-aromatic ring selected from the group consisting of a ring of 5 carbon atoms, a ring of 6 carbon atoms one of which carbon atoms can bear an oxo oxygen atom and a ring of 5 carbon atoms and one oxygen atom, said gem-bivalent non-aromatic ring being fused to said aromatic rings;

(b) "Y" represents a segment comprising stiff units (SU′) and optional flexible units (FU′) which stiff units and flexible units are interconnected;

(c) said stiff units, SU and SU′, are independently selected from the group consisting of substituted and non-substituted benzene, naphthalene, anthracene and phenanthrene rings, and non-interfering heterocyclic rings;

(d) said flexible units, FU and FU′, are independently selected from the group consisting of



and S; and

(e) the ratio of the number of stiff units to flexible units in said X segment (SU/FU) is equal to or greater than the ratio of the number of stiff units to flexible units in said Y segment (SU′/FU′).

4,861,811

DISPERSION OF LOW MOLECULAR WEIGHT POLYOLEFIN

Keiichi Yasuda, Joyo, Japan, assignor to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed Mar. 10, 1988, Ser. No. 166,307
Claims priority, application Japan, Mar. 25, 1987, 62-71209
Int. Cl.[4] C08K 3/20
U.S. Cl. 523—501 7 Claims

1. A nonaqueous resin dispersion wherein particles of a low molecular weight polyolefin (B) are finely and uniformly dispersed, said dispersion being obtained by the polymerization of styrene and/or (meth)acrylate having an alkyl group of C_1–C_8 carbon atoms (C) in the presence of 20 to 90 % by weight of a polyester resin (A) based on the total weight of (A), (B) and (C), and said low mlecular weight polyolefin (B).

4,861,812

COMPOSITIONS FOR PREPARING CEMENT-ADHESIVE REINFORCING FIBERS

James J. McAlpin, and Wai Y. Chow, both of Houston, Tex., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation-in-part of Ser. No. 846,666, Mar. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 816,032, Jan. 3, 1986, Pat. No. 4,710,540. This application Dec. 23, 1986, Ser. No. 941,979
Int. Cl.[4] C08K 3/00
U.S. Cl. 524—3 3 Claims

1. A fiber reinforced cement article comprising: cement having in intimate admixture therein from about 1 to about 10 percent by volume fibers composed of from about 90 to about 99 wt% of an olefinic polymer containing from about 1 wt% to about 10 wt% of a modifying agent which is the reaction product resulting from dry blending an alkylamino alkoxysilane with an acid modified polyolefin in an amount of from 50 to 150% of the stoichiometric amount required to react with the acid functionality of the acid modified polyolefin.

4,861,813

5-ARALKYL SUBSTITUTED 2H-BENZOTRIAZOLES IN STABILIZED COMPOSITIONS

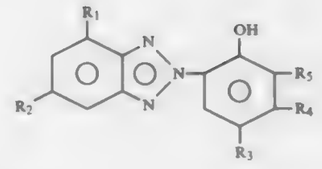
Raymond Seltzer, New City, and Roland A. E. Winter, Armonk, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 772,221, Sep. 3, 1985, Pat. No. 4,760,148. This application Apr. 1, 1988, Ser. No. 176,556
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—91 10 Claims

1. A stabilized composition which comprises

(a) an organic polymer substrate subject to light-induced deterioration, and

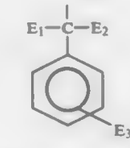
(b) 0.1 to 5% by weight of the stabilized composition of the compound of formula I



(I)

wherein

R_1 and R_2 are independently hydrogen, halogen, alkyl of 1 to 18 carbon atoms or a group of formula II



(II)

wherein E_1 and E_2 are independently hydrogen or alkyl of 1 to 4 carbon atoms and E_3 is hydrogen, halogen or alkyl of 1 to 4 carbon atoms, with the proviso that at least one of R_1 and R_2 must be a group of formula II;

R_3 is hydrogen, hydroxyl, alkyl of 1 to 12 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, phenyl substituted by one, two or three alkyl groups having 1 to 8 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, carboalkoxy of 2 to 9 carbon atoms, chlorine, carboxyethyl or a group of formula II,

R_4 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 12 carbon atoms, chlorine or hydroxyl, and

R_5 is hydrogen, hydroxyl, alkyl of 1 to 12 carbon atoms, chlorine, cycloalkyl of 5 to 6 carbon atoms or a group of formula II,

with the proviso that R_3, R_4 and R_5 cannot each be hydrogen at the same time, and that only one of R_3, R_4 and R_5 can be hydroxyl at the same time.

4,861,814

POLYOXYMETHYLENE COMPOSITIONS AND METHOD OF MANUFACTURING THE SAME

Nozomu Nakagawa, Fuji; Masaru Kubota, Fujinomiya, and Shuichi Chino, Fuji, all of Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Apr. 22, 1988, Ser. No. 184,861
Claims priority, application Japan, Apr. 22, 1987, 62-99329
Int. Cl.[4] C08K 5/17
U.S. Cl. 524—102 11 Claims

1. A polyoxymethylene composition comprising, (i) between 0.05 to 5% by weight, based on polyoxymethylene, of an antioxidant, and (ii) between 0.01 to 2% by weight, based on polyoxymethylene, of a basic compound containing, in the same molecule, at least one tertiary nitrogen atom and a metallic salt of carboxylic acid.

4,861,815

HYDROPHOBICIZED, EASILY-FLOWING THERMOPLASTIC POLYAMIDE CONTAINING MONOEPOXIDE

Klaus-Dieter Schultz; Rolf-Volker Meyer; Friedrich Fahnler; Rolf Dhein, and Dietrich Michael, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Akteingesellschaft, Leverkusen, Fed. Rep. of Germany

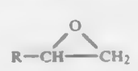
Filed Feb. 25, 1986, Ser. No. 832,661

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1985, 3508531

Int. Cl.[4] C08L *77/00*

U.S. Cl. 524—114 9 Claims

1. An easily flowing, hydrophobic, thermoplastic polyamide composition which comprises (i) linear thermoplastic polycondensate of lactam containing 6 to 12 carbon atoms, a polycondensate of a diamine and a dicarboxylic acid, or a mixture of both wherein the polycondensate has a relative viscosity of at least 1.8 as measured in a 1% solution in m-cresol at 25° C. and (ii) from 2 to 15% by weight, based on (i), of at least one monoepoxide corresponding to the formula:



wherein R represents a hydrocarbon moiety containing at least 4 carbon atoms.

4,861,816

POLYVINYL CHLORIDE RESIN COMPOSITION FOR POWDER MOLDING

Masanori Kobayashi; Isao Matsuura; Akira Wakatsuki, and Yu Shida, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Osaka, Japan

Filed Dec. 9, 1987, Ser. No. 132,887

Claims priority, application Japan, Dec. 29, 1986, 61-311269

Int. Cl.[4] C08K *5/09*

U.S. Cl. 524—204 1 Claim

1. A polyvinyl chloride resin composition for powder molding, excellent in resistance to mold staining and in amine resistance, characterized in that said polyvinyl chemical resin has blended therein 0.1–10 parts by weight of a stabilizer mixture of a barium salt of a carboxylic acid and a zinc salt of a carboxylic acid, each having a melting point not lower than 250° C., the barium and zinc metallic weight ratio being 1:5 to 5:1, and 0.1–10 parts by weight of a perchlorate ion type hydrotalcite compound per 100 parts by weight of polyvinylchloride resin, wherein the perchlorate ion type hydrotalcite compound has the formula:



wherein x is a number satisfying the equation $0<x\leqq 0.5$ and m represents a positive number of 5 or less, wherein

said barium salt of a carboxylic acid is selected from the group consisting of barium oxalate, barium malonate, barium maleate, barium tartrate, barium benzoate, barium p-tert-butyl benzoate, barium succinate, barium glutarate, barium adipate, barium pimelate, barium suberate, barium azelate, barium sebacate, barium paratartrate, barium malate, barium phthalate, barium isophthalate, barium terephthalate, barium salicylate, barium anthranilate and barium mandelate, and

said zinc salt of a carboxylic acid is selected from the group consisting of zinc oxalate, zinc malonate, zinc maleate, zinc tartrate, zinc benzoate, zinc p-tert-butyl benzoate, zinc succinate, zinc glutarate, zind adipate, zinc pimelate, zinc suberate, zinc azelate, zinc sebacate, zinc paratartrate and zinc malate.

4,861,817

THERMOPLASTIC COMPOSITIONS BASED ON GRAFTED RUBBER AND POLYESTER, A PROCESS FOR THEIR MANUFACTURE, AND ARTICLES OBTAINED THEREFROM

Michel Erpelding, Saint Maximin, and Jacques Vandome, Rantigny, both of France, assignors to Societe Chimique des Charbonnages, France

Continuation of Ser. No. 826,964, Feb. 7, 1986, abandoned. This application Feb. 23, 1988, Ser. No. 161,417

Claims priority, application France, Feb. 8, 1985, 85 01770

Int. Cl.[4] C08L *51/04, 51/06, 55/02*

U.S. Cl. 524—411 11 Claims

1. Thermoplastic composition based on a crystalline polyester and a modified vinylaromatic polymer consisting essentially of:

(1) from 80 to 90% by weight based on the total weight of the thermoplastic composition of at least one polymer phase (A) comprising at least one terpolymer produced by grafting (a) at least one vinylaromatic monomer and (b) at least one unsaturated nitrile onto (c) at least one rubber, said terpolymer being dispersed in a matrix of a copolymer comprising units derived from (d) at least one unsaturated nitrile and (e) at least one vinylaromatic monomer, the overall composition of the polymer phase (A) being such that it contains from 17 to 35 parts of unsaturated nitrile, from 10 to 60 parts of rubber, and from 10 to 60 parts of vinylaromatic monomer per 100 parts by weight of said phase and,

(2) from 10 to 20% by weight based on the total weight of the thermoplastic composition of at least one high molecular weight polybutylene terephthalate (B), the polybutylene terephthalate having a molecular weight between 80,000 and 150,000 weight average molecular weight,

the thermoplastic composition having a Vicat softening point above 113° C. and an Izod impact strength not below 330 J/m.

4,861,818

METHOD FOR THE PREPARATION OF STABLE AQUEOUS DISPERSIONS OF POLYMER BEADS AND THE USE OF THESE DISPERSIONS IN PHOTOGRAPHIC ELEMENTS

Daniel M. Timmerman; Jan J. Priem, both of Mortsel, and Wilhelmus Janssens, Aarschot, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Division of Ser. No. 580,272, Feb. 16, 1984, Pat. No. 4,614,708, which is a continuation of Ser. No. 442,021, Nov. 16, 1982, abandoned. This application Sep. 25, 1986, Ser. No. 911,465

Claims priority, application United Kingdom, Nov. 23, 1981, [illegible]

Int. Cl.[4] C08F *2/16*

U.S. Cl. 524—460 8 Claims

1. Method for the preparation of stable aqueous dispersions of finely divided solid spherical polymer beads having an average particle size between about 0.5 and about 5 μm and having a glass transition temperature of at least 40° C., comprising the steps of:

(A) dissolving in an aqueous solvent mixture of water and at least one water-miscible polar organic solvent chosen from the group consisting of lower alcohol, dioxan, acetone, acetonitrile, and dimethylformamide:

(1) at least one alpha,beta-ethylenically unsaturated monomer chosen from the group consisting of styrene, vinyltoluene, substituted vinyltoluene, chlorostyrene, alkyl methacrylate, substituted alkyl methacrylate, butadiene, isobutylene, chlorobutadiene, 2-methylbutadiene, and vinyl pyridine, and capable of forming a polymer that is soluble in the monomer(s) present in said aqueous solvent mixture but which is insoluble in said aqueous solvent mixture,

(2) a free radical-forming persulphate polymerization initiator that is soluble in the aqueous solvent mixture, and

(3) a graft-polymerizable polymer containing hydrophilic groups, said graft-polymerizable polymer being chosen from the group consisting of polyethylene oxide, low molecular weight polyvinyl alcohol, polyvinyl pyrrolidone, co(vinyl alcohol/vinyl acetate) containing 12 mol % of vinyl acetate units, co(vinyl alcohol/vinyl acetate) containing 40 mol % of vinyl acetate units, sodium or potassium salt of co(acrylic acid/styrene) containing 40 to 60 mol % of acrylic acid, co(vinyl acetate/crotonic acid), a reaction product of copoly(-styrene/maleic anhydride) with hydroxyalkyl methacrylate, a reaction product of copoly(styrene/maleic anhydride) with hydroxyalkyl acrylate, a reaction product of copoly(styrene/maleic anhydride) with aminoalkyl methacrylate, a reaction product of copoly(-styrene/maleic anhydride) with aminoalkyl acrylate, a reaction product of copoly(vinyl acetate/maleic anhydride) with hydroxyalkyl methacrylate, a reaction product of copoly(vinyl acetate/maleic anhydride) with hydroxyalkyl acrylate, a reaction product of copoly(vinyl acetate/maleic anhydride) with aminoalkyl methacrylate, a reaction product of copoly(vinyl acetate/maleic anhydride) with aminoalkyl acrylate, a reaction product of copoly(ethylene/maleic anhydride) with hydroxyalkyl methacrylate, a reaction product of copoly(ethylene/maleic anhydride) with hydroxyalkyl acrylate, a reaction product of copoly(ethylene/maleic anhydride) with aminoalkyl methacrylate, a reaction product of copoly(ethylene/maleic anhydride) with aminoalkyl acrylate, a reaction product of copoly(N-vinyl pyrrolidone/maleic anhydride) with hydroxyalkyl methacrylate, a reaction product of copoly(N-vinyl pyrrolidone/maleic anhydride) with hydroxyalkyl acrylate, a reaction product of copoly(N-vinyl pyrrolidone/maleic anhydride) with aminoalkyl methacrylate, a reaction product of copoly(N-vinyl pyrrolidone/maleic anhydride) with aminoalkyl acrylate, and co(styrene/maleic acid monosodium salt), and said graft-polymerizable polymer being capable of forming a graft polymer that remains soluble in said aqueous solvent mixture,

the weight ratio of said graft-polymerizable polymer to said monomer(s) being in the range from 1.5:100 to 8:100 and the weight ratio of polymerization initiator to monomer(s) from 0.1:100 to 5:100, and

(B) heating the solution obtained to a temperature from 50° C. to the reflux temperature thereof with continuous stirring to initiate by polymerization the simultaneous massive formation of homopolymer or copolymer from said monomer and precipitation thereof, and the formation of a small proportion of graft polymer.

4,861,819

WIPER BLADE COMPOSITIONS

Ares N. Theodore, Farmington Hills, and Paul C. Killgoar, Jr., Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 2, 1987, Ser. No. 115,801

The portion of the term of this patent subsequent to Feb. 24, 2004, has been disclaimed.

Int. Cl.[4] C08K *5/01*

U.S. Cl. 524—491 22 Claims

1. An improved elastomer composition comprising a substantially homogenous mixture of:

(a) 100 parts by weight of elastomer having a fully saturated backbone;

(b) curing agent for said elastomer in amount sufficient to crosslink said elastomer;

(c) reinforcing particulate filler;

(d) at least 20 parts by weight aliphatic oil having a number average molecular weight of between about 250 and about 1500, wherein at least 90% by weight of said aliphatic oil boils above about 200° C.; and

(e) at least 2 parts by weight modifying oil selected from the group consisting of:

(i) naphthenic oil having a number average molecular weight between about 300 and about 500 and a pour point between about −30° F. and about +25° F.;

(ii) paraffinic oil having a number average molecular weight between about 400 and about 1000 and a pour point between about 0° F. and about 10° F.; and

(iii) mixtures of (i) and (ii).

4,861,820

ADHESIVE COMPOSITION

Yasushi Toyoda; Saburo Mishiba, both of Niihama, and Toshiyasu Nishioka, Settsu, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Osaka, Japan

Filed Aug. 27, 1987, Ser. No. 89,767

Claims priority, application Japan, Aug. 28, 1986, 61-202153

Int. Cl.[4] C08K *3/20*

U.S. Cl. 524—510 2 Claims

1. An adhesive composition for adhering polyester fiber or aramid fiber to a rubber comprising

(A) 100 parts by weight of a copolymer latex mixture comprising of

(a1) 50 to 95% by weight (expressed as a solid content) of a latex of a butadiene-styrene-vinylpyridine copolymer comprising 35 to 65% by weight of butadiene, 8 to 57% by weight of styrene and 8 to 32% by weight of vinylpyridine and having an average particle size of 70 to 150 nm and a gel content of not more than 90% by weight and

(a2) 5 to 50% by weight (expressed as a solid content) of a latex of a carboxylated butadiene-styrene base copolymer comprising 1 to 20% by weight of a ethylenically unsaturated carboxylic acid, 25 to 50% by weight of butadiene, 30 to 74% by weight of styrene and 0 to 20% by weight of at least one copolymerizable comonomer selected from the group consisting of alkyl and hydroxyalkyl esters of ethylenically unsaturated carboxylic acid and acryl amide and having an average particle size of 70 to 300 nm and a gel content of not more than 70% by weight and

(B) 10 to 30 parts by weight of a resorcin-formalin resin.

4,861,821

COPOLYMERS BASED ON ETHYLENIC MONOMERS AND METHYLOLPHENYL ALLYL ETHERS

Jean Aubry, Bethune; Serge Cassiani-Ingoni, Ermont, and Remi Hauschild, Paris, all of France, assignors to Societe Chimique Des Charbonnages S.A., Paris La Defense, France

Filed Jun. 26, 1987, Ser. No. 66,600

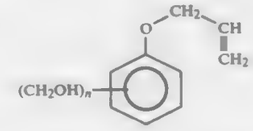
Claims priority, application France, Jun. 26, 1986, 86 09258

Int. Cl.[4] C08L *61/00*

U.S. Cl. 524—512 22 Claims

1. A free radical polymerized copolymer, soluble in at least one of an organic solvent and an aqueous medium,

of at least one mono-, bis- or trismethylolphenyl allyl ether (I) of formula:



n being from 1 to 3, and

of at least one ethylenic monomer, at least one of said ethylenic monomers being a (meth)acrylic monomer.

4,861,822

LATEXES AS BINDERS FOR CAST CEILING TILES

William H. Keskey, and Kenneth R. Meath, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 22, 1988, Ser. No. 146,947

Int. Cl.[4] C08K *3/34, 3/26;* **C08F** *2/10;* **C08L** *39/00*

U.S. Cl. 524—559 **6 Claims**

1. A latex binder for cast ceiling tile which comprises an alkali-swellable latex copolymer comprising (i) a C_3–C_8 α,β-ethylenically unsaturated carboxylic acid monomer in an amount from about 15 to about 60 weight percent based on the weight of the monomers in the copolymer; (ii) at least one of a copolymerizable nonionic vinyl monomer in an amount from about 45 to about 30 weight percent based on the weight of the monomers in the copolymer; and (iii) at least one of an additional nonionic vinyl monomer in an amount from about 10 to about 40 weight percent based on the weight of the monomers in the copolymer wherein in the process for preparing the latex, the nonionic vinyl monomer of (iii) is added to a polymerization vessel to polymerize the monomers from (i) and (ii), the addition and polymerization of monomers (i) and (ii) having previously started in the polymerization vessel prior to the addition of monomer (iii) wherein said latex is mixed with fillers and water to form a mixture, the mixture has a sharp yield point when measured with a recording Brookfield Viscometer.

4,861,823

THERMOSET COMPOSITION COMPRISING AROMATIC CYANATE ESTER OF ALLYL ETHER OF BISPHENOL

Shahid P Qureshi, Piscataway, N.J., assignor to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 932,879, Nov. 20, 1986, Pat. No. 4,774,282. This application Aug. 3, 1988, Ser. No. 205,676

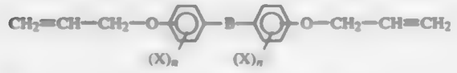
Int. Cl.[4] C08L *87/00*

U.S. Cl. 524—606 **15 Claims**

1. A curable composition comprising structural fiber, a thermoplastic polymer and a cyanate ester having the formula:

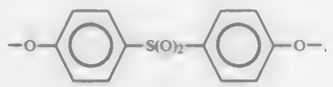
$$R\text{—}(O\text{—}C{\equiv}N)_m$$

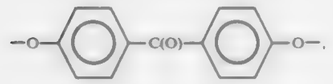
wherein m is an integer of from 2 to 5 and R is an aromatic radical, and at least one diallyl ether of a bisphenol having the following general formula:



wherein B is selected from the group consisting of

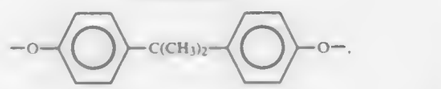
—$S(O)_2$—, —C(O)—, —$C(CH_3)_2$—, —CH_2—, —O—, —S—

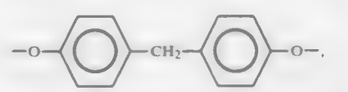






-continued





or B is a direct bond; x is independently selected from the group consisting of halogen and C_1–C_6 alkyl groups; and n is 0 to 4.

4,861,824

PROCESS FOR PREPARING ANTIRUST COMPONENTS WITH IMPROVED FLOWABILITY AND PENETRATION

Vincenzo Petrillo, Cirie'; Gianpiero Crotti, Ranica, and Giovanni Marchello, Aglie' Canavese, all of Italy, assignors to Sulfochem S.p.A., Italy

Filed Apr. 17, 1987, Ser. No. 40,575

Claims priority, application Italy, Aug. 7, 1986, 21444 A/86

Int. Cl.[4] C08K *3/14*

U.S. Cl. 524—745 **12 Claims**

1. Process for preparing an antirust composition for underbody and boxed parts of already painted and finished motor vehicles containing an in situ formed polymer, having a controlled and high viscosity as well as high basicity, and exhibiting good capillary penetration and rust strength, which process comprises the steps of:

preparing a reaction mass which is obtained by mixing a first mixture of about 84% by weight to about 99% by weight of a preformed product containing about 15% by weight to about 25% by weight of an emulsifying agent selected from one or more oil-soluble hydrocarbosulfonic and carboxylic acids, both being salified with an alkali-earth metal, about 50% by weight to about 65% by weight of an organic diluent selected from one or more lubricating oils and hydrocarbon solvents having a distillation range of from about 80° C. to about 300° C., and about 15% by weight to about 20% by weight of a preformed inorganic carbonate that is uniformly dispersed in said emulsifying agent, with a second mixture of about 0.8% by weight to about 6% by weight of one or more ethylenically unsaturated organic monomers, with about 0.2% by weight to about 10% by weight of water, and with about 0.05% by weight to about 1% by weight of a radicalic catalyst selected from an organic peroxide and hydroperoxide, wherein that water in said reaction mass ranges from about 1% by weight to about 70% by weight based on emulsifying agent weight;

heating said mixture from about 70° C. to its reflux temperature to allow organic monomer polymerization to occur in the presence of said catalyst;

heating the polymer containing endmixture at such a temperature and pressure to obtain an almost entire removal of the water present.

4,861,825

AQUEOUS URETHANE COATINGS

G. D. Ernst, Minnetonka, and Alan R. Schuweiler, St. Paul, both of Minn., assignors to Teanant Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 131,894, Dec. 11, 1987, Pat. No. 4,772,643. This application Sep. 14, 1988, Ser. No. 244,131

Int. Cl.[4] C08L *75/04*

U.S. Cl. 524—839 **13 Claims**

1. A method of preparing a primary amine terminated urethane oligomer in aqueous dispersion form to result in an ambient curing (room temperature curing, e.g. 70° F.) urethane polymer coating comprising the steps of:

A. producing a mono or polyketimine by reacting a monoketone and the primary amine functionality of a mono or polyfunctional primary amine compound that contains one other functional group bearing one active hydrogen atom that is reactive with isocyanate functionality, and;

B. producing an isocyanate terminated prepolymer of an equivalent weight per unreacted isocyanate group ranging from about 250 to about 5000, and preferably from about 750 to about 4000 by combining suitable polyfunctional hydroxyl bearing monomers and/or polymers with an excess of suitable aromatc and/or aliphatic polyfunctional isocyanate monomers, preferably difunctional isocyanate monomers, and subsequently terminating the prepolymer reactive isocyanate functionality by an essentially stoichiometric addition of the mono or polyketimine, based on the free hydrogen atom equivalency of the mono or polyketimine compound, whereby the addition reaction yields a mono or polyketimine terminated urethane oligomer substantially free of residual isocyanate functionality, and;

C. neutralizing to salt form part of the amine nitrogens of the oligomer with a volatile acid and dispersing in water both the neutralized and unneutralized oligomer, thereby hydrolyzing the ketimine to restore the primary amine functionality and to regnerate the ketone which is subsequently stripped, yielding an aqueous oligomer dispersion with only residual volatile organic content.

4,861,826

AQUEOUS POLYURETHANE ADHESIVE DISPERSIONS

Rainer Hummerich, Worms; Michael Kerber, Weinheim; Lothar Maempel, Bruehl, and Peter Weyland, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 15, 1987, Ser. No. 133,378

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1986, 3643791

Int. Cl.[4] C08L *75/12, 75/06*

U.S. Cl. 524—839 **6 Claims**

1. An aqueous dispersion of a polyurethane capable of forming adhesive bonds having high temperature strength and peel strength, in the absence of a crosslinking agent, which consists essentially of:

(a) at least one organic polyisocyanate, or at least one organic polyisocyanate containing up to 10 NCO equivalent % of at least one organic monoisocyanate;

(b) at least one polyester polyol having a molecular weight of from about 1,400 to 3,000;

(c) at least one difunctional amino alcohol having a molecular weight of from about 62 to 150, as a chain extender, said chain extender compound being used in an amount of from about 2 to 6 moles per mole of compound (b); and

(d) at least one compound containing ionic groups or groups which are capable of being converted into ionic groups, which compound is selected from the group consisting of diaminocarboxylic acids and diamines having at least one additional tertiary amine nitrogen atom, and the neutralized or quaternized salts thereof, wherein said compound is used in such an amount that said polyurethane contains 0.07 to 1 meq of ionic groups per gram of polyurethane.

4,861,827

CONTINUOUS PROCESS FOR THE PRODUCTION OF HIGH IMPACT POLYSTYRENE USING NON-ACID FORMING INITIATORS

Jose M. Sosa, Big Spring, and Jeffrey Morris, Roanoke, both of Tex., assignors to Fina Technology, Inc., Dallas, Tex.

Filed Dec. 24, 1987, Ser. No. 138,089

Int. Cl.[4] C08F *279/02, 4/04*

U.S. Cl. 525—54 **13 Claims**

1. A continuous process for producing high impact polystyrene, comprising:

polymerizing a mixture of at least one vinyl-aromatic monomer and a rubber in a polymerization reactor, said polymerization being initiated by a free radical initiator which decomposes to form at least one initiating radical and substantially only non-acidic decomposition by-products;

feeding said mixture to a pre-heater to heat said mixture and produce a heated mixture;

feeding said heated mixture to a devolatilizer to remove volatile components including some unreacted monomer and said non-acidic decompositon by-products of the free radical initiator from said heated mixture, thereby producing a high impact polystyrene; and

feeding said volatile components as a recycle stream to said polymerization reactor;

wherein introduction of the non-acidic decomposition by-products in the recycle stream into the polymerization reactor does not inhibit polymerization of the vinylaromatic monomer; and

wherein the non-acidic decomposition by-products do not react with the free radical initiator to inhibit polymerization of the vinylaromatic monomer.

4,861,828

TOUGHENED THERMOPLASTIC POLYARYLATE-POLYAMIDE COMPOSITIONS

Marion G. Waggoner, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 6, 1987, Ser. No. 35,005

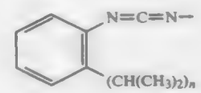
Int. Cl.[4] C08L *67/02, 77/00*

U.S. Cl. 525—66 **27 Claims**

1. A polyarylate composition consisting essentially of:

(a) 10–60 weight percent of at least one polyamide resin;

(b) 0.05–1 weight percent of at least one polycarbodiimide having a number average molecular weight greater than (2,000) and containing units of the formula,



where n has an average value of about 3,

(c) a complemental amount of at least one polyarylate resin, which is the reaction product of at least one compound selected from dihydric phenols and derivatives thereof, and at least one compound selected from aromatic acids and derivatives thereof, and

(d) 0–20 weight percent of an elastomeric modifier, with the above weight percents based on the total weight of components (a), (b), (c), and (d) of the composition.

4,861,829

THERMOPLASTIC POLYCARBONATE MOULDING MATERIALS

Hans-Jürgen Kress; Winfried Paul, both of Pittsburgh, Pa.; Horst Peters, Leverkusen, Fed. Rep. of Germany; Christian Lindner, Cologne, Fed. Rep. of Germany, and Josef Buekers, Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 933,250, Nov. 21, 1986, abandoned. This application Mar. 28, 1988, Ser. No. 174,071

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1985, 3543119; European Pat. Off., Nov. 20, 1986, 86116069; Japan, Nov. 27, 1986, 61-280914

Int. Cl.[4] C08L *69/00, 83/10*

U.S. Cl. 525—92 **10 Claims**

1. A thermoplastic moulding material consisting of

A. 40 to 95 parts by weight, relative to the sum of the weight of A.+B., of polydiorganosiloxane-polycarbonate block copolymer, with an average molecular weight $\overline{M}_w$ of 10,000 to 200,000 and containing between about 75% by weight and 99% by weight of aromatic carbonate struc-

tural units and containing between 1% by weight and 25% by weight of diorganosiloxy units, the block copolymers, starting from α,ω-bishydroxy-aryloxy terminal group-containing polydiorganosiloxanes, being prepared with a degree of polymerization P_n from 5 to 100, and

B. 5 to 60 parts by weight, relative to the sum of the weight of A.+B., of a randomly constructed copolymer from 95 to 70% by weight of a vinyl aromatic selected from styrene, α-methylstyrene, nuclear-substituted styrenes and mixtures thereof, and 5 to 30% by weight of maleic anhydride.

4,861,830

POLYMER SYSTEMS SUITABLE FOR BLOOD-CONTACTING SURFACES OF A BIOMEDICAL DEVICE, AND METHODS FOR FORMING

Robert S. Ward, Jr., Lafayette, Calif., assignor to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 507,517, Jun. 24, 1983, Pat. No. 4,675,361, which is a continuation-in-part of Ser. No. 385,813, Jun. 7, 1982, abandoned, and a continuation-in-part of Ser. No. 472,189, Mar. 4, 1983, abandoned, which is a continuation-in-part of Ser. No. 385,813, Jun. 7, 1982, abandoned, which is a continuation of Ser. No. 278,664, Jun. 29, 1981, abandoned, which is a continuation of Ser. No. 125,845, Feb. 29, 1980, abandoned. This application Jun. 22, 1987, Ser. No. 65,416

The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.

Int. Cl.⁴ C08L *75/00, 83/10, 83/12*

U.S. Cl. 525—92 **61 Claims**

1. In a method of forming a thermoplastic modified solid polymer the steps of thoroughly blending a minor portion of a thermoplastic polymer additive throughout a major portion of base polymer, whole said polymer additive and base are in fluid form, to form a polymer admixture, said additive comprising an essentially linear first segmented copolymer chain; said additive characterized by a γ_c less than said base polymer and said segmented copolymer characterized by the presence of at least one polar hard segment having a glass transition temperature or crystalline melting temperature above 37° C., and a nonpolar soft block having a glass transition temperature or crystalline melting temperature below 37° C. with the proviso that said base polymer is not a polycarbonate of 4,4'-diphenyldimethylmethane.

4,861,831

PARTICULATE MULTIPHASE POLYMERS

Volker Damrath, Burscheid; Christian Lindner, Cologne, both of Fed. Rep. of Germany; Hans-Jürgen Kress, Pittsburgh, Pa., and Dieter Wittmann, Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 10, 1988, Ser. No. 154,849

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1987, 3704655

Int. Cl.⁴ C08F *8/00;* **C08L** *83/04*

U.S. Cl. 525—100 **4 Claims**

1. Particulate, multiphase polymers which have a core (A) and an overlying shell (B) wherein the core (A) is an organic, resinous polymer comprising polymerized olefinically unsaturated monomer units and having softening point temperatures of at least 30° C. and wherein the shell (B) is an organopolysiloxane.

4,861,832

FLEXIBLE EPOXY FILM FROM AN EPOXY RESIN REACTED WITH A KETIMINE/AMINE TERMINATED BUTADIENE/ACRYLONITRILE COPOLYMER BLEND

Michael L. Walsh, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Apr. 4, 1988, Ser. No. 176,896

Int. Cl.⁴ C08L *61/20, 63/02*

U.S. Cl. 525—113 **11 Claims**

1. A two-component epoxy resin composition comprising a mixture of:

A. an epoxy resin component, and

B. a hardener component for curing Component A comprising a mixture of a ketimine and an amine-terminated butadiene/acrylonitrile copolymer rubber in a weight ratio of ketimine to said copolymer rubber of 47.1 to 12.5:52.9 to 87.5.

4,861,833

EPOXIDE AND RUBBER BASED CURABLE COMPOSITIONS HAVING GOOD ADHESION DIRECT TO METAL

Anthony M. Chasser, Glenshaw, and Joseph M. Makhlouf, Mars, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 28, 1987, Ser. No. 101,700

Int. Cl.⁴ C08L *9/02, 9/06, 63/02*

U.S. Cl. 525—122 **13 Claims**

1. A one package, stable curable composition comprising:

(a) a nonfunctional polydiene;

(b) a polyepoxide;

(c) a vulcanization system comprising a sulfur containing material and a zinc containing material other than said sulfur containing material; and

(d) an anhydride containing material adapted to promote adhesion of the curable composition to metal, wherein the vulcanization system cures the nonfunctional polydiene and polyepoxide, and the anhydride contaning material remains essentially unreacted with the epoxide and is retreated in a manner to obtain dissolution of the anhydride containing material in the epoxide.

4,861,834

COMPOSITIONS OF ETHYLENE POLYMERS, AND METHOD FOR THE PREPARATION THEREOF

Joel Audureau, Noeux les Mines, and Edouard Piecuch, Beuvry les Bethune, both of France, assignors to Societe Chimique des Charbonnages S.A., France

PCT No. PCT/FR86/00438, § 371 Date Oct. 6, 1987, § 102(e) Date Oct. 6, 1987, PCT Pub. No. WO87/03888, PCT Pub. Date Jul. 2, 1987

PCT Filed Dec. 19, 1986, Ser. No. 97,587

Claims priority, application France, Dec. 24, 1985, 85 19117

Int. Cl.⁴ C08L *23/26, 23/18, 23/10, 23/04*

U.S. Cl. 525—194 **8 Claims**

1. Process for manufacturing compositions by modification of a polymer (A) containing at least 80 mol% of units derived from ethylene and at most 20 mol% of units derived from at least one α-olefin having from 3 to 12 carbon atoms, by means of a modifying agent consisting at least one free-radical initiator brought into contact with said polymer (A), at a temperature above the melting point of said polymer (A) for a time longer than or equal to one tenth of the half-life of the initiator at a temperature above the melting point of said polymer (A), characterized in that the free-radical initiator, prior to being brought into contact with the polymer (A), is dispersed in at least one polymer phase (B) comprising at least one polymer containing at least 90 mol% of units derived from at least one α-olefin having from 3 to 12 carbon atoms and at most 10 mol% of units derived from ethylene, said phase (B) being present in an amount such that its proportion in the resulting composition is between 0.2 and 10% by weight.

4,861,835

POLYMER BLEND COMPOSITION SUITABLE AS OPTICAL MATERIAL

Kazuhiko Maeda, Tokyo; Taku Yamauchi, Kamifukuoka, and Toshio Koishi, Sakado, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Dec. 22, 1987, Ser. No. 136,714

Claims priority, application Japan, Dec. 23, 1986, 61-305279

Int. Cl.⁴ C08L *27/18;* **G02B** *6/16*

U.S. Cl. 525—200 **10 Claims**

1. A polymer blend composition, consisting essentially of a blend of 2–80 wt % of a first polymer, which is an acrylic ormethacrylic ester base polymer, and the balance of a ymer which is a ternary copolymer of 2–5 mol % of hexafluoroacetone, 5–60 mol % of tetrafluoroethylene and the balance of vinylidene fluoride.

4,861,836

NOVEL, IODINE-CONTAINING COMPOUND, PREPARATION THEREOF AND BLOCK COPOLYMER COMPRISING THE SAME

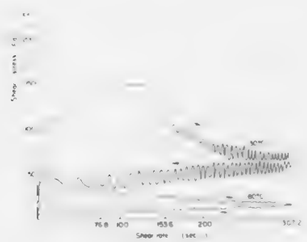
Masayoshi Tatemoto; Yuji Yutani, and Koji Fujiwara, all of Osaka, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Dec. 22, 1987, Ser. No. 136,916

Claims priority, application Japan, Dec. 23, 1986, 61-310397; Dec. 23, 1986, 61-310398

Int. Cl.⁴ C08F *214/16*

U.S. Cl. 525—276 **2 Claims**



1. A block copolymer having a number average molecular weight of from 1×10^3 to 1×10^6 comprising at least two types of blocks in a molecule wherein at least one block is a homopolymeric or random copolymeric block comprising at least one block selected from the group consisting of:

(a) a block consisting of least two repeating units selected from the formulae:

$$-(CH_2CF_2CF_2O)_a-$$

$$-(CHClCF_2CF_2O)_b-$$

$$-(CCl_2CF_2CF_2O)_c-$$

$$-(CHFCF_2CF_2O)_d-$$

$$-(CFClCF_2CF_2O)_e-$$

$$-(CF_2CF_2CF_2O)_f-$$

a, b, c, d, e and f are each 0 or a positive integer and satisfy the following equations:

$$2\leqq a+b+c+d+e+f\leqq 200 \text{ and}$$

$$1\leqq a+c+d+f,$$

(b) a block consisting of the repeating units of the formula:

$$\begin{array}{l} CF_3 \\ | \\ -(CFCF_2O)_p-(CF_2CF_2O)_q-(CF_2O)_r- \end{array}$$

wherein p, q and r are each 0 or a positive integer and satisfy the following equations:

$$2\leqq p+q+r\leqq 200 \text{ and}$$

$$1\leqq p+q,$$

(c) a block consisting of the repeating units of the formula:

$$\begin{array}{l} \quad\quad\quad\quad R_{f1} \\ \quad\quad\quad\quad | \\ -(CF_2CF_2)_k-(CF_2CF)_m- \\ \quad\quad\quad\quad | \\ \quad\quad\quad\quad (OCF_2CF)_n-OR_{f2} \end{array}$$

wherein R_{f1} and R_{f2} are the same or different and C_1–C_3 perfluoroalkyl, k and m are each a positive integer and satisfy the equations:

$$2\leqq k+m\leqq 50 \text{ and}$$

$$0.2\leqq m/(k+m),$$

and n is an integer of 0 to 10, and

(d) a block consisting of repeating units of the formula:

$$-(CF_2CFCl)_x-$$

wherein x is an integer of 2 to 11,

and at least one block is a homopolymeric or random copolymeric block consisting of repeating units of the formula:

$$-(CF_2CXY)-$$

wherein X is hydrogen or fluorine, Y is hydrogen, chlorine, fluorine, difluoromethyl or C_1–C_8 perfluoroalkyl or perfluoroalkoxyl provided that when the former block consists of the repeating unit (d) alone, the combination of X=fluorine and Y=chlorine is excluded, wherein the content of the latter block is 1 to 95 % by weight based on the total weight of the block copolymer.

4,861,837

SHAPED ARTICLE FORMED FROM A BLEND OF A POLY(ARYL ETHER) AND A POLYCARBONATE AND/OR A POLYARYLATE

Barry L. Dickinson, and Lloyd M. Robeson, both of Whitehouse Station, N.J., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 773,113, Sep. 6, 1985, Pat. No. 4,746,710. This application Apr. 18, 1988, Ser. No. 183,010

Int. Cl.⁴ C08L *69/00*

U.S. Cl. 525—394 **5 Claims**

1. A process which comprises steam sterilizing an article comprising a blend of a polycarbonate and a poly(aryl ether).

4,861,838

PROCESS FOR PRODUCTION OF QUASI-RANDOM COPOLYMERS FROM HOMOPOLYMERS

Yash P. Khanna, Morris, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jun. 22, 1987, Ser. No. 64,366

Int. Cl.⁴ C08L *77/00*

U.S. Cl. 525—432 **19 Claims**

1. A process for forming random copolymers which comprises the steps of:

(a) forming an intimate mixture of two or more polyamides and an amount of one or more acidic inorganic salts which is effective to form a random copolymer;

(b) heating said mixture for a period of time sufficient to produce the desired amount of random copolymer.

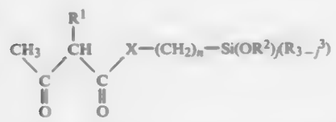
4,861,839

METAL CHELATE COMPOUND AND CURABLE COATING COMPOSITION THEREFROM

Katsumi Mizaguchi, Suita; Yoshitaka Okude, Hirakata; Hiroshi Miwa, Itami, and Hidefumi Okuda, Toyonaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jun. 15, 1988, Ser. No. 207,143
Claims priority, application Japan, Jun. 15, 1987, 62-148766
Int. Cl.[4] C08G *59/70*
U.S. Cl. 525—506 **5 Claims**

1. A metal chelate compound in which a chelate forming metal is coordinated with a ligand represented by the formula



(I)

wherein R^1, R^2 and R^3, which are the same or different, represent a hydrogen atom or an alkyl group having 1 to 3 carbon atoms, X represents —NR^4— (wherein R^4 represents a hydrogen atom or an alkyl group having 1 to 3 carbon atoms), an oxygen atom or a sulfur atom, n is an integer of 1 to 3, and j is an integer of 1 to 3.

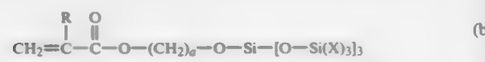
4,861,840

NOVEL SILOXANYL ACRYLIC MONOMER AND GAS-PERMEABLE CONTACT LENSES MADE THEREFROM

Drahoslav Lim, and Chidambar L. Kulkarni, both of San Diego, Calif., assignors to Barnes-Hind, Inc., Sunnyvale, Calif.

Filed Dec. 3, 1986, Ser. No. 937,250
Int. Cl.[4] C08F *30/08*
U.S. Cl. 525—326.5 **21 Claims**

1. A contact lens made of a copolymer of a compound having the formula:



wherein each X is independently a straight or branched-chain alkyl group containing 1–6 carbon atoms, or phenyl; a is an integer from 1–6; and R is hydrogen or methyl.

4,861,841

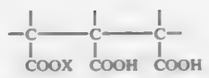
POWDER COATING COMPOSITIONS

Alastair R. Marrion, Near Morpeth, United Kingdom, assignor to International Paint public limited company, United Kingdom

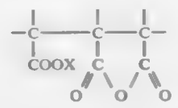
Filed Jul. 14, 1986, Ser. No. 885,831
Claims priority, application United Kingdom, Jul. 17, 1985, 8517971
Int. Cl.[4] C08F *16/26*
U.S. Cl. 525—327.3 **20 Claims**

1. A powder coating composition comprising a non-polymeric compound (A) containing carboxylic acid or anhydride functionality and a polymer (B) containing hydroxy functionality, the non-polymeric compound

(A) being solid at temperatures up to 50° C. and either containing at least two cyclic carboxylic anhydride groups per molecule or being a carboxylic acid containing a moiety of the formula



or a cyclic anhydride thereof containing a moiety of the formula



where X is a hydrogen atom or an alkyl group, with the proviso that non-polymeric compound (A) does not contain an olefinically unsaturated double bond in the alpha, beta- or beta, gamma-position with respect to any carboxylic acid or anhydride group, and polymer (B) being solid at temperatures up to 50° C. and being a synthetic resin having a glass transition temperature in the range 0° to 120° C. and containing at least two hydroxy groups per molecule and at least one amine group in its molecule to catalyse the reaction of the carboxylic acid or anhydride groups of non-polymeric compound (A) with the hydroxy groups of polymer (B).

4,861,842

CURE SYSTEM FOR SULFUR VULCANIZABLE RUBBER

Martin P. Cohen, Akron; Robert J. Brown, Cuyahoga Falls, and Norbert Majerus, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 28, 1988, Ser. No. 290,958
Int. Cl.[4] C08F *8/34*; C08C *19/20*
U.S. Cl. 525—329.3 **10 Claims**

1. A sulfur vulcanizable rubber composition comprising:

(a) an elastomer containing olefinic unsaturation and selected from the group consisting of natural rubber, neoprene, polyisoprene, butyl rubber, polybutadiene, styrene-butadiene copolymer, isoprene-styrene copolymer, methyl methacrylate-isoprene copolymer, acrylonitrile-isoprene copolymer, acrylonitrile-butadiene copolymer, EPDM or mixtures thereof;

(b) from about 0.50 to about 2.0 phr of a sulfenamide accelerator selected from the group consisting of N-oxydiethylene benzothiazole-2 sulfenamide, N-cyclohexyl-2-benzothiazole sulfenamide, N-t-butyl-2-benzothiazole sulfenamide and N-oxydiethylene-thiocarbamyl-N'-oxydiethylene sulfenamide;

(c) from about 0.10 to about 1.0 phr of a guanidine accelerator selected from the group consisting of diphenyl guanidine and di-ortho-tolylguanidine;

(d) from about 0.05 to about 1.0 phr of mercaptobenzothiazyl disulfide;

(e) from about 0.10 to about 1.0 phr of a thiuram accelerator selected from the group consisting of tetraethyl thiuramdisulfide, tetramethyl thiuram monosulfide, tetramethyl thiuramdisulfide;

(f) from about 0.75 to about 3.0 phr of a sulfur vulcanizing agent;

(g) from about 0.05 to about 0.50 phr of N-cyclohexylthiophthalimide;

(h) from about 1.0 to about 5.0 phr of a zinc compound selected from the group consisting of zinc oxide and zinc stearate; and

(i) from about 0.05 to about 1.0 phr of an activator of the formula: wherein R^1, R^2, and R^3 are independently alkyl radicals having 8 to 10 carbon atoms and M is selected from the group consisting of Cl, Br, CH_3SO_4 and HSO_4;

and wherein the sulfur vulcanizable rubber has a plasticity of 35 or less.

4,861,843

CARBOXYLATED PROPYLENE POLYMERS

Anne C. Udding, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 184,644, Apr. 22, 1988. This application Feb. 15, 1989, Ser. No. 310,164
Claims priority, application United Kingdom, Nov. 27, 1987, 8727775
Int. Cl.[4] C08F *8/42*
U.S. Cl. 525—373 **3 Claims**

1. An ionomer which is the reaction product of

(a) a carboxylated propylene homo- or copolymer prepared by reacting a thermoplastic propylene homo- or copolymer with an azidosulfonylbenzoic acid by mechanically mixing said polymer and said acid at a temperature of at least 180° C. in the presence of a radical scavenger and in the substantial absence of a free-radical initiator, and

(b) a metal compound of basic character based on a mono-, di- or trivalent metal.

4,861,844

CATIONIC CATALYSIS PROCESS FOR THE TREATMENT OF A POLYSILAZANE CONTAINING ON AVERAGE AT LEAST TWO ≡SIH GROUPS PER MOLECULE

Jean-Jacques Lebrun, Caluire, and Hugues Porte, Lyons, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Continuation of Ser. No. 878,281, Jun. 25, 1986, abandoned. This application Feb. 22, 1988, Ser. No. 161,397
Claims priority, application France, Jun. 26, 1985, 85 10033
Int. Cl.[4] C08G *77/08, 77/06*
U.S. Cl. 525—475 **19 Claims**

1. A process for the catalytic treatment of a polysilazane aminolysate, comprising the step of:

catalytically treating at least one polysilazane aminolysate with a catalytically effective amount of a strong acid catalyst to polymerize, copolymerize or molecularly rearrange said aminolysate at the silicon atom, the polysilazane containing on average at least two ≡SiH groups per molecule and the other organic radicals in the polysilazane that are bonded to the silicon or nitrogen atoms being hydrocarbon radicals free from alkene or alkyne unsaturation, the acid being used in proportion of from 1 ppm to 10,000 ppm relative to the weight of the starting polysilazane aminolysate and the polymerization temperature being from 20° C. to 180° C.

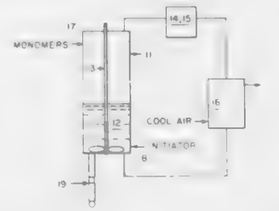
4,861,845

POLYMERIZATION OF FLUOROOLEFINS

Edgar W. Slocum, Wilmington, Del.; Aquiles C. Sobrero, Parkersburg, W. Va., and Robert C. Wheland, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 10, 1988, Ser. No. 166,484
Int. Cl.[4] C08F *2/34, 14/18*
U.S. Cl. 526—68 **8 Claims**

1. In a continuous, free-radical initiated process for preparing fluorinated polymers comprising polymerizing at least one gaseous fluoroolefin in a stirred polymerizer, the improvement consisting essentially of removing polymerization heat by recycling polymerizer gases through an external heat exchanger and the initiator used for polymerization is not capable of entering the recycle gas stream.



4,861,846

PROCESS FOR SIMULTANEOUSLY DIMERIZING ETHYLENE AND COPOLYMERIZING ETHYLENE WITH THE DIMERIZED PRODUCT

Kevin J. Cann, Belle Mead; Michael W. Chen, Bridgewater, and Frederick J. Karol, Belle Mead, all of N.J., assignors to Union Carbidae Corporation, Danbury, Conn.

Filed Mar. 22, 1985, Ser. No. 714,828
Int. Cl.[4] C08F *2/34, 210/16*
U.S. Cl. 526—75 **60 Claims**

1. A continuous process for simultaneously dimerizing ethylene to produce butene-1 and copolymerizing ethylene with the dimerized product in a fluidized bed which comprises continuously contacting ethylene in a fluid bed reactor, at a temperature of from 30° C. up to 115° C. and a pressure no greater than 7000 kPa, with a catalytically effective amount of a catalyst system comprising:

(a) a titanium tetraalkoxide having the formula

$Ti(OR)_4$

wherein each R is a hydrocarbon radical free from aliphatic unsaturation containing from 1 to 12 carbon atoms,

(b) a magnesium-titanium-based composition having the formula

$Mg_mTi(OR')_nX_p[ED]_q$

wherein

R' is an aliphatic or aromatic hydrocarbon radical containing from 1 to 14 carbon atoms, or COR'' wherein R'' is an aliphatic or aromatic hydrocarbon radical containing from 1 to 14 carbon atoms.

X is selected from the group consisting of Cl, Br, I, and mixtures thereof,

ED is an organic electron donor compound selected from the group consisting of alkyl esters of aliphatic and aromatic carboxylic acids, aliphatic ethers, cyclic ethers and aliphatic ketones,

m is 0.5 to 56,

n is 0, 1 or 2,

p is 2 to 116, and

q is 2 to 85

said magnesium-titanium-based composition being diluted with an inert carrier material, and

(c) a trialkylaluminum compound having the formula

AlR_3'''

wherein each R''' is a saturated hydrocarbon radical containing from 1 to 14 carbon atoms,

said titanium tetraalkoxide and said magnesium-titanium-based composition being employed in such amounts as to provide an atomic ratio of titanium in the titanium

tetraalkoxide to titanium in the magnesium-titanium-based composition of from 0.01:1 to 50:1, and

said trialkylaluminum compound being employed in an amount such as to provide a total aluminum:titanium atomic ratio of from 5:1 to 500:1.

4,861,847

CATALYST SYSTEM FOR USE IN OLEFINIC POLYMERIZATION

Bingquan Mao; Aichun Yang; Ying Zheng; Juxiou Yang, and Zhulan Li, all of Beijing, China, assignors to Beijing Research Institute of Chemical Industry and China Petrochemical Corp., both of Beijing, China

Division of Ser. No. 907,667, Sep. 15, 1986, Pat. No. 4,784,983. This application Jun. 24, 1988, Ser. No. 211,459

Claims priority, application China, Apr. 1, 1985, 85100997

Int. Cl.[4] C08F *4/64*

U.S. Cl. 526—125 **7 Claims**

1. A process for producing olefinic polymers which comprises polymerizing olefins by contacting the olefin monomer under gas or liquid-phase polymerization conditions with a catalyst system comprising:

(A) a catalyst component consisting essentially of about 1.5–6.0% by weight of titanium, about 10–20% by weight of magnesium, about 40–70% by weight of a halide selected from the group consisting of chlorine, bromine and iodine; about 5–25% by weight of a polycarboxylic ester selected from the group consisting of the esters of aliphatic, aromatics and alicyclic polycarboxylic acids; and about 0.1–2.5% by weight of an organic phosphorus compound selected from the group consisting of hydrocarbon esters of phosphoric acid and phosphorus acid wherein each hydrocarbon group has 1 to 6 carbon atoms, said catalyst component being prepared by a process having the following steps:

(a) dissolving in a solvent mixture a magnesium halide compound selected from the group consisting of magnesium halide, complexes of magnesium halide with water or alcohol and derivatives of magnesium halide wherein a halogen atom is replaced by a hydrocarboxyl group or a halohydrocarboxyl group; the solvent mixture consisting of an organic epoxy compound, selected from the group consisting of oxides of aliphatic olefins and diolefins, oxides of halogenated aliphatic olefins and diolefins, and glycidyl ethers all having 2 to 8 carbon atoms, and an organic phosphorus compound selected from the group consisting of alkyl phosphates, aryl phosphates, aralkyl phosphates, alkyl phosphites, aryl phosphites and aralkyl phosphites where alkyl has one to four carbon atoms and aryl has six to ten carbon atoms to form a homogeneous solution;

(b) mixing the homogeneous solution with a liquid titanium compound having the formula $TiX_n(OR)_{4-n}$ wherein X is halogen, R is an alkyl group being identical or different, and n is an integer of 0 to 4;

(c) adding at least one auxiliary precipitant selected from the group consisting of carboxylic acid anhydrides, carboxylic acids, ethers and ketones to form a precipitate;

(d) adding a polycarboxylic acid ester when a precipitate appears;

(e) separating the precipitate from the mixture and treating the separated precipitation with titanium compound, $TiX_n(OR)_{4-n}$ wherein X is halogen, R is a hydrocarbon group and may be identical or different, and n is an integer of from 0 to 4, or a mixture thereof in an inert diluent; and

(f) washing the treated precipitate with an organic inert diluent; in combination with

(B) an organic aluminum compound, having the formula:

$$AlR_{n'}X_{3-n'}$$

wherein R is hydrogen, or a hydrocarbonyl group having 1–20 carbon atoms; X is a halogen selected from the group consisting of chlorine, bromine and iodine; and n' is an integer of from 1 to 3.

4,861,848

POLYMERIZATION OF UNSATURATED HYDROCARBONS WITH AN INDUCTION PERIOD

Jean-Marie Basset; Michel Leconte, both of Villeurbanne; Jean Ollivier, Arudy, and Francoise Quignard, Lyons, all of France, assignors to Societe Nationale Elf Aquitaine, France

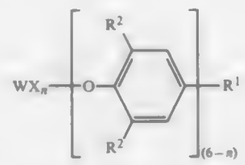
Filed Aug. 21, 1987, Ser. No. 88,045

Claims priority, application France, Aug. 22, 1986, 86 11978

Int. Cl.[4] C08F *4/78, 32/08*

U.S. Cl. 526—169 **21 Claims**

1. A process of polymerisation of dicyclopentadiene by reaction injection molding, with an initial induction period comprising, in the absence of a polymerisation moderator, combining in a mold dicyclopentadiene, a catalyst of the formula



where X is Cl or Br, n is 2 to 4, R^1 is H or an alkoxy group and R^2 is H or a branched C_3 to C_9 alkyl, and an organoaluminum co-catalyst, wherein (a) R^1 is a C_1 to C_8 alkoxy group, the R^2s are H and n=2 or 3, or (b) R^1 is H, the R^2s are branched C_3 to C_9 alkyls, and n is 3 or 4.

4,861,849

SODIUM THIOSULFATE AS PART OF A REDOX INITIATOR SYSTEM FOR THE POLYMERIZATION OF WATER-SWELLABLE POLYMERS

Fredric L. Buchholz, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 15, 1988, Ser. No. 144,150

Int. Cl.[4] C08F *4/32, 4/00*

U.S. Cl. 526—230 **13 Claims**

1. An improved process for producing a water-swellable polymer having excellent free swell capacity and relatively low water-soluble polymer content properties characterized by polymerizing an aqueous solution of an α,β-ethylenically unsaturated monomer and at least one crosslinking monomer, the improvement comprising using an effective amount of sodium thiosulfate as a component of a redox initiator system for the polymerization.

4,861,850

OPHTHALAMIC DEVICE FROM FLUORO-SILICON POLYMERS

Nick N. Novicky, Calgary, Canada, assignor to Progressive Chemical Research, Ltd., Calgary, Canada

Continuation-in-part of Ser. No. 880,668, Jun. 30, 1987, Pat. No. 4,743,106. This application Feb. 8, 1988, Ser. No. 153,811

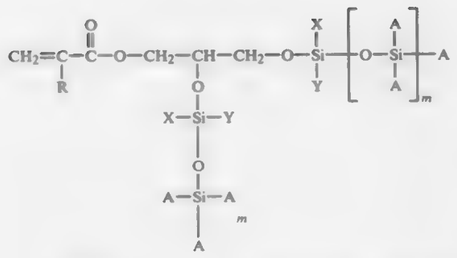
Int. Cl.[4] G02C *7/04*; C08F *230/08*

U.S. Cl. 526—243 **8 Claims**

1. An ophthlamic device formed of a copolymer plastic material which comprises:

from about 5 to about 65 weight percent of at least one organosiloxanylalkoxy ester monomer selected from the group consisting of

(1) an organosiloxanylalkoxy ester monomer of acrylic or methacrylic acid which is represented by the following structural formula:

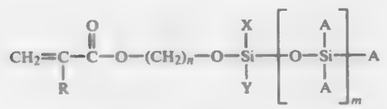


wherein X and Y are C_1 to C_6 alkyl, phenyl or groups of the following structure:



A is C_1–C_6 alkyl or phenyl, m being an integer from 1 to 5 and R is methyl or hydrogen; and,

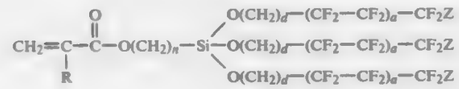
(2) an organosiloxanylalkoxy ester monomer of acrylic or methacrylic acid represented by the following structural formula:



n being an integer from 1 to 3, wherein A, X, Y, R and m are as defined above;

which are copolymerized with

from about 2 to 40 weight percent of at least one perfluoroalkyl ester monomer selected from the group consisting of perfluoroalkyl ester monomers of acrylic or methacrylic acid, said perfluoroalkyl ester monomer having the following structural formula:



wherein R and n are as defined above, d being an integer from 1 to 4, a being an integer from 1 to 10 and z is selected from the group consisting of fluorine, hydrogen and mixtures thereof;

which are copolymerized with

from about 2 to 40 weight percent of at least one organosulfone monomer selected from the group consisting of

an organosulfone monomer having the following structural formula:



wherein R_1 is selected from one of the following: wherein Q is C_1 to C_{20} alkyl, perfluoroalkyl or phenyl and g is an integer from 1 to 5;

said copolymer plastic material including

from about 10 to 70 weight percent of at least one hardening agent monomer, said hardening agent selected from the group consisting of alkyl ester monomers of acrylic, methacrylic and itaconic acid and mixtures thereof; namely, phenyl methacrylate, tetrahydrofurfuryl methacrylate, methyl acrylate, ethyl acrylate, propyl acrylate, cyclohexyl acrylate, phenoxyethyl acrylate, phenyl acrylate, tetrahydrofurfuryl acrylate, dimethyl itaconate, diethyl itaconate, dipropyl itaconate, dicylohexyl itaconate, diphenyl itaconate, vinyl benzene (styrene), divinyl benzene and mixture thereof;

said copolymer plastic material further including

from about 1 to 15 weight percent of at least one wettability agent selected from the group consisting of methacrylic acid, acrylic acid, 2-hydroxyethyl acrylate, 2-hydroxyethyl methacrylate, 2,3-dihydroxypropyl acrylate, 2,3-dihydroxypropyl methacrylate, N-vinyl 2-pyrrolidinone and mixtures thereof;

said copolymer plastic including

from about 1 to 18 weight percent of at least one difunctional cross-linking monomer selected from the group consisting of

ethyleneglycol dimethacrylate, diethyleneglycol dimethacrylate, triethyleneglycol dimethacrylate, tetraethylene glycol dimethacrylate, dimethacrylate siloxanyl ester monomer ethyleneglycol diacrylate, tetraethyleneglycol diacrylate, divinyl benzene, divinyl sulfone, trimethylolpropane trimethacrylate and mixtures thereof.

4,861,851

VINYLIDENE FLUORIDE-ACRYLIC ACID ESTER COPOLYMER, PROCESS FOR PRODUCING THE SAME AND COMPOSITION CONTAINING THE SAME

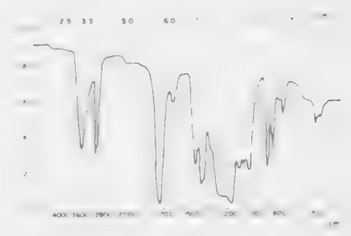
Toshio Miyabayashi; Nobuyuki Sakabe, and Shinichiro Zen, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,103

Claims priority, application Japan, Jan. 22, 1987, 62-12931

Int. Cl.[4] C08F *14/18*

U.S. Cl. 526—255 **14 Claims**



1. A substantially random, linear vinylidene fluoride-acrylic acid ester copolymer consisting essentially of:

(A) 5–85% by weight of a vinylidene fluoride unit and

(B) 15–95% by weight of an alkyl acrylate unit, an alkoxy-substituted alkyl unit or both of them, and having an intrinsic viscosity of 0.01–10 dl/g as measured at 30° C. in N,N-dimethylformamide, wherein said copolymer has a gasoline permeation coefficient which is 65% or less of a gasoline permeation coefficient of a material which is a blend of components (A) and (B) rather than a copolymer thereof.

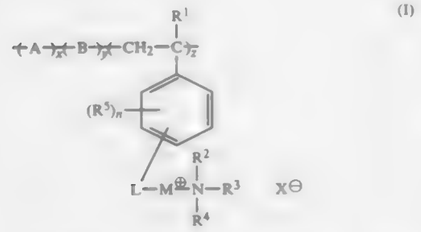
4,861,852

POLYMER MORDANT

Junichi Yamanouchi, and Masaharu Toriuchi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

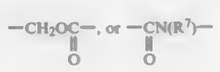
Filed Jul. 9, 1986, Ser. No. 883,661
Claims priority, application Japan, Jul. 9, 1985, 60-150810
Int. Cl.⁴ C08F 226/06
U.S. Cl. 526—263 **5 Claims**

1. A polymer mordant represented by the general formula (I):

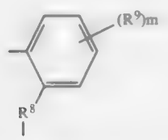


(I)

wherein A represents a monomer unit produced by copolymerization of copolymerizable monomers having at least two ethylenically unsaturated groups; B represents a monomer unit produced by copolymerization of copolymerizable ethylenically unsaturated monomers; R^1 represents a hydrogen atom or a C_{1-6} alkyl group L represents $—CH_2O—$, $—CH_2N(R^6)—$,



in which R^6 and R^7 each represents a hydrogen atom or an alkyl group; M represents



wherein R^8 represents an alkylene group having 1 to 6 carbon atoms; R^9 represents a C_{1-20} alkyl group, a substituted C_{1-20} alkyl group, a C_{1-20} alkoxy group, a C_{1-20} acylamino group, or a halogen atom,; and m represents an integer of 1 to 4; R^2, R^3 and R^4, which may be the same or different, each represents a C_{1-20} alkyl group or a C_{7-20} aralkyl group and at least two of R^2, R^3, and R^4 may be connected to each other to form a cyclic structure together with the nitrogen atom; R^5 represents a C_{1-20} alkyl group, substituted C_{1-20} alkoxy group, a C_{1-20} acylamino group, or a halogen atom, $X^\ominus$ represents an anion; x represents 1.0 to 60 mol%; y represents 0 to 79 mol%; z represents 20 to 99 mol%; and n represents an integer of 0, 1, or 2;

wherein substituted C_{1-20} alkyl groups represented by R^2, R^3, R^4, and R^5 are selected from the group consisting of an alkoxyalkyl group, a cyanoalkyl group, a halogenated alkyl group, an alkoxycarbonylalkyl group, and allyl group, a 2-butenyl group, and a propagyl group.

4,861,853

ISOCYANATE FUNCTIONAL POLYMERS

Brian C. Petrie, Berkeley, Calif.; Thomas W. Druetzler, Lynwood, and Rodney M. Harris, Chicago, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Dec. 27, 1985, Ser. No. 814,336
Int. Cl.⁴ C08F 26/02
U.S. Cl. 526—302 **4 Claims**

1. An isocyanate functional polymer which comprises the saturated, ungelled addition polymerization reaction product of:

(a) 1 to 100% by weight of at least one isocyanate functional ethylenically unsaturated monomer which comprises the reaction product obtained by the gradual addition of an ethylenically unsaturated monomer having a single active hydrogen to a diisocyanate selected from the group consisting of isophorone diisocyanate and 2,4 toluene diisocyanate wherein the final molar ratio of active hydrogen containing monomer to diisocyanate is essentially 1 to 1; and

(b) 0 to 99% by weight of at least one ethylenically unsaturated monomer which is free of active hydrogen functionality and which is copolymerizable with the ethylenically unsaturated isocyanate functional monomer.

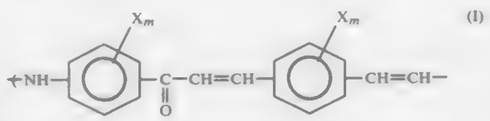
4,861,854

PHOTOSENSITIVE POLYIMIDE PRECURSOR

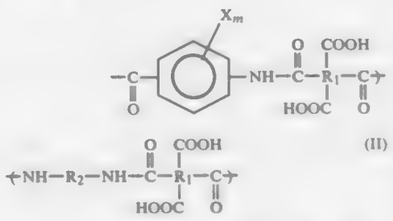
Akitoshi Sugio, Yokkaichi; Takao Kawaki, Tokyo; Makoto Kobayashi, Nagareyama; Katsushige Hayashi, Matsudo, and Masahito Watanabe, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 3,877, Jan. 16, 1987, abandoned. This application Jun. 1, 1988, Ser. No. 200,864
Claims priority, application Japan, Feb. 3, 1986, 61-20189
The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.
Int. Cl.⁴ C08G 16/00, 73/10
U.S. Cl. 528—125 **5 Claims**

1. A photosensitive polyimide precursor consisting essentially of the structural units (A) represented by the following general formula (I) and the structural units (B) represented by the following general formula (II), wherein the ratio of the molar quantity of said structural units (A) to the sum of the molar quantity of said structural units (A) and that of said structural units (B) is 0.01 or greater, and having a viscosity of 100 cP or above as measured at 25° C. in the state of a 10% by weight solution in N-methylpyrrolidone:



(I)



(II)

wherein R_1 represents a tetravalent aromatic hydrocarbon residue; R_2 represents a divalent aromatic hydrocarbon residue; X, identical or different, represents a halogen or an alkyl group; and m represents 0 or an integer from 1 to 4.

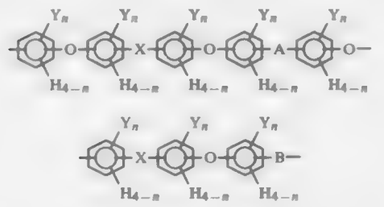
4,861,855

POLYAMIDE-IMIDE COMPOSITIONS FROM BISPHENOXYPHENYL DIAMINE TRICARBOXYLIC ANHYDRIDE AND TETRACARBOXYLIC DIANHYDRIDE

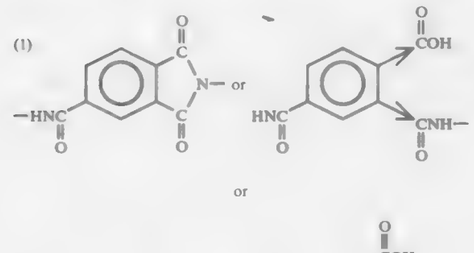
Ronald E. Bockrath, Oswego, and Bill W. Cole, Naperville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 31, 1987, Ser. No. 32,740
Int. Cl.⁴ C08G 73/10
U.S. Cl. 528—125 **35 Claims**

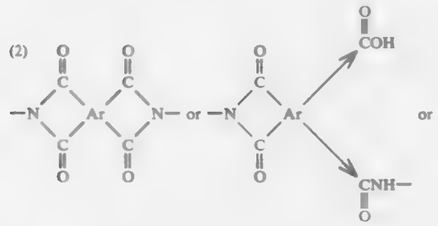
1. A polyamide-imide composition comprising recurring units corresponding to the formula



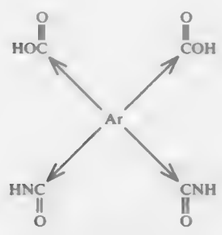
wherein each of the A and B moieties is independently



or



or



with →denoting isomerism and Ar being a tetravalent aromatic radical having each carboxyl group ortho to one other carboxyl group;

each Y is independently halogen or C_{1-6} alkyl;

each n is independently an integer of 0 to 4, inclusive;

and each X is independently a meta- or para-disposed stable linkage free of sulfone and amide groups, the A and B moieties of said composition providing about 5 to about 95 mole % (1) and about 95 to about 5 mole % (2) based on total moles of (1) and (2).

4,861,856

PROCESS FOR THE PREPARATION OF POLYKETONE AND POLY(KETONE-SULFONE) POLYMERS

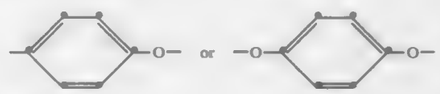
W. Ronald Darnell, Weber City, Va., and Winston J. Jackson, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 6, 1988, Ser. No. 240,642
Int. Cl.⁴ C08G 67/00
U.S. Cl. 528—125 **9 Claims**

1. Process for the preparation of a polyketone or poly(ketone-sulfone) containing at least 50 mole percent of monomer segments derived from an aromatic diacarboxylic acid and an aromatic compound, which comprises reacting at a temperature of about 0° to 150° C. until the desired degree of polymerization is achieved an aromatic dicarboxylic acid and an aromatic compound having the formula



wherein X^1 and X^2 represent direct bonds or X^1 and X^2 are independently selected from a direct bond, —O—, —S— or groups having the formula



and Z is



in the presence of a perfluoroalkanesulfonic acid in an amount wich is at least three times the theoretical amount of poly(ether-ketone) product and (1) an oxide of phosphorus, (2) a perhaloalkanoic anhydride or (3) a mixture of (1) and (2) in an amount of at least a total of two gram-moles of —P—O—P— unit and/or gram-moles of perhaloalkanoic anhydride per gram-mole of dicarboxylic acid reactant.

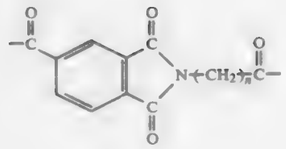
4,861,857

THERMOTROPIC POLYESTERIMIDE FROM N-CARBOXYALKYLENE TRIMELLITIMIDE HAVING EXCELLENT PROCESSIBILITY, A PROCESS FOR THEIR PRODUCTION AND THEIR USE FOR THE PRODUCTION OF MOLDINGS, FILAMENTS, FIBERS AND FILMS

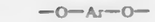
Hans-Rytger Kricheldorf; Ralf Pakull, both of Hamburg; Volker Eckhardt, and Hans-Rudolf Dicke, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,646
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1987, 3718396
Int. Cl.⁴ C08G 73/16
U.S. Cl. 528—170 **8 Claims**

1. Thermotropic polyesterimide which consists essentially of units corresponding to the following formulae



and



(II)

with or without



(III)

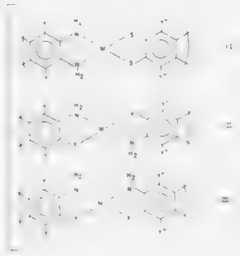
in which n is an integer of 3 to 12, Ar consists of 1,4-phenylene units or 4,4'-biphenylene units or mixtures thereof, up to 50 mol-% of these units being replaced by other C_6–C_{18} divalent aromatic radicals or mixtures thereof, in which 50 to 100 mol-% of the chain-extending bonds are coaxially or parallel opposed and 50 to 0 mol-% angled and which are unsubstituted or substituted by C_1–C_4 alkoxy groups or halogen atoms, with the proviso that the molar ratio of III to I is 0 to 4.0 and the molar ratio of I to II is 0.95 to 1.05.

4,861,859

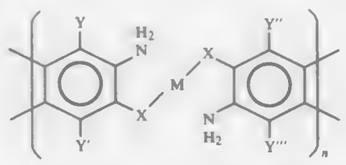
CONDUCTIVE POLYMERS OF TRANSITION-METAL COMPLEXES COORDINATED BY A DIAMINO-DICHALCOGEN-BENZENE COMPOUND

Oh-Kil Kim, Burke, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 28, 1988, Ser. No. 174,261
Int. Cl.[4] C08G *8/02*; H01B *1/00*
U.S. Cl. 528—210 **16 Claims**

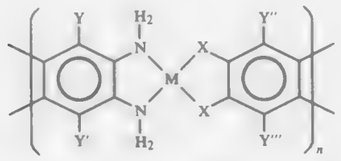


1. A polymer with the repeating unit of the formula:



where X is a chalcogen, M is a divalent metal, Y, Y', Y'' and Y''' are hydrogen or an alkyl group of thirty or less carbon atoms and n is the average number of repeating units of the polymer in the range from one to fifteen.

3. A polymer with the repeating unit of the formula:



where X is a chalcogen, M is a divalent metal, Y, Y', Y'' and Y''' are hydrogen or an alkyl group of thirty or less carbon atoms and n is the average number of repeating units of the polymer in the range from one to fifteen.

4,861,858

WHOLLY AROMATIC THERMOTROPIC POLYESTERS

Hans-Jakob Kock, Ludwigshafen; Bernd Hisgen, Limburgerhof; Michael Portugall, Wachenheim; Erhard Seiler, Ludwigshafen, and Gerd Blinne, Bobenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 12, 1988, Ser. No. 142,954
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1987, 3700821
The portion of the term of this patent subsequent to Jun. 14, 2005, has been disclaimed.
Int. Cl.[4] C08G *63/02, 63/18*
U.S. Cl. 528—193 **4 Claims**

1. A wholly aromatic thermotropic polyester based on
(A) from 30 to 60 mol % of 4-hydroxybenzoic acid,
(B) from 20 to 35 mol % of terephthalic acid and
(C) from 20 to 35 mol % of a mixture of
(C_1) trimethylhydroquinone and
(C_2) resorcinol,
the molar ratio of C_1:C_2 being within the range from 0.4:1 to 0.7:1 and the molar ratio of B:C within the range from 0.9:1 to 1.1:1.

4,861,860

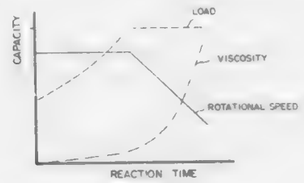
PROCESS FOR PRODUCING POLYESTER

Kohji Ohishi, Shizuoka; Minoru Akiyama, Fuji, and Ryuichi Sekita, Numatsu, all of Japan, assignors to Polyplastics Co., Ltd., Japan

Filed Nov. 3, 1988, Ser. No. 266,941
Claims priority, application Japan, Dec. 7, 1987, 62-309216
Int. Cl.[4] C08G *63/22*
U.S. Cl. 528—272 **3 Claims**

1. A process for producing a polyester comprising as the main structural unit any of the following components (1) to (3):
(1) a dicarboxylic acid residue and a dihydroxy compound residue,
(2) a hydroxy carboxylic acid compound residue, and

(3) a dicarboxylic acid residue, a dihydroxy compound residue and a hydroxy carboxylic acid compound residue,
by conducting a polycondensation reaction in its molten state while stirring it in such a way that the stirring rate is reduced



continuously in a stepless manner corresponding to an increase in the melt viscosity as the reaction proceeds so that the stirring load is substantially constant after the viscosity of the reaction system has reached an arbitrary value between 20 and 800 P until the completion of the reaction.

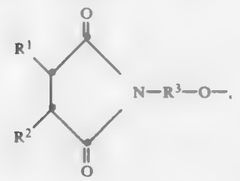
4,861,861

SATURATED POLYESTERS CONTAINING IMIDE GROUPS AND TERMINAL CARBOXYL GROUPS

Claudio A. Gabutti, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 7, 1987, Ser. No. 82,706
Claims priority, application Switzerland, Aug. 19, 1986, 3321/86
Int. Cl.[4] C08G *63/02*
U.S. Cl. 528—272 **18 Claims**

1. A saturated polyester containing terminal carboxyl groups and, per molecule, at least one side chain, containing imide groups, of the formula I



(I)

in which R^1 and R^2 independently of one another are each hydrogen or a C_1–C_4-alkyl group or, together with the carbon atoms to which they are attached, are a cyclopentane, cyclohexane or benzene ring, and R^3 is a linear C_2–C_{12}-alkylene radical, a C_6–C_{12}-arylene radical or a group of the formula II



(II)

in which T is methylene, propylidene, NH, CO, SO_2, O or S, the side chains of the formula I being attached via ester linkages to tribasic or tetrabasic aromatic carboxylic acids present in the polyester main chain, the average molecular weight $\overline{M}_w$ of the polyester being between 3,000 and 20,000 and the polyester having an acid number from 10 to 200.

4,861,862

POLYETHERIMIDE AMIDE FROM POLYOXYALKYLENE DIIMIDE DICARBOXYLIC ACID

John A. Tyrell, Dalton, Mass., and Russell J. McCready, Downingtown, Pa., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 31, 1987, Ser. No. 139,925
Int. Cl.[4] C08G *73/10*
U.S. Cl. 528—322 **11 Claims**

1. A polyetherimide amide composition reaction product of (a) one or more diamines, and (b) one or more polyoxyalkylene diimide dicarboxylic acids.

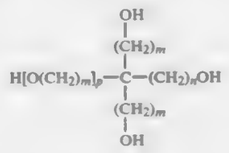
4,861,863

PROCESS FOR THE PRODUCTION AND PURIFICATION OF SH-TERMINATED PREPOLYMERS AND USE THEREOF

Renè-Andrés A. González, Duesseldorf; Winfried Emmerling, Erkrath; Werner Krause, Duesseldorf; Tore Podola, Monheim, and Klaus Neitzer, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 115,225
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637151
Int. Cl.[4] C08G *65/02*
U.S. Cl. 528—408 **17 Claims**

1. A process for the preparation of SH-terminated prepolymers comprising the steps of:
(a) reacting one or more adducts of ethylene oxide, propylene oxide, or mixtures thereof with triols or tetraols of the formula:



(I)

in which
m=1, 2 or 3,
n=0, 1 or 2 and
p=0 or 1
wherein the one or more adducts have a number average molecular weight of from about 400 to about 10,000, with one or more thioalkane carboxylic acids corresponding to the formula:



(II)

in which R is a straight-chain or branched-chain C_1–C_8 alkylene radical, in such a molar ratio that, for every mole of thioalkane carboxylic acid (II), there is an equivalent of the OH groups in compound (I);
(b) add to the reaction mixture a neutralizing agent in a quantity sufficient to neutralize any unreacted thioalkane carboxylic acid (II);
(c) adding to the reaction mixture one or more compounds which bind the water of neutralization and a precipitant in excess at the same time as, or immediately after, the neutralizing agent; and
(d) removing precipitated solids from the reaction mixture.

4,861,864

ROTAVIRUS ANTIGENS

Paul H. Atkinson, New York, N.Y.; A. Richard Bellamy, Auckland, New Zealand; Gerald W. Both, Northride, Australia, and Marianne S. Poruchynsky, Bronx, N.Y., assignors to Albert Einstein College of Medicine of Yeshiva University (a Div. of Yeshiva University), Bronx, N.Y.

Continuation of Ser. No. 768,971, Aug. 23, 1985, abandoned, and a continuation-in-part of Ser. No. 768,395, Aug. 22, 1985, abandoned. This application Jun. 13, 1988, Ser. No. 206,916
Claims priority, application Australia, May 14, 1985, P400542
Int. Cl.[4] C07K *7/10, 13/00*
U.S. Cl. 530—324 12 Claims

1. A neutralizing antigen of rotavirus comprising a VP7 protein modified to be cell secreted by the removal of coding sequences from the codon for the mature N-terminus to the codom for amino acid number 6I in the open reading frame and the addition of a cleavable translocation signal allowing transport into the secretory compartment of the cell and subsequent secretion of the antigen.

4,861,865

NOVEL ANTITHROMBIN PEPTIDE

Glen L. Hortin, St. Louis, Mo., assignor to Washington University, St. Louis, Mo.

Filed Jan. 23, 1989, Ser. No. 299,576
Int. Cl.[4] A61K *37/02;* C07K *7/10*
U.S. Cl. 530—326 1 Claim



1. A novel synthetic peptide with antithrombin activity having the following amino acid sequence:

1 11
Gly—Glu—Glu—Asp—Asp—Asp—Tyr—Leu—Asp—Leu—Glu—

12 22
Lys—Ile—Phe—Ala—Glu—Asp—Asp—Asp—Tyr—Ile—Asp.

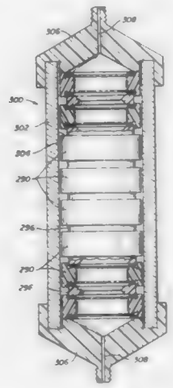
4,861,866

CONTINUOUS FLOW PEPTIDE SYNTHESIZER

Emmett L. Durrum, Menlo Park; Stephen Amendola, San Carlos, both of Calif., and Bruce W. Erickson, Chapel Hill, N.C., assignors to Eldex Laboratories, Inc., Menlo Park, Calif.

Filed Jan. 21, 1987, Ser. No. 5,915
Int. Cl.[4] C12M *1/00, 1/36;* A61K *37/02;* C07C *103/52*
U.S. Cl. 530—333 24 Claims

1. A continuous flow peptide synthesizer, which comprises a first plurality of reservoirs for amino acid derivatives, a second plurality of reservoirs for peptide synthesis reagents, a column having a third plurality of separate column segments forming stacked, serially interconnected chambers for holding peptide synthesis polymeric resin supports, said separate column segments each having an axially extending bore with at least one mesh screen extending across said axially extending bore, said stacked chambers being formed between said mesh screens when said separate column segments are assembled in stacked relationship, each of said first plurality of amino acid derivative reservoirs and said second plurality of reagent reservoirs being connected through a separate controllable valve to said column, and means for supplying the amino acid derivatives and



the reagents simultaneously to each of said separate column segments in said column.

4,861,867

PURIFIED HEMOGLOBIN SOLUTIONS AND METHOD FOR MAKING SAME

Timothy N. Estep, Lindenhust, Ill., assignor to Baxter International, Inc., Deerfield, Ill.

Division of Ser. No. 151,842, Feb. 3, 1988, Pat. No. 4,831,012, which is a continuation-in-part of Ser. No. 747,477, Jun. 21, 1985, abandoned, which is a continuation-in-part of Ser. No. 592,633, Mar. 23, 1984, abandoned. This application Jan. 23, 1989, Ser. No. 280,111
Int. Cl.[4] C07K *15/22*
U.S. Cl. 530—385 7 Claims

1. The method of precipitating nonhemoglobin proteins from a hemoglobin solution without substantially precipitating or deactivating said hemoglobin which comprises heating substantially cell-free hemoglobin solution at a temperature of 45 degrees to 85 degrees C., while maintaining said hemoglobin in substantially its deoxyhemoglobin form, whereby heat precipitate nonhemoglobin proteins present are precipitated.

4,861,868

PRODUCTION OF PROTEINS IN PROCARYOTES

Gwen G. Krivi, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 22, 1985, Ser. No. 704,362
Int. Cl.[4] C07K *13/00*
U.S. Cl. 530—399 1 Claim

1. A composition comprising bacterially produced pGH(A) substantially free of other porcine somatotropin species.

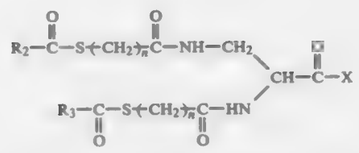
4,861,869

COUPLING AGENTS FOR JOINING RADIONUCLIDE METAL IONS WITH BIOLOGICALLY USEFUL PROTEINS

Robert A. Nicolotti, Furguson, and Richard T. Dean, Chesterfield, both of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed May 29, 1986, Ser. No. 868,800
Int. Cl.[4] C07K *3/00*
U.S. Cl. 530—402 28 Claims

1. A coupling agent for joining a radionuclide metal ion with a biologically useful protein or polypeptide molecule comprising a compound of the formula:



wherein R_2 and R_3 are the same or different and each represents a radical selected from the group consisting of alkyls having from 1 to 6 carbon atoms, aryls having from 6 to 8 carbon atoms and alkaryls having 7 to 9 carbon atoms, any which can be substituted with one or more hydroxyl, alkoxy, carboxy or sulfonate groups; n is either 1 or 2; and X is an activating group capable of forming an amide bond with an ε-amino group of said biologically useful protein or polypeptide molecule.

4,861,870

PROCESS FOR PURIFYING ANTHRACYCLINONE GLYCOSIDES BY SELECTIVE ADSORPTION ON RESINS

Ernesto Oppico, Milan; Carlo Varesio, and Onorino Rosa, both of Turin, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Italy

Continuation of Ser. No. 758,838, Jul. 25, 1985, abandoned, which is a continuation of Ser. No. 563,136, Dec. 19, 1983, abandoned. This application Feb. 2, 1987, Ser. No. 9,550
Claims priority, application Italy, Dec. 23, 1982, 24939 A/82
Int. Cl.[4] C07M *1/06, 15/24*
U.S. Cl. 536—16.9 6 Claims

6. A process for the purification of a raw doxorubicin obtained by a fermentation or synthetic method, whereby organic and inorganic impurities are removed therefrom, said process comprising adsorbing an aqueous solution of the raw doxorubicin, having a pH of about 4 and a concentration of about 0.3%, on an ion exchange resin which is carboxymethyl cellulose, the ratio of resin to doxorubicin being about 20:1 v/w, de-adsorbing the doxorubicin by elution with a slightly acidic water, concentrating the eluate in vacuo and then isolating the so purified doxorubicin, whereby the thusly isolated product contains not more than about 1.5% of impurities at a titer of about 98%.

4,861,871

PROCESS FOR CYCLO-DEHYDRATING KETOSES, OBTAINED ANHYDRIDES AND THEIR USE AS FOOD ADDITIVES

Jacques Defaye; Andrée Gadelle, both of Saint Dismier, France, and Christian Pedersen, Virum, Denmark, assignors to Beghin-Say S.A., Thumeries, France

Division of Ser. No. 723,965, Apr. 5, 1985, Pat. No. 4,737,584. This application Apr. 11, 1988, Ser. No. 180,074
Claims priority, application France, Aug. 8, 1983, 8313031; Aug. 8, 1983, 8313032
Int. Cl.[4] C08B *37/18;* C07H *17/00, 15/24, 15/00*
U.S. Cl. 536—18.1 2 Claims

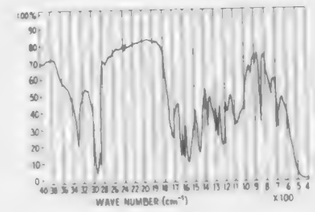
1. A sweetened food product comprising an unsweetened food product in admixture with a non-caloric food component which is the product obtained by cyclodehydrating glucides wherein the glucide molecule includes at least one ketose type group characterized in that the glucide is made to react without added water, with hydrogen fluoride being used as a solvent for said glucide and with said hydrogen fluoride being eliminated in a dry manner.

4,861,872

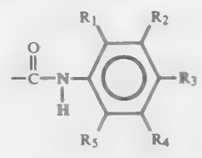
ALKYL-PHENYLCARBAMATE DERIVATIVE OF POLYSACCHARIDE

Yoshio Okamoto, Amagasaki, and Koichi Hatada, Ikeda, both of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Continuation-in-part of Ser. No. 24,741, Mar. 11, 1987. This application Feb. 26, 1988, Ser. No. 160,539
Claims priority, application Japan, Mar. 20, 1986, 61-62828; Mar. 4, 1987, 62-49144; Mar. 20, 1987, 62-65989; Feb. 8, 1988, 63-26995
Int. Cl.[4] C08B *15/06, 33/00, 37/02, 37/08*
U.S. Cl. 536—18.7 17 Claims



1. An alkyl-phenylcarbamate derivative of a polysaccharide 80 to 100 percent of hydrogen in the amino and hydroxyl groups of which have been substituted by an alkylphenylcarbamoyl group having the formula (I):



(I)

in which (1) at least one of R1 to R5 is a straight alkyl having 4 to 8 carbon atoms or a branched alkyl having 3 to 8 carbon atoms or at least two of R1 to R5 each are a straight alkyl having 1 to 3 carbon atoms when the polysaccharide is cellulose; (2) at least one of R1 to R5 is a straight alkyl having 1 to 8 carbon atoms or a branched alkyl having 3 to 8 carbon atoms when the polysaccharide is any one other than cellulose and dextran; and the other (s) of R1 to R5 is hydrogen.

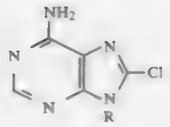
4,861,873

8-CHLOROADENOSINE 3', 5'-CYCLIC MONOPHOSPHATE PREPARATIONS

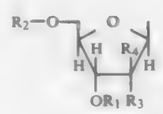
Roland K. Robins; Ganapathi R. Revankar, both of Irvine, and Yu-an Chang, Costa Mesa, all of Calif., assignors to Nucleic Acid Research Institute, Costa Mesa, Calif.

Filed Dec. 21, 1987, Ser. No. 136,407
Int. Cl.[4] C07H *19/20, 19/00*
U.S. Cl. 536—27 12 Claims

1. A process for preparing chloro compounds of the formula



wherein R is H or



R_1 and R_2 are H or

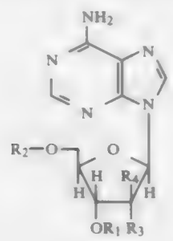


or together R_1 and R_2 are



and R_3 and R_4 are H or one of R_3 or R_4 is OH and the other is H, and pharmaceutically acceptable salts thereof which comprises the steps of:

stirring a starting compound of the formula



wherein R_1 and R_2 are H or



or together R_1 and R_2 are



and R_3 and R_4 are H or one of R_3 or R_4 is OH and the other is H,

in a solvent with N-chlorosuccinimide and an acid of a strength insufficient to cleave the sugar-heterocycle glycosidic bond of said compound.

4,861,874

METHOD OF LOWERING THE CARBAMATE CONTENT OF CELLULOSE CARBAMATE PRODUCTS USING A BASE/ALKALI METAL SALT MIXTURE

Vidar Ekland; Jan Fors; Leo Mandell; Kerstin Meinander, all of Porvoo; Johan-Fredrik Selin, Helsinki, and Olli T. Turunen, Porvoo, all of Finland, assignors to Neste Oy, Finland

Filed Apr. 7, 1988, Ser. No. 178,546

Claims priority, application Finland, Jul. 7, 1987, 872992

Int. Cl.[4] D06M *1/02;* **D01F** *2/00;* **C08B** *15/06*

U.S. Cl. 536—32 **13 Claims**

1. Method of lowering the carbamate content of cellulose carbamate without adversely affecting strength and elongation characteristics thereof, which comprises contacting cellulose carbamate with a solution of an alkali or organic base and also containing in solution at least one soluble alkali metal salt.

4,861,875

3α,5-CYCLO-22,23-DIHYDROXY-5α-STEROID COMPOUNDS

Masakazu Aburatani, Takaoka; Tadashi Takeuchi, Himi, and Kenji Mori, Tokyo, all of Japan, assignors to Fuji Yakuhin Kogyo Kabushiki Kaisha and National Federation of Agricultural Co-Operative Associations, Tokyo, Japan

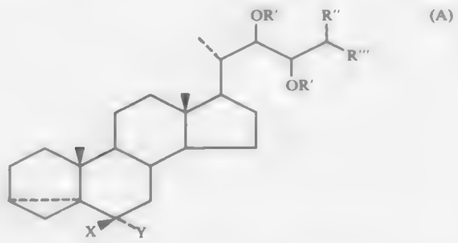
Filed May 1, 1986, Ser. No. 858,129

Claims priority, application Japan, May 1, 1985, 60-92199

Int. Cl.[4] C07J *17/00*

U.S. Cl. 540—114 **12 Claims**

1. A 3α,5-cyclo-22,23-dihydroxy-5α-steroid compound of the formula:



(A)

wherein X is a hydroxyl group and Y is a hydrogen atom or X and Y, taken together, form an oxo group; each of the two R, radicals is independently a hydrogen atom, an acyl group derived from a residue of C_1–C_4 alkanoic acid, a silyl group, a C_1–C_5 alkoxycarbonyl group or a benzyl group, or the two R, radicals, taken together, form an alkylidene group or a carbonyl group, the stereo-configuration at the 22- and 23-positions being either 22R and 23R, or 22S and 23S; and R'' and R''' are independently a hydrogen atom or a lower alkyl group with the proviso that when X and Y are taken together to form an oxo group, R'' is a hydrogen atom or a methyl group in the S-configuration and R''' is isopropyl.

4,861,876

HEMATOPORPHYRIN DERIVATIVE AND METHOD OF PREPARATION AND PURIFICATION

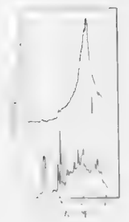
David Kessel, Detroit, Mich., assignor to Wayne State University, Detroit, Mich.

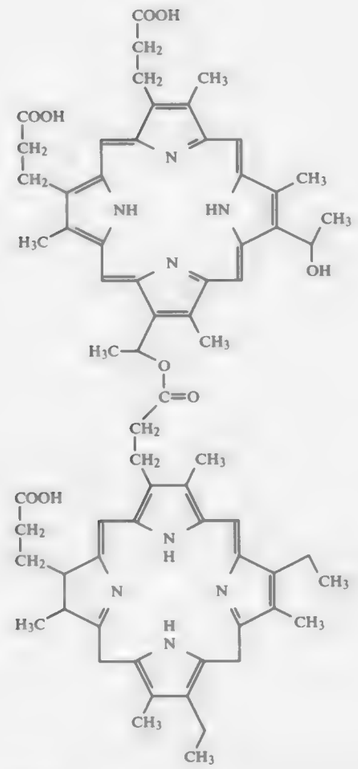
Filed Nov. 26, 1986, Ser. No. 935,269

Int. Cl.[4] C07D *487/22*

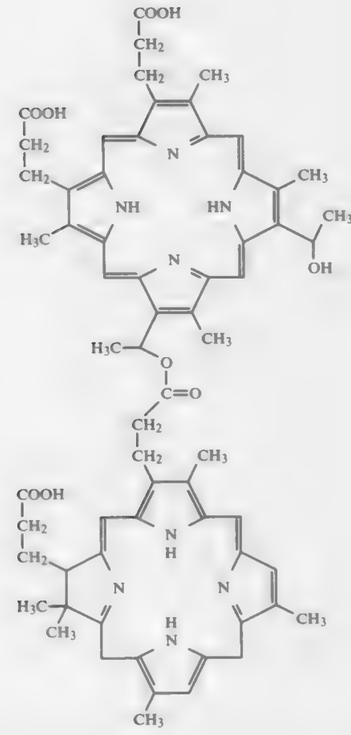
U.S. Cl. 540—145 **4 Claims**

1. A substance effective for treatment of tumor cells having a fluorescent emission between 640 and 650 nm and capable of preferentially localizing in and being retained in tumor cells over normal cells, the substance selected from the group consisting of:





and its isomers;



and its isomers;

II. the alkali metal salts thereof; and mixtures thereof;

IV. the alkali metal salts thereof; and mixtures thereof;

2. A process for the production and purification of the substance of claim 1 comprising the steps of:

(a) admixing a chlorin which is a reduced porphyrin selected from the group consisting of: mesochlorin, bonellin and mixtures thereof, in an aqueous alkaline solution having a concentration of an alkali metal hydroxide between about 0.05 and about 0.5 M;

(b) adding an amount of hematoporphyrin diacetate to the solution formed in Step A, the hematoporphyrin being added over an interval of between two and twenty minutes;

(c) allowing the solution to react for a period sufficient to exhaust the chlorin available in solution;

(d) hydrolyzing any unreacted hematoporphyrin diacetates remaining in solution after the reaction period of Step C;

(e) adjusting the acidity of the solution to a pH of 5 after the reaction period of Step C;

(f) maintaining ambient temperatures throughout the process; and

(g) isolating the reaction product of esterification of hematoporphyrin with chlorin as a result of Steps a through f.

4,861,877

PROCESS FOR PREPARING 4-ACETOXY-3-HYDROXYETHYLAZETIDIN-2-ONE DERIVATIVES

Takehisa Ohashi; Kazunori Kan, both of Kobe; Noboru Ueyama; Isao Sada, both of Akashi; Akimasa Miyama, Takasago, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

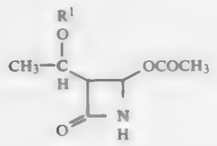
Continuation-in-part of Ser. No. 750,824, Jul. 1, 1985, abandoned. This application Jan. 6, 1987, Ser. No. 809

Claims priority, application Japan, Jul. 5, 1984, 59-139797; Jan. 14, 1985, 60-4724; Jan. 14, 1986, 61-5636

Int. Cl.[4] C07D *205/08; C07F 7/18; C07B 41/12*

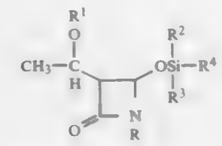
U.S. Cl. 540—357 **12 Claims**

1. A process for preparing a 4-acetoxy-3-hydroxyethylazetidin-2-one derivative having the formula (II):



(II)

wherein R^1 is a protective group for the hydroxyl group, which comprises reacting a β-lactam compound having the formula (I):



(I)

wherein R^1 is as defined above, and each of R^2, R^3 and R^4 is independently a lower alkyl group having 1 to 4 carbon atoms, phenyl group or an aralkyl group and R is a protective group for N, with acetic anhydride in an organic solvent in the presence of a base at a temperature ranging from −30° C. to 5° C., and removing the protective group for N, the proportion of acetic anhydride to said β-lactam compound (I) being 1:1 to 20:1, and the proportion of said base to said β-lactam compound (I) being 1:1 to 5:1.

4,861,878

1H-PYRIDO-(2,3-B) (1,4)-THIAZINES

Gerd Fengler; Alexander Klausener; Hans-Josef Buysch, all of Krefeld, Fed. Rep. of Germany; Mithat Mardin, Madison, Conn., and Bernhard Pelster, St. Augustin, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

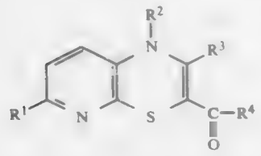
Filed Nov. 6, 1986, Ser. No. 927,909

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1985, 3540702

Int. Cl.[4] C07D *513/04*

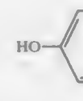
U.S. Cl. 544—48 **6 Claims**

1. A 1H-Pyrido-[2,3-b][1,4]-thiazine of the formula



wherein

R^1 is hydrogen



R^2 and R^3 are identical or different and denote hydrogen, C_1 to C_8-alkoxy, C_1 to C_8-alkyl or C_1 to C_8-alkoxy or C_1 to C_8-alkyl substituted by halogen, hydroxyl, amino, dimethylamino, diethylamino, cyano, methoxycarbonyl or ethoxycarbonyl, R^4 denotes hydroxyl or

C_1 to C_8-alkoxy or C_1-C_8-alkoxy substituted by halogen, hydroxyl, amino, dimethylamino, diethylamino, cyano, methoxycarbonyl or ethoxycarbonyl,

or

R^3 and R^4 are linked via a polymethylene chain to form a 5 or 7-membered cr bocylic ring, and quaternary salts thereof.

4,861,879

[[4-[4-PHENYL-1-PIPERAZINYL)PHENOXYMETHYL]-1-3-DIOXOLAN-2-YL]-METHYL]-1H-IMIDAZOLES AND 1H-1,2,4-TRIAZOLES

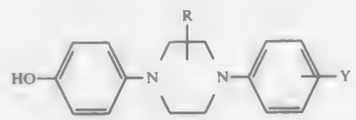
Jan Heeres, Vosselaar; Raymond A. Stokbroekx, Beerse, and Leo J. J. Backx, Arendonk, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 869,537, Jun. 2, 1986, Pat. No. 4,735,942, which is a division of Ser. No. 569,122, Jan. 9, 1984, Pat. No. 4,619,931, which is a continuation-in-part of Ser. No. 470,405, Feb. 28, 1983, abandoned. This application Feb. 9, 1988, Ser. No. 154,173

Int. Cl.[4] C07D *417/10, 403/10, 413/10, 419/10*

U.S. Cl. 544—55 **7 Claims**

1. A chemical compound having the formula

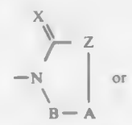


(III)

a pharmaceutically acceptable acid-addition salt or a stereochemically isomeric form thereof, wherein

R is hydrogen or lower alkyl; and

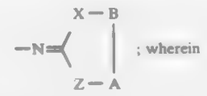
Y is a radical having the formula



(a)

or

a radical having the formula



(b)

; wherein

Z is O or NR^1;

said R^1 being hydrogen; lower alkenyl; lower alkynyl; Ar; cyclopropyl; cyclobutyl; cyclopentyl; cyclohexyl; lower alkyl optionally substituted with a member selected from the group consisting of Ar, lower alkyloxy cyclopropyl, cyclobutyl, cyclopentyl and cyclohexyl; pyrimidine, optionally substituted with up to two substituents selected from the group consisting of lower alkyl, amino, nitro, hydroxy, lower alkyloxy, lower alkylthio, halo, phenyl, carboxyl and lower alkyloxycarbonyl;

Ar is phenyl or substituted phenyl, said substituted phenyl having from 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, nitro, amino and trifluoromethyl;

X is O, S or NR^2

said R^2 being hydrogen or lower alkyl;

A is C═O, NR^3 or methylene, optionally substituted with up to two radicals selected from the group consisting of lower alkyl and Ar;

said R^3 being hydrogen or lower alkyl, or R^1 and R^3, taken together, form a lower alkanediyl radical;

provided that, when A is NR^3, Z is other that oxygen; and

B is C═O or methylene optionally substituted with up to two radicals selected from the group consisting of lower alkyl and lower alkyloxy;

or A and B, taken together, form a bivalent radical of formula:

$$-CH_2-CH_2-CH_2, \quad (c)$$

$$-C(O)-CH_2-C(O)- \quad \text{or} \quad (d)$$

$$-C(O)-N(R^4)-C(O)-; \quad (e)$$

wherein R^4 is hydrogen or lower alkyl; or where Y is a radical of formula (b), A and B, when taken together, can also form a bivalent radical of formula

$$-CH=CH- \quad \text{or} \quad (f)$$

$$-N=CH-; \quad (g)$$

wherein one hydrogen in the said radical (g) and up to two hydrogens in the said radicals (c), (d) or (f) may be replaced by a lower alkyl radical;

provided than when —A—B— is a radical of formula (g), said radical is connected to Z by its nitrogen atom and said Z is other than O.

4,861,880

1-PHENYL-2(1H,3H)-INDOLONE PSYCHO-THERAPEUTIC AGENTS

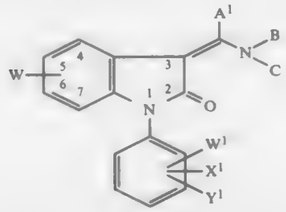
Harry R. Howard, Jr., Bristol, and Reinhard Sarges, Mystic, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 420,544, Sep. 20, 1982, Pat. No. 4,476,307. This application Aug. 15, 1984, Ser. No. 641,071

Int. Cl.[4] C07D *413/04, 401/04, 403/04*

U.S. Cl. 544—144 **6 Claims**

1. A compound of the formula



wherein,

A^1 is hydrogen or methyl; and B and C together with the nitrogen atom to which they are attached form a piperidine, pyrrolidine, morpholine or imidazole ring;

W is hydrogen, $(C_1$–$C_2)$alkyl, $(C_1$–$C_2)$alkoxy, chloro, or fluoro; and

W^1, X^1 and Y^1 are each independently hydrogen, $(C_1$–$C_2)$alkyl, $(C_1$–$C_2)$alkoxy, $(C_1$–$C_2)$alkylthio, bromo, chloro, fluoro, trifluoromethyl, hydroxy, formyl, carboxamido, $(C_1$–$C_2)$alkylcarboxamido, di$(C_1$–$C_2)$alkylcarboxamido, cyano, nitro, amino, $(C_1$–$C_2)$alkylamino or di$(C_1$–$C_2)$alkylamino.

4,861,881

POLYGLYCIDAMIDES

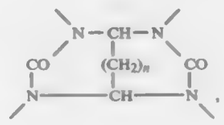
William F. Pfohl, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed May 2, 1984, Ser. No. 606,030

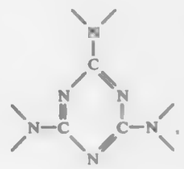
Int. Cl.[4] C07D *251/00*

U.S. Cl. 544—196 **9 Claims**

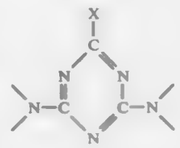
1. A polyglycidamide composition represented by the formula $Y(R)_m$, wherein Y is a nucleus selected from the group consisting of:



(I)

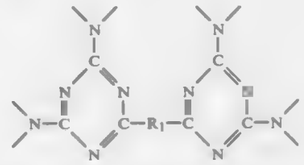


(II)



(III)

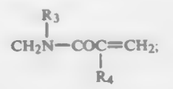
and



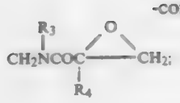
(IV)

wherein R is selected from the group consisting of:

A. $(CH_2O)_pR_2$;

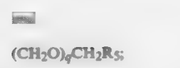
■. 

-continued



C.

and



D.

wherein R_1 is a C_1 to C_{10}, linear or branched or cyclic, saturated or unsaturated or epoxidized, divalent hydrocarbyl radical;
wherein R_2 is H or a C_1 to C_{10}, linear or branched or cyclic, saturated or unsaturated or epoxidized, aliphatic, or aromatic, monovalent hydrocarbyl radical but not more than one R_2 per Y nucleus is H;
wherein R_3 and R_4 are individually selected from hydrogen and methyl;
wherein R_5 is

$$[Y(R)_{m-2}—(CH_2O)_r—CH_2]_s—Y(R)_{m-1};$$

wherein X is R_2 as defined hereinabove;
wherein m is the equivalence of the Y nucleus and is in the range of 4 to 8;
wherein n, p, q and r are individually in the range of 0 to 1;
wherein the average s is in the range of 0 to 2;
wherein the average number of A groups per Y nucleus is in the range of 1 to m−1, the average number of B groups per Y nucleus is in the range of 0 to m−2, the average number of C groups per Y nucleus is in the range of 1 to m−1 and wherein the average number of Y nuclei per molecule is in the range of about 1 to about 4 and the average number of C groups per molecule is in the range of about 1.2 to about 10.

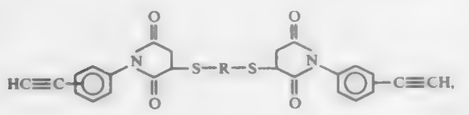
4,861,852

ETHYNYL TERMINATED IMIDOTHIOETHERS AND RESINS THEREFROM

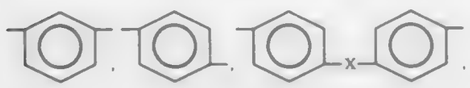
Paul M. Hergenrother, Yorktown; John W. Connell, Newport News, and R. Gerald Bass, Richmond, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 14, 1988, Ser. No. 218,792
Int. Cl.[4] C08G *75/16*
U.S. Cl. 544—216 **3 Claims**

1. An ethynyl terminated imidothioether having the following structural formula



wherein R is selected from the group of divalent radicals consisting of CH_2CH_2, $CH_2CH_2CH_2$, $CH_2CH_2CH_2CH_2CH_2$, $CH_2OCH_2OCH_2$,



wherein X is a bond, or X represents a member selected from the group consisting of CH_2, O, S, $C(CH_3)_2$, $C(CF_3)_2$, SO_2, and O=C; the ethynyl terminated imidothioether being formed as a mixture of stereoisomers comprising the d, l, and meso forms.

4,861,853

PROCESS FOR PREPARING ADENINE

Jiro Suzuki, Kumamoto, Japan, assignor to Kohjin Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 285,805, Jul. 22, 1981, abandoned. This application Jan. 17, 1984, Ser. No. 571,150
Claims priority, application Japan, Aug. 5, 1980, 55-108946; Oct. 13, 1980, 55-141960
Int. Cl.[4] C07D *473/34*
U.S. Cl. 544—277 **7 Claims**

1. In a continuous process for preparing adenine by reacting an arylazomalononitrile of the general formula:
wherein Ar is an aryl group, with formic acid or its derivatives in the presence of ammonia at an elevated temperature to produce a 4,6-diamino-5-arylazopyrimidine and subjecting the resulting reaction mixture to a reaction under a catalytic reduction condition in which catalytic reduction of the 4,6-diamino-5-arylazopyrimidine and cyclization of the resulting 4,5,6-triaminopyrimidine into adenine take place, the improvement which comprises carrying out the catalytic reduction in the substantial absence of ammonia, wherein before carrying out the catalytic reduction, ammonia is removed by gradually opening a closed reaction vessel and bubbling an inert gas through the reaction mixture while it is still hot.

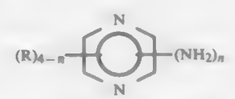
4,861,864

COMPOSITIONS PREPARED FROM AMINO SUBSTITUTED PYRAZINES AND CARBOXYLIC ACIDS, CARBOXYLIC ACID ANHYDRIDES, CARBOXYLIC ACID ESTERS OR CARBOXYLIC ACID HALIDES

Duane S. Treybig, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

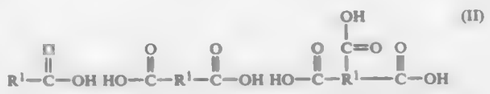
Continuation-in-part of Ser. No. 787,586, Oct. 15, 1985, abandoned. This application Apr. 4, 1988, Ser. No. 176,901
Int. Cl.[4] C07D *241/20*
U.S. Cl. 544—336 **5 Claims**

1. A composition resulting from reacting
(A) at least one pyrazine compound represented by the formula



(I)

wherein each R is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to 20 carbon atoms; or a halogen atom, and n has a value from 1 to 4; and
(B) at least one carboxylic acid represented by the formulas



(II)

wherein R^1 is an aliphatic or cycloaliphatic group or a sulfur

atom, halogen or hydroxyl substituted aliphatic or cycloaliphatic group having from 10 to 72 carbon atoms;
and
(C) optionally in the presence of sodium hydride; and wherein components (A) and (B) are present in



quantities which provided a ratio of groups to —NH_2 or —NH—groups of from about 0.25:1 to about 1.2:1 and component (C) is present in quantities which provide a ratio of sodium hydride to —NH_2 or —NH—groups of from about 0:1 to about 1.5:1; thereby resulting in a product consisting essentially of a salt of components (A) and (B).

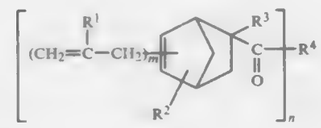
4,861,885

ALLYLBICYCLO[2.2.1]HEPT-5-ENE-2-CARBOXYLIC ACID AMIDES

Andreas Kramer, Düdingen, and Roland Darms, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 8, 1986, Ser. No. 939,216
Claims priority, application Switzerland, Dec. 16, 1985, 5340/85
Int. Cl.[4] A61K *7/22, 31/19, 31/44*; C07C *59/48, 103/19*; C07D *31/44, 209/94*
U.S. Cl. 544—387 **7 Claims**

1. A compound of the formula:



wherein
each of R^1, R^2, and R^3, independently of the other, is hydrogen or methyl;
m is an integer from 1 to 5;
n is an integer from 2 to 5; and
R^4 is the radical of an aliphatic, cycloaliphatic, aromatic, araliphatic, or heterocyclic polyamine having n primary or secondary amino groups, each of said n primary or secondary amino groups, after removal of a single active hydrogen atom, being bound to one of the depicted n carbonyl groups to form a carboxamido group.

4,861,886

METHOD FOR ISOMERIZATION OF TRANS-FORM 2-METHYLSPIRO (1,3-OXATHIOLANE-5,3')QUINUCLIDINE OR ACID ADDITION SALTS THEREOF

Takahiro Haga; Itaru Shigehara; Toru Koyanagi; Kazutoshi Hara, and Masaru Maeda, all of Kusatsu, Japan, assignors to Ishahara Sangyo Kaisha Ltd, Osaka, Japan

Filed Jul. 6, 1988, Ser. No. 215,532
Claims priority, application Japan, Jul. 10, 1987, 62-172451; Jul. 21, 1987, 62-180119; Aug. 13, 1987, 62-202170; Jan. 18, 1988, 63-7020
Int. Cl.[4] C07D *495/20*
U.S. Cl. 546—16 **10 Claims**

1. A method for isomerization of trans-form 2-methylspiro(1,3-oxathiolane-5,3')quinuclidine or acid addition salts thereof which comprises isomerizing said trans-form quinuclidine or acid addition salts thereof to cis-form 2-methylspiro(1,3-oxathiolane-5,3')quinuclidine or acid addition salts thereof in the presence of at least one acid catalyst selected from the group consisting of an organic sulfonic acid, a halide functioning as a Lewis acid, and sulfonic acid.

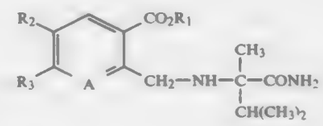
4,861,887

HERBICIDAL O-(SUBSTITUTED, AMINOMETHYLBENZOIC, NICOTINIC AND QUINOLINE-3-CARBOXYLIC ACIDS, ESTERS, AND SALTS

Robert F. Doehner, Jr., East Windsor, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 27, 1988, Ser. No. 148,743
Int. Cl.[4] C07D *213/46, 215/20*
U.S. Cl. 546—170 **8 Claims**

1. A 2-{[(1-carbamoyl-1,2-dimethylpropyl)-amino]methyl} benzoic acid, nicotinic acid or quinoline-3-carboxylic acid compound represented by formula II



(II)

wherein
A is CH, or N;
R_1 is H or C_1–C_{12} alkyl;
R_2 is H or C_1–C_6 alkyl;
R_3 is H, C_1–C_6 alkyl, or when R_2 and R_3 are taken together they may form a ring represented by

—CH=CH—CH=CH—.

4,861,888

PROCESS FOR THE PREPARATION OF 3,4-DIHYDROISOQUINOLINE

Kálmán Takács; Ilona K. Ajzert, both of Budapest; Katalin M. Kellner, Biatorbágy; Judit Fleischer; Mariann E. Puskás, both of Budapest, and József Rimai, Budaors, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

PCT No. PCT/HU87/00030, § 371 Date May 11, 1988, § 102(e) Date May 11, 1988, PCT Pub. No. WO88/00586, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 17, 1987, Ser. No. 196,221
Claims priority, application Hungary, Aug. 17, 1986, 2958/86
Int. Cl.[4] C07D *217/02*
U.S. Cl. 546—150 **5 Claims**

1. A process for the preparation of a 3,4-dihydroisoquinoline which comprises dehydrogenating a 1,2,3,4-tetrahydroisoquinoline with elemental sulphur, and recovering the 3,4-dihydroisoquinoline thus obtained.

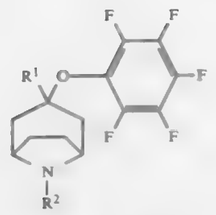
4,861,889

3-(2,3,4,5,6-PENTAFLUOROPHENOXY)-8-AZABICYCLO[3.2.1]OCTANES

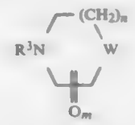
Grover C. Helsley, Pluckemin; Larry Davis, Sergeantsville, and Gordon E. Olsen, Somerset, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Filed Mar. 14, 1988, Ser. No. 167,942
Int. Cl.[4] C07D *221/22, 241/08, 401/14, 417/14*
U.S. Cl. 546—183 **56 Claims**

1. A compound of the formula



wherein R^1 is hydrogen or aryl and R^2 is a monovalent radical selected from the group consisting of hydrogen, cyano, loweralkyl, cycloalkylloweralkyl, aryllowerallkyl, heteroaryllowerallkyl, formyl, loweralkylcarbonyl, loweralkoxycarbonyl, (aryloweralkyl)carbonyl, thioformyl, loweralkythiocarbonyl, loweralkoxythiocarbonyl, (aryloweralkyl)thiocarbonyl, aminocarbonyl, (loweralkylamino)carbonyl, (diloweralkylamino)carbonyl, (arylamino)carbonyl, aminocarbonyl, (loweralkylamino)thiocarbonyl, (diloweralkylamino)thiocarbonyl, (arylamino)thiocarbonyl, aminoloweralkyl, (loweralkylamino)loweralkyl, (diloweralkylamino)loweralkyl, (diloweralkylphosphinyl)loweralkyl, a group of the formula



wherein n is an integer having a value of zero or 1, m is an integer having a value of zero or 1, W is CH_2, or NR_{3a} wherein R_{3a} is hydrogen, loweralkyl or aryl, and R^3 is loweralkylene, or loweralkynylene, and a group of the formula



wherein R^4 is CH(Cl)CH_3[.], the term aryl in each occurrence signifying a phenyl group optionally substituted by one or more substituents selected from the group consisting of halogen, loweralkyl, loweralkoxy and trifluoromethyl; the term cycloalkyl in each occurrence signifying saturated carbocyclic group having from 3 to 7 carbon atoms; and the term heteroaryl in each occurrence signifying an aromatic heterocyclic mono- or dicyclic radical selected from the group consisting of benzisoxazolyl, indolyl, benzimidazolyl, and pyrrolidinyl optionaly substituted by one or more substituents selected from the group consisting of halogen, loweralkyl and loweralkoxy.

4,861,890

ISOMERIZATION

Bernd Heiser, Inzlingen, Fed. Rep. of Germany, and Hansjörg Stoller, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

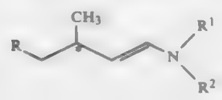
Filed Aug. 10, 1987, Ser. No. 83,349

Claims priority, application Switzerland, Aug. 21, 1986, 3351/86

Int. Cl.[4] C07D *211/00*

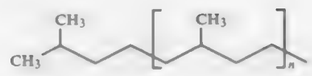
U.S. Cl. 546—184 **14 Claims**

1. A process of producing chiral enamines of the formula

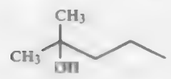


I

wherein R is

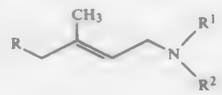


(a)



(b)

n is the number 0, 1 or 2; and the dotted bond can be optionally hydrogenated; and R^1 and R^2 are lower alkyl or cycloalkyl or when taken together with their attached nitrogen atom form a 5- or 6-membered heterocyclic ring; comprising isomerizing the E- or Z-form of a compound of the formula



II

wherein R, R^1 and R^2 are as above; with a rhodium-diphosphine complex of the general formula

$$[Rh(L^1)(L^2)]^+X^- \qquad \text{III}$$

wherein L^1 is a chiral diphosphine ligand, L^2 is a bis-olefin and X^- is a non-complexing anion; with the addition of an achiral triarylphosphine in an amount sufficient to provide a mole ratio of said rhodium-diphosphine complex to said achiral triarylphosphine of from about 1:2 to about 1:10.

4,861,891

ANTIDEPRESSANT N-SUBSTITUTED NICOTINAMIDE COMPOUNDS

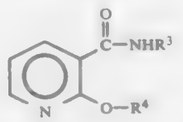
Nicholas A. Saccomano, Ledyard, and Frederic J. Vinick, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Aug. 31, 1988, Ser. No. 238,951

Int. Cl.[4] C07D *401/12*

U.S. Cl. 546—194 **5 Claims**

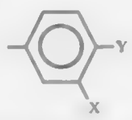
1. A compound having the formula



or a pharmaceutically acceptable acid addition salt thereof wherein

R^3 is 1-piperidyl, 1-(3-indolyl)ethyl, (C_{1-4})-alkyl, phenyl, benzyl, 1-(1-phenylethyl) or monosubstituted benzyl wherein the substituent is chloro, fluoro, methyl or methoxy and said substituent is on the aromatic ring;

R^4 is bicyclo[2 2.1]hept-2-yl or



wherein Y is hydrogen, fluoro or chloro; and

X is hydrogen, fluoro, chloro, methoxy, trifluoromethyl, cyano, carboxy, methylcarbamoyl, dimethyl-carbamoyl or carbo(C_{1-4} alkoxy);

provided that when R^3 is phenyl, benzyl, monosubstituted benzyl, 1-(1-phenylethyl) or (C_{1-4})alkyl, R^4 is bicyclo[2.2.1]hept-2-yl.

4,861,892

METHOD FOR SYNTHESIS OF DEOXYMANNOJIRIMYCIN

George W. J. Fleet, Oxford, United Kingdom, assignor to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 155,667, Feb. 12, 1988, abandoned. This application Sep. 26, 1988, Ser. No. 249,153

Int. Cl.[4] A61K *31/445*; C07D *211/42*

U.S. Cl. 546—219 **18 Claims**

1. A method for the chemical synthesis of L-deoxymannojirimycin from 2,3-O-isopropylidene-D-gulono-γ-lactone comprising:

(a) introducing a silyl protecting group at C-6,

(b) esterifying the alcohol at C-5 with triflic anhydride to give the triflate ester and then introducing the azide group at C-5,

(c) reducing the azide group with a hydrogenation catalyst to provide a cyclic secondary amine,

(d) reducing said amine with a borane reducing agent followed by deprotecting the resulting product by acid hydrolysis to remove the isopropylidene and silyl groups and thereby yield L-deoxymannojirimycin.

4,861,893

CHEMICAL PROCESS

Gary T. Borrett, Harlow, England, assignor to Beecham Group PLC., Brentford, United Kingdom

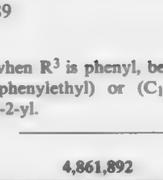
Filed Aug. 8, 1986, Ser. No. 894,765

Claims priority, application United Kingdom, Aug. 10, 1985, 8520154

Int. Cl.[4] C07D *211/02, 211/82, 213/133, 213/55*

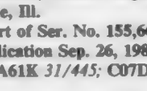
U.S. Cl. 546—185 **8 Claims**

1. A process for the preparation of a compound of formula (I):

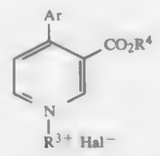


(I)

wherein Ar is a group:



in which X is hydrogen, alkyl having 1–4 carbon atoms, alkoxy, trifluoroalkyl, hydroxy, halogen, methylthio, or aralkyloxy and R^3 and R^4 are the same or different and each is C_{1-6} alkyl, which process comprises hydrogenating a compound of formula (II):



where Ar, R^3 and R^4 are as defined with respect to formula (I) and Hal is a halogen atom.

4,861,894

PYRIDINE AND ALKYLPYRIDINE SYNTHESIS USING A CRYSTALLINE SILICATE CATALYST HAVING THE ZSM-5 STRUCTURE

Emmerson Bowes, Hopewell, N.J., and Tsoung Y. Yan, Philadelphia, Pa., assignors to Mobil Oil Corp., New York, N.Y.

Filed Jun. 11, 1987, Ser. No. 60,544

Int. Cl.[4] C07D *213/10, 213/12*

U.S. Cl. 546—251 **13 Claims**

1. In a process for synthesizing pyridine or alkylpyridines comprising reacting ammonia with a carbonyl reactant at reaction conditions suitable to synthesize said pyridine or alkylpyridines in the presence of a catalyst composition which comprises a crystalline silicate, the improvement comprising reacting said ammonia with said carbonyl at reaction conditions suitable to synthesize said pyridine or alkylpyridines in the presence of a catalyst composition which comprises (i) a crystalline silicate having the structure of ZSM-5 and an Alpha Value of less than about 50, and (ii) a binder of amorphous silica.

4,861,895

TREATMENT OF AQUEOUS SOLUTIONS OBTAINED IN THE CARBALKOXYLATION OF OLEFINICALLY UNSATURATED COMPOUNDS

Werner Bertleff, Viernheim; Robert Maerkl, Fussgoenheim; Peter Magnussen, Bad Duerkheim; Gebhard Kuehn, Ludwigshafen, and Peter Stops, Altrip, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 24, 1987, Ser. No. 77,630

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1986, 3628357

Int. Cl.[4] C07D *211/70*; C07C *67/00, 69/34*

U.S. Cl. 546—353 **7 Claims**

1. A process for the treatment of an aqueous solution which is obtained in the carbalkoxylation of olefinically unsaturated compounds and contains heterocyclic aromatic tertiary nitrogen bases, their transformation products and lower fatty acids and/or their salts, which comprises:

(a) heating the aqueous solution to 150°–300° C. under from 10 to 300 bar, and

(b) separating off the heterocyclic aromatic nitrogen bases which are formed again from the transformation products by distillation.

4,861,896

PREPARATION OF HALO SUBSTITUTED ISOTHIAZOLONES

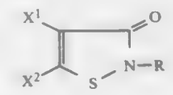
Adam C. T. Hsu, Lansdale, and Geore M. Lein, Jr., Chalfont, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 26, 1987, Ser. No. 112,786

Int. Cl.[4] C07D *275/02*

U.S. Cl. 548—213 **11 Claims**

1. A process for preparing haloisothiazolones of the formula



wherein

X^1 is halo;

X^2 is hydrogen or halo;

R is alkyl of 1 to 18 carbon atoms, alkenyl or alkynyl of 2 to

18 carbon atoms, cycloalkyl of 3 to 12 carbon atoms, aralkyl of up to 10 carbon atoms, or aryl of up to 10 carbon atoms; which comprises reacting an amide of the formula:



wherein x^1, X^2 and R are as defined above, with a sulfur-halogen compound or formula $(S)_m(halo)_n$ where m and n are integers of 1 or 2, optionally in the presence of an organic base.

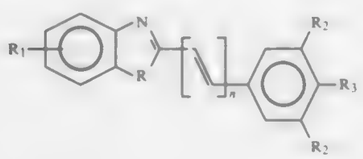
4,861,897

2-ARYLOXYALKYLAMINOBENZOXAZOLES AND 2-ARYLOXYALKYLAMINOBENZOTHIAZOLES

Jeffery B. Press, Rocky Hill, and Pauline Sanfilippo, Flemington, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jun. 22, 1987, Ser. No. 64,718
Int. Cl.[4] C07D *263/56*
U.S. Cl. 548—217 **7 Claims**

1. A compound of the formula



where
R is O
R_1 is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, Br, Cl or I,
R_2 and R_3 are H or —O—$(CH_2)_m$—NR_4R_5, wherein one of R_2 and R_3 is H and the other is —O—$(CH_2)_m$—NR_4R_5, when R_3 is —O—$(CH_2)_m$—NR_4R_5, R_2 independently is hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy,
R_4 and R_5 are the same or different, and are C_1–C_5 alkyl, C_3–C_6 cycloalkyl, benzyl, benzyl substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, Br, Cl, I, or R_4 and R_5 together with N are piperidine, pyrrolidine, imidazole or N-substituted piperazine, wherein the substituent is C_1–C_4 alkyl, phenyl or phenyl substituted by C_1–C_3 alkoxy,
n is 0 or 1, and
m is 2–6,
with the provisos that when m is 2, R_4 and R_5 cannot both be C_1–C_5 alkyl and when m is 3, R_4 and R_5 cannot both be C_1–C_2 alkyl, and acid addition salts thereof.

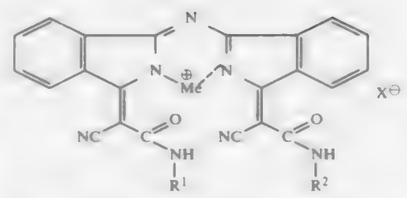
4,861,898

ISOINDOLINE METAL COMPLEXES

Volker Radtke, Hassloch; Heinrich Kowarsch, Oberderdingen, and Erwin Hahn, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 9, 1987, Ser. No. 130,653
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1986, 3642856
Int. Cl.[4] C07F *15/04, 15/06, 3/06, 1/08*
U.S. Cl. 548—402 **14 Claims**

1. An isoindoline metal complex of the formula I



(I)

where R^1 and R^2 are independently of each other H or C_1–C_4-alkyl, $X^{\ominus}$ is one equivalent of a colorless anion and Me is Zn^{2+}, Ni^{2+}, Co^{2+} or Cu^{2+}.

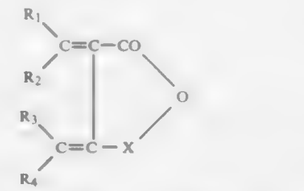
4,861,899

PHOTOCHROMIC GAMMA BUTYROLACTONES

Clive Trundle, Towcester, United Kingdom, assignor to The Plessey Company plc., United Kingdom

Filed Jun. 3, 1987, Ser. No. 57,144
Claims priority, application United Kingdom, Jun. 3, 1987, 8613470
Int. Cl.[4] C07D *233/56*
U.S. Cl. 549—58 **4 Claims**

1. A photochromic gamma butyrolactone having the general formula (I):



(I)

wherein X represents $>CH_2$ or $>C(CH_3)_2$; R_1, R_2 and R_4 independently represent a group selected from hydrogen, alkyl or aryl with the proviso that one of R_1 or R_2 is always hydrogen, and R_3 is a 3-thienyl, 3-furyl, 3-benzothienyl or 3-benzofuryl group in which the 2-position is substituted with an alkyl, aralkyl or aryl group and wherein said alkyl groups have from 1 to 20 carbon atoms, said aryl groups have 6 to 14 carbon atoms and said aralkyl groups have 7 to 12 carbon atoms.

4,861,900

PURIFICATION AND HYDROGENATION OF SULFOLENES

Marvin M. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 16, 1986, Ser. No. 864,047
Int. Cl.[4] C07D *333/48*
U.S. Cl. 549—87 **21 Claims**

1. A process comprising the step of (a) contacting a sulfolene-containing feed stream, which also contains polysulfones as impurities with activated carbon at a weight ratio of said activated carbon to said sulfolene-containing feed stream of at least about 1.6:100 and under such conditions as to obtain a sulfolene-containing stream having reduced concentration of said polysulfones.

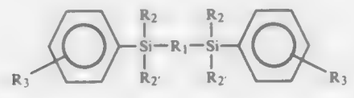
4,861,901

SUBSTITUTED AROMATIC SILANE COMPOUNDS AND METHOD FOR PREPARATION OF SAME

Kreisler S. Y. Lau, Alhambra; Susan L. Oldham, Torrance; William E. Elias, Redondo Beach, and Stephen J. Bigus, Long Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 5, 1987, Ser. No. 46,013
Int. Cl.[4] C07F *7/08*; C07D *303/02*
U.S. Cl. 549—215 **16 Claims**

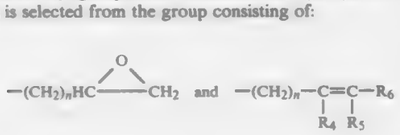
1. A compound having the formula:



where
R_1 is selected from the group consisting of:
(a) an aliphatic hydrocarbon group containing 2 to 10 carbon atoms, and
(b) a group having the formula



where
n=1 to 3
m=0 to 5.
R_2 and R_2' are each selected from the group consisting of an alkyl group containing 1 to 4 carbon atoms, an unsubstituted aryl group, and a substituted aryl group; and
R_3 is selected from the group consisting of:



where
R_4, R_5, and R_6 are each selected from the group consisting of H, an alkyl group containing 1 to 4 carbon atoms, and an aryl group; and
n=0 to 10.

4,861,902

METHOD FOR THE PREPARATION OF TETRAHYDROFURFURYL-(ALPHA)-METHACRYLATE AND CATALYST THEREFOR

Gerhard Haubrich, Bonn; Guenter Prescher, Hanau, and Juergen Faller, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 933,441, Nov. 21, 1986, abandoned. This application Sep. 16, 1988, Ser. No. 246,020
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1985, 3543115
Int. Cl.[4] C07D *307/08*
U.S. Cl. 549—499 **6 Claims**

1. A method for the preparation of tetrahydrofurfuryl-(2)-methacrylate, comprising forming a reaction mixture by reacting methyl or ethyl methacrylate with a sufficient amount of tetrahydrofurfuryl-(2)-methyl alcohol at a temperature of 60 to 80° C. in the presence of a sufficient amount of the tetrahydrofurfuryl-(2)-methoxide of an alkali metal or alkaline-earth metal as a catalyst for the reaction while passing dried air or pure oxygen through the reaction mixture, wherein the molar ratio of said methacrylate to said alcohol is from 1.5 to 2:1 and reacting for a period of time of 2 to 3 hours.

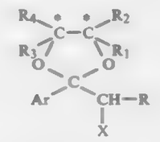
4,861,903

INTERMEDIATES FOR PREPARING OPTICALLY ACTIVE CARBOXYLIC ACIDS

Claudio Giordano, Vicenza, and Graziano Castaldi, Briona, both of Italy, assignors to Zambon spa, Vicenza, Italy

Filed Jul. 31, 1986, Ser. No. 891,349
Claims priority, application Italy, Jul. 31, 1985, 21802 A/85
Int. Cl.[4] C07D *317/12, 317/44, 317/18, 317/26*
U.S. Cl. 549—434 **2 Claims**

1. Compounds of formula



in which
Ar represents a naphthyl, unsubstituted or substituted by one or two substituents selected from the group consisting of bromine atom, methoxy, hydroxy and O-M^+ group wherein M^+ is the cation of an alkaline metal;
R represents a C_1–C_4 alkyl;
X represents a hydrogen atom;
R_1, R_2, R_3 and R_4 independently represent a hydrogen atom, a C_1–C_{10} alkyl unsubstituted or substituted with from 1 to 4 substituents chosen from halogen atoms, C_1–C_4 alkoxy, hydroxyl, formyl, or benzyloxy groups; a phenyl unsubstituted or substituted with from 1 or 3 halogen atoms, C_1–C_4 alkyl or C_1–C_4 alkoxy; or one only of R_1, R_2, R_3 and R_4 represents a carboxyl or an alkylester of an optically active or inactive alcohol, an amide or an alkaline salt; or R_1+R_3 or R_2+R_4 together constitute a tri or tetramethylene chain unsubstituted or alkyl-substituted;
on condition that at least one of the carbon atoms indicated by an asterick is a center of asymmetry.

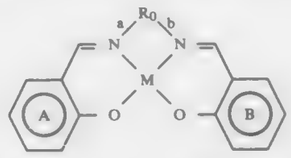
4,861,904

SCHIFF BASE METAL COMPLEX COMPOUNDS, AND ORGANOMETALLIC ULTRATHIN FILM COMPOSED THEREOF AND OXYGEN SEPARATION FILMS COMPOSED THEREOF

Kiyoshi Sugie, Iwakuni, Japan, assignor to Agency of Industrial Science and Technology, Japan

Filed Mar. 17, 1987, Ser. No. 26,896
Claims priority, application Japan, Apr. 17, 1986, 61-87133; Jun. 20, 1986, 61-142720; Oct. 8, 1986, 61-238020
Int. Cl.[4] C07F *1/08, 3/06, 13/00, 15/06*
U.S. Cl. 556—32 **1 Claim**

1. A Schiff base metal complex compound represented by formula (I)



(I)

wherein ring A and B each denote an σ-phenylene or orthonaphthalene group having at least one group represented by the formula —X—C_nH_m
wherein —C_nH_m is a long-chain alkyl, alkenyl or alkynyl hydrocarbon group, $14 \leqq n \leqq 22$ and $21 \leqq m \leqq 45$, and X represents a binding group between —C_nH_m and the ring A or B

selected from the group consisting of —O—, —COO—, —NHCO— and —S—;
R_0 represents a hydrocarbon group having not moe than 6 carbon atoms, whose adjacent carbon atoms or adjacent carbon atoms via one carbon atom are bound to bonds a and b; and M represents a metal selected from the group consisting of Fe, Co, Cu, Ni, Mn, Cr and Zn.

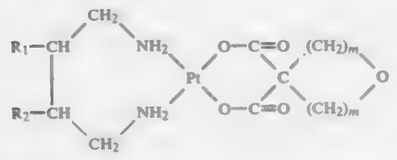
4,861,905

PLATINUM COMPLEXES

Hiroyoshi Nowatari; Hiroshi Hayami, both of Takasaki; Yasuo Kuroda, Gunma; Sumio Yoda, Takasaki, and Katsutoshi Takahashi, Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1987, Ser. No. 91,034
Claims priority, application Japan, Feb. 19, 1987, 62-34512
The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.
Int. Cl.[4] C07F 9/68
U.S. Cl. 556—40 4 Claims

1. A diamine platinum (II) complex represented by the formula:



wherein R_1 and R_2 are each a C_1–C_4 alkyl group and wherein both occurrences of m are 1 or 2.

4,861,906

PROCESS FOR THE SYNTHESIS OF ACYLAMINO ORGANOSILICON COMPOUNDS

Sudarsanan Varaprath, and Padmakumari J. Varaprath, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 10, 1989, Ser. No. 335,919
Int. Cl.[4] C07F 7/10
U.S. Cl. 556—419 20 Claims

1. A method for preparing an organosilicon compound containing at least one silicon-bonded acylamino-substituted hydrocarbon radical comprising: reacting an acyl halide with an aminosilicon compound having at least one silicon-bonded amino-substituted hydrocarbon radical containing at least one nitrogen-bonded hydrogen, all other silicon valences therein being satisfied by radicals selected from the group consisting of organic radicals and divalent, silicon-linking, oxygen atoms, in the presence of a non-aqueous solvent, a metal alkoxide, and a non-aqueous cosolvent for said metal alkoxide.

4,861,907

PROCESS FOR SYNTHESIS OF ACYLAMINO SILICON COMPOUNDS

Antony P. Wright, Rhodes, and David J. Bunge, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 10, 1989, Ser. No. 335,612
Int. Cl.[4] C07F 7/10
U.S. Cl. 556—419 28 Claims

1. A method for preparing an organosilicon compound containing at least one silicon-bonded acylamino-substituted hydrocarbon radical comprising reacting an acyl halide with an aminosilicon compound having at least one silicon-bonded amino-substituted hydrocarbon radical containing at least one nitrogen-bonded hydrogen, all other silicon valences therein being satisfied by radicals selected from the group consisting of organic radicals and divalent, silicon-linking, oxygen atoms, in a nonaqueous solvent in the presence of an aqueous solution of a watersoluble acid acceptor and an additive that promotes transfer of said acid acceptor from said aqueous solution to said nonaqueous solvent and is at least partially soluble in both said aqueous solution and nonaqueous solvent.

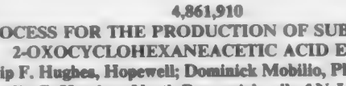
4,861,908

ORGANOSILICON COMPOUND

Shinichi Satoh, and Kazutoshi Fujioka, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1988, Ser. No. 216,023
Claims priority, application Japan, Jul. 8, 1987, 62-170119
Int. Cl.[4] C07F 7/10, 7/18
U.S. Cl. 556—420 8 Claims

1. An organosilicon compound represented by the general formula (I):



(I)

wherein R^1 may be the same or different and represents an alkyl group having 1 to 8 carbon atoms; R^2 and R^3 may be the same or different and represents an alkylene group having 1 to 8 carbon atoms; and R^4 represents a hydrogen atom or an alkyl group having 1 to 8 carbon atoms.

4,861,909

ISOCYANATE-MODIFIER POLY(ALKYLENE CARBONATE) POLYAHLS

Robert F. Harris, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 850,788, Apr. 11, 1986, Pat. No. 4,709,069. This application Feb. 24, 1987, Ser. No. 18,267
Int. Cl.[4] C07C 69/96; C08G 63/62
U.S. Cl. 558—267 29 Claims

1. An isocyanate-modified poly(alkylene carbonate) polyahl which is a polymer comprising
(1) a backbone having
(a) the residue of at least one polyahl initiator;
(b) the residue of at least one polyisocyanate;
(c) a plurality of poly(alkyleneoxy) moieties;
(d) a plurality of poly(alkylene carbonate) moieties; and
(2) a plurality of active hydrogen end groups,
in an amount sufficient to act as reaction sites when the isocyanate-modified poly(alkylene carbonate) polyahls are advanced to higher molecular weights by heating under reduced pressure.

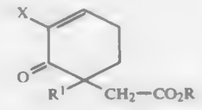
4,861,910

PROCESS FOR THE PRODUCTION OF SUBSTITUTED 2-OXOCYCLOHEXANEACETIC ACID ESTERS

Philip F. Hughes, Hopewell; Dominick Mobilio, Plainsboro, and Leslie G. Humber, North Brunswick, all of N.J., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 20,426, Feb. 2, 1987, which is a continuation-in-part of Ser. No. 868,230, May 28, 1986, abandoned. This application Dec. 11, 1987, Ser. No. 131,698
Int. Cl.[4] C07C 67/30
U.S. Cl. 560—126 2 Claims

1. A compound of formula (III)



(III)

wherein R and R^1 are lower alkyl wherein lower alkyl contains 1 to 6 carbon atoms; and X is bromine, or chlorine.

4,861,911

PROCESS FOR OXIDATION OF BENZENE TO PHENOL PRECURSOR

Robert DiCosimo, Shaker Heights, and Hsiao-Chiung Szabo, Mentor, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 750,552, Jul. 1, 1985, Pat. No. 4,783,550. This application Mar. 28, 1988, Ser. No. 174,297
The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed.
Int. Cl.[4] C07C 67/05
U.S. Cl. 560—145 3 Claims

1. A process for the catalytic reaction of benzene which comprises contacting benzene with
(a) an oxidant selected from H_2O_2, perfluoroperoxyacetic acid, saturated hydrocarbyl percarboxylic acids having 2–12 carbon atoms, and a combination of acetaldehyde and molecular oxygen;
(b) a solvent which is a perfluoroalkylmonocarboxylic acid having 2–6 carbon atoms and zero to 20 volume percent of an anhydride of such a perfluoro acid, based on the volume of the anhydride plus the perfluoro acid used;
(c) as catalyst a Co(II) of Co(III) salt or an organic acid which is soluble in said solvent,
said reaction being effected (1) under substantially anhydrous conditions and (2) at a temperature in the range zero to 50° C. when H_2O_2 or a peracid is the oxidant; and in the range 25°–150° C. when acetaldehyde plus molecular oxygen is the oxidant,
thereby forming the phenyl ester of said perfluoromonocarboxylic acid.

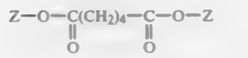
4,861,912

PROCESS FOR THE PREPARATION OF A DIESTER OF ADIPIC ACID

Eit Drent, and Johan Van Gogh, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 18, 1988, Ser. No. 169,698
Claims priority, application United Kingdom, Mar. 27, 1987, #707405
Int. Cl.[4] C07C 67/38, 51/14
U.S. Cl. 560—204 32 Claims

1. A process for the preparation of a compound of formula I

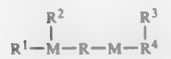


(I)

wherein each Z represents a hydrogen atom or a hydrocarbon group, which process comprises:
(a) contacting 1,3-butadiene with carbon monoxide and a compound of formula II

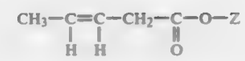
ZOH (II)

in which Z represents a hydrogen atom or a hydrocarbon group, in the presence of a first carbonylation catalyst prepared by combining a palladium compound and a polydentate ligand having formula III



(III)

wherein each M represents an atom of Group VA of the Periodic Table of the Elements having an atom number in the range of from 15 to 51, R represents a divalent organic bridging group having in the range of from 2 to about 6 carbon atoms in the bridge, none of these carbon atoms carrying substituents that may cause steric hindrance, and R^1, R^2, R^3 and R^4 each represent hydrocarbon group, thereby forming a compound of formula IV



(IV)

in which Z represents a hydrogen atom or a hydrocarbon group;
(b) isolating the compound of formula IV from the reaction mixture obtained in (a), and
(c) reacting the compound isolated in (b) with carbon monoxide and a compound of formula II in the presence of a second carbonylation catalyst.

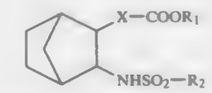
4,861,913

BICYCLIC SULFONAMIDE DERIVATIVES

Masayuki Narisada, Osaka; Mitsuaki Ohtani, Nara; Fumihiko Watanabe, Nara; Sanji Hagishita, Nara; Kaoru Seno; Susumu Kamata, both of Hyogo; Nobuhiro Haga, Osaka; Tatsuo Tsuri, Hyogo; Tadahiko Tsushima, and Kenji Kawada, both of Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Nov. 5, 1986, Ser. No. 927,823
Claims priority, application Japan, Nov. 18, 1985, 60-259154; Feb. 13, 1986, 61-30130; May 19, 1986, 61-115599; Jun. 3, 1986, 61-129011; Jul. 17, 1986, 61-169257
Int. Cl.[4] C07C 143/72
U.S. Cl. 562—427 13 Claims

1. A compound represented by the formula:



wherein R_1 is a hydrogen or C_1–C_5 alkyl; R_2 is an C_1–C_{10} alkyl, aryl, aralkyl, or pyridyl, where the aryl, aralkyl, or pyridyl are unsubstituted or are substituted by C_1–C_5 alkyl, C_1–C_5 alkoxy, nitro, hydroxy, carboxy, amino, C_1–C_5 alkylamino, C_1–C_5 dialkylamino whose two alkyl groups may be different from each other, C_1–C_3 alkanoylamino, or halogen and X is an C_1–C_7 alkylene, C_2–C_7 alkenylene, 1-fluoro-2-hexenylene, trimethylenethioethylene, ethylenethiotrimethylene, phenyleneoxymethylene, or 2-propenylene-m-phenylene, or its pharmaceutically acceptable salt.

4,861,914

DISCOLORATION INHIBITORS FOR AROMATIC AMINES

Charles F. Weidig, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 776,674, Sep. 16, 1985, abandoned. This application May 11, 1987, Ser. No. 48,261
Int. Cl.[4] C07C 85/26, 87/58, 87/56
U.S. Cl. 564—7 6 Claims

1. A composition of matter consisting essentially of a major amount by weight of a substituted aromatic amine selected from the group consisting of 2-methyl-6-ethylaniline, 2,6-diethylaniline, ortho-ethylaniline and mixtures of 2 or more of said aromatic amines, said aromatic amine being subject to gradual discoloration, and a minor amount by weight of 2,6-di-tert-butyl-4-methylphenol whereby said phenol inhibits discoloration of said aromatic amine.

3. A composition of matter consisting essentially of a major amount by weight of a substituted aromatic amine selected from the group consisting of 2,4-diamino-3,5-diethyltoluene, 2,6-diamino-3,5-diethyltoluene and mixtures thereof, said aromatic amine being subject to gradual discoloration, and a minor amount by weight of 2,6-di-tert-butyl-4-methylphenol whereby said phenol inhibits discoloration of said aromatic amine.

4,861,915

POLY (ARYL ETHER KETONE) BLOCK COPOLYMERS

Robert A. Clendinning, New Providence; James E. Harris, Piscataway; George T. Kwiatkowski, Green Brook, all of N.J.; Lee P. McMaster, Brookfield, Conn.; Markus Matzner, Edison, N.J., and Paul A. Winslow, Millington, N.J., assignors to Amoco Corporation, Chicago, Ill.

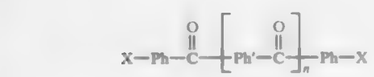
Division of Ser. No. 39,310, Apr. 16, 1987, Pat. No. 4,786,694, which is a continuation-in-part of Ser. No. 729,580, May 2, 1985, Pat. No. 4,774,296. This application Mar. 29, 1988, Ser. No. 174,849

Int. Cl.[4] C07C *49/786*

U.S. Cl. 568—328 **13 Claims**

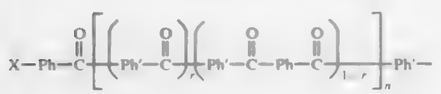
1. A biphenylene, terephenylene, naphthylene and/or anthracenylene containing dihalo-terminated poly(aryl ketone) oligomer having a molecular weight below about 10,000,

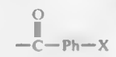
wherein said dihalo-terminated oligomer comprises at least one formula selected from the group consisting of:

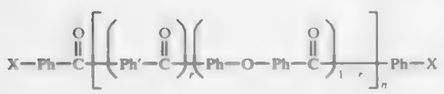


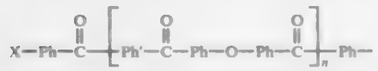


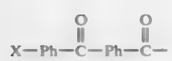


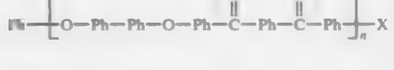


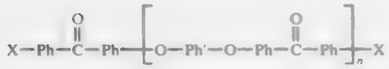


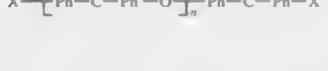




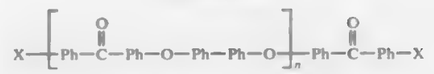


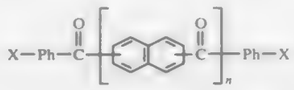


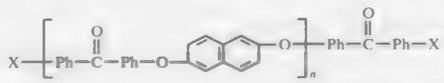




-continued







Ph is 1,4-phenylene, Ph′ is biphenylene, terphenylene, naphthylene and/or anthracenylene, each X is independently halogen and r is less than one and n is two or greater when ph′ is terephenylene, naphthylene or anthracenylene and four or greater when ph′ is biphenylene.

4,861,916

PHOTOINITIATORS FOR PHOTOPOLYMERIZATION OF UNSATURATED SYSTEMS

Manfred Köhler, Darmstadt; Jörg Ohngemach, Reinheim; Gregor Wehner, Darmstadt, and Jürgen Gehlhaus, Lautertal, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP86/00183, § 371 Date Dec. 3, 1986, § 102(e) Date Dec. 3, 1986, PCT Pub. No. WO86/05777, PCT Pub. Date Oct. 9, 1986

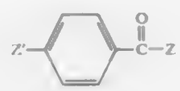
PCT Filed Mar. 27, 1986, Ser. No. 948,305

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1985, 3512179

Int. Cl.[4] C07C *49/82*

U.S. Cl. 568—337 **7 Claims**

1. A compound of the formula



[1]

wherein

Z is $Cr^1R^2(OR^3)$,

R^1 being H, C_{1-6}-alkyl or phenyl,

R^2 being H, C_{1-6}-alkyl or C_{1-6}-alkoxy and

R^3 being H, C_{1-6}-alkyl or C_{1-6}-alkanoyl and

Z′ is Y-$[(CH_2)_m$-$X]_n$—,

X being CH_2 or O,

Y being OH; COOH; SO_3H; an alkali metal, alkaline earth metal or ammonium salt thereof; a salt thereof with an organic nitrogen base; NRR, in which R and R, are in each case H, C_{1-20}-alkyl or C_{1-4}-hydroxyalkyl, or quaternized NRR′ or NRR′ in the form of an acid addition salt, and

n and m each being a number 1–4.

4,861,917

PROCESS FOR PREPARING MACROCYCLIC 2-HALOGENOKETONES

Masakatsu Matsumoto, Sagamihara; Tamotsu Fujimoto, Yamato, and Emiko Ejiri, Sagamihara, all of Japan, assignors to Sagami Chemical Research Center and Nippon Mining Company, Limited, both of Tokyo, Japan

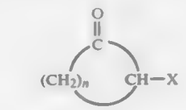
Filed May 6, 1988, Ser. No. 191,258

Claims priority, application Japan, May 7, 1987, 62-109801

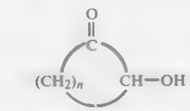
Int. Cl.[4] C07C *45/63*

U.S. Cl. 568—347 **16 Claims**

1. A process for preparing a macrocyclic 2-halogenoketone of the formula



where X is a halogen atom and n is a whole number of 10 to 16, which process comprises reacting a macrocyclic 2-hydroxyketone of the formula



with a halogenating agent, wherein the halogenating agent is one member selected from the group consisting of hydrobromic acid, hydrochloric acid, phosphorus tribromide, phosphorus oxychloride, phosphorus pentachloride, thionyl chloride and thionyl bromide.

4,861,918

REACTIVATION OF HYDROFORMYLATION CATALYSTS

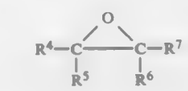
David J. Miller, Charleston; David R. Bryant, South Charleston; Ernst Billig, Charleston, all of W. Va., and Bernard L. Shaw, Leeds, England, assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 12, 1988, Ser. No. 231,510

Int. Cl.[4] C07C *45/50*

U.S. Cl. 568—454 **28 Claims**

1. A process for improving the catalytic activity of a partially deactivated solubilized rhodium-tertiary organophosphine complex hydroformylation catalyst, which comprises (1) mixing under non hydroformylating conditions, a liquid medium containing said solubilized partially deactivated complex catalyst, with an organic reagent selected from the group consisting of (a) alkyne compounds having the formula R—C≡C CH_2—X, (b) alkene compounds having the formula $(R^2)C=C(R^3)$—CH_2 X, (c) diketene, (d) methyl halides, (e) methyl sulfonates, (f) propiolate compounds having the formula HC≡C—(O)OR^{14} and (g) oxide compounds having the formula



wherein X represents a radical selected from the group consisting of halogen atoms, a carboxylate radical of the formula —OC(O)R^8, a sulfonate radical of the formula —OSOphd 2R^8 a a phosphonium radical of the formula [—,⁻(R^8)$_3$][Y—]- wherein R^8 in the above formulae for X, each individually represent a monovalent hydrocarbon radical having from 1 to 18 carbon atoms selected from the group consisting of alkyl, aryl, aralkyl, alkaryl and cycloalkyl radicals and wherein Y represents an acid anion; and wherein each R, R^1, R^2, R^3, R^4, R^5, R^6, R^7, and R^{14} radical individually represents hydrogen or a monovalent hydrocarbon radical having from 1 to 18 carbon atoms selected from the group consisting of alkyl, aryl, alkaryl, aralkyl and cycloalkyl radicals; with the following provisos: that R^8 in the above carboxylate formula can also be hydrogen; that R^2 and R^3 in the above formula for the alkene compounds can also be bonded together to form a five or six membered heterocyclic ring or monocyclic hydrocarbon ring along with the C=C group shown in said formula; and wherein any two of said R^4, R^5, $R^6$and R^7 groups in the above formula for the oxides can be bonded together to form a five or six membered monocyclic hydrocarbon ring along with the C—C group shown in said formula; to obtain an organic reagent treated solubilized rhodium-tertiary organophosphine complex product; and (2) eliminating from said product, any hydroformylation catalytic inhibitor formed by said Step (1), to obtain a rhodium-tertiary organophosphine complex hydroformylation catalyst that is more catalytically active than said partially deactivated rhodium-tertiary organophosphine complex hydroformylation catalyst.

4,861,919

COUNTERCURRENT MULTI-STAGE WATER CRYSTALLIZATION OF AROMATIC COMPOUNDS

Lanny A. Robbins, Midland, Mich., and Ben B. Gammill, Angleton, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 29, 1988, Ser. No. 161,589

Int. Cl.[4] C07B *63/00*; C07C *37/84, 39/06*

U.S. Cl. 568—724 **8 Claims**

1. A multi-stage, countercurrent process for the removal of impurities from a mixture of bisphenol-A and congeneric impurities contaminated by one or more related congeneric impurities, the process comprising subjecting the crude compound to at least two cycles of crystallization and purification wherein the purification step(s) comprise washing the crystals of the bisphenol-A countercurrently with a mixture of the compound in molten form and water followed by a final crystallization step wherein the cycles comprise

(1) melting the compound crystals prior to each crystallization by the addition of heat and water and in the absence of an added organic solvent;

(2) conducting one crystallization step at a low temperature pre-selected to increase recovery of the bisphenol-A;

(3) conducting at least one crystallization step at a temperature greater than about 95° C.; and

(4) separating water and oil which remain after each of the purification steps of the process and after the final crystallization step; and

(a) recycling the separated water to the crystallization and purification step(s); and

(b) recycling the separated oil to be recrystallized;

and the final crystallization step consists essentially of separating the crystals from the oil and water and drying the crystals without further purification.

4,861,920

PROCESS FOR THE PREPARATION OF 2,6-DIHYDROXYNAPHTHALENE

Martin Clausen, and Paul Rys, both of Zürich, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 14, 1988, Ser. No. 167,807

Claims priority, application Switzerland, Mar. 24, 1987, 1120/87

Int. Cl.[4] C07C *37/00, 37/08*

U.S. Cl. 568—741 **15 Claims**

1. A process for the preparation of 2,6-dihydroxynaphthalene, which comprises oxidizing 2,6-dialkylnaphthalenes, in an inert solvent, at temperatures from 50° to 150° C. by means of oxygen or oxygen donors in the presence of an alkali metal salt

or alkaline earth metal salt of an organic carboxylic acid having 5 to 14 carbon atoms, to give the corresponding 2,6-dialkylnaphthalene dihydroperoxides, and then hydrolysing the latter under acid conditions.

4,861,921

PROCESS FOR MANUFACTURE OF RESORCINOL

Jere D. Fellmann, 1474 Lexington Way, Livermore, Calif. 94550; Robert J. Saxton, 1460 Lewiston Dr., Sunnyvale, and Paul Tung, 908 Exmoor Way, both of Sunnyvale, Calif. 94087

Continuation-in-part of Ser. No. 840,838, Mar. 18, 1986, abandoned. This application Mar. 3, 1987, Ser. No. 21,219

Int. Cl.[4] C07C *37/06*

U.S. Cl. 568—772 13 Claims

1. A process for the manufacture of resorcinol which comprises the steps of

a. reacting an α,β-unsaturated cyclic ketone, under acid-catalyzed conditions, with a hydroxyl-moiety-containing compound selected from the group consisting of water, oxygen, alcohols, carboxylic acids, peroxides and peracids to obtain a cyclic resorcinol precursor having at least six carbon atoms and with meta-oriented hydroxyl moieties; and,

b. converting said cyclic resorcinol precursor to resorcinol by dehydrogenation, in the presence of a metal catalyst.

4,861,922

HYDROFORMYLATION OF 3-METHYL-3-BUTEN-1-OL AND ANALOGS THEREOF AND USE OF SUCH HYDROFORMYLATION PRODUCTS

Yasuo Tokitoh, and Noriaki Yoshimura, both of Kurashiki, Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

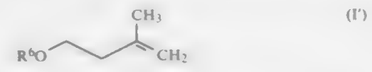
Division of Ser. No. 710,852, Mar. 12, 1985, Pat. No. 4,663,468. This application Feb. 11, 1987, Ser. No. 13,535

Claims priority, application Japan, Mar. 14, 1984, 59-49962; Mar. 29, 1984, 59-62448; Mar. 30, 1984, 59-64201; May 25, 1984, 59-107012; May 25, 1984, 59-107013; May 28, 1984, 59-109087

Int. Cl.[4] C07C *27/00*

U.S. Cl. 568—865 4 Claims

1. A method of producing 3-methylpentane-1,5-diol which comprises reacting a compound of the general formula



(I')

wherein R^6 is a hydrogen atom or a tetrahydro-4-methyl-2H-2-pyranyl group, with carbon monoxide and hydrogen in the presence of a rhodium compound free from modification by a ligand containing an element belonging to the group V of the periodic table and hydrogenating the hydroformylation product obtained in the presence of water, a hydrogenation catalyst and an acidic substance.

4,861,923

HYDRATION OF PROPYLENE TO ISOPROPYL ALCOHOL OVER SOLID SUPERACIDIC PERFLUORINATED SULFONIC ACID CATALYSTS

George Olah, Beverly Hills, Calif., assignor to PCUK Products Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation of Ser. No. 178,889, Aug. 18, 1980, abandoned. This application Sep. 7, 1984, Ser. No. 648,861

Int. Cl.[4] C07C *29/04, 31/10, 31/12*

U.S. Cl. 568—899 7 Claims

1. A process for the hydration of lower olefins to a corresponding alcohol which comprises contacting said olefin and water vapor each in the gaseous phase with a solid perfluorinated alkane sulfonic acid catalyst of a C_{10} to C_{18} perfluorinated alkanesulfonic acid, a polymeric perfluorinated ethene sulfonic acid or a tetrafluoroethylene trifluoroethane sulfonic acid copolymer under continuous flow conditions at a reaction temperature of between about 120° and 180° C. for a sufficient time to effect hydration of the olefin to the corresponding alcohol.

4,861,924

1,3,5-TRINITRO-2,4,6-TRIPICRYLBENZENE

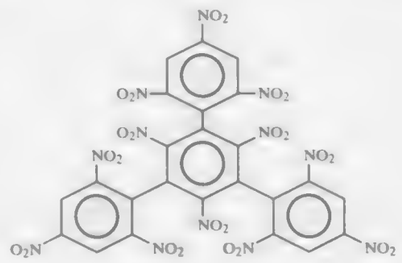
Robert S. Riggs, Grand Prairie, Tex., assignor to Jet Research Center, Inc., Arlington, Tex.

Filed Aug. 25, 1988, Ser. No. 237,610

Int. Cl.[4] C07C *79/10*

U.S. Cl. 568—931 1 Claim

1. The compound 1,3,5-trinitro-2,4,6-tripicrylbenzene of the formula



4,861,925

PROCESS FOR THE PREPARATION OF NITROOLEFINS

Jennifer M. Quirk, Highland, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

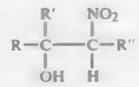
Filed Jul. 15, 1988, Ser. No. 219,682

Int. Cl.[4] C07C *79/08*

U.S. Cl. 568—942 20 Claims

1. A process for the preparation of nitroolefins consisting essentially of:

(a) mixing a nucleophilic addition reagent and a itroalcohol, said nitroalcohol having the formula



wherein R, R′ and R″ are independently selected from hydrogen, alkyl or cycloalkyl, heating the mixture to a temperature of at least 125° C. to dehydrate the nitroalcohol to form a corresponding nitroolefin, the nucleophilic addition reagent trapping the nitroolefin in situ to form an addition product; and

(b) separating said addition product.

4,861,926

STABILIZED 1,1,1-TRICHLOROETHANE COMPOSITIONS

Michel Servais, Kraainem, Belgium, assignor to SOLVAY & Cie (Societe Anonyme), Brussels, Belgium

Continuation-in-part of Ser. No. 586,871, Mar. 6, 1984, which is a continuation of Ser. No. 367,909, Apr. 13, 1982, abandoned. This application May 31, 1984, Ser. No. 615,511

Claims priority, application France, Apr. 13, 1981, 81 07528; Jun. 9, 1983, 83 09718

Int. Cl.[4] C07C *17/42, 19/05*

U.S. Cl. 570—110 5 Claims

1. Stabilized 1,1,1-trichloroethane composition for use in the presence of water in an amount of water in excess of the saturation level of the stabilized composition, said composition comprising:

1,1,1-trichloroethane;

an epoxide compound;

a nitro compound;

a furan compound; and

methyl acetate,

wherein said composition is stable in the presence of water and metals, and

wherein said composition immediately separates into a separate non-aqueous phase after being mixed with water in an amount greater than the saturation level of said composition.

4,861,927

DEHYDROHALOGENATION OF RING-HALOGENATED α-HALOCUMENES

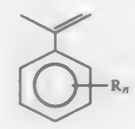
Mark R. Johnson, Grayslake, Ill., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 53,924, May 26, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 253,455

Int. Cl.[4] C07C *17/24, 17/34, 21/24*

U.S. Cl. 570—200 8 Claims

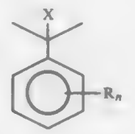
1. A process for preparing a ring-halogenated α-methylstyrene of the Formula (1)



(I)

wherein

R represents halogen and n represents 1 or 2 which comprises contacting a ring-halogenated α-halocumene of the Formula (II)



(II)

wherein

X is chloro or bromo and R and n are as previously defined with water at ambient pressure and at a temperature from about 70° to about 130° C. in the absence of an added base and in the absence of a phase-transfer catalyst.

4,861,928

PROCESS FOR THE ISOMERIZATION OF DICHLOROTOLUENE

Kazuyoshi Iwayama; Yasuhiro Magatani, both of Aichi, and Kuniyuki Tada, Kanagawa, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 4, 1988, Ser. No. 152,406

Claims priority, application Japan, Feb. 9, 1987, 62-26386

Int. Cl.[4] C07C *17/00, 25/02*

U.S. Cl. 570—202 7 Claims

1. A process for the isomerization of dichlorotoluene comprising the steps of contacting a mixture of isomers of dichlorotoluene with a catalyst containing an acid type zeolite selected from the group consisting of mordenite zeolite and beta zeolite and at least one component of metal selected from the group consisting of rhenium, nickel, and silver, said isomerization being conducted in the presence of hydrogen.

4,861,929

PROCESS FOR PRODUCING HALOGENATED BENZENE DERIVATIVE USING ZEOLITE CATALYST

Takanori Miyake; Kazuhiko Sekizawa; Toshio Hironaka, and Yukihiro Tsutsumi, all of Yamaguchi, Japan, assignors to Tosoh Corporation, Yamaguchi, Japan

Filed Dec. 29, 1986, Ser. No. 947,306

Claims priority, application Japan, Dec. 27, 1985, 60-292431; Jan. 20, 1986, 61-7832

Int. Cl.[4] C07C *17/12*

U.S. Cl. 570—209 8 Claims

1. A process for the production of parahalogenated holobenzenes or parahalogented alkylbenzenes comprising:

reacting, in liquid phase, at least one number selected from the group consisting of benzene, an alkyl benzene and a halogenated benzene, with elementary halogen at a reaction temperature of from 0° C. to 200° C., utilizing a faujasite zeolite as catalyst, in the presence of a co-catalyst selected from the group consisting of sulphur-containing compounds selected from the group consisting of sulfur, inorganic compounds containing a divalent sulfur atom and organic compounds containing a sulfur atom, and nitrogen-containing organic basic compounds selected from the group consisting of nitrogen-containing heterocyclic compounds, salts of nitrogen-containing heterocyclic compounds, aliphatic amines, salts of aliphatic amines, aromatic amines, salts of aromatic amines and mixtures therof.

4,861,930

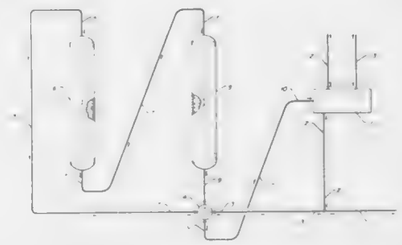
COMBINATION PROCESS FOR THE CONVERSION OF A C_2–C_6 ALIPHATIC HYDROCARBON

Paul R. Cottrell, Arlington Heights; Thomas R. Fritsch, Wheaton, and Christopher D. Gosling, Roselle, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Sep. 28, 1988, Ser. No. 250,288

Int. Cl.[4] C07C *2/00*

U.S. Cl. 585—317 17 Claims



1. A process for producing naphthenic hydrocarbons from a C_2–C_6 aliphatic hydrocarbon feedstock by the steps of:

(a) passing a hydrocarbon feedstock comprising at least one C_2–C_6 aliphatic hydrocarbon into a dehydrocyclodimerization reaction zone containing a dehydrocyclodimerization catalyst and operated at dehydrocyclodimerization conditions to produce a dehydrocyclodimerization reaction zone effluent stream comprising aromatic hydrocarbons and hydrogen;

(b) passing the dehydrocyclodimerization reaction zone effluent stream comprising aromatic hydrocarbons and hydrogen into a hydrogenation reaction zone containing a hydrogenation catalyst and operating at hydrogenation reaction conditions sufficient to covert aromatic hydrocarbons in the hydrogenation reaction zone feedstock into aliphatic hydrocarbons; and

(c) recovering the products of the hydrogenation reaction zone.

4,861,931

PROCESS FOR PRODUCING 5-ALKYLIDENENORBORNENE

Yasuo Hara, Yokohama; Ryuji Onishi, Yokkaichi; Yoshitaka Kawahara, Ibaraki, and Mikio Takeuchi, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1988, Ser. No. 208,667
Claims priority, application Japan, Jun. 23, 1987, 62-156097
Int. Cl.[4] C07C *5/25*
U.S. Cl. 585—363 16 Claims

1. A process for producing a 5-alkylidenenorbornene, which comprises contacting a 5-alkenylnorbornene with an organolithium compound and at least one compound selected from the group consisting of ammonia, a hydrazine compound and an aliphatic amine compound wherein at least one nitrogen atom in the molecule bonds to at least one hydrogen atom, to isomerize the 5-alkenylnorbornene.

4,861,932

AROMATIZATION PROCESS

Nai Y. Chen, Titusville, N.J.; Thomas F. Degnan, Yardley, and Sharon B. McCullen, Newtown, both of Pa., assignors to Mobil Oil Corp., New York, N.Y.

Filed Dec. 31, 1987, Ser. No. 140,274
Int. Cl.[4] C07C *12/00;* C10G *35/06*
U.S. Cl. 585—412 26 Claims

1. In a process for converting a C_2–C_{12} paraffinic hydrocarbon feed to aromatics by contacting the feed with at least one zeolite catalyst in a least one conversion zone, the improvement which comprises,

passing the feed through a first conversion zone wherein the feed contacts a noble metal/low acidity medium pore size zeolite catalyst having an alpha value of less than about 5, and then passing the resulting hydrocarbon mixture through a second conversion zone wherein the resulting hydrocarbon mixture contacts a medium pore size acidic zeolite catalyst having an alpha value of greater than about 10.

4,861,933

PROCESS FOR CONVERTING ALIPHATICS TO AROMATICS OVER A GALLIUM-ACTIVATED ZEOLITE

Margaret Nemet-Mavrodin, Cherry Hill, N.J., assignor to Mobil Oil Corp., New York, N.Y.

Continuation-in-part of Ser. No. 89,194, Aug. 25, 1987, abandoned, which is a continuation-in-part of Ser. No. 133,773, Dec. 16, 1987, Pat. No. 4,808,295. This application Sep. 6, 1988, Ser. No. 240,299
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[4] C07C *2/52*
U.S. Cl. 585—417 14 Claims

1. A process for producing aromatic compounds which comprises contacting a C_3+ feed containing at least 50 weight percent of C_3 to C_{12} aliphatic hydrocarbons under conversion conditions of a severity resulting in a conversion of least about 80 wt. % of said hydrocarbons, with a catalyst prepared by loading with gallium a zeolite characterized by a Constraint Index within the approximate range of 1 to 12 and having a silica/alumina ratio of about 25:1 to 1000:1, and subsequently calcining the catalyst at a temperature of at least about 700° C.

4,861,934

PRODUCTION OF HIGH-OCTANE GAS BLENDING STOCK

Isao Suzuki; Kazuo Hirabayashi, both of Yokohama; Tadami Kondoh, Ebina, and Hiroaki Nishijima, Ebina, all of Japan, assignors to Research Association for Utilization of Light Oil, Japan

Continuation-in-part of Ser. No. 1,370, Jan. 8, 1987, abandoned. This application Feb. 25, 1988, Ser. No. 163,188
Claims priority, application Japan, Jan. 9, 1986, 61-2658
Int. Cl.[4] C07C *12/02*
U.S. Cl. 585—415 12 Claims

1. A process for the preparation of a high-octane gasoline, which comprises contacting a light hydrocarbon containing one or more paraffins and/or olefins, each having 2 to 7 carbon atoms, with a crystalline silicate catalyst, characterized in that said catalyst comprises an aluminogallosilicate with its skeleton comprised of SiO_4, AlO_4 and GaO_4 tetrahedra, that said alumino-gallosilcate has the following formula:

$$aM_{2/n}O{\cdot}bAl_2O_3{\cdot}Ga_2O_3{\cdot}cSiO_2{\cdot}dH_2O$$

wherein M is a metal selected from an alkali metal, an alkaline earth metal and a mixture thereof, n is the valence of said metal, a is a positive number of $(b+1)+3.0$, b is between 1 and 6, c is between 80 and 490, d is between 1 and 200, $c/(b+1)$ is between 40 and 70, and c/b is between 46.7–140, and that said contacting is performed at a temperature of 350°–650 ° C. under a hydrogen partial prssure of not higher than 5 kg/cm^2.

4,861,935

CATALYTIC COMPOSITION AND PROCESS FOR THE TRANSALKYLATION OF AROMATIC HYDROCARBONS

Steve T. Bakas, Willowbrook, and Paul T. Barger, Arlington Heights, both of Ill., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 124,147, Nov. 23, 1987, Pat. No. 4,826,801, which is a continuation-in-part of Ser. No. 932,113, Nov. 18, 1986, Pat. No. 4,735,929, which is a continuation-in-part of Ser. No. 772,099, Sep. 3, 1985, abandoned. This application Nov. 3, 1988, Ser. No. 266,770
Int. Cl.[4] C07C *5/22*
U.S. Cl. 585—474 6 Claims

1. A process for the transalkylation of transalkylatable aromatics which comprises passing a feed stream comprising a transalkylatable aromatic and an aromatic substrate into a transalkylation reaction zone containing a transalkylation catalyst, at transalkylation reaction conditions and recovering the transalkylation reaction zone products where the transalkylation catalyst comprises a hydrogen form mordenite dispersed in an alumina matrix, said composite comprising from about 5 to 25 percent by weight of alumina, and wherein the support is contacted with an acidic aqueous solution after it is formed, said contacting occurring at conditions selected to increase the surface area of the composite to at least 580 m^2/g without increasing the silica to alumina ratio of the mordenite.

4,861,936

BORON-PROMOTED REDUCIBLE METAL OXIDES AND METHODS OF THEIR USE

John A. Sofranko, Malvern; Robert G. Gastinger, Brookhaven, and C. Andrew Jones, Newtown Square, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 877,574, Jun. 23, 1986, Pat. No. 4,777,313, which is a continuation-in-part of Ser. No. 683,296, Dec. 18, 1984, abandoned, and a continuation-in-part of Ser. No. 522,937, Aug. 12, 1983, Pat. No. 4,499,322, and a continuation-in-part of Ser. No. 522,936, Aug. 12, 1983, Pat. No. 4,495,374, and a continuation-in-part of Ser. No. 600,654, Apr. 16, 1984, Pat. No. 4,547,611, and a continuation-in-part of Ser. No. 600,655, Apr. 16, 1984, abandoned, Ser. No. 600,654, and Ser. No. 600,655, each is a continuation-in-part of Ser. No. 522,937, and Ser. No. 522,936. This application Jun. 27, 1988, Ser. No. 212,357
Int. Cl.[4] C07C *2/00*
U.S. Cl. 585—500 37 Claims

1. In an improved method for dehydrogenating dehydrogenatable hydrocarbons which comprises contacting a gas comprising dehydrogenatable hydrocarbons at oxidative dehydrogenation conditions with a solid comprising at least one oxide of at least one metal which oxides when contacted with dehydrogenatable hydrocarbons at oxidative dehydrogenation conditions are reduced and produce dehydrogenated hydrocarbons and water, the improvement which comprises conducting the contacting in the presence of a promoting amount of at least one member of the group consisting of boron and compounds thereof, said solid being substantially free of catalytically effective iron.

22. In an improved method for dehydrogenating dehydrogenatable hydrocarbons which comprises contacting a gas comprising dehydrogenatable hydrocarbons at a temperature within the range of about 500° to about 1000° C. with a solid comprising at least one oxide of at least one metal which oxides when contacted with dehydrogenatable hydrocarbons are reduced and produce dehydrogenated hydrocarbons and water, the improvement which comprises conducting the contacting in the presence of:

(a) at least one member of the group consisting of Li and compounds thereof,

(b) at least one member selected from the group consisting of boron and compounds thereof, and

(c) at least one member of the group consisting of alkaline earth metals and compounds thereof.

34. In an improved hydrocarbon conversion process which comprises contacting a hydrocarbon feedstock with a solid comprising a reducible oxide of Mn and which is characterized by the production of hydrocarbon product, coproduct water, and a reduced oxide of Mn, the improvement which comprises conducting the contacting with a mixed oxide composition containing Mn, Na, B and Mg and the mixed oxide composition is characterized by the presence of the crystalline compound $NaB_2Mg_4Mn_2O_x$.

4,861,937

CATALYSTS FOR CONVERTING ALCOHOLS AND/OR ALIPHATIC ETHER TO UNSATURATED HYDROCARBONS AND PROCESS FOR THEIR PRODUCTION

Michael Baacke, Hanau; Klaus Deller, Hainburg; Peter Kleinschmit, Hanau, and Edgar Koberstein, Alzenau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 29, 1983, Ser. No. 518,402
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1982, 3228269
Int. Cl.[4] C07C *1/00, 1/20*
U.S. Cl. 585—640 18 Claims

1. In a process for the production of hydrocarbons from an alcohol or an aliphatic ether in the presence of a catalyst which contacts the alcohol or ether, the improvement comprising employing a catalyst consisting essentially of (1) crystalline aluminum silicate in the hydrogen form modified with (2) a cadmium compound or a mixture of compounds of both zinc and cadmium, and (3) additional silica and thereby forming a product having a high olefin and lower portion of paraffin hydrocarbons;

wherein the amount of cadmium is 0.1 to 30% by weight cadmium calculated on CdO and the amount of silica is 5–30% by weight 5 to 30% silica based on the amount the aluminum silicate.

4,861,938

CHEMICAL CONVERSION PROCESS

Jeffrey M. O. Lewis, and William H. Henstock, both of Charleston, W. Va., assignors to UOP, Des Plaines, Ill.

Filed Jul. 7, 1987, Ser. No. 70,578
Int. Cl.[4] C07C *1/00*
U.S. Cl. 585—640 42 Claims

1. In a process for converting a non-olefinic feedstock containing 1 to about 6 carbon atoms per molecule which includes the discrete sequential steps of (a) contacting said feedstock with a solid composition comprising a crystalline microporous three dimensional solid catalyst having the ability to promote said conversion, and matrix material at conditions effective to convert said feedstock, to produce a hydrocarbon product containing light olefins and to at least partially deactivate said solid composition; (b) contacting said deactivated solid composition with regeneration medium at conditions effective to at least partially regenerate said solid composition; and (c) repeating step (a), the improvement which comprises (d) conditioning said regenerated solid composition in the presence of at least one added conditioning agent comprising a basic material that is substantially incapable of entering the pores of said catalyst upon completion of step (b) to provide said regenerated solid composition with increased effectiveness in step (c).

4,861,939

PROCESS FOR REMOVING ARSINE FROM LIGHT OLEFIN CONTAINING HYDROCARBON FEEDSTOCKS

Guy Debras, Les-Bons-Villers, and Philippe Bodart, Mozet, both of Belgium, assignors to Labofina, S.A., Brussels, Belgium

Filed Sep. 23, 1988, Ser. No. 248,533
Claims priority, application European Pat. Off., Sep. 24, 1987, [redacted]
Int. Cl.[4] C10G *17/02*
U.S. Cl. 585—820 25 Claims

1. A process for removing arsine from a light olefin-containing hydrocarbon feedstock, said process comprising the steps of:

(a) passing said feedstock over an absorbent material comprising nickel deposited on a support material wherein said nickel is present as both nickel oxide and metallic nickel; and

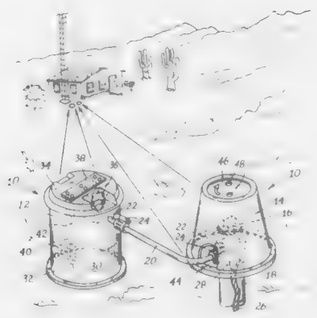
(b) recovering a hydrocarbon stream from said absorbent material having a substantially reduced arsine content.

4,861,940

AUTOMATED MOISTURIZED GROUNDING ELECTRODE SYSTEM

Roy B. Carpenter, Jr., 6687 Arapahoe Rd., Boulder, Colo. 80303

Filed Sep. 7, 1988, Ser. No. 241,253
Int. Cl.[4] H01R 4/66
U.S. Cl. 174—6 4 Claims



1. Apparatus for forming a grounding system for providing an electrical interface with the soil for various electrical and lightning protection systems, comprising:

a grounding electrode for extending into the soil;

means attached to the grounding electrode for connecting a pipe to the grounding electrode;

a solar humidifier having a watertight container for containing water;

said watertight container comprising means for adding water thereinto;

said watertight container further comprising a top having a solar energizable heat sink;

said heat sink including heat conductors which extend downward into the inside of the watertight container for transforming water into a mist;

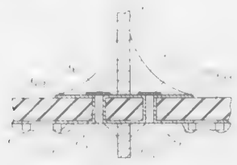
said watertight container further comprising a pipe near its top connected to the means for connecting a pipe to the grounding electrode for conducting moisture to the grounding electrode.

4,861,941

SHIELDING DEVICE

Kazuhiko Kubo, Mishima; Susumu Saitou, Ibaraki; Akira Usui, Takatsuki, and Hiroyuki Nagai, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Inc., Osaka, Japan

PCT No. PCT/JP87/00396, § 371 Date Feb. 11, 1988, § 102(e) Date Feb. 11, 1988, PCT Pub. No. WO87/07998, PCT Pub. Date Dec. 30, 1987
PCT Filed Jun. 18, 1987, Ser. No. 184,490
Claims priority, application Japan, Jun. 20, 1986, 61-145239
Int. Cl.[4] H05K 9/00, 1/00, 3/00
U.S. Cl. 174—35 R 8 Claims



1. A shielding device wherein a shielding plate is erected on one side of a substrate and is connected to a grounding conductor film on the other side of said substrate, comprising:

grounding conductor films respectively formed on said one side and on said other side of said substrate, said conductor film on said one side being connected to said conductor film on said other side by at least one through-hole conductor applied to at least one through-hole in said substrate, an opening portion of said at least one through-hole on at least one side of said substrate being covered and closed by a solder resist, and said shielding plate being mounted on said grounding conductor film on the at least one side and soldered thereto.

5. A method of forming a shielding device comprising the steps of:

forming grounding conductor films respectively on opposite sides of a substrate;

electrically interconnecting the respective grounding conductor films through at least one through-hole formed in said substrate;

covering an open portion of said through-hole on at least one side of said substrate with a solder resist;

coating the grounding conductor film on said one side of said substrate with a creamy solder;

mounting a shielding plate on said grounding conductor film on said one side of said substrate through said creamy solder; and

soldering said shielding plate to said conductor film on said one side of said substrate.

4,861,942

ADJUSTABLE RISER ASSEMBLY

Thomas F. Moran, Jr., Chagrin Falls, Ohio, assignor to Midwest Plastic Fabricators, Inc., Chagrin Falls, Ohio

Filed Jun. 22, 1988, Ser. No. 210,001
Int. Cl.[4] H02G 3/04, 9/06
U.S. Cl. 174—38 2 Claims



1. An adjustable meter riser assembly comprising, in combination:

a first rigid thermoplastic conduit having first and second ends;

a bend of at least about 30 degrees in said first rigid conduit between said ends;

a portion of the first conduit adjacent said first end being adapted to extend underground in a direction having a horizontal component;

said first end of said first conduit being adapted to receive an underground electrical cable with or without a conduit;

a second rigid thermoplastic conduit having first and second ends;

said first end of said second conduit having an enlarged diameter portion sufficient to receive the second end of said first conduit with a sliding fit;

a fitting secured on said second end of said second conduit for connection to an electrical meter box rigidly mounted above ground on a substantially vertical wall of a building;

said enlarged diameter portion of said first end of said second conduit being at least six inches long for vertical

telescoping adjustment with said second end of said first conduit;

the nominal inner diameter of the second conduit adjacent its second end being substantially the same as the nominal inner diameter of the second end of the first rigid conduit so as to act as a stop for the second end of the first conduit;

said telescoping adjustment establishing a close fitting, sliding interconnection between said first and second conduits to accommodate ground settling, thermal expansion, and other forces and not transmit them to the electrical meter box;

said first and second conduits when installed with the first conduit having a portion in the ground and a portion out of the ground providing physical protection below and above ground for an electrical cable when within said conduits.

4,861,943

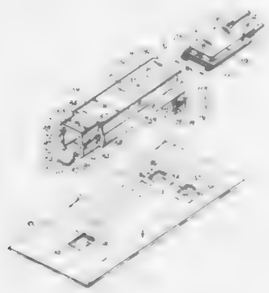
ENCLOSURE FOR THERMAL PROTECTOR AND METHOD OF ASSEMBLY

Martin J. Yarmark, Huntingdon Valley, Pa., assignor to Triboro Electric Corporation, Doylestown, Pa.

Filed Nov. 12, 1987, Ser. No. 119,470

Int. Cl.[4] H05K *5/00*

U.S. Cl. 174—52.1 **10 Claims**



1. An enclosure for a thermal protector comprising:

an electrically insulating housing having an exterior surface, locking means for securing the thermal protector to a predetermined position within the housing, an open front end, an open rear end operable for receiving said thermal protector and a hollow interior formed by a pair of side walls, a top wall and a bottom wall, said interior side walls being step shaped, said bottom and top walls having continuous, uninterrupted planar surfaces and extending parallel to each other; and

clip means extending from and integral with the exterior surface of the housing for connection of the housing to an object;

wherein the locking means include a resilient tab protruding downwardly from the top interior wall of the housing.

4,861,944

LOW COST, HERMETIC PIN GRID ARRAY PACKAGE

Kenneth L. Jones, II, Escondido; Tom R. O'Connor, San Marcos, and Kenneth A. Trevellyan, San Diego, all of Calif., assignors to Cabot Electronics Ceramics, Inc., San Diego, Calif.

Filed Dec. 9, 1987, Ser. No. 130,469

Int. Cl.[4] H05K *01/18*

U.S. Cl. 174—68.5 **18 Claims**

1. A hermetic pin grid array package for supporting an electronic device, comprising:

an electrically insulating, moisture impervious base having a plurality of bores therethrough and adapted for supporting the electronic device thereupon at a device location;

a plurality of electrically conducting pins, one pin extending through each of said bores and having a size of the portion of said pin within said bore that is less than the size of said bore so that there is a clearance gap between said pin and said bore, said pins communicating with a top side of said base and extending through said base to emerge on a bottom side of said base;

means for preventing foreign matter from entering into the clearance gap between each of said pins and said bores, from the bottom side of said base, said means for preventing being a separate element from, and non-integral with,



said pins, said means for preventing being a plurality of metallic collars, one around each of said pins and positioned to contact the bottom side of said base where said pin emerges from said base, each of said collars being wedged between said pin and said bore to prevent foreign matter from entering into the clearance gap from the bottom side of said base, the collars being formed as a metallic layer deposited upon the bottom side of said base; and

means for electrically connecting said pins to the electronic device in a selected pattern.

4,861,945

YIELDABLY EXTENSIBLE SELF-RETRACTING SHIELDED CABLE

Arthur G. Buck, Sherwood; Ronald A. Olson, Portland, and Doris A. Beck, Beaverton, all of Oreg., assignors to Precision Interconnect Corporation, Portland, Oreg.

Filed Dec. 9, 1988, Ser. No. 281,741

Int. Cl.[4] H01B *7/06;* **H01P** *3/06*

U.S. Cl. 174—69 **5 Claims**

1. A yieldably extensible, self-retracting cable comprising:

electrical conductor;

primary dielectric material (b) a flexible primary dielectric material surrounding said conductor, said dielectric material having a dielectric constant suitable for high frequency signal transmission and having a predetermined degradation temperature above which its electrical insulating capability is significantly decreased;

(c) a flexible wire shield surrounding said primary dielectric material, said shield comprising at least a pair of concentric layers of electrically-conductive wire wound helically in mutually-opposite directions, one layer being exterior of the other; and

(d) a dielectric jacket surrounding said wire shield, said dielectric jacket comprising a heat-settable elastomeric dielectric material permanently formed in a yield ably extensible helical shape which likewise forms said conductor, said primary dielectric material, and said wire shield in a yieldably extensible helical shape, said elastomeric dielectric material of said jacket having a setting temperature which is less than said degradation temperature of said primary dielectric material.

4,861,946

CABLE SLEEVE HAVING END MEMBERS AND A SLEEVE MEMBER WITH AT LEAST ONE LONGITUDINALLY EXTENDING SLOT

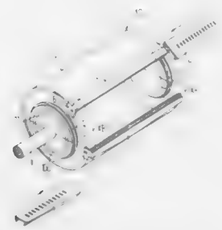
Klaus Pichler, Otterfing, and Dieter Kunze, Neuried, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 20, 1988, Ser. No. 208,528

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1987, 3721935

Int. Cl.[4] H02G *15/113*

U.S. Cl. 174—92 **15 Claims**



1. In a cable sleeve having a pair of end members with annular seals, a sleeve member having a pair of longitudinal edges forming a longitudinally extending slot, and clamping means for pressing the pair of longitudinal edges into sealing engagement with each other as the sleeve member is sealed onto the seals of the pair of end members, the improvements comprising the sleeve member at each end of the slot having a pair of segment-like, inwardly projecting flanges in the region adjacent a parting line between said pair of the longitudinal edges and fixing means for engaging each pair of flanges including a stiffening element for extending across a gap between each pair of the flanges to hold the pair of flanges in a fixed position to prevent separation of the ends of the pair of longitudinal edges of the slot.

4,861,947

COMMUNICATION OR CONTROL CABLE WITH SUPPORTING ELEMENT

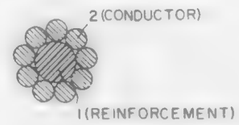
Ernst Altermatt, Nunningen, and Peter Heim, Breitenbach, both of Switzerland, assignors to Schweizerische Isola-Werke, Breitenbach, Switzerland

Filed Apr. 13, 1988, Ser. No. 180,898

Claims priority, application Switzerland, Apr. 13, 1987, 1423/87

Int. Cl.[4] H01B *5/10, 7/08*

U.S. Cl. 174—113 C **11 Claims**



1. In a communication or control cable comprising a supporting element made of high-molecular weight reinforcing fibers or filaments having a modulus of elasticity greater than 100 GPa, which are firmly joined to one another by means of a high-molecular weight, crosslinked resin, the improvement wherein the high-molecular weight, crosslinked resin is a polymer blend of polyurethane resin and phenoxy resin.

4,861,948

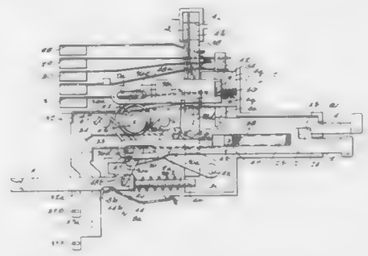
INTERLOCK SWITCH WITH LOW ENERGY OPERATING MECHANISM

Eric W. Fogleman, Sr., Four Oaks, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 27, 1988, Ser. No. 212,353

Int. Cl.[4] H01H *9/26*

U.S. Cl. 200—5 B **23 Claims**



1. An interlock switch having a low energy operating mechanism comprising:

contact means biased to a normally open condition;

cam means reciprocally movable between first and second positions closing said contact means in said second position;

an operator biased to an extended position operable to a depressed position;

means coupling said operator and said cam means, depression of said operator moving said cam means to said second position, said contact means biasing said cam means to said first position upon return of said operator to said extended position;

latch means alternately latching and releasing said cam means in said second position upon successive depressions of said operator; and

interlock means normally blocking movement of said cam means from said first position to said second position, said interlock means being movable to a non-blocking position; and

second operator means operable to move said interlock means to said non-blocking position.

4,861,949

CAM SWITCH FORMED BY MODULAR UNITS

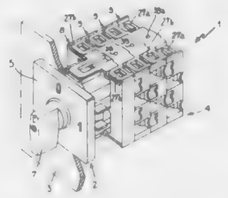
Sergio Bortolloni, and Glauco M. Bernier, both of Milan, Italy, assignors to Breter S.p.a., Paderno Dugnano, Italy

Filed Nov. 23, 1987, Ser. No. 123,883

Claims priority, application Italy, Jul. 26, 1987, 21094 A/87

Int. Cl.[4] H01H *9/02*

U.S. Cl. 200—5R **11 Claims**



1. A cam switch formed by modular units comprising an operating member provided with a rotary coupling shank, a

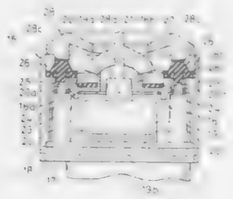
trip unit housing a trip mechanism operatively connected to the coupling shank; a number of pack-aligned switching units contiguously fixed to said trip unit and each provided with contact means comprising fixed and movable contacts, the latter being movable, in opposition to the action exerted by counter-springs, from a closure position in which the movable contacts come in contact with the fixed contacts and a break condition in which the movable contacts are spaced apart from the fixed contacts; a drive shaft operatively connected to said trip mechanism and provided with a rotating motion by said coupling shank, in order to cause the translation of said movable contacts through cams associated therewith; a terminal closure element fixed to one of said switching units opposite the trip unit and rotatably supporting the drive shaft at one free end thereof; the trip unit, switching units and terminal closure element forming each a modular unit, and being engageable with and disengageable from each other by restrained fixing, wherein each of said switching units comprises a casing with first housings, each first housing having one of said fixed contacts forcibly inserted therein, as well as second housings each accommodating an envelope, said envelope containing one of said counter-springs, one of said movable contacts and a tappet member, said tappet member operable by one of said cams to bring the movable contact from a closure condition to a break condition, said movable contact coming out of the envelope from either side thereof so that it overlaps the fixed contacts with its opposed ends.

4,861,950

MULTIPLE SWITCH DEVICE HAVING WATERPROOF STRUCTURE

Shinji Yanai, and Yujiro Shimoyama, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd, Japan

Filed Feb. 26, 1988, Ser. No. 160,520
Claims priority, application Japan, May 2, 1987, 62-74361[U]
Int. Cl.[4] H01H *9/04*
U.S. Cl. 200—5 R **3 Claims**



1. A switch device comprising:

a casing;

an actuator swingably supported to the casing, the actuator including a plurality of projections extending down from the lower surface of the actuator for actuating a switch;

a plurality of switch elements arranged in the casing such that each of the plurality of switch elements can be actuated by a corresponding one of the projections;

a partition plate separating the casing into an upper portion which includes the actuator and a lower portion which includes the switch elements, the partition plate being provided with holes through which the projections may communicate with the switch elements; and

a plurality of pressing gaskets, each of the pressing gaskets being of unitary construction including a central downwardly extending pressing portion and a peripheral water sealing portion, each of the pressing gaskets being located in one of the holes such that the pressing portion can be contacted by a corresponding one of the projections and can in turn contact a corresponding one of the switch elements, and the peripheral portion being attached to the partition plate adjacent the one of the holes such that a waterproof seal is provided between the one of the projections and the corresponding one of the switch elements.

4,861,951

ROTARY SWITCH WITH INDEXING STRUCTURE MOUNTED TO A PRINTED CIRCUIT BOARD

Elwyn H. Olson, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 13, 1988, Ser. No. 218,182
Int. Cl.[4] H01H *19/58*
U.S. Cl. 200—11 DA **5 Claims**



1. A rotary electrical switch for mounting on a printed circuit board and providing selective direct electrical interconnections among printed wiring electrical contacts carried by the printed circuit board comprising

an electrical contact strip,

a rotatable indexing means for supporting the contact strip,

a shaft for rotating the indexing means,

a housing having location defining means cooperating with the indexing means for establishing a plurality of predetermined rotational indexed positions of said indexing means, said housing means including a first limit means defining a first and a second rotational limit position and said indexing means including a second limit means cooperating with said first limit means to limit a rotation of said indexing means between the first and second rotational limit positions, and

outwardly projecting ears attached to said housing for mounting the switch on a printed circuit board to allow the contact strip to directing cooperate with the printed wiring electrical contacts carried by and projecting from the printed circuit board to provide selective electrical connections therebetween.

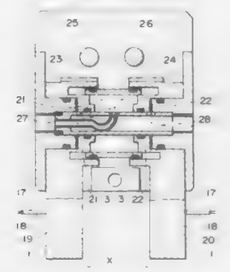
4,861,952

PRESSURE ACTIVATED SWITCH

Yoji Ise, Tokyo, Japan, assignor to Kabushiki Kaisha Myotoku, Tokyo, Japan

Filed May 24, 1988, Ser. No. 198,172
Claims priority, application Japan, May 26, 1987, 62-79286[U]
Int. Cl.[4] H01H *35/38*
U.S. Cl. 200—81 R **1 Claim**

1. A pressure activated switch comprising a body, a pressure receiving block slidably fitted to said body, and a pressure sensing assembly interposed between said body and block comprising in sequence, a first electrode plate insulated from the body, a pressure applied conductive rubber plate, a second electrode plate insulated from the pressure receiving block, and a bolt passing through the electrode plates and pressure applied conductive rubber plate to hold said plates together, said bolt being fixed at its tip to said pressure receiving block for conjoint movement therewith, an adjustable pressure spring disposed between said assembly and said body biasing said assembly away from said body and lead wires attached to



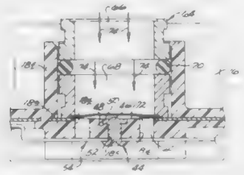
and leading out of said electrode plates whereby an electrical signal is established when pressure is applied via said block to compress said assembly against said body.

4,861,953

PRESSURE SWITCH APPARATUS HAVING IMPROVED LONGEVITY AND WIDENED TOLERENCE FOR LOCATION OF STATIONARY CONTACT

Carlton E. Sanford, East Providence, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 18, 1988, Ser. No. 169,799
Int. Cl.[4] H01H *35/40*
U.S. Cl. 200—83 P **9 Claims**



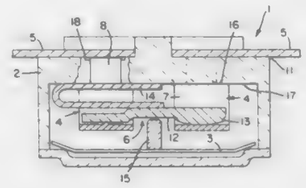
1. An electric switch having an electrically insulative base member, the base member having a bottom wall and a side wall extending from the bottom wall defining a switch chamber, an electrical contact member disposed on the base member having at least a portion in the switch chamber, a dish shaped metallic diaphragm having an at rest convex surface configuration on a face thereof and having a circular outer peripheral edge engaging the electric contact member and with the convex surface facing away from the bottom wall, the diaphragm being movable between convex and concave configurations, retainer means including a retainer member having an inner and an outer end and a passageway extending therebetween, the retainer member having a diaphragm receiving recess formed at its inner end, said recess having a depth greater than the thickness of the diaphragm, the retainer member thereby loosely retaining the diaphragm on the electric contact member, the passageway being connectable to a pressure source, and an electrically conductive center contact mounted on said base member and in alignment with the center of the diaphragm and being adapted to close a circuit through the diaphragm and the electrical contact member in one of its configurations whereby positive fluid pressure introduced into the passageway engages and biases the diaphragm into sealing and electrical connection with the electrical contact member.

4,861,954

PROCESS FOR CONNECTING CONDUCTIVE PARTS OF AN ELECTRICAL SWITCH COMPONENT

Helmut Bayer, and Peter Sekira, both of Vienna, Austria, assignors to Electrovac, Fabrikation, Elektrotechnischer Spezialartike, Vienna, Austria

Filed Dec. 18, 1987, Ser. No. 134,658
Claims priority, application Austria, Dec. 18, 1986, 3380/86
Int. Cl.[4] H01H *1/00*
U.S. Cl. 200—284 **6 Claims**



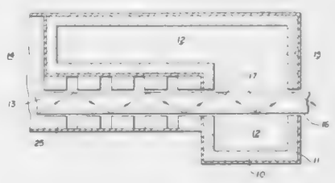
1. A electrical switch component comprising: an insulating body having an opening extending therethrough, a conductive feed part extending through the opening in the insulating body, a switch unit attached to a first end of the feed part, a contact part connected to a second end of the feed part, wherein the feed part has a body portion and includes a weld section that extends from the body portion and passes through the insulating body, the weld section having a smaller cross section than the body portion, a transition region between the body portion and the weld section and being constructed stepwise to define a support shoulder to limit inward movement of the feed part into the opening in the insulating body, the second end of the feed part defined by an outer end of the weld section end projecting outwardly from the insulating body and connected by a weld to the contact part, wherein the feed part is formed with a U-shape and each of the mutually parallel shanks of the U has a respective body portion adjoining a central, perpendicular shank, and each body portion includes a weld section that passes through the insulating body.

4,861,955

MATCHED ABSORPTIVE END CHOKE FOR MICROWAVE APPLICATORS

Zhi-Yuan Shen, Universal Exect. P.O. Box 2365, Darien, Conn. 06820

Filed Jul. 9, 1987, Ser. No. 71,413
Int. Cl.[4] H05B *6/76*
U.S. Cl. 219—10.55 D **27 Claims**



1. A tunnel microwave applicator comprising in combination:

material in said tunnel which is treated with microwaves;

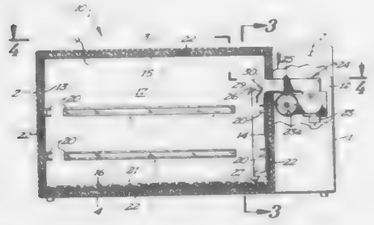
a microwave generator in said tunnel;

a conveyor belt extending through an opening in said applicator; a concrete absorptive choke surrounding said conveyor at said opening in said applicator; and

said absorptive choke having a dielectric constant which prevents the wave guide effect in said material on said

conveyor and allows microwave energy to pass into said choke material.

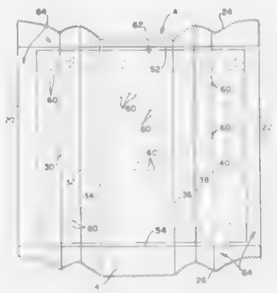
4,861,956
MICROWAVE/STEAM STERILIZER
Calice G. Courneya, Alexandria, Minn., assignor to Magnetronics, Inc., Maple Grove, Minn.
Filed Oct. 17, 1986, Ser. No. 920,572
Int. Cl.[4] H05B *9/06*
U.S. Cl. 219—10.55 A 48 Claims



1. Microwave waveguide structure for use in conducting microwave energy in a path intermediate a microwave energy generator and a working cavity comprising, in combination: a first waveguide conduit having a first end and a second end; a second waveguide conduit having a first end, with the first and second waveguide conduits being connected together by their first ends at an intersection generally perpendicularly to each other; with the first waveguide conduit extending from the microwave energy generator into the working cavity and with the second waveguide conduit located in the working cavity, with the microwave energy generator applying the microwave energy adjacent to the second end of the first waveguide conduit resulting in standing waves; means in the second waveguide conduit for introducing microwave energy generated by the microwave energy generator into the working cavity; and means located at the intersection of the first and second waveguide conduits for communicating the microwave energy from the first waveguide conduit continuously into the second waveguide conduit and for selectively shifting the standing waves of the microwave energy in the second waveguide conduit.

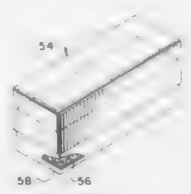
4,861,957
MICROWAVE PACKAGE WITH PINHOLE VENTS
Theodore W. Welles, Pepper Pike, Ohio, assignor to The Moser Bag and Paper Company, Cleveland, Ohio
Filed Jul. 28, 1988, Ser. No. 225,728
Int. Cl.[4] H05B *6/80;* B65B *25/22*
U.S. Cl. 219—10.55 E 8 Claims

1. A package for microwave heating of a food product comprising:
a sheet material having a plurality of pinholes extending completely through said sheet material in a first regional and being absent from said sheet material in a peripheral second region, said pinholes being approximately 0.01 inches in diameter;
means for securing said sheet material so as to define a cavity adapted to receive an associated food product, said securing means being disposed on said sheet material second



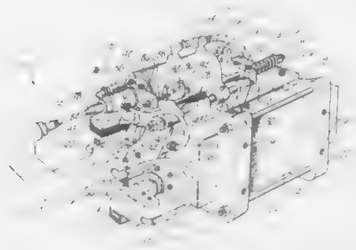
region to inhibit passage thereof through said pinholes to the cavity.

4,861,958
PACKAGING CONTAINER FOR MICROWAVE POPCORN POPPING
Timothy H. Bohrer; Thomas D. Pawlowski, both of Neenah, and Richard K. Brown, Appleton, all of Wis., assignors to James River-Norwalk, Inc., Norwalk, Conn.
Continuation of Ser. No. 21,688, Mar. 4, 1987, abandoned, which is a continuation of Ser. No. 815,318, Jan. 3, 1986, Pat. No. 4,678,882, which is a continuation of Ser. No. 735,576, May 20, 1985, abandoned, which is a division of Ser. No. 510,735, Jul. 5, 1983, Pat. No. 4,553,010. This application Aug. 15, 1988, Ser. No. 232,554
The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.
Int. Cl.[4] H05B *6/80*
U.S. Cl. 219—10.55 E 14 Claims



1. A package for shipping and microwave popping of popcorn, comprising:
(a) a predetermined quantity of popcorn kernels which will occupy a predictable volume when popped;
(b) a package containing said predetermined quantity of popcorn and, when used for popping corn, having a predetermined internal volume at least equal to said predictable volume occupied by said popcorn kernels when popped, said package having a wall having an interior surface, at least an area of said wall being adapted to rest in a generally flat horizontal configuration upon a horizontal support surface in a microwave oven; and
(c) a microwave converting means connected with said package for converting microwave energy into heat for transfer in a sufficient amount to the popcorn kernels to reduce substantially the number of burned or unpopped kernels that could result if the kernels were popped solely by direct impingement of microwave energy, said microwave converting means including a microwave interactive material whose temperature increases in response to impinging microwave energy, said microwave interactive material being supported by said wall and being at least co-extensive with the interior surface of said area of said wall, said area being sufficiently large to permit said kernels to be sufficiently close to said interactive material during the popping process to receive enough heat from said interactive material to reduce substantially the number of burned or unpopped kernels, wherein said package comprises a flat-bottom bag and said wall is the flat-bottom of said bag.

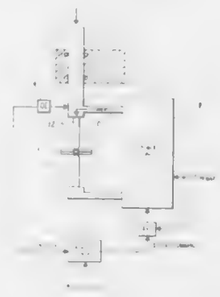
4,861,959
RESISTANCE SPOT WELDING GUN AND TRANSFORMER ASSEMBLY
Dimitrios G. Cecil, 1277 Ashover Dr., Bloomfield Hills, Mich. 48013
Continuation of Ser. No. 605,563, Aug. 4, 1987, Pat. No. 4,684,778. This application Jul. 31, 1987, Ser. No. 80,310
The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.
Int. Cl.[4] B23K *11/32*
U.S. Cl. 219—89 19 Claims



1. A resistance welding apparatus for forming a weld on a work piece, said apparatus comprising:
a transformer having a pair of output terminals;
a cylinder and piston assembly shiftable axially relative to one another along a cylinder axis and including a piston rod attached to the piston and extending axially from at least one end of the cylinder and piston assembly;
a pair of electrodes, one of the electrodes being connected to the cylinder and the other electrode being connected to the piston rod;
flexible connector means for electrically connecting said electrodes to the transformer output terminals; and
bracket means for slidably attaching the cylinder and piston assembly to the transformer to allow limited movement therebetween along an axis substantially parallel to the cylinder axis and enabling the electrodes to maintain a self-equalizing pressure on the work piece.

4,861,960
REAL TIME ADAPTIVE CONTROL FOR RESISTANCE SPOT WELDING PROCESS
Kenneth B. Haefner; Bruce M. Bernstein; Bernard J. Carey, all of Schenectady, and Kenneth J. Overton, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 185,599, Apr. 25, 1988, abandoned. This application Jan. 19, 1989, Ser. No. 299,102
Int. Cl.[4] B23K *11/24*
U.S. Cl. 219—110 20 Claims

1. A method of controlling in real time a resistance spot welding process performed on a welding machine, comprising:
providing a model reference control whose output is a dynamic welding machine heat command to control welding current and heat generated in a workpiece and yield acceptable spot welds over a range of process variability, said model reference control having a model of the spot welding process to which said heat command is input;
calculating estimated displacement using a real time process gain determined from an output of said model and measurements of workpiece displacement;



generating a desired displacement trajectory command to achieve good welds under ideal conditions using constant heat; and
comparing said estimated and desired displacements to yield an error, compensating the latter, and regulating said welding machine heat command with the compensated error.

4,861,961
WELDING ELECTRODE
John H. Huys, R.R. #3, Tottenham, Ontario, Canada
Continuation-in-part of Ser. No. 240,516, Mar. 4, 1981, abandoned, which is a continuation-in-part of Ser. No. 36,906, May 7, 1979. This application Jul. 8, 1985, Ser. No. 752,566
Int. Cl.[4] B23K *35/22*
U.S. Cl. 219—119 11 Claims



1. An electric resistance welding electrode shaped to define a tip surface for contact with a workpiece during welding and comprising an electrode body of a first material having a relatively low electrical resistivity, and a layer of a second material on said body defining said tip surface, said second material having a relatively high electrical resistivity and a degree of high-temperature hardness and comprehensive strength selected to minimize electrode distortion in use, and comprising at least 90% pure titanium, said second material being fused to the electrode body so as to form a unitary electrode therewith, and said layer of said second material having a thickness in the approximate range 1 to 5 thousandths of an inch.

7. A method of manufacturing an electric resistance welding electrode comprising the steps of:
providing an electrode body which is of a material having a relatively low electrical resistivity and which is shaped to define a surface intended for contact with a workpiece in use;
fusing to said surface a layer of a second material having a relatively high electrical resistivity, by:
(a) providing a probe of said second material;

(b) causing said probe to vibrate against said electrode body surface while passing an electric current between said probe and body at a level sufficient to cause material to be fused into said electrode body surface; and
(c) traversing the vibrating probe across said electrode body surface until a layer of said material has been fused into said surface.

4,861,962

NOZZLE SHIELD FOR A PLASMA ARC TORCH

Nicholas A. Sanders, Norwich, Vt., and Richard W. Couch, Jr., Hanover, N.H., assignors to Hypertherm, Inc., Hanover, N.H.

Filed Jun. 7, 1988, Ser. No. 203,440
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121.5 **17 Claims**



1. In a plasma arch torch for cutting and piercing a metal workpiece having a body, an electrode mounted within the body, a nozzle with an outlet orifice mounted on the body at one end thereof, means for introducing a primary gas flow passing through the body, between the electrode and the nozzle, and exiting through the nozzle outlet orifice, and means for directing an electrical current between said electrode and said nozzle to produce a plasma arc exiting the torch through said nozzle orifice, and impinging on said workpiece where it liquifies and splatters the molten metal, the improvement comprising,

an electrically conductive shield mounted on said torch body, said shield generally surrounding said nozzle in a spaced relationship and having an exit orifice aligned with said nozzle orifice, said exit orifice being sufficiently large that it does not interfere with said arc, but being sufficiently small that substantially all of the splattered molten metal strikes the shield without reaching said nozzle and other components of said torch,

means for insulating said shield electrically from said body to prevent double arcing, said shield being electrically floating, and

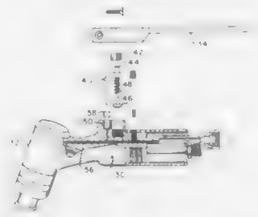
means for producing a secondary gas glow through said body, said secondary gas flow passing through the space between said nozzle and said shield at a rate sufficient to cool the shield and a first portion of said secondary gas flow exiting said space through at least one bleed port formed in said shield and a second portion exiting through said shield exit orifice, said second portion being of a velocity that it stabilizes the plasma produced by said primary gas flow exiting said torch at said nozzle orifice and said shield exit orifice.

4,861,963

PLASMA ARC TORCH DISCONNECT AND VISIBLE INDICIA MEANS

Manfred J. Wallner, Solingen, Fed. Rep. of Germany, assignor to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 23, 1988, Ser. No. 248,650
Int. Cl.[4] B23K *9/06*
U.S. Cl. 219—121.48 **7 Claims**



1. In a plasma arc torch having an nozzle with a tip end section which includes an arc constricting orifices of predetermined diameter, said tip defining a plenum cavity within the confines thereof for receiving an electrode with its free end positioned in close predetermined proximity to said arc constricting orifice, means for injecting plasma gas into said plenum cavity to issue through said arc constricting orifice, means for establishing an electric arc in the vicinity of plasma gas issuing from the arc constricting orifice to produce a high intensity plasma jet for metalworking operations, and operator control means electrically connecting a control circuit to source of power to regulate the operation of the plasma arc torch, wherein the improvement comprises: visible indicia means associated with said operator control means to assist the operator in the safe operation of the plasma arc torch, said visible indicia means connected to the control circuit and including by-pass control means by-passing the operator control means for electrically connecting the visible indicia means to the source of power to energize same when the operator control means is electrically disconnected in an off position to the source of the power, said by-pass control means being electrically bypassed when the operator control means is electrically connected in an on condition to the source of power causing electrical de-energizing of the visible indicia means, and thermostatically controlled switch means associated with the torch for opening the control circuit when a predetermined excessive temperature in the torch head is reached.

4,861,964

LASER SCRIVING SYSTEM AND METHOD

Hisato Sinohara, Sagamihara, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Filed Sep. 16, 1987, Ser. No. 97,190
Claims priority, application Japan, Sep. 26, 1986, 61-229252
Int. Cl.[4] B23K *26/06*
U.S. Cl. 219—121.68 **5 Claims**

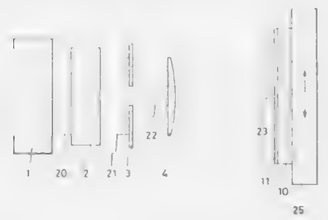
1. A laser scribing system comprising:

an eximer laser;

a laser beam expander for expanding a laser beam emitted from said eximer laser;

obturating means for removing a border portion from the expanded laser beam;

a convex lens for focusing the laser beam passing through said obturating means, the distance between said obturating means and said convex lens being shorter than the focal length of said convex lens; and



a substrate holder for holding a substrate to be treated away from said convex lens a distance approximately equal to the focal length of said convex lens.

4,861,965

METHOD AND APPARATUS FOR TIG WELDING

Elliott K. Stava, Brecksville, Ohio, assignor to Lincoln Electric Company, Cleveland, Ohio

Filed Dec. 29, 1987, Ser. No. 138,854
Int. Cl.[4] B23K *9/09*
U.S. Cl. 219—130.51 **18 Claims**



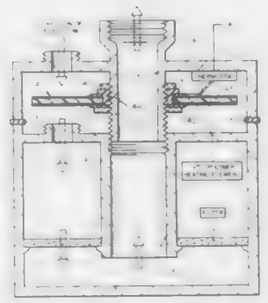
1. A device, driven by a direct current power supply having a positive output and negative output, for causing an alternating current to flow between the workpiece member and electrode member in an arc welding system, said device comprising: an inductive reactor having a tap, first and second opposite ends and a common core, means for connecting said tap to one of said members, means for connecting the other of said members to one of said power supply outputs, a first power switch, means for connecting said first power switch between the first end of said reactor and one of said power supply outputs having a first polarity, a second power switch, means for connecting said second power switch between the second end of said reactor and the one of said power supply outputs having a second polarity, said switches each having a conductive state allowing flow of current through said reactor in a like direction from said positive output to said negative output, and a control means for said first and second switches, said control means including signal means for shifting between a first condition providing energy from said power supply to said reactor with said first switch in its conductive state and said second switch in its non-conductive state to pass current through said reactor between said first end and said tap to magnetize said core and a second condition supplying energy by said reactor with said second switch in its conductive state and said first switch in its non-conductive state to cause current flow through said reactor between said tap and said second end of said reactor as said core is demagnetized.

4,861,966

METHOD AND APPARATUS FOR ELECTRICALLY HEATING DIESEL FUEL UTILIZING A PTC POLYMER HEATING ELEMENT

Martin Matthiesen, Fremont, and Michelle Small, Mountain View, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 787,218, Oct. 15, 1985, Pat. No. 4,689,875. This application May 19, 1986, Ser. No. 864,930
Int. Cl.[4] F02M *31/12;* **F24H** *1/10;* **H05B** *3/00;* **H01C** *1/14*
U.S. Cl. 219—205 **13 Claims**



8. Apparatus for heating and filtering diesel fuel which comprises

(1) a heating chamber having an inlet port for incoming diesel fuel;

(2) within the heating chamber, a laminar electrical heater which is arranged to be immersed in and to heat diesel fuel entering through the inlet port, which has a resistance at room temperature of 0.30 to 0.75 ohm, and which comprises

(a) first and second metal foil electrodes which can be connected to a source of electrical power, and

(b) a laminar resistive element which has a cross-sectional area, in a plane parallel to the electrodes, of 3 to 10 square inches, which is sandwiched between the electrodes and which is composed of a conductive polymer having a resistivity at room temperature of 20 to 2,000 ohm-cm and exhibiting PTC behavior; the first and second electrodes being imperforate and coextensive with the resistive element;

(3) a filtering chamber which is in communication with the heating chamber; and

(4) within the filtering chamber, a diesel fuel filter which is arranged to filter fuel which has been heated by the electrical heater.

4,861,967

CARD CONTROLLED SOLDERING IRON TEMPERATURE CONTROL DEVICE

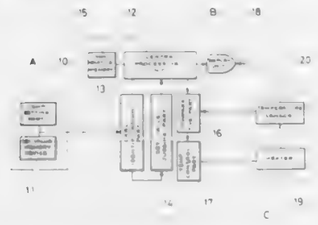
Hiroshi Yoshimura, Osaka, Japan, assignor to Hakko Metal Industries Limited, Osaka, Japan

Filed Apr. 4, 1988, Ser. No. 177,122
Claims priority, application Japan, Nov. 8, 1987, 62-181676
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—241 **7 Claims**

1. A card controlled soldering iron temperature control device for a soldering iron having a tip and electrical heating means therefore wherein the control device is capable of adjusting set values of the tip temperature of the soldering iron responsive to card means comprising:

a device main body having a card inlet for the card means, setting means for changing the set value of said tip temperature and control means for controlling the tip temperature on the basis of the set value of said setting means, wherein

said setting means comprises temperature setting means disposed in the card means; and
said control means comprises;
card identification means for identifying that the card means inserted into the card inlet provided in the device main body is a specific card means capable of setting temperature;
set value judging means for judging if an input numerical value of the temperature setting means is within the allowable heating temperature of the tip temperature;



memory means for storing the set value entered through said set value judging means;
temperature sensor means for detecting the tip temperature of the soldering iron;
comparator means for comparing the detected temperature of said temperature sensor means and the set value of said memory means; and
temperature control means for delivering a control signal according to the result of comparison by said comparator means and heating and controlling the heating means of the soldering iron.

4,861,968

FOAM INSULATED WATER HEATER AND METHOD OF MAKING SAME

Eugene L. West, Grand Rapids, Mich., assignor to Bradford White Corporation, Philadelphia, Pa.

Continuation of Ser. No. 113,396, Oct. 22, 1987, abandoned, which is a continuation of Ser. No. 934,725, Nov. 25, 1986, abandoned, which is a continuation-in-part of Ser. No. 716,024, Mar. 26, 1985, Pat. No. 4,628,184. This application Oct. 27, 1988, Ser. No. 265,322

Int. Cl.[4] F24H *1/18*

U.S. Cl. 219—312 **20 Claims**



1. In a water heater comprising a water tank having a component intended to be kept substantially free from contact with an expandable foam insulating material and a jacket surrounding the tank and providing an insulating space therebetween, a pair of flexible sheets forming an apron, the sheets being joined to form a seal protecting said component from contact with the foam, the apron being positioned over a part of the tank surface in a position whereby the seal surrounds said component, the apron being substantially unsealed along its top and a side wherein foam introduced between the sheets flows out of an unsealed side of the apron to fill said space.

4,861,969

ELECTRIC HOTPLATE, APPARATUS AND METHOD FOR FITTING A COVER PLATE THERETO

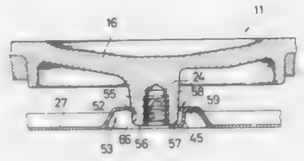
Robert Kicherer; Felix Schreder, and Stefan Reif, all of Oberderdingen, Fed. Rep. of Germany, assignors to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

Filed Mar. 18, 1988, Ser. No. 170,275

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1987, 3709433

Int. Cl.[4] H05B *3/70*

U.S. Cl. 219—458 **18 Claims**



1. An electric hotplate, comprising:
a hotplate body having an upper side and an underside, the upper side being a cooking surface, the underside being provided with a central, downwardly-projecting pin having an outer face;
a cover plate covering the underside and fixed to the hotplate body, the cover plate having a central recess and being fixed by screwless fixing means operative between the outer face of the pin and the recess of the cover plate, said recess surrounding the pin and the pin having projections securing the cover plate to the pin, which projections are formed by notching of a lower face of the pin below the cover plate, the projections extending into a marginal region of the lower face.

4,861,970

MULTIPURPOSE CALCULATOR

Kuo H. Hwang, 115, Kuo Tze Lih, Pei Twen District, Taichung, Taiwan

Filed Jan. 17, 1989, Ser. No. 297,973

Int. Cl.[4] G06C *5/02*

U.S. Cl. 235—10 **1 Claim**



1. A multipurpose calculator, including:
a casing body, having one pair of side slots respectively made in right and left side walls of said casing body at a front end wall thereof for pivotally movable connection thereto of a movable cassette block, a steel tape provided within said casing body near the right side wall, a snap-off cutter set within said casing body adjacent the left side wall, and four elongated holes made in the front end wall extending through the body of the casing for respectively setting therein screw drivers, a fluorescent marker and scraper, opening and closing of said elongated holes being controlled by said movable cassette block;
said movable cassette block, being movably attached to said casing by means of one pair of linking rods through pivotal connection;
an elongated slide slot made in the left sidewall of said casing for sliding therealong a pusher plate;
said snap-off cutter being connected to and moved by the pusher plate to slide along said elongated slide slot;
the pusher plate, being connected to a rear end of said cutter to move said cutter so as to slide along said elongated slide slot;
said steel tape, being wind around a post arranged in said casing on the right side;
an illuminating apparatus comprised of dry battery cells, bulbs, and mirror, said battery cells being operated to turn on said bulbs to illuminate, the illumination provided by said bulbs being reflected by said mirror onto a solar energy collector of said calculator disposed on said casing;
a movable swinging-doors-switch, being mounted on said movable cassette block to protect said mirror, said dry battery cells and said bulbs, and to control turning-on/off of said bulbs;
said fluorescent marker, being set in any one of said four elongated holes of said casing;
said screw drivers, being set in any other said number of elongated holes of said casing;
said scraper, being set in any remaining one of said elongated holes of said casing; and
a resilient clip, being mounted on a back side of said casing, to let said multipurpose calculator be attached to an apparel of a user.

4,861,971

PARKING METERS CAPABLE OF BEING OPERATED WITHOUT MONETARY COINS

Mike T. Chan, 308 Midvalley Pl. SE., Calgary, Alberta, Canada T2X 1M5

Filed Sep. 17, 1987, Ser. No. 97,753

Claims priority, application Canada, Aug. 10, 1987, 544106

Int. Cl.[4] G07B *15/02*

U.S. Cl. 235—384 **7 Claims**



1. A parking meter capable of being operated without the use of a monetary coin for the purchase of a parking period, comprising:
a body having means for receiving a user's account card incorporating a read/write memory for recording an identity code and a discrete monetary value;
a timer for measuring an elapse of time;
an indicator for indicating a termination of said parking period;
means for reading said read/write memory of said card;
means for amending said read/write memory of said card; and
programmable means capable of carrying out the following steps:
(a) receiving information read from said user's account card, memorizing said identity code and said discrete monetary value, confirming the validity of said account card and issuing a reject signal if said card is invalid;
(b) noting the time of day and date and comparing same with a memorized list of parking payment rates and maximum permissible parking times;
(c) calculating a charge for a maximum permissible parking time corresponding to the time of day and date;
(d) comparing said calculated charge with said discrete monetary value from said user's account card;
(e) starting the measurement of said maximum time if said charge is less than said monetary value, or calculating the time period corresponding to said monetary value if said charge is greater than said monetary value and then commencing measurement of said calculated time period;
(f) forwarding said charge or said monetary value, whichever is the smaller, to said means for amending said read/write memory for deduction from said discrete monetary value;
(g) forwarding a meter identification code to said means for amending said read/write memory for recordal on said user's card;
(h) calculating a refund amount if a user's card bearing said recorded meter identification code is read by said reading means prior to expiry of said maximum or corresponding parking time period;
(i) ending the measurement of time started in (e) following step (h) ;
(j) conveying said refund amount to said means for amending said read/write memory to record on said user's card as a credit; and
(k) sending a signal to said indicator at an end of said maximum or calculated time measured in step (e) or after step (i), whichever is the sooner, in order to operate said indicator to indicate the termination of said parking period.

4,861,972

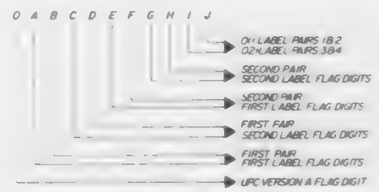
BAR CODE SCANNER AND METHOD OF PROGRAMMING

Randy D. Elliott, and Nicolas N. Tabet, both of Eugene, Oreg., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Nov. 5, 1987, Ser. No. 116,962

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—462 **12 Claims**



1. A scanner for scanning bar code labels and for providing data related thereto to a host computer, comprising:
scanning means for optically scanning bar code labels and providing an electrical signal in response thereto,
decoding means, responsive to said scanning means for translating said electrical signal into a digital signal,
microprocessor means, responsive to said decoding means, for controlling operation of said scanner and for translating said digital signal into data to be provided to the associated host computer under control of control characters,

a non-volatile random access control memory in which control characters are stored,

interface means, connected to said host computer and to said microprocessor means, for transferring data from said microprocessor means to said host computer, and

switch means for enabling said microprocessor to translate said digital into control characters and for enabling said microprocessor to store said control characters in said non-volatile random access control memory.

4,861,973

OPTICAL SCAN PATTERN GENERATING ARRANGEMENT FOR A LASER SCANNER

Ronald A. Hellekson, Eugene, Oreg.; John S. Campbell, Palo Alto, Calif., and Jorge L. Acosta, Eugene, Oreg., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Jun. 18, 1987, Ser. No. 64,317

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—467 **18 Claims**



1. In a laser scanner, an optical arrangement for generating a laser light beam scan pattern comprising:

an optical device mounted for movement repetitively through a rotational cycle about a generally upright axis and having a plurality of primary reflective elements oriented in angularly displaced relation from one to the next about said upright axis, each primary reflective element being adapted to receive and reflect a laser light beam as said primary reflective elements move successively through a portion of each rotational cycle of said optical device, each of said primary reflective elements being tilted relative to said upright axis so as to reflect said beam upward;

means for rotatably moving said optical device about said upright axis; and

a multiplicity of secondary reflective elements being disposed in stationary positions relative to one another as said each primary reflective element moves through said rotational cycle portion, said secondary reflective elements being adapted to receive the laser light beam reflected from said primary reflective elements and to reflect the same initially downward and then upward to trace scan lines of the laser light beam scan pattern at different orientations with respect to one another as said primary reflective elements move successively through said portion of each rotational cycle.

4,861,974

CARD READER

Takayuki Kondo, Ootsu, and Muneki Morishita, Takatsuki, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 7, 1988, Ser. No. 254,596

Claims priority, application Japan, Oct. 13, 1987, 62-156509[U]

Int. Cl.[4] G06K *13/00*

U.S. Cl. 235—475 **2 Claims**



1. A card reader comprising:

a card conveying apparatus arranged between right and left frames;

a one-sided setting member, swingably supported to one of said frames, for pressing a card which is conveyed by said conveying apparatus to the other frame and thereby restricting the position of the card, said one-sided setting member having a spring and being pressed toward the side of the other frame by said spring so as to be set to an oblique attitude; and

a sensor for detecting a portion of said one-sided setting member and outputting a card detection signal when the one-sided setting member is returned to the side of one frame against a pressing force of said spring by the card which is conveyed by the conveying apparatus.

4,861,975

VARIABLE FOCUS OPTICAL SYSTEM AND METHOD USING ELECTRO-OPTIC MATERIAL

Gordon S. Kino, Stanford, and Timothy R. Corle, Menlo Park, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 70,791, Jul. 7, 1987, abandoned. This application Feb. 8, 1989, Ser. No. 310,027

Int. Cl.[4] G01J *1/20*; G02B *21/06*

U.S. Cl. 250—201 **7 Claims**



1. A variable focus optical system comprising means projecting a light beam; a transparent cell of electro-optic material coated on both sides with a layer of transparent conductive material, with the layer on one side divided into at least two parts: a central disc surrounded by a ring-shaped region; a lens focusing the light transmitted through said cell at a predetermined distance; and means for applying an a-c voltage between said central disc or outer region and the layer on the other side to thereby change the phase of the light transmitted through the central disc with respect to the surrounding ring to focus the light transmitted through said disc or region at a distance which moves in and out periodically with respect to the light transmitted through said region or disc at the frequency of said a-c voltage.

4,861,976

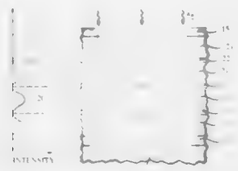
OPTICAL OR OPTO-ELECTRONIC DEVICE HAVING A TRAPPING LAYER IN CONTACT WITH A SEMICONDUCTIVE LAYER

Jack L. Jewell, Bridgewater, and Samuel L. McCall, Jr., Gillette, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 6, 1988, Ser. No. 202,648

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—211 J **23 Claims**



1. Apparatus comprising

(a) a source of electromagnetic radiation of wavelength λ_o;

(b) at least one optical or opto-electronic device comprising a quantity of a first semiconductor material, during at least part of the time of operation of the apparatus the device is exposed to radiation from the source of radiation, and a non-equilibrium density of electrons and/or holes is caused to be present in the first semiconductor material during at least part of the time of operation of the apparatus; and

(c) means that are responsive to the density of electrons and/or holes in the first semiconductor material;

characterized in that

(d) the device further comprises at least one layer (to be referred to as the "trapping layer") of a second material in contact with the first semiconductor material, the second material chosen such that at least one of the electrons and/or holes has a lower potential energy in the second material than in the first semiconductor material, whereby at least some of the electrons and/or holes that enter the trapping layer from the first semiconductor material are being trapped in the trapping layer such that the non-equilibrium density of electrons and/or holes in the first semiconductor material can be decreased.

4,861,977

ELONGATED X-RAY DETECTOR TUBE

Marcel R. de la Fonteijne, Delft, Netherlands, assignor to B.V. Optische Industrie 'De Oude Delft', Delft, Netherlands

Filed Feb. 8, 1988, Ser. No. 153,250

Claims priority, application Netherlands, Feb. 13, 1987, 8700389

Int. Cl.[4] H01J *40/14*

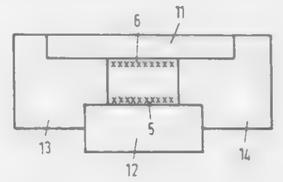
U.S. Cl. 250—213 VT **20 Claims**

1. An X-ray detector tube which comprises;

an elongated front wall;

an elongated rear wall;

elongated side walls for receiving said elongated front wall and elongated rear wall thereby forming an elongated housing and defining therebetween an elongated proximity-focus image intensifier device, at least two walls being configured to support walls of said housing along its length.



4,861,978

AUTOMATIC GAIN SETTING CIRCUIT

Thor W. Anderson, 9720 Forest Creek Dr., Bozeman, Mont. 59715

Filed Nov. 25, 1987, Ser. No. 125,183

Int. Cl.[4] H01J *40/14*; G01R *15/08, 1/30*

U.S. Cl. 250—214 A **4 Claims**



4. An apparatus for optimally aligning a first and second optical fiber for splicing, the circuit comprising:

(a) a light source for injecting light into a first fiber across a junction between the two fibers and into the second fiber;

(b) a detector for detecting the light being transmitted in the second fiber and providing a detected electrical signal responsive to the light detected;

(c) an operational amplifier having an input terminal and an output terminal;

(d) an adjustable feedback circuit means connected to the operational amplifier for changing the gain of the operational amplifier in accordance with a received control electrical signal;

(e) the detected signal being applied to the input terminal of the operational amplifier;

(f) the output terminal of the operational amplifier being electrically connected to an analog meter for displaying the magnitude of the detected signal;

(g) a comparison circuit means having a first and second input terminals for comparing the relative magnitude of voltages applied to the first and second input terminals and for providing an output signal having a polarity and magnitude corresponding to the relative difference;

(h) the output terminal of the operational amplifier being additionally connected to the first input terminal of the comparison circuit;

(i) a reference voltage source connected to the second input terminal of the comparison circuit, the reference voltage being selected to be of a magnitude to cause the meter to read approximately mid-range;

(j) the output of the comparison circuit being the control

electrical signal/which signal is directed to the adjustable feedback circuit of the operational amplifier to adjust the gain of the operational amplifier circuit in accordance with the polarity and magnitude of the control electrical signal;

(k) switch means connected to the comparison circuit which when activated, operatively permits the comparison circuit to change the gain of the operational amplifier; whereby, the gain of the operational amplifier is automatically adjusted to amplify the detected signal to produce an approximate mid-range reading of the detected electrical signal on the meter.

4,861,979

OPTICAL FIBER MULTIPOINT MEASURING DEVICE WITH TIME MULTIPLEXING

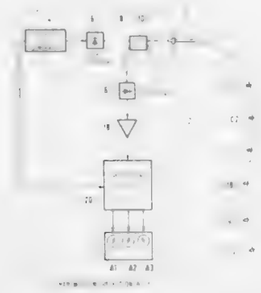
André Tardy, Egly, and Michel Jurczyszyn, Ivry sur Seine, both of France, assignors to Societe anonyme dite Compagnie Generale D'Electricite, Paris Cedex, France

Filed Jun. 1, 1987, Ser. No. 55,972

Claims priority, application France, May 30, 1986, 86 07818

Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—227 **11 Claims**



1. An optical fiber multipoint measuring device with time multiplexing and intended to measure the values of a physical magnitude which arise at measurement points that succeed one another along a measurement line, said device comprising:

a transmission/reception body (2);

a generator (4,6) in said body for generating interrogation light pulses;

an optical fiber (F) disposed along said line and transmitting light at a known propagation speed, one end of said fiber being connected to said body to receive said interrogation light pulses, said fiber guiding said pulses while returning along its entire length a back-scattered light signal towards said body;

sensors (C1, C2, C3, . . . C20) disposed at respective ones of said successive measurement points, each of said sensors including a transparent gap between an upstream length (F2) and a downstream length (F3) of said fiber and also including means for maintaining said two lengths in alignment to transmit each of said interrogation pulses from the upstream length of the downstream length and towards the following sensors, such that a back-scattered signal is returned from each of the successive lengths of said fiber, said fiber and said sensors constituting said measurement line, a light reflective optical surface being formed by an end face (38) of one of said upstream and downstream lengths (F2, F3), said face being perpendicular to the length of said fiber (F) in order to respond to said interrogation pulse by returning a reflection pulse (P2) towards said body, said gap being occupied by a sensitive medium (36) having a refractive index sensitive to said physical magnitude to be measured such that the coefficient of reflection from said optical surface and the intensity of said reflected pulse depend on the value of said magnitude; and

a reception circuit (16, 18, 20) comprising a light detector (16) disposed in said body (2) to receive said light returned towards said body in order to measure the intensity thereof as a function of time to generate measurement signals from the intensity of said reflection pulses and representative of the values of said physical magnitude, and to make said measurement signals correspond with respective ones of said sensors as a function of the times at which said reflection pulses are received by said detector;

said device being characterized by the fact that said sensitive medium is an optical glue (36) which is hardenable from a prior liquid state and which adheres to said upstream and downstream lengths (F2, F3).

4,861,980

OPTICAL SENSOR HAVING STATIONARY CO-TERMINUS ENDS OF THE INPUT AND OUTPUT OPTICAL FIBRES

John P. Dakin, Hampshire, and Christopher A. Wade, Mariland, both of Great Britain, assignors to Plessey Overseas Limited, Ilford, England

Filed Dec. 10, 1987, Ser. No. 131,168

Claims priority, application United Kingdom, Dec. 10, 1986, 8629479

Int. Cl.[4] H01J *5/16, 40/14*

U.S. Cl. 250—227 **8 Claims**



1. A spectral filtering optical sensor sensing a particular parameter, comprising a reflective stationary zone plate from which broadband light is divided into spectral components and input and output optical fibres spaced therefrom having stationary co-terminus ends establishing an optical path, said input fibre receiving the broadband light from a remote source, a variable optical focusing arrangement having focusing characteristics varying in response to changes in magnitude of the particular parameter being sensed to vary the effective optical path length between the zone plate and the optical fibre ends and the wavelength of light impinging on the fibre end of the output optical fibre.

4,861,981

OPTOELECTRONIC THEODOLITE SENSOR

Hans-Rudolf Winiger, Zollbrück, Switzerland, assignor to Notron Engineering AG, Zollbrück, Switzerland

Filed May 10, 1988, Ser. No. 192,192

Claims priority, application Switzerland, Sep. 15, 1986, 3686/86

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—231 R **19 Claims**

1. An optoelectronic theodolite sensor comprising:

(a) a vertically positioned hollow measuring cell having spaced parallel faces confining an opaque liquid filling half of the height of said measuring cell, said parallel faces each having a transparent verticle side portion and an opaque verticle side portion, with said opaque portions positioned opposite to and congruent with each other and said transparent portions positioned opposite to and congruent with each other;

(b) at least one light source positioned on one side of said measuring cell and spaced therefrom; and,

(c) at least one optoelectronic sensing element positioned on the other side of said measuring cell and spaced therefrom, whereby rotation of said measuring cell from the verticle causes the level of said opaque liquid to vary the luminous flux passing through the transparent side portion of said



measuring cell from said light source to said optoelectronic sensing element to thereby cause an output signal change measurable as a function of the angle of rotation from the verticle axis and the horizontal axis of said measuring cell.

4,861,982

SCANNING OPTICAL MICROSCOPE WITH POSITION DETECTION GRATING

Albert Smid; Antonius H. M. Akkermans; Jozef P. H. Benschop, all of Eindhoven, and Cornelis J. P. M. Rooyackers, Waalre, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 15, 1988, Ser. No. 219,516

Claims priority, application Netherlands, Jul. 21, 1987, 8701716

Int. Cl.[4] H01J *3/14*

U.S. Cl. 250—235 **8 Claims**



1. A scanning optical microscope comprising a radiation source unit for supplying a radiation beam, an objective system for focussing the radiation beam to a scanning spot in an object plane, at least one beam-deflecting element arranged in the radiation path of the radiation beam for displacing the scanning spot in the object plane, a beam splitter arranged in the radiation path of the radiation beam between the beam-deflecting element and the objective system for splitting off a reference beam from the radiation beam, and a radiation-sensitive detection system in which a reference plane is present which is arranged in the radiation path of the reference beam for detecting the position of a reference spot formed by the reference beam in the reference plane, characterized in that the reference plane has a grating with grating lines extending in a direction substantially transverse to a direction of movement of the reference spot determined by the beam-deflecting element and in that a cylindrical lens is arranged in the radiation path of the reference beam for deforming the reference spot to a reference iine extending in a direction substantially transverse to the said direction of movement.

4,861,983

OPTICAL SYSTEM FOR FLYING-SPOT SCANNING SYSTEM

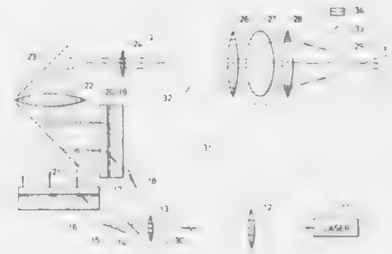
Shigeru Sasada; Shinichi Nagata; Makoto Hirosawa, and Yoshihiro Kishida, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Apr. 26, 1988, Ser. No. 186,386

Claims priority, application Japan, Apr. 27, 1987, 62-101799; Apr. 27, 1987, 62-101800; May 13, 1987, 62-114704

Int. Cl.[4] H01J *3/14;* **G02B** *26/08;* **G01D** *9/42*

U.S. Cl. 250—235 **28 Claims**



1. A flying-spot scanning apparatus for recording an image on a recording medium by a plurality of scanning beams, comprising:

a light source emitting a scanning beam;

beam dividing means disposed along an optical axis for dividing the beam into a plurality of scanning beams;

modulator means disposed after said beam dividing means for modulating the scanning beams;

deflection means disposed after said beam dividing means for moving the scanning beams in a first direction;

a recording medium on which an image is to be recorded, said recording medium being fed in a second direction perpendicular to the first direction, while the scanning beams move in the first direction;

an objective lens disposed optically between said deflection means and the recording medium, said objective lens having the characteristic of:

$$h = f \sin \theta$$

where h is the distance on an object between the optical axis thereof and a point upon which the scanning beam impinges, f is the focal length of the objective lens, and θ is the angle formed by the scanning beam entering the objective lens with respect to the optical axis,

said objective lens having the third-order distortion coefficient of approximately "1", through which the scanning beams are focused upon the recording medium to effect a row of scanning spots thereon; and

sensor means for detecting both a position of the scanning spots and the intensity thereof on the recording medium, wherein a reference beam divided from the scanning beam impinges upon the deflection means to advance through the objective lens to said sensor means, the reference beam moving to scan said sensor means synchronously with the movement of the scanning spots,

whereby substantially straight and parallel loci of the scanning spots are effected on the recording medium.

4,861,984

SURFACE INSPECTION OR RANGING APPARATUS WITH IMAGE DEROTATION

Robert N. West, Chislehurst, United Kingdom, assignor to Sira Limited, Kent, United Kingdom

Filed Nov. 4, 1987, Ser. No. 116,314
Claims priority, application United Kingdom, Nov. 10, 1986, 8626811
Int. Cl.[4] H01J 3/14
U.S. Cl. 250—236 12 Claims



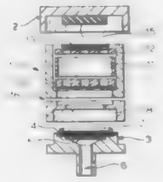
1. Apparatus for measuring the distance from the apparatus to a surface comprising:
first optical means for passing a beam of radiation to the surface at an angle other than normal,
second optical means for viewing the area of the surface illuminated by the beam,
means to relatively rotate the optical axis of the first optical means and the surface so that the illuminated area is moved across the surface,
means to derotate the image of the illuminated area caused by said relative rotation, and
means for measuring the movement of an image of said illuminated area with respect to the optical axis of the second optical means to thereby measure the position of the illuminated area and indicate the distance from the apparatus to the surface.

4,861,985

TIME-AVERAGED RADON DAUGHTERS (WL) DOSIMETER AND METHOD FOR SURVEYS OF INDOOR, OUTDOOR AND UNDERGROUND (MINE) CONTAMINATION

Hsiang L. Pai, 50 Silver Star Blvd. Unit 208, Scarborough, Ontario M1V 3L3, Canada

Continuation-in-part of Ser. No. 849,551, Apr. 8, 1986, abandoned. This application Sep. 4, 1987, Ser. No. 92,954
Int. Cl.[4] G01V 5/00; G01T 5/00
U.S. Cl. 250—253 40 Claims



1. A method for selectively detecting alpha particles which comprises:
sampling air through a filter which retains alpha emitting aerosols;
positioning a plurality of collimators adjacent to the filter such that alpha particles emitted by aerosols in the filter are directed to a detector which is positioned at the opposite ends of the collimators, each collimator having an inlet port at the end nearest to the filter and an exit port at the end nearest to the detector; and
providing said detector, positioned adjacent to the collimators' exit ports, possessing such properties that alpha particles corresponding to the respective energies of the alpha emissions of radium A and radium C' are selectively detected by each collimator.

4,861,986

TRACER INJECTION METHOD

Dan M. Arnold, Houston, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.

Filed Mar. 7, 1988, Ser. No. 164,670
Int. Cl.[4] G01N 5/04
U.S. Cl. 250—260 15 Claims



1. A method of measuring fluid flow velocity along a flowing well comprising the steps of:
(a) injecting distinguishable first and second fluid soluble radioactive isotopes from a sonde in a well for flow along the well;
(b) positioning a pair of spaced detectors along the sonde for detection of the isotopes flowing therepast and forming output signals indicative of the flowing isotopes forming past said detectors; and
(c) locating the points of injection so that one isotope is injected above said detectors and the remaining one is below said detector wherein one of said isotopes flows past said detectors to form output signals indicative of fluid flow velocity.

4,861,987

PROCESS FOR THE DETECTION OF A CHEMICAL SUBSTANCE OF KNOWM MASS M

Fernand M. Devienne, 117 La Croisette, 06400 Cannes, France

Filed Oct. 28, 1988, Ser. No. 263,877
Claims priority, application France, Nov. 3, 1987, 87 15217
Int. Cl.[4] H01J 49/00
U.S. Cl. 250—282 3 Claims

1. Process for the detection of a chemical substance of known mass M with the aid of an ionization, dissociation, filtration and detection apparatus having in a vacuum enclosure and in the indicated order on the trajectory of the ions:
an ion source (1) producing ions of the substance of mass M and unit charge e under an extraction voltage V_1 from a gaseous atmosphere to be analysed,
a dissociation box (3) raised to a potential V_2 according to the mass M filled with a neutral gas in which the ions of the substance of mass M are dissociated by impacts on the molecules of the neutral gas into different fragments of known masses $m_1, m_2 \ldots m_p$, characteristic of the substance of mass M to be identified,
an electrostatic analyser (4) filtering the ions of energy level W, said energy level W being regulatable,
a magnetic analyser (5) operating with an induction B_o in its air gap,



a detector (6) of the ions which have already passed through the aforementioned apparatus. characterized in that:
the first step is to fix the value of the induction B_o in the air gap of the magnetic analyser by choosing for V and W values V_o, W_o such that an indissociable atom of mass M_o passes through the entire apparatus and is detected by the ion detector, such that

$$B_o \simeq \frac{144\sqrt{eV_oM_o}}{R} \text{ and } W_o = eV_o$$

in which R is the radius of curvature of the trajectory of the ion in the magnetic analyser are satisfied,
to then investigate the presence in the atmosphere to be analysed of the known substance of mass M, which is dissociated into known fragments of masses $m_1=x_1M$, $m_2=x_2M, \ldots m_p=x_pM$, the apparatus being calibrated for the specific investigation of the mass M by giving to V_o and W_o new values V' and W' such that $V'M=V_oM_o$ and $W'=eV'$, followed by the sequential investigation of the different fragments m_p, whilst forming on each occasion $V_p=(V'/x_p^2)$ and $W_p=(W'/x_p)$, which makes it possible for the ion of mass m_p to pass through the entire apparatus and to be revealed by the ion detector and
the effective presence of the substance of mass M in the supply gas of the ion source is deduced by the presence of an adequate number, in practice three or four, of dissociation fragments of mass m_p characteristic of the dissociation of the substance of mass M.

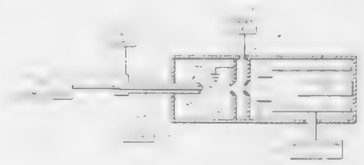
4,861,988

ION SPRAY APPARATUS AND METHOD

John D. Henion, Trumansburg, N.Y.; Thomas R. Covey, Houston, Tex., and Andries P. Bruins, Leek, Netherlands, assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Sep. 30, 1987, Ser. No. 103,056
Int. Cl.[4] B01D 59/44
U.S. Cl. 290—288 17 Claims

1. Apparatus for analyzing ions from trace sample molecules in a liquid comprising:
(a) a chamber,
(b) an inner capillary tube to receive said liquid and having a first free end in said chamber for discharging said liquid into said chamber,
(c) an outer tube encircling said inner capillary tube and defining therewith an annular space therebetween, said outer tube having a second free end located substantially at said first free end, said second free end therefore also being in said chamber,
(d) means for directing a flow of gas through said annular space for said gas to flow over said first free and into said chamber at a velocity of substantially at least 50 meters per second,
(e) an orifice plate having an orifice therein, said tubes being located on one side of said orifice plate with said free ends spaced therefrom, said orifice defining an outlet from said chamber,



(f) a mass analyser on the other side of said orifice plate, outside said chamber, for receiving ions passing through said orifice plate,
(g) means for providing the pressure in said chamber to be substantially atmospheric pressure, and the temperature in said inner tube and in said chamber being sufficiently low to avoid thermal decomposition of said trace sample molecules,
(h) means for creating an electric field between said first free end and said orifice plate, wherein the combination of said electric field and said gas flow past said free end of said inner capillary tube produces a mist of fine charged droplets of said liquid, and wherein said charged droplets evaporate in said chamber and release ions therefrom.

4,861,989

ION VAPOR SOURCE FOR MASS SPECTROMETRY OF LIQUIDS

Marvin L. Vestal, Houston; Calvin R. Blakley, Kingwood, both of Tex., and Gordon J. Fergusson, Claremont, Calif., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Continuation of Ser. No. 832,743, Feb. 24, 1986, Pat. No. 4,730,111, which is a continuation of Ser. No. 527,751, Aug. 30, 1983, abandoned. This application Mar. 2, 1988, Ser. No. 163,960
Int. Cl.[4] B01D 59/44
U.S. Cl. 250—288 20 Claims



11. A thermospray vaporizer for obtaining an ion vapor from a liquid sample for analysis of vaporized ions of interest, the vaporizer comprising:
a capillary tube means defining a discharge nozzle at an end thereof for passing the liquid sample therethrough;
a temperature sensing means for sensing the temperature of the liquid sample at a predetermined location within the vaporizer;

first heating means for heating a predetermined length of the capillary tube means and thereby heating the liquid sample passing therethrough;

control means for regulating the first heating means in response to the temperature sensing means to partially vaporize the liquid sample within the capillary tube and to form a thermospray of vapor having ions of interest and unvaporized minute particles, the thermospray having a constant proportion of vapor to unvaporized particles when discharged from the capillary tube means;

confining means forming a chamber for receiving at least a portion of the thermospray discharged from the capillary tube means to limit adiabatic expansion of the discharged vapor; and

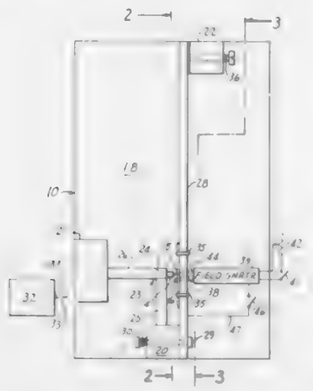
second heating means for heating the vapor within the confining means to vaporize substantially all the discharged minute particles within the confining means by contact with the heated vapor.

4,861,990

TUNNELING SUSCEPTOMETRY

Terry R. Coley, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Feb. 9, 1988, Ser. No. 154,084
Int. Cl.[4] H01J *37/00*
U.S. Cl. 250—306 **56 Claims**



1. A method of determining magnetic susceptibility at a surface of a sample, comprising in combination the steps of:

providing said sample on an elastic support;

providing an electric tunneling current through a gap between an electrode and said elastic support;

varying said gap with a magnetic field applied to said surface and sample on said elastic support to effect a corresponding variation in an electrical property of said gap; and

determining magnetic susceptibility of said sample in response to said variation in said electrical property.

4,861,991

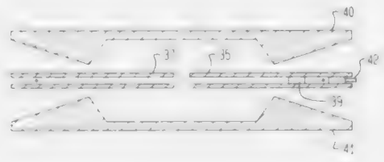
ELECTRON STORAGE SOURCE FOR ELECTRON BEAM TESTERS

John R. Michener, Princeton, N.J., assignor to Siemens Corporate Research & Support, Inc., Iselin, N.J.

Filed Sep. 30, 1988, Ser. No. 252,286
Int. Cl.[4] H01T *37/00*
U.S. Cl. 250—310 **7 Claims**

1. An apparatus for contactless measurement of voltage potentials having a keyed primary electron beam impinging on an electronic component, the apparatus comprising:

(a) an electron gun comprising means for storing electrons in an orbital path, the electron gun having an electron extractor electrode positioned at a point in the orbital path for tangentially extracting the stored electrons to produce the keyed primary electron beam;



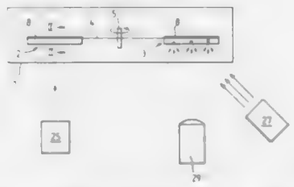
(b) means for aiming the keyed primary electron beam at an operative electronic component and means for determining voltage potentials at selected points on said component for contactless measurement.

4,861,992

TESTING OF THERMAL IMAGERS

Michael G. Clark, Gerrards Cross, and Michael C. Wiltshire, High Wycombe, both of United Kingdom, assignors to The General Electric Company, p.l.c., United Kingdom

PCT No. PCT/GB87/00140, § 371 Date Nov. 12, 1987, § 102(e) Date Nov. 12, 1987, PCT Pub. No. WO87/05713, PCT Pub. Date Sep. 24, 1987
PCT Filed Feb. 27, 1987, Ser. No. 124,993
Claims priority, application United Kingdom, Mar. 19, 1986, 8606783
Int. Cl.[4] G03C *5/16*
U.S. Cl. 250—316.1 **9 Claims**



1. A method of testing a thermal imager having a predetermined operational infrared waveband, comprising the steps of:

(a) heating selected portions of a quantity of smectic liquid crystal material such that the material in said selected portions changes from a state in which it is transparent to incident infrared radiation to a state in which it scatters incident infrared radiation;

(b) directing onto said material thermal infrared radiation within said waveband of said thermal imager under test from a first radiation source so that by scattering of said thermal infrared radiation from said selected portions across said quantity a thermal image is generated; and

(c) using said thermal image for testing said thermal imager.

4,861,993

RADIATION IMAGE READ-OUT METHOD

Yuuma Adachi, and Nobuyoshi Nakajima, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 13, 1985, Ser. No. 776,185
Claims priority, application Japan, Sep. 13, 1984, 59-192097
The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.
Int. Cl.[4] G03C *5/16*
U.S. Cl. 250—327.2 **4 Claims**

1. A radiation image read-out method in which, prior to final read-out for exposing a stimulable phosphor sheet carrying a radiation image of an object stored therein to stimulating rays which cause the stimulable phosphor sheet to emit light in proportion to the stored radiation energy, detecting the emitted light by use of a photoelectric read-out means to obtain an electric image signal for reproducing a visible image, preliminary read-out is conducted by use of stimulating rays of a level lower than the level of stimulating rays used in the final read-out, read-out conditions in the final read/out and or/image processing conditions are adjusted on the basis of image input information on the stimulable phosphor sheet obtained by the preliminary read-out, and the final read-out is conducted by use of the adjusted conditions,

wherein the improvement comprises the steps of:

(i) when the image read-out is conducted for a plurality of the stimulable phosphor sheets carrying a radiation

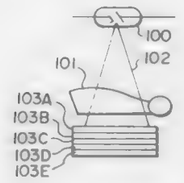


image of the same object recorded thereon by combination image recording, conducting said preliminary read-out and said final read-out only for the first stimulable phosphor sheet which is first subjected to the image read-out, and

(ii) conducting only said final read-out for the other stimulable phosphor sheets by use of conditions which are obtained by adjusting the read-out conditions and/or image processing conditions in accordance with the image input information obtained by said preliminary read-out of said first stimulable phosphor sheet, and in accordance with a difference in the image input information between said first stimulable phosphor sheet and each of said other stimulable phosphor sheets

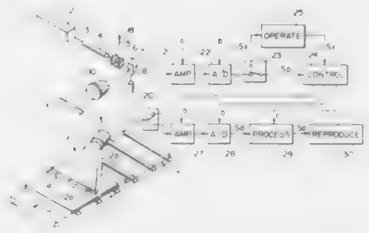
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4,861,994

METHOD OF MEASURING AFTER-GLOW OF STIMULABLE PHOSPHOR SHEET, AND METHOD OF ADJUSTING RADIATION IMAGE READ-OUT CONDITIONS

Shigeru Sactome; Tsutomu Kimura, and Nobuyoshi Nakajima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 17, 1987, Ser. No. 63,052
Claims priority, application Japan, Jun. 17, 1986, 61-141168; Jun. 26, 1986, 61-150225
Int. Cl.[4] G03B *42/00*
U.S. Cl. 250—327.2 **5 Claims**



1. In a radiation image read-out method in which final read-out is carried out for obtaining image signals for use in reproduction of a visible image by exposing a stimulable phosphor sheet carrying a radiation image stored thereon to stimulating rays, and photoelectrically detecting light emitted by the stimulable phosphor sheet in proportion to the stored radiation energy upon exposure to the stimulating rays by use of a light detection means, and preliminary read-out for approximately detecting image input information stored on the stimulable phosphor sheet is carried out prior to the final read-out,

detecting an instantaneous light emission after-glow emanated by said stimulable phosphor sheet by use of a light detection means in the course of conveyance of said stimulable phosphor sheet toward a final read-out system after said preliminary read-out is finished so as to measure the level of said after-glow and,

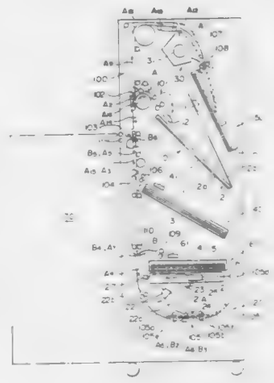
compensating said final read-out in accordance with the measured level of after-glow.

4,861,995

RADIATION IMAGE READ-OUT APPARATUS

Makoto Ohgoda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 24, 1988, Ser. No. 172,539
Claims priority, application Japan, Mar. 24, 1987, 62-69651
Int. Cl.[4] G03B *42/00*; G01T *1/00*
U.S. Cl. 250—327.2 **6 Claims**



1. A radiation image read-out apparatus comprising:

(i) a cassette holding section for releasably holding a cassette which houses therein a stimulable phosphor sheet carrying a radiation image stored thereon, said cassette holding section being provided with a take-out means for taking said stimulable phosphor sheet out of said cassette.

(ii) a magazine holding section for releasably holding a magazine which houses a plurality of stimulable phosphor sheets each carrying a radiation image stored thereon, said magazine holding section being provided with a take-out means for taking said stimulable phosphor sheets one by one out of said magazine,

(iii) an image read-out section for carrying out radiation image read-out by scanning said stimulable phosphor sheet by a light beam which causes said stimulable phosphor sheet to emit light carrying said radiation image stored on said stimulable phosphor sheet, and detecting the emitted light,

(iv) an erasing section for erasing radiation energy remaining on said stimulable phosphor sheet after the radiation image read-out from said stimulable phosphor sheet is finished at said image read-out section.

(v) a tray holding section for releasably holding a tray for housing therein a plurality of said stimulable phosphor sheets on which the erasing has been finished, and

(vi) a stimulable phosphor sheet conveyance means for:

(a) receiving the stimulable phosphor sheet from said take-out means at said cassette holding section, convey-

ing said stimulable phosphor sheet to said image read-out section and said erasing section, and then conveying said stimulable phosphor sheet into said cassette at said cassette holding section or into said tray at said tray holding section, and

(b) receiving the stimulable phosphor sheet from said take-out means at said magazine holding section, conveying said stimulable phosphor sheet to said image read-out section and said erasing section, and then conveying said stimulable phosphor sheet into said tray at said tray holding section or into said cassette at said cassette holding section,

wherein the length of said erasing section in the direction of conveyance of said stimulable phosphor sheet is shorter than the length of a single stimulable phosphor sheet, said erasing section and said tray at said tray holding section are providing adjacent to each other so that said tray supports the leading edge of said stimulable phosphor sheet conveyed at said erasing section, and said stimulable phosphor sheet conveyance means conveys said stimulable phosphor sheet, on which the erasing has been finished, by switch-back into said cassette at said cassette holding section, and wherein said erasing section and said tray are disposed at one end of said conveyance means.

4,861,996

OBSERVATION AND GUIDE BEAM APPARATUS FOR DAY AND NIGHT USE

Siegfried Roth, Riemerling, and Helmut Mueller, Eichenau, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 27, 1986, Ser. No. 924,214

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1985, 3538123

Int. Cl.[4] H04N *5/33*

U.S. Cl. 250—330 **15 Claims**



1. An observation and guide apparatus comprising a first viewing system (10) including first means suitable for night viewing or day viewing, said first means including a channel (10*b*) having a first optical axis (10*a*), said apparatus further comprising second means (13) forming a daylight channel (13*b*) having a second optical axis (13*a*), said first and second optical axes (10*a* and 13*a*) being harmonized with each other on a long term basis, a guide beam projector (12) for generating a guide beam defining a third optical axis (12*a*), an ocular arm (14) optically connected to both said first and second means, and axial harmonizing means (11) provided for automatically harmonizing said first and second optical axes (10*a* and 13*a*) with said third optical axis of said guide beam projector (12), said apparatus further comprising means for statically and mechanically fixing said first and second optical axes (10*a* and 13*a*) in a rigid position, said harmonizing means including adjusting means (11*a*) arranged in said second optical axis (13*a*) of said daylight channel (13*b*) for enforcing a parallelism between said first and second optical axes (10*a* and 13*a*), such that the apparatus is especially useful for weapons systems using remote controlled weapons.

4,861,997

STEREOSCOPIC THERMOGRAPHIC APPARATUS

Dieter Marx, Aalen-Waldhausen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Aug. 25, 1987, Ser. No. 89,068

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629458

Int. Cl.[4] G02B *26/10, 27/22*

U.S. Cl. 250—334 **6 Claims**



1. A stereoscopic thermographic apparatus comprising a detector (1), an infra-red (IR) objective (2), a scanner system (3), a first binocular telescope system for recording an image, said first telescope system having a left optical channel and a right optical channel, and a left mask arranged in said left optical channel for delivering a signal from only said left optical channel to only a first half of said detector and a right mask arranged in said right optical channel for delivering a signal from only said right optical channel to only a second half of said detector.

4,861,998

RAPID FIRE-DETECTION DEVICE FOR ARMORED VEHICLES

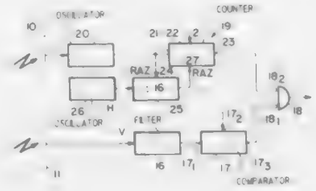
André Benhamou, Beauzelle, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 7, 1987, Ser. No. 1,215

Claims priority, application France, Jan. 10, 1986, 86 00319

Int. Cl.[4] G01J *1/00*

U.S. Cl. 250—339 **8 Claims**



1. Device for the rapid detection, within a period of no more than about 100 ms of hydrocarbon fire inside an armored vehicle, comprising a detector having a pyroelectric sensor for sensing infra-red radiation from a hydrocarbon flame, said sensor accumulating heat energy to produce an output voltage signal within 100 ms indicative of the presence of a hydrocarbon flame; and a means for responding to said output voltage signal.

4,861,999

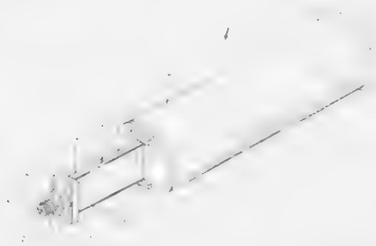
SUPERSONIC NOZZLE FOR USE IN AN INFRARED SPECTROMETER

Terrance E. Gough, R.R. #5, Cambridge, Ontario, Canada N1R 5S6

Filed Aug. 20, 1987, Ser. No. 87,361

Int. Cl.[4] G01N *21/03*

U.S. Cl. 250—339 **15 Claims**



1. A supersonic nozzle for injecting a gas in an infrared spectrometer using a pumping system for pumping said gas through said spectrometer, said nozzle comprising:

(a) an entrance and an exit for said gas with means at said entrance and at said exit for connecting said nozzle into said spectrometer so that gas to be analyzed will flow through said nozzle from said entrance to said exit using the pumping system;

(b) a narrow passageway extending from said entrance to a wall containing an aperture ;

(c) two windows extending from either side of said aperture towards said exit, each window being normal to a plane formed by said aperture and parallel to the other window, each window having an interior surface that is set back slightly from said aperture, said windows together defining a region for one-dimensional expansion of said gas said windows being of an appropriate material to pass infrared rays;

(d) means in said spectrometer to pass infrared rays through said windows; and

(e) an expansion chamber located between said windows and said exit, said chamber being substantially larger than said one-dimensional space.

4,862,000

METHOD FOR PREDICTING DENSITY OF MICRO CRYSTAL DEFECTS IN SEMICONDUCTOR ELEMENT FROM SILICON WAFER USED IN THE MANUFACTURE OF THE ELEMENT, AND INFRARED ABSORPTION MEASUREMENT APPARATUS FOR THIS METHOD

Atsuko Kubota, Yokohama; Yoshiaki Matsushita, Kawasaki, and Yoshiaki Ohwada, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 17, 1987, Ser. No. 15,039

Claims priority, application Japan, Feb. 25, 1986, 61-38265

Int. Cl.[4] G01J *3/42*

U.S. Cl. 250—341 **5 Claims**

1. A method for predicting a density of micro crystal defects in a production semiconductor element produced from thermal treatment of a production silicon wafer, said method comprising:

a first step of measuring a test coefficient ratio threshold value for a plurality of test silicon wafers, said first step including,

forming an infrared absorption spectrum for each of the test silicon wafers prior to thermally treating the respective test silicon wafers to make test semiconductor elements using radiation having a wavenumber range of 1500 to 450 cm^{-1}, the spectrum including a first oxygen absorption peak representative of a first oxygen concentration and appearing in the wavenumber range of 1150 to 1050 cm^{-1} and a second oxygen absorption peak representative of a second oxygen concentration and appearing within the wavenumber range of 530 to 500 cm^{-1},

reading from the spectrum and defining as a first coefficient a magnitude of the first oxygen absorption peak, and reading from the spectrum and defining as a second coefficient a magnitude of the second absorption peak, for each of the test silicon wafers,

calculating a test coefficient ratio of the first and second coefficients for each of the test silicon wafers,

thermally treating respective ones of the test silicon wafers to manufacture a plurality of the test semiconductor elements,

measuring a density of micro crystal defects for each of the test semiconductor elements, and

selecting as the test coefficient ratio threshold value one of the test coefficient ratios for which the defect density of the test semiconductor elements is a predetermined amount;



a second step of measuring a production coefficient ratio for the production silicon wafer prior to thermally treating the production silicon wafer to make the production semiconductor element, said second step including,

forming an infrared absorption spectrum for the production silicon wafer within a wavenumber range of 1500 to 450 cm^{-1}, the spectrum including the first oxygen absorption peak and the second oxygen absorption peak,

reading the first and second coefficients for the production silicon wafer, and

calculating a production coefficient ratio of the first and second coefficients for the production silicon wafer; and

a third step of comparing the production coefficient ratio of the production silicon wafer with the test coefficient ratio threshold value to predict a density of the micro crystal defects produced in the production semiconductor element which is to be manufactured from the production silicon wafer.

4,862,001

RADIANT ENERGY ABSORPTION STEAM QUALITY MONITORING MEANS AND METHOD

Donald J. Dowling, and Jackie C. Sims, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 7, 1988, Ser. No. 141,448

Int. Cl.[4] G01N *21/35*

U.S. Cl. 250—345 **16 Claims**

1. A steam quality monitor which measures the quality of steam flowing in a steam pipe comprising:

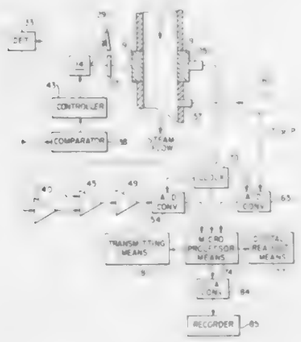
a measurement cell connected in the steam pipe so that steam flows through the measurement cell, said measurement

cell has two windows aligned along an axis which is traverse to the flow axis of the steam,

source means spatially arranged with the windows of the measurement cell for providing IR energy so as to enter the measurement cell through one window and leave through the other window so that the IR energy passes through the steam flowing in the measurement cell,

first detector means arranged with the windows for detecting IR energy that has passed through the steam flow and providing a signal corresponding thereto,

a mirror spatially arranged with the source means to reflect IR energy from the source means,



second IR detector means spatially arranged with the mirror for detecting the reflected IR energy and providing a signal corresponding thereto,

sensing means for sensing the temperature of the steam flowing through the measurement cell and providing a corresponding temperature signal, and

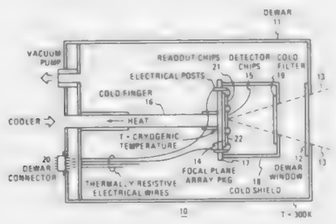
means connected to the first and second detector means and to the sensing means for deriving the steam quality in accordance with the signals from the both detector means and the temperature signal.

4,862,002

MULTIPLE CHANNEL READOUT CIRCUIT OPTIMIZED FOR A CRYOGENICALLY OPERATED IR SENSOR HEAD

Samuel C. Wang, 4798 Hyde Rd., Manlius, N.Y. 13104, and David N. Ludington, #4 Briarwood, Amherst, N.H. 03031

Filed May 31, 1988, Ser. No. 200,245
Int. Cl.[4] G01J *5/26*; H01L *27/4*
U.S. Cl. 250—352 **7 Claims**



1. In an IR sensor having plural readout channels, the combination comprising

(1) an evacuated cryogenic enclosure having an aperture for admission of IR image radiation through a predetermined aperture, and a cold radiation shield within said enclosure and spaced from the walls thereof,

(2) a thermally and electrically conductive cold finger extending into said enclosure for conductively cooling and mechanically supporting said cold radiation shield,

(3) a focal plane array installed within said cold radiation shield, mechanically supported by, electrically grounded to, and conductively cooled by said cold finger, including

(a) an M×N plurality of IR detector elements for intercepting said IR image radiation within said aperture,

(b) a multiple channel electrical readout circuit for sensing an electrical signal representing the IR image at each of (N×M) IR detector elements and grouping said sensed signals from sets of N IR detector elements into M separately scanned readout channels to facilitate a higher scanning rate and/or higher signal to noise ratio, and

(c) M preamplifiers, one for each set of N IR detector elements, each preamplifier including four field effect transistors (T1–T4), each transistor having a gate and as principal electrodes, a source and drain;

three field effect transistors (T1–T3) forming a cascoded amplifier having their principal electrodes connected in series between a ground node (VSS) and a drain node (VDD), both nodes being common to said M preamplifiers,

the first transistor (T1), with source connected to said ground node (VSS), having the gate thereof connected to the set of N IR detector elements associated with that preamplifier,

the second transistor (T2), with source connected to the drain of the first transistor, having the gate thereof connected to a cascode gate node common to said M preamplifiers,

the third transistor (T3), with the source connected to the drain of the second transistor having the gate thereof connected to a load gate node common to said M preamplifiers, and

the fourth transistor (T4) forming a source follower, the source of which is connected via a current setting resistor to said ground node (VSS), the drain of which is connected to said drain node (VDD), and the gate of which is connected to the drain of the second transistor of the same preamplifier, and

(4) electrical conductors of minimum number and cross sectional area entering said cryogenic enclosure for operating said focal plane array with minimum heat loss, comprising,

(a) a first conductor for supplying the load current of said M preamplifiers, connected between said drain node and a first terminal for a first external source (VDD') of dc drain potential, and having substantial electrical resistance (RDD) to minimize thermal conductance,

(b) said cold finger, which returns the load current of said M preamplifiers, being electrically connected between said ground node and an external ground terminal for said first external source, and having negligible electrical resistance,

(c) a second conductor of minimum thermal conductance for providing a gate potential with negligible current drain for effecting cascode operation of said first and second transistors, connected between said cascode gate node of said M preamplifiers and a second terminal for a second external source of dc potentials (VGC), and

(d) a third conductor of minimum thermal conductance for providing a gate potential with negligible current drain for operating said third transistors as loads, connected between said load gate node of said M preamplifiers and a third terminal for a third external source of dc potentials (VGL), and

(e) a low ac impedance connected between said third terminal and said cold finger for eliminating crosstalk between said preamplifiers due to a signal induced voltage perturbations on said first conductor.

4,862,003

NUCLEAR MEDICAL DIAGNOSTIC APPARATUS

Kazuhiro Tsuda; Tomohiko Kihara, and Kaoru Suzuki, all of Otawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 21, 1987, Ser. No. 135,264
Claims priority, application Japan, Dec. 27, 1986, 61-309064
Int. Cl.[4] G01T *1/175*
U.S. Cl. 250—363.02 **3 Claims**



1. A nuclear medical diagnostic apparatus comprising:

a gamma ray detector for detecting gamma rays emitted from a body being examined in reference to a radioisotope applied to the body;

display means arranged near the gamma ray detector so as to display a result of detection of the gamma rays;

an initializing signal generating means for generating a periodic initializing signal to update the display of the result of detection of said gamma rays; and

a control means for comparing the period of the initializing signal with a predetermined setting time and generating a signal for stopping the display of said display means when said comparing indicates that the period of the initializing signal exceeds said predetermined time.

4,862,004

RADIATION DOSE MEASURING METHOD AND APPARATUS WITH NUCLIDE DISCRIMINATION FUNCTION

Kiyoshi Koike; Hiroshi Tsuchiya, and Tsuyoshi Hayakawa, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Feb. 24, 1988, Ser. No. 159,752
Claims priority, application Japan, Oct. 9, 1987, 62-255731
Int. Cl.[4] G01T *1/20*
U.S. Cl. 250—369 **19 Claims**



1. A portable radiation measurement apparatus comprising:

first memory means for storing nuclear radiation decay energy spectra of a plurality of selected radionuclides;

detection means, responsive to independent absorptions of nuclear radiation, for generating electrical pulses having a charge magnitude proportional to the energy of said nuclear radiation and the number of said pulses being proportional to the number of said independent radiation absorptions;

digitizing means, having a predetermined resolution, for digitizing the charge magnitude of said pulses;

second memory means for accumulating a charge magnitude distribution of the number of said independent radiation absorptions having similar digital values; and

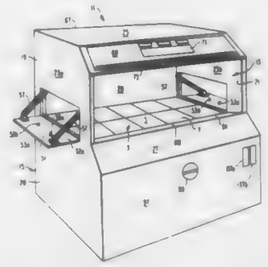
a central processing unit (CPU) operative to convert said charge magnitude distribution into a nuclear radiation energy level distribution, and operative to compare said nuclear radiation energy level distribution to said stored nuclear radiation decay energy spectra to identify the radionuclide emitting said nuclear radiation.

4,862,005

APPARATUS FOR DETECTING RADIOACTIVE CONTAMINANTS ON HAND TOOLS

Alfred N. Johnson, Voorhees, and Martin D. Humphrey, Vicentown, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 2, 1988, Ser. No. 201,808
Int. Cl.[4] G21F *3/00*; G01T *1/185*
U.S. Cl. 250—385.1 **37 Claims**



1. An apparatus for detecting radiation in hand-holdable objects, comprising:

a. a radiation detector assembly including a radiation detector means having a top side that is sensitive to both beta and gamma radiation throughout its area, and a platform means disposed over the top side of the detector means for both supporting the hand-holdable object being examined and for uniformly spacing the object from the detector means, and

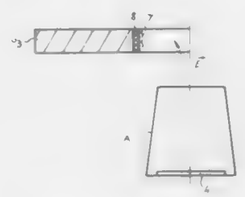
b. a shielding cabinet for containing the radiation detector assembly and shielding the detector means from background radiation, said cabinet having an access opening for allowing an operator to deposit and withdraw an object onto and the off of the platform means.

4,862,006

METHOD OF FABRICATION OF AN X-RAY IMAGE INTENSIFIER AND AN X-RAY IMAGE INTENSIFIER THUS OBTAINED

Gérard Vieux, Grenoble; Henri Rougeot, Nazaire Les Eymes, and Francis Diaz, Moirance, all of France, assignors to Thomson-CSF, Paris, France

Filed Jun. 15, 1987, Ser. No. 61,980
Claims priority, application France, Jun. 16, 1986, 8608588
Int. Cl.[4] H01J *31/52*
U.S. Cl. 250—483.1 **12 Claims**



1. A method of fabrication of an X-ray image intensifier including in particular a photocathode formed of alkali antimonide, a plurality of grids and an anode, said method comprising the steps of:

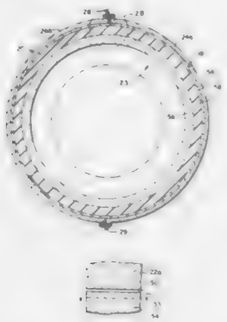
fabricating of said photocathode within said intensifier;
introducing said plurality of grids within said intensifier wherein at least one of said plurality of grids is introduced before said step of fabricating of said photocathode; and
depositing on at least a portion of a first one of said plurality of grids which is to be located nearest an anode a layer of electrically conductive material having the property of oxidizing alkali metals employed as constituents of the photocathode before introducing said first grid within the intensifier.

4,862,007

THERMAL PROTECTION SHELL FOR RADIOACTIVE WASTE CONTAINERS

Charles W. Mallory, Severna Park, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 19, 1987, Ser. No. 109,506
Int. Cl.[4] G21F *5/00*
U.S. Cl. 250—506.1 21 Claims



1. A thermal protection shell for protecting the exterior walls of a container used for containing heat generating toxic materials, characterized by a shell of heat conductive material which circumscribes and engages the exterior container walls in heat-conducting contact under ambient temperature conditions, wherein the thermal coefficient of expansion of the shell is greater than the thermal coefficient of expansion of the outer container walls so that the heat-conducting contact between the shell and the outer walls is substantially broken when the shell is exposed to an exterior source of thermal radiation that raises the temperature of the shell above a selected temperature, and the material forming the shell is fusible near said selected temperature so that the ablation of the shell also serves to obstruct the transmission of heat from the source of thermal radiation to the container walls.

4,862,008

METHOD AND APPARATUS FOR OPTICAL ALIGNMENT OF SEMICONDUCTOR BY USING A HOLOGRAM

Yoshitada Oshida, Fujisawa; Naoto Nakashima, and Yasuhiro Yoshitake, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 29, 1988, Ser. No. 213,141
Claims priority, application Japan, Jun. 30, 1987, 62-161296
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—548 40 Claims

1. A method for optical alignment of a semiconductor by irradiating an exposure light to a mask having a fine pattern drawn thereon and directing the transmitted light therefrom to a wafer as a pattern image through an exposure reduction lens, comprising:
an alignment illumination step for illuminating an alignment mark on the wafer by an alignment light having a different wavelength than that of he exposure light;
an alignment detection step for detecting a reflected light of the alignment light through the exposure reduction lens to detect the position of the alignment mark on the wafer to align the wafer relative to the alignment mark; and



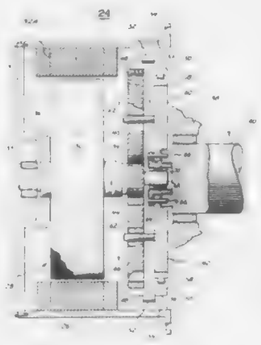
compensation step for compensating for a wavefront aberration at the alignment wavelength of the exposure reduction lens by using a hologram in at least one of alignment illumination and alignment detection in the relative alignment.

4,862,009

COMBINED ELECTRIC STARTER AND ALTERNATOR SYSTEM USING A PERMANENT MAGNET SYNCHRONOUS MACHINE

Robert D. King, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 22, 1988, Ser. No. 158,516
Int. Cl.[4] F02N *11/04*
U.S. Cl. 290—22 21 Claims



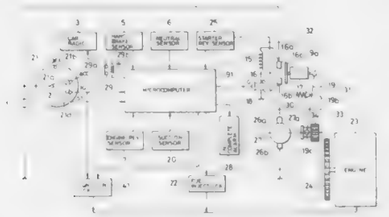
1. A system for engine cranking/starting and for providing electrical power during engine operation, comprising:
a dynamoelectric machine having a shaft, a rotor mounted to said shaft, and a stator;
a combustion engine having rotatable means adapted to be rotated by said machine when the engine is to be started and further adapted to be rotated by the engine during engine operation; and
a gear assembly connecting said shaft to said rotatable means, said gear assembly comprising a first clutch and a second clutch;
said system being operable in:
I. a start mode in which rotation of said rotor is initiated and maintained in rotation in a given direction by application of electrical energy to said stator such that said dynamoelectric machine operates as a motor and drives said rotatable means through said gear assembly, such that said first clutch responds to being driven by said machine by engaging in the start mode and said second clutch responds to being driven by said machine by disengaging in the start mode, said gear assembly having a gear ratio to provide torque multiplication in the start mode; and
II. a run mode in which said rotatable means drives said rotor in said given direction through said gear assembly such that said dynamoelectric machine operates as a generator with said stator supplying electrical power, such that said second clutch responds to being driven by said rotatable means by engaging in the run mode and said first clutch responds to being driven by said rotatable means by disengaging in the run mode, said gear assembly having a gear ratio in the run mode which is different than its gear ratio in the start mode.

4,862,010

METHOD OF STARTING ENGINE AND APPARATUS THEREFOR

Kyohei Yamamoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1988, Ser. No. 203,361
Claims priority, application Japan, May 28, 1987, 62-135739
Int. Cl.[4] F02N *11/08*
U.S. Cl. 290—38 R 2 Claims



1. A method of starting an engine automatically comprising the steps of
stopping a current supply to electrical accessaries of a vehicle when an engine start instruction is given after a power source is connected by a key switch and starting an exciting current supply to an electromagnetic switch of an engine starter such that the exciting current supplied to said electromagnetic switch increases gradually,
checking various conditions necessary to start the engine before said electromagnetic is closed,
continuing the gradually increasing exciting current supply to said electromagnetic switch when said conditions are satisfied to close said electromagnetic switch to thereby supply a current to said starter so that the engine is started thereby and terminating said exciting current when a completion of engine start is confirmed,
stopping said exciting current for a time including a time period for which said checking step is executed and ending at a time when said completion of engine start is not confirmed, and
allowing a current supply to said accessaries after the termination or the stopping of said exciting current.

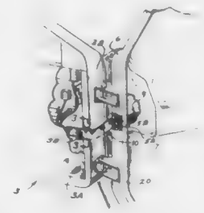
4,862,011

ELECTRICAL PLANAR CABLE INTERCONNECTION BETWEEN VEHICULAR DOOR AND BODY

James A. Wright, Dearborn Heights, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed May 6, 1988, Ser. No. 191,089
Int. Cl.[4] H01B *13/00*
U.S. Cl. 307—10.1 15 Claims

1. In a vehicle having
a movable door and a main body having a body opening in it for receiving an electrical interconnection through it, and a main electrical power supply system located in the vehicle body with a flexible electrical interconnection extending between the door and the vehicle body,
a door frame member and a movable, vehicular door panel movably carried by the vehicle body for movement to and from open and closed door positions with respect to the vehicle body, said movable door panel having a cable area at its side edge for receiving an electrical cable at its attachment side closest to the vehicle body, the door frame member and the door panel being mated together to form the door of the vehicle having side edge area, and
several electrical components mounted in said door to be powered by the main power supply system,
the improvement comprising:



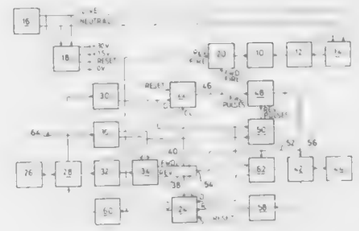
an electrical, planar cable extending from the door panel past the cable area and extended to the vehicle body, said electrical cable being at least relatively flat and laterally extended, having a greater width than thickness, and having included within it a series of at least three juxtaposed, substantially parallel, extended electrical wires in a substantially side-by-side array and having less than five wires in its thickness dimension, said planar cable electrically interconnecting the several electrical components in the door into the main electrical power supply system of the vehicle and said flat cable and the side edges of the door in combination with a seal member on the vehicle body having a side edge area forming a face-to-face seal between themselves when the door is closed, with said planar cable being sandwiched between the facing side edge areas of the door and said sealing member.

4,862,012

ELECTRICAL SWITCHING APPARATUS

Paul F. Mardon, Fulbourn, Great Britain, assignor to Pulsar Light of Cambridge Limited, Great Britain

Filed Feb. 22, 1988, Ser. No. 158,586
Int. Cl.[4] H02J *1/00*
U.S. Cl. 307—38 15 Claims



1. An electrical switching system comprising a power supply, a source of control signals of differing characteristics, a plurality of appliances each of which is connected in parallel with the other appliances and the power supply, and a single wire linking the appliances to the source of control signals for

selectively operating the appliances, the system also comprising for each appliance, a control unit powered from the power supply, and an input terminal and an output terminal whereby the control units are connected in series with the output terminal of one control unit being connected to the input terminal of the next and the input terminal of the first control unit being connected to the source of control signals, no connection being made to the output terminal of the last control unit in the chain, and wherein each control unit includes discriminating means and routing means whereby electrical signals having one characteristic can be distinguished from and routed separately from electrical signals having a differing characteristic, thereby to cause a signal having a particular characteristic to actuate only a selected one or ones of the appliances, wherein said routing means comprises bi-state circuit means arranged to route a signal of a first characteristic from the input to the output of a unit, for triggering the bi-state circuit means into one mode, whereby the arrival at the routing means of a subsequent signal of a second characteristic triggers the bi-state circuit means into its other mode, and means whereby triggering of the bi-state circuit means into its other mode causes operation of the appliance associated with the unit and generation of a signal of the first characteristic for transmission from the output of the unit to the input of the next unit.

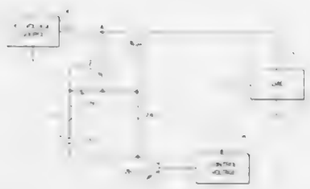
4,862,013

CONSTANT CURRENT SOURCE AND BATTERY CHARGER

John G. Konopka, Barrington, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Division of Ser. No. 127,745, Dec. 2, 1987, Pat. No. 4,829,259.
This application Nov. 16, 1988, Ser. No. 272,194
Int. Cl.[4] H03K *17/60, 17/04*
U.S. Cl. 307—254 3 Claims





1. A speed up circuit for a power transistor switch operated from a single-ended power supply comprising:
- a switch transistor coupled between said power supply and a load circuit;
- control means for controlling the conduction of said switch transistor in response to a control signal;
- said control means comprising a shorting transistor connected across the base-emitter junction of said switch transistor and trigger means, including a trigger transistor, for rapidly driving said shorting transistor into conduction in response to said control signal; and
- a diode coupled across the base-emitter circuit of said shorting transistor and a resistor and capacitor series circuit connected between said diode and the load circuit of said trigger transistor.

4,862,014

METHOD AND APPARATUS FOR CONTROLLING THE PHASE OF SIGNAL DRIVING A FERRIMAGNETIC LOAD

Terrence L. Myers, Fullerton, and William A. Harrington, Whittier, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 880,765, Jul. 1, 1986, abandoned. This application Mar. 7, 1988, Ser. No. 168,611
Int. Cl.[4] H03K *3/01;* H03B *3/04*
U.S. Cl. 307—270 16 Claims





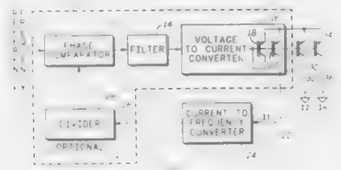
16. A device for applying a metered quantity of magnetic flux to a phase shifting ferrimagnetic load of the type employed in an array antenna means including a plurality of phase elements for producing an antenna beam for steering the antenna beam by controlling the phase of the elements of the array through magnetic flux density in the ferrimagnetic load, comprising:
- first means for sensing the voltage applied across said ferrimagnetic load and for producing an output voltage signal proportional to the sensed voltage;
- an operational amplifier integrator having an input connected to receive said output voltage signal and an output providing an integrated signal;
- a register means for storing and presenting at an output a digital representation of the amount of phase shift to be imparted by said phase shifting ferrimagnetic load;
- converter means connected to the output of said register means for converting said digital representation to an analog reference value, said analog reference value corresponding to a selected phase shift to be imparted by said phase shifting ferrimagnetic load;
- an inverting amplifier having an output and an input connected to receive said analog reference value from said converter means;
- a first comparator amplifier having an output, a first input connected to the output of said operational amplifier integrator, and a second input connected to receive said analog reference value from said converter means;
- a second comparator amplifier having an output, a third input connected to the output of said operational amplifier integrator and a fourth input connected to the output of said inverting amplifier; and
- means receiving the output of each of said first and second comparators for removing electrical power from said ferrimagnetic load in response to a signal on either of said outputs of said first and second comparators.

4,862,015

CONSTANT PROPAGATION DELAY CURRENT REFERENCE

Walter J. Grandfield, Lake Worth, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 3, 1988, Ser. No. 163,909
Int. Cl.[4] H03K *3/01;* G05F *3/16*
U.S. Cl. 307—270 15 Claims



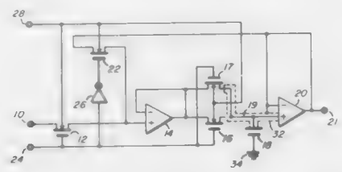
1. A current reference generator for coupling to a source of a reference frequency signal, said current reference generator comprising:
- phase locking means, responsive to said reference frequency signal and to an operating frequency signal, for providing a current reference signal;
- a current to frequency converter, responsive to said current reference signal, for generating the operating frequency signal; and
- a current mirroring device, responsive to the current reference signal, for providing an output current essentially equal to the current reference signal.

4,862,016

HIGH SPEED, LOW DRIFT SAMPLE AND HOLD CIRCUIT

Thad J. Genrich, Morrison, Colo., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 24, 1984, Ser. No. 685,696
Int. Cl.[4] G11C *27/02*
U.S. Cl. 307—353 12 Claims



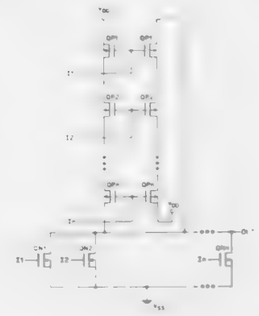
1. A sample and hold circuit having sample and hold modes, said circuit being for responding to an input signal exhibiting a voltage relative to a common potential and for providing an output signal, said circuit comprising:
- a first operation an amplifier having a signal input and an output;
- a second operational amplifier having a signal input and an output, the output from said second operational amplifier producing the output signal;
- a hold capacitor coupled between the signal input of said second operational amplifier and a ground terminal adapted to receive the common potential;
- a sample switch coupled between the output of said first operational amplifier and the signal input of said second operational amplifier, said sample switch including at least one of a predetermined type of switch and having an on-resistance being less than the on-resistance characteristic of two of the predetermined type of switches connected in series;
- an input terminal adapted to receive the input signal, said input terminal and the output of said second operational amplifier being coupled to the signal input of said first operational amplifier so that when the circuit is in the sample mode a signal produced at the output of said first operational amplifier corresponds to the input signal and when the circuit is in the hold mode the signal produced at the output of said first operational amplifier corresponds to the output signal and so that in the hold mode substantially no voltage difference appears across said sample switch.

4,862,017

CURRENT-MIRROR TRANSISTOR LOGIC CIRCUIT

Sywe-Neng Lee, Boston, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 10, 1988, Ser. No. 166,331
Int. Cl.[4] H03K *17/16, 19/20, 19/017, 19/094*
U.S. Cl. 307—443 3 Claims



1. A logic circuit comprising
- a plurality of input terminals for receiving input signals at first or a second logic level;
- an output terminal;
- a like plurality of transistors of a first conductivity type connected in parallel between said output terminal and a point of reference potential, and each having an input connected to one of said input terminals,
- a first set of a like plurality of transistors of a second conductivity type connected in series between a source of operating potential and said output terminal, each having an input connected to one of said input terminals; and
- a second set of a like plurality of transistors of said second conductivity type connected in series between said source of operating potential and said output terminal, each having an input connected to one of said input terminals such that each transistor in said first set is paired with transistor in said second set having a like position in said series and both are connected to the same one of said input terminals;
- wherein the first transistor in said series of transistors of said first set is connected to said source of operating potential; and
- wherein the last transistor in said series of transistors of said

second set is connected to said source of operating potential;

wherein said first conductivity type is opposite to said second conductivity type;

wherein each transistor of said first conductivity type is in a conducting condition in response to an input signal of said first logic level at its input and is in a nonconducting condition in response to an input signal of said second logic level at its input; and

wherein each transistor of said second conductivity type is in a nonconducting condition in response to an input signal of said first logic level at its input and is in a conducting condition in response to an input signal of said second logic level at its input;

whereby said output terminal is at the potential of the point of reference potential when input signals of the first logic level are present at one or more of the input terminals, and said output terminal is at the potential of the source of operating potential when input signals of the second logic level are present at all of the input terminals.

4,862,018

NOISE REDUCTION FOR OUTPUT DRIVERS

Ronald T. Taylor, Grapevine; George A. Giles, Plano, and Doran David, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 30, 1987, Ser. No. 126,539
Int. Cl.⁴ H03K *17/16, 17/687*
U.S. Cl. 307—443 **26 Claims**



1. A logic driver for compensating for the effects of parasitic inductance comprising:

means for receiving a logic signal of one current level;

means for generating an output current at another current level;

control logic means connected between said receiving means and said current generating means and adapted to change the output current in accordance with the received logic signal;

voltage altering means connected between a potential source and said means for receiving a logic signal and between said potential source and said means for generating an output current, for altering the effects of a voltage produced by parasitic inductance.

4,862,019

SINGLE-LEVEL POLY PROGRAMMABLE BIT CIRCUIT

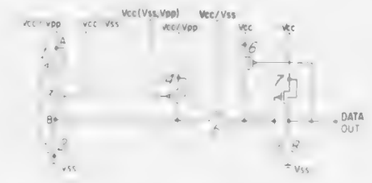
Benjamin H. Ashmore, Jr., Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 20, 1988, Ser. No. 183,958
Int. Cl.⁴ G11C *11/34*
U.S. Cl. 307—469 **12 Claims**

1. A zero-power bit circuit comprising:

a first-impurity-type-channel and a second-impurity-type-channel programmable transistor pair having connected single-level gates and having source-drain paths connected to a source of supply voltage and a source of reference potential during read operation and connected to a source of programming voltage and said source of reference potential during programming operation such that the voltage across one of said programmable transistors indicates the programmed status of said transistor pair,

a programming/isolating means connected to the source-drain paths of said programmable transistor pair to isolate



said source-drain paths during at least programming operation and to provide a signal in response to the programmed status of said transistor pair, and

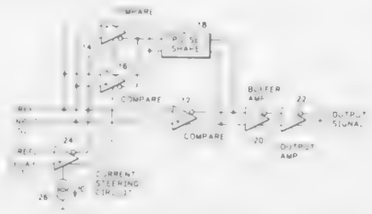
an inverter-buffer mans connected to said programming/isolation means and with output comprising the output of said zero-power bit circuit.

4,862,020

ELECTRONIC DELAY CONTROL CIRCUIT HAVING PULSE WIDTH MAINTENANCE

Clarence E. Cowan, Newberg, Oreg., and Ronald K. Christensen, Aloha, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 20, 1988, Ser. No. 208,450
Int. Cl.⁴ H03K *17/28*
U.S. Cl. 307—601 **4 Claims**



1. An electronic delay control circuit comprising:

means for generating an output current pulse from an input pulse signal;

means for generating a delay current pulse from the input pulse signal at each edge of the input pulse signal; and

means for adding the output current pulse and the delay current pulse to produce an output pulse signal corresponding to the input pulse signal delayed by a predetermined amount.

4,862,021

EXPLOSIVELY DRIVEN POWER SUPPLY

Edward W. LaRocca, 115 San Luis Way, Placentia, Calif. 92670

Filed Dec. 10, 1987, Ser. No. 131,079
Int. Cl.⁴ H02K *1/00*; G21B *1/00*; G01R *33/02*
U.S. Cl. 310—10 **18 Claims**

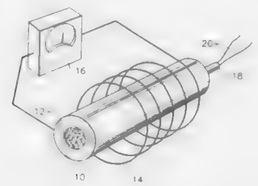
1. A power supply comprising:

a permanent magnet made of a pulverizable magnetic material;

a quantity of an explosive, concentric with or coaxial to the permanent magnet;

an electrically conductive coil surrounding the permanent magnet and the explosive; and

a detonator for detonating the explosive to remove the magnet from inside the coil by causing disintegration of the permanent magnet;



whereby a single-pulse electrical signal will be induced in the coil.

4,862,022

ROTOR OF ELECTRIC MACHINE WITH SUPERCONDUCTING FIELD WINDING

Garri M. Khutoretsky, ulitsa Altaiskaya, 20, kv. 5; Jury G. Tjurin, ulitsa Rudneva, 11, kv. 56; Viktor S. Yakovlev, ulitsa Basseinaya, 111, korpus 3, kv. 151, and Vladimir D. Varshavsky, ulitsa Zhukovskogo, 22, kv. 45, all of Leningrad, U.S.S.R.

Filed Nov. 18, 1987, Ser. No. 122,250
Int. Cl.⁴ H02K *9/00, 1/32*
U.S. Cl. 310—52 **4 Claims**

1. A rotor of an electric machine with a superconducting field winding, comprising:

a support structure (1) having an internal cavity (11) and radial slots (2) with superconducting field winding (4) placed therein, provided with ducts (10) for cooling said superconducting winding,

a shrouding cylinder (7) enclosing said support structure (1), said support structure (1) including a sector (13) of said support structure, having on its periphery, inside of said shrouding cylinder (7) a ring header (9) communicating with said cooling ducts (10), and also radial through holes (17) in said sector (13) spaced apart along the rotor axis and being in communication with said ring header (9), and said sector (13) having a slot (16) communicating with said header (9),

a trough (14) for supplying the coolant, located in said internal cavity (11) of said support structure (1) and communicating with said radial holes (17),

first heat-conducting members (19) disposed in said radial holes (17), having radial through slots (20) for feeding the coolant from said trough (14) to said header (9) and heat-insulated from said support structure by first heat-insulating members (18) of a low thermal conductivity material, so that, during operation of the machine, the heat in said radial through slots (20) can be transferred from the warmer coolant at the larger radius of said support structure (1) to the colder coolant at the smaller radius thereof,

second heat-conducting members (23) extending in the radial direction of said support structure (1), disposed in said slot (16) and heat-insulated by spacers (25, 29) from said support structure (1) and from said first heat-insulating member, so that the heat released in said shrouding cylinder (7) can be removed from said first heat-conducting member (18), and

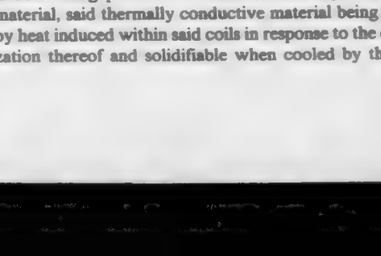
means (28) for securing said second heat-conducting members in said recess.

4,862,023

SYNCHRONOUS MACHINE WITH SUPERCONDUCTING WINDINGS

Yves Laumond, Andelnans, and Jean-Louis Sabrié, Cravanche, both of France, assignors to Societe Anonyme dite : ALSTHOM, Paris Cedex, France

Continuation-in-part of Ser. No. 920,500, Oct. 20, 1986. This application Jun. 14, 1988, Ser. No. 206,391
Claims priority, application France, Oct. 17, 1985, 85 15416
Int. Cl.⁴ H02K *9/00*
U.S. Cl. 310—54 **1 Claim**



1. In a synchronous machine having a rotor fixed to a shaft and said rotor having superconducting rotor windings, bearings rotatably supporting said shaft, a stator having superconducting stator windings about said rotor, and a gap between said rotor and said stator, means for cooling said rotor and said stator windings by very low temperature helium, the improvement wherein said rotor and stator windings and said gap are disposed inside a common enclosure connected to a common vacuum source, wherein vacuum-resisting oil seals and cryogenic traps separate said gap from said bearings of said shaft, and wherein said means for cooling said stator windings comprises a bath of liquid helium surrounding said stator windings, wherein said rotor windings are contained inside a rotor enclosure, and said machine further comprises means for flowing hypercritical helium inside rotor enclosure for cooling said rotor windings.

4,862,024

HEAT DISSIPATION IN AN ELECTRIC MOTOR

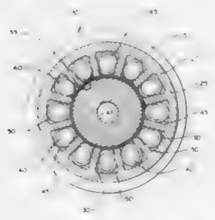
Frederick W. Stingle, Simsbury, Conn., and Samuel Schmidt, Windsor, Conn., assignors to United Technologies Corp., Hartford, Conn.

Filed Dec. 14, 1987, Ser. No. 132,737
Int. Cl.⁴ H02K *9/00*
U.S. Cl. 310—64 **7 Claims**

1. In an electric motor having a stator and a rotor disposed within said stator for rotary movement with respect thereto, said stator comprising a core accommodating coils of electrically conductive material therewithin, the improvement characterized by:

said coils being packed in a fusible, thermally conductive material, said thermally conductive material being fusible by heat induced within said coils in response to the energization thereof and solidifiable when cooled by the con-

duction of heat therefrom into said stator core, thereby rejecting the heat of fusion of said material into said stator



core for enhancing the cooling, as well as the electrical input and torque output capabilities of said motor.

4,862,025

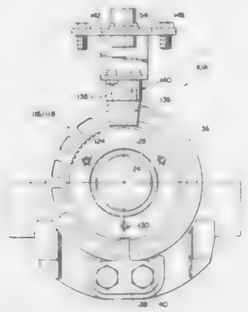
DUAL SPEED SENSOR PICKUP ASSEMBLY

Joseph B. Dierker, Jr., Southfield; Glen D. Peterson, Battle Creek, and Thomas A. Gee, Allen Park, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 25, 1988, Ser. No. 236,570

Int. Cl.[4] G01L *3/14;* **B60K** *23/04;* **B60L** *3/10;* **H02K** *11/00*

U.S. Cl. 310—68 B **17 Claims**



1. A dual speed sensor pickup assembly (140) for sensing the rotational velocity of a first (116) and a second (118) exciter rotor, said exciter rotors closely axially spaced and independently rotatable about a common axis of rotation (24), said pickup assembly comprising mounting means (150/150*a*) for mounting said pickup assembly in predetermined position relative to said first and second exciter rotors, a first (136) and a second (138) pole piece assembly fixedly retained in said mounting means, each of said pole piece assemblies comprising a ferromagnetic pole piece (160), a permanent magnet (162) and a conductive coil (146) surrounding the pole piece, said coil and pole pieces each defining a longitudinally extending axis (166) about which the coil is looped, said pickup assembly characterized by:

said first and second pole piece assemblies being oriented within said mounting means such that said longitudinal axes thereof are each radial with respect to the common axis of rotation of said rotors, but are skewed relative to one another.

4,862,026

MOTOR UNIT BEARING

Richard Riback, 930 North Ave., Deerfield, Ill. 60015

Filed Jun. 20, 1988, Ser. No. 208,883

Int. Cl.[4] H02K *7/08*

U.S. Cl. 310—90 **7 Claims**



1. A motor having a stator and a rotor core rotatable therein, and a rotor shaft secured for rotation with said rotor core, comprising:

a motor housing;

said stator supported by said motor housing;

said rotor core having a counterbore extending partially along the axial length thereof and circumscribing a portion of said rotor shaft;

said motor housing including a cylindrical unit bearing tower extending into said counterbore and surrounding said portion of said rotor shaft whereby said portion of said rotor shaft is free to rotate in a bore in said unit bearing tower;

said unit bearing tower including a radially extending surface at one end thereof which supports said rotor core.

4,862,027

COAXIAL STARTER MOTOR

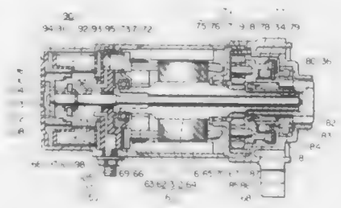
Shuzoo Isozumi, and Keiichi Konishi, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1988, Ser. No. 288,930

Claims priority, application Japan, Dec. 23, 1987, 62-326015

Int. Cl.[4] H02K *7/10, 49/00;* **F02N** *11/00*

U.S. Cl. 310—99 **6 Claims**



1. A coaxial starter motor comprising:

a d.c. motor having a hollow rotary shaft extended forward;

a planetary speed reduction gear having a sun gear which is a spur gear disposed on the outer periphery of the intermediate portion of said rotary shaft;

an overruning clutch in which an inner sleeve is arranged to be rotated in one direction and helical splines are formed in the inner periphery of said inner sleeve, said over-runing clutch being disposed on the front side of said rotary shaft and rotated at a reduced speed by said planetary gear speed reduction gear;

an output sleeve mounted on the front end portion of said rotary shaft and having a pinion at its front end portion and axially movably and relatively rotatably supported by a bearing, in which helical splines formed close to the rear portion of the outer periphery is in mesh with helical splines of said inner sleeve; and

a solenoid switch disposed on the rear end portion of said d.c. motor, said solenoid switch having an excitation coil, a plunger electromagnetically moved forward when a current flows through said excitation coil, a movable rod operatively associated with said plunger and extending into a hollow bore of said rotary shaft to oppose the front wall inner surface of said output sleeve at its front end, said movable rod being moved forward by the forward movement of said plunger to move forward said output sleeve, and a movable contact engageable with a stationary contact by the forward movement of said movable rod for supplying an electrical power to said armature.

4,862,028

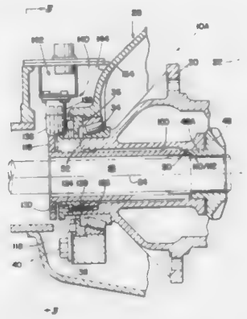
EXCITER ROTOR ASSEMBLY

Joseph B. Dierker, Jr., Southfield; Glen D. Peterson, Battle Creek, and Thomas A. Gee, Allen Park, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 25, 1988, Ser. No. 236,569

Int. Cl.[4] H02K *19/20*

U.S. Cl. 310—168 **24 Claims**



1. An exciter rotor assembly (100) for a drive-axle wheel speed sensor for sensing the rotational speeds of a drive axle ring gear (14/30) and of a drive axle differential side gear (48), said assembly characterized by:

a generally tubular member (102), said tubular member having first coupling means (110) at one end (108) thereof for engagement with complimentary second coupling means (112) on the side gear for joining said tubular member and said side gear for joint rotation;

a first exciter rotor (116) fixed to said tubular member at the other end (114) thereof; and,

a second exciter rotor (118) axially fixed to said tubular member axially adjacent said first exciter rotor, said second exciter rotor axially displaced from said first exciter rotor in the direction towards said one end, said second exciter rotor rotatable relative to said tubular member and provided with third coupling means (124/128) for rotationally and axially fixing said second exciter rotor to said ring gear.

4,862,029

ACTUATOR

Kiyoaki Kasai; Naomichi Sakai; Tomoyuki Oikawa; Kenji Uchino, all of Kanagawa; Takaaki Tsukidate, Tokyo; Hiroshi Asakura, Kanagawa; Hiroshi Yamamura, Kanagawa, and Hiroya Nagata, Kanagawa, all of Japan, assignors to Tosoh Corporation, Yamaguchi, Japan

Continuation-in-part of Ser. No. 47,485, May 11, 1987, abandoned. This application Jan. 20, 1988, Ser. No. 145,861

Claims priority, application Japan, Feb. 11, 1987, 62-275732; Oct. 23, 1987, 62-266486

Int. Cl.[4] H01L *41/18*

U.S. Cl. 310—311 **12 Claims**



1. An actuator comprising an actuator element capable of bending in response to an applied electric field, said actuator element consisting of an unpolarized monomorph-type PZT-based piezoelectric ceramic which includes at least one additive selected from oxides of Nb, Sb, Ta, La, Mn and Bi in an amount between 0.8 to 2.0 mol% relative to the PZT powder in said PZT-based piezoelectric ceramic, and wherein said PZT-based ceramic exhibits a dielectric loss value of at least 5% at 1 kHz, and a dielectric loss value at 100 kHz which is at least 30% less than the dielectric loss value at 1 kHz.

4,862,030

PIEZO-ELECTRIC DEVICE

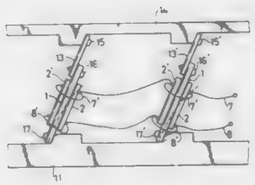
Katsunori Yokoyama, Ebina; Yukio Sato, and Shunzo Shimai, both of Togane, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Japan

Filed Feb. 17, 1988, Ser. No. 156,800

Claims priority, application Japan, Apr. 7, 1986, 61-78289; Jul. 10, 1986, 61-160846; Oct. 24, 1986, 61-251850

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—332 **21 Claims**



1. A piezo-electric device comprising:

an intermediate plate having opposite surfaces,

a plate-like first piezo ceramic element fixed on one of the opposite surfaces of the intermediate plate,

a plate-like second piezo ceramic element fixed on the other surface of the intermediate plate,

the intermediate plate, the first piezo ceramic element and the second piezo ceramic element being arranged in a sandwich manner,

a lead wire for connecting the first piezo ceramic element with the second piezo ceramic element,

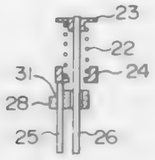
the intermediate plate being made of a ceramic material having an apparent porosity of 5% or less.

4,862,031

MAGNETRON CATHODE STRUCTURE

Tomokatsu Ogaro, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 19, 1987, Ser. No. 16,409
Claims priority, application Japan, Mar. 19, 1986, 61-59134
Int. Cl.[4] H01J *1/15*
U.S. Cl. 313—341 12 Claims



1. In a cathode structure of a magnetron comprising a cathode filament, an upper end shield and a lower end shield respectively secured to upper and lower ends of said cathode filament, a center lead having one end secured to said upper end shield and extending downwardly passing through the centers of said cathode filament and said lower end shield, a side lead having one end secured to said lower end shield and extending substantially in parallel with said center lead, and a spacer made of a ceramic material and having two holes into which said side lead and said center lead are inserted, an improvement in which

in fitting said side lead and said center lead respectively into said two holes of said spacer, one of said side lead and said center lead is fitted into a corresponding one of said two holes with a large looseness with respect to said one of said two holes when said one of said side lead and said center lead is fitted therein, and the other of said side lead and said center lead is fitted into the other of said two holes with small looseness as far as possible with respect to said other of said two holes when said other of said side lead and said center lead is fitted therein,

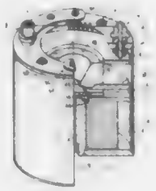
wherein a portion of said other of said side lead and said center lead fitted into said other of said two holes with small looseness is fixedly secured therein, and said one of said side lead and said center lead fitted into said one of said two holes with a large looseness is relatively movable with respect thereto so that friction between said one of said side lead and said center lead and said spacer is reduced, and the production of extraneous sounds is suppressed.

4,862,032

END-HALL ION SOURCE

Harold R. Kaufman, 925 Columbia, Apt. 622, Fort Collins, Colo. 80525, and Raymond S. Robinson, 2612 Bradbury Ct., Fort Collins, Colo. 80521

Filed Oct. 20, 1986, Ser. No. 920,798
Int. Cl.[4] F03H *5/00*
U.S. Cl. 313—359.1 21 Claims



1. An ion source comprising:

means for introducing and distributing a gas, ionizable to produce a plasma, uniformly in a transverse direction across a region within said source;

an anode disposed within said source near one longitudinal end of said region;

a cathode disposed near the other longitudinal end of said region and spaced from said anode;

means for impressing a potential difference between said anode and said cathode to produce electrons flowing generally in a longitudinal direction from said cathode toward said anode in bombardment of said gas to create said plasma, the production of said electrons being independent of any substantial bombardment of said cathode by ions in said plasma;

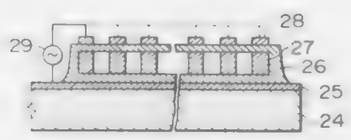
and means included within said source for establishing within said region a magnetic field the strength of which decreases in the direction from said anode to said cathode and the direction of which field is generally between said anode and said cathode, said establishing means including a magnet located entirely outside of and on the side of said anode away from said region in said longitudinal direction.

4,862,033

ELECTROLUMINESCENT DISPLAY APPARATUS HAVING A MULTI-COLOR ILLUMINANT LAYER AND PROCESS FOR PRODUCING THE SAME

Masahito Migita, Hachioji; Osam Kanehisa, Kodaira; Masatoshi Shiiki, Kokubunji, and Hajime Yamamoto, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 17, 1987, Ser. No. 85,762
Claims priority, application Japan, Sep. 16, 1986, 61-216036
Int. Cl.[4] H05B *33/14*
U.S. Cl. 313—502 30 Claims



1. An electroluminescent display apparatus comprising:

a pair of electrode layers of which at least one is divided into a plurality of electrodes; and

an illuminant layer interposed between said pair of electrode layers, said illuminant layer including a base substance and a plurality of activators each selectively doped into the base substance so as to provide a plurality of respective luminant regions in the illuminant layer, each one of the luminant regions illuminating with a desired color in accordance with the respective type of activator doped into the base substance in the respective luminant region.

4,862,034

STRUCTURE OF ANODE OF MAGNETRON AND A METHOD OF MANUFACTURING THE SAME

Tomokatsu Oguro, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

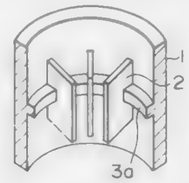
Filed Aug. 19, 1987, Ser. No. 86,933
Claims priority, application Japan, Aug. 27, 1986, 61-198802
Int. Cl.[4] H01J *25/587*
U.S. Cl. 315—39.75 1 Claim

1. An anode of a magnetron comprising:

a cylindrical outer frame portion;

a plurality of vanes radially extending from inside of said outer frame portion in a central direction thereof so as to have an integrated structure with the outer frame portion;

a continuous annular projecting portion formed between adjacent vanes so as to be integrally formed on the inside surface of said integrated structure of the outer frame portion and having a width in a direction perpendicular to said central direction smaller than a corresponding width of said vanes thereby avoiding a substantial change in oscillation frequency of the magnetron;



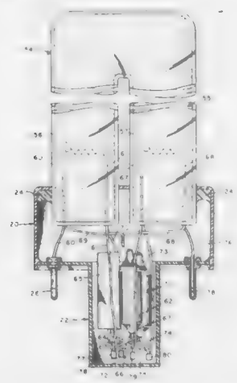
wherein said projecting portion is integrally formed at an end portion of said vanes, said end portion being at a distal end of said vanes in a direction perpendicular to an axial direction of said outer frame portion, said projecting portion being integrally formed on the inside surface of the outer frame portion and being integrated with said vanes.

4,862,035

FLUORESCENT LAMP UNIT HAVING PLURAL SEPARATE TUBES AND PARTICULAR ARRANGEMENT OF CIRCUIT ELEMENTS

John Cunliffe, Manchester, N.H., and Brian J. Grabham, Bingley, England, assignors to GTE Sylvania Limited, Shipley, United Kingdom

Continuation of Ser. No. 104,138, Oct. 5, 1987, abandoned. This application Feb. 23, 1989, Ser. No. 315,211
Int. Cl.[4] H01J *61/72, 61/30*
U.S. Cl. 315—58 5 Claims



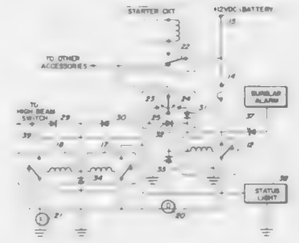
1. A fluorescent lamp unit comprising a fluorescent tube assembly (54, 55) defining a folded arc discharge path extending between filaments (56, 59) located at respective ends of said path, a mountng (20, 22), supporting said fluorescent tube assembly and providing releasable mechancial (22) and electrical (26, 28) connections for engagement with a base fitting, and starter means (62, 65, 71) housed within said mounting (20, 22) and electrically connected with said lamp filaments, characterised in that said fluorescent tube assembly comprises a plurality of folded fluorescent tubes (54, 55) each defining a separate arc discharge path between filaments (56, 57; 58, 59) located at respective ends of the tube, the separate arc discharge paths defined by said tubes are electrically connected in series between the electrical connections (26, 28) of said mounting (20, 22), each said fluorescent tube has lead in wires (60, 61, 67, 68; 69, 70, 72, 76) for the filaments (56, 57; 58, 59) at respective ends thereof disposed in an array of four wires extending from the tube substantially in a common plane, that the two tubes are mounted in juxtaposition with the said arrays of lead in wires located in opposite parallel planes, the four intermediate lead in wires (61, 67, 70, 73) are extended axially and connected to lead in wires of said starter means (62, 65, 71) at points remote from the ends of said fluorescent tubes, the casings of components forming said starter means (62, 65, 71) being located between said axially extending intermediate lead in wires (61, 67, 70, 73) to maintain the latter in spaced apart relation.

4,862,036

ELECTRICAL CIRCUIT FOR CONTROLLING THE OPERATION OF HIGH INTENSITY MOTORCYCLE LAMPS

George H. Kriss, II, P.O. Box 35331, Tucson, Ariz. 85740

Filed Dec. 7, 1987, Ser. No. 129,599
Int. Cl.[4] B60Q *1/14*
U.S. Cl. 315—82 13 Claims



1. An electrical circuit for controlling the operation of first and second lights connected in series between a power supply terminal and a reference potential, said circuit comprising:

(a) mode selection means coupled to the power supply and having full intensity, zero intensity and low intensity operating modes;

(b) a power control switch connected between the power supply terminal and said first light, said switch being responsive to the placement of said mode selection means in the full intensity and low intensity operating modes to couple said first light to the power supply terminal;

(c) first controlled switch means responsive to the placement of said mode selection means in the full intensity operating mode; said means being coupled between said first and second lights for connecting said first light to a reference potential when activated by said mode selection means;

(d) second controlled switch means coupled between said first and second lights and responsive to the placement of said mode selection means in the full intensity operating mode; said second means coupling said second light to the power supply terminal and concurrently terminating the series connection between first and second lights when activated by said mode selection means.

4,862,037

AUTOMATIC HEADLAMP DIMMING SYSTEM

Eugene I. Farber, and Lyman M. Forbes, both of Birmingham, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1987, Ser. No. 137,773
Int. Cl.[4] B60Q *1/02*
U.S. Cl. 315—83 18 Claims

1. A method of controlling the down-switching of a multibeam pattern headlamp system in a vehicle when opposing

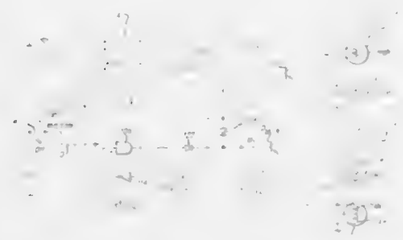
vehicles approach within the corresponding beam pattern, comprising the steps of:

providing headlamps on said vehicle for projecting a plurality of predetermined high intensity patterns directed outwardly from the vehicle in overlapping areas;

providing a source of electrical energy for energizing the headlamps;

providing a switching means that is controllable to connect said source of electrical energy to selected headlamps;

providing a first sensor for sensing the presence of headlamp radiation from oncoming vehicle headlamps over a wide range including said overlapping areas of said beam patterns and indicating said presence when said oncoming



radiation is sensed as being above a predetermined threshold;

providing a second sensor for sensing the presence of headlamp radiation from oncoming vehicle headlamps within a limited area of said overlapping beam patterns corresponding to one of the beam patterns and indicating said presence when the intensity of said oncoming radiation is sensed as being above a predetermined threshold; and

controlling said switching means in response to the indications from said first and second sensors in order to downswitch said headlamp beam patterns by disconnecting said source of electrical energy from appropriate headlamps and restoring said connections when said first and second sensors cease to provide said indications.

4,862,039

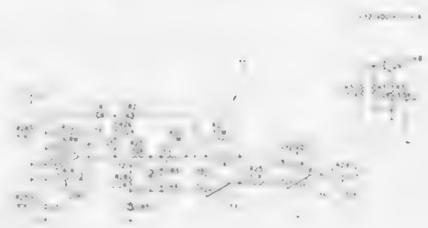
LINE REGULATED BALLAST CIRCUIT

Edwin N. Kile, Dallas; Gary W. Irwin, Garland, and Samuel S. Hartness, Mesquite, all of Tex., assignors to Kile Technology Corporation, Garland, Tex.

Filed Dec. 2, 1986, Ser. No. 936,768

Int. Cl.[4] H05B *37/00*

U.S. Cl. 315—194 10 Claims



1. A ballast circuit for controlling illumination device means comprising:

(a) a control chip;

(b) driver sub-circuit means connected to said control chip for receiving drive pulses from predetermined pins of said chip said driver subcircuit means further including a bridge amplifier driving first transformer means;

(c) power oscillator sub-circuit means connected to said first transformer means and having two transistors connected in parallel across said first transformer means and including a second transformer means;

(d) power supply means for providing direct current power to said circuit; and

(e) said illumination device means being connected to said second transformer means.

4,862,040

FREQUENCY-MODULATED INVERTER-TYPE BALLAST

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Mar. 18, 1987, Ser. No. 27,558

The portion of the term of this patent subsequent to Feb. 23, 2005, has been disclaimed.

Int. Cl.[4] H05B *41/29*

U.S. Cl. 315—244 20 Claims

1. An arrangement comprising:

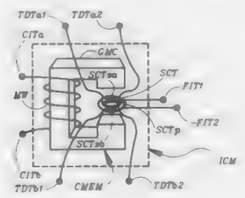
a DC source providing a DC voltage at a set of DC terminals, the DC voltage exhibiting periodic variations in magnitude;

gas discharge lamp means having a set of lamp terminals;

ballasting means connected in circuit between the DC terminals and the lamp terminals, the ballasting means having an AC output and being operative therefrom to supply an AC current to the lamp means, the magnitude of this AC current being a function of the magnitude of the DC voltage as well as of the frequency of the AC current, the ballasting means having frequency control input means

operative in response to a frequency-controlling input to control the frequency of the AC current; and

sensing means connected in circuit between the DC terminals and the frequency control input means, the sensing means being responsive to the magnitude of the DC voltage and operative to provide said frequency-controlling input to the frequency control input means, thereby to cause the magnitude of the AC current to remain relatively constant regardless of the periodic variations in the magnitude of the DC voltage.



4,862,041

DIMMABLE ELECTRONIC TRANSFORMER CIRCUIT

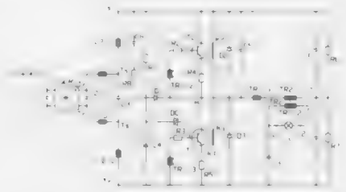
Walter Hirschmann, Munich, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen m.b.H., Munich, Fed. Rep. of Germany

Filed Oct. 13, 1987, Ser. No. 107,934

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1986, 3635109

Int. Cl.[4] H05B *41/24*

U.S. Cl. 315—246 9 Claims



1. Electronic transformer circuit for operation of a low-voltage load (L), and especially an incandescent lamp, having terminals (L1, L2), from an a.c. power network having a substantially higher supply voltage, said circuit being capable of connection to said power network through a dimmer circuit utilizing phase control,

said circuit having

a rectifier system adapted for connection to the power network, said rectifier system including

system output terminals (Ts), a rectifier (GLR) having rectifier output terminals (Tr) and a rectifier output capacitor (C3) of low capacity value connected across the system output terminals;

a self-starting half-bridge oscillator circuit connected in parallel across the rectifier system output terminals (Ts) including

two alternately conducting transistors (T1, T2) having their main current paths serially connected across the rectifier system output terminals and defining, between said transistors, a common middle junction (M),

a feedback circuit (TR1.1, TR1.2; TR1.3) coupled to said transistors to operate the transistors as a freely oscillating half bridge oscillator; and

a starting circuit for the transistors, including a starting resistor (R1), a starting capacitor (C4), a starting diac (DC) and a starting diode (D1) connected to provide for triggering one of the transistors to operate the transistors as the freely oscillating half-bridge oscillator;

a symmetry circuit including two symmetry capacitors (C6, C7) of equal capacity value, each having one terminal connected across the main current paths of the respective transistors and each having a second terminal connected together and defining a junction (J), said junction being coupled to said common middle junction (M); and

a lamp supply transformer (TR2) having a primary winding (TR2.1) connected between the common middle junction (M) of the transistors and the junction (J) of the second terminals of the symmetry capacitors (C6, C7), said transformer (TR2) forming the coupling to the common middle junction (M) and having a secondary winding (TR2.2) to which the terminals (L1, L2) of the load (L) are connected,

and comprising, in accordance with the invention,

a non-current-compensated choke (L1) having an inductance of at least 50 mH connected in series between the rectifier output terminals (Tr) and the system output terminals (Ts) for storing energy from said rectifier and providing for substantially sinusoidal power to said rectifier;

an oscillation start-accelerating circuit (C8, R8) comprising a series circuit including an accelerating capacitor (C8) and an accelerating resistor (R8) connected in parallel to the starting resistor (R1) of the starting circuit; and

a pair of symmetry resistors (R6, R7) of equal resistance value, each symmetry resistor of the pair being connected in parallel to a respective symmetry capacitor (C6, C7) and hence to said junction (J), thereby providing for gradual transistor voltage adjustment and substantially flicker-free brightness of the lamp upon operation of the circuit at less than full wave from said a.c. power network upon phase control by said dimmer.

4,862,042

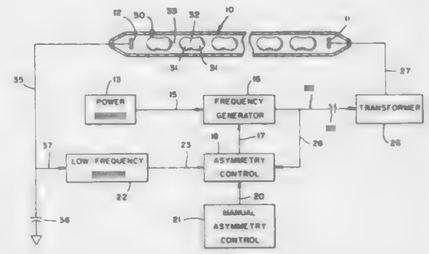
APPARATUS AND METHOD FOR FORMING SEGMENTED LUMINOSITY IN GAS DISCHARGE TUBES

Keanan C. Herrick, 2160 Mastlands Dr., Oakland, Calif. 94611

Continuation-in-part of Ser. No. 727,810, Apr. 26, 1985, abandoned. This application Apr. 13, 1987, Ser. No. 37,423

Int. Cl.[4] G05F *1/00*

U.S. Cl. 315—291 15 Claims



1. In a device including a gas discharge tube having electrodes, an AC circuit including said electrodes and an AC power source connected to impose sufficient potential between said electrodes to ionize the gas in said tube to produce segmented luminosity, the improvement comprising:

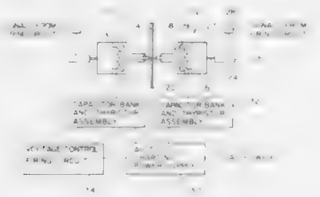
first means to produce AC current through said tube at a frequency between 1500 and 8000 Hz,

second means to eliminate direct current flow between said electrodes, and

third means to regulate and modify the asymmetry of the wave pattern of said AC current flowing through said ionized gas without the application of direct current in

order to control movement of luminous segments in said tube.

4,862,043
LOW VOLTAGE ELECTROMAGNETIC PULSE ACTUATOR
Peter B. Zieve, 5766-27th Ave. N.E, Seattle, Wash. 98105
Filed May 27, 1987, Ser. No. 54,587
Int. Cl.[4] H02K *33/00*
U.S. Cl. 318—114 63 Claims



1. A high energy electromagnetic pulse actuator, comprising:

an actuator means, including (a) a river having a first portion which is receptive to the establishment of eddy currents therein and a second portion adapted to receive a tool or the like for metal forming or other high force impact work on a workpiece, and (b) a coil positionable in close proximity to said first portion of said driver;

a source of stored charge defining a selected, relatively low voltage, adapted to produce a current pulse through the coil when connected thereto;

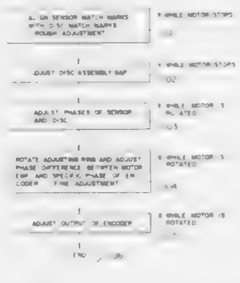
control means for selectively connecting the stored charge to the coil to produce a relatively large, short duration current pulse in the coil which in turn results in the creation of a high energy, rapidly changing magnetic field and the subsequent induction of eddy currents in the first portion of said driver, wherein said first portion of the driver is configured so as to reduce the axial diffusion of the rapidly changing magnetic field to such an extent that the current pulse in the coil which is produced by the relatively low voltage still results in a magnetic force pulse large enough to repel the driver away from the coil toward the workpiece with sufficient momentum to accomplish the desired impact work.

4,862,044
METHOD FOR ADJUSTING ENCODER IN A BRUSHLESS MOTOR-ENCODER COMBINATION
Kunihiko Karashima; Shoji Kumada; Katsumasa Yoshida, and Hiroharu Katase, all of Iruma, Japan, assignors to Kabushiki Kaisha Yaskawa Denki Seisakusho, Kitakyushu, Japan
Filed Mar. 18, 1988, Ser. No. 170,323
Claims priority, application Japan, Mar. 25, 1987, 62-71179
Int. Cl.[4] H02K *29/06*; G01D *5/00*
U.S. Cl. 318—254 4 Claims

1. A method for adjusting an encoder in a brushless motor-encoder combination comprising a brushless motor including a rotor comprising a magnetic core having a cylindrical shape, a permanent magnet which is alternately magnetized to different polarities at an equal pitch and which is secured onto the outer periphery of the magnetic core, and a shaft which is integrally formed with the magnetic core and rotatably supported by bearings that, in turn, are supported by a bracket forming one part of an outer casing of the brushless motor, and a stator comprising a stator core made of laminated steel plates and having an internal cylindrical surface facing the outer periphery of the rotor magnetic core, teeth formed on the internal surface of the stator core in a manner opposing the permanent magnet of the rotor, and excitation coils provided in the teeth for generating a rotating magnetic field therein; and

an encoder including an encoder disc assembly formed by an encoder disc and a hub through which the encoder disc is secured to the motor shaft, and a sensor base plate assembly formed by a sensor base plate in opposition to the encoder disc and a plurality of sensor elements mounted thereon, the sensor base plate assembly being indirectly coupled with the bracket of said motor, said method comprising the steps of:

(A) providing a set of sensor match marks on said sensor base plate at positions aligned with diametrical lines passing through the centers of the sensor elements of a specific phase, and a set of disc match marks on the encoder disc at positions where a predetemined phase difference Φ is obtained between a theoretically determined EMF voltage waveform of said motor at a time when the motor is held in an energized but locked state, and the output voltage waveform of said specific phase of said encoder;



(B) bringing said sets of match marks into alignment for executing a rough adjustment of the encoder;

(C) while the motor is held in a stopped state, displacing the encoder disc assembly in the axial direction for adjusting a gap formed between the disc assembly and the sensor elements;

(D) while the motor is rotated, adjusting the positions of the sensor elements on the sensor base plate such that the output signals delivered from said sensor elements as a result of the motor rotation exhibit predetermined phase angles therebetween;

(E) while the motor is held in a rotating state, rotating an adjustable ring which is adjustably connected with the sensor base plate and is rotatably received in a socket member secured to the bracket of the motor around the motor shaft to effect a fine adjustment of the encoder; and

(F) while the motor is held in the rotating state, adjusting the magnitude of the output voltage of the encoder to a predetermined value.

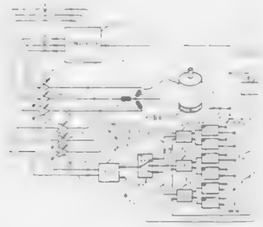
4,862,045
METHOD AND APPARATUS FOR CONTROLLING THE NUMBER OF REVOLUTIONS OF A ROTOR
Günter Gleim, Villingen, and Dietmar Uhde, Königsfeld, both of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Ger-
Filed May 31, 1988, Ser. No. 200,145
Claims priority, application Fed. Rep. of Germany, May 29, 1987, 3718207
Int. Cl.[4] H02K *29/10*
U.S. Cl. 318—254 3 Claims

1. An apparatus for controlling the number of revolutions of a rotor including tachometer means for generating a sequence of n pulses per revolution of the rotor with each pulse being generated when a respective one of n points on the circumference of the rotor passes a fixed point, means for evaluating the sequence of pulses to provide at least one control signal, and

means for using said at least one control signal to control the number of revolutions of the rotor; an improvement wherein:

said means for evaluating includes means for determining the actual time difference between corresponding ones of said pulses of said sequence at the end of at least one complete revolution of the rotor, means for producing a first signal corresponding to a sequence representing the determined said actual time difference, and means for comparing said first signal with a second signal corresponding to a sequence representing a desired time difference and for deriving said at least one control signal from the result of the comparison;

said means for determining includes first means for storing each of said n pulses during one revolution of the rotor and for comparing each of the stored pulses with the

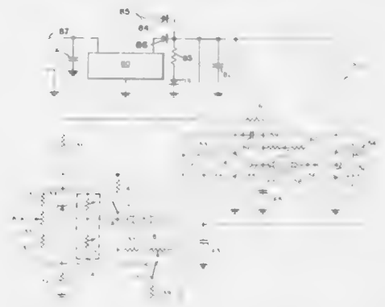


corresponding pulse during a subsequent revolution of the rotor to determine the respective actual time difference and to produce a signal corresponding thereto;

said means for producing a first signal includes means for sequentially reading out the signals corresponding to the determined actual time differences from said first means; and

said first means includes a respective pair of first and second memories associated with each of said n-pulses, means for alternatingly feeding said sequence of n-pulses to the respective first memories and the respective second memories on subsequent revolutions of the rotor, and a respective evaluation circuit means, connected to the output of each of said pair of memories, for determining the actual time difference between the pulses stored in said first and second memories.

4,862,046
ZOOM MOTOR CONTROL
Howard J. Preston, 920 Centinela Ave., Santa Monica, Calif. 90403
Filed Sep. 23, 1982, Ser. No. 421,793
Int. Cl.[4] G05B *1/06*
U.S. Cl. 318—467 3 Claims



1. A zoom motor control for controlling an electric motor for use in combination with an auto zoom device for a movie camera including a rotating member driven bu the electric motor and a zoom-lens tube rotating member with the electric motor being mechanically coupled to a tachometer, said zoom motor control comprising:

a. a rectangular housing having a hollow cavity which an operator of the movie camera may comfortably hold said rectangular housing in his hand;

b. a strain gauge sensor which is mechanically coupled to said rectangular housing and which is disposed so that the operator may apply with his thumb a varying amount of pressure in either direction wherein said strain gauge sensor has an output signal which is proportional to the amount of pressure which the operator applies with his thumb to said strain gauge sensor whereby said strain gauge sensor is functionally equivalent to an electrical circuit including a first variable resistor and a second variable resistor which are electrically coupled in parallel to the tachometer; and

c. a control circuit means for converting the output signal of said strain gauge sensor to a control signal for controlling the electric motor of the auto zoom device wherein said control circuit means is disposed in said cavity of said rectangular housing and is electrically coupled to said strain gauge sensor, said control circuit means including:

a. a multi-turn potentiometer which controls a maximum zoom speed setting of the auto zoom device;

b. a high/low speed switching means for lowering a maximum zoom speed of the auto zoom device by a fixed amount wherein said high/low speed switching means is electrically coupled to said multi-turn potentiometer;

c. a "zap" switch which allows the operator to drive the electric motor of the auto zoom device at high speed without having to change the maximum speed setting of said multi-turn potentiometer and said high/low switching means;

d. a first resistor electrically coupled to a first potentiometer and the first variable resistor in series;

e. a second resistor electrically coupled to said first potentiometer and the second variable resistor in series;

f. a third resistor which is electrically coupled to a positive voltage source and which is electrically coupled to said first variable resistor and said first resistor; and

g. a fourth resistor which is electrically coupled to ground and which is electrically coupled to said second variable resistor and said second resistor; and

h. a first diode which is electrically coupled to said third and fourth resistors.

4,862,047
APPARATUS FOR GUIDING MOVEMENT OF AN UNMANNED MOVING BODY
Toru Suzuki, Hiratsuka; Atsuhiko Kato, Isehara; Mitsuo Hosoi, and Ichiro Nakano, both of Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan
PCT No. PCT/JP87/00324, § 371 Date Jan. 20, 1988, § 102(e) Date Jan. 20, 1988, PCT Pub. No. WO87/07403, PCT Pub. Date Dec. 3, 1987
PCT Filed May 21, 1987, Ser. No. 157,510
Claims priority, application Japan, May 21, 1986, 61-116856; Jun. 27, 1986, 61-150902
Int. Cl.[4] G05D *1/02*
U.S. Cl. 318—587 7 Claims

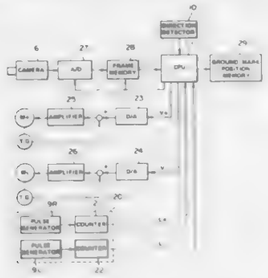
1. An apparatus for guiding the movement of an unmanned moving body, wherein plural sets of at least two ground marks are placed on a movement passage of said unmanned moving body in a spaced relation along a reference passage, and wherein said unmanned moving body includes;

first detecting means for detecting the existent position and posture of the unmanned moving body,

visual recognizing means for visually recognizing presence of each of said ground marks,

memory means for storing coordinate positions of each of the ground marks,

second detecting means for obtaining a declination angle and a displacement of the unmanned moving body relative to said reference passage and a distance from a line segment which extends through the moving body to perpendicularly intersect the reference passage to the moving body with reference to at least the two ground marks which are recognized by said visual recognizing means, and detect-



ing the existent position and posture of the unmanned moving body with reference to the thus obtained declination angle, displacement and distance as well as the content stored in said memory means, and

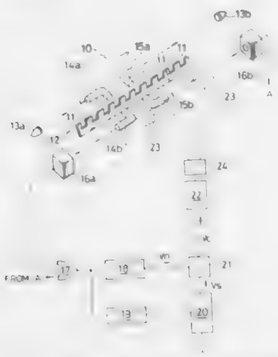
guiding position correcting means for correcting the position and posture detected by said first detecting means with reference to the position and posture detected by said second detecting means, when detecting output from the second detecting means is obtained.

4,862,048

SPEED CONTROL SYSTEM

Yoshikazu Shimodaira, Tokorozawa, and Teruo Nozawa, Hanno, both of Japan, assignors to Tsubakimoto Chain Co., Japan

Filed Feb. 10, 1989, Ser. No. 309,501
Claims priority, application Japan, Feb. 10, 1988, 63-15655[U]
Int. Cl.[4] G05B *11/00*
U.S. Cl. 318—640 **4 Claims**



1. In a system comprising a running body movable along a predetermined path, a speed control system comprising:

a slotted plate provided along the path of said running body, said plate having a plurality of slots disposed at predetermined intervals along the path of the running body;

a light source;

light receiving means for producing electrical pulses corresponding to received light pulses:

means establishing a light path between said light source and said light receiving means, at least part of said light path being arranged to move with said running body and to be alternately passed through said slots and interrupted by portions of the plate between the slots as the running body moves along said running path;

transducer means, arranged to receive said electrical pulses from said light receiving means, and responsive to said pulses for producing a speed signal representative of the current speed of said running body;

counter means, arranged to receive and count electrical pulses from said light receiving means, for providing a position signal representative of the position of said running body;

speed setting means, responsive to the position signal from said counter means, for generating a speed set signal which is a predetermined function of the position of the running body; and

comparator means, responsive to the speed signal and to the speed set signal, for generating a speed control signal for the running body.

4,862,049

CONSTANT AREA PULSE GENERATING NETWORK

Donald E. Fulton, Stoneham, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Feb. 21, 1978, Ser. No. 879,431
Int. Cl.[4] G05B *17/00*
U.S. Cl. 318—689 **4 Claims**



1. Constant area pulse generating network comprising:

A. constant current source means for generating a constant current,

B. controlled source means for generating a controlled current,

C. switch means for periodically chopping said controlled current to generate a first chopped current therefrom,

D. difference means for generating a control signal representative of the difference between said constant current and said first chopped current,

wherein said controlled source means is responsive to said control signal to generate said controlled current, said controlled current being proportional to said control signal.

4,862,050

OPTICAL COMMUTATION AND TILT SENSING FOR A PERMANENT MAGNET GYRO

Walter Parfomak, Wallington; Jerome Sears, Wyckoff, and Walter J. Kluss, Clifton, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 2, 1987, Ser. No. 127,723
Int. Cl.[4] G05B *17/00*
U.S. Cl. 318—689 **9 Claims**

1. A permanent magnet motor gyro apparatus comprising:

a permanent magnet rotor which is rotated about a spin axis;

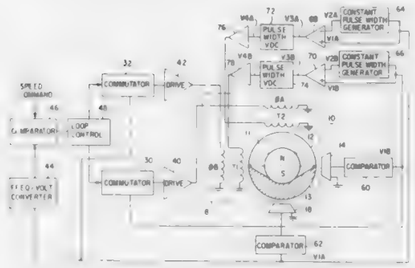
at least two stator windings, disposed for driving said permanent magnet rotor when energized;

an optical pattern having a generally trapezoidal shape consisting of a reflective segment and a nonreflective segment formed on said permanent magnet rotor;

optical detector means comprising a pair of optical detectors disposed with respect to said permanent magnet rotor for sensing said trapezoidal optical pattern;

drive circuit means responsive to said optical detector means

for driving said stator windings to start and drive said permanent magnet rotor; and,



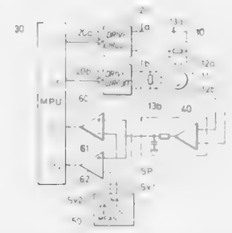
means for sensing the output of said optical detector means for determining tilt of said permanent magnet rotor in relation to a spin reference axis.

4,862,051

STEPPING MOTOR'S NEGATIVE-PHASE BRAKING CONTROL DEVICE

Eiji Moteki, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Feb. 22, 1988, Ser. No. 158,679
Claims priority, application Japan, Mar. 18, 1987, 62-63594
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **8 Claims**



1. A negative phase breaking control device for a stepping motor, comprising:

drive means for supplying phase currents to a plural-phase stepping motor including a rotor and a stator having plural-phase coils to drive said rotor and lock said rotor at a predetermined position;

drive instruction means for producing specifying signals to specify for said drive means a vector position at which said rotor is to be stopped;

position detecting means for detecting a present position of said rotor and providing a present position signal value representing said present position on the basis of oscillating counterelectromotive force waveforms induced in said phase coils of said stepping motor;

signal value setting means for setting a first signal value and at least one of several second signal values which said present position signal value should take at a target position where said rotor should be stopped and at a predetermined position before said target position, respectively; and

signal value comparing means for comparing said present position signal value with said first and second signal values and outputting first and second state signals representing the results of comparison, respectively, to said drive instruction means; in response to said first and second state signals, said drive instruction means being operated so as to actuate a negative-phase braking operation on said motor when said present position signal value reaches said at least one second signal value.

4,862,052

METHOD FOR STOPPING AN ELECTRIC MOTOR

Peter J. Unsworth, Lewes, United Kingdom; John C. Merrison, and Timothy M. Rowan, both of Wauwatosa, Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Mar. 8, 1988, Ser. No. 165,538
Int. Cl.[4] H02P *3/18*
U.S. Cl. 318—757 **12 Claims**



1. A method for braking an electric motor in response to a brake signal comprising the steps of:

sensing the polarity of the voltage from a source of alternating electricity;

sensing the polarity of the back emf voltage from the motor;

applying electricity from the source to the motor in a manner which tends to slow the rotation of the motor, the application of electricity being in response to the voltage from the source and the back emf voltage being of opposite polarities;

stopping the application of the electricity to the motor a given interval after the electricity is applied to the motor during consecutive cycles of the source voltage.

4,862,053

MOTOR STARTING CIRCUIT

Howard E. Jordan, Euclid, Ohio; Edward J. Woods, Southworth, Wash.; John T. Caruso, Bound Brook, N.J., and Luciano Forte, Spring Valley, N.Y., assignors to Reliance Electric Company, Cleveland, Ohio

Filed Aug. 7, 1987, Ser. No. 82,748
Int. Cl.[4] H02P *1/44*
U.S. Cl. 318—786 **24 Claims**



1. An electronic starting circuit for a single-phase electric

motor of any one of single-speed, multi-speed, and instant reversing types, the motor having at least a first main winding and at least one auxiliary winding for starting, said electronic starting circuit comprising, in combination:

an auxiliary switch adapted to be connected to said motor auxiliary winding to control energization thereto from AC voltage conductors;

means to obtain a signal increasing as the motor speed accelerates to a switching speed near normal running speed and remaining as a signal of substantial magnitude after opening of said auxiliary switch;

an amplifier having an input from said signal obtaining [redacted]

peak detector means connected responsive to the output of said amplifier to determine a peak DC output;

a reference voltage;

comparison means to compare the output of said peak detector means with said reference voltage;

a switching circuit connected to said voltage comparison means and connected to close said auxiliary switch when said peak detected voltage is less than said reference voltage and to open said auxiliary switch and terminate current through said auxiliary winding when said peak detected voltage is greater than said reference voltage; and

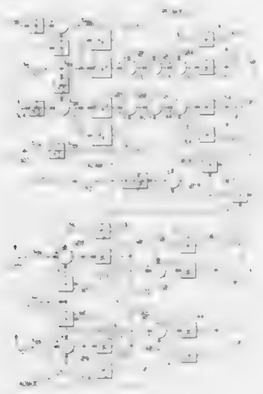
means establishing a positive feedback from output to input of said comparison means to maintain said auxiliary switch open despite lowered voltage from said signal obtaining means.

4,862,054

TACHO-LESS VECTOR CONTROL ADAPTIVE SYSTEM FOR MOTOR DRIVE

Colin D. Schauder, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 31, 1988, Ser. No. 265,094
Int. Cl.[4] H02P 5/40
U.S. Cl. 318—800 **5 Claims**



1. Apparatus for the determination of the rotor speed r of an induction motor having a squirrel cage rotor of stator resistance R_s, of stator reactance L_s, of rotor resistance R_r, of rotor reactance L_r, of mutual inductance M, a rotor flux represented by orthogonal components λ_{dr} and λ_{qr} in a stationary reference frame, the motor being supplied under three terminal voltages (v_a, v_b, v_c) and three line currents (i_a, i_b, i_c) derived from three AC phase lines without neutral connection, comprising:

means responsive to the terminal voltages and line currents for deriving signals representative of the direct and quadrature components (v_{ds}, v_{qs}) of the stator voltage vector and signals representative of the direct and quadrature components (i_{ds}, i_{qs}) of the current vector in accordance with the matrices:

$$\begin{bmatrix} v_{ds} \\ v_{qs} \end{bmatrix} = 2/3 \begin{bmatrix} 1 & -1/2 \\ 0 & -3/2 \end{bmatrix} \begin{bmatrix} v_{ab} \\ v_{cb} \end{bmatrix}$$

$$\begin{bmatrix} i_{ds} \\ i_{qs} \end{bmatrix} = -2/\sqrt{3} \begin{bmatrix} -\sqrt{3}/2 & 0 \\ 1/2 & 1 \end{bmatrix} \begin{bmatrix} i_a \\ i_c \end{bmatrix}$$

with $i_a+i_b+i_c=0$; $v_a+v_b+v_c=0$; and v_{ab} and v_{bc} being line to line voltages;

reference model means responsive to said voltage vector and current vector direct and quadrature components representative signals in relation to the first rows of the following model matrix expressed in a stationary reference frame:

$$\begin{bmatrix} v_{ds} \\ v_{qs} \\ 0 \\ 0 \end{bmatrix} = \begin{bmatrix} (R_s+L_s\sigma p.) & (0) & (M/L_r)p. & (0) \\ (0) & (R_s+L_s\sigma p.) & (0) & (M/L_r)p. \\ (-MR_r/L_r) & (0) & (R_r/L_r+p.) & \omega_r \\ (0) & (-MR_r/L_r) & -\omega_r & (R_r/L_r+p.) \end{bmatrix} \begin{bmatrix} i_{ds} \\ i_{qs} \\ \lambda_{dr} \\ \lambda_{qr} \end{bmatrix}$$

where:

R_r is the resistance of the rotor;

R_s is the resistance of the stator;

L_r is the inductance of the rotor;

L_s is the inductance of the stator;

$\lambda_{dr}=(Mi_{ds}+L_r i_{dr})$;

$\lambda_{qr}=(Mi_{qs}+L_r i_{qr})$;

$\sigma=(1-M^2/L_sL_r)$ namely the motor leakage coefficient;

whereby said reference model means is generating first and second signals representative of the direct and quadrature components of the rotor flux vector, λ_{dr} and λ_{qr} respectively;

adjustable model means responsive on the one hand to said current vector direct and quadrature components signals, and on the other hand to an estimated signal ω_r characteristic of rotor speed, and operative in relation to the two last rows of said model matrix, for generating respective third and fourth signals representative of the direct and quadrature components of a speed related rotor flux vector, λ_{dr} and λ_{qr};

means responsive to a deviation between the pair of said first and second signals, on the one hand, and the pair of said third and fourth signals on the other hand, for generating said estimated signal ω_r;

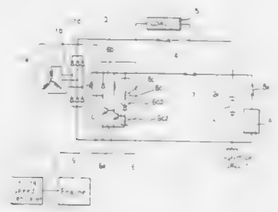
whereby said deviation, through said estimated signal, causes said speed related flux representative vector to be aligned with said flux representative vector and said estimated signal ω_r to be equal to said rotor speed ω_r.

4,862,055

AUTOMOTIVE CHARGING APPARATUS

Toshinori Maruyama, Kariya; Hirohide Sato, Toyokawa, and Toshiaki Matsuhashi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 24, 1988, Ser. No. 198,056
Claims priority, application Japan, May 25, 1987, 62-127437
Int. Cl.[4] H02J 1/00
U.S. Cl. 322—8 **5 Claims**



1. An automotive charging apparatus comprising;

alternator means for charging a battery,

voltage regulator means for regulating an output voltage of said alternator means in such a manner that a battery voltage is maintained within a range of a first predetermined value,

a high voltage load connected between said alternator means and said battery,

a switch member provided in parallel with said high voltage load,

means for changing the output voltage of said alternator to a second predetermined value which is higher than said first predetermined value when said switch member opens, and

means for increasing a rotating speed of said alternator for increasing the output voltage of said alternator when said switch member is opened.

4,862,056

INTERFACE FOR AN ELECTRICAL DEVICE

Kouji Goto, Toyota, and Syuji Noda, Toyoake, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed May 16, 1988, Ser. No. 194,534
Claims priority, application Japan, May 15, 1987, 62-119294
Int. Cl.[4] B05F 1/56
U.S. Cl. 323—275 **6 Claims**



1. An input-output interface disposed between an output electrical device which produces a first voltage at an output thereof and an input electrical device which has a second voltage as an input thereto, comprising:

resistor means for providing a resistance between the output of said first electrical device and the input of said second electrical device;

first circuit means for preventing the voltage at the input of said second electrical device from exceeding a predetermined maximum input voltage;

second circuit means for preventing the voltage at the input of said second electrical device from falling below a predetermined minimum input voltage;

first current control means for causing a first current to flow when the voltage at the input of said second electrical device is less than a first predetermined voltage and causing a second current to flow when the voltage at the input of said second electrical device is greater than said first predetermined voltage; and

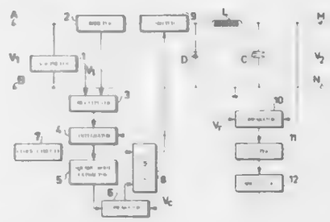
second current control means for causing a third current to flow when the voltage at the input of said second electrical device is greater than a second predetermined voltage and causing a fourth current to flow when the voltage at the input of said second electrical device is less than said second predetermined voltage.

4,862,057

CYCLE-CONTROLLED POWER CONVERTER

Giulio Contartese, Massy, and Alain Batlle, Toulouse, both of France, assignors to Societe anonyme dite: Alcatel Thomson Espace, Paris, France

Filed May 30, 1985, Ser. No. 739,262
Claims priority, application France, May 30, 1984, 84 08497
Int. Cl.[4] G05F 1/44
U.S. Cl. 323—285 **5 Claims**



1. A cycle-controlled DC electrical power converter comprising: an input (AB) for connection to a DC power supply; an output (MN) for connection to a load; switch means (9) inserted between the input and the output; and control means (1–8) for causing said switch means to open, characterized in that the control means comprise a measuring circuit (1–5) which is reset to zero with the beginning of each cycle and which has an output on which it supplies a measurement signal reprsentative of the energy at the input to the converter, and a comparator (6) coupled to the measuring circuit for controlling said opening by comparison with a control parameter (Vc).

4,862,058

VOLTAGE REGULATOR

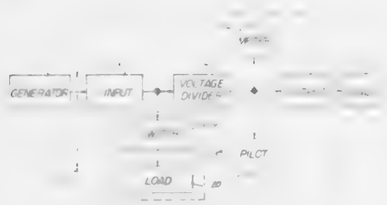
Ivan M. Engleman, 85 Everett Dr., Security, Colo. 80911, and Thomas G. Kozisek, 4445 Enchanted Clr. N., Colorado Springs, Colo. 80917

Filed Apr. 25, 1988, Ser. No. 185,968
Int. Cl.[4] G05F 1/63; H02P 9/10
U.S. Cl. 323—298 **9 Claims**

1. A voltage regulator for use with an on-demand generator having a voltage output, said voltage regulator comprising:

(A) input means for coupling to said voltage output of said on-demand generator;

(B) voltage divider means coupled to said input means for dividing a voltage appearing at said voltage output to produce a controlled voltage output;
(C) output means coupled to said voltage divider means for providing said controlled voltage output to an external load;



(D) load means for presenting a predetermined load to the on-demand generator;
(E) switch means coupled between said input means and said load means, for selectively connecting said load means to said input means to cause said on-demand generator to begin operating by presenting said predetermined load to said voltage output of said on-demand generator.

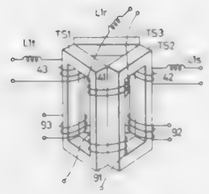
4,862,059

FERRORESONANT CONSTANT AC VOLTAGE TRANSFORMER

Fukutoshi Tominaga, Fukuoka; Mitsuo Iwanaga, Saga, and Hiromichi Yokomizo, Fukuoka, all of Japan, assignors to Nishimu Electronics Industries Co., Ltd., Jukuoka, Japan

Filed Jun. 29, 1988, Ser. No. 213,257
Claims priority, application Japan, Jul. 16, 1987, 62-177947
Int. Cl.[4] G05F *3/06, 1/13*
U.S. Cl. 323—307 **13 Claims**





1. A ferroresonant three-phase constant AC voltage transformer comprising:
three magnetically permeable cores,
first and second primary windings formed on each of said magnetically permeable cores,
first and second secondary windings formed on each of said magnetically permeable cores,
three input terminals and three output terminals,
three input means each providing a self-inductive reactance effectively in series with a corresponding one of said second primary windings formed on its said magnetically permeable core and a corresponding one of said first primary windings formed on another of said magnetically permeable cores to thereby form three primary phase circuit branches connected to said three input terminals in a selected one of star and delta connection patterns, and
said first secondary windings each formed on its magnetically permeable core and each provided in series with a corresponding second secondary winding formed on another of said magnetically permeable cores to thereby form three secondary phase circuit branches connected to said three output terminals in a selected one of star and delta connection patterns.

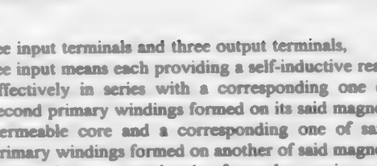
4,862,060

MICROWAVE APPARATUS FOR MEASURING FLUID MIXTURES

Bentley N. Scott, Richardson, and Y. Sam Yang, Plano, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 18, 1986, Ser. No. 932,068
Int. Cl.[4] G01N *22/00*
U.S. Cl. 324—58.5 A **17 Claims**





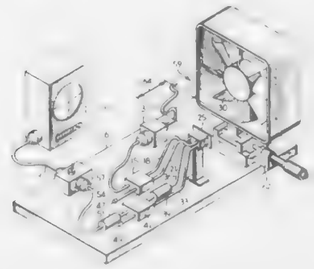
1. Apparatus for measuring the concentration of one fluid such as water in another fluid such as oil using the alternate of microwave energy characteristics, said apparatus comprising:
means forming a measurement section including a conduit for conducting a fluid mixture therethrough;
microwave transmission means extending through said measurement section;
an unisolated free running oscillator circuit operably connected to said transmission means for generating microwave energy for propagation through said measurement section at an operating frequency which changes with a change in the complex impedance of the oscillator load which includes the properties of said fluid mixture flowing through said measurement section;
means for measuring a change in the operating frequency of said unisolated oscillator circuit resulting from the properties of the fluid mixture flowing through said measurement section; and
means for comparing the change in frequency with a reference frequency corresponding to a certain concentration of one fluid in the other for determining the concentration of said one fluid in the fluid mixture flowing through said conduit.

4,862,061

MICROWAVE PROXIMITY SENSOR

Edward K. Damon, Columbus, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 24, 1986, Ser. No. 946,348
Int. Cl.[4] G01N *27/00*
U.S. Cl. 324—58.5 R **5 Claims**



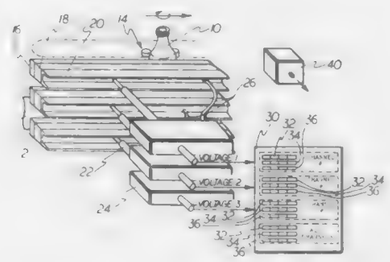
2. Apparatus for inferring distance based on a change in a signal velocity, comprising:
(a) a signal source;
(b) means for providing at least two electromagnetic signals having first magnitudes and a fixed phase relationship;
(c) sensing means for receiving two of the signals and for changing the velocity of propagation of one or more of the signals in response to a nearby object; and
(d) measuring means for measuring the change in velocity.

4,862,062

GLASS CONTAINER INSPECTION MACHINE

Russ J. Baker, Horseheads; Robert A. Hansen, Elmira, both of N.Y.; Paul F. Scott, Hartford, Conn., and Edward F. Vozenilek, Elmira, N.Y., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Oct. 5, 1988, Ser. No. 253,832
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—61 R **4 Claims**



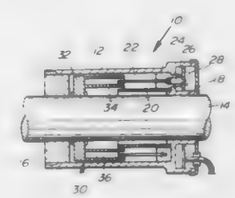
1. An apparatus for testing a glass container comprising
elongated capacitance sensing means
means for forcefully rolling the wall of a glass container along said elongated capacitance sensing means,
oscillator means for generating a voltage representative of the sensed capacitance,
means for sampling the voltage generated by said oscillator means at a selected number of sample locations around the wall of the rolling glass container,
first means for determining the smallest sampled voltage which is representative of the thinnest sampled location of the glass container,
second means for determining the highest sampled voltage which is representative of the thickest sampled location of the glass container,
means for translating said determined lowest and highest voltages to minimum and maximum dimensions and
means for determining the ratio of said minimum to maximum dimensions and
means for operating rejecting a glass container whenever the ratio of said minimum to maximum dimension is lower than a selected value.

4,862,063

ELECTROSTATIC CAPACITY-TYPE STROKE SENSOR AND DIELECTRIC MATERIAL THEREFOR

Hiroshi Kobayashi, and Toshiro Ichikawa, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama and Atsugi Motor Parts Company, Limited, Atsugi, both of, Japan

Filed Nov. 16, 1987, Ser. No. 121,244
Claims priority, application Japan, Nov. 14, 1986, 61-174052[U]; Jan. 23, 1987, 62-12478
Int. Cl.[4] G01R *27/26;* **G08C** *19/10*
U.S. Cl. 324—61 P **28 Claims**



1. An electrostatic capacity-type stroke sensor for monitoring relatively displaceable first and second structural members, comprising:
a cylindrical sensor casing secured to said first structural member and defining an internal sensor chamber therein;
a rod member thrustingly disposed within said cylindrical sensor casing for displacement relative to said cylindrical sensor casing according to movement of said second structural member;
a first electrode member fixed to said cylindrical casing and arranged within said sensor chamber and extending substantially in parallel to the axis of said rod member, said first electrode member forming a first electrode; and
a second electrode member made of a dielectric material and movable with said rod member relative to said first electrode member and constituting a second electrode for establishing an electrostatic capacity with said first electrode member, said electrostatic capacity varying depending upon a relative position of said first and second electrode members and indicative of a relative position of said first and second structural members;
said dielectric material comprising materials having opposite dielectric temperature variation characteristics so that the influence of temperature on dielectric properties of said dielectric material is minimized.

4,862,064

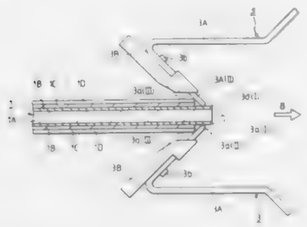
END SENSOR

Sigeo Sumi, Saitama, Japan, assignor to Somar Corporation, Tokyo, Japan

Filed Apr. 11, 1988, Ser. No. 179,813
Claims priority, application Japan, Apr. 10, 1987, 62-88064
Int. Cl.[4] G01R *27/02*
U.S. Cl. 324—65 P **11 Claims**

1. An end sensor for detecting an end of a thin film stuck to a surface of a base plate conveyed in a prescribed direction, comprising: a plurality of electroconductive contact members,

a tip of said contact member being oriented in a direction at an acute angle to a direction of conveyance of said base plate so as to contact a surface of said base plate and a surface of said thin



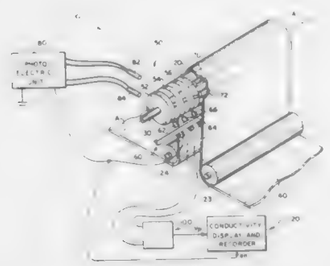
film; and means for mounting said contact members adjacent a conveyance path of said base plate such that an electrical parameter of said contact members changes when the base plate is conveyed between them.

4,862,065

ON-LINE WEB INTERNAL RESISTIVITY MEASURING APPARATUS

Robert J. Pazda, Waterloo, and Kenneth L. Clum, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 7, 1988, Ser. No. 178,700
Int. Cl.[4] G01R *27/02, 27/26*
U.S. Cl. 324—65 R **6 Claims**



1. An apparatus for measuring the resistivity of a web of material comprised of a conductive sheet material sandwiched between layers of insulating material comprising:
- a roller having an outer surface and mounted for rotation about a longitudinal axis;
- a first insulator affixed to the outer surface of said roller;
- a first electrode affixed to said first insulator;
- a second insulator affixed to the outer surface of said roller;
- an electrode assembly comprising, a second electrode affixed to said second insulator parallel to said first electrode, an insulating layer affixed to said second electrode, and a third electrode affixed to said insulating layer;
- a source of pulses electrically coupled to said first electrode for providing pulses to said first electrode when the web is in contact with said first and said third electrode; and
- means electrically connected to said second and said third electrode for receiving the pulses passing from said first electrode through said web to provide a signal indicative of the resistivity of the conductive sheet material.

4,862,066

OIL LEAKAGE SENSOR ELEMENT

Yoshiaki Sato, and Tazuru Ishikawa, both of Saitama, Japan, assignors to Junkosha Co., Ltd., Japan

Filed Aug. 24, 1988, Ser. No. 235,461
Claims priority, application Japan, Aug. 31, 1987, 62-217103
Int. Cl.[4] H01L *7/00*
U.S. Cl. 324—65 P **6 Claims**



1. An oil leakage sensor element comprising a plurality of electrical conductors contained within and separated from each other by a continuously porous, stretched polytetrafluoroethylene (PTFE) material containing from 15 to 40 weight percent carbon particles, said carbon particles having irregular shapes and average diameter between 10 and 30 millimicrons, at least a portion of the exterior surfaces of the carbon particles being exposed at the pore walls of the PTFE and extending into said pores.

4,862,067

METHOD AND APPARATUS FOR IN-CIRCUIT TESTING OF ELECTRONIC DEVICES

William A. Bruse, San Jose, and Scott D. Grimes, Morgan Hill, both of Calif., assignors to Schlumberger Technologies, Inc., San Jose, Calif.

Continuation of Ser. No. 65,985, Jun. 24, 1987, abandoned. This application Mar. 31, 1989, Ser. No. 334,802
Int. Cl.[4] G01R *15/12*
U.S. Cl. 324—73 R **36 Claims**



1. A method for testing an electronic circuit device while said device is electrically connected in the circuit for which said device is to be employed, said circuit device having a plurality of electrical terminals through which said device is operated in accordance with its intended circuit function, said method comprising:
- (a) applying electrical power to said circuit containing said device, so as to activate said circuit;
- (b) connecting a tester clip mechanism to said terminals of said circuit device;
- (c) electrically determining the physical orientation of said circuit device terminals with respect to said tester clip mechanism;
- (d) electrically determining whether said circuit device terminals are each in electrical contact with said tester clip mechanism; and
- (e) electrically determining whether said circuit device terminals are each properly electrically connected in said circuit containing said circuit device.

4,862,068

LST LOGIC CIRCUIT

Masatoshi Kawashima, Ohme; Makoto Takechi, Tokorozawa, and Hiroshi Odani, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 20, 1987, Ser. No. 75,527
Claims priority, application Japan, Jul. 23, 1986, 61-171625
Int. Cl.[4] G01R *31/28, 15/12*
U.S. Cl. 324—73 R **13 Claims**



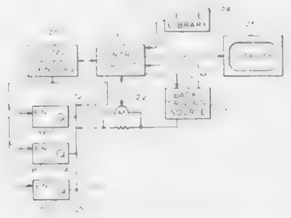
1. A logic circuit comprising:
- a first terminal;
- a second terminal;
- a plurality of combinational circuits disposed between the first and second terminals; and
- a plurality of flip-flops with at least one flip-flop being coupled to each of said combinational circuits, said plurality of flip-flops being coupled between said first and second terminals for shifting test data which is inputted to the flip-flop coupled to said first terminal through the coupled flip-flops to the second terminal, each flip-flop having a switching means coupled thereto which receives a control signal and which inhibits reception of a normal mode clock in response to said control signal during a period when said test data is inputted thereto.

4,862,069

METHOD OF IN-CIRCUIT TESTING

Alan J. Albee, Nashua, N.H., assignor to GenRad, Inc., Concord, Mass.

Filed Aug. 5, 1987, Ser. No. 82,054
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—73 R **5 Claims**



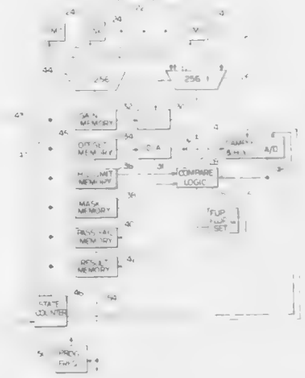
5. For performing a test on an electronic circuit comprising a common bus and a plurality of bus devices that are operable by application of enabling and disabling signals thereto to assume, when they are operating properly, enabled and disabled states, respectively, such that they drive the bus voltage to an assertion voltage value when at least one of the bus devices is in its asserted state, and such that the bus voltage assumes a de-assertion voltage value when all of the bus devices are in their disabled states, the purpose of the test being to determine which of the bus devices is driving the bus to an assertion voltage level even though all of the bus devices have had disabling signals applied thereto, a method comprising the steps of:
- A. applying disabling signals to all of the bus devices so that all properly operating bus devices are disabled;
- B. back-driving the bus to the de-assertion voltage level while all properly operating devices remain disabled;
- C. measuring the quiescent current that results from the back-driving;
- D. selecting each bus device in succession;
- E. applying enabling signals to the selected bus device individually while the other bus devices that are operating properly remain disabled;
- F. driving the bus with a current to tend to drive it to the de-assertion level but with a current limit greater than the quiescent current but less than the sum of the quiescent current and the assertion-current capacity of the selected bus device;
- G. determining whether the resultant departure of the bus current from its quiescent level is greater than a predetermined current minimum; and
- H. if the resultant departure of the bus current from its quiescent level is not greater than a predetermined current minimum, indicating that the selected bus device is defective.

4,862,070

APPARATUS FOR TESTING INPUT PIN LEAKAGE CURRENT OF A DEVICE UNDER TEST

Edward A. Ostertag, Thousand Oaks, Calif., assignor to Teradyne, Inc., Boston, Mass.

Filed Oct. 30, 1987, Ser. No. 115,156
Int. Cl.[4] G01R *31/00, 15/12*
U.S. Cl. 324—73 R **21 Claims**



11. Apparatus for testing leakage currents of input pins of an electronic device under test comprising
- a connector having a plurality of contacts for making electrical contact to respective said input pins,
- a plurality of current measuring circuits connected to respective contacts of said connector for sensing leakage current magnitudes and providing analog outputs having magnitudes indicating current,
- a multiplexer connected to receive said analog outputs and selectively provide one said analog output as a multiplexer output,
- a correction memory means for storing a correction value for each said pin, said correction memory being selec-

tively addressable to present a said correction value corresponding to the current measuring circuit providing said one analog output, and

means to correct said multiplexer output based on said correction value.

4,862,071

HIGH SPEED CIRCUIT TESTING APPARATUS HAVING PLURAL TEST CONDITIONS

Kazuhiko Sato; Junji Nishiura, and Keiichi Takahashi, all of Saitama, assignors to Advantest Corporation, Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 273,347

Claims priority, application Japan, Nov. 24, 1987, 62-296995

Int. Cl.[4] G01R *31/00*; G06F *11/26*

U.S. Cl. 324—73 R 18 Claims



1. A circuit testing apparatus having a plurality of test channels, in each of which a test signal is applied to a circuit under test, the circuit under test producing an output response signal which is compared with an expected value signal to detect coincidence or noncoincidence between them so as to determine whether the circuit under test is good or bad, said apparatus comprising:

a plurality of signal detecting means, each of which compares, at arbitrary timing, the output response signal with a reference level defining a normal logical level, to decide whether or not the output response signal is at the normal logical level, and which holds and outputs the decided logical level;

a plurality of independent strobe signal lines, coupled to said plurality of signal detecting means, through which strobe pulses for determining the timing for the level comparison are applied to said plurality of signal detecting means individually; and

a plurality of logical comparison means which are supplied with the decided logical levels from said plurality of signal detecting means, for comparing the decided logical levels with the expected value signal to detect coincidence or noncoincidence therebetween.

4,862,072

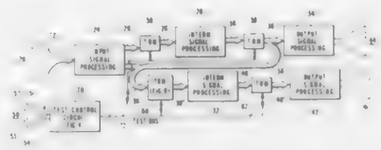
DISTRIBUTED ACCESS SERIAL PORT TEST ARRANGEMENT FOR INTEGRATED CIRCUITS

John W. Harris, Mt. Laurel Township, Burlington County; Jon L. Sherling, West Ampton Township, Burlington County, and Carl N. Puschak, Mt. Laurel Township, Burlington County all of N.J., assignors to General Electric Company, Morrestown, N.J.

Filed Sep. 8, 1988, Ser. No. 241,742

Int. Cl.[4] G01R *31/28*

U.S. Cl. 324—73 R 7 Claims



1. A monolithic semiconductor integrated circuit having a plurality of functional blocks for processing signals and adapted for receipt of test signals from a test apparatus external to said integrated circuit and also adapted for return of test signals thereto for, in at least one type of operation, controllably testing one or more of said functional blocks without affecting others of said functional blocks, and for returning the results of said test to said test apparatus, said integrated circuit comprising:

plural input pads adapted to be coupled to circuits external to said semiconductor integrated circuit for receiving normal operation signals therefrom;

at least one logic circuit coupled to said plural input pads, said logic circuit including at least input, intermediate and output signal processing blocks, each of said input, intermediate and output signal processing blocks including at least input terminals and output terminals, said logic circuit also including first and second coupling means, said logic circuit and coupling means being adapted for receiving said normal operating signals and for processing said normal operating signals in said input signal processing block to generate first processed signals, for controllably coupling said first processed signals to said input terminals of said intermediate signal processing block for generation in said intermediate signal processing block of second processed signals, and for controllable coupling said second processed signals to said input terminals of said output signal processing block for producing output processed signals at said output terminals of said output signal processing block;

plural output pads coupled to said output signal processing block for receiving said output processed signals, said plural output pads being adapted to be coupled to utilization apparatus external to said semiconductor integrated circuit;

a set of four additional pads adapted to be coupled to said test apparatus external to said semiconductor integrated circuit for, at least in part, performing individual tests upon at least a portion of said intermediate signal processing block, said four additional pads being

(a) a test data pad controllably adapted for receiving serial test information from said test apparatus in a write mode of operation and for transmitting serial response data to said test apparatus in a read mode of operation, said serial test information including address information and at least one of command data and test data;

(b) a test data direction pad adapted for receiving a test data direction signal from said test apparatus for establishing the direction of data flow through said test data pad;

(c) a test clock pad for receiving test clock signals from said test apparatus;

(d) a test command pad for receiving test command signals from said test apparatus;

wherein said first coupling means further comprises

(a) a first controllable test register including at least serial input and parallel output terminals;

(b) first controllable multiplexing means including control terminals, said first multiplexing means being coupled to said output terminals of said input signal processing block, to said input terminals of said intermediate signal processing block, and to said first test register, for, in a normal mode of operation, coupling said first processed signals to said input terminals of said intermediate signal processing block, and in said write mode of operation coupling said serial input terminal of said first test register to said test data pad whereby said first test register may be loaded with serial test data, and in a test mode of operation coupling said parallel output terminals of said first test register to said input terminals of said intermediate signal processing block whereby said first test register may be unloaded to said intermediate signal processing block for processing said test data for producing processed test data at said output terminals of said intermediate signal processing block;

and wherein said second coupling means further comprises:

(a) a second controllable test register including at least serial output and parallel input terminals;

(b) second controllable multiplexing means including control terminals, said second multiplexing means being coupled to said output terminals of said intermediate signal processing block, to said input terminals of said output signal processing block, and to said second test register, for, in said normal mode of operation, coupling said second processed signals to said input terminals of said output signal processing block, and for, in said test mode of operation, coupling said parallel input terminals of said second test register to said output terminals of said intermediate signal processing block, whereby said second test register may be loaded with said processed test data from said output terminals of said intermediate signal processing block, and for, in said read mode of operation, connecting said serial output terminal of said second test register to said test data pad, whereby said processed test data is available at said test data pad; and

control means coupled to said test command pad, to said test data direction pad, and test data pad, and to said first and second controllable test registers, and to said first and second controllable multiplexing means, for selectively assuming said normal, said write, said test and said read modes of operation for thereby testing said intermediate signal processing block.

4,862,073

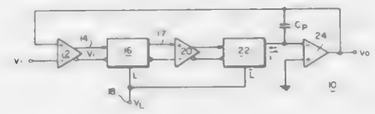
REPETITIVE WAVE SAMPLER

Jeffrey G. Barrow, Oak Ridge, N.C., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Oct. 12, 1988, Ser. No. 256,645

Int. Cl.[4] G01R *23/02*

U.S. Cl. 324—78 R 9 Claims



1. A method of determining the instantaneous value of an unknown repetitive waveform having a known repetition rate, each cycle comprising 360°, comprising the steps of:

a. comparing a first series of instantaneous values on the repetitive waveform with a second series of instantaneous values on a test signal, the first series comprising instantaneous values separated by 360° so that each instantaneous value in the series is of equal value, said equal value being termed the test value, and the second series comprising instantaneous values concurrent with the instantaneous values in the first series;

b. producing, for each comparison, a reference signal, the reference signal being in a first state if the unknown waveform is lower than the test signal and in a second state if the unknown waveform is higher than the test signal the first and second states being of equal magnitude and opposite polarity; and

c. integrating the reference signal after each comparison to produce the test signal, the test signal also being a measurement of the test value after a specified number of comparisons.

4,862,074

POLYPHASE VOLT-HOUR INDICATING CIRCUIT

Scott J. Weikel, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 14, 1988, Ser. No. 258,297

Int. Cl.[4] G01R *1/00, 21/06*

U.S. Cl. 324—107 6 Claims



1. An electronic circuit arrangement for producing an output signal representative of the average value of an alternating voltage in a power transmission system, comprising:

at least one circuit unit composed of pulse width modulator means connected to derive, from the alternating voltage, a train of pulses modulated in width as a function of the amplitude of the alternating voltage and with a defined phase relation to the alternating voltage, electronic circuit means connected to derive, from the alternating voltage, an alternating signal which varies in frequency with the alternating voltage and which has the defined phase relation to the alternating voltage, and signal multiplying means connected to receive the train of pulses modulated in width and the alternating signal for multiplying the pulses and the alternating signal to produce a product signal having an amplitude proportional to the average magnitude of the alternating voltage; and

signal to frequency converter means connected to derive from the product signal a train of output pulses having a repetition rate proportional to the amplitude of the product signal and constituting the output signal.

4,862,075

HIGH FREQUENCY TEST HEAD USING ELECTRO-OPTICS

Hee-June Choi, Fremont; Francois J. Henley, San Jose, and Maurice R. Barr, Saratoga, all of Calif., assignors to Photon Dynamics, Inc., San Jose, Calif.

Filed Sep. 1, 1988, Ser. No. 240,016

Int. Cl.[4] G01R *19/00, 5/28*

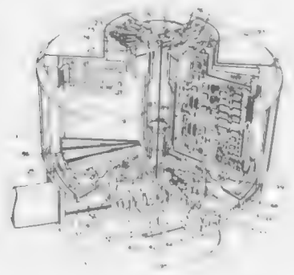
U.S. Cl. 324—158 F 23 Claims

16. A test system that measures electrical properties of various devices, the test system including a test head having first and second sides and comprising:

a test platform for receiving a device under test, the test platform being exposed on the first side of the test head;

pin driving means for inputting high frequency electrical signals to the device under test for causing the device under test to perform particular tasks, the pin driving means including a plurality of pin driver boards positioned radially about the test platform to minimize the distance between the device under test and the pin driver boards, each said pin driver board having an associated electrical transmission line that extends across the test platform, the radially arranged pin driver boards having a longitudinal axis;

an adapter board supported by said test platform and electrically communicating with the driving means for coupling contacts of a device under test to the driving means, wherein the test platform supports the adapter board on the first end of the test platform to facilitate removal of the



adapter board and coupling the test head to various devices;

receiver means including an electro-optic sensor that modulates light in response to the electrical field applied thereto for measuring the electrical signals presented at specific locations on the device under test in response to the inputted signals, and optical means for directing light towards the electro-optic sensor, the optical means having an optical transmission path, and wherein the electro-optic sensor and the optical transmission path are located central of the pin driver boards substantially aligned with said longitudinal axis, and the electro-optic sensor is located within 1.0 cm of the device under test to minimize pin capacitance, the pin capacitance of the receiving means being less than 5 picofarads; and

cooling means for maintaining said pin driving means at a substantially constant temperature during operation to minimize pin driver timing drift.

4,862,076

TEST POINT ADAPTER FOR CHIP CARRIER SOCKETS

Robert E. Renner, 16017 N. 48th Ave., Glendale, Ariz. 85306, and David A. Kutz, 4632 W. Julie Dr., Glendale, Ariz. 85308

Continuation of Ser. No. 876,070, Jun. 19, 1986, abandoned. This application May 26, 1988, Ser. No. 206,983

Int. Cl.[4] G01R *31/02;* **H01R** *23/72*

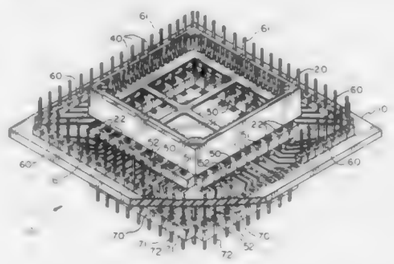
U.S. Cl. 324—158 F **7 Claims**

1. A test point adaptor for permitting an electrical connection of a test probe apparatus to a semiconductor chip mounted in a semiconductor chip carrier, said chip carrier including a plurality of connecting pins electrically connected to said semiconductor chip extending from said chip carrier, said test point adaptor comprising:

a circuit board having a plurality of conductive foil paths, each conductive foil path connecting a corresponding inner foil pad to a corresponding outer foil pad;

first terminal means connected to said circuit board, said first terminal means including a plurality of electrically conductive pin members, each pin member electrically connected to a corresponding inner foil pad;

said first terminal means further including a plurality of electrically conductive pin accepting members, each pin member electrically connected to an associated first terminal means pin member and each pin accepting member is arranged to accept a respective and associated chip carrier connecting pin, therein, connecting said circuit board and said foil paths to said chip carrier with said semiconductor chip; and



second terminal means connected to said circuit board, said second terminal means including a plurality of electrically conductive pin members, each of said second terminal means pin members connected to a corresponding outer foil pad of said circuit card, said second terminal means pin members providing for selective electrical connection of said test probe apparatus to said semiconductor chip in said leaded chip carrier.

4,862,077

PROBE CARD APPARATUS AND METHOD OF PROVIDING SAME WITH RECONFIGURABLE PROBE CARD CIRCUITRY

Timothy A. Horel, Fletcher; Edward S. Hoyt, and Lloyd A. Walls, both of Williston, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 43,789, Apr. 29, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 311,448

Int. Cl.[4] G01R *1/04, 1/067*

U.S. Cl. 324—158 F **21 Claims**



17. A method of providing a reconfigurable probe card apparatus for allowing connection to miniature test contact pads of an integrated circuit on a surface of a semiconductor substrate, said method comprising the steps of:

providing a plurality of incomplete first probing circuits on a first probe card member, each of said probing circuits having associated therewith first contact means for use in providing electrical connection to a probe pin, second contact means, and third contact means for providing electrical connection to test equipment;

providing a plurality of second probing circuits on a second probe card member, each of said second probing circuits having fourth contact means for electrically connecting to said first contact means, fifth contact means for electrically connecting to said second contact means, sixth contact means for electrically connecting to said third contact means, and conductive line means for providing electrical connection between said fourth, fifth and sixth contact means;

removably mounting said second probe card member in a position relative to said first probe card member such that said fourth, fifth and sixth contact means of at least a portion of said second probing circuits are aligned to and placed in electrical communication with said first, second and third contact means, respectively, of at least a portion of said first probing circuits, such that said probe card apparatus is configurable to a desired probe card circuitry by the removable mounting of a preselected second probe card member.

4,862,078

CIRCUIT FOR DETECTING DEFECTS OF A MAGNETIC RECORDING HEAD

Tomoyuki Kawabata, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Apr. 26, 1988, Ser. No. 186,153

Claims priority, application Japan, May 7, 1987, 62-111375

Int. Cl.[4] G01R *33/12*

U.S. Cl. 324—212 **4 Claims**



1. In a circuit for detecting a defect of a magnetic recording head having at least one coil which is driven during recording by a switching circuit which is driven by a write current pulse having a leading edge and a trailing edge, and wherein a back electromotive voltage is produced at the coil of the magnetic recording head following said trailing edge of the write current pulse, and a detecting circuit coupled to the coil for detecting the back electromotive voltage as an indication of the quality of the magnetic recording head based on the level of the back electromotive voltage produced by the coil,

the improvement comprising a synchronizing circuit, coupled to said detecting circuit and receiving the write current pulse as an input, for generating a synchronized enabling pulse for said detection circuit upon detection of the trailing edge of the write current pulse, to synchronize the enabled operation of said detection circuit with the generation of the back electromotive voltage.

4,862,079

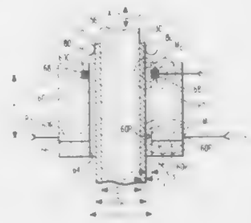
MAGNETIC METHOD AND APPARATUS FOR MEASURING AND LOCATING WEAR OF CONTROL RODS IN NUCLEAR REACTORS

Ronald W. Chickering, Greensburg; Richard S. Miller, Murrysville, and H. Donald Moss, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 16, 1987, Ser. No. 121,812

Int. Cl.[4] G01N *27/82;* **G01R** *33/00;* **G21C** *17/00*

U.S. Cl. 324—227 **20 Claims**



1. Apparatus for measuring and locating wear in a test piece subject to distortion, comprising:

a transducer test fixture having at least one through-hole therein for passage of said test piece, said hole having a shape corresponding closely to the shape of the test piece;

an RF-excited circumferential coil mounted in the test fixture and adapted to surround said hole in a plane perpendicular to a longitudinal axis of the hole for producing a circumferential magnetic field, said circumferential coil producing a corresponding RF volume output in response to volume changes in the test piece;

a plurality of RF-excited radial coils, for producing a radial magnetic field, mounted in the test fixture and circumferentially spaced about said hole such that the axes about which the coils turn are normal to the surface of said hole, said radial coils producing corresponding RF thickness outputs in response to thickness changes in the test piece; and

means for distinguishing wear in the piece from distortion responsive to said volume and thickness outputs for generating an output corresponding to localized wear when the values of said volume and thickness outputs are outside preselected limits.

4,862,[illegible]

METHOD OF DERIVING A SPIN RESONANCE SIGNAL FROM A MOVING FLUID, AND DEVICE FOR PERFORMING THIS METHOD

Hendrik Van as, Lunteren, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 21, 1988, Ser. No. 170,480

Claims priority, application Netherlands, Mar. 25, 1987, [illegible]700700

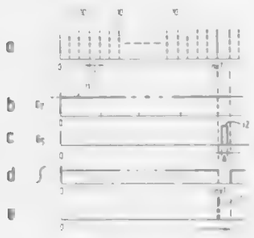
Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—306 **19 Claims**

1. A method of deriving a spin resonance signal from a moving fluid which is subjected to a magnetic field consisting of a constant field component, one or more gradient field components of which at least one extends in the direction of motion of the fluid, and an r.f. field component generated by r.f. electromagnetic signals, the r.f. field component being perpendicular to the constant field component and exciting the nuclear spins of the fluid; such method comprising the steps of:

subjecting the fluid to at least one further gradient field component which produces relative phase shifts of components of the excited nuclear spins in a direction transversely to the constant field component, such phase shifts mutually cancelling the spin excitations in said transverse

direction so they are caused to relax as imposed by said further gradient field component; and



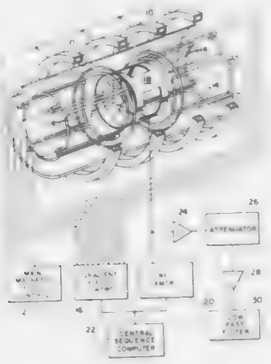
detecting and measuring magnetic resonance signals obtained from said fluid in response to said nuclear spin excitation.

4,862,081

DC ARTIFACT REMOVAL IN MAGNETIC RESONANCE IMAGING

Kenneth S. Denison, Shaker Hts., Ohio, assignor to Picker International, Inc., Highland Heights, Ohio

Filed Nov. 23, 1988, Ser. No. 275,392
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—307 15 Claims



1. A method of determining a DC offset correction for magnetic resonance imaging, the method comprising:

in the absence of radio frequency, magnetic resonance and magnetic field gradient signals, sampling an output of an analog-to-digital converter for digitizing magnetic resonance signals;

statistically analyzing variations in the sampled outputs to determine a number of samples that are statistically required to be averaged to determine a DC offset value within a preselected tolerance;

repeating the sampling of at least the selected number of times; and,

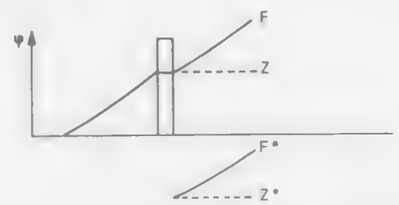
averaging the sampled outputs to determine a DC offset value.

4,862,082

METHOD FOR ENCODING AND DISPLAYING N PARAMETERS IN MULTI-DIMENSIONAL FOURIER NMR SPECTROSCOPY

Jurgen Hennig, Freiburg, Fed. Rep. of Germany, assignor to Spectrospin AG, Fallanden/Zurich, Switzerland

Filed Aug. 12, 1988, Ser. No. 232,391
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1987, 3726932
Int. Cl.[4] G01B *33/20*
U.S. Cl. 324—309 15 Claims



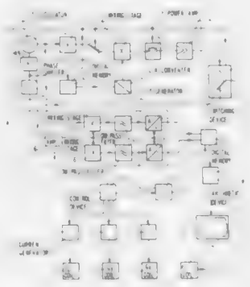
1. Method for encoding and displaying n parameters in multi-dimensional Fourier NMR spectroscopy, wherein n represents an integer ≧2, wherein two data sets are generated simultaneously which are encoded in the same manner relative to (n−1) parameters, but shifted in phase relative to in the direction of evolution of the nth parameter, which data sets furnish first and second signals following each other in pairs, the relative phase position of the said signals being determined by the value of the nth parameter, and the former of the said signals corresponding to the one, the latter to the other of the two data sets, and wherein a signal characteristic of the value of the nth parameter is obtained by Fourier transformation of the signals corresponding to the two data sets, characterized in that the first and second signals belonging to one pair are treated as one signal for the purposes of Fourier transformation so that a (n−1)-dimensional spectrum is obtained with a superposed striated pattern characteristic of the value of the nth parameter.

4,862,083

MAGNETIC RESONANCE EXAMINATION APPARATUS AND METHOD OF OPERATION THEREOF

Graeme C. McKinnon, Zürich, and Peter Bösiger, Eanetbaden, both of Switzerland, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 19, 1988, Ser. No. 221,154
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1987, 3724157
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 4 Claims



1. A magnetic resonance examination method in which an

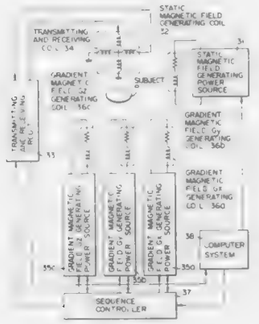
excitation sequence includes first and second 90° rf pulses (HF2, HF4) each generated in the presence of a magnetic gradient field, said first and second 90° rf pulses being sufficiently close to each other in time in order to act together as a selective 180° rf pulse, characterized in that a first non-selective 180° rf pulse (HF3) is generated halfway between the first and second selective 90° rf pulses (HF2, HF4).

4,862,084

METHOD AND SYSTEM FOR CONTROLLING CHARACTERISTICS OF GRADIENT MAGNETIC FIELDS IN MAGNETIC RESONANCE IMAGING APPARATUS

Michio Mitomi, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 14, 1988, Ser. No. 167,511
Claims priority, application Japan, Mar. 18, 1987, 62-63262
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 18 Claims



1. A method for controlling waveforms of coil currents supplied to gradient magnetic field generating coil systems from magnetic field generating power sources, the method comprising the sequence of steps of:

supplying the coil currents to the gradient magnetic field generating coil systems while detecting the waveforms of the coil currents;

controlling the waveforms of the coil currents in response to the detected waveforms of the supplied coil currents to achieve a predetermined agreement among the waveforms of the coil currents; and

supplying the coil currents having the controlled waveforms to the gradient magnetic field generating coil systems to generate gradient magnetic fields.

4,862,085

METHOD OF REGULATING THE MAGNETIC FIELD DELIVERED BY A RESISTIVE MAGNET, A RESISTIVE MAGNET SYSTEM USING THIS METHOD AND AN INSTALLATION FOR FORMING IMAGES BY NUCLEAR MAGNETIC RESONANCE INCORPORATING SUCH A SYSTEM

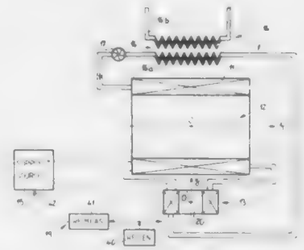
Guy Aubert, Grenoble, and Daniel Kaplan, Paris, both of France, assignors to Thomson-CGR, Paris, France

PCT No. PCT/FR85/00342, § 371 Date Oct. 3, 1986, § 102(e) Date Oct. 3, 1986, PCT Pub. No. WO86/03857, PCT Pub. Date Jul. 3, 1986
Continuation of Ser. No. 901,511, Oct. 3, 1986, abandoned. This PCT application Nov. 29, 1985, Ser. No. 191,799
Claims priority, application France, Dec. 14, 1984, 84 19190
Int. Cl.[4] G01N *24/06*
U.S. Cl. 324—315 15 Claims

1. A method of regulating a magnetic field delivered by a main resistive magnet cooled by a fluid flow and creating a field having the required homogeneity in a given region in space, including:

supplying an auxiliary magnet and a main magnet electrically from a common adjustable DC source,

placing said auxiliary magnet in thermal contact with said fluid so that said auxiliary magnet is substantially at the temperature of said main magnet,



measuring a reference magnetic field representative of said main field and created by said auxiliary magnet, and

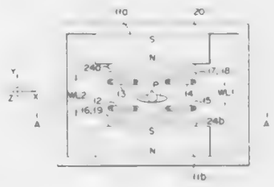
adjusting said DC source common to the two magnets for stabilizing said reference field at a chosen value.

4,862,086

SYSTEM FOR GENERATING MAGNETIC FIELDS UTILIZED FOR MAGNETIC RESONANCE IMAGING APPARATUS

Tomohisa Maeda, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 21, 1988, Ser. No. 184,506
Claims priority, application Japan, Apr. 28, 1987, 62-107559; Jul. 22, 1987, 62-183025
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 2 Claims



1. A system for generating magnetic fields utilized for magnetic resonance imaging apparatus, the system comprising:

magnetic field generating means for generating a static magnetic field relative to a subject positioned within a space by arranging a pair of magnets facing each other;

first coil means, including at least one pair of first plane coils facing each other between the pair of magnets, for generating a first gradient magnetic field within the space, each said first plane coil having at least one circular concentric turn;

second coil means, including at least one pair of second plane coils facing each other between the pair of magnets, for generating a second gradient magnetic field within the space, each said second plane coil having at least one turn; and

third coil means, including at least one pair of third plane coils facing each other between the pair of magnets, for generating a third gradient magnetic field within the space, each said third plane coil having at least one turn;

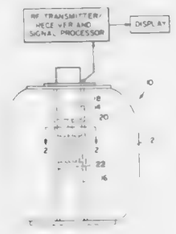
wherein each of said second plane coil and third plane coil includes at least one straight portion corresponding to a chord and a return portion corresponding to an arc.

4,862,087

PROCESS AND APPARATUS FOR HOMOGENIZING A STATIC MAGNETIC FIELD

David F. Hillenbrand, Groveland, Mass., and Piotr M. Starewicz, North Plainfield, N.J., assignors to Resonance Research, Inc., Billerica, Mass.

Filed Apr. 18, 1988, Ser. No. 182,953
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—320 3 Claims



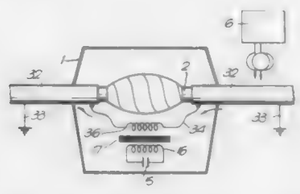
1. High resolution nuclear magnetic resonance apparatus for concurrent analysis of discrete samples which comprises:
- nuclear magnetic resonance analysis apparatus adapted to analyze concomitantly a plurality of samples at rest,
- a sample container adapted to retain a plurality of discrete samples in a solvent, said samples being retained in radially discrete positions within a volume of a magnet within said apparatus having a substantially homogeneous static magnetic field,
- and a cylinder positioned within the volume of said magnet and having mounted thereon a plurality of electrically conducting coils designed to zero out at least the first 6 orders of the spherical harmonic expansion of gradient of a static magnetic field generated by said magnet.

4,862,088

REMOTE LOCATING OF A STRUCTURE AND REMOTE MEASUREMENT OF CONDITIONS THEREIN

Nolf J. Etienne, Kessel-Lo, Belgium, and Atkinson E. Browell, Wallbrook Ipswich, England, assignors to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 4, 1985, Ser. No. 784,407
Claims priority, application United Kingdom, Oct. 11, 1984, 8425761
Int. Cl.[4] G01V *3/08, 3/10;* G01R *9/00;* G08B *21/00*
U.S. Cl. 324—326 29 Claims



1. An article comprising an enclosure and a sensor in communication therewith, the sensor being responsive to a condition within the enclosure, the sensor response being capable of being detected remotely so that the location and the condition of the enclosure can be determined without access to the enclosure, wherein the sensor comprises:
(a) a tuned electrical circuit capable of exhibiting a first resonant frequency;
(b) means for modifying the electrical circuit in response to a change in the condition so that it exhibits a second resonant frequency; and
(c) a transducer which includes a field effect transistor for performing the switching of the modifying means into or out of the circuit in response to a change in the condition within the enclosure.

4,862,089

METHOD OF MAGNETOTELLURIC EXPLORATION USING A ZIGZAG ARRAY

Richard F. Sigal, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Sep. 23, 1988, Ser. No. 248,527
Int. Cl.[4] G01V *3/08*
U.S. Cl. 324—350 17 Claims



1. A method of magnetotelluric exploration, comprising:
(a) measuring a first electric dipole representative of one component of the earth's electric field between first and second electrodes;
(b) measuring a second electric dipole representative of one component of the earth's electric field between the second and a third electrode, wherein the included angle ϕ between the first and second adjacent components of the electric field is less than 180° ;
(c) measuring additional first and second components of the earth's electric field in an alternating array of adjacent electrodes forming a generally zigzag line; and
(d) simultaneously, measuring at least two components of the earth's magnetic field at at least one location in the area to be surveyed.

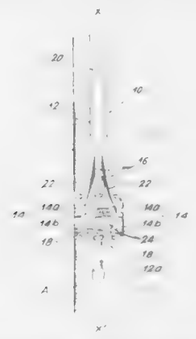
4,862,090

MEASURING PAD ARRANGEMENT FOR A LOGGING SONDE

Daniel Vannier, St Cyr l'Ecole, and Jacques Tromelin, Longjumeau, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Mar. 4, 1988, Ser. No. 164,253
Claims priority, application France, Mar. 5, 1987, 87 02973
Int. Cl.[4] G01V *3/02, 3/20*
U.S. Cl. 324—367 15 Claims

1. A logging sonde for use in a borehole traversing an earth formation, said logging sonde comprising:
- an elongated sonde body;
- a plurality of measuring means for measuring a characteristic of the earth formation, each of said measuring means comprising:
- a central element;
- a first measuring flap hingably connected to said central element;
- a second measuring flap hingably connected to said central element; said measuring flaps being disposed on either side of said central element, said first measuring flap staggered relative to said second measuring flap along the longitudinal direction of said sonde body;
- means operatively connected between said sonde body and said first and second measuring flaps for applying a resilient force to each of said measuring flaps, thereby tending to move said flaps away from said sonde body; and



- means connected between said sonde body and each of said measuring means for translocating said measuring means away from and back to said sonde body,

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4,862,091

CIRCUIT ARRANGEMENT FOR TESTING THE CONNECTING LINES OF A SWITCH OR SENSOR

Helmut Hillebrand, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Munich, Fed. Rep. of Germany

Filed Jul. 20, 1988, Ser. No. 221,742
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1987, 3724926
Int. Cl.[4] G01R *31/02;* B60Q *1/44*
U.S. Cl. 324—415 3 Claims



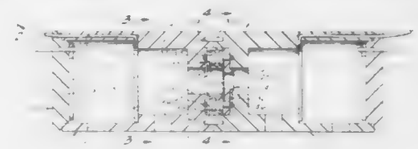
1. A circuit arrangement for monitoring the connecting lines of a switchable device open in the normal condition, comprising:
- a first resistance means connected in series with said device;
- a second resistance means connected in parallel with the first resistance means and the device to form a parallel circuit;
- a first connecting line connecting said parallel circuit with ground potential;
- a second connecting line connecting said parallel circuit to a voltage supply means by way of a third resistance means and to a voltage discriminator means;
- a Zener diode in series with the second resistance and operable to disconnect the second resistance means; and
- said voltage supply means including a first output voltage larger then the breakdown voltage of the Zener diode and a second output voltage smaller than the breakdown voltage of the Zener diode, and means for selecting the first or second output voltage.

4,862,092

APPARATUS AND METHOD FOR IN VITRO DETECTION OF ABNORMAL TISSUES

Robert D. Juncosa, Santa Ana, Calif., assignor to American Mediscan, Inc., Los Angeles, Calif.

Filed Aug. 4, 1986, Ser. No. 892,301
Int. Cl.[4] G01N *27/28*
U.S. Cl. 324—450 12 Claims



1. Apparatus for use in measuring epithelial tissue impedance, comprising:
- first and second insulative chambers each having a closed end wall and an opening in the opposite end wall;
- a pair of first platelike electrodes respectively mounted within the insulative chambers closely adjacent the inner surface of the closed end wall of each chamber;
- a pair of second platelike electrodes having at least one opening therein respectively mounted within the insulative chambers spaced from said first platelike electrode toward the open end wall;
- means for interfitting the insulative chambers open end walls together in fluid sealing relation and for simultaneously securing a tissue specimen between the open end walls of the first and second insulative chambers; and
- separate means conductively secured to each electrode and extending to the outside of the chambers for connection to electrical impedance measuring equipment.

4,862,093

METHOD AND AN ARRANGEMENT FOR THE DETECTION OF IONIZING CURRENT IN THE IGNITION SYSTEM OF AN INTERNAL COMBUSTION ENGINE INCLUDING ENGINE START SEQUENCE DETECTION

Sten Jiewertz, Järna, Sweden, assignor to Saab-Scania AB, Sweden

Filed Aug. 25, 1988, Ser. No. 236,664
Claims priority, application Sweden, Aug. 27, 1987, 8703320
Int. Cl.[4] G01N *27/62;* F02P *17/00*
U.S. Cl. 324—464 7 Claims



1. A method for detecting ionizing current in an ignition circuit forming part of an ignition system of an internal combustion engine, in which method a measuring voltage is applied to the ignition circuit in at least one secondary winding, and in which a measuring device is used to detect the possible presence of ionizing current in the ignition circuit, comprising the steps of:
- detecting a parameter reprsenting an engine start sequence;
- when an engine start sequence is detected applying one of a

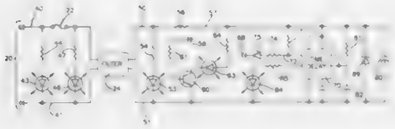
first substantially constant measuring voltage or no measuring voltage to the ignition; and
when detection of the engine start sequence is terminated, applying a second, substantially constant measuring voltage to the ignition circuit;
said first measuring voltage being lower than the second measuring voltage.

4,862,094

STROBOSCOPIC LIGHT CIRCUIT DIAGNOSTIC SYSTEM

Donald C. Wetzel, Berea, and Robert A. Livsey, Richmond Heights, both of Ohio, assignors to Meg Trans Corp., Berea, Ohio

Filed Jul. 6, 1987, Ser. No. 69,649
Int. Cl.[4] G01R *31/00*
U.S. Cl. 324—500 **6 Claims**



1. A diagnostic stroboscopic light circuit having a flash lamp comprising:
an operating voltage source;
a first indicating light connected to the operating voltage source for indicating
that the operating voltage source is providing a supply of voltage;
means connected to the operating voltage source for providing a high-voltage power supply to the flash lamp;
a second indicating light connected to the means for providing the high-voltage power supply for indicating that power is being supplied from the high-voltage power supply;
means for providing a trigger impulse signal to actuate the flash lamp;
time delay means connected to the means for providing the trigger impulse signal, the time delay means providing a signal coincident with the trigger impulse signal and of a longer duration which is visually perceptible; and
a third indicating light connected to the time delay means for indicating that the trigger impulse signal has been provided from the means for providing the trigger impulse signal;
the first, second and third signal indicating lights together providing an array uniquely indicating the operating status of the stroboscopic light circuit.

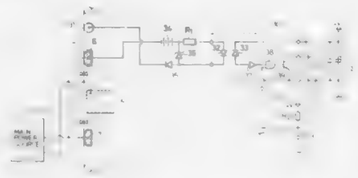
4,862,095

WIRE ELECTRODE BREAKAGE DETECTION METHOD AND APPARATUS

Masahiro Yamamoto, and Takeshi Yatomi, both of Aichi, Japan, assignors to Mitsubushi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1985, Ser. No. 739,260
Claims priority, application Japan, May 30, 1984, 59-108659
Int. Cl.[4] G01R *31/00*
U.S. Cl. 324—543 **16 Claims**

1. A method of detecting breakage of an electrode of an electric discharge machine using a wire electrode, comprising the steps of:
supplying the wire electrode from a supply bobbin through feeding dies and a workpiece to a recovery position, said feeding dies being in contact with said wire electrode;
applying a working voltage between said feeding dies and said workpiece form a main power source;
supplying a current from a detection power source through a loop including a detection roller, a portion of said wire electrode, and one of said feeding dies, said detection roller being in contact with said wire electrode and being separated from said feeding dies; and



detecting a variation of said current to thereby detect breakage of said wire electrode.

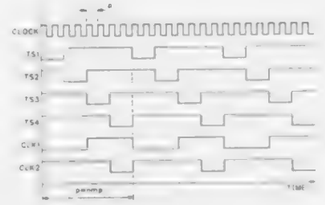
4,862,096

PROGRAMMABLE MULTIPHASE SEQUENCE CONTROLLER

Gary A. Spence, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed May 13, 1987, Ser. No. 49,638
Int. Cl.[4] H03K *3/00*
U.S. Cl. 328—75 **9 Claims**





1. A sequence controller comprising:
means for generating a system clock signal of period p;
means responsive to said system clock signal for generating a plurality of n periodic time slice signals, each time slice signal having a similar period P proportional to the product of n and p according to an integer constant of proportionality, phase relationships between said time slice signals being such that each said time slice signal is of a phase differing from phases of the other time slice signals;
means for selecting first and second time slice signals from among said n time slice signals; and
means for periodically generating an output pulse having a rising edge timed according to said first time slice clock signal and having a falling edge timed according to said second time slice clock signal.

4,862,097

PULSATING NOISE REMOVAL DEVICE

Kiyoshi Amazawa, and Akira Mori, both of Tokyo, Japan, assignors to Clarion, Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,220
Claims priority, application Japan, Jan. 23, 1987, 62-013878
Int. Cl.[4] H03K *5/00, 3/06;* **H04B** *1/10*
U.S. Cl. 328—165 **7 Claims**



1. A pulsating noise removal device, comprising:
a noise removal gate circuit provided in a major signal path for a first audio signal which includes a signal component and a pulsating noise component, said gate circuit having an output and having an input to which is applied said first audio signal;
a variable gain amplifier having an output and having an input to which is applied a second audio signal which includes said signal component and said pulsating noise component;
noise component detecting means responsive to said output of said amplifier for detecting said pulsating noise component in said second audio signal;
signal component detecting means responsive to said output of said amplifier for detecting said signal component in said second audio signal;
noise automatic gain control means responsive to detection of said noise component by said noise component detecting means for varying the gain of said amplifier;
audio automatic gain control means responsive to said signal component detected by said signal component detecting means for varying the gain of said amplifier; and
gate control signal generating means responsive to detection of said noise component by said noise component detecting means for generating a control signal for turning on or off said gate circuit.

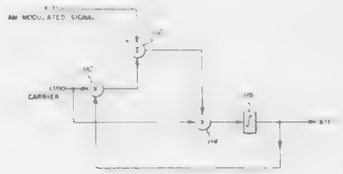
4,862,098

CONTINUOUS-WAVE-MODULATION DETECTORS USING PREDICTION METHODS

Fathy F. Yassa, Clifton Park, and Barbara A. Thompson, Ballston Spa, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 190,191, May 4, 1988, abandoned, and a continuation-in-part of Ser. No. 194,257, May 16, 1988, abandoned. This application Feb. 28, 1989, Ser. No. 316,822
Int. Cl.[4] H03D *3/18*
U.S. Cl. 329—50 **50 Claims**

1. A detector for a first continuous-wave-modulation signal encoding an input signal, said detector developing an output signal that decodes said input signal for application to subsequent circuitry and comprising:
means for applying said first continuous-wave-modulation signal to said detector;
means for supplying a carrier signal;
means for modulating said carrier signal with a predicted input signal to generate a second continuous-wave-modulation signal encoding said predicted input signal in substantially the same way said first continuous-wave-modulation signal encodes said input signal;
means for comparing the instantaneous amplitudes of said first and second continuous-wave-modulation signals to generate a third continuous-wave-modulation signal,



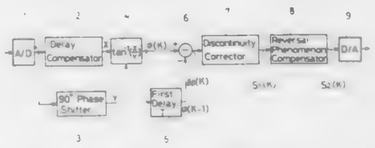
which encodes an error signal indicative of any difference between said input signal and said predicted input signal;
means for decoding the error signal encoded in said third continuous-wave-modulation signal;
means for combining said decoded error signal with said predicted input signal to develop an output signal;
means for generating said predicted input signal based on previous said output signal; and
means for supplying said output signal from said detector to said subsequent circuitry.

4,862,099

DIGITAL FM DEMODULATOR WITH DISTORTION CORRECTION

Takahiro Nakai; Keiji Hatanaka, and Yoshiko Hatano, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 17, 1988, Ser. No. 233,143
Claims priority, application Japan, Aug. 18, 1987, 62-205517
Int. Cl.[4] H03D *3/00*
U.S. Cl. 329—126 **3 Claims**



1. A frequency demodulator comprising:
analog-to-digital converter means for converting an inputted FM signal into a digital FM signal;
90° phase shifter means, operatively connected to said analog-to-digital converter means, for phase shifting the converted digital signal 90°;
calculator means, operatively connected to said analog-to-digital converter means and said 90° phase shifter means, for performing a calculation of $\tan^{-1}(X/Y)$ wherein X represents an output from said analog-to-digital converter means and Y represents an output from said 90° phase shifter means;
first delay means, operatively connected to said calculator means, for delaying an output from the calculator means for a period of time equal to one sampling cycle;
subtractor means, operatively connected to said calculator means and said first delay means, for subtracting an output of said first delay means from said output of said calculator means;
discontinuity corrector means, operatively connected to said

subtractor means, for correcting a discontinuity in an output from said subtractor means; and

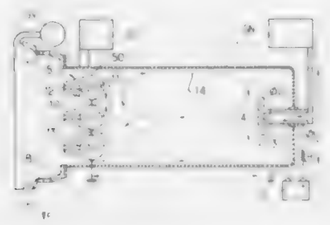
reversal phenomenon compensator means, operatively connected to said discontinuity corrector means, for correcting an output from said discontinuity corrector means when said output from said discontinuity corrector means exceeds a predetermined range of levels corresponding to an appearance of discrete lines of black or white color on a reproduced picture, thereby providing a demodulated output within said predetermined range of levels.

4,862,100

GAS LASER GENERATOR

Bernard Lavarini, Paris; Jean-Pierre Crancon, Arpajon, and Jean-Yves Thomas, Paris, all of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed May 9, 1984, Ser. No. 469,144
Claims priority, application France, May 17, 1973, 73.17950
The portion of the term of this patent subsequent to Jun. 24, 1992, has been disclaimed.
Int. Cl.[4] H01S *3/00*
U.S. Cl. 330—4.3 **2 Claims**



1. A gaseous flux laser generator comprising:

an elongated enclosure, a plurality of equally, laterally spaced, transversely aligned, aerodynamically profiled gas injectors positioned within said enclosure adjacent a first end thereof and forming transfer openings at said first end with said enclosure, an injection nozzle opening into said enclosure close to its second end for supplying said enclosure with at least one jet of a first gas capable of being excited by an electric discharge;

longitudinally spaced electrodes disposed in the container at respective ends for producing an electrical discharge in the first gas, an elongated expansion chamber leading from said enclosure at the first end with the cross-section of said expansion chamber progressively increasing from its first end adjacent to said enclosure towards its second end;

evacuation means for maintaining the second end of the expansion chamber at a low pressure and for circulating the first gas from the injection nozzle through said elongated enclosure and into the elongated expansion chamber through openings between said gas injector, said profiled gas injectors including gas discharge nozzles facing into the expansion chamber and being supplied with at least one second gas capable of being excited by molecular interaction with the first gas in its excited state, and being situated in the vicinity of the enclosure so as to set up a mixture of said first and second gases, an optical resonant cavity capable of setting up a laser emission in the presence of said second gas in its excited state, that cavity being arranged in said expansion chamber in such a manner as to be traversed by the gaseous mixture downstream of said gas discharge nozzles;

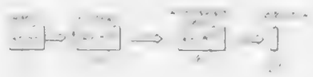
said generator being characterized in that said enclosure comprises a cylinder having a circular cross-section whose length comprises between five and seven times its diameter, an wherein the dimensions of said enclosure, the diameter and position of said injection nozzle, the speed of injection of said first gas, the dimensions of the gas passages between said profiled gas injectors and the arrangement of the injection nozzle along the axis of the cylinder are such that a whirling movement of the first gas is produced longitudinally throughout said container, upstream of said injector nozzles with a first, interflow portion extending longitudinally from the second end to the first end, between said electrodes, and at least one second flow portion is produced radially outwards of the first flow portion, reverse thereto and near the side wall of said cylinder.

4,862,101

SYSTEM FOR PRODUCING SPECTRALLY PURE OPTICAL PUMPING LIGHT

Donald A. Emmons, Carlisle, Mass., assignor to Frequency and Time Systems, Inc., Beverly, Mass.

Filed Apr. 6, 1987, Ser. No. 34,669
Int. Cl.[4] G02B *5/20, 5/24*
U.S. Cl. 330—4.3 **28 Claims**



1. A system for producing pumping light of the hyperfine double resonance type at a specific resonant frequency of an atomic isotope, said system comprising:

a lamp source containing a first atomic isotope, said first isotope having a plurality of hyperfine components, said lamp source producing incident light,

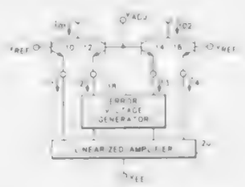
a transmission filter comprising a second atomic isotope having a plurality of hyperfine components with one of the hyperfine components of said second atomic isotope overlapping one of the hyperfine components of the first atomic isotope, the overlapped hyperfine components being substantially the reasonant frequency of the pumping light to produce hyperfine level population imbalance at substantially ground state in a radio frequency resonance cell.

4,862,102

METHOD AND APPARATUS FOR MINIMIZING THE SELF HEATING DISTORTION OF A COMPENSATED DIFFERENTIAL TRANSCONDUCTANCE AMPLIFIER

Marvin E. LaVoie, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 29, 1988, Ser. No. 129,570
Int. Cl.[4] H03F *3/45, 3/04*
U.S. Cl. 330—256 **5 Claims**



1. A method for minimizing the self heating distortion of a differential transconductance amplifier whose output current is linearized by the output current of an error amplifier, said differential transconductance amplifier having an error voltage generator for providing an error voltage to the error amplifier and through which flows at least part of the output current of the differential transconductance amplifier, comprising:

a. separating a first differential output current into a first differential current flowing through the error voltage generator and a second differential current;

b. directing the first differential current to the emitters of a first pair of transistors whose bases are coupled together and to an adjustment voltage source;

c. directing the second differential current to the emitters of a second pair of transistors whose bases are coupled together and to a reference voltage source;

d. summing the collector currents of the first and second transistor pairs to form a second differential output current; and

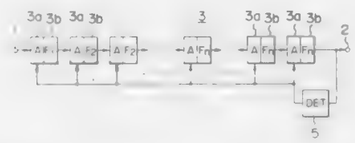
e. changing the value of the adjustment voltage source in order to change the power dissipation of the error voltage generator and the resultant error voltage, thereby controlling the output of the error amplifier and the resultant thermal distortion of the differential transconductance amplifier.

4,862,103

VARIABLE EQUALIZATION SYSTEM

Takashi Funada, Yokosuka, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 17, 1988, Ser. No. 272,449
Claims priority, application Japan, Nov. 20, 1987, 62-292042
Int. Cl.[4] H03F *3/191;* **H03H** *5/00*
U.S. Cl. 330—304 **4 Claims**



1. A variable equalization system comprising:

a plurality of first amplification cells, each including a variable gain amplifier with a flat frequency characteristic and a filter with a natural frequency of F_1;

a plurality of second amplification cells twice more than the first amplification cells, and each including a variable gain amplifier of a flat frequency characteristic and a filter having a natural frequency F_2 four times higher than the natural frequency F_1 of the filters of the first amplification cells: and

a plurality of third amplification cells twice the second amplification cells in number, each of the third amplification cells having a variable gain amplifier of a flat frequency characteristic and a filter of a natural frequency F_3 four times higher than the natural frequency F_2 of the filters of the second amplification cells,

the first amplification cells, the second amplification cells and the third amplification cells being connected in series.

4,862,104

PHASE SYNCHRONIZATION SYSTEM

Takuro Muratani, Yokohama; Hideo Kobayashi, and Toshinari Kimura, both of Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 178,125, Apr. 6, 1988, abandoned. This application Jan. 12, 1989, Ser. No. 296,897
Claims priority, application Japan, Apr. 8, 1987, 62-84852
Int. Cl.[4] H03L *7/00, 7/06*
U.S. Cl. 331—1 A **10 Claims**

1. A phase synchronization circuit, characterized in that a received signal is phase-detected by first and second reference carriers orthogonal to each other and controlled by a voltage-controlled oscillator and a phase shifter; two baseband oiutput signals thus obtained are sampled with a certain period and converted from analog values into digital values; phase and amplitude values at each sample point are obtained from these digital values orthogonal to each other; frequency and phase differences between the received signal and each of the first and second reference carriers as estimated by an optimization method through utilization of pluralities of phase and amplitude value data obtained in a fixed period of time; and the



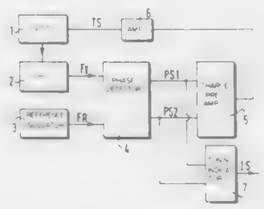
voltage-controlled oscillator and the phase shifter are controlled with the estimated values of the frequency and phase differences, thereby generating a recovered carrier of a phase synchronized with the received signal.

4,862,105

FREQUENCY SYNTHESIZER COMPRISING A TUNING INDICATOR

Pascal Walbrou, 7, impasse César Franck, 14740 Bretevelle L'Org, France, and Nicolas P. Cowley, 10 Summerhouse Road, Wroughton, Wiltsire, United Kingdom

Filed Jul. 28, 1988, Ser. No. 225,500
Claims priority, application France, Jul. 29, 1987, 87 10726
Int. Cl.[4] H03L *7/18*
U.S. Cl. 331—1 A **4 Claims**



1. A frequency synthesizer comprising at least an oscillator whose frequency is controlled by a tuning signal and produces a tuning frequency signal, means for generating a reference frequency signal, a phase detector receiving the tuning frequency signal and the reference frequency signal, a phase lock loop receiving at its input signals produced by the phase detector and producing at its output said tuning signal, and a tuning indicator presenting a tolerance on the phase difference between the tuning frequency signal and the reference signal, characterized in that the phase detector (**4**) is operated such as to produce at the output a first (**PS1**) and a second (**PS2**) phase signal when the phase between the tuning frequency signal (F_T) and the reference frequency signals (F_R) leads and lags, respectively, the phase lock loop receiving said first and second phase signals, and in that the tuning indicator (**7**) comprises a first logic circuit producing at its output a first logic signal (S_1) formed by the logic product of the first phase signal delayed by a predetermined period of time by a first delay circuit (**31**) and of the first phase signal (**PS1**), a second logic circuit producing at its output a second logic signal (S_2) formed by the logic product of the second phase signal delayed by the same predetermined period of time by a second delay circuit (**32**) and of the second phase signal (**PS2**), a third logic circuit producing at its output a third logic signal (S_3) formed

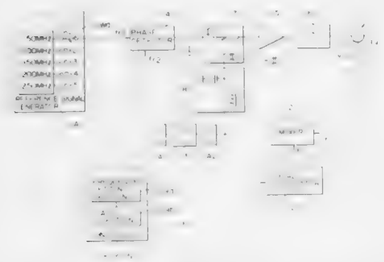
by the logic sum of the first (S_1) and the second (S_2) logic signals, and a register (72) receiving said reference frequency signal (F_R) and said third logic signal (S_3) and producing at its output a tuning indication signal (IS), the register being operated in such a manner that the tuning indication signal level corresponds to a tuning only when the third logic signal (S_3) has a level indicating a stable tuning during at least two consecutive periods of the reference frequency.

4,862,106

SIGNAL GENERATING APPARATUS USING PLL CIRCUIT

Kouichi Toda, and Masaaki Hashizu, both of Tokyo, Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Apr. 20, 1988, Ser. No. 183,827
Claims priority, application Japan, Apr. 20, 1987, 62-95079
Int. Cl.[4] H03L *7/00*
U.S. Cl. 331—2 **10 Claims**



1. A signal generating apparatus using a PLL circuit which includes a reference signal generator, a phase detector, a voltage controlled oscillator (VCO), a mixer, and a local oscillator, for generating a signal having a desired frequency within a predetermined frequency bandwidth, that said apparatus further comprising:

switching means for performing a switching operation to connect an output terminal of said phase detector to an input terminal of said VCO in a first state, and to connect an output terminal of said mixer to an input terminal of said VCO in a second state; and

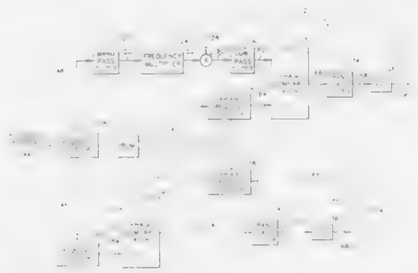
control means, connected to said switching means, for selectively supplying first and second switching signals to said switch means so as to establish connection relationships corresponding to the first and second state, said control means including means for substantially determining a coincidence between a frequency of an output signal from said VCO and a frequency of a local oscillation signal from said local oscillator, so as to generate the first switching signal for establishing the connection relationship corresponding to the first state when a determination result representing a predetermined coincidence is not obtained, and to generate the second switching signal for establishing the connection relationship corresponding to the second state when the determination result representing the predetermined coincidence is obtained.

4,862,107

FREQUENCY SYNTHESIZER FOR BROADCAST TELEPHONE SYSTEM HAVING MULTIPLE ASSIGNABLE FREQUENCY CHANNELS

Eric Paneth, Givataiim, Israel, assignor to International Mobile Machines Corporation, Philadelphia, Pa.

Continuation of Ser. No. 840,908, Mar. 18, 1986, Pat. No. 4,785,260. This application Jun. 27, 1988, Ser. No. 211,758
The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.
Int. Cl.[4] H03L *7/00*
U.S. Cl. 331—2 **2 Claims**



1. In a broadcast telephone system for communicating information signals over an assigned frequency channel, the combination of a synthesizer for generating a signal at the assigned frequency and a read-only memory (ROM) storing a plurality of sets of first and second signals associated with different predetermined assignable frequencies, the synthesizer comprising

a first phase-locked loop for generating an output signal at a frequency within a first predetermined range including the plurality of assignable frequencies in response to the combination of a first frequency reference signal having a predetermined frequency and a second reference frequency signal having a frequency within a second predetermined range and derived from a second phase-locked loop, wherein the first phase-locked loop includes a first band-pass filter having a passband adapted for minimizing phase noise and electronic noise due to microphonics;

said second phase-locked loop generating a third reference frequency signal within a third predetermined range in response to a combination of a first signal from the ROM associated with a given assignable frequency and a fourth frequency reference signal having a predetermined frequency, wherein the second phase-locked loop includes a second band-pass filter having a passband adapted for minimizing phase noise and electronic noise due to microphonics; and

a frequency divider coupled to the ROM for dividing the frequency of the output signal from the second phase-locked loop by an amount indicated by a second signal from the ROM associated with said given assignable frequency to provide the second reference frequency signal to the first phase-locked loop.

4,862,108

FREQUENCY LOCKING CIRCUIT WITH SIDEBAND IMBALANCE CORRECTION

Gregory M. Cutler, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 9, 1988, Ser. No. 192,041
Int. Cl.[4] H03L *7/06*
U.S. Cl. 331—9 **16 Claims**

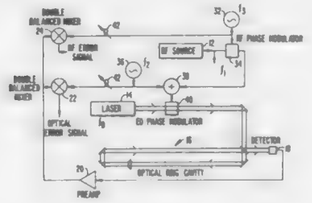
1. A frequency locking circuit comprising:

a source of a carrier signal at frequency f_c;

means for phase modulating the carrier signal by a first signal at frequency f_m to produce a modulated carrier signal with sidebands, said phase modulating means containing imperfections so that the sidebands are imbalanced, said imbalance inducing modulation including amplitude modulation at f_m;

means for reducing amplitude modulation at f_m in the modulated carrier signal to provide an output signal;

a filter for filtering the output signal to produce a filtered signal, said filter having a transfer function that has a characteristic resonant frequency f_f;



a detector responsive to the filtered signal to produce a detector signal, wherein a time shift in the first signal will cause substantially the same time shift in the detector signal;

means responsive to the component of the detector signal at frequency f_m for adjusting the ratio f_c/f_f to a fixed value N, wherein the frequency offset of the ratio caused by any sideband imbalance in the phase modulating means is reduced by reducing the amplitude modulation at f_m.

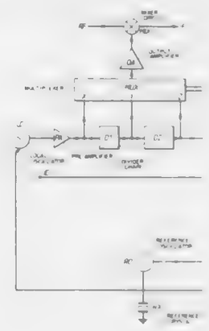
4,862,109

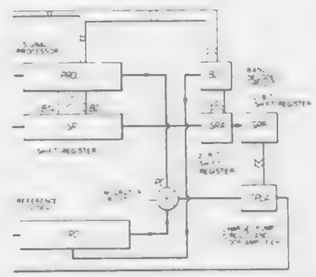
PROCESSOR CONTROLLED PHASE LOCKED LOOP MULTI-BAND FREQUENCY SYNTHESIZER

Nicholas P. Cowley, Wiltshire, Great Britain, assignor to Plessey Overseas Limited, Ilford, England

PCT No. PCT/GB87/00228, § 371 Date Feb. 4, 1988, § 102(e) Date Feb. 4, 1988, PCT Pub. No. WO87/06076, PCT Pub. Date Oct. 8, 1987
PCT Filed Apr. 2, 1987, Ser. No. 130,389
Claims priority, application United Kingdom, Apr. 4, 1986, 8608303; Jun. 11, 1986, 8614194
Int. Cl.[4] H03L *7/18*
U.S. Cl. 331—16 **8 Claims**

1. A frequency synthesizer including a store for receiving and temporarily storing a data word received on a data highway, a processor circuit controllable by output signals generated by the store, a prescale divider circuit driven by a local oscillator and arranged to provide a signal for presentation to the processor circuit, a reference divider chain providing a reference signal presented to a phase comparator which also receives a signal from the processor circuit and arranged to provide an output signal for presentation to a loop amplifier which controls the local oscillator, and a control and decode circuit arranged to receive a signal from the store, characterized in that the reference divider chain is driven by a single reference oscillator, and the prescale divider circuit and processor circuit generate output signals for presentation to an output interface under the control of the control and decode circuit which generates control signals for controlling the processor circuit and the output interface, said control and decode circuit also generates a control signal which is fed-back to the reference divider chain whereby the reference signal applied to the phase comparator is altered in a manner which





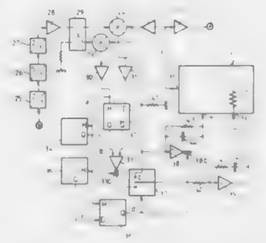
requires the reference divider chain to be driven by the single reference oscillator only.

4,862,110

OSCILLATOR, IN PARTICULAR A SURFACE ACOUSTIC WAVE OSCILLATOR, FREQUENCY CONTROLLED BY CONTROLLING ITS TEMPERATURE

Roger Charbonnier, Meudon Bellevue, France, assignor to Schlumberger Industries, France

Filed May 6, 1988, Ser. No. 190,988
Claims priority, application France, Feb. 18, 1988, 88 01925
Int. Cl.[4] H03B *1/00*
U.S. Cl. 331—70 **10 Claims**



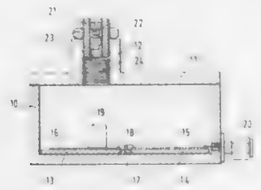
1. An oscillator having a resonator, an active circuit for energizing said resonator and means for setting the ouput frequency of the oscillator, said means including a heating member thermally coupled to the resonator and at least one servocontrol loop controlling the heating member as a function of the difference between said output frequency and a predetermined reference frequency.

4,862,111

MICROWAVE OSCILLATOR HAVING A DIELECTRIC RESONATOR, IN PARTICULAR FOR THE 22 GHZ RANGE

Isaac Mettoudi, Levallois-Perret, and Francois Lafranca, Chelles, both of France, assignors to Societe Anonyme dite Alcatel Thomson Faisceaux Hertziens, France

Filed Apr. 13, 1988, Ser. No. 181,011
Claims priority, application France, Apr. 15, 1987, 87 05360
Int. Cl.[4] H03B *5/18*
U.S. Cl. 331—96 **10 Claims**



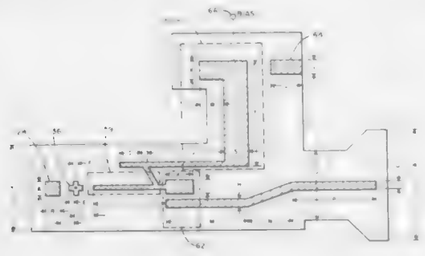
1. A microwave oscillator having a dielectric resonator, in particular for use in the 22 GHz range, said oscillator comprising: a housing, a substrate situated in said housing, a negative resistance component and a dielectric resonator disposed on a surface of said substrate, said housing including a chimney extending perpendicular to the surface of the substrate and providing a clearance over the dielectric resonator, said chimney being tapped on the inside surface thereof, and a double threaded, hollow screw having internal and external threads, said hollow screw being threaded in said chimney, and an adjustable self-locking screw, screwed in the hollow screw.

4,862,112

W-BAND MICROSTRIP OSCILLATOR USING GUNN DIODE

Donald R. Singh, Minneapolis, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Feb. 22, 1988, Ser. No. 158,702
Int. Cl.[4] H03B *9/14*
U.S. Cl. 331—107 SL **5 Claims**



1. A microstrip oscillator for providing high frequency power to a load comprising, in combination:
(a) a packaged Gunn diode having first and second terminals and exhibiting a negative resistance characteristic over a predetermined frequency range;
(b) a planar dielectric substrate having a metallic ground plane on one major surface thereof and a pattern of conductive strips on the other major surface thereof, said conductive strips defining
(i) a quarter-wave shunt microstrip resonator,
(ii) a microstrip quarter-wave transformer,
(iii) a microstrip coupled line transformer,
(iv) a d.c. bias network, and
(v) an output microstrip line;
(c) means for mounting said Gunn diode in generally co-planar relationship on said dielectric substrate; and
(d) means for coupling said first terminal of said Gunn diode to said shunt resonator and to said d.c. bias network and said second terminal of said Gunn diode to said ground plane, said quarter-waver transformer and said coupled line transformer being disposed between said first terminal of said Gunn diode and said output line for isolating the d.c. bias voltage applied to said bias network from the high frequency signals on said output line while matching the impedance of said Gunn diode to said load connected to said output line.

4,862,113

SINUSOIDAL OSCILLATOR WITH INSTANT START-UP

Otto R. Buhler, Boulder; Brian A. Simpson, Niwot, and John C. Twombly, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 6, 1988, Ser. No. 141,433
Int. Cl.[4] H03B *5/12*
U.S. Cl. 331—117 R **4 Claims**



4. A method of controlling an oscillator which has a passive filter section including an inductor and an amplifier section for applying energy to the filter section comprising the steps of:
generating a gating signal which has a duration corresponding to the intended operating period for the oscillator;
enabling the oscillator amplifier section to apply energy to the filter section so as to cause the oscillator to operate in its normal oscillatory mode in response to said gating signal from said generating step;
disabling the oscillator amplifier section from applying energy to the filter section in the absence of said gating signal;
producing a current flow of a magnitude corresponding to the magnitude of current flow through the oscillator inductor when the oscillator is operating in its frequency stable oscillating mode;
driving said produced current flow through the oscillator inductor whenever the oscillator is operating in response to said disabling step; and
switching said produced current flow from the oscillator inductor to a load circuit isolated from said oscillator inductor whenever the oscillator amplifier section is operating in response to said enabling step.

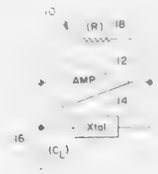
4,862,114

CRYSTAL OSCILLATORS USING NEGATIVE VOLTAGE GAIN, SINGLE POLE RESPONSE AMPLIFIERS

Leonard L. Kleinberg, Annapolis, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 23, 1988, Ser. No. 210,488
Int. Cl.[4] H03B *5/32*
U.S. Cl. 331—158 **13 Claims**

1. An oscillator circuit including:
a negative voltage gain, single pole response amplifier, having at least one input and at least one output, said amplifier operating on the roll-off portion of its gain versus frequency curve;
a network including a crystal, connected across said amplifier, from one of said inputs to one of said outputs, said crystal operating in its inductive mode;



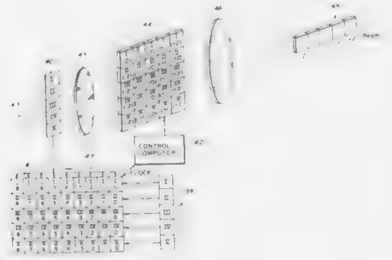
a resistor connected across said amplifier from said one of said inputs to said one of said outputs; and
a loading capacitor connected from said one of said inputs to ground.

4,862,115

OPTICAL BEAMFORMERS

John N. Lee, Silver Spring, Md.; Ravindra A. Athale, Burk, Va., and Peter B. Rolsma, Edgewater, Md., assignors to The United states of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 12, 1988, Ser. No. 155,434
Int. Cl.[4] G06G *9/00;* **G01S** *13/58;* **H01J** *40/14*
U.S. Cl. 332—7.51 **7 Claims**



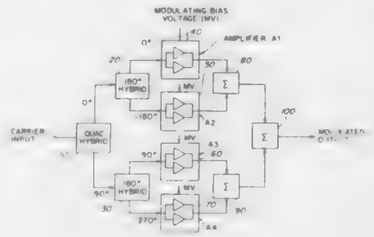
1. A beamforming system effective to form one or more distinct system beams, said system comprising:
a plurality of sensors;
means for storing outputs of said sensors, said means for storing comprising means for transducing said outputs into a plurality of optical outputs;
means for summing one or more preselected subsets of said optical outputs into said one or more distinct system beams, said one or more preselected subsets corresponding to said one or more distinct system beams;
wherein said means for storing is effective to delay each output of each subset of said one or more subsets for a time greater than or zero; wherein:
said system comprises a means for supplying a clocking signal to said means for storing;
said means for summing comprises a means for detection of said one or more distinct system beams;
said means for storing comprises one or more pluralities of cell means for storing said one or more preselected subsets, said one or more pluralities of cell means corresponding to said one or more distinct system beams;
each plurality of said one or more pluralities of cell means having as many as n of cell means denominated by integers 1 through n, respectively, and wherein:
for i being an integer between 1 and n inclusive, for cell means number 2 through n of said each plurality of cell means, the ith cell means is adapted to transfer any signal stored in said ith cell means to the (ith-1) cell means responsive to the presence of said clocking signal; and
for i=1, the 1st cell means of said each plurality of cell means is adapted to transfer any signal in said 1st cell means to said means for detection, said means for detection being effective to cause detection of each said one or more distinct system beams responsive to said clocking signal.

4,862,116

ACTIVE PHASE AND AMPLITUDE MODULATOR

Terence E. Olver, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 17, 1988, Ser. No. 262,380
Int. Cl.[4] H03C *3/00, 3/40*
U.S. Cl. 332—23 R **2 Claims**



1. A phase and amplitude modulator comprising:
means for generating a plurality of phases from an input signal;
means for separately amplifying each of the generated phases, which means may be modulated to change the amplitude output of each phase in response to a modulating signal, wherein said means for amplifying comprises field effect transistors in push-pull configuration; and,
means for summing the output of the said amplifying means such that a single output signal of modified phase and amplitude is obtained.

4,862,117

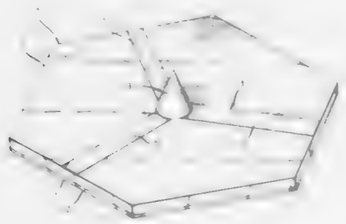
COMPACT MILLIMETER WAVE MICROSTRIP CIRCULATOR

Richard A. Stern, Allenwood, and Richard W. Babbitt, Fair Haven, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 27, 1989, Ser. No. 302,509
Int. Cl.[4] H01P *1/387*
U.S. Cl. 333—1.1 **5 Claims**

1. A microstrip Y-junction circulator comprising
a microstrip dielectric substrate having planar top and bottom surfaces;
an electrically conductive ground plane mounted on the bottom surface of said substrate;
a substantialy cone-shaped ferrite element having a base, an apex and a substantially conical surface mounted on the top surface of said substrate with the base of said ferrite element abutting the top surface of said substrate;
electrically conductive microstrip conductor means having a central portion and three arm portions extending radially outwardly from said central portion, said central portion being mounted on said substantially conical sur-

face of said ferrite element and said arm portions being mounted on the top surface of said substrate, said arm portions being disposed in a Y-junction configuration with respect to each other; and



magnetic biasing means for applying a unidirectional magnetic field between the apex and the base of said ferrite element to cause said ferrite element to act as a circulator and said arm portions of said microstrip conductor means to act as circulator ports therefor.

4,862,118

SIGNAL PROCESSING SYSTEM USING A COMPRESSOR AND AN EXPANDER

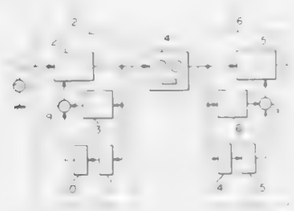
Masanori Kojima, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1987, Ser. No. 105,288

Claims priority, application Japan, Oct. 13, 1986, 61-243607

Int. Cl.⁴ H04B *1/64*; H03G *7/00*

U.S. Cl. 333—14 **15 Claims**



1. A signal processing system comprising a load and a compressor for compressing the dynamic range of an input signal to supply a compressed signal to said load, wherein said compressor comprises:

(a) an amplifying means for amplifying said input signal,

(b) a first detecting means having a first integrating time constant for receiving an output signal from said amplifying means and outputting a first detecting signal,

(c) a second detecting means having a second integrating time constant which is less than said first integrating tiem constant and including a voltage threshold means which detects said output signal from said amplifying means, said second detecting means outputting a signal exceeding a predetermined voltage threshold level, and

(d) a combining means for combining signals outputted from both said first and second detecting means to output a composite signal to control said amplifying means, whereby the amplification factor of said amplifying means is changed.

4,862,119

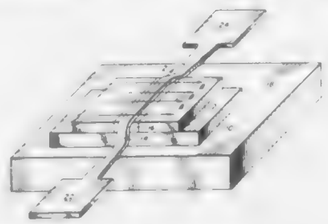
NON-RECIPROCAL SEMICONDUCTOR DEVICE

Clifford M. Krowne; Gary A. Prinz, and James J. Krebs, all of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 29, 1988, Ser. No. 213,042

Int. Cl.⁴ H01P *1/36*

U.S. Cl. 333—24 R **19 Claims**



1. A semiconductor device comprising:

a semiconductor substrate;

a layer of metal epitaxial with said substrate, the moments of the atoms of said layer of metal being oriented effective to create a net magnetic field across said layer of metal;

a waveguiding means for transmitting electromagnetic radiation, said waveguiding means being located so as to be exposed to said magnetic field effective to permit said magnetic field to cause the electromagnetic propagation constant of said waveguiding means to differ depending on the direction that said electromagnetic radiation traverses said waveguide.

4,862,120

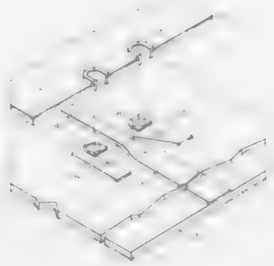
WIDEBAND STRIPLINE TO MICROSTRIP TRANSITION

James Ruxton, Ottawa, Canada, and John Catranis, Clinton, N.Y., assignors to Canadian Patents and Development Limited/Société Canadienne des Brevets et d'Exploitation Limitée , Ottawa, Canada

Filed Feb. 29, 1988, Ser. No. 162,195

Int. Cl.⁴ H01P *5/08*

U.S. Cl. 333—34 **10 Claims**



1. A wideband stripline to microstrip transition providing a continuous transmission path consisting of a stripline region, a microstrip region and an intermediate transitional region, said transition comprising

(1) first and second juxtaposed dielectric layers each having a ground plane contiguous with the outwardly facing surface thereof, said first dielectric layer being coextensive with said stripline region and terminating at a midpoint in said transitional region, and said second dielectric layer being coextensive with said stripline, microstrip and transitional regions,

(2) a patterned conductive layer between and contiguous with the inwardly facing surfaces of said first and second dielectric layers and including

(a) an ungrounded central conductor defining said transmission path and supporting wave propagation between said central conductor and both said ground planes in the stripline region and between said central conductor and the ground plane on said first dielectric layer in the microstrip region, and

(b) a first pair of conductor members electrically connected to said ground planes and disposed in co-planar flanking relation with said central conductor to define therewith a double slot transmission path in said transitional region adjoining the microstrip region, and

(3) a second pair of conductor members extending through said first and second dielectric layers in flanking relation with said central conductor and electrically connected to each of said ground planes to form a grounded surface encircling said central conductor and defining therewith a quasi-coaxial transmission path between and adjoining the stripline region and said double slot transmission path in said transitional region.

4,862,121

SWITCHED CAPACITOR FILTER

James R. Hochschild, Plano, and William A. Severin, Allen, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 13, 1987, Ser. No. 85,054

Int. Cl.⁴ H03H *11/12*

U.S. Cl. 333—173 **27 Claims**



1. A switched capacitor filter, comprising:

a pair of series-connected integrators each having at least one input terminal, one of said input terminals having a switched capacitor input network connected thereto;

a feedforward switched capacitor circuit for coupling a signal from an input of one said integrator input network to an input terminal of the other integrator; and

a nonoverlapping biphase clock for driving said switched capacitor input networks during one phase for sampling an input signal and during another phase for settling of said filter, said clock being connected to said switched capacitor networks for causing said integrators to simultaneously sample and simultaneously settle toward a steady state value during said respective different clock phases, said clock being connected to said feedforward switched capacitor circuit to switch in said feedforward capacitor during said one phase and switch out said feedforward capacitor during said other phase, wherein said integrators each comprise a differential input/output integrator amplifier.

4,862,122

DIELECTRIC NOTCH FILTER

William D. Blair, Jr., Lanoka Harbor; Salvatore Bentivenga, Manalapan, and Gregory J. Lamont, Englishtown, all of N.J., assignors to Alcatel NA, Inc, Claremont, N.C.

Filed Dec. 14, 1988, Ser. No. 284,334

Int. Cl.⁴ H01P *1/20*

U.S. Cl. 333—202 **45 Claims**



1. A dielectric notch filter for attenuating the signal strength of an electromagnetic signal about a frequency bandwidth M, spanning frequencies f_1 to f_2, comprising P dielectric notch resonators, where P is an integer equal to or greater than one, wherein each dielectric resonator has an attenuation bandwidth N equal to or less than M and operable within frequencies f_1 to f_2, so that P times N is at least approximately equal to M, wherein each dielectric notch resonator comprises:

(A) a dielectric resonator formed from a high dielectric constant material,

(B) a housing positioned about the dielectric resonator,

(C) means for positioning the dielectric resonator within the volume defined by the housing so as to generate a resonate reactive impedance about a center frequency; and

(D) a coupling reactance mechanism comprising:

(1) an inductive coupling wire,

(2) a capacitive element connected to the coupling wire at one end and forming therewith a reactive element having an imaginary impedance component of approximately the same magnitude as the imaginary reactive component of the resonator at the center frequency of the dielectric resonator, with the imaginary component of the coupling mechanism reactance approximately 90 degrees out of phase with that of the dielectric resonator so as to effectively cancel the imaginary reactive component of the resonator reactance at the center frequency, and

(3) means, connected at the second end of the coupling wire, for providing interconnection of the dielectric notch resonator with an external element; and

E. a coupling transmission means to which each dielectric notch resonator is attached by said interconnecting means of the dielectric notch resonator, and further wherein the coupling of the dielectric notch resonators to the coupling transmission means is approximately at or less than the theoretical quarter wavelength of the center frequency of the desired attenuation bandwidth therein.

4,862,123

SOLENOID FOR ELECTRIC STARTERS

Ronald N. Gray, and Raymond C. Butler, Jr., both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

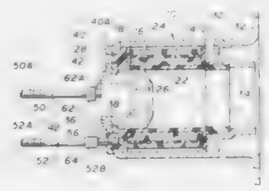
Filed May 5, 1988, Ser. No. 190,625

Int. Cl.⁴ H01H *67/02*

U.S. Cl. 335—131 **3 Claims**

1. A solenoid switch comprising, a tubular case, a coil support formed of electrical insulating material disposed within said case, at least one coil winding carried by said coil support, a plurality of metallic studs each having an end portion that is insert molded into said coil support whereby said studs are rigidly supported by said coil support, each stud having a

threaded portion, a cover formed of electrical insulating material, said studs extending through openings in said cover with the threaded portions of the studs positioned exterior of the cover, nut means threaded onto the threaded portions of said studs for securing said cover to said case, a plunger shiftable



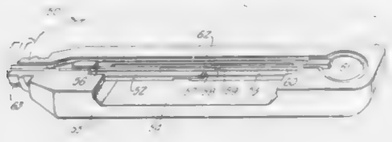
relative to said coil support, switch means including movable contact means disposed within said cover and actuated by said plunger, and means electrically connecting an end lead of said coil winding to one of said studs at a point located within said cover.

4,862,124

FIBER-OPTIC REED SWITCH

Joseph D. Rando, Dudley, Mass., assignor to Imo Industries, Inc., Princeton, N.Y.

Filed Jan. 20, 1988, Ser. No. 146,196
Int. Cl.[4] H01H *1/66*
U.S. Cl. 335—151 **20 Claims**



1. Optical-fiber switching means, comprising a base providing two longitudinally spaced upstanding pedestals and a separate elongate reed element having cantilevered mounting to each of said pedestals, said element having free ends which longitudinally overlap at a location between said pedestals, said elements being of paramagnetic material and establishing a transverse gap relationship between their overlapped ends in the presence of a first environmental magnetic condition in which said reeds do not conduct sufficient magnetic flux to close said gap, and said elements coacting for actuation into a second relationship of gap closure in the presence of a second environmental ma netic condition in which said reeds define a gap-free path of magnetic-flux conduction, and optical-fiber lengths having adjacent ends carried by the respective reed elements, said optical-fiber ends being in mutually aligned closely spaced confronting relation when said reed ends are in one of said relationships and being in transversely offset misaligned but partially confronting relation when said reed ends are in the other of said relationships.

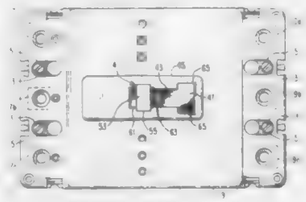
4,862,125

ELECTRICAL SWITCHING DEVICE WITH COVER INTERLOCK

Alfred E. Maier, Chippewa, and James R. Farley, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 8, 1988, Ser. No. 241,734
Int. Cl.[4] H01H *9/02*
U.S. Cl. 335—202 **7 Claims**

1. An electrical device comprising:
first and second electrical contacts;
an operating mechanism operative to open and close said first and second electrical contacts;
an operating handle secured to said operating mechanism and movable therewith between a first position in which said first and second contacts are open and a second position in which said first and second contacts are closed;
a housing having an opening through which said first and second contacts and said operating mechanism are inserted into said housing, and
a cover removably secured to the housing over said opening to enclose said first and second electrical contacts and said operating mechanism, and defining an enclosed elongated



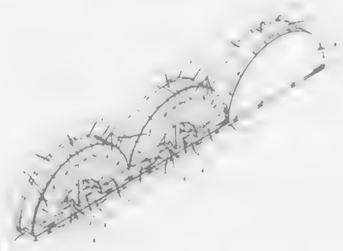
slot through which said handle extends and is movable between said first and second positions, said handle having a terminal portion extending beyond said cover and which is enlarged in a direction transverse to the elongated slot, said elongated slot having a width at the first position of the handle which is wider than the enlarged terminal portion of the handle and a width at the second position of the handle which is narrower than the enlarged terminal portion of the handle, whereby the cover is only removable from the housing when the handle is in the first position and hence when the first and second electric contacts are open.

4,862,126

SUPERCONDUCTING SHIELDED PYX PPM STACKS

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 7, 1989, Ser. No. 335,649
Int. Cl.[4] H01F *7/22*
U.S. Cl. 335—216 **10 Claims**



1. A periodic permanent magnet structure comprising a plurality of paired segments of sliced hollow cylindrical flux sources, each flux source producing a uniform high-field in its central cavity, each pair of segments being mounted on opposite sides of a respective plate of permeable material so that the plate closes the open ends thereof, each flux source having an axial bore hole through the magnetic pole of the flux source, said bore hole continuing through each plate of permeable material, each set of paired segments being in peripheral edge

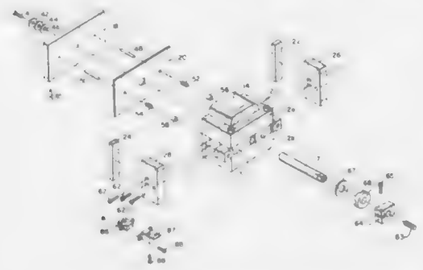
contact so that the magnetic field orientations are in alignment so as to form a continuous channel through the plurality of axially aligned flux sources, and a pair of superconducting sheets covering the end faces of each sliced flux source.

4,862,127

SOLENOID SHOCK ABSORBING BUMPER ARRANGEMENT AND METHOD

Robert W. Lundstrom, Plymouth, and Thomas R. Emmons, Minneapolis, both of Minn., assignors to DataCard Corporation, Minnetonka, Minn.

Filed Nov. 23, 1988, Ser. No. 276,355
Int. Cl.[4] H01F *7/08*
U.S. Cl. 335—257 **12 Claims**



1. An energy-absorbing bumper arrangement used with solenoids having a solenoid body and plunger, the plunger being coaxially movable away and toward the solenoid body and comprising a head portion and a shaft portion projecting into the solenoid body, the solenoid being a magnetic field with a magnetic path extending between the solenoid body and the plunger head portion, the spacing between the solenoid body and the plunger head portion forcing an effective magnetic gap whose size affects the force with which the plunger is moved toward the solenoid body, the bumper arrangement comprising:
(a) substantially nonresilient stop means for stopping movement of a plunger at a repeatable, predetermined location; and
(b) energy-absorbing means for reducing impact force of the plunger striking the stop means, energy-absorbing means comprising a resilient member removed from the magnetic path of the solenoid body so as to not increase the effective magnetic gap, and projecting beyond the stop means in a direction facing the plunger head portion, so that as the plunger moves toward the stop means, the plunger impacts the energy-absorbing means and transfers energy to the energy-absorbing means, the energy-absorbing means providing less resistance than required to stop movement of plunger toward the stop means, thereby allowing the plunger to strike the stop means and stop at a repeatable, predetermine location.

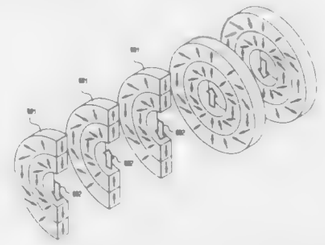
4,862,128

FIELD ADJUSTABLE TRANSVERSE FLUX SOURCES

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 27, 1989, Ser. No. 345,045
Int. Cl.[4] 335 *306, 212, 210;* **315** *5.26, 5.28, 5.34, 5.35*
U.S. Cl. 335—306 **15 Claims**

1. A magnetic structure comprising a plurality of hollow substantially cylindrical flux sources embedded one within another about an axially extending central cavity, the outer radius of one flux source being substantially equal to the inner radius of the next surrounding flux source, each flux source being free to independently rotate about the axis in either direction and by any angular amount, said plurality of flux



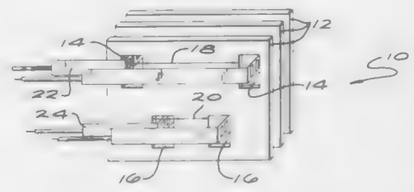
sources serving to produce a uniform high field in said central cavity.

4,862,129

SINGLE-TURN PRIMARY AND SINGLE-TURN SECONDARY FLAT VOLTAGE TRANSFORMER

Waseem A. Roshen; David E. Turcotte, and Dale F. Regelman, all of Tucson, Ariz., assignors to ITT Corporation, New York, N.Y.

Filed Apr. 29, 1988, Ser. No. 188,247
Int. Cl.[4] H01F *27/08, 27/24, 27/28*
U.S. Cl. 336—61 **9 Claims**



1. A transformer comprising at least one ferromagnetic planar slab, said slab having first and second pairs of slots defined therethrough, said slots of said first pair being separated from each other within said slab by a first corresponding predetermined distance, said slots of said second one of said pairs being separated from one another within said slab by a second predetermined distance, said first and second predetermined distances being unequal;
a first conductive ribbon disposed through said first pair of slots to form a first loop, said loop having one dimension approximately equal to said first predetermined distance; and
a second conductive ribbon disposed through said second pair of slots and forming a second loop having at least one dimension approximately equal to said second predetermined distance, said first and second loops being magnetically coupled with each other through said slab for providing magnetic coupling between said loops with a voltage ratio between said loops approximately equal to the ratio of said first and second predetermined distances,
further comprising a plurality of said ferromagnetic planar slabs, each slab having defined therethrough corresponding first and second pairs of slots, said first and second conductive ribbons disposed through corresponding ones of said slots to form said corresponding first and second loops through all of said plurality of planar slabs; and
wherein each slab is insulatively separated by an insulating layer having high thermal conductivity so that heat is readily conducted out of said plurality of slabs,
whereby said transformer presents a thin planar profile.

4,862,130

WIRE CROSS-OVER ARRANGEMENT FOR ANGULAR COIL ASSEMBLY

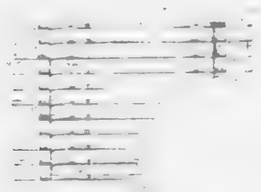
Donald E. Ellison, St. Clair Shores, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Jul. 16, 1987, Ser. No. 74,109

The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.

Int. Cl.[4] H01F *27/30*

U.S. Cl. 336—185 **3 Claims**



1. In a coil assembly including a bobbin and a multi-turn winding of coil wire disposed on the bobbin, the bobbin including a central spindle and a plurality of axially-spaced annular flanges extending outward from the spindle to define a plurality of respective slots between facing surfaces of adjacent pairs of said flanges and the winding being disposed in multiple layers in the respective said slots on the bobbin and being continuous between successive said slots in which it is disposes, one flange of each pair of said flanges between which the winding is disposed including a cross-over groove formed in the facing surface thereof for receiving the coil wire which transitions from one said slot to another, the diameter of the coil wire being much less than the axial width of a said slot, said cross-over groove being directly axially open to the slot into which the coil wire is transmitting and being of a width and depth in the respective said flange such as to receive the full diameter of the coil wire therewith throughout the extent of said groove while also preventing the separating function of the flange, thereby to minimize or prevent contact of the coil wire transitioning into a slot with the radially-outward windings in the respective slot and with the radially inward windings in the slot from which it is transitioning, the improvement wherein;

the bobbin spindle is of rectangular cross section having an outer perimeter including four axially-extending corners, the perimeter of said bobbin spindle being substantially planar between successive said corners, the contour of the perimeter of the respective said flanges conforming substantially to the perimeter of said bobbin spindle, the axial thickness of respective said flanges being less than said axial width of respective said slots, the respective said cross-over grooves extending inward form a position near the radially-outer edge of the respective said flange in a direction substantially coplanar with said planar bobbin spindle perimeter at a said corner and to a position of substantial coincidence with said bobbin spindle the respective said cross-over grooves being positioned to be of minimal possible extent from the perimeter of the flange to said coincidence with said bobbin spindle, the remaining geometry and positioning of said cross-over grooves relative to the geometry of the respective said flanges being such that the transitioning coil wire necessarily lies within the respective said groove for substantially the full length of said groove, and wherein each said flange which includes a said cross-over groove formed in the facing surface thereof further includes a second said cross-over groove formed in said facing surface thereof thereby to provide a pair of said cross-over grooves in said flange, said pair of cross-over grooves being disposed for substantial coincidence with said bobbin spindle substantially at a respective pair of adjacent ones of said corners thereby to facilitate coil winding in either of two opposite directions.

4,862,131

TRIP CROSSBAR TRANSLATION TO PREVENT BIMETAL OVERSTRESSING IN A CIRCUIT BREAKER

Clark L. Oster, Cedar Rapids; Paul Rustebakke, Swisher, and Daniel R. Schiefen, Cedar Rapids, all of Iowa, assignors to Square D Company, Palatine, Ill.

Filed Oct. 11, 1988, Ser. No. 255,559

Int. Cl.[4] H01H *71/16, 75/08*

U.S. Cl. 337—48 **7 Claims**



1. A circuit breaker for breaking an electrical circuit between an electrical supply and an electrical load in response to an over-current condition, the circuit breaker comprising;

a supporting structure;

a line connector for coupling said circuit breaker to said electrical supply, and a load connector for coupling said circuit breaker to said electrical load;

a line terminal mounted on said supporting structure and having a first end and a second end, said first end coupled to said line connector;

a blade having a first end and a second end, said first end coupled to said load connector, wherein said blade is movable between a closed position and an open position;

first means for biasing said blade towards said open position;

means for releasably latching said blade in said closed position;

a deforming thermal element conductively disposed between said blade second end and said load connector, wherein current passing between said line connector and said load connector when said blade is in said closed position passes through said thermal element, said current developing a stress in said thermal element, causing said thermal element to deform;

means responsive to said thermal element deformation for releasing said latching means, said responsive means including a trip crossbar first rotatable an angular distance about a pivot axis to release said latching means and subsequently translatable away from said pivot axis to relieve remaining stress on said thermal element.

4,862,132

BIMETAL SWITCH

Walter Hollweck, Heroldsberg, Fed. Rep. of Germany, assignor to Inter Control Hermann Kohler Elektrik GmbH & Co. KG, Nuremberg, Fed. Rep. of Germany

Filed Dec. 24, 1987, Ser. No. 137,748

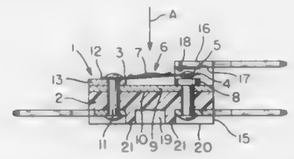
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644514

Int. Cl.[4] H01H *61/02, 63/13*

U.S. Cl. 337—102 **9 Claims**

1. A bimetal switch comprising, as the only support member therein, an insulating body fully planar in its expanse and having first and second opposed flat sides, a plurality of electrical connectors supported on said insulating body first flat side, an electrical heating resistor in direct thermal relation with said

insulating body and disposed on said first flat side thereof in electrical continuity with said plurality of electrical connectors, and a contact spring having one fixed contact at one end thereof secured to said second flat side of said insulating body and a second end bearing a moving contact, said insulating



body supporting a second fixed contact on said second flat side in registry with said moving contact for engagement therewith upon movement thereof, and a bimetal element supported on said contact spring and adapted to move said contact spring responsively to heat generated by said electrical heating resistor.

4,862,133

THERMAL SWITCH

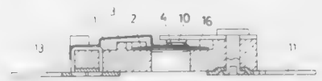
Shigeru Tabei, Machida, Japan, assignor to Tobu Electric Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1988, Ser. No. 238,003

Claims priority, application Japan, Mar. 29, 1988, 63-73188

Int. Cl.[4] H01H *61/02, 71/16*

U.S. Cl. 337—102 **16 Claims**



1. A thermal switch comprising a base, a fixed contact means and a movable contact means mounted on said base, a bimetallic element disposed on said base and operable upon being heated to deflect and to cause said movable contact means to be out of contact with said fixed contact means and to thereby dispose the switch in an open state, said switch having a closed state in which said movable contact means is biased into contact with said fixed contact means and current flows along a current path which includes said movable contact means and said fixed contact means, said base being connected electrically in parallel with said current path, said base being made of an electrically conductive plastic material having a resistance such that said base does not generate heat when the switch is in said closed state, said base being operable to generate heat when said switch is in said open state to maintain said bimetallic strip in said deflected state.

4,862,134

ELECTRICAL FUSE AND METHOD FOR ITS PRODUCTION

Karl Poerschke, Sprockhövel; Klaus Stürk, Witten, and Bernd Fröchte, Herne, all of Fed. Rep. of Germany, assignors to Wickmann Werke GmbH, Fed. Rep. of Germany

Filed Jul. 19, 1988, Ser. No. 221,126

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725280; Dec. 23, 1987, 3743857

Int. Cl.[4] H01H *85/16, 85/04*

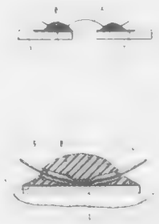
U.S. Cl. 337—231 **30 Claims**

1. An electrical fuse comprising:

two conductors having contact surfaces; and

a fusible conductor welded or bonded onto the contact surfaces;

the fusible conductor being completely coated by a coating; the welding or bonding forming contact zones between the fusible conductor and the contact surfaces; and



the complete coating existing within the contact zones and within areas immediately adjacent to the contact zones.

4,862,135

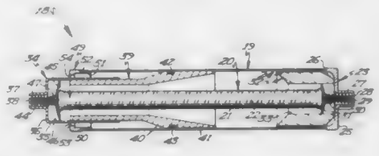
RESISTOR HOLDER

John H. Broadhurst, Golden Valley, Minn., assignor to Sysmed, Inc., Golden Valley, Minn.

Filed Sep. 29, 1988, Ser. No. 250,609

Int. Cl.[4] H01C *1/06*

U.S. Cl. 338—64 **9 Claims**



1. A resistor device for use with an electrostatic particle accelerator having a plurality of apertured axially spaced apart electrode plates and a plurality of annular insulators, each insulator being positioned between a pair of electrode plates, said resistor device comprising:

an elongate tubular housing formed of electrically conductive material,

a fixed end cap formed of conductive material and being connected to one end of said tubular housing,

a movable end cap formed of conductive material spaced radially inwardly and projecting interiorly of the tubular housing at the other end of the latter, non-conductive means mounted within said tubular housing and slidably supporting said movable end cap for axial movement of the latter relative to said tubular housing,

an elongate cylindrical resistor element,

means engaging said resistor element and positioning the latter in inwardly spaced concentric relation within the tubular housing, said tubular housing and end caps defining an electromagnetic shield substantially shielding the resistor element from the exterior,

resilient means in said tubular housing engaging said fixed end cap and said resistor element for permitting yieldable axial movement of the latter relative to the housing,

an annular conducting element electrically connected to said other end of the tubular housing and being spaced radially outwardly of the movable cap and defining an annular spark gap with the latter, and

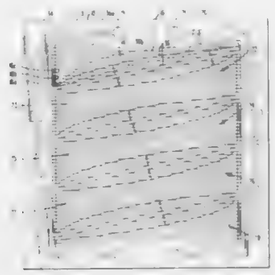
means electrically connecting the ends of said resistor element with the movable and fixed end caps whereby, when said resistor device is electrically connected through the end caps across a pair of adjacent electrode plates of an electrostatic particle accelerator, severe electrical transients will be conducted to said resistor device.

4,862,136

PROGRAMMABLE RESISTANCE NETWORK

John M. Birkner, 330 N. Mathilda, #112, Sunnyvale, Calif. 94086

Filed Apr. 13, 1983, Ser. No. 484,396
Int. Cl.[4] H01C *10/10*
U.S. Cl. 338—195 25 Claims



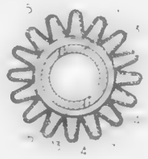
1. A programmable resistance network, comprising:
an array of resistors capable of being selectively deleted by applying a programming flow of electricity across first and a second array terminals, said flow of electricity having a value sufficient to progressively fuse successive array resistors, each successive array resistor having the property of being fusible at a progressively greater flow of electricity than that of preceding array resistors.

4,862,137

ELECTRIC HEATING DEVICE HAVING A METAL SHEATH

Richard Javme, Moret sur Loing, France, assignor to Electricite De France, Paris, France

Filed Jun. 26, 1987, Ser. No. 66,443
Claims priority, application France, Jun. 26, 1986, 86 09274
Int. Cl.[4] H01C *1/03*
U.S. Cl. 338—237 12 Claims



1. A resistance heating device having a longitudinal axis and comprising:
a substantially cylindrical graphite heating element having means for connection to an electric power source, and
a sheath surrounding said graphite heating element, radially spaced therefrom and defining a gas tight chamber about said graphite heating element, said sheath being made from a refractory oxidation resisting alloy sheet having angularly distributed longitudinal corrugations and an internal surface arranged to directly receive over its whole area radiation emitted by the graphite heating element when energized, whereby said gas tight chamber sealingly retains carbon monoxide upon oxidation of said graphite heating element.

4,862,138

PROGRAMMABLE COMPARATOR OUTPUT FILTER

Mark D. Tilden, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 8, 1988, Ser. No. 153,165
Int. Cl.[4] G06F *7/02*
U.S. Cl. 340—146.2 16 Claims



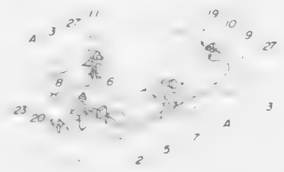
1. A comparator circuit with filtered output comprising:
means for comparing, having a binary output;
means for storing a previous output of the comparator;
programmable means for timing, enabled by differences between the previous output and the binary output, and providing a timer output signal if the differences persist for longer than a programmed value;
means for changing the contents of the storing means to the value of the binary output of the comparing means, the changing means being responsive to the timer output signal; and
means for initializing the storing means so that it contains the value of the binary output of the comparing means.

4,862,139

ANTI-THEFT SYSTEM FOR AUTOMOTIVE VEHICLES

Masaaki Fukamachi; Nobuyuki Onitsuka, both of Miyazaki; Akira Tanaka, and Kazuo Nakamura, both of Wako, all of Japan, assignors to Honda Lock Manufacturing Co., Ltd., Miyazaki and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Division of Ser. No. 17,756, Feb. 24, 1987. This application Aug. 16, 1988, Ser. No. 232,865
Claims priority, application Japan, Feb. 28, 1986, 61-043245; Feb. 28, 1986, 61-043247; Feb. 14, 1987, 62-31966
Int. Cl.[4] B60R *25/10*
U.S. Cl. 340—426 21 Claims



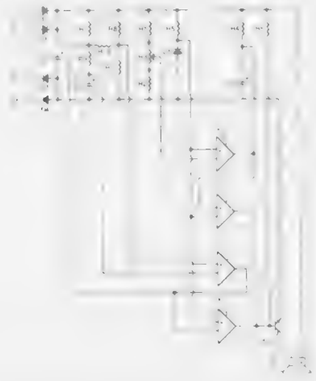
1. An anti-theft system for an automotive vehicle, comprising: a key having predetermined information; receiver means provided in said automotive vehicle for receiving a signal from said key; discriminating means for receiving an output signal from said receiver means and discriminating whether or not said output signal represents said predetermined information; first detecting means for detecting whether a plurality of covering members of said automotive vehicle are closed or open; second detecting means for detecting whether said covering members are locked or unlocked; operating means responsive to output signals from said first and second detecting means indicating that at least one predetermined one of said covering members is closed and locked, for performing a predetermined anti-theft operation; and disabling means responsive to an output signal from said discriminating means indicating that the output signal from said receiver means represents said predetermined information, for disabling the operation of said operatintg means.

4,862,140

INSTALLABLE HEADLIGHT ALARM SYSTEM

Michael B. Case, 1516 E. Maple, Glendale, Calif. 91205, and Orlando F. Farach, 12226 Victory Blvd., #330, North Hollywood, Calif. 91606

Filed Apr. 29, 1988, Ser. No. 187,911
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—457.2 1 Claim



1. In an automobile headlight alarm system, which connects to an automobile's headlight connector to monitor the voltage level at the connector, and which uses this voltage level to detect that the headlights of the automobile are on when the engine is not operating so that the drive can be alerted by the system, the improvement wherein said system comprises:
means to detect both if the engine of an automobile is not running and if the headlights of the automobile are on by monitoring only the voltage level at the headlight connector;
alarm means connected to the detection means to alert the driver of the automobile when the engine is not operating and the lights are on.

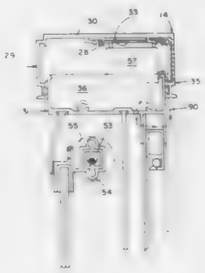
4,862,141

INTEGRATED SMOKE AND INTRUSION ALARM SYSTEM

Robert L. Jordal, Rte. 10, Box 351, Winston-Salem, N.C. 27127

Filed Nov. 5, 1987, Ser. No. 117,055
Int. Cl.[4] G08B *19/00, 13/00*
U.S. Cl. 340—521 16 Claims

1. An alarm system for placement in a wall opening of a building such as with a window or door comprising: a frame assembly, said frame assembly having:
(a) a header,
(b) a starter member, and
(c) a detecting device holding member, said header joined to said starter member, said detecting device holding member joined to said starter member to form a container, said header defining a smoke entry aperture, said detecting device holding member defining a smoke entry aperture, means to detect smoke, means to detect intrusion, alarm circuitry, said alarm circuitry connected to said smoke detecting means and to said intrusion detecting means, said smoke and intrusion detecting means removably attached to said detecting device holding member and concealed within said container, said header aperture and



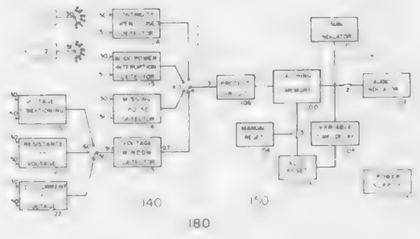
said holding member aperture coincidentally mounted to allow smoke to pass through said header to said smoke detecting means contained within said holding member and wherein said alarm circuitry includes a power supply.

4,862,142

CIRCUIT WITH MEMORY FOR DETECTING INTERMITTENT CHANGES IN RESISTANCE, CURRENT, VOLTAGE, CONTINUITY, POWER INTERRUPTION, LIGHT, AND TEMPERATURE

Eldon L. Knight, 1441 W. Colonial Pky., Roseville, Calif. 95661

Filed Oct. 26, 1987, Ser. No. 112,734
Int. Cl.[4] G08B *19/00, 21/00*
U.S. Cl. 340—522 22 Claims



9. A multi-function test circuit which detects, electrical continuity for open or closed circuits; direct current power interruptions; alternating current power interruptions or decrease in alternating current frequency; missing pulses; and voltages, or resistances, or currents that are greater than or less than preset high and low limits; and whereby provides a plurality of visual indications and a defeatable audio indication that an intermittent of continous fault has been detected;
said multi-function test circuit comprises:
a terminal means for coupling the multi-function test circuit to units under test, and a means for coupling said terminal means to a first switching means such as to selectively select a continuity detector, an AC and DC power detector, a missing pulse detector, a voltage conditioning means, a resistance conditioning means, or a direct current conditioning means;
a second switching means for selectively coupling said voltage conditioning means or said resistance conditioning means, or said direct current conditioning means to a voltage comparator means;
a third switching means for selective coupling said continuity detector, said AC and DC power detector, said missing pulse detector, and said voltage comparator

means to a memory means; said first, second, and third switching means are mechanically coupled together.

4,862,143

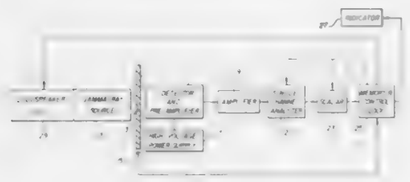
METHOD AND APPARATUS FOR DETECTING COUNTERFEIT ARTICLES

Jay L. Hirshfield, and Israel Nowik, both of Jerusalem, Israel, assignors to Isomed, Inc., Melville, N.Y.

Continuation-in-part of Ser. No. 937,862, Dec. 4, 1986, Pat. No. 4,742,340. This application Feb. 1, 1988, Ser. No. 150,807

Int. Cl.[4] G08B *13/18*

U.S. Cl. 340—572 **19 Claims**



1. A counterfeit detecting apparatus for detecting the authenticity of an article having a label containing an isotope of a chemical element, said apparatus comprising:

(a) a housing;

(b) a source of gamma radiation positioned in said housing, said source being subject to the Mossbauer effect, when employed with a particular isotope in the label;

(c) gamma radiation detector means positioned in said housing for detecting radiation from said source;

(d) receiving means in said housing for enabling at least a portion of the article to be inserted therein such that the label is positioned between said source and said detector means;

(e) vibrating means for vibrating said source such that the frequency of the gamma radiation therefrom is shifted;

(f) calculating means coupled to said detector means for calculating the ratio of the number of gamma rays counted by said detector means, during a predetermined period of time, when the article is not positioned by said receiving means (N_O) to the number of gamma rays counted by said detector means, during a period of time equal to said predetermined period, when the article is positioned by said receiving means (N_R), and for calculating the ratio of the number of gamma rays counted by said detector means, during the predetermined period of time when the article is not positioned by said receiving means (N_O), to the number of gamma rays counted during a period of time equal to the predetermined period when said source is vibrated by said vibrating means (N_E) and for calculating the ratio N_R/N_E; and

(g) output means for provrding an output indicating whether N_R/N_E is within a predetermined range.

4,862,144

MOVEMENT MONITOR

Billy S. K. Tao, 6 Jennifer Avenue, Bellevue Heights, South Australia, Australia 5050

Filed Apr. 4, 1988, Ser. No. 176,835

Claims priority, application Australia, Apr. 21, 1987, PI1529; Aug. 20, 1987, PI3861

Int. Cl.[4] G08B *23/00;* **A61B** *5/08*

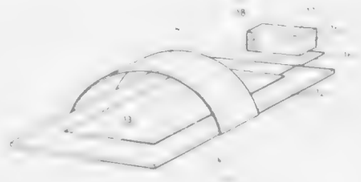
U.S. Cl. 340—573 **31 Claims**

1. A movement monitor comprising:

a rigid base member for supporting a moving object in which movement is being monitored,

a transducer located between said moving object and said base member for detecting movement of said moving object, said transducer providing an output signal in response to forces applied thereto,

a reaction means secured to the base member and arranged to extend over, and be held in contact with, the moving object such that upward movement by the moving object is restricted by said reaction means and movement by the



moving object against said reaction means causes force to be applied to the transducer, and

circuit means for monitoring said output signal from the transducer, said circuit means arranged to provide an alarm when said output from the transducer corresponds to no movement from the object.

4,862,145

PEST MONITORING SYSTEM

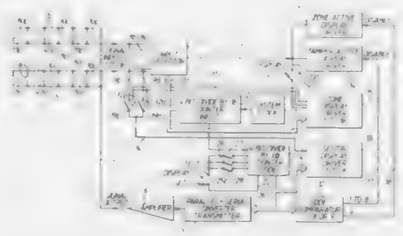
Adrian P. Meehan, Uckfild, and Vernon R. Ash, Walter-on-Thames, both of England, assignors to Rentokil Limited, West Sussex, England

Filed Feb. 24, 1988, Ser. No. 159,664

Claims priority, application United Kingdom, Feb. 25, 1987, #704375

Int. Cl.[4] G08B *26/00*

U.S. Cl. 340—573 **19 Claims**



1. Apparatus for monitoring the activity of pests, including a plurality of detector means distributed over an area under surveillance, an indicating means for indicating whether or not a pest has been detected by any of the detector means and being capable of sending a signal to each detector means, the indicating means and each detector means being linked by transmission means, each detector means being capable of providing information to the indicating means as to whether or not a pest has been detected only on receipt of a signal from the indicating means, and, when the apparatus is in use for monitoring, responding to a said signal or making no response to the signal to indicate to the indicating means whether or not a pest has been detected by that detector means, and testing means capable of providing at the indicating means an indication as to whether or not there is a fault in the transmission means.

4,862,146

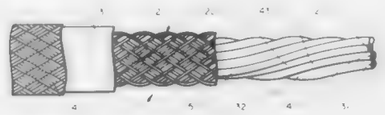
DETECTION APPARATUS

Kenneth McCoy; Neil Edwards, both of Redwood City; Robert Wasley, San Carlos, and Denis Wales, Fremont, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Mar. 27, 1987, Ser. No. 31,481

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—605 **19 Claims**



15. A sensor which comprises

(1) a core which comprises first and second sensing members which are insulated from each other in the absence of electrolyte but which become electrically connected to each other if they are exposed to electrolyte, and

(2) an outer member which surrounds the core, which is pervious to electrolyte, and which undergoes a reversible change in appearance when exposed to electrolyte.

4,862,147

SMOKE ALARM WITH DROPOUT SMOKE HOOD

Byron E. Thomas, Placentia, Calif., assignor to Puritan-Bennett Aero Systems Company, Lenexa, Kans.

Filed Aug. 26, 1985, Ser. No. 769,394

Int. Cl.[4] G08B *17/10*

U.S. Cl. 340—628 **8 Claims**



1. A protection system for use in a room or the like in order to afford a person a means of safe breathing and escape from the room in the event of smoke or other hazard therein, said system comprising:

a housing including walls defining a compartment therein, shiftable door means normally closing the compartment, and releasable latch means for normally retaining the door means in the compartment-closing position thereof, and for selective opening of the door means upon release of the latch means;

means for detecting a hazard within said room, and for generating an output signal in response to such detection;

means operably coupling said detecting means and said latch means for releasing the latch means and opening of said door means in response to said output signal; and

a self-contained portable protective device of the type to be used by said person and be operable when completely separate from said housing so as to permit safe breathing by the person and escape of the person from said room,

said protective device being normally releasably retained within said housing compartment,

said device being deployable upon opening of said door means for ready access to the device by said person, and being completely detachable from the housing for allowing the person to use the device and also move freely and independently away from said housing and thereby escape from said room.

4,862,148

PORTABLE ELECTRIC SMOKE DETECTOR/ALARM FLASHLIGHT

Timothy J. Kichline, 811 Center St., Bethlehem, Pa. 18018

Filed Oct. 13, 1987, Ser. No. 112,940

Int. Cl.[4] G08B *17/10*

U.S. Cl. 340—628 **7 Claims**



1. A portable flashlight and smoke alarm device comprising:

an elongated tube comprised of first end, center, and second end chambers where

the first end chamber contains a conventional flashlight assembly;

the center chamber contains: a first power supply and flashlight circuit means with a first push button switch connecting the flashlight circuit means to the first power supply,

the second end chamber being partially vented and containing a second power supply and smoke detection means including a smoke detector and alarm and where a second push button switch connects the smoke detection means with the second power supply.

4,862,149

FAULT DISPLAY DEVICE FOR GYROSCOPIC INSTRUMENTS

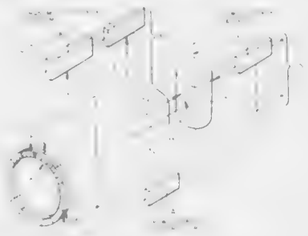
Francis Boyer, Maurepas, France, assignor to Societe Francaise D'Equipments pour la Navigation Aerienne S.F.E.N.A., Velizy Villacoublay Cedex, France

Continuation of Ser. No. 19,320, Jan. 27, 1987, abandoned. This application Sep. 26, 1988, Ser. No. 251,351

Claims priority, application France, May 28, 1985, 87 07964

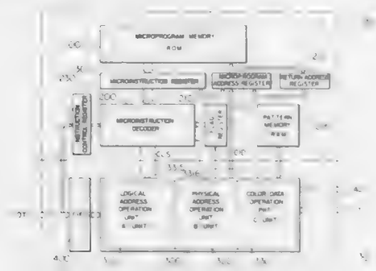
Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—635 **14 Claims**



1. Fault display device for gyroscopic instruments comprising a roll indicator, a reduced gyroscope rotor speed alarm and a power failure alarm, the device comprising at least one display area on the roll indicator, the at least one area comprising a set of juxtaposed active members switched progressively, to give a synoptic view of the reduced speed of the gyroscopic rotor of the instrument.

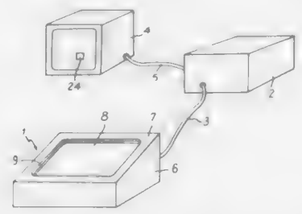
4,862,150
GRAPHIC PATTERN PROCESSING APPARATUS
Koyo Katsura; Hideo Maejima, and Hisashi Kajiwara, all of Hitachi, Japan, assignors to Hitachi, Ltd. and Hitachi Engineering Co., Ltd., both of Tokyo, Japan
Filed Dec. 24, 1984, Ser. No. 686,039
Claims priority, application Japan, Dec. 26, 1983, 58-246986; Feb. 17, 1984, 59-27155; Jun. 14, 1984, 59-120679
Int. Cl.[4] G09G *1/28*
U.S. Cl. 340—703 **27 Claims**



1. A graphic data processing apparatus for accessing memory means which stores pixels to be used to generate graphic pattern data comprising:
- a control unit for controlling a drawing function by decoding a drawing instruction applied thereto;
- an operation unit, responsive to the control unit, for performing a drawing operation for writing data into the memory means, said operation unit including a logical address operation unit having means for storing logical coordinates at a current drawing point, and means for performing an arithmetic operation to modify the logical coordinates; and
- a physical address operation unit having means for storing information including a physical address of the memory means corresponding to the current drawing point, means for storing a first constant corresponding to a number of pixels extending in one direction of the memory means, means for storing a second constant corresponding to the number of bits per pixel, and means for performing an arithmetic operation to modify at least the address of the current drawing point using at least one of the stored first constant and stored second constant for outputting a modified address to said memory means.

4,862,151
REMOTE CONTROL DEVICE FOR A COMPUTER ASSOCIATED WITH A VIDEO SCREEN
Daniel Grauz, Montigny le Bretonneux, and Claude Marchal, Garancieres, both of France, assignors to Societe Francaise d'Equipements Pour la Navigation Aerienne (SFENA), Velizy-Villacoublay, France
Filed May 23, 1988, Ser. No. 197,346
Claims priority, application France, May 25, 1987, 87 07322
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—706 **4 Claims**

1. A remote control device for a computer associated with a video screen, said device comprising a member for selecting and changing a data item displayed on the video screen, a switch associated with the member for selecting and changing a data item, and connection means between the remote control device and the computer, wherein the member for selecting and modifying a data item is a touch-sensitive pad movably



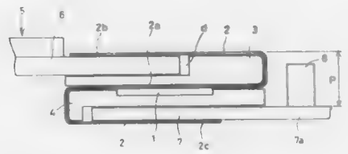
mounted on a support, and wherein the switch is disposed to be actuated by displacing the touch-sensitive pad.

4,862,152
SONIC POSITIONING DEVICE
Ronald E. Milner, P.O. Box 1916, Grass Valley, Calif. 95945
Filed Jan. 25, 1985, Ser. No. 694,765
Int. Cl.[4] G09G *3/02*
U.S. Cl. 340—712 **26 Claims**



1. A system for indicating the position of a hand movable ultrasonic transmitter with respect to an array of detectors comprising:
- an ultrasonic transducer for transmitting a burst of ultrasonic waves;
- an array of detectors responsive to the burst including three point detectors positioned such that a first axis through the first and second detectors intersects a second axis through the second and third detectors;
- means responsive to the detection of the burst by the first and second detectors for indicating the position of the transmitter relative to the first axis and responsive to the detection of the burst by the second and third detectors for indicating the position of the transmitter relative to the second axis and responsive to the detection of the burst by only one of the detectors for indicating the position of the transmitter relative to a third axis orthogonal to the plane defined by the three detectors.

4,862,153
FLAT DISPLAY PANEL WITH FRAMING FOR FLEXIBLE SUBSTRATE FOLDING
Hiroshi Nakatani, Tenri; Hisao Kawaguchi, and Shigeo Nakabu, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed May 29, 1987, Ser. No. 55,527
Claims priority, application Japan, May 30, 1986, 61-126579
Int. Cl.[4] G02F *1/13*
U.S. Cl. 340—719 **8 Claims**



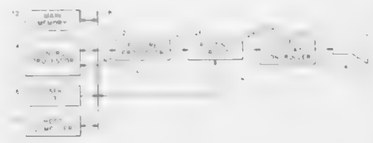
1. A display panel comprising:
- a flexible substrate having an LSI chip mounted to substantially a middle portion thereof;
- a flat display panel element connected to a first end portion of said flexible substrate;
- a first frame positioned adjacent to said display element, said flexible substrate having a second portion folded about said first frame; and
- a second frame positioned opposite to said second portion of said flexible substrate, said first frame and said display element, said flexible substrate having said middle portion constrained between said first and second frames, said second frame having a recess for positioning said LSI chip.

4,862,154
IMAGE DISPLAY PROCESSOR FOR GRAPHICS WORKSTATION
Jorge Gonzalez-Lopez, Red Hook, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 31, 1986, Ser. No. 926,310
Int. Cl.[4] G09G *1//16*
U.S. Cl. 340—747 **4 Claims**



1. A graphics workstation for displaying both image data and graphics data comprising:
- first and second buses, said first bus communicating said image data and said graphics data and control information between elements of said graphics workstation and an external processing system, and said second bus communicating processed graphics data and processed image data between processing elements of said graphics workstation and one or more frame buffers;
- system control processing means connected to said first bus for controlling workstation functions;
- storage means connected to said first bus for storing image data and graphics data;
- graphics data processing means connected between said first bus and said second bus for generating graphics images to be displayed from graphics data;
- image data processing means connected between said first bus and said second bus for controlling the display of image data on a display;
- a plurality of interleaved frame buffers connected between said second bus and a display means for storing said graphics images, said image data, or a composite of said graphics images and said image data to be displayed, said plurality of interleaved frame buffers excepting said graphics images and said image data at a first rate; and
- display means for displaying image and graphics data at a second rate greater than said first rate.

4,862,155
GRAPHIC DISPLAY SYSTEM WITH SECONDARY PIXEL IMAGE STORAGE
John C. Dalrymple, and Byron G. Paul, both of Portland, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.
Filed Oct. 26, 1987, Ser. No. 113,028
Int. Cl.[4] G09G *1//16*
U.S. Cl. 340—747 **5 Claims**



1. A graphic display system for displaying portions of a graphic design defined by input instructions, the graphic design comprising displayed first portions and undisplayed second portions, the input instructions also indicating which portions of said graphic design are displayed first portions and which are undisplayed second portions, the graphics display system comprising:
- a display controller for storing a primary pixel image comprising pixel data representing the first portions of the graphics design in accordance with first pixel data provided as input thereto and for generating a graphics display of the first portions in accordance with the primary pixel image;
- a picture processor for producing first and second pixel data as output, the first pixel data representing the first portions of the design and the second pixel data representing the second portions of the design, said picture processor producing said first and second pixel data in response to input primary display lists comprising instructions to the picture processor for generating pixel data, said picture processor also producing the first pixel data in response to input secondary display lists directly including the first pixel data;
- memory means for storing a secondary pixel image comprising second pixel data representing the second portions of the graphic design;
- control processor means responsive to said input instructions for altering the secondary pixel image stored in the memory means in accordance with second pixel data output of the picture processor, for generating and transmitting a secondary display list to the picture processor when an input instruction indicates a previously undisplayed second portion of the graphic design is to become a displayed first portion, the secondary display list including pixel data of the secondary pixel image representing the previously undisplayed second portion of the graphic design; and
- means for conveying output first pixel data produced by the picture processor as input to the display controller for storage as the primary pixel image and for conveying output second pixel data produced by the picture proces-

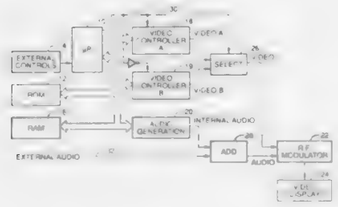
sor as input to the control processor means for storage as the second pixel image.

4,862,156

VIDEO COMPUTER SYSTEM INCLUDING MULTIPLE GRAPHICS CONTROLLERS AND ASSOCIATED METHOD

Thomas E. Westberg, Boston; Christian S. Rode, Brookline, and Bruce G. Burns, Belmont, all of Mass., assignors to Atari Corporation, Sunnyvale, Calif.

Filed May 21, 1984, Ser. No. 612,625
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—747 **13 Claims**



1. A video computer system for executing graphics programs used to control the display of video graphics, comprising:

means for storing at least one graphics program;

first graphics control means for executing graphics programs of a first type;

second graphics control means for executing graphics programs of a second type;

means for searching the at least one graphics program for at least one digital signature and for providing at least one first signal to indicate whether the at least one graphics program is of the first or second type; and

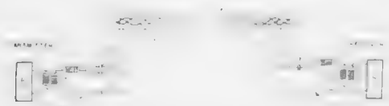
means for receiving the first signal and for selecting between said first and second graphics control means for execution of the at least one graphics program.

4,862,157

SIGNAL TRANSFER METHOD AND EQUIPMENT FOR ELECTRIC MACHINE EQUIPPED WITH THREE-PHASE POWER SUPPLY CABLE

Marc Noel, Neuilly en Thelle, France, assignor to Charbonnages De France, Paris, France

Continuation of Ser. No. 747,367, Jun. 21, 1985, abandoned. This application Jan. 20, 1988, Ser. No. 147,101
Claims priority, application France, Jul. 3, 1984, 84 10526
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825 **18 Claims**



1. A method for transferring on a frequency carrier, signals relative to an electric machine powered through a three-phase power supply with three phase-conductors in a cable comprising the steps of

supplying an input signal to two terminals at a first location with an output signal representative of said input signal caused to be received at a second location;

connecting two of said three phase-conductors of said cable to a first of said two terminals at said first location;

connecting the remaining third one of said three phase-conductors to a second of said two terminals at said first location;

connecting one of said phase-conductors as a first terminal at said second location;

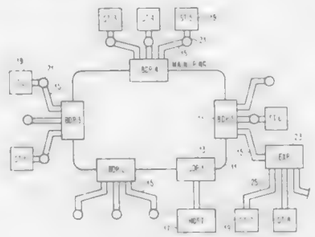
and connecting the remaining two of said three phase-conductors as a second terminal at said second location with one of said three phase-conductors at said second location connected to one of said phase-conductors of a different phase than the phase of said phase-conductor to which it is connected to at said first location.

4,862,158

EXTENSION ARRANGEMENT AND STATION CONNECTING METHOD FOR A RING COMMUNICATION SYSTEM

Heinz J. Keller, Alte Landstrasse 30, CH-8803 Ruschlikon, and Johann R. Mueller, Erlenweg 7, CH-8135 Langnau am Albis, both of Switzerland

Continuation of Ser. No. 848,605, Apr. 7, 1986, abandoned. This application Apr. 11, 1988, Ser. No. 183,377
Claims priority, application European Pat. Off., Apr. 23, 1985, 85104886.8
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.050 **6 Claims**



1. Method for connecting a workstation at a remote location to a ring communication network via a basic switching unit, a remote switching unit, a basic extension line interconnecting said basic switching unit and said remote switching unit and a remote extension line connected between said remote switching unit and said remote workstation, comprising the steps of:

sending a DC signal as insertion request from the workstation via the remote extension line to the remote switching unit,

connecting, in the remote switching unit in response to the DC signal insertion request, the remote extension line to the basic extension line,

sending an AC signal as insertion request from the remote switching unit via the basic extension line to the basic switching unit, and

connecting, in the basic switching unit in response to the AC signal insertion request, the basic extension line to the main ring network.

4,862,159

CENTRALIZED SYSTEM FOR SELECTING AND REPRODUCING PERCEPTIBLE PROGRAMS

David M. Marusa, Santa Fe, N. Mex., and Bruce R. Munroe, Rolling Hills, Calif., assignors to Audio Technology, Inc., Palos Verdes, Calif.

Filed Apr. 18, 1988, Ser. No. 182,388
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.24 **12 Claims**

1. A system for providing user selected programs to a plurality of uniquely identified stations, said system comprising:

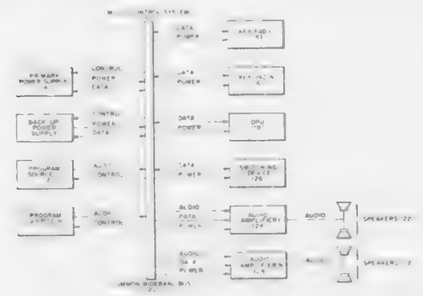
a plurality of program sources each adapted to be pre-set manually to a selected program signal by a user;

a power supply unit adapted to be connected to a source of power and to each of said program sources, said power supply unit being operable in response to a power control signal to either enable or disable a selected one of said program sources;

a plurality of control pads, each located at a respective one of the plurality of uniquely identified stations, each pad including a plurality of switch means and means for generating a program call signal in response to the actuation by a user of each switch means, and further including means for producing said program call signal wherein said program call signal has a first portion uniquely identifying the station generating said program call signal, a second portion identifying a type of program source being selected by said user, and a third portion identifying a volume or line level out selected by said user,

said control pads each further including timer means and memory storage means, said memory storage means adapted to retain a set of instructions applied thereto by said user using said plurality of switch means associated with each said control pad, and said set of instructions being operable to selectively control said program call signal generating means associated with each said control pad, relative to a timing standard provided by said control pad timer means,

said memory storage means adapted to retain a user stored



instruction set for controlling said program call signal generating means on a recurring periodic basis unless a superseding set of instructions is stored therein by a user;

a microprocessor control unit coupled to said power supply unit and to said plurality of control pads, operable in response to said program call signal from each of said control pads, in accordance with a set of pre-set instructions for:

(1) generating power control signals to enable or disable a selected program source based upon said second portion of said program call signal,

(2) producing a routing signal for use by a switching device based upon said first portion of said program call signal, by polling through the type of program sources identified by said first portion of said program call signal, and for generating said routing signal to connect the first non-connected program source of said identified type to selected transducing means, and, if all of the individual program sources of the type identified by said program call signal are connected, then to the last of the program sources of said identified type polled by said microprocessor control unit, and

(3) generating a volume or line level out control signal based upon said third portion of said program call signal for use by a plurality of transducing means;

said plurality of transducing means coupled to said microprocessor control unit, each located at a respective one of the stations for converting received program signals to a sensibly perceptible program for said user, each of said transducing means being operable in response to an applied volume or line level out control signal to control the volume level of the sensibly perceptible program being produced,

each said transducing means including amplifier means for changing the volume or line level out of the applied program signal, and an audio speaker unit for generating the audio portion of the sensibly perceptible program being generated;

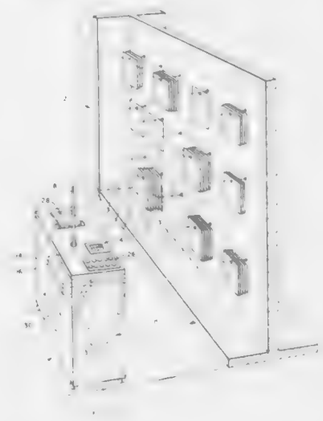
said switching means coupled to said microprocessor control unit, to said plurality of program sources, and to said plurality of transducing means, for responding to said routing signal to connect a selected one of said plurality of program sources to at least one selected transducing means.

4,862,160

ITEM IDENTIFICATION TAG FOR RAPID INVENTORY DATA ACQUISITION SYSTEM

Jack A. Ekchian, Watertown; Robert W. Hoffman, Arlington, both of Mass.; Leon Ekchian, Woodland Hills, Calif., and Kaigham J. Gabriel, Belmont, Mass., assignors to Revlon, Inc., New York, N.Y.

Division of Ser. No. 566,534, Dec. 29, 1983, Pat. No. 4,673,932. This application Mar. 20, 1987, Ser. No. 28,342
Int. Cl.[4] H04Q *9/00*; G06K *7/00*
U.S. Cl. 340—825.54 **4 Claims**



1. A method of forming electronically differentiatable item tags for plural groups of items, comprising the steps of

supplying a plurality of tags, each comprising at least two electronic circuit elements with adjustable electronic properties determined by the length of said elements, said circuit elements being a pair of coaxial, coplanar, interleaved, spiral conductive arms,

assigning a unique set of said electronic properties to each group of items,

dividing the tags up into sets corresponding to respective groups of items,

adjusting the circuit elements of the tags in each set to achieve the electronic properties assigned to the corresponding group, the step of adjusting to achieve electronic properties including altering the length of said arms, and

affixing the tags in each set to the items in the corresponding group,

whereby collectively testing the tags on an arbitrary number of items ascertains the membership of said groups.

4,862,161

THREE-STAGE COUPLING ARRANGEMENT

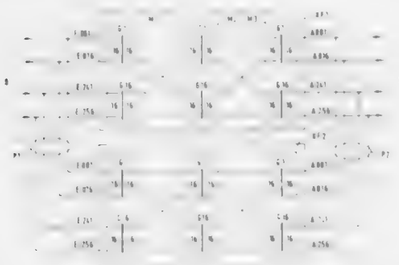
Josef Schomers, Backnang, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 864,418, Jan. 24, 1986, Pat. No. 4,679,121. This application Apr. 2, 1987, Ser. No. 38,126

Claims priority, application European Pat. Off., Apr. 3, 1986, 86104544.1

Int. Cl.[4] H04Q *11/00*

U.S. Cl. 340—825.800 11 Claims



1. In a three-stage coupling arrangement for an electrical data exchange system including a first stage, a second stage and a third stage, each stage comprising: a plurality of coupling matrixes each having inputs and outputs and a matrix of switching points for selectively coupling the inputs with the outputs of the coupling matrix; and intermediate conductors for connecting the outputs of the coupling matrixes of one stage with the inputs of the coupling matrixes of a next stage, the inputs of the coupling matrixes of the first stage constituting the inputs of the coupling arrangement and the outputs of the coupling matrixes of the third stage constituting the outputs of the coupling arrangement, the improvement comprising:

first and second identical three-stage switchboards between which said coupling matrixes are distributed, each said stage of each said switchboard having the same number of coupling matrixes, each said coupling matrix having a number of inputs equal to its number of outputs, each one of the inputs of the coupling matrixes of the first stage of each respective switchboard constituting one of the inputs of that switchboard, each one of the outputs of the coupling matrixes of the third stage of each respective switchboard constituting one of the outputs of that switchboard, the inputs of said first switchboard being positioned in an identical numbered sequence as the inputs of said second switchboard, the outputs of said first switchboard being positioned in an identical numbered sequence as the outputs of said second switchboard, each input of said first switchboard being connected with the identically numbered input of said second switchboard, and each output of said first switchboard being connected with an identically numbered output of said second switchboard; and further including:

a common control means connected with each of said first and second switchboards for producing addresses identifying switching points to be switched through, each address including a designation of: the row and column of a switching point within a coupling matrix; the number of a coupling matrix within a stage; and the number of a stage within a switchboard; said control means further having two outputs and producing at said two outputs respective switchboard addresses identifying a respective one of said first and second switchboards;

lines connected in parallel between said common control means and the inputs of said first and second switchboards for carrying the switching point addresses to both said switchboards; and

two individual lines each leading from a respective one of said two outputs of said control means to a respective one of said switchboards for carrying a corresponding switchboard address to that switchboard.

4,862,162

ENVIRONMENTAL TRACKING IN INDUCTANCE LOOP VEHICLE DETECTION SYSTEMS

Richard K. Duley, Hampshire, England, assignor to Sarasota Automation Limited, Hampshire, England

Continuation of Ser. No. 557,302, Dec. 2, 1983, abandoned. This application Jul. 30, 1987, Ser. No. 80,148

Claims priority, application United Kingdom, Dec. 2, 1982, [illegible]

Int. Cl.[4] G08G *1/01*

U.S. Cl. 340—938 11 Claims



1. In a vehicle presence detection system in which an inductive sensor loop is an element of a tuned circuit in a loop oscillator, a method of discriminating against parameter variations due to environmental changes during the presence of a vehicle, comprising the steps of repeatedly comparing a variable sample number that is a function of the oscillator inductance with a reference number for providing an indication of the arrival or departure of a vehicle, and repeatedly updating the reference number in accordance with detected environmental changes at predetermined rail time intervals dependent of an operational frequency of the system.

4,862,163

TRAFFIC MONITORING SYSTEM

Bruce Sobut, Clearwater, Fla., assignor to Timelapse, Inc., St. Petersburg, Fla.

Filed Dec. 30, 1987, Ser. No. 139,555

Int. Cl.[4] G08G *1/02*

U.S. Cl. 340—940 11 Claims

1. A traffic monitoring system, comprising:

a tube formed of a resilient material and defining an interior air chamber, adapted to be disposed transversely to a roadway, traffic on which is to be monitored;

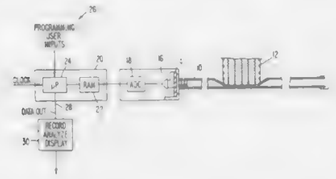
a pressure sensing element generating an analog signal responsive to air pressure in said chamber;

means for sampling said signal at intervals of time, providing a sequence of samples;

means for repetitively storing ones of said samples to provide a continuously-updated baseline value of said signal;

means for analyzing variation in said signal as a function of time to determine the speeds and types of vehicles passing over said tube;

wherein said means for analyzing analyzes said samples by comparing the sequence of samples to said baseline value, detects peaks in the pressure in said chamber, and determines that ones of said peaks are responsive to a vehicle tire passing over said tube upon detection of subsequent reduction in the pressure in said tube to a value below said baseline value, thus discriminating between pulses in the pressure in said tube due to tires passing over said tube and other pulses.



4,862,164

INFRARED AIRCRAFT LANDING SYSTEM

Henry C. Croley, and A. Wayne Antesberger, both of Fairfax County, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 9, 1988, Ser. No. 153,895

Int. Cl.[4] B64F *1/18*; G08G *5/00*

U.S. Cl. 340—952 3 Claims



1. A lighting kit for a temporary aircraft landing site including a plurality of covert markers each consisting of:

a rodlike support adapted at one end to be driven into the ground with an integral battery receptacle at the opposite end thereof;

a battery with snap fastener terminals loosely mounted in said receptacle;

an infrared light emitting diode electrically and mechanically fastened to said battery terminals by means of a single pair of snap fasteners; and

at least four of said markers being arranged in the form of a "Y" located adjacent said landing site with the stem of said "Y" pointing toward the center of said site and in the direction from which the wind is blowing.

4,862,165

ERGONOMICALLY-SHAPED HAND CONTROLLER

Samuel Gart, 4321 Colfax Ave., Studio City, Calif. 91604

Filed Feb. 12, 1988, Ser. No. 155,197

Int. Cl.[4] G09G *1/00*

U.S. Cl. 341—20 8 Claims

1. A hand controller apparatus of the type used for generating a computer input, the apparatus being ergonomically shaped to minimize hand muscle fatigue even during a protracted period of continuous use; the apparatus comprising the following elements:

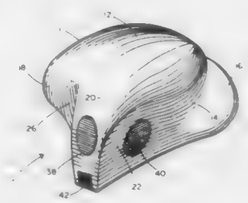
(a) an arched metacarpal-phalangeal support surface upon which to rest the mid-palm of the hand;

(b) a concave thenar support surface upon which to rest the thenar pad of the hand;

(c) a substantially flat hypo-thenar ledge surface upon which to rest the hypo-thenar portion of the hand;

(d) an arched distal phalange support surface upon which to rest the distal volar pad of the forefinger;

(e) a concave lateral depression upon which to rest the distal volar pad of the thumb;



(f) a medial ledge upon which to rest the middle phalanges of the ring and small fingers, the bottom of the medial ledge being concavely shaped to receive the distal volar pads of those two fingers; and

(g) a concave depression between the medial ledge and the arched distal phalange support surface for receiving the distal volar pad of the middle finger;

(h) each of said elements (a) through (g) being integrally arranged to form a continuous hand-bearing hollow housing enclosed by a substantially planar member for stable engagement with an underlying surface.

4,862,166

COMBINATION KEYBOARD INCLUDING PLURAL STROKE KEYS AND PLURAL TOUCH KEYS

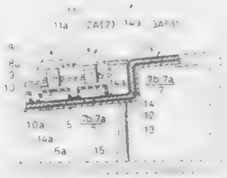
Kiyoshi Yamakawa, Hashima-gun, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 5, 1987, Ser. No. 104,273

Claims priority, application Japan, Oct. 6, 1986, 61-237712; Oct. 6, 1986, 61-237713

Int. Cl.[4] G06F *3/02*

U.S. Cl. 341—22 8 Claims



1. An input device comprising:

a flexible printed circuit (FPC) board having a common circuit matrix with plural columns and plural rows of electric contacts;

plurality of stoke keys and plurality of touch keys disposed on said common circuit matrix of said FPC board;

key scan control means for key scanning while delivering scan signals sequentially in each row or each column of said circuit matrix;

plurality of first counting means each of which corresponds to a respective stroke key for counting the results of key scanning effected by said key scan control means in a first specified mode for said respective stroke key;

plurality of second counting means each of which corresponds to a respective touch key for counting the results

of key scanning effected by said key scan control means in a second specified mode for said respective touch key;

first judging means responsive to said first counting means for determining an ON action of respective stroke key when said respective first counting means has reached a first specified count number; and

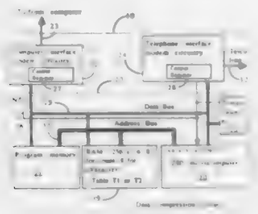
second judging means responsive to second counting means for determining an ON action of a touch key when said respective second counting means has reached a second specified count number greater than said first specified count number.

4,862,167

ADAPTIVE DATA COMPRESSION METHOD AND APPARATUS

John A. Copeland, III, Dunwoody, Ga., assignor to Hayes Microcomputer Products, Inc., Norcross, Ga.

Filed Feb. 24, 1987, Ser. No. 18,340
Int. Cl.[4] H03M 7/40
U.S. Cl. 341—107 **63 Claims**



1. A dynamic data compression method, comprising the steps

(1) providing an encoding table having a plurality of sets of digital codes of varying lengths associated with characters of an alphabet, some of the digital codes being shorter than others, the digital codes being of the same length in a given set but of a different length between sets, said encoding table comprising an initial ordered array of the characters in the alphabet and their corresponding digital codes, with a set of shorter codes toward the beginning of the array and a set of longer codes toward the end of the array;

(2) presenting for encoding an item of data represented by one of the characters of the alphabet;

(3) in response to the presented item of data, selecting a code from one of the sets in the encoding table which corresponds to the particular character of the alphabet represented by the presented item of data;

(4) providing the selected code as an output; and

(5) periodically adjusting the corresponding relationship of the codes, the characters of the alphabet, and the sizes of the sets of digital codes in the encoding table as a function of the frequency of occurrence of characters of the alphabet over a plurality of characters presented for encoding, whereby as the frequency of occurrence of characters over a plurality of characters presented for encoding changes, the more frequently occurring characters become associated with shorter codes in the encoding table.

4,862,168

AUDIO DIGITAL/ANALOG ENCODING AND DECODING

Terry D. Beard, 1407 N. View Dr., Westlake Village, Calif. 91362

Filed Mar. 19, 1987, Ser. No. 27,747
Int. Cl.[4] H03M 1/00
U.S. Cl. 341—140 **24 Claims**

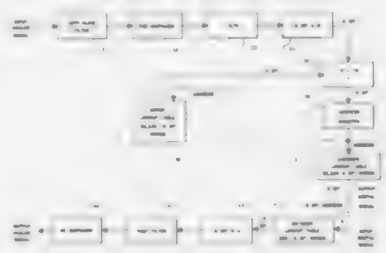
1. The method of encoding an analog signal to a digital representation thereof and then decoding the digital representation to reconstruct a duplicate of the original analog signal therefrom with low quantization noise and error, comprising the steps of:

(a) pre-emphasizing the analog signal to accentuate the high frequency components thereof;

(b) obtaining a series of high resolution digitized samples of the pre-emphasized analog signal;

(c) encoding the high resolution digitized samples to create a series of digital representations of the high resolution digitized samples having a lower order resolution than the high resolution digitized sample resolution, each of said lower order digital representations corresponding to a respective series of high resolution digitized sample values;

(d) obtaining difference measurements between said high



resolution digitized samples and their corresponding lower resolution digital representations, said difference measurements being less than the number of high resolution digitized sample values in each lower order digital representation;

(e) combining each high resolution digitized sample prior to encoding with the difference measurement for the previous sample;

(f) decoding the combined encoded samples and difference measurements in a manner complementary to the sample encoding to create an approximate analog output signal; and

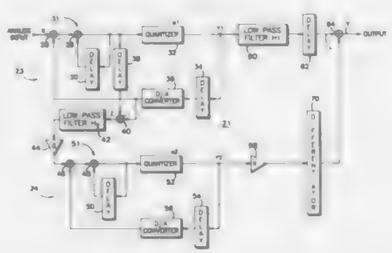
(g) de-emphasizing the approximate analog output signal in a manner complementary to the pre-emphasis to produce an analog output signal which closely approximates the original analog signal.

4,862,169

OVERSAMPLED A/D CONVERTER USING FILTERED, CASCADED NOISE SHAPING MODULATORS

Nicholas R. Van Bavel, and Tim A. Williams, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 25, 1988, Ser. No. 172,823
Int. Cl.[4] H03M 3/02
U.S. Cl. 341—143 **11 Claims**



1. An oversampling A/D converter operating at a sampling frequency higher than an input signal frequency and having an input for receiving an analog input signal and an output for providing an equivalent digital output signal, comprising: first and second quantization loops, each quantization loop comprising:

means for integrating a difference between an input terminal signal and a feedback signal;

a quantizer for quantizing an output from the integrator and providing a loop output signal; and

feedback means having an input coupled to the loop output signal and an output for providing the feedback signal;

first filter means having an input coupled to a first loop output signal of a first quantization loop, for filtering the first loop output signal by a first transfer function to provide a first filter signal;

second filter means having an input coupled to the output of the integrator of the first loop, and an output, said second filter means filtering the output of the integrator of the first loop by a second transfer function to provide the input terminal signal for the second quantization loop;

gain means having an input coupled to the output of the second filter means, for amplifying the input terminal signal for the second quantization loop; and

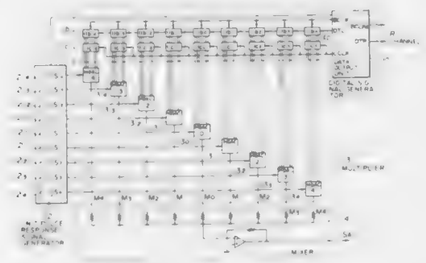
output means having an input coupled to the loop output signal of the second quantization loop for attenuating the loop output signal of the second quantization loop.

4,862,170

DIGITAL-ANALOG CONVERTER

Youichi Hashimoto, Wako; Takashi Tokuyama; Kazuya Nishiga, both of Iwaki; Yoshihiro Arai, Funabashi; Nobuhide Ueki, Iwaki, and Naoki Adachi, Iwaki, all of Japan, assignors to Ryoichi Mori and Kazuo Toraichi, both of Tokyo, Japan

Filed Mar. 22, 1988, Ser. No. 171,812
Claims priority, application Japan, Mar. 31, 1987, 62-078878
Int. Cl.[4] H03M 1/66
U.S. Cl. 341—144 **7 Claims**



1. A digital-to-analog converter comprising:

a unit pulse response signal generator for successively generating unit pulse response signals at a predetermined time interval;

a digital data generator for generating digital data at said predetermined time interval;

a multiplier for multiplying a unit pulse response signal generated at a certain time by a predetermined item of said digital data; and

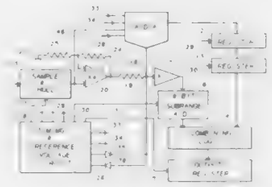
a mixer for producing an analog signal output by combining the unit pulse response signals that have been multiplied by said digital data.

4,862,171

ARCHITECTURE FOR HIGH SPEED ANALOG TO DIGITAL CONVERTERS

William P. Evans, Glen Burnie, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 23, 1987, Ser. No. 111,764
Int. Cl.[4] H03M 1/14
U.S. Cl. 341—156 **12 Claims**



1. An analog to digital converter system for developing output which corresponds to the magnitude of an input analog signal, said system comprising: input means for receiving said input analog signal, a main range A/D converter including reference voltage means for developing a series of reference levels in steps of uniform magnitude, a plurality of comparator means coupled to said means and said reference voltage means and arranged to compare the magnitude of said input analog signal with said reference voltage levels to develop a number of comparator output signals equal to the number of reference voltage levels which are exceeded by the magnitude of said input analog signal, and decoder means coupled to said comparator means for responding to said comparator output signals and developing a group of binary coded MSB signals for defining the more significant bits of the digital output, circuit means coupled to said input means and to said plurality of comparator means of said main range A/D converter and arranged for developing first and second signals and a difference signal having a magnitude equal to the difference between the magnitudes of said first and second signals, said circuit means including amplifier means operative to develop said first signal from said input analog signal said first signal being directly developed from said input analog signal and having an amplified magnitude proportional to the magnitude of said input analog signal, and said second signal being directly developed from said comparator output signals and having a magnitude proportional to the number of said comparator output signals, said circuit means including a summing node at which said difference signal is developed, summing resistance means having one end connected to said summing node, with the other end of said summing resistance means connected to said amplifier means, and current source means connected to said summing node and to said comparator means and arranged to control current flow through said summing resistance means in proportional to the number of said comparator output signals, a buffer means having an input connected to said summing node for applying said difference signal developed at the summing node to a subrange A/D converter connected to said buffer means, said subrange A/D converter responding to said difference signal to develop a group of LSB signals for defining the less significant bits of the digital output, and logic means for combining said MSB signals from said main range A/D converter and said LSB signals from said subrange A/D converter to develop said digital output.

4,862,172

COMPUTER CONTROL APPARATUS INCLUDING A GRAVITY REFERENCED INCLINOMETER

J. David Ross, DeSoto, Tex., assignor to Texas Scottish Rite Hospital for Crippled Children, Dallas, Tex.

Filed Sep. 14, 1987, Ser. No. 96,973
Int. Cl.[4] H03M *1/60*
U.S. Cl. 341—157 21 Claims



8. Computer control apparatus, comprising: an inclinometer adapted to convert angular movement relative to gravity into a direct current electrical signal; means for attaching said inclinometer to the head of a person using the computer so that the angular movement is provided by the person tilting his head; and electrical interface circuit means connecting to said inclinometer for converting the direct current electrical signal into a pulse output used in controlling a computer, said electrical interface circuit means including virtual ground circuit means for providing symmetrical plus and minus power from a power source supplied by the computer, sample and hold circuit means connected to said inclinometer for providing a reference signal, differential amplifier circuit means connected to said inclinometer and to said sample and hold circuit means for providing a proportional electrical signal, the proportional electrical signal being an amplification of the difference in the voltage between the direct current electrical signal and the reference signal, inverting absolute value amplifier circuit means connected to said differential amplifier circuit means for providing a negative going output signal, schmitt trigger threshold detector circuit means connected to said inverting absolute value amplifier circuit means for providing a pulse signal in response to the negative going output signal, said sample and hold circuit means connected to said inverting absolute value amplifier circuit means for regulating the reference signal being provided to said differential amplifier circuit means, polarity detector circuit means connected to said differential amplifier circuit means for providing a phase control signal directly related to the proportional electrical signal provided to said inverting absolute value amplifier circuit means, and quadrature converter means connected to said schmitt trigger threshold detector circuit means and said polarity detector circuit means for providing the pulse output, the pulse output being a pair of square wave electrical signals, the square wave electrical signals being 90° out of phase and the phase relationship being determined by the phase control signal.

4,862,173

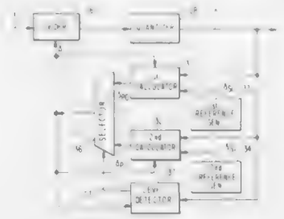
METHOD AND CIRCUIT FOR CARRYING OUT FORWARD AND INVERSE QUANTIZATION BY VARYING A REFERENCE STEP SIZE

Takao Nishitani, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 399,590, Jul. 19, 1982, abandoned. This application May 1, 1986, Ser. No. 858,865
Claims priority, application Japan, Jul. 17, 1981, 56-111977; May 18, 1982, 57-83490
Int. Cl.[4] H03M *7/36*
U.S. Cl. 341—200 20 Claims

1. A method of carrying out a forward quantizing operation by processing a succession of input digital signals into a succession of digital quantized codes, respectively, said digital quantized codes being disposed at successive instants spaced by a predetermined interval of time, respectively, in relation to step sizes which are decided at the respective instants with a current one of step sizes decided for disposition of a current one of said quantized codes at a current one of said instants with reference to a previous step size, a previous quantized code, and a preselected number smaller than unity, said previous step size being one of said step sizes that is decided at a previous instant, said previous instant being one of said instants that is said predetermined interval prior to said current instant, said previous quantized code being one of said quantized codes that is disposed at said previous instant, said forward quantizing operation comprising the steps of:

monitoring said quantized code succession to provide a level signal representative of, at said current instant, a level



dependent on particular ones of said quantized codes that precede said current quantized code and include said previous quantized code;

setting a reference size variable at a predetermined period longer than said predetermined interval and adjusted in accordance with said level;

deciding the step size at a subsequent one of said instants that is said predetermined interval after said current instant, with reference to said current quantized code and said current step size and additionally to said reference size;

dividing said input signals by the step size to produce a sequence of quotient digital signals representative of quotients which appear as results of the division, respectively; and

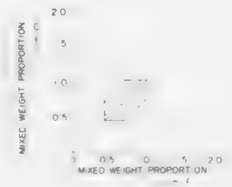
quantizing said quotient signals into said digital quantized codes, respectively.

4,862,174

ELECTROMAGNETIC WAVE ABSORBER

Yoshiyuki Natio, 9-29, Tsukimino 8-chome, Yamato, and Michiharu Takahashi, 390-190 Takatsu, Yachiyo, both of Japan

Filed Jul. 7, 1987, Ser. No. 70,420
Claims priority, application Japan, Nov. 19, 1986, 61-276288
Int. Cl.[4] H01Q *17/00*
U.S. Cl. 342—1 3 Claims



1. An electromagnetic wave absorber containing a mixture of a magnetic material and a carbon material, both in powder form, in a binding medium wherein the weight proportions of said binding medium taken as unity, said magnetic material in powder form 1:F:C fall within the following limitation ranges:

$$|F-C| \leqq 0.3,$$

$$0.45 \leqq F \leqq 1.05,$$

$$0.45 \leqq C \leqq 1.05,$$

where F represent the magnetic materials and C represents the carbon material.

4,862,175

POLICE RADAR SIGNAL BAND DISCRIMINATION CIRCUITRY FOR A POLICE RADAR WARNING RECEIVER

Michael A. Biggs, Mason, and James L. Jaeger, Cincinnati, both of Ohio, assignors to Cincinnati Microwave, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 878,055, Jun. 24, 1986, Pat. No. 4,750,215. This application Feb. 29, 1988, Ser. No. 162,244
Int. Cl.[4] H04B *17/00, 1/26;* G01S *7/40*
U.S. Cl. 342—20 19 Claims



1. A police radar warning receiver adapted to indicate presence in one of at least two bands of a police radar signal, the receiver comprising:

oscillator means for generating an oscillator signal which is swept in frequency between a first frequency and a second frequency;

mixer means for mixing said oscillator signal with a signal correlated to a received police radar signal to provide a primary IF signal and an image IF signal;

filter means for passing one of said image IF and primary IF signals; and

circuit means responsive to said passed IF signal adapted to indicate reception of the police radar signal and in which band the police radar signal is present.

4,862,176

IDENTIFICATION OF FRIEND OR FOE (IFF) SYSTEMS

Roger Voles, London, England, assignor to EMI Limited, Hayes, England

Filed Feb. 17, 1978, Ser. No. 879,804
Claims priority, application United Kingdom, Feb. 20, 1977, 2307
Int. Cl.[4] G01S *13/78*
U.S. Cl. 342—45 10 Claims

1. An IFF apparatus for transmitting a first code to and receiving a second code from another IFF apparatus, comprising

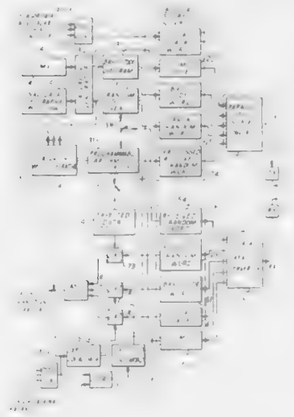
a transmitter for transmitting the first code,

a receiver for receiving the second code,

means for producing the first code either in dependence upon the time of its production and upon the position of the apparatus or in dependence upon the time of production of the second code and upon the position of the another apparatus at the time of production of the second code,

an input for receiving positional information relating to at least the direction of the another IFF apparatus relative to the apparatus,

reference code producing means responsive to the positional information and to the time of production of the received code to produce at least one reference code, and



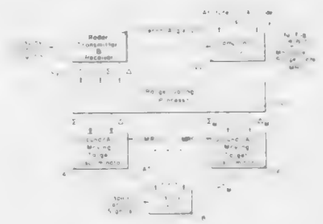
means for comparing the at least one reference code with the received code.

4,862,177

PROCESSOR FOR DISCRIMINATING BETWEEN GROUND AND MOVING TARGETS

Sung Y. Wong, Tarzana, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 25, 1974, Ser. No. 527,106
Int. Cl.[4] G01S *13/52, 13/58*
U.S. Cl. 342—160 13 Claims



1. A processor adapted for use in conjunction with a radar system and being responsive to range gated received energy provided thereby, for discriminating between ground and airborne moving targets, said processor comprising:

thresholding means, responsive to received energy from a given range internal, for providing output signals indicative of detected moving targets;

angle measurement means, responsive to the received energy from said given range interval, for providing output signals indicative of the relative angle to each of said moving targets and to the ground; and

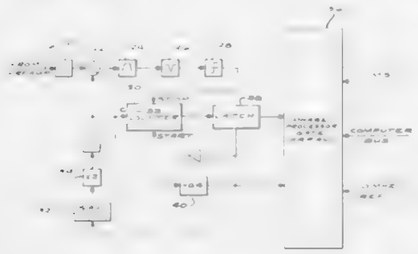
logic means, responsive to the output signals from said thresholding means and said angle measurement means, for providing signals indicative of whether detected moving targets are ground or airborne moving targets, as a function whether or not respectively, the relative angles to said detected moving targets are substantially the same as the relative angle to the ground.

4,862,178

DIGITAL SYSTEM FOR CODELESS PHASE MEASUREMENT

Mark A. Sturza, Woodland Hills, Calif., and Alison K. Brown, Monument, Colo., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jun. 27, 1988, Ser. No. 211,814
Int. Cl.[4] H04B *7/185*
U.S. Cl. 342—357 **14 Claims**



1. In a method for determining baseline vectors from information contained in the L1 and L2 signals from a plurality of G.P.S. transmitters of the type wherein said transmissions are detected by receivers located at each end of said baseline and said transmitters are identified by comparing the measured phase of said received transmissions with predicted values thereof whereby a priori knowledge of the singal modulating codes is not required; the improvement comprising measuring the phases of said signals by the steps of:

(a) mixing said L2 signals with local oscillator to provide an intermediate frequency signal; and

(b) clocking a counter with said local oscillator; and

(c) starting said counter with a signal that is synchronized with and whose frequency is a fraction of said local oscillator; then

(d) stopping said counter with said intermediate frequency signal; and then

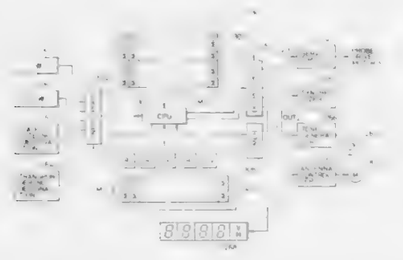
(e) discarding the most significant bit of said count.

4,862,179

SATELLITE RECEIVER

Tsuneo Yamada, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 110,540, Oct. 20, 1987, abandoned, which is a continuation of Ser. No. 841,618, Mar. 20, 1986, abandoned. This application Feb. 13, 1989, Ser. No. 309,995
Claims priority, application Japan, Mar. 26, 1985, 60-42364[U]; Mar. 26, 1985, 60-42365[U]
Int. Cl.[4] H01Q *3/08*
U.S. Cl. 342—359 **4 Claims**



1. A satellite receiver for receiving a radio wave signal through a feedhorn, and with a rotatable probe for obtaining mechanical polarization of an antenna which is to be pointed toward a designated satellite, comprising:

a designation means for selectively designating one of a plurality of satellites and for generating a designated satellite code representative of the designated satellite;

a memory means for storing attitude data for each one of said plurality of satellites;

a control means which is responsive to the designated satellite code for reading out the attitude data for the designated satellite from said memory means and being sequentially responsive to the readout attitude data for generating a probe position drive signal during a predetermined interval to rotate the probe to a position corresponding, to the read-out attitude data, the probe position drive signal's form being determined by the read-out attitude data; and

a fine adjustment means manually operated to generate a fine adjustment instruction indicative of the position of the probe to obtain satisfactory reception of a polarized signal from the designated satellite,

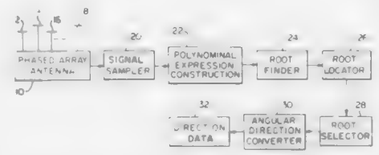
wherein said contro! means responsive to the fine adjustment instruction updates the attitude data stored in said memory means for the designated satellite by a predetermined amount and sequentially reads out the updated attitude data for the designated satellite from said memory means, and generates an updated probe position drive signal during the predetermined interval to rotate the probe to an updated position corresponding to the readout updated attitude data, the form of the updated probe position drive signal being determined by the read-out updated attitude data.

4,862,180

DISCRETE SOURCE LOCATION BY ADAPTIVE ANTENNA TECHNIQUES

Raymond G. Martin, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 12, 1985, Ser. No. 744,088
Int. Cl.[4] G01S *5/02*
U.S. Cl. 342—417 **15 Claims**



1. A radar receiving system suitable for determining the approximate direction to a source of signal energy, said system comprising:

a phased array antenna having a plurality of separate antenna elements;

means for sampling the signal at the separate elements to provide values corresponding to the sampled signals;

means for forming at least one polynomial expression, with the coefficients of said expression being derived from said values;

means for finding the roots of said polynomial expression;

means for determining the closeness of said roots to the unit circle in at least one complex plane;

means for selecting the roots Which satisfy a predetermined closeness criterion; and

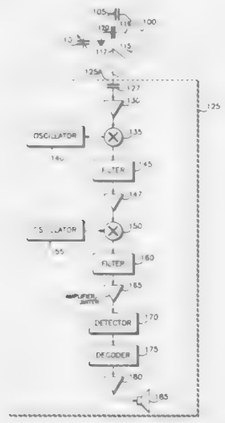
means for providing the angular direction in the complex plane to said selected roots, said angular direction of the selected roots corresponding to the angular direction to the source of signal energy.

4,862,181

MINIATURE INTEGRAL ANTENNA-RADIO APPARATUS

Lorenzo A. Ponce De Leon, Lake Worth; Douglass K. Stamps, Jr., Boynton, and Quirino Balzano, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 926,313, Oct. 31, 1986, abandoned. This application Oct. 30, 1987, Ser. No. 115,735
Int. Cl.[4] H01Q *1/24, 7/00*
U.S. Cl. 343—702 **14 Claims**



1. An antenna comprising:

a ground plane;

an antenna element isolated from said ground plane and is geometrically configured to be substantially closed upon itself, said antenna element including first and second ends;

at least one capacitor coupled in series between the first and second ends of said antenna element, said capacitor being variable to permit tuning of said antenna element at an operating frequency; and

a coupler element, situated generally within said antenna element, a portion of said coupler element being substantially parallel with, and sufficiently close to, a portion of said antenna element to permit distributed coupling between said portion of said antenna element and said portion of said coupler element, said coupler element including an input end which is adapted to be coupled to a receiver, and a terminating end coupled to said ground plane through a second capacitor.

4,862,182

ANTENNA FOR A PORTABLE RADIOTELEPHONE

Yoshimi Egashira, Kanagawa, Japan, assignor to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 216,824
Claims priority, application Japan, Jul. 10, 1987, 62-106069[U]
Int. Cl.[4] H01Q *1/24*
U.S. Cl. 343—702 **4 Claims**

1. An antenna system for a portable radiotelephone comprising:

a rod-shaped transmitting and receiving main antenna element which is freely inserted into and withdrawn from a case of said portable radiotelephone, said antenna element having a first conductive means at its base;

an antenna retaining mechanism which holds said main antenna element so that said main antenna element is free to slide, said antenna retaining mechanism being equipped with a second conductive means which is electrically coupled with said first conductive means only when said main antenna element is withdrawn from said case and is thereby connected with a transmitter-receiver set via a matching device;

a sub-antenna element provided within said case for receiving call signals from calling parties, one end of said sub-antenna element being made of a conductive elastic material and being biased into electrical contact with said



second conductive means of said retaining mechanism; and

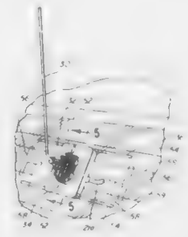
a means for separating said one end of said sub-antenna element from said second conductive means of said retaining mechanism when said main antenna element is withdrawn from said case, whereby said sub-antenna element is disconnected from and said main antenna element is connected to said transmitter-receiver set.

4,862,183

CURRENT FED ANTENNA WITH IMPROVED RADIATOR

Herbert R. Blaese, 3314 Olcott Ave., Chicago, Ill. 60634

Division of Ser. No. 6,573, Jan. 22, 1987, Pat. No. 4,779,098. This application May 31, 1988, Ser. No. 200,232
Int. Cl.[4] H01Q *1/32*
U.S. Cl. 343—715 **1 Claim**



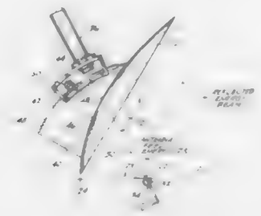
1. A current fed antenna system for mounting on a motor vehicle's glass plate with a current fed radiator extending from a carrier attached to a first side of the glass plate and with an electrical connector and a coaxial cable extending from a second, opposite side of the glass plate whereby energy is transferred through the glass plate and the drilling of a hole for connecting the radiator to the electrical connector is unnecessary, the improvement comprising, in combination: the current fed radiator comprising an elongated rod with a flexible helically coiled base portion attached to said carrier, said flexible helically coiled base portion having an electrical length of about ½ wavelength and operating as a phase cancelling coil for electrically cancelling part of a ⅝ wavelength antenna to render it a ¼ wavelength antenna and for enhancing the flexibility of the radiator to withstand the buffeting of an automatic car wash whereby disconnection of the radiator is unnecessary during a car wash.

4,862,184
METHOD AND CONSTRUCTION OF HELICAL ANTENNA
George Ploussios, 4 Hackney Cir., Andover, Mass. 01810
Continuation-in-part of Ser. No. 11,736, Feb. 6, 1987, abandoned. This application Aug. 24, 1987, Ser. No. 88,429
Int. Cl.[4] H01Q *1/36*
U.S. Cl. 343—745 9 Claims



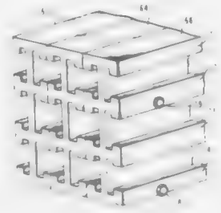
5. In a helical antenna, the combination comprising
a support formed of insulating material and having in its outer surface a helical channel,
a radiating element including
a conductive coating on the inner surfaces of said channel, and
a conductive cover in electrical contact with said coating and closing said channel, whereby the outer surfaces of said cover and said channel coating form a helical radiating element.

4,862,185
VARIABLE WIDE ANGLE CONICAL SCANNING ANTENNA
George S. Andrews; Bernard J. Lamberty, both of Kent, and Daniel J. Tracy, Maple Valley, all of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Apr. 5, 1988, Ser. No. 177,966
Int. Cl.[4] H01Q *3/20*
U.S. Cl. 343—761 15 Claims



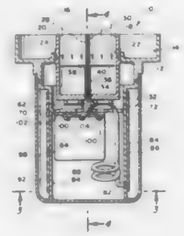
1. A variable angle conical scanning antenna comprising:
an offset paraboloidal reflector having a surface contour that is defined by an offset geometric region of a paraboloid of revolution formed by rotating a parabola about its focal axis, said geometric region of said paraboloid of revolution having a geometric center point;
means for rotating said offset paraboloidal reflector about an axis of rotation that extends through the focus of said paraboloid of revolution;
antenna feed means positioned at said focus of said paraboloid of revolution for directing electromagnetic energy toward said offset paraboloidal reflector; said electromagnetic energy being directed substantially along said axis of rotation; and
means for tilting said offset paraboloidal reflector about said focus of said paraboloid of revolution with said focal axis of said paraboloid of revolution remaining substantially coplanar with said axis of rotation of said paraboloidal reflector.

4,862,186
MICROWAVE ANTENNA ARRAY WAVEGUIDE ASSEMBLY
Charles A. Strider, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Nov. 12, 1986, Ser. No. 929,566
Int. Cl.[4] H01Q *13/00*
U.S. Cl. 343—776 52 Claims



1. A waveguide assembly employing a first plate (34) with a vertical structural member and a second plate (36) with a vertical structural member (37) for use in antenna arrays having half waveguides with a zero electrical current line along the center of the waveguide assembly comprising:
(a) said first plate consisting of a plurality of matching protruding equal-length members perpendicularly disposed to said structual member of said first plate (34) each said protruding member having two ends;
(b) said second plate (36) consisting of a plurality of protruding equal length members (41, 42, 43, 44) perpendicularly disposed to said structural member of said second plate (36) each said protruding member (41, 42, 43 44) having two ends;
(c) said first plate (34) in juxtaposition with said second plate (36) so that each of said ends of each of said plurality of matching protruding members in said first plate (34) is aligned with each of said ends of said corresponding plurality of matching said ends of said protruding members in said second plate (36) such that said zero electrical current line exists at the junction of each of said ends; and
(d) means for holding said first plate (34) and said second plate (36) together.

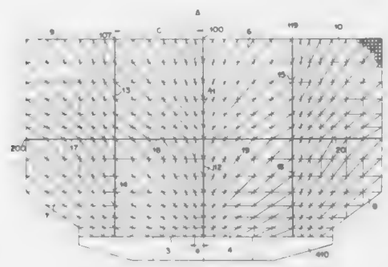
4,862,187
DUAL BAND FEEDHORN WITH TWO DIFFERENT DIPOLE SETS
Harvey K. Y. Hom, Santa Monica, Calif., assignor to Microwave Components and Systems, Inc., Agoura Hills, Calif.
Filed Oct. 24, 1988, Ser. No. 261,321
Int. Cl.[4] H01Q *13/02*
U.S. Cl. 343—786 7 Claims



1. A dual band feedhorn comprising:
a housing;
a cup mounted within said housing;

a throat formed within said cup, said throat being opened to the ambient and adapted to receive a microwave signal, said cup being pivotable relative to said housing;
a dipole assembly fixedly mounted to said cup and located within said throat, said dipole assembly for receiving the microwave signal;
a cable integrally connected to said dipole assembly, said cable comprising a continuous electrical conductor for transmitting the received microwave signal; and
an electrical circuit board assembly mounted on said housing, said cable being connected to said electrical circuit board assembly, said electrical circuit board assembly including first switch means, said first switch means being remotely operated, operation of said first switch means causes pivoting of said cup, said electrical circuit board assembly being adapted to transmit the received microwave signal to a receiver.

4,862,188
MICROWAVE ANTENNA OF LIGHT WEIGHT AND SMALL BULK
Jacques Monvoisin, Argenteuil, and Valdo Trubett, Poissy, both of France, assignors to Thomson-CSF, Paris, France
Filed Jun. 22, 1987, Ser. No. 65,290
Claims priority, application France, Jun. 24, 1986, 86 09104
Int. Cl.[4] H01Q *19/12*
U.S. Cl. 343—840 9 Claims

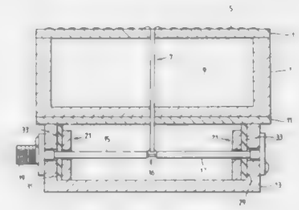


1. A microwave antenna of light weight and small bulk provided with a reflector having a shaping structure and a reflecting mirror which is placed against the structure, said structure comprising a first set of vertical combs and a second set of horizontal combs transverse thereto which combs intersect each other at different points so as to form part of a lattice arrangement, said structure further comprising a third set of oblique combs which pass through the points of intersection formed by the horizontal and vertical combs and which complete said lattice arrangement, a generator-line being formed by each front comb profile for generating the shape to be given to the mirror, wherein said structure includes a plurality of interassembled modules and wherein vertical and horizontal combs of each module respectively form a first and a second arrangement of combs, each arrangement being made according to the law of distribution:

$$C=a(1+x+x^2+\ldots+x^n)$$

where C is the size of said module, a is the smallest spacing within said arrangement between one side of a module and the first adjacent comb, x is predetermined parameter, and (n+2) is the number of combs within said arrangement.

4,862,189
MICROWAVE TRANSFORMER
Thomas E. Morgan, Greenford, England, assignor to The Marconi Company Limited, England
PCT No. PCT/GB88/00077, § 371 Date Oct. 24, 1988, § 102(e) Date Oct. 24, 1988, PCT Pub. No. WO86/06343, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 10, 1988, Ser. No. 254,472
Claims priority, application United Kingdom, Feb. 11, 1987, 8703065
Int. Cl.[4] H01Q *1/36;* H03H *7/42*
U.S. Cl. 343—859 5 Claims



1. A microwave balun transformer comprising:
(a) a conductive housing having opposite end walls bounding a cavity;
(b) a first terminal port at one of the end walls;
(c) a balanced line having conductors extending through the housing to provide a second terminal port;
(d) a dipole having two elongated arms extending through the cavity, and having a junction between the arms, at least one of the arms comprising a coaxial line connected to the first terminal port, the arms of the dipole being connected at said junction to the respective conductors of the balanced line; and
(e) a reflector positioned close to each end of the dipole arms and extending across the cavity transverse to the dipole arms, each reflector being substantially transparent at the frequency for which the length of each dipole arm is a quarter wavelength but being a substantial reflector at higher frequencies so that the effective length of each dipole arm remains closer to a quarter wavelength over a range of frequencies.

4,862,190
DEPLOYABLE OFFSET DISH STRUCTURE
William B. Palmer, Rancho Palos Verdes, and Martin M. Giebler, Redondo Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed May 15, 1987, Ser. No. 49,919
Int. Cl.[4] H01Q *15/20*
U.S. Cl. 343—915 4 Claims

1. A collapsible/deployable offset dish structure, comprising:
a substantially rigid and solid fixed center panel; and
a plurality of substantially rigid and solid outer panel assemblies foldably connected about the periphery of the fixed center panel;
wherein the outer panel assemblies are inwardly foldable to contracted positions in order to form a collapsed configuration for compact storage of the dish structure and the outer panel assemblies are outwardly foldable to extended positions in order to form a deployed configuration of the dish structure for operation as a reflecting surface, the

deployed configuration of the dish structure conforming to an offset surface of revolution in which the principal



axis of the offset surface of revolution does not intersect the surface of revolution.

4,862,191

VEHICLE OPERATION RECORDER

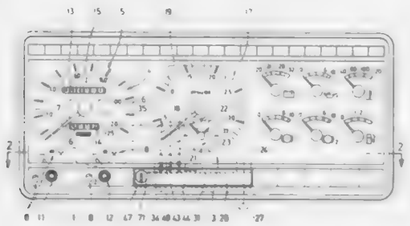
Roland Siefert, Bad Dürrheim, Fed. Rep. of Germany, assignor to Motor Meter AG, Fed. Rep. of Germany

Continuation of Ser. No. 55,165, May 28, 1987, abandoned. This application Aug. 19, 1988, Ser. No. 235,819

Claims priority, application Fed. Rep. of Germany, May 30, 1986, 3618109; Aug. 8, 1986, 3626892

Int. Cl.[4] G01D *9/00*

U.S. Cl. 346—18 28 Claims



1. Vehicle operation recorder for motor vehicles comprising:

a casing,

measuring instruments, including speedometer, mileage counters and clock, arranged in said casing,

recording devices and display devices included in said measuring instruments,

marker pens connected to said recording devices,

at least one main instrument dial allocated to said display devices,

a diagram chart carrier rotationally driven by said clock for accommodation of at least one diagram chart on which the measured values indicated by said measuring instruments are recorded by said marker pens,

means acting upon said marker pens for lifting said marker pens off said diagram chart to change said diagram chart, and wherein:

said recording devices are permanently undetachably connected to said display devices,

said diagram chart carrier (29) is arranged in a separate compartment of said casing, said compartment being laterally offset in relation to said main instrument dial,

said marker pens are arranged above said diagram chart in likewise laterally offset relation to said main instrument dial and are connected to said recording devices by a rigid bridge member,

said diagram chart carrier is movable relative to said recording and display devices of said measuring instruments to change said diagram sheet, said recording and display devices being stationarily arranged in said casing, and

said clock is also arranged in laterally offset relation to said main instrument dial in fixed relation in said casing, and

further comprising gear assembly means for permanently connecting said clock to said movable diagram chart carrier.

4,862,192

INK SYSTEM FOR INK JET MATRIX PRINTER

Jan Slomianny, Am Sonnenhang 33, D-5223 Nümbrecht, Fed. Rep. of Germany

Filed Mar. 14, 1988, Ser. No. 167,405

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708120

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—75 7 Claims



1. In an ink jet matrix printer comprising an ink system having a fluid transport device which optionally, transports thick ink from a first supply container into an ink chamber and, independently thereof, feeds solvent from a second supply container into the ink chamber; supplies ink from this ink chamber under pressure to a write head; and returns ink formed of ink droplets not diverted for writing purposes, from a collection channel into the ink chamber, the collection channel is located across from the write head;

wherein the improvement comprises:

the transport device is exclusively operated by means of pressurized air, has a connection to a source of pressurized air, and has a suction jet pump;

the ink chamber includes:

an ink container fluidly connected with the write head;

a mixer container which is fluidly connected with the said two supply containers; and

a collection container fluidly connected to the collection channel;

the ink container is connected to a first air pressure line and the ink therein is under pressure, the ink container fluidly connected to the mixer container by means of a connection line;

that the mixer container is connected via a suction line alternatively to the suction jet pump or to a second pressure line; and,

that the collection container is connected with the suction jet pump via a line with negative pressure, and with the mixer container via a run-off line, and a valve controlling flow in said run-off line.

4,862,193

THERMAL RECORDING HEAD

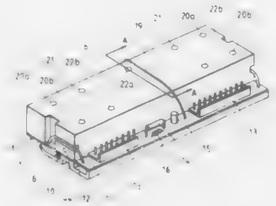
Osamu Hattori, Chigasaki; Toshihiko Gotoh, Tokyo, and Kohtarou Tanno, Kamakura, all of Japan, assignors to Hitachi Video Engineering Inc. and Hitachi Ltd., Tokyo, Japan

Filed Oct. 5, 1988, Ser. No. 253,561

Claims priority, application Japan, Oct. 7, 1987, 62-251505

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH 6 Claims



1. In a thermal recording head having a base plate, heating elements which are disposed in one array on a front surface of the base plate, a radiating plate which is fixed to a rear surface of the base plate, and mounting holes which are formed so as to extend toward the base plate from a rear surface side of the radiating plate opposite to a base plate side thereof; a thermal recording head characterized in that, letting d denote the largest one of the diameters of said mounting holes, a thickness l of said radiating plate satisfies $l \geqq 2d$, that some of said mounting holes are disposed at predetermined intervals at positions substantially corresponding to the heating element array, and that a spacing l_2 between said base plate and a bottom of each of said mounting holes satisfies $l_2 \geqq d$.

4,862,194

LABEL PRINTER HAVING BOTH IMAGE AND CHARACTER DATA PRINTING MEANS

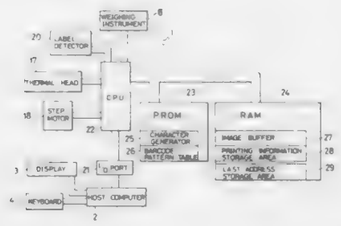
Kaoru Uematsu, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1987, Ser. No. 130,629

Claims priority, application Japan, Dec. 9, 1986, 61-292783

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH 11 Claims



1. A label printer, comprising:

a printing information storage area for storing therein printing data which is inputted from outside and are to be printed on a portion of a label;

an image buffer for storing therein printing picture image data representative of a picture image which is the same as a picture image to be printed on the label;

a printing picture image data producing means for producing, in said image buffer from which stored contents have been erased, printing picture image data from printing data stored in said printing information storage area;

a printing means operable upon production of printing picture image data in said image buffer for printing on the label by means of a printing station printing picture image data only at a printing picture image data producing portion of the whole memory capacity of said image buffer;

a judging means operable after printing on the label by said printing means for judging whether or not there remains any printing data in said printing information storage area; and

an erasing means operable when said judging means judges that there remains some printing data in said printing information storage area for erasing the printing picture image data produced in said image buffer.

4,862,195

OVERCOATING LAYER FOR THERMAL PRINTING HEAD

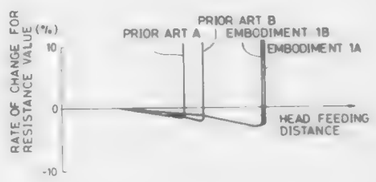
Masakazu Kato, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1987, Ser. No. 129,649

Claims priority, application Japan, Mar. 5, 1987, 62-50939

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH 1 Claim



1. A protective layer for a thermal printing head, the layer comprising a compound of silicon, aluminum, oxygen and nitrogen to which a metal or mixture of metals is added in a concentration of substantially 1–5 atomic percent, with the metal to be added being selected from a group consisting of chromium, molybdenum, tungsten, vanadium, niobium, tantalum, titanium, zirconium, hafnium, copper, nickel, palladium, and magnesium.

4,862,196

IMAGE RECORDING APPARATUS

Toshikazu Umeda; Shinsuke Funaki, and Taketo Noza, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 59,261, Jun. 5, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 282,972

Claims priority, application Japan, Jun. 7, 1986, 61-132174; Dec. 12, 1986, 61-296054

Int. Cl.[4] G01D *9/42*; H04N *1/46*

U.S. Cl. 346—108 15 Claims

3. An image recording apparatus for recording an image on a photosensitive material by the scanning operation of a plurality of beams separated along a main scanning direction, which comprises:

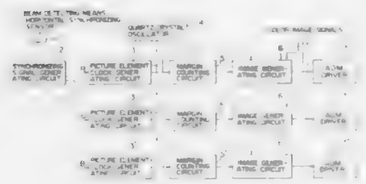
optical deflecting means for scanning said laser beams on a recording and scanning surface;

beam detecting means for detecting a time of passage of each laser beam and generating a detection signal in response thereto;

a plurality of picture element clock generating means corresponding to each one of said plurality of laser beams for generating picture element clock signals synchronized with said detection signals generated by said beam detecting means on the basis of said detection signals; optical modulating means for modulating the intensity of the laser beam; and

a plurality of image signal generating means corresponding to each of said plurality of laser beams for applying an

image signal to said optical modulating means after the picture element clock signal from said picture element



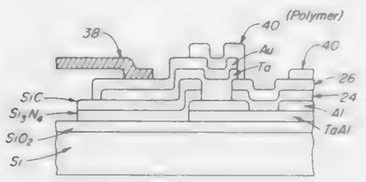
clock generating means is received and a predetermined number of picture elements are counted, said image signal being synchronized with said picture element clock signal.

4,862,197

PROCESS FOR MANUFACTURING THERMAL INK JET PRINTHEAD AND INTEGRATED CIRCUIT (IC) STRUCTURES PRODUCED THEREBY

John L. Stoffel, San Diego, Calif., assignor to Hewlett-Packard Co., Palo Alto, Calif.

Filed Aug. 28, 1986, Ser. No. 902,287
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R 5 Claims



5. A thin film interconnect structure including, in combination:

a. a resistive layer and a conductive trace pattern formed thereon disposed on a predetermined area of an insulating substrate, and said conductive trace pattern having an opening therein defining a resistive transducer element,

b. an insulating barrier layer formed atop said conductive trace pattern and having a surface geometry which exposes a predetermined area of said conductive trace pattern, and

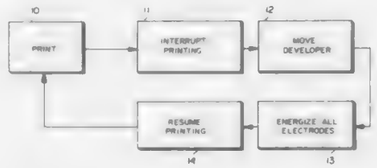
c. a metal overlay pattern extending from said predetermined area of said conductive trace pattern and down over and on an adjacent area of said insulating substrate under which no conductive trace pattern appears, whereby the metal on said adjacent area of said insulating substrate provides a relatively large and flat electrical contact area for receiving an electrical contact.

4,862,198

ELECTROSTATIC CLEANING OF ELECTRODES IN AN ELECTROGRAPHIC PRINTER

Robert S. Rizza, Manchester; Ben W. Fagen, Jr., Enfield; Michael W. Raymond, Bolton; Peter Feher, West Hartford, all of Conn.; Norman L. Milliard, Hampton, N.H., and Thomas B. Kegelman, Palm Harbor, Fla., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Oct. 6, 1988, Ser. No. 254,075
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—153.1 15 Claims



1. A method of cleaning a print head of an electrographic printer having an electrode array and electric means for selectively energizing the electrodes in the electrode array during normal printing, comprising the steps of sequentially:

(a) periodically temporarily interrupting electrographic printing with the print head;

(b) while printing is temporarily interrupted, activating substantially all of the electrodes of the electrode array with the same electric means that energizes selective electrodes during normal printing to effect cleaning of the electrodes; and

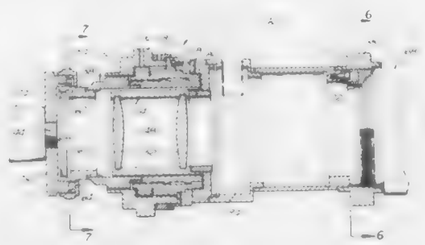
(c) resuming electrographic printing.

4,862,199

ADJUSTABLE ADAPTER FOR BORESCOPE AND FILM/VIDEO CAMERA

Mark Centkowski, Santa Monica; Steven E. Manios, Sr., Northridge, both of Calif., and James Weaver, Glaewyne, Pa., assignors to Innovision Optics, Inc., Santa Monica, Calif.

Filed Sep. 8, 1988, Ser. No. 241,715
Int. Cl.[4] G03B *29/00*
U.S. Cl. 354—62 23 Claims



1. An adapter for coupling a borescope or the like to a camera, comprising:

an adapter housing having a first end and a second end;

means for attaching the first end of the adapter housing to the borescope whereby a real image detected by the borescope is provided to the adapter;

means for attaching the second end of the adapter housing to the camera whereby the real image is directed by the adapter to a camera aperture;

a multi-element relay lens assembly within the housing having at least two optical pieces for directing the real image viewed by the borescope to the camera; and

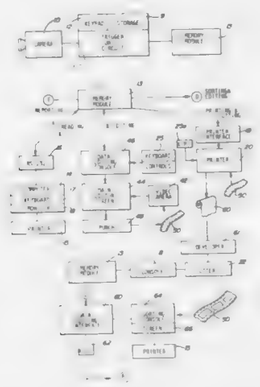
means for adjusting the longitudinal positioning of the relay lens assembly within the housing, the adjusting means providing a focus control for the relay lens assembly.

4,862,200

AUTOMATED PHOTOGRAPHIC APPARATUS

Ray Hicks, 2605 Corunna Rd., Flint, Mich. 48503-3362

Continuation-in-part of Ser. No. 914,000, Oct. 1, 1986, abandoned. This application Mar. 28, 1988, Ser. No. 172,805
Int. Cl.[4] G03B *29/00, 17/38, 27/52*; H04N *7/18*
U.S. Cl. 354—75 21 Claims



1. A method of storing, retrieving and utilizing data regarding the development of one or more photographic exposures of one or more photographic subjects, comprising:

(A) entry of said data in a temporary storage register;

(B) simultaneously (1) transferring said data from said temporary storage register to self-contained, removable non-volatile storage media and (2) operating the shutter of a photographic camera, exposing photographic film contained therein;

(C) retaining said data in said non-volatile storage media for an indefinite period of time;

(D) developing said film;

(E) transferring said developed film to an automated photographic printer; and

(F) utilizing said data to operate said automated printer, thereby exposing a section of photographic paper.

4,862,201

PHOTOGRAPHIC CAMERA

Nobuyuki Taniguchi; Yoshiaki Hata, both of Nishinomiya; Manabu Inoue, Kobe; Yoshinobu Kudo, Sakai; Takeo Hoda, Kawachinagano, and Hiroshi Ueda, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

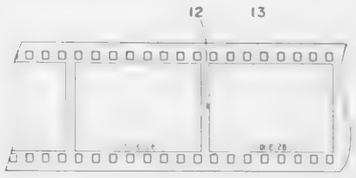
Continuation of Ser. No. 928,025, Nov. 7, 1986, abandoned. This application Jun. 7, 1988, Ser. No. 203,508
Claims priority, application Japan, Nov. 11, 1985, 60-252473; Nov. 11, 1985, 60-252474
Int. Cl.[4] G03B *17/24*
U.S. Cl. 354—105 5 Claims

1. A photographic camera system comprising:

means for selectively setting the camera system to one of a real focal length photographing mode in which an ordinary photographic zone of a film is to be printed and a pseudo focal length photographing mode in which a photographic zone of the film narrower than the ordinary photographic zone is to be printed;

means for recording mode setting data corresponding to a mode set by said setting means;

means for imprinting chronometric data at a predetermined common location of the film included within both the



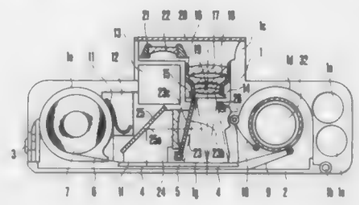
ordinary photographic zone and the narrower photographic zone.

4,862,202

MAGNIFICATION CHANGE-OVER DEVICE FOR CAMERA

Takayuki Tsuboi; Isao Nakazawa, both of Kanagawa; Yoshihiro Harunari, Tokyo; Yasuhisa Sato, Kanagawa, and Yasuyuki Yamada, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 213,451, Jun. 29, 1988, abandoned, which is a continuation of Ser. No. 129,919, Dec. 3, 1987, abandoned, which is a continuation of Ser. No. 866,328, May 22, 1986, abandoned. This application Dec. 5, 1988, Ser. No. 282,947
Claims priority, application Japan, May 23, 1985, 60-111804; May 23, 1985, 60-111805; May 23, 1985, 60-111806
Int. Cl.[4] G03B *3/00, 1/18*
U.S. Cl. 354—195.12 45 Claims



1. A magnification change-over device for a camera, comprising:

(a) an incident optical path for the incidence of the light of an object to be photographed;

(b) a first optical path for guiding the object light incident on said incident optical path to a first aperture;

(c) a second optical path for guiding said object light on said incident optical path to a second aperture;

(d) change-over means for selecting one of, said first and second optical paths said change-over means prohibiting the non-selected optical path from operating; and

(e) optical means for differentiating the magnification of an image formed through said second aperture from that of an image formed through said first aperture.

4,862,203

LENS DRIVING AND SHUTTER OPENING AND CLOSING DEVICE FOR A CAMERA

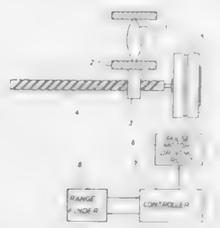
Saburo Sasaki, Tokyo; Keiji Himuro, Yokohama, and Shinichiro Koshiishi, Hachioji, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 35,513, Apr. 7, 1987. This application Feb. 12, 1988, Ser. No. 155,558

Claims priority, application Japan, Apr. 7, 1986, 61-50921; Apr. 19, 1986, 61-90950; Apr. 30, 1986, 61-100388; Apr. 30, 1986, 61-100389

Int. Cl.[4] G03B *3/10, 7/093*

U.S. Cl. 354—400 4 Claims



1. A lens driving and shutter opening and closing device for a camera, comprising:

a pulse motor adapted to rotate an output member by an angle proportional to the number of pulses of a pulse train supplied thereto and increase an output torque thereof when a pulse rate of said pulse train is reduced;

a member coupled to said output member of said pulse motor through a speed-reduction gear for driving a lens and opening and closing shutter blades of said camera selectively when said pulse motor rotates; and

control means for supplying a first pulse train having a first pulse rate to said pulse motor for driving said lens and supplying a second pulse train having a second pulse rate to said pulse motor for opening and closing said shutter blades,

said first pulse rate being smaller than said second pulse rate in order that said pulse motor produces an output torque required for driving said lens which is larger than that required for opening and closing said shutter blades and rotates at a speed required for opening and closing said shutter blades faster than that required for driving said lens.

4,862,204

FOCUS DETECTION DEVICE AND METHOD

Tokuji Ishida, Daito; Masataka Hamada, Osaka; Toshihiko Karasaki; Toshio Norita, both of Sakai, and Nobuyuki Taniguchi, Nishinomiya, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 946,486, Dec. 23, 1986, abandoned. This application Feb. 26, 1988, Ser. No. 160,581

Claims priority, application Japan, Dec. 25, 1985, 60-296034

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—408 8 Claims

1. A focus detection device comprising:

an objective lens;

optical means for forming first and second images of an object so that the relative position of said first and second images varies with the focus condition of said objective lens;

first and second image sensor arrays for sensing said first and second images and for producing first and second image signals representing the light intensity distributions of said first and second images, respectively;

calculation means for shifting one of said first and second image signals relative to the other to calculate correlations between said first and second image signals and thereby to find an amount of shift affording the highest correlation;

focus condition signal producing means for producing a focus condition signal representing the focus condition of said objective lens in accordance with said amount of shift found to afford the highest correlation;

control means for repeatedly operating said calculation means;

shift range restriction means for restricting the range of shift for a present correlation calculation by said calculation means, in accordance with said amount of shift found



through the last correlation calculation by said calculation means, to afford the highest correlation;

reliability determination means for determining the reliability of a correlation calculation of said calculation means; and

inhibition means for inhibiting the operation of said shift range restricting means, to permit said calculating means to calculate correlation over its entire permissible range of shift when the determination by said reliability determining means indicates that the calculation result of said calculation means was not reliable.

4,862,205

AUTO-BRACKET DEVICE FOR CAMERA

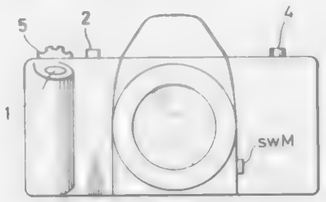
Masaharu Kawamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1987, Ser. No. 79,127

Claims priority, application Japan, Aug. 1, 1986, 61-179841; Aug. 1, 1986, 61-179842; Aug. 1, 1986, 61-179844; Aug. 1, 1986, 61-179845; Aug. 1, 1986, 61-179849; Aug. 1, 1986, 61-179852; Aug. 1, 1986, 61-179853

Int. Cl.[4] G03B *1/00, 7/00, 17/18, 17/40*

U.S. Cl. 354—412 10 Claims



1. An auto-bracket device for a camera for repeatedly carrying out a continuous exposure operation by an exposure control circuit and film feeding by a film feed circuit during manual actuation of a shutter release member, comprising:

(a) a variable exposure control circuit for varying a control exposure for each exposure control in an auto-bracket mode exposure control by said exposure control circuit;

(b) a detection circuit for detecting the number of photographing operations in the auto-bracket mode for determining whether a predetermined number of frames have been photographed with different exposures by said variable exposure control circuit; and

(c) an auto-bracket control circuit for causing the repetitive exposure operation in the auto-bracket mode until the end of photographing the predetermined number of frames is detected by said detection circuit, irrespective of the state of the shutter release member, and for stopping the repetitive exposure operation at the end of the photographing of the predetermined number of frames.

4,862,206

EXPOSURE CONTROL SYSTEM

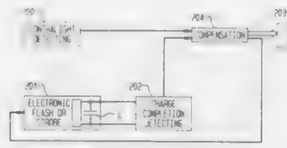
Hiroshi Ootsuka, Sakai; Shinji Tominaga, Chihayaakasaka; Haruo Kobayashi, Sakai; Shuzo Matsushita, Ikeda; Takeo Hoda, and Hiromu Mukai, both of Kawachinagano, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 89,924, Aug. 25, 1987, abandoned, which is a continuation of Ser. No. 878,844, Jun. 12, 1986, abandoned. This application Apr. 26, 1988, Ser. No. 186,756

Claims priority, application Japan, Oct. 12, 1984, 59-214788; Apr. 5, 1985, 60-73358; Apr. 5, 1985, 60-73359; Apr. 5, 1985, 60-73360; Apr. 5, 1985, 60-73361

Int. Cl.[4] G03B *15/05, 7/08;* G01J *1/42*

U.S. Cl. 354—414 9 Claims



1. An exposure control device for use in a flash photography, comprising:

light measuring means for receiving light from a scene to be photographed and outputting first data representative of the brightness of the relatively small area of the scene and second data representative of the brightness of the relatively large area of the scene;

electric flash means including a flash tube, a capacitor for storing electric energy for firing said flash tube, means for detecting whether a charging of said capacitor has been completed or not, and means for controlling the firing of said flash tube;

contralight detecting means for detecting a contralight condition based on the first and second data;

exposure control means for controlling a camera exposure to a first exposure value; and

exposure value correcting means for correcting the first exposure value to generate a second exposure value smaller than the first exposure value;

wherein said exposure control means controls the camera exposure to the first exposure value and said firing control means allows the firing of said flash tube with the charge completion of said capacitor and the contralight condition having been detected, while said exposure control means controls the camera exposure to the second exposure value and said firing control means inhibits the firing of said flash tube with the charge incompletion of said capacitor and the contralight condition being detected.

4,862,207

DIAPHRAGM APPARATUS FOR CAMERA

Yasuo Asakura, and Toshiyuki Toyofuku, both of Hachioji, Japan, assignors to Olympus Optical Company Limited, Japan

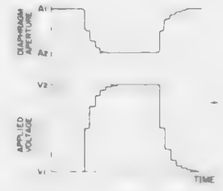
Filed May 18, 1988, Ser. No. 193,045

Claims priority, application Japan, May 21, 1987, 62-124614; Jun. 24, 1987, 62-158552

Int. Cl.[4] G03B *9/02*

U.S. Cl. 354—453 41 Claims





1. A diaphragm control apparatus for a camera, comprising:

(a) voltage-displacement conversion means for producing a displacement which is controlled in accordance with an applied voltage level;

(b) a diaphragm drive mechanism connected to the conversion means and operated by the displacement of the conversion means to achieve an aperture corresponding to such displacement;

(c) diaphragm controlling information generating means for determining a diaphragm aperture and generating an electrical signal representing diaphragm controlling information; and

(d) a control unit connected to the diaphragm controlling information generating means and receiving the electrical signal, the control unit producing a voltage required by the conversion means in order to obtain the determined aperture, the control unit controlling its output voltage to change the voltage gradually from zero to approach the required voltage with time and to gradually return the voltage to zero after the completion of the exposure operation.

4,862,208

INFORMATION TRANSMITTING DEVICE FOR CAMERA

Akira Yamada, Kanagawa, and Ichiro Ohnuki, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 211,086, Jun. 21, 1988, abandoned, which is a continuation of Ser. No. 828,957, Feb. 12, 1986, abandoned. This application Dec. 19, 1988, Ser. No. 287,565

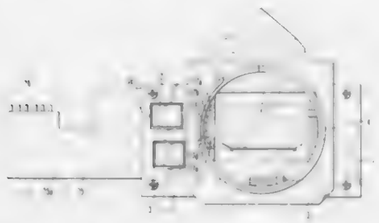
Claims priority, application Japan, Feb. 14, 1985, 60-027194

Int. Cl.[4] G03B *7/00*

U.S. Cl. 354—485 10 Claims

1. An information transmitting device for a camera body incorporated with a detachable front panel construction unifying therein a focal detection device including an AF optical system and a light sensor, comprising:

(a) a circuit for AF control in said camera body;
(b) a circuit for camera sequence control other than said AF control in said camera body;
(c) a flexible printed circuit board having said circuit for AF control fabricated therein, said board being mounted on a wing portion of said front panel construction;
(d) camera side signal transmitting pins electrically connected to circuit patterns on said flexible printed circuit board, said pins being arranged, upon attachment of a



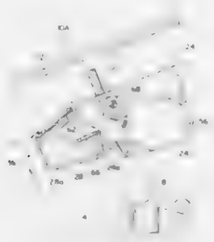
photographic lens to said camera body, to contact with signal transmitting pins of said photographic lens, so that electrical signals related to the AF control are transmitted therebetween; and
(e) a large size chip element electrically connected to said flexible printed circuit board and substantially rigidly held in said wing portion in said front panel construction, said large size chip element overlapping with said wing portion and having a connection terminal formed on both sides to connect said board.

4,862,209

IMAGE FORMING APPARATUS HAVING A REMOVABLE IMAGE FORMING PROCESS KIT

Koji Sakamoto, Tokyo, and Misao Tanzawa, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 4, 1988, Ser. No. 164,134
Claims priority, application Japan, Mar. 5, 1987, 62-48690; Mar. 5, 1987, 62-48691; Mar. 5, 1987, 62-48693
Int. Cl.[4] G03G *21/00, 15/00*
U.S. Cl. 355—211 **17 Claims**



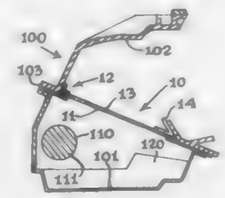
1. An image recorder having an image carrier and a plurality of process units which are arranged around said image carrier, said image carrier and said process units being individually removably mounted in a body of said image recorder which is constituted by an upper and a lower unit, said upper unit being openable away from said lower unit, said image recorder comprising:
a process kit constituting said upper unit and in which said process units are assembled integrally with each other; and
control means for controlling opening and closing movements of said upper unit relative to said lower unit wherein said process units comprise a cleaning unit having a collecting section which stores a developer collected from said image carrier and has an opening which faces said image carrier and wherein said image recorder further comprises a closure means interlocked with an opening movement of said upper unit relative to said lower unit for blocking said opening of said cleaning unit.

4,862,210

REPLACEABLE SEAL ASSEMBLY FOR TONER CARTIDGES AND METHOD OF USE

Lee G. Woolley, El Paso County, Colo., assignor to Xerox Computer Products, Inc., Ann Arbor, Mich.

Filed Feb. 25, 1988, Ser. No. 160,558
Int. Cl.[4] G03G *15/00*; B65B *1/04, 3/04, 31/00*
U.S. Cl. 355—245 **8 Claims**



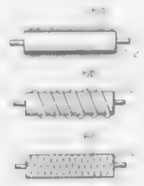
1. In a used developer station wherein the unused developer station originally comprised: a toner reservoir housing having a toner inlet port and an original toner reservoir seal; and, a roller housing joined along its common edges with the toner reservoir housing wherein the roller housing includes a roller assembly, and a metering blade assembly; and, wherein the removal of the original toner reservoir seal converts the new developer station to a used developer station and creates a peripheral recess in the interior walls of the developer station wherein the recess is defined by an upper ledge and a lower ledge, an improvement comprising:
a seal assembly including a seal unit wherein the seal unit comprises a generally rigid seal member that is dimensioned to be received, removed and reengaged on the peripheral recess in said used developer station.

4,862,211

IMAGE-FORMING BELT SUPPORTING APPARATUS

Atsushi Kutami; Akira Hashimoto, and Yoshihiro Takada, all of Numazu, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Jun. 10, 1987, Ser. No. 61,055
Claims priority, application Japan, Jun. 19, 1986, 61-93948[U]; Jul. 18, 1986, 61-169460[U]; Sep. 17, 1986, 61-[illegible][U]
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—212 **9 Claims**



1. In an apparatus used in conveying and rotating an image-forming belt used in electrophotographic and electrostatic processes while supporting said belt by at least two rolls, the improvement comprising:
the peripheral surface of at least one of said rolls has short

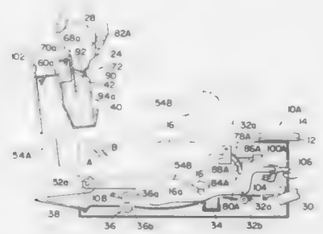
fibres embedded therein and projecting outwardly therefrom or has thread or cloth wrapped therearound, the length, diameter and number of said fibres being respectively about 0.1–2 mm, about 0.5–5 denier and about 1,000–100,000 pieces/cm^2, the diameter and interval of said thread being respectively about 0.1–2 mm and about 0.1–2 mm, and the mesh of said cloth being about 50–400.

4,862,212

IMAGE FORMING APPARATUS

Misao Tanzawa, Kawasaki; Koji Sakamoto, and Mitsuru Satoh, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 2, 1988, Ser. No. 163,027
Claims priority, application Japan, Mar. 3, 1987, 62-30914; Mar. 3, 1987, 62-30915
Int. Cl.[4] G03G *15/00, 21/00*
U.S. Cl. 355 **7 Claims**



1. In an image forming apparatus having at least a housing, an image carrier in said housing for carrying an electrostatic latent image thereon, a developing device for developing said latent image to produce a visible image, and a cleaning device for forming a developer, a combination comprising:
a unit rotatable body rotatably supported relative to said housing for movement between an operative position and an inoperative position, wherein when said unit rotatable body is in said operative position, said developing and cleaning devices are positioned adjacent said image carrier with an opening defined between said developing and cleaning devices for accommodating said image carrier,
means for pivotally supporting said developing and cleaning devices on said unit rotatable body, wherein said developing and cleaning devices together comprise an image forming unit; and
positioning means for positively rotating said developing and cleaning devices relative to one another when said unit rotatable body is rotated between said operative and inoperative positions,
wherein said positioning means comprises means for positioning said image forming unit relative to said image carrier when said unit rotatable body is rotated between said operative and inoperative positions and guide means for guiding at least one of said developing and cleaning devices to rotate about said means for pivotally supporting such that said image forming unit does not interfere with said image carrier, wherein said guide means comprises means for guiding said developing and cleaning devices such that when said unit rotatable body is moved from said operative position to said inoperative position, said developing and cleaning devices rotate about said pivots means for pivotally supporting so as to close said opening and, when said unit rotatable body is moved from said inoperative position to said operative position, said developing and cleaning devices rotate about said means for pivotally supporting so as to open said opening.

4,862,213

IMAGE FORMING APPARATUS AND METHOD

Issey Ichihara, Funabashi; Kenshi Toshimitsu, Kawasaki, and Natsuki Tachibana, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Oct. 30, 1987, Ser. No. 114,761
Claims priority, application Japan, Oct. 31, 1986, 61-259704; Oct. 31, 1986, 61-259713
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—245 **12 Claims**





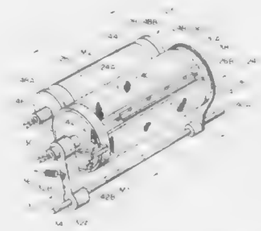
1. An image forming apparatus comprising:
storage means for initially storing a two-component developing agent containing a carrier and a first toner;
replenishment means for continuously resupplying a second toner to the two-component developing agent in the storage means in proportion to the consumption of the first toner, said first and second toners being of different types, the amount of charge on the first toner increasing with time and the amount of charge on the second toner decreasing with time; and
developing means for developing an electrostatic latent image by means of the two-component developing agent.

4,862,214

IMAGE FORMING APPARATUS

Nobuo Kasahara, and Tosio Nakahara, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 2, 1988, Ser. No. 163,084
Claims priority, application Japan, Mar. 2, 1987, 62-46994
Int. Cl.[4] G03G *15/00, 15/14*
U.S. Cl. 355—377 **35 Claims**



1. A device for positioning relative to each other a first and a second body which are movably driven independently of each other, comprising:
a base constituting said first body;
a first contact surface member provided on a part of said base;

a frame constituting said second body and having an opening formed therethrough; and

a second contact surface member provided on and supported by a part of said frame and closing said opening, said second contact surface member making contact with said first contact surface member;

said first contact surface member having a width in a direction perpendicular to a driven direction of movement of said first body which is smaller than a width of said opening of said frame in a direction perpendicular to a driven direction of movement of said second body.

4,862,215

IMAGE FORMING APPARATUS

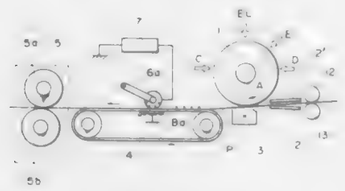
Akihiro Nomura, Yokohama; Kiyokazu Namekata, Machida; Mitsuru Kurata, Kawasaki; Takuji Niizawa, Tokyo; Tokihide Ebata, Tokyo, and Shinichi Sasaki, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 183,485, Apr. 15, 1988, abandoned, which is a continuation of Ser. No. 873,535, Jun. 12, 1986, abandoned. This application Dec. 15, 1988, Ser. No. 285,371

Claims priority, application Japan, Jun. 15, 1985, 60-133539

Int. Cl.⁴ G03G *15/20, 21/00*

U.S. Cl. 355—309 **18 Claims**



1. An image forming apparatus comprising:

transfer means for transferring a toner image to a sheet-like medium;

a pair of fixing rollers which are held in pressure contact with each other such that the nip line formed therebetween does not orthogonally cross the direction of feed of said sheet-like medium, thereby to form a curl in said sheet-like medium when said sheet-like medium passes between said fixing rollers;

sheet feeding means arranged along a feed passage extending from the position of said transfer means to the position of said fixing rollers, said feeding means being capable of feeding said sheet-like medium in contact only with a first surface of said sheet-like medium; and

first and second rollers disposed downstream of said transfer means and spaced apart from each other in the direction perpendicular to the direction of feed of said sheet-like medium, said first and second rollers being adapted for rotating in contact with a second surface of said sheet-like medium opposite to said first surface, said first and second rollers being arranged such that they diverge in the downstream direction so as to impart a breadthwise tension to the curl in said sheet-like medium;

wherein the second surface of said sheet-like medium is contacted only by said first and second rollers during feeding from said transfer means to said fixing rollers, and wherein the length of said feed passage extending from the position of said transfer means to the nip of said fixing rollers is shorter than the length of said sheet-like medium.

4,862,216

MULTICOLOR COPYING APPARATUS

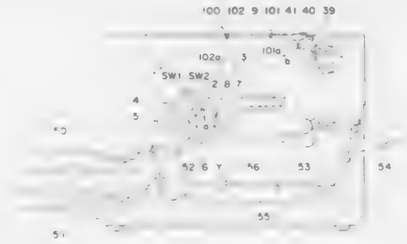
Toshikazu Higashi, and Masazumi Ito, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 26, 1988, Ser. No. 148,625

Claims priority, application Japan, Jan. 28, 1987, 62-18847; Feb. 12, 1987, 62-30004; May 21, 1987, 62-124159

Int. Cl.⁴ G03G *15/00, 15/01*

U.S. Cl. 355—218 **30 Claims**



1. A copying apparatus comprising:

an original document placing plate which is disposed at a predetermined place of a housing of the copying apparatus and on which an original document is placed;

an electrostatic latent image holding member rotatably supported in the housing of the copying apparatus;

means for forming an electrostatic latent image, disposed in the vicinity of said original document placing plate, for exposing an image of the original document placed on said original document placing plate so as to form an electrostatic latent image, corresponding to the image of the original document, on said electrostatic latent image holding member;

a developing means which is disposed in the periphery of said electrostatic latent image holding member in the housing of the copying apparatus, and has at least a first developing unit housing a first developer and a second developing unit housing a second developer different in the color thereof from the color of the first developer housed in the first developing unit;

a supply means, disposed at a predetermined place of the housing of the copying apparatus, for supplying a material to be copied sequentially to said electrostatic latent image holding member;

a transfer means, disposed in the periphery of said electrostatic latent image holding member in the housing of the copying apparatus, for transferring the developed image to the material to be copied supplied by said supply means;

a switching means for switching a copy mode from a first mode in which a monochrome copying operation is carried out by selecting any one of the developing units to a second mode in which a plural color copying operation is carried out during one image exposure operation and vice versa;

a developing unit selection means for selecting and specifying any one of the developing units when the first mode is specified by said switching means;

a first mode copying operation means for carrying out a monochrome copying operation when the first mode is specified by said switching means;

a region specifying means for specifying a region of the original document image to be developed by the first developer so as to be copied and a region of the original document image to be developed by the second developer so as to be copied;

a drive means for driving either the first developing unit or the second developing unit during one image exposure operation according to a region specified by said region specifying means in the housing of the copying apparatus so as to supply said electrostatic latent image holding member with the developer housed either in the first developing unit or in the second developing unit so as to develop the electrostatic latent image formed on said electrostatic latent image holding member;

a second mode copying means for carrying out a copying operation in the second mode when the second mode is specified by said switching means;

a storing means for storing a developing unit which has been selected in the first mode when a copy mode is switched by said switching means from the first mode to the second mode;

a return control means for automatically selecting a developing unit stored by said storing means when a copy mode is switched from the second mode to the first mode by said switching means.

4,862,217

COPYING APPARATUS AND METHOD WITH EDITING AND PRODUCTION CONTROL CAPABILITY

Matthew J. Russel, Mendon, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 132,637, Dec. 9, 1987, Pat. No. 4,777,510, which is a continuation of Ser. No. 940,695, Dec. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 809,547, Dec. 16, 1985, abandoned. This application Oct. 7, 1988, Ser. No. 254,998

Int. Cl.⁴ G03G *15/00, 15/01*

U.S. Cl. 355—218 **14 Claims**



1. Apparatus for reproducing a multisheet document, at least some of the document sheets having image information with accompanying indicia thereon indicating that such sheet is to be specially treated, the apparatus comprising:

an image recording member;

an exposure station including means for serially exposing the recording member with image information on the document sheets without reproducing the indicia upon the recording member;

scanning means for scanning each document sheet seriatim prior to exposing of same on the recording member for determining the presence or absence of said indicia on any document sheet and for generating a signal in accordance with such determination; and

means responsive to said signal for determining the number of exposures of a particular document sheet at the exposure station with each document sheet receiving at least one exposure upon the image recording member.

4,862,218

SUPPORT AND ADJUSTING APPARATUS FOR AN OPTICAL UNIT

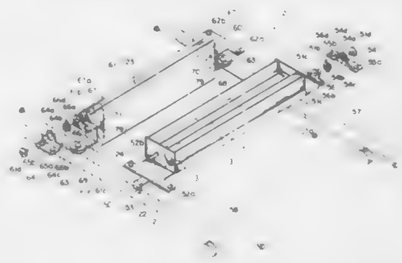
Arihiro Tsunoda, Higashiosaka; Kikunosuke Tsuji, Sakai; Akira Nakakuma, Takaishi, and Tetsuya Matsushita, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Sep. 28, 1987, Ser. No. 101,921

Claims priority, application Japan, Sep. 30, 1986, 61-232250; Sep. 30, 1986, 61-232251

Int. Cl.⁴ G03G *15/28, 15/00;* **G03B** *27/32, 27/54*

U.S. Cl. 355—235 **8 Claims**



1. A supporting apparatus for an optical unit comprising a first reciprocatingly movable supporting frame body equipped with a light source to illuminate an original set on a contact glass, a second reciprocatingly movable supporting frame body equipped with a reflecting mirror to reflect light reflected from the original, at least one of the supporting frame bodies having first and second ends which have sliding means mounted thereon, said sliding means on the first end of the supporting frame body including a pair of spaced apart sliding members which are normally fixed relative to the supporting frame body, sliding means on the second end of the supporting frame body, and an eccentric cam mechanism provided on said second end of the supporting frame body for adjustably connecting the second end of the supporting frame body to its respective sliding means, said eccentric cam comprising the only connection between the second end of the supporting frame body and the respective sliding means so that the supporting frame body is supported at only three points.

4,862,219

COPYING APPARATUS

Nobutoshi Yoshida; Nobuyuki Miyke, both of Yokohama; Atsushi Takagi, Tokyo; Takashi Saito, Ichikawa; Tadashi Suzaki, Yokohama; Naoyuki Ohki, Tokyo; Masahiro Tomosada, Kawasaki; Hideki Adachi, Kawasaki, and Hiroaki Takeda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 830,745, Feb. 19, 1986, abandoned. This application Mar. 10, 1988, Ser. No. 169,132

Claims priority, application Japan, Feb. 21, 1985, 60-033278; Mar. 8, 1985, 60-047241; Mar. 8, 1985, 60-047242; Mar. 8, 1985, 60-047244; Mar. 28, 1985, 60-064248; Mar. 28, 1985, 60-064249; Mar. 28, 1985, 60-064250; Jun. 5, 1985, 60-120380

Int. Cl.⁴ G03G *15/00, 15/01*

U.S. Cl. 355—202 **73 Claims**

1. A copying apparatus comprising:

means for designating a first area, which is surrounded in two dimensions, of an original, wherein said designating means includes coordinate input means for inputting coordinates of said first area;

first visualizing means for visualizing an image of said first area in a first color in response to said coordinates input by said coordinate input means; and

second visualizing means for visualizing an image of a second area, of said original, different from said first area in a

second color different from said first color, wherein said second visualizing means automatically visualizes said

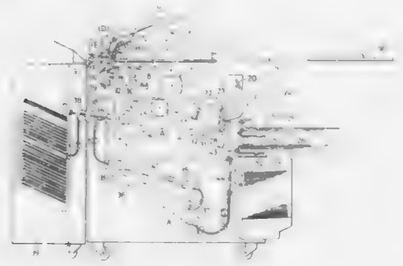


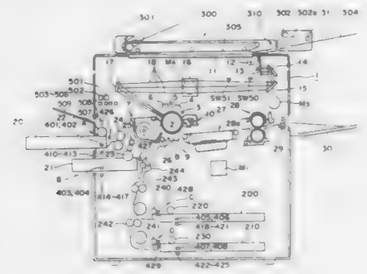
image of said second area after said first visualizing means has visualized said image of said first area.

4,862,220

COPYING MACHINE

Masazumi Ito, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 5, 1988, Ser. No. 215,400
Claims priority, application Japan, Jul. 6, 1987, 62-169314
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—311 5 Claims



1. A copying machine comprising:
a document placing table;
document transporting means for placing a document on said document placing plate and transporting the document therefrom after a copying operation finishes;
image forming means for forming an image of the document placed on said document placing plate on a copying paper;
a plurality of automatic paper feeding means for holding plural copying papers respectively, one of said automatic paper feeding means being selected and feeding one copying paper to said image forming means at a time;
manual paper feeding means for feeding a manual set copying paper to said image forming means;
means for detecting a size of the document;
means for detecting a size of each copying paper held in each automatic paper feeding means;
switching means for switching an operating state of said automatic paper feeding means into a non-operating state thereof and switching a non-operating state of said manual paper feeding means into an operating state thereof;
copying operation instruction output means for outputting a copying operation instruction;
first control means for placing the document on said document placing table by said document transporting means in response to the copying operation instruction outputted from said copying operation output means;
second control means for selecting one of said automatic paper feeding means holding at least one copying paper having a size corresponding to a size of the document after the document places on said document placing plate, controlling said image forming means to form an image of the document on the copying paper fed from said selected automatic paper feeding means, and controlling said document transporting means to discharge the document from said document placing table after an image of the document is formed thereon;
third control means for controlling to prohibit from operating said image forming means and to hold the document on said document placing table, after the document is placed on said document placing table, when there is no automatic paper feeding means holding a copying paper having a size corresponding to a size of a document; and
forth control means for canceling the prohibition of the operation of said image forming means in response to said switching means when said third control means prohibits the operation of said image forming means.

4,862,221

CLEANING DEVICE

Kenji Tabuchi, and Tomohisa Kanada, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 24, 1988, Ser. No. 198,928
Claims priority, application Japan, May 27, 1987, 62-130270
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—300 18 Claims



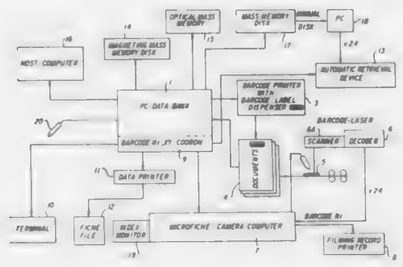
1. In electrophotographic recording machines wherein residual toners or the like remaining on an image bearing member are scraped off from the image bearing member by a cleaning device after a toner image formed on the image bearing member is transferred onto a sheet, the cleaning device comprising:
a cleaning web with a regularly formed concave-convex pattern; and
means for bringing the cleaning web in pressing contact with the image bearing member.

4,862,222

DOCUMENT FILMING APPARATUS AND PROCESS

Eckhard Stande, and Juergen Kaus, both of Woelfersheim, Fed. Rep. of Germany, assignors to Stande Foto-Chemi Eva Stande, Fed. Rep. of Germany

Filed Apr. 28, 1988, Ser. No. 187,155
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—40 11 Claims



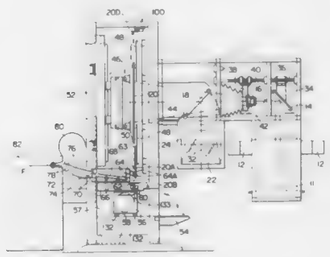
1. A microfilming method comprising the steps of:
entering a document specific identification and search code into a computer;
indexing a memory address corresponding to a document in accordance with said document specific identification code and reserving data storage space under said memory address;
storing fiche image position data corresponding to a coordinate position of an image of a document on a fiche in said data storage space upon filming said document.

4,862,223

PROCESS CAMERA FOR REPRODUCING MULTIPLE IMAGES ON SINGLE FILM

Miyuki Yamashita, Tokyo, Japan, assignor to Mitsubishi Paper Mills Limited and Hirakawa Kogyosha Co., Ltd., both of Tokyo, Japan

Filed Jun. 15, 1988, Ser. No. 206,843
Claims priority, application Japan, Jun. 18, 1987, 62-151753; Jun. 18, 1987, 62-151754; Jun. 18, 1987, 62-93665[U]
Int. Cl.[4] G03B *27/44*
U.S. Cl. 355—54 8 Claims



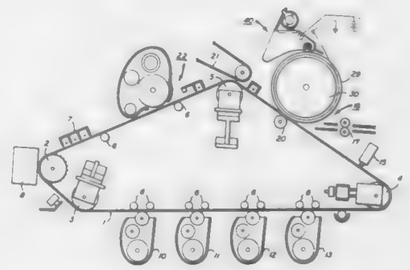
1. A process camera comprising:
a subject holder for supporting one, at a time, of a plurality of originals each composed of a page or a combination of pages;
an object lens;
a movable platen for mounting a photosensitive member thereon, said movable platen being associated with movable mask plates, said subject holder, said object lens, and said movable platen being successively arranged in the order named along an optical path from said subject holder toward said platen through said object lens; and
the arrangement being such that said originals can successively be supported on said subject holder and exposed to light to produce respective images thereof which are focused by said object lens and reproduced on said photosensitive member according to a programmed sequence.

4,862,224

CLEANING DEVICE FOR ELECTROSTATIC IMAGING APPARATUS

Wayne W. Ku, Henrietta, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 4, 1988, Ser. No. 177,292
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—200 16 Claims



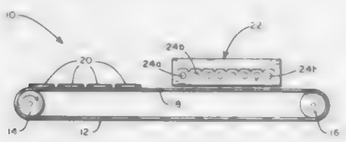
1. Electrostatic imaging apparatus comprising:
a transfer drum having an external cylindrical surface;
means for applying an electrical bias of a first potential to said transfer drum to urge toner to transfer from an imaging member to a transfer surface associated with said drum, said transfer surface either being the cylindrical surface of the drum itself or the surface of a transfer sheet carried by the cylindrical surface of the drum;
means for cleaning the cylindrical surface of said drum, said cleaning means being moveable from a first position out of cleaning relation with said cylindrical surface to a second position in cleaning relation with said cylindrical surface;
means moveable into engagement with said drum for applying to said drum a bias of a second potential different from said first potential, and
means for applying an electrical bias to said cleaning means having a third potential urging toner from said cylindrical surface to the cleaning means with respect to said second potential associated with said drum; and
means for controlling the engagement of said second potential applying means with said drum in response to movement of said cleaning means from its second position to its first position.

9. A disposable cleaning device for cleaning a surface in an electrostatic apparatus, comrising:
a one-piece molded housing shaped to provide a chamber to permanently collect toner;
a cleaning roller journaled for rotation in said housing and having a soft surface for cleaning toner from a transfer drum;
a scraper blade positioned to contact said roller for removing toner therefrom and for depositing it in said chamber; and
pivot means axially aligned and molded into opposite walls of the housing to engage complementary structure on a receiving apparatus to support said housing for pivotal movement about an axis parallel with said roller.

4,862,225
POWER SUPPLY SEQUENCING CIRCUIT FOR FLASH FUSER

Glenn H. Heiller, Minnetonka, and Michael P. Petersen, Eagan, both of Minn., assignors to Check Technology Corporation, Eagan, Minn.

Filed Mar. 21, 1988, Ser. No. 170,923
Int. Cl.[4] G03G *15/00*; H05B *1/00, 3/02*
U.S. Cl. 355—288 6 Claims



1. A circuit for controlling the operation of a plurality of flash lamps used to fuse toner particles to paper sheets in a xerographic printing system wherein the number of lamps energized is dependent upon the side of said paper sheets, comprising:

(a) a plurality of flash lamps positioned orthogonally to the direction of flow of said paper sheets through said xerographic printing system;

(b) at least one energy storage capacitor operatively and individually coupled to each of said flash lamps;

(c) capacitor charging circuit means, each including electronic switch means disposed in series between said energy storage capacitors for each of said flash lamps and a source of alternating current voltage;

(d) sequencing means for producing control signals for turning on said electronic switch means in said capacitor charging circuit means at predetermined discrete sequential time intervals whereby said energy storage capacitors are connected said charging circuits means in a timed sequence, said sequencing means including

(i) a zero-crossing detector circuit coupled to said source of alternating current voltage for producing clocking pulses at each zero-crossing of said alternating current voltage;

(ii) frequency dividing means coupled to the output of said zero-crossing detector circuit; and

(iii) shift register means coupled to the output of said frequency divider means for generating said control signals in a predetermined time serial order

(e) gating means coupled to receive said control signals and capacitor circuit identification signals for selectively applying said control signals to said electronic switch means only in particular identified ones of said capacitor charging circuit means; and

(f) trigger means for simultaneously applying a flash lamp triggering signal simultaneously to all of said flash lamps whereby only whose flash lamps identified by said charging circuit identification signal will be flashed.

4,862,226
REFILL AND WASTE TONER CONTAINER WITH FORM CHANGING MEMBER

Masaru Imaizumi, and Hiroyoshi Hayama, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 17, 1988, Ser. No. 156,661
Claims priority, application Japan, Feb. 20, 1987, 62-23988[U]
Int. Cl.[4] G03G *15/00, 21/00*; B21F *45/16*; B65D *1/02*
U.S. Cl. 355—298 15 Claims

1. A toner container arrangement for detachable attachment to a developing device for supplying developing agent to said developing device, and, after developing agent has been supplied to said developing device for detachable attachment at a position suitable for recovering developing agent remaining on an electrostatic latent image carrier, the toner container arrangement comprising:

a main toner container body for accommodating developing agent therein, said main toner container body including an upper portion;

a mouth formed in said upper portion of said main toner container body, said mouth including an opening through which developing agent is supplied and recovered; and

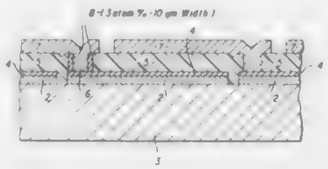
an attaching member means attachable to said mouth of said main toner container body without obstructing said opening of said mouth, said attaching member means fixed to said mouth when said main toner container body is disposed at said position suitable for recovering developing agent remaining on said electrostatic image carrier and after said main toner container body has supplied developing agent to said developing device, and said attaching member means, when attached to said main toner container body, rendering said main toner container body unable to be reattached to said developing device to supply developing agent to said developing device.



4,862,227
SEMICONDUCTOR DEVICE AND ITS MANUFACTURING METHOD

Kazunori Tsuge, Kobe; Shinji Kuwamura, Takasago, and Yoshihisa Tawada, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 832,621, Feb. 25, 1986, abandoned.
This application Jan. 17, 1989, Ser. No. 298,282
Claims priority, application Japan, Feb. 27, 1985, 60-39909
Int. Cl.[4] H01L *45/00, 23/48, 27/02*
U.S. Cl. 357—2 3 Claims

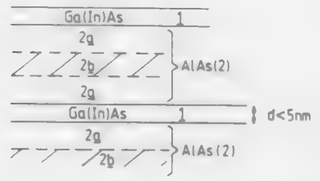


1. A semiconductor device comprising a substrate, separate electrodes formed on the substrate and a semiconductor layer formed over the electrodes; said semiconductor layer: (1) comprising an amorphous semiconductor material and (2) being obtained by forming a layer comprising an amorphous semiconductor material over the electrodes and thereafter cutting through said layer with a laser scribe in an oxidative environment to form a scribed end face, the semiconductor layer having a mean oxygen content of 0.5–10 atom % in a portion thereof between the scribed end face and a distance 10–50 μm away from the scribed end face.

4,862,228
HIGH MOBILITY SEMICONDUCTOR DEVICES

Hugh I. Ralph, Lewes, England, assignor to U.S. Philips Corp., New York, N.Y.

Filed Apr. 15, 1987, Ser. No. 38,806
Claims priority, application United Kingdom, Apr. 16, 1986, 8609337
Int. Cl.[4] H01L *29/203, 29/205, 29/80*
U.S. Cl. 357—4 15 Claims

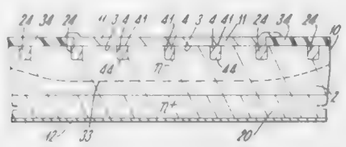


1. A high mobility semiconductor device having a conduction channel of p type conductivity formed as at least one quantum well, the quantum well being a heterostructure provided by a layer of narrow bandgap semiconductor material located between p type doped barrier layers of wide bandgap semiconductor material, the semiconductor materials each having cubic lattice symmetry, the channel extending longitudinally along the plane of the quantum well with conduction holes of the channel being confined in the direction of thickness of the layers by the quantum well, and comprising means for increasing the mobility of conduction holes in said channel by making the quantum well width less than 5 nm and the quantum well depth sufficiently deep such that conduction along the channel is by holes of reduced mass having at 300 degrees K. a mobility in excess of 2.5 times the mobility at 300 degrees K. of conduction holes in bulk material of said narrow bandgap semiconductor which is not intentionally doped.

4,862,229
SEMICONDUCTOR SCHOTTKY DEVICES HAVING IMPROVED VOLTAGE BLOCKING CHARACTERISTICS

Stephen J. Mundy, Manchester, and John M. Shannon, Whyteleafe, both of England, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 90,421, Aug. 26, 1987, abandoned, which is a continuation of Ser. No. 860,274, May 6, 1986, abandoned. This application Feb. 6, 1989, Ser. No. 309,017
Claims priority, application United Kingdom, Jun. 10, 1985, 8514625
Int. Cl.[4] H01L *29/48*
U.S. Cl. 357—15 6 Claims

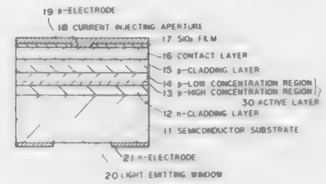


1. A semiconductor device comprising a semiconductor body having a body portion of a first conductivity type, a metal-based layer at a surface of the body and forming an active Schottky barrier with said body portion at a plurality of separate areas, and a plurality of closely-spaced field-relief regions of a second, opposite conductivity type at said surface of the body and extending only partly through said body portion, each of which field-relief regions forms with the body portion a p-n junction which extends to a depth in the body below that of the active Schottky barrier, the separate areas of the active Schottky barrier being located between the closely-spaced field-relief regions, the closely-spaced field-relief regions being distributed throughout the width of said active Schottky barrier and being contacted at said surface by the metal-based layer and being sufficiently closely spaced such that in operation depletion layers extending in the body portion from neighboring field-relief regions merge together under reverse-bias of the active Schottky barrier, and means for establishing a sufficiently low conductivity-type determining dopant concentration of the field-relief regions of less than about 5×10^{16} cm^{-3} at the surface where contacted by the metal-based layer to form with the metal-based layer a further Schottky barrier which is in series with the p-n junction between the field-relief regions and the body portion, thus restricting the flow of minority carriers into the body portion under forward-bias of the active Schottky barrier.

4,862,230
DOUBLE HETEROSTRUCTURE LIGHT EMITTING DIODE

Toshio Uji, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 14, 1987, Ser. No. 95,712
Claims priority, application Japan, Sep. 12, 1986, 61-216505
Int. Cl.[4] H01L *33/00*
U.S. Cl. 357—17 5 Claims



1. A double heterostructure semiconductor light emitting diode comprising,

a double heterostructure provided on a semiconductor substrate including a p-active layer, and n and p-cladding layers respectively provided on the both sides of said p-active layer, and

means for applying a predetermined level of voltage across said n and p-cladding layers,

wherein said p-active layer is doped with a p-impurity such that the concentration thereof is distributed therein to be higher in a region proximate to the p-n junction between said p-active and n-cladding layers than in the region of said p-active layer proximate the p-p junction between said p-cladding layer and said p-active layer, whereby said region proximate to the p-p junction provides a high speed electron-hole recombination, and said region of said p-active layer proximate to said p-p junction decreases the p-impurity concentration in the light emitting and recombination region of said active layer to maintain a high light output.

4,862,231
NON-CONTACT I/O SIGNAL TRANSMISSION IN INTEGRATED CIRCUIT PACKAGING

Robert J. Abend, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Continuation-in-part of Ser. No. 767,703, Aug. 22, 1985, abandoned, which is a continuation of Ser. No. 553,115, Nov. 18, 1983, abandoned. This application Feb. 7, 1986, Ser. No. 827,285
Int. Cl.[4] H01L *31/12, 23/02, 27/14*; G02B *6/12*
U.S. Cl. 357—19 8 Claims

1. A packaged integrated circuit comprising:

a semiconductor die including silicon regions and electro-optical conversion material regions;

a housing encompassing said die;

a plurality of circuits in said silicon regions of said die, each having input and output nodes located in an array throughout the central area of the die spaced from the periphery of said die;

a plurality of transmission means in said electro-optical conversion material regions of said die in an array throughout said central area each adjacent to and electrically connected to a respective output node for generating an optical signal as a function of a signal at said respective output node;

a plurality of receiving means in said electro-optical conversion material regions of said die, in an array throughout said central area each adjacent and electrically connected to a respective input node for generating an electrical signal at said respective input node as a function of an optical signal applied thereto;

a plurality of apertures in an array in said housing, each aperture being juxtaposed a respective transmitting or receiving means; and

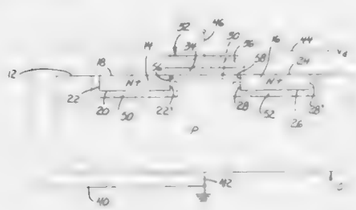
a plurality of optical conduits mounted in a respective aperture in said housing and separated from said die by a space for optically connecting a respective transmitting or receiving means in said die to the exterior of said housing.

4,862,232

TRANSISTOR STRUCTURE FOR HIGH TEMPERATURE LOGIC CIRCUITS WITH INSULATION AROUND SOURCE AND DRAIN REGIONS

Han-Sheng Lee, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 22, 1986, Ser. No. 909,565
Int. Cl.⁴ H01L *29/78*
U.S. Cl. 357—23.1 **7 Claims**



1. A field effect transistor device, comprising:

a homogeneous monocrystalline silicon substrate having a surface and a thickness, and being of a first conductivity type and doping concentration substantially throughout its thickness, except as hereinafter defined;

a source region of a second conductivity type, said source region being recessed in the substrate and adjacent the substrate surface and having a surface in the substrate;

a drain region, spaced apart from the source region and being of the second conductivity type, said drain region being recessed in the substrate and adjacent the substrate surface and having a surface in the substrate;

a channel region in said monocrystalline substrate disposed between the closest portions of the respective surfaces of the source and drain regions within the substrate, a channel in said channel region adjacent said substrate surface and being shallow relative to the greatest spacings of said surfaces of the source and drain regions from the substrate surface;

source and drain region insulating layers, respectively contacting substantially the entirety of those portions of the surfaces of the source and drain regions disposed in said substrate, including the majority of facing surface portions of said source and drain regions but not including those facing surface portions intersecting the channel region; and

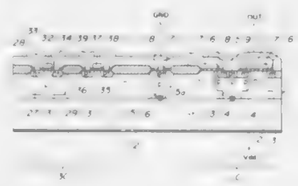
an electronic gate on the substrate surface adjacent the channel region for affecting the electric field in the channel region.

4,862,233

INTEGRATED CIRCUIT DEVICE HAVING VERTICAL MOS PROVIDED WITH ZENER DIODE

Tsutomu Matsushita, Yokohama, and Teruyoshi Mihara, Yokosuka, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Jun. 17, 1987, Ser. No. 63,116
Claims priority, application Japan, Jun. 18, 1986, 61-140320
Int. Cl.⁴ H01L *29/78*
U.S. Cl. 357—23.4 **15 Claims**



1. A semiconductor device comprising:

a semiconductor substrate comprising a highly doped underlying layer of a first conductivity type and a lightly doped top layer of said first conductivity type formed on said underlying layer,

a semiconductor channel region of a second conductivity type opposite to said first conductivity type, formed in said top layer of said substrate, said channel region being deep and joined with said highly doped underlying layer to form a first Zener diode,

a semiconductor source region of said first conductivity type formed in said channel region to form a vertical MOS transistor with said channel region and said substrate which serves as a drain region,

a separate group of semiconductor regions formed in said substrate to form another circuit component,

a semiconductor guard ring region of said second conductivity type formed in said top layer of said substrate between said channel region of said MOS transistor and said separate group, said guard ring region extending deeply and reaching said highly doped underlying layer of said substrate,

first means for applying a supply voltage to said drain region of said vertical MOS transistor,

second means for connecting said source region to a load, and

third means for grounding said guard ring region.

4,862,234

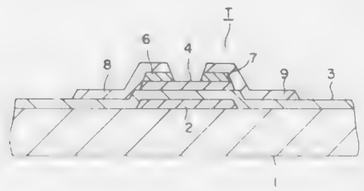
THIN-FILM TRANSISTOR

Mitsuhiro Koden, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 27, 1987, Ser. No. 125,961
Claims priority, application Japan, Nov. 29, 1986, 61-284950; Dec. 5, 1986, 61-291222
Int. Cl.⁴ H01L *29/78*
U.S. Cl. 357—23.7 **3 Claims**

1. A thin-film transistor comprising an insulating substrate;

an opaque metal gate electrode disposed on a portion of said insulating substrate; a gate insulating layer disposed on said insulating substrate including said gate electrode; an a-Si semiconductor film disposed on the portion of said gate insulating layer, said a-Si semiconductor film having been formed to attain self-alignment with respect to said gate electrode; a-Si contact films constituting source and drain regions, respectively, with a gap therebetween disposed on said a-Si semiconductor film, the outer end of each of said contact films being formed to attain self-alignment with respect to said gate electrode; souce and drain electrodes, respectively, disposed on said source and drain regions, the thickness of each of said a-Si semiconductor film and said a-Si contact film being 100 Å or more and the total amount of thicknesses thereof being 1,000 Å or less.



4,862,235

ELECTRODE STRUCTURE FOR A CORNER TURN IN A SERIES-PARALLEL-SERIES CHARGE COUPLED DEVICE

Raymond Hayes, Beaverton, and Denis L. Heidtmann, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 30, 1988, Ser. No. 213,805
Int. Cl.⁴ H01L *29/78;* **G11C** *19/28*
U.S. Cl. 357—24 **4 Claims**



1. A charge-coupled device having an electrode structure suitable for use as a corner turn in a series-parallel-series configuration comprising:

a body of semiconductor material having a channel region of a first conductivity type bounded by a substrate region of a second, opposite conductivity type and a surface of the body, the body of semiconductor material having, within the channel region, a zone of said first conductivity type and of different doping concentration than other portions of the channel region, and

an electrode structure that overlies said surface and is composed of at least first, second, and third gates, the first and second gates being spaced from each other, and said zone of said first conductivity type being beneath the space between the first and second gates, and the third gate extending at least partially across the space between the first and second gates

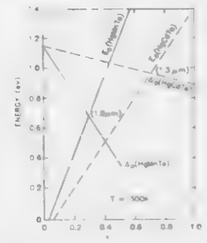
wherein the first and second gates are each elongate, have an angled end portion, and have a length component parallel to a predetermined direction, the electrode structure further comprising a fourth gate that extends transverse to said predetermined direction and is spaced from the angled end portions of the first and second gates, the third gate and said zone of said first conductivity type having a generally triangular shape defined by the angled portions of the first and second gates, and the fourth gate.

4,862,236

HGMNCDTE AVALANCHE PHOTODIODE

Soo H. Shin; John G. Pasko, both of Thousand Oaks, Calif., and J. R. Anderson, Hyattsville, Md., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 2, 1988, Ser. No. 227,585
Int. Cl.⁴ H01L *27/22, 27/14, 29/223*
U.S. Cl. 357—30 **6 Claims**



1. A semiconducting photodiode for detecting light at a predetermined wavelength, comprising:

a first semiconducting region having a first conductivity type and comprising a quaternary alloy of Hg, Mn, Cd, and Te; and

a second semiconducting region having a second conductivity type and electrically contacting the first semiconducting region, such that a semiconducting junction is formed between the first and second regions,

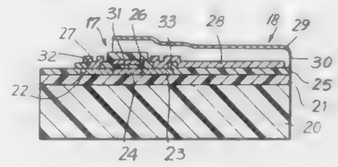
the relative proportions of Hg, Mn, and Cd in the first region being selected so that the bandgap energy of the first region is approximately equal to the spin orbit splitting energy of the first region at the predetermined wavelength.

4,862,237

SOLID STATE IMAGE SENSOR

Shinji Morozumi, Sawa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 96,279, Sep. 10, 1987, abandoned, which is a continuation of Ser. No. 569,641, Jan. 10, 1984, abandoned. This application Oct. 4, 1988, Ser. No. 253,917
Claims priority, application Japan, Jan. 10, 1983, 58-2080; Sep. 20, 1983, 58-173362
Int. Cl.⁴ H01L *27/14*
U.S. Cl. 357—30 **18 Claims**



1. A solid state image sensor having a plurality of photo-sensitive sensing cells arranged in a line or matrix, comprising:

an insulating substrate having a plurality of photo-sensitive sensing cells arranged on the insulating substrate;

each sensing cell including a photo-sensitive member and a switching transistor electrically coupled thereto;

each photo-sensitive member formed of a lower electrode region on the insulating substrate, a thin film of photo-sen-

sitive amorphous silicon semiconductor on the lower electrode region and an upper electrode region on the photo-sensitive film, said photo-sensitive silicon film having high photo-current and having high impedance in the dark;

each switching transistor associated with a photo-sensitive member being a thin film transistor formed by disposing a thin film of a poly-crystalline semi-conductor material forming an island of semiconductor material on the insulating substrate, said semiconductor material being selected to have high channel mobility and a low light absorption coefficient and being doped with an impurity forming a source and drain of the switching resistor and having an intrinsic channel region in the polycrystalline film having a thickness of less than 300 Å;

one of the electrode of the photo-sensitive member being electrically coupled to one of the source and drain of the associated thin film switching transistor; and

a video signal line coupled to one of each transistor and photo-sensitive member.

4,862,238

TRANSISTORS

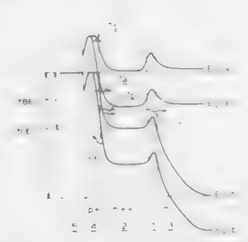
John M. Shannon, Whyteleafe, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 176,221, Aug. 7, 1980, abandoned. This application Apr. 22, 1983, Ser. No. 487,234

Claims priority, application United Kingdom, Aug. 8, 1979, 7927647; Dec. 20, 1979, 7943911

Int. Cl.⁴ H01L *29/72*

U.S. Cl. 357—34 **6 Claims**



1. An improved transistor comprising a semiconductor body including a base region of one conductivity type having current flow by hot majority charge carriers, a base-collector barrier, and an emitter-base barrier region having an impurity concentration of an opposite conductivity type, wherein the improvement comprises said emitter-base barrier region having a thickness and impurity concentration sufficiently large to provide at least a part of the thickness of said emitter-base barrier region undepleted at zero bias by at least one depletion layer present at said emitter-base barrier region, and means for applying a bias voltage between said emitter-region and said base-region to establish by avalanche breakdown of said emitter-base barrier region a supply of said hot majority charge carriers having energies above said base-collector barrier.

4,862,239

POWER SEMICONDUCTOR COMPONENT

Bruno Broich, and Horst Grüning, both of Baden, Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Sep. 8, 1987, Ser. No. 93,607

Claims priority, application Switzerland, Sep. 16, 1986, 3707/86

Int. Cl.⁴ H01L *29/74*

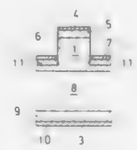
U.S. Cl. 357—38 **7 Claims**

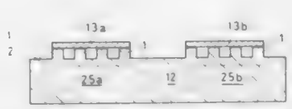
1. A power semiconductor device, comprising:

a plurality of differently doped layers which are arranged in a semiconductor substrate between an anode and a cathode;

on the cathode side, a gate cathode structure comprised of a plurality of narrow cathode fingers and a gate plane, whereby said cathode fingers project over and are separated from each other by said gate plane thus forming a large-area recessed gate control structure, said control structure having an area determined by a diameter of greater than or equal to 4 mm;

said control structure being divided into a plurality of small-area control zones which are spatially separated from each other and each comprise a plurality of said cathode fingers, thereby dividing said device into a plurality of thyristor elements each with a load carrying capability of less than or equal to 10A;





each of said control zones being provided with a separate cathode block covering the whole area of said control zone;

each of said cathode blocks being soldered on and thereby electrically connecting all cathode fingers of each respective control zone; and

each of said cathode blocks consisting of a high resistance material and thereby acting as an electrical feedback for the respective thyristor elements.

4,862,240

COMPLEMENTARY SEMICONDUCTOR DEVICE

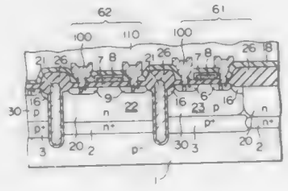
Atsuo Watanabe, Hitachiota; Takahiro Nagano, Hitachi; Takahide Ikeda, Tokorozawa; Naohiro Momma, and Ryuichi Saito, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 788,563, Oct. 17, 1985, abandoned. This application Aug. 12, 1987, Ser. No. 85,260

Claims priority, application Japan, Oct. 17, 1984, 49-216251; Nov. 26, 1984, 49-249339

Int. Cl.⁴ H01L *27/02*

U.S. Cl. 357—42 **21 Claims**



1. A monolithic complementary semiconductor device comprising

a semiconductor substrate region of a first conductivity type, the substrate region having surface;

semiconductor embedded regions of high impurity concentration disposed ion and directly in contact with the surface of said substrate region and comprising at least a first embedded region of said first conductivity type and a second embedded region having a second conductivity type which is opposite to said first conductivity type, the first and second embedded regions having a spacing therebetween;

semiconductor well regions, of low impurity concentration compared to said embedded regions, disposed on said embedded regions, the semiconductor well regions extending to and forming a main surface, and comprising at least a first well region of the first conductivity type disposed on said first embedded region and a second well region of the second conductivity type disposed on said second embedded region, whereby the same spacing as between the first and second embedded regions is provided between the first and second well regions; and

an insulating member extending from said main surface into said substrate region and filling the space between (1) said first well and embedded regions and (2) said second well and embedded regions nearest thereto, said insulating member surrounding said second well and embedded regions, and not surrounding said first well and embedded regions, whereby the first well and embedded regions are separated from the second well and embedded regions by said insulating member.

4,862,241

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Yasuhiro Ashida, and Shigeki Yokota, both of Gifu, Japan, assignors to Sanyo Electric Co. Ltd., Osaka, Japan

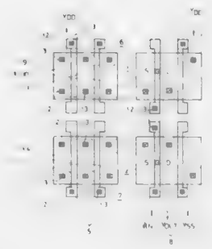
Filed Dec. 11, 1985, Ser. No. 807,831

Claims priority, application Japan, Dec. 18, 1984, 59-266712

Int. Cl.⁴ H01L *27/10*

U.S. Cl. 357—45 **2 Claims**





1. A semiconductor integrated circuit device of the type manufactured by a master slice method, said device including an arrangement of a plurality of elementary units, each unit having separate diffusion regions defining a source region and a drain region respectively and a gate electrode overlying a region between the source and drain regions, said device comprising:

field effect transistor elements each having a source and a drain region and a gate electrode formed from the corresponding components of desired ones of said elementary units, and

resistive elements formed by selectively connected source and drain diffusion regions in elementary units other than said desired elementary units, said selectively connected regions being connected in electrical circuit by conductors, the gate electrodes of units forming said resistive elements being connected to a voltage potential calculated to eliminate transistor action between the source and drain regions thereof, whereby the source and drain regions of said resistive elements provide the resistance thereof.

4,862,242

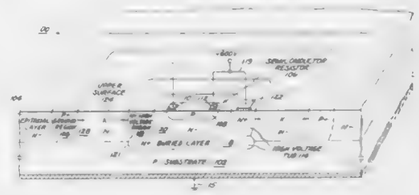
SEMICONDUCTOR WAFER WITH AN ELECTRICALLY-ISOLATED SEMICONDUCTOR DEVICE

Eric J. Wildi, Clifton Park, and Tat-Sing P. Chow, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 558,405, Dec. 5, 1983, abandoned. This application Dec. 11, 1985, Ser. No. 807,612

Int. Cl.⁴ H01L *27/04, 29/80, 29/90, 29/34*

U.S. Cl. 357—48 **11 Claims**



1. A specially configured semiconductor wafer for supporting the isolated high voltage operation of low voltage semiconductor devices comprising:

a substantially planar silicon substrate of one conductivity type;

a layer of opposite conductivity type atop said substantially planar substrate, and having an upper surface;

a heavily doped annular high voltage region of said opposite type conductivity extending from said upper surface into said layer of opposite conductivity type;

a heavily doped substantially planar buried layer of said opposite type conductivity disposed in said layer of opposite conductivity type underlying and substantially coextensive with said annular region;

said annular region and said buried layer substantially enclosing a portion of said layer of opposite conductivity type to define a semiconductor device high voltage operating region;

conductive means contacting said annular high voltage region for referencing the high voltage of said annular high voltage region to the voltage of said semiconductor device operating region;

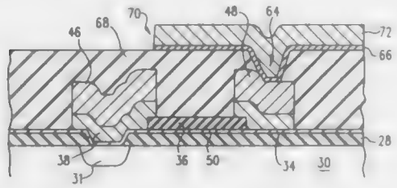
an annular ground region of said one type conductivity extending from said upper surface into and through said layer of opposite conductivity type to form a continuous one conductivity type region with said substrate, said ground region being laterally separated from said high voltage region by an isolation zone comprised of a portion of said layer of opposite conductivity type, said isolation zone having a lateral dimension X sufficient to provide a selected breakdown isolation potential in excess of 100 volts, wherein X is selected in view of the substrate carrier concentration to provide said breakdown potential, said ground region in combination with said substrate substantially enclosing said high voltage region and said buried layer.

4,862,243

SCALABLE FUSE LINK ELEMENT

Michael T. Welch, Sugarland; Ronald E. McMann, Rosenberg; Manuel L. Torreno, Jr., Houston, and Evaristo Garcia, Jr., Rosenberg, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 1, 1987, Ser. No. 57,064
Int. Cl.⁴ H01L *27/02, 29/34, 23/48*
U.S. Cl. 357—51 **3 Claims**



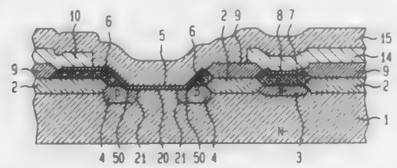
1. A semiconductor device comprising:
a semiconductor surface having an active device;
two electrically conducting interconnects spaced over said semiconductor surface;
a fuse layer formed between said semiconductor surface and said interconnects, said fuse layer having a linking portion of a predetermined shape between said interconnects; and
an isolating layer formed over said linking portion, said isolating layer also having said predetermined shape of said fuse layer, said interconnects have an edge extending over a portion of said isolating layer, said fuse layer being electrically isolated from desired portions of said semiconductor surface.

4,862,244

SEMICONDUCTOR DEVICE HAVING SCHOTTKY BARRIER BETWEEN METAL SILICIDE AND SILICON

Hidetaka Yamagishi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 716,539, Mar. 27, 1985, abandoned. This application Aug. 3, 1988, Ser. No. 228,848
Claims priority, application Japan, Mar. 27, 1984, 59-58817
Int. Cl.⁴ H01L *29/64, 29/36, 29/62*
U.S. Cl. 357—67 **7 Claims**



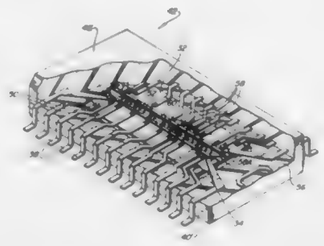
1. A semiconductor device comprising:
a monocrystalline silicon layer of an N-type conductivity having a main surface;
a silicon oxide film selectively covering said main surface;
a first aperture formed in said silicon oxide film and exposing a first surface portion of said main surface, said first surface portion having a central portion and a peripheral portion surrounding said central portion;
a second aperture formed in said silicon oxide film and exposing a second surface portion of said main surface;
first and second polycrystalline silicon layers, said first polycrystalline silicon layer being formed in contact with said peripheral portion of said first surface portion through said first aperture, said first polycrystalline silicon layer being extended over said silicon oxide film to form an extended portion lying on said silicon oxide film, said first polycrystalline silicon layer being highly doped with impurities of a P-type conductivity, said second polycrystalline silicon layer being in contact with the entire area of said second surface portion and being highly doped with impurities of said N-type conductivity;
a first region of said P-type conductivity formed in said monocrystalline silicon layer at said peripheral portion of said first surface portion, said first region being in contact with said first polycrystalline silicon layer and including impurities of said P-type conductivity derived from said first polycrystalline silicon layer;
a second region of said N-type conductivity formed in said monocrystalline silicon layer at said second surface portion, said second region being in contact with said second polycrystalline silicon layer and having an impurity concentration higher than that of said monocrystalline silicon layer;
a first metal silicide layer formed continuously on said central portion of said first surface portion and on a surface of said first polycrystalline silicon layer, said first metal silicide layer constituting a Schottky barrier with said monocrystalline silicon layer at said central portion of said first surface portion and an ohmic contact with said first polycrystalline silicon layer;
a second metal silicide layer formed on a surface of said second polycrystalline silicon layer and constituting an ohmic contact therewith;
a first electrode provided on a part of said first metal silicide layer, said part of said first metal silicide layer being formed on said extended portion of said first polycrystalline silicon layer, said first electrode being remote from another part of said first metal silicide layer, said other part of said first metal silicide layer being formed on said central portion of said first surface portion;
an insulating film formed on said other part of said first metal silicide layer; and
a second electrode provided on said second metal silicide layer.

4,862,245

PACKAGE SEMICONDUCTOR CHIP

Richard P. Pashby, Williston; Douglas W. Phelps, Jr., Burlington; Sigvart J. Samuelsen, Burlington, and William C. Ward, Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 940,235, Dec. 8, 1986, abandoned, which is a continuation of Ser. No. 724,736, Apr. 18, 1985, abandoned. This application Feb. 19, 1988, Ser. No. 161,319
Int. Cl.⁴ H01L *23/48*
U.S. Cl. 357—70 **20 Claims**



1. An encapsulated semiconductor module comprising:
a semiconductor chip having a major surface with terminals thereon disposed within an encapsulating material;
a plurality of self supporting unitary, discrete, and continuous lead frame conductors formed of metal sheet stock extending over and joined with an adhesive in dielectric relationship to said major surface of said chip at spaced locations from said terminals and extending from said chip and cantilevered out of the encapsulating material; and
discrete electrical conducting means bonded to said conductors and said terminals and electrically connecting said conductors to said terminals.

4,862,246

SEMICONDUCTOR DEVICE LEAD FRAME WITH ETCHED THROUGH HOLES

Masachika Masuda, Kodaira, and Akira Suzuki, Ohme, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 767,598, Aug. 20, 1985, abandoned. This application Feb. 24, 1988, Ser. No. 159,902
Claims priority, application Japan, Sep. 26, 1984, 59-199563
Int. Cl.⁴ H01L *23/48*
U.S. Cl. 357—70 **7 Claims**



1. A semiconductor integrated circuit device comprising:
a semiconductor integrated circuit pellet having a plurality of bonding pads on a major surface thereof;
a plurality of conductive leads having inner end portions which extend to the vicinity of the pellet;
a plurality of connecting wires, one end of each of said wires being connected to one of the pads and the other ends of said wires being connected to the inner end portions of the leads;
a resin encapsulation body sealing the pellet, connecting wires, and the inner end portions of the leads; and
wherein a plurality of the inner end portions of said leads each have a plurality of semispherical depressions formed by etching to have a smaller diameter at the bottom of said semispherical depressions than at the surface side of said semispherical depressions, and said plurality of inner end portions of said leads having said semispherical depressions each further have at least one through hole in the vicinity of the periphery of the resin body formed therein between depressions on opposite sides of the inner end portion by overetching when said semispherical depressions are formed by etching, the diameter of the through hole being smaller than the diameter of the depressions at the surface side of said depressions, such that the resin material of said body fills said through holes of said plurality of inner end portions of said leads, both said semispherical depressions and said at least one through hole on said leads enhancing the adhesion and mechanical strength between said resin material and said inner end portions without any substantial reduction in the mechanical strength of said inner end portion.

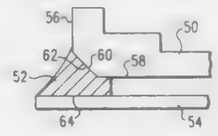
4,862,247

CONTACT JOINT FOR SEMICONDUCTOR CHIP CARRIERS

Leali Derryberry, Dallas, and Tom Petrovich, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 124,803, Nov. 24, 1987, abandoned. This application Jan. 26, 1989, Ser. No. 302,997
Int. Cl.⁴ H01L *23/30, 23/04, 23/14*
U.S. Cl. 357—74 **4 Claims**

1. An improved leadless chip carrier including a contact area for joining the chip carrier to conductive pad on a printed wiring board, the leadless chip carrier further including:
a peripheral edge;
a bottom surface; and
a connecting surface including a metallized solder adhering portion flush with the face of the connecting surface, the connecting surface being directed inwardly toward the bottom surface from the peripheral edge to the bottom surface, in order to provide a contact area which allows for an improved distribution of stress in a joint between the chip carrier and the wiring board.

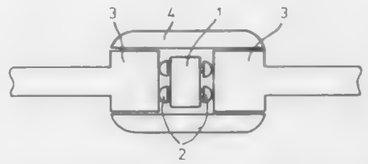


4,862,248

CONTACTING SYSTEM FOR BIPOLAR ELECTRONIC CIRCUIT ELEMENTS, MORE PARTICULARLY SEMICONDUCTOR CIRCUIT ELEMENTS

Henrich Zeile, Hamburg, and Heinz Sauermann, Halstenbek, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 23, 1985, Ser. No. 694,187
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1984, 3402970
Int. Cl.⁴ H01L *23/42, 23/02*
U.S. Cl. 357—79 **16 Claims**



1. A contacting system for bipolar electronic circuit elements comprising a housing structure, a circuit element contained in said housing structure, a plurality of separated electrical contact blocks provided on each opposite surface of said circuit element within said housing structure, and electrical contact bodies provided at opposite sides of said circuit element to make contact with said contact blocks within said housing structure, said contact bodies holding said circuit element in said housing structure under pressure.

4,862,249

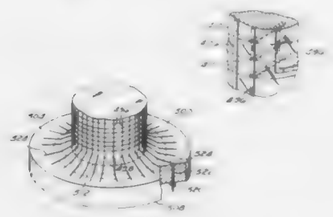
PACKAGING SYSTEM FOR STACKING INTEGRATED CIRCUITS

Randolph S. Carlson, Carson City, Nev., assignor to XOC Devices, Inc.

Filed Apr. 17, 1987, Ser. No. 39,632
Int. Cl.⁴ H01L *23/12, 23/04, 23/14*
U.S. Cl. 357—80 **29 Claims**

1. An apparatus for interconnecting a plurality of integrated circuits in a stack, comprising:
a plurality of sandwiched structures, each sandwiched structure comprising:
an integrated circuit die having a plurality of bonding pads on an active surface thereof, said active surface of said integrated circuit die having an outer periphery;
a first set of electrical conductors, said first set of electrical conductors electrically and mechanically bonded to said bonding pads of said integrated circuit die; and
a first electrically insulating plate attached to said integrated circuit die, said first electrically insulating plate having a planar surface and an edge, said edge forming an outer

periphery of said first electrically insulating plate with dimensions selected so that said outer periphery of said first electrically insulating plate extends beyond the outer periphery of said surface of said integrated circuit die and so that an exposed portion of a plurality of conductors of said first set of electrical conductors extends to the outer periphery of said first electrically insulating plate, said plurality of sandwiched structures positioned with respect to each other in said stack so that said planar surfaces of said first insulating plates are substantially parallel, with at least one edge of each of said first insulating plates aligned



to form a common outer surface of said stack, said plurality of sandwiched structures further oriented so that the active surfaces of the integrated circuit dies in at least two of said sandwiched structures face in the same direction; and

a second set of electrical conductors formed on said common outer surface of said stack that electrically interconnects exposed portions of a plurality of conductors of said first set of electrical conductors of one of said sandwiched structures with exposed portions of a plurality of conductors of said first set of electrical conductors of others of said sandwiched structures.

4,862,250

STILL PICTURE TRANSMITTING AND RECEIVING SYSTEM

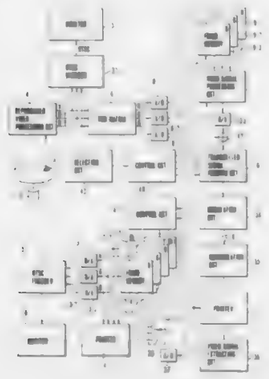
Masahiro Takei, Yokohama; Tsuguhide Sakata, Machida; Tomishige Taguchi, Urawa, and Somei Kawasaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 916,221, Oct. 7, 1986, abandoned. This application Jan. 30, 1989, Ser. No. 303,974

Claims priority, application Japan, Oct. 8, 1985, 62-224501

Int. Cl.[4] H04N *11/06*

U.S. Cl. 358—12 **20 Claims**



4,862,251

COLOR CORRECTION SYSTEM AND METHOD

Armand Belmares-Sarabia, Catskill, N.Y., and Stanley J. Chayka, Parsippany, N.J., assignors to Corporate Communications Consultants, Inc., Fairfield, N.J.

Continuation of Ser. No. 851,164, Apr. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 598,468, Apr. 9, 1984, Pat. No. 4,679,067. This application Sep. 22, 1988, Ser. No. 248,249

Int. Cl.[4] H04N *9/68, 9/73, 9/75, 9/74*

U.S. Cl. 358—22 **19 Claims**



1. Apparatus for color correcting video picture signals, said apparatus comprising, in combination:

hue detector means that generates output signals only when the input signals represent a selected band of hues, the amplitude of said output signals representing the saturation of the input signals;

means for varying the location of said band in the spectrum of hues;

means for selectively developing correction signals for the video picture signals corresponding to said selected band of hues; and

correcting means for applying the correction signals to the latter video picture signals.

4,862,252

Y/C SEPARATOR CIRCUIT FOR SEPARATING LUMINANCE AND CHROMINANCE SIGNALS CONDITIONED ON AN AC LUMINANCE COMPONENT

Kazuo Kuroda, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 2, 1988, Ser. No. 201,829

Int. Cl.[4] H04N *9/78*

U.S. Cl. 358—31 **5 Claims**



1. A Y/C separator circuit for separating luminance and chrominance signals from a composite video signal, comprising:

a comb filter for receiving said composite video signal and outputting said luminance and chrominance signals separately;

a filter means connected to said comb filter, for extracting an ac (alternating current) component of said luminance signal;

an ac component detecting means connected to said filter means, for detecting a level of said ac component of said luminance signal and generating an ac component detection signal when the level of said ac component of said luminance signal exceeds a predetermined level;

signal leakage detection circuit means connected to said comb filter, for detecting a leakage signal between said luminance signal and said chrominance signal on the basis of a difference between information signals of said color composite video signal in two adjacent horizontal scanning periods, and generating a leakage detection signal when said difference exceeds a predetermined value;

control circuit means connected to said ac component detecting means and said signal leakage detecting circuit means, for generating an operation command signal when said leakage detection signal is present and said ac component detection signal is absent; and

a signal suppressing circuit means connected to said comb filter and said control circuit means for reducing levels of components of said luminance signal in a chroma signal frequency band in response to said operation command signal.

4,862,253

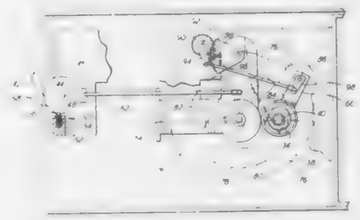
APPARATUS FOR CONVERTING A VIDEO PROCESSOR

Stanley R. English, Elbridge, and Dominick Danna, Syracuse, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Jul. 20, 1988, Ser. No. 221,776

Int. Cl.[4] H04N *9/04*

U.S. Cl. 358—42 **19 Claims**



1. An apparatus for converting an image generation system of a video processor from one form into at least one other form, the image generation system being of the type having a light source emitting a light beam and a rotating light control wheel disposed in the path of the light beam, comprising

a mounting member, having first and second ends, displaceably connected to a frame at its first end to permit reciprocal movement of said mounting member between a plurality of positions,

means, coupled to said mounting member, for actuating said mounting member, and

a wheel assembly, including the control wheel and means for rotating the control wheel, rotatably mounted to the second end of said mounting member, such that the position of the control wheel relative to the light source is determined by the position of said mounting member,

such that when said mounting member is in one position, the rotating control wheel affects the light beam in one way to provide an image generation system of one form, and when said mounting member is in another position, the rotating control wheel affects the light beam in another way to provide an image generation system of another form.

4,862,254

COLOR FACSIMILE MACHINE WITH A COLOR SELECTION FUNCTION

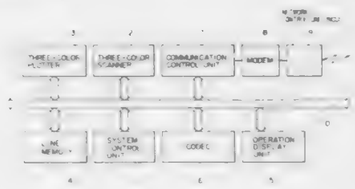
Toshiyuki Takada, Hadano, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 117,512, Nov. 6, 1987, abandoned. This application Nov. 30, 1988, Ser. No. 277,499

Claims priority, application Japan, Nov. 6, 1986, 61-262638

Int. Cl.[4] H04N *1/46, 1/32*

U.S. Cl. 358—75 **7 Claims**



1. A color facsimile machine, comprising:

receiving means for receiving information from a transmitter at a remote location;

processing means for processing said information received by said receiving means;

storing means for storing the informaton thus processed by said processing means;

setting means for setting at least one color to be used for recording said information stored in said storing means;

recording means for recording said information stored in said storing means using said at least one color set in said setting means;

wherein said setting means is also capable of setting a color to be used in recording accompanying information, such as identification of the transmitter and the time of reception of said information, and said recording means records the accompanying information with the color thus set.

4,862,255

COLOR CORRECTING CIRCUIT FOR THERMAL PRINTER SELECTIVELY OUTPUTTING A SECOND DEGREE CORRECTION OPERATION RESULT AND A MODIFIED RESULT THEREOF

Itsuo Takanashi, Kamakura; Hideshi Tanaka, Yokohama; Terumi Ohara, Yokohama; Kenichi Miyazaki, Yokohama; Toshinori Takahashi, Kawasaki; Hiroki Kitamura, Tokyo; Tadao Shinya, and Yutaka Mizoguchi, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Dec. 7, 1987, Ser. No. 129,046

Claims priority, application Japan, Dec. 16, 1986, 61-299150

Int. Cl.[4] G03F *3/08;* **H04N** *1/46*

U.S. Cl. 358—80 **4 Claims**



1. A color correcting circuit for a thermal printer for carrying out a predetermined color correction operation with respect to input signals of three additive primary colors related to an input image, the thermal printer printing an output image based on the predetermined color correction operation which

is dependent on correction data by use of color inks of three subtractive primary colors, said color correcting circuit compensating for a difference in a characteristic of a color separation system from which the input signals are obtained and a characteristic of a color mixing system of the thermal printer so as to obtain an output image in which color reproduction is approximately the same as that in the input image, said color correcting circuit comprising:

first means for carrying out a first degree correction operation on the input signals for each additive primary color so that a ratio between a density of the input image and a density of the output image becomes linear, said first means outputting a first degree correction operation result which is an operation result of the first degree correction operation;

second means for carrying out a second degree correction operation on the input signals for each additive primary color by use of the method of least squares so that a difference between the density of the input image and the density of the output image is reduced when compared with the difference in the case where the second degree correction operation is not carried out, said second means outputting a second degree correction operation result which is an operation result of the second degree correction operation; and

difference limiting means responsive to the first degree correction operation result and the second degree correction operation result for selectively outputting as the correction data the second degree correction operation result then a difference between the second degree correction operation result and the first degree correction operation result falls within a predetermined range about the first degree correction operation result, and for selectively outputting as the correction data a value which is deviated from the first degree correction operation result by a boundary value of said predetermined range when the difference between the second degree correction operation result and the first degree correction operation result falls outside said predetermined range,

said color correcting circuit outputting output signals of the three subtractive primary colors describing the output image by carrying out the predetermined color correction operation based on the correction data outputted from said difference limiting means.

4,862,256

METHOD OF, AND APPARATUS FOR, COLORING A BLACK AND WHITE VIDEO SIGNAL

Wilson Markle, Toronto, Canada, and Christopher Mitchell, Anaheim, Calif., assignors to Colorization Inc., Toronto, Canada

Continuation of Ser. No. 44,524, Jul. 27, 1987, abandoned, which is a continuation of Ser. No. 512,844, Nov. 7, 1983, Pat. No. 4,710,805. This application Nov. 16, 1988, Ser. No. 275,632

Claims priority, application Canada, May 5, 1983, 427543

Int. Cl.[4] H04N *9/43*

U.S. Cl. 358—81 **13 Claims**

1. A method of modifying a black and white video signal comprising successive frames, the method comprising:

(a) Defining at least one area of a frame with reference to luminance values in that frame;

(b) Assigning luminance levels to each such area;

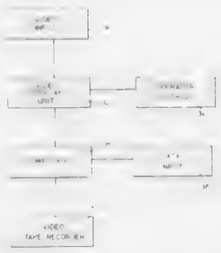
(c) Assigning a colour to each such area;

(d) Colouring each such area with its assigned colour by adding a colour signal to the black and white video signal;

(e) Comparing a subsequent frame to a preceding coloured frame and determining from the luminance values in the subsequent frame and the respective assigned luminance levels which parts of each coloured area from the preceding coloured frame are present in the corresponding area of the subsequent frame;

(f) Colouring those parts of the subsequent frame with the respective assigned colour by adding a colour signal to the black and white video signal;

(g) Determining which portions of the subsequent frame adjacent a coloured part of that frame have a luminance



value within the assigned luminance levels for that coloured part;

(h) Colouring each such portion with the respective assigned colour by adding a colour signal to the black and white video signal.

4,862,257

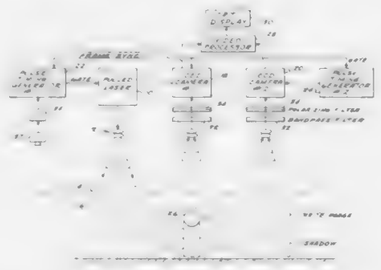
IMAGING LIDAR SYSTEM

Bobby L. Ulich, Tucson, Ariz., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Jul. 7, 1988, Ser. No. 216,341

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—95 **40 Claims**



1. A method of detecting and imaging an object enveloped by a backscattering medium which is at least partially transmitting to light including the steps of:

selectively generating short pulses of light;

projecting said short pulses of light toward the backscattering medium and at an object enveloped by the medium;

detecting said pulses of light reflected back from said object after a time delay corresponding to the round-trip propagation time of said light pulses to and from said object; and

converting said detected pulses of light to a video image of said object;

wherein said step of detecting said reflected pulses of light further comprises the steps of;

detecting a first image of the object against the backscattered light from the backscattering medium;

detecting a second image of the shadow of the object against the backscattered light from the backscattering medium; and

subtracting the first image from the second image to improve detectability and imaging of the object.

4,862,258

MULTIPLE CHARACTERISTIC ENDOSCOPE LIGHT SOURCE FOR FRAME SEQUENTIAL COLOR IMAGING, MOSAIC COLOR IMAGING AND FIBER IMAGE GUIDE SCOPES

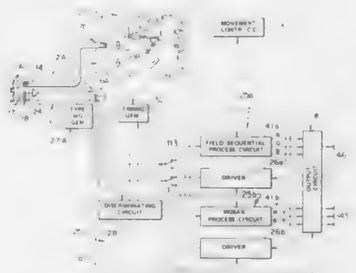
Atsushi Kidawara, Tachikawa; Toshiaki Nishikori, Sagamihara; Masahide Kanno; Hisao Yabe, both of Hachioji; Shinichi Katoh; Yuji Ikuno, both of Oume, and Takeaki Nakamura, Hino, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1988, Ser. No. 188,775

Claims priority, application Japan, May 13, 1987, 62-116403; May 13, 1987, 62-116404

Int. Cl.[4] H04N *7/18;* **A61B** *1/06*

U.S. Cl. 358—98 **7 Claims**



1. An endoscope light source apparatus comprising:

a light source means for emitting a white color light as an illuminating light;

a filter means in a light path of the illuminating light source for sequentially transmitting respective color lights adapted to a frame sequential color imaging system; and

a light path switching means for selectively switching the light path from said light source between a light path passing through said filter means and a light path avoiding said filter means.

4,862,259

MOTION VECTOR REDUCTION IN TELEVISION IMAGES

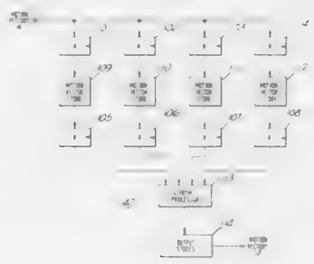
Clive H. Gillard, and Vincent C. Harradine, both of Chineham, England, assignors to Sony Corp., Tokyo, Japan

Filed May 31, 1988, Ser. No. 200,531

Claims priority, application United Kingdom, Jun. 9, 1987, 8713455; Dec. 4, 1987, 8728445

Int. Cl.[4] H04N *7/01*

U.S. Cl. 358—105 **25 Claims**



1. A method of reducing the number of motion vectors associated with a digital television image, the method comprising the steps of:

deriving for each block of pixels within said television image a plurality of motion vectors representing the most common motion vectors of pixels in said block, each of said plurality of motion vectors having associated with it an indication of the accuracy thereof;

associating with said plurality of motion vectors, a further motion vector for the same position from the previous field and a further motion vector for the same position from the next field, each of said further motion vectors having associated with it an indication of the accuracy thereof; and

selecting a smaller plurality of motion vectors from said plurality of motion vectors and said further motion vectors in dependence on said indications.

4,862,260

MOTION VECTOR PROCESSING IN TELEVISION IMAGES

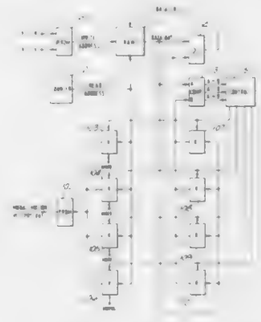
Vincent C. Harradine; Clive H. Gillard, both of Basingstoke, and John W. Richards, Near Stockbridge, all of United Kingdom, assignors to Sony Corp., Tokyo, Japan

Filed May 31, 1988, Ser. No. 199,680

Claims priority, application United Kingdom, Jun. 9, 1987, 8713455; Dec. 4, 1987, 8728451

Int. Cl.[4] H04N *7/01*

U.S. Cl. 358—105 **25 Claims**



1. A method of processing motion vectors associated with a digital television image, the method comprising the steps of:

deriving a plurality of motion vectors respectively representing the motion of pixels in a corresponding plurality of blocks of pixels in said image;

distributing said plurality of motion vectors into groups, each said group comprising motion vectors lying within a respective different predetermined range of magnitudes and directions; and

substituting for the motion vectors in each of a plurality of said groups into which the largest number of said motion vectors fall, a single motion vector representing the motion vectors in the respective said group.

4,862,261

IMAGE SIGNAL COMPRESSING METHOD BY VECTOR QUANTIZATION

Nobuyuki Tanaka, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 25, 1988, Ser. No. 160,373

Claims priority, application Japan, Feb. 25, 1987, 62-42115; Feb. 24, 1988, 63-41717

Int. Cl.[4] H04N *7/12*

U.S. Cl. 358—133 **4 Claims**

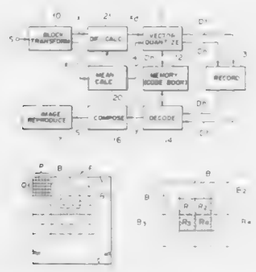
1. A method of compressing image signals by vector quantization, which comprises the steps of:

(i) dividing two-dimensional image signals into blocks B

wherein each of said block B is composed of the signals at M number of picture elements adjacent to one another,

(ii) selecting a vector that corresponds with the minimum distortion to differences (x_1-m, x_2-m, x_3-m, . . . , x_M-m) between the image signals x in each of the blocks B and a representative value m of signals from a code book comprising a plurality of vectors different from one another and prepared in advance by defining M number of vector elements, and

(iii) encoding the information representing the selected vector, and the information representing the representative value m,



wherein the improvement comprises the steps of:

(a) dividing said two-dimensional image signals into blocks B' whose picture element regions are deviated from the picture element regions of said blocks B,

(b) calculating a representative value n with respect to the image signals in each of said blocks B', and

(c) for each of partial regions R, whose picture element regions overlap the picture element regions of said blocks B', within each of said blocks B, using said representative value n, which is calculated for one of said blocks B' that includes one of said partial regions R, as said representative value m for said one of said partial regions R.

4,862,262

METHOD OF COMPRESSING IMAGE SIGNALS BY VECTOR QUANTIZATION

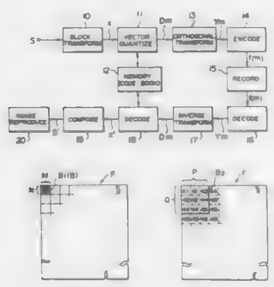
Nobuyuki Tanaka, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 25, 1988, Ser. No. 160,446

Claims priority, application Japan, Feb. 25, 1987, 62-42113; Feb. 25, 1987, 62-42114; Feb. 24, 1988, 63-41715; Feb. 24, 1988, 63-41715

Int. Cl.[4] H04N *7/12*

U.S. Cl. 358—133 **5 Claims**



1. A method of compressing image signals by vector quantization, which comprises the steps of:

i) dividing two-dimensional image signals into blocks B1 each of which is composed of signals at M×N number of picture elements adjacent to one another,

ii) selecting a vector that corresponds with the minimum distortion to said M×N number of image signals in each of the blocks B1 from a code book comprising a plurality of vectors different from one another and prepared in advance by defining M×N number of vector elements, and

iii) encoding a number representing the selected vector to correspond to each of the blocks B1,

wherein the improvement comprises the steps of:

a) defining said number representing said selected vector so that said number is larger or smaller as the distortion of said vector in said code book with respect to a predetermined vector is larger,

b) dividing group signals of said numbers selected for the respective blocks B1 into blocks B2, each of which is composed of P×Q number of samples, by putting together said group signals at the blocks B1 adjacent to one another,

c) carrying out orthogonal transformation of said group signals in each of said blocks B2, and

d) encoding the transformed signals obtained by said orthogonal transformation respectively with an intrinsic code length.

4,862,263

ARRANGEMENT FOR OPTIMIZED WEIGHTING OF TRANSMITTED TRANSFORMATION COEFFICIENTS IN TRANSFORAMTION CODERS FOR THE PURPOSE OF MINNIMIZING CONVOLUTION DISTORTIONS

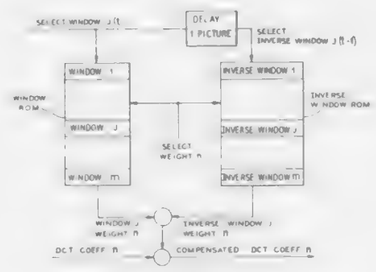
Peter Strobach, Roehrbach; Herbert Hoelzlwimmer, Munich, and Walter Tengler, Friedberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 30, 1987, Ser. No. 103,111

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633185

Int. Cl.[4] H04N *7/133*

U.S. Cl. 358—135 **1 Claim**



1. A method for optimized weighting of transmitted transformation coefficients in a transformation coder, for the purpose of minimizing distorting of transform coefficients in the transform coding of image signals, for the purpose of a reduction in the transmission rate for such coefficients, including the steps of windowing the coefficients to be transmitted, and selecting the weighting factors which effect a minimization of the convolution distortions in the reconstructed image in accordance with the coefficients to be transmitted.

4,862,264

METHOD OF CODING A VIDEO SIGNAL FOR TRANSMISSION IN A RESTRICTED BANDWIDTH

Nicholas D. Wells, Brighton; Michael J. Knee, Guildford, and Charles P. Sandbank, Reigate, all of United Kingdom, assignors to British Broadcasting Corporation, London, England

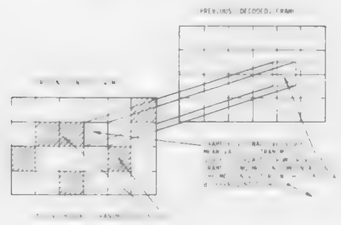
PCT No. PCT/GB86/00798, § 371 Date Oct. 5, 1987, § 102(e) Date Oct. 5, 1987, PCT Pub. No. WO87/04033, PCT Pub. Date Jul. 2, 1987

PCT Filed Dec. 23, 1986, Ser. No. 94,671

Claims priority, application United Kingdom, Dec. 24, 1985, 8531779; Aug. 28, 1986, 8620801

Int. Cl.[4] H04N *7/13*

U.S. Cl. 358—138 **35 Claims**



1. A method of coding a video signal for transmission in a restricted bandwidth, the method comprising the steps of:

sub-dividing a frame of picture information of the video signal into a set of constituent blocks;

pre-filtering the video signal with a digital anti-aliasing filter;

measuring the amount of picture activity in each block;

coding a block by sampling the picture information in the block at a rate related to the amount of measured activity in that block;

adding to each thus coded block a supplementary signal which is related to the sampling rate used in that block; and

transmitting the coded video signal in analogue form.

4,862,265

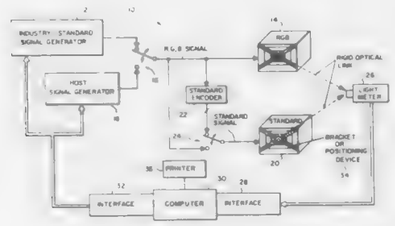
CRT DEVICE LIGHT VERSUS INPUT SIGNAL CHARACTERISTIC FUNCTION

Richard E. Bartow, Macedon; William K. Darrow, Webster, and Wayne T. Hartmann, Brockport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 1, 1988, Ser. No. 239,246

Int. Cl.[4] H04N *17/04*

U.S. Cl. 358—139 **4 Claims**



1. A method for determining the light output from a cathode ray tube device comprising the steps of:

(a) positioning a light sensor to receive the light output from the cathode ray tube as a function of differing valued input signals driving the device;

(b) forming a light table of light measurement values for each value of each input signal;

(c) determining the optimum values of K, G, O and γ utilizing a predicted light equation,

$$L=K(GS+O)^{\gamma}$$

by using the sum of the percent differences between the light measurement values and the predicted light values,

where:

L=predicted phosphor-light output

K=a constant which converts a specific unit of signal into a specific unit of light

S=input signal to the device

G=device gain

O=device offset, and

γ=an exponential relationship between a CRT's drive signal and its light output.

4,862,266

TELEVIKION STANDARDS CONVERTERS

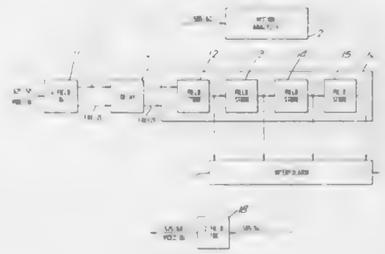
Clive H. Gillard, Basingstoke, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed May 31, 1988, Ser. No. 199,681

Claims priority, application United Kingdom, Jun. 9, 1987, 8713454; Dec. 4, 1987, 878446

Int. Cl.[4] H04N *7/01*

U.S. Cl. 358—140 **15 Claims**



1. A television standards converter for converting from a first television standard to a second television standard having a different number of lines per frame and a different number of fields per second, comprising:

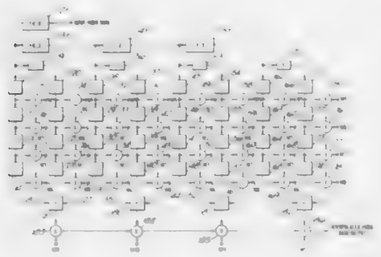
time base correcting means receiving an input television signal of said first television standard and producing therefrom a corresponding television signal of an intermediate format having the same number of fields per second as one of said first and second television standards and a number of lines per frame that is intermediate the numbers of lines per frame in said first and second television standards, respectively, said intermediate number of lines per frame being selected so that all lines of said television signal of the intermediate format have equal whole numbers of pixels;

means for analyzing the motion between consecutive fields of said television signal of said intermediate format;

means for aligning said consecutive fields in dependence on the analyzed motion so as to effectively represent static pictures; and

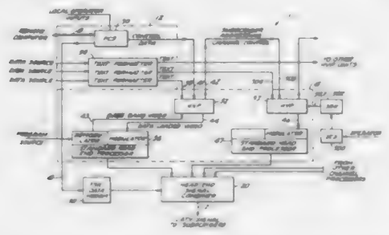
means for effecting conversion using said static pictures to derive an output television signal of said second television standard.

4,862,267
MOTION COMPENSATED INTERPOLATION OF DIGITAL TELEVISION IMAGES
Clive H. Gillard, Basingstoke, and David A. Dougall, Reading, both of United Kingdom, assignors to Sony Corp., Tokyo, Japan
Filed May 31, 1988, Ser. No. 199,682
Claims priority, application United Kingdom, Jun. 9, 1987, 8713454; Dec. 4, 1987, 8728452
Int. Cl.[4] H04N 7/01
U.S. Cl. 358—140 26 Claims



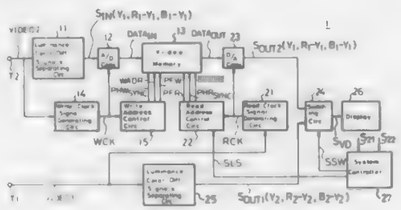
1. A method of motion compensated interpolation of digital television images comprising applying input video data corresponding to said television images to a three-dimensional finite impulse response interpolation filter operating in the horizontal, vertical and temporal domains.

4,862,268
ADDRESSABLE CABLE TELEVISION CONTROL SYSTEM WITH VIDEO FORMAT DATA TRANSMISSION
John G. Campbell, Irving; Carl F. Schoeneberger; Allan B. Bundens, both of Carrollton; Richard M. Fogle, Bedford, and John R. Lemburg, Richardson, all of Tex., assignors to General Instrument Corporation, New York, N.Y.
Division of Ser. No. 617,137, Jun. 4, 1984, Pat. No. 4,536,791, which is a continuation of Ser. No. 348,937, Nov. 27, 1981, abandoned, which is a continuation-in-part of Ser. No. 135,987, Mar. 31, 1980, abandoned. This application Apr. 18, 1985, Ser. No. 708,236
Int. Cl.[4] H04N 7/04
U.S. Cl. 358—141 2 Claims



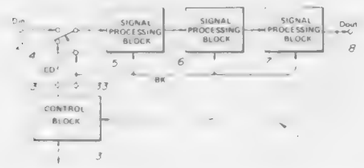
1. A television communications system for transmitting data signals on a frequency channel from a headend station to a plurality of user stations comprising:
data means for generating data signals at said headend station;
control means for generating a control signal at said headend station;
video format means for generating video line timing signals at said headend station;
first headend processing means in communication with said data means and said video format means for combining said data signals with said video line timing signals to generate full-field data signals in video line format for transmission to said user stations, each line of said full-field data signals in video line format corresponding to one or more individual pages of data for viewing;
second headend processing means in communication with said control means and said first headend processing means for injecting said control signal in a vertical interval of said full-field data signals in video line format;
transmitting means in communication with said second headend processing means for transmitting said full-field data signals in video line format injected with said control signal to said user stations;
receiver means at each of said user stations for selectively receiving said full-field data signals in video line format injected with said control signal;
extractor means connected to said receiver means for removing said control signal from the vertical interval of said full-field data signals in video format injected with said control signal;
text and/or graphics generator means at each user station connected to said receiver means for generating text and/or graphics data from said data signals; and
logic means for activating said text and/or graphics generator means in response to said control signal.

4,862,269
MEMORY CONTROL APPARATUS
Yutaka Sonoda, Kanagawa; Hirofumi Yuchi, Tokyo; Kyoichi Murakami, and Masaharu Tokuhara, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jul. 20, 1988, Ser. No. 222,084
Claims priority, application Japan, Aug. 14, 1987, 62-202640
Int. Cl.[4] H04N 5/14, 5/445
U.S. Cl. 358—160 28 Claims



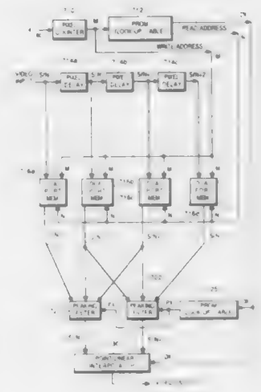
1. Memory control apparatus comprising:
a first input terminal supplied with a first analog video signal including successive units of video information and first synchronizing signals;
a second input terminal supplied with a second analog video signal including second synchronizing signals;
analog-to-digital converter means connected to said first input terminal for converting said first analog video signal to corresponding digital data;
memory means having at least four successively numbered unit areas each being capable of storing said digital data corresponding to one of said units of said first analog video signal;
writing unit area selecting means for selecting one of said four unit areas as a writing unit area of said memory means in which digital data corresponding to a unit of said first analog video signal is to be stored;
reading unit area selecting means for selecting one of said four unit areas as a reading unit area of said memory means from which digital data corresponding to a unit of said first analog video signal is to be read-out;
digital-to-analog converter means connected to said reading area selecting means for converting the read-out digital data to a read-out analog video signal;
writing clock signal generator means for generating writing clock signals synchronized with said first synchronizing signals;
writing address control means for generating writing address signals and writing unit signals and being supplied with said writing clock signals;
writing unit area control means supplied with said writing unit signals for generating a writing unit area control signal to control said writing area selecting means;
reading clock signal generator means for generating reading clock signals synchronized with said second synchronizing signals;
reading address control means for generating reading address signals and reading unit signals, and being supplied with said reading clock signals;
reading unit area control means supplied with said reading unit signals for controlling said reading unit area selecting means; and
detecting means supplied with said writing unit area control signal and said reading unit area control signal for detecting the number of said writing unit area and the number of said reading unit area which are adjacent to each other and for controlling one of said writing unit area control means and said reading unit area control means so as to distance said number of said writing unit area and said number of said reading unit area from each other.

4,862,270
CIRCUIT FOR PROCESSING A DIGITAL SIGNAL HAVING A BLANKING INTERVAL
Naoki Nishio, Kanagawa, Japan, assignor to Sony Corp., Tokyo, Japan
Filed Sep. 26, 1988, Ser. No. 249,293
Claims priority, application Japan, Sep. 29, 1987, 62-148529[U]
Int. Cl.[4] H04N 5/087, 5/202, 5/208, 5/225
U.S. Cl. 358—160 8 Claims



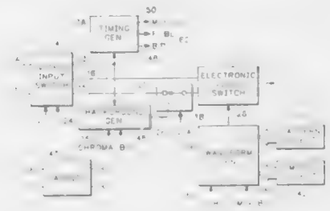
1. A digital signal processing circuit used in a video camera for processing a digital video signal having an effective signal interval and a blanking interval in a repeated fashion, said digital signal processing circuit comprising:
an input terminal for receiving the digital video signal;
control data generating means for generating control data with a block address;
control data inserting means for inserting said control data with the block address into the blanking interval of said digital video signal; and
a plurality of signal processing circuit blocks connected in series with each other,
each of said signal processing circuit blocks processing the effective signal interval of the digital video signal in accordance with the control data having the block address designating that block and each of said signal processing blocks including control data separating means for separating the control data having the block address designating that block.

4,862,271
VIDEO SIGNAL INTERPOLATOR WITH PEAKING
Terrence R. Smith, Westmont; Michael A. Isnardi, Plainsboro; Jack S. Fuhrer, Princeton, and Chandrakant B. Patel, Hopewell, all of N.J., assignors to General Electric Company, Princeton, N.J.
Division of Ser. No. 78,341, Jul. 27, 1987. This application Aug. 4, 1988, Ser. No. 228,192
Int. Cl.[4] H04N 5/208, 5/262
U.S. Cl. 358—166 14 Claims



1. In a system for processing a video signal containing picture element (pixel) image information, apparatus comprising:
video signal interpolator means having an input and an output; and
peaking means for providing a peaked video signal to said input of said interpolator means, said peaking means providing a variable amount of peaking in accordance with a variable distance between predetermined pixels.

4,862,272
VIDEO SWITCHER/EFFECTS GENERATOR
James A. Karlock, 3311 N.E. 35th Ave., Portland, Oreg. 97212
Filed Nov. 15, 1985, Ser. No. 798,591
Int. Cl.[4] H04N 5/262, 5/275
U.S. Cl. 358—181 27 Claims



1. A video effects generator comprising:
an electronic video switch having first and second input terminals for receiving first and second synchronous video input signals, a control terminal, an outut terminal, and means for conducting said first video signal or said second video signal to the output terminal in dependence upon a switching signal applied to said control terminal,
an effects waveform generator comprising pulse generator means for generating a pulse train having a rectangular waveform, a first resettable integrator for receiving the

pulse train from the pulse generator means and providing a signal having a ramp waveform in response thereto, a second resettable integrator for receiving the signal having the ramp waveform from the first resettable integrator and providing a signal having a parabola waveform in response thereto, and switch means for selecting either the signal having the ramp waveform or the signal having the parabola waveform and applying the selected signal to an output terminal of the waveform generator, and

means connecting the output terminal of the waveform generator to the control terminal of the electronic video switch.

4,862,273

FOCUS CONDITION DETECTING DEVICE FOR USE IN A CAMERA

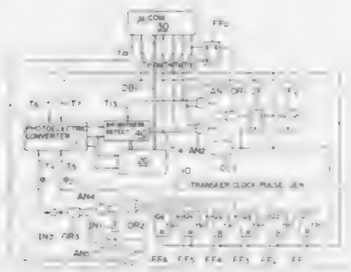
Tokuji Ishida, Osaka, and Toshio Norita, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 905,686, Sep. 9, 1986, Pat. No. 4,783,701, which is a continuation of Ser. No. 763,338, Aug. 6, 1985, Pat. No. 4,660,953, which is a continuation of Ser. No. 669,107, Nov. 7, 1984, abandoned. This application Sep. 30, 1988, Ser. No. 251,770

Claims priority, application Japan, Nov. 8, 1983, 58-210664; Nov. 17, 1983, 58-217391; Dec. 5, 1983, 58-230372; Dec. 12, 1983, 58-234551; May 15, 1984, 59-98367

Int. Cl.[4] H04N 3/19

U.S. Cl. 358—213.19 **3 Claims**



1. An image sensing system comprising:

image sensing means for sensing an image formed thereon, said image sensing means including a plurality of photosensitive elements adapted to accumulate electric charges at a speed dependent upon the intensity of light being incident thereon, respectively;

serial output means for serially outputting electrical signals being indicative of the quantity of the electric changes accumulated in said photosensitive elements when the electric charges accumulated in said photosensitive elements are shifted thereto;

clear pulse producing means for producing a clear pulse which causes said image sensing means to clear the electric charges accumulated in said photosensitive elements;

photosensitive means for sensing the luminance of said im-

[redacted]

a first accumulator having a charge accumulation path through which it accumulates electric charges at a speed dependent upon the luminance of said image senses by said photosensitive means and adapted to produce an output voltage indicative of the quantity of the electric charges accumulated therein;

a second accumulator having no charge accumulation path through which it accumulates electric charges at a speed dependent upon the luminance of said image sense by said photosensitive means and adapted to produce an output voltage indicative of the electric charges accumulated therein;

first and second charge clearing means for clearing the electric charges accumulated in said first and second accumulators in response to said clear pulse for restoring the output voltages thereof to a given initial voltage level, respectively;

charge stopping means for stopping the electric charges accumulated in each of said photosensitive elements when said output voltage of said first accumulator represents a given relationship with respect to said output voltage of said second accumulator.

4,862,274

PHOTOSENSOR WITH FRAME TRANSFER STRUCTURE AND ITS USE IN AN IMAGE SENSOR WITH REDUCED SMEARING EFFECT

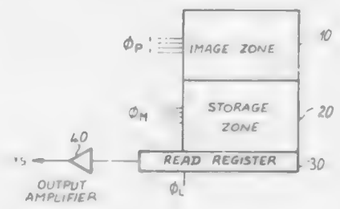
Yvon Cazaux, Grenoble, France, assignor to Thomson-Csf, Paris, France

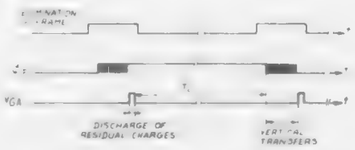
Filed May 24, 1988, Ser. No. 197,997

Claims priority, application France, May 26, 1987, 87 07419

Int. Cl.[4] H04N 3/14

U.S. Cl. 358—213.24 **8 Claims**





1. A photosensor with a frame transfer structure comprising an image zone, provided with vertical charge transfer registers and transfer control electrodes, a storage zone and an output register, wherein each photosite of the photosensitive matrix, being bounded by vertical insulating gates and localized beneath a transfer control electrode, is provided with a device to discharge, in a short period of time, the unwanted charges which are present therein at the end of the frame transfer; and wherein the device to discharge the unwanted charges in each photosite comprises a MOS transistor, having insulating gates constituting a source, a doped zone of the substrate constituting a drain (D), and a control gate, said transistor receiving short control pulse at the end of the frame transfer, to discharge the charges towards the drain.

4,862,275

READOUT OF CHARGE PACKETS FROM AREA IMAGER CCD USING AN INVERTER-CHAIN SHIFT REGISTER

Eric Meisenzahl, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 27, 1988, Ser. No. 263,302

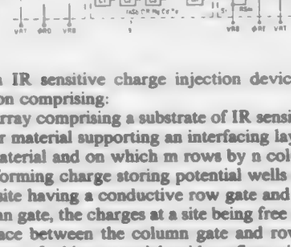
Int. Cl.[4] H04N 3/14

U.S. Cl. 358—213.29 **3 Claims**

1. Apparatus for controlling readout of integrated charge from each row of charge packets, one at a time, from an area CCD image sensor having rows and columns of electrodes into a horizontal CCD comprising:

(a) means for applying during charge integration two different potential levels to alternating rows of electrodes such that two adjacent electrodes in each column are used to collect an integrated charge packet; and

(b) readout means including a delay line having a plurality of inverters and resistors connected in series and responsive to a periodic clock signal for applying a predetermined potential level opposite to that applied during charge



integration to the first row of electrodes closest to the horizontal CCD, and in sequence delaying in time and then inverting such predetermined potential level and applying such inverted potential level to the next row of electrodes so that three electrodes per charge packet in each column are involved in the transfer of charge packets down to the horizontal CCD.

4,862,276

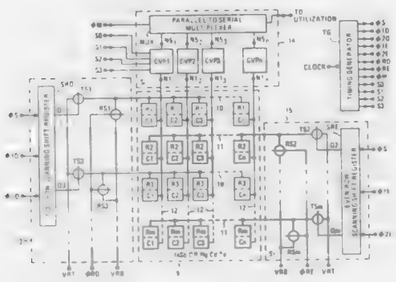
PUSH-PULL READOUT OF DUAL GATE CID ARRAYS

Samuel C. Wang, 4798 Hyde Rd., Manlius, N.Y. 13104; John M. Swab, 3036 Walpole Ln., Baldwinsville, N.Y. 13027, and Michael L. Winn, 4219 Ursa Course, Liverpool, N.Y. 13090

Filed Oct. 7, 1988, Ser. No. 254,571

Int. Cl.[4] H04N 3/14

U.S. Cl. 358—213.31 **5 Claims**



1. In an IR sensitive charge injection device (CID), the combination comprising:

(A) an array comprising a substrate of IR sensitive semiconductor material supporting an interfacing layer of insulating material and on which m rows by n columns of pixel sites forming charge storing potential wells are arranged, each site having a conductive row gate and a conductive column gate, the charges at a site being free to flow at the interface between the column gate and row gate in the presence of a bias potential, said configuration producing capacitive coupling (CRC) between the row gate and column gate at each pixel site, the row gates for each row of sites being interconnected by a conductive row line and the column gates for each column of sites being interconnected by a conductive column line,

(B) a readout circuit comprising:

(a) a source (VRT) of row transfer potentials and m controllable row transfer switches (TS_{1-m}) for injecting signal charge into the substrate and transferring charge via the column line during readout,

(b) shift register means (SRO,SRE) coupled to said row transfer switches for connecting a respective (jth) row line to said source (VRT) to begin injection, injection (duration ti) terminating with disconnection of said (jth) row line from said source (VRT)

(c) row reset means including a source (VRB) of row bias potentials and m controllable row bias reset switches (RS_{1-m}), for establishing said charge storing potential wells at the row gates and for facilitating charge exchange between column and row gates at a site, said reset switches being timed to disconnect said (jth) row from said source VRB when injection of said jth row begins, the reconnection of said (jth) row line to said source (VRB) for reset occurring at the same instant that the (j+1)th row line is connected to said source (VRT) to begin injection of said (j+1)th row line,

(d) n column video processors, each kth processor comprising:

(1) a gain amplifier ($A1_k$) having the input thereof coupled to the (kth) column line at a first node ($N1_k$),

(2) column reset means including a source (VCB) of column bias potentials and a controllable column bias reset switch ($S0_k$), for applying a column bias potential (VCB) to said first node ($N1_k$) for establishing said charge storing potential wells at the column gates, and for facilitating charge exchange between column and row gates at a site,

(3) means including a series connected capacitor ($C1_k$) and a shunt connected switch ($S1_k$) coupled to the output of said gain amplifier for taking a first sample, means including a series connected switch ($S3_j$) and a shunt connected a capacitor ($C3_k$) coupled to the output of said first sample taking means for taking a second sample correlated to the first sample, and

(e) timing means including a timing generator for timing the operation of said shift register and said reset switches, the readout of each selected site (jth row, kth column) being effected by switches TS_j, RS_j, $S0_k$, $S1_k$ and $S3_k$,

the switches $S0_k$ and $S1_k$ being closed to reset the first node ($N1_k$) to start readout of the jth row, switch $S0_k$ being opened after resetting, switch $S1_k$ being opened after settling to finish charging capacitor $C1_k$ to obtain a first sample, followed by closure of the jth row transfer switch (TS_j) to inject signal charge into said substrate and to transfer charge to and from the column gates, said switch $S3_k$ being closed prior to the opening of the jth row transfer switch to obtain a second sample correlated with the first sample, closure of switch $S0_k$ at the end of injection resetting the first node ($N1_k$) to terminate readout of the jth pixel,

the resetting of the jth row, which produces a negative going pulse due to said capacitive coupling (CRC), simultaneous with injection of said $(j+1)^{th}$ row, which produces a positive going pulse due to said capacitive coupling (CRC), cancelling the extraneous injection pedestal and reducing the voltage excursion at the input of said amplifier ($A1_k$).

4,862,277

IMAGING DEVICE WITH HAND WOBBLE DISPLAY CIRCUIT

Kunio Iwaibana, Osaka, Japan, assignor to NEC Home Electronics Ltd., Osaka, Japan

Filed Sep. 29, 1988, Ser. No. 250,723

Claims priority, application Japan, Oct. 19, 1987, 62-263324

Int. Cl.[4] H04N 5/21

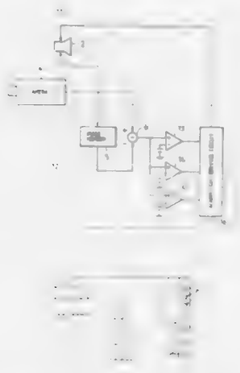
U.S. Cl. 358—222 **9 Claims**

1. An imaging device for reproducing images comprising:

a viewfinder for displaying an imaging signal representing

the image to be reproduced to a user of said imaging device; and

a hand wobble display circuit, connected to said viewfinder, for generating a difference signal from said imaging signal



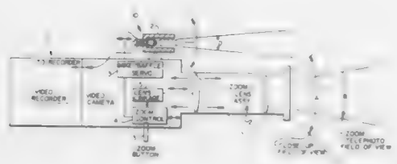
and displaying said difference signal on said viewfinder, the magnitude of said difference signal indicating the degree of hand wobble of said imaging device by said user.

4,862,278

VIDEO CAMERA MICROPHONE WITH ZOOM VARIABLE ACOUSTIC FOCUS

Lynn D. Dann, Rochester, and Earl E. Rapp, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 14, 1986, Ser. No. 918,757
Int. Cl.[4] H04N *5/225*
U.S. Cl. 358—225 9 Claims



1. An imaging system comprising:

means characterized by an optical acceptance angle for sensing an image;

means characterized by an effective acoustic acceptance angle for sensing sound;

means for varying said optical acceptance angle; and

means, responsive to said optical acceptance angle varying means, for varying said effective acoustic acceptance angle in a corresponding manner, whereby changes in the field of view of said image sensing means are accompanied by corresponding changes in sound transmitted by said sound sensing means,

wherein said optical acceptance angle varying means comprises a zoom lens controlling said optical acceptance angle,

said imaging system further comprising a zoom lens control knob connected to said zoom lens for moving said zoom lens between wide angle and telephoto lens positions,

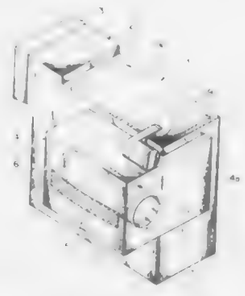
wherein said sound sensing means comprises a microphone with a baffle adapted to control the acoustic focus of said microphone, wherein said effective acoustic acceptance angle varying means changes the relative location of said microphone and baffle whereby said microphone has a narrow focus whenever said zoom lens control knob holds said zoom lens in said telephoto position, and has a wide acoustic focus whenever said zoom lens control knob holds said zoom lens in said wide angle position.

4,862,279

VIDEO CAMERA WITH AUTOMATICALLY MOVABLE MICROPHONE

Hiroyuki Tsumazawa; Daigo Yoshioka, and Atsushi Kuwada, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 6, 1988, Ser. No. 254,026
Claims priority, application Japan, Oct. 9, 1987, 62-155009; Nov. 6, 1987, 62-170526; Nov. 6, 1987, 62-170527; Nov. 18, 1987, 62-176060
Int. Cl.[4] H04N *5/30*
U.S. Cl. 358—229 8 Claims



1. A video camera, comprising a video camera device, a switch for changing over said video camera device between a photographing enabled condition and a photographing disabled condition, a microphone mounted on said video camera device for movement between an inoperative position in which said microphone is accommodated in or closely contacted with said video camera device and an operative position in which said microphone is projected from said video camera device, and means for moving said microphone from the inoperative position to the operative position in response to changing over of said video camera device from the photographing disabled condition to the photographing enabled condition by said switch.

4,862,280

DUAL FILM AND VIDEO TAPE CAMERA

Toshiharu Iida; Koji Shimanuki; Kimiaki Nakada, and Akira Masuda, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd. and Sony Corporation, both of Tokyo, Japan

Filed Apr. 1, 1988, Ser. No. 178,451
Claims priority, application Japan, Apr. 18, 1987, 62-94306; Apr. 18, 1987, 62-94307; Apr. 20, 1987, 62-95039
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—229 7 Claims

1. A camera for shooting a movie picture and a still picture comprising:

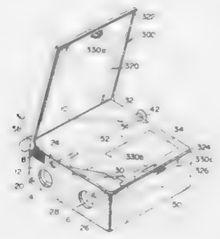
a casing having generally substantially rectangular parallelepiped shape;

a first imaging optical system for shooting a still image and a second imaging optical system for shooting a video picture disposed in a front surface of said casing, said first and second imaging optical systems being directed to an object scene;

a still camera unit disposed in the proximity of said first imaging optical system in said casing for shooting the object scene to record a still picture thereof on a film; and

a video camera unit disposed in said casing for shooting the object scene to record a movie picture thereof on a video tape;

said video camera unit including an imaging circuit section disposed on a rear side of said second imaging optical system for shooting the object scene to generate a video signal representing a movie image thereof, and a video tape recording section disposed on a rear side of said still camera unit for recording the video signal on a video tape;



said casing having in the upper surface of the casing a first opening for loading a film in said still camera unit, and a second opening for installing a video tape cassette in said video tape recording section;

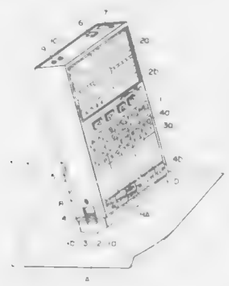
said casing further having a cap member to cover said upper surface, said cap being disposed so that the cap can position both in a first position covering the second opening and in a second position enabling the video tape cassette to be installed in and removed from the video tape recording section.

4,862,281

MANUAL SWEEPING APPARATUS

Takashi Sato; Kazuki Yamauchi, and Norio Ishibashi, all of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1987, Ser. No. 133,023
Claims priority, application Japan, Dec. 18, 1986, 61-299975; Dec. 24, 1986, 61-309420; Dec. 26, 1986, 61-315553; Aug. 27, 1987, 62-213551
Int. Cl.[4] H04N *1/04*
U.S. Cl. 358—400 27 Claims



25. A manual sweeping apparatus including a manually movable housing, comprising:

input means for producing image information signals while said housing is manually swept across a material having image information thereon;

position-detecting means for detecting the position of said housing being swept across said material, and for producing a signal every time said housing is swept over a predetermined distance, said signal representing the position of said housing with respect to said material;

character-generating means for generating character pattern signals;

signal-combining means for combining the image information signals produced by said input means with the character pattern signals generated by said character-generating means, and for producing combined signals;

output means for outputting the combined signals produced by said signal-combining means;

said signal-combining means comprising:

first memory means for storing said image information signals produced by said input means and the character pattern signals generated by said character-generating means;

memory -input control means for storing said image information signals and the character pattern signals at predetermined addresses of said first memory means; and

memory-output control means for outputting data from said first memory means to said output means; said character-generating means comprising:

key-input means for inputting character data;

storing means for storing character data input by said key-input means, and for outputting character data; and

converting means for converting character data output from said storing means, into character pattern signals;

second memory means for storing image information signals produced by said input means;

memory control means for controlling the writing of data into, and the reading of data out from, said second memory means, said memory control means including means for controlling the writing of data into said second memory means in accordance with the signals produced by said position-detecting means;

display means for displaying image information in response to the image information signals output from said second memory means, said display means including means for displaying the image information corresponding to the image information signals output from said second memory means, and for also displaying the character pattern corresponding to said character pattern signals output from said converting means;

said character-generating means comprising:

position-designating means for designating a position in the image information being displayed by said display means, at which the character data input by said key-input means is to be displayed; and

key-input control means for storing the character data input by said key-input means, at that position in said storing means which has been designated by said position-designating means.

4,862,282

FACSIMILE MACHINE WITH CAPABILITY OF READING HALF-TONE AND BINARY IMAGE DATA

Toshifumi Nakajima, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1988, Ser. No. 155,083
Claims priority, application Japan, Feb. 16, 1987, 62-34177
Int. Cl.[4] H04N *1/32*
U.S. Cl. 358—400 6 Claims

1. A facsimile machine comprising:

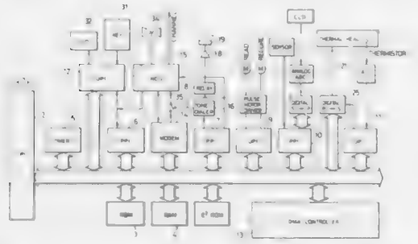
read means for reading an image;

memory means for storing image data read by said read means;

transmission means for transmitting the image data, said transmission means having a plurality of transmission modes including a halftone image mode; and

select means for selecting transmission of read image data through said memory means or outside of said memory means, said select means performing the selection opera-

tion in accordance with a transmission mode of said transmission means;



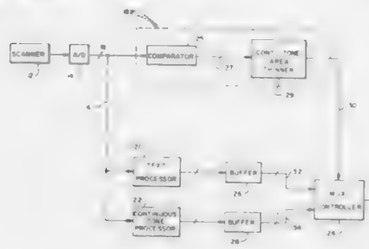
wherein, when said halftone image mode is effected, the image data is transmitted outside of said memory means.

4,862,283

IMAGE DISCRIMINATION WITH CONTINUOUS TONE AREA THINNING

Craig M. Smith, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 2, 1987, Ser. No. 115,321
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—443 **8 Claims**



1. Apparatus for selecting image processing by either text mode or continuous tone mode, said apparatus comprising:

means for differentiating between text and continuous tone pixels, and for generating a preliminary discrimination signal;

means, operable upon the preliminary discrimination signal for a pixel of interest, for creating a final discrimination signal by changing a continuous tone preliminary decision to a text decision if the pixel of interest is within a predetermined distance of a text pixel; and

means for selecting (1) text mode image processing when the final discrimination signal is a text decision, and (2) continuous tone image processing when the final discrimination signal is a continuous tone decision.

4,862,284

COPIER WITH ACCURATELY POSITION-CONTROLLABLE SUB-SCANNING UNIT

Kazuyuki Murata, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

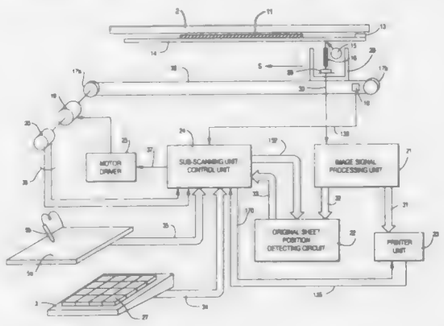
Filed Sep. 11, 1987, Ser. No. 95,109
Claims priority, application Japan, Sep. 16, 1986, 61-217405; Oct. 7, 1986, 61-238305
Int. Cl.[4] H04N *1/04*
U.S. Cl. 358—451 **7 Claims**

1. A copier comprising:

an original table for placing thereon an original sheet;

a sub-scanning unit including an image reading means for reading an image on said original sheet on said original table and for scanning said original sheet on said original table;

a printing means for printing said image read by said image reading means on a printing sheet; and



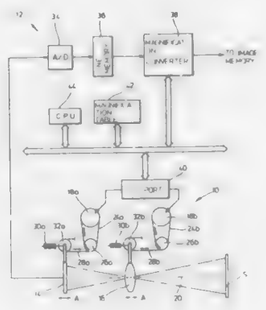
a control means for controlling operation of said sub-scanning unit by selectively using a position profile control and a speed profile control.

4,862,285

METHOD OF CHANGING IMAGE MAGNIFICATION

Tadashi Miyakawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 5, 1987, Ser. No. 81,512
Claims priority, application Japan, Aug. 13, 1986, 61-190778
Int. Cl.[4] H04N *1/04*
U.S. Cl. 358—451 **5 Claims**



1. A method of changing a magnification ratio of image information produced from an original for reproduction at a desired magnification ratio, said method comprising the steps of:

optically resolving said image information by performing one of a reducing and enlarging of said image information to a prescribed size with optical means;

thereafter, photoelectrically converting said image information with a light sensor; and

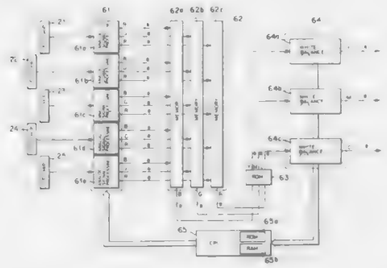
selectively picking up the photoelectrically converted image information and utilizing interpolation means for determining data between adjacent items of the photoelectrically converted image information by interpolation, thereby obtaining image information at a desired size wherein, for each respective one of a plurality of desired magnification ratios, a magnification ratio to be established by said optical means and a corresponding magnification ratio to be established by said interpolation means to produce said image information at a desired magnification ratio are stored in combination in a magnification table.

4,862,286

IMAGE READING APPARATUS WHICH ADJUSTS IMAGE SIGNALS TO IMPROVE SIGNAL BALANCE

Kenichi Suda, Yokohama; Shizuo Hasegawa, Tokyo, and Nobuo Matsuoka, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1987, Ser. No. 119,842
Claims priority, application Japan, Nov. 14, 1986, 61-269842; Nov. 14, 1986, 61-269843
Int. Cl.[4] H04N *1/10, 1/024*
U.S. Cl. 358—494 **11 Claims**



1. An image reading apparatus comprising:

a plurality of linear sensor means for reading an image of a document, each of said linear sensor means reading a different portion of a line of the document in a divided manner;

a plurality of level shift means each for shifting a level of a signal generated by a respective one of said plurality of linear sensor means; and

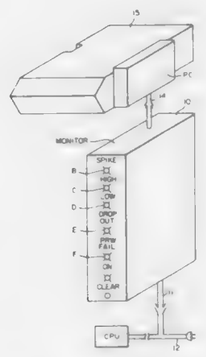
control means for controlling said plurality of level shift means on the basis of a plurality of black reference signals generated by said plurality of linear sensor means, so as to align levels of those black reference signals that correspond to a boundary of adjacent linear sensor means.

4,862,287

POWER LINE MONITOR AND PRINTER SYSTEM

Gerald R. Paul, Webster, N.Y., assignor to Mendon Electronics Corporation, Pittsford, N.Y.

Filed Sep. 30, 1987, Ser. No. 102,881
Int. Cl.[4] G01R *19/00, 19/30*
U.S. Cl. 358—296 **9 Claims**



1. The combination comprising

an electrically operated printer having a paper feed mechanism for advancing paper from a supply thereof through said printer,

a power line monitor for sensing predetermined voltage variations in the power supplied to a computer,

control circuit means interposed between said printer and said monitor and responsive to signals from said monitor and said printer during advance of said paper through said printer to cause said printer to print on said paper in the form of a strip chart a record of the respective voltage variations sensed by said monitor,

said control means including driver means for selectively operating said feed mechanism at a predetermined rate, whereby said strip chart indicates the time of occurrence of said recorded voltage variations,

said feed mechanism being a stepper motor operative in response to signals from said driver means to advance said paper intermittently in equal increments,

said printer being a dot line printer having a linear array of printing elements extending transversely of the path of travel of said paper through said printer,

said control means including printer signal means operative in the intervals between the incremental advances of said paper selectively to operate said printing elements to cause said strip chart to be printed on said paper, and

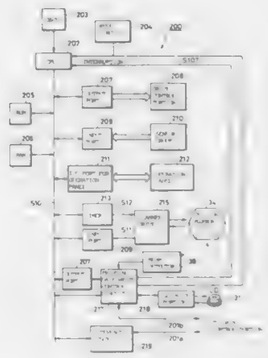
said printer signal means comprising first signal source means operative during advance of said paper to cause certain of said elements to print on said paper a first series of spaced, parallel, laterally registering lines extending in the direction of travel of said paper, and equal in number to the different voltage variations sensed by said monitor, and second signal source means responsive to said signals from said monitor to cause certain others of said elements selectively to print on said paper during said intervals a second series of lines each of which extends transversely from a different one of said parallel lines to denote the presence of predetermined one of said voltage variations.

4,862,288

PRINTING APPARATUS WITH PLURAL DENSITY CONTROL

Makoto Sekiya, Okazaki, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 27, 1987, Ser. No. 114,250
Claims priority, application Japan, Oct. 27, 1986, 61-255092; Oct. 27, 1986, 61-255093; Oct. 27, 1986, 61-255094; Oct. 27, 1986, 61-255096
Int. Cl.[4] H04N *1/21*
U.S. Cl. 358—298 **13 Claims**



1. A printing apparatus for performing printing for each picture element based on printing data, comprising:

printing means (**31, 34, 217 and 218**) for performing printing

based on the printing data with a preset density of picture elements,

means (200, 237, 250 to 253) for setting said printing means to enable the same to perform printing with a density of picture elements to be adopted,

means (300) for receiving from outside a request for changing the density of picture element,

determination means (202, 205 and 206) for determining whether printing is being performed by said printing means, and

control means (202, 205 and 206) responsive to said receiving means and said determination means for retaining said request for changing the density picture elements until an end of printing when said request is received during printing by said printing means, and operating said setting means based on said change request after the end of the printing.

4,862,289

PIXEL DENSITY VARIABLE IMAGE APPARATUS

Kazuyuki Shimada, Chofu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

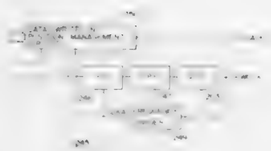
Filed Nov. 30, 1987, Ser. No. 126,924

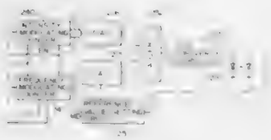
Claims priority, application Japan, Nov. 28, 1986, 61-283666

Int. Cl.[4] H04N *1/23, 1/40;* G01D *9/42*

U.S. Cl. 358—298 11 Claims







1. An image forming apparatus, comprising:

emitting means for emitting a light beam which may be modulated with image information to be written;

deflecting means for deflecting said light beam emitted from said emitting means over a predetermined angle repetitively;

an imaging member for receiving said light beam deflected by said deflecting means, whereby said deflected light beam scans said imaging member to thereby define an image on said imaging member; and

controlling means for controlling the overall operation of said apparatus, said controlling means including pixel density switching means for switching an image density in accordance with input pixel density information,

wherein said pixel density switching means changes a frequency of a pixel clock used in said apparatus in accordance with a pixel density or line speed.

4,862,290

POWER FEEDING AND INPUT SIGNAL SWITCHING CONTROL SYSTEM FOR VIDEO TAPE RECORDER COMBINED WITH TELEVISION RECEIVER AND CAMERA IN A BODY

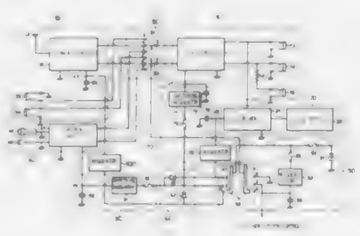
Se-Young Jung, and Tea-Weon Moon, both of Suweon, Rep. of Korea, assignors to SamSung Electronkcs Co., Ltd., Seoul, Rep. of Korea

Filed Aug. 21, 1987, Ser. No. 87,868

Claims priority, application Rep. of Korea, Aug. 22, 1986, 6936[U]

Int. Cl.[4] H04N *5/44*

U.S. Cl. 358—335 15 Claims



1. A power feeding and input signal switching control system, comprising:

control means for selectively switching on/off each operation of a video tape recorder, a television receiver and a camera and providing a plurality of main power sources and selection control signals;

power feeding means adapted to be coupled to the control means for alternatively supplying each operating power source voltage exclusively to said video tape recorder, to said video tape recorder and said television receiver or to said video tape recorder and said camera in response to said main power sources selectively provided by said control means; and

signal selecting means responsive to said selection controls signals supplied by said control means for selecting an input source of video and audio signals to said video tape recorder, said signal selecting means including a video select switch for selecting an input source of video signals to said video tape recorder and an audio select switch for selecting an input source of audio signals to said video tape recorder, said video select switch having a first input terminal coupled to a line video-in jack, a second input terminal coupled to a video output of said camera, a third input terminal coupled to a video output of a tuner of said television receiver and an output terminal coupled to a video input of said video tape recorder, said audio select switch having a first input terminal of said video tape recorder, said audio select switch having a first input terminal coupled to a line audio-in jack, a second input terminal coupled to an audio output of said camera, a third input terminal coupled to an audio output of a tuner of said television receiver and an output terminal coupled to an audio input of said video tape recorder, said input terminals of said select switches respectively being selected in a pair of video and audio signal inputs in response to said selection control signals;

whereby in accordance with the use of said video tape recorder, said television receiver and said camera, each of said main power sources selectively feed each said operating power source voltage exclusively to said video tape recorder to said video tape recorder and television receiver, or to said video tape recorder and camera and simultaneously the input source of the video and audio signals to said video tape recorder is selectively switched by said signal selecting means in response to said control means.

4,862,291

SCANNING SYSTEM IN INFORMATION REPRODUCING APPARATUS

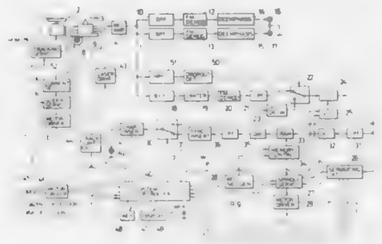
Masahiro Nakajima, and Tutomu Banno, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 16, 1987, Ser. No. 121,246

Claims priority, application Japan, Nov. 14, 1986, 61-271294; Nov. 14, 1986, 61-271295

Int. Cl.[4] H04N *5/11*

U.S. Cl. 358—342 7 Claims



1. A time base control system for a rotating recording medium, comprising:

means for rotating a recording medium and including time base means for controlling a rotational speed of said rotating means;

accessing means for accessing recording tracks on said rotating recording medium and having a detection point on said recording medium;

means for generating an error signal corresponding to a relative speed between said detection point and said rotating recording medium;

means for jumping said detection point radially across a track of said rotating recording medium;

tracking means for causing said accessing means to follow a selected one of said tracks of said rotating recording medium;

a clock;

first tuning means responsive to said error signal for correcting a time base of said time base means within a range of control and including a clock response delay having a signal delay time corresponding to a frequency of said clock; and

control means, operative during a jumping mode of said accessing means, for changing said range of control, wherein said control means stops an operation of said first tuning means during a predetermined time from a start of said jumping mode and shifts a center frequency of said clock during said predetermined period, wherein said range of control of said time base means is enlarged during said jumping mode of said accessing means.

4,862,292

DIGITAL INFORMATION SIGNAL RECORDING APPARATUS

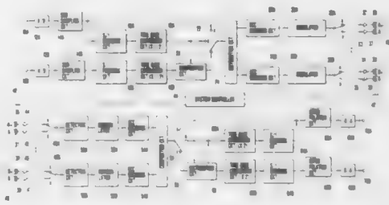
Masahiko Enari; Katsuji Yoshimura, both of Kanagawa; Akio Aoki, Tokyo; Shinichi Yamashita; Makoto Shimokoriyama, both of Kanagawa; Motokazu Kashida, Tokyo; Tetsuya Shimizu, Kanagawa; Yoshiki Ishii, Kanagawa, and Akio Fujii, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1988, Ser. No. 235,002

Claims priority, application Japan, Aug. 26, 1987, 62-211733; Aug. 26, 1987, 62-211735; Aug. 26, 1987, 62-211736

Int. Cl.[4] G11B *5/09;* H04N *9/60*

U.S. Cl. 360—8 23 Claims



1. A digital information signal recording apparatus comprising:

(a) first signal generating means for generating a digital information signal of one channel having a given bit rate;

(b) second signal generating means for generating digital information signals of n channels having a bit rate which is 1/n of said given bit rate, n being an integer which is at least 2;

(c) composition means for combining said digital information signals of n channels generated by said second signal generating means to generate a composite information signal of said given bit rate;

(d) selection means for selectively outputting one of said composite digital information signal and said digital information signal of one channel generated by said first signal generating means; and

(e) recording means for recording on a recording medium a digital signal output from said selection means.

4,862,293

STILL VIDEO ADAPTER

Mitsuru Saito, Ibaraki; Kaoru Umeda, Sennan, and Tetsuyuki Tanimoto, Takatsuki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 31, 1987, Ser. No. 90,912

Claims priority, application Japan, Aug. 30, 1986, 61-205002; Feb. 20, 1987, 62-38327

Int. Cl.[4] H04N *5/781*

U.S. Cl. 360—35.1 19 Claims



10. An adapter which, when attached to a camera body of a standard photographic still picture camera, record picture

images obtained through said camera body to a recording medium machine readable for future reproduction and viewing, comprising:

optical means receiving said images from at least part of an exposure window of said camera body;

opto-electrical conversion means for converting said images into electrical signals; and

recording means for receiving and recording said electrical signals to said recording medium.

4,862,294

DISC ERASING APPARATUS FOR SELECTIVE ERASURE OF DISC TRACKS

Yoshikazu Mihara, Yawata, and Hiroshi Nakashima, Hirakata, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Apr. 7, 1987, Ser. No. 35,534

Claims priority, application Japan, Apr. 19, 1986, 61-59259[U]

Int. Cl.[4] H04N *5/781*; G11B *21/10*

U.S. Cl. 360—35.1 **19 Claims**



1. A disc erasing apparatus for erasing selectively a record of each of a plurality of tracks formed concentrically on a disc, comprising:

a head used for at least reproduction and erasing of the record of said track,

head moving means for moving said head in a radial direction of said disc and movably controlling the trace position of said head on said disc,

tracking servo means responsive to a signal reproduced from said track by said head for outputting a tracking control signal which changes in amplitude following deviation between the actual trace position of said head and the position of a track reproduced by said head, said tracking control signal including at least a direct current signal component,

means for inputting an erase command signal,

operation controlling means responsive to said erase command signal for performing reproducing operation by said head of the track to be erased, supplying said tracking control signal outputted from said tracking servo means to said head moving means to drive said head moving means, and switching said reproducing operation into erasing operation by said head after a lapse of a sufficient predetermined period to control the trace position of said head to the position of said track to be erased,

signal holding means for holding said direct current signal component of said tracking control signal when said predetermined period is lapsed,

alternating current generating means for generating an alternating current signal with a predetermined amplitude, and

switching means for combining the direct current signal component held in said signal holding means with the alternating current signal generated by said alternating current generating means and supplying said head moving means with the combined signal instead of said tracking control signal to drive said head moving means.

4,862,295

METHOD OF FORMATTING A STORAGE MEDIUM AND DRIVE UNIT FOR CONTROLLING THE READING AND WRITING OF DATA ON THE FORMATTED STORAGE MEDIUM

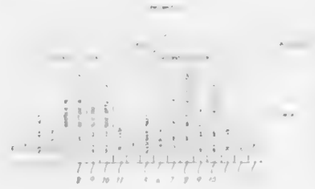
Shinichi Tanaka, Kyoto, and Shigeru Matsukawa, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 26, 1986, Ser. No. 879,042

Claims priority, application Japan, Jun. 27, 1985, 60-140820; Mar. 7, 1986, 61-51164

Int. Cl.[4] G11B *5/09, 7/007*

U.S. Cl. 360—48 **10 Claims**



1. A method formatting a storage medium comprising the steps of:

dividing the storage medium into a plurality of sectors each containing an identification field; and

recording identification information in the identification field, the identification information having address information of a plurality of sectors including the sector containing the identification field and at least one of the other sectors each being in a predetermined position on the storage medium relative to a position of the sector containing the identification field on the storage medium;

wherein the plurality of sectors on the recording medium are arranged spirally to form a spiral information track which is divided into a plurality of logical tracks; and,

wherein the address information includes a track number of logical track on which the sector containing the identification field is located, a sector number of the sector containing the identification field, a track number of a logical track on which at least one of the other sectors is located, and a sector number of at least one of the other sectors.

4,862,296

PCM SIGNAL REPRODUCING APPARATUS WITH ADJUSTABLE PHASE LOCK LOOP CIRCUITRY

Noboru Murabayashi, Tokyo, and Keiji Kanota, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,863

Claims priority, application Japan, Sep. 21, 1987, 62-238570

Int. Cl.[4] G11B *5/02*

U.S. Cl. 360—51 **13 Claims**

1. In apparatus which reproduces and demodulates digital data recorded on magnetic tape which is one of plural different types of magnetic tape and which has been recorded in accordance with different types of modulation having different recording densities, clock regeneration circuit including a phase locked loop for regenerating a clock signal for a clock component included in the reproduced data and comprising:

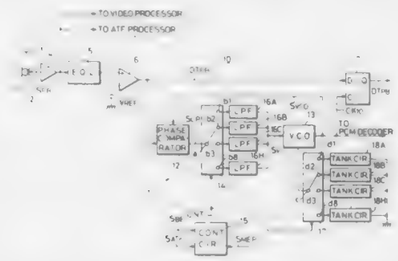
switchable voltage controlled oscillator means for selecting the frequency of a reference signal generated thereby in correspondence with the type of modulation with which the digital data was recorded;

phase comparison means for phase comparing the reference signal with a signal derived from the reproduced data;

switchable low-pass filter means for selecting a time constant thereof in correspondence with the type of modulation with which the digital data was recorded and coupled to

said phase comparison means for supplying a control voltage to the voltage controlled oscillator means; and

control means for additionally controlling the frequency



selection of said voltage controlled oscillator means and the time constant selection of said low-pass filter means as a function of said one of the plural different types of magnetic tape on which the digital data was recorded.

4,862,297

APPARATUS FOR REPRODUCING A DIGITAL SIGNAL WITHOUT EMPLOYING TRACKING SIGNALS

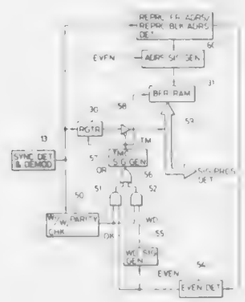
Tadashi Fukami, and Hiroyuki Ino, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 5, 1988, Ser. No. 152,821

Claims priority, application Japan, Feb. 6, 1987, 62-025774; Feb. 6, 1987, 62-025771; Feb. 21, 1987, 62-038972

Int. Cl.[4] G11B *5/008*

U.S. Cl. 360—53 **7 Claims**



1. A digital signal reproducing apparatus for a recording medium on which a plurality of signal blocks are recorded on a plurality of recording tracks and reproduced using a rotary head, said rotary head being rotated at a speed which allows said head to scan each recorded track at least twice, comprising:

error detection means for performing error detection of a reproduced signal for each signal block;

memory means for storing a detection signal from said error detection means and the reproduced signal from the signal block corresponding to the detection signal; and

means for checking the content of said detection signal in said memory means, and when the detection signal represents no error, preventing the reproduced signal of the same signal block corresponding to the detection signal from being again written in said memory means.

4,862,298

SHOCK LOAD DETECTION DEVICE

Stephen R. Genheimer, and Ken L. Pottebaum, both of Yukon, Okla., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Mar. 11, 1988, Ser. No. 167,072

Int. Cl.[4] G11B *15/04, 5/012*

U.S. Cl. 360—60 **8 Claims**



1. A shock load detection device mounted in a housing of a computer disk drive unit for measuring a mechanical shock imposed thereon and issuing a command signal to stop the writing of a read/write head should a predetermined g force be exceeded, the detection device comprising:

sensor means for detecting a mechanical shock load imposed thereon and generating an electrical charge proportional to the mechanical shock load;

amplifier means connected to the sensor means for producing a voltage signal proportional to the electrical charge received from the sensor means; and

comparator means connected to the amplifier means for measuring the voltage signal and comparing the voltage signal within a predetermined range of g force values, a write-fault signal received from the comparator means when the voltage signal received by the comparator means falls within the predetermined range of g force for stopping the writing of the read/write head.

4,862,299

CLOCK SIGNAL REGENERATOR

Hiroyuki Hagita, Hachiohji, Japan, assignor to Kabushiki Kaisha Kenwood, Japan

Filed Jan. 29, 1988, Ser. No. 150,155

Claims priority, application Japan, Jan. 31, 1987, 62-19633

Int. Cl.[4] G11B *15/14, 5/09*

U.S. Cl. 360—64 **4 Claims**



1. Magnetic record/reproduction apparatus including a rotary drum provided with substantially opposed first and second magnetic heads, the first and second magnetic heads being respectively arranged with different azimuth angles for a guardband-less recording, the apparatus comprising:

a phase-locked loop circuit in response to first and second reproduced signals respectively from said first and second magnetic heads for locking the transmission rates of the first and second reproduced signals to generate first and second reproduction clocks;

means in response to a rotary phase signal from the rotary drum for generating a timing signal to change over the

reproduction mode between the signals from said first and second magnetic heads; and

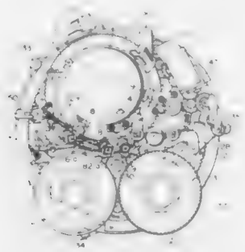
means in response to said timing signal for applying to said phase-locked loop circuit a DC voltage level at the start point of the locking to the transmission rate of each of the first and second reproduced signals, the applied DC voltage level corresponding to a DC voltage level which the phase-locked loop circuit held from one rotation of the rotary drum earlier.

4,862,300

TAPE GUIDE MOVING MECHANISM FOR MAGNETIC RECORD REPRODUCING APPARATUS

Nobuyuki Kaku; Kenji Ogiro; Atsuo Osawa; Takashi Sasaki, and Koubei Takita, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 22, 1987, Ser. No. 111,426
Claims priority, application Japan, Oct. 22, 1986, 61-249658
Int. Cl.[4] G11B *15/665*
U.S. Cl. 360—85 20 Claims



1. A tape guide moving mechanism for use with magnetic tape reproducing apparatus having a cylindrical cylinder mounted with a rotatable magnetic head thereon, said magnetic record reproduction apparatus receiving a magnetic tape cartridge including a tape, a supply reel loaded with said magnetic tape, and a take-up reel, said tape guide moving mechanism being adapted to draw the magnetic tape from said tape cartridge and to wind said magnetic tape on a cylindrical outer surface of said cylinder, said tape guide moving mechanism comprising:

a first group of tape guides having pins for maintaining a running path of said magnetic tape in a manner such that, when the magnetic tape is loaded on said cylinder, the magnetic tape is drawn from said magnetic tape cartridge in a direction lying in a plane that is perpendicular to a rotation axis of said supply reel,

drive means for controlling movement of said pins in a plane perpendicular to the direction of the rotational axis of said supply reel slowly to a first predetermined position and thereafter to a second predetermined position at a higher speed, said means being in engagement with said magnetic tape before reaching said second predetermined position for maintaining the running path for the magnetic tape from said tape cartridge to said second predetermined position in a direction substantially perpendicular to the rotational axis of said supply reel;

a second group of tape guides having a plurality of guide rollers, in which while the pins of said first tape guide group move to said first predetermined position, said guide rollers move slantingly along the cylindrical outer surface of said cylinder while continuously drawing said magnetic tape from said magnetic tape cartridge, and after said pins of the first group of tape guides have moved to said second predetermined position, said guide rollers continue moving slantingly along the cylindrical outer surface of said cylinder so as to wind the magnetic tape slantingly on the outer cylindrical surface of said cylinder while continuously drawing the magnetic tape from said cassette;

means at a third predetermined position at which said guide rollers stop for establishing and maintaining a running path for the magnetic tape which extends slantingly on the outer cylindrical surface of the cylinder;

a loading mechanism for driving said first and second groups of tape guides; and

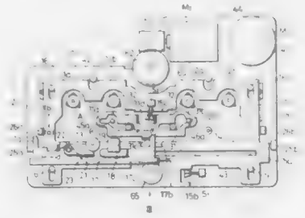
a drive mechanism having a motor and power transmitting gears arranged to transmit power to said loading mechanism.

4,862,301

DOUBLE CASSETTE TAPE PLAYER

Norimasa Komatsu, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Oct. 20, 1987, Ser. No. 111,554
Claims priority, application Japan, Feb. 9, 1987, 62-18520[U]
Int. Cl.[4] G11B *15/68*
U.S. Cl. 360—92 5 Claims



1. A double cassette tape playing and/or recording apparatus for use with magnetic cassette tapes of the type having a housing, and a magnetic tape wound around a pair of reels within said housing, said apparatus comprising:

a chassis;

a pair of cassette mounting sections arranged on said chassis, each for receiving such a cassette tape, and each of said cassette mounting sections having a reel plate and a capstan;

a sliding member disposed on said chassis so as to extend over both of said cassette mounting sections;

a head base slidably mounted on said sliding member;

a magnetic head mounted to said head base;

means for reciprocally moving said head base on said sliding member so that said magnetic head moves from one of said cassette mounting sections to the other of said cassette mounting sections;

means for moving said sliding member along said chassis so that said magnetic head is moved to contact such a magnetic tape for playing and/or recording.

4,862,302

AIR BLADDER APPARATUS FOR POSITIONING A MAGNETIC HEAD

Donald L. Ekhoff, 1600 Day Rd., Gilroy, Calif. 95020

Filed May 27, 1988, Ser. No. 199,611
Int. Cl.[4] G11B *5/54, 21/12, 21/22*
U.S. Cl. 360—105 18 Claims

1. A magnetic head load-unload device for use with an actuator in the recording and reading of information on a magnetic disk, comprising,

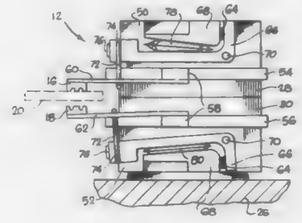
a support arm,

means for suspending a transducer from said support arm,

a transducer coupled to said suspension means, said transducer having a load position and an unload position relative to said support arm, movement of said transducer from said unload position to said load position having the effect of placing the transducer in data transfer engagement with a magnetic disk,

biasing means for exerting a force with relation to said suspension means in a manner to urge said transducer into one of said load and unload positions,

an elastically expandable pneumatic bladder operatively



coupled to said biasing means such that expansion of said pneumatic bladder provides a of said pneumatic bladder providing a force to overcome said biasing means, thereby moving said transducer to the other of said load and unload positions, and

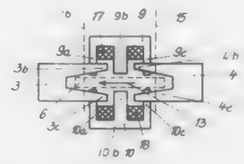
gas supply means for selectively inflating said pneumatic bladder.

4,862,303

MAGNETIC INSTRUMENT FOR READING TELEGRAPHIC SIGNALS

Norbert Normann, Pforzheim; Erwin Groos, Karlsruhe, and Harald Schlager, Rheinstetten, all of Fed. Rep. of Germany, assignors to Dodduco KG. Dr. Eugen Durrwachter, Pforzheim, Fed. Rep. of Germany

Filed Nov. 3, 1987, Ser. No. 116,638
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637320
Int. Cl.[4] G11B *5/27;* H02M *5/10*
U.S. Cl. 360—110 15 Claims



1. Magnetic reader for a disk-shaped carrier into which two parallel rows of mutually parallel Wiegand wires or wire-shaped bistable magnetic elements (BMEs) of similar characteristics are embedded which extend transversely to the longitudinal direction of the rows which corresponds to the direction of movement of the carrier during reading,

with a slot which is limited by guide parts and into which the carrier is introduced for reading and which defines the direction of movement of the carrier,

with two permanent magnets which are arranged in the vicinity of the slot in such a manner that the magnetic field generated by them has, behind one another in the direction of movement, two zones with oppositely directed field strength vectors extending transversely to the direction of movement,

and with an inductive sensor,

wherein two E-shaped ferromagnetic cores (9, 10) extending transversely to the direction of movement are provided for forming the sensor, which are located on opposite long sides of the slot (5) and the three legs of which are directed towards the long side of the slot (5), two cores (9, 10) carry on their center leg (9*b*, 10*b*) an electrical sensor winding (17, 18),

the north pole face (1*b*) of the first permanent magnet (1) is connected to a first flux concentrating piece (3) and the south pole face (2*a*) of the second permanent magnet (2) is connected to a second flux concentrating piece (4),

these two flux concentrating pieces (3, 4) are located on different sides of the main plane extending perpendicularly to the long side of the insertion slot (5) and containing its longitudinal center line (14) and their free ends (3*a*, 4*a*) face each other,

the south pole face (1*a*) of the first permanent magnet (1) and the north pole face (2*b*) of the second permanent magnet (2) are connected to one another by a third flux concentrating piece (7),

the E-shaped cores (9, 10) are arranged between the free ends (3*a*, 4*a*) of the first two flux concentrating pieces (3, 4) on one hand and the third flux concentrating piece (7) on the other hand,

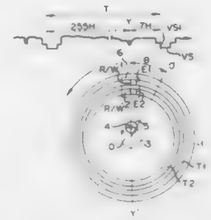
and the cores (9, 10) and the free ends (3*a*, 4*a*) of the first two flux concentrating pieces (3, 4) are mirror symmetrically arranged with respect to the longitudinal center line (14) of the slot (5)

4,862,304

COMPOSITE MAGNETIC HEAD

Yutaka Yunoki, Kunitachi; Manabu Inoue, Kokubunji, and Hiroyuki Watanabe, Yokohama, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 866,491, May 13, 1986, abandoned.
This application Nov. 10, 1988, Ser. No. 270,386
Claims priority, application Japan, Oct. 5, 1984, 59-209526; Oct. 24, 1984, 59-223617; Oct. 24, 1984, 59-223618; Oct. 24, 1984, 59-223619; Oct. 2, 1985, 60-219540
Int. Cl.[4] G11B *5/024, 5/115, 5/265, 5/48*
U.S. Cl. 360—121 2 Claims



1. A composite magnetic head for use with a generally disc-shaped recording medium having elongated tracks thereon, the composite magnetic head having a head center, and the recording medium being movable relative to the composite magnetic head, comprising

a read/write head section including a plurality of thin film read/write heads which are joined together such that respective gaps of the read/write heads are aligned at predetermined intervals in a widthwise direction of the tracks of the generally disc-shaped recording medium, and the read/write gaps coincide with a head center most close to the generally disc-shaped recording medium for optimally contacting the recording medium;

an erase head section including a plurality of bulk erase heads respectively corresponding to said thin film read/write heads and which are joined together said that respective erase gaps of the bulk erase heads are aligned at predetermined intervals in the widthwise direction of said tracks; and

a magnetic shielding member arranged between the read/write head section and the erase head section, and located a predetermined distance from said head center upstream

of the direction of motion of the recording medium relative to the composite magnetic head; and

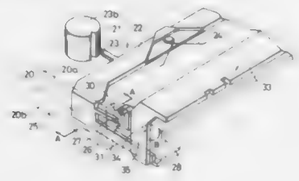
said read/write head section and said erase head section being joined in the longitudinal direction of said elongated tracks with the head gaps of said respective sections being sufficiently close to each other such that when the read/write head section is moved in a radial direction of the recording medium, the read/write gaps of said read/write head section are moved along a line passing through the center of the disc-shaped recording medium, and said erase head section is sufficiently close to said read/write head section so that azimuth and spacing losses concerning the erase head are sufficiently reduced to erase a recorded signal completely.

4,862,305

OPTICAL SYSTEM FOR MAGNETIC TAPE END DETECTION

Shingo Katagiri; Seizi Odate, and Shozo Onmori, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 29, 1987, Ser. No. 67,030
Claims priority, application Japan, Jun. 27, 1986, 61-97638[U]
Int. Cl.⁴ G11B *23/02*
U.S. Cl. 360—132 **5 Claims**



1. A tape cassette for a magnetic tape, comprising:

a cassette case having formed therein an internal space and having formed in a sidewall thereof a first light port hole and a second light port hole;

two tape hubs rotatably supported in said internal space for supporting a magnetic tape.

a prism disposed in said internal space and having a light receiving surface for receiving light from a light emitting element located outside said cassette case through said first light port hole and having a light transmitting surface for transmitting said light reflected in said prism across a transport path of said tape and through said second light port hole to a light receiving element;

a projection projecting outwardly from said cassette case in an area between said first and second light port holes for preventing light reflected from said light receiving surface from reaching said light receiving element; and

a locking member movable between first and second locations for locking and unlocking said hubs, said projection being formed unitarily with said locking member.

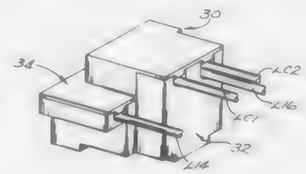
4,862,306

COMBINATION MOTOR PROTECTOR AND STARTER APPARATUS

Richard J. Lisauskas, Wrentham, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 22, 1988, Ser. No. 288,070
Int. Cl.⁴ A02H *5/04*
U.S. Cl. 361—24 **10 Claims**

6. A combination motor protector and starter for protecting and starting single phase asynchronous motors comprising a combination housing formed of electrically insulative material having a first portion with a recessed portion formed by a bottom wall and side walls, a motor starter comprising a starter housing, a resistor of a material of positive temperature coefficient of resistivity within the starter housing, electrically conducting starter contact means mounted in the starter housing for connecting the resistor in an electrical circuit, the starter contact means having upper and lower starter terminal means thereon extending from spaced portions of the starter housing, the lower starter terminal means comprising first and second resilient starter socket means for facilitating mounting of the starter on connector pins of a refrigerator compressor motor, the starter housing received in the recessed portion with the resilient starter socket means aligned with a pin receiving aperture in the bottom wall of the combination housing, electrical leads secured to the upper terminal means, a motor protector comprising a protector housing, first protector terminal means comprising a resilient protector socket means coupled to the protector for mounting of the protector on a connector pin of the refrigerator compressor motor and second protector terminal means coupled to the protector for connection to a power source, the motor protector received in the recessed portion with the resilient protector socket means aligned with the pin receiving aperture in the bottom wall of the combination housing, an electrical lead secured to the second protector terminal means, one of the side walls of the first portion of the combination housing and wall means of a second portion of the combination housing formed with lead apertures through which the electric leads attached to the starter and the protector extend,



a second portion of the combination housing having wall means, the second portion of the combination housing meeting with the first portion to enclose the starter and the protector and electrically isolate the starter and the protector from the outer environment except for the leads extending through walls of the combination housing and the resilient starter and protector socket means whereby the combination motor protector and starter can be installed on a refrigerator compressor on an assembly line in a single step by aligning the resilient starter and protector socket means with the connector pins of the refrigerator compressor and pushing the combination housing onto the connector pins.

4,862,307

DUAL VOLTAGE DISTRIBUTION TRANSFORMER WITH INTERNAL VARISTOR SURGE PROTECTION

Carl A. Larson; Charles J. McMillen, both of Hickory, and Edgar E. McQuay, Conover, all of N.C., assignors to General Electric Company, King of Prussia, Pa.

Filed Jul. 6, 1988, Ser. No. 215,525
Int. Cl.⁴ H02H *7/04*
U.S. Cl. 361—38 **14 Claims**

1. A dual voltage distribution transformer comprising, in combination:

(a) a transformer tank,

(b) a primary winding disposed within said tank and having:

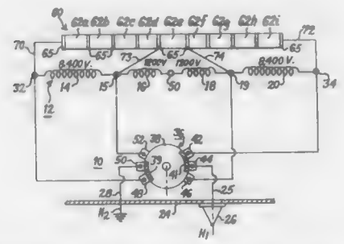
(i) a first termination for connection to line voltage when the transformer is to be operated at a relatively high voltage applied between said first termination and ground and (ii) a second termination for connection to the ground,

(c) a tap at a location intermediate the length of said winding for connection to line voltage when the transformer is to be operated at a relatively low voltage, applied between said tap and ground,

(d) a dual voltage switch operable in a first condition to connect said first termination to line voltage while said tap is idle and operable in a second condition to connect said tap to line voltage and to disconnect said first termination from line voltage except through a then-idle portion of said primary winding extending between said tap and said first termination,

(e) first varistor means disposed within said tank and having opposed first and second electrode ends,

(f) means for electrically connecting said first electrode end to said first winding termination and for electrically connecting said second electrode end to said second winding termination,



(g) second varistor means disposed within said tank, having a lower breakover voltage than said first varistor means, and having opposed electrode ends, and

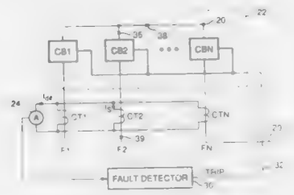
(h) connection means operable when said tap is connected to line voltage for electrically connecting one of the electrode ends of said second varistor means to said tap and the other electrode end of said second varistor means to ground.

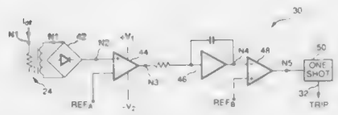
4,862,308

POWER BUS FAULT DETECTION AND PROTECTION SYSTEM

Eric A. Udren, Coral Springs, Fla., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed May 1, 1987, Ser. No. 44,647
Int. Cl.⁴ H07H *3/08*
U.S. Cl. 361—45 **22 Claims**





1. A power bus fault detector for detecting faults in a predefined portion of an electrical power bus having at least one phase, said predefined portion of said power bus consisting of the portion of an electrical power bus bounded by a preselected set of feed lines having connectors which controllably connect said feed lines to said power bus, said power bus fault detector comprising:

current transformer means for detecting the current flowing through at least one phase of each said power feed lines to said power bus;

summing means for generating a current differential signal for said at least one phase equal to the sum of said currents detected by said current transformer means;

fault detection means for generating a trip signal which causes said feed line connectors to disconnect said feed lines from said power bus when a fault is detected in said portion of said power bus, including means for detecting when said current differential signal is substantially nonsinusoidal in shape.

4,862,309

PROTECTION CIRCUIT FOR BATTERY FEED CIRCUIT

Toshiro Tojo; Kenji Takato; Kazumi Kinoshita, and Yuzo Yamamoto, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 16, 1988, Ser. No. 207,635
Claims priority, application Japan, Jun. 17, 1987, 62-150806; Dec. 11, 1987, 62-312033; Dec. 22, 1987, 62-326122; Mar. 9, 1988, 63-055329
Int. Cl.⁴ H02H *3/20*
U.S. Cl. 361—56 **19 Claims**



1. A protection circuit for a battery feed circuit, the battery feed circuit having A and B subscriber's lines for supplying a DC current from a supply to telephone terminal equipment, battery feed resistors connected to the A and B subscriber's lines, respectively, battery feed transistors, each having an emitter connected to one of the battery feed resistors, and operational amplifiers, each having an output connected to the base of one of the battery feed transistors, for applying predetermined voltages at the emitter of the battery feed transistor connected thereto, said protection circuit comprising:

a supervising circuit, operatively connected to at least one of the battery feed resistors connected to the A and B subscriber's lines, for generating a first control signal upon detection of an abnormal current flowing through at least one of the battery feed resistors; and

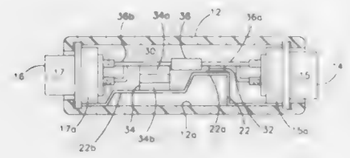
at least one voltage limiting circuit, operatively connected to said supervising circuit and a corresponding subscriber's line, for clamping a fixed voltage across the battery feed resistor connected to the corresponding subscriber's line, upon receipt of the first control signal from said supervising circuit.

4,862,310
LOW LEAKAGE BATTERY PROTECTION DIODE STRUCTURE
Thomas E. Harrington, III, Carrollton, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.
Filed Apr. 29, 1988, Ser. No. 187,864
Int. Cl.[4] H02J *9/02*
U.S. Cl. 361—58 **32 Claims**



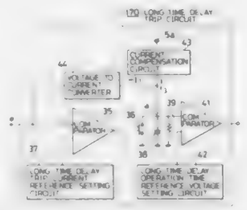
17. A method for protecting a battery from battery charging, comprising:
providing a substrate, the substrate containing a first PN junction therein that is capable of being reverse biased;
disposing a second PN junction between the battery and the substrate;
connecting one end of a battery terminal to one side of the second PN junction such that the second PN junction is forward biased when supplying current therethrough to the substrate and the second PN junction operable to be reverse biased to prevent charging from the substrate;
preventing minority carriers from being injected into the substrate from the other side of the second PN junction when the second PN junction is forward biased and the first PN junction is reverse biased; and
ohmically connecting the other side of the second PN junction to the substrate in such a manner that minority carriers are not injected to the substrate from the second PN junction.

4,862,311
OVERVOLTAGE PROTECTOR FOR USE WITH DATA CABLES
Wayne Rust, Chicago, Ill., and John S. Bonnesen, Eden Prairie, Minn., assignors to Reliance Comm/Tec Corporation, Chicago, Ill.
Filed Apr. 12, 1988, Ser. No. 180,382
Int. Cl.[4] H02H *9/04*
U.S. Cl. 361—91 **19 Claims**



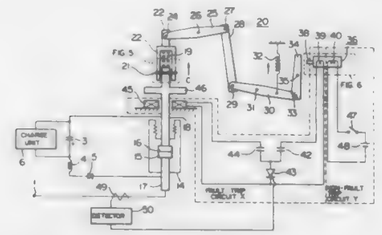
1. An overvoltage protector for interconnection between a data cable having a connector and a connector mounted on a piece of equipment having a chassis ground, said equipment connector having a conductive shell connected to said chassis ground, said data cable connector ordinarily connected to said equipment connector, said protector comprising:
(a) a first connector having a conductive shell and a multiplicity of pins, said first connector designed for connection to said equipment connector in a manner such that said first connector conductive shell is in electrical contact with said equipment connector conductive shell when said connectors are connected to each other;
(b) a second connector in spaced relationship to said first connector, said second connector having a multiplicity of pins, said second connector designed for connection to said data cable connector;
(c) a planar ground plate extending between said first and second connectors, said plate in electrical connection with said first connector conductive shell; and
(d) overvoltage protection means connected between a predetermined one of said first connector multiplicity of pins, a predetermined one of said second connector multiplicity of pins and said ground plate.

4,862,312
CIRCUIT BREAKER WITH OVERCURRENT PROTECTION
Kazuhiro Ishii, Fukuyamashi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 22, 1988, Ser. No. 274,858
Int. Cl.[4] H02H *3/093*
U.S. Cl. 361—96 **5 Claims**



1. A circuit breaker device comprising:
a line contact inserted in an AC line conductor;
a current transformer for detecting the current flowing through the line contact;
a rectifier circuit connected to the secondary winding of the current transformer to convert the AC secondary current into a unidirectional current;
a DC constant voltage power supply circuit connected across the output terminals of the rectifier circuit and having positive, negative and intermediate output terminals for producing positive, negative and intermediate potentials;
a current detection resistor connected in series with said power supply circuit;
a differential amplifier circuit powered from the output of said power supply circuit and converting a voltage drop across said current detection resistor which is proportional to said unidirectional current into an output signal having a potential which is between said positive and negative potentials and takes the intermediate potential as a reference;
a time delay circuit powered from said power supply circuit and connected to receive the output signal of said differential amplifier circuit proportional to said unidirectional current and producing a predetermined time delay with respect to a predetermined magnitude of said unidirectional current;
a switch circuit operated from an open-state to a closed-state in accordance with the output of said time delay circuit;
an electromagnetic trip coil connected in series with said switch circuit, the series circuit of said electromagnetic trip coil and said switch circuit being connected to be energized by the output of said rectifier circuit;
a trip mechanism excited when said electromagnetic trip coil is energized;
wherein said time delay circuit comprises a long time delay trip circuit which comprises a capacitor charged by an current corresponding to the fault current, and a current compensation circuit for compensating the leak current of said capacitor.

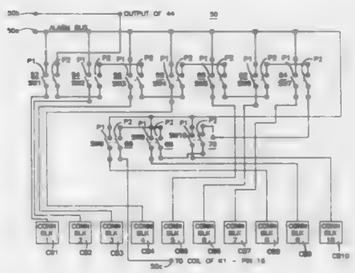
4,862,313
DRIVING APPARATUS FOR DC CIRCUIT BREAKERS
Tatsuji Shirouzu; Tatsuo Takahashi; Motoo Sato, and Satoshi Mizuno, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 8, 1988, Ser. No. 281,211
Claims priority, application Japan, Dec. 11, 1987, 62-311983
Int. Cl.[4] H02H *2/02*
U.S. Cl. 361—102 **11 Claims**



1. In a DC circuit breaker of reverse current insertion type wherein a preliminarily charged capacitor is connected to a breaker unit through a switch whereby a capacitor discharge current opposite in polarity to a main circuit current is supplied to breaker contacts to forcibly develop a current zero point and thereby to effect a current-limiting breaking, a driving apparatus comprising:
a vacuum valve used as said breaker contacts;
at least one pair of stationary and movable electrodes oppositely arranged within said vacuum valve so as to come into and out of contact with each other;
a pair of rods each thereof being fastened to a back of one of said electrodes to extend to the outside of said vacuum valve;
a magnetic repulsive coil mounted halfway on said movable-side rod to move said movable-side rod in an opening direction;
an operating mechanism connected to said movable-side rod through a contact spring contacting with said movable-side rod;
trip coil means engaged with said operating mechanism and adapted to be energized to release said engagement to open said breaker unit;
a fault trip circuit for simultaneously energizing said trip coil means, said magnetic repulsive coil and capacitors; and
a non-fault trip circuit for operating a switch connected to said trip coil means to energize said trip coil means to open said breaker unit.

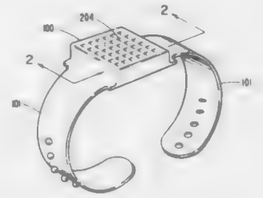
4,862,314
SYSTEM FOR PROVIDING POWER TO A CENTRAL OFFICE PROTECTOR MODULE WITH ALARM INDICATOR AND INCLUDING REMOTE ALARM INDICATION
Phil Corvino, Naperville, and Tom McCormick, Dwight, both of Ill., assignors to Reliance Comm/Tec Corporation, Chicago, Ill.
Filed Jun. 3, 1988, Ser. No. 202,713
Int. Cl.[4] G08B *17/06*
U.S. Cl. 361—119 **18 Claims**

6. The system of claim 1 further comprising another frame connector assembly having a multiplicity of groups of receptacles, each of said groups for receiving one of said modules, said first transmission means for connecting said power supply means first terminal to a first terminal of said another frame connector assembly which is connected to one of said receptacles in each of said another assembly groups and said second transmission means for connecting said power supply means second terminal to a second terminal of said another frame connector assembly which is connected to another one of said receptacles in each of said another assembly groups, said current flowing from said power supply means to said one or more



of said another assembly groups only when a module received in each of said another assembly groups has shorted to ground, said current activating said module alarm indicating means.

4,862,315
STATIC ELECTRIC DISCHARGE APPARATUS
Richard J. Cubbison, Jr., Westminster, Colo., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.
Filed Oct. 31, 1988, Ser. No. 265,152
Int. Cl.[4] H05F *3/02*
U.S. Cl. 361—212 **10 Claims**

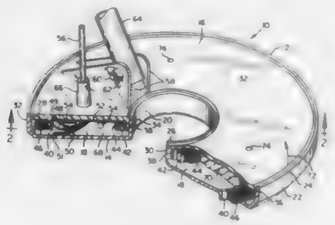


1. Apparatus for the static electric discharge of a human body and which is worn on the human body, comprising:
an electrode adapted to be electrically connected to said human body;
ionization means located in proximity to said electrode for ionizing air in vicinity of said electrode to form pairs of oppositely charged ions; and
chamber means for allowing one member of each pair of said ions to be attracted to said electrode to flow to said electrode and the other member of each pair of ions to be repelled by said electrode to flow from said chamber into the surrounding air thereby discharging static electricity from said human body.

4,862,316
STATIC CHARGE DISSIPATING HOUSING FOR METAL DETECTOR SEARCH LOOP ASSEMBLY
Peter T. Smith, Sweet Home; Mark W. Rohde, Scio, and Donald K. Shoemaker, Sweet Home, all of Oreg., assignors to White's Electronics, Inc., Sweet Home, Oreg.
Filed Feb. 29, 1988, Ser. No. 162,183
Int. Cl.[4] H05F *3/02*
U.S. Cl. 361—220 **12 Claims**

1. A housing for a metal detector search loop assembly including a transmit coil and a receive coil magnetically coupled therewith, the housing comprising:

(a) a shell defining a cavity, said shell being constructed of a plastic material including a predetermined concentration of non-metallic electrically conductive fibers distributed throughout said plastic material, said concentration of said conductive fibers in said plastic material being at least



sufficient to provide conductive paths having the ability to dissipate electrostatic charges; and

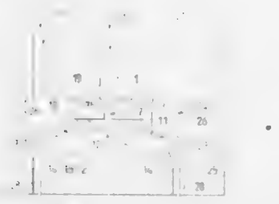
(b) coil mounting means included in said housing for supporting said transmit coil and said receive coil in a fixed spatial relationship within said cavity.

4,862,317

CAPACITIVE PRESSURE TRANSDUCER

Heikki Kuisma, Helsinki, Finland, assignor to Vaisala Oy, Helsinki, Finland

Filed May 4, 1988, Ser. No. 190,112
Claims priority, application Finland, May 8, 1987, 872050
Int. Cl.[4] H01G *5/16;* **G01L** *9/12*
U.S. Cl. 361—283 **5 Claims**



1. A capacitive pressure transducer, comprising:

a capacitive sensor structure;

a case into which the capacitive sensor structure is mounted;

channels formed in the case for introducing a measured medium into the capacitive sensor structure;

electric conductors through which the capacitive pressure information available from the capacitive sensor structure is made externally available; and

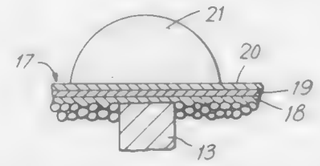
thin resilient structure means formed within the case for fixing the capacitive sensor structure in the case so that the capacitive sensor structure is floating between said thin resilient structure means, wherein said thin resilient structure means are of a substantially rectangular shape and wherein the width of each is more than six times its height.

4,862,318

METHOD OF FORMING THIN FILM TERMINATIONS OF LOW INDUCTANCE CERAMIC CAPACITORS AND RESULTANT ARTICLE

John Galvagni, Myrtle Beach, S.C.; James M. Oberschmidt, Stanfordville, and James N. Humenik, LeGrangeville, both of N.Y., assignors to AVX Corporation, Great Neck and IBM Corporation, Armonk, both of, N.Y.

Filed Apr. 4, 1989, Ser. No. 332,993
Int. Cl.[4] H01G *1/01, 3/06;* **H05K** *1/04*
U.S. Cl. 361—321 **8 Claims**



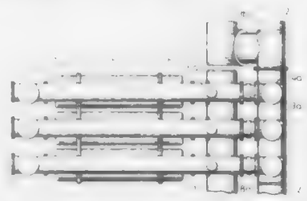
1. The method of termination by thin film vacuum deposition techniques of a low inductance high value tab type sintered ceramic capacitor having side by side disposed conductive tabs exiting on a first surface of said capacitor which comprises the steps of abrading said first surface of said as-sintered capacitor to form a generally smooth configuration, thereafter polishing said surface using an abrasive polishing medium having an average particle size in the range of from about 2 microns to about 10 microns, thereafter masking said surface to cover portions thereof while exposing other portions in registry with selected ones of said tabs and thereafter depositing one or more metal layers on said surface through said mask by a vacuum deposition technique.

4,862,319

GAS-INSULATED SWITCHGEAR

Hiroshi Suzuyama; Yoshirou Suzuki, and Minoru Sakaguchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP87/00742, § 371 Date Feb. 8, 1988, § 102(e) Date Feb. 8, 1988, PCT Pub. No. WO88/02941, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 5, 1987, Ser. No. 163,751
Claims priority, application Japan, Oct. 7, 1986, 61-237254
Int. Cl.[4] H02B *1/20*
U.S. Cl. 361—341 **22 Claims**



1. A gas-insulated switchgear forming a bus section unit comprising:

two three-phase common enclosure type gas-insulated main buses each of which is firmly supported on a rigid support surface along substantially parallel straight lines in an installation area; one of the gas-insulated main buses being sectionalized into two gas-insulated main buses; the sectionalized gas-insulated main buses being arranged in line on the same axis;

a circuit breaker for each phase of the three phases having a disconnecting switch at each terminal thereof, the circuit breakers being connected between the two sectionalized gas-insulated main buses; the circuit breakers being disposed by a side of the sectionalized gas-insulated main buses; and

a shifted bus section formed at the end of one of the two sectionalized gas-insulated main buses; the shifted bus section being supported on the gas-insulated main bus; the shifted bus section being staggered from the other sectionalized gas-insulated main bus to form an axially overlapping bus structure; the shifted bus section being connected to the other sectionalized gas-insulated main bus via the circuit breaker and the disconnecting switches which are respectively mounted on the shifted bus section and the other sectionalized gas-insulated main bus.

4,862,320

RACK FOR CIRCUIT BOARDS OF AN ELECTRICAL SYSTEM

William L. Schmidt, Acton; Richard E. Olson, Townsend, and Douglas A. Bailey, Concord, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 97,309, Sep. 14, 1987, abandoned, which is a continuation of Ser. No. 827,387, Jan. 28, 1986, abandoned. This application May 23, 1988, Ser. No. 198,644
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—383 **14 Claims**



9. In an electronic system having a fan for forced air cooling of components of said system, a rack mounting circuit boards for inclusion within said electrical system, and positioned in the air stream generated by said fan, said rack comprising:

a back plate;

two parallel grilles extending perpendicular from opposite ends of said back plate;

two parallel side panels extending perpendicular from opposite sides of said back plate and between said grilles;

said grilles having tracks for guiding and positioning circuit boards in said rack in a manner parallel with said side panels;

a zero-insertion-force connection assembly secured in said back plate for electrically connecting circuit boards disposed in said tracks with said electronic system;

said zero-insertion-force connection assembly including a rotatable shaft extending from said back plate connected to the contacts of said connection assembly whereby rotation of said shaft from a first to a second position urges said contacts from an open position to a closed, active position;

a remote actuating assembly for actuating said shaft to permit the opening and closing of said contacts;

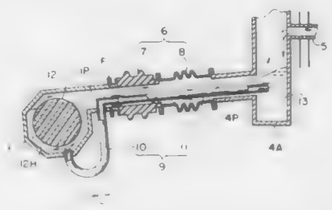
said actuating assembly including a shaft actuating unit which is connected with said shaft, said actuating unit being rotably mounted on the outer surface of one of said grilles, a link member secured at one end to said actuation unit such that linear movement of said link member causes the rotation of said shaft actuation unit, a lever member secured at the other end of said link member and movable from a first to a second position whereby movement of said lever member from said first to said second position results in urging the linear movement of said link member and the rotary movement of said actuating member to thereby rotate said shaft member, whereby the selective movement of said lever member from its first and second positions remotely opens and closes said electrical contacts of said zero-insertion-force connectors.

4,862,321

COOLING SYSTEM FOR HEATING BODY

Shuuji Saitoo, and Yoshikatu Tokunaga, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1988, Ser. No. 250,159
Claims priority, application Japan, Sep. 30, 1987, 62-243818
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—385 **7 Claims**



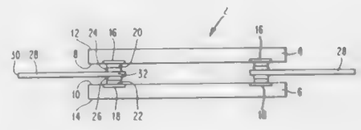
1. A cooling system for a heating body which comprises an evaporation vessel having a thermal conductor therein and being filled with liquid refrigerant, a condenser, a connecting pipe to connect said evaporation vessel and said condenser, and a liquid return pipe which passes through the connecting pipe and opens in said evaporation vessel at its one end as well as in said condenser at its other end, and which cools the heating body by means of said liquid refrigerant by contacting said heating body with the surface of said evaporation vessel, wherein one end of said liquid return pipe on said evaporation vessel side is branched off from said connecting pipe in the vicinity of the connecting portion of said evaporation vessel and said connecting pipe to open in the bottom of said evaporation vessel.

4,862,322

DOUBLE ELECTRONIC DEVICE STRUCTURE HAVING BEAM LEADS SOLDERLESSLY BONDED BETWEEN CONTACT LOCATIONS ON EACH DEVICE AND PROJECTING OUTWARDLY FROM THEREBETWEEN

Harry R. Bickford, 57 Sherwood Ave., Ossining, N.Y. 10562; Mark F. Bregman, 63 Old Washington Rd., Ridgefield, Conn. 06877; Paul A. Moskowitz, R.D. #1, Box 343, Hunterbrook Rd., Yorktown Heights, N.Y. 10598; Michael J. Palmer, R.D. #2, Box 372, Walden, N.Y. 12586; Timothy C. Reiley, 16865 Kennedy Rd., Los Gatos, Calif. 95032; Paige A. Poore, 1214 Huntsman Dr., Durham, N.C. 27713, and Caroline A. Kovac, 20 Blue Ridge Rd., Ridgefield, Conn. 06877

Filed May 2, 1988, Ser. No. 188,805
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 **12 Claims**



1. A structure comprising:

a first and second electronic device each having a first face and a second face, there being a plurality of input/output

terminals extending to at least said first face of each of said devices, there being a pattern at said first face of said first and said second devices at least a portion of which is electrically conducting and connected to at least a portion of said terminals on said first faces of said first and said second devices;

said first and second devices being mounted together, with said first face of said first device facing said first face of said second device, at least a portion of said pattern on said first device being aligned opposite to at least a portion of said pattern on said second device;

a plurality of beam leads projecting outwardly from between said first and said second devices;

each of said beam leads having an inner and outer lead bond site; and

said inner lead bond site of at least one of said beam leads being solderlessly bonded between said at least a portion of said pattern on said first device and said at least a portion of said pattern on said second device, said inner lead bond site being aligned between and in substantially a straight line with said oppositely aligned portions of said pattern on said devices, said straight line being normal to said first faces of said devices.

4,862,323

CHIP CARRIER

Sheldon H. Butt, Godfrey, Ill., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 599,421, Apr. 12, 1984, abandoned. This application May 22, 1985, Ser. No. 736,907

Int. Cl.[4] H05K *1/18*

U.S. Cl. 361—388 **14 Claims**



1. A circuit board structure, comprising:

circuit board means having a first coefficient of thermal expansion of at least about 160×10^{-7} in/in/°C., said circuit board means comprising:

a first wrought metal component comprising a thin wrought foil having a first electrical circuit pattern thereon;

a second wrought metal component;

said first and second wrought metal components being selected from the group consisting of copper and copper base alloys;

a first bonding means having a second coefficient of thermal expansion of at least about 160×10^{-7} in/in/°C. bonding said first component to said second component whereby thermal stress generated by thermal cycling is substantially reduced within said circuit board means;

chip carrier means having a third coefficient of thermal expansion being closely matched to the first and second coefficients of thermal expansion;

means affixing said chip carrier means to said first electrical circuit pattern on said thin wrought foil whereby thermal cycling of said circuit board structure does not substantially stress the connection between said chip carrier means and said circuit board means.

4,862,324

SWITCHGEAR ENCLOSURE AND METHOD OF FABRICATION

Arvydas J. Kalvaitis, Northbrook, and Thomas W. Ernst, Mt. Prospect, both of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Oct. 23, 1986, Ser. No. 922,376

Int. Cl.[4] H05K *5/00*

U.S. Cl. 361—390 **14 Claims**

1. An enclosure for metal-enclosed switchgear having at least one access opening and being assembled from a plurality to generally planar panels, the enclosure comprising:

at least three vertical wall panels, said vertical wall panels each including inwardly turned edges so as to define a first flange along at least a substantial portion of each vertical edge thereof, said three vertical wall panels when assembled defining three sides of said enclosure, a second inwardly turned edge being formed on at least one of said vertical wall panels so as to provide a second inwardly turned edge at each intersection where two of said vertical wall panels abut to define said three sides of said enclosure, said second inwardly turned edge forming a second



flange extending from and being substantially perpendicular to said first flange; and

means for assembling said enclosure, said assembling means affixing said first flange of a vertical wall panel to said second flange of another of said vertical wall panels, said first flange of a respective wall panel and said second flange of an abutting wall panel being substantially parallel and coextensive, each of said affixed flanges including an aperture, said assembling means comprising fasteners that are arranged internal to said enclosure, one of said fasteners being positioned through each of said apertures to directly clamp said affixed flanges.

4,862,325

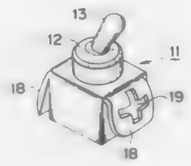
PRINTED WIRING BOARD MOUNTED ELECTRONIC COMPONENT

Shigeo Ohashi, Tokyo, Japan, assignor to Nihon Kaibeiki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1987, Ser. No. 134,082

Int. Cl.[4] H05K *7/12*

U.S. Cl. 361—400 **6 Claims**



1. A printed wiring board mounted with at least one electronic component,

said printed wiring board having cut out portions, and

said electronic component having a generally rectangular shape,

tongue pieces made of a resilient material provided on said electronic component at opposite side portions thereof, each tongue piece having a cross-shaped groove, each cross-shaped groove including a first groove portion and a second groove portion disposed perpendicular to each other,

whereby said electronic component can be mounted on said wiring board in a first direction relative to said wiring board by engaging said first groove portions with the opposite side walls of the cut out portion of the printed wiring board, or in a second direction perpendicular to said first direction by engaging said second groove portions with said opposite side walls of said cut out portion of the printed wiring board.

4,862,326

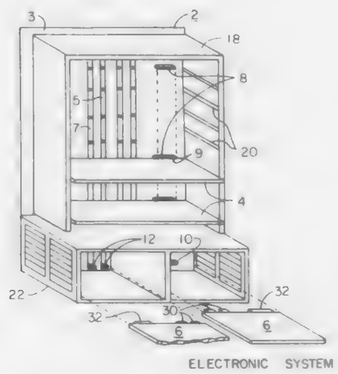
POWER SUPPLY CONTACT

John W. Blomstedt, 22 Jeffrey Cir., Bedford, Mass. 01730; Wesley F. Irving, 169 Arnold St., Braintree, Mass. 02184, and Mark S. Pusateri, 187 Lancaster, West Boylston, Mass. 01583

Continuation of Ser. No. 20,154, Feb. 26, 1987, abandoned, which is a continuation of Ser. No. 750,431, Jul. 1, 1985, Pat. No. 4,685,032. This application Apr. 12, 1988, Ser. No. 183,356

Int. Cl.[4] H05K *1/14*

U.S. Cl. 361—413 **3 Claims**



ELECTRONIC SYSTEM

1. An electronic system includes a plurality of logic circuit boards and a plurality of power supplies providing for the high current needs of of up to a maximum of 208 amperes said electronic system, said plurality of logic circuit boards being plugged into logic connectors mounted on an integrated etched backplane assembly for transferring logic signals and receiving voltage and ground signals, and each of said plurality of power supplies being plugged into a first power connector for completing a ground path and into a second power connector for completing a voltage path, each of said first and said second power connectors being mounted on said backplane assembly, each power connector comprising:

fastening means for coupling to said backplane assembly;

contact means for coupling to one of said plurality of power supplies, said contact means including a plurality of sets of fingers, each set being in contact with blade means, said blade means being coupled to said one of said plurality of power supplies for completing said voltage or said ground path, a top portion of each finger of each set of said plurality of sets of fingers being in contact with said blade means on opposite sides of said blade means and exerting forces in opposite directions against said blade means; and

flexing means coupled to said contact means and said fastening means for providing a fulcrum at a bottom portion of said each finger about which said each finger will rotate to exert said force when said blade means is inserted between said each set.

4,862,327

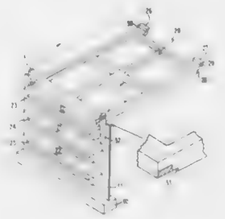
ADAPTER CARD MOUNTING IN A LOW PROFILE MICROCOMPUTER

Daniel F. Ansell, Coral Springs; James C. Harris, Boca Raton; Steven E. Howell, Lantana; Michael S. Miller, Delray Beach, and Robert D. Wysong, Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 19,455, Feb. 26, 1987, abandoned. This application Jun. 9, 1988, Ser. No. 205,593

Int. Cl.[4] H05K *1/14*

U.S. Cl. 361—415 **11 Claims**



1. A microcomputer system including: a housing; a planar board carrying components of the microcomputer system and mounted in the housing; and means for mounting optional adapter cards within the housing, each adapter card having principally a length and width dimension, the length and width dimensions of some adapter cards rendering such cards unmountable in said housing in an orientation where their planes are perpendicular to said planar board, said mounting means comprising:

(a) first socket means connected to and supported by said planar board;

(b) an extender card pluggable into and supportable by said first socket means to extend substantially perpendicular to said planar board;

(c) at least one second socket means connected to and supported by said extender card, each second socket means for accepting an edge connector of an adapter card mounted substantially parallel to said planar board, thereby permitting mounting of optional adapter cards within the housing notwithstanding a width dimension of an adapter card being larger than said height dimension of said housing.

4,862,328

ELECTRIC DOUBLE LAYER CAPACITOR

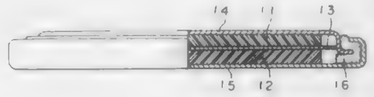
Takeshi Morimoto; Yasuhiro Sanada; Shinichi Ohashi, and Yoshikatsu Kimura, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo and Elna Company Ltd., Fujisawa, both of, Japan

Filed Mar. 28, 1988, Ser. No. 177,854

Claims priority, application Japan, Aug. 13, 1985, 60-176855; Jun. 6, 1986, 61-130391

Int. Cl.[4] H01G *9/02*

U.S. Cl. 361—502 **5 Claims**



1. A coin-shaped electric double layer capacitor comprising an assembly of a pair of sheet-shaped polarizable electrodes and a separator interposed between the electrodes and impregnated with an electrolyte, a metal casing accommodating the assembly and electrically connected at its bottom to one of the

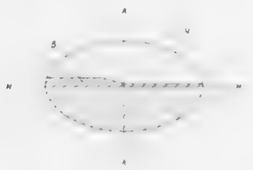
polarizable electrodes, a metal cover for the metal casing, connected to the other electrode, and a sealing material interposed between and electrically insulating a periphery of the metal cover and the open edge of the metal casing and integrally caulked by an open edge of the metal casing, wherein the polarizable electrodes are composed of a continuously micro-porous structure of a fluorine-containing polymer resin with a fine carbon powder incorporated therein said fluorine-containing polymer resin being to 5 to 30% by weight relative to the fine carbon powder, wherein said structure comprises a numerous fine nodes of the resin and fine fibers of the resin three dimensionally connecting the nodes so that the nodes are partially in contact with or connected to one another, and the fine carbon powder is contained substantially in the nodes whereby said capacitor has a capacity of at least 40 F/cm^3.

4,862,329

VEHICULAR HEADLAMP

Naohi Nino, Shizuoka, Japan, assignor to Koito Seisakusho Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1989, Ser. No. 321,130
Claims priority, application Japan, Mar. 11, 1988, 63-57471
Int. Cl.[4] F21M *3/14*
U.S. Cl. 362—61 10 Claims



1. A vehicular headlamp comprising:

a concave light reflector having a focus and a light ray converging point, said converging point being positioned in front of said focus with respect to the reflector;

a first light source located on said focus;

a second light source located behind said focus;

a cover member covering front and lower portions of said first light source;

a first shade member positioned in the vicinity of said converging point of the light reflector, said first shade member having an upper edge positioned near an optical axis of said light reflector;

a second shade member located in the vicinity of a sub-converging point at which light rays produced by said second light source and reflected by said light reflector are converged;

a converging lens arranged in front of said first shade member in such a manner that a focus of the lens is positioned on said upper edge of said first shade member; and

first and second light reflecting surfaces respectively defined by said first and second shade members, said first and second light reflecting surfaces being so arranged and constructed that said light rays from said light reflector are reflected by said second and first reflecting surfaces in this order and directed toward said converging lens.

4,862,330

VEHICLE LAMP

Tsutomu Machida; Toshiyasu Mochizuki, and Masaru Sasaki, all of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1988, Ser. No. 247,012
Claims priority, application Japan, Sep. 21, 1987, 62-235026; Sep. 21, 1987, 62-142929[U]; Jun. 17, 1988, 63-148323
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 362—61 13 Claims



1. A lamp for a vehicle, comprising:

a lamp unit comprising a lamp body, a front lens, and a plurality of light-emitting diodes juxtaposed at predetermined intervals; and

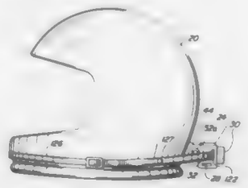
a plurality of light control parts each comprising nine prisms arranged in a 3×3 matrix formed in an inner wall of said front lens in correspondence to each of the respective light-emitting diodes to direct output light beams of said light-emitting diodes in a predetermined direction, a central one of said nine prisms of each of said light control parts facing the respective light-emitting diode, and each of the four prisms adjacent said central one of said nine prisms having a step along inner edges thereof.

4,862,331

DETACHABLE REAR-MOUNTED LIGHT FOR A MOTORCYCLE HELMET

Akira Hanabusa, 1045 S. Ridgeley Dr., Los Angeles, Calif. 90019

Division of Ser. No. 139,401, Dec. 30, 1987. This application Mar. 6, 1989, Ser. No. 319,371
Int. Cl.[4] F21L *15/14*
U.S. Cl. 362—106 16 Claims



1. A detachable light for installation in a helmet having a base which encircles a wearers head to form a chin protection comprising:

(a) a light assembly including an electrical lamp and power source for energizing said lamp,

(b) maintaining means for removably securing said light assembly to a predetermined position on said helmet, said maintaining means including,

(1) an elastic strap attached at one end thereof to the left side of said light assembly and at the other end thereof to the right side of said housing,

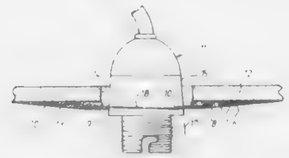
(2) said elastic band being stretched around the base and chin protector portion of said helmet to maintain said light assembly in said predetermined position.

4,862,332

LIGHT FITTING SUPPORT MEMBER

Samuel F. Hardy, 554 Waverley Road, Chadstone, Victoria, Australia

Filed May 18, 1988, Ser. No. 195,695
Claims priority, application Australia, May 18, 1987, PI1982
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—145 4 Claims



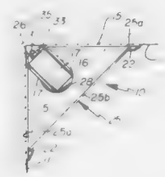
1. A support member for securing a light fitting to a wall surrounding an aperture in said wall comprising a plate member having a planar outer base rim portion provided with a plurality of apertures, an inwardly angularly extending land portion offset from the plane of said base rim portion and including a plurality of apertures and an inner planar portion extending from the inner edge of said offset portion and including a centrally located aperture for receiving said light fitting therein, and a coating of filling and settable material applied to said wall surrounding said wall aperture to an extent to embed the planar outer base rim portion and the inwardly angularly extending land portion of said support member with said filling and settable material extending through said plurality of apertures in said rim and land portions to provide the attachment for said support member to said wall.

4,862,333

CORNER WALL LAMP

Denis R. Brasket, 2745 Winnetka Ave. North - #185, Golden Valley, Minn. 55427

Filed Jul. 29, 1988, Ser. No. 225,793
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—147 8 Claims



1. A tetrahedral corner lamp for attachment to the corner of a room defined by the orthagonal relation of a pair of walls and the ceiling of the room, comprising:

a metal frame formed of a heat resistant, light reflective material and including a generally rectangular-shaped vertically extending central panel and a pair of triangular-shaped side panels integral with said central panel and extending angularly outwardly therefrom,

means of attaching the triangular side panels to the associated vertical walls defining the corner,

said triangular side panels each having an upper edge with a portion thereof engaging the ceiling and having a front outer edge bent to define an inturned flange, said inturned flange on one side panel inclined towards the inturned flange on the other side panel,

a light bulb socket connected with said central panel and projecting forwardly therefrom between said triangular side panels, a light bulb mounted in said socket, an elongate two-wire electrical cord having one end thereof connected to said socket and extending downwardly therefrom and having a male socket member secured to the other end thereof for connection to an electrical outlet, said triangular side panels and said central panel defining reflective surfaces for reflecting light outwardly of said frame, and

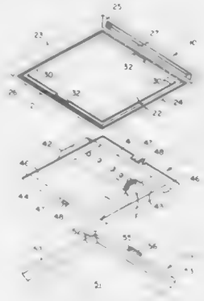
a triangular-shaped translucent lens positioned between said side panels in contact therewith having an apex extending downwardly, engaging and supported by said flanges and urging each of said triangular side panels against the adjacent associated vertical wall.

4,862,334

LAMP, REFLECTOR AND GRILLE INTERLOCK ASSEMBLY

Charles W. Ivey, Hope Mills; David G. Wilson, and Clarence R. Thorne, both of Fayetteville, all of N.C., assignors to Fasco Industries, Inc., Lake Forest, Ill.

Filed Feb. 9, 1989, Ser. No. 308,086
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—149 14 Claims



1. The combination, comprising

a grille having therein a central opening and a plurality spaced slots each of which communicates at one end with said central opening and at its opposite end with the exterior of the grille,

a reflector having a closed end extending through said central opening in said grille beyond one side thereof, and having a flange portion projecting laterally from said central portion and engaging said grille adjacent the opposite side thereof,

first latching means on said flange portion of said reflector releasably engaged with said grille to secure said reflector to said grille,

means for mounting a lamp in said reflector to have light therefrom reflected by said closed end of said reflector out of an opening in the opposite end thereof,

a light-transmissive lens positioned over and closing said opening in said opposite end of said reflector, and

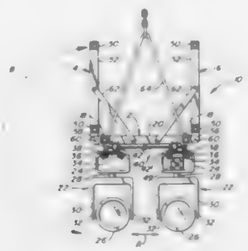
second latching means on said lens releasably engaged with said grille to secure said lens to said grille and against said flange portion on said reflector.

4,862,335
CLOSURE SYSTEM FOR TWO CONTAINER PARTS
Jan E. Vadseth, Sevelen, Switzerland, assignor to Meta-Fer Holding S.A., Luxembourg-Kirchberg, Luxembourg
Filed Mar. 16, 1988, Ser. No. 168,904
Claims priority, application Switzerland, Mar. 16, 1987, 976/87
Int. Cl.[4] F21V *31/02*
U.S. Cl. 362—267 13 Claims



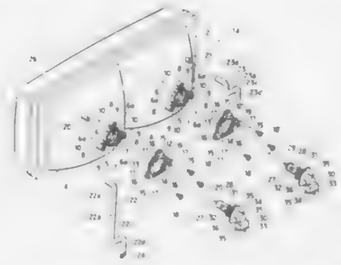
1. A casing for an air field light comprising a rigid container consisting substantially of first and second parts, each said part having a flange portion, said flange portions being connected to one another so as to seal the container; and
a shrink sleeve surrounding said flange portions and providing a water-tight seal of said first and second parts.

4,862,336
DIMORPHIC TRUSS UNIT
Brian Richardson, San Jose, and John Richardson, Los Gatos, both of Calif., assignors to Morpheus Lights, Inc., San Jose, Calif.
Filed Dec. 2, 1987, Ser. No. 127,931
Int. Cl.[4] E04F *19/00*; E04H *14/00*
U.S. Cl. 362—285 20 Claims



1. A truss unit reconfigurable between a transportation state and an operation state, comprising:
an elongated frame having opposed first and second longitudinally extending sides,
at least one row of lights suspended downwardly along the length of said frame,
a first rigid lateral member,
a second rigid lateral member,
first hinge means interconnecting said first lateral member to said first side and second hinge means interconnecting said second lateral member to said second side of said frame for selectively pivoting said first and second lateral members between a downwardly extending transportation configuration and an upwardly extending operation configuration, and
locking means for fastening said first and second lateral members relative to said frame to secure said lateral members in an upwardly extending operation configuration.

4,862,337
AUTOMOTIVE LAMP ASSEMBLY
Hirohiko Ohshio; Horoyuki Makita; Hidehiko Nagasawa; Yoshiki Kurosawa, and Yoshinobu Koyanagi, all of Shimizu, Japan, assignors to Koito Seisakusho Co., Ltd., Tokyo, Japan
Filed Feb. 10, 1988, Ser. No. 154,556
Claims priority, application Japan, Feb. 10, 1987, 62-18590[U]; Feb. 12, 1987, 62-29983; May 1, 1987, 62-108588; Dec. 28, 1987, 62-200022[U]
Int. Cl.[4] F21V *29/00*
U.S. Cl. 362—294 40 Claims



1. An automotive lamp assembly comprising:
a body structure having an open chamber formed therein;
a lens attached to said body structure to cover said open chamber thereby to form an enclosed chamber in said body structure;
an electric bulb arranged in said enclosed chamber;
a first pipe member having one end projected into a first given portion of said enclosed chamber and the other end open to the atmosphere;
a second pipe member having one end projected into a second given portion of said enclosed chamber and the other end open to the atmosphere; and
means for producing a negative pressure in the other end of said second pipe member when a certain air flow passes through the same.

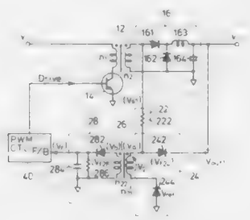
4,862,338
RINGING CHOKE CONVERTER USING SINGLE SWITCHING ELEMENT
Kiichi Tanaka, Hanno, Japan, assignor to Shindengen Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 21, 1987, Ser. No. 98,563
Claims priority, application Japan, Sep. 29, 1986, 61-230260; Sep. 29, 1986, 61-230261; Sep. 29, 1986, 61-230262
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—19 12 Claims

1. A ringing choke converter comprising, an output transformer having a primary winding, a feedback winding and a secondary winding for outputting an output voltage, a main switching transistor having a collector connected to the primary winding and a base and an emitter connected to the feedback winding, a rectifying diode connected to the secondary winding, a control circuit comprising a control transistor connected between the base and the emitter of the main switching transistor, a time-constant circuit composed of a resistor and a capacitor connected across the feedback winding, a connection point between the resistor and the capacitor being connected to the base of the control transistor, and an adjusting circuit connected to the connection point for adjusting a charging time constant of said capacitor by application of



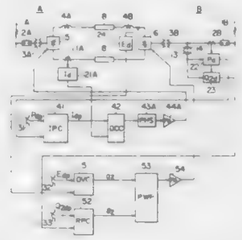
a reverse voltage to the time-constant circuit proportional with an output voltage of the transformer.

4,862,339
DC POWER SUPPLY WITH IMPROVED OUTPUT STABILIZING FEEDBACK
Kiyoharu Inou, and Katsuji Sakimoto, both of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan
Filed Mar. 31, 1988, Ser. No. 175,924
Claims priority, application Japan, Jun. 5, 1987, 62-87396[U]; Jun. 24, 1987, 62-96709[U]; Jun. 24, 1987, 62-96710[U]; Oct. 2, 1987, 62-151455[U]; Oct. 21, 1987, 62-161170[U]
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 19 Claims



1. A forward type DC power supply comprising a main transformer comprising a first primary winding and a first secondary winding and to which a direct current is inputted to said first primary winding, a switching element for turning ON and OFF said direct current into said first primary winding, and a rectifying and smoothing circuit for rectifying and smoothing a switching signal generated in said first secondary winding and supplying said switching signal to a load said DC power supply further comprising
said rectifying and smoothing circuit comprising a first diode having an anode connected to one end of said first secondary winding, a second diode having an anode connected to the other end of said first secondary winding, a choke winding having one end thereof connected to a cathode of said first and second diodes, and a capacitor having one terminal thereof connected to the other end of said choke winding and another terminal thereof connected to the other end of said first secondary winding so that forward conversion is obtained and full cycle switching signal is supplied to said load;
excitation energy supplying means for producing an excitation energy;
means directly connecting said first secondary winding to said excitation energy supplying means for supplying said switching signal from said first secondary winding to said excitation energy supplying means;
stabilizing signal supplying means comprising voltage reference means and connected to said rectifying and smoothing circuit for generating a stabilizing signal which relates to an output voltage from said rectifying and smoothing circuit;
first insulating transformer comprising a second primary winding and a second secondary winding which generates signals in said second secondary winding;
means for supplying said stabilizing signal from said stabilizing signal supplying means to said second primary winding;
means for supplying said excitation energy from said excitation energy supplying means to said second primary winding;
stabilizing signal extracting means connected to said first insulating transformer for extracting a stabilizing signal from said signals generated in said second secondary winding; and
switching control means connected to said stabilizing signal extracting means for stabilizing an output an output voltage by adjusting an ON/OFF control signal to be supplied to said switching element in response to said stabilizing signal extracted by said stabilizing signal extracting means.

4,862,340
DC POWER TRANSMISSION SYSTEM
Haruhisa Inokuchi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 16, 1987, Ser. No. 26,231
Claims priority, application Japan, Mar. 14, 1986, 61-56675
Int. Cl.[4] H02J *3/36*
U.S. Cl. 363—35 11 Claims



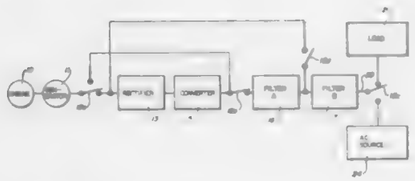
1. A DC power transmission system wherein two AC systems are interconnected by a first converter, a DC transmission line and a second converter to transmit power from a first AC system to a second AC system via the DC transmission line, and at least one of said first and second converters is a current type self-commutated converter capable of being pulse-width controlled, said DC power transmission system comprising:
reactive power control means for controlling a phase difference angle between an AC voltage and current of said current type self-commutated converter so as to make the reactive power of said current type self-commutated converter have a predetermined value; DC voltage control means for controlling the control factor by pulse-width control of said current type self-commutated converter so as to make the DC voltage of said DC transmission line have a predetermined value; and
DC current control means for controlling one of said first and second converters operating as a rectifier so as to make the DC current flowing through said DC transmission line have a predetermined value.

4,862,341

FILTER FOR VARIABLE SPEED, CONSTANT FREQUENCY ELECTRICAL SYSTEM

Alexander Cook, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 2, 1988, Ser. No. 265,951
Int. Cl.[4] H02M *5/45*
U.S. Cl. 363—37 7 Claims



1. In a power system
having a variable speed engine,
a three phase electrical machine connected with said engine,
a rectifier having an input and an output,
a converter having an input connected to the output of the rectifier and a three phase output, and
a filter for converter switching frequencies, the filter having three sections, one for each phase and the filter having an input and an output, the power system having
a generate mode of operation in which the engine drives the machine to generate variable frequency alternating electrical power, with the input of the rectifier connected with the electrical machine and the inverter having a three phase alternating output, with neutral, connected with an electrical bus, and
an engine start mode of operation in which the input of the rectifier is connected with a three phase electrical source and the output of the inverter is connected with the machine, the machine driving the engine,
means operative in the generate mode of the power system connecting the input of said filter with the output of said inverter and connecting the output of the filter with said electrical bus, and
means operative in the engine start mode of the power system connecting the input of said filter with the input of said rectifier and connecting the output of the filter with said electrical source, the filter blocking switching frequencies from the electrical bus and the electrical source in the generate and start modes of operation, respectively, the improvement in which each section of said filter includes:
a plurality of shunt trap circuits, at least one of said shunt trap circuits being connected from phase-to-phase and at least one other of said shunt trap circuits being connected from phase-to-neutral.

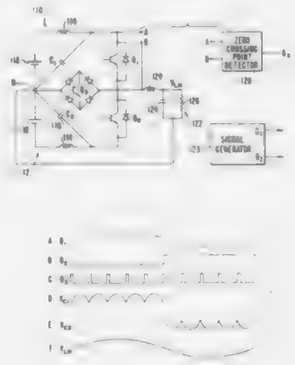
4,862,342

DC TO AC INVERTER WITH NEUTRAL HAVING A RESONANT CIRCUIT

John J. Dhyanchand; Sampat F. Shekhawat, and Vietson M. Nguyen, all of Rockford, Ill., assignors to Sundstrand Corp., Rockford, Ill.

Filed Dec. 3, 1987, Ser. No. 128,444
Int. Cl.[4] H02M *7/538, 1/12*
U.S. Cl. 363—40 8 Claims

1. An inverter for producing an output signal at a fundamental frequency for connection to a load with a load neutral comprising:
(a) a DC power supply means for providing a DC potential;
(b) a first LC circuit, coupled to the DC power supply means, having a resonant frequency and resonating at the resonant frequency when the DC potential is applied to the first LC circuit to cause current flow between the DC power supply means and the first LC circuit;
(c) a second LC circuit, coupled to the DC power supply means, having the resonant frequency and resonating at the resonant frequency when the DC potential is applied to the second LC circuit to cause current flow between the DC power supply means and the second LC circuit;
(d) first switching means having a conductivity controlled by a first control signal, coupled to the first LC circuit and the load, and having a first conductivity state permitting current to flow from the first LC circuit to the load and a second conductivity state blocking current flow to the load;



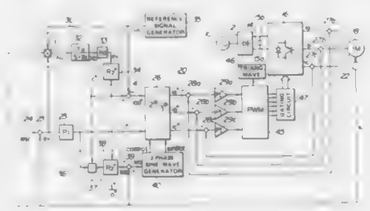
(e) second switching means having a conductivity controlled by a second control signal, coupled to the second LC circuit and the load, and having a first conductivity state permitting current to flow from the second LC circuit to the load and a second conductivity state blocking flow to the load; and
(f) control means for generating the first and second control signals to cause the first and second conductivity states of the first switching means to cyclically vary at a fundamental frequency and to cause the first and second states of the second switching means to cyclically vary at the fundamental frequency with the first and second control signals being 180° out of phase with each other and the fundamental frequency being lower than the resonant frequency.

4,862,343

INDUCTION MOTOR CONTROL APPARATUS

Masakatsu Nomura; Keiko Suda, both of Kanagawa, and Tadashi Ashikaga, Tokyo, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 157,041
Claims priority, application Japan, Feb. 17, 1987, 62-34049
Int. Cl.[4] H02M *1/12*
U.S. Cl. 363—41 11 Claims



1. An apparatus for vector control of an adjustable-speed induction motor, including a motor drive circuit for applying

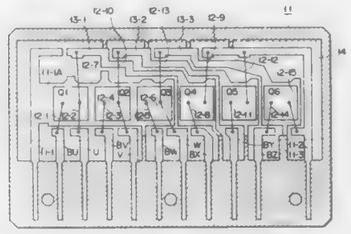
power to drive the motor, and a control circuit responsive to a torque command signal, an excitation current command signal and a slip frequency for controlling the operation of the motor drive circuit so as to vary the power to the motor, the control circuit including:
a speed sensor sensitive to motor rotation speed for producing a speed feedback signal indicative of a sensed speed of rotation of the motor;
a source for producing a speed command signal indicative of a desired motor speed;
a source for producing an excitation current command signal indicative of a desired motor excitation current;
a source for producing a reference signal;
means for summing the speed feedback signal and the speed command signal to provide a speed error signal indicative of the difference between the sensed and desired motor speeds;
means for converting the speed error signal into the torque command signal;
means for adding the reference signal to the excitation current command signal applied to the control circuit;
means responsive to the excitation current command signal and the torque command signal for calculating the slip frequency using a secondary time constant;
means for calculating a correlation coefficient indicative of a mutual relation between the speed error signal and the reference signal; and
means for modifying the secondary time constant, in accordance with the correlation coefficient, in a direction zeroing the correlation coefficient.

4,862,344

3-PHASE BRIDGE CONVERTING CIRCUIT MODULE

Takao Emoto, Yokosuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 22, 1988, Ser. No. 158,714
Claims priority, application Japan, Feb. 23, 1987, 62-37781
Int. Cl.[4] G05B *11/01*
U.S. Cl. 363—147 22 Claims



1. A 3-phase bridge converting circuit module comprising:
a first lead;
first switching means having a control input terminal and connected at one terminal to said first lead;
a second lead connected to the control input terminal of said first switching means;
a third lead connected to another terminal of said first switching means;
second switching means having a control input terminal and connected at one terminal to said first lead;
a fourth lead connected to the control input terminal of said second switching means;
a fifth lead connected to another terminal of said second switching means;
third switching means having a control input terminal and connected at one terminal to said first lead;
a sixth lead connected to the control input terminal of said third switching means;
a seventh lead connected to another terminal of said third switching means;
fourth switching means having a control input terminal and connected at one terminal to said third lead;
an eighth lead connected to the control input terminal of said fourth switching means;
fifth switching means having a control input terminal and connected at one terminal to said fifth lead;
a ninth lead connected to the control input terminal of said fifth switching means;
sixth switching means having a control input terminal and connected at one terminal to said seventh lead;
a tenth lead connected to the control input terminal of said sixth switching means;
an eleventh lead connected to the other terminals of said fourth to sixth switching means; and
a SIP type package for sealing therein the inner lead sections of said first to eleventh leads and said first to sixth switching means; with said eighth lead, ninth lead, tenth lead and eleventh lead arranged adjacent to one another.

4,862,345

PROCESS PLANT INSTRUMENTATION DESIGN SYSTEM

Charles E. Lekron, Houston, Tex., assignor to Litwin Engineers & Constructors, Inc., Houston, Tex.

Filed Nov. 16, 1987, Ser. No. 120,609
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—188 14 Claims



1. A method of creating a database of instrumentation information for use in designing a process plant instrumentation system, comprising:
setting up at least one default database adapted to contain default instrumentation information;
inputting at least one piece of default instrumentation information that is applicable to more than one piece of instrumentation;
inputting additional instrumentation information; and
editing said additional instrumentation information by supplementing or revising it with said default instrumentation information.

4,862,346

INDEX FOR A REGISTER FILE WITH UPDATE OF ADDRESSES USING SIMULTANEOUSLY RECEIVED CURRENT, CHANGE, TEST, AND RELOAD ADDRESSES

Lawrence F. Wagner, Berkeley; Korbin S. Van Dyke, Fremont; Wayne P. Burleson, Palo Alto; Robert D. Hemming, San Jose, and John P. Guadagna, Morgan Hill, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Jul. 2, 1985, Ser. No. 751,304
Int. Cl.[4] G06F *9/32*
U.S. Cl. 364—200 1 Claim

1. In a digital processor having an address bus and a data bus for communicating therewith, said processor having a controller means for generating program instructions for controlling said processor and receiving clock cycles for the control

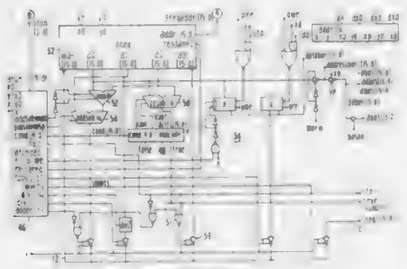
thereof, said controller means having an address register file for storing addresses from said address bus, wherein said improvement comprising

an index unit connected to said address register file;

said unit comprising means for receiving a current address from said file;

means for receiving a test address from said file simultaneous with said current address;

means for receiving a change address from said file simultaneous with said current address and said test address;



means for receiving a reload address from said file simultaneous with said current address, test address and change address;

said unit further comprising

means for changing said current address by said change address to produce a resultant address;

means for comparing said resultant address to said test address; and

means for storing said reload address directly as the current address in said address register file based upon said comparison between said resultant address and said test address in a single clock cycle.

4,862,347

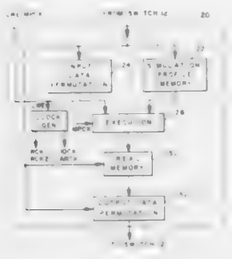
SYSTEM FOR SIMULATING MEMORY ARRAYS IN A LOGIC SIMULATION MACHINE

Ann M. Rudy, San Jose, Calif., assignor to International Business Machine Corporation, Armonk, N.Y.

Filed Apr. 22, 1986, Ser. No. 855,013

Int. Cl.[4] G06F *15/16, 9/44, 9/38, 13/12*

U.S. Cl. 364—200 **10 Claims**



6. In a highly parallel logic simulation machine (LSM) which produces access instructions, a permutation pattern, and input simulated memory access signals, a memory simulation processor for simulating multiport memory, said memory simultation processor comprising:

an input memory connected to said LSM for receiving groups of input simulated memory access signals, each of said groups defining parameters for a simulated memory access operation to be conducted at a simulated port of said multiport memory;

a programmable simulation profile memory means connected to said LSM for receiving and storing a set of array instructions, each array instruction of said set of array instructions defining a simulated port and a simualted memory access operation to be conducted at said simulated port;

programmable input permutation means connected to said LSM and to said input memory for permutatively entering each of said groups of input simulated memory access signals into a respective portion of said input memory according to said permutation pattern, said permutation pattern corresponding respective portions of said input memory with a simulated port defined by a respective array instruction of said set of array instructions;

instruction execution means connected to said programmable simulation profile memory means and to said input memory for obtaining an array instruction and a group of input simulated memory access signals in a respective portion of said input memory corresponding with the simulated port defined by said array instruction, said instruction execution means including means for executing said array instruction using said group of input simulated memory access signals to produce a group of output simulated memory access signals which indicate the result of the simulated memory access operation performed by said array instruction; and

output means connected to said LSM and to said instruction execution means for obtaining groups of output simulated memory access signals and for permutatively providing said groups of output simulated memory access signals to said LSM as simulated output of said multiport memory.

4,862,348

MICROCOMPUTER HAVING HIGH-SPEED AND LOW-SPEED OPERATION MODES FOR READING A MEMORY

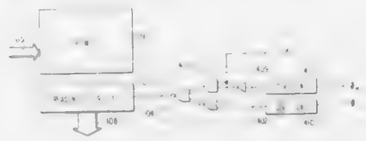
Michiya Nakamura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 4,927

Claims priority, application Japan, Jan. 20, 1986, 61-10419

Int. Cl.[4] G06F *13/00, 15/00*

U.S. Cl. 364—200 **2 Claims**



1. A microcomputer having a high-speed operation mode and a low-speed operation mode, comprising; a memory storing information used in said microcomputer, a reading circuit coupled to said memory for reading said information out of said memory, said reading circuit having an enable terminal and being activated by an operation-enable signal applied to said enable terminal, and a control circuit including means for producing a mode designating signal having a first level when said high-speed operation mode is designated and a second level when said low-speed operation mode is designated, means for intermittently producing a read control signal, means responsive to said first level mode designating signal for generating a first enable signal during the entire time period of said high-speed operation mode irrespective of said read control signal and for applying said first enable signal to said enable terminal of said reading circuit as said operation-enable signal, and means responsive to said second level mode designating signal and said read control signal for intermittently generating a second enable signal and for applying said second enable signal to said enable terminal of said reading circuit as said operation-enable signal, whereby said reading circuit is continuously activated during said high-speed operation mode by said first enable signal and is activated intermittently in said low-speed operation mode by said second enable signal.

4,862,349

METHOD FOR EXTRACTING AND/OR REPLACING CONTROL SYSTEM INFORMATION IN A COMPUTER OPERATING SYSTEM

Dennis J. Foreman, Binghamton; David A. Hellenga, and Richard K. Hill, both of Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1987, Ser. No. 109,367

Int. Cl.[4] G06F *9/46, 12/06*

U.S. Cl. 364—200 **10 Claims**



1. A method for locating control information in a control program of a data processing system, said control program being organized as a plurality of Control Blocks identifying related items of control information, comprising:

organizing in a first table the identity of an items of information used in said application program along with the name of a related control block;

requesting in an application program instruction an item of said information as well as designating a storage location for receiving said information:

addressing said first table with said requested item of information to identify a Control Block containing said item of information;

a second table identifying individual data processing routines in said control program for locating said item of information and for supplying said information to a designated address, said second table being addressed in response to a Control Block identified in said first table; and,

executing said individual data processing routines, whereby said information is located, and transferring said located information to said storage location requested by said application program.

4,862,350

ARCHITECTURE FOR A DISTRIBUTIVE MICROPROCESSING SYSTEM

Michael A. Orr, and Crawford E. Williams, both of Raleigh, N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 637,369, Aug. 3, 1984, abandoned. This application Apr. 24, 1987, Ser. No. 42,556

Int. Cl.[4] G06F *3/00*

U.S. Cl. 364—200 **1 Claim**



1. In a multiprocessing system having a plurality of secondary device control processors for processing data generated from particular devices and to provide the data to a satellite terminal and a remote primary processor for further processing an improved interface for controlling and transmitting data between the primary processor and the secondary processors, said improved interface comprising:

a common buffer for storing data and for enabling messages to be exchanged between the primary processor and the secondary device control processors, the satellite terminal;

a serial I/O link for transmitting data;

a first set of tri-state buffers connected to the common buffer;

a first microprocessor interconnecting the first set of tri-state buffers and the serial I/O link; said first microprocessor dedicated to managing said common buffer and formatting messages placed in said common buffer for transmission on said serial I/O link and placing messages received on said link into the common buffer;

a primary microprocessor;

a second set of tri-state buffers interconnecting the common buffer and the primary microprocessor such that said primary processor can be isolated from said common buffer;

a first decode logic means connected to the first microprocessor; said first decode logic means responsive to signals outputted from the first microprocessor for generating a first control signal;

a first latch means connected to the first decode means and responsive to the first control signal to generate a first interrupt signal for setting said second set of tri-state buffers in a first state which allows the primary microprocessor to access the common buffer and interrupts the primary microprocessor;

a second decode means connected to the primary microprocessor and responsive to signals outputted from the primary microprocessor to generate a second control signal;

a second latch means connected to the second decode means and responsive to the second control signal to generate a second interrupt signal for interrupting the first microprocessor;

an inverter circuit means connected to the first latch means and responsive to the first interrupt signal to generate a

third control signal for setting the first set of tri-state buffers in a second state opposite to the state of the second set of tristate buffers with said second state inhibiting the first microprocessor from accessing the common buffer;

a thrid latch means connected to the second and first decode means,

said third latch means responsive to be set to a first state by electrical signals outputted from said second decode means when the primary microprocessor terminates its use of the common buffer and responsive to be reset to a second state by electrical signals outputted from said first decode means when the first microprocessor resumes control of said common buffer;

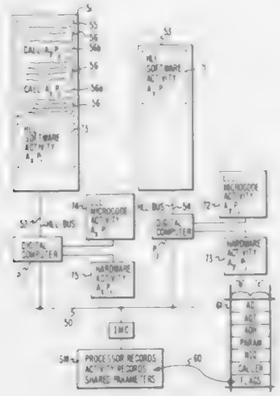
whereby messages from said primary processor to said satellite terminal and said secondary device control processors are placed in said common buffer by the primary processor while said first microprocessor is isolated from said common buffer, and said first microprocessor places received messages from said satellite terminal and said secondary device control processors into said common buffer while said primary processor is isolated from said common buffer.

4,862,351

METHOD OF EXECUTING CALLED ACTIVITIES VIA DEPICTOR-LINKED LOW LEVEL LANGUAGE MICROCODE, HARDWARE LOGIC, AND HIGH LEVEL LANGUAGE COMMANDS; AND APPARATUS FOR SAME

Howard H. Green, San Diego, and Christopher J. Tomlinson, Encinitas, both of Calif., assignors to Burroughs Corporation

Filed Sep. 1, 1983, Ser. No. 528,461
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **11 Claims**



11. A data processing system comprising:

a digital computer;

a memory means coupled to said digital computer containing a high level language program for said computer to execute;

said program including first, second, and third instructions which respectively CALL first, second, and third activities;

a first depictor means coupled to said computer for linking said first activity via a first code and a pointer to another high level language program which performs said first activity;

a second depictor means coupled to said computer for linking said second activity via a second code and a pointer to a low level language program which performs said second activity; and

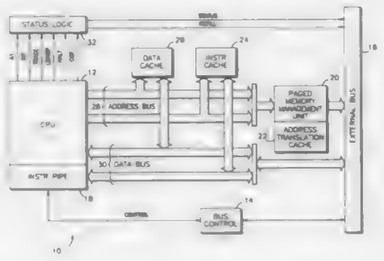
a third depictor means coupled to said computer for linking said third activity via a third code and a pointer to a hardware logic unit which performs said third activity.

4,862,352

DATA PROCESSOR HAVING PULSE WIDTH ENCODED STATUS OUTPUT SIGNAL

William C. Moyer, Dripping Springs; Jay A. Hartvigsen, and Russell C. Stanphill, both of Austin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 16, 1987, Ser. No. 97,032
Int. Cl.[4] G06F *9/38, 13/26*
U.S. Cl. 364—200 **9 Claims**



1. In a data processor having a processing unit for sequentially executing each of a plurality of instructions except in response to an occurrence of a first exception condition, the improvement comprising:

first means for receiving a first operating condition signal from the processing unit indicating that a next one of said plurality of said instructions is to begin execution, and providing a first control signal in response thereto;

second means for detecting the occurrence of said first exception condition by receiving a second operating condition signal from the processing unit, and providing a second control signal in response thereto; and

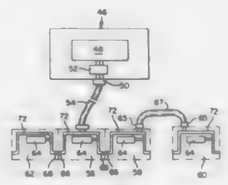
third means for receiving the first and second control signals, and providing at a single output terminal external to said data processor a single output signal for a first predetermined duration in response to receiving the first control signal and for a second predetermined duration in response to receiving the second control signal.

4,862,353

MODULAR INPUT DEVICE SYSTEM

David L. Williams, Tualatin, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 606,503, Mar. 5, 1984, abandoned. This application Aug. 24, 1987, Ser. No. 89,041
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **5 Claims**



1. A plurality of peripheral units adapted for electrical and mechanical interconnection, each peripheral unit comprising:

(a) a housing;

(b) a set of lugs mounted on one lateral side of said housing, each of said lugs having a pair of vertically spaced apart "C" shaped sections;

(c) a set of "T" shaped tongue portions secured to a slide mounted on the opposite lateral side of said housing for engaging lugs on an adjacent peripheral unit;

(d) first and second electrical receptacles mounted on opposite lateral sides of said housing for electrically interconnecting with electrical receptacles of laterally adjacent peripheral units; and

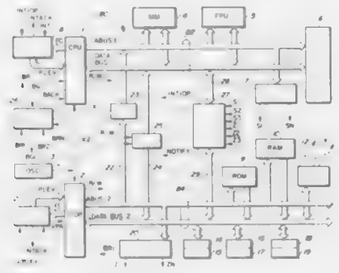
(e) pivotal support means for adjusting the elevation of the unit and means on opposite ends of said pivotal support means for nesting pivotal support means of adjacent peripheral units together when the units are electrically and mechanically interconnected.

4,862,354

MULTIPROCESSOR SYSTEM WITH INTERRUPT NOTIFICATION AND VERIFICATION UNIT

Claudio Fiacconi, Arcore, and Antonio Franzosi, Pavia, both of Italy, assignors to Honeywell Bull Italia S.p.A., Milan, Italy

Filed May 5, 1986, Ser. No. 859,593
Claims priority, application Italy, May 7, 1985, 20599 A/85
Int. Cl.[4] F06F *13/14*
U.S. Cl. 364—200 **6 Claims**



1. In a multiprocessor system having a plurality of data processing system, each data processing system having a processor whereby each data processing system is able to operate in an autonomous manner and wherein each of the plurality of data processing systems includes a first data processing system having a first processor operatively connected to a first bus, and a second data processing system having a second processor operatively connected to a second bus, each of said buses including a corresponding address bus and a corresponding data bus, and further wherein said first data processing system includes a main memory operatively connected to said first bus, said main memory being a common resource of said multiprocessing system, said main memory further having mailboxes, said mailboxes being predetermined locations of said main memory dedicated to a predetermined processor accessible by all the processors whereby messages may be written into the mailboxes by a processor initiating communications, a transmitting processor, said multiprocessor system further including an apparatus for controlling communications between said data processing systems, said apparatus comprising:

(a) unidirectional channel means, operatively connected to each address bus, for coupling address information applied to the second address bus by said second processor to said first address bus in response to a first enable selection signal;

(b) bidirectional channel means, operatively connected to each data bus, for coupling data information between said first and second data processing system in response to a second enable selection signal, the direction of transfer of the data information via said bidirectional channel means being controlled by a R/W command signal; and

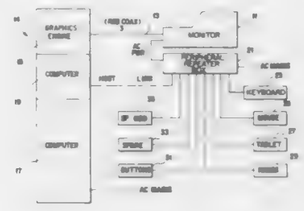
(c) first logic means, operatively connected to each data bus and operatively connected to each processor, said first logic means generating an interrupt signal for one processor, a receiving processor, in response to input signals via the address bus of another processor, the transmitting processor.

4,862,355

SYSTEM PERMITTING PERIPHERAL INTERCHANGEABILITY DURING SYSTEM OPERATION

Bruce E. Newman, North Plainfield, N.J., and Steven D. DiPirro, Holliston, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 13, 1987, Ser. No. 85,105
Int. Cl.[4] G06F *3/04, 13/22*
U.S. Cl. 364—200 **6 Claims**



1. In a system including a host processor and a peripheral repeater having a processor and at least one connector, a method of determining which of a plurality of different types of peripherals having a peripheral type are plugged into said connector, comprising:

(a) sensing any change in the connection of a peripheral to said connector by the peripheral repeater;

(b) generating an interrupt at said peripheral repeater processor when a change is sensed;

(c) upon initial start-up of the system, each time a change from not plugged in to plugged in is detected, and in response to an interrupt, interrogating the connector by said host to obtain a result including the peripheral type if a peripheral is present; and

(d) storing in a table the type of peripheral which is plugged in to allow different types of peripherals to be interchangeably coupled to said connector during system start-up and in system operation.

4,862,356

METHOD AND DEVICE FOR SORTING OBJECTS PROVIDED WITH A PARAMETER, ACCORDING TO THE VALUE OF THIS PARAMETER

Cornelius H. P. Van Trigt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, NY, N.Y.

Filed Jan. 8, 1987, Ser. No. 1,307
Claims priority, application Netherlands, Jan. 9, 1986, 8600028
Int. Cl.[4] G06F *7/00, 7/22, 7/32, 7/36*
U.S. Cl. 364—300 **4 Claims**

1. A method for sorting a plurality of objects into an output file according to a parameter associated with each object, said objects being successively presented in an input file and said sorting taking place by presenting the objects to a direct sorting machine which offers space for a sub-file of at least a predetermined number of objects, comprising the steps of:

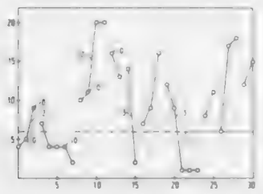
(a) in a chain-formation phase, comparing the parameter of an object with the parameter of a preceding object and forming a plurality of chains of objects monotonically varying parameters storing the number of objects in each chain and the parameter of a selection object of the chain;

(b) in an inspection phase, selecting (k) selection objects such

that the objects of the number of chains belonging to these k selection objects is less than said predetermined number of objects;

(c) storing the parameter of the $(k+1)^{th}$ selection object;

(d) forming a sub-file consisting of the objects which based



on their parameters, should appear in the output file not later than the said $(k+1)^{th}$ selection object;

(e) directly sorting the sub-file;

(f) repeating steps a-e until all objects are sorted into sub-files; and

(g) concatinating the sub-files.

4,862,357

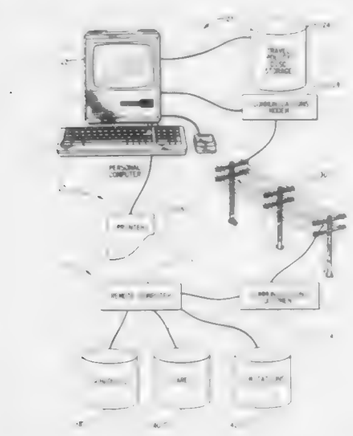
COMPUTER RESERVATION SYSTEM WITH MEANS TO RANK TRAVEL ITINERARIES CHOSEN IN TERMS OF SCHEDULE/FARE DATA

Mark L. Ahlstrom, Minneapolis; Bruce A. Keller, Vadnais Heights, both of Minn., and Randy S. Storch, Chicago, Ill., assignors to SystemOne Holdings, Inc., Houston, Tex.

Continuation of Ser. No. 8,223, Jan. 28, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 273,657

Int. Cl.[4] G06F *15/26*

U.S. Cl. 364—407 **48 Claims**



1. A system for providing a plurality of alternative travel itineraries ranked in order of preference in accordance with previously stored travel policy data, comprising:

means for accessing a data base comprising travel data including separately maintained travel schedule data items, fare data items, and fare limitation information, said travel schedule data items including arrival and departure information;

means for processing said travel data including—

means for merging selected ones of said travel schedule data items with applicable ones of said fare data items to create a plurality of schedule/fare data items;

means for evaluating each schedule/fare data item in accordance with said fare limitations information to provide said plurality of alternative travel itineraries;

means for scoring individual ones of said alternative travel itineraries with a relative score in accordance with said travel policy; and

means for displaying said alternative travel itineraries as scored in accordance with said travel policy.

4,862,358

SIGNAL PROCESSING METHOD IN AUTORADIOGRAPHY

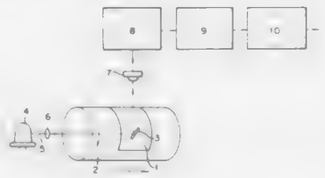
Tsutomu Kimura, and Kazuhiro Hishinuma, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 568,873, Jan. 6, 1984, abandoned. This application Jul. 8, 1986, Ser. No. 883,139

Claims priority, application Japan, Jan. 8, 1983, 58-1337; Jan. 8, 1983, 58-1338; Jan. 8, 1983, 58-1343; Jan. 8, 1983, 58-57416

Int. Cl.[4] G01T *1/29*

U.S. Cl. 364—413 **30 Claims**



1. A signal processing method for processing an autoradiograph recorded on a support medium and containing locational information on the one dimensional location of radioactively labeled substances in a sample where the substances are distributed in at least one one dimensional direction on said support medium to form at least one row of the distributed substances, which comprises the steps of:

(1) generating digital image data where the data comprises sets of digital signals corresponding to the autoradiograph including the row of distributed substances;

(2) scanning said digital image data in at least two different positions in such a manner that each scanning selects certain ones of said digital signals corresponding to the row of distributed substances to obtain relationships between positions of said certain ones of the digital signals in the directiion of the scanning and the signal levels at said positions;

(3) generating at least two distributed point signals based on said relationships where the two distributed point signals are generated for said row of distributed substances, the two distributed point signals respectively corresponding to the two different scanning positions and where said two distributed points are disposed on said row;

(4) generating a signal corresponding to a continuous line selected from the group consisting of a straight line, a curved line and a polygonal line connecting said points on the row where said continuous line corresponds to a scanning line for detection of sampling points respectively corresponding to the locations of said substances;

(5) scanning said digital image data along said scanning line to obtain locational information signals representative of said locational information for each of said substances in said sample;

(6) said digital image data being generated by (a) exposing a radiosensitive material to radiation emitted by said radioactively labeled substances on the support medium to record the autoradiograph of the radioactively labeled substances on the radiosensitive material, and (b) reading out said autoradiograph photoelectrically to obtain said image data; and

whereby said locational information signals can be obtained

irrespective of one or more deviations of said row of said distributed substances from a straight line due to the compensation effected by said scanning line for said deviations where said deviations may be present in the support medium and/or the radiosensitive material.

4,862,359

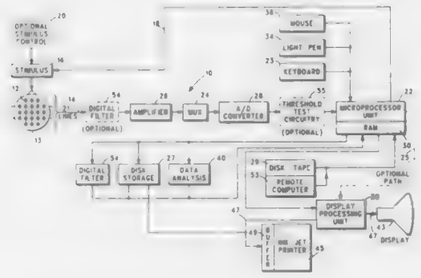
TOPOGRAPHICAL MAPPING OF BRAIN FUNCTIONALITY FROM NEUROPSYCHOLOGICAL TEST RESULTS

Sushma S. Trivedi, Sunnyale, Calif.; Raquel E. Gur, and Ruben Gur, both of Philadelphia, Pa., assignors to Bio-Logic Systems Corporation, Mundelein, Ill.

Continuation-in-part of Ser. No. 646,614, Aug. 31, 1984, Pat. No. 4,744,029. This application Dec. 30, 1986, Ser. No. 947,673

Int. Cl.[4] A61B *5/04*; G06F *15/42*

U.S. Cl. 364—413.05 **43 Claims**



1. A method of evaluating brain functionality of a subject comprising the steps of:

providing neuropsychological test result data obtained from said subject in response to at least one preselected test;

generating a weighted matrix of test output signals by applying to said test result data a plurality of coefficients, each said coefficient being representative of said one preselected test and corresponding to a preselected region of the brain; and

displaying said weighted matrix of test output signals as a topographic map.

4,862,360

SIGNAL PROCESSING METHOD IN AUTORADIOGRAPHY

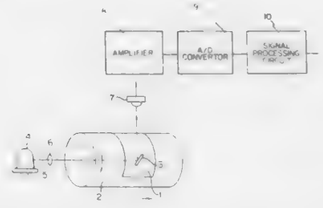
Tsutomu Kimura, and Kazuhiro Hishinuma, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 6, 1984, Ser. No. 568,874

Claims priority, application Japan, Jan. 8, 1983, 58-1341; Jan. 8, 1983, 58-1342; Mar. 31, 1983, 58-57420

Int. Cl.[4] H04N *1/40*; G01N *33/58*; C12Q *1/68*

U.S. Cl. 364—413.01 **12 Claims**



1. A signal processing method in autoradiography for determination of the base sequence of DNA or a DNA fragment, employing radioactively labeled cleavage products obtained by specifically cleaving the DNA or DNA fragment labeled with a radioactive element, comprising the steps of:

(1) providing at least two sets of reference mixtures each consisting essentially of guanine specific cleavage products, adenine specific cleavage products, thymine specific cleavage products and cytosine specific cleavage products;

(2) providing at least one group of cleavage products or a mixture thereof containing at least one kind of the base specific cleavage products;

(3) resolving both the reference mixtures provided in step (1) and the product group provided in step (2) one-dimensionally in such parallel relation that the resolved rows of said two sets of reference mixtures (1) sandwich at least one resolved row of the product group (2) to form at least three resolved rows on a support medium;

(4) obtaining an autoradiograph having locational information on groups of radioactively labeled cleavage products contained in said rows on the support medium;

(5) generating an electrical digital signal corresponding to said autoradiograph including said rows;

(6) detecting reference sampling points in each resolved reference row of the digital signal;

(7) detecting sampling points in said one resolved row;

(8) joining corresponding reference sampling points in said reference rows to generate plural continuous lines comprising straight lines, polygonal lines or curved lines; and

(9) identifying said sampling points in said one resolved row of the product group (2) by comparison of the last-mentioned sampling points with said continuous lines to thus determine said base sequence of said DNA or DNA fragment.

4,862,361

METHODS AND APPARATUS FOR MONITORING CARDIOVASCULAR REGULATION USING HEART RATE POWER SPECTRAL ANALYSIS

David Gordon, Chicago, Ill.; Solange Akselrod, Ramat-Ilan, Israel; Richard J. Cohen, Newton Highlands, Mass.; Jerome C. Tu, Monterey Park, Calif.; Stephen K. Burns, Henniker, N.H., and Victoria H. DeLeon, Arlington, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

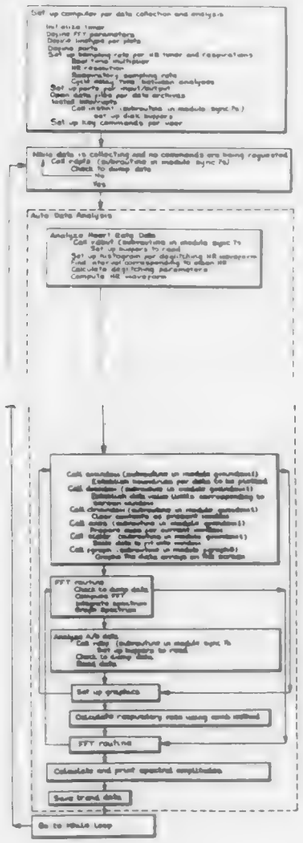
Filed Jun. 5, 1985, Ser. No. 742,114

Int. Cl.[4] A61B *5/02*

U.S. Cl. 364—413.06 **4 Claims**

1. A method for diagnosis of malfunctions of the cardiovascular control system in a patient comprising the steps of:

monitoring a power spectrum of heart rate fluctuations in the patient; and



identifying a level below 0.1 (beats/min)^2 in the power spectrum of heart rate fluctuations at a frequency between 0.04 and 0.10 Hz as indicative of cardiovascular instability.

4,862,362

APPARATUS FOR GENERATING ACCELERATION SIGNAL FOR BACKUP

Kazumasa Kurihara, and Kenji Arai, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1987, Ser. No. 111,227

Claims priority, application Japan, Oct. 24, 1986, 61-251844; Oct. 24, 1986, 61-251845

Int. Cl.^{4} G06F *15/50*; G06G *7/70*

U.S. Cl. 364—424.1 **26 Claims**

1. A system for generating a backup acceleration signal for a vehicle having an automatic transmission controlled in accordance with at least one actual acceleration signal which is a function of an actual amount of acceleration of an accelerating member of said vehicle and the operation of a gear selector, comprising:

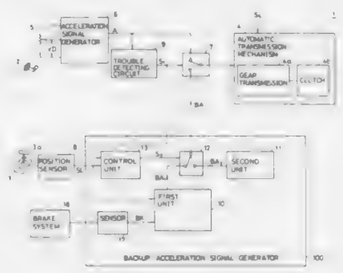
a generating means for generating a backup acceleration signal, said generating means being capable of producing a signal representing a small amount of acceleration which is insufficient for enabling the control operation in said automatic transmission for starting the vehicle;

a first sensing means for sensing a gear position of the transmission;

a second sensing means for sensing the engaged/disengaged condition of the clutch;

a detecting means responsive to said first and second sensing means for detecting whether or not the gear is in a set condition and the clutch is in a disengaged state;

a control means responsive to said detecting means for enabling said generating means to produce said backup



acceleration signal representing the small amount of acceleration when the gear of said automatic transmission is in a set condition and the clutch in said automatic transmission is in a disengaged state;

a discriminating means responsive to said actual acceleration signal for determining whether or not the actual acceleration signal is abnormal; and,

means responsive to said discriminating means for providing said backup acceleration signal to said automatic transmission instead of said actual acceleration signal.

4,862,363

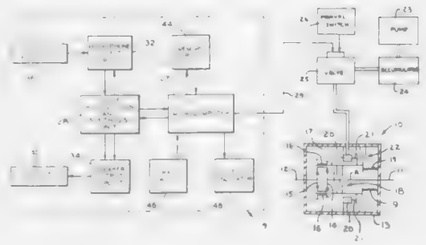
VOICE ACTUATED TWO SPEED AXLE

James A. Krisher, Fort Wayne, Ind., and Barry R. Lloyd, Ohio City, Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 16, 1987, Ser. No. 133,968

Int. Cl.^{4} G10L *5/00*; B60Q *5/00*

U.S. Cl. 364—424.1 **12 Claims**



7. An apparatus for controlling the gear ratio of an engine-driven vehicle, comprising:

transmission means having a fluid-actuated shifting means for shifting said transmission between a first gear ratio and a second higher gear ratio;

a voice recognizing means for recognizing vocal commands and delivering an upshift command signal in response to an upshift vocal command and a downshift command in response to a downshift vocal command;

a supply of pressurized fluid;

valve means operatively connected between said fluid supply and said fluid-actuated shifting means;

said valve means being responsive to said upshift command signal to actuate said shifting means to shift said transmission means from said first gear ratio to said second gear ratio and responsive to said downshift command signal to operate said shifting means to shift said transmission from said second gear ratio to said first gear ratio.

4,862,364

SELF-MONITOR SYSTEM FOR AUTOMOTIVE DIGITAL CONTROL SYSTEM INSENSITIVE TO BATTERY VOLTAGE FLUCTUATIONS

Toshiro Matsuda, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 619,305, Jun. 11, 1984, abandoned. This application Nov. 30, 1987, Ser. No. 126,513

Claims priority, application Japan, Jul. 8, 1983, 58-123299

Int. Cl.^{4} G06F *11/22*

U.S. Cl. 364—424.01 **8 Claims**



1. A self-monitoring system for an automotive digital control system which checks elements to be controlled by the system comprising:

an ignition switch assembly interposed between said control system and said vehicle battery and supplying battery power to said control system in a first switch position thereof;

first means for applying a testing voltage having a signal level operating said element to a predetermined condition, for testing operation of said elements; and

second means for activating said first means with a given delay period after said ignition switch assembly is actuated from a predetermined second switch position to said first switch position.

4,862,365

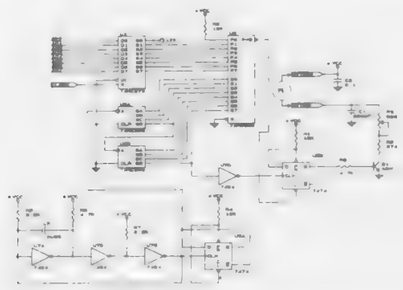
UNIVERSAL ELECTROMECHANICAL GAUGE

Robert J. Onesti, Ft. Wayne, Ind., assignor to Navistar International Transportion Corp., Chicago, Ill.

Filed Dec. 21, 1987, Ser. No. 136,223

Int. Cl.^{4} G06F *3/14*

U.S. Cl. 364—424.01 **23 Claims**



1. In an instrumentation system in which a sensor that monitors the value of a parameter of interest presents to a central processing unit (CPU) a data signal representing the value of the parameter of interest, the CPU presents to an indicator gauge that has an electromechanical movement a multi-bit value that correlates to the value of the data signal, and hence to the value of the parameter of interest, and the electromechanical movement of the gauge is operated in response to said multi-bit value to thereby cause the gauge to display movement as a function of said multi-bit value, and hence to indicate the value of the parameter of interest, the improvement comprising said CPU intermittently presenting said multi-bit value to said gauge, and said gauge comprising:

a. a multi-bit latching memory circuit in which the latest multi-bit value received by the gauge from the CPU is latched;

b. timing circuit means for periodically generating a basic time interval comprising a multi-bit counting circuit;

c. correlating circuit means having inputs connected to said multi-bit latching memory circuit and to said timing circuit means and comprising means for correlating the multi-bit value latched in said latching memory circuit to the counting by said multi-bit counting circuit during each basic time interval, said correlating circuit means having an output; and

d. modulating circuit means having an input connected to the output of said correlating circuit means and comprising means for modulating a circuit that operates said movement of said gauge in accordance with the occurrence of a predetermined correlation, as determined by said correlating circuit means, of the multi-bit value latched in said multi-bit latching memory circuit to the counting of said counting circuit during each basic time interval to cause the gauge to display movement as a function of the multi-bit value latched in said multi-bit latching memory circuit.

4,862,366

MOTOR-DRIVEN POWER STEERING SYSTEM FOR A VEHICLE

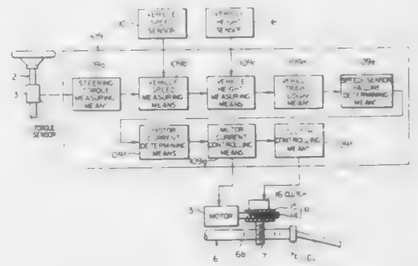
Mitsuharu Morishita, and Shinichi Kohge, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 27, 1987, Ser. No. 54,773

Claims priority, application Japan, May 27, 1986, 61-124009; Jul. 11, 1986, 61-164161

Int. Cl.^{4} B62D *5/04*

U.S. Cl. 364—424.05 **8 Claims**



1. A power steering system for a vehicle having a steering wheel for steering steerable road wheels in response to force exerted thereon by an operator comprising:

means for sensing vehicle speed and for generating an output signal indicative of the sensed vehicle speed;

a motor for applying a power-assisting force to said steerable road wheels for power-assisting the operator in steering said steerable road wheels;

clutch means for interrupting the transmission of the power-assisting force from said motor to said steerable road wheels when the vehicle speed exceeds a prescribed speed, and for transmitting the power-assisting force from

said motor to said steerable road wheels when the vehicle speed does not exceed the prescribed speed;

means for indirectly determining vehicle motion and for generating a motion signal indicative of motion of said vehicle; and

control means receiving said output signal and said motion signal for controlling said motor and clutch means in response to said output signal, for determining from said motion signal when said vehicle is in motion while said output signal indicates that the vehicle speed is zero, and for removing any power-assisting force from said steerable road wheels when said motion signal indicates said vehicle is in motion and said output signal indicates that the vehicle speed is zero whereby no power-assisting force is applied when said means for sensing vehicle speed has failed and/or the signal from the means for sensing vehicle speed is not received by said control means.

4,862,367

AUTOMATIC SPEED CONTROL APPARATUS FOR CONTROLLING VEHICLE SPEED AT SET SPEED

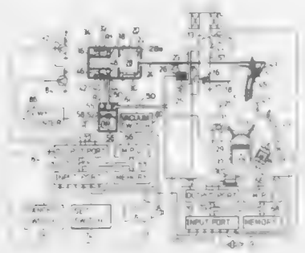
Tetsuya Tada, Anjo; Masumi Nagasaka, Toyota; Kouji Iwamoto, Toyota; Tatsuo Teratani, Aichi; Junji Takahashi, Kobe; Akira Miyazaki, Kobe; Masaki Hitotsuya, Kobe, and Kiyoshi Yagi, Kobe, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi and Fujitsu Ten Kabushiki Kaisha, Hyogo, both of, Japan

Filed Feb. 10, 1988, Ser. No. 154,310

Claims priority, application Japan, Mar. 20, 1987, 62-066728

Int. Cl.[4] B60K *31/04;* **F02M** *39/00, 23/06*

U.S. Cl. 364—426.04 **24 Claims**



1. An automatic speed control apparatus for controlling running speed of a vehicle at a constant set speed, said vehicle having an internal combustion engine, the speed control apparatus comprising:

means for selectively activating said speed control apparatus;

a surge tank provided with a main intake passage connected to said engine, and having a throttle valve therein; an auxiliary intake passage providing direct communication between portions of the main intake passage upstream and downstream of said throttle valve so as to bypass said throttle valve; an auxiliary intake air valve adapted for controlling a flow rate of air in said auxiliary intake passage; and fuel supply cut-off means for suspending supply of fuel to said engine from completion of a fuel supply cut-off condition until completion of a fuel supply recovery condition;

an actuator means for controlling an opening degree of said throttle valve;

a vehicle speed sensor for sensing an instant running speed of said vehicle;

actuator control means for controlling ssid actuator means to coincide the sensed vehicle speed with a predetermined set vehicle speed so as to enable said vehicle to run at said set vehicle speed, said actuator control means comprising an actuator chamber in which at least a portion of said actuator means is positioned, a vacuum pump and means for providing communication between said surge tank and said actuator chamber so that said actuator means can be actuated by vacuum in said surge tank; and

auxiliary intake air valve control means for controlling said auxiliary intake air valve such that a flow rate of air in said auxiliary intake passage is reduced before said fuel supply cut-off condition is met while said speed control apparatus is activated.

4,862,368

METHOD FOR ADJUSTING OPTIMAL WHEEL SLIP

Friedrich Kost, Stuttgart; Anton Van Zanten, Ditzingen; Gerhard Heess, Tamm, and Gerhard Kreisselmeier, Ahnatal, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

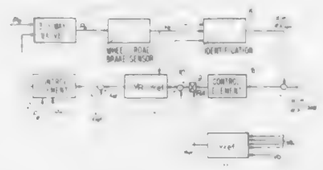
PCT No. PCT/EP86/00334, § 371 Date Feb. 4, 1987, § 102(e) Date Feb. 4, 1987, PCT Pub. No. WO86/07321, PCT Pub. Date Dec. 18, 1986

PCT Filed Jun. 4, 1986, Ser. No. 24,101

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1985, 3519888

Int. Cl.[4] B60T *8/32*

U.S. Cl. 364—426.02 **23 Claims**



1. A method for adjusting an optimal vehicle wheel slip in terms of the coefficient of adhesion in the longitudinal and transverse direction, which comprises: determining a deviation of an ascertained slip value λ_{ref} from a comparison slip value λ^{*}_{ref} by means of a slip controller, varying brake pressure by triggering a brake pressure control system in a direction of adjusting the slip value to the comparison slip value by an underlying control circuit, determining the slope of the μ slip curve $d\mu/d\lambda$ within a superimposed control circuit, comparing this slope with a specified positive slope value, using the comparison in a second controller to produce said comparison slip value λ^{*}_{ref} dependent upon the comparison result.

4,862,369

ELECTRONICALLY-CONTROLLED FUEL INJECTION SYSTEM

Masahiko Yakuwa, Tochigi, and Yoshio Suzuki, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

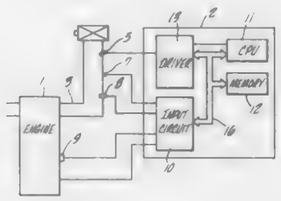
Filed Sep. 8, 1987, Ser. No. 93,878

Claims priority, application Japan, Sep. 8, 1986, 61-209627

Int. Cl.[4] F02D *41/18*

U.S. Cl. 364—431.07 **3 Claims**

1. In an electronically-controlled fuel injection system having a synchronous counter which receives main injection time data corresponding to an amount of fuel to be injected synchronously to engine revolutions, and an asynchronous counter which receives increment injection time data corresponding to an amount of fuel to be injected at a selected time interval asynchronously to the engine revolutions, wherein the synchronous counter is operated for a period of time equal to the main injection time data upon receiving a synchronous signal which is generated synchronously to the engine revolutions, while the asynchronous counter is operated for a period of time equal to the increment time data upon receiving an asynchronous signal which is generated at the selected time interval, so as to open a fuel injection valve by pulses which are output from the respective counters during the operations thereof, comprising, timer means which add a predetermined period of time after an end of the operation of each of said respective counters, and delay means operating when, during the operation of one of the two counters, a synchronous signal



or an asynchronous signal for operating the other counter has been generated for delaying the input of said synchronous signal or asynchronous signal to the other counter until the timer means completes the timing of the addition of said predetermined period of time after the end of operation of said one counter.

4,862,370

INTERFACE AND CONTROL UNIT FOR A DIESEL ENGINE ELECTRONIC CONTROLLER AND GLOW PLUG CIRCUITS, AND METHOD OF GLOW PLUG OPERATION

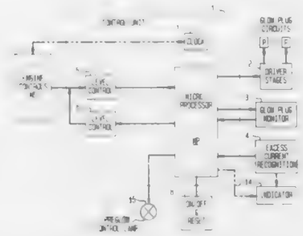
Brigitte Arnold, Stuttgart; Franz Eidler, Vaihingen/Enz, and Wolf Wessel, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 2, 1987, Ser. No. 34,389

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1986, 3624664

Int. Cl.[4] F02P *19/02*

U.S. Cl. 364—431.10 **20 Claims**



1. In combination with a Diesel internal combustion engine (ICE) electronic control unit (MS) which processes operating parameter data and generates data words containing generalized non-engine-specific glow plug control signals.

a glow plug control system (1) forming an interface between the engine control unit (MS) and glow plug circuits (P),

wherein said control system (1) controls current in the glow plug circuits,

monitoring and indicating means (3, 4, 14, 15) are provided, said control system (1) additionally controlling said monitoring and indicating means to provide for indication and supervision of operation of said glow plug circuits,

said glow plug control system comprising, in accordance with the invention,

a microprocessor (MP) coupled to, and receiving said data words from, said engine control unit (MS),

said data words each comprising a plurality of pulses in which both signal level and pulse duration are modulated, thereby simultaneously transmitting numeric information and synchronization information;

said microprocessor (MP) decoding said data words and being coupled to said glow plug circuits (P) and to said monitoring and indicating means (3, 4, 14, 15) and generating engine-specific current control signals to glow plug driver and monitoring circuits (2, 3, P) and providing monitoring and indicating signals to said monitoring and indicating means.

4,862,371

FAULT DIAGNOSIS SYSTEM FOR ELECTRONIC DEVICES ON AUTOMOBILES

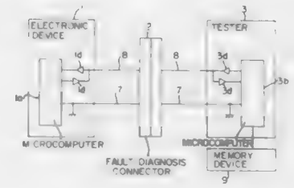
Hirotoshi Maekawa, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 13, 1987, Ser. No. 84,840

Claims priority, application Japan, Aug. 18, 1986, 61-193121

Int. Cl.[4] G06F *15/74*

U.S. Cl. 364—431.11 **8 Claims**



1. A fault diagnosis system for electronic devices on automobiles wherein respective electronic devices are adapted to transmit diagnosis data at different data transmission speeds peculiar thereto, the system comprising:

memory means for storing transmission data concerning speeds of data transmission optimum for the respective electronic devices and for writably storing diagnosis data concerning the respective electronic devices;

fault detecting means for reading, when connected selectively to one of said electronic devices, the transmission data concerning the data transmission speed optimum for the selected electronic device from said memory means; for forming a transmission reference clock signal; for exchanging data with said selected electronic device in accordance with said transmission reference clock signal and other stored data; and for storing diagnosis data received from the selected electronic device in the memory means; and

a fault diagnosis connector connected between said fault detecting means and one of said electronic devices.

4,862,372

APPARATUS AND METHODS FOR GENERATING AIRCRAFT CONTROL COMMANDS USING NONLINEAR FEEDBACK GAIN

Lyle R. Appleford, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 26, 1985, Ser. No. 801,921

Int. Cl.[4] G05D *1/08*

U.S. Cl. 364—433 **17 Claims**

1. A method for controlling an aircraft to intercept a non-level flight path segment, the method comprising the steps of:

a. determining an altitude rate of the aircraft for flying the non-level path segment;

b. determining an altitude of a location on the path segment;

c. determining an altitude difference between the location on the path segment and an altitude of the aircraft;

d. generating an altitude rate command as a function of a combination of (i) the path altitude rate and (ii) an altitude

term which is a function of a gain factor and the altitude difference;

e. adjusting the altitude term so that there is an increase in



the gain factor as the aircraft approaches the path segment; and

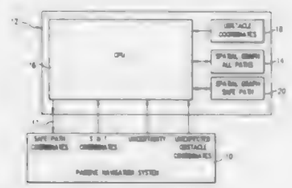
f. responding to the altitude rate command in a manner to intercept the non-level path segment.

4,862,373

METHOD FOR PROVIDING A COLLISION FREE PATH IN A THREE-DIMENSIONAL SPACE

Alex C-C Meng, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 13, 1987, Ser. No. 49,754
Int. Cl.[4] G01C *21/00*
U.S. Cl. 364—444 29 Claims



1. A method for collision free navigation in a predefined region comprising:

storing a predetermined set of points defining the available paths through navigable free space in the region, each of the points having associated therewith predetermined navigational constraints;

receiving externally generated position coordinates;

receiving externally generated navigational limitations;

comparing the received navigational limitations with the navigational constraints associated with the stored predetermined set of points to determine the ones of a predetermined set of points that can be safely navigated;

generating a collision free set of points that is comprised of the ones of the predetermined set of points that can be safely navigated through the free space in the region;

calculating the shortest path through the collison free set of points that can be navigated from the received position coordinates to a predetermined goal; and

outputting coordinates defining the calculated shortest path.

4,862,374

NAVIGATIONAL PLOTTING SYSTEM

Erich T. Ziemann, 1534 Parmenter St., Middleton, Wis. 53562

Filed May 13, 1988, Ser. No. 193,610
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—449 7 Claims

3. A navigational apparatus for use with a craft, vessel or vehicle, the apparatus comprising:

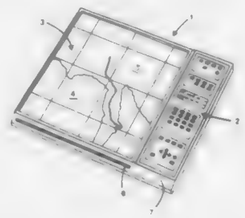
a graphical display which is at least semi-transparent and which has a plurality of pixels, wherein the pixels can be selectively illuminated to show a cursor that moves from point to point and wherein the pixels can be selectively illuminated to show navigational positions, the graphical display having at least two reference indicia at separate and diagonally opposite positions corresponding to two respective locations on a map received behind the screen element;

means behind the graphical display for defining a viewing area in which a map is positioned for viewing through the graphical display;

a first input means for entering latitude and longitude information;

a second input means for entering first commands to move the cursor into coincidence with each of the reference indicia in turn and for entering second commands for associating each of the reference indicia with respective latitude and longitude information entered through the first input means;

a navigational processing means operatively connected to the first and second input means, the navigational processing means being responsive to the first commands re-



ceived from the second input means to cause the selective illumination of pixels on the graphical display means to display the cursor, and the navigational processing means also being responsive to the second commands for associating each of the reference indicia with respective latitude and longitude information entered through the first input means to provide a pair of calibrated points;

communication circuitry that is connectable to a navigational receiver for receiving positional data signals from the navigational receiver;

wherein the navigational processing means is also operatively connected to the communication circuitry to receive positional data signals from the navigational receiver;

wherein the navigational processing means includes means for relating he positional data signals to the calibrated points; and

wherein the means for relating generates signals to cause the graphical display to show navigational positions on the map in relation to the calibrated points.

4,862,375

MAGNETIC POWER COUPLER FOR A VAULT CARTRIDGE

Paul C. Talmadge, Ansonia, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

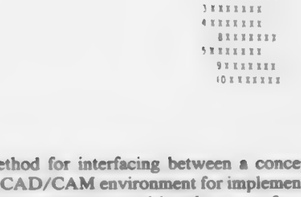
Filed Oct. 5, 1987, Ser. No. 104,126
Int. Cl.[4] G07F *7/10*
U.S. Cl. 364—464.02 17 Claims

1. A magnetic power coupling system comprising:

means for magnetically coupling electrical power from a cartridge receptacle to a cartridge comprising a substantially planar primary core having a primary winding disposed thereabout and a source of excitation energy operatively coupled to said primary winding, said primary core being disposed within said receptacle; and

a substantially planar secondary core having a secondary winding disposed thereabout and a power conditioning means coupled to said secondary winding for deriving a desired voltage therefrom, said secondary core being disposed within said cartridge; and wherein

said cartridge has an area of said secondary core exposed on an outer surface thereof, said exposed area being disposed



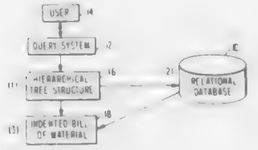
such that when said cartridge is coupled to said receptacle said exposed area is magnetically coupled to a corresponding exposed area of said primary core for completing a magnetic flux path between said primary and said secondary cores.

4,862,376

BILL OF MATERIAL INTERFACE TO CAD/CAM ENVIRONMENT

Kate M. Ferriter, Atlanta, Ga., and Elaine R. Palmer, Yorktown Heights, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 28, 1987, Ser. No. 113,837
Int. Cl.[4] G06F *15/21*
U.S. Cl. 364—468 5 Claims





1. A method for interfacing between a conceptual design tool and a CAD/CAM environment for implementing product design on a computer, comprising the steps of:

prompting a user to input functional product structure data;

capturing the product structure data input by the user in a database;

generating a hierarchical tree structure of the product structure and displaying the tree structure to the user as the product structure data is captured in the database;

generating an indented bill of materials for the product from the product structure data captured in the database and storing the indented bill of materials in the database;

storing the indented bill of materials in a graphics standard as a primitive text file;

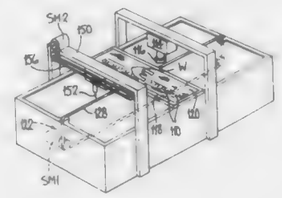
displaying an image of the indented bill of materials in the CAD/CAM environment while retaining the character of the displayed image as a primitive text file.

4,862,377

DETECTING WORKPIECE ORIETATION AND TREATING WORKPIECES WITHOUT REORIETING

David C. Reedman, Wartnaby, and Clive Preece, High Sincliffe, both of England, assignors to British United Shoe Machinery Ltd., Leicester, England

Filed Oct. 28, 1987, Ser. No. 114,296
Claims priority, application United Kingdom, Nov. 6, 1986, 8626499
Int. Cl.[4] G01B *11/00*
U.S. Cl. 364—468 25 Claims



1. A method of treating work pieces at a desired locality and in accordance with a desired pattern, data for the desired pattern being stored in a computer memory, said data being used to control the operation of an operating tool on each work piece presented to said tool, said method comprising:

supporting work pieces in random location and orientation on a support;

successively scanning said work pieces to obtain positional data relating to the location and orientation of each such work piece;

processing the positional data with a computer by which work piece shape data obtained by such scanning and taught work piece shape data stored in the computer memory are compared and the orientation of each such work piece is calculated on the basis of the comparison;

modifying the stored pattern data for each such work piece and utilizing the positional data obtained as aforesaid in respect of such work piece; and

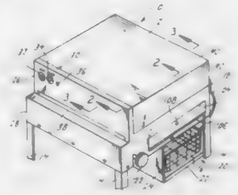
using the modified pattern data to cause the operating tool to operate in accordance with the desired pattern and at the desired locality of the work piece when said work pieces is presented to said tool.

4,862,378

PERFORATED WEB SEPARATOR

Stephen R. Melton, 8510 Henrietta Ave., St. Louis, Mo. 63144, and Rebecca Redelsheimer, University City, Mo., assignors to Stephen R. Melton, St. Louis, Mo.

Filed Jan. 12, 1987, Ser. No. 2,680
Int. Cl.[4] G06F *15/46;* B26F *3/02;* B25H *35/10*
U.S. Cl. 364—469 14 Claims



1. A perforated web separating device comprising:

(a) a tractor feed means for feeding a length of perforated web into operative association with a web separating device, the web including transverse, longitudinally spaced apart perforations, and at least one tractor feed strip including a plurality of holes in serial relationship

along the length of the tractor feed strip, the tractor feed means operating at a constant speed,

(b) sensor means for sensing the feeding of a pre-determined length of web by the tractor feed means, the sensor means responsive to the passage of a pre-determined number of holes in the tractor feed strip,

(c) means for separating the length of web along the perforation in response to a signal from the sensor means corresponding to the passage of a number of holes in the tractor feed strip as the web is continuously fed through the web separating device,

(d) interface means for integrated and continuous operation of the tractor feed means, sensor means and separating means whereby separation of the web at the perforation is accomplished during continuous operation of the separating device.

4,862,379

NUMERICAL CONTROL MACHINE

Akihiko Fujimoto, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1987, Ser. No. 69,336

Claims priority, application Japan, Jul. 4, 1986, 61-156298; Aug. 6, 1986, 61-183470; Aug. 20, 1986, 61-192977; Aug. 22, 1986, 61-195640; Aug. 22, 1986, 61-195639; Aug. 26, 1986, 61-198250; Aug. 26, 1986, 61-198251; Aug. 26, 1986, 61-198252; Aug. 26, 1986, 61-198253; Aug. 26, 1986, 61-198249; Aug. 26, 1986, 61-198248

Int. Cl.[4] G05B *19/18*

U.S. Cl. 364—474.11 14 Claims



1. A numerical control apparatus for controlling a plurality of independently operable systems comprising:

a control unit including a central processing unit, an arithmetic unit, and a memory having a plurality of program areas and at least one data area;

an information input/output unit having a plurality of means for inputting and outputting working data and control data to and from said control unit;

a driving unit having a plurality of means for independently driving an object to be controlled; and

said memory having a plurality of control programs capable of being independently executable, said control unit including system control means responsive to said control programs for systemizing groups of systems of said information input/output unit and systems of said driving unit in accordance with instructions of any of a plurality of instructions of said control programs in said memory program areas;

such that said apparatus operates to control, simultaneously and independently, each said group of systems systemized by said system control means.

4,862,[illegible]

NUMERICAL CONTROL UNIT

Hideaki Kawamura, and Takao Sasaki, both of Tokyo, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

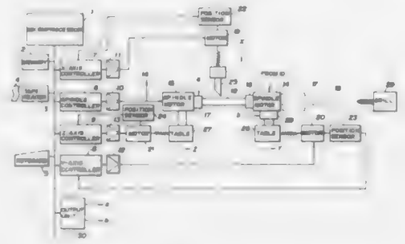
PCT No. PCT/JP87/00217, § 371 Date Dec. 4, 1987, § 102(e) Date Dec. 4, 1987, PCT Pub. No. WO87/06364, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 8, 1987, Ser. No. 143,129

Claims priority, application Japan, Apr. 8, 1986, 61-80868

Int. Cl.[4] G06F *15/46;* B24B *19/08*

U.S. Cl. 364—474.11 3 Claims



1. A method for machining a workpiece under control of a microprocessor, comprising the steps of:

(a) synchronously controlling movement of first and second spindle motors along first and second axes, respectively, in response to a synchronous control command provided by the microprocessor, the first and second spindle motors being coupled to the workpiece;

(b) performing a first type of machining on the workpiece while the first and second spindle motors are coupled to the workpiece;

(c) automatically controlling the movement of the second spindle motor independently of the first spindle motor in response to an independent control command from the microprocessor, and uncoupling the first spindle motor from the workpiece; and

(d) automatically performing a second type of machining while the workpiece is coupled only to the second spindle motor.

4,862,381

POSITION CONTROL METHOD IN WHICH A CARTESIAN POINT IS TRANSFORMED THROUGH TWO CARTESIAN COORDINATE SYSTEMS

Tomoatsu Shibata, Tokyo, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP87/00476, § 371 Date Mar. 7, 1988, § 102(e) Date Mar. 7, 1988, PCT Pub. No. WO88/00366, PCT Pub. Date Jan. 14, 1988

PCT Filed Apr. 7, 1987, Ser. No. 171,868

Claims priority, application Japan, Jul. 9, 1986, 61-161516

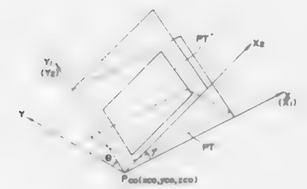
Int. Cl.[4] G05B *19/403, 19/41*

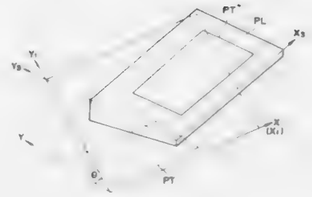
U.S. Cl. 364—474.36 3 Claims

1. A position control method for performing pulse distribution processing based on position data coordinates (x, y, z) in a three-dimensional program coordinate system, and controlling the position of a movable element on the basis of data obtained by said pulse distribution processing, comprising:

a first step of obtaining, in the program coordinate system, a central axis vector (i_o, j_o, k_o) of a first rotational axis, coordinates (x_{co}, y_{co}, z_{co}) of a rotational center point on said first rotational axis, and an angle of rotation θ, and defining a central axis vector (i_1, j_1, k_1) of a second rotational axis in a new three-dimensional coordinate system determined by rotation of the program coordinate system through θ, coordinates (x_{c1}, y_{c1}, z_{c1}) of a rotational center point on said second rotational axis, and an angle of rotation ϕ;

a second step of calculating a transformation matrix $[M_1]$ using the central axis vector (i_o, j_o, k_o) of the first rotational axis and θ, wherein coordinates (x_1, y_1, z_1) in the





new three-dimensional coordinate system are obtained, when coordinates (x, y, z) in the program coordinate system are rotated by θ about the first rotational axis, in accordance with the following equation:

$$\begin{pmatrix} x' \\ y' \\ z' \end{pmatrix} + [M_1] \begin{pmatrix} x - x_{co} \\ y - y_{co} \\ z - z_{co} \end{pmatrix} + \begin{pmatrix} x_{co} \\ y_{co} \\ z_{co} \end{pmatrix}$$

and calculating a transformation matrix $[M_2]$ using the central axis vector (i_1, j_1, k_1) and ϕ, wherein coordinates (x_2, y_2, z_2) are obtained, when the new three-dimensional coordinate system is rotated by ϕ about the second rotational axis, in accordance with the following equation:

$$\begin{pmatrix} x_2 \\ y_2 \\ z_2 \end{pmatrix} = [M_2] \begin{pmatrix} x_1 - x_{c1} \\ y_1 - y_{c1} \\ z_1 - z_{c1} \end{pmatrix} + \begin{pmatrix} x_{c1} \\ y_{c1} \\ z_{c1} \end{pmatrix}$$

a third step of transforming the position data coordinates (x, y, z) in accordance with the following equation:

$$\begin{pmatrix} x' \\ y' \\ z' \end{pmatrix} = [M_1] \cdot [M_2] \begin{pmatrix} x \\ y \\ z \end{pmatrix} + [M1] \begin{pmatrix} x_{c1} \\ y_{c1} \\ z_{c1} \end{pmatrix} + \begin{pmatrix} x_{co} \\ y_{co} \\ z_{co} \end{pmatrix}$$

and

a fourth step of moving a movable element along a path based on the transformed position data (x', y', z').

4,862,382

ARRANGEMENT FOR PROCESSING THE OUTPUT SIGNALS OF A RESISTANCE BRIDGE

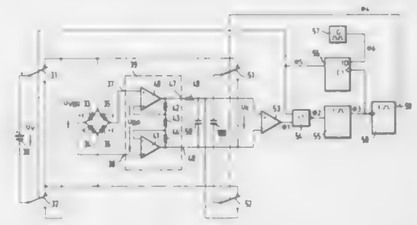
Georg Schneider, Schopfheim-Langenau, and Markus Bausch, Lörrach-Brombach, both of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Filed Sep. 24, 1987, Ser. No. 100,589

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1986, 3633790

Int. Cl.[4] G06F *15/20;* H03K *5/00*

U.S. Cl. 364—481 6 Claims



1. Arrangement for processing output signals of a resistance bridge comprising, a DC voltage source, periodically actuated changeover switching means connecting the terminals of a first bridge diagonal to said DC voltage source so that a bridge supply voltage supplied to said first bridge diagonal is periodically reversed in polarity, a clock generator furnishing a clock signal for controlling the periodic actuation of said changeover switching means, a bridge amplifier having input terminals connected to the terminals of a second diagonal of said resistance bridge and output terminals for furnishing an amplified bridge output voltage, and a voltage to frequency converter having signal input terminals connected to said output terminals of said bridge amplifier and reference input terminals connected to said terminals of said first bridge diagonal so that a reference voltage supplied to said reference inputs is always equal to said bridge supply voltage, said voltage to frequency converter comprising means for integrating said amplified bridge output voltage, means for comparing said integrated amplified bridge output voltage with said reference voltage, and means for generating an output pulse train having a recurrence frequency which is proportional to said bridge output voltage and always higher than the frequency of said clock signal controlling the actuation of said changeover switching means, said clock signal being synchronized with said output pulse train so that the instants of actuation of said changeover switching means have a predetermined time relationship with pulses of said output pulse train.

4,862,383

ULTRASONIC INSPECTION APPARATUS

Chishio Koshimizu, Yamanashi; Yasuo Hayakawa; Toshio Nonaka, both of Ibaraki, and Sakae Takeda, Tsuchiura, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,766

Claims priority, application Japan, Oct. 16, 1985, 60-228778

Int. Cl.[4] G01N *29/04*

U.S. Cl. 364—507 9 Claims

1. An ultrasonic inspection apparatus having a probe for emitting an ultrasonic beam to at least one kind of an object to be inspected, a pulser for transmitting to said probe a pulse signal necessary for generation of the ultrasonic beam, a receiver for receiving a reflection beam of said ultrasonic beam from said object and for generating an RF signal corresponding to said reflection beam, and display means for displaying data of said RF signal to allow a presence or absence of a defect in said object to be judged on a basis of contents displayed on said display means, said apparatus comprising:

a peak detector, connected to said receiver, for detecting a maximum value indicative of a positive peak and a maximum absolute value indicative of a negative peak of said RF signal; and

control means, connected to said peak detector, for performing a computation for comparing in magnitude said maximum value indicative of the positive peak with said maximum absolute value indicative of the negative peak and transmitting a computed value to said display means to cause the computed value to be displayed thereon,

wherein said peak detector comprises a first polarity circuit



for passing only a positive-going waveform of said RF signal and a second polarity circuit for passing only a negative-going waveform, first and second detection circuits for respectively detecting the positive-going waveform passed through said first polarity circuit and the negative-going waveform passed through said second polarity circuit, and first and second hold circuits for respectively holding maximum values of said waveforms respectively detected by said first and second detection circuits thereby enabling said positive peak maximum value and negative peak maximum absolute value of said RF signal to be detected.

4,862,384

METHOD OF MEASURING THE DYNAMIC VISCOSITY OF A VISCOUS FLUID UTILIZING ACOUSTIC TRANSDUCER

Martial R. Bujard, Hinterkappelen, Switzerland, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 3, 1987, Ser. No. 81,042

Int. Cl.[4] G01N *11/00, 29/02*

U.S. Cl. 364—509 **5 Claims**

1. A method of measuring the dynamic viscosity of a viscous fluid, comprising the steps of:

positioning an acoustic transducer in the temperature and pressure environment of the fluid and spaced from the fluid;

applying a first input signal to the transducer to generate acoustic shear waves within the transducer;

measuring the frequency and amplitude of the output signal produced by the transducer in response to the acoustic shear waves;

repeating the steps of applying and measuring for a range of first input signal frequencies to determine a first resonant frequency and associated bandwidth for acoustic shear wave propagation within the transducer;

positioning the transducer in the temperature and pressure environment of the fluid and in surface contact with the fluid;

applying a second input signal to the transducer to generate acoustic shear waves within the transducer;

measuring the frequency and amplitude of the output signal produced by the transducer in response to the acoustic shear waves;

repeating the steps of applying and measuring for a range of second input signal frequencies to determine a second



resonant frequency and associated bandwidth for acoustic shear wave propagation within the transducer; and

using the shift between the first and second resonant frequencies and the difference between the first and second bandwidths to calculate the dynamic viscosity of the fluid.

4,862,385

MONITORING DATA DISPLAY DEVICE

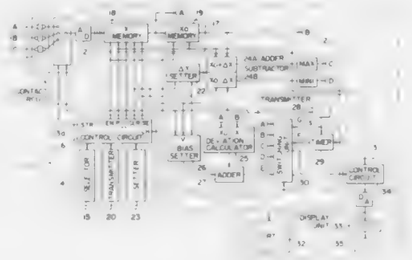
Shigeru Fujita; Hideo Banzai, and Makoto Takada, all of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 580,822, Feb. 16, 1984, Pat. No. 4,695,965. This application Feb. 24, 1987, Ser. No. 18,165

Claims priority, application Japan, Feb. 22, 1983, 58-28851

Int. Cl.[4] G06F *15/40;* **G09G** *1/06;* **G01R** *19/50*

U.S. Cl. 364—518 **3 Claims**



1. A device for displaying monitoring data of a continuously varying operation condition of a drive mechanism driven by an actuator comprising:

detecting means for detecting data regarding an operation of the drive mechanism as a variable of time;

monitoring means connected to said detecting means for monitoring the detected data; and,

display means connected to said monitoring means for displaying reference and detected data;

said monitoring means comprising:

a signal transmission unit for generating periodic signals corresponding to the operation of said drive mechanism,

a memory unit connected to said detecting means and said signal transmission unit for storing detected data of one operation cycle of the drive mechanism as reference data; and

an operation unit connected to said memory unit and said signal transmission unit for discriminating between and comparing conditions of the reference data and detected data of an operation cycle of the drive mechanism succeeding to said one operation cycle,

said operation unit including a setter for setting allowable uppermost and lowermost data of said reference data, a memory for storing said allowable uppermost and lowermost data, a counter responsive to said periodic signals for counting an operating time of one operation cycle of the drive mechanism, and an operation circuit for controlling a sampling frequency for multipoint sampling of the detected data on the basis of the counted operation time and a frequency for output of sampling data to an output device, said operation unit controlling a change in said sampling frequency in accordance with a counted operation time of said drive mechanism,

said display means comprising:

a display unit, responsive to data supplied by said monitoring means, on which said reference data is preliminarily displayed, with the detected data of said operation cycle succeeding to said one operation cycle being visually superimposed on said reference data on a coordinate axis, and with said allowable uppermost and lowermost data also being displayed on said coordinate axis.

4,862,386

APPARATUS FOR PREPARING A LETTER

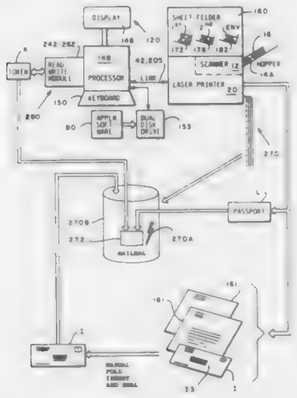
Barry H. Axelrod, Newtown; Robert T. Durst, Jr., Monroe; Kevin D. Hunter, Stratford, and Alfred C. Schmidt, Wilton, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 13, 1987, Ser. No. 25,537

The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.

Int. Cl.[4] G06F *15/20;* **B65H** *39/02*

U.S. Cl. 364—518 **53 Claims**



1. Apparatus for printing letter including information parts in proper locations on a stationery item, said apparatus comprising:

a. printing means,

b. input means including a letter data signal representative of information having a format, said information having a plurality of information parts, and

c. computer means coupled to said input means and including a plurality of memory locations, said computer means further including: means coupled to said printing means and responsive to said letter data signal for identifying each of said information parts; means for converting said identified information parts of said letter data into a plurality of data parts; means for storing each of said data parts into separate memory locations; processing means including stored sequence data and stored location data corresponding to respective ones of said identified information parts; means coupled to said processing means and responsive to said sequence data and said location data for retrieving from said means for storing at least one of said data parts corresponding to an identified information part in accordance with said sequence and location of said information part, said computer means coupled to said printing means to print on said stationery item in proper sequence and location retrieved information part corresponding to a selected data part.

4,862,387

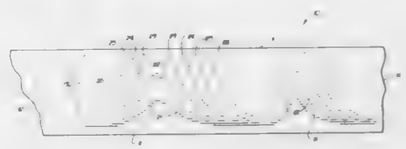
UNIVERSAL-GAIN DATA PLOTTER

Arnold S. J. Lee, 1033 Hilts Ave., Los Angeles, Calif. 90024

Continuation of Ser. No. 690,594, Jan. 11, 1985, abandoned. This application Mar. 31, 1988, Ser. No. 178,893

Int. Cl.[4] G01D *1/16;* **B43L** *33/00;* **H03L** *5/00;* **G01R** *1/38*

U.S. Cl. 364—520 **18 Claims**



1. Apparatus for plotting a sequence of data values in real time as they are received from a single data source at a suitable scale expansion on a visually readable medium, comprising:

means for receiving said sequence of data values from said single data source and for deriving in response to each of said data values a multiplicity of display signals that substantially correspond to the representation of that data value at a respective multiplicity of scale expansions, comprising:

means for receiving and deriving, for each of said data values, a first binary signal having a number of data bits sufficient to accomodate binary signals over a range of magnitudes defined by the variation in values of said sequence of data values;

a shift register adapted to receive and store said first binary signal as a plurality of data bits, and to produce a second binary signal at a set of parallel output-signal lines for transmission to said indicia-producing means, the number of said output-signal lines in the set being large enough to resolve a number of binary signal levels corresponding to the resolution of said indicia-producing means; and

means for causing the data bits stored in said shift register to be progressively shifted within the register, whereby successive values of said second binary signal represent successively different multiples of said data value;

means, responsive to said display signals, for producing a corresponding multiplicity of visible indicia on said medium, the magnitude of each of said data values at said respective multiplicity of scale expansions being represented by respective displacements of said indicia from a baseline, along a first dimension of said medium; and

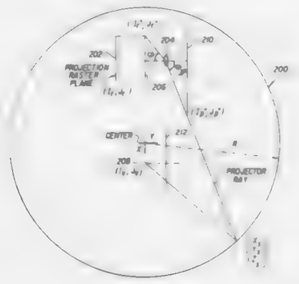
means for providing relative motion between said medium and said indicia-producing means, along a second dimension of said medium.

4,862,388

DYNAMIC COMPREHENSIVE DISTORTION CORRECTION IN A REAL TIME IMAGING SYSTEM

William M. Bunker, Ormond Beach, Fla., assignor to General Electric Company, Philadelphia, Pa.

Filed Dec. 15, 1986, Ser. No. 941,316
Int. Cl.[4] G06F *3/14*
U.S. Cl. 364—521 9 Claims



2. A method for generating an apparent non-distorted image on a viewscreen from a computer generated image source, the image being projected from a projector raster to a viewscreen oriented such that the projector raster appears distorted to the viewer, the image including a plurality of frames, for each frame the method comprising the steps of:

(A) translating selected points from the raster to a projection plane;

(B) mapping the selected points on the projection plane to corresponding points on the viewscreen;

(C) determining for the selected points mapped on the viewscreen their apparent location to a viewer; and

(D) mapping other selected points from viewer space to projector space; and

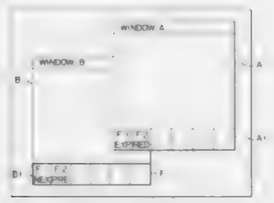
(E) distorting the image in projector space using the computer locations of the selected points and other selected points for presenting a non-distorted image to the viewer.

4,862,389

INFORMATION PROCESSOR WITH MULTI-WINDOW DISPLAY FUNCTION

Shiro Takagi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 25, 1987, Ser. No. 100,884
Claims priority, application Japan, Dec. 26, 1986, 61-315331
Int. Cl.[4] G06F *15/626;* H01R *1/06*
U.S. Cl. 364—521 31 Claims



1. An information processing apparatus comprising:

display means for displaying a plurality of windows, ordered by a display priority, each of the windows having a processing area that displays information to be processed and a function area that displays a plurality of function commands;

designating means, having a plurality of function keys, for designating one function command by operation of one of the function keys, each of the function commands displayed in the function area of the each window indicating a processing operation that corresponds to each function key of the designating means;

selecting means for selecting the window that contains the function command corresponding to the function key of the designating means that is operated, without changing a display condition of the windows;

distinguishing means for indicating on the display means the function area of the window selected by the selecting means; and

processing means for performing, when one of the function keys is operated, a processing operation according to the function command that is distinctly displayed on the display means and that corresponds to the function key operated.

4,862,390

METHOD AND APPARATUS FOR SELECTION OF ONE FROM A PLURALITY OF ENTRIES LISTED ON A COMPUTER DISPLAY

Jonathan A. Weiner, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 24, 1987, Ser. No. 137,988
Int. Cl.[4] G06D *3/037*
U.S. Cl. 364—521 7 Claims



1. In a computing system having a keyboard, a search control program and a display, a method for allowing a user from a keyboard to select a selected entry from a plurality of entries, the method comprising the steps of:

(a) displaying in a first region on the display letters typed in by the user on the keyboard;

(b) displaying in a second region on the display a first subset of the plurality of entries;

(c) highlighting on the display, at the direction of the search control program, a first entry whose first letter(s) match the letter(s) displayed in the first region when the search control program determines the first entry is in alphabetical order first among entries from the plurality of entries whose first letter(s) match the letter(s) displayed in the first region; and,

(d) making, at the direction of the search control program, the first entry the selected entry when the search control program determines that the user has pressed a designated key on the keyboard;

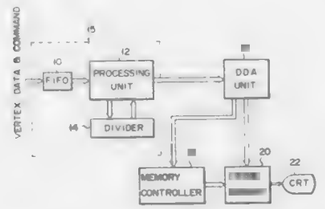
(e) displaying the first subset of the plurality of entries in the second region, highlighting no entry, and making the selected entry equal to a null set when the search control program determines that the first letter(s) of no entry in the plurality of entries match the letter(s) displayed in the first region.

4,862,391

SHADING CIRCUIT FOR SHADING A PLURALITY OF POLYGONS WHICH CONSTITUTE A SOLID MODEL, AND METHOD OF SHADING THE SAME

Masahide Ohhashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 28, 1987, Ser. No. 101,980
Claims priority, application Japan, Sep. 29, 1986, 61-227980
Int. Cl.[4] G09G *1/06*
U.S. Cl. 364—522 10 Claims



1. A shading circuit for shading a plurality of triangular polygons which constitute a solid model to be displayed on a screen defined by X, Y and Z coordinate axes, each orthogonal to the other, comprising:

preprocessing means including means for receiving three vertex data, each containing the intensity and X, Y, and Z coordinates of a corresponding vertex of a corresponding one of the plurality of triangular polygons, and means for defining two points at which a selected one of a plurality of scan lines disposed substantially parallel to the X coordinate axis intersects a corresponding one of the polygons, obtaining the intensity and Z coordinate corresponding to each of said two points, and obtaining a unit change $\Delta I/\Delta X$ of intensity with respect to each unit change of the X coordinate axis and a unit change $\Delta Z/\Delta X$ of the Z coordinate axis with respect to each unit change of the X coordinate axis, based on the intensities and Z coordinates of said two points; and

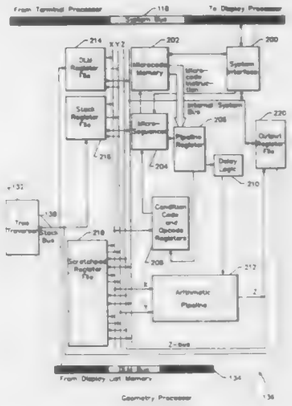
shading section, responsive to said received three vertex data and the obtained changes $\Delta I/\Delta X$ and $\Delta Z/\Delta X$, for sequentially obtaining the intensity and Z coordinate corresponding to each of a plurality of points disposed on a selected one of the sides of a corresponding one of the polygons to define a starting intensity and Z coordinate for a corresponding one of said scan lines, and for sequentially obtaining the intensity and Z coordinate of each of a plurality of points disposed inside a corresponding one of the polygons on a corresponding one of the scan lines, based on the corresponding starting intensity and Z coordinate thereof and the obtained changes $\Delta I/\Delta X$ and $\Delta Z/\Delta X$.

4,862,392

GEOMETRY PROCESSOR FOR GRAPHICS DISPLAY SYSTEM

Walter R. Steiner, Ormond Beach, Fla., assignor to Star Technologies, Inc., Sterling, Va.

Filed Mar. 7, 1986, Ser. No. 838,300
Int. Cl.[4] G09B *9/08*
U.S. Cl. 364—522 8 Claims



1. A programmable electronic geometry processor circuit for use in a graphics display system that includes a database memory for storing segments of graphics data which represent three-dimensional objects to be displayed and which contain operation codes pertaining to the objects, a first processing means for writing segments of graphics data into the memory, a second processing means responsive to the first processing means for sequentially fetching graphics data stored in the memory and placing such fetched graphics data on a dedicated memory bus, and a third processing means for accepting processed graphics data from the geometry processor for display on a display device, where the geometry processor includes:

a. an input register means coupled to the memory by the dedicated memory bus, for temporarily storing graphics data fetched from the memory by the second processing means;

b. a buffer register means coupled to the second processing means by a dedicated stack bus, for buffering data transferred between the second processing means and the geometry processor;

c. an arithmetic pipeline module, coupled to the input and buffer register means, for mathematically processing graphics data temporarily stored in the input register means or the buffer register means;

d. an output register means coupled to the arithmetic pipeline module and to the buffer register means, for temporarily storing the output of the arithmetic pipeline module; and

e. a microcontroller means, coupled to the first and third processing means by a system bus, to the input, buffer, and output register means, and to the arithmetic pipeline module, for accepting from the first processing means a sequence of processing instructions, storing the instructions in an instruction memory, and selectively executing the instructions in response to the operation codes stored in each segment of graphics data, to:

(1) select during a first processing phase from the input register means and temporarily transfer to the second processing means over the stack bus only segments containing data that is at least partly within a defined viewing volume,

(2) accept during a second processing phase the selected segments from the second processing means over the stack bus and associated graphics data from the memory fetched by the second processing means over the dedicated mem-

ory bus, and use the arithmetic pipeline module to transform the graphics data from a three-dimensional representation to a two-dimensional representation, and

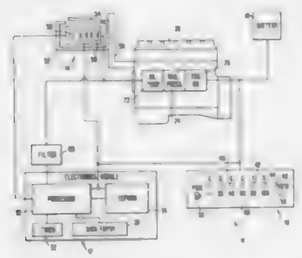
(3) transfer the transformed graphics data to the third processing means over the system bus for display.

4,862,393

OIL CHANGE INTERVAL MONITOR

David L. Reid, Brighton, Mich., and Robert J. Weimer, Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jan. 12, 1988, Ser. No. 143,039
Int. Cl.[4] G06F *15/20*; F01M *11/10*
U.S. Cl. 364—550 19 Claims



1. An oil change interval monitor for estimating the percentage of oil life used since the last oil change for a diesel engine having an engine fuel rail comprising:

rail pressure sensing means for sensing the rail pressure of the diesel engine and providing a rail pressure signal;

computing means for receiving said rail pressure signal, for calculating a fuel flow value using the rail pressure signal, and for calculating the percentage of oil life used by the engine using data signals and the fuel flow value;

data entry means for providing data signals to said computing means, the data signals being indicative of engine parameters determined by the engine type; and

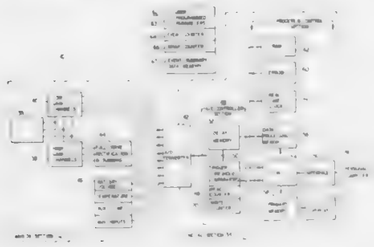
display means connected to said computing means for displaying the percentage of oil used.

4,862,394

DROP HEIGHT RECORDER

David B. Thompson, Grand Prairie; Stanley V. Preskitt, Dallas; Harvey L. Downing, Garland, and Michael V. Allred, Irving, all of Tex., assignors to Dallas Instruments Incorporated, Dallas, Tex.

Filed Jan. 28, 1987, Ser. No. 8,189
Int. Cl.[4] G11B *5/00*; G06F *15/74*; G01N *3/30*; G01P *15/08*
U.S. Cl. 364—551.01 19 Claims



2. A drop height recorder apparatus comprising:

(a) a housing suitable for packaging for shipment via a transportation source from an origin point to a destination point;

(b) a sensor means mounted in the housing and including: a sensor for generating data signals representative of gravitational forces including free-fall, and impact forces; first and second means connected to the sensor for preprocessing, respectively, the gravitational and impact force representative signals, and third means connected to the first and second means for generating digitized data sample signals representative of the impact and gravitational force representative signals; and an event determining means connected to the third means for receiving the digitized impact force signals and producing event triggering signals; and

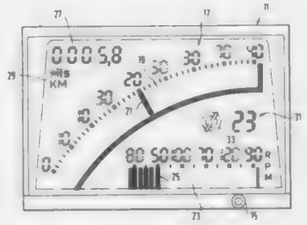
(c) a recorder means mounted in the housing and connected to the sensor means, the recorder means including: a data delay means connected to the third means for storing preselected quantities of the digitized data signals; and a data storage means connected to the data delay means for storing a preselected portion of the digitized signals as event data signals; and a programmable controller connected to: the event determining means, data delay means, and data storage means; the programmable controller being programmed responsive to the trigger signals to transfer from the data delay means to the data storage means preselected portions of pre-trigger and post-trigger digitized data sample signals as event waveforms to the data storage means, for subsequent processing to determine from the event waveforms free-fall events and their free-fall times from which the free-fall drop heights can be computed.

4,862,395

DATA DISPLAY INSTRUMENT FOR A BICYCLE

Rainer Fey, Schweinfurt; Günter Look, Bergrheinfeld, and Gerhard Dumboer, Niederwerrn, all of Fed. Rep. of Germany, assignors to Sachs-Huret S.A.

Filed Jun. 29, 1987, Ser. No. 68,358
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1986, 3622632
Int. Cl.[4] G06M *3/06*; G01P *3/48*; A63B *21/00*; G01C *22/00*
U.S. Cl. 364—561 9 Claims



1. A data display instrument for a bicycle, comprising:

(a) a wheel rotation sensor for generating plural pulse signals at a rate corresponding to the rotary speed of a wheel of the bicycle,

(b) computing means responsive to the pulse signal for generating data signals for a plurality of types of information based on the travelling speed and the distance travelled,

(c) visual display means for displaying information of the data signals, and

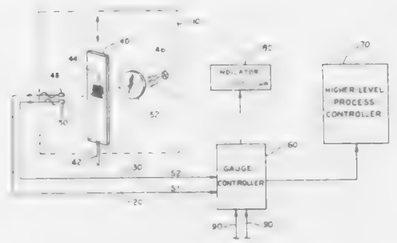
(d) control means for clearing, in dependence on the pulse rate of the pulse signals, the display means for display of a first group of types of information when the pulse rate represents a travelling movement of the wheel and for display of a second group of types of information when the pulse rate approaches zero.

4,862,396

ANALYZING ANALOG QUADRATURE SIGNALS

Mohammadreza Nirumandrad, Columbia, S.C., assignor to Industrial Microsystems, Inc., W. Columbia, S.C.

Filed Oct. 20, 1987, Ser. No. 112,107
Int. Cl.[4] G01C *25/00*
U.S. Cl. 364—571.02 31 Claims



1. An apparatus for analyzing a pair of analog, generally sinusoidal signals in phase quadrature produce by a conventional plunger-type gauge head responsive to movement of the plunger thereof, said apparatus comprising:

amplifier means for receiving a pair of analog signals from a gauge head, and for amplifying and outputting same and respective complements of same:

quadrant status means, responsive to the amplified signals and their complements, for dividing each cycle of one of said amplified signals into four quadrants, and for producing a status indication of which quadrant said one amplified signal is in at a given time sample; converter means responsive to said pair of amplified signals and their respective complements for selectively converting at a given time sample of such four signals from analog to digital representations using respective high and low reference values for such converting, and for selecting and using two of such three signals as said respective high and low references; and

resolver means for receiving said three digital representations, ratio-metrically comparing the nonreference third of said digital representations with said two selected references, and assigning an intraquadrant position value thereto, whereby the distance traveled by the plunger of said gauge head as represented by the production of signals within a given quadrant may be determined.

4,862,397

REMOTE OPERATION OF OPTICAL SYSTEM

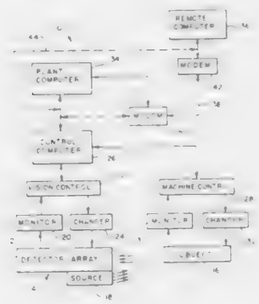
Timothy R. Pryor, Tecumseh, Canada, assignor to Diffracto Ltd., Windsor, Canada

Division of Ser. No. 454,989, Jan. 3, 1983, Pat. No. 4,692,884.
This application Aug. 27, 1987, Ser. No. 89,836
The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.
Int. Cl.[4] G06F *3/14*
U.S. Cl. 364—571.01 21 Claims

14. A method of controlling a detector array based optical system using light received by a detector array for machine vision from a plurality of succeedingly presented objects comprising the steps of:

detecting a light characteristic of the light received by the detector array from a presented object during use;

transmitting a signal indicative of the light characteristic to a remotely located control system; and



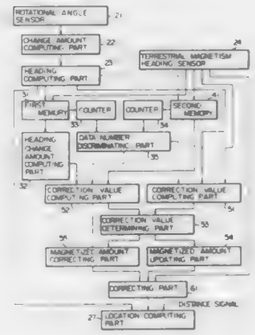
adjusting a light characteristic variable of the optical system for succeeding objects when the received signal of at least one previous object is deficient.

4,862,398

CORRECTING METHOD AND CORRECTING ERRORS IN A TERRESTRIAL MAGNETISM HEADING SENSOR

Toshiyuki Shimizu; Osamu Shimizu; Kenji Tenmoku; Kunihiko Mitoh, and Yasuhiro Honoki, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Filed Nov. 13, 1987, Ser. No. 119,966
Claims priority, application Japan, Nov. 18, 1986, 61-275003; Jan. 8, 1987, 62-2166; Oct. 12, 1987, 62-256629
Int. Cl.[4] G01C *17/38*
U.S. Cl. 364—571.05 11 Claims



2. In a location detecting apparatus which detects a location of a moving body on the basis of a heading signal from a terrestrial magnetism heading sensor attached to the moving body, a correcting method for correcting errors in said terrestrial magnetism heading sensor, comprising the steps of:

detecting an amount of a heading change of said moving body that is made when said moving body turns a curve, by calculating a difference between a present location and a previous location of said moving body which is located on a road map represented by road map data,

detecting a magnetized amount of said moving body on the basis of the detected amount of said heading change, an output from said terrestrial magnetism heading sensor before said heading change is made an output from said terrestrial magnetism heading sensor after said heading change is made, and

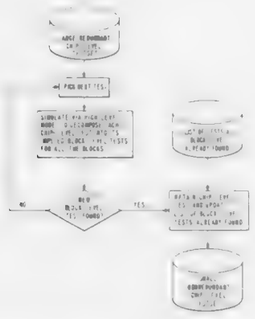
correcting said heading signal on the basis of the detected magnetized amount.

4,862,399

METHOD FOR GENERATING EFFICIENT TESTSETS FOR A CLASS OF DIGITAL CIRCUITS

Smith Freeman, Skillman, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 31, 1987, Ser. No. 91,567
Int. Cl.[4] G01R 31/28
U.S. Cl. 364—580 15 Claims



1. A method for generating a set of chip level test patterns for a digital circuit having a set of chip level output signal patterns in response to an applied set of chip level input signal patterns comprising:

identifying a plurality of separate different functional circuit blocks in said circuit, each block having an input port and an output port;

creating an exhaustive set of chip level test patterns which tend to cause block level test patterns to be applied to each said blocks;

determining by circuit simulation which chip level test patterns cause each block level test pattern to be applied; and

selecting those chip level test patterns that form said set of chip level output signal patterns wherein a block level test pattern is applied to each block at least once and discarding those chip level input test patterns which produce redundant block level test patterns.

4,862,400

MICROCOMPUTER BUS ASSEMBLY

Martin G. Sefbrede, 9205 Alabama Ave., Suite E, Chatsworth, Calif. 91311

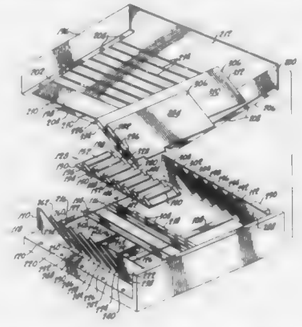
Filed May 28, 1987, Ser. No. 55,183
Int. Cl.[4] H05K 7/74
U.S. Cl. 364—708 8 Claims

1. In a microcomputer which includes a chassis, a motherboard rigidly attached to said chassis, which motherboard includes an integral data bus and two edge card connectors rigidly disposed on said motherboard, daughtercard mounting means comprising:

a flat bus extension card;

means mounted on said bus extension card to engage said edge card connectors of said motherboard so as to retain said bus extension card parallel to said motherboard; and

a multiplicity of edge card connectors disposed on said bus extension card, which edge card connectors include slots formed to slidably receive and resiliently retain daughter-



card connecting tabs, which slots are disposed at an acute angle in relation to said bus extension card.

4,862,401

APPARATUS, SPECIFICALLY A BALANCE, HAVING A DISPLAY OF RESULTS OF SUCCESSIVE FUNCTION SEQUENCES

Rudolf Kubli, Zürich, and Hanspeter Wachter, Wallisellen, both of Switzerland, assignors to Mettler Instruments AG, Greifensee, Switzerland

Filed Sep. 14, 1987, Ser. No. 95,650
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1986, 3631487
Int. Cl.[4] G06F 15/20; G01G 23/28, 23/00
U.S. Cl. 364—710.07 8 Claims



1. Apparatus having a display for the results of function sequences occurring in succession from a variety of function sequences which can be run by the apparatus independently from each other, comprising:

means for implementing the function sequences and including function selection keys corresponding to the complete scope of functions of the apparatus, matrix-like organized storage blocks that retain one sequence based on the function sequences of previously run operations and automatically suggest this sequence to the operator by activation or is playing at least one function key corresponding to this sequence or the next step, a plausibility matrix which checks, prior to the running of a function, if the function can be executed; and

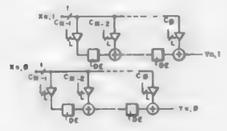
a control key operative to interrupt the automatically suggested sequence at any tim and to allow the selection of an arbitrary function of the complete scope of functions.

4,862,402

FAST MULTIPLIERLESS ARCHITECTURE FOR GENERAL PURPOSE VLSI FIR DIGITAL FILTERS WITH MINIMIZED HARDWARE

Imran A. Shah, North White Plains, and Arup K. Bhattacharya, Peekskill, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Jul. 24, 1986, Ser. No. 890,247
Int. Cl.[4] G06F 15/31
U.S. Cl. 364—724.12 10 Claims



1. A multiplierless digital transversal filter comprising:

a first set of N registers for respectfully receiving and storing respective coefficients of a set of N filter tap coefficients C_i, where i=0, 1, . . . N−1, each coefficient having L bits in successive bit positions j, where j=0, 1, . . . , L-1;

means for receiving successive samples x_n of a digital input word X, all bits of a sample x_n being received in parallel and each such sample having M bits in successive bit positions k, where k=0, 1, . . . , M-1;

means to bit slice each input word sample x_n into a plurality of segments, each segment having a number w of bits, each segment constituting a processing plane of said filter;

means to perform a convolution of the w-bits of the bit-slice segment of each of said processing planes by said set of coefficients C_i in parallel, each segment being convolved with said set of coefficients C_i, the output of each processing plane being the convolution of the w-bits of the bit slice segment thereof and the L bits of each of said set of coefficients C_i;

means to add the results of all said convolutions of all of said M bits of each input word sample x_n, the sum so derived being Y_n;

means to output said sum Y_n as a filtered digital output signal sample corresponding to said input word sample x_n; and

means for biasing the input word samples x_n and the coefficients C_i so that they represent only positive numbers, whereby said sum Y_n is derived over all four possible quadrants of the results of each of said convolutions.

4,862,403

DIGITAL FILTER

Seiichiro Iwase, Sagamihara, Japan, and Takao Yamazaki, Goleta, Calif., assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 14, 1985, Ser. No. 797,845
Claims priority, application Japan, Nov. 14, 1984, 59-240311
Int. Cl.[4] G03F 7/38
U.S. Cl. 364—724.16 2 Claims

1. A digital filter comprising:

an input terminal provided with an input digital signal;

frame-delay circuit means connected to said input terminal for producing a digital signal frame-delayed with respect to said input digital signal;

first adder circuit means for adding said input and fame-delayed delayed digital signals to produce added digital signals;

line-delay circuit means connected to said output of said first adder circuit means and having an output;

second adder circuit means having a plurality of inputs respectively connected to selected ones of the output of said first adder circuit means and said output of said line-delay circuit means, and having an output;

sample-delay circuit means connected to said output of said second adder circuit means and having at least one output;

third adder circuit means having a plurality of inputs respectively connected to selected ones of the output of said second adder circuit means and said output of said sample-delay circuit means, and having a plurality of outputs;

a plurality of multiplying circuit means having inputs respectively connected to respective ones of said outputs of said third adder circuit means for respectively multiplying a plurality of digital coefficient signals by respective output signals of said third adder circuit means, and having respective outputs;



fourth adder circuit means having a plurality of inputs respectively connected to the outputs of said plurality of multiplying circuit means and having an output; and

an output terminal connected to the output of said fourth adder circuit means.

4,862,404

DIGITAL CIRCUIT FOR SUPPRESSING FAST SIGNAL VARIATIONS

Wolfgang Schwartz; Otto L. Warmuth, and Claus D. Grzyb, all of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 9, 1987, Ser. No. 71,695
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1986, 3623301
Int. Cl.[4] G06F 15/31; H04N 5/44
U.S. Cl. 364—733 9 Claims

1. A digital circuit which receives a serial input signal and

which suppresses fast signal variations in said signal, said digital circuit comprising an integrator circuit which generates a multi-bit signal by integration of said serial input signal, and an evaluation circuit which derives from said multi-bit signal a serial output signal which assumes a first state when said multi-bit signal exceeds a first threshold value and a second state



when said multi-bit signal is below a second threshold value, said evaluation circuit comprising logic means for combining the three most significant bits of said multi-bit signal into a control signal when said multi-bit signal exceeds said first threshold value which sets a flipflop so as to generate said serial output signal, and resets said flipflop when said multi-bit signal is below said second threshold value.

4,862,405

APPARATUS AND METHOD FOR EXPEDITING SUBTRACTION PROCEDURES IN A CARRY/SAVE ADDER MULTIPLICATION UNIT

Bradley J. Benschneider, Findlay, Ohio, and Victor Peng, Shrewsbury, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 30, 1987, Ser. No. 68,262
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—760 **20 Claims**



1. A multiplier unit capable of implementing a modified Booth algorithm, said multiplier unit comprising:

a multiplier storage means for storing a multiplier operand;

a multiplicand storage means for storing a multiplicand operand;

a plurality of sequential carry/save adder means coupled to said multiplicand storage means and a next previous carry/save adder stage, each carry/save adder means for performing a processing operation on said multiplicand operand and combining an internal operand resulting from said processing operation with a processed operand from a next previous carry/save adder stage, wherein said processed operand is shifted a preestablished amount between said next previous carry/save adder stage and said carry/save adder stage;

a plurality of encoding means coupled to said multiplier operand storage means and responsive to said multiplier operand for applying control signals to an associated carry/save adder means, said control signals determining said processing operation of said associated carry/save adder means, each of said plurality of encoding means generating a positive logic signal when said control signals result in a subtraction processing operation in said associated carry/save adder means, wherein said positive logic signal is entered in a first carry/save adder stage at a predetermined position and combined with said multiplicand operand in said first carry/save adder means, and

combining means for combining signals from a last carry/save adder means.

4,862,406

ADAPTIVE ASSOCIATIVE-PROCESSING OPTICAL COMPUTING ARCHITECTURES

Arthur D. Fisher, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 29, 1986, Ser. No. 823,719
Int. Cl.[4] G06G *7/16*
U.S. Cl. 364—807 **11 Claims**



1. A method for adaptively storing associated information patterns $\bar{u}^k$ and $\bar{v}^k$ according to the equation $M_{n+1}=M_n+g\bar{v}^k\bar{u}^{kT}-g\bar{v}\bar{u}^{kT}$; where k and n are indexes, the overbar — signifies a vector, the double overbar = signifies a matrix, the T signifies transpose and M_n is a matrix, comprising the steps of:

creating a first beam of light carrying information pattern $\bar{v}^k$;

shining the first beam of light carrying $\bar{v}^k$ into a Bragg cell possessing information pattern $\bar{u}^k$ in order to create a second beam of light carrying the outer product cross-correlation $g\bar{v}^k\bar{u}^{kT}$, where g is the gain factor;

shining the second beam of light carrying $g\bar{v}^k\bar{u}^{kT}$ onto a detector side in addition mode of an optically-addressed spatial light modulator having a detector side, a readout side, a matrix M_n internally-stored therein, an addition mode and a subtraction mode, in order to store $M_n+g\bar{v}^k\bar{u}^{kT}$ in the light modulator;

creating a third beam of light carrying information pattern $\bar{u}^k$;

reflecting the third beam of light off of the readout side of the light modulator in order to create a fourth beam of light carrying information pattern $\bar{v}=M\bar{u}^k$, where $M=M_n+g\bar{v}^k\bar{u}^{kT}$;

switching the light modulator to a subtraction mode;

shining the fourth beam of light onto the Bragg cell possessing information pattern $\bar{u}^k$ in order to form a fifth beam of light containing the outer product cross correlation matrix $\bar{v}\bar{u}^{kT}$; and

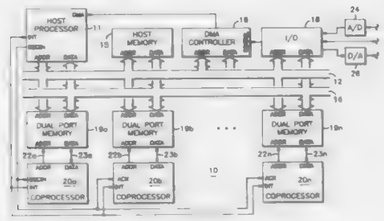
shining the fifth beam of light onto the detector side of the light modulator possessing information pattern $M_n+g\bar{v}^k\bar{u}^{kT}$ in order to store Matrix $M_{n+1}=M_n+g\bar{v}^k\bar{u}^{kT}-g\bar{v}\bar{u}^{kT}$.

4,862,407

DIGITAL SIGNAL PROCESSING APPARATUS

Bruce A. Fette, Mesa; Leslie K. Lewis, Scottsdale; Marc L. Briel, Tempe, and Thomas J. Makovicka, Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 5, 1987, Ser. No. 104,479
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—900 **15 Claims**



1. A digital signal processing apparatus comprising:

a host processor having a data bus and an address bus;

first and second dual port memory elements, wherein each of said memory elements has first and second data and address interfaces, said first data interfaces of said first and second memory elements being coupled to said host processor data bus, and said first address interfaces of said first and second memory elements being coupled to said host processor address bus; and

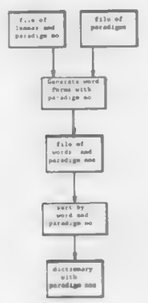
first and second coprocessors each being for performing predetermined arithmetic functions required by digital signal processing applications, and each having a data bus and a data address bus, said first coprocessor data bus being coupled to said first memory element second data interface, said first coprocessor data address bus being coupled to said first memory element second address interface, said second coprocessor data bus being coupled to said second memory element second data interface, and said second coprocessor data address bus being coupled to said second memory element second address interface.

4,862,408

PARADIGM-BASED MORPHOLOGICAL TEXT ANALYSIS FOR NATURAL LANGUAGES

Antonio Zamora, Chevy Chase, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 20, 1987, Ser. No. 28,437
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—900 **5 Claims**



1. In a computer system, a method for generating a file structure for enabling paradigm-based morphological text analysis upon words in an input word stream of natural language text, the computer system including a memory, comprising the steps of:

compiling in said computer system from a starting list of lemmas associated with their corresponding paradigm references, a list of all the word forms generated by each lemma and its paradigm and associating each word form with its paradigm reference;

ordering in said computer system said compiled list of word forms and paradigm references in any desired collating sequence;

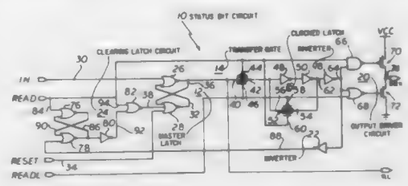
consolidating in said computer system duplicate word entries generated from multiple lemma and paradigm combinations and compiling a file structure of unique word forms, each of which is associated with a list of paradigm references, and a list of paradigm tables which may be accessed by these references.

4,862,409

ASYNCHRONOUS INTERRUPT STATUS BIT CIRCUIT

Michael A. Nix, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 13, 1988, Ser. No. 205,636
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 **9 Claims**



1. An asynchronous interrupt status bit circuit for use in conjunction with a microprocessor which guarantees that no interrupting conditions are missed and that no single interrupting condition is indicated twice, said circuit comprising:

master latch means (12) having an output and being responsive to an interrupt input signal for generating an interrupting logic signal at its output which is latched to a low logic level;

transfer gate means (14) responsive to true and complement read signals generated by the microprocessor for passing said interrupting logic signal received on its signal input node to its signal output node when the true read signal is at a low logic level and the complement read signal is at a high logic level;

clocked latch means (16) having an input and an output, said clocked latch means (16) being coupled to said signal output node of said transfer gate mans (14) for latching its output to the logic level of said interrupting logic signal when the true signal is at a high logic level;

inverting means (18) having an input and an output, said inverting means (18) having its input coupled to the output of said clocked latch means (16) for generating a control signal at its output;

output driver means (20) responsive to said control signal and said true complement read signals for generating an output signal which is fed to the microprocessor so as to indicate reading of an interrupting condition when it is at a high logic level; and

clearing means (22, 24) responsive to said control signal and said true and complement read signals for generating a clear signal to clear the output of said master latch means (12) to a high logic level only when said interrupting logic signal at the output of said clocked latch means (16) is latched at a low logic level before the time when the true read signal is making a high-to-low transition,

whereby the next read signal causes the output signal to

produce a low logic level if no interrupt input signal has occurred again.

4,862,410

WORD PROCESSOR PERMITTING MODIFICATION OR ADDITION OF DATA IN RESPONSE TO PARTICULAR INDENTATION OF DATA

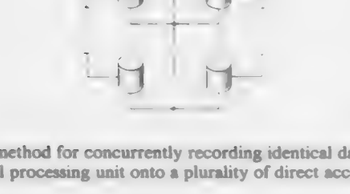
Koji Fukunaga, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1986, Ser. No. 822,102

Claims priority, application Japan, Jan. 31, 1985, 60-017045; Jan. 31, 1985, 60-017046; Jan. 31, 1985, 60-017047; Jan. 31, 1985, 60-017048

Int. Cl.[4] G06F *1/00*

U.S. Cl. 364—900 **17 Claims**



1. A text processing apparatus or word processor comprising:

input means for entering character data;

indent input means for entering indent data;

memory means, connected to said input means and said indent input means, for storing the character data from said input means and the indent data from said indent input means;

indent modifying means, connected to said memory means, for modifying a position of the indent data stored in said memory means; and

control means, connected to said memory means and said indent modifying means, for modifying the data stored in said memory means according to the position of the indent data as modified by said indent modifying means.

4,862,411

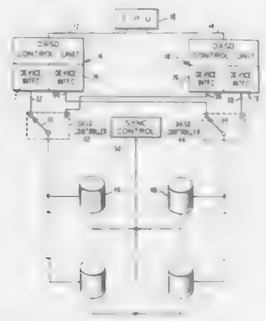
MULTIPLE COPY DATA MECHANISM ON SYNCHRONOUS DISK DRIVES

Yitzhak Dishon, Stamford, Conn., and Michelle Y. Kim, Scarsdale, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 26, 1987, Ser. No. 19,407

Int. Cl.[4] G11B *52/00, 38/00, 5/86*

U.S. Cl. 364—952 **14 Claims**



1. A method for concurrently recording identical data from a central processing unit onto a plurality of direct access storage devices over a single data transfer path between said central processing unit and a single control unit, said single control unit having a plurality of device interfaces, with each such device interface communicating with a different one of said direct access storage devices, the method comprising the steps of:

initiating and maintaining rotational synchronization of said plurality of direct access storage devices with one another;

transferring a given set of commands from said central processing unit to said single control unit over said single data transfer path for concurrently locating desired identical records on each of said synchronized direct access storage devices through said plurality of device interfaces; and

upon locating said desired records, transferring a write command from said central processing unit to said single control unit over said data transfer path for concurrently recording said identical data onto locations of said desired records on said plurality of synchronized direct access storage devices over said data transfer path and said plurality of device interfaces.

4,862,412

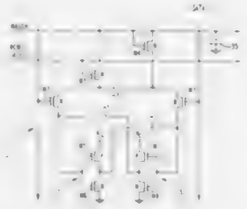
CONTENT-ADDRESSABLE MEMORY HAVING CONTROL CIRCUITRY AND INDEPENDENT CONTROLS FOR MATCH AND WRITE CYCLES

Jeffrey A. Fried, Somerville, and Christopher P. Rosebrugh, Beverly, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 25, 1988, Ser. No. 185,624

Int. Cl.[4] G11C *15/00*

U.S. Cl. 365—49 **18 Claims**



1. A content-addressable memory comprising

an array of memory cells each operable to store a bit of digital information arranged in a matrix of J rows and K columns;

K first data lines and K second data lines;

one of said K first data lines and one of said K second data lines associated with a respective column of memory cells and being coupled to each memory cell of the associated column for applying a bit and its complement to the memory cells of that column;

row select means including J row select lines, each row select line being associated with a row of memory cells and being coupled to each memory cell of that row;

each memory cell being operable to store a representation of the bit present on the first data line coupled thereto and its complement present on the second data line coupled thereto when a ROW SELECT signal is present on the row select line coupled thereto;

match means including J match lines, each match line being associated with a row of memory cells and being coupled to each memory cell of that row;

each memory cell including an enabling means coupled to an associated match line and an associated row select line for making the memory cell operable to accept a bit present on the associated first data line and its complement on the associated second data line and to store the bit and its complement in the memory cell when both a ROW SELECT signal is present on an associated row select line and a PRECHARGE signal is absent on an associated match line; and

each memory cell further including match discharge means coupled to an associated match line for causing the memory cell to discharge a PRECHARGE charge present on the associated match line thereby producing a NO-MATCH signal on the associated match line when a particular bit value is present on the first data line coupled thereto and its complement is present on the second data line coupled thereto, the NO-MATCH signal indicating that bit values on the first and second data lines do not match the bit values originally stored in the memory cell;

whereby said enabling means and said match discharge means of each memory cell operate independently of one another wherein during a match cycle only the match discharge means is operable, and during a write cycle only the enabling means is operable.

4,862,413

SEMICONDUCTOR ROM WITH REDUCED SUPPLY VOLTAGE REQUIREMENT

Masashi Hashimoto, Garland, Tex., and Tadashi Tachibana, Miho, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 839,844, Mar. 13, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 180,648

Claims priority, application Japan, Mar. 29, 1985, 60-65556

Int. Cl.[4] G11C *17/00*

U.S. Cl. 365—104 **3 Claims**



1. A semiconductor read-only-memory device for use with a source of original operating voltage, said semiconductor read-only-memory device comprising:

first and second sets of conductor lines respectively extending in crossing relation to each other and defining a plurality of intersections between respective individual conductor lines of said first and second sets of conductor lines;

a plurality of memory cells arranged in a matrix and corresponding in number to said plurality of intersections between said first and second sets of conductor lines, each of said memory cells being operably associated with a particular intersection of individual conductor lines from said first and second sets of conductor lines corresponding thereto;

voltage supply terminal means adapted to be connected to said source of original operating voltage as a supplied reference voltage;

control circuit means connected to said voltage supply terminal means for receiving the supplied reference voltage, said control circuit means including

first and second addressing circuits respectively connected to said first and second sets of conductor lines for selecting one conductor line from each of said first and second sets of conductor lines in response to an applied address signal, the individual selected conductor lines defining a particular intersection identifying a memory cell corresponding to the address signal,

a sensing circuit responsive to a voltage on a selected one of said first set of conductor lines to produce an output signal indicative of the logic state of the selected memory cell, and

a timing control circuit connected to said first and second addressing circuits for controlling the operation thereof in a timed sequence in selecting conductor lines from said first and second sets of conductor lines to identify a memory cell in response to an address signal;

a voltage step down circuit connected to said voltage supply terminal means for producing a reduced reference voltage lower than the supplied reference voltage;

a plurality of discharge devices connected to each of said conductor lines include in said first set of conductor lines, said plurality of discharge devices having respective gates commonly connected to said timing control circuit and being simultaneously actuated in response to a first timo signal pulse from said timing control circuit applied to the gates thereof to momentarily connect each of said conductor lines included in said first set of conductor lines to ground potential, said first set of conductor lines being effective to float at ground potential upon termination of said first time signal pulse;

a plurality of input transfer devices commonly connected to said voltage stepdown circuit and individually connected to a respective one of said conductor lines included in said first set of conductor lines, said plurality of input transfer devices having respective gates individually connected to said first addressing circuit;

one of said input transfer device being actuated in response to an output signal from said first addressing circuit selectively applied to the gate thereof in accordance with the address signal applied to said first and second addressing circuits for selectively applying the reduced reference voltage from said voltage stepdown circuit to the sole selected one of said first set of conductor lines corresponding to the actuated input transfer device;

a plurality of output transfer device commonly connected to said sensing circuit and respectively connected to individual ones of said first set of conductor lines, said plurality of output transfer devices having respective gates individually connected to said first addressing circuit; and

one of said output transfer devices being actuated in response to the output signal from said first addressing circuit selectively applied to the gate thereof for selectively connecting the selected one of said first set of conductor lines to said sensing circuit.

4,862,414

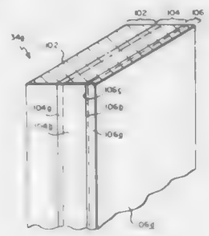
OPTOELECTRONIC RECORDING TAPE OR STRIP COMPRISING PHOTOCONDUCTIVE LAYER ON THIN, MONOCRYSTALLINE, FLEXIBLE SAPPHIRE BASE

Manfred R. Kuehnle, Waldesruh, Rte. 103A, New London, N.H. [illegible]

Filed Jun. 11, 1986, Ser. No. 872,899

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—106 **23 Claims**



1. An optoelectronic recording medium in tape or strip form

of the type including a base and one or more layers added to the base, at least one of which is photoconductive, the improvement wherein the base consists solely of a thin, web-like monocrystalline sapphire crystal whose c-axis is oriented perpendicular to the nominal plane of the medium and whose thinness is such that it is flexible, yet of sufficient strength to support said added layers so that the medium can be formed into a roll having a relatively small diameter.

4,862,415

COMPLEMENTARY SEMICONDUCTOR DEVICE REDUCING LATCH-UP PHENOMENON

Tomio Nakano, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 896,198, Aug. 14, 1986, abandoned. This application Nov. 1, 1988, Ser. No. 266,332

Claims priority, application Japan, Aug. 14, 1985, 60-178958

Int. Cl.[4] G11C *7/00, 11/40*

U.S. Cl. 365—189.09 **24 Claims**



1. A semiconductor device comprising:

a first region of a first conductivity type incorporating second regions of a second conductivity type opposite to said first conductivity type to form first P-N junctions therebetween;

a third region of said second conductivity type formed in said first region, said third region incorporating fourth regions of said first conductivity type to form second P-N junctions therebetween;

a first potential power source line for applying a first potential to said semiconductor device;

a second potential power source line for applying a second potential to said semiconductor device, said second potential being less than said first potential;

an internal circuit having a complementary semiconductor configuration and including means for applying a boosted potential when a potential of said first region is lower than the second potential, and having a high potential as high as said first potential;

a bias potential generating circuit, connected to one of said first and third regions, for generating a bias potential, so that a reverse bias is generated in one of said first and second P-N junctions;

a potential detecting circuit, connected to said first and third regions, for detecting a potential of one of said first and third regions; and

a gate circuit, connected to receive an enabling signal and connected between said means for applying a boosted potential and said potential detecting circuit, for determining whether the means for applying a boosted potential is operating and for applying an enable signal to said internal circuit in accordance with the detected potential of one of said first and third regions.

4,862,416

SEMICONDUCTOR MEMORY DEVICE WITH REDUNDANT MEMORY CELL

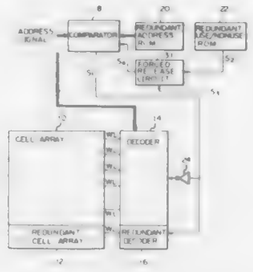
Atsushi Takeuchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Feb. 13, 1987, Ser. No. 14,331

Claims priority, application Japan, Feb. 27, 1986, 61-42586

Int. Cl.[4] G11C *7/00*

U.S. Cl. 371—10 **7 Claims**



1. A semiconductor memory device receiving an accessing address comprising:

a plurality of memory cells;

a decoder, connected to said memory cells, for selecting the memory cell corresponding to the accessing address;

a redundant memory cell for replacing a faulty memory cell in the memory cells;

a redundant decoder, connected to said redundant memory cell, for selecting the redundant memory cell;

a first nonvolatile memory for storing an address of the faulty memory cell;

a second nonvolatile memory for storing information indicating the use or nonuse of the redundant memory cell;

a comparator means, connected to said first nonvolatile memory, said redundant decoder and said decoder, for comparing the accessing address with the address of the faulty memory cell stored in the first nonvolatile memory and for making the redundant decoder active and making the decoder inactive when the accessing address coincides with the address of the faulty memory cell; and

a forced release circuit, connected to said comparator means and said second nonvolatile memory, for receiving a forced redundant release signal, for releasing the replacement of the faulty memory cell by the redundant memory cell, for making the decoder active, and for making the redundant decoder inactive by application of the forced redundant release signal to the comparator means, even when the accessing address coincides with the address of the faulty memory cell.

4,862,417

REDUNDANT-STORAGE MEMORY

Frans J. List, and Cathal G. Phelan, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Nov. 30, 1987, Ser. No. 126,396

Claims priority, application Netherlands, May 5, 1987, 8701068

Int. Cl.[4] G11C *7/00, 8/00*

U.S. Cl. 365—280 **6 Claims**

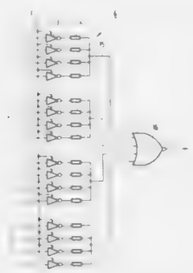
1. A row-and-column organized memory having standard memory columns and at least one redundant memory column, and an addressing structure for selectively addressing a single one of said memory columns, said addressing structure comprising:

input means for inputting a set of address bits;

a first plurality of predecoders fed by said input means, each predecoder receiving an exclusive subset of said set of address bits and decoding the subset received to a one-out-of-n-code on n respective outputs thereof;

a main decoder comprising a second plurality of logic circuits each fed by all predecoders of said first plurality for each receiving an exclusive combination among said outputs for responding to one particular content of said address bits, each such logic circuit feeding an associated standard memory column via an interconnection that comprises a fuse element for disabling the associated interconnection by selectively blowing the fuse element; and

a redundancy decoder having for each redundant memory column an associated redundancy structure, each redundancy structure having a third plurality, equal to said first plurality, of groups of inputs, within any group each input being one-to-one connected to one said output of the predecoder associated with the group in question, each such input comprising a second fuse element for disabling the associated input by selectively blowing the second fuse element, and also a gating element for disabling the associated input under control of a control signal on a control signal input, each redundancy structure having all of its control signal inputs joined for receiving a global control signal, all inputs of each group feeding a wired logic structure associated with said particular group, and an active logic gate having, for each of said third plurality of groups, a separate further input fed by an exclusive one of said wired logic structures, said active logic gate feeding an associated redundant memory column.



4,862,418

NON-VOLATILE, PROGRAMMABLE SEMICONDUCTOR MEMORY HAVING REDUCED TESTING TIME

Roger Cuppens, and Joannes J. M. Koomen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

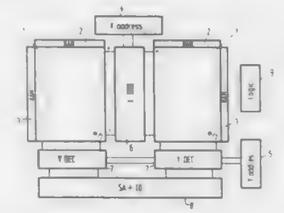
Continuation of Ser. No. 5,516, Jan. 16, 1987, abandoned. This application Nov. 1, 1988, Ser. No. 266,346

Claims priority, application Netherlands, Jan. 20, 1986, 8600099

Int. Cl.[4] G11C *7/00, 11/40, 29/00*

U.S. Cl. 365—201 **12 Claims**

1. A non-volatile, programmable semiconductor memory with at least one matrix of non-volatile memory cells, comprising at least one of a row and a column of test memory cells added to said matrix of memory cells, and on-chip peripheral circuits for selecting and reading the test memory cells in a test mode and selecting and reading the memory cells in a read mode, wherein the peripheral circuits comprise means for writing the test memory cells in the test mode and the test memory cells are of a type different from that of said memory cells and having means for providing a shorter write time than that of the memory cells.



4,862,419

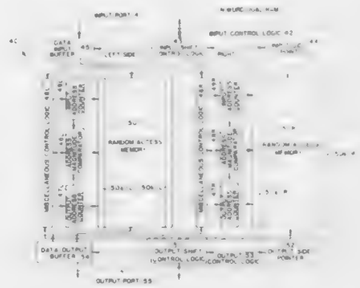
HIGH SPEED POINTER BASED FIRST-IN-FIRST-OUT MEMORY

Barry A. Hoberman, Mountain View, Calif., assignor to Monolithic Memories, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 551,735, Nov. 10, 1983, Pat. No. 4,642,797. This application Sep. 16, 1986, Ser. No. 908,059

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—221 **5 Claims**



1. A FIFO memory system comprising:

a plurality of RAMs;

means electrically coupled to said plurality of RAMs for writing a sequence of data words in a corresponding sequence of write time periods cyclically into said plurality of RAMS so that at least two of said write time periods overlap;

means electrically coupled to said plurality of RAMs for reading a sequence of data words in a corresponding sequence of read time periods cyclically out of said plurality of RAMS so that at least two of said read time periods overlap;

wherein said means for writing comprise:

a plurality of storage elements for storing data;

an input data buffer for receiving said sequence of data words and for providing said sequence of data words to said plurality of storage elements; and

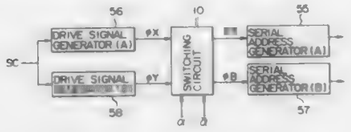
an input control logic circuit connected to said plurality of storage elements for causing said sequence of data words to be stored cyclically into said plurality of storage elements, each of said plurality of storage elements providing a word from said sequence stored therein to a RAM of said plurality of RAMs.

4,862,420

INTERNAL INTERLEAVING TYPE SEMICONDUCTOR MEMORY DEVICE

Haruki Toda, Yokohama; Hiroshi Sahara, and Shigeo Ohshima, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 22, 1988, Ser. No. 171,858
Claims priority, application Japan, Mar. 27, 1987, 62-71617
Int. Cl.[4] G11C *11/40, 13/00*
U.S. Cl. 365—221 **5 Claims**



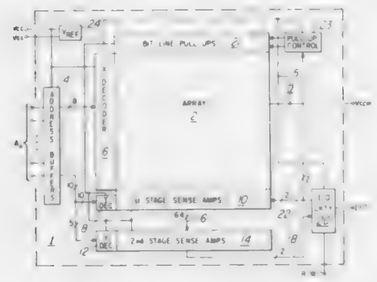
1. A serially-accessed type memory device comprising:
first and second data selecting/fetching systems for alternately selecting and fetching data in a serial access manner;
a first drive signal generating circuit for generating a first drive signal, to control said first and second data selecting-/fetching systems, according to a serial access control signal;
a second drive signal generating circuit for generating a second drive signal, to control said first and second data selecting/fetching systems, according to a serial access control signal, wherein the second drive signal is in inverse relation to the first drive signal;
a select circuit for alternately outputting said first and second drive signals from two output terminals in response to a select control signal;
a first serial address generating circuit for inputting one of said first and second drive signal from said select circuit; and
a second serial address generating circuit for inputting the drive signal from said select circuit that is in inverse relation to the drive signal input to said first serial address generating circuit.

4,862,421

SENSING AND DECODING SCHEME FOR A BICMOS READ/WRITE MEMORY

Hiep V. Tran, Carrollton, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 16, 1988, Ser. No. 156,520
Int. Cl.[4] G11C *19/08*
U.S. Cl. 365—189.07 **20 Claims**



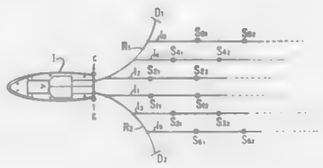
1. A read/write memory, comprising:
an array of memory cells arranged in rows and columns;
an address buffer for receiving an address signal;
a row decoder, connected to said address buffer, for selecting a row of said array responsive to a row address portion of said address signal;
a plurality of first stage sense amplifiers, grouped into a first group and a second group, each of said first stage sense amplifiers associated with a column of said array;
a first local data bus connected to each of said first stage sense amplifiers in said said first group;
a second local data bus connected to each of said first stage sense amplifiers in said second group;
a data-out bus;
a first second stage sense amplifier connected to said first local data bus and to said data-out bus;
a second second stage sense amplifier connected to said second local data bus and to said data-out bus;
column decode means, connected to said address buffer, for selecting a first stage sense amplifier responsive to a column address portion of said address signal, and for selecting a second stage sense amplifier responsive to said column address portion of said address signal, said column decode means selecting the second stage sense amplifier responsive to at least one of the bits of said column address portion of said address signal used in selecting a first stage sense amplifier, so that the selected second stage sense amplifier presents on said data-out bus the output of the first stage sense amplifier selected by said column decode means.

4,862,422

METHOD FOR DETERMINING THE GEOMETRY OF A MULTISOURCE SEISMIC WAVE EMISSION DEVICE

Jean Brac, Royan, France, assignor to Institut Francais du Petrole, Cedex, France

PCT No. PCT/FR87/00216, § 371 Date Apr. 13, 1988, § 102(e) Date Apr. 13, 1988, PCT Pub. No. WO87/07732, PCT Pub. Date Dec. 17, 1987
PCT Filed Jun. 12, 1987, Ser. No. 159,849
Claims priority, application France, Jun. 13, 1986, 86 08538
Int. Cl.[4] G01V *1/38*
U.S. Cl. 367—19 **11 Claims**



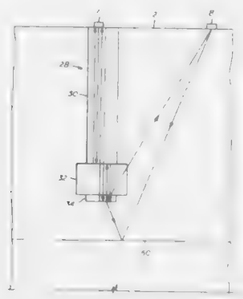
1. A method for determining a geometrical configuration in water of a seismic wave emission source array comprising a plurality of seismic sources towed in immersion by a ship and distant from one another, with each source having in close proximity thereto and associated therewith a proximity pick-up sensor for acoustic waves, said method comprising the steps of:
triggering a first one of said plurality of seismic sources for generating a seismic signal;
detecting said generated seismic signal after propagation through water by means of said proximity pick-up sensors associated with others of said seismic sources;
measuring parameters of said detected acoustic signal representative of distance between said triggered seismic source and said proximity pick-up sensors respectively;
repeating the three previous steps successively for others of said seismic sources of the array; and
determining the relative positions of the different seismic sources of said array with respect to one another by multiple acoustic triangulations using a combination of said parameters representative of distances.

4,862,423

SYSTEM FOR REDUCING DRILL STRING MULTIPLES IN FIELD SIGNALS

James W. Rector, Menlo Park, Calif., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Jun. 30, 1988, Ser. No. 213,640
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—25 **20 Claims**



1. A method of geophysical exploration comprising:
generating energy at substantially the lower end of a drill string utilized for drilling a borehole into the earth, said energy being imparted into the earth as seismic wave energy from said lower end of said drill string and imparted upwardly as acoustic wave energy through the drill string and at least a portion of said acoustic wave energy imparted upwardly through said drill string being reflected downwardly from at least a first location below the top of said drill string and imparted into the earth as seismic energy at the lower end of said drill string;
detecting said acoustic wave energy at substantially the upper end of said drill string to generate a pilot signal;
detecting said acoustic wave energy at least one field location substantially at the earth's surface to generate a field signal; and
utilizing said detected pilot signal to develop an operator for reducing the magnitude in said field signal of said energy reflected downwardly from said first location below the top of said drill string.

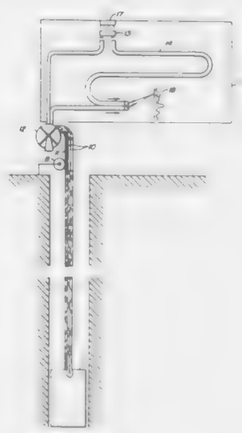
4,862,424

INTERFEROMETRIC MEANS AND METHOD FOR ACCURATE DETERMINATION OF FIBEROPTIC WELL LOGGING CABLE LENGTH

Peter Graebner, Santa Ana; Swan A. Sie, Placentia, and Jorg A. Angehrn, Brea, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 111,245, Oct. 21, 1987, Pat. No. 4,803,479, which is a division of Ser. No. 879,854, Jun. 27, 1986, Pat. No. 4,722,603. This application Mar. 15, 1988, Ser. No. 168,217
The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.
Int. Cl.[4] G01V *1/40*; G01B *9/02*
U.S. Cl. 367—33 **4 Claims**

4. A method of determining the change in length of an optical fiber in a well logging cable comprising:
splitting a single beam of monochromatic light between a first end of a first optical fiber and a first end of a second optical fiber, said second optical fiber fixably attached to a well logging cable, said well logging cable adapted to hold a well logging tool, said second optical fiber subject to a change in length;
combining a light beam from a second end of said second optical fiber and a light beam from second end of said first optical fiber to form a combined beam;
detecting an interference pattern in said combined beam;



determining a number of interference fringes which pass a fixed point; and
calculating the change in length of said well logging cable based on said number of interference fringes.

4,862,425

DEVICE FOR ACQUIRING SEISMIC DATA IN A BOREHOLE AND TRANSMISSION THEREOF TO A CENTRAL CONTROL AND RECORDING SYSTEM

Jacques Cretin, Le Chesnay; Jean-Francois Therond, Neuilly S/Seine, and Daniel Saussier, Aubergenville, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 1, 1988, Ser. No. 177,476
Claims priority, application France, Apr. 2, 1987, 87 04677
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—33 **17 Claims**



1. A device for the acquisition of seismic data in a borehole and transmission thereof to a central control and recording system disposed outside the borehole, including a reception assembly having a plurality of seismic sensors disposed in at least one probe lowered into a borehole at the end of a cable having several signal transmission lines, said probe comprising anchorage arms associated with hydraulic pressure means

controlled from the central system and an acquisition apparatus adapted for collecting the signals received by the different sensors and transmitting them to the central system in the form of multiplexed and digitized signal samples over the transmission lines of said cable, said device further comprising:

a monitoring assembly in said one probe and said central control and recording assembly, said assembly including means for testing signals from said seismic sensors when said probe is moving along the borehole, said signals being tested for detection of low level signals indicating unevenness in the progress of movement of said probe; and

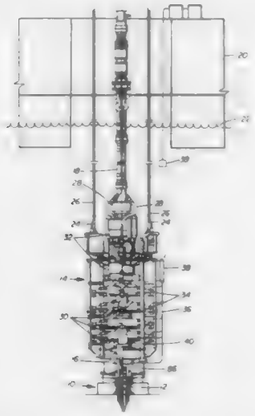
transmitting means for intermittently connecting said monitoring assembly with the control and recording assembly at least during progressing of movement of said reception assembly along the borehole and for monitoring progress of movement of said probe.

4,862,426

METHOD AND APPARATUS FOR OPERATING EQUIPMENT IN A REMOTE LOCATION

Thomas G. Cassity, Katy; William C. Montgomery, Sugar Land; Gerald S. Baker, Houston; Alfred W. Wedel, Houston, and William M. Taylor, Houston, all of Tex., assignors to Cameron Iron Works USA, Inc., Houston, Tex.

Filed Dec. 8, 1987, Ser. No. 130,244
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—81 **29 Claims**



20. An apparatus for manipulating equipment including a well component in a subsea wellhead of a subsea marine well comprising

detecting means for detecting the occurrence of a condition with respect to said well component within the subsea wellhead,

transmitting means for transmitting a signal to the water surface,

means for supporting the detecting means and the transmitting means on the running string with the well component,

a running string for lowering the well component, said detecting means and said transmitting means into the subsea marine well,

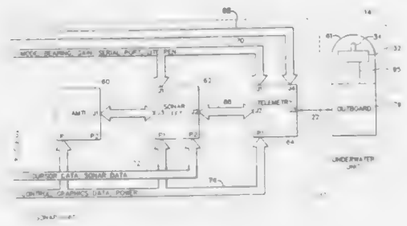
said detecting means upon the detection of the occurrence of a condition with respect to said well component within the subsea wellhead causing said transmitting means to transmit a signal to the water surface that the condition has occurred.

4,862,427

SONAR SYSTEM WITH AREA MOVING TARGET INDICATOR

David Almagor, and John M. Peters, both of San Diego, Calif., assignors to Ketema, Inc., San Diego, Calif.

Filed Dec. 22, 1987, Ser. No. 137,525
Int. Cl.[4] G01S *15/66, 15/04*
U.S. Cl. 367—101 **1 Claim**



1. A sonar system, comprising:

means for generating a frequency modulated sonar signal in a predetermined sonar frequency band for transmission through a body of water;

projector means for receiving the sonar signal and continuously transmitting acoustic energy through the body of water representative of the sonar signal;

hydrophone means for receiving portions of the acoustic energy reflected by a plurality of underwater objects in a predetermined beam pattern and generating output signals representative thereof;

telemetry means for receiving the output signals from a plurality of successive scans of the hydrophone means and generating frequency variance and bearing signals for each scan;

FFT means for parsing the frequency variance and bearing signals for each scan into a grid of range by bearing resolution elements; and

AMTI means for calculating a T statistic value for each resolution element over a predetermined number of contiguous range and bearing resolution elements according to the formula: $T=(X-m)/sigma$

where:

X is the value of the incoming signal,

m is the time updated means, and sigma is the standard deviation defined as the square root of the time updated variance,

and for determining if the T statistic exceeds a predetermined threshold value,

whereby a moving one of the underwater objects will be detected.

4,862,428

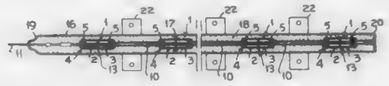
DISTRIBUTED ARRAY HYDROPHONE

Stephen G. Jackett, Kenthurst; Stephen N. Kastel, Cranebrook, and Zdenek Jandera, Ashfield, all of Australia, assignors to The Commonwealth of Australia, Canberra and Plessey Australia Pty. Limited, Meadowbank, both of, Australia

PCT No. PCT/AU87/00386, § 371 Date Sep. 14, 1988, § 102(e) Date Sep. 14, 1988, PCT Pub. No. WO88/04131, PCT Pub. Date Jun. 16, 1988
PCT Filed Nov. 17, 1987, Ser. No. 259,116
Claims priority, application Australia, Nov. 19, 1986, PH9048
Int. Cl.[4] H04R *17/00*
U.S. Cl. 367—155 **9 Claims**

1. A distributed array hydrophone comprising an array of hydrophone elements positioned in a pressure wave transmitting tube so as to be actuated by pressure waves passing through said tube and having signal collecting means, each hydrophone element comprising a doublet assembly of abutting ceramic members which are hollow and radially oppositely polarized, said doublet assembly being held in a bobbin by two end flanges thereof engaging ends of said doublet assembly, the bobbin of one hydrophone element being connected by hollow resilient spacing members joined to said end flanges thereby forming said array, said array being encapsulated in a pressure wave transmitting potting medium in said tube

wherein said doublet assembly has two ends engaged by the decoupling assembly which are in turn engaged by said two end flanges of the bobbin, whereby each doublet assembly is free to be actuated by pressure waves applied



to an external surface of said doublet assembly whereby a signal can be received across a junction between said abutting ceramic members of said doublet assembly, and

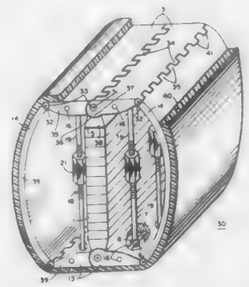
wherein said end flanges of each bobbin are joined by an axially positioned perforated hollow stem projecting from one of said end flanges and joined by a hollow retaining screw to a second of said end flanges whereby electrical leads attached to an internal surface of said ceramic members can be extended into a hollow of said axially positioned perforated hollow stem and then extended into and through said hollow resilient spacing members.

4,862,429

FLEXTENSIONAL ELECTROACOUSTIC TRANSDUCER WITH HYDROSTATICALLY COMPRESSION-LOADED DRIVER

Kenneth D. Rolt, Arlington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 4, 1988, Ser. No. 253,019
Int. Cl.[4] H01V *7/00*
U.S. Cl. 367—165 **14 Claims**



1. A flextensional electroacoustic transducer comprising:

a transduction member;

a tensioning member;

a housing containing said transduction and tensioning members;

said housing comprising end portions and shell portions connected to each other to form said housing with said shell portions and said end portions opposite each other, respectively;

said transduction member being in rotational and compression contact with said opposite end portions; and

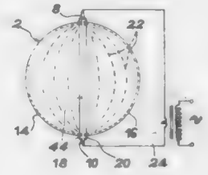
said tensioning member being rotationally hingedly connected to said opposite end portions between each said shell portion connections and said transduction member contact.

4,862,430

WIDE PASS BAND ELASTIC WAVE OMNIDIRECTIONAL TRANSDUCER

Siegfried Klein, 42, rue de la Tour d'Auvergne, 75009 Paris, France, assignor to Siegfried Klein and Commissariat a l'Energie Atomique, both of Paris, France

Filed Aug. 4, 1988, Ser. No. 228,302
Claims priority, application France, Aug. 14, 1987, 87 11598
The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.
Int. Cl.[4] H04R *15/00*
U.S. Cl. 367—168 **8 Claims**



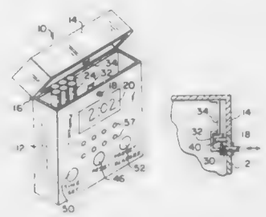
1. An elastic wave omnidirectional transducer comprising: a rigid magnetostrictive membrane constituted by two hemispherical elements joined to form a spherical shell having an outer face and an inner face, each hemispherical element of the membrane constituting, at least on the outer face, a unidirectional transducer of elastic waves in a direction normal to the membrane; an electric control means provided with two electric terminals located on each hemispherical element at diametrically opposite points of the shell for producing in the membrane a uniform magnetic field in response to an electric signal applied to the terminals of the control means; and a continuous polarization means incorporating a part having a magnetic permeability adapted to distribute a magnetic field and a substantially identical spherical shape to that of the membrane, said part being fitted inside the shell and being in magnetic communication with said shell, and a permanent magnet in contact with said part.

4,862,431

CIGARETTE CASE WITH BUILT IN ELECTRONIC TIMING DEVICE

Richard Drouin, 82-15 134th St., Kew Gardens, N.Y. 11435

Filed May 27, 1988, Ser. No. 200,719
Int. Cl.[4] G04B *47/00*; A24F *15/14*
U.S. Cl. 368—10 **2 Claims**



1. A cigarette case having a built in timing device, comprising:

(a) a rigid housing having a substantially rectangular cross section with a pair of short sides and a pair of long sides and into which can be inserted a conventional package of cigarettes;

(b) a cover that surmounts said housing and also having a pair of short sides and a pair of long sides;

(c) a spring loaded hinge affixed to a long side of said pair of long sides of said housing and a long side of said pair of long sides of said cover so that when said cover is hinged to its open position cigarettes can be withdrawn from said housing;

(d) means disposed on other long side of said pair of long sides of said housing for latching said cover into its normally closed position and for unlatching said cover to permit the withdrawal of cigarettes, said means for latching said cover into its normally closed position and unlatching said cover to permit the withdrawal of cigarettes include an opening button that protrudes through said other long side of said pair of long sides of said housing; a coiled spring biasing said opening button toward said other long side of said pair of long sides of said housing; a hook-shaped lock end component attached to said opening button; and a hook end component attached to said cover such that in the normally closed configuration said hook end and said lock end are engaged so that to open said cover said opening button is depressed therefor disengaging said hook end and said lock end and allowing said cover to be opened;

(e) interval timing means being disposed internally to said housing and including a speaker, said timing means may be set to produce an audible noise after each user-definable preset time interval alerting a user that it is permissible to withdraw a cigarette, and that said timing means produces a louder, irritating noise, if said user withdraws a cigarette prior to the end of a timing interval, said interval timing means include an electronic timer; a time set button switch that sets the interval of said timer; a cigarette case switch activated each time said cover is opened; a divide by n circuit where n is the number of cigarettes in a package of cigarettes so that n activations of said cigarette case switch causes said divide by n circuit to yield an output; a reset button switch; a reset enable circuit to which said reset button switch and said divide by n circuit are connected such that said reset button switch can reset said timer interval only after said cover has been opened n times and therefor preventing a user from resetting said interval at whim; a numeric display; a preset time/elapse time button switch connected to said numeric display such that said time button switch determines whether said numeric display shows the preset time interval or the time elapesed since the last opening of said cover; an OK to smoke audible alarm that emits a pleasing noise through said speaker disposed internally to said housing; a NOT OK to smoke audible alarm that emits a loud irritating noise through said speaker disposed internally to said housing; and alarm logic that interfaces between said electronic timer and both of said alarms such that said alarm logic activates said OK to smoke alarm after each preset time interval and similarly activates said NOT OK to smoke alarm if said cover is opened before the completion of a time interval; and

(f) a display that is disposed internally to said housing and reports to said user definable preset time internal and also the time elapsed since the withdrawal of the last cigarette.

4,862,432

SECURING CONSTRUCTION FOR TIMEPIECE

Imao Hiraga; Noriaki Shimura; Yojiro Okakura; Masaru Kubota, all of Shiojiri, and Osamu Takashi, Suwa, all of Japan, assignors to Shiojiri Kagyo Kabushiki Kaisha, Nagano and Seiko Epson Corporation, Tokyo, both of, Japan

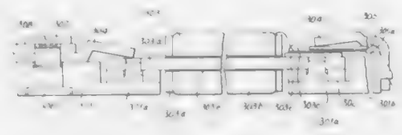
PCT No. PCT/JP87/00258, § 371 Date Dec. 21, 1987, § 102(e) Date Dec. 21, 1987, PCT Pub. No. WO88/00727, PCT Pub. Date Jan. 28, 1988

PCT Filed Apr. 22, 1987, Ser. No. 162,382

Claims priority, application Japan, Apr. 22, 1986, 61-060554[U]; Sep. 8, 1986, 61-137441[U]; Oct. 7, 1986, 61-154056[U]

Int. Cl.[4] G04C *23/02*

U.S. Cl. 368—88 3 Claims



1. A securing construction for an analog timepiece including a motor for driving a display, comprising a timepiece construction member including a timepiece frame, trains, a motor, at least one circuit member and a supporting member for securing and supporting said timepiece construction member, said motor including a stator mounted on said timepiece frame, magnetic cores mounted on said stator, magnetic coils surrounding said magnetic cores, and a coil lead substrate mounted on said magnetic cores wherein said supporting member is an elastic plate having elastic beams and engaging projections, and said engaging projections being securely engaged with a plurality of cooperating receiving portions disposed at the periphery portion of said timepiece frame and at least one of said elastic beams pressing said coil lead substrate to press said circuit member and bring said circuit member in electrical contact with said coil lead substrate and securing said magnetic core and stator and acting to support the remainder of said timepiece construction member.

4,862,433

TIMER CIRCUIT FOR DRAG OPERATION IN AN ENGINEMAN MONITORING DEVICE

Angel P. Bezos, Rockville, Md., and Emilio A. Fernandez, McLean, Va., assignors to Pulse Electronics, Inc., Rockville, Md.

Filed Feb. 7, 1989, Ser. No. 306,860

Int. Cl.[4] G04F *8/00*

U.S. Cl. 368—108 10 Claims

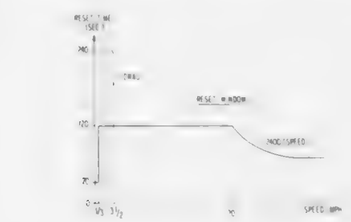
1. In an engineman monitoring device for a vehicle including means for monitoring operations performed by an engineman and generating a reset signal in response to the performance of a monitored operation, an improved timer circuit for selecting a drag operation comprising:

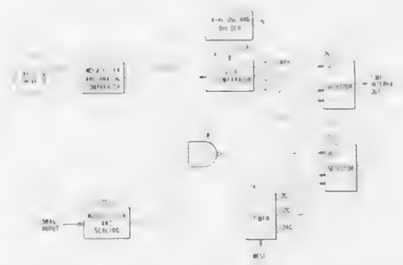
means for measuring the speed of the vehicle and generating a speed signal;

comparing means for comparing said speed signal with a predefined range of speeds and generating an output signal when said speed signal is within said predefined range;

drag select means, operable by an engineman, for generating a drag select output; and

timing means responsive to the output comparing means and said drag select output for normally generating a first timing signal having a first predefined timing interval but when both the output of said comparing means and said drag select output are simultaneously present, generating a second timing signal having a second predefined timing





interval longer than said first timing interval, said timing means being reset by said reset signal.

4,862,434

TIMEPIECE STRUCTURE

Imao Hiraga; Satoshi Yamazaki; Takehide Yamada, and Tadashi Nishitani, all of Suwa, Japan, assignors to Shiojiro Kogyo Kabushiki Kaisha, Nagano, Japan

PCT No. PCT/JP87/00015, § 371 Date Dec. 28, 1987, § 102(e) Date Dec. 28, 1987, PCT Pub. No. WO87/06031, PCT Pub. Date Oct. 8, 1987

PCT Filed Jan. 12, 1987, Ser. No. 138,904

Claims priority, application Japan, Apr. 1, 1986, 61-48711[U]; Apr. 1, 1986, 61-48712[U]; Apr. 30, 1986, 61-100165; Jun. 11, 1986, 61-88688[U]; Jun. 24, 1986, 61-96078[U]

Int. Cl.[4] G04B *19/24, 19/02*

U.S. Cl. 368—190 9 Claims

1. A timepiece structure comprising:

a main plate;

a transducer composed of a stepping motor;

a gear train bridge;

a gear train including at least one wheel and pinion driven by said transducer supported between the main plate and the gear train bridge;

a displaying gear train driven by said gear train and including an hour hand and a minute hand mounted thereon;

an external controlling member having an axis, the member displaceable to a plurality of axis positions including a time correcting position guided by the main plate; and

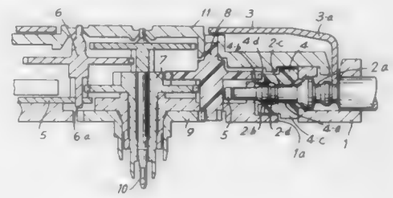
a time correcting member which is engaged and connected with said external controlling member and said displaying gear train when the external controlling member is displaced to said time correcting position;

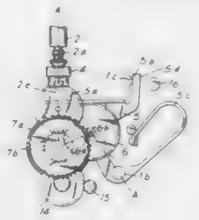
an operating lever mounted on said main plate for supporting at least one pivot of said wheel and pinion of said gear train;

said operating lever comprising a supporting portion for said wheel and pinion, a rotary center, and an engaging portion interlocked with said external controlling member;

the wheel and pinion being supported at a first end by the operating lever and at a second opposed end by the gear train bridge; and

when said external controlling member is placed in the time correcting position the operating lever displaces the rotary center to incline the axis of the wheel and pinion to disengage the wheel and pinion from the remaining gears of the gear train, whereby the transmission of driving power is interrupted.





4,862,435

COMBINATION BRACELET AND WRISTWATCH

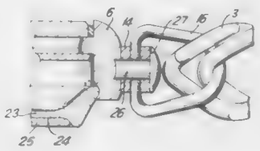
Judith Reichel, Southbury, Conn., and Kristin M. Olsen, Oslo, Norway, assignors to Timex Corporation, Middlebury, Conn.

Filed Jun. 15, 1988, Ser. No. 212,742

Int. Cl.[4] G04B *37/00;* A44C *5/14*

U.S. Cl. 368—282 6 Claims





1. A combination bracelet and wristwatch comprising:

a watch case including a bezel, a crystal, and a case back defining an enclosure;

a movement disposed in said enclosure having hands viewable through said crystal;

said case back defining a recessed well on exterior thereof, and having a decorative insert disposed in said well,

a pair of spindles extending from opposite ends of said bezel on a 12 o'clock–6 o'clock axis relative to the timepiece hands;

a bracelet attachment including articulated chain elements; and

a pair of universal connectors attaching the ends of said bracelet to said spindles and adapted to provide rotation of said watch case about the axis of said spindles and to provide pivoting motion of said bracelet with respect to said spindles, said universal connectors comprising a collar rotatably mounted around said spindle, a connecting link having diametrically opposed ends pivotally mounted in said collar and means retaining said collar on said spindle.

4,862,436

WATCH WITH STRAP

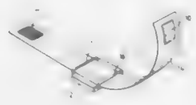
Mangharam J. Harilela, Kowloon, Hong Kong, assignor to Harilela Bob Limited, Kowloon, Japan

Filed Mar. 10, 1988, Ser. No. 166,498

Claims priority, application United Kingdom, Mar. 11, 1987, 8705713

Int. Cl.[4] G04B *37/00*; A44C *5/00*

U.S. Cl. 368—282 **13 Claims**





1. A watch and strap combination for wearing on the wrist, the combination comprising:

(a) a watch having a watch body, a timepiece in the watch body, and retaining means on said body for the strap;

(b) a strap essentially constituted by an elongate strip of paper material having two surfaces and two ends, and printed matter on at least one of the surfaces which surface is adapted for receiving the printed matter such that the printed matter is viewable when the watch and strap combination is worn; and

(c) means for fastening together the ends of the strip of paper material to encircle the wrist, the strip passing through the watch retaining means whereby the watch is retainable on the wrist.

4,862,437

MAGNETO-OPTICAL RECORDING REPRODUCING, AND ERASING APPARATUS HAVING TWO INDEPENDENT MAGNETIC FIELD APPLYING DEVICES

Mitsuya Okada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 791,952, Oct. 28, 1985, abandoned. This application Feb. 29, 1988, Ser. No. 165,353

Claims priority, application Japan, Oct. 26, 1984, 59-225235

Int. Cl.[4] G11B *13/04, 11/12, 11/10*

U.S. Cl. 369—13 **7 Claims**

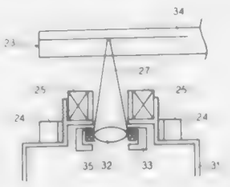
1. An apparatus for magneto-optically recording, reproducing and erasing information, comprising:

a magneto-optical recording medium including a recording layer initially magnetized in a first direction perpendicular to a surface of the recording layer;

means for applying a laser beam onto said magnetooptical recording medium to record, reproduce and erase information in said recording layer;

first means for applying a constant magnetic field to said recording layer in a location where said laser beam impinges upon said recording medium, said constant magnetic field having a first value in said first direction, said first means applying said constant magnetic field during both recording and erasing; and

second means for applying a variable magnetic field to said recording layer in said location, said second means applying during recording, in a second direction opposite said first direction, a recording magnetic field having a second



value which is greater than said first value, wherein a recording magnetic field having a value substantially equal to a difference between said first and second values is applied to said recording layer for recording information, said second means applying during erasing, in said first direction, an erasing magnetic field having said second value, wherein an erasing magnetic field having a value substantially equal to a sum of said first and second values is applied to said recording layer for erasing information.

4,862,438

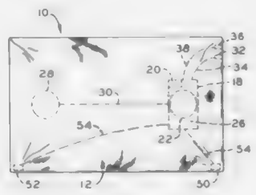
PILLOW/AUDIO SYSTEM COMBINATION

Michael L. Fry, 6307-10 Reed Rd., Fort Wayne, Ind. 46815

Filed Oct. 29, 1987, Ser. No. 114,690

Int. Cl.[4] G11B *31/00, 33/06*

U.S. Cl. 369—19 **25 Claims**



1. A pillow audio system combination comprising:

a pillow casing defining a cavity therein,

yieldably-resilient stuffing material disposed in said cavity;

an audio signal generating means disposed in said cavity for generating an electrical audio signal;

a speaker electrically connected to said audio signal generating means disposed in said cavity for generating audible sound in response to said electrical audio signal;

a battery disposed in said cavity and connected to said audio signal generating means for providing electrical power thereto;

switch means connected in series with said battery and said audio signal generating means for selectively energizing and deenergizing said audio signal generating means by applying a compressive force to said switch means, said switch means disposed in said cavity and said compressive force being applied through said casing; and,

an audio jack connected to said audio signal generating means for receiving said electrical audio signal from said audio signal generating means, said audio jack extending through and connected to said casing;

4,862,439

RECORDING DEVICE THAT IDENTIFIES RECORDABLE AREAS OF A DISK RECORD

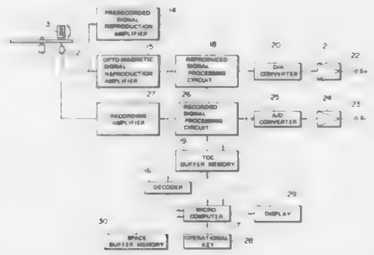
Ryo Ando, Tokyo; Tadao Yoshida, Kanagawa; Kazuhiko Fujiie, Tokyo, and Toshio Yoshida, Saitama, all of, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,589

Claims priority, application Japan, Jan. 19, 1987, 62-09485; Mar. 3, 1987, 62-48520; Mar. 10, 1987, 62-54498

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—30 **15 Claims**



1. A disk recording device for recording data such as musical information on a recordable disk, said disk having a program area, absolute addresses recorded in said program area, a circumferential area, and a lead-in section in said circumferential area, and said device comprising:

recording means for first recording blocks of said data in said program area and thereafter recording in said lead-in section address data indicating respective addresses of said blocks; and

data processing means for reading said address data, obtaining respective start and end addresses of said blocks on the basis of said address data, comparing the end address of respective ones of said blocks with the start address of respective next succeeding ones of said blocks to obtain respective address differences, and identifying respective recordable areas corresponding to said respective address differences in each case where one of said address differences exceeds a predetermined threshold.

4,862,440

OPTICAL HEAD WITH OPTICAL BEAM CONTROL USING ACOUSTIC WAVE DEVICE

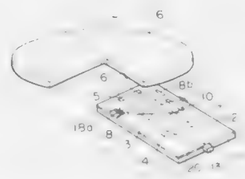
Norifumi Miyamoto; Yoshio Sato, both of Hitachi; Nobuyoshi Tsuboi, Ibaraki; Satoshi Shimada, Hitachi; Hiroshi Sasaki, Hitachi; Hiroaki Koyanagi, Hitachi, and Hiroyuki Minemura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 9, 1987, Ser. No. 98,969

Claims priority, application Japan, Sep. 9, 1986, 61-212312

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—45 **11 Claims**



1. An optical head for focusing and projecting a laser light beam, adapted to focus a laser light sport on an optical recording medium for recording, reproducing and erasing information, comprising:

an optical wave guide being formed of a material which is capable of establishing variations in refractive index by a surface acoustic wave, and said optical wave guide being provided with an optical system including a collimator lens and an objective lens;

a laser light source disposed at one of the end surfaces of said optical wave guide for emitting a laser light beam so that light emitted by said laser light source is adapted to be directed in the form of a light beam to said optical recording medium; and

electro-acoustic transducer means disposed between said beam splitter and said objective lens, said transducer mans being adapted to be driven by ultra-sonic vibration for producing a standing wave of an ultrasonic surface acoustic wave corresponding to a half period of a sine curve, said standing wave extending across a path of said light beam in said optical wave guide thereby giving rise to a form of the half period of a sine curve representative of the variations in refractive index in said optical wave guide, and providing a function of a lens for the light beam passing therethrough with a variable focal position controlled by varying the amplitude of said ultra-sonic vibration.

4,862,441

CARRIAGE ASSEMBLY

Takashi Yumura, and Tetsu Yamamoto, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 26, 1987, Ser. No. 53,636

Claims priority, application Japan, May 27, 1986, 61-120074; May 27, 1986, 61-120075

Int. Cl.[4] G11B *7/095*

U.S. Cl. 369—45 **11 Claims**

1. A carriage assembly for use with an optical recording disc, said carriage assembly comprising:

a box-shaped frame having walls of magnetic material surrounding an interior, said walls including a top wall having a narrow elongated slot located intermediate side walls of said frame, said top walls on opposite sides of said slot, said side walls and a bottom wall providing a closed magnetic circuit including the slot;

an optical lens which projects and receives a light beam;

a carriage movably supported in the interior of said frame and carrying said optical lens for movement parallel to the slot in a radial direction relative to an optical recording disc;

vertical guide means including a lens support extending into the slot for guiding movement of said optical lens relative to said carriage in a vertical direction relative to a disc surface;

vertical drive means for driving said lens support relative to said carriage in the vertical direction;

radial guide means for guiding movement of said carriage in a radial direction relative to the optical disc; and

radial drive means for driving said carriage relative to said frame in the radial direction, said radial drive means including a magnet and a coil electromagnetically coupled by flux in a closed magnetic circuit formed by walls of said frame surrounding said radial drive magnet and coil;

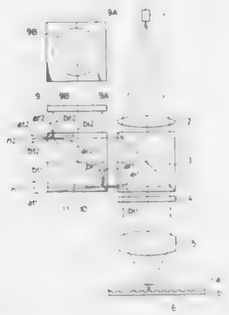
said vertical drive means including a permanent magnet and an electromagnetic coil electromagnetically coupled with said permanent magnet by flux of the closed magnetic circuit, and one of said permanent magnet and said electromagnetic coil being mounted to said lens support in the slot and the other of them being mounted to said frame in the slot.

4,862,442

FOCUS DETECTING APPARATUS UTILIZING REFLECTING SURFACE HAVING VARIABLE REFLECTIVITY OR TRANSMISSIVITY

Michihiro Tadokoro; Kazuo Okada, and Hitoshi Imai, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1988, Ser. No. 182,248
Claims priority, application Japan, Apr. 20, 1987, 62-96665
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—45 6 Claims



1. A focus detecting apparatus comprising

a light source,

an optical system for guiding the beam generated by the light source,

an objective lens for focusing the beam guided by the optical system onto an object,

an optical member for receiving at least part of the reflected beam that has been focused onto the object by the objective lens and reflected from the object, and having a reflecting surface comprising a dielectric multilayer coating the reflectivity or transmissibity of which varies continuously with respect to the angle of incidence, and

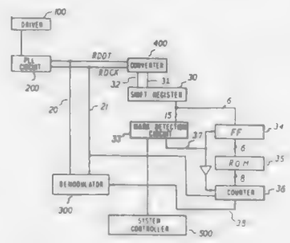
a photodetector for detecting changes in the intensity distribution of the beam reflected by or transmitted through the reflecting surface in the optical member.

4,862,443

SYNC SIGNAL DETECTION APPARATUS FOR ACCURATELY SYNCHRONIZING REPRODUCED DATA

Kentaroh Tsuji, Nara; Shigemi Maeda, Yamatokoriyama; Takeshi Yamaguchi, Tenri; Toshihisa Deguchi, Nara; Noriaki Sakamoto, Kyoto, and Shigeo Terashima, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1987, Ser. No. 19,707
Claims priority, application Japan, Feb. 28, 1986, 61-45759
Int. Cl.[4] H04L *7/06;* G11B *5/09;* H03M *5/00*
U.S. Cl. 369—59 3 Claims



1. A sync signal detection apparatus for detecting a sync signal indicating the top of recorded data, the sync signal being divided into a plurality of unique marks and each of the plurality of marks being divided into a sync pattern and an address pattern, comprising:

means for sequentially detecting the sync and address patterns for each of the plurality of marks during a reproduction mode; and

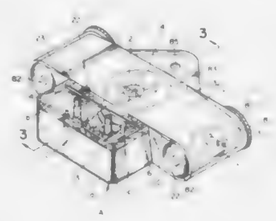
means for generating a sync pulse at the top of the recorded data corresponding to the address pattern for said marks in response to a predetermined number of marks being detected by said means for sequentially detecting.

4,862,444

INDEX CARRIER FOR INDEXING AND REPRODUCING A PLURALITY OF RECORD DISCS AND A SIMPLIFIED SOUND REPRODUCING DEVICE INCORPORATING THEREOF

Eishi Koike, Sagamihara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Jul. 28, 1987, Ser. No. 78,660
Claims priority, application Japan, Jul. 31, 1986, 61-180756
Int. Cl.[4] G11B *25/04, 3/40, 3/4*
U.S. Cl. 369—67 6 Claims



1. A simplified sound reproducing device, which comprises:

(a) a casing,

(b) a record disc disposed in said casing, the record disc having a recorded face being directed toward the interior of said casing, the record disc having a starting point and an end point,

(c) a turn table having an outer periphe y,

(d) a tone arm, the tone arm being disposed by the turn table, the tone arm having a sound reproducing stylus projecting toward said recorded face of said record disc and being swingable between the starting point and the end point of sound reproduction of said record disc, the tone arm being urged by a return spring toward the starting point of said sound reproduction and being urged by a stylus force spring in an axial direction.

(e) a speaker diaphragm mounted in said turn table and with said tone arm,

(f) a sound transmitting member in contact with the speaker diaphragm, the sound transmitting member thereby acting to transmit the reproduction vibration of said tone arm to said speaker diaphragm,

(g) a reproduction terminating means for retracting said turn table against the stylus force spring, the reproduction terminating means having an inner end and an outer end,

(h) a starting means for advancing said turn table by said stylus force spring,

(i) an electric motor for driving said turn table, and

(j) an electrical contact, said contact being capable of supplying electricity to said electric motor when said contact is actuated by said starting means, and said contact being capable of terminating the flow of electricity to said motor; and

wherein said plurality of record discs are incorporated in an index carrier, comprising a carrier proper, a plurality of index points formed at suitable points on said index carrier corresponding to said record discs, a restraining portion for guiding said carrier proper in a specified regular direction, said casing comprising at least one track for indexing said record discs into a position where one of said record discs confronts said turn table, an index carrier magazine formed contiguous to said track and a locking member which engages said index points for indexing and locking said record disc in said position where one of said record discs confronts said turn table;

a cancelling means disposed at a rear end position of said tone arm, the cancelling means protruding radially outward beyond the outer periphery of said turn table, said cancelling means having a plane of rotation, said sound reproduction stylus being disposed at said one end point of said sound reproduction;

said cancelling means cooperating with said reproduction terminating means, the reproduction terminating means comprising a member horizontally swingably supported at an intermediate portion thereof, the inner end of the reproduction terminating means being located at the plane of rotation of said cancelling means protruding radially outward beyond the outer periphery of said turn table, the inner end abutting the cancelling means, an upstanding post having an upwardly facing stepped face, the outer end of the reproduction terminating means being biased onto the side of the upstanding post;

a bar having a first end and a second end, the second end of said bar being proximate to said upstanding post, said bar being supported on a fulcrum, said bar being pivotable vertically in a seesaw-like motion, a spring biasing said second end of said bar upward thereby biasing the first end of said bar downward, an electrical contact which closes the electric circuit for said motor whenever the second end of the bar is pushed downward against said spring, said first end of the bar being able to move said turn table downward against said stylus force spring, the second end of the bar being biased and moveable upward by said spring;

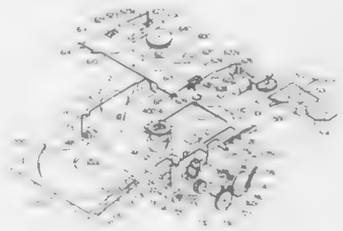
said starting means pushing down the second end of said bar which thereby raises said first end of the bar upward and enabling said turn table to move upward by said stylus force spring, the position being retainable by engaging the outer end of the reproduction terminating means with the upward facing stepped face of said upstanding post, and the position being cancellable by the engagement of the cancelling means with the inner end of the reproduction terminating means which causes rotation of the reproduction terminating means thereby disengaging the outer end of the reproduction terminating means from the upward facing stepped face of said upstanding post.

4,862,445

DISK SETTING MECHANISM FOR A DISK PLAYER

Mashiko Sasaki, Abiko, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Dec. 3, 1987, Ser. No. 128,107
Claims priority, application Japan, Dec. 3, 1986, 61-288489
Int. Cl.[4] G11B *1/00, 17/04, 25/04*
U.S. Cl. 369—75.2 39 Claims



1. A disk setting mechanism for a disk player including a disk tray for receiving a disk thereon, said disk tray being reciprocally moved between an inwardly retracted position and an outwardly projected position through an intermediate position, said disk setting mechanism comprising:

holding means for holding said disk tray when said disk tray is at the outwardly projected position so that said disk tray is inclined downwardly, at a given angle of inclination towards a front end of the disk tray;

first feeding means for reciprocally transferring said disk tray, between the outwardly projected position and the intermediate position, along the angle of inclination of said disk tray;

second feeding means for horizontally transferring said disk tray between the intermediate position and the inwardly retracted position while allowing said disk tray to be shifted between the inclined state and a horizontal state; and

shifting means for shifting said disk tray between the inclined state and the horizontal state while allowing said disk tray to be horizontally transferred between the intermediate position and the inwardly retracted position.

4,862,446

OPTICAL FOCUS ERROR CONTROL PICKUP DEVICE FOR AN OPTICAL RECORDING/REPRODUCING SYSTEM

Takanori Maeda, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 17, 1987, Ser. No. 97,769
Claims priority, application Japan, Sep. 17, 1986, 61-218615
Int. Cl.[4] G11B *7/35*
U.S. Cl. 369—112 6 Claims

1. An optical pickup device comprising:

a light source;

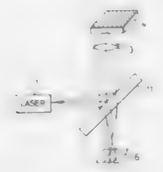
an objective lens for focusing a light beam from said light source on a disk;

an optical detector which is substantially divided into first, second and third regions for detecting a light beam reflected from said disk in such a manner that said first region is located between said second and third regions;

optical means for giving astigmatism and other aberrations to said light beam applied to said optical detector;

a differential amplifier for receiving a first signal outputed by said first region and a second signal obtained by adding

output signals of said second and third regions, to form a focus error signal; and



gain preset control means for controlling a gain of at least one of said first and second signals.

4,862,447

OPTICAL RECORD CARRIER WITH SURFACE LAYER EXTENDING TO THE CENTER OF A SUBSTANTIALLY CIRCULAR INFORMATION TRACK STRUCTURE THEREIN

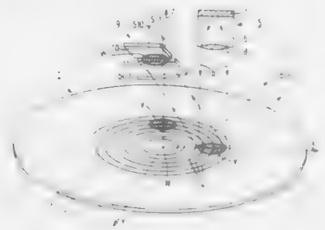
Willem G. Opheij, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 833,922, Feb. 27, 1986, Pat. No. 4,761,776. This application Feb. 24, 1988, Ser. No. 159,983

Claims priority, application Netherlands, Dec. 11, 1985, [illegible]

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—270 **5 Claims**



1. An optical record carrier comprising a substrate having a planar surface layer which includes a substantially circular information track structure therein which may be scanned during rotation of said record carrier by a beam of radiation producing a scanning spot thereon; said planar surface layer extending without interruption substantially up to the center of said information track structure; said track structure producing, when said scanning spot has a width transverse to said tracks of at least a few times the period of said tracks, a diffracted beam of radiation in a direction indicative of deviation between the center of said track structure and the axis of rotation of said record carrier.

4,862,448

DISC CARTRIDGE AND CASING THEREFOR

Kimio Tanaka; Morimasa Sasaki, and Masaru Ikebe, all of Nagano, Japan, assignors to TDK Corporation, Japan

Filed Aug. 6, 1987, Ser. No. 83,259

Claims priority, application Japan, Aug. 7, 1986, 61-120365[U]

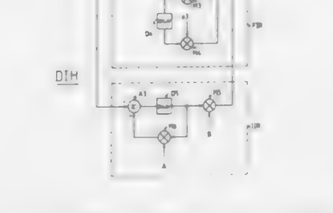
Int. Cl.[4] G11B *23/03*

U.S. Cl. 369—291 **21 Claims**

1. A casing for a disc cartridge, comprising:

a casing body comprising an upper cover member and a lower cover member joined together to define therein a space which is adapted to rotatably and removably house therein a disc having a non-recording section and mounted to be separable at least at rear ends thereof from each other, resulting in at least a rear end of said casing body being openable; and

guide means arranged in said casing body for permitting insertion and removal of said disc with respect to said casing body to be carried out along said guide means through said rear end of said casing body opened by separating said rear ends of said upper and lower cover



members from each other while contactingly supporting said non-recording section of said disc;

wherein said casing body comprises a rear portion and said guide means comprise two guides arranged on at least one of inner sides of the rear portion of said casing body in a manner to be opposite to each other; and

said non-recording section of said disc is at an outer periphery thereof.

4,862,449

ADJUSTABLE ECHO CANCELLER

Daniel S. G. Hoefkens, Antwerp; Joannes H. P. M. Spaenjers, Kalmthout; Eduard C. M. Boeykens, Hingene; Henri A. J. Verhille, Borgerhout, and Gustaaf A. L. Geernaert, Antwerpen, all of Belgium, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Nov. 16, 1987, Ser. No. 120,848

Claims priority, application Belgium, Nov. 17, 1986, 2/61088

Int. Cl.[4] H04B *3/23*

U.S. Cl. 370—32.1 **10 Claims**

1. An echo canceller including an echo canceller circuit adapted to be coupled between a receive path and a transmit path in a communications system, said echo canceller comprising

a digital filter responsive to a digital input signal for producing a replica signal comprising a plurality of digitized replica samples,

said digital filter having an associated plurality of filter coefficients,

said digital input signal comprising a plurality of digitized input samples applied to said receive path,

each digitized sample of said replica signal being equal to the sum of a plurality of terms, each term being equal to the product of a respective one of said filter coefficients and of a respective factor which is a function of said digital input signal,

a subtracter circuit, responsive to said replica signal and to the output signal which appears on said transmit path in response to said input signal being applied to said receive path, for subtracting said replica signal from said output signal,

first processing means for first determining each of said respective factors from replica signal samples which are output by the digital filter when all the filter coefficients, except the filter coefficient by which said each factor is multiplied, are equal to zero, and

second processing means responsive to the factors determined by said first processing means for thereafter determining said filter coefficients from a plurality of output signal samples.

4,862,450

ARRANGEMENT FOR CANCELLING A COMPOSITE ECHO SIGNAL

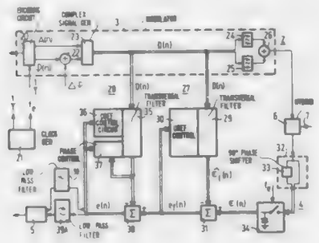
Loïc B. Y. Guidoux, Garencieres, France, assignor to Telecommunications Radioelectriques Et Telephoniques T.R.T, Paris, France

Continuation of Ser. No. 578,996, Feb. 14, 1984, abandoned, which is a continuation of Ser. No. 282,125, Jul. 10, 1981, abandoned. This application Mar. 28, 1985, Ser. No. 717,476

Claims priority, application France, Jul. 21, 1980, 80 16048

Int. Cl.[4] H04B *3/24*

U.S. Cl. 370—32.1 **10 Claims**



1. Apparatus for cancelling an echo signal, the echo signal arising in a receive path of a data communication device as a result of a send signal appearing in a send path of the device, the echo signal being a composite signal including a phase variable and a linear component,

the apparatus comprising:

a. a linear echo canceller comprising:

i. an input for receiving a complex representation of the send signal;

ii. a transversal filter having adjustable coefficients and comprising means for storing samples D(n) of the representation of the send signal;

iii. a coefficients control circuit for adjusting the coefficients in the linear transversal filter, the coefficients control circuit having an input coupled to the receive path for receiving a residual echo signal from which the linear synthetic echo signal has been subtracted; and

iv. an output for supplying a synthetic echo signal representing an approximation of the linear component of the echo signal; and

b. a variable-phase echo canceller comprising:

i. an input for receiving a complex representation of the send signal;

ii. a transversal filter having adjustable coefficients and comprising means for storing samples D(n) of the representation of the send signal and an output;

iii. a coefficients control circuit for adjusting the coefficients in the variable-phase transversal filter, the coefficients control circuit having an input coupled to the receive path for receiving a residual echo signal from which the variable-phase synthetic echo signal has been subtracted;

iv. means for compensating for the variable-phase component of the echo signal; and

v. an output for supplying a synthetic echo signal representing an approximation of the variable-phase component of the echo signal;

c. first and second difference circuits, disposed in cascade within the receive path, each difference circuit corresponding to a respective one of the linear and variable-phase echo cancellers and comprising:

i. a first input connected in the receive path for receiving a first signal containing a representation of the echo signal;

ii. a second input for receiving a second signal which contains at least a part of the respective synthetic echo signal from the respective echo canceller;

iii. an output connected in the receive path for supplying thereto a respective residual echo signal representing a difference between signals received at the first and second inputs; wherein the improvement comprises that:

d. the linear and variable-phase echo cancellers operate simultaneously to supply, at the output of the cascaded difference circuits, a combined residual echo signal in which both the linear and the variable-phase components of the echo signal are reduced; and

e. the compensating means is disposed so that it has an output coupled with one of the inputs of the second difference circuit, the compensating means having a first input coupled with the output of the cascaded difference circuits and a second input coupled with one of the inputs of the second difference circuit.

4,862,451

METHOD AND APPARATUS FOR SWITCHING INFORMATION BETWEEN CHANNELS FOR SYNCHRONOUS INFORMATION TRAFFIC AND ASYNCHRONOUS DATA PACKETS

Felix H. Closs, Adliswil; Johann R. Mueller, Langnau, and Pitro A. Zafiropulo, Rueschlikon, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 14, 1988, Ser. No. 143,893

Claims priority, application Switzerland, Jan. 28, 1987, 101194/87

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—60 **18 Claims**

1. Apparatus for concurrently connecting first input communication lines carrying circuit switched synchronous information traffic to first output communication lines carrying circuit switched synchronous information traffic, and second input communication lines carrying packet switched asynchronous data packets to second output communication lines carrying packet switched asynchronous data packets, said apparatus comprising:

circuit switched input buffers connecting to said first input communication lines;

circuit switched output buffers connecting to said first output communication lines;

packet switched input buffers connecting to said second input communication lines;

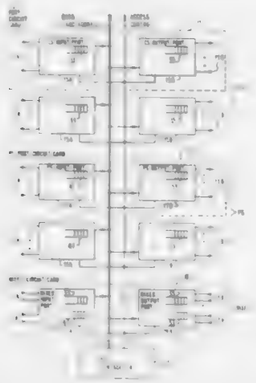
packet switched output buffers connecting to said second output communication lines;

a bus arrangement interconnecting the output of all said input buffers to the input of all said output buffers, including at least one data bus line for transferring data and addresses, at least one circuit switched access control line

for the circuit switched input buffers, and at least one packet switched access control line for the pocket switched input buffers;

first control means for each circuit switched input buffer, for accumulating minipackets of synchronous information received on associated input lines assembly for each destination output line and for storing them in the respective circuit switched input buffer; for attaching a local routing address to each minipacket; and for attaching an end indicator to the last minipacket stored in the circuit switched input buffer in each time frame period;

second control means for each circuit switched input buffer for sequentially reading out, in response to an active signal on said circuit switched access control line, minipackets from said circuit switched input buffer onto said data bus



lines until a minipacket with an end indicator is detected; and for changing the control signal on said circuit switched access control line so that the next circuit switched input buffer in a predetermined sequence receives an active signal on said line;

third control means for activating a window indicator signal when all said circuit switched input buffers are read out in response to a control signal on said access control line; and

fourth control means for each said pocket switched input buffer, for transmitting in response to the reception of an access authorization on said packet switched access control line, a data packet with a local routing address onto said data bus lines, or for resuming a previously interrupted data packet transmission in response to said window indicator signal.

4,862,452

DIGITAL SIGNAL PROCESSING SYSTEM

A. David Milton, and Jerry Stroobach, both of Kanata, Canada, assignors to Mitel Corporation, Kanata, Canada

Filed Jan. 11, 1988, Ser. No. 142,816

Claims priority, application Canada, Jan. 23, 1987, 528063

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—62 **19 Claims**

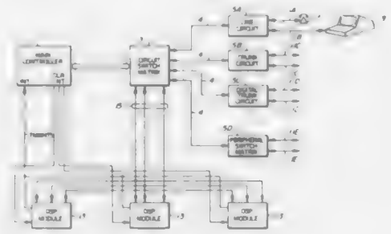
1. A digital signal processing system for use in a communication system connected to a plurality of input/output ports, comprised of:

(a) main controller means for transmitting and receiving message signals,

(b) digital signal processing means for implementing one or more service features characterized by one or both of transmission and reception of both of PCM and message signals, and

(c) digital switching means connected to said main controller means, digital signal processing means, and input/output ports, for bidirectionally translating PCM and message signals therebetween, via one or more time divided communication links under control of said main controller means, and

(d) means for dynamically allocating predetermined channels of said one or more time divided communication links for PCM and message signal translation, wherein the



proportion of channels allotted to PCM and message signal translation is dependent on which of said one or more service features is being implemented, thereby maintaining high signal bandwidth efficiency of said PCM and message signal translation.

4,862,453

COMMUNICATION SYSTEM

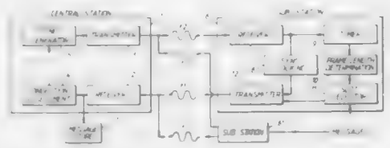
Barry G. West; Bolesław M. Sosin, both of Chelmsford, and Roger K. Tolfree, Witham, all of United Kingdom, assignors to The Marconi Company Limited, Stanmore, United Kingdom

Filed Oct. 2, 1987, Ser. No. 103,744

Claims priority, application United Kingdom, Oct. 3, 1986, 8623763

Int. Cl.[4] H04J *3/16*

U.S. Cl. 370—82 **7 Claims**



1. A communication system comprising: a central station (1) having means (5,3) for transmitting synchronizing signals each defining the beginning of a time slot and means (4) for selecting the intervals between synchronising signals from different integral multiples of a time slot and for providing to said transmitting means signals corresponding to said intervals; and a number of sub-stations (6,61) each having means (10,11,12) which is responsive to the timing of the synchronising signals and which is operative to transmit a message in a time slot selected from a number of time slots together forming a frame, the duration of said frame being determined by said synchronizing signals.

4,862,454

SWITCHING METHOD FOR MULTISTAGE INTERCONNECTION NETWORKS WITH HOT SPOT TRAFFIC

Daniel M. Dias, Mahopac, and Manoj Kumar, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 15, 1988, Ser. No. 219,960

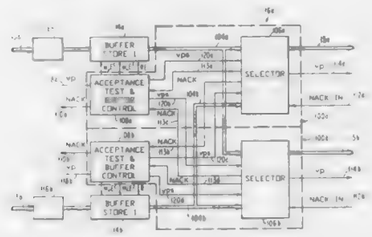
Int. Cl.[4] H04J *3/26*

U.S. Cl. 370—94 **6 Claims**

1. A method for switching packets in a multistage interconnection network including a plurality of switching means each having at least one input port and an output port, a buffer coupled to the input port adapted to receive packets from the input port, comprising the steps of:

(a) detecting an arrival of a packet at the input port;

(b) determining whether the buffer is full;



(c) determining as an acceptance test of the packet whether the buffer contains less than a predetermined number of packets directed to a same destination as the packet detected in step (a);

(d) moving the packet detected in step (a) into the buffer only if the buffer is not full and also the separate acceptance test is met.

4,862,455

DEMULTIPLEXING CIRCUIT FOR A MULTIPLEX SIGNAL

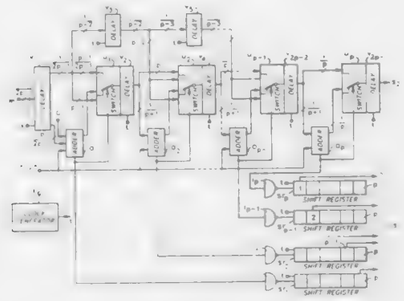
David Gillies, Strasbourg, France, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Nov. 21, 1988, Ser. No. 274,154

Claims priority, application European Pat. Off., Nov. 24, 1987, 87117254.0

Int. Cl.[4] H04J *3/02*

U.S. Cl. 370—112 **1 Claim**



1. A demultiplexing circuit for a multiplex signal (m) whose pulses occur at the pulse repetition rate of a clock signal, and which is formed from a first digital signal (s_1) having p bits and a second digital signal (s_2) having p bits, said first and second digital signals being present in the straight binary code and being sufficiently redundant as to each represent an analog signal by only n amplitude levels instead of 2^p maximum possible amplitude levels, where n satisfies the relation: $2 \log_2 n$ less than or equal to 2_{p-1}, and where said multiplex signal m comprises $2p-1$ bits that are the digital sum of the first and second digital signals corresponding to the formula $m=ns_1+s_2$, said demultiplexing circuit providing a demultiplexed first digital output signal and a demultiplexed second digital output signal in response to said multiplexed input signal and a binary digital input word having a value of $-n$ corresponding to the negative value of n, said demultiplexing circuit comprising:

a first delay element that receives the $(2p-1)$-bit multiplex signal and provides a first delayed output signal having $2p-1$ bits;

a first iterative stage comprising:

a first $(p+1)$-bit adder having a first input, a second input, a sum output and a carry output, the p least significant bits of the first input of said first adder being connected to the p most significant bits of the first delayed output of the first delay element, the $(p+1)$st most significant bit of said first input having a logical zero connected thereto, the second input of said first adder being connected to receive said binary word $-n$;

a first $(p+1)$-bit switch having a first input, a second input, a control input and an output, said first input being connected to receive the $p+1$ most significant bits of the output of the first delay element, and the p most significant bits of the second input of said first switch being connected to receive the unsigned sum output of the first adder, the least significant bit of the second input of said first switch being connected to the least significant bit of the first input of said switch to thereby receive the $(p-1)$st bit of the first delayed output of said first delay element, the control input of said first switch being connected to the carry output of said first adder;

a second delay element having an input and an output, said input connected to receive the output of said first switch, said output providing a second delayed output signal; and

a third delay element having an input and an output, said input connected to receive the $p-2$ least significant bits of the first delayed output of said first delay element, said output providing a third delayed output signal;

a second iterative stage comprising:

a second $(p+1)$-bit adder having a first input, a second input, a sum output and a carry output, the first input of said second adder being connected to receive the second delayed output of said second delay element, the second input of said second adder being connected to receive said binary word $-n$;

a second $(p+1)$-bit switch having a first input, a second input, a control input and an output, the p most significant bits of the first input being connected to receive the p most significant bits of the output of the second delay element, the p most significant bits of the second input of said second switch being connected to receive the unsigned sum output of the second adder, the control input of said second switch being connected to receive the carry output of of said second adder, the least significant bit of each of the first and second inputs of said second switch being connected to receive the most significant bit of the third delayed output of said third delay element;

a forth delay element having an input and an output, the input of said fourth delay element being connected to receive the output of said second switch, the output of said fourth delay element providing a fourth delayed output signal; and

a fifth delay element having an input and an output, the input being connected to receive the $p-3$ least significant bits of the output of said third delay element, the output of said fifth delay element providing a fifth delayed output signal;

$p-3$ additional iterative stages, each iterative stage receiving the output signals from the delay elements of the preceding iterative stage, such that the $(p-1)$st iterative stage comprises:

a $(p-1)$st) $(p+1)$-bit adder having a first input, a second input, a sum output and a carry output, the first input of said $(p-1)$st adder being connected to receive the output of a $(2p-4)$th delay element of a $(p-2)$nd iterative

stage, the second input of said (p−1)st adder being connected to receive said binary word −n;

a (p−1)st (p+1)-bit switch having a first input, a second input, a control input and an output, said first input being connected to receive the p least significant bits of the output of said (2p−4)th delay element of said preceding iterative stage, the p most significant bits of the second input of said (p−1st) switch being connected to receive the unsigned sum output of said (p−1)st adder, the control input being connected to receive the carry output of said (p−1)st adder, the least significant bit of each of the first input and the second input of said (p−1)st switch being connected to receive the output of a (2p−3)rd delay element of said preceding iterative stage; and

a (2p−2)nd delay element having an input and an output, said output connected to receive the output of said (p−1)st switch, the output of said (2p−2)nd delay element providing a (2p−2)nd delayed output;

a pth (p+1)-bit adder having a first input, a second input, a sum output and a carry output, the first input of said pth adder being connected to receive the (2p−2)nd output of said (2p−2)nd delay element, the second input of said pth adder being connected to receive said binary word −n;

a p-bit pth switch having a first input, a second input, a control input and an output, the first input of said pth switch being connected to receive the p least significant bits of the (2p−1)st delayed output of the (2p−1)st delay element, the second input of said pth switch being connected to receive the unsigned sum output of said pth adder, the control input of said pth switch being connected to receive the carry output of said pth adder;

a (2p−1)st delay element having an input and an output, the input of said (2p−1)st delay element being connected to the output of said pth switch, the output of said (2p−1)st delay element being the demultiplexed second digital output signal;

first through pth inverters, each of said inverters having an input and an output, the inputs of said first through pth inverters being connected to the respective carry outputs of said first through pth adders;

first through pth p-stage shift registers, each having a serial input and an output for each of said p stages, said serial inputs of said first through pth shift registers connected to the respective outputs of said first through pth inverters, said shift registers shifting in response to said clock signal, one stage of each of said first through pth shift registers providing a respective bit of said demultiplexed first digital output signal such that:

the bit with the weight 2^{p-1} is provided by the pth stage of the first shift register;

the bit with the weight 2^{p-2} is provided by the (p−1)st stage of the second shift register;

the bit with the weight 2^1 is provided by the second stage of the (p−1)st shift register; and

the bit with the weight 2^0 from the first stage of the pth shift register.

4,862,456

HIGH SPEED MODEM

Paul J. Giorgio, Providence, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 4, 1988, Ser. No. 195,991

Int. Cl.[4] H04J *3/00*

U.S. Cl. 370—118 **7 Claims**

1. A modem for use in a communication system that transfers first and second data over a first and second plurality of telephone lines comprising:

sensing means for selecting particular lines having a quantity equal to the maximum number of telephone lines available at both said first and second plurality of telephone lines;

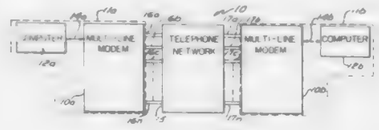
first interfacing means for receiving and transmitting the first data at a first data rate;

separating means connected to said first interfacing means for separating said first data to form a first separated data, said first separated data being at a second data rate that is lower than said first data rate;

modulating means connected to said separating means through lines including said particular lines, said modulating means for receiving said first separated data over said particular lines exclusively and for converting said first separated data to a first separated analog data, said first separated analog data being at said second data rate;

sending means connected to said modulating means for transmitting said first separated analog data;

receiving means for receiving a second separated analog



data, said second separated analog data being at said second data rate;

demodulating means connected to said receiving means for receiving said second separated analog data, said demodulating means for converting said second separated analog data to a second separated data said second separated data being at said second data rate;

combining means connected to said demodulating means through lines including said particular lines for receiving said second separated data over said particular lines exclusively and for combining said second separated data to a second data, said second data being at said first data rate; and

second interfacing means connected to said combining means for receiving said second data and for transmitting said second data.

4,862,457

RADIO TRANSMISSION SYSTEM HAVING SIMPLIFIED ERROR CODING CIRCUITRY AND FAST CHANNEL SWITCHING

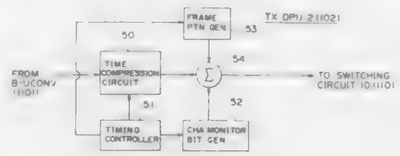
Hideaki Morimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 31, 1987, Ser. No. 32,645

Claims priority, application Japan, Mar. 31, 1986, 61-74912; Nov. 19, 1986, 61-277157

Int. Cl.[4] G06F *11/20*

U.S. Cl. 371—8 **4 Claims**



1. A digital radio transmission system comprising:

transmit digital processing means for compressing the time scale of a prescribed number of consecutive data bits and leaving a time interval of a predetermined number of bits, generating an additional bit for a channel supervision and inserting it into a first time slot of said time interval immediately following said time-compressed data bits, and generating a timing signal indicative of the position of a second time slot in said time interval following said first time slot to thereby form composite bits;

error correcting encoder means for performing computations on said composite bits according to an error encoding theorem and inserting an error correcting code derived from the computations into said second time slot in response to said timing signal, thereby forming a block code with said composite bits and said error correcting code;

error correcting decoder means for performing computations on the block code according to an error decoding theorem for correcting error in said composite bits; and

receive digital processing means responsive to the output of said error correcting decoder means for separating the additional bit and the time-compressed data bits of said error-corrected composite bits from each other and expanding the time scale of the separated time-compressed data bits.

4,862,458

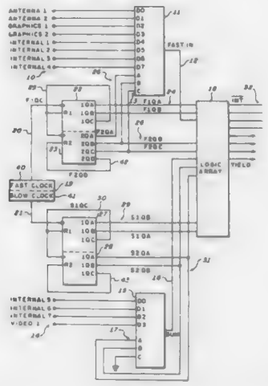
MULTIPLEXED BUILT IN TEST EQUIPMENT

Mark J. Baginski, Boyd Tavern, Va., assignor to Sperry Marine Inc., Charlottsville, Va.

Filed Sep. 17, 1987, Ser. No. 97,976

Int. Cl.[4] G06F *11/22*

U.S. Cl. 371—15 **4 Claims**



1. Built-in test equipment (BITE) for a system having a plurality of subsystems, said system including lines to be tested by said BITE, said lines comprising fast lines and slow lines, each said fast line normally having a signal thereon of a first periodicity, each said slow line normally having a signal thereon of a second periodicity, said second periodicity being longer than said first periodicity, said lines to be tested comprising groups of lines associated with said subsystems, respectively, at least one of said groups comprising both fast lines and slow lines, said BITE comprising

a plurality of error status indicating means for indicating error status of said subsystems, respectively,

first multiplexer means having a first multiplexer output and responsive to said fast lines for multiplexing said fast lines to said first multiplexer output in response to first control signals,

second multiplexer means having a second multiplexer output and responsive to said slow lines for multiplexng said slow lines to said second multiplexer output in response to second control signals,

first sequencing means for generating said first control signals for controlling said first multiplexer means to sequentially couple said fast lines to said first multiplexer output to provide a fast line under test,

second sequencing means for generating said second control signals for controlling said second multiplexer means to sequentially couple said slow lines to said second multiplexer output to provide a slow line under test,

first testing means responsive to said first multiplexer output for providing a fast test output in accordance with whether said first multiplexer output fails to toggle within a first time interval, thereby providing an error indication,

second testing means responsive to said second multiplexer output for providing a slow test output in accordance with whether said second multiplexer output fails to toggle within a second time interval, thereby providing an error indication,

said second time interval being longer than said first time interval, and

gating means responsive to said fast and slow test outputs and to said first and second control signals for actuating an appropriate one of said error status indicating means in accordance with said error indication from said first or second testing means and in accordance with said group containing said fast or slow line under test that resulted in said error indication, so as to provide an error status indication with respect to said subsystems, respectively.

4,862,459

TEST METHOD FOR DETECTING FAULTY MEMORY CELL OF A PROGRAMMABLE DEVICE

Toshitaka Fukushima, Yokohama, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 8, 1986, Ser. No. 904,571

Claims priority, application Japan, Sep. 9, 1985, 60-198761

Int. Cl.[4] G01R *31/28*

U.S. Cl. 371—21 **17 Claims**



1. A method for testing a programmable semiconductor device having unwritten-in cells for field-programming as well as previous written-in cells for test, said method comprising the steps of:

(a) switching an application of a current between a first cell to be tested and a second cell, said first and second cells being one of the unwritten-in cells and one of the written-in cells respectively;

(b) detecting a variation of a voltage induced across said first cell within a predetermined time period after said switching; and

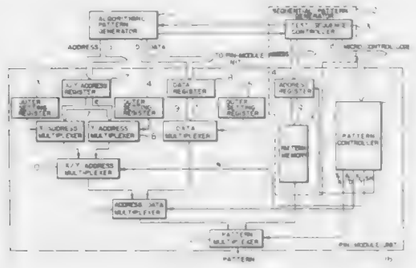
(c) comparing said detected variation of the voltage with a predetermined threshold level, whereby a detected variation of the voltage lower than said predetermined threshold level indicates a faulty cell.

4,862,460

TEST PATTERN GENERATOR

Kazuo Yamaguchi, Sagamihara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 14, 1986, Ser. No. 918,499
Claims priority, application Japan, Oct. 11, 1985, 60-224859
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—27 14 Claims



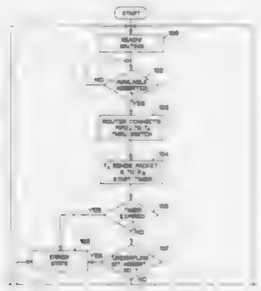
1. A test pattern generator comprising:
means for generating an algorithmic pattern;
means for generating a sequential pattern;
means coupled to said algorithmic pattern generating means and to said sequential pattern generating means for selecting pattern data generated from either said algorithmic pattern generator means or said sequential pattern generator means for use with a specified pin or pin block of an object device to be tested; and
a pattern controller for controlling said selecting means, whereby data to be supplied to a pin or pin block can be selectively assigned in real time by said pattern controller.

4,862,461

PACKET SWITCH NETWORK PROTOCOL

Bartholomew Blaner, Newark Valley, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jan. 12, 1987, Ser. No. 2,351
Int. Cl.[4] G08C *25/02*
U.S. Cl. 371—33 3 Claims



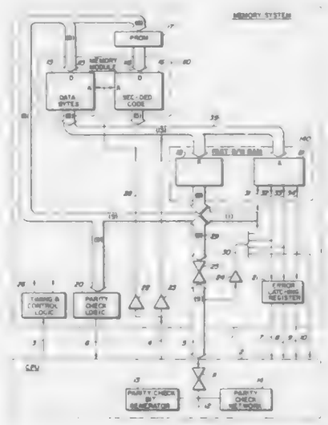
1. A method for transmitting a data packet in an asynchronous digital network system having a plurality of nodes, comprising:
(a) transmitting a packet of data from a transmitter of a first node to a receiver of a second node over a first data channel, and initiating a time delay at said first node;
(b) analyzing said data packet for errors at said second node;
(c) transmitting from said second node to said first node over a second data channel an ACK signal when said packet is determined to have no errors, and a NACK signal when said packet is determined to have errors;
(i) storing each error free packet received at said second node in a FIFO buffer;
(ii) detecting whether said FIFO buffer is full;
(iii) signalling said first node when said FIFO is full;
(iv) initiating a second time delay at said first node when said FIFO buffer is full; and,
(v) asserting a signal on said second channel indicating to said first node that said second node is available to receive traffic if said FIFO buffer is not full before said second time delay expires;
(d) initiating a retransmission of said packet of data from said first node transmitter to said second node if said ACK signal has not been determined to be present during said first time delay; and,
(e) transmitting said packet from said second node to a further node when said packet has been received by said second node.

4,862,462

MEMORY SYSTEMS AND RELATED ERROR DETECTION AND CORRECTION APPARATUS

Ferruccio Zulian, Cornaredo, Italy, assignor to Honeywell Bull Italia S.p.A., Caluso, Italy

Filed Dec. 14, 1987, Ser. No. 132,842
Claims priority, application Italy, Feb. 12, 1987, 19353A/87
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—38 4 Claims



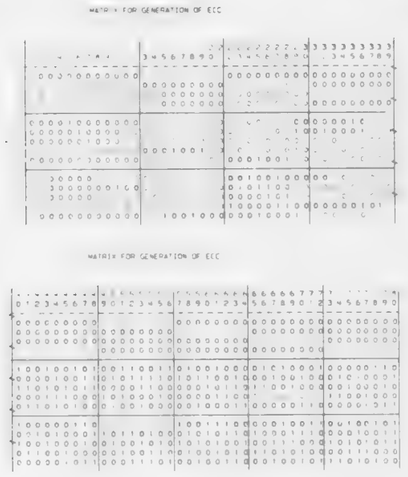
1. A Memory System, including error detection and correction means comprising:
(a) a memory module means, having address inputs and data inputs, for storing at each memory address a first (information) binary code and a second (error detection and correction) binary code related to said information, said first and second binary codes being provided as input to said memory module means, said memory module means further having data outputs to read out from said memory module means at each address a third and fourth binary code, which in absence of a memory error coincide with said first and second binary code, respectively; and
(b) a fast memory means, having address inputs connected to said data outputs of said memory module means and further having read-out outputs, said fast memory means containing an information set such that for each address defined by said third and fourth binary code there is a corresponding fifth and a sixth binary code output of said read-out outputs provided, said fifth code being coincident with said first code in the absence of a memory error or in the presence of a correctable error, and said sixth code being indicative of the absence of an error, or the presence of a correctable error in said third code, or of the presence of errors which cannot be corrected.

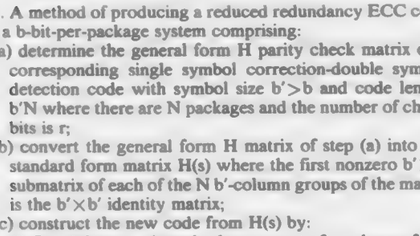
4,862,463

ERROR CORRECTING CODE FOR 8-BIT-PER-CHIP MEMORY WITH REDUCED REDUNDANCY

Chin-Long Chen, Wappingers Falls, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 75,390, Jul. 20, 1987, abandoned. This application Oct. 17, 1988, Ser. No. 258,080
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—38 5 Claims





1. A method of producing a reduced redundancy ECC code for a b-bit-per-package system comprising:
(a) determine the general form H parity check matrix of a corresponding single symbol correction-double symbol detection code with symbol size b′>b and code length b′N where there are N packages and the number of check bits is r;
(b) convert the general form H matrix of step (a) into the standard form matrix H(s) where the first nonzero b′×b′ submatrix of each of the N b′-column groups of the matrix is the b′×b′ identity matrix;
(c) construct the new code from H(s) by:
(i) first delete consistently the same set of e columns from each b′-column group of the H(s) matrix where e is the number of reduced bits from the general H matrix SSC-DSD code,
(ii) then delete the e all zeroes rows from the matrix formed in step (c)(i) to create a resultant matrix H(r) with symbol size (b′−e)=b and code length (b′−e)N and the number of check bits equal to r−e.

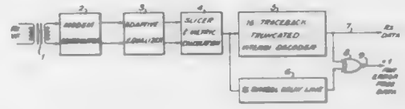
4,862,464

DATA ERROR DETECTOR FOR DIGITAL MODEMS USING TRELLIS CODING

William L. Betts, St. Petersburg, and Edward S. Zuranski, Largo, both of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Dec. 30, 1987, Ser. No. 139,449
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—43 8 Claims

1. A data error detector circuit for digital modems comprising:
means for receiving an analog signal representative of a digital data stream from a communications channel and for reconstituting said signal in digital form;
a parallel combination of a traceback truncated Viterbi decoder and a symbol delay line, said decoder and said symbol delay line being connected to an output of said receiving and reconstituting means; and



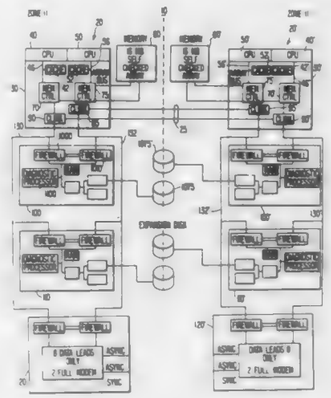
logic means having inputs from said traceback Viterbi decoder and said symbol delay line and functioning to produce a relatively positive output when error free data is being received from said communications channel.

4,862,465

DUAL-RAIL PROCESSORS WITH ERROR CHECKING ON I/O READS

William F. Bruckert, Northboro, Mass., and Thomas D. Bissett, Derry, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 4, 1987, Ser. No. 93,495
Int. Cl.[4] G06F *11/16*
U.S. Cl. 371—68 8 Claims



1. A dual processor data processing system with interprocessor error checking comprising:
a first central processing unit executing a series of instructions;
a second central processing unit executing said series of instructions in the same order as, independently of, and in synchronism with said first central processing unit;
a first data bus coupled to said first central processing unit for receiving data to be input to said first central processing unit;
a second data bus coupled to said second central processing unit for receiving data to be input to said second central processing unit;
error checking means, coupled to said first and second data busses, for checking data transmitted over said first and second data busses prior to delivery of said data to said first and second central processing units, said error checking means including comparison means for indicating an error when said data on said first and second data busses are unequal; and

error isolation means, responsive to an error detected from said error checking means, for analyzing the cause of error while maintaining system synchronization.

4,862,466

LASER EMITTING APPARATUS WITH TEMPERATURE INTENSITY CONTROL

Tatsuya Eguchi, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 16, 1987, Ser. No. 97,537
Claims priority, application Japan, Sep. 25, 1986, 61-227600
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—9 **5 Claims**



1. A laser emitting apparatus comprising:
a semiconductor laser;
drive means for applying an excitation current to said semiconductor laser to cause said semiconductor laser to emit a laser beam;
photoreceptor means for detecting intensity of the laser beam emitted from said semiconductor laser and for outputting a detecting signal corresponding to the intensity of the laser beam;
control means responsive to said detecting signal for controlling said drive means so as to vary the excitation current to be applied to said semiconductor laser in order to maintain the laser beam emitted from said semiconductor laser at a predetermined intensity;
interrupt signal output means for outputting an interrupt signal for interrupting emission of the laser beam, and
psuedosignal generating means responsive to said interrupt signal for generating a pseudo-signal equivalent to the detecting signal outputted from said photoreceptor means when said photoreceptor means receives a laser beam exceeding the predetermined intensity and for outputting the psuedo-signal to said control means in place of the detecting signal

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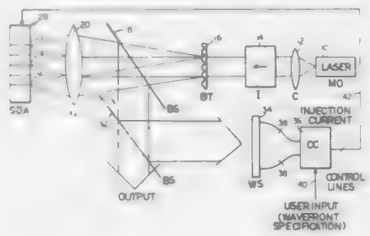
4,862,467

ONE- AND TWO-DIMENSIONAL OPTICAL WAVEFRONT SYNTHESIS IN REAL TIME

Michael J. Carter, Newmarket, N.H., and David Welford, Middleton, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 18, 1988, Ser. No. 169,852
Int. Cl.[4] H01S *3/098*
U.S. Cl. 372—18 **7 Claims**

1. Apparatus for optical wavefront synthesis comprising:
a master laser;
a slave laser array; capable of being injection locked; means for providing optical isolation;
optical elements for splitting light from the master laser into a plurality of beams and to image each of the beams onto one of the slave lasers thereby injection locking the frequency of each of the slave lasers to the master laser frequency;
a wavefront measurement sensor responsive to the spatial variation of the phase and intensity of the light from the slave laser array to generate an output signal; and



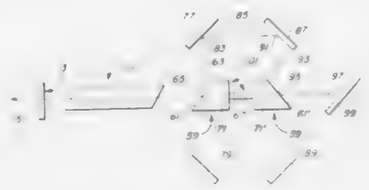
a computer responsive to the output signal from the wavefront measurement sensor to control the injection current applied to each of the slave lasers, whereby the relative phase of each slave laser is controlled to effect the wavefront synthesis.

4,862,468

RAPIDLY SWITCHABLE LINE SELECTOR FOR PULSED LASERS

David Fink, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 27, 1987, Ser. No. 42,753
Int. Cl.[4] H01S *3/098*
U.S. Cl. 342—19 **2 Claims**



1. In a method for rapidly switching a pulsed laser between different and distinct spectral lines, said laser having an optical path, an end-reflector position in said optical path, and a resonant cavity
having a preselected gain medium therein, wherein the improvement comprises
the steps of:
connecting a common shaft between a pair of first and second fold mirrors whose diagonal mirror faces are directed in different directions from one another;
arranging a first set of "n" plane mirrors in a first circular array about the face of the first one of said fold mirrors;
arranging a second corresponding set of "n" plane mirrors in a second circular array about the face of the second one of said fold mirrors;
orienting the reflective faces of each of said first and second circular arrays of "n" mirrors opposite one another so that they face generally toward one another such that each of said second set of "n" mirrors receives a beam reflected from a corresponding one of the first set of "n" mirrors;
positioning a single diffraction grating in the end-reflector position of the laser's optical path; and
rotating the common shaft of said first and second fold mirrors for simultaneously rotating the diagonal faces of each in synchronism with one another;

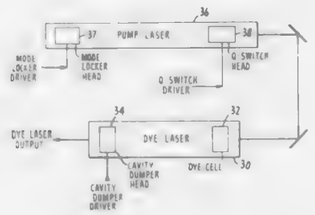
impinging the laser beam on the diagonal mirror face of the first rotating fold mirror;
reflecting said beam therefrom and impinging it on a face of one of the "n" mirrors in said first circular array;
reflecting said beam onto the face of a corresponding mirror in the second circular array;
reflecting said beam onto the diagonal mirror face of the second rotating fold mirror;
impinging the beam onto the single diffraction grating occupying the end-reflector position of the laser's optical path; and
selecting different and distinct spectral lines as each of the mirror pairs of the first and second arrays pass into the laser's optical path with the rotation of said fold mirrors to bring the reflected beam to the single diffraction grating at different angles of incidence.

4,862,469

SUPPRESSION OF THE SECOND INTRACAVITY PULSE IN A SYNCHRONOUSLY PUMPED DYE LASER

Bernard Couillaud, Palo Alto, and Gerald M. Mitchell, Cupertino, both of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Filed Oct. 10, 1986, Ser. No. 917,721
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—33 **9 Claims**



1. A laser comprising:
a resonant cavity;
an amplifying medium located in the resonant cavity;
source means for periodically introducing pulses of pump energy into the amplifying medium such that two counter-propagating pulses are generated in the cavity;
means for extracting energy from the resonant cavity; and
timing means functioning to trigger the operation of the extracting means a first time and being programmed to cause the extracting means to extract some of the energy from one of the two counter propagating pulses in the cavity thereby creating an energy imbalance between said counter propagating pulses such that the energy from subsequent pump pulses will be transferred primarily to the remaining pulse in the cavity from which no energy has been extracted and wherein said timing means further functions to trigger the operation of the extracting means a second time to extract said remaining pulse after the energy of said subsequent pump pulses has been transferred thereto.

4,862,470

SEMICONDUCTOR LASER DEVICE

Takahiro Suyama, Tenri; Kosei Takahashi, Nara; Masafumi Kondo, Tenri, and Toshiro Hayakawa, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 27, 1988, Ser. No. 186,818
Claims priority, application Japan, Apr. 28, 1987, 62-105612
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **3 Claims**

1. In a semiconductor laser device comprising an active layer, optical guiding layers sandwiching said active layer therebetween, and a cladding layer disposed on each of said optical guiding layers, the device wherein



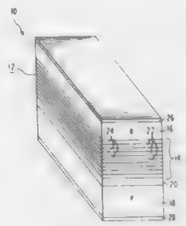
the refractive index of each of said optical guiding layers gradually increases in the direction away from said active layer substantially identically, and the thickness of each of said cladding layers is 0.5 um or less.

4,862,471

SEMICONDUCTOR LIGHT EMITTING DEVICE

Jacques I. Pankove, Boulder, Colo., assignor to University of Colorado Foundation, Inc., Boulder, Colo.

Filed Apr. 22, 1988, Ser. No. 185,601
Int. Cl.[4] H01S *3/19*; H01L *33/00*
U.S. Cl. 372—45 **11 Claims**



1. An injection mode light emitting device comprising:
a body of a semiconductor material having;
a quantum well region having opposed sides and adapted to receive both injected electrons and holes and which emits light upon the recombination of the holes and electrons;
a layer of N-type gallium nitride over one side of the quantum well region and adapted to inject electrons into the quantum well region;
a layer of narrower band gap P-type semiconductor material over the other side of the quantum well region and adapted to inject holes into the quantum well region;
a barrier layer between the P-type layer and the quantum well region for blocking the flow of electrons from the quantum well region into the P-type layer so that recombination of the electrons and holes and the generation of light takes place in the quantum well region; and
conducting contacts on each of the N-type layer and the P-type layer.

4,862,472

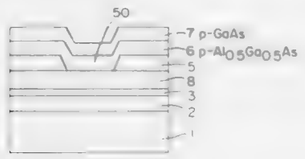
SEMICONDUCTOR LASER DEVICE

Haruhisa Takiguchi; Shinji Kaneiwa, both of Nara; Hiroaki Kudo, Tenri; Chitose Sakane, Tenri, and Toshihiko Yoshida, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 14, 1988, Ser. No. 143,730
Claims priority, application Japan, Jan. 16, 1987, 62-8833
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **4 Claims**

1. In a semiconductor laser device comprising a double-heterostructure that is composed of an active layer and a pair of cladding layers comprising first and second cladding layers,

sandwiching said active layer therebetween, and a stripe structure that is disposed on said second cladding layer, said stripe structure being composed of a current blocking layer with a conductive type different from that of said second cladding layer, and said current blocking layer having a striped groove constituting a current path,



the improvement comprising said second cladding layer that contains no components that are readily oxidized and that is composed of an $In_{1-s}Ga_sP_{1-t}As_t$ crystal material (wherein $0.51 \leqq s \leqq 1$, $0 \leqq t \leqq 1$ and $s = 2.04t - 1.04$).

4,862,473

SEMICONDUCTOR LASER APPARATUS HAVING A HIGH HARMONIC GENERATING WAVEGUIDE

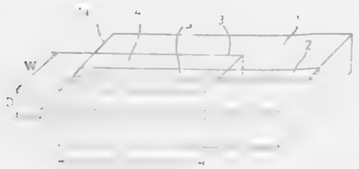
Seiki Yano, Kashihara, and Toshiki Hijikata, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 8, 1987, Ser. No. 105,585

Claims priority, application Japan, Oct. 8, 1986, 61-154856[U]

Int. Cl.⁴ H01S *3/19*

U.S. Cl. 372—50 **6 Claims**



1. A structure for a semiconductor laser apparatus comprising:

a semiconductor laser element having a groove of a predetermined length formed from an end portion of said semiconductor laser element;

a higher harmonic generating device formed to said groove;

a waveguide of first cross-sectional dimensions formed in said higher harmonic generating device along a first optical axis of said semiconductor laser element; and

a resonator having approximately said first cross-sectional dimensions disposed along said first optical axis.

4,862,474

SEMICONDUTOR LASER DEVICE

Motoyasu Morinaga, Yokohama; Hideto Furuyama, Tokyo; Masaru Nakamura, Kawaguchi; Nobuo Suzuki, Tokyo; Yuzo Hirayama, and Hajime Okuda, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 26, 1988, Ser. No. 198,866

Claims priority, application Japan, May 26, 1987, 62-126944; Aug. 19, 1987, 62-204223; Sep. 28, 1987, 62-240845

Int. Cl.⁴ H01S *3/19*

U.S. Cl. 372—50 **9 Claims**

1. A semiconductor laser device comprising:

a substrate having a first semiconductor layer of a first conductivity type; and

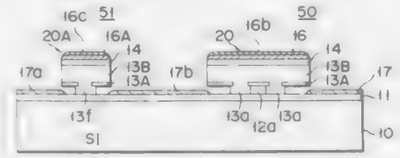
a semiconductor laser element and an auxiliary mechanism, provided side by side on said substrate;

said semiconductor laser element including:

a mesa portion having a second semiconductor layer provided above said first semiconductor layer and of a second conductivity type;

an active region consisting of a semiconductor formed between said first and second semiconductor layers, having a predetermined width and having an energy gap smaller than the energy gap of said first and second semiconductor layers, said active region having opposed edge surfaces serving as reflecting mirrors for oscillating a laser beam between said opposed edge surfaces and emitting a laser beam from one of said edge surfaces, thereby contributing to light emission;

a pair of buried portions consisting of a semiconductor formed on and contiguous to opposite sides of said active



region in the width direction thereof and having a greater forbidden band width than the energy gap of said active region;

electric insulating regions formed on the opposite sides of said buried portions and between said first and second semiconductor layers; and

first and second electrodes for supplying current to said active region; and

said auxiliary mechanism including:

a third semiconductor later made of the same material as the buried portions;

a high resistivity layer provided on said third semiconductor layer; and

an electrode take-out pad portion provided on said high resistivity layer and electrically connected to said first electrode of said semiconductor laser element.

4,862,475

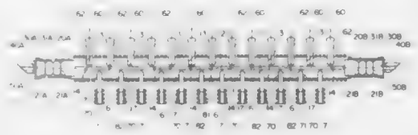
HOLLOW-CATHODE TYPE METAL VAPOR LASER TUBE

Kyoichi Deki, Kakogawa, Japan, assignor to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1988, Ser. No. 246,202

Int. Cl.⁴ H01S *3/03*

U.S. Cl. 372—61 **9 Claims**



1. A metal vapor iaser tube of the hollow-cathode type, comprising:

a central tube member made of a metal and serving as a cathode, said central tube member having a fine hole which extends in the direction of an axis of said central tube member and defines a laser oscillating path, said central tube member further having a large number of anode member receiving through-holes formed in a juxtaposed spaced relationship in the direction of the axis thereof and extending therethrough from an outer wall in one side thereof to said fine hole therein, each of said anode member receiving through-holes having a discharge opening communicating with said fine hole, said central tube member further having a large number of working metal container receiving through-holes formed in a juxtaposed spaced relationship in the direction of the axis thereof and extending therethrough from the outer wall in another side thereof to said fine hole therein;

a pair of end tube members made of a hard glass and connected in an air-tight relationship to the opposite ends of said central tube member;

a pair of cap members made of a metal and connected in an air-tight relationship to outer ends of said end tube members, each of said cap members having an opening formed at a central location thereof;

a pair of holding tube members having first ends connected in an air-tight relationship to said cap members with central openings in the holding tube members coaxial with the openings of said cap members and having second ends for holding a pair of Brewster windows or mirrors thereon;

anode members with each anode member inserted in a respective one of said anode member receiving through-holes of said central tube member, each of said anode members being secured in an air-tight relationship to said central tube member by way of an insulating member such that an end thereof may be positioned in said discharge opening of the anode member receiving through-hole; and

working metal containers inserted respectively in said working metal container receiving through-holes of said central tube member, each of said working metal containers being secured in an air-tight relationship to said central tube member such that the inside of each working metal container communicates with said fine hole of said central tube member;

said central tube member constituting an enclosure.

4,862,476

GAS LASER HAVING FLAT DISCHARGER CROSS-SECTION

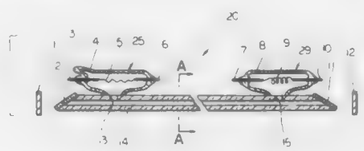
Ling Yiming, Nanjing, China, assignor to Nanjing Institute of Technology, Nanjing, China

Continuation of Ser. No. 843,092, Mar. 24, 1986. This application May 26, 1988, Ser. No. 201,357

Claims priority, application China, Apr. 1, 1985, 85100563

Int. Cl.⁴ H01S *3/03*

U.S. Cl. 372—61 **6 Claims**



1. A longitudinally excited high power gas laser comprising:

means defining an optical axis along which the laser light propagates substantially back and forth in optical resonation;

a gas-tight discharge tube for containing an oxide cathode able to supply a high emission current and an anode which may also be used as a pump to improve vacuity within said discharge tube, each of said gaseous medium which defines a sole discharge passage between electrodes being enclosed respectively in glass bulbs connected by three section conductor wires with the discharge tube at opposite ends thereof by an excitation circuit which produces an for exciting discharge in said discharge tube, said discharge tube having a geometrical axis coaxial with the optical axis and a discharge cross section defined by the wall of the discharge tube, the cross section being substantially rectangular and having two orthogonal dimensions of width and height;

said substantially rectangular discharge cross section having a width to height ratio being greater than 4:1.

4,862,477

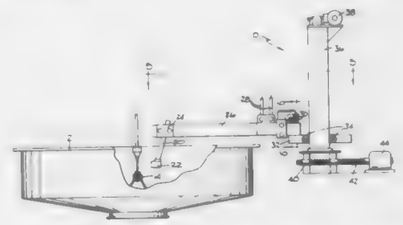
APPARATUS AND METHOD FOR MELTING AND HOMOGENIZING BATCH MATERIAL

Leonard E. Olds, Castle Rock; Michael D. Peterson, Parker, both of Colo., and Jean P. Martin, Villeanes, France, assignors to Manville Corporation, Denver, Colo.

Filed Sep. 1, 1988, Ser. No. 239,829

Int. Cl.⁴ H05B *7/00*

U.S. Cl. 373—85 **31 Claims**



1. An electric furnace for melting thermally fusible batch material and mixing the molten material produced thereby, comprising:

a vessel containing batch material to be melted, the vessel having an outlet therein for discharging the molten material;

a plurality of electrodes, each electrode having a leg portion teminating in a tip;

means supporting each electrode so that each tip is positioned to generate a corona discharge from the electrode to within the molten material and producing thereby electromagnetic forces within an active melting zone of the molten material causing circulation of said material within said zone in generally horizontal paths, about said electrode; and

means for causing relative movement between each electrode and the vessel, whereby said zones produced by said electrodes are moved in separate arcs within said molten material through an angle sufficient to distribute said active melting zones, and the stirring effect of the electromagnetic forces therein, to substantially throughout said material, and thereby provide generally uniform temperature distribution thoughout said molten material.

4,862,478

SPREAD SPECTRUM COMMUNICATIONS WITH RESISTANCE TO MULTIPATH AT DIFFERENTIAL DELAYS BOTH LARGER AND SMALLER THAN A CHIP WIDTH

Stuckey McIntosh, Atlanta, Ga., assignor to Gambatte, Inc., Atlanta, Ga.

Filed Nov. 6, 1987, Ser. No. 117,946

Int. Cl.⁴ H04K *1/00*

U.S. Cl. 375—1 **7 Claims**



2. A spread spectrum communication system resistant to multi-path due to differential delays equal to or less than a chip width comprising:

a transmitter including:

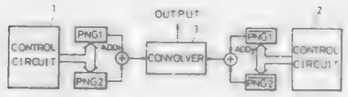
a digital data input,
p-n generator means for generating a p-n signal sequence at a first clock rate, said first clock rate defining such chip width,
means for logically combining said p-n signal sequence with a signal available at said digital data input,
a Manchester encoder with an input and an output, said Manchester encoder input coupled to an output of said means for logically combining,
a modulator with an oscillator input, a signal input and an output,
means coupling said Manchester encoder output to said signal input of said modulator,
an oscillator coupled to said oscillator input of said modulator,
means for transmitting a signal produced at said output of said modulator, and
a receiver responsive to said transmitted signal, said receiver including:
an IF demodulator with a two input mixer, one said input fed with an IF signal and another fed by said IF signal delayed by a predetermined delay, and,
a notch filter with a center frequency at about said clock rate driven by said mixer, an output of said notch filter coupled to a low pass filter with cutoff frequency at about one half said clock rate, an output of said low pass filter comprising a baseband signal corresponding to an output of said means for logically combining.

4,862,479

SPREAD SPECTRUM COMMUNICATION SYSTEM

Masahiro Hamatsu, and Takao Kunihara, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1987, Ser. No. 107,378
Claims priority, application Japan, Oct. 24, 1986, 61-253992
Int. Cl.[4] H01L 9/00
U.S. Cl. 375—1 **2 Claims**



1. A GOLD code generating system used in a spread spectrum communication system, in which a correlation output is obtained by giving a correlator a sender side output code and a receiver side output code, comprising:
means for generating a first m sequence u and a second m sequence v at the sender side;
sender side control means for generating a sender side GOLD code which is a spreading code and which is an element of a set of GOLD codes G(u,v) where

$$G(U,v)=\{u,v,u\oplus v,u\oplus Tv,\ldots,u\oplus T^{N-1}v\}$$

and where
T: state transition matrix of v
N: code length of each sequence in G(u,v);
means for generating image codes $\bar{u}$ and $\bar{v}$ of said first and second m sequences at the receiver side; and
receiver side control means for generating a receiver side GOLD code which is a spreading code and which is an element of a set of GOLD codes $G(\bar{u},\bar{v})$ where

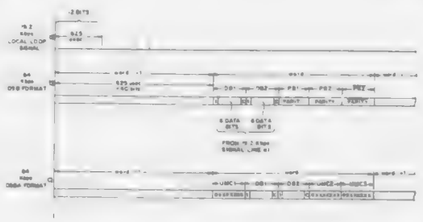
$$G(u,v)=\{u,v,u\oplus v,u\oplus T^{N-1}v,\ldots,u\oplus Tv\}.$$

4,862,480

DIGITAL DATA SERVICE SYSTEM

Dev V. Gupta, Flemington, N.J., assignor to Integrated Network Corporation, Bridgewater, N.J.

Filed Apr. 9, 1987, Ser. No. 36,293
Int. Cl.[4] H04L 27/00
U.S. Cl. 375—37 **22 Claims**



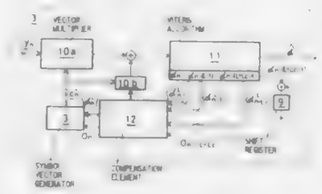
1. A method for formatting a series of data bits originally generated at a rate of 19.2 kbps for re-transmission at a rate of 64 kbps comprising the steps of:
(a) formatting said series of data bits into words of forty bit length; each word being divided into five bytes of 8 bits length; and wherein
(i) the first byte in a word comprises the sequence of a first framing bit, followed by six bits of said bit signals, followed by a first control bit;
(ii) the second byte in a word comprises the sequence of a second framing bit, followed by six more bits of said bit signals, followed by a second control bit;
(iii) the third byte in a word comprises a first set of 8 parity bits;
(iv) the fourth byte in a word comprises a second set of 8 parity bits; and
(v) the fifth byte in a word comprises a framing byte of 8 bits length;
(b) transmitting said words at a bit rate of 64 kbps such that the time duration of 12 of the original bits is the same duration for 40 of the reformatted bits when transmitted at 64 kbps.

4,862,481

SIGNAL TRANSMISSION PROCESS

Dacfey Dzung, Wettingen, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed May 20, 1988, Ser. No. 196,494
Claims priority, application Switzerland, May 25, 1987, 2011/87
Int. Cl.[4] H04L 27/10
U.S. Cl. 375—57 **4 Claims**



1. A signal transmission process transmitting digital data from a transmitter to a receiver according to a continuous phase modulation method, comprising the steps of:
(a) converting digital data which are present as a sequence of symbols α_k, which symbols have a given time interval T and may assume M values, into a symbol vector c_k or M^L components;
(b) converting said symbol vector c_k into a time-dependent scalar envelope signal v(t) using a baseband filter having a characteristic r(t) of M^L components, where

$$v(t)=\sum_{K=-\infty}^{+\infty} c_k' r(t-kT);$$

(c) phase modulating a carrier wave according to the envelope signal v(t) and transmitting said modulated carrier wave to a receiver via a channel with a given unit pulse response $h_c(t)$, an additive, white Gaussian noise w(t) being superimposed, so that at a receiver the envelop signal v(t) is transformed into a signal y(t) of the form

$$y(t)=h_c{}^{*}v(t)+w(t),$$

where "*" denotes a convolution product;
(d) demodulating said carrier wave into said signal y(t);
(e) filtering said signal y(t) by a channel specific filter of the form $h_c{}^{*}(-t)$ for getting sufficient statistics in a subsequent sampling step;
(f) filtering said filtered signal y(t) by an adjoined baseband filter of M^L components of the form

$$r^{30}(-t),$$

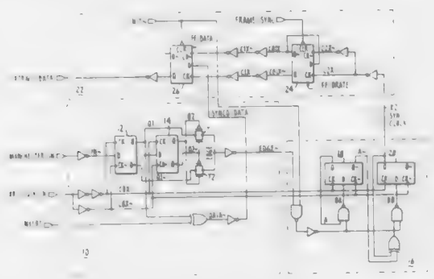
wherein "+" denotes conjugate complex;
(g) sampling the filtered signal produced by step (f) after the adjoined baseband filter at points of time kT, where k denotes an integer; and
(h) determining, based on the sampled filtered signal produced by step (g), a sequence of estimated symbols α_k by an optimization algorithm.

4,862,482

RECEIVER FOR MANCHESTER ENCODED DATA

Paul J. Patchen, Arlington, Tex., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 16, 1988, Ser. No. 207,772
Int. Cl.[4] H03M 5/12
U.S. Cl. 375—87 **5 Claims**



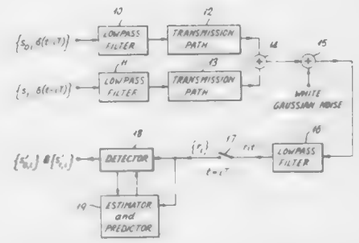
1. A receiver for extracting binary data from a Manchester-encoded input signal having a predetermined bit cell rate utilizing an input sampling clock having a frequency that is an integer multiple of the bit cell rate of the input signal, the receiver comprising:
(a) means for generating a pulsed signal that pulses in correspondence to midbit transitions of the input signal, comprising:
(i) a first D-type flip-flop that receives the input signal as its data input and is clocked by the input sampling clock;
(ii) a second D-type flip-flop that receives the output of the first flip-flop as its data input and is clocked by the input sampling clock such that each rising edge of the input sampling clock places new data in the first flip-flop while the prior data of the first-flop is placed in the second flip-flop; add
(iii) means responsive to the outputs of the first and second flip-flops for generating the pulsed signal when the logic state of the output of the first flip-flop differs from the logic state of the output of the second flip-flop;
(b) means for sampling the input signal at the frequency of the input sampling clock to provide a synchronized data signal having a first bit cell half and a second bit cell half;
(c) means for recovering a data sampling clock from the pulsed signal;
(d) means for sampling the first bit cell half of the synchronized data signal to provide an output data signal having the logic state of the first bit cell half; and
(e) means responsive to the output data signal for providing an extracted binary data signal.

4,862,483

CHANNEL ESTIMATION AND DETECTION FOR DIGITAL COMMUNICATION SYSTEMS

Adrian P. Clark, Loughborough, England, assignor to National Research Development Corporation, London, England

Filed Apr. 14, 1987, Ser. No. 38,351
Claims priority, application United Kingdom, Apr. 21, 1986, 8609711
Int. Cl.[4] H04L 27/00
U.S. Cl. 375—94 **18 Claims**



1. A method of channel estimation and detection at a receiver, comprising the steps, carried out for each of sample instants, of:
receiving over a communication channel a digital sample which is dependent on one or more of the most recently transmitted data symbols of a series of transmitted data symbols,
expanding each of a first number k of stored first vectors, each representing a different possible received sequence of a second number n of data symbols by means of n components, into a third number m of second vectors by adding for each of possible second vectors a further component representing a respective combination of data symbols which could be received at that sample instant and selecting as the m second vectors those of the possible vectors which represent the data-symbol sequences most likely to have been received as derived from the received sample and one of a fourth number j of stored predictions of the channel for the current sample instant,
determining costs, of a type where a lower cost is indicative of a higher likelihood that sequences are correct, associated with each respective second vector,
selecting that combination of data symbols represented by one component of a second vector having a relatively low cost as the detected data symbol,
selecting k second vectors with relatively low costs, and storing the selected vectors and their associated costs, and
forming and storing j new predictions of the channel for the next sample instant, the new predictions representing the attenuation and phase change introduced into the signal by the channel, each prediction using the current sample,

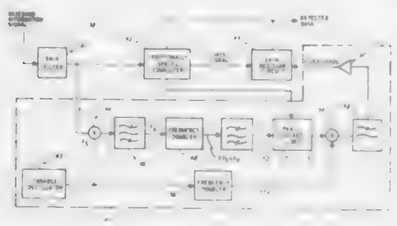
and a respective one of the j stored predictions of the channel for the current sample instant.

4,862,484

APPARATUS FOR CLOCK RECOVERY FROM DIGITAL DATA

Richard D. Roberts, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 21, 1988, Ser. No. 146,530
Int. Cl.⁴ H04L *7/02*
U.S. Cl. 375—110 **13 Claims**



12. A data detector responsive to a baseband information signal having a data rate R, for producing a detected signal, said data detector comprising:

means for providing an oscillating signal having a frequency f;

first mixer means having a first input terminal responsive to the baseband information signal and a second input terminal responsive to said oscillating signal;

wherein said mixer means produces a first mixed signal centered at a frequency of the baseband information signal frequency plus f, and a second mixed signal centered at a frequency of the baseband information signal frequency minus f;

first filter means for removing said second mixed signal;

means for filtering said first mixed signal to extract the spectral line signal at f+R/2;

a nonlinear device responsive to said spectral line signal for doubling the frequency thereof, to produce a doubled-frequency signal;

zonal bandpass filter means responsive to said doubled-frequency signal for attenuating unwanted frequency components therein;

a phase-locked loop responsive to the filtered double-frequency signal for extracting the spectral line at the frequency 2f+R,

a fractionally-spaced equalizer responsive to the baseband information signal for time-shifting the baseband information signal and for producing a correction signal, wherein said correction signal is input to said phase-locked loop for changing the phase of the spectral line at 2f+R;

frequency doubling means responsive to said oscillating signal for producing a doubled oscillating signal;

second mixer means having a first input terminal responsive to said spectral line at 2f+R and a second input terminal responsive to said doubled oscillating signal, for producing a third mixed signal centered at a frequency of 2f+2f+R and a fourth mixed signal centered at a frequency of 2f−2f+R;

second filter means for attenuating said third mixed signal;

wherein said fourth mixed signal has a frequency R and represents the recovered clock signal;

comparator means responsive to the recovered clock signal for shaping the edges thereof.

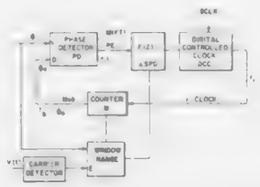
data decision means having a first input terminal responsive to the recovered clock signal and a second input terminal responsive to the time-shifted baseband information signal for producing the detected signal.

4,862,485

QUOTIENT PHASE-SHIFT PROCESSOR FOR DIGITAL PHASE-LOCKED-LOOPS

Jesus Guinea, Santa Clara, and Hee Wong, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 14, 1987, Ser. No. 108,371
Int. Cl.⁴ H03L *7/06*
U.S. Cl. 375—120 **9 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 31 Pages)



1. A quotient digital phase locked loop, comprising:

(a) binary phase detector means which compares an incoming signal to an internally-generated baud clock signal to provide a phase error bit sequence which indicates whether the phase of the incoming signal is early or late with respect to the phase of the baud clock signal; and

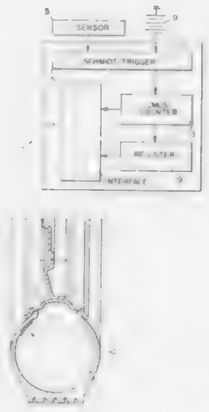
(b) a digital controlled clock which integrates the phase error bit sequence to effect nonperiodic phase manipulation of the baud clock signal.

4,862,486

REVOLUTION COUNTER ATTACHED TO TIRES

J. Keith Wing, Rte. 1, Merry Oak Ter., Piedmont, S.C. 29673; E. Lamar Sheppard, 232 Kings Way, Clemson, S.C. 29631, and William L. Willis, P.O. Box 349, Clemson, S.C. 29633

Filed Nov. 16, 1987, Ser. No. 121,401
Int. Cl.⁴ B60C *23/06;* **G01C** *22/00*
U.S. Cl. 377—16 **6 Claims**



1. An apparatus for mounting upon a flexible tire to count tire revolutions comprising:

a piezoelectric sensor with means for securely mounting on the flexing portion on the inside wall of said tire;

a counter circuit which receives input from said sensor when said sensor is stressed by the flexing of said tire to count the number of deflections thereof; and

a battery which powers said counter circuit;

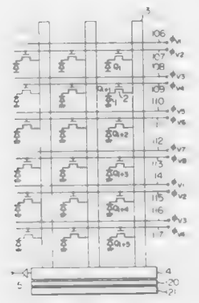
whereby revolutions are counted and stored in an automotive and truck tire.

4,862,487

SOLID-STATE IMAGING DEVICE

Haruhisa Ando, Tokyo; Masaaki Nakai, Tokorozawa; Hideyuki Ono, Kokubunji; Toshifumi Ozaki, Koganei; Shinya Ohba, Kanagawa, and Norio Koike, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 6, 1988, Ser. No. 178,197
Claims priority, application Japan, Apr. 8, 1987, 62-84736
Int. Cl.⁴ G11C *19/28;* **H01L** *29/78;* **H03K** *3/42;* **H04N** *3/14*
U.S. Cl. 377—58 **9 Claims**



1. A solid-state imaging device, comprising:

photoelectric conversion elements arrayed two-dimensionally on a major surface of a semiconductor substrate;

vertical charge transfer means for transferring signal charges from the photoelectric conversion elements disposed in vertical arrays;

select gate means for taking out the signal charge from said photoelectric conversion elements to said vertical charge transfer means; and

horizontal charge transfer means for transferring the signal charges from said vertical charge transfer means to an output end in a predetermined sequence;

wherein signal charge transfer from said photoelectric conversion elements to said vertical charge transfer means is carried out at least twice during one field period, said vertical charge transfer means transferring the received signal charges independent of one another.

4,862,488

DEVICE FOR MEASURING THE ORIENTATION OF BULK MONOCRYSTALLINE MATERIALS USING THE LAUE METHOD

Claude Schiller, Savigny-sur-Orge, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 20, 1987, Ser. No. 17,391
Claims priority, application France, Mar. 18, 1986, 86 03818
Int. Cl.⁴ G01N *23/20*
U.S. Cl. 378—81 **7 Claims**

1. A device for measuring orientation of bulk monocrystalline materials comprising

polychromatic X-ray source means for producing X-rays,

photographic film support means for supporting film,

collimator means disposed in the path of said X-rays between said source means and said film support means,

a Laue chamber containing said X-ray source means, said film support means, and said collimator means, said collimator means defining the optical axis of said Laue chamber,

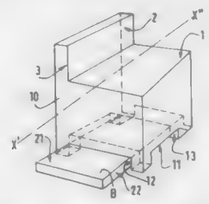
first means for supporting a bulk specimen,

second means for aligning said Laue chamber and said first means, and

third means for determining orientation of said bulk specimen relative to crystallographic axes,

wherein said first means includes at least one specimen carrier means for carrying said bulk specimen, said specimen carrier means comprising a first planar surface to receive said bulk specimen and a second planar surface perpendicular to said first planar surface to immobilize said bulk specimen,

wherein said specimen carrier means further comprises a first reference planar surface parallel to said first planar surface, a second reference planar surface parallel to said second planar surface, and a third reference planar surface



perpendicular to both said first reference planar surface and said second reference planar surface,

wherein said second means includes an optical bench comprising at least two planar reference faces, said at least two planar reference faces being parallel to said optical axis of said Laue chamber, and

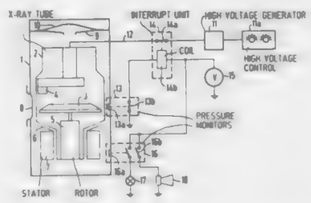
wherein said first means and said second means are disposed to provide said third means, said at least two planar reference faces of said optical bench being disposed during measurements either to be parallel to said first and second reference planar surfaces of said specimen carrier means or to be parallel to said first and third reference planar surfaces of said specimen carrier means.

4,862,489

X-RADIATOR

Guenther Appelt, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 4, 1988, Ser. No. 152,235
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 3705544
Int. Cl.⁴ H05G *1/54*
U.S. Cl. 378—117 **25 Claims**



1. An x-radiator comprising:

a housing filled with electrically insulating fluid and having a radiation exit window;

an x-ray tube disposed in said housing surrounded by said fluid and directing x-radiation through said radiation exit window, said x-ray tube generating heat during the operations thereof causing an increase in pressure of said fluid in said housing;

protection means for discontinuing operation of said x-ray tube when a monitored pressure of said fluid in said housing reaches a limit value; and

warning means separate from said protection means for generating a signal when the pressure of said fluid in said

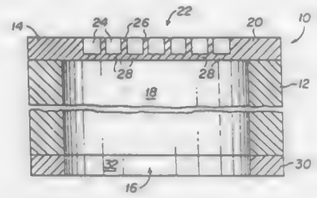
housing reaches a threshold level, said threshold level being below said limit value.

4,862,490

VACUUM WINDOWS FOR SOFT X-RAY MACHINES

Marcos Karnezos, Palo Alto, and Randal S. Jones, Los Altos, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 921,994, Oct. 23, 1986. This application Feb. 29, 1988, Ser. No. 162,107
Int. Cl.[4] G21K *1/00*
U.S. Cl. 378—161 15 Claims



1. A vacuum window for an x-ray device comprising:
support means provided with an aperture;
a membrane covering said aperture and being supported from said support means and said membrane having a window portion aligned with said aperture, where said window portion includes a plurality of pane sections which are relatively transparent to soft x-rays and a plurality of rib sections separating said pane sections; and
wherein said rib and pane sections are made of the same material.

4,862,491

REMOTE DISCONNECTION AND SHORT-CIRCUITING APPARATUS AND METHOD

Roger J. La Salle, Donvale, and Roger H S Riordan, East Brighton, both of Australia, assignors to Teletech Pty. Ltd., Australia

Filed Apr. 13, 1988, Ser. No. 181,533
Claims priority, application Australia, Apr. 14, 1987, PI1473
Int. Cl.[4] H04B *3/46;* H04M *1/24*
U.S. Cl. 379—6 31 Claims



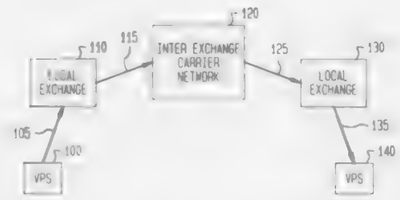
1. Apparatus for remote disconnection and short-circuiting of a pair of conductors, including:
(a) a switching unit adapted to be connected to one end of said pair of conductors, and
(b) a probe unit adapted to be connected to the other end of said pair of conductors,
said probe unit having signal generation means for generating a signal having predetermined characteristics, said signal being capable of being sent by said probe unit along said pair of conductors, said switching unit including detection means for detecting said signal, and switching means for carrying out switching operation on said pair of conductors in response to the receipt of said signal.

4,862,492

MEASUREMENT OF TRANSMISSION QUALITY OF A TELEPHONE CHANNEL

Nicholas Zwick, Denville, N.J., assignor to Dialogic Corporation, Parsippany, N.J.

Filed Oct. 26, 1988, Ser. No. 262,975
Int. Cl.[4] H04B *3/46;* H04M *3/32*
U.S. Cl. 379—6 12 Claims



1. Apparatus for measuring the transmission quality of a transmission medium connected between a sending apparatus for sending pre-defined audio signals comprised of DTMF (TOUCH-TONE) pulses and a receiving apparatus for receiving audio signals comprised of DTMF pulses and determining the value thereof, which apparatus comprises:
means for causing the sending apparatus to transmit a predetermined sequence of DTMF pulses having predetermined amplitude values over the transmission medium to the receiving apparatus;
means, responsive to the receiving apparatus, for counting the number of received DTMF pulses; and
means for comparing the number with a predetermined threshold value, whereby the transmission medium is determined to have acceptable transmission quality if the number exceeds the predetermined threshold value.

4,862,493

ELECTRONIC REMOTE DATA RECORDER FOR ELECTRIC ENERGY METERING

Krishnan Venkataraman, Dover, and Richard A. Balch, Rochester, both of N.H., assignors to General Electric Company

Filed Dec. 28, 1987, Ser. No. 119,790
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—107 5 Claims



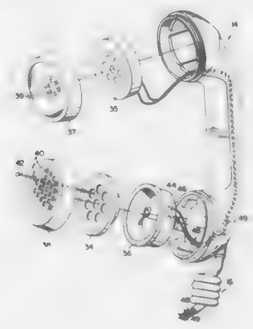
1. A power fail detector and recovery apparatus for an electronic remote data recorder, said electronic remote data recorder including a processor therein, comprising:
means for producing a power failure signal in response to a first predetermined voltage reduction in a power source to said electronic remote data recorder;
said electronic remote data recorder being responsive to said power fail signal by halting operation of said processor;
a non-volatile storage device for storing contents of said processor in said non-volatile storage upon occurrence of said power fail signal;
means for restoring operation of said processor upon a second predetermined voltage increase in said power source above said first predetermined voltage;
said means for restoring including means for comparing a pattern of said contents in said non-volatile storage with a predetermined data pattern indicating a programmed electronic remote data recorder, and for producing an enable signal when a pattern of said contents indicates that said processor has not been previously programmed; and
means responsive to said enable signal for connecting programming data from an external source to said processor for initial programming thereof.

4,862,494

ANTI-FRAUD DEVICE FOR USE WITH A COIN OPERATED TELEPHONE INSTRUMENT

Mark Matheny, 159 Deer Run Trail, Manchester, Conn. 06040

Filed Nov. 22, 1988, Ser. No. 274,830
Int. Cl.[4] H04M *17/02*
U.S. Cl. 379—145 2 Claims



1. Apparatus located internally within a telephone instrument housing for preventing fraudulent calling from a coin operated telephone instrument characterized by transmission network means for connecting the telephone instrument to a telephone subscriber line to send and receive electrical signals representative of audio and call supervision to and from the telephone line, the telephone instrument further including a transmitting element for converting audio signals into electrical signals, a receiving element for converting electrical signals into audio signals and a touch-tone dial keypad, wherein said fraudulent calling is initiated by the telephone user introducing a "tip-to-ground" fraud condition to defeat detection of a coin collect supervisory signal generated by associated coin collection telephone supervisory circuits located in a telephone office serving the coin operated telephone instrument, said apparatus comprising:
relay circuit means having first and second transfer contracts arranged in series with the transmitting element for electrically connecting and disconnecting the transmitting element to and from the telephone subscriber line;
means coupled to the telephone line for sensing an "ON-HOOK" and "OFF-HOOK" condition at the telephone instrument and for generating an electrical signal representative of said "ON-HOOK" and said "OFF-HOOK" condition;
timing pulse generating means responsive to said "ON-HOOK" - "OFF-HOOK" sensing means for producing a voltage pulse signal at predetermined timed intervals in response to the sensing of an "OFF-HOOK" condition;
means coupled to the touch-tone dial keypad for sensing the activation of any of the buttons associated with the keypad and used in dialing a telephone number;
first counting circuit means coupled to said dial keypad sensing means for counting the number of keypad activations after sensing an "OFF-HOOK" condition, said counter having an output and producing a voltage signed at its output after counting a predetermined number of keypad activations;
means coupled to the transmitting element for sensing the presence of an electrical ground potential between the transmitting element and the telephone instrument and for producing a voltage signal representative of the presence of the electrical ground potential at the transmitting element when said potential is present;
second counting circuit means coupled to said ground sensing means for counting the number of occurrences of the presence of electrical the ground potential, said second counting circuit means having a reset input for receiving a reset voltage signal to restart a count from zero, said reset input being coupled to said timing pulse generating means for receiving said predetermined timed interval voltage pulse signal, said second counting circuit means having an output and producing an output voltage signal in response to counting a predetermined number of grounding occurrences during the time interval between successive predetermined timed interval voltage pulse signals;
circuit logic means having an output and a plurality of inputs and arranged to produce an output voltage upon the presence of a voltage signal at any one of said plurality of inputs, a first of said inputs being coupled to said "ON-HOOK" - "OFF-HOOK" sensing means, a second of said inputs being coupled to the output of said first counting means, a third of said inputs being coupled to the output of said second counting circuit means;
first relay driving means coupled to the output of said circuit logic means and having an output coupled to said relay circuit means for causing said first relay driving means to produce an output voltage signal in response to the sensing of an "ON-HOOK" to "OFF-HOOK" condition of the telephone instrument to set said relay circuit means to operate said first and second transfer contacts to electrically connect the transmitting element to the telephone subscriber line, and
second relay driving means coupled to the output of said circuit logic means and having an output coupled to said relay circuit means for causing said second relay driving means to produce an output voltage signal in response to the sensing of any one of a number of conditions including the sensing of an electrical ground potential between the transmitting element and the telephone instrument, the activation of said touch-tone dial keypad and the change from an "OFF-HOOK" to an "ON-HOOK" condition of the telephone instrument to reset said relay circuit means to operate said first and second transfer contacts to electrically disconnect the transmitting element from the telephone subscriber line.

4,862,495

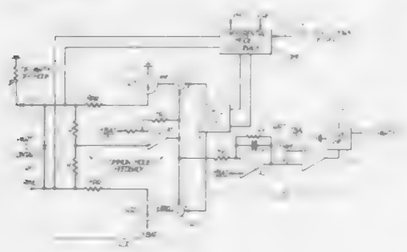
TELECOMMUNICATIONS SUBSCRIBER LINE INTERFACE CIRCUIT AND PARTY IDENTIFICATION FACILITY

Michael E. Stibila, Winter Park, Fla., assignor to GEC Plessey Telecommunications, LTD., Coventry, United Kingdom

Filed Apr. 22, 1988, Ser. No. 184,860
Int. Cl.[4] H04M *15/36*
U.S. Cl. 379—183 1 Claim

1. A telecommunications central office including a telecommunications subscriber line interface circuit and party identification facility, comprising:
a differential mode feedback circuit having a feed shut down control input, and arranged to monitor a ring line and a tip line, and generate a current output which is applied to a converter to generate a voltage output,
a first amplifier arranged to monitor the ring and tip lines and generate an output which is proportional to a common-mode current flowing in the ring and tip lines when the subscriber line interface circuit is in a feed shut down mode as dictated by the output from differential mode feedback circuit,
a second amplifier arranged to receive the output from the first amplifier and amplify a direct current component of the output from the first amplifier and attenuate the alter-

nating current component of the output from the first amplifier, and,



a comparator arranged to receive the amplified direct current component and compare it witl a reference voltage to determine if the tip party is off-hook.

4,862,496

ROUTING OF NETWORK TRAFFIC

Francis P. Kelly; Richard J. Gibbens, both of Cambridge; Peter B. Key, Woodbridge; Paul A. Turton, London; Roger R. Stacey, Basingstoke, and Martin J. Whitehead, Woodbridge, all of England, assignors to British Telecommunications public limited company, Great Britain

Filed Dec. 16, 1986, Ser. No. 942,323

Claims priority, application United Kingdom, Dec. 18, 1985, 8531136

Int. Cl.[4] H04M *7/00*

U.S. Cl. 379—221 **27 Claims**



11. A method of routing traffic in a circuit-switched network, said method comprising:

offering calls between an origin node and a destination node to one of a plurality of routes,

wherein calls are and continue to be offered to one or more current nominated routes until the or one of said current nominated routes is not available, at which point a replacement nomination for the unavailable current nominated route is made from a set of said routes,

a current nominated route being an alternative route which the origin node immediately offers to a call blocked on previously offered routes.

15. A method of routing traffic in a circuit-switched network, comprising:

offering calls between an origin node and a destination node to one of a plurality of routes,

wherein calls are offered to one or more current nominated routes until the or one of said current nominated routes is not available, at which point a replacement nomination for the unavailable current nominated route is made from a set of said routes,

wherein successive replacement nominations are made by stepping cyclically through the set of alternative routes.

4,862,497

HYBRID ALPHANUMERIC TELEPHONE DIRECTORY

Raymond A. Seto, Nepean, and Marc P. Soubliere, Mississauga, both of Canada, assignors to Telequest Systems Corporation, Ottawa, Canada

Filed Dec. 17, 1987, Ser. No. 134,141

Claims priority, application Canada, Dec. 30, 1986, 526464

Int. Cl.[4] H04M *1/272*

U.S. Cl. 379—355 **17 Claims**



1. A hybrid alphanumeric directory comprising, in combination: a portable notebook having a plurality of bound pages which can be opened to expose a desired page, each page having a plurality of writing areas in the same relative positions where alphanumeric information can be entered, and an electronic memory attached to said notebook for electronically storing data associated respectively with each writing area; and a base unit comprising an electronic control unit, a receiving surface on which said notebook can be located, fastening means for detachably fastening said notebook to said receiving surface, means for establishing electrical connection between said control unit and said electronic memory attached to said notebook, a plurality of actuators associated with said respective relative positions when said notebook is fastened to said base unit on said receiving surface, means for indicating which page is exposed, and means responsive to an output from said indicating means to associate said actuators with the respective data associated with the writing areas of the exposed page, whereby actuation of one of said actuators initiates an operation dependent on the stored data associated with the writing area associated with said one actuator

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4,862,498

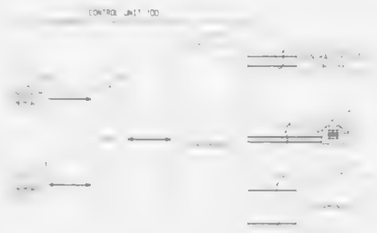
METHOD AND APPARATUS FOR AUTOMATICALLY SELECTING SYSTEM COMMANDS FOR DISPLAY

Adam V. Reed, Manalapan, N.J., assignor to AT&T Information Systems, Inc., New York, N.Y.

Filed Nov. 28, 1986, Ser. No. 935,799

Int. Cl.[4] H04M *1/27*

U.S. Cl. 379—355 **9 Claims**



1. Telephone dialing apparatus for use with a telephone communication system for enabling a user to select a telephone dialing command for input to and execution by said system, said apparatus comprising

means for identifying each telephone dialing command of a group of telephone dialing commands inputted into said system,

means responsive to said identifying means for counting the number of times each telephone dialing command is identified,

table memory means responsive to any change in the count of said counting means for listing a plurality of frequently identified telephone dialing commands which have the highest accumulated count, and

selection means operable by said user for selecting one of said plurality of frequently identified telephone dialing commands from said table memory means for input to said system.

4,862,499

DEFORMABLE MEMBRANE KEYPAD ASSEMBLY FOR PUBLIC TELEPHONES

David E. Jekot, Cumming, Ga., and Harold W. Jordan, Homosassa, Fla., assignors to Phillips & Brooks, Inc., Cumming, Ga.

Filed Sep. 4, 1987, Ser. No. 93,045

Int. Cl.[4] H01H *3/32*

U.S. Cl. 379—368 **7 Claims**



1. In a telephone keypad assembly comprising a plurality of keypad pushbuttons, each of said pushbuttons including a cylindrical recess on an ainterior facing side, each of said pushbuttons including an annular surface positioned coaxially with said cylindrical recess, a housing unit with an openings region comprising a plurality of openings for osupport of individual ones of said keypad pushbuttons and including a sealing surface around a periphery of said openings region, and electrical contacts forming a part of a telephone electrical circuit in response to selective depression of one of said keypad pushbuttons, an improved sealing and circuit actuation membrane, comprising:

an upper surface for mating with said interior facing side of said keypad pushbuttons and said sealing of said housing unit, and a lower surface;

said upper surface defining a plurality of raised areas and including a peripheral edge portion for mating with said sealing surface of said housing unit;

each of said raised areas defining a dome, a cylindrical collar disposed on top of said dome for mating with said annular surface of said pushbuttons, and a cylindrical alignment protrusion extending from said cylindrical collar for mating with said cylindrical recesses in said pushbuttons;

said lower surface defining a plurality of well areas corresponding to said plurality of raised areas in said upper surface;

each of said well areas including a contact actuator extending perpendicularly to said lower surface;

each of said contact actuators having an electrically conductive material disposed at the distal end thereof for contacting said electrical contacts for completing said telephone electrical circuit when said pushbuttons are depressed; and

said well areas and said raised areas forming biasing means for urging each of said raised areas away from said electrical contacts when said pushbuttons are released.

4,862,500

TELEPHONE JACK LOCK-OUT PLUG

Donald M. May, Newhall, Calif., assignor to May Engineering Company, Newhall, Calif.

Filed May 16, 1988, Ser. No. 194,105

Int. Cl.[4] H04M *1/66*

U.S. Cl. 379—445 **5 Claims**



1. A lock-out plug for preventing use of a telephone outlet jack including a jack receptacle having a cavity with a side wall at one side thereof, said lock-out plug comprising:

a plug fitting having a size and shape for relatively snug sliding fit reception into the jack receptacle, said plug fitting having a threaded bore formed therein to extend generally transversely therethrough, said bore being angularly set in a position such that one end of said bore opens within said jack receptacle adjacent said side wall when said plug fitting is received into the jack receptacle, and the other end of the bore opens to the exterior of the jack receptacle when said plug fitting is received into the jack receptacle; and

a lock member carried by said plug fitting for movement between a first position permitting said plug fitting to be inserted into and withdrawn from said jack receptacle, and a second position extending into binding engagement with said side wall of the jack receptacle when said plug fitting is received into the jack receptacle to prevent removal of said plug fitting from the jack receptacle.

4,862,501

COMMUNICATIONS NETWORK USING IC CARDS

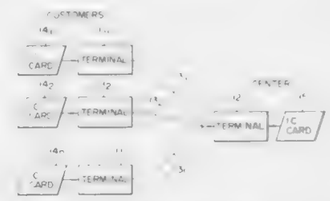
Takashi Kamitake, Tokyo; Hiroyuki Mizutani, and Shin-ichi Kawamura, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 4, 1986, Ser. No. 836,163

Claims priority, application Japan, Mar. 8, 1985, 60-46012

Int. Cl.[4] H04K *3/00*

U.S. Cl. 380—50 **12 Claims**



1. A communication system comprising:

a first communicating terminal and a second communication

terminal coupled to each other through a communication line; and

first and second integrated circuit card devices adapted for coupling with said first and second communication terminals, respectively;

said first integrated circuit card device comprising first integrated circuit means for enciphering each of first kinds of messages supplied from said first communication terminal for transmission to said second communication terminal over said communication line, and a nonerasable integrated circuit memory, coupled to said first integrated circuit means, which can be accessed from outside of said first integrated circuit card device for readout, said first integrated circuit means being arranged to automatically store each of the first kinds of messages in said nonerasable integrated circuit memory;

said second integrated circuit card device comprising second integrated circuit means for deciphering each of the enciphered first kinds of messages transmitted from said first communication terminal and supplied from said second communication terminal;

wherein said second integrated circuit means further comprises means for enciphering each of second kinds of messages supplied from said second communication terminal, and wherein said first integrated circuit means comprises means for deciphering each of the enciphered second kinds of messages transmitted from said second communication terminal to said first communication terminal and supplied from said first communication terminal and to automatically store each of the second kinds of messages deciphered by said first integrated circuit means in said nonerasable integrated circuit memory.

4,862,502

SOUND REPRODUCTION

David H. Griesinger, Cambridge, Mass., assignor to Lexicon, Inc., Waltham, Mass.

Filed Jan. 6, 1988, Ser. No. 141,212
Int. Cl.[4] H04S *3/00*
U.S. Cl. 381—22 19 Claims



1. A directionality enhancement system for converting encoded stereo signals on input channels A and B into four signals on left, center, right and surround output channels, respectively, comprising:

means for attentuating the input signal on the A input channel as a function of the difference of the logs of the signals on the A and B input channels to produce a first attentuated signal,

means for attenuating the input signal on the B input channel as a function of the difference of the logs of the signals on the A and B input channels to produce a second attenuated signal,

means for obtaining the sum of the input signals on the A and B input channels, means for obtaining the difference of the input signals on the A and B input channels;

means for attenuating said sum of the input signals on the A and B input channels as a function of the difference of the logs of the sum and difference of the signals on the A and B input channels to produce a third attenuated signal,

means for attenuating said difference of the signals on the A and B input channels as a function of the difference of the logs of the sum and difference of the signals on the A and B input channels to produce a fourth attenuated signal, and

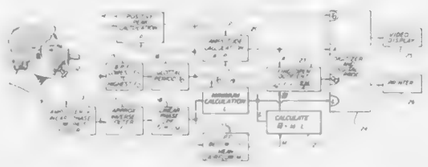
means for combining the signal on the A input channel, the signal on the B input channel, the sum of the signals on said A and B input channels, the difference of the signals on the A and B channels, and said first, second, third and fourth attenuated signals to produce left, center, right and surround outputs.

4,862,503

VOICE PARAMETER EXTRACTOR USING ORAL AIRFLOW

Martin Rothenberg, Dewitt, N.Y., assignor to Syracuse University, Syracuse, N.Y.

Filed Jan. 19, 1988, Ser. No. 145,295
Int. Cl.[4] G10L *7/10*
U.S. Cl. 381—48 19 Claims



10. Apparatus for extracting voice parameters from oral or combined oral and nasal air flow produced during voiced speech, comprising

a pneumotachographic instrument into which a patient pronounces a voiced vowel and having an output that produces an output signal representing a volume velocity airflow waveform for the voiced vowel including a signal component that represents the mean air flow;

low pass filter means having an input coupled to said penumotachographic instrument output which filters said output signal to produce a prefiltered waveform in which frequencies higher than the first formant frequency of the pronounced vowel are suppressed;

signal processing means having inputs to receive the prefiltered waveform and which derives therefrom a peak value P, minimum value L, glottal wave period T_0, and mean air flow value M for a glottal waveform;

calculating means input with values P, L, T_0, and M for finding an amplitude A of the glottal waveform from the relationship $A=P-L$; and for finding a wave center value $\overline{M}$ from the relation $\overline{M}=M-L$;

calculating means for finding an open quotient Q_0 which represents the ratio $Q_0=B/T_0$, where B is the open portion of the glottal wave period in which the patient's glottis is open and T_0 is the entire glottal wave period, wherein the open quotient Q_0 is a function of the amplitude A and wave center value $\overline{M}$; and

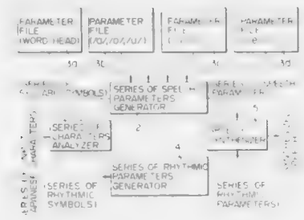
means for presenting a record of the values T_0, P, L, and Q_0 of the patient.

4,862,504

SPEECH SYNTHESIS SYSTEM OF RULE-SYNTHESIS TYPE

Norimasa Nomura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 2, 1987, Ser. No. 167
Claims priority, application Japan, Jan. 9, 1986, 61-2481
Int. Cl.[4] G10L *5/02*
U.S. Cl. 381—51 5 Claims



1. A speech synthesis system comprising:

a character analyzing means for analyzing a series of input characters to generate a series of syllabic symbols and a series of rhythmic symbols according to the series of input characters;

a plurality of parameter file means for storing speech parameters determined by taking into consideration an influence of immediately preceding vowels of the syllabic symbols;

a speech parameter generating means for generating a series of speech parameters by combining speech parameters obtained from said parameter file means in accordance with a determined vowel immediately preceding a syllabic symbol of said series of syllabic symbols;

rhythmic parameter generating means for generating a series of rhythmic parameters according to the series of rhythmic symbols supplied from said character analyzing means; and

a speech synthesizing means for synthesizing said series of speech parameters and said series of rhythmic parameters.

4,862,505

AUDIOMETER WITH INTERACTIVE GRAPHIC DISPLAY FOR CHILDREN

William J. Keith, 16 Paris Place, Birkenhead, Auckland; Michael Parsons, 6 Hurunui Street, Cashmere, Christchurch; Russell P. Smith, 14 View Terrace, Huntsbury, Christchurch; Christopher J. Glenn, 5 Titoki Street, Fendalton, Christchurch, and Stephen Bell, 131 Major Hornbrook Rd., Mt. Pleasant, Christchurch, all of New Zealand

Filed Oct. 23, 1987, Ser. No. 113,220
Claims priority, application New Zealand, Oct. 23, 1986, 218051
Int. Cl.[4] H04R *29/00*
U.S. Cl. 381—60 3 Claims

1. An audiometer for use with young children comprising:

(a) a frequency and level programmable tone generator;

(b) an electric-acoustic transducer driven by said tone generator to supply sound to the child whose hearing is being tested;

(c) a two-state response switch operated by the child in response to detected acoustic tones;

(d) a microprocessor having input-output ports to which the response switch and tone generator are connected;

(e) a video display unit for viewing by the child;

(f) a graphics controller which drives said display unit connected to a further input-output port of said microprocessor;

said microprocessor being programmed to cause a first picture sequence to be displayed, to activate said tone generator at predetermined frequencies and levels, including levels deliberately inaudible to the child, and to alter the first picture sequence to a more favorable picture sequence upon detecting a change of state of the response device within a time window subsequent in time to each tone period.



4,862,506

MONITORING, TESTING AND OPERATOR CONTROLLING OF ACTIVE NOISE AND VIBRATION CANCELLATION SYSTEMS

Harris B. Landgarten, Douglaston, N.Y., and Eldon W. Ziegler, Columbia, Md., assignors to Noise Cancellation Technologies, Inc., Columbia, Md.

Filed Feb. 24, 1988, Ser. No. 159,908
Int. Cl.[4] H03B *29/00*; H04B *15/00*
U.S. Cl. 381—71 35 Claims



1. Vibration cancellation and monitoring system comprising:

input means for receiving sensed vibration signals from vibration sensors and generating input vibration signals;

output means for receiving output vibration signals and generating a vibration cancellation actuator signal for a vibration actuator;

transfer means for deriving a transfer function from said input vibration signals from said input means and generating output vibration signals for said output means as a function of said transfer function; and

display means for displaying more than one of the following:

said input vibration signals, said transfer function and said output vibration signals.

4,862,507

MICROPHONE ACOUSTICAL POLAR PATTERN CONVERTER

Alan P. Woodard, Chicago, Ill., assignor to Shure Brothers, Inc., Evanston, Ill.

Filed Jan. 16, 1987, Ser. No. 3,721
Int. Cl.[4] H04R *1/20*
U.S. Cl. 381—155 4 Claims



1. A microphone apparatus comprising a microphone having a microphone element with an acoustical polar pattern which is substantially cardioid about a principal axis, and an acoustical polar pattern converter including a converter body with an annular body portion having a plurality of ports, the convertor attached to the microphone with the converter body proximate to the microphone element and the angular body portion aligned along the principle axis, the converter causing the acoustical polar pattern of the microphone to be substantially supercardioid about the principle axis;

the annular body portion formed of an open pore material, said open pore material being porous plastic with a pore size of approximately 70 microns, the pores of the open pore material being the ports of said annular body portion;

said annular body portion defining a central cavity within said annular body portion, the central cavity extending along and centered on the principle axis of the microphone; and

the converter having an end cap, the end cap closing the converter body remote from the microphone element.

4,862,508

METHOD FOR LARGE-SCALE MULTIPLE SOURCE SOUND REINFORCEMENT

John Lemon, Shipbottom, N.J., assignor to U.S. Sound, Inc., Philadelphia, Pa.

Filed Jun. 10, 1987, Ser. No. 61,099
Int. Cl.[4] H04R *1/00*
U.S. Cl. 381—156 18 Claims

1. An improved method for transmitting sound at high power levels over a wide angle zone of dispersion without distortion, comprising the steps of:

emitting sound waves from a plurality of individual sources, each source having a constant acoustic power output at a predetermined angle of divergence and over a predetermined frequency range covering substantially a full audio range of frequencies above approximately 125 to 500 Hz, the sources being of a constant-directivity type and characterized by a relatively narrow, wedge-shaped envelope of sound projection with an angle of sound dispersion not more than approximately forty degrees; and,

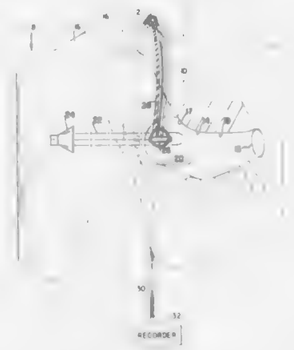
positioning the plurality of said individual sources in side-by-side relationship so that adjacent edges of respective sound projection envelopes are in substantial alignment and do not overlap, whereby the absence of interference between sounds emitted from any of the sources preclude sound distortion and enables sound dispersion and high sound quality throughout the zone.

4,862,509

PORTABLE RECORDING SYSTEM FOR TELEPHONE CONVERSATIONS

Marvin S. Towsend, Rockville, Md., assignor to Genvention, Inc., Rockville, Md.

Continuation-in-part of Ser. No. 107,193, Oct. 13, 1987, abandoned. This application Nov. 2, 1987, Ser. No. 115,857
Int. Cl.[4] H04M *1/21*; H04R *1/10*
U.S. Cl. 381—163 32 Claims



18. A microphone holder for a microphone small enough to be entirely located in an air space defined by the inner surface of a pinna of an ear of the listener thereby permitting a telephone earpiece to be placed against the pinna without touching the microphone, the microphone being connected to an audio recorder used by a listener, said microphone holder comprising:

means for retaining the microphone entirely in the air space defined by the inner surface of the pinnar of the ear of the listener near the auditory meatus of the listener, said microphone retaining means being supported by the head of the listener.

4,862,510

LEAD SENSE SYSTEM FOR COMPONENT INSERTION MACHINE

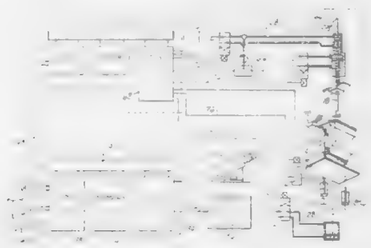
Robert J. Duncan, Magnolia, and Jean A. McLean, South Hamilton, both of Mass., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 24, 1987, Ser. No. 29,834
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—8 3 Claims

1. A system for verifying the proper insertion of a row of leads of an electronic component such as a DIP into a printed circuit board prior to securing the leads to the board comprising:

camera means including a plurality of photosensitive binary elements arranged in horizontal rows to define a two-dimensional array, such elements having a one value when the image sensed is dark and having a zero value when the image sensed is light,

means for locating the image of each lead having an area of about three photosensitive elements wide by about eight photosensitive elements high within a corresponding discrete window of photosensitive elements defined by about eight consecutive horizontal rows of such photosensitive elements each row having about eight photosensitive elements, thus providing a window of about eight vertical rows by about eight horizontal rows,



means for determining whether each of the component leads is present, including:

means for ascertaining whether a selected plurality of consecutive photosensitive elements in one of the vertical rows of photosensitive elements defining each window have a one value indicating that a lead is present,

means for defining the value of a given photosensitive element from a zero value to a one value when the value of the horizontally adjacent photosensitive element in the next vertical row has a one value, and

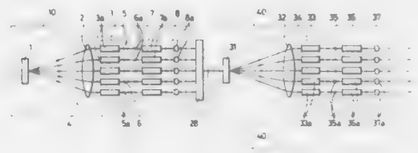
means for verifying the presence of a lead when a selected number of consecutive elements in one of the vertical rows have a one value.

4,862,511

LOCAL FEATURE ANALYSIS APPARATUS

Norman A. Peppers, Belmont; James R. Young, Palo Alto; Gerald A. Pierce, Redwood City, all of Calif.; Kazuo Katsuki, Dosho, Japan, and Kazuo Katsuki, Osaka, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Jan. 15, 1987, Ser. No. 62,485
Int. Cl.[4] G06K *9/74*
U.S. Cl. 382—32 8 Claims



1. A local feature analysis apparatus comprising:

a display for displaying an input image serving as an object to be discriminated;

first multiplying means for receiving light from the input image displayed on said display and multiplying light to form a plurality of optical pattern images of a substantially identical shape for local feature extraction;

a plurality of first reference masks arranged at a position spaced by a predetermined distance apart from an image formation plane of the plurality of optical pattern images from said first multiplying means in one-to-one correspondence therewith and respectively having various types of local features as reference patterns;

first photodetecting means for simultaneously detecting lights respectively obtained through said plurality of first reference masks, the lights being obtained by optical correlation calculations between the plurality of optical pattern images and said various types of reference patterns of said plurality of first reference masks;

wherein the local features of the input image are extracted by the optical correlation calculations between the plurality of optical pattern images from said first multiplying means and said plurality of first reference masks;

a vector display having a plurality of display areas each of which corresponds to one or more components of vector corresponding to the local features extracted by the optical correlation calculations, and displaying an optical pattern image obtained by converting said vector into an image such that said components are displayed as bright lines or light spots at positions corresponding to magnitudes thereof in said display areas;

second multiplying means for multiplying the optical pattern image displayed on said vector display to obtain a plurality of optical pattern images of a substantially identical shape;

a plurality of second reference masks respectively having various types of reference patterns subjected to matching with the plurality of optical pattern images from said second multiplying means, the plurality of optical pattern images from said second multiplying means being respectively guided to said plurality of second reference masks; and

second photodetecting means for simultaneously detecting lights obtained by optical pattern matching through said plurality of second reference masks.

4,862,512

SCANNING TYPE IMAGE READING APPARATUS

Shinobu Hidaka, Sagamihara; Katsumi Miwa, Machida, and Masato Higashi, Sagamihara, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 942,280, Dec. 16, 1986, abandoned. This application Jun. 20, 1988, Ser. No. 208,791
Claims priority, application Japan, Dec. 20, 1985, 60-288092
Int. Cl.[4] G06K *9/20, 9/22*
U.S. Cl. 382—58 15 Claims

1. An image reading apparatus, comprising:

scanning means for an optical image;

image sensor means for converting optical image data to electric data with the scanning of said scanning means, said image sensor means including photo-electric converters aligned one-dimensionally in the direction perpendicular to the scanning direction;

signal generating means for generating serial signals every time said scanning means is driven for a predetermined distance;

outputting means for outputting said electric data from said image sensor means in response to said signals generated by said signal generating means;

detecting means for detecting the driving speed of said scanning means at every said predetermined distance;

correcting means for correcting said electric data output by said outputting means in accordance with the driving speed detected by said detecting means;

comparator means for comparing said detected speed with a predetermined speed;

compensating means for compensating said output data to indicate higher image when said comparator mans judges

that said speed is larger than the predetermined speed, and for compensating said output data to indicate lower den-



sity image when said comparator means judges that said detected speed is less than said predetermined speed.

4,862,513

RADIO RECEIVER WITH TWO DIFFERENT TRAFFIC INFORMATION DECODERS

Peter Bragas, Hildesheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 1, 1988, Ser. No. 162,607

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1987, 3709523

Int. Cl.[4] H04B *1/06*

U.S. Cl. 455—45 **16 Claims**



1. Radio broadcast receiver capable of receiving traffic information modulated on any subcarrier which is in turn modulated on the broadcast carrier for receiving either of both of two different kinds of traffic information modulation that they be provided on said subcarrier, comprising:

a first traffic signal decoder (**22**) for decoding traffic information signals provided in analog modulation and said subcarrier including those designating patient and regional identification of the traffic information;

a second traffic information decoder (**28**) for decoding a digitally incoded traffic information modulated on said subcarrier by double-sideband suppressed-carrier modulation, said second decoder including speech synthesizer means for providing an output of said second decoder into a form readily convertible into intellegible audible signals;

program detection means (**20**);

means for audio frequency amplification and for converting amplified signals into audible information, suitable for connection to the respective outputs of said broadcast detection means, said first decoder and said second decoder;

automatic switch means responsive to the presence of a traffic information signal in a said decoder for disconnecting said audio frequency amplifier from said broadcast signal detector means during the presence of a traffic information signal and for leaving said audio frequency amplifier connected to said detector means in the absence of a traffic information signal, and

selector switch means both for selectively connecting as of the output of said first decoder or the output of said second decoder to said audio frequency amplifier means at least when a traffic information signal is presented on said subcarrier.

4,862,514

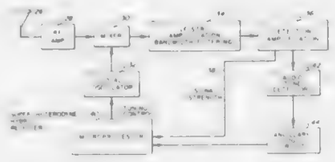
HYBRID ELECTRONIC RADIO REPEATER

Fred D. Kedjierski, Margate, Fla., assignor to World Electronics, Inc., Coral Springs, Fla.

Filed Nov. 24, 1986, Ser. No. 934,267

Int. Cl.[4] H04B *7/14*

U.S. Cl. 455—161 **20 Claims**



1. An improved hybrid electronic radio repeater, comprising:

antenna means, for receiving a select, narrow frequency band of radio wave signals;

said radio wave signals being transmitted from a source, said radio wave signals containing source status and control information;

radio frequency amplifier means, for filtering and amplifying said radio signals;

mixing means, including local oscillator means, for combining said radio frequency signals with said local oscillator signals to produce intermediate frequency signals;

tuning means for filtering, tuning, and controlling the bandpass of said intermediate frequency signals:

intermediate frequency amplifier means, for detecting and amplifying said intermediate frequency signals, and for generating a signal strength level indication in response thereto; and

control means, said control means including microprocessor means, said control means being an intelligent unit capable of discerning information and generating responses thereto, for monitoring said signal strength level indication, said control means also for initiating the scan of said narrow frequency band for the presence of select radio wave signals, said control means tuning said hybrid repeater in response to the presence of said select signals,

said control means tuning said receiver by scanning a select frequency bandwidth, reading the signal strength level indicator at each scan location, storing maximum readings at each scan frequency corresponding thereto, storing noise data corresponding to each said reading, generating and storing a signal-to-noise ratio corresponding to each said reading, and fine tuning said receiver based upon a slow scan generated in response to said signal-to-noise readings.

4,862,515

FREQUENCY DIVIDING ARRANGEMENTS

Nicholas P. Cowley, Wiltshire, England, assignor to Plessey Overseas Limited, Ilford, England

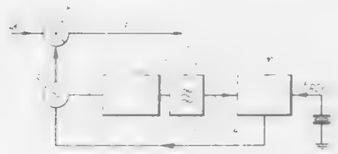
PCT No. PCT/GB86/00351, § 371 Date Apr. 9, 1987, § 102(e) Date Apr. 9, 1987, PCT Pub. No. WO87/00365, PCT Pub. Date Jan. 15, 1987

PCT Filed Jun. 18, 1986, Ser. No. 19,276

Claims priority, application United Kingdom, Jun. 25, 1985, 8516008

Int. Cl.[4] H04B *1/10*

U.S. Cl. 455—183 **4 Claims**



1. A tuner for providing an intermediate frequency signal in dependence on an input radio frequency signal and a local oscillator signal, including mixer means for mixing the input radio frequency signal with the local oscillator signal to produce the intermediate frequency signal; a frequency synthesizer generating the local oscillator signal, comprising: a voltage controlled oscillator connected to the mixer means transmitting thereto the local oscillator signal; a frequency dividing arrangement connected in a feedback loop to the voltage controlled oscillator transmitting a feedback signal therefrom; a source of a reference signal; comparison means coupled to the frequency dividing arrangement and said reference signal source for providing a control signal to the voltage controlled oscillator in dependence upon a difference between said reference signal and the feedback signal from the frequency dividing arrangement; the frequency dividing arrangement comprising a frequency divider connected to the voltage controlled oscillator and low pass filter means coupling the frequency divider to the comparison means for severely attenuating harmonic signals from the frequency divider to prevent radiation interference with establishment of the intermediate frequency signal.

4,862,516

SYSTEM FOR AUTOMATICALLY TUNING THE ANTENNA OF A MINIATURE PORTABLE COMMUNICATIONS DEVICE

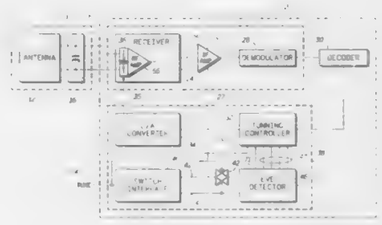
Philip P. Macnak, West Palm Beach; James S. Irwin, Ft. Lauderdale, and Walter L. Davis, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

PCT No. PCT/US87/00002, § 371 Date Feb. 27, 1987, § 102(e) Date Feb. 27, 1987, PCT Pub. No. WO88/05214, PCT Pub. Date Jul. 14, 1988

PCT Filed Jan. 2, 1987, Ser. No. 121,824

Int. Cl.[4] H04B *1/18*

U.S. Cl. 455—193 **36 Claims**



1. An antenna tuning apparatus for a portable communications device, the device including means for adapting the device to be worn on the body, and having a receiver for receiving transmitted signals including at least one tuning mode signal, said apparatus comprising:

antenna means for intercepting the transmitted signals;

antenna tuning means coupled to said antenna means for tuning the same;

receiver means, responsive to said antenna means, for receiving the transmitted signals to derive a carrier monitor signal, said receiver means further demodulating the transmitted signals to recover the tuning mode signal;

decoder means, responsive to the tuning mode signal, for generating a tuning mode detection signal;

carrier detection means, responsive to the carrier monitor signal, for generating a carrier magnitude signal;

tuning controller means, responsive to the tuning mode detection signal, for generating a tuning enable signal which is supplied to said carrier detection means for enabling the same;

said tuning controller means, further responsive to the carrier magnitude signal, for generating a tuning control signal; and

converter means, responsive to the tuning control signal, for generating a tuning control voltage, the tuning control voltage being supplied to said antenna tuning means for effecting the tuning of said antenna means.

DESIGN PATENTS

GRANTED AUG. 29, 1989

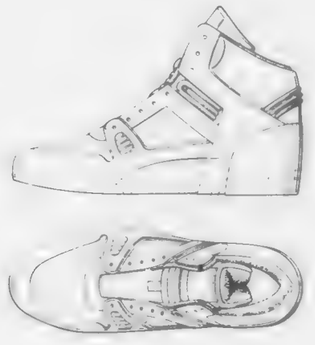
ERRATA

For CLASS	See PATENT NO.
D09-408	303,100

303,036
FOOTBALL CAP
James Giles, 99 Lido Blvd., Point Lookout, N.Y. 11561
Filed Jul. 28, 1986, Ser. No. 890,119
Term of patent 14 years
U.S. Cl. D2—248



303,038
SHOE UPPER
Larry M. Clark, Simi Valley, Calif., assignor to L.A. Gear, Inc., Los Angeles, Calif.
Filed Dec. 11, 1987, Ser. No. 131,539
Term of patent 14 years
U.S. Cl. D2—314



303,037
BOOT FOR MOTORCYCLIST
Hisashi Kushitani, No. 9-14,4-chome, Yoga, Setagaya-ku, Japan
Filed Sep. 12, 1986, Ser. No. 907,606
Term of patent 14 years
U.S. Cl. D2—275



303,039
SHOE SOLE
Brenda C. Kelley, Beaverton, and Mona McCrea, Portland, both of Oreg., assignors to Avia Group International, Inc., Portland, Oreg.
Filed Nov. 7, 1988, Ser. No. 267,918
Term of patent 14 years
U.S. Cl. D2—320



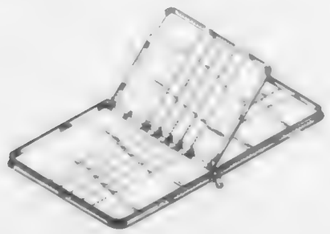
303,040
PROTECTIVE VISOR FOR USE WHEN BATHING
Anne Paone, 628 S. Racine Ave., Chicago, Ill. 60614
Filed May 30, 1986, Ser. No. 869,027
Term of patent 14 years
U.S. Cl. D2—510



303,041
CASSETTE STORAGE CONTAINER
Peter H. Thompson, Buckinghamshire, England, assignor to Amaray International Ltd., Buckinghamshire, England
Filed Jan. 21, 1986, Ser. No. 821,576
Term of patent 14 years
U.S. Cl. D3—35



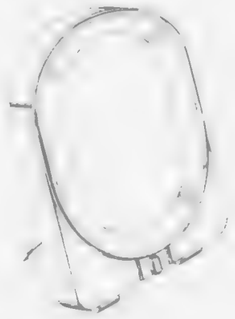
303,042
FLOPPY DISK WALLET
David L. Mackey, Amherst, N.H., assignor to Amherst International Corporation, Manchester, N.H.
Filed Jun. 16, 1986, Ser. No. 875,652
Term of patent 14 years
U.S. Cl. D3—35



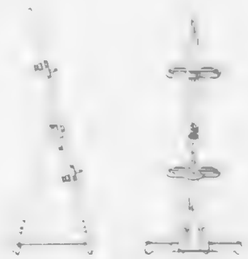
303,043
TOOTHBRUSH
Emanuel B. Tarrson; Dane Maric, both of Chicago, and Thomas P. Kelly, Palatine, all of Ill., assignors to John O. Butler Company, Chicago, Ill.
Filed Mar. 4, 1986, Ser. No. 836,053
The portion of the term of this patent subsequent to Aug. 25, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—104



303,044
LIGHTED MIRROR
Peter W. Bressler, and Eric A. Schneider, both of Philadelphia, Pa., assignors to Clairol Incorporated, New York, N.Y.
Filed Jun. 5, 1987, Ser. No. 59,675
Term of patent 14 years
U.S. Cl. D6—308



303,045
EASEL
Edward F. Kramer, 130 Knowlton St., Manchester, N.H. 03103
Filed Oct. 29, 1986, Ser. No. 924,509
Term of patent 14 years
U.S. Cl. D6—311



303,046
CHILD SAFETY SEAT
Kevin J. Miller, 2123 Morton Ave., Elkhart, Ind. 46515
Filed Oct. 22, 1986, Ser. No. 922,137
Term of patent 14 years
U.S. Cl. D6—333



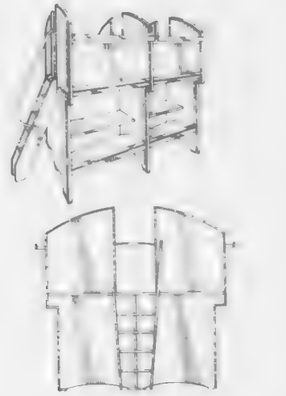
303,047
RECLINING EASY CHAIR
Giovanni Offredi, Milan, Italy, assignor to Saporiti Italia S.p.A., Italy
Filed Aug. 26, 1986, Ser. No. 902,393
Term of patent 14 years
U.S. Cl. D6—367

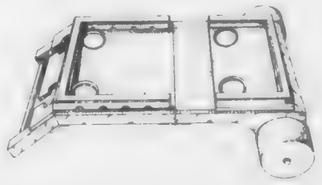


303,048
CARREL UNIT
Benjamin H. Weese, Chicago, Ill., assignor to Midland Manufacturing Corp., Skokie, Ill.
Filed Dec. 15, 1986, Ser. No. 941,939
Term of patent 14 years
U.S. Cl. D6—421



303,049
COMBINATION TABLE AND CARRIER OR THE LIKE
D. Wayne Higson, 505 Queen Anne's Rd., Greenville, N.C. 22834, and Michael E. Higson, 108 Eighth Ave., North Myrtle Beach, S.C. 29582
Filed Oct. 6, 1986, Ser. No. 916,091
Term of patent 14 years
U.S. Cl. D6—429





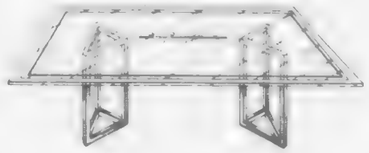
303,050
DISPLAY MOUNT FOR AN UNDERARM PORTFOLIO
Meredith Spence, Jr., Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Filed Jun. 18, 1986, Ser. No. 875,789
Term of patent 14 years
U.S. Cl. D6—449



303,051
HOLDER FOR MEDICAL SUPPLIES OR THE LIKE TO BE MOUNTED ON THE HANDRAIL
Sarah Steed, 1815 Friendly Rd., Goldsboro, N.C. 27530
Filed Sep. 13, 1985, Ser. No. 775,839
Term of patent 14 years
U.S. Cl. D6—475



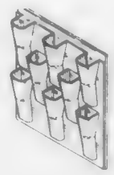
303,052
TABLE
Leon Rosen, Scarsdale, N.Y., assignor to The Pace Collection, Inc., Long Island City, N.Y.
Filed Nov. 13, 1986, Ser. No. 930,856
Term of patent 14 years
U.S. Cl. D6—480



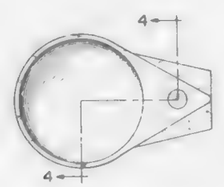
303,053
FISHING ROD HOLDER
Dennis L. Albert, 28172 Rebicon Ct., Laguna Niguel, Calif. 92656, and Max Limon, 4505 Cathan St., Torrance, Calif. 90503
Filed Apr. 30, 1987, Ser. No. 44,136
Term of patent 14 years
U.S. Cl. D6—552

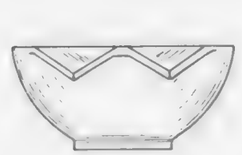


303,054
FLOWER DISPLAY SUPPORT OR SIMILAR ARTICLE
Walter M. Mendenhall, 512 Lillian Dr., Madeira Beach, Fla. 33738
Filed Sep. 26, 1986, Ser. No. 912,625
Term of patent 14 years
U.S. Cl. D6—553

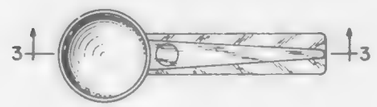


303,055
MEASURING CUP
William A. Prindle, Santa Barbara, Calif., assignor to Corning Incorporated, Corning, N.Y.
Filed Dec. 22, 1986, Ser. No. 944,617
Term of patent 14 years
U.S. Cl. D7—50





303,056
MEASURING SPOON
William A. Prindle, Santa Barbara, Calif. 93109, assignor to Corning Incorporated, Corning, N.Y.
Filed Dec. 22, 1986, Ser. No. 944,618
Term of patent 14 years
U.S. Cl. D7—50



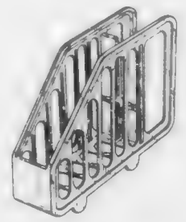


303,057
CUP HOLDER OR THE LIKE
Howard J. Smith, 6389 Pawnee Dr., West Jordan, Utah 84084
Filed Nov. 10, 1986, Ser. No. 929,158
Term of patent 14 years
U.S. Cl. D7—70

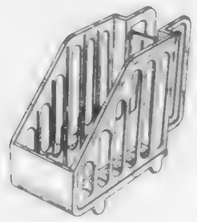




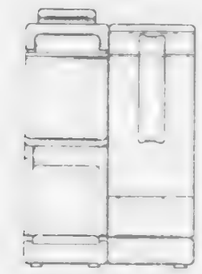
303,058
COOKING DEVICE FOR HOLDING FOOD-CONTAINING BAGS
William D. Hiscott, Chicago, Ill.; Ina Witlin, North Miami Beach, Fla.; Theodore J. Hasler, and Andrew T. Jastrzebski, both of Chicago, Ill., assignors to Ekco Housewares, Inc., Franklin Park, Ill.
Filed May 4, 1987, Ser. No. 45,141
Term of patent 14 years
U.S. Cl. D7—99



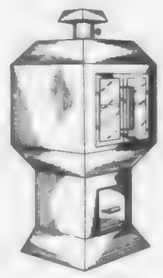
303,059
COOKING DEVICE FOR HOLDING FOOD-CONTAINING BAGS
Frank E. Stepanek, Indian Head Park, and William Lelyk, Roselle, both of Ill., assignors to Ekco Housewares, Inc., Franklin Park, Ill.
Filed May 11, 1987, Ser. No. 47,459
Term of patent 14 years
U.S. Cl. D7—99



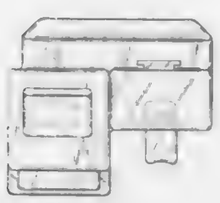
303,060
BEVERAGE DISPENSING MACHINE
Mark F. Jennings, Windsor; Michael B. Woodhall, Maidenhead, and Terence W. Gander, Bracknell, all of United Kingdom, assignors to Mars G.B. Limited, London, England
Filed Aug. 19, 1986, Ser. No. 898,126
Claims priority, application United Kingdom, Feb. 19, 1986, [illegible]
Term of patent 14 years
U.S. Cl. D7—309



303,061
BARBECUE GRILL
Herman Fountain, Sr., 415 Commerce St., West Point, Miss. 39773
Filed Mar. 23, 1987, Ser. No. 29,481
Term of patent 14 years
U.S. Cl. D7—332

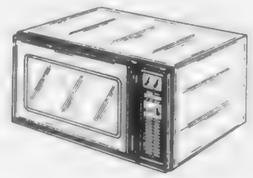


303,062
ELECTRIC OVEN TOASTER
Kazuo Takada, Nara, and Yayoi Ogata, Hyogo, both of Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed Apr. 22, 1986, Ser. No. 857,544
Claims priority, application Japan, Nov. 11, 1985, 60-47163
The portion of the term of this patent subsequent to Jan. 6, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—350



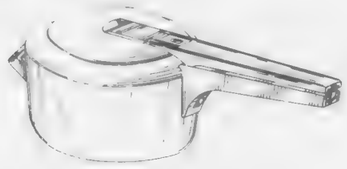


303,063
MICROWAVE OVEN
Koji Satake, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Oct. 20, 1986, Ser. No. 922,108
Claims priority, application Japan, Apr. 22, 1986, 61-15407
The portion of the term of this patent subsequent to Sep. 30, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—351

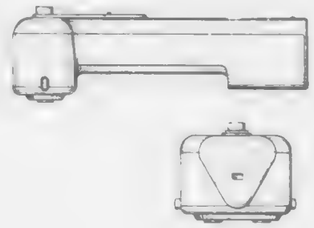




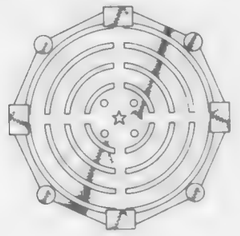
303,064
PRESSURE COOKER
Hari D. Vasudeva, F101 Maker Towers, Post Box No. 16083, Cuffe Parade, Bombay, 400005, India
Continuation-in-part of Ser. No. 414,429, Sep. 2, 1982, abandoned. This application Mar. 11, 1985, Ser. No. 710,912
Term of patent 14 years
U.S. Cl. D7—358



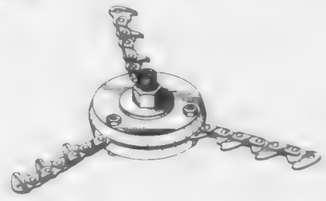
303,065
HANDLE FOR A MIXER OR THE LIKE
Masao Tsuji, Old Lyme, Conn., assignor to North American Philips Corp., New York, N.Y.
Filed Mar. 16, 1987, Ser. No. 26,354
Term of patent 14 years
U.S. Cl. D7—379



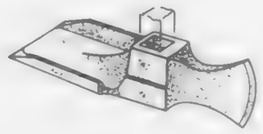
303,066
ROASTING RACK OR SIMILAR ARTICLE
Bruce Gadzinski, and Roseann Gadzinski, both of 9807 Hillcrest Rd., Whitelaw, Wis. 54247
Filed Apr. 28, 1986, Ser. No. 857,822
Term of patent 14 years
U.S. Cl. D7—388



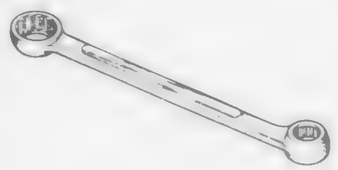
303,067
ROTARY BRUSH CUTTER ATTACHMENT
Paul I. Pinson, and Gary P. Pinson, both of Winnsboro, Tex., assignors to Power Cut, Inc., Winnsboro, Tex.
Filed Nov. 18, 1987, Ser. No. 122,415
Term of patent 14 years
U.S. Cl. D8—8



303,068
AXE MATTOCK
Ron Zabarte, 70 Alberta Ter., Walnut Creek, Calif. 94596
Filed Oct. 5, 1987, Ser. No. 104,489
Term of patent 14 years
U.S. Cl. D8—11

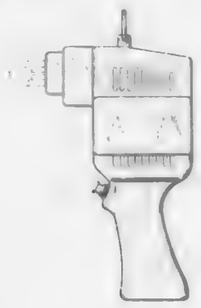


303,069
DOUBLE-ENDED BOX WRENCH
Robert E. Heberlie, R.R. #1, Box 199A, Chester, Ill. 62233
Filed Jun. 30, 1986, Ser. No. 880,491
Term of patent 14 years
U.S. Cl. D8—24





303,070
HAND HELD WELDING GUN
Milton Hinden, Glen Head, and Charles Giannone, N. Babylon, both of N.Y., assignors to Duro Dyne Corporation, Farmingdale, N.Y.
Filed Aug. 17, 1987, Ser. No. 86,039
Term of patent 14 years
U.S. Cl. D8—30



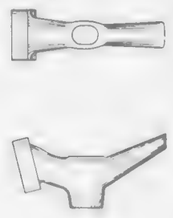
303,071
BOTTLE OPENER
Jane Ancona, and Bruce Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Dec. 23, 1988, Ser. No. 290,089
Term of patent 14 years
U.S. Cl. D8—33



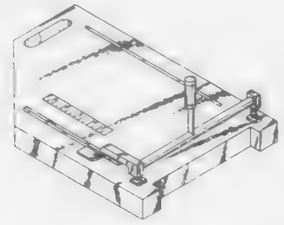
303,072
CAN OPENER
Jane Ancona, and Bruce Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Dec. 23, 1989, Ser. No. 290,087
Term of patent 14 years
U.S. Cl. D8—39



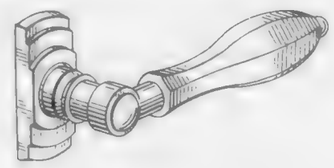
303,073
OFFSET BODY HAMMER
Richard C. Johnsen, 7105 Howard Ave., Hammond, Ind. 46324
Filed Jul. 10, 1985, Ser. No. 752,996
Term of patent 14 years
U.S. Cl. D8—78



303,074
FLOOR TILE CUTTER
Samuel Agee, 4305 Begg St., St. Louis, Mo. 63121
Filed Sep. 18, 1986, Ser. No. 909,094
Term of patent 14 years
U.S. Cl. D8—98



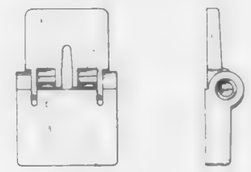
303,075
COMBINED HANDLE AND ESCUTCHEON
Duane L. Mosch, Owatonna, Minn., assignor to Truth Incorporated, Owatonna, Minn.
Division of Ser. No. 922,543, Oct. 23, 1986. This application Jun. 30, 1988, Ser. No. 213,677
Term of patent 14 years
U.S. Cl. D8—301



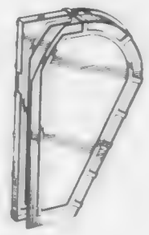
303,076
HANDLE
Renato P. Castelli, Gent; Willibald J. Van Hoye, Zwijnaarde, both of Belgium; Richard Miles, Crowborough, and Wendy Flicker, Surrey, both of England, assignors to Samsonite Corporation, Denver, Colo.
Filed Apr. 30, 1986, Ser. No. 858,296
Claims priority, application United Kingdom, Oct. 31, 1985, 1030153
Term of patent 14 years
U.S. Cl. D8—306



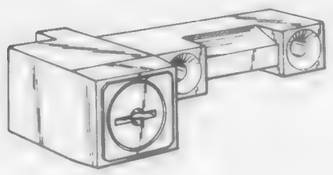
303,077
HINGE
Akira Sorimachi, Yokohama, Japan, assignor to Katoh Electrical Machinery Co., Ltd., Yokohama, Japan
Filed Oct. 13, 1988, Ser. No. 257,079
Term of patent 14 years
U.S. Cl. D8—327



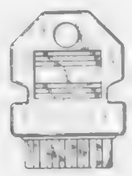
303,078
GARAGE DOOR HARDWARE GUARD
Terry L. Blubaugh, Diamond Bar, Calif., assignor to Holmes-Halley Industries, Los Angeles, Calif.
Filed Jun. 26, 1987, Ser. No. 66,638
Term of patent 14 years
U.S. Cl. D8—330



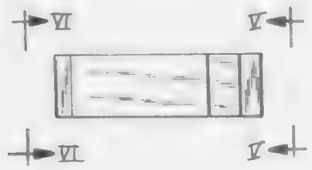
303,079
WINDOW LOCK
John Parthenis, Brookvale, Australia, assignor to Chubb Australia Limited, New South Wales, Australia
Filed Jun. 21, 1988, Ser. No. 209,756
Claims priority, application Australia, Dec. 23, 1987, 4777/87
Term of patent 14 years
U.S. Cl. D8—331



303,080
VEHICLE ANTI-THEFT KEY
John F. Phillips, Mercerville, N.J., assignor to Alternative Product Marketing, Inc., Mercerville, N.J.
Filed Mar. 2, 1988, Ser. No. 163,067
Term of patent 14 years
U.S. Cl. D8—347



303,081
SINGLE PIECE, ELECTRICAL BOX RETAINER
Thomas M. Angell, 324 S. Kentucky, Mason City, Iowa 50401
Filed Feb. 10, 1986, Ser. No. 827,425
Term of patent 14 years
U.S. Cl. D8—364



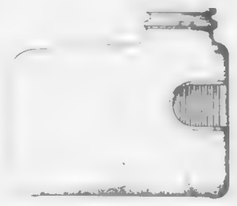
303,082
UTILITY BLADE DISPENSER OR SIMILAR ARTICLE
Clemens A. Iten, Staunton, Va., assignor to American Safety Razor Company, Verona, Va.
Filed Apr. 24, 1986, Ser. No. 857,615
Term of patent 14 years
U.S. Cl. D9—340



303,083
BOTTLE
David H. Powell, Putney, and Richard W. Seymour, Ham, both of England, assignors to Lever Brothers Company, New York, N.Y.
Filed Apr. 1, 1986, Ser. No. 847,612
Claims priority, application United Kingdom, Oct. 4, 1985, [illegible]
Term of patent 14 years
U.S. Cl. D9—375



303,084
CONTAINER
Jason K. Sedam, Dunwoody, and Lawrence S. Mucha, Mableton, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed May 29, 1986, Ser. No. 868,344
Term of patent 14 years
U.S. Cl. D9—376



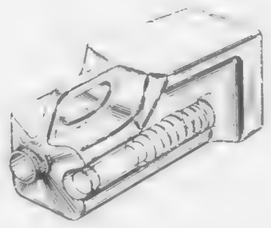
303,085
BOTTLE
Juris M. Mednis, Howell, N.J., assignor to Universal Symetrics Corporation, Howell, N.J.
Filed Dec. 18, 1987, Ser. No. 134,915
Term of patent 14 years
U.S. Cl. D9—376



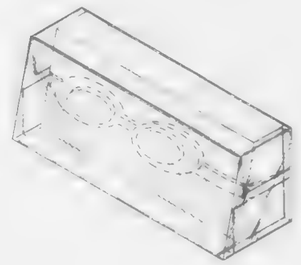
303,086
GLASS CONTAINER
Jan B. Rothfos, Hamburg, Fed. Rep. of Germany, assignor to KORD Beteiligungsgesellschaft mbH & Co. KG, Hamburg, Fed. Rep. of Germany
Filed Feb. 3, 1986, Ser. No. 825,192
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1985, 66 AR 1994/85
Term of patent 14 years
U.S. Cl. D9—377



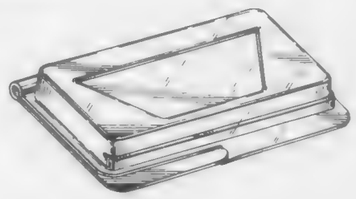
303,087
BOTTLE
Gary E. Gendron, Boiceville, N.Y., assignor to Marpac Industries, Inc., Waldwick, N.J.
Filed Apr. 1, 1986, Ser. No. 847,618
Term of patent 14 years
U.S. Cl. D9—378

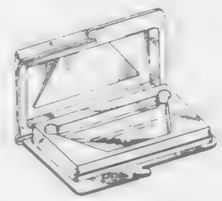


303,088
PACKAGE FOR SWIM GOGGLES
Barry R. Fireman, Sharon, Mass., assignor to Aqua Leisure Industries, Inc., Avon, Mass.
Filed Jul. 8, 1986, Ser. No. 883,489
Term of patent 14 years
U.S. Cl. D9—418



303,089
KNIFE BLADE CONTAINER
C. Kenard Roberts, Clinton, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Jun. 20, 1986, Ser. No. 876,906
Term of patent 14 years
U.S. Cl. D9—425





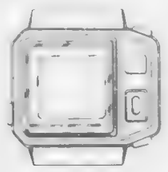
303,090
CONTAINER BLANK
Patrick D. Armor, Fairfield, and Robert H. Hanson, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jan. 27, 1986, Ser. No. 824,382
Term of patent 14 years
U.S. Cl. D9—433



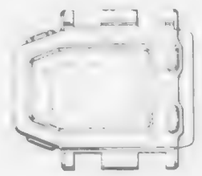
303,091
WRIST WATCH
Atsushi Goto, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Nov. 24, 1986, Ser. No. 934,323
Term of patent 14 years
U.S. Cl. D10—30



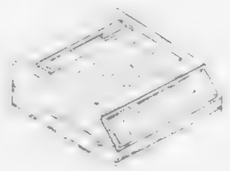
303,092
WRIST WTACH WITH PULSIMETER
Masamichi Wakamatsu, Akishima, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Sep. 25, 1986, Ser. No. 911,628
Term of patent 14 years
U.S. Cl. D10—31



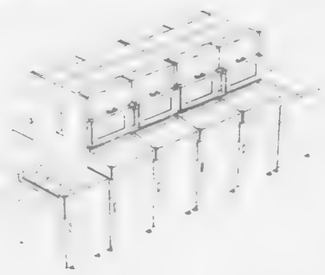
303,093
ERGONOMIC DIGITAL WRISTWATCH
John T. Houlihan, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.
Filed Sep. 5, 1986, Ser. No. 905,616
Term of patent 14 years
U.S. Cl. D10—38



303,094
PEDOMETER
Wong L. Ling, Shatin, Hong Kong, assignor to Innovative Time Corporation, Carlsbad, Calif.
Filed Feb. 24, 1987, Ser. No. 17,800
Term of patent 14 years
U.S. Cl. D10—70



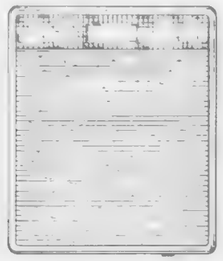
303,095
AUTOMATIC CHEMICAL ANALYZER
Yawara Nagai, Hachioji; Shigeru Yoshinari, and Masao Ushikubo, both of Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Japan
Filed Apr. 16, 1986, Ser. No. 852,918
Term of patent 14 years
U.S. Cl. D10—81



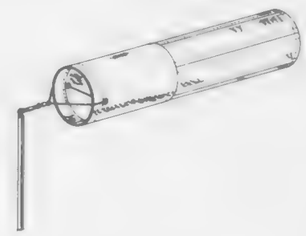
303,096
BATHROOM SCALE
Stephen A. Francis, Milford, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Dec. 17, 1986, Ser. No. 943,290
Term of patent 14 years
U.S. Cl. D10—92



303,097
DIGITAL BATHROOM SCALE
Ronald L. Muller, Old Saybrook, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Dec. 17, 1986, Ser. No. 943,962
Term of patent 14 years
U.S. Cl. D10—92



303,099
PENNANT WINDSOCK
Jolynn Rolofson, R.R. 2, 17 Florentina, Platte City, Mo. 64079
Filed Nov. 17, 1986, Ser. No. 931,570
Term of patent 14 years
U.S. Cl. D10—109



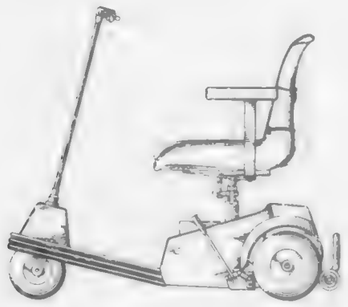
303,100
BOTTLE
Umberto D. I. Segati, Brussels, Belgium, assignor to Colgate-Palmolive Company, Piscataway, N.J.
Filed Mar. 31, 1988, Ser. No. 176,140
Term of patent 14 years
U.S. Cl. D9—408



303,098
INDICATING DIAL FOR FUEL OIL DELIVERY TRUCK DISPENSING APPARATUS
H. Anthony Nester, 20 Morris Rd., Peekskill, N.Y. 10566
Filed Nov. 17, 1986, Ser. No. 931,355
Term of patent 14 years
U.S. Cl. D10—102

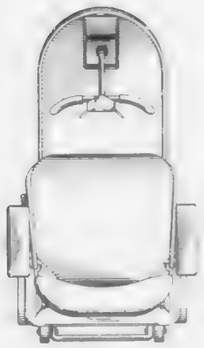


303,101
ELECTRICALLY POWERED THREE-WHEELED VEHICLE FOR THE HANDICAPPED AND OTHERS DESIRING ASSISTANCE
Melvin E. Shepard, Bridgeport, and Allen L. Bussinger, Saginaw, both of Mich., assignors to Amigo Sales, Inc., Bridgeport, Mich.
Filed May 21, 1987, Ser. No. 52,754
Term of patent 14 years
U.S. Cl. D12—131

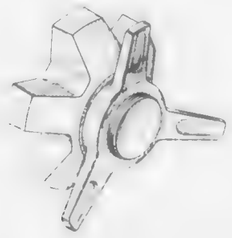


303,102
BICYCLE RACK
Melvin G. Peterman, 7720 SW. Bel Aire Dr., #4, Beaverton, Oreg. 97005, and Bradley A. Stivers, 608 Cottonwood Dr., Richland, Wash. 99352
Filed Sep. 11, 1987, Ser. No. 96,144
Term of patent 14 years
U.S. Cl. D12—158

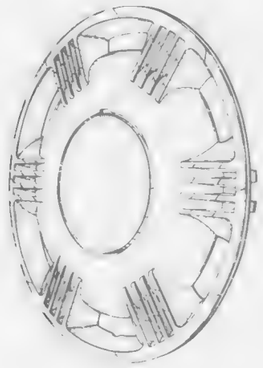




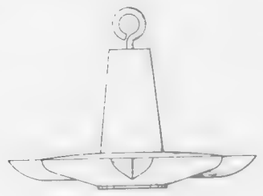
303,103
VEHICLE WHEEL SPINNER HUB UNIT
William J. Brouch, and Dale E. Gerber, both of Pekin, Ill., assignors to B & G Dezign, Inc., Pekin, Ill.
Filed Jun. 18, 1987, Ser. No. 64,298
Term of patent 14 years
U.S. Cl. D12—207



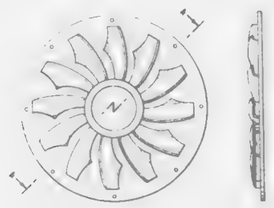
303,104
WHEEL COVER
William B. Shannon, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 28, 1987, Ser. No. 138,881
Term of patent 14 years
U.S. Cl. D12—211



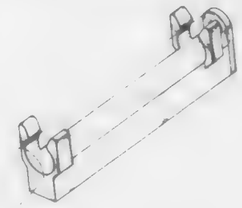
303,105
ANCHOR
Edward Stafford, 322 Englewood Dr., Crawfordsville, Ind. 47933
Filed Oct. 22, 1986, Ser. No. 922,119
Term of patent 14 years
U.S. Cl. D12—215



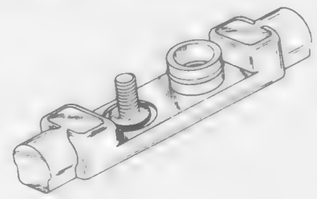
303,106
AIRCRAFT LANDING WHEEL ROTATOR ATTACHMENT
Lawrence L. Macaluso, 6632 Baird Ave., Reseda, Calif. 91335
Filed Oct. 21, 1986, Ser. No. 921,279
Term of patent 14 years
U.S. Cl. D12—345



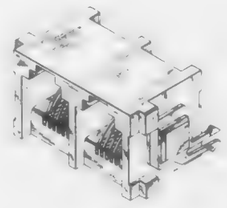
303,107
MINIATURE FLASHLIGHT RECHARGER
Anthony Maglica, Ontario; Ralph E. Johnson, Los Alamitos, and Armis L. Lewis, Cucamonga, all of Calif., assignors to MAG Instrument, Inc., Ontario, Calif.
Filed Oct. 23, 1987, Ser. No. 111,835
Term of patent 14 years
U.S. Cl. D13—6



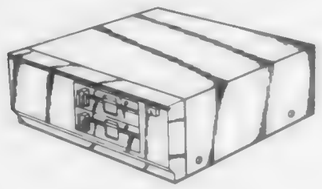
303,108
BATTERY CABLE TERMINATION
Victor J. Julian, 2400 Belvue, Westchester, Ill. 60153, and Kenneth A. Julian, 409 Suffolk La., Oak Brook, Ill. 60521
Filed Oct. 20, 1986, Ser. No. 920,888
Term of patent 14 years
U.S. Cl. D13—10



303,109
MULTIPLE RECEPTACLE ELECTRICAL CONNECTOR
Shuichi Matsuzaki, and Akira Nakazawa, both of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan
Filed Aug. 23, 1985, Ser. No. 768,945
Claims priority, application Japan, Feb. 27, 1985, 60-7117; Feb. 27, 1985, 60-7119; Feb. 27, 1985, 60-7121
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—24



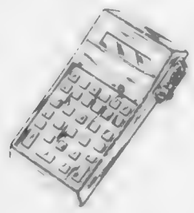
303,110
DISK DRIVE
Hyung S. Ji, Seoul, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyougki, Rep. of Korea
Filed Jan. 6, 1987, Ser. No. 1,086
Claims priority, application Rep. of Korea, Dec. 9, 1986, 86-17318
Term of patent 14 years
U.S. Cl. D14—100



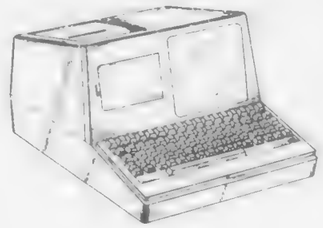
303,111
PORTABLE COMPUTER TERMINAL HOUSING FOR ACCESSING AND INPUTTING PATIENT MEDICAL DATA
Steven J. Paley, Aberdeen, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Filed Nov. 18, 1985, Ser. No. 805,366
Term of patent 14 years
U.S. Cl. D14—100



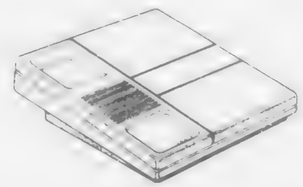
303,112
PORTABLE HAND HELD DATA ENTRY TERMINAL
Franklin J. Desrochers, Clarkston, Mich., assignor to Universal Data Incorporated, Clarkston, Mich.
Filed Aug. 20, 1986, Ser. No. 898,378
Term of patent 14 years
U.S. Cl. D14—100



303,113
COMPUTER FOR POINT OF SALE SYSTEMS, OR SIMILAR ARTICLE
Arvin D. Danielson, Solon; Deanis A. Durbin, Cedar Rapids; George G. Lippisch, Cedar Rapids; Kevin L. Fischer, Cedar Rapids, and Lyndon L. Dunbar, Cedar Rapids, all of Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa
Filed Nov. 10, 1986, Ser. No. 929,157
Term of patent 14 years
U.S. Cl. D14—106

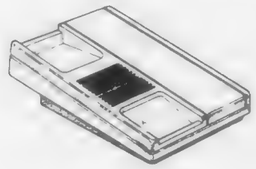


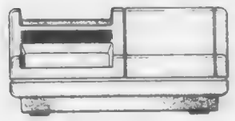
303,114
TELEPHONE SET
David C. Danielson, New Canaan, Conn.; Norman K. Hart, Greenfield, Ind.; Lynnet Koh, Springfield, N.J.; John N. McGarvey, Drexel Hill, Pa., and Eugene A. Mills, Coatesville, Ind., assignors to American Telephone and Telegraph Company, AT&T Information Systems, Morristown, N.J.
Filed Mar. 28, 1988, Ser. No. 174,483
Term of patent 14 years
U.S. Cl. D14—142



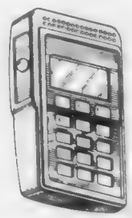


303,115
TELEPHONE STAND
Norman K. Hart, Greenfield, Ind.; Lynnet Koh, Springfield, N.J., and Eugene A. Mills, Coatesville, Ind., assignors to American Telephone and Telegraph Company, AT&T Information Systems, Morristown, N.J.
Filed Mar. 28, 1988, Ser. No. 174,484
Term of patent 14 years
U.S. Cl. D14—142

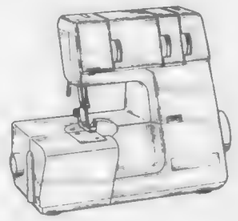




303,116
COMBINED MICROPHONE AND RADIO CONTROL UNIT OR SIMILAR ARTICLE
Scott H. Richards, Sunrise; David H. Karl, Tamarac, and Craig F. Siddoway, Ft. Lauderdale, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 9, 1986, Ser. No. 939,933
Term of patent 14 years
U.S. Cl. D14—226



303,117
SEWING MACHINE
Tetsuya Aono, Ibaraki, and Ichirou Shibayama, Kobe, both of Japan, assignors to Maruzen Sewing Machine Co., Ltd., Osaka, Japan
Filed Mar. 3, 1987, Ser. No. 21,314
Claims priority, application Japan, Sep. 3, 1986, 61-34679
Term of patent 14 years
U.S. Cl. D15—70



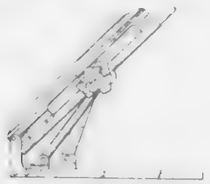
303,118
HOLE SAW
Larry E. Cox, Sherwood, Oreg., assignor to Credo Tool Company, Louisville, Ky.
Filed Feb. 24, 1986, Ser. No. 835,326
Term of patent 14 years
U.S. Cl. D15—139



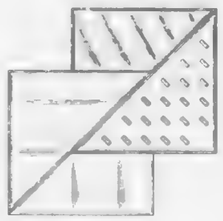
303,119
MAGNIFIER
Veronica G. Steel, London, England, and David F. Francis, Sydney, Australia, assignors to Combined Optical Industries Limited, England
Filed Apr. 9, 1987, Ser. No. 36,278
Claims priority, application United Kingdom, Oct. 14, 1986, 1037360
Term of patent 14 years
U.S. Cl. D16—135



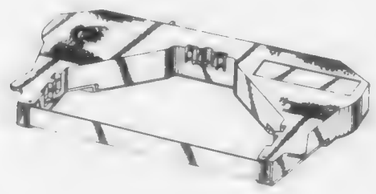
303,120
TILT PLATE ASSEMBLY FOR PHOTOGRAPHIC AND TELEVISION CAMERAS
Richard S. Cavdek, Sunland, Calif., assignor to Otto Nemenz International, Hollywood, Calif.
Filed Dec. 29, 1986, Ser. No. 947,546
Term of patent 14 years
U.S. Cl. D16—242



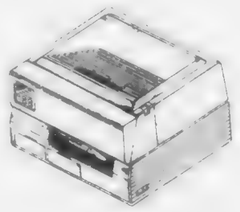
303,121
ELECTRONIC CALCULATOR
Hiroshi Sakaguchi; Katsuhiro Iida, and Toshiya Takahashi, all of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Nov. 21, 1986, Ser. No. 933,584
Claims priority, application Japan, May 23, 1986, 61-19752
Term of patent 14 years
U.S. Cl. D18—7



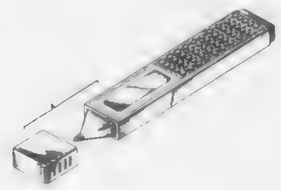
303,122
CORRECTING RIBBON CARTRIDGE
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Aug. 12, 1988, Ser. No. 231,461
Claims priority, application Italy, Feb. 22, 1988, 52907/88[U]
Term of patent 14 years
U.S. Cl. D18—12



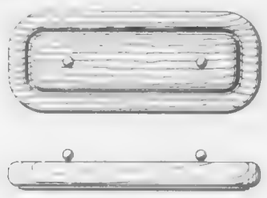
303,123
PRINTER FOR ELECTRONIC COMPUTER
Koji Maruyama, Akikawa; Hisao Shibata, Akishima, and Tsugio Temma, Iruma, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Sep. 2, 1986, Ser. No. 903,081
Term of patent 14 years
U.S. Cl. D18—13



303,124
DATA PEN
Robert S. K. Li, 2007 Shun Tak Centre, 20/F, 200 Connaught Road, Central, Hong Kong
Filed Oct. 6, 1986, Ser. No. 915,921
Term of patent 14 years
U.S. Cl. D19—36



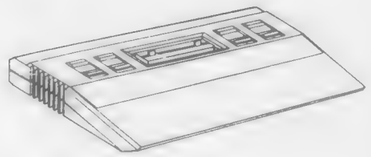
303,125
PEN STAND BASE
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Division of Ser. No. 741,455, Jun. 5, 1985. This application Jan. 19, 1989, Ser. No. 299,248
Term of patent 14 years
U.S. Cl. D19—85



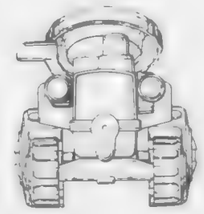
303,126
COMBINED COMPUTER COPYHOLDER WITH PAPER CLAMP
Mark P. Rossow, 9550 Litzsinger Rd., St. Louis, Mo. 63124
Filed Sep. 18, 1986, Ser. No. 909,088
Term of patent 14 years
U.S. Cl. D19—91



303,127
VIDEO GAME CONSOLE
Mark A. Biasotti, 545 Alviso St., Santa Clara, Calif. 95050
Filed Jan. 3, 1983, Ser. No. 455,132
The portion of the term of this patent subsequent to Aug. 29, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—48

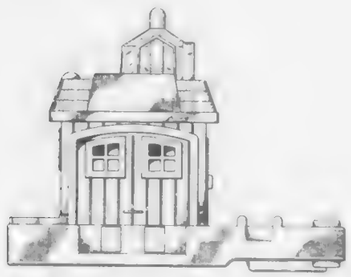


303,128
TOY TRACTOR
Harry S. Thomson, Richmond; Dzvid M. Raffo, and John A. Pape, both of Hitchin, all of England, assignors to Hestair Kiddicraft Limited, Bristol, England
Filed Apr. 29, 1987, Ser. No. 43,986
Claims priority, application United Kingdom, Nov. 4, 1986, [illegible]
Term of patent 14 years
U.S. Cl. D21—79

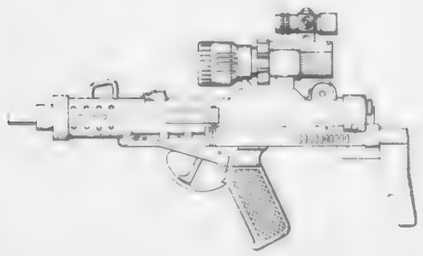




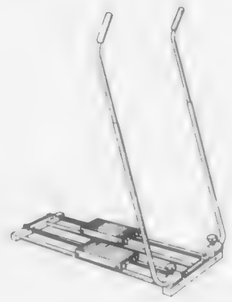
303,129
FLOATING WATER TOY
Craig J. McElhaney, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jul. 8, 1987, Ser. No. 70,886
Term of patent 14 years
U.S. Cl. D21—119



303,130
TOY RIFLE
Sid Noble, Hong Kong, Hong Kong, assignor to Arco Toys Limited, Kowloon, Hong Kong
Filed Mar. 6, 1987, Ser. No. 22,628
Term of patent 14 years
U.S. Cl. D21—146



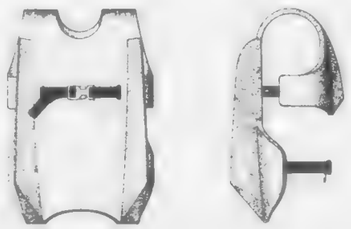
303,131
SKIING EXERCISE MACHINE
Yuan-Hung Lo, 3 Fl., No. 85, Sec. 2, Chien-Kuo N. Rd., Taipei, Taiwan
Filed Jan. 19, 1988, Ser. No. 145,253
Term of patent 14 years
U.S. Cl. D21—192



303,132
GOLF CLUB HEAD
Yasumori Muta, Higashikurume, Japan, assignor to Daiwa Golf Co., Ltd., Higashikurume, Japan
Filed Jun. 3, 1986, Ser. No. 870,015
Claims priority, application Japan, Dec. 4, 1985, 60-50562
Term of patent 14 years
U.S. Cl. D21—220



303,133
SURFER'S VEST
Brian N. Talbot, 281 S. Spalding #H, Beverly Hills, Calif. 90212
Filed Aug. 19, 1987, Ser. No. 87,448
Term of patent 14 years
U.S. Cl. D21—238



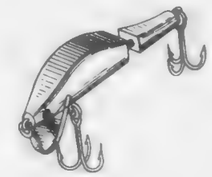
303,134
SELF PROTECTION HAND WEAPON
Randall F. Hutton, 300 Williams Rd., Elkton, Md. 21921
Filed Mar. 21, 1988, Ser. No. 171,305
Term of patent 14 years
U.S. Cl. D22—117



303,135
COLLAPSIBLE CASTABLE CRAB TRAP
Henry J. Simonson, 8515 29th NW., Seattle, Wash. 98117
Filed Mar. 14, 1989, Ser. No. 323,631
Term of patent 14 years
U.S. Cl. D22—121

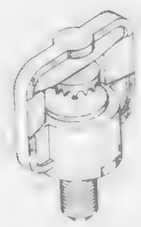


303,136
FISHING PLUG
Bruce Russell, 19 Lincoln Ave., Bradford, Pa. 16701
Continuation-in-part of Ser. No. 909,093, Sep. 18, 1986, abandoned. This application Mar. 4, 1987, Ser. No. 21,425
Term of patent 14 years
U.S. Cl. D22—133

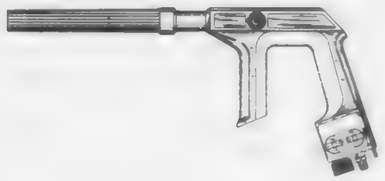


303,137
NON-LETHAL SELF DEFENSE WEAPON
Lynn H. Brown, 12380 Rock Mt. St., Reno, Nev. 89506
Filed Mar. 7, 1988, Ser. No. 164,648
Term of patent 14 years
U.S. Cl. D22—117

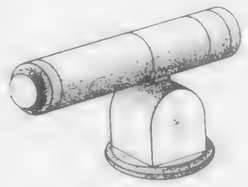
303,138
SPRINKLER HEAD
Allan L. Smith, P.O. Box 428, Exeter, Calif. 93221
Filed Aug. 10, 1987, Ser. No. 83,143
Term of patent 14 years
U.S. Cl. D23—214



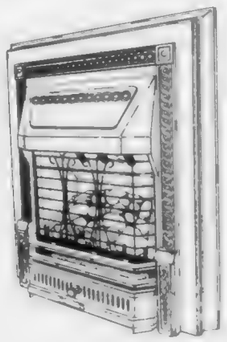
303,139
POWER WASHER GUN
Fredrick M. Morgan, Toledo, Ohio, assignor to DeVilbiss Corporation, Toledo, Ohio
Filed Aug. 25, 1986, Ser. No. 899,689
Term of patent 14 years
U.S. Cl. D23—223



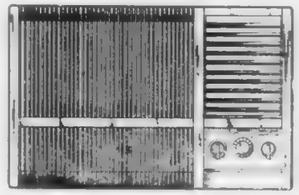
303,140
FAUCET HANDLE
Tom E. Robbins, Oakland, Calif., assignor to Kallista, Inc., Oakland, Calif.
Filed May 11, 1987, Ser. No. 48,690
Term of patent 14 years
U.S. Cl. D23—252



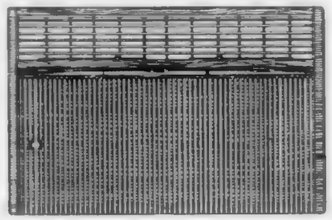
303,141
GAS FIRED HEATER
Francis J. B. Rowley, Cuddington, and Ian M. Hollingsworth, Birmingham, both of England, assignors to Valor Heating Limited, London, England
Filed Jul. 17, 1987, Ser. No. 75,027
Claims priority, application United Kingdom, Jan. 21, 1987, 1039415
Term of patent 14 years
U.S. Cl. D23—342



303,142
FRONT PANEL FOR A ROOM AIR CONDITIONER
Walter W. Hoyle, Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Oct. 26, 1987, Ser. No. 112,339
Term of patent 14 years
U.S. Cl. D23—354



303,143
FRONT PANEL FOR A ROOM AIR CONDITIONER
Walter W. Hoyle, Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Oct. 26, 1987, Ser. No. 112,340
Term of patent 14 years
U.S. Cl. D23—354



303,144
ADJUSTABLE SUPPORT FOR LIMB SURGERY
Beverly J. Sparks, 19250 Clement Dr., Castro Valley, Calif. 94552
Filed Feb. 13, 1987, Ser. No. 14,652
Term of patent 14 years
U.S. Cl. D24—7



303,145
EYE EXAMINATION SCOPE WITH ACCESS ORIFICE IN EYE CUP
Dieter R. Berndt, Allenwood, N.J., assignor to Vision Care Research Labs., Inc., Allenwood, N.J.
Continuation-in-part of Ser. No. 925,171, Oct. 31, 1986. This application Sep. 12, 1988, Ser. No. 243,663
Term of patent 14 years
U.S. Cl. D24—17



303,146
STETHOSCOPE ENDPIECE RETAINER
Jeanne Stamm, 4819 Pierpont Dr., Dayton, Ohio 45426
Filed Apr. 11, 1986, Ser. No. 851,413
Term of patent 14 years
U.S. Cl. D24—20



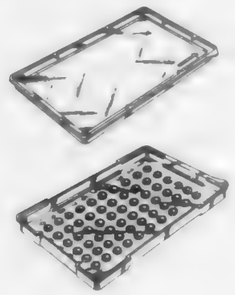
303,147
SMALL TYPE MICRO CENTRIFUGE
Michihiro Ota, Tokyo, Japan, assignor to Tomy Seiko Co., Ltd., Tokyo, Japan
Filed Mar. 13, 1987, Ser. No. 25,839
Term of patent 14 years
U.S. Cl. D24—22



303,148
HANDPIECE FOR SURGICAL DRIVE UNIT FOR USE IN ARTHROSCOPIC SURGERY
Fred Rexroth, Dunedin, Fla., and Paul J. Altmeier, St. Louis, Mo., assignors to Concept, Inc., Largo, Fla.
Filed Feb. 18, 1987, Ser. No. 16,198
Term of patent 14 years
U.S. Cl. D24—28



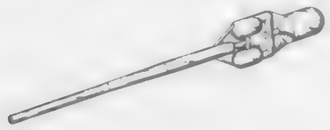
303,149
ANALYSIS PLATE WITH MATCHING LID FOR BIOLOGICAL PURPOSES
Verner B. Andersen, Roskilde, Denmark, assignor to A/S Nunc, Roskilde, Denmark
Filed Jul. 28, 1986, Ser. No. 889,916
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1986, URA 476/86
Term of patent 14 years
U.S. Cl. D24—31



303,150
INSULATED BABY-BOTTLE CASE
Karen Falcon, 15 South 43 St., Philadelphia, PA 19104
Filed Nov. 14, 1986, Ser. No. 931,169
Term of patent 14 years
U.S. Cl. D24—48



303,151
DISPENSING PIPETTE
Elmer Saint-Amand, San Fernando, Calif., assignor to Saint-Amand Manufacturing Co., San Fernando, Calif.
Filed Jul. 24, 1987, Ser. No. 77,325
Term of patent 14 years
U.S. Cl. D24—55



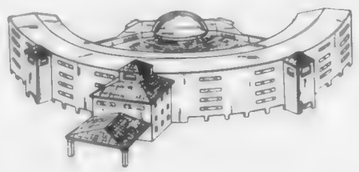
303,152
VOLUMETRIC DISPENSING PIPETTE
Elmer Saint-Amand, San Fernando, Calif., assignor to Saint-Amand Manufacturing Co., San Fernando, Calif.
Filed Jul. 24, 1987, Ser. No. 77,326
Term of patent 14 years
U.S. Cl. D24—55



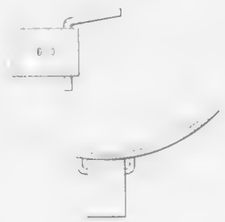
303,153
PROPHYLACTIC GENITAL SHIELD FOR USE WITH CONDOM
Thomas A. Puggard, 2209 Medbury, Detroit, Mich. 48211
Filed May 8, 1986, Ser. No. 862,443
Term of patent 14 years
U.S. Cl. D24—99



303,154
MULTIPLE INDIVIDUAL LOUNGE THEATRE
John P. Kwake, 2507 Carob Dr., Los Angeles, Calif. 90046
Filed Mar. 14, 1986, Ser. No. 845,023
Term of patent 14 years
U.S. Cl. D24—12



303,155
TREE STEP
Billy E. Ayers, 2801 13th Ave., Vienna, W. Va. 26105
Filed Jul. 16, 1987, Ser. No. 74,463
Term of patent 14 years
U.S. Cl. D25—62



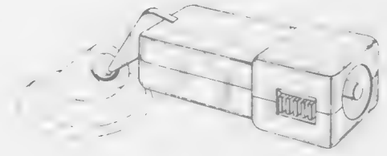
303,156
LAMP
Kirti B. Chakrabarti, Danvers, Mass.; Donald F. Garrity, Jr., Chester, N.H., and James L. Cashman, III, Salem, Mass., assignors to GTE Products Corporation, Danvers, Mass.
Filed Sep. 18, 1986, Ser. No. 909,459
Term of patent 14 years
U.S. Cl. D26—2



303,157
FLUORESCENT LAMP TUBE
Katsuhide Misono, Yokohama, and Yoichi Hattori, Yokosuka, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 3, 1987, Ser. No. 10,567
Claims priority, application Japan, Aug. 8, 1986, 61-30879
Term of patent 14 years
U.S. Cl. D26—3



303,158
PORTABLE SINGLE BEAM LIGHT
Pierre Charet, and Duke Kraai, both of Miami, Fla., assignors to Rally Manufacturing, Inc., Miami, Fla.
Filed May 21, 1986, Ser. No. 865,602
Term of patent 14 years
U.S. Cl. D26—60



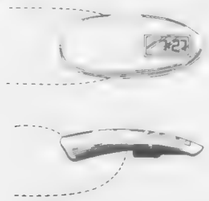
303,159
CLIP FOR HOLDING A LIGHTER
Charles Heath, 504 Riverview Dr., Marietta, Ga. 30067
Filed Jun. 30, 1986, Ser. No. 880,328
Term of patent 14 years
U.S. Cl. D27—172



303,160
PHARMACEUTICAL TABLET
Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories, Limited, Welwyn Garden City, England
Filed Mar. 20, 1987, Ser. No. 28,625
Claims priority, application United Kingdom, Sep. 26, 1986, 1037014
Term of patent 14 years
U.S. Cl. D28—2



303,161
ARTIFICIAL FINGERNAIL WITH CLOCK/CALENDAR DISPLAY
Dallas Tomkins, Hawthorne, Calif., assignor to International Product Technology and Marketing, Inc., Los Angeles, Calif.
Filed Feb. 28, 1986, Ser. No. 838,023
Term of patent 14 years
U.S. Cl. D28—56



303,162
WATERFALL PEDICURE STATION
John Meyerovich, 4852 N. 105th St., Milwaukee, Wis. 53225; Lev Yakubovich, 4121 W. Martin Dr., Apt. 102, Milwaukee, Wis. 53208; Gerald Tearney, 4515 Delphine Dr., New Berlin, Wis. 53151, and Joseph Galati, 16820 Burnet Ct., Brookfield, Wis. 53005
Filed Jan. 23, 1987, Ser. No. 6,616
Term of patent 14 years
U.S. Cl. D28—61



303,163
COSMETIC CASE
Karena Bakic, Varese, Italy, assignor to Cosmede Anstalt, Vaduz, Liechtenstein
Filed Apr. 6, 1987, Ser. No. 34,566
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1986, URA 1318/86
Term of patent 14 years
U.S. Cl. D28—78



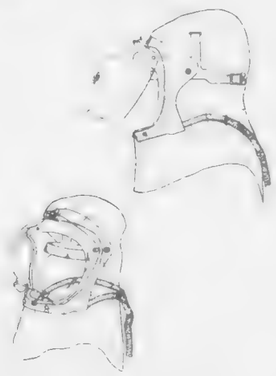
303,164
LIPSTICK CASE
Karen E. McCready, Ten Esquire Rd., Suite 19, New City, N.Y. 10956
Filed Jul. 24, 1987, Ser. No. 77,327
Term of patent 14 years
U.S. Cl. D28—85



303,165
LIPSTICK CASE
Karen E. McCready, 10 Esquire Rd., New City, N.Y. 10956
Filed Aug. 10, 1987, Ser. No. 83,082
Term of patent 14 years
U.S. Cl. D28—85

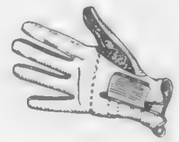


303,166
CLEAN ROOM SAFETY HOOD
Wyman H. Stackhouse, 3201 Poinsettia Ave., Manhattan Beach, Calif. 90266, and Ian M. Williamson, 555 N. Harbor Dr., Redondo Beach, Calif. 90277
Filed Aug. 25, 1986, Ser. No. 899,898
Term of patent 14 years
U.S. Cl. D29—9



303,167
GOLF GLOVE
James D. Giambazi, 12 Abbott St., Cumberland, R.I. 02864
Filed Feb. 3, 1986, Ser. No. 825,523
Term of patent 14 years
U.S. Cl. D29—22

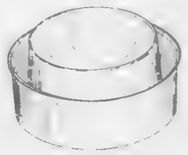




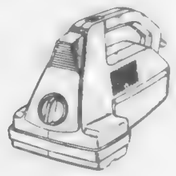
303,168
COMBINED BIRD FEEDER SHIELD AND PERCH
Peter Kilham, Mill Rd., Foster, R.I. 02825
Filed Dec. 3, 1987, Ser. No. 128,517
Term of patent 14 years
U.S. Cl. D30—128



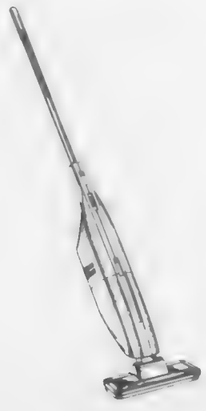
303,169
MOATED PET FEEDER
Leigh K. Hovey, 731 Ashland Ave., Santa Monica, Calif. 90405
Filed Dec. 9, 1987, Ser. No. 130,663
Term of patent 14 years
U.S. Cl. D30—130



303,170
ELECTRIC VACUUM CLEANER
Yukio Hirano, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed May 22, 1987, Ser. No. 53,437
Claims priority, application Japan, Feb. 24, 1987, 62-6794
Term of patent 14 years
U.S. Cl. D32—18

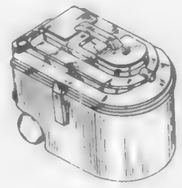


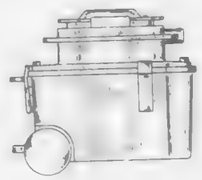
303,171
VACUUM CLEANER
Gordon W. Goodrich, Grand Rapids, Mich., and Roy Chung, North Point, Hong Kong, assignors to Bissell Inc., Grand Rapids, Mich.
Filed Apr. 3, 1986, Ser. No. 847,877
Term of patent 14 years
U.S. Cl. D32—21





303,172
CANISTER FOR LIQUID EXTRACTION SURFACE CLEANER
Gordon W. Goodrich, Grand Rapids, Mich., assignor to Bissell, Inc., Grand Rapids, Mich.
Filed Mar. 20, 1987, Ser. No. 28,298
Term of patent 14 years
U.S. Cl. D32—21





303,173
VACUUM CLEANER
Isshin Miyamoto; Yasuo Nagamatsu; Yasuhiko Tanaka; Masaharu Sakamoto; Masataka Hidaka; Hideaki Sakamoto, and Kazuo Ishida, all of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed May 19, 1986, Ser. No. 864,912
Claims priority, application Japan, Nov. 20, 1985, 60-48665
Term of patent 14 years
U.S. Cl. D32—22



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF AUGUST, 1989

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

: *See*—
Rumble, Richard R.; and , 4,860,908, Cl. 220-1.00R.
A. M. Todd Company: *See*—
Spencer, Jeffrey S., 4,861,616, Cl. 426-651.000.
A. Monforts GmbH & Co.: *See*—
van Wersch, Kurt; and Voigt, Klaus, 4,860,399, Cl. 8-151.000.
A/S Spilka Inco Ltd.: *See*—
Flakk, Egil, 4,860,811, Cl. 160-92.000.
A. W. Plume Limited: *See*—
Pereira, Joseph A. T., 4,860,820, Cl. 164-457.000.
AB Tetra Pak: *See*—
Franke, Rickard; and Martensson, Lars, 4,861,328, Cl. 493-470.000.
ABB Stal AB: *See*—
Brannstrom, Roine, 4,860,536, Cl. 60-39.464.
MÅnsson, Martin; and Torstenfelt, Ragnar, 4,860,535, Cl. 60-39.464.
Abe, Morio, to Chisso Corporation. Cylindrical filter. 4,861,633, Cl. 428-36.300.
Abela, George S., to University of Florida. Laser method and apparatus for the recanalization of vessels and the treatment of other cardiac conditions. 4,860,743, Cl. 128-303.100
Abend, Robert J., to Harris Corporation. Non-contact I/O signal transmission in integrated circuit packaging. 4,862.231, Cl. 357-19.000.
Abisare Co., Ltd.: *See*—
Kasahara, Keiji, 4,861,665, Cl. 428-411.100
Abondance, Roger, to Skis Rossignol S.A. Downhill ski with elongated tip. 4,861,063, Cl. 280-601.000.
Abouav, David M., to Moorhouse, D. J.; and Deeley, S. T. Detonator actuator. 4,860,653, Cl. 102-200.000.
Aburatani, Masakazu; Takeuchi, Tadashi; and Mori, Kenji, to Fuji Yakuhin Kogyo Kabushiki Kaisha; and National Federation of Agricultural Co-Operative Associations. 3α,5-cyclo-22,23-dihydroxy-5α-steroid compounds. 4,861,875, Cl. 540-114.000.
Access Computer Products, Inc.: *See*—
Woolley, Lee G., 4,862,210, Cl. 355-245.000
ACCO World Corporation: *See*—
Fosnaugh, William L., 4,861,286, Cl. 439-651.000.
Aceti, John G.: *See*—
Lock, Brian E.; and Aceti, John G., 4,861,085, Cl. 294-87.100.
Achille, Geoffrey D., to Asdren Limited. Surface stripper. 4,860,450, Cl. 30-172.000.
Ackeret, Peter, to Licinvest AG. Picture viewing device. 4,860,472, Cl. 40-513.000.
Ackeret, Peter, to Licinvest AG. Device for the cyclic rearrangement of a pile of rectangular or square sheets. 4,860,473, Cl. 40-513.000.
Ackerman, Neil R.; Harris, Richard R.; Loveless, Scott E.; and Neubauer, Russel H., to Du Pont de Nemours, E. I., and Company. 4-quinoline carboxylic acid derivatives useful for treating skin and muco-epithelial diseases. 4,861,783, Cl. 514-311.000.
Acosta, Jorge L.: *See*—
Hellekson, Ronald A.; Campbell, John S.; and Acosta, Jorge L., 4,861,973, Cl. 235-467.000.
Acton, Hugh C.; and Walworth, Robert S., to American Seating Company. Auditorium seat. 4,861,108, Cl. 297-445.000.
Adachi, Hideki: *See*—
Yoshida, Nobutoshi; Miyke, Nobuyuki; Takagi, Atsushi; Saito, Takashi; Suzuki, Tadashi; Ohki, Naoyuki; Tomosada, Masahiro; Adachi, Hideki; and Takeda, Hiroaki, 4,862,219, Cl. 355-202.000.
Adachi, Naoki: *See*—
Hashimoto, Youichi; Tokuyama, Takashi; Nishiga, Kazuya; Arai, Yoshihiro; Ueki, Nobuhide; and Adachi, Naoki, 4,862,170, Cl. 341-144.000.
Adachi, Takehiro, to Koyo Seiko Co., Ltd. Composite cylindrical roller bearing assembly. 4,861,171, Cl. 384-455.000.
Adachi, Yuuma; and Nakajima, Nobuyoshi, to Fuji Photo Film Co., Ltd. Radiation image read-out method. 4,861,993, Cl. 250-327.200.
Adams, David W. Lotion applicator apparatus with timer. 4,861,180, Cl. 401-195.000.
Adolph Coors Company: *See*—
Dugan, Larry M., 4,860,520, Cl. 53-287.000.
Advanced Graphics Technology, Inc.: *See*—
Kemp, Norman H., 4,861,173, Cl. 384-538.000.
Advanced Micro Devices, Inc.: *See*—
Nix, Michael A., 4,862,409, Cl. 364-900.000.
Advantest Corporation: *See*—
Sato, Kazuhiko; Nishiura, Junji; and Takahashi, Keiichi, 4,862,071, Cl. 324-73.00R.
AEG Olympia Aktiengeseilschaft: *See*—
Heins, Hans-Peter; Keiter, Alfred; and Jendricke, Hermann, 4,861,177, Cl. 400-208.000.
Agency of Industrial Science and Technology: *See*—
Sugie, Kiyoshi, 4,861,904, Cl. 556-32.000.
AGFA-Gevaert Aktiengesellschaft: *See*—
Toral, Jose , 4,861,086, Cl. 294-88.000.
Agfa-Gevaert, N.V.: *See*—
Timmerman, Daniel M.; Priem, Jan J.; and Janssens, Wilhelmus, 4,861,818, Cl. 524-460.000.
Agnew, Paul: *See*—
Dean, Tracy C., 4,860,388, Cl. 2-247.000.
Ahlers, Utz-Udo: *See*—
Muller, Peter; Nagler, Josef; and Ahlers, Utz-Udo, 4,860,969, Cl. 244-3.270.
Ahlstrom, Mark L.; Keller, Bruce A.; and Storch, Randy S., to SystemOne Holdings, Inc. Computer reservation system with means to rank travel itineraries chosen in terms of schedule/fare data. 4,862,357, Cl. 364-407.000.
Ahlstromforetagen Svenska AB: *See*—
Ryham, Rolf, 4,860,548, Cl. 62-94.000.
Aibara, Yutaka: *See*—
Teteishi, Iwao; Ogura, Yoshiyuki; Hashimoto, Takeshi; Ritou, Tuguyoshi; Kajiyama, Katsufumi; Shimizu, Fumiaki; Tanaka, Kenji; Aibara, Yutaka; Kataoka, Hiroaki; Nakai, Katsuya; Yoshikawa, Takashi; Kanamori, Masaaki; Miyajima, Masao; Seki, Shuzo; and Takahashi, Sadanobu, 4,860,523, Cl. 53-512.000.
Aihara, Makoto: *See*—
Fukuoka, Hirotsugu; Kawakami, Kanji; Aihara, Makoto; Suda, Mitsuo; Takeshita, Kouji; and Isono, Yukihiro, 4,861,398, Cl. 156-64.000.
Ainsworth, Roger W.; Allen, John L.; and Kurtz, Anthony D., to Kulite Semiconductor. Methods for mounting components on convoluted three-dimensional structures. 4,860,442, Cl. 29-8.320.
Air Products and Chemicals, Inc.: *See*—
Bertin, Robert; Miller, Michael B.; Moon, Burl M.; and Post, Robert C., 4,861,533, Cl. 264-81.000.
Nicholas, David M.; Hopkins, Jeffrey A.; and Bushinsky, Joseph P., 4,861,351, Cl. 55-23.000.
Airmaster Fan Company: *See*—
Breining, Frank E., 4,861,230, Cl. 416-247.00R.
Aisan Kogyo Kabushiki Kaisha: *See*—
Suzuki, Takio; and Imamura, Kaneo, 4,860,706, Cl. 123-337.000.
Aisin Seiki Kaboshiki Kaisha: *See*—
Goto, Kouji; and Noda, Syuji, 4,862,056, Cl. 323-275.000.
Aisin Seiki Kabushiki Kaisha: *See*—
Inagaki, Toshiyuki; and Maeda, Hiroaki, 4,860,873, Cl. 192-113.00B.
Kobayashi, Toshimitsu; Inagaki, Akio; Kobayashi, Yasuhiro; Mori, Masanori, and Sakakibara, Takashi, 4,861,323, Cl. 474-260.000.
Ajinomoto Company, Inc.: *See*—
Sano, Konosuke; Ito, Koichi; Miwa, Kiyoshi; and Nakamori, Shigeru, 4,861,722, Cl. 435-252.320.
Ajzert, Ilona K.: *See*—
Takacs, Kalman; Ajzert, Ilona K.; Kellner, Katalin M.; Fleischer, Judit; Puskas, Mariann E.; and Rimai, Jozsef, 4,861,888, Cl. 546-150.000.
Akashic Memories Corporation: *See*—
Kobliska, Robert J.; and Li, Eric K., 4,861,662, Cl. 428-408.000.
Akebi, Kazuhiko: *See*—
Hashida, Kenji; Yamamoto, Takeshi; Fukumoto, Tatsuya; Deguchi, Tetsuji; Hirata, Shigeyuki; Uehara, Osamu; and Akebi, Kazuhiko, 4,861,409, Cl. 156-308.200
Akiba, Jyuji, to Junkosha Co., Ltd. Attachment bracket for a liquid leakage sensor used in drain openings. 4,860,983, Cl. 248-205.100.
Akiyama, Minoru: *See*—
Ohishi, Kohji; Akiyama, Minoru; and Sekita, Ryuichi, 4,861,860, Cl. 528-272.000.
Akkermans, Antonius H. M.: *See*—
Smid, Albert; Akkermans, Antonius H. M.; Benschop, Jozef P. H.; and Rooyackers, Cornelis J. P. M., 4,861,982, Cl. 250-235.000.
Akselrod, Solange: *See*—
Gordon, David; Akselrod, Solange; Cohen, Richard J.; Tu, Jerome C.; Burns, Stephen K.; and DeLeon, Victoria H., 4,862,361, Cl. 364-413.060.
Aktiebolaget IRO: *See*—
Jacobsson, Kurt A. G., 4,860,558, Cl. 66-163.000.
Al-Harbi, Tarik S. Infant bottle timer apparatus. 4,860,684, Cl. 116-308.000
Alameel, George M.; and Petrunia, Alexander, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Opto-electronic and optical fiber interface arrangement. 4,861,134, Cl. 350-96.200.
Albee, Alan J., to GenRad, Inc. Method of in-circuit testing. 4,862,069, Cl. 324-73.00R

Albert Einstein College of Medicine of Yeshiva University (a Div. of Yeshiva University): *See—*
Atkinson, Paul H.; Bellamy, A. Richard; Both, Gerald W.; and Poruchynsky, Marianne S., 4,861,864, Cl. 530-324.000

Albert-Frankenthal AG: *See—*
Kuhner, Rudolf; Schmitt, Gunter K.; and Stab, Rudolf, 4,861,326, Cl. 493-359.000.

Alcan International Limited: *See—*
Bryant, Anthony J.; Field, David J.; and Butler, Ernest P., 4,861,389, Cl. 148-3.000.
Fortin, Paul-Emile; and Galleneault, Willard M., 4,861,388, Cl. 148-2.000
Otto, Alexander J., 4,860,941, Cl. 228-179.000

Alcatel NA, Inc: *See—*
Blair, William D., Jr.; Bentivenga, Salvatore; and Lamont, Gregory J., 4,862,122, Cl. 333-202.000

Alcatel N.V.: *See—*
Hoefkens, Daniel S. G.; Spaenjers, Joannes H. P. M.; Boeykens, Eduard C. M.; Verhille, Henri A. J.; and Geernaert, Gustaaf A. L., 4,862,449, Cl. 370-32.100.

Alfa-Laval Separation AB: *See—*
Borgstrom, Leonard; Carlsson, Claes G.; Franzen, Peter; Inge, Claes; Lagerstedt, Torgny; Moberg, Hans; and Nabo, Olle, 4,861,329, Cl. 494-73.000.

Alfred Teves GmbH: *See—*
Reinartz, Hans-Dieter; and Steffes, Helmut, 4,861,117, Cl. 303-100.000.

Allegretti & Company: *See—*
Pilatowicz, Edward J.; and Zatulovsky, Leonid, 4,860,451, Cl. 30-276.000

Allemann, James G., to Rain Bird Consumer Products MFG. Corp. Adjustable oscillating wave-type sprinkler. 4,860,954, Cl. 239-101.000.

Allen, Adrian S.; Farrar, David; and Flesher, Peter, to Allied Colloids Ltd. Process of making water-absorbent, water-insoluble, cross linked fiber or film. 4,861,539, Cl. 264-204.000.

Allen-Bradley Company, Inc.: *See—*
Unsworth, Peter J.; Merrison, John C.; and Rowan, Timothy M., 4,862,052, Cl. 318-757.000.

Allen, Henry V.: *See—*
Knutti, James W.; Allen, Henry V.; Petersen, Kurt E.; and Kowalski, Carl R., 4,861,420, Cl. 156-633.000

Allen, John L.: *See—*
Ainsworth, Roger W.; Allen, John L.; and Kurtz, Anthony D., 4,860,442, Cl. 29-8.320.

Allen, Lynne M.: *See—*
Newhouse, Thomas J.; Allen, Lynne M.; and Goeman, Donald D., 4,861,122, Cl. 312-317.100.

Allen, Margaret A., to United States of America, National Aeronautics and Space Administration. Emergency egress fixed rocket package. 4,860,971, Cl. 244-122.0AD.

Allen, Michael C.: *See—*
Dorner, Wolfgang C.; Allen, Michael C.; Wedell, Mark C.; and Hosch, Michael A., 4,861,225, Cl. 414-789.900.

Allen, Nicholas J.: *See—*
Lowe, Christopher H.; and Allen, Nicholas J., 4,860,929, Cl 222-189.000.

Allen, Ralph S., III. Multi-functional filtering medium. 4,861,481, Cl. 210-502.100.

Allergan, Inc.: *See—*
Kaufman, Herbert E.; Knight, Patricia M.; and Buchen, Shelley, 4,860,885, Cl. 206-5.100.

Allied Colloids Ltd.: *See—*
Allen, Adrian S.; Farrar, David; and Flesher, Peter, 4,861,539, Cl. 264-204.000.
Bublik, Eugene P.; and Sartowski, Zbigniew, 4,861,349, Cl. 51-293.000.

Allied Products Corporation: *See—*
Hottes, Ronald W., 4,860,526, Cl. 56-13.600.

Allied-Signal Inc.: *See—*
Joy, Theodore J.; Mohile, Vivek V.; and Richards, William L., 4,861,234, Cl. 417-273.000.
Khanna, Yash P., 4,861,838, Cl. 525-432.000.
Parfomak, Walter; Sears, Jerome; and Kluss, Walter J., 4,862,050, Cl. 318-689.000.
Steer, John E., 4,860,541, Cl. 60-578.000.
Tettman, Barton J., 4,861,359, Cl. 55-419.000.

Allison, Anthony C.: *See—*
Nelson, Peter H.; Gu, Chee-Liang L.; Allison, Anthony C.; Eugui, Elsie M.; and Lee, William A., 4,861,776, Cl. 514-233.500

Allred, Michael V.: *See—*
Thompson, David B.; Preskitt, Stanley V.; Downing, Harvey L.; and Allred, Michael V., 4,862,394, Cl. 364-551.010.

Almagor, David; and Peters, John M., to Ketema, Inc. Sonar system with area moving target indicator. 4,862,427, Cl. 367-101.000.

Alperson, Joel H. Height-extender adapter for retailing display brackets. 4,860,984, Cl. 248-225.200.

Alps Electric Co., Ltd.: *See—*
Aratsu, Shuichi, 4,861,174, Cl. 400-18.000.
Kato, Masakazu, 4,862,195, Cl. 346-76.0PH.
Kawata, Sadao, 4,860,432, Cl. 29-602.100.
Komatsu, Norimasa, 4,862,301, Cl. 360-92.000.

Alps Electric Co., Ltd: *See—*
Yanai, Shinji; and Shimoyama, Yujiro, 4,861,950, Cl. 200-5.00R.

Alskog, Bjorn. Bearing arrangement for rods and axles in plastic toys. 4,861,311, Cl. 446-469.000.

Altermatt, Ernst; and Heim, Peter, to Schweizerische Isola-Werke. Communication or control cable with supporting element. 4,861,947, Cl. 174-113.00C.

Aluminum Company of America: *See—*
Rioja, Roberto J.; Colvin, Edward L.; Vasudevan, Asuri K.; and Cheney, Brian A., 4,861,391, Cl. 148-12.70A.

Alvarez, Edwardo: *See—*
Ward, Bennett C.; Alvarez, Edwardo; and Blake, Ralph S., 4,861,537, Cl. 264-126.000.

Amafilter Membrantechnik GmbH: *See—*
Kohlheb, Robert; and Rautenbach, Robert, 4,861,476, Cl. 210-321.760.

Amazawa, Kiyoshi; and Mori, Akira, to Clarion, Co., Ltd. Pulsating noise removal device. 4,862,097, Cl. 328-165.000

Amendola, Stephen: *See—*
Durrum, Emmett L.; Amendola, Stephen; and Erickson, Bruce W., 4,861,866, Cl. 530-333.000.

Amerena, William A., to Gillette Company, The. Monitoring apparatus. 4,860,753, Cl. 128-632.000.

American Combustion, Inc.: *See—*
Gitman, Gregory M.; and Khudenko, Boris M., 4,861,262, Cl. 431-5.000.

American Cyanamid Company: *See—*
Doehner, Robert F., Jr., 4,861,887, Cl. 546-170.000.
Meyer, Harry M., Jr.; and Weiss, Martin J., 4,861,579, Cl. 424-1.100.
Neff, Roger E.; and Ryles, Roderick G., 4,861,499, Cl. 252-8.551.

American Home Products Corporation: *See—*
Hughes, Philip F.; Mobilio, Dominick; and Humber, Leslie G., 4,861,910, Cl. 560-126.000.
Weierstall, Richard P.; Enever, Robin P.; Brunelle, Kathleen L.; Thone, Gerard F.; and Warner, Ronald N., 4,861,591, Cl. 424-690.000

American Medscan, Inc.: *See—*
Juncosa, Robert D., 4,862,092, Cl. 324-450.000.

American Optical Corporation: *See—*
Winthrop, John T., 4,861,153, Cl. 351-169.000

American Seating Company: *See—*
Acton, Hugh C.; and Walworth, Robert S., 4,861,108, Cl 297-445.000.

American Telephone and Telegraph Company: *See—*
Bina, Dale C., 4,861,277, Cl. 439-377.000.
Cubbison, Richard J., Jr., 4,862,315, Cl. 361-212.000
Stone, Julian; and Stulz, Lawrence W., 4,861,136, Cl. 350-96.300.

American Telephone and Telegraph Company, AT&T Bell Laboratories: *See—*
Alameel, George M.; and Petrunia, Alexander, 4,861,134, Cl. 350-96.200.
Bean, John C.; Feldman, Leonard C.; and Fiory, Anthony T., 4,861,393, Cl. 148-33.400.
Dautartas, Mindaugas F.; Harrus, Alain S.; Martin, Edward P., Jr.; and Stevie, Fred A., 4,861,126, Cl. 350-96.110.
Jewell, Jack L.; and McCall, Samuel L., Jr., 4,861,976, Cl. 250-211.00J
McBride, Antoinette D.; and Smith, Arnold R., 4,861,278, Cl 439-395.000.

American Telephone and Telegraph Company, AT&T Technologies, Inc.: *See—*
Jennings, Lois R.; and Long, Roger W., 4,860,903, Cl. 211-4.000.

American Trailers, Inc.: *See—*
Zajic, Albert H., 4,861,095, Cl. 296-182.000.

American Transportation Technology, Inc.: *See—*
Rossi, James L.; and Lawrence, Franklin B., 4,861,469, Cl 210-172.000.

Amerock Corporation: *See—*
Lense, Robert F., 4,860,493, Cl. 49-279.000.

Amoco Corporation: *See—*
Bach, David T., 4,861,163, Cl. 356-417.000.
Bockrath, Ronald E.; and Cole, Bill W., 4,861,855, Cl. 528-125.000.
Clendinning, Robert A.; Harris, James E.; Kwiatkowski, George T.; McMaster, Lee P.; Matzner, Markus; and Winslow, Paul A., 4,861,915, Cl. 568-328.000.
Dickinson, Barry L.; and Robeson, Lloyd M., 4,861,837, Cl. 525-394.000.
Edwards, Robert C., 4,861,738, Cl. 502-34.000.
Levan, Chris D., 4,861,575, Cl. 423-447.200.
Qureshi, Shahid P., 4,861,823, Cl. 524-606.000.
Sigal, Richard F., 4,862,089, Cl. 324-350.000.

AMP Incorporated: *See—*
Bogar, Jerry H.; Cassel, Willard F., Jr.; Mummey, Dale B.; Oberman, Carl D.; and Summers, Donald J., 4,861,271, Cl. 439-63.000.
Nicholas, Vincent; and Siwinski, Paul P., 4,860,447, Cl. 29-863.000.
Nicholas, Vincent; and Siwinski, Paul P., 4,860,801, Cl. 140-105.000.
Pauza, William V.; and Sheesley, Wilmer L., 4,861,284, Cl. 439-580.000.

AMS Packaging: *See—*
Quennessen, Rene, 4,860,920, Cl 220-326.000.

Analog Devices, Inc.: *See—*
Barrow, Jeffrey G., 4,862,073, Cl. 324-78.00R.

Anand, Raj K.: *See—*
Johnson, Norman J.; and Anand, Raj K., 4,860,744, Cl. 128-303.100.

Anchor Group, The: *See—*
Covey, Michael K., 4,861,256, Cl. 425-378.100.

Anciens Etablissements Warin Fils BWF: *See—*
Dumoulin, Patrick; and Recalt, Hugues, 4,860,524, Cl. 54-44.000.

Anderson, Douglas C.: *See—*
Eastlund, Bernard J.; Schmitt, Kenneth J.; and Anderson, Douglas C., 4,861,074, Cl. 285-53.000.

Anderson, J. R.: *See—*
Shin, Soo H.; Pasko, John G.; and Anderson, J. R., 4,862,236, Cl. 357-30.000.

Anderson, Joseph; Baldi, Barney T.; and Engstrom, John M., to Bechtel International Corporation. Pressure/compression concrete joint seal. 4,861,043, Cl. 277-1.000.

Anderson, Thor W. Automatic gain setting circuit. 4,861,978, Cl. 250-214.00A.

Andersson, Bengt H.; and Palmgren, Kent I., to Autoliv-Cipro Aktiebolag. Method and apparatus for elimination of wheel spin of vehicles. 4,860,849, Cl. 180-197.000.

Andersson, Nils T., to Nordiskafilt AB. Controlling a paper web path in the press section with an impermeable belt. 4,861,430, Cl. 162-205.000.

Ando, Haruhisa; Nakai, Masaaki; Ono, Hideyuki; Ozaki, Toshifumi; Ohba, Shinya; and Koike, Norio, to Hitachi, Ltd. Solid-state imaging device. 4,862,487, Cl. 377-58.000

Ando, Ryo; Yoshida, Tadao; Fujiie, Kazuhiko; and Yoshida, Toshio, to Sony Corporation. Recording device that identifies recordable areas of a disk record. 4,862,439, Cl. 369-30.000.

Andou, Nobuyoshi; and Imai, Hitoshi, to Mitsubishi Denki Kabushiki. Apparatus for positioning an optical element. 4,861,139, Cl. 350-255.000.

Andrecovich, Mark J.: *See—*
Jain, Ravi; LaCava, Alberto; Andrecovich, Mark J.; and MacLean, Donald L., 4,861,361, Cl. 62-18.000.

Andreetta, Rodolfo, to Simmel Difesa S.p.A. Tubular shell for artillery projectiles. 4,860,659, Cl. 102-473.000.

Andrews, George S.; Lamberty, Bernard J.; and Tracy, Daniel J., to Boeing Company, The. Variable wide angle conical scanning antenna. 4,862,185, Cl. 343-761.000.

Angehrn, Jorg A.: *See—*
Graebner, Peter; Sie, Swan A.; and Angehrn, Jorg A., 4,862,424, Cl. 367-33.000.

Anritsu Corporation: *See—*
Toda, Kouichi; and Hashizu, Masaaki, 4,862,106, Cl. 331-2.000.

Ansell, Daniel F.; Harris, James C.; Howell, Steven E.; Miller, Michael S.; and Wysong, Robert D., to International Business Machines Corporation. Adapter card mounting in a low profile microcomputer. 4,862,327, Cl. 361-415.000.

ANT Nachrichtentechnik GmbH: *See—*
Blume, Georg; Bohmwetsch, Dieter; and Eckardt, Fritz, 4,861,133, Cl. 350-96.200.
Schomers, Josef, 4,862,161, Cl. 340-825.800.

Antal, Kalman; Ugrosdy, Laszlo ; and Rimay, Bela, to Tungsram Reszvenytarsasag. Process for flushing and filling a low pressure gas discharge light source. 4,861,302, Cl. 445-38.000.

Antal, Sandor: *See—*
Kovacs, Ferenc; Lengyel, Miklosne ; Nagy, Tibor; Antal, Sandor; Gyongyosi, Gyorgy; Palotas, Laszlo ; and Pfisztner, Nandor, 4,860,798, Cl. 138-133.000.

Antesberger, A. Wayne: *See—*
Croley, Henry C.; and Antesberger, A. Wayne, 4,862,164, Cl. 340-952.000.

Antoniades, Harry N.; Lynch, Samuel E.; and Williams, Ray C., to Institute of Molecular Biology; and President and Fellows of Harvard College. Wound healing and bone regeneration using PDGF and IGF-I. 4,861,757, Cl. 514-21.000.

Antonio, Anthony I., Jr.: *See—*
Richards, Toby D.; and Antonio, Anthony I., Jr., 4,860,797, Cl. 138-122.000.

Anze, Kimio: *See—*
Tajima, Shoji; Kadomatsu, Yasuo; Miyazaki, Yoshio; Sakurai, Michikazu; and Anze, Kimio, 4,860,417, Cl. 29-130.000.

Aoki, Akio: *See—*
Enari, Masahiko; Yoshimura, Katsuji; Aoki, Akio; Yamashita, Shinichi; Shimokoriyama, Makoto; Kashida, Motokazu; Shimizu, Tetsuya; Ishii, Yoshiki; and Fujii, Akio, 4,862,292, Cl. 360-8.000.

Aoki, Ken; Hoshi, Katsuhiko; Satoh, Shigeo; Kakinuma, Mitsuru; Togashi, Shigeru; and Saitoh, Hiromi, to Sanyo Electric Co., Ltd. Apparatus for preparing ice creams. 4,860,550, Cl. 62-135.000.

Aoki, Takayoshi; Takeda, Masayuki; Nagatsuka, Ikutaroh; Honjo, Toshio; Itoh, Kazuhiro; and Uchida, Kenji, to Hitachi, Ltd. Process for producing carriers for developer. 4,861,694, Cl. 430-137.000.

Aoshiro, Hisatake, to Kabushiki Kaisha Machida Seisakusho. Outer tubular envelope for inserting apparatus. 4,860,631, Cl. 87-9.000.

AP Parts Manufacturing Company: *See—*
Moring, Walter G., III, 4,860,853, Cl. 181-282.000.

Apffel, Fred, to Flexivol, Inc. Carbon dioxide absorption methanol process. 4,861,360, Cl. 62-17.000.

Apollo Seiko Ltd.: *See—*
Kawaguchi, Seiji, 4,860,427, Cl. 29-564.400.

Appelt, Guenther, to Siemens Aktiengesellschaft. X-radiator. 4,862,489, Cl. 378-117.000

Appleford, Lyle R., to Boeing Company, The. Apparatus and methods for generating aircraft control commands using nonlinear feedback gain. 4,862,372, Cl. 364-433.000.

Applied Automation, Inc.: *See—*
Mowery, Richard A., Jr., 4,861,555, Cl. 422-70.000

Aprica Kassai Kabushikikaisha: *See—*
Kassai, Kenzou, 4,861,405, Cl. 156-204.000.

Arai, Kenji: *See—*
Kurihara, Kazumasa; and Arai, Kenji, 4,862,362, Cl. 364-424.100.

Arai, Masumi: *See—*
Suzuki, Akio; Yoshida, Eiji; Nagasaki, Satoru; Arai, Masumi; and Tsuji, Nobuaki, 4,861,702, Cl. 430-564.000.

Arai, Mikiro: *See—*
Funayama, Osamu; Arai, Mikiro; and Isoda, Takeshi, 4,861,569, Cl. 423-324.000.

Arai, Yoshihiro: *See—*
Hashimoto, Youichi; Tokuyama, Takashi; Nishiga, Kazuya; Arai, Yoshihiro; Ueki, Nobuhide; and Adachi, Naoki, 4,862,170, Cl. 341-144.000.

Araki, Kazunori: *See—*
Yamaguchi, Shogo; Araki, Kazunori; and Tazuke, Hisashi, 4,860,802, Cl. 141-6.000.

Araki, Nobuhiro: *See—*
Sato, Takeo; Araki, Nobuhiro; Kawata, Koichi; Nomura, Noboru; Ueno, Atushi; and Yoshida, Shotaro, 4,861,148, Cl. 350-505.000.

Aratsu, Shuichi, to Alps Electric Co., Ltd. Device for driving print member of printer. 4,861,174, Cl. 400-18.000.

Arco Chemical Technology, Inc.: *See—*
White, John F.; and Pollard, Michael R., 4,861,613, Cl. 426-611.000.

Arimoto, Akira: *See—*
Ishikawa, Sachiko; and Arimoto, Akira, 4,861,128, Cl. 350-96.130.

Arnao, Marlene. Forms layout gauge. 4,860,456, Cl. 33-1.00B.

Arnesson, Joel C. E.: *See—*
Brolund, Theodore F.; and Arnesson, Joel C. E., 4,860,428, Cl 29-568.000.

Arnold, Brigitte; Eidler, Franz; and Wessel, Wolf, to Robert Bosch GmbH. Interface and control unit for a diesel engine electronic controller and glow plug circuits, and method of glow plug operation. 4,862,370, Cl. 364-431.100.

Arnold, Dan M., to Halliburton Logging Services, Inc. Tracer injection method. 4,861,986, Cl. 250-260.000.

Arnold, Gerhard, to Friedhelm Pickhan. Device for driving in nails for hanging pictures and similar articles. 4,860,937, Cl. 227-147.000.

Asahi Denka Kogyo Kabushiki Kaisha: *See—*
Kato, Masaaki; Shinohara, Katumi; and Sugiyama, Hiromu, 4,861,610, Cl. 426-582.000
Uchida, Yasuzo; and Shirakawa, Yoichi, 4,861,602, Cl. 426-56.000

Asahi Glass Company Ltd.: *See—*
Morimoto, Takeshi; Sanada, Yasuhiro; Ohashi, Shinichi; and Kimura, Yoshikatsu, 4,862,328, Cl. 361-502.000
Takayanagi, Takashi; Munekata, Seiji; Miyazaki, Nobuyuki; and Moriwaki, Ken, 4,861,667, Cl. 428-421.000.

Asahi Kogaku Kogyo K.K.: *See—*
Sasaki, Mashiko, 4,862,445, Cl. 369-75.200.

Asai, Kazumitsu: *See—*
Fukukawa, Mitsuo; Yazawa, Masayuki; Asai, Kazumitsu; Okamoto, Yoshiharu; and Mio, Kouhei, 4,861,189, Cl. 404-84.000.

Asak, Kare, to Drill Systems International Ltd. Latching bit sub. 4,860,838, Cl. 175-320.000.

Asakura, Hiroshi: *See—*
Kasai, Kiyoshi; Sakai, Naomichi; Oikawa, Tomoyuki; Uchino, Kenji; Tsukidate, Takaaki; Asakura, Hiroshi; Yamamura, Hiroshi; and Nagata, Hiroya, 4,862,029, Cl. 310-311.000.

Asakura, Yasuo; and Toyofuku, Toshiyuki, to Olympus Optical Company Limited. Diaphragm apparatus for camera. 4,862,207, Cl. 354-453.000.

Asano, Kyoichi: *See—*
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,861,792, Cl. 514-389.000.

Asano, Masami; Toma, Ken; and Takeuchi, Yo, to Mitsubishi Aluminum Kabushiki Kaisha. Brazed aluminum article. 4,861,681, Cl. 428-654.000.

Asaoka, Masaharu, to Kayaba Industry Co. Ltd. Metering valve. 4,860,788, Cl. 137-491.000.

Asaoka, Teruo; and Yoshioka, Shogo, to Shizuoka Seiki Co., Ltd. Power supply system for electrolytic processing apparatus. 4,861,450, Cl. 204-224.00M.

Asazuma, Masaaki: *See—*
Yoshimi, Keiichi; Goto, Shigeo; and Asazuma, Masaaki, 4,861,403, Cl. 156-138.000.

Asdren Limited: *See—*
Achille, Geoffrey D., 4,860,450, Cl. 30-172.000.

Asea Stal AB: *See—*
Jarvstrat, Goran, 4,860,693, Cl. 122-4.00D.

Ash, Vernon R.: *See—*
Meehan, Adrian P.; and Ash, Vernon R., 4,862,145, Cl. 340-573.000

Ashida, Yasuhiro; and Yokota, Shigeki, to Sanyo Electric Co. Ltd. Semiconductor integrated circuit device. 4,862,241, Cl. 357-45.000.

Ashikaga, Tadashi: *See—*
Nomura, Masakatsu; Suda, Keiko; and Ashikaga, Tadashi, 4,862,343, Cl. 363-41.000

Ashiku, Mark. Dental aspirator valve and valve sheath. 4,861,266, Cl 433-95.000.

Ashland Oil, Inc.: *See—*
Reeve-Parker, Michael C., 4,861,370, Cl. 75-68.00R.

Ashmore, Benjamin H., Jr., to Texas Instruments Incorporated. Single-level poly programmable bit circuit. 4,862,019, Cl. 307-469.000.

Ashworth, Robert H.: *See—*
DePietro, Mark A.; Klim, William T.; Ashworth, Robert H.; and Thiele, Robert E., 4,860,812, Cl. 160-135.000.

Askey, William G.; and Hopkins, Steven M., to United Technologies Corporation. Ring forging process. 4,860,567, Cl. 72-254.000.
Askoll S.r.l.: *See—*
Marioni, Elio; and Cavalcante, Vittorio, 4,861,240, Cl. 417-423.300.
AT&T Bell Laboratories: *See—*
Stone, Julian; and Stulz, Lawrence W., 4,861,136, Cl. 350-96.300.
AT&T Information Systems, Inc.: *See—*
Bina, Dale C., 4,861,277, Cl. 439-377.000.
Cubbison, Richard J., Jr., 4,862,315, Cl. 361-212.000.
Reed, Adam V., 4,862,498, Cl. 379-355.000.
Atari Corporation: *See—*
Westberg, Thomas E.; Rode, Christian S.; and Burns, Bruce G., 4,862,156, Cl. 340-747.000.
Athale, Ravindra A.: *See—*
Lee, John N.; Athale, Ravindra A.; and Rolsma, Peter B., 4,862,115, Cl. 332-7.510.
Atkinson, Paul H.; Bellamy, A. Richard; Both, Gerald W.; and Poruchynsky, Marianne S., to Albert Einstein College of Medicine of Yeshiva University (a Div. of Yeshiva University). Rotavirus antigens. 4,861,864, Cl. 530-324.000.
Atlantic Richfield Company: *See—*
Chao, Tai S., 4,861,504, Cl. 252-48.200.
Scott, Bentley N.; and Yang, Y. Sam, 4,862,060, Cl. 324-58.50A.
Sofranko, John A.; Gastinger, Robert G.; and Jones, C. Andrew, 4,861,936, Cl. 585-500.000.
Atsugi Motor Parts Company, Limited: *See—*
Kobayashi, Hiroshi; and Ichikawa, Toshiro, 4,862,063, Cl. 324-61.00P.
Aubert, Guy; and Kaplan, Daniel, to Thomson-CGR. Method of regulating the magnetic field delivered by a resistive magnet, a resistive magnet system using this method and an installation for forming images by nuclear magnetic resonance incorporating such a system. 4,862,085, Cl. 324-315.000.
Aubry, Jean; Cassiani-Ingoni, Serge; and Hauschuld, Remi, to Societe Chimique Des Charbonnages S.A. Copolymers based on ethylenic monomers and methylolphenyl allyl ethers. 4,861,821, Cl. 524-512.000.
Audio Technology, Inc.: *See—*
Marusa, David M.; and Munroe, Bruce R., 4,862,159, Cl. 340-825.240.
Audureau, Joel; and Piecuch, Edouard, to Societe Chimique des Charbonnages S.A. Compositions of ethylene polymers, and method for the preparation thereof. 4,861,834, Cl. 525-194.000.
Augustin, Karl-Heinz, to Hans-Georg Augustin. Method and apparatus for straightening a workpiece. 4,860,566, Cl. 72-110.000.
Augustyniak, Stanley D. Anti-reverse siphoning water circulating system for aquariums. 4,861,465, Cl. 210-109.000
Aunspach Controls Co.: *See—*
Aunspach, Dale, 4,860,992, Cl. 251-81.000.
Aunspach, Dale, to Aunspach Controls Co. Valve/actuator torque overload protector. 4,860,992, Cl. 251-81.000.
Autoliv-Cipro Aktiebolag: *See—*
Andersson, Bengt H.; and Palmgren, Kent I., 4,860,849, Cl. 180-197.000.
Automated Technology Systems, Inc.: *See—*
Pierpoint, James W., 4,860,441, Cl. 29-825.000.
Automobiles Citroen: *See—*
Gillet, Guy, 4,861,182, Cl. 403-264.000.
Automobiles Peugeot: *See—*
Gillet, Guy, 4,861,182, Cl. 403-264.000.
Avery International Corporation: *See—*
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Azelrod, Barry H.; Durst, Robert T., Jr.; Hunter, Kevin D.; and Schmidt, Alfred C., to Pitney Bowes Inc. Apparatus for preparing a letter. 4,862,386, Cl. 364-518.000.
Azkoyen Industrial, S.A.: *See—*
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Azuma, Kenkoku; and Sakaki, Masaaki, to Mitsubishi Denki Kabushiki Kaisha. Method of laser marking. 4,861,620, Cl. 427-53.100.
B.A.T. Cigarettenfabriken GmbH: *See—*
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Baacke, Michael; Deller, Klaus; Kleinschmit, Peter; and Koberstein, Edgar, to Degussa Aktiengesellschaft. Catalysts for converting alcohols and/or aliphatic ether to unsaturated hydrocarbons and process for their production. 4,861,937, Cl. 585-640.000.
Baba, Hideki; Maeda, Hirokazu; Kurooka, Akira; and Nago, Atsushi, to Fuji Oil Company, Limited. Fractionated soft laurin fat and food containing the same. 4,861,611, Cl. 426-601.000.
Babbitt, Richard W.: *See—*
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Babcock & Wilcox Company, The: *See—*
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Dziubakowski, Donald J.; Keyes, Marion A., IV; and Shaffer, Jeremiah J., 4,861,233, Cl. 417-201.000.
Miers, David R.; Raj, David; and Varshneya, Deepak, 4,860,586, Cl. 73-517.00R.
Walker, David J., 4,860,694, Cl. 122-4.00D.
Baccaro, Mario, to O.M.S.I. s.a.s. di Baccaro Vincenzo & C. Reclining angle folding chair. 4,861,100, Cl. 297-19.000.
Bach, David T., to Amoco Corporation. Ellipsoidal cylinder fluorescence analyzer. 4,861,163, Cl. 356-417.000.
Backx, Leo J. J.: *See—*
Heeres, Jan; Stokbroekx, Raymond A.; and Backx, Leo J. J., 4,861,879, Cl. 544-55.000.
Bade, Volkbert, to Th. Goldschmidt AG. Method for the preparation of concentrated flowable aqueous solutions of betaines: addition of mineral acid. 4,861,517, Cl. 252-546.000.
Baginski, Mark J., to Sperry Marine Inc. Multiplexed built in test equipment. 4,862,458, Cl. 371-15.000.
Bailey, Christian E.; and Bowser, John J., to W. L. Gore & Associates, Inc. Air-stream sampling device. 4,860,598, Cl. 73-863.330.
Bailey, Douglas A.: *See—*
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Bakas, Steve T.; and Barger, Paul T., to UOP. Catalytic composition and process for the transalkylation of aromatic hydrocarbons. 4,861,935, Cl. 585-474.000.
Baker, Edwin T.; Neilson, George V.; and Stumpf, George R., Jr., to Boeing Company, The. Method and apparatus for handling plies of composite material. 4,861,406, Cl. 156-230.000.
Baker, Gerald S.: *See—*
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Baldi, Barney T.: *See—*
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Ballyns, Jan; Martin, Paul H.; and Martin, John C., to Diesel Equipment Limited. Doors for vans. 4,860,813, Cl. 160-188.000.
Baltensperger, Eduard, to Eduard Baltensperger; and Kurt Eicher. Pulling or loading vehicle with free space between the rear wheels. 4,860,843, Cl. 180-373.000.
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Ponce De Leon, Lorenzo A.; Stamps, Douglass K., Jr.; and Balzano, Quirino, 4,862,181, Cl. 343-702.000.
Banks, Christopher P.; and Irving, Edward, to Ciba-Geigy Corporation. Method of making patterns. 4,861,438, Cl. 204-15.000.
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Bany, Stephen W.: *See—*
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Barger, Paul T.: *See—*
Bakas, Steve T.; and Barger, Paul T., 4,861,935, Cl. 585-474.000.
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Barker, Stanley G. Multipurpose warming and heating vessel. 4,860,726, Cl. 126-208.000.
Barnes, Andrew C.; and Edwards, David L., to Mycogen Corporation. Cellular encapsulation of biologicals for animal and human use. 4,861,595, Cl. 424-195.100.
Barnes, Billy R.; Barnes, Ronny L.; and Gary, David A., to Bar-Gar Corporation. Draft connection. 4,860,833, Cl. 172-26.000.
Barnes-Hind, Inc.: *See—*
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Barnes, Ronny L.: *See—*
Barnes, Billy R.; Barnes, Ronny L.; and Gary, David A., 4,860,833, Cl. 172-26.000.
Barnett, Clifford J.; Greenwood, John E.; and Holman, Earl V., to United States of America, Administrator, National Aeronautics and Space Administration. Payload deployment method and system. 4,860,974, Cl. 244-158.00R.
Barnett, Daniel J.; and Michalopoulos, Daniel L., to Betz Laboratories, Inc. Process for inhibiting white pitch deposition in papermaking felts. 4,861,429, Cl. 162-199.000.

Barnette, C. Joseph, to Kent Adhesive Products Company. Feedstock lamination. 4,861,636, Cl. 428-41.000.
Barr, Maurice R.: *See—*
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Barrow, Jeffrey G., to Analog Devices, Inc. Repetitive wave sampler. 4,862,073, Cl. 324-78.00R.
Barth, Guenter; Stegmaier, Alwin; and van Zanten, Anton, to Robert Bosch GmbH. Apparatus for actuating the throttle valve of an internal combustion engine. 4,860,848, Cl. 180-197.000.
Bartl, Knut; Lill, Helmut; and Wielinger, Hans, to Boehringer Mannheim GmbH. Analysis element for determination of a coagulation parameter. 4,861,712, Cl. 435-13.000.
Bartley, Harold D.; and Gaiser, William R., to Broadway Companies, Inc. Apparatus for forming a blown plastic container. 4,861,260, Cl. 425-529.000.
Bartley, Tracy L. Bib-bowl. 4,860,381, Cl. 2-49.00A.
Bartow, Richard E.; Darrow, William K.; and Hartmann, Wayne T., to Eastman Kodak Company. CRT device light versus input signal characteristic function. 4,862,265, Cl. 358-139.000.
BASF Aktiengesellschaft: *See—*
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Bronstert, Klaus; Bohnet, Siegbert; Himmele, Walter; and Bott, Kaspar, 4,861,742, Cl. 502-157.000.
Hummerich, Rainer; Kerber, Michael; Maempel, Lothar; and Weyland, Peter, 4,861,826, Cl. 524-839.000.
Kock, Hans-Jakob; Hisgen, Bernd; Portugall, Michael; Seiler, Erhard; and Blinne, Gerd, 4,861,858, Cl. 528-193.000.
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Pfeifer, Charles R., 4,861,501, Cl. 252-8.600.
Bass, R. Gerald: *See—*
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Basseches, Mark T.: *See—*
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Basset, Jean-Marie; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, to Societe Nationale Elf Aquitaine. Polymerization of unsaturated hydrocarbons with an induction period. 4,861,848, Cl. 526-169.000.
Bassett, Roger, and Negus, Terence I., to Multi-Bar Systems Ltd. Cutting tool holder adaptor. 4,861,203, Cl. 409-136.000.
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Baudenbacher, Christian, to Visita Mtc Ltd. Movement-controlled locking mechanism, particularly for movable support tables or platforms. 4,860,668, Cl. 108-144.000.
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Bayer Akteingesellschaft: *See—*
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Bayer Aktiengesellschaft: *See—*
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Kress, Hans-Jurgen; Paul, Winfried; Peters, Horst; Lindner, Christian; and Buekers, Josef, 4,861,829, Cl. 525-92.000.
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Bayer, Helmut; and Sekira, Peter, to Electrovac, Fabrikation, Elektrotechnischer Spezialartike. Process for connecting conductive parts of an electrical switch component. 4,861,954, Cl. 200-284.000.
Bayerische Mass-Industrie Arno Keller GmbH. *See—*
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BBC Brown Boveri AG: *See—*
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Bean, John C.; Feldman, Leonard C.; and Fiory, Anthony T., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Semiconductor heterostructures having Ge_xSi_{1-x} layers on Si utilizing molecular beam epitaxy. 4,861,393, Cl. 148-33.400.
Beard, Larry R. One handed currycomb apparatus and method. 4,860,692, Cl. 119-88.000.
Beard, Terry D. Audio digital/analog encoding and decoding. 4,862,168, Cl. 341-140.000.
Beaucamp, Klaus: *See—*
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Beaulieu, Laurence A. J.; and Cristescu, Alex G., to Northern Telecom Limited. Distribution frames and electrical connectors. 4,861,283, Cl. 439-540.000.
Beaver, Robert A.; Johnson, Leonard L.; and Medlen, Lester R., to Lincoln Logotype Company, Inc. Printing apparatus for marking indicia on articles being successively conveyed. 4,860,648, Cl. 101-35.000.
Bechtel International Corporation: *See—*
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Beck, Doris A.: *See—*
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Beck, Wayne T.: *See—*
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Becker, Mary G., to Talerico, Maria, one half interest to each. Fingernail reinforcement material and method. 4,860,774, Cl. 132-200.000
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Beijing Research Institute of Chemical Industry: *See—*
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Belmares-Sarabia, Armand; and Chayka, Stanley J., to Corporate Communications Consultants, Inc. Color correction system and method. 4,862,251, Cl. 358-22.000.

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Bender, David C. Construction block. 4,860,505, Cl. 52-98.000.

Benessis, Philippe L.; and Jannitte, Patrick H., to Societe Sofratemed S.A. Hospital bed or hospital table. 4,860,394, Cl. 5-62.000.

Benhamou, Andre , to Thomson-CSF. Rapid fire-detection device for armored vehicles. 4,861,998, Cl. 250-339.000.

Benschneider, Bradley J.; and Peng, Victor, to Digital Equipment Corporation. Apparatus and method for expediting subtraction procedures in a carry/save adder multiplication unit. 4,862,405, Cl. 364-760.000.

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Benson, David K.; and Barret, Peter F., to Midwest Research Institute. Method and apparatus for nucleating the crystallization of undercooled materials. 4,860,729, Cl. 126-400.000.

Bentivenga, Salvatore: *See*—
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Benz & Hilgers BmbH: *See*—
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Beran, Anthony V. Humidification in respiratory systems. 4,861,523, Cl. 261-104.000.

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Berejka, Anthony J.: *See*—
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Berg, Lloyd; Rall, Richard R.; and Paffhausen, Marc W., to Berg, Lloyd. Recovery of 4-methyl-2-pentanone from acetic acid by distillation. 4,861,436, Cl. 203-38.000.

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Berge, John; and Beeley, Lee J., to Beecham Group plc. Dihydroindene-amine-dihydrooxazoles. 4,861,789, Cl. 514-370.000.

Bergeron, Jean J. Craftman's valet. 4,861,050, Cl. 280-47.350.

Bergter, Friedrich; Bocker, Harald; Bormann, Ernst-Joachim; Forberg, Wolfgang; Fricke, Heinz; Grafe, Udo; Grosse, Hans-Helmut; Heller, Ingeborg; Hilliger, Matthias; Junne, Wolf; Linde, Hellmut; Menner, Michael; Menzel, Klaus-Dieter; Muller, Peter-Jurger; Plonka, Gunter; Pohl, Hans D.; Schneider, Jorg; and Thrum, Heinz, to VEB Jenapharm. Process for the production of nourseothricine and its adsorbate. 4,861,715, Cl. 435-70.000.

Beriger, Ernst; Eckhardt, Wolfgang; and Nyfeler, Robert, to Ciba-Geigy Corporation. Nematicidal compositions. 4,861,787, Cl. 514-363.000.

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Bernstein, Bruce M.: *See*—
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Bernstein, David M.; and Fleissner, Hermut, to Research & Consulting Co. A.G. Modular inhalation tower for laboratory animals. 4,860,741, Cl. 128-204.180.

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Berstein, Garri; Obrig, Hans W.; and Wittkopp, Helmut, to Wilhelm Hegenscheidt Gesellschaft mbH. Turn broaching tool. 4,861,204, Cl. [illegible].

Bertin, Robert; Miller, Michael B.; Moon, Burl M.; and Post, Robert C., to Air Products and Chemicals, Inc. Method of preparing silicon carbide capillaries. 4,861,533, Cl. 264-81.000.

Bertleff, Werner; Maerkl, Robert; Magnussen, Peter; Kuehn, Gebhard; and Stops, Peter, to BASF Aktiengesellschaft. Treatment of aqueous solutions obtained in the carbalkoxylation of olefinically unsaturated compounds. 4,861,895, Cl. 546-353.000.

Bertling, Hannes; Mergenthaler, Robert; Schmitt, Edgar; and Siegel, Heinz, to Robert Bosch GmbH. Brake booster for vehicles. 4,860,636, Cl. 91-376.00R.

Bertolini, William A. Cabinet restraint system for cargo container. 4,860,913, Cl. 220-1.500.

Betts, William L.; and Zuranski, Edward S., to Paradyne Corporation. Data error detector for digital modems using trellis coding. 4,862,464, Cl. 371-43.000.

Betz Laboratories, Inc.: *See*—
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Beuret, Pascal: *See*—
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Beuret, Pierre; and Beuret, Pascal, to Pierre Beuret. Installation having several elements for heat treatments. 4,861,000, Cl. 266-143.000.

Bevacqua, Joseph P.; Eastep, Robert E.; and Collins, Thomas J., to Bell Atlantic. Telephone network multiple transmission line interface. 4,861,287, Cl. 439-718.000.

Bevan, Charles E.: *See*—
Vine, Raymond W.; Sheffler, Keith D.; and Bevan, Charles E., 4,861,618, Cl. 427-34.000.

Beverly, James A., to Eaton Corporation. Tire leakage detection method for central tire inflation system. 4,860,579, Cl. 73-146.200.

Bezos, Angel P.; and Fernandez, Emilio A., to Pulse Electronics, Inc. Timer circuit for drag operation in an engineman monitoring device. 4,862,433, Cl. 368-108.000.

Bhagat, Jayant K., to General Motors Corporation. Method of fabricating a lateral dual gate thyristor. 4,861,731, Cl. 437-51.000.

Bhattacharya, Arup K.: *See*—
Shah, Imran A.; and Bhattacharya, Arup K., 4,862,402, Cl. 364-724.120.

Bickford, Harry R.; Bregman, Mark F.; Moskowitz, Paul A.; Palmer, Michael J.; Reiley, Timothy C.; Poore, Paige A.; and Kovac, Caroline A. Double electronic device structure having beam leads solderlessly bonded between contact locations on each device and projecting outwardly from therebetween. 4,862,322, Cl. 361-386.000.

Biddulph, Stuart, to Eyring Research Institute, Inc. Hardened electrical connector. 4,861,289, Cl. 439-792.000.

Bidgood, William E. Converting assembly. 4,860,834, Cl. 172-820.000.

Bienstock, Rachelle J., to Texas Instruments Incorporated. Photochemical semiconductor etching. 4,861,421, Cl. 156-635.000

Biggio, Raymond. Paint and brush holder. 4,860,891, Cl. 206-362.000.

Biggs, Michael A.; and Jaeger, James L., to Cincinnati Microwave, Inc. Police radar signal band discrimination circuitry for a police radar warning receiver. 4,862,175, Cl. 342-20.000.

Bigus, Stephen J.: *See*—
Lau, Kreisler S. Y.; Oldham, Susan L.; Elias, William E.; and Bigus, Stephen J., 4,861,901, Cl. 549-215.000.

Billig, Ernst: *See*—
Miller, David J.; Bryant, David R.; Billig, Ernst; and Shaw, Bernard L., 4,861,918, Cl. 568-454.000.

Billington, Richard W.; and Williams, Jill A., to Dentsply Limited. Glass/poly (carboxylic acid) cement compositions. 4,861,808, Cl. 523-116.000.

Bina, Dale C., to American Telephone and Telegraph Company; and AT&T Information Systems, Inc. Printed circuit card guide. 4,861,277, Cl. 439-377.000.

Bio-Affinity Systems, Inc.: *See*—
Stolowitz, Mark L.; Dixit, Vyas M.; and Kesicki, Edward A., 4,861,726, Cl. 436-89.000.

Bio-Logic Systems Corporation: *See*—
Trivedi, Sushma S.; Gur, Raquel E.; and Gur, Ruben, 4,862,359, Cl. 364-413.050.

Biotechnology Research Partners, Ltd.: *See*—
Frossard, Philippe M., 4,861,708, Cl. 435-6.000.

Birkner, John M. Programmable resistance network. 4,862,136, Cl. 338-195.000.

Bishop, Arthur E.; and Scott, David W., to Bishop & Associates, A. E. Indexing and transporting mechanism. 4,860,414, Cl. 29-38.00C.

Bishop & Associates, A. E.: *See*—
Bishop, Arthur E.; and Scott, David W., 4,860,414, Cl. 29-38.00C.

Bishop, Jerry W.; Savas, Keith G.; and Wilson, Wendell G., to Jerry W. Bishop. Vegetable crisper. 4,860,555, Cl. 62-376.000.

Blaese, Herbert R. Current fed antenna with improved radiator. 4,862,183, Cl. 343-715.000.

Blair, William D., Jr.; Bentivenga, Salvatore; and Lamont, Gregory J., to Alcatel NA, Inc. Dielectric notch filter. 4,862,122, Cl. 333-202.000.

Blake, Ralph S.: *See*—
Ward, Bennett C.; Alvarez, Edwardo; and Blake, Ralph S. 4,861,537, Cl. 264-126.000.

Blakley, Calvin R.: *See*—
Vestal, Marvin L.; Blakley, Calvin R.; and Fergusson, Gordon J., 4,861,989, Cl. 250-288.000

Blaner, Bartholomew, to International Business Machines Corp. Packet switch network protocol. 4,862,461, Cl. 371-33.000.

Blinne, Gerd: *See*—
Kock, Hans-Jakob; Hisgen, Bernd; Portugall, Michael; Seiler, Erhard; and Blinne, Gerd, 4,861,858, Cl. 528-193.000.

Blizzard, William A.; and Pringle, Ronald E., to Camco, Incorporated. Safety valve. 4,860,991, Cl. 251-62.000.

Blom, Peter W. E.; and Wingard, Johann H., to Union Steel Corporation of South Africa Limited, The; and Edward L. Bateman Limited. Treatment of gas liquor. 4,861,446, Cl. 204-170.000.

Blomstedt, John W.; Irving, Wesley F.; and Pusateri, Mark S. Power supply contact. 4,862,326, Cl. 361-413.000.

Bloomfield Industries, Inc.: *See*—
Pellegrini, Louis; and Roberts, Melvin F., 4,860,906, Cl. 215-12.200.

Blume, Georg; Bohmwetsch, Dieter; and Eckardt, Fritz, to ANT Nachrichtentechnik GmbH. Device for applying a splice protector to optical conductors. 4,861,133, Cl. 350-96.200.

Blytas, George C.; and Knott, Robert F., to Shell Oil Company. Process for reducing corrosive impurities in sulfolane used for extracting aromatic hydrocarbons. 4,861,447, Cl. 204-181.800.

Boag, John, to Ford Motor Company. Seatbelt guide ring with anti-twist feature. 4,861,070, Cl. 280-808.000.

Boatcallie, Billie. Portable forearm exerciser. 4,861,022, Cl. 272-137.000.

BOC Group, Inc., The: *See*—
Jain, Ravi; LaCava, Alberto; Andrecovich, Mark J.; and MacLean, Donald L., 4,861,361, Cl. 62-18.000.

Bock, Erich; and Weber, Adolf, to DIEHL GmbH & Co. Saboted projectile with propellant cage. 4,860,661, Cl. 102-523.000.

Bocker, Harald: *See*—
Bergter, Friedrich; Bocker, Harald; Bormann, Ernst-Joachim; Forberg, Wolfgang; Fricke, Heinz; Grafe, Udo; Grosse, Hans-Helmut; Heller, Ingeborg; Hilliger, Matthias; Junne, Wolf; Linde, Hellmut; Menner, Michael; Menzel, Klaus-Dieter; Muller, Peter-Jurger; Plonka, Gunter; Pohl, Hans D.; Schneider, Jorg; and Thrum, Heinz, 4,861,715, Cl. 435-70.000.

Bockrath, Ronald E.; and Cole, Bill W., to Amoco Corporation. Polyamide-imide compositions from bisphenoxyphenyl diamine tricarboxylic anhydride and tetracarboxylic dianhydride 4,861,855, Cl. 528-125.000.

Boda, James C.; and Slattery, Gordon C., to Brunswick Corporation. Cowl assembly with water resistant air intake duct and sealing. 4,860,703, Cl. 123-195.00P.

Bodart, Philippe: *See*—
Debras, Guy; and Bodart, Philippe, 4,861,939, Cl. 585-820.000.

Boehm, Russell W.; Guinn, Rex A.; and Koerner, Hans J., to International Business Machines Corporation. Method and apparatus for the injection molding of circuit boards. 4,861,534, Cl. 264-102.000.

Boehringer Ingelheim KG: *See*—
Rauber, Gerhard; and Stechert, Roland, 4,861,784, Cl. 514-314.000

Boehringer Mannheim GmbH: *See*—
Bartl, Knut; Lill, Helmut; and Wielinger, Hans, 4,861,712, Cl. 435-13.000.

Boehringer Mannheim GmbH: *See*—
Demmer, Fritz; Gruber, Werner; and Woog, Heinrich, 4,861,786, Cl. 514-347.000.
Schumacher, Gunter; Buckel, Peter; and Beaucamp, Klaus, 4,861,717, Cl. 435-172.300.

Boeing Company, The: *See*—
Andrews, George S.; Lamberty, Bernard J.; and Tracy, Daniel J., 4,862,185, Cl. 343-761.000.
Appleford, Lyle R., 4,862,372, Cl. 364-433.000.
Baker, Edwin T.; Neilson, George V.; and Stumpf, George R., Jr., 4,861,406, Cl. 156-230.000.
Fenner, James A., 4,860,973, Cl. 244-137.100.
McFadden, Russell E.; and Shure, Charles H., III, 4,860,976, Cl. 244-207.000.
Pinson, George T., 4,860,968, Cl. 244-3.120.
Scollard, Cynthia M., 4,861,643, Cl. 428-162.000.

Boeykens, Eduard C. M.: *See*—
Hoefkens, Daniel S. G.; Spaenjers, Joannes H. P. M.; Boeykens, Eduard C. M.; Verhille, Henri A. J.; and Geernaert, Gustaaf A. L., 4,862,449, Cl. 370-32.100.

Bogar, Jerry H.; Cassel, Willard F., Jr.; Mummey, Dale B.; Oberman, Carl D.; and Summers, Donald J., to AMP Incorporated. Right-angle coaxial plug connector. 4,861,271, Cl. 439-63.000.

Bogard, Donald E. Pick-up truck tonneau cover. 4,861,092, Cl. 296-100.000.

Bohler, Erwin: *See*—
Bruderer, Werner; and Bohler, Erwin. 4,860,632, Cl. 89-33.250.

Bohmwetsch, Dieter: *See*—
Blume, Georg; Bohmwetsch, Dieter; and Eckardt, Fritz, 4,861,133, Cl. 350-96.200.

Bohnet, Siegbert: *See*—
Bronstert, Klaus; Bohnet, Siegbert; Himmele, Walter; and Bott, Kaspar, 4,861,742, Cl. 502-157.000.

Bohrer, Timothy H.; Pawlowski, Thomas D.; and Brown, Richard K., to James River-Norwalk, Inc. Packaging container for microwave popcorn popping. 4,861,958, Cl. 219-10.55E.

Bois, Emmanuel; Huard, Serge; and Boisde, Gilbert, to Sick-Optique-Electronique; and Commissariat a l'Energie Atomique. Displacement transducer with staggered optical fibres. 4,861,131, Cl. 350-96.180.

Boisde, Gilbert: *See*—
Bois, Emmanuel; Huard, Serge; and Boisde, Gilbert, 4,861,131, Cl. 350-96.180.

Bolcsak, Lois E.: *See*—
Janoff, Andrew S.; Bolcsak, Lois E.; Weiner, Alan L.; Tremblay, Paul A.; Bergamini, Michael V. W.; and Suddith, Robert L., 4,861,580, Cl. 424-1.100.

Bolli, Peter; Looser, Heniz; and Tanner, Werner, to Interlego A.G. Toy cog railway. 4,861,306, Cl. 446-90.000.

Bonander, James; and Torza, Sergio, to Beloit Corporation. Extended nip press apparatus with tracks to slideably accommodate beaded blanket edges. 4,861,434, Cl. 162-358.000.

Bonanomi, Jacques, to Observatorie Cantonal. Display means. 4,860,471, Cl. 40-450.000.

Bond, Robert, to General Kinematics Corporation. Control system for vibratory apparatus. 4,860,816, Cl. 164-154.000.

Boner, Heinrich: *See*—
Fullemann, Jorg; Boner, Heinrich; and Granwehr, Erik, 4,861,216, Cl. 414-326.000.

Bonerb, Timothy C., to Flexair, Inc. Bulk storage bin with pneumatically assisted discharge. 4,861.215, Cl. 414-288.000.

Bonfilio, Ciriaco: *See*—
Brasse, Jean-Jacques; and Bonfilio, Ciriaco, 4,861,317, Cl. 474-11.000.

Bonnesen, John S.: *See*—
Rust, Wayne; and Bonnesen, John S., 4,862,311, Cl. 361-91.000.

Bonnet, Roger J. A.: *See*—
Vinzia, Francis D.; and Bonnet, Roger J. A., 4,861,152, Cl. 351-161.000.

Bonsi, Conrad K.: *See*—
Morris, Carlton E.; Loretan, Philip A.; Bonsi, Conrad K.; and Hill, Walter A., 4,860,490, Cl. 47-63.000.

Booher, Benjamin V., to Suspension Group, Ltd. Active vehicle suspension with composite control arm. 4,861,067. Cl. 280-707.000.

Borgstrom, Leonard; Carlsson, Claes G.; Franzen, Peter; Inge, Claes; Lagerstedt, Torgny; Moberg, Hans; and Nabo, Olle, to Alfa-Laval Separation AB. Centrifugal separator. 4,861,329, Cl. 494-73.000.

Bork, Stanley A. Adjustable plant support. 4,860,489, Cl. 47-47.000.

Bormann, Ernst-Joachim: *See*—
Bergter, Friedrich; Bocker, Harald; Bormann, Ernst-Joachim; Forberg, Wolfgang; Fricke, Heinz; Grafe, Udo; Grosse, Hans-Helmut; Heller, Ingeborg; Hilliger, Matthias; Junne, Wolf; Linde, Hellmut; Menner, Michael; Menzel, Klaus-Dieter; Muller, Peter-Jurger; Plonka, Gunter; Pohl, Hans D.; Schneider, Jorg; and Thrum, Heinz, 4,861,715, Cl. 435-70.000.

Borrett, Gary T., to Beecham Group PLC. Chemical process. 4,861,893, Cl. 546-185.000.

Borse, Dietrich, to Ernst Winter & Sohn (GmbH & Co.), Firma. Apparatus for exhibiting grains of precious stone. 4,860,469, Cl. 40-409.000.

Bortolloni, Sergio; and Bernier, Glauco M., to Breter S.p.a. Cam switch formed by modular units. 4,861,949, Cl. 200-5.00R

Bosiger, Peter: *See*—
McKinnon, Graeme C.; and Bosiger, Peter, 4,862,083, Cl. 324-309.000

Boston University, Trustees of: *See*—
Ju, Shyr-Te, 4,861,589, Cl. 424-93.000.

Both, Gerald W.: *See*—
Atkinson, Paul H.; Bellamy, A. Richard; Both, Gerald W.; and Poruchynsky, Marianne S., 4,861,864, Cl. 530-324.000

Bott, Kaspar: *See*—
Bronstert, Klaus; Bohnet, Siegbert; Himmele, Walter; and Bott, Kaspar, 4,861,742, Cl. 502-157.000.

Boundy, Timothy M., to Chrysler Motors Corporation. Door trim panel fastening assembly. 4,861,208, Cl. 411-339.000

Bourguet, Lucien; and Gatellier, Claude, to Institut Francais du Petrole. Method and device for assessing the clogging risks of a well or bore hole passing through a porous revervoir, more particularly a geological formation. 4,860,582, Cl. 73-155.000.

Bowers, Gary R.: *See*—
Hardiman, Christopher J.; and Bowers, Gary R., 4,861,668, Cl. 428-424.400.

Bowes, Emmerson; and Yan, Tsoung Y., to Mobil Oil Corp. Pyridine and alkylpyridine synthesis using a crystalline silicate catalyst having the ZSM-5 structure. 4,861,894, Cl. 546-251.000.

Bowker, Jeffrey C.; and Singh, Prabhakar, to Westinghouse Electric Corp. Method of bonding a conductive layer on an electrode of an electrochemical cell. 4,861,345, Cl. 29-623.100.

Bowser, John J.: *See*—
Bailey, Christian E.; and Bowser, John J., 4,860,598, Cl. 73-863.330

Boyer, Francis, to Societe Francaise D'Equipments pour la Navigation Aerienne S.F.E.N.A. Fault display device for gyroscopic instruments. 4,862,149, Cl. 340-635.000.

Bozich, George J.: *See*—
Smedberg, Kenneth L.; Bozich, George J.; and Kotynski, Robert J., 4,860,571, Cl. 72-453.130.

BPCO Inc.: *See*—
Stagg, Malcolm J.; Stern, Eric P.; and Vidyarthi, Sunil, 4,861,642, Cl. 428-139.000.

Brac, Jean, to Insitut Francais du Petrole. Method for determining the geometry of a multisource seismic wave emission device. 4,862,422, Cl. 367-19.000.

Brace, Regie P. Woodsplitting head assembly. 4,860,806, Cl. 144-193.00E

Braden, Jeffrey L.: *See*—
Huang, Dinah C.; and Braden, Jeffrey L., 4,861,745, Cl 502-314.000.

Bradford White Corporation: *See—*
West, Eugene L., 4,861,968, Cl. 219-312.000.

Braga, Umberto: *See—*
Malservisi, William; Righetti, Claudio; Nadalini, Raffaele; Braga, Umberto; and Romagnoli, Marino, 4,860,922, Cl. 221-6.000.

Bragas, Peter, to Robert Bosch GmbH. Radio receiver with two different traffic information decoders. 4,862,513, Cl. 455-45.000.

Brand, Peter: *See—*
Hensgen, Gerhard; Heitmann, Uwe; Brand, Peter; and Pinck, Peter, 4,860,772, Cl. 131-84.100

Brandt, Claude R. Snow grooming vehicle and attachments. 4,860,465, Cl. 37-221.000.

Brandt, Inc.: *See—*
Taylor, John B., 4,860,537, Cl. 60-226.100

Brannstrom, Roine, to ABB Stal AB. Power plant with drying means for fuel. 4,860,536, Cl. 60-39.464.

Brantley, Randall F.; and McVey, Harry D., to General Motors Corporation. Battery handle adapter. 4,861,687, Cl. 429-187.000.

Branwer, Alexander: *See—*
Fish, Aaron M.; Matzeld, Leon; Branwer, Alexander; Miresmaili, Masoud; and Dausseine, Sean-Paul, 4,861,083, Cl. 292-347.000.

Brar, Amarjit S.; Sharma, Jagdish P.; and Kaja, Suryanarayana, to Magnetic Peripherals Inc. Apparatus and methods for testing surface properties of a material. 4,860,572, Cl. 73-12.000.

Brasket, Denis R. Corner wall lamp. 4,862,333, Cl. 362-147.000

Brasse, Jean-Jacques; and Bonfilio, Ciriaco, to Valeo. Speed changer pulley. 4,861,317, Cl. 474-11.000.

Bratten, Jack R. Automatic cycle control arrangement and method for a pressure filter. 4,861,494, Cl. 210-739.000

Braud, Harry A., to Moore Business Forms, Inc. Invoice form with card and envelope. 4,860,946, Cl. 229-69.000.

Bray, Douglas; R.: *See—*
Wenman, James A.; Bray, Douglas; R.; and Porter, David H., 4,861,273, Cl. 439-111.000.

Breda, Michael A.; and Snyder, George K., to General Motors Corporation. Method for assembling plate type heat exchangers. 4,860,421, Cl. 29-157.30A.

Breen, Michael T., to Eaton Corporation. Chirp and Doppler optical gauge. 4,861,158, Cl. 356-5.000.

Breen, Michael T., to Eaton Corporation. Dynamic doppler optical gauge. 4,861,159, Cl. 356-5.000.

Breen, Thomas J., to National Computer Print, Inc. Fan-folded, multiple coupon/envelope form set and method of making same. 4,860,945, Cl. 229-69.000.

Bregman, Mark F.: *See—*
Bickford, Harry R.; Bregman, Mark F.; Moskowitz, Paul A.; Palmer, Michael J.; Reiley, Timothy C.; Poore, Paige A.; and Kovac, Caroline A., 4,862,322, Cl. 361-386.000.

Breiding-Mack, Sabine: *See—*
Zeeck, Axel; Breiding-Mack, Sabine; Grabley, Susanne; Voelskow, Hartmut; and Seibert, Gerhard, 4,861,775, Cl. 514-229.800.
Zeeck, Axel; Breiding-Mack, Sabine; Grabley, Susanne; Voelskow, Hartmut; and Seibert, Gerhard, 4,861,796, Cl. 514-535.000.

Breining, Frank E., to Airmaster Fan Company. Interlocking fan guard. 4,861,230, Cl. 416-247.00R.

Breipohl, Gerhard; Knolle, Jochen; Konig, Wolfgang; and Scholkens, Bernward, to Hoechst Aktiengesellschaft. Peptides with vasorelaxant, natriuretic and diuretic effects a process for their preparation, agents containing them, and their use. 4,861,755, Cl. 514-11.000.

Breitenbach, Otto: *See—*
Raschbichler, Hans G.; Miller, Luitpold; Wcislo, Manfred; and Breitenbach, Otto, 4,860,430, Cl. 29-596.000

Breter S.p.a.: *See—*
Bortolloni, Sergio; and Bernier, Glauco M., 4,861,949, Cl. 200-5.00R.

Bridgestone Corporation: *See—*
Sakaguchi, Yuji, 4,860,639, Cl. 92-5.00R
Takano, Kazuya; and Noguchi, Takeshi, 4,861,006, Cl. 267-140.100.

Briel, Marc L.: *See—*
Fette, Bruce A.; Lewis, Leslie K.; Briel, Marc L.; and Makovicka, Thomas J., 4,862,407, Cl. 364-900.000.

Brigham, William D.: *See—*
Zwick, Eugene B.; and Brigham, William D., 4,860,545, Cl. 62-50.600.

Brighi, Massimo: *See—*
de Concini, Roberto; and Brighi, Massimo, 4,860,593, Cl. 73-861.290

Bristol-Myers Company: *See—*
Tramposch, Kenneth M.; Zusi, Fred C.; and Marathe, Suresh A., 4,861,798, Cl. 514-575.000

British Broadcasting Corporation: *See—*
Wells, Nicholas D.; Knee, Michael J.; and Sandbank, Charles P., 4,862,264, Cl. 358-138.000

British Telecommunications public limited company: *See—*
Kelly, Francis P.; Gibbens, Richard J.; Key, Peter B.; Turton, Paul A.; Stacey, Roger R.; and Whitehead, Martin J., 4,862,496, Cl. 379-221.000.

British United Shoe Machinery Ltd.: *See—*
Reedman, David C.; and Preece, Clive, 4,862,377, Cl. 364-468.000.

Brttain, Harry G.: *See—*
Havenstein, Bennett L.; Picerno, Raysna; Brittain, Harry G.; and Nestor, James R., 4,861,727, Cl. 436-136.000.

Brizio, Giuseppe: *See—*
Margiaria, Giorgio; and Brizio, Giuseppe, 4,861,258, Cl. 425-444.000.

Broadhurst, John H., to Sysmed, Inc. Resistor holder. 4,862,135, Cl. 338-64.000

Broadway Companies, Inc.: *See—*
Bartley, Harold D.; and Gaiser, William R., 4,861,260, Cl. 425-529.000

Brochard, Claude: *See—*
Warnan, Francois; Barbot, Joel;; and Brochard, Claude, 4,861,297, Cl. 441-33.000

Broder, Samuel: *See—*
Mitsuya, Hiroaki; and Broder, Samuel, 4,861,759, Cl. 514-46.000.

Broich, Bruno; and Gruning, Horst, to BBC Brown Boveri AG. Power semiconductor component. 4,862,239, Cl. 357-38.000.

Brolund, Theodore F.; and Arnesson, Joel C. E., to W. A. Whitney Corp. Lifting hand for a punch press tool changer. 4,860,428, Cl. 29-568.000

Bronstert, Klaus; Bohnet, Siegbert; Himmele, Walter; and Bott, Kaspar, to BASF Aktiengesellschaft. Bifunctional alkali metal compounds, preparation and use thereof as polymerization initiators. 4,861,742, Cl. 502-157.000.

Brother Kogyo Kabushiki: *See—*
Higashiyama, Shunichi, 4,861,695, Cl. 430-138.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Hori, Masaaki; and Kamiya, Mitsuharu, 4,861,175, Cl. 400-76.000.
Yamakawa, Kiyoshi, 4,862,166, Cl. 341-22.000.

Brotzmann, Karl; Moodie, Jonathan P.; and Turner, Richard E., deceased (Turner, Trenna R., executor), to Kloeckner CRA Technologie GmbH. Method for producing iron. 4,861,368, Cl. 75-25.000.

Browell, Atkinson E.: *See—*
Etienne, Nolf J.; and Browell, Atkinson E., 4,862,088, Cl. 324-326.000.

Brower, David; and Jernigan, Thomas K., to TD Quilting Machinery. Automatic quilting machine for specialized quilting of patterns which can be controlled by a remote joy stick and monitored on a video screen. 4,860,675, Cl. 112-119.000.

Brown, Alison K.: *See—*
Sturza, Mark A.; and Brown, Alison K., 4,862,178, Cl. 342-357.000.

Brown, Boveri & Cie AG: *See—*
Hochreuther, Karl; and Reichler, Edmund, 4,860,901, Cl. 206-586.000.

Brown, Regina A.: *See—*
Tang, Jiunn-Yann; Brown, Regina A.; and Ke, Victor H., 4,861,604, Cl. 426-94.000.

Brown, Richard K.: *See—*
Bohrer, Timothy H.; Pawlowski, Thomas D.; and Brown, Richard K., 4,861,958, Cl. 219-10.55E.

Brown, Robert J.: *See—*
Cohen, Martin P.; Brown, Robert J.; and Majerus, Norbert, 4,861,842, Cl. 525-329.300.

Brown, Roy, to Graphoidal Developments Limited. Lubricant spray device for glass moulds. 4,861,363, Cl. 65-24.000.

Browne, James M. Impact resistent composites. 4,861,649, Cl. 428-240.000.

Browne, John, to NEI Canada Limited. Single core display device. 4,860,470, Cl. 40-449.000

Browning, Bruce E., Jr. Self-supporting concrete form. 4,860,515, Cl. 52-426.000.

Bruderer, Werner; and Bohler, Erwin, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Apparatus for radially securing a cartridge inserted by a breechblock into the weapon barrel of a firing weapon. 4,860,632, Cl. 89-33.250.

Brugger, Franz: *See—*
Burckhardt, Manfred; Brugger, Franz; and Faulhaber, Andreas, 4,861,118, Cl. 303-110.000.

Bruins, Andries P.: *See—*
Henion, John D.; Covey, Thomas R.; and Bruins, Andries P., 4,861,988, Cl. 290-288.000

Brune, Johannes; and Latussek, Hans-Peter, to Siemens Aktiengesellschaft. Backplane having a movable contact means. 4,861,274, Cl. 439-189.000.

Brune, William A.; and Grimes, Scott D., to Schlumberger Technologies, Inc. Method and apparatus for in-circuit testing of electronic devices. 4,862,067, Cl. 324-73.00R.

Brunelle, Kathleen L.: *See—*
Weierstall, Richard P.; Enever, Robin P.; Brunelle, Kathleen L.; Thone, Gerard F.; and Warner, Ronald N., 4,861,591, Cl. 424-690.000

Brunswick Corporation: *See—*
Boda, James C.; and Slattery, Gordon C., 4,860,703, Cl. 123-195.00P
Griffiths, John M.; Beck, Wayne T.; and Newman, Neil A., 4,861,292, Cl. 440-1.000.

Bryant, Anthony J.; Field, David J.; and Butler, Ernest P., to Alcan International Limited. Al-Mg-Si extrusion alloy and method. 4,861,389, Cl. 148-3.000.

Bryant, David R.: *See—*
Miller, David J.; Bryant, David R.; Billig, Ernst; and Shaw, Bernard L., 4,861,918, Cl. 568-454.000.

BSD Medical Corporation: *See—*
Turner, Paul F., 4,860,752, Cl. 128-422.000.

BTG Kalle Inventing AB: *See—*
Skalen, Bengt, 4,860,576, Cl. 73-59.000.

Bublik, Eugene P.; and Sartowski, Zbigniew, to Allied Colloids Ltd. Grinding method. 4,861,349, Cl. 51-293.000.

Bucci, George H., to Whitehead Engineered Products, Inc. In-tank fuel pump assembly for fuel-injected engines. 4,860,714, Cl. 123-514.000.

Buchen, Shelley: *See—*
Kaufman, Herbert E.; Knight, Patricia M.; and Buchen, Shelley, 4,860,885, Cl. 206-5.100.

Buchholz, Fredric L., to Dow Chemical Company, The. Sodium thiosulfate as part of a redox initiator system for the polymerization of water-swellable polymers. 4,861,849, Cl. 526-230.000.

Buck, Albert P. Primary standard gas flow calibrator. 4,860,590, Cl. 73-861.050.

Buck, Arthur G.; Olson, Ronald A.; and Beck, Doris A., to Precision Interconnect Corporation. Yieldably extensible self-retracting shielded cable. 4,861,945, Cl. 174-69.000.

Buck Chemisch-Technische Werke GmbH & Co.: *See—*
Steinicke, Wolfgang; Schiessl, Alois; and Busel, Horst, 4,860,657, Cl. 102-334.000.

Buckel, Peter: *See—*
Schumacher, Gunter; Buckel, Peter; and Beaucamp, Klaus, 4,861,717, Cl. 435-172.300.

Buckley, Alan: *See—*
Che, Tessie M.; Stuetz, Dagobert E.; Buckley, Alan; and Ulrich, Donald R., 4,861,129, Cl. 350-96.130.

Buekers, Josef: *See—*
Kress, Hans-Jurgen; Paul, Winfried; Peters, Horst; Lindner, Christian; and Buekers, Josef, 4,861,829, Cl. 525-92.000.

Buhler, Gebruder: *See—*
Groebli, Werner; Hegelbach, Hugo; and Schaffner, Hanspeter, 4,861,529, Cl. 264-40.100.

Buhler, Otto R.; Simpson, Brian A.; and Twombly, John C., to International Business Machines Corporation. Sinusoidal oscillator with instant start-up. 4,862,113, Cl. 331-117.00R.

Bujard, Martial R., to Rockwell International Corporation. Method of measuring the dynamic viscosity of a viscous fluid utilizing acoustic transducer. 4,862,384, Cl. 364-509.000.

Bundens, Allan B.: *See—*
Campbell, John G.; Schoeneberger, Carl F.; Bundens, Allan B.; Fogle, Richard M.; and Lemburg, John R., 4,862,268, Cl. 358-141.000.

Bunge, David J.: *See—*
Wright, Antony P.; and Bunge, David J., 4,861,907, Cl. 556-419.000.

Bunker, William M., to General Electric Company. Dynamic comprehensive distortion correction in a real time imaging system. 4,862,388, Cl. 364-521.000.

Burckhardt, Manfred; Brugger, Franz; and Faulhaber, Andreas, to Dailmer-Benz Aktiengesellschaft. Anti-lock brake system. 4,861,118, Cl. 303-110.000.

Burger, Christa: *See—*
Preiner, Gerhard; Hockemeyer, Friedrich; and Burger, Christa, 4,861,807, Cl. 522-99.000.

Burgos, Stephen W. Hospital sheet. 4,860,771, Cl. 128-872.000.

Burleson, Wayne P.: *See—*
Wagner, Lawrence F.; Van Dyke, Korbin S.; Burleson, Wayne P.; Hemming, Robert D.; and Guadagna, John P., 4,862,346, Cl. 364-200.000.

Burlington Industries, Inc.: *See—*
Pritchard, F. D., 4,861,561, Cl. 422-116.000.

Burnand, Richard P.: *See—*
Phaal, Cornelius; and Burnand, Richard P., 4,861,350, Cl. 51-307.000.

Burns, Bruce G.: *See—*
Westberg, Thomas E.; Rode, Christian S.; and Burns, Bruce G., 4,862,156, Cl. 340-747.000.

Burns, Paul A.; and Taber, Terry R., to Eastman Kodak Company. Photographic element and process comprising a compound which comprises two timing groups in sequence. 4,861,701, Cl. 430-543.000.

Burns, Stephen K.: *See—*
Gordon, David; Akselrod, Solange; Cohen, Richard J.; Tu, Jerome C.; Burns, Stephen K.; and DeLeon, Victoria H., 4,862,361, Cl. 364-413.060.

Burroughs Corporation: *See—*
Green, Howard H.; and Tomlinson, Christopher J., 4,862,351, Cl. 364-200.000

Burt, Lionel J. Two-handed racquet. 4,861,030, Cl. 273-73.00J.

Busel, Horst: *See—*
Steinicke, Wolfgang; Schiessl, Alois; and Busel, Horst, 4,860,657, Cl. 102-334.000.

Bushinsky, Joseph P.: *See—*
Nicholas, David M.; Hopkins, Jeffrey A.; and Bushinsky, Joseph P., 4,861,351, Cl. 55-23.000

Butler, Ernest P.: *See—*
Bryant, Anthony J.; Field, David J.; and Butler, Ernest P., 4,861,389, Cl. 148-3.000.

Butler, Raymond O., Jr.: *See—*
Gray, Ronald N.; and Butler, Raymond O., Jr., 4,862,123, Cl. 335-131.000.

Butt, Sheldon H., to Olin Corporation. Chip carrier. 4,862,323, Cl. 361-388.000.

Buysch, Hans-Josef: *See—*
Fengler, Gerd; Klausener, Alexander; Buysch, Hans-Josef; Mardin, Mithat; and Pelster, Bernhard, 4,861,878, Cl. 544-48.000

Buyske, Donald A. Method for administering the drug deprenyl so as to minimize the danger of side effects. 4,861,800, Cl. 514-646.000.

B.V. Optische Industrie 'De Oude Delft': *See—*
de la Fonteijne, Marcel R., 4,861,977, Cl. 250-213.0VT.

C. J. Leacho, Inc.: *See—*
Leach, Jamie S., 4,861,109, Cl. 297-467.000.

C. R. Bard, Inc.: *See—*
Havenstein, Bennett L.; Picerno, Raysna; Brittain, Harry G.; and Nestor, James R., 4,861,727, Cl. 436-136.000.

C. van der Lely, N.V.: *See—*
Maarten, Koorn, 4,860,527, Cl. 56-13.600.

Cabot Electronics Ceramics, Inc.: *See—*
Jones, Kenneth L., II; O'Connor, Tom R.; and Trevellyan, Kenneth A., 4,861,944, Cl. 174-68.500.

Cadwell, George H., Jr.; and Wood, Joseph A., to Flanders Filters, Inc. Method of fabricating a clean room filter bank. 4,860,420, Cl. 29-157.00R.

Caggiano, Michael A. Laminated bag. 4,861,632, Cl. 428-35.200.

Cahmberlin, Jeffery L.: *See—*
Fredriksson, Borje; and Cahmberlin, Jeffery L., 4,861,165, Cl. 366-165.000.

Caillier, Michael J. Well apparatuses and methods. 4,860,831, Cl. 166-384.000.

Calandra, Frank, Jr., to Jennmar Corporation. Roof bolt system. 4,861,197, Cl. 405-259.000.

California Institute of Technology: *See—*
Coley, Terry R., 4,861,990, Cl. 250-306.000.

California Institute Technology: *See—*
Neurath, Alexander R.; and Kent, Stephen B. H., 4,861,588, Cl. 424-89.000.

California Nickel Co.: *See—*
Lowenhaupt, Harris, 4,861,371, Cl. 75-101.00R.

Callaghan, Frank J., to Cordis Corporation. Activity sensor for pacemaker control. 4,860,751, Cl. 128-419.0PG.

Calloway, Charles B.: *See—*
Waterbury, John B.; Calloway, Charles B.; and Turner, Ruth D., 4,861,721, Cl. 435-252.100.

Camber International Limited: *See—*
Hill, Malcolm D., 4,860,559, Cl. 66-168.000.

Camco, Incorporated: *See—*
Blizzard, William A.; and Pringle, Ronald E., 4,860,991, Cl. 251-62.000.

Camenisch, Gian C., to Raymond, A. Adjustable fastening strap. 4,860,979, Cl. 248-74.300.

Cameron Iron Works USA, Inc.: *See—*
Cassity, Thomas G.; Montgomery, William C.; Baker, Gerald S.; Wedel, Alfred W.; and Taylor, William M., 4,862,426, Cl. 367-81.000.

Campbell, Frederick; Geary, John M.; and Schofield, John D., to Imperial Chemical Industries PLC. Composition. 4,861,380, Cl. 106-504.000.

Campbell, John G.; Schoeneberger, Carl F.; Bundens, Allan B.; Fogle, Richard M.; and Lemburg, John R., to General Instrument Corporation. Addressable cable television control system with video format data transmission. 4,862,268, Cl. 358-141.000.

Campbell, John S.: *See—*
Hellekson, Ronald A.; Campbell, John S.; and Acosta, Jorge L., 4,861,973, Cl. 235-467.000.

Campbell Soup Company: *See—*
Webb, Jerry E.; Dake, Roger L.; and Wolfe, Rodney E., 4,860,403, Cl. 17-1.00E.

Canadian Instrumentation & Research Ltd.: *See—*
Failes, Michael, 4,861,127, Cl. 350-96.150.

Canadian Liquid Air, Ltd.: *See—*
Lee, Robert; Hornsey, Derek; Garrido, Guillermo; and Dieguez, Jose M., 4,860,827, Cl. 166-261.000.

Canadian Patents and Development Limited/Societe Canadienne des Brevets et d'Exploitation Limitee : *See—*
Ruxton, James; and Catranis, John, 4,862,120, Cl. 333-34.000.

Cancer Biologics, Inc.: *See—*
Epstein, Alan L.; and Taylor, Clive R., 4,861,581, Cl. 424-1.100.

Cann, Kevin J.; Chen, Michael W.; and Karol, Frederick J., to Union Carbidae Corporation. Process for simultaneously dimerizing ethylene and copolymerizing ethylene with the dimerized product. 4,861,846, Cl. 526-75.000.

Canon Kabushiki Kaisha: *See—*
Enari, Masahiko; Yoshimura, Katsuji; Aoki, Akio; Yamashita, Shinichi; Shimokoriyama, Makoto; Kashida, Motokazu; Shimizu, Tetsuya; Ishii, Yoshiki; and Fujii, Akio, 4,862,292, Cl. 360-8.000.
Fukunaga, Koji, 4,862,410, Cl. 364-900.000.
Hiro, Masaaki; Nakagawa, Masaru; Kawamorita, Yoichi; and Yamazaki, Koji, 4,860,898, Cl. 206-455.000.
Kawamura, Masaharu, 4,862,205, Cl. 354-412.000.
Nakajima, Toshifumi, 4,862,282, Cl. 358-400.000.
Nomura, Akihiro; Namekata, Kiyokazu; Kurata, Mitsuru; Niizawa, Takuji; Ebata, Tokihide; and Sasaki, Shinichi, 4,862,215, Cl. 355-309.000.
Suda, Kenichi; Hasegawa, Shizuo; and Matsuoka, Nobuo, 4,862,286, Cl. 358-494.000.
Takei, Masahiro; Sakata, Tsuguhide; Taguchi, Tomishige; and Kawasaki, Somei, 4,862,250, Cl. 358-12.000.
Tanaka, Tsunefumi, 4,861,147, Cl. 350-429.000.
Tsuboi, Takayuki; Nakazawa, Isao; Harunari, Yoshihiro; Sato, Yasuhisa; and Yamada, Yasuyuki, 4,862,202, Cl. 354-195.120.
Ueki, Masao; Hirooka, Masaaki; Hanna, Junichi; and Shimizu, Isamu, 4,861,623, Cl. 427-69.000
Yamada, Akira; and Ohnuki, Ichiro, 4,862,208, Cl. 354-485.000.
Yoshida, Nobutoshi; Miyke, Nobuyuki; Takagi, Atsushi; Saito, Takashi; Suzuki, Tadashi; Ohki, Naoyuki; Tomosada, Masahiro; Adachi, Hideki; and Takeda, Hiroaki, 4,862,219, Cl. 355-202.000.

Cantatore, Luigi: *See—*
Mawhirt, James A.; Cantatore, Luigi; DiFlora, Joseph E.; McCandless, William J. C.; and Trieb, Marvin, 4,861,553, Cl. 422-65.000.

Cantor, Charles R.; and Schwartz, David C., to Columbia University in the City of New York, The Trustees of. Electrophoretic methods employing gel inserts. 4,861,448, Cl. 204-182.800

Capilli, Anna D.: *See—*
Capilli, Sergio; and Capilli, Anna D., 4,860,730, Cl. 126-450.000.

Capilli, Sergio; and Capilli, Anna D. Air-warming unit. 4,860,730, Cl 126-450.000

Carabateas, Philip M.: *See—*
Diana, Guy D.; and Carabateas, Philip M., 4,861,791, Cl 514-374.600.

Cardenas, Alfonso; and de la Cruz, Juan, to Sunclipse, Inc. Disassemblable corrugated board table. 4,860,667, Cl. 108-115.000

Carey, Bernard J.: *See—*
Haefner, Kenneth B.; Bernstein, Bruce M.; Carey, Bernard J.; and Overton, Kenneth J., 4,861,960, Cl. 219-110.000.

Caribbean Stud Enterprises, Inc.: *See—*
Jones, Daniel A.; and Suttle, James P., 4,861,041, Cl. 273-292.000.

Carl Freudenberg, Firma: *See—*
Graf, Gunter; Gross, Heinz; and Sponagel, Stefan, 4,861,536, Cl. 264-108.000.

Carl-Zeiss-Stiftung: *See—*
Marx, Dieter, 4,861,997, Cl. 250-334.000

Carlberg, Bob L.; Wolf, Nicholas O.; Pober, Kenneth W.; and Nash, William D., to Conoco Inc. Inhibition of reservoir scale. 4,860,829, Cl. 166-279.000.

Carlson, Randolph S., to XOC Devices, Inc. Packaging system for stacking integrated circuits. 4,862,249, Cl. 357-80.000.

Carlsson, Claes G.: *See—*
Borgstrom, Leonard; Carlsson, Claes G.; Franzen, Peter; Inge, Claes; Lagerstedt, Torgny; Moberg, Hans; and Nabo, Olle, 4,861,329, Cl. 494-73.000.

Carmichael, Stephen L.: *See—*
Yater, Jerry L.; and Carmichael, Stephen L., 4,860,862, Cl. 192-18.00A.

Carondelet Foundry Company: *See—*
Culling, John H., 4,861,547, Cl. 420-53.000

Carpenter, Roy B., Jr. Automated moisturized grounding electrode system. 4,861,940, Cl. 174-6.000.

Carpenter, Theresa L.; Sipinen, Alan J.; and Bany, Stephen W., to Minnesota Mining and Manufacturing Company. Pressure-sensitive adhesive closure for disposable diaper. 4,861,635, Cl. 428-40.000.

Carrier Corporation: *See—*
Sacks, Paul S., 4,860,822, Cl. 165-151.000

Carriere, Claude; Renard, Jean; and Lavolee, Thierry, to Societe Anonyme dite: ALCATEL CIT. Method of etching a surface of an indium phosphide part. 4,861,423, Cl. 156-643.000.

Carrillon, Henri, to Comptoir General d'Emballage. Device for mixing fluids, notably liquids, and dispensing the mixture thus obtained, and apparatus incorporating this device. 4,860,925, Cl. 222-145.000.

Carroll, Joseph J. Deburring tool. 4,860,453, Cl. 30-347.000

Carter, Michael J.; and Welford, David, to Massachusetts Institute of Technology. One- and two-dimensional optical wavefront synthesis in real time. 4,862,467, Cl. 372-18.000.

Caruso, John T.: *See—*
Jordan, Howard E.; Woods, Edward J.; Caruso, John T.; and Forte, Luciano, 4,862,053, Cl. 318-786.000

Casagrande, Angelo F.; and Casagrande, Rocco J. Pool flotation device. 4,861,300, Cl. 441-81.000.

Casagrande, Rocco J.: *See—*
Casagrande, Angelo F.; and Casagrande, Rocco J., 4,861,300, Cl. 441-81.000

Cascade Corporation: *See—*
Olson, John E., 4,861,223, Cl. 414-661.000.

Case, Michael B.; and Farach, Orlando F. Installable headlight alarm system. 4,862,140, Cl. 340-457.200.

Casey, Edward P. J. Device for removing water from a fuel tank. 4,861,470, Cl. 210-172.000

Casio Computer Co., Ltd.: *See—*
Sato, Takashi; Yamauchi, Kazuki; and Ishibashi, Norio, 4,862,281, Cl. 358-400.000.

Cassel, Willard F., Jr.: *See—*
Bogar, Jerry H.; Cassel, Willard F., Jr.; Mummey, Dale B.; Oberman, Carl D.; and Summers, Donald J., 4,861,271, Cl. 439-63.000.

Cassiani-Ingoni, Serge: *See—*
Aubry, Jean; Cassiani-Ingoni, Serge; and Hauschild, Remi, 4,861,821, Cl. 524-512.000

Cassity, Thomas G.; Montgomery, William C.; Baker, Gerald S.; Wedel, Alfred W.; and Taylor, William M., to Cameron Iron Works USA, Inc. Method and apparatus for operating equipment in a remote location. 4,862,426, Cl. 367-81.000

Castaldi, Graziano: *See—*
Giordano, Claudio; and Castaldi, Graziano, 4,861,903, Cl. 549-434.000

Caswell, Debra S., to Procter & Gamble Company, The. Conditioning agent containing amine ion-pair complexes and composiitons thereof. 4,861,502, Cl. 252-8.750.

Catalyst Semiconductor, Inc.: *See—*
Hsia, Steve K.; Mahal, Pritpal S.; and Shih, Wei-Ren, 4,861,730, Cl. 437-43.000

Caterpillar Industrial Inc.: *See—*
Smith, Adam J., 4,861,220, Cl. 414-495.000

Catranis, John: *See—*
Ruxton, James; and Catranis, John, 4,862,120, Cl. 333-34.000.

Cavalcante, Vittorio: *See—*
Marioni, Elio; and Cavalcante, Vittorio, 4,861,240, Cl. 417-423.300.

Cazaux, Yvon, to Thomson-Csf. Photosensor with frame transfer structure and its use in an image sensor with reduced smearing effect. 4,862,274, Cl. 358-213.240.

Cecil, Dimitrios G. Resistance spot welding gun and transformer assembly. 4,861,959, Cl. 219-89.000

Celmac Limited: *See—*
Ozagir, Ozcan; and Proffitt, Raymond, 4,861,084, Cl. 292-359.000.

CEM Corporation: *See—*
Neas, Edwin D.; and Floyd, Terry S., 4,861,556, Cl. 422-78.000.

Centkowski, Mark; Manios, Steven E., Sr.; and Weaver, James, to Innovision Optics, Inc. Adjustable adapter for borescope and film/video camera. 4,862,199, Cl. 354-62.000.

Central Glass Company, Limited: *See—*
Maeda, Kazuhiko; Yamauchi, Taku; and Koishi, Toshio, 4,861,835, Cl. 525-200.000.

Ceradyne, Inc.: *See—*
Takvorian, Lawrence K., 4,860,942, Cl. 228-220.000.

Ceramics Process Systems Corp.: *See—*
Barringer, Eric A.; Lieberman, Sheldon I.; Schmidt, Mark S.; Hodge, James D.; Waack, Richard; Kelley, Donald J.; Saxton, Brian W.; and Gruber, William C., 4,861,646, Cl. 428-210.000.
Foster, Brian C.; and Lind, Roger S., 4,861,641, Cl. 428-137.000.

Cerny, Elmer J.; and Stanton, Mark F., to Beltone Electronics Corporation. Battery holder. 4,860,890, Cl. 206-333.000.

Cetinkaya, Ismail B., to UOP Inc. Low pressure mixing process for atomizing fluids. 4,861,459, Cl. 208-157.000.

Ch. Wauters & Fils: *See—*
Wauters, Jacques G., 4,860,947, Cl. 229-103.000

Champetier, Robert J., to Hughes Aircraft Company. Barrier for molecular contaminates. 4,861,445, Cl. 204-157.300

Chan, Mike T. Parking meters capable of being operated without monetary coins. 4,861,971, Cl. 235-384.000.

Chandler, Jennifer K.: *See—*
Kahn, Alan R.; and Chandler, Jennifer K., 4,860,759, Cl 128-668.000

Chang, Jin K.: *See—*
Moon, Juhn W.; Hwang, Bun; and Chang, Jin K., 4,861,605, Cl. 426-96.000

Chang, Yu-an: *See—*
Robins, Roland K.; Revankar, Ganapathi R.; and Chang, Yu-an, 4,861,873, Cl. 536-27.000

Channel Products, Inc.: *See—*
Romanak, Alfred J.; and Moss, Russell W., 4,861,264, Cl. 431-263.000

Chao, Tai S., to Atlantic Richfield Company. Oil additive having reduced lacquer forming tendencies. 4,861,504, Cl. 252-48.200.

Chapman, Fred L. Tailgate assembly. 4,861,093, Cl. 296-180.100.

Chapman, James M., Jr.: *See—*
Hall, Iris H.; Wyrick, Steven D.; and Chapman, James M., Jr., 4,861,778, Cl. 514-248.000.

Charbonnages De France: *See—*
Noel, Marc, 4,862,157, Cl. 340-825.000

Charbonneau, Arthur G.; McMennamy, John A.; and Nafziger, Steven, to NSS of Delaware, Inc. Motor operated valve analysis and testing system with monitoring of spring pack movement through torque switch post. 4,860,596, Cl. 73-862.320

Charbonnier, Roger, to Schlumberger Industries. Oscillator, in particular a surface acoustic wave oscillator, frequency controlled by controlling its temperature. 4,862,110, Cl. 331-70.000.

Charland, Gabriel: *See—*
Lemieux, Andre; and Charland, Gabriel, 4,860,889, Cl. 206-315.600.

Charles Stark Draper Laboratory, Inc., The: *See—*
Fulton, Donald E., 4,862,049, Cl. 318-689.000.

Chasser, Anthony M.; and Makhlouf, Joseph M., to PPG Industries, Inc. Epoxide and rubber based curable compositions having good adhesion direct to metal. 4,861,833, Cl. 525-122.000.

Chauvier, Jean-Marie; Moussiaux, Leon; and Scoman, Henry, to INTEROX (Societe Anonyme). Stabilized particles of peroxygen compounds, process for their manufacture, and compositions containing them. 4,861,506, Cl. 252-95.000

Chawla, Manmohan S.; and McPhee, William A., to Western Atlas International, Inc. Implosion shaped charge perforator. 4,860,654, Cl. 102-306.000

Chawla, Manmohan S., to Western Atlas International, Inc. Implosion shaped charge perforator. 4,860,655, Cl. 102-306.000.

Chayka, Stanley J.: *See—*
Belmares-Sarabia, Armand; and Chayka, Stanley J., 4,862,251, Cl. 358-22.000

Che, Tessie M.; Stuetz, Dagobert E.; Buckley, Alan; and Ulrich, Donald R., to Hoechst Celanese Corp. Inorganic-organic composite compositions exhibiting nonlinear optical response. 4,861,129, Cl 350-96.130

Check Technology Corporation: *See—*
Heiller, Glenn H.; and Petersen, Michael P., 4,862,225, Cl. 355-288.000

Chee, Seck W. Rotary cutting machines and components therefor. 4,860,525, Cl. 56-12.700

Chemical New York Corporation: *See—*
Losi, Paul F., 4,861,049, Cl. 280-47.160.

Chen, Chin-Long, to International Business Machines Corp. Error correcting code for 8-bit-per-chip memory with reduced redundancy. 4,862,463, Cl. 371-38.000

Chen, Horng-Hwei, to Industrial Technology Research Institute. Surface mounting device pick-and-place head. 4,860,438, Cl. 29-740.000.

Chen, Michael W.: *See—*
Cann, Kevin J.; Chen, Michael W.; and Karol, Frederick J., 4,861,846, Cl. 526-75.000

Chen, Nai Y.; Degnan, Thomas F.; and McCullen, Sharon B., to Mobil Oil Corp. Aromatization process. 4,861,932, Cl. 585-412.000.

Chen, Shih L.: *See—*
Heap, Michael P.; Chen, Shih L.; McCarthy, James M.; and Pershing, David W., 4,861,567, Cl. 423-235.000.

Cheney, Brian A.: *See—*
Rioja, Roberto J.; Colvin, Edward L.; Vasudevan, Asuri K.; and Cheney, Brian A., 4,861,391, Cl. 148-12.70A.

Cheng, Alan T., to Union Carbide Corporation. Method of separating a gas and/or particulate matter from a liquid. 4,861,352, Cl. 55-53.000.

Cherney, Dale M., to Hayssen Manufacturing Company. Form, fill and seal registration system apparatus and method including variable length compensation and out of registration restoration. 4,860,522, Cl. 53-451.000.

Chevron Research Company: *See—*
Graebner, Peter; Sie, Swan A.; and Angehrn, Jorg A., 4,862,424, Cl. 367-33.000.

Chiappini, Giuseppe: *See—*
Vittone, Andrea; and Chiappini, Giuseppe, 4,861,639, Cl. 428-105.000.

Chickering, Ronald W.; Miller, Richard S.; and Moss, H. Donald, to Westinghouse Electric Corp. Magnetic method and apparatus for measuring and locating wear of control rods in nuclear reactors. 4,862,079, Cl. 324-227.000.

Chin, Albert K.: *See—*
Fogarty, Thomas J.; Chin, Albert K.; and Feehan, Joe, 4,860,769, Cl. 128-786.000.

China Petrochemical Corp.: *See—*
Mao, Bingquan; Yang, Aichun; Zheng, Ying; Yang, Juxiou; and Li, Zhulan, 4,861,847, Cl. 526-125.000.

Chino, Shuichi: *See—*
Nakagawa, Nozomu; Kubota, Masaru; and Chino, Shuichi, 4,861,814, Cl. 524-102.000

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Takacs, Kalman; Ajzert, Ilona K.; Kellner, Katalin M.; Fleischer, Judit; Puskas, Mariann E.; and Rimai, Jozsef, 4,861,888, Cl. 546-150.000.

Chinone, Naoki: *See—*
Katsuyama, Toshio; Matsumura, Hiroyoshi; Inoue, Hiroaki; Fukuzawa, Tadashi; and Chinone, Naoki, 4,861,130, Cl. 350-96.140.

Chiodini, Laura: *See—*
Bernardi, Luigi; Chiodini, Laura; and Temperilli, Aldemio, 4,861,793, Cl. 514-410.000.

Chiovini, Jacky: *See—*
Margolis, Geoffrey; Chiovini, Jacky; and Pagliaro, Fulvio A., 4,861,607, Cl. 426-481.000.

Chisari, Paul R.; and Midon, Christian, to Wm. Wrigley Jr., Company. Method of improving chewing gum to reduce alditol bulking agent spots using gum rework material. 4,861,600, Cl. 426-3.000.

Chisso Corporation: *See—*
Abe, Morio, 4,861,633, Cl. 428-36.300.

Chiurco, Anthony A.; and Littman, Michael G., to Thermapeutics, Inc. Thermal pattern generator for pain relief. 4,860,748, Cl. 128-399.000.

Choi, Hee-June; Henley, Francois J.; and Barr, Maurice R., to Photon Dynamics, Inc. High frequency test head using electro-optics. 4,862,075, Cl. 324-158.00F.

Chow, Tat-Sing P.: *See—*
Wildi, Eric J.; and Chow, Tat-Sing P., 4,862,242, Cl. 357-48.000.

Chow, Wai Y.: *See—*
McAlpin, James J.; and Chow, Wai Y., 4,861,812, Cl. 524-3.000.

Christensen, Ronald K.: *See—*
Cowan, Clarence E.; and Christensen, Ronald K., 4,862,020, Cl. 307-601.000.

Christenson, Harlan B., to Berkley, Inc. Solid graphite rod tip. 4,860,481, Cl. 43-18.100.

Chrysler Motors Corporation: *See—*
Boundy, Timothy M., 4,861,208, Cl. 411-339.000.
Fenech, Anthony J., 4,860,597, Cl. 73-862.450.
Gorski, William J., 4,861,098, Cl. 296-195.000.

Chuan-Tien, Chuang. Wishing game. 4,861,026, Cl. 273-1.0GD.

Ciba-Geigy Corporation: *See—*
Banks, Christopher P.; and Irving, Edward, 4,861,438, Cl. 204-15.000.
Beriger, Ernst; Eckhardt, Wolfgang; and Nyfeler, Robert, 4,861,787, Cl. 514-363.000.
Clausen, Martin; and Rys, Paul, 4,861,920, Cl. 568-741.000
Danel, Paul, 4,861,342, Cl. 8-444.000.
Gabutti, Claudio A., 4,861,861, Cl. 528-272.000
Kramer, Andreas; and Darms, Roland, 4,861,885, Cl. 544-387.000.
Nyfeler, Robert; Eckhardt, Wolfgang; and Beriger, Ernst, 4,861,367, Cl. 71-92.000.
Rembold, Manfred; Sitek, Franciszek; Rutsch, Werner; and Berner, Godwin, 4,861,806, Cl. 522-66.000.
Seltzer, Raymond; and Winter, Roland A. E., 4,861,813, Cl. 524-91.000.

Cincinnati Microwave, Inc.: *See—*
Biggs, Michael A.; and Jaeger, James L., 4,862,175, Cl. 342-20.000

Cinotti, Andrea, to Wrapmatic S.p.A. Apparatus for the automatic separation of stacked sheets of large format paper into reams, and for subsequent transfer of the reams to wrapping machinery. 4,861,227, Cl. 414-796.800.

Clairol Incorporated: *See—*
Reeves, Kevin E.; and Santhouse, Daniel, 4,860,775, Cl. 132-118.000.

Clarion, Co., Ltd.: *See—*
Amazawa, Kiyoshi; and Mori, Akira, 4,862,097, Cl. 328-165.000.
Hamatsu, Masahiro; and Kunihara, Takao, 4,862,479, Cl. 375-1.000.

Clark, Adrian P., to National Research Development Corporation. Channel estimation and detection for digital communication systems. 4,862,483, Cl. 375-94.000.

Clark, Clair D., to General Electric Company. Automated method of brazing. 4,860,938, Cl. 228-102.000.

Clark, David E.; and Krabill, Robert H., to University of Florida. Method of joining metal oxide containing ceramic bodies. 4,861,410, Cl. 156-325.000.

Clark, Michael G.; and Wiltshire, Michael C., to General Electric Company, p.l.c., The. Testing of thermal imagers. 4,861,992, Cl. 250-316.100.

Clark, Stephen L., to Du Pont de Nemours, E. I., and Company. Impedance controlled connector interface. 4,861,272, Cl. 439-79.000.

Clarke, James R.; and Wolfe, Brian C., to Ford Motor Company. Engine induction system and method. 4,860,709, Cl. 123-432.000.

Clausen, Martin; and Rys, Paul, to Ciba-Geigy Corporation. Process for the preparation of 2,6-dihydroxynaphthalene. 4,861,920, Cl. 568-741.000.

Clavette, Norman: *See—*
Parker, Kent; Batchelder, Bruce; and Clavette, Norman, 4,860,815, Cl. 164-47.000.

Clayton, Cameron, to Willard L. Phelps Consultants Ltd. Cartridge holder. 4,860,478, Cl. 42-71.010.

Clements, Jack T., to Standard Havens, Inc. Baghouse with integral wall stiffeners. 4,860,915, Cl. 220-4.00R

Clendinning, Robert A.; Harris, James E.; Kwiatkowski, George T.; McMaster, Lee P.; Matzner, Markus; and Winslow, Paul A., to Amoco Corporation. Poly (aryl ether ketone) block copolymers. 4,861,915, Cl. 568-328.000.

Cliborn, David L. Windowed matrix display for baseball cards and similar objects. 4,860,468, Cl. 40-124.200.

Closs, Felix H.; Mueller, Johann R.; and Zafiropulo, Pitro A., to International Business Machines Corporation. Method and apparatus for switching information between channels for synchronous information traffic and asynchronous data packets. 4,862,451, Cl. 370-60.000

Clough, Thomas J.; and Pinsky, Naum, to Ensci, Inc. Battery element and method for making same. 4,861,689, Cl. 429-210.000.

Cloutier, Robert P., to Eastman Kodak Company. Film cassette. 4,860,966, Cl. 242-71.100.

Clum, Kenneth L.: *See—*
Pazda, Robert J.; and Clum, Kenneth L., 4,862,065, Cl. 324-65.00R.

Coates, William J.; and Kruse, Lawrence I., to Smith Kline & French Laboratories Limited. Heterocyclic compounds. 4,861,773, Cl. 514-222.800.

Cobe Laboratories, Inc.: *See—*
Finsterwald, P. Michael, 4,861,242, Cl. 417-477.000.

Coca-Cola Company, The: *See—*
Kirschner, Jonathan; Smazik, Kenneth G.; and Paisley, Gary V., 4,860,923, Cl. 222-1.000.

Cochran, Dwayne V.: *See—*
Gamboa, Gerardo; and Cochran, Dwayne V., 4,861,241, Cl. 417-454.000.

Cohen, Martin P.; Brown, Robert J.; and Majerus, Norbert, to Goodyear Tire & Rubber Company, The. Cure system for sulfur vulcanizable rubber. 4,861,842, Cl. 525-329.300.

Cohen, Richard J.: *See—*
Gordon, David; Akselrod, Solange; Cohen, Richard J.; Tu, Jerome C.; Burns, Stephen K.; and DeLeon, Victoria H., 4,862,361, Cl. 364-413.060

Coherent, Inc.: *See—*
Couillaud, Bernard; and Mitchell, Gerald M., 4,862,469, Cl. 372-33.000.

Cole, Bill W.: *See—*
Bockrath, Ronald E.; and Cole, Bill W., 4,861,855, Cl. 528-125.000

Coley, Terry R., to California Institute of Technology. Tunneling susceptometry. 4,861,990, Cl. 250-306.000.

Colgate-Palmolive Company: *See—*
Gervasio, Gregorio C., 4,861,507, Cl. 252-108.000.
Grodberg, Mg32arcus G., 4,861,590, Cl. 424-602.000.
Misevich, Kenneth W.; McGregor, Rob R.; and Mintel, Thomas E., 4,860,464, Cl. 36-114.000.

Colin, Joseph F.; Kaercher, Leo T.; and Roberts, Charles D., to Babcock & Wilcox Company, The. Controlled slow cooling of steel tubulars. 4,861,394, Cl. 148-153.000.

Collins, Earl R., Jr.; Suitor, Jerry W.; and Dubis, David, to United States of America, National Aeronautics and Space Administration. Energy efficient continuous flow ash lockhoper. 4,860,669, Cl. 110-165.00R.

Collins, Thomas J.: *See—*
Bevacqua, Joseph P.; Eastep, Robert E.; and Collins, Thomas J., 4,861,287, Cl. 439-718.000.

Colorization Inc.: *See—*
Markle, Wilson; and Mitchell, Christopher, 4,862,256, Cl. 358-81.000.

Colt Industries Inc.: *See—*
McCabe, Ralph P., 4,861,068, Cl. 280-714.000.

Columbia University in the City of New York, The Trustees of: *See*—
Cantor, Charles R.; and Schwartz, David C., 4,861,448, Cl. 204-182.800.
Reemtsma, Keith; Hardy, Mark A.; and Lau, Henry T., 4,861,704, Cl. 435-1.000.
Colvin, Edward L.: *See*—
Rioja, Roberto J.; Colvin, Edward L.; Vasudevan, Asuri K.; and Cheney, Brian A., 4,861,391, Cl. 148-12.70A.
Colvin, Jack A.: *See*—
Parrott, Richard M.; Colvin, Jack A.; and Shuey, Lyle W., 4,860,794, Cl. 137-637.200.
Combs, Robert F.: *See*—
Hall, Arthur, III; and Combs, Robert F., 4,860,613, Cl. 74-687.000.
Combustion Engineering, Inc.: *See*—
Weisel, Eric M.; and Schuker, Glen F., 4,860,919, Cl. 220-240.000.
Commissariat a l'Energie Atomique: *See*—
Berardo, Michel; Darnez, Charles; Martinet, Jean-Marie; and Roche, Gilbert, 4,861,480, Cl. 210-490.000.
Bois, Emmanuel; Huard, Serge; and Boisde, Gilbert, 4,861,131, Cl. 350-96.180.
Klein, Siegfried, 4,862,430, Cl. 367-168.000.
Levillain, Claude, 4,860,832, Cl. 169-49.000.
Commonwealth of Australia, The: *See*—
Jackett, Stephen G.; Kastel, Stephen N.; and Jandera, Zdenek, 4,862,428, Cl. 367-155.000.
Compagnie Generale d'Electricite: *See*—
Lavarini, Bernard; Crancon, Jean-Pierre; and Thomas, Jean-Yves, 4,862,100, Cl. 330-4.300.
Compagnie Generale des Etablissements Michelin: *See*—
Lacour, Jean-Charles, 4,860,810, Cl. 152-540.000.
Compeau, David E.; Rogers, Lloyd W.; and Myslicki, Robert J., to General Motors Corporation. Vehicle venting arrangement responsive to side door opening and closing. 4,861,089, Cl. 296-76.000.
Comptoir General d'Emballage: *See*—
Carrillon, Henri, 4,860,925, Cl. 222-145.000.
Compton, Gery R.: *See*—
Cotton, Lawrence M.; and Compton, Gery R., 4,860,809, Cl. 144-371.000.
Concept R.K.K. Limited: *See*—
Krieg, Ronald K.; and Drumheller, John A., 4,860,544, Cl. 62-45.100.
Condrashoff, Sergi F.: *See*—
Puritch, George S.; and Condrashoff, Sergi F., 4,861,762, Cl. 514-122.000.
Conkle, H. Nicholas, to Battelle Memorial Institute. Removing pollutant. 4,861,354, Cl. 55-96.000.
Conneally, Martin L., to Sears, Roebuck & Co. Single hand operation can opener. 4,860,455, Cl. 30-404.000.
Connectron, Inc.: *See*—
Norden, Alexander R., 4,861,285, Cl. 439-621.000.
Connell, John W.: *See*—
Hergenrother, Paul M.; Connell, John W.; and Bass, R. Gerald, 4,861,882, Cl. 544-216.000.
Conoco Inc.: *See*—
Carlberg, Bob L.; Wolf, Nicholas O.; Pober, Kenneth W.; and Nash, William D., 4,860,829, Cl. 166-279.000.
Folse, Keith A., 4,861,196, Cl. 405-224.000.
Contartese, Giulio; and Batlle, Alain, to Societe anonyme dite: Alcatel Thomson Espace. Cycle-controlled power converter. 4,862,057, Cl. 323-285.000.
Conway, Gerald A.: *See*—
Schott, David B.; Kump, Danny J.; and Conway, Gerald A., 4,860,905, Cl. 211-59.100.
Cook, Alexander, to Sundstrand Corporation. Filter for variable speed, constant frequency electrical system. 4,862,341, Cl. 363-37.000.
Cook, C. Edgar; Tallent, C. Ray; Reel, Jerry R.; and Wani, Mansukh C., to Research Triangle Institute. 17 α-(substituted-methyl)-17β-hydroxy/esterified hydroxy steroids and their progestational use. 4,861,763, Cl. 514-172.000.
Cooper, Leonard M., to Manville Corporation. Wrap-around carton locking means. 4,860,943, Cl. 229-40.000.
Coopetanche S.A.: *See*—
Renaud, Alain S., 4,861,634, Cl. 428-36.100.
Coopman, Lucien: *See*—
Victoor, Johnny; Coopman, Lucien; and Moeneclaey, Denis, 4,860,800, Cl. 139-448.000.
Copeland, John A., III, to Hayes Microcomputer Products, Inc. Adaptive data compression method and apparatus. 4,862,167, Cl. 341-107.000.
Coppi, Germano: *See*—
Springolo, Vanna; Coppi, Germano; and Scevola, Mario E., 4,861,599, Cl. 424-494.000.
Cordia, Anne-Louise, to Avery International Corporation. Apparatus for binding a pile of paper. 4,861,212, Cl. 412-36.000.
Cordis Corporation: *See*—
Callaghan, Frank J., 4,860,751, Cl. 128-419.0PG.
Smith, Kevin W.; and Slater, Charles R., 4,861,340, Cl. 604-141.000.
Corecon Corporation: *See*—
Sheehan, Robert K.; and Smester, Paul R., 4,861,279, Cl. 439-412.000.
Corle, Timothy R.: *See*—
Kino, Gordon S.; and Corle, Timothy R., 4,861,975, Cl. 250-201.000.
Cornelissen, Johannes M.; Klugkist, Jan; Lagerwaard, Cornelis A.; Swarthoff Ton; Thom, David; and Thom, David, to Lever Brothers Company. Enzymatic detergent and bleaching composition. 4,861,509, Cl. 252-174.120.
Cornell Research Foundation, Inc.: *See*—
Efthymiou, George S.; and Shuler, Michael L., 4,861,483, Cl. 210-636.000.
Henion, John D.; Covey, Thomas R.; and Bruins, Andries P., 4,861,988, Cl. 290-288.000.
Lobo, Hubert; and Wang, Kuo K., 4,861,167, Cl. 374-44.000.
Corning Incorporated: *See*—
MacDowell, John F., 4,861,734, Cl. 501-10.000.
Corporate Communications Consultants, Inc.: *See*—
Belmares-Sarabia, Armand; and Chayka, Stanley J., 4,862,251, Cl. 358-22.000.
Corser, George A.: *See*—
Hammond, Gary C.; Corser, George A.; and Eddy, Dale P., 4,860,594, Cl. 73-861.420.
Corteville, Jacques; Pauc, Andre ; and Hoffmann, Frederic, to Institut Francais du Petrole. Device for positioning a tool or instrument in a duct. 4,860,825, Cl. 166-68.000.
Corvino, Phil; and McCormick, Tom, to Reliance Comm/Tec Corporation. System for providing power to a central office protector module with alarm indicator and including remote alarm indication. 4,862,314, Cl. 361-119.000.
Cote, Jean-Marie, to Forest Engineering Research Institute of Canada. Suspension system for a bogie vehicle. 4,861,065, Cl. 280-678.000.
Cotton, Lawrence M.; and Compton, Gery R., to Robert Bosch Power Tool Corporation. Device for and method of producing workpieces with alternating contour mating surfaces. 4,860,809, Cl. 144-371.000.
Cottrell, Paul R.; Fritsch, Thomas R.; and Gosling, Christopher D., to UOP. Combination process for the conversion of a C_2–C_6 aliphatic hydrocarbon. 4,861,930, Cl. 585-317.000.
Couch, Richard W., Jr.: *See*—
Sanders, Nicholas A.; and Couch, Richard W., Jr., 4,861,962, Cl. 219-121.500.
Coughlin, Peter K.: *See*—
Mercer, William C.; Coughlin, Peter K.; McLeod, Donald, Jr.; and Flanigen, Edith M., 4,860,584, Cl. 73-336.500.
Pellet, Regis J.; Coughlin, Peter K.; Springer, Albert R.; and Gajek, Richard T., 4,861,739, Cl. 502-64.000.
Couillaud, Bernard; and Mitchell, Gerald M., to Coherent, Inc. Suppression of the second intracavity pulse in a synchronously pumped dye laser. 4,862,469, Cl. 372-33.000.
Courneya, Calice G., to Magnetronics, Inc. Microwave/steam sterilizer. 4,861,956, Cl. 219-10.55A.
Couwenbergs, Paul. Roll-block and to a roll-way assembled from roll blocks. 4,860,875, Cl. 193-35.0MD.
Couzens, Kenneth A. Mounting rack. 4,860,986, Cl. 248-313.000.
Covey, Michael K., to Anchor Group, The. Injection molding tool. 4,861,256, Cl. 425-378.100.
Covey, Thomas R.: *See*—
Henion, John D.; Covey, Thomas R.; and Bruins, Andries P., 4,861,988, Cl. 290-288.000.
Covino, Charles P. Electrolytic formation of an aluminum oxide surface. 4,861,440, Cl. 204-38.300.
Cowan, Clarence E.; and Christensen, Ronald K., to Tektronix, Inc. Electronic delay control circuit having pulse width maintenance. 4,862,020, Cl. 307-601.000.
Cowley, Nicholas P., to Plessey Overseas Limited. Processor controlled phase locked loop multi-band frequency synthesizer. 4,862,109, Cl. 331-16.000.
Cowley, Nicholas P., to Plessey Overseas Limited. Frequency dividing arrangements. 4,862,515, Cl. 455-183.000.
Cowley, Nicolas P.: *See*—
Walbrou, Pascal; and Cowley, Nicolas P., 4,862,105, Cl. 331-1.00A.
Crancon, Jean-Pierre: *See*—
Lavarini, Bernard; Crancon, Jean-Pierre; and Thomas, Jean-Yves, 4,862,100, Cl. 330-4.300.
Crater, Timothy G.: *See*—
Petersen, James A.; and Crater, Timothy G., 4,860,784, Cl. 137-315.000.
Cresswell, Thomas A. Disassemblable sulky vehicle. 4,861,058, Cl. 280-278.000.
Cretin, Jacques; Therond, Jean-Francois; and Saussier, Daniel, to Institut Francais du Petrole. Device for acquiring seismic data in a borehole and transmission thereof to a central control and recording system. 4,862,425, Cl. 367-33.000.
Crimmin, Michael J.: *See*—
Rogers, Norman H.; Walker, Graham; Crimmin, Michael J.; and O'Hanlon, Peter J., 4,861,788, Cl. 514-364.000.
Cristescu, Alex G.: *See*—
Beaulieu, Laurence A. J.; and Cristescu, Alex G., 4,861,283, Cl. 439-540.000.
Criticare Systems, Inc.: *See*—
Kahn, Alan R.; and Chandler, Jennifer K., 4,860,759, Cl. 128-668.000.
Croley, Henry C.; and Antesberger, A. Wayne, to United States of America, Army. Infrared aircraft landing system. 4,862,164, Cl. 340-952.000.
Crones & Co., GmbH: *See*—
Hilgarth, Gunter, 4,860,961, Cl. 241-92.000.
Cross, William D., to Hughes Aircraft Company. Very high density interconnections. 4,861,275, Cl. 439-289.000.
Crotti, Gianpiero: *See*—
Petrillo, Vincenzo; Crotti, Gianpiero; and Marchello, Giovanni, 4,861,824, Cl. 524-745.000.

Crowley, Michael J.: *See*—
Kaminski, Ronald S.; Snyder, Robert P.; and Crowley, Michael J., 4,861,541, Cl. 264-509.000.
Cubbison, Richard J., Jr., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Static electric discharge apparatus. 4,862,315, Cl. 361-212.000.
Cuilleron, Jean, to Societe Francaise D'Etudes et de Realisation D'Outillage. Quick change adapter with a torque limiter for a tapping chuck. 4,861,201, Cl. 408-139.000.
Culling, John H., to Carondelet Foundry Company. Iron-chromium-nickel heat resistant alloys. 4,861,547, Cl. 420-53.000.
Cummins Engine Company, Inc.: *See*—
Reid, David L.; and Weimer, Robert J., 4,862,393, Cl. 364-550.000.
Cunliffe, John; and Grabham, Brian J., to GTE Sylvania Limited. Fluorescent lamp unit having plural separate tubes and particular arrangement of circuit elements. 4,862,035, Cl. 315-58.000.
Cuppens, Roger; and Koomen, Joannes J. M., to U.S. Philips Corp. Non-volatile, programmable semiconductor memory having reduced testing time. 4,862,418, Cl. 365-201.000.
Curtiss, Alan C.; and Lo, Jeelin, to Pfizer Inc. Rolled matrix device having enhanced ability to unroll and method for its production. 4,861,596, Cl. 424-438.000.
Cutler, Gregory M., to Hewlett-Packard Company. Frequency locking circuit with sideband imbalance correction. 4,862,108, Cl. 331-9.000.
Cwycyshyn, Walter; and Kudwa, Frank J., to General Motors Corporation. Clutch for robot or like. 4,860,864, Cl. 192-56.00R.
Czaja, Anthony J.: *See*—
Scheiterlein, Ernst, 4,860,719, Cl. 124-25.000.
D M Enterprises Inc.: *See*—
Mraz, Dennis; and Skuce, Donald R., 4,860,878, Cl. 198-309.000.
Dabney, Upton R., to Hoover Group, Inc. Spring module with improved mounting foot structure. 4,861,002, Cl. 267-103.000.
Daelmans, Adriaan L.: *See*—
Wuyten, Johannes M.; and Daelmans, Adriaan L., 4,860,918, Cl. 220-84.000.
Dahms, Ronald H., to Monsanto Company. Polyimide laminates. 4,861,650, Cl. 428-251.000.
Daicel Chemical Industries, Ltd.: *See*—
Okamoto, Yoshio; and Hatada, Koichi, 4,861,872, Cl. 536-18.700.
Daiken Trade & Industry Co., Ltd.: *See*—
Yoshimi, Satoshi; and Koga, Youichiro, 4,860,506, Cl. 52-144.000.
Daikin Industries Ltd.: *See*—
Tatemoto, Masayoshi; Yutani, Yuji; and Fujiwara, Koji, 4,861,836, Cl. 525-276.000.
Dailmer-Benz Aktiengesellschaft: *See*—
Burckhardt, Manfred; Brugger, Franz; and Faulhaber, Andreas, 4,861,118, Cl. 303-110.000.
Daimler-Benz Aktiengesellschaft: *See*—
Zivkovic, Milorad, 4,861,119, Cl. 303-115.000.
Dainippon Screen Mfg. Co., Ltd.: *See*—
Sasada, Shigeru; Nagata, Shinichi; Hirosawa, Makoto; and Kishida, Yoshihiro, 4,861,983, Cl. 250-235.000.
Dake, Roger L.: *See*—
Webb, Jerry E.; Dake, Roger L.; and Wolfe, Rodney E., 4,860,403, Cl. 17-1.00E.
Dakin, John P.; and Wade, Christopher A., to Plessey Overseas Limited. Optical sensor having stationary co-terminus ends of the input and output optical fibres. 4,861,980, Cl. 250-227.000.
Dallas Instruments Incorporated: *See*—
Thompson, David B.; Preskitt, Stanley V.; Downing, Harvey L.; and Allred, Michael V., 4,862,394, Cl. 364-551.010.
Dallas Semiconductor Corporation: *See*—
Harrington, Thomas E., III, 4,862,310, Cl. 361-58.000.
Dalrymple, John C.; and Paul, Byron G., to Tektronix, Inc. Graphic display system with secondary pixel image storage. 4,862,155, Cl. 340-747.000.
Damon, Edward K., to General Electric Company. Microwave proximity sensor. 4,862,061, Cl. 324-58.50R.
Damrath, Volker; Lindner, Christian; Kress, Hans-Jurgen; and Wittmann, Dieter, to Bayer Aktiengesellschaft. Particulate multiphase polymers. 4,861,831, Cl. 525-100.000.
Dana Corporation: *See*—
Dick, Wesley M.; and Reuter, David C., 4,860,612, Cl. 74-665.00H.
Flotow, Richard A., 4,860,872, Cl. 192-107.00R.
Krisher, James A.; and Lloyd, Barry R., 4,862,363, Cl. 364-424.100.
Danel, Paul, to Ciba-Geigy Corporation. Dyeing or finishing process using padding with continuous fixing of textile materials: graft polymer and microwave heating. 4,861,342, Cl. 8-444.000.
Dann, Lynn D.; and Rapp, Earl E., to Eastman Kodak Company. Video camera microphone with zoom variable acoustic focus. 4,862,278, Cl. 358-225.000.
Danna, Dominick: *See*—
English, Stanley R.; and Danna, Dominick, 4,862,253, Cl. 358-42.000.
Dannoura, Sadayuki, to Ube Industries, Ltd. Die casting apparatus. 4,860,818, Cl. 164-314.000.
Dapo, Roland F.: *See*—
Stevens, James L.; and Dapo, Roland F., 4,861,439, Cl. 204-27.000.
Darms, Roland: *See*—
Kramer, Andreas; and Darms, Roland, 4,861,885, Cl. 544-387.000.
Darnell, W. Ronald; and Jackson, Winston J., Jr., to Eastman Kodak Company. Process for the preparation of polyketone and poly(ketone-sulfone) polymers. 4,861,856, Cl. 528-125.000.
Darnez, Charles: *See*—
Berardo, Michel; Darnez, Charles; Martinet, Jean-Marie; and Roche, Gilbert, 4,861,480, Cl. 210-490.000.
Darrow, William K.: *See*—
Bartow, Richard E.; Darrow, William K.; and Hartmann, Wayne T., 4,862,265, Cl. 358-139.000.
Daskalakis, Stefanos: *See*—
Samour, Carlos M.; and Daskalakis, Stefanos, 4,861,764, Cl. 514-177.000.
DataCard Corporation: *See*—
Lundstrom, Robert W.; and Emmons, Thomas R., 4,862,127, Cl. 335-257.000.
Dausseine, Sean-Paul: *See*—
Fish, Aaron M.; Matzeld, Leon; Branwer, Alexander; Miresmaili, Masoud; and Dausseine, Sean-Paul, 4,861,083, Cl. 292-347.000.
Dautartas, Mindaugas F.; Harrus, Alain S.; Martin, Edward P., Jr.; and Stevie, Fred A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Low temperature intrinsic gettering technique. 4,861,126, Cl. 350-96.110.
Davey, John R.; and Harris, William H., to General Hospital Corporation, The. Drill alignment guide for osteoplastic surgery. 4,860,735, Cl. 128-92.00V.
David, Doran: *See*—
Taylor, Ronald T.; Giles, George A.; and David, Doran, 4,862,018, Cl. 307-443.000.
David, Lennie F., to Hammond Royce Corporation Pty. Limited. Chlorinator cell. 4,861,451, Cl. 204-230.000.
Davidson Textron Inc.: *See*—
Parker, Kent; Batchelder, Bruce; and Clavette, Norman, 4,860,815, Cl. 164-47.000.
Rafferty, Scott, 4,861,543, Cl. 264-545.000.
Davis, Larry: *See*—
Helsley, Grover C.; Davis, Larry; and Olsen, Gordon E., 4,861,889, Cl. 546-183.000.
Davis, Walter L.: *See*—
Macnak, Philip P.; Irwin, James S.; and Davis, Walter L., 4,862,516, Cl. 455-193.000.
Dayley, Kyle E.: *See*—
Willard, Miles J.; and Dayley, Kyle E., 4,861,609, Cl. 426-550.000.
de la Cruz, Juan: *See*—
Cardenas, Alfonso; and de la Cruz, Juan, 4,860,667, Cl. 108-115.000.
de la Fonteijne, Marcel R., to B.V. Optische Industrie 'De Oude Delft'. Elongated X-ray detector tube. 4,861,977, Cl. 250-213.0VT.
Dean, Richard T.: *See*—
Nicolotti, Robert A.; and Dean, Richard T., 4,861,869, Cl. 530-402.000.
Dean, Robert C., Jr.; Silver, Frederick H.; Berg, Richard A.; Phillips, Philip G.; and Runstadler, Peter W., Jr., to Verax Corporation. Weighted collagen microsponge for immobilizing bioactive material. 4,861,714, Cl. 435-68.000.
Dean, Tracy C., to Agnew, Paul. Uniform garment. 4,860,388, Cl. 2-247.000.
Debras, Guy; and Bodart, Philippe, to Labofina, S.A. Process for removing arsine from light olefin containing hydrocarbon feedstocks. 4,861,939, Cl. 585-820.000.
de Concini, Roberto; and Brighi, Massimo, to Weber s.r.l. Ultrasonic device for measuring the rate of flow of fluid in a duct. 4,860,593, Cl. 73-861.290.
Dee Howard Co., The: *See*—
Fage, Etienne, 4,860,956, Cl. 239-265.190.
Deeley, S. T.: *See*—
Abouav, David M., 4,860,653, Cl. 102-200.000.
Deere & Company: *See*—
Erdmann, Alan J.; and Shirley, Ralph E., 4,860,614, Cl. 74-710.000.
Defaye, Jacques; Gadelle, Andree; and Pedersen, Christian, to Beghin-Say S.A. Process for cyclo-dehydrating ketoses, obtained anhydrides and their use as food additives. 4,861,871, Cl. 536-18.100.
DeForrest, William, Sr. Multi-purpose lock bolt. 4,861,079, Cl. 292-148.000.
Degen, Peter J.: *See*—
Pall, David B.; Degen, Peter J.; Matkovich, Vlado I.; and Gsell, Thomas C., 4,861,617, Cl. 427-2.000.
Degnan, Thomas F.: *See*—
Chen, Nai Y.; Degnan, Thomas F.; and McCullen, Sharon B., 4,861,932, Cl. 585-412.000.
Deguchi, Tetsuji: *See*—
Hashida, Kenji; Yamamoto, Takeshi; Fukumoto, Tatsuya; Deguchi, Tetsuji; Hirata, Shigeyuki; Uehara, Osamu; and Akebi, Kazuhiko, 4,861,409, Cl. 156-308.200.
Deguchi, Toshihisa: *See*—
Tsuji, Kentaroh; Maeda, Shigemi; Yamaguchi, Takeshi; Deguchi, Toshihisa; Sakamoto, Noriaki; and Terashima, Shigeo, 4,862,443, Cl. 369-59.000.
Degussa Aktiengesellschaft: *See*—
Baacke, Michael; Deller, Klaus; Kleinschmit, Peter; and Koberstein, Edgar, 4,861,937, Cl. 585-640.000.
Haubrich, Gerhard; Prescher, Guenter; and Faller, Juergen, 4,861,902, Cl. 549-499.000.
Deki, Kyoichi, to Ushio Denki Kabushiki Kaisha. Hollow-cathode type metal vapor laser tube. 4,862,475, Cl. 372-61.000.
de Laforcade, Vincent: *See*—
Morane, Bruno; and de Laforcade, Vincent, 4,860,933, Cl. 222-402.130.
Delancey, Warren H.: *See*—
Tallman, William R.; McDevitt, Steven C.; and Delancey, Warren H., 4,860,725, Cl. 126-110.00R.

DeLeon, Victoria H.: *See—*
Gordon, David; Akselrod, Solange; Cohen, Richard J.; Tu, Jerome C.; Burns, Stephen K.; and DeLeon, Victoria H., 4,862,361, Cl. 364-413.060.

Del Giudice, James E. Graphite trombone slide. 4,860,629. Cl. 84-395.000.

Deller, Klaus: *See—*
Baacke, Michael; Deller, Klaus; Kleinschmit, Peter; and Koberstein, Edgar, 4,861,937, Cl. 585-640.000.

DeLucca, George V.; Pelosi, Lorenzo F.; and O'Brien, John P. High strength chitosan fibers and fabrics thereof. 4,861,527, Cl 264-186.000.

Demmer, Fritz; Gruber, Werner; and Woog, Heinrich, to Boehringer Mannheim GmbH. Composition for a stable vein compatible injectable solution of torasemide process for the preparation and method of use. 4,861,786, Cl. 514-347.000.

Demuth, Robert: *See—*
Staheli, Paul; Demuth, Robert; and Fritzsche, Peter, 4,860,406, Cl. 19-105.000.

Den norske stats oljeselskap a.s.: *See—*
Svenning, Bjornar, 4,860,681, Cl. 114-321.000

deNeufville, John P.; Rajoria, Dalbir; and Ovshinsky, Stanford R., to Voltaix, Inc. Composite coating for electrochemical electrode and method. 4,861,573, Cl. 423-464.000.

Dengler, Herbert, to Bayerische Mass-Industrie Arno Keller GmbH. Bubble level. 4,860,459, Cl. 33-379.000.

Denison, Kenneth S., to Picker International, Inc. DC artifact removal in magnetic resonance imaging. 4,862,081, Cl. 324-307.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Watanabe, Yoshiharu; Shimizu, Hisayuki; Ito, Mineo; and Moriyama, Hitoshi, 4,861,378, Cl. 106-314.000

Denniston, Donald W. Method and apparatus for forming fibers from thermoplastic materials. 4,861,362, Cl. 65-5.000

Denny, Patrick J., to Imperial Chemical Industries PLC. Desulphurization. 4,861,566, Cl. 423-230.000.

Dentsply Limited: *See—*
Billington, Richard W.; and Williams, Jill A., 4,861,808, Cl 523-116.000.

DePietro, Mark A.; Klim, William T.; Ashworth, Robert H.; and Thiele, Robert E., to GF Furniture Systems, Inc. Connecting means for partition systems. 4,860,812, Cl. 160-135.000

Derni, Nicodeme B.: *See—*
Derni, Roxanne M.; and Derni, Nicodeme B., 4,860,914, Cl. 220-4.00C.

Derni, Roxanne M.; and Derni, Nicodeme B. Collapsible swimming pool. 4,860,914, Cl. 220-4.00C.

Dernie, Frank W., to Williams Grand Prix Engineering Limited. Vehicle suspension systems. 4,861,066, Cl. 280-707.000.

Derryberry, Lesli; and Petrovich, Tom, to Texas Instruments Incorporated. Contact joint for semiconductor chip carriers. 4,862,247, Cl 357-74.000.

De Santo, Robert S.; and Shapiro, Jeffrey H. Marina dock and aquatic life habitat. 4,860,690, Cl. 119-3.000

Desty, Dennis H.: *See—*
Swift, Thomas R.; and Desty, Dennis H., 4,861,489, Cl 210-668.000

Deutsche Babcock Werke Aktiengesellschaft: *See—*
Kiefer, Dieter; and Grommes, Helmut, 4,860,962, Cl. 241-117.000.

Deutsche ITT Industries GmbH: *See—*
Gillies, David, 4,862,455, Cl. 370-112.000.

Deutsche Thomson-Brandt GmbH: *See—*
Gleim, Gunter; and Uhde, Dietmar, 4,862,045, Cl. 318-254.000.

Deutschmann, Herbert, to Mtu-Motoren und Turbinen Union. Multicylinder diesel internal combustion engine with low compression ratio in the cylinders. 4,860,716, Cl. 123-560.000.

Deveaux, George A. Dipstick wiper. 4,860,401, Cl. 15-210.00B.

Devienne, Fernand M. Process for the detection of a chemical substance of knowm mass m. 4,861,987, Cl. 250-282.000.

Dewhirst, Kenneth C., to Shell Oil Company. New resin materials based on amines. 4,861,810, Cl. 523-445.000.

Dhein, Rolf: *See—*
Schultz, Klaus-Dieter; Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; and Michael, Dietrich, 4,861,815, Cl. 524-114.000.

DHV Raadgevend Ingenieursbureau BV: *See—*
Jansen, Cornelis W., 4,861,493, Cl. 210-715.000.

Dhyanchand, John J.; Shekhawat, Sampat F.; and Nguyen, Vietson M., to Sundstrand Corp. DC to AC inverter with neutral having a resonant circuit. 4,862,342, Cl. 363-40.000.

Dialogic Corporation: *See—*
Zwick, Nicholas, 4,862,492, Cl. 379-6.000.

Diana, Guy D.; and Carabateas, Philip M., to Sterling Drug Inc. Dihydro-oxazolyl substituted-phenyl-aliphatic lower alkyl and their use as antiviral agents. 4,861,791, Cl. 514-374.000.

Dias, Daniel M.; and Kumar, Manoj, to International Business Machines Corporation. Switching method for multistage interconnection networks with hot spot traffic. 4,862,454, Cl. 370-94.000.

Diaz, Francis: *See—*
Vieux, Gerard; Rougeot, Henri; and Diaz, Francis, 4,862,006, Cl. 250-483.100.

Diaz, Manuel, to Recycled Energy, Inc. Electro-dewatering method and apparatus. 4,861,496, Cl. 210-748.000.

Di Bernardo, Pietro, to Interdibipack S.p.A. Machine for cutting sheet material by means of a dinking die. 4,860,622, Cl. 83-285.000.

Dichtel, Ronald J. Carpet mat retainer clip. 4,860,402, Cl. 16-4.000.

Dick, Wesley M.; and Reuter, David C., to Dana Corporation. Vehicle torque transfer case for a four wheel drive system. 4,860,612, Cl. 74-665.00H.

Dicke, Hans-Rudolf: *See—*
Kricheldorf, Hans-Rytger; Pakull, Ralf; Eckhardt, Volker; and Dicke, Hans-Rudolf, 4,861,857, Cl. 528-170.000.

Dickinson, Barry L.; and Robeson, Lloyd M., to Amoco Corporation. Shaped article formed from a blend of a poly(aryl ether) and a polycarbonate and/or a polyarylate. 4,861,837, Cl. 525-394.000.

DiCosimo, Robert; and Szabo, Hsiao-Chiung, to Standard Oil Company, The. Process for oxidation of benzene to phenol precursor 4,861,911, Cl. 560-145.000.

Dieguez, Jose M.: *See—*
Lee, Robert; Hornsey, Derek; Garrido, Guillermo; and Dieguez, Jose M., 4,860,827, Cl. 166-261.000.

Diehard Engineering, Inc.: *See—*
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DIEHL GmbH & Co.: *See—*
Bock, Erich; and Weber, Adolf, 4,860,661, Cl. 102-523.000.
Lindstadt, Klaus; and Wittmer, Detlev, 4,860,658, Cl. 102-427.000.
Muller, Peter; Nagler, Josef; and Ahlers, Utz-Udo, 4,860,969, Cl. 244-3.270.

Dierker, Joseph B., Jr.; Peterson, Glen D.; and Gee, Thomas A., to Eaton Corporation. Dual speed sensor pickup assembly. 4,862,025, Cl. 310-68.00B

Dierker, Joseph B., Jr.; Peterson, Glen D.; and Gee, Thomas A., to Eaton Corporation. Exciter rotor assembly. 4,862,028, Cl. 310-168.000

Diesel Equipment Limited: *See—*
Ballyns, Jan; Martin, Paul H.; and Martin, John C., 4,860,813, Cl 160-188.000

Diesel Kiki Co., Ltd.: *See—*
Ichihashi, Kouji; and Inaba, Akira, 4,860,792, Cl. 137-596.170.
Kurihara, Kazumasa; and Arai, Kenji, 4,862,362, Cl. 364-424.100.
Nakajima, Nobuyuki; Inomata, Kenichi; Moruta, Masaya; Eitai, Kazuo; and Yamaguchi, Toshio, 4,861,235, Cl. 417-295.000.
Noguchi, Ichiro, 4,860,823, Cl. 165-153.000.

Diffracto Ltd.: *See—*
Pryor, Timothy R., 4,862,397, Cl. 364-571.010.

DiFlora, Joseph E.: *See—*
Mawhirt, James A.; Cantatore, Luigi; DiFlora, Joseph E.; McCandless, William J. C.; and Trieb, Marvin, 4,861,553, Cl. 422-65.000

Digital Equipment Corporation: *See—*
Benschneider, Bradley J.; and Peng, Victor, 4,862,405, Cl. 364-760.000
Foley, John M.; Piuze, Ronald L.; Larson, Ralph I., Jr.; and Doumani, George, 4,860,824, Cl. 165-165.000.
Newman, Bruce E.; and DiPirro, Steven D., 4,862,355, Cl. 364-200.000
Schmidt, William L.; Olson, Richard E.; and Bailey, Douglas A., 4,862,320, Cl. 361-383.000

DiMarzio, Frank; and Mitman, David, to Dopaco, Inc. Carton former 4,861,325, Cl. 493-124.000.

DiMauro, Thomas M.: *See—*
Lichtin, Norman N.; DiMauro, Thomas M.; and Svrluga, Richard C., 4,861,484, Cl. 210-638.000.

Dinger, Bruce R.; McClanahan, Mark R.; Quinn, David B.; and Kennard, Frederick, to General Motors Corporation. Apparatus for measuring grinding forces on ceramic parts. 4,860,499, Cl. 51-165.740.

Dinnan, James A.; and Dinnan, Joseph A., to Meta-C Corporation. Electronic musical instrument employing tru-scale interval system for prevention of overtone collisions. 4,860,624, Cl. 84-1.010.

Dinnan, Joseph A.: *See—*
Dinnan, James A.; and Dinnan, Joseph A., 4,860,624, Cl. 84-1.010.

DiPirro, Steven D.: *See—*
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Director General of Agency of Industrial Science and Technology: *See—*
Sugihara, Hideki; Hiratani, Kazuhisa; and Okada, Tatsuhiro, 4,861,455, Cl. 204-418.000.

Dishon, Yitzhak; and Kim, Michelle Y., to International Business Machines Corporation. Multiple copy data mechanism on synchronous disk drives. 4,862,411, Cl. 364-952.000.

Di Stefano, Giorgio, to Ing. C. Olivetti & C., S.p.A. Cartridge including epicyclic gearing drive for a multistrike typing ribbon for printing machines. 4,861,176, Cl. 400-208.000.

Ditzel, Roger E.: *See—*
Stearns, Floyd E.; Pitas, Jeffery A.; LeRoy, Robert D.; and Ditzel, Roger E., 4,861,015, Cl. 271-213.000.

Diversified Products Corporation: *See—*
Rockwell, Gary, 4,861,025, Cl. 272-144.000.

Dixit, Vyas M.: *See—*
Stolowitz, Mark L.; Dixit, Vyas M.; and Kesicki, Edward A., 4,861,726, Cl. 436-89.000.

DNE Corporation: *See—*
Huber, Thomas V; and Hone, Ronald D., 4,860,615, Cl. 74-785.000

Do, Tai H., to Rexnord Inc. Barrel nut fastener apparatus. 4,861,207, Cl. 411-104.000.

Dr. Madis Laboratories, Inc.: *See—*
Madis, Valdemar H.; Omar, Mostafa M.; and Madis, Voldemar, 4,861,761, Cl. 514-54.000

Doduco KG. Dr. Eugen Durrwachter: *See—*
Normann, Norbert; Gross, Erwin; and Schlager, Harald, 4,862,303, Cl. 360-110.000.

Doehner, Robert F., Jr., to American Cyanamid Company. Herbicidal o-(substituted, aminomethylbenzoic, nicotinic and quinoline-3-carboxylic acids, esters, and salts. 4,861,887, Cl. 546-170.000.

Doherr, Karl-Friedrich: *See—*
Synofzik, Reinhard; Doherr, Karl-Friedrich; Munscher, Dieter; and Saliaris, Christos, 4,860,660, Cl. 102-501.000.

Dolins, Steven B.: *See—*
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Donaldson Company, Inc.: *See—*
Kohl, James W.; and Belcher, Mark D., 4,860,644, Cl. 98-115.400.

Dongsuh Foods Corp.: *See—*
Moon, Juhn W.; Hwang, Bun; and Chang, Jin K., 4,861,605, Cl. 426-96.000.

Donlee Technologies, Inc.: *See—*
Korenberg, Jacob, 4,860,695, Cl. 122-136.00R.

Donnelly Corporation: *See—*
Nieboer, Keith A.; and Tucker, Herbert D., 4,861,540, Cl. 264-263.000.

Dopaco, Inc.: *See—*
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Dorner Mfg. Corp.: *See—*
Dorner, Wolfgang C.; Allen, Michael C.; Wedell, Mark C.; and Hosch, Michael A., 4,861,225, Cl. 414-789.900.

Dorner Mgf. Corp.: *See—*
Dorner, Wolfgang C.; and Hosch, Michael A., 4,861,226, Cl. 414-790.300.

Dorner, Wolfgang C.; Allen, Michael C.; Wedell, Mark C.; and Hosch, Michael A., to Dorner Mfg. Corp. Apparatus for stacking articles in a side-by-side relation. 4,861,225, Cl. 414-789.900.

Dorner, Wolfgang C.; and Hosch, Michael A., to Dorner Mgf. Corp. Apparatus for stacking articles and feeding the stacks to a discharge site. 4,861,226, Cl. 414-790.300.

Dorr-Oliver Incorporated: *See—*
Pietzsch, Kurt E., 4,861,495, Cl. 210-739.000.

Dost, Walfired: *See—*
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Dougall, David A.: *See—*
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Doumani, George: *See—*
Foley, John M.; Piuze, Ronald L.; Larson, Ralph I., Jr.; and Doumani, George, 4,860,824, Cl. 165-165.000.

Doundoulakis, George J. Compression ratio control in reciprocating piston engines. 4,860,702, Cl. 123-78.00F.

Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel: *See—*
van der Lijn, Joost; and van Thoor, Bernardus M., 4,860,645, Cl. 99-295.000.

Dover Cylinder Head Service: *See—*
Robinson, Robert C., 4,860,575, Cl. 73-49.700.

Dow Chemical Company, The: *See—*
Buchholz, Fredric L., 4,861,849, Cl. 526-230.000.
Harris, Robert F., 4,861,909, Cl. 558-267.000.
Johnson, Mark R., 4,861,927, Cl. 570-200.000.
Keskey, William H.; and Meath, Kenneth R., 4,861,822, Cl. 524-559.000.
Oswald, Thomas; and Robson, Ian A., 4,860,828, Cl. 166-274.000.
Robbins, Lanny A.; and Gammill, Ben B., 4,861,919, Cl. 568-724.000.
Saavedra, Jose V.; Hunter, Douglas L.; Sims, Steve A.; Maschmeyer, Donald M.; and Knobel, Thomas M., 4,861,805, Cl. 521-105.000.
Treybig, Duane S., 4,861,884, Cl. 544-336.000.
Turner, Robert B., 4,861,803, Cl. 521-37.000.
Volkmann, Curtis L.; Kester, John J.; and Stevens, Gregory A., 4,861,407, Cl. 156-272.800.
Walles, Wilhem E.; and Tomkinson, Donald L., 4,861,250, Cl. 425-90.000.

Dow Corning Corporation: *See—*
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Varaprath, Sudarsanan; and Varaprath, Padmakumari J., 4,861,906, Cl. 556-419.000.
Wright, Antony P.; and Bunge, David J., 4,861,907, Cl. 556-419.000.

Dowell Schlumberger Incorporated: *See—*
Hodge, Richard M., 4,861,500, Cl. 252-8.551.
Hoy, Edgar F., 4,861,386, Cl. 134-27.000.

Dowling, Donald J.; and Sims, Jackie C., to Texaco Inc. Radiant energy absorption steam quality monitoring means and method. 4,862,001, Cl. 250-345.000.

Downey, Max. Method and apparatus for measuring curvature of the cornea. 4,861,155, Cl. 351-212.000.

Downing, Harvey L.: *See—*
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Drackett Company, The: *See—*
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Draney, Robert G.: *See—*
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Drent, Eit; and Van Gogh, Johan, to Shell Oil Company. Process for the preparation of a diester of adipic acid. 4,861,912, Cl. 560-204.000

Dreyer, Dieter: *See—*
Durr, Manfred; Unland, Georg; Driemeier, Gunter; Krutzner, Karl; Schmits, Heinz-Herbert; von Seebach, Michael; Heinemann, Otto; Rother, Wolfgang; and Dreyer, Dieter, 4,861,265, Cl. 432-103.000.

Driemeier, Gunter: *See—*
Durr, Manfred; Unland, Georg; Driemeier, Gunter; Krutzner, Karl; Schmits, Heinz-Herbert; von Seebach, Michael; Heinemann, Otto; Rother, Wolfgang; and Dreyer, Dieter, 4,861,265, Cl. 432-103.000.

Drill Systems International Ltd.: *See—*
Asak, Kare, 4,860,838, Cl. 175-320.000.

Drohan, William N.: *See—*
Sobel, Mark E.; Liotta, Lance A.; Wewer, Ulla M.; Jaye, Michael C.; and Drohan, William N., 4,861,710, Cl. 435-6.000.

Dronet, Jean-Marc: *See—*
Lemaire, Didier; and Dronet, Jean-Marc, 4,860,519, Cl. 53-167.000.

Drouin, Richard. Cigarette case with built in electronic timing device. 4,862,431, Cl. 368-10.000.

Drozd, Edward J., Jr.: *See—*
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Druetzler, Thomas W.: *See—*
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Drumheller, John A.: *See—*
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Du Pont Tau Laboratories, Inc.: *See—*
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Dubis, David: *See—*
Collins, Earl R., Jr.; Suitor, Jerry W.; and Dubis, David, 4,860,669, Cl. 110-165.00R.

Dubrinsky, Max M.: *See—*
Edwards, Marysue; and Dubrinsky, Max M., 4,861,021, Cl. 272-69.000.

Duchess Limited: *See—*
Ramik, Vincent L., 4,861,528, Cl. 264-39.000.

Due, Jorgen; Graves, Bjarne; and Bak, Henning, to Hoechst Aktiengesellschaft. Process for preparing formable sheet structures. 4,861,535, Cl. 264-103.000.

Duffy, George Y., Jr.; and Flum, Ted O., to Iron Horse Productions, Inc. Folding wheelchair with improved frame and suspension system. 4,861,056, Cl. 280-250.100.

Dugan, Larry M., to Adolph Coors Company. System for controlling the movement of filled and sealed containers. 4,860,520, Cl. 53-287.000.

Duley, Richard K., to Sarasota Automation Limited. Environmental tracking in inductance loop vehicle detection systems. 4,862,162, Cl. 340-938.000.

Duma AB: *See—*
Sondal, Sven, 4,860,907, Cl. 215-230.000.

Dumbser, Gerhard: *See—*
Fey, Rainer; Look, Gunter; and Dumbser, Gerhard, 4,862,395, Cl. 364-561.000.

Dumoulin, Patrick; and Recalt, Hugues, to Anciens Etablissements Warin Fils BWF. Riding saddle and method of manufacture. 4,860,524, Cl. 54-44.000.

Duncan, David S., to Wilkinson Sword Limited. Razor blade assembly. 4,860,449, Cl. 30-47.000.

Duncan, Robert J.; and McLean, Jean A., to Emhart Industries, Inc Lead sense system for component insertion machine. 4,862,510, Cl. 382-8.000.

Dunsmore, Richard F., to Lockheed Corporation. Composite rivet. 4,861,211, Cl. 411-501.000.

Duoject Medical Systems Inc.: *See—*
Reynolds, David L., 4,861,335, Cl. 604-88.000.

Du Pont de Nemours, E. I., and Company: *See—*
Ackerman, Neil R.; Harris, Richard R.; Loveless, Scott E.; and Neubauer, Russel H., 4,861,783, Cl. 514-311.000
Clark, Stephen L., 4,861,272, Cl. 439-79.000.
Ivanoff, Lucinda A.; and Petteway, Steven R., 4,861,707, Cl. 435-5.000.
Lee, I-Hwa, 4,861,676, Cl. 428-516.000.
Lee, I-Hwa, 4,861,677, Cl. 428-516.000.
Levitt, George, 4,861,366, Cl. 71-90.000.
McCann, Elrey L., 4,861,802, Cl. 518-717.000
McCarron, Eugene M., III, 4,861,753, Cl. 505-1.000.
Parrish, Robert G., 4,861,653, Cl. 428-288.000.
Popper, Peter; and Velvel, William E., 4,860,610, Cl. 74-572.000.
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Slocum, Edgar W.; Sobrero, Aquiles C.; and Wheland, Robert C., 4,861,845, Cl. 526-68.000.
Waggoner, Marion G., 4,861,828, Cl. 525-66.000.
Wyss, Kurt H., 4,861,353, Cl. 55-96.000.

Duragrid, Inc.: *See—*
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Durchschlag, Gerald; and Lang, Alfred, to Voest-Alpine Aktiengesellschaft. Control mechanism for railway switches. 4,860,978, Cl. 246-448.000.

Duro Dyne Corporation: *See—*
Hinden, Milton; and Lyons, John, 4,861,631, Cl. 428-34.500

DuRocher, David. Formation testing apparatus and method. 4,860,580, Cl. 73-155.000.

Durr, Manfred; Unland, Georg; Driemeier, Gunter; Krutzner, Karl; Schmits, Heinz-Herbert; von Seebach, Michael; Heinemann, Otto;

Rother, Wolfgang; and Dreyer, Dieter, to Krupp Polysius AG. Apparatus and method for the heat treatment of fine-grained material. 4,861,265, Cl. 432-103.000

Durrum, Emmett L.; Amendola, Stephen; and Erickson, Bruce W., to Eldex Laboratories, Inc. Continuous flow peptide synthesizer. 4,861,866, Cl. 530-333.000.

Durst, Robert T., Jr.: *See—*
Axelrod, Barry H.; Durst, Robert T., Jr.; Hunter, Kevin D.; and Schmidt, Alfred C., 4,862,386, Cl. 364-518.000.

Dwyer Instruments, Inc.: *See—*
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Dynamit Nobel Aktiengesellschaft: *See—*
Hellriegel, Edmund, 4,860,496, Cl. 49-502.000

Dziubakowski, Donald J.; Keyes, Marion A., IV; and Shaffer, Jeremiah J., to Babcock & Wilcox Company, The. Compressor surge control system. 4,861,233, Cl. 417-201.000.

Dzung, Dacfey, to BBC Brown Boveri AG. Signal transmission process. 4,862,481, Cl. 375-57.000.

E.G.O. Elektro-Gerate Blanc u. Fischer: *See—*
Kicherer, Robert; Schreder, Felix; and Reif, Stefan, 4,861,969, Cl. 219-458.000.

E.P. Remy & Cie: *See—*
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E. R. Squibb & Sons, Inc.: *See—*
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Eads, George W.: *See—*
Eads, Mark E.; and Eads, George W., 4,860,727, Cl. 126-271.20A.

Eads, Mark E.; and Eads, George W. Mobile rail heater and method for expanding rails. 4,860,727. Cl. 126-271.20A.

Ealey, Mark A., to United Technologies Corporation. Magnetodistortive actuator arrangement. 4,861,149, Cl. 350-611.000.

Easley, Sydney E.; Heathco, Craig E.; and Smith, Clayton L., to General Motors Corporation. Inlet particle separator with anti-icing means. 4,860,534, Cl. 60-39.092.

East, Gary P.; Laguette, Stephen W.; Heindl, Alfons; and Lintula, Leanne M., to Pudenz-Schulte Medical Research Corp. Implantable shunt system and method of assembly. 4,861,331, Cl. 604-9.000.

Eastep, Robert E.: *See—*
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Easter, Michael D. Wraparound cover for guns during field use. 4,860,479, Cl. 42-96.000

Eastlund, Bernard J.; Schmitt, Kenneth J.; and Anderson, Douglas C., to Production Technologies International Inc. Tubing collar 4,861,074, Cl. 285-53.000

Eastman Kodak Company: *See—*
Bartow, Richard E.; Darrow, William K.; and Hartmann, Wayne T., 4,862,265, Cl. 358-139.000
Burns, Paul A.; and Taber, Terry R., 4,861,701, Cl. 430-543.000.
Cloutier, Robert P., 4,860,966, Cl. 242-71.100.
Dann, Lynn D.; and Rapp, Earl E., 4,862,278, Cl. 358-225.000.
Darnell, W. Ronald; and Jackson, Winston J., Jr., 4,861,856, Cl 528-125.000.
Ku, Wayne W., 4,862,224, Cl. 355-200.000.
Lok, Roger; Gunther, Wolfgang H. H.; and Freeman, John P., 4,861,703, Cl. 430-608.000
Lucitte, Richard D.; Melnychuck, Paul W.; Murray, Joseph J.; Ray, Lawrence A.; and Sullivan, James R., 4,861,140, Cl. 350-320.000.
Meisenzahl, Eric, 4,862,275, Cl. 358-213.290.
Pazda, Robert J.; and Clum, Kenneth L., 4,862,065, Cl. 324-65.00R.
Russel, Matthew J., 4,862,217, Cl. 355-218.000
Shuttleworth, Leslie; and Merkel, Paul B., 4,861,700, Cl. 430-517.000.
Smith, Craig M., 4,862,283, Cl. 358-443.000.
Stearns, Floyd E.; Pitas, Jeffery A.; LeRoy, Robert D.; and Ditzel, Roger E., 4,861,015, Cl. 271-213.000.

Eaton Corporation: *See—*
Beverly, James A., 4,860,579, Cl. 73-146.200.
Breen, Michael T., 4,861,158, Cl. 356-5.000.
Breen, Michael T., 4,861,159, Cl. 356-5.000.
Dierker, Joseph B., Jr.; Peterson, Glen D.; and Gee, Thomas A., 4,862,025, Cl. 310-68.00B
Dierker, Joseph B., Jr.; Peterson, Glen D.; and Gee, Thomas A., 4,862,028, Cl. 310-168.000.
Fogleman, Eric W., Sr., 4,861,948, Cl. 200-5.00B
Gooch, Douglas C.; and Morscheck, Timothy J., 4,860,861, Cl 192-3.260
Halmstad, Terrence R.; and Schachameyer, Steven R., 4,861,290, Cl. 439-810.000.
Janson, David A., 4,860,845, Cl. 180-140.000
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Ebara Corporation: *See—*
Fujita, Tadao, 4,860,696, Cl. 122-448.00B
Fukunaga, Akira; and Mori, Yoichi, 4,861,578, Cl. 423-240.000.
Miyasaka, Matsuho; Ichikawa, Katsuhiro; Sasaki, Katsumi; Mizobuchi, Syotaro; and Ogure, Naoaki, 4,861,395, Cl. 148-321.000.

Ebara, Katsuya: *See—*
Ishida, Masahiko; Haga, Ryooichi; Odawara, Yoji; Takahashi, Sankichi; and Ebara, Katsuya, 4,861,383, Cl. 127-67.000.

Ebara Research Co., Ltd.: *See—*
Fukunaga, Akira; and Mori, Yoichi, 4,861,578, Cl. 423-240.000

Ebata, Tokihide: *See—*
Nomura, Akihiro; Namekata, Kiyokazu; Kurata, Mitsuru; Niizawa, Takuji; Ebata, Tokihide; and Sasaki, Shinichi, 4,862,215, Cl. 355-309.000

Eberhard, Norbert: *See—*
Lubbehusen, Paul; Eberhard, Norbert; and Hoppe, Hans, 4,861,200, Cl. 406-14.000.

Eckardt, Fritz: *See—*
Blume, Georg; Bohmwetsch, Dieter; and Eckardt, Fritz, 4,861,133, Cl. 350-96.200.

Eckhardt, Volker: *See—*
Kricheldorf, Hans-Rytger; Pakull, Ralf; Eckhardt, Volker; and Dicke, Hans-Rudolf, 4,861,857, Cl. 528-170.000

Eckhardt, Wolfgang: *See—*
Beriger, Ernst; Eckhardt, Wolfgang; and Nyfeler, Robert, 4,861,787, Cl. 514-363.000
Nyfeler, Robert; Eckhardt, Wolfgang; and Beriger, Ernst, 4,861,367, Cl. 71-92.000.

Eckley, Robert C. Apparatus for drying material transported in a fluid stream. 4,860,405, Cl. 19-0.270.

Ecolab Inc.: *See—*
Morganson, Stephen A.; and Beecher, John L., 4,861,518, Cl. 252-548.000.

Economy, Constantine F.: *See—*
Moore, William A.; Economy, Constantine F.; and Economy, Theodore F., 4,860,876, Cl. 194-205.000.

Economy, Theodore F.: *See—*
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Eddy, Dale P.: *See—*
Hammond, Gary C.; Corser, George A.; and Eddy, Dale P., 4,860,594, Cl. 73-861.420.

Edenborough, Kevin L.: *See—*
Schliesing, John A.; and Edenborough, Kevin L., 4,860,975, Cl. 244-161.000.

Eduard Baltensperger: *See—*
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Edward L. Bateman Limited: *See—*
Blom, Peter W. E.; and Wingard, Johann H., 4,861,446, Cl. 204-170.000.

Edwards, David L.: *See—*
Barnes, Andrew C.; and Edwards, David L., 4,861,595, Cl. 424-195.100.

Edwards, Derek W.; and Townsend, David F., to Hercules Incorporated. High-solids alkyl ketene dimer dispersion. 4,861,376, Cl. 106-123.100.

Edwards, Harper, McNew & Company: *See—*
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Edwards, John W.; Harper, Daniel R.; and McNew, Quinton B., to Edwards, Harper, McNew & Company. Modular endless track drive system and methods of making, installing and repairing same. 4,861,120, Cl. 305-35.00R

Edwards, Marysue; and Dubrinsky, Max M., to Safe/Stress, Inc. Safety harness on/off switch assembly for treadmills. 4,861,021, Cl. 272-69.000

Edwards, Neil: *See—*
McCoy, Kenneth; Edwards, Neil; Wasley, Robert; and Wales, Denis, 4,862,146, Cl. 340-605.000.

Edwards, Peter R.: *See—*
Muller, Peter H.; Lowe, Peter E.; Edwards, Peter R.; and Harris, Samuel W., 4,861,276, Cl. 439-365.000.

Edwards, Robert C., to Amoco Corporation. Process for regenerating and stabilizing phosphorus-vanadium-oxygen complex catalysts. 4,861,738, Cl. 502-34.000

Efthymiou, George S.; and Shuler, Michael L., to Cornell Research Foundation, Inc. Apparatus and process to eliminate diffusional limitations in a membrane biological reactor by pressure cycling. 4,861,483, Cl. 210-636.000.

Egami, Kazuhito: *See—*
Shiraki, Manabu; and Egami, Kazuhito, 4,861,237, Cl. 417-353.000

Egashira, Yoshimi, to Harada Kogyo Kabushiki Kaisha. Antenna for a portable radiotelephone. 4,862,182, Cl. 343-702.000.

Eguchi, Tatsuya, to Minolta Camera Kabushiki Kaisha. Laser emitting apparatus with temperature intensity control. 4,862,466, Cl. 372-9.000.

Eidler, Franz: *See—*
Arnold, Brigitte; Eidler, Franz; and Wessel, Wolf, 4,862,370, Cl. 364-431.100

Eikelenboon, Peter A. J. Collapsible road barrier. 4,861,185, Cl. 404-6.000

Eisai Co., Ltd. *See—*
Kuwabara, Chihiro, 4,861,166, Cl. 366-219.000

Eitai, Kazuo: *See—*
Nakajima, Nobuyuki; Inomata, Kenichi; Moruta, Masaya; Eitai, Kazuo; and Yamaguchi, Toshio, 4,861,235, Cl. 417-295.000.

Ejiri, Emiko: *See—*
Matsumoto, Masakatsu; Fujimoto, Tamotsu; and Ejiri, Emiko, 4,861,917, Cl. 568-347.000.

Ekchian, Jack A.; Hoffman, Robert W.; Ekchian, Leon; and Gabriel, Kaigham J., to Revlon, Inc. Item identification tag for rapid inventory data acquisition system. 4,862,160, Cl. 340-825.540.

Ekchian, Leon. *See—*
Ekchian, Jack A.; Hoffman, Robert W.; Ekchian, Leon; and Gabriel, Kaigham J., 4,862,160, Cl. 340-825.540

Ekhoff, Donald L. Air bladder apparatus for positioning a magnetic head. 4,862,302, Cl. 360-105.000.

Eklund, Vidar; Fors, Jan; Mandell, Leo; Meinander, Kerstin; Selin, Johan-Fredrik; and Turunen, Olli T., to Neste Oy. Method of lowering the carbamate content of cellulose carbamate products using a base/alkali metal salt mixture. 4,861,874, Cl. 536-32.000.

Eldex Laboratories, Inc.: *See—*
Durrum, Emmett L.; Amendola, Stephen; and Erickson, Bruce W., 4,861,866, Cl. 530-333.000.

Electraflo Technology Corp.: *See—*
Gaudreau, Paul D.; Hickling, J. Gordon; and Schachter, Howard E., 4,860,460, Cl. 34-26.000.

Electric Power Research Institute, Inc.: *See—*
Udren, Eric A., 4,862,308, Cl. 361-45.000.

Electricite De France: *See—*
Javme, Richard, 4,862,137, Cl. 338-237.000.

Electrovac, Fabrikation, Elektrotechnischer Spezialartike: *See—*
Bayer, Helmut; and Sekira, Peter, 4,861,954, Cl. 200-284.000.

Elias, William E.: *See—*
Lau, Kreisler S. Y.; Oldham, Susan L.; Elias, William E.; and Bigus, Stephen J., 4,861,901, Cl. 549-215.000.

Elliott, Randy D.; and Tabet, Nicolas N., to Spectra-Physics, Inc. Bar code scanner and method of programming. 4,861,972, Cl. 235-462.000.

Ellis, Keith O.: *See—*
White, Ralph L., Jr.; and Ellis, Keith O., 4,861,790, Cl. 514-374.000.

Ellison, Donald E., to United Technologies Automotive, Inc. Wire cross-over arrangement for angular coil assembly. 4,862,130, Cl. 336-185.000

Elna Company Ltd.: *See—*
Morimoto, Takeshi; Sanada, Yasuhiro; Ohashi, Shinichi; and Kimura, Yoshikatsu, 4,862,328, Cl. 361-502.000.

Elopak A/S: *See—*
Kieser, Wolfgang, 4,860,902, Cl. 206-631.300.

Emerson Electric Co.: *See—*
Wallner, Manfred J., 4,861,963, Cl. 219-121.480.

Emhart Industries, Inc.: *See—*
Baker, Russ J.; Hansen, Robert A.; Scott, Paul F.; and Vozenilek, Edward F., 4,862,062, Cl. 324-61.00R.
Duncan, Robert J.; and McLean, Jean A., 4,862,510, Cl. 382-8.000.
Zsifkovits, Johann, 4,861,365, Cl. 65-323.000.

EMI Limited: *See—*
Voles, Roger, 4,862,176, Cl. 342-45.000.

Emmerling, Winfried: *See—*
Gonzalez, Rene-Andres A.; Emmerling, Winfried; Krause, Werner; Podola, Tore; and Neitzer, Klaus, 4,861,863, Cl. 528-408.000.

Emmons, Donald A., to Frequency and Time Systems, Inc. System for producing spectrally pure optical pumping light. 4,862,101, Cl. 330-4.300.

Emmons, Thomas R.: *See—*
Lundstrom, Robert W.; and Emmons, Thomas R., 4,862,127, Cl. 335-257.000.

Emoto, Takao, to Kabushiki Kaisha Toshiba. 3-phase bridge converting circuit module. 4,862,344, Cl. 363-147.000.

Enari, Masahiko; Yoshimura, Katsuji; Aoki, Akio; Yamashita, Shinichi; Shimokoriyama, Makoto; Kashida, Motokazu; Shimizu, Tetsuya; Ishii, Yoshiki; and Fujii, Akio, to Canon Kabushiki Kaisha. Digital information signal recording apparatus. 4,862,292, Cl. 360-8.000.

Endo, Katsunori: *See—*
Minamisawa, Tsuyoshi; Endo, Katsunori; and Kanoe, Toshio, 4,861,515, Cl. 252-299.010.

Endo, Masahiko: *See—*
Kobayashi, Yasuo; and Endo, Masahiko, 4,861,282, Cl. 439-540.000.

Endress u. Hauser GmbH u. Co.: *See—*
Schneider, Georg; and Bausch, Markus, 4,862,382, Cl. 364-481.000.

Energy and Environmental Research Corporation: *See—*
Heap, Michael P.; Chen, Shih L.; McCarthy, James M.; and Pershing, David W., 4,861,567, Cl. 423-235.000.

Enever, Robin P.: *See—*
Weierstall, Richard P.; Enever, Robin P.; Brunelle, Kathleen L.; Thone, Gerard F.; and Warner, Ronald N., 4,861,591, Cl. 424-690.000.

Engel, Georg; and Kosak, Dietmar, to SMS Schloemann-Siemag Aktiengesellschaft. System for rolling continuously cast profiles. 4,860,426, Cl. 29-527.700.

Engineered Controls International, Inc.: *See—*
Petersen, James A.; and Crater, Timothy G., 4,860,784, Cl. 137-315.000.

Engleman, Ivan M.; and Kozisek, Thomas G. Voltage regulator. 4,862,058, Cl. 323-298.000.

English, Stanley R.; and Danna, Dominick, to Welch Allyn, Inc. Apparatus for converting a video processor. 4,862,253, Cl. 358-42.000.

Engstrom, John M.: *See—*
Anderson, Joseph; Baldi, Barney T.; and Engstrom, John M., 4,861,043, Cl. 277-1.000.

Enloe, Kenneth M.: *See—*
Lippert, Mary E.; Enloe, Kenneth M.; Koch, Debra J.; Roessler, Thomas H.; and Pazdernik, Patrick A., 4,861,652, Cl. 428-284.000.

Ennovation Corporation: *See—*
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Ensci, Inc.: *See—*
Clough, Thomas J.; and Pinsky, Naum, 4,861,689, Cl. 429-210.000.

Ensign, Edward: *See—*
Mandel, Linda; and Ensign, Edward, 4,861,150, Cl. 350-622.000.

Enviro-Gro Technologies, Inc.: *See—*
Glorioso, John D., 4,860,671, Cl. 110-236.000.

Environetics, Inc.: *See—*
Winters, Raymond S., 4,860,916, Cl. 220-5.00A.

Epitaux, Jacques. Apparatus for adjusting a safety ski binding. 4,860,595, Cl. 73-862.020.

Epstein, Alan L.; and Taylor, Clive R., to Cancer Biologics, Inc. Detection of necrotic malignant tissue and associated therapy. 4,861,581, Cl. 424-1.100.

ERA Aviation, Inc.: *See—*
Lannerd, Robert F.; and Murphy, David K., 4,860,972, Cl. 244-135.00R.

Erath, Louis W., to Erath-Young Instrument Company, Inc. Differential pressure applanation tonometer. 4,860,755, Cl. 128-645.000.

Erath-Young Instrument Company, Inc.: *See—*
Erath, Louis W., 4,860,755, Cl. 128-645.000.

Erbe Elektromedizin GmbH: *See—*
Farin, Gunter; Haag, Reiner; and Putz, Peter, 4,860,745, Cl. 128-303.170.

Erben, Ralf; Langert, Albert; Madzgalla, Frank-Wilhelm; and Madzgalla, Hans-Georg, to Lucas Industries public limited Company. Spot-type disc brake with resetting means. 4,860,858, Cl. 188-71.800.

Erdmann, Alan J.; and Shirley, Ralph E., to Deere & Company. Transmission differential. 4,860,614, Cl. 74-710.000.

Erickson, Bruce W.: *See—*
Durrum, Emmett L.; Amendola, Stephen; and Erickson, Bruce W., 4,861,866, Cl. 530-333.000.

Eriksson, Hans E. K., to Sunds Defibrator Aktiebolag. Dewatering press with perforated metal outer shell and resilient elastic mounting means. 4,861,433, Cl. 162-323.000.

Eriksson, Jan-Olof. Non-abrasive polish or cleaning composition and process for its preparation. 4,861,374, Cl. 106-3.000

Erlandsson, Kjell I., to Kelley Company, Inc. Vehicle restraint using both linear and pivotal movement. 4,861,217, Cl. 414-401.000.

Ernst, G. D.; and Schuweiler, Alan R., to Tennant Company. Aqueous urethane coatings. 4,861,825, Cl. 524-839.000.

Ernst, James; Williamson, Steven; Rogers, George; and Musto, Dominick, to Symtron Systems, Inc. Fire fighting trainer. 4,861,270, Cl. 434-226.000.

Ernst, Thomas W.: *See—*
Kalvaitis, Arvydas J.; and Ernst, Thomas W., 4,862,324, Cl. 361-390.000.

Ernst Winter & Sohn (GmbH & Co.), Firma: *See—*
Borse, Dietrich, 4,860,469, Cl. 40-409.000.

Ernstsen, Leif. Bow string peep sight. 4,860,458, Cl. 33-265.000.

Erpelding, Michel; and Vandome, Jacques, to Societe Chimique des Charbonnages. Thermoplastic compositions based on grafted rubber and polyester, a process for their manufacture, and articles obtained therefrom. 4,861,817, Cl. 524-411.000.

Essex Composite Systems: *See—*
Wycech, Joseph, 4,861,097, Cl. 296-188.000.

Esslingcr, Dwaine E. Oil pressure adjustment device for engines 4,860,856, Cl. 181-6.400.

Estep, Timothy N., to Baxter International, Inc. Purified hemoglobin solutions and method for making same. 4,861,867, Cl. 530-385.000.

Ethyl Corporation: *See—*
Weidig, Charles F., 4,861,914, Cl. 564-7.000.

Etienne, Nolf J.; and Browell, Atkinson E., to Raychem Corporation. Remote locating of a structure and remote measurement of conditions therein. 4,862,088, Cl. 324-326.000.

Eugui, Elsie M.: *See—*
Nelson, Peter H.; Gu, Chee-Liang L.; Allison, Anthony C.; Eugui, Elsie M.; and Lee, William A., 4,861,776, Cl. 514-233.500.

Euroceltique, S.A.: *See—*
Oshlack, Benjamin, 4,861,598, Cl. 424-468.000.

Evans, Jack L. Appliance leveling apparatus. 4,860,553, Cl. 62-297.000.

Evans, William P., to Westinghouse Electric Corp. Architecture for high speed analog to digital converters. 4,862,171, Cl. 341-156.000.

Evanson, Delbert L.: *See—*
Patrichi, Mihai D.; and Evanson, Delbert L., 4,860,698, Cl. 123-24.00R.

EVG Entwicklungsu. Verwertungs-Gesellschaft m.b.H: *See—*
Ritter, Gerhard; and Ritter, Klaus, 4,860,999, Cl. 266-103.000.

Exxon Chemical Patents Inc.: *See—*
McAlpin, James J.; and Chow, Wai Y., 4,861,812, Cl. 524-3.000.

Exxon Research and Engineering Company: *See—*
Schucker, Robert C., 4,861,628, Cl. 427-245.000.
Wachs, Israel E.; and Yang, Darchun B., 4,861,747, Cl. 502-325.000.

Eyring Research Institute, Inc.: *See—*
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F. Oberdorfer GmbH & Co. KG, Industriegewebe-Technik: *See—*
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Fabricated Plastics, Inc.: *See—*
Richards, Toby D.; and Antonio, Anthony I., Jr., 4,860,797, Cl. 138-122.000.

Factor, Arnold: *See—*
Goossens, John C.; Factor, Arnold; and Miranda, Peter M., 4,861,664, Cl. 428-409.000.

Fage, Etienne, to Dee Howard Co., The. Thrust reverser for aircraft jet engine and aircraft engine equipped with said thrust reverser. 4,860,956, Cl. 239-265.190

Fagen, Ben W., Jr.: *See—*
Rizza, Robert S.; Fagen, Ben W., Jr.; Raymond, Michael W.; Feher, Peter; Milliard, Norman L.; and Kegelman, Thomas B., 4,862,198, Cl. 346-153.100.

Fahnler, Friedrich: *See—*
Schultz, Klaus-Dieter; Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; and Michael, Dietrich, 4,861,815, Cl. 524-114.000.

Failes, Michael, to Canadian Instrumentation & Research Ltd. Optical coupler. 4,861,127, Cl. 350-96.150.

Fairbairn, James P.: *See—*
Parrett, John T.; Fairbairn, James P.; and Jaworski, Walter, 4,860,539, Cl. 60-426.000

Fairman, Ronald E., to General Signal Corporation. Hydraulic isolation valve. 4,860,781, Cl. 137-118.000

Faller, Juergen: *See—*
Haubrich, Gerhard; Prescher, Guenter; and Faller, Juergen, 4,861,902, Cl. 549-499.000

Fanuc Ltd: *See—*
Kawamura, Hideaki; and Sasaki, Takao, 4,862,380, Cl. 364-474.110.
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Farach, Orlando F.: *See—*
Case, Michael B.; and Farach, Orlando F., 4,862,140, Cl. 340-457.200

Farber, Eugene I.; and Forbes, Lyman M., to Ford Motor Company. Automatic headlamp dimming system. 4,862,037, Cl. 315-83.000.

Farin, Gunter; Haag, Reiner; and Putz, Peter, to Erbe Elektromedizin GmbH. High frequency electrosurgical apparatus for thermal coagulation of biologic tissues. 4,860,745, Cl. 128-303.170.

Farkas-Himsley, Hannah. Bacteriocins and compositions thereof in anti-viral treatment. 4,861,754, Cl. 514-2.000

Farley, James R.: *See—*
Maier, Alfred E.; and Farley, James R., 4,862,125, Cl. 335-202.000.

Farman, Jacqueline. Novelty soap. 4,861,505, Cl. 252-92.000.

Farmitalia Carlo Erba, S.p.A.: *See—*
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Farmitalia Carlo Erba S.p.A.: *See—*
Oppico, Ernesto; Varesio, Carlo; and Rosa, Onorino, 4,861,870, Cl. 536-16.900

Farrar, David: *See—*
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Fasco Industries, Inc.: *See—*
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Faudi Feinbau GmbH: *See—*
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Faulconer, H. A. Sailboat with leeway reducing keel. 4,860,680, Cl. 114-140.000.

Faulhaber, Andreas: *See—*
Burckhardt, Manfred; Brugger, Franz; and Faulhaber, Andreas, 4,861,118, Cl. 303-110.000

Faulkenberry, William E.: *See—*
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Fecondini, Luciano, to W. R. Grace & Co. Hemodiafiltration device. 4,861,485, Cl. 210-641.000

Fedrigo, Joseph G. Vehicle tailgate assembly. 4,861,088, Cl. 296-57.100

Feehan, Joe: *See—*
Fogarty, Thomas J.; Chin, Albert K.; and Feehan, Joe, 4,860,769, Cl. 128-786.000.

Feher, Peter: *See—*
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Feinwerktechnik Schleicher & Co.: *See—*
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Feldman, Leonard C.: *See—*
Bean, John C.; Feldman, Leonard C.; and Fiory, Anthony T., 4,861,393, Cl. 148-33.400

Fellmann, Jere D.; Saxton, Robert J.; and Tung, Paul. Process for manufacture of resorcinol. 4,861,921, Cl. 568-772.000

Fendler, Arthur H. Boring head. 4,861,202, Cl. 408-181.000

Fenech, Anthony J., to Chrysler Motors Corporation. Belt tension tester. 4,860,597, Cl. 73-862.450

Fengler, Gerd; Klausener, Alexander; Buysch, Hans-Josef; Mardin, Mithat; and Pelster, Bernhard, to Bayer Aktiengesellschaft. 1H-pyrido-(2,3-b) (1,4)-thiazines. 4,861,878, Cl. 544-48.000

Fenner, James A., to Boeing Company, The. Cargo conveying system. 4,860,973, Cl. 244-137.100.

Ferguson, Ian J.: *See—*
Hulme-Lowe, Alan G.; Bell, Vivien L.; and Ferguson, Ian J., 4,861,697, Cl. 430-270.000.

Fergusson, Gordon J.: *See—*
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Ferns, Derek, to Von Roll, AG. Covering for an opening with a cover or grating placed in a frame. 4,861,186, Cl. 404-25.000

Ferriter, Kate M.; and Palmer, Elaine R., to International Business Machines Corp. Bill of material interface to CAD/CAM environment. 4,862,376, Cl. 364-468.000.

Fette, Bruce A.; Lewis, Leslie K.; Briel, Marc L.; and Makovicka, Thomas J., to Motorola, Inc. Digital signal processing apparatus. 4,862,407, Cl. 364-900.000.

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Fey, Rainer; Look, Gunter; and Dumbser, Gerhard, to Sachs-Huret S.A. Data display instrument for a bicycle. 4,862,395, Cl. 364-561.000.

Fiacconi, Claudio; and Franzosi, Antonio, to Honeywell Bull Italia S.p.A. Multiprocessor system with interrupt notification and verification unit. 4,862,354, Cl. 364-200.000.

Fiat Auto S.p.A.: *See—*
Margiaria, Giorgio; and Brizio, Giuseppe, 4,861,258, Cl. 425-444.000.

Field, David J.: *See—*
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Fina Technology, Inc.: *See—*
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Fink, David, to Hughes Aircraft Company. Rapidly switchable line selector for pulsed lasers. 4,862,468, Cl. 342-19.000

Finsterwald, P. Michael, to Cobe Laboratories, Inc. Self-loading peristaltic pump. 4,861,242, Cl. 417-477.000

Fiory, Anthony T.: *See—*
Bean, John C.; Feldman, Leonard C.; and Fiory, Anthony T., 4,861,393, Cl. 148-33.400

First Lady Coiffures Ltd.: *See—*
Sciara, Anthony, 4,860,747, Cl. 128-330.000

Fischer, Georg: *See—*
Juenkersfeld, Harald; and Fischer, Georg, 4,860,926, Cl. 222-148.000

Fish, Aaron M.; Matzeld, Leon; Branwer, Alexander; Miresmaili, Masoud; and Dausseine, Sean-Paul, to Ilco Unican Inc. Lock actuator assembly and card reader. 4,861,083, Cl. 292-347.000.

Fisher, Arthur D., to United States of America, Navy. Adaptive associative-processing optical computing architectures. 4,862,406, Cl. 364-807.000.

Fisher, Wesley. Earthquake safety valve shut-off. 4,860,780, Cl. 137-45.000

Fishman, Udi: *See—*
Park, Harry; and Fishman, Udi, 4,860,742, Cl. 128-303.00R

Flachs, Bernard E. Portable deer pole. 4,860,404, Cl. 17-44.000.

Flakk, Egil, to A/S Spilka Inco Ltd. Turnable window arrangement. 4,860,811, Cl. 160-92.000

Flanagan, Ralph C.; and Wong, Jimmy J. Energy storage rotor with flexible rim hub. 4,860,611, Cl. 74-574.000.

Flanders Filters, Inc.: *See—*
Cadwell, George H., Jr.; and Wood, Joseph A., 4,860,420, Cl. 29-157.00R

Flanigen, Edith M.: *See—*
Flank, William H.; Wilson, Stephen T.; Marte, Julio C.; and Flanigen, Edith M., 4,861,743, Cl. 502-214.000
Mercer, William C.; Coughlin, Peter K.; McLeod, Donald, Jr.; and Flanigen, Edith M., 4,860,584, Cl. 73-336.500
Wilson, Stephen T.; Woodard, Naomi A.; and Flanigen, Edith M., 4,861,457, Cl. 208-46.000

Flank, William H.; Wilson, Stephen T.; Marte, Julio C.; and Flanigen, Edith M., to UOP. Process for the production of molecular sieves. 4,861,743, Cl. 502-214.000

Fleet, George W. J., to G. D. Searle & Co. Method for synthesis of deoxymannojirimycin. 4,861,892, Cl. 546-219.000

Fleischer, Judit: *See—*
Takacs, Kalman; Ajzert, Ilona K.; Kellner, Katalin M.; Fleischer, Judit; Puskas, Mariann E.; and Rimai, Jozsef, 4,861,888, Cl. 546-150.000

Fleissner, Hermut: *See—*
Bernstein, David M.; and Fleissner, Hermut, 4,860,741, Cl. 128-204.180

Flesher, Peter: *See—*
Allen, Adrian S.; Farrar, David; and Flesher, Peter, 4,861,539, Cl. 264-204.000

Fleury, Daniel, to Societe Anonyme dite: ALSTHOM. Method of assembling a rotor of a steam turbine constituted by disks shrunk onto a shaft. 4,860,418, Cl. 29-156.80R

Flexair, Inc.: *See—*
Bonerb, Timothy C., 4,861,215, Cl. 414-288.000

Flexivol, Inc. *See—*
Apffel, Fred, 4,861,360, Cl. 62-17.000.

Flexon, Inc.: *See—*
Kroha, John L., 4,861,474, Cl. 210-232.000

Flinchbaugh, Bruce E.; Dolins, Steven B.; Srivastava, Aditya; and Reese, Jon, to Texas Instruments Incorporated. Apparatus and method for production process diagnosis using dynamic time warping. 4,861,419, Cl. 156-626.000.

Flotow, Richard A., to Dana Corporation. Friction disc assembly. 4,860,872, Cl. 192-107.00R.

Floyd, Terry S.: *See—*
Neas, Edwin D.; and Floyd, Terry S., 4,861,556, Cl. 422-78.000.

Flum, Ted O.: *See—*
Duffy, George Y., Jr.; and Flum, Ted O., 4,861,056, Cl. 280-250.100.

FMC Corporation: *See—*
Wiethoff, Roger H.; and Nelson, Gary J., 4,860,633, Cl. 89-45.000.

Fogarty, Thomas J.; Chin, Albert K.; and Feehan, Joe, to Fogarty, Thomas J.; and Ventritex, Inc. Implantable defibrillation electrode. 4,860,769, Cl. 128-786.000.

Fogle, Richard M.: *See—*
Campbell, John G.; Schoeneberger, Carl F.; Bundens, Allan B.; Fogle, Richard M.; and Lemburg, John R., 4,862,268, Cl. 358-141.000

Fogleman, Eric W., Sr., to Eaton Corporation. Interlock switch with low energy operating mechanism. 4,861,948, Cl. 200-5.00B.

Foley, John M.; Piuze, Ronald L.; Larson, Ralph I., Jr.; and Doumani, George, to Digital Equipment Corporation. Heat exchange element. 4,860,824, Cl. 165-165.000.

Folse, Keith A., to Conoco Inc. Offshore drilling/production platform with a retractable work deck. 4,861,196, Cl. 405-224.000.

Forberg, Wolfgang: *See—*
Bergter, Friedrich; Bocker, Harald; Bormann, Ernst-Joachim; Forberg, Wolfgang; Fricke, Heinz; Grafe, Udo; Grosse, Hans-Helmut; Heller, Ingeborg; Hilliger, Matthias; Junne, Wolf; Linde, Hellmut; Menner, Michael; Menzel, Klaus-Dieter; Muller, Peter-Jurger; Plonka, Gunter; Pohl, Hans D.; Schneider, Jorg; and Thrum, Heinz, 4,861,715, Cl. 435-70.000.

Forbes, Lyman M.: *See—*
Farber, Eugene I.; and Forbes, Lyman M., 4,862,037, Cl. 315-83.000

Force Control Industries, Inc.: *See—*
Yater, Jerry L.; and Carmichael, Stephen L., 4,860,862, Cl. 192-18.00A.

Ford Motor Company: *See—*
Boag, John, 4,861,070, Cl. 280-808.000.
Clarke, James R.; and Wolfe, Brian C., 4,860,709, Cl. 123-432.000.
Farber, Eugene I.; and Forbes, Lyman M., 4,862,037, Cl. 315-83.000
Theodore, Ares N.; and Killgoar, Paul C., Jr., 4,861,819, Cl. 524-491.000
Wade, Wallace R., 4,861,243, Cl. 417-499.000.

Ford New Holland, Inc.: *See—*
Seymour, Shaun A., 4,860,528, Cl. 56-16.400.

Foreman, Dennis J.; Hellenga, David A.; and Hill, Richard K., to International Business Machines Corporation. Method for extracting and/or replacing control system information in a computer operating system. 4,862,349, Cl. 364-200.000.

Forest Engineering Research Institute of Canada: *See—*
Cote, Jean-Marie, 4,861,065, Cl. 280-678.000.

Fors, Jan: *See—*
Eklund, Vidar; Fors, Jan; Mandell, Leo; Meinander, Kerstin; Selin, Johan-Fredrik; and Turunen, Olli T., 4,861,874, Cl. 536-32.000.

Forschner, Horst. Garment kit and method of assembly thereof. 4,860,900, Cl. 206-574.000.

Forte, Luciano: *See—*
Jordan, Howard E.; Woods, Edward J.; Caruso, John T.; and Forte, Luciano, 4,862,053, Cl. 318-786.000.

Fortin, Conrad. Ceramic tile spacing gauge and tile holder. 4,860,723, Cl. 125-23.00T.

Fortin, Paul-Emile; and Gallerneault, Willard M., to Alcan International Limited. Method for contact conductor for electric vehicles. 4,861,388, Cl. 148-2.000

Fosnaugh, William L., to ACCO World Corporation. Electrical connector device. 4,861,286, Cl. 439-651.000.

Fosse, Daniel K. Method of forming packaging and packaging structure in accordance with the method. 4,860,887, Cl. 206-204.000.

Foster, Brian C.; and Lind, Roger S., to Ceramics Process Systems Corporation. Substrates with dense metal vias. 4,861,641, Cl. 428-137.000.

Fowler, James F.; Barker, Nick; Kaneko, Steven; and Moore, Loyd C. Disc storage device. 4,860,897, Cl. 206-444.000.

Fox, Robert: *See—*
Sefton, Verner B.; Fox, Robert; and Lorenz, William P., 4,861,565, Cl. 423-55.000.

Framatome: *See—*
Malaval, Claude, 4,860,697, Cl. 122-510.000.

Franke, Rickard; and Martensson, Lars, to AB Tetra Pak. Mandrel for forming a bottom in a packaging container. 4,861,328, Cl. 493-470.000.

Frankenberger, William, Jr.; and Karlson, Ulrich. Selenium detoxification. 4,861,482, Cl. 210-611.000.

Frantz, Marvin O. Tow bar for towing a motor vehicle. 4,861,061, Cl. 280-479.200.

Franz, Reinhard; and Dost, Walfired, to Franz, Reinhard. Manual for electronic organs and the like. 4,860,630, Cl. 84-439.000.

Franzen, Peter: *See—*
Borgstrom, Leonard; Carlsson, Claes G.; Franzen, Peter; Inge, Claes; Lagerstedt, Torgny; Moberg, Hans; and Nabo, Olle, 4,861,329, Cl. 494-73.000.

Franzosi, Antonio: *See—*
Fiacconi, Claudio; and Franzosi, Antonio, 4,862,354, Cl. 364-200.000.

Fred Hutchinson Cancer Research Center: *See—*
Miller, A. Dusty, 4,861,719, Cl. 435-236.000.

Fredriksson, Borje; and Cahmberlin, Jeffery L., to Beloit Corporation. Method of and means for hydrodynamic mixing. 4,861,165, Cl. 366-165.000.

Freeman, John P.: *See—*
Lok, Roger; Gunther, Wolfgang H. H.; and Freeman, John P., 4,861,703, Cl. 430-608.000.

Freeman, Smith, to General Electric Company. Method for generating efficient testsets for a class of digital circuits. 4,862,399, Cl. 364-580.000.

Frequency and Time Systems, Inc.: *See—*
Emmons, Donald A., 4,862,101, Cl. 330-4.300.

Frerejacques, Jean-Claude, to Simmonds S.A. Threaded element forming for example a screw, and assembly of pieces obtained with the aid of this element. 4,861,210, Cl. 411-411.000.

Freudenberg Nonwovens Ltd.: *See—*
Markwell, Edgar R., 4,860,382, Cl. 2-82.000

Frey, Michael L.; and Becker, Gunter, to Intermedics Inc. Sidelock pacer lead connector. 4,860,750, Cl. 128-419.00P.

Fricke, Heinz: *See—*
Bergter, Friedrich; Bocker, Harald; Bormann, Ernst-Joachim; Forberg, Wolfgang; Fricke, Heinz; Grafe, Udo; Grosse, Hans-Helmut; Heller, Ingeborg; Hilliger, Matthias; Junne, Wolf; Linde, Hellmut; Menner, Michael; Menzel, Klaus-Dieter; Muller, Peter-Jurger; Plonka, Gunter; Pohl, Hans D.; Schneider, Jorg; and Thrum, Heinz, 4,861,715, Cl. 435-70.000.

Fried, Jeffrey A.; and Rosebrugh, Christopher P., to GTE Laboratories Incorporated. Content-addressable memory having control circuitry and independent controls for match and write cycles. 4,862,412, Cl. 365-49.000

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Kostrewa, Ludwig, 4,860,884, Cl. 198-509.000.
von Haas, Rainer, 4,860,429, Cl. 29-568.000.

Friedhelm Pickhan: *See—*
Arnold, Gerhard, 4,860,937, Cl. 227-147.000.

Friedman, Gerald I., to Precision Castparts Corp. Method of forming a metal article from powdered metal. 4,861,546, Cl. 419-8.000

Friedman, Samuel B., to Royal Technologies USA, Inc. Electrical cordset. 4,861,288, Cl. 439-736.000.

Friesen, Heinz-Jurgen; Grenner, Gerd; Pauly, Hans-Erwin; Kohl, Helmut; Habenstein, Klaus; and Stark, Joseph, to Behringwerke Aktiengesellschaft. Sheet-like diagnostic device. 4,861,711, Cl. 436-7.000.

Frijlink, Peter M., to U.S. Philips Corporation. Device comprising a flat susceptor rotating parallel to a reference surface about a shift perpendicular to this surface. 4,860,687, Cl. 118-500.000.

Friteyre, Marie-Claire: *See—*
Mazuel, Claude; and Friteyre, Marie-Claire, 4,861,760, Cl. 514-54.000.

Frito-Lay, Inc.: *See—*
Tang, Jiunn-Yann; Brown, Regina A.; and Ke, Victor H., 4,861,604, Cl. 426-94.000.

Fritsch, Thomas R.: *See—*
Cottrell, Paul R.; Fritsch, Thomas R.; and Gosling, Christopher D., 4,861,930, Cl. 585-317.000.

Fritzsche, Peter: *See—*
Staheli, Paul; Demuth, Robert; and Fritzsche, Peter, 4,860,406, Cl. 19-105.000.

Frochte, Bernd: *See—*
Poerschke, Karl; Stark, Klaus; and Frochte, Bernd, 4,862,134, Cl. 337-231.000.

Frolov, George, to Harrow Products, Inc. Support for electromagnetic shear lock armature. 4,861,080, Cl. 292-251.500

Frossard, Philippe M., to Biotechnology Research Partners, Ltd. Restriction fragment analysis of individuals using cardiovascular system probes. 4,861,708, Cl. 435-6.000.

Fry, Michael L. Pillow/audio system combination. 4,862,438, Cl. 369-19.000.

Fuchs, Werner K. H. Stacking device for the displacement of sheets. 4,861,213, Cl. 414-791.200.

Fucinato, Gene J. Golf putter. 4,861,038, Cl. 273-169.000.

Fuhrer, Jack S.: *See—*
Smith, Terrence R.; Isnardi, Michael A.; Fuhrer, Jack S.; and Patel, Chandrakant B., 4,862,271, Cl. 358-166.000.

Fuji Electric Company, Ltd.: *See—*
Kuroda, Masami; Nakamura, Yoichi; and Furusho, Noboru, 4,861,691, Cl. 430-59.000.
Kuroda, Masami; Nakamura, Yoichi; and Furusho, Noboru, 4,861,692, Cl. 430-59.000.
Moteki, Eiji, 4,862,051, Cl. 318-696.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Morikawa, Koji, 4,860,711, Cl. 123-48.00D.

Fuji Kikai Kogyo Co., Ltd.: *See—*
Hanyu, Akinobu; and Kurokawa, Tsukasa, 4,861,327, Cl. 493-415.000.

Fuji Oil Company, Limited: *See—*
Baba, Hideki; Maeda, Hirokazu; Kurooka, Akira; and Nago, Atsushi, 4,861,611, Cl. 426-601.000.
Saito, Toshiaki; Ueno, Chizuru; and Sunada, Fumiyuki, 4,861,603, Cl. 426-93.000.

Fuji Photo Film Co., Ltd.: *See—*
Adachi, Yuuma; and Nakajima, Nobuyoshi, 4,861,993, Cl. 250-327.200.
Hiruma, Toshihiko; Takahashi, Hiroshi; and Kato, Norihiko, 4,861,698, Cl. 430-272.000.
Iida, Toshiharu; Shimanuki, Koji; Nakada, Kimiaki; and Masuda, Akira, 4,862,280, Cl. 358-229.000.
Inaba, Hiroo; Ushimaru, Akira; Yamamoto, Nobuyuki; Hibino, Noburo; and Iwamoto, Kenzo, 4,861,674, Cl. 428-480.000.
Ishii, Yoshiyuki; and Shimizu, Shigehisa, 4,860,964, Cl. 242-57.100.
Katagiri, Shingo; Odate, Seizi; and Onmori, Shozo, 4,862,305, Cl. 360-132.000
Kimura, Tsutomu; and Hishinuma, Kazuhiro, 4,862,358, Cl. 364-413.000.
Kimura, Tsutomu; and Hishinuma, Kazuhiro, 4,862,360, Cl. 364-413.010.
Masuda, Nobuhito; Nagatomo, Shigeru; Makiuchi, Hajime; and Yasuda, Yukio, 4,861,552, Cl. 422-56.000.
Matsuo, Mamoru; Okuda, Yutaka; Takizawa, Kazushige; and Sakaki, Hirokazu, 4,861,396, Cl. 148-439.000.
Miyakawa, Tadashi, 4,862,285, Cl. 358-451.000.

Ohgoda, Makoto, 4,861,995, Cl. 250-327.200.
Saeki, Keiso; Takashima, Masanobu; and Iwakura, Ken, 4,861,748, Cl. 503-208.000
Saotome, Shigeru; Kimura, Tsutomu; and Nakajima, Nobuyoshi, 4,861,994, Cl. 250-327.200.
Tamagawa, Shigehisa; and Kuroishi, Masayuki, 4,861,696, Cl. 430-138.000
Tanaka, Nobuyuki, 4,862,261, Cl. 358-133.000
Tanaka, Nobuyuki, 4,862,262, Cl. 358-133.000
Tezuka, Shigeru, 4,861,411, Cl. 156-344.000
Yamanouchi, Junichi; and Toriuchi, Masaharu, 4,861,852, Cl 526-263.000
Fuji Xerox Co., Ltd.: *See—*
Kunisaki, Toshiharu; and Higuchi, Masamori, 4,860,425, Cl. 29-527.400.
Fuji Yakuhin Kogyo Kabushiki Kaisha: *See—*
Aburatani, Masakazu; Takeuchi, Tadashi; and Mori, Kenji, 4,861,875, Cl. 540-114.000
Fujii, Akio: *See—*
Enari, Masahiko; Yoshimura, Katsuji; Aoki, Akio; Yamashita, Shinichi; Shimokoriyama, Makoto; Kashida, Motokazu; Shimizu, Tetsuya; Ishii, Yoshiki; and Fujii, Akio, 4,862,292, Cl. 360-8.000.
Fujii, Hiroshi; and Takahashi, Atsushi, to Nissan Motor Co., Ltd.; and Nifco Inc. Vertically movable window glass retainer for motor car door. 4,860,494, Cl. 49-493.000.
Fujii, Yasuhiro: *See—*
Haga, Takahiro; Toki, Tadaaki; Koyanagi, Toru; Fujii, Yasuhiro; Yoshida, Kiyomitsu; and Imai, Osamu, 4,861,799, Cl 514-594.000
Fujiie, Kazuhiko: *See—*
Ando, Ryo; Yoshida, Tadao; Fujiie, Kazuhiko; and Yoshida, Toshio, 4,862,439, Cl. 369-30.000
Fujiki, Tatsuo: *See—*
Yokota, Motoyuki; Tanabe, Mamoru; and Fujiki, Tatsuo, 4,861,004, Cl. 267-140.100
Fujimoto, Akihiko, to Mitsubishi Denki Kabushiki Kaisha. Numerical control machine. 4,862,379, Cl. 364-474.110
Fujimoto, Tamotsu: *See—*
Matsumoto, Masakatsu; Fujimoto, Tamotsu; and Ejiri, Emiko, 4,861,917, Cl. 568-347.000
Fujimura, Fumio: *See—*
Satake Toshimi; Nagai, Tomoaki; and Fujimura, Fumio, 4,861,749, Cl. 503-211.000.
Fujimura, Shuzo; and Konno, Junichi, to Fujitsu Limited. Ashing process of a resist layer formed on a substrate under fabrication to a semiconductor device. 4,861,424, Cl. 156-643.000
Fujimura, Shuzo; and Konno, Junichi, to Fujitsu Limited. Method for removing an ion-implanted organic resin layer during fabrication of semiconductor devices. 4,861,732, Cl. 437-229.000.
Fujioka, Kazutoshi: *See—*
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Fujisawa Pharmaceutical Co., Ltd.: *See—*
Kohsaka, Masanobu: Terano, Hiroshi: Komori, Tadaaki; Iwami, Morita; Yamashita, Michio; Hashimoto, Masashi; Uchida, Itsuo; and Takase, Shigehiro, 4,861,774, Cl. 514-299.500
Takaya, Takao; Tozuka, Zenzoburo; Yasuda, Nobuyoshi; and Nishimura, Shintaro, 4,861,769, Cl. 514-202.000
Fujita, Shigeru; Banzai, Hideo; and Takada, Makoto, to Toshiba Kikai Kabushiki Kaisha. Monitoring data display device. 4,862,385, Cl. 364-518.000
Fujita, Tadao, to Ebara Corporation. Apparatus for controlling boiler system. 4,860,696, Cl. 122-448.00B
Fujitsu Limited: *See—*
Fujimura, Shuzo; and Konno, Junichi, 4,861,424, Cl. 156-643.000.
Fujimura, Shuzo; and Konno, Junichi, 4,861,732, Cl. 437-229.000.
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Mochizuki, Kouji; Ozeki, Masashi; and Ohtsuka, Nobuyuki, 4,861,417, Cl. 156-610.000.
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Takeuchi, Atsushi, 4,862,416, Cl. 371-10.000.
Tojo, Toshiro; Takato, Kenji; Kinoshita, Kazumi, and Yamamoto, Yuzo, 4,862,309, Cl. 361-56.000
Fujitsu Ten Kabushiki Kaisha: *See—*
Tada, Tetsuya; Nagasaka, Masumi; Iwamoto, Kouji: Teratani, Tatsuo; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Yagi, Kiyoshi, 4,862,367, Cl. 364-426.040
Fujiwara, Katsuji; and Yumoto, Hideaki, to TLV Co., Ltd. Reducing valve equipped with a vapor-liquid separator. 4,860,782, Cl. 137-193.000
Fujiwara, Koji: *See—*
Tatemoto, Masayoshi; Yutani, Yuji; and Fujiwara, Koji, 4,861,836, Cl. 525-276.000
Fukamachi, Masaaki; Onitsuka, Nobuyuki; Tanaka, Akira; and Nakamura, Kazuo, to Honda Lock Manufacturing Co., Ltd.; and Honda Giken Kogyo Kabushiki Kaisha. Anti-theft system for automotive vehicles. 4,862,139, Cl. 340-426.000.
Fukami, Tadashi; and Ino, Hiroyuki, to Sony Corporation. Apparatus for reproducing a digital signal without employing tracking signals. 4,862,297, Cl. 360-53.000
Fukuchi, Toshiki: *See—*
Okada, Itaru, Okui, Shuko; Nishimata, Mana; Takahashi Yoji: and Fukuchi, Toshiki, 4,861,777, Cl 514-234.500
Fukuhara, Hiroshi, to Fukuhara Seisaku Co., Ltd. System for removing contaminants from an oil tank in a hydraulic device. 4,861,467, Cl. 210-168.000
Fukuhara Seisaku Co., Ltd.: *See—*
Fukuhara, Hiroshi, 4,861,467, Cl. 210-168.000
Fukui, Shigetoshi: *See—*
Kawai, Hironao; Fukui, Shigetoshi; and Ikeda, Kenji, 4,860,676, Cl. 112-121.140
Fukukawa, Mitsuo; Yazawa, Masayuki; Asai, Kazumitsu; Okamoto, Yoshiharu; and Mio, Kouhei, to Kajima Corporation; and Kajima Road Company. System for paving inclined and/or curved surfaces. 4,861,189, Cl. 404-84.000.
Fukumoto, Tatsuya: *See—*
Hashida, Kenji; Yamamoto, Takeshi; Fukumoto, Tatsuya; Deguchi, Tetsuji; Hirata, Shigeyuki; Uehara, Osamu; and Akebi, Kazuhiko, 4,861,409, Cl. 156-308.200
Fukunaga, Akira; and Mori, Yoichi, to Ebara Corporation; and Ebara Research Co., Ltd. Method of treating waste gas. 4,861,578, Cl. 423-240.000
Fukunaga, Koji, to Canon Kabushiki Kaisha. Word processor permitting modification or addition of data in response to particular indentation of data. 4,862,410, Cl. 364-900.000.
Fukuoka, Hirotsugu; Kawakami, Kanji; Aihara, Makoto; Suda, Mitsuo; Takeshita, Kouji; and Isono, Yukihiro, to Hitachi, Ltd. Method for making a thin film magnetic head. 4,861,398, Cl. 156-64.000.
Fukushima, Masato: *See—*
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,861,792, Cl. 514-389.000
Fukushima, Toshitaka, to Fujitsu Limited. Test method for detecting faulty memory cell of a programmable device. 4,862,459, Cl. 371-21.000
Fukuzawa, Sooichi; Takeda, Yoshiaki; and Ohwa, Yoshio, to Hitachi, Ltd. Diaphragm type water inlet valve. 4,860,990, Cl. 251-30.030.
Fukuzawa, Tadashi: *See—*
Katsuyama, Toshio; Matsumura, Hiroyoshi; Inoue, Hiroaki; Fukuzawa, Tadashi; and Chinone, Naoki, 4,861,130, Cl. 350-96.140.
Fulk, Clyde W., Jr. Spiral wound membrane modules and systems with improved feed spacer. 4,861,487, Cl. 210-644.000.
Fullemann, Jorg; Boner, Heinrich; and Granwehr, Erik, to VTH AG. Feeding device for feeding pulverous or granular material from a container to a material consuming apparatus. 4,861,216, Cl. 414-326.000
Fuller, Jerald W. Tray assembly for attachment to folding chairs and other supporting structures. 4,861,102, Cl. 297-162.000.
Fulton, Donald E., to Charles Stark Draper Laboratory, Inc., The Constant area pulse generating network. 4,862,049, Cl. 318-689.000.
Funada, Takashi, to Hitachi, Ltd. Variable equalization system. 4,862,103, Cl. 330-304.000
Funaki, Shinsuke: *See—*
Umeda, Toshikazu; Funaki, Shinsuke; and Nozu, Taketo, 4,862,196, Cl. 346-108.000
Funayama, Osamu; Arai, Mikiro; and Isoda, Takeshi, to Petroleum Energy Center; and Toa Nenryo Kogyo Kabushiki Kaisha. Reformed, inorganic polysilazane and method of producing same 4,861,569, Cl. 423-324.000.
Furukawa Aluminum Co., Ltd.: *See—*
Yamanoi, Tukio; Kandachi, Mitsuo; Iwata, Masahiro; and Kato, Kazumi, 4,860,568, Cl. 72-291.000
Furukawa, Takao: *See—*
Okumoto, Yutaka; and Furukawa, Takao, 4,860,773, Cl 131-281.000
Furusho, Noboru: *See—*
Kuroda, Masami; Nakamura, Yoichi; and Furusho, Noboru, 4,861,691, Cl. 430-59.000
Kuroda, Masami; Nakamura, Yoichi; and Furusho, Noboru, 4,861,692, Cl. 430-59.000.
Furuya, Osamu; and Taguchi, Hiromi, to Nissan Motor Co., Ltd Automatic transmission casing with servomotor and anchor pin installed in upper side of casing. 4,860,860. Cl. 188-77.00R.
Furuyama, Hideto: *See—*
Morinaga, Motoyasu; Furuyama, Hideto; Nakamura, Masaru; Suzuki, Nobuo; Hirayama, Yuzo; and Okuda, Hajime, 4,862,474, Cl. 372-50.000
Fuse, Genshu; Hirao, Takashi; and Ohzone, Takashi, to Matsushita Electric Industrial Co., Ltd. Method of doping impurities into sidewall of trench by use of plasma source. 4,861,729, Cl. 437-18.000.
G. D. Searle & Co.: *See—*
Fleet, George W. J., 4,861,892, Cl. 546-219.000
Gabriel, Kaigham J.: *See—*
Ekchian, Jack A.; Hoffman, Robert W.; Ekchian, Leon; and Gabriel, Kaigham J., 4,862,160, Cl. 340-825.540.
Gabutti, Claudio A., to Ciba-Geigy Corporation. Saturated polyesters containing imide groups and terminal carboxyl groups. 4,861,861, Cl. 528-272.000.
Gadelle, Andree: *See—*
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Gaiser, William R.: *See—*
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Gaitanopoulos, Dimitri; Mico, Bruce; and Weinstock, Joseph, to Smith-Kline Beckman Corporation. Carbamates of 6-chloro-7,8-dihydroxy-1-(4'-hydroxyphenyl)-2,3,4,5-tetrahydro-1H-3-benzazepine as prodrugs. 4,861,771, Cl. 514-213.000.

Gajek, Richard T.: *See—*
Pellet, Regis J.; Coughlin, Peter K.; Springer, Albert R.; and Gajek, Richard T., 4,861,739, Cl. 502-64.000
Galef, Bennett G., Jr.; and Mason, J. Russell, to Monell Chemical Senses Center. Enhanced rodent edible with natural attractants. 4,861,585, Cl. 424-84.000.
Gallagher Electronics Limited: *See—*
Standing, Colin A., 4,861,645, Cl. 428-196.000.
Gallerneault, Willard M.: *See—*
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Galvagni, John; Oberschmidt, James M.; and Humenik, James N., to AVX Corporation; and International Business Machines Corporation. Method of forming thin film terminations of low inductance ceramic capacitors and resultant article. 4,862,318, Cl. 361-321.000.
Gambatte, Inc.: *See—*
McIntosh, Stuckey, 4,862,478, Cl. 375-1.000.
Gamberini, Ernesto, to MG 2 S.p.A. Machine for moistening a cover to be fixed onto a base filled for example with a pharmaceutical product. 4,861,415, Cl. 156-556.000.
Gamboa, Gerardo; and Cochran, Dwayne V., to Parker Technology, Inc. Valve guide bracket. 4,861,241, Cl. 417-454.000.
Gammill, Ben B.: *See—*
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Ganser, Volker: *See—*
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Garay, Anne-Ly: *See—*
Garay, Gabriel L.; Garay, Anne-Ly; and Tacy, Robert, 4,861,268, Cl. 433-229.000.
Garay, Gabriel L.; Garay, Anne-Ly; and Tacy, Robert, to Transpharm Group. Tooth-anchored beneficial agent delivery device. 4,861,268, Cl. 433-229.000.
Garbrick, Randy. Tool and method for assisting the extraction of a wire from a connector. 4,860,440, Cl. 29-825.000.
Garcia, Evaristo, Jr.: *See—*
Welch, Michael T.; McMann, Ronald E.; Torreno, Manuel L., Jr.; and Garcia, Evaristo, Jr., 4,862,243, Cl. 357-51.000.
Gardenier, John; and Maiuccoro, John. Hydrotherapy massage unit. 4,860,392, Cl. 4-542.000.
Garland, Emmanuel, to Societe Nationale Elf Aquitaine (Production). Gas-liquid separation and flow measurement apparatus. 4,860,591, Cl. 73-861.040.
Garrido, Guillermo: *See—*
Lee, Robert; Hornsey, Derek; Garrido, Guillermo; and Dieguez, Jose M., 4,860,827, Cl. 166-261.000.
Gart, Samuel. Ergonomically-shaped hand controller. 4,862,165, Cl. 341-20.000.
Gary, David A.: *See—*
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Garza-Tamez, Federico. Structure stabilization system. 4,860,507, Cl. 52-167.000.
Gasteier, Rolf: *See—*
Goldhammer, Albert; Schleicher, Hans; Stangenberg, Hartmut; and Gasteier, Rolf, 4,860,963, Cl. 241-236.000.
Gastinger, Robert G.: *See—*
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Gates, Robert J.: *See—*
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Gaudreau, Paul D.; Hickling, J. Gordon; and Schachter, Howard E., to Electraflo Technology Corp. Apparatus for heating articles. 4,860,460, Cl. 34-26.000.
Gavin, Michael T.: *See—*
Gavin, Thomas W.; and Gavin, Michael T., 4,861,357, Cl. 55-367.000.
Gavin, Thomas W.; and Gavin, Michael T. Vacuum cleaner bar collar. 4,861,357, Cl. 55-367.000.
Gavrieli, Haviv. Fan-type automobile window shade. 4,861,090, Cl. 160-134.000.
Gaylor, Eli, to Winners' Choice Selector Inc., The. Random number selector. 4,861,032, Cl. 273-144.00B.
Gaymar Industries, Inc.: *See—*
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Geary, John M.: *See—*
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Gebruder Lindenmeyer GmbH: *See—*
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Dierker, Joseph B., Jr.; Peterson, Glen D.; and Gee, Thomas A., 4,862,025, Cl. 310-68.00B.
Dierker, Joseph B., Jr.; Peterson, Glen D.; and Gee, Thomas A., 4,862,028, Cl. 310-168.000.
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Hoefkens, Daniel S. G.; Spaenjers, Joannes H. P. M.; Boeykens, Eduard C. M.; Verhille, Henri A. J.; and Geernaert, Gustaaf A. L., 4,862,449, Cl. 370-32.100.
Gehlhaus, Jurgen: *See—*
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General Electric Company: *See—*
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Clark, Clair D., 4,860,938, Cl. 228-102.000.
Damon, Edward K., 4,862,061, Cl. 324-58.50R.
Freeman, Smith, 4,862,399, Cl. 364-580.000.
Goossens, John C.; Factor, Arnold; and Miranda, Peter M., 4,861,664, Cl. 428-409.000.
Gordon, Gerald M., 4,861,544, Cl. 376-333.000.
Haefner, Kenneth B.; Bernstein, Bruce M.; Carey, Bernard J.; and Overton, Kenneth J., 4,861,960, Cl. 219-110.000.
Harris, John W.; Sherling, Jon L.; and Puschak, Carl N., 4,862,072, Cl. 324-73.00R.
King, Robert D., 4,862,009, Cl. 290-22.000.
Lampe, Warren R.; Moore, Annette A.; and Hartley, Kathleen R., 4,861,670, Cl. 428-447.000.
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LeGrand, Donald G.; and Olszewski, William V., 4,861,666, Cl. 428-412.000.
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Smith, Terrence R.; Isnardi, Michael A.; Fuhrer, Jack S.; and Patel, Chandrakant B., 4,862,271, Cl. 358-166.000.
Thompson, Robert A., 4,860,500, Cl. 51-165.770.
Tyrell, John A.; and McCready, Russell J., 4,861,862, Cl 528-322.000.
Venkataraman, Krishnan; and Balch, Richard A., 4,862,493, Cl. 379-107.000.
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General Electric Company, p.l.c., The: *See—*
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General Instrument Corporation: *See—*
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Bausch, Paul, 4,861,005, Cl. 267-140.100.
Baynes, Dennis, 4,860,423, Cl. 29-434.000.
Bering, Anton J.; and Hildebrandt, William V., 4,860,409, Cl 24-289.000.
Bhagat, Jayant K., 4,861,731, Cl. 437-51.000.
Brantley, Randall F.; and McVey, Harry D., 4,861,687, Cl. 429-187.000.
Breda, Michael A.; and Snyder, George K., 4,860,421, Cl. 29-157.30A.
Compeau, David E.; Rogers, Lloyd W.; and Myslicki, Robert J., 4,861,089, Cl. 296-76.000.
Cwycyshyn, Walter; and Kudwa, Frank J., 4,860,864, Cl. 192-56.00R.
Dinger, Bruce R.; McClanahan, Mark R.; Quinn, David B.; and Kennard, Frederick, 4,860,499, Cl. 51-165.740.
Easley, Sydney E.; Heathco, Craig E.; and Smith, Clayton L., 4,860,534, Cl. 60-39.092
Gray, Ronald N.; and Butler, Raymond O., Jr., 4,862,123, Cl. 335-131.000.
Hall, Arthur, III; and Combs, Robert F., 4,860,613, Cl. 74-687.000.
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Hekman, Frederick A., 4,860,419, Cl. 29-156.50A.
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Lee, Han-Sheng, 4,862,232, Cl. 357-23.100.
Malak, Ronald J., 4,861,104, Cl. 297-218.000.
Parrott, Richard M.; Colvin, Jack A.; and Shuey, Lyle W., 4,860,794, Cl. 137-637.200.
Rees, Richard W. A.; and Humer, Mladen, 4,860,988, Cl. 248-420.000.
Romig, Kenneth L., 4,860,870, Cl. 192-99.00S.
St. Angelo, Stephen; and Lucci, John J., 4,860,588, Cl. 73-794.000.
Smith, Stephen, 4,860,700, Cl. 123-41.310.
Spears, Thomas D., 4,860,641, Cl. 92-71.000.
Stanek, Carl E., 4,860,866, Cl. 192-71.000.
General Signal Corporation: *See—*
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Genheimer, Stephen R.; and Pottebaum, Ken L., to Magnetic Peripherals Inc. Shock load detection device. 4,862,298, Cl. 360-60.000

GenRad, Inc.: *See—*
Albee, Alan J., 4,862,069, Cl. 324-73.00R

Genrich, Thad J., to Motorola, Inc. High speed, low drift sample and hold circuit. 4,862,016, Cl. 307-353.000

Genvention, Inc.: *See—*
Towsend, Marvin S., 4,862,509, Cl. 381-163.000

Georg Fischer AG: *See—*
Joern, Alfred; and Weimann, Wendelin, 4,860,817, Cl. 164-169.000.

George, Eric R., to Shell Oil Company. Coating process. 4,861,675, Cl 428-501.000

George, Robert D., to Sherwood Medical Company. Collapsible urethral catheter. 4,861,337, Cl. 604-96.000

Gerald Conway & Company: *See—*
Schott, David B.; Kump, Danny J.; and Conway, Gerald A., 4,860,905, Cl. 211-59.100

Gerch, Edward L., to Kingport International Corporation. Keyholder for luggage. 4,860,563, Cl. 70-456.00R

Gerhardy, Reinhard; Holderle, Hans; Wolf, Jurgen; and Vonderau, Werner, to Stihl, Andreas. Carburetor for an internal combustion engine. 4,861,522, Cl. 261-35.000

Gervasio, Gregorio C., to Colgate-Palmolive Company. Toilet soap bars made from topped, distilled coco fatty acid. 4,861,507, Cl 252-108.000

GF Furniture Systems, Inc.: *See—*
DePietro, Mark A.; Klim, William T.; Ashworth, Robert H.; and Thiele, Robert E., 4,860,812, Cl. 160-135.000

Gibbens, Richard J.: *See—*
Kelly, Francis P.; Gibbens, Richard J.; Key, Peter B.; Turton, Paul A.; Stacey, Roger R.; and Whitehead, Martin J., 4,862,496, Cl 379-221.000

Gibbons, Charles E.; and Whillock, Allan A., to International Paper Company. Method of making a laminate using heat sealable barrier material for improved juice packaging (Evoh). 4,861,526, Cl 264-22.000

Gibson, David A.: *See—*
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Gibson, George A.: *See—*
Simms, Robert M.; and Gibson, George A., 4,860,924, Cl 222-56.000

Gidseg, Edward. Thermal breaker strip for refrigeration cabinets 4,860,921, Cl. 220-467.000

Giebler, Martin M.: *See—*
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Gila River Products, Inc.: *See—*
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Giles, George A.: *See—*
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Gilian Instrument Corp.: *See—*
Van Emden, Bernard; and Stobnicki, Roman, 4,860,592, Cl. 73-861.050

Gill, David C., to Nomix Manufacturing Co. Lmited. Spraying equipment with rotatable cap for adjusting flowrate. 4,860,955, Cl. 239-223.000

Gillard, Clive H.; and Harradine, Vincent C., to Sony Corp. Motion vector reduction in television images. 4,862,259, Cl. 358-105.000.

Gillard, Clive H., to Sony Corporation. Television standards converters. 4,862,266, Cl. 358-140.000.

Gillard, Clive H.; and Dougall, David A., to Sony Corp. Motion compensated interpolation of digital television images. 4,862,267, Cl. 358-140.000.

Gillard, Clive H.: *See—*
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Gillemans, Johannes C. M.: *See—*
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Gillery, Frank H., to PPG Industries, Inc. Sputtered titanium oxynitride films. 4,861,669, Cl. 428-434.000

Gillet, Guy, to Automobiles Peugeot; and Automobiles Citroen. Device for fixing an element on an outer surface of a support wall of a hollow body. 4,861,182, Cl. 403-264.000.

Gillette Company, The: *See—*
Amerena, William A., 4,860,753, Cl. 128-632.000

Gillies, David, to Deutsche ITT Industries GmbH. Demultiplexing circuit for a multiplex signal. 4,862,455, Cl. 370-112.000.

Giordano, Claudio; and Castaldi, Graziano, to Zambon spa. Intermediates for preparing optically active carboxylic acids. 4,861,903, Cl. 549-434.000

Giorgio, Paul J., to United States of America, Navy. High speed modem. 4,862,456, Cl. 370-118.000

Gitman, Gregory M.; and Khudenko, Boris M., to American Combustion, Inc. Method and apparatus for waste disposal. 4,861,262, Cl. 431-5.000.

Gits Manufacturing Company: *See—*
Warner, Dale J., 4,860,857, Cl. 184-7.400

Givot, George. Hand held wrench for helical spring type wire connectors. 4,860,618, Cl. 81-121.100.

Glassel, Brian D. Ride-on road stripers. 4,861,190, Cl. 404-93.000

Gleim, Gunter; and Uhde, Dietmar, to Deutsche Thomson-Brandt GmbH. Method and apparatus for controlling the number of revolutions of a rotor. 4,862,045, Cl. 318-254.000.

Glenn, Christopher J.: *See—*
Keith, William J.; Parsons, Michael; Smith, Russell P.; Glenn, Christopher J.; and Bell, Stephen, 4,862,505, Cl. 381-60.000

Glennon, Roger J.: *See—*
Moscoe, Gerald F.; Mastervich, Joel C.; Kreevich, William J.; Knoepke, John R.; Rellis, Daniel, Jr.; Glennon, Roger J.; and Pielet, Howard M., 4,860,819, Cl. 164-437.000.

Glorioso, John D., to Enviro-Gro Technologies, Inc. Odor control for a sludge treatment process. 4,860,671, Cl. 110-236.000.

Glover, Paul E., to BCL Limited. Multilayer carrier films. 4,861,654, Cl. 428-287.000

GMI Engineering & Management Institute: *See—*
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Gobel, Richard J., to Beloit Corporation. Flight arrangement for rotary drum dryers. 4,860,462, Cl. 34-108.000

Goedecke Aktiengesellschaft: *See—*
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Goeman, Donald D.: *See—*
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Goineau, Andre M., to Milliken Research Corporation. Loop breaker for textured yarn. 4,860,412, Cl. 28-219.000.

Goldberg, Leon I., to University of Chicago, The. Quaternary derivatives of noroxymorphone which relieve nausea and emesis. 4,861,781, Cl. 514-282.000

Goldenhersh, Michael A. Ultraviolet blocking material and method of making same. 4,861,651, Cl. 428-255.000.

Goldhammer, Albert; Schleicher, Hans; Stangenberg, Hartmut; and Gasteier, Rolf, to Feinwerktechnik Schleicher & Co. Cutting mechanism for devices for comminuting material. 4,860,963, Cl 241-236.000

Gonzalez-Lopez, Jorge, to International Business Machines Corporation. Image display processor for graphics workstation. 4,862,154, Cl 340-747.000

Gonzalez, Rene-Andres A.; Emmerling, Winfried; Krause, Werner; Podola, Tore; and Neitzer, Klaus, to Henkel Kommanditgesellschaft auf Aktien. Process for the production and purification of SH-terminated prepolymers and use thereof. 4,861,863, Cl. 528-408.000.

Gooch, Douglas C.; and Morscheck, Timothy J., to Eaton Corporation. Torque converter lock-up and disconnect clutch structure. 4,860,861, Cl. 192-3.260.

Gooch, William E. Styrofoam ball advertising display apparatus and method. 4,860,477, Cl. 40-603.000.

Goodacre, Brita C.; and Smithson, Alan, to Tate & Lyle PLC. Sugar process. 4,861,382, Cl. 127-60.000.

Goode, William B., to Teledyne Industries, Inc. Valve design to reduce cavitation and noise. 4,860,993, Cl. 251-127.000.

Goodyear Tire & Rubber Company, The: *See—*
Cohen, Martin P.; Brown, Robert J.; and Majerus, Norbert, 4,861,842, Cl. 525-329.300.

Goossens, John C.; Factor, Arnold; and Miranda, Peter M., to General Electric Company. Process for UV stabilizer impregnation of plastic surfaces. 4,861,664, Cl. 428-409.000.

Gordon, David; Akselrod, Solange; Cohen, Richard J.; Tu, Jerome C.; Burns, Stephen K.; and DeLeon, Victoria H., to Massachusetts Institute of Technology. Methods and apparatus for monitoring cardiovascular regulation using heart rate power spectral analysis. 4,862,361, Cl. 364-413.060.

Gordon, Gerald M., to General Electric Company. BWR control rod 4,861,544, Cl. 376-333.000

Gordon, Joseph, to Du Pont Tau Laboratories, Inc. Method of making a cellulose acetate butyrate pellicle. 4,861,402, Cl. 156-108.000.

Gorski, William J., to Chrysler Motors Corporation. Vehicle structure including a bracket structure assembly for mounting a loose upper deck panel onto a vehicle body. 4,861,098, Cl. 296-195.000.

Gosis, Anatoly, to General Signal Corp. Automatic workpiece thickness control for dual lapping machines. 4,860,498, Cl. 51-165.770.

Gosling, Christopher D.: *See—*
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Gosselink, Eugene P., to Procter & Gamble Company, The. Sulfonated block polyesters useful as soil release agents in detergent compositions. 4,861,512, Cl. 252-174.230.

Gotaverken Arendal AB: *See—*
Liljestrom, Goran; and Johansson, Bengt, 4,860,679, Cl. 114-40.000

Goto, Kouji; and Noda, Syuji, to Aisin Seiki Kaboshiki Kaisha. Interface for an electrical device. 4,862,056, Cl. 323-275.000

Goto, Shigeo: *See—*
Yoshimi, Keiichi; Goto, Shigeo; and Asazuma, Masaaki, 4,861,403, Cl. 156-138.000

Gotoh, Toshihiko: *See—*
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Gottwald, Eberhard F.; and Machoczek, Horst M., to Smith Kline Dauelsberg GmbH. Pharmaceutical compositions. 4,861,592, Cl. 424-687.000

Gotz, Lasar, to Lam-Wood Products Inc. Space efficient cabinet for housing a computer work station. 4,861,121, Cl. 312-208.000

Gough, Terrance E. Supersonic nozzle for use in an infrared spectrometer. 4,861,999, Cl. 250-339.000

Grabe, Evelyn A.: *See—*
Grabe, Richard J., 4,861,392, Cl. 148-23.000.

Grabe, Richard J., to Grabe, Evelyn A. Welding aid. 4,861,392, Cl. 148-23.000.

Grabham, Brian J.: *See—*
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Grabley, Susanne: *See—*
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Zeeck, Axel; Breiding-Mack, Sabine; Grabley, Susanne; Voelskow, Hartmut; and Seibert, Gerhard, 4,861,796, Cl. 514-535.000.

Graebner, Peter; Sie, Swan A.; and Angehrn, Jorg A., to Chevron Research Company. Interferometric means and method for accurate determination of fiberoptic well logging cable length. 4,862,424, Cl. 367-33.000.

Graf, Gunter; Gross, Heinz; and Sponagel, Stefan, to Carl Freudenberg, Firma. Method for manufacturing a sealing ring. 4,861,536, Cl. 264-108.000.

Grafe, Udo: *See—*
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Grafoplast S.p.A.: *See—*
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Graham Engineering Corporation: *See—*
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Grandfield, Walter J., to Motorola, Inc. Constant propagation delay current reference. 4,862,015, Cl. 307-270.000.

Grant, Louis A., to Louis A. Grant, Inc. Apparatus for cleaning aluminum cells. 4,861,112, Cl. 299-70.000.

Granwehr, Erik: *See—*
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Graphoidal Developments Limited: *See—*
Brown, Roy, 4,861,363, Cl. 65-24.000.

Graton, Michel; and Jochun, Alain, to Valeo. Clutch friction disc with predamper. 4,860,871, Cl. 192-106.100.

Grau, Thomas D., to International Pipe Machinery Corp. Vibrator type concrete pipe making machines having combined lubrication and cooling system. 4,861,252, Cl. 425-135.000.

Grauz, Daniel; and Marchal, Claude, to Societe Francaise d'Equipements Pour la Navigation Aerienne (SFENA). Remote control device for a computer associated with a video screen. 4,862,151, Cl. 340-706.000.

Graves, Bjarne: *See—*
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Gray, Ronald N.; and Butler, Raymond O., Jr., to General Motors Corporation. Solenoid for electric starters. 4,862,123, Cl. 335-131.000.

Green, Howard H.; and Tomlinson, Christopher J., to Burroughs Corporation. Method of executing called activities via depictor-linked low level language microcode, hardware logic, and high level language commands; and apparatus for same. 4,862,351, Cl. 364-200.000.

Green, Milton J.; and Grennan, Timothy D. Reel seat structures for fishing rods. 4,860,484, Cl. 43-22.000.

Greenwood, John E.: *See—*
Barnett, Clifford J.; Greenwood, John E.; and Holman, Earl V., 4,860,974, Cl. 244-158.00R.

Greer, Stuart E.; and Howard, Robert T., Jr., to International Business Machines Corporation. Lift-off process for terminal metals. 4,861,425, Cl. 156-644.000.

Grennan, Timothy D.: *See—*
Green, Milton J.; and Grennan, Timothy D., 4,860,484, Cl. 43-22.000.

Grenner, Gerd: *See—*
Friesen, Heinz-Jurgen; Grenner, Gerd; Pauly, Hans-Erwin; Kohl, Helmut; Habenstein, Klaus; and Stark, Joseph, 4,861,711, Cl. 436-7.000.

Griesinger, David H., to Lexicon, Inc. Sound reproduction. 4,862,502, Cl. 381-22.000.

Griffin, Donald L.; and Pfister, Ralph E., to Barriergen, Inc. Hypoallergenic jewelry and method of making the same. 4,861,658, Cl. 428-336.000.

Griffis, Steven C. Apparatus for sampling hazardous materials. 4,860,599, Cl. 73-864.450.

Griffiths, John M.; Beck, Wayne T.; and Newman, Neil A., to Brunswick Corporation. Speed optimizing positioning system for a marine drive unit. 4,861,292, Cl. 440-1.000.

Grimes, Scott D.: *See—*
Brune, William A.; and Grimes, Scott D., 4,862,067, Cl. 324-73.00R.

Grinde, James E. Blow molded two-compartment container. 4,860,927, Cl. 222-158.000.

Grinnell Corporation: *See—*
Pepi, Jerome S.; and Horgan, Michael W., 4,861,075, Cl. 285-112.000.

Grodberg, Mg32arcus G., to Colgate-Palmolive Company. Sustained release fluoride and calcium composition. 4,861,590, Cl. 424-602.000.

Groebli, Werner; Hegelbach, Hugo; and Schaffner, Hanspeter, to Buhler, Gebruder. Press roller adjustment. 4,861,529, Cl. 264-40.100

Grommes, Helmut: *See—*
Kiefer, Dieter; and Grommes, Helmut, 4,860,962, Cl. 241-117.000.

Gross, Erwin: *See—*
Normann, Norbert; Gross, Erwin; and Schlager, Harald, 4,862,303, Cl. 360-110.000.

Gross, Heinz: *See—*
Graf, Gunter; Gross, Heinz; and Sponagel, Stefan, 4,861,536, Cl. 264-108.000.

Grosse, Hans-Helmut: *See—*
Bergter, Friedrich; Bocker, Harald; Bormann, Ernst-Joachim; Forberg, Wolfgang; Fricke, Heinz; Grafe, Udo; Grosse, Hans-Helmut; Heller, Ingeborg; Hilliger, Matthias; Junne, Wolf; Linde, Hellmut; Menner, Michael; Menzel, Klaus-Dieter; Muller, Peter-Jurger; Plonka, Gunter; Pohl, Hans D.; Schneider, Jorg; and Thrum, Heinz, 4,861,715, Cl. 435-70.000.

Grosselin, Pascal, to IMAJE, S.A. Pressure regulator with integrated sensor. 4,860,787, Cl. 137-487.500.

Grubb, Lawrence B.: *See—*
Williams, D. Michael; and Grubb, Lawrence B., 4,861,309, Cl. 446-168.000.

Gruber, Werner: *See—*
Demmer, Fritz; Gruber, Werner; and Woog, Heinrich, 4,861,786, Cl. 514-347.000.

Gruber, William C.: *See—*
Barringer, Eric A.; Lieberman, Sheldon I.; Schmidt, Mark S.; Hodge, James D.; Waack, Richard; Kelley, Donald J.; Saxton, Brian W.; and Gruber, William C., 4,861,646, Cl. 428-210.000.

Grumman Aerospace Corporation: *See—*
Meenen, Raymond P., Jr., 4,861,269, Cl. 434-45.000.

Gruning, Horst: *See—*
Broich, Bruno; and Gruning, Horst, 4,862,239, Cl. 357-38.000.

Grzyb, Claus D.: *See—*
Schwartz, Wolfgang; Warmuth, Otto L.; and Grzyb, Claus D., 4,862,404, Cl. 364-733.000.

Gsell, Thomas C.: *See—*
Pall, David B.; Degen, Peter J.; Matkovich, Vlado I.; and Gsell, Thomas C., 4,861,617, Cl. 427-2.000.

GTE Laboratories Incorporated: *See—*
Fried, Jeffrey A.; and Rosebrugh, Christopher P., 4,862,412, Cl. 365-49.000.
Lee, Sywe-Neng, 4,862,017, Cl. 307-443.000.

GTE Products Corporation: *See—*
Jones, Gerald M., 4,860,445, Cl. 29-842.000.
Powell, John R., 4,860,435, Cl. 29-622.000.

GTE Sylvania Limited: *See—*
Cunliffe, John; and Grabham, Brian J., 4,862,035, Cl. 315-58.000.

Gu, Chee-Liang L.: *See—*
Nelson, Peter H.; Gu, Chee-Liang L.; Allison, Anthony C.; Eugui, Elsie M.; and Lee, William A., 4,861,776, Cl. 514-233.500.

Guadagna, John P.: *See—*
Wagner, Lawrence F.; Van Dyke, Korbin S.; Burleson, Wayne P.; Hemming, Robert D.; and Guadagna, John P., 4,862,346, Cl. 364-200.000.

Guarnaccia, Joseph J.; and Masucci, Ernest J., to Stanley Works, The. Single edge razor blade with integral back. 4,860,452, Cl. 30-346.600.

Guell, Jose M. D., to Jumberca, S.A. Needle selection system for a circular knitting machine. 4,860,557, Cl. 66-14.000.

Guerriero, Renato; and Tangerini, Ilario, to Nuova Samim S.p.A. Composite material of Zn-Al alloy reinforced with silicon carbide powder. 4,861,679, Cl. 428-614.000.

Guidoux, Loic B. Y., to Telecommunications Radioelectriques Et Telephoniques T.R.T. Arrangement for cancelling a composite echo signal. 4,862,450, Cl. 370-32.100.

Guinea, Jesus; and Wong, Hee, to National Semiconductor Corporation. Quotient phase-shift processor for digital phase-locked-loops. 4,862,485, Cl. 375-120.000.

Guinet, Jannick; Hubert, Jean-Claude; and Martial, Marie-Francoise, to La Telemecanique Electrique. Method for bonding a copper sheet to a substrate made of an electrically insulating material. 4,860,939, Cl. 228-122.000.

Guinn, Rex A.: *See—*
Boehm, Russell W.; Guinn, Rex A.; and Koerner, Hans J., 4,861,534, Cl. 264-102.000.

Gulf States Paper Corporation: *See—*
Northrup, David; and Hanko, Jimmy J., 4,860,886, Cl. 206-45.290.

Gummiwerke Kraiburg Elastik Beteiligungs GmbH & Co.: *See—*
Schmidt, Peter, 4,860,952, Cl. 238-8.000.

Gunderson, Charles F. Unitary-panel boat hull construction. 4,860,682, Cl. 114-358.000.

Gunter, Willard C. Adjustable vehicle counterweight device with cylinder positioning means. 4,861,069, Cl. 280-758.000.

Gunther, Larry J. Method and apparatus for indicating sample collection times during well drilling. 4,860,836, Cl. 175-44.000.

Gunther, Wolfgang H. H.: *See—*
Lok, Roger; Gunther, Wolfgang H. H.; and Freeman, John P., 4,861,703, Cl. 430-608.000.

Gunze Kabushiki Kaisha: *See—*
Hashida, Kenji; Yamamoto, Takeshi; Fukumoto, Tatsuya; Deguchi, Tetsuji; Hirata, Shigeyuki; Uehara, Osamu; and Akebi, Kazuhiko, 4,861,409, Cl. 156-308.200.

Gupta, Dev V., to Integrated Network Corporation. Digital data service system. 4,862,480, Cl. 375-37.000.

Gur, Raquel E.: *See—*
Trivedi, Sushma S.; Gur, Raquel E.; and Gur, Ruben, 4,862,359, Cl 364-413.050.

Gur, Ruben: *See—*
Trivedi, Sushma S.; Gur, Raquel E.; and Gur, Ruben, 4,862,359, Cl. 364-413.050.

Gurol, Ismail M., to John Fluke Mfg. Co., Inc. Molded circuit board and manufacturing method therefor. 4,861,640, Cl. 428-137.000.

Gusakov, Ignaty, to Gaymar Industries, Inc. Pneumatic cushion. 4,860,397, Cl. 5-455.000.

Gyongyosi, Gyorgy: *See*—
Kovacs, Ferenc; Lengyel, Miklosne ; Nagy, Tibor; Antal, Sandor; Gyongyosi, Gyorgy; Palotas, Laszlo ; and Pfisztner, Nandor, 4,860,798, Cl. 138-133.000.

Haag, Reiner: *See*—
Farin, Gunter; Haag, Reiner; and Putz, Peter, 4,860,745, Cl. 128-303.170.

Haas, Ronald T., to Oratech Pharmaceutical Development Corporation. Liquid ibuprofen compositions and methods of making them. 4,861,797, Cl. 514-557.000.

Habenstein, Klaus: *See*—
Friesen, Heinz-Jurgen; Grenner, Gerd; Pauly, Hans-Erwin; Kohl, Helmut; Habenstein, Klaus; and Stark, Joseph, 4,861,711, Cl. 436-7.000.

Hackmack, Alfred. Slit trencher. 4,861,199, Cl. 405-267.000.

Haefner, Kenneth B.; Bernstein, Bruce M.; Carey, Bernard J.; and Overton, Kenneth J., to General Electric Company. Real time adaptive control for resistance spot welding process. 4,861,960, Cl. 219-110.000.

Hafner, Udo; and Knapp, Heinrich, to Robert Bosch GmbH. Fuel supply line. 4,860,710, Cl. 123-470.000.

Haga, Nobuhiro: *See*—
Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, 4,861,913, Cl. 562-427.000.

Haga, Ryooichi: *See*—
Ishida, Masahiko; Haga, Ryooichi; Odawara, Yoji; Takahashi, Sankichi; and Ebara, Katsuya, 4,861,383, Cl. 127-67.000.

Haga, Takahiro; Toki, Tadaaki; Koyanagi, Toru; Fujii, Yasuhiro; Yoshida, Kiyomitsu; and Imai, Osamu, to Ishihara Sangyo Kaisha Ltd. Benzoylurea compounds and pesticides containing them. 4,861,799, Cl. 514-594.000.

Haga, Takahiro; Shigehara, Itaru; Koyanagi, Toru; Hara, Kazutoshi; and Maeda, Masaru, to Ishahara Sangyo Kaisha Ltd. Method for isomerization of trans-form 2-methylspiro (1,3-oxathiolane-5,3')quinuclidine or acid addition salts thereof. 4,861,886, Cl 546-16.000.

Hagewood, Brown T. Process for cleaning tube type heat exchangers. 4,860,821, Cl. 165-95.000.

Hagin, Roy. Solvent weld pipe test disk. 4,860,796, Cl. 138-90.000.

Hagishita, Sanji: *See*—
Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, 4,861,913, Cl. 562-427.000.

Hagita, Hiroyuki, to Kabushiki Kaisha Kenwood. Clock signal regenerator. 4,862,299, Cl. 360-64.000.

Hahn, Erwin: *See*—
Radtke, Volker; Kowarsch, Heinrich; and Hahn, Erwin, 4,861,898, Cl. 548-402.000.

Hahnle, Reinhard: *See*—
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Hakko Metal Industries Limited: *See*—
Yoshimura, Hiroshi, 4,861,169, Cl. 374-179.000
Yoshimura, Hiroshi, 4,861,967, Cl. 219-241.000.

Hall, Arthur, III; and Combs, Robert F., to General Motors Corporation. Steer-by-driving transmission with ground speed control. 4,860,613, Cl. 74-687.000.

Hall, Arthur, III, to General Motors Corporation. Brake apply system with a differential mechanism. 4,860,869, Cl. 192-93.00A

Hall Chemical Company, The: *See*—
Sefton, Verner B.; Fox, Robert; and Lorenz, William P., 4,861,565, Cl. 423-55.000.

Hall, Iris H.; Wyrick, Steven D.; and Chapman, James M., Jr., to Research Corporation. 2,3-dihydrophthalazine-1,4-diones. 4,861,778, Cl. 514-248.000.

Hall, Morris D. Removable fuel tank filter. 4,861,478, Cl. 210-416.400.

Hall, Tony R., to Lite Works, Inc. Automobile display device. 4,860,476, Cl. 40-593.000.

Halliburton Logging Services, Inc.: *See*—
Arnold, Dan M., 4,861,986, Cl. 250-260.000.

Halmstad, Terrence R.; and Schachameyer, Steven R., to Eaton Corporation. Aluminum electrical connector with threaded opening having electroplated layer of uniform thickness. 4,861,290, Cl. 439-810.000.

Halstead, Lawrence T., to Williams International Corporation. Ceramic-matrix composite nozzle assembly for a turbine engine. 4,861,229, Cl. 415-138.000.

Haluska, Loren A., to Dow Corning Corporation. Method of preparing ceramics from polymers derived from cyclic silazanes, and halosilanes. 4,861,532, Cl. 264-65.000.

Hamada, Masataka: *See*—
Ishida, Tokuji; Hamada, Masataka; Karasaki, Toshihiko; Norita, Toshio; and Taniguchi, Nobuyuki, 4,862,204, Cl. 354-408.000.

Hamamatsu Photonics Kabushiki Kaisha: *See*—
Koike, Kiyoshi; Tsuchiya, Hiroshi; and Hayakawa, Tsuyoshi, 4,862,004, Cl. 250-369.000

Hamatani, Toshiji: *See*—
Yamazaki, Shunpei; Inujima, Takashi; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Sakama, Mitsunori; Miyazaki, Minoru; Koyanagi, Kaoru; and Yamaguchi, Toshiharu, 4,861,143, Cl. 350-350.00S.

Hamatsu, Masahiro; and Kunihara, Takao, to Clarion Co., Ltd. Spread spectrum communication system. 4,862,479, Cl. 375-1.000.

Hamit, James L.: *See*—
Jackson, Thomas L. A.; and Hamit, James L., 4,860,508, Cl. 52-169.100.

Hammett, Rawlings H. Air cooling and directing apparatus. 4,860,556, Cl. 62-406.000.

Hammond, Gary C.; Corser, George A.; and Eddy, Dale P., to GMI Engineering & Management Institute. Apparatus and method for measuring mass flow and density. 4,860,594, Cl. 73-861.420.

Hammond Royce Corporation Pty. Limited: *See*—
David, Lennie F., 4,861,451, Cl. 204-230.000.

Hammons, Sheridan W.; and Moore, Robert H., to Litton Systems, Inc. Method for planar beam path alignment of a square ring laser gyroscope. 4,861,160, Cl. 356-138.000.

Hanabusa, Akira. Detachable rear-mounted light for a motorcycle helmet. 4,862,331, Cl. 362-106.000.

Handleman, Avrom R., to Semi-Bulk Systems, Inc. Apparatus for subjecting particles dispersed in a fluid to a shearing action. 4,860,959, Cl. 241-39.000.

Hanes, Lewis F.: *See*—
Sherwin, Gary W.; Schmidt, Albert L.; and Hanes, Lewis F., 4,861,154, Cl. 351-205.000

Hanko, Jimmy J.: *See*—
Northrup, David; and Hanko, Jimmy J., 4,860,886, Cl. 206-45.290.

Hanna, Junichi: *See*—
Ueki, Masao; Hirooka, Masaaki; Hanna, Junichi; and Shimizu, Isamu, 4,861,623, Cl. 427-69.000.

Hans-Georg Augustin: *See*—
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Hansen, Robert A.: *See*—
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Hanyu, Akinobu; and Kurokawa, Tsukasa, to Fuji Kikai Kogyo Co., Ltd. Zigzag folding apparatus for a form printing machine. 4,861,327, Cl. 493-415.000.

Hanzawa, Asao: *See*—
Koyama, Kazuhito; Sugita, Shigehisa; Sakaguchi, Seiichiro; Seiki, Nobuhiro; and Hanzawa, Asao, 4,861,348, Cl. 48-94.000.

Hara, Akio; and Yamamura, Akihiko, to Sumitomo Electric Industries, Ltd. Composite sintered material having sandwich structure. 4,861,673, Cl. 428-469.000.

Hara, Kazutoshi: *See*—
Haga, Takahiro; Shigehara, Itaru; Koyanagi, Toru; Hara, Kazutoshi; and Maeda, Masaru, 4,861,886, Cl. 546-16.000.

Hara, Yasuo; Oashi, Ryuji; Kawahara, Yoshitaka; and Takeuchi, Mikio, to Japan Synthetic Rubber Co., Ltd. Process for producing 5-alkylidenenorbornene. 4,861,931, Cl. 585-363.000.

Harada Kogyo Kabushiki Kaisha: *See*—
Egashira, Yoshimi, 4,862,182, Cl. 343-702.000.

Harada, Masashi; Miyazaki, Hiroshi; and Itabashi, Keiji, to Toyo Soda Manufacturing Co., Ltd. Process for preparation of synthetic mordenite molded body. 4,861,571, Cl. 423-328.000.

Harada, Tetsuro: *See*—
Ohya, Seiji; and Harada, Tetsuro, 4,860,497, Cl. 51-98.500.

Haraguchi, Kazuo: *See*—
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Harder, Norbert: *See*—
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Hardiman, Christopher J.; and Bowers, Gary R., to Monsanto Company. Process for coating urethane substrates. 4,861,668, Cl. 428-424.400.

Hardwick, Roy, to Imperial Chemical Industries PLC. Joining metal tubes in a liquid environment. 4,860,656, Cl. 102-312.000.

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Hardy, Samuel F. Light fitting support member. 4,862,332, Cl. 362-145.000

Harilela Bob Limited: *See*—
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Harilela, Mangharam J., to Harilela Bob Limited. Watch with strap. 4,862,436, Cl. 368-282.000

Harper, Daniel R.: *See*—
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Harper Truck, Inc.: *See*—
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Harradine, Vincent C.; Gillard, Clive H.; and Richards, John W., to Sony Corp. Motion vector processing in television images. 4,862,260, Cl. 358-105.000

Harradine, Vincent C.: *See*—
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Harrington, Thomas E., III, to Dallas Semiconductor Corporation. Low leakage battery protection diode structure. 4,862,310, Cl. 361-58.000

Harrington, William A.: *See*—
Myers, Terrence L.; and Harrington, William A., 4,862,014, Cl. 307-270.000

Harris Corporation: *See*—
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Hines, Edward E.; Royer, Lee J.; Jehring, Thomas D.; Faulkenberry, William E.; Posey, Norvan J.; and Richeson, Joseph T., 4,860,602, Cl. 73-865.900.
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Harris, James E.: *See*—
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Harris, John L.: *See*—
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Harris, John W.; Sherling, Jon L.; and Puschak, Carl N., to General Electric Company. Distributed access serial port test arrangement for integrated circuits. 4,862,072, Cl. 324-73.00R.

Harris, Richard R.: *See*—
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Harris, Robert F., to Dow Chemical Company, The. Isocyanate-modifier poly(alkylene carbonate) polyahls. 4,861,909, Cl. 558-267.000.

Harris, Rodney M.: *See*—
Petrie, Brian C.; Druetzler, Thomas W.; and Harris, Rodney M., 4,861,853, Cl. 526-302.000.

Harris, Samuel W.: *See*—
Muller, Peter H.; Lowe, Peter E.; Edwards, Peter R.; and Harris, Samuel W., 4,861,276, Cl. 439-365.000.

Harris, William H.: *See*—
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Harrow Products, Inc.: *See*—
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Harrus, Alain S.: *See*—
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Harsch, Erich; and Gaissmaier, Franz, to Maschinenfabrik Mueller-Weingarten AG. Plate bar loading system including an automatic packet or plate bar stack alignment station. 4,860,879, Cl. 198-395.000.

Hart, Lynn W.: *See*—
Ko, Harvey W.; Hart, Lynn W.; and Skura, Joseph P., 4,860,756, Cl. 128-653.000.

Hartel, Franklin J.: *See*—
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Hartl, Hans-Georg, to Hewlett-Packard. Mixing valve. 4,860,793, Cl. 137-606.000.

Hartley, Kathleen R.: *See*—
Lampe, Warren R.; Moore, Annette A.; and Hartley, Kathleen R., 4,861,670, Cl. 428-447.000.

Hartline, Michael F., to Super Sagless Corp. Sofa ottoman. 4,861,101, Cl. 297-69.000.

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Hartness, Samuel S.: *See*—
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Hartvigsen, Jay A.: *See*—
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Harvell, John T.; and Lessard, Philip A., to Helix Technology Corporation. Vacuum system with molecular flow line. 4,860,546, Cl. 62-55.500.

Hasegawa, Hiroshi; and Miyanaga, Hirofumi, to Olympus Optical Co., Ltd. Endoscope apparatus provided with endoscope insertion aid. 4,860,732, Cl. 128-6.000.

Hasegawa, Shizuo: *See*—
Suda, Kenichi; Hasegawa, Shizuo; and Matsuoka, Nobuo, 4,862,286, Cl. 358-494.000.

Hashida, Kenji; Yamamoto, Takeshi; Fukumoto, Tatsuya; Deguchi, Tetsuji; Hirata, Shigeyuki; Uehara, Osamu; and Akebi, Kazuhiko, to Gunze Kabushiki Kaisha. Process and apparatus for forming laminate by thermocompression bonding. 4,861,409, Cl. 156-308.200.

Hashimoto, Akira: *See*—
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Hashimoto, Eiichi: *See*—
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Hashimoto, Masashi; and Tachibana, Tadashi, to Texas Instruments Incorporated. Semiconductor ROM with reduced supply voltage requirement. 4,862,413, Cl. 365-104.000.

Hashimoto, Masashi: *See*—
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Hashimoto, Takeshi: *See*—
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Hashimoto, Yoshio; Kawano, Tsuyoshi; Hasuka, Kaname; and Otomo, Seiji, to Nippon Steel Corporation. Clad steel materials having excellent ductility and corrosion resistance. 4,861,682, Cl. 428-685.000.

Hashimoto, Youichi; Tokuyama, Takashi; Nishiga, Kazuya; Arai, Yoshihiro; Ueki, Nobuhide; and Adachi, Naoki, to Mori, Ryoichi; and Toraichi, Kazuo. Digital-analog converter. 4,862,170, Cl. 341-144.000.

Hashizu, Masaaki: *See*—
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Hastings, John M. Utility vehicle. 4,861,096, Cl. 296-183.000.

Hasuka, Kaname: *See*—
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Hata, Akio: *See*—
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Hata, Yoshiaki: *See*—
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Hatanaka, Keiji: *See*—
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Hatano, Yoshiko: *See*—
Nakai, Takahiro; Hatanaka, Keiji; and Hatano, Yoshiko, 4,862,099, Cl. 329-126.000.

Hatase, Takayuki; and Ohno, Yoshimi, to Ricoh Company, Ltd. Variable focal lens device. 4,861,146, Cl. 350-429.000.

Hatayama, Haruaki; Takei, Hideo; Okabe, Takuji; Waku, Yoshiharu; and Ueno, Toyoaki, to UBE Industries, Ltd. Piston-cylinder pulsator circuit with superplastic alloy pressure transmitting medium. 4,860,542, Cl. 60-583.000.

Hattori, Osamu; Gotoh, Toshihiko; and Tanno, Kohtarou, to Hitachi Video Engineering Inc.; and Hitachi Ltd. Thermal recording head. 4,862,193, Cl. 346-76.0PH.

Hattori, Shogo: *See*—
Yamaguchi, Kouji; Ishikawa, Yoshikazu; Kameda, Toshihiro; Hattori, Shogo; and Miyake, Junichi, 4,860,708, Cl. 123-399.000.

Haubrich, Gerhard; Prescher, Guenter; and Faller, Juergen, to Degussa Aktiengesellschaft. Method for the preparation of tetrahydrofurfuryl-(alpha)-methacrylate and catalyst therefor. 4,861,902, Cl. 549-499.000.

Hauk, Rolf: *See*—
von Bogdandy, Ludwig; Kepplinger, Werner; Stift, Kurt; Papst, Gero; and Hauk, Rolf, 4,861,369, Cl. 75-38.000.

Hauschild, Remi: *See*—
Aubry, Jean; Cassiani-Ingoni, Serge; and Hauschild, Remi, 4,861,821, Cl. 524-512.000.

Havenstein, Bennett L.; Picerno, Raysna; Brittain, Harry G.; and Nestor, James R., to C. R. Bard, Inc. Luminescent oxygen sensor based on a lanthanide complex. 4,861,727, Cl. 436-136.000.

Hayakawa, Toshiro: *See*—
Suyama, Takahiro; Takahashi, Kosei; Kondo, Masafumi; and Hayakawa, Toshiro, 4,862,470, Cl. 372-45.000.

Hayakawa, Tsuyoshi: *See*—
Koike, Kiyoshi; Tsuchiya, Hiroshi; and Hayakawa, Tsuyoshi, 4,862,004, Cl. 250-369.000.

Hayakawa, Yasuo: *See*—
Koshimizu, Chishio; Hayakawa, Yasuo; Nonaka, Toshio; and Takeda, Sakae, 4,862,383, Cl. 364-507.000.

Hayama, Hiroyoshi: *See*—
Imaizumi, Masaru; and Hayama, Hiroyoshi, 4,862,226, Cl. 355-298.000.

Hayami, Hiroshi: *See*—
Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumio; and Takahashi, Katsutoshi, 4,861,905, Cl. 556-40.000.

Hayashi, Katsushige: *See*—
Sugio, Akitoshi; Kawaki, Takao; Kobayashi, Makoto; Hayashi, Katsushige; and Watanabe, Masahito, 4,861,854, Cl. 528-125.000.

Hayashi, Takashi, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling a clutch of a vehicle. 4,860,863, Cl. 192-0.033.

Hayashi, Tsutomu; and Hashimoto, Eiichi, to Honda Giken Kogyo Kabushiki Kaisha. Static hydraulic pressure type continuously variable transmission. 4,860,540, Cl. 60-487.000.

Hayes Microcomputer Products, Inc.: *See*—
Copeland, John A., III, 4,862,167, Cl. 341-107.000.
Muller, Peter H.; Lowe, Peter E.; Edwards, Peter R.; and Harris, Samuel W., 4,861,276, Cl. 439-365.000.

Hayes, Raymond; and Heidtmann, Denis L., to Tektronix, Inc. Electrode structure for a corner turn in a series-parallel-series charge coupled device. 4,862,235, Cl. 357-24.000.

Hayssen Manufacturing Company: *See*—
Cherney, Dale M., 4,860,522, Cl. 53-451.000.

Heap, Michael P.; Chen, Shih L.; McCarthy, James M.; and Pershing, David W., to Energy and Environmental Research Corporation. Methods of reducing NO_x and SO_x emissions from combustion systems. 4,861,567, Cl. 423-235.000.

Heathco, Craig E.: *See*—
Easley, Sydney E.; Heathco, Craig E.; and Smith, Clayton L., 4,860,534, Cl. 60-39.092.

Hediger, Ernst H. Sled dog training cart. 4,861,052, Cl. 280-87.043.

Heeres, Jan; Stokbroekx, Raymond A.; and Backx, Leo J. J., to Janssen Pharmaceutica N.V. [[4-[4-Phenyl-1-piperazinyl)phenoxymethyl]-1-

3-dioxolan-2-yl]-methyl]-1H-imidazoles and 1H-1,2,4-triazoles. 4,861,879, Cl. 544-55.000.
Heess, Gerhard: *See*—
Kost, Friedrich; Van Zanten, Anton; Heess, Gerhard; and Kreisselmeier, Gerhard, 4,862,368, Cl. 364-426.020.
Hegelbach, Hugo: *See*—
Groebli, Werner; Hegelbach, Hugo; and Schaffner, Hanspeter, 4,861,529, Cl. 264-40.100.
Hegemann, Manfred K.; and Drozd, Edward J., Jr., to Schering Corporation. Hand held metered spray dispenser. 4,860,738, Cl. 128-200.220.
Heidtmann, Denis L.: *See*—
Hayes, Raymond; and Heidtmann, Denis L., 4,862,235, Cl. 357-24.000.
Heiller, Glenn H.; and Petersen, Michael P., to Check Technology Corporation. Power supply sequencing circuit for flash fuser. 4,862,225, Cl. 355-288.000.
Heim, Peter: *See*—
Altermatt, Ernst; and Heim, Peter, 4,861,947, Cl. 174-113.00C.
Hein, Lehmann AG: *See*—
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Hein, Theo, to Mannesmann Rexroth GmbH. Arrangement for controlling the travel of two hydraulic cylinders. 4,860,634, Cl. 91-363.00R.
Heindl, Alfons: *See*—
East, Gary P.; Laguette, Stephen W.; Heindl, Alfons; and Lintula, Leanne M., 4,861,331, Cl. 604-9.000.
Heineken Technisch Beheer B.V.: *See*—
Versteegh, Christiaan W., 4,861,608, Cl. 426-489.000.
Heinemann, Otto: *See*—
Durr, Manfred; Unland, Georg; Driemeier, Gunter; Krutzner, Karl; Schmits, Heinz-Herbert; von Seebach, Michael; Heinemann, Otto; Rother, Wolfgang; and Dreyer, Dieter, 4,861,265, Cl. 432-103.000.
Heins, Hans-Peter; Keiter, Alfred; and Jendricke, Hermann, to AEG Olympia Aktiengesellschaft. Reloadable ribbon cassette system. 4,861,177, Cl. 400-208.000.
Heiser, Bernd; and Stoller, Hansjorg, to Hoffmann-La Roche Inc. Isomerization. 4,861,890, Cl. 546-184.000.
Heitmann, Uwe: *See*—
Hensgen, Gerhard; Heitmann, Uwe; Brand, Peter; and Pinck, Peter, 4,860,772, Cl. 131-84.100.
Hekman, Frederick A., to General Motors Corporation. Split bearing assemblies, method for making. 4,860,419, Cl. 29-156.50A.
Helix Technology Corporation: *See*—
Harvell, John T.; and Lessard, Philip A., 4,860,546, Cl. 62-55.500.
Higham, Graham J.; Morris, Ronald N.; and Pruitt, Gerald R., 4,860,543, Cl. 62-6.000.
Helleksoa, Ronald A.; Campbell, John S.; and Acosta, Jorge L., to Spectra-Physics, Inc. Optical scan pattern generating arrangement for a laser scanner. 4,861,973, Cl. 235-467.000
Hellenga, David A.: *See*—
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Heller, Ingeborg: *See*—
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Hellriegel, Edmund, to Dynamit Nobel Akiengesellschaft. Door for a motor vehicle. 4,860,496, Cl. 49-502.000.
Helsley, Grover C.; Davis, Larry; and Olsen, Gordon E., to Hoechst-Roussel Pharmaceuticals, Inc. 3-(2,3,4,5,6-pentafluorophenoxy)-8-azabicyclo[3.2.1]octanes. 4,861,889, Cl. 546-183.000
Helzel, Manfred W. Puncture catheter. 4,861,336, Cl. 604-95.000.
Hemenway, Patrick A. Amusement device. 4,861,310, Cl. 446-453.000.
Hemming, Robert D.: *See*—
Wagner, Lawrence F.; Van Dyke, Korbin S.; Burleson, Wayne P.; Hemming, Robert D.; and Guadagna, John P., 4,862,346, Cl. 364-200.000.
Henion, John D.; Covey, Thomas R.; and Bruins, Andries P., to Cornell Research Foundation, Inc. Ion spray apparatus and method. 4,861,988, Cl. 290-288.000.
Henke-Sass, Wolf GmbH: *See*—
Jonischkeit, Horst, 4,861,339, Cl. 604-118.000
Henkel Kommanditgesellschaft auf Aktien: *See*—
Gonzalez, Rene-Andres A.; Emmerling, Winfried; Krause, Werner; Podola, Tore; and Neitzer, Klaus, 4,861,863, Cl. 528-408.000.
Kurzendoerfer, Claus-Peter; and Wichelhaus, Winfried, 4,861,516, Cl. 252-531.000.
Wegener, Ingo; Giesen, Brigitte; Meffert, Alfred; Werner, Claus; Hennen, Udo; and Hormes, Marlene, 4,861,508, Cl. 252-121.000.
Wilms, Elman; Jung, Dieter; Linsenbold, Herbert; Pioch, Lothar; and Wichelhaus, Winfried, 4,861,510, Cl. 252-174.130.
Henley, Francois J.: *See*—
Choi, Hee-June; Henley, Francois J.; and Barr, Maurice R., 4,862,075, Cl. 324-158.00F.
Henlopen Manufacturing Co., Inc.: *See*—
Schrepf, Volker; and Hartel, Franklin J., 4,861,179, Cl. 401-129.000.
Hennen, Udo: *See*—
Wegener, Ingo; Giesen, Brigitte; Meffert, Alfred; Werner, Claus; Hennen, Udo; and Hormes, Marlene, 4,861,508, Cl. 252-121.000.
Hennig, Jurgen, to Spectrospin AG. Method for encoding and displaying N parameters in multi-dimensional fourier NMR spectroscopy. 4,862,082, Cl. 324-309.000.
Hennuy, Jean: *See*—
Louison, Bernard; and Hennuy, Jean, 4,860,434, Cl. 29-611.000.
Hensgen, Gerhard; Heitmann, Uwe; Brand, Peter; and Pinck, Peter, to Korber AG. Method of and apparatus for making a rod of fibrous material. 4,860,772, Cl. 131-84.100.
Henstock, William H.: *See*—
Lewis, Jeffrey M. O.; and Henstock, William H., 4,861,938, Cl. 585-640.000.
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., to Mobil Oil Corporation. Mixed catalyst system and catalytic conversion process employing same. 4,861,741, Cl. 502-67.000.
Hercules Incorporated: *See*—
Edwards, Derek W.; and Townsend, David F., 4,861,376, Cl. 106-123.100.
Nahm, Steven H., 4,861,629, Cl. 427-355.000.
Herdzina, Frank J., to Service Tool Die & Mfg. Company. Conveyor for conversion systems. 4,860,569, Cl. 72-361.000.
Hergenrother, Paul M.; Connell, John W.; and Bass, R. Gerald, to United States of America, National Aeronautics and Space Administration. Ethynyl terminated imidothioethers and resins therefrom. 4,861,882, Cl. 544-216.000.
Herman Miller, Inc.: *See*—
Newhouse, Thomas J.; Allen, Lynne M.; and Goeman, Donald D., 4,861,122, Cl. 312-317.100.
Herrell, Dennis J.; and Gibson, David A., to Microelectronics and Computer Technology Corporation. Method of assembling a fluid-cooled integrated circuit package. 4,860,444, Cl. 29-840.000.
Herrera Sanguinetti, Carlos. Flexible guardrail for a sailing vessel. 4,860,683, Cl. 114-364.000.
Herrick, Kennan C. Apparatus and method for forming segmented luminosity in gas discharge tubes. 4,862,042, Cl. 315-291.000.
Heumann, John M.; and Lindauer, James M., to Hewlett-Packard Company. Dual channel resolver for real time arrythmia analysis. 4,860,762, Cl. 128-702.000.
Hewlett-Packard: *See*—
Hartl, Hans-Georg, 4,860,793, Cl. 137-606.000.
Hewlett-Packard Company: *See*—
Cutler, Gregory M., 4,862,108, Cl. 331-9.000.
Heumann, John M.; and Lindauer, James M., 4,860,762, Cl. 128-702.000.
Karnezos, Marcos; and Jones, Randal S., 4,862,490, Cl. 378-161.000.
Stoffel, John L., 4,862,197, Cl. 346-140.00R.
Weiner, Jonathan A., 4,862,390, Cl. 364-521.000.
Hi-Ranger, Inc.: *See*—
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Hibino, Noburo: *See*—
Inaba, Hiroo; Ushimaru, Akira; Yamamoto, Nobuyuki; Hibino, Noburo; and Iwamoto, Kenzo, 4,861,674, Cl. 428-480.000.
Hickling, J. Gordon: *See*—
Gaudreau, Paul D.; Hickling, J. Gordon; and Schachter, Howard E., 4,860,460, Cl. 34-26.000
Hicks, Ray. Automated photographic apparatus. 4,862,200, Cl. 354-75.000.
Hidaka, Shinobu; Miwa, Katsumi; and Higashi, Masato, to Minolta Camera Kabushiki Kaisha. Scanning type image reading apparatus. 4,862,512, Cl. 382-58.000
Hider, Robert C.; Kontoghiorghes, George; and Stockham, Michael A., to National Research Corporation. Pharmaceutical compositions. 4,861,767, Cl. 514-184.000.
Higashi, Masato: *See*—
Hidaka, Shinobu; Miwa, Katsumi; and Higashi, Masato, 4,862,512, Cl. 382-58.000.
Higashi, Toshikazu; and Ito, Masazumi, to Minolta Camera Kabushiki Kaisha. Multicolor copying apparatus. 4,862,216, Cl. 355-218.000.
Higashioka, Hiroshi: *See*—
Nakano, Akira; Higashioka, Hiroshi; Nomura, Masaki; Kawahara, Yoshiharu; Yamashita, Ko; Sano, Yoshito; and Kase, Minoru, 4,861,612, Cl. 426-607.000.
Higashiyama, Shunichi, to Brother Kogyo Kabushiki. Light-sensitive recording medium, cartridge encasing same, and image recording system therefor. 4,861,695, Cl. 430-138.000.
Higby, Jeffrey P.: *See*—
McElroy, Kennedy K., Jr.; Higby, Jeffrey P.; and Zorc, Philip A., 4,861,295, Cl. 440-86.000
Higham, Graham J.; Morris, Ronald N.; and Pruitt, Gerald R., to Helix Technology Corporation. Vibration isolation system for a linear reciprocating machine. 4,860,543, Cl. 62-6.000.
Higuchi, Masamori: *See*—
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Hijikata, Toshiki: *See*—
Yano, Seiki; and Hijikata, Toshiki, 4,862,473, Cl. 372-50.000.
Hildebrandt, Bodo, to Wella Aktiengesellschaft. Arrangement for treatment of hair with circulating liquid. 4,860,391, Cl. 4-518.000.
Hildebrandt, William V.: *See*—
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Hilgarth, Gunter, to Crones & Co., GmbH. Garden chipper/shredder 4,860,961, Cl. 241-92.000.
Hill, Malcolm D., to Camber International Limited. Information transfer. 4,860,559, Cl. 66-168.000.

Hill, Richard K.: *See*—
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Hill, Walter A.: *See*—
Morris, Carlton E.; Loretan, Philip A.; Bonsi, Conrad K.; and Hill, Walter A., 4,860,490, Cl. 47-63.000.
Hillard, Randy H.; Draney, Robert G.; and Lesher, Joseph J., to J. I. Case Company. Cable plow chute. 4,861,195, Cl. 405-180.000.
Hillebrand, Helmut, to Bayerische Motoren Werke AG. Circuit arrangement for testing the connecting lines of a switch or sensor. 4,862,091, Cl. 324-415.000.
Hillenbrand, David F.; and Starewicz, Piotr M., to Resonance Research, Inc. Process and apparatus for homogenizing a static magnetic field. 4,862,087, Cl. 324-320.000.
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Bergter, Friedrich; Bocker, Harald; Bormann, Ernst-Joachim; Forberg, Wolfgang; Fricke, Heinz; Grafe, Udo; Grosse, Hans-Helmut; Heller, Ingeborg; Hilliger, Matthias; Junne, Wolf; Linde, Hellmut; Menner, Michael; Menzel, Klaus-Dieter; Muller, Peter-Jurger; Plonka, Gunter; Pohl, Hans D.; Schneider, Jorg; and Thrum, Heinz, 4,861,715, Cl. 435-70.000.
Hillstrom, Warren W., to United States of America, Army. Fire-resistant explosives. 4,861,397, Cl. 149-19.400.
Himmele, Walter: *See*—
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Himolla Polstermobelwerk GmbH: *See*—
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Sasaki, Saburo; Himuro, Keiji; and Koshiishi, Shinichiro, 4,862,203, Cl. 354-400.000.
Hinchcliffe, Dennis; and Stone, William A., to Molins Limited. Conveyor system for rod-like articles. 4,860,880, Cl. 198-405.000.
Hinden, Milton; and Lyons, John, to Duro Dyne Corporation. Flexible connector material. 4,861,631, Cl. 428-34.500.
Hines, Edward E.; Royer, Lee J.; Jehring, Thomas D.; Faulkenberry, William E.; Posey, Norvan J.; and Richeson, Joseph T., to Harris Corporation. RF transparent thermal test chamber. 4,860,602, Cl. 73-865.900.
Hirabayashi, Kazuo: *See*—
Suzuki, Isao; Hirabayashi, Kazuo; Kondoh, Tadami; and Nishijima, Hiroaki, 4,861,934, Cl. 585-415.000.
Hirabayashi, Michio; Koizumi, Tosio; and Shibao, Kiyotada, to 501 IDEC IZUMI Corporation. Method of manufacturing a compact switch. 4,860,436, Cl. 29-622.000.
Hiraga, Imao; Shimura, Noriaki; Okakura, Yojiro; Kubota, Masaru; and Takashi, Osamu, to Shiojiri Kagyo Kabushiki Kaisha; and Seiko Epson Corporation. Securing construction for timepiece. 4,862,432, Cl. 368-88.000.
Hiraga, Imao; Yamazaki, Satoshi; Yamada, Takehide; and Nishitani, Tadashi, to Shiojiro Kogyo Kabushiki Kaisha. Timepiece structure. 4,862,434, Cl. 368-190.000.
Hiraka, Masahiro: *See*—
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Hiraku, Akira; Minezawa, Morio; Katoh, Isao; and Itoh, Kouichi, to Toyota Jidosha Kabushiki Kaisha; and Horie Metal Co., Ltd. Device for purifying fuel vapors generated in vehicle fuel tank. 4,860,715, Cl. 123-519.000.
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Hirao, Kenichi: *See*—
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Hirata, Haruhisa; Okada, Hirosuke; and Negoro, Seiji, to Wakamoto Pharmaceutical Co., Ltd. Gene coding for thermostable beta-galactosidase, bacillus subtilis having the gene, enzyme coded by the gene and a process for the production thereof. 4,861,718, Cl. 435-207.000.
Hirata, Shigeyuki: *See*—
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Hirayama, Yuzo: *See*—
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Hiro, Masaaki; Nakagawa, Masaru; Kawamorita, Yoichi; and Yamazaki, Koji, to Canon Kabushiki Kaisha. Packaging arrangement for electrophotographic photosensitive member. 4,860,898, Cl. 206-455.000.
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Hirooka, Masaaki: *See*—
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Hirosawa, Makoto: *See*—
Sasada, Shigeru; Nagata, Shinichi; Hirosawa, Makoto; and Kishida, Yoshihiro, 4,861,983, Cl. 250-235.000.
Hirose, Ichiro; Tani, Shichisei; Inamura, Motonori; and Koyama, Takashi, to Japan Tobacco Inc. Apparatus for manufacturing tobacco filter. 4,861,324, Cl. 493-48.000.
Hirschmann, Walter, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen m.b.H. Dimmable electronic transformer circuit. 4,862,041, Cl. 315-246.000.
Hirshfield, Jay L.; and Nowik, Israel, to Isomed, Inc. Method and apparatus for detecting counterfeit articles. 4,862,143, Cl. 340-572.000.
Hiruma, Toshihiko; Takahashi, Hiroshi; and Kato, Norihiko, to Fuji Photo Film Co., Ltd. Photosensitive lithographic plate using no dampening water. 4,861,698, Cl. 430-272.000.
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Hitachi Engineering Co., Ltd.: *See*—
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Fukuoka, Hirotsugu; Kawakami, Kanji; Aihara, Makoto; Suda, Mitsuo; Takeshita, Kouji; and Isono, Yukihiro, 4,861,398, Cl. 156-64.000.
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Ishida, Masahiko; Haga, Ryooichi; Odawara, Yoji; Takahashi, Sankichi; and Ebara, Katsuya, 4,861,383, Cl. 127-67.000.
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Koyama, Kazuhito; Sugita, Shigehisa; Sakaguchi, Seiichiro; Seiki, Nobuhiro; and Hanzawa, Asao, 4,861,348, Cl. 48-94.000.
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Saitoo, Shuuji; and Tokunaga, Yoshikatu, 4,862,321, Cl. 361-385.000.
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Suzuyama, Hiroshi; Suzuki, Yoshirou; and Sakaguchi, Minoru, 4,862,319, Cl. 361-341.000.
Tojo, Kenji; Kawashima, Kenichi; Suefuji, Kazutaka; and Nakamura, Yozo, 4,861,245, Cl. 418-55.000.
Watanabe, Atsuo; Nagano, Takahiro; Ikeda, Takahide; Momma, Naohiro; and Saito, Ryuichi, 4,862,240, Cl. 357-42.000.
Yamaguchi, Kazuo, 4,862,460, Cl. 371-27.000.
Hitachi Video Engineering Inc.: *See*—
Hattori, Osamu; Gotoh, Toshihiko; and Tanno, Kohtarou, 4,862,193, Cl. 346-76.0PH.
Hitotsuya, Masaki: *See*—
Tada, Tetsuya; Nagasaka, Masumi; Iwamoto, Kouji; Teratani, Tatsuo; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Yagi, Kiyoshi, 4,862,367, Cl. 364-426.040.
Hlad, Myron. Rod handle. 4,860,483, Cl. 43-18.100.
Hoberman, Barry A., to Monolithic Memories, Inc. High speed pointer based first-in-first-out memory. 4,862,419, Cl. 365-221.000.
Hoch, Paul-Gerhard: *See*—
Olschewski, Armin; Schlereth, Armin; and Hoch, Paul-Gerhard, 4,860,605, Cl. 74-99.00R.

Hochreuther, Karl; and Reichler, Edmund, to Brown, Boveri & Cie AG. Housing with a flexible shock protector for a portable measuring instrument. 4,860,901, Cl. 206-586.000.

Hochschild, James R.; and Severin, William A., to Texas Instruments Incorporated. Switched capacitor filter. 4,862,121, Cl. 333-173.000.

Hockemeyer, Friedrich: *See—*
Preiner, Gerhard; Hockemeyer, Friedrich; and Burger, Christa, 4,861,807, Cl. 522-99.000.

Hoda, Takeo: *See—*
Ootsuka, Hiroshi; Tominaga, Shinji; Kobayashi, Haruo; Matsushita, Shuzo; Hoda, Takeo; and Mukai, Hiromu, 4,862,206, Cl. 354-414.000.
Taniguchi, Nobuyuki; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; Hoda, Takeo; and Ueda, Hiroshi, 4,862,201, Cl. 354-105.000.

Hodge, James D.: *See—*
Barringer, Eric A.; Lieberman, Sheldon I.; Schmidt, Mark S.; Hodge, James D.; Waack, Richard; Kelley, Donald J.; Saxton, Brian W.; and Gruber, William C., 4,861,646, Cl. 428-210.000.

Hodge, Richard M., to Dowell Schlumberger Incorporated. Delayed crosslinker composition containing organic titanium complexes and hydroxycarboxylic acids. 4,861,500, Cl. 252-8.551.

Hodgetts, Graham L., to Rolflor Industries. Internally mounted drive mechanism for a belt-winding drum. 4,860,965, Cl. 242-67.10R.

Hodgkins, David H., to Stanadyne Automotive Corp. Back-to-back fuel filter and water separator. 4,860,713, Cl. 123-510.000.

Hoechst Aktiengesellschaft: *See—*
Breipohl, Gerhard; Knolle, Jochen; Konig, Wolfgang; and Scholkens, Bernward, 4,861,755, Cl. 514-11.000
Due, Jorgen; Graves, Bjarne; and Bak, Henning, 4,861,535, Cl. 264-103.000.
Raether, Wolfgang, 4,861,758, Cl. 514-27.000.
Schlafer, Ludwig; Springer, Hartmut; and Hahnle, Reinhard, 4,861,344, Cl. 8-532.000.
Zeeck, Axel; Breiding-Mack, Sabine; Grabley, Susanne; Voelskow, Hartmut; and Seibert, Gerhard, 4,861,775, Cl. 514-229.800.
Zeeck, Axel; Breiding-Mack, Sabine; Grabley, Susanne; Voelskow, Hartmut; and Seibert, Gerhard, 4,861,796, Cl. 514-535.000.

Hoechst Celanese Corp.: *See—*
Che, Tessie M.; Stuetz, Dagobert E.; Buckley, Alan; and Ulrich, Donald R., 4,861,129, Cl. 350-96.130.
Ward, Bennett C.; Alvarez, Edwardo; and Blake, Ralph S., 4,861,537, Cl. 264-126.000.

Hoechst-Roussel Pharmaceuticals, Inc.: *See—*
Helsley, Grover C.; Davis, Larry; and Olsen, Gordon E., 4,861,889, Cl. 546-183.000.

Hoefkens, Daniel S. G.; Spaenjers, Joannes H. P. M.; Boeykens, Eduard C. M.; Verhille, Henri A. J.; and Geernaert, Gustaaf A. L., to Alcatel N.V. Adjustable echo canceller. 4,862,449, Cl. 370-32.100.

Hoelzlwimmer, Herbert: *See—*
Strobach, Peter; Hoelzlwimmer, Herbert; and Tengler, Walter, 4,862,263, Cl. 358-135.000.

Hoffman, Aharon: *See—*
Zaltzman, Arthur; Schmilovitch, Zeev; Verma, Brahm P.; and Hoffman, Aharon, 4,861,464, Cl. 209-474.000.

Hoffman, Robert W.: *See—*
Ekchian, Jack A.; Hoffman, Robert W.; Ekchian, Leon; and Gabriel, Kaigham J., 4,862,160, Cl. 340-825.540.

Hoffmann, Frederic: *See—*
Corteville, Jacques; Pauc, Andre ; and Hoffmann, Frederic, 4,860,825, Cl. 166-68.000.

Hoffmann-La Roche Inc.: *See—*
Heiser, Bernd; and Stoller, Hansjorg, 4,861,890, Cl. 546-184.000.
Merz, Walter, 4,861,772, Cl. 514-219.000.

Hofstede, Wilhelmus. Foldable box and blank therefor. 4,860,948, Cl. 229-143.000.

Holderle, Hans: *See—*
Gerhardy, Reinhard; Holderle, Hans; Wolf, Jurgen; and Vonderau, Werner, 4,861,522, Cl. 261-35.000.

Holland Heating BV: *See—*
Wuyten, Johannes M.; and Daelmans, Adriaan L., 4,860,918, Cl. 220-84.000.

Hollingsworth, Michael W.; and Russell, Peter J., to Lever Brothers Company. Zero-phosphorous detergent powders containing aluminosilicate, succinate and polycarboxylate polymer. 4,861,503, Cl. 252-135.000.

Hollweck, Walter, to Inter Control Hermann Kohler Elektrik GmbH & Co. KG. Bimetal switch. 4,862,132, Cl. 337-102.000.

Holm, Lauri, to Systemteknik AB. Arrangement in a load-sensing body. 4,860,840, Cl. 177-208.000.

Holman, Earl V.: *See—*
Barnett, Clifford J.; Greenwood, John E.; and Holman, Earl V., 4,860,974, Cl. 244-158.00R.

Holmes, William K., to Hi-Ranger, Inc. Aerial lift including overload sensing system. 4,861,224, Cl. 414-680.000.

Hom, Harvey K. Y., to Microwave Components and Systems, Inc. Dual band feedhorn with two different dipole sets. 4,862,187, Cl. 343-786.000.

Hon, Edward D.: *See—*
Hon, Edward H.; Hon, Edward D.; and Hon, Robert W., 4,860,768, Cl. 128-778.000.

Hon, Edward H.; Hon, Edward D.; and Hon, Robert W., to Hon Group, The. Transducer support base with a depending annular isolation ring. 4,860,768, Cl. 128-778.000.

Hon Group, The: *See—*
Hon, Edward H.; Hon, Edward D.; and Hon, Robert W., 4,860,768, Cl. 128-778.000.

Hon, Robert W.: *See—*
Hon, Edward H.; Hon, Edward D.; and Hon, Robert W., 4,860,768, Cl. 128-778.000.

Honda Giken Kogyc Kabushiki Kaisha: *See—*
Fukamachi, Masaaki; Onitsuka, Nobuyuki; Tanaka, Akira; and Nakamura, Kazuo, 4,862,139, Cl. 340-426.000.
Hayashi, Tsutomu; and Hashimoto, Eiichi, 4,860,540, Cl. 60-487.000
Kaibuki, Shigeo; Watanabe, Shinpei; Takahashi, Mitsugu; and Moriya, Hiroshi, 4,860,424, Cl. 29-434.000
Nakajima, Toyohei; and Mieno, Toshiyuki, 4,860,712, Cl. 123-489.000.
Shiraishi, Shuji; Sakaguchi, Masakazu; and Nishihara, Takashi, 4,860,847, Cl. 180-197.000.
Takahashi, Hirotake, 4,860,850, Cl. 180-215.000.
Yakuwa, Masahiko; and Suzuki, Yoshio, 4,862,369, Cl. 364-431.070.
Yamaguchi, Kouji; Ishikawa, Yoshikazu; Kameda, Toshihiro; Hattori, Shogo; and Miyake, Junichi, 4,860,708, Cl. 123-399.000.
Yamatoh, Kouhei; and Ogura, Masami, 4,860,859, Cl. 188-72.100.

Honda Lock Manufacturing Co., Ltd.: *See—*
Fukamachi, Masaaki; Onitsuka, Nobuyuki; Tanaka, Akira; and Nakamura, Kazuo, 4,862,139, Cl. 340-426.000.

Hone, Ronald D.: *See—*
Huber, Thomas V; and Hone, Ronald D., 4,860,615, Cl. 74-785.000.

Honeywell Bull Italia S.p.A.: *See—*
Fiacconi, Claudio; and Franzosi, Antonio, 4,862,354, Cl. 364-200.000.
Zulian, Ferruccio, 4,862,462, Cl. 371-38.000.

Honeywell, Inc.: *See—*
Beckey, Thomas J., 4,860,552, Cl. 62-158.000.
Olson, Elwyn H., 4,861,951, Cl. 200-11.0DA.
Singh, Donald R., 4,862,112, Cl. 331-107.0SL.

Hong, Seung-Ok: *See—*
Marancik, William G.; and Hong, Seung-Ok, 4,860,431, Cl. 29-599.000.

Honjo, Toshio: *See—*
Aoki, Takayoshi; Takeda, Masayuki; Nagatsuka, Ikutaroh; Honjo, Toshio; Itoh, Kazuhiro; and Uchida, Kenji, 4,861,694, Cl. 430-137.000.

Honoki, Yasuhiro: *See—*
Shimizu, Toshiyuki; Shimizu, Osamu; Tenmoku, Kenji; Mitoh, Kunihiko; and Honoki, Yasuhiro, 4,862,398, Cl. 364-571.050.

Hoover Group, Inc.: *See—*
Dabney, Upton R., 4,861,002, Cl. 267-103.000.

Hoover Universal, Inc.: *See—*
Vidwans, Mohan P.; Potes, Duane; and Opalia, John P., 4,861,107, Cl. 297-408.000.
Witzke, Duane W., 4,860,415, Cl. 29-91.100.

Hope, Stephen F.: *See—*
ope, Henry F.; and Hope, Stephen F., 4,861,690, Cl. 429-233.000.

Hopkins, Jeffrey A.: *See—*
Nicholas, David M.; Hopkins, Jeffrey A.; and Bushinsky, Joseph P., 4,861,351, Cl. 55-23.000.

Hopkins, Steven M.: *See—*
Askey, William G.; and Hopkins, Steven M., 4,860,567, Cl. 72-254.000.

Hoppe, Hans: *See—*
Lubbehusen, Paul; Eberhard, Norbert; and Hoppe, Hans, 4,861,200, Cl. 406-14.000.

Horaguchi, Tatsuo: *See—*
Takahashi, Toshihiro; Horaguchi, Tatsuo; Nakamaru, Koichi; and Suzuki, Yoshikuni, 4,861,780, Cl. 514-259.000.

Horel, Timothy A.; Hoyt, Edward S.; and Walls, Lloyd A., to International Business Machines Corporation. Probe card apparatus and method of providing same with reconfigurable probe card circuitry. 4,862,077, Cl. 324-158.00F.

Horgan, Michael W.: *See—*
Pepi, Jerome S.; and Horgan, Michael W., 4,861,075, Cl. 285-112.000.

Hori, Masaaki; and Kamiya, Mitsuharu, to Brother Kogyo Kabushiki Kaisha. Serial printer control system. 4,861,175, Cl. 400-76.000.

Horie Metal Co., Ltd.: *See—*
Hiraku, Akira; Minezawa, Morio; Katoh, Isao; and Itoh, Kouichi, 4,860,715, Cl. 123-519.000.

Hormes, Marlene: *See—*
Wegener, Ingo; Giesen, Brigitte; Meffert, Alfred; Werner, Claus; Hennen, Udo; and Hormes, Marlene, 4,861,508, Cl. 252-121.000.

Hornsey, Derek: *See—*
Lee, Robert; Hornsey, Derek; Garrido, Guillermo; and Dieguez, Jose M., 4,860,827, Cl. 166-261.000.

Hortin, Glen L., to Washington University. Novel antithrombin peptide. 4,861,865, Cl. 530-326.000.

Hosch, Michael A.: *See—*
Dorner, Wolfgang C.; Allen, Michael C.; Wedell, Mark C.; and Hosch, Michael A., 4,861,225, Cl. 414-789.900.
Dorner, Wolfgang C.; and Hosch, Michael A., 4,861,226, Cl. 414-790.300.

Hoshi, Katsuhiko: *See—*
Aoki, Ken; Hoshi, Katsuhiko; Satoh, Shigeo; Kakinuma, Mitsuru; Togashi, Shigeru; and Saitoh, Hiromi, 4,860,550, Cl. 62-135.000.

Hoshino, Yoshinori: *See—*
Ishikawa, Hiroshi; Takano, Hiroshi; Ohtomo, Ryosuke; Hoshino, Yoshinori; and Ohyama, Taro, 4,861,647, Cl. 428-216.000.

Hosoi, Mitsuo: *See—*
Suzuki, Toru; Kato, Atsuhiko; Hosoi, Mitsuo; and Nakano, Ichiro, 4,862,047, Cl. 318-587.000.

Hosono, Masayuki; Waragai, Kengi; and Hiramoto, Jun, to SMC Corporation. Actuator driving system. 4,860,638, Cl. 91-536.000.

Hottes, Ronald W., to Allied Products Corporation. Angle drive assembly for rotary cutters. 4,860,526, Cl. 56-13.600.

House Food Industrial Company Limited: *See—*
Sugisawa, Ko; Sekiguchi, Kazuya; Tuji, Kiyoaki; and Ono, Akinobu, 4,861,559, Cl. 422-110.000

Houser, Lee F. Method for attaining longitudinal registry of rolls in printing presses. 4,860,650, Cl. 101-211.000.

How, Peter: *See—*
Macrae, Alasdair R.; and How, Peter, 4,861,716, Cl. 435-134.000.

Howard, Harry R., Jr.; and Sarges, Reinhard, to Pfizer Inc. 1-phenyl-2(1H,3H)-indolone psycho-therapeutic agents. 4,861,880, Cl. 544-144.000.

Howard, Herbert H. Liquid level sensing device. 4,861,231, Cl. 417-38.000.

Howard, Robert T., Jr.: *See—*
Greer, Stuart E.; and Howard, Robert T., Jr., 4,861,425, Cl. 156-644.000

Howell, Keith C. Projectile toy. 4,860,718, Cl. 124-18.000.

Howell, Steven E.: *See—*
Ansell, Daniel F.; Harris, James C.; Howell, Steven E.; Miller, Michael S.; and Wysong, Robert D., 4,862,327, Cl. 361-415.000.

Hoy, Edgar F., to Dowell Schlumberger Incorporated. Enhanced cleaning procedure for copper alloy equipment. 4,861,386, Cl. 134-27.000.

Hoyt, Edward S.: *See—*
Horel, Timothy A.; Hoyt, Edward S.; and Walls, Lloyd A., 4,862,077, Cl. 324-158.00F.

HS Veglio S.r.l.: *See—*
Veglio, Oreste, 4,860,722, Cl. 125-15.000.

Hsia, Steve K.; Mahal, Pritpal S.; and Shih, Wei-Ren, to Catalyst Semiconductor, Inc. Process for making a high density split gate nonvolatile memory cell. 4,861,730, Cl. 437-43.000.

Hsien, Simon. Aesthetically pleasing air freshener. 4,860,953, Cl. 239-47.000.

Hsu, Adam C. T.; and Lein, Geore M., Jr., to Rohm and Haas Company. Preparation of halo substituted isothiazolones. 4,861,896, Cl. 548-213.000

Huang, Dinah C.; and Braden, Jeffrey L., to United Catalyst Inc. High temperature shift catalyst and process for its manufacture. 4,861,745, Cl. 502-314.000.

Huard, Serge: *See—*
Bois, Emmanuel; Huard, Serge; and Boisde, Gilbert, 4,861,131, Cl. 350-96.180.

Hubbard, Julian D., to Romneya Trading Co. Keg tap. 4,860,931, Cl. 222-400.800.

Huber, Thomas V; and Hone, Ronald D., to DNE Corporation. Reversible transmission. 4,860,615, Cl. 74-785.000.

Hubert, Jean-Claude: *See—*
Guinet, Jannick; Hubert, Jean-Claude; and Martial, Marie-Francoise, 4,860,939, Cl. 228-122.000.

Hubner Gummi- und Kunststoff GmbH: *See—*
Schmidt, Helmbrecht, 4,860,665, Cl. 105-18.000.

Hudimac, George S., Jr., to Mechanical Service Co., Inc. Air flow sensor. 4,860,764, Cl. 128-725.000

Hudimac, George S., Jr., to Mechanical Service Co. Inc. Air flow sensor. 4,860,765, Cl. 128-725.000.

Hudson, David K.: *See—*
Morrill, Vaughan, Jr.; Scandrett, John H.; and Hudson, David K., 4,860,437, Cl. 29-623.000.

Huels Aktiengesellschaft: *See—*
Lueders, Harald; Ratajczak, Hans-Josef; and Wienhoefer, Ekkehard, 4,861,513, Cl. 252-182.240.

Huether, Werner, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Molded article made of a composite material including metals and nonmetallic substances. 4,861,638, Cl. 428-71.000.

Hughes Aircraft Company: *See—*
Champetier, Robert J., 4,861,445, Cl. 204-157.300.
Cross, William D., 4,861,275, Cl. 439-289.000.
Fink, David, 4,862,468, Cl. 342-19.000.
Lau, Kreisler S. Y.; Oldham, Susan L.; Elias, William E.; and Bigus, Stephen J., 4,861,901, Cl. 549-215.000.
Moulin, Norbert L., 4,861,132, Cl. 350-96.200.
Myers, Terrence L.; and Harrington, William A., 4,862,014, Cl. 307-270.000.
Park, Joon, 4,861,087, Cl. 294-119.100.
Pesavento, Philip V., 4,860,443, Cl. 29-840.000.
Strider, Charles A., 4,862,186, Cl. 343-776.000.
Wong, Sung Y., 4,862,177, Cl. 342-160.000.

Hughes, Philip F.; Mobilio, Dominick; and Humber, Leslie G., to American Home Products Corporation. Process for the production of substituted 2-oxocyclohexaneacetic acid esters. 4,861,910, Cl. 560-126.000.

Hulett Aluminium Limited: *See—*
Kipross, Stanley, 4,860,517, Cl. 52-656.000.

Hulme-Lowe, Alan G.; Bell, Vivien L.; and Ferguson, Ian J., to Minnesota Mining and Manufacturing Company. Recording medium for optical data storage. 4,861,697, Cl. 430-270.000.

Humber, Leslie G.: *See—*
Hughes, Philip F.; Mobilio, Dominick; and Humber, Leslie G., 4,861,910, Cl. 560-126.000.

Humenik, James N.: *See—*
Galvagni, John; Oberschmidt, James M.; and Humenik, James N., 4,862,318, Cl. 361-321.000.

Humer, Mladen: *See—*
Rees, Richard W. A.; and Humer, Mladen, 4,860,988, Cl. 248-420.000.

Hummerich, Rainer; Kerber, Michael; Maempel, Lothar; and Weyland, Peter, to BASF Aktiengesellschaft. Aqueous polyurethane adhesive dispersions. 4,861,826, Cl. 524-839.000.

Humphrey, Lloyd E. Apparatus and method for carrying skis and ski poles. 4,861,072, Cl. 280-814.000.

Humphrey, Martin D.: *See—*
Johnson, Alfred N.; and Humphrey, Martin D., 4,862,005, Cl. 250-385.100.

Hunter Douglas Inc.: *See—*
Neff, Craig A., 4,861,404, Cl. 156-204.000.

Hunter, Douglas L.: *See—*
Saavedra, Jose V.; Hunter, Douglas L.; Sims, Steve A.; Maschmeyer, Donald M.; and Knobel, Thomas M., 4,861,805, Cl 521-105.000

Hunter, Kevin D.: *See—*
Axelrod, Barry H.; Durst, Robert T., Jr.; Hunter, Kevin D.; and Schmidt, Alfred C., 4,862,386, Cl. 364-518.000.

Hurni, William M.; Miller, William J.; and McAleer, William J., to Merck & Co., Inc. Assay for hepatitis a virus. 4,861,706, Cl. 435-5.000.

Husain, Abbas, to Ennovation Corporation. Triangular-shaped ornamental nail clipper with side flap. 4,860,448, Cl. 30-28.000.

Husqvarna Aktiebolag: *See—*
Skogward, Kenneth O. E., 4,860,678, Cl. 112-445.000.

Hutchings, Richard S., to Drackett Company, The. Compositions containing chlorine dioxide and their preparation. 4,861,514, Cl. 252-187.210.

Huyck Corporation: *See—*
Jones, Roy, 4,861,432, Cl. 162-300.000

Huys, John H. Welding electrode. 4,861,961, Cl. 219-119.000.

Hwang, Blake. Numerical lock. 4,860,561, Cl. 70-28.000.

Hwang, Bun: *See—*
Moon, Juhn W.; Hwang, Bun; and Chang, Jin K., 4,861,605, Cl 426-96.000.

Hwang, Kuo H. Multipurpose calculator. 4,861,970, Cl. 235-10.000.

Hypertherm, Inc.: *See—*
Sanders, Nicholas A.; and Couch, Richard W., Jr., 4,861,962, Cl. 219-121.500.

I Poijarvi, Jaakko T.: *See—*
Talonen, Timo T.; I Poijarvi, Jaakko T.; and Metsarinta, Maija-Leena, 4,861,577, Cl. 423-577.000.

Iaslovits, Michael, to Safetray, Inc. Stemware holder. 4,860,895, Cl. 206-426.000.

Ibarrola, Jesus E., to Azkoyen Industrial, S.A. Tilting multiple passage rectangular block coin sorter. 4,860,877, Cl. 194-346.000.

Ichihara, Issey; Toshimitsu, Kenshi; and Tachibana, Natsuki, to Kabushiki Kaisha Toshiba. Image forming apparatus and method. 4,862,213, Cl. 355-245.000.

Ichihashi, Kouji; and Inaba, Akira, to Diesel Kiki Co., Ltd. Electromagnetic control valve. 4,860,792, Cl. 137-596.170.

Ichikawa, Katsuhiro: *See—*
Miyasaka, Matsuho; Ichikawa, Katsuhiro; Sasaki, Katsumi; Mizobuchi, Syotaro; and Ogure, Naoaki, 4,861,395, Cl. 148-321.000.

Ichikawa, Katsumi: *See—*
Kudou, Makoto; and Ichikawa, Katsumi, 4,861,422, Cl. 156-640.000.

Ichikawa, Toshiro: *See—*
Kobayashi, Hiroshi; and Ichikawa, Toshiro, 4,862,063, Cl. 324-61.00P.

Ihara, Masahiro; Suzuki, Kazuo; Maekawa, Hideya; Ito, Haremi; and Tanaka, Kenichi, to NGK Insulators, Ltd. Extrusion die, method of producing the same and method of reclaiming the same. 4,861,626, Cl. 427-133.000

Iida, Toshiharu; Shimanuki, Koji; Nakada, Kimiaki; and Masuda, Akira, to Fuji Photo Film Co., Ltd.; and Sony Corporation. Dual film and video tape camera. 4,862,280, Cl. 358-229.000.

Ikebe, Masaru: *See—*
Tanaka, Kimio; Sasaki, Morimasa; and Ikebe, Masaru, 4,862,448, Cl. 369-291.000

Ikeda, Hiroshi; Tsunashima, Makoto; and Mieda, Akihiko, to Mitsubishi Kinzoku Kabushiki Kaisha. Process for preparing chloropolysilanes. 4,861,574, Cl. 423-342.000.

Ikeda, Kenji: *See—*
Kawai, Hironao; Fukui, Shigetoshi; and Ikeda, Kenji, 4,860,676, Cl. 112-121.140.

Ikeda, Masaki: *See—*
Nishino, Atsushi; Ikeda, Masaki; Watanabe, Yoshihiro; and Hiraka, Masahiro, 4,861,657, Cl. 428-336.000.

Ikeda, Shigehito: *See—*
Nakao, Shinichi; Yasuda, Shunji; and Ikeda, Shigehito, 4,861,471, Cl. 210-182.000.

Ikeda, Takahide: *See—*
Watanabe, Atsuo; Nagano, Takahiro; Ikeda, Takahide; Momma, Naohiro; and Saito, Ryuichi, 4,862,240, Cl. 357-42.000

Ikemoto, Tomoyuki: *See—*
Mitsukuchi, Morihiro; Ikemoto, Tomoyuki; Watanabe, Yoshiaki; and Sota, Kaoru, 4,861,765, Cl. 514-181.000.

Ikuno, Yuji: *See—*
Kidawara, Atsushi; Nishikori, Toshiaki; Kanno, Masahide; Yabe, Hisao; Katoh, Shinichi; Ikuno, Yuji; and Nakamura, Takeaki, 4,862,258, Cl. 358-98.000.

Ilco Unican Inc.: *See—*
Fish, Aaron M.; Matzeld, Leon; Branwer, Alexander; Miresmaili, Masoud; and Dausseine, Sean-Paul, 4,861,083, Cl. 292-347.000.

Imai, Hitoshi: *See—*
Andou, Nobuyoshi; and Imai, Hitoshi, 4,861,139, Cl. 350-255.000.
Tadokoro, Michihiro; Okada, Kazuo; and Imai, Hitoshi, 4,862,442, Cl. 369-45.000.

Imai, Osamu: *See—*
Haga, Takahiro; Toki, Tadaaki; Koyanagi, Toru; Fujii, Yasuhiro; Yoshida, Kiyomitsu; and Imai, Osamu, 4,861,799, Cl. 514-594.000.

Imai, Takeo; and Iwano, Kazuko, to Kao Corporation. Spherical fine particulate pigment and process for preparing the same. 4,861,379, Cl. 106-402.000.

Imaizumi, Masaru; and Hayama, Hiroyoshi, to Minolta Camera Kabushiki Kaisha. Refill and waste toner container with form changing member. 4,862,226, Cl. 355-298.000.

IMAJE, S.A.: *See—*
Grosselin, Pascal, 4,860,787, Cl. 137-487.500.

Imamura, Kaneo: *See—*
Suzuki, Takio; and Imamura, Kaneo, 4,860,706, Cl. 123-337.000.

Imamura, Tadashi; Shigaki, Kazuyuki; Yamazaki, Yuji; Masuda, Tadashi; and Okumura, Tsunemasa, to Topy Kogyo Kabushiki Kaisha. Cast wheel. 4,861,113, Cl. 301-65.000.

Imatran Voima Oy: *See—*
Tusa, Esko; Maaatta, Raimo; and Ruuskanen, Antti, 4,861,519,,Cl. 252-633.000.

Imo Industries, Inc.: *See—*
Rando, Joseph D., 4,862,124, Cl. 335-151.000.

Imperial Chemical Industries PLC: *See—*
Campbell, Frederick; Geary, John M.; and Schofield, John D., 4,861,380, Cl. 106-504.000.
Denny, Patrick J., 4,861,566, Cl. 423-230.000.
Hardwick, Roy, 4,860,656, Cl. 102-312.000.
Manley, James D.; Mockford, Mary J.; and Stanley, David R., 4,861,735, Cl. 501-96.000.
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Ina, Hideki. Alignment of an object. 4,861,162, Cl. 356-401.000.

Inaba, Akira: *See—*
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Inaba, Hiroo; Ushimaru, Akira; Yamamoto, Nobuyuki; Hibino, Noburo; and Iwamoto, Kenzo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,861,674, Cl. 428-480.000.

Inagaki, Akio: *See—*
Kobayashi. Toshimitsu; Inagaki, Akio; Kobayashi, Yasuhiro; Mori, Masanori; and Sakakibara, Takashi, 4,861,323, Cl. 474-260.000.

Inagaki, Toshiyuki; and Maeda, Hiroaki, to Aisin Seiki Kabushiki Kaisha. Lubricating system for friction engaging means in transmission. 4,860,873, Cl. 192-113.00B.

Inamura, Motonori: *See—*
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Indexible Soft Jaws Limited: *See—*
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Industrial Microsystems, Inc.: *See—*
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Industrial Scientific Devices, Inc.: *See—*
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Industrial Technology Research Institute: *See—*
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Ing. C. Olivetti & C., S.p.A.: *See—*
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Inge, Claes: *See—*
Borgstrom, Leonard; Carlsson, Claes G.; Franzen, Peter; Inge, Claes; Lagerstedt, Torgny; Moberg, Hans; and Nabo, Olle, 4,861,329, Cl. 494-73.000.

Inland Steel Company: *See—*
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Innes, Robert S.; and McGuire, Bernard. Counter-flow poultry chiller. 4,860,554, Cl. 62-374.000.

Innovision Optics, Inc.: *See—*
Centkowski, Mark; Manios, Steven E., Sr.; and Weaver, James, 4,862,199, Cl. 354-62.000.

Ino, Hiroyuki: *See—*
Fukami, Tadashi; and Ino, Hiroyuki, 4,862,297, Cl. 360-53.000.

Inokuchi, Haruhisa, to Kabushiki Kaisha Toshiba. DC power transmission system. 4,862,340, Cl. 363-35.000.

Inomata, Kenichi: *See—*
Nakajima, Nobuyuki; Inomata, Kenichi; Moruta, Masaya; Eitai, Kazuo; and Yamaguchi, Toshio, 4,861,235, Cl. 417-295.000.

Inou, Kiyoharu; and Sakimoto, Katsuji, to Yokogawa Electric Corporation. DC power supply with improved output stabilizing feedback. 4,862,339, Cl. 363-21.000.

Inoue, Akira: *See—*
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Inoue, Hiroaki: *See—*
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Inoue, Manabu: *See—*
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Insitut Francais du Petrole: *See—*
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Instant Defence Inc.: *See—*
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Institut Francais du Petrole: *See—*
Bourguet, Lucien; and Gatellier, Claude, 4,860,582, Cl. 73-155.000.
Corteville, Jacques; Pauc, Andre ; and Hoffmann, Frederic, 4,860,825, Cl. 166-68.000.
Cretin, Jacques; Therond, Jean-Francois; and Saussier, Daniel, 4,862,425, Cl. 367-33.000.
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Institute of Molecular Biology: *See—*
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Integrated Network Corporation: *See—*
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Inter Control Hermann Kohler Elektrik GmbH & Co. KG: *See—*
Hollweck, Walter, 4,862,132, Cl. 337-102.000.

Interdibipack S.p.A.: *See—*
Di Bernardo, Pietro, 4,860,622, Cl. 83-285.000.

Interlego A.G.: *See—*
Bolli, Peter; Looser, Heniz; and Tanner, Werner, 4,861,306, Cl. 446-90.000.

Intermedics Inc.: *See—*
Frey, Michael L.; and Becker, Gunter, 4,860,750, Cl. 128-419.00P

International Business Machine Corporation: *See—*
Rudy, Ann M., 4,862,347, Cl. 364-200.000.

International Business Machines Corporation: *See—*
Ansell, Daniel F.; Harris, James C.; Howell, Steven E.; Miller, Michael S.; and Wysong, Robert D., 4,862,327, Cl. 361-415.000.
Blaner, Bartholomew, 4,862,461, Cl. 371-33.000.
Boehm, Russell W.; Guinn, Rex A.; and Koerner, Hans J., 4,861,534, Cl. 264-102.000.
Buhler, Otto R.; Simpson, Brian A.; and Twombly, John C., 4,862,113, Cl. 331-117.00R.
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Closs, Felix H.; Mueller, Johann R.; and Zafiropulo, Pitro A., 4,862,451, Cl. 370-60.000.
Dias, Daniel M.; and Kumar, Manoj, 4,862,454, Cl. 370-94.000.
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Ferriter, Kate M.; and Palmer, Elaine R., 4,862,376, Cl. 364-468.000.
Foreman, Dennis J.; Hellenga, David A.; and Hill, Richard K., 4,862,349, Cl. 364-200.000
Galvagni, John; Oberschmidt, James M.; and Humenik, James N., 4,862,318, Cl. 361-321.000.
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Greer, Stuart E.; and Howard, Robert T., Jr., 4,861,425, Cl. 156-644.000
Horel, Timothy A.; Hoyt, Edward S.; and Walls, Lloyd A., 4,862,077, Cl. 324-158.00F.
Orr, Michael A.; and Williams, Crawford E., 4,862,350, Cl. 364-200.000.
Pashby, Richard P.; Phelps, Douglas W., Jr.; Samuelsen, Sigvart J.; and Ward, William C., 4,862,245, Cl. 357-70.000
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International Fuel Cells Corporation: *See—*
Szydlowski, Donald F.; and Suljak, George T., 4,861,347, Cl. 48-61.000

International Mobile Machines Corporation: *See—*
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International Paint public limited company: *See—*
Marrion, Alastair R., 4,861,841, Cl. 525-327.300.

International Paper Company: *See—*
Gibbons, Charles E.; and Whillock, Allan A., 4,861,526, Cl. 264-22.000.

International Pipe Machinery Corp.: *See—*
Grau, Thomas D., 4,861,252, Cl. 425-135.000.

INTEROX (Societe Anonyme): *See—*
Chauvier, Jean-Marie; Moussiaux, Leon; and Scoman, Henry, 4,861,506, Cl. 252-95.000.

Interpore International: *See—*
White, Eugene W., 4,861,733, Cl. 501-1.000.

Inujima, Takashi: *See—*
Yamazaki, Shunpei; Inujima, Takashi; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Sakama, Mitsunori; Miyazaki, Minoru; Koyanagi, Kaoru; and Yamaguchi, Toshiharu, 4,861,143, Cl. 350-350.00S.
Yamazaki, Shunpei; and Inujima, Takashi, 4,861,622, Cl. 427-54.100.

Irie, Toshio: *See—*
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Iron Horse Productions, Inc.: *See—*
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Irving, Edward: *See—*
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Irving, Wesley F.: *See—*
Blomstedt, John W.; Irving, Wesley F.; and Pusateri, Mark S., 4,862,326, Cl. 361-413.000.

Irwin, Gary W.: *See—*
Kile, Edwin N.; Irwin, Gary W.; and Hartness, Samuel S., 4,862,039, Cl. 315-194.000.

Irwin, James S.: *See—*
Macnak, Philip P.; Irwin, James S.; and Davis, Walter L., 4,862,516, Cl. 455-193.000.

Isao KAI: *See—*
Miyawaki, Yoshinori; Matumoto, Kazuhiro; and Shirasaki, Osamu, 4,860,760, Cl. 128-680.000.

Ise, Yoji; and Yamaguchi, Akira, to Myotoku Ltd. Vacuum generating device. 4,861,232, Cl. 417-76.000.

Ise, Yoji, to Kabushiki Kaisha Myotoku. Pressure activated switch. 4,861,952, Cl. 200-81.00R.

Ishahara Sangyo Kaisha Ltd: *See—*
Haga, Takahiro; Shigehara, Itaru; Koyanagi, Toru; Hara, Kazutoshi; and Maeda, Masaru, 4,861,886, Cl. 546-16.000.

Ishibashi, Norio: *See—*
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Ishida, Masahiko; Haga, Ryooichi; Odawara, Yoji; Takahashi, Sankichi; and Ebara, Katsuya, to Hitachi, Ltd. Process for recovering subterranean stem starch and protein. 4,861,383, Cl. 127-67.000.

Ishida, Tokuji; Hamada, Masataka; Karasaki, Toshihiko; Norita, Toshio; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Focus detection device and method. 4,862,204, Cl. 354-408.000.

Ishida, Tokuji; and Norita, Toshio, to Minolta Camera Kabushiki Kaisha. Focus condition detecting device for use in a camera. 4,862,273, Cl. 358-213.190.

Ishihara Sangyo Kaisha Ltd.: *See—*
Haga, Takahiro; Toki, Tadaaki; Koyanagi, Toru; Fujii, Yasuhiro; Yoshida, Kiyomitsu; and Imai, Osamu, 4,861,799, Cl. 514-594.000.

Ishihara, Yoshihiro, to Juki Corporation; and Nakajima Seisakusho Company. Clutch reversing roll feed for a sewing machine. 4,860,677, Cl. 112-318.000

Ishii, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker with overcurrent protection. 4,862,312, Cl. 361-96.000.

Ishii, Koji; and Okuda, Yukito, to Ryobi Ltd. Skew correcting apparatus for multi-color printing machine. 4,860,651, Cl. 101-232.000.

Ishii, Seiji, to Teijin Limited. Stretchable synthetic polymer composite filament. 4,861,660, Cl. 428-371.000

Ishii, Yoshiki: *See—*
Enari, Masahiko; Yoshimura, Katsuji; Aoki, Akio; Yamashita, Shinichi; Shimokoriyama, Makoto; Kashida, Motokazu; Shimizu, Tetsuya; Ishii, Yoshiki; and Fujii, Akio, 4,862,292, Cl. 360-8.000.

Ishii, Yoshiyuki; and Shimizu, Shigehisa, to Fuji Photo Film Co., Ltd Method for controlling the position of a web moving along a given path and apparatus for use in such method. 4,860,964, Cl. 242-57.100.

Ishikawa Gasket Co., Ltd.: *See—*
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Udagawa, Tsunekazu, 4,861,046, Cl. 277-235.00B.

Ishikawa, Hiroshi; Takano, Hiroshi; Ohtomo, Ryosuke; Hoshino, Yoshinori; and Ohyama, Taro, to Nippon Kokan Kabushiki Kaisha; and Toyo Ink Mfg. Co., Ltd. Precoating metal sheet for two-piece can. 4,861,647, Cl. 428-216.000

Ishikawa, Sachiko; and Arimoto, Akira, to Hitachi, Ltd. Optical pickup using a waveguide. 4,861,128, Cl. 350-96.130.

Ishikawa, Tazuru: *See—*
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Ishikawa, Yoshikazu: *See—*
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Isoda, Takeshi: *See—*
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Isomed, Inc.: *See—*
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Isono, Yukihiro: *See—*
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Isoyama, Eizo: *See—*
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Isozumi, Shuzoo; and Konishi, Keiichi, to Mitsubishi Denki Kabushiki Kaisha. Coaxial starter motor. 4,862,027, Cl. 310-99.000.

Itabashi, Keiji: *See—*
Harada, Masashi; Miyazaki, Hiroshi; and Itabashi, Keiji, 4,861,571, Cl. 423-328.000.

Itagaki, Shuichi: *See—*
Ono, Shuichi; Yahagi, Masahiro; Itagaki, Shuichi; and Kikuchi, Nobuaki, 4,861,736, Cl. 501-137.000.

Ito, Haremi: *See—*
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Ito, Koichi: *See—*
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Ito, Masazumi, to Minolta Camera Kabushiki Kaisha. Copying machine. 4,862,220, Cl. 355-311.000.

Ito, Masazumi: *See—*
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Ito, Mineo: *See—*
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Ito, Satoshi: *See—*
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Ito, Takashi: *See—*
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Itoh, Kazuhiro: *See—*
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Itoh, Kouichi: *See—*
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ITT Corporation: *See—*
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Ivanoff, Lucinda A.; and Petteway, Steven R., to Du Pont de Nemours, E. I., and Company. Human immunodeficiency virus antigen 4,861,707, Cl. 435-5.000

Ivasauskas, Jonas: *See—*
Willinger, Allan H.; and Ivasauskas, Jonas, 4,861,468, Cl 210-169.000

Ivey, Charles W.; Wilson, David G.; and Thorne, Clarence R., to Fasco Industries, Inc. Lamp, reflector and grille interlock assembly. 4,862,334, Cl. 362-149.000.

Iwaibana, Kunio, to NEC Home Electronics Ltd. Imaging device with hand wobble display circuit. 4,862,277, Cl. 358-222.000

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Iwamoto, Kenzo: *See—*
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Iwano, Kazuko: *See—*
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Iwayama, Kazuyoshi; Magatani, Yasuhiro; and Tada, Kuniyuki, to Toray Industries, Inc. Process for the isomerization of dichlorotoluene. 4,861,928, Cl. 570-202.000.

J. I. Case Company: *See—*
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Jackett, Stephen G.; Kastel, Stephen N.; and Jandera, Zdenek, to Commonwealth of Australia, The; and Plessey Australia Pty. Limited. Distributed array hydrophone. 4,862,428, Cl. 367-155.000.

Jackson, Francis W. Multiple piston expansion chamber engine. 4,860,701, Cl. 123-51.00A.

Jackson, Owen E., to Jog Corporation. Fluid removal cannister device 4,861,384, Cl. 134-9.000.

Jackson, Richard L., to Merrell Dow Pharmaceuticals Inc. Synthetic pulmonary surfactant. 4,861,756, Cl. 514-11.000.

Jackson, Sharon I.: *See—*
Spearmon, JoAnn M.; and Jackson, Sharon I., 4,861,593, Cl. 424-195.100.

Jackson, Thomas L. A.; and Hamit, James L. Flooring system and method for constructing same. 4,860,508, Cl. 52-169.100.

Jackson, Winston J., Jr.: *See—*
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Jacobsson, Kurt A. G., to Aktiebolaget IRO. Monitoring circuit for a knitting machine. 4,860,558, Cl. 66-163.000.

Jaeger, James L.: *See—*
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Jain, Ravi; LaCava, Alberto; Andrecovich, Mark J.; and MacLean, Donald L., to BOC Group, Inc., The. Argon and nitrogen coproduction process. 4,861,361, Cl. 62-18.000.

James River-Norwalk, Inc.: *See—*
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Jandera, Zdenek: *See—*
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Janoff, Andrew S.; Bolcsak, Lois E.; Weiner, Alan L.; Tremblay, Paul A.; Bergamini, Michael V. W.; and Suddith, Robert L., to Liposome Company, Inc., The. Composition using salt form of organic acid derivative of alpha-tocopheral. 4,861,580, Cl. 424-1.100
Jansen, Cornelis W., to DHV Raadgevend Ingenieursbureau BV. Process for the removal of metals, in particular heavy metals, from waste water. 4,861,493, Cl. 210-715.000.
Janson, David A., to Eaton Corporation. Four wheel steering system 4,860,845, Cl. 180-140.000
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Stokbroekx, Raymond A.; Luyckx, Marcel G. M.; and Janssens, Frans E., 4,861,785, Cl. 514-321.000
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Japan Tobacco Inc.: *See—*
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Okumoto, Yutaka; and Furukawa, Takao, 4,860,773, Cl. 131-281.000.
Jarvstrat, Goran, to Asea Stal AB. Method in fluidized bed combustion. 4,860,693, Cl. 122-4.00D
Javme, Richard, to Electricite De France. Electric heating device having a metal sheath. 4,862,137, Cl. 338-237.000.
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Jekot, David E.; and Jordan, Harold W., to Phillips & Brooks, Inc. Deformable membrane keypad assembly for public telephones. 4,862,499, Cl. 379-368.000.
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Jennings, Alfred R., Jr.; and Shucart, John K., to Mobil Oil Corporation. Method of cleaning a horizontal wellbore. 4,860,830, Cl 166-312.000
Jennings, Lois R.; and Long, Roger W., to American Telephone and Telegraph Company, AT&T Technologies, Inc. Component insertion machine with releasable magazine. 4,860,903, Cl. 211-4.000.
Jennmar Corporation: *See—*
Calandra, Frank, Jr., 4,861,197, Cl. 405-259.000.
Stankus, John C., 4,861,198, Cl. 405-261.000
Jensen, Finn N. Method of adding liquid substances to products made by extrusion. 4,861,606, Cl. 426-305.000.
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Jerry W. Bishop: *See—*
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Jet Research Center, Inc.: *See—*
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Jewell, Jack L.; and McCall, Samuel L., Jr., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical or optoelectronic device having a trapping layer in contact with a semiconductive layer. 4,861,976, Cl. 250-211.00J.
Jewell, John H., II: *See—*
Sasamura, Ross S.; and Jewell, John H., II, 4,861,099, Cl 296-202.000
Jiewertz, Sten, to Saab-Scania AB. Method and an arrangement for the detection of ionizing current in the ignition system of an internal combustion engine including engine start sequence detection 4,862,093, Cl. 324-464.000
Jochun, Alain: *See—*
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Joern, Alfred; and Weimann, Wendelin, to Georg Fischer AG. Apparatus for the compacting of granular molding materials. 4,860,817, Cl. 164-169.000
Jog Corporation: *See—*
Jackson, Owen E., 4,861,384, Cl. 134-9.000.
Johansson, Bengt: *See—*
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John Fluke Mfg. Co., Inc.: *See—*
Gurol, Ismail M., 4,861,640, Cl. 428-137.000.
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Ko, Harvey W.; Hart, Lynn W.; and Skura, Joseph P., 4,860,756, Cl. 128-653.000.
Johnson, Alfred N.; and Humphrey, Martin D., to Westinghouse Electric Corp. Apparatus for detecting radioactive contaminants on hand tools. 4,862,005, Cl. 250-385.100.
Johnson, Brian K. Cargo strap. 4,860,408, Cl. 24-68.0CD.
Johnson, Donald C.; Neogi, Amar N.; and LeBlanc, Henry A., to Weyerhaeuser Company. Bacterial cellulose as surface treatment for fibrous web. 4,861,427, Cl. 162-129.000
Johnson & Johnson Consumer Products, Inc.: *See—*
Williams, D. Michael; and Grubb, Lawrence B., 4,861,309, Cl. 446-168.000.
Johnson, Leonard L.: *See—*
Beaver, Robert A.; Johnson, Leonard L.; and Medlen, Lester R., 4,860,648, Cl. 101-35.000
Johnson, Mark R., to Dow Chemical Company, The. Dehydrohalogenation of ring-halogenated α-halocumenes. 4,861,927, Cl. 570-200.000.
Johnson, Marvin M., to Phillips Petroleum Company. Purification and hydrogenation of sulfolenes. 4,861,900, Cl. 549-87.000.
Johnson, Norman J.; and Anand, Raj K., to Anand, Raj K. Thermoelectrically controlled heat medical catheter. 4,860,744, Cl. 128-303.100.
Jones, C. Andrew: *See—*
Sofranko, John A.; Gastinger, Robert G.; and Jones, C. Andrew, 4,861,936, Cl. 585-500.000
Jones, Daniel A.; and Suttle, James P., to Caribbean Stud Enterprises, Inc. Methods of progressive jackpot gaming. 4,861,041, Cl. 273-292.000
Jones, Gerald M., to GTE Products Corporation. Method of mounting electrical contacts in connector body. 4,860,445, Cl. 29-842.000.
Jones, John L., Sr. Cargo container. 4,860,911, Cl. 220-1.500.
Jones, Kenneth L., II; O'Connor, Tom R.; and Trevellyan, Kenneth A., to Cabot Electronics Ceramics, Inc. Low cost, hermetic pin grid array package. 4,861,944, Cl. 174-68.500.
Jones, Micheal D. Drive mechanism. 4,861,055, Cl. 280-234.000.
Jones, Randal S.: *See—*
Karnezos, Marcos; and Jones, Randal S., 4,862,490, Cl. 378-161.000.
Jones, Roy, to Huyck Corporation. Dual compartment vacufoil unit to eliminate secondary headbox chatter. 4,861,432, Cl. 162-300.000.
Jonischkeit, Horst, to Henke-Sass, Wolf GmbH. Injection spray gun with adjustable pressure limitation. 4,861,339, Cl. 604-118.000.
Jordal, Robert L. Integrated smoke and intrusion alarm system. 4,862,141, Cl. 340-521.000.
Jordan, Harold W.: *See—*
Jekot, David E.; and Jordan, Harold W., 4,862,499, Cl. 379-368.000.
Jordan, Howard E.; Woods, Edward J.; Caruso, John T.; and Forte, Luciano, to Reliance Electric Company. Motor starting circuit. 4,862,053, Cl. 318-786.000.
Jorgensen, Lars L. S., to Jydsk Varmekedelfabrik A/S. Method and apparatus for the cleaning of flue gas and the recovery of heat from same. 4,860,670, Cl. 110-215.000.
Joseph, Frank: *See—*
Sielaff, Gunter; Joseph, Frank; and Harder, Norbert, 4,861,524, Cl. 261-130.000.
Joshi, Narendra D., to Prutech II. Torch igniter for a combustor having U.V. flame detection. 4,860,533, Cl. 60-39.060.
Joubert S. A.: *See—*
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Jouveinal: *See—*
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Joy, Theodore J.; Mohile, Vivek V.; and Richards, William L., to Allied-Signal Inc. Low-noise pump assembly. 4,861,234, Cl. 417-273.000.
Ju, Shyr-Te, to Boston University, Trustees of. Method for therapeutically treating abnormal cells expressing a major histocompatibility complex class II antigen using cytolytic inducer T4 cells. 4,861,589, Cl. 424-93.000
Juenkersfeld, Harald; and Fischer, Georg, to Benz & Hilgers BmbH. Arrangement for dosingly filling of fluid or pasty material into containers. 4,860,926, Cl. 222-148.000.
Jujo Paper Co., Ltd.: *See—*
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Jumberca, S.A.: *See—*
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Juncosa, Robert D., to American Mediscan, Inc. Apparatus and method for in vitro detection of abnormal tissues. 4,862,092, Cl. 324-450.000
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Jung, Se-Young; and Moon, Tea-Weon, to SamSung Electronkes Co., Ltd. Power feeding and input signal switching control system for video tape recorder combined with television receiver and camera in a body. 4,862,290, Cl. 358-335.000.

Junkosha Co., Ltd.: *See—*
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Sato, Yoshiaki; and Ishikawa, Tazuru, 4,862,066, Cl. 324-65.00P.
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Kabushiki Kaisha Komatsu Seisakusho: *See—*
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Kabushiki Kaisha Machida Seisakusho: *See—*
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Kabushiki Kaisha Meidensha: *See—*
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Kahn, Alan R.; and Chandler, Jennifer K., to Criticare Systems, Inc. Vital signs monitor. 4,860,759, Cl. 128-668.000.
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Kaitz, Miriam J.: *See—*
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Kaitz, Richard A.; and Kaitz, Miriam J., to Miriam Collins - Palm Beach Laboratories Co. Fingernail solution applicator pad and nutrient solution kit. 4,860,736, Cl. 128-155.000.
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Kalvaitis, Arvydas J.; and Ernst, Thomas W., to S&C Electric Company. Switchgear enclosure and method of fabrication. 4,862,324, Cl. 361-390.000
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Kamitake, Takashi; Mizutani, Hiroyuki; and Kawamura, Shin-ichi, to Kabushiki Kaisha Toshiba. Communications network using IC cards. 4,862,501, Cl. 380-50.000.
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Kassabian, Levon. Display apparatus. 4,861,678, Cl. 428-542.400
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Kawabata, Tomoyuki, to Yamaha Corporation. Circuit for detecting defects of a magnetic recording head. 4,862,078, Cl. 324-212.000.
Kawada, Kenji: *See*—
Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, 4,861,913, Cl. 562-427.000.
Kawaguchi, Hisao: *See*—
Nakatani, Hiroshi; Kawaguchi, Hisao; and Nakabu, Shigeo, 4,862,153, Cl. 340-719.000
Kawaguchi, Seiji, to Apollo Seiko Ltd. Wire stripping apparatus and an automatic wiring device which incorporates it. 4,860,427, Cl. 29-564.400
Kawahara, Yoshiharu: *See*—
Nakano, Akira; Higashioka, Hiroshi; Nomura, Masaki; Kawahara, Yoshiharu; Yamashita, Ko; Sano, Yoshito; and Kase, Minoru, 4,861,612, Cl. 426-607.000.
Kawahara, Yoshitaka: *See*—
Hara, Yasuo; Oashi, Ryuji; Kawahara, Yoshitaka; and Takeuchi, Mikio, 4,861,931, Cl. 585-363.000
Kawai, Hironao; Fukui, Shigetoshi; and Ikeda, Kenji, to Morimoto Mfg. Co., Ltd. Waistband sew-in device. 4,860,676, Cl. 112-121.140.
Kawakami, Hiroshi: *See*—
Yamashita, Masashi; Sugihara, Koichi; and Kawakami, Hiroshi, 4,860,842, Cl. 180-140.000.
Kawakami, Kanji: *See*—
Fukuoka, Hirotsugu; Kawakami, Kanji; Aihara, Makoto; Suda, Mitsuo; Takeshita, Kouji; and Isono, Yukihiro, 4,861,398, Cl 156-64.000
Kawaki, Takao: *See*—
Sugio, Akitoshi; Kawaki, Takao; Kobayashi, Makoto; Hayashi, Katsushige; and Watanabe, Masahito, 4,861,854, Cl. 528-125.000.
Kawamorita, Yoichi: *See*—
Hiro, Masaaki; Nakagawa, Masaru; Kawamorita, Yoichi; and Yamazaki, Koji, 4,860,898, Cl. 206-455.000.
Kawamura, Hideaki; and Sasaki, Takao, to Fanuc Ltd. Numerical control unit. 4,862,380, Cl. 364-474.110.
Kawamura, Masaharu, to Canon Kabushiki Kaisha. Auto-bracket device for camera. 4,862,205, Cl. 354-412.000.
Kawamura, Shin-ichi: *See*—
Kamitake, Takashi; Mizutani, Hiroyuki; and Kawamura, Shin-ichi, 4,862,501, Cl. 380-50.000.
Kawano, Tsuyoshi: *See*—
Hashimoto, Yoshio; Kawano, Tsuyoshi; Hasuka, Kaname; and Otomo, Seiji, 4,861,682, Cl. 428-685.000.
Kawasaki, Somei: *See*—
Takei, Masahiro; Sakata, Tsuguhide; Taguchi, Tomishige; and Kawasaki, Somei, 4,862,250, Cl. 358-12.000.
Kawasaki Steel Corporation: *See*—
Satoh, Susumu; Matsuoka, Saiji; Obara, Takashi; Tsunoyama, Kozo; and Irie, Toshio, 4,861,390, Cl. 148-12.00R.
Kawashima, Kenichi: *See*—
Tojo, Kenji; Kawashima, Kenichi; Suefuji, Kazutaka; and Nakamura, Yozo, 4,861,245, Cl. 418-55.000.
Kawashima, Masatoshi; Takechi, Makoto; and Odani, Hiroshi, to Hitachi, Ltd. LST logic circuit. 4,862,068, Cl. 324-73.00R.
Kawata, Koichi: *See*—
Sato, Takeo; Araki, Nobuhiro; Kawata, Koichi; Nomura, Noboru; Ueno, Atushi; and Yoshida, Shotaro, 4,861,148, Cl. 350-505.000
Kawata, Sadao, to Alps Electric Co., Ltd. Method of manufacturing a magnetoresistive sensor. 4,860,432, Cl. 29-602.100.
Kawata, Tomoshi, to Kabushikigaisha Tokyo Kikai Seisakusho. Mesh roller for planography. 4,860,652, Cl. 101-348.000.
Kayaba Industry Co. Ltd.: *See*—
Asaoka, Masaharu, 4,860,788, Cl. 137-491.000.
Kazda, Stanislav: *See*—
Schwenner, Eckhard; Stegelmeier, Hartmut; Kazda, Stanislav; and Knorr, Andreas, 4,861,782, Cl. 514-294.000.

Ke, Victor H.: *See*—
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Kearfott Guidance & Navigation Corporation: *See*—
Ljung, Bo H. G., 4,861,161, Cl. 356-350.000.
Kedjierski, Fred D., to World Electronics, Inc. Hybrid electronic radio repeater. 4,862,514, Cl. 455-161.000.
Kegelman, Thomas B.: *See*—
Rizza, Robert S.; Fagen, Ben W., Jr.; Raymond, Michael W.; Feher, Peter; Milliard, Norman L.; and Kegelman, Thomas B., 4,862,198, Cl. 346-153.100.
Keiter, Alfred: *See*—
Heins, Hans-Peter; Keiter, Alfred; and Jendricke, Hermann, 4,861,177, Cl. 400-208.000.
Keith, Roger H., to Minnesota Mining and Manufacturing Company. Shipping and handling container for two part composition. 4,860,888, Cl. 206-223.000.
Keith, William J.; Parsons, Michael; Smith, Russell P.; Glenn, Christopher J.; and Bell, Stephen. Audiometer with interactive graphic display for children. 4,862,505, Cl. 381-60.000.
Kelber, Jeffry A., to United States of America, Energy. Modification of polymeric surface for improved adhesion via electron beam exposure. 4,861,408, Cl. 156-273.300.
Keller, Bruce A.: *See*—
Ahlstrom, Mark L.; Keller, Bruce A.; and Storch, Randy S., 4,862,357, Cl. 364-407.000.
Keller, Carl E. Stress gauge. 4,860,587, Cl. 73-774.000.
Keller, Heinz J.; and Mueller, Johann R. Extension arrangement and station connecting method for a ring communication system. 4,862,158, Cl. 340-825.050.
Kelley Company, Inc.: *See*—
Erlandsson, Kjell I., 4,861,217, Cl. 414-401.000.
Kelley, Donald J.: *See*—
Barringer, Eric A.; Lieberman, Sheldon I.; Schmidt, Mark S.; Hodge, James D.; Waack, Richard; Kelley, Donald J.; Saxton, Brian W.; and Gruber, William C., 4,861,646, Cl. 428-210.000.
Kellner, Katalin M.: *See*—
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Kelly, Francis P.; Gibbens, Richard J.; Key, Peter B.; Turton, Paul A.; Stacey, Roger R.; and Whitehead, Martin J., to British Telecommunications public limited company. Routing of network traffic. 4,862,496, Cl. 379-221.000.
Kelly, Thomas L. Single ply roof membrane securing system and method of making and using same. 4,860,514, Cl. 52-410.000.
Kemp, Dennis E., Jr., to Basseches, Mark T., a part interest. Speed reduction drive. 4,861,319, Cl. 474-69.000.
Kemp, Norman H., to Advanced Graphics Technology, Inc. Bearing locking apparatus. 4,861,173, Cl. 384-538.000.
Kemp, Richard A., to Shell Oil Company. Hydrotreating with wide-pore hydrogel-derived catalysts. 4,861,460, Cl. 208-216.0PP.
Kenergy Enterprises Limited Partnership: *See*—
Weisner, Kent A.; and Walls, Lester L., Jr., 4,860,511, Cl. 52-200.000.
Kennard, Frederick: *See*—
Dinger, Bruce R.; McClanahan, Mark R.; Quinn, David B.; and Kennard, Frederick, 4,860,499, Cl. 51-165.740.
Kenney, Andrew C.; Thompson, Philip W.; and Harris, John L., to Oros Systems Limited. Automatic chromatography process. 4,861,488, Cl. 210-656.000.
Kent Adhesive Products Company: *See*—
Barnette, C. Joseph, 4,861,636, Cl. 428-41.000.
Kent, Stephen B. H.: *See*—
Neurath, Alexander R.; and Kent, Stephen B. H., 4,861,588, Cl. 424-89.000.
Kepplinger, Werner: *See*—
von Bogdandy, Ludwig; Kepplinger, Werner; Stift, Kurt; Papst, Gero; and Hauk, Rolf, 4,861,369, Cl. 75-38.000.
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Hummerich, Rainer; Kerber, Michael; Maempel, Lothar; and Weyland, Peter, 4,861,826, Cl. 524-839.000.
Kerdix, Inc.: *See*—
Muchnik, Boris J.; and Robertson, Frank H., III, 4,861,671, Cl. 428-457.000.
Kerslake, James L. Can draining implement. 4,860,647, Cl. 100-234.000.
Kerstein, Melvin, to Bell & Howell Co. Idler release pulley lever mechanism for document transport. 4,861,018, Cl. 271-274.000.
Kesicki, Edward A.: *See*—
Stolowitz, Mark L.; Dixit, Vyas M.; and Kesicki, Edward A., 4,861,726, Cl. 436-89.000.
Keskey, William H.; and Meath, Kenneth R., to Dow Chemical Company, The. Latexes as binders for cast ceiling tiles. 4,861,822, Cl. 524-559.000.
Kessel, David, to Wayne State University. Hematoporphyrin derivative and method of preparation and purification. 4,861,876, Cl. 540-145.000.
Kessler, Gerald. Low friction plastic weatherstrip. 4,860,495, Cl. 49-498.000.
Kester, John J.: *See*—
Volkmann, Curtis L.; Kester, John J.; and Stevens, Gregory A., 4,861,407, Cl. 156-272.800.
Ketema, Inc.: *See*—
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Key, Peter B.: *See*—
Kelly, Francis P.; Gibbens, Richard J.; Key, Peter B.; Turton, Paul A.; Stacey, Roger R.; and Whitehead, Martin J., 4,862,496, Cl. 379-221.000.
Keyes, Marion A., IV: *See*—
Dziubakowski, Donald J.; Keyes, Marion A., IV; and Shaffer, Jeremiah J., 4,861,233, Cl. 417-201.000.
Khanna, Yash P., to Allied-Signal Inc. Process for production of quasi-random copolymers from homopolymers. 4,861,838, Cl. 525-432.000.
Khare, Ashok E., to National Forge Company. Roller caster shell steel. 4,861,549, Cl. 420-109.000.
Khorin, Vladimir N.: *See*—
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Khudenko, Boris M.: *See*—
Gitman, Gregory M.; and Khudenko, Boris M., 4,861,262, Cl. 431-5.000.
Khutoretsky, Garri M.; Tjurin, Jury G.; Yakovlev, Viktor S.; and Varshavsky, Vladimir D. Rotor of electric machine with superconducting field winding. 4,862,022, Cl. 310-52.000.
Kicherer, Robert; Schreder, Felix; and Reif, Stefan, to E.G.O. Elektro-Gerate Blanc u. Fischer. Electric hotplate, apparatus and method for fitting a cover plate thereto. 4,861,969, Cl. 219-458.000.
Kichline, Timothy J. Portable electric smoke detector/alarm flashlight. 4,862,148, Cl. 340-628.000.
Kida, Masaaki; Kitabata, Isako; Kubotsu, Kazuhisa; and Sakata, Yoshitsugu, to Wako Pure Chemical Industries, Ltd. Novel functionallized liposomes and a process for production thereof. 4,861,597, Cl. 424-450.000.
Kidawara, Atsushi; Nishikori, Toshiaki; Kanno, Masahide; Yabe, Hisao; Katoh, Shinichi; Ikuno, Yuji; and Nakamura, Takeaki, to Olympus Optical Co., Ltd. Multiple characteristic endoscope light source for frame sequential color imaging, mosaic color imaging and fiber image guide scopes. 4,862,258, Cl. 358-98.000.
Kiefer, Dieter; and Grommes, Helmut, to Deutsche Babcock Werke Aktiengesellschaft. Bowl-mill crusher. 4,860,962, Cl. 241-117.000.
Kieser, Wolfgang, to Elopak A/S. Sealing of container closure. 4,860,902, Cl. 206-631.300.
Kihara, Tomohiko: *See*—
Tsuda, Kazuhiro; Kihara, Tomohiko; and Suzuki, Kaoru, 4,862,003, Cl. 250-363.020.
Kihira, Hiroshi: *See*—
Matsuoka, Kazumi; Kihira, Hiroshi; Ito, Satoshi; and Murata, Tomomi, 4,861,453, Cl. 204-404.000.
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, to Tokyo Keiki Co., Ltd. Heating apparatus for hyperthermia. 4,860,770, Cl. 128-804.000.
Kikuchi, Nobuaki: *See*—
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Kikuchi, Shuichi, to Ricoh Company, Ltd. Small-size zoom lens of widely variable magnification. 4,861,145, Cl. 350-427.000.
Kile, Edwin N.; Irwin, Gary W.; and Hartness, Samuel S., to Kile Technology Corporation. Line regulated ballast circuit. 4,862,039, Cl. 315-194.000.
Kile Technology Corporation: *See*—
Kile, Edwin N.; Irwin, Gary W.; and Hartness, Samuel S., 4,862,039, Cl. 315-194.000.
Killgoar, Paul C., Jr.: *See*—
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Kim, Michelle Y.: *See*—
Dishon, Yitzhak; and Kim, Michelle Y., 4,862,411, Cl. 364-952.000.
Kim, Oh-Kil, to United States of America, Navy. Conductive polymers of transition-metal complexes coordinated by a diamino-dichalcogenbenzene compound. 4,861,859, Cl. 528-210.000.
Kimberly-Clark Corporation: *See*—
Lippert, Mary E.; Enloe, Kenneth M.; Koch, Debra J.; Roessler, Thomas H.; and Pazdernik, Patrick A., 4,861,652, Cl. 428-284.000.
Rajala, Gregory J.; and King, Lon M., 4,861,399, Cl. 156-66.000.
Kimura, Shiro. Tubular container for centrifugal separation. 4,861,477, Cl. 210-359.000.
Kimura, Toshinari: *See*—
Muratani, Takuro; Kobayashi, Hideo; and Kimura, Toshinari, 4,862,104, Cl. 331-1.00A.
Kimura, Tsutomu; and Hishinuma, Kazuhiro, to Fuji Photo Film Co., Ltd. Signal processing method in autoradiography. 4,862,358, Cl. 364-413.000.
Kimura, Tsutomu; and Hishinuma, Kazuhiro, to Fuji Photo Film Co., Ltd. Signal processing method in autoradiography. 4,862,360, Cl. 364-413.010.
Kimura, Tsutomu: *See*—
Saotome, Shigeru; Kimura, Tsutomu; and Nakajima, Nobuyoshi, 4,861,994, Cl. 250-327.200.
Kimura, Yoshikatsu: *See*—
Morimoto, Takeshi; Sanada, Yasuhiro; Ohashi, Shinichi; and Kimura, Yoshikatsu, 4,862,328, Cl. 361-502.000.
King, Lon M.: *See*—
Rajala, Gregory J.; and King, Lon M., 4,861,399, Cl. 156-66.000.
King, Robert D., to General Electric Company. Combined electric starter and alternator system using a permanent magnet synchronous machine. 4,862,009, Cl. 290-22.000.
Kingham, James R. Fixture and method of laying shingles on the surface of a roof or vertical wall. 4,860,518, Cl. 52-748.000.

Kingport International Corporation: *See—*
Gerch, Edward L., 4,860,563, Cl. 70-456.00R

Kingston, William. Multi-cycle sea bed traversing system. 4,860,487, Cl. 43-102.000.

Kino, Gordon S.; and Corle, Timothy R., to Leland Stanford Junior University, The Board of Trustees of the. Variable focus optical system and method using electro-optic material. 4,861,975, Cl. 250-201.000.

Kino, Takuya: *See—*
Tamaki, Yoji; Kino, Takuya; Ito, Takashi; and Nakamura, Akihiko, 4,860,461, Cl. 34-68.000.

Kinoshita, Kazumi: *See—*
Tojo, Toshiro; Takato, Kenji; Kinoshita, Kazumi; and Yamamoto, Yuzo, 4,862,309, Cl. 361-56.000.

Kinoshita, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Starter. 4,860,604, Cl. 74-7.00E.

Kipross, Stanley, to Hulett Aluminium Limited. Framework structure for windows and doors. 4,860,517, Cl. 52-656.000.

Kirk, William F.; Wass, Anthony C. L.; Baum, Eric A.; Tansey, Ian P.; and Meredith, William G., to Riker Laboratories, Inc. Powder inhalation device. 4,860,740, Cl. 128-203.150

Kirschner, Jonathan; Smazik, Kenneth G.; and Paisley, Gary V., to Coca-Cola Company, The. Postmix juice dispensing system. 4,860,923, Cl. 222-1.000.

Kishida, Yoshihiro: *See—*
Sasada, Shigeru; Nagata, Shinichi; Hirosawa, Makoto; and Kishida, Yoshihiro, 4,861,983, Cl. 250-235.000.

Kitabata, Isako: *See—*
Kida, Masaaki; Kitabata, Isako; Kubotsu, Kazuhisa; and Sakata, Yoshitsugu, 4,861,597, Cl. 424-450.000.

Kitamura, Hiroki: *See—*
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Klar, Erhard; Svilar, Mark; and Berry, David F., to SCM Metal Products, Inc. Infiltrated powder metal part having improved impact strength tensile strength and dimensional control and method for making same. 4,861,373, Cl. 75-244.000.

Klausener, Alexander: *See—*
Fengler, Gerd; Klausener, Alexander; Buysch, Hans-Josef; Mardin, Mithat; and Pelster, Bernhard, 4,861,878, Cl. 544-48.000.

Klein, Siegfried, to Klein, Siegfried; and Commissariat a l'Energie Atomique. Wide pass band elastic wave omnidirectional transducer. 4,862,430, Cl. 367-168.000.

Kleinberg, Leonard L., to United States of America, National Aeronautics and Space Administration. Crystal oscillators using negative voltage gain, single pole response amplifiers. 4,862,114, Cl. 331-158.000.

Kleinschmidt, Eric W.; Kloss, Thomas M., Jr.; and Bell, William R., to Gila River Products, Inc. Materials for laminating flexible printed circuits. 4,861,648, Cl. 428-40.000.

Kleinschmit, Peter: *See—*
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Klim, William T.: *See—*
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Klocke, Hartmut: *See—*
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Kloeckner CRA Technologie GmbH: *See—*
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Kloss, Thomas M., Jr.: *See—*
Kleinschmidt, Eric W.; Kloss, Thomas M., Jr.; and Bell, William R., 4,861,648, Cl. 428-40.000

Klugkist, Jan: *See—*
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Kluss, Walter J.: *See—*
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Knapp, Heinrich: *See—*
Hafner, Udo; and Knapp, Heinrich, 4,860,710, Cl. 123-470.000.

Knaul, Per; Schelhorn, Fritz; and Witte, Roland, to B.A.T. Cigarettenfabriken GmbH. Apparatus for cleaning of an endless conveyor belt. 4,860,883, Cl. 198-495.000.

Knee, Michael J.: *See—*
Wells, Nicholas D.; Knee, Michael J.; and Sandbank, Charles P., 4,862,264, Cl. 358-138.000.

Knight, Eldon L. Circuit with memory for detecting intermittent changes in resistance, current, voltage, continuity, power interruption, light, and temperature. 4,862,142, Cl. 340-522.000

Knight, Patricia M.: *See—*
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Knobel, Thomas M.: *See—*
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Knoepke, John R.: *See—*
Moscoe, Gerald F.; Mastervich, Joel C.; Kreevich, William J.; Knoepke, John R.; Rellis, Daniel, Jr.; Glennon, Roger J.; and Pielet, Howard M., 4,860,819, Cl. 164-437.000.

Knolle, Jochen: *See—*
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Knorr, Andreas: *See—*
Schwenner, Eckhard; Stegelmeier, Hartmut; Kazda, Stanislav; and Knorr, Andreas, 4,861,782, Cl. 514-294.000.

Knott, Robert F.: *See—*
Blytas, George C.; and Knott, Robert F., 4,861,447, Cl. 204-181.800.

Knutti, James W.; Allen, Henry V.; Petersen, Kurt E.; and Kowalski, Carl R., to Tactile Perceptions, Inc. Method of making a semiconductor transducer. 4,861,420, Cl. 156-633.000.

Ko, Harvey W.; Hart, Lynn W.; and Skura, Joseph P., to Johns Hopkins University, The. Electromagnetic bone healing sensor using a multi-coil sensor array. 4,860,756, Cl. 128-653.000.

Kobayashi, Haruo: *See—*
Ootsuka, Hiroshi; Tominaga, Shinji; Kobayashi, Haruo; Matsushita, Shuzo; Hoda, Takeo; and Mukai, Hiromu, 4,862,206, Cl. 354-414.000

Kobayashi, Hideo: *See—*
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Kobayashi, Hiroshi; and Ichikawa, Toshiro, to Nissan Motor Company, Limited; and Atsugi Motor Parts Company, Limited. Electrostatic capacity-type stroke sensor and dielectric material therefor. 4,862,063, Cl. 324-61.00P

Kobayashi, Kazuyuki, to Mitsubishi Jukogyo Kabushiki Kaisha. Control device for a vertical shaft type engine. 4,860,608, Cl. 74-501.600.

Kobayashi, Makoto: *See—*
Sugio, Akitoshi; Kawaki, Takao; Kobayashi, Makoto; Hayashi, Katsushige; and Watanabe, Masahito, 4,861,854, Cl. 528-125.000.

Kobayashi, Masanori; Matsuura, Isao; Wakatsuki, Akira; and Shida, Yu, to Sumitomo Chemical Company. Polyvinyl chloride resin composition for powder molding. 4,861,816, Cl. 524-204.000.

Kobayashi, Toshimitsu; Inagaki, Akio; Kobayashi, Yasuhiro; Mori, Masanori; and Sakakibara, Takashi, to Aisin Seiki Kabushiki Kaisha. Belt having embedded wires interlaced across lengthwise surfaces of shafts. 4,861,323, Cl. 474-260.000.

Kobayashi, Yasuhiro: *See—*
Kobayashi, Toshimitsu; Inagaki, Akio; Kobayashi, Yasuhiro; Mori, Masanori; and Sakakibara, Takashi, 4,861,323, Cl. 474-260.000.

Kobayashi, Yasuo; and Endo, Masahiko, to Yazaki Corporation. Waterproof connecting structure for connector. 4,861,282, Cl. 439-540.000.

Koberstein, Edgar: *See—*
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Kobliska, Robert J.; and Li, Eric K., to Akashic Memories Corporation. Protective layer for magnetic disk. 4,861,662, Cl. 428-408.000.

Koch, Debra J.: *See—*
Lippert, Mary E.; Enloe, Kenneth M.; Koch, Debra J.; Roessler, Thomas H.; and Pazdernik, Patrick A., 4,861,652, Cl. 428-284.000.

Kock, Hans-Jakob; Hisgen, Bernd; Portugall, Michael; Seiler, Erhard; and Blinne, Gerd, to BASF Aktiengesellschaft. Wholly aromatic thermotropic polyesters. 4,861,858, Cl. 528-193.000.

Koden, Mitsuhiro, to Sharp Kabushiki Kaisha. Thin-film transistor. 4,862,234, Cl. 357-23.700.

Koenig & Bauer Aktiengesellschaft: *See—*
Michalik, Horst B., 4,861,019, Cl. 271-315.000.

Koenig, David G., to OI-NEG TV Products, Inc. Package assembly for glass funnel parts. 4,860,894, Cl. 206-421.000.

Koerner, Hans J.: *See—*
Boehm, Russell W.; Guinn, Rex A.; and Koerner, Hans J., 4,861,534, Cl. 264-102.000.

Koga, Youichiro: *See—*
Yoshimi, Satoshi; and Koga, Youichiro, 4,860,506, Cl. 52-144.000.

Kohge, Shinichi: *See—*
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Kohjin Co., Ltd.: *See—*
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Kohl, Helmut: *See—*
Friesen, Heinz-Jurgen; Grenner, Gerd; Pauly, Hans-Erwin; Kohl, Helmut; Habenstein, Klaus; and Stark, Joseph, 4,861,711, Cl. 436-7.000.

Kohl, James W.; and Belcher, Mark D., to Donaldson Company, Inc. Articulatable fume exhauster trunk. 4,860,644, Cl. 98-115.400.

Kohler, Manfred; Ohngemach, Jorg; Wehner, Gregor; and Gehlhaus, Jurgen, to Merck Patent Gesellschaft mit Beschrankter Haftung. Photoinitiators for photopolymerization of unsaturated systems. 4,861,916, Cl. 568-337.000.

Kohlheb, Robert; and Rautenbach, Robert, to Amafilter Membrantechnik GmbH. Separator cell for pressure filtering and reverse osmosis. 4,861,476, Cl. 210-321.760.

Kohsaka, Masanobu; Terano, Hiroshi; Komori, Tadaaki; Iwami, Morita; Yamashita, Michio; Hashimoto, Masashi; Uchida, Itsuo; and Takase, Shigehiro, to Fujisawa Pharmaceutical Co., Ltd. Method of treating tumors using tetracyclo compounds. 4,861,774, Cl. 514-299.500.

Koike, Eishi, to Ozen Corporation. Index carrier for indexing and reproducing a plurality of record discs and a simplified sound reproducing device incorporating thereof. 4,862,444, Cl. 369-67.000.

Koike, Kiyoshi; Tsuchiya, Hiroshi; and Hayakawa, Tsuyoshi, to Hamamatsu Photonics Kabushiki Kaisha. Radiation dose measuring method and apparatus with nuclide discrimination function. 4,862,004, Cl. 250-369.000.

Koike, Norio: *See—*
Ando, Haruhisa; Nakai, Masaaki; Ono, Hideyuki; Ozaki, Toshifumi; Ohba, Shinya; and Koike, Norio, 4,862,487, Cl. 377-58.000.

Koike, Takashi, to Sanshin Kogyo Kabushiki Kaisha. Marine engine protection device. 4,861,291, Cl. 440-1.000.

Koishi, Toshio: *See—*
Maeda, Kazuhiko; Yamauchi, Taku; and Koishi, Toshio, 4,861,835, Cl. 525-200.000.

Koito Manufacturing Co., Ltd.: *See—*
Machida, Tsutomu; Mochizuki, Toshiyasu; and Sasaki, Masaru, 4,862,330, Cl. 362-61.000.
Shibata, Hiroki; Toda, Atsushi; Takahashi, Kazuki; and Wada, Kiyoshi, 4,860,601, Cl. 73-865.800.

Koito Seisakusho Co., Ltd.: *See—*
Nino, Naohi, 4,862,329, Cl. 362-61.000.
Ohshio, Hirohiko; Makita, Horoyuki; Nagasawa, Hidehiko; Kurosawa, Yoshiki; and Koyanagi, Yoshinobu, 4,862,337, Cl. 362-294.000.

Koizumi, Tosio: *See—*
Hirabayashi, Michio; Koizumi, Tosio; and Shibao, Kiyotada, 4,860,436, Cl. 29-622.000.

Kojima, Masanori, to Mitsubishi Denki Kabushiki Kaisha. Signal processing system using a compressor and an expander. 4,862,118, Cl. 333-14.000

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Muratani, Takuro; Kobayashi, Hideo; and Kimura, Toshinari, 4,862,104, Cl. 331-1.00A.

Kolb, Roland; and Weber, Jurg, to BBC Brown Boveri AG. Spiral displacement machine with concave circular arcs sealingly engaging circular steps. 4,861,244, Cl. 418-15.000.

Koller, Gregory V.; and Koller, Harold A. Portable cushioned floor system. 4,860,516, Cl. 52-480.000.

Koller, Harold A.: *See—*
Koller, Gregory V.; and Koller, Harold A., 4,860,516, Cl. 52-480.000

Komatsu, Norimasa, to Alps Electric Co., Ltd. Double cassette tape player. 4,862,301, Cl. 360-92.000.

Komischke, Karl-Heinz, to Schmalbach-Lubeca AG. Closure for receptacles for receiving free-flowing filling material. 4,860,934, Cl. 222-534.000.

Komori Printing Machinery Co., Ltd.: *See—*
Ohyoshi, Hisaaki; and Saito, Nobuaki, 4,861,016, Cl. 271-215.000.

Komori, Tadaaki: *See—*
Kohsaka, Masanobu; Terano, Hiroshi; Komori, Tadaaki; Iwami, Morita; Yamashita, Michio; Hashimoto, Masashi; Uchida, Itsuo; and Takase, Shigehiro, 4,861,774, Cl. 514-299.500.

Kondo, Kazuo; and Kurachi, Tatsunori, to NGB Spark Plug co., Ltd. Method of manufacturing a thermal printing head having a partially-glazed ceramic substrate. 4,861,625, Cl. 427-126.200.

Kondo, Masafumi: *See—*
Suyama, Takahiro; Takahashi, Kosei; Kondo, Masafumi; and Hayakawa, Toshiro, 4,862,470, Cl. 372-45.000.

Kondo, Takayuki; and Morishita, Muneki, to Omron Tateisi Electronics Co. Card reader. 4,861,974, Cl. 235-475.000.

Kondo, Yasuaki: *See—*
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,861,792, Cl. 514-389.000.

Kondoh, Tadami: *See—*
Suzuki, Isao; Hirabayashi, Kazuo; Kondoh, Tadami; and Nishijima, Hiroaki, 4,861,934, Cl. 585-415.000.

Konica Corporation: *See—*
Suzuki, Akio; Yoshida, Eiji; Nagasaki, Satoru; Arai, Masumi; and Tsuji, Nobuaki, 4,861,702, Cl. 430-564.000.

Konig, Wolfgang: *See—*
Breipohl, Gerhard; Knolle, Jochen; Konig, Wolfgang; and Scholkens, Bernward, 4,861,755, Cl. 514-11.000.

Konishi Co., Ltd.: *See—*
Miura, Ryuichi; and Nakao, Toshinobu, 4,861,401, Cl. 156-94.000.

Konishi, Keiichi: *See—*
Isozumi, Shuzoo; and Konishi, Keiichi, 4,862,027, Cl. 310-99.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Umeda, Toshikazu; Funaki, Shinsuke; and Nozu, Taketo, 4,862,196, Cl. 346-108.000.

Konno, Junichi: *See—*
Fujimura, Shuzo; and Konno, Junichi, 4,861,424, Cl. 156-643.000.
Fujimura, Shuzo; and Konno, Junichi, 4,861,732, Cl. 437-229.000.

Konopka, John G., to Zenith Electronics Corporation. Constant current source and battery charger. 4,862,013, Cl. 307-254.000.

Kontoghiorghes, George: *See—*
Hider, Robert C.; Kontoghiorghes, George; and Stockham, Michael A., 4,861,767, Cl. 514-184.000.

Konuma, Toshimitsu: *See—*
Yamazaki, Shunpei; Inujima, Takashi; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Sakama, Mitsunori; Miyazaki, Minoru; Koyanagi, Kaoru; and Yamaguchi, Toshiharu, 4,861,143, Cl. 350-350.00S.

Koomen, Joannes J. M.: *See—*
Cuppens, Roger; and Koomen, Joannes J. M., 4,862,418, Cl. 365-201.000.

Koop, Hermann; and Pechtheiden-Meier, Claudia, to Philips & DuPont Optical Company. Method of manfacturing a mould and providing it with a backing and mould manufactured according to the invention. 4,861,437, Cl. 204-5.000.

Korber AG: *See—*
Hensgen, Gerhard; Heitmann, Uwe; Brand, Peter; and Pinck, Peter, 4,860,772, Cl. 131-84.100.
Pawelko, Karl-Heinz, 4,860,623, Cl. 83-346.000.

Koren, Izchak; Gates, Robert J.; and Smith, Craig J. Actuating device and key. 4,860,562, Cl. 70-352.000.

Korenberg, Jacob, to Donlee Technologies, Inc. Cyclone combustion apparatus. 4,860,695, Cl. 122-136.00R.

Korf Engineering GmbH: *See—*
von Bogdandy, Ludwig; Kepplinger, Werner; Stift, Kurt; Papst, Gero; and Hauk, Rolf, 4,861,369, Cl. 75-38.000.

Kornecki, Tadeusz: *See—*
Peterson, Donald L.; and Kornecki, Tadeusz, 4,860,529, Cl. 56-330.000.

Koromilas, Constantinos A., to General Motors Corporation. Positive displacement rotary mechanism. 4,860,705, Cl. 123-246.000.

Kosak, Dietmar: *See—*
Engel, Georg; and Kosak, Dietmar, 4,860,426, Cl. 29-527.700.

Koshiishi, Shinichiro: *See—*
Sasaki, Saburo; Himuro, Keiji; and Koshiishi, Shinichiro, 4,862,203, Cl. 354-400.000.

Koshimizu, Chishio; Hayakawa, Yasuo; Nonaka, Toshio; and Takeda, Sakae, to Hitachi Construction Machinery Co., Ltd. Ultrasonic inspection apparatus. 4,862,383, Cl. 364-507.000.

Kost, Friedrich; Van Zanten, Anton; Heess, Gerhard; and Kreisselmeier, Gerhard, to Robert Bosch GmbH. Method for adjusting optimal wheel slip. 4,862,368, Cl. 364-426.020.

Kostrewa, Ludwig, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Bucket conveyor, particularly for unloading ships. 4,860,884, Cl. 198-509.000.

Kotler, Daniel, to Duragrid, Inc. Modular protective surfacing member. 4,860,510, Cl. 52-177.000

Kotynski, Robert J.: *See—*
Smedberg, Kenneth L.; Bozich, George J.; and Kotynski, Robert J., 4,860,571, Cl. 72-453.130.

Kovac, Caroline A.: *See—*
Bickford, Harry R.; Bregman, Mark F.; Moskowitz, Paul A.; Palmer, Michael J.; Reiley, Timothy C.; Poore, Paige A.; and Kovac, Caroline A., 4,862,322, Cl. 361-386.000.

Kovacs, Ferenc; Lengyel, Miklosne ; Nagy, Tibor; Antal, Sandor; Gyongyosi, Gyorgy; Palotas, Laszlo ; and Pfisztner, Nandor, to Taurus Gumiipari Vallalat. Reinforced flexible hose. 4,860,798, Cl 138-133.000

Kowalski, Carl R.: *See—*
Knutti, James W.; Allen, Henry V.; Petersen, Kurt E.; and Kowalski, Carl R., 4,861,420, Cl. 156-633.000

Kowarsch, Heinrich: *See—*
Radtke, Volker; Kowarsch, Heinrich; and Hahn, Erwin, 4,861,898, Cl. 548-402.000.

Koyama, Kazuhito; Sugita, Shigehisa; Sakaguchi, Seiichiro; Seiki, Nobuhiro; and Hanzawa, Asao, to Hitachi, Ltd. Fuel reforming apparatus. 4,861,348, Cl. 48-94.000.

Koyama, Takashi: *See—*
Hirose, Ichiro; Tani, Shichisei; Inamura, Motonori; and Koyama, Takashi, 4,861,324, Cl. 493-48.000.

Koyanagi, Hiroaki: *See—*
Miyamoto, Norifumi; Sato, Yoshio; Tsuboi, Nobuyoshi; Shimada, Satoshi; Sasaki, Hiroshi; Koyanagi, Hiroaki; and Minemura, Hiroyuki, 4,862,440, Cl. 369-45.000.

Koyanagi, Kaoru: *See—*
Yamazaki, Shunpei; Inujima, Takashi; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Sakama, Mitsunori; Miyazaki, Minoru; Koyanagi, Kaoru; and Yamaguchi, Toshiharu, 4,861,143, Cl. 350-350.00S.

Koyanagi, Toru: *See—*
Haga, Takahiro; Toki, Tadaaki; Koyanagi, Toru; Fujii, Yasuhiro; Yoshida, Kiyomitsu; and Imai, Osamu, 4,861,799, Cl. 514-594.000.
Haga, Takahiro; Shigehara, Itaru; Koyanagi, Toru; Hara, Kazutoshi; and Maeda, Masaru, 4,861,886, Cl. 546-16.000.

Koyanagi, Yoshinobu: *See—*
Ohshio, Hirohiko; Makita, Horoyuki; Nagasawa, Hidehiko; Kurosawa, Yoshiki; and Koyanagi, Yoshinobu, 4,862,337, Cl. 362-294.000.

Koyo Seiko Co., Ltd.: *See—*
Adachi, Takehiro, 4,861,171, Cl. 384-455.000

Kozisek, Thomas G.: *See—*
Engleman, Ivan M.; and Kozisek, Thomas G., 4,862,058, Cl. 323-298.000.

Kozo Iizuka, Director General, Agency of Industrial Science and Technology: *See—*
Nishimura, Tadashi; Inoue, Yasuo; Sugahara, Kazuyuki; and Kusunoki, Shigeru, 4,861,418, Cl. 156-620.720.

Krabill, Robert H.: *See—*
Clark, David E.; and Krabill, Robert H., 4,861,410, Cl. 156-325.000.

Kramer, Andreas; and Darms, Roland, to Ciba-Geigy Corporation. Allylbicyclo[2.2.1]hept-5-ene-2-carboxylic acid amides. 4,861,885, Cl. 544-387.000.

Kraska, Robert E.: *See—*
Lessar, Joseph F.; Rosenberg, Duane L.; Kraska, Robert E.; Speckien, James M.; and Upton, James E., 4,860,446, Cl. 29-858.000.

Krause, Werner: *See—*
Gonzalez, Rene-Andres A.; Emmerling, Winfried; Krause, Werner; Podola, Tore; and Neitzer, Klaus, 4,861,863, Cl. 528-408.000.

Krebs, James J.: *See*—
Krowne, Clifford M.; Prinz, Gary A.; and Krebs, James J., 4,862,119, Cl. 333-24.00R.

Kreevich, William J.: *See*—
Moscoe, Gerald F.; Mastervich, Joel C.; Kreevich, William J.; Knoepke, John R.; Rellis, Daniel, Jr.; Glennon, Roger J.; and Pielet, Howard M., 4,860,819, Cl. 164-437.000.

Kreisselmeier, Gerhard: *See*—
Kost, Friedrich; Van Zanten, Anton; Heess, Gerhard; and Kreisselmeier, Gerhard, 4,862,368, Cl. 364-426.020.

Kress, Hans-Jurgen; Paul, Winfried; Peters, Horst; Lindner, Christian; and Buekers, Josef, to Bayer Aktiengesellschaft. Thermoplastic polycarbonate moulding materials. 4,861,829, Cl. 525-92.000.

Kress, Hans-Jurgen: *See*—
Damrath, Volker; Lindner, Christian; Kress, Hans-Jurgen; and Wittmann, Dieter, 4,861,831, Cl. 525-100.000.

Krevor, David H.; and Martens, Paul, to Raychem Corporation. Dimensionally-recoverable damping article. 4,860,851, Cl. 181-207.000.

Kricheldorf, Hans-Rytger; Pakull, Ralf; Eckhardt, Volker; and Dicke, Hans-Rudolf, to Bayer Aktiengesellschaft. Thermotropic polyesterimide from N-carboxyalkylene trimellitimide having excellent processibility, a process for their production and their use for the production of moldings, filaments, fibers and films. 4,861,857, Cl. 528-170.000.

Krieg, Ronald K.; and Drumheller, John A., to Concept R.K.K. Limited. Closed cryogenic barrier for containment of hazardous material migration in the earth. 4,860,544, Cl. 62-45.100.

Krieger, Kurt. Method of operating a gas-infrared radiator, and the gas-infrared radiator. 4,861,261, Cl. 431-1.000.

Krisa, Michael. Vehicle lifting and towing attachment. 4,861,221, Cl. 414-563.000.

Krisher, James A.; and Lloyd, Barry R., to Dana Corporation. Voice actuated two speed axle. 4,862,363, Cl. 364-424.100.

Kriss, George H., II. Electrical circuit for controlling the operation of high intensity motorcycle lamps. 4,862,036, Cl. 315-82.000.

Krivi, Gwen G., to Monsanto Company. Production of proteins in procaryotes. 4,861,868, Cl. 530-399.000.

Kroha, John L., to Flexon, Inc. Fuel filter coupling. 4,861,474, Cl. 210-232.000.

Krowne, Clifford M.; Prinz, Gary A.; and Krebs, James J., to United States of America, Navy. Non-reciprocal semiconductor device. 4,862,119, Cl. 333-24.00R

Krueger, John G., to Krueger Transport Equipment Pty. Ltd. Curtain sided trailers. 4,861,094, Cl. 296-181.000

Krueger Transport Equipment Pty. Ltd.: *See*—
Krueger, John G., 4,861,094, Cl. 296-181.000.

Krupp Polysius AG: *See*—
Durr, Manfred; Unland, Georg; Driemeier, Gunter; Krutzner, Karl; Schmits, Heinz-Herbert; von Seebach, Michael; Heinemann, Otto; Rother, Wolfgang; and Dreyer, Dieter, 4,861,265, Cl. 432-103.000.

Kruse, Lawrence I.: *See*—
Coates, William J.; and Kruse, Lawrence I., 4,861,773, Cl. 514-222.800.

Krutzner, Karl: *See*—
Durr, Manfred; Unland, Georg; Driemeier, Gunter; Krutzner, Karl; Schmits, Heinz-Herbert; von Seebach, Michael; Heinemann, Otto; Rother, Wolfgang; and Dreyer, Dieter, 4,861,265, Cl. 432-103.000.

Ku, Wayne W., to Eastman Kodak Company. Cleaning device for electrostatic imaging apparatus. 4,862,224, Cl. 355-200.000.

Kubli, Rudolf; and Wachter, Hanspeter, to Mettler Instruments AG. Apparatus, specifically a balance, having a display of results of successive function sequences. 4,862,401, Cl. 364-710.070.

Kubo, Kazuhiko; Saitou, Susumu; Usui, Akira; and Nagai, Hiroyuki, to Matsushita Electric Industrial Co., Inc. Shielding device. 4,861,941, Cl. 174-35.00R.

Kubota, Atsuko; Matsushita, Yoshiaki; and Ohwada, Yoshiaki, to Kabushiki Kaisha Toshiba. Method for predicting density of micro crystal defects in semiconductor element from silicon wafer used in the manufacture of the element, and infrared absorption measurement apparatus for this method. 4,862,000, Cl. 250-341.000.

Kubota, Masaru: *See*—
Hiraga, Imao; Shimura, Noriaki; Okakura, Yojiro; Kubota, Masaru; and Takashi, Osamu, 4,862,432, Cl. 368-88.000.
Nakagawa, Nozomu; Kubota, Masaru; and Chino, Shuichi, 4,861,814, Cl. 524-102.000.

Kubotsu, Kazuhisa: *See*—
Kida, Masaaki; Kitabata, Isako; Kubotsu, Kazuhisa; and Sakata, Yoshitsugu, 4,861,597, Cl. 424-450.000.

Kudo, Hiroaki: *See*—
Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; Sakane, Chitose; and Yoshida, Toshihiko, 4,862,472, Cl. 372-45.000.

Kudo, Yoshinobu: *See*—
Taniguchi, Nobuyuki; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; Hoda, Takeo; and Ueda, Hiroshi, 4,862,201, Cl. 354-105.000

Kudou, Makoto; and Ichikawa, Katsumi, to Kabushiki Kaisha Toshiba. Method of manufacturing shadow mask and apparatus. 4,861,422, Cl. 156-640.000

Kudwa, Frank J.: *See*—
Cwycyshyn, Walter; and Kudwa, Frank J., 4,860,864, Cl. 192-56.00R

Kuehl, Guenter H.; and Landis, Michael E., to Mobil Oil Corporation. Novel silicate. 4,861,570, Cl. 423-326.000.

Kuehn, Gebhard: *See*—
Bertleff, Werner; Maerkl, Robert; Magnussen, Peter; Kuehn, Gebhard; and Stops, Peter, 4,861,895, Cl. 546-353.000

Kuehnle, Manfred R. Optoelectronic recording tape or strip comprising photoconductive layer on thin, monocrystalline, flexible sapphire base. 4,862,414, Cl. 365-106.000.

Kuhn, Jonathan C.: *See*—
Ulitzur, Shimon Y.; and Kuhn, Jonathan C., 4,861,709, Cl. 435-6.000.

Kuhner, Rudolf; Schmitt, Gunter K.; and Stab, Rudolf, to Albert-Frankenthal AG. Modular folding apparatus. 4,861,326, Cl. 493-359.000.

Kuisma, Heikki, to Vaisala Oy. Capacitive pressure transducer. 4,862,317, Cl. 361-283.000.

Kulite Semiconductor: *See*—
Ainsworth, Roger W.; Allen, John L.; and Kurtz, Anthony D., 4,860,442, Cl. 29-8.320.

Kulkarni, Chidambar L.: *See*—
Lim, Drahoslav; and Kulkarni, Chidambar L., 4,861,840, Cl. 525-326.500.

Kumada, Shoji: *See*—
Karashima, Kunihiko; Kumada, Shoji; Yoshida, Katsumasa; and Katase, Hiroharu, 4,862,044, Cl. 318-254.000.

Kumar, Manoj: *See*—
Dias, Daniel M.; and Kumar, Manoj, 4,862,454, Cl. 370-94.000.

Kump, Danny J.: *See*—
Schott, David B.; Kump, Danny J.; and Conway, Gerald A., 4,860,905, Cl. 211-59.100.

Kunczynski, Alexander J.: *See*—
Kunczynski, Jan K., 4,860,664, Cl. 104-204.000.

Kunczynski, Jan K., to Kunczynski, Zygmunt A.; and Kunczynski, Alexander J. Haul rope grip assembly for aerial tramway with elastic block jaw actuating means. 4,860,664, Cl. 104-204.000.

Kunczynski, Zygmunt A.: *See*—
Kunczynski, Jan K., 4,860,664, Cl. 104-204.000.

Kunihara, Takao: *See*—
Hamatsu, Masahiro; and Kunihara, Takao, 4,862,479, Cl. 375-1.000.

Kunisaki, Toshiharu; and Higuchi, Masamori, to Fuji Xerox Co., Ltd Composite member manufacturing method. 4,860,425, Cl. 29-527.400.

Kunkle, Jerry A. Cart and method of use. 4,861,057, Cl. 280-47.131.

Kunze, Dieter: *See*—
Pichler, Klaus; and Kunze, Dieter, 4,861,946, Cl. 174-92.000.

Kupersmit, Julius B. Collapsible cargo container for aircraft. 4,860,912, Cl. 220-1.500

Kuppenheimer, John D., Jr.: *See*—
Labaugh, Kenneth D.; and Kuppenheimer, John D., Jr., 4,861,124, Cl. 350-6.500.

Kurachi, Tatsunori: *See*—
Kondo, Kazuo; and Kurachi, Tatsunori, 4,861,625, Cl. 427-126.200.

Kuraray Company, Ltd.: *See*—
Tokitoh, Yasuo; and Yoshimura, Noriaki, 4,861,922, Cl. 568-865.000.

Kurata, Mitsuru: *See*—
Nomura, Akihiro; Namekata, Kiyokazu; Kurata, Mitsuru; Niizawa, Takuji; Ebata, Tokihide; and Sasaki, Shinichi, 4,862,215, Cl. 355-309.000.

Kurihara, Kazumasa; and Arai, Kenji, to Diesel Kiki Co., Ltd. Apparatus for generating acceleration signal for backup. 4,862,362, Cl. 364-424.100.

Kurihara, Takashi: *See*—
Uchida, Koh; and Kurihara, Takashi, 4,860,635, Cl. 91-375.00A.
Uchida, Koh; Kurihara, Takashi; and Miyoshi, Makoto, 4,860,846, Cl. 180-141.000

Kuroda, Kazuo, to Pioneer Electronic Corporation. Y/C separator circuit for separating luminance and chrominance signals conditioned on an ac luminance component. 4,862,252, Cl. 358-31.000.

Kuroda, Masami; Nakamura, Yoichi; and Furusho, Noboru, to Fuji Electric Company, Ltd. Electrophotographic photosensitive material containing hydrazone compound. 4,861,691, Cl. 430-59.000.

Kuroda, Masami; Nakamura, Yoichi; and Furusho, Noboru, to Fuji Electric Company, Ltd. Electrophotographic photosensitive material containing thiophene compound. 4,861,692, Cl. 430-59.000.

Kuroda, Yasuo: *See*—
Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumio; and Takahashi, Katsutoshi, 4,861,905, Cl. 556-40.000.

Kuroishi, Masayuki: *See*—
Tamagawa, Shigehisa; and Kuroishi, Masayuki, 4,861,696, Cl. 430-138.000.

Kuroiwa, Katsumasa; Katayama, Katsuhiro; and Nagasawa, Takeshi, to Nitto Boseki Co., Ltd. Novel method for determining cholinesterase activity. 4,861,713, Cl. 435-20.000.

Kurokawa, Tsukasa: *See*—
Hanyu, Akinobu; and Kurokawa, Tsukasa, 4,861,327, Cl. 493-415.000

Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, to Sanwa Kagaku Kenkyusho Co., Ltd. Hydantoin derivatives for treating complications of diabetes. 4,861,792, Cl. 514-389.000.

Kurooka, Akira: *See*—
Baba, Hideki; Maeda, Hirokazu; Kurooka, Akira; and Nago, Atsushi, 4,861,611, Cl. 426-601.000

Kurosawa, Yoshiki: *See*—
Ohshio, Hirohiko; Makita, Horoyuki; Nagasawa, Hidehiko; Kurosawa, Yoshiki; and Koyanagi, Yoshinobu, 4,862,337, Cl. 362-294.000.

Kurose, Shigeru: *See*—
Mitsui, Susumu; Kurose, Shigeru; and Saimoto, Hiroshi, 4,861,766, Cl. 514-184.000.

Kurt Eicher: *See*—
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Kurtz, Anthony D.: *See*—
Ainsworth, Roger W.; Allen, John L.; and Kurtz, Anthony D., 4,860,442, Cl. 29-8.320.

Kurzendoerfer, Claus-Peter; and Wichelhaus, Winfried, to Henkel Kommanditgesellschaft auf Aktien. Laundry pretreatment composition for oily and greasy soil. 4,861,516, Cl. 252-531.000.

Kustes, Alan M.: *See*—
Kustes, Ryon; and Kustes, Alan M., 4,861,236, Cl. 417-315.000

Kustes, Ryon; and Kustes, Alan M. Birotational pump. 4,861,236, Cl. 417-315.000.

Kusunoki, Shigeru: *See*—
Nishimura, Tadashi; Inoue, Yasuo; Sugahara, Kazuyuki; and Kusunoki, Shigeru, 4,861,418, Cl. 156-620.720.

Kutami, Atsushi; Hashimoto, Akira; and Takada, Yoshihiro, to Ricoh Co., Ltd. Image-forming belt supporting apparatus. 4,862,211, Cl. 355-212.000.

Kutz, David A.: *See*—
Renner, Robert E.; and Kutz, David A., 4,862,076, Cl. 324-158.00F.

Kuwabara, Chihiro, to Eisai Co., Ltd. Method for removing bubbles from container made of synthetic resin filled with solution and device thereof. 4,861,166, Cl. 366-219.000.

Kuwada, Atsushi: *See*—
Tsumazawa, Hiroyuki; Yoshioka, Daigo; and Kuwada, Atsushi, 4,862,279, Cl. 358-229.000.

Kuwamura, Shinji: *See*—
Tsuge, Kazunori; Kuwamura, Shinji; and Tawada, Yoshihisa, 4,862,227, Cl. 357-2.000.

Kwiatkowski, George T.: *See*—
Clendinning, Robert A.; Harris, James E.; Kwiatkowski, George T.; McMaster, Lee P.; Matzner, Markus; and Winslow, Paul A., 4,861,915, Cl. 568-328.000.

La Telemecanique Electrique: *See*—
Guinet, Jannick; Hubert, Jean-Claude; and Martial, Marie-Francoise, 4,860,939, Cl. 228-122.000.

Laaly, Heshmat O.; and Stevenson, Edward J. Photovoltaic cells in combination with single ply roofing membranes. 4,860,509, Cl. 52-173.00R.

Labaugh, Kenneth D.; and Kuppenheimer, John D., Jr., to Sanders Associates, Inc. Dual-section spatial modulation transmitter. 4,861,124, Cl. 350-6.500.

Labofina, S.A.: *See*—
Debras, Guy; and Bodart, Philippe, 4,861,939, Cl. 585-820.000

LaCava, Alberto: *See*—
Jain, Ravi; LaCava, Alberto; Andrecovich, Mark J.; and MacLean, Donald L., 4,861,361, Cl. 62-18.000.

Lacour, Jean-Charles, to Compagnie Generale des Etablissements Michelin. Pneumatic tire having bead ring with sawtooth ridges. 4,860,810, Cl. 152-540.000

Lafon, Laboratoire L.: *See*—
Lafon, Louis, 4,861,801, Cl. 514-653.000.

Lafon, Louis, to Lafon, Laboratoire L. Treatment of depression by using a fluorophenacylamine derivative. 4,861,801, Cl. 514-653.000

Lafranca, Francois: *See*—
Mettoudi, Isaac; and Lafranca, Francois, 4,862,111, Cl. 331-96.000.

Lagerstedt, Torgny: *See*—
Borgstrom, Leonard; Carlsson, Claes G.; Franzen, Peter; Inge, Claes; Lagerstedt, Torgny; Moberg, Hans; and Nabo, Olle, 4,861,329, Cl. 494-73.000.

Lagerwaard, Cornelis A.: *See*—
Cornelissen, Johannes M.; Klugkist, Jan; Lagerwaard, Cornelis A.; Swarthoff Ton; Thom, David; and Thom, David, 4,861,509, Cl. 252-174.120.

Laguette, Stephen W.: *See*—
East, Gary P.; Laguette, Stephen W.; Heindl, Alfons; and Lintula, Leanne M., 4,861,331, Cl. 604-9.000.

Lam-Wood Products Inc.: *See*—
Gotz, Lasar, 4,861,121, Cl. 312-208.000.

Lamberty, Bernard J.: *See*—
Andrews, George S.; Lamberty, Bernard J.; and Tracy, Daniel J., 4,862,185, Cl. 343-761.000.

Lamer, Gerald P., to Marine Travelift, Inc. Mobile boat hoist. 4,861,218, Cl. 414-461.000.

Lamont, Gregory J.: *See*—
Blair, William D., Jr.; Bentivenga, Salvatore; and Lamont, Gregory J., 4,862,122, Cl. 333-202.000.

Lampe, Warren R.; Moore, Annette A.; and Hartley, Kathleen R., to General Electric Company. Marine foulant release coating. 4,861,670, Cl. 428-447.000.

Land, John L. Apparatus for sealing a tubing string in a high pressure wellbore. 4,860,826, Cl. 166-80.000.

Landgarten, Harris B.; and Ziegler, Eldon W., to Noise Cancellation Technologies, Inc. Monitoring, testing and operator controlling of active noise and vibration cancellation systems. 4,862,506, Cl. 381-71.000

Landis, Michael E.: *See*—
Kuehl, Guenter H.; and Landis, Michael E., 4,861,570, Cl. 423-326.000.

Lang, Alfred: *See*—
Durchschlag, Gerald; and Lang, Alfred, 4,860,978, Cl. 246-448.000.

Lang, Raymond G. Waste disposal system. 4,861,194, Cl. 405-128.000

Lang, Stephen M.; and Webster, David F., to Smith and Nephew Associated Companies p.l.c. Wound dressing, manufacture and use. 4,860,737, Cl. 128-156.000

Langer, Robert S.: *See*—
Mathiowitz, Edith; and Langer, Robert S., 4,861,627, Cl 427-213.310.

Langert, Albert: *See*—
Erben, Ralf; Langert, Albert; Madzgalla, Frank-Wilhelm; and Madzgalla, Hans-Georg, 4,860,858, Cl. 188-71.800

Lannerd, Robert F.; and Murphy, David K., to ERA Aviation, Inc Auxiliary fuel tanks for aircraft. 4,860,972, Cl. 244-135.00R.

LaRocca, Edward W. Explosively driven power supply. 4,862,021, Cl. 310-10.000

LaRoche Chemicals, Inc.: *See*—
Sobolev, Igor, 4,861,744, Cl. 502-227.000

Larson, Carl A.; McMillen, Charles J.; and McQuay, Edgar E., to General Electric Company. Dual voltage distribution transformer with internal varistor surge protection. 4,862,307, Cl. 361-38.000

Larson, James D. Stretching frame with adhesive fastening of a fabric workpiece. 4,860,467, Cl. 38-102.400.

Larson, Ralph I., Jr.: *See*—
Foley, John M.; Piuze, Ronald L.; Larson, Ralph I., Jr.; and Doumani, George, 4,860,824, Cl. 165-165.000

Larsson, Kenneth L., to Sandvik AB. Threaded coupling. 4,861,209, Cl. 411-411.000.

Larws, Peter, to Palimondial S.A. Wheel for a modular assembly system. 4,861,307, Cl. 446-95.000.

La Salle, Roger J.; and Riordan, Roger H S, to Teletech Pty. Ltd Remote disconnection and short-circuiting apparatus and method 4,862,491, Cl. 379-6.000.

Latussek, Hans-Peter: *See*—
Brune, Johannes; and Latussek, Hans-Peter, 4,861,274, Cl. 439-189.000.

Lau, Henry T.: *See*—
Reemtsma, Keith; Hardy, Mark A.; and Lau, Henry T., 4,861,704, Cl. 435-1.000.

Lau, Kreisler S. Y.; Oldham, Susan L.; Elias, William E.; and Bigus, Stephen J., to Hughes Aircraft Company. Substituted aromatic silane compounds and method for preparation of same. 4,861,901, Cl. 549-215.000.

Laue, Hans-Joachim: *See*—
Sirinyan, Kirkor; Laue, Hans-Joachim; Merten, Rudolf; Michael, Dietrich; and Tima, Milan-Josef, 4,861,663, Cl. 428-409.000.

Laumond, Yves; and Sabrie, Jean-Louis, to Societe Anonyme dite : ALSTHOM. Synchronous machine with superconducting windings. 4,862,023, Cl. 310-54.000.

Laurel Bank Machine Co., Ltd.: *See*—
Sentoku, Hideshi, 4,861,312, Cl. 453-7.000

Lavarini, Bernard; Crancon, Jean-Pierre; and Thomas, Jean-Yves, to Compagnie Generale d'Electricite. Gas laser generator. 4,862,100, Cl. 330-4.300.

LaVoie, Marvin E., to Tektronix, Inc. Method and apparatus for minimizing the self heating distortion of a compensated differential transconductance amplifier. 4,862,102, Cl. 330-256.000

Lavolee, Thierry: *See*—
Carriere, Claude; Renard, Jean; and Lavolee, Thierry, 4,861,423, Cl. 156-643.000.

Law, Dwight D. Electrical safety system for batteries. 4,861,684, Cl. 429-7.000.

Lawrence, Albert B. R. Stressed structure shelter. 4,860,504, Cl. 52-86.000.

Lawrence, Franklin B.: *See*—
Rossi, James L.; and Lawrence, Franklin B., 4,861,469, Cl. 210-172.000.

Lawson, R. J.: *See*—
Sachtler, J. W.; and Lawson, R. J., 4,861,740, Cl. 502-66.000.

Leach, Jamie S., to C. J. Leacho, Inc. Body restraint device. 4,861,109, Cl. 297-467.000.

Leatherman, Dennis D.: *See*—
Young, James; and Leatherman, Dennis D., 4,861,644, Cl. 428-195.000.

LeBlanc, Henry A.: *See*—
Johnson, Donald C.; Neogi, Amar N.; and LeBlanc, Henry A., 4,861,427, Cl. 162-129.000.

Lebrun, Jean-Jacques; and Porte, Hugues, to Rhone-Poulenc Specialites Chimiques. Cationic catalysis process for the treatment of a polysilazane containing on average at least two ≡SiH groups per molecule. 4,861,844, Cl. 525-475.000.

Le Clerc De Bussy, Jacques. Process and device for harvesting copses grown in lines. 4,860,808, Cl. 144-335.000.

Leconte, Michel: *See*—
Basset, Jean-Marie; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, 4,861,848, Cl. 526-169.000.

Lederich, Richard J.: *See*—
Meschter, Peter; Lederich, Richard J.; and O'Neal, James E., 4,861,551, Cl. 420-533.000.

Lee, Arnold S. J. Universal-gain data plotter. 4,862,387, Cl. 364-520.000.

Lee, Han-Sheng, to General Motors Corporation. Transistor structure for high temperature logic circuits with insulation around source and drain regions. 4,862,232, Cl. 357-23.100.

Lee, I-Hwa, to Du Pont de Nemours, E. I., and Company. Improved coextrudable adhesive and products therefrom. 4,861,676, Cl. 428-516.000.

Lee, I-Hwa, to Du Pont de Nemours, E. I., and Company. Coextrudable adhesive for polystyrene, and products therefrom. 4,861,677, Cl 428-516.000

Lee, John N.; Athale, Ravindra A.; and Rolsma, Peter B., to United States of America, Navy. Optical beamformers. 4,862,115, Cl. 332-7.510.

Lee, Robert; Hornsey, Derek; Garrido, Guillermo; and Dieguez, Jose M., to Canadian Liquid Air, Ltd. Process and device for oil recovery using steam and oxygen-containng gas. 4,860,827, Cl. 166-261.000.

Lee, Scott. Exercise bench. 4,861,024, Cl. 272-123.000

Lee, Sung Y. Golf-grip training device. 4,861,034, Cl. 273-183.00D.

Lee, Sywe-Neng, to GTE Laboratories Incorporated. Current-mirror transistor logic circuit. 4,862,017, Cl. 307-443.000.

Lee, William A.: *See*—
Nelson, Peter H.; Gu, Chee-Liang L.; Allison, Anthony C.; Eugui, Elsie M.; and Lee, William A., 4,861,776, Cl. 514-233.500

Lefebvre, Michel S. M., to Limitinstant Limited. Immobilized inorganic diffusion barriers and the use thereof in the separation of small molecular species from a solution. 4,861,486, Cl. 210-644.000.

Leflet, David. Single-position signal device. 4,860,474, Cl. 40-530.000.

LeGrand, Donald G.; and Olszewski, William V., to General Electric Company. Asymmetric impact resistant laminates. 4,861,666, Cl. 428-412.000.

Lehmann, Michael H., to Wayne State University. Tachycardia detection for automatic implantable cardioverter/defibrillator with atrial and ventricular sensing capability. 4,860,749, Cl. 128-419.0PG.

Lehmann, Wolfgang; and Neukam, Christian, to Hein, Lehmann AG Method of forming sieve unit for screening machine. 4,861,462, Cl 209-269.000

Lehmkuhl, Josef; Nikesch, Ulrich; and Presslein, Kurt, to Nalco Chemical Company. Method of dewatering sewage sludge particularly on recessed plate pressing equipment. 4,861,492, Cl. 210-709.000

Lehto, John M., to Northern States Power Company. Flue gas scrubber system with chloride removal. 4,861,558, Cl. 422-106.000

Lein, Geore M., Jr.: *See*—
Hsu, Adam C. T.; and Lein, Geore M., Jr., 4,861,896, Cl. 548-213.000.

Leja, Andrzej: *See*—
Schlosser, Erich J.; and Leja, Andrzej, 4,860,724, Cl. 126-38.000.

Lekron, Charles E., to Litwin Engineers & Constructors, Inc. Process plant instrumentation design system. 4,862,345, Cl. 364-188.000

Leland Stanford, Jr. University, The Board of Trustees of the: *See*—
Mathews, Max V., 4,860,625, Cl. 84-1.160

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Kino, Gordon S.; and Corle, Timothy R., 4,861,975, Cl. 250-201.000

Lemaire, Didier; and Dronet, Jean-Marc, to E.P. Remy & Cie. Machine for the automatic packaging of containers. 4,860,519, Cl. 53-167.000.

Lemburg, John R.: *See*—
Campbell, John G.; Schoeneberger, Carl F.; Bundens, Allan B.; Fogle, Richard M.; and Lemburg, John R., 4,862,268, Cl. 358-141.000

Lemieux, Andre; and Charland, Gabriel. Universal golf club separator 4,860,889, Cl. 206-315.600

Lemon, John, to U.S. Sound, Inc. Method for large-scale multiple source sound reinforcement. 4,862,508, Cl. 381-156.000

Lengyel, Miklosne : *See*—
Kovacs, Ferenc; Lengyel, Miklosne ; Nagy, Tibor; Antal, Sandor; Gyongyosi, Gyorgy; Palotas, Laszlo ; and Pfisztner, Nandor, 4,860,798, Cl. 138-133.000

Lense, Robert F., to Amerock Corporation. Non-backdriving actuator for opening and closing a window sash. 4,860,493, Cl. 49-279.000

Leoncavallo, Richard A.; Phillips, Gregory R.; and Mehra, Ravinder C., to Nalge Company. Pressure filter assembly with bleed valve. 4,861,466, Cl. 210-120.000.

LeRoy, Robert D.: *See*—
Stearns, Floyd E.; Pitas, Jeffery A.; LeRoy, Robert D.; and Ditzel, Roger E., 4,861,015, Cl. 271-213.000

Les Placements Paro Inc.: *See*—
Rouillard, Roger, 4,861,188, Cl. 404-75.000.

Lesher, Joseph J.: *See*—
Hillard, Randy H.; Draney, Robert G.; and Lesher, Joseph J., 4,861,195, Cl. 405-180.000

Lessar, Joseph F.; Rosenberg, Duane L.; Kraska, Robert E.; Speckien, James M.; and Upton, James E., to Medtronic, Inc. Medical electrical lead and method of manufacture. 4,860,446, Cl. 29-858.000

Lessard, Philip A.: *See*—
Harvell, John T.; and Lessard, Philip A., 4,860,546, Cl. 62-55.500

Leumi, Dov A. Trash receptacle mounted for rotation. 4,860,909, Cl. 220-1.00T

Leupold, Herbert A., to United States of America, Army. High-field permanent-magnet structures. 4,861,752, Cl. 505-1.000.

Leupold, Herbert A., to United States of America, Army. Superconducting shielded PYX PPM stacks. 4,862,126, Cl. 335-216.000

Leupold, Herbert A., to United States of America, Army. Field adjustable transverse flux sources. 4,862,128, Cl. 335-306.000

Levan, Chris D., to Amoco Corporation. Method of producing carbon fibers by overwrappings tows. 4,861,575, Cl. 423-447.200.

Lever Brothers Company: *See*—
Cornelissen, Johannes M.; Klugkist, Jan; Lagerwaard, Cornelis A.; Swarthoff Ton; Thom, David; and Thom, David, 4,861,509, Cl. 252-174.120.

Hollingsworth, Michael W.; and Russell, Peter J., 4,861,503, Cl. 252-135.000

Macrae, Alasdair R.; and How, Peter, 4,861,716, Cl. 435-134.000.

Levillain, Claude, to Commissariat a l'Energie Atomique. Receptacle for extinguishing a burning liquid fuel by isolation. 4,860,832, Cl. 169-49.000

Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal acetals and ketals. 4,861,366, Cl. 71-90.000

Levy, Zubin; and Swemer, Gerry E. Fiber optic pictorial display kit. 4,860,475, Cl. 40-547.000.

Lewis, Jeffrey M. O.; and Henstock, William H., to UOP. Chemical conversion process. 4,861,938, Cl. 585-640.000.

Lewis, Leslie K.: *See*—
Fette, Bruce A.; Lewis, Leslie K.; Briel, Marc L.; and Makovicka, Thomas J., 4,862,407, Cl. 364-900.000.

Lexicon, Inc.: *See*—
Griesinger, David H., 4,862,502, Cl. 381-22.000.

Li, Eric K.: *See*—
Kobliska, Robert J.; and Li, Eric K., 4,861,662, Cl. 428-408.000.

Li, Zhulan: *See*—
Mao, Bingquan; Yang, Aichun; Zheng, Ying; Yang, Juxiou; and Li, Zhulan, 4,861,847, Cl. 526-125.000

Liau, Ming Y. Mammalian cell culture apparatus. 4,861,725, Cl. 435-294.000

Lichtin, Norman N.; DiMauro, Thomas M.; and Svrluga, Richard C., to Synlize, Inc. Catalytic process for degradation of organic materials in aqueous and organic fluids to produce environmentally compatible products. 4,861,484, Cl. 210-638.000.

Licinvest AG: *See*—
Ackeret, Peter, 4,860,472, Cl. 40-513.000
Ackeret, Peter, 4,860,473, Cl. 40-513.000

Lidstrom, Lars. Treatment of middlings. 4,860,957, Cl. 241-20.000.

Lieberman, Sheldon I.: *See*—
Barringer, Eric A.; Lieberman, Sheldon I.; Schmidt, Mark S.; Hodge, James D.; Waack, Richard; Kelley, Donald J.; Saxton, Brian W.; and Gruber, William C., 4,861,646, Cl. 428-210.000

Liljestrom, Goran; and Johansson, Bengt, to Gotaverken Arendal AB Ice breaker vessel. 4,860,679, Cl. 114-40.000

Lill, Helmut: *See*—
Bartl, Knut; Lill, Helmut; and Wielinger, Hans, 4,861,712, Cl 435-13.000.

Lim, Drahoslav; and Kulkarni, Chidambar L., to Barnes-Hind, Inc Novel siloxanyl acrylic monomer and gas-permeable contact lenses made therefrom. 4,861,840, Cl. 525-326.500

Limitinstant Limited: *See*—
Lefebvre, Michel S. M., 4,861,486, Cl. 210-644.000

Lin, George Y.: *See*—
Newman, David W.; and Lin, George Y., 4,861,076, Cl. 285-332.300

Lincoln Electric Company: *See*—
Stava, Elliott K., 4,861,965, Cl. 219-130.510.

Lincoln Logotype Company, Inc.: *See*—
Beaver, Robert A.; Johnson, Leonard L.; and Medlen, Lester R., 4,860,648, Cl. 101-35.000

Lind, Roger S.: *See*—
Foster, Brian C.; and Lind, Roger S., 4,861,641, Cl. 428-137.000.

Lindauer, James M.: *See*—
Heumann, John M.; and Lindauer, James M., 4,860,762, Cl. 128-702.000

Linde, Hellmut: *See*—
Bergter, Friedrich; Bocker, Harald; Bormann, Ernst-Joachim; Forberg, Wolfgang; Fricke, Heinz; Grafe, Udo; Grosse, Hans-Helmut; Heller, Ingeborg; Hilliger, Matthias; Junne, Wolf; Linde, Hellmut; Menner, Michael; Menzel, Klaus-Dieter; Muller, Peter-Jurger; Plonka, Gunter; Pohl, Hans D.; Schneider, Jorg; and Thrum, Heinz, 4,861,715, Cl. 435-70.000.

Lindner, Christian: *See*—
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Lindstadt, Klaus; and Wittmer, Detlev, to Diehl GmbH & Co. Remote action mine. 4,860,658, Cl. 102-427.000

Linsenbold, Herbert: *See*—
Wilms, Elman; Jung, Dieter; Linsenbold, Herbert; Pioch, Lothar; and Wichelhaus, Winfried, 4,861,510, Cl. 252-174.130.

Lintula, Leanne M.: *See*—
East, Gary P.; Laguette, Stephen W.; Heindl, Alfons; and Lintula, Leanne M., 4,861,331, Cl. 604-9.000

Liotta, Lance A.: *See*—
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Liposome Company, Inc., The: *See*—
Janoff, Andrew S.; Bolcsak, Lois E.; Weiner, Alan L.; Tremblay, Paul A.; Bergamini, Michael V. W.; and Suddith, Robert L., 4,861,580, Cl. 424-1.100.

Lippert, Hans-Joachim, to Siemens Aktiengesellschaft. Nuclear reactor fuel assembly. 4,861,545, Cl. 376-448.000.

Lippert, Mary E.; Enloe, Kenneth M.; Koch, Debra J.; Roessler, Thomas H.; and Pazdernik, Patrick A., to Kimberly-Clark Corporation. Diaper article with elasticized waist panel. 4,861,652, Cl. 428-284.000.

Lisauskas, Richard J., to Texas Instruments Incorporated. Combination motor protector and starter apparatus. 4,862,306, Cl. 361-24.000.

List, Frans J.; and Phelan, Cathal G., to U.S. Philips Corp. Redundant-storage memory. 4,862,417, Cl. 365-200.000

Lite Works, Inc.: *See*—
Hall, Tony R., 4,860,476, Cl. 40-593.000.

Littman, Michael G.: *See*—
Chiurco, Anthony A.; and Littman, Michael G., 4,860,748, Cl 128-399.000

Litton Systems, Inc.: *See*—
Hammons, Sheridan W.; and Moore, Robert H., 4,861,160, Cl 356-138.000.
Sturza, Mark A.; and Brown, Alison K., 4,862,178, Cl. 342-357.000.

Litwin Engineers & Constructors, Inc.: *See*—
Lekron, Charles E., 4,862,345, Cl. 364-188.000.

Livsey, Robert A.: *See*—
Wetzel, Donald C.; and Livsey, Robert A., 4,862,094, Cl. 324-500.000.

Ljung, Bo H. G., to Kearfott Guidance & Navigation Corporation. Method of constructing a moment insensitive pathlength control mirror assembly for a ring laser gyroscope. 4,861,161, Cl. 356-350.000

Lloyd, Barry R.: *See*—
Krisher, James A.; and Lloyd, Barry R., 4,862,363, Cl. 364-424.100.

Lo, Jeelin: *See*—
Curtiss, Alan C.; and Lo, Jeelin, 4,861,596, Cl. 424-438.000.

Lobo, Hubert; and Wang, Kuo K., to Cornell Research Foundation, Inc. Line-heat-source thermal conductivity measuring system. 4,861,167, Cl. 374-44.000

Lock, Brian E.; and Aceti, John G., to General Electric Company. Pin transfer apparatus. 4,861,085, Cl. 294-87.100.

Lockheed Corporation: *See*—
Dunsmore, Richard F., 4,861,211, Cl. 411-501.000.

Lodholz, Gus A., Jr. Retractable ladder assembly. 4,860,854, Cl 182-88.000

Lohr & Bromkamp GmbH: *See*—
Welschof, Hans-Heinrich, 4,861,316, Cl. 464-145.000

Lok, Roger; Gunther, Wolfgang H. H.; and Freeman, John P., to Eastman Kodak Company. Cyclic dichalcogenide fog inhibiting agents for silver halide photography. 4,861,703, Cl. 430-608.000

Long, Roger W.: *See*—
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Look, Gunter: *See*—
Fey, Rainer; Look, Gunter; and Dumbser, Gerhard, 4,862,395, Cl. 364-561.000

Loos, Horst, to Siegenia-Frank KG. Overlapping connection. 4,861,183, Cl. 403-354.000

Looser, Heniz: *See*—
Bolli, Peter; Looser, Heniz; and Tanner, Werner, 4,861,306, Cl. 446-90.000

Lord Corporation: *See*—
Walsh, Michael L., 4,861,832, Cl. 525-113.000.

L'Oreal: *See*—
Morane, Bruno; and de Laforcade, Vincent, 4,860,933, Cl. 222-402.130.

Lorenz, William P.: *See*—
Sefton, Verner B.; Fox, Robert; and Lorenz, William P., 4,861,565, Cl. 423-55.000

Loretan, Philip A.: *See*—
Morris, Carlton E.; Loretan, Philip A.; Bonsi, Conrad K.; and Hill, Walter A., 4,860,490, Cl. 47-63.000

Losi, Paul F., to Chemical New York Corporation. Mobile bank teller unit. 4,861,049, Cl. 280-47.160

Louis A. Grant, Inc.: *See*—
Grant, Louis A., 4,861,112, Cl. 299-70.000.

Louison, Bernard; and Hennuy, Jean, to Seb S.A. Method of making flat electrical resistance heating element. 4,860,434, Cl. 29-611.000.

Loveless, Scott E.: *See*—
Ackerman, Neil R.; Harris, Richard R.; Loveless, Scott E.; and Neubauer, Russel H., 4,861,783, Cl. 514-311.000.

Lowe, Christopher H.; and Allen, Nicholas J. Dispensing device for soluble granular materials. 4,860,929, Cl. 222-189.000.

Lowe, Greg E. Method and structure for attaching adjustable backpack straps. 4,860,936, Cl. 224-210.000

Lowe, Peter E.: *See*—
Muller, Peter H.; Lowe, Peter E.; Edwards, Peter R.; and Harris, Samuel W., 4,861,276, Cl. 439-365.000.

Lowenhaupt, Harris, to California Nickel Co. Nickel-containing leachate having low aluminum content. 4,861,371, Cl. 75-101.00R.

Lubbehusen, Paul; Eberhard, Norbert; and Hoppe, Hans, to Waeschle Maschinenfabrik GmbH. Apparatus for pneumatically conveying bulk material. 4,861,200, Cl. 406-14.000.

Lucas Industries public limited Company: *See*—
Erben, Ralf; Langert, Albert; Madzgalla, Frank-Wilhelm; and Madzgalla, Hans-Georg, 4,860,858, Cl. 188-71.800.

Lucci, John J.: *See*—
St. Angelo, Stephen; and Lucci, John J., 4,860,588, Cl. 73-794.000.

Lucitte, Richard D.; Melnychuck, Paul W.; Murray, Joseph J.; Ray, Lawrence A.; and Sullivan, James R., to Eastman Kodak Company. Method of making a thin lens. 4,861,140, Cl. 350-320.000.

Ludington, David N.: *See*—
Wang, Samuel C.; and Ludington, David N., 4,862,002, Cl. 250-352.000.

Lueders, Harald; Ratajczak, Hans-Josef; and Wienhoefer, Ekkehard, to Huels Aktiengesellschaft. Preparation of specifically adjusted polyalcohol mixtures based on sorbitol. 4,861,513, Cl. 252-182.240.

Lundelius, William. Restraining device. 4,860,560, Cl 70-16.000.

Lundstrom, Robert W.; and Emmons, Thomas R., to DataCard Corporation. Solenoid shock absorbing bumper arrangement and method. 4,862,127, Cl. 335-257.000

Luyckx, Marcel G. M.: *See*—
Stokbroekx, Raymond A.; Luyckx, Marcel G. M.; and Janssens, Frans E., 4,861,785, Cl. 514-321.000.

Lynch, Arthur S.; and MacEachern, A. Walter, to Medical Parameters, Incorporated. Guidewire advancement system. 4,860,757, Cl. 128-657.000.

Lynch, Samuel E.: *See*—
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Lyons, John: *See*—
Hinden, Milton; and Lyons, John, 4,861,631, Cl. 428-34.500.

Lyu, Keun Chul. Exercising apparatus for adjusting intervertebral disc and articulations clearances. 4,860,734, Cl. 128-57.000.

Maaatta, Raimo: *See*—
Tusa, Esko; Maaatta, Raimo; and Ruuskanen, Antti, 4,861,519, Cl. 252-633.000

Maarten, Koorn, to C. van der Lely, N.V. Mowing machine. 4,860,527, Cl. 56-13.600.

MacDowell, John F., to Corning Incorporated. Alkaline earth aluminoborate glass-ceramics. 4,861,734, Cl. 501-10.000.

MacEachern, A. Walter: *See*—
Lynch, Arthur S.; and MacEachern, A. Walter, 4,860,757, Cl. 128-657.000.

Machida, Junji: *See*—
Ohtani, Junji; Machida, Junji; Sano, Eiichi; and Masuda, Fumio, 4,861,693, Cl. 430-106.600.

Machida, Tsutomu; Mochizuki, Toshiyasu; and Sasaki, Masaru, to Koito Manufacturing Co., Ltd. Vehicle lamp. 4,862,330, Cl 362-61.000.

Machoczek, Horst M.: *See*—
Gottwald, Eberhard F.; and Machoczek, Horst M., 4,861,592, Cl. 424-687.000.

MacLean, Donald L.: *See*—
Jain, Ravi; LaCava, Alberto; Andrecovich, Mark J.; and MacLean, Donald L., 4,861,361, Cl. 62-18.000.

Macnak, Philip P.; Irwin, James S.; and Davis, Walter L., to Motorola, Inc. System for automatically tuning the antenna of a miniature portable communications device. 4,862,516, Cl. 455-193.000.

Macrae, Alasdair R.; and How, Peter, to Lever Brothers Company. Rearrangement process. 4,861,716, Cl. 435-134.000.

Macro Chem. Corp.: *See*—
Samour, Carlos M.; and Daskalakis, Stefanos, 4,861,764, Cl. 514-177.000.

Macrow, Lawrence. Ionizer diffuser air purifier. 4,861,355, Cl 55-127.000.

Madgavkar, Ajay M., to Shell Oil Company. Microbiological desulfurization of coal and coal water admixture to provide a desulfurized fuel. 4,861,723, Cl. 435-262.000.

Madis, Valdemar H.; Omar, Mostafa M.; and Madis, Voldemar, to Dr Madis Laboratories, Inc. Aloeferon isolation, manufacturing and its applications. 4,861,761, Cl. 514-54.000.

Madis, Voldemar: *See*—
Madis, Valdemar H.; Omar, Mostafa M.; and Madis, Voldemar, 4,861,761, Cl. 514-54.000.

Madzgalla, Frank-Wilhelm: *See*—
Erben, Ralf; Langert, Albert; Madzgalla, Frank-Wilhelm; and Madzgalla, Hans-Georg, 4,860,858, Cl. 188-71.800.

Madzgalla, Hans-Georg: *See*—
Erben, Ralf; Langert, Albert; Madzgalla, Frank-Wilhelm; and Madzgalla, Hans-Georg, 4,860,858, Cl. 188-71.800.

Maeda, Hiroaki: *See*—
Inagaki, Toshiyuki; and Maeda, Hiroaki, 4,860,873, Cl. 192-113.00B.

Maeda, Hirofumi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for production of expansion-molded articles in a mold of linear low density polyethylene resins. 4,861,531, Cl. 264-50.000.

Maeda, Hirokazu: *See*—
Baba, Hideki; Maeda, Hirokazu; Kurooka, Akira, and Nago, Atsushi, 4,861,611, Cl. 426-601.000

Maeda, Hiromu; Haraguchi, Kazuo; and Ohbuchi, Yasutsugu, to Kabushiki Kaisha Maki Seisakusho. Method and device for distributing and feeding. 4,860,882, Cl. 198-458.000

Maeda, Kazuhiko; Yamauchi, Taku; and Koishi, Toshio, to Central Glass Company, Limited. Polymer blend composition suitable as optical material. 4,861,835, Cl. 525-200.000.

Maeda, Masaru: *See*—
Haga, Takahiro; Shigehara, Itaru; Koyanagi, Toru; Hara, Kazutoshi; and Maeda, Masaru, 4,861,886, Cl. 546-16.000.

Maeda, Masato; and Takeuchi, Hideo, to Yokogawa Electric Corporation. Paramagnetic oxygen analyzer. 4,860,574, Cl. 73-27.00A.

Maeda, Shigemi: *See*—
Tsuji, Kentaroh; Maeda, Shigemi; Yamaguchi, Takeshi; Deguchi, Toshihisa; Sakamoto, Noriaki; and Terashima, Shigeo, 4,862,443, Cl. 369-59.000.

Maeda, Takanori, to Pioneer Electronic Corporation. Optical focus error control pickup device for an optical recording/reproducing system. 4,862,446, Cl. 369-112.000.

Maeda, Tomohisa, to Kabushiki Kaisha Toshiba. System for generating magnetic fields utilized for magnetic resonance imaging apparatus. 4,862,086, Cl. 324-318.000.

Maejima, Hideo: *See*—
Katsura, Koyo; Maejima, Hideo; and Kajiwara, Hisashi, 4,862,150, Cl. 340-703.000

Maekawa, Hideya: *See*—
Ihara, Masahiro; Suzuki, Kazuo; Maekawa, Hideya; Ito, Haremi; and Tanaka, Kenichi, 4,861,626, Cl. 427-133.000.

Maekawa, Hirotoshi, to Mitsubishi Denki Kabushiki Kaisha. Fault diagnosis system for electronic devices on automobiles. 4,862,371, Cl. 364-431.110

Maekawa, Satosi, to Maekawa Seisakujo Co., Ltd. Toilet bowl with health testing system. 4,860,767, Cl. 128-760.000.

Maekawa Seisakujo Co., Ltd.: *See*—
Maekawa, Satosi, 4,860,767, Cl. 128-760.000.

Maempel, Lothar: *See*—
Hummerich, Rainer; Kerber, Michael; Maempel, Lothar; and Weyland, Peter, 4,861,826, Cl. 524-839.000.

Maennel, Daniela: *See*—
Urbaschek, Renate; Urbaschek, Berhard; and Maennel, Daniela, 4,861,587, Cl. 424-85.100.

Maerkl, Robert: *See*—
Bertleff, Werner; Maerkl, Robert; Magnussen, Peter; Kuehn, Gebhard; and Stops, Peter, 4,861,895, Cl. 546-353.000

Magatani, Yasuhiro: *See*—
Iwayama, Kazuyoshi; Magatani, Yasuhiro; and Tada, Kuniyuki, 4,861,928, Cl. 570-202.000

Magnetic Peripherals Inc.: *See*—
Brar, Amarjit S.; Sharma, Jagdish P.; and Kaja, Suryanarayana, 4,860,572, Cl. 73-12.000.
Genheimer, Stephen R.; and Pottebaum, Ken L., 4,862,298, Cl. 360-60.000.

Magnetronics, Inc.: *See*—
Courneya, Calice G., 4,861,956, Cl. 219-10.55A.

Magnussen, Peter: *See*—
Bertleff, Werner; Maerkl, Robert; Magnussen, Peter; Kuehn, Gebhard; and Stops, Peter, 4,861,895, Cl. 546-353.000

Mahal, Pritpal S.: *See*—
Hsia, Steve K.; Mahal, Pritpal S.; and Shih, Wei-Ren, 4,861,730, Cl. 437-43.000.

Mahnich, James A.: *See*—
McGowan, Philip J.; McNeill, Steven R.; Mondek, Matthew H.; and Mahnich, James A., 4,861,293, Cl. 440-76.000

Maier, Alfred E.; and Farley, James R., to Westinghouse Electric Corp. Electrical switching device with cover interlock. 4,862,125, Cl. 335-202.000

Maiuccoro, John: *See*—
Gardenier, John; and Maiuccoro, John, 4,860,392, Cl. 4-542.000

Majerus, Norbert: *See*—
Cohen, Martin P.; Brown, Robert J.; and Majerus, Norbert, 4,861,842, Cl. 525-329.300.

Makhlouf, Joseph M.: *See*—
Chasser, Anthony M.; and Makhlouf, Joseph M., 4,861,833, Cl 525-122.000.

Makita, Horoyuki: *See*—
Ohshio, Hirohiko; Makita, Horoyuki; Nagasawa, Hidehiko; Kurosawa, Yoshiki; and Koyanagi, Yoshinobu, 4,862,337, Cl. 362-294.000

Makiuchi, Hajime: *See*—
Masuda, Nobuhito; Nagatomo, Shigeru; Makiuchi, Hajime; and Yasuda, Yukio, 4,861,552, Cl. 422-56.000.

Makiura, Yoshinori: *See*—
Yamamoto, Kiyonori; Sota, Osamu; Sakae, Masahiko; Makiura, Yoshinori; Murakami, Masahiro; and Mitsuya, Toshiyuki, 4,861,017, Cl. 271-258.000

Makovicka, Thomas J.: *See*—
Fette, Bruce A.; Lewis, Leslie K.; Briel, Marc L.; and Makovicka, Thomas J., 4,862,407, Cl. 364-900.000

Malak, Ronald J., to General Motors Corporation. Seat cushion construction and method of utilization thereof. 4,861,104, Cl. 297-218.000.

Malaval, Claude, to Framatome. Apparatus for the antivibratory wedging of component parts of an installation, and in particular antivibratory bars for wedging the tubes of a steam generator. 4,860,697, Cl. 122-510.000.

Maldague, Pierre, to S.A. Separgaz. Process and apparatus for extracting liquids from aggregates and from gas/vapor mixtures. 4,860,547, Cl. 62-86.000.

Mallinckrodt, Inc.: *See*—
Nicolotti, Robert A.; and Dean, Richard T., 4,861,869, Cl. 530-402.000

Mallory, Charles W., to Westinghouse Electric Corp. Thermal protection shell for radioactive waste containers. 4,862,007, Cl. 250-506.100.

Mallory, Charles W.: *See*—
Wozniak, David J.; and Mallory, Charles W., 4,861,205, Cl. 410-47.000

Malservisi, William; Righetti, Claudio; Nadalini, Raffaele; Braga, Umberto; and Romagnoli, Marino, to Unimac s.n.c. di Nadalini Raffaele & C. Automatic dispenser for cylindrical commodities, in particular packets of coin. 4,860,922, Cl. 221-6.000.

Mandel, Linda; and Ensign, Edward, to Mandel, Linda. Image rotator for rotating an image ninety degrees. 4,861,150, Cl. 350-622.000.

Mandell, Leo: *See*—
Eklund, Vidar; Fors, Jan; Mandell, Leo; Meinander, Kerstin; Selin, Johan-Fredrik; and Turunen, Olli T., 4,861,874, Cl. 536-32.000.

Manios, Steven E., Sr.: *See*—
Centkowski, Mark; Manios, Steven E., Sr.; and Weaver, James, 4,862,199, Cl. 354-62.000

Manley, James D.; Mockford, Mary J.; and Stanley, David R., to Imperial Chemical Industries PLC. Production of ceramic materials. 4,861,735, Cl. 501-96.000.

Mannesmann Rexroth GmbH: *See*—
Hein, Theo, 4,860,634, Cl. 91-363.00R

Manville Corporation: *See*—
Cooper, Leonard M., 4,860,943, Cl. 229-40.000.
Olds, Leonard E.; Peterson, Michael D.; and Martin, Jean P., 4,862,477, Cl. 373-85.000

Mao, Bingquan; Yang, Aichun; Zheng, Ying; Yang, Juxiou; and Li, Zhulan, to Beijing Research Institute of Chemical Industry; and China Petrochemical Corp. Catalyst system for use in olefinic polymerization. 4,861,847, Cl. 526-125.000.

Marancik, William G.; and Hong, Seung-Ok, to Oxford Superconducting Technology. Fabrication of multifilament intermetallic superconductor using strengthened tin. 4,860,431, Cl. 29-599.000.

Marathe, Suresh A.: *See*—
Tramposch, Kenneth M.; Zusi, Fred C.; and Marathe, Suresh A., 4,861,798, Cl. 514-575.000

Marathon Corporation: *See*—
Spiers, Kent, 4,860,646, Cl. 100-48.000.

Marchal, Claude: *See*—
Grauz, Daniel; and Marchal, Claude, 4,862,151, Cl. 340-706.000

Marchello, Giovanni: *See*—
Petrillo, Vincenzo; Crotti, Gianpiero; and Marchello, Giovanni, 4,861,824, Cl. 524-745.000.

Marconi Company Limited, The: *See*—
Morgan, Thomas E., 4,862,189, Cl. 343-859.000.
West, Barry G.; Sosin, Boleslaw M.; and Tolfree, Roger K., 4,862,453, Cl. 370-82.000.

Mardin, Mithat: *See*—
Fengler, Gerd; Klausener, Alexander; Buysch, Hans-Josef; Mardin, Mithat; and Pelster, Bernhard, 4,861,878, Cl. 544-48.000.

Mardon, Paul F., to Pulsar Light of Cambridge Limited. Electrical switching apparatus. 4,862,012, Cl. 307-38.000.

Margel, Shlomo, to Yeda Research and Development Company, Ltd Method for removing components of biological fluids. 4,861,705, Cl 435-2.000

Margiaria, Giorgio; and Brizio, Giuseppe, to Fiat Auto S.p.A. Press and method for molding plastics articles, in particular thermoplastic, thermosetting and polyurethane polymeric articles. 4,861,258, Cl. 425-444.000.

Margolis, Geoffrey; Chiovini, Jacky; and Pagliaro, Fulvio A., to Nestec S. A. Removal of xanthine stimulants from cocoa. 4,861,607, Cl. 426-481.000

Marine Travelift, Inc.: *See*—
Lamer, Gerald P., 4,861,218, Cl. 414-461.000

Marino, Joseph J., to Quigley Company, Inc. Rebuilding of the stack, bosh and hearth of a blast furnace using a remote controlled refractory gunning device. 4,860,422, Cl. 29-402.180.

Marioni, Elio; and Cavalcante, Vittorio, to Askoll S.r.l. Centrifugal pump for electric household appliances such as washing machines, dishwashers and the like. 4,861,240, Cl. 417-423.300

Markle, Wilson; and Mitchell, Christopher, to Colorization Inc Method of, and apparatus for, coloring a black and white video signal. 4,862,256, Cl. 358-81.000.

Markwell, Edgar R., to Freudenberg Nonwovens Ltd. Protective garment. 4,860,382, Cl. 2-82.000.

Marrion, Alastair R., to International Paint public limited company. Powder coating compositions. 4,861,841, Cl. 525-327.300.

Marte, Julio C.: *See*—
Flank, William H.; Wilson, Stephen T.; Marte, Julio C.; and Flanigen, Edith M., 4,861,743, Cl. 502-214.000.

Martens, Paul: *See*—
Krevor, David H.; and Martens, Paul, 4,860,851, Cl. 181-207.000

Martensson, Lars: *See*—
Franke, Rickard; and Martensson, Lars, 4,861,328, Cl. 493-470.000.

Martial, Marie-Francoise: *See*—
Guinet, Jannick; Hubert, Jean-Claude; and Martial, Marie-Francoise, 4,860,939, Cl. 228-122.000.

Martin, Edward P., Jr.: *See*—
Dautartas, Mindaugas F.; Harrus, Alain S.; Martin, Edward P., Jr.; and Stevie, Fred A., 4,861,126, Cl. 350-96.110.

Martin, Gerard; and Feugier, Alain, to Institut Francais Du Petrole. Process for catalytic cracking of a hydrocarbon charge subjected to a pretreatment with solid particles of low activity. 4,861,458, Cl. 208-73.000.

Martin, Jean P.: *See*—
Olds, Leonard E.; Peterson, Michael D.; and Martin, Jean P., 4,862,477, Cl. 373-85.000

Martin, John C.: *See*—
Ballyns, Jan; Martin, Paul H.; and Martin, John C., 4,860,813, Cl. 160-188.000.

Martin, Mary Ann. Method of making an enclosed sleeve. 4,860,386, Cl. 2-243.00R.

Martin, Merrill D. Sheet stacking machine. 4,861,014, Cl. 271-198.000.

Martin, Paul H.: *See*—
Ballyns, Jan; Martin, Paul H.; and Martin, John C., 4,860,813, Cl. 160-188.000

Martin, Raymond G., to Westinghouse Electric Corp. Discrete source location by adaptive antenna techniques. 4,862,180, Cl. 342-417.000.

Martin, William G.: *See*—
Montgomery, Terry G.; and Martin, William G., 4,860,530, Cl. 57-5.000

Martinet, Jean-Marie: *See*—
Berardo, Michel; Darnez, Charles; Martinet, Jean-Marie; and Roche, Gilbert, 4,861,480, Cl. 210-490.000

Marugo Rubber Industries, Ltd.: *See*—
Yokota, Motoyuki; Tanabe, Mamoru; and Fujiki, Tatsuo, 4,861,004, Cl. 267-140.100.

Marusa, David M.; and Munroe, Bruce R., to Audio Technology, Inc. Centralized system for selecting and reproducing perceptible programs. 4,862,159, Cl. 340-825.240.

Maruyama, Toshinori; Sato, Hirohide; and Matsuhashi, Toshiaki, to Nippondenso Co., Ltd. Automotive charging apparatus. 4,862,055, Cl. 322-8.000.

Marx, Dieter, to Carl-Zeiss-Stiftung. Stereoscopic thermographic apparatus. 4,861,997, Cl. 250-334.000.

Maschinenfabrik Mueller-Weingarten AG: *See*—
Harsch, Erich; and Gaissmaier, Franz, 4,860,879, Cl. 198-395.000.

Maschmeyer, Donald M.: *See*—
Saavedra, Jose V.; Hunter, Douglas L.; Sims, Steve A.; Maschmeyer, Donald M.; and Knobel, Thomas M., 4,861,805, Cl. 521-105.000.

Mase, Akira: *See*—
Yamazaki, Shunpei; Inujima, Takashi; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Sakama, Mitsunori; Miyazaki, Minoru; Koyanagi, Kaoru; and Yamaguchi, Toshiharu, 4,861,143, Cl. 350-350.00S.

Mase, Syunzo; and Soejima, Shigeo, to NGK Insulators, Ltd. Electrochemical device. 4,861,456, Cl. 204-425.000.

Mason, J. Russell: *See*—
Galef, Bennett G., Jr.; and Mason, J. Russell, 4,861,585, Cl. 424-84.000.

Masovich, Felix Z.; Khorin, Vladimir N.; Starichnev, Vladimir V.; and Turkin, Vladimir V. Mining cutter-loader for winning minerals. 4,861,111, Cl. 299-43.000.

Massachusetts Institute of Technology: *See*—
Carter, Michael J.; and Welford, David, 4,862,467, Cl. 372-18.000.
Gordon, David; Akselrod, Solange; Cohen, Richard J.; Tu, Jerome C.; Burns, Stephen K.; and DeLeon, Victoria H., 4,862,361, Cl. 364-413.060.
Mathiowitz, Edith; and Langer, Robert S., 4,861,627, Cl. 427-213.310.

Mastervich, Joel C.: *See*—
Moscoe, Gerald F.; Mastervich, Joel C.; Kreevich, William J.; Knoepke, John R.; Rellis, Daniel, Jr.; Glennon, Roger J.; and Pielet, Howard M., 4,860,819, Cl. 164-437.000.

Masucci, Ernest J.: *See*—
Guarnaccia, Joseph J.; and Masucci, Ernest J., 4,860,452, Cl. 30-346.600.

Masuda, Akira: *See*—
Iida, Toshiharu; Shimanuki, Koji; Nakada, Kimiaki; and Masuda, Akira, 4,862,280, Cl. 358-229.000.

Masuda, Fumio: *See*—
Ohtani, Junji; Machida, Junji; Sano, Eiichi; and Masuda, Fumio, 4,861,693, Cl. 430-106.600.

Masuda, Masachika; and Suzuki, Akira, to Hitachi, Ltd. Semiconductor device lead frame with etched through holes. 4,862,246, Cl. 357-70.000.

Masuda, Nobuhito; Nagatomo, Shigeru; Makiuchi, Hajime; and Yasuda, Yukio, to Fuji Photo Film Co., Ltd. Biological reaction layer and its preparation. 4,861,552, Cl. 422-56.000.

Masuda, Tadashi: *See*—
Imamura, Tadashi; Shigaki, Kazuyuki; Yamazaki, Yuji; Masuda, Tadashi; and Okumura, Tsunemasa, 4,861,113, Cl. 301-65.000.

Masui, Takeshi; Matsumoto, Yoshiro; Tomizawa, Atsushi; and Hirooka, Eiji, to Sumitomo Metal Industries. Variable-crown roll. 4,860,416, Cl. 29-116.200.

Matheny, Mark. Anti-fraud device for use with a coin operated telephone instrument. 4,862,494, Cl. 379-145.000.

Matheny, Ronnie A.: *See*—
Tien, Spencer W. H.; and Matheny, Ronnie A., 4,861,685, Cl. 429-7.000.

Mather Seal Company: *See*—
Riley, William M., 4,861,045, Cl. 277-25.000.

Mathews, Max V., to Leland Stanford, Jr. University, The Board of Trustees of the. Bimorphic piezoelectric pickup device for stringed musical instruments. 4,860,625, Cl. 84-1.160.

Mathiesen, George E.; and Mayo, Charles H., II, to Mediverse Inc. Safety syringe. 4,861,338, Cl. 604-110.000.

Mathiowitz, Edith; and Langer, Robert S., to Massachusetts Institute of Technology. Preparation of multiwall polymeric microcapsules. 4,861,627, Cl. 427-213.310.

Matkovich, Vlado I.: *See*—
Pall, David B.; Degen, Peter J.; Matkovich, Vlado I.; and Gsell, Thomas C., 4,861,617, Cl. 427-2.000.

Matsubara, Akira: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,861,792, Cl. 514-389.000.

Matsuda, Shuzou; Naitou, Satoomi; and Wakano, Takahiro, to Murata Manufacturing Co., Ltd. Method of manufacturing a cylindrical capacitor. 4,861,624, Cl. 427-81.000.

Matsuda, Toshiro, to Nissan Motor Co., Ltd. Self-monitor system for automotive digital control system insensitive to battery voltage fluctuations. 4,862,364, Cl. 364-424.010.

Matsuda, Yusaku, to Sanwa Diamond Industrial Co., Ltd. Super abrasive cutting saw. 4,860,721, Cl. 125-15.000.

Matsuhashi, Toshiaki: *See*—
Maruyama, Toshinori; Sato, Hirohide; and Matsuhashi, Toshiaki, 4,862,055, Cl. 322-8.000.

Matsukawa, Shigeru: *See*—
Tanaka, Shinichi; and Matsukawa, Shigeru, 4,862,295, Cl. 360-48.000.

Matsumoto, Hideo, to Mitsubishi Denki Kabushiki Kaisha. Solar cell and method of fabricating solar cell. 4,861,387, Cl. 136-256.000.

Matsumoto, Masakatsu; Fujimoto, Tamotsu; and Ejiri, Emiko, to Sagami Chemical Research Center; and Nippon Mining Company, Limited. Process for preparing macrocyclic 2-halogenoketones. 4,861,917, Cl. 568-347.000.

Matsumoto, Takashi; and Udagawa, Shigeru, to Shinko Electric Co., Ltd. Linear motor truck apparatus. 4,860,662, Cl. 104-93.000.

Matsumoto, Yoshiro: *See*—
Masui, Takeshi; Matsumoto, Yoshiro; Tomizawa, Atsushi; and Hirooka, Eiji, 4,860,416, Cl. 29-116.200.

Matsumura, Hiroyoshi: *See*—
Katsuyama, Toshio; Matsumura, Hiroyoshi; Inoue, Hiroaki; Fukuzawa, Tadashi; and Chinone, Naoki, 4,861,130, Cl. 350-96.140.

Matsuo, Mamoru; Okuda, Yutaka; Takizawa, Kazushige; and Sakaki, Hirokazu, to Fuji Photo Film Co., Ltd.; and Sky Aluminum Co., Ltd. Aluminum alloy material plate for printing. 4,861,396, Cl. 148-439.000.

Matsuoka, Kazumi; Kihira, Hiroshi; Ito, Satoshi; and Murata, Tomomi, to Nippon Steel Corporation. Corrosion detecting probe for steel buried in concrete. 4,861,453, Cl. 204-404.000.

Matsuoka, Nobuo: *See*—
Suda, Kenichi; Hasegawa, Shizuo; and Matsuoka, Nobuo, 4,862,286, Cl. 358-494.000.

Matsuoka, Saiji: *See*—
Satoh, Susumu; Matsuoka, Saiji; Obara, Takashi; Tsunoyama, Kozo; and Irie, Toshio, 4,861,390, Cl. 148-12.00R.

Matsushita Electric Indus. Co. Ltd.: *See*—
Miura, Akira; Takata, Kanji; Okazaki, Ryoji; Uemura, Toyohide; and Kagawa, Keiichi, 4,861,688, Cl. 429-206.000.

Matsushita Electric Industrial Co., Inc.: *See*—
Kubo, Kazuhiko; Saitou, Susumu; Usui, Akira; and Nagai, Hiroyuki, 4,861,941, Cl. 174-35.00R.
Sato, Takeo; Araki, Nobuhiro; Kawata, Koichi; Nomura, Noboru; Ueno, Atushi; and Yoshida, Shotaro, 4,861,148, Cl. 350-505.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Fuse, Genshu; Hirao, Takashi; and Ohzone, Takashi, 4,861,729, Cl. 437-18.000.
Murata, Kazuyuki, 4,862,284, Cl. 358-451.000.
Nishino, Atsushi; Ikeda, Masaki; Watanabe, Yoshihiro; and Hiraka, Masahiro, 4,861,657, Cl. 428-336.000.
Satake, Tetsuo, 4,861,619, Cl. 427-48.000.
Tanaka, Shinichi; and Matsukawa, Shigeru, 4,862,295, Cl. 360-48.000.

Matsushita, Shuzo: *See*—
Ootsuka, Hiroshi; Tominaga, Shinji; Kobayashi, Haruo; Matsushita, Shuzo; Hoda, Takeo; and Mukai, Hiromu, 4,862,206, Cl. 354-414.000.

Matsushita, Tetsuya: *See*—
Tsunoda, Arihiro; Tsuji, Kikunosuke; Nakakuma, Akira; and Matsushita, Tetsuya, 4,862,218, Cl. 355-235.000.

Matsushita, Tsutomu; and Mihara, Teruyoshi, to Nissan Motor Company Limited. Integrated circuit device having vertical MOS provided with Zener diode. 4,862,233, Cl. 357-23.400.

Matsushita, Yoshiaki: *See*—
Kubota, Atsuko; Matsushita, Yoshiaki; and Ohwada, Yoshiaki, 4,862,000, Cl. 250-341.000.

Matsuura, Isao: *See*—
Kobayashi, Masanori; Matsuura, Isao; Wakatsuki, Akira; and Shida, Yu, 4,861,816, Cl. 524-204.000.

Matsuura, Nobuyuki, to Olympus Optical Co., Ltd. Endoscope. 4,860,731, Cl. 128-6.000.

Matsuura, Yoshikatsu: *See*—
Miyabayashi, Shigeaki; Kanai, Hiroshi; Oka, Joji; and Matsuura, Yoshikatsu, 4,861,672, Cl. 428-458.000.

Matthiesen, Martin; and Small, Michelle, to Raychem Corporation. Method and apparatus for electrically heating diesel fuel utilizing a PTC polymer heating element. 4,861,966, Cl. 219-205.000.

Mattson, William F., to Uniroyal Goodrich Tire Company, The. Apparatus for curing thick-walled articles. 4,861,253, Cl. 425-143.000.

Matumoto, Kazuhiro: *See*—
Miyawaki, Yoshinori; Matumoto, Kazuhiro; and Shirasaki, Osamu, 4,860,760, Cl. 128-680.000.

Matzeld, Leon: *See*—
Fish, Aaron M.; Matzeld, Leon; Branwer, Alexander; Miresmaili, Masoud; and Dausseine, Sean-Paul, 4,861,083, Cl. 292-347.000.

Matzner, Markus: *See*—
Clendinning, Robert A.; Harris, James E.; Kwiatkowski, George T.; McMaster, Lee P.; Matzner, Markus; and Winslow, Paul A., 4,861,915, Cl. 568-328.000.

Mauch, Magnus, to Gebruder Lindenmeyer GmbH. Diesel type pile-driver. 4,860,835, Cl. 173-133.000.

Maurer, Dieter: *See*—
Rudolf, Annast; Schuster, Max; Maurer, Dieter; and Rauter, Jurgen, 4,861,172, Cl. 384-477.000.

Mawhirt, James A.; Cantatore, Luigi; DiFlora, Joseph E.; McCandless, William J. C.; and Trieb, Marvin, to Technicon Instruments Corporation. Automatic sampling system. 4,861,553, Cl. 422-65.000.

May, Donald M., to May Engineering Company. Telephone jack lock-out plug. 4,862,500, Cl. 379-445.000.

May Engineering Company: *See*—
May, Donald M., 4,862,500, Cl. 379-445.000.

Mayer, Lowell A. Animal feeder. 4,860,691, Cl. 119-51.500.
Mayle, Steven R. Apparatus for lifting and carrying heavy loads. 4,861,219, Cl. 414-469.000.
Mayo, Charles H., II: *See*—
Mathiesen, George E.; and Mayo, Charles H., II, 4,861,338, Cl. 604-110.000.
Mazuel, Claude; and Friteyre, Marie-Claire, to Merck & Co., Inc. Ophthalmological composition of the type which undergoes liquid-gel phase transition. 4,861,760, Cl. 514-54.000.
Mazziotti, Philip J., to Zeller Corporation, The. Versatile mounting for bearing cups of universal joints. 4,861,314, Cl. 464-130.000.
Mazziotti, Philip J., to Zeller Corporation, The. Flexible internal universal joint seal. 4,861,315, Cl. 464-131.000.
McAleer, William J.: *See*—
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McAlpin, James J.; and Chow, Wai Y., to Exxon Chemical Patents Inc. Compositions for preparing cement-adhesive reinforcing fibers. 4,861,812, Cl. 524-3.000.
McBride, Antoinette D.; and Smith, Arnold R., to American Telephone and Telegraph Company AT&T Bell Laboratories. Connector for drop wire and other conductors. 4,861,278, Cl. 439-395.000.
McCabe, Ralph P., to Colt Industries Inc. Solenoid valve for programmer vehicle suspension system. 4,861,068, Cl. 280-714.000.
McCall, Samuel L., Jr.: *See*—
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McCandless, William J. C.: *See*—
Mawhirt, James A.; Cantatore, Luigi; DiFlora, Joseph E.; McCandless, William J. C.; and Trieb, Marvin, 4,861,553, Cl. 422-65.000.
McCann, Elrey L., to Du Pont de Nemours, E. I., and Company. Preparation of low molecular weight olefinic hydrocarbons using a perovskite catalyst. 4,861,802, Cl. 518-717.000
McCarron, Eugene M., III, to Du Pont de Nemours, E. I., and Company. Process for making superconductors using barium nitrate. 4,861,753, Cl. 505-1.000
McCarthy, James M.: *See*—
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McCauley, Archie N.: *See*—
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McCauley, Daniel S.: *See*—
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McCoy, Kenneth; Edwards, Neil; Wasley, Robert; and Wales, Denis, to Raychem Corporation. Detection apparatus. 4,862,146, Cl. 340-605.000.
McCready, Russell J.: *See*—
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McCullen, Sharon B.: *See*—
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McDevitt, Steven C.: *See*—
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McElroy, Kennedy K., Jr.; Higby, Jeffrey P.; and Zorc, Philip A., to Outboard Marine Corporation. Marine propulsion device with reversible shift apparatus. 4,861,295, Cl. 440-86.000.
McFadden, Russell E.; and Shure, Charles H., III, to Boeing Company, The. Attached jet spanwise blowing lift augmentation system. 4,860,976, Cl. 244-207.000.
McGowan, Philip J.; McNeill, Steven R.; Mondek, Matthew H.; and Mahnich, James A., to Outboard Marine Corporation. Marine propulsion device with screened water inlet. 4,861,293, Cl. 440-76.000.
McGregor, Rob R.: *See*—
Misevich, Kenneth W.; McGregor, Rob R.; and Mintel, Thomas E., 4,860,464, Cl. 36-114.000.
McGuire, Bernard: *See*—
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McIntosh, Stuckey, to Gambatte, Inc. Spread spectrum communications with resistance to multipath at differential delays both larger and smaller than a chip width. 4,862,478, Cl. 375-1.000.
McKee, John H., to RNA, Incorporated. Medication control system. 4,860,899, Cl. 206-534.000.
McKinnon, Graeme C.; and Bosiger, Peter, to U.S. Philips Corporation. Magnetic resonance examination apparatus and method of operation thereof. 4,862,083, Cl. 324-309.000.
McLean, Jean A.: *See*—
Duncan, Robert J.; and McLean, Jean A., 4,862,510, Cl. 382-8.000.
McLeod, Donald, Jr.: *See*—
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McNally, Frank X., to Industrial Scientific Devices, Inc. Combustible gas detector through use of reaction control block. 4,861,557, Cl. 422-97.000.
McNamara, Thomas F.: *See*—
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McNeill, Steven R.: *See*—
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McNew, Quinton B.: *See*—
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McPhee, William A.: *See*—
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Larson, Carl A.; McMillen, Charles J.; and McQuay, Edgar E., 4,862,307, Cl. 361-38.000.
McVey, Harry D.: *See*—
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Meador, Lawrence D. Animal aspirating and irrigating apparatus. 4,861,333, Cl. 604-35.000.
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Mec-Lift A.S.: *See*—
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Hudimac, George S., Jr., 4,860,765, Cl. 128-725.000.
Medical Innovations Corporation: *See*—
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Medical Parameters, Incorporated: *See*—
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Mediverse Inc.: *See*—
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Medtronic, Inc.: *See*—
Lessar, Joseph F.; Rosenberg, Duane L.; Kraska, Robert E.; Speckien, James M.; and Upton, James E., 4,860,446, Cl. 29-858.000.
Meehan, Adrian P.; and Ash, Vernon R., to Rentokil Limited. Pest monitoring system. 4,862,145, Cl. 340-573.000
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Meermans, Matheus J. M., to U.S. Philips Corporation. Magnetic-tape cassette and tape-pressure member for use in such a cassette. 4,860,967, Cl. 242-199.000.
Meffert, Alfred: *See*—
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Meinander, Kerstin: *See*—
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Meisenzahl, Eric, to Eastman Kodak Company. Readout of charge packets from area imager CCD using an inverter-chain shift register. 4,862,275, Cl. 358-213.290.
Meister, Anton, to Meistermatic AG. Large area welding machine for plastic sheets. 4,861,412, Cl. 156-499.000.
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Melnychuck, Paul W.: *See*—
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Melton, Stephen R.; and Redelsheimer, Rebecca, to Melton, Stephen R. Perforated web separator. 4,862,378, Cl. 364-469.000.

Memorex Corporation: *See*—
Karle, Dennis W., 4,861,655, Cl. 428-328.000.
Menard, Paul R.: *See*—
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Mendon Electronics Corporation: *See*—
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Menner, Michael: *See*—
Bergter, Friedrich; Bocker, Harald; Bormann, Ernst-Joachim; Forberg, Wolfgang; Fricke, Heinz; Grafe, Udo; Grosse, Hans-Helmut; Heller, Ingeborg; Hilliger, Matthias; Junne, Wolf; Linde, Hellmut; Menner, Michael; Menzel, Klaus-Dieter; Muller, Peter-Jurger; Plonka, Gunter; Pohl, Hans D.; Schneider, Jorg; and Thrum, Heinz, 4,861,715, Cl. 435-70.000.
Menzel, Klaus-Dieter: *See*—
Bergter, Friedrich; Bocker, Harald; Bormann, Ernst-Joachim; Forberg, Wolfgang; Fricke, Heinz; Grafe, Udo; Grosse, Hans-Helmut; Heller, Ingeborg; Hilliger, Matthias; Junne, Wolf; Linde, Hellmut; Menner, Michael; Menzel, Klaus-Dieter; Muller, Peter-Jurger; Plonka, Gunter; Pohl, Hans D.; Schneider, Jorg; and Thrum, Heinz, 4,861,715, Cl. 435-70.000.
Mercer, William C.; Coughlin, Peter K.; McLeod, Donald, Jr.; and Flanigen, Edith M., to UOP. Composite moisture sensing apparatus and method. 4,860,584, Cl. 73-336.500.
Merck & Co., Inc.: *See*—
Hurni, William M.; Miller, William J.; and McAleer, William J., 4,861,706, Cl. 435-5.000.
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Merck Patent Gesellschaft mit Beschrankter Haftung: *See*—
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Mergenthaler, Robert: *See*—
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Merten, Barron C.; and Morton, Kenneth P., to Quaker Oats Company, The. Infant car seat mountable on a grocery cart. 4,861,105, Cl. 297-250.000.
Merten, Rudolf: *See*—
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Merz, Walter, to Hoffmann-La Roche Inc. Method and composition to treat panic syndrome. 4,861,772, Cl. 514-219.000.
Meschter, Peter; Lederich, Richard J.; and O'Neal, James E., to United States of America, Administrator, National Aeronautics and Space Administration. Elevated temperature aluminum alloys. 4,861,551, Cl. 420-533.000.
Messerschmitt-Boelkow-Blohm GmbH: *See*—
Roth, Siegfried; and Mueller, Helmut, 4,861,996, Cl. 250-330.000.
Meta-C Corporation: *See*—
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Meta-Fer Holding S.A.: *See*—
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Metcalf, Philip R., Jr.: *See*—
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Metpost Ltd.: *See*—
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Metsarinta, Maija-Leena: *See*—
Talonen, Timo T.; I Poijarvi, Jaakko T.; and Metsarinta, Maija-Leena, 4,861,577, Cl. 423-577.000.
Mettler Instruments AG: *See*—
Kubli, Rudolf; and Wachter, Hanspeter, 4,862,401, Cl. 364-710.070.
Reichmuth, Arthur, 4,860,839, Cl. 177-185.000.
Mettoudi, Isaac; and Lafranca, Francois, to Societe Anonyme dite Alcatel Thomson Faisceaux Hertziens. Microwave oscillator having a dielectric resonator, in particular for the 22 GHz range. 4,862,111, Cl. 331-96.000.
Meyer, Harry M., Jr.; and Weiss, Martin J., to American Cyanamid Company. Suppression of B-lymphocytes in mammals by administration of anti-B-lymphocyte antibodies. 4,861,579, Cl. 424-1.100.
Meyer, Rolf-Volker: *See*—
Schultz, Klaus-Dieter; Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; and Michael, Dietrich, 4,861,815, Cl. 524-114.000.
Meyer, Stephen F.; and Sans, Claude A., to Southwall Technologies. Bronze-grey glazing film and window made therefrom. 4,861,680, Cl. 428-623.000.
MG 2 S.p.A.: *See*—
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Michael, Dietrich: *See*—
Schultz, Klaus-Dieter; Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; and Michael, Dietrich, 4,861,815, Cl. 524-114.000.
Sirinyan, Kirkor; Laue, Hans-Joachim; Merten, Rudolf; Michael, Dietrich; and Tima, Milan-Josef, 4,861,663, Cl. 428-409.000.
Michalik, Horst B., to Koenig & Bauer Aktiengesellschaft. Device to deliver printed products from a fanwheel. 4,861,019, Cl. 271-315.000.
Michalopoulos, Daniel L.: *See*—
Barnett, Daniel J.; and Michalopoulos, Daniel L., 4,861,429, Cl. 162-199.000.
Michener, John R., to Siemens Corporate Research & Support, Inc. Electron storage source for electron beam testers. 4,861,991, Cl. 250-310.000.
Michot, Alain F., to Northern Telecom Limited. Connector holder. 4,860,980, Cl. 248-74.400.
Mickelsen, Michael M. Deck gutter system. 4,860,502, Cl. 52-11.000.
Mico, Bruce: *See*—
Gaitanopoulos, Dimitri; Mico, Bruce; and Weinstock, Joseph, 4,861,771, Cl. 514-213.000.
Microelectronics and Computer Technology Corporation: *See*—
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Mieda, Akihiko: *See*—
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Mieno, Toshiyuki: *See*—
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Mier, Francisco D. Continuous flow cloverleaf type interchange. 4,861,184, Cl. 404-1.000.
Miers, David R.; Raj, David; and Varshneya, Deepak, to Babcock & Wilcox Company, The. Fiberoptic microbend accelerometer. 4,860,586, Cl. 73-517.00R.
Migita, Masahito; Kanehisa, Osam; Shiiki, Masatoshi; and Yamamoto, Hajime, to Hitachi, Ltd. Electroluminescent display apparatus having a multi-color illuminant layer and process for producing the same. 4,862,033, Cl. 313-502.000.
Mihalich, James M., to General Electric Company. Multilayered articles formed by coextrusion of polycarbonate and polyester. 4,861,630, Cl. 428-34.100.
Mihara, Teruyoshi: *See*—
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Mihara, Yoshikazu; and Nakashima, Hiroshi, to Sanyo Electric Co., Ltd. Disc erasing apparatus for selective erasure of disc tracks. 4,862,294, Cl. 360-35.100.
Miller, A. Dusty, to Fred Hutchinson Cancer Research Center. DNA constructs for retrovirus packaging cell lines. 4,861,719, Cl. 435-236.000.
Miller, David J.; Bryant, David R.; Billig, Ernst; and Shaw, Bernard L., to Union Carbide Corporation. Reactivation of hydroformylation catalysts. 4,861,918, Cl. 568-454.000.
Miller, Luitpold: *See*—
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Milner, Ronald E. Sonic positioning device. 4,862,152, Cl. 340-712.000.
Milton, A. David; and Stroobach, Jerry, to Mitel Corporation. Digital signal processing system. 4,862,452, Cl. 370-62.000
Milz, Arthur, to Milz Produkte AG. Method for joining together two segments of a snow-chain, and connecting element to implement the method. 4,860,532, Cl. 59-35.100.
Milz Produkte AG: *See*—
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Minamisawa, Tsuyoshi; Endo, Katsunori; and Kanoe, Toshio. Polyester composition. 4,861,515, Cl. 252-299.010

Minemura, Hiroyuki: *See—*
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Miner, Robert A. Practice putting cup. 4,861,033, Cl. 273-177.00R.

Minezawa, Morio: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
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Ishida, Tokuji; Hamada, Masataka; Karasaki, Toshihiko; Norita, Toshio; and Taniguchi, Nobuyuki, 4,862,204, Cl. 354-408.000.
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Miresmaili, Masoud: *See—*
Fish, Aaron M.; Matzeld, Leon; Branwer, Alexander; Miresmaili, Masoud; and Dausseine, Sean-Paul, 4,861,083, Cl. 292-347.000.

Miriam Collins - Palm Beach Laboratories Co.: *See—*
Kaitz, Richard A.; and Kaitz, Miriam J., 4,860,736, Cl. 128-155.000.

Mirkovich, Ninko T., to Tegal Corporation. Cassette elevator for use in a modular article processing machine. 4,861,222, Cl. 414-648.000.

Misawa Home Kabushiki Kaisha: *See—*
Nakano, Sota; and Tada, Shinsaku, 4,861,375, Cl. 106-90.000.

Misevich, Kenneth W.; McGregor, Rob R.; and Mintel, Thomas E., to Colgate-Palmolive Company. Transverse support sling. 4,860,464, Cl. 36-114.000

Mishiba, Saburo: *See—*
Toyoda, Yasushi; Mishiba, Saburo; and Nishioka, Toshiyasu, 4,861,820, Cl. 524-510.000.

Mita Industrial Co., Ltd.: *See—*
Shibata, Kiyotaka; and Morimoto, Kiyoshi, 4,861,013, Cl. 271-119.000.
Tsunoda, Arihiro; Tsuji, Kikunosuke; Nakakuma, Akira; and Matsushita, Tetsuya, 4,862,218, Cl. 355-235.000.
Yamamoto, Kiyonori; Sota, Osamu; Sakae, Masahiko; Makiura, Yoshinori; Murakami, Masahiro; and Mitsuya, Toshiyuki, 4,861,017, Cl. 271-258.000.

Mitchell, Christopher: *See—*
Markle, Wilson; and Mitchell, Christopher, 4,862,256, Cl. 358-81.000.

Mitchell, Gerald M.: *See—*
Couillaud, Bernard; and Mitchell, Gerald M., 4,862,469, Cl. 372-33.000.

Mitel Corporation: *See—*
Milton, A. David; and Stroobach, Jerry, 4,862,452, Cl. 370-62.000.

Mitman, David: *See—*
DiMarzio, Frank; and Mitman, David, 4,861,325, Cl. 493-124.000.

Mitoh, Kunihiko: *See—*
Shimizu, Toshiyuki; Shimizu, Osamu; Tenmoku, Kenji; Mitoh, Kunihiko; and Honoki, Yasuhiro, 4,862,398, Cl. 364-571.050.

Mitomi, Michio, to Kabushiki Kaisha Toshiba. Method and system for controlling characteristics of gradient magnetic fields in magnetic resonance imaging apparatus. 4,862,084, Cl. 324-309.000.

Mitsuba Electric Manufacturing Co., Ltd.: *See—*
Kamiyama, Akira; Yamagisawa, Nobuo; and Oshima, Nobuyuki, 4,861,238, Cl. 417-363.000.

Mitsubishi Aluminum Kabushiki Kaisha: *See—*
Asano, Masami; Toma, Ken; and Takeuchi, Yo, 4,861,681, Cl. 428-654.000

Mitsubishi Denki Kabushiki: *See—*
Andou, Nobuyoshi; and Imai, Hitoshi, 4,861,139, Cl. 350-255.000

Mitsubishi Denki Kabushiki Kaisha: *See—*
Azuma, Kenkoku; and Sakaki, Masaaki, 4,861,620, Cl. 427-53.100.
Fujimoto, Akihiko, 4,862,379, Cl. 364-474.110.
Ishii, Kazuhiro, 4,862,312, Cl. 361-96.000
Isozumi, Shuzoo; and Konishi, Keiichi, 4,862,027, Cl. 310-99.000
Kinoshita, Takashi, 4,860,604, Cl. 74-7.00E.
Kojima, Masanori, 4,862,118, Cl. 333-14.000.
Maekawa, Hirotoshi, 4,862,371, Cl. 364-431.110.
Matsumoto, Hideo, 4,861,387, Cl. 136-256.000.
Morishita, Mitsuharu; and Kohge, Shinichi, 4,862,366, Cl. 364-424.050.
Nakai, Takahiro; Hatanaka, Keiji; and Hatano, Yoshiko, 4,862,099, Cl. 329-126.000.
Tadokoro, Michihiro; Okada, Kazuo; and Imai, Hitoshi, 4,862,442, Cl. 369-45.000
Yamamoto, Kyohei, 4,862,010, Cl. 290-38.00R
Yumura, Takashi; and Yamamoto, Tetsu, 4,862,441, Cl. 369-45.000

Mitsubishi Gas Chemical Company, Inc.: *See—*
Sugio, Akitoshi; Kawaki, Takao; Kobayashi, Makoto; Hayashi, Katsushige; and Watanabe, Masahito, 4,861,854, Cl. 528-125.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Kobayashi, Kazuyuki, 4,860,608, Cl. 74-501.600
Yamaguchi, Shogo; Araki, Kazunori; and Tazuke, Hisashi, 4,860,802, Cl. 141-6.000
Yamaguchi, Shogo; and Tazuke, Hisashi, 4,860,804, Cl. 141-94.000.

Mitsubishi Kasei Corporation: *See—*
Okada, Itaru; Okui, Shuko; Nishimata, Mana; Takahashi, Yoji; and Fukuchi, Toshiki, 4,861,777, Cl. 514-234.500.

Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Ikeda, Hiroshi; Tsunashima, Makoto; and Mieda, Akihiko, 4,861,574, Cl. 423-342.000.

Mitsubishi Metal Corporation of Tokyo: *See—*
Yoshida, Takeshi; Takizawa, Yoshio; and Sekine, Ichiro, 4,861,550, Cl. 420-460.000

Mitsubishi Paper Mills Limited: *See—*
Yamashita, Miyuki, 4,862,223, Cl. 355-54.000.

Mitsuboshi Belting Ltd.: *See—*
Yoshimi, Keiichi; Goto, Shigeo; and Asazuma, Masaaki, 4,861,403, Cl. 156-138.000

Mitsubushi Denki Kabushiki Kaisha: *See—*
Yamamoto, Masahiro; and Yatomi, Takeshi, 4,862,095, Cl. 324-543.000

Mitsui Kinzoku Kogyo Kabushiki Kaisha: *See—*
Satoh, Seiki, 4,861,081, Cl. 292-336.300.

Mitsui Mining & Smelting Co., Ltd.: *See—*
Miura, Akira; Takata, Kanji; Okazaki, Ryoji; Uemura, Toyohide; and Kagawa, Keiichi, 4,861,688, Cl. 429-206.000.

Mitsui, Susumu; Kurose, Shigeru; and Saimoto, Hiroshi, to Takeda Chemical Industries, Ltd. Antimicrobial composition. 4,861,766, Cl. 514-184.000

Mitsukuchi, Morihiro; Ikemoto, Tomoyuki; Watanabe, Yoshiaki; and Sota, Kaoru, to Jouveinal. 21-alkyl-, cycloalkyl- or aryl-substituted ths steroids and pharmaceutical compositions containing them. 4,861,765, Cl. 514-181.000

Mitsuya, Hiroaki; and Broder, Samuel, to United States of America, Health and Human Services. Antiviral compositions and methods. 4,861,759, Cl. 514-46.000

Mitsuya, Toshiyuki: *See—*
Yamamoto, Kiyonori; Sota, Osamu; Sakae, Masahiko; Makiura, Yoshinori; Murakami, Masahiro; and Mitsuya, Toshiyuki, 4,861,017, Cl. 271-258.000

Miura, Akira; Takata, Kanji; Okazaki, Ryoji; Uemura, Toyohide; and Kagawa, Keiichi, to Matsushita Electric Indus. Co. Ltd.; and Mitsui Mining & Smelting Co., Ltd. Zinc-alkaline battery. 4,861,688, Cl. 429-206.000

Miura, Kenji: *See—*
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira, Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,861,792, Cl. 514-389.000

Miura, Norio, to Sanyo Electric Co., Ltd. Method of manufacturing an inductance element. 4,860,433, Cl. 29-605.000

Miura, Ryuichi; and Nakao, Toshinobu, to Konishi Co., Ltd.; and Sunkit Co., Ltd. Method of injecting adhesives into cracks. 4,861,401, Cl. 156-94.000

Miwa, Hiroshi: *See—*
Mizuguchi, Katsumi; Okude, Yoshitaka; Miwa, Hiroshi; and Okuda, Hidefumi, 4,861,839, Cl. 525-506.000.

Miwa, Katsumi: *See—*
Hidaka, Shinobu; Miwa, Katsumi; and Higashi, Masato, 4,862,512, Cl. 382-58.000

Miwa, Kiyoshi: *See—*
Sano, Konosuke; Ito, Koichi; Miwa, Kiyoshi; and Nakamori, Shigeru, 4,861,722, Cl. 435-252.320

Miyabayashi, Shigeaki; Kanai, Hiroshi; Oka, Joji; and Matsuura, Yoshikatsu, to Takeda Chemical Industries, Ltd.; and Nippon Steel Corporation. One-can heat-curable resin compositions and precoated metal. 4,861,672, Cl. 428-458.000

Miyabayashi, Toshio; Sakabe, Nobuyuki; and Zen, Shinichiro, to Japan Synthetic Rubber Co., Ltd. Vinylidene fluoride-acrylic acid ester copolymer, process for producing the same and composition containing the same. 4,861,851, Cl. 526-255.000.

Miyajima, Masao: *See—*
Teteishi, Iwao; Ogura, Yoshiyuki; Hashimoto, Takeshi; Ritou, Tuguyoshi; Kajiyama, Katsufumi; Shimizu, Fumiaki; Tanaka, Kenji; Aibara, Yutaka; Kataoka, Hiroaki; Nakai, Katsuya; Yoshikawa, Takashi; Kanamori, Masaaki; Miyajima, Masao; Seki, Shuzo; and Takahashi, Sadanobu, 4,860,523, Cl. 53-512.000.

Miyakawa, Tadashi, to Fuji Photo Film Co., Ltd. Method of changing image magnification. 4,862,285, Cl. 358-451.000.

Miyake, Junichi: *See—*
Yamaguchi, Kouji; Ishikawa, Yoshikazu; Kameda, Toshihiro; Hattori, Shogo; and Miyake, Junichi, 4,860,708, Cl. 123-399.000.

Miyake, Takanori; Sekizawa, Kazuhiko; Hironaka, Toshio; and Tsutsumi, Yukihiro, to Tosoh Corporation. Process for producing halogenated benzene derivative using zeolite catalyst. 4,861,929, Cl. 570-209.000.

Miyama, Akimasa: *See—*
Ohashi, Takehisa; Kan, Kazunori; Ueyama, Noboru; Sada, Isao; Miyama, Akimasa; and Watanabe, Kiyoshi, 4,861,877, Cl. 540-357.000.

Miyamoto, Norifumi; Sato, Yoshio; Tsuboi, Nobuyoshi; Shimada, Satoshi; Sasaki, Hiroshi; Koyanagi, Hiroaki; and Minemura, Hiroyuki, to Hitachi, Ltd. Optical head with optical beam control using acoustic wave device. 4,862,440, Cl. 369-45.000.

Miyanaga, Hirofumi: *See—*
Hasegawa, Hiroshi; and Miyanaga, Hirofumi, 4,860,732, Cl. 128-6.000.

Miyasaka, Matsuho; Ichikawa, Katsuhiro; Sasaki, Katsumi; Mizobuchi, Syotaro; and Ogure, Naoaki, to Ebara Corporation. Method of using machine parts made of austenitic cast iron having resistance to stress corrosion cracking in contact with salt water. 4,861,395, Cl. 148-321.000

Miyawaki, Yoshinori; Matumoto, Kazuhiro; and Shirasaki, Osamu, to Omron Tateisi Electronics Co.; and Isao KAI. Electronic blood pressure meter incorporating compensation function for systolic and diastolic blood pressure determinations. 4,860,760, Cl. 128-680.000.

Miyazaki, Akira: *See—*
Tada, Tetsuya; Nagasaka, Masumi; Iwamoto, Kouji; Teratani, Tatsuo; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Yagi, Kiyoshi, 4,862,367, Cl. 364-426.040.

Miyazaki, Hiroshi: *See—*
Harada, Masashi; Miyazaki, Hiroshi; and Itabashi, Keiji, 4,861,571, Cl. 423-328.000.

Miyazaki, Kenichi: *See—*
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Miyazaki, Kenichi; Takahashi, Toshinori; Kitamura, Hiroki; Shinya, Tadao; and Mizoguchi, Yutaka, 4,862,255, Cl. 358-80.000.

Miyazaki, Minoru: *See—*
Yamazaki, Shunpei; Inujima, Takashi; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Sakama, Mitsunori; Miyazaki, Minoru; Koyanagi, Kaoru; and Yamaguchi, Toshiharu, 4,861,143, Cl. 350-350.00S.

Miyazaki, Nobuyuki: *See—*
Takayanagi, Takashi; Munekata, Seiji; Miyazaki, Nobuyuki; and Moriwaki, Ken, 4,861,667, Cl. 428-421.000.

Miyazaki, Yoshio: *See—*
Tajima, Shoji; Kadomatsu, Yasuo; Miyazaki, Yoshio; Sakurai, Michikazu; and Anze, Kimio, 4,860,417, Cl. 29-130.000.

Miyke, Nobuyuki: *See—*
Yoshida, Nobutoshi; Miyke, Nobuyuki; Takagi, Atsushi; Saito, Takashi; Suzuki, Tadashi; Ohki, Naoyuki; Tomosada, Masahiro; Adachi, Hideki; and Takeda, Hiroaki, 4,862,219, Cl. 355-202.000.

Miyoshi, Makoto: *See—*
Uchida, Koh; Kurihara, Takashi; and Miyoshi, Makoto, 4,860,846, Cl. 180-141.000.

Mizobuchi, Syotaro: *See—*
Miyasaka, Matsuho; Ichikawa, Katsuhiro; Sasaki, Katsumi; Mizobuchi, Syotaro; and Ogure, Naoaki, 4,861,395, Cl. 148-321.000.

Mizoguchi, Yutaka: *See—*
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Miyazaki, Kenichi; Takahashi, Toshinori; Kitamura, Hiroki; Shinya, Tadao; and Mizoguchi, Yutaka, 4,862,255, Cl. 358-80.000.

Mizuguchi, Katsumi; Okude, Yoshitaka; Miwa, Hiroshi; and Okuda, Hidefumi, to Nippon Paint Co., Ltd. Metal chelate compound and curable coating composition therefrom. 4,861,839, Cl. 525-506.000.

Mizuno, Kuniharu: *See—*
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,861,792, Cl. 514-389.000.

Mizuno, Satoshi: *See—*
Shirouzu, Tatsuji; Takahashi, Tatsuo; Sato, Motoo; and Mizuno, Satoshi, 4,862,313, Cl. 361-102.000.

Mizutani, Hiroyuki: *See—*
Kamitake, Takashi; Mizutani, Hiroyuki; and Kawamura, Shin-ichi, 4,862,501, Cl. 380-50.000.

MÅnsson, Martin; and Torstenfelt, Ragnar, to ABB Stal AB. Power plant for burning a fuel at high pressure and a gas turbine driven by the combustion gases. 4,860,535, Cl. 60-39.464.

Moberg, Hans: *See—*
Borgstrom, Leonard; Carlsson, Claes G.; Franzen, Peter; Inge, Claes; Lagerstedt, Torgny; Moberg, Hans; and Nabo, Olle, 4,861,329, Cl. 494-73.000.

Mobil Oil Corp.: *See—*
Bowes, Emmerson; and Yan, Tsoung Y., 4,861,894, Cl. 546-251.000.
Chen, Nai Y.; Degnan, Thomas F.; and McCullen, Sharon B., 4,861,932, Cl. 585-412.000.
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,861,741, Cl. 502-67.000.
Jennings, Alfred R., Jr.; and Shucart, John K., 4,860,830, Cl. 166-312.000.
Kuehl, Guenter H.; and Landis, Michael E., 4,861,570, Cl. 423-326.000
Nemet-Mavrodin, Margaret, 4,861,933, Cl. 585-417.000.

Mobilio, Dominick: *See—*
Hughes, Philip F.; Mobilio, Dominick; and Humber, Leslie G., 4,861,910, Cl. 560-126.000.

Mochizuki, Kouji; Ozeki, Masashi; and Ohtsuka, Nobuyuki, to Fujitsu Limited. Method of growing group III-V compound semiconductor epitaxial layer. 4,861,417, Cl. 156-610.000.

Mochizuki, Toshiyasu: *See—*
Machida, Tsutomu; Mochizuki, Toshiyasu; and Sasaki, Masaru, 4,862,330, Cl. 362-61.000.

Mockford, Mary J.: *See—*
Manley, James D.; Mockford, Mary J.; and Stanley, David R., 4,861,735, Cl. 501-96.000.

Moeneclaey, Denis: *See—*
Victoor, Johnny; Coopman, Lucien; and Moeneclaey, Denis, 4,860,800, Cl. 139-448.000.

Mohile, Vivek V.: *See—*
Joy, Theodore J.; Mohile, Vivek V.; and Richards, William L., 4,861,234, Cl. 417-273.000.

Moitzger, Max, to Diehard Engineering, Inc. Apparatus for encapsulating selected portions of a printed circuit board. 4,861,251, Cl. 425-116.000.

Molins Limited: *See—*
Hinchcliffe, Dennis; and Stone, William A., 4,860,880, Cl. 198-405.000.

Momma, Naohiro: *See—*
Watanabe, Atsuo; Nagano, Takahiro; Ikeda, Takahide; Momma, Naohiro; and Saito, Ryuichi, 4,862,240, Cl. 357-42.000.

Mondek, Matthew H.: *See—*
McGowan, Philip J.; McNeill, Steven R.; Mondek, Matthew H.; and Mahnich, James A., 4,861,293, Cl. 440-76.000.

Monell Chemical Senses Center: *See—*
Galef, Bennett G., Jr.; and Mason, J. Russell, 4,861,585, Cl. 424-84.000.

Mong-Sheng, Lin. Toy bubble pipe with blow air-actuated pivoting animal shaped blowpipe. 4,861,303, Cl. 446-17.000.

Monolithic Memories, Inc.: *See—*
Hoberman, Barry A., 4,862,419, Cl. 365-221.000.

Monsan, Pierre F.: *See—*
Paul, Francois B.; Monsan, Pierre F.; Remaud, Magali M. C.; and Pelenc, Vincent P., 4,861,381, Cl. 127-41.000.

Monsanto Company: *See—*
Dahms, Ronald H., 4,861,650, Cl. 428-251.000.
Hardiman, Christopher J.; and Bowers, Gary R., 4,861,668, Cl. 428-424.400.
Krivi, Gwen G., 4,861,868, Cl. 530-399.000.
Pfohl, William F., 4,861,881, Cl. 544-196.000.

Montalvo Corporation, The: *See—*
Montalvo, William W., III; and Metcalf, Philip R., Jr., 4,860,865, Cl. 192-70.000.

Montalvo, William W., III; and Metcalf, Philip R., Jr., to Montalvo Corporation, The. Quick release, high torque, friction brakes and clutches. 4,860,865, Cl. 192-70.000.

Montgomery, Terry G.; and Martin, William G., to Springs Industries, Inc. Corespun yarn friction spinning apparatus and method. 4,860,530, Cl. 57-5.000.

Montgomery, William C.: *See—*
Cassity, Thomas G.; Montgomery, William C.; Baker, Gerald S.; Wedel, Alfred W.; and Taylor, William M., 4,862,426, Cl. 367-81.000.

Monvoisin, Jacques; and Trubett, Valdo, to Thomson-CSF. Microwave antenna of light weight and small bulk. 4,862,188, Cl. 343-840.000.

Moodie, Jonathan P.: *See—*
Brotzmann, Karl; Moodie, Jonathan P.; and Turner, Richard E., deceased, 4,861,368, Cl. 75-25.000.

Moon, Burl M.: *See—*
Bertin, Robert; Miller, Michael B.; Moon, Burl M.; and Post, Robert C., 4,861,533, Cl. 264-81.000.

Moon, Juhn W.; Hwang, Bun; and Chang, Jin K., to Dongsuh Foods Corp. Process of preparing instant powdered food. 4,861,605, Cl. 426-96.000.

Moon, Tea-Weon: *See—*
Jung, Se-Young; and Moon, Tea-Weon, 4,862,290, Cl. 358-335.000.

Moore, Annette A.: *See—*
Lampe, Warren R.; Moore, Annette A.; and Hartley, Kathleen R., 4,861,670, Cl. 428-447.000.

Moore Business Forms, Inc.: *See—*
Braud, Harry A., 4,860,946, Cl. 229-69.000.
Rizza, Robert S.; Fagen, Ben W., Jr.; Raymond, Michael W.; Feher, Peter; Milliard, Norman L.; and Kegelman, Thomas B., 4,862,198, Cl. 346-153.100.

Moore, John R. Mailbox signaling arrangement. 4,860,949, Cl. 232-35.000

Moore, Loyd C.: *See—*
Fowler, James F.; Barker, Nick; Kaneko, Steven; and Moore, Loyd C., 4,860,897, Cl. 206-444.000.

Moore, Robert H.: *See*—
Hammons, Sheridan W.; and Moore, Robert H., 4,861,160, Cl. 356-138.000.

Moore, William A.; Economy, Constantine F.; and Economy, Theodore F., to Midway Video, Ltd. Article vending machine employing unique robotic arm and the robotic arms employed therein. 4,860,876, Cl. 194-205.000.

Moorhouse, D. J.: *See*—
Abouav, David M., 4,860,653, Cl. 102-200.000

Moplefan S.p.A.: *See*—
Vittone, Andrea; and Chiappini, Giuseppe, 4,861,639, Cl. 428-105.000.

Moran, Thomas F., Jr., to Midwest Plastic Fabricators, Inc. Adjustable riser assembly. 4,861,942, Cl. 174-38.000.

Morane, Bruno; and de Laforcade, Vincent, to L'Oreal. Container for packaging a product and dispensing it under good conditions of cleanliness. 4,860,933, Cl. 222-402.130

Morgan, Thomas E., to Marconi Company Limited, The. Microwave transformer. 4,862,189, Cl. 343-859.000

Morganson, Stephen A.; and Beecher, John L., to Ecolab Inc. Nonfilming high performance solid floor cleaner. 4,861,518, Cl. 252-548.000

Mori, Akira: *See*—
Amazawa, Kiyoshi; and Mori, Akira, 4,862,097, Cl 328-165.000

Mori, Kenji: *See*—
Aburatani, Masakazu; Takeuchi, Tadashi; and Mori, Kenji, 4,861,875, Cl. 540-114.000.

Mori, Masanori: *See*—
Kobayashi, Toshimitsu; Inagaki, Akio; Kobayashi, Yasuhiro; Mori, Masanori; and Sakakibara, Takashi, 4,861,323, Cl. 474-260.000

Mori, Ryoichi: *See*—
Hashimoto, Youichi; Tokuyama, Takashi; Nishiga, Kazuya; Arai, Yoshihiro; Ueki, Nobuhide; and Adachi, Naoki, 4,862,170, Cl. 341-144.000.

Mori, Shinsaku: *See*—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,860,770, Cl. 128-804.000

Mori, Yoichi: *See*—
Fukunaga, Akira; and Mori, Yoichi, 4,861,578, Cl. 423-240.000.

Morikawa, Koji, to Fuji Jukogyo Kabushiki Kaisha. Engine with variable compression ratio. 4,860,711, Cl. 123-48.00D.

Morimoto, Hideaki, to NEC Corporation. Radio transmission system having simplified error coding circuitry and fast channel switching. 4,862,457, Cl. 371-8.000

Morimoto, Kiyoshi: *See*—
Shibata, Kiyotaka; and Morimoto, Kiyoshi, 4,861,013, Cl. 271-119.000.

Morimoto Mfg. Co., Ltd.: *See*—
Kawai, Hironao; Fukui, Shigetoshi; and Ikeda, Kenji, 4,860,676, Cl. 112-121.140.

Morimoto, Takeshi; Sanada, Yasuhiro; Ohashi, Shinichi; and Kimura, Yoshikatsu, to Asahi Glass Company Ltd.; and Elna Company Ltd Electric double layer capacitor. 4,862,328, Cl. 361-502.000.

Morin, Claude, to T.A.C. (Tongerese Automaten Centrale). Protective helmet with movable integrated screen. 4,860,389, Cl. 2-424.000.

Morinaga, Motoyasu; Furuyama, Hideto; Nakamura, Masaru; Suzuki, Nobuo; Hirayama, Yuzo; and Okuda, Hajime, to Kabushiki Kaisha Toshiba. Semicondutor laser device. 4,862,474, Cl. 372-50.000.

Moring, Walter G., III, to AP Parts Manufacturing Company. Stamp formed muffler with nonplanar array of tubes. 4,860,853, Cl. 181-282.000.

Morini, Emilio, to Pirelli Sistemi Antivibranti S.p.A. Element for supporting suspension-springs. 4,861,007, Cl. 267-153.000.

Morishita, Mitsuharu; and Kohge, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Motor-driven power steering system for a vehicle. 4,862,366, Cl. 364-424.050.

Morishita, Muneki: *See*—
Kondo, Takayuki; and Morishita, Muneki, 4,861,974, Cl. 235-475.000.

Moriwaki, Ken: *See*—
Takayanagi, Takashi; Munekata, Seiji; Miyazaki, Nobuyuki; and Moriwaki, Ken, 4,861,667, Cl. 428-421.000

Moriya, Hiroshi: *See*—
Kaibuki, Shigeo; Watanabe, Shinpei; Takahashi, Mitsugu; and Moriya, Hiroshi, 4,860,424, Cl. 29-434.000.

Moriyama, Hitoshi: *See*—
Watanabe, Yoshiharu; Shimizu, Hisayuki; Ito, Mineo; and Moriyama, Hitoshi, 4,861,378, Cl. 106-314.000

Morozumi, Shinji, to Seiko Epson Corporation. Solid state image sensor. 4,862,237, Cl. 357-30.000.

Morpheus Lights, Inc.: *See*—
Richardson, Brian; and Richardson, John, 4,862,336, Cl. 362-285.000.

Morrill Glasstek, Inc.: *See*—
Morrill, Vaughan, Jr.; Scandrett, John H.; and Hudson, David K., 4,860,437, Cl. 29-623.000

Morrill, Vaughan, Jr.; Scandrett, John H.; and Hudson, David K., to Morrill Glasstek, Inc. Method of making a sub-miniature fuse 4,860,437, Cl. 29-623.000

Morris, Carlton E.; Loretan, Philip A.; Bonsi, Conrad K.; and Hill, Walter A., to Tuskegee University. Movable root contact-pressure plate assembly for hydroponic system. 4,860,490, Cl. 47-63.000.

Morris, Jeffrey: *See*—
Sosa, Jose M.; and Morris, Jeffrey, 4,861,827, Cl. 525-54.000.

Morris, Ronald N.: *See*—
Higham, Graham J.; Morris, Ronald N.; and Pruitt, Gerald R., 4,860,543, Cl. 62-6.000

Morris, Susan B., to Phosphate Engineering & Construction Co., Inc Removal of cationic impurities from inorganic solutions. 4,861,490, Cl. 210-669.000.

Morrison, Andrew D., to United States of America, Administrator, National Aeronautics and Space Administration. Ribbon growing method and apparatus. 4,861,416, Cl. 156-608.000.

Morscheck, Timothy J.: *See*—
Gooch, Douglas C.; and Morscheck, Timothy J., 4,860,861, Cl. 192-3.260

Morten, John F. Automatic relamping system. 4,862,038, Cl. 315-86.000

Morton, Henry H.: *See*—
Reeser, Larry J.; and Morton, Henry H., 4,860,950, Cl. 236-51.000.

Morton, Kenneth P.: *See*—
Merten, Barron C.; and Morton, Kenneth P., 4,861,105, Cl. 297-250.000.

Moruta, Masaya: *See*—
Nakajima, Nobuyuki; Inomata, Kenichi; Moruta, Masaya; Eitai, Kazuo; and Yamaguchi, Toshio, 4,861,235, Cl. 417-295.000

Moscoe, Gerald F.; Mastervich, Joel C.; Kreevich, William J.; Knoepke, John R.; Rellis, Daniel, Jr.; Glennon, Roger J.; and Pielet, Howard M., to Inland Steel Company. Continuous casting tundish and assembly. 4,860,819, Cl. 164-437.000.

Moser Bag and Paper Company, The: *See*—
Welles, Theodore W., 4,861,957, Cl. 219-10.55E

Moskowitz, Paul A.: *See*—
Bickford, Harry R.; Bregman, Mark F.; Moskowitz, Paul A.; Palmer, Michael J.; Reiley, Timothy C.; Poore, Paige A.; and Kovac, Caroline A., 4,862,322, Cl. 361-386.000.

Moss, H. Donald: *See*—
Chickering, Ronald W.; Miller, Richard S.; and Moss, H. Donald, 4,862,079, Cl. 324-227.000

Moss, Russell W.: *See*—
Romanak, Alfred J.; and Moss, Russell W., 4,861,264, Cl. 431-263.000

Moteki, Eiji, to Fuji Electric Co., Ltd. Stepping motor's negative-phase braking control device. 4,862,051, Cl. 318-696.000.

Motor Meter AG: *See*—
Siefert, Roland, 4,862,191, Cl. 346-18.000

Motor Wheel Corporation: *See*—
Stalter, Robert J., Sr., 4,861,538, Cl. 264-161.000

Motorola, Inc.: *See*—
Fette, Bruce A.; Lewis, Leslie K.; Briel, Marc L.; and Makovicka, Thomas J., 4,862,407, Cl. 364-900.000
Genrich, Thad J., 4,862,016, Cl. 307-353.000
Grandfield, Walter J., 4,862,015, Cl. 307-270.000.
Macnak, Philip P.; Irwin, James S.; and Davis, Walter L., 4,862,516, Cl. 455-193.000.
Moyer, William C.; Hartvigsen, Jay A.; and Stanphill, Russell C., 4,862,352, Cl. 364-200.000.
Ponce De Leon, Lorenzo A.; Stamps, Douglass K., Jr.; and Balzano, Quirino, 4,862,181, Cl. 343-702.000
Snyder, Gilbert R., 4,861,686, Cl. 429-90.000
Van Bavel, Nicholas R.; and Williams, Tim A., 4,862,169, Cl. 341-143.000.

Moulin, Norbert L., to Hughes Aircraft Company. Self-aligning precision guide pin. 4,861,132, Cl. 350-96.200.

Moussiaux, Leon: *See*—
Chauvier, Jean-Marie; Moussiaux, Leon; and Scoman, Henry, 4,861,506, Cl. 252-95.000

Movick, Nyle O. Method and apparatus for determining the center of gravity of a spherical ball. 4,860,578, Cl. 73-65.000.

Mowery, Richard A., Jr., to Applied Automation, Inc. Apparatus for chromatographic analysis of ionic species. 4,861,555, Cl. 422-70.000.

Moyer, William C.; Hartvigsen, Jay A.; and Stanphill, Russell C., to Motorola, Inc. Data processor having pulse width encoded status output signal. 4,862,352, Cl. 364-200.000.

Mraz, Dennis; and Skuce, Donald R., to D M Enterprises Inc. Collapsible conveyor support structure/carrier. 4,860,878, Cl. 198-309.000.

Mtu-Motoren und Turbinen Union: *See*—
Deutschmann, Herbert, 4,860,716, Cl. 123-560.000.

MTU Motoren-und Turbinen-Union Muenchen GmbH: *See*—
Huether, Werner, 4,861,638, Cl. 428-71.000.

Muchnik, Boris J.; and Robertson, Frank H., III, to Kerdix, Inc. Magneto-optic recording media with protective layer. 4,861,671, Cl. 428-457.000

Mueller, Friedhelm; and Straub, Horst, to Siemens Aktiengesellschaft. Branch coupling for use between capillary columns of gas chromatographs. 4,861,358, Cl. 55-386.000.

Mueller, Helmut: *See*—
Roth, Siegfried; and Mueller, Helmut, 4,861,996, Cl. 250-330.000.

Mueller, Johann R.: *See*—
Closs, Felix H.; Mueller, Johann R.; and Zafiropulo, Pitro A., 4,862,451, Cl. 370-60.000.
Keller, Heinz J.; and Mueller, Johann R., 4,862,158, Cl. 340-825.050

Mukai, Hiromu: *See*—
Ootsuka, Hiroshi; Tominaga, Shinji; Kobayashi, Haruo; Matsushita, Shuzo; Hoda, Takeo; and Mukai, Hiromu, 4,862,206, Cl. 354-414.000.

Muller, Peter; Nagler, Josef; and Ahlers, Utz-Udo, to Diehl GmbH & Co. Airborne body. 4,860,969, Cl. 244-3.270.

Muller, Peter H.; Lowe, Peter E.; Edwards, Peter R.; and Harris, Samuel W., to Hayes Microcomputer Products, Inc. Adaptor with notched strain relief plate. 4,861,276, Cl. 439-365.000.

Muller, Peter-Jurger: *See*—
Bergter, Friedrich; Bocker, Harald; Bormann, Ernst-Joachim; Forberg, Wolfgang; Fricke, Heinz; Grafe, Udo; Grosse, Hans-Helmut; Heller, Ingeborg; Hilliger, Matthias; Junne, Wolf; Linde, Hellmut; Menner, Michael; Menzel, Klaus-Dieter; Muller, Peter-Jurger; Ploaka, Gunter; Pohl, Hans D.; Schneider, Jorg; and Thrum, Heinz, 4,861,715, Cl. 435-70.000.

Multi-Bar Systems Ltd.: *See*—
Bassett, Roger; and Negus, Terence I., 4,861,203, Cl. 409-136.000.

Mummey, Dale B.: *See*—
Bogar, Jerry H.; Casael, Willard F., Jr.; Mummey, Dale B.; Oberman, Carl D.; and Summers, Donald J., 4,861,271, Cl. 439-63.000.

Mundy, Stephen J.; and Shannon, John M., to U.S. Philips Corp. Semiconductor Schottky devices having improved voltage blocking characteristics. 4,862,229, Cl. 357-15.000.

Munekata, Seiji: *See*—
Takayanagi, Takashi; Munekata, Seiji; Miyazaki, Nobuyuki; and Moriwaki, Ken, 4,861,667, Cl. 428-421.000.

Munoz, Jose, to Stanley Works, The. Oven door latch with handle stabilizer. 4,861,078, Cl. 292-113.000.

Munroe, Bruce R.: *See*—
Marusa, David M.; and Munroe, Bruce R., 4,862,159, Cl. 340-825.240.

Munscher, Dieter: *See*—
Synofzik, Reinhard; Doherr, Karl-Friedrich; Munscher, Dieter; and Saliaris, Christos, 4,860,660, Cl. 102-501.000.

Murabayashi, Noboru; and Kanota, Keiji, to Sony Corporation. PCM signal reproducing apparatus with adjustable phase lock loop circuitry. 4,862,296, Cl. 360-51.000.

Murakami, Kiyoharu, to Kabushiki Kaisha Daikin Seisakusho. Air pressure control valve of an air clutch. 4,860,868, Cl. 192-85.00R.

Murakami, Kyoichi: *See*—
Sonoda, Yutaka; Yuchi, Hirofumi; Murakami, Kyoichi; and Tokuhara, Masaharu, 4,862,269, Cl. 358-160.000.

Murakami, Masahiro: *See*—
Yamamoto, Kiyonori; Sota, Osamu; Sakae, Masahiko; Makiura, Yoshinori; Murakami, Masahiro; and Mitsuya, Toshiyuki, 4,861,017, Cl. 271-258.000.

Murata, Kazuyuki, to Matsushita Electric Industrial Co., Ltd. Copier with accurately position-controllable sub-scanning unit. 4,862,284, Cl. 358-451.000.

Murata Manufacturing Co., Ltd.: *See*—
Matsuda, Shuzou; Naitou, Satoomi; and Wakano, Takahiro, 4,861,624, Cl. 427-81.000.

Murata, Tomomi: *See*—
Matsuoka, Kazumi; Kihira, Hiroshi; Ito, Satoshi; and Murata, Tomomi, 4,861,453, Cl. 204-404.000.

Murata, Toshimichi: *See*—
Saito, Katushi; Shindou, Yoshio; Murata, Toshimichi; Yamazaki, Fumio; and Shimazu, Takashi, 4,861,441, Cl. 204-38.700.

Muratani, Takuro; Kobayashi, Hideo; and Kimura, Toshinari, to Kokusai Denshin Denwa Kabushiki Kaisha. Phase synchronization system. 4,862,104, Cl. 331-1.00A.

Murayama, Koji, to Nihon Radiator Co., Ltd. Variable displacement wobble plate type compressor. 4,860,549, Cl. 62-115.000.

Murphy, David K.: *See*—
Lannerd, Robert P.; and Murphy, David K., 4,860,972, Cl. 244-135.00R.

Murray, Joseph J.: *See*—
Lucitte, Richard D.; Melnychuck, Paul W.; Murray, Joseph J.; Ray, Lawrence A.; and Sullivan, James R., 4,861,140, Cl. 350-320.000.

Musto, Dominick: *See*—
Ernst, James; Williamson, Steven; Rogers, George; and Musto, Dominick, 4,861,270, Cl. 434-226.000.

Mycogen Corporation: *See*—
Barnes, Andrew C.; and Edwards, David L., 4,861,595, Cl. 424-195.100.

Myers, Terrence L.; and Harrington, William A., to Hughes Aircraft Company. Method and apparatus for controlling the phase of signal driving a ferrimagnetic load. 4,862,014, Cl. 307-270.000.

Myotoku Ltd.: *See*—
Ise, Yoji; and Yamaguchi, Akira, 4,861,232, Cl. 417-76.000.

Myslicki, Robert J.: *See*—
Compeau, David E.; Rogers, Lloyd W.; and Myslicki, Robert J., 4,861,089, Cl. 296-76.000.

Nabo, Olle: *See*—
Borgstrom, Leonard; Carlsson, Claes G.; Franzen, Peter; Inge, Claes; Lagerstedt, Torgny; Moberg, Hans; and Nabo, Olle, 4,861,329, Cl. 494-73.000.

Nadalini, Raffaele: *See*—
Malservisi, William; Righetti, Claudio; Nadalini, Raffaele; Braga, Umberto; and Romagnoli, Marino, 4,860,922, Cl. 221-6.000.

Nafziger, Steven: *See*—
Charbonneau, Arthur G.; McMennamy, John A.; and Nafziger, Steven, 4,860,596, Cl. 73-862.320.

Nagai, Hiroyuki: *See*—
Kubo, Kazuhiko; Saitou, Susumu; Usui, Akira; and Nagai, Hiroyuki, 4,861,941, Cl. 174-35.00R.

Nagai, Tomoaki: *See*—
Satake, Toshimi; Nagai, Tomoaki; and Fujimura, Fumio, 4,861,749, Cl. 503-211.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Positioning device for a derailleur for a bicycle. 4,861,320, Cl. 474-80.000.

Nagano, Takahiro: *See*—
Watanabe, Atsuo; Nagano, Takahiro; Ikeda, Takahide; Momma, Naohiro; and Saito, Ryuichi, 4,862,240, Cl. 357-42.000.

Nagasaka, Masumi: *See*—
Tada, Tetsuya; Nagasaka, Masumi; Iwamoto, Kouji; Teratani, Tatsuo; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Yagi, Kiyoshi, 4,862,367, Cl. 364-426.040.

Nagasaki, Satoru: *See*—
Suzuki, Akio; Yoshida, Eiji; Nagasaki, Satoru; Arai, Masumi; and Tsuji, Nobuaki, 4,861,702, Cl. 430-564.000.

Nagasawa, Hidehiko: *See*—
Ohshio, Hirohiko; Makita, Horoyuki; Nagasawa, Hidehiko; Kurosawa, Yoshiki; and Koyanagi, Yoshinobu, 4,862,337, Cl. 362-294.000.

Nagasawa, Takeshi: *See*—
Kuroiwa, Katsumasa; Katayama, Katsuhiro; and Nagasawa, Takeshi, 4,861,713, Cl. 435-20.000.

Nagata, Hiroya: *See*—
Kasai, Kiyoshi; Sakai, Naomichi; Oikawa, Tomoyuki; Uchino, Kenji; Tsukidate, Takaaki; Asakura, Hiroshi; Yamamura, Hiroshi; and Nagata, Hiroya, 4,862,029, Cl. 310-311.000.

Nagata, Niro, to Kabushiki Kaisha Toshiba. Mounting device for a resin lens. 4,861,137, Cl. 350-253.000.

Nagata, Shinichi: *See*—
Sasada, Shigeru; Nagata, Shinichi; Hirosawa, Makoto; and Kishida, Yoshihiro, 4,861,983, Cl. 250-235.000.

Nagatomo, Shigeru: *See*—
Masuda, Nobuhito; Nagatomo, Shigeru; Makiuchi, Hajime; and Yasuda, Yukio, 4,861,552, Cl. 422-56.000.

Nagatsuka, Ikutaroh: *See*—
Aoki, Takayoshi; Takeda, Masayuki; Nagatsuka, Ikutaroh; Honjo, Toshio; Itoh, Kazuhiro; and Uchida, Kenji, 4,861,694, Cl. 430-137.000.

Nagler, Josef: *See*—
Muller, Peter; Nagler, Josef; and Ahlers, Utz-Udo, 4,860,969, Cl. 244-3.270.

Nago, Atsushi: *See*—
Baba, Hideki; Maeda, Hirokazu; Kurooka, Akira; and Nago, Atsushi, 4,861,611, Cl. 426-601.000.

Nagy, Imre. Bottle siphon and dispenser. 4,860,932, Cl. 222-402.100.

Nagy, Tibor: *See*—
Kovacs, Ferenc; Lengyel, Miklosne ; Nagy, Tibor; Antal, Sandor; Gyongyosi, Gyorgy; Palotas, Laszlo ; and Pfisztner, Nandor, 4,860,798, Cl. 138-133.000.

Nahm, Steven H., to Hercules Incorporated. Polyfunctional ethylenically unsaturated cellulosic polymer-based photocurable compositions. 4,861,629, Cl. 427-355.000.

Naitou, Satoomi: *See*—
Matsuda, Shuzou; Naitou, Satoomi; and Wakano, Takahiro, 4,861,624, Cl. 427-81.000.

Najjar, Mitri S.; Yaghmaie, Farokh; and Sorell, Louis S., to Texaco Inc. Stable aqueous suspension of partial oxidation ash, slag and char containing polyethoxylated quaternary ammonium salt surfactant. 4,861,346, Cl. 44-51.000.

Nakabu, Shigeo: *See*—
Nakatani, Hiroshi; Kawaguchi, Hisao; and Nakabu, Shigeo, 4,862,153, Cl. 340-719.000.

Nakachi, Takeshi; Hata, Akio; and Watanabe, Yoshihisa, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Quaternary-containing resin used for magnetic recording media. 4,861,683, Cl. 428-694.000.

Nakada, Kimiaki: *See*—
Iida, Toshiharu; Shimanuki, Koji; Nakada, Kimiaki; and Masuda, Akira, 4,862,280, Cl. 358-229.000.

Nakagawa, Masaru: *See*—
Hiro, Masaaki; Nakagawa, Masaru; Kawamorita, Yoichi; and Yamazaki, Koji, 4,860,898, Cl. 206-455.000.

Nakagawa, Nozomu; Kubota, Masaru; and Chino, Shuichi, to Polyplastics Co., Ltd. Polyoxymethylene compositions and method of manufacturing the same. 4,861,814, Cl. 524-102.000.

Nakahara, Tosio: *See*—
Kasahara, Nobuo; and Nakahara, Tosio, 4,862,214, Cl. 355-377.000.

Nakai, Akira: *See*—
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; Ohbayashi, Hisashi; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; and Ohbayashi, Hisashi, 4,861,768, Cl. 514-195.000.
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; Ohbayashi, Hisashi; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; and Ohbayashi, Hisashi, 4,861,768, Cl. 514-195.000.

Nakai, Katsuya: *See*—
Teteishi, Iwao; Ogura, Yoshiyuki; Hashimoto, Takeshi; Ritou, Tuguyoshi; Kajiyama, Katsufumi; Shimizu, Fumiaki; Tanaka, Kenji; Aibara, Yutaka; Kataoka, Hiroaki; Nakai, Katsuya; Yoshikawa, Takashi; Kanamori, Masaaki; Miyajima, Masao; Seki, Shuzo; and Takahashi, Sadanobu, 4,860,523, Cl. 53-512.000.

Nakai, Masaaki: *See*—
Ando, Haruhisa; Nakai, Masaaki; Ono, Hideyuki; Ozaki, Toshifumi; Ohba, Shinya; and Koike, Norio, 4,862,487, Cl. 377-58.000.

Nakai, Takahiro; Hatanaka, Keiji; and Hatano, Yoshiko, to Mitsubishi Denki Kabushiki Kaisha. Digital FM demodulator with distortion correction. 4,862,099, Cl. 329-126.000.

Nakajima Doko Company Limited: *See*—
Nakajima, Masahiko, 4,861,560, Cl. 422-111.000.

Nakajima, Masahiko, to Nakajima Doko Company Limited. Liquid supply device. 4,861,560, Cl. 422-111.000.
Nakajima, Masahiro; and Banno, Tutomu, to Pioneer Electronic Corporation. Scanning system in information reproducing apparatus. 4,862,291, Cl. 358-342.000.
Nakajima, Nobuyoshi: *See*—
Adachi, Yuuma; and Nakajima, Nobuyoshi, 4,861,993, Cl. 250-327.200.
Saotome, Shigeru; Kimura, Tsutomu; and Nakajima, Nobuyoshi, 4,861,994, Cl. 250-327.200.
Nakajima, Nobuyuki; Inomata, Kenichi; Moruta, Masaya; Eitai, Kazuo; and Yamaguchi, Toshio, to Diesel Kiki Co., Ltd. Variable capacity type compressor. 4,861,235, Cl. 417-295.000.
Nakajima Seisakusho Company: *See*—
Ishihara, Yoshihiro, 4,860,677, Cl. 112-318.000.
Nakajima, Toshifumi, to Canon Kabushiki Kaisha. Facsimile machine with capability of reading half-tone and binary image data. 4,862,282, Cl. 358-400.000.
Nakajima, Toyohei; and Mieno, Toshiyuki, to Honda Giken Kogyo Kabushiki Kaisha. Method of controlling an oxygen concentration sensor. 4,860,712, Cl. 123-489.000.
Nakakuma, Akira: *See*—
Tsunoda, Arihiro; Tsuji, Kikunosuke; Nakakuma, Akira; and Matsushita, Tetsuya, 4,862,218, Cl. 355-235.000.
Nakamaru, Koichi: *See*—
Takahashi, Toshihiro; Horaguchi, Tatsuo; Nakamaru, Koichi; and Suzuki, Yoshikuni, 4,861,780, Cl. 514-259.000.
Nakamori, Shigeru: *See*—
Sano, Konosuke; Ito, Koichi; Miwa, Kiyoshi; and Nakamori, Shigeru, 4,861,722, Cl. 435-252.320.
Nakamura, Akihiko: *See*—
Tamaki, Yoji; Kino, Takuya; Ito, Takashi; and Nakamura, Akihiko, 4,860,461, Cl. 34-68.000.
Nakamura, Kazuo: *See*—
Fukamachi, Masaaki; Onitsuka, Nobuyuki; Tanaka, Akira; and Nakamura, Kazuo, 4,862,139, Cl. 340-426.000.
Nakamura, Masaru: *See*—
Morinaga, Motoyasu; Furuyama, Hideto; Nakamura, Masaru; Suzuki, Nobuo; Hirayama, Yuzo; and Okuda, Hajime, 4,862,474, Cl. 372-50.000.
Nakamura, Michiya, to NEC Corporation. Microcomputer having high-speed and low-speed operation modes for reading a memory. 4,862,348, Cl. 364-200.000.
Nakamura, Takeaki: *See*—
Kidawara, Atsushi; Nishikori, Toshiaki; Kanno, Masahide; Yabe, Hisao; Katoh, Shinichi; Ikuno, Yuji; and Nakamura, Takeaki, 4,862,258, Cl. 358-98.000.
Nakamura, Yoichi: *See*—
Kuroda, Masami; Nakamura, Yoichi; and Furusho, Noboru, 4,861,691, Cl. 430-59.000.
Kuroda, Masami; Nakamura, Yoichi; and Furusho, Noboru, 4,861,692, Cl. 430-59.000.
Nakamura, Yozo: *See*—
Tojo, Kenji; Kawashima, Kenichi; Suefuji, Kazutaka; and Nakamura, Yozo, 4,861,245, Cl. 418-55.000.
Nakanishi, Motoyasu, to Kabushiki Kaisha Cubic Engineering. Compound type silicone gel material. 4,861,804, Cl. 521-54.000.
Nakano, Akira; Higashioka, Hiroshi; Nomura, Masaki; Kawahara, Yoshiharu; Yamashita, Ko; Sano, Yoshito; and Kase, Minoru, to Kao Corporation. Method of separating oleaginous matter into components having various melting points. 4,861,612, Cl. 426-607.000.
Nakano, Ichiro: *See*—
Suzuki, Toru; Kato, Atsuhiko; Hosoi, Mitsuo; and Nakano, Ichiro, 4,862,047, Cl. 318-587.000.
Nakano, Sota; and Tada, Shinsaku, to Misawa Home Kabushiki Kaisha. Rust preventive composition for steel reinforcements. 4,861,375, Cl. 106-90.000.
Nakano, Tomio, to Fujitsu Limited. Complementary semiconductor device reducing latch-up phenomenon. 4,862,415, Cl. 365-189.090.
Nakao, Shinichi; Yasuda, Shunji; and Ikeda, Shigehito, to Toshiba Ceramics Co., Ltd. Activated sludge treatment apparatus. 4,861,471, Cl. 210-182.000.
Nakao, Toshinobu: *See*—
Miura, Ryuichi; and Nakao, Toshinobu, 4,861,401, Cl. 156-94.000.
Nakashima, Hiroshi: *See*—
Mihara, Yoshikazu; and Nakashima, Hiroshi, 4,862,294, Cl. 360-35.100.
Nakashima, Naoto: *See*—
Oshida, Yoshitada; Nakashima, Naoto; and Yoshitake, Yasuhiro, 4,862,008, Cl. 250-548.000.
Nakatani, Hiroshi; Kawaguchi, Hisao; and Nakabu, Shigeo, to Sharp Kabushiki Kaisha. Flat display panel with framing for flexible substrate folding. 4,862,153, Cl. 340-719.000.
Nakazawa, Isao: *See*—
Tsuboi, Takayuki; Nakazawa, Isao; Harunari, Yoshihiro; Sato, Yasuhisa; and Yamada, Yasuyuki, 4,862,202, Cl. 354-195.120.
Nakazawa, Takashi, to Seiko Epson Corporation. Electro optical device and method for manufacturing same. 4,861,141, Cl. 350-336.000.
Nalco Chemical Company: *See*—
Kaplan, Roy I., 4,861,511, Cl. 252-174.230.
Lehmkuhl, Josef; Nikesch, Ulrich; and Presslein, Kurt, 4,861,492, Cl. 210-709.000.
Nalge Company: *See*—
Leoncavallo, Richard A.; Phillips, Gregory R.; and Mehra, Ravinder C., 4,861,466, Cl. 210-120.000.
Namekata, Kiyokazu: *See*—
Nomura, Akihiro; Namekata, Kiyokazu; Kurata, Mitsuru; Niizawa, Takuji; Ebata, Tokihide; and Sasaki, Shinichi, 4,862,215, Cl. 358-309.000.
Nanjing Institute of Technology: *See*—
Yiming, Liug, 4,862,476, Cl. 372-61.000.
Napper, John C. Rehabilitation walker device. 4,861,051, Cl. 280-87.021.
Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, to Shionogi & Co., Ltd. Bicyclic sulfonamide derivatives. 4,861,913, Cl. 562-427.000.
Naruse, Kazuo; Tobita, Hideaki; and Shibata, Yoichi, to Toyota Jidosha Kabushiki Kaisha. Apparatus for transferring work pieces between stations in an assembly line. 4,860,663, Cl. 104-162.000.
Nash, William D.: *See*—
Carlberg, Bob L.; Wolf, Nicholas O.; Pober, Kenneth W.; and Nash, William D., 4,860,829, Cl. 166-279.000
Natio, Yoshiyuki; and Takahashi, Michiharu. Electromagnetic wave absorber. 4,862,174, Cl. 342-1.000.
National Computer Print, Inc.: *See*—
Breen, Thomas J., 4,860,945, Cl. 229-69.000.
National Federation of Agricultural Co-Operative Associations: *See*—
Aburatani, Masakazu; Takeuchi, Tadashi; and Mori, Kenji, 4,861,875, Cl. 540-114.000.
National Forge Company: *See*—
Khare, Ashok E., 4,861,549, Cl. 420-109.000.
National Research Corporation: *See*—
Hider, Robert C.; Kontoghiorghes, George; and Stockham, Michael A., 4,861,767, Cl. 514-184.000.
National Research Development Corporation: *See*—
Clark, Adrian P., 4,862,483, Cl. 375-94.000.
Ruddell, James N., 4,861,249, Cl. 425-66.000.
National Semiconductor Corporation: *See*—
Guinea, Jesus; and Wong, Hee, 4,862,485, Cl. 375-120.000.
Patchen, Paul J., 4,862,482, Cl. 375-87.000.
Navistar International Transportion Corp.: *See*—
Onesti, Robert J., 4,862,365, Cl. 364-424.010.
Nawaz, Arain. Self-retaining gastrostomy tube. 4,861,334, Cl. 604-49.000.
Nazzarro, Ugo. Depilatory wax automatic dispenser on depilatory strips. 4,860,688, Cl. 118-694.000.
Neas, Edwin D.; and Floyd, Terry S., to CEM Corporation. Microwave-based apparatus and Kjeldahl method. 4,861,556, Cl. 422-78.000.
NEC Corporation: *See*—
Morimoto, Hideaki, 4,862,457, Cl. 371-8.000.
Nakamura, Michiya, 4,862,348, Cl. 364-200.000.
Okada, Mitsuya, 4,862,437, Cl. 369-13.000.
Uji, Toshio, 4,862,230, Cl. 357-17.000.
Yamagishi, Hidetaka, 4,862,244, Cl. 357-67.000.
NEC Home Electronics Ltd.: *See*—
Iwaibana, Kunio, 4,862,277, Cl. 358-222.000.
Nederlandes Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek TNO: *See*—
Barendz, Anton W.; and Nieuwenhuizen, Maarten S., 4,860,573, Cl. 73-23.000.
Neff, Craig A., to Hunter Douglas Inc. Method of making a honeycomb product. 4,861,404, Cl. 156-204.000.
Neff, Roger E.; and Ryles, Roderick G., to American Cyanamid Company. Water-dispersible hydrophobic thickening agent. 4,861,499, Cl. 252-8.551.
Negishi, Tohru. Frame for multifocal spectacles. 4,861,151, Cl. 351-137.000.
Negoro, Seiji: *See*—
Hirata, Haruhisa; Okada, Hirosuke; and Negoro, Seiji, 4,861,718, Cl. 435-207.000.
Negus, Terence I.: *See*—
Bassett, Roger; and Negus, Terence I., 4,861,203, Cl. 409-136.000.
NEI Canada Limited: *See*—
Browne, John, 4,860,470, Cl. 40-449.000.
Neil, Michael A. Affixation of vise jaw removable faceplates by keyhole apertures. 4,861,010, Cl. 269-282.000.
Neilson, George V.: *See*—
Baker, Edwin T.; Neilson, George V.; and Stumpf, George R., Jr., 4,861,406, Cl. 156-230.000.
Neitzer, Klaus: *See*—
Gonzalez, Rene-Andres A.; Emmerling, Winfried; Krause, Werner; Podola, Tore; and Neitzer, Klaus, 4,861,863, Cl. 528-408.000.
Nelson, Gary J.: *See*—
Wiethoff, Roger H.; and Nelson, Gary J., 4,860,633, Cl. 89-45.000.
Nelson, Peter H.; Gu, Chee-Liang L.; Allison, Anthony C.; Eugui, Elsie M.; and Lee, William A., to Syntex (U.S.A) Inc. Heterocyclic aminoalkyl esters of mycophenolic acid and derivatives thereof, compositions and usc. 4,861,776, Cl. 514-233.500.
Nelson, Thomas E. Water heater device. 4,860,728, Cl. 126-361.000.
Nemet-Mavrodin, Margaret, to Mobil Oil Corp. Process for converting aliphatics to aromatics over a gallium-activated zeolite. 4,861,933, Cl. 585-417.000.
Neogi, Amar N.: *See*—
Johnson, Donald C.; Neogi, Amar N.; and LeBlanc, Henry A., 4,861,427, Cl. 162-129.000.
Neste Oy: *See*—
Eklund, Vidar; Fors, Jan; Mandell, Leo; Meinander, Kerstin; Selin, Johan-Fredrik; and Turunen, Olli T., 4,861,874, Cl. 536-32.000.

Nestec S. A.: *See*—
Margolis, Geoffrey; Chiovini, Jacky; and Pagliaro, Fulvio A., 4,861,607, Cl. 426-481.000.
Nestor, James R.: *See*—
Havenstein, Bennett L.; Picerno, Raysna; Brittain, Harry G.; and Nestor, James R., 4,861,727, Cl. 436-136.000.
Networks Electronic Corp.: *See*—
Patrichi, Mihai D.; and Evanson, Delbert L., 4,860,698, Cl. 123-24.00R.
Neubauer, Russel H.: *See*—
Ackerman, Neil R.; Harris, Richard R.; Loveless, Scott E.; and Neubauer, Russel H., 4,861,783, Cl. 514-311.000.
Neukam, Christian: *See*—
Lehmann, Wolfgang; and Neukam, Christian, 4,861,462, Cl. 209-259.000.
Neunzig, Franz-Theo, to Bayer Aktiengesellschaft. Process to enclose flock tow in a permeable sleeve for dyeing or textile treatment before cutting into a flock. 4,861,343, Cl. 8-488.000.
Neurath, Alexander R.; and Kent, Stephen B. H., to New York Blood Center, Inc.; and California Institute Technology. Pre-S gene coded peptide hepatitis B immunogens, vaccines, diagnostics, and synthetic lipid vesicle carriers. 4,861,588, Cl. 424-89.000.
New Pac Systems AB: *See*—
Widenback, Ralph H., 4,860,384, Cl. 2-115.000.
New York Blood Center, Inc.: *See*—
Neurath, Alexander R.; and Kent, Stephen B. H., 4,861,588, Cl. 424-89.000.
Neway Corp.: *See*—
Ware, Nathan C., 4,860,640, Cl. 92-63.000.
Newhouse, Thomas J.; Allen, Lynne M.; and Goeman, Donald D., to Herman Miller, Inc. Storage cabinet. 4,861,122, Cl. 312-317.100.
Newkirk, Haywood H. Soft seawall. 4,861,193, Cl. 405-28.000.
Newman, Bruce E.; and DiPirro, Steven D., to Digital Equipment Corporation. System permitting peripheral interchangeability during system operation. 4,862,355, Cl. 364-200.000.
Newman, David W.; and Lin, George Y., to Newman Sanitary Gasket Company. Gasket for sanitary pipe fittings. 4,861,076, Cl. 285-332.300.
Newman, Neil A.: *See*—
Griffiths, John M.; Beck, Wayne T.; and Newman, Neil A., 4,861,292, Cl. 440-1.000.
Newman Sanitary Gasket Company: *See*—
Newman, David W.; and Lin, George Y., 4,861,076, Cl. 285-332.300.
Ney, Robert J. Mixing orifice extruder. 4,861,255, Cl. 425-202.000.
NGB Spark Plug co., Ltd.: *See*—
Kondo, Kazuo; and Kurachi, Tatsunori, 4,861,625, Cl. 427-126.200.
NGK Insulators, Ltd.: *See*—
Ihara, Masahiro; Suzuki, Kazuo; Maekawa, Hideya; Ito, Haremi; and Tanaka, Kenichi, 4,861,626, Cl. 427-133.000.
Mase, Syunzo; and Soejima, Shigeo, 4,861,456, Cl. 204-425.000.
NGK Insulators Ltd: *See*—
Tamaki, Yoji; Kino, Takuya; Ito, Takashi; and Nakamura, Akihiko, 4,860,461, Cl. 34-68.000.
Nguyen, Vietson M.: *See*—
Dhyanchand, John J.; Shekhawat, Sampat F.; and Nguyen, Vietson M., 4,862,342, Cl. 363-40.000.
NI Chemicals, Inc.: *See*—
Svensson, Anders, 4,861,491, Cl. 210-691.000.
Nicholas, David M.; Hopkins, Jeffrey A.; and Bushinsky, Joseph P., to Air Products and Chemicals, Inc. Production of hydrogen and carbon monoxide. 4,861,351, Cl. 55-23.000.
Nicholas, Vincent; and Siwinski, Paul P., to AMP Incorporated. Method and apparatus for coupling connectors to ribbon cables. 4,860,447, Cl. 29-863.000.
Nicholas, Vincent; and Siwinski, Paul P., to AMP Incorporated. Method and apparatus for bending ribbon cables. 4,860,801, Cl. 140-105.000.
Nicolotti, Robert A.; and Dean, Richard T., to Mallinckrodt, Inc. Coupling agents for joining radionuclide metal ions with biologically useful proteins. 4,861,869, Cl. 530-402.000.
Nieboer, Keith A.; and Tucker, Herbert D., to Donnelly Corporation. Method for forming a molded assembly with an embedded part. 4,861,540, Cl. 264-263.000.
Nieuwenhuizen, Maarten S.: *See*—
Barendz, Anton W.; and Nieuwenhuizen, Maarten S., 4,860,573, Cl. 73-23.000.
Nifco Inc.: *See*—
Fujii, Hiroshi; and Takahashi, Atsushi, 4,860,494, Cl. 49-493.000.
Nihon Dennetsu Co., Ltd.: *See*—
Teteishi, Iwao; Ogura, Yoshiyuki; Hashimoto, Takeshi; Ritou, Tuguyoshi; Kajiyama, Katsufumi; Shimizu, Fumiaki; Tanaka, Kenji; Aibara, Yutaka; Katsoka, Hiroaki; Nakai, Katsuya; Yoshikawa, Takashi; Kanamori, Masaaki; Miyajima, Masso; Seki, Shuzo; and Takahashi, Sadanobu, 4,860,523, Cl. 53-512.000.
Nihon Kaiheiki Kogyo Kabushiki Kaisha: *See*—
Ohashi, Shigeo, 4,862,325, Cl. 361-400.000.
Nihon Naishi Co., Ltd.: *See*—
Shigetoyo, Hiromi, 4,860,488, Cl. 43-129.000.
Nihon Radiator Co., Ltd.: *See*—
Murayama, Koji, 4,860,549, Cl. 62-115.000.
Niijima, Kenji: *See*—
Ogawa, Hiroyasu; Shimazaki, Kenji; and Niijima, Kenji, 4,861,809, Cl. 523-149.000.
Niizawa, Takuji: *See*—
Nomura, Akihiro; Namekata, Kiyokazu; Kurata, Mitsuru; Niizawa, Takuji; Ebata, Tokihide; and Sasaki, Shinichi, 4,862,215, Cl. 358-309.000.
Nikawa, Yoshio: *See*—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,860,770, Cl. 128-804.000.
Nikesch, Ulrich: *See*—
Lehmkuhl, Josef; Nikesch, Ulrich; and Presslein, Kurt, 4,861,492, Cl. 210-709.000.
Nilsen, Ole K. Frequency-modulated inverter-type ballast. 4,862,040, Cl. 315-244.000.
Nino, Naohi, to Koito Seisakusho Co., Ltd. Vehicular headlamp. 4,862,329, Cl. 362-61.000.
Nippon Electric Co., Ltd.: *See*—
Nishitani, Takao, 4,862,173, Cl. 341-200.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumjo; and Takahashi, Katsutoshi, 4,861,905, Cl. 556-40.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Ishikawa, Hiroshi; Takano, Hiroshi; Ohtomo, Ryosuke; Hoshino, Yoshinori; and Ohyama, Taro, 4,861,647, Cl. 428-216.000.
Nippon Mining Company, Limited: *See*—
Matsumoto, Masakatsu; Fujimoto, Tamotsu; and Ejiri, Emiko, 4,861,917, Cl. 568-347.000.
Nippon Oil Co., Ltd.: *See*—
Oishi, Yasuyuki; and Inoue, Akira, 4,861,746, Cl. 502-314.000.
Nippon Paint Co., Ltd.: *See*—
Mizuguchi, Katsumi; Okude, Yoshitaka; Miwa, Hiroshi; and Okuda, Hidefumi, 4,861,839, Cl. 525-506.000.
Nippon Piston Ring Co., Ltd.: *See*—
Shimomura, Soichi, 4,861,372, Cl. 75-232.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Peppers, Norman A.; Young, James R.; Pierce, Gerald A.; Katsuki, Kazuo; and Katsuki, Kazuo, 4,862,511, Cl. 382-32.000.
Nippon Steel Corporation: *See*—
Hashimoto, Yoshio; Kawano, Tsuyoshi; Hasuka, Kaname; and Otomo, Seiji, 4,861,682, Cl. 428-685.000.
Matsuoka, Kazumi; Kihira, Hiroshi; Ito, Satoshi; and Murata, Tomomi, 4,861,453, Cl. 204-404.000.
Miyabayashi, Shigeaki; Kanai, Hiroshi; Oka, Joji; and Matsuura, Yoshikatsu, 4,861,672, Cl. 428-458.000.
Saito, Katushi; Shindou, Yoshio; Murata, Toshimichi; Yamazaki, Fumio; and Shimazu, Takashi, 4,861,441, Cl. 204-38.700.
Shimada, Haruo; and Sakakibara, Yoshiaki, 4,861,548, Cl. 420-79.000.
Nippondenso Co., Ltd.: *See*—
Maruyama, Toshinori; Sato, Hirohide; and Matsuhashi, Toshiaki, 4,862,055, Cl. 322-8.000.
Nirumandrad, Mohammadreza, to Industrial Microsystems, Inc. Analyzing analog quadrature signals. 4,862,396, Cl. 364-571.020.
Nishiga, Kazuya: *See*—
Hashimoto, Youichi; Tokuyama, Takashi; Nishiga, Kazuya; Arai, Yoshihiro; Ueki, Nobuhide; and Adachi, Naoki, 4,862,170, Cl. 341-144.000.
Nishihara, Takashi: *See*—
Shiraishi, Shuji; Sakaguchi, Masakazu; and Nishihara, Takashi, 4,860,847, Cl. 180-197.000.
Nishijima, Hiroaki: *See*—
Suzuki, Isao; Hirabayashi, Kazuo; Kondoh, Tadami; and Nishijima, Hiroaki, 4,861,934, Cl. 585-415.000.
Nishikori, Toshiaki: *See*—
Kidawara, Atsushi; Nishikori, Toshiaki; Kanno, Masahide; Yabe, Hisao; Katoh, Shinichi; Ikuno, Yuji; and Nakamura, Takeaki, 4,862,258, Cl. 358-98.000.
Nishimata, Mana: *See*—
Okada, Itaru; Okui, Shuko; Nishimata, Mana; Takahashi, Yoji; and Fukuchi, Toshiki, 4,861,777, Cl. 514-234.500.
Nishimu Electronics Industries Co., Ltd.: *See*—
Tominaga, Fukutoshi; Iwanaga, Mitsuo; and Yokomizo, Hiromichi, 4,862,059, Cl. 323-307.000.
Nishimura, Kazuo, to Sanden Corporation. Electromagnetic clutch. 4,860,867, Cl. 192-84.00C.
Nishimura, Shintaro: *See*—
Takaya, Takao; Tozuka, Zenzoburo; Yasuda, Nobuyoshi; and Nishimura, Shintaro, 4,861,769, Cl. 514-202.000.
Nishimura, Tadashi; Inoue, Yasuo; Sugahara, Kazuyuki; and Kusunoki, Shigeru, to Kozo Iizuka, Director General, Agency of Industrial Science and Technology. Method of manufacturing semiconductor crystalline layer. 4,861,418, Cl. 156-620.720.
Nishino, Atsushi; Ikeda, Masaki; Watanabe, Yoshihiro; and Hiraka, Masahiro, to Matsushita Electric Industrial Co., Ltd. Article having insulation abrasion coated layer. 4,861,657, Cl. 428-336.000.
Nishio, Naoki, to Sony Corp. Circuit for processing a digital signal having a blanking interval. 4,862,270, Cl. 358-160.000.
Nishioka, Toshiyasu: *See*—
Toyoda, Yasushi; Mishiba, Saburo; and Nishioka, Toshiyasu, 4,861,820, Cl. 524-510.000.
Nishitani, Tadashi: *See*—
Hiraga, Imao; Yamazaki, Satoshi; Yamada, Takehide; and Nishitani, Tadashi, 4,862,434, Cl. 368-190.000.
Nishitani, Takao, to Nippon Electric Co., Ltd. Method and circuit for carrying out forward and inverse quantization by varying a reference step size. 4,862,173, Cl. 341-200.000.

Nishiura, Junji: *See—*
Sato, Kazuhiko; Nishiura, Junji; and Takahashi, Keiichi, 4,862,071, Cl. 324-73.00R.

Nissan Motor Co., Ltd.: *See—*
Fujii, Hiroshi; and Takahashi, Atsushi, 4,860,494, Cl. 49-493.000.
Furuya, Osamu; and Taguchi, Hiromi, 4,860,860, Cl. 188-77.00R.
Kobayashi, Hiroshi; and Ichikawa, Toshiro, 4,862,063, Cl. 324-61.00P.
Matsuda, Toshiro, 4,862,364, Cl. 364-424.010.
Matsushita, Tsutomu; and Mihara, Teruyoshi, 4,862,233, Cl. 357-23.400.
Uchida, Koh; and Kurihara, Takashi, 4,860,635, Cl. 91-375.00A.
Uchida, Koh; Kurihara, Takashi; and Miyoshi, Makoto, 4,860,846, Cl. 180-141.000.

Nissei Jushi Kogyo Kabushiki Kaisha: *See—*
Takada, Minoru, 4,861,259, Cl. 425-451.200.

Nisshin Flour Milling Co., Ltd.: *See—*
Takahashi, Toshihiro; Horaguchi, Tatsuo; Nakamaru, Koichi; and Suzuki, Yoshikuni, 4,861,780, Cl. 514-259.000.

Nissin Electric Co., Ltd.: *See—*
Nogawa, Shuichi; and Kamijo, Eiji, 4,861,750, Cl. 505-1.000.

Nitto Boseki Co., Ltd.: *See—*
Kuroiwa, Katsumasa; Katayama, Katsuhiro; and Nagasawa, Takeshi, 4,861,713, Cl. 435-20.000.

Nix, Michael A., to Advanced Miere Devices, Inc. Asynchronous interrupt status bit circuit. 4,862,409, Cl. 364-900.000.

Noda, Eiji: *See—*
Ueda, Yutaka; and Noda, Eiji, 4,861,637, Cl. 428-65.000.

Noda, Syuji: *See—*
Goto, Kouji; and Noda, Syuji, 4,862,056, Cl. 323-275.000.

Noel, Marc, to Charbonnages De France. Signal transfer method and equipment for electric machine equipped with three-phase power supply cable. 4,862,157, Cl. 340-825.000

Nogawa, Shuichi; and Kamijo, Eiji, to Nissin Electric Co., Ltd. Process for producing superconducting thin film. 4,861,750, Cl. 505-1.000.

Noguchi, Ichiro, to Diesel Kiki Co., Ltd. Laminated heat exchanger. 4,860,823, Cl. 165-153.000.

Noguchi, Takeshi: *See—*
Takano, Kazuya; and Noguchi, Takeshi, 4,861,006, Cl. 267-140.100.

Noise Cancellation Technologies, Inc.: *See—*
Landgarten, Harris B.; and Ziegler, Eldon W., 4,862,506, Cl. 381-71.000.

Nomix Manufacturing Co. Lmited: *See—*
Gill, David C., 4,860,955, Cl. 239-223.000.

Nomura, Akihiro; Namekata, Kiyokazu; Kurata, Mitsuru; Niizawa, Takuji; Ebata, Tokihide; and Sasaki, Shinichi, to Canon Kabushiki Kaisha. Image forming apparatus. 4,862,215, Cl. 355-309.000.

Nomura, Masakatsu; Suda, Keiko; and Ashikaga, Tadashi, to Kabushiki Kaisha Meidensha. Induction motor control apparatus. 4,862,343, Cl. 363-41.000.

Nomura, Masaki: *See—*
Nakano, Akira; Higashioka, Hiroshi; Nomura, Masaki; Kawahara, Yoshiharu; Yamashita, Ko; Sano, Yoshito; and Kase, Minoru, 4,861,612, Cl. 426-607.000.

Nomura, Noboru: *See—*
Sato, Takeo; Araki, Nobuhiro; Kawata, Koichi; Nomura, Noboru; Ueno, Atushi; and Yoshida, Shotaro, 4,861,148, Cl. 350-505.000.

Nomura, Norimasa, to Kabushiki Kaisha Toshiba. Speech synthesis system of rule-synthesis type. 4,862,504, Cl. 381-51.000.

Nonaka, Toshio: *See—*
Koshimizu, Chishio; Hayakawa, Yasuo; Nonaka, Toshio; and Takeda, Sakae, 4,862,383, Cl. 364-507.000.

Norden, Alexander R., to Connectron, Inc. Switching fusible apparatus. 4,861,285, Cl. 439-621.000.

Nordiskafilt AB: *See—*
Andersson, Nils T., 4,861,430, Cl. 162-205.000.

Norita, Toshio: *See—*
Ishida, Tokuji; Hamada, Masataka; Karasaki, Toshihiko; Norita, Toshio; and Taniguchi, Nobuyuki, 4,862,204, Cl. 354-408.000.
Ishida, Tokuji; and Norita, Toshio, 4,862,273, Cl. 358-213.190.

Normann, Norbert; Gross, Erwin; and Schlager, Harald, to Doduco KG. Dr. Eugen Durrwachter. Magnetic instrument for reading telegraphic signals. 4,862,303, Cl. 360-110.000.

North American Philips Corporation: *See—*
Shah, Imran A.; and Bhattacharya, Arup K., 4,862,402, Cl. 364-724.120.
Stevens, James L.; and Dapo, Roland F., 4,861,439, Cl. 204-27.000.

Northern States Power Company: *See—*
Lehto, John M., 4,861,558, Cl. 422-106.000.

Northern Telecom Limited: *See—*
Beaulieu, Laurence A. J.; and Cristescu, Alex G., 4,861,283, Cl. 439-540.000.
Michot, Alain F., 4,860,980, Cl. 248-74.400.

Northrup, David; and Hanko, Jimmy J., to Gulf States Paper Corporation. Pre-glued display carton with integral display panel. 4,860,886, Cl. 206-45.290.

Norton, David J., to Westinghouse Brake & Signal Co. Ltd. Railway signalling system. 4,860,977, Cl. 246-3.000.

Norwich Eaton Pharmaceuticals, Inc.: *See—*
White, Ralph L., Jr.; and Ellis, Keith O., 4,861,790, Cl. 514-374.000.

Notron Engineering AG: *See—*
Winiger, Hans-Rudolf, 4,861,981, Cl. 250-231.00R.

Novicky, Nick N., to Progressive Chemical Research, Ltd. Ophthalamic device from fluoro-silicon polymers. 4,861,850, Cl. 526-243.000.

Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumio; and Takahashi, Katsutoshi, to Nippon Kayaku Kabushiki Kaisha. Platinum complexes. 4,861,905, Cl. 556-40.000.

Nowik, Israel: *See—*
Hirshfield, Jay L.; and Nowik, Israel, 4,862,143, Cl. 340-572.000.

Nozawa, Teruo: *See—*
Shimodaira, Yoshikazu; and Nozawa, Teruo, 4,862,048, Cl. 318-640.000.

Nozu, Taketo: *See—*
Umeda, Toshikazu; Funaki, Shinsuke; and Nozu, Taketo, 4,862,196, Cl. 346-108.000.

NSS of Delaware, Inc.: *See—*
Charbonneau, Arthur G.; McMennamy, John A.; and Nafziger, Steven, 4,860,596, Cl. 73-862.320.

Nucleic Acid Research Institute: *See—*
Robins, Roland K.; Revankar, Ganapathi R.; and Chang, Yu-an, 4,861,873, Cl. 536-27.000.

Numazawa, Akio; Sato, Akira; and Ushijima, Fumihiro, to Toyota Jidosha Kabushiki Kaisha. Automatic transmission for automotive vehicle. 4,860,607, Cl. 74-330.000.

Nuova Samim S.p.A.: *See—*
Guerriero, Renato; and Tangerini, Ilario, 4,861,679, Cl. 428-614.000.

Nussbaum, Otto J. Personalized air conditioning and method. 4,860,642, Cl. 98-40.190.

Nyfeler, Robert; Eckhardt, Wolfgang; and Beriger, Ernst, to Ciba-Geigy Corporation. 2-Mercapto-5-pyrazinyl-1,3,4-oxadiazoles or 2-mercapto-5-pyrazinyl-1,3,4-thiadiazoles as nematicides. 4,861,367, Cl. 71-92.000.

Nyfeler, Robert: *See—*
Beriger, Ernst; Eckhardt, Wolfgang; and Nyfeler, Robert, 4,861,787, Cl. 514-363.000.

O.M.S.I. s.a.s. di Baccaro Vincenzo & C.: *See—*
Baccaro, Mario, 4,861,100, Cl. 297-19.000.

Oashi, Ryuji: *See—*
Hara, Yasuo; Oashi, Ryuji; Kawahara, Yoshitaka; and Takeuchi, Mikio, 4,861,931, Cl. 585-363.000.

Obara, Takashi: *See—*
Satoh, Susumu; Matsuoka, Saiji; Obara, Takashi; Tsunoyama, Kozo; and Irie, Toshio, 4,861,390, Cl. 148-12.00R.

Oberman, Carl D.: *See—*
Bogar, Jerry H.; Cassel, Willard F., Jr.; Mummey, Dale B.; Oberman, Carl D.; and Summers, Donald J., 4,861,271, Cl. 439-63.000.

Oberschmidt, James M.: *See—*
Galvagni, John; Oberschmidt, James M.; and Humenik, James N., 4,862,318, Cl. 361-321.000.

O'Brien, John P.: *See—*
DeLucca, George V.; Pelosi, Lorenzo F.; and O'Brien, John P., 4,861,527, Cl. 264-186.000.

Obrig, Hans W.: *See—*
Berstein, Garri; Obrig, Hans W.; and Wittkopp, Helmut, 4,861,204, Cl. 409-200.000.

Observatorie Cantonal: *See—*
Bonanomi, Jacques, 4,860,471, Cl. 40-450.000.

Ochi, Yasuo: *See—*
Sugoh, Yoshihisa; and Ochi, Yasuo, 4,861,572, Cl. 423-339.000.

O'Connor, Tom R.: *See—*
Jones, Kenneth L., II; O'Connor, Tom R.; and Trevellyan, Kenneth A., 4,861,944, Cl. 174-68.500.

Odani, Hiroshi: *See—*
Kawashima, Masatoshi; Takechi, Makoto; and Odani, Hiroshi, 4,862,068, Cl. 324-73.00R.

Odate, Seizi: *See—*
Katagiri, Shingo; Odate, Seizi; and Onmori, Shozo, 4,862,305, Cl. 360-132.000

Odawara, Yoji: *See—*
Ishida, Masahiko; Haga, Ryooichi; Odawara, Yoji; Takahashi, Sankichi; and Ebara, Katsuya, 4,861,383, Cl. 127-67.000.

Oestreich, Ulrich, to Siemens Aktiengesellschaft. Method of identifying the length difference between an optical fiber and an envelope. 4,861,525, Cl. 264-1.500.

Ogawa, Hiroyasu; Shimazaki, Kenji; and Niijima, Kenji, to Toho Rayon Co., Ltd. Friction material. 4,861,809, Cl. 523-149.000.

Ogiro, Kenji: *See—*
Kaku, Nobuyuki; Ogiro, Kenji; Osawa, Atsuo; Sasaki, Takashi; and Takita, Kouhei, 4,862,300, Cl. 360-85.000.

Ogura, Masami: *See—*
Yamatoh, Kouhei; and Ogura, Masami, 4,860,859, Cl. 188-72.100.

Ogura, Yoshiyuki: *See—*
Teteishi, Iwao; Ogura, Yoshiyuki; Hashimoto, Takeshi; Ritou, Tuguyoshi; Kajiyama, Katsufumi; Shimizu, Fumiaki; Tanaka, Kenji; Aibara, Yutaka; Kataoka, Hiroaki; Nakai, Katsuya; Yoshikawa, Takashi; Kanamori, Masaaki; Miyajima, Masao; Seki, Shuzo; and Takahashi, Sadanobu, 4,860,523, Cl. 53-512.000.

Ogure, Naoaki: *See—*
Miyasaka, Matsuho; Ichikawa, Katsuhiro; Sasaki, Katsumi; Mizobuchi, Syotaro; and Ogure, Naoaki, 4,861,395, Cl. 148-321.000.

Oguro, Tomokatsu, to Hitachi, Ltd. Magnetron cathode structure. 4,862,031, Cl. 313-341.000.

Oguro, Tomokatsu, to Hitachi, Ltd. Structure of anode of magnetron and a method of manufacturing the same. 4,862,034, Cl. 315-39.750.

Ohama, Masanori; and Soma, Koroku, to Pasco Corporation. Apparatus for continuously photographing road surface. 4,861,157, Cl. 352-132.000.

O'Hanlon, Peter J.: *See—*
Rogers, Norman H.; Walker, Graham; Crimmin, Michael J.; and O'Hanlon, Peter J., 4,861,788, Cl. 514-364.000.

Ohara, Terumi: *See—*
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Miyazaki, Kenichi; Takahashi, Toshinori; Kitamura, Hiroki; Shinya, Tadao; and Mizoguchi, Yutaka, 4,862,255, Cl. 358-80.000.

Ohashi, Shigeo, to Nihon Kaiheiki Kogyo Kabushiki Kaisha. Printed wiring board mounted electronic component. 4,862,325, Cl. 361-400.000.

Ohashi, Shinichi: *See—*
Morimoto, Takeshi; Sanada, Yasuhiro; Ohashi, Shinichi; and Kimura, Yoshikatsu, 4,862,328, Cl. 361-502.000.

Ohashi, Takehisa; Kan, Kazunori; Ueyama, Noboru; Sada, Isao; Miyama, Akimasa; and Watanabe, Kiyoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for preparing 4-acetoxy-3-hydroxyethylazetidin-2-one derivatives. 4,861,877, Cl. 540-357.000.

Ohata, Akira, to Toyota Jidosha Kabushiki Kaisha. Non-linear feedback controller for internal combustion engine. 4,860,707, Cl. 123-399.000.

Ohba, Shinya: *See—*
Ando, Haruhisa; Nakai, Masaaki; Ono, Hideyuki; Ozaki, Toshifumi; Ohba, Shinya; and Koike, Norio, 4,862,487, Cl. 377-58.000.

Ohbayashi, Hisashi: *See—*
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; Ohbayashi, Hisashi; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; and Ohbayashi, Hisashi, 4,861,768, Cl. 514-195.000.
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; Ohbayashi, Hisashi; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; and Ohbayashi, Hisashi, 4,861,768, Cl. 514-195.000.

Ohbuchi, Yasutsugu: *See—*
Maeda, Hiromu; Haraguchi, Kazuo; and Ohbuchi, Yasutsugu, 4,860,882, Cl. 198-458.000.

Ohgoda, Makoto, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 4,861,995, Cl. 250-327.200.

Ohhashi, Masahide, to Kabushiki Kaisha Toshiba. Shading circuit for shading a plurality of polygons which constitute a solid model, and method of shading the same. 4,862,391, Cl. 364-522.000.

Ohishi, Kohji; Akiyama, Minoru; and Sekita, Ryuichi, to Polyplastics Co., Ltd. Process for producing polyester. 4,861,860, Cl. 528-272.000.

Ohki, Naoyuki: *See—*
Yoshida, Nobutoshi; Miyke, Nobuyuki; Takagi, Atsushi; Saito, Takashi; Suzuki, Tadashi; Ohki, Naoyuki; Tomosada, Masahiro; Adachi, Hideki; and Takeda, Hiroaki, 4,862,219, Cl. 355-202.000.

Ohngemach, Jorg: *See—*
Kohler, Manfred; Ohngemach, Jorg; Wehner, Gregor; and Gehlhaus, Jurgen, 4,861,916, Cl. 568-337.000.

Ohno, Yoshimi: *See—*
Hatase, Takayuki; and Ohno, Yoshimi, 4,861,146, Cl. 350-429.000.

Ohnuki, Ichiro: *See—*
Yamada, Akira; and Ohnuki, Ichiro, 4,862,208, Cl. 354-485.000.

Ohshima, Shigeo: *See—*
Toda, Haruki; Sahara, Hiroshi; and Ohshima, Shigeo, 4,862,420, Cl. 365-221.000.

Ohshio, Hirohiko; Makita, Horoyuki; Nagasawa, Hidehiko; Kurosawa, Yoshiki; and Koyanagi, Yoshinobu, to Koito Seisakusho Co., Ltd. Automotive lamp assembly. 4,862,337, Cl. 362-294.000.

Ohta, Ikumi. Drainage plug. 4,860,390, Cl. 4-295.000.

Ohtani, Junji; Machida, Junji; Sano, Eiichi; and Masuda, Fumio, to Minolta Camera Kabushiki Kaisha. Carrier for electrophotography. 4,861,693, Cl. 430-106.600.

Ohtani, Mitsuaki: *See—*
Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, 4,861,913, Cl. 562-427.000.

Ohtomo, Ryosuke: *See—*
Ishikawa, Hiroshi; Takano, Hiroshi; Ohtomo, Ryosuke; Hoshino, Yoshinori; and Ohyama, Taro, 4,861,647, Cl. 428-216.000.

Ohtsuka, Nobuyuki: *See—*
Mochizuki, Kouji; Ozeki, Masashi; and Ohtsuka, Nobuyuki, 4,861,417, Cl. 156-610.000.

Ohwa, Yoshio: *See—*
Fukuzawa, Sooichi; Takeda, Yoshiaki; and Ohwa, Yoshio, 4,860,990, Cl. 251-30.030.

Ohwada, Yoshiaki: *See—*
Kubota, Atsuko; Matsushita, Yoshiaki; and Ohwada, Yoshiaki, 4,862,000, Cl. 250-341.000.

Ohya, Seiji; and Harada, Tetsuro, to Toyo Machinery Co., Ltd.; and OSG Corporation. Drill grinder having drill holder including chucks for gripping shank and body of the drill. 4,860,497, Cl. 51-98.500.

Ohyama, Taro: *See—*
Ishikawa, Hiroshi; Takano, Hiroshi; Ohtomo, Ryosuke; Hoshino, Yoshinori; and Ohyama, Taro, 4,861,647, Cl. 428-216.000.

Ohyoshi, Hisaaki; and Saito, Nobuaki, to Komori Printing Machinery Co., Ltd. Delivery safety apparatus for sheet-fed printing press. 4,861,016, Cl. 271-215.000.

Ohzone, Takashi: *See—*
Fuse, Genshu; Hirao, Takashi; and Ohzone, Takashi, 4,861,729, Cl. 437-18.000.

OI-NEG TV Products, Inc.: *See—*
Koenig, David G., 4,860,894, Cl. 206-421.000.

Oikawa, Tomoyuki: *See—*
Kasai, Kiyoshi; Sakai, Naomichi; Oikawa, Tomoyuki; Uchino, Kenji; Tsukidate, Takaaki; Asakura, Hiroshi; Yamamura, Hiroshi; and Nagata, Hiroya, 4,862,029, Cl. 310-311.000.

Oishi, Yasuyuki; and Inoue, Akira, to Nippon Oil Co., Ltd.; and Petroleum Energy Center Foundation. Catalyst for hydrotreating heavy hydrocarbon oils and a method of preparing the catalyst. 4,861,746, Cl. 502-314.000.

Oka, Joji: *See—*
Miyabayashi, Shigeaki; Kanai, Hiroshi; Oka, Joji; and Matsuura, Yoshikatsu, 4,861,672, Cl. 428-458.000.

Okabe, Takuji: *See—*
Hatayama, Haruaki; Takei, Hideo; Okabe, Takuji; Waku, Yoshiharu; and Ueno, Toyoaki, 4,860,542, Cl. 60-583.000.

Okada, Hirosuke: *See—*
Hirata, Haruhisa; Okada, Hirosuke; and Negoro, Seiji, 4,861,718, Cl. 435-207.000.

Okada, Itaru; Okui, Shuko; Nishimata, Mana; Takahashi, Yoji; and Fukuchi, Toshiki, to Mitsubishi Kasei Corporation. Pyrazole derivative and insecticidal and miticidal composition containing the derivative as active ingredient. 4,861,777, Cl. 514-234.500.

Okada, Kazuo: *See—*
Tadokoro, Michihiro; Okada, Kazuo; and Imai, Hitoshi, 4,862,442, Cl. 369-45.000.

Okada, Mitsuya, to NEC Corporation. Magneto-optical recording reproducing, and erasing apparatus having two independent magnetic field applying devices. 4,862,437, Cl. 369-13.000.

Okada, Tatsuhiro: *See—*
Sugihara, Hideki; Hiratani, Kazuhisa; and Okada, Tatsuhiro, 4,861,455, Cl. 204-418.000.

Okakura, Yojiro: *See—*
Hiraga, Imao; Shimura, Noriaki; Okakura, Yojiro; Kubota, Masaru; and Takashi, Osamu, 4,862,432, Cl. 368-88.000.

Okamoto, Yoshiharu: *See—*
Fukukawa, Mitsuo; Yazawa, Masayuki; Asai, Kazumitsu; Okamoto, Yoshiharu; and Mio, Kouhei, 4,861,189, Cl. 404-84.000.

Okamoto, Yoshio; and Hatada, Koichi, to Daicel Chemical Industries, Ltd. Alkyl-phenylcarbamate derivative of polysaccharide. 4,861,872, Cl. 536-18.700.

Okano, Takashi, to Ishikawa Gasket Co., Ltd. Metal plate with reinforced beads for a metal gasket. 4,861,047, Cl. 277-235.00B.

Okazaki, Ryoji: *See—*
Miura, Akira; Takata, Kanji; Okazaki, Ryoji; Uemura, Toyohide; and Kagawa, Keiichi, 4,861,688, Cl. 429-206.000.

Okuda, Hajime: *See—*
Morinaga, Motoyasu; Furuyama, Hideto; Nakamura, Masaru; Suzuki, Nobuo; Hirayama, Yuzo; and Okuda, Hajime, 4,862,474, Cl. 372-50.000.

Okuda, Hidefumi: *See—*
Mizuguchi, Katsumi; Okude, Yoshitaka; Miwa, Hiroshi; and Okuda, Hidefumi, 4,861,839, Cl. 525-506.000.

Okuda, Yukito: *See—*
Ishii, Koji; and Okuda, Yukito, 4,860,651, Cl. 101-232.000.

Okuda, Yutaka: *See—*
Matsuo, Mamoru; Okuda, Yutaka; Takizawa, Kazushige; and Sakaki, Hirokazu, 4,861,396, Cl. 148-439.000.

Okude, Yoshitaka: *See—*
Mizuguchi, Katsumi; Okude, Yoshitaka; Miwa, Hiroshi; and Okuda, Hidefumi, 4,861,839, Cl. 525-506.000.

Okui, Shuko: *See—*
Okada, Itaru; Okui, Shuko; Nishimata, Mana; Takahashi, Yoji; and Fukuchi, Toshiki, 4,861,777, Cl. 514-234.500.

Okumoto, Yutaka; and Furukawa, Takao, to Japan Tobacco Inc. Perforating apparatus for rod-shaped objects. 4,860,773, Cl. 131-281.000.

Okumura, Tsunemasa: *See—*
Imamura, Tadashi; Shigaki, Kazuyuki; Yamazaki, Yuji; Masuda, Tadashi; and Okumura, Tsunemasa, 4,861,113, Cl. 301-65.000.

Okuno Chemical Industries Co., Ltd.: *See—*
Tanaka, Noriko, 4,861,442, Cl. 204-44.200.

Olah, George, to PCUK Products Chimiques Uqine Kuhlmann. Hydration of propylene to isopropyl alcohol over solid superacidic perfluorinated sulfonic acid catalysts. 4,861,923, Cl. 568-899.000.

Oldham, Susan L.: *See—*
Lau, Kreisler S. Y.; Oldham, Susan L.; Elias, William E.; and Bigus, Stephen J., 4,861,901, Cl. 549-215.000.

Olds, Leonard E.; Peterson, Michael D.; and Martin, Jean P., to Manville Corporation. Apparatus and method for melting and homogenizing batch material. 4,862,477, Cl. 373-85.000.

Oles, Paul M.; and Shepps, Frederick J., to Graham Engineering Corporation. Rotary blow molding method. 4,861,542, Cl. 264-542.000.

Olin Corporation: *See—*
Butt, Sheldon H., 4,862,323, Cl. 361-388.000.

Ollivier, Jean: *See—*
Basset, Jean-Marie; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, 4,861,848, Cl. 526-169.000.

Olschewski, Armin; Schlereth, Armin; and Hoch, Paul-Gerhard, to SKF GmbH. Apparatus and system for converting pivoting motion to an axial displacement. 4,860,605, Cl. 74-99.00R.

Olsen, Gordon E.: *See—*
Helsley, Grover C.; Davis, Larry; and Olsen, Gordon E., 4,861,889, Cl. 546-183.000.

Olsen, Kristin M.: *See—*
Reichel, Judith; and Olsen, Kristin M., 4,862,435, Cl. 368-282.000.

Olson, Elwyn H., to Honeywell Inc. Rotary switch with indexing structure mounted to a printed circuit board. 4,861,951, Cl. 200-11.0DA.

Olson, John E., to Cascade Corporation. Automatic load push-pull slipsheet handler. 4,861,223, Cl. 414-661.000.

Olson Pattern & Foundry Works, Inc.: *See*—
Olson, Raylin J.; Prunty, Lawrence L.; and Whitehead, Wendell W., 4,860,985, Cl. 248-229.000.

Olson, Raylin J.; Prunty, Lawrence L.; and Whitehead, Wendell W., to Olson Pattern & Foundry Works, Inc. Bracket assembly for supporting a traffic sign. 4,860,985, Cl. 248-229.000.

Olson, Richard E.: *See*—
Schmidt, William L.; Olson, Richard E.; and Bailey, Douglas A., 4,862,320, Cl. 361-383.000.

Olson, Ronald A.: *See*—
Buck, Arthur G.; Olson, Ronald A.; and Beck, Doris A., 4,861,945, Cl. 174-69.000.

Olson, Thomas R., to Dwyer Instruments, Inc. Air velocity transmitter device. 4,860,583, Cl. 73-204.150.

Olszewski, William V.: *See*—
LeGrand, Donald G.; and Olszewski, William V., 4,861,666, Cl. 428-412.000.

Olver, Terence E., to United States of America, Navy. Active phase and amplitude modulator. 4,862,116, Cl. 332-23.00R.

Olympus Optical Company Limited: *See*—
Asakura, Yasuo; and Toyofuku, Toshiyuki, 4,862,207, Cl. 354-453.000
Hasegawa, Hiroshi; and Miyanaga, Hirofumi, 4,860,732, Cl. 128-6.000.
Kidawara, Atsushi; Nishikori, Toshiaki; Kanno, Masahide; Yabe, Hisao; Katoh, Shinichi; Ikuno, Yuji; and Nakamura, Takeaki, 4,862,258, Cl. 358-98.000.
Matsuura, Nobuyuki, 4,860,731, Cl. 128-6.000.
Sakuma, Hajime, 4,861,554, Cl. 422-65.000
Yanagawa, Yutaka; and Taniguchi, Akira, 4,860,758, Cl. 128-662.060.
Yunoki, Yutaka; Inoue, Manabu; and Watanabe, Hiroyuki, 4,862,304, Cl. 360-121.000.

Omar, Mostafa M.: *See*—
Madis, Valdemar H.; Omar, Mostafa M.; and Madis, Voldemar, 4,861,761, Cl. 514-54.000.

Omni Systems, Inc.: *See*—
Priola, James W.; and Sauder, James W., 4,861,082, Cl. 292-346.000.

Omron Tateisi Electronics Co.: *See*—
Kondo, Takayuki; and Morishita, Muneki, 4,861,974, Cl. 235-475.000.
Miyawaki, Yoshinori; Matumoto, Kazuhiro; and Shirasaki, Osamu, 4,860,760, Cl. 128-680.000
Yamasawa, Tsutomu; Yamakoshi, Kenichi; and Shimazu, Hideaki, 4,860,761, Cl. 128-686.000.

O'Neal, James E.: *See*—
Meschter, Peter; Lederich, Richard J.; and O'Neal, James E., 4,861,551, Cl. 420-533.000

O'Neil, Walter K., to Eaton Corporation. Power steering system. 4,860,844, Cl. 180-79.100

Onesti, Robert J., to Navistar International Transportion Corp. Universal electromechanical gauge. 4,862,365, Cl. 364-424.010.

Onitsuka, Nobuyuki: *See*—
Fukamachi, Masaaki; Onitsuka, Nobuyuki; Tanaka, Akira; and Nakamura, Kazuo, 4,862,139, Cl. 340-426.000.

Onmori, Shozo: *See*—
Katagiri, Shingo; Odate, Seizi; and Onmori, Shozo, 4,862,305, Cl. 360-132.000.

Ono, Akinobu: *See*—
Sugisawa, Ko; Sekiguchi, Kazuya; Tuji, Kiyoaki; and Ono, Akinobu, 4,861,559, Cl. 422-110.000

Ono, Hideyuki: *See*—
Ando, Haruhisa; Nakai, Masaaki; Ono, Hideyuki; Ozaki, Toshifumi; Ohba, Shinya; and Koike, Norio, 4,862,487, Cl. 377-58.000.

Ono, Shuichi; Yahagi, Masahiro; Itagaki, Shuichi; and Kikuchi, Nobuaki, to TDK Corporation. Semiconductive ceramic composition. 4,861,736, Cl. 501-137.000

Ootsuka, Hiroshi; Tominaga, Shinji; Kobayashi, Haruo; Matsushita, Shuzo; Hoda, Takeo; and Mukai, Hiromu, to Minolta Camera Kabushiki Kaisha. Exposure control system. 4,862,206, Cl. 354-414.000.

Opalia, John P.: *See*—
Vidwans, Mohan P.; Potes, Duane; and Opalia, John P., 4,861,107, Cl. 297-408.000.

ope, Henry F.; and Hope, Stephen F. Lightweight battery construction. 4,861,690, Cl. 429-233.000

Opheij, Willem G., to U.S. Philips Corporation. Optical record carrier with surface layer extending to the center of a substantially circular information track structure therein. 4,862,447, Cl. 369-270.000.

Oppico, Ernesto; Varesio, Carlo; and Rosa, Onorino, to Farmitalia Carlo Erba S.p.A. Process for purifying anthracyclinone glycosides by selective adsorption on resins. 4,861,870, Cl. 536-16.900.

Optical Recording Corporation: *See*—
Russell, James T., 4,861,144, Cl. 350-412.000.

Oratech Pharmaceutical Development Corporation: *See*—
Haas, Ronald T., 4,861,797, Cl. 514-557.000

Orlando, Anthony. Combination beach blanket and wind protector device. 4,860,777, Cl. 135-87.000.

Oros Systems Limited: *See*—
Kenney, Andrew C.; Thompson, Philip W.; and Harris, John L., 4,861,488, Cl. 210-656.000

Orr, Michael A.; and Williams, Crawford E., to International Business Machines Corp. Architecture for a distributive microprocessing system. 4,862,350, Cl. 364-200.000.

Ortho Pharmaceutical Corporation: *See*—
Press, Jeffery B.; and Sanfilippo, Pauline, 4,861,897, Cl. 548-217.000.

Osawa, Atsuo: *See*—
Kaku, Nobuyuki; Ogiro, Kenji; Osawa, Atsuo; Sasaki, Takashi; and Takita, Kouhei, 4,862,300, Cl. 360-85.000.

OSG Corporation: *See*—
Ohya, Seiji; and Harada, Tetsuro, 4,860,497, Cl. 51-98.500.

Oshida, Yoshitada; Nakashima, Naoto; and Yoshitake, Yasuhiro, to Hitachi, Ltd. Method and apparatus for optical alignment of semiconductor by using a hologram. 4,862,008, Cl. 250-548.000.

Oshima, Akira. Seal system for butterfly valve. 4,860,994, Cl. 251-173.000.

Oshima, Nobuyuki: *See*—
Kamiyama, Akira; Yamagisawa, Nobuo; and Oshima, Nobuyuki, 4,861,238, Cl. 417-363.000.

Oshlack, Benjamin, to Euroceltique, S.A. Controlled release bases for pharmaceuticals. 4,861,598, Cl. 424-468.000

Oster, Clark L.; Rustebakke, Paul; and Schiefen, Daniel R., to Square D Company. Trip crossbar translation to prevent bimetal overstressing in a circuit breaker. 4,862,131, Cl. 337-48.000

Ostertag, Edward A., to Teradyne, Inc. Apparatus for testing input pin leakage current of a device under test. 4,862,070, Cl. 324-73.00R.

Oswald, Thomas; and Robson, Ian A., to Dow Chemical Company, The. Gas flooding processing for the recovery of oil from subterranean formations. 4,860,828, Cl. 166-274.000.

Oten, Peter D. Venturi block having cut off. 4,860,795, Cl. 138-46.000.

Otomo, Seiji: *See*—
Hashimoto, Yoshio; Kawano, Tsuyoshi; Hasuka, Kaname; and Otomo, Seiji, 4,861,682, Cl. 428-685.000.

Otterness, Ivan G., to Pfizer Inc. 3-substituted-2-oxindole-1-carboxamides as inhibitors of interleukin-1 biosynthesis. 4,861,794, Cl 514-414.000.

Otto, Alexander J., to Alcan International Limited. Ball bonding of aluminum bonding wire. 4,860,941, Cl. 228-179.000.

Oursler, Barry, to Williams Electronics Games, Inc. Pinball runway and scoring feature. 4,861,037, Cl. 273-121.00D.

Ousley, Frank B., II, to Sea Ray Boats, Inc. Shaft pressure ring and method for lubricating shaft log seals. 4,861,294, Cl. 440-83.000.

Outboard Marine Corporation: *See*—
McElroy, Kennedy K., Jr.; Higby, Jeffrey P.; and Zorc, Philip A., 4,861,295, Cl. 440-86.000
McGowan, Philip J.; McNeill, Steven R.; Mondek, Matthew H.; and Mahnich, James A., 4,861,293, Cl. 440-76.000.
Wlezien, Richard A., 4,861,296, Cl. 440-89.000.

Outokumpu Oy: *See*—
Talonen, Timo T.; I Poijarvi, Jaakko T.; and Metsarinta, Maija-Leena, 4,861,577, Cl. 423-577.000.

Ovako Steel Couplings AB: *See*—
Sundberg, Staffan, 4,861,181, Cl. 403-15.000.

Overton, Kenneth J.: *See*—
Haefner, Kenneth B.; Bernstein, Bruce M.; Carey, Bernard J.; and Overton, Kenneth J., 4,861,960, Cl. 219-110.000.

Ovshinsky, Stanford R.: *See*—
deNeufville, John P.; Rajoria, Dalbir; and Ovshinsky, Stanford R., 4,861,573, Cl. 423-464.000.

Owen, Hartley: *See*—
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,861,741, Cl. 502-67.000.

Owens-Illinois Plastic Products Inc.: *See*—
Kaminski, Ronald S.; Snyder, Robert P.; and Crowley, Michael J., 4,861,541, Cl. 264-509.000.

Oxford Superconducting Technology: *See*—
Marancik, William G.; and Hong, Seung-Ok, 4,860,431, Cl. 29-599.000.

Ozagir, Ozcan; and Proffitt, Raymond, to Celmac Limited. Door lock with extra release. 4,861,084, Cl. 292-359.000.

Ozaki, Toshifumi: *See*—
Ando, Haruhisa; Nakai, Masaaki; Ono, Hideyuki; Ozaki, Toshifumi; Ohba, Shinya; and Koike, Norio, 4,862,487, Cl. 377-58.000.

Ozawa, Hiroshi: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,861,792, Cl. 514-389.000.

Ozeki, Masashi: *See*—
Mochizuki, Kouji; Ozeki, Masashi; and Ohtsuka, Nobuyuki, 4,861,417, Cl. 156-610.000.

Ozen Corporation: *See*—
Koike, Eishi, 4,862,444, Cl. 369-67.000.

Paccar Inc.: *See*—
Sasamura, Ross S.; and Jewell, John H., II, 4,861,099, Cl. 296-202.000

Pacific Fence and Wire Company: *See*—
Schoenheit, Joseph W.; and Weisensee, Stephen E., 4,860,997, Cl. 256-34.000.

Paffhausen, Marc W.: *See*—
Berg, Lloyd; Rall, Richard R.; and Paffhausen, Marc W., 4,861,436, Cl. 203-38.000

Page, Joseph U. Golf practice apparatus. 4,861,035, Cl. 273-184.00B.

Pagliaro, Fulvio A.: *See*—
Margolis, Geoffrey; Chiovini, Jacky; and Pagliaro, Fulvio A., 4,861,607, Cl. 426-481.000

Pai, Hsiang L. Time-averaged radon daughters (WL) dosimeter and method for surveys of indoor, outdoor and underground (MINE) contamination. 4,861,985, Cl. 250-253.000

Paisley, Gary V.: *See*—
Kirschner, Jonathan; Smazik, Kenneth G.; and Paisley, Gary V., 4,860,923, Cl. 222-1.000.

Pakull, Ralf: *See*—
Kricheldorf, Hans-Rytger; Pakull, Ralf; Eckhardt, Volker; and Dicke, Hans-Rudolf, 4,861,857, Cl. 528-170.000.

Palmondial S.A.: *See*—
Larws, Peter, 4,861,307, Cl. 446-95.000.

Pall Corporation: *See*—
Pall, David B.; Degen, Peter J.; Matkovich, Vlado I.; and Gsell, Thomas C., 4,861,617, Cl. 427-2.000.

Pall, David B.; Degen, Peter J.; Matkovich, Vlado I.; and Gsell, Thomas C., to Pall Corporation. Method of reducing the adhesion of bubbles in medical equipment. 4,861,617, Cl. 427-2.000

Palmer, Elaine R.: *See*—
Ferriter, Kate M.; and Palmer, Elaine R., 4,862,376, Cl 364-468.000

Palmer, Michael J.: *See*—
Bickford, Harry R.; Bregman, Mark F.; Moskowitz, Paul A.; Palmer, Michael J.; Reiley, Timothy C.; Poore, Paige A.; and Kovac, Caroline A., 4,862,322, Cl. 361-386.000

Palmer, William B.; and Giebler, Martin M., to TRW Inc. Deployable offset dish structure. 4,862,190, Cl. 343-915.000

Palmer, Winston H. Plumbing apparatus. 4,860,503, Cl. 52-35.000.

Palmgren, Kent I.: *See*—
Andersson, Bengt H.; and Palmgren, Kent I., 4,860,849, Cl 180-197.000

Palotas, Laszlo : *See*—
Kovacs, Ferenc; Lengyel, Miklosne ; Nagy, Tibor; Antal, Sandor; Gyongyosi, Gyorgy; Palotas, Laszlo ; and Pfisztner, Nandor, 4,860,798, Cl. 138-133.000

Paneth, Eric, to International Mobile Machines Corporation. Frequency synthesizer for broadcast telephone system having multiple assignable frequency channels. 4,862,107, Cl. 331-2.000.

Pankove, Jacques I., to University of Colorado Foundation, Inc. Semiconductor light emitting device. 4,862,471, Cl. 372-45.000.

Panuski, William R. Potter's grate. 4,860,491, Cl. 47-66.000.

Paolella, Arthur, to United States of America, Army. Method of making a millimeter wave monolithic integrated circuit. 4,861,426, Cl. 156-644.000.

Papst, Gero: *See*—
von Bogdandy, Ludwig; Kepplinger, Werner; Stift, Kurt; Papst, Gero; and Hauk, Rolf, 4,861,369, Cl. 75-38.000.

Paradyne Corporation: *See*—
Betts, William L.; and Zuranski, Edward S., 4,862,464, Cl. 371-43.000.

Parfomak, Walter; Sears, Jerome; and Kluss, Walter J., to Allied-Signal Inc. Optical commutation and tilt sensing for a permanent magnet gyro. 4,862,050, Cl. 318-689.000.

Parisi, Tulio T., to Ultramed Corporation. Ultrasonic probe. 4,861,332, Cl. 604-22.000

Park, Harry; and Fishman, Udi, to Medical Innovations Corporation. Assembly of wire inserter and lock for a medical wire. 4,860,742, Cl. 128-303.00R.

Park, Joon, to Hughes Aircraft Company. Offset mechanical gripper. 4,861,087, Cl. 294-119.100.

Parker, Alonzo E., Jr. Oscillating reclining chair. 4,860,733, Cl. 128-25.00R.

Parker, Kent; Batchelder, Bruce; and Clavette, Norman, to Davidson Textron Inc. Method for forming recyclable pour tool. 4,860,815, Cl. 164-47.000

Parker Technology, Inc.: *See*—
Gamboa, Gerardo; and Cochran, Dwayne V., 4,861,241, Cl. 417-454.000

Parrett, John T.; Fairbairn, James P.; and Jaworski, Walter, to Terex Corporation. Vehicle stabilizer apparatus and stabilizer actuator component thereof. 4,860,539, Cl. 60-426.000.

Parrish, Robert G., to Du Pont de Nemours, E. I., and Company. Pitch carbon fibers and batts. 4,861,653, Cl. 428-288.000.

Parrott, Richard M.; Colvin, Jack A.; and Shuey, Lyle W., to General Motors Corporation. Single ended solenoid valve assembly. 4,860,794, Cl. 137-637.200.

Parsons, Michael: *See*—
Keith, William J.; Parsons, Michael; Smith, Russell P.; Glenn, Christopher J.; and Bell, Stephen, 4,862,505, Cl. 381-60.000.

Pasco Corporation: *See*—
Ohama, Masanori; and Soma, Koroku, 4,861,157, Cl. 352-132.000.

Pashby, Richard P.; Phelps, Douglas W., Jr.; Samuelsen, Sigvart J.; and Ward, William C., to International Business Machines Corporation. Package semiconductor chip. 4,862,245, Cl. 357-70.000.

Pasko, John G.: *See*—
Shin, Soo H.; Pasko, John G.; and Anderson, J. R., 4,862,236, Cl. 357-30.000

Patchen, Paul J., to National Semiconductor Corporation. Receiver for Manchester encoded data. 4,862,482, Cl. 375-87.000.

Patel, Chandrakant B.: *See*—
Smith, Terrence R.; Isnardi, Michael A.; Fuhrer, Jack S.; and Patel, Chandrakant B., 4,862,271, Cl. 358-166.000.

Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen m.b.H.: *See*—
Hirschmann, Walter, 4,862,041, Cl. 315-246.000

Patrichi, Mihai D.; and Evanson, Delbert L., to Networks Electronic Corp. Pyrotechnic piston device. 4,860,698, Cl. 123-24.00R.

Patriksson Inventing AB: *See*—
Patriksson, Stig, 4,861,170, Cl. 383-6.000.

Patriksson, Stig, to Patriksson Inventing AB. Portable container. 4,861,170, Cl. 383-6.000

Patterson James A., to Southeastern Illinois College Foundation. Osmotic applications of hollow fibers. 4,860,577, Cl. 73-64.300.

Pauc, Andre : *See*—
Corteville, Jacques; Pauc, Andre ; and Hoffmann, Frederic, 4,860,825, Cl. 166-68.000.

Paul, Byron G.: *See*—
Dalrymple, John C.; and Paul, Byron G., 4,862,155, Cl. 340-747.000.

Paul, Francois B.; Monsan, Pierre F.; Remaud, Magali M. C.; and Pelenc, Vincent P., to Sucre Recherches et Developpements. Process for the enzymatic preparation from sucrose of a mixture of sugars having a high content of isomaltose, and products obtained. 4,861,381, Cl. 127-41.000

Paul, Gerald R., to Mendon Electronics Corporation. Power line monitor and printer system. 4,862,287, Cl. 358-296.000

Paul, Winfried: *See*—
Kress, Hans-Jurgen; Paul, Winfried; Peters, Horst; Lindner, Christian; and Buekers, Josef, 4,861,829, Cl. 525-92.000.

Pauly, Hans-Erwin: *See*—
Friesen, Heinz-Jurgen; Grenner, Gerd; Pauly, Hans-Erwin; Kohl, Helmut; Habenstein, Klaus; and Stark, Joseph, 4,861,711, Cl 436-7.000

Pauza, William V.; and Sheesley, Wilmer L., to AMP Incorporated Switch activating plug for a coaxial connector. 4,861,284, Cl 439-580.000

Pawelko, Karl-Heinz, to Korber AG. Apparatus for severing a running web of tipping paper or the like. 4,860,623, Cl. 83-346.000.

Pawlowski, Thomas D.: *See*—
Bohrer, Timothy H.; Pawlowski, Thomas D.; and Brown, Richard K., 4,861,958, Cl. 219-10.55E.

Paylinsky, Joseph F. Apparatus and method for containing snow skis and ski poles. 4,860,935, Cl. 224-202.000.

Pazda, Robert J.; and Clum, Kenneth L., to Eastman Kodak Company On-line web internal resistivity measuring apparatus. 4,862,065, Cl. 324-65.00R

Pazdernik, Patrick A.: *See*—
Lippert, Mary E.; Enloe, Kenneth M.; Koch, Debra J.; Roessler, Thomas H.; and Pazdernik, Patrick A., 4,861,652, Cl. 428-284.000.

PCUK Products Chimiques Ugine Kuhlmann: *See*—
Olah, George, 4,861,923, Cl. 568-899.000.

Pechtheiden-Meier, Claudia: *See*—
Koop, Hermann; and Pechtheiden-Meier, Claudia, 4,861,437, Cl 204-5.000

Pedersen, Christian: *See*—
Defaye, Jacques; Gadelle, Andree; and Pedersen, Christian, 4,861,871, Cl. 536-18.100.

Pedersen, Neils C.; and Yamamoto, Janet, to University of California, Regents of the. Oncornavirus vaccines and feline alpha-type interferon. 4,861,720, Cl. 435-238.000.

Pelenc, Vincent P.: *See*—
Paul, Francois B.; Monsan, Pierre F.; Remaud, Magali M. C.; and Pelenc, Vincent P., 4,861,381, Cl. 127-41.000.

Pellegrini, Louis; and Roberts, Melvin F., to Bloomfield Industries, Inc. Glass container with safety coating. 4,860,906, Cl. 215-12.200.

Pellet, Regis J.; Coughlin, Peter K.; Springer, Albert R.; and Gajek, Richard T., to UOP. Microporous crystalline composite compositions. 4,861,739, Cl. 502-64.000

Pelosi, Lorenzo F.: *See*—
DeLucca, George V.; Pelosi, Lorenzo F.; and O'Brien, John P., 4,861,527, Cl. 264-186.000.

Pelster, Bernhard: *See*—
Fengler, Gerd; Klausener, Alexander; Buysch, Hans-Josef; Mardin, Mithat; and Pelster, Bernhard, 4,861,878, Cl. 544-48.000.

Pendelton, Robert G.: *See*—
Suh, John T.; Pendelton, Robert G.; Pendley, Charles E., II; Yu, Kin T.; Menard, Paul R.; and Schreiber, Alain B., 4,861,795, Cl 514-510.000

Pendley, Charles E., II: *See*—
Suh, John T.; Pendelton, Robert G.; Pendley, Charles E., II; Yu, Kin T.; Menard, Paul R.; and Schreiber, Alain B., 4,861,795, Cl. 514-510.000.

Peng, Victor: *See*—
Benschneider, Bradley J.; and Peng, Victor, 4,862,405, Cl. 364-760.000

Penney, Gaylord W. Close-spaced electrostatic precipitator. 4,861,356, Cl. 55-137.000

Pepi, Jerome S.; and Horgan, Michael W., to Grinnell Corporation Coupling for rigidly connecting pipe sections. 4,861,075, Cl. 285-112.000.

Peppers, Norman A.; Young, James R.; Pierce, Gerald A.; Katsuki, Kazuo; and Katsuki, Kazuo, to Nippon Sheet Glass Co., Ltd. Local feature analysis apparatus. 4,862,511, Cl. 382-32.000.

Pereira, Joseph A. T., to A. W. Plume Limited. Method and apparatus for the low-pressure die-casting of metals. 4,860,820, Cl. 164-457.000.

Perkins, Joseph L.: *See—*
Zimmerman, Thomas H.; Pop, Julian J.; and Perkins, Joseph L., 4,860,581, Cl. 73-155.000.

Perrault, Frederick; and Perrault, Raymond E. Low tonnage high quality thread stamping. 4,860,570, Cl. 72-379.000.

Perrault, Raymond E.: *See—*
Perrault, Frederick; and Perrault, Raymond E., 4,860,570, Cl. 72-379.000.

Pershing, David W.: *See—*
Heap, Michael P.; Chen, Shih L.; McCarthy, James M.; and Pershing, David W., 4,861,567, Cl. 423-235.000.

Pesavento, Philip V., to Hughes Aircraft Company. Method for connecting leadless chip package. 4,860,443, Cl. 29-840.000.

Peters, Horst: *See—*
Kress, Hans-Jurgen; Paul, Winfried; Peters, Horst; Lindner, Christian; and Buekers, Josef, 4,861,829, Cl. 525-92.000.

Peters, John M.: *See—*
Almagor, David; and Peters, John M., 4,862,427, Cl. 367-101.000.

Petersen, Erwin, to WABCO Westinghouse Fahrzeugbremsen GmbH. Electrically-controlled motor vehicle brake system. 4,861,115, Cl. 303-15.000.

Petersen, James A.; and Crater, Timothy G., to Engineered Controls International, Inc. Non-rising stem valve assembly and method of replacing a permanent seal. 4,860,784, Cl. 137-315.000.

Petersen, Kurt E.: *See—*
Knutti, James W.; Allen, Henry V.; Petersen, Kurt E.; and Kowalski, Carl R., 4,861,420, Cl. 156-633.000.

Petersen, Michael P.: *See—*
Heiller, Glenn H.; and Petersen, Michael P., 4,862,225, Cl 355-288.000.

Peterson, Donald L.; and Kornecki, Tadeusz, to United States of America, Agriculture. Shaking mechanism for fruit harvesting. 4,860,529, Cl. 56-330.000.

Peterson, Gary J. Device for absorbing liquid contaminants such as oil and gasoline and fumes thereof. 4,861,475, Cl. 210-242.400.

Peterson, Glen D.: *See—*
Dierker, Joseph B., Jr.; Peterson, Glen D.; and Gee, Thomas A., 4,862,025, Cl. 310-68.00B.
Dierker, Joseph B., Jr.; Peterson, Glen D.; and Gee, Thomas A., 4,862,028, Cl. 310-168.000.

Peterson, Jeffrey D. Multi-level board game. 4,861,040, Cl. 273-241.000.

Peterson, Michael D.: *See—*
Olds, Leonard E.; Peterson, Michael D.; and Martin, Jean P., 4,862,477, Cl. 373-85.000.

Petrie, Brian C.; Druetzler, Thomas W.; and Harris, Rodney M., to Sherwin-Williams Company, The. Isocyanate functional polymers. 4,861,853, Cl. 526-302.000.

Petrillo, Vincenzo; Crotti, Gianpiero; and Marchello, Giovanni, to Sulfochem S.p.A. Process for preparing antirust components with improved flowability and penetration. 4,861,824, Cl. 524-745.000.

Petroleum Energy Center: *See—*
Funayama, Osamu; Arai, Mikiro; and Isoda, Takeshi, 4,861,569, Cl. 423-324.000.

Petroleum Energy Center Foundation: *See—*
Oishi, Yasuyuki; and Inoue, Akira, 4,861,746, Cl. 502-314.000.

Petrovich, Tom: *See—*
Derryberry, Lesli; and Petrovich, Tom, 4,862,247, Cl. 357-74.000.

Petrunia, Alexander: *See—*
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Petteway, Steven R.: *See—*
Ivanoff, Lucinda A.; and Petteway, Steven R., 4,861,707, Cl. 435-5.000.

Pfeifer, Charles R., to BASF Corporation. Stain resistant composition for synthetic organic polymer fibers and method of use: fluorocarbon polymer. 4,861,501, Cl. 252-8.600.

Pfister, Ralph E.: *See—*
Griffin, Donald L.; and Pfister, Ralph E., 4,861,658, Cl 428-336.000.

Pfisztner, Nandor: *See—*
Kovacs, Ferenc; Lengyel, Miklosne ; Nagy, Tibor; Antal, Sandor; Gyongyosi, Gyorgy; Palotas, Laszlo ; and Pfisztner, Nandor, 4,860,798, Cl. 138-133.000.

Pfizer Inc.: *See—*
Curtiss, Alan C.; and Lo, Jeelin, 4,861,596, Cl. 424-438.000.
Howard, Harry R., Jr.; and Sarges, Reinhard, 4,861,880, Cl. 544-144.000.
Jefson, Martin R.; and McGuirk, Paul R., 4,861,779, Cl. 514-249.000.
Otterness, Ivan G., 4,861,794, Cl. 514-414.000.
Saccomano, Nicholas A.; and Vinick, Frederic J., 4,861,891, Cl. 546-194.000.

Pfohl, William F., to Monsanto Company. Polyglycidamides. 4,861,881, Cl. 544-196.000.

Phaal, Cornelius; and Burnand, Richard P. Tool component. 4,861,350, Cl. 51-307.000.

Phelan, Cathal G.: *See—*
List, Frans J.; and Phelan, Cathal G., 4,862,417, Cl. 365-200.000.

Phelps, Douglas W., Jr.: *See—*
Pashby, Richard P.; Phelps, Douglas W., Jr.; Samuelsen, Sigvart J.; and Ward, William C., 4,862,245, Cl. 357-70.000.

Phelps, Stephen R.: *See—*
Wells, D. Phillips; and Phelps, Stephen R., 4,860,531, Cl 57-234.000.

Philips & DuPont Optical Company: *See—*
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Philips Petroleum Co.: *See—*
Megee, Bryan A.; and Whiteside, James D., II, 4,860,783, Cl. 137-268.000.

Phillips & Brooks, Inc.: *See—*
Jekot, David E.; and Jordan, Harold W., 4,862,499, Cl. 379-368.000.

Phillips, E. Lakin; and Romero, Bernardino. Method of playing a magnetic checkers game. 4,861,039, Cl. 273-239.000.

Phillips, Gregory R.: *See—*
Leoncavallo, Richard A.; Phillips, Gregory R.; and Mehra, Ravinder C., 4,861,466, Cl. 210-120.000.

Phillips Petroleum Company: *See—*
Johnson, Marvin M., 4,861,900, Cl. 549-87.000.
Schirmer, Robert M., 4,861,263, Cl. 431-158.000.
Stegelman, Albert F., 4,861,576, Cl. 423-574.00R.

Phillips, Philip G.: *See—*
Dean, Robert C., Jr.; Silver, Frederick H.; Berg, Richard A.; Phillips, Philip G.; and Runstadler, Peter W., Jr., 4,861,714, Cl. 435-68.000.

Phosphate Engineering & Construction Co., Inc.: *See—*
Morris, Susan B., 4,861,490, Cl. 210-669.000.

Photon Dynamics, Inc.: *See—*
Choi, Hee-June; Henley, Francois J.; and Barr, Maurice R., 4,862,075, Cl. 324-158.00F.

Piana, Ivana; and Piana, Silvano, to Grafoplast S.p.A. Electric cable terminal consisting of two independent elements to be assembled by axial sliding. 4,861,280, Cl. 439-491.000.

Piana, Silvano: *See—*
Piana, Ivana; and Piana, Silvano, 4,861,280, Cl. 439-491.000.

Picanol N.V.: *See—*
Victoor, Johnny; Coopman, Lucien; and Moeneclaey, Denis, 4,860,800, Cl. 139-448.000.

Picerno, Raysna: *See—*
Havenstein, Bennett L.; Picerno, Raysna; Brittain, Harry G.; and Nestor, James R., 4,861,727, Cl. 436-136.000.

Pichler, Klaus; and Kunze, Dieter, to Siemens Aktiengesellschaft. Cable sleeve having end members and a sleeve member with at least one longitudinally extending slot. 4,861,946, Cl. 174-92.000.

Picker International, Inc.: *See—*
Denison, Kenneth S., 4,862,081, Cl. 324-307.000.

Piecuch, Edouard: *See—*
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Pielet, Howard M.: *See—*
Moscoe, Gerald F.; Mastervich, Joel C.; Kreevich, William J.; Knoepke, John R.; Rellis, Daniel, Jr.; Glennon, Roger J.; and Pielet, Howard M., 4,860,819, Cl. 164-437.000.

Pierce, Gerald A.: *See—*
Peppers, Norman A.; Young, James R.; Pierce, Gerald A.; Katsuki, Kazuo; and Katsuki, Kazuo, 4,862,511, Cl. 382-32.000.

Pierpoint, James W., to Automated Technology Systems, Inc. Electrical cord filler removal apparatus and method. 4,860,441, Cl. 29-825.000.

Pierre Beuret: *See—*
Beuret, Pierre; and Beuret, Pascal, 4,861,000, Cl. 266-143.000.

Pierson, Tyler V., to Tyler's Fine Dry Cleaning, Inc. Combination bag holder and bag therefor. 4,860,981, Cl. 248-97.000.

Pietzsch, Kurt E., to Dorr-Oliver Incorporated. Press belt device for horizontal filters. 4,861,495, Cl. 210-739.000.

Pilatowicz, Edward J.; and Zatulovsky, Leonid, to Allegretti & Company. String trimmer. 4,860,451, Cl. 30-276.000.

Pin, Huang. Footwear having ventilation and shock-absorbing properties. 4,860,463, Cl. 36-3.00B.

Pinck, Peter: *See—*
Hensgen, Gerhard; Heitmann, Uwe; Brand, Peter; and Pinck, Peter, 4,860,772, Cl. 131-84.100.

Pinsky, Naum: *See—*
Clough, Thomas J.; and Pinsky, Naum, 4,861,689, Cl. 429-210.000.

Pinson, George T., to Boeing Company, The. Communication link between moving bodies. 4,860,968, Cl. 244-3.120.

Pioch, Lothar: *See—*
Wilms, Elman; Jung, Dieter; Linsenbold, Herbert; Pioch, Lothar; and Wichelhaus, Winfried, 4,861,510, Cl. 252-174.130.

Pioneer Electronic Corporation: *See—*
Kuroda, Kazuo, 4,862,252, Cl. 358-31.000.
Maeda, Takanori, 4,862,446, Cl. 369-112.000.
Nakajima, Masahiro; and Banno, Tutomu, 4,862,291, Cl. 358-342.000.
Suzuki, Jun, 4,861,138, Cl. 350-255.000.

Pirelli Coordinamento Pneumatici S.p.A.: *See—*
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Pirelli Sistemi Antivibranti S.p.A.: *See—*
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Pitas, Jeffery A.: *See—*
Stearns, Floyd E.; Pitas, Jeffery A.; LeRoy, Robert D.; and Ditzel, Roger E., 4,861,015, Cl. 271-213.000.

Pitney Bowes Inc.: *See—*
Axelrod, Barry H.; Durst, Robert T., Jr.; Hunter, Kevin D.; and Schmidt, Alfred C., 4,862,386, Cl. 364-518.000.
Talmadge, Paul C., 4,862,375, Cl. 364-464.020.

Piuze, Ronald L.: *See—*
Foley, John M.; Piuze, Ronald L.; Larson, Ralph I., Jr.; and Doumani, George, 4,860,824, Cl. 165-165.000.

Pizzorno, Augusto, to Pirelli Coordinamento Pneumatici S.p.A. Device apt for cutting or for trimming the edges of rubberized fabrics. 4,860,620, Cl. 83-156.000.

Plessey Australia Pty. Limited: *See—*
Jackett, Stephen G.; Kastel, Stephen N.; and Jandera, Zdenek, 4,862,428, Cl. 367-155.000.

Plessey Company plc., The: *See—*
Trundle, Clive, 4,861,899, Cl. 549-58.000.

Plessey Overseas Limited: *See—*
Cowley, Nicholas P., 4,862,109, Cl. 331-16.000.
Cowley, Nicholas P., 4,862,515, Cl. 455-183.000.
Dakin, John P.; and Wade, Christopher A., 4,861,980, Cl. 250-227.000.

Pletsch, Hubert: *See—*
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Plociennik, James J.: *See—*
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Plonka, Gunter: *See—*
Bergter, Friedrich; Bocker, Harald; Bormann, Ernst-Joachim; Forberg, Wolfgang; Fricke, Heinz; Grafe, Udo; Grosse, Hans-Helmut; Heller, Ingeborg; Hilliger, Matthias; Junne, Wolf; Linde, Hellmut; Menner, Michael; Menzel, Klaus-Dieter; Muller, Peter-Jurger; Plonka, Gunter; Pohl, Hans D.; Schneider, Jorg; and Thrum, Heinz, 4,861,715, Cl. 435-70.000.

Ploussios, George. Method and construction of helical antenna. 4,862,184, Cl. 343-745.000.

Pober, Kenneth W.: *See—*
Carlberg, Bob L.; Wolf, Nicholas O.; Pober, Kenneth W.; and Nash, William D., 4,860,829, Cl. 166-279.000.

Podola, Tore: *See—*
Gonzalez, Rene-Andres A.; Emmerling, Winfried; Krause, Werner; Podola, Tore; and Neitzer, Klaus, 4,861,863, Cl. 528-408.000.

Poerschke, Karl; Stark, Klaus; and Frochte, Bernd, to Wickmann Werke GmbH. Electrical fuse and method for its production. 4,862,134, Cl. 337-231.000.

Pohl, Hans D.: *See—*
Bergter, Friedrich; Bocker, Harald; Bormann, Ernst-Joachim; Forberg, Wolfgang; Fricke, Heinz; Grafe, Udo; Grosse, Hans-Helmut; Heller, Ingeborg; Hilliger, Matthias; Junne, Wolf; Linde, Hellmut; Menner, Michael; Menzel, Klaus-Dieter; Muller, Peter-Jurger; Plonka, Gunter; Pohl, Hans D.; Schneider, Jorg; and Thrum, Heinz, 4,861,715, Cl. 435-70.000.

Pohl, Ronald R., to Venderbush Industrial Corporation. Contaminant shield and method of constructing same. 4,860,778, Cl. 135-97.000.

Pokka Corporation: *See—*
Tamaki, Yoji; Kino, Takuya; Ito, Takashi; and Nakamura, Akihiko, 4,860,461, Cl. 34-68.000.

Pollard, Michael R.: *See—*
White, John F.; and Pollard, Michael R., 4,861,613, Cl. 426-611.000.

Pollard, Stephen L. Shut off for a gas line. 4,860,786, Cl. 137-384.000.

Pollock, Jerry J.; and McNamara, Thomas F., to Research Foundation of State University of New York, The. Dental compositions containing monovalent ions. 4,861,582, Cl. 424-520.000.

Polyplastics Co., Ltd.: *See—*
Nakagawa, Nozomu; Kubota, Masaru; and Chino, Shuichi, 4,861,814, Cl. 524-102.000.
Ohishi, Kohji; Akiyama, Minoru; and Sekita, Ryuichi, 4,861,860, Cl. 528-272.000.

Pomeroy, Jimmy R.; and Warwick, Ruth N. Personal flotation system. 4,861,301, Cl. 441-131.000.

Ponce De Leon, Lorenzo A.; Stamps, Douglass K., Jr.; and Balzano, Quirino, to Motorola, Inc. Miniature integral antenna-radio apparatus. 4,862,181, Cl. 343-702.000.

Poore, Paige A.: *See—*
Bickford, Harry R.; Bregman, Mark F.; Moskowitz, Paul A.; Palmer, Michael J.; Reiley, Timothy C.; Poore, Paige A.; and Kovac, Caroline A., 4,862,322, Cl. 361-386.000.

Pop, Julian J.: *See—*
Zimmerman, Thomas H.; Pop, Julian J.; and Perkins, Joseph L., 4,860,581, Cl. 73-155.000.

Popkin, Leonard I. Offset press with adjustable axle-bearing assembly for impression cylinder. 4,860,649, Cl. 101-137.000.

Popper, Peter; and Velvel, William E., to Du Pont de Nemours, E. I., and Company. Wound rotor element and centrifuge fabricated therefrom. 4,860,610, Cl. 74-572.000.

Poretsky, Leonid. Newspaper holder. 4,861,073, Cl. 281-45.000.

Porte, Hugues: *See—*
Lebrun, Jean-Jacques; and Porte, Hugues, 4,861,844, Cl. 525-475.000.

Porter, David H.: *See—*
Wenman, James A.; Bray, Douglas; R.; and Porter, David H., 4,861,273, Cl. 439-111.000.

Porter, Glenn A. Marine craft lift. 4,861,192, Cl. 405-3.000.

Portugall, Michael: *See—*
Kock, Hans-Jakob; Hisgen, Bernd; Portugall, Michael; Seiler, Erhard; and Blinne, Gerd, 4,861,858, Cl. 528-193.000.

Poruchynsky, Marianne S.: *See—*
Atkinson, Paul H., Bellamy, A. Richard, Both, Gerald W.; and Poruchynsky, Marianne S., 4,861,864, Cl. 530-324.000.

Posey, Norvan J.: *See—*
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Post, Robert C.: *See—*
Bertin, Robert; Miller, Michael B.; Moon, Burl M.; and Post, Robert C., 4,861,533, Cl. 264-81.000.

Potes, Duane: *See—*
Vidwans, Mohan P.; Potes, Duane; and Opalia, John P., 4,861,107, Cl. 297-408.000.

Pottebaum, Ken L.: *See—*
Genheimer, Stephen R.; and Pottebaum, Ken L., 4,862,298, Cl. 360-60.000.

Powell, Bert L., Jr.: *See—*
Powell, Richard; and Powell, Bert L., Jr., 4,860,717, Cl. 124-7.000.

Powell, John R., to GTE Products Corporation. Calibration process for bimetallic circuit breakers. 4,860,435, Cl. 29-622.000.

Powell, Richard; and Powell, Bert L., Jr., to Powell/Teeple Enterprises, Inc. Self-loading, remotely operable and variable, portable ball throwing apparatus and method. 4,860,717, Cl. 124-7.000.

Powell/Teeple Enterprises, Inc.: *See—*
Powell, Richard; and Powell, Bert L., Jr., 4,860,717, Cl. 124-7.000.

Powell, Thomas W., Jr.; Schulz, Anthony A.; and Beall, Gary W., to United Catalysts, Inc. Allergen absorbent and blocking aerosol composition. 4,861,584, Cl. 424-79.000.

PPG Industries, Inc.: *See—*
Chasser, Anthony M.; and Makhlouf, Joseph M., 4,861,833, Cl. 525-122.000.
Gillery, Frank H., 4,861,669, Cl. 428-434.000.
Young, James; and Leatherman, Dennis D., 4,861,644, Cl. 428-195.000.

Precision Castparts Corp.: *See—*
Friedman, Gerald I., 4,861,546, Cl. 419-8.000.

Precision Interconnect Corporation: *See—*
Buck, Arthur G.; Olson, Ronald A.; and Beck, Doris A., 4,861,945, Cl. 174-69.000.

Preece, Clive: *See—*
Reedman, David C.; and Preece, Clive, 4,862,377, Cl. 364-468.000.

Preiner, Gerhard; Hockemeyer, Friedrich; and Burger, Christa, to Wacker-Chemie GmbH. Radiation-crosslinkable compositions. 4,861,807, Cl. 522-99.000.

Prescher, Guenter: *See—*
Haubrich, Gerhard; Prescher, Guenter; and Faller, Juergen, 4,861,902, Cl. 549-499.000.

President and Fellows of Harvard College: *See—*
Antoniades, Harry N.; Lynch, Samuel E.; and Williams, Ray C., 4,861,757, Cl. 514-21.000.

Preskitt, Stanley V.: *See—*
Thompson, David B.; Preskitt, Stanley V.; Downing, Harvey L.; and Allred, Michael V., 4,862,394, Cl. 364-551.010.

Press, Jeffery B.; and Sanfilippo, Pauline, to Ortho Pharmaceutical Corporation. 2-Aryloxyalkylaminobenzoxazoles and 2-aryloxyalkylaminobenzothiazoles. 4,861,897, Cl. 548-217.000.

Presslein, Kurt: *See—*
Lehmkuhl, Josef; Nikesch, Ulrich; and Presslein, Kurt, 4,861,492, Cl. 210-709.000.

Preston, Howard J. Zoom motor control. 4,862,046, Cl. 318-467.000.

Price, J. B.: *See—*
Shekerjian, Brian H.; and Price, J. B., 4,861,563, Cl. 422-186.050.

Priem, Jan J.: *See—*
Timmerman, Daniel M.; Priem, Jan J.; and Janssens, Wilhelmus, 4,861,818, Cl. 524-460.000.

Pringle, Ronald E.: *See—*
Blizzard, William A.; and Pringle, Ronald E., 4,860,991, Cl. 251-62.000.

Prinz, Gary A.: *See—*
Krowne, Clifford M.; Prinz, Gary A.; and Krebs, James J., 4,862,119, Cl. 333-24.00R.

Priola, James W.; and Sauder, James W., to Omni Systems, Inc. Door security system. 4,861,082, Cl. 292-346.000.

Pritchard, F. D., to Burlington Industries, Inc. High speed extraction and treatment apparatus. 4,861,561, Cl. 422-116.000.

Procter & Gamble Company, The: *See—*
Caswell, Debra S., 4,861,502, Cl. 252-8.750.
Gosselink, Eugene P., 4,861,512, Cl. 252-174.230.

Production Technologies International Inc.: *See—*
Eastlund, Bernard J.; Schmitt, Kenneth J.; and Anderson, Douglas C., 4,861,074, Cl. 285-53.000.

Proffitt, Raymond: *See—*
Ozagir, Ozcan; and Proffitt, Raymond, 4,861,084, Cl. 292-359.000.

Progressive Chemical Research, Ltd.: *See—*
Novicky, Nick N., 4,861,850, Cl. 526-243.000.

Proter S.p.A.: *See—*
Springolo, Vanna; Coppi, Germano; and Scevola, Mario E., 4,861,599, Cl. 424-494.000.

Prud'Homme van Reine, Peter R.; and van Ijzendoorn, Leonardus J., to U.S. Philips Corporation. Ceramic translucent material, method of manufacturing such a material and high-pressure discharge lamp provided with such a material. 4,861,737, Cl. 501-152.000.

Pruitt, Gerald R.: *See—*
Higham, Graham J.; Morris, Ronald N.; and Pruitt, Gerald R., 4,860,543, Cl. 62-6.000.

Prunty, Lawrence L.: *See—*
Olson, Raylin J.; Prunty, Lawrence L.; and Whitehead, Wendell W., 4,860,985, Cl. 248-229.000.

Prutech II: *See—*
Joshi, Narendra D., 4,860,533, Cl. 60-39.060.

Pryor, Timothy R., to Diffracto Ltd. Remote operation of optical system. 4,862,397, Cl. 364-571.010.

Pudenz-Schulte Medical Research Corp.: *See*—
East, Gary P.; Laguette, Stephen W.; Heindl, Alfons; and Lintula, Leanne M., 4,861,331, Cl. 604-9.000.

Pulsar Light of Cambridge Limited: *See*—
Mardon, Paul F., 4,862,012, Cl. 307-38.000.

Pulse Electronics, Inc.: *See*—
Bezos, Angel P.; and Fernandez, Emilio A., 4,862,433, Cl. 368-108.000.

Puritan-Bennett Aero Systems Company: *See*—
Thomas, Byron E., 4,862,147, Cl. 340-628.000

Puritch, George S.; and Condrashoff, Sergi F., to Safer, Inc. Insecticide mixtures containing fatty acids. 4,861,762, Cl. 514-122.000

Pusateri, Mark S.: *See*—
Blomstedt, John W.; Irving, Wesley F.; and Pusateri, Mark S., 4,862,326, Cl. 361-413.000.

Puschak, Carl N.: *See*—
Harris, John W.; Sherling, Jon L.; and Puschak, Carl N., 4,862,072, Cl. 324-73.00R.

Puskas, Mariann E.: *See*—
Takacs, Kalman; Ajzert, Ilona K.; Kellner, Katalin M.; Fleischer, Judit; Puskas, Mariann E.; and Rimai, Jozsef, 4,861,888, Cl. 546-150.000.

Putnam, Brett J., to Speed Queen Company. Strain relief clamp for washing machine drain hose. 4,860,791, Cl. 137-565.000.

Putz, Peter: *See*—
Farin, Gunter; Haag, Reiner; and Putz, Peter, 4,860,745, Cl. 128-303.170

Quaker Oats Company, The: *See*—
Merten, Barron C.; and Morton, Kenneth P., 4,861,105, Cl. 297-250.000.

Quennessen, Rene, to AMS Packaging. Cosmetics box with improved closing means. 4,860,920, Cl. 220-326.000.

Query, Daniel S., to Whirlpool Corporation. Frost sensor for an appliance. 4,860,551, Cl. 62-140.000.

Quigley Company, Inc.: *See*—
Marino, Joseph J., 4,860,422, Cl. 29-402.180

Quignard, Francoise: *See*—
Basset, Jean-Marie; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, 4,861,848, Cl. 526-169.000.

Quinn, David B.: *See*—
Dinger, Bruce R.; McClanahan, Mark R.; Quinn, David B.; and Kennard, Frederick, 4,860,499, Cl. 51-165.740.

Quirk, Jennifer M., to W. R. Grace & Co.-Conn. Process for the preparation of nitroolefins. 4,861,925, Cl. 568-942.000.

Qureshi, Shahid P., to Amoco Corporation. Thermoset composition comprising aromatic cyanate ester of allyl ether of bisphenol. 4,861,823, Cl. 524-606.000

R & L Filtration Limited: *See*—
Robinsky, Eli I., 4,861,498, Cl. 210-791.000.

Radtke, Volker; Kowarsch, Heinrich; and Hahn, Erwin, to BASF Aktiengesellschaft. Isoindoline metal complexes. 4,861,898, Cl. 548-402.000.

Raether, Wolfgang, to Hoechst Aktiengesellschaft. Coccidiocidal compositions. 4,861,758, Cl. 514-27.000

Rafferty, Scott, to Davidson Textron Inc. Method for thermoforming multiple coverstock and such stock having finished styling lines therein. 4,861,543, Cl. 264-545.000.

Rain Bird Consumer Products MFG. Corp.: *See*—
Allemann, James G., 4,860,954, Cl. 239-101.000.

Rainin Instrument Co., Inc.: *See*—
Shackelford, Carl L.; and Rainin, Kenneth, 4,861,473, Cl. 210-198.200.

Rainin, Kenneth: *See*—
Shackelford, Carl L.; and Rainin, Kenneth, 4,861,473, Cl. 210-198.200.

Raj, David: *See*—
Miers, David R.; Raj, David; and Varshneya, Deepak, 4,860,586, Cl. 73-517.00R.

Rajala, Gregory J.; and King, Lon M., to Kimberly-Clark Corporation. Apparatus and method for forming filament and loop fasteners. 4,861,399, Cl. 156-66.000.

Rajoria, Dalbir: *See*—
deNeufville, John P.; Rajoria, Dalbir; and Ovshinsky, Stanford R., 4,861,573, Cl. 423-464.000.

Rall, Richard R.: *See*—
Berg, Lloyd; Rall, Richard R.; and Paffhausen, Marc W., 4,861,436, Cl. 203-38.000.

Ralph, Hugh I., to U.S. Philips Corp. High mobility semiconductor devices. 4,862,228, Cl. 357-4.000.

Ramaker, Johannes M.: *See*—
Wijdenes, Jacob; Ramaker, Johannes M.; and Weening, Cornelis, 4,861,699, Cl. 430-321.000.

Ramik, Vincent L., to Duchess Limited. Method of making a hair-streaking cap. 4,861,528, Cl. 264-39.000.

Rando, Joseph D., to Imo Industries, Inc. Fiber-optic reed switch. 4,862,124, Cl. 335-151.000.

Rapp, Earl E.: *See*—
Dann, Lynn D.; and Rapp, Earl E., 4,862,278, Cl. 358-225.000.

Raschbichler, Hans G.; Miller, Luitpold; Weisio, Manfred; and Breitenbach, Otto, to Kabelmetal Electro GmbH; and Thyssen Industrie AG. Completing a linear motor stator. 4,860.430, Cl. 29-596.000.

Ratajczak, Hans-Josef: *See*—
Lueders, Harald; Ratajczak, Hans-Josef; and Wienhoefer, Ekkehard, 4,861,513, Cl. 252-182.240.

Rauber, Gerhard; and Stechert, Roland, to Boehringer Ingelheim KG. Use of oxoquinazoline derivatives in the treatment of hyperuricaemia. 4,861,784, Cl. 514-314.000.

Rautenbach, Robert: *See*—
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Rauter, Jurgen: *See*—
Rudolf, Annast; Schuster, Max; Maurer, Dieter; and Rauter, Jurgen, 4,861,172, Cl. 384-477.000.

Ray, Lawrence A.: *See*—
Lucitte, Richard D.; Melnychuck, Paul W.; Murray, Joseph J.; Ray, Lawrence A.; and Sullivan, James R., 4,861,140, Cl. 350-320.000.

Raychem Corporation: *See*—
Etienne, Nolf J.; and Browell, Atkinson E., 4,862,088, Cl 324-326.000.
Krevor, David H.; and Martens, Paul, 4,860,851, Cl. 181-207.000.
Matthiesen, Martin; and Small, Michelle, 4,861,966, Cl. 219-205.000.
McCoy, Kenneth; Edwards, Neil; Wasley, Robert; and Wales, Denis, 4,862,146, Cl. 340-605.000.
Van Noten, Louis, 4,860,799, Cl. 138-167.000.

Raymond, A.: *See*—
Camenisch, Gian C., 4,860,979, Cl. 248-74.300.

Raymond, Michael W.: *See*—
Rizza, Robert S.; Fagen, Ben W., Jr.; Raymond, Michael W.; Feher, Peter; Milliard, Norman L.; and Kegelman, Thomas B., 4,862,198, Cl. 346-153.100.

Raytheon Company: *See*—
Rolt, Kenneth D., 4,862,429, Cl. 367-165.000.

Readman, John: *See*—
Zeiser, Philip; and Readman, John, 4,861,313, Cl. 464-89.000.

Rebek, Julius, to Year Laboratories, Inc. Method of use of 1,3 disubstituted aromatic cyclohexane imides as chelating agents. 4,861,564, Cl. 423-21.500

Recalt, Hugues: *See*—
Dumoulin, Patrick; and Recalt, Hugues, 4,860,524, Cl. 54-44.000.

Rector, James W., to Western Atlas International, Inc. System for reducing drill string multiples in field signals. 4,862,423, Cl. 367-25.000

Recycled Energy, Inc.: *See*—
Diaz, Manuel, 4,861,496, Cl. 210-748.000.

Reddick, Gary M. Emergency drive (fan) belt. 4,861,322, Cl. 474-254.000.

Redelsheimer, Rebecca: *See*—
Melton, Stephen R.; and Redelsheimer, Rebecca, 4,862,378, Cl. 364-469.000.

Reed, Adam V., to AT&T Information Systems, Inc. Method and apparatus for automatically selecting system commands for display. 4,862,498, Cl. 379-355.000.

Reed, Patrick G. Vacuum system for computer printers. 4,861,178, Cl. 400-719.000.

Reedman, David C.; and Preece, Clive, to British United Shoe Machinery Ltd. Detecting workpiece orietation and treating workpieces without reorieting. 4,862,377, Cl. 364-468.000.

Reel, Jerry R.: *See*—
Cook, C. Edgar; Tallent, C. Ray; Reel, Jerry R.; and Wani, Mansukh C., 4,861,763, Cl. 514-172.000.

Reemtsma, Keith; Hardy, Mark A.; and Lau, Henry T., to Columbia University in the City of New York, The Trustees of. Processes for development of acceptance of transplanted organs and tissues. 4,861,704, Cl. 435-1.000.

Rees, Richard W. A.; and Humer, Mladen, to General Motors Corporation. Vertical seat adjuster apparatus and method. 4,860,988, Cl. 248-420.000.

Reese, Jon: *See*—
Flinchbaugh, Bruce E.; Dolins, Steven B.; Srivastava, Aditya; and Reese, Jon, 4,861,419, Cl. 156-626.000.

Reeser, Larry J.; and Morton, Henry H., to Reeser, Larry J. Remote controlled thermostat. 4,860,950, Cl. 236-51.000.

Reeve-Parker, Michael C., to Ashland Oil, Inc. Process for treating molten aluminum alloy with powdered flux. 4,861,370, Cl. 75-68.00R.

Reeves, Kevin E.; and Santhouse, Daniel, to Clairol Incorporated. Hair brush. 4,860,775, Cl. 132-118.000.

Regelman, Dale F.: *See*—
Roshen, Waseem A.; Turcotte, David E.; and Regelman, Dale F., 4,862,129, Cl. 336-61.000.

Reichel, Judith; and Olsen, Kristin M., to Timex Corporation. Combination bracelet and wristwatch. 4,862,435, Cl. 368-282.000.

Reichler, Edmund: *See*—
Hochreuther, Karl; and Reichler, Edmund, 4,860,901, Cl. 206-586.000.

Reichmuth, Arthur, to Mettler Instruments AG. Weighing apparatus including active low-pass filter means. 4,860,839, Cl. 177-185.000.

Reid, David L.; and Weimer, Robert J., to Cummins Engine Company, Inc. Oil change interval monitor. 4,862,393, Cl. 364-550.000.

Reif, Stefan: *See*—
Kicherer, Robert; Schreder, Felix; and Reif, Stefan, 4,861,969, Cl. 219-458.000.

Reiley, Timothy C.: *See*—
Bickford, Harry R.; Bregman, Mark F.; Moskowitz, Paul A.; Palmer, Michael J.; Reiley, Timothy C.; Poore, Paige A.; and Kovac, Caroline A., 4,862,322, Cl. 361-386.000.

Reinartz, Hans-Dieter; and Steffes, Helmut, to Alfred Teves GmbH. Brake pressure regulator. 4,861,117, Cl. 303-100.000.

Reliance Comm/Tec Corporation: *See*—
Corvino, Phil; and McCormick, Tom, 4,862,314, Cl. 361-119.000.
Rust, Wayne; and Bonnesen, John S., 4,862,311, Cl. 361-91.000.

Reliance Electric Company: *See*—
Jordan, Howard E.; Woods, Edward J.; Caruso, John T.; and Forte, Luciano, 4,862,053, Cl. 318-786.000.

Rellis, Daniel, Jr.: *See*—
Moscoe, Gerald F.; Mastervich, Joel C.; Kreevich, William J.; Knoepke, John R.; Rellis, Daniel, Jr.; Glennon, Roger J.; and Pielet, Howard M., 4,860,819, Cl. 164-437.000.

Remaud, Magali M. C.: *See*—
Paul, Francois B.; Monsan, Pierre F.; Remaud, Magali M. C.; and Pelenc, Vincent P., 4,861,381, Cl. 127-41.000.

Rembold, Manfred; Sitek, Franciszek; Rutsch, Werner; and Berner, Godwin, to Ciba-Geigy Corporation. Process for curing polyisocyanate coatings in the presence of a ferrocenium compound. 4,861,806, Cl. 522-66.000.

Renard, Jean: *See*—
Carriere, Claude; Renard, Jean; and Lavolee, Thierry, 4,861,423, Cl. 156-643.000.

Renaud, Alain S., to Coopetanche S.A. Method for internally lining ducts and sleeves for ducts lined with this method. 4,861,634, Cl. 428-36.100.

Renner, Robert E.; and Kutz, David A. Test point adapter for chip carrier sockets. 4,862,076, Cl. 324-158.00F.

Rent, Ltd.: *See*—
Simmons, Eugene D.; Thomson, Graham C., III; and Reynaud, Richard J., 4,861,239, Cl. 417-383.000.

Rentokil Limited: *See*—
Meehan, Adrian P.; and Ash, Vernon R., 4,862,145, Cl. 340-573.000.

Research Association for Utilization of Light Oil: *See*—
Suzuki, Isao; Hirabayashi, Kazuo; Kondoh, Tadami; and Nishijima, Hiroaki, 4,861,934, Cl. 585-415.000.

Research & Consulting Co. A.G.: *See*—
Bernstein, David M.; and Fleissner, Hermut, 4,860,741, Cl. 128-204.180.

Research Corporation: *See*—
Hall, Iris H.; Wyrick, Steven D.; and Chapman, James M., Jr., 4,861,778, Cl. 514-248.000.
Waterbury, John B.; Calloway, Charles B.; and Turner, Ruth D., 4,861,721, Cl. 435-252.100.

Research Corporation Technologies, Inc.: *See*—
Siegwart, John T., Jr., 4,861,321, Cl. 474-133.000.
Vestal, Marvin L.; Blakley, Calvin R.; and Fergusson, Gordon J., 4,861,989, Cl. 250-288.000.

Research Foundation of State University of New York, The: *See*—
Pollock, Jerry J.; and McNamara, Thomas F., 4,861,582, Cl. 424-520.000.

Research Triangle Institute: *See*—
Cook, C. Edgar; Tallent, C. Ray; Reel, Jerry R.; and Wani, Mansukh C., 4,861,763, Cl. 514-172.000.

Resonance Research, Inc.: *See*—
Hillenbrand, David F.; and Starewicz, Piotr M., 4,862,087, Cl. 324-320.000.

Respitrace Corp.: *See*—
Sackner, Marvin A., 4,860,766, Cl. 128-748.000.

Retech, Inc.: *See*—
Schlienger, Max P., 4,861,001, Cl. 266-242.000.

Reuter, David C.: *See*—
Dick, Wesley M.; and Reuter, David C., 4,860,612, Cl. 74-665.00H.

Revankar, Ganapathi R.: *See*—
Robins, Roland K.; Revankar, Ganapathi R.; and Chang, Yu-an, 4,861,873, Cl. 536-27.000.

Revlon, Inc.: *See*—
Ekchian, Jack A.; Hoffman, Robert W.; Ekchian, Leon; and Gabriel, Kaigham J., 4,862,160, Cl. 340-825.540.

Rexnord Inc.: *See*—
Do, Tai H., 4,861,207, Cl. 411-104.000.

Reynaud, Richard J.: *See*—
Simmons, Eugene D.; Thomson, Graham C., III; and Reynaud, Richard J., 4,861,239, Cl. 417-383.000.

Reynolds, David L., to Duoject Medical Systems Inc. Syringe. 4,861,335, Cl. 604-88.000.

Rheinmetall GmbH: *See*—
Synofzik, Reinhard; Doherr, Karl-Friedrich; Munscher, Dieter; and Saliaris, Christos, 4,860,660, Cl. 102-501.000.

Rhone-Poulenc Specialites Chimiques: *See*—
Lebrun, Jean-Jacques; and Porte, Hugues, 4,861,844, Cl. 525-475.000.

Rhoton, William L.; and Sabell, Gary M., to Rhoton, William L. Detachable tip for fishing rod. 4,860,485, Cl. 43-24.000.

Riback, Richard. Motor unit bearing. 4,862,026, Cl. 310-90.000.

Richards, John W.: *See*—
Harradine, Vincent C.; Gillard, Clive H.; and Richards, John W., 4,862,260, Cl. 358-105.000.

Richards, Toby D.; and Antonio, Anthony I., Jr., to Fabricated Plastics, Inc. Reinforced strip and flexible hoses produced therewith. 4,860,797, Cl. 138-122.000.

Richards, William L.: *See*—
Joy, Theodore J.; Mohile, Vivek V.; and Richards, William L., 4,861,234, Cl. 417-273.000.

Richardson, Brian; and Richardson, John, to Morpheus Lights, Inc. Dimorphic truss unit. 4,862,336, Cl. 362-285.000.

Richardson, John: *See*—
Richardson, Brian; and Richardson, John, 4,862,336, Cl. 362-285.000.

Richeson, Joseph T.: *See*—
Hines, Edward E.; Royer, Lee J.; Jehring, Thomas D.; Faulkenberry, William E.; Posey, Norvan J.; and Richeson, Joseph T., 4,860,602, Cl. 73-865.900.

Ricoh Company, Ltd.: *See*—
Hatase, Takayuki; and Ohno, Yoshimi, 4,861,146, Cl. 350-429.000.
Kasahara, Nobuo; and Nakahara, Tosio, 4,862,214, Cl. 355-377.000.
Kikuchi, Shuichi, 4,861,145, Cl. 350-427.000.
Kutami, Atsushi; Hashimoto, Akira; and Takada, Yoshihiro, 4,862,211, Cl. 355-212.000.
Sakamoto, Koji; and Tanzawa, Misao, 4,862,209, Cl. 355-211.000.
Sasaki, Saburo; Himuro, Keiji; and Koshiishi, Shinichiro, 4,862,203, Cl. 354-400.000.
Shimada, Kazuyuki, 4,862,289, Cl. 358-298.000.
Tajima, Shoji; Kadomatsu, Yasuo; Miyazaki, Yoshio; Sakurai, Michikazu; and Anze, Kimio, 4,860,417, Cl. 29-130.000.
Takada, Toshiyuki, 4,862,254, Cl. 358-75.000.
Tanzawa, Misao; Sakamoto, Koji; and Satoh, Mitsuru, 4,862,212, Cl. 355-3.00A.
Ueda, Yutaka; and Noda, Eiji, 4,861,637, Cl. 428-65.000.

Riedel, Josef, to Tox-Dubel-Werk Richard M. Heckhausen GmbH & Co. KG. Straddling plug. 4,861,206, Cl. 411-36.000.

Riegler, Andreas: *See*—
Stritzl, Karl; Wurthner, Hubert; and Riegler, Andreas, 4,861,064, Cl. 280-618.000.

Rieter Machine Works Ltd.: *See*—
Staheli, Paul; Demuth, Robert; and Fritzsche, Peter, 4,860,406, Cl. 19-105.000.

Riggs, Robert S., to Jet Research Center, Inc. 1,3,5-trinitro-2,4,6-tripicrylbenzene. 4,861,924, Cl. 568-931.000.

Righetti, Claudio: *See*—
Malservisi, William; Righetti, Claudio; Nadalini, Raffaele; Braga, Umberto; and Romagnoli, Marino, 4,860,922, Cl. 221-6.000.

Riker Laboratories, Inc.: *See*—
Kirk, William F.; Wass, Anthony C. L.; Baum, Eric A.; Tansey, Ian P.; and Meredith, William G., 4,860,740, Cl. 128-203.150.

Riley, Bryan R. Universal alignment fixture. 4,860,439, Cl. 29-741.000.

Riley, Jon D. Collapsible safety attachment for ladder. 4,860,855, Cl. 182-106.000.

Riley, William M., to Mather Seal Company. Dust excluder for vehicle air conditioning compressor seal assembly. 4,861,045, Cl. 277-25.000.

Rimai, Jozsef: *See*—
Takacs, Kalman; Ajzert, Ilona K.; Kellner, Katalin M.; Fleischer, Judit; Puskas, Mariann E.; and Rimai, Jozsef, 4,861,888, Cl. 546-150.000.

Rimay, Bela: *See*—
Antal, Kalman; Ugrosdy, Laszlo ; and Rimay, Bela, 4,861,302, Cl. 445-38.000.

Rioja, Roberto J.; Colvin, Edward L.; Vasudevan, Asuri K.; and Cheney, Brian A., to Aluminum Company of America. Aluminum alloy two-step aging method and article. 4,861,391, Cl. 148-12.70A.

Riordan, Roger H S: *See*—
La Salle, Roger J.; and Riordan, Roger H S, 4,862,491, Cl. 379-6.000.

Ritou, Tuguyoshi: *See*—
Teteishi, Iwao; Ogura, Yoshiyuki; Hashimoto, Takeshi; Ritou, Tuguyoshi; Kajiyama, Katsufumi; Shimizu, Fumiaki; Tanaka, Kenji; Aibara, Yutaka; Kataoka, Hiroaki; Nakai, Katsuya; Yoshikawa, Takashi; Kanamori, Masaaki; Miyajima, Masao; Seki, Shuzo; and Takahashi, Sadanobu, 4,860,523, Cl. 53-512.000.

Ritter, Gerhard; and Ritter, Klaus, to EVG Entwicklungsu. Verwertungs-Gesellschaft m.b.H. Device for heat-treating, in particular annealing, a continuously advanced metal wire. 4,860,999, Cl. 266-103.000.

Ritter, Klaus: *See*—
Ritter, Gerhard; and Ritter, Klaus, 4,860,999, Cl. 266-103.000.

Rizza, Robert S.; Fagen, Ben W., Jr.; Raymond, Michael W.; Feher, Peter; Milliard, Norman L.; and Kegelman, Thomas B., to Moore Business Forms, Inc. Electrostatic cleaning of electrodes in an electrographic printer. 4,862,198, Cl. 346-153.100.

RNA, Incorporated: *See*—
McKee, John H., 4,860,899, Cl. 206-534.000.

Robbins, Edward S., III. Composite strand fence. 4,860,996, Cl. 256-10.000.

Robbins, Jerry B. Oil filter tool. 4,860,617, Cl. 81-64.000.

Robbins, Lanny A.; and Gammill, Ben B., to Dow Chemical Company, The. Countercurrent multi-stage water crystallization of aromatic compounds. 4,861,919, Cl. 568-724.000.

Robert Bosch GmbH: *See*—
Arnold, Brigitte; Eidler, Franz; and Wessel, Wolf, 4,862,370, Cl. 364-431.100.
Barth, Guenter; Stegmaier, Alwin; and van Zanten, Anton, 4,860,848, Cl. 180-197.000.
Bernhardt, Wolfgang; and Wetzel, Gerhard, 4,861,116, Cl. 303-100.000.
Bertling, Hannes; Mergenthaler, Robert; Schmitt, Edgar; and Siegel, Heinz, 4,860,636, Cl. 91-376.00R.
Bragas, Peter, 4,862,513, Cl. 455-45.000.
Hafner, Udo; and Knapp, Heinrich, 4,860,710, Cl. 123-470.000.
Kost, Friedrich; Van Zanten, Anton; Heess, Gerhard; and Kreisselmeier, Gerhard, 4,862,368, Cl. 364-426.020.
Schmitt, Edgar, 4,860,637, Cl. 91-376.00R.

Robert Bosch Power Tool Corporation: *See—*
Cotton, Lawrence M.; and Compton, Gery R., 4,860,809, Cl. 144-371.000.

Robert, Henri F. A., to Sorenam. Rotary and reciprocating drilling machine. 4,860,837, Cl. 175-113.000.

Roberts, Charles D.: *See—*
Colin, Joseph F.; Kaercher, Leo T.; and Roberts, Charles D., 4,861,394, Cl. 148-153.000

Roberts, Keith; and McConnell, Thomas A. Film container. 4,860,892, Cl. 206-389.000.

Roberts, Melvin F.: *See—*
Pellegrini, Louis; and Roberts, Melvin F., 4,860,906, Cl. 215-12.200.

Roberts, Richard D., to Harris Corporation. Apparatus for clock recovery from digital data. 4,862,484, Cl. 375-110.000.

Robertson, Frank H., III: *See—*
Muchnik, Boris J.; and Robertson, Frank H., III, 4,861,671, Cl. 428-457.000.

Robeson, Lloyd M.: *See—*
Dickinson, Barry L.; and Robeson, Lloyd M., 4,861,837, Cl. 525-394.000.

Robins, Roland K.; Revankar, Ganapathi R.; and Chang, Yu-an, to Nucleic Acid Research Institute. 8-Chloroadenosine 3', 5'-cyclic monophosphate preparations. 4,861,873, Cl. 536-27.000

Robinsky, Eli I., to R & L Filtration Limited. Backwash system for filter-thickeners. 4,861,498, Cl. 210-791.000.

Robinson, Melville W., Jr. Process for removing sulfur dioxide from flue gases. 4,861,568, Cl. 423-243.000.

Robinson, Raymond S.: *See—*
Kaufman, Harold R.; and Robinson, Raymond S., 4,862,032, Cl. 313-359.100.

Robinson, Robert C., to Dover Cylinder Head Service. Apparatus for testing water jackets on cylinder heads of internal combustion engines. 4,860,575, Cl. 73-49.700.

Robson, Ian A.: *See—*
Oswald, Thomas; and Robson, Ian A., 4,860,828, Cl. 166-274.000.

Roche, Gilbert: *See—*
Berardo, Michel; Darnez, Charles; Martinet, Jean-Marie; and Roche, Gilbert, 4,861,480, Cl. 210-490.000

Rocklein, John. Two-cycle engine. 4,860,699, Cl. 123-26.000.

Rockwell, Gary, to Diversified Products Corporation. Articulated storable exercise bench. 4,861,025, Cl. 272-144.000

Rockwell International Corporation: *See—*
Bujard, Martial R., 4,862,384, Cl. 364-509.000
Shin, Soo H.; Pasko, John G.; and Anderson, J. R., 4,862,236, Cl. 357-30.000.

Rode, Christian S.: *See—*
Westberg, Thomas E.; Rode, Christian S.; and Burns, Bruce G., 4,862,156, Cl. 340-747.000

Roess, Hans. Device for the blending of different fibres in a desired ratio of components. 4,860,407, Cl. 19-145.500.

Roessler, Thomas H.: *See—*
Lippert, Mary E.; Enloe, Kenneth M.; Koch, Debra J.; Roessler, Thomas H.; and Pazdernik, Patrick A., 4,861,652, Cl. 428-284.000.

Rogers, George: *See—*
Ernst, James; Williamson, Steven; Rogers, George; and Musto, Dominick, 4,861,270, Cl. 434-226.000

Rogers, John T., to Utex Industries, Inc. Valve element for use in pumps for handling fluids containing abrasive materials. 4,860,995, Cl. 251-356.000.

Rogers, Lloyd W.: *See—*
Compeau, David E.; Rogers, Lloyd W.; and Myslicki, Robert J., 4,861,089, Cl. 296-76.000

Rogers, Norman H.; Walker, Graham; Crimmin, Michael J.; and O'Hanlon, Peter J., to Beecham Group plc. Antibacterial 1-normon-2-yl-heterocyclic compounds. 4,861,788, Cl. 514-364.000

Rohde, Mark W.: *See—*
Smith, Peter T.; Rohde, Mark W.; and Shoemaker, Donald K., 4,862,316, Cl. 361-220.000.

Rohm and Haas Company: *See—*
Hsu, Adam C. T.; and Lein, Geore M., Jr., 4,861,896, Cl. 548-213.000.

Rohner, Peter; and Ziemek, Gerhard, to Kabelmetal Electro Gesellschaft mit beschrankter Haftung. Ribbon cable with optical waveguides. 4,861,135, Cl. 350-96.230.

Rolflor Industries: *See—*
Hodgetts, Graham L., 4,860,965, Cl. 242-67.10R.

Rolls-Royce PLC: *See—*
Todman, Michael T., 4,861,228, Cl. 415-115.000

Rolsma, Peter B.: *See—*
Lee, John N.; Athale, Ravindra A.; and Rolsma, Peter B., 4,862,115, Cl. 332-7.510.

Rolt, Kenneth D., to Raytheon Company. Flextensional electroacoustic transducer with hydrostatically compression-loaded driver. 4,862,429, Cl. 367-165.000.

Romagnoli, Marino: *See—*
Malservisi, William; Righetti, Claudio; Nadalini, Raffaele; Braga, Umberto; and Romagnoli, Marino, 4,860,922, Cl. 221-6.000.

Romanak, Alfred J.; and Moss, Russell W., to Channel Products, Inc. Gas collector electrode assembly for gas burners. 4,861,264, Cl. 431-263.000

Romero, Bernardino: *See—*
Phillips, E. Lakin; and Romero, Bernardino, 4,861,039, Cl 273-239.000.

Romig, Kenneth L., to General Motors Corporation. Clutch control mechanism. 4,860,870, Cl. 192-99.00S.

Romneya Trading Co.: *See—*
Hubbard, Julian D., 4,860,931, Cl. 222-400.800.

Rooyackers, Cornelis J. P. M.: *See—*
Smid, Albert; Akkermans, Antonius H. M.; Benschop, Jozef P. H.; and Rooyackers, Cornelis J. P. M., 4,861,982, Cl. 250-235.000.

Rorer Pharmaceutical Corporation: *See—*
Suh, John T.; Pendelton, Robert G.; Pendley, Charles E., II; Yu, Kin T.; Menard, Paul R.; and Schreiber, Alain B., 4,861,795, Cl 514-510.000.

Rosa, Onorino: *See—*
Oppico, Ernesto; Varesio, Carlo; and Rosa, Onorino, 4,861,870, Cl. 536-16.900.

Rose, James H.; and Spector, George. Quickie mirror. 4,860,989, Cl. 248-471.000

Rosebrugh, Christopher P.: *See—*
Fried, Jeffrey A.; and Rosebrugh, Christopher P., 4,862,412, Cl. 365-49.000.

Roselli, Auro. Nonrigid wing aircraft. 4,860,970, Cl. 244-16.000.

Rosenberg, Duane L.: *See—*
Lessar, Joseph F.; Rosenberg, Duane L.; Kraska, Robert E.; Speckien, James M.; and Upton, James E., 4,860,446, Cl. 29-858.000

Roshen, Waseem A.; Turcotte, David E.; and Regelman, Dale F., to ITT Corporation. Single-turn primary and single-turn secondary flat voltage transformer. 4,862,129, Cl. 336-61.000.

Ross, J. David, to Texas Scottish Rite Hospital for Crippled Children. Computer control apparatus including a gravity referenced inclinometer. 4,862,172, Cl. 341-157.000

Rossi, James L.; and Lawrence, Franklin B., to American Transportation Technology, Inc. Fuel tank dewatering apparatus. 4,861,469, Cl. 210-172.000

Roth, Siegfried; and Mueller, Helmut, to Messerschmitt-Boelkow-Blohm GmbH. Observation and guide beam apparatus for day and night use. 4,861,996, Cl. 250-330.000.

Rothenberg, Martin, to Syracuse University. Voice parameter extractor using oral airflow. 4,862,503, Cl. 381-48.000.

Rother, Wolfgang: *See—*
Durr, Manfred; Unland, Georg; Driemeier, Gunter; Krutzner, Karl; Schmits, Heinz-Herbert; von Seebach, Michael; Heinemann, Otto; Rother, Wolfgang; and Dreyer, Dieter, 4,861,265, Cl. 432-103.000.

Rougeot, Henri: *See—*
Vieux, Gerard; Rougeot, Henri; and Diaz, Francis, 4,862,006, Cl. 250-483.100.

Rouillard, Roger, to Les Placements Paro Inc. Apparatus for levelling concrete. 4,861,188, Cl. 404-75.000

Rousseau, Kenneth E., to Harper Truck, Inc. Ratchet apparatus with hand truck assembly. 4,860,606, Cl. 74-157.000.

Rowan, Timothy M.: *See—*
Unsworth, Peter J.; Merrison, John C.; and Rowan, Timothy M., 4,862,052, Cl. 318-757.000.

Rowe, Frederick, to Imperial Chemical Industries PLC. Fluidized bed apparatus for the mixing of fluids and solids. 4,861,562, Cl. 422-143.000.

Roy, Fernand. Louvered blind structure, more particularly for double-glazed sealed window unit. 4,860,492, Cl. 49-84.000.

Royal Technologies USA, Inc.: *See—*
Friedman, Samuel B., 4,861,288, Cl. 439-736.000

Royer, Lee J.: *See—*
Hines, Edward E.; Royer, Lee J.; Jehring, Thomas D.; Faulkenberry, William E.; Posey, Norvan J.; and Richeson, Joseph T., 4,860,602, Cl. 73-865.900.

Ruddell, James N., to National Research Development Corporation Apparatus for thermally treating tape. 4,861,249, Cl. 425-66.000.

Rudolf, Annast; Schuster, Max; Maurer, Dieter; and Rauter, Jurgen, to Zahradfabrik Friedrichshafen AG. Liquid seal for machine parts moving rotationally and axially in relation to one another. 4,861,172, Cl. 384-477.000

Rudy, Ann M., to International Business Machine Corporation. System for simulating memory arrays in a logic simulation machine 4,862,347, Cl. 364-200.000

Ruger, William B., to Sturm, Ruger & Company, Inc. Firearm receiver including scope mount arrangement. 4,860,480, Cl. 42-101.000

Rumble, Richard R.; and . Crushable container and method for weakening the container. 4,860,908, Cl. 220-1.00R.

Rumpke, Joseph M. Tilt truck apparatus. 4,861,110, Cl. 298-2.000.

Runstadler, Peter W., Jr.: *See—*
Dean, Robert C., Jr.; Silver, Frederick H.; Berg, Richard A.; Phillips, Philip G.; and Runstadler, Peter W., Jr., 4,861,714, Cl. 435-68.000

Russel, Matthew J., to Eastman Kodak Company. Copying apparatus and method with editing and production control capability. 4,862,217, Cl. 355-218.000.

Russell, James T., to Optical Recording Corporation. Field correction apparatus. 4,861,144, Cl. 350-412.000

Russell, Milo F., to Waterloo Industries, Inc. Integral slide formed from drawer shell. 4,861,123, Cl. 312-330.100.

Russell, Peter J.: *See—*
Hollingsworth, Michael W.; and Russell, Peter J., 4,861,503, Cl. 252-135.000.

Russoniello, Fabio. Covection cooling probe mounting jacket 4,860,603, Cl. 73-866.500.

Rust, Wayne; and Bonnesen, John S., to Reliance Comm/Tec Corporation. Overvoltage protector for use with data cables. 4,862,311, Cl. 361-91.000.

Rustebakke, Paul: *See—*
Oster, Clark L.; Rustebakke, Paul; and Schiefen, Daniel R., 4,862,131, Cl. 337-48.000.

Ruter, Hans-Werner, to U.S. Philips Corporation. Method of packing small components. 4,860,521, Cl. 53-397.000.

Rutsch, Werner: *See—*
Rembold, Manfred; Sitek, Franciszek: Rutsch, Werner; and Berner, Godwin, 4,861,806, Cl. 522-66.000.

Ruuskanen, Antti: *See—*
Tusa, Esko; Maaatta, Raimo; and Ruuskanen, Antti, 4,861,519, Cl. 252-633.000.

Ruxton, James; and Catranis, John, to Canadian Patents and Development Limited/Societe Canadienne des Brevets et d'Exploitation Limitee . Wideband stripline to microstrip transition. 4,862,120, Cl. 333-34.000.

Ryham, Rolf, to Ahlstromforetagen Svenska AB. Air conditioning process and apparatus therefor. 4,860,548, Cl. 62-94.000

Ryles, Roderick G.: *See—*
Neff, Roger E.; and Ryles, Roderick G., 4,861,499, Cl. 252-8.551.

Ryobi Ltd.: *See—*
Ishii, Koji; and Okuda, Yukito, 4,860,651, Cl. 101-232.000.

Rys, Paul: *See—*
Clausen, Martin; and Rys, Paul, 4,861,920, Cl. 568-741.000.

S.A.I.A.G. S.p.A.: *See—*
Zaccaria, Manrico, 4,861,530, Cl. 264-40.200.

S&C Electric Company: *See—*
Kalvaitis, Arvydas J.; and Ernst, Thomas W., 4,862,324, Cl. 361-390.000.

S. C. Johnson & Son, Inc.: *See—*
Sramek, John A., 4,861,583, Cl. 424-70.000.

S. Smith & Son Pty. Ltd.: *See—*
Whitford, Darryl R., 4,860,779, Cl. 137-1.000.

Saab-Scania AB: *See—*
Jiewertz, Sten, 4,862,093, Cl. 324-464.000.

Saavedra, Jose V.; Hunter, Douglas L.; Sims, Steve A.; Maschmeyer, Donald M.; and Knobel, Thomas M., to Dow Chemical Company, The. Antistatic polyurethane shoe sole compositions. 4,861,805, Cl. 521-105.000.

Sabell, Gary M.: *See—*
Rhoton, William L.; and Sabell, Gary M., 4,860,485, Cl. 43-24.000.

Sabrie, Jean-Louis: *See—*
Laumond, Yves; and Sabrie, Jean-Louis, 4,862,023, Cl. 310-54.000.

Sacco, Angelo. Device for maneuvering of trailers. 4,860,841, Cl. 180-13.000.

Saccomano, Nicholas A.; and Vinick, Frederic J., to Pfizer Inc. Antidepressant N-substituted nicotinamide compounds. 4,861,891, Cl. 546-194.000.

Sachs-Huret S.A.: *See—*
Fey, Rainer; Look, Gunter; and Dumbser, Gerhard, 4,862,395, Cl. 364-561.000.

Sachtler, J. W.; and Lawson, R. J., to UOP. Magnesium-exchanged zeolitic catalyst for isomerization of alkylaromatics. 4,861,740, Cl. 502-66.000.

Sackner, Marvin A., to Respitrace Corp. Noninvasive method for measuring and monitoring intrapleural pressure in newborns. 4,860,766, Cl. 128-748.000.

Sacks, Paul S., to Carrier Corporation. Lanced sine-wave heat exchanger. 4,860,822, Cl. 165-151.000.

Sada, Isao: *See—*
Ohashi, Takehisa; Kan, Kazunori; Ueyama, Noboru; Sada, Isao; Miyama, Akimasa; and Watanabe, Kiyoshi, 4,861,877, Cl. 540-357.000.

Saeki, Keiso; Takashima, Masanobu; and Iwakura, Ken, to Fuji Photo Film Co., Ltd. Recording material. 4,861,748, Cl. 503-208.000.

Safe/Stress, Inc.: *See—*
Edwards, Marysue; and Dubrinsky, Max M., 4,861,021, Cl. 272-69.000.

Safer, Inc.: *See—*
Puritch, George S.; and Condrashoff, Sergi F., 4,861,762, Cl. 514-122.000.

Safetray, Inc.: *See—*
Isslovits, Michael, 4,860,895, Cl. 206-426.000.

Safety First Limited: *See—*
Swift, Thomas R.; and Desty, Dennis H., 4,861,489, Cl. 210-668.000.

Sagami Chemical Research Center: *See—*
Matsumoto, Masakatsu; Fujimoto, Tamotsu; and Ejiri, Emiko, 4,861,917, Cl. 568-347.000.

Sahara, Hiroshi: *See—*
Toda, Haruki; Sahara, Hiroshi; and Ohshima, Shigeo, 4,862,420, Cl. 365-221.000.

Saimoto, Hiroshi: *See—*
Mitsui, Susumu; Kurose, Shigeru; and Saimoto, Hiroshi, 4,861,766, Cl. 514-184.000.

St. Angelo, Stephen; and Lucci, John J., to General Motors Corporation. Device for measuring weatherstrip torsional rigidity. 4,860,588, Cl. 73-794.000.

St. Onge, Hank. Composite anode. 4,861,449, Cl. 204-197.000.

St. Regis Packaging Limited: *See—*
Wonnacott, Roger J., 4,860,944, Cl. 229-52.00B.

Saito, Katushi; Shindou, Yoshio; Murata, Toshimichi; Yamazaki, Fumio; and Shimazu, Takashi, to Nippon Steel Corporation. Method of making a black surface treated steel sheet. 4,861,441, Cl. 204-38.700.

Saito, Mitsuru; Umeda, Kaoru; and Tanimoto, Tetsuyuki, to Minolta Camera Kabushiki Kaisha. Still video adapter. 4,862,293, Cl. 360-35.100.

Saito, Nobuaki: *See—*
Ohyoshi, Hisaaki; and Saito, Nobuaki, 4,861,016, Cl. 271-215.000.

Saito, Ryuichi: *See—*
Watanabe, Atsuo; Nagano, Takahiro; Ikeda, Takahide; Momma, Naohiro; and Saito, Ryuichi, 4,862,240, Cl. 357-42.000.

Saito, Shiro: *See—*
Tanaka, Hajime; and Saito, Shiro, 4,860,626, Cl. 84-236.000.

Saito, Takashi: *See—*
Yoshida, Nobutoshi; Miyke, Nobuyuki; Takagi, Atsushi, Saito, Takashi; Suzuki, Tadashi; Ohki, Naoyuki; Tomosada, Masahiro; Adachi, Hideki; and Takeda, Hiroaki, 4,862,219, Cl. 355-202.000.

Saito, Toshiaki; Ueno, Chizuru; and Sunada, Fumiyuki, to Fuji Oil Company, Limited. Food filled soybean protein casing. 4,861,603, Cl. 426-93.000.

Saitoh, Hiromi: *See—*
Aoki, Ken; Hoshi, Katsuhiko; Satoh, Shigeo; Kakinuma, Mitsuru; Togashi, Shigeru; and Saitoh, Hiromi, 4,860,550, Cl. 62-135.000.

Saitoo, Shuuji; and Tokunaga, Yoshikatu, to Hitachi, Ltd. Cooling system for heating body. 4,862,321, Cl. 361-385.000.

Saitou, Susumu: *See—*
Kubo, Kazuhiko; Saitou, Susumu; Usui, Akira; and Nagai, Hiroyuki, 4,861,941, Cl. 174-35.00R.

Sakabe, Nobuyuki: *See—*
Miyabayashi, Toshio; Sakabe, Nobuyuki; and Zen, Shinichiro, 4,861,851, Cl. 526-255.000.

Sakae, Masahiko: *See—*
Yamamoto, Kiyonori; Sota, Osamu; Sakae, Masahiko; Makiura, Yoshinori; Murakami, Masahiro; and Mitsuya, Toshiyuki, 4,861,017, Cl. 271-258.000.

Sakaguchi, Masakazu: *See—*
Shiraishi, Shuji; Sakaguchi, Masakazu; and Nishihara, Takashi, 4,860,847, Cl. 180-197.000.

Sakaguchi, Minoru: *See—*
Suzuyama, Hiroshi; Suzuki, Yoshirou; and Sakaguchi, Minoru, 4,862,319, Cl. 361-341.000.

Sakaguchi, Seiichiro: *See—*
Koyama, Kazuhito; Sugita, Shigehisa; Sakaguchi, Seiichiro; Seiki, Nobuhiro; and Hanzawa, Asao, 4,861,348, Cl. 48-94.000.

Sakaguchi, Yuji, to Bridgestone Corporation. Flexible tubular wall actuator with end-mounted strain gauge. 4,860,639, Cl. 92-5.00R.

Sakai, Naomichi: *See—*
Kasai, Kiyoshi; Sakai, Naomichi; Oikawa, Tomoyuki; Uchino, Kenji; Tsukidate, Takaaki; Asakura, Hiroshi; Yamamura, Hiroshi; and Nagata, Hiroya, 4,862,029, Cl. 310-311.000.

Sakaki, Hirokazu: *See—*
Matsuo, Mamoru; Okuda, Yutaka; Takizawa, Kazushige; and Sakaki, Hirokazu, 4,861,396, Cl. 148-439.000.

Sakaki, Masaaki: *See—*
Azuma, Kenkoku; and Sakaki, Masaaki, 4,861,620, Cl. 427-53.100.

Sakakibara, Takashi: *See—*
Kobayashi, Toshimitsu; Inagaki, Akio; Kobayashi, Yasuhiro; Mori, Masanori; and Sakakibara, Takashi, 4,861,323, Cl. 474-260.000.

Sakakibara, Yoshiaki: *See—*
Shimada, Haruo; and Sakakibara, Yoshiaki, 4,861,548, Cl. 420-79.000.

Sakama, Mitsunori: *See—*
Yamazaki, Shunpei; Inujima, Takashi; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Sakama, Mitsunori; Miyazaki, Minoru; Koyanagi, Kaoru; and Yamaguchi, Toshiharu, 4,861,143, Cl. 350-350.00S.

Sakamoto, Koji; and Tanzawa, Misao, to Ricoh Company, Ltd. Image forming apparatus having a removable image forming process kit. 4,862,209, Cl. 355-211.000.

Sakamoto, Koji: *See—*
Tanzawa, Misao; Sakamoto, Koji; and Satoh, Mitsuru, 4,862,212, Cl. 355-3.00A.

Sakamoto, Noriaki: *See—*
Tsuji, Kentaroh; Maeda, Shigemi; Yamaguchi, Takeshi; Deguchi, Toshihisa; Sakamoto, Noriaki; and Terashima, Shigeo, 4,862,443, Cl. 369-59.000.

Sakane, Chitose: *See—*
Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; Sakane, Chitose; and Yoshida, Toshihiko, 4,862,472, Cl. 372-45.000.

Sakata, Tsuguhide: *See—*
Takei, Masahiro; Sakata, Tsuguhide; Taguchi, Tomishige; and Kawasaki, Somei, 4,862,250, Cl. 358-12.000.

Sakata, Yoshitsugu: *See—*
Kida, Masaaki; Kitabata, Isako; Kubotsu, Kazuhisa; and Sakata, Yoshitsugu, 4,861,597, Cl. 424-450.000.

Sakimoto, Katsuji: *See—*
Inou, Kiyoharu; and Sakimoto, Katsuji, 4,862,339, Cl. 363-21.000.

Sakuma, Hajime, to Olympus Optical Co., Ltd. Automatic analyzing apparatus for analyzing agglutination patterns. 4,861,554, Cl. 422-65.000.

Sakurai, Michikazu: *See—*
Tajima, Shoji; Kadomatsu, Yasuo; Miyazaki, Yoshio; Sakurai, Michikazu; and Anze, Kimio, 4,860,417, Cl. 29-130.000.

Saliaris, Christos: *See—*
Synofzik, Reinhard; Doherr, Karl-Friedrich; Munscher, Dieter; and Saliaris, Christos, 4,860,660, Cl. 102-501.000.

Samour, Carlos M.; and Daskalakis, Stefanos, to Macro Chem. Corp. Percutaneous absorption enhancers, compositions containing same and method of use. 4,861,764, Cl. 514-177.000.

SamSung Electronkcs Co., Ltd.: *See*—
Jung, Se-Young; and Moon, Tea-Weon, 4,862,290, Cl. 358-335.000.
Samuelsen, Sigvart J.: *See*—
Pashby, Richard P.; Phelps, Douglas W., Jr.; Samuelsen, Sigvart J.; and Ward, William C., 4,862,245, Cl. 357-70.000
Samuelson, Harry V., to Du Pont de Nemours, E. I., and Company. Co-spun filament within a hollow filament and spinneret for production thereof. 4,861,661, Cl. 428-398.000
Sanada, Yasuhiro: *See*—
Morimoto, Takeshi; Sanada, Yasuhiro; Ohashi, Shinichi; and Kimura, Yoshikatsu, 4,862,328, Cl. 361-502.000
Sandbank, Charles P.: *See*—
Wells, Nicholas D.; Knee, Michael J.; and Sandbank, Charles P., 4,862,264, Cl. 358-138.000
Sanden Corporation: *See*—
Nishimura, Kazuo, 4,860,867, Cl. 192-84.00C.
Sander, Rembrandt, to Gebr. Hofmann GmbH & Co. KG. Apparatus for conveying counterweights and retaining springs from storage magazines to insertion heads of a wheel balancing installation. 4,861,214, Cl. 414-225.000
Sanders Associates, Inc.: *See*—
Labaugh, Kenneth D.; and Kuppenheimer, John D., Jr., 4,861,124, Cl. 350-6.500
Sanders, Nicholas A.; and Couch, Richard W., Jr., to Hypertherm, Inc Nozzle shield for a plasma arc torch. 4,861,962, Cl. 219-121.500.
Sanderson-Macleod, Inc.: *See*—
Schrepf, Volker; and Hartel, Franklin J., 4,861,179, Cl. 401-129.000
Sandvik AB: *See*—
Larsson, Kenneth L., 4,861,209, Cl. 411-411.000
Sanfilippo, Pauline: *See*—
Press, Jeffery B.; and Sanfilippo, Pauline, 4,861,897, Cl. 548-217.000
Sanford, Carlton E., to Texas Instruments Incorporated. Pressure switch apparatus having improved longevity and widened tolerence for location of stationary contact. 4,861,953, Cl. 200-83.00P
Sano, Eiichi: *See*—
Ohtani, Junji; Machida, Junji; Sano, Eiichi, and Masuda, Fumio, 4,861,693, Cl. 430-106.600
Sano, Konosuke; Ito, Koichi; Miwa, Kiyoshi; and Nakamori, Shigeru, to Ajinomoto Company, Inc. Coryneform bacteria carrying recombinant plasmids and their use in the fermentative production of L-lysine. 4,861,722, Cl. 435-252.320.
Sano, Yoshito: *See*—
Nakano, Akira; Higashioka, Hiroshi; Nomura, Masaki; Kawahara, Yoshiharu; Yamashita, Ko; Sano, Yoshito; and Kase, Minoru, 4,861,612, Cl. 426-607.000
Sans, Claude A.: *See*—
Meyer, Stephen F.; and Sans, Claude A., 4,861,680, Cl. 428-623.000
Sanshin Kogyo Kabushiki Kaisha: *See*—
Koike, Takashi, 4,861,291, Cl. 440-1.000
Santa Clara Plastics: *See*—
Spearow, Ralph G., 4,860,643, Cl. 98-115.300
Santhouse, Daniel: *See*—
Reeves, Kevin E.; and Santhouse, Daniel, 4,860,775, Cl. 132-118.000
Sanwa Diamond Industrial Co., Ltd.: *See*—
Matsuda, Yusaku, 4,860,721, Cl. 125-15.000
Sanwa Kagaku Kenkyusho Co., Ltd.: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,861,792, Cl. 514-389.000
Sanyo Chemical Industries, Ltd.: *See*—
Yasuda, Kenichi, 4,861,811, Cl. 523-501.000
Sanyo Electric Co., Ltd.: *See*—
Aoki, Ken; Hoshi, Katsuhiko; Satoh, Shigeo; Kakinuma, Mitsuru; Togashi, Shigeru; and Saitoh, Hiromi, 4,860,550, Cl. 62-135.000
Ashida, Yasuhiro; and Yokota, Shigeki, 4,862,241, Cl. 357-45.000.
Mihara, Yoshikazu; and Nakashima, Hiroshi, 4,862,294, Cl. 360-35.100
Miura, Norio, 4,860,433, Cl. 29-605.000
Saotome, Shigeru; Kimura, Tsutomu; and Nakajima, Nobuyoshi, to Fuji Photo Film Co., Ltd. Method of measuring after-glow of stimulable phosphor sheet, and method of adjusting radiation image read-out conditions. 4,861,994, Cl. 250-327.200
Sarasota Automation Limited: *See*—
Duley, Richard K., 4,862,162, Cl. 340-938.000.
Sargent, Richard G. Tool for eliminating air voids underneath a membrane seam and method therefor. 4,861,400, Cl. 156-71.000
Sarges, Reinhard: *See*—
Howard, Harry R., Jr.; and Sarges, Reinhard, 4,861,880, Cl. 544-144.000
Sartowski, Zbigniew: *See*—
Bublik, Eugene P.; and Sartowski, Zbigniew, 4,861,349, Cl. 51-293.000
Sasada, Shigeru; Nagata, Shinichi; Hirosawa, Makoto; and Kishida, Yoshihiro, to Dainippon Screen Mfg. Co., Ltd. Optical system for flying-spot scanning system. 4,861,983, Cl. 250-235.000
Sasaki, Hiroshi: *See*—
Miyamoto, Norifumi; Sato, Yoshio; Tsuboi, Nobuyoshi; Shimada, Satoshi; Sasaki, Hiroshi; Koyanagi, Hiroaki; and Minemura, Hiroyuki, 4,862,440, Cl. 369-45.000
Sasaki, Katsumi: *See*—
Miyasaka, Matsuho; Ichikawa, Katsuhiro; Sasaki, Katsumi; Mizobuchi, Syotaro; and Ogure, Naoaki, 4,861,395, Cl 148-321.000
Sasaki, Masaru: *See*—
Machida, Tsutomu; Mochizuki, Toshiyasu; and Sasaki, Masaru, 4,862,330, Cl 362-61.000
Sasaki, Mashiko, to Asahi Kogaku Kogyo K.K. Disk setting mechanism for a disk player. 4,862,445, Cl. 369-75.200
Sasaki, Morimasa: *See*—
Tanaka, Kimio; Sasaki, Morimasa; and Ikebe, Masaru, 4,862,448, Cl. 369-291.000
Sasaki, Saburo; Himuro, Keiji; and Koshiishi, Shinichiro, to Ricoh Company, Ltd. Lens driving and shutter opening and closing device for a camera. 4,862,203, Cl. 354-400.000
Sasaki, Shinichi: *See*—
Nomura, Akihiro; Namekata, Kiyokazu; Kurata, Mitsuru; Niizawa, Takuji; Ebata, Tokihide; and Sasaki, Shinichi, 4,862,215, Cl. 355-309.000
Sasaki, Takao: *See*—
Kawamura, Hideaki; and Sasaki, Takao, 4,862,380, Cl. 364-474.110
Sasaki, Takashi: *See*—
Kaku, Nobuyuki; Ogiro, Kenji; Osawa, Atsuo; Sasaki, Takashi; and Takita, Kouhei, 4,862,300, Cl. 360-85.000
Sasamura, Ross S.; and Jewell, John H., II, to Paccar Inc. Door alignment assembly and method. 4,861,099, Cl. 296-202.000
Satake, Tetsuo, to Matsushita Electric Industrial Co., Ltd. Method for producing magnetic recording medium. 4,861,619, Cl. 427-48.000
Satake, Toshimi; Nagai, Tomoaki; and Fujimura, Fumio, to Jujo Paper Co., Ltd. Heat-sensitive recording material. 4,861,749, Cl 503-211.000
Sato, Akira: *See*—
Numazawa, Akio, Sato, Akira; and Ushijima, Fumihiro, 4,860,607, Cl. 74-330.000
Sato, Hirohide: *See*—
Maruyama, Toshinori; Sato, Hirohide; and Matsuhashi, Toshiaki, 4,862,055, Cl. 322-8.000
Sato, Kazuhiko; Nishiura, Junji; and Takahashi, Keiichi, to Advantest Corporation. High speed circuit testing apparatus having plural test conditions. 4,862,071, Cl 324-73.00R
Sato, Motoo: *See*—
Shirouzu, Tatsuji; Takahashi, Tatsuo; Sato, Motoo; and Mizuno, Satoshi, 4,862,313, Cl. 361-102.000
Sato, Takashi; Yamauchi, Kazuki; and Ishibashi, Norio, to Casio Computer Co., Ltd. Manual sweeping apparatus. 4,862,281, Cl. 358-400.000
Sato, Takeo; Araki, Nobuhiro; Kawata, Koichi; Nomura, Noboru; Ueno, Atushi; and Yoshida, Shotaro, to Matsushita Electric Industrial Co., Inc. Projection optical system for use in precise copy. 4,861,148, Cl. 350-505.000
Sato, Yasuhisa: *See*—
Tsuboi, Takayuki; Nakazawa, Isao; Harunari, Yoshihiro; Sato, Yasuhisa; and Yamada, Yasuyuki, 4,862,202, Cl. 354-195.120.
Sato, Yoshiaki; and Ishikawa, Tazuru, to Junkosha Co., Ltd. Oil leakage sensor element. 4,862,066, Cl. 324-65.00P
Sato, Yoshio: *See*—
Miyamoto, Norifumi; Sato, Yoshio; Tsuboi, Nobuyoshi; Shimada, Satoshi; Sasaki, Hiroshi; Koyanagi, Hiroaki; and Minemura, Hiroyuki, 4,862,440, Cl. 369-45.000
Sato, Yukio: *See*—
Yokoyama, Katsunori; Sato, Yukio; and Shimai, Shunzo, 4,862,030, Cl. 310-332.000
Satoh, Mitsuru: *See*—
Tanzawa, Misao; Sakamoto, Koji; and Satoh, Mitsuru, 4,862,212, Cl. 355-3.00A
Satoh, Seiki, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Apparatus for connecting a handle and a locking device on automotive doors. 4,861,081, Cl. 292-336.300
Satoh, Shigeo: *See*—
Aoki, Ken, Hoshi, Katsuhiko; Satoh, Shigeo; Kakinuma, Mitsuru; Togashi, Shigeru; and Saitoh, Hiromi, 4,860,550, Cl. 62-135.000.
Satoh, Shinichi; and Fujioka, Kazutoshi, to Shin-Etsu Chemical Co., Ltd. Organosilicon compound. 4,861,908, Cl. 556-420.000.
Satoh, Susumu; Matsuoka, Saiji; Obara, Takashi; Tsunoyama, Kozo; and Irie, Toshio, to Kawasaki Steel Corporation. Method of manufacturing formable as-rolled thin steel sheets. 4,861,390, Cl. 148-12.00R.
Satzinger, Gerhard: *See*—
Weiershausen, Ute; Ganser, Volker; and Satzinger, Gerhard, 4,861,770, Cl. 514-211.000
Sauder, James W.: *See*—
Priola, James W.; and Sauder, James W., 4,861,082, Cl. 292-346.000
Sauermann, Heinz: *See*—
Zeile, Henrich; and Sauermann, Heinz, 4,862,248, Cl. 357-79.000
Saussier, Daniel: *See*—
Cretin, Jacques, Therond, Jean-Francois; and Saussier, Daniel, 4,862,425, Cl. 367-33.000
Savas, Keith G.: *See*—
Bishop, Jerry W., Savas, Keith G.; and Wilson, Wendell G., 4,860,555, Cl. 62-376.000
Savin Corporation: *See*—
Simms, Robert M.; and Gibson, George A., 4,860,924, Cl. 222-56.000
Sawai, Kiichi: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki, Sawai,

Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,861,792, Cl. 514-389.000.
Saxton, Brian W.: *See*—
Barringer, Eric A.; Lieberman, Sheldon I.; Schmidt, Mark S.; Hodge, James D.; Waack, Richard; Kelley, Donald J.; Saxton, Brian W.; and Gruber, William C., 4,861,646, Cl. 428-210.000.
Saxton, Robert J.: *See*—
Fellmann, Jere D.; Saxton, Robert J.; and Tung, Paul, 4,861,921, Cl. 568-772.000.
Scandrett, John H.: *See*—
Morrill, Vaughan, Jr.; Scandrett, John H.; and Hudson, David K., 4,860,437, Cl. 29-623.000.
Scaramucci, John P. Swing check valve with hinge pin insert. 4,860,789, Cl. 137-515.700.
Scaramucci, John P. Swing check valve disc. 4,860,790, Cl. 137-527.000.
Scevola, Mario E.: *See*—
Springolo, Vanna; Coppi, Germano; and Scevola, Mario E., 4,861,599, Cl. 424-494.000.
Schachameyer, Steven R.: *See*—
Halmstad, Terrence R.; and Schachameyer, Steven R., 4,861,290, Cl. 439-810.000.
Schachter, Howard E.: *See*—
Gaudreau, Paul D.; Hickling, J. Gordon; and Schachter, Howard E., 4,860,460, Cl. 34-26.000.
Schaffner, Hanspeter: *See*—
Groebli, Werner; Hegelbach, Hugo; and Schaffner, Hanspeter, 4,861,529, Cl. 264-40.100.
Schauder, Colin D., to Westinghouse Electric Corp. Tacho-less vector control adaptive system for motor drive. 4,862,054, Cl. 318-800.000.
Schaudt Maschinenbau GmbH: *See*—
Belthle, Heinz, 4,860,501, Cl. 51-288.000.
Scheffhaler, Alois, to Himolla Polstermobelwerk GmbH. Convertible chair for either sitting or lying. 4,860,393, Cl. 5-21.000.
Scheiterlein, Ernst, to Czaja, Anthony J., a part interest. Magnetic hold-down device for crossbow. 4,860,719, Cl. 124-25.000.
Schelhorn, Fritz: *See*—
Knaul, Per; Schelhorn, Fritz; and Witte, Roland, 4,860,883, Cl. 198-495.000.
Schering Corporation: *See*—
Hegemann, Manfred K.; and Drozd, Edward J., Jr., 4,860,738, Cl. 128-200.220.
Scherping Systems, Inc.: *See*—
Jay, Jeffrey L., 4,861,044, Cl. 277-24.000.
Schiefen, Daniel R.: *See*—
Oster, Clark L.; Rustebakke, Paul; and Schiefen, Daniel R., 4,862,131, Cl. 337-48.000.
Schiessl, Alois: *See*—
Steinicke, Wolfgang; Schiessl, Alois; and Busel, Horst, 4,860,657, Cl. 102-334.000.
Schiller, Claude, to U.S. Philips Corporation. Device for measuring the orientation of bulk monocrystalline materials using the Laue method. 4,862,488, Cl. 378-81.000.
Schilling, Peter, to Westvaco Corporation. Cationic aqueous bituminous emulsion-aggregate slurries. 4,861,377, Cl. 106-277.000.
Schimanek, Karl. Expandable ring for sealing an envelope against the bead of a tire to be retreaded. 4,861,247, Cl. 425-11.000.
Schipper, Paul H.: *See*—
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,861,741, Cl. 502-67.000.
Schirmer, Robert M., to Phillips Petroleum Company. Method and apparatus for the recovery of hydrocarbons. 4,861,263, Cl. 431-158.000.
Schlafer, Ludwig; Springer, Hartmut; and Hahnle, Reinhard, to Hoechst Aktiengesellschaft. Reactive water-soluble azo dyes containing carboxy- or carbamoyl-pydridinium groups for dyeing textiles. 4,861,344, Cl. 8-532.000.
Schlager, Harald: *See*—
Normann, Norbert; Gross, Erwin; and Schlager, Harald, 4,862,303, Cl. 360-110.000.
Schleicher, Hans: *See*—
Goldhammer, Albert; Schleicher, Hans; Stangenberg, Hartmut; and Gasteier, Rolf, 4,860,963, Cl. 241-236.000.
Schlereth, Armin: *See*—
Olschewski, Armin; Schlereth, Armin; and Hoch, Paul-Gerhard, 4,860,605, Cl. 74-99.00R.
Schlienger, Max P., to Retech, Inc. Melting retort and method of melting materials. 4,861,001, Cl. 266-242.000.
Schliesing, John A.; and Edenborough, Kevin L., to United States of America, National Aeronautics and Space Administration. Smart tunnel - docking mechanism. 4,860,975, Cl. 244-161.000.
Schlosser, Erich J.; and Leja, Andrzej, to Weber-Stephen Products Co. Gas burner assembly. 4,860,724, Cl. 126-38.000.
Schlumberger Industries: *See*—
Charbonnier, Roger, 4,862,110, Cl. 331 70.000.
Schlumberger Technologies, Inc.: *See*—
Brune, William A.; and Grimes, Scott D., 4,862,067, Cl. 324-73.00R.
Schlumberger Technology Corporation: *See*—
Vannier, Daniel; and Tromelin, Jacques, 4,862,090, Cl. 324-367.000.
Zimmerman, Thomas H.; Pop, Julian J.; and Perkins, Joseph L., 4,860,581, Cl. 73-155.000.
Schmalbach-Lubeca AG: *See*—
Komischke, Karl-Heinz, 4,860,934, Cl. 222-534.000.
Schmidt, Albert L.: *See*—
Sherwin, Gary W.; Schmidt, Albert L.; and Hanes, Lewis F., 4,861,154, Cl. 351-205.000.
Schmidt, Alfred C.: *See*—
Axelrod, Barry H.; Durst, Robert T., Jr.; Hunter, Kevin D.; and Schmidt, Alfred C., 4,862,386, Cl. 364-518.000.
Schmidt, Helmbrecht, to Hubner Gummi- und Kunststoff GmbH. Method for producing a bellows structure. 4,860,665, Cl. 105-18.000.
Schmidt, Mark S.: *See*—
Barringer, Eric A.; Lieberman, Sheldon I.; Schmidt, Mark S.; Hodge, James D.; Waack, Richard; Kelley, Donald J.; Saxton, Brian W.; and Gruber, William C., 4,861,646, Cl. 428-210.000.
Schmidt, Peter, to Gummiwerke Kraiburg Elastik Beteiligungs GmbH & Co. Elastic plate for level rail crossings. 4,860,952, Cl. 238-8.000.
Schmidt, Samuel: *See*—
Stingle, Frederick W.; and Schmidt, Samuel, 4,862,024, Cl. 310-64.000.
Schmidt, William L.; Olson, Richard E.; and Bailey, Douglas A., to Digital Equipment Corporation. Rack for circuit boards of an electrical system. 4,862,320, Cl. 361-383.000.
Schmilovitch, Zeev: *See*—
Zaltzman, Arthur; Schmilovitch, Zeev; Verma, Brahm P.; and Hoffman, Aharon, 4,861,464, Cl. 209-474.000.
Schminke, Kevin L. Cardiovascular conditioning and therapeutic system. 4,860,763, Cl. 128-707.000.
Schmits, Heinz-Herbert: *See*—
Durr, Manfred; Unland, Georg; Driemeier, Gunter; Krutzner, Karl; Schmits, Heinz-Herbert; von Seebach, Michael; Heinemann, Otto; Rother, Wolfgang; and Dreyer, Dieter, 4,861,265, Cl. 432-103.000.
Schmitt, Edgar, to Robert Bosch GmbH. Brake valve with brake booster. 4,860,637, Cl. 91-376.00R.
Schmitt, Edgar: *See*—
Bertling, Hannes; Mergenthaler, Robert; Schmitt, Edgar; and Siegel, Heinz, 4,860,636, Cl. 91-376.00R.
Schmitt, Gunter K.: *See*—
Kuhner, Rudolf; Schmitt, Gunter K.; and Stab, Rudolf, 4,861,326, Cl. 493-359.000.
Schmitt, Kenneth J.: *See*—
Eastlund, Bernard J.; Schmitt, Kenneth J.; and Anderson, Douglas C., 4,861,074, Cl. 285-53.000.
Schmitz, Roger, to Societe Generale Des Eaux Minerales de Vittel. Welding and cutting tongs for a film of synthetic material. 4,861,413, Cl. 156-515.000.
Schneider, Georg; and Bausch, Markus, to Endress u. Hauser GmbH u. Co. Arrangement for processing the output signals of a resistance bridge. 4,862,382, Cl. 364-481.000.
Schneider, Irma: *See*—
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Schneider, Jorg: *See*—
Bergter, Friedrich; Bocker, Harald; Bormann, Ernst-Joachim; Forberg, Wolfgang; Fricke, Heinz; Grafe, Udo; Grosse, Hans-Helmut; Heller, Ingeborg; Hilliger, Matthias; Junne, Wolf; Linde, Hellmut; Menner, Michael; Menzel, Klaus-Dieter; Muller, Peter-Jurger; Plonka, Gunter; Pohl, Hans D.; Schneider, Jorg; and Thrum, Heinz, 4,861,715, Cl. 435-70.000.
Schneider, Lothar; and Schneider, Irma, to Klocke, Hartmut. Animal bait. 4,861,586, Cl. 424-84.000.
Schoeneberger, Carl F.: *See*—
Campbell, John G.; Schoeneberger, Carl F.; Bundens, Allan B.; Fogle, Richard M.; and Lemburg, John R., 4,862,268, Cl. 358-141.000.
Schoenheit, Joseph W.; and Weisensee, Stephen E., to Pacific Fence and Wire Company. Slat fence with retainer wire construction. 4,860,997, Cl. 256-34.000.
Schoessow, Glen J.; and Wethington, John A., Jr. Process for treating radioactive material to make it safe for disposal. 4,861,444, Cl. 204-130.000.
Schofield, John D.: *See*—
Campbell, Frederick; Geary, John M.; and Schofield, John D., 4,861,380, Cl. 106-504.000.
Scholkens, Bernward: *See*—
Breipohl, Gerhard; Knolle, Jochen; Konig, Wolfgang; and Scholkens, Bernward, 4,861,755, Cl. 514-11.000.
Schomers, Josef. to ANT Nachrichtentechnik GmbH. Three-stage coupling arrangement. 4,862,161, Cl. 340-825.800.
Schott, David B.; Kump, Danny J.; and Conway, Gerald A., to Gerald Conway & Company. Display and method of forming. 4,860,905, Cl. 211-59.100.
Schreder, Felix: *See*—
Kicherer, Robert; Schreder, Felix; and Reif, Stefan, 4,861,969, Cl. 219-458.000.
Schreiber, Alain B.: *See*—
Suh, John T.; Pendelton, Robert G.; Pendley, Charles E., II; Yu, Kin T.; Menard, Paul R.; and Schreiber, Alain B., 4,861,795, Cl. 514-510.000.
Schrepf, Volker; and Hartel, Franklin J., to Henlopen Manufacturing Co., Inc.; and Sanderson-Macleod, Inc. Mascara brush. 4,861,179, Cl. 401-129.000.
Schucker, Robert C., to Exxon Research and Engineering Company. Thin film composite membrane prepared by suspension deposition. 4,861,628, Cl. 427-245.000.
Schukei, Glen F.: *See*—
Weisel, Eric M.; and Schukei, Glen F., 4,860,919, Cl. 220-240.000.
Schult, Leslie H.; and Tekautz, Charles J., Jr., to Tartan Transportation Systems, Inc. Air suspension apparatus. 4,861,060, Cl. 280-439.000.

Schultz, Klaus-Dieter; Meyer, Rolf-Volker; Fahnler, Friedrich; Dhein, Rolf; and Michael, Dietrich, to Bayer Akteingesellschaft. Hydrophobicized, easily-flowing thermoplastic polyamide containing monoepoxide. 4,861,815, Cl. 524-114.000

Schulz, Anthony A.: *See—*
Powell, Thomas W., Jr.; Schulz, Anthony A.; and Beall, Gary W., 4,861,584, Cl. 424-79.000.

Schumacher, Gunter; Buckel, Peter; and Beaucamp, Klaus, to Boehringer Mannheim GmbH. Microorganisms and plasmids for the constitutive formation of creatinamidinohydrolase and processes for the production thereof. 4,861,717, Cl. 435-172.300.

Schumacher, Larry L. Three degree of freedom micro-gravity simulator. 4,860,600, Cl. 73-865.600.

Schuster, Max: *See—*
Rudolf, Annast; Schuster, Max; Maurer, Dieter; and Rauter, Jurgen, 4,861,172, Cl. 384-477.000.

Schuweiler, Alan R.: *See—*
Ernst, G. D.; and Schuweiler, Alan R., 4,861,825, Cl. 524-839.000.

Schwartz, David C.: *See—*
Cantor, Charles R.; and Schwartz, David C., 4,861,448, Cl. 204-182.800.

Schwartz, Wolfgang; Warmuth, Otto L.; and Grzyb, Claus D., to U.S. Philips Corporation. Digital circuit for suppressing fast signal variations. 4,862,404, Cl. 364-733.000.

Schwarz, Manfred, to Gebruder Lodige Maschinenbaugesellschaft mbH. Mixing apparatus containing a mixer and a pulveriser. 4,860,960, Cl. 241-89.300.

Schweizersche Isola-Werke: *See—*
Altermatt, Ernst; and Heim, Peter, 4,861,947, Cl. 174-113.00C.

Schwenner, Eckhard; Stegelmeier, Hartmut; Kazda, Stanislav; and Knorr, Andreas, to Bayer Aktiengesellschaft. Certain 2h-benzo[a]-quinolizin-2-yl-aminoalkyl esters of 1,4-dihydro-3,5-pyridinedicarboxylates useful for treating circulation disorders. 4,861,782, Cl. 514-294.000.

Sciara, Anthony, to First Lady Coiffures Ltd. Ear piercing apparatus. 4,860,747, Cl. 128-330.000.

SCM Metal Products, Inc.: *See—*
Klar, Erhard; Svilar, Mark; and Berry, David F., 4,861,373, Cl. 75-244.000.

Scollard, Cynthia M., to Boeing Company, The. Aerospace structure having a cast-in-place noncompressible void filler. 4,861,643, Cl. 428-162.000.

Scoman, Henry: *See—*
Chauvier, Jean-Marie; Moussiaux, Leon; and Scoman, Henry, 4,861,506, Cl. 252-95.000.

Scott, Bentley N.; and Yang, Y. Sam, to Atlantic Richfield Company. Microwave apparatus for measuring fluid mixtures. 4,862,060, Cl. 324-58.50A.

Scott, David W.: *See—*
Bishop, Arthur E.; and Scott, David W., 4,860,414, Cl. 29-38.00C.

Scott, Paul F.: *See—*
Baker, Russ J.; Hansen, Robert A.; Scott, Paul F.; and Vozenilek, Edward F., 4,862,062, Cl. 324-61.00R.

Sea Ray Boats, Inc.: *See—*
Ousley, Frank B., II, 4,861,294, Cl. 440-83.000

Seaborne, Jonathan, to General Mills, Inc. Instant traditional oatmeal and method of preparation. 4,861,614, Cl. 426-619.000.

Sears, Jerome: *See—*
Parfomak, Walter; Sears, Jerome; and Kluss, Walter J., 4,862,050, Cl. 318-689.000.

Sears, Roebuck & Co.: *See—*
Connealy, Martin L., 4,860,455, Cl. 30-404.000.

Seb S.A.: *See—*
Louison, Bernard; and Hennuy, Jean, 4,860,434, Cl. 29-611.000.

Sefton, Verner B.; Fox, Robert; and Lorenz, William P., to Hall Chemical Company, The. Method of separately recovering metal values of petroleum refining catalyst. 4,861,565, Cl. 423-55.000.

Seibert, Gerhard: *See—*
Zeeck, Axel; Breiding-Mack, Sabine; Grabley, Susanne; Voelskow, Hartmut; and Seibert, Gerhard, 4,861,775, Cl. 514-229.800.
Zeeck, Axel; Breiding-Mack, Sabine; Grabley, Susanne; Voelskow, Hartmut; and Seibert, Gerhard, 4,861,796, Cl. 514-535.000.

Seiki, Nobuhiro: *See—*
Koyama, Kazuhito; Sugita, Shigehisa; Sakaguchi, Seiichiro; Seiki, Nobuhiro; and Hanzawa, Asao, 4,861,348, Cl. 48-94.000.

Seiko Epson Corporation: *See—*
Hiraga, Imao; Shimura, Noriaki; Okakura, Yojiro; Kubota, Masaru; and Takashi, Osamu, 4,862,432, Cl. 368-88.000.
Morozumi, Shinji, 4,862,237, Cl. 357-30.000.
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Seikosha Co., Ltd.: *See—*
Tanaka, Sakae; Yamaoka, Tadahiko; Takahashi, Shingo; and Takahashi, Tomoaki, 4,861,142, Cl. 350-345.000.

Seiler, Erhard: *See—*
Kock, Hans-Jakob; Hisgen, Bernd; Portugall, Michael; Seiler, Erhard; and Blinne, Gerd, 4,861,858, Cl. 528-193.000.

Seki, Shuzo: *See—*
Teteishi, Iwao; Ogura, Yoshiyuki; Hashimoto, Takeshi; Ritou, Tuguyoshi; Kajiyama, Katsufumi; Shimizu, Fumiaki; Tanaka, Kenji; Aibara, Yutaka; Kataoka, Hiroaki; Nakai, Katsuya; Yoshikawa, Takashi; Kanamori, Masaaki; Miyajima, Masao; Seki, Shuzo; and Takahashi, Sadanobu, 4,860,523, Cl. 53-512.000.

Sekiguchi, Kazuya: *See—*
Sugisawa, Ko; Sekiguchi, Kazuya; Tuji, Kiyoaki; and Ono, Akinobu, 4,861,559, Cl. 422-110.000.

Sekine, Ichiro: *See—*
Yoshida, Takeshi; Takizawa, Yoshio; and Sekine, Ichiro, 4,861,550, Cl. 420-460.000.

Sekira, Peter: *See—*
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Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Nakachi, Takeshi; Hata, Akio; and Watanabe, Yoshihisa, 4,861,683, Cl. 428-694.000.

Sekita, Ryuichi: *See—*
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Sekiya, Makoto, to Minolta Camera Kabushiki Kaisha. Printing apparatus with plural density control. 4,862,288, Cl. 358-298.000.

Sekizawa, Kazuhiko: *See—*
Miyake, Takanori; Sekizawa, Kazuhiko; Hironaka, Toshio; and Tsutsumi, Yukihiro, 4,861,929, Cl. 570-209.000.

Selbrede, Martin G. Microcomputer bus assembly. 4,862,400, Cl. 364-708.000.

Selin, Johan-Fredrik: *See—*
Eklund, Vidar; Fors, Jan; Mandell, Leo; Meinander, Kerstin; Selin, Johan-Fredrik; and Turunen, Olli T., 4,861,874, Cl. 536-32.000

Seltzer, Raymond; and Winter, Roland A. E., to Ciba-Geigy Corporation. 5-Aralkyl substituted 2h-benzotriazoles in stabilized compositions. 4,861,813, Cl. 524-91.000.

Semi-Bulk Systems, Inc.: *See—*
Handleman, Avrom R., 4,860,959, Cl. 241-39.000.

Semiconductor Energy Laboratory Co., Ltd.: *See—*
Sinohara, Hisato, 4,861,964, Cl. 219-121.680.
Yamazaki, Shunpei; Inujima, Takashi; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Sakama, Mitsunori; Miyazaki, Minoru; Koyanagi, Kaoru; and Yamaguchi, Toshiharu, 4,861,143, Cl. 350-350.00S.
Yamazaki, Shunpei; and Inujima, Takashi, 4,861,622, Cl. 427-54.100.

Seneau, Bernard, to General Foods Corporation. Preproofed, partially-baked and frozen, crusty bread and method of making same. 4,861,601, Cl. 426-19.000.

Seno, Kaoru: *See—*
Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, 4,861,913, Cl. 562-427.000.

Sentoku, Hideshi, to Laurel Bank Machine Co., Ltd. Coin handling apparatus. 4,861,312, Cl. 453-7.000.

Servais, Michel, to SOLVAY & Cie (Societe Anonyme). Stabilized 1,1,1-trichloroethane compositions. 4,861,926, Cl. 570-110.000.

Service Tool Die & Mfg. Company: *See—*
Herdzina, Frank J., 4,860,569, Cl. 72-361.000.

Seto, Raymond A.; and Soubliere, Marc P., to Telequest Systems Corporation. Hybrid alphanumeric telephone directory. 4,862,497, Cl. 379-355.000.

Severin, William A.: *See—*
Hochschild, James R.; and Severin, William A., 4,862,121, Cl. 333-173.000.

Seymour, Shaun A., to Ford New Holland, Inc. Reciprocating conditioning rolls. 4,860,528, Cl. 56-16.400.

Shackelford, Carl L.; and Rainin, Kenneth, to Rainin Instrument Co., Inc. Apparatus for facilitating compression of packing material in a liquid chromatography column. 4,861,473, Cl. 210-198.200.

Shaffer, Jeremiah J.: *See—*
Dziubakowski, Donald J.; Keyes, Marion A., IV; and Shaffer, Jeremiah J., 4,861,233, Cl. 417-201.000.

Shah, Imran A.; and Bhattacharya, Arup K., to North American Philips Corporation. Fast multiplierless architecture for general purpose VLSI FIR digital filters with minimized hardware. 4,862,402, Cl. 364-724.120.

Shannon, John M., to U.S. Philips Corporation. Transistors. 4,862,238, Cl. 357-34.000.

Shannon, John M.: *See—*
Mundy, Stephen J.; and Shannon, John M., 4,862,229, Cl. 357-15.000.

Shapiro, Jeffrey H.: *See—*
De Santo, Robert S.; and Shapiro, Jeffrey H., 4,860,690, Cl. 119-3.000.

Sharik, Clyde L.; and Berejka, Anthony J., to E. R. Squibb & Sons, Inc. Electrically conductive adhesive materials. 4,860,754, Cl. 128-640.000.

Sharma, Jagdish P.: *See—*
Brar, Amarjit S.; Sharma, Jagdish P.; and Kaja, Suryanarayana, 4,860,572, Cl. 73-12.000.

Sharp Kabushiki Kaisha: *See—*
Koden, Mitsuhiro, 4,862,234, Cl. 357-23.700.
Nakatani, Hiroshi; Kawaguchi, Hisao; and Nakabu, Shigeo, 4,862,153, Cl. 340-719.000.
Suyama, Takahiro; Takahashi, Kosei; Kondo, Masafumi; and Hayakawa, Toshiro, 4,862,470, Cl. 372-45.000.
Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; Sakane, Chitose; and Yoshida, Toshihiko, 4,862,472, Cl. 372-45.000
Teteishi, Iwao; Ogura, Yoshiyuki; Hashimoto, Takeshi; Ritou, Tuguyoshi; Kajiyama, Katsufumi; Shimizu, Fumiaki; Tanaka, Kenji; Aibara, Yutaka; Kataoka, Hiroaki; Nakai, Katsuya; Yoshikawa, Takashi; Kanamori, Masaaki; Miyajima, Masao; Seki, Shuzo; and Takahashi, Sadanobu, 4,860,523, Cl. 53-512.000.
Tsuji, Kentaroh; Maeda, Shigemi; Yamaguchi, Takeshi; Deguchi, Toshihisa; Sakamoto, Noriaki; and Terashima, Shigeo, 4,862,443, Cl. 369-59.000.

Yano, Seiki; and Hijikata, Toshiki, 4,862,473, Cl. 372-50.000.

Shaw, Bernard L.: *See—*
Miller, David J.; Bryant, David R.; Billig, Ernst; and Shaw, Bernard L., 4,861,918, Cl. 568-454.000.

Sheehan, Robert K.; and Smester, Paul R., to Corecon Corporation. Electrical apparatus to be directly coupled to sheathed cable and to wall structures. 4,861,279, Cl. 439-412.000.

Sheesley, Wilmer L.: *See—*
Pauza, William V.; and Sheesley, Wilmer L., 4,861,284, Cl. 439-580.000.

Sheffler, Keith D.: *See—*
Vine, Raymond W.; Sheffler, Keith D.; and Bevan, Charles E., 4,861,618, Cl. 427-34.000.

Shekerjian, Brian H.; and Price, J. B., to Spectrum CVD, Inc. Vacuum load lock. 4,861,563, Cl. 422-186.050.

Shekhawat, Sampat F.: *See—*
Dhyanchand, John J.; Shekhawat, Sampat F.; and Nguyen, Vietson M., 4,862,342, Cl. 363-40.000.

Shell Oil Company: *See—*
Blytas, George C.; and Knott, Robert F., 4,861,447, Cl. 204-181.800.
Dewhirst, Kenneth C., 4,861,810, Cl. 523-445.000.
Drent, Eit; and Van Gogh, Johan, 4,861,912, Cl. 560-204.000.
George, Eric R., 4,861,675, Cl. 428-501.000.
Kemp, Richard A., 4,861,460, Cl. 208-216.0PP.
Madgavkar, Ajay M., 4,861,723, Cl. 435-262.000.
Udding, Anne C., 4,861,843, Cl. 525-373.000.
Van Breen, Adriaan W.; and Gillemans, Johannes C. M., 4,861,428, Cl. 162-168.100.

Shen, Zhi-Yuan. Matched absorptive end choke for microwave applicators. 4,861,955, Cl. 219-10.55D.

Sheppard, E. Lamar: *See—*
Wing, J. Keith; Sheppard, E. Lamar; and Willis, William L., 4,862,486, Cl. 377-16.000.

Shepps, Frederick J.: *See—*
Oles, Paul M.; and Shepps, Frederick J., 4,861,542, Cl. 264-542.000.

Sherling, Jon L.: *See—*
Harris, John W.; Sherling, Jon L.; and Puschak, Carl N., 4,862,072, Cl. 324-73.00R.

Sherwin, Gary W.; Schmidt, Albert L.; and Hanes, Lewis F., to Westinghouse Electric Corp. Automated visual assessment system with steady state visual evoked potential stimulator and product detector. 4,861,154, Cl. 351-205.000.

Sherwin-Williams Company, The: *See—*
Petrie, Brian C.; Druetzler, Thomas W.; and Harris, Rodney M., 4,861,853, Cl. 526-302.000.

Sherwood Medical Company: *See—*
George, Robert D., 4,861,337, Cl. 604-96.000.

Shibao, Kiyotada: *See—*
Hirabayashi, Michio; Koizumi, Tosio; and Shibao, Kiyotada, 4,860,436, Cl. 29-622.000.

Shibata, Hiroki; Toda, Atsushi; Takahashi, Kazuki; and Wada, Kiyoshi, to Koito Manufacturing Co., Ltd. Apparatus for determining a rotation center of a rotating body. 4,860,601, Cl. 73-865.800.

Shibata, Kiyotaka; and Morimoto, Kiyoshi, to Mita Industrial Co., Ltd. Mechanism for preventing the feeding of more than one sheet of paper at one time. 4,861,013, Cl. 271-119.000.

Shibata, Tomoatsu, to Fanuc Ltd. Position control method in which a cartesian point is transformed through two cartesian coordinate systems. 4,862,381, Cl. 364-474.360.

Shibata, Yoichi: *See—*
Naruse, Kazuo; Tobita, Hideaki; and Shibata, Yoichi, 4,860,663, Cl. 104-162.000.

Shicoh Engineering Co., Ltd.: *See—*
Shiraki, Manabu; and Egami, Kazuhito, 4,861,237, Cl. 417-353.000.

Shida, Yu: *See—*
Kobayashi, Masanori; Matsuura, Isao; Wakatsuki, Akira; and Shida, Yu, 4,861,816, Cl. 524-204.000.

Shigaki, Kazuyuki: *See—*
Imamura, Tadashi; Shigaki, Kazuyuki; Yamazaki, Yuji; Masuda, Tadashi; and Okumura, Tsunemasa, 4,861,113, Cl. 301-65.000.

Shigehara, Itaru: *See—*
Haga, Takahiro; Shigehara, Itaru; Koyanagi, Toru; Hara, Kazutoshi; and Maeda, Masaru, 4,861,886, Cl. 546-16.000.

Shigetoyo, Hiromi, to Nihon Naishi Co., Ltd. Volatile insecticide emitter. 4,860,488, Cl. 43-129.000.

Shih, Wei-Ren: *See—*
Hsia, Steve K.; Mahal, Pritpal S.; and Shih, Wei-Ren, 4,861,730, Cl. 437-43.000.

Shiiki, Masatoshi: *See—*
Migita, Masahito; Kanehisa, Osam; Shiiki, Masatoshi; and Yamamoto, Hajime, 4,862,033, Cl. 313-502.000.

Shimada, Haruo; and Sakakibara, Yoshiaki, to Nippon Steel Corporation. Seawater-corrosion-resistant non-magnetic steel materials. 4,861,548, Cl. 420-79.000.

Shimada, Kazuyuki, to Ricoh Company, Ltd. Pixel density variable image apparatus. 4,862,289, Cl. 358-298.000.

Shimada, Satoshi: *See—*
Miyamoto, Norifumi; Sato, Yoshio; Tsuboi, Nobuyoshi; Shimada, Satoshi; Sasaki, Hiroshi; Koyanagi, Hiroaki; and Minemura, Hiroyuki, 4,862,440, Cl. 369-45.000.

Shimai, Shunzo: *See—*
Yokoyama, Katsunori; Sato, Yukio; and Shimai, Shunzo, 4,862,030, Cl. 310-332.000.

Shimano Industrial Company Limited: *See—*
Nagano, Masashi, 4,861,320, Cl. 474-80.000.

Yamato, Yoshiro, 4,860,482, Cl. 43-18.100.

Shimanuki, Koji: *See—*
Iida, Toshiharu; Shimanuki, Koji; Nakada, Kimiaki; and Masuda, Akira, 4,862,280, Cl. 358-229.000.

Shimazaki, Kenji: *See—*
Ogawa, Hiroyasu; Shimazaki, Kenji; and Niijima, Kenji, 4,861,809, Cl. 523-149.000.

Shimazu, Hideaki: *See—*
Yamasawa, Tsutomu; Yamakoshi, Kenichi; and Shimazu, Hideaki, 4,860,761, Cl. 128-686.000.

Shimazu, Tadahiro. Powder constant-volume feeder. 4,860,928, Cl. 222-167.000.

Shimazu, Takashi: *See—*
Saito, Katushi; Shindou, Yoshio; Murata, Toshimichi; Yamazaki, Fumio; and Shimazu, Takashi, 4,861,441, Cl. 204-38.700.

Shimizu, Fumiaki: *See—*
Teteishi, Iwao; Ogura, Yoshiyuki; Hashimoto, Takeshi; Ritou, Tuguyoshi; Kajiyama, Katsufumi; Shimizu, Fumiaki; Tanaka, Kenji; Aibara, Yutaka; Kataoka, Hiroaki; Nakai, Katsuya; Yoshikawa, Takashi; Kanamori, Masaaki; Miyajima, Masao; Seki, Shuzo; and Takahashi, Sadanobu, 4,860,523, Cl. 53-512.000.

Shimizu, Hisayuki: *See—*
Watanabe, Yoshiharu; Shimizu, Hisayuki; Ito, Mineo; and Moriyama, Hitoshi, 4,861,378, Cl. 106-314.000.

Shimizu, Isamu: *See—*
Ueki, Masao; Hirooka, Masaaki; Hanna, Junichi; and Shimizu, Isamu, 4,861,623, Cl. 427-69.000.

Shimizu, Osamu: *See—*
Shimizu, Toshiyuki; Shimizu, Osamu; Tenmoku, Kenji; Mitoh, Kunihiko; and Honoki, Yasuhiro, 4,862,398, Cl. 364-571.050.

Shimizu, Shigehisa: *See—*
Ishii, Yoshiyuki; and Shimizu, Shigehisa, 4,860,964, Cl. 242-57.100.

Shimizu, Tadafumi, to Minolta Camera Kabushiki Kaisha. Paper feeder for image forming apparatus. 4,861,012, Cl. 271-3.100.

Shimizu, Tetsuya: *See—*
Enari, Masahiko; Yoshimura, Katsuji; Aoki, Akio; Yamashita, Shinichi; Shimokoriyama, Makoto; Kashida, Motokazu; Shimizu, Tetsuya; Ishii, Yoshiki; and Fujii, Akio, 4,862,292, Cl. 360-8.000.

Shimizu, Toshiyuki; Shimizu, Osamu; Tenmoku, Kenji; Mitoh, Kunihiko; and Honoki, Yasuhiro, to Sumitomo Electric Industries, Ltd. Correcting method and correcting errors in a terrestrial magnetism heading sensor. 4,862,398, Cl. 364-571.050.

Shimodaira, Yoshikazu; and Nozawa, Teruo, to Tsubakimoto Chain Co. Speed control system. 4,862,048, Cl. 318-640.000.

Shimokoriyama, Makoto: *See—*
Enari, Masahiko; Yoshimura, Katsuji; Aoki, Akio; Yamashita, Shinichi; Shimokoriyama, Makoto; Kashida, Motokazu; Shimizu, Tetsuya; Ishii, Yoshiki; and Fujii, Akio, 4,862,292, Cl. 360-8.000

Shimomura, Soichi, to Nippon Piston Ring Co., Ltd. Roller in rotary compressor and method for producing the same. 4,861,372, Cl. 75-232.000.

Shimomura, Takeshi: *See—*
Ushizawa, Norihiko; and Shimomura, Takeshi, 4,861,454, Cl. 204-414.000.

Shimoyama, Yujiro: *See—*
Yanai, Shinji; and Shimoyama, Yujiro, 4,861,950, Cl. 200-5.00R.

Shimura, Noriaki: *See—*
Hiraga, Imao; Shimura, Noriaki; Okakura, Yojiro; Kubota, Masaru; and Takashi, Osamu, 4,862,432, Cl. 368-88.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Satoh, Shinichi; and Fujioka, Kazutoshi, 4,861,908, Cl. 556-420.000.

Shin, Soo H.; Pasko, John G.; and Anderson, J. R., to Rockwell International Corporation. HgMnCdTe avalanche photodiode. 4,862,236, Cl. 357-30.000.

Shindengen Kogyo Kabushiki Kaisha: *See—*
Tanaka, Kiichi, 4,862,338, Cl. 363-19.000.

Shindou, Yoshio: *See—*
Saito, Katushi; Shindou, Yoshio; Murata, Toshimichi; Yamazaki, Fumio; and Shimazu, Takashi, 4,861,441, Cl. 204-38.700.

Shinko Electric Co., Ltd.: *See—*
Matsumoto, Takashi; and Udagawa, Shigeru, 4,860,662, Cl. 104-93.000.

Shinkoh Sellbic Co., Ltd.: *See—*
Takeuchi, Hiroshi; and Takeuchi, Yoshiaki, 4,861,254, Cl. 425-190.000.

Shinohara, Katumi: *See—*
Kato, Masaaki; Shinohara, Katumi; and Sugiyama, Hiromu, 4,861,610, Cl. 426-582.000

Shinya, Tadao: *See—*
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Miyazaki, Kenichi; Takahashi, Toshinori; Kitamura, Hiroki; Shinya, Tadao; and Mizoguchi, Yutaka, 4,862,255, Cl. 358-80.000.

Shiojiri Kagyo Kabushiki Kaisha: *See—*
Hiraga, Imao; Shimura, Noriaki; Okakura, Yojiro; Kubota, Masaru; and Takashi, Osamu, 4,862,432, Cl. 368-88.000.

Shiojiro Kogyo Kabushiki Kaisha: *See—*
Hiraga, Imao; Yamazaki, Satoshi; Yamada, Takehide; and Nishitani, Tadashi, 4,862,434, Cl. 368-190.000.

Shionogi & Co., Ltd.: *See—*
Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, 4,861,913, Cl. 562-427.000.

Shiraishi, Shuji; Sakaguchi, Masakazu; and Nishihara, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle traction control device. 4,860,847, Cl. 180-197.000.

Shirakawa, Yoichi: *See—*
Uchida, Yasuzo; and Shirakawa, Yoichi, 4,861,602, Cl. 426-56.000.
Shiraki, Manabu; and Egami, Kazuhito, to Shicoh Engineering Co., Ltd. Axial-flow fan apparatus. 4,861,237, Cl. 417-353.000.
Shirasaki, Osamu: *See—*
Miyawaki, Yoshinori; Matumoto, Kazuhiro; and Shirasaki, Osamu, 4,860,760, Cl. 128-680.000.
Shirk, Lynn V. Holder apparatus attachable on a wheelchair for holding a catheter bag and the like. 4,861,059, Cl. 280-304.100.
Shirley, Ralph E.: *See—*
Erdmann, Alan J.; and Shirley, Ralph E., 4,860,614, Cl. 74-710.000.
Shirouzu, Tatsuji; Takahashi, Tatsuo; Sato, Motoo; and Mizuno, Satoshi, to Hitachi, Ltd. Driving apparatus for DC circuit breakers. 4,862,313, Cl. 361-102.000.
Shizuoka Seiki Co., Ltd.: *See—*
Asaoka, Teruo; and Yoshioka, Shogo, 4,861,450, Cl. 204-224.00M.
Shoemaker, Donald K.: *See—*
Smith, Peter T.; Rohde, Mark W.; and Shoemaker, Donald K., 4,862,316, Cl. 361-220.000.
Shoher, Itzhak; and Whiteman, Aharon E. Slitted metal foil for forming a dental coping and method. 4,861,267, Cl. 433-218.000.
Showa Aluminum Corporation: *See—*
Kato, Yutaka; and Isoyama, Eizo, 4,860,565, Cl. 72-38.000.
Shucart, John K.: *See—*
Jennings, Alfred R., Jr.; and Shucart, John K., 4,860,830, Cl. 166-312.000.
Shuey, Lyle W.: *See—*
Parrott, Richard M.; Colvin, Jack A.; and Shuey, Lyle W., 4,860,794, Cl. 137-637.200.
Shuler, Michael L.: *See—*
Efthymiou, George S.; and Shuler, Michael L., 4,861,483, Cl. 210-636.000.
Shure Brothers, Inc.: *See—*
Woodard, Alan P., 4,862,507, Cl. 381-155.000.
Shure, Charles H., III: *See—*
McFadden, Russell E.; and Shure, Charles H., III, 4,860,976, Cl. 244-207.000.
Shuttleworth, Leslie; and Merkel, Paul B., to Eastman Kodak Company. Photographic element containing yellow filter dyes having tricyanovinyl groups. 4,861,700, Cl. 430-517.000.
Sick-Optique-Electronique: *See—*
Bois, Emmanuel; Huard, Serge; and Boisde, Gilbert, 4,861,131, Cl. 350-96.180.
Sie, Swan A.: *See—*
Graebner, Peter; Sie, Swan A.; and Angehrn, Jorg A., 4,862,424, Cl. 367-33.000.
Siefert, Roland, to Motor Meter AG. Vehicle operation recorder. 4,862,191, Cl. 346-18.000.
Siegel, Heinz: *See—*
Bertling, Hannes; Mergenthaler, Robert; Schmitt, Edgar; and Siegel, Heinz, 4,860,636, Cl. 91-376.00R.
Siegenia-Frank KG: *See—*
Loos, Horst, 4,861,183, Cl. 403-354.000.
Siegwart, John T., Jr., to Research Corporation Technologies, Inc. Pulley shift assembly. 4,861,321, Cl. 474-133.000.
Siegwarth, James D.: *See—*
Welch, James F.; and Siegwarth, James D., 4,861,497, Cl. 210-759.000.
Sielaff, Gunter; Joseph, Frank; and Harder, Norbert, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Apparatus for producing a gas mixture by the saturation method. 4,861,524, Cl. 261-130.000.
Siemens Aktiengesellschaft: *See—*
Appelt, Guenther, 4,862,489, Cl. 378-117.000.
Brune, Johannes; and Latussek, Hans-Peter, 4,861,274, Cl. 439-189.000.
Lippert, Hans-Joachim, 4,861,545, Cl. 376-448.000.
Mueller, Friedhelm; and Straub, Horst, 4,861,358, Cl. 55-386.000.
Oestreich, Ulrich, 4,861,525, Cl. 264-1.500.
Pichler, Klaus; and Kunze, Dieter, 4,861,946, Cl. 174-92.000.
Strobach, Peter; Hoelzlwimmer, Herbert; and Tengler, Walter, 4,862,263, Cl. 358-135.000.
Siemens Corporate Research & Support, Inc.: *See—*
Michener, John R., 4,861,991, Cl. 250-310.000.
Sigal, Richard F., to Amoco Corporation. Method of magnetotelluric exploration using a zigzag array. 4,862,089, Cl. 324-350.000.
Sih, Charles J., to Wisconsin Alumni Research Foundation. Process for preparing optically active 2,2'-dihydroxy-1,1'-binaphthyl. 4,861,724, Cl. 435-280.000.
Silver, Frederick H.: *See—*
Dean, Robert C., Jr.; Silver, Frederick H.; Berg, Richard A.; Phillips, Philip G.; and Runstadler, Peter W., Jr., 4,861,714, Cl. 435-68.000.
Simmel Difesa S.p.A.: *See—*
Andreetta, Rodolfo, 4,860,659, Cl. 102-473.000.
Simmonds S.A.: *See—*
Frerejacques, Jean-Claude, 4,861,210, Cl. 411-411.000.
Simmons, Eugene D.; Thomson, Graham C., III; and Reynaud, Richard J., to Rent, Ltd. High efficiency pump method and apparatus with hydraulic actuation. 4,861,239, Cl. 417-383.000.
Simms, Cosmian E. Card wrestling game. 4,861,031, Cl. 273-85.00G.
Simms, Robert M.; and Gibson, George A., to Savin Corporation. Liquid developer charge director control. 4,860,924, Cl. 222-56.000.
Simpson, Brian A.: *See—*
Buhler, Otto R.; Simpson, Brian A.; and Twombly, John C., 4,862,113, Cl. 331-117.00R.
Sims, Jackie C.: *See—*
Dowling, Donald J.; and Sims, Jackie C., 4,862,001, Cl. 250-345.000.
Sims, Steve A.: *See—*
Saavedra, Jose V.; Hunter, Douglas L.; Sims, Steve A.; Maschmeyer, Donald M.; and Knobel, Thomas M., 4,861,805, Cl. 521-105.000.
Singh, Donald R., to Honeywell, Inc. W-band microstrip oscillator using Gunn diode. 4,862,112, Cl. 331-107.0SL.
Singh, Prabhakar: *See—*
Bowker, Jeffrey C.; and Singh, Prabhakar, 4,861,345, Cl. 29-623.100.
Sinkkonen, Matti, to Tana Jyra Ky. Method for arranging the cooling in a compactor and a cooling system for the realization of the method. 4,861,187, Cl. 404-72.000.
Sinohara, Hisato, to Semiconductor Energy Laboratory Co., Ltd. Laser scriving system and method. 4,861,964, Cl. 219-121.680.
Siotani, Masao, to Toto Ltd. Core structure of molding apparatus. 4,861,257, Cl. 425-438.000.
Sipinen, Alan J.: *See—*
Carpenter, Theresa L.; Sipinen, Alan J.; and Bany, Stephen W., 4,861,635, Cl. 428-40.000.
SIRA Limited: *See—*
West, Robert N., 4,861,164, Cl. 356-445.000.
West, Robert N., 4,861,984, Cl. 250-236.000.
Sirinyan, Kirkor; Laue, Hans-Joachim; Merten, Rudolf; Michael, Dietrich; and Tima, Milan-Josef, to Bayer Aktiengesellschaft. Process for antistatic treatment or pretreatment of polyamides, polyimides, antistatically treated or pretreated materials, and the use thereof. 4,861,663, Cl. 428-409.000.
Sitek, Franciszek: *See—*
Rembold, Manfred; Sitek, Franciszek; Rutsch, Werner; and Berner, Godwin, 4,861,806, Cl. 522-66.000.
Siwinski, Paul P.: *See—*
Nicholas, Vincent; and Siwinski, Paul P., 4,860,447, Cl. 29-863.000.
Nicholas, Vincent; and Siwinski, Paul P., 4,860,801, Cl. 140-105.000.
Skalen, Bengt, to BTG Kalle Inventing AB. Device in viscosity meters. 4,860,576, Cl. 73-59.000.
SKF GmbH: *See—*
Olschewski, Armin; Schlereth, Armin; and Hoch, Paul-Gerhard, 4,860,605, Cl. 74-99.00R.
Skis Rossignol S.A.: *See—*
Abondance, Roger, 4,861,063, Cl. 280-601.000.
Skogward, Kenneth O. E., to Husqvarna Aktiebolag. Sewing machine with graphic instructions. 4,860,678, Cl. 112-445.000.
Skuce, Donald R.: *See—*
Mraz, Dennis; and Skuce, Donald R., 4,860,878, Cl. 198-309.000.
Skura, Joseph P.: *See—*
Ko, Harvey W.; Hart, Lynn W.; and Skura, Joseph P., 4,860,756, Cl. 128-653.000.
Sky Aluminum Co., Ltd.: *See—*
Matsuo, Mamoru; Okuda, Yutaka; Takizawa, Kazushige; and Sakaki, Hirokazu, 4,861,396, Cl. 148-439.000.
Slater, Charles R.: *See—*
Smith, Kevin W.; and Slater, Charles R., 4,861,340, Cl. 604-141.000.
Slater, Paul S., to Indexible Soft Jaws Limited. Jaw assembly for lathe chuck. 4,861,048, Cl. 279-123.000.
Slattery, Gordon C.: *See—*
Boda, James C.; and Slattery, Gordon C., 4,860,703, Cl. 123-195.00P.
Slattery, Ian, to Spencer Wright Industries, Inc. Tufting machine and method for producing level cut and loop pile. 4,860,674, Cl. 112-80.420.
Slaughter, Eldon E. Hinge valved rotary engine with separate compression and expansion sections. 4,860,704, Cl. 123-237.000.
Slesarenko, Vladimir F., to Vsesojuzny Nauchno-Issledovatelsky Institut Mekhanicheskoi Obrabotki Poleznykh Iskopaemykh. Vibratory screening machine. 4,861,463, Cl. 209-315.000.
Sloane, Irving. Tuning machines. 4,860,627, Cl. 84-306.000.
Slocum, Edgar W.; Sobrero, Aquiles C.; and Wheland, Robert C., to Du Pont de Nemours, E. I., and Company. Polymerization of fluoroolefins. 4,861,845, Cl. 526-68.000.
Slomianny, Jan. Ink system for ink jet matrix printer. 4,862,192, Cl. 346-75.000.
Small, Michelle: *See—*
Matthiesen, Martin; and Small, Michelle, 4,861,966, Cl. 219-205.000.
Smazik, Kenneth G.: *See—*
Kirschner, Jonathan; Smazik, Kenneth G.; and Paisley, Gary V., 4,860,923, Cl. 222-1.000.
SMC Corporation: *See—*
Hosono, Masayuki; Waragai, Kengi; and Hiramoto, Jun, 4,860,638, Cl. 91-536.000.
Smedberg, Kenneth L.; Bozich, George J.; and Kotynski, Robert J., to Smedberg, Kenneth L. Power press with improved cushioning system. 4,860,571, Cl. 72-453.130.
Smester, Paul R.: *See—*
Sheehan, Robert K.; and Smester, Paul R., 4,861,279, Cl. 439-412.000.
Smid, Albert; Akkermans, Antonius H. M.; Benschop, Jozef P. H.; and Rooyackers, Cornelis J. P. M., to U.S. Philips Corporation. Scanning optical microscope with position detection grating. 4,861,982, Cl. 250-235.000.
Smith, Adam J., to Caterpillar Industrial Inc. Load positioning assembly and method. 4,861,220, Cl. 414-495.000.

Smith, Arnold R.: *See—*
McBride, Antoinette D.; and Smith, Arnold R., 4,861,278, Cl. 439-395.000.
Smith, Clayton L.: *See—*
Easley, Sydney E.; Heathco, Craig E.; and Smith, Clayton L., 4,860,534, Cl. 60-39.092.
Smith, Craig J.: *See—*
Koren, Izchak; Gates, Robert J.; and Smith, Craig J., 4,860,562, Cl. 70-352.000.
Smith, Craig M., to Eastman Kodak Company. Image discrimination with continuous tone area thinning. 4,862,283, Cl. 358-443.000.
Smith, Donald W.; and Plociennik, James J., to Barber-Greene Company. Road widener. 4,861,191, Cl. 404-104.000.
Smith, Kevin W.; and Slater, Charles R., to Cordis Corporation. Hand-held pneumatic power assisted syringe. 4,861,340, Cl. 604-141.000.
Smith Kline Dauelsberg GmbH: *See—*
Gottwald, Eberhard F.; and Machoczek, Horst M., 4,861,592, Cl. 424-687.000.
Smith Kline & French Laboratories Limited: *See—*
Coates, William J.; and Kruse, Lawrence I., 4,861,773, Cl. 514-222.800.
Smith & Loveless, Inc.: *See—*
Weis, Frank G., 4,861,472, Cl. 210-189.000.
Smith, Michael G. Water-cooled lounging pad. 4,860,395, Cl. 5-420.000.
Smith and Nephew Associated Companies p.l.c.: *See—*
Lang, Stephen M.; and Webster, David F., 4,860,737, Cl. 128-156.000.
Smith, Peter T.; Rohde, Mark W.; and Shoemaker, Donald K., to White's Electronics, Inc. Static charge dissipating housing for metal detector search loop assembly. 4,862,316, Cl. 361-220.000.
Smith, Richard D Treatment of cellulosic materials. 4,860,685, Cl. 118-300.000
Smith, Roy E., to UTDC Inc. Multi-axle, steered articulated railway vehicle with compensation for transitional spirals. 4,860,666, Cl 105-168.000.
Smith, Russell P.: *See—*
Keith, William J.; Parsons, Michael; Smith, Russell P.; Glenn, Christopher J.; and Bell, Stephen, 4,862,505, Cl. 381-60.000.
Smith, Stephen, to General Motors Corporation. Tangent flow cylinder head. 4,860,700, Cl. 123-41.310.
Smith, Terrence R.; Isnardi, Michael A.; Fuhrer, Jack S.; and Patel, Chandrakant B., to General Electric Company. Video signal interpolator with peaking. 4,862,271, Cl. 358-166.000.
Smith, Winford L. Method and apparatus for the manufacture of rotary sheet dies. 4,860,616, Cl. 76-4.000.
SmithKline Beckman Corporation: *See—*
Gaitanopoulos, Dimitri; Mico, Bruce; and Weinstock, Joseph, 4,861,771, Cl. 514-213.000.
Smithson, Alan: *See—*
Goodacre, Brita C.; and Smithson, Alan, 4,861,382, Cl. 127-60.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See—*
Engel, Georg; and Kosak, Dietmar, 4,860,426, Cl. 29-527.700.
Snider, Keith. Locking ring for aluminum beverage cans. 4,860,896, Cl 206-427.000
Snyder, Daniel E. Slatted chain link fence construction, slats therefor, and method of slat installation. 4,860,998, Cl. 256-34.000.
Snyder, George K.: *See—*
Breda, Michael A.; and Snyder, George K., 4,860,421, Cl. 29-157.30A.
Snyder, Gilbert R., to Motorola, Inc. Multi-cell, vacuum activated deferred action battery. 4,861,686, Cl. 429-90.000.
Snyder, Robert P.: *See—*
Kaminski, Ronald S.; Snyder, Robert P.; and Crowley, Michael J., 4,861,541, Cl. 264-509.000.
Sobel, Mark E.; Liotta, Lance A.; Wewer, Ulla M.; Jaye, Michael C., and Drohan, William N., to United States of America, Health and Human Services. Recombinant DNA clone encoding laminin receptor. 4,861,710, Cl. 435-6.000.
Sobolev, Igor, to LaRoche Chemicals, Inc. Process for preparing a fluorination catalyst and the catalyst prepared by the process. 4,861,744, Cl. 502-227.000
Sobrero, Aquiles C.: *See—*
Slocum, Edgar W.; Sobrero, Aquiles C.; and Wheland, Robert C., 4,861,845, Cl. 526-68.000.
Sobut, Bruce, to Timelapse, Inc. Traffic monitoring system. 4,862,163, Cl. 340-940.000.
Societe Anonyme dite: ALCATEL CIT: *See—*
Carriere, Claude; Renard, Jean; and Lavolee, Thierry, 4,861,423, Cl. 156-643.000.
Societe anonyme dite: Alcatel Thomson Espace: *See—*
Contartese, Giulio; and Batlle, Alain, 4,862,057, Cl. 323-285.000
Societe Anonyme dite Alcatel Thomson Faisceaux Hertziens: *See—*
Mettoudi, Isaac; and Lafranca, Francois, 4,862,111, Cl. 331-96.000
Societe Anonyme dite: ALSTHOM: *See—*
Fleury, Daniel, 4,860,418, Cl. 29-156.80R.
Laumond, Yves; and Sabrie, Jean-Louis, 4,862,023, Cl. 310-54.000.
Societe anonyme dite Compagnie Generale D'Electricite: *See—*
Tardy, Andre ; and Jurczyszyn, Michel, 4,861,979, Cl. 250-227.000
S.A. Separgaz: *See—*
Maldague, Pierre, 4,860,547, Cl. 62-86.000
Societe Chimique des Charbonnages: *See—*
Erpelding, Michel; and Vandome, Jacques, 4,861,817, Cl. 524-411.000.
Societe Chimique Des Charbonnages S.A.: *See—*
Aubry, Jean; Cassiani-Ingoni, Serge; and Hauschild, Remi, 4,861,821, Cl. 524-512.000
Audureau, Joel; and Piecuch, Edouard, 4,861,834, Cl. 525-194.000.
Societe Francaise d'Equipements Pour la Navigation Aerienne (SFENA): *See—*
Grauz, Daniel; and Marchal, Claude, 4,862,151, Cl. 340-706.000.
Societe Francaise D'Equipments pour la Navigation Aerienne S.F.E.N.A.: *See—*
Boyer, Francis, 4,862,149, Cl. 340-635.000.
Societe Francaise D'Etudes et de Realisation D'Outillage: *See—*
Cuilleron, Jean, 4,861,201, Cl. 408-139.000.
Societe Generale Des Eaux Minerales de Vittel: *See—*
Schmitz, Roger, 4,861,413, Cl. 156-515.000.
Societe Nationale Elf Aquitaine: *See—*
Basset, Jean-Marie; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, 4,861,848, Cl. 526-169.000.
Societe Nationale Elf Aquitaine (Production): *See—*
Garland, Emmanuel, 4,860,591, Cl. 73-861.040.
Societe Sofratemed S.A.: *See—*
Benessis, Philippe L.; and Jannitte, Patrick H., 4,860,394, Cl. 5-62.000.
Soejima, Shigeo: *See—*
Mase, Syunzo; and Soejima, Shigeo, 4,861,456, Cl. 204-425.000
Sofranko, John A.; Gastinger, Robert G.; and Jones, C. Andrew, to Atlantic Richfield Company. Boron-promoted reducible metal oxides and methods of their use. 4,861,936, Cl. 585-500.000
Soligny, Robert E., Sr. Exercise device for installation in a doorway. 4,861,020, Cl. 272-62.000.
SOLVAY & Cie (Societe Anonyme): *See—*
Servais, Michel, 4,861,926, Cl. 570-110.000.
Solzer, Willi, to Faudi Feinbau GmbH. Tubular filter element with biasing element and method of making. 4,861,479, Cl. 210-485.000.
Soma, Koroku: *See—*
Ohama, Masanori; and Soma, Koroku, 4,861,157, Cl. 352-132.000.
Somar Corporation: *See—*
Sumi, Sigeo, 4,862,064, Cl. 324-65.00P
Sondal, Sven, to Duma AB. Closure for containers. 4,860,907, Cl. 215-230.000
Sondergeld, Horst. Seat for an office chair or the like, with seat and back adjustable, especially by body weight displacement. 4,861,106, Cl. 297-316.000
Sonoda, Yutaka; Yuchi, Hirofumi; Murakami, Kyoichi; and Tokuhara, Masaharu, to Sony Corporation. Memory control apparatus 4,862,269, Cl. 358-160.000.
Sony Corporation: *See—*
Ando, Ryo, Yoshida, Tadao; Fujiie, Kazuhiko; and Yoshida, Toshio, 4,862,439, Cl. 369-30.000
Fukami, Tadashi; and Ino, Hiroyuki, 4,862,297, Cl. 360-53.000.
Gillard, Clive H.; and Harradine, Vincent C., 4,862,259, Cl. 358-105.000
Gillard, Clive H., 4,862,266, Cl. 358-140.000.
Gillard, Clive H.; and Dougall, David A., 4,862,267, Cl. 358-140.000
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Iida, Toshiharu; Shimanuki, Koji; Nakada, Kimiaki; and Masuda, Akira, 4,862,280, Cl. 358-229.000
Iwase, Seiichiro; and Yamazaki, Takao, 4,862,403, Cl. 364-724.160
Murabayashi, Noboru; and Kanota, Keiji, 4,862,296, Cl. 360-51.000
Nishio, Naoki, 4,862,270, Cl. 358-160.000
Sonoda, Yutaka; Yuchi, Hirofumi; Murakami, Kyoichi; and Tokuhara, Masaharu, 4,862,269, Cl. 358-160.000
Sorell, Louis S.: *See—*
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Sorenam: *See—*
Robert, Henri F. A., 4,860,837, Cl. 175-113.000
Sosa, Jose M.; and Morris, Jeffrey, to Fina Technology, Inc. Continuous process for the production of high impact polystyrene using non-acid forming initiators. 4,861,827, Cl. 525-54.000.
Sosin, Boleslaw M.: *See—*
West, Barry G.; Sosin, Boleslaw M.; and Tolfree, Roger K., 4,862,453, Cl. 370-82.000
Sota, Kaoru: *See—*
Mitsukuchi, Morihiro; Ikemoto, Tomoyuki; Watanabe, Yoshiaki; and Sota, Kaoru, 4,861,765, Cl. 514-181.000.
Sota, Osamu: *See—*
Yamamoto, Kiyonori, Sota, Osamu; Sakae, Masahiko; Makiura, Yoshinori; Murakami, Masahiro; and Mitsuya, Toshiyuki, 4,861,017, Cl 271-258.000.
Soubliere, Marc P.: *See—*
Seto, Raymond A., and Soubliere, Marc P., 4,862,497, Cl. 379-355.000
Southeastern Illinois College Foundation: *See—*
Patterson James A., 4,860,577, Cl. 73-64.300.
Southwall Technologies: *See—*
Meyer, Stephen F.; and Sans, Claude A., 4,861,680, Cl. 428-623.000.
Spaenjers, Joannes H. P. M.: *See—*
Hoefkens, Daniel S. G.; Spaenjers, Joannes H. P. M., Boeykens, Eduard C. M.; Verhille, Henri A. J.; and Geernaert, Gustaaf A. L., 4,862,449, Cl. 370-32.100
Spearmon, JoAnn M.; and Jackson, Sharon I. Conditioner-hair dressing. 4,861,593, Cl. 424-195.100
Spearow, Ralph G., to Santa Clara Plastics. Ventilated clean room work station with aerodynamic exhaust baffle. 4,860,643, Cl. 98-115.300
Spears, Thomas D., to General Motors Corporation. Variable stroke compressor socket plate. 4,860,641, Cl. 92-71.000

Spease, Arthur L., to Teleflex Incorporated. Sealed rotating end fitting for a flexible cable. 4,860,609, Cl. 74-502.400.

Speckien, James M.: *See—*
Lessar, Joseph F.; Rosenberg, Duane L.; Kraska, Robert E.; Speckien, James M.; and Upton, James E., 4,860,446, Cl. 29-858.000.

Spector, George: *See—*
Rose, James H.; and Spector, George, 4,860,989, Cl. 248-471.000.

Spectra-Physics, Inc.: *See—*
Elliott, Randy D.; and Tabet, Nicolas N., 4,861,972, Cl. 235-462.000.
Hellekson, Ronald A.; Campbell, John S.; and Acosta, Jorge L., 4,861,973, Cl. 235-467.000.

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Spectrum CVD, Inc.: *See—*
Shekerjian, Brian H.; and Price, J. B., 4,861,563, Cl. 422-186.050.

Speed Queen Company: *See—*
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Spence, Gary A., to Tektronix, Inc. Programmable multiphase sequence controller. 4,862,096, Cl. 328-75.000.

Spencer, Jeffrey S., to A. M. Todd Company. Stable peppermint oil having reduced pulegone content and method of producing the same. 4,861,616, Cl. 426-651.000.

Spencer Wright Industries, Inc.: *See—*
Slattery, Ian, 4,860,674, Cl. 112-80.420.

Sperry Marine Inc.: *See—*
Baginski, Mark J., 4,862,458, Cl. 371-15.000.

Spiers, Kent, to Marathon Corporation. Compactor with hydraulic dwell and method. 4,860,646, Cl. 100-48.000.

Spital, Wade. Pedal-powered skateboard. 4,861,054, Cl. 280-221.000.

Sponagel, Stefan: *See—*
Graf, Gunter; Gross, Heinz; and Sponagel, Stefan, 4,861,536, Cl. 264-108.000.

Springer, Albert R.: *See—*
Pellet, Regis J.; Coughlin, Peter K.; Springer, Albert R.; and Gajek, Richard T., 4,861,739, Cl. 502-64.000.

Springer, Hartmut: *See—*
Schlafer, Ludwig; Springer, Hartmut; and Hahnle, Reinhard, 4,861,344, Cl. 8-532.000.

Springolo, Vanna; Coppi, Germano; and Scevola, Mario E., to Proter S.p.A. Galenic formulations for oral use of rhein derivatives with delayed release for therapeutical use. 4,861,599, Cl. 424-494.000.

Springs Industries, Inc.: *See—*
Montgomery, Terry G.; and Martin, William G., 4,860,530, Cl. 57-5.000.

Square D Company: *See—*
Oster, Clark L.; Rustebakke, Paul; and Schiefen, Daniel R., 4,862,131, Cl. 337-48.000.

Sramek, John A., to S. C. Johnson & Son, Inc. Hot curling hair treatment. 4,861,583, Cl. 424-70.000.

Srivastava, Aditya: *See—*
Flinchbaugh, Bruce E.; Dolins, Steven B.; Srivastava, Aditya; and Reese, Jon, 4,861,419, Cl. 156-626.000.

Stab, Rudolf: *See—*
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Stacey, Roger R.: *See—*
Kelly, Francis P.; Gibbens, Richard J.; Key, Peter B.; Turton, Paul A.; Stacey, Roger R.; and Whitehead, Martin J., 4,862,496, Cl. 379-221.000.

Stagg, Malcolm J.; Stern, Eric P.; and Vidyarthi, Sunil, to BPCO Inc. Reinforcement of phenolic foams composite. 4,861,642, Cl. 428-139.000.

Staheli, Paul; Demuth, Robert; and Fritzsche, Peter, to Rieter Machine Works Ltd. Method for detecting the density or thickness and variations thereof of fiber material at the infeed of a textile machine as well as a method for evening the density or thickness variations of fiber material at the infeed of a textile machine machine. 4,860,406, Cl. 19-105.000.

Stalter, Robert J., Sr., to Motor Wheel Corporation. Method for molding composite metal-elastomer wheels. 4,861,538, Cl. 264-161.000.

Stamps, Douglass K., Jr.: *See—*
Ponce De Leon, Lorenzo A.; Stamps, Douglass K., Jr.; and Balzano, Quirino, 4,862,181, Cl. 343-702.000.

Stanadyne Automotive Corp.: *See—*
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Standard Havens, Inc.: *See—*
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Standard Oil Company, The: *See—*
DiCosimo, Robert; and Szabo, Hsiac-Chiung, 4,861,911, Cl. 560-145.000
Tenhover, Michael A., 4,861,751, Cl. 505-1.000.

Standing, Colin A., to Joubert S. A.; and Gallagher Electronics Limited. Fencing tape with electrically conducting wires. 4,861,645, Cl. 428-196.000.

Stanek, Carl E., to General Motors Corporation. Vehicle seat adjuster clutch. 4,860,866, Cl. 192-71.000.

Stangenberg, Hartmut: *See—*
Goldhammer, Albert; Schleicher, Hans; Stangenberg, Hartmut; and Gasteier, Rolf, 4,860,963, Cl. 241-236.000.

Stankus, John C., to Jennmar Corporation. Expansion assembly for mine roof bolts. 4,861,198, Cl. 405-261.000.

Stanley, David R.: *See—*
Manley, James D.; Mockford, Mary J.; and Stanley, David R., 4,861,735, Cl. 501-96.000.

Stanley Works, The: *See—*
Guarnaccia, Joseph J.; and Masucci, Ernest J., 4,860,452, Cl. 30-346.600.
Munoz, Jose, 4,861,078, Cl. 292-113.000.

Stanphill, Russell C.: *See—*
Moyer, William C.; Hartvigsen, Jay A.; and Stanphill, Russell C., 4,862,352, Cl. 364-200.000.

Stanton, Mark F.: *See—*
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Star Technologies, Inc.: *See—*
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Starewicz, Piotr M.: *See—*
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Starichnev, Vladimir V.: *See—*
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Stark, Joseph: *See—*
Friesen, Heinz-Jurgen; Grenner, Gerd; Pauly, Hans-Erwin; Kohl, Helmut; Habenstein, Klaus; and Stark, Joseph, 4,861,711, Cl. 436-7.000.

Stark, Klaus: *See—*
Poerschke, Karl; Stark, Klaus; and Frochte, Bernd, 4,862,134, Cl. 337-231.000.

State of Israel, Ministry of Agriculture: *See—*
Zaltzman, Arthur; Schmilovitch, Zeev; Verma, Brahm P.; and Hoffman, Aharon, 4,861,464, Cl. 209-474.000.

State University of New York: *See—*
Zipper, Joseph D., 4,860,910, Cl. 220-1.00T.

Staude, Eckhard; and Kaus, Juergen, to Staude Foto-Chemi Eva Staude. Document filming apparatus and process. 4,862,222, Cl. 355-40.000

Staude Foto-Chemi Eva Staude: *See—*
Staude, Eckhard; and Kaus, Juergen, 4,862,222, Cl. 355-40.000.

Stava, Elliott K., to Lincoln Electric Company. Method and apparatus for TIG welding. 4,861,965, Cl. 219-130.510.

Stearns, Floyd E.; Pitas, Jeffery A.; LeRoy, Robert D.; and Ditzel, Roger E., to Eastman Kodak Company. Sheet accumulating apparatus. 4,861,015, Cl. 271-213.000.

Stechert, Roland: *See—*
Rauber, Gerhard; and Stechert, Roland, 4,861,784, Cl. 514-314.000.

Steele, Jeffrey S.: *See—*
Steele, Willard A.; and Steele, Jeffrey S., 4,861,008, Cl. 269-21.000.

Steele, Willard A.; and Steele, Jeffrey S. Vacuum support table for glass glazing and the like. 4,861,008, Cl. 269-21.000.

Steer, John E., to Allied-Signal Inc. Two stage relief valve for master cylinder quick-fill chamber. 4,860,541, Cl. 60-578.000.

Steffes, Helmut: *See—*
Reinartz, Hans-Dieter; and Steffes, Helmut, 4,861,117, Cl. 303-100.000.

Stegelman, Albert F., to Phillips Petroleum Company. Method for reducing corrosion in a bypass system. 4,861,576, Cl. 423-574.00R.

Stegelmeier, Hartmut: *See—*
Schwenner, Eckhard; Stegelmeier, Hartmut; Kazda, Stanislav; and Knorr, Andreas, 4,861,782, Cl. 514-294.000.

Stegmaier, Alwin: *See—*
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Steiner, Walter R., to Star Technologies, Inc. Geometry processor for graphics display system. 4,862,392, Cl. 364-522.000.

Steinicke, Wolfgang; Schiessl, Alois; and Busel, Horst, to Buck Chemisch-Technische Werke GmbH & Co. Projectile. 4,860,657, Cl. 102-334.000.

Sterling Drug Inc.: *See—*
Diana, Guy D.; and Carabateas, Philip M., 4,861,791, Cl. 514-374.000.

Stern, Eric P.: *See—*
Stagg, Malcolm J.; Stern, Eric P.; and Vidyarthi, Sunil, 4,861,642, Cl. 428-139.000.

Stern, Richard A.; and Babbitt, Richard W., to United States of America, Army. Compact millimeter wave microstrip circulator. 4,862,117, Cl. 333-1.100.

Stevens, Gregory A.: *See—*
Volkmann, Curtis L.; Kester, John J.; and Stevens, Gregory A., 4,861,407, Cl. 156-272.800.

Stevens, James L.; and Dapo, Roland F., to North American Philips Corporation. Method of improving the capacitance of anodized aluminum foil. 4,861,439, Cl. 204-27.000.

Stevenson, Edward J.: *See—*
Lasly, Heshmat O.; and Stevenson, Edward J., 4,860,509, Cl. 52-173.00R.

Stevie, Fred A.: *See—*
Dautartas, Mindaugas F.; Harrus, Alain S.; Martin, Edward P., Jr.; and Stevie, Fred A., 4,861,126, Cl. 350-96.110.

Stewart, Robert M. Pet lounge. 4,860,689, Cl. 119-1.000.

Steyr-Daimler-Puch AG: *See—*
Valev, Assen, 4,860,852, Cl. 181-240.000.

Stibila, Michael E., to GEC Plessey Telecommunications, LTD. Telecommunications subscriber line interface circuit and party identification facility. 4,862,495, Cl. 379-183.000.

Sticht, Walter, to Stiwa-Fertigungstechnik Sticht GesmbH. Apparatus for conveying assembly parts. 4,860,881, Cl. 198-443.000.

Stidsen, Poul. Covering hood for hitch balls. 4,861,062, Cl. 280-507.000.

Stierman, Roger J.; McCauley, Archie N.; and Zart, Robert C., to Texas Instruments Incorporated. Fixture for plating tall contact bumps on integrated circuit. 4,861,452, Cl. 204-297.00W.

Stift, Kurt: *See—*
von Bogdandy, Ludwig; Kepplinger, Werner; Stift, Kurt; Papst, Gero; and Hauk, Rolf, 4,861,369, Cl. 75-38.000.

Stihl, Andreas: *See—*
Gerhardy, Reinhard; Holderle, Hans; Wolf, Jurgen; and Vonderau, Werner, 4,861,522, Cl. 261-35.000.

Stingle, Frederick W.; and Schmidt, Samuel, to United Technologies Corp. Heat dissipation in an electric motor. 4,862,024, Cl. 310-64.000.

Stiwa-Fertigungstechnik Sticht GesmbH: *See—*
Sticht, Walter, 4,860,881, Cl. 198-443.000.

Stobnicki, Roman: *See—*
Van Emden, Bernard; and Stobnicki, Roman, 4,860,592, Cl. 73-861.050.

Stockham, Michael A.: *See—*
Hider, Robert C.; Kontoghiorghes, George; and Stockham, Michael A., 4,861,767, Cl. 514-184.000.

Stoffel, John L., to Hewlett-Packard Co. Process for manufacturing thermal ink jet printhead and integrated circuit (IC) structures produced thereby. 4,862,197, Cl. 346-140.00R.

Stohr, Albert, to Gebr. Hennig GmbH. Scraping arrangement for telescopic covers. 4,860,917, Cl. 220-8.000.

Stokbroekx, Raymond A.; Luyckx, Marcel G. M.; and Janssens, Frans E., to Janssen Pharmaceutica N.V. Benzoxazol-and benzothiazolamine derivatives, useful as anti-anoxic agents. 4,861,785, Cl. 514-321.000.

Stokbroekx, Raymond A.: *See—*
Heeres, Jan; Stokbroekx, Raymond A.; and Backx, Leo J. J., 4,861,879, Cl. 544-55.000.

Stoller, Hansjorg: *See—*
Heiser, Bernd; and Stoller, Hansjorg, 4,861,890, Cl. 546-184.000.

Stolowitz, Mark L.; Dixit, Vyas M.; and Kesicki, Edward A., to Bio-Affinity Systems, Inc. Method of thioacylation peptide sequencing with acylation of triazolinones. 4,861,726, Cl. 436-89.000.

Stone, Julian; and Stulz, Lawrence W., to American Telephone and Telegraph Company; and AT&T Bell Laboratories. Optical communication systems using fabry-perot cavities. 4,861,136, Cl. 350-96.300.

Stone, William A.: *See—*
Hinchcliffe, Dennis; and Stone, William A., 4,860,880, Cl. 198-405.000.

Stops, Peter: *See—*
Bertleff, Werner; Maerkl, Robert; Magnussen, Peter; Kuehn, Gebhard; and Stops, Peter, 4,861,895, Cl. 546-353.000.

Storch, Randy S.: *See—*
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Storey, David C. String supporting apparatus for stringed musical instruments. 4,860,628, Cl. 84-313.000.

Straub, Horst: *See—*
Mueller, Friedhelm; and Straub, Horst, 4,861,358, Cl. 55-386.000.

Strider, Charles A., to Hughes Aircraft Company. Microwave antenna array waveguide assembly. 4,862,186, Cl. 343-776.000.

Strtzl, Karl; Wurthner, Hubert; and Riegler, Andreas, to TMC Corporation. Ski safety binding. 4,861,064, Cl. 280-618.000.

Strobach, Peter; Hoelzlwimmer, Herbert; and Tengler, Walter, to Siemens Aktiengesellschaft. Arrangement for optimized weighting of transmitted transformation coefficients in transforamtion coders for the purpose of minnimizing convolution distortions. 4,862,263, Cl. 358-135.000

Stroobach, Jerry: *See—*
Milton, A. David; and Stroobach, Jerry, 4,862,452, Cl. 370-62.000.

Stuetz, Dagobert E.: *See—*
Che, Tessie M.; Stuetz, Dagobert E.; Buckley, Alan; and Ulrich, Donald R., 4,861,129, Cl. 350-96 130.

Stulz, Lawrence W.: *See—*
Stone, Julian; and Stulz, Lawrence W., 4,861,136, Cl. 350-96.300.

Stumpf, George R., Jr.: *See—*
Baker, Edwin T.; Neilson, George V.; and Stumpf, George R., Jr., 4,861,406, Cl. 156-230.000.

Sturm, Ruger & Company, Inc.: *See—*
Ruger, William B., 4,860,480, Cl. 42-101.000.

Sturza, Mark A.; and Brown, Alison K., to Litton Systems, Inc. Digital system for codeless phase measurement. 4,862,178, Cl. 342-357.000.

Subbiah, M. T. Ravi, to University of Cincinnati. Guarana seed extract and method of preparation. 4,861,594, Cl. 424-195.100.

Sucre Recherches et Developpements: *See—*
Paul, Francois B.; Monsan, Pierre F.; Remaud, Magali M. C.; and Pelenc, Vincent P., 4,861,381, Cl. 127-41.000.

Suda, Keiko: *See—*
Nomura, Masakatsu; Suda, Keiko; and Ashikaga, Tadashi, 4,862,343, Cl. 363-41.000.

Suda, Kenichi; Hasegawa, Shizuo; and Matsuoka, Nobuo, to Canon Kabushiki Kaisha. Image reading apparatus which adjusts image signals to improve signal balance. 4,862,286, Cl. 358-494.000.

Suda, Mitsuo: *See—*
Fukuoka, Hirotsugu; Kawakami, Kanji; Aihara, Makoto; Suda, Mitsuo; Takeshita, Kouji; and Isono, Yukihiro, 4,861,398, Cl. 156-64.000.

Suddith, Robert L.: *See—*
Janoff, Andrew S.; Bolcsak, Lois E.; Weiner, Alan L.; Tremblay, Paul A.; Bergamini, Michael V. W.; and Suddith, Robert L., 4,861,580, Cl. 424-1.100.

Suefuji, Kazutaka: *See—*
Tojo, Kenji; Kawashima, Kenichi; Suefuji, Kazutaka; and Nakamura, Yozo, 4,861,245, Cl. 418-55.000.

Sugahara, Kazuyuki: *See—*
Nishimura, Tadashi; Inoue, Yasuo; Sugahara, Kazuyuki; and Kusunoki, Shigeru, 4,861,418, Cl. 156-620.720.

Sugie, Kiyoshi, to Agency of Industrial Science and Technology. Schiff base metal complex compounds, and organometallic ultrathin film composed thereof and oxygen separation films composed thereof. 4,861,904, Cl. 556-32.000.

Sugihara, Hideki; Hiratani, Kazuhisa; and Okada, Tatsuhiro, to Director General of Agency of Industrial Science and Technology. Electrode membrane. 4,861,455, Cl. 204-418.000.

Sugihara, Koichi: *See—*
Yamashita, Masashi; Sugihara, Koichi; and Kawakami, Hiroshi, 4,860,842, Cl. 180-140.000.

Sugio, Akitoshi; Kawaki, Takao; Kobayashi, Makoto; Hayashi, Katsushige; and Watanabe, Masahito, to Mitsubishi Gas Chemical Company, Inc. Photosensitive polyimide precursor. 4,861,854, Cl. 528-125.000.

Sugisawa, Ko; Sekiguchi, Kazuya; Tuji, Kiyoaki; and Ono, Akinobu, to House Food Industrial Company Limited. Continuous sterilizing and packing apparatus. 4,861,559, Cl. 422-110.000.

Sugita, Shigehisa: *See—*
Koyama, Kazuhito; Sugita, Shigehisa; Sakaguchi, Seiichiro; Seiki, Nobuhiro; and Hanzawa, Asao, 4,861,348, Cl. 48-94.000.

Sugiyama, Hiromu: *See—*
Kato, Masaaki; Shinohara, Katumi; and Sugiyama, Hiromu, 4,861,610, Cl. 426-582.000.

Sugoh, Yoshihisa; and Ochi, Yasuo, to Kabushiki Kaisya Advance. Process for manufacture of metal oxide. 4,861,572, Cl. 423-339.000.

Suh, John T.; Pendelton, Robert G.; Pendley, Charles E., II; Yu, Kin T.; Menard, Paul R.; and Schreiber, Alain B., to Rorer Pharmaceutical Corporation. Treatment of conditions requiring enhanced oxygen availability to mammalian tissues. 4,861,795, Cl. 514-510.000.

Suitor, Jerry W.: *See—*
Collins, Earl R., Jr.; Suitor, Jerry W.; and Dubis, David, 4,860,669, Cl. 110-165.00R.

Sulfochem S.p.A.: *See—*
Petrillo, Vincenzo; Crotti, Gianpiero; and Marchello, Giovanni, 4,861,824, Cl. 524-745.000.

Suljak, George T.: *See—*
Szydlowski, Donald F.; and Suljak, George T., 4,861,347, Cl. 48-61.000.

Sullivan, James R.: *See—*
Lucitte, Richard D.; Melnychuck, Paul W.; Murray, Joseph J.; Ray, Lawrence A.; and Sullivan, James R., 4,861,140, Cl. 350-320.000.

Sumi, Sigeo, to Somar Corporation. End sensor. 4,862,064, Cl. 324-65.00P.

Sumitomo Chemical Company: *See—*
Kobayashi, Masanori; Matsuura, Isao; Wakatsuki, Akira; and Shida, Yu, 4,861,816, Cl. 524-204.000.

Sumitomo Electric Industries, Ltd.: *See—*
Hara, Akio; and Yamamura, Akihiko, 4,861,673, Cl. 428-469.000.
Shimizu, Toshiyuki; Shimizu, Osamu; Tenmoku, Kenji; Mitoh, Kunihiko; and Honoki, Yasuhiro, 4,862,398, Cl. 364-571.050.
Takata, Koji, 4,861,114, Cl. 303-9.720.

Sumitomo Metal Industries: *See—*
Masui, Takeshi; Matsumoto, Yoshiro; Tomizawa, Atsushi; and Hirooka, Eiji, 4,860,416, Cl. 29-116.200.

Sumitomo Naugatuck Co., Ltd.: *See—*
Toyoda, Yasushi; Mishiba, Saburo; and Nishioka, Toshiyasu, 4,861,820, Cl. 524-510.000.

Summers, Donald J.: *See—*
Bogar, Jerry H.; Cassel, Willard F., Jr.; Mummey, Dale B.; Oberman, Carl D.; and Summers, Donald J., 4,861,271, Cl. 439-63.000

Sunada, Fumiyuki: *See—*
Saito, Toshiaki; Ueno, Chizuru; and Sunada, Fumiyuki, 4,861,603, Cl. 426-93.000.

Sunclipse, Inc.: *See—*
Cardenas, Alfonso; and de la Cruz, Juan, 4,860,667, Cl. 108-115.000.

Sundberg, Staffan, to Ovako Steel Couplings AB. Removably plugging element channels. 4,861,181, Cl. 403-15.000.

Sunds Defibrator Aktiebolag: *See—*
Eriksson, Hans E. K., 4,861,433, Cl. 162-323.000.

Sundstrand Corporation: *See—*
Cook, Alexander, 4,862,341, Cl. 363-37.000.
Dhyanchand, John J.; Shekhawat, Sampat F.; and Nguyen, Vietson M., 4,862,342, Cl. 363-40.000.
Zeiser, Philip; and Readman, John, 4,861,313, Cl. 464-89.000.

Sundstrom, Lowell W., Jr. Emergency fuel transfer accessory. 4,860,785, Cl. 137-351.000.

Sunkit Co., Ltd.: *See—*
Miura, Ryuichi; and Nakao, Toshinobu, 4,861,401, Cl. 156-94.000

Super Sagless Corp.: *See—*
Hartline, Michael F., 4,861,101, Cl. 297-69.000

Suspension Group, Ltd.: *See—*
Booher, Benjamin V., 4,861,067, Cl. 280-707.000.

Suttle, James P.: *See—*
Jones, Daniel A.; and Suttle, James P., 4,861,041, Cl. 273-292.000.

Suyama, Takahiro; Takahashi, Kosei; Kondo, Masafumi; and Hayakawa, Toshiro, to Sharp Kabushiki Kaisha. Semiconductor laser device. 4,862,470, Cl. 372-45.000.

Suzuki, Akio; Yoshida, Eiji; Nagasaki, Satoru; Arai, Masumi; and Tsuji, Nobuaki, to Konica Corporation. Rapidly processing silver halide photographic light-sensitive material and the processing thereof. 4,861,702, Cl. 430-564.000.

Suzuki, Akira: *See—*
Masuda, Masachika; and Suzuki, Akira, 4,862,246, Cl. 357-70.000.

Suzuki, Isao; Hirabayashi, Kazuo; Kondoh, Tadami; and Nishijima, Hiroaki, to Research Association for Utilization of Light Oil. Production of high-octane gas blending stock. 4,861,934, Cl. 585-415.000.

Suzuki, Jiro, to Kohjin Co., Ltd. Process for preparing adenine. 4,861,883, Cl. 544-277.000.

Suzuki, Jun, to Pioneer Electronic Corporation. Device for driving optical parts of an optical pickup. 4,861,138, Cl. 350-255.000.

Suzuki, Kaoru: *See—*
Tsuda, Kazuhiro; Kihara, Tomohiko; and Suzuki, Kaoru, 4,862,003, Cl. 250-363.020.

Suzuki, Kazuhiko; and Yoshioka, Hiroshi, to Terumo Corporation. Polymerizable liposome-forming lipid, and method for production thereof. 4,861,521, Cl. 260-403.000.

Suzuki, Kazuo: *See—*
Ihara, Masahiro; Suzuki, Kazuo; Maekawa, Hideya; Ito, Haremi; and Tanaka, Kenichi, 4,861,626, Cl. 427-133.000.

Suzuki, Mitsuo: *See—*
Takada, Takashi; Hirao, Kenichi; Tanaka, Hiroyoshi; and Suzuki, Mitsuo, 4,861,659, Cl. 428-364.000.

Suzuki, Nobuo: *See—*
Morinaga, Motoyasu; Furuyama, Hideto; Nakamura, Masaru; Suzuki, Nobuo; Hirayama, Yuzo; and Okuda, Hajime, 4,862,474, Cl. 372-50.000.

Suzuki, Tadashi: *See—*
Yoshida, Nobutoshi; Miyke, Nobuyuki; Takagi, Atsushi; Saito, Takashi; Suzuki, Tadashi; Ohki, Naoyuki; Tomosada, Masahiro; Adachi, Hideki; and Takeda, Hiroaki, 4,862,219, Cl. 355-202.000.

Suzuki, Takio; and Imamura, Kaneo, to Aisan Kogyo Kabushiki Kaisha. Throttle body. 4,860,706, Cl. 123-337.000.

Suzuki, Toru; Kato, Atsuhiko; Hosoi, Mitsuo; and Nakano, Ichiro, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for guiding movement of an unmanned moving body. 4,862,047, Cl. 318-587.000.

Suzuki, Yoshikuni: *See—*
Takahashi, Toshihiro; Horaguchi, Tatsuo; Nakamaru, Koichi; and Suzuki, Yoshikuni, 4,861,780, Cl. 514-259.000

Suzuki, Yoshio: *See—*
Yakuwa, Masahiko; and Suzuki, Yoshio, 4,862,369, Cl. 364-431.070.

Suzuki, Yoshirou: *See—*
Suzuyama, Hiroshi; Suzuki, Yoshirou; and Sakaguchi, Minoru, 4,862,319, Cl. 361-341.000

Suzuyama, Hiroshi; Suzuki, Yoshirou; and Sakaguchi, Minoru, to Hitachi, Ltd. Gas-insulated switchgear. 4,862,319, Cl. 361-341.000.

Svenning, Bjornar, to Den norske stats oljeselskap a.s. Apparatus for carrying out operations under water. 4,860,681, Cl. 114-321.000.

Svensson, Anders, to NI Chemicals, Inc. Method of detackifying paint overspray. 4,861,491, Cl. 210-691.000.

Svilar, Mark: *See—*
Klar, Erhard; Svilar, Mark; and Berry, David F., 4,861,373, Cl. 75-244.000.

Svrluga, Richard C.: *See—*
Lichtin, Norman N.; DiMauro, Thomas M.; and Svrluga, Richard C., 4,861,484, Cl. 210-638.000.

Swab, John M.: *See—*
Wang, Samuel C.; Swab, John M.; and Winn, Michael L., 4,862,276, Cl. 358-213.310.

Swarthoff Ton: *See—*
Cornelissen, Johannes M.; Klugkist, Jan; Lagerwaard, Cornelis A.; Swarthoff Ton; Thom, David; and Thom, David, 4,861,509, Cl. 252-174.120.

Sweet, Herbert F., Jr. Water distillation apparatus for under-the-sink operation. 4,861,435, Cl. 202-180.000.

Swemer, Gerry E.: *See—*
Levy, Zubin; and Swemer, Gerry E., 4,860,475, Cl. 40-547.000.

Swift, Thomas R.; and Desty, Dennis H., to Safety First Limited. Water recirculating apparatus and method. 4,861,489, Cl. 210-668.000.

Symtron Systems, Inc.: *See—*
Ernst, James; Williamson, Steven; Rogers, George; and Musto, Dominick, 4,861,270, Cl. 434-226.000.

Synlize, Inc.: *See—*
Lichtin, Norman N.; DiMauro, Thomas M.; and Svrluga, Richard C., 4,861,484, Cl. 210-638.000.

Synofzik, Reinhard; Doherr, Karl-Friedrich; Munscher, Dieter; and Saltaris, Christos, to Rheinmetall GmbH. Projectile. 4,860,660, Cl. 102-501.000.

Syntex (U.S.A) Inc.: *See—*
Nelson, Peter H.; Gu, Chee-Liang L.; Allison, Anthony C.; Eugui, Elsie M.; and Lee, William A., 4,861,776, Cl. 514-233.500.

Syracuse University: *See—*
Rothenberg, Martin, 4,862,503, Cl. 381-48.000.

Sysmed, Inc.: *See—*
Broadhurst, John H., 4,862,135, Cl. 338-64.000.

SystemOne Holdings, Inc.: *See—*
Ahlstrom, Mark L.; Keller, Bruce A.; and Storch, Randy S., 4,862,357, Cl. 364-407.000.

Systemteknik AB: *See—*
Holm, Lauri, 4,860,840, Cl. 177-208.000.

Szabo, Hsiao-Chiung: *See—*
DiCosimo, Robert; and Szabo, Hsiao-Chiung, 4,861,911, Cl. 560-145.000.

Szydlowski, Donald F.; and Suljak, George T., to International Fuel Cells Corporation. Compact chemical reaction vessel. 4,861,347, Cl. 48-61.000.

T.A.C. (Tongerese Automaten Centrale): *See—*
Morin, Claude, 4,860,389, Cl. 2-424.000.

Tabei, Shigeru, to Tobu Electric Co., Ltd. Thermal switch. 4,862,133, Cl. 337-102.000

Taber, Terry R.: *See—*
Burns, Paul A.; and Taber, Terry R., 4,861,701, Cl. 430-543.000.

Tabet, Nicolas N.: *See—*
Elliott, Randy D.; and Tabet, Nicolas N., 4,861,972, Cl. 235-462.000.

Tabuchi, Kenji; and Kanada, Tomohisa, to Minolta Camera Kabushiki Kaisha. Cleaning device. 4,862,221, Cl. 355-300.000.

Tachibana, Natsuki: *See—*
Ichihara, Isey; Toshimitsu, Kenshi; and Tachibana, Natsuki, 4,862,213, Cl. 355-245.000.

Tachibana, Tadashi: *See—*
Hashimoto, Masashi; and Tachibana, Tadashi, 4,862,413, Cl. 365-104.000.

Tactile Perceptions, Inc.: *See—*
Knutti, James W.; Allen, Henry V.; Petersen, Kurt E.; and Kowalski, Carl R., 4,861,420, Cl. 156-633.000

Tacy, Robert: *See—*
Garay, Gabriel L.; Garay, Anne-Ly; and Tacy, Robert, 4,861,268, Cl. 433-229.000.

Tada, Kuniyuki: *See—*
Iwayama, Kazuyoshi; Magatani, Yasuhiro; and Tada, Kuniyuki, 4,861,928, Cl. 570-202.000.

Tada, Shinsaku: *See—*
Nakano, Sota; and Tada, Shinsaku, 4,861,375, Cl. 106-90.000.

Tada, Tetsuya; Nagasaka, Masumi; Iwamoto, Kouji; Teratani, Tatsuo; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Yagi, Kiyoshi, to Toyota Jidosha Kabushiki Kaisha; and Fujitsu Ten Kabushiki Kaisha. Automatic speed control apparatus for controlling vehicle speed at set speed. 4,862,367, Cl. 364-426.040.

Tadokoro, Michihiro; Okada, Kazuo; and Imai, Hitoshi, to Mitsubishi Denki Kabushiki Kaisha. Focus detecting apparatus utilizing reflecting surface having variable reflectivity or transmissivity. 4,862,442, Cl. 369-45.000.

Taguchi, Hiromi: *See—*
Furuya, Osamu; and Taguchi, Hiromi, 4,860,860, Cl. 188-77.00R.

Taguchi, Tomishige: *See—*
Takei, Masahiro; Sakata, Tsuguhide; Taguchi, Tomishige; and Kawasaki, Somei, 4,862,250, Cl. 358-12.000.

Taiho Pharmaceutical Company, Limited: *See—*
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; Ohbayashi, Hisashi; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; and Ohbayashi, Hisashi, 4,861,768, Cl. 514-195.000

Tajima, Shoji; Kadomatsu, Yasuo; Miyazaki, Yoshio; Sakurai, Michikazu; and Anze, Kimio, to Ricoh Co., Ltd. Developer carrier. 4,860,417, Cl. 29-130.000.

Takacs, Kalman; Ajzert, Ilona K.; Kellner, Katalin M.; Fleischer, Judit, Puskas, Mariann E.; and Rimai, Jozsef, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Process for the preparation of 3,4-dihydroisoquinoline. 4,861,888, Cl. 546-150.000.

Takada, Juichiro, to Takata Corporation. Anchoring device for seat belt. 4,861,071, Cl. 280-808.000.

Takada, Makoto: *See—*
Fujita, Shigeru; Banzai, Hideo; and Takada, Makoto, 4,862,385, Cl. 364-518.000.

Takada, Minoru, to Nissei Jushi Kogyo Kabushiki Kaisha. Mold clamping device. 4,861,259, Cl. 425-451.200.

Takada, Takashi; Hirao, Kenichi; Tanaka, Hiroyoshi; and Suzuki, Mitsuo, to Toray Industries, Inc. High tenacity acrylonitrile fibers and a process for production thereof. 4,861,659, Cl. 428-364.000.

Takada, Toshiyuki, to Ricoh Company, Ltd. Color facsimile machine with a color selection function. 4,862,254, Cl. 358-75.000.

Takada, Yoshihiro: *See—*
Kutami, Atsushi; Hashimoto, Akira; and Takada, Yoshihiro, 4,862,211, Cl. 355-212.000.

Takagi, Atsushi: *See—*
Yoshida, Nobutoshi; Miyke, Nobuyuki; Takagi, Atsushi; Saito, Takashi; Suzuki, Tadashi; Ohki, Naoyuki; Tomosada, Masahiro; Adachi, Hideki; and Takeda, Hiroaki, 4,862,219, Cl. 355-202.000.

Takagi, Shiro, to Kabushiki Kaisha Toshiba. Information processor with multi-window display function. 4,862,389, Cl. 364-521.000.

Takahashi, Atsushi: *See—*
Fujii, Hiroshi; and Takahashi, Atsushi, 4,860,494, Cl. 49-493.000.

Takahashi, Hiroshi: *See—*
Hiruma, Toshihiko; Takahashi, Hiroshi; and Kato, Norihiko, 4,861,698, Cl. 430-272.000.

Takahashi, Hirotake, to Honda Giken Kogyo Kabushiki Kaisha. Saddle riding type vehicle. 4,860,850, Cl. 180-215.000.

Takahashi, Junji: *See—*
Tada, Tetsuya; Nagasaka, Masumi; Iwamoto, Kouji; Teratani, Tatsuo; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Yagi, Kiyoshi, 4,862,367, Cl. 364-426.040.

Takahashi, Katsutoshi: *See—*
Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumio; and Takahashi, Katsutoshi, 4,861,905, Cl. 556-40.000.

Takahashi, Kazuki: *See—*
Shibata, Hiroki; Toda, Atsushi; Takahashi, Kazuki; and Wada, Kiyoshi, 4,860,601, Cl. 73-865.800.

Takahashi, Keiichi: *See—*
Sato, Kazuhiko; Nishiura, Junji; and Takahashi, Keiichi, 4,862,071, Cl. 324-73.00R.

Takahashi, Kosei: *See—*
Suyama, Takahiro; Takahashi, Kosei; Kondo, Masafumi; and Hayakawa, Toshiro, 4,862,470, Cl. 372-45.000.

Takahashi, Michiharu: *See—*
Natio, Yoshiyuki; and Takahashi, Michiharu, 4,862,174, Cl. 342-1.000.

Takahashi, Mitsugu: *See—*
Kaibuki, Shigeo; Watanabe, Shinpei; Takahashi, Mitsugu; and Moriya, Hiroshi, 4,860,424, Cl. 29-434.000.

Takahashi, Sadanobu: *See—*
Teteishi, Iwao; Ogura, Yoshiyuki; Hashimoto, Takeshi; Ritou, Tuguyoshi; Kajiyama, Katsufumi; Shimizu, Fumiaki; Tanaka, Kenji; Aibara, Yutaka; Kataoka, Hiroaki; Nakai, Katsuya; Yoshikawa, Takashi; Kanamori, Masaaki; Miyajima, Masao; Seki, Shuzo; and Takahashi, Sadanobu, 4,860,523, Cl. 53-512.000.

Takahashi, Sankichi: *See—*
Ishida, Masahiko; Haga, Ryooichi; Odawara, Yoji; Takahashi, Sankichi; and Ebara, Katsuya, 4,861,383, Cl. 127-67.000.

Takahashi, Shingo: *See—*
Tanaka, Sakae; Yamaoka, Tadahiko; Takahashi, Shingo; and Takahashi, Tomoaki, 4,861,142, Cl. 350-345.000.

Takahashi, Tatsuo: *See—*
Shirouzu, Tatsuji; Takahashi, Tatsuo; Sato, Motoo; and Mizuno, Satoshi, 4,862,313, Cl. 361-102.000.

Takahashi, Tomoaki: *See—*
Tanaka, Sakae; Yamaoka, Tadahiko; Takahashi, Shingo; and Takahashi, Tomoaki, 4,861,142, Cl. 350-345.000.

Takahashi, Toshihiro; Horaguchi, Tatsuo; Nakamaru, Koichi; and Suzuki, Yoshikuni, to Nisshin Flour Milling Co., Ltd. 4(3H)-quinazolinone derivatives and pharmaceutical compositions. 4,861,780, Cl. 514-259.000.

Takahashi, Toshinori: *See—*
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Miyazaki, Kenichi; Takahashi, Toshinori; Kitamura, Hiroki; Shinya, Tadao; and Mizoguchi, Yutaka, 4,862,255, Cl. 358-80.000.

Takahashi, Yoji: *See—*
Okada, Itaru; Okui, Shuko; Nishimata, Mana; Takahashi, Yoji; and Fukuchi, Toshiki, 4,861,777, Cl. 514-234.500.

Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Miyazaki, Kenichi; Takahashi, Toshinori; Kitamura, Hiroki; Shinya, Tadao; and Mizoguchi, Yutaka, to Victor Company of Japan, Ltd. Color correcting circuit for thermal printer selectively outputting a second degree correction operation result and a modified result thereof. 4,862,255, Cl. 358-80.000.

Takano, Hiroshi: *See—*
Ishikawa, Hiroshi; Takano, Hiroshi; Ohtomo, Ryosuke; Hoshino, Yoshinori; and Ohyama, Taro, 4,861,647, Cl. 428-216.000.

Takano, Kazuya; and Noguchi, Takeshi, to Bridgestone Corporation. Anti-vibration apparatus. 4,861,006, Cl. 267-140.100.

Takase, Shigehiro: *See—*
Kohsaka, Masanobu; Terano, Hiroshi; Komori, Tadaaki; Iwami, Morita; Yamashita, Michio; Hashimoto, Masashi; Uchida, Itsuo; and Takase, Shigehiro, 4,861,774, Cl. 514-299.500.

Takashi, Osamu: *See—*
Hiraga, Imao; Shimura, Noriaki; Okakura, Yojiro; Kubota, Masaru; and Takashi, Osamu, 4,862,432, Cl. 368-88.000.

Takashima, Masanobu: *See—*
Saeki, Keiso; Takashima, Masanobu; and Iwakura, Ken, 4,861,748, Cl. 503-208.000.

Takata Corporation: *See—*
Takada, Juichiro, 4,861,071, Cl. 280-808.000.

Takata, Kanji: *See—*
Miura, Akira; Takata, Kanji; Okazaki, Ryoji; Uemura, Toyohide; and Kagawa, Keiichi, 4,861,688, Cl. 429-206.000.

Takata, Koji, to Sumitomo Electric Industries, Ltd. Proportioning control valve for use with antilock device. 4,861,114, Cl. 303-9.720.

Takato, Kenji: *See—*
Tojo, Toshiro; Takato, Kenji; Kinoshita, Kazumi; and Yamamoto, Yuzo, 4,862,309, Cl. 361-56.000.

Takatsuka, Masanori, to Yamaha Corp. Racket frame. 4,861,029, Cl. 273-73.00C.

Takaya, Takao; Tozuka, Zenzoburo; Yasuda, Nobuyoshi; and Nishimura, Shintaro, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,861,769, Cl. 514-202.000.

Takayama, Suguru: *See—*
Uchiyama, Kenji; Ishizaki, Hideki; and Takayama, Suguru, 4,861,656, Cl. 428-333.000.

Takayanagi, Takashi; Munekata, Seiji; Miyazaki, Nobuyuki; and Moriwaki, Ken, to Asahi Glass Company, Ltd. Coating composition and coated product. 4,861,667, Cl. 428-421.000.

Takechi, Makoto: *See—*
Kawashima, Masatoshi; Takechi, Makoto; and Odani, Hiroshi, 4,862,068, Cl. 324-73.00R.

Takeda Chemical Industries, Ltd.: *See—*
Mitsui, Susumu; Kurose, Shigeru; and Saimoto, Hiroshi, 4,861,766, Cl. 514-184.000.
Miyabayashi, Shigeaki; Kanai, Hiroshi; Oka, Joji; and Matsuura, Yoshikatsu, 4,861,672, Cl. 428-458.000.

Takeda, Hiroaki: *See—*
Yoshida, Nobutoshi; Miyke, Nobuyuki; Takagi, Atsushi; Saito, Takashi; Suzuki, Tadashi; Ohki, Naoyuki; Tomosada, Masahiro; Adachi, Hideki; and Takeda, Hiroaki, 4,862,219, Cl. 355-202.000.

Takeda, Masayuki: *See—*
Aoki, Takayoshi; Takeda, Masayuki; Nagatsuka, Ikutaroh; Honjo, Toshio; Itoh, Kazuhiro; and Uchida, Kenji, 4,861,694, Cl. 430-137.000.

Takeda, Sakae: *See—*
Koshimizu, Chishio; Hayakawa, Yasuo; Nonaka, Toshio; and Takeda, Sakae, 4,862,383, Cl. 364-507.000.

Takeda, Yoshiaki: *See—*
Fukuzawa, Sooichi; Takeda, Yoshiaki; and Ohwa, Yoshio, 4,860,990, Cl. 251-30.030.

Takei, Hideo: *See—*
Hatayama, Haruaki; Takei, Hideo; Okabe, Takuji; Waku, Yoshiharu; and Ueno, Toyoaki, 4,860,542, Cl. 60-583.000.

Takei, Masahiro; Sakata, Tsuguhide; Taguchi, Tomishige; and Kawasaki, Somei, to Canon Kabushiki Kaisha. Still picture transmitting and receiving system. 4,862,250, Cl. 358-12.000.

Takeshita, Kouji: *See—*
Fukuoka, Hirotsugu; Kawakami, Kanji; Aihara, Makoto; Suda, Mitsuo; Takeshita, Kouji; and Isono, Yukihiro, 4,861,398, Cl. 156-64.000.

Takeuchi, Atsushi, to Fujitsu Limited. Semiconductor memory device with redundant memory cell. 4,862,416, Cl. 371-10.000.

Takeuchi, Hideo: *See—*
Maeda, Masato; and Takeuchi, Hideo, 4,860,574, Cl. 73-27.00A.

Takeuchi, Hiroshi; and Takeuchi, Yoshiaki, to Shinkoh Sellbic Co., Ltd. Cassette-type molding die. 4,861,254, Cl. 425-190.000.

Takeuchi, Mikio: *See—*
Hara, Yasuo; Oashi, Ryuji; Kawahara, Yoshitaka; and Takeuchi, Mikio, 4,861,931, Cl. 585-363.000.

Takeuchi, Tadashi: *See—*
Aburatani, Masakazu; Takeuchi, Tadashi; and Mori, Kenji, 4,861,875, Cl. 540-114.000.

Takeuchi, Yo: *See—*
Asano, Masami; Toma, Ken; and Takeuchi, Yo, 4,861,581, Cl. 428-654.000.

Takeuchi, Yoshiaki: *See—*
Takeuchi, Hiroshi; and Takeuchi, Yoshiaki, 4,861,254, Cl. 425-190.000.

Takeuchi, Yoshikiho, to Yamaha Hatsudoki Kabushiki Kaisha. Exhaust gas control means for motorcycle and the like. 4,860,538, Cl. 60-313.000.

Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; Sakane, Chitose; and Yoshida, Toshihiko, to Sharp Kabushiki Kaisha. Semiconductor laser device. 4,862,472, Cl. 372-45.000.

Takita, Kouhei: *See—*
Kaku, Nobuyuki; Ogiro, Kenji; Osawa, Atsuo; Sasaki, Takashi; and Takita, Kouhei, 4,862,300, Cl. 360-85.000.

Takizawa, Kazushige: *See—*
Matsuo, Mamoru; Okuda, Yutaka; Takizawa, Kazushige; and Sakaki, Hirokazu, 4,861,396, Cl. 148-439.000.

Takizawa, Yoshio: *See—*
Yoshida, Takeshi; Takizawa, Yoshio; and Sekine, Ichiro, 4,861,550, Cl. 420-460.000.

Takvorian, Lawrence K., to Ceradyne, Inc. Method for soldering void-free joints. 4,860,942, Cl. 228-220.000.

Talerico, Maria: *See—*
Becker, Mary G., 4,860,774, Cl. 132-200.000.

Tallent, C. Ray: *See—*
Cook, C. Edgar; Tallent, C. Ray; Reel, Jerry R.; and Wani, Mansukh C., 4,861,763, Cl. 514-172.000.

Tallman, William R.; McDevitt, Steven C.; and Delancey, Warren H., to Yukon Energy Corporation. Power burner-fluid condensing mode furnace. 4,860,725, Cl. 126-110.00R.

Talmadge, Paul C., to Pitney Bowes Inc. Magnetic power coupler for a vault cartridge. 4,862,375, Cl. 364-464.020.

Talonen, Timo T.; I Poijarvi, Jaakko T.; and Metsarinta, Maija-Leena, to Outokumpu Oy. Method for removing the sulphur content of a weak gas containing sulfur dioxide. 4,861,577, Cl. 423-577.000.

Tamagawa, Shigehisa; and Kuroishi, Masayuki, to Fuji Photo Film Co., Ltd. Light-sensitive material comprising light-sensitive layer provided on support having low air permeability. 4,861,696, Cl. 430-138.000.

Tamaki, Yoji; Kino, Takuya; Ito, Takashi; and Nakamura, Akihiko, to Pokka Corporation; and NGK Insulators Ltd. Coffee beans roasting device. 4,860,461, Cl. 34-68.000.

Tana Jyra Ky: *See—*
Sinkkonen, Matti, 4,861,187, Cl. 404-72.000.

Tanabe, Mamoru: *See—*
Yokota, Motoyuki; Tanabe, Mamoru; and Fujiki, Tatsuo, 4,861,004, Cl. 267-140.100.

Tanaka, Akira: *See—*
Fukamachi, Masaaki; Onitsuka, Nobuyuki; Tanaka, Akira; and Nakamura, Kazuo, 4,862,139, Cl. 340-426.000.

Tanaka, Hajime; and Saito, Shiro. Wippen heel mechanism for an upright piano. 4,860,626, Cl. 84-236.000.

Tanaka, Hideo: *See—*
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; Ohbayashi, Hisashi; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; and Ohbayashi, Hisashi, 4,861,768, Cl. 514-195.000.
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; Ohbayashi, Hisashi; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; and Ohbayashi, Hisashi, 4,861,768, Cl. 514-195.000.

Tanaka, Hideshi: *See—*
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Miyazaki, Kenichi; Takahashi, Toshinori; Kitamura, Hiroki; Shinya, Tadao; and Mizoguchi, Yutaka, 4,862,255, Cl. 358-80.000.

Tanaka, Hiroyoshi: *See—*
Takada, Takashi; Hirao, Kenichi; Tanaka, Hiroyoshi; and Suzuki, Mitsuo, 4,861,659, Cl. 428-364.000.

Tanaka, Kenichi: *See*—
Ihara, Masahiro; Suzuki, Kazuo; Maekawa, Hideya; Ito, Haremi; and Tanaka, Kenichi, 4,861,626, Cl. 427-133.000

Tanaka, Kenji: *See*—
Teteishi, Iwao; Ogura, Yoshiyuki; Hashimoto, Takeshi; Ritou, Tuguyoshi; Kajiyama, Katsufumi; Shimizu, Fumiaki; Tanaka, Kenji; Aibara, Yutaka; Kataoka, Hiroaki; Nakai, Katsuya; Yoshikawa, Takashi; Kanamori, Masaaki; Miyajima, Masao; Seki, Shuzo; and Takahashi, Sadanobu, 4,860,523, Cl. 53-512.000.

Tanaka, Kiichi, to Shindengen Kogyo Kabushiki Kaisha. Ringing choke converter using single switching element. 4,862,338, Cl. 363-19.000.

Tanaka, Kimio; Sasaki, Morimasa; and Ikebe, Masaru, to TDK Corporation. Disc cartridge and casing therefor. 4,862,448, Cl. 369-291.000.

Tanaka, Motoaki: *See*—
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; Ohbayashi, Hisashi; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; and Ohbayashi, Hisashi, 4,861,768, Cl. 514-195.000.
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; Ohbayashi, Hisashi; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; and Ohbayashi, Hisashi, 4,861,768, Cl. 514-195.000.

Tanaka, Nobuyuki, to Fuji Photo Film Co., Ltd. Image signal compressing method by vector quantization. 4,862,261, Cl. 358-133.000.

Tanaka, Nobuyuki, to Fuji Photo Film Co., Ltd. Method of compressing image signals by vector quantization. 4,862,262, Cl. 358-133.000

Tanaka, Noriko, to Okuno Chemical Industries Co., Ltd. Zinc-nickel alloy plating bath and plating method. 4,861,442, Cl. 204-44.200.

Tanaka, Sakae; Yamaoka, Tadahiko; Takahashi, Shingo; and Takahashi, Tomoaki, to Seikosha Co., Ltd. Projection type liquid crystal displaying device. 4,861,142, Cl. 350-345.000.

Tanaka, Shinichi; and Matsukawa, Shigeru, to Matsushita Electric Industrial Co., Ltd. Method of formatting a storage medium and drive unit for controlling the reading and writing of data on the formatted storage medium. 4,862,295, Cl. 360-48.000.

Tanaka, Tsunefumi, to Canon Kabushiki Kaisha. Zoom lens system. 4,861,147, Cl. 350-429.000

Tang, Jiunn-Yann; Brown, Regina A.; and Ke, Victor H., to Frito-Lay, Inc. Sheetable thermostable filling composition. 4,861,604, Cl. 426-94.000.

Tangerini, Ilario: *See*—
Guerriero, Renato; and Tangerini, Ilario, 4,861,679, Cl. 428-614.000.

Tani, Shichisei: *See*—
Hirose, Ichiro; Tani, Shichisei; Inamura, Motonori; and Koyama, Takashi, 4,861,324, Cl. 493-48.000.

Taniguchi, Akira: *See*—
Yanagawa, Yutaka; and Taniguchi, Akira, 4,860,758, Cl. 128-662.060.

Taniguchi, Nobuyuki; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; Hoda, Takeo; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Photographic camera. 4,862,201, Cl. 354-105.000.

Taniguchi, Nobuyuki: *See*—
Ishida, Tokuji; Hamada, Masataka; Karasaki, Toshihiko; Norita, Toshio; and Taniguchi, Nobuyuki, 4,862,204, Cl. 354-408.000.

Tanimoto, Tetsuyuki: *See*—
Saito, Mitsuru; Umeda, Kaoru; and Tanimoto, Tetsuyuki, 4,862,293, Cl. 360-35.100.

Tanner, Werner: *See*—
Bolli, Peter; Looser, Heniz; and Tanner, Werner, 4,861,306, Cl. 446-90.000.

Tanno, Kohtarou: *See*—
Hattori, Osamu; Gotoh, Toshihiko; and Tanno, Kohtarou, 4,862,193, Cl. 346-76.0PH.

Tansey, Ian P.: *See*—
Kirk, William F.; Wass, Anthony C. L.; Baum, Eric A.; Tansey, Ian P.; and Meredith, William G., 4,860,740, Cl. 128-203.150.

Tanzawa, Misao; Sakamoto, Koji; and Satoh, Mitsuru, to Ricoh Company, Ltd. Image forming apparatus. 4,862,212, Cl. 355-3.00A.

Tanzawa, Misao: *See*—
Sakamoto, Koji; and Tanzawa, Misao, 4,862,209, Cl. 355-211.000.

Tao, Billy S. K. Movement monitor. 4,862,144, Cl. 340-573.000.

Tardy, Andre ; and Jurczyszyn, Michel, to Societe anonyme dite Compagnie Generale D'Electricite. Optical fiber multipoint measuring device with time multiplexing. 4,861,979, Cl. 250-227.000.

Tartan Transportation Systems, Inc.: *See*—
Schult, Leslie H.; and Tekautz, Charles J., Jr., 4,861,060, Cl. 280-439.000.

Tate & Lyle PLC: *See*—
Goodacre, Brita C.; and Smithson, Alan, 4,861,382, Cl. 127-60.000.

Tatemoto, Masayoshi; Yutani, Yuji; and Fujiwara, Koji, to Daikin Industries Ltd. Novel, iodine-containing compound, preparation thereof and block copolymer comprising the same. 4,861,836, Cl. 525-276.000.

Taurus Gumiipari Vallalat: *See*—
Kovacs, Ferenc; Lengyel, Miklosne ; Nagy, Tibor; Antal, Sandor; Gyongyosi, Gyorgy; Palotas, Laszlo ; and Pfisztner, Nandor, 4,860,798, Cl. 138-133.000.

Tawada, Yoshihisa: *See*—
Tsuge, Kazunori; Kuwamura, Shinji; and Tawada, Yoshihisa, 4,862,227, Cl. 357-2.000.

Taylor, Clive R.: *See*—
Epstein, Alan L.; and Taylor, Clive R., 4,861,581, Cl. 424-1.100

Taylor, John B., to Brandt, Inc. High bypass ratio counterrotating gearless front fan engine. 4,860,537, Cl. 60-226.100

Taylor, Ronald T.; Giles, George A.; and David, Doran, to Texas Instruments Incorporated. Noise reduction for output drivers. 4,862,018, Cl. 307-443.000.

Taylor, William M.: *See*—
Cassity, Thomas G.; Montgomery, William C.; Baker, Gerald S.; Wedel, Alfred W.; and Taylor, William M., 4,862,426, Cl. 367-81.000.

Tazuke, Hisashi: *See*—
Yamaguchi, Shogo; Araki, Kazunori; and Tazuke, Hisashi, 4,860,802, Cl. 141-6.000
Yamaguchi, Shogo; and Tazuke, Hisashi, 4,860,804, Cl. 141-94.000.

TD Quilting Machinery: *See*—
Brower, David; and Jernigan, Thomas K., 4,860,675, Cl. 112-119.000.

TDK Corporation: *See*—
Ono, Shuichi; Yahagi, Masahiro; Itagaki, Shuichi; and Kikuchi, Nobuaki, 4,861,736, Cl. 501-137.000.
Tanaka, Kimio; Sasaki, Morimasa; and Ikebe, Masaru, 4,862,448, Cl. 369-291.000.
Uchiyama, Kenji; Ishizaki, Hideki; and Takayama, Suguru, 4,861,656, Cl. 428-333.000.

Technicon Instruments Corporation: *See*—
Mawhirt, James A.; Cantatore, Luigi; DiFlora, Joseph E.; McCandless, William J. C.; and Treb, Marvin, 4,861,553, Cl. 422-65.000.

Technicon Research A.G.: *See*—
Ulitzur, Shimon Y.; and Kuhn, Jonathan C., 4,861,709, Cl. 435-6.000.

Tegal Corporation: *See*—
Mirkovich, Ninko T., 4,861,222, Cl. 414-648.000

Teijin Limited: *See*—
Ishii, Seiji, 4,861,660, Cl. 428-371.000.

Tekautz, Charles J., Jr.: *See*—
Schult, Leslie H.; and Tekautz, Charles J., Jr., 4,861,060, Cl. 280-439.000.

Tektronix, Inc.: *See*—
Cowan, Clarence E.; and Christensen, Ronald K., 4,862,020, Cl. 307-601.000
Dalrymple, John C.; and Paul, Byron G., 4,862,155, Cl. 340-747.000.
Hayes, Raymond; and Heidtmann, Denis L., 4,862,235, Cl. 357-24.000.
LaVoie, Marvin E., 4,862,102, Cl. 330-256.000.
Spence, Gary A., 4,862,096, Cl. 328-75.000.
Tilden, Mark D., 4,862,138, Cl. 340-146.200.
Williams, David L., 4,862,353, Cl. 364-200.000.

Telecommunications Radioelectriques Et Telephoniques T.R.T: *See*—
Guidoux, Loic B. Y., 4,862,450, Cl. 370-32.100.

Telect, Inc.: *See*—
Warner, Robert J., 4,861,281, Cl. 439-540.000.

Teledyne Industries, Inc.: *See*—
Goode, William B., 4,860,993, Cl. 251-127.000.

Teleflex Incorporated: *See*—
Spease, Arthur L., 4,860,609, Cl. 74-502.400.

Telequest Systems Corporation: *See*—
Seto, Raymond A.; and Soubliere, Marc P., 4,862,497, Cl. 379-355.000.

Teletech Pty. Ltd.: *See*—
La Salle, Roger J.; and Riordan, Roger H S, 4,862,491, Cl. 379-6.000

Temperilli, Aldemio: *See*—
Bernardi, Luigi; Chiodini, Laura; and Temperilli, Aldemio, 4,861,793, Cl. 514-410.000.

Tencor Instruments: *See*—
Vaught, John L., 4,861,125, Cl. 350-6.600.

Tengler, Walter: *See*—
Strobach, Peter; Hoelzlwimmer, Herbert; and Tengler, Walter, 4,862,263, Cl. 358-135.000.

Tenhover, Michael A., to Standard Oil Company. Production of high temperature superconducting materials. 4,861,751, Cl. 505-1.000.

Tenmoku, Kenji: *See*—
Shimizu, Toshiyuki; Shimizu, Osamu; Tenmoku, Kenji; Mitoh, Kunihiko; and Honoki, Yasuhiro, 4,862,398, Cl. 364-571.050.

Tennant Company: *See*—
Ernst, G. D.; and Schuweiler, Alan R., 4,861,825, Cl. 524-839.000.

Terada, Naofumi: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,861,792, Cl. 514-389.000.

Teradyne, Inc.: *See*—
Ostertag, Edward A., 4,862,070, Cl. 324-73.00R.

Terakawa, Takashige: *See*—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,860,770, Cl. 128-804.000.

Terano, Hiroshi: *See*—
Kohsaka, Masanobu; Terano, Hiroshi; Komori, Tadaaki; Iwami, Morita; Yamashita, Michio; Hashimoto, Masashi; Uchida, Itsuo; and Takase, Shigehiro, 4,861,774, Cl. 514-299.500.

Terashima, Shigeo: *See*—
Tsuji, Kentaroh; Maeda, Shigemi; Yamaguchi, Takeshi; Deguchi, Toshihisa; Sakamoto, Noriaki; and Terashima, Shigeo, 4,862,443, Cl. 369-59.000.

Teratani, Tatsuo: *See*—
Tada, Tetsuya; Nagasaka, Masumi; Iwamoto, Kouji; Teratani, Tatsuo; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Yagi, Kiyoshi, 4,862,367, Cl. 364-426.040.

Terex Corporation: *See*—
Parrett, John T.; Fairbairn, James P.; and Jaworski, Walter, 4,860,539, Cl. 60-426.000.

Terry, Clifford M. Visual acuity testing system. 4,861,156, Cl. 351-243.000.

Terumo Corporation: *See*—
Suzuki, Kazuhiko; and Yoshioka, Hiroshi, 4,861,521, Cl. 260-403.000.

Terumo Kabushiki Kaisha: *See*—
Ushizawa, Norihiko; and Shimomura, Takeshi, 4,861,454, Cl. 204-414.000.

Teteishi, Iwao; Ogura, Yoshiyuki; Hashimoto, Takeshi; Ritou, Tuguyoshi; Kajiyama, Katsufumi; Shimizu, Fumiaki; Tanaka, Kenji; Aibara, Yutaka; Kataoka, Hiroaki; Nakai, Katsuya; Yoshikawa, Takashi; Kanamori, Masaaki; Miyajima, Masao; Seki, Shuzo: and Takahashi, Sadanobu, to Sharp Kabushiki Kaisha; and Nihon Dennetsu Co., Ltd. Hermetic packaging apparatus. 4,860,523, Cl. 53-512.000.

Tettman, Barton J., to Allied-Signal Inc. Dual function air filter. 4,861,359, Cl. 55-419.000.

Texaco Inc.: *See*—
Dowling, Donald J.; and Sims, Jackie C., 4,862,001, Cl. 250-345.000.
Najjar, Mitri S.; Yaghmaie, Farokh; and Sorell, Louis S., 4,861,346, Cl. 44-51.000.

Texas Instruments Incorporated: *See*—
Ashmore, Benjamin H., Jr., 4,862,019, Cl. 307-469.000.
Bienstock, Rachelle J., 4,861,421, Cl. 156-635.000.
Derryberry, Lesli; and Petrovich, Tom, 4,862,247, Cl. 357-74.000.
Flinchbaugh, Bruce E.; Dolins, Steven B.; Srivastava, Aditya; and Reese, Jon, 4,861,419, Cl. 156-626.000.
Hashimoto, Masashi; and Tachibana, Tadashi, 4,862,413, Cl. 365-104.000.
Hochschild, James R.; and Severin, William A., 4,862,121, Cl. 333-173.000.
Lisauskas, Richard J., 4,862,306, Cl. 361-24.000.
Meng, Alex C-C, 4,862,373, Cl. 364-444.000.
Sanford, Carlton E., 4,861,953, Cl. 200-83.00P.
Stierman, Roger J.; McCauley, Archie N.; and Zart, Robert C., 4,861,452, Cl. 204-297.00W.
Taylor, Ronald T.; Giles, George A.; and David, Doran, 4,862,018, Cl. 307-443.000.
Tran, Hiep V., 4,862,421, Cl. 365-189.070.
Welch, Michael T.; McMann, Ronald E.; Torreno, Manuel L., Jr.; and Garcia, Evaristo, Jr., 4,862,243, Cl. 357-51.000.

Texas Scottish Rite Hospital for Crippled Children: *See*—
Ross, J. David, 4,862,172, Cl. 341-157.000.

Tezuka, Shigeru, to Fuji Photo Film Co., Ltd. Method of producing gel sheet for electrophoresis. 4,861,411, Cl. 156-344.000.

Th. Goldschmidt AG: *See*—
Bade, Volkbert, 4,861,517, Cl. 252-546.000.
Ward, Robert S., Jr., 4,861,830, Cl. 525-92.000.

Thaxton, George K. Tennis practice and game apparatus. 4,861,027, Cl. 273-29.00A.

Theodore, Ares N.; and Killgoar, Paul C., Jr., to Ford Motor Company. Wiper blade compositions. 4,861,819, Cl. 524-491.000.

Therma-Tru Corp.: *See*—
Thorn, John E., 4,860,512, Cl. 52-309.110.

Thermapeutics, Inc.: *See*—
Chiurco, Anthony A.; and Littman, Michael G., 4,860,748, Cl. 128-399.000.

Therond, Jean-Francois: *See*—
Cretin, Jacques; Therond, Jean-Francois; and Saussier, Daniel, 4,862,425, Cl. 367-33.000.

Thiele, Robert E.: *See*—
DePietro, Mark A.; Klim, William T.; Ashworth, Robert H.; and Thiele, Robert E., 4,860,812, Cl. 160-135.000.

Thom, David: *See*—
Cornelissen, Johannes M.; Klugkist, Jan; Lagerwaard, Cornelis A.; Swarthoff Ton; Thom, David; and Thom, David, 4,861,509, Cl. 252-174.120.
Cornelissen, Johannes M.; Klugkist, Jan; Lagerwaard, Cornelis A.; Swarthoff Ton; Thom, David; and Thom, David, 4,861,509, Cl. 252-174.120.

Thomas, Byron E., to Puritan-Bennett Aero Systems Company. Smoke alarm with dropout smoke hood. 4,862,147, Cl. 340-628.000.

Thomas Industries, Inc.: *See*—
Wenman, James A.; Bray, Douglas; R.; and Porter, David H., 4,861,273, Cl. 439-111.000.

Thomas, Jean-Yves: *See*—
Lavarini, Bernard; Crancon, Jean-Pierre; and Thomas, Jean-Yves, 4,862,100, Cl. 330-4.300.

Thomas, Michael D. Variable force exerting clamp assembly having a variable clamping area. 4,861,009, Cl. 269-43.000.

Thompson, Barbara A.: *See*—
Yassa, Fatby F.; and Thompson, Barbara A., 4,862,098, Cl. 329-50.000.

Thompson, David B.; Preskitt, Stanley V.; Downing, Harvey L.; and Allred, Michael V., to Dallas Instruments Incorporated. Drop height recorder. 4,862,394, Cl. 364-551.010.

Thompson, Philip W.: *See*—
Kenney, Andrew C.; Thompson, Philip W.; and Harris, John L., 4,861,488, Cl. 210-656.000.

Thompson, Robert A., to General Electric Company. Passive actuator to maintain a constant normal cutting force during robotic deburring. 4,860,500, Cl. 51-165.770.

Thomson-CGR *See*—
Aubert, Guy; and Kaplan, Daniel, 4,862,085, Cl. 324-315.000.

Thomson-CSF: *See*—
Benhamou, Andre , 4,861,998, Cl. 250-339.000.
Cazaux, Yvon, 4,862,274, Cl. 358-213.240.
Monvoisin, Jacques; and Trubett, Valdo, 4,862,188, Cl. 343-840.000.
Vieux, Gerard; Rougeot, Henri; and Diaz, Francis, 4,862,006, Cl. 250-483.100.
Warnan, Francois; Barbot, Joel;; and Brochard, Claude, 4,861,297, Cl. 441-33.000.

Thomson, Graham C., III: *See*—
Simmons, Eugene D.; Thomson, Graham C., III; and Reynaud, Richard J., 4,861,239, Cl. 417-383.000.

Thone, Gerard F.: *See*—
Weierstall, Richard P.; Enever, Robin P.; Brunelle, Kathleen L.; Thone, Gerard F.; and Warner, Ronald N., 4,861,591, Cl. 424-690.000.

Thorn, John E., to Therma-Tru Corp. Compression molded door assembly. 4,860,512, Cl. 52-309.110.

Thorne, Clarence R.: *See*—
Ivey, Charles W.; Wilson, David G.; and Thorne, Clarence R., 4,862,334, Cl. 362-149.000.

Thrum, Heinz: *See*—
Bergter, Friedrich; Bocker, Harald; Bormann, Ernst-Joachim; Forberg, Wolfgang; Fricke, Heinz; Grafe, Udo; Grosse, Hans-Helmut; Heller, Ingeborg; Hilliger, Matthias; Junne, Wolf; Linde, Heilmut; Menner, Michael; Menzel, Klaus-Dieter; Muller, Peter-Jurger; Plonka, Gunter; Pohl, Hans D.; Schneider, Jorg; and Thrum, Heinz, 4,861,715, Cl. 435-70.000.

Thyssen Industrie AG: *See*—
Raschbichler, Hans G.; Miller, Luitpold; Wcislo, Manfred; and Breitenbach, Otto, 4,860,430, Cl. 29-596.000.

Tien, Spencer W. H.; and Matheny, Ronnie A. Portable rechargeable battery. 4,861,685, Cl. 429-7.000.

Tilden, Mark D., to Tektronix, Inc. Programmable comparator output filter. 4,862,138, Cl. 340-146.200.

Tima, Milan-Josef: *See*—
Sirinyan, Kirkor; Laue, Hans-Joachim; Merten, Rudolf; Michael, Dietrich; and Tima, Milan-Josef, 4,861,663, Cl. 428-409.000.

Timelapse, Inc.: *See*—
Sobut, Bruce, 4,862,163, Cl. 340-940.000.

Timex Corporation: *See*—
Reichel, Judith; and Olsen, Kristin M., 4,862,435, Cl. 368-282.000.

Timmerman, Daniel M.; Priem, Jan J.; and Janssens, Wilhelmus, to Agfa-Gevaert, N.V. Method for the preparation of stable aqueous dispersions of polymer beads and the use of these dispersions in photographic elements. 4,861,818, Cl. 524-460.000.

Tjurin, Jury G.: *See*—
Khutoretsky, Garri M.; Tjurin, Jury G.; Yakovlev, Viktor S.; and Varshavsky, Vladimir D., 4,862,022, Cl. 310-52.000.

TLV Co., Ltd.: *See*—
Fujiwara, Katsuji; and Yumoto, Hideaki, 4,860,782, Cl. 137-193.000.

TMC Corporation: *See*—
Stritzl, Karl; Wurthner, Hubert; and Riegler, Andreas, 4,861,064, Cl. 280-618.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Funayama, Osamu; Arai, Mikiro; and Isoda, Takeshi, 4,861,569, Cl. 423-324.000.

Tobita, Hideaki: *See*—
Naruse, Kazuo; Tobita, Hideaki; and Shibata, Yoichi, 4,860,663, Cl. 104-162.000.

Tobu Electric Co., Ltd.: *See*—
Tabei, Shigeru, 4,862,133, Cl. 337-102.000.

Toda, Atsushi: *See*—
Shibata, Hiroki; Toda, Atsushi; Takahashi, Kazuki; and Wada, Kiyoshi, 4,860,601, Cl. 73-865.800.

Toda, Haruki; Sahara, Hiroshi; and Ohshima, Shigeo, to Kabushiki Kaisha Toshiba. Internal interleaving type semiconductor memory device. 4,862,420, Cl. 365-221.000.

Toda, Kouichi; and Hashizu, Masaaki, to Anritsu Corporation. Signal generating apparatus using PLL circuit. 4,862,106, Cl. 331-2.000.

Todd, Gary J. Bow string release device. 4,860,720, Cl. 124-35.00A.

Todman, Michael T., to Rolls-Royce PLC. Variable stator vane assembly. 4,861,228, Cl. 415-115.000.

Toews, Harvey R. Throwing toy. 4,861,304, Cl. 446-34.000.

Togashi, Shigeru: *See*—
Aoki, Ken; Hoshi, Katsuhiko; Satoh, Shigeo; Kakinuma, Mitsuru; Togashi, Shigeru; and Saitoh, Hiromi, 4,860,550, Cl. 62-135.000.

Toho Rayon Co., Ltd.: *See*—
Ogawa, Hiroyasu; Shimazaki, Kenji; and Niijima, Kenji, 4,861,809, Cl. 523-149.000.

Tojo, Kenji; Kawashima, Kenichi; Suefuji, Kazutaka; and Nakamura, Yozo, to Hitachi, Ltd. Scroll compressor with sealed pressure space biasing the orbiting scroll member. 4,861,245, Cl. 418-55.000.

Tojo, Toshiro; Takato, Kenji; Kinoshita, Kazumi; and Yamamoto, Yuzo, to Fujitsu Limited. Protection circuit for battery feed circuit. 4,862,309, Cl. 361-56.000.

Toki, Tadaaki: *See*—
Haga, Takahiro; Toki, Tadaaki; Koyanagi, Toru; Fujii, Yasuhiro; Yoshida, Kiyomitsu; and Imai, Osamu, 4,861,799, Cl. 514-594.000.

Tokitoh, Yasuo; and Yoshimura, Noriaki, to Kuraray Company, Ltd. Hydroformylation of 3-methyl-3-buten-1-ol and analogs thereof and use of such hydroformylation products. 4,861,922, Cl. 568-865.000.

Tokuhara, Masaharu: *See*—
Sonoda, Yutaka; Yuchi, Hirofumi; Murakami, Kyoichi; and Tokuhara, Masaharu, 4,862,269, Cl. 358-160.000

Tokunaga, Yoshikatu: *See*—
Saitoo, Shuuji; and Tokunaga, Yoshikatu, 4,862,321, Cl. 361-385.000.

Tokuyama, Takashi: *See*—
Hashimoto, Youichi; Tokuyama, Takashi; Nishiga, Kazuya; Arai, Yoshihiro; Ueki, Nobuhide; and Adachi, Naoki, 4,862,170, Cl. 341-144.000

Tokyo Electric Co., Ltd.: *See*—
Uematsu, Kaoru, 4,862,194, Cl. 346-76.0PH.

Tokyo Keiki Co., Ltd.: *See*—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,860,770, Cl. 128-804.000

Tolfree, Roger K.: *See*—
West, Barry G.; Sosin, Boleslaw M.; and Tolfree, Roger K., 4,862,453, Cl. 370-82.000

Toma, Ken: *See*—
Asano, Masami; Toma, Ken; and Takeuchi, Yo, 4,861,681, Cl 428-654.000

Tominaga, Fukutoshi; Iwanaga, Mitsuo; and Yokomizo, Hiromichi, to Nishimu Electronics Industries Co., Ltd. Ferroresonant constant AC voltage transformer. 4,862,059, Cl. 323-307.000.

Tominaga, Shinji: *See*—
Ootsuka, Hiroshi; Tominaga, Shinji; Kobayashi, Haruo; Matsushita, Shuzo; Hoda, Takeo; and Mukai, Hiromu, 4,862,206, Cl. 354-414.000.

Tomizawa, Atsushi: *See*—
Masui, Takeshi; Matsumoto, Yoshiro; Tomizawa, Atsushi; and Hirooka, Eiji, 4,860,416, Cl. 29-116.200.

Tomkinson, Donald L.: *See*—
Walles, Wilhem E.; and Tomkinson, Donald L., 4,861,250, Cl. 425-90.000

Tomlinson, Christopher J.: *See*—
Green, Howard H.; and Tomlinson, Christopher J., 4,862,351, Cl 364-200.000

Tomosada, Masahiro: *See*—
Yoshida, Nobutoshi; Miyke, Nobuyuki; Takagi, Atsushi; Saito, Takashi; Suzuki, Tadashi; Ohki, Naoyuki; Tomosada, Masahiro; Adachi, Hideki; and Takeda, Hiroaki, 4,862,219, Cl. 355-202.000

Tomy Kogyo Co., Inc.: *See*—
Kakizaki, Katsumi, 4,861,308, Cl. 446-129.000

Topy Kogyo Kabushiki Kaisha: *See*—
Imamura, Tadashi; Shigaki, Kazuyuki; Yamazaki, Yuji; Masuda, Tadashi; and Okumura, Tsunemasa, 4,861,113, Cl. 301-65.000.

Toraichi, Kazuo: *See*—
Hashimoto, Youichi; Tokuyama, Takashi; Nishiga, Kazuya; Arai, Yoshihiro; Ueki, Nobuhide; and Adachi, Naoki, 4,862,170, Cl 341-144.000

Toral, Jose , to AGFA-Gevaert Aktiengesellschaft. Apparatus for taking up and depositing spools. 4,861,086, Cl. 294-88.000

Toray Industries, Inc.: *See*—
Iwayama, Kazuyoshi; Magatani, Yasuhiro; and Tada, Kuniyuki, 4,861,928, Cl. 570-202.000
Takada, Takashi; Hirao, Kenichi; Tanaka, Hiroyoshi; and Suzuki, Mitsuo, 4,861,659, Cl. 428-364.000.

Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; Ohbayashi, Hisashi; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; and Ohbayashi, Hisashi, to Taiho Pharmaceutical Company, Limited. 2 β-substituted thiomethylpenicillin derivatives and their preparation and use. 4,861,768, Cl. 514-195.000.

Toriuchi, Masaharu: *See*—
Yamanouchi, Junichi; and Toriuchi, Masaharu, 4,861,852, Cl. 526-263.000.

Tormanen, Aimo, to Valmet Paper Machinery, Inc. Apparatus in a cantilevered frame part of a paper machine. 4,861,431, Cl 162-273.000.

Torreno, Manuel L., Jr.: *See*—
Welch, Michael T.; McMann, Ronald E.; Torreno, Manuel L., Jr.; and Garcia, Evaristo, Jr., 4,862,243, Cl. 357-51.000

Torstenfelt, Ragnar: *See*—
MAnsson, Martin; and Torstenfelt, Ragnar, 4,860,535, Cl. 60-39.464.

Torza, Sergio: *See*—
Bonander, James; and Torza, Sergio, 4,861,434, Cl. 162-358.000.

Toshiba Ceramics Co., Ltd.: *See*—
Nakao, Shinichi; Yasuda, Shunji; and Ikeda, Shigehito, 4,861,471, Cl. 210-182.000
Yokoyama, Katsunori; Sato, Yukio; and Shimai, Shunzo, 4,862,030, Cl. 310-332.000

Toshiba Kikai Kabushiki Kaisha: *See*—
Fujita, Shigeru; Banzai, Hideo; and Takada, Makoto, 4,862,385, Cl. 364-518.000.

Toshimitsu, Kenshi: *See*—
Ichihara, Issey; Toshimitsu, Kenshi; and Tachibana, Natsuki, 4,862,213, Cl. 355-245.000.

Tosoh Corporation: *See*—
Kasai, Kiyoshi; Sakai, Naomichi; Oikawa, Tomoyuki; Uchino, Kenji; Tsukidate, Takaaki; Asakura, Hiroshi; Yamamura, Hiroshi; and Nagata, Hiroya, 4,862,029, Cl. 310-311.000

Miyake, Takanori; Sekizawa, Kazuhiko; Hironaka, Toshio; and Tsutsumi, Yukihiro, 4,861,929, Cl. 570-209.000

Totani Giken Kogyo Co., Ltd.: *See*—
Totani, Mikio, 4,860,621. Cl. 83-171.000.

Totani, Mikio, to Totani Giken Kogyo Co., Ltd. Heat knife holding device for heat cutting plastic films. 4,860,621, Cl. 83-171.000.

Toto Ltd.: *See*—
Siotani, Masao, 4,861,257, Cl. 425-438.000

Townsend, Arthur M. Filtered waterbed filling system. 4,860,805, Cl. 141-382.000.

Townsend, David F.: *See*—
Edwards, Derek W.; and Townsend, David F., 4,861,376, Cl. 106-123.100.

Towsend, Marvin S., to Genvention, Inc. Portable recording system for telephone conversations. 4,862,509, Cl. 381-163.000.

Tox-Dubel-Werk Richard M. Heckhausen GmbH & Co. KG: *See*—
Riedel, Josef, 4,861,206, Cl. 411-36.000.

Toyo Boseki Kabushiki Kaisha: *See*—
Kanzaki, Takashi, 4,861,621, Cl. 427-54.100.

Toyo Ink Mfg. Co., Ltd.: *See*—
Ishikawa, Hiroshi; Takano, Hiroshi; Ohtomo, Ryosuke; Hoshino, Yoshinori; and Ohyama, Taro, 4,861,647, Cl. 428-216.000.

Toyo Machinery Co., Ltd.: *See*—
Ohya, Seiji; and Harada, Tetsuro, 4,860,497, Cl. 51-98.500.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Harada, Masashi; Miyazaki, Hiroshi; and Itabashi, Keiji, 4,861,571, Cl. 423-328.000

Toyoda, Yasushi; Mishiba, Saburo; and Nishioka, Toshiyasu, to Sumitomo Naugatuck Co., Ltd. Adhesive composition. 4,861,820, Cl. 524-510.000

Toyofuku, Toshiyuki: *See*—
Asakura, Yasuo; and Toyofuku, Toshiyuki, 4,862,207, Cl. 354-453.000

Toyota Jidosha Kabushiki Kaisha: *See*—
Hayashi, Takashi, 4,860,863, Cl. 192-0.033.
Hiraku, Akira; Minezawa, Morio; Katoh, Isao; and Itoh, Kouichi, 4,860,715, Cl. 123-519.000
Naruse, Kazuo; Tobita, Hideaki; and Shibata, Yoichi, 4,860,663, Cl. 104-162.000.
Numazawa, Akio; Sato, Akira; and Ushijima, Fumihiro, 4,860,607, Cl. 74-330.000
Ohata, Akira, 4,860,707, Cl. 123-399.000.
Tada, Tetsuya; Nagasaka, Masumi; Iwamoto, Kouji; Teratani, Tatsuo; Takahashi, Junji; Miyazaki, Akira; Hitotsuya, Masaki; and Yagi, Kiyoshi, 4,862,367, Cl. 364-426.040
Yamashita, Masashi; Sugihara, Koichi; and Kawakami, Hiroshi, 4,860,842, Cl. 180-140.000.

Tozuka, Zenzoburo: *See*—
Takaya, Takao; Tozuka, Zenzoburo; Yasuda, Nobuyoshi; and Nishimura, Shintaro, 4,861,769, Cl. 514-202.000

Tracy, Daniel J.: *See*—
Andrews, George S.; Lamberty, Bernard J.; and Tracy, Daniel J., 4,862,185, Cl. 343-761.000

Tramposch, Kenneth M.; Zusi, Fred C.; and Marathe, Suresh A., to Bristol-Myers Company. Lipoxygenase inhibitory compounds. 4,861,798, Cl. 514-575.000

Tran, Hiep V., to Texas Instruments Incorporated. Sensing and decoding scheme for a BiCMOS read/write memory. 4,862,421, Cl. 365-189.070.

Transpha·m Group: *See*—
Garay, Gabriel L.; Garay, Anne-Ly; and Tacy, Robert, 4,861,268, Cl. 433-229.000

Tremblay, Paul A.: *See*—
Janoff, Andrew S.; Bolcsak, Lois E.; Weiner, Alan L.; Tremblay, Paul A.; Bergamini, Michael V. W.; and Suddith, Robert L., 4,861,580, Cl. 424-1.100

Trettin, Douglas F. Replaceable net for lacrosse stick. 4,861,042, Cl. 273-326.000

Trevellyan, Kenneth A.: *See*—
Jones, Kenneth L., II; O'Connor, Tom R.; and Trevellyan, Kenneth A., 4,861,944, Cl. 174-68.500.

Treybig, Duane S., to Dow Chemical Company, The. Compositions prepared from amino substituted pyrazines and carboxylic acids, carboxylic acid anhydrides, carboxylic acid esters or carboxylic acid halides. 4,861,884, Cl. 544-336.000.

Triboro Electric Corporation: *See*—
Yarmark, Martin J., 4,861,943, Cl. 174-52.100

Trieb, Marvin: *See*—
Mawhirt, James A.; Cantatore, Luigi; DiFlora, Joseph E.; McCandless, William J. C.; and Trieb, Marvin, 4,861,553, Cl. 422-65.000

Trio Kabushiki Kaisha: *See*—
Yamada, Tsuneo, 4,862,179, Cl. 342-359.000.

Trivedi, Sushma S.; Gur, Raquel E.; and Gur, Ruben, to Bio-Logic Systems Corporation. Topographical mapping of brain functionality from neuropsychological test results. 4,862,359, Cl. 364-413.050.

Tromelin, Jacques: *See*—
Vannier, Daniel; and Tromelin, Jacques, 4,862,090, Cl. 324-367.000.

Trubetti, Valdo: *See*—
Monvoisin, Jacques; and Trubett, Valdo, 4,862,188, Cl. 343-840.000.

Trujillo, Suzanne S.: *See*—
Trujillo, Ted A.; and Trujillo, Suzanne S., 4,861,364, Cl. 65-36.000.

Trujillo, Ted A.; and Trujillo, Suzanne S. Method for using stained glass revolving work station with removable work surface. 4,861,364, Cl. 65-36.000

Trundle, Clive, to Plessey Company plc., The. Photochromic gamma butyrolactones. 4,861,899, Cl. 549-58.000.

TRW Inc.: *See*—
Palmer, William B.; and Giebler, Martin M., 4,862,190, Cl. 343-915.000.

Tsubakimoto Chain Co.: *See*—
Shimodaira, Yoshikazu; and Nozawa, Teruo, 4,862,048, Cl. 318-640.000.

Tsuboi, Nobuyoshi: *See*—
Miyamoto, Norifumi; Sato, Yoshio; Tsuboi, Nobuyoshi; Shimada, Satoshi; Sasaki, Hiroshi; Koyanagi, Hiroaki; and Minemura, Hiroyuki, 4,862,440, Cl. 369-45.000.

Tsuboi, Takayuki; Nakazawa, Isao; Harunari, Yoshihiro; Sato, Yasuhisa; and Yamada, Yasuyuki, to Canon Kabushiki Kaisha. Magnification change-over device for camera. 4,862,202, Cl. 354-195.120.

Tsuchiya, Hiroshi: *See*—
Koike, Kiyoshi; Tsuchiya, Hiroshi; and Hayakawa, Tsuyoshi, 4,862,004, Cl. 250-369.000.

Tsuda, Kazuhiro; Kihara, Tomohiko; and Suzuki, Kaoru, to Kabushiki Kaisha Toshiba. Nuclear medical diagnostic apparatus. 4,862,003, Cl. 250-363.020.

Tsuge, Kazunori; Kuwamura, Shinji; and Tawada, Yoshihisa, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Semiconductor device and its manufacturing method. 4,862,227, Cl. 357-2.000.

Tsuji, Kentaroh; Maeda, Shigemi; Yamaguchi, Takeshi; Deguchi, Toshihisa; Sakamoto, Noriaki; and Terashima, Shigeo, to Sharp Kabushiki Kaisha. Sync signal detection apparatus for accurately synchronizing reproduced data. 4,862,443, Cl. 369-59.000.

Tsuji, Kikunosuke: *See*—
Tsunoda, Arihiro; Tsuji, Kikunosuke; Nakakuma, Akira; and Matsushita, Tetsuya, 4,862,218, Cl. 355-235.000.

Tsuji, Nobuaki: *See*—
Suzuki, Akio; Yoshida, Eiji; Nagasaki, Satoru; Arai, Masumi; and Tsuji, Nobuaki, 4,861,702, Cl. 430-564.000.

Tsukidate, Takaaki: *See*—
Kasai, Kiyoshi; Sakai, Naomichi; Oikawa, Tomoyuki; Uchino, Kenji; Tsukidate, Takaaki; Asakura, Hiroshi; Yamamura, Hiroshi; and Nagata, Hiroya, 4,862,029, Cl. 310-311.000.

Tsumazawa, Hiroyuki; Yoshioka, Daigo; and Kuwada, Atsushi, to Minolta Camera Kabushiki Kaisha. Video camera with automatically movable microphone. 4,862,279, Cl. 358-229.000.

Tsunashima, Makoto: *See*—
Ikeda, Hiroshi; Tsunashima, Makoto; and Mieda, Akihiko, 4,861,574, Cl. 423-342.000.

Tsunoda, Arihiro; Tsuji, Kikunosuke; Nakakuma, Akira; and Matsushita, Tetsuya, to Mita Industrial Co., Ltd. Support and adjusting apparatus for an optical unit. 4,862,218, Cl. 355-235.000.

Tsunoyama, Kozo: *See*—
Satoh, Susumu; Matsuoka, Saiji; Obara, Takashi; Tsunoyama, Kozo; and Irie, Toshio, 4,861,390, Cl. 148-12.00R.

Tsuri, Tatsuo: *See*—
Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, 4,861,913, Cl. 562-427.000.

Tsushima, Tadahiko: *See*—
Narisada, Masayuki; Ohtani, Mitsuaki; Watanabe, Fumihiko; Hagishita, Sanji; Seno, Kaoru; Kamata, Susumu; Haga, Nobuhiro; Tsuri, Tatsuo; Tsushima, Tadahiko; and Kawada, Kenji, 4,861,913, Cl. 562-427.000.

Tsutsumi, Yukihiro: *See*—
Miyake, Takanori; Sekizawa, Kazuhiko; Hironaka, Toshio; and Tsutsumi, Yukihiro, 4,861,929, Cl. 570-209.000.

Tu, Jerome C.: *See*—
Gordon, David; Akselrod, Solange; Cohen, Richard J.; Tu, Jerome C.; Burns, Stephen K.; and DeLeon, Victoria H., 4,862,361, Cl. 364-413.060.

Tu, Ming L. Quantitative feeding device. 4,860,930, Cl. 222-231.000.

Tucker, Herbert D.: *See*—
Nieboer, Keith A.; and Tucker, Herbert D., 4,861,540, Cl. 264-263.000.

Tufting and Textile Systems Limited: *See*—
Ward, Gerald F.; and Beckett, Allan, 4,860,673, Cl. 112-80.400.

Tuji, Kiyoaki: *See*—
Sugisawa, Ko; Sekiguchi, Kazuya; Tuji, Kiyoaki; and Ono, Akinobu, 4,861,559, Cl. 422-110.000.

Tung, Paul: *See*—
Fellmann, Jere D.; Saxton, Robert J.; and Tung, Paul, 4,861,921, Cl. 568-772.000.

Tungsram Reszvenytarsasag: *See*—
Antal, Kalman; Ugrosdy, Laszlo ; and Rimay, Bela, 4,861,302, Cl. 445-38.000.

Turcotte, David E.: *See*—
Roshen, Waseem A.; Turcotte, David E.; and Regelman, Dale F., 4,862,129, Cl. 336-61.000.

Turkin, Vladimir V.: *See*—
Masovich, Felix Z.; Khorin, Vladimir N.; Starichnev, Vladimir V.; and Turkin, Vladimir V., 4,861,111, Cl. 299-43.000.

Turner, Paul F., to BSD Medical Corporation. Invasive microwave array with destructive and coherent phase. 4,860,752, Cl. 128-422.000.

Turner, Richard E., deceased: *See*—
Brotzmann, Karl; Moodie, Jonathan P.; and Turner, Richard E., deceased, 4,861,368, Cl. 75-25.000.

Turner, Robert B., to Dow Chemical Company, The. Organic polymers reinforced with rigid rod micro fillers. 4,861,803, Cl. 521-37.000.

Turner, Ruth D.: *See*—
Waterbury, John B.; Calloway, Charles B.; and Turner, Ruth D., 4,861,721, Cl. 435-252.100.

Turner, Trenna R., executor: *See*—
Brotzmann, Karl; Moodie, Jonathan P.; and Turner, Richard E., deceased, 4,861,368, Cl. 75-25.000.

Turton, Paul A.: *See*—
Kelly, Francis P.; Gibbens, Richard J.; Key, Peter B.; Turton, Paul A.; Stacey, Roger R.; and Whitehead, Martin J., 4,862,496, Cl. 379-221.000.

Turunen, Olli T.: *See*—
Eklund, Vidar; Fors, Jan; Mandell, Leo; Meinander, Kerstin; Selin, Johan-Fredrik; and Turunen, Olli T., 4,861,874, Cl. 536-32.000.

Tusa, Esko; Maaatta, Raimo; and Ruuskanen, Antti, to Imatran Voima Oy. Method for volume reduction of low activity organic wastes from nuclear power plants by anaerobic decomposition. 4,861,519, Cl. 252-633.000.

Tuskegee University: *See*—
Morris, Carlton E.; Loretan, Philip A.; Bonsi, Conrad K.; and Hill, Walter A., 4,860,490, Cl. 47-63.000.

Tuyn, Richard R.: *See*—
Tuyn, William W.; and Tuyn, Richard R., 4,860,585, Cl. 73-493.000.

Tuyn, William W.; and Tuyn, Richard R. Measuring and indicating device for a snow skier. 4,860,585, Cl. 73-493.000.

Twombly, John C.: *See*—
Buhler, Otto R.; Simpson, Brian A.; and Twombly, John C., 4,862,113, Cl. 331-117.00R.

Tyler's Fine Dry Cleaning, Inc.: *See*—
Pierson, Tyler V., 4,860,981, Cl. 248-97.000.

Tyrell, John A.; and McCready, Russell J., to General Electric Company. Polyetherimide amide from polyoxyalkylene diimide dicarboxylic acid. 4,861,862, Cl. 528-322.000.

Ube Industries, Ltd.: *See*—
Dannoura, Sadayuki, 4,860,818, Cl. 164-314.000.
Hatayama, Haruaki; Takei, Hideo; Okabe, Takuji; Waku, Yoshiharu; and Ueno, Toyoaki, 4,860,542, Cl. 60-583.000.

Uchida, Itsuo: *See*—
Kohsaka, Masanobu; Terano, Hiroshi; Komori, Tadaaki; Iwami, Morita; Yamashita, Michio; Hashimoto, Masashi; Uchida, Itsuo; and Takase, Shigehiro, 4,861,774, Cl. 514-299.500.

Uchida, Kenji: *See*—
Aoki, Takayoshi; Takeda, Masayuki; Nagatsuka, Ikutaroh; Honjo, Toshio; Itoh, Kazuhiro; and Uchida, Kenji, 4,861,694, Cl. 430-137.000.

Uchida, Koh; and Kurihara, Takashi, to Nissan Motor Co., Ltd. Steering control valve for variable power assist steering system. 4,860,635, Cl. 91-375.00A.

Uchida, Koh; Kurihara, Takashi; and Miyoshi, Makoto, to Nissan Motor Co., Ltd. Vehicle speed responsive variable assist power steering system. 4,860,846, Cl. 180-141.000.

Uchida, Yasuzo; and Shirakawa, Yoichi, to Asahi Denka Kogyo Kabushiki Kaisha. Process for treating fish bodies. 4,861,602, Cl. 426-56.000.

Uchino, Kenji: *See*—
Kasai, Kiyoshi; Sakai, Naomichi; Oikawa, Tomoyuki; Uchino, Kenji; Tsukidate, Takaaki; Asakura, Hiroshi; Yamamura, Hiroshi; and Nagata, Hiroya, 4,862,029, Cl. 310-311.000.

Uchiyama, Kenji; Ishizaki, Hideki; and Takayama, Suguru, to TDK Corporation. Optical recording medium. 4,861,656, Cl. 428-333.000.

Udagawa, Shigeru: *See*—
Matsumoto, Takashi; and Udagawa, Shigeru, 4,860,662, Cl. 104-93.000.

Udagawa, Tsunekazu, to Ishikawa Gasket Co., Ltd. Steel laminate gasket with separate beads. 4,861,046, Cl. 277-235.00B.

Udding, Anne C., to Shell Oil Company. Carboxylated propylene polymers. 4,861,843, Cl. 525-373.000.

Udren, Eric A., to Electric Power Research Institute, Inc. Power bus fault detection and protection system. 4,862,308, Cl. 361-45.000.

Ueberschaer, Hubert. Rescue lift. 4,861,299, Cl. 441-80.000.

Ueda, Hiroshi: *See*—
Taniguchi, Nobuyuki; Hata, Yoshiaki; Inoue, Manabu; Kudo, Yoshinobu; Hoda, Takeo; and Ueda, Hiroshi, 4,862,201, Cl. 354-105.000.

Ueda, Yutaka; and Noda, Eiji, to Ricoh Company, Ltd. Optical information recording medium. 4,861,637, Cl. 428-65.000.

Uehara, Osamu: *See*—
Hashida, Kenji; Yamamoto, Takeshi; Fukumoto, Tatsuya; Deguchi, Tetsuji; Hirata, Shigeyuki; Uehara, Osamu; and Akebi, Kazuhiko, 4,861,409, Cl. 156-308.200.

Ueki, Masao; Hirooka, Masaaki; Hanna, Junichi; and Shimizu, Isamu, to Canon Kabushiki Kaisha. Method for forming deposited film by generating precursor with halogenic oxidizing agent. 4,861,623, Cl. 427-69.000.

Ueki, Nobuhide: *See*—
Hashimoto, Youichi; Tokuyama, Takashi; Nishiga, Kazuya; Arai, Yoshihiro; Ueki, Nobuhide; and Adachi, Naoki, 4,862,170, Cl. 341-144.000.

Uematsu, Kaoru, to Tokyo Electric Co., Ltd. Label printer having both image and character data printing means. 4,862,194, Cl. 346-76.0PH.

Uemura, Toyohide: *See*—
Miura, Akira; Takata, Kanji; Okazaki, Ryoji; Uemura, Toyohide; and Kagawa, Keiichi, 4,861,688, Cl. 429-206.000.

Ueno, Atushi: *See*—
Sato, Takeo; Araki, Nobuhiro; Kawata, Koichi; Nomura, Noboru; Ueno, Atushi; and Yoshida, Shotaro, 4,861,148, Cl. 350-505.000.

Ueno, Chizuru: *See*—
Saito, Toshiaki; Ueno, Chizuru; and Sunada, Fumiyuki, 4,861,603, Cl. 426-93.000.
Ueno, Toyoaki: *See*—
Hatayama, Haruaki; Takei, Hideo; Okabe, Takuji; Waku, Yoshiharu; and Ueno, Toyoaki, 4,860,542, Cl. 60-583.000.
Ueyama, Noboru: *See*—
Ohashi, Takehisa; Kan, Kazunori; Ueyama, Noboru; Sada, Isao; Miyama, Akimasa; and Watanabe, Kiyoshi, 4,861,877, Cl. 540-357.000.
Ugrosdy, Laszlo : *See*—
Antal, Kalman; Ugrosdy, Laszlo ; and Rimay, Bela, 4,861,302, Cl. 445-38.000.
Uhde, Dietmar: *See*—
Gleim, Gunter; and Uhde, Dietmar, 4,862,045, Cl. 318-254.000.
Uji, Toshio, to NEC Corporation. Double heterostructure light emitting diode. 4,862,230, Cl. 357-17.000.
Ulich, Bobby L., to Kaman Aerospace Corporation. Imaging lidar system. 4,862,257, Cl. 358-95.000.
Ulitzur, Shimon Y.; and Kuhn, Jonathan C., to Technicon Research A.G. Detection and/or identification of microorganisms in a test sample using bioluminescence or other exogenous genetically-introduced marker. 4,861,709, Cl. 435-6.000.
Ulrich, Donald R.: *See*—
Che, Tessie M.; Stuetz, Dagobert E.; Buckley, Alan; and Ulrich, Donald R., 4,861,129, Cl. 350-96.130.
Ultramed Corporation: *See*—
Parisi, Tulio T., 4,861,332, Cl. 604-22.000.
Umeda, Kaoru: *See*—
Saito, Mitsuru; Umeda, Kaoru; and Tanimoto, Tetsuyuki, 4,862,293, Cl. 360-35.100.
Umeda, Toshikazu; Funaki, Shinsuke; and Nozu, Taketo, to Konishiroku Photo Industry Co., Ltd. Image recording apparatus. 4,862,196, Cl. 346-108.000.
Unimac s.n.c. di Nadalini Raffaele & C.: *See*—
Malservisi, William; Righetti, Claudio; Nadalini, Raffaele; Braga, Umberto; and Romagnoli, Marino, 4,860,922, Cl. 221-6.000.
Union Carbidae Corporation: *See*—
Cann, Kevin J.; Chen, Michael W.; and Karol, Frederick J., 4,861,846, Cl. 526-75.000.
Union Carbide Corporation: *See*—
Cheng, Alan T., 4,861,352, Cl. 55-53.000
Miller, David J.; Bryant, David R.; Billig, Ernst; and Shaw, Bernard L., 4,861,918, Cl. 568-454.000.
Union Steel Corporation of South Africa Limited, The: *See*—
Blom, Peter W. E.; and Wingard, Johann H., 4,861,446, Cl. 204-170.000.
Uniroyal Goodrich Tire Company, The: *See*—
Mattson, William F., 4,861,253, Cl. 425-143.000.
United Catalyst Inc.: *See*—
Huang, Dinah C.; and Braden, Jeffrey L., 4,861,745, Cl. 502-314.000.
United Catalysts, Inc.: *See*—
Powell, Thomas W., Jr.; Schulz, Anthony A.; and Beall, Gary W., 4,861,584, Cl. 424-79.000.
United Engineering, Inc.: *See*—
Kaplan, Naum M., 4,860,564, Cl. 72-19.000.
United States of America
Administrator, National Aeronautics and Space Administration: *See*—
Barnett, Clifford J.; Greenwood, John E.; and Holman, Earl V., 4,860,974, Cl. 244-158.00R.
Meschter, Peter; Lederich, Richard J.; and O'Neal, James E., 4,861,551, Cl. 420-533.000
Morrison, Andrew D., 4,861,416, Cl. 156-608.000.
Agriculture: *See*—
Peterson, Donald L.; and Kornecki, Tadeusz, 4,860,529, Cl. 56-330.000.
Army: *See*—
Croley, Henry C.; and Antesberger, A. Wayne, 4,862,164, Cl. 340-952.000.
Hillstrom, Warren W., 4,861,397, Cl. 149-19.400.
Leupold, Herbert A., 4,861,752, Cl. 505-1.000
Leupold, Herbert A., 4,862,126, Cl. 335-216.000.
Leupold, Herbert A., 4,862,128, Cl. 335-306.000.
Paolella, Arthur, 4,861,426, Cl. 156-644.000.
Stern, Richard A.; and Babbitt, Richard W., 4,862,117, Cl. 333-1.100.
Commerce: *See*—
Wells, F. Morgan, 4,860,803, Cl. 141-9.000.
Energy: *See*—
Kelber, Jeffry A., 4,861,408, Cl. 156-273.300.
Health and Human Services: *See*—
Mitsuya, Hiroaki; and Broder, Samuel, 4,861,759, Cl. 514-46.000.
Sobel, Mark E.; Liotta, Lance A.; Wewer, Ulla M.; Jaye, Michael C.; and Drohan, William N., 4,861,710, Cl. 435-6.000.
National Aeronautics and Space Administration: *See*—
Allen, Margaret A., 4,860,971, Cl. 244-122.0AD.
Collins, Earl R., Jr.; Suitor, Jerry W.; and Dubis, David, 4,860,669, Cl. 110-165.00R.
Hergenrother, Paul M.; Connell, John W.; and Bass, R. Gerald, 4,861,882, Cl. 544-216.000.
Kleinberg, Leonard L., 4,862,114, Cl. 331-158.000.
Schliesing, John A.; and Edenborough, Kevin L., 4,860,975, Cl. 244-161.000.
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Fisher, Arthur D., 4,862,406, Cl. 364-807.000
Giorgio, Paul J., 4,862,456, Cl. 370-118.000.
Kim, Oh-Kil, 4,861,859, Cl. 528-210.000
Krowne, Clifford M.; Prinz, Gary A.; and Krebs, James J., 4,862,119, Cl. 333-24.00R.
Lee, John N.; Athale, Ravindra A.; and Rolsma, Peter B., 4,862,115, Cl. 332-7.510.
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Whitman, Gary R.; and McCauley, Daniel S., 4,861,298, Cl. 441-42.000.
U.S. Philips Corp.: *See*—
Cuppens, Roger; and Koomen, Joannes J. M., 4,862,418, Cl. 365-201.000
Frijlink, Peter M., 4,860,687, Cl. 118-500.000.
List, Frans J.; and Phelan, Cathal G., 4,862,417, Cl. 365-200.000.
McKinnon, Graeme C.; and Bosiger, Peter, 4,862,083, Cl. 324-309.000.
Meermans, Matheus J. M., 4,860,967, Cl. 242-199.000.
Mundy, Stephen J.; and Shannon, John M., 4,862,229, Cl 357-15.000
Opheij, Willem G., 4,862,447, Cl. 369-270.000.
Prud'Homme van Reine, Peter R.; and van Ijzendoorn, Leonardus J., 4,861,737, Cl. 501-152.000.
Ralph, Hugh I., 4,862,228, Cl. 357-4.000.
Ruter, Hans-Werner, 4,860,521, Cl. 53-397.000.
Schiller, Claude, 4,862,488, Cl. 378-81.000
Schwartz, Wolfgang; Warmuth, Otto L.; and Grzyb, Claus D., 4,862,404, Cl. 364-733.000.
Shannon, John M., 4,862,238, Cl. 357-34.000.
Smid, Albert; Akkermans, Antonius H. M.; Benschop, Jozef P. H.; and Rooyackers, Cornelis J. P. M., 4,861,982, Cl. 250-235.000.
Van as, Hendrik, 4,862,080, Cl. 324-306.000.
Van Trigt, Cornelius H. P., 4,862,356, Cl. 364-300.000.
Wijdenes, Jacob; Ramaker, Johannes M.; and Weening, Cornelis, 4,861,699, Cl. 430-321.000.
Zeile, Henrich; and Sauermann, Heinz, 4,862,248, Cl. 357-79.000.
U.S. Sound, Inc.: *See*—
Lemon, John, 4,862,508, Cl. 381-156.000.
United Technologies Automotive, Inc.: *See*—
Ellison, Donald E., 4,862,130, Cl. 336-185.000
Wright, James A., 4,862,011, Cl. 307-10.100.
United Technologies Corporation: *See*—
Askey, William G.; and Hopkins, Steven M., 4,860,567, Cl 72-254.000.
Ealey, Mark A., 4,861,149, Cl. 350-611.000.
Stingle, Frederick W.; and Schmidt, Samuel, 4,862,024, Cl. 310-64.000.
Vine, Raymond W.; Sheffler, Keith D.; and Bevan, Charles E., 4,861,618, Cl. 427-34.000
University of California, Regents of the: *See*—
Pedersen, Neils C.; and Yamamoto, Janet, 4,861,720, Cl. 435-238.000
University of Chicago, The: *See*—
Goldberg, Leon I., 4,861,781, Cl. 514-282.000
University of Cincinnati: *See*—
Subbiah, M. T. Ravi, 4,861,594, Cl. 424-195.100.
University of Colorado Foundation, Inc.: *See*—
Pankove, Jacques I., 4,862,471, Cl. 372-45.000.
University of Florida: *See*—
Abela, George S., 4,860,743, Cl. 128-303.100
Clark, David E.; and Krabill, Robert H., 4,861,410, Cl. 156-325.000.
Unland, Georg: *See*—
Durr, Manfred; Unland, Georg; Driemeier, Gunter; Krutzner, Karl; Schmits, Heinz-Herbert; von Seebach, Michael; Heinemann, Otto; Rother, Wolfgang; and Dreyer, Dieter, 4,861,265, Cl. 432-103.000.
Unno, Ryoichi: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,861,792, Cl. 514-389.000.
Unsworth, Peter J.; Merrison, John C.; and Rowan, Timothy M., to Allen-Bradley Company, Inc. Method for stopping an electric motor. 4,862,052, Cl. 318-757.000.
UOP: *See*—
Bakas, Steve T.; and Barger, Paul T., 4,861,935, Cl. 585-474.000.
Cottrell, Paul R.; Fritsch, Thomas R.; and Gosling, Christopher D., 4,861,930, Cl. 585-317.000.
Flank, William H.; Wilson, Stephen T.; Marte, Julio C.; and Flanigen, Edith M., 4,861,743, Cl. 502-214.000
Lewis, Jeffrey M. O.; and Henstock, William H., 4,861,938, Cl. 585-640.000.
Mercer, William C.; Coughlin, Peter K.; McLeod, Donald, Jr.; and Flanigen, Edith M., 4,860,584, Cl. 73-336.500.
Pellet, Regis J.; Coughlin, Peter K.; Springer, Albert R.; and Gajek, Richard T., 4,861,739, Cl. 502-64.000.
Sachtler, J. W.; and Lawson, R. J., 4,861,740, Cl. 502-66.000
Wilson, Stephen T.; Woodard, Naomi A.; and Flanigen, Edith M., 4,861,457, Cl. 208-46.000.
UOP Inc.: *See*—
Cetinkaya, Ismail B., 4,861,459, Cl. 208-157.000.
Upton, James E.: *See*—
Lessar, Joseph F.; Rosenberg, Duane L.; Kraska, Robert E.; Speckien, James M.; and Upton, James E., 4,860,446, Cl. 29-858.000.

Urakami, Fukashi. Device capable of adhering to a wall surface by suction and treating it. 4,860,400, Cl. 15-98.000.
Urbaschek, Berhard: *See*—
Urbaschek, Renate; Urbaschek, Berhard; and Maennel, Daniela, 4,862,187, Cl. 424-85.100.
Urbaschek, Renate; Urbaschek, Berhard; and Maennel, Daniela, to BASF Aktiengesellschaft. Use of TNF for the prevention or treatment of radiation damage. 4,861,587, Cl. 424-85.100.
Ushijima, Fumihiro: *See*—
Numazawa, Akio; Sato, Akira; and Ushijima, Fumihiro, 4,860,607, Cl. 74-330.000.
Ushimaru, Akira: *See*—
Inaba, Hiroo; Ushimaru, Akira; Yamamoto, Nobuyuki; Hibino, Noburo; and Iwamoto, Kenzo, 4,861,674, Cl. 428-480.000.
Ushio Denki Kabushiki Kaisha: *See*—
Deki, Kyoichi, 4,862,475, Cl. 372-61.000.
Ushizawa, Norihiko; and Shimomura, Takeshi, to Terumo Kabushiki Kaisha. Oxygen sensor. 4,861,454, Cl. 204-414.000.
Usui, Akira: *See*—
Kubo, Kazuhiko; Saitou, Susumu; Usui, Akira; and Nagai, Hiroyuki, 4,861,941, Cl. 174-35.00R.
Usui, Toshinao: *See*—
Kurono, Masayasu; Kondo, Yasuaki; Yamaguchi, Takuji; Miura, Kenji; Usui, Toshinao; Terada, Naofumi; Asano, Kyoichi; Mizuno, Kuniharu; Matsubara, Akira; Kato, Noriaki; Sawai, Kiichi; Unno, Ryoichi; Ozawa, Hiroshi; and Fukushima, Masato, 4,861,792, Cl. 514-389.000.
UTDC Inc.: *See*—
Smith, Roy E., 4,860,666, Cl. 105-168.000.
Utex Industries, Inc.: *See*—
Rogers, John T., 4,860,995, Cl. 251-356.000.
Utterback, Eugene C. Pipeline padding machine and method. 4,861,461, Cl. 209-234.000.
Vacchiano, Ted. Portable workbench and power saw stand. 4,860,807, Cl. 144-286.00R.
Vadseth, Jan E., to Meta-Fer Holding S.A. Closure system for two container parts. 4,862,335, Cl. 362-267.000.
Vaisala Oy: *See*—
Kuisma, Heikki, 4,862,317, Cl. 361-283.000.
Valeo: *See*—
Brasse, Jean-Jacques; and Bonfilio, Ciriaco, 4,861,317, Cl. 474-11.000.
Graton, Michel; and Jochun, Alain, 4,860,871, Cl. 192-106.100.
Valev, Assen, to Steyr-Daimler-Puch AG. Assembly for mounting an exhaust system on an exhaust gas source source of an internal combustion engine. 4,860,852, Cl. 181-240.000.
Vallee, Bernard, to 501 Societe Industrielle et Commerciale de Materiel Aeronauti Que Societe Anonyme. Structure forming a mounting for a seat of an air transport craft. 4,861,103, Cl. 297-216.000.
Valmet Paper Machinery, Inc.: *See*—
Tormanen, Aimo, 4,861,431, Cl. 162-273.000.
Van Doorne's Transmissie B.V.: *See*—
van Beek, Coenraad H.; and van Wijk, Wilhelmus J. M., 4,861,318, Cl. 474-18.000.
Van as, Hendrik, to U.S. Philips Corporation. Method of deriving a spin resonance signal from a moving fluid, and device for performing this method. 4,862,080, Cl. 324-306.000.
Van Bavel, Nicholas R.; and Williams, Tim A., to Motorola, Inc. Oversampled A/D converter using filtered, cascaded noise shaping modulators. 4,862,169, Cl. 341-143.000.
van Beek, Coenraad H.; and van Wijk, Wilhelmus J. M., to Van Doorne's Transmissie B.V. Control of an infinitely variable transmission of a vehicle. 4,861,318, Cl. 474-18.000.
Van Breen, Adriaan W.; and Gillemans, Johannes C. M., to Shell Oil Company. Reinforced polymer sheet. 4,861,428, Cl. 162-168.100.
Vandepol, Herbert D., to Wenoka Seastyle. Snorkel. 4,860,739, Cl. 128-201.110.
Vanderheyden, Herman E. C., to 501 E.M. D'Hooge N.V. Rotary ironing rolls with serial feed. 4,860,466, Cl. 38-8.000.
van der Lijn, Joost; and van Thoor, Bernardus M., to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel. Disposable filter cartridge, whether or not combined with a water reservoir. 4,860,645, Cl. 99-295.000.
van der Merwe, Jacobus C.; and van der Merwe, Lucas C. Self-propelled, self-steered vehicle for power driven plant trimming tools. 4,860,454, Cl. 30-379.500.
van der Merwe, Lucas C.: *See*—
van der Merwe, Jacobus C.; and van der Merwe, Lucas C., 4,860,454, Cl. 30-379.500.
Vanderplow, Allen P. Keeled fishing lure apparatus. 4,860,486, Cl. 43-42.190.
Vandome, Jacques: *See*—
Erpelding, Michel; and Vandome, Jacques, 4,861,817, Cl. 524-411.000.
Van Dyke, Korbin S.: *See*—
Wagner, Lawrence F.; Van Dyke, Korbin S.; Burleson, Wayne P.; Hemming, Robert D.; and Guadagna, John P., 4,862,346, Cl. 364-200.000.
Van Effen, Richard M., to Merrell Dow Pharmaceuticals Inc. Process for preparing 4,4'-isopropylidenedithio-bis-(2,6-di-tertiarybutylphenol) by electrocatalysis. 4,861,443, Cl. 204-72.000.
Van Emden, Bernard; and Stobnicki, Roman, to Gilian Instrument Corp. Soap film gas flow measuring device. 4,860,592, Cl. 73-861.050.
Van Gogh, Johan: *See*—
Drent, Eit; and Van Gogh, Johan, 4,861,912, Cl. 560-204.000.
van Ijzendoorn, Leonardus J.: *See*—
Prud'Homme van Reine, Peter R.; and van Ijzendoorn, Leonardus J., 4,861,737, Cl. 501-152.000.
Vannier, Daniel; and Tromelin, Jacques, to Schlumberger Technology Corporation. Measuring pad arrangement for a logging sonde. 4,862,090, Cl. 324-367.000.
Van Noten, Louis, to Raychem Corporation. Closure for wraparound sleeve. 4,860,799, Cl. 138-167.000.
van't Hooft, Eric; and van Zwol, Libbe, to van't Hooft, Eric. Capsule for radioactive source. 4,861,520, Cl. 252-644.000.
van Thoor, Bernardus M.: *See*—
van der Lijn, Joost; and van Thoor, Bernardus M., 4,860,645, Cl. 99-295.000.
Van Trigt, Cornelius H. P., to U.S. Philips Corporation. Method and device for sorting objects provided with a parameter, according to the value of this parameter. 4,862,356, Cl. 364-300.000.
van Wersch, Kurt; and Voigt, Klaus, to A. Monforts GmbH & Co. Method of and apparatus for conditioning a traveling textile fabric substrate. 4,860,399, Cl. 8-151.000.
van Wijk, Wilhelmus J. M.: *See*—
van Beek, Coenraad H.; and van Wijk, Wilhelmus J. M., 4,861,318, Cl. 474-18.000.
van Zanten, Anton: *See*—
Barth, Guenter; Stegmaier, Alwin; and van Zanten, Anton, 4,860,848, Cl. 180-197.000.
Kost, Friedrich; Van Zanten, Anton; Heess, Gerhard; and Kreisselmeier, Gerhard, 4,862,368, Cl. 364-426.020.
van Zwol, Libbe: *See*—
van't Hooft, Eric; and van Zwol, Libbe, 4,861,520, Cl. 252-644.000.
Varaprath, Padmakumari J.: *See*—
Varaprath, Sudarsanan; and Varaprath, Padmakumari J., 4,861,906, Cl. 556-419.000.
Varaprath, Sudarsanan; and Varaprath, Padmakumari J., to Dow Corning Corporation. Process for the synthesis of acylamino organosilicon compounds. 4,861,906, Cl. 556-419.000.
Varesio, Carlo: *See*—
Oppico, Ernesto; Varesio, Carlo; and Rosa, Onorino, 4,861,870, Cl. 536-16.900.
Varga, Paul. Workpiece receiving and positioning device for machining operations. 4,861,011, Cl. 269-99.000.
Varshavsky, Vladimir D.: *See*—
Khutoretsky, Garri M.; Tjurin, Jury G.; Yakovlev, Viktor S.; and Varshavsky, Vladimir D., 4,862,022, Cl. 310-52.000.
Varshneya, Deepak: *See*—
Miers, David R.; Raj, David; and Varshneya, Deepak, 4,860,586, Cl. 73-517.00R.
Vasudevan, Asuri K.: *See*—
Rioja, Roberto J.; Colvin, Edward L.; Vasudevan, Asuri K.; and Cheney, Brian A., 4,861,391, Cl. 148-12.70A.
Vaught, John L., to Tencor Instruments. Suspension assembly for a scanning mirror. 4,861,125, Cl. 350-6.600.
VEB Jenapharm: *See*—
Bergter, Friedrich; Bocker, Harald; Bormann, Ernst-Joachim; Forberg, Wolfgang; Fricke, Heinz; Grafe, Udo; Grosse, Hans-Helmut; Heller, Ingeborg; Hilliger, Matthias; Junne, Wolf; Linde, Hellmut; Menner, Michael; Menzel, Klaus-Dieter; Muller, Peter-Jurger; Plonka, Gunter; Pohl, Hans D.; Schneider, Jorg; and Thrum, Heinz, 4,861,715, Cl. 435-70.000.
Veglio, Oreste, to HS Veglio S.r.l. Diamond segments and inserts. 4,860,722, Cl. 125-15.000.
Velvel, William E.: *See*—
Popper, Peter; and Velvel, William E., 4,860,610, Cl. 74-572.000.
Venderbush Industrial Corporation: *See*—
Pohl, Ronald R., 4,860,778, Cl. 135-97.000.
Venkataraman, Krishnan; and Balch, Richard A., to General Electric Company. Electronic remote data recorder for electric energy metering. 4,862,493, Cl. 379-107.000.
Ventritex, Inc.: *See*—
Fogarty, Thomas J.; Chin, Albert K.; and Feehan, Joe, 4,860,769, Cl. 128-786.000.
Verax Corporation: *See*—
Dean, Robert C., Jr.; Silver, Frederick H.; Berg, Richard A.; Phillips, Philip G.; and Runstadler, Peter W., Jr., 4,861,714, Cl. 435-68.000.
Verhille, Henri A. J.: *See*—
Hoefkens, Daniel S. G.; Spaenjers, Joannes H. P. M.; Boeykens, Eduard C. M.; Verhille, Henri A. J.; and Geernaert, Gustaaf A. L., 4,862,449, Cl. 370-32.100.
Verma, Brahm P.: *See*—
Zaltzman, Arthur; Schmilovitch, Zeev; Verma, Brahm P.; and Hoffman, Aharon, 4,861,464, Cl. 209-474.000.
Versteegh, Christiaan W., to Heineken Technisch Beheer B.V. Method of separating trub from hot wort. 4,861,608, Cl. 426-489.000.
Vestal, Marvin L.; Blakley, Calvin R.; and Fergusson, Gordon J., to Research Corporation Technologies, Inc. Ion vapor source for mass spectrometry of liquids. 4,861,989, Cl. 250-288.000.
Victoor, Johnny; Coopman, Lucien; and Moeneclaey, Denis, to Picanol N.V. Weft carrying gripper for weaving looms. 4,860,800, Cl. 139-448.000.
Victor Company of Japan, Ltd.: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Miyazaki, Kenichi; Takahashi, Toshinori; Kitamura, Hiroki; Shinya, Tadao; and Mizoguchi, Yutaka, 4,862,255, Cl. 358-80.000.
Vidwans, Mohan P.; Potes, Duane; and Opalia, John P., to Hoover Universal, Inc. Head rest with forwardly pivotable pad mounted on friction hinge. 4,861,107, Cl. 297-408.000.

Vidyarthi, Sunil: *See*—
Stagg, Malcolm J.; Stern, Eric P.; and Vidyarthi, Sunil, 4,861,642, Cl. 428-139.000.
Vieux, Gerard; Rougeot, Henri; and Diaz, Francis, to Thomson-CSF. Method of fabrication of an x-ray image intensifier and an x-ray image intensifier thus obtained. 4,862,006, Cl. 250-483.100.
Vilmann, James R.; and Vilmann, Margaret J. D. Stretcher frame assembly. 4,860,814, Cl. 160-381.000.
Vilmann, Margaret J. D.: *See*—
Vilmann, James R.; and Vilmann, Margaret J. D., 4,860,814, Cl. 160-381.000.
Vine, Raymond W.; Sheffler, Keith D.; and Bevan, Charles E., to United Technologies Corporation. Thermal barrier coating system. 4,861,618, Cl. 427-34.000.
Vinick, Frederic J.: *See*—
Saccomano, Nicholas A.; and Vinick, Frederic J., 4,861,891, Cl. 546-194.000.
Vinzia, Francis D.; and Bonnet, Roger J. A. Contact lens having at least one aspherical, progressive multifocal face, process for the preparation thereof and use of this contact lens as an intra-ocular implant to be substituted for the eye crystalline lens. 4,861,152, Cl. 351-161.000.
Visita Mtc Ltd.: *See*—
Baudenbacher, Christian, 4,860,668, Cl. 108-144.000.
Vittone, Andrea; and Chiappini, Giuseppe, to Moplefan S.p.A. Reticular structures having improved mechanical characteristics. 4,861,639, Cl. 428-105.000.
VLSI Technology, Inc.: *See*—
Wagner, Lawrence F.; Van Dyke, Korbin S.; Burleson, Wayne P.; Hemming, Robert D.; and Guadagna, John P., 4,862,346, Cl. 364-200.000.
Voelskow, Hartmut: *See*—
Zeeck, Axel; Breiding-Mack, Sabine; Grabley, Susanne; Voelskow, Hartmut; and Seibert, Gerhard, 4,861,775, Cl. 514-229.800.
Zeeck, Axel; Breiding-Mack, Sabine; Grabley, Susanne; Voelskow, Hartmut; and Seibert, Gerhard, 4,861,796, Cl. 514-535.000.
Voest-Alpine Aktiengesellschaft: *See*—
Durchschlag, Gerald; and Lang, Alfred, 4,860,978, Cl. 246-448.000.
Vogan, Dennis J., to W. R. Grace & Co. Easy-open flexible pouch and apparatus and method for making same. 4,861,414, Cl. 156-530.000.
Vogel, Frank D., II. Backboard for dual occupancy bed. 4,860,396, Cl. 5/416.1 R
Vohringer, Fritz, to F. Oberdorfer GmbH & Co. KG, Industriegewebe-Technik. Thread separator for seaming machines. 4,860,411, Cl. 28-141.000.
Voigt, Klaus: *See*—
van Wersch, Kurt; and Voigt, Klaus, 4,860,399, Cl. 8-151.000.
Voles, Roger, to EMI Limited. Identification of friend or foe (IFF) systems. 4,862,176, Cl. 342-45.000.
Volkmann, Curtis L.; Kester, John J.; and Stevens, Gregory A., to Dow Chemical Company, The. Method for adhesive bonding articles via pretreatment with energy beams. 4,861,407, Cl. 156-272.800
Voller, Ronald L. Cam action fastener. 4,860,410, Cl. 24-297.000.
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von Bogdandy, Ludwig; Kepplinger, Werner; Stift, Kurt; Papst, Gero; and Hauk, Rolf, to Korf Engineering GmbH. Process for gaining electric energy in addition to producing molten pig iron and an arrangement for carrying out the process. 4,861,369, Cl. 75-38.000.
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von Haas, Rainer, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Automatic tool changing device. 4,860,429, Cl. 29-568.000.
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Voss, Gene. Cardiac assist device and method. 4,861,330, Cl. 600-18.000.
Vozenilek, Edward F.: *See*—
Baker, Russ J.; Hansen, Robert A.; Scott, Paul F.; and Vozenilek, Edward F., 4,862,062, Cl. 324-61.00R.
Vsesojuzny Nauchno-Issledovatelsky Institut Mekhanicheskoi Obrabotki Poleznykh Iskopaemykh: *See*—
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VTH AG: *See*—
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W. A. Whitney Corp.: *See*—
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W. C. Heraeus GmbH: *See*—
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W. L. Gore & Associates, Inc.: *See*—
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W. R. Grace & Co.: *See*—
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W. R. Grace & Co.-Conn.: *See*—
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Barringer, Eric A.; Lieberman, Sheldon I.; Schmidt, Mark S.; Hodge, James D.; Waack, Richard; Kelley, Donald J.; Saxton, Brian W.; and Gruber, William C., 4,861,646, Cl. 428-210.000.
Waas, Peter, to Webasto-Werk W. Baier GmbH & Co. Heating apparatus, especially a vehicle auxiliary heating apparatus. 4,860,951, Cl. 237-2.00A.
WABCO Westinghouse Fahrzeugbremsen GmbH: *See*—
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Wachter, Hanspeter: *See*—
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Wada, Kiyoshi: *See*—
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Wade, Christopher A.: *See*—
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Waggoner, Marion G., to Du Pont de Nemours, E. I., and Company. Toughened thermoplastic polyarylate-polyamide compositions. 4,861,828, Cl. 525-66.000.
Wagner, Daniel B., to Becton, Dickinson and Company. Immunoassay of glycosylated hemoglobin using a labeled boron reagent. 4,861,728, Cl. 436-501.000.
Wagner, Lawrence F.; Van Dyke, Korbin S.; Burleson, Wayne P.; Hemming, Robert D.; and Guadagna, John P., to VLSI Technology, Inc. Index for a register file with update of addresses using simultaneously received current, change, test, and reload addresses. 4,862,346, Cl. 364-200.000.
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Wallen, Russell J. Glare reducing adjustable visor system. 4,861,091, Cl. 296-97.600.
Walles, Wilhem E.; and Tomkinson, Donald L., to Dow Chemical Company, The. Mold sulfonation system. 4,861,250, Cl. 425-90.000.
Wallner, Manfred J., to Emerson Electric Co. Plasma arc torch disconnect and visible indicia means. 4,861,963, Cl. 219-121.480.
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Wang, Samuel C.; and Ludington, David N. Multiple channel readout circuit optimized for a cryogenically operated IR sensor head. 4,862,002, Cl. 250-352.000.
Wang, Samuel C.; Swab, John M.; and Winn, Michael L. Push-pull readout of dual gate cid arrays. 4,862,276, Cl. 358-213.310.
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Ward, Bennett C.; Alvarez, Edwardo; and Blake, Ralph S., to Hoechst Celanese Corp. Process of making a sintered polybenzimidazole article. 4,861,537, Cl. 264-126.000.
Ward, Gerald F.; and Beckett, Allan, to Tufting and Textile Systems Limited. Tufting machines. 4,860,673, Cl. 112-80.400.
Ward, Robert S., Jr., to Th. Goldschmidt AG. Polymer systems suitable for blood-contacting surfaces of a biomedical device, and methods for forming. 4,861,830, Cl. 525-92.000.
Ward, William C.: *See*—
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Warnan, Francois; Barbot, Joel;; and Brochard, Claude, to Thomson-CSF. Releasable airborne buoy particularly for undersea listening. 4,861,297, Cl. 441-33.000.
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Watanabe, Yoshiharu; Shimizu, Hisayuki; Ito, Mineo; and Moriyama, Hitoshi, to Denki Kagaku Kogyo Kabushiki Kaisha. Cement additive containing superplasticizer and bentonite. 4,861,378, Cl. 106-314.000.
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Nishino, Atsushi; Ikeda, Masaki; Watanabe, Yoshihiro; and Hiraka, Masahiro, 4,861,657, Cl. 428-336.000.
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Weiershausen, Ute; Ganser, Volker; and Satzinger, Gerhard, to Goedecke Aktiengesellschaft. Use of benzothiazepine derivatives as lymphocyte protectors. 4,861,770, Cl. 514-211.000.
Weierstall, Richard P.; Enever, Robin P.; Brunelle, Kathleen L.; Thone, Gerard F.; and Warner, Ronald N., to American Home Products Corporation. Formulations for hygroscopic pharmaceuticals. 4,861,591, Cl. 424-690.000.
Weikel, Scott J., to Westinghouse Electric Corp. Polyphase volt-hour indicating circuit. 4,862,074, Cl. 324-107.000.
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Wells, J. Morgan, to United States of America, Commerce. Continuous nitrox mixer. 4,860,803, Cl. 141-9.000.
Wells, Nicholas D.; Knee, Michael J.; and Sandbank, Charles P., to British Broadcasting Corporation. Method of coding a video signal for transmission in a restricted bandwidth. 4,862,264, Cl. 358-138.000.

Welschof, Hans-Heinrich, to Lohr & Bromkamp GmbH. Constant velocity universal ball joint. 4,861,316, Cl. 464-145.000.

Wenman, James A.; Bray, Douglas; R.; and Porter, David H., to Thomas Industries, Inc. Low-voltage miniature track lighting system. 4,861,273, Cl. 439-111.000.

Wenoka Seastyle: *See—*
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West, Barry G.; Sosin, Boleslaw M.; and Tolfree, Roger K., to Marconi Company Limited, The. Communication system. 4,862,453, Cl. 370-82.000.

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West, Robert N., to SIRA Limited. Apparatus for separating specular from diffuse radiation. 4,861,164, Cl. 356-445.000.

West, Robert N., to Sira Limited. Surface inspection or ranging apparatus with image derotation. 4,861,984, Cl. 250-236.000

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White, Ralph L., Jr.; and Ellis, Keith O., to Norwich Eaton Pharmaceuticals, Inc. Use of azumolene for the treatment of malignant hyperthermia. 4,861,790, Cl. 514-374.000.

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Megee, Bryan A.; and Whiteside, James D., II, 4,860,783, Cl. 137-268.000.

Whitford, Darryl R., to S. Smith & Son Pty. Ltd. Valve control means. 4,860,779, Cl. 137-1.000

Whitman, Gary R.; and McCauley, Daniel S., to United States of America, Navy. Actuation system for an encapsulating life raft. 4,861,298, Cl. 441-42.000.

Whitman, Robert E. Roofing fastener. 4,860,513, Cl. 52-410.000.

Wichelhaus, Winfried: *See—*
Kurzendoerfer, Claus-Peter; and Wichelhaus, Winfried, 4,861,516, Cl. 252-531.000
Wilms, Elman; Jung, Dieter; Linsenbold, Herbert; Pioch, Lothar; and Wichelhaus, Winfried, 4,861,510, Cl. 252-174.130

Wickmann Werke GmbH: *See—*
Poerschke, Karl; Stark, Klaus; and Frochte, Bernd, 4,862,134, Cl. 337-231.000

Widenback, Ralph H., to New Pac Systems AB. Sleeve arrangement and method of manufacture thereof. 4,860,384, Cl. 2-115.000.

Wiedmann, Werner, to Werner & Pfleiderer GmbH. Methods for preparing chocolate mixtures. 4,861,615, Cl. 426-631.000.

Wielinger, Hans: *See—*
Bartl, Knut; Lill, Helmut; and Wielinger, Hans, 4,861,712, Cl. 435-13.000.

Wienhoefer, Ekkehard: *See—*
Lueders, Harald; Ratajczak, Hans-Josef; and Wienhoefer, Ekkehard, 4,861,513, Cl. 252-182.240.

Wiethoff, Roger H.; and Nelson, Gary J., to FMC Corporation. Autoloader for military vehicle. 4,860,633, Cl. 89-45.000.

Wijdenes, Jacob; Ramaker, Johannes M.; and Weening, Cornelis, to U.S. Philips Corporation. Method of making a master disk used in making optical readable information disks. 4,861,699, Cl. 430-321.000.

Wildi, Eric J.; and Chow, Tat-Sing P., to General Electric Company Semiconductor wafer with an electrically-isolated semiconductor device. 4,862,242, Cl. 357-48.000.

Wilhelm Hegenscheidt Gesellschaft mbH: *See—*
Berstein, Garri; Obrig, Hans W.; and Wittkopp, Helmut, 4,861,204, Cl. 409-200.000.

Wilkinson Sword Limited: *See—*
Duncan, David S., 4,860,449, Cl. 30-47.000.

Willard L. Phelps Consultants Ltd.: *See—*
Clayton, Cameron, 4,860,478, Cl. 42-71.010.

Willard, Miles J.; and Dayley, Kyle E. Prevention of puffing during frying of expanded snack products. 4,861,609, Cl. 426-550.000.

Wm. Wrigley Jr., Company: *See—*
Chisari, Paul R.; and Midon, Christian, 4,861,600, Cl. 426-3.000.

Williams, Crawford E.: *See—*
Orr, Michael A.; and Williams, Crawford E., 4,862,350, Cl. 364-200.000.

Williams, D. Michael; and Grubb, Lawrence B., to Johnson & Johnson Consumer Products, Inc. Spiral cylinder toy. 4,861,309, Cl. 446-168.000

Williams, David L., to Tektronix, Inc. Modular input device system. 4,862,353, Cl. 364-200.000.

Williams, Donald E., to Wilson Sporting Goods Co. Game ball. 4,861,028, Cl. 273-60.00B.

Williams Electronics Games, Inc.: *See—*
Oursler, Barry, 4,861,037, Cl. 273-121.00D.

Williams Grand Prix Engineering Limited: *See—*
Dernie, Frank W., 4,861,066, Cl. 280-707.000.

Williams, Henry R. Paper stacker. 4,860,904, Cl. 211-50.000.

Williams International Corporation: *See—*
Halstead, Lawrence T., 4,861,229, Cl. 415-138.000.

Williams, Jill A.: *See—*
Billington, Richard W.; and Williams, Jill A., 4,861,808, Cl. 523-116.000.

Williams, Lesia M. Doll decorated garment with detachable doll clothing. 4,860,387, Cl. 2-244.000.

Williams, Ray C.: *See—*
Antoniades, Harry N.; Lynch, Samuel E.; and Williams, Ray C., 4,861,757, Cl. 514-21.000

Williams, Tim A.: *See—*
Van Bavel, Nicholas R.; and Williams, Tim A., 4,862,169, Cl. 341-143.000

Williamson, Steven: *See—*
Ernst, James; Williamson, Steven; Rogers, George; and Musto, Dominick, 4,861,270, Cl. 434-226.000.

Williford, Ralph E., to Battelle Memorial Institute. Procedure for estimating fracture energy from fracture surface roughness. 4,860,589, Cl. 73-799.000.

Willinger, Allan H.; and Ivasauskas, Jonas, to Willinger Brothers, Inc. Rotor impeller assembly. 4,861,468, Cl. 210-169.000.

Willinger Brothers, Inc.: *See—*
Willinger, Allan H.; and Ivasauskas, Jonas, 4,861,468, Cl. 210-169.000.

Willis, William L.: *See—*
Wing, J. Keith; Sheppard, E. Lamar; and Willis, William L., 4,862,486, Cl. 377-16.000.

Wilms, Elman; Jung, Dieter; Linsenbold, Herbert; Pioch, Lothar; and Wichelhaus, Winfried, to Henkel Kommanditgesellschaft auf Aktien. Porpous layer silicate/sodium sulfate agglomerate. 4,861,510, Cl. 252-174.130.

Wilson, David G.: *See—*
Ivey, Charles W.; Wilson, David G.; and Thorne, Clarence R., 4,862,334, Cl. 362-149.000.

Wilson, Rickey D. Child's criminal investigative game kit. 4,861,305, Cl. 446-75.000.

Wilson Sporting Goods Co.: *See—*
Williams, Donald E., 4,861,028, Cl 273-60.00B.

Wilson, Stephen T.; Woodard, Naomi A.; and Flanigen, Edith M., to UOP. Crystalline gallophosphate compositions. 4,861,457, Cl. 208-46.000.

Wilson, Stephen T.: *See—*
Flank, William H.; Wilson, Stephen T.; Marte, Julio C.; and Flanigen, Edith M., 4,861,743, Cl. 502-214.000.

Wilson, Wendell G.: *See—*
Bishop, Jerry W.; Savas, Keith G.; and Wilson, Wendell G., 4,860,555, Cl. 62-376.000.

Wiltshire, Michael C.: *See—*
Clark, Michael G.; and Wiltshire, Michael C., 4,861,992, Cl. 250-316.100.

Winderl, Stephen. Vibrating sluice box. 4,860,874, Cl. 193-2.00B.

Wing, J. Keith; Sheppard, E. Lamar; and Willis, William L. Revolution counter attached to tires. 4,862,486, Cl. 377-16.000.

Wingard, Johann H.: *See—*
Blom, Peter W. E.; and Wingard, Johann H., 4,861,446, Cl. 204-170.000.

Winiger, Hans-Rudolf, to Notron Engineering AG. Optoelectronic theodolite sensor. 4,861,981, Cl. 250-231.00R.

Winn, Michael L.: *See—*
Wang, Samuel C.; Swab, John M.; and Winn, Michael L., 4,862,276, Cl. 358-213.310.

Winners' Choice Selector Inc., The: *See—*
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Winslow, Paul A.: *See—*
Clendinning, Robert A.; Harris, James E.; Kwiatkowski, George T.; McMaster, Lee P.; Matzner, Markus; and Winslow, Paul A., 4,861,915, Cl. 568-328.000.

Winter, Roland A. E.: *See—*
Seltzer, Raymond; and Winter, Roland A. E., 4,861,813, Cl. 524-91.000.

Winters, Raymond S., to Environetics, Inc. Tank and method of making same. 4,860,916, Cl. 220-5.00A.

Winthrop, John T., to American Optical Corporation. Progressive addition spectacle lens. 4,861,153, Cl. 351-169.000.

Wisconsin Alumni Research Foundation: *See—*
Sih, Charles J., 4,861,724, Cl. 435-280.000.

Witte, Roland: *See—*
Knaul, Per; Schelhorn, Fritz; and Witte, Roland, 4,860,883, Cl. 198-495.000.

Wittkopp, Helmut: *See—*
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Wittmann, Dieter: *See—*
Damrath, Volker; Lindner, Christian; Kress, Hans-Jurgen; and Wittmann, Dieter, 4,861,831, Cl. 525-100.000.

Wittmer, Detlev: *See—*
Lindstadt, Klaus; and Wittmer, Detlev, 4,860,658, Cl. 102-427.000.

Witzke, Duane W., to Hoover Universal, Inc. Method of making a vehicle seat assembly with pour-in-place foam body. 4,860,415, Cl. 29-91.100.

Wlezien, Richard A., to Outboard Marine Corporation. Marine propulsion device exhaust system. 4,861,296, Cl. 440-89.000.

WOCO Franz-Josef Wolf & Co.: *See—*
Wolf, Franz J.; and Pletsch, Hubert, 4,861,003, Cl. 267-140.100.

Wolf, Franz J.; and Pletsch, Hubert, to WOCO Franz-Josef Wolf & Co. Cup-shaped hydraulic bearing. 4,861,003, Cl. 267-140.100.

Wolf, Jurgen: *See—*
Gerhardy, Reinhard; Holderle, Hans; Wolf, Jurgen; and Vonderau, Werner, 4,861,522, Cl. 261-35.000.

Wolf, Nicholas O.: *See—*
Carlberg, Bob L.; Wolf, Nicholas O.; Pober, Kenneth W.; and Nash, William D., 4,860,829, Cl. 166-279.000.

Wolfe, Brian C.: *See—*
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Wolfe, Rodney E.: *See—*
Webb, Jerry E.; Dake, Roger L.; and Wolfe, Rodney E., 4,860,403, Cl. 17-1.00E.

Wong, Hee: *See—*
Guines, Jesus; and Wong, Hee, 4,862,485, Cl. 375-120.000.

Wong, Jimmy J.: *See—*
Flanagan, Ralph C.; and Wong, Jimmy J., 4,860,611, Cl. 74-574.000.

Wong, Sung Y., to Hughes Aircraft Company. Processor for discriminating between ground and moving targets. 4,862,177, Cl. 342-160.000.

Wonnacott, Roger J., to St. Regis Packaging Limited. Carton and blank therefor. 4,860,944, Cl. 229-52.00B.

Wood, Joseph A.: *See—*
Cadwell, George H., Jr.; and Wood, Joseph A., 4,860,420, Cl. 29-157.00R.

Woodard, Alan P., to Shure Brothers, Inc. Microphone acoustical polar pattern converter. 4,862,507, Cl. 381-155.000.

Woodard, Naomi A.: *See—*
Wilson, Stephen T.; Woodard, Naomi A.; and Flanigen, Edith M., 4,861,457, Cl. 208-46.000.

Woodburn, Robert T. Subcutaneous venous access device and needle system. 4,861,341, Cl. 604-175.000.

Woods, Edward J.: *See—*
Jordan, Howard E.; Woods, Edward J.; Caruso, John T.; and Forte, Luciano, 4,862,053, Cl. 318-786.000.

Woodward, Richard. Method of and apparatus for use in forming diametrically opposed studs on tubular connectors. 4,860,413, Cl. 29-38.00C.

Woog, Heinrich: *See—*
Demmer, Fritz; Gruber, Werner; and Woog, Heinrich, 4,861,786, Cl. 514-347.000.

Woolley, Lee G., to Access Computer Products, Inc. Replaceable seal assembly for toner cartidges and method of use. 4,862,210, Cl. 355-245.000.

World Electronics, Inc.: *See—*
Kedjierski, Fred D., 4,862,514, Cl. 455-161.000.

Wozniak, David J.; and Mallory, Charles W., to Westinghouse Electric Corp. Tie-down assembly for securing a cask containing radioactive waste to a vehicle. 4,861,205. Cl. 410-47.000.

Wrapmatic S.p.A.: *See—*
Cinotti, Andrea, 4,861,227, Cl. 414-796.800.

Wright, Antony P.; and Bunge, David J., to Dow Corning Corporation. Process for synthesis of acylamino silicon compounds. 4,861,907, Cl. 556-419.000.

Wright, James A., to United Technologies Automotive, Inc. Electrical planar cable interconnection between vehicular door and body. 4,862,011, Cl. 307-10.100.

Wurthner, Hubert: *See—*
Stritzl, Karl; Wurthner, Hubert; and Riegler, Andreas, 4,861,064, Cl. 280-618.000.

Wuyten, Johannes M.; and Daelmans, Adriaan L., to Holland Heating BV. System for constructing air conditioning cabinets and method for constructing same. 4,860,918, Cl. 220-84.000.

Wycech, Joseph, to Essex Composite Systems. Lightweight composite automotive door beam and method of manufacturing same. 4,861,097, Cl. 296-188.000.

Wyrick, Steven D.: *See—*
Hall, Iris H.; Wyrick, Steven D.; and Chapman, James M., Jr., 4,861,778, Cl. 514-248.000.

Wysong, Robert D.: *See—*
Ansell, Daniel F.; Harris, James C.; Howell, Steven E.; Miller, Michael S.; and Wysong, Robert D., 4,862,327, Cl. 361-415.000.

Wyss, Kurt H., to Du Pont de Nemours, E. I., and Company. Filter element and assembly. 4,861,353, Cl. 55-96.000.

XOC Devices, Inc.: *See—*
Carlson, Randolph S., 4,862,249, Cl. 357-80.000.

Yabe, Hisao: *See—*
Kidawara, Atsushi; Nishikori, Toshiaki; Kanno, Masahide; Yabe, Hisao; Katoh, Shinichi; Ikuno, Yuji; and Nakamura, Takeaki, 4,862,258, Cl. 358-98.000.

Yaghmaie, Farokh: *See—*
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Yagi, Kiyoshi: *See—*
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Yagishita, Aisaburo. Article washing method. 4,861,385, Cl. 134-10.000.

Yahagi, Masahiro: *See—*
Ono, Shuichi; Yahagi, Masahiro; Itagaki, Shuichi; and Kikuchi, Nobuaki, 4,861,736, Cl. 501-137.000.

Yakovlev, Viktor S.: *See—*
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Yakuwa, Masahiko; and Suzuki, Yoshio, to Honda Giken Kogyo Kabushiki Kaisha. Electronically-controlled fuel injection system. 4,862,369, Cl. 364-431.070.

Yamada, Akira; and Ohnuki, Ichiro, to Canon Kabushiki Kaisha. Information transmitting device for camera. 4,862,208, Cl. 354-485.000.

Yamada, Kengi: *See—*
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Yamada, Shozo: *See—*
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; Ohbayashi, Hisashi; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; and Ohbayashi, Hisashi, 4,861,768, Cl. 514-195.000.
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; Ohbayashi, Hisashi; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; Nakai, Akira; and Ohbayashi, Hisashi, 4,861,768, Cl. 514-195.000.

Yamada, Takehide: *See—*
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Yamada, Tsuneo, to Trio Kabushiki Kaisha. Satellite receiver. 4,862,179, Cl. 342-359.000.

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Yamagishi, Hidetaka, to NEC Corporation. Semiconductor device having Schottky barrier between metal silicide and silicon. 4,862,244 Cl. 357-67.000.

Yamaguchi, Akira: *See—*
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Yamaguchi, Kazuo, to Hitachi, Ltd. Test pattern generator. 4,862,460, Cl. 371-27.000.

Yamaguchi, Kouji; Ishikawa, Yoshikazu; Kameda, Toshihiro; Hattori, Shogo; and Miyake, Junichi, to Honda Giken Kogyo Kabushiki Kaisha. Throttle control system for automotive internal combustion engine. 4,860,708, Cl. 123-399.000.

Yamaguchi, Shogo; Araki, Kazunori; and Tazuke, Hisashi, to Mitsubishi Jukogyo Kabushiki Kaisha. Filling liquids. 4,860,802, Cl 141-6.000.

Yamaguchi, Shogo; and Tazuke, Hisashi, to Mitsubishi Jukogyo Kabushiki Kaisha. Filled amount control system. 4,860,804, Cl. 141-94.000.

Yamaguchi, Tokeshi: *See—*
Tsuji. Kentaroh; Maeda, Shigemi; Yamaguchi, Takeshi; Deguchi, Toshihisa; Sakamoto, Noriaki; and Terashima, Shigeo, 4,862,443, Cl. 369-59.000.

Yamaguchi, Takuji: *See—*
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Yamaguchi, Toshio: *See—*
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Yamaha Hatsudoki Kabushiki Kaisha: *See—*
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Yamakawa, Kiyoshi, to Brother Kogyo Kabushiki Kaisha. Combination keyboard including plural stroke keys and plural touch keys 4,862,166, Cl. 341-22.000.

Yamakoshi, Kenichi: *See—*
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Yamamoto, Hajime: *See—*
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Yamamoto, Kiyonori; Sota, Osamu; Sakae, Masahiko; Makiura, Yoshinori; Murakami, Masahiro; and Mitsuya, Toshiyuki, to Mita Industrial Co., Ltd. Paper-feeding device. 4,861,017, Cl. 271-258.000

Yamamoto, Kyohei, to Mitsubishi Denki Kabushiki Kaisha. Method of starting engine and apparatus therefor. 4,862,010, Cl. 290-38.00R

Yamamoto, Masahiro; and Yatomi, Takeshi, to Mitsubushi Denki Kabushiki Kaisha. Wire electrode breakage detection method and apparatus. 4,862,095, Cl. 324-543.000

Yamamoto, Nobuyuki: *See—*
Inaba, Hiroo; Ushimaru, Akira; Yamamoto, Nobuyuki; Hibino, Noburo; and Iwamoto, Kenzo, 4,861,674, Cl. 428-480.000

Yamamoto, Takeshi: *See—*
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Yamamoto, Tetsu: *See—*
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Yamamura, Akihiko: *See—*
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Yamamura, Hiroshi: *See—*
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Yamanoi, Tukio; Kandachi, Mitsuo; Iwata, Masahiro; and Kato, Kazumi, to Furukawa Aluminum Co., Ltd. Tubular material drawing apparatus for manufacturing precision tube. 4,860,568, Cl. 72-291.000.

Yamanouchi, Junichi; and Toriuchi, Masaharu, to Fuji Photo Film Co., Ltd. Polymer mordant. 4,861,852, Cl. 526-263.000

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Yamasawa, Tsutomu; Yamakoshi, Kenichi; and Shimazu, Hideaki, to Omron Tateisi Electronics Co. Pulse wave detecting apparatus for blood pressure measurement. 4,860,761, Cl. 128-686.000.

Yamashita, Ko: *See—*
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Yamashita, Masashi; Sugihara, Koichi; and Kawakami, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Steering system in wheeled vehicle. 4,860,842, Cl. 180-140.000.

Yamashita, Michio: *See—*
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Yamashita, Miyuki, to Mitsubishi Paper Mills Limited; and Hirakawa Kogyosha Co., Ltd. Process camera for reproducing multiple images on single film. 4,862,223, Cl. 355-54.000.

Yamashita, Shinichi: *See—*
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Yamato, Yoshiro, to Shimano Industrial Company Limited. Fishing rod. 4,860,482, Cl. 43-18.100.

Yamatoh, Kouhei; and Ogura, Masami, to Honda Giken Kogyo Kabushiki Kaisha. Brake device. 4,860,859, Cl. 188-72.100.

Yamauchi, Kazuki: *See—*
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Yamauchi, Taku: *See—*
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Yamazaki, Satoshi: *See—*
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Yamazaki, Shunpei; Inujima, Takashi; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Sakama, Mitsunori; Miyazaki, Minoru; Koyanagi, Kaoru; and Yamaguchi, Toshiharu, to Semiconductor Energy Laboratory Co., Ltd. Liquid crystal display capable of displaying gray tone. 4,861,143, Cl. 350-350.00S

Yamazaki, Shunpei; and Inujima, Takashi, to Semiconductor Energy Laboratory Co., Ltd. Method for forming a film coat on the inside of a depression. 4,861,622, Cl. 427-54.100.

Yamazaki, Takao: *See—*
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Yamazaki, Yuji: *See—*
Imamura, Tadashi; Shigaki, Kazuyuki; Yamazaki, Yuji; Masuda, Tadashi; and Okumura, Tsunemasa, 4,861,113, Cl. 301-65.000.

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Yanagawa, Yutaka; and Taniguchi, Akira, to Olympus Optical Co. Ltd. Multiple diagnosable distance range ultrasonic diagnostic apparatus. 4,860,758, Cl. 128-662.060

Yanai, Shinji; and Shimoyama, Yujiro, to Alps Electric Co., Ltd. Multiple switch device having waterproof structure. 4,861,950, Cl. 200-5.00R

Yang, Aichun: *See—*
Mao, Bingquan; Yang, Aichun; Zheng, Ying; Yang, Juxiou; and Li, Zhulan, 4,861,847, Cl. 526-125.000.

Yang, Darchun B.: *See—*
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Yang, Juxiou: *See—*
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Yang, Y. Sam: *See—*
Scott, Bentley N.; and Yang, Y. Sam, 4,862,060, Cl. 324-58.50A.

Yano, Seiki; and Hijikata, Toshiki, to Sharp Kabushiki Kaisha. Semiconductor laser apparatus having a high harmonic generating waveguide. 4,862,473, Cl. 372-50.000.

Yarmark, Martin J., to Triboro Electric Corporation. Enclosure for thermal protector and method of assembly. 4,861,943, Cl. 174-52.100.

Yassa, Fatby F.; and Thompson, Barbara A., to General Electric Company. Continuous-wave-modulation detectors using prediction methods. 4,862,098, Cl. 329-50.000

Yasuda, Keiichi, to Sanyo Chemical Industries, Ltd. Dispersion of low molecular weight polyolefin. 4,861,811, Cl. 523-501.000.

Yasuda, Nobuyoshi: *See—*
Takaya, Takao; Tozuka, Zenzoburo; Yasuda, Nobuyoshi; and Nishimura, Shintaro, 4,861,769, Cl. 514-202.000.

Yasuda, Shunji: *See—*
Nakao, Shinichi; Yasuda, Shunji; and Ikeda, Shigehito, 4,861,471, Cl. 210-182.000.

Yasuda, Yukio: *See—*
Masuda, Nobuhito; Nagatomo, Shigeru; Makiuchi, Hajime; and Yasuda, Yukio, 4,861,552, Cl. 422-56.000

Yater, Jerry L.; and Carmichael, Stephen L., to Force Control Industries, Inc. Clutch/brake unit with self-contained actuating pump system. 4,860,862, Cl. 192-18.00A.

Yatomi, Takeshi: *See—*
Yamamoto, Masahiro; and Yatomi, Takeshi, 4,862,095, Cl. 324-543.000.

Yazaki Corporation: *See—*
Kobayashi, Yasuo; and Endo, Masahiko, 4,861,282, Cl. 439-540.000

Yazawa, Masayuki: *See—*
Fukukawa, Mitsuo; Yazawa, Masayuki; Asai, Kazumitsu; Okamoto, Yoshiharu; and Mio, Kouhei, 4,861,189, Cl. 404-84.000

Year Laboratories, Inc.: *See—*
Rebek, Julius, 4,861,564, Cl. 423-21.500.

Yeda Research and Development Company, Ltd.: *See—*
Margel, Shlomo, 4,861,705, Cl. 435-2.000.

Yeomans, Arthur S., Jr. Spherical support apparatus movable over plane surfaces. 4,861,053, Cl. 280-205.000.

Yerman, Emil A. Plastic syringe destruction device. 4,860,958, Cl. 241-23.000.

Yiming, Liug, to Nanjing Institute of Technology. Gas laser having flat discharger cross-section. 4,862,476, Cl. 372-61.000.

Yoda, Sumio: *See—*
Nowatari, Hiroyoshi; Hayami, Hiroshi; Kuroda, Yasuo; Yoda, Sumio; and Takahashi, Katsutoshi, 4,861,905, Cl. 556-40.000.

Yokogawa Electric Corporation: *See—*
Inou, Kiyoharu; and Sakimoto, Katsuji, 4,862,339, Cl. 363-21.000.
Maeda, Masato; and Takeuchi, Hideo, 4,860,574, Cl. 73-27.00A.

Yokomizo, Hiromichi: *See—*
Tominaga, Fukutoshi; Iwanaga, Mitsuo; and Yokomizo, Hiromichi, 4,862,059, Cl. 323-307.000.

Yokota, Motoyuki; Tanabe, Mamoru; and Fujiki, Tatsuo, to Marugo Rubber Industries, Ltd. Fluid damped elastomeric bushing. 4,861,004, Cl. 267-140.100.

Yokota, Shigeki: *See—*
Ashida, Yasuhiro; and Yokota, Shigeki, 4,862,241, Cl. 357-45.000.

Yokoyama, Katsunori; Sato, Yukio; and Shimai, Shunzo, to Toshiba Ceramics Co., Ltd. Piezo-electric device. 4,862,030, Cl. 310-332.000.

Yoon, InBae. Elastic surgical ring olip and ring loader. 4,860,746, Cl. 128-326.000.

Yoshida, Eiji: *See—*
Suzuki, Akio; Yoshida, Eiji; Nagasaki, Satoru; Arai, Masumi; and Tsuji, Nobuaki, 4,861,702, Cl. 430-564.000.

Yoshida, Katsumasa: *See—*
Karashima, Kunihiko; Kumada, Shoji; Yoshida, Katsumasa; and Katase, Hiroharu, 4,862,044, Cl. 318-254.000.

Yoshida, Kiyomitsu: *See—*
Haga, Takahiro; Toki, Tadaaki; Koyanagi, Toru; Fujii, Yasuhiro; Yoshida, Kiyomitsu; and Imai, Osamu, 4,861,799, Cl. 514-594.000.

Yoshida Kogyo K. K.: *See—*
Yunoki, Akio, 4,860,619, Cl. 83-80.000.

Yoshida, Nobutoshi; Miyke, Nobuyuki; Takagi, Atsushi; Saito, Takashi; Suzuki, Tadashi; Ohki, Naoyuki; Tomosada, Masahiro; Adachi, Hideki; and Takeda, Hiroaki, to Canon Kabushiki Kaisha. Copying apparatus. 4,862,219, Cl. 355-202.000.

Yoshida, Shotaro: *See—*
Sato, Takeo; Araki, Nobuhiro; Kawata, Koichi; Nomura, Noboru; Ueno, Atushi; and Yoshida, Shotaro, 4,861,148, Cl. 350-505.000.

Yoshida, Tadao: *See—*
Ando, Ryo; Yoshida, Tadao; Fujiie, Kazuhiko; and Yoshida, Toshio, 4,862,439, Cl. 369-30.000.

Yoshida, Takeshi; Takizawa, Yoshio; and Sekine, Ichiro, to Mitsubishi Metal Corporation of Tokyo. Corrosion-resistant nickel-base alloy having high resistance to stress corrosion cracking. 4,861,550, Cl. 420-460.000.

Yoshida, Toshihiko: *See—*
Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; Sakane, Chitose; and Yoshida, Toshihiko, 4,862,472, Cl. 372-45.000.

Yoshida, Toshio: *See—*
Ando, Ryo; Yoshida, Tadao; Fujiie, Kazuhiko; and Yoshida, Toshio, 4,862,439, Cl. 369-30.000.

Yoshikawa, Takashi: *See—*
Teteishi, Iwao; Ogura, Yoshiyuki; Hashimoto, Takeshi; Ritou, Tuguyoshi; Kajiyama, Katsufumi; Shimizu, Fumiaki; Tanaka, Kenji; Aibara, Yutaka; Kataoka, Hiroaki; Nakai, Katsuya; Yoshikawa, Takashi; Kanamori, Masaaki; Miyajima, Masao; Seki, Shuzo; and Takahashi, Sadanobu, 4,860,523, Cl. 53-512.000.

Yoshimi, Keiichi; Goto, Shigeo; and Asazuma, Masaaki, to Mitsuboshi Belting Ltd. Method of fabricating a double-toothed belt. 4,861,403, Cl. 156-138.000

Yoshimi, Satoshi; and Koga, Youichiro, to Daiken Trade & Industry Co., Ltd. Floor panel for floating floor. 4,860,506, Cl. 52-144.000.

Yoshimura, Hiroshi, to Hakko Metal Industries Limited. Temperature sensor using thermocouple. 4,861,169, Cl. 374-179.000.

Yoshimura, Hiroshi, to Hakko Metal Industries Limited. Card controlled soldering iron temperature control device. 4,861,967, Cl. 219-241.000.

Yoshimura, Katsuji: *See—*
Enari, Masahiko; Yoshimura, Katsuji; Aoki, Akio; Yamashita, Shinichi; Shimokoriyama, Makoto; Kashida, Motokazu; Shimizu, Tetsuya; Ishii, Yoshiki; and Fujii, Akio, 4,862,292, Cl. 360-8.000.

Yoshimura, Noriaki: *See—*
Tokitoh, Yasuo; and Yoshimura, Noriaki, 4,861,922, Cl. 568-865.000.

Yoshioka, Daigo: *See—*
Tsumazawa, Hiroyuki; Yoshioka, Daigo; and Kuwada, Atsushi, 4,862,279, Cl. 358-229.000.

Yoshioka, Hiroshi: *See—*
Suzuki, Kazuhiko; and Yoshioka, Hiroshi, 4,861,521, Cl. 260-403.000.

Yoshioka, Shogo: *See—*
Asaoka, Teruo; and Yoshioka, Shogo, 4,861,450, Cl. 204-224.00M.

Yoshitake, Yasuhiro: *See—*
Oshida, Yoshitada; Nakashima, Naoto; and Yoshitake, Yasuhiro, 4,862,008, Cl. 250-548.000.

Young, James; and Leatherman, Dennis D., to PPG Industries, Inc. Printed microporous material. 4,861,644, Cl. 428-195.000.

Young, James R.: *See—*
Peppers, Norman A.; Young, James R.; Pierce, Gerald A.; Katsuki, Kazuo; and Katsuki, Kazuo, 4,862,511, Cl. 382-32.000.

Yu, Kin T.: *See—*
Suh, John T.; Pendelton, Robert G.; Pendley, Charles E., II; Yu, Kin T.; Menard, Paul R.; and Schreiber, Alain B., 4,861,795, Cl. 514-510.000.

Yuchi, Hirofumi: *See—*
Sonoda, Yutaka; Yuchi, Hirofumi; Murakami, Kyoichi; and Tokuhara, Masaharu, 4,862,269, Cl. 358-160.000.

Yukon Energy Corporation: *See—*
Tallman, William R.; McDevitt, Steven C.; and Delancey, Warren H., 4,860,725, Cl. 126-110.00R.

Yumoto, Hideaki: *See—*
Fujiwara, Katsuji; and Yumoto, Hideaki, 4,860,782, Cl. 137-193.000.

Yumura, Takashi; and Yamamoto, Tetsu, to Mitsubishi Denki Kabushiki Kaisha. Carriage assembly. 4,862,441, Cl. 369-45.000.

Yunoki, Akio, to Yoshida Kogyo K. K. Elongate article processing apparatus with an improved discharge device. 4,860,619, Cl. 83-80.000.

Yunoki, Yutaka; Inoue, Manabu; and Watanabe, Hiroyuki, to Olympus Optical Co., Ltd. Composite magnetic head. 4,862,304, Cl. 360-121.000.

Yutani, Yuji: *See—*
Tatemoto, Masayoshi; Yutani, Yuji; and Fujiwara, Koji, 4,861,836, Cl. 525-276.000.

Zaccaria, Manrico, to S.A.I.A.G. S.p.A. Method for enabling the cutting to size of a continuously extruded weather strip with variable characteristics, particularly for motor vehicle bodies. 4,861,530, Cl. 264-40.200.

Zafiropulo, Pitro A.: *See—*
Closs, Felix H.; Mueller, Johann R.; and Zafiropulo, Pitro A., 4,862,451, Cl. 370-60.000.

Zahradfabrik Friedrichshafen AG: *See—*
Rudolf, Annast; Schuster, Max; Maurer, Dieter; and Rauter, Jurgen, 4,861,172, Cl. 384-477.000.

Zajic, Albert H., to American Trailers, Inc. Floor for conditioned air vehicles. 4,861,095, Cl. 296-182.000.

Zaltzman, Arthur; Schmilovitch, Zeev; Verma, Brahm P.; and Hoffman, Aharon, to State of Israel, Ministry of Agriculture. Method and apparatus for separation using fluidized bed. 4,861,464, Cl. 209-474.000.

Zambon spa: *See—*
Giordano, Claudio; and Castaldi, Graziano, 4,861,903, Cl. 549-434.000.

Zamora, Antonio, to International Business Machines Corporation. Paradigm-based morphological text analysis for natural languages. 4,862,408, Cl. 364-900.000.

Zart, Robert C.: *See—*
Stierman, Roger J.; McCauley, Archie N.; and Zart, Robert C., 4,861,452, Cl. 204-297.00W.

Zatulovsky, Leonid: *See—*
Pilatowicz, Edward J.; and Zatulovsky, Leonid, 4,860,451, Cl. 30-276.000.

Zeeck, Axel; Breiding-Mack, Sabine; Grabley, Susanne; Voelskow, Hartmut; and Seibert, Gerhard, to Hoechst Aktiengesellschaft. Pharmacological use of phenoxazinones. 4,861,775, Cl. 514-229.800.

Zeeck, Axel; Breiding-Mack, Sabine; Grabley, Susanne; Voelskow, Hartmut; and Seibert, Gerhard, to Hoechst Aktiengesellschaft. Gentisic acid derivatives having antibiotic activity. 4,861,796, Cl. 514-535.000.

Zeile, Henrich; and Sauermann, Heinz, to U.S. Philips Corporation. Contacting system for bipolar electronic circuit elements, more particularly semiconductor circuit elements. 4,862,248, Cl. 357-79.000.

Zeiser, Philip; and Readman, John, to Sundstrand Corporation. Elastomeric shaft coupling for concentric shafts. 4,861,313, Cl. 464-89.000.

Zeller Corporation, The: *See—*
Mazziotti, Philip J., 4,861,314, Cl. 464-130.000.
Mazziotti, Philip J., 4,861,315, Cl. 464-131.000.

Zen, Shinichiro: *See—*
Miyabayashi, Toshio; Sakabe, Nobuyuki; and Zen, Shinichiro, 4,861,851, Cl. 526-255.000.

Zenith Electronics Corporation: *See—*
Konopka, John G., 4,862,013, Cl. 307-254.000.

Zheng, Ying: *See—*
Mao, Bingquan; Yang, Aichun; Zheng, Ying; Yang, Juxiou; and Li, Zhulan, 4,861,847, Cl. 526-125.000.

Zidele, Israel. Reversible seamless glove. 4,860,385, Cl. 2-163.000.

Ziegler, Eldon W.: *See—*
Landgarten, Harris B.; and Ziegler, Eldon W., 4,862,506, Cl. 381-71.000.

Ziegler, Horst; and Behlen, Horst, to W. C. Heraeus GmbH. Electronic thermometer. 4,861,168, Cl. 374-117.000.

Ziemann, Erich T. Navigational plotting system. 4,862,374, Cl. 364-449.000

Ziemek, Gerhard: *See—*
Rohner, Peter; and Ziemek, Gerhard, 4,861,135, Cl. 350-96.230.

Zieve, Peter B. Low voltage electromagnetic pulse actuator. 4,862,043, Cl. 318-114.000.

Zimmerman, Robert. Trip mechanism for drill seed boot. 4,860,672, Cl. 111-84.000.

Zimmerman, Thomas H.; Pop, Julian J.; and Perkins, Joseph L., to Schlumberger Technology Corporation. Down hole tool for determination of formation properties. 4,860,581, Cl. 73-155.000.

Zimmern, Bernard. Injected compressor with liquid switch. 4,861,246, Cl. 418-84.000.

Zipper, Joseph D., to State University of New York. Paper separation device for waste containers. 4,860,910, Cl. 220-1.00T.

Zivkovic, Milorad, to Daimler-Benz Aktiengesellschaft. Pressure modulator for an anti-lock vehicle wheel braking system. 4,861,119, Cl. 303-115.000.

Zorc, Philip A.: *See*—
McElroy, Kennedy K., Jr.; Higby, Jeffrey P.; and Zorc, Philip A., 4,861,295, Cl. 440-86.000.

Zsifkovits, Johann, to Emhart Industries, Inc. Supporting mechanism for three moulds in a glassware forming machine. 4,861,365, Cl. 65-323.000.

Zulian, Ferruccio, to Honeywell Bull Italia S.p.A. Memory systems and related error detection and correction apparatus. 4,862,462, Cl 371-38.000.

Zuranski, Edward S.: *See*—
Betts, William L.; and Zuranski, Edward S., 4,862,464, Cl. 371-43.000.

Zusi, Fred C.: *See*—
Tramposch, Kenneth M.; Zusi, Fred C.; and Marathe, Suresh A., 4,861,798, Cl. 514-575.000.

Zwick Energy Research Organization, Inc.: *See*—
Zwick, Eugene B.; and Brigham, William D., 4,860,545, Cl. 62-50.600.

Zwick, Eugene B.; and Brigham, William D., to Zwick Energy Research Organization, Inc. Cryogenic storage tank with a retrofitted in-tank cryogenic pump. 4,860,545, Cl. 62-50.600.

Zwick, Nicholas, to Dialogic Corporation. Measurement of transmission quality of a telephone channel. 4,862,492, Cl. 379-6.000.

501 E.M. D'Hooge N.V.: *See*—
Vanderheyden, Herman E. C., 4,860,466, Cl. 38-8.000.

501 IDEC IZUMI Corporation: *See*—
Hirabayashi, Michio; Koizumi, Tosio; and Shibao, Kiyotada, 4,860,436, Cl. 29-622.000.

501 Societe Industrielle et Commerciale de Materiel Aeronauti Que Societe Anonyme: *See*—
Vallee, Bernard, 4,861,103, Cl. 297-216.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF AUGUST, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Telephone and Telegraph Company: *See*—
Calderbank, Arthur R.; and Sloane, Neil J. A., Re. 33,041, Cl. 341-50.000.

Arnott, Eric J. Lens implant for insertion in the human eye. Re. 33,039, Cl. 623-6.000.

AT&T Bell Laboratories: *See*—
Calderbank, Arthur R.; and Sloane, Neil J. A., Re. 33,041, Cl. 341-50.000.

Bumberger, Herbert: *See*—
Schiefer, Bernhard; and Bumberger, Herbert, Re. 33,036, Cl. 222-597.000.

Calderbank, Arthur R.; and Sloane, Neil J. A., to American Telephone and Telegraph Company; and AT&T Bell Laboratories. Multidimensional coding for error reduction. Re. 33,041, Cl. 341-50.000.

Didier-Werke AG: *See*—
Schiefer, Bernhard; and Bumberger, Herbert, Re. 33,036, Cl. 222-597.000.

Flamig, Hans: *See*—
Schiel, Christian; Flamig, Hans; Grossmann, Udo; Mullner, Joseph; and Steiner, Karl, Re. 33,034, Cl. 241-119.000.

Genicom Corporation: *See*—
Zerillo, Samuel D., Re. 33,038, Cl. 400-216.100.

Grossmann, Udo: *See*—
Schiel, Christian; Flamig, Hans; Grossmann, Udo; Mullner, Joseph; and Steiner, Karl, Re. 33,034, Cl. 241-119.000.

J. M. Voith GmbH: *See*—
Schiel, Christian; Flamig, Hans; Grossmann, Udo; Mullner, Joseph; and Steiner, Karl, Re. 33,034, Cl. 241-119.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Kakiuchi, Hiroshi, Re. 33,040, Cl. 252-62.200.

Kakiuchi, Hiroshi, to Kabushiki Kaisha Daini Seikosha. Electrochromic display device. Re. 33,040, Cl. 252-62.200.

Kauffman, Kenneth L.: *See*—
Kauffman, Lawrence R.; and Kauffman, Kenneth L., Re. 33,037, Cl. 256-1.000.

Kauffman, Lawrence R.; and Kauffman, Kenneth L. Fenceliner. Re. 33,037, Cl. 256-1.000.

Mullner, Joseph: *See*—
Schiel, Christian; Flamig, Hans; Grossmann, Udo; Mullner, Joseph; and Steiner, Karl, Re. 33,034, Cl. 241-119.000.

Schiefer, Bernhard; and Bumberger, Herbert, to Didier-Werke AG; and Voest-Alpine AG. Closure mechanism with gas seal. Re. 33,036, Cl. 222-597.000.

Schiel, Christian; Flamig, Hans; Grossmann, Udo; Mullner, Joseph; and Steiner, Karl, to J. M. Voith GmbH. Press roll for web material with clamped press jacket. Re. 33,034, Cl. 241-119.000.

Sloane, Neil J. A.: *See*—
Calderbank, Arthur R.; and Sloane, Neil J. A., Re. 33,041, Cl. 341-50.000.

Steiner, Karl: *See*—
Schiel, Christian; Flamig, Hans; Grossmann, Udo; Mullner, Joseph; and Steiner, Karl, Re. 33,034, Cl. 241-119.000.

Voest-Alpine AG: *See*—
Schiefer, Bernhard; and Bumberger, Herbert, Re. 33,036, Cl. 222-597.000.

Zerillo, Samuel D., to Genicom Corporation. Dot matrix printing system. Re. 33,038, Cl. 400-216.100.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Akahane, Kenji: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, B1 4,656,269, Cl. 544-139.000.
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, B1 4,711,958, Cl. 544-139.000.

Angio-Medical Corporation: *See*—
Catsimpoolas, Nicholas; McCluer, Robert; Sinn, Robert S.; and Evans, James, B1 4,710,490, Cl. 514-25.000.

Boston University, Trustees of: *See*—
Catsimpoolas, Nicholas; McCluer, Robert; Sinn, Robert S.; and Evans, James, B1 4,710,490, Cl. 514-25.000.

Catsimpoolas, Nicholas; McCluer, Robert; Sinn, Robert S.; and Evans, James, to Angio-Medical Corporation; and Boston University, Trustees of. Compositions containing ganglioside molecules with enhanced angiogenic activity. B1 4,710,490, 8-29-89, Cl. 514-25.000.

Evans, James: *See*—
Catsimpoolas, Nicholas; McCluer, Robert; Sinn, Robert S.; and Evans, James, B1 4,710,490, Cl. 514-25.000.

Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, to Kissei Pharmaceutical Co., Ltd. Histidine derivitives. B1 4,656,269, 8-29-89, Cl. 544-139.000.

Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, to Kissei Pharmaceutical Co., Ltd. Morpholine containing amino acid derivatives. B1 4,711,958, 8-29-89, Cl. 544-139.000.

Kamijo, Tetsuhide: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, B1 4,656,269, Cl. 544-139.000.
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, B1 4,711,958, Cl. 544-139.000.

Kiso, Yoshiaki: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, B1 4,656,269, Cl. 544-139.000.
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, B1 4,711,958, Cl. 544-139.000.

Kissei Pharmaceutical Co., Ltd.: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, B1 4,656,269, Cl. 544-139.000.
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, B1 4,711,958, Cl. 544-139.000.

Kubota, Tetsuhiro: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, B1 4,656,269, Cl. 544-139.000.
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, B1 4,711,958, Cl. 544-139.000.

McCluer, Robert: *See*—
Catsimpoolas, Nicholas; McCluer, Robert; Sinn, Robert S.; and Evans, James, B1 4,710,490, Cl. 514-25.000.

Sinn, Robert S.: *See*—
Catsimpoolas, Nicholas; McCluer, Robert; Sinn, Robert S.; and Evans, James, B1 4,710,490, Cl. 514-25.000.

Umeyama, Hideaki: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, B1 4,656,269, Cl. 544-139.000.
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, B1 4,711,958, Cl. 544-139.000.

LIST OF DESIGN PATENTEES

A/S Nunc: *See*—
Andersen, Verner B., 303,149, Cl. D24-31.000.
Agee, Samuel. Floor tile cutter. 303,074, 8-29-89, Cl. D8-98.000.
Albert, Dennis L.; and Limon, Max. Fishing rod holder. 303,053, 8-29-89, Cl. D6-552.000.
Alternative Product Marketing, Inc.: *See*—
Phillips, John F., 303,080, Cl. D8-347.000.
Altnether, Paul J.: *See*—
Rexroth, Fred; and Altnether, Paul J., 303,148, Cl. D24-28.000.
Amaray International Ltd.: *See*—
Thompson, Peter H., 303,041, Cl. D3-35.000.
American Safety Razor Company: *See*—
Iten, Clemens A., 303,082, Cl. D9-340.000.
American Telephone and Telegraph Company, AT&T Bell Laboratories: *See*—
Paley, Steven J., 303,111, Cl. D14-100.000.
American Telephone and Telegraph Company, AT&T Information Systems: *See*—
Danielson, David C.; Hart, Norman K.; Koh, Lynnet; McGarvey, John N.; and Mills, Eugene A., 303,114, Cl. D14-142.000.
Hart, Norman K.; Koh, Lynnet; and Mills, Eugene A., 303,115, Cl. D14-142.000.
Amherst International Corporation: *See*—
Mackey, David L., 303,042, Cl. D3-35.000.
Amigo Sales, Inc.: *See*—
Shepard, Melvin E.; and Bussinger, Allen L., 303,101, Cl. D12-131.000.
Ancona, Bruce: *See*—
Ancona, Jane; and Ancona, Bruce, 303,071, Cl. D8-33.000.
Ancona, Jane; and Ancona, Bruce, 303,072, Cl. D8-39.000.
Ancona, Jane; and Ancona, Bruce, to M. Kamenstein, Inc. Bottle opener. 303,071, 8-29-89, Cl. D8-33.000.
Ancona, Jane; and Ancona, Bruce, to M. Kamenstein, Inc. Can opener. 303,072, 8-29-89, Cl. D8-39.000.
Andersen, Verner B., to A/S Nunc. Analysis plate with matching lid for biological purposes. 303,149, 8-29-89, Cl. D24-31.000.
Angell, Thomas M. Single piece, electrical box retainer. 303,081, 8-29-89, Cl. D8-364.000.
Aono, Tetsuya; and Shibayama, Ichirou, to Maruzen Sewing Machine Co., Ltd. Sewing machine. 303,117, 8-29-89, Cl. D15-70.000.
Aqua Leisure Industries, Inc.: *See*—
Fireman, Barry R., 303,088, Cl. D9-418.000.
Arco Toys Limited: *See*—
Noble, Sid, 303,130, Cl. D21-146.000.
Armor, Patrick D.; and Hanson, Robert H., to Procter & Gamble Company, The. Container blank. 303,090, 8-29-89, Cl. D9-433.000.
Avia Group International, Inc.: *See*—
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Powell, David H.; and Seymour, Richard W., to Lever Brothers Company. Bottle. 303,083, 8-29-89, Cl. D9-375.000.

Power Cut, Inc.: *See*—
Pinson, Paul I.; and Pinson, Gary P., 303,067, Cl. D8-8.000.

Prindle, William A., to Corning Incorporated. Measuring cup. 303,055, 8-29-89, Cl. D7-50.000.

Prindle, William A., to Corning Incorporated. Measuring spoon. 303,056, 8-29-89, Cl. D7-50.000.

Procter & Gamble Company, The: *See*—
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Richards, Scott H.; Karl, David H.; and Siddoway, Craig F., to Motorola, Inc. Combined microphone and radio control unit or similar article. 303,116, 8-29-89, Cl. D14-226.000.

Robbins, Tom E., to Kallista, Inc. Faucet handle. 303,140, 8-29-89, Cl. D23-252.000.

Roberts, C. Kenard, to Stanley Works, The. Knife blade container. 303,089, 8-29-89, Cl. D9-425.000.

Rolofson, Jolynn. Pennant windsock. 303,099, 8-29-89, Cl. D10-109.000.

Rosen, Leon, to Pace Collection, Inc., The. Table. 303,052, 8-29-89, Cl. D6-480.000.

Rossow, Mark P. Combined computer copyholder with paper clamp. 303,126, 8-29-89, Cl. D19-91.000.

Rothfos, Jan B., to KORD Beteiligungsgesellschaft mbH & Co. KG. Glass container. 303,086, 8-29-89, Cl. D9-377.000.

Rowley, Francis J. B.; and Hollingsworth, Ian M., to Valor Heating Limited. Gas fired heater. 303,141, 8-29-89, Cl. D23-342.000.

Russell, Bruce. Fishing plug. 303,136, 8-29-89, Cl. D22-133.000.

Saint-Amand, Elmer, to Saint-Amand Manufacturing Co. Dispensing pipette. 303,151, 8-29-89, Cl. D24-55.000.

Saint-Amand, Elmer, to Saint-Amand Manufacturing Co. Volumetric dispensing pipette. 303,152, 8-29-89, Cl. D24-55.000.

Saint-Amand Manufacturing Co.: *See*—
Saint-Amand, Elmer, 303,151, Cl. D24-55.000.
Saint-Amand, Elmer, 303,152, Cl. D24-55.000.

Sakaguchi, Hiroshi; Iida, Katsuhiro; and Takahashi, Toshiya, to Sharp Kabushiki Kaisha. Electronic calculator. 303,121, 8-29-89, Cl. D18-7.000.

Sakamoto, Hideaki: *See*—
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Samsonite Corporation: *See*—
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Saporiti Italia S.p.A.: *See*—
Offredi, Giovanni, 303,047, Cl. D6-367.000.

Satake, Koji, to Sharp Corporation. Microwave oven. 303,063, 8-29-89, Cl. D7-351.000.

Schneider, Eric A.: *See*—
Bressler, Peter W.; and Schneider, Eric A., 303,044, Cl. D6-308.000.

Sedam, Jason K.; and Mucha, Lawrence S., to Coca-Cola Company, The. Container. 303,084, 8-29-89, Cl. D9-376.000.

Segati, Umberto D. I., to Colgate-Palmolive Company. Bottle. 303,100, 8-29-89, Cl. D9-408.000.

Seymour, Richard W.: *See*—
Powell, David H.; and Seymour, Richard W., 303,083, Cl. D9-375.000.

Shannon, William B., to Ford Motor Company. Wheel cover. 303,104, 8-29-89, Cl. D12-211.000.

Sharp Corporation: *See*—
Satake, Koji, 303,063, Cl. D7-351.000.

Sharp Kabushiki Kaisha: *See*—
Sakaguchi, Hiroshi; Iida, Katsuhiro; and Takahashi, Toshiya, 303,121, Cl. D18-7.000.

Shepard, Melvin E.; and Bussinger, Allen L., to Amigo Sales, Inc. Electrically powered three-wheeled vehicle for the handicapped and others desiring assistance. 303,101, 8-29-89, Cl. D12-131.000.

Shibata, Hisao: *See*—
Maruyama, Koji; Shibata, Hisao; and Temma, Tsugio, 303,123, Cl. D18-13.000.

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Aono, Tetsuya; and Shibayama, Ichirou, 303,117, Cl. D15-70.000.

Siddoway, Craig F.: *See*—
Richards, Scott H.; Karl, David H.; and Siddoway, Craig F., 303,116, Cl. D14-226.000.

Simonson, Henry J. Collapsible castable crab trap. 303,135, 8-29-89, Cl. D22-121.000.

Smith, Allan L. Sprinkler head. 303,138, 8-29-89, Cl. D23-214.000.

Smith, Howard J. Cup holder or the like. 303,057, 8-29-89, Cl. D7-70.000.

Smith Kline & French Laboratories, Limited: *See*—
Tovey, Geoffrey D., 303,160, Cl. D28-2.000.

Sorimachi, Akira, to Katoh Electrical Machinery Co., Ltd. Hinge. 303,077, 8-29-89, Cl. D8-327.000.

Sparks, Beverly J. Adjustable support for limb surgery. 303,144, 8-29-89, Cl. D24-7.000.

Spence, Meredith, Jr., to Mead Corporation, The. Display mount for an underarm portfolio. 303,050, 8-29-89, Cl. D6-449.000.

Stackhouse, Wyman H.; and Williamson, Ian M. Clean room safety hood. 303,166, 8-29-89, Cl. D29-9.000.

Stafford, Edward. Anchor. 303,105, 8-29-89, Cl. D12-215.000.

Stamm, Jeanne. Stethoscope endpiece retainer. 303,146, 8-29-89, Cl. D24-20.000.

Stanley Works, The: *See*—
Roberts, C. Kenard, 303,089, Cl. D9-425.000.

Steed, Sarah. Holder for medical supplies or the like to be mounted on the handrail. 303,051, 8-29-89, Cl. D6-475.000.

Steel, Veronica G.; and Francis, David F., to Combined Optical Industries Limited. Magnifier. 303,119, 8-29-89, Cl. D16-135.000.

Stepanek, Frank E.; and Lelyk, William, to Ekco Housewares, Inc. Cooking device for holding food-containing bags. 303,059, 8-29-89, Cl. D7-99.000.

Stivers, Bradley A.: *See*—
Peterman, Melvin G.; and Stivers, Bradley A., 303,102, Cl. D12-158.000.

Takada, Kazuo; and Ogata, Yayoi, to Sanyo Electric Co., Ltd. Electric oven toaster. 303,062, 8-29-89, Cl. D7-350.000.

Takahashi, Toshiya: *See*—
Sakaguchi, Hiroshi; Iida, Katsuhiro; and Takahashi, Toshiya, 303,121, Cl. D18-7.000.

Talbot, Brian N. Surfer's vest. 303,133, 8-29-89, Cl. D21-238.000.

Tanaka, Yasuhiko: *See*—
Miyamoto, Isshin; Nagamatsu, Yasuo; Tanaka, Yasuhiko; Sakamoto, Masaharu; Hidaka, Masataka; Sakamoto, Hideaki; and Ishida, Kazuo, 303,173, Cl. D32-22.000.

Tarrson, Emanuel B.; Maric, Dane; and Kelly, Thomas P., to John O. Butler Company. Toothbrush. 303,043, 8-29-89, Cl. D4-104.000.

Tearney, Gerald: *See*—
Meyerovich, John; Yakubovich, Lev; Tearney, Gerald; and Galati, Joseph, 303,162, Cl. D28-61.000.

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Thompson, Peter H., to Amaray International Ltd. Cassette storage container. 303,041, 8-29-89, Cl. D3-35.000.

Thomson, Harry S.; Raffo, Dzvid M.; and Pape, John A., to Hestair Kiddicraft Limited. Toy tractor. 303,128, 8-29-89, Cl. D21-79.000.

Timex Corporation: *See*—
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Tomkins, Dallas, to International Product Technology and Marketing, Inc. Artificial fingernail with clock/calendar display. 303,161, 8-29-89, Cl. D28-56.000.

Tomy Seiko Co., Ltd.: *See*—
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Tovey, Geoffrey D., to Smith Kline & French Laboratories, Limited. Pharmaceutical tablet. 303,160, 8-29-89, Cl. D28-2.000.

Truth Incorporated: *See*—
Mosch, Duane L., 303,075, Cl. D8-301.000.

Tsuji, Masao, to North American Philips Corp. Handle for a mixer or the like. 303,065, 8-29-89, Cl. D7-379.000.

Universal Data Incorporated: *See*—
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Valor Heating Limited: *See*—
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Van Hoye, Willibald J.: *See*—
Castelli, Renato P.; Van Hoye, Willibald J.; Miles, Richard; and Flicker, Wendy, 303,076, Cl. D8-306.000.

Vasudeva, Hari D. Pressure cooker. 303,064, 8-29-89, Cl. D7-358.000.

Vision Care Research Labs., Inc.: *See*—
Berndt, Dieter R., 303,145, Cl. D24-17.000.

Wakamatsu, Masamichi, to Casio Computer Co., Ltd. Wrist wtach with pulsimeter. 303,092, 8-29-89, Cl. D10-31.000.

Weese, Benjamin H., to Midland Manufacturing Corp. Carrel unit. 303,048, 8-29-89, Cl. D6-421.000.

Williamson, Ian M.: *See*—
Stackhouse, Wyman H.; and Williamson, Ian M., 303,166, Cl. D29-9.000.

Witlin, Ina: *See*—
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Yoshinari, Shigeru: *See*—
Nagai, Yawara; Yoshinari, Shigeru; and Ushikubo, Masao, 303,095, Cl. D10-81.000.

Zabarte, Ron. Axe mattock. 303,068, 8-29-89, Cl. D8-11.000.

LIST OF PLANT PATENTEES

Adams County Nursery, Inc.: *See*—
Greiner, Ernest B., 7,002, Cl. 34.000.

Barco, Arthur: *See*—
Drewlow, Lyndon W.; and Barco, Arthur, 7,004, Cl. 68.000.

Drewlow, Lyndon W.; and Barco, Arthur, to Mikkelsens, Inc. Begonia plant named Appleblossom. 7,004, 8-29-89, Cl. 68.000.

Frazer, Edwin J., to Hartman Plant Laboratories, Inc. Dieffenbachia Hybrida Maui. 7,010, 8-29-89, Cl. 88.000.

Greiner, Ernest B., to Adams County Nursery, Inc. Apple tree named Pioneer Mac. 7,002, 8-29-89, Cl. 34.000.

Hartman Plant Laboratories, Inc.: *See*—
Frazer, Edwin J., 7,010, Cl. 88.000.

Hiraragi, Tadao, to Okada, Makoto. Apple tree: Yataka. 7,001, 8-29-89, Cl. 34.000.

Holtkamp, Reinhold, Sr. African violet plant named Martinique. 7,005, 8-29-89, Cl. 69.000.

Holtkamp, Reinhold, Sr. African violet plant named Dolly. 7,006, 8-29-89, Cl. 69.000.

Holtkamp, Reinhold, Sr. African violet plant named Taurus. 7,007, 8-29-89, Cl. 69.000.

Holtkamp, Reinhold, Sr. African violet plant named Knoxville. 7,008, 8-29-89, Cl. 69.000.

Metropolitan Life Insurance Company: *See*—
Metzler, Ronald H., 7,003, Cl. 43.000

Metzler Investments: *See*—
Metzler, Ronald H., 7,003, Cl. 43.000.

Metzler, Ronald H., to Metzler Investments; and Metropolitan Life Insurance Company. Peach tree, "Jefferson Sun". 7,003, 8-29-89, Cl. 43.000.

Mikkelsens, Inc.: *See*—
Drewlow, Lyndon W.; and Barco, Arthur, 7,004, Cl. 68.000.

Okada, Makoto: *See*—
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VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Tanaga. 7,009, 8-29-89, Cl. 74.000.

Yoder Brothers, Inc.: *See*—
VandenBerg, Cornelis P., 7,009, Cl. 74.000.

CLASSIFICATION OF PATENTS

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NOTE—First number, class; second number, subclass; third number, patent number

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6 4,860,731
4,860,732
25 R 4,860,733
57 4,860,734
92 V 4,860,735
155 4,860,736
156 4,860,737
200 22 4,860,738
201 11 4,860,739
203 15 4,860,740
204 18 4,860,741
303 R 4,860,742
303 1 4,860,743
4,860,744
303 17 4,860,745
326 4,860,746
330 4,860,747
399 4,860,748
419 P 4,860,750
419 PG 4,860,749
4,860,751
422 4,860,752
632 4,860,753
640 4,860,754
645 4,860,755
653 4,860,756
657 4,860,757
662 06 4,860,758

[illegible] 4,860,759
680 4,860,760
[illegible] 4,860,761
702 4,860,762
707 4,860,763
725 4,860,764
4,860,765
748 4,860,766
760 4,860,767
778 4,860,768
[illegible] 4,860,769
[illegible] 4,860,770
872 4,860,771

CLASS 131

84.1 4,860,772
281 4,860,773

CLASS 132

118 4,860,775
[illegible] 4,860,774

CLASS 134

9 4,861,384
10 4,861,385
27 4,861,386

CLASS 135

19.5 4,860,776
87 4,860,777
97 4,860,778

CLASS 136

256 4,861,387

CLASS 137

1 4,860,779
45 4,860,780
118 4,860,781
193 4,860,782
268 4,860,783
315 4,860,784
351 4,860,785
384 4,860,786
487.5 4,860,787
491 4,860,788
515.7 4,860,789
527 4,860,790
565 4,860,791
596.17 4,860,792
606 4,860,793
637.2 4,860,794

CLASS 138

46 4,860,795
90 4,860,796
122 4,860,797
133 4,860,798
167 4,860,799

CLASS 139

448 4,860,800

CLASS [illegible]

105 4,860,801

CLASS 141

6 4,860,802
9 4,860,803
[illegible] 4,860,804
382 4,860,805

CLASS 144

193 E 4,860,806
286 R 4,860,807
335 4,860,808
371 4,860,809

CLASS [illegible]

2 4,861,388
3 4,861,389
12 R 4,861,390
12.7 A 4,861,391
23 4,861,392
33.4 4,861,393
153 4,861,394
321 4,861,395
439 4,861,396

CLASS 149

19.4 4,861,397

CLASS 152

540 4,860,810

CLASS 156

[illegible] 4,861,398
[illegible] 4,861,399
71 4,861,400
[illegible] 4,861,401
108 4,861,402
138 4,861,403
204 4,861,404
4,861,405
230 4,861,406
272.8 4,861,407
273.3 4,861,408
308.2 4,861,409
325 4,861,410
344 4,861,411
499 4,861,412
515 4,861,413
530 4,861,414
556 4,861,415
[illegible] 4,861,416
610 4,861,417
620.72 4,861,418
626 4,861,419
633 4,861,420
635 4,861,421
[illegible] 4,861,422
643 4,861,423
[illegible] 4,861,424
[illegible] 4,861,425
4,861,426

CLASS [illegible]

92 4,860,811
134 4,861,090
135 4,860,812
[illegible] 4,860,813
381 4,860,814

CLASS 162

129 4,861,427
168.1 4,861,428
199 4,861,429
[illegible] 4,861,430
273 4,861,431
[illegible] 4,861,432
323 4,861,433
358 4,861,434

CLASS 164

47 4,860,815
154 4,860,816
169 4,860,817
314 4,860,818
437 4,860,819
457 4,860,820

CLASS 165

95 4,860,821
151 4,860,822
153 4,860,823
165 4,860,824

CLASS 166

68 4,860,825
80 4,860,826
261 4,860,827
274 4,860,828
279 4,860,829
312 4,860,830
384 4,860,831

CLASS [illegible]

49 4,860,832

CLASS 172

26 4,860,833
820 4,860,834

CLASS 173

133 4,860,835

CLASS 174

6 4,861,940
35 R 4,861,941
[illegible] 4,861,942
52.1 4,861,943
68.5 4,861,944
69 4,861,945
92 4,861,946
113 C 4,861,947

CLASS 175

44 4,860,836
113 4,860,837
320 4,860,838

CLASS 177

185 4,860,839
208 4,860,840

CLASS [illegible]

13 4,860,841
79.1 4,860,844
140 4,860,842
4,860,845
141 4,860,846
197 4,860,847
4,860,848
4,860,849
215 4,860,850
373 4,860,843

CLASS 181

6.4 4,860,856
207 4,860,851
240 4,860,852
282 4,860,853

CLASS 182

88 4,860,854
106 4,860,855

CLASS [illegible]

7.4 4,860,857

CLASS [illegible]

71.8 4,860,858
72.1 4,860,859
77 R 4,860,860

CLASS [illegible]

0.033 4,860,863
3.26 4,860,861
18 A 4,860,862
[illegible] 4,860,864
70 4,860,865
71 4,860,866
84 C 4,860,867
[illegible] 4,860,868
93 A 4,860,869
99 S 4,860,870
106.1 4,860,871
107 R 4,860,872
113 B 4,860,873

CLASS 193

2 B 4,860,874
35 MD 4,860,875

CLASS 194

205 4,860,876
346 4,860,877

CLASS [illegible]

309 4,860,878
395 4,860,879
405 4,860,880
443 4,860,881
458 4,860,882
495 4,860,883
509 4,860,884

CLASS [illegible]

5 B 4,861,948
5 R 4,861,950
5R 4,861,949
11 DA 4,861,951
81 R 4,861,952
83 P 4,861,953
[illegible] 4,861,954
390 4,860,893

CLASS 202

180 4,861,435

CLASS 203

38 4,861,436

CLASS [illegible]

5 4,861,437
15 4,861,438
27 4,861,439
38.3 4,861,440
38.7 4,861,441
44.2 4,861,442
72 4,861,443
130 4,861,444
157.3 4,861,445
170 4,861,446
181.8 4,861,447
182.8 4,861,448
197 4,861,449
224 M 4,861,450
230 4,861,451
297 W 4,861,452
[illegible] 4,861,453
414 4,861,454
418 4,861,455
425 4,861,456

CLASS 206

5.1 4,860,885
45.29 4,860,886
204 4,860,887
223 4,860,888
315.6 4,860,889
333 4,860,890
362 4,860,891
389 4,860,892
421 4,860,894
426 4,860,895
427 4,860,896
[illegible] 4,860,897
455 4,860,898
534 4,860,899
574 4,860,900
586 4,860,901
631.3 4,860,902

CLASS 208

46 4,861,457
73 4,861,458
157 4,861,459
216 PP 4,861,460

CLASS [illegible]

234 4,861,461
269 4,861,462
315 4,861,463
474 4,861,464

CLASS 210

109 4,861,465
120 4,861,466
[illegible] 4,861,467
169 4,861,468
172 4,861,469
4,861,470
[illegible] 4,861,471
189 4,861,472
198.2 4,861,473
232 4,861,474
242.4 4,861,475
321.76 4,861,476
359 4,861,477
416.4 4,861,478
[illegible] 4,861,479
[illegible] 4,861,480
502.1 4,861,481
611 4,861,482
636 4,861,483
638 4,861,484
641 4,861,485
644 4,861,486
4,861,487
656 4,861,488
668 4,861,489
[illegible] 4,861,490
691 4,861,491
709 4,861,492
715 4,861,493
739 4,861,494
4,861,495
748 4,861,496
759 4,861,497
791 4,861,498

CLASS 211

[illegible] 4,860,903
[illegible] 4,860,904
59.1 4,860,905

CLASS 215

12.2 4,860,906
230 4,860,907

CLASS 219

10.55 A 4,861,956
10.55 D 4,861,955
10.55 E 4,861,957
4,861,958
89 4,861,959
110 4,861,960
119 4,861,961
121.48 4,861,963
121.5 4,861,962
121.68 4,861,964
130.51 4,861,965
205 4,861,966
241 4,861,967
312 4,861,968
458 4,861,969

CLASS [illegible]

1 R 4,860,908
1 T 4,860,909
4,860,910
1.5 4,860,911
4,860,912
4,860,913
4 C 4,860,914
4 R 4,860,915
5 A 4,860,916
8 4,860,917
84 4,860,918
240 4,860,919
326 4,860,920
467 4,860,921

CLASS 221

6 4,860,922

CLASS 222

1 4,860,923
[illegible] 4,860,924
145 4,860,925
148 4,860,926
158 4,860,927
167 4,860,928
189 4,860,929
231 4,860,930
[illegible] 4,860,931
402.1 4,860,932
402.13 4,860,933
534 4,860,934
597 Re.33,036

CLASS 224

202 4,860,935
210 4,860,936

CLASS 227

147 4,860,937

CLASS 228

102 4,860,938
122 4,860,939
173.4 4,860,940
179 4,860,941
220 4,860,942

CLASS [illegible]

40 4,860,943
52 B 4,860,944
69 4,860,945
4,860,946
103 4,860,947
143 4,860,948

CLASS 232

35 4,860,949

CLASS 235

10 4,861,970
384 4,861,971
462 4,861,972
467 4,861,973
475 4,861,974

CLASS [illegible]

51 4,860,950

CLASS 237

2 A 4,860,951

CLASS [illegible]

8 4,860,952

CLASS 239

47 4,860,953
101 4,860,954
223 4,860,955
265.19 4,860,956

CLASS 241

20 4,860,957
23 4,860,958
39 4,860,959
89.3 4,860,960
92 4,860,961
117 4,860,962
119 Re.33,034
236 4,860,963

CLASS 242

57.1 4,860,964
67.1 R 4,860,965
71.1 4,860,966
199 4,860,967

CLASS 244

3.12 4,860,968
3.27 4,860,969
16 4,860,970
122 AD 4,860,971
135 R 4,860,972
137.1 4,860,973
158 R 4,860,974
161 4,860,975
207 4,860,976

CLASS 246

3 4,860,977
448 4,860,978

CLASS 248

74.3 4,860,979
74.4 4,860,980
97 4,860,981
100 4,860,982
205.1 4,860,983
225.2 4,860,984
229 4,860,985
313 4,860,986
405 4,860,987
420 4,860,988
471 4,860,989

CLASS 250

[illegible] 4,861,975
211 J 4,861,976
213 VT 4,861,977
214 A 4,861,978
227 4,861,979
4,861,980
231 R 4,861,981
235 4,861,982
4,861,983
236 4,861,984
253 4,861,985
260 4,861,986
282 4,861,987
288 4,861,989
306 4,861,990
310 4,861,991
316.1 4,861,992
327.2 4,861,993
4,861,994
4,861,995
330 4,861,996
334 4,861,997
339 4,861,998
4,861,999
341 4,862,000
345 4,862,001
352 4,862,002
363.02 4,862,003
369 4,862,004
385.1 4,862,005
483.1 4,862,006
506.1 4,862,007
548 4,862,008

CLASS 251

30.03 4,860,990
62 4,860,991
81 4,860,992
127 4,860,993
173 4,860,994
356 4,860,995

CLASS 252

8.551 4,861,499
4,861,500
8.6 4,861,501
8.75 4,861,502
48.2 4,861,504
62.2 Re.33,040
92 4,861,505
95 4,861,506
[illegible] 4,861,507
121 4,861,508
135 4,861,503
174.12 4,861,509
174.13 4,861,510
174.23 4,861,511
4,861,512
182.24 4,861,513
187.21 4,861,514
299.01 4,861,515
531 4,861,516
[illegible] 4,861,517
[illegible] 4,861,518
633 4,861,519
644 4,861,520

CLASS 256

1 Re.33,037
10 4,860,996
34 4,860,997
4,860,998

CLASS 260

403 4,861,521

CLASS 261

35 4,861,522
104 4,861,523
130 4,861,524

CLASS 264

1.5 4,861,525
22 4,861,526
39 4,861,528
40.1 4,861,529
40.2 4,861,530
50 4,861,531
65 4,861,532
81 4,861,533
102 4,861,534
103 4,861,535
[illegible] 4,861,536
126 4,861,537
161 4,861,538
186 4,861,527
[illegible] 4,861,539
263 4,861,540
[illegible] 4,861,541
542 4,861,542
545 4,861,543

CLASS 266

103 4,860,999
143 4,861,000
242 4,861,001

CLASS 267

103 4,861,002
140.1 4,861,003
4,861,004
4,861,005
4,861,006
153 4,861,007

CLASS 269

21 4,861,008
43 4,861,009
99 4,861,011
282 4,861,010

CLASS 271

3.1 4,861,012
119 4,861,013
198 4,861,014
213 4,861,015
215 4,861,016
258 4,861,017
274 4,861,018
315 4,861,019

CLASS 272

62 4,861,020

69 4,861,021
120 4,861,023
123 4,861,024
137 4,861,022
144 4,861,025

CLASS 273

1 GD 4,861,026
29 A 4,861,027
60 B 4,861,028
73 C 4,861,029
73 J 4,861,030
85 G 4,861,031
113 4,861,036
121 D 4,861,037
144 B 4,861,032
169 4,861,038
177 R 4,861,033
183 D 4,861,034
184 B 4,861,035
239 4,861,039
241 4,861,040
292 4,861,041
326 4,861,042

CLASS 277

1 4,861,043
24 4,861,044
25 4,861,045
235 B 4,861,046
4,861,047

CLASS 279

123 4,861,048

CLASS 280

47.131 4,861,057
47.16 4,861,049
47.35 4,861,050
87.021 4,861,051
87.043 4,861,052
205 4,861,053
221 4,861,054
234 4,861,055
250.1 4,861,056
278 4,861,058
304.1 4,861,059
439 4,861,060
479.2 4,861,061
507 4,861,062
601 4,861,063
618 4,861,064
678 4,861,065
707 4,861,066
4,861,067
714 4,861,068
758 4,861,069
808 4,861,070
4,861,071
814 4,861,072

CLASS 281

45 4,861,073

CLASS 285

53 4,861,074
112 4,861,075
332.3 4,861,076
334.1 4,861,077

CLASS 290

22 4,862,009
38 R 4,862,010
288 4,861,988

CLASS 292

113 4,861,078
148 4,861,079
251.5 4,861,080
336.3 4,861,081
346 4,861,082
347 4,861,083
359 4,861,084

CLASS 294

87.1 4,861,085
88 4,861,086
119.1 4,861,087

CLASS 296

57.1 4,861,088
76 4,861,089
97.6 4,861,091
100 4,861,092
180.1 4,861,093
181 4,861,094
182 4,861,095
183 4,861,096
188 4,861,097
195 4,861,098
202 4,861,099

CLASS 297

19 4,861,100
69 4,861,101
162 4,861,102
216 4,861,103
218 4,861,104
250 4,861,105
316 4,861,106
[illegible] 4,861,107
445 4,861,108
467 4,861,109

CLASS 298

2 4,861,110

CLASS 299

43 4,861,111
70 4,861,112

CLASS 301

65 4,861,113

CLASS 303

9.72 4,861,114
15 4,861,115
100 4,861,116
4,861,117
110 4,861,118
115 4,861,119

CLASS 305

35 R 4,861,120

CLASS 307

10.1 4,862,011
38 4,862,012
254 4,862,013
270 4,862,014
4,862,015
353 4,862,016
443 4,862,017
4,862,018
469 4,862,019
601 4,862,020

CLASS 310

10 4,862,021
52 4,862,022
54 4,862,023
[illegible] 4,862,024
68 B 4,862,025
[illegible] 4,862,026
99 4,862,027
168 4,862,028
311 4,862,029
332 4,862,030

CLASS 312

208 4,861,121
317.1 4,861,122
330.1 4,861,123

CLASS 313

341 4,862,031
359.1 4,862,032
502 4,862,033

CLASS 315

39.75 4,862,034
58 4,862,035
82 4,862,036
83 4,862,037
86 4,862,038
194 4,862,039
244 4,862,040
246 4,862,041
291 4,862,042

CLASS 318

114 4,862,043
254 4,862,044
4,862,045
4,862,046
467 4,862,047
587 4,862,048
640 4,862,049
689 4,862,050
696 4,862,051
757 4,862,052
786 4,862,053
800 4,862,054

CLASS 322

8 4,862,055

CLASS 323

275 4,862,056
285 4,862,057
298 4,862,058
307 4,862,059

CLASS 324

58.5 A 4,862,060
58.5 R 4,862,061
61 P 4,862,063
61 R 4,862,062
65 P 4,862,064
4,862,066
65 R 4,862,065
73 R 4,862,067
4,862,068
4,862,069
4,862,070
4,862,072
78 R 4,862,073
107 4,862,074
158 F 4,862,075
4,862,076
4,862,077
212 4,862,078
227 4,862,079
306 4,862,080
307 4,862,081
309 4,862,082
4,862,083
4,862,084
315 4,862,085
318 4,862,086
320 4,862,087
326 4,862,088
350 4,862,089
367 4,862,090
415 4,862,091
450 4,862,092
464 4,862,093
[illegible] 4,862,094
543 4,862,095

CLASS 328

75 4,862,096
165 4,862,097

CLASS 329

50 4,862,098
126 4,862,099

CLASS 330

4.3 4,862,100
4,862,101
256 4,862,102
304 4,862,103

CLASS 331

1 A 4,862,104
4,862,105
2 4,862,106
4,862,107
[illegible] 4,862,108
16 4,862,109
70 4,862,110
96 4,862,111
107 SL 4,862,112
117 R 4,862,113
158 4,862,114

CLASS 332

7.51 4,862,115
23 R 4,862,116

CLASS 333

1.1 4,862,117
14 4,862,118
24 R 4,862,119
34 4,862,120
173 4,862,121
202 4,862,122

CLASS 335

131 4,862,123
151 4,862,124
202 4,862,125
216 4,862,126
257 4,862,127
306 4,862,128

CLASS 336

61 4,862,129
1[illegible] 4,862,130

CLASS 337

48 4,862,131
102 4,862,132
4,862,133
231 4,862,134

CLASS 338

64 4,862,135
195 4,862,136
237 4,862,137

CLASS 340

146.2 4,862,138
426 4,862,139
457.2 4,862,140
521 4,862,141
522 4,862,142
572 4,862,143
573 4,862,144
4,862,145
605 4,862,146
628 4,862,147
4,862,148
635 4,862,149
703 4,862,150
706 4,862,151
712 4,862,152
719 4,862,153
747 4,862,154
4,862,155
4,862,156
825 4,862,157
825.050 4,862,158
825.24 4,862,159
825.54 4,862,160
825.800 4,862,161
938 4,862,162
[illegible] 4,862,163
952 4,862,164

CLASS 341

20 4,862,165
22 4,862,166
50 Re.33,041
107 4,862,167
140 4,862,168
143 4,862,169
144 4,862,170
156 4,862,171
157 4,862,172
200 4,862,173

CLASS 342

1 4,862,174
19 4,862,468
20 4,862,175
45 4,862,176
160 4,862,177
357 4,862,178
359 4,862,179
417 4,862,180

CLASS 343

702 4,862,181
4,862,182
715 4,862,183
745 4,862,184
761 4,862,185
776 4,862,186
786 4,862,187
4,862,188
[illegible] 4,862,189
915 4,862,190

CLASS 346

18 4,862,191
75 4,862,192
76 PH 4,862,193
4,862,194
4,862,195
108 4,862,196
140 R 4,862,197
153.1 4,862,198

CLASS 350

6.5 4,861,124
6.6 4,861,125
96.11 4,861,126
96.13 4,861,128
4,861,129
96.14 4,861,130
96 15 4,861,127
96 18 4,861,131
96.2 4,861,133
96.20 4,861,132
4,861,134
96.23 4,861,135
96.3 4,861,136
253 4,861,137
255 4,861,138
4,861,139
320 4,861,140
336 4,861,141
345 4,861,142
350 S 4,861,143
412 4,861,144
427 4,861,145
429 4,861,146
4,861,147
505 4,861,148
611 4,861,149
622 4,861,150

CLASS 351

137 4,861,151
161 4,861,152
169 4,861,153
205 4,861,154
212 4,861,155
243 4,861,156

CLASS 352

132 4,861,157

CLASS 354

62 4,862,199
75 4,862,200
105 4,862,201
195.12 4,862,202
400 4,862,203
[illegible] 4,862,204
412 4,862,205
414 4,862,206
453 4,862,207
485 4,862,208

CLASS 355

3 A 4,862,212
[illegible] 4,862,222
54 4,862,223
[illegible] 4,862,224
202 4,862,219
211 4,862,209
212 4,862,211
218 4,862,216
4,862,217
235 4,862,218
245 4,862,210
4,862,213
288 4,862,225
298 4,862,226
[illegible] 4,862,221
[illegible] 4,862,215
311 4,862,220
377 4,862,214

CLASS 356

5 4,861,158
4,861,159
138 4,861,160
350 4,861,161
[illegible] 4,861,162
417 4,861,163
445 4,861,164

CLASS 357

2 4,862,227
[illegible] 4,862,228
15 4,862,229
17 4,862,230
19 4,862,231
23.1 4,862,232
23.4 4,862,233
23.7 4,862,234
24 4,862,235
[illegible] 4,862,236
4,862,237
34 4,862,238
38 4,862,239
42 4,862,240
45 4,862,241
[illegible] 4,862,242
51 4,862,243
67 4,862,244
70 4,862,245
4,862,246
74 4,862,247
79 4,862,248
80 4,862,249

CLASS 358

12 4,862,250
22 4,862,251
31 4,862,252
42 4,862,253
75 4,862,254
80 4,862,255
81 4,862,256
95 4,862,257
98 4,862,258
105 4,862,259
4,862,260
133 4,862,261
4,862,262
135 4,862,263
138 4,862,264
139 4,862,265
140 4,862,266
4,862,267
141 4,862,268
160 4,862,269
4,862,270
166 4,862,271
181 4,862,272
213.19 4,862,273
213.24 4,862,274
213.29 4,862,275
213.31 4,862,276
222 4,862,277
225 4,862,278
229 4,862,279
4,862,280
296 4,862,287
298 4,862,288
4,862,289
335 4,862,290
342 4,862,291
400 4,862,281
4,862,282
443 4,862,283
451 4,862,284
4,862,285
494 4,862,286

CLASS 360

8 4,862,292
35.1 4,862,293
4,862,294
4,862,295
51 4,862,296
53 4,862,297
60 4,862,298
[illegible] 4,862,299
[illegible] 4,862,300
92 4,862,301
105 4,862,302
110 4,862,303
121 4,862,304
132 4,862,305

CLASS 361

24 4,862,306
38 4,862,307
45 4,862,308
56 4,862,309
58 4,862,310
91 4,862,311
96 4,862,312
102 4,862,313
119 4,862,314
212 4,862,315
220 4,862,316
283 4,862,317
321 4,862,318
341 4,862,319
383 4,862,320
385 4,862,321
386 4,862,322
388 4,862,323
390 4,862,324
[illegible] 4,862,325
413 4,862,326
415 4,862,327
502 4,862,328

CLASS 362

61 4,862,329
4,862,330
106 4,862,331
145 4,862,332
147 4,862,333
149 4,862,334
267 4,862,335
285 4,862,336
294 4,862,337

CLASS 363

19 4,862,338
21 4,862,339
35 4,862,340
37 4,862,341
40 4,862,342
41 4,862,343
147 4,862,344

CLASS 364

188 4,862,345
200 4,862,346
4,862,347
4,862,348
4,862,349
4,862,350
4,862,351
4,862,352
4,862,353
4,862,354
4,862,355
[illegible] 4,862,356
407 4,862,357
413 4,862,358
413.01 4,862,360
413.05 4,862,359
413.06 4,862,361
424.01 4,862,364
4,862,365
424.05 4,862,366
424.1 4,862,362
4,862,363
426.02 4,862,368
426.04 4,862,367
431.07 4,862,369
431.10 4,862,370
431.11 4,862,371
433 4,862,372
[illegible] 4,862,373
[illegible] 4,862,374
464.02 4,862,375
[illegible] 4,862,376
4,862,377
[illegible] 4,862,378
474.11 4,862,379
4,862,380
474.36 4,862,381
[illegible] 4,862,382
507 4,862,383
[illegible] 4,862,384
518 4,862,385
4,862,386
520 4,862,387
521 4,862,388
4,862,389
522 4,862,390
4,862,391
4,862,392
550 4,862,393
551.01 4,862,394
561 4,862,395
571.01 4,862,397
571.02 4,862,396
571.05 4,862,398
[illegible] 4,862,399
[illegible] 4,862,400

710 07 4,862,401
724 12 4,862,402
724 16 4,862,403
733 4,862,404
760 4,862,405
[illegible] 4,862,406
900 4,862,407
4,862,408
4,862,409
4,862,410
952 4,862,411

CLASS 365

49 4,862,412
104 4,862,413
106 4,862,414
189 07 4,862,421
189 09 4,862,415
200 4,862,417
201 4,862,418
221 4,862,419
4,862,420

CLASS 366

165 4,861,165
219 4,861,166

CLASS 367

19 4,862,422
25 4,862,423
33 4,862,424
4,862,425
81 4,862,426
101 4,862,427
155 4,862,428
165 4,862,429
168 4,862,430

[illegible]

10 4,862,431
88 4,862,432
108 4,862,433
190 4,862,434
282 4,862,435
4,862,436

CLASS 369

13 4,862,437
19 4,862,438
30 4,862,439
45 4,862,440
4,862,441
4,862,442
59 4,862,443
67 4,862,444
75.2 4,862,445
112 4,862,446
270 4,862,447
291 4,862,448

CLASS 370

32.1 4,862,449
4,862,450
[illegible] 4,862,451
62 4,862,452
82 4,862,453
94 4,862,454
112 4,862,455
118 4,862,456

CLASS 371

8 4,862,457
10 4,862,416
15 4,862,458
21 4,862,459
27 4,862,460
33 4,862,461
38 4,862,462
4,862,463
43 4,862,464

CLASS 372

9 4,862,466
18 4,862,467
33 4,862,469
45 4,862,470
4,862,471
4,862,472
50 4,862,473
4,862,474
61 4,862,475
4,862,476

CLASS 373

[illegible] 4,862,477

CLASS 374

44 4,861,167
117 4,861,168
179 4,861,169

CLASS 375

1 4,862,478
4,862,479
37 4,862,480
57 4,862,481
87 4,862,482

[illegible] 4,862,483
110 4,862,484
120 4,862,485

CLASS 376

333 4,861,544
448 4,861,545

CLASS 377

16 4,862,486
58 4,862,487

CLASS 378

81 4,862,488
117 4,862,489
161 4,862,490

CLASS 379

6 4,862,491
4,862,492
107 4,862,493
145 4,862,494
183 4,862,495
221 4,862,496
355 4,862,497
4,862,498
368 4,862,499
445 4,862,500

CLASS 380

50 4,862,501

CLASS 381

22 4,862,502
48 4,862,503
51 4,862,504
60 4,862,505
71 4,862,506
155 4,862,507
156 4,862,508
163 4,862,509

CLASS 382

8 4,862,510
32 4,862,511
58 4,862,512

CLASS 383

6 4,861,170

CLASS 384

455 4,861,171
477 4,861,172
538 4,861,173

CLASS 400

18 4,861,174
76 4,861,175
208 4,861,176
4,861,177
216.1 Re.33,038
719 4,861,178

CLASS 401

129 4,861,179
195 4,861,180

CLASS 403

15 4,861,181
264 4,861,182
354 4,861,183

CLASS 404

1 4,861,184
6 4,861,185
25 4,861,186
72 4,861,187
75 4,861,188
[illegible] 4,861,189
93 4,861,190
104 4,861,191

CLASS 405

3 4,861,192
28 4,861,193
128 4,861,194
[illegible] 4,861,195
224 4,861,196
259 4,861,197
261 4,861,198
267 4,861,199

CLASS 406

14 4,861,200

[illegible]

139 4,861,201
181 4,861,202

CLASS 409

136 4,861,203
200 4,861,204

CLASS 410

47 4,861,205

CLASS 411

36 4,861,206
104 4,861,207

339 4,861,208
411 4,861,209
[illegible] 4,861,210
501 4,861,211

CLASS 412

36 4,861,212

CLASS 414

225 4,861,214
288 4,861,215
326 4,861,216
401 4,861,217
461 4,861,218
469 4,861,219
495 4,861,220
563 4,861,221
[illegible] 4,861,222
661 4,861,223
[illegible] 4,861,224
789 9 4,861,225
790 3 4,861,226
791 2 4,861,213
796 8 4,861,227

CLASS 415

115 4,861,228
138 4,861,229

CLASS 416

247 R 4,861,230

CLASS 417

38 4,861,231
76 4,861,232
201 4,861,233
273 4,861,234
295 4,861,235
315 4,861,236
353 4,861,237
363 4,861,238
383 4,861,239
423.3 4,861,240
454 4,861,241
477 4,861,242
499 4,861,243

CLASS 418

15 4,861,244
55 4,861,245
84 4,861,246

CLASS 419

8 4,861,546

CLASS 420

53 4,861,547
79 4,861,548
109 4,861,549
460 4,861,550
533 4,861,551

CLASS 422

56 4,861,552
65 4,861,553
4,861,554
70 4,861,555
78 4,861,556
97 4,861,557
106 4,861,558
110 4,861,559
111 4,861,560
116 4,861,561
143 4,861,562
186.05 4,861,563

CLASS 423

21.5 4,861,564
55 4,861,565
230 4,861,566
235 4,861,567
240 4,861,578
243 4,861,568
324 4,861,569
326 4,861,570
328 4,861,571
339 4,861,572
342 4,861,574
447 2 4,861,575
464 4,861,573
574 R 4,861,576
577 4,861,577

CLASS 424

1 1 4,861,579
4,861,580
4,861,581
70 4,861,583
79 4,861,584
[illegible] 4,861,585
4,861,586
85 1 4,861,587
[illegible] 4,861,588
93 4,861,589
195.1 4,861,593
4,861,594
4,861,595
438 4,861,596

450 4,861,597
468 4,861,598
[illegible] 4,861,599
520 4,861,582
602 4,861,590
687 4,861,592
690 4,861,591

CLASS 425

11 4,861,247
13 4,861,248
66 4,861,249
90 4,861,250
116 4,861,251
135 4,861,252
143 4,861,253
190 4,861,254
202 4,861,255
378.1 4,861,256
438 4,861,257
444 4,861,258
451.2 4,861,259
529 4,861,260

CLASS 426

3 4,861,600
19 4,861,601
56 4,861,602
93 4,861,603
94 4,861,604
96 4,861,605
305 4,861,606
481 4,861,607
489 4,861,608
550 4,861,609
582 4,861,610
601 4,861,611
607 4,861,612
611 4,861,613
619 4,861,614
631 4,861,615
651 4,861,616

CLASS 427

2 4,861,617
34 4,861,618
48 4,861,619
53.1 4,861,620
54.1 4,861,621
4,861,622
69 4,861,623
81 4,861,624
126.2 4,861,625
133 4,861,626
213.31 4,861,627
245 4,861,628
355 4,861,629

CLASS 428

34.1 4,861,630
34.5 4,861,631
35.2 4,861,632
36.1 4,861,634
36.3 4,861,633
[illegible] 4,861,635
4,861,648
41 4,861,636
65 4,861,637
71 4,861,638
105 4,861,639
137 4,861,640
4,861,641
139 4,861,642
162 4,861,643
195 4,861,644
196 4,861,645
210 4,861,646
216 4,861,647
240 4,861,649
251 4,861,650
255 4,861,651
284 4,861,652
287 4,861,654
288 4,861,653
328 4,861,655
333 4,861,656
336 4,861,657
4,861,658
364 4,861,659
371 4,861,660
398 4,861,661
[illegible] 4,861,662
409 4,861,663
4,861,664
411.1 4,861,665
412 4,861,666
421 4,861,667
424.4 4,861,668
434 4,861,669
447 4,861,670
457 4,861,671
458 4,861,672
469 4,861,673
[illegible] 4,861,674
501 4,861,675
516 4,861,676
4,861,677

542.4 4,861,678
614 4,861,679
623 4,861,680
654 4,861,681
685 4,861,682
694 4,861,683

CLASS 429

7 4,861,684
4,861,685
90 4,861,686
187 4,861,687
[illegible] 4,861,688
210 4,861,689
233 4,861,690

CLASS 430

59 4,861,691
4,861,692
106.6 4,861,693
137 4,861,694
138 4,861,695
4,861,696
270 4,861,697
272 4,861,698
321 4,861,699
517 4,861,700
543 4,861,701
564 4,861,702
608 4,861,703

CLASS 431

1 4,861,261
5 4,861,262
158 4,861,263
263 4,861,264

CLASS 432

103 4,861,265

CLASS 433

95 4,861,266
218 4,861,267
229 4,861,268

CLASS 434

45 4,861,269
226 4,861,270

CLASS 435

1 4,861,704
2 4,861,705
5 4,861,706
4,861,707
6 4,861,708
4,861,709
4,861,710
13 4,861,712
20 4,861,713
68 4,861,714
70 4,861,715
134 4,861,716
172.3 4,861,717
207 4,861,718
236 4,861,719
238 4,861,720
252.1 4,861,721
252.32 4,861,722
262 4,861,723
280 4,861,724
294 4,861,725

CLASS 436

7 4,861,711
4,861,726
89 4,861,727
136 4,861,728

CLASS 437

18 4,861,729
43 4,861,730
51 4,861,731
229 4,861,732

CLASS 439

63 4,861,271
79 4,861,272
111 4,861,273
189 4,861,274
289 4,861,275
365 4,861,276
377 4,861,277
395 4,861,278
412 4,861,279
491 4,861,280
540 4,861,281
4,861,282
4,861,283
[illegible] 4,861,284
621 4,861,285
651 4,861,286
718 4,861,287
736 4,861,288
792 4,861,289
810 4,861,290

CLASS 440

1 4,861,291

76 4,861,292
4,861,293
83 4,861,294
86 4,861,295
89 4,861,296

CLASS 441

33 4,861,297
42 4,861,298
[illegible] 4,861,299
81 4,861,300
131 4,861,301

CLASS 445

38 4,861,302

CLASS 446

17 4,861,303
34 4,861,304
75 4,861,305
4,861,306
95 4,861,307
129 4,861,308
168 4,861,309
453 4,861,310
469 4,861,311

CLASS 453

7 4,861,312

CLASS 455

45 4,862,513
161 4,862,514
183 4,862,515
193 4,862,516

CLASS 464

89 4,861,313
130 4,861,314
131 4,861,315
145 4,861,316

CLASS 474

11 4,861,317
18 4,861,318
69 4,861,319
80 4,861,320
133 4,861,321
254 4,861,322
260 4,861,323

CLASS 493

48 4,861,324
124 4,861,325
359 4,861,326
415 4,861,327
470 4,861,328

CLASS 494

73 4,861,329

CLASS 501

[illegible] 4,861,733
10 4,861,734
96 4,861,735
137 4,861,736
152 4,861,737

CLASS 502

34 4,861,738
[illegible] 4,861,739
[illegible] 4,861,740
67 4,861,741
157 4,861,742
214 4,861,743
227 4,861,744
314 4,861,745
4,861,746
325 4,861,747

CLASS 503

208 4,861,748
211 4,861,749

CLASS 505

1 4,861,750
4,861,751
4,861,752
4,861,753

CLASS 514

[illegible] 4,861,754
11 4,861,755
4,861,756
21 4,861,757
25 B1 4,710,490
27 4,861,758
46 4,861,759
54 4,861,760
4,861,761
122 4,861,762
172 4,861,763
177 4,861,764
181 4,861,765
184 4,861,766
4,861,767
195 4,861,768

202 4,861,769
211 4,861,770
213 4,861,771
219 4,861,772
222.8 4,861,773
229.8 4,861,775
233.5 4,861,776
234.5 4,861,777
[illegible] 4,861,778
249 4,861,779
259 4,861,780
282 4,861,781
294 4,861,782
299.5 4,861,774
311 4,861,783
314 4,861,784
321 4,861,785
347 4,861,786
363 4,861,787
364 4,861,788
370 4,861,789
374 4,861,790
4,861,791
389 4,861,792
410 4,861,793
414 4,861,794
510 4,861,795
535 4,861,796
557 4,861,797
575 4,861,798
594 4,861,799
[illegible] 4,861,800
653 4,861,801

CLASS 518

717 4,861,802

CLASS 521

37 4,861,803
54 4,861,804

[illegible] 4,861,805

CLASS 522

66 4,861,806
99 4,861,807

CLASS 523

116 4,861,808
149 4,861,809
[illegible] 4,861,810
[illegible] 4,861,811

CLASS 524

[illegible] 4,861,812
91 4,861,813
102 4,861,814
114 4,861,815
[illegible] 4,861,816
411 4,861,817
[illegible] 4,861,818
[illegible] 4,861,819
510 4,861,820
512 4,861,821
559 4,861,822
[illegible] 4,861,823
745 4,861,824
[illegible] 4,861,825
4,861,826

CLASS 525

[illegible] 4,861,827
66 4,861,828
92 4,861,829
100 4,861,830
113 4,861,831
122 4,861,832
194 4,861,833
200 4,861,834
276 4,861,835
4,861,836

326.5 4,861,840
327.3 4,861,841
329.3 4,861,842
373 4,861,843
[illegible] 4,861,837
432 4,861,838
475 4,861,844
506 4,861,839

CLASS 526

68 4,861,845
75 4,861,846
125 4,861,847
[illegible] 4,861,848
[illegible] 4,861,849
243 4,861,850
255 4,861,851
263 4,861,852
[illegible] 4,861,853

CLASS 528

125 4,861,854
4,861,855
4,861,856
170 4,861,857
193 4,861,858
210 4,861,859
272 4,861,860
4,861,861
322 4,861,862
408 4,861,863

CLASS 530

324 4,861,864
326 4,861,865
333 4,861,866
[illegible] 4,861,867
399 4,861,868
[illegible] 4,861,869

CLASS 536

16.9 4,861,870
18.1 4,861,871
18.7 4,861,872
27 4,861,873
32 4,861,874

CLASS 540

114 4,861,875
145 4,861,876
357 4,861,877

CLASS 544

[illegible] 4,861,878
55 4,861,879
139 B1 4,656,269
B1 4,711,958
144 4,861,880
[illegible] 4,861,881
216 4,861,882
277 4,861,883
336 4,861,884
387 4,861,885

CLASS 546

16 4,861,886
150 4,861,888
170 4,861,887
183 4,861,889
[illegible] 4,861,890
185 4,861,893
194 4,861,891
219 4,861,892
251 4,861,894
353 4,861,895

CLASS 548

213 4,861,896
217 4,861,897

402 4,861,898

CLASS 549

[illegible] 4,861,899
87 4,861,900
215 4,861,901
434 4,861,903
[illegible] 4,861,902

CLASS 556

32 4,861,904
[illegible] 4,861,905
419 4,861,906
4,861,907
420 4,861,908

CLASS 558

267 4,861,909

CLASS 560

126 4,861,910
145 4,861,911
[illegible] 4,861,912

CLASS 562

427 4,861,913

CLASS 564

7 4,861,914

CLASS 568

328 4,861,915
337 4,861,916
347 4,861,917
454 4,861,918
724 4,861,919
741 4,861,920
772 4,861,921
[illegible] 4,861,922
[illegible] 4,861,923

931 4,861,924
[illegible] 4,861,925

CLASS 570

110 4,861,926
200 4,861,927
[illegible] 4,861,928
209 4,861,929

CLASS 585

317 4,861,930
[illegible] 4,861,931
412 4,861,932
415 4,861,934
417 4,861,933
474 4,861,935
[illegible] 4,861,936
640 4,861,937
4,861,938
[illegible] 4,861,939

CLASS 600

18 4,861,330

CLASS 604

9 4,861,331
22 4,861,332
35 4,861,333
49 4,861,334
88 4,861,335
95 4,861,336
[illegible] 4,861,337
110 4,861,338
118 4,861,339
141 4,861,340
175 4,861,341

CLASS 623

[illegible] Re.33,039

CLASSIFICATION OF DESIGNS

D2— 248 303,036
275 303,037
314 303,038
320 303,039
510 303,040
D3— 35 303,041
303,042
D4— 104 303,043
D6— 308 303,044
311 303,045
333 303,046
367 303,047
421 303,048
429 303,049
449 303,050
475 303,051
[illegible] 303,052
552 303,053
553 303,054
D7— 50 303,055
303,056
70 303,057
[illegible] 303,058

303,059
[illegible] 303,060
332 303,061
350 303,062
351 303,063
358 303,064
379 303,065
388 303,066
D8— [illegible] 303,067
11 303,068
24 303,069
30 303,070
33 303,071
39 303,072
[illegible] 303,073
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4,861,733	4,860,689	4,861,360	4,862,268	4,861,856	4,861,684
4,861,771	4,861,069	4,861,419	4,862,310	4,861,859	4,861,918
4,861,795	48 : 4,860,388	4,861,421	4,862,345	4,861,882	4,861,938
4,861,802	4,860,444	4,861,447	4,862,352	4,862,119	55 : 4,860,486
4,861,829	4,860,580	4,861,452	4,862,373	4,862,164	4,860,516
4,861,832	4,860,581	4,861,460	4,862,394	4,862,406	4,860,522
4,861,833	4,860,654	4,861,478	4,862,409	4,862,458	4,860,691
4,861,896	4,860,655	4,861,576	4,862,413	53 : 4,860,440	4,860,703
4,861,936	4,860,692	4,861,604	4,862,421	4,860,467	4,860,719
4,861,943	4,860,717	4,861,675	4,862,426	4,860,484	4,860,791
4,862,054	4,860,750	4,861,723	4,862,482	4,860,502	4,860,834
4,862,079	4,860,783	4,861,803	49 : 4,860,465	4,860,544	4,860,914
4,862,125	4,860,830	4,861,805	4,860,510	4,860,589	4,861,052
4,862,148	4,860,833	4,861,810	4,860,752	4,860,672	4,861,217
44 : 4,860,777	4,860,886	4,861,812	4,860,785	4,860,718	4,861,218
4,861,288	4,860,888	4,861,827	4,860,836	4,860,897	4,861,224
4,861,953	4,860,975	4,861,884	4,860,998	4,860,913	4,861,225
4,862,456	4,860,981	4,861,924	4,861,289	4,860,973	4,861,226
45 : 4,860,412	4,860,991	4,861,986	50 : 4,860,806	4,861,144	4,861,290
4,860,575	4,860,993	4,861,989	4,861,425	4,861,281	4,861,292
4,861,377	4,860,995	4,862,001	4,861,714	4,861,310	4,861,399
4,861,439	4,861,022	4,862,018	4,861,962	4,861,406	4,861,583
4,862,318	4,861,074	4,862,019	4,862,077	4,861,427	4,861,652
4,862,396	4,861,077	4,862,039	4,862,245	4,861,643	4,861,724
4,862,486	4,861,096	4,862,060	51 : 4,861,039	4,861,719	4,861,958
47 : 4,860,454	4,861,173	4,862,121	4,861,400	4,862,043	4,862,374

DESIGN PATENTS

06 : 303,038	303,154	303,043	303,104	36 : 303,036	303,146
303,053	303,161	303,048	303,112	303,052	41 : 303,039
303,055	303,166	303,058	303,153	303,070	303,102
303,056	303,169	303,059	303,171	303,071	303,118
303,068	09 : 303,065	303,069	303,172	303,072	42 : 303,044
303,078	303,089	303,103	27 : 303,075	303,087	303,136
303,106	303,093	303,108	28 : 303,061	303,098	303,150
303,107	303,096	18 : 303,046	29 : 303,074	303,129	44 : 303,167
303,120	303,097	303,073	303,099	303,142	303,168
303,125	303,114	303,105	303,126	303,143	48 : 303,067
303,127	12 : 303,054	303,115	32 : 303,137	303,164	49 : 303,057
303,133	303,116	19 : 303,081	33 : 303,042	303,165	51 : 303,082
303,138	303,148	303,113	303,045	37 : 303,049	53 : 303,135
303,140	303,158	24 : 303,134	34 : 303,080	303,051	54 : 303,155
303,144	13 : 303,084	25 : 303,088	303,085	39 : 303,050	55 : 303,066
303,151	303,159	303,156	303,111	303,090	
303,152	17 : 303,040	26 : 303,101	303,145	303,139	303,162

PLANT PATENTS

06 : 7,003	7,009	36 : 7,002	39 : 7,004		

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